

HUAWEI NE20E-S Universal Service Router

Hardware Description

Issue

Date

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1 About This Document

Purpose

This document describes hardware features of the NE20E, which helps intended readers obtain detailed information about each chassis, board, and cable, and rapidly locate specific information through lists of components.



NOTE

The pictures in this document are for your reference only, the hardware components please make the object as the standard.

Related Version

The following table lists the product version related to this document.

| Product Name | Version |
|----------------|-------------|
| NE20E-S Series | V800R010C00 |
| U2000 | V200R017C60 |

Intended Audience

This document is intended for:

- Network planning engineers
- Hardware installation engineers
- Commissioning engineers
- On-site maintenance engineers
- System maintenance engineers

Security Declaration

- Encryption algorithm declaration
The encryption algorithms DES/3DES/SKIPJACK/RC2/RSA (RSA-1024 or lower)/MD2/MD4/MD5 (in digital signature scenarios and password encryption)/SHA1 (in digital signature scenarios) have a low security, which may bring security risks. If

protocols allowed, using more secure encryption algorithms, such as AES/RSA (RSA-2048 or higher)/SHA2/HMAC-SHA2 is recommended.

- Password configuration declaration
 - Do not set both the start and end characters of a password to "%^%#". This causes the password to be displayed directly in the configuration file.
 - To further improve device security, periodically change the password.
- Personal data declaration

Your purchased products, services, or features may use users' some personal data during service operation or fault locating. You must define user privacy policies in compliance with local laws and take proper measures to fully protect personal data.
- Feature declaration
 - The NetStream feature may be used to analyze the communication information of terminal customers for network traffic statistics and management purposes. Before enabling the NetStream feature, ensure that it is performed within the boundaries permitted by applicable laws and regulations. Effective measures must be taken to ensure that information is securely protected.
 - The mirroring feature may be used to analyze the communication information of terminal customers for a maintenance purpose. Before enabling the mirroring function, ensure that it is performed within the boundaries permitted by applicable laws and regulations. Effective measures must be taken to ensure that information is securely protected.
 - The packet header obtaining feature may be used to collect or store some communication information about specific customers for transmission fault and error detection purposes. Huawei cannot offer services to collect or store this information unilaterally. Before enabling the function, ensure that it is performed within the boundaries permitted by applicable laws and regulations. Effective measures must be taken to ensure that information is securely protected.
- Reliability design declaration

Network planning and site design must comply with reliability design principles and provide device- and solution-level protection. Device-level protection includes planning principles of dual-network and inter-board dual-link to avoid single point or single link of failure. Solution-level protection refers to a fast convergence mechanism, such as FRR and VRRP.






Special Declaration

- This document serves only as a guide. The content is written based on device information gathered under lab conditions. The content provided by this document is intended to be taken as general guidance, and does not cover all scenarios. The content provided by this document may be different from the information on user device interfaces due to factors such as version upgrades and differences in device models, board restrictions, and configuration files. The actual user device information takes precedence over the content provided by this document. The preceding differences are beyond the scope of this document.
- The maximum values provided in this document are obtained in specific lab environments (for example, only a certain type of board or protocol is configured on a tested device). The actually obtained maximum values may be different from the maximum values provided in this document due to factors such as differences in hardware configurations and carried services.
- Interface numbers used in this document are examples. Use the existing interface numbers on devices for configuration.

- The pictures of hardware in this document are for reference only.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

| Symbol | Description |
|--|---|
|  DANGER | Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. |
|  WARNING | Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. |
|  CAUTION | Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. |
|  NOTICE | Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury. |
|  NOTE | Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration. |

Change History

Updates between document issues are cumulative. Therefore, the latest document issue contains all updates made in previous issues.

- **Changes in Issue 01 (2017-09-10)**
This issue is the first official release. The software version of this issue is V800R010C00.

2 Technical Specifications

| Item | NE20E-S4 | NE20E-S8 | NE20E-S16 | NE20E-S8A | NE20E-S16 A |
|-----------------------------|---|---|--|---|--|
| Dimensions (H x W x D) | <ul style="list-style-type: none"> DC: 132 mm x 220 mm x 442 mm (5.2 in. x 8.66 in. x 8.66 in.)(3U) AC: 175 mm x 220 mm x 442 mm (6.89 in. x 8.66 in. x 8.66 in.)(4U) | <ul style="list-style-type: none"> DC: 222 mm x 220 mm x 442 mm (8.74 in. x 8.66 in. x 8.66 in.)(5U) AC: 264 mm x 220 mm x 442 mm (10.39 in. x 8.66 in. x 8.66 in.)(6U) | 353 mm x 220 mm x 442 mm (13.9 in. x 8.66 in. x 8.66 in.)(8U) | <ul style="list-style-type: none"> DC: 222 mm x 220 mm x 442 mm (8.74 in. x 8.66 in. x 8.66 in.)(5U) AC: 264 mm x 220 mm x 442 mm (10.39 in. x 8.66 in. x 8.66 in.)(6U) | 353 mm x 220 mm x 442 mm (13.9 in. x 8.66 in. x 8.66 in.)(8U) |
| Weight (empty) | <ul style="list-style-type: none"> DC:4.4 kg (9.68 lb) AC:5.5 kg (12.13 lb) | <ul style="list-style-type: none"> DC:7.1 kg (15.66 lb) AC:8.5 kg (18.74 lb) | 11.5 kg (25.36 lb) | <ul style="list-style-type: none"> DC:7.1 kg (15.66 lb) AC:8.5 kg (18.74 lb) | 11.5 kg (25.36 lb) |
| Weight (full configuration) | <ul style="list-style-type: none"> DC:13.7 kg (30.21 lb) AC:18.1 kg (39.91 lb) | <ul style="list-style-type: none"> [NSP-A]: DC:21.5 kg (47.41 lb) [NSP-A]: AC:26.5 kg (58.43 lb) [NSP-C]: DC:24.1 kg (53.14 lb) [NSP-C]: AC:28.8 kg (63.5 lb) | <ul style="list-style-type: none"> [NSP-A]: DC:32.6 kg (71.88 lb) [NSP-A]: AC:34.6 kg (76.29 lb) [NSP-C]: DC:34.8 kg (76.73 lb) [NSP-C]: AC:36.8 | <ul style="list-style-type: none"> [NSP-A]: DC:21.6 kg (47.63 lb) [NSP-A]: AC:26.5 kg (58.43 lb) [NSP-C]: DC:24.5 kg (54.02 lb) [NSP-C]: AC:29.1 | <ul style="list-style-type: none"> [NSP-A]: DC:32.6 kg (71.79 lb) [NSP-A]: AC:34.5 kg (76.07 lb) [NSP-C]: DC:35.4 kg (77.97 lb) [NSP-C]: AC:37.3 |

| Item | NE20E-S4 | NE20E-S8 | NE20E-S16 | NE20E-S8A | NE20E-S16 A |
|-------------------------------|--|--|--|--|---|
| | | | kg (81.14 lb) | kg (64.17 lb) | kg (82.25 lb) |
| Cabinet installation standard | ETSI 21-inch; IEC 19-inch | ETSI 21-inch; IEC 19-inch | ETSI 21-inch; IEC 19-inch | ETSI 21-inch; IEC 19-inch | ETSI 21-inch; IEC 19-inch |
| Typical power consumption | <ul style="list-style-type: none"> DC:398 W AC:456 W | <ul style="list-style-type: none"> DC:645 W(NSP-A full configuration) AC:703 W(NSP-A full configuration) | <ul style="list-style-type: none"> DC:696 W(NSP-A full configuration) AC:740 W(NSP-A full configuration) | 1010W(NSP-C full configuration) | 1072 W(NSP-C full configuration) |
| Typical heat dissipation | <ul style="list-style-type: none"> DC:1291.3 BTU/hour AC:1479.5 BTU/hour | <ul style="list-style-type: none"> DC:2092.7 BTU/hour(NSP-A full configuration) AC:2280.8 BTU/hour(NSP-A full configuration) | <ul style="list-style-type: none"> DC:2258.1 BTU/hour(NSP-A full configuration) AC:2400.9 BTU/hour(NSP-A full configuration) | 3276.9 BTU/hour(NSP-C full configuration) | 3478 BTU/hour(NSP-C full configuration) |
| DC input voltage | <ul style="list-style-type: none"> input voltage range:-40 V to -72V input rated voltage:-48V/-60V | <ul style="list-style-type: none"> input voltage range:-40V to -72V input rated voltage:-48 V/-60V | <ul style="list-style-type: none"> input voltage range:-40 V to -72V input rated voltage:-48V/-60V | <ul style="list-style-type: none"> input voltage range:-40 V to -72V input rated voltage:-48V/-60V | <ul style="list-style-type: none"> input voltage range:-40 V to -72V input rated voltage:-48V/-60 V |
| AC input voltage | <ul style="list-style-type: none"> input voltage range:180 V-264V input rated voltage:20 | <ul style="list-style-type: none"> input voltage range:180V to 264V input rated voltage:200 | <ul style="list-style-type: none"> input voltage range:180 V to 264V input rated | <ul style="list-style-type: none"> input voltage range:180 V to 264V input rated voltage:20 | <ul style="list-style-type: none"> input voltage range:180 V to 264V input |

| Item | NE20E-S4 | NE20E-S8 | NE20E-S16 | NE20E-S8A | NE20E-S16A |
|------------------------|--|--|--|--|--|
| | 0V-240V/100V-127V(dual-live-wire) | V-240V/100V-127V(dual-live-wire) | voltage:200V-240V/100V-127V(dual-live-wire) | 0V-240V/100V-127V(dual-live-wire) | rated voltage:200V-240V/100V-127V(dual-live-wire) |
| MTBF | 31.07 years | 138.61 years | 138.61 years | 138.61 years | 138.61 years |
| MTTR | 0.5 hours | 0.5 hours | 0.5 hours | 0.5 hours | 0.5 hours |
| Availability | 0.999998163 | 0.999999588 | 0.999999588 | 0.999999588 | 0.999999588 |
| Slot quantity | 4 | 8 | 16 | 8 | 16 |
| Processing unit | <ul style="list-style-type: none"> • MPUE:single-core1.2 G • MPUE1:eight-core1.5 G | <ul style="list-style-type: none"> • MPUE:single-core1.2 G • MPUE1:eight-core1.5 G | <ul style="list-style-type: none"> • MPUE:single-core1.2 G • MPUE1:eight-core1.5 G | MPUE1:eight-core1.5 G | MPUE1:eight-core1.5 G |
| Flash | MPU:16 MB | MPU:16 MB | MPU:16 MB | MPU:16 MB | MPU:16 MB |
| SDRAM | <ul style="list-style-type: none"> • MPUE:2 GB • MPUE1:8 GB | <ul style="list-style-type: none"> • MPUE:2 GB • MPUE1:8 GB | <ul style="list-style-type: none"> • MPUE:2 GB • MPUE1:8 GB | • MPUE1:8 GB | • MPUE1:8 GB |
| Storage | 2GB, eUSB | 2 GB, eUSB | 2 GB, eUSB | 2 GB, eUSB | 2 GB, eUSB |
| Redundant MPUs | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 |
| Redundant NSPs | 1 | 1:1 | 1:1 | 1:1 | 1:1 |
| Redundant fans | The device can work properly for a short time at 40 ℃ if a single fan fails. | The device can work properly for a short time at 40 ℃ if a single fan fails. | The device can work properly for a short time at 40 ℃ if a single fan fails. | The device can work properly for a short time at 40 ℃ if a single fan fails. | The device can work properly for a short time at 40 ℃ if a single fan fails. |
| Redundant power supply | 1+1 | 1+1 | 1+1 | 1+1 | 1+1 |

| Item | NE20E-S4 | NE20E-S8 | NE20E-S16 | NE20E-S8A | NE20E-S16 A |
|------------------------|--|--|--|--|--|
| Forwarding performance | <ul style="list-style-type: none"> • 50 Mpps(NS P-50) • 180 Mpps(NS P-120) • 180 Mpps(NS P-A/B) | <ul style="list-style-type: none"> • 50 Mpps(NSP-50) • 180 Mpps(NSP-120) • 180 Mpps(NSP-A/B) • 360 Mpps(NSP-C) | <ul style="list-style-type: none"> • 50 Mpps(NS P-50) • 180 Mpps(NS P-120) • 180 Mpps(NS P-A/B) • 360 Mpps(NS P-C) | <ul style="list-style-type: none"> • 50 Mpps(NS P-50) • 180 Mpps(NS P-120) • 180 Mpps(NS P-A/B) • 360 Mpps(NS P-C) | <ul style="list-style-type: none"> • 50 Mpps(NS P-50) • 180 Mpps(NS P-120) • 180 Mpps(NS P-A/B) • 360 Mpps(NS P-C) |
| Switching capacity | <ul style="list-style-type: none"> • 100 Gbps(NSP-50) • 240 Gbps(NSP-120) • 240 Gbps(NSP-A) • 480 Gbps(NSP-B) | <ul style="list-style-type: none"> • 100 Gbps(NSP-50) • 240 Gbps(NSP-120) • 240 Gbps(NSP-A) • 480 Gbps(NSP-B) • 960 Gbps(NSP-C) | <ul style="list-style-type: none"> • 100 Gbps(NS P-50) • 240 Gbps(NS P-120) • 240 Gbps(NS P-A) • 480 Gbps(NS P-B) • 960 Gbps(NS P-C) | <ul style="list-style-type: none"> • 100 Gbps(NSP-50) • 240 Gbps(NSP-120) • 240 Gbps(NSP-A) • 480 Gbps(NSP-B) • 960 Gbps(NSP-C) | <ul style="list-style-type: none"> • 100 Gbps(NS P-50) • 240 Gbps(NS P-120) • 240 Gbps(NS P-A) • 480 Gbps(NS P-B) • 960 Gbps(NS P-C) |
| Operating temperature | <ul style="list-style-type: none"> • Long-term: 0 °C to 45 °C (32 °F to 113 °F) • Short-term: -5 °C to 55 °C (23 °F to 131 °F) • Enhance: DC:-40 °C to 65 °C, -20 °C start • Remark:Restriction on the temperature | <ul style="list-style-type: none"> • Long-term: 0 °C to 45 °C (32 °F to 113 °F) • Short-term: -5 °C to 55 °C (23 °F to 131 °F) • Enhance: DC:-40 °C to 65 °C, -20 °C start • Remark:Restriction on the temperature variation rate: | <ul style="list-style-type: none"> • Long-term: 0 °C to 45 °C (32 °F to 113 °F) • Short-term: -5 °C to 55 °C (23 °F to 131 °F) • Remark:Restriction on the temperature variation rate: 30 °C/hour | <ul style="list-style-type: none"> • Long-term: 0 °C to 45 °C (32 °F to 113 °F) • Short-term: -5 °C to 55 °C (23 °F to 131 °F) • Enhance: DC: -5 °C to 65 °C • Remark:Restriction on the temperature variation rate: | <ul style="list-style-type: none"> • Long-term: 0 °C to 45 °C (32 °F to 113 °F) • Short-term: -5 °C to 55 °C (23 °F to 131 °F) • Remark:Restriction on the temperature variation rate: 30 °C/hour |

| Item | NE20E-S4 | NE20E-S8 | NE20E-S16 | NE20E-S8A | NE20E-S16A |
|------------------------------|---|---|---|---|---|
| | variation rate: 30 °C/hour | 30 °C/hour | | 30 °C/hour | |
| Storage temperature | -40 °C to 70 °C (-40 °F to 158 °F) | -40 °C to 70 °C (-40 °F to 158 °F) | -40 °C to 70 °C (-40 °F to 158 °F) | -40 °C to 70 °C (-40 °F to 158 °F) | -40 °C to 70 °C (-40 °F to 158 °F) |
| Relative operating humidity | <ul style="list-style-type: none"> Long-term: 5% to 85% RH, non-condensing Short-term: 5% to 95% RH, non-condensing | <ul style="list-style-type: none"> Long-term: 5% to 85% RH, non-condensing Short-term: 5% to 95% RH, non-condensing | <ul style="list-style-type: none"> Long-term: 5% to 85% RH, non-condensing Short-term: 5% to 95% RH, non-condensing | <ul style="list-style-type: none"> Long-term: 5% to 85% RH, non-condensing Short-term: 5% to 95% RH, non-condensing | <ul style="list-style-type: none"> Long-term: 5% to 85% RH, non-condensing Short-term: 5% to 95% RH, non-condensing |
| Relative storage humidity | 5% to 95% RH, non-condensing | 5% to 95% RH, non-condensing | 5% to 95% RH, non-condensing | 5% to 95% RH, non-condensing | 5% to 95% RH, non-condensing |
| Long-term operating altitude | 3000m @ 40 °C | 3000m @ 40 °C | 3000m @ 40 °C | 3000m @ 40 °C | 3000m @ 40 °C |
| Storage altitude | < 5000 m | < 5000 m | < 5000 m | < 5000 m | < 5000 m |

3 Product Compatibility

The supported items of boards list in the Table 3-1 ("●" indicates supported items, "-" indicates unsupported items).

Table 3-1 Mapping products and versions

| BO M | Module | Descript ion | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|------------------|--|--------------|--------------|---------------|---------------|----------------|
| 030 30Q CX | CR2D00 MPUE10 | 7.2.2 Main Processin g Unit E | ● | ● | ● | - | - |
| 030 31E DQ | CR2D0M PUE110 | 7.2.3 Main Processin g Unit E1 | ● | ● | ● | ● | ● |
| 030 30Q GY | CR2D0N SP5010 | 7.3.2 Network Service Processor (NSP-50) | ● | ● | ● | ● | ● |
| 030 30Q HA | CR2DNS PE5010 | 7.3.3 Network Service Processor (NSP-50- E) | ● | ● | ● | ● | ● |
| 030 30R FH | CR2DNS P12010 | 7.3.4 Network Service Processor (NSP-12 0) | ● | ● | ● | ● | ● |
| 030 30R FG | CR2DNS P1201E | 7.3.5 Network Service | ● | ● | ● | ● | ● |

| BO M | Module | Description | NE20E-S4 | NE20E-S8 | NE20E-S16 | NE20E-S8A | NE20E-S16A |
|------------------|------------------|---|----------|----------|-----------|-----------|------------|
| | | Processor (NSP-120-E) | | | | | |
| 030 31D BV | CR2DNS PA0010 | 7.3.6 Network Service Processor (NSP-A) | • | • | • | • | • |
| 030 31D BX | CR2DNS PB0010 | 7.3.7 Network Service Processor (NSP-B) | • | • | • | • | • |
| 030 31Y CJ | CR2DNS PC0010 | 7.3.8 Network Service Processor (NSP-C) | - | • | • | • | • |
| 030 32A ML | CR2D00 E1NC10 | 7.4.6 1-Port 100GBas e-CFP2 Physical Interface Card(PIC) | - | - | • | • | • |
| 030 32A MM | CR2D00 LAXF10 | 7.4.7 10-Port 10GBase LAN/W AN-SFP + Physical Interface Card(PIC) | - | - | • | • | • |
| 030 31L PW | CR2D00 E1MF70 | 7.4.22 1-Port 40GBase -CFP Physical Interface Card(PIC) | • | • | • | • | • |
| 030 31D JP | CR2D00 L4XF11 | 7.4.25 4-Port 10GBase | • | • | • | • | • |

| BO M | Module | Descript ion | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|------------------|--|--------------|--------------|---------------|---------------|----------------|
| | | LAN/W AN-SFP + Physical Interface Card | | | | | |
| 030 31D JQ | CR2DL1 XE8G11 | 7.4.26 1-Port 10GBase LAN/W AN-SFP + + 8-Port 100/1000 Base-X-S FP Physical Interface Card | • | • | • | • | • |
| 030 30W GQ | CR2D00 L2XF12 | 7.4.27 2-Port 10GBase LAN/W AN-SFP + Physical Interface Card | • | • | • | • | • |
| 030 32C RN | CR2D0L 2XFH11 | 7.4.38 2-Port 10GBase LAN/W AN-SFP + Physical Interface Card H | • | • | • | • | • |
| 030 31D HB | CR2D00 E8GE12 | 7.4.23 8-Port 100/1000 Base-RJ4 5 Physical Interface Card | • | • | • | • | • |
| 030 31D JK | CR2D00 EAGF10 | 7.4.24 10-Port 100/1000 Base-X-S | • | • | • | • | • |

| BO M | Module | Descript ion | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|----------------------|---|--------------|--------------|---------------|---------------|----------------|
| | | FP Physical Interface Card | | | | | |
| 030 32C RP | CR2D0E 8GFH10 | 7.4.39 8-Port 100/1000 Base-X-S FP Physical Interface Card H | • | • | • | • | • |
| 030 31X CH | CR2D00 EEGF10 | 7.4.40 20-Port 100/1000 Base-X-S FP Physical Interface Card | - | - | • | - | • |
| 030 30R JQ | CR5D08 CWDM7 0 | 7.4.37 8-Channe l CWDM Multiple xing & Demultip lexing (1471/14 91/1511/ 1531/155 1/1571/1 591/1611 nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 32E EY | CR5D1D MD1M0 1 | 7.4.8 Bidirecti onal 1-Channe l CWDM Optical Add/Dro p Multiple xing (1471nm) | • | • | • | • | • |

| BO M | Module | Descript ion | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|----------------------|--|--------------|--------------|---------------|---------------|----------------|
| | | Physical Interface Card(PIC) | | | | | |
| 030 32E FA | CR5D1D MD1M0 2 | 7.4.9 Bidirecti onal 1-Channe l CWDM Optical Add/Dro p Multiple xing (1491nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 32E FB | CR5D1D MD1M0 3 | 7.4.10 Bidirecti onal 1-Channe l CWDM Optical Add/Dro p Multiple xing (1511nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 32E FC | CR5D1D MD1M0 4 | 7.4.11 Bidirecti onal 1-Channe l CWDM Optical Add/Dro p Multiple xing (1531nm) Physical Interface | • | • | • | • | • |

| BO M | Module | Descript ion | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|----------------------|--|--------------|--------------|---------------|---------------|----------------|
| | | Card(PIC) | | | | | |
| 030 32E FD | CR5D1D MD1M0 5 | 7.4.12 Bidirecti onal 1-Channe l CWDM Optical Add/Dro p Multiple xing (1551nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 32E FE | CR5D1D MD1M0 6 | 7.4.13 Bidirecti onal 1-Channe l CWDM Optical Add/Dro p Multiple xing (1571nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 32E FF | CR5D1D MD1M0 7 | 7.4.14 Bidirecti onal 1-Channe l CWDM Optical Add/Dro p Multiple xing (1591nm) Physical Interface Card(PIC) | • | • | • | • | • |

| BO M | Module | Description | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|----------------------|--|--------------|--------------|---------------|---------------|----------------|
| 030 32E FG | CR5D1D MD1M0 8 | 7.4.15 Bidirectional 1-Channel 1 CWDM Optical Add/Drop Multiplexing (161nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 32E FH | CR5D2D MD2M0 1 | 7.4.16 Bidirectional 2-Channel 1 CWDM Optical Add/Drop Multiplexing (1471/1491nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 32E FJ | CR5D2D MD2M0 2 | 7.4.17 Bidirectional 2-Channel 1 CWDM Optical Add/Drop Multiplexing (1511/1531nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 32E | CR5D2D MD2M0 | 7.4.18 Bidirectional | • | • | • | • | • |

| BO M | Module | Descript ion | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|----------------------|---|--------------|--------------|---------------|---------------|----------------|
| FK | 3 | onal 2-Channe 1 CWDM Optical Add/Dro p Multiple xing (1551/15 71nm) Physical Interface Card(PIC) | | | | | |
| 030 32E FL | CR5D2D MD2M0 4 | 7.4.19 Bidirecti onal 2-Channe 1 CWDM Optical Add/Dro p Multiple xing (1591/16 11nm) Physical Interface Card(PIC) | • | • | • | • | • |
| 030 30Q CQ | CR2D00 0IE110 | 7.4.29 32-Port E1 Physical Interface Card(75o hm) | • | • | • | • | • |
| 030 30Q CP | CR2D00 0IE111 | 7.4.30 32-Port E1 Physical Interface Card(120 ohm) | • | • | • | • | • |
| 030 30R FA | CR2D00 0DE110 | 7.4.31 16-Port E1 Physical Interface | • | • | • | • | • |

| BO M | Module | Descript ion | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|------------------|--|--------------|--------------|---------------|---------------|----------------|
| | | Card(75ohm) | | | | | |
| 030 30R EY | CR2D00 0DE111 | 7.4.32 16-Port E1 Physical Interface Card(120 ohm) | • | • | • | • | • |
| 030 31W DR | CR2D00 A2CF10 | 7.4.41 2-Port OC-3c/S TM-1c ATM-SFP Physical Interface Card | - | - | • | - | • |
| 030 30Q CN | CR2D00 C4CF11 | 7.4.28 4-Port Channeli zed STM-1c POS-SFP Physical Interface Card(PIC) | • | • | • | • | • |
| 030 30R ET | CR2D00 P4CF11 | 7.4.33 4-Port OC-3c/S TM-1c POS-SFP Physical Interface Card | • | • | • | • | • |
| 030 31D KA | CR2DP2 C1HF11 | 7.4.34 2-Port OC-3c/S TM-1c (or 1-Port OC-12c/ STM-4C) POS-SFP Physical Interface Card | • | • | • | • | • |
| 030 | CR2D00 | 7.4.35 | • | • | • | • | • |

| BO M | Module | Description | NE20E- S4 | NE20E- S8 | NE20E- S16 | NE20E- S8A | NE20E- S16A |
|------------------|------------------|--|--------------|--------------|---------------|---------------|----------------|
| 31D KB | C1CF11 | 1-Port Channeli zed STM-1c POS-SFP Physical Interface Card | | | | | |
| 030 30M ER | CR5D00 AUXQ10 | 7.4.36 Auxiliary Flexible Interface Card with 4-Port 100Base- RJ45 (FIC,Sup porting 1588v2) | • | • | • | • | • |

The supported items of boards list in the Table 3-2 ("•" indicates supported items, "-" indicates unsupported items).

Table 3-2 Mapping products and versions

| B O M | Modu le | Descr iption | NSP-5 0 | NSP-5 0-E | NSP-1 20 | NSP-1 20-E | NSP- A | NSP- B | NSP- C |
|--------------------------|----------------------|--|------------|--------------|-------------|---------------|-----------|-----------|-----------|
| 03 03 2A M L | CR2D 00E1N C10 | 7.4.6 1-Port 100GB ase-CF P2 Physic al Interfa ce Card(P IC) | - | - | - | - | - | - | • |
| 03 03 2A M M | CR2D 00LA XF10 | 7.4.7 10-Port 10GBa se LAN/ WAN- SFP+ | - | - | - | - | - | - | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|--------------|--------------|---|--------|----------|---------|-----------|-------|-------|-------|
| | | Physical Interface Card(PIC) | | | | | | | |
| 03031L PW | CR2D00E1MF70 | 7.4.22 1-Port 40Gb ase-CF P Physical Interfa ce Card(P IC) | - | - | • | • | • | • | • |
| 03031D JP | CR2D00L4XF11 | 7.4.25 4-Port 10Gb ase LAN/ WAN- SFP+ Physic al Interfa ce Card | • | • | • | • | • | • | • |
| 03031D JQ | CR2DL1XE8G11 | 7.4.26 1-Port 10Gb ase LAN/ WAN- SFP+ + 8-Port 100/10 00Bas e-X-S FP Physic al Interfa ce Card | • | • | • | • | • | • | • |
| 03 | CR2D | 7.4.27 | • | • | • | • | • | • | • |

| B O M | Modu le | Descr iption | NSP-5 0 | NSP-5 0-E | NSP-1 20 | NSP-1 20-E | NSP- A | NSP- B | NSP- C |
|--------------------------|----------------------|---|------------|--------------|-------------|---------------|-----------|-----------|-----------|
| 03 0 W G Q | 00L2X F12 | 2-Port 10GBa se LAN/ WAN- SFP+ Physic al Interfa ce Card | | | | | | | |
| 03 03 2C R N | CR2D 0L2XF H11 | 7.4.38 2-Port 10GBa se LAN/ WAN- SFP+ Physic al Interfa ce Card H | - | - | - | - | • | • | • |
| 03 03 1D H B | CR2D 00E8G E12 | 7.4.23 8-Port 100/10 00Bas e-RJ45 Physic al Interfa ce Card | • | • | • | • | • | • | • |
| 03 03 1D JK | CR2D 00EA GF10 | 7.4.24 10-Port 100/10 00Bas e-X-S FP Physic al Interfa ce Card | • | • | • | • | • | • | • |
| 03 03 | CR2D 0E8GF | 7.4.39 8-Port | - | - | - | - | • | • | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|--------------------------|------------------|---|--------|----------|---------|-----------|-------|-------|-------|
| 2C RP | H10 | 100/1000Base-X-SFP Physical Interface Card H | | | | | | | |
| 03 03 1X C H | CR2D00EE GF10 | 7.4.4020-Port 100/1000Base-X-SFP Physical Interface Card | - | - | • | • | • | • | • |
| 03 03 0R JQ | CR5D08CW DM70 | 7.4.378-Channel CWD M Multiplexing & Demultiplexing (1471/1491/1511/1551/1571/1591/1611nm) Physical Interface Card(PIC) | • | • | • | • | • | • | • |
| 03 03 | CR5D1DMD | 7.4.8 Bidire | • | • | • | • | • | • | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|----------------------|----------------------|--|--------|----------|---------|-----------|-------|-------|-------|
| 2E EY | 1M01 | ctional 1-Channel CWD M Optical Add/Drop Multiplexing (1471nm) Physical Interface Card(PIC) | | | | | | | |
| 03 03 2E FA | CR5D 1DMD 1M02 | 7.4.9 Bidirectional 1-Channel CWD M Optical Add/Drop Multiplexing (1491nm) Physical Interface Card(PIC) | • | • | • | • | • | • | • |
| 03 03 2E FB | CR5D 1DMD 1M03 | 7.4.10 Bidirectional 1-Channel CWD M Optical Add/D | • | • | • | • | • | • | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|----------|--------------|---|--------|----------|---------|-----------|-------|-------|-------|
| | | rop Multiplexing (151nm) Physical Interface Card(PIC) | | | | | | | |
| 03032EFC | CR5D1DMD1M04 | 7.4.11 Bidirectional 1-Channel CWD M Optical Add/Drop Multiplexing (153nm) Physical Interface Card(PIC) | • | • | • | • | • | • | • |
| 03032EFD | CR5D1DMD1M05 | 7.4.12 Bidirectional 1-Channel CWD M Optical Add/Drop Multiplexing (155nm) Physical Interface | • | • | • | • | • | • | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|-------------|--------------|--|--------|----------|---------|-----------|-------|-------|-------|
| | | ce Card(PIC) | | | | | | | |
| 03032E2E FE | CR5D1DMD1M06 | 7.4.13 Bidirectional 1-Channel CWD M Optical Add/Drop Multiplexing (1571nm) Physical Interface Card(PIC) | • | • | • | • | • | • | • |
| 03032E2E FF | CR5D1DMD1M07 | 7.4.14 Bidirectional 1-Channel CWD M Optical Add/Drop Multiplexing (1591nm) Physical Interface Card(PIC) | • | • | • | • | • | • | • |
| 03032E2E FG | CR5D1DMD1M08 | 7.4.15 Bidirectional 1-Channel | • | • | • | • | • | • | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|----------|--------------|--|--------|----------|---------|-----------|-------|-------|-------|
| | | nnel CWD M Optical Add/Drop Multiplexing (161nm) Physical Interface Card(PIC) | | | | | | | |
| 03032EFH | CR5D2DMD2M01 | 7.4.16 Bidirectional 2-Channel CWD M Optical Add/Drop Multiplexing (1471/1491nm) Physical Interface Card(PIC) | • | • | • | • | • | • | • |
| 03032EFJ | CR5D2DMD2M02 | 7.4.17 Bidirectional 2-Channel CWD M Optical Add/Drop | • | • | • | • | • | • | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|----------|--------------|---|--------|----------|---------|-----------|-------|-------|-------|
| | | Multiplexing (1511/1531nm) Physical Interface Card(PIC) | | | | | | | |
| 03032EFK | CR5D2DMD2M03 | 7.4.18 Bidirectional 2-Channel CWD M Optical Add/Drop Multiplexing (1551/1571nm) Physical Interface Card(PIC) | • | • | • | • | • | • | • |
| 03032EFL | CR5D2DMD2M04 | 7.4.19 Bidirectional 2-Channel CWD M Optical Add/Drop Multiplexing (1591/1611nm) Physical | • | • | • | • | • | • | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|-----------|--------------|---|--------|----------|---------|-----------|-------|-------|-------|
| | | al Interface Card(PIC) | | | | | | | |
| 03030Q0CQ | CR2D000IE110 | 7.4.29 32-Port E1 Physical Interface Card(75ohm) | • | • | • | • | • | • | • |
| 03030Q0CP | CR2D000IE111 | 7.4.30 32-Port E1 Physical Interface Card(120ohm) | • | • | • | • | • | • | • |
| 03030R0FA | CR2D000DE110 | 7.4.31 16-Port E1 Physical Interface Card(75ohm) | • | • | • | • | • | • | • |
| 03030R0EY | CR2D000DE111 | 7.4.32 16-Port E1 Physical Interface Card(120ohm) | • | • | • | • | • | • | • |
| 03031WD | CR2D00A2CF10 | 7.4.41 2-Port OC-3c/STM-1c | - | - | • | • | • | • | - |

| B O M | Modu le | Descr iption | NSP-5 0 | NSP-5 0-E | NSP-1 20 | NSP-1 20-E | NSP- A | NSP- B | NSP- C |
|--------------------------|----------------------|--|------------|--------------|-------------|---------------|-----------|-----------|-----------|
| R | | ATM-SFP Physical Interface Card | | | | | | | |
| 03 03 0Q C N | CR2D 00C4C F11 | 7.4.28 4-Port Chann elized STM-1 c POS-S FP Physic al Interfa ce Card(P IC) | • | • | • | • | • | • | • |
| 03 03 0R E T | CR2D 00P4C F11 | 7.4.33 4-Port OC-3c /STM- 1c POS-S FP Physic al Interfa ce Card | • | • | • | • | • | • | • |
| 03 03 1D K A | CR2D P2C1 HF11 | 7.4.34 2-Port OC-3c /STM- 1c (or 1-Port OC-12 c/STM -4C) POS-S FP Physic al Interfa ce Card | • | • | • | • | • | • | • |

| BOM | Module | Description | NSP-50 | NSP-50-E | NSP-120 | NSP-120-E | NSP-A | NSP-B | NSP-C |
|----------|--------------|---|--------|----------|---------|-----------|-------|-------|-------|
| 03031DKB | CR2D00C1CF11 | 7.4.35 1-Port Channelized STM-1c POS-SFP Physical Interface Card | • | • | • | • | • | • | - |
| 03030MER | CR5D00AUXQ10 | 7.4.36 Auxiliary Flexible Interface Card with 4-Port 100Base-RJ45 (FIC, Supporting 1588v2) | • | • | • | • | • | • | • |

4 Chassis

About This Chapter

- 4.1 NE20E-S4
- 4.2 NE20E-S8
- 4.3 NE20E-S8A
- 4.4 NE20E-S16
- 4.5 NE20E-S16A

4.1 NE20E-S4

Overview

Table 4-1 Device attributes

| Product Type | Description | BOM | Model | Earliest Software Version |
|--------------|---|----------|--------------|---------------------------|
| NE20E-S4 DC | NE20E-S4 Integrated DC Chassis Components | 02355528 | CR2B0BKP0410 | V800R005C00 |
| NE20E-S4 AC | NE20E-S4 Integrated AC Chassis Components | 02350DCV | CR2B0BKP0411 | V800R007C00 |

Appearance

Figure 4-1 Appearance (DC)

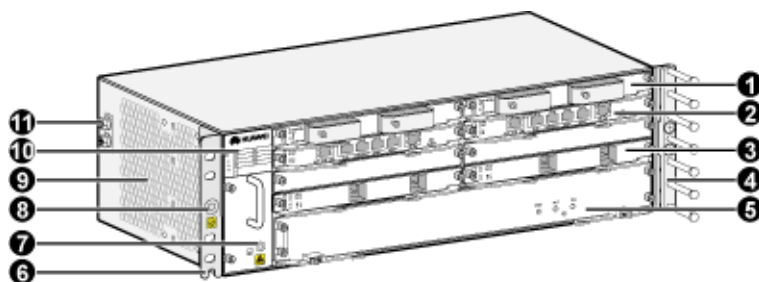


Figure 4-2 Appearance (AC)

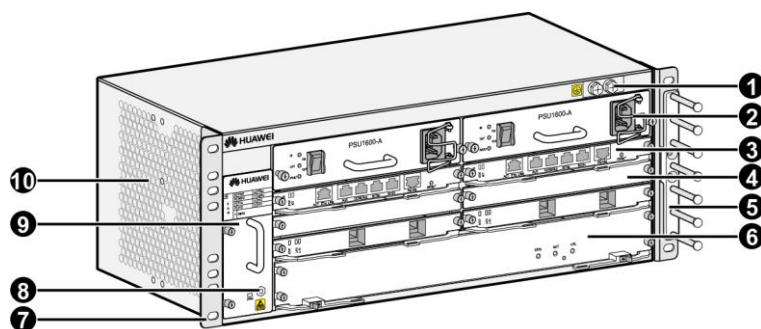


Components

Figure 4-3 Components (DC)



- | | | | |
|--------------------|----------------------|------------------------|-----------------------|
| 1. PSU | 2. MPU | 3. PIC | 4. Cable tray |
| 5. NSP | 6. Rack-mounting ear | 7. ESD jack | 8. Grounding Terminal |
| 9. Air intake vent | 10. Fan module | 11. Grounding Terminal | - |

Figure 4-4 Components (AC)

- | | | | |
|-----------------------|---------------------|----------------------|-------------|
| 1. Grounding Terminal | 2. PSU | 3. MPU | 4. PIC |
| 5. Cable tray | 6. NSP | 7. Rack-mounting ear | 8. ESD jack |
| 9. Fan module | 10. Air intake vent | - | - |

Slot Layout

Figure 4-5 Slot layout

| | | |
|-----------|-------|-------|
| 10 FAN | 8 PSU | 9 PSU |
| | 6 MPU | 7 MPU |
| | 3 PIC | 4 PIC |
| | 1 PIC | 2 PIC |
| | 5 NSP | |

Table 4-2 Description of slot layout

| Slot Name | Slot Quantity | Slot ID | Remarks |
|----------------|---------------|---------|--|
| Slots for PICs | 4 | 1 to 4 | including high-speed, low-speed cards and other PICs that support hot swap |
| Slots for PSUs | 1 | 5 | - |
| Slot for MPUs | 2 | 6 and 7 | - |
| Slot for PSUs | 2 | 8 and 9 | - |
| Slot for fans | 1 | 10 | - |

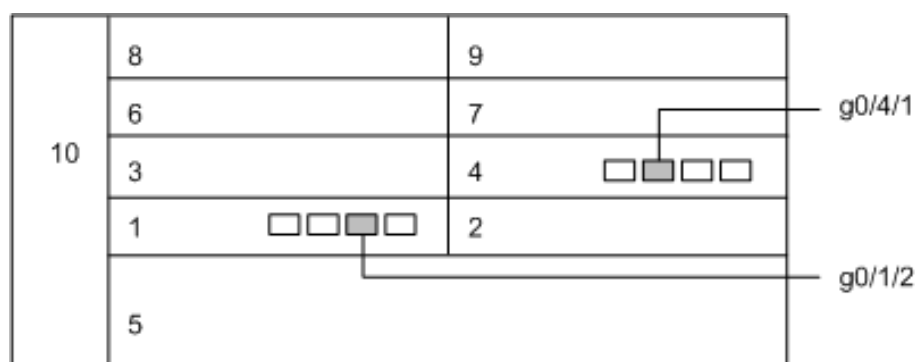
Interface Numbering

Numbering Rule of Service Interfaces on the NE20E-S4

- A subcard slot number is the number of the slot where an interface's subcard resides. A subcard slot number ranges from 1 to 4.
- An interface number on the subcard starts with 0, and its maximum value is determined by the actual number of interfaces on the subcard.

The following figure shows how a service interface is numbered on the NE20E-S4.

