5 Heat Dissipation System

5.1 Overview of the Heat Dissipation System

The heat dissipation system of CloudEngine 16800 series switches consists of fan modules and a chassis door.

- Fan modules installed at the rear of the device cool the MPUs, LPUs, and SFUs in the chassis through front-to-back airflow (from the perspective of the cabinet), ensuring a normal operating temperature range for the chassis.

  Power modules have their own fans, which take the heat generated by power modules out of the chassis through front-to-back airflow. These fans ensure that the power modules work in a normal temperature range.

- The chassis door is optional and installed at the front of the chassis to shield electromagnetic noise. The door also can prevent dust from entering the chassis with airflows so that the chassis can work properly.

NOTICE

Cover vacant power module and card slots with filler panels to ensure efficient heat dissipation and EMC compliance.
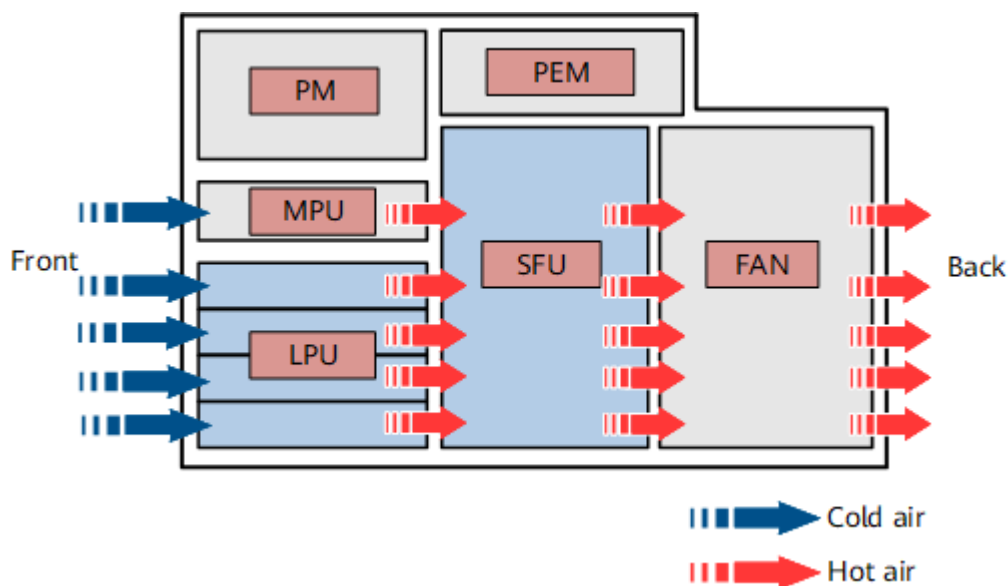
Heat Dissipation of Cards

The MPUs, LPUs, and SFUs use a front-to-back airflow design.

1. Front panels of the MPUs and LPUs have air holes. Cold air flows from these air holes into the MPUs and LPUs.
2. Cool air flows through the MPUs and LPUs to the SFUs.
3. Hot air flows through the SFUs and is exhausted from the chassis by fan modules.

Figure 5-1 shows the airflow for heat dissipation of the MPUs, LPUs, and SFUs.

Figure 5-1 Airflow for heat dissipation of the MPUs, LPUs, and SFUs (side view)
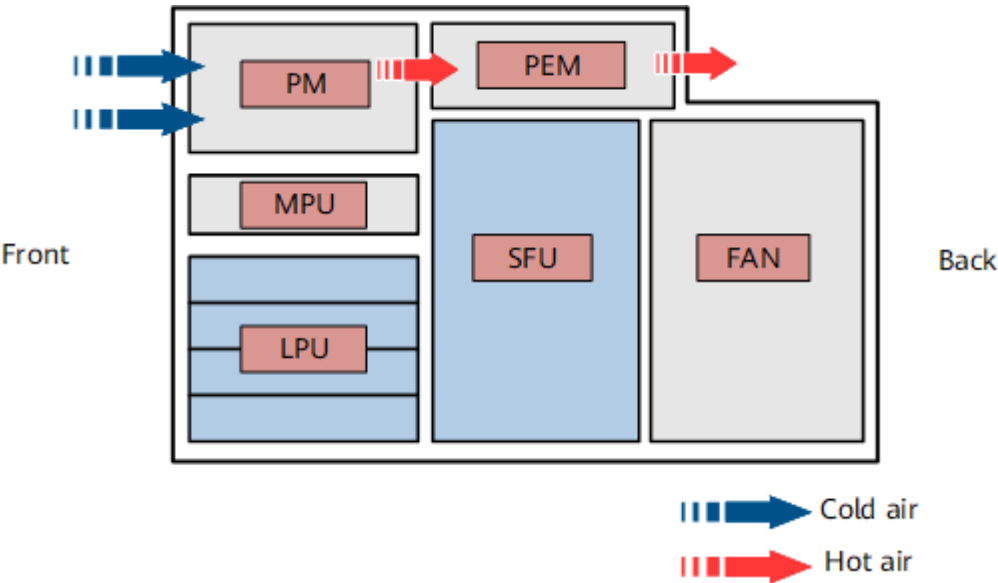

