Huawei CX116 Pass Through Module

V100R001

White Paper

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About This Document

Purpose

The white paper of the CX116 GE pass through module of the E9000 server describes the CX116 in terms of the functions, appearance, ports, physical structure, logical structure, technical specifications, and certifications. You can learn about the CX116 by reading this document.

Intended Audience

This document is intended for:

- Huawei presales engineers
- Channel partner presales engineers
- Huawei enterprise presales engineers

Symbol Conventions

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

Symbol	Description
⚠ DANGER	Indicates a hazard with a high level or medium level of risk which, if not avoided, could result in death or serious injury.
⚠ WARNING	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ CAUTION	Indicates a potentially hazardous situation that, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.
☞ TIP	Indicates a tip that may help you solve a problem or save time.
📖 NOTE	Provides additional information to emphasize or supplement important points in the main text.

Change History

Issue 05 (2017-03-27)

This issue is the fifth official release.

Mode	Change Description
Added	Added product model descriptions to **1.2 Appearance**.

Issue 04 (2017-02-17)

This issue is the fourth official release.

Mode	Change Description
Modified	Changed the altitude in **1.8 Technical Specifications**.

Issue 03 (2016-11-22)

This issue is the third official release.

Mode	Change Description
Added	Added the description about the working temperature's compliance with the ASHRAE Class A3 standard in **1.8 Technical Specifications**.

Issue 02 (2016-08-20)

This issue is the second official release.

Mode	Change Description
Deleted	Deleted the "Hardware Structure" and "Architecture" sections.
	Deleted some international standards and protocols in **2.2 Certifications**.

Issue 01 (2015-11-03)

This issue is the first official release.

Contents

1 Overview

About This Chapter

1.1 Functions

This topic describes the functions and ports of the CX116 pass through module.

The CX116 Pass Through Module (short for CX116) is the GE pass through module of the E9000 server and provides external network ports for the compute nodes, storage nodes, or service process nodes installed in the front slots of the E9000. Each CX116 provides a maximum of 32 gigabit Ethernet (GE) ports.

1.2 Appearance

This topic describes the CX116 in terms of its appearance, panel, and installation positions in the chassis.

CX116

Figure 1-1 shows the CX116.

Figure 1-1 Appearance

Installation Positions

The CX116 is installed in a rear slot of the E9000 chassis. **Figure 1-2** shows the positions and slot numbers for installing the CX116s in a chassis.

Figure 1-2 Positions for installing the CX116s
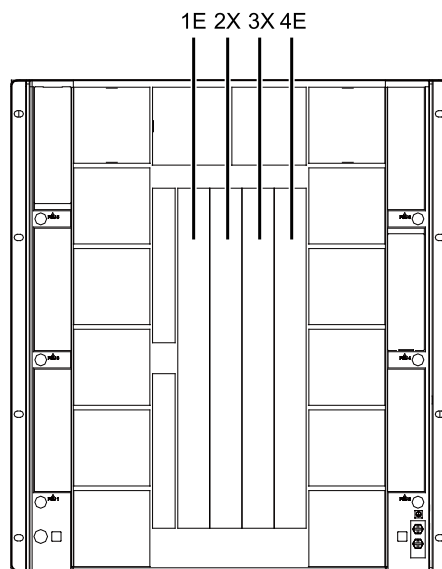
NOTE

> The CX116 panel provides more ports than other switch modules. For ease of cable routing and maintenance, you are advised to install the CX116 in slot 1E or 4E.

Panel

Figure 1-3 shows the CX116 panel.