Figure 4-6 Numbering rule of service interfaces



Technical Specifications

| Item | Specification |
|-------------------------------|---|
| Dimensions (H x W x D) | <ul style="list-style-type: none"> • DC: 132 mm x 220 mm x 442 mm (5.2 in. x 8.66 in. x 8.66 in.)(3U) • AC: 175 mm x 220 mm x 442 mm (6.89 in. x 8.66 in. x 8.66 in.)(4U) |
| Weight (empty) | <ul style="list-style-type: none"> • DC:4.4 kg (9.68 lb) • AC:5.5 kg (12.13 lb) |
| Weight (full configuration) | <ul style="list-style-type: none"> • DC:13.7 kg (30.21 lb) • AC:18.1 kg (39.91 lb) |
| Cabinet installation standard | ETSI 21-inch; IEC 19-inch |
| Typical power consumption | <ul style="list-style-type: none"> • DC:398 W • AC:456 W |
| Typical heat dissipation | <ul style="list-style-type: none"> • DC:1291.3 BTU/hour • AC:1479.5 BTU/hour |
| DC input voltage | <ul style="list-style-type: none"> • input voltage range:-40V to -72V • input rated voltage:-48V/-60V |
| AC input voltage | <ul style="list-style-type: none"> • input voltage range:180V-264V • input rated |

| Item | Specification |
|------------------------------|---|
| | voltage:200V-240V/100V-127V(dual-live-wire) |
| MTBF | 31.07 years |
| MTTR | 0.5 hours |
| Availability | 0.999998163 |
| Slot quantity | 4 |
| Processing unit | <ul style="list-style-type: none"> • MPUE:single-core1.2 G • MPUE1:eight-core1.5 G |
| Flash | MPU:16 MB |
| SDRAM | <ul style="list-style-type: none"> • MPUE:2 GB • MPUE1:8 GB |
| Storage | 2GB, eUSB |
| Redundant MPUs | 1:1 |
| Redundant NSPs | 1 |
| Redundant fans | The device can work properly for a short time at 40 °C if a single fan fails. |
| Redundant power supply | 1+1 |
| Forwarding performance | <ul style="list-style-type: none"> • 50 Mpps(NSP-50) • 180 Mpps(NSP-120) • 180 Mpps(NSP-A/B) |
| Switching capacity | <ul style="list-style-type: none"> • 100 Gbps(NSP-50) • 240 Gbps(NSP-120) • 240 Gbps(NSP-A) • 480 Gbps(NSP-B) |
| Operating temperature | <ul style="list-style-type: none"> • Long-term: 0 °C to 45 °C (32 °F to 113 °F) • Short-term: -5 °C to 55 °C (23 °F to 131 °F) • Enhance: DC:-40 °C to 65 °C, -20 °C start • Remark:Restriction on the temperature variation rate: 30 °C/hour |
| Storage temperature | -40 °C to 70 °C (-40 °F to 158 °F) |
| Relative operating humidity | <ul style="list-style-type: none"> • Long-term:5% to 85% RH, non-condensing • Short-term:5% to 95% RH, non-condensing |
| Relative storage humidity | 5% to 95% RH, non-condensing |
| Long-term operating altitude | 3000m @ 40 °C |
| Storage altitude | < 5000 m |

4.2 NE20E-S8

Overview

Table 4-3 Device attributes

| Product Type | Description | BOM | Model | Earliest Software Version |
|--------------|---|----------|--------------|---------------------------|
| NE20E-S8 DC | NE20E-S8 Integrated DC Chassis Components | 02355529 | CR2B0BKP0810 | V800R005C00 |
| NE20E-S8 AC | NE20E-S8 Integrated AC Chassis Components | 02356553 | CR2B0BKP0811 | V800R005C01 |

Appearance

Figure 4-7 Appearance (DC)

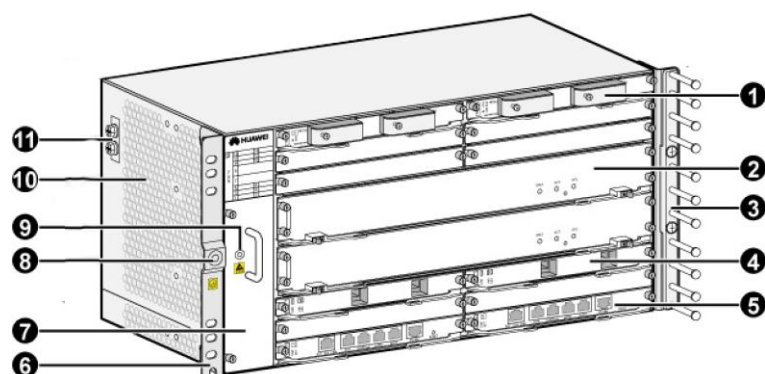


Figure 4-8 Appearance (AC)



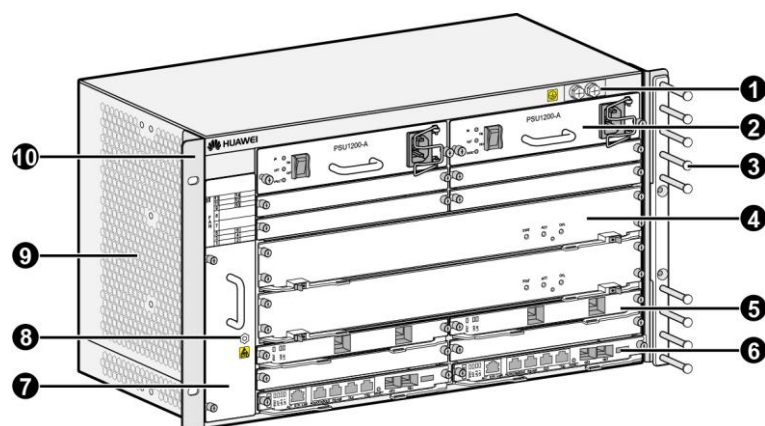
Components

Figure 4-9 Components(DC)



- | | | | |
|-------------|----------------------|------------------------|-----------------------|
| 1. PSU | 2. NSP | 3. Cabling rack | 4. PIC |
| 5. MPU | 6. Rack mounting ear | 7. Fan Module | 8. Grounding Terminal |
| 9. ESD jack | 10. Air intake vent | 11. Grounding Terminal | - |

Figure 4-10 Components(AC)



- | | | | |
|-----------------------|-----------------------|-----------------|-------------|
| 1. Grounding Terminal | 2. PSU | 3. Cabling rack | 4. NSP |
| 5. PIC | 6. MPU | 7. Fan Module | 8. ESD jack |
| 9. Air intake vent | 10. Rack mounting ear | - | - |

Slot Layout

Figure 4-11 Slot layout

| | | |
|-----------|--------|--------|
| 15 FAN | 13 PSU | 14 PSU |
| | 7 PIC | 8 PIC |
| | 5 PIC | 6 PIC |
| | 10 NSP | |
| | 9 NSP | |
| | 3 PIC | 4 PIC |
| | 1 PIC | 2 PIC |
| | 11 MPU | 12 MPU |

Table 4-4 Description of slot layout

| Slot Name | Slot Quantity | Slot ID | Remarks |
|----------------|---------------|-----------|--|
| Slots for PICs | 8 | 1 to 8 | including high-speed, low-speed cards and other PICs that support hot swap |
| Slots for NSPs | 2 | 9 and 10 | - |
| Slot for MPUs | 2 | 11 and 12 | - |
| Slot for PSUs | 2 | 13 and 14 | - |
| Slot for fans | 1 | 15 | - |

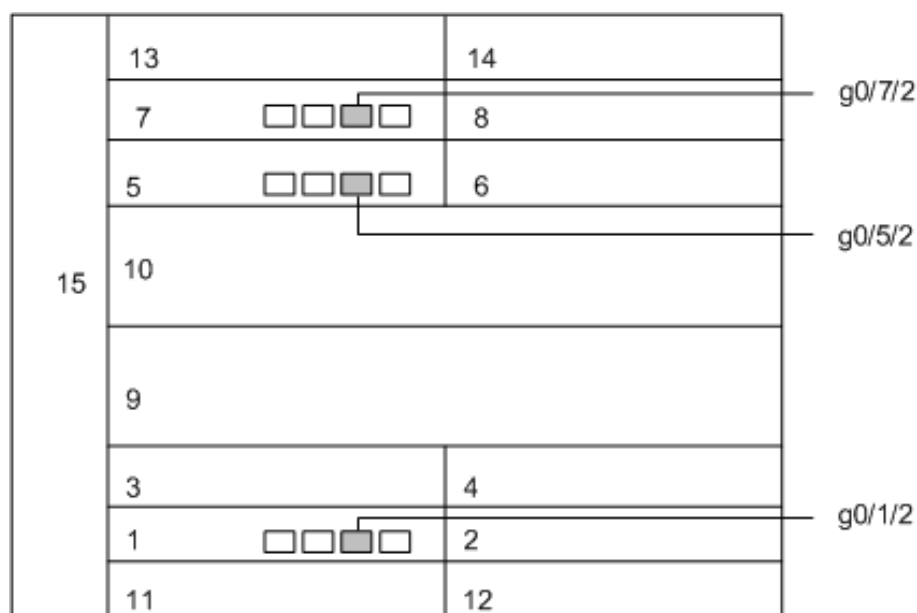
Interface Numbering

Numbering Rule of Service Interfaces on the NE20E-S8

Service interfaces on the NE20E-S8 are numbered in the following format: 0/subcard slot number/interface number on the subcard.

- A subcard slot number is the number of the slot where an interface's subcard resides. A subcard slot number ranges from 1 to 8.
- An interface number on the subcard starts with 0, and its maximum value is determined by the actual number of interfaces on the subcard.

The following figure shows how a service interface is numbered on the NE20E-S8.

Figure 4-12 Numbering rule of service interfaces

Technical Specifications

| Item | Specification |
|-------------------------------|---|
| Dimensions (H x W x D) | <ul style="list-style-type: none"> DC: 222 mm x 220 mm x 442 mm (8.74 in. x 8.66 in. x 8.66 in.)(5U) AC: 264 mm x 220 mm x 442 mm (10.39 in. x 8.66 in. x 8.66 in.)(6U) |
| Weight (empty) | <ul style="list-style-type: none"> DC:7.1 kg (15.66 lb) AC:8.5 kg (18.74 lb) |
| Weight (full configuration) | <ul style="list-style-type: none"> [NSP-A]: DC:21.5 kg (47.41 lb) [NSP-A]: AC:26.5 kg (58.43 lb) [NSP-C]: DC:24.1 kg (53.14 lb) [NSP-C]: AC:28.8 kg (63.5 lb) |
| Cabinet installation standard | ETSI 21-inch; IEC 19-inch |
| Typical power consumption | <ul style="list-style-type: none"> DC:645 W(NSP-A full configuration) AC:703 W(NSP-A full configuration) |
| Typical heat dissipation | <ul style="list-style-type: none"> DC:2092.7 BTU/hour(NSP-A full configuration) AC:2280.8 BTU/hour(NSP-A full configuration) |
| DC input voltage | <ul style="list-style-type: none"> input voltage range:-40V to -72V input rated voltage:-48V/-60V |
| AC input voltage | <ul style="list-style-type: none"> input voltage range:180V to 264V input rated |

| Item | Specification |
|------------------------------|---|
| | voltage:200V-240V/100V-127V(dual-live-wire) |
| MTBF | 138.61 years |
| MTTR | 0.5 hours |
| Availability | 0.999999588 |
| Slot quantity | 8 |
| Processing unit | <ul style="list-style-type: none"> • MPUE:single-core1.2 G • MPUE1:eight-core1.5 G |
| Flash | MPU:16 MB |
| SDRAM | <ul style="list-style-type: none"> • MPUE:2 GB • MPUE1:8 GB |
| Storage | 2 GB, eUSB |
| Redundant MPUs | 1:1 |
| Redundant NSPs | 1:1 |
| Redundant fans | The device can work properly for a short time at 40 °C if a single fan fails. |
| Redundant power supply | 1+1 |
| Forwarding performance | <ul style="list-style-type: none"> • 50 Mpps(NSP-50) • 180 Mpps(NSP-120) • 180 Mpps(NSP-A/B) • 360 Mpps(NSP-C) |
| Switching capacity | <ul style="list-style-type: none"> • 100 Gbps(NSP-50) • 240 Gbps(NSP-120) • 240 Gbps(NSP-A) • 480 Gbps(NSP-B) • 960 Gbps(NSP-C) |
| Operating temperature | <ul style="list-style-type: none"> • Long-term: 0 °C to 45 °C (32 °F to 113 °F) • Short-term: -5 °C to 55 °C (23 °F to 131 °F) • Enhance: DC:-40 °C to 65 °C, -20 °C start • Remark:Restriction on the temperature variation rate: 30 °C/hour |
| Storage temperature | -40 °C to 70 °C (-40 °F to 158 °F) |
| Relative operating humidity | <ul style="list-style-type: none"> • Long-term:5% to 85% RH, non-condensing • Short-term:5% to 95% RH, non-condensing |
| Relative storage humidity | 5% to 95% RH, non-condensing |
| Long-term operating altitude | 3000m @ 40 °C |

| Item | Specification |
|------------------|---------------|
| Storage altitude | < 5000 m |

4.3 NE20E-S8A

Overview

Table 4-5 Device attributes

| Product Type | Description | BOM | Model | Earliest Software Version |
|--------------|--|----------|------------------|---------------------------|
| NE20E-S8A DC | NE20E-S8A Integrated DC Chassis Components | 02350RGE | CR2B0BKP081 2 | V800R008C10 |
| NE20E-S8A AC | NE20E-S8A Integrated AC Chassis Components | 02350RGF | CR2B0BKP081 3 | V800R008C10 |

Appearance

Figure 4-13 Appearance (DC)

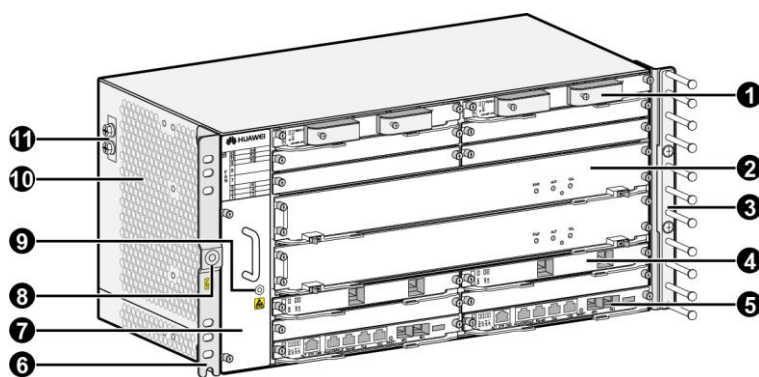


Figure 4-14 Appearance (AC)



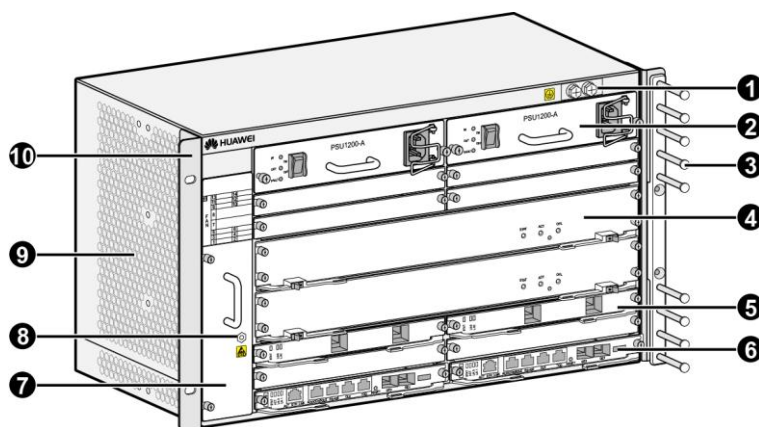
Components

Figure 4-15 Components(DC)



- | | | | |
|-------------|----------------------|------------------------|-----------------------|
| 1. PSU | 2. NSP | 3. Cabling rack | 4. PIC |
| 5. MPU | 6. Rack mounting ear | 7. Fan Module | 8. Grounding Terminal |
| 9. ESD jack | 10. Air intake vent | 11. Grounding Terminal | - |

Figure 4-16 Components(AC)



- | | | | |
|-----------------------|--------|-----------------|-------------|
| 1. Grounding Terminal | 2. PSU | 3. Cabling rack | 4. NSP |
| 5. PIC | 6. MPU | 7. Fan Module | 8. ESD jack |

9. Air intake vent

10. Rack mounting ear

-

-

Slot Layout

Figure 4-17 Slot layout

| | | |
|-----------|--------|--------|
| 15 FAN | 13 PSU | 14 PSU |
| | 7 PIC | 8 PIC |
| | 5 PIC | 6 PIC |
| | 10 NSP | |
| | 9 NSP | |
| | 3 PIC | 4 PIC |
| | 1 PIC | 2 PIC |
| | 11 MPU | 12 MPU |

Table 4-6 Description of slot layout

| Slot Name | Slot Quantity | Slot ID | Remarks |
|----------------|---------------|-----------|--|
| Slots for PICs | 8 | 1 to 8 | including high-speed, low-speed cards and other PICs that support hot swap |
| Slots for NSPs | 2 | 9 and 10 | - |
| Slot for MPUs | 2 | 11 and 12 | - |
| Slot for PSUs | 2 | 13 and 14 | - |
| Slot for fans | 1 | 15 | - |

Interface Numbering

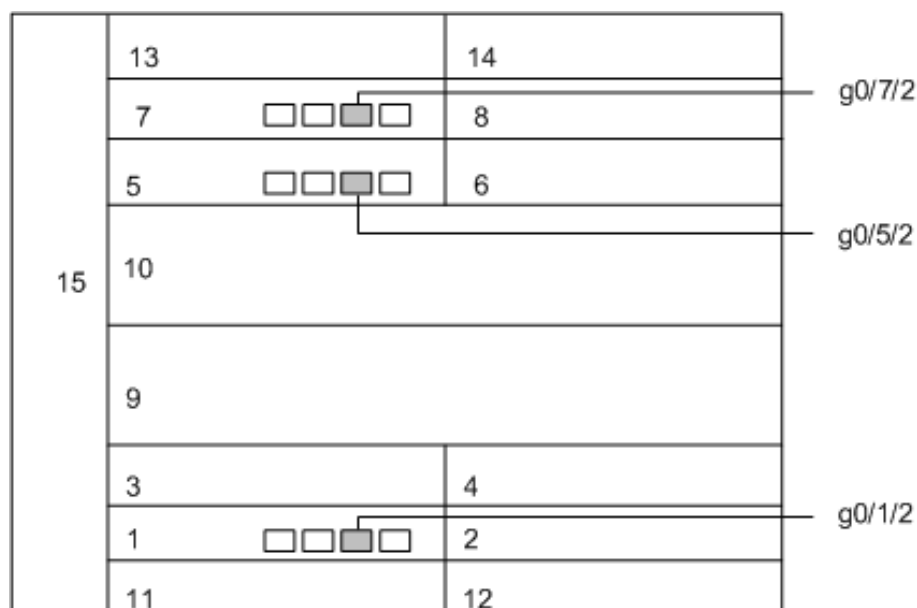
Numbering Rule of Service Interfaces on the NE20E-S8A

Service interfaces on the NE20E-S8A are numbered in the following format: 0/subcard slot number/interface number on the subcard.

- A subcard slot number is the number of the slot where an interface's subcard resides. A subcard slot number ranges from 1 to 8.
- An interface number on the subcard starts with 0, and its maximum value is determined by the actual number of interfaces on the subcard.

The following figure shows how a service interface is numbered on the NE20E-S8A.

Figure 4-18 Numbering rule of service interfaces



Technical Specifications

| Item | Specification |
|-------------------------------|--|
| Dimensions (H x W x D) | <ul style="list-style-type: none"> DC: 222 mm x 220 mm x 442 mm (8.74 in. x 8.66 in. x 8.66 in.)(5U) AC: 264 mm x 220 mm x 442 mm (10.39 in. x 8.66 in. x 8.66 in.)(6U) |
| Weight (empty) | <ul style="list-style-type: none"> DC:7.1 kg (15.66 lb) AC:8.5 kg (18.74 lb) |
| Weight (full configuration) | <ul style="list-style-type: none"> [NSP-A]: DC:21.6 kg (47.63 lb) [NSP-A]: AC:26.5 kg (58.43 lb) [NSP-C]: DC:24.5 kg (54.02 lb) [NSP-C]: AC:29.1 kg (64.17 lb) |
| Cabinet installation standard | ETSI 21-inch; IEC 19-inch |
| Typical power consumption | 1010W(NSP-C full configuration) |
| Typical heat dissipation | 3276.9 BTU/hour(NSP-C full configuration) |
| DC input voltage | <ul style="list-style-type: none"> input voltage range:-40V to -72V input rated voltage:-48V/-60V |
| AC input voltage | <ul style="list-style-type: none"> input voltage range:180V to 264V input rated voltage:200V-240V/100V-127V(dual-live-wire) |

| Item | Specification |
|------------------------------|--|
| MTBF | 138.61 years |
| MTTR | 0.5 hours |
| Availability | 0.999999588 |
| Slot quantity | 8 |
| Processing unit | MPUE1: eight-core 1.5 G |
| Flash | MPU: 16 MB |
| SDRAM | <ul style="list-style-type: none"> MPUE1: 8 GB |
| Storage | 2 GB, eUSB |
| Redundant MPUs | 1:1 |
| Redundant NSPs | 1:1 |
| Redundant fans | The device can work properly for a short time at 40 °C if a single fan fails. |
| Redundant power supply | 1+1 |
| Forwarding performance | <ul style="list-style-type: none"> 50 Mpps(NSP-50) 180 Mpps(NSP-120) 180 Mpps(NSP-A/B) 360 Mpps(NSP-C) |
| Switching capacity | <ul style="list-style-type: none"> 100 Gbps(NSP-50) 240 Gbps(NSP-120) 240 Gbps(NSP-A) 480 Gbps(NSP-B) 960 Gbps(NSP-C) |
| Operating temperature | <ul style="list-style-type: none"> Long-term: 0 °C to 45 °C (32 °F to 113 °F) Short-term: -5 °C to 55 °C (23 °F to 131 °F) Enhance:DC: -5 °C to 65 °C Remark:Restriction on the temperature variation rate: 30 °C/hour |
| Storage temperature | -40 °C to 70 °C (-40 °F to 158 °F) |
| Relative operating humidity | <ul style="list-style-type: none"> Long-term: 5% to 85% RH, non-condensing Short-term: 5% to 95% RH, non-condensing |
| Relative storage humidity | 5% to 95% RH, non-condensing |
| Long-term operating altitude | 3000m @ 40 °C |
| Storage altitude | < 5000 m |

4.4 NE20E-S16

Overview

Table 4-7 Device attributes

| Product Type | Description | BOM | Model | Earliest Software Version |
|--------------|---|----------|--------------|---------------------------|
| NE20E-S16 | NE20E-S16 Integrated Chassis Components | 02356551 | CR2B0BKP1610 | V800R005C01 |

Appearance

Figure 4-19 Appearance (DC)

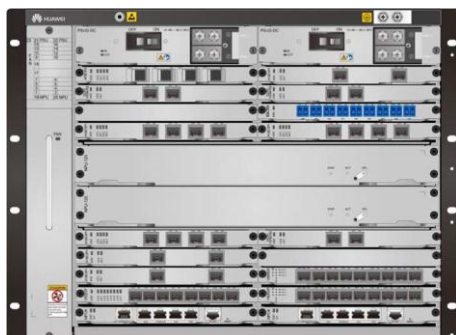
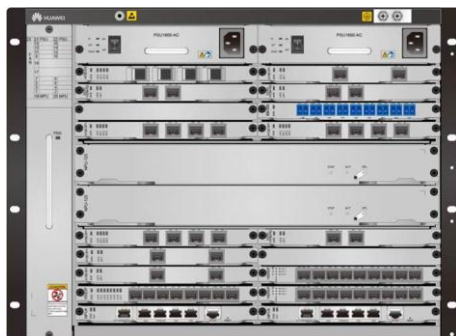
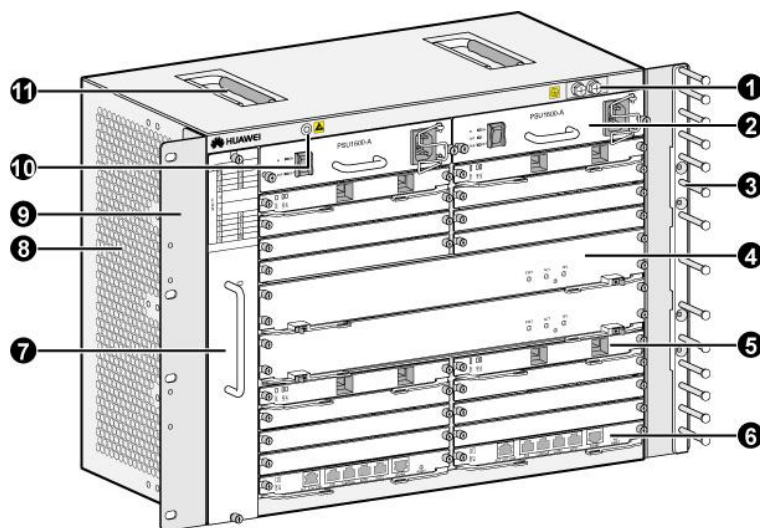


Figure 4-20 Appearance (AC)



Components

Figure 4-21 Components



- | | | | |
|-----------------------|--------------|---------------|--------------------|
| 1. Grounding Terminal | 2. PSU | 3. Cable tray | 4. NSP |
| 5. PIC | 6. MPU | 7. Fan Module | 8. Air intake vent |
| 9. Rack mounting ear | 10. ESD jack | 11. Handle | - |

Slot Layout

Figure 4-22 Slot layout

| | | |
|-----------|--------|--------|
| 23 FAN | 21 PSU | 22 PSU |
| | 15 PIC | 16 PIC |
| | 13 PIC | 14 PIC |
| | 11 PIC | 12 PIC |
| | 9 PIC | 10 PIC |
| | 18 NSP | |
| | 17 NSP | |
| | 7 PIC | 8 PIC |
| | 5 PIC | 6 PIC |
| | 3 PIC | 4 PIC |
| | 1 PIC | 2 PIC |
| | 19 MPU | 20 MPU |

Table 4-8 Description of slot layout

| Slot Name | Slot Quantity | Slot ID | Remarks |
|----------------|---------------|-----------|--|
| Slots for PICs | 16 | 1 to 16 | including high-speed, low-speed cards and other PICs that support hot swap Other subcards, including the 8-Channel CWDM Multiplexing/Demultiplexing Physical Interface Card and Auxiliary Flexible Interface Card, can be installed in any slot numbered 1 to 16. |
| Slots for NSPs | 2 | 17 and 18 | - |
| Slot for MPUs | 2 | 19 and 20 | - |
| Slot for PSUs | 2 | 21 and 22 | - |
| Slot for fans | 1 | 23 | - |

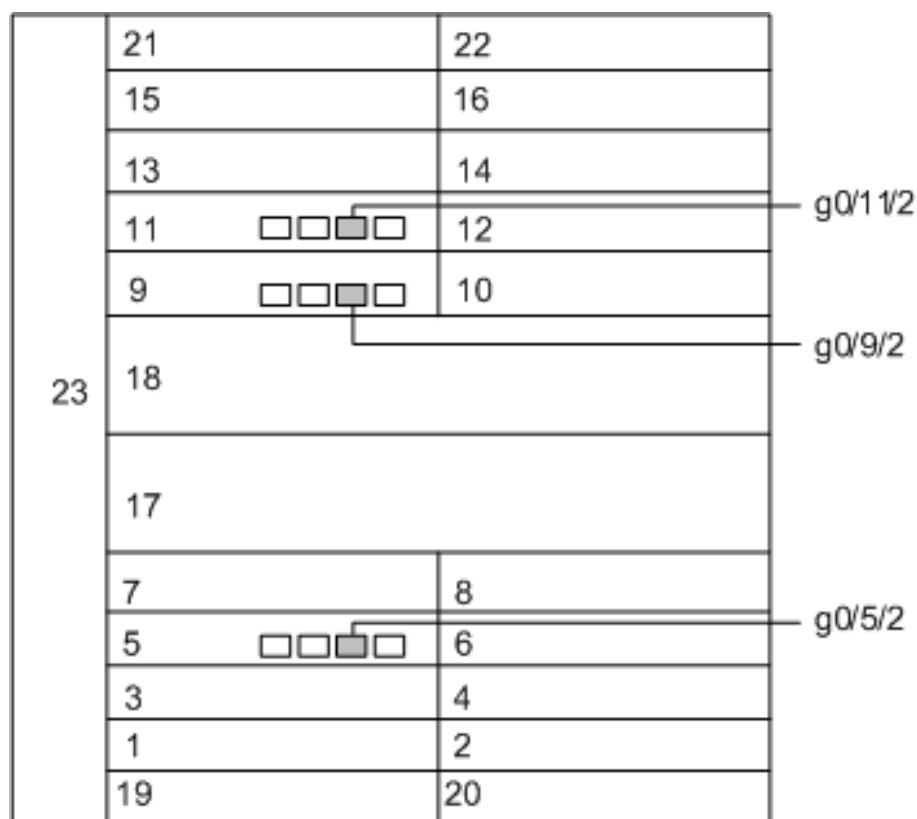
Interface Numbering

Numbering Rule of Service Interfaces on the NE20E-S16

Service interfaces on the NE20E-S16 are numbered in the following format: 0/subcard slot number/interface number on the subcard.

- A subcard slot number is the number of the slot where an interface's subcard resides. A subcard slot number ranges from 1 to 16.
- An interface number on the subcard starts with 0, and its maximum value is determined by the actual number of interfaces on the subcard.

The following figure shows how a service interface is numbered on the NE20E-S16.

Figure 4-23 Numbering rule of service interfaces

Technical Specifications

| Item | Specification |
|-------------------------------|--|
| Dimensions (H x W x D) | 353 mm x 220 mm x 442 mm (13.9 in. x 8.66 in. x 8.66 in.)(8U) |
| Weight (empty) | 11.5 kg (25.36 lb) |
| Weight (full configuration) | <ul style="list-style-type: none"> • [NSP-A]: DC:32.6 kg (71.88 lb) • [NSP-A]: AC:34.6 kg (76.29 lb) • [NSP-C]: DC:34.8 kg (76.73 lb) • [NSP-C]: AC:36.8 kg (81.14 lb) |
| Cabinet installation standard | ETSI 21-inch; IEC 19-inch |
| Typical power consumption | <ul style="list-style-type: none"> • DC:696 W(NSP-A full configuration) • AC:740 W(NSP-A full configuration) |
| Typical heat dissipation | <ul style="list-style-type: none"> • DC:2258.1 BTU/hour(NSP-A full configuration) • AC:2400.9 BTU/hour(NSP-A full configuration) |
| DC input voltage | <ul style="list-style-type: none"> • input voltage range:-40V to -72V • input rated voltage:-48V/-60V |

| Item | Specification |
|-----------------------------|--|
| AC input voltage | <ul style="list-style-type: none"> input voltage range:180V to 264V input rated voltage:200V-240V/100V-127V(dual-live-wire) |
| MTBF | 138.61 years |
| MTTR | 0.5 hours |
| Availability | 0.999999588 |
| Slot quantity | 16 |
| Processing unit | <ul style="list-style-type: none"> MPUE:single-core1.2 G MPUE1:eight-core1.5 G |
| Flash | MPU:16 MB |
| SDRAM | <ul style="list-style-type: none"> MPUE:2 GB MPUE1:8 GB |
| Storage | 2 GB, eUSB |
| Redundant MPUs | 1:1 |
| Redundant NSPs | 1:1 |
| Redundant fans | The device can work properly for a short time at 40 °C if a single fan fails. |
| Redundant power supply | 1+1 |
| Forwarding performance | <ul style="list-style-type: none"> 50 Mpps(NSP-50) 180 Mpps(NSP-120) 180 Mpps(NSP-A/B) 360 Mpps(NSP-C) |
| Switching capacity | <ul style="list-style-type: none"> 100 Gbps(NSP-50) 240 Gbps(NSP-120) 240 Gbps(NSP-A) 480 Gbps(NSP-B) 960 Gbps(NSP-C) |
| Operating temperature | <ul style="list-style-type: none"> Long-term: 0 °C to 45 °C (32 °F to 113 °F) Short-term: -5 °C to 55 °C (23 °F to 131 °F) Remark:Restriction on the temperature variation rate: 30 °C/hour |
| Storage temperature | -40 °C to 70 °C (-40 °F to 158 °F) |
| Relative operating humidity | <ul style="list-style-type: none"> Long-term:5% to 85% RH, non-condensing Short-term:5% to 95% RH, non-condensing |
| Relative storage humidity | 5% to 95% RH, non-condensing |

| Item | Specification |
|------------------------------|---------------|
| Long-term operating altitude | 3000m @ 40 ℃ |
| Storage altitude | < 5000 m |

4.5 NE20E-S16A

Overview

Table 4-9 Device attributes

| Product Type | Description | BOM | Model | Earliest Software Version |
|--------------|--|----------|------------------|---------------------------|
| NE20E-S16A | NE20E-S16A Integrated Chassis Components | 02350RGG | CR2B0BKP161 1 | V800R008C10 |

Appearance

Figure 4-24 Appearance (DC)

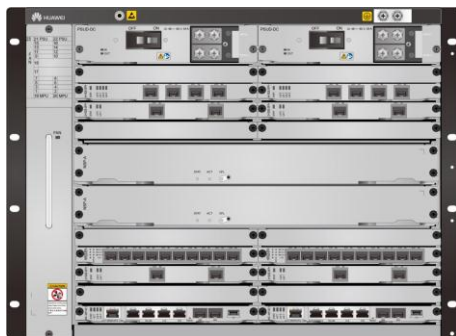
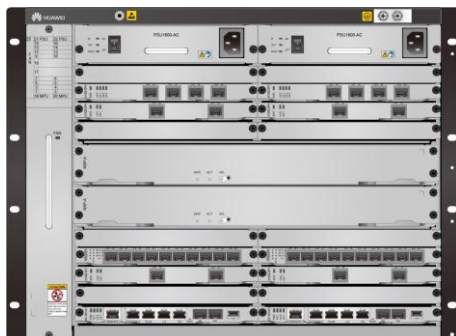
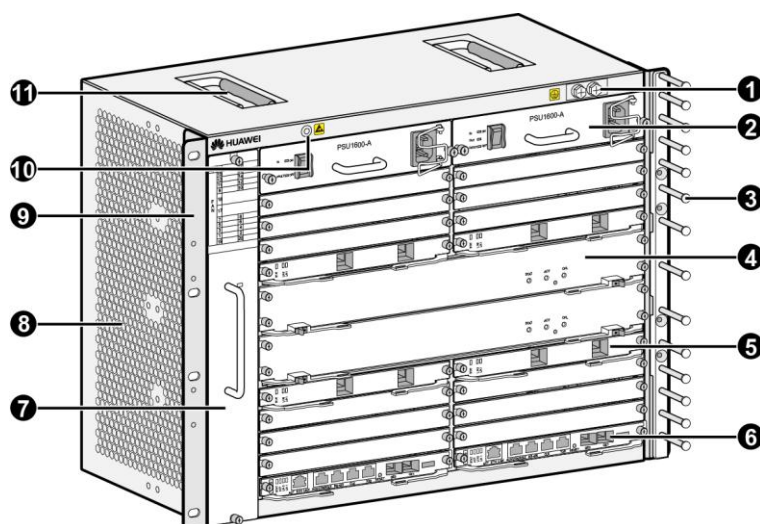


Figure 4-25 Appearance (AC)



Components

Figure 4-26 Components



- | | | | |
|-----------------------|--------------|---------------|--------------------|
| 1. Grounding Terminal | 2. PSU | 3. Cable tray | 4. NSP |
| 5. PIC | 6. MPU | 7. Fan Module | 8. Air intake vent |
| 9. Rack mounting ear | 10. ESD jack | 11. Handle | - |

Slot Layout

Figure 4-27 Slot layout

| | | |
|-----------|--------|--------|
| 23 FAN | 21 PSU | 22 PSU |
| | 15 PIC | 16 PIC |
| | 13 PIC | 14 PIC |
| | 11 PIC | 12 PIC |
| | 9 PIC | 10 PIC |
| | 18 NSP | |
| | 17 NSP | |
| | 7 PIC | 8 PIC |
| | 5 PIC | 6 PIC |
| | 3 PIC | 4 PIC |
| | 1 PIC | 2 PIC |
| | 19 MPU | 20 MPU |

Table 4-10 Description of slot layout

| Slot Name | Slot Quantity | Slot ID | Remarks |
|----------------|---------------|-----------|--|
| Slots for PICs | 16 | 1 to 16 | including high-speed, low-speed cards and other PICs that support hot swap Other subcards, including the 8-Channel CWDM Multiplexing/Demultiplexing Physical Interface Card and Auxiliary Flexible Interface Card, can be installed in any slot numbered 1 to 16. |
| Slots for NSPs | 2 | 17 and 18 | - |
| Slot for MPUs | 2 | 19 and 20 | - |
| Slot for PSUs | 2 | 21 and 22 | - |
| Slot for fans | 1 | 23 | - |

Interface Numbering

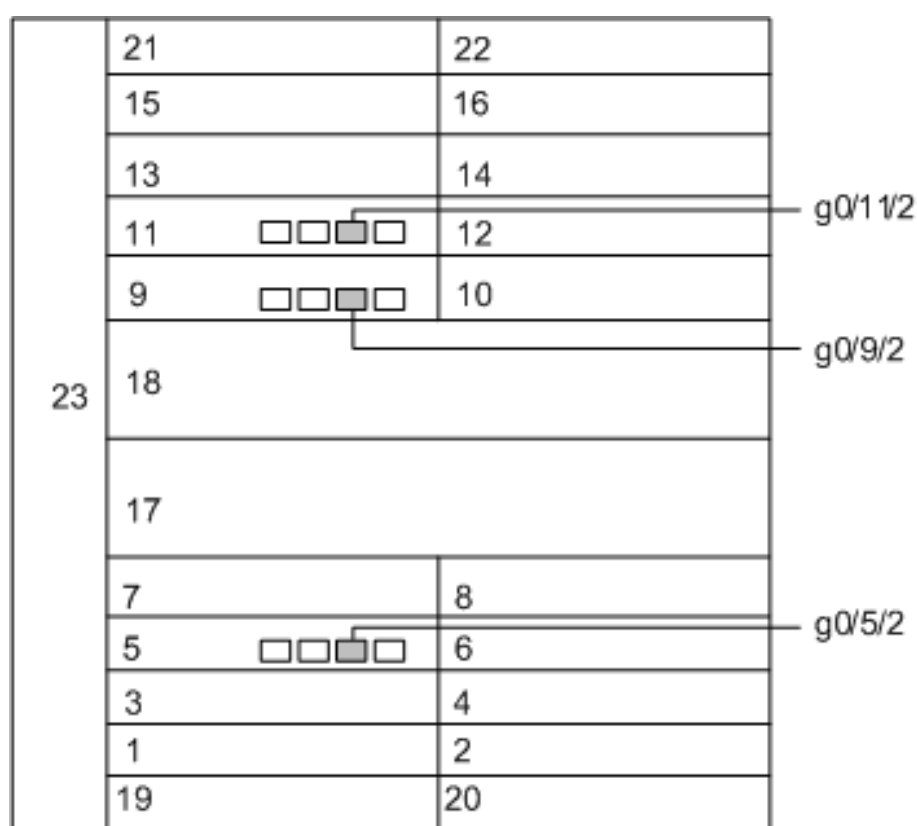
Numbering Rule of Service Interfaces on the NE20E-S16A

Service interfaces on the NE20E-S16A are numbered in the following format: 0/subcard slot number/interface number on the subcard.

- A subcard slot number is the number of the slot where an interface's subcard resides. A subcard slot number ranges from 1 to 16.
- An interface number on the subcard starts with 0, and its maximum value is determined by the actual number of interfaces on the subcard.

The following figure shows how a service interface is numbered on the NE20E-S16A.