Heat Dissipation of Power Modules

The power modules use a front-to-back airflow design.

1. There are air holes on power module panels. Cold air flows into the power modules from these holes and is blown through the power module area by built-in fans of the power modules.
2. Cold air becomes hot air, passes through the power backplane, and goes out of the chassis from holes on the PEM.

Figure 5-2 shows the airflow for heat dissipation of power modules.

Figure 5-2 Airflow for heat dissipation of power modules (side view)

5.2 FAN-240SA-B (FAN-240SA-B Fan Module)

Overview

Table 5-1 Basic information about the FAN-240SA-B

Item	Details
Description	FAN-240SA-B Fan Module
Part Number	02122487
Model	FAN-240SA-B

Appearance

The FAN-240SA-B fan module consists of a fan tray, fans, and a Fan Monitoring Unit (FMU). Figure 5-3 shows the appearance of the FAN-240SA-B fan module.

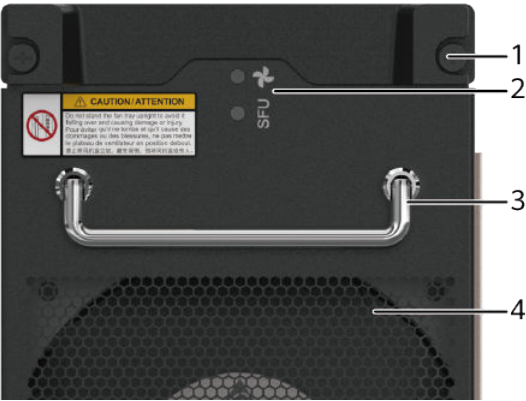**Figure 5-3** Appearance of the FAN-240SA-B

Version Mapping

Table 5-2 Mappings between FAN-240SA-B and product

Product	First Supported Version	Unsupported Model	Limitations	IDs of available slots
CloudEngine 16804	V200R005C20	-	-	FAN1 to FAN3

Panel

Figure 5-4 Panel of the FAN-240SA-B

1. Captive screw	2. Status indicators	3. Handle	4. Air exhaust vent

Table 5-3 Indicators on the FAN-240SA-B

Silkscreen	Name	Color	Status	Description
-	Fan status indicator	Green	Fast blinking (4 Hz)	The fan module has not established communication with the MPU or communication loss occurs.
		Green	Slow blinking (0.5 Hz)	The fan module is working and communicating with the MPU properly.
		Red	Slow blinking (0.5 Hz)	An alarm is generated, and the fan module is faulty.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The fan module is abnormal. The possible cause is that the software of the FMU on the fan module is abnormal or the fan module fails.
SFU	SFU status indicator	Green	Steady on	The SFU is working properly.
		Red	Steady on	A fault that affects services has occurred. The fault cannot be rectified automatically and requires manual intervention.
		Yellow	Steady on	The fan module software is not loaded, or the communication fails, and the SFU indicator cannot be properly displayed.

Functions and Features

Table 5-4 Functions and features of the FAN-240SA-B

Functions and Features	Description
Basic function	The fan module dissipates heat for the chassis so that the chassis can work properly and efficiently within the operating temperature range.
Noise reduction	When the fan module is powered on, it rotates at 48% of the full speed for at most 5 minutes. After the fan module communicates with the MPU normally, the MPU controls running of the fan module.
Automatic fan speed adjustment	After the fan module communicates with the MPU normally, the MPU controls the speed of the fan module according to temperature of cards in the chassis.
Alarm report	The fan module can report alarms on fan module failures and communication failures.
Electronic label	The MPU reads and loads the electronic label of the fan module through RS485.
Hot swapping	Supported