Figure 1-3 Panel
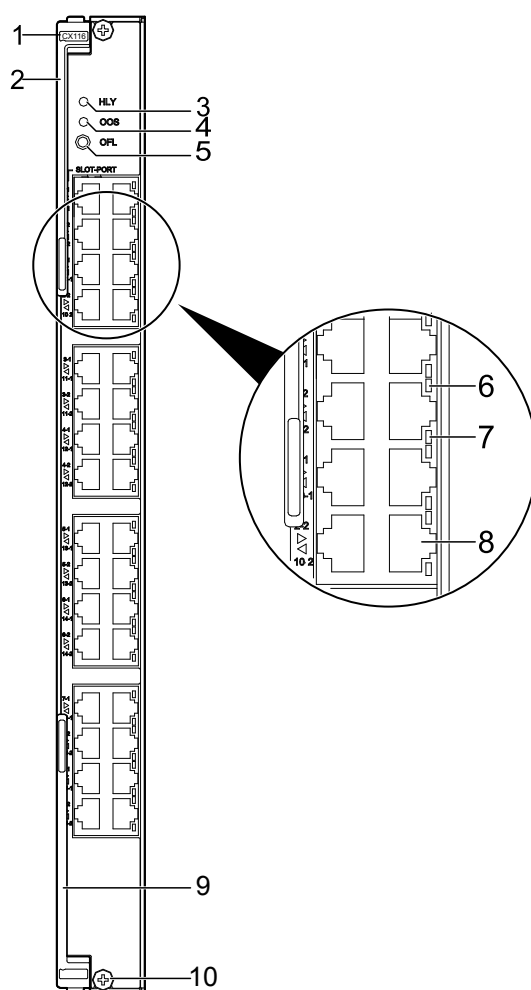
1	Product model	2	Customization label (with an ESN label)
3	PWR indicator	4	HLY indicator
5	OFL button (reserved)	6	Status indicator for the right GE electrical port
7	Status indicator for the left GE electrical port	8	GE electrical port
9	Ejector lever	10	Captive screw

📖 **NOTE**

The numbers on the left side are port serial numbers. The arrow direction of a triangle indicates the direction of a port.

ESNs

An Equipment Serial Number (ESN) is a string that uniquely identifies a server. An ESN is required when you apply for technical support from Huawei.

Figure 1-4 shows the ESN format.

Figure 1-4 ESN example
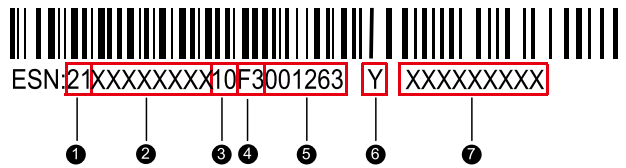
No.	Description
1	Indicates the ESN ID (two digits).
2	Indicates the item identification code (eight characters).
3	Indicates the vendor code (two characters).
4	Indicates the year and month (two characters). The first character indicates the year. The digits 1 to 9 indicate 2001 to 2009, and the letters A to Z indicate 2010 to 2035. The second character indicates the month. The digits 1 to 9 indicate January to September, and the letters A to C indicate October to December.
5	Indicates the sequence number (six digits).
6	Indicates RoHS compliance (one character).
7	Indicates the internal model number of the board.

1.3 Ports

This topic describes the ports on the CX116.

Overview

Table 1-1 describes the ports on the CX116.

Table 1-1 Ports

Port	Type	Quantity	Description
GE electrical port	RJ45	32	The panel provides four 2*4 RJ45 connectors. Each CX116 provides 32 GE electrical ports. Each port has one green indicator.

Figure 1-5 shows the CX116 port naming rules.

Figure 1-5 Port naming rules

CX116 physical port numbers   CX116 logical port numbers

16–2	8–2	31	15
16–1	8–1	30	14
15–2	7–2	29	13
15–1	7–1	28	12
14–2	6–2	27	11
14–1	6–1	26	10
13–2	5–2	25	9
13–1	5–1	24	8
12–2	4–2	23	7
12–1	4–1	22	6
11–2	3–2	21	5
11–1	3–1	20	4
10–2	2–2	19	3
10–1	2–1	18	2
9–2	1–2	17	1
9–1	1–1	16	0
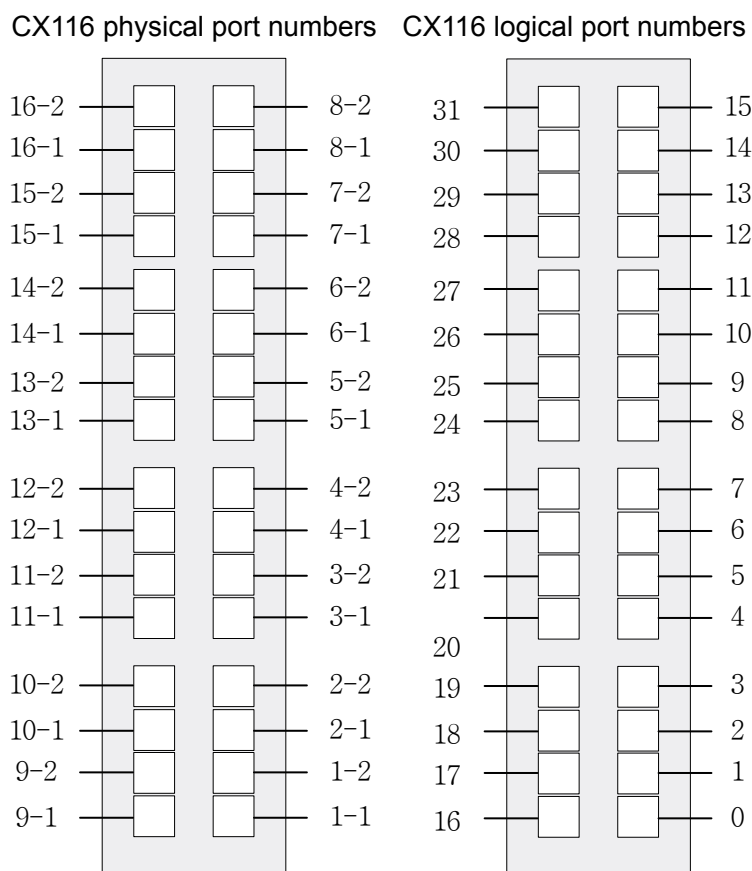
⚠ NOTICE

The ports on the CX116 are in GE full-duplex mode. The current version does not support port rate auto-negotiation or duplex mode auto-negotiation between the local and peer ends. Check that the speed and duplex modes on the local CX116 and peer end are the same before any connection.

The logical numbers of the 32 ports are 0 to 31, which are used for running commands remotely. A physical number is in **slot number-port number** format. Physical numbers are used for locating ports when you connect network cables and view the mapping between the ports on the pass through module and the server slots. The 16 front half-width slots of the E9000 server are numbered 1 to 16. Each slot has two ports: **slot number-1** and **slot number-2**. For example, half-width slot 7 has ports **7-1** and **7-2**, and half-width slot 15 has ports **15-1** and **15-2**.

Each full-width slot has four ports, which map to two half-width slots. For example, full-width slot 7 maps to half-width slots 7 and 15, and full-width slot 7 has ports **7-1**, **7-2**, **15-1**, and **15-2**.

Port Mapping Between a Pass Through Module and a Mezz Module

Port Mapping Between the CX116 and the MZ110

The MZ110 in Mezz2 of the compute node in slot n provides four GE ports: ports 1, 2, 3, and 4. Port 1 and port 2 respectively correspond to slot n-2 and slot n-1 of the CX116 in slot 1E; port 3 and port 4 respectively correspond to slot n-2 and slot n-1 of the CX116 in slot 4E, as shown in **Figure 1-6**.