Figure 4-28 Numbering rule of service interfaces



Technical Specifications

| Item | Specification |
|-----------------------------|--|
| Dimensions (H x W x D) | 353 mm x 220 mm x 442 mm (13.9 in. x 8.66 in. x 8.66 in.)(8U) |
| Weight (empty) | 11.5 kg (25.36 lb) |
| Weight (full configuration) | <ul style="list-style-type: none"> • [NSP-A]: DC:32.6 kg (71.79 lb) • [NSP-A]: AC:34.5 kg (76.07 lb) |

| Item | Specification |
|-------------------------------|---|
| | <ul style="list-style-type: none"> [NSP-C]: DC:35.4 kg (77.97 lb) [NSP-C]: AC:37.3 kg (82.25 lb) |
| Cabinet installation standard | ETSI 21-inch; IEC 19-inch |
| Typical power consumption | 1072 W(NSP-C full configuration) |
| Typical heat dissipation | 3478 BTU/hour(NSP-C full configuration) |
| DC input voltage | <ul style="list-style-type: none"> input voltage range:-40V to -72V input rated voltage:-48V/-60V |
| AC input voltage | <ul style="list-style-type: none"> input voltage range:180V to 264V input rated voltage:200V-240V/100V-127V(dual-live-wire) |
| MTBF | 138.61 years |
| MTTR | 0.5 hours |
| Availability | 0.999999588 |
| Slot quantity | 16 |
| Processing unit | MPUE1:eight-core1.5 G |
| Flash | MPU:16 MB |
| SDRAM | <ul style="list-style-type: none"> MPUE1:8 GB |
| Storage | 2 GB, eUSB |
| Redundant MPUs | 1:1 |
| Redundant NSPs | 1:1 |
| Redundant fans | The device can work properly for a short time at 40 °C if a single fan fails. |
| Redundant power supply | 1+1 |
| Forwarding performance | <ul style="list-style-type: none"> 50 Mpps(NSP-50) 180 Mpps(NSP-120) 180 Mpps(NSP-A/B) 360 Mpps(NSP-C) |
| Switching capacity | <ul style="list-style-type: none"> 100 Gbps(NSP-50) 240 Gbps(NSP-120) 240 Gbps(NSP-A) 480 Gbps(NSP-B) 960 Gbps(NSP-C) |
| Operating temperature | <ul style="list-style-type: none"> Long-term: 0 °C to 45 °C (32 °F to 113 °F) Short-term: -5 °C to 55 °C (23 °F to 131 °F) Remark:Restriction on the temperature variation |

| Item | Specification |
|------------------------------|--|
| | rate: 30 °C/hour |
| Storage temperature | -40 °C to 70 °C (-40 °F to 158 °F) |
| Relative operating humidity | <ul style="list-style-type: none">• Long-term:5% to 85% RH, non-condensing• Short-term:5% to 95% RH, non-condensing |
| Relative storage humidity | 5% to 95% RH, non-condensing |
| Long-term operating altitude | 3000m @ 40 °C |
| Storage altitude | < 5000 m |

5 Power

About This Chapter

- 5.1 NE20E-S4 Power Supply System
- 5.2 NE20E-S8 Power Supply System
- 5.3 NE20E-S8A Power Supply System
- 5.4 NE20E-S16 Power Supply System
- 5.5 NE20E-S16A Power Supply System

5.1 NE20E-S4 Power Supply System

5.1.1 Architecture of the Power Supply System

The device supports DC power input and AC power input.

The device is powered by two PSUs, which work in 1+1 backup mode. When one PSU fails or is removed, the other one can still supply adequate power for the device. The PSUs are installed in the two top slots of the chassis and supply power for the MPUs, NSPs, PICs, and fan module.

The following measures are taken to ensure that the PSUs can supply stable and safe power for the system:

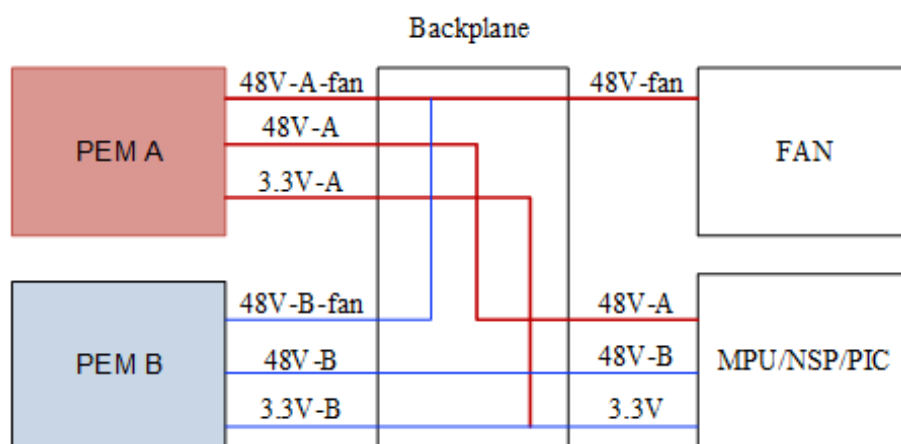
- Protection against output overcurrent
- Protection against output overvoltage
- Protection against input undervoltage
- Protection against overtemperature
- Protection against short circuit
- Alarm generation

5.1.2 Diagram of the Power Supply Architecture

A power supply system consists of two power modules working in 1+1 redundancy mode. Figure 5-1 shows the diagram of the power supply architecture. Each power module provides

a 48 V power input and a 3.3 V power input to the boards. The two 48 V power inputs are integrated in the boards and the two 3.3 V power inputs are integrated in the backplane and then input to the boards. Each power module provides a 48 V power input to the fans. The two 48 V power inputs are integrated in the backplane and then input to the fans.

Figure 5-1 Diagram of the power supply architecture



5.1.3 DC Power System

Overview

Table 5-1 Power attributes

| Attribute | Description |
|-------------|-----------------|
| Description | DC Power Supply |
| BOM | 03030QAS |
| Model | CR5D00PSUC70 |

Table 5-2 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|--------------------|---------------------------|
| NE20E-S4 | slot 8 to 9 | V800R005C00 |
| NE20E-S8 | slot 13 to slot 14 | V800R005C00 |

The device uses two PSUs, which work in 1+1 backup mode, for power supply. Figure 5-2 shows the outline of a PSU.

Figure 5-2 Appearance**Table 5-3** Description of the indicators on the PSUs

| Indicator Name | Description |
|----------------|--|
| OUT | <p>When the indicator is steady green, the PSUs are working properly and supply stable power.</p> <p>When the indicator is steady red, the hardware of the PSUs fails or the device is not supplied with power ranging from -48 V or -60 V or the input voltage is lower or higher than the normal range.</p> <p>When the indicator is steady orange, the PSUs fail to communicate with the main control.</p> <p>When the indicator is off, the PSUs are switched off or the hardware of the PSUs is faulty.</p> |
| IN | <p>When the indicator is steady green, the power input is normal.</p> <p>When the indicator is off, the device is not supplied with power ranging from -48 V or -60 V.</p> |

- Notes on DC power monitoring:

The DC power monitoring channel can implement real-time monitoring on power supply. In addition, the DC power monitoring channel allows you to query the manufacturing ID, input voltage, and temperature of the PSUs in real time, and supports real-time reporting of power supply alarms.
- Notes on the configuration of DC power cables:

You do not need to connect protection ground cables to the PSUs, but the protection ground cable for the chassis must be properly grounded. DC power cables include a -48 V power cable and a return (RTN) ground cable. The required cable length depends on the distance between the cabinet and the power distribution cabinet for the device.

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 19.8mm x 198.5mm x 183.8mm (0.77 in. x 7.81 in. x 7.23 in.) |
| Weight | 0.9 kg (1.98 lb) |
| Rated DC input voltage | -48V/-60V DC |

| Item | Specification |
|---------------------------------|------------------------------|
| DC input voltage range | -40V to -72V DC |
| Maximum current | NE20E-S4:16A NE20E-S8:32A |
| Circuit breaker of each channel | NE20E-S4:16A NE20E-S8:32A |
| Typical power consumption | 8 W |

5.1.4 AC Power Supply System

Overview

Table 5-4 Power attributes

| Attribute | Description |
|-------------|--------------|
| Description | AC power |
| BOM | 02310RBJ |
| Model | CR5D0PSUAC00 |

Table 5-5 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S4 | slot 8 to 9 | V800R007C00 |
| NE20E-S8 | slot 13 to 14 | V800R005C01 |
| NE20E-S8A | slot 13 to 14 | V800R008C10 |
| NE20E-S16 | slot 21 to 22 | V800R005C01 |
| NE20E-S16A | slot 21 to 22 | V800R008C10 |

Appearance

The device has two AC rectifier modules working in 1+1 backup mode. Figure shows the outline of an AC rectifier module.



Table 5-6 Introduction to the Power System

| Indicator Name | Color | Normal Status | Abnormal Status | Remarks |
|------------------|-------|---------------|-----------------|--|
| Input indicator | Green | On | Off | The indicator is on when the input is normal, and is off when the input is abnormal. |
| | | | Blink | Overvoltage or undervoltage is input. The panel switch is Off. |
| Output indicator | Green | On | Off | The indicator is on when the output is normal, and is off when the output is abnormal. |
| Fault indicator | Red | Off | Blink | The indicator is blinking in the following situations: The communication is interrupted for 60s or more than 60s. The power is input unevenly. The AC power module is reset remotely. |
| | | | On | The indicator is blinking in the following situations: Protection against overtemperature is performed. Fans become faulty. |

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 42mm x 198.5mm x 183.8mm (1.65 in. x 7.81 in. x 7.23 in.) |
| Weight | 2.5 kg (5.51 lb) |
| Rated AC input voltage | 200V-240V/100V-127V(dual-live-wire) |
| AC input voltage range | 180V to 264V |
| Maximum current | 10 A |

| Item | Specification |
|---------------------------|---------------|
| Typical power consumption | 70 W |
| Maximum output power | 1600 W |

5.2 NE20E-S8 Power Supply System

5.2.1 Architecture of the Power Supply System

The device supports DC power input and AC power input.

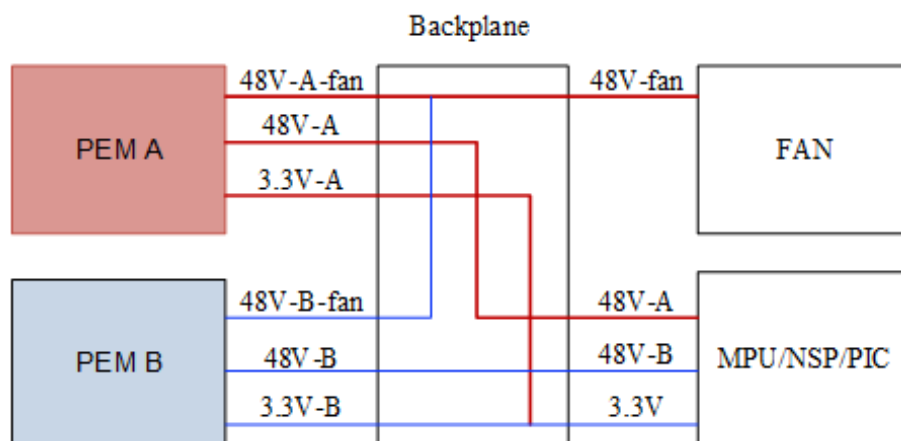
The device is powered by two PSUs, which work in 1+1 backup mode. When one PSU fails or is removed, the other one can still supply adequate power for the device. The PSUs are installed in the two top slots of the chassis and supply power for the MPUs, NSPs, PICs, and fan module.

The following measures are taken to ensure that the PSUs can supply stable and safe power for the system:

- Protection against output overcurrent
- Protection against output overvoltage
- Protection against input undervoltage
- Protection against overtemperature
- Protection against short circuit
- Alarm generation

5.2.2 Diagram of the Power Supply Architecture

A power supply system consists of two power modules working in 1+1 redundancy mode. Figure 5-3 shows the diagram of the power supply architecture. Each power module provides a 48 V power input and a 3.3 V power input to the boards. The two 48 V power inputs are integrated in the boards and the two 3.3 V power inputs are integrated in the backplane and then input to the boards. Each power module provides a 48 V power input to the fans. The two 48 V power inputs are integrated in the backplane and then input to the fans.

Figure 5-3 Diagram of the power supply architecture

5.2.3 DC Power System

Overview

Table 5-7 Power attributes

| Attribute | Description |
|-------------|-----------------|
| Description | DC Power Supply |
| BOM | 03030QAS |
| Model | CR5D00PSUC70 |

Table 5-8 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|--------------------|---------------------------|
| NE20E-S4 | slot 8 to 9 | V800R005C00 |
| NE20E-S8 | slot 13 to slot 14 | V800R005C00 |

The device uses two PSUs, which work in 1+1 backup mode, for power supply. Figure 5-4 shows the outline of a PSU.

Figure 5-4 Appearance



Table 5-9 Description of the indicators on the PSUs

| Indicator Name | Description |
|----------------|--|
| OUT | <p>When the indicator is steady green, the PSUs are working properly and supply stable power.</p> <p>When the indicator is steady red, the hardware of the PSUs fails or the device is not supplied with power ranging from -48 V or -60 V or the input voltage is lower or higher than the normal range.</p> <p>When the indicator is steady orange, the PSUs fail to communicate with the main control.</p> <p>When the indicator is off, the PSUs are switched off or the hardware of the PSUs is faulty.</p> |
| IN | <p>When the indicator is steady green, the power input is normal.</p> <p>When the indicator is off, the device is not supplied with power ranging from -48 V or -60 V.</p> |

- Notes on DC power monitoring:

The DC power monitoring channel can implement real-time monitoring on power supply. In addition, the DC power monitoring channel allows you to query the manufacturing ID, input voltage, and temperature of the PSUs in real time, and supports real-time reporting of power supply alarms.
- Notes on the configuration of DC power cables:

You do not need to connect protection ground cables to the PSUs, but the protection ground cable for the chassis must be properly grounded. DC power cables include a -48 V power cable and a return (RTN) ground cable. The required cable length depends on the distance between the cabinet and the power distribution cabinet for the device.

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 19.8mm x 198.5mm x 183.8mm (0.77 in. x 7.81 in. x 7.23 in.) |
| Weight | 0.9 kg (1.98 lb) |
| Rated DC input voltage | -48V/-60V DC |

| Item | Specification |
|---------------------------------|------------------------------|
| DC input voltage range | -40V to -72V DC |
| Maximum current | NE20E-S4:16A NE20E-S8:32A |
| Circuit breaker of each channel | NE20E-S4:16A NE20E-S8:32A |
| Typical power consumption | 8 W |

5.2.4 AC Power Supply System

Overview

Table 5-10 Power attributes

| Attribute | Description |
|-------------|--------------|
| Description | AC power |
| BOM | 02310RBJ |
| Model | CR5D0PSUAC00 |

Table 5-11 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S4 | slot 8 to 9 | V800R007C00 |
| NE20E-S8 | slot 13 to 14 | V800R005C01 |
| NE20E-S8A | slot 13 to 14 | V800R008C10 |
| NE20E-S16 | slot 21 to 22 | V800R005C01 |
| NE20E-S16A | slot 21 to 22 | V800R008C10 |

Appearance

The device has two AC rectifier modules working in 1+1 backup mode. Figure shows the outline of an AC rectifier module.



Table 5-12 Introduction to the Power System

| Indicator Name | Color | Normal Status | Abnormal Status | Remarks |
|------------------|-------|---------------|-----------------|--|
| Input indicator | Green | On | Off | The indicator is on when the input is normal, and is off when the input is abnormal. |
| | | | Blink | Overvoltage or undervoltage is input. The panel switch is Off. |
| Output indicator | Green | On | Off | The indicator is on when the output is normal, and is off when the output is abnormal. |
| Fault indicator | Red | Off | Blink | The indicator is blinking in the following situations: The communication is interrupted for 60s or more than 60s. The power is input unevenly. The AC power module is reset remotely. |
| | | | On | The indicator is blinking in the following situations: Protection against overtemperature is performed. Fans become faulty. |

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 42mm x 198.5mm x 183.8mm (1.65 in. x 7.81 in. x 7.23 in.) |
| Weight | 2.5 kg (5.51 lb) |
| Rated AC input voltage | 200V-240V/100V-127V(dual-live-wire) |
| AC input voltage range | 180V to 264V |
| Maximum current | 10 A |

| Item | Specification |
|---------------------------|---------------|
| Typical power consumption | 70 W |
| Maximum output power | 1600 W |

5.3 NE20E-S8A Power Supply System

5.3.1 Architecture of the Power Supply System

The device supports DC power input and AC power input.

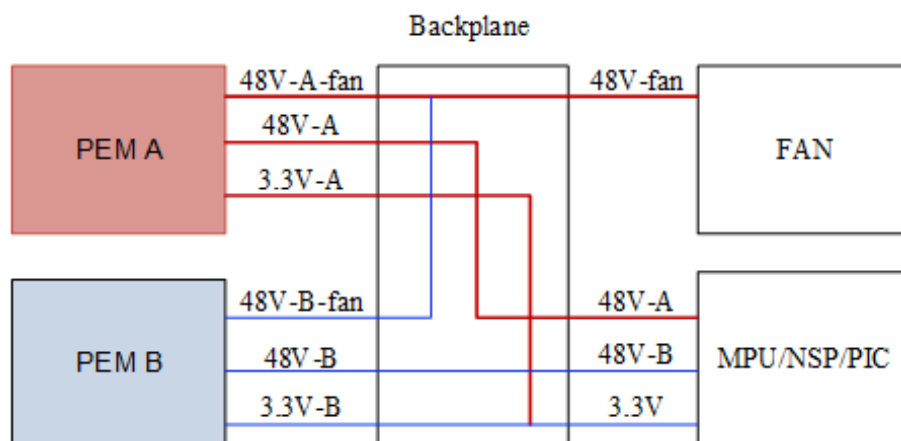
The device is powered by two PSUs, which work in 1+1 backup mode. When one PSU fails or is removed, the other one can still supply adequate power for the device. The PSUs are installed in the two top slots of the chassis and supply power for the MPUs, NSPs, PICs, and fan module.

The following measures are taken to ensure that the PSUs can supply stable and safe power for the system:

- Protection against output overcurrent
- Protection against output overvoltage
- Protection against input undervoltage
- Protection against overtemperature
- Protection against short circuit
- Alarm generation

5.3.2 Diagram of the Power Supply Architecture

A power supply system consists of two power modules working in 1+1 redundancy mode. Figure 5-5 shows the diagram of the power supply architecture. Each power module provides a 48 V power input and a 3.3 V power input to the boards. The two 48 V power inputs are integrated in the boards and the two 3.3 V power inputs are integrated in the backplane and then input to the boards. Each power module provides a 48 V power input to the fans. The two 48 V power inputs are integrated in the backplane and then input to the fans.

Figure 5-5 Diagram of the power supply architecture

5.3.3 DC Power System

Overview

Table 5-13 Power attributes

| Attribute | Description |
|-------------|--------------|
| Description | DC Power |
| BOM | 03032CYL |
| Model | CR5D00PSUC71 |

Table 5-14 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---------------|---------------------------|
| NE20E-S8A | slot 13 to 14 | V800R008C10 |

The device uses two PSUs, which work in 1+1 backup mode, for power supply. Figure shows the outline of a PSU.

Figure 5-6 Appearance**Table 5-15** Description of the indicators on the PSUs

| Indicator Name | Description |
|----------------|--|
| OUT | <p>When the indicator is steady green, the PSUs are working properly and supply stable power.</p> <p>When the indicator is steady red, the hardware of the PSUs fails or the device is not supplied with power ranging from -48 V or -60 V or the input voltage is lower or higher than the normal range.</p> <p>When the indicator is steady orange, the PSUs fail to communicate with the main control.</p> <p>When the indicator is off, the PSUs are switched off or the hardware of the PSUs is faulty.</p> |
| IN | <p>When the indicator is steady green, the power input is normal.</p> <p>When the indicator is off, the device is not supplied with power ranging from -48 V or -60 V.</p> |

- Notes on DC power monitoring:

The DC power monitoring channel can implement real-time monitoring on power supply. In addition, the DC power monitoring channel allows you to query the manufacturing ID, input voltage, and temperature of the PSUs in real time, and supports real-time reporting of power supply alarms.
- Notes on the configuration of DC power cables:

You do not need to connect protection ground cables to the PSUs, but the protection ground cable for the chassis must be properly grounded. DC power cables include a -48 V power cable and a return (RTN) ground cable. The required cable length depends on the distance between the cabinet and the power distribution cabinet for the device.

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 19.8mm x 198.5mm x 183.8mm (0.77 in. x 7.81 in. x 7.23 in.) |
| Weight | 0.9 kg (1.98 lb) |
| Rated DC input voltage | -48V/-60V DC |

| Item | Specification |
|---------------------------------|-----------------|
| DC input voltage range | -40V to -72V DC |
| Maximum current | 40 A |
| Circuit breaker of each channel | 50 A |
| Typical power consumption | 8 W |

5.3.4 AC Power Supply System

Overview

Table 5-16 Power attributes

| Attribute | Description |
|-------------|--------------|
| Description | AC power |
| BOM | 02310RBJ |
| Model | CR5D0PSUAC00 |

Table 5-17 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S4 | slot 8 to 9 | V800R007C00 |
| NE20E-S8 | slot 13 to 14 | V800R005C01 |
| NE20E-S8A | slot 13 to 14 | V800R008C10 |
| NE20E-S16 | slot 21 to 22 | V800R005C01 |
| NE20E-S16A | slot 21 to 22 | V800R008C10 |

Appearance

The device has two AC rectifier modules working in 1+1 backup mode. Figure shows the outline of an AC rectifier module.



Table 5-18 Introduction to the Power System

| Indicator Name | Color | Normal Status | Abnormal Status | Remarks |
|------------------|-------|---------------|-----------------|--|
| Input indicator | Green | On | Off | The indicator is on when the input is normal, and is off when the input is abnormal. |
| | | | Blink | Overvoltage or undervoltage is input. The panel switch is Off. |
| Output indicator | Green | On | Off | The indicator is on when the output is normal, and is off when the output is abnormal. |
| Fault indicator | Red | Off | Blink | The indicator is blinking in the following situations: The communication is interrupted for 60s or more than 60s. The power is input unevenly. The AC power module is reset remotely. |
| | | | On | The indicator is blinking in the following situations: Protection against overtemperature is performed. Fans become faulty. |

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 42mm x 198.5mm x 183.8mm (1.65 in. x 7.81 in. x 7.23 in.) |
| Weight | 2.5 kg (5.51 lb) |
| Rated AC input voltage | 200V-240V/100V-127V(dual-live-wire) |
| AC input voltage range | 180V to 264V |
| Maximum current | 10 A |

| Item | Specification |
|---------------------------|---------------|
| Typical power consumption | 70 W |
| Maximum output power | 1600 W |

5.4 NE20E-S16 Power Supply System

5.4.1 Architecture of the Power Supply System

The device supports DC power input and AC power input.

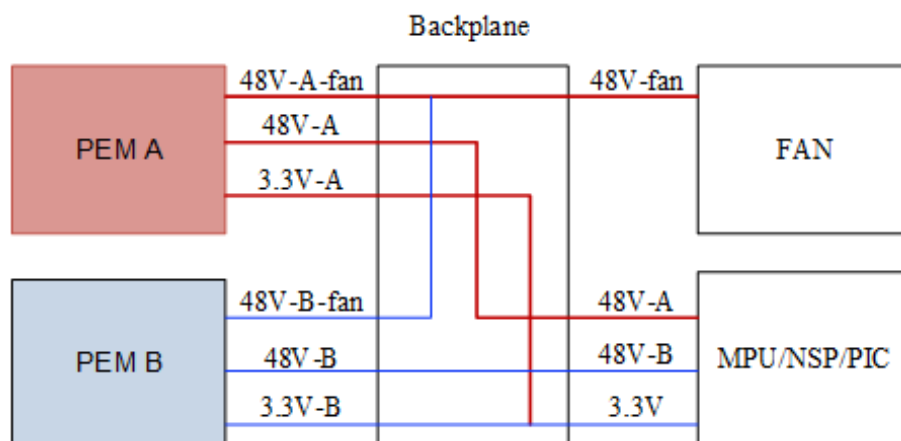
The device is powered by two PSUs, which work in 1+1 backup mode. When one PSU fails or is removed, the other one can still supply adequate power for the device. The PSUs are installed in the two top slots of the chassis and supply power for the MPUs, NSPs, PICs, and fan module.

The following measures are taken to ensure that the PSUs can supply stable and safe power for the system:

- Protection against output overcurrent
- Protection against output overvoltage
- Protection against input undervoltage
- Protection against overtemperature
- Protection against short circuit
- Alarm generation

5.4.2 Diagram of the Power Supply Architecture

A power supply system consists of two power modules working in 1+1 redundancy mode. Figure 5-7 shows the diagram of the power supply architecture. Each power module provides a 48 V power input and a 3.3 V power input to the boards. The two 48 V power inputs are integrated in the boards and the two 3.3 V power inputs are integrated in the backplane and then input to the boards. Each power module provides a 48 V power input to the fans. The two 48 V power inputs are integrated in the backplane and then input to the fans.

Figure 5-7 Diagram of the power supply architecture

5.4.3 DC Power System

Overview

Table 5-19 Power attributes

| Attribute | Description |
|-------------|--------------|
| Description | DC Power |
| BOM | 03030RFQ |
| Model | CR5D00PSUD71 |

Table 5-20 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---------------|---------------------------|
| NE20E-S16 | slot 21 to 22 | V800R005C01 |

The device adopts two PSUs, which work in 1+1 backup mode, for power supply. Figure 5-8 shows the outline of a PSU.

Figure 5-8 Appearance**Table 5-21** Description of the indicators on the PSUs

| Indicator Name | Description |
|----------------|---|
| OUT | <p>If the indicator is steady green, the PSUs is working properly and supply stable power.</p> <p>When the indicator is steady red, the hardware of the PSUs fails or the device is not supplied with power ranging from -48 V or -60 V.</p> <p>When the indicator is steady orange, the PSUs fail to communicate with the main control.</p> <p>When the indicator is off, the PSUs are switched off or the hardware of the PSUs is faulty.</p> |
| IN | <p>When the indicator is steady green, the power input is normal.</p> <p>When the indicator is off, the device is not supplied with power ranging from -48 V or -60 V.</p> |

- Notes on DC power monitoring:
The DC power monitoring channel can implement real-time monitoring on power supply. In addition, the DC power monitoring channel allows you to query the manufacturing ID, input voltage, and temperature of the PSUs in real time, and supports real-time reporting of power supply alarms.
- Notes on the configuration of DC power cables:
You do not need to connect protection ground cables to the PSUs, but the protection ground cable for the chassis must be properly grounded. DC power cables include a -48 V power cable and a return (RTN) ground cable. The required cable length depends on the distance between the cabinet and the power distribution cabinet for the device. The DC power cables need to be prepared according to the required lengths on site.

Technical Specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|---------------------------------|---|
| Dimensions (H x D x W) | 41.5mm x 233.6mm x 193.8mm (1.63 in. x 9.19 in. x 7.62 in.) |
| Weight | 1.4 kg (3.08 lb) |
| Rated DC input voltage | -48V/-60V DC |
| DC input voltage range | -40V to -72V DC |
| Maximum current | 42 A |
| Circuit breaker of each channel | 50 A |
| Typical power consumption | 15 W |

5.4.4 AC Power Supply System

Overview

Table 5-22 Power attributes

| Attribute | Description |
|-------------|--------------|
| Description | AC power |
| BOM | 02310RBJ |
| Model | CR5D0PSUAC00 |

Table 5-23 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S4 | slot 8 to 9 | V800R007C00 |
| NE20E-S8 | slot 13 to 14 | V800R005C01 |
| NE20E-S8A | slot 13 to 14 | V800R008C10 |
| NE20E-S16 | slot 21 to 22 | V800R005C01 |
| NE20E-S16A | slot 21 to 22 | V800R008C10 |

Appearance

The device has two AC rectifier modules working in 1+1 backup mode. Figure shows the outline of an AC rectifier module.



Table 5-24 Introduction to the Power System

| Indicator Name | Color | Normal Status | Abnormal Status | Remarks |
|------------------|-------|---------------|-----------------|--|
| Input indicator | Green | On | Off | The indicator is on when the input is normal, and is off when the input is abnormal. |
| | | | Blink | Overvoltage or undervoltage is input. The panel switch is Off. |
| Output indicator | Green | On | Off | The indicator is on when the output is normal, and is off when the output is abnormal. |
| Fault indicator | Red | Off | Blink | The indicator is blinking in the following situations: The communication is interrupted for 60s or more than 60s. The power is input unevenly. The AC power module is reset remotely. |
| | | | On | The indicator is blinking in the following situations: Protection against overtemperature is performed. Fans become faulty. |

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 42mm x 198.5mm x 183.8mm (1.65 in. x 7.81 in. x 7.23 in.) |
| Weight | 2.5 kg (5.51 lb) |
| Rated AC input voltage | 200V-240V/100V-127V(dual-live-wire) |
| AC input voltage range | 180V to 264V |
| Maximum current | 10 A |

| Item | Specification |
|---------------------------|---------------|
| Typical power consumption | 70 W |
| Maximum output power | 1600 W |

5.5 NE20E-S16A Power Supply System

5.5.1 Architecture of the Power Supply System

The device supports DC power input and AC power input.

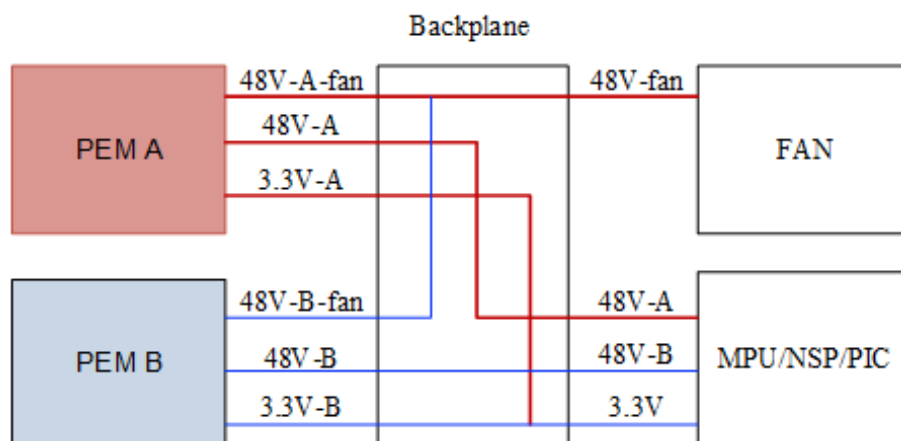
The device is powered by two PSUs, which work in 1+1 backup mode. When one PSU fails or is removed, the other one can still supply adequate power for the device. The PSUs are installed in the two top slots of the chassis and supply power for the MPUs, NSPs, PICs, and fan module.

The following measures are taken to ensure that the PSUs can supply stable and safe power for the system:

- Protection against output overcurrent
- Protection against output overvoltage
- Protection against input undervoltage
- Protection against overtemperature
- Protection against short circuit
- Alarm generation

5.5.2 Diagram of the Power Supply Architecture

A power supply system consists of two power modules working in 1+1 redundancy mode. Figure 5-9 shows the diagram of the power supply architecture. Each power module provides a 48 V power input and a 3.3 V power input to the boards. The two 48 V power inputs are integrated in the boards and the two 3.3 V power inputs are integrated in the backplane and then input to the boards. Each power module provides a 48 V power input to the fans. The two 48 V power inputs are integrated in the backplane and then input to the fans.

Figure 5-9 Diagram of the power supply architecture

5.5.3 DC Power System

Overview

Table 5-25 Power attributes

| Attribute | Description |
|-------------|--------------|
| Description | DC Power |
| BOM | 03032CYM |
| Model | CR5D00PSUD72 |

Table 5-26 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S16A | slot 21 to 22 | V800R008C10 |

The device adopts two PSUs, which work in 1+1 backup mode, for power supply. Figure 5-10 shows the outline of a PSU.

Figure 5-10 Appearance**Table 5-27** Description of the indicators on the PSUs

| Indicator Name | Description |
|----------------|---|
| OUT | <p>If the indicator is steady green, the PSUs is working properly and supply stable power.</p> <p>When the indicator is steady red, the hardware of the PSUs fails or the device is not supplied with power ranging from -48 V or -60 V.</p> <p>When the indicator is steady orange, the PSUs fail to communicate with the main control.</p> <p>When the indicator is off, the PSUs are switched off or the hardware of the PSUs is faulty.</p> |
| IN | <p>When the indicator is steady green, the power input is normal.</p> <p>When the indicator is off, the device is not supplied with power ranging from -48 V or -60 V.</p> |

- Notes on DC power monitoring:

The DC power monitoring channel can implement real-time monitoring on power supply. In addition, the DC power monitoring channel allows you to query the manufacturing ID, input voltage, and temperature of the PSUs in real time, and supports real-time reporting of power supply alarms.
- Notes on the configuration of DC power cables:

You do not need to connect protection ground cables to the PSUs, but the protection ground cable for the chassis must be properly grounded. DC power cables include a -48 V power cable and a return (RTN) ground cable. The required cable length depends on the distance between the cabinet and the power distribution cabinet for the device.

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 41.5mm x 233.6mm x 193.8mm (1.63 in. x 9.19 in. x |

| Item | Specification |
|---------------------------------|------------------|
| | 7.62 in.) |
| Weight | 1.4 kg (3.08 lb) |
| Rated DC input voltage | -48V/-60V DC |
| DC input voltage range | -40V to -72V DC |
| Maximum current | 50 A |
| Circuit breaker of each channel | 63 A |
| Typical power consumption | 15 W |

5.5.4 AC Power Supply System

Overview

Table 5-28 Power attributes

| Attribute | Description |
|-------------|--------------|
| Description | AC power |
| BOM | 02310RBJ |
| Model | CR5D0PSUAC00 |

Table 5-29 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S4 | slot 8 to 9 | V800R007C00 |
| NE20E-S8 | slot 13 to 14 | V800R005C01 |
| NE20E-S8A | slot 13 to 14 | V800R008C10 |
| NE20E-S16 | slot 21 to 22 | V800R005C01 |
| NE20E-S16A | slot 21 to 22 | V800R008C10 |

Appearance

The device has two AC rectifier modules working in 1+1 backup mode. Figure shows the outline of an AC rectifier module.



Table 5-30 Introduction to the Power System

| Indicator Name | Color | Normal Status | Abnormal Status | Remarks |
|------------------|-------|---------------|-----------------|--|
| Input indicator | Green | On | Off | The indicator is on when the input is normal, and is off when the input is abnormal. |
| | | | Blink | Overvoltage or undervoltage is input. The panel switch is Off. |
| Output indicator | Green | On | Off | The indicator is on when the output is normal, and is off when the output is abnormal. |
| Fault indicator | Red | Off | Blink | The indicator is blinking in the following situations: The communication is interrupted for 60s or more than 60s. The power is input unevenly. The AC power module is reset remotely. |
| | | | On | The indicator is blinking in the following situations: Protection against overtemperature is performed. Fans become faulty. |

Technical Specifications

| Item | Specification |
|------------------------|---|
| Dimensions (H x D x W) | 42mm x 198.5mm x 183.8mm (1.65 in. x 7.81 in. x 7.23 in.) |
| Weight | 2.5 kg (5.51 lb) |
| Rated AC input voltage | 200V-240V/100V-127V(dual-live-wire) |
| AC input voltage range | 180V to 264V |
| Maximum current | 10 A |

| Item | Specification |
|---------------------------|---------------|
| Typical power consumption | 70 W |
| Maximum output power | 1600 W |

6 Fan

About This Chapter

This section describes the appearance, functions, and technical specifications of the fan module.

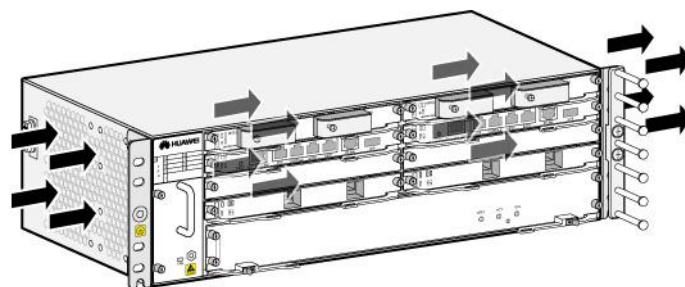
- 6.1 NE20E-S4 Heat Dissipation System
- 6.2 NE20E-S8 Heat Dissipation System
- 6.3 NE20E-S8A Heat Dissipation System
- 6.4 NE20E-S16 Heat Dissipation System
- 6.5 NE20E-S16A Heat Dissipation System

6.1 NE20E-S4 Heat Dissipation System

6.1.1 Air Channel

The NE20E-S4 dissipates heat by blowing air in a left-to-right direction. Figure 6-1 shows the air flow in the NE20E-S4.

Figure 6-1 Air flow in the NE20E-S4



6.1.2 NE20E-S4 Fan Module

Overview

Table 6-1 Fan attributes

| Attribute | Description |
|-------------|---------------------|
| Description | NE20E-S4 Fan Module |
| BOM | 02310MSU |
| Model | CR2M004FBX10 |

Table 6-2 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|---------|---------------------------|
| NE20E-S4 | slot 10 | V800R005C00 |

Appearance



Indicators

Table 6-3 Description of indicators on the fan module

| Indicator | Status Description |
|-----------|---|
| FAN | The indicator is off when the fan module is powered off, or |

| Indicator | Status Description |
|-----------|---|
| | <p>has a hardware fault.</p> <p>If the indicator is steady green, it indicates that the fan module works normally.</p> <p>If the indicator is steady orange, it indicates that the fan module is unregistered.</p> <p>If the indicator is steady red, it indicates that the fan module fails.</p> |

Technical Specifications

Table 6-4 Fan specifications

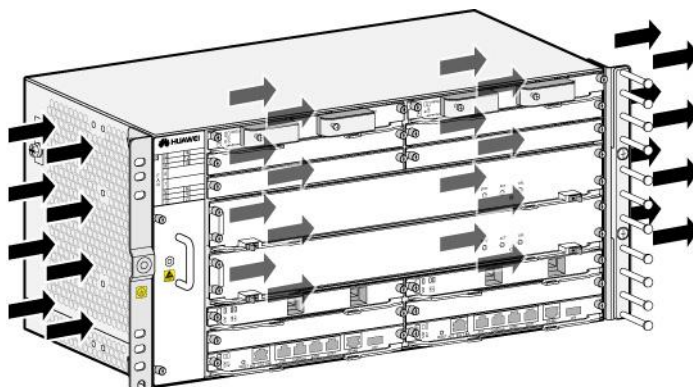
| Item | Specification |
|------------------------|-----------------------------|
| Dimensions (H x W x D) | 50mm x 129.7mm x 217mm |
| Weight | 1.1kg |
| Fan quantity | 6 |
| Power consumption | 18W |
| Noise | 61dB,<72dB(Meet ETSI 72dBA) |

6.2 NE20E-S8 Heat Dissipation System

6.2.1 Air Channel

The NE20E-S8 dissipates heat by blowing air from left to right. Figure 6-2 shows the air flow in the NE20E-S8.

Figure 6-2 Air flow in the NE20E-S8



6.2.2 NE20E-S8/NE20E-S8A DC Fan Module

Overview

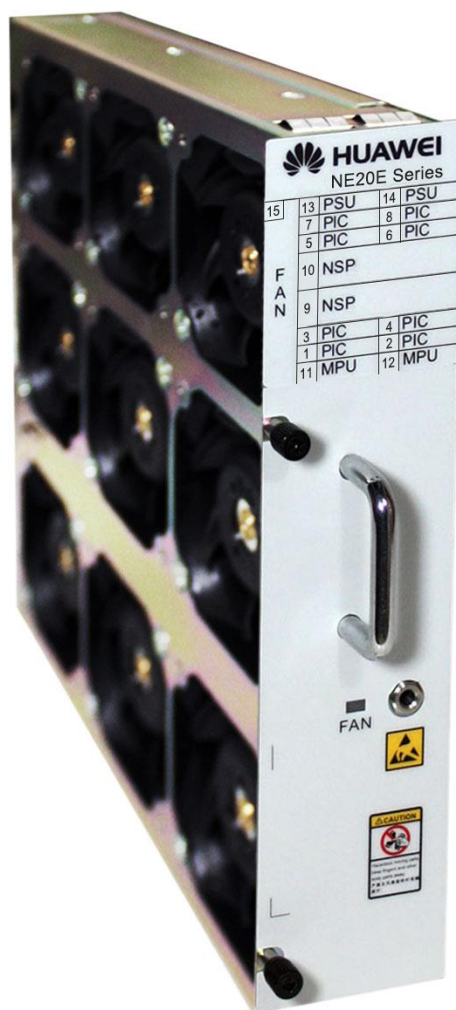
Table 6-5 Fan attributes

| Attribute | Description |
|-------------|----------------------------------|
| Description | NE20E-S8/NE20E-S8A DC Fan Module |
| BOM | 02310MSV |
| Model | CR2M008FBX10 |

Table 6-6 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---------|---------------------------|
| NE20E-S8 | slot 15 | V800R005C00 |
| NE20E-S8A | slot 15 | V800R008C10 |

Appearance



Indicators

Table 6-7 Description of indicators on the fan module

| Indicator | Status Description |
|-----------|---|
| FAN | <p>The indicator is off when the fan module is powered off, or has a hardware fault.</p> <p>If the indicator is steady green, it indicates that the fan module works normally.</p> <p>If the indicator is steady orange, it indicates that the fan module is unregistered.</p> <p>If the indicator is steady red, it indicates that the fan module fails.</p> |

Technical Specifications

Table 6-8 Fan specifications

| Item | Specification |
|------------------------|-----------------------------|
| Dimensions (H x W x D) | 50mm x 200.7mm x 217.7mm |
| Weight | 1.7kg |
| Fan quantity | 9 |
| Power consumption | 27W |
| Noise | 61dB,<72dB(Meet ETSI 72dBA) |

6.2.3 NE20E-S8/NE20E-S8A AC Fan Module

Overview

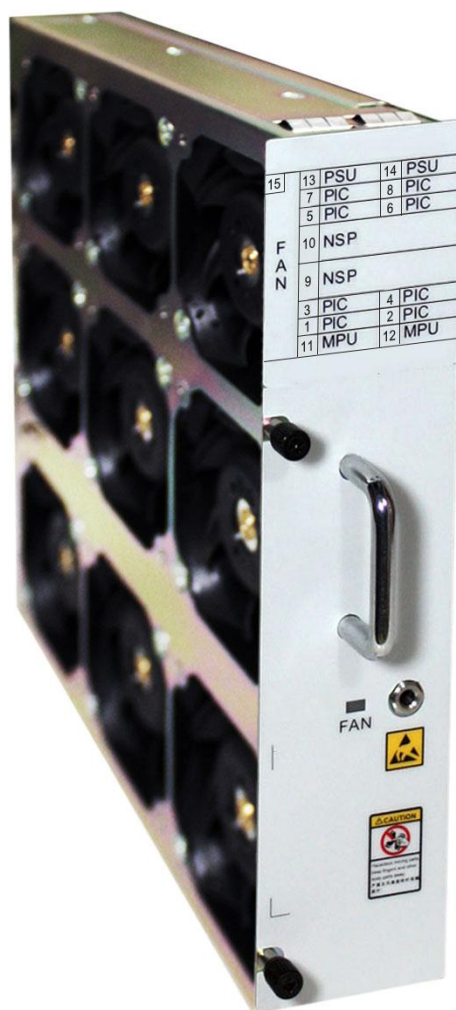
Table 6-9 Fan attributes

| Attribute | Description |
|-------------|----------------------------------|
| Description | NE20E-S8/NE20E-S8A AC Fan Module |
| BOM | 02310SFU |
| Model | CR2M008FBX11 |

Table 6-10 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---------|---------------------------|
| NE20E-S8 | slot 15 | V800R005C00 |
| NE20E-S8A | slot 15 | V800R008C10 |

Appearance



Indicators

Table 6-11 Description of indicators on the fan module

| Indicator | Status Description |
|-----------|---|
| FAN | <p>The indicator is off when the fan module is powered off, or has a hardware fault.</p> <p>If the indicator is steady green, it indicates that the fan module works normally.</p> <p>If the indicator is steady orange, it indicates that the fan module is unregistered.</p> <p>If the indicator is steady red, it indicates that the fan module fails.</p> |

Technical Specifications

Table 6-12 Fan specifications

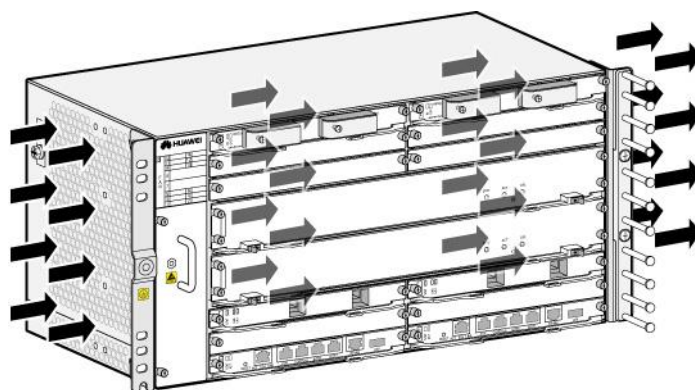
| Item | Specification |
|------------------------|-----------------------------|
| Dimensions (H x W x D) | 50mm x 226mm x 219mm |
| Weight | 1.7kg |
| Fan quantity | 9 |
| Power consumption | 27W |
| Noise | 61dB,<72dB(Meet ETSI 72dBA) |

6.3 NE20E-S8A Heat Dissipation System

6.3.1 Air Channel

The NE20E-S8A dissipates heat by blowing air from left to right. Figure 6-3 shows the air flow in the NE20E-S8A.

Figure 6-3 Air flow in the NE20E-S8A



6.3.2 NE20E-S8/NE20E-S8A DC Fan Module

Overview

Table 6-13 Fan attributes

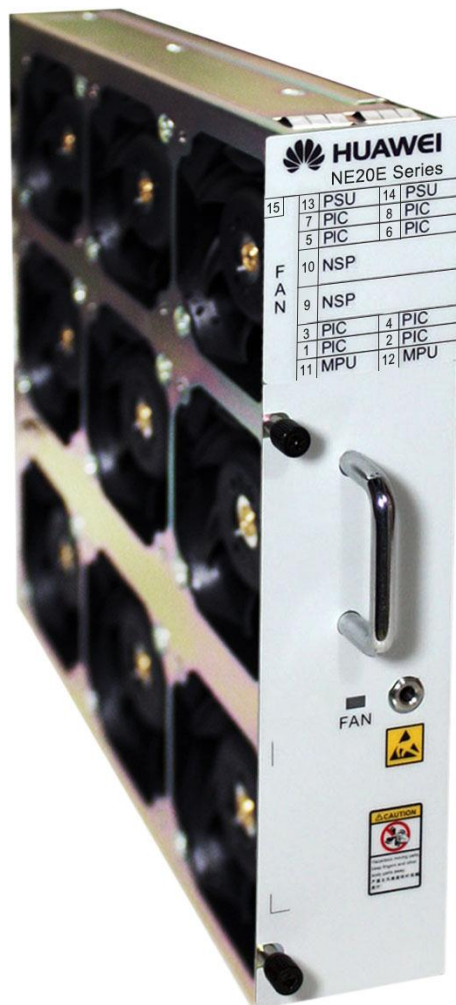
| Attribute | Description |
|-------------|----------------------------------|
| Description | NE20E-S8/NE20E-S8A DC Fan Module |
| BOM | 02310MSV |

| Attribute | Description |
|-----------|--------------|
| Model | CR2M008FBX10 |

Table 6-14 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---------|---------------------------|
| NE20E-S8 | slot 15 | V800R005C00 |
| NE20E-S8A | slot 15 | V800R008C10 |

Appearance



Indicators

Table 6-15 Description of indicators on the fan module

| Indicator | Status Description |
|-----------|---|
| FAN | <p>The indicator is off when the fan module is powered off, or has a hardware fault.</p> <p>If the indicator is steady green, it indicates that the fan module works normally.</p> <p>If the indicator is steady orange, it indicates that the fan module is unregistered.</p> <p>If the indicator is steady red, it indicates that the fan module fails.</p> |

Technical Specifications

Table 6-16 Fan specifications

| Item | Specification |
|------------------------|-----------------------------|
| Dimensions (H x W x D) | 50mm x 200.7mm x 217.7mm |
| Weight | 1.7kg |
| Fan quantity | 9 |
| Power consumption | 27W |
| Noise | 61dB,<72dB(Meet ETSI 72dBA) |

6.3.3 NE20E-S8/NE20E-S8A AC Fan Module

Overview

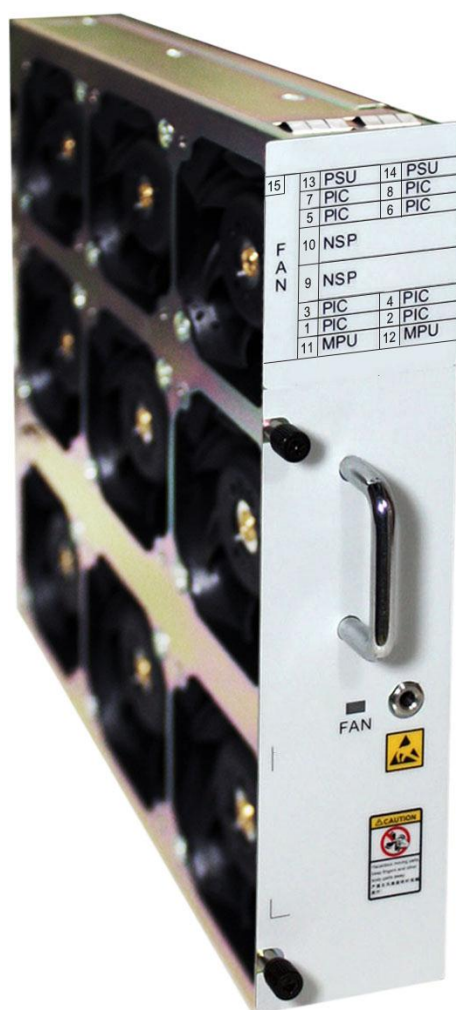
Table 6-17 Fan attributes

| Attribute | Description |
|-------------|----------------------------------|
| Description | NE20E-S8/NE20E-S8A AC Fan Module |
| BOM | 02310SFU |
| Model | CR2M008FBX11 |

Table 6-18 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---------|---------------------------|
| NE20E-S8 | slot 15 | V800R005C00 |
| NE20E-S8A | slot 15 | V800R008C10 |

Appearance



Indicators

Table 6-19 Description of indicators on the fan module

| Indicator | Status Description |
|-----------|--|
| FAN | The indicator is off when the fan module is powered off, or has a hardware fault. If the indicator is steady green, it indicates that the fan |

| Indicator | Status Description |
|-----------|--|
| | <p>module works normally.</p> <p>If the indicator is steady orange, it indicates that the fan module is unregistered.</p> <p>If the indicator is steady red, it indicates that the fan module fails.</p> |

Technical Specifications

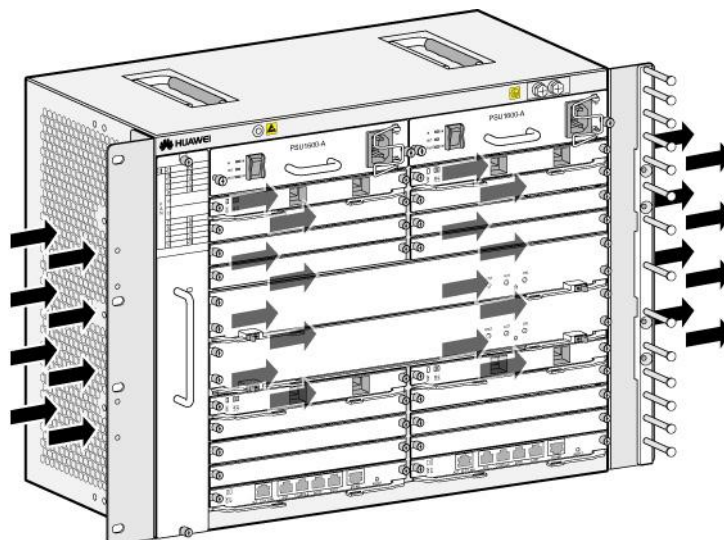
Table 6-20 Fan specifications

| Item | Specification |
|------------------------|-----------------------------|
| Dimensions (H x W x D) | 50mm x 226mm x 219mm |
| Weight | 1.7kg |
| Fan quantity | 9 |
| Power consumption | 27W |
| Noise | 61dB,<72dB(Meet ETSI 72dBA) |

6.4 NE20E-S16 Heat Dissipation System

6.4.1 Air Channel

The NE20E-S16 dissipates heat by blowing air from left to right. Figure 6-4 shows the air flow in the NE20E-S16.

Figure 6-4 Air flow in the NE20E-S16

6.4.2 NE20E-S16 Fan Module

Overview

Table 6-21 Fan attributes

| Attribute | Description |
|-------------|----------------------|
| Description | NE20E-S16 Fan Module |
| BOM | 02310QMQ |
| Model | CR2M016FBX10 |

Table 6-22 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---------|---------------------------|
| NE20E-S16 | slot 23 | V800R005C01 |

Appearance



Indicators

Table 6-23 Description of indicators on the fan module

| Indicator | Status Description |
|-----------|--|
| FAN | <p>The indicator is off when the fan module is powered off, or has a hardware fault.</p> <p>If the indicator is steady green, it indicates that the fan module works normally.</p> <p>If the indicator is steady orange, it indicates that the fan module is unregistered.</p> <p>If the indicator is steady red, it indicates that the fan module</p> |

| Indicator | Status Description |
|-----------|--------------------|
| | fails. |

Technical Specifications

Table 6-24 Fan specifications

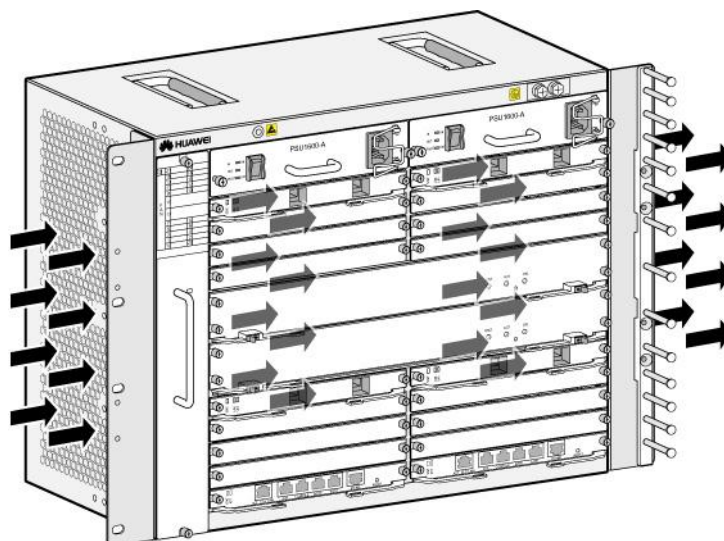
| Item | Specification |
|------------------------|------------------------------|
| Dimensions (H x W x D) | 50mm x 226mm x 334mm |
| Weight | 2.5kg |
| Fan quantity | 6 |
| Power consumption | 30W |
| Noise | 68dB, <72dB(Meet ETSI 72dBA) |

6.5 NE20E-S16A Heat Dissipation System

6.5.1 Air Channel

The NE20E-S16A dissipates heat by blowing air from left to right. Figure 6-5 shows the air flow in the NE20E-S16A.

Figure 6-5 Air flow in the NE20E-S16A



6.5.2 NE20E-S16A Fan Module

Overview

Table 6-25 Fan attributes

| Attribute | Description |
|-------------|-----------------------|
| Description | NE20E-S16A Fan Module |
| BOM | 02311MUS |
| Model | CR2M016FBX12 |

Table 6-26 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------|---------------------------|
| NE20E-S16A | slot 23 | V800R008C10 |

Appearance



Indicators

Table 6-27 Description of indicators on the fan module

| Indicator | Status Description |
|-----------|--|
| FAN | <p>The indicator is off when the fan module is powered off, or has a hardware fault.</p> <p>If the indicator is steady green, it indicates that the fan module works normally.</p> <p>If the indicator is steady orange, it indicates that the fan module is unregistered.</p> <p>If the indicator is steady red, it indicates that the fan module</p> |

| Indicator | Status Description |
|-----------|--------------------|
| | fails. |

Technical Specifications

Table 6-28 Fan specifications

| Item | Specification |
|------------------------|-----------------------------|
| Dimensions (H x W x D) | 50mm x 226mm x 334mm |
| Weight | 2.5kg |
| Fan quantity | 6 |
| Power consumption | 42W |
| Noise | 68dB,<72dB(Meet ETSI 72dBA) |

7 Boards

About This Chapter

This chapter describes the boards of the device.

[7.1 Overview](#)

This chapter describes the appearance and structure of boards and subcards, filler panel, board and subcard specifications, rules for numbering slots and interfaces.

[7.2 Control Plane](#)

[7.3 Data Plane](#)

[7.4 Interface Card](#)

7.1 Overview

This chapter describes the appearance and structure of boards and subcards, filler panel, board and subcard specifications, rules for numbering slots and interfaces.

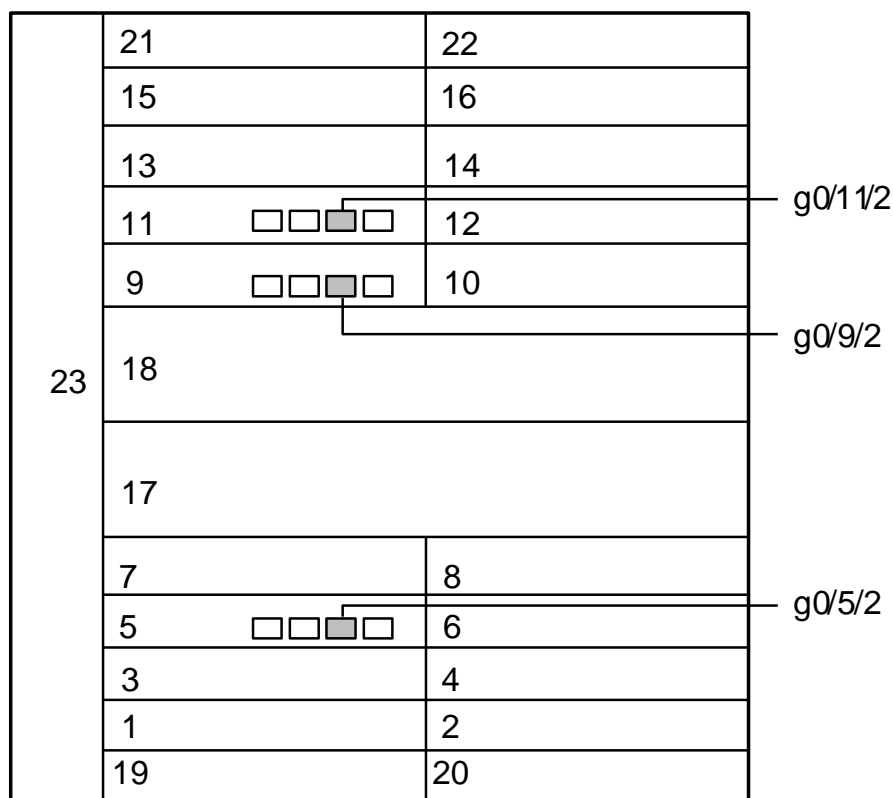
7.1.1 Rules for Numbering Slots and Interfaces

Numbering Rule of Service Interfaces on the NE20E-S4

Service interfaces on the NE20E-S4 are numbered in the following format: 0/subcard slot number/interface number on the subcard.

- A subcard slot number is the number of the slot where an interface's subcard resides. A subcard slot number ranges from 1 to 4.
- An interface number on the subcard starts with 0, and its maximum value is determined by the actual number of interfaces on the subcard.

The following figure shows how a service interface is numbered on the NE20E-S4.

Figure 7-1 Numbering rule of service interfaces on the NE20E-S4**Table 7-1** NE20E-S4 slot description

| Slot | Quantity | Remarks |
|----------------|----------|---|
| 1, 2, 3, and 4 | 4 | Slots for high-speed and low-speed subcards |
| 5 | 1 | Slot for the NSP |
| 6 and 7 | 2 | Slots for MPUs in 1:1 backup mode |
| 8 and 9 | 2 | Slots for DC power modules in 1+1 backup mode |
| 10 | 1 | Slot for a fan module |

Numbering Rule of Service Interfaces on the NE20E-S8/NE20E-S8A

Numbering Rule of Service Interfaces on the NE20E-S8/NE20E-S8A

Service interfaces on the NE20E-S8/NE20E-S8A are numbered in the following format: 0/subcard slot number/interface number on the subcard.

- A subcard slot number is the number of the slot where an interface's subcard resides. A subcard slot number ranges from 1 to 8.

- An interface number on the subcard starts with 0, and its maximum value is determined by the actual number of interfaces on the subcard.

The following figure shows how a service interface is numbered on the NE20E-S8/NE20E-S8A.

Figure 7-2 Numbering rule of service interfaces on the NE20E-S8/NE20E-S8A

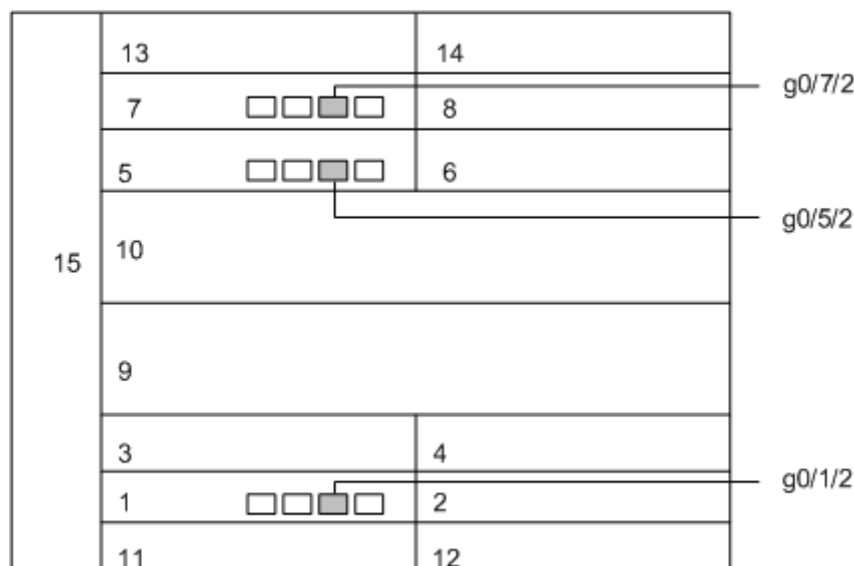


Table 7-2 NE20E-S8/NE20E-S8A slot description

| Slot | Quantity | Remarks |
|-----------|----------|--|
| 1 to 8 | 8 | For PICs, which include HICs, FICs and the other subcards. |
| 9 and 10 | 2 | Slots for NSPs |
| 11 and 12 | 2 | Slots for MPUs in 1:1 backup mode |
| 13 and 14 | 2 | Slots for DC power modules in 1+1 backup mode |
| 15 | 1 | Slot for a fan module |

Numbering Rule of Service Interfaces on the NE20E-S16/NE20E-S16A

Numbering Rule of Service Interfaces on the NE20E-S16/NE20E-S16A

Service interfaces on the NE20E-S16/NE20E-S16A are numbered in the following format: 0/subcard slot number/interface number on the subcard.

- A subcard slot number is the number of the slot where an interface's subcard resides. A subcard slot number ranges from 1 to 16.
- An interface number on the subcard starts with 0, and its maximum value is determined by the actual number of interfaces on the subcard.

The following figure shows how a service interface is numbered on the NE20E-S16/NE20E-S16A.

Figure 7-3 Numbering rule of service interfaces on the NE20E-S16/NE20E-S16A

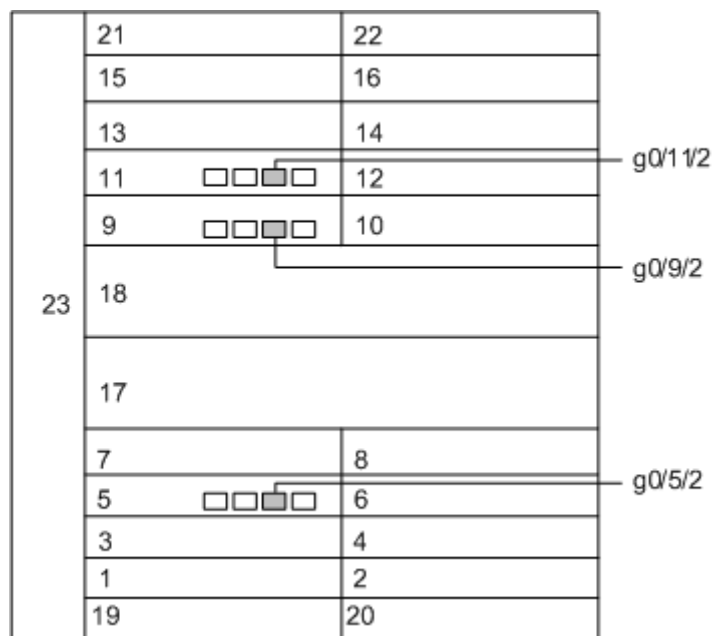


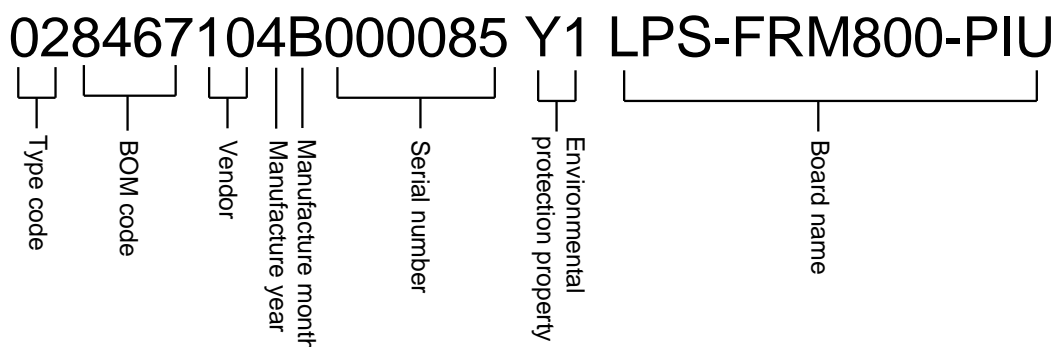
Table 7-3 Slot layout of the NE20E-S16/NE20E-S16A

| Slot | Number | Remarks |
|-----------|--------|--|
| 1 to 16 | 16 | For PICs, which include HICs, FICs and the other subcards. |
| 17 and 18 | 2 | For NSPs. |
| 19 and 20 | 2 | For MPUs, which are in 1:1 backup. |
| 21 and 22 | 2 | For PSUs, which are in 1+1 backup. |
| 23 | 1 | For the fan frame. |

7.1.2 Bar Code for Boards

The bar code of a board is provided on the front panel of the board and contains the basic information about the board, including the BOM code and delivery time.

The bar code of a board provides the feature information about the board and varies according to boards. Figure 7-4 shows a bar code and Table 7-4 provides the description of the bar code.

Figure 7-4 Bar code of a board**NOTE**

The bar code in the figure is only an example and it may differ in practice.

Table 7-4 Description of the bar code of a board

| Item | Description |
|-----------------------------------|---|
| Type Code | Indicates whether a board is a manufactured or finished board. "02" indicates a manufactured board and "03" indicates a finished board. |
| BOM Code | Indicates the last four digits of the BOM code of a board. |
| Vendor | Indicates the vendor of a board. "10" indicates Huawei. |
| Manufacture Year | Indicates the last digit of the year when a board is manufactured. For example, "4" indicates 2004. From 2010 onwards, a letter is used to indicate the manufacture year. For example, the letter A indicates 2010, the letter B indicates 2011, and so on. |
| Manufacture Month | Indicates the month when a board is manufactured. The value is expressed in hexadecimal format. For example, the letter B indicates November. |
| Serial Number | Indicates the production serial number of a board. The value ranges from 000001 to 999999. |
| Environmental Protection Property | Indicates the environmental protection property of a board. |
| Board Name | Indicates the name and associated information about a board. |

7.2 Control Plane

7.2.1 Introduction to the Control Plane

The function of control plane is implemented by the MPU.

The device can be equipped with a single MPU or double MPUs (in backup mode).

In the case of double MPUs, when the master MPU is working, the slave MPU is in the standby state. You can connect either the management network port on the master MPU or that on the slave MPU to the device. The slave MPU exchanges information (heartbeat messages and backup data) with only the master MPU. Data consistency between the master and slave MPUs is ensured through high reliability mechanisms such as batch backup and real-time backup. After a master/slave switchover, the slave MPU immediately becomes the master MPU. You can configure a default master MPU. During the start process, the MPU that you configure wins the competition and becomes the master MPU.

MPUs support two switchover modes: failover and manual switchover. The failover is triggered by serious faults or resetting of the master MPU. The manual switchover is triggered by commands run on the console interface or management interface.

The MPU integrates multiple functional units. By integrating the system control and management unit, clock unit, and system maintenance unit, the MPU provides the functions of the control plane and maintenance plane. The functions of the MPU are detailed as follows:

- **System control and management unit**
The MPU is mainly responsible for processing routing protocols. In addition, the MPU broadcasts and filters routing packets, downloads routing policies from the policy server. The MPU manages the NSPs and communicates with the NSPs. The MPU implements outband communication between boards. The MPU manages and carries out communication between the NSPs and slave MPU through the outband management bus. The MPU is also responsible for data management. The system configuration data, booting file, upgrade software, and system logs are stored on the MPU. The EUSB card on the MPU functions as a mass storage device for saving data files including system files, configuration files, and logs, and is not hot-swappable. The MPU manages and maintains the device. Through management interfaces such as serial interfaces and network interfaces on the MPU, you can manage and maintain the device.
- **System clock unit**
The system clock unit of the MPU provides NSPs and PICs with reliable and synchronous SDH clock signals.
- **System maintenance unit**
The system maintenance unit of the MPU collects monitoring information, remotely or locally tests system units, or performs in-service upgrades on system units. Through the Monitorbus, the MPU collects the operation data periodically. The MPU produces controlling information, such as detecting the board presence and adjusting the fan speed.



NOTE

The MPUs work in 1:1 hot backup mode, improving system reliability.

7.2.2 Main Processing Unit E

Overview

Table 7-5 Board attributes

| Attribute | Description |
|-----------|-------------|
|-----------|-------------|

| Attribute | Description |
|-----------------------|------------------------|
| Board name silkscreen | NE-MPUE |
| Description | Main Processing Unit E |
| BOM | 03030QCX |
| Model | CR2D00MPUE10 |

Table 7-6 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---------------|--|
| NE20E-S4 | slot 5 to 6 | <ul style="list-style-type: none"> • DC:V800R005C00 • AC:V800R007C00 |
| NE20E-S8 | slot 11 to 12 | <ul style="list-style-type: none"> • DC:V800R005C00 • AC:V800R005C01 |
| NE20E-S16 | slot 19 to 20 | V800R005C01 |

Appearance



Panel

Table 7-7 Buttons

| Button | Description |
|--------|--|
| RESET | When this button is pressed, the MPU is reset. |

Table 7-8 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | If this indicator is steady green, the board is working properly. |

| Indicator | Status Description |
|------------------|---|
| | <p>If this indicator is blinking green, the board is registering.</p> <p>If this indicator is steady red, the hardware on the board is faulty.</p> <p>If this indicator is off, the board is not powered on or is not registered.</p> |
| ACT (green) | <p>If this indicator is steady on, the MPU functions as the master MPU.</p> <p>If this indicator is off, the MPU functions as the slave MPU or is not registered.</p> |
| ETH LINK (green) | <p>If this indicator is steady on, the link is Up.</p> <p>If this indicator is off, the link is Down.</p> |
| ETH ACT (yellow) | <p>If this indicator is blinking, data is being transmitted and received.</p> <p>If this indicator is off, no data is being transmitted or received.</p> |

Table 7-9 Management interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|---|----------------|---|--|
| MGMT-ETH | Ethernet interface (10M/100M/1000M Base-TX autonegotiation) | RJ45 | It connects to an NMS. | Super category 5 shielded twisted pair |
| AUX | RS-232 serial interface | RJ45 | <p>It connects to the modem for remote maintenance by means of dial-up. Baud rate: 9600 bit/s (default value), which is configurable.</p> <p>Currently the device cannot be managed through the AUX interface. The AUX interface is reserved for further expansion.</p> | 8-core shielded cable |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|-------------------------|----------------|--|--|
| CONSOLE | RS-232 serial interface | RJ45 | It connects to the console for on-site system configuration. Baud rate: 9600 bit/s (default value), which is configurable. | 8-core shielded cable |
| CLK | CLK/PPS interface | RJ45 | Used to input or output 2-Mbit/s clock signals, 2-MHz clock signals, or 1 PPS signals. | 120-ohm clock cable |
| RS-485 | RS-485 interface | RJ45 | Used to connect to the monitoring interface on the external AC power supply module. | 8-core shielded cable |
| TOD | TOD interface | RJ45 | Used to input or output 1pps+ASCII time signals or DCLS time signals. | (Shielded or unshielded) straight-through cables |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | By integrating the system control and management unit, clock unit, and maintenance unit, the board provides the functions of the control plane and maintenance plane. |
| Reliability and availability | Support for hot swap and 1:1 backup mode. |
| Restrictions and Remarks | This board cannot be used together with other MPUs. |

Technical Specifications

Table 7-10 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 20.0 W |
| Typical heat dissipation | 64.9 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |
| Memory | 2GB(9*2Gbit) |
| Storage | 2G eUSB |
| Processing unit | Single-core 1.2G |
| SDRAM | 2GB(9*2Gbit) |
| Flash | 16bit/16MB |

7.2.3 Main Processing Unit E1

Overview

Table 7-11 Board attributes

| Attribute | Description |
|-----------------------|-------------------------|
| Board name silkscreen | NE-MPUE1 |
| Description | Main Processing Unit E1 |
| BOM | 03031EDQ |
| Model | CR2D0MPUE110 |

Table 7-12 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|---------------|---------------------------|
| NE20E-S4 | slot 5 to 6 | V800R007C10 |
| NE20E-S8 | slot 11 to 12 | V800R007C10 |

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S8A | slot 11 to 12 | V800R008C10 |
| NE20E-S16 | slot 19 to 20 | V800R007C10 |
| NE20E-S16A | slot 19 to 20 | V800R008C10 |

Appearance



Panel

Table 7-13 Buttons

| Button | Description |
|--------|--|
| RESET | When this button is pressed, the MPU is reset. |

Table 7-14 Indicators

| Indicator | Status Description |
|------------------|---|
| STAT | If this indicator is steady green, the board is working properly. If this indicator is blinking green, the board is registering. If this indicator is steady red, the hardware on the board is faulty. If this indicator is off, the board is not powered on or is not registered. |
| ACT (green) | If this indicator is steady on, the MPU functions as the master MPU. If this indicator is off, the MPU functions as the slave MPU or is not registered. |
| ETH LINK (green) | If this indicator is steady on, the link is Up. If this indicator is off, the link is Down. |
| ETH ACT (yellow) | If this indicator is blinking, data is being transmitted and received. If this indicator is off, no data is being transmitted or received. |
| L/A (yellow) | If this indicator is steady on, the link is Up. |

| Indicator | Status Description |
|-----------|---|
| | If this indicator is blinking, data is being transmitted or received. If this indicator is steady off, the link is Down. |

Table 7-15 Management interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|---|----------------|---|---|
| MGMT-ETH | Ethernet interface (10M/100M/1000M Base-TX autonegotiation) | RJ45 | It connects to an NMS. | Super category 5 shielded twisted pair |
| AUX | RS-232 serial interface | RJ45 | It connects to the modem for remote maintenance by means of dial-up. Baud rate: 9600 bit/s (default value), which is configurable. Currently the device cannot be managed through the AUX interface. The AUX interface is reserved for further expansion. | 8-core shielded cable |
| CONSOLE | RS-232 serial interface | RJ45 | It connects to the console for on-site system configuration. Baud rate: 9600 bit/s (default value), which is configurable. | 8-core shielded cable |
| GE0, GE1 | GE interface | SFP | Cascading interface, used for control | Single-mode or multi-mode optical fiber |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|-------------------|----------------|--|--|
| | | | panel expansion in the virtual cluster scenario. | |
| CLK | CLK/PPS interface | RJ45 | Used to input or output 2-Mbit/s clock signals, 2-MHz clock signals, or 1 PPS signals. | 120-ohm clock cable |
| RS-485 | RS-485 interface | RJ45 | Used to connect to the monitoring interface on the external AC power supply module. | 8-core shielded cable |
| TOD | TOD interface | RJ45 | Used to input or output 1pps+ASCII time signals or DCLS time signals. | (Shielded or unshielded) straight-through cables |
| USB | USB 2.0 | USB TYPE A | USB interface. | - |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | By integrating the system control and management unit, clock unit, and maintenance unit, the board provides the functions of the control plane and maintenance plane. |
| Reliability and availability | Support for hot swap and 1:1 backup mode. |
| Restrictions and Remarks | This board cannot be used together with other MPUs. |

Technical Specifications

Table 7-16 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 35.0 W |
| Typical heat dissipation | 119.5 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: -5 °C to 65 °C (23 °F to 149 °F) |
| Memory | 8GB(18*4Gbit) |
| Storage | 2G eUSB |
| Processing unit | Octa-core 1.5G |
| SDRAM | 8GB(18*4Gbit) |
| Flash | 16bit/128MB |

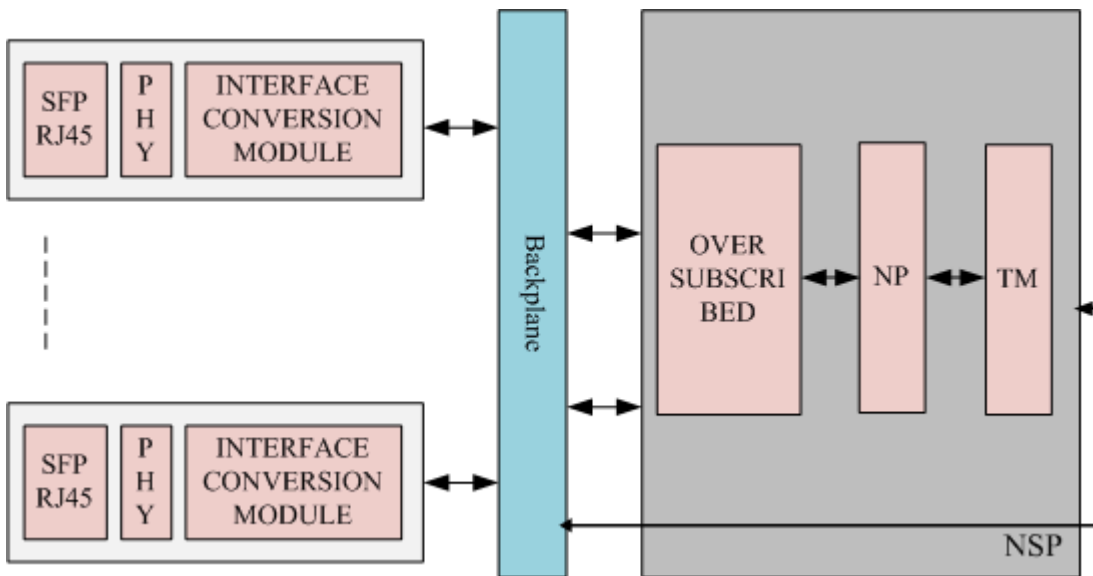
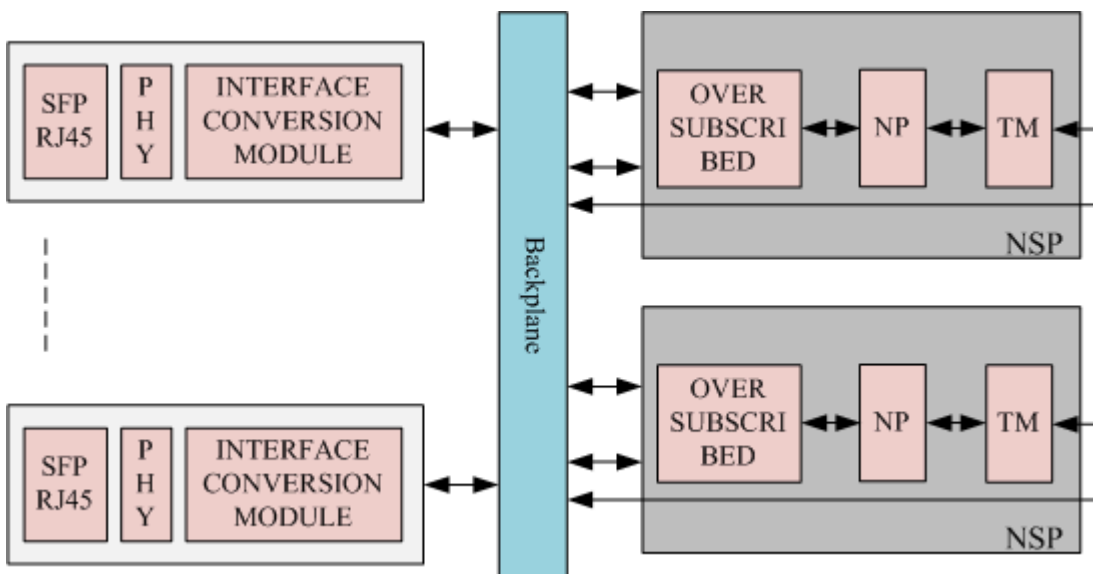
7.3 Data Plane

7.3.1 Introduction to the Data Plane

NSPs are key parts on the NE20E and are responsible for network processing and data exchange between PICs and NSPs.