Technical Specifications

Table 5-5 Technical specifications of the FAN-240SA-B

Item	Specification
Dimensions without packaging (H x W x D) [mm (in.)]	361 mm x 129 mm x 143 mm (14.21 in. x 5.08 in. x 5.63 in.)
Weight without packaging [kg (lb)]	3.3 kg (7.28 lb)
Number of fans	2
Typical power consumption	18
Maximum power consumption [W]	180 W
Maximum airflow [CFM]	580 CFM
Maximum wind pressure [Pa]	652.8 Pa

5.3 FAN-480SA-B (FAN-480SA-B Fan Module)

Overview

Table 5-6 Basic information about the FAN-480SA-B

Item	Details
Description	FAN-480SA-B Fan Module
Part Number	02122486
Model	FAN-480SA-B

Appearance

The FAN-480SA-B fan module consists of a fan tray, fans, and a Fan Monitoring Unit (FMU). **Figure 5-5** shows the appearance of the FAN-480SA-B fan module.
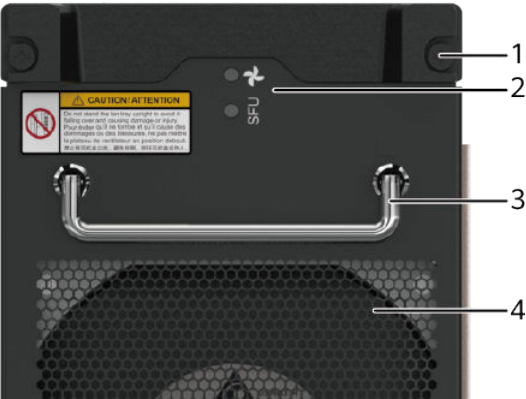
Figure 5-5 Appearance of the FAN-480SA-B

Version Mapping

Table 5-7 Mappings between FAN-480SA-B and product

Product	First Supported Version	Unsupported Model	Limitations	IDs of available slots
CloudEngine 16808	V200R005C20	-	-	FAN1 to FAN3

Panel

Figure 5-6 Panel of the FAN-480SA-B

| 1. Captive screw | 2. Status indicators | 3. Handle | 4. Air exhaust vent |

Table 5-8 Indicators on the FAN-480SA-B

Silkscreen	Name	Color	Status	Description
-	Fan status indicator	Green	Fast blinking (4 Hz)	The fan module has not established communication with the MPU or communication loss occurs.
		Green	Slow blinking (0.5 Hz)	The fan module is working and communicating with the MPU properly.
		Red	Slow blinking (0.5 Hz)	An alarm is generated, and the fan module is faulty.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The fan module is abnormal. The possible cause is that the software of the FMU on the fan module is abnormal or the fan module fails.
SFU	SFU status indicator	Green	Steady on	The SFU is working properly.
		Red	Steady on	A fault that affects services has occurred. The fault cannot be rectified automatically and requires manual intervention.
		Yellow	Steady on	The fan module software is not loaded, or the communication fails, and the SFU indicator cannot be properly displayed.

Functions and Features

Table 5-9 Functions and features of the FAN-480SA-B

Functions and Features	Description
Basic function	The fan module dissipates heat for the chassis so that the chassis can work properly and efficiently within the operating temperature range.
Noise reduction	When the fan module is powered on, it rotates at 48% of the full speed for at most 5 minutes. After the fan module communicates with the MPU normally, the MPU controls running of the fan module.
Automatic fan speed adjustment	After the fan module communicates with the MPU normally, the MPU controls the speed of the fan module according to temperature of cards in the chassis.
Alarm report	The fan module can report alarms on fan module failures and communication failures.
Electronic label	The MPU reads and loads the electronic label of the fan module through RS485.
Hot swapping	Supported

Technical Specifications

Table 5-10 Technical specifications of the FAN-480SA-B

Item	Specification
Dimensions without packaging (H x W x D) [mm (in.)]	605 mm x 129 mm x 143 mm (23.82 in. x 5.08 in. x 5.63 in.)
Weight without packaging [kg (lb)]	5.5 kg (12.13 lb)
Number of fans	4
Typical power consumption	36
Maximum power consumption [W]	360 W
Maximum airflow [CFM]	1160 CFM
Maximum wind pressure [Pa]	652.8 Pa

5.4 FAN-960SA-B (FAN-960SA-B Fan Module)

Overview

Table 5-11 Basic information about the FAN-960SA-B

Item	Details
Description	FAN-960SA-B Fan Module
Part Number	02122582
Model	FAN-960SA-B

Appearance

The FAN-960SA-B fan module consists of a fan tray, fans, and a Fan Monitoring Unit (FMU). **Figure 5-7** shows the appearance of the FAN-960SA-B fan module.