Figure 1-6 Port mapping
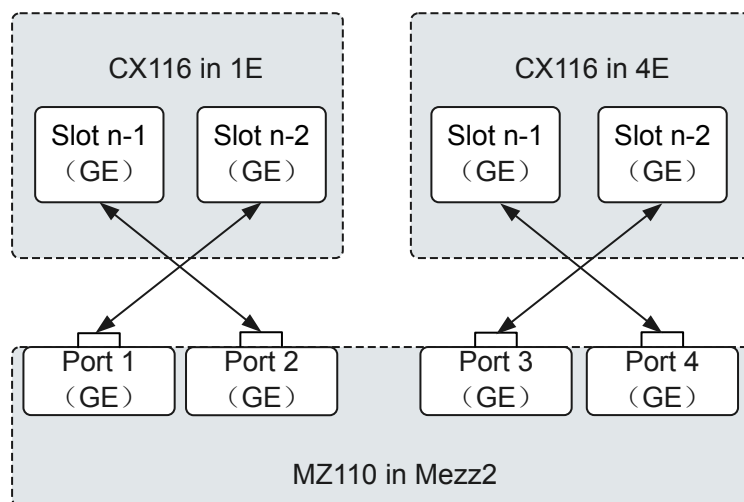
Port Mapping Between the CX116 and the MZ111

The MZ111 provides four GE ports, including ports 1, 2, 3, and 4. Ports 1 and 3 map to the CX116 in slot 1E, and ports 2 and 4 map to the CX116 of the in slot 4E, as shown in **Figure 1-7**.

Figure 1-7 Port mapping

1.4 Indicators

This topic describes the indicators on the CX116.

By observing the indicators, you can determine the current operating status of the CX116. **Table 1-2** describes the indicators.

Table 1-2 Indicators

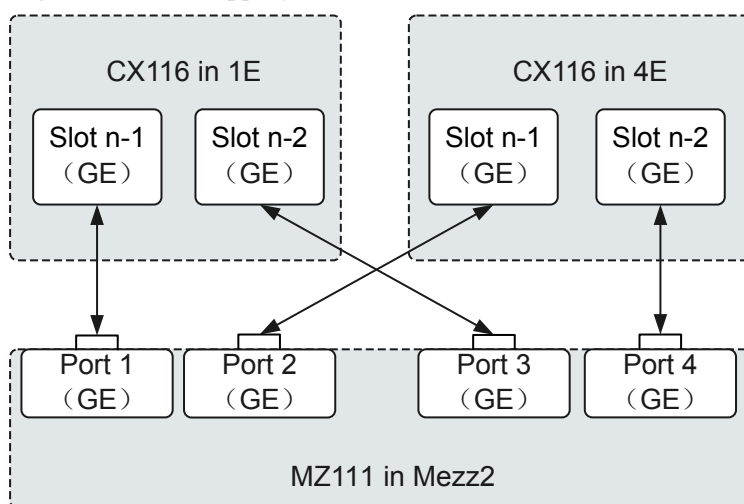| Indicator	Meaning	Color	Description
PWR indicator	Power indicator	Green	• Off: The module is not powered on. • Blinking green: The module is being powered on. • Steady green: The module is working properly.
HLY indicator	Healthy indicator	Red and green	• Off: The module is not powered on. • Steady green: The module is working properly. • Blinking red (1 Hz): A major alarm is generated. • Blinking red (4 Hz): A critical alarm is generated. • Blinking red (5 Hz): The CX116 is not installed properly. **NOTE** It is difficult to distinguish a blinking frequency of 4 Hz from a blinking frequency of 5 Hz. When the HLY indicator is quickly blinking red, you are advised to check whether the device is securely inserted and then check whether a critical alarm is generated.
GE electrical port status indicator	Connection and data transmission status indicator for an Ethernet electrical port	Green	• Off: The port is not connected or not properly connected. • Blinking green: Data is being sent or received over the port. • Steady green: The port is properly connected.

1.5 Hardware Structure

This topic describes the components, mainboard layout, and connectors of the CX116.

Figure 1-8 shows the components of the CX116.

Figure 1-8 Components

1	Midplane signal connector	2	Positioning pin
3	Midplane power connector	4	PHY module
5	Air deflector	6	Captive screw
7	Ejector lever	8	GE electrical port module
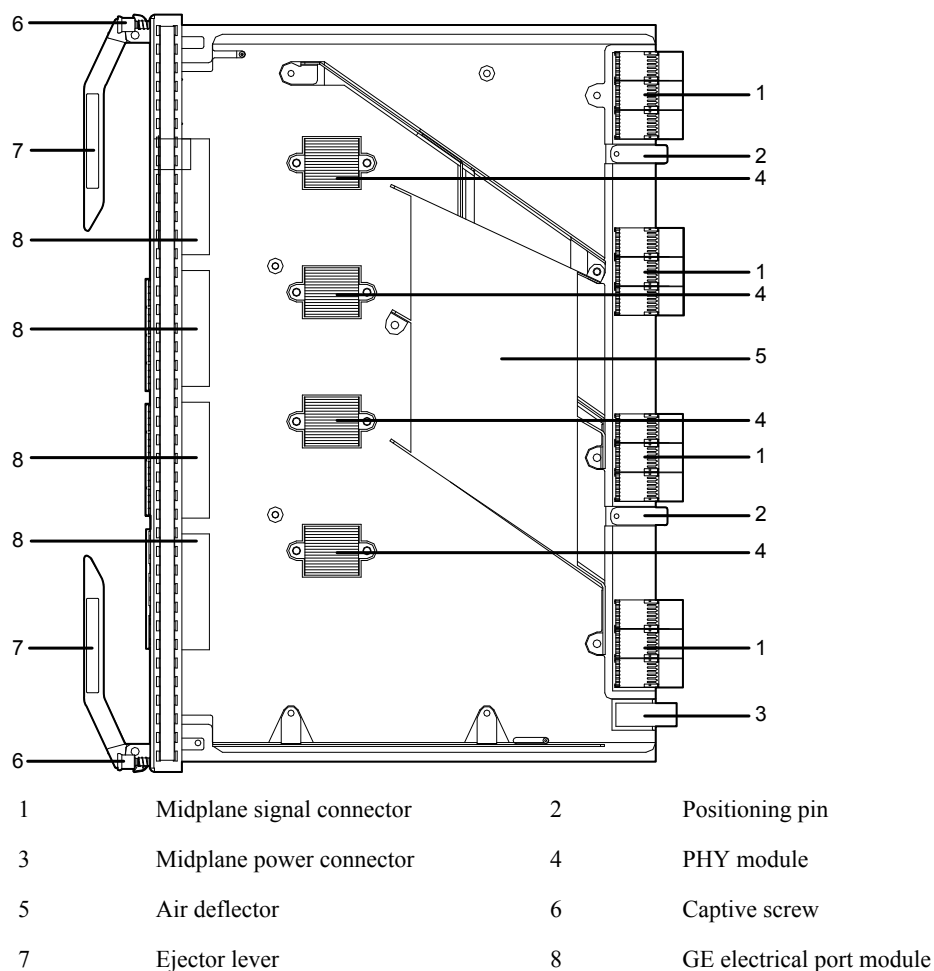
Table 1-3 describes the components of the CX116.

Table 1-3 Components

No.	Name	Description
1	Midplane signal connector	Provides signal channels for the CX116 and other slots.
2	Positioning pin	Positions the CX116 in the slot.
3	Midplane power connector	Supplies power to the CX116.
4	PHY module	Converts 32 Serdes signals to 32 1000 Base-T Ethernet electric signals that are transmitted to the 32 GE ports on the CX116 panel. The CX116 CPLD manages the four PHY modules over the MIIM interfaces.

No.	Name	Description
5	Air deflector	Directs air flows to reduce the CX116 temperature and achieve optimal heat dissipation of the PHY module.
6	Captive screw	Secures the CX116.
7	Ejector lever	-
8	GE electrical port module	Provides 32 x 1000 Base-T Ethernet electric ports (RJ45) on the CX116. Each port provides a green indicator.

1.6 Architecture

This topic describes the CX116 logical architecture.

The CX116 logical architecture includes the processor module, CPLD module, PHY module, and GE pass through module.

- Processor module: The processor module, in a dominant frequency of 333 MHz, is the controlling core for the CX116 and supports master/slave and multi-master modes.
- CPLD module: The CPLD module is a key module to help the processors to collect the CX116 information, and power on, power off, and reset the CX116.
- PHY module: The PHY module converts the 32 Serdes signals to 32 x 1000 BASE-T signals.

Figure 1-9 Logical architecture
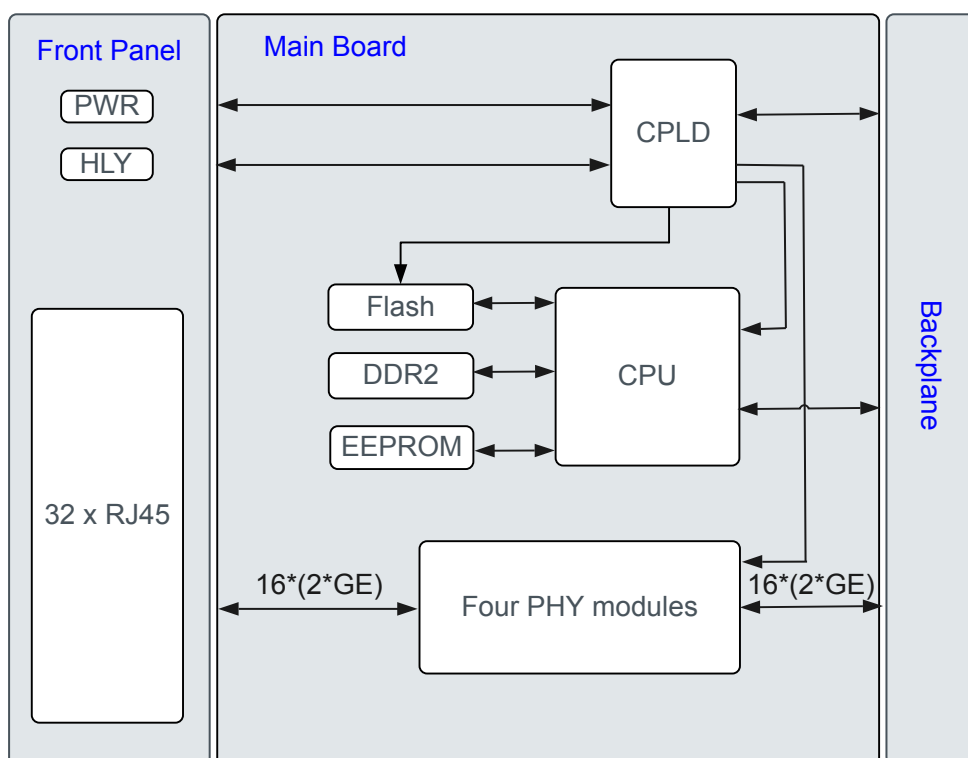
1.7 Compatibility

This topic describes mezz modules that can work with the CX116 and cables supported by ports on the CX116 panel.

For details about the software and hardware that are compatible with the CX116, see **Huawei Server Compatibility Checker**.

Supported Mezz Modules

The CX116 connects to mezz modules of compute nodes. **Table 1-4** describes models and specifications of the supported mezz modules.

Table 1-4 Supported mezz modules

Model	Specifications
MZ110	4–port GE NIC (Network Interface Card) mezzanine card
MZ111	4–port GE dual-chip NIC (Network Interface Card) mezzanine card

Supported Cables

Table 1-5 Supported cables

Module/Cable	Description
Cat-5 unshielded twisted pair (UTP) cable	Category 5 UTP cables that support RJ45 ports
Cat-5e UTP cable	Category 5e (Category 5 enhanced) UTP cables that support RJ45 ports
Note: The table is for reference only. For details about the components that can be purchased, consult the local Huawei sales representatives.	

1.8 Technical Specifications

This topic describes the CX116 technical specifications.

Table 1-6 describes the CX116 technical specifications.

Table 1-6 Technical specifications

Category	Item	Specifications
Physical specifications	Dimensions (H x W x D)	388.55 mm x 35.06 mm x 272.15 mm (15.30 in. x 1.38 in. x 10.71 in.)
	Color	Silver white
	Net weight	2.2 kg (4.85 lb)
Environmental specifications	Temperature	● Operating temperature: 5°C to 40°C (41°F to 104°F) (ASHRAE Class A3 compliant) ● Storage temperature: -40°C to +65°C (-40°F to +149°F) ● Long-term storage temperature: 21°C to 27°C (69.8°F to 80.6°F)
	Temperature change rate	15 °C/h (27 °F/h)
	Humidity	● Operating humidity: 5% RH to 85% RH (non-condensing) ● Storage humidity: 5% RH to 95% RH (non-condensing) ● Long-term storage humidity: 30% RH to 69% RH (non-condensing)
	Altitude	At an altitude of 900 m (2952.72 ft), the highest operating temperature is 40°C (104°F). When the device is used at an altitude of 900 m to 5000 m, the highest operating temperature decreases by 1°C (1.8°F) as the altitude increases by 300 m (984.24 ft).
Input power supply specifications	Rated input voltage	12 V DC
Power consumption	Maximum power consumption	28 W

2 Standards and Certifications

About This Chapter

2.1 Standards Compliance

This topic describes the international and industrial standards and communication protocols that the CX116 complies with.

International Standards

Table 2-1 lists the international standards.

Table 2-1 Standards and protocol compliance

Standard	Protocol
IEEE 802.3z	Gigabit Ethernet
IEEE 802.3ab	1000BASE-T

Industrial Standards

Table 2-2 lists the industrial standards.

Table 2-2 Industrial standards

Standard	Description
ECMA TR/70	Environmental protection
EN60950	Safety (Europe)
GR-929	Reliability
IEC 812	Procedure for Failure Mode and Effects Analysis (FMEA)
IEC 863	Reliability, maintainability, and availability compliance standard
IEC60950	Safety
IEC60825-1/2/6	Safety
IEC60215	Safety
Telcordia SR-332	Reliability
IEC61000	EMC standard
UL60950	Safety (North America)

2.2 Certifications

This topic describes the certifications that the E9000 has passed.

Table 2-3 lists the certifications.

Table 2-3 Certifications

Country /Region	Certification	Standard
Europe	WEEE	2002/96/EC, 2012/19/EU
Europe	RoHS	2002/95/EC, 2011/65/EU, EN 50581: 2012
Europe	REACH	EC NO. 1907/2006
Europe	CE	Safety: EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011 EMC: ● EN 55022: 2010 ● CISPR 22: 2008 ● EN 55024: 2010 ● CISPR 24: 2010 ● ETSI EN 300 386 V1.6.1: 2012 ● ETSI ES 201 468 V1.3.1: 2005
China	RoHS	SJ/T-11363-20006 SJ/T-11364-20006 GB/T 26572-2011
China	China Environmental Labeling	GB/T24024: 2001 idt ISO14024: 1999 HJ 2507-2011
Australia	C-tick	AS/NZS CISPR22: 2009
America	UL	UL 60950-1
America	FCC	FCC Part 15 (Class A)
America	NTRL-UL	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No.60950-1-07, 2nd Edition, 2011-12 (Information Technology Equipment-Safety-Part 1: General Requirements)
Canada	IC	ICES-003 Class A
Nigeria	SONCAP	IEC 60950-1: 2005 (2nd Edition) + A1: 2009 EN 60950-1: 2006+A11: 2009+A1: 2010 + A12: 2011
Kingdom of Saudi Arabia (KSA)	SASO	IEC 60950-1: 2005 (2nd Edition) + A1: 2009 EN 60950-1: 2006+A11: 2009+A1: 2010 + A12: 2011
Global	CB	IEC 60950-1
Japan	VCCI	VCCI V-4: 2012