The procedure for data processing is as follows:

1. The IP packets sent from PICs and NSP converge at a convergence module.
2. The NP processes the IP packets.
3. The TM module performs traffic management on the IP packets.

Figure 7-5 Data plane architecture of the NE20E-S4**Figure 7-6** Data plane architecture of the NE20E-S8/NE20E-S16/NE20E-S8A/NE20E-S16A

7.3.2 Network Service Processor (NSP-50)

Overview

Table 7-17 Board attributes

| Attribute | Description |
|-----------------------|-------------|
| Board name silkscreen | NSP-50 |

| Attribute | Description |
|-------------|------------------------------------|
| Description | Network Service Processor (NSP-50) |
| BOM | 03030QGY |
| Model | CR2D0NSP5010 |

Table 7-18 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|--|
| NE20E-S4 | slot 7 | <ul style="list-style-type: none"> DC:V800R005C00 AC:V800R007C00 |
| NE20E-S8 | slot 9 to 10 | <ul style="list-style-type: none"> DC:V800R005C00 AC:V800R005C01 |
| NE20E-S8A | slot 9 to 10 | V800R008C10 |
| NE20E-S16 | slot 17 to 18 | V800R005C01 |
| NE20E-S16A | slot 17 to 18 | V800R008C10 |

Appearance



Panel

Table 7-19 Buttons

| Button | Description |
|--------|--|
| OFL | Before removing a board, press and hold the OFL button for about 6 seconds until the OFL indicator turns on. Then, you can remove the board. |

Table 7-20 Indicators

| Indicator | Status Description |
|-----------|--------------------|
|-----------|--------------------|

| Indicator | Status Description |
|-----------|--|
| STAT | <p>If this indicator is steady green, the board is working properly.</p> <p>If this indicator is blinking green, the board is registering.</p> <p>If this indicator is steady red, the hardware on the board is faulty.</p> <p>If this indicator is off, the board is not powered on or is not registered.</p> |
| ACT | <p>If this green indicator is steady on, the board is in the master forwarding state. If this green indicator is steady off, the board is in the slave forwarding state or is not registered.</p> |
| OFL | <p>When the board is working properly, the OFL red indicator is off.</p> <p>After the OFL button is pressed to power off the board, the OFL red indicator is on.</p> |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | <ul style="list-style-type: none"> Data forwarding: The NSP is the core of service processing in the entire system, and is connected to all subcards through data channels. Control and management: Through the management channels between MPUs and the NSP, the MPUs can manage subcards and transmit routing protocol data. |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | This board is not applicable to outdoor scenarios. In addition, this board cannot be used together with other NSPs. |

Technical Specifications

Table 7-21 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 44mm x 388.4mm x 209.3 mm (1.73 in. x 15.29 in. x 8.24 in.) |
| Typical power consumption | 165.0 W |
| Typical heat dissipation | 535.3 BTU/hour |
| Weight | 2.6 kg (5.73 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: |

| Item | Specification |
|--------|----------------------------------|
| | -5 °C to 55 °C (23 °F to 131 °F) |
| Memory | 2 GB |

7.3.3 Network Service Processor (NSP-50-E)

Overview

Table 7-22 Board attributes

| Attribute | Description |
|-----------------------|--------------------------------------|
| Board name silkscreen | NSP-50-E |
| Description | Network Service Processor (NSP-50-E) |
| BOM | 03030QHA |
| Model | CR2DNSPE5010 |

Table 7-23 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|--|
| NE20E-S4 | slot 7 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |
| NE20E-S8 | slot 9 to 10 | V800R005C01 |
| NE20E-S8A | slot 9 to 10 | V800R008C10 |
| NE20E-S16 | slot 17 to 18 | V800R005C01 |
| NE20E-S16A | slot 17 to 18 | V800R008C10 |

Appearance



Panel

Table 7-24 Buttons

| Button | Description |
|--------|--|
| OFL | Before removing a board, press and hold the OFL button for about 6 seconds until the OFL indicator turns on. Then, you can remove the board. |

Table 7-25 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | If this indicator is steady green, the board is working properly. If this indicator is blinking green, the board is registering. If this indicator is steady red, the hardware on the board is faulty. If this indicator is off, the board is not powered on or is not registered. |
| ACT | If this green indicator is steady on, the board is in the master forwarding state. If this green indicator is steady off, the board is in the slave forwarding state or is not registered. |
| OFL | When the board is working properly, the OFL red indicator is off. After the OFL button is pressed to power off the board, the OFL red indicator is on. |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | <ul style="list-style-type: none"> Data forwarding: The NSP is the core of service processing in the entire system, and is connected to all subcards through data channels. Control and management: Through the management channels between MPUs and the NSP, the MPUs can manage subcards and transmit routing protocol data. |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | This board cannot be used together with other NSPs. |

Technical Specifications

Table 7-26 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 44mm x 388.4mm x 209.3 mm (1.73 in. x 15.29 in. x 8.24 in.) |
| Typical power consumption | 165.0 W |
| Typical heat dissipation | 535.3 BTU/hour |
| Weight | 2.6 kg (5.73 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |
| Memory | 2 GB |

7.3.4 Network Service Processor (NSP-120)

Overview

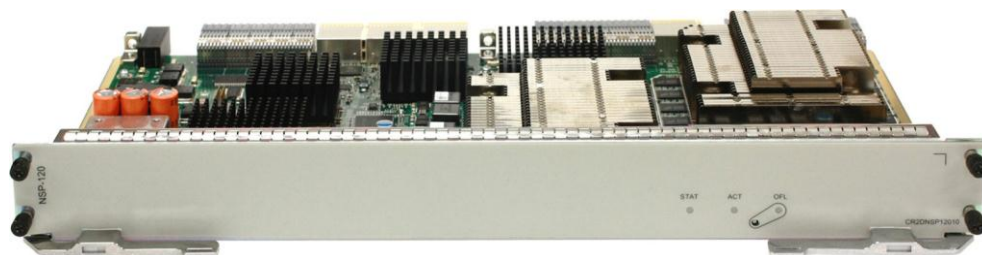
Table 7-27 Board attributes

| Attribute | Description |
|-----------------------|-------------------------------------|
| Board name silkscreen | NSP-120 |
| Description | Network Service Processor (NSP-120) |
| BOM | 03030RFH |
| Model | CR2DNSP12010 |

Table 7-28 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|--|
| NE20E-S4 | slot 7 | <ul style="list-style-type: none"> • DC:V800R005C01 • AC:V800R007C00 |
| NE20E-S8 | slot 9 to 10 | V800R005C01 |
| NE20E-S8A | slot 9 to 10 | V800R008C10 |
| NE20E-S16 | slot 17 to 18 | V800R005C01 |
| NE20E-S16A | slot 17 to 18 | V800R008C10 |

Appearance



Panel

Table 7-29 Buttons

| Button | Description |
|--------|--|
| OFL | Before removing a board, press and hold the OFL button for about 6 seconds until the OFL indicator turns on. Then, you can remove the board. |

Table 7-30 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | If this indicator is steady green, the board is working properly. If this indicator is blinking green, the board is registering. If this indicator is steady red, the hardware on the board is faulty. If this indicator is off, the board is not powered on or is not registered. |
| ACT | If this green indicator is steady on, the board is in the master forwarding state. If this green indicator is steady off, the board is in the slave forwarding state or is not registered. |
| OFL | When the board is working properly, the OFL red indicator is off. After the OFL button is pressed to power off the board, the OFL red indicator is on. |

Functional Specifications

| Features and Functions | Remarks |
|------------------------|--|
| Basic function | <ul style="list-style-type: none"> Data forwarding: The NSP is the core of service processing in the entire system, and is connected to all subcards through data channels. Control and management: Through the management channels between MPUs and the NSP, the MPUs can manage subcards and |

| Features and Functions | Remarks |
|------------------------------|---|
| | transmit routing protocol data. |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | This board is not applicable to outdoor scenarios. In addition, this board cannot be used together with other NSPs. |

Technical Specifications

Table 7-31 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 44mm x 388.4mm x 209.3 mm (1.73 in. x 15.29 in. x 8.24 in.) |
| Typical power consumption | 200.0 W |
| Typical heat dissipation | 648.9 BTU/hour |
| Weight | 2.6 kg (5.73 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |
| Memory | 2 GB |

7.3.5 Network Service Processor (NSP-120-E)

Overview

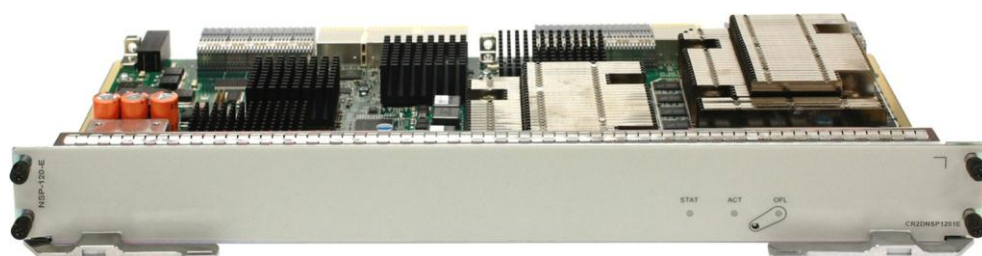
Table 7-32 Board attributes

| Attribute | Description |
|-----------------------|---------------------------------------|
| Board name silkscreen | NSP-120-E |
| Description | Network Service Processor (NSP-120-E) |
| BOM | 03030RFG |
| Model | CR2DNSP1201E |

Table 7-33 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|--|
| NE20E-S4 | slot 7 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |
| NE20E-S8 | slot 9 to 10 | V800R005C01 |
| NE20E-S8A | slot 9 to 10 | V800R008C10 |
| NE20E-S16 | slot 17 to 18 | V800R005C01 |
| NE20E-S16A | slot 17 to 18 | V800R008C10 |

Appearance



Panel

Table 7-34 Buttons

| Button | Description |
|--------|--|
| OFL | Before removing a board, press and hold the OFL button for about 6 seconds until the OFL indicator turns on. Then, you can remove the board. |

Table 7-35 Indicators

| Indicator | Status Description |
|-----------|--|
| STAT | <p>If this indicator is steady green, the board is working properly.</p> <p>If this indicator is blinking green, the board is registering.</p> <p>If this indicator is steady red, the hardware on the board is faulty.</p> <p>If this indicator is off, the board is not powered on or is not registered.</p> |
| ACT | If this green indicator is steady on, the board is in the master forwarding state. If this green indicator is steady off, the board is in |

| Indicator | Status Description |
|-----------|--|
| | the slave forwarding state or is not registered. |
| OFL | When the board is working properly, the OFL red indicator is off. After the OFL button is pressed to power off the board, the OFL red indicator is on. |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | <ul style="list-style-type: none"> Data forwarding: The NSP is the core of service processing in the entire system, and is connected to all subcards through data channels. Control and management: Through the management channels between MPUs and the NSP, the MPUs can manage subcards and transmit routing protocol data. |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | This board cannot be used together with other NSPs. |

Technical Specifications

Table 7-36 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 44mm x 388.4mm x 209.3 mm (1.73 in. x 15.29 in. x 8.24 in.) |
| Typical power consumption | 200.0 W |
| Typical heat dissipation | 648.9 BTU/hour |
| Weight | 2.6 kg (5.73 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |
| Memory | 2 GB |

7.3.6 Network Service Processor(NSP-A)

Overview

Table 7-37 Board attributes

| Attribute | Description |
|-----------------------|----------------------------------|
| Board name silkscreen | NSP-A |
| Description | Network Service Processor(NSP-A) |
| BOM | 03031DBV |
| Model | CR2DNSPA0010 |

Table 7-38 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S4 | slot 7 | V800R007C00 |
| NE20E-S8 | slot 9 to 10 | V800R007C00 |
| NE20E-S8A | slot 9 to 10 | V800R008C10 |
| NE20E-S16 | slot 17 to 18 | V800R007C00 |
| NE20E-S16A | slot 17 to 18 | V800R008C10 |

Appearance



Panel

Table 7-39 Buttons

| Button | Description |
|--------|--|
| OFL | Before removing a board, press and hold the OFL button for about 6 seconds until the OFL indicator turns on. Then, you can remove the board. |

Table 7-40 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | If this indicator is steady green, the board is working properly. If this indicator is blinking green, the board is registering. If this indicator is steady red, the hardware on the board is faulty. If this indicator is off, the board is not powered on or is not registered. |
| ACT | If this green indicator is steady on, the board is in the master forwarding state. If this green indicator is steady off, the board is in the slave forwarding state or is not registered. |
| OFL | When the board is working properly, the OFL red indicator is off. After the OFL button is pressed to power off the board, the OFL red indicator is on. |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | <ul style="list-style-type: none"> Data forwarding: The NSP is the core of service processing in the entire system, and is connected to all subcards through data channels. Control and management: Through the management channels between MPUs and the NSP, the MPUs can manage subcards and transmit routing protocol data. |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | This board does not support value-added services and is not applicable to outdoor scenarios. In addition, this board cannot be used together with other NSPs. |

Technical Specifications

Table 7-41 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 44mm x 388.4mm x 209.3 mm (1.73 in. x 15.29 in. x 8.24 in.) |
| Typical power consumption | 198.0 W |

| Item | Specification |
|--------------------------|--|
| Typical heat dissipation | 642.4 BTU/hour |
| Weight | 2.7 kg (5.95 lb) |
| Ambient temperature | Long terms: -5 °C to 65 °C (23 °F to 149 °F) |
| Memory | 4 GB |

7.3.7 Network Service Processor(NSP-B)

Overview

Table 7-42 Board attributes

| Attribute | Description |
|-----------------------|----------------------------------|
| Board name silkscreen | NSP-B |
| Description | Network Service Processor(NSP-B) |
| BOM | 03031DBX |
| Model | CR2DNSPB0010 |

Table 7-43 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S4 | slot 7 | V800R007C00 |
| NE20E-S8 | slot 9 to 10 | V800R007C00 |
| NE20E-S8A | slot 9 to 10 | V800R008C10 |
| NE20E-S16 | slot 17 to 18 | V800R007C00 |
| NE20E-S16A | slot 17 to 18 | V800R008C10 |

Appearance



Panel

Table 7-44 Buttons

| Button | Description |
|--------|--|
| OFL | Before removing a board, press and hold the OFL button for about 6 seconds until the OFL indicator turns on. Then, you can remove the board. |

Table 7-45 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | If this indicator is steady green, the board is working properly. If this indicator is blinking green, the board is registering. If this indicator is steady red, the hardware on the board is faulty. If this indicator is off, the board is not powered on or is not registered. |
| ACT | If this green indicator is steady on, the board is in the master forwarding state. If this green indicator is steady off, the board is in the slave forwarding state or is not registered. |
| OFL | When the board is working properly, the OFL red indicator is off. After the OFL button is pressed to power off the board, the OFL red indicator is on. |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | <ul style="list-style-type: none"> Data forwarding: The NSP is the core of service processing in the entire system, and is connected to all subcards through data channels. Control and management: Through the management channels between MPUs and the NSP, the MPUs can manage subcards and transmit routing protocol data. |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | This board is not applicable to outdoor scenarios. In addition, this board cannot be used together with other NSPs. |

Technical Specifications

Table 7-46 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 44mm x 388.4mm x 209.3 mm (1.73 in. x 15.29 in. x 8.24 in.) |
| Typical power consumption | 203.0 W |
| Typical heat dissipation | 658.6 BTU/hour |
| Weight | 2.7 kg (5.95 lb) |
| Ambient temperature | Long terms: -5 °C to 65 °C (23 °F to 149 °F) |
| Memory | 4 GB |

7.3.8 Network Service Processor(NSP-C)

Overview

Table 7-47 Board attributes

| Attribute | Description |
|-----------------------|----------------------------------|
| Board name silkscreen | NSP-C |
| Description | Network Service Processor(NSP-C) |
| BOM | 03031YCJ |
| Model | CR2DNSPC0010 |

Table 7-48 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S8 | slot 9 to 10 | V800R009C00 |
| NE20E-S8A | slot 9 to 10 | V800R009C00 |
| NE20E-S16 | slot 17 to 18 | V800R009C00 |
| NE20E-S16A | slot 17 to 18 | V800R009C00 |

Appearance



Panel

Table 7-49 Buttons

| Button | Description |
|--------|--|
| OFL | Before removing a board, press and hold the OFL button for about 6 seconds until the OFL indicator turns on. Then, you can remove the board. |

Table 7-50 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | If this indicator is steady green, the board is working properly. If this indicator is blinking green, the board is registering. If this indicator is steady red, the hardware on the board is faulty. If this indicator is off, the board is not powered on or is not registered. |
| ACT | If this green indicator is steady on, the board is in the master forwarding state. If this green indicator is steady off, the board is in the slave forwarding state or is not registered. |
| OFL | When the board is working properly, the OFL red indicator is off. After the OFL button is pressed to power off the board, the OFL red indicator is on. |

Functional Specifications

| Features and Functions | Remarks |
|------------------------|--|
| Basic function | <ul style="list-style-type: none"> Data forwarding: The NSP is the core of service processing in the entire system, and is connected to all subcards through data channels. Control and management: Through the management channels between MPUs and the NSP, the MPUs can manage subcards and transmit routing protocol data. |

| Features and Functions | Remarks |
|------------------------------|---|
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | This board is not applicable to outdoor scenarios. In addition, this board cannot be used together with other NSPs. |

Technical Specifications

Table 7-51 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 44mm x 388.4mm x 209.3 mm (1.73 in. x 15.29 in. x 8.24 in.) |
| Typical power consumption | 314.3 W |
| Typical heat dissipation | 1019.7 BTU/hour |
| Weight | 3.6 kg (7.94 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |
| Memory | 16 GB |

7.3.9 Network Service Processor (NSP-D)

Overview

Table 7-52 Board attributes

| Attribute | Description |
|-----------------------|----------------------------------|
| Board name silkscreen | NSP-D |
| Description | Network Service Processor(NSP-D) |
| BOM | 03032SKX |
| Model | CR2DNSPD0010 |

Table 7-53 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|---------|---------|---------------------------|
|---------|---------|---------------------------|

| Product | Slot ID | Earliest Software Version |
|------------|---------------|---------------------------|
| NE20E-S8A | slot 9 to 10 | V800R010C00 |
| NE20E-S16A | slot 17 to 18 | V800R010C00 |

Appearance



Panel

Table 7-54 Indicators

| Name | Description |
|------|--|
| STAT | <p>If this indicator is steady green, the board is working properly.</p> <p>If this indicator is blinking green, the board is registering.</p> <p>If this indicator is steady red, the hardware on the board is faulty.</p> <p>If this indicator is off, the board is not powered on or is not registered.</p> |
| ACT | <p>If this green indicator is steady on, the board is in the master forwarding state. If this green indicator is steady off, the board is in the slave forwarding state or is not registered.</p> |
| OFL | <p>When the board is working properly, the OFL red indicator is off. After the OFL button is pressed to power off the board, the OFL red indicator is on.</p> |

Functional Specifications

Table 7-55 Functions and features

| Functions and Features | Remarks |
|------------------------|--|
| Line-Rate capability | <p>Data forwarding: The NSP is the core of service processing in the entire system and is connected to all subcards through data channels.</p> <p>Control and management: Through the management channels between MPUs and the NSP, the MPUs can</p> |

| Functions and Features | Remarks |
|------------------------------|---|
| | manage subcards and transmit routing protocol data. |
| Reliability and availability | Support for hot swap. |

Technical Specifications

Table 7-56 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 44 mm x 388.4 mm x 209.3 mm (1.73 in. x 15.29 in. x 8.24 in.) |
| Typical power consumption | 310.0 W |
| Typical heat dissipation | 1005.8 BTU/hour |
| Weight | 4.3 kg (9.48 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |
| Memory | 16G |

7.4 Interface Card

7.4.1 2-Port 100GBase-QSFP28 Physical Interface Card(PIC)

Overview

Table 7-57 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 2x100GE-QSFP28 |
| Description | 2-Port 100GBase-QSFP28 Physical Interface Card(PIC) |
| BOM | 03032TTW |
| Model | CR2D00E2NF10 |

Table 7-58 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|--------------------|---------------------------|
| NE20E-S8A | NSP-D: slot 7 to 8 | V800R010C00 |

Appearance



Panel

Table 7-59 Indicators

| Name | Description |
|------|--|
| STAT | <p>Status indicator</p> <p>Green:</p> <p>If the indicator is steady on, the PIC is working properly.</p> <p>Red:</p> <p>If the indicator is steady on, the hardware on the PIC is faulty.</p> <p>Yellow:</p> <p>If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic.</p> <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| 0~1 | <p>Running status indicator</p> <p>Green:</p> <p>If the indicator is steady on, the link is normal.</p> <p>If the indicator is off, the link is Down.</p> <p>If the indicator blinks, data is being transmitted.</p> |

Table 7-60 Service interfaces

| Interface Name | Interface Type | Connect or Type | Description | Cable |
|----------------|----------------|-----------------|---------------------------------|------------|
| OUT0 IN0 | IN0:100GE | QSFP28 | Interfaces for 2-channel QSFP28 | LC optical |

| Interface Name | Interface Type | Connect or Type | Description | Cable |
|----------------|----------------|-----------------|---------------------------------|-------|
| OUT1 IN1 | IN1: 100GE | | optical signal input and output | fiber |

Functional Specifications

Table 7-61 Functions and features

| Functions and Features | Remarks |
|------------------------------|-------------------------------|
| Line-Rate capability | Both interfaces support 100G. |
| Reliability and availability | Support for hot swap. |

Technical Specifications

Table 7-62 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | 100Gbps QSFP28 optical module 100Gbps QSFP28 optical module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II、Ethernet_SAP、Ethernet_SNAP |

Table 7-63 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8 mm x 193.8 mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 63.0 W |
| Typical heat dissipation | 204.4 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.2 10-Port 10GBase LAN/WAN-SFP+ Physical Interface Card(PIC)

Overview

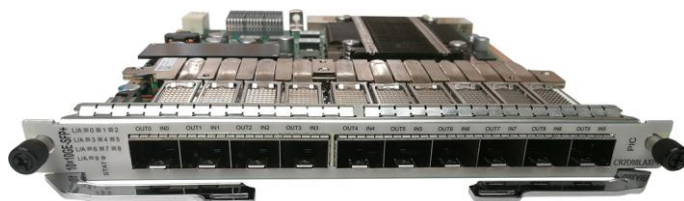
Table 7-64 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 10x10GE-SFP+ |
| Description | 10-Port 10GBase LAN/WAN-SFP+ Physical Interface Card(PIC) |
| BOM | 03032TTX |
| Model | CR2D00LAXF11 |

Table 7-65 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S8A | NSP-C: slot 1 to 2 NSP-D: slot 1 to 8 | V800R010C00 |
| NE20E-S16 | NSP-C: slot 7 to 8 | V800R010C00 |
| NE20E-S16A | NSP-C: slot 9 to 10 NSP-D: slot 5 to 12 | V800R010C00 |

Appearance



Panel

Table 7-66 Indicators

| Name | Description |
|------|------------------|
| STAT | Status indicator |

| Name | Description |
|-----------|---|
| | <p>Green: If the indicator is steady on, the PIC is working properly.</p> <p>Red: If the indicator is steady on, the hardware on the PIC is faulty.</p> <p>Yellow: If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic.</p> <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| L/A0-L/A9 | <p>Running status indicator</p> <p>Green: If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted.</p> |

Table 7-67 Service interfaces

| Interface Name | Interface Type | Connect or Type | Description | Cable |
|-------------------------|----------------|-----------------------|--|------------------|
| IN OUT | GE/10GE | Optical fiber adapter | Input/output interface (8 wavelength) | LC optical fiber |
| OUT0 IN0~OUT1 IN9 | 10 GE | SFP+ | Interfaces for 10-channel SFP+ optical signal input and output | LC optical fiber |

Functional Specifications

Table 7-68 Functions and features

| Functions and Features | Remarks |
|------------------------------|---|
| Line-Rate capability | Support for optical signal input and output of 10 10GE/GE interfaces |
| Reliability and availability | Support for hot swap. |
| Restrictions and remarks | The outdoor application is not supported. The board does not support the OTN or FEC mode. When being used with the colored optical module, it does not support the intermediate optical amplifier and supports only |

| Functions and Features | Remarks |
|------------------------|------------------------------|
| | point-to-point transmission. |

Technical Specifications

Table 7-69 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | 10Gbps SFP+ optical module 10Gbps SFP+ DWDM optical module 10Gbps SFP+ CWDM optical module 10Gbps SFP+ BIDI optical module 1.25Gbps eSFP Optical Module 1.25Gbps eSFP CWDM optical module 1.25Gbps eSFP BIDI optical module 1.25/9.953/10.3125Gbps SFP+ optical module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II、Ethernet_SAP、Ethernet_SNAP |

Table 7-70 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8 mm x 193.8 mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 46.7 W |
| Typical heat dissipation | 151.5 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.3 2-Port 10GBase LAN/WAN-SFP+ Physical Interface Card E(PIC-E)

Overview

Table 7-71 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | 2x10GE-SFP+ |
| Description | 2-Port 10GBase LAN/WAN-SFP+ Physical Interface Card E(PIC-E) |
| BOM | 03032KLS |
| Model | CR2D0L2XFE10 |

Table 7-72 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C10 |
| NE20E-S8 | NSP-A: slot 3 to 6 NSP-B: slot 3 to 6 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S8A | NSP-A: slot 3 to 6 NSP-B: slot 3 to 6 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S16 | NSP-C: slot 7 to 10 | V800R009C10 |
| NE20E-S16A | NSP-C: slot 7 to 10 | V800R009C10 |

Appearance



Panel

Table 7-73 Indicators

| Indicator | Status Description |
|--------------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| OUT IN (0-1) | <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-74 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|--|------------------|
| OUT0 IN0-OUT1 IN1 | 10GE | SFP+ | Interface for 2-channel SFP+ optical signal input and output | LC Optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | 2-port 10GBase LAN/WAN-SFP+ physical interface card (PIC), supporting optical signal input and output of two 10GE interfaces. |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | The board does not support the OTN mode or FEC function. If a colored optical module is used and does not support optical amplifier insertion, the board supports only point-to-point optical transmission. |

Technical Specifications

Table 7-75 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> 8.14 10Gbps SFP+ Optical Module 8.15 10Gbps SFP+ CWDM Optical Module 8.16 10Gbps SFP+ BIDI Optical Module 8.17 10Gbps SFP+ DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-76 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 41.5 W |
| Typical heat dissipation | 134.6 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.4 10-Port 100/1000Base-X-SFP Physical Interface Card E(PIC-E)

Overview

Table 7-77 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 10xGE-SFP |
| Description | 10-Port 100/1000Base-X-SFP Physical Interface Card E(PIC-E) |
| BOM | 03032KLR |
| Model | CR2D0EAGFE10 |

Table 7-78 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C10 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S16 | NSP-A: slot 3 to 14 NSP-B: slot 3 to 14 NSP-C: slot 3 to 14 | V800R009C10 |
| NE20E-S16A | NSP-A: slot 1 to 6, 11 to 16 NSP-B: slot 1 to 6, 11 to 16 NSP-C: slot 3 to 14 | V800R009C10 |

Appearance



Panel

Table 7-79 Indicators

| Indicator | Status Description |
|-----------|--|
| STATUS | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the |

| Indicator | Status Description |
|-----------|--|
| | logic. If the indicator is off, the PIC is powered off or is not registered. |
| 0-9 | Running status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-80 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|--|-----------------------------|
| OUT0 IN0-OUT9 IN9 | GE/FE | SFP | Interfaces for 10-channel optical/electrical signal input and output | Optical fiber/network cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|----------------------------|
| Basic function | Supports FE/GE interfaces. |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-81 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> 8.2 155Mbps SFP Electrical Transceiver 8.3 155Mbps eSFP Optical Module 8.4 155Mbps eSFP BIDI Optical Module 8.6 1Gbps Electrical Transceiver 8.9 1.25Gbps eSFP Optical Module 8.11 1.25Gbps eSFP CWDM Optical Module |

| Attribute | Description |
|--------------------|---|
| | <ul style="list-style-type: none"> 8.10 1.25Gbps eSFP BIDI Optical Module 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-82 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 50.0 W |
| Typical heat dissipation | 162.2 BTU/hour |
| Weight | 0.8 kg (1.76 lb) |
| Ambient temperature | Long terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.5 20-Port 100/1000Base-X-CSFP Physical Interface Card(PIC)

Overview

Table 7-83 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | 20xGE-CSFP |
| Description | 20-Port 100/1000Base-X-CSFP Physical Interface Card(PIC) |
| BOM | 03032KLT |
| Model | CR2D00EEGF11 |

Table 7-84 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|--------------------|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 | V800R009C10 |

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| | NSP-B: slot 1 to 4 | |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S16 | NSP-A: slot 3 to 14 NSP-B: slot 3 to 14 NSP-C: slot 3 to 14 | V800R009C10 |
| NE20E-S16A | NSP-A: slot 1 to 6, 11 to 16 NSP-B: slot 1 to 6, 11 to 16 NSP-C: slot 3 to 14 | V800R009C10 |

Appearance



Panel

Table 7-85 Indicators

| Indicator | Status Description |
|-----------|---|
| STATUS | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |
| 0-19 | Running status indicator |

| Indicator | Status Description |
|-----------|--|
| | Green: <ul style="list-style-type: none"> • If the indicator is steady on, the link is normal. • If the indicator is off, the link is Down. • If the indicator blinks, data is being transmitted. |

Table 7-86 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|--|-----------------------------|
| 0-19 | GE/FE | SFP/CSFP | Interfaces for 20-channel optical/electrical signal input and output | Optical fiber/network cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports FE/GE interfaces. |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | A chassis supports a maximum of five subcards of this type. |

Technical Specifications

Table 7-87 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> • 8.3 155Mbps eSFP Optical Module • 8.4 155Mbps eSFP BIDI Optical Module • 8.9 1.25Gbps eSFP Optical Module • 8.11 1.25Gbps eSFP CWDM Optical Module • 8.10 1.25Gbps eSFP BIDI Optical Module • 8.7 1.25Gbps CSFP BIDI Optical Module • 8.8 125M-1.25Gbps CSFP BIDI Optical Module • 8.12 125M~2.67Gbps eSFP DWDM Optical Module |

| Attribute | Description |
|--------------------|--|
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-88 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 51.5 W |
| Typical heat dissipation | 167.1 BTU/hour |
| Weight | 0.8 kg (1.76 lb) |
| Ambient temperature | Long terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.6 1-Port 100GBase-CFP2 Physical Interface Card(PIC)

Overview

Table 7-89 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 1x100GE-CFP2 |
| Description | 1-Port 100GBase-CFP2 Physical Interface Card(PIC) |
| BOM | 03032AML |
| Model | CR2D00E1NC10 |

Table 7-90 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------------|---------------------------|
| NE20E-S8A | NSP-C: slot 1 to 2 | V800R009C00 |
| NE20E-S16 | NSP-C: slot 7 to 8 | V800R009C00 |
| NE20E-S16A | NSP-C: slot 9 to 10 | V800R009C00 |

Appearance



Panel

Table 7-91 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |
| 100G L/A0 | 100G running status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-92 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|---|---------------|
| OUT0 IN0 | 100GE | CFP2 | Interface for 100GE optical signal input and output | Optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | 1-port 100GBase-CFP2 physical interface card (PIC), supporting 100GE optical signal input and output. |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | Not applicable to outdoor scenarios. |

Technical Specifications

Table 7-93 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> 8.19 100Gbps CFP2 Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-94 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 52.5 W |
| Typical heat dissipation | 170.3 BTU/hour |
| Weight | 0.8 kg (1.76 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.7 10-Port 10GBase LAN/WAN-SFP+ Physical Interface Card(PIC)

Overview

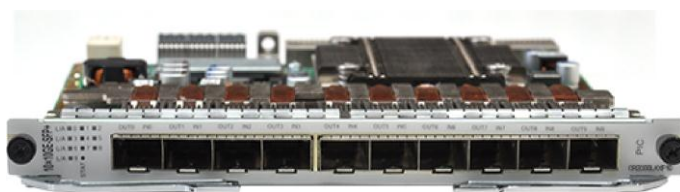
Table 7-95 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 10x10GE-SFP+ |
| Description | 10-Port 10GBase LAN/WAN-SFP+ Physical Interface Card(PIC) |
| BOM | 03032AMM |
| Model | CR2D00LAXF10 |

Table 7-96 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---------------------|---------------------------|
| NE20E-S8A | NSP-C: slot 1 to 2 | V800R009C00 |
| NE20E-S16 | NSP-C: slot 7 to 8 | V800R009C00 |
| NE20E-S16A | NSP-C: slot 9 to 10 | V800R009C00 |

Appearance



Panel

Table 7-97 Indicators

| Indicator | Status Description |
|-----------|--|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. |

| Indicator | Status Description |
|-----------|--|
| | Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |
| L/A 0-9 | Running status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-98 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|---|------------------|
| OUT0 IN0-OUT9 IN9 | 10GE/GE | SFP+/SFP | 10 interfaces for 10GE/GE optical signal input and output | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Support for optical signal input and output of 10 10GE/GE interfaces. |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | <ul style="list-style-type: none"> Not applicable to outdoor scenarios. The board does not support the OTN mode or FEC function. If a colored optical module is used and does not support optical amplifier insertion, the board supports only point-to-point optical transmission. |

Technical Specifications

Table 7-99 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> • 8.14 10Gbps SFP+ Optical Module • 8.15 10Gbps SFP+ CWDM Optical Module • 8.16 10Gbps SFP+ BIDI Optical Module • 8.17 10Gbps SFP+ DWDM Optical Module • 8.13 1.25/9.953/10.3125Gbps SFP+ Optical Module • 8.9 1.25Gbps eSFP Optical Module • 8.11 1.25Gbps eSFP CWDM Optical Module • 8.10 1.25Gbps eSFP BIDI Optical Module • 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-100 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 58.8 W |
| Typical heat dissipation | 190.8 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.8 Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1471nm) Physical Interface Card(PIC)

Overview

Table 7-101 Board attributes

| Attribute | Description |
|-----------|-------------|
|-----------|-------------|

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | DMD1-CWDM |
| Description | Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1471nm) Physical Interface Card(PIC) |
| BOM | 03032EEY |
| Model | CR5D1DMD1M01 |

Table 7-102 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-103 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-104 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|--|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Optical fiber adapter Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1471 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping (single wavelength) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1471 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (wavelength 1471 nm). |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-105 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1471nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw /23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-106 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 F to 113 F) Short terms: |

| Item | Specification |
|------|----------------------------------|
| | -5 °C to 55 °C (23 °F to 131 °F) |

7.4.9 Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1491nm) Physical Interface Card(PIC)

Overview

Table 7-107 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | DMD1-CWDM |
| Description | Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1491nm) Physical Interface Card(PIC) |
| BOM | 03032EFA |
| Model | CR5D1DMD1M02 |

Table 7-108 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-109 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-110 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|---|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1491 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|---|------------------|
| eA1 eD1 1491 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (wavelength 1491 nm). |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-111 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1491nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-112 Board specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 F to 113 F) Short terms: -5 °C to 55 °C (23 F to 131 F) |

7.4.10 Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1511nm) Physical Interface Card(PIC)

Overview

Table 7-113 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | DMD1-CWDM |
| Description | Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1511nm) Physical Interface Card(PIC) |
| BOM | 03032EFB |
| Model | CR5D1DMD1M03 |

Table 7-114 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 | V800R009C00 |

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| | NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-115 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-116 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|---|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel | LC optical fiber |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|---|------------------|
| | | | wavelength) | |
| wA1 wD1 1511 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1511 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (wavelength 1511 nm). |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-117 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1511nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical | 500 mw/23 dBm |

| Attribute | Description |
|--------------------|-------------|
| power | |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-118 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 F to 113 F) Short terms: -5 °C to 55 °C (23 F to 131 F) |

7.4.11 Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1531nm) Physical Interface Card(PIC)

Overview

Table 7-119 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | DMD1-CWDM |
| Description | Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1531nm) Physical Interface Card(PIC) |
| BOM | 03032EFC |
| Model | CR5D1DMD1M04 |

Table 7-120 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-121 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. |

| Indicator | Status Description |
|-----------|---|
| | If the indicator is off, the PIC is powered off or is not registered. |

Table 7-122 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|---|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1531 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1531 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (wavelength 1531 nm). |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-123 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1531nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-124 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.12 Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1551nm) Physical Interface Card(PIC)

Overview

Table 7-125 Board attributes

| Attribute | Description |
|-----------|-------------|
|-----------|-------------|

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | DMD1-CWDM |
| Description | Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1551nm) Physical Interface Card(PIC) |
| BOM | 03032EFD |
| Model | CR5D1DMD1M05 |

Table 7-126 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-127 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |

Table 7-128 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|---|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1551 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1551 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (wavelength 1551 nm). |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-129 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1511nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-130 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.13 Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1571nm) Physical Interface Card(PIC)

Overview

Table 7-131 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | DMD1-CWDM |
| Description | Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1571nm) Physical Interface Card(PIC) |
| BOM | 03032EFE |
| Model | CR5D1DMD1M06 |

Table 7-132 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Table 7-133 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|--------------------|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 | V800R009C00 |

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| | NSP-B: slot 1 to 4 | |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-134 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |

Table 7-135 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|---|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1571 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping (single wavelength) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1571 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (wavelength 1571 nm). |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-136 Interface specifications

| Attribute | Description |
|--------------------------|-----------------------|
| Center wavelength | 1571nm |
| Single-channel insertion | The insertion loss of |

| Attribute | Description |
|-----------------------------|--|
| loss | wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-137 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.14 Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1591nm) Physical Interface Card(PIC)

Overview

Table 7-138 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | DMD1-CWDM |
| Description | Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1591nm) Physical Interface Card(PIC) |
| BOM | 03032EFF |
| Model | CR5D1DMD1M07 |

Table 7-139 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-140 Indicators

| Indicator | Status Description |
|-----------|--|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a |

| Indicator | Status Description |
|-----------|--|
| | HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |

Table 7-141 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|---|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1591 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping (single wavelength) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1591 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (wavelength 1591 nm). |
| Reliability and availability | Support for hot swap. |

Technical Specifications

Table 7-142 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1591nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-143 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.15 Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1611nm) Physical Interface Card(PIC)

Overview

Table 7-144 Board attributes

| Attribute | Description |
|-----------|-------------|
|-----------|-------------|

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | DMD1-CWDM |
| Description | Bidirectional 1-Channel CWDM Optical Add/Drop Multiplexing (1611nm) Physical Interface Card(PIC) |
| BOM | 03032EFG |
| Model | CR5D1DMD1M08 |

Table 7-145 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-146 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |

Table 7-147 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|---|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1611 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping (single wavelength) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1611 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (single wavelength) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (wavelength 1611 nm). |
| Reliability and availability | Support for hot swap. |

Technical Specifications

Table 7-148 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1611 nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | ≥ 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | ≤ 0.2 dB |

Table 7-149 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.16 Bidirectional 2-Channel CWDM Optical Add/Drop Multiplexing (1471/1491nm) Physical Interface Card(PIC)

Overview

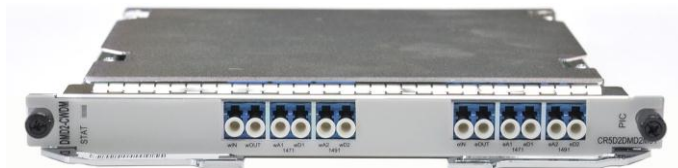
Table 7-150 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | DMD2-CWDM |
| Description | Bidirectional 2-Channel CWDM Optical Add/Drop Multiplexing (1471/1491nm) Physical Interface Card(PIC) |
| BOM | 03032EFH |
| Model | CR5D2DMD2M01 |