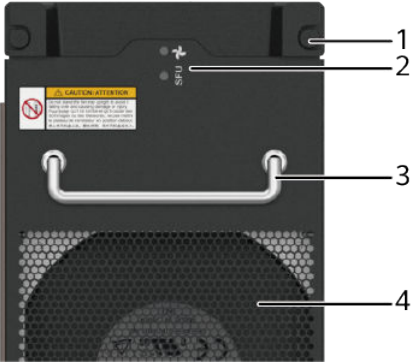**Figure 5-7** Appearance of the FAN-960SA-B

Version Mapping

Table 5-12 Mappings between FAN-960SA-B and product

Product	First Supported Version	Unsupported Model	Limitations	IDs of available slots
CloudEngine 16816	V200R005C20	-	-	FAN1 to FAN3

Panel

Figure 5-8 Panel of the FAN-960SA-B

1. Captive screw	2. Status indicators	3. Handle	4. Air exhaust vent

Table 5-13 Indicators on the FAN-960SA-B

Silkscreen	Name	Color	Status	Description
-	Fan status indicator	Green	Fast blinking (4 Hz)	The fan module has not established communication with the MPU or communication loss occurs.
		Green	Slow blinking (0.5 Hz)	The fan module is working and communicating with the MPU properly.
		Red	Slow blinking (0.5 Hz)	An alarm is generated, and the fan module is faulty.

Silkscreen	Name	Color	Status	Description
		Yellow	Steady on	The fan module is abnormal. The possible cause is that the software of the FMU on the fan module is abnormal or the fan module fails.
SFU	SFU status indicator	Green	Steady on	The SFU is working properly.
		Red	Steady on	A fault that affects services has occurred. The fault cannot be rectified automatically and requires manual intervention.
		Yellow	Steady on	The fan module software is not loaded, or the communication fails, and the SFU indicator cannot be properly displayed.

Functions and Features

Table 5-14 Functions and features of the FAN-960SA-B

Functions and Features	Description
Basic function	The fan module dissipates heat for the chassis so that the chassis can work properly and efficiently within the operating temperature range.
Noise reduction	When the fan module is powered on, it rotates at 48% of the full speed for at most 5 minutes. After the fan module communicates with the MPU normally, the MPU controls running of the fan module.
Automatic fan speed adjustment	After the fan module communicates with the MPU normally, the MPU controls the speed of the fan module according to temperature of cards in the chassis.
Alarm report	The fan module can report alarms on fan module failures and communication failures.
Electronic label	The MPU reads and loads the electronic label of the fan module through RS485.
Hot swapping	Supported

Technical Specifications

Table 5-15 Technical specifications of the FAN-960SA-B

Item	Specification
Dimensions without packaging (H x W x D) [mm (in.)]	1193 mm x 129 mm x 143 mm (46.97 in. x 5.08 in. x 5.63 in.)
Weight without packaging [kg (lb)]	10.4 kg (22.93 lb)
Number of fans	8
Typical power consumption	72
Maximum power consumption [W]	720 W
Maximum airflow [CFM]	2320 CFM
Maximum wind pressure [Pa]	652.8 Pa

5.5 CloudEngine 16804 Chassis Door

Overview

The chassis door is optional and is installed at the front side of the chassis. It is used to shield electromagnetic noise and can protect the air intake vents of MPUs and LPUs from dust.
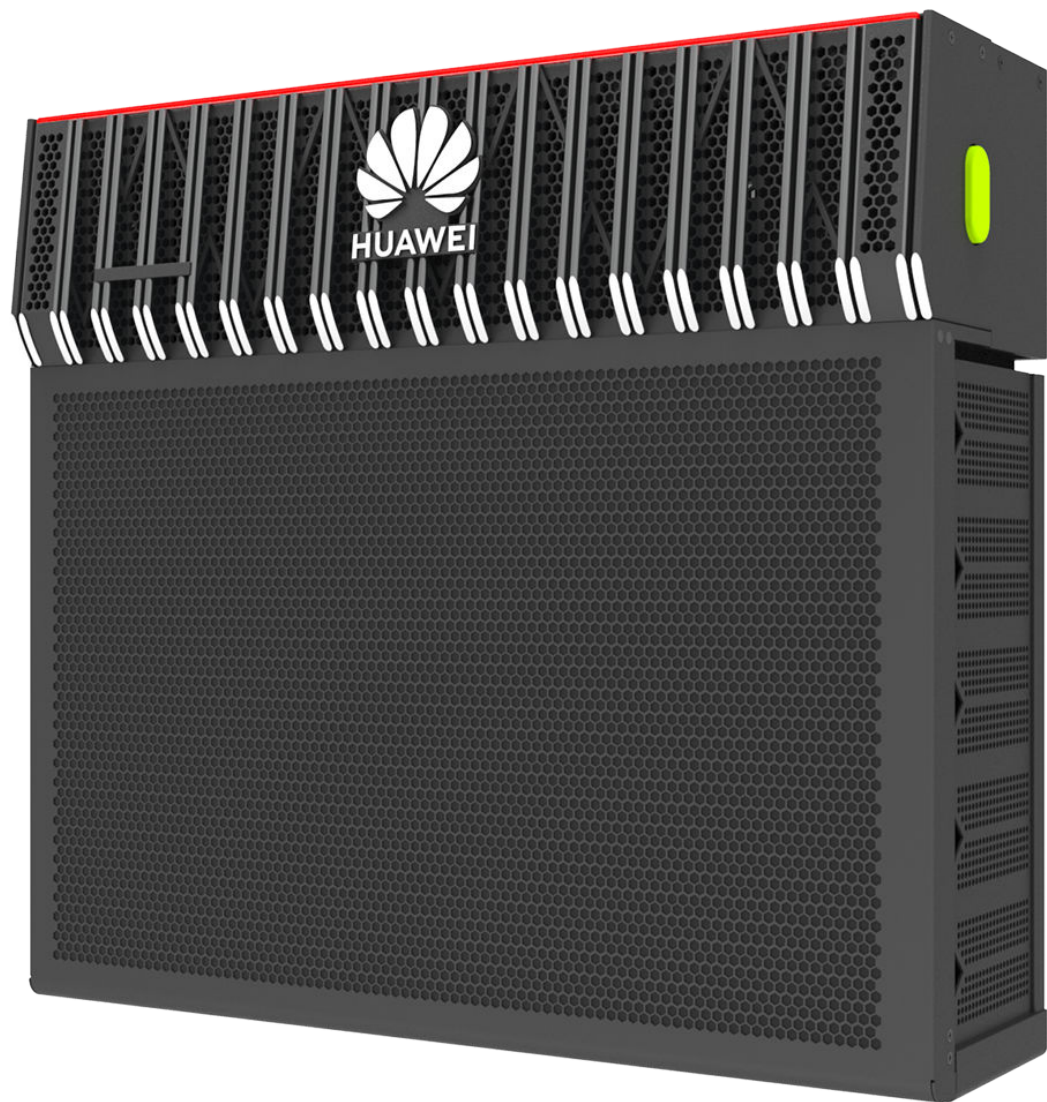
- Install a door on a chassis when the chassis is installed in a dusty environment or a cabinet without doors.
- A chassis door must be configured for a device that complies with FCC standards.

Table 5-16 Basic attributes of the CloudEngine 16804 chassis door

Item	Details
Description	Chassis door
Part number	02352TPK

Appearance

Figure 5-9 Appearance of the CloudEngine 16804 chassis door

Version Mapping

Table 5-17 Chassis and version matching the CloudEngine 16804 chassis door

Chassis	First Supported Version
CloudEngine 16804	V200R005C20

Components

Figure 5-10 Structure of the CloudEngine 16804 chassis door

Table 5-18 Components

1. Chassis door body	2. Upper enclosure frame	3. Lower enclosure frame	4. Cable management frame (including the rubber part)	5. Release button

5.6 CloudEngine 16808 Chassis Door

Overview

The chassis door is optional and is installed at the front side of the chassis. It is used to shield electromagnetic noise and can protect the air intake vents of MPUs and LPUs from dust.

- Install a door on a chassis when the chassis is installed in a dusty environment or a cabinet without doors.
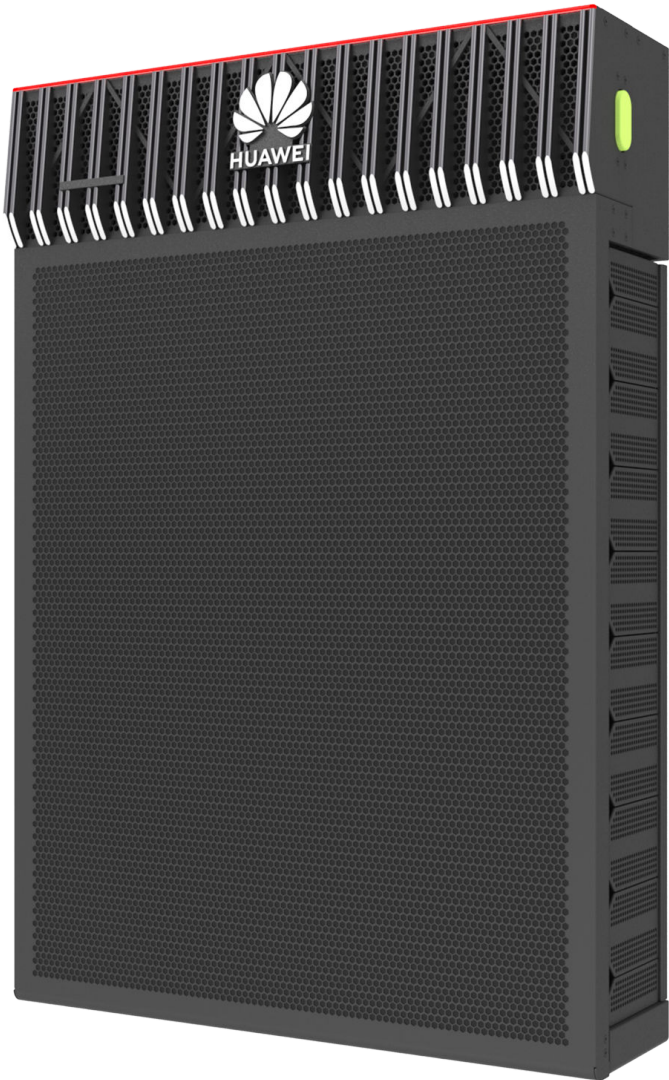
- A chassis door must be configured for a device that complies with FCC standards.

Table 5-19 Basic attributes of the CloudEngine 16808 chassis door

Item	Details
Description	Chassis door
Part number	02352TPL

Appearance

Figure 5-11 Appearance of the CloudEngine 16808 chassis door

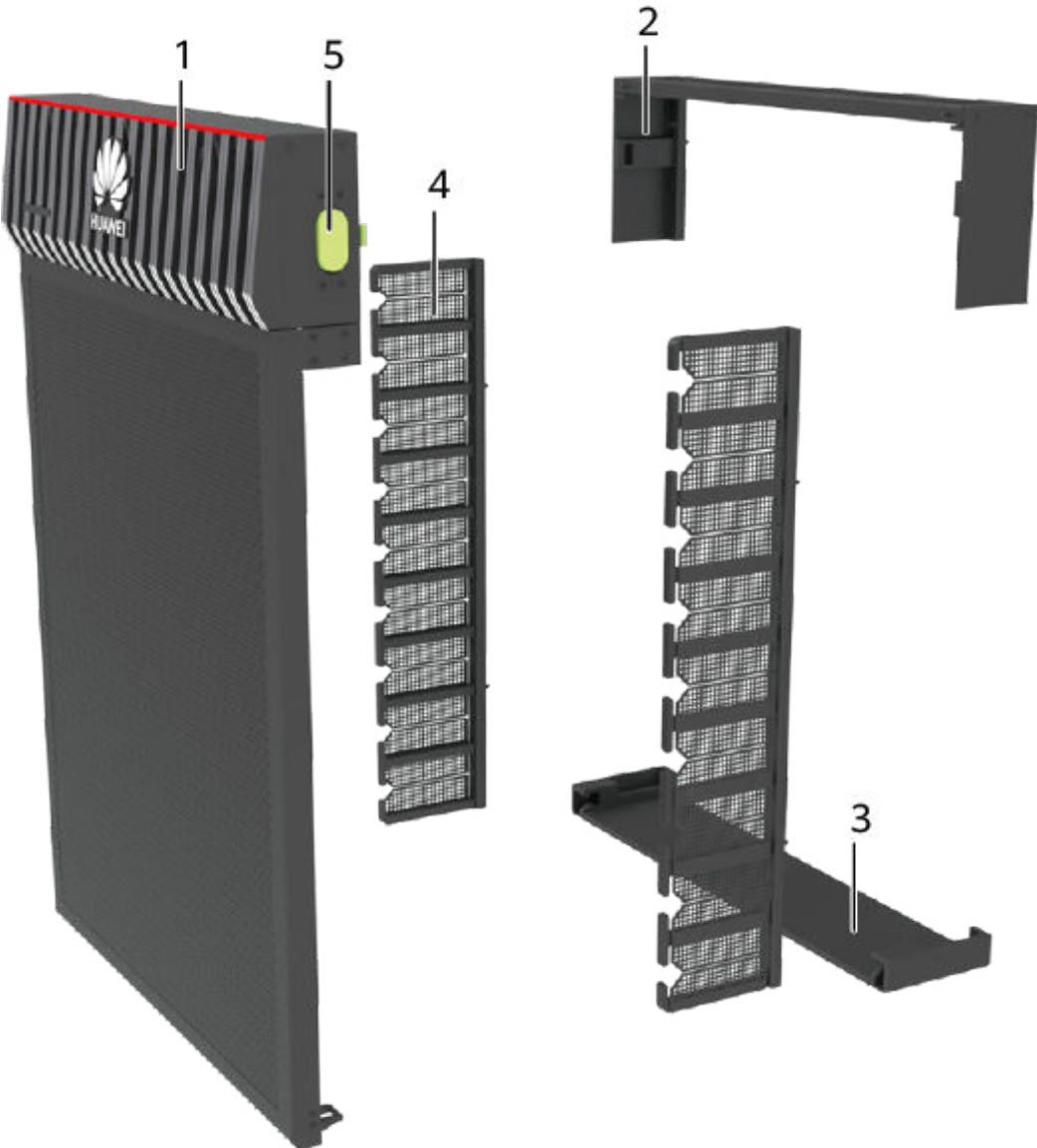## Version Mapping

Table 5-20 Chassis and version matching the CloudEngine 16808 chassis door

Chassis	First Supported Version
CloudEngine 16808	V200R005C20

Components

Figure 5-12 Structure of the CloudEngine 16808 chassis door

Table 5-21 Components

1. Chassis door body	2. Upper enclosure frame	3. Lower enclosure frame	4. Cable management frame (including the rubber part)	5. Release button

5.7 CloudEngine 16816 Chassis Door

Overview

The chassis door is optional and is installed at the front side of the chassis. It is used to shield electromagnetic noise and can protect the air intake vents of MPUs and LPUs from dust.

- Install a door on a chassis when the chassis is installed in a dusty environment or a cabinet without doors.
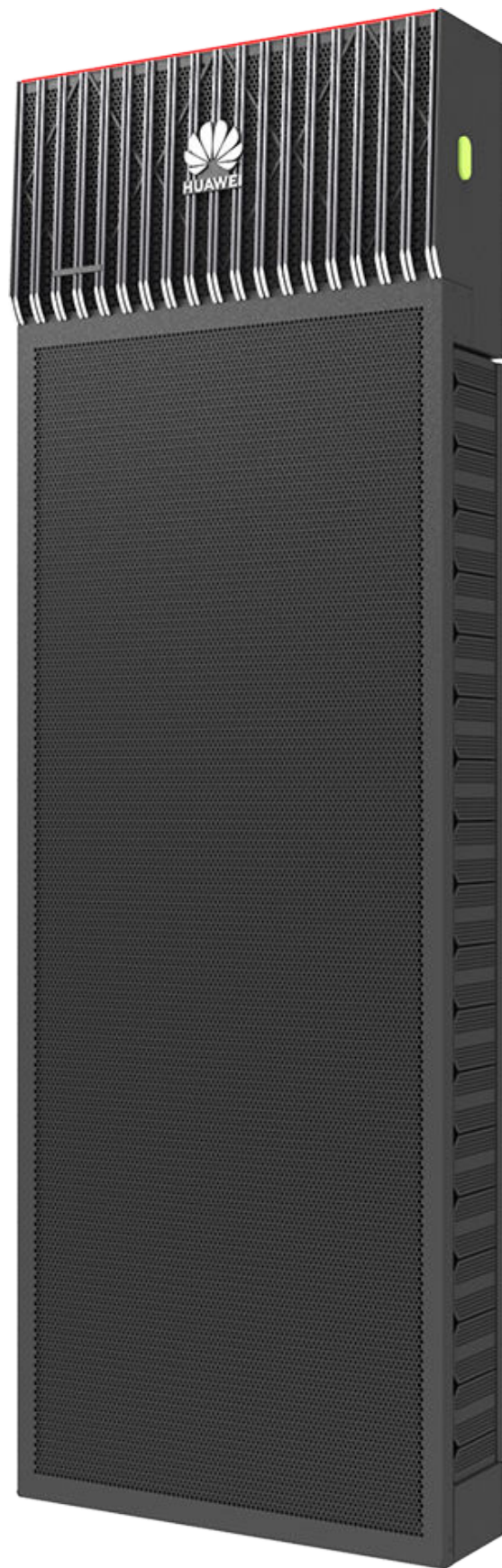- A chassis door must be configured for a device that complies with FCC standards.

Table 5-22 Basic attributes of the CloudEngine 16816 chassis door

Item	Details
Description	Chassis door
Part number	02352TPM

Appearance

Figure 5-13 Appearance of the CloudEngine 16816 chassis door

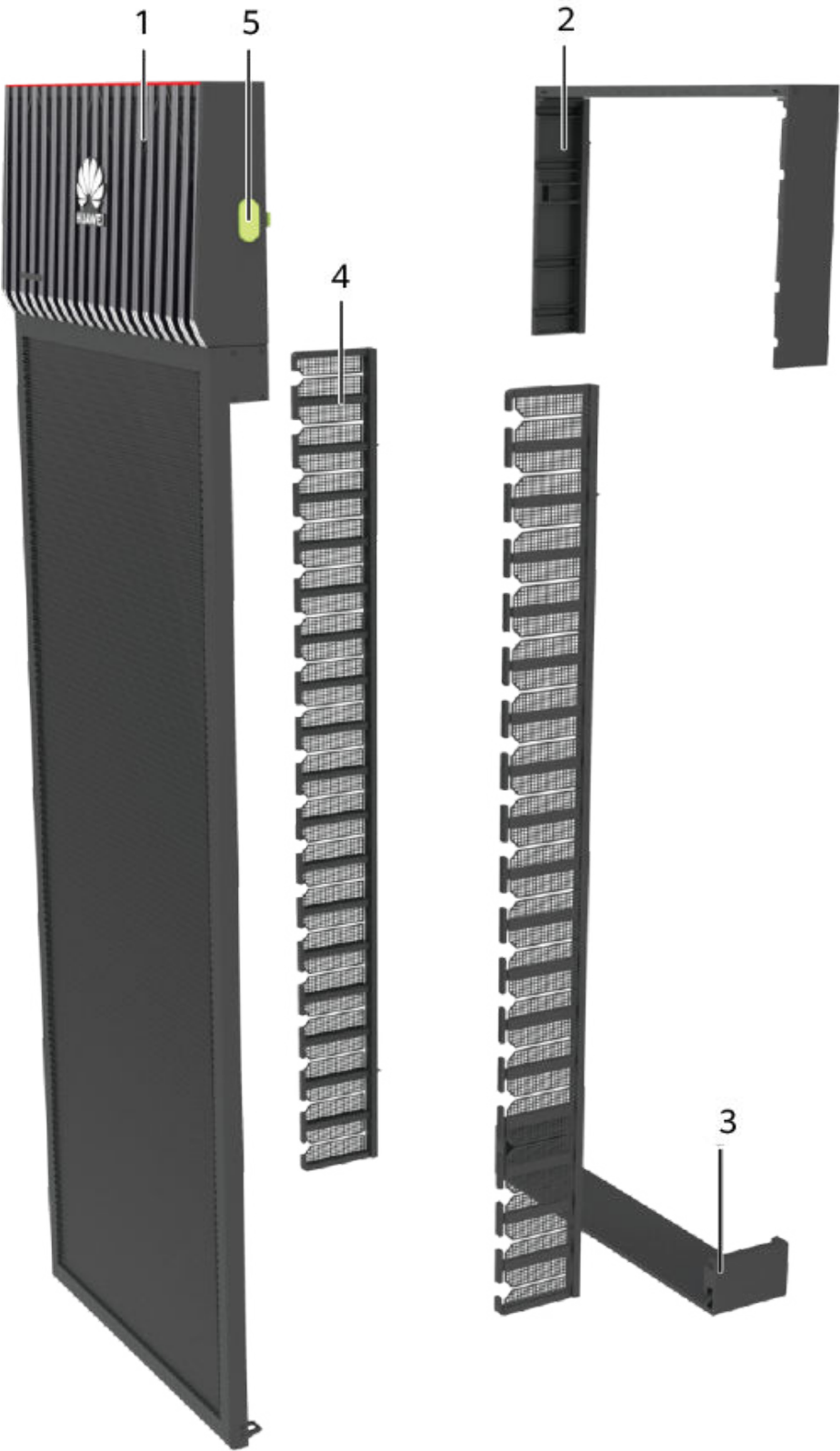## Version Mapping

Table 5-23 Chassis and version matching the CloudEngine 16816 chassis door

Chassis	First Supported Version
CloudEngine 16816	V200R005C20

Components

Figure 5-14 Structure of the CloudEngine 16816 chassis door

Table 5-24 Components

1. Chassis door body	2. Upper enclosure frame	3. Lower enclosure frