4 Cards

4.1 Card Introduction

4.1.1 Card Classification

Depending on their functions, cards of CloudEngine 16800 seriesswitch devices are classified into the following types: Main Processing Unit (MPU), Line Processing Unit (LPU), and Switch Fabric Unit (SFU). **Table 4-1** describes these cards.

Table 4-1 Cards supported by CloudEngine 16800 seriesswitch devices

Card Type	Full Name	Function
MPU	Main Processing Unit	Responsible for system control, management, and monitoring
SFU	Switch Fabric Unit	Responsible for line-rate data switching on the data plane
LPU	Line Processing Unit	Responsible for data packet processing and traffic management

4.1.2 Card Naming Conventions

MPU Naming Conventions

Figure 4-1 MPU naming conventions

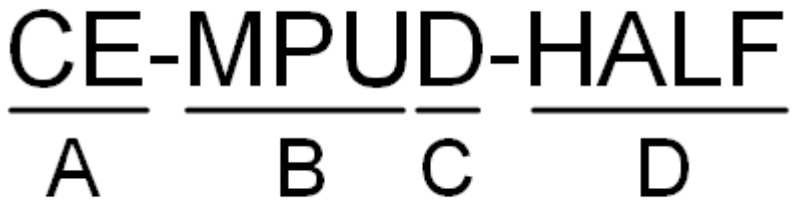


Table 4-2 MPU naming conventions

Identifier	Meaning	Description
A	Brand name	It is fixed as CE, representing CloudEngine.
B	MPU	The card is an MPU.
C	Version	This field indicates the MPU version.
D	Extended field	• HALF: half-width MPU • FULL: full-width MPU

SFU Naming Conventions

Figure 4-2 SFU naming conventions

Table 4-3 SFU naming conventions

Identifier	Meaning	Description
A	Brand name	It is fixed as CE, representing CloudEngine.
B	SFU	The card is an SFU.

Identifier	Meaning	Description
C	Chassis model	The last two digits (number of slots) of the chassis name indicate the chassis model.
D	Version	This field indicates the SFU version. SFU versions are sorted by capacity. A indicates the minimum capacity. The capacity increases in ascending order.
E	Extended field	This field indicates SFUs with different chips. This suffix helps you quickly know the mapping between LPUs and SFUs.

LPU Naming Conventions

Figure 4-3 LPU naming conventions

Table 4-4 LPU naming conventions

Identifier	Meaning	Description
A	Brand name	It is fixed as CE, representing CloudEngine.
B	LPU type	• L: line processing unit for modular switches • F: flexible service unit for modular switches
C	Number of ports	For an LPU with different types of ports, this field stands for the number of downlink ports. It has two digits. The first digit is 0 if the card has fewer than 10 ports.
D	Port rate	• G: GE port • X: 10GE/25GE port • L: 40GE/50GE port • C: 100GE port • D: 400GE port

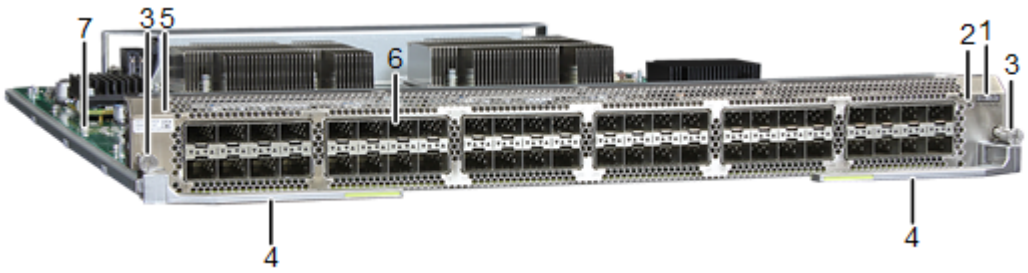
Identifier	Meaning	Description
E	Port type	• T: BASE-T port • S: SFP/SFP+ port • X: XFP port • Q: QSFP+/QSFP28 port • F: CFP/CFP2/CFP4 port • C: CXP port
F	LPU specifications	• FD: enhanced specifications
G	Applicable chassis model	G: LPU applicable to the chassis of the CloudEngine 16800 seriesswitch

4.1.3 Card Structure and Dimensions

Card Structure

Figure 4-4 shows components on a card.

Figure 4-4 Components on a card



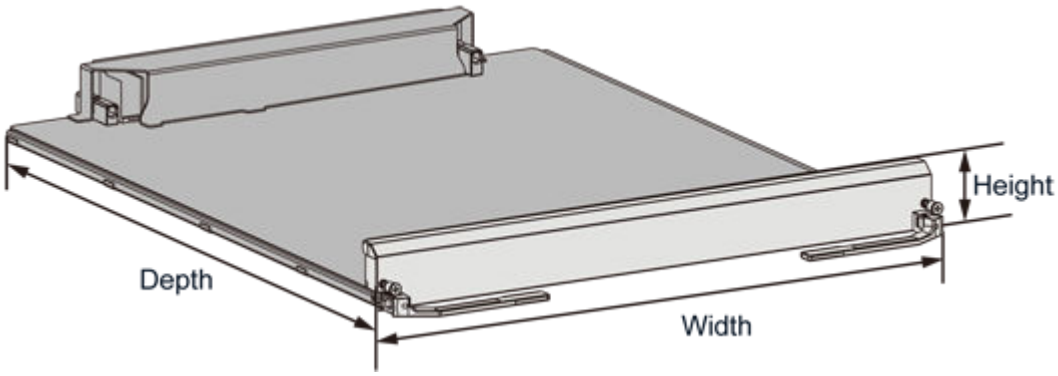
1. Card name label	2. Indicator	3. Captive screw **NOTE** Fix the card into the chassis.

4. Ejector lever **NOTE** Allow you to insert and remove the card.	5. Front panel plate **NOTE** Connects the ejector levers and the PCB. There are card name label, indicators, and ports on the plate, as well as some other labels, such as the bar code and laser label.	6. Ports
7. Printed circuit board (PCB) **NOTE** • The PCB contains all the functional modules of the card and is the core of the card. The PCB provides indicators, buttons, and ports on the front panel. • Different cards provide different indicators, buttons, and ports. For details, see the description of specific cards.	-	-

Card Dimensions

Figure 4-5 shows how the height, width, and depth of a card are measured.

Figure 4-5 Card dimensions



NOTE

The card dimensions are defined as follows:

- Height: the height of the front panel
- Width: the longest distance between the tops of two ejector levers
- Depth: the distance between the front panel and the card connector

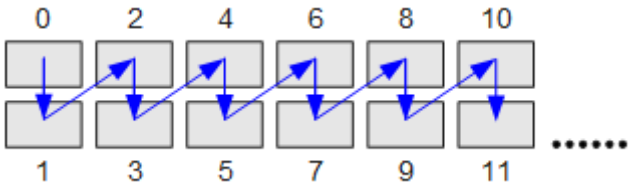
4.1.4 Port Numbering of LPUs

On the CloudEngine 16800 seriesswitch, ports are numbered in the format of stack member ID/slot ID/subcard ID/port sequence number.

- Stack member ID: A port number does not contain the stack member ID if the switch is not in a stack.
- Slot ID: identifies in which slot a card is installed.
- Subcard ID: Cards on the CloudEngine 16800 seriesswitch do not support subcards, so the subcard ID is always 0.
- Port sequence number: indicates the number of each port on a card.

  There are two rows of ports on a card of the CloudEngine 16800 seriesswitch, these ports are numbered from top to bottom and left to right starting from 0.

Figure 4-6 Port sequence number



4.1.5 Port Rate Description

The port rate is the rate at which a port transmits data. To meet various transmission rate requirements, pluggable modules with different rates are provided, including 100GE, 40GE, 25GE, 10GE, GE, and FE optical modules, as well as GE copper modules. Generally, the rate supported by a port corresponds to the rate of the pluggable module on the port, but it is also affected by the following factors:

Port Rate Auto-Sensing

Typically, port rate auto-sensing allows a port to automatically work at the rate of a medium when the medium is installed. You do not need to manually run a command to change the port rate.

Port Auto-Negotiation

Different from auto-sensing, auto-negotiation provides a mode of exchanging information between two ports on connected devices. You can connect the two ports through media that support rate auto-negotiation so that some port attribute settings can be negotiated and the two ports can automatically configure their transmission capabilities. The duplex mode, rate, and FEC of the two ports are negotiated. Ports at both ends of a physical link automatically select the same operating parameter settings by exchanging information. In this way, the transmission capabilities of the ports can reach the maximum supported by them.

Interface Split

Interface split allows a high-bandwidth physical port on the switch to be split into multiple independent low-bandwidth ports. With the interface split function, ports on a card can connect to various types of ports on the remote device, allowing for flexible networking and lowering hardware costs. For example, a 40GE port on a CEL36LQFD-G card can be split into four 10GE ports.

Port Rate Configuration

In addition to the preceding methods, you can also run commands to change the port rate. For details, see "Configuring the Interface Rate" in the *Configuration Guide - Interface Management Configuration Guide*.

4.2 Main Processing Units

4.2.1 CE-MPUD-HALF (CE16800 Main Processing Unit D (half-width))

The CE-MPUD-HALF is the main processing unit of the device and is responsible for system control, management, and monitoring.

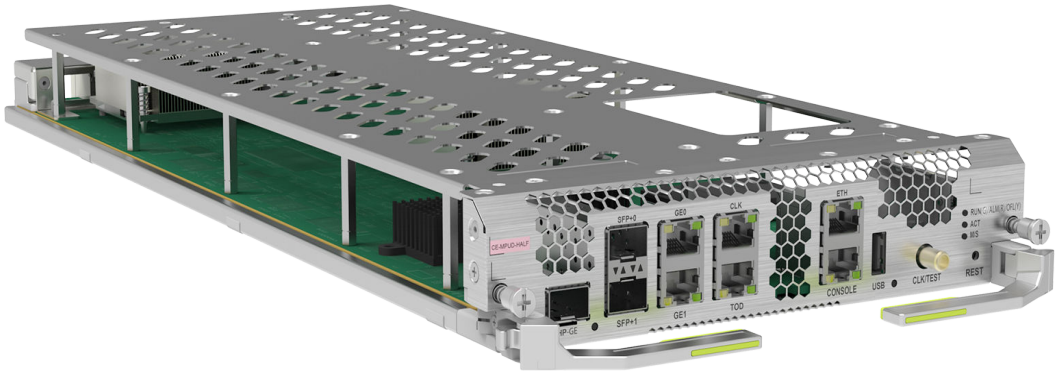
Overview

Table 4-5 Basic information about the CE-MPUD-HALF

Item	Details
Description	CE16800 Main Processing Unit D (half-width)
Part number	03058876
Silkscreen	CE-MPUD-HALF
Model	CE-MPUD-HALF
First supported version	V200R005C20

Appearance

Figure 4-7 Appearance of the CE-MPUD-HALF



Version Mapping

Table 4-6 Chassis and version matching the CE-MPUD-HALF

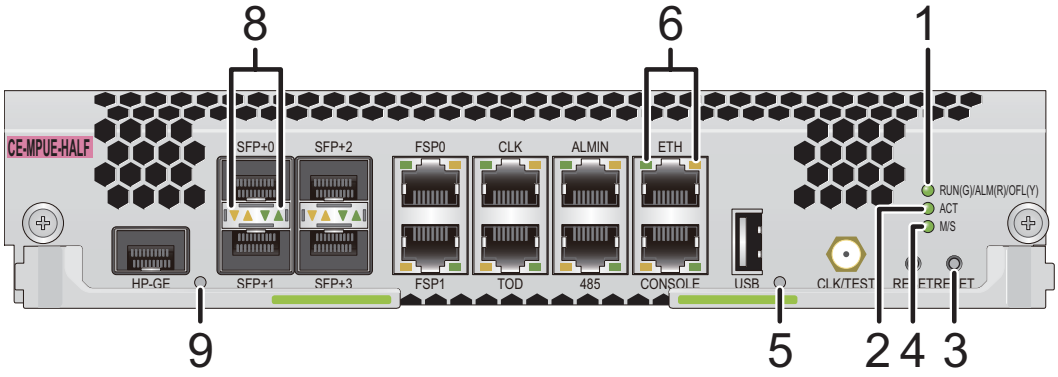
Chassis	First Supported Version
CloudEngine 16804	V200R005C20
CloudEngine 16808	V200R005C20

NOTE

In the same chassis, the CE-MPUD-HALF cannot be installed together with an MPU of a different model.

Indicators and Buttons

Figure 4-8 Indicators and button on the CE-MPUD-HALF



1. Running status indicator	2. Active/ Standby status indicator	3. Reset button	4. Stack status indicator	5. USB-based deployment indicator
6. ETH port indicator	7. GE electrical port indicator	8. SFP+ optical port indicator	9. High-precision clock optical transceiver indicator	-

NOTE

The indicators on console, CLK, and TOD ports are not in use.

Table 4-7 Indicators on the CE-MPUD-HALF

Silkscreen	Name	Color	Status	Description
RUN(G)/ ALM(R)/ OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	A fault that affects services has occurred and it cannot be rectified automatically (critical alarm about hardware), or the card has generated an alarm because the memory size is not equal to the standard specification.
			Fast blinking (4 Hz)	The system power is insufficient.
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
ACT	Active/ Standby status indicator	Green	Steady on	The card is the active MPU.
			Off	The card is the standby MPU.
M/S	Stack status indicator	Green	Steady on	The stacking function is enabled, and the card is the active MPU of the stack.
			Slow blinking (0.5 Hz)	The stacking function is enabled, and the card is not the active MPU of the stack.

Silkscreen	Name	Color	Status	Description
	NOTE You can run the **dfs-master led enable** command to enable the stack status indicator to display the DFS group master and backup status. After this function is enabled, the stack status indicator on the DFS master device is steady on and that on the DFS backup device is off.		Off	The stacking function is not enabled.
-	USB-based deployment indicator	Green	Steady on	USB-based deployment has been completed.
			Blinking (4 Hz)	The system is reading data from a USB flash drive.
		Red	Steady on	USB-based deployment fails.

Silkscreen	Name	Color	Status	Description
		-	Off	USB-based deployment is disabled (default state).
-	ETH port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	GE electrical port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	SFP+ optical port indicator Two single-	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.

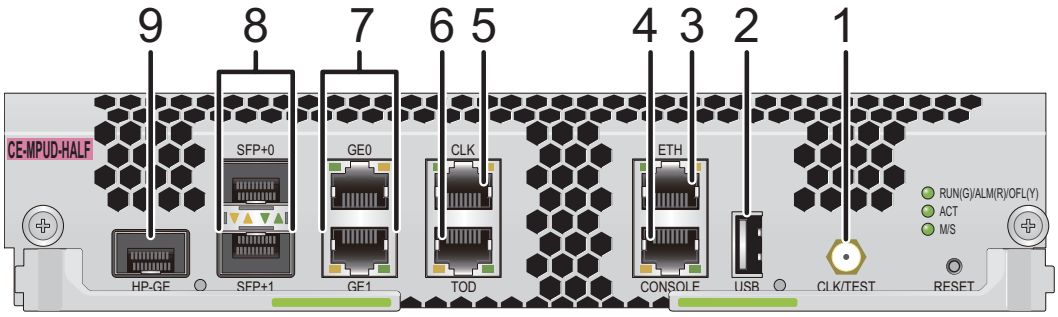
Silkscreen	Name	Color	Status	Description
	color indicators for each port: • Green: LINK indicator • Yellow: ACK indicator	Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	High-precision clock optical transceiver indicator	Green	Steady on	The link on the port is connected.
			Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The link on the port is disconnected.

Table 4-8 Button on the CE-MPUD-HALF

Silkscreen	Name	Description
RESET	Reset button	The button is used to manually reset an MPU. • If the device has only one MPU, pressing this button will cause the device to restart. • If the device has double MPUs, the following situations may occur: – Pressing the reset button on the active MPU will trigger an active/standby switchover. – Pressing the reset button on the standby MPU will reset the standby MPU, which does not affect running of the system.

Ports

Figure 4-9 Ports on the CE-MPUD-HALF



1. Clock SMA port	2. USB port	3. ETH management port	4. Console port	5. External synchronization port CLK
6. External synchronization port TOD	7. GE electrical port	8. SFP+ optical port	9. Clock SFP port	-

Table 4-9 Ports on the CE-MPUD-HALF

Silkscreen	Name	Connector Type	Description
CLK/TEST	Clock SMA port	SMA	Connects to an external clock.
USB	USB port	USB Type A	Is used for USB-based deployment. It is recommended that the dimensions of the USB flash drive be less than 10 mm x 40 mm x 20 mm (H x W x D, 0.39 in. x 1.57 in. x 0.79 in.). If the dimensions of a USB flash drive are larger than this specification, an extension cable is required.
ETH	ETH management port	RJ45	Connects to the NMS workstation. This port can work at the rates of 10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s.
CONSOLE	Console port	RJ45	Connects to the control platform and implements onsite system configuration. The default baud rate is 9600 bit/s, and the baud rate is configurable.

Silkscreen	Name	Connector Type	Description
CLK	External synchronization port CLK	RJ45	Inputs or outputs 2-Mbit/s clock signals, 2-MHz clock signals, or 1 pps time signals.
TOD	External synchronization port TOD	RJ45	Inputs or outputs 1 pps and ASCII time signals or DCLS time signals.
GE0 and GE1	GE electrical port	RJ45	GE0 and SFP+0, and GE1 and SFP+1 form a SIP port respectively. The two SIP ports are used to establish stack management links. Each SIP port is a combo port that consists of a GE electrical port and an SFP+ optical port. If the GE electrical port and the SFP+ optical port of a combo port do not establish links at the same time, the one that establishes a link first is used. If the two ports establish links at the same time, the optical port is used by default. SFP+0 and SFP+1 support the following media: ● GE optical transceiver ● GE copper transceiver ● 10GE optical transceiver (excluding the DWDM optical transceiver)
SFP+0 and SFP+1	SFP+ optical port	SFP+/SFP	
HP-GE	Clock SFP port	SFP	High-precision clock SFP port

NOTE

The device does not support the CLK/TEST, CLK, TOD, and HP-GE ports.

Functions and Features

Table 4-10 Functions and features of the CE-MPUD-HALF

Function and Feature	Description
Device management and maintenance	The CE-MPUD-HALF provides management ports for managing and maintaining the system.
Device monitoring	The CE-MPUD-HALF integrates a monitoring module. The monitoring module provides the monitoring plane, which allows administrators to remotely power on, power off, and reset the card, upgrade firmware, monitor card temperature, voltage, and power, manage asset information, and diagnose system faults.
Out-of-band communication between cards	The CE-MPUD-HALF integrates a LAN switch module that provides out-of-band communication between cards. The LAN switch module completes control, monitoring, maintenance, and message exchange between SFUs and LPUs.
Route calculation	• The CE-MPUD-HALF processes all routing protocol packets, which are sent from the forwarding engine. • The CE-MPUD-HALF broadcasts and filters routing protocol packets, and downloads routing policies from the policy server.
Data configuration	The CE-MPUD-HALF stores system configuration data, startup files, upgrade software, and system logs.
Data saving	The CE-MPUD-HALF uses NAND flash to save data files.

Technical Specifications

Table 4-11 Technical specifications of the CE-MPUD-HALF

Item	Specification
Dimensions without packaging (H x W x D)	45.7 mm x 215 mm x 522.5 mm (1.80 in. x 8.46 in. x 20.57 in.)
Weight without packaging	3.1 kg (6.83 lb)
CPU	16-core, 1.85 GHz clock speed
Flash	4 GB
Memory	Standard 16 GB

Item	Specification
Typical power consumption	58 W
Maximum power consumption	82 W
Typical heat dissipation	198 BTU/hour
Maximum heat dissipation	280 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.2.2 CE-MPUD-HK (CE16800 Main Processing Unit D-HK (half-width))

The CE-MPUD-HK is the main processing unit of the device and is responsible for system control, management, and monitoring.

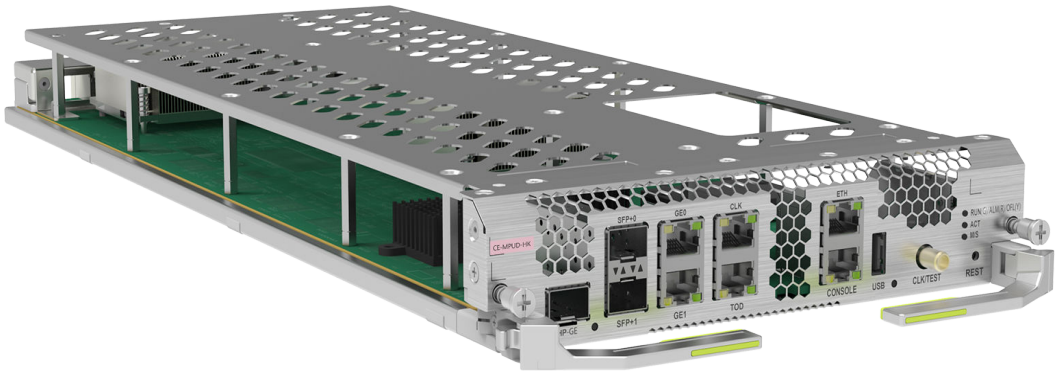
Overview

Table 4-12 Basic information about the CE-MPUD-HK

Item	Details
Description	CE16800 Main Processing Unit D-HK (half-width)
Part number	03059590
Silkscreen	CE-MPUD-HK
Model	CE-MPUD-HK
First supported version	V200R019C10

Appearance

Figure 4-10 Appearance of the CE-MPUD-HK



Version Mapping

Table 4-13 Chassis and version matching the CE-MPUD-HK

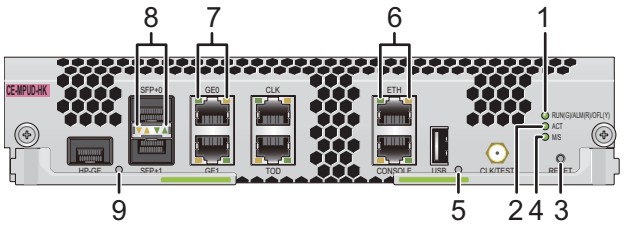
Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10

NOTE

In the same chassis, the CE-MPUD-HK cannot be installed together with an MPU of a different model.

Indicators and Buttons

Figure 4-11 Indicators and button on the CE-MPUD-HK



1. Running status indicator	2. Active/ Standby status indicator	3. Reset button	4. Stack status indicator	5. USB-based deployment indicator

6. ETH port indicator	7. GE electrical port indicator	8. SFP+ optical port indicator	9. High-precision clock optical module indicator	-

NOTE

The indicators on console, CLK, and TOD ports are not in use.

Table 4-14 Indicators on the CE-MPUD-HK

Silkscreen	Name	Color	Status	Description
RUN(G)/ ALM(R)/ OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	A fault that affects services has occurred and it cannot be rectified automatically (critical alarm about hardware), or the card has generated an alarm because the memory size is not equal to the standard specification.
			Fast blinking (4 Hz)	The system power is insufficient.
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
ACT	Active/ Standby	Green	Steady on	The card is the active MPU.

Silkscreen	Name	Color	Status	Description
	status indicator		Off	The card is the standby MPU.
M/S	Stack status indicator **NOTE** You can run the **dfs-master led enable** command to enable the stack status indicator to display the DFS group master and backup status. After this function is enabled, the stack status indicator on the DFS master device is steady on and that on the DFS backup device is off.	Green	Steady on	The stacking function is enabled, and the card is the active MPU of the stack.
			Slow blinking (0.5 Hz)	The stacking function is enabled, and the card is not the active MPU of the stack.
			Off	The stacking function is not enabled.
-	USB-based deployment indicator	Green	Steady on	USB-based deployment has been completed.

Silkscreen	Name	Color	Status	Description
			Blinking (4 Hz)	The system is reading data from a USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
-	ETH port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	GE electrical port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.

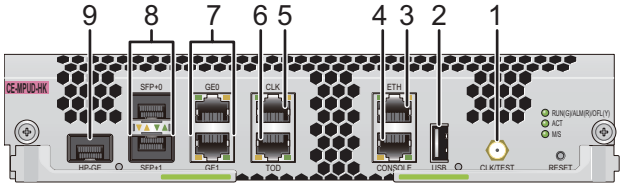
Silkscreen	Name	Color	Status	Description
	indicator		Off	The port is not transmitting or receiving data.
-	SFP+ optical port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	High-precision clock optical module indicator	Green	Steady on	The link on the port is connected.
			Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The link on the port is disconnected.

Table 4-15 Button on the CE-MPUD-HK

Silkscreen	Name	Description
RESET	Reset button	The button is used to manually reset an MPU. • If the switch has only one MPU, pressing this button will cause the switch to restart. • If the switch has double MPUs, the following situations may occur: – Pressing the reset button on the active MPU will trigger an active/standby switchover. – Pressing the reset button on the standby MPU will reset the standby MPU, which does not affect running of the system.

Ports

Figure 4-12 Ports on the CE-MPUD-HK



1. Clock SMA port	2. USB port	3. ETH management port	4. Console port	5. External synchronization port CLK
6. External synchronization port TOD	7. GE electrical port	8. SFP+ optical port	9. Clock SFP port	-

Table 4-16 Ports on the CE-MPUD-HK

Silkscreen	Name	Connector Type	Description
CLK/TEST	Clock SMA port	SMA	Connects to an external clock.

Silkscreen	Name	Connector Type	Description
USB	USB port	USB Type A	Is used for USB-based deployment. It is recommended that the dimensions of the USB flash drive be less than 10 mm x 40 mm x 20 mm (H x W x D, 0.39 in. x 1.57 in. x 0.78 in.). If the dimensions of a USB flash drive are larger than this specification, an extension cable is required.
ETH	ETH management port	RJ45	Connects to the NMS workstation.
CONSOLE	Console port	RJ45	Connects to the control platform and implements onsite system configuration. The default baud rate is 9600 bit/s, and the baud rate is configurable.
CLK	External synchronization port CLK	RJ45	Inputs or outputs 2-Mbit/s clock signals, 2-MHz clock signals, or 1 pps time signals.
TOD	External synchronization port TOD	RJ45	Inputs or outputs 1 pps and ASCII time signals or DCLS time signals.
GE0 and GE1	GE electrical port	RJ45	GE0 and SFP+0, and GE1 and SFP+1 form a SIP port respectively. The two SIP ports are used to establish stack management links. Each SIP port is a combo port that consists of a GE electrical port and an SFP+ optical port. If the GE electrical port and the SFP+ optical port of a combo port do not establish links at the same time, the one that establishes a link first is used. If the two ports establish links at the same time, the optical port is used by default.
SFP+0 and SFP+1	SFP+ optical port	SFP+/SFP	

Silkscreen	Name	Connector Type	Description
HP-GE	Clock SFP port	SFP	High-precision clock SFP port

NOTE

The device does not support time or clock synchronization.

Functions and Features

Table 4-17 Functions and features of the CE-MPUD-HK

Function and Feature	Description
Device management and maintenance	The CE-MPUD-HK provides management ports for managing and maintaining the system.
Device monitoring	The CE-MPUD-HK integrates a monitoring module. The monitoring module provides the monitoring plane, which allows administrators to remotely power on, power off, and reset the card, upgrade firmware, monitor card temperature, voltage, and power, manage asset information, and diagnose system faults.
Out-of-band communication between cards	The CE-MPUD-HK integrates a LAN switch module that provides out-of-band communication between cards. The LAN switch module completes control, monitoring, maintenance, and message exchange between SFUs and LPUs.
Route calculation	• The CE-MPUD-HK processes all routing protocol packets, which are sent from the forwarding engine. • The CE-MPUD-HK broadcasts and filters routing protocol packets, and downloads routing policies from the policy server.

Function and Feature	Description
Data configuration	The CE-MPUD-HK stores system configuration data, startup files, upgrade software, and system logs.
Data saving	The CE-MPUD-HK uses NAND flash to save data files.

Technical Specifications

Table 4-18 Technical specifications of the CE-MPUD-HK

Item	Specification
Dimensions without packaging (H x W x D)	45.7 mm x 215 mm x 522.5 mm (1.80 in. x 8.46 in. x 20.57 in.)
Weight without packaging	3.1 kg (6.83 lb)
CPU	16-core, 1.85 GHz clock speed
Flash	4 GB
Memory	Standard 16 GB
Typical power consumption	58 W
Maximum power consumption	82 W
Typical heat dissipation	198 BTU/hour
Maximum heat dissipation	280 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.2.3 CE-MPUE-HALF (CE16800 Main Processing Unit E (half-width))

The CE-MPUE-HALF is the main processing unit of the device and is responsible for system control, management, and monitoring.

Overview

Table 4-19 Basic information about the CE-MPUE-HALF

Item	Details
Description	CE16800 Main Processing Unit E (half-width)
Part number	03059364
Silkscreen	CE-MPUE-HALF
Model	CE-MPUE-HALF
First supported version	V200R019C10

Appearance

Figure 4-13 Appearance of the CE-MPUE-HALF

Version Mapping

Table 4-20 Chassis and version matching the CE-MPUE-HALF

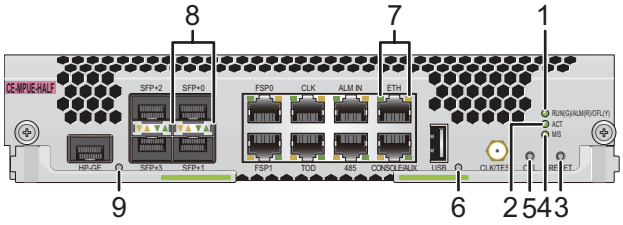
Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10

NOTE

In the same chassis, the CE-MPUE-HALF can be installed together with an MPU of a different model.

Indicators and Buttons

Figure 4-14 Indicators and buttons on the CE-MPUE-HALF



1. Running status indicator	2. Active/ Standby status indicator	3. Reset button	4. Stack status indicator	5. OFL button
6. USB-based deployment indicator	7. ETH port indicator	8. SFP+ optical port indicator	9. High-precision clock optical module indicator	-

NOTE

The indicators on console, ALMIN, RS485, CLK, TOD, and FSP ports are not in use.

Table 4-21 Indicators on the CE-MPUE-HALF

Silkscreen	Name	Color	Status	Description
RUN(G)/ ALM(R)/ OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	A fault that affects services has occurred and it cannot be rectified automatically (critical alarm about hardware), or the card has generated an alarm because the memory size is not equal to the standard specification.
			Fast blinking (4 Hz)	The system power is insufficient.
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
ACT	Active/ Standby status indicator	Green	Steady on	The card is the active MPU.
			Off	The card is the standby MPU.
M/S	Stack status indicator **NOTE** You can run the **dfs-master led enable** command to enable the stack status indicator to display the DFS group master and backup status. After this function is enabled, the stack status indicator on the DFS master device is steady on and that on the DFS backup device is off.	Green	Steady on	The stacking function is enabled, and the card is the active MPU of the stack. **NOTE** SIP ports on the CE-MPUE-HALF do not support the stacking function.
			Slow blinking (0.5 Hz)	The stacking function is enabled, and the card is not the active MPU of the stack.
			Off	The stacking function is not enabled.
-	USB-based deployment indicator	Green	Steady on	USB-based deployment has been completed.

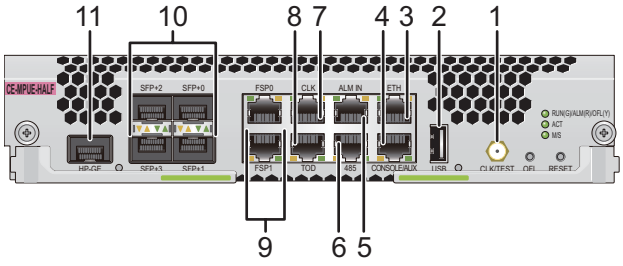
Silkscreen	Name	Color	Status	Description
			Blinking (4 Hz)	The system is reading data from a USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
-	ETH port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	SFP+ optical port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	High-precision clock optical module indicator	Green	Steady on	The link on the port is connected.
			Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The link on the port is disconnected.

Table 4-22 Buttons on the CE-MPUE-HALF

Silkscreen	Name	Description
RESET	Reset button	The button is used to manually reset an MPU. • If the device has only one MPU, pressing this button will cause the device to restart. • If the device has two MPUs: – Pressing the reset button on the active MPU will trigger an active/standby switchover. – Pressing the reset button on the standby MPU will reset the standby MPU, which does not affect running of the system.
OFL	OFL button	The button is used to power off the MPU and collect logs. To implement this, you need to press and hold down the OFL button for about 6 seconds.

Ports

Figure 4-15 Ports on the CE-MPUE-HALF



1. Clock SMA port	2. USB port	3. ETH management port	4. Console port	5. Boolean alarm input port
6. RS485 port	7. External synchronization port CLK	8. External synchronization port TOD	9. FSP serial port	10. SFP+ optical port
11. Clock SFP port	-	-	-	-

Table 4-23 Ports on the CE-MPUE-HALF

Silkscreen	Name	Connector Type	Description
CLK/TEST	Clock SMA port	SMA	Connects to an external clock.
USB	USB port	USB Type A	Is used for USB-based deployment. It is recommended that the dimensions of the USB flash drive be less than 10 mm x 40 mm x 20 mm (H x W x D, 0.39 in. x 1.57 in. x 0.79 in.). If the dimensions of a USB flash drive are larger than this specification, an extension cable is required.
ETH	ETH management port	RJ45	Connects to the NMS workstation. The port can work at the rates of 10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s.
CONSOLE/AUX	Console port	RJ45	Connects to the control platform and implements onsite system configuration. The default baud rate is 9600 bit/s, and the baud rate is configurable.
ALMIN	Boolean input port	RJ45	Functions as a port for Boolean detection.
485	RS485 port	RJ45	Is an RS485 monitoring/management port.
CLK	External synchronization port CLK	RJ45	Inputs or outputs 2-Mbit/s clock signals, 2-MHz clock signals, or 1 pps time signals.
TOD	External synchronization port TOD	RJ45	Inputs or outputs 1 pps and ASCII time signals or DCLS time signals.
FSP0 and FSP1	FSP serial port	RJ45	Functions as a port for fast inter-chassis switchovers.
SFP+0, SFP+1, SFP+2, and SFP+3	SFP+ optical port	SFP+/SFP	Are four mutually independent 10GE optical ports that are dedicated to establishing stack management links. **NOTE** SIP ports on the CE-MPUE-HALF do not support the stacking function.
HP-GE	Clock SFP port	SFP	Is a high-precision clock SFP port.

NOTE

The device does not support the CLK/TEST, ALMIN, 485, CLK, TOD, FSP0, FSP1, and HP-GE ports.

Functions and Features

Table 4-24 Functions and features of the CE-MPUE-HALF

Function and Feature	Description
Device management and maintenance	The CE-MPUE-HALF provides management ports for managing and maintaining the system.
Device monitoring	The CE-MPUE-HALF integrates a monitoring module. The monitoring module provides the monitoring plane, which allows administrators to remotely power on, power off, and reset the card, upgrade firmware, monitor card temperature, voltage, and power, manage asset information, and diagnose system faults.
Out-of-band communication between cards	The CE-MPUE-HALF integrates a LAN switch module that provides out-of-band communication between cards. The LAN switch module completes control, monitoring, maintenance, and message exchange between SFUs and LPUs.
Route calculation	• The CE-MPUE-HALF processes all routing protocol packets, which are sent from the forwarding engine. • The CE-MPUE-HALF broadcasts and filters routing protocol packets, and downloads routing policies from the policy server.
Data configuration	The CE-MPUE-HALF stores system configuration data, startup files, upgrade software, and system logs.
Data saving	The CE-MPUE-HALF uses NAND flash to save data files.

Technical Specifications

Table 4-25 Technical specifications of the CE-MPUE-HALF

Item	Specification
Dimensions without packaging (H x W x D)	45.7 mm x 215 mm x 522.5 mm (1.80 in. x 8.46 in. x 20.57 in.)
Weight without packaging	4.0 kg
CPU	24-core, 2.5 GHz clock speed
Flash	32 GB SSD
Memory	Standard configuration: 32 GB (Three DIMMs can be configured to expand the memory to 96 GB.)
Typical power consumption	116 W
Maximum power consumption	145 W
Typical heat dissipation	396 BTU/hour
Maximum heat dissipation	495 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.2.4 CE-MPUD-FULL (CE16800 Main Processing Unit D (full-width))

The CE-MPUD-FULL is the main processing unit of the device and is responsible for system control, management, and monitoring.

Overview

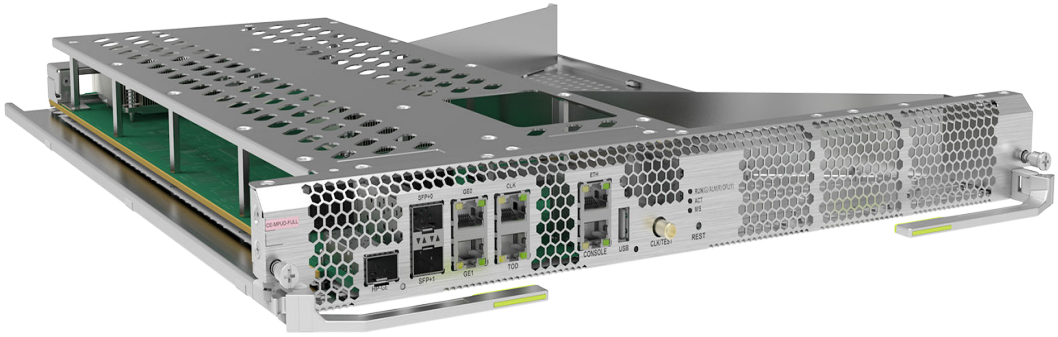
Table 4-26 Basic information about the CE-MPUD-FULL

Item	Details
Description	CE16800 Main Processing Unit D (full-width)
Part number	03058877

Item	Details
Silkscreen	CE-MPUD-FULL
Model	CE-MPUD-FULL
First supported version	V200R005C20

Appearance

Figure 4-16 Appearance of the CE-MPUD-FULL



Version Mapping

Table 4-27 Chassis and version matching the CE-MPUD-FULL

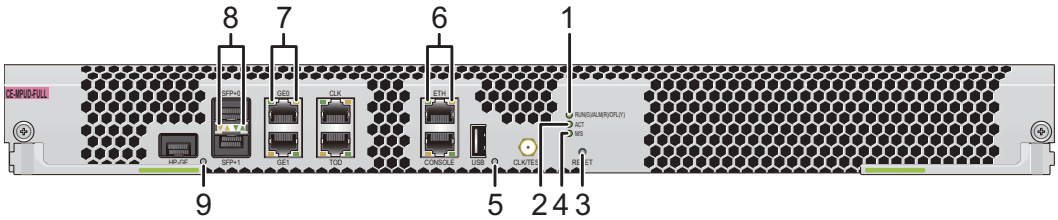
Chassis	First Supported Version
CloudEngine 16816	V200R005C20

NOTE

In the same chassis, the CE-MPUD-FULL cannot be installed together with an MPU of a different model.

Indicators and Buttons

Figure 4-17 Indicators and button on the CE-MPUD-FULL



1. Running status indicator	2. Active/ Standby status indicator	3. Reset button	4. Stack status indicator	5. USB-based deployment indicator
6. ETH port indicator	7. GE electrical port indicator	8. SFP+ optical port indicator	9. High-precision clock optical transceiver indicator	-

NOTE

The indicators on console, CLK, and TOD ports are not in use.

Table 4-28 Indicators on the CE-MPUD-FULL

Silkscreen	Name	Color	Status	Description
RUN(G)/ ALM(R)/ OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	A fault that affects services has occurred and it cannot be rectified automatically (critical alarm about hardware), or the card has generated an alarm because the memory size is not equal to the standard specification.
			Fast blinking (4 Hz)	The system power is insufficient.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
ACT	Active/ Standby status indicator	Green	Steady on	The card is the active MPU.
			Off	The card is the standby MPU.
M/S	Stack status indicator **NOTE** You can run the **dfs-master led enable** command to enable the stack status indicator to display the DFS group master and backup status. After this function is enabled, the stack status indicator on the DFS master device is steady on and that on the DFS backup device is off.	Green	Steady on	The stacking function is enabled, and the card is the active MPU of the stack.
			Slow blinking (0.5 Hz)	The stacking function is enabled, and the card is not the active MPU of the stack.
			Off	The stacking function is not enabled.

Silkscreen	Name	Color	Status	Description
-	USB-based deployment indicator	Green	Steady on	USB-based deployment has been completed.
			Blinking (4 Hz)	The system is reading data from a USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
-	ETH port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	GE electrical port indicator Two single-color indicators for each port: ● Green: LINK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.

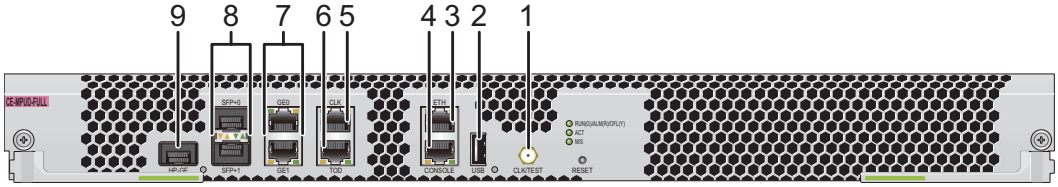
Silkscreen	Name	Color	Status	Description
	• Yellow: ACK indicator		Off	The port is not transmitting or receiving data.
-	SFP+ optical port indicator Two single-color indicators for each port: • Green: LINK indicator • Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	High-precision clock optical transceiver indicator	Green	Steady on	The link on the port is connected.
			Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The link on the port is disconnected.

Table 4-29 Button on the CE-MPUD-FULL

Silkscreen	Name	Description
RESET	Reset button	The button is used to manually reset an MPU. • If the switch has only one MPU, pressing this button will cause the switch to restart. • If the switch has double MPUs, the following situations may occur: – Pressing the reset button on the active MPU will trigger an active/standby switchover. – Pressing the reset button on the standby MPU will reset the standby MPU, which does not affect running of the system.

Ports

Figure 4-18 Ports on the CE-MPUD-FULL



1. Clock SMA port	2. USB port	3. ETH management port	4. Console port	5. External synchronization port CLK
6. External synchronization port TOD	7. GE electrical port	8. SFP+ optical port	9. Clock SFP port	-

Table 4-30 Ports on the CE-MPUD-FULL

Silk screen	Name	Connector Type	Description
CLK / TEST	Clock SMA port	SMA	Connects to an external clock.

Silkscreen	Name	Connector Type	Description
USB	USB port	USB Type A	Is used for USB-based deployment.
ETH	ETH management port	RJ45	Connects to the NMS workstation. This port can work at the rates of 10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s.
CONSOLE	Console port	RJ45	Connects to the control platform and implements onsite system configuration. The default baud rate is 9600 bit/s, and the baud rate is configurable.
CLK	External synchronization port CLK	RJ45	Inputs or outputs 2-Mbit/s clock signals, 2-MHz clock signals, or 1 pps time signals.
TOD	External synchronization port TOD	RJ45	Inputs or outputs 1 pps and ASCII time signals or DCLS time signals.
GE0 and GE1	GE electrical port	RJ45	GE0 and SFP+0, and GE1 and SFP+1 form a SIP port respectively. The two SIP ports are used to establish stack management links. Each SIP port is a combo port that consists of a GE electrical port and an SFP+ optical port. If the GE electrical port and the SFP+ optical port of a combo port do not establish links at the same time, the one that establishes a link first is used. If the two ports establish links at the same time, the optical port is used by default. SFP+0 and SFP+1 support the following media: • GE optical transceiver • GE copper transceiver • 10GE optical transceiver (excluding DWDM optical transceiver)
SFP+0 and SFP+1	SFP+ optical port	SFP+/SFP	

Silkscreen	Name	Connector Type	Description
HP-GE	Clock SFP port	SFP	High-precision clock SFP port

NOTE

The device does not support the CLK/TEST, CLK, TOD, and HP-GE ports.

Functions and Features

Table 4-31 Functions and features of the CE-MPUD-FULL

Function and Feature	Description
Device management and maintenance	The CE-MPUD-FULL provides management ports for managing and maintaining the system.
Device monitoring	The CE-MPUD-FULL integrates a monitoring module. The monitoring module provides the monitoring plane, which allows administrators to remotely power on, power off, and reset the card, upgrade firmware, monitor card temperature, voltage, and power, manage asset information, and diagnose system faults.
Out-of-band communication between cards	The CE-MPUD-FULL integrates a LAN switch module that provides out-of-band communication between cards. The LAN switch module completes control, monitoring, maintenance, and message exchange between SFUs and LPUs.
Route calculation	• The CE-MPUD-FULL processes all routing protocol packets, which are sent from the forwarding engine. • The CE-MPUD-FULL broadcasts and filters routing protocol packets, and downloads routing policies from the policy server.

Function and Feature	Description
Data configuration	The CE-MPUD-FULL stores system configuration data, startup files, upgrade software, and system logs.
Data saving	The CE-MPUD-FULL uses NAND flash to save data files.

Technical Specifications

Table 4-32 Technical specifications of the CE-MPUD-FULL

Item	Specification
Dimensions without packaging (H x W x D)	45.7 mm x 433 mm x 522.5 mm (1.80 in. x 17.05 in. x 20.57 in.)
Weight without packaging	4.3 kg (9.48 lb)
CPU	16-core, 1.85 GHz clock speed
Flash	4 GB
Memory	Standard 16 GB
Typical power consumption	58 W
Maximum power consumption	82 W
Typical heat dissipation	198 BTU/hour
Maximum heat dissipation	280 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.2.5 CE-MPUD-FK (CE16800 Main Processing Unit D-FK (full-width))

The CE-MPUD-FK is the main processing unit of the device and is responsible for system control, management, and monitoring.

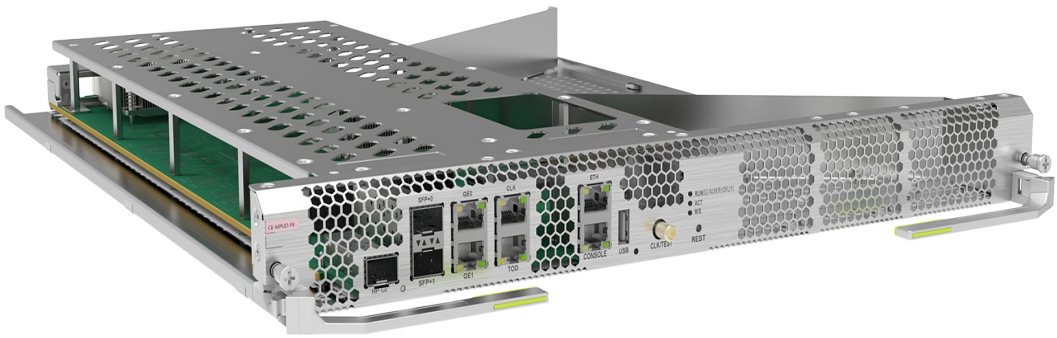
Overview

Table 4-33 Basic information about the CE-MPUD-FK

Item	Details
Description	CE16800 Main Processing Unit D-FK (full-width)
Part number	03059636
Silkscreen	CE-MPUD-FK
Model	CE-MPUD-FK
First supported version	V200R019C10

Appearance

Figure 4-19 Appearance of the CE-MPUD-FK



Version Mapping

Table 4-34 Chassis and version matching the CE-MPUD-FK

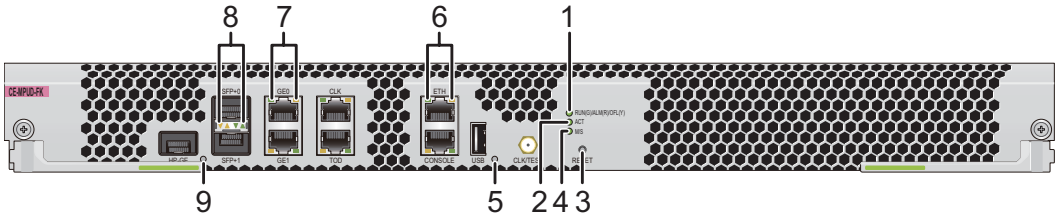
Chassis	First Supported Version
CloudEngine 16816	V200R019C10

NOTE

In the same chassis, the CE-MPUD-FK cannot be installed together with an MPU of a different model.

Indicators and Buttons

Figure 4-20 Indicators and button on the CE-MPUD-FK



1. Running status indicator	2. Active/ Standby status indicator	3. Reset button	4. Stack status indicator	5. USB-based deployment indicator
6. ETH port indicator	7. GE electrical port indicator	8. SFP+ optical port indicator	9. High-precision clock optical module indicator	-

NOTE

The indicators on console, CLK, and TOD ports are not in use.

Table 4-35 Indicators on the CE-MPUD-FK

Silkscreen	Name	Color	Status	Description
RUN(G)/ ALM(R)/ OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	A fault that affects services has occurred and it cannot be rectified automatically (critical alarm about hardware), or the card has generated an alarm because the memory size is not equal to the standard specification.
			Fast blinking (4 Hz)	The system power is insufficient.
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
ACT	Active/ Standby status indicator	Green	Steady on	The card is the active MPU.
			Off	The card is the standby MPU.
M/S	Stack status indicator	Green	Steady on	The stacking function is enabled, and the card is the active MPU of the stack.
			Slow blinking (0.5 Hz)	The stacking function is enabled, and the card is not the active MPU of the stack.

Silkscreen	Name	Color	Status	Description
	NOTE You can run the **dfs-master led enable** command to enable the stack status indicator to display the DFS group master and backup status. After this function is enabled, the stack status indicator on the DFS master device is steady on and that on the DFS backup device is off.		Off	The stacking function is not enabled.
-	USB-based deployment indicator	Green	Steady on	USB-based deployment has been completed.
			Blinking (4 Hz)	The system is reading data from a USB flash drive.
		Red	Steady on	USB-based deployment fails.

Silkscreen	Name	Color	Status	Description
		-	Off	USB-based deployment is disabled (default state).
-	ETH port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	GE electrical port indicator Two single-color indicators for each port: ● Green: LINK indicator ● Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	SFP+ optical port indicator Two single-	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.

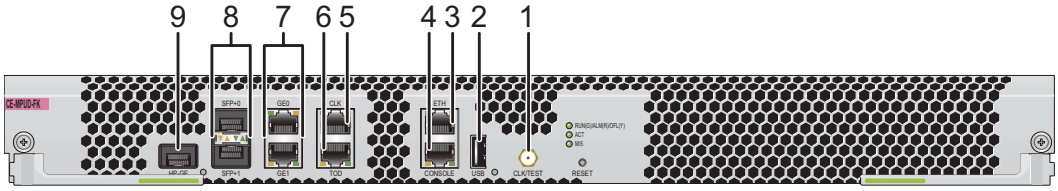
Silkscreen	Name	Color	Status	Description
	color indicators for each port: • Green: LINK indicator • Yellow: ACK indicator	Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	High-precision clock optical module indicator	Green	Steady on	The link on the port is connected.
			Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The link on the port is disconnected.

Table 4-36 Button on the CE-MPUD-FK

Silkscreen	Name	Description
RESET	Reset button	The button is used to manually reset an MPU. • If the switch has only one MPU, pressing this button will cause the switch to restart. • If the switch has double MPUs, the following situations may occur: – Pressing the reset button on the active MPU will trigger an active/standby switchover. – Pressing the reset button on the standby MPU will reset the standby MPU, which does not affect running of the system.

Ports

Figure 4-21 Ports on the CE-MPUD-FK



1. Clock SMA port	2. USB port	3. ETH management port	4. Console port	5. External synchronization port CLK
6. External synchronization port TOD	7. GE electrical port	8. SFP+ optical port	9. Clock SFP port	-

Table 4-37 Ports on the CE-MPUD-FK

Silkscreen	Name	Connector Type	Description
CLK/TEST	Clock SMA port	SMA	Connects to an external clock.
USB	USB port	USB Type A	Is used for USB-based deployment.
ETH	ETH management port	RJ45	Connects to the NMS workstation.
CONSOLE	Console port	RJ45	Connects to the control platform and implements onsite system configuration. The default baud rate is 9600 bit/s, and the baud rate is configurable.

Silkscreen	Name	Connector Type	Description
CLK	External synchronization port CLK	RJ45	Inputs or outputs 2-Mbit/s clock signals, 2-MHz clock signals, or 1 pps time signals.
TOD	External synchronization port TOD	RJ45	Inputs or outputs 1 pps and ASCII time signals or DCLS time signals.
GE0 and GE1	GE electrical port	RJ45	GE0 and SFP+0, and GE1 and SFP+1 form a SIP port respectively. The two SIP ports are used to establish stack management links. Each SIP port is a combo port that consists of a GE electrical port and an SFP+ optical port. If the GE electrical port and the SFP+ optical port of a combo port do not establish links at the same time, the one that establishes a link first is used. If the two ports establish links at the same time, the optical port is used by default.
SFP+0 and SFP+1	SFP+ optical port	SFP+/SFP	
HP-GE	Clock SFP port	SFP	High-precision clock SFP port

NOTE

The switch does not support time or clock synchronization.

Functions and Features

Table 4-38 Functions and features of the CE-MPUD-FK

Function and Feature	Description
Device management and maintenance	The CE-MPUD-FK provides management ports for managing and maintaining the system.
Device monitoring	The CE-MPUD-FK integrates a monitoring module. The monitoring module provides the monitoring plane, which allows administrators to remotely power on, power off, and reset the card, upgrade firmware, monitor card temperature, voltage, and power, manage asset information, and diagnose system faults.
Out-of-band communication between cards	The CE-MPUD-FK integrates a LAN switch module that provides out-of-band communication between cards. The LAN switch module completes control, monitoring, maintenance, and message exchange between SFUs and LPUs.
Route calculation	• The CE-MPUD-FK processes all routing protocol packets, which are sent from the forwarding engine. • The CE-MPUD-FK broadcasts and filters routing protocol packets, and downloads routing policies from the policy server.
Data configuration	The CE-MPUD-FK stores system configuration data, startup files, upgrade software, and system logs.
Data saving	The CE-MPUD-FK uses NAND flash to save data files.

Technical Specifications

Table 4-39 Technical specifications of the CE-MPUD-FK

Item	Specification
Dimensions without packaging (H x W x D)	45.7 mm x 433 mm x 522.5 mm (1.80 in. x 17.05 in. x 20.57 in.)
Weight without packaging	4.3 kg (9.48 lb)
CPU	16-core, 1.85 GHz clock speed
Flash	4 GB
Memory	Standard 16 GB
Typical power consumption	58 W
Maximum power consumption	82 W
Typical heat dissipation	198 BTU/hour
Maximum heat dissipation	280 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.2.6 CE-MPUE-FULL (CE16800 Main Processing Unit E (full-width))

The CE-MPUE-FULL is the main processing unit of the device and is responsible for system control, management, and monitoring.

Overview

Table 4-40 Basic information about the CE-MPUE-FULL

Item	Details
Description	CE16800 Main Processing Unit E (full-width)
Part number	03059365
Silkscreen	CE-MPUE-FULL
Model	CE-MPUE-FULL
First supported version	V200R019C10

Appearance

Figure 4-22 Appearance of the CE-MPUE-FULL

Version Mapping

Table 4-41 Chassis and version matching the CE-MPUE-FULL

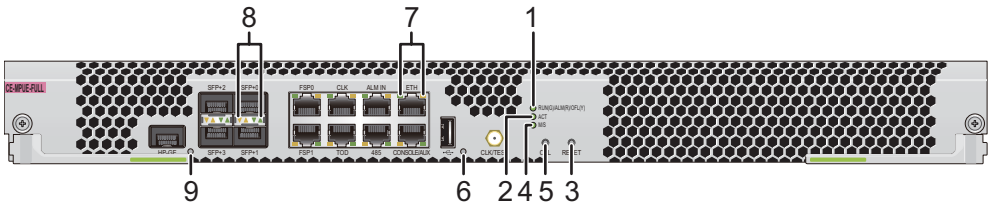
Chassis	First Supported Version
CloudEngine 16816	V200R019C10

NOTE

In the same chassis, the CE-MPUE-FULL cannot be installed together with an MPU of a different model.

Indicators and Buttons

Figure 4-23 Indicators and buttons on the CE-MPUE-FULL



1. Running status indicator	2. Active/ Standby status indicator	3. Reset button	4. Stack status indicator	5. OFL button
6. USB-based deployment indicator	7. ETH port indicator	8. SFP+ optical port indicator	9. High-precision clock optical transceiver indicator	-

NOTE

The indicators on console, ALMIN, RS485, CLK, TOD, and FSP ports are not in use.

Table 4-42 Indicators on the CE-MPUE-FULL

Silkscreen	Name	Color	Status	Description
RUN(G)/ ALM(R)/ OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	A fault that affects services has occurred and it cannot be rectified automatically (critical alarm about hardware), or the card has generated an alarm because the memory size is not equal to the standard specification.

Silkscreen	Name	Color	Status	Description
			Fast blinking (4 Hz)	The system power is insufficient.
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
ACT	Active/ Standby status indicator	Green	Steady on	The card is the active MPU.
			Off	The card is the standby MPU.
M/S	Stack status indicator **NOTE** You can run the **dfs-master led enable** command to enable the stack status indicator to display the DFS group master and backup status. After this function is enabled, the stack status indicator on the DFS master device is steady on and that on the DFS backup device is off.	Green	Steady on	The stacking function is enabled, and the card is the active MPU of the stack. **NOTE** SIP ports on the CE-MPUE-FULL do not support the stacking function.
			Slow blinking (0.5 Hz)	The stacking function is enabled, and the card is not the active MPU of the stack.
			Off	The stacking function is not enabled.
-	USB-based deployment indicator	Green	Steady on	USB-based deployment has been completed.
			Blinking (4 Hz)	The system is reading data from a USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).

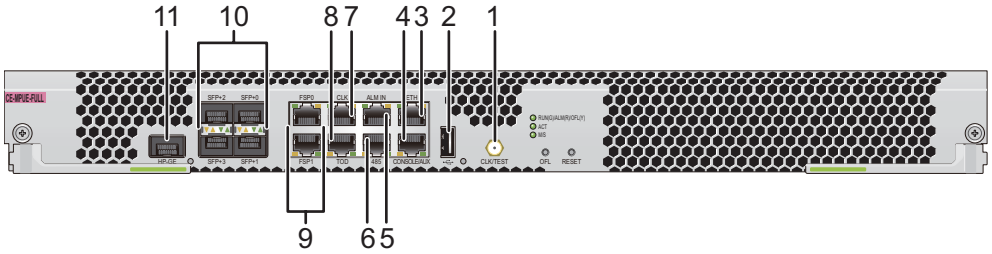
Silkscreen	Name	Color	Status	Description
-	ETH port indicator Two single-color indicators for each port: • Green: LINK indicator • Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	SFP+ optical port indicator Two single-color indicators for each port: • Green: LINK indicator • Yellow: ACK indicator	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.
-	High-precision clock optical transceiver indicator	Green	Steady on	The link on the port is connected.
			Blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The link on the port is disconnected.

Table 4-43 Buttons on the CE-MPUE-FULL

Silkscreen	Name	Description
RESET	Reset button	The button is used to manually reset an MPU. • If the device has only one MPU, pressing this button will cause the device to restart. • If the device has two MPUs: – Pressing the reset button on the active MPU will trigger an active/standby switchover. – Pressing the reset button on the standby MPU will reset the standby MPU, which does not affect running of the system.
OFL	OFL button	The button is used to power off the MPU and collect logs. To implement this, you need to press and hold down the OFL button for about 6 seconds.

Ports

Figure 4-24 Ports on the CE-MPUE-FULL



1. Clock SMA port	2. USB port	3. ETH management port	4. Console port	5. Boolean alarm input port
6. RS485 port	7. External synchronization port CLK	8. External synchronization port TOD	9. FSP serial port	10. SFP+ optical port
11. Clock SFP port	-	-	-	-

Table 4-44 Ports on the CE-MPUE-FULL

Silkscreen	Name	Connector Type	Description
CLK/TEST	Clock SMA port	SMA	Connects to an external clock.
USB	USB port	USB Type A	Is used for USB-based deployment.
ETH	ETH management port	RJ45	Connects to the NMS workstation. This port can work at the rates of 10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s.
CONSOLE/AUX	Console port	RJ45	Connects to the control platform and implements onsite system configuration. The default baud rate is 9600 bit/s, and the baud rate is configurable.
ALMIN	Boolean input port	RJ45	Functions as a port for Boolean detection.
485	RS485 port	RJ45	Is an RS485 monitoring/management port.
CLK	External synchronization port CLK	RJ45	Inputs or outputs 2-Mbit/s clock signals, 2-MHz clock signals, or 1 pps time signals.
TOD	External synchronization port TOD	RJ45	Inputs or outputs 1 pps and ASCII time signals or DCLS time signals.
FSP0 and FSP1	FSP serial port	RJ45	Functions as a port for fast inter-chassis switchovers.
SFP+0, SFP+1, SFP+2, and SFP+3	SFP+ optical port	SFP+/SFP	Are four mutually independent 10GE optical ports that are dedicated to establishing stack management links. **NOTE** SIP ports on the CE-MPUE-FULL do not support the stacking function.
HP-GE	Clock SFP port	SFP	Is a high-precision clock SFP port.

NOTE

The device does not support the ALMIN, 485, CLK, TOD, FSP0, FSP1, and HP-GE ports.

Functions and Features

Table 4-45 Functions and features of the CE-MPUE-FULL

Function and Feature	Description
Device management and maintenance	The CE-MPUE-FULL provides management ports for managing and maintaining the system.
Device monitoring	The CE-MPUE-FULL integrates a monitoring module. The monitoring module provides the monitoring plane, which allows administrators to remotely power on, power off, and reset the card, upgrade firmware, monitor card temperature, voltage, and power, manage asset information, and diagnose system faults.
Out-of-band communication between cards	The CE-MPUE-FULL integrates a LAN switch module that provides out-of-band communication between cards. The LAN switch module completes control, monitoring, maintenance, and message exchange between SFUs and LPUs.
Route calculation	• The CE-MPUE-FULL processes all routing protocol packets, which are sent from the forwarding engine. • The CE-MPUE-FULL broadcasts and filters routing protocol packets, and downloads routing policies from the policy server.
Data configuration	The CE-MPUE-FULL stores system configuration data, startup files, upgrade software, and system logs.
Data saving	The CE-MPUE-FULL uses NAND flash to save data files.

Technical Specifications

Table 4-46 Technical specifications of the CE-MPUE-FULL

Item	Specification
Dimensions without packaging (H x W x D)	45.7 mm x 433 mm x 522.5 mm (1.80 in. x 17.05 in. x 20.57 in.)

Item	Specification
Weight without packaging	5.1 kg
CPU	24-core, 2.5 GHz clock speed
Flash	32 GB SSD
Memory	Standard configuration: 32 GB (Three DIMMs can be configured to expand the memory to 96 GB.)
Typical power consumption	116 W
Maximum power consumption	145 W
Typical heat dissipation	396 BTU/hour
Maximum heat dissipation	495 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3 Switch Fabric Units

4.3.1 CE-SFU04G-G (CE16804 Switch Fabric Unit G)

The CE-SFU04G-G functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

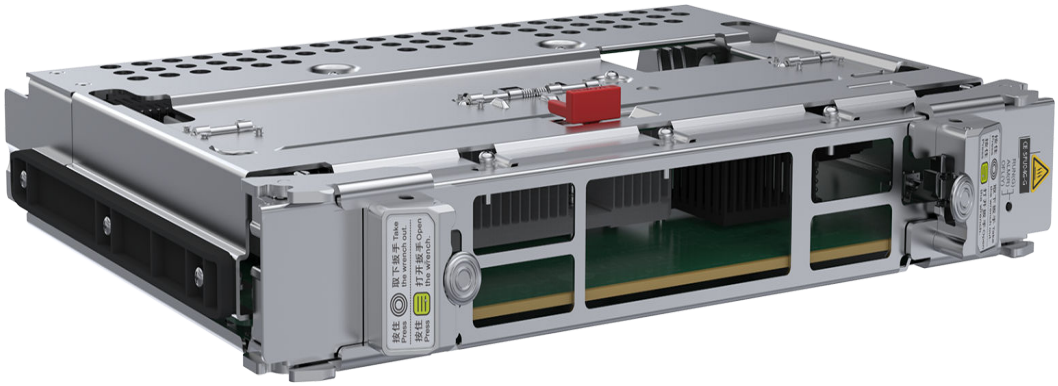
Overview

Table 4-47 Basic information about the CE-SFU04G-G

Item	Details
Description	CE16804 Switch Fabric Unit G
Part number	03058880
Silkscreen	CE-SFU04G-G
Model	CE-SFU04G-G
First supported version	V200R005C20

Appearance

Figure 4-25 Appearance of the CE-SFU04G-G



Version Mapping

Table 4-48 Chassis and version matching the CE-SFU04G-G

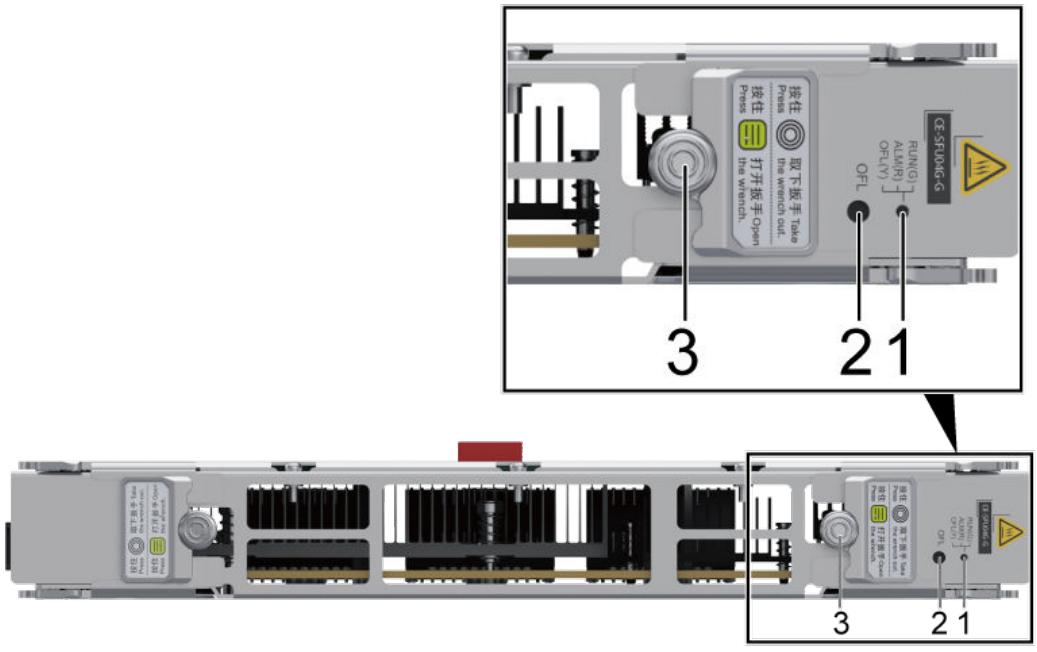
Chassis	First Supported Version
CloudEngine 16804	V200R005C20

NOTE

SFUs of the CE-SFU04G-G cannot be installed together with SFUs of other models in the same chassis.

Indicators and Buttons

Figure 4-26 Indicator and buttons on the CE-SFU04G-G



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-49 Indicator on the CE-SFU04G-G

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-50 Buttons on the CE-SFU04G-G

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU04G-G is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU04G-G does not provide any ports.

Functions and Features

Table 4-51 Functions and features of the CE-SFU04G-G

Function and Feature	Description
Line-rate data switching	Six CE-SFU04G-G cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-52 Technical specifications of the CE-SFU04G-G

Item	Specification
Dimensions without packaging (H x W x D)	316.5 mm x 233.6 mm x 42.4 mm
Weight without packaging	3.3 kg
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	87 W
Maximum power consumption	128 W
Typical heat dissipation	297BTU/hour
Maximum heat dissipation	437 BTU/hour

Item	Specification
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.2 CE-SFU04G-GK (CE16804 Switch Fabric Unit GK)

The CE-SFU04G-GK functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

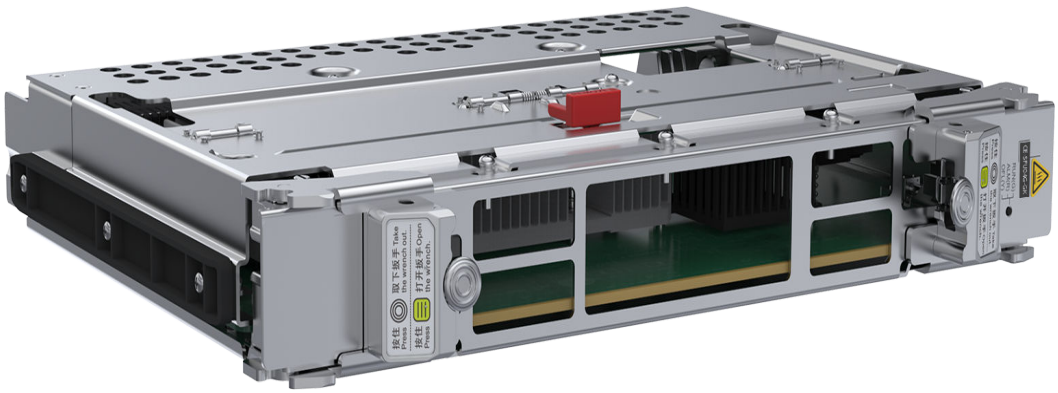
Overview

Table 4-53 Basic information about the CE-SFU04G-GK

Item	Details
Description	CE16804 Switch Fabric Unit GK
Part number	03059596
Silkscreen	CE-SFU04G-GK
Model	CE-SFU04G-GK
First supported version	V200R019C10

Appearance

Figure 4-27 Appearance of the CE-SFU04G-GK



Version Mapping

Table 4-54 Chassis and version matching the CE-SFU04G-GK

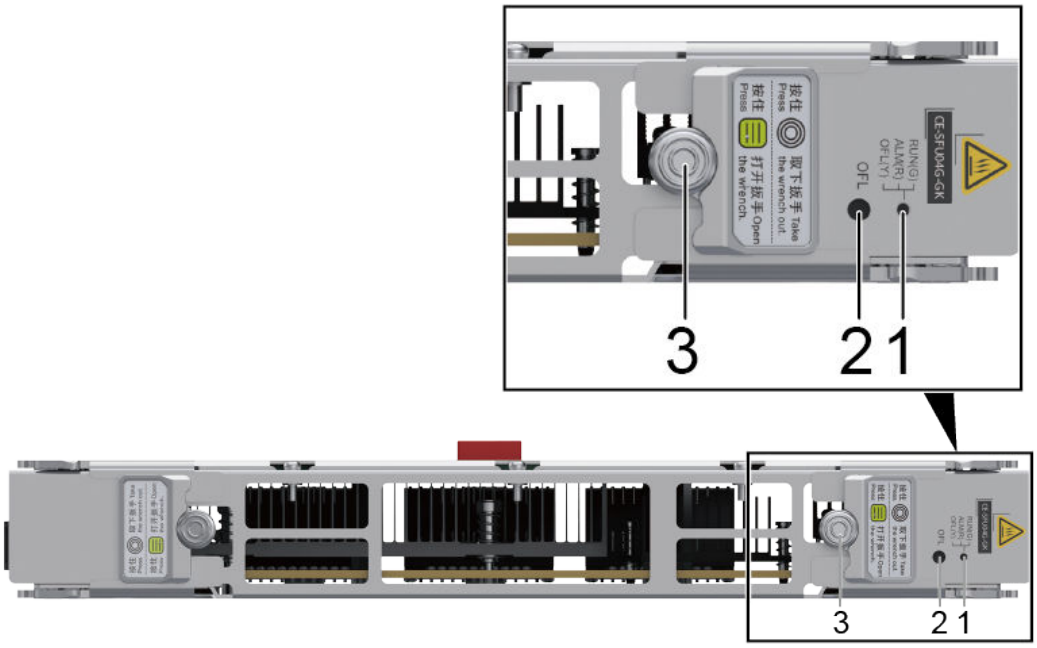
Chassis	First Supported Version
CloudEngine 16804	V200R019C10

NOTE

The CE-SFU04G-GK and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-28 Indicator and buttons on the CE-SFU04G-GK



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-55 Indicator on the CE-SFU04G-GK

Silkscreen	Name	Color	Status	Description
RUN(G)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.

Silkscreen	Name	Color	Status	Description
ALM(R) OFL(Y)			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-56 Buttons on the CE-SFU04G-GK

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU04G-GK is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU04G-GK does not provide any ports.

Functions and Features

Table 4-57 Functions and features of the CE-SFU04G-GK

Function and Feature	Description
Line-rate data switching	Six CE-SFU04G-GK cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-58 Technical specifications of the CE-SFU04G-GK

Item	Specification
Dimensions without packaging (H x W x D)	316.5 mm x 42.4 mm x 233.6 mm (12.46 in. x 1.67 in. x 9.20 in.)
Weight without packaging	3.3 kg (7.28 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	87 W
Maximum power consumption	128 W
Typical heat dissipation	297 BTU/hour
Maximum heat dissipation	437 BTU/hour

Item	Specification
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.3 CE-SFU04F-G (CE16804 Switch Fabric Unit F)

The CE-SFU04F-G functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

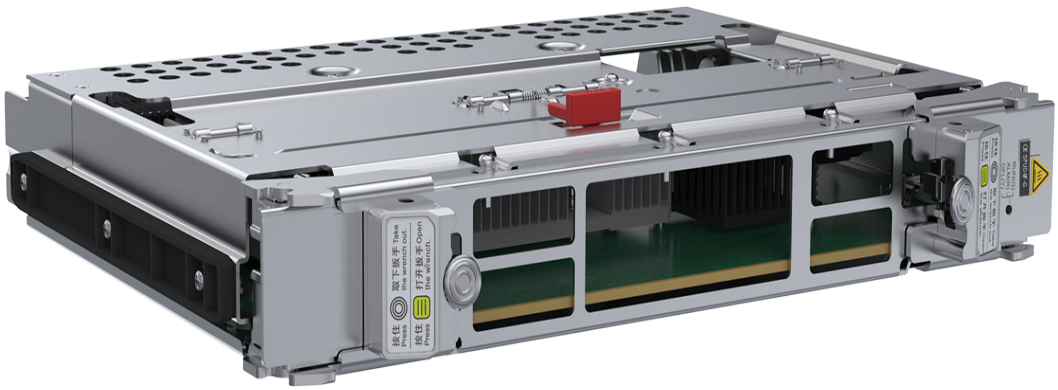
Overview

Table 4-59 Basic information about the CE-SFU04F-G

Item	Details
Description	CE16804 Switch Fabric Unit F
Part number	03058881
Silkscreen	CE-SFU04F-G
Model	CE-SFU04F-G
First supported version	V200R005C20

Appearance

Figure 4-29 Appearance of the CE-SFU04F-G



Version Mapping

Table 4-60 Chassis and version matching the CE-SFU04F-G

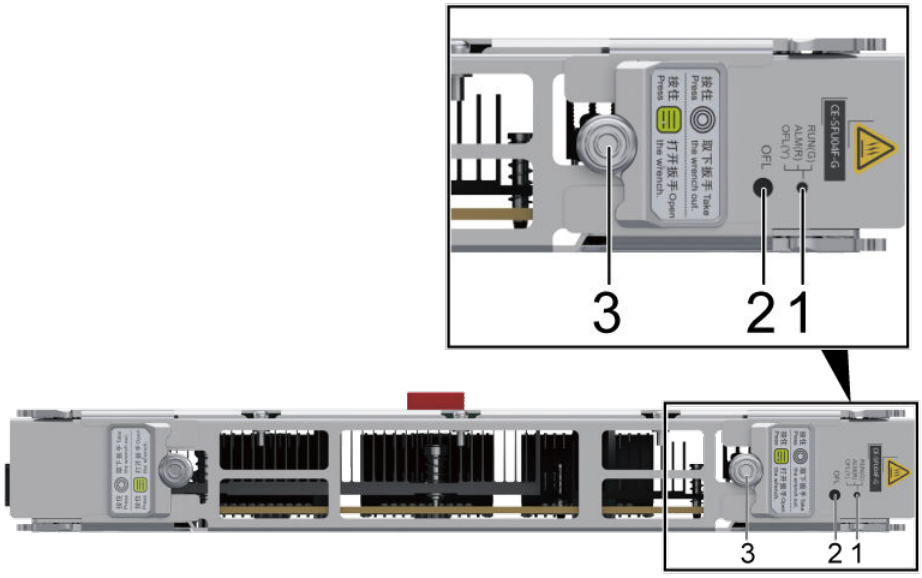
Chassis	First Supported Version
CloudEngine 16804	V200R005C20

NOTE

The CE-SFU04F-G and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-30 Indicator and buttons on the CE-SFU04F-G



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-61 Indicator on the CE-SFU04F-G

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.

Silkscreen	Name	Color	Status	Description
OFL(Y)			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-62 Buttons on the CE-SFU04F-G

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU04F-G is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU04F-G does not provide any ports.

Functions and Features

Table 4-63 Functions and features of the CE-SFU04F-G

Functions and Features	Description
Line-rate data switching	Six CE-SFU04F-G cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-64 Technical specifications of the CE-SFU04F-G

Item	Specification
Dimensions without packaging (H x W x D)	316.5 mm x 42.4 mm x 233.6 mm (12.46 in. x 1.67 in. x 9.20 in.)
Weight without packaging	3.3 kg (7.28 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	72 W
Maximum power consumption	99 W
Typical heat dissipation	246 BTU/hour
Maximum heat dissipation	338 BTU/hour

Item	Specification
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.4 CE-SFU04F1-G (CE16804 Switch Fabric Unit F1)

The CE-SFU04F1-G functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

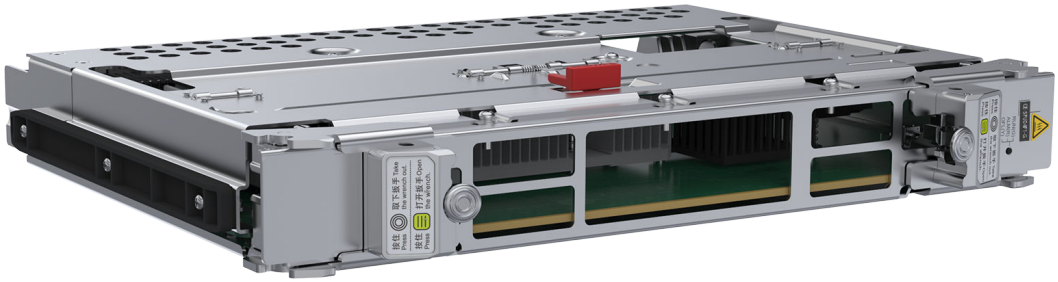
Overview

Table 4-65 Basic information about the CE-SFU04F1-G

Item	Details
Description	CE16804 Switch Fabric Unit F1
Part number	03059671
Silkscreen	CE-SFU04F1-G
Model	CE-SFU04F1-G
First supported version	V200R019C10

Appearance

Figure 4-31 Appearance of the CE-SFU04F1-G



Version Mapping

Table 4-66 Chassis and version matching the CE-SFU04F1-G

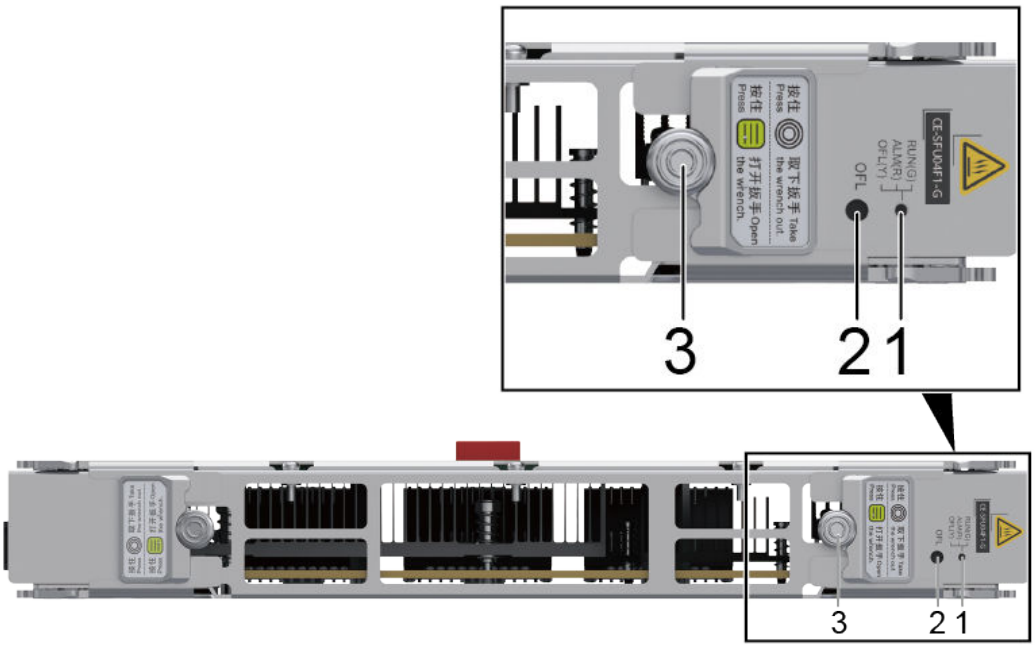
Chassis	First Supported Version
CloudEngine 16804	V200R019C10

NOTE

The CE-SFU04F1-G and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-32 Indicator and buttons on the CE-SFU04F1-G



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-67 Indicator on the CE-SFU04F1-G

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-68 Buttons on the CE-SFU04F1-G

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU04F1-G is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU04F1-G does not provide any ports.

Functions and Features

Table 4-69 Functions and features of the CE-SFU04F1-G

Functions and Features	Description
Line-rate data switching	Six CE-SFU04F1-G cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-70 Technical specifications of the CE-SFU04F1-G

Item	Specification
Dimensions without packaging (H x W x D)	316.5 mm x 42.4 mm x 233.6 mm (12.46 in. x 1.67 in. x 9.20 in.)
Weight without packaging	3.3 kg (7.28 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	72 W
Maximum power consumption	99 W
Typical heat dissipation	246 BTU/hour
Maximum heat dissipation	338 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.5 CE-SFU08G-G (CE16808 Switch Fabric Unit G)

The CE-SFU08G-G functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

Overview

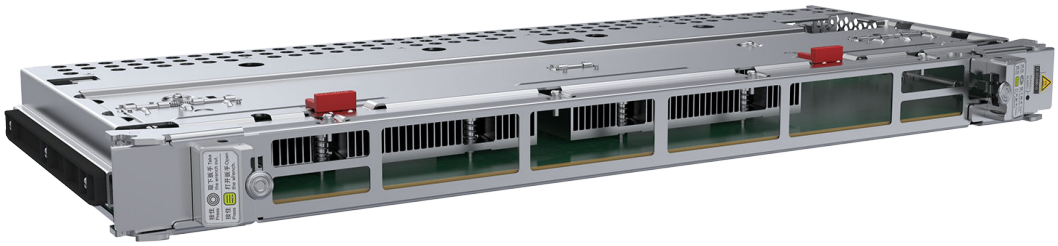
Table 4-71 Basic information about the CE-SFU08G-G

Item	Details
Description	CE16808 Switch Fabric Unit G
Part number	03058882

Item	Details
Silkscreen	CE-SFU08G-G
Model	CE-SFU08G-G
First supported version	V200R005C20

Appearance

Figure 4-33 Appearance of the CE-SFU08G-G



Version Mapping

Table 4-72 Chassis and version matching the CE-SFU08G-G

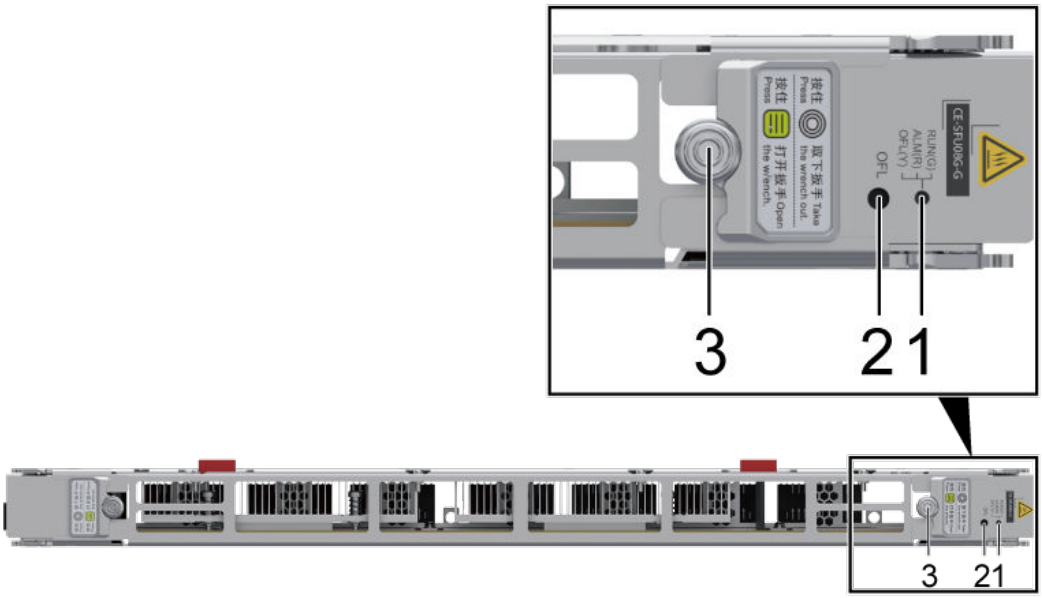
Chassis	First supported version
CloudEngine 16808	V200R005C20

NOTE

The CE-SFU08G-G and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-34 Indicator and buttons on the CE-SFU08G-G



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-73 Indicator on the CE-SFU08G-G

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-74 Buttons on the CE-SFU08G-G

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU08G-G is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU08G-G does not provide any ports.

Functions and Features

Table 4-75 Functions and features of the CE-SFU08G-G

Functions and Features	Description
Line-rate data switching	Six CE-SFU08G-G cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-76 Technical specifications of the CE-SFU08G-G

Item	Specification
Dimensions without packaging (H x W x D)	559.9 mm x 233.6 mm x 42.4 mm
Weight without packaging	5.8 kg (12.79 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	181 W
Maximum power consumption	261 W
Typical heat dissipation	618 BTU/hour
Maximum heat dissipation	891 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.6 CE-SFU08G-GK (CE16808 Switch Fabric Unit GK)

The CE-SFU08G-GK functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

Overview

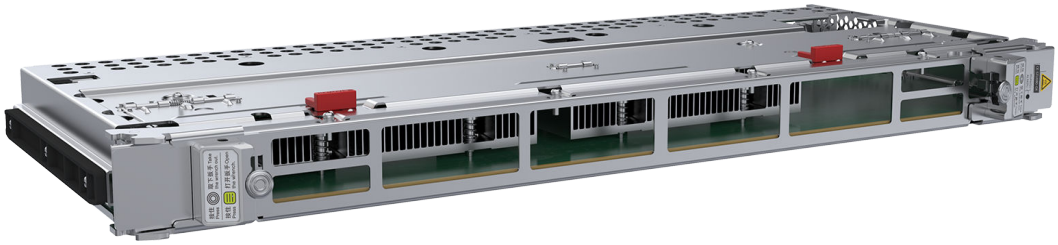
Table 4-77 Basic information about the CE-SFU08G-GK

Item	Details
Description	CE16808 Switch Fabric Unit GK

Item	Details
Part number	03059595
Silkscreen	CE-SFU08G-GK
Model	CE-SFU08G-GK
First supported version	V200R019C10

Appearance

Figure 4-35 Appearance of the CE-SFU08G-GK



Version Mapping

Table 4-78 Chassis and version matching the CE-SFU08G-GK

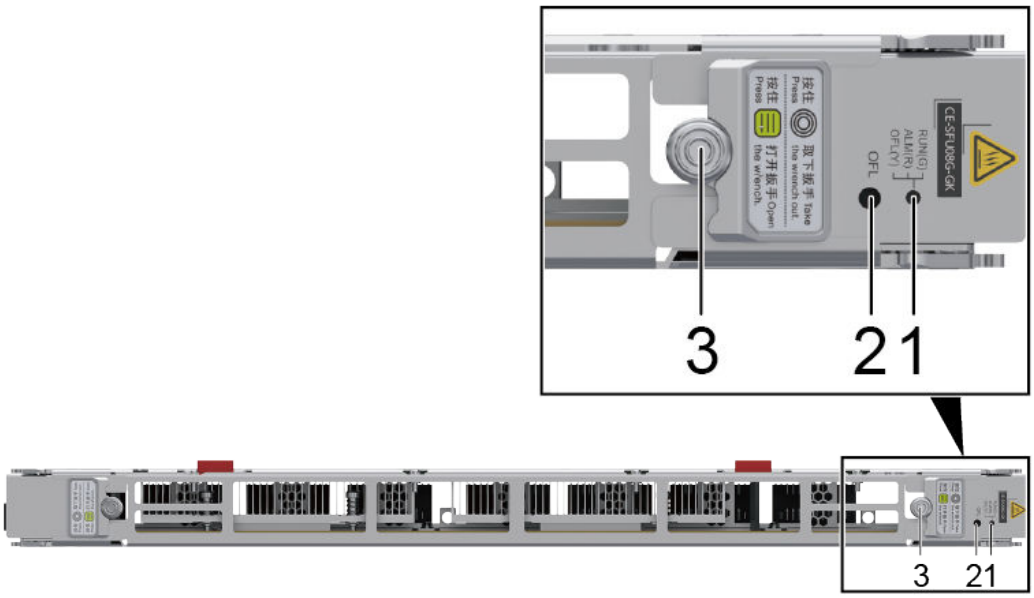
Chassis	First supported version
CloudEngine 16808	V200R019C10

NOTE

The CE-SFU08G-GK and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-36 Indicator and buttons on the CE-SFU08G-GK



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-79 Indicator on the CE-SFU08G-GK

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-80 Buttons on the CE-SFU08G-GK

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU08G-GK is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU08G-GK does not provide any ports.

Functions and Features

Table 4-81 Functions and features of the CE-SFU08G-GK

Functions and Features	Description
Line-rate data switching	Six CE-SFU08G-GK cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-82 Technical specifications of the CE-SFU08G-GK

Item	Specification
Dimensions without packaging (H x W x D)	559.9 mm x 42.4 mm x 233.6 mm (22.04 in. x 1.67 in. x 9.20 in.)
Weight without packaging	5.8 kg (12.79 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	181 W
Maximum power consumption	261 W
Typical heat dissipation	618 BTU/hour
Maximum heat dissipation	891 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.7 CE-SFU08F-G (CE16808 Switch Fabric Unit F)

The CE-SFU08F-G functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

Overview

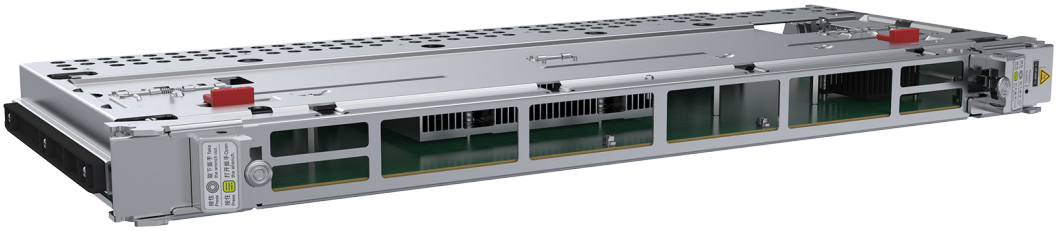
Table 4-83 Basic information about the CE-SFU08F-G

Item	Details
Description	CE16808 Switch Fabric Unit F

Item	Details
Part number	03058883
Silkscreen	CE-SFU08F-G
Model	CE-SFU08F-G
First supported version	V200R005C20

Appearance

Figure 4-37 Appearance of the CE-SFU08F-G



Version Mapping

Table 4-84 Chassis and version matching the CE-SFU08F-G

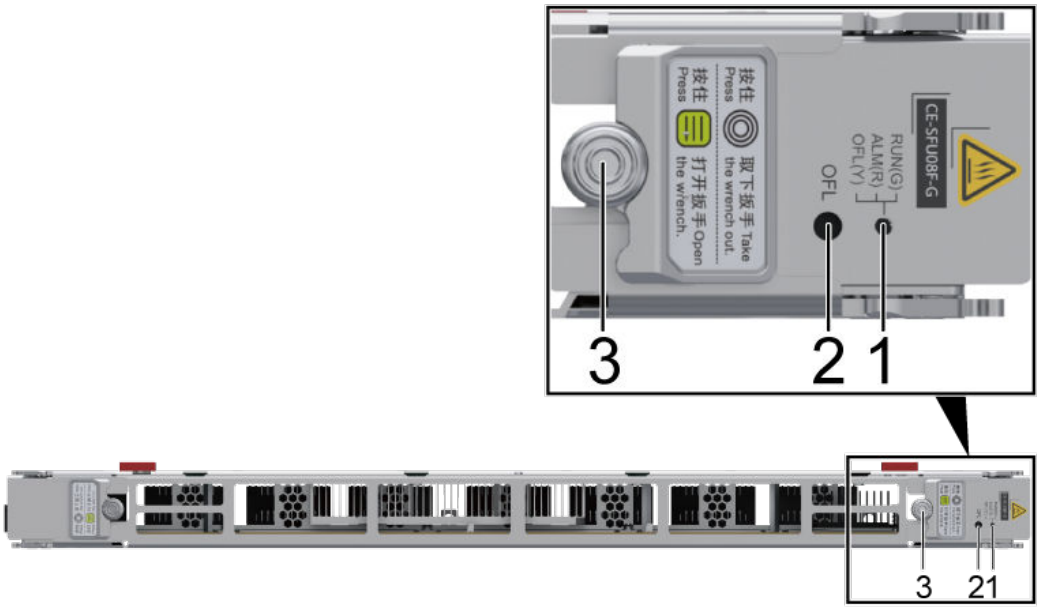
Chassis	First Supported Version
CloudEngine 16808	V200R005C20

NOTE

The CE-SFU08F-G and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-38 Indicator and buttons on the CE-SFU08F-G



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-85 Indicator on the CE-SFU08F-G

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-86 Buttons on the CE-SFU08F-G

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU08F-G is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU08F-G does not provide any ports.

Functions and Features

Table 4-87 Functions and features of the CE-SFU08F-G

Functions and Features	Description
Line-rate data switching	CE-SFU08F-G SFUs in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-88 Technical specifications of the CE-SFU08F-G

Item	Specification
Dimensions without packaging (H x W x D)	559.9 mm x 233.6 mm x 42.4 mm
Weight without packaging	5.4 kg
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	105 W
Maximum power consumption	142 W
Typical heat dissipation	359 BTU/hour
Maximum heat dissipation	485 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.8 CE-SFU08F1-G (CE16808 Switch Fabric Unit F1)

The CE-SFU08F1-G functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

Overview

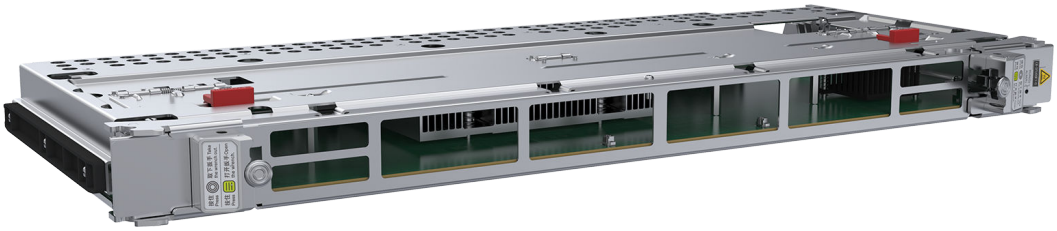
Table 4-89 Basic information about the CE-SFU08F1-G

Item	Details
Description	CE16808 Switch Fabric Unit F1

Item	Details
Part number	03059672
Silkscreen	CE-SFU08F1-G
Model	CE-SFU08F1-G
First supported version	V200R019C10

Appearance

Figure 4-39 Appearance of the CE-SFU08F1-G



Version Mapping

Table 4-90 Chassis and version matching the CE-SFU08F1-G

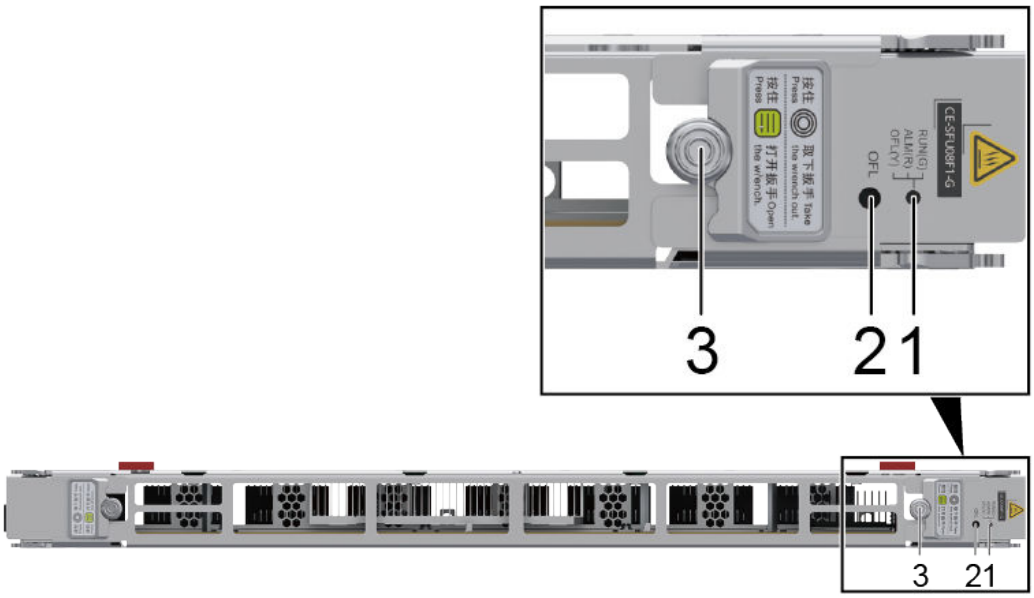
Chassis	First Supported Version
CloudEngine 16808	V200R019C10

NOTE

The CE-SFU08F1-G and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-40 Indicator and buttons on the CE-SFU08F1-G



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-91 Indicator on the CE-SFU08F1-G

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-92 Buttons on the CE-SFU08F1-G

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU08F1-G is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU08F1-G does not provide any ports.

Functions and Features

Table 4-93 Functions and features of the CE-SFU08F1-G

Functions and Features	Description
Line-rate data switching	Six CE-SFU08F1-G cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure non-stop service data switching.

Technical Specifications

Table 4-94 Technical specifications of the CE-SFU08F1-G

Item	Specification
Dimensions without packaging (H x W x D)	559.9 mm x 42.4 mm x 233.6 mm (22.04 in. x 1.67 in. x 9.20 in.)
Weight without packaging	5.4 kg (11.9 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	105 W
Maximum power consumption	142 W
Typical heat dissipation	359 BTU/hour
Maximum heat dissipation	485 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.9 CE-SFU16G-G (CE16816 Switch Fabric Unit G)

The CE-SFU16G-G functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

Overview

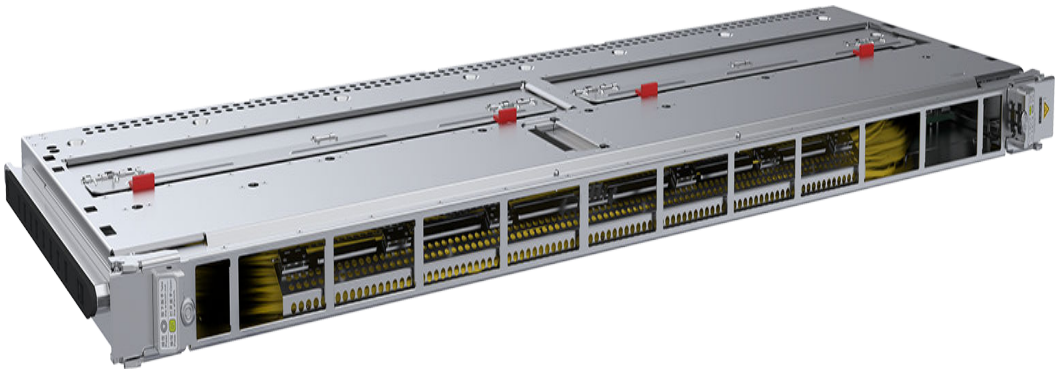
Table 4-95 Basic information about the CE-SFU16G-G

Item	Details
Description	CE16816 Switch Fabric Unit G
Part number	03058884

Item	Details
Silkscreen	CE-SFU16G-G
Model	CE-SFU16G-G
First supported version	V200R005C20

Appearance

Figure 4-41 Appearance of the CE-SFU16G-G



Version Mapping

Table 4-96 Chassis and version matching the CE-SFU16G-G

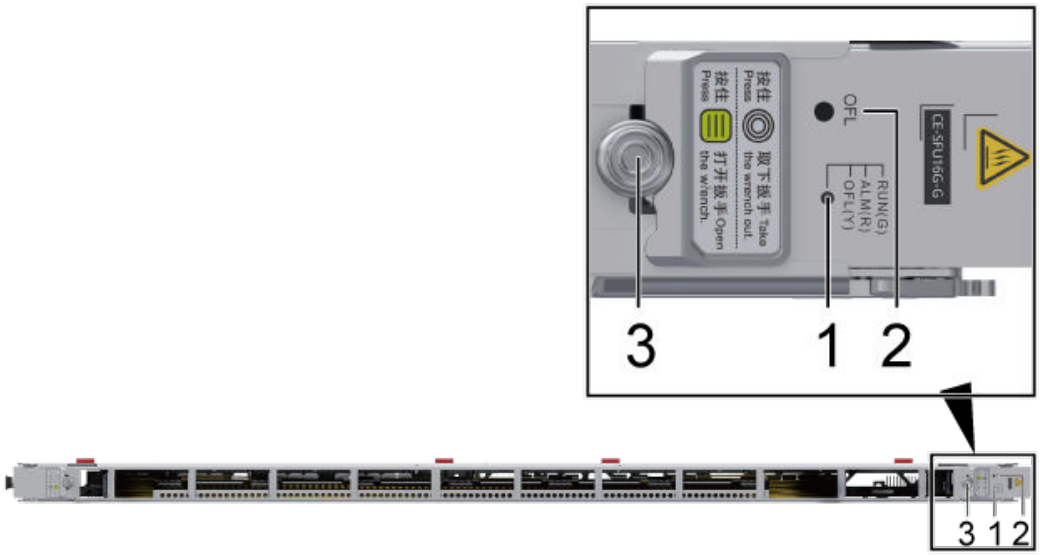
Chassis	First Supported Version
CloudEngine 16816	V200R005C20

NOTE

The CE-SFU16G-G and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-42 Indicator and buttons on the CE-SFU16G-G



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-97 Indicator on the CE-SFU16G-G

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-98 Buttons on the CE-SFU16G-G

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU16G-G is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU16G-G does not provide any ports.

Functions and Features

Table 4-99 Functions and features of the CE-SFU16G-G

Function and Feature	Description
Line-rate data switching	Six CE-SFU16G-G cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-100 Technical specifications of the CE-SFU16G-G

Item	Specification
Dimensions without packaging (H x W x D)	1116.2 mm x 42.4 mm x 389.2 mm (43.94 in. x 1.67 in. x 15.32 in.)
Weight without packaging	22.4 kg (49.38 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	524 W
Maximum power consumption	661 W
Typical heat dissipation	1789 BTU/hour
Maximum heat dissipation	2257 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.10 CE-SFU16G-GK (CE16816 Switch Fabric Unit GK)

The CE-SFU16G-GK functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

Overview

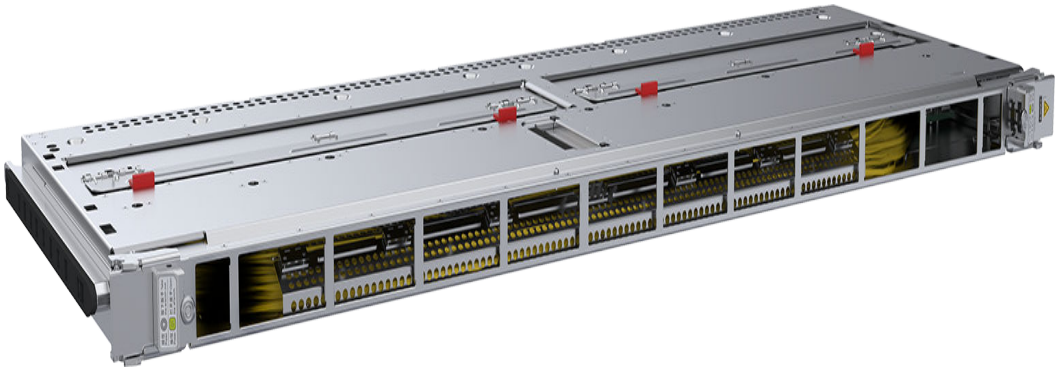
Table 4-101 Basic information about the CE-SFU16G-GK

Item	Details
Description	CE16816 Switch Fabric Unit GK

Item	Details
Part number	03059632
Silkscreen	CE-SFU16G-GK
Model	CE-SFU16G-GK
First supported version	V200R019C10

Appearance

Figure 4-43 Appearance of the CE-SFU16G-GK



Version Mapping

Table 4-102 Chassis and version matching the CE-SFU16G-GK

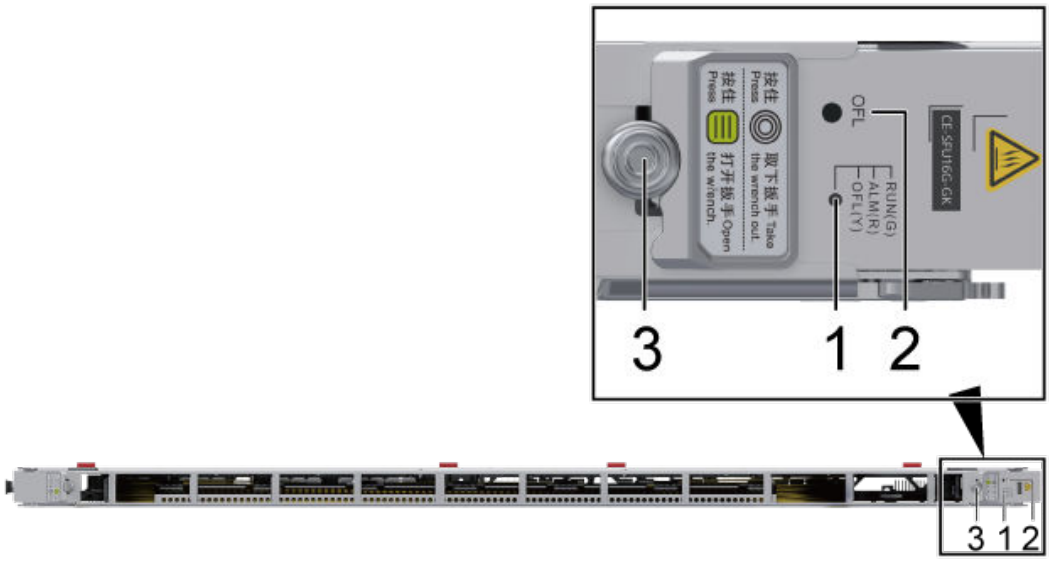
Chassis	First Supported Version
CloudEngine 16816	V200R019C10

NOTE

The CE-SFU16G-GK and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-44 Indicator and buttons on the CE-SFU16G-GK



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-103 Indicator on the CE-SFU16G-GK

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-104 Buttons on the CE-SFU16G-GK

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU16G-GK is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU16G-GK does not provide any ports.

Functions and Features

Table 4-105 Functions and features of the CE-SFU16G-GK

Function and Feature	Description
Line-rate data switching	Six CE-SFU16G-GK cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-106 Technical specifications of the CE-SFU16G-GK

Item	Specification
Dimensions without packaging (H x W x D)	1116.2 mm x 42.4 mm x 389.2 mm (43.94 in. x 1.67 in. x 15.32 in.)
Weight without packaging	22.4 kg (49.38 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	524 W
Maximum power consumption	661 W
Typical heat dissipation	1789 BTU/hour
Maximum heat dissipation	2257 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.3.11 CE-SFU16F-G (CE16816 Switch Fabric Unit F)

The CE-SFU16F-G functions as the switching unit of the device and is responsible for line-rate switching of the system data plane.

Overview

Table 4-107 Basic information about the CE-SFU16F-G

Item	Details
Description	CE16816 Switch Fabric Unit F

Item	Details
Part number	03058885
Silkscreen	CE-SFU16F-G
Model	CE-SFU16F-G
First supported version	V200R005C20

Appearance

Figure 4-45 Appearance of the CE-SFU16F-G

Version Mapping

Table 4-108 Chassis and version matching the CE-SFU16F-G

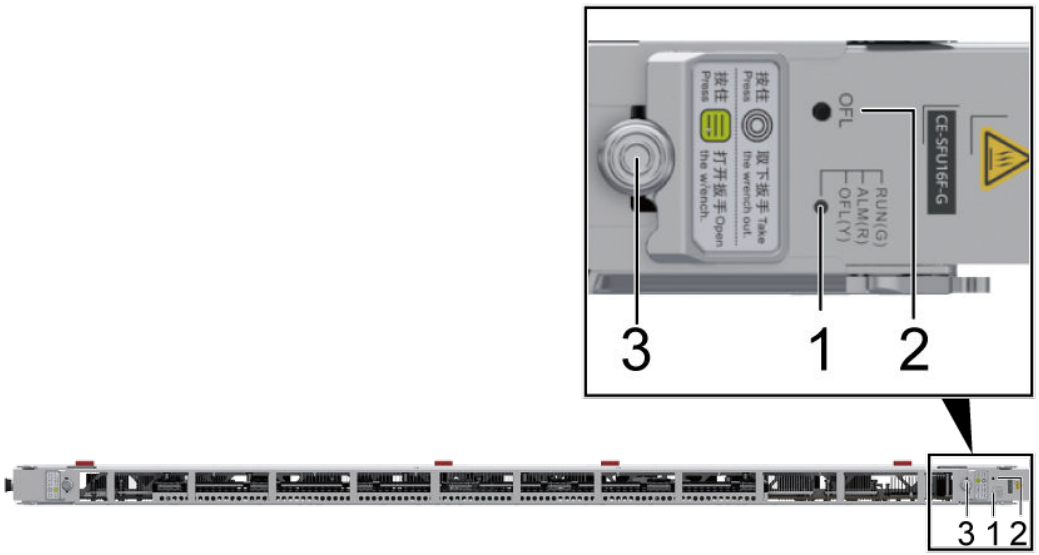
Chassis	First Supported Version
CloudEngine 16816	V200R005C20

NOTE

The CE-SFU16F-G and SFUs of other models cannot be installed in the same chassis.

Indicators and Buttons

Figure 4-46 Indicator and buttons on the CE-SFU16F-G



1. Running status indicator	2. OFL button	3. Wrench removal button

Table 4-109 Indicator on the CE-SFU16F-G

Silkscreen	Name	Color	Status	Description
RUN(G) ALM(R) OFL(Y)	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)

Table 4-110 Buttons on the CE-SFU16F-G

Silkscreen	Name	Description
OFL	OFL button	To remove an SFU, hold down the OFL button for 6s. You can remove the SFU until the running status indicator is steady yellow.
-	Wrench removal button	The CE-SFU16F-G is installed and removed using removable wrenches. To remove the wrenches from an SFU, press and hold the round button (marked by number 3 in the preceding figure) on the SFU.

Ports

The CE-SFU16F-G does not provide any ports.

Functions and Features

Table 4-111 Functions and features of the CE-SFU16F-G

Function and Feature	Description
Line-rate data switching	Six CE-SFU16F-G cards in a chassis constitute the switching core of the data plane and provide high-speed SerDes channels for LPUs.
Reliability	The device uses a single-stage multi-plane switch fabric to expand the switching capacity. The system has 5+1 switching planes, which work in load balancing and redundancy mode to ensure nonstop service data switching.

Technical Specifications

Table 4-112 Technical specifications of the CE-SFU16F-G

Item	Specification
Dimensions without packaging (H x W x D)	1116.2 mm x 42.4 mm x 389.2 mm (43.94 in. x 1.67 in. x 15.32 in.)
Weight without packaging	19.3 kg (42.55 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 2 GB
Typical power consumption	312 W
Maximum power consumption	447 W
Typical heat dissipation	1065 BTU/hour
Maximum heat dissipation	1527 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.4 10GE Interface Cards

4.4.1 CEL48XSFD-G (48-Port 10GE Interface Card (FD-G, SFP+))

The CEL48XSFD-G provides 48 10GE optical ports for data access and processing.

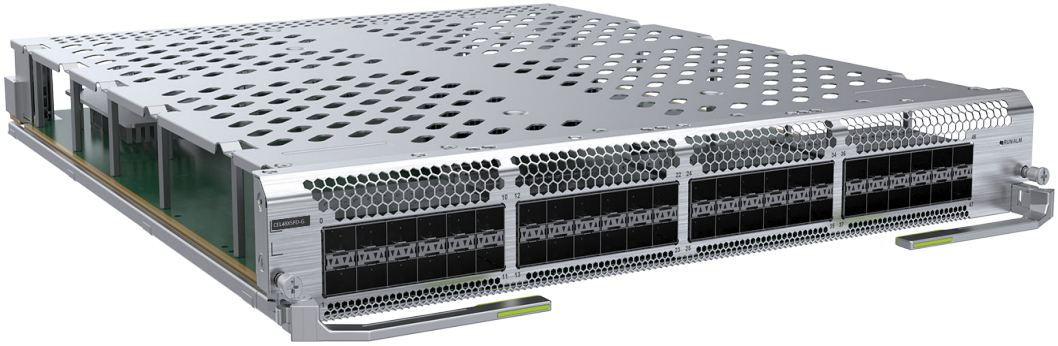
Overview

Table 4-113 Basic information about the CEL48XSFD-G

Item	Details
Description	48-Port 10GE Interface Card (FD-G, SFP+)
Part number	03058873
Silkscreen	CEL48XSFD-G
Model	CEL48XSFD-G
First supported version	V200R005C20

Appearance

Figure 4-47 Appearance of the CEL48XSFD-G



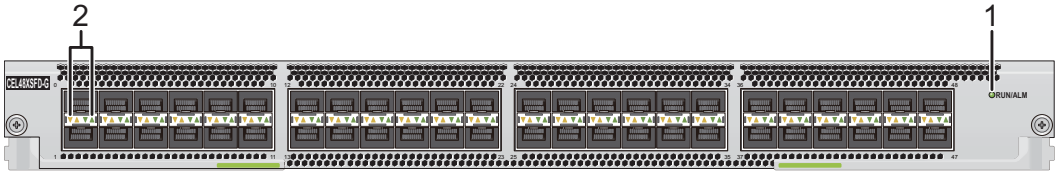
Version Mapping

Table 4-114 Chassis and version matching the CEL48XSFD-G

Chassis	First Supported Version
CloudEngine 16804	V200R005C20
CloudEngine 16808	V200R005C20
CloudEngine 16816	V200R005C20

Indicators

Figure 4-48 Indicators on the CEL48XSFD-G



1. Running status indicator	2. Port status indicator

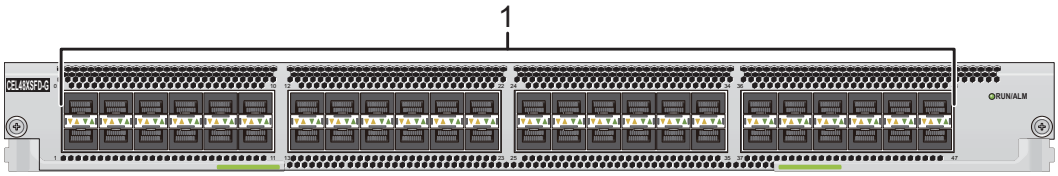
Table 4-115 Indicators on the CEL48XSFD-G

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	Two single-color indicators for each port • Steady green: LINK indicator • Blinking yellow: ACT indicator The indicator with an up arrowhead shows the status of the port on the top, and the indicator with	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Fast blinking (15 Hz)	The port is transmitting or receiving data.

Silkscreen	Name	Color	Status	Description
	a down arrowhead shows the status of the port at the bottom.		Off	The port is not transmitting or receiving data.

Ports

Figure 4-49 Ports on the CEL48XSFD-G



1. Forty-eight 10GE optical ports

Table 4-116 Information about optical ports on the CEL48XSFD-G

Item	Description
Connector type	The connector type varies depending on the used SFP/SFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used SFP/SFP+ optical module.
Applicable cable	• SFP optical module and LC optical fiber • SFP+ optical module and LC optical fiber • SFP+ 10GE high-speed cable • SFP+ 10GE AOC cable

Functions and Features

Table 4-117 Functions and features of the CEL48XSFD-G

Function and Feature	Description
Basic function	The CEL48XSFD-G provides data packet processing and traffic management on 48 10GE optical ports.

Function and Feature	Description
Maximum port density	If all LPUs are CEL48XSFD-G cards: • The CloudEngine 16804 chassis provides a maximum of 192 10GE ports. • The CloudEngine 16808 chassis provides a maximum of 384 10GE ports. • The CloudEngine 16816 chassis provides a maximum of 768 10GE ports.
10GE port	• When the 10GE ports work in 10GE mode, they support SFP+ 10GE optical modules, 10GE high-speed cables, and AOC cables. • When the 10GE ports work in GE mode, they support SFP GE optical modules and 1000BASE-T copper modules. When using a 1000BASE-T copper module, a port supports 100M/1000M auto-sensing.

Technical Specifications

Table 4-118 Technical specifications of the CEL48XSFD-G

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	6.7 kg (14.77 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	103 W
Maximum power consumption	193 W
Typical heat dissipation	352 BTU/hour
Maximum heat dissipation	659 BTU/hour

Item	Specification
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.4.2 CEL48XSFD-GK (48-Port 10GE Interface Card (FD-GK, SFP+))

The CEL48XSFD-GK provides 48 10GE optical ports for data access and processing.

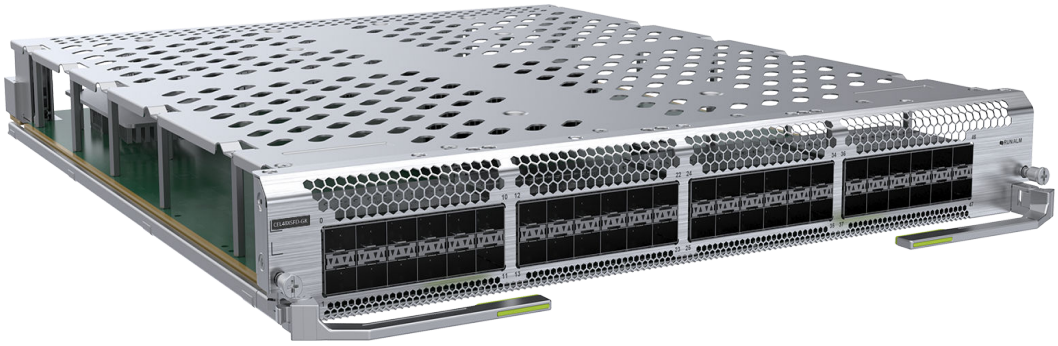
Overview

Table 4-119 Basic information about the CEL48XSFD-GK

Item	Details
Description	48-Port 10GE Interface Card (FD-GK, SFP+)
Part number	03059594
Silkscreen	CEL48XSFD-GK
Model	CEL48XSFD-GK
First supported version	V200R019C10

Appearance

Figure 4-50 Appearance of the CEL48XSFD-GK



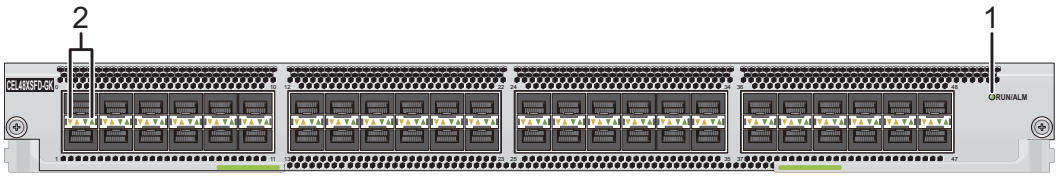
Version Mapping

Table 4-120 Chassis and version matching the CEL48XSFD-GK

Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10
CloudEngine 16816	V200R019C10

Indicators

Figure 4-51 Indicators on the CEL48XSFD-GK



1. Running status indicator	2. Port status indicator

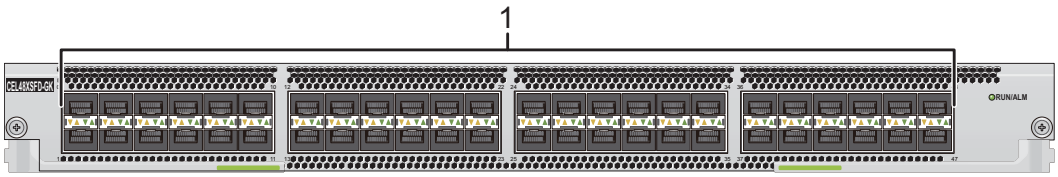
Table 4-121 Indicators on the CEL48XSFD-GK

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	Two single-color indicators for each port • Steady green: LINK indicator • Blinking yellow: ACT indicator The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the port at the bottom.	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Fast blinking (15 Hz)	The port is transmitting or receiving data.
			Off	The port is not transmitting or receiving data.

Ports

Figure 4-52 Ports on the CEL48XSFD-GK



1. Forty-eight 10GE optical ports

Table 4-122 Information about optical ports on the CEL48XSFD-GK

Item	Description
Connector type	The connector type varies depending on the used SFP/SFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used SFP/SFP+ optical module.
Applicable cable	• SFP optical module and LC optical fiber • SFP+ optical module and LC optical fiber • SFP+ 10GE high-speed cable • SFP+ 10GE AOC cable

Functions and Features

Table 4-123 Functions and features of the CEL48XSFD-GK

Function and Feature	Description
Basic function	The CEL48XSFD-GK provides data packet processing and traffic management on 48 10GE optical ports.
Maximum port density	If all LPUs are CEL48XSFD-GK cards: • The CloudEngine 16804 chassis provides a maximum of 192 10GE ports. • The CloudEngine 16808 chassis provides a maximum of 384 10GE ports. • The CloudEngine 16816 chassis provides a maximum of 768 10GE ports.
10GE port	• When the 10GE ports work in 10GE mode, they support SFP+ 10GE optical modules, 10GE high-speed cables, and AOC cables. • When the 10GE ports work in GE mode, they support SFP GE optical modules and 1000BASE-T copper modules. When using a 1000BASE-T copper module, a port supports 100M/1000M auto-sensing.

Technical Specifications

Table 4-124 Technical specifications of the CEL48XSFD-GK

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	6.7 kg (14.77 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	103 W
Maximum power consumption	193 W
Typical heat dissipation	352 BTU/hour
Maximum heat dissipation	659 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.4.3 CEL48XSFD1-G (48-Port 10GE Interface Card (FD1-G, SFP+))

The CEL48XSFD1-G provides 48 10GE optical ports for data access and processing.

Overview

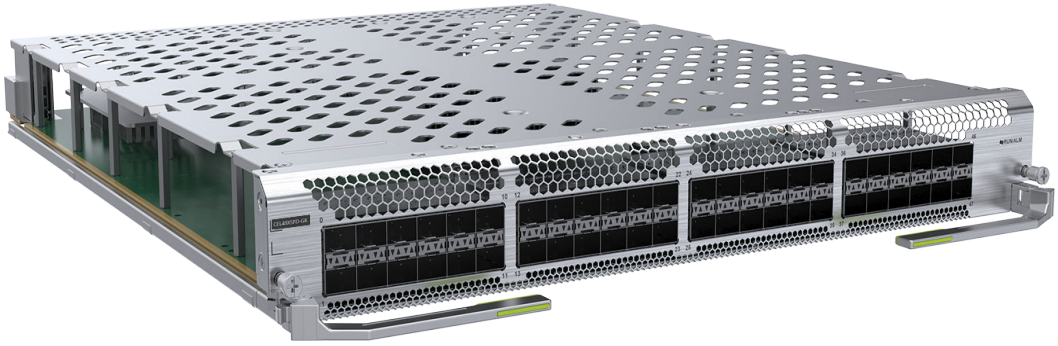
Table 4-125 Basic information about the CEL48XSFD1-G

Item	Details
Description	48-Port 10GE Interface Card (FD1-G, SFP+)

Item	Details
Part number	03059594
Silkscreen	CEL48XSFD1-G
Model	CEL48XSFD1-G
First supported version	V200R019C10

Appearance

Figure 4-53 Appearance of the CEL48XSFD1-G



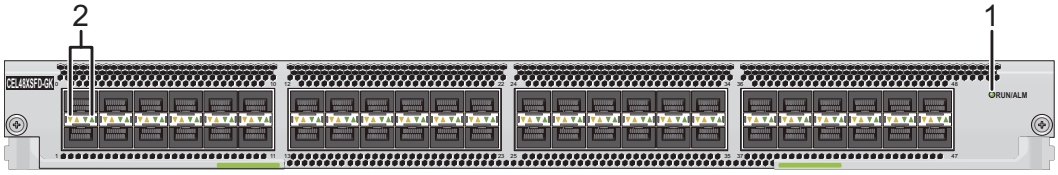
Version Mapping

Table 4-126 Chassis and version matching the CEL48XSFD1-G

Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10
CloudEngine 16816	V200R019C10

Indicators

Figure 4-54 Indicators on the CEL48XSFD1-G



1. Running status indicator	2. Port status indicator

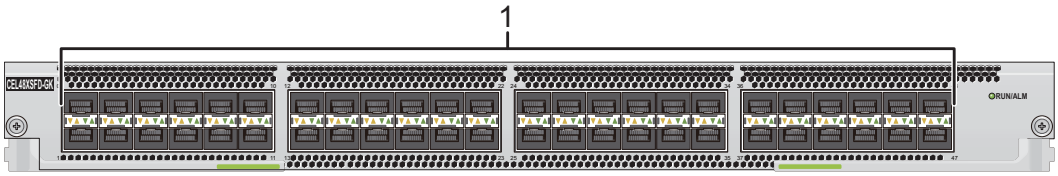
Table 4-127 Indicators on the CEL48XSFD1-G

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	Two single-color indicators for each port • Steady green: LINK indicator • Blinking yellow: ACT indicator The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the	Green	Steady on	The link on the port is connected.
			Off	The link on the port is disconnected.
		Yellow	Fast blinking (15 Hz)	The port is transmitting or receiving data.

Silkscreen	Name	Color	Status	Description
	port at the bottom.		Off	The port is not transmitting or receiving data.

Ports

Figure 4-55 Ports on the CEL48XSFD1-G



1. Forty-eight 10GE optical ports

Table 4-128 Information about optical ports on the CEL48XSFD1-G

Item	Description
Connector type	The connector type varies depending on the used SFP/SFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used SFP/SFP+ optical module.
Applicable cable	• SFP optical module and LC optical fiber • SFP+ optical module and LC optical fiber • SFP+ 10GE high-speed cable • SFP+ 10GE AOC cable

Functions and Features

Table 4-129 Functions and features of the CEL48XSFD1-G

Function and Feature	Description
Basic function	The CEL48XSFD1-G provides data packet processing and traffic management on 48 10GE optical ports.

Function and Feature	Description
Maximum port density	If all LPUs are CEL48XSFD1-G cards: • The CloudEngine 16804 chassis provides a maximum of 192 10GE ports. • The CloudEngine 16808 chassis provides a maximum of 384 10GE ports. • The CloudEngine 16816 chassis provides a maximum of 768 10GE ports.
10GE port	• When the 10GE ports work in 10GE mode, they support SFP+ 10GE optical modules, 10GE high-speed cables, and AOC cables. • When the 10GE ports work in GE mode, they support SFP GE optical modules and 1000BASE-T copper modules. When using a 1000BASE-T copper module, a port supports 100M/1000M auto-sensing.

Technical Specifications

Table 4-130 Technical specifications of the CEL48XSFD1-G

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	6.7 kg (14.77 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	103 W
Maximum power consumption	193 W

Item	Specification
Typical heat dissipation	352 BTU/hour
Maximum heat dissipation	659 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.5 40GE Interface Cards

4.5.1 CEL24LQFD-G (24-Port 40GE Interface Card (FD-G, QSFP+))

The CEL24LQFD-G provides 24 40GE optical ports for data access and processing. Among these optical ports, 12 40GE optical ports can be used as 100GE ports, and each 40GE optical port can be split into four 10GE optical ports.

Overview

Table 4-131 Basic information about the CEL24LQFD-G

Item	Details
Description	24-Port 40GE Interface Card (FD-G, QSFP+)
Part number	03058872
Silkscreen	CEL24LQFD-G
Model	CEL24LQFD-G
First supported version	V200R005C20

Appearance

Figure 4-56 Appearance of the CEL24LQFD-G

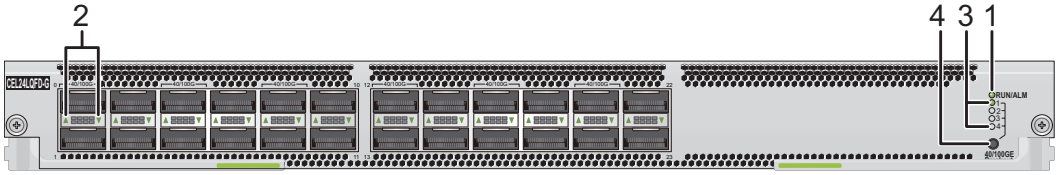
Version Mapping

Table 4-132 Chassis and version matching the CEL24LQFD-G

Chassis	First Supported Version
CloudEngine 16804	V200R005C20
CloudEngine 16808	V200R005C20
CloudEngine 16816	V200R005C20

Indicators and Buttons

Figure 4-57 Indicators and button on the CEL24LQFD-G



1. Running status indicator	2. Port status indicator	3. 10GE port sequence number indicators	4. Button for manually controlling 10GE/25GE port sequence number indicators

Table 4-133 Indicators on the CEL24LQFD-G

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the port at the bottom.	Green	Steady on	The link on the port is connected.
			Blinking	The port is transmitting or receiving data.

Silkscreen	Name	Color	Status	Description
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted ports. ● If a port is split, a port indicator (2 in **Figure 4-57**) shows the status of a converted port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE converted port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 40GE or 100GE port is not split, the port indicator shows the status of the 40GE or 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 10GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 10GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

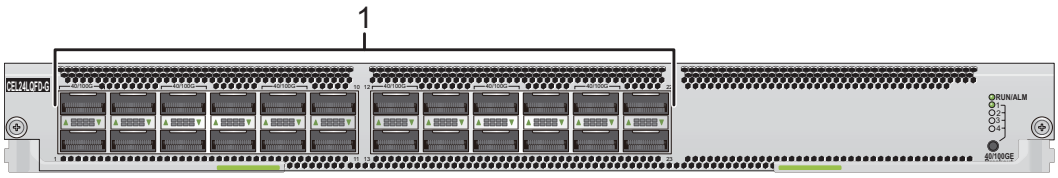
- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-134 Button on the CEL24LQFD-G

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE port sequence number indicators	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the 10GE port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-58 Ports on the CEL24LQFD-G



1. Twenty-four 40GE optical ports

Table 4-135 Information about optical ports on the CEL24LQFD-G

Item	Description
Connector type	The connector type varies depending on the used QSFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP+ optical module.

Item	Description
Applicable cable	When a 40GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 40GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When one of the 12 40GE ports (0, 1, 4, 5...) on the CEL24LQFD-G works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When one of the 12 40GE ports (0, 1, 4, 5...) on the CEL24LQFD-G functions as a 100GE port and works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable **NOTE** After a 100GE port is split into four 25GE ports and has a 40GE medium installed, the four 25GE ports automatically work as four 10GE ports.

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-136 Functions and features of the CEL24LQFD-G

Function and Feature	Description
Basic function	The CEL24LQFD-G provides data packet processing and traffic management on 24 40GE optical ports, which can be split into 96 10GE optical ports.
Maximum port density	If all LPUs are CEL24LQFD-G cards: • The CloudEngine 16804 chassis provides a maximum of 96 40GE ports. • The CloudEngine 16808 chassis provides a maximum of 192 40GE ports. • The CloudEngine 16816 chassis provides a maximum of 384 40GE ports.

Function and Feature	Description
40GE port	• A 40GE port on a CEL24LQFD-G card can be split into four 10GE ports. That is, a CEL24LQFD-G card provides a maximum port density of 96x10GE. All the 24 40GE ports are independent, and each can be split into four 10GE ports. • On the CEL24LQFD-G card, the 12 40GE ports that can be used as 100GE ports are marked with silkscreen 40/100G. Their IDs are: 0, 1, 4, 5, 8, 9, 12, 13, 16, 17, 20, and 21. These port IDs are represented by (0, 1, 4, 5...) in the following descriptions. • The 24 ports on the CEL24LQFD-G card are divided into groups, each of which contains four ports starting from port 0. The total port rate of a group cannot exceed 200GE. When port *n* is used as a 100GE port, port *n*+2 becomes unavailable and is in DOWN(Port unavailable) state. For example: – Ports 0 to 3 are in the same group. If ports 0 and 1 are used as 100GE ports, ports 2 and 3 become unavailable and are in DOWN(Port unavailable) state. – If only one port (for example, port 0) is used as a 100GE port, port 2 becomes unavailable and is in DOWN(Port unavailable) state. Ports 1 and 3 can work as 40GE ports or each of them can be split into four 10GE ports.

Technical Specifications

Table 4-137 Technical specifications of the CEL24LQFD-G

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	7.3 kg (16.09 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	163 W
Maximum power consumption	307 W
Typical heat dissipation	557 BTU/hour
Maximum heat dissipation	1048 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.5.2 CEL24LQFD-GK (24-Port 40GE Interface Card (FD-GK, QSFP+))

The CEL24LQFD-GK provides 24 40GE optical ports for data access and processing. Among these optical ports, 12 40GE optical ports can be used as 100GE ports, and each 40GE optical port can be split into four 10GE optical ports.

Overview

Table 4-138 Basic information about the CEL24LQFD-GK

Item	Details
Description	24-Port 40GE Interface Card (FD-GK, QSFP+)
Part number	03059593
Silkscreen	CEL24LQFD-GK
Model	CEL24LQFD-GK
First supported version	V200R019C10

Appearance

Figure 4-59 Appearance of the CEL24LQFD-GK

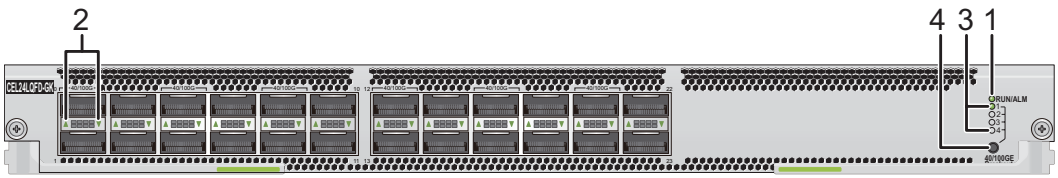
Version Mapping

Table 4-139 Chassis and version matching the CEL24LQFD-GK

Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10
CloudEngine 16816	V200R019C10

Indicators and Buttons

Figure 4-60 Indicators and button on the CEL24LQFD-GK



1. Running status indicator	2. Port status indicator	3. 10GE port sequence number indicators	4. Button for manually controlling 10GE/ 25GE port sequence number indicators

Table 4-140 Indicators on the CEL24LQFD-GK

Silkscreen	Name	Color	Status	Description
RUN/ ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the	Green	Steady on	The link on the port is connected.

Silkscreen	Name	Color	Status	Description
	port at the bottom.		Blinking	The port is transmitting or receiving data.
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted ports. ● If a port is split, a port indicator (2 in **Figure 4-60**) shows the status of a converted port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE converted port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 40GE or 100GE port is not split, the port indicator shows the status of the 40GE or 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 10GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 10GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

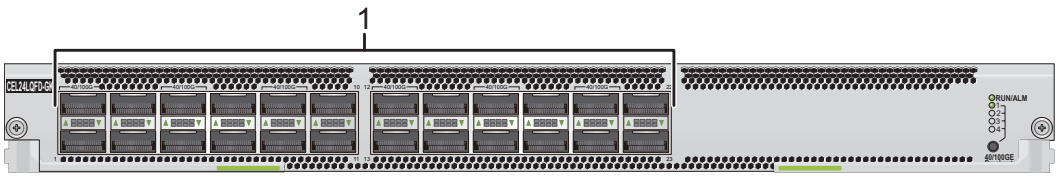
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-141 Button on the CEL24LQFD-GK

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE port sequence number indicators	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the 10GE port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-61 Ports on the CEL24LQFD-GK



1. Twenty-four 40GE optical ports

Table 4-142 Information about optical ports on the CEL24LQFD-GK

Item	Description
Connector Type	The connector type varies depending on the used QSFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP+ optical module.

Item	Description
Applicable cable	When a 40GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 40GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When one of the 12 40GE ports (0, 1, 4, 5...) on the CEL24LQFD-GK works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When one of the 12 40GE ports (0, 1, 4, 5...) on the CEL24LQFD-GK functions as a 100GE port and works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable **NOTE** After a 100GE port is split into four 25GE ports and has a 40GE medium installed, the four 25GE ports automatically work as four 10GE ports.

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-143 Functions and features of the CEL24LQFD-GK

Function and Feature	Description
Basic function	The CEL24LQFD-GK provides data packet processing and traffic management on 24 40GE optical ports, which can be split into 96 10GE optical ports.
Maximum port density	If all LPUs are CEL24LQFD-GK cards: • The CloudEngine 16804 chassis provides a maximum of 96 40GE ports. • The CloudEngine 16808 chassis provides a maximum of 192 40GE ports. • The CloudEngine 16816 chassis provides a maximum of 384 40GE ports.

Function and Feature	Description
40GE port	• A 40GE port on a CEL24LQFD-GK card can be split into four 10GE ports. That is, a CEL24LQFD-GK card provides a maximum port density of 96x10GE. All the 24 40GE ports are independent, and each can be split into four 10GE ports. • On the CEL24LQFD-GK card, the 12 40GE ports that can be used as 100GE ports are marked with silkscreen 40/100G. Their IDs are: 0, 1, 4, 5, 8, 9, 12, 13, 16, 17, 20, and 21. These port IDs are represented by (0, 1, 4, 5...) in the following descriptions. • The 24 ports on the CEL24LQFD-GK card are divided into groups, each of which contains four ports starting from port 0. The total port rate of a group cannot exceed 200GE. When port *n* is used as a 100GE port, port *n*+2 becomes unavailable and is in DOWN(Port unavailable) state. For example: – Ports 0 to 3 are in the same group. If ports 0 and 1 are used as 100GE ports, ports 2 and 3 become unavailable and are in DOWN(Port unavailable) state. – If only one port (for example, port 0) is used as a 100GE port, port 2 becomes unavailable and is in DOWN(Port unavailable) state. Ports 1 and 3 can work as 40GE ports or each of them can be split into four 10GE ports.

Technical Specifications

Table 4-144 Technical specifications of the CEL24LQFD-GK

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	7.3 kg (16.09 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	163 W
Maximum power consumption	307 W
Typical heat dissipation	557 BTU/hour
Maximum heat dissipation	1048 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.5.3 CEL24LQFD1-G (24-Port 40GE Interface Card (FD1-G, QSFP+))

The CEL24LQFD1-G provides 24 40GE optical ports for data access and processing. Among these optical ports, 12 40GE optical ports can be used as 100GE ports, and each 40GE optical port can be split into four 10GE optical ports.

Overview

Table 4-145 Basic information about the CEL24LQFD1-G

Item	Details
Description	24-Port 40GE Interface Card (FD1-G, QSFP+)
Part number	03059669
Silkscreen	CEL24LQFD1-G
Model	CEL24LQFD1-G
First supported version	V200R019C10

Appearance

Figure 4-62 Appearance of the CEL24LQFD1-G

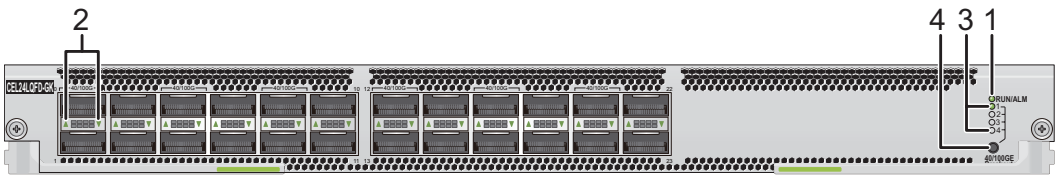
Version Mapping

Table 4-146 Chassis and version matching the CEL24LQFD1-G

Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10
CloudEngine 16816	V200R019C10

Indicators and Buttons

Figure 4-63 Indicators and button on the CEL24LQFD1-G



1. Running status indicator	2. Port status indicator	3. 10GE port sequence number indicators	4. Button for manually controlling 10GE/25GE port sequence number indicators

Table 4-147 Indicators on the CEL24LQFD1-G

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the	Green	Steady on	The link on the port is connected.

Silkscreen	Name	Color	Status	Description
	port at the bottom.		Blinking	The port is transmitting or receiving data.
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted ports. ● If a port is split, a port indicator (2 in **Figure 4-63**) shows the status of a converted port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE converted port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 40GE or 100GE port is not split, the port indicator shows the status of the 40GE or 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 10GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 10GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

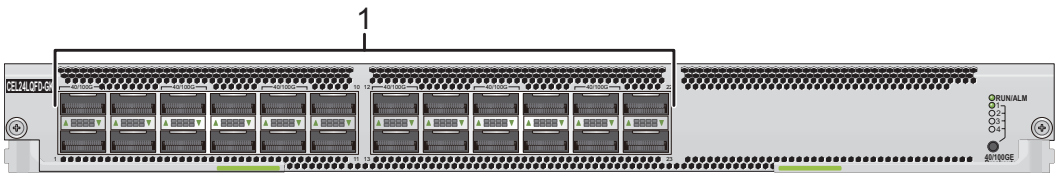
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-148 Button on the CEL24LQFD1-G

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE port sequence number indicators	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the 10GE port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-64 Ports on the CEL24LQFD1-G



1. Twenty-four 40GE optical ports

Table 4-149 Information about optical ports on the CEL24LQFD1-G

Item	Description
Connector Type	The connector type varies depending on the used QSFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP+ optical module.

Item	Description
Applicable cable	When a 40GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 40GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When one of the 12 40GE ports (0, 1, 4, 5...) on the CEL24LQFD1-G works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When one of the 12 40GE ports (0, 1, 4, 5...) on the CEL24LQFD1-G functions as a 100GE port and works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable **NOTE** After a 100GE port is split into four 25GE ports and has a 40GE medium installed, the four 25GE ports automatically work as four 10GE ports.

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-150 Functions and features of the CEL24LQFD1-G

Function and Feature	Description
Basic function	The CEL24LQFD1-G provides data packet processing and traffic management on 24 40GE optical ports, which can be split into 96 10GE optical ports.
Maximum port density	If all LPUs are CEL24LQFD1-G cards: • The CloudEngine 16804 chassis provides a maximum of 96 40GE ports. • The CloudEngine 16808 chassis provides a maximum of 192 40GE ports. • The CloudEngine 16816 chassis provides a maximum of 384 40GE ports.

Function and Feature	Description
40GE port	• A 40GE port on a CEL24LQFD1-G card can be split into four 10GE ports. That is, a CEL24LQFD1-G card provides a maximum port density of 96x10GE. All the 24 40GE ports are independent, and each can be split into four 10GE ports. • On the CEL24LQFD1-G card, the 12 40GE ports that can be used as 100GE ports are marked with silkscreen 40/100G. Their IDs are: 0, 1, 4, 5, 8, 9, 12, 13, 16, 17, 20, and 21. These port IDs are represented by (0, 1, 4, 5...) in the following descriptions. • The 24 ports on the CEL24LQFD1-G card are divided into groups, each of which contains four ports starting from port 0. The total port rate of a group cannot exceed 200GE. When port *n* is used as a 100GE port, port *n*+2 becomes unavailable and is in DOWN(Port unavailable) state. For example: – Ports 0 to 3 are in the same group. If ports 0 and 1 are used as 100GE ports, ports 2 and 3 become unavailable and are in DOWN(Port unavailable) state. – If only one port (for example, port 0) is used as a 100GE port, port 2 becomes unavailable and is in DOWN(Port unavailable) state. Ports 1 and 3 can work as 40GE ports or each of them can be split into four 10GE ports.

Technical Specifications

Table 4-151 Technical specifications of the CEL24LQFD1-G

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	7.3 kg (16.09 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	163 W
Maximum power consumption	307 W
Typical heat dissipation	557 BTU/hour
Maximum heat dissipation	1048 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.5.4 CEL36LQFD-G (36-Port 40GE Interface Card (FD-G, QSFP+))

The CEL36LQFD-G provides 36 40GE optical ports for data access and processing. Among these optical ports, 18 40GE optical ports can be used as 100GE ports, and each 40GE optical port can be split into four 10GE optical ports.

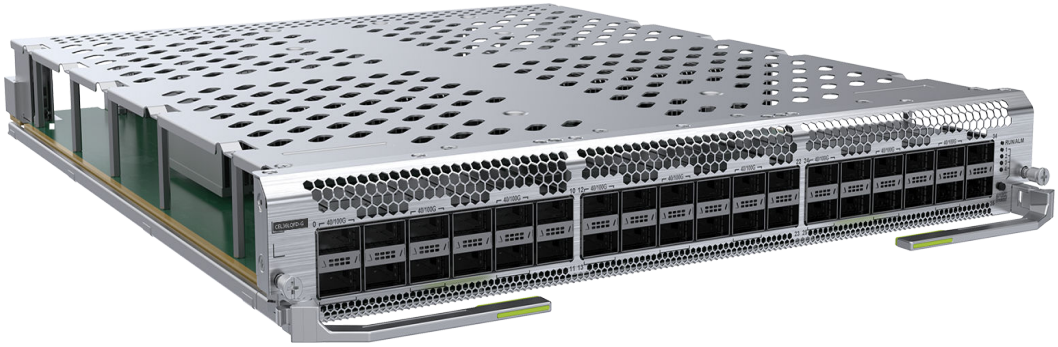
Overview

Table 4-152 Basic information about the CEL36LQFD-G

Item	Details
Description	36-Port 40GE Interface Card (FD-G, QSFP+)
Part number	03058871
Silkscreen	CEL36LQFD-G
Model	CEL36LQFD-G
First supported version	V200R005C20

Appearance

Figure 4-65 Appearance of the CEL36LQFD-G



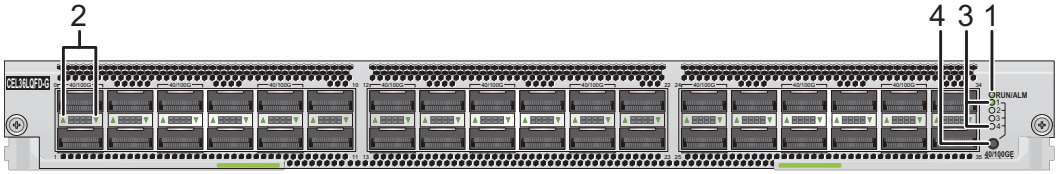
Version Mapping

Table 4-153 Chassis and version matching the CEL36LQFD-G

Chassis	First Supported Version
CloudEngine 16804	V200R005C20
CloudEngine 16808	V200R005C20
CloudEngine 16816	V200R005C20

Indicators and Buttons

Figure 4-66 Indicators and button on the CEL36LQFD-G



1. Running status indicator	2. Port status indicator	3. 10GE port sequence number indicators	4. Button for manually controlling 10GE/ 25GE port sequence number indicators

Table 4-154 Indicators on the CEL36LQFD-G

Silkscreen	Name	Color	Status	Description
RUN/ ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the	Green	Steady on	The link on the port is connected.

Silkscreen	Name	Color	Status	Description
	port at the bottom.		Blinking	The port is transmitting or receiving data.
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted ports. ● If a port is split, a port indicator (2 in **Figure 4-66**) shows the status of a converted port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE converted port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 40GE or 100GE port is not split, the port indicator shows the status of the 40GE or 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 10GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 10GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

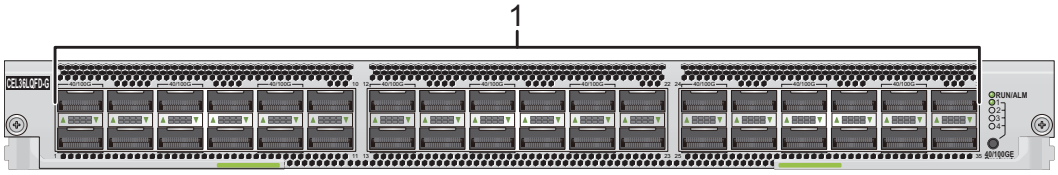
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-155 Button on the CEL36LQFD-G

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE/25GE port sequence number indicators	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-67 Ports on the CEL36LQFD-G



1. Thirty-six 40GE optical ports

Table 4-156 Information about optical ports on the CEL36LQFD-G

Item	Description
Connector type	The connector type varies depending on the used QSFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP+ optical module.

Item	Description
Applicable cable	When a 40GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 40GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When one of the 18 40GE ports (0, 1, 4, 5...) on the CEL36LQFD-G works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When one of the 18 40GE ports (0, 1, 4, 5...) on the CEL36LQFD-G functions as a 100GE port and works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable **NOTE** After a 100GE port is split into four 25GE ports and has a 40GE medium installed, the four 25GE ports automatically work as four 10GE ports.

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-157 Functions and features of the CEL36LQFD-G

Function and Feature	Description
Basic function	The CEL36LQFD-G provides data packet processing and traffic management on 36 40GE optical ports, which can be split into 144 10GE optical ports.
Maximum port density	If all LPUs are CEL36LQFD-G cards: • The CloudEngine 16804 chassis provides a maximum of 144 40GE ports. • The CloudEngine 16808 chassis provides a maximum of 288 40GE ports. • The CloudEngine 16816 chassis provides a maximum of 576 40GE ports.

Function and Feature	Description
40GE port	• A 40GE port on a CEL36LQFD-G card can be split into four 10GE ports. That is, a CEL36LQFD-G card provides a maximum port density of 144x10GE. All the 36 40GE ports are independent, and each can be split into four 10GE ports. • On the CEL36LQFD-G card, the 18 40GE ports that can be used as 100GE ports are marked with silkscreen 40/100G. The port IDs are 0, 1, 4, 5, 8, 9, 12, 13, 16, 17, 20, 21, 24, 25, 28, 29, 32, and 33. These port IDs are represented by (0, 1, 4, 5...) in the following descriptions. • The 36 ports on the CEL36LQFD-G card are divided into groups, each of which contains four ports starting from port 0. The total port rate of a group cannot exceed 200GE. When port *n* is used as a 100GE port, port *n*+2 becomes unavailable and is in DOWN(Port unavailable) state. For example: – Ports 0 to 3 are in the same group. If ports 0 and 1 are used as 100GE ports, ports 2 and 3 become unavailable and are in DOWN(Port unavailable) state. – If only one port (for example, port 0) is used as a 100GE port, port 2 becomes unavailable and is in DOWN(Port unavailable) state. Ports 1 and 3 can work as 40GE ports or each of them can be split into four 10GE ports.

Technical Specifications

Table 4-158 Technical specifications of the CEL36LQFD-G

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	8.0 kg (17.64 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	256 W
Maximum power consumption	443 W
Typical heat dissipation	874 BTU/hour
Maximum heat dissipation	1513 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.5.5 CEL36LQFD-GK (36-Port 40GE Interface Card (FD-GK, QSFP+))

The CEL36LQFD-GK provides 36 40GE optical ports for data access and processing. Among these optical ports, 18 40GE optical ports can be used as 100GE ports, and each 40GE optical port can be split into four 10GE optical ports.

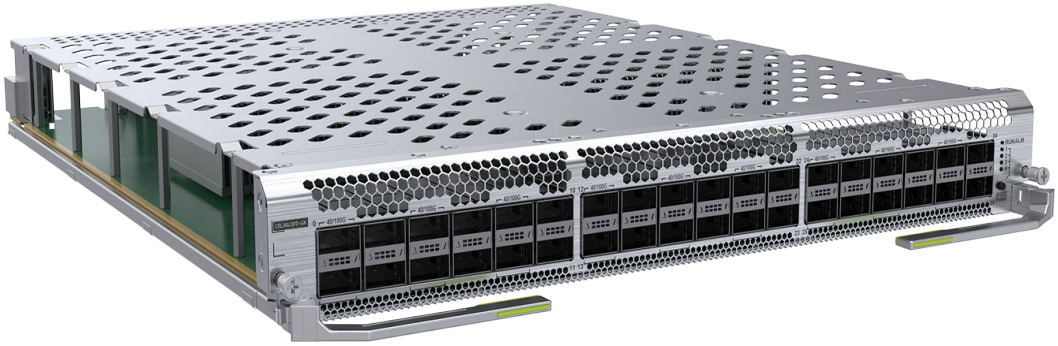
Overview

Table 4-159 Basic information about the CEL36LQFD-GK

Item	Details
Description	36-Port 40GE Interface Card (FD-GK, QSFP+)
Part number	03059592
Silkscreen	CEL36LQFD-GK
Model	CEL36LQFD-GK
First supported version	V200R019C10

Appearance

Figure 4-68 Appearance of the CEL36LQFD-GK



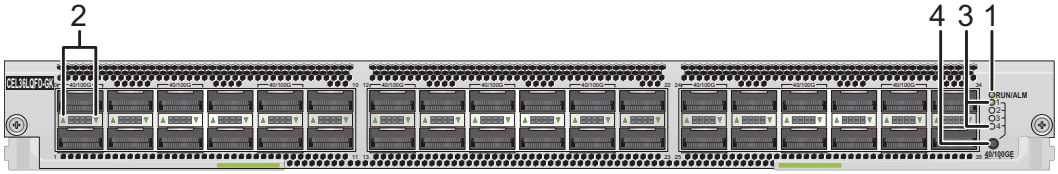
Version Mapping

Table 4-160 Chassis and version matching the CEL36LQFD-GK

Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10
CloudEngine 16816	V200R019C10

Indicators and Buttons

Figure 4-69 Indicators and button on the CEL36LQFD-GK



1. Running status indicator	2. Port status indicator	3. 10GE port sequence number indicators	4. Button for manually controlling 10GE/25GE port sequence number indicators

Table 4-161 Indicators on the CEL36LQFD-GK

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the	Green	Steady on	The link on the port is connected.

Silkscreen	Name	Color	Status	Description
	port at the bottom.		Blinking	The port is transmitting or receiving data.
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted ports. ● If a port is split, a port indicator (2 in **Figure 4-69**) shows the status of a converted port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE converted port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 40GE or 100GE port is not split, the port indicator shows the status of the 40GE or 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 10GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 10GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

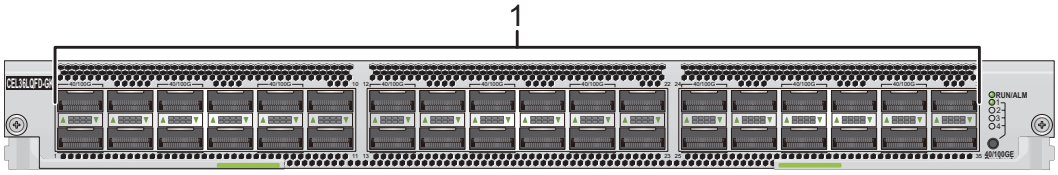
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-162 Button on the CEL36LQFD-GK

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE/25GE port sequence number indicators	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-70 Ports on the CEL36LQFD-GK



1. Thirty-six 40GE optical ports

Table 4-163 Information about optical ports on the CEL36LQFD-GK

Item	Description
Connector type	The connector type varies depending on the used QSFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP+ optical module.

Item	Description
Applicable cable	When a 40GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 40GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When one of the 18 40GE ports (0, 1, 4, 5...) on the CEL36LQFD-GK works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When one of the 18 40GE ports (0, 1, 4, 5...) on the CEL36LQFD-G functions as a 100GE port and works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable **NOTE** After a 100GE port is split into four 25GE ports and has a 40GE medium installed, the four 25GE ports automatically work as four 10GE ports.

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-164 Functions and features of the CEL36LQFD-GK

Function and Feature	Description
Basic function	The CEL36LQFD-GK provides data packet processing and traffic management on 36 40GE optical ports, which can be split into 144 10GE optical ports.
Maximum port density	If all LPUs are CEL36LQFD-GK cards: • The CloudEngine 16804 chassis provides a maximum of 144 40GE ports. • The CloudEngine 16808 chassis provides a maximum of 288 40GE ports. • The CloudEngine 16816 chassis provides a maximum of 576 40GE ports.

Function and Feature	Description
40GE port	• A 40GE port on a CEL36LQFD-GK card can be split into four 10GE ports. That is, a CEL36LQFD-GK card provides a maximum port density of 144x10GE. All the 36 40GE ports are independent, and each can be split into four 10GE ports. • On the CEL36LQFD-GK card, the 18 40GE ports that can be used as 100GE ports are marked with silkscreen 40/100G. The port IDs are 0, 1, 4, 5, 8, 9, 12, 13, 16, 17, 20, 21, 24, 25, 28, 29, 32, and 33. These port IDs are represented by (0, 1, 4, 5...) in the following descriptions. • The 36 ports on the CEL36LQFD-GK card are divided into groups, each of which contains four ports starting from port 0. The total port rate of a group cannot exceed 200GE. When port *n* is used as a 100GE port, port *n*+2 becomes unavailable and is in DOWN(Port unavailable) state. For example: – Ports 0 to 3 are in the same group. If ports 0 and 1 are used as 100GE ports, ports 2 and 3 become unavailable and are in DOWN(Port unavailable) state. – If only one port (for example, port 0) is used as a 100GE port, port 2 becomes unavailable and is in DOWN(Port unavailable) state. Ports 1 and 3 can work as 40GE ports or each of them can be split into four 10GE ports.

Technical Specifications

Table 4-165 Technical specifications of the CEL36LQFD-GK

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	8.0 kg (17.64 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	256 W
Maximum power consumption	443 W
Typical heat dissipation	874 BTU/hour
Maximum heat dissipation	1513 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.5.6 CEL36LQFD1-G (36-Port 40GE Interface Card (FD1-G, QSFP+))

The CEL36LQFD-GK provides 36 40GE optical ports for data access and processing. Among these optical ports, 18 40GE optical ports can be used as 100GE ports, and each 40GE optical port can be split into four 10GE optical ports.

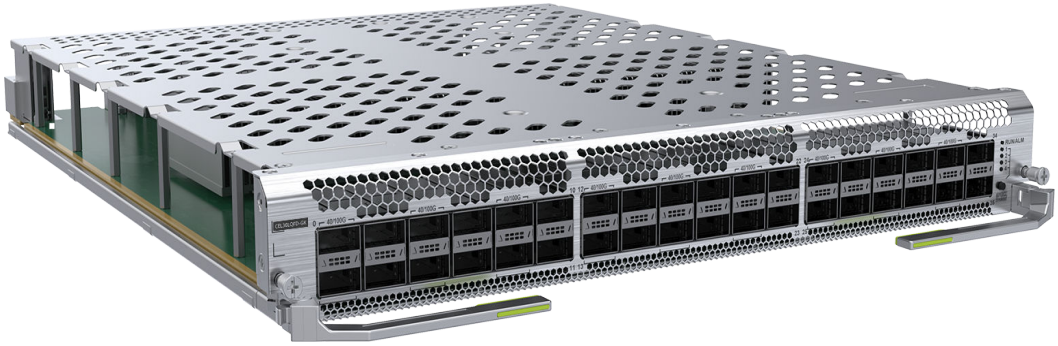
Overview

Table 4-166 Basic information about the CEL36LQFD1-G

Item	Details
Description	36-Port 40GE Interface Card (FD1-G, QSFP+)
Part number	03059668
Silkscreen	CEL36LQFD1-G
Model	CEL36LQFD1-G
First supported version	V200R019C10

Appearance

Figure 4-71 Appearance of the CEL36LQFD-GK



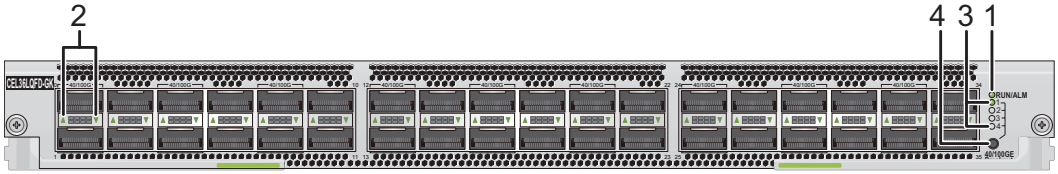
Version Mapping

Table 4-167 Chassis and version matching the CEL36LQFD1-G

Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10
CloudEngine 16816	V200R019C10

Indicators and Buttons

Figure 4-72 Indicators and button on the CEL36LQFD1-G



1. Running status indicator	2. Port status indicator	3. 10GE port sequence number indicators	4. Button for manually controlling 10GE/25GE port sequence number indicators

Table 4-168 Indicators on the CEL36LQFD1-G

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the	Green	Steady on	The link on the port is connected.

Silkscreen	Name	Color	Status	Description
	port at the bottom.		Blinking	The port is transmitting or receiving data.
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted ports. ● If a port is split, a port indicator (2 in **Figure 4-72**) shows the status of a converted port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE converted port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 40GE or 100GE port is not split, the port indicator shows the status of the 40GE or 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 10GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 10GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

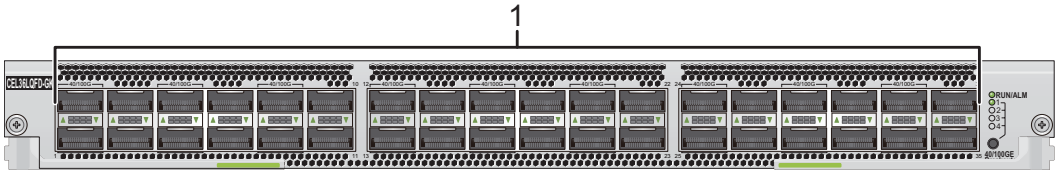
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-169 Button on the CEL36LQFD1-G

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE/25GE port sequence number indicators	When one or more 40GE or 100GE ports are split, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-73 Ports on the CEL36LQFD1-G



1. Thirty-six 40GE optical ports

Table 4-170 Information about optical ports on the CEL36LQFD1-G

Item	Description
Connector type	The connector type varies depending on the used QSFP+ optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP+ optical module.

Item	Description
Applicable cable	When a 40GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 40GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When one of the 18 40GE ports (0, 1, 4, 5...) on the CEL36LQFD1-G works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When one of the 18 40GE ports (0, 1, 4, 5...) on the CEL36LQFD-G functions as a 100GE port and works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable **NOTE** After a 100GE port is split into four 25GE ports and has a 40GE medium installed, the four 25GE ports automatically work as four 10GE ports.

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-171 Functions and features of the CEL36LQFD1-G

Function and Feature	Description
Basic function	The CEL36LQFD1-G provides data packet processing and traffic management on 36 40GE optical ports, which can be split into 144 10GE optical ports.
Maximum port density	If all LPUs are CEL36LQFD1-G cards: • The CloudEngine 16804 chassis provides a maximum of 144 40GE ports. • The CloudEngine 16808 chassis provides a maximum of 288 40GE ports. • The CloudEngine 16816 chassis provides a maximum of 576 40GE ports.

Function and Feature	Description
40GE port	• A 40GE port on a CEL36LQFD1-G card can be split into four 10GE ports. That is, a CEL36LQFD1-G card provides a maximum port density of 144x10GE. All the 36 40GE ports are independent, and each can be split into four 10GE ports. • On the CEL36LQFD1-G card, the 18 40GE ports that can be used as 100GE ports are marked with silkscreen 40/100G. The port IDs are 0, 1, 4, 5, 8, 9, 12, 13, 16, 17, 20, 21, 24, 25, 28, 29, 32, and 33. These port IDs are represented by (0, 1, 4, 5...) in the following descriptions. • The 36 ports on the CEL36LQFD1-G card are divided into groups, each of which contains four ports starting from port 0. The total port rate of a group cannot exceed 200GE. When port *n* is used as a 100GE port, port *n*+2 becomes unavailable and is in DOWN(Port unavailable) state. For example: – Ports 0 to 3 are in the same group. If ports 0 and 1 are used as 100GE ports, ports 2 and 3 become unavailable and are in DOWN(Port unavailable) state. – If only one port (for example, port 0) is used as a 100GE port, port 2 becomes unavailable and is in DOWN(Port unavailable) state. Ports 1 and 3 can work as 40GE ports or each of them can be split into four 10GE ports.

Technical Specifications

Table 4-172 Technical specifications of the CEL36LQFD1-G

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	8.0 kg (17.64 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	256 W
Maximum power consumption	443 W
Typical heat dissipation	874 BTU/hour
Maximum heat dissipation	1513 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.6 100GE Interface Cards

4.6.1 CEL18CQFD-G (18-Port 100GE Interface Card (FD-G, QSFP28))

The CEL18CQFD-G provides 18 100GE optical ports for data access and processing. The 100GE optical ports can be used as 40GE ports, and each 100GE optical port can be split into four 25GE or four 10GE ports.

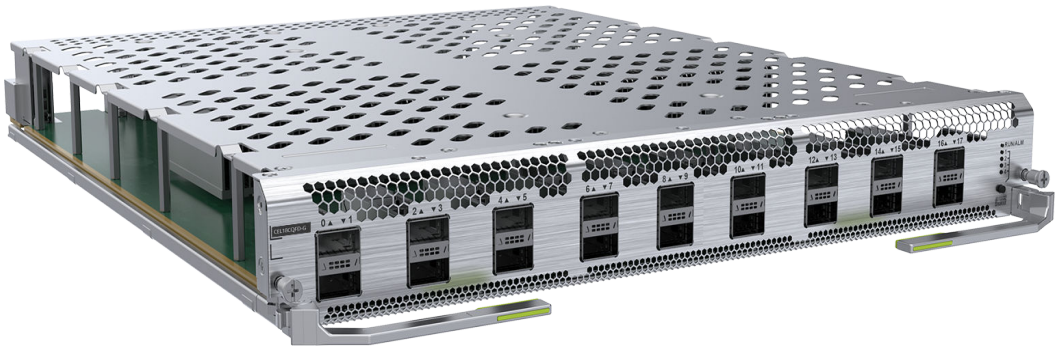
Overview

Table 4-173 Basic information about the CEL18CQFD-G

Item	Details
Description	18-Port 100GE Interface Card (FD-G, QSFP28)
Part number	03058870
Silkscreen	CEL18CQFD-G
Model	CEL18CQFD-G
First supported version	V200R005C20

Appearance

Figure 4-74 Appearance of the CEL18CQFD-G



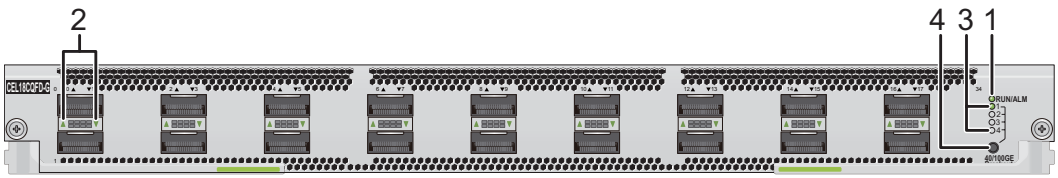
Version Mapping

Table 4-174 Chassis and version matching the CEL18CQFD-G

Chassis	First Supported Version
CloudEngine 16804	V200R005C20
CloudEngine 16808	V200R005C20
CloudEngine 16816	V200R005C20

Indicators and Buttons

Figure 4-75 Indicators and button on the CEL18CQFD-G



1. Running status indicator	2. Port status indicator	3. 10GE/25GE port sequence number indicators	4. Button for manually controlling 10GE/25GE port sequence number indicators

Table 4-175 Indicators on the CEL18CQFD-G

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the	Green	Steady on	The link on the port is connected.

Silkscreen	Name	Color	Status	Description
	port at the bottom.		Blinking	The port is transmitting or receiving data.
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 100GE ports are split into 10GE or 25GE ports, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted 10GE or 25GE ports. ● If a 100GE port is split into four 10GE or four 25GE ports, a port indicator (2 in **Figure 4-75**) shows the status of a 10GE or 25GE port converted from the 100GE port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE port that is converted from a 100GE port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 100GE port works in 100GE mode, the port indicator shows the status of the 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 25GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 25GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

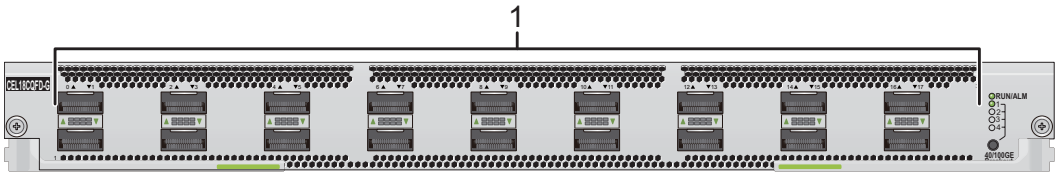
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-176 Button on the CEL18CQFD-G

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE/25GE port sequence number indicators	When one or more 100GE ports are split into 10GE or 25GE ports, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the 10GE/25GE port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-76 Ports on the CEL18CQFD-G



1. Eighteen 100GE optical ports

Table 4-177 Information about optical ports on the CEL18CQFD-G

Item	Description
Connector type	The connector type varies depending on the used QSFP28 optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP28 optical module.

Item	Description
Applicable cable	When a 100GE optical port works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When a 100GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 100GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When a 100GE optical port works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-178 Functions and features of the CEL18CQFD-G

Function and Feature	Description
Basic function	The device provides data packet processing and traffic management on 18 100GE optical ports, which can be used as 18 40GE optical ports or split into 72 25GE or 72 10GE optical ports.

Function and Feature	Description
Maximum port density	If all LPUs are CEL18CQFD-G cards: • The CloudEngine 16804 chassis provides a maximum of 72 100GE ports. • The CloudEngine 16808 chassis provides a maximum of 144 100GE ports. • The CloudEngine 16816 chassis provides a maximum of 288 100GE ports.
100GE port	100GE ports on a CEL18CQFD-G card support QSFP28 optical modules. A 100GE port can be used as a 40GE port or split into four 25GE or four 10GE ports. That is, a CEL18CQFD-G card can provide a maximum port density of 18 x 40GE, 72 x 25GE, or 72 x 10GE. All the 18 100GE ports are independent, and each can be configured as one 40GE port, four 25GE ports, or four 10GE ports.

Technical Specifications

Table 4-179 Technical specifications of the CEL18CQFD-G

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)
Weight without packaging	7.64 kg (16.85 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	251 W
Maximum power consumption	388 W
Typical heat dissipation	857 BTU/hour
Maximum heat dissipation	1325 BTU/hour

Item	Specification
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.6.2 CEL18CQFD-GK (18-Port 100GE Interface Card (FD-GK, QSFP28))

The CEL18CQFD-GK provides 18 100GE optical ports for data access and processing. The 100GE optical ports can be used as 40GE ports, and each 100GE optical port can be split into four 25GE or four 10GE ports.

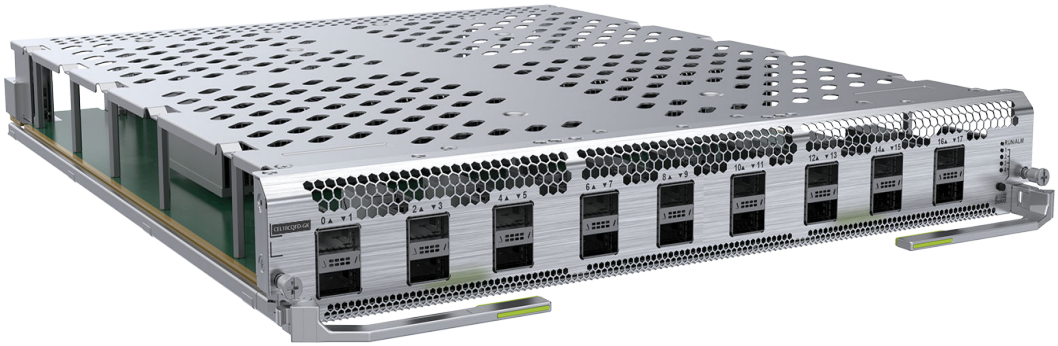
Overview

Table 4-180 Basic information about the CEL18CQFD-GK

Item	Details
Description	18-Port 100GE Interface Card (FD-GK, QSFP28)
Part number	03059591
Silkscreen	CEL18CQFD-GK
Model	CEL18CQFD-GK
First supported version	V200R019C10

Appearance

Figure 4-77 Appearance of the CEL18CQFD-GK



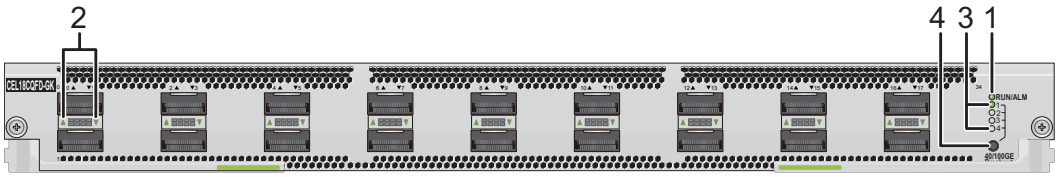
Version Mapping

Table 4-181 Chassis and version matching the CEL18CQFD-GK

Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10
CloudEngine 16816	V200R019C10

Indicators and Buttons

Figure 4-78 Indicators and button on the CEL18CQFD-GK



1. Running status indicator	2. Port status indicator	3. 10GE/25GE port sequence number indicators	4. Button for manually controlling 10GE/25GE port sequence number indicators

Table 4-182 Indicators on the CEL18CQFD-GK

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the port at the bottom.	Green	Steady on	The link on the port is connected.
			Blinking	The port is transmitting or receiving data.

Silkscreen	Name	Color	Status	Description
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 100GE ports are split into 10GE or 25GE ports, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted 10GE or 25GE ports. ● If a 100GE port is split into four 10GE or four 25GE ports, a port indicator (2 in **Figure 4-78**) shows the status of a 10GE or 25GE port converted from the 100GE port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE port that is converted from a 100GE port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 100GE port works in 100GE mode, the port indicator shows the status of the 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 25GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 25GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

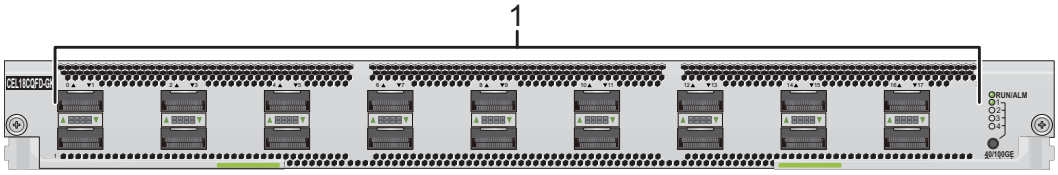
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-183 Button on the CEL18CQFD-GK

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE/25GE port sequence number indicators	When one or more 100GE ports are split into 10GE or 25GE ports, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the 10GE/25GE port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-79 Ports on the CEL18CQFD-GK



1. Eighteen 100GE optical ports

Table 4-184 Information about optical ports on the CEL18CQFD-GK

Item	Description
Connector Type	The connector type varies depending on the used QSFP28 optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP28 optical module.

Item	Description
Applicable cable	When a 100GE optical port works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When a 100GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 100GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When a 100GE optical port works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-185 Functions and features of the CEL18CQFD-GK

Function and Feature	Description
Basic function	The CEL18CQFD-GK provides data packet processing and traffic management on 18 100GE optical ports, which can be used as 18 40GE optical ports or split into 72 25GE or 72 10GE optical ports.
Maximum port density	If all LPUs are CEL18CQFD-GK cards: • The CloudEngine 16804 chassis provides a maximum of 72 100GE ports. • The CloudEngine 16808 chassis provides a maximum of 144 100GE ports. • The CloudEngine 16816 chassis provides a maximum of 288 100GE ports.
100GE port	100GE ports on the CEL18CQFD-GK support QSFP28 optical modules. A 100GE port can be used as a 40GE port or split into four 25GE or four 10GE ports. That is, the CEL18CQFD-GK can provide a maximum of 18 40GE ports, 72 25GE ports, or 72 10GE ports. All the 18 100GE ports are independent, and each can be configured as one 40GE port, four 25GE ports, or four 10GE ports.

Technical Specifications

Table 4-186 Technical specifications of the CEL18CQFD-GK

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)

Item	Specification
Weight without packaging	7.6 kg (16.76 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 4 GB
Typical power consumption	251 W
Maximum power consumption	388 W
Typical heat dissipation	857 BTU/hour
Maximum heat dissipation	1325 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.6.3 CEL36CQFD-G (36-Port 100GE Interface Card (FD-G, QSFP28))

The CEL36CQFD-G provides 36 100GE optical ports for data access and processing. 100GE optical ports can be used as 40GE ports or split into four 25GE or four 10GE ports.

Overview

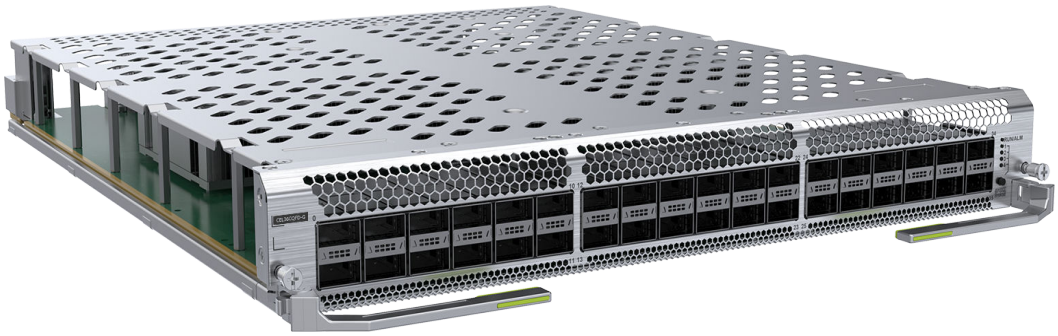
Table 4-187 Basic information about the CEL36CQFD-G

Item	Details
Description	36-Port 100GE Interface Card (FD-G, QSFP28)
Part number	03058869
Silkscreen	CEL36CQFD-G
Model	CEL36CQFD-G

Item	Details
First supported version	V200R005C20

Appearance

Figure 4-80 Appearance of the CEL36CQFD-G



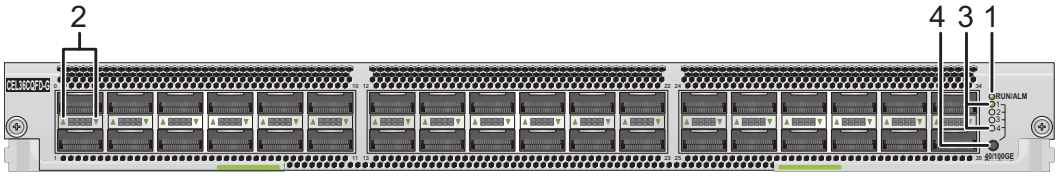
Version Mapping

Table 4-188 Chassis and version matching the CEL36CQFD-G

Chassis	First Supported Version
CloudEngine 16804	V200R005C20
CloudEngine 16808	V200R005C20
CloudEngine 16816	V200R005C20

Indicators and Buttons

Figure 4-81 Indicators and button on the CEL36CQFD-G



1. Running status indicator	2. Port status indicator	3. 10GE/25GE port sequence number indicators	4. Button for manually controlling 10GE/25GE port sequence number indicators

Table 4-189 Indicators on the CEL36CQFD-G

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the port at the bottom.	Green	Steady on	The link on the port is connected.
			Blinking	The port is transmitting or receiving data.

Silkscreen	Name	Color	Status	Description
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 100GE ports are split into 10GE or 25GE ports, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted 10GE or 25GE ports. ● If a 100GE port is split into four 10GE or four 25GE ports, a port indicator (2 in **Figure 4-81**) shows the status of a 10GE or 25GE port converted from the 100GE port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE port that is converted from a 100GE port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 100GE port works in 100GE mode, the port indicator shows the status of the 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 25GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 25GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

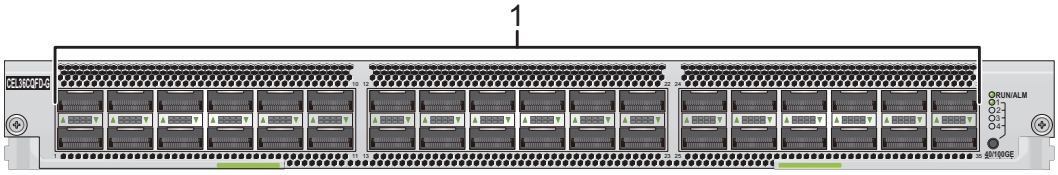
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-190 Button on the CEL36CQFD-G

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE/25GE port sequence number indicators	When one or more 100GE ports are split into 10GE or 25GE ports, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the 10GE/25GE port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-82 Ports on the CEL36CQFD-G



1. Thirty-six 100GE optical ports

Table 4-191 Information about optical ports on the CEL36CQFD-G

Item	Description
Connector type	The connector type varies depending on the used QSFP28 optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP28 optical module.

Item	Description
Applicable cable	When a 100GE optical port works in 100GE mode, it can use: ● QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) ● QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP28 to QSFP28 AOC cable
	When a 100GE optical port works in 40GE mode, it can use: ● QSFP+ optical module and LC optical fiber (when the connector type of the optical module is LC) ● QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) ● QSFP+ to QSFP+ high-speed cable ● QSFP+ to QSFP+ AOC cable
	When a 100GE optical port works in 4*10GE mode, it can use: ● QSFP+ optical module and MPO-4*DLC optical fiber ● QSFP+ to 4*SFP+ high-speed cable ● QSFP+ to 4*SFP+ AOC cable
	When a 100GE optical port works in 4*25GE mode, it can use: ● QSFP28 optical module and MPO-4*DLC optical fiber

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-192 Functions and features of the CEL36CQFD-G

Function and Feature	Description
Basic function	The CEL36CQFD-G provides data packet processing and traffic management on 36 100GE optical ports, which can be used as 36 40GE optical ports or split into 144 25GE or 144 10GE optical ports.
Maximum port density	If all LPUs are CEL36CQFD-G cards: • The CloudEngine 16804 chassis provides a maximum of 144 100GE ports. • The CloudEngine 16808 chassis provides a maximum of 288 100GE ports. • The CloudEngine 16816 chassis provides a maximum of 576 100GE ports.
100GE port	100GE ports on a CEL36CQFD-G card support QSFP28 optical modules. A 100GE port can be used as a 40GE port or split into four 25GE or four 10GE ports. That is, a CEL36CQFD-G card can provide a maximum port density of 36x40GE, 144x25GE, or 144x10GE. All the 36 100GE ports are independent, and each can be configured as one 40GE port, four 25GE ports, or four 10GE ports.

Technical Specifications

Table 4-193 Technical specifications of the CEL36CQFD-G

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)

Item	Specification
Weight without packaging	8.4 kg (18.52 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 8 GB
Typical power consumption	525 W
Maximum power consumption	764 W
Typical heat dissipation	1793 BTU/hour
Maximum heat dissipation	2609 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

4.6.4 CEL36CQFD-GK (36-Port 100GE Interface Card (FD-GK, QSFP28))

The CEL36CQFD-GK provides 36 100GE optical ports for data access and processing. 100GE optical ports can be used as 40GE ports or split into four 25GE or four 10GE ports.

Overview

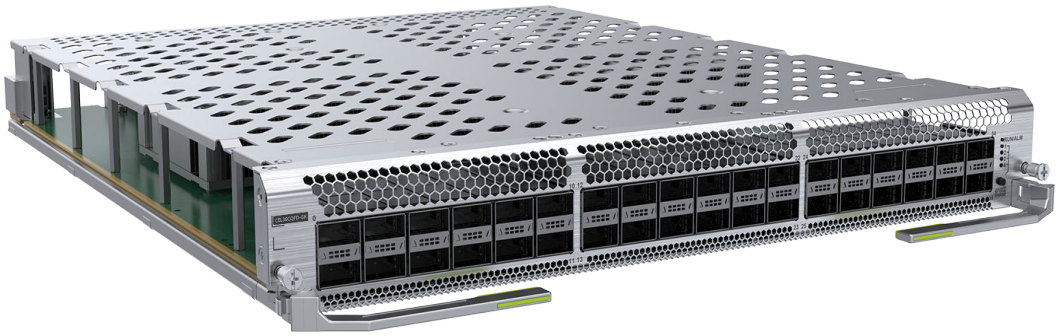
Table 4-194 Basic information about the CEL36CQFD-GK

Item	Details
Description	36-Port 100GE Interface Card (FD-GK, QSFP28)
Part number	03059589
Silkscreen	CEL36CQFD-GK
Model	CEL36CQFD-GK

Item	Details
First supported version	V200R019C10

Appearance

Figure 4-83 Appearance of the CEL36CQFD-GK



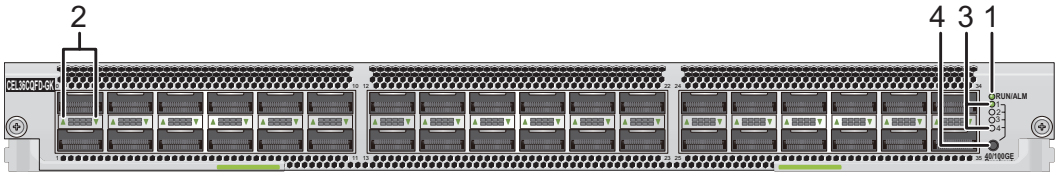
Version Mapping

Table 4-195 Chassis and version matching the CEL36CQFD-GK

Chassis	First Supported Version
CloudEngine 16804	V200R019C10
CloudEngine 16808	V200R019C10
CloudEngine 16816	V200R019C10

Indicators and Buttons

Figure 4-84 Indicators and button on the CEL36CQFD-GK



1. Running status indicator	2. Port status indicator	3. 10GE/25GE port sequence number indicators	4. Button for manually controlling 10GE/25GE port sequence number indicators

Table 4-196 Indicators on the CEL36CQFD-GK

Silkscreen	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
			Slow blinking (0.5 Hz)	The card is working properly.
			Fast blinking (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		Yellow	Steady on	The card is in power-off state. (For example, the card has been forcibly powered off using the **power off** command or is about to start.)
-	One single-color indicator for each port The indicator with an up arrowhead shows the status of the port on the top, and the indicator with a down arrowhead shows the status of the port at the bottom.	Green	Steady on	The link on the port is connected.
			Blinking	The port is transmitting or receiving data.

Silkscreen	Name	Color	Status	Description
-	10GE/25GE port sequence number indicators (1, 2, 3, 4)	Green	-	When one or more 100GE ports are split into 10GE or 25GE ports, these sequence number indicators take effect. The sequence number indicators work with the port indicators to show the status of converted 10GE or 25GE ports. ● If a 100GE port is split into four 10GE or four 25GE ports, a port indicator (2 in **Figure 4-84**) shows the status of a 10GE or 25GE port converted from the 100GE port. – When the sequence number indicator N (N can be 1, 2, 3, or 4) is on, the port indicator shows the status of the Nth 10GE or 25GE port that is converted from a 100GE port. – Sequence number indicators 1, 2, 3, 4 turn on in cyclic order, with each indicator keeping on for 5s. This is the default automatic mode. You can also press the 40/100GE Breakout button to manually control a specific port sequence number indicator. ● If a 100GE port works in 100GE mode, the port indicator shows the status of the 100GE port.

The sequence number indicators work with the port indicators to show the status of converted ports. The following uses ports 0, 1, 2, and 3 as an example. Port 0 is split into four 25GE ports. Converted port 1 is Up, and converted ports 2, 3, and 4 are Down. Port 1 is split into four 25GE ports. Converted ports 1, 2, and 3 are Down, and converted port 4 is Up. Port 2 is not split and is Up. Port 3 is Down. The indicator states are as follows:

- When sequence number indicator 1 is on, the indicator of port 0 is steady on or blinking, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 2 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.
- When sequence number indicator 3 is on, the indicator of port 0 is off, the indicator of port 1 is off, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

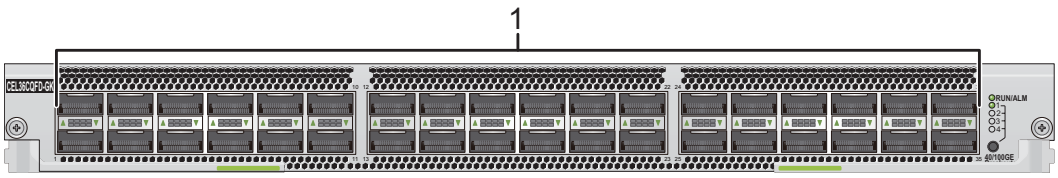
- When sequence number indicator 4 is on, the indicator of port 0 is off, the indicator of port 1 is steady on or blinking, the indicator of port 2 is steady on or blinking, and the indicator of port 3 is off.

Table 4-197 Button on the CEL36CQFD-GK

Silkscreen	Name	Description
40/100GE Breakout	Button for manually controlling 10GE/25GE port sequence number indicators	When one or more 100GE ports are split into 10GE or 25GE ports, these sequence number indicators take effect. Press the 40/100GE Breakout button to turn on the 10GE/25GE port sequence number indicators cyclically. For example, if you press the 40/100GE Breakout button when indicator 3 is on, indicator 3 is still on. When you press the button a second time, indicator 4 turns on. Indicators 1 and 2 turn on in sequence when you press the 40/100GE Breakout button a third and fourth time. The manual control mode restores to the default automatic mode 60s after you stop pressing the 40/100GE Breakout button.

Ports

Figure 4-85 Ports on the CEL36CQFD-GK



1. Thirty-six 100GE optical ports

Table 4-198 Information about optical ports on the CEL36CQFD-GK

Item	Description
Connector type	The connector type varies depending on the used QSFP28 optical module.
Optical port attributes	Optical port attributes vary depending on the used QSFP28 optical module.

Item	Description
Applicable cable	When a 100GE optical port works in 100GE mode, it can use: • QSFP28 optical module and LC-LC optical fiber (when the connector type of the optical module is LC) • QSFP28 optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) • QSFP28 to QSFP28 AOC cable
	When a 100GE optical port works in 40GE mode, it can use: • QSFP+ optical module and LC optical fiber (when the connector type of the optical module is LC) • QSFP+ optical module and MPO-MPO optical fiber (when the connector type of the optical module is MPO) • QSFP+ to QSFP+ high-speed cable • QSFP+ to QSFP+ AOC cable
	When a 100GE optical port works in 4*10GE mode, it can use: • QSFP+ optical module and MPO-4*DLC optical fiber • QSFP+ to 4*SFP+ high-speed cable • QSFP+ to 4*SFP+ AOC cable
	When a 100GE optical port works in 4*25GE mode, it can use: • QSFP28 optical module and MPO-4*DLC optical fiber

NOTE

When a QSFP+ to QSFP+ high-speed cable is installed on the port, the cable can only be used as a stack cable or a cable that connects peer-link interfaces in an M-LAG.

Functions and Features

Table 4-199 Functions and features of the CEL36CQFD-GK

Function and Feature	Description
Basic function	The CEL36CQFD-GK provides data packet processing and traffic management on 36 100GE optical ports, which can be used as 36 40GE optical ports or split into 144 25GE or 144 10GE optical ports.
Maximum port density	If all LPUs are CEL36CQFD-GK cards: • The CloudEngine 16804 chassis provides a maximum of 144 100GE ports. • The CloudEngine 16808 chassis provides a maximum of 288 100GE ports. • The CloudEngine 16816 chassis provides a maximum of 576 100GE ports.
100GE port	100GE ports on a CEL36CQFD-GK card support QSFP28 optical modules. A 100GE port can be used as a 40GE port or split into four 25GE or four 10GE ports. That is, a CEL36CQFD-GK card can provide a maximum port density of 36x40GE, 144x25GE, or 144x10GE. All the 36 100GE ports are independent, and each can be configured as one 40GE port, four 25GE ports, or four 10GE ports.

Technical Specifications

Table 4-200 Technical specifications of the CEL36CQFD-GK

Item	Specification
Dimensions without packaging (H x W x D)	55.4 mm x 433.0 mm x 523.2 mm (2.18 in. x 17.05 in. x 20.60 in.)

Item	Specification
Weight without packaging	8.4 kg (18.52 lb)
CPU	Quad-core, 1.4 GHz clock speed
Flash	Standard 128 MB
Memory	Standard 8 GB
Typical power consumption	525 W
Maximum power consumption	764 W
Typical heat dissipation	1793 BTU/hour
Maximum heat dissipation	2609 BTU/hour
Product certification	• Safety standards compliance • EMC standards compliance • Environmental standards compliance