Table 7-151 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-152 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-153 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|--|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1471 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (wavelength 1471 nm) | LC optical fiber |
| wA1 wD1 1491 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping | LC optical fiber |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|--|------------------|
| | | | channel (wavelength 1471 nm) | |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1471 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (wavelength 1471 nm) | LC optical fiber |
| eA1 eD1 1491 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (wavelength 1491 nm) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports bidirectional 2-channel CWDM optical add/drop multiplexing (wavelength 1471 nm/1491 nm). |
| Reliability and availability | Support for hot swap. |

Technical Specifications

Table 7-154 Interface specifications

| Attribute | Description |
|-------------------------------|---|
| Center wavelength | 1471 nm/1491 nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or |

| Attribute | Description |
|-----------------------------|--|
| | west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-155 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.17 Bidirectional 2-Channel CWDM Optical Add/Drop Multiplexing (1511/1531nm) Physical Interface Card(PIC)

Overview

Table 7-156 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | DMD2-CWDM |
| Description | Bidirectional 2-Channel CWDM Optical Add/Drop Multiplexing (1511/1531nm) Physical Interface Card(PIC) |
| BOM | 03032EFJ |
| Model | CR5D2DMD2M02 |

Table 7-157 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-158 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. |

| Indicator | Status Description |
|-----------|---|
| | If the indicator is off, the PIC is powered off or is not registered. |

Table 7-159 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|--|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1511 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (wavelength 1511 nm) | LC optical fiber |
| wA1 wD1 1531 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (wavelength 1531 nm) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1511 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (wavelength 1511 nm) | LC optical fiber |
| eA1 eD1 1531 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (wavelength 1531 nm) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports bidirectional 2-channel CWDM optical add/drop multiplexing (wavelength 1511 nm/1531 nm). |
| Reliability and availability | Support for hot swap. |

Technical Specifications

Table 7-160 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1511nm/1531nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-161 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.18 Bidirectional 2-Channel CWDM Optical Add/Drop Multiplexing (1551/1571nm) Physical Interface Card(PIC)

Overview

Table 7-162 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | DMD2-CWDM |
| Description | Bidirectional 2-Channel CWDM Optical Add/Drop Multiplexing (1551/1571nm) Physical Interface Card(PIC) |
| BOM | 03032EFK |
| Model | CR5D2DMD2M03 |

Table 7-163 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-164 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-165 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|--|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1551 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (wavelength 1551 nm) | LC optical fiber |
| wA1 wD1 1571 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping | LC optical fiber |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|--|------------------|
| | | | channel (wavelength 1571 nm) | |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1551 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (wavelength 1551 nm) | LC optical fiber |
| eA1 eD1 1571 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (wavelength 1571 nm) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports bidirectional 2-channel CWDM optical add/drop multiplexing (wavelength 1551 nm/1571 nm). |
| Reliability and availability | Support for hot swap. |

Technical Specifications

Table 7-166 Interface specifications

| Attribute | Description |
|-------------------------------|---|
| Center wavelength | 1551nm/1571nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or |

| Attribute | Description |
|-----------------------------|--|
| | west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw/23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-167 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.19 Bidirectional 2-Channel CWDM Optical Add/Drop Multiplexing (1591/1611nm) Physical Interface Card(PIC)

Overview

Table 7-168 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | DMD2-CWDM |
| Description | Bidirectional 2-Channel CWDM Optical Add/Drop Multiplexing (1591/1611nm) Physical Interface Card(PIC) |
| BOM | 03032EFL |
| Model | CR5D2DMD2M04 |

Table 7-169 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C00 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C00 |

Appearance



Panel

Table 7-170 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. |

| Indicator | Status Description |
|-----------|---|
| | If the indicator is off, the PIC is powered off or is not registered. |

Table 7-171 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------|----------------|-----------------------|--|------------------|
| wIN wOUT | GE/10GE | Optical fiber adapter | Westbound input/output interface (8-channel wavelength) | LC optical fiber |
| wA1 wD1 1591 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (wavelength 1591 nm) | LC optical fiber |
| wA1 wD1 1611 | GE/10GE | Optical fiber adapter | Westbound wavelength-adding/wavelength-dropping channel (wavelength 1611 nm) | LC optical fiber |
| eIN eOUT | GE/10GE | Optical fiber adapter | Eastbound input/output interface (8-channel wavelength) | LC optical fiber |
| eA1 eD1 1591 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (wavelength 1591 nm) | LC optical fiber |
| eA1 eD1 1611 | GE/10GE | Optical fiber adapter | Eastbound wavelength-adding/wavelength-dropping channel (wavelength 1611 nm) | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports bidirectional 2-channel CWDM optical add/drop multiplexing (wavelength 1591 nm/1611 nm). |
| Reliability and availability | Support for hot swap. |

Technical Specifications

Table 7-172 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1591nm/1611nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw /23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.2 dB |

Table 7-173 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.20 4-Channel CWDM Optical Add/Drop Multiplexing (1471/1491/1511/1531nm) Physical Interface Card(PIC)

Overview

Table 7-174 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | MR4-CWDM |
| Description | 4-Channel CWDM Optical Add/Drop Multiplexing (1471/1491/1511/1531nm) Physical Interface Card(PIC) |
| BOM | 03032JKV |
| Model | CR5D3DMR4M01 |

Table 7-175 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C10 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C10 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C10 |

Appearance



Panel

Table 7-176 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-177 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|---|------------------|
| OUT IN | GE/10GE | Optical fiber adapter | Interface for input and output | LC optical fiber |
| A1 D1 1471 | GE/10GE | Optical fiber adapter | wavelength-adding/wavelength-dropping channel (1471 nm single wavelength) | LC optical fiber |
| A1 D1 1491 | GE/10GE | Optical fiber adapter | wavelength-adding/wavelength-dropping channel (1491 nm single wavelength) | LC optical fiber |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|---|------------------|
| A1 D1 1511 | GE/10GE | Optical fiber adapter | wavelength-adding/wavelength-dropping channel (1511 nm single wavelength) | LC optical fiber |
| A1 D1 1531 | GE/10GE | Optical fiber adapter | wavelength-adding/wavelength-dropping channel (1531 nm single wavelength) | LC optical fiber |
| MI MO | GE/10GE | Optical fiber adapter | Cascading channel for input and output | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (1471/1491/1511/1531 nm). |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | No applicable to outdoor scenarios. |

Technical Specifications

Table 7-178 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1471/1491/1511/1531 nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical | 500 mw |

| Attribute | Description |
|--------------------|-------------|
| power | |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.3 dB |

Table 7-179 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 F to 113 F) Short terms: -5 °C to 55 °C (23 F to 131 F) |

7.4.21 4-Channel CWDM Optical Add/Drop Multiplexing (1551/1571/1591/1611nm) Physical Interface Card(PIC)

Overview

Table 7-180 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | MR4-CWDM |
| Description | 4-Channel CWDM Optical Add/Drop Multiplexing (1551/1571/1591/1611nm) Physical Interface Card(PIC) |
| BOM | 03032JKX |
| Model | CR5D3DMR4M02 |

Table 7-181 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R009C10 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R009C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C10 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R009C10 |

Appearance



Panel

Table 7-182 Indicators

| Indicator | Status Description |
|-----------|--|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the |

| Indicator | Status Description |
|-----------|---|
| | logic. If the indicator is off, the PIC is powered off or is not registered. |

Table 7-183 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|---|------------------|
| OUT IN | GE/10GE | Optical fiber adapter | Interface for input and output | LC optical fiber |
| A1 D1 1551 | GE/10GE | Optical fiber adapter | wavelength-adding/wavelength-dropping channel (1551 nm single wavelength) | LC optical fiber |
| A1 D1 1571 | GE/10GE | Optical fiber adapter | wavelength-adding/wavelength-dropping channel (1571 nm single wavelength) | LC optical fiber |
| A1 D1 1591 | GE/10GE | Optical fiber adapter | wavelength-adding/wavelength-dropping channel (1591 nm single wavelength) | LC optical fiber |
| A1 D1 1611 | GE/10GE | Optical fiber adapter | wavelength-adding/wavelength-dropping channel (1611 nm single wavelength) | LC optical fiber |
| MI MO | GE/10GE | Optical fiber adapter | Cascading channel for input and output | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------|---------|
| | |

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports bidirectional single-channel CWDM optical add/drop multiplexing (1551/1571/1591/1611 nm). |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | No applicable to outdoor scenarios. |

Technical Specifications

Table 7-184 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1551/1571/1591/1611 nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |
| PDL | <= 0.3 dB |

Table 7-185 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.22 1-Port 40GBase-CFP Physical Interface Card(PIC)

Overview

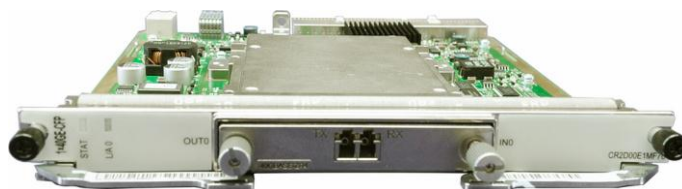
Table 7-186 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 1x40GE-CFP |
| Description | 1-Port 40GBase-CFP Physical Interface Card(PIC) |
| BOM | 03031LPW |
| Model | CR2D00E1MF70 |

Table 7-187 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R007C10 |
| NE20E-S8 | NSP-A: slot 3 to 6 NSP-B: slot 3 to 6 NSP-C: slot 1 to 8 | V800R007C10 |
| NE20E-S8A | NSP-A: slot 3 to 6 NSP-B: slot 3 to 6 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-C: slot 7 to 10 | V800R009C00 |
| NE20E-S16A | NSP-C: slot 7 to 10 | V800R009C00 |

Appearance



Panel

Table 7-188 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| L/A 0 | <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-189 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|--|----------------------|
| OUT0 IN0 | 40GE | CFP | Interface for 40GE optical signal input and output | MPO/LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | 1-port 40GBase-CFP physical interface card (PIC), supporting 40GE optical signal input and output. |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | Not applicable to outdoor scenarios. |

Technical Specifications

Table 7-190 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> 8.18 40Gbps CFP Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-191 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 23.0 W |
| Typical heat dissipation | 74.6 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.23 8-Port 100/1000Base-RJ45 Physical Interface Card

Overview

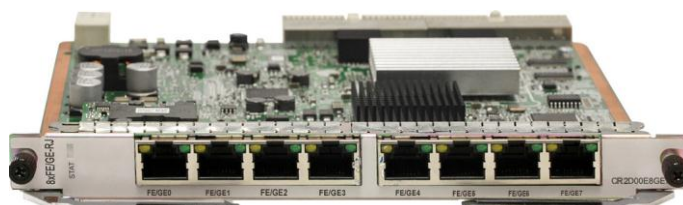
Table 7-192 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | 8xFE/GE-RJ |
| Description | 8-Port 100/1000Base-RJ45 Physical Interface Card |
| BOM | 03031DHB |
| Model | CR2D00E8GE12 |

Table 7-193 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R007C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 3 to 14 NSP-B: slot 3 to 14 NSP-C: slot 3 to 14 | V800R007C00 |
| NE20E-S16A | NSP-A: slot 1 to 6, 11 to 16 NSP-B: slot 1 to 6, 11 to 16 NSP-C: slot 1 to 6, 11 to 16 | V800R008C10 |

Appearance



Panel

Table 7-194 Indicators

| Indicator | Status Description |
|-----------|--|
| STAT | <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. |

| Indicator | Status Description |
|-----------|---|
| | If the indicator is off, the PIC is powered off or is not registered. |

Table 7-195 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|---|---------------|
| FE/GE0-FE/GE7 | FE | RJ45 | Interfaces for 8-channel electrical signal input and output | Network cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports eight GE electrical interfaces. |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | Supported when the NSP-A or NSP-B is used. The line rate cannot be reached when queues of eight different priorities exist and packets longer than 6000 bytes are sent. |

Technical Specifications

Table 7-196 Interface specifications

| Attribute | Description |
|--------------------|--|
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-197 Board specifications

| Item | Specification |
|------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |

| Item | Specification |
|---------------------------|--|
| Typical power consumption | 11.7 W |
| Typical heat dissipation | 38.0 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.24 10-Port 100/1000Base-X-SFP Physical Interface Card

Overview

Table 7-198 Board attributes

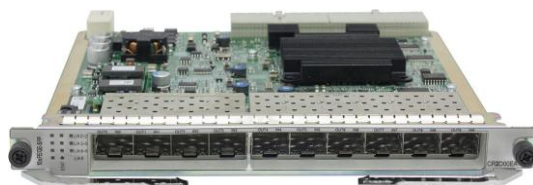
| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | 10xFE/GE-SFP |
| Description | 10-Port 100/1000Base-X-SFP Physical Interface Card |
| BOM | 03031DJK |
| Model | CR2D00EAGF10 |

Table 7-199 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R007C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 3 to 14 NSP-B: slot 3 to 14 NSP-C: slot 3 to 14 | V800R007C00 |
| NE20E-S16A | NSP-A: slot 1 to 6, 11 to 16 NSP-B: slot 1 to 6, 11 to 16 | V800R008C10 |

| Product | Slot ID | Earliest Software Version |
|---------|------------------------------|---------------------------|
| | NSP-C: slot 1 to 6, 11 to 16 | |

Appearance



Panel

Table 7-200 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| L/A(0-9) | <p>Running status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-201 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|---|-----------------------------|
| OUT0 IN0-OUT9 IN9 | GE/FE | SFP | Interfaces for 8-channel optical/electrical | Optical fiber/network cable |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|---------------------------|-------|
| | | | 1 signal input and output | |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|----------------------------|
| Basic function | Supports FE/GE interfaces. |
| Reliability and availability | Supports hot swap. |

Technical Specifications

Table 7-202 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> • 8.2 155Mbps SFP Electrical Transceiver • 8.3 155Mbps eSFP Optical Module • 8.4 155Mbps eSFP BIDI Optical Module • 8.6 1Gbps Electrical Transceiver • 8.9 1.25Gbps eSFP Optical Module • 8.11 1.25Gbps eSFP CWDM Optical Module • 8.10 1.25Gbps eSFP BIDI Optical Module • 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-203 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 13.3 W |

| Item | Specification |
|--------------------------|--|
| Typical heat dissipation | 43.2 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.25 4-Port 10GBase LAN/WAN-SFP+ Physical Interface Card

Overview

Table 7-204 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 4×10GE-SFP+ |
| Description | 4-Port 10GBase LAN/WAN-SFP+ Physical Interface Card |
| BOM | 03031DJP |
| Model | CR2D00L4XF11 |

Table 7-205 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R007C00 |
| NE20E-S8 | NSP-A: slot 3 to 6 NSP-B: slot 3 to 6 NSP-C: slot 1 to 8 | V800R007C00 |
| NE20E-S8A | NSP-A: slot 3 to 6 NSP-B: slot 3 to 6 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-C: slot 7 to 10 | V800R009C00 |
| NE20E-S16A | NSP-C: slot 7 to 10 | V800R009C00 |

Appearance



Panel

Table 7-206 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |
| L/A(0-3) | Running status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-207 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|--------------------------|-----------------|----------------|---|------------------|
| OUT0 IN0 -OUT3 IN3 | 10GE LAN/WAN | SFP+ | Interfaces for 4-channel 10GE optical signal input and output | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Provides 4 10GE SFP+ optical interfaces. |
| Reliability and availability | Supports hot swap. |
| Restrictions and Remarks | The board does not support the OTN mode or FEC function. If a colored optical module is used and does not support optical amplifier insertion, the board supports only point-to-point optical transmission. |

Technical Specifications

Table 7-208 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> • 8.14 10Gbps SFP+ Optical Module • 8.15 10Gbps SFP+ CWDM Optical Module • 8.16 10Gbps SFP+ BIDI Optical Module • 8.17 10Gbps SFP+ DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-209 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 25.0 W |
| Typical heat dissipation | 81.1 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.26 1-Port 10GBase LAN/WAN-SFP+ + 8-Port 100/1000Base-X-SFP Physical Interface Card

Overview

Table 7-210 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 1x10GE-8xGE-SFP |
| Description | 1-Port 10GBase LAN/WAN-SFP+ + 8-Port 100/1000Base-X-SFP Physical Interface Card |
| BOM | 03031DJQ |
| Model | CR2DL1XE8G11 |

Table 7-211 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R007C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 3 to 14 NSP-B: slot 3 to 14 NSP-C: slot 3 to 14 | V800R007C00 |
| NE20E-S16A | NSP-A: slot 1 to 6, 11 to 16 NSP-B: slot 1 to 6, 11 to 16 NSP-C: slot 3 to 6, 11 to 14 | V800R008C10 |

Appearance



Panel

Table 7-212 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |
| L/A(0-8) | Running status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-213 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|--|------------------------|
| OUT0 10GE IN0 | 10GE | SFP+ | Interface for 1-channel SFP+ optical signal input and output | LC optical fiber |
| OUT1 IN1-OUT8 IN8 | FE/GE | SFP | Interfaces for 8-channel SFP optical signal input and | LC optical fiber/cable |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|-------------|-------|
| | | | output | |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | <ul style="list-style-type: none"> Provides 10GBase LAN/WAN-SFP+ interfaces for 10GE SFP+ optical modules and supports 10GE optical interface features and synchronous Ethernet. Provides 8 100/1000Base-X-SFP interfaces for GE optical modules and supports GE optical interface features. Provides 8 100/1000Base-X-SFP interfaces for FE optical modules and supports FE optical interface features. Provides 8 100/1000Base-X-SFP interfaces for SFP modules with electrical interfaces and supports 100M/1000M autonegotiation electrical interface features but not synchronous Ethernet. Provides 8 100/1000Base-X-SFP interfaces for intermixing of GE optical modules, FE optical modules, and SFP modules with electrical interfaces. |
| Reliability and availability | Supports hot swap. |
| Restrictions and Remarks | The board does not support the OTN mode or FEC function. If a colored optical module is used and does not support optical amplifier insertion, the board supports only point-to-point optical transmission. |

Technical Specifications

Table 7-214 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> 8.14 10Gbps SFP+ Optical Module 8.15 10Gbps SFP+ CWDM Optical Module 8.16 10Gbps SFP+ BIDI Optical Module 8.17 10Gbps SFP+ DWDM Optical Module 8.2 155Mbps SFP Electrical Transceiver 8.3 155Mbps eSFP Optical Module 8.4 155Mbps eSFP BIDI Optical Module 8.6 1Gbps Electrical Transceiver 8.9 1.25Gbps eSFP Optical Module |

| Attribute | Description |
|--------------------|---|
| | <ul style="list-style-type: none"> 8.11 1.25Gbps eSFP CWDM Optical Module 8.10 1.25Gbps eSFP BIDI Optical Module 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-215 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 14.3 W |
| Typical heat dissipation | 46.4 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.27 2-Port 10GBase LAN/WAN-SFP+ Physical Interface Card

Overview

Table 7-216 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 2x10GE-SFP+ |
| Description | 2-Port 10GBase LAN/WAN-SFP+ Physical Interface Card |
| BOM | 03030WGQ |
| Model | CR2D00L2XF12 |

Table 7-217 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|---------|---------|---------------------------|
|---------|---------|---------------------------|

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R007C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 3 to 14 NSP-B: slot 3 to 14 NSP-C: slot 3 to 14 | V800R007C00 |
| NE20E-S16A | NSP-A: slot 1 to 6, 11 to 16 NSP-B: slot 1 to 6, 11 to 16 NSP-C: slot 3 to 6, 11 to 14 | V800R008C10 |

Appearance



Panel

Table 7-218 Indicators

| Indicator | Status Description |
|-----------|--|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. |

| Indicator | Status Description |
|-----------|--|
| | If the indicator is off, the PIC is powered off or is not registered. |
| L/A(0-1) | Running status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-219 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------------|----------------|----------------|---|------------------|
| OUT0 IN0 OUT1 IN1 | 10GE | SFP+ | Interfaces for 2-channel SFP+ optical signal input and output | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | 2-port 10GBase LAN/WAN-SFP+ physical interface card (PIC), supporting optical signal input and output of two 10GE interfaces. |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | The board does not support the OTN mode or FEC function. If a colored optical module is used and does not support optical amplifier insertion, the board supports only point-to-point optical transmission. |

Technical Specifications

Table 7-220 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> 8.14 10Gbps SFP+ Optical Module 8.15 10Gbps SFP+ CWDM Optical Module 8.16 10Gbps SFP+ BIDI Optical Module 8.17 10Gbps SFP+ DWDM Optical Module |

| Attribute | Description |
|--------------------|--|
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-221 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 10.0 W |
| Typical heat dissipation | 32.4 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.28 4-Port Channelized STM-1c POS-SFP Physical Interface Card(PIC)

Overview

Table 7-222 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | 4xSTM1-cPOS |
| Description | 4-Port Channelized STM-1c POS-SFP Physical Interface Card(PIC) |
| BOM | 03030QCN |
| Model | CR2D00C4CF11 |

Table 7-223 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|--|--|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R005C01 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R005C01 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-224 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

| Indicator | Status Description |
|-----------|--|
| L/A(0-3) | Running status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-225 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|--|------------------------|
| OUT0 IN0-OUT3 IN3 | CPOS | SFP | Interfaces for 4-channel 155M optical/electrical signal input and output | LC optical fiber/cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports 63 E1 links over one 155M SDH link. |
| Reliability and availability | Support for hot swap. |
| Link protocol | PPP, MP, TDM, ATM, and IMA |

Technical Specifications

Table 7-226 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> 8.2 155Mbps SFP Electrical Transceiver 8.3 155Mbps eSFP Optical Module 8.4 155Mbps eSFP BIDI Optical Module 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IMA 1.1, RFC4717, RFC4385, RFC4816, RFC5086, |

| Attribute | Description |
|--------------|---|
| | RFC4553_SATOP, and RFC1662 |
| Frame format | The 155M interface supports SDH; the channelized e1 supports non-framed, CRC4, and NO-CRC4. |

Table 7-227 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 14.5 W |
| Typical heat dissipation | 47.0 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.29 32-Port E1 Physical Interface Card(75ohm)

Overview

Table 7-228 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 32xE1-75 |
| Description | 32-Port E1 Physical Interface Card(75ohm) |
| BOM | 03030QCQ |
| Model | CR2D000IE110 |

Table 7-229 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|--|--|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 | V800R005C01 |

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| | NSP-C: slot 1 to 8 | |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R005C01 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-230 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-231 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------------|----------------|----------------|------------------|-------|
| E1(0-15) E1(16-31) | E1 | DB32 | 32 E1 interfaces | Cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports a maximum of 32 E1 interfaces. Services on each interface can be configured. |
| Reliability and availability | Support for hot swap |
| Link protocol | PPP, MP, TDM, ATM, and IMA |

Technical Specifications

Table 7-232 Interface specifications

| Attribute | Description |
|--------------------|---|
| Working mode | Full-duplex |
| Compliant standard | IMA 1.1, RFC4717, RFC4385, RFC4816, RFC5086, RFC4553_SATOP, and RFC1662 |
| Frame format | Non-framed, CRC4, and NO-CRC4 |
| Interface code | HDB3 |
| Stated bit rate | 2048 kbit/s |

Table 7-233 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 13.5 W |
| Typical heat dissipation | 43.8 BTU/hour |

| Item | Specification |
|---------------------|--|
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.30 32-Port E1 Physical Interface Card(120ohm)

Overview

Table 7-234 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | 32xE1-120 |
| Description | 32-Port E1 Physical Interface Card(120ohm) |
| BOM | 03030QCP |
| Model | CR2D000IE111 |

Table 7-235 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|--|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R005C01 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R005C01 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-236 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |

Table 7-237 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-----------------------|----------------|----------------|------------------|-------|
| E1(0-15) E1(16-31) | E1 | DB32 | 32 E1 interfaces | Cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports a maximum of 32 E1 interfaces. Services on each interface can be configured. |
| Reliability and availability | Support for hot swap |
| Link protocol | PPP, MP, TDM, ATM, and IMA |

Technical Specifications

Table 7-238 Interface specifications

| Attribute | Description |
|--------------------|---|
| Working mode | Full-duplex |
| Compliant standard | IMA 1.1, RFC4717, RFC4385, RFC4816, RFC5086, RFC4553_SATOP, and RFC1662 |
| Frame format | Non-framed, CRC4, and NO-CRC4 |
| Interface code | HDB3 |
| Stated bit rate | 2048 kbit/s |

Table 7-239 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 13.5 W |
| Typical heat dissipation | 43.8 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.31 16-Port E1 Physical Interface Card(75ohm)

Overview

Table 7-240 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 16xE1-75 |
| Description | 16-Port E1 Physical Interface Card(75ohm) |
| BOM | 03030RFA |
| Model | CR2D000DE110 |

Table 7-241 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|--|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R005C01 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R005C01 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-242 Indicators

| Indicator | Status Description |
|-----------|--|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the |

| Indicator | Status Description |
|-----------|---|
| | logic. If the indicator is off, the PIC is powered off or is not registered. |

Table 7-243 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|------------------|-------|
| E1(0-15) | E1 | DB16 | 16 E1 interfaces | Cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports a maximum of 16 E1 interfaces. Services on each interface can be configured. |
| Reliability and availability | Support for hot swap |
| Link protocol | PPP, MP, TDM, ATM, and IMA |

Technical Specifications

Table 7-244 Interface specifications

| Attribute | Description |
|--------------------|---|
| Working mode | Full-duplex |
| Compliant standard | IMA 1.1, RFC4717, RFC4385, RFC4816, RFC5086, RFC4553_SATOP, and RFC1662 |
| Frame format | Non-framed, CRC4, and NO-CRC4 |
| Interface code | HDB3 |
| Stated bit rate | 2048 kbit/s |

Table 7-245 Board specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 9.5 W |
| Typical heat dissipation | 30.7 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.32 16-Port E1 Physical Interface Card(120ohm)

Overview

Table 7-246 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | 16xE1-120 |
| Description | 16-Port E1 Physical Interface Card(120ohm) |
| BOM | 03030REY |
| Model | CR2D000DE111 |

Table 7-247 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|---|--|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R005C01 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R005C01 |

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-248 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-249 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|------------------|-------|
| E1(0-15) | E1 | DB16 | 16 E1 interfaces | Cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Supports a maximum of 16 E1 interfaces. Services on each interface can be configured. |
| Reliability and availability | Support for hot swap |
| Link protocol | PPP, MP, TDM, ATM, and IMA |

Technical Specifications

Table 7-250 Interface specifications

| Attribute | Description |
|--------------------|---|
| Working mode | Full-duplex |
| Compliant standard | IMA 1.1, RFC4717, RFC4385, RFC4816, RFC5086, RFC4553_SATOP, and RFC1662 |
| Frame format | Non-framed, CRC4, and NO-CRC4 |
| Interface code | HDB3 |
| Stated bit rate | 2048 kbit/s |

Table 7-251 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 9.5 W |
| Typical heat dissipation | 30.7 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.33 4-Port OC-3c/STM-1c POS-SFP Physical Interface Card

Overview

Table 7-252 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 4xOC3-POS |
| Description | 4-Port OC-3c/STM-1c POS-SFP Physical Interface Card |
| BOM | 03030RET |
| Model | CR2D00P4CF11 |

Table 7-253 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|--|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R005C01 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R005C01 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-254 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| L/A(0-3) | <p>Running status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-255 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|--|---------------------------|
| OUT0 IN0-OUT3 IN3 | POS | SFP | Interfaces for 4-channel 155M optical/electrical signal input and output | LC optical fiber/PC cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|------------------------------------|
| Basic function | Provides four 155M POS interfaces. |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-256 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> • 8.2 155Mbps SFP Electrical Transceiver • 8.3 155Mbps eSFP Optical Module • 8.4 155Mbps eSFP BIDI Optical Module • 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | ITU-T G707 |
| Frame format | HDLC and PPP |

Table 7-257 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 14.5 W |
| Typical heat dissipation | 47.0 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.34 2-Port OC-3c/STM-1c (or 1-Port OC-12c/STM-4C) POS-SFP Physical Interface Card

Overview

Table 7-258 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 2xSTM1/1xSTM4-POS |
| Description | 2-Port OC-3c/STM-1c (or 1-Port OC-12c/STM-4C) POS-SFP Physical Interface Card |
| BOM | 03031DKA |
| Model | CR2DP2C1HF11 |

Table 7-259 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R007C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R007C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-260 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| L/A(0-1) | <p>Running status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-261 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|--|---------------------------|
| OUT0 IN0-OUT1 IN1 | POS | SFP | Interfaces for 2-channel 155M optical/electrical signal input and output | LC optical fiber/PC cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Provides two 155 Mbit/s POS interfaces (default configuration) or one 622 Mbit/s POS interface. |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | Support for configuration of the interface rate on the board using the set service-mode port-rate command to allow interface rate switching between 2 x 155M POS and 1 x 622M POS. The board automatically power cycles after interface rate switching. |

Technical Specifications

Table 7-262 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> • 8.2 155Mbps SFP Electrical Transceiver • 8.3 155Mbps eSFP Optical Module • 8.4 155Mbps eSFP BIDI Optical Module • 8.12 125M~2.67Gbps eSFP DWDM Optical Module • 8.5 622Mbps eSFP Optical Module |
| Working mode | Full-duplex |
| Compliant standard | ITU G.707 |
| Frame format | HDLC and PPP |

Table 7-263 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 14.5 W |
| Typical heat dissipation | 47.0 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.35 1-Port Channelized STM-1c POS-SFP Physical Interface Card

Overview

Table 7-264 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 1xSTM1-cPOS |
| Description | 1-Port Channelized STM-1c POS-SFP Physical Interface Card |
| BOM | 03031DKB |
| Model | CR2D00C1CF11 |

Table 7-265 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 | V800R007C00 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 | V800R007C00 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-266 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | Status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |
| L/A | Running status indicator Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-267 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|---|------------------|
| OUT0 IN0 | 1*155M CPOS | SFP | Single-channel STM-1c POS-SFP interface | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports 63 E1 links over one 155M SDH link. |
| Reliability and availability | Support for hot swap. |
| Link protocol | PPP, MP, TDM, ATM, and IMA |

Technical Specifications

Table 7-268 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> 8.2 155Mbps SFP Electrical Transceiver 8.3 155Mbps eSFP Optical Module 8.4 155Mbps eSFP BIDI Optical Module 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IMA 1.1, RFC4717, RFC4385, RFC4816, RFC5086, RFC4553_SATOP, and RFC1662 |
| Frame format | The 155M interface supports SDH; the channelized e1 supports non-framed, CRC4, and NO-CRC4. |

Table 7-269 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 14.5 W |
| Typical heat dissipation | 47.0 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.36 Auxiliary Flexible Interface Card with 4-Port 100Base-RJ45 (FIC, Supporting 1588v2)

Overview

Table 7-270 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | AUX/4xFE-A |
| Description | Auxiliary Flexible Interface Card with 4-Port 100Base-RJ45 (FIC, Supporting 1588v2) |
| BOM | 03030MER |

| Attribute | Description |
|-----------|--------------|
| Model | CR5D00AUXQ10 |

Table 7-271 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|--|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | <ul style="list-style-type: none"> DC:V800R005C01 AC:V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R005C01 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R005C01 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-272 Indicators

| Indicator | Status Description |
|-----------|--------------------|
| STAT | Status indicator |

| Indicator | Status Description |
|-----------|---|
| | <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-273 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|----------------|--|---------------|
| F1 | FE | RJ45 | Interface for 1-channel service transparent transmission | Network cable |
| PHONE | FE | RJ45 | Interface for orderwires | Network cable |
| ALMO | FE | RJ45 | Interface for enabling and disabling status alarm output | Network cable |
| ALMI | FE | RJ45 | Interface for enabling and disabling status alarm input | Network cable |
| FE0-FE3 | FE | RJ45 | Reserved | Network cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | Provides four FE electrical interfaces. The ALM interfaces on the board can be connected to the burglarproof sensor (on the cabinet door) and smoke sensor to implement on-site ambinet monitoring. |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-274 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 10.0 W |
| Typical heat dissipation | 32.4 BTU/hour |
| Weight | 0.4 kg (0.88 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.37 8-Channel CWDM Multiplexing & Demultiplexing (1471/1491/1511/1531/1551/1571/1591/1611nm) Physical Interface Card(PIC)

Overview

Table 7-275 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | MD8A-CWDM |
| Description | 8-Channel CWDM Multiplexing & Demultiplexing (1471/1491/1511/1531/1551/1571/1591/1611nm) Physical Interface Card(PIC) |
| BOM | 03030RJQ |
| Model | CR5D08CWDM70 |

Table 7-276 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|--|--|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | <ul style="list-style-type: none"> • DC:V800R005C01 • AC:V800R007C00 |
| NE20E-S8 | NSP-A: slot 1 to 8 | V800R005C01 |

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| | NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R005C01 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 NSP-C: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-277 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |

Table 7-278 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|---|------------------|
| OUT IN LINE | GE/10GE | Optical fiber adapter | Interface for 8-channel wavelength multiplexer input and output | LC optical fiber |
| OUT0 IN0 | GE/10GE | Optical fiber adapter | Interface for 1471 nm wavelength demultiplexer input and output | LC optical fiber |
| OUT0 IN1 | GE/10GE | Optical fiber adapter | Interface for 1491 nm wavelength demultiplexer input and output | LC optical fiber |
| OUT0 IN2 | GE/10GE | Optical fiber adapter | Interface for 1511 nm wavelength demultiplexer input and output | LC optical fiber |
| OUT0 IN3 | GE/10GE | Optical fiber adapter | Interface for 1531 nm wavelength demultiplexer input and output | LC optical fiber |
| OUT0 IN4 | GE/10GE | Optical fiber adapter | Interface for 1551 nm wavelength demultiplexer input and output | LC optical fiber |
| OUT0 IN5 | GE/10GE | Optical fiber adapter | Interface for 1571 nm wavelength demultiplexer input and output | LC optical fiber |
| OUT0 IN6 | GE/10GE | Optical fiber | Interface for 1591 nm | LC optical fiber |

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------|----------------|-----------------------|---|------------------|
| | | adapter | wavelength demultiplexer input and output | |
| OUT0 IN7 | GE/10GE | Optical fiber adapter | Interface for 1611 nm wavelength demultiplexer input and output | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | 8-channel wavelength multiplexer/demultiplexer (1471/1491/1511/1531/1551/1571/1591/1611 nm) |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | No applicable to outdoor scenarios. |

Technical Specifications

Table 7-279 Interface specifications

| Attribute | Description |
|-------------------------------|--|
| Center wavelength | 1471/1491/1511/1531/1551/1571/1591/1611nm |
| Single-channel insertion loss | The insertion loss of wavelength-dropping/wavelength-adding channels is less than 1.2 dB, and the insertion loss of east-in-and-west-out or west-in-and-east-out is less than 1.4 dB, with no optical fiber insertion loss being taken into consideration. |
| Maximum input optical power | 500 mw /23 dBm |
| Return loss | >= 40 dB |
| Optical fiber type | Single-mode |
| PMD | Single-mode |

| Attribute | Description |
|-----------|-------------|
| PDL | <= 0.2 dB |

Table 7-280 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 1.0 W |
| Typical heat dissipation | 3.2 BTU/hour |
| Weight | 0.7 kg (1.54 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.38 2-Port 10GBase LAN/WAN-SFP+ Physical Interface Card H

Overview

Table 7-281 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 2x10GE-SFP+-H |
| Description | 2-Port 10GBase LAN/WAN-SFP+ Physical Interface Card H |
| BOM | 03032CRN |
| Model | CR2D0L2XFH11 |

Table 7-282 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|----------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R008C10 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 | V800R008C10 |

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| | NSP-C: slot 1 to 8 | |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 3 to 14 NSP-B: slot 3 to 14 NSP-C: slot 3 to 14 | V800R008C10 |
| NE20E-S16A | NSP-A: slot 1 to 6, 11 to 16 NSP-B: slot 1 to 6, 11 to 16 NSP-C: slot 3 to 6, 11 to 14 | V800R008C10 |

Appearance



Panel

Table 7-283 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| L/A(0-1) | <p>Running status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. |

| Indicator | Status Description |
|-----------|---|
| | <ul style="list-style-type: none"> If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-284 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|---|------------------|
| OUT0 IN0-OUT1 IN1 | 10GE | SFP+ | Interfaces for 2-channel SFP+ optical signal input and output | LC optical fiber |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|---|
| Basic function | 2-port 10GBase LAN/WAN-SFP+ physical interface card (PIC), supporting optical signal input and output of two 10GE interfaces. |
| Reliability and availability | Support for hot swap. |
| Restrictions and Remarks | The board does not support the OTN mode or FEC function. If a colored optical module is used and does not support optical amplifier insertion, the board supports only point-to-point optical transmission. |

Technical Specifications

Table 7-285 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> 8.14 10Gbps SFP+ Optical Module 8.15 10Gbps SFP+ CWDM Optical Module 8.16 10Gbps SFP+ BIDI Optical Module 8.17 10Gbps SFP+ DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-286 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 10.0 W |
| Typical heat dissipation | 32.4 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.39 8-Port 100/1000Base-X-SFP Physical Interface Card H

Overview

Table 7-287 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 8xFE/GE-SFP-H |
| Description | 8-Port 100/1000Base-X-SFP Physical Interface Card H |
| BOM | 03032CRP |
| Model | CR2D0E8GFH10 |

Table 7-288 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|-----------|--|---------------------------|
| NE20E-S4 | NSP-A: slot 1 to 4 NSP-B: slot 1 to 4 | V800R008C10 |
| NE20E-S8 | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S8A | NSP-A: slot 1 to 8 NSP-B: slot 1 to 8 NSP-C: slot 1 to 8 | V800R008C10 |
| NE20E-S16 | NSP-A: slot 3 to 14 | V800R008C10 |

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| | NSP-B: slot 3 to 14 NSP-C: slot 3 to 14 | |
| NE20E-S16A | NSP-A: slot 1 to 6, 11 to 16 NSP-B: slot 1 to 6, 11 to 16 NSP-C: slot 1 to 6, 11 to 16 | V800R008C10 |

Appearance



Panel

Table 7-289 Indicators

| Indicator | Status Description |
|-----------|---|
| STAT | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| L/A(0-7) | <p>Running status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-290 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|---|---------------------|
| OUT0 IN0-OUT7 IN7 | FE/GE | SFP | Interfaces for 8-channel optical/electrical signal input and output | fiber/network cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports GE/FE interfaces. 100M/1000M autonegotiation is supported on FE interfaces. |
| Reliability and availability | Support for hot swap |

Technical Specifications

Table 7-291 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> • 8.2 155Mbps SFP Electrical Transceiver • 8.3 155Mbps eSFP Optical Module • 8.4 155Mbps eSFP BIDI Optical Module • 8.6 1Gbps Electrical Transceiver • 8.9 1.25Gbps eSFP Optical Module • 8.11 1.25Gbps eSFP CWDM Optical Module • 8.10 1.25Gbps eSFP BIDI Optical Module • 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-292 Board specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 11.0 W |
| Typical heat dissipation | 35.7 BTU/hour |
| Weight | 0.6 kg (1.32 lb) |
| Ambient temperature | Long terms: -40 °C to 65 °C (-40 °F to 149 °F) |

7.4.40 20-Port 100/1000Base-X-SFP Physical Interface Card

Overview

Table 7-293 Board attributes

| Attribute | Description |
|-----------------------|--|
| Board name silkscreen | 20xFE/GE-SFP |
| Description | 20-Port 100/1000Base-X-SFP Physical Interface Card |
| BOM | 03031XCH |
| Model | CR2D00EEGF10 |

Table 7-294 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|---|---------------------------|
| NE20E-S16 | NSP-A: slot 1 to 6, 9 to 14 NSP-B: slot 1 to 6, 9 to 14 NSP-C: slot 1 to 6, 9 to 14 | V800R008C10 |
| NE20E-S16A | NSP-A: slot 1 to 6, 9 to 14 NSP-B: slot 1 to 6, 9 to 14 NSP-C: slot 1 to 6, 9 to 14 | V800R008C10 |

Appearance



Panel

Table 7-295 Indicators

| Indicator | Status Description |
|-----------|---|
| STATUS | <p>Status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. <p>Red:</p> <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. <p>Yellow:</p> <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. <p>If the indicator is off, the PIC is powered off or is not registered.</p> |
| L/A(0-19) | <p>Running status indicator</p> <p>Green:</p> <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-296 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|----------------------------|----------------|----------------|--|-----------------------|
| OUT0 IN0-OUT1 9 IN19 | 100M/1000M | SFP | Interfaces for 20-channel optical/electrical signal input and output | LC optical fiber/RJ45 |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|--|
| Basic function | Supports a maximum of 20 100M/1000M interfaces. Services on each interface can be configured. |
| Reliability and availability | Support for hot swap |
| Restrictions and Remarks | Not applicable to outdoor scenarios, a chassis supports a maximum of five subcards of this type. |

Technical Specifications

Table 7-297 Interface specifications

| Attribute | Description |
|------------------------|--|
| Optical type supported | <ul style="list-style-type: none"> • 8.2 155Mbps SFP Electrical Transceiver • 8.3 155Mbps eSFP Optical Module • 8.4 155Mbps eSFP BIDI Optical Module • 8.6 1Gbps Electrical Transceiver • 8.9 1.25Gbps eSFP Optical Module • 8.11 1.25Gbps eSFP CWDM Optical Module • 8.10 1.25Gbps eSFP BIDI Optical Module • 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | IEEE 802.3 |
| Frame format | Ethernet_II, Ethernet_SAP, and Ethernet_SNAP |

Table 7-298 Board specifications

| Item | Specification |
|---------------------------|---|
| Dimensions (H x W x D) | 39.6mm x 193.8mm x 209.3 mm (1.56 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 49.0 W |
| Typical heat dissipation | 159.0 BTU/hour |
| Weight | 1.0 kg (2.2 lb) |
| Ambient temperature | Long terms: 0 °C to 45 °C (32 °F to 113 °F) Short terms: -5 °C to 55 °C (23 °F to 131 °F) |

7.4.41 2-Port OC-3c/STM-1c ATM-SFP Physical Interface Card

Overview

Table 7-299 Board attributes

| Attribute | Description |
|-----------------------|---|
| Board name silkscreen | 2xSTM1-ATM |
| Description | 2-Port OC-3c/STM-1c ATM-SFP Physical Interface Card |
| BOM | 03031WDR |
| Model | CR2D00A2CF10 |

Table 7-300 Mapping products and versions

| Product | Slot ID | Earliest Software Version |
|------------|--|---------------------------|
| NE20E-S16 | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 | V800R008C10 |
| NE20E-S16A | NSP-A: slot 1 to 16 NSP-B: slot 1 to 16 | V800R008C10 |

Appearance



Panel

Table 7-301 Indicators

| Indicator | Status Description |
|-----------|---|
| STATUS | Green: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is working properly. Red: |

| Indicator | Status Description |
|-----------|---|
| | <ul style="list-style-type: none"> If the indicator is steady on, the hardware on the PIC is faulty. Yellow: <ul style="list-style-type: none"> If the indicator is steady on, the PIC is installed in a slot for a HIC and an alarm is reported or the PIC is not loaded with the logic. If the indicator is off, the PIC is powered off or is not registered. |
| L/A(0-1) | Green: <ul style="list-style-type: none"> If the indicator is steady on, the link is normal. If the indicator is off, the link is Down. If the indicator blinks, data is being transmitted. |

Table 7-302 Service interfaces

| Interface Name | Interface Type | Connector Type | Description | Cable |
|-------------------------|----------------|----------------|--|---------------------------|
| OUT0 IN0-OUT1 IN1 | ATM | SFP | Interfaces for 2-channel 155M optical/electrical signal input and output | LC optical fiber/PC cable |

Functional Specifications

| Features and Functions | Remarks |
|------------------------------|-------------------------------------|
| Basic function | Support for 2-port 155M ATM service |
| Reliability and availability | Support for hot swap |
| Link protocol | ATM |

Technical Specifications

Table 7-303 Interface specifications

| Attribute | Description |
|------------------------|---|
| Optical type supported | <ul style="list-style-type: none"> 8.2 155Mbps SFP Electrical Transceiver 8.3 155Mbps eSFP Optical Module |

| Attribute | Description |
|--------------------|---|
| | <ul style="list-style-type: none"> 8.4 155Mbps eSFP BIDI Optical Module 8.12 125M~2.67Gbps eSFP DWDM Optical Module |
| Working mode | Full-duplex |
| Compliant standard | RFC1483, RFC2225, RFC2514, RFC4717, and ITU-I L.610 |
| Frame format | SDH and SONET |

Table 7-304 Board specifications

| Item | Specification |
|---------------------------|--|
| Dimensions (H x W x D) | 19.8mm x 193.8mm x 209.3 mm (0.78 in. x 7.63 in. x 8.24 in.) |
| Typical power consumption | 25.6 W |
| Typical heat dissipation | 83.1 BTU/hour |
| Weight | 0.8 kg (1.76 lb) |
| Ambient temperature | Long terms: -5 °C to 65 °C (23 °F to 149 °F) |

8 Optical Module

About This Chapter

This chapter presents the optical module.

- 8.1 Instructions on How to Use an Optical Module
- 8.2 155Mbps SFP Electrical Transceiver
- 8.3 155Mbps eSFP Optical Module
- 8.4 155Mbps eSFP BIDI Optical Module
- 8.5 622Mbps eSFP Optical Module
- 8.6 1Gbps Electrical Transceiver
- 8.7 1.25Gbps CSFP BIDI Optical Module
- 8.8 125M-1.25Gbps CSFP BIDI Optical Module
- 8.9 1.25Gbps eSFP Optical Module
- 8.10 1.25Gbps eSFP BIDI Optical Module
- 8.11 1.25Gbps eSFP CWDM Optical Module
- 8.12 125M~2.67Gbps eSFP DWDM Optical Module
- 8.13 1.25/9.953/10.3125Gbps SFP+ Optical Module
- 8.14 10Gbps SFP+ Optical Module
- 8.15 10Gbps SFP+ CWDM Optical Module
- 8.16 10Gbps SFP+ BIDI Optical Module
- 8.17 10Gbps SFP+ DWDM Optical Module
- 8.18 40Gbps CFP Optical Module
- 8.19 100Gbps CFP2 Optical Module
- 8.20 AE 905S Module

8.1 Instructions on How to Use an Optical Module

NOTE

Only optical modules matching Huawei products can be used. These optical modules are strictly tested by Huawei. If non-matching optical modules are used, device requirements may fail to be met, and services may fail to run properly. To replace optical modules, see Parts Replacement-Replacing an Optical Module.

Precautions for the loosened optical module

- When installing an optical module, force it into position. If a click is heard or a slight tremor is felt, it indicates that the latch is secured. When the latch is not secured, the connecting finger is not properly connected to the board, and the link may become Up. In the rare event where the optical module collides with another object or is made to tremor, the optical module will be loosened or the optical signals will be temporarily cut off.
- When inserting the optical module, make sure that the tab is closed. (At this time, the latch locks the optical module.) After the optical module is inserted, try pulling it out to see whether it is installed properly. If the optical module cannot be pulled out, it is secured.

The tab is closed



The tab is open

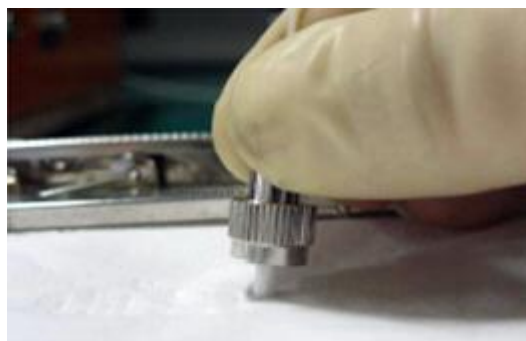


Precautions for receptacle contamination

- Clean tissues must be prepared for deployment on site. You need to clean the optical connector before inserting it in the receptacle. This protects the receptacle against the contamination.

NOTE

Use at least three cleaning tissues. Wipe the end of an optical connector horizontally in one direction, and then move the connector end to the unused part of the cleaning tissue to continue. Generally, one cleaning tissue is used for cleaning an optical connector.



- To prevent contamination, the optical module should be covered with either a dust cap or an optical connector.

Cover an optical module with a dust cap



Cover an optical module with an optical connector



- Lay the optical fibers on the Optical-fiber Distribution Frame (ODF) or coil them up in a fiber management tray. Make sure that the optical fibers are not squeezed.



- If a receptacle or an optical connector has not been used for a long time and has not been covered with a dust cap, you should clean it before using it. A cotton swab is used to clean a receptacle, and a cleaning tissue is used to clean an optical connector.



NOTE

During the cleaning process, insert the cotton swab and turn it slowly in the receptacle. Do not use too much force, because the receptacle may be damaged.



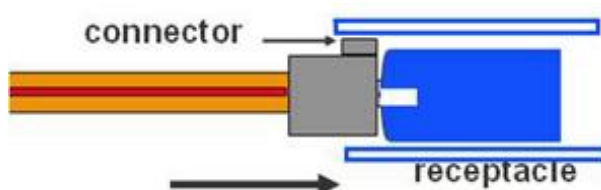
- If, for no apparent reason, optical signals are lost during the operation of a device, use the preceding method to clean the receptacle or the optical connector. This will eliminate contamination as the cause of the signal loss.

Precautions for the overload-caused burnt optical module

- When using an OTDR to test the connectivity or the attenuation of optical signals, disconnect the optical connector from the optical module. Otherwise, the optical module may be burnt.
- When performing a self-loop test, use an optical attenuator. Do not loosen the optical connector.
- It is required that a long-distance optical module have an input optical power of less than -7 dBm. If the input optical power is larger than -7 dBm, you need to add an optical attenuator. For example, if the transmitting optical power is X dBm and the optical attenuation is Y dB, the receiving optical power is $X-Y$, which must be smaller than -7 dBm ($X-Y < -7$ dBm).

Other precautions

- The optical connector should be horizontally inserted in the receptacle to avoid damages to the receptacle.



- Mixed use of multi-mode and single-mode optical fibers is prohibited. Otherwise, faults such as signal loss may occur.

8.2 155Mbps SFP Electrical Transceiver

Figure 8-1 155Mbps SFP Electrical Transceiver



8.2.1 155Mbps-SFP-120m-extended

Table 8-1 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 02310WQY |
| Model | OECD01N03 |
| Encapsulation mode | SFP |
| Interface standard | ITU-T G.703/G.783, STM-1e |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -20 to 85 (-4 ℉ to 185 ℉) |
| Digital diagnosis | - |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | SMB |
| Transmission distance (km) | 0.1 |

8.3 155Mbps eSFP Optical Module

Figure 8-2 155Mbps eSFP Optical Module



8.3.1 155Mbps-eSFP-MMF-1310nm-2km-commercial

Table 8-2 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | S4015731 |
| Model | SFP-FE-SX-MM1310 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-1 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | - |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | LC |
| Transmission distance (km) | 2 |
| Optical fiber type | MMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1270-1380 |

| Item | Specification |
|---|---------------|
| Maximum sending optical power (AVG) (dBm) | -14 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -19 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1270-1380 |
| Receiving sensitivity (AVG) (dBm) | -30 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -14 |
| Minimum extinction ratio (dB) | 10 |

8.3.2 155Mbps-eSFP-SMF-1310nm-15km-commercial

Table 8-3 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | S4015755 |
| Model | eSFP-FE-LX-SM1310 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-1 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | LC |
| Transmission distance (km) | 15 |
| Optical fiber type | SMF |

| Item | Specification |
|--|---------------|
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1261-1360 |
| Maximum sending optical power (AVG) (dBm) | -8 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -15 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1580 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.3.3 155Mbps-eSFP-SMF-1310nm-40km-commercial

Table 8-4 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | S4015715 |
| Model | eSFP-FE-LH40-SM1310 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-1 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |

| Item | Specification |
|--|---------------|
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1263-1360 |
| Maximum sending optical power (AVG) (dBm) | 0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -5 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1263-1360 |
| Receiving sensitivity (AVG) (dBm) | -34 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -10 |
| Minimum extinction ratio (dB) | 10.5 |

8.3.4 155Mbps-eSFP-SMF-1550nm-80km-commercial

Table 8-5 Technical specifications

| Item | Specification |
|--------------------------------|---------------------------------|
| BOM | 34060282 |
| Model | eSFP-FE-LH80-SM1550 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-1 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |

| Item | Specification |
|--|----------------------------------|
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550 |
| Working wavelength range of the optical transmitter (nm) | 1480-1580 |
| Maximum sending optical power (AVG) (dBm) | 0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -5 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1263-1580 |
| Receiving sensitivity (AVG) (dBm) | -34 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -10 |
| Minimum extinction ratio (dB) | 10.5 |

8.3.5 155Mbps-eSFP-SMF-1310nm-15km-industry

Table 8-6 Technical specifications

| Item | Specification |
|-----------------------|--------------------|
| BOM | 02310WRA |
| Model | OSC015N03 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-1 |
| Bit Error Ratio (BER) | <1x10E-12 |

| Item | Specification |
|--|----------------------------------|
| Working case temperature (°C) | -40 to 85 (-40 ℉ to 185 ℉) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | LC |
| Transmission distance (km) | 15 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310.0 |
| Working wavelength range of the optical transmitter (nm) | 1261-1360 |
| Maximum sending optical power (AVG) (dBm) | -8.0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -15.0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1580 |
| Receiving sensitivity (AVG) (dBm) | -31.0 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8.0 |
| Minimum extinction ratio (dB) | 8.2 |

8.3.6 155Mbps-eSFP-SMF-1310nm-40km-industry

Table 8-7 Technical specifications

| Item | Specification |
|-------|---------------|
| BOM | 02310WRB |
| Model | OSC040N03 |

| Item | Specification |
|--|----------------------------------|
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-1 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 to 85 (-40 ℉ to 185 ℉) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310.0 |
| Working wavelength range of the optical transmitter (nm) | 1263-1360 |
| Maximum sending optical power (AVG) (dBm) | 0.0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -5.0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1263-1360 |
| Receiving sensitivity (AVG) (dBm) | -34.0 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -10.0 |
| Minimum extinction ratio (dB) | 10.5 |

8.3.7 155Mbps-eSFP-SMF-1550nm-80km-industry

Table 8-8 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 02310WRC |
| Model | OSC080N03 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-1 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 to 85 (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550.0 |
| Working wavelength range of the optical transmitter (nm) | 1480-1580 |
| Maximum sending optical power (AVG) (dBm) | 0.0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -5.0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1263-1580 |
| Receiving sensitivity (AVG) (dBm) | -34.0 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -10.0 |
| Minimum extinction ratio (dB) | 10.5 |

8.4 155Mbps eSFP BIDI Optical Module

Figure 8-3 155Mbps eSFP BIDI Optical Module



8.4.1 155Mbps-eSFP-SM-1310nm-15km-commercial

Table 8-9 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 02310QNG |
| Model | OSC015B01 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 100BASE-BX10-U |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | LC |
| Transmission distance (km) | 15 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |

| Item | Specification |
|--|---------------|
| Working wavelength range of the optical transmitter (nm) | 1260-1360 |
| Maximum sending optical power (AVG) (dBm) | -8 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -14 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1480-1580 |
| Receiving sensitivity (AVG) (dBm) | -32 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.5 |

8.4.2 155Mbps-eSFP-SM-1550nm-15km-commercial

Table 8-10 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 02310QNH |
| Model | OSC015B02 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 100BASE-BX10-D |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M |
| Connector type | LC |

| Item | Specification |
|--|---------------|
| Transmission distance (km) | 15 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550 |
| Working wavelength range of the optical transmitter (nm) | 1480-1580 |
| Maximum sending optical power (AVG) (dBm) | -8 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -14 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | -32 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.5 |

8.5 622Mbps eSFP Optical Module

Figure 8-4 622Mbps eSFP Optical Module



8.5.1 622Mbps-eSFP-SMF-1310nm-15km-commercial

Table 8-11 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | S4015760 |
| Model | OSH015N05 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-4 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 622M |
| Connector type | LC |
| Transmission distance (km) | 15 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1274-1356 |
| Maximum sending optical power (AVG) (dBm) | -8 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -15 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1580 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.5 |

8.6 1Gbps Electrical Transceiver

Figure 8-5 1Gbps Electrical Transceiver



8.6.1 1Gbps-SFP-100m-industry

Table 8-12 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 02310RAV |
| Model | OEGD01N01 |
| Encapsulation mode | SFP |
| Interface standard | IEEE 802.3, 1000Base-T |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 °C to 85 °C (-40 °F to 185 °F) |
| Digital diagnosis | - |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 10M/100M/1000M |
| Connector type | RJ45 |
| Transmission distance (km) | 0.1 |

8.6.2 1Gbps-SFP-100m-industry

Table 8-13 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 02310VPT |
| Model | OEGD01N02 |
| Encapsulation mode | SFP |
| Interface standard | IEEE 802.3, 1000Base-T |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 °C to 85 °C (-40 °F to 185 °F) |
| Digital diagnosis | - |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 10M/100M/1000M |
| Connector type | RJ45 |
| Transmission distance (km) | 0.1 |

8.7 1.25Gbps CSFP BIDI Optical Module

Figure 8-6 1.25Gbps CSFP BIDI Optical Module



8.7.1 1.25Gbps-CSFP-SMF-1490nm-10km-industry

Table 8-14 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060525 |
| Model | O00CSFP25 |
| Encapsulation mode | CSFP |
| Interface standard | IEEE 802.3ah, 1000BASE-BX10-D |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 °C to 85 °C (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1490 |
| Working wavelength range of the optical transmitter (nm) | 1480-1500 |
| Maximum sending optical power (AVG) (dBm) | -3 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -9 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | -19.5 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 6 |

8.7.2 1.25Gbps-CSFP-SMF-1310(Tx)/1490(Rx)nm-10km-industry

Table 8-15 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34061329 |
| Model | OSG010007 |
| Encapsulation mode | CSFP |
| Interface standard | IEEE 802.3ah 1000BASE-BX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 °C to 85 °C (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310(Tx)/1490(Rx) |
| Working wavelength range of the optical transmitter (nm) | 1260-1360 |
| Maximum sending optical power (AVG) (dBm) | -3 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -9 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1480-1500 |
| Receiving sensitivity (AVG) (dBm) | -24 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 6.6 |

8.7.3 1.25Gbps-CSFP-SMF-1490(Tx)/1310(Rx)nm-40km-industry

Table 8-16 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060894 |
| Model | OSG040008 |
| Encapsulation mode | CSFP |
| Interface standard | IEEE 802.3ah 1000BASE-BX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 °C to 85 °C (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1490(Tx)/1310(Rx) |
| Working wavelength range of the optical transmitter (nm) | 1480-1500 |
| Maximum sending optical power (AVG) (dBm) | -5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |

| Item | Specification |
|-----------------------------------|---------------|
| Receiving sensitivity (AVG) (dBm) | -25 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | 0 |
| Minimum extinction ratio (dB) | 6.6 |

8.8 125M-1.25Gbps CSFP BIDI Optical Module

Figure 8-7 125M-1.25Gbps CSFP BIDI Optical Module



8.8.1 125M~1.25Gbps-CSFP-SMF-1490(Tx)/1310(Rx)nm-10km-industry

Table 8-17 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060803 |
| Model | OSG010005 |
| Encapsulation mode | CSFP |
| Interface standard | IEEE 802.3ah 1000BASE-BX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 °C to 85 °C (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |

| Item | Specification |
|--|----------------------------------|
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 125M~1.25G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1490(Tx)/1310(Rx) |
| Working wavelength range of the optical transmitter (nm) | 1480-1500 |
| Maximum sending optical power (AVG) (dBm) | -9 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -3 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | -24 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 6.6 |

8.8.2 125M~1.25Gbps-CSFP-SMF-1490(Tx)/1310(Rx)nm-10km-commercial

Table 8-18 Technical specifications

| Item | Specification |
|--------------------|--------------------------|
| BOM | 34060805 |
| Model | OSG010006 |
| Encapsulation mode | CSFP |
| Interface standard | IEEE 802.3ah 1000BASE-BX |

| Item | Specification |
|--|----------------------------------|
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 to 70 (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 125M~1.25Gbps |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1490(Tx)/1310(Rx) |
| Working wavelength range of the optical transmitter (nm) | 1480-1500 |
| Maximum sending optical power (AVG) (dBm) | -9 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -3 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 6.6 |

8.8.3 125M~1.25Gbps-CSFP-SMF-1490(Tx)/1310(Rx)nm-20km-commercial

Table 8-19 Technical specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|--|----------------------------------|
| BOM | 34060900 |
| Model | OSG020007 |
| Encapsulation mode | CSFP |
| Interface standard | IEEE 802.3ah 1000BASE-BX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 to 70 (32 ℉ to 158 ℉) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 125M~1.25Gbps |
| Connector type | LC |
| Transmission distance (km) | 20 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1490(Tx)/1310(Rx) |
| Working wavelength range of the optical transmitter (nm) | 1480-1500 |
| Maximum sending optical power (AVG) (dBm) | -9 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -3 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 6.6 |

8.9 1.25Gbps eSFP Optical Module

Figure 8-8 1.25Gbps eSFP Optical Module



8.9.1 1.25Gbps-eSFP-MMF-850nm-500m-extended

Table 8-20 Technical specifications

| Item | Specification |
|--|-----------------------------------|
| BOM | 34060286 |
| Model | eSFP-850nm-1000Base-Sx/FC200MM |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 1000BASE-SX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -20 °C to 85 °C (-4 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 0.5(OM1) |
| Optical fiber type | MMF |
| Center wavelength (nm) | 850 |
| Working wavelength range of the optical transmitter (nm) | 770-860 |

| Item | Specification |
|---|---------------|
| Maximum sending optical power (AVG) (dBm) | 0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -9.5 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 760-860 |
| Receiving sensitivity (AVG) (dBm) | -17 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | 0 |
| Minimum extinction ratio (dB) | 9 |

8.9.2 1.25Gbps-eSFP-SMF-1310nm-10km-commercial

Table 8-21 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | S4016067 |
| Model | OSG010N05 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 1000BASE-LX10 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |

| Item | Specification |
|--|---------------|
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1270-1355 |
| Maximum sending optical power (AVG) (dBm) | -3 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -9 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1270-1355 |
| Receiving sensitivity (AVG) (dBm) | -20 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 9.5 |

8.9.3 1.25Gbps-eSFP-SMF-1310nm-40km-commercial

Table 8-22 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | S4016954 |
| Model | OSG040002 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 1000BASE-EX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |

| Item | Specification |
|--|---------------|
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1275-1350 |
| Maximum sending optical power (AVG) (dBm) | 0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -5 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1580 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 9.5 |

8.9.4 1.25Gbps-eSFP-SMF-1550nm-80km-commercial

Table 8-23 Technical specifications

| Item | Specification |
|--------------------------------|-------------------------|
| BOM | 02310RAW |
| Model | OSG080N01 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 1000BASE-ZX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 to 70 (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |

| Item | Specification |
|--|----------------------------------|
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550.0 |
| Working wavelength range of the optical transmitter (nm) | 1500-1580 |
| Maximum sending optical power (AVG) (dBm) | 5.0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -2.0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1580 |
| Receiving sensitivity (AVG) (dBm) | -23.0 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3.0 |
| Minimum extinction ratio (dB) | 9.0 |

8.9.5 1.25Gbps-eSFP-SMF-1550nm-100km-commercial

Table 8-24 Technical specifications

| Item | Specification |
|-----------------------|-------------------------|
| BOM | 34060295 |
| Model | eSFP-GE-ZX100-SM1550 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 1000BASE-ZX |
| Bit Error Ratio (BER) | <1x10E-12 |

| Item | Specification |
|--|--|
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 100 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550 |
| Working wavelength range of the optical transmitter (nm) | 1500-1580 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1580 |
| Receiving sensitivity (AVG) (dBm) | -30 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 9.5 |
| Note | The interface standard is Huawei-specific. |

8.9.6 1.25Gbps-eSFP-MMF-850nm-500m-industry

Table 8-25 Technical specifications

| Item | Specification |
|------|---------------|
| BOM | 02310WQT |

| Item | Specification |
|--|----------------------------------|
| Model | OMGD55N03 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 1000BASE-SX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 to 85 (-40 ℉ to 185 ℉) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 0.5 |
| Optical fiber type | MMF |
| Center wavelength (nm) | 850.0 |
| Working wavelength range of the optical transmitter (nm) | 770-860 |
| Maximum sending optical power (AVG) (dBm) | 0.0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -9.5 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 760-860 |
| Receiving sensitivity (AVG) (dBm) | -17.0 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | 0.0 |
| Minimum extinction ratio (dB) | 9.0 |

8.9.7 1.25Gbps-eSFP-SMF-1310nm-10km-industry

Table 8-26 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 02310WQW |
| Model | OSG010N03 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 1000BASE-LX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 to 85 (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310.0 |
| Working wavelength range of the optical transmitter (nm) | 1260-1360 |
| Maximum sending optical power (AVG) (dBm) | -3.0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -9.0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | -19.0 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3.0 |
| Minimum extinction ratio (dB) | 9.5 |

8.9.8 1.25Gbps-eSFP-SMF-1310nm-40km-industry

Table 8-27 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 02310WQX |
| Model | OSG040N03 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3, 1000BASE-EX |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 to 85 (-40 ℉ to 185 ℉) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310.0 |
| Working wavelength range of the optical transmitter (nm) | 1275-1350 |
| Maximum sending optical power (AVG) (dBm) | 0.0 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -5.0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1275-1350 |
| Receiving sensitivity (AVG) (dBm) | -23.0 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3.0 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 9.5 |

8.10 1.25Gbps eSFP BIDI Optical Module

Figure 8-9 1.25Gbps eSFP BIDI Optical Module



8.10.1 1.25Gbps-eSFP-SMF-1310nm-10km-commercial

Table 8-28 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 34060470 |
| Model | SFP-GE-LX-SM1310-BIDI |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3ah, 1000Base-BX10-U |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 10 |

| Item | Specification |
|--|---------------|
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1260-1360 |
| Maximum sending optical power (AVG) (dBm) | -3 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -9 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1480-1500 |
| Receiving sensitivity (AVG) (dBm) | -19.5 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 6 |

8.10.2 1.25Gbps-eSFP-SMF-1490nm-10km-commercial

Table 8-29 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 34060475 |
| Model | SFP-GE-LX-SM1490-BIDI |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3ah, 1000Base-BX10-D |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |

| Item | Specification |
|--|---------------|
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1490 |
| Working wavelength range of the optical transmitter (nm) | 1480-1500 |
| Maximum sending optical power (AVG) (dBm) | -3 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -9 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | -19.5 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 6 |

8.10.3 1.25Gbps-eSFP-SMF-1310nm-40km-commercial

Table 8-30 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 34060638 |
| Model | eSFP-1310/1550-L1.1-BIDI |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3ah, 1000Base-BX40-U |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -5 °C to 70 °C (23 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |

| Item | Specification |
|--|----------------------------------|
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1260-1360 |
| Maximum sending optical power (AVG) (dBm) | 2 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -3 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1480-1580 |
| Receiving sensitivity (AVG) (dBm) | -25 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 9 |

8.10.4 1.25Gbps-eSFP-SMF-1550nm-40km-commercial

Table 8-31 Technical specifications

| Item | Specification |
|--------------------|-------------------------------|
| BOM | 34060639 |
| Model | eSFP-1550/1310-L1.1-BIDI |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3ah, 1000Base-BX40-D |

| Item | Specification |
|--|----------------------------------|
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -5 °C to 70 °C (23 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550 |
| Working wavelength range of the optical transmitter (nm) | 1530-1580 |
| Maximum sending optical power (AVG) (dBm) | 2 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -3 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | -25 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 9 |

8.10.5 1.25Gbps-eSFP-SMF-1490nm-40km-commercial

Table 8-32 Technical specifications

| Item | Specification |
|------|---------------|
| BOM | 34060540 |

| Item | Specification |
|--|----------------------------------|
| Model | OGEBIDI40 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3ah, 1000Base-BX40-D |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1490 |
| Working wavelength range of the optical transmitter (nm) | 1480-1500 |
| Maximum sending optical power (AVG) (dBm) | 3 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -2 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1360 |
| Receiving sensitivity (AVG) (dBm) | - |
| Receiving sensitivity (OMA) (dBm) | -23 |
| Saturated optical power (dBm) | -3 -3(Stressed OMA, EOL) |
| Minimum extinction ratio (dB) | 9 |

8.10.6 1.25Gbps-eSFP-SMF-1310nm-40km-commercial

Table 8-33 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060539 |
| Model | OGEBIDI41 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3ah, 1000Base-BX40-U |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1260-1360 |
| Maximum sending optical power (AVG) (dBm) | 3 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -2 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1480-1500 |
| Receiving sensitivity (AVG) (dBm) | - |
| Receiving sensitivity (OMA) (dBm) | -23 |
| Saturated optical power (dBm) | -3 -3(Stressed OMA, EOL) |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 9 |

8.10.7 1.25Gbps-eSFP-SMF-1570nm-80km-commercial

Table 8-34 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060595 |
| Model | OGEBIDI80 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3ah, 1000Base-BX80-D |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1570 |
| Working wavelength range of the optical transmitter (nm) | 1560-1580 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -2 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1480-1500 |

| Item | Specification |
|-----------------------------------|---------------|
| Receiving sensitivity (AVG) (dBm) | -26 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 9 |

8.10.8 1.25Gbps-eSFP-SMF-1490nm-80km-commercial

Table 8-35 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060596 |
| Model | OGE800181 |
| Encapsulation mode | eSFP |
| Interface standard | IEEE 802.3ah, 1000Base-BX80-U |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1490 |
| Working wavelength range of the optical transmitter (nm) | 1480-1500 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -2 |

| Item | Specification |
|---|---------------|
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1560-1580 |
| Receiving sensitivity (AVG) (dBm) | -26 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -3 |
| Minimum extinction ratio (dB) | 9 |

8.11 1.25Gbps eSFP CWDM Optical Module

Figure 8-10 1.25Gbps eSFP CWDM Optical Module



8.11.1 1.25Gbps-eSFP-SMF-1571nm-80km-commercial

Table 8-36 Technical specifications

| Item | Specification |
|--------------------------------|---------------------------------|
| BOM | 34060476 |
| Model | eSFP-LH80-SM1571 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-16 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |

| Item | Specification |
|--|----------------------------------|
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1571 |
| Working wavelength range of the optical transmitter (nm) | 1564.5-1577.5 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1620 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 8.5 |

8.11.2 1.25Gbps-eSFP-SMF-1591nm-80km-commercial

Table 8-37 Technical specifications

| Item | Specification |
|--------------------|------------------|
| BOM | 34060477 |
| Model | eSFP-LH80-SM1591 |
| Encapsulation mode | eSFP |

| Item | Specification |
|--|----------------------------------|
| Interface standard | ITU-T G.957, STM-16 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1591 |
| Working wavelength range of the optical transmitter (nm) | 1584.5-1597.5 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1620 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 8.5 |

8.11.3 1.25Gbps-eSFP-SMF-1551nm-80km-commercial

Table 8-38 Technical specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|--|----------------------------------|
| BOM | 34060478 |
| Model | eSFP-LH80-SM1551 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-16 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1551 |
| Working wavelength range of the optical transmitter (nm) | 1544.5-1557.5 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1620 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 8.5 |

8.11.4 1.25Gbps-eSFP-SMF-1511nm-80km-commercial

Table 8-39 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060479 |
| Model | eSFP-LH80-SM1511 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-16 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1511 |
| Working wavelength range of the optical transmitter (nm) | 1504.5-1517.5 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1620 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 8.5 |

8.11.5 1.25Gbps-eSFP-SMF-1611nm-80km-commercial

Table 8-40 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060480 |
| Model | eSFP-LH80-SM1611 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-16 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1611 |
| Working wavelength range of the optical transmitter (nm) | 1604.5-1617.5 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1620 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 8.5 |

8.11.6 1.25Gbps-eSFP-SMF-1491nm-80km-commercial

Table 8-41 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060481 |
| Model | eSFP-LH80-SM1491 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-16 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1491 |
| Working wavelength range of the optical transmitter (nm) | 1484.5-1497.5 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1620 |

| Item | Specification |
|-----------------------------------|---------------|
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 8.5 |

8.11.7 1.25Gbps-eSFP-SMF-1531nm-80km-commercial

Table 8-42 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060482 |
| Model | eSFP-LH80-SM1531 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-16 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1531 |
| Working wavelength range of the optical transmitter (nm) | 1524.5-1537.5 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |

| Item | Specification |
|---|---------------|
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1620 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 8.5 |

8.11.8 1.25Gbps-eSFP-SMF-1471nm-80km-commercial

Table 8-43 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060483 |
| Model | eSFP-LH80-SM1471 |
| Encapsulation mode | eSFP |
| Interface standard | ITU-T G.957, STM-16 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1471 |
| Working wavelength range of the optical transmitter (nm) | 1464.5-1477.5 |
| Maximum sending optical power (AVG) (dBm) | 5 |

| Item | Specification |
|---|---------------|
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1620 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 8.5 |

8.12 125M~2.67Gbps eSFP DWDM Optical Module

Figure 8-11 125M~2.67Gbps eSFP DWDM Optical Module



8.12.1 125M~2.67Gbps-eSFP-SMF-1560.61nm-120km-commercial

Table 8-44 Technical specifications

| Item | Specification |
|-------|---------------------|
| BOM | 34060366 |
| Model | eSFP-LH120-SM192.10 |

| Item | Specification |
|--|------------------------------------|
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1560.61 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.2 125M~2.67Gbps-eSFP-SMF-1559.79nm-120km-commercial

Table 8-45 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060372 |
| Model | eSFP-LH120-SM192.20 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1559.79 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.3 125M~2.67Gbps-eSFP-SMF-1558.98nm-120km-commercial

Table 8-46 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060373 |
| Model | eSFP-LH120-SM192.30 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1558.98 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 8.2 |

8.12.4 125M~2.67Gbps-eSFP-SMF-1558.17nm-120km-commercial

Table 8-47 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060374 |
| Model | eSFP-LH120-SM192.40 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1558.17 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |

| Item | Specification |
|-----------------------------------|---------------|
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.5 125M~2.67Gbps-eSFP-SMF-1557.36nm-120km-commercial

Table 8-48 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060375 |
| Model | eSFP-LH120-SM192.50 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1557.36 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |

| Item | Specification |
|---|---------------|
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.6 125M~2.67Gbps-eSFP-SMF-1556.55nm-120km-commercial

Table 8-49 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060376 |
| Model | eSFP-LH120-SM192.60 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1556.55 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |

| Item | Specification |
|---|---------------|
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.7 125M~2.67Gbps-eSFP-SMF-1555.75nm-120km-commercial

Table 8-50 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060377 |
| Model | eSFP-LH120-SM192.70 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1555.75 |

| Item | Specification |
|--|---------------|
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.8 125M~2.67Gbps-eSFP-SMF-1554.94nm-120km-commercial

Table 8-51 Technical specifications

| Item | Specification |
|--------------------------------|-----------------------------------|
| BOM | 34060378 |
| Model | eSFP-LH120-SM192.80 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, igabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |

| Item | Specification |
|--|---------------|
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1554.94 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.9 125M~2.67Gbps-eSFP-SMF-1554.13nm-120km-commercial

Table 8-52 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060379 |
| Model | eSFP-LH120-SM192.90 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |

| Item | Specification |
|--|---------------|
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1554.13 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.10 125M~2.67Gbps-eSFP-SMF-1553.33nm-120km-commercial

Table 8-53 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060380 |
| Model | eSFP-LH120-SM193.00 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |

| Item | Specification |
|--|----------------------------------|
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1553.33 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.11 125M~2.67Gbps-eSFP-SMF-1552.52nm-120km-commercial

Table 8-54 Technical specifications

| Item | Specification |
|--------------------|---------------------|
| BOM | 34060381 |
| Model | eSFP-LH120-SM193.10 |
| Encapsulation mode | eSFP |

| Item | Specification |
|--|------------------------------------|
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1552.52 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.12 125M~2.67Gbps-eSFP-SMF-1551.72nm-120km-commercial

Table 8-55 Technical specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|--|------------------------------------|
| BOM | 34060382 |
| Model | eSFP-LH120-SM193.20 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1551.72 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.13 125M~2.67Gbps-eSFP-SMF-1550.92nm-120km-commercial

Table 8-56 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060383 |
| Model | eSFP-LH120-SM193.30 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550.92 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.14 125M~2.67Gbps-eSFP-SMF-1550.12nm-120km-commercial

Table 8-57 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060384 |
| Model | eSFP-LH120-SM193.40 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550.12 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 8.2 |

8.12.15 125M~2.67Gbps-eSFP-SMF-1549.32nm-120km-commercial

Table 8-58 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060385 |
| Model | eSFP-LH120-SM193.50 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1549.32 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |

| Item | Specification |
|-----------------------------------|---------------|
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.16 125M~2.67Gbps-eSFP-SMF-1548.51nm-120km-commercial

Table 8-59 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060386 |
| Model | eSFP-LH120-SM193.60 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1548.51 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |

| Item | Specification |
|---|---------------|
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.17 125M~2.67Gbps-eSFP-SMF-1547.72nm-120km-commercial

Table 8-60 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060387 |
| Model | eSFP-LH120-SM193.70 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1547.72 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |

| Item | Specification |
|---|---------------|
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.18 125M~2.67Gbps-eSFP-SMF-1546.92nm-120km-commercial

Table 8-61 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060388 |
| Model | eSFP-LH120-SM193.80 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1546.92 |

| Item | Specification |
|--|---------------|
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.19 125M~2.67Gbps-eSFP-SMF-1546.12nm-120km-commercial

Table 8-62 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060389 |
| Model | eSFP-LH120-SM193.90 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |

| Item | Specification |
|--|---------------|
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1546.12 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.20 125M~2.67Gbps-eSFP-SMF-1545.32nm-120km-commercial

Table 8-63 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060390 |
| Model | eSFP-LH120-SM194.00 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |

| Item | Specification |
|--|---------------|
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1545.32 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.21 125M~2.67Gbps-eSFP-SMF-1544.53nm-120km-commercial

Table 8-64 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060391 |
| Model | eSFP-LH120-SM194.10 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |

| Item | Specification |
|--|----------------------------------|
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1544.53 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.22 125M~2.67Gbps-eSFP-SMF-1543.73nm-120km-commercial

Table 8-65 Technical specifications

| Item | Specification |
|--------------------|---------------------|
| BOM | 34060392 |
| Model | eSFP-LH120-SM194.20 |
| Encapsulation mode | eSFP |

| Item | Specification |
|--|------------------------------------|
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1543.73 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.23 125M~2.67Gbps-eSFP-SMF-1542.94nm-120km-commercial

Table 8-66 Technical specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|--|------------------------------------|
| BOM | 34060393 |
| Model | eSFP-LH120-SM194.30 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1542.94 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.24 125M~2.67Gbps-eSFP-SMF-1542.14nm-120km-commercial

Table 8-67 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060394 |
| Model | eSFP-LH120-SM194.40 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1542.14 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.25 125M~2.67Gbps-eSFP-SMF-1541.35nm-120km-commercial

Table 8-68 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060395 |
| Model | eSFP-LH120-SM194.50 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1541.35 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 8.2 |

8.12.26 125M~2.67Gbps-eSFP-SMF-1540.56nm-120km-commercial

Table 8-69 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060396 |
| Model | eSFP-LH120-SM194.60 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1540.56 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |

| Item | Specification |
|-----------------------------------|---------------|
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.27 125M~2.67Gbps-eSFP-SMF-1539.77nm-120km-commercial

Table 8-70 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060397 |
| Model | eSFP-LH120-SM194.70 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1539.77 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |

| Item | Specification |
|---|---------------|
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.28 125M~2.67Gbps-eSFP-SMF-1538.98nm-120km-commercial

Table 8-71 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060398 |
| Model | eSFP-LH120-SM194.80 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1538.98 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |

| Item | Specification |
|---|---------------|
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.29 125M~2.67Gbps-eSFP-SMF-1538.19nm-120km-commercial

Table 8-72 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060399 |
| Model | eSFP-LH120-SM194.90 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1538.19 |

| Item | Specification |
|--|---------------|
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.30 125M~2.67Gbps-eSFP-SMF-1537.40nm-120km-commercial

Table 8-73 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060400 |
| Model | eSFP-LH120-SM195.00 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |

| Item | Specification |
|--|---------------|
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1537.4 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.31 125M~2.67Gbps-eSFP-SMF-1536.61nm-120km-commercial

Table 8-74 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060401 |
| Model | eSFP-LH120-SM195.10 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |

| Item | Specification |
|--|---------------|
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1536.61 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.32 125M~2.67Gbps-eSFP-SMF-1535.82nm-120km-commercial

Table 8-75 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060402 |
| Model | eSFP-LH120-SM195.20 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |

| Item | Specification |
|--|----------------------------------|
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1535.82 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.33 125M~2.67Gbps-eSFP-SMF-1535.04nm-120km-commercial

Table 8-76 Technical specifications

| Item | Specification |
|--------------------|---------------------|
| BOM | 34060403 |
| Model | eSFP-LH120-SM195.30 |
| Encapsulation mode | eSFP |

| Item | Specification |
|--|------------------------------------|
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1535.04 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.34 125M~2.67Gbps-eSFP-SMF-1534.25nm-120km-commercial

Table 8-77 Technical specifications

| Item | Specification |
|------|---------------|
|------|---------------|

| Item | Specification |
|--|------------------------------------|
| BOM | 34060404 |
| Model | eSFP-LH120-SM195.40 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1534.25 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.35 125M~2.67Gbps-eSFP-SMF-1533.47nm-120km-commercial

Table 8-78 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060405 |
| Model | eSFP-LH120-SM195.50 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1533.47 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.36 125M~2.67Gbps-eSFP-SMF-1532.68nm-120km-commercial

Table 8-79 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060406 |
| Model | eSFP-LH120-SM195.60 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1532.68 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 8.2 |

8.12.37 125M~2.67Gbps-eSFP-SMF-1531.90nm-120km-commercial

Table 8-80 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060407 |
| Model | eSFP-LH120-SM195.70 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1531.9 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |

| Item | Specification |
|-----------------------------------|---------------|
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.38 125M~2.67Gbps-eSFP-SMF-1531.12nm-120km-commercial

Table 8-81 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060408 |
| Model | eSFP-LH120-SM195.80 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1531.12 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |

| Item | Specification |
|---|---------------|
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.39 125M~2.67Gbps-eSFP-SMF-1530.33nm-120km-commercial

Table 8-82 Technical specifications

| Item | Specification |
|--|------------------------------------|
| BOM | 34060409 |
| Model | eSFP-LH120-SM195.90 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1530.33 |
| Working wavelength range of the optical transmitter (nm) | - |
| Maximum sending optical power (AVG) (dBm) | 4 |

| Item | Specification |
|---|---------------|
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1520-1570 |
| Receiving sensitivity (AVG) (dBm) | -28 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -8 |
| Minimum extinction ratio (dB) | 8.2 |

8.12.40 125M~2.67Gbps-eSFP-SMF-1529.55nm-120km-commercial

Table 8-83 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060410 |
| Model | eSFP-LH120-SM196.00 |
| Encapsulation mode | eSFP |
| Interface standard | SONET OC-48 LR-2, Gigabit Ethernet |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 155M~2.67G |
| Connector type | LC |
| Transmission distance (km) | 120 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1529.55 |

8.13.1 1.25/9.953/10.3125Gbps-SFP+-MMF-850nm-0.3km-commercial

Table 8-84 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34061041 |
| Model | OSXD50N00 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-SR/SW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G/9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 0.3(OM3) |
| Optical fiber type | MMF |
| Center wavelength (nm) | 850 |
| Working wavelength range of the optical transmitter (nm) | 840-860 |
| Maximum sending optical power (AVG) (dBm) | -1 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -7.3 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 840-860 |
| Receiving sensitivity (AVG) (dBm) | -9.8 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -1 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 3 |

8.13.2 1.25/9.953/10.3125Gbps-SFP+-SMF-1310nm-10km-commercial

Table 8-85 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34061042 |
| Model | OSX010N13 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-LR/LW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G/9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1260-1355 |
| Maximum sending optical power (AVG) (dBm) | 0.5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -8.2 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical | 1260-1355 |

| Item | Specification |
|-----------------------------------|---------------|
| receiver (nm) | |
| Receiving sensitivity (AVG) (dBm) | -14.4 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | 0.5 |
| Minimum extinction ratio (dB) | 3 |

8.13.3 1.25/9.953/10.3125Gbps-SFP+-SMF-1550nm-40km-commercial

Table 8-86 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34061043 |
| Model | OSX040N12 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-ER/EW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 1.25G/9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550 |
| Working wavelength range of the optical transmitter (nm) | 1530-1565 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |

| Item | Specification |
|---|---------------|
| Minimum sending optical power (AVG) (dBm) | -4.7 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1530-1565 |
| Receiving sensitivity (AVG) (dBm) | -15.8 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | 3 |
| Minimum extinction ratio (dB) | 3 |

8.14 10Gbps SFP+ Optical Module

Figure 8-13 10Gbps SFP+ Optical Module



8.14.1 10Gbps-SFP+-MMF-850nm-0.3km-commercial

Table 8-87 Technical specifications

| Item | Specification |
|-----------------------|-----------------------------|
| BOM | S4017482 |
| Model | OSX040N03 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-SR/SW |
| Bit Error Ratio (BER) | <1x10E-12 |

| Item | Specification |
|--|----------------------------------|
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 0.3(OM3) |
| Optical fiber type | MMF |
| Center wavelength (nm) | 850 |
| Working wavelength range of the optical transmitter (nm) | 840-860 |
| Maximum sending optical power (AVG) (dBm) | -1 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -7.3 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 840-860 |
| Receiving sensitivity (AVG) (dBm) | -9.9 |
| Receiving sensitivity (OMA) (dBm) | -11.1 |
| Saturated optical power (dBm) | -1 |
| Minimum extinction ratio (dB) | 3 |

8.14.2 10Gbps-SFP+-SMF-1310nm-10km-commercial

Table 8-88 Technical specifications

| Item | Specification |
|-------|---------------|
| BOM | S4017483 |
| Model | OSX001002 |

| Item | Specification |
|--|----------------------------------|
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-LR/LW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310 |
| Working wavelength range of the optical transmitter (nm) | 1260-1355 |
| Maximum sending optical power (AVG) (dBm) | 0.5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -8.2 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1355 |
| Receiving sensitivity (AVG) (dBm) | -14.4 |
| Receiving sensitivity (OMA) (dBm) | -12.6 |
| Saturated optical power (dBm) | 0.5 |
| Minimum extinction ratio (dB) | 3.5 |

8.14.3 10Gbps-SFP+-SMF-1550nm-40km-commercial

Table 8-89 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | S4017484 |
| Model | OMXD30002 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-ER/EW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550 |
| Working wavelength range of the optical transmitter (nm) | 1530-1565 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -4.7 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1530-1565 |
| Receiving sensitivity (AVG) (dBm) | -15.8 |
| Receiving sensitivity (OMA) (dBm) | -14.1 |
| Saturated optical power (dBm) | -1 |
| Minimum extinction ratio (dB) | 3 |

| Item | Specification |
|------|---|
| Note | Self-loop is not supported. An optical attenuator must be added if self-loop is required. |

8.14.4 10Gbps-SFP+-SMF-1550nm-80km-commercial

Table 8-90 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 02310PVU |
| Model | OSX080N04 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-ZR/ZW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550 |
| Working wavelength range of the optical transmitter (nm) | 1530-1565 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical | 1260-1565 |

| Item | Specification |
|-----------------------------------|--|
| receiver (nm) | |
| Receiving sensitivity (AVG) (dBm) | -24 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 9 |
| Note | The interface standard is Huawei-specific. Self-loop is not supported. An optical attenuator must be added if self-loop is required. |

8.14.5 10Gbps-SFP+-MMF-850nm-0.1km-industry

Table 8-91 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 02310WRD |
| Model | OMXD10N02 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-SR/SW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 to 85 (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 0.3(OM3) 82(OM2) |
| Optical fiber type | MMF |
| Center wavelength (nm) | 850.0 |
| Working wavelength range of the optical transmitter (nm) | 840-860 |
| Maximum sending optical power (AVG) | -1.0 |

| Item | Specification |
|---|---------------|
| (dBm) | |
| Maximum sending optical power (OMA) (dBm) | -7.3 |
| Minimum sending optical power (AVG) (dBm) | -5.0 |
| Minimum sending optical power (OMA) (dBm) | |
| Working wavelength range of the optical receiver (nm) | 840-860 |
| Receiving sensitivity (AVG) (dBm) | -9.9 |
| Receiving sensitivity (OMA) (dBm) | -11.1 |
| Saturated optical power (dBm) | -1.0 |
| Minimum extinction ratio (dB) | 3.0 |

8.14.6 10Gbps-SFP+-SMF-1310nm-10km-industry

Table 8-92 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 02310WRE |
| Model | OSX010N07 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-LR/LW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 to 85 (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1310.0 |

| Item | Specification |
|--|---------------|
| Working wavelength range of the optical transmitter (nm) | 1260-1355 |
| Maximum sending optical power (AVG) (dBm) | 0.5 |
| Maximum sending optical power (OMA) (dBm) | -5.2 |
| Minimum sending optical power (AVG) (dBm) | -8.2 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1355 |
| Receiving sensitivity (AVG) (dBm) | -14.4 |
| Receiving sensitivity (OMA) (dBm) | -12.6 |
| Saturated optical power (dBm) | 0.5 |
| Minimum extinction ratio (dB) | 3.5 |

8.14.7 10Gbps-SFP+-SMF-1550nm-40km-industry

Table 8-93 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 02310WRF |
| Model | OSX040N08 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-ER/EW |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 to 85 (-40 ℉ to 185 ℉) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |

| Item | Specification |
|--|---------------|
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1550.0 |
| Working wavelength range of the optical transmitter (nm) | 1530-1565 |
| Maximum sending optical power (AVG) (dBm) | 4.0 |
| Maximum sending optical power (OMA) (dBm) | -1.7 |
| Minimum sending optical power (AVG) (dBm) | -4.7 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1530-1565 |
| Receiving sensitivity (AVG) (dBm) | -15.8 |
| Receiving sensitivity (OMA) (dBm) | -14.1 |
| Saturated optical power (dBm) | -1.0 |
| Minimum extinction ratio (dB) | 3.0 |

 **NOTE**

When performing a self-loop test, use an optical attenuator.

8.15 10Gbps SFP+ CWDM Optical Module

Figure 8-14 10Gbps SFP+ CWDM Optical Module



8.15.1 10Gbps-SFP+-SMF-1511nm-70km-commercial

Table 8-94 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060686 |
| Model | OSX070001 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-X |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 70 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1511 |
| Working wavelength range of the optical transmitter (nm) | 1504.5-1517.5 |

| Item | Specification |
|---|---------------|
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1460-1620 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 8.2 |

8.15.2 10Gbps-SFP+-SMF-1471nm-70km-commercial

Table 8-95 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 34060687 |
| Model | OSX070002 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-X |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 70 |
| Optical fiber type | SMF |

| Item | Specification |
|--|---------------|
| Center wavelength (nm) | 1471 |
| Working wavelength range of the optical transmitter (nm) | 1464.5-1477.5 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1460-1620 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 8.2 |

8.15.3 10Gbps-SFP+-SMF-1491nm-70km-commercial

Table 8-96 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 34060688 |
| Model | OSX070003 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-X |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |

| Item | Specification |
|--|---------------|
| Connector type | LC |
| Transmission distance (km) | 70 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1491 |
| Working wavelength range of the optical transmitter (nm) | 1484.5-1497.5 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1460-1620 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 8.2 |

8.15.4 10Gbps-SFP+-SMF-1531nm-70km-commercial

Table 8-97 Technical specifications

| Item | Specification |
|--------------------------------|---------------------------------|
| BOM | 34060689 |
| Model | OSX070004 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-X |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |

| Item | Specification |
|--|----------------------------------|
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 70 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1531 |
| Working wavelength range of the optical transmitter (nm) | 1524.5-1537.5 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1460-1620 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 8.2 |

8.15.5 10Gbps-SFP+-SMF-1551nm-70km-commercial

Table 8-98 Technical specifications

| Item | Specification |
|-----------------------|-------------------------|
| BOM | 34060690 |
| Model | OSX070005 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-X |
| Bit Error Ratio (BER) | <1x10E-12 |

| Item | Specification |
|--|----------------------------------|
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 70 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1551 |
| Working wavelength range of the optical transmitter (nm) | 1544.5-1557.5 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1460-1620 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 8.2 |

8.15.6 10Gbps-SFP+-SMF-1571nm-70km-commercial

Table 8-99 Technical specifications

| Item | Specification |
|-------|---------------|
| BOM | 34060691 |
| Model | OSX070006 |

| Item | Specification |
|--|----------------------------------|
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-X |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 70 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1571 |
| Working wavelength range of the optical transmitter (nm) | 1564.5-1577.5 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1460-1620 |
| Receiving sensitivity (AVG) (dBm) | -23 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 8.2 |

8.15.7 10Gbps-SFP+-SMF-1591nm-70km-commercial

Table 8-100 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060692 |
| Model | OSX070007 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-X |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 70 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1591 |
| Working wavelength range of the optical transmitter (nm) | 1584.5-1597.5 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1460-1620 |
| Receiving sensitivity (AVG) (dBm) | -21 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 8.2 |

8.15.8 10Gbps-SFP+-SMF-1611nm-70km-commercial

Table 8-101 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 34060693 |
| Model | OSX070008 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-X |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 70 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1611 |
| Working wavelength range of the optical transmitter (nm) | 1604.5-1617.4 |
| Maximum sending optical power (AVG) (dBm) | 4 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1460-1620 |
| Receiving sensitivity (AVG) (dBm) | -21 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |

| Item | Specification |
|-------------------------------|---------------|
| Minimum extinction ratio (dB) | 8.2 |

8.16 10Gbps SFP+ BIDI Optical Module

Figure 8-15 10Gbps SFP+ BIDI Optical Module



8.16.1 10Gbps-SFP+-SMF-1270nm-10km-industry

Table 8-102 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060544-002 |
| Model | OSX010B10 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-BX10-U |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 °C to 85 °C (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 10 |

| Item | Specification |
|--|---------------|
| Optical fiber type | SMF |
| Center wavelength (nm) | 1270 |
| Working wavelength range of the optical transmitter (nm) | 1260-1280 |
| Maximum sending optical power (AVG) (dBm) | 0.5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -8.2 |
| Minimum sending optical power (OMA) (dBm) | -5.2 |
| Working wavelength range of the optical receiver (nm) | 1320-1340 |
| Receiving sensitivity (AVG) (dBm) | -14.4 |
| Receiving sensitivity (OMA) (dBm) | -10.3 |
| Saturated optical power (dBm) | 0.5 |
| Minimum extinction ratio (dB) | 3.5 |

8.16.2 10Gbps-SFP+-SMF-1330nm-10km-industry

Table 8-103 Technical specifications

| Item | Specification |
|--------------------------------|------------------------------------|
| BOM | 34060546-002 |
| Model | OSX010B11 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-BX10-D |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | -40 °C to 85 °C (-40 °F to 185 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |

| Item | Specification |
|--|-----------------|
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1330 |
| Working wavelength range of the optical transmitter (nm) | 1320-1340 |
| Maximum sending optical power (AVG) (dBm) | 0.5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -8.2 |
| Minimum sending optical power (OMA) (dBm) | -5.2 |
| Working wavelength range of the optical receiver (nm) | 1260-1280 |
| Receiving sensitivity (AVG) (dBm) | -14.4 |
| Receiving sensitivity (OMA) (dBm) | -12.6 |
| Saturated optical power (dBm) | 0.5 |
| Minimum extinction ratio (dB) | 3.5 |

8.16.3 10Gbps-SFP+-SMF-1330nm-40km-commercial

Table 8-104 Technical specifications

| Item | Specification |
|--------------------------------|---------------------------------|
| BOM | 02311JNQ |
| Model | OSX040B11 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-BX40-D |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |

| Item | Specification |
|--|----------------------------------|
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1330 |
| Working wavelength range of the optical transmitter (nm) | 1320-1340 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1280 |
| Receiving sensitivity (AVG) (dBm) | -18 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 3.5 |

8.16.4 10Gbps-SFP+-SMF-1270nm-40km-commercial

Table 8-105 Technical specifications

| Item | Specification |
|--------------------|----------------------------|
| BOM | 02311JNF |
| Model | OSX040B10 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-BX-U |

| Item | Specification |
|--|----------------------------------|
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1270 |
| Working wavelength range of the optical transmitter (nm) | 1260-1280 |
| Maximum sending optical power (AVG) (dBm) | 5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | 0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1320-1340 |
| Receiving sensitivity (AVG) (dBm) | -18 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -9 |
| Minimum extinction ratio (dB) | 3.5 |

8.17 10Gbps SFP+ DWDM Optical Module

Figure 8-16 10Gbps SFP+ DWDM Optical Module



8.17.1 10Gbps-SFP+-SMF-1528nm~1568nm-80km-commercial

Table 8-106 Technical specifications

| Item | Specification |
|--------------------------------|--|
| BOM | 02311GSA |
| Model | OSX080C00 |
| Encapsulation mode | SFP+ |
| Interface standard | IEEE 802.3ae, 10GBASE-ZR/ZW, ITUT G.709 |
| Bit Error Ratio (BER) | <1x10E-12(10GE) <1x10E-4(OTU2, OTU2e) |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8472 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 9.953G/10.3125G/11.1G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | - |

| Item | Specification |
|--|--|
| Working wavelength range of the optical transmitter (nm) | 1529.163-1560.606 |
| Maximum sending optical power (AVG) (dBm) | 3 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | -1 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1260-1600 |
| Receiving sensitivity (AVG) (dBm) | -24(10GE 1e-12); -26(OTU2,OTU2e,1e-4) |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | -7 |
| Minimum extinction ratio (dB) | 9 |
| Note | The interface standard is Huawei-specific. |

8.18 40Gbps CFP Optical Module

Figure 8-17 40Gbps CFP Optical Module



8.18.1 40Gbps(4*10.3)-CFP-MMF-850nm-0.1km-commercial

Table 8-107 Technical specifications

| Item | Specification |
|--|----------------------------------|
| BOM | 02310WUV |
| Model | OSMD10N02 |
| Encapsulation mode | CFP |
| Interface standard | IEEE 802.3ba, 40GBASE-SR4 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | CFP MSA |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 41.25G |
| Connector type | MPO-12 |
| Transmission distance (km) | 0.1(OM3) 0.15(OM4) |
| Optical fiber type | MMF |
| Center wavelength (nm) | 850 |
| Working wavelength range of the optical transmitter (nm) | 840-860 |
| Maximum sending optical power (AVG) (dBm) | - |
| Maximum sending optical power (OMA) (dBm) | per lane:3 |
| Minimum sending optical power (AVG) (dBm) | - |
| Minimum sending optical power (OMA) (dBm) | per lane:-5.6 |
| Working wavelength range of the optical receiver (nm) | 840-860 |
| Receiving sensitivity (AVG) (dBm) | - |
| Receiving sensitivity (OMA) (dBm) | per lane:-5.4 |
| Saturated optical power (dBm) | per lane:3.4 |
| Minimum extinction ratio (dB) | 3 |

8.18.2 40Gbps(4*10.3)-CFP-SMF-1271~1331nm-10km-commercial

Table 8-108 Technical specifications

| Item | Specification |
|--|--|
| BOM | S4017471 |
| Model | OSM010C02 |
| Encapsulation mode | CFP |
| Interface standard | IEEE 802.3ba, 40GBASE-LR4 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | CFP MSA |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 41.25G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1271 1291 1311 1331 |
| Working wavelength range of the optical transmitter (nm) | 1264.5-1277.5 1284.5-1297.5 1304.5-1317.5 1324.5-1337.5 |
| Maximum sending optical power (AVG) (dBm) | per lane:2.3 |
| Maximum sending optical power (OMA) (dBm) | per lane:3.5 |
| Minimum sending optical power (AVG) (dBm) | per lane:-7 |
| Minimum sending optical power (OMA) (dBm) | per lane:-4 |

| Item | Specification |
|---|--|
| Working wavelength range of the optical receiver (nm) | 1264.5-1277.5 1284.5-1297.5 1304.5-1317.5 1324.5-1337.5 |
| Receiving sensitivity (AVG) (dBm) | - |
| Receiving sensitivity (OMA) (dBm) | per lane:-11.5 |
| Saturated optical power (dBm) | per lane:2.3 |
| Minimum extinction ratio (dB) | 3.5 |
| Note | The optical power calculation is based on the OMA value. |

8.18.3 40Gbps(4*10.3)-CFP-SMF-1531.12~1550.12nm-80km-commercial

Table 8-109 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 02311AYS |
| Model | OSX080N05 |
| Encapsulation mode | CFP |
| Interface standard | IEEE 802.3bm, 40GBASE-ZR4 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | CFP MSA |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 41.25G |
| Connector type | LC |
| Transmission distance (km) | 80 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1531.12 1537.4 |

| Item | Specification |
|--|---|
| | 1543.73 1550.12 |
| Working wavelength range of the optical transmitter (nm) | 1530.09-1532.15 1536.37-1538.43 1542.7-1544.75 1549.09-1551.15 |
| Maximum sending optical power (AVG) (dBm) | per lane:4.5 |
| Maximum sending optical power (OMA) (dBm) | - |
| Minimum sending optical power (AVG) (dBm) | per lane:0 |
| Minimum sending optical power (OMA) (dBm) | - |
| Working wavelength range of the optical receiver (nm) | 1530.09-1532.15 1536.37-1538.43 1542.7-1544.75 1549.09-1551.15 |
| Receiving sensitivity (AVG) (dBm) | per lane:-20 |
| Receiving sensitivity (OMA) (dBm) | - |
| Saturated optical power (dBm) | per lane:4.5 |
| Minimum extinction ratio (dB) | 9 |
| Note | The interface standard is Huawei-specific. |

8.19 100Gbps CFP2 Optical Module

Figure 8-18 100Gbps CFP2 Optical Module



8.19.1 100Gbps(4*25.7)-CFP2-SMF-1295.56~1309.14nm-10km-commercial

Table 8-110 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 02310WUR |
| Model | OSN010N09 |
| Encapsulation mode | CFP2 |
| Interface standard | IEEE 802.3ba, 100GBASE-LR4 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | CFP MSA |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 103.125G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1295.56 |

| Item | Specification |
|--|--|
| | 1300.05 1304.58 1309.14 |
| Working wavelength range of the optical transmitter (nm) | 1294.53-1296.59 1299.02-1301.09 1303.54-1305.63 1308.09-1310.19 |
| Maximum sending optical power (AVG) (dBm) | per lane:4.5 |
| Maximum sending optical power (OMA) (dBm) | per lane:4.5 |
| Minimum sending optical power (AVG) (dBm) | per lane:-4.3 |
| Minimum sending optical power (OMA) (dBm) | per lane:-1.3 |
| Working wavelength range of the optical receiver (nm) | 1294.53-1296.59 1299.02-1301.09 1303.54-1305.63 1308.09-1310.19 |
| Receiving sensitivity (AVG) (dBm) | - |
| Receiving sensitivity (OMA) (dBm) | per lane:-8.6 |
| Saturated optical power (dBm) | per lane:4.5 |
| Minimum extinction ratio (dB) | 4 |
| Note | The optical power calculation is based on the OMA value. |

8.19.2 100Gbps(4*25.7)-CFP2-SMF-1295.56~1309.14nm-40km-commercial

Table 8-111 Technical specifications

| Item | Specification |
|--------------------|----------------------------|
| BOM | 02311FAP |
| Model | OSN040N03 |
| Encapsulation mode | CFP2 |
| Interface standard | IEEE 802.3ba, 100GBASE-ER4 |

| Item | Specification |
|--|--|
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | CFP MSA |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 103.125G |
| Connector type | LC |
| Transmission distance (km) | 40 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1295.56 1300.05 1304.58 1309.14 |
| Working wavelength range of the optical transmitter (nm) | 1294.53-1296.59 1299.02-1301.09 1303.54-1305.63 1308.09-1310.19 |
| Maximum sending optical power (AVG) (dBm) | per lane:2.9 |
| Maximum sending optical power (OMA) (dBm) | per lane:4.5 |
| Minimum sending optical power (AVG) (dBm) | per lane:-2.9 |
| Minimum sending optical power (OMA) (dBm) | per lane:0.1 |
| Working wavelength range of the optical receiver (nm) | 1294.53-1296.59 1299.02-1301.09 1303.54-1305.63 1308.09-1310.19 |
| Receiving sensitivity (AVG) (dBm) | - |
| Receiving sensitivity (OMA) (dBm) | per lane:-21.4 |
| Saturated optical power (dBm) | per lane:4.5 |
| Minimum extinction ratio (dB) | 8 |

| Item | Specification |
|------|--|
| Note | The optical power calculation is based on the OMA value. |

8.20 100Gbps QSFP28 Optical Module

Figure 8-19 100Gbps QSFP28 Optical Module



8.20.2 100Gbps(4*25.7)-QSFP28-MMF-850nm-0.07km-commercial

Table 8-112 Technical specifications

| Item | Specification |
|--------------------------------|----------------------------------|
| BOM | 02311NTY |
| Model | OMND10N13 |
| Encapsulation mode | QSFP28 |
| Interface standard | IEEE 802.3bm, 100GBASE-SR4 |
| Bit Error Ratio (BER) | <5x10E-5 |
| Working case temperature (°C) | 0 °C to 70 °C (32 °F to 158 °F) |
| Digital diagnosis | SFF-8636 |
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 103.125G |
| Connector type | MPO-12 |
| Transmission distance (km) | 0.07(OM3) 0.1(OM4) |

| Item | Specification |
|--|---|
| Optical fiber type | MMF |
| Center wavelength (nm) | 850 |
| Working wavelength range of the optical transmitter (nm) | 840-860 |
| Maximum sending optical power (AVG) (dBm) | per lane:2.4 |
| Maximum sending optical power (OMA) (dBm) | per lane:3 |
| Minimum sending optical power (AVG) (dBm) | per lane:-8.4 |
| Minimum sending optical power (OMA) (dBm) | per lane:-6.4 |
| Working wavelength range of the optical receiver (nm) | 840-860 |
| Receiving sensitivity (AVG) (dBm) | - |
| Receiving sensitivity (OMA) (dBm) | per lane:-8.5 |
| Saturated optical power (dBm) | per lane:2.4 |
| Minimum extinction ratio (dB) | 2 |
| Note | The board FEC function must be enabled. The optical power calculation is based on the OMA value. |

8.20.3 100Gbps(4*25.7)-QSFP28-SMF-1295.56~1309.14nm-10km-commercial

Table 8-113 Technical specifications

| Item | Specification |
|--------------------------------|-------------------------------|
| BOM | 02311NTX |
| Model | OSN010N23 |
| Encapsulation mode | QSFP28 |
| Interface standard | IEEE 802.3ba, 100GBASE-LR4 |
| Bit Error Ratio (BER) | <1x10E-12 |
| Working case temperature (°C) | 0 °C to 70 °C (32 F to 158 F) |
| Digital diagnosis | SFF-8636 |

| Item | Specification |
|--|--|
| Environment standard | RoHS |
| Security standard | FCC class B, IEC 60825-1 Class 1 |
| ESD(HBM1) (V) | 500 |
| Transmission rate (bit/s) | 103.125G |
| Connector type | LC |
| Transmission distance (km) | 10 |
| Optical fiber type | SMF |
| Center wavelength (nm) | 1295.56 1300.05 1304.58 1309.14 |
| Working wavelength range of the optical transmitter (nm) | 1294.53-1296.59 1299.02-1301.09 1303.54-1305.63 1308.09-1310.19 |
| Maximum sending optical power (AVG) (dBm) | per lane:4.5 |
| Maximum sending optical power (OMA) (dBm) | per lane:4.5 |
| Minimum sending optical power (AVG) (dBm) | per lane:-4.3 |
| Minimum sending optical power (OMA) (dBm) | per lane:-1.3 |
| Working wavelength range of the optical receiver (nm) | 1294.53-1296.59 1299.02-1301.09 1303.54-1305.63 1308.09-1310.19 |
| Receiving sensitivity (AVG) (dBm) | - |
| Receiving sensitivity (OMA) (dBm) | per lane:-8.6 |
| Saturated optical power (dBm) | per lane:4.5 |
| Minimum extinction ratio (dB) | 4 |
| Note | The optical power calculation is based on the OMA value. |

8.21 AE 905S Module

Description

Existing core network devices, which do not support 1588, cannot obtain clock signals from BITS servers. Upgrading core network devices to support 1588 is both complex and costly. To address this issue, the AE 905S module is developed. After having an AE 905S module equipped, the NE20E will be able to support 1588v2. Figure 8-20 and Figure 8-21 illustrate the appearance of an AE 905S module.

Figure 8-20 AE 905S module (front view)



Figure 8-21 AE 905S module (back view)

 **NOTE**

An AE 905S module must be inserted into a GE optical interface of SFP type.

The AE 905S module has a STAT indicator under the **HUAWEI** logo. Table 8-114 describes STAT indicator states.

Table 8-114 Description of STAT indicator states

| State | Description |
|----------------------------------|---|
| On (green) | The AE 905S module is operating properly. |
| On (red) | The AE 905S module has experienced a hardware fault or is overheated. |
| Blinking green once every second | No connection has been established on the GE interface. |
| Blinking red every second | The GPS frequency or time is out of lock. |
| Off | The AE 905S module is powered off or not operating. |

The AE 905S module meets industrial-grade requirements. Table 8-115 lists its interface specifications.

Table 8-115 AE 905S module interface specifications

| Item | Specification |
|----------------------|---------------|
| BOM Number | 03031TUX |
| Board Name for Order | ANPM000GPS01 |

| Item | Specification |
|--------------------|---|
| Interface type | SMA |
| Encapsulation type | SFP |
| Input signal | An AE 905S module uses the SMA interface to receive GPS satellite signals. |
| Output signal | An AE 905S module uses the GE interface to provide synchronous Ethernet and 1588v2 for NE20E. |

Installation

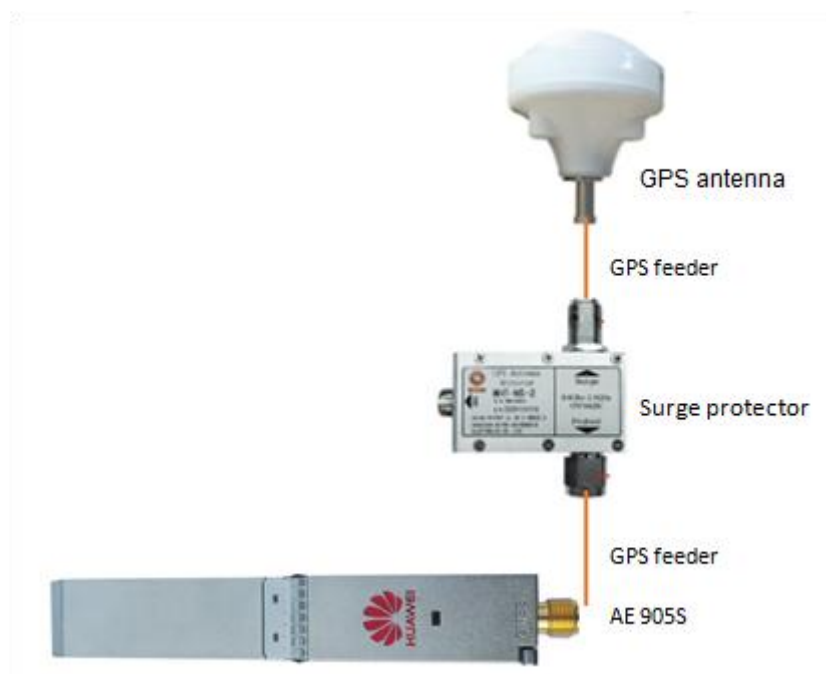


NOTICE

To meet heat dissipation requirements, leave interfaces around the AE 905S module empty. A maximum of two AE 905S modules can be installed on a device.

Figure 8-22 illustrates connections between the AE 905S module, surge protector, and antenna.

Figure 8-22 Connections between the AE 905S module, surge protector, and antenna



**NOTE**

The AE 905S module must be used with the GPS antenna and GPS surge protector and is connected to the GPS antenna and GPS surge protector through the GPS feeder.

The GPS antenna receives satellite signals from the GPS. A GPS surge protector can protect a device against the lightning strikes induced by the antenna feeder. Without the protection of a surge protector, a device may be damaged by surge currents or voltage in a lightning weather. The GPS feeder transmits GPS signals.

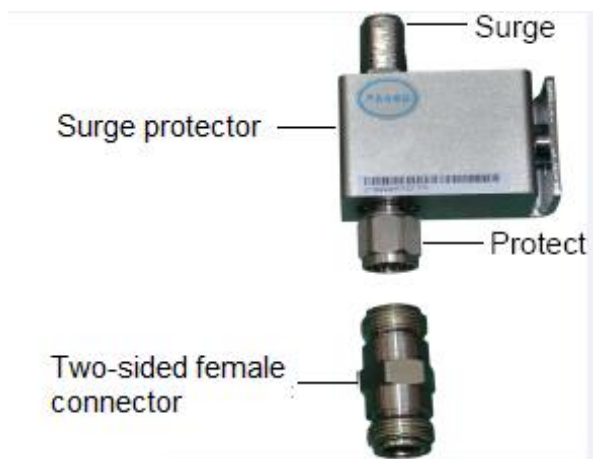
The image shown here is indicative only. If there is any inconsistency between the image and the actual product, the actual product shall govern.

Before inserting an AE 905S module into an interface, lock the latch. Before removing an AE 905S module from an optical interface, unlock the latch. For details, see Figure 8-23.

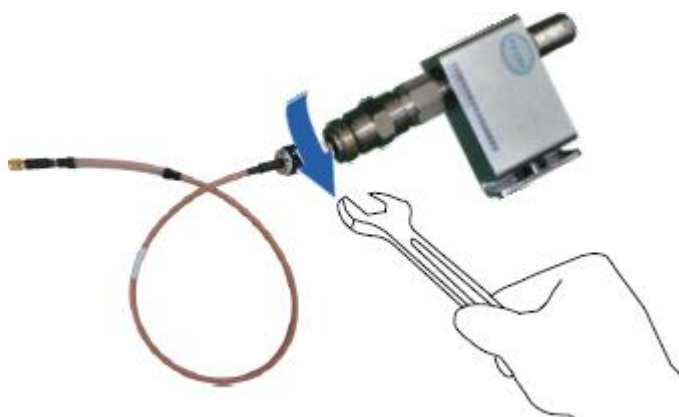
Figure 8-23 Latch**Installation Procedure****NOTE**

For details about how to install the GPS satellite antenna system, see the GPS quick installation guide.

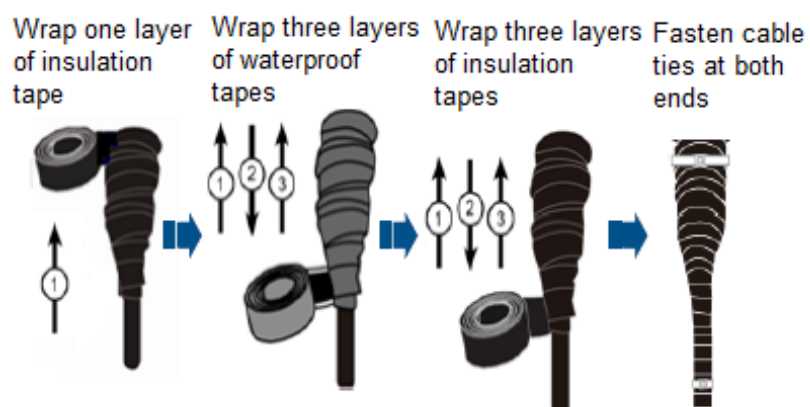
1. Connect a two-sided female connector to the Protect interface of the surge protector.



2. Connect one end of the coaxial cable to the Protect interface of the surge protector and fasten the joint with a wrench.



3. Implement 1+3+3 waterproof protection where the coaxial cable and the Protect interface of the surge protector are connected and fasten cable ties at both ends.



4. Fasten the surge protector to the GPS antenna support and use screws to secure it.



5. Fasten the GPS antenna support to the ground bar on the right of the device and use screws to secure it.



6. Install the ground cable of the surge protector. Connect one end of the ground cable to the GND interface of the surge protector and the other end of the cable to the ground bar.

**NOTE**

The surge protector must use OT M8 terminals.

7. Connect the GPS feeder to the AE 905S module.
8. Insert the AE 905S module into an optical interface of the NE20E with the latch of the AE 905S module locked.
9. Connect one end of the GPS feeder to the Surge interface of the surge protector and the other end of the GPS feeder to the GPS antenna. Fasten each connector with a wrench.
10. Implement 1+3+3 waterproof protection where the coaxial cable and the Protect interface of the surge protector are connected and fasten cable ties at both ends.
 - Implement waterproof protection where the feeder connector and the Surge interface of the surge protector are connected.

- Implement waterproof protection where the feeder connector and the N joint of the GPS antenna are connected.



NOTE

For details about how to make a GPS feeder connector, see the GPS quick installation guide.

9 Glossary

A

Asynchronization Asynchronization does not use the exact data signals timed by the clock. The signals have different frequencies and phases. The asynchronization usually encapsulates the bits into the control flag, which specifies the beginning and end of the bits.

D

DCE Data Circuit-terminating Equipment is a network device composing the UNI. DCE provides the physical connection to the network, forwards the data, and provides the clock signals for the DTE.

DRAM Dynamic Random Access Memory. The information stored in the RAM must be refreshed periodically. When the contents of the DRAM are being refreshed, a user cannot access it. Delay can thus occur.

DTE Data terminal equipment is a user device composing the UNI. The DTE accesses the data network through the DCE equipment (for example, model) and usually uses the clock signals produced by DCE.

E

EMC Electro magnetic compatibility is the condition which prevails when telecommunications equipment is performing its individually designed function in a common electromagnetic environment without causing or suffering unacceptable degradation due to unintentional electromagnetic interference to or from other equipment in the same environment.

F

Flash Flash is a kind of special Erasable Programmable Read Only Memory (EEPROM), which can be completely erased and rewritten one time instead of only one byte.

N

NVRAM Nonvolatile Random Access Memory. The data in NVRAM cannot be lost when the system is Down.

R

RAM Random Access Memory is a memory that can be lost easily, and read and rewritten by the micro processor.

ROM Read Only Memory is a memory that cannot be lost easily, and can only be read, but not written by the micro processor.

S

SRAM Static Random Access Memory is a type of random access memory. Its contents can be saved only if the SRAM is provided with the uninterrupted power supply. Unlike the DRAM, the SRAM does not need to be refreshed repeatedly.

10 Acronyms and Abbreviations

A

| | |
|-----|----------------------------|
| AC | Alternating Current |
| ATM | Asynchronous Transfer Mode |
| AUX | Auxiliary (port) |

C

| | |
|-----|-------------------------|
| CAN | Control Area Network |
| CE1 | Channelized E1 |
| CF | Compact Flash |
| CLK | Clock Card |
| CPU | Central Processing Unit |
| CT1 | Channelized T1 |
| CTS | Clear to Send |

D

| | |
|-----|------------------------------------|
| DC | Direct Current |
| DCE | Data Circuit-terminating Equipment |
| DSR | Data Set Ready |
| DTE | Data Terminal Equipments |
| DTR | Data Terminal Ready |

E

| | |
|-----|--------------------------------|
| EMC | Electro Magnetic Compatibility |
|-----|--------------------------------|

| | |
|-------|---|
| F | |
| FAD | Fabric Adaptor |
| FC | Patch Cord (Connector + Fiber) |
| FCB | Fan Control Board |
| FPIC | Flexible Plug-in Card |
| G | |
| GND | Ground |
| I | |
| IEC | International Electrotechnical Commission |
| L | |
| LC | Lucent Connector |
| LPU | Line Processing Unit |
| M | |
| MPU | Main Processing Unit |
| N | |
| NEG | Negative |
| NSP | Network Service Processor |
| NVRAM | Non-Volatile Random Access Memory |
| O | |
| ODF | Optical Distribution Frame |
| OFL | Offline |
| P | |
| PC | Personal Computer |
| PCB | Printed Circuit Board |
| PCS | Physical Coding Sublayer |
| PGND | Protection Ground |

| | |
|-------|---|
| PMD | Physical Medium Dependent |
| R | |
| RJ45 | Registered Jack 45 |
| RTS | Request to Send |
| RXD | Receive Data |
| S | |
| SC | Square Connector |
| SDRAM | Synchronous Dynamic Random Access Memory |
| SFU | Switch Fabric Unit |
| SMB | Sub-miniature B |
| T | |
| TXD | Transmit Data |
| U | |
| UART | Universal Asynchronous Receiver/Transmitter |
| UTP | Unshielded Twisted Pair |
| V | |
| VRP | Versatile Routing Platform |

11 More Conference

- [Basic Router Hardware Concept - Optical Fibers and Modules](#)
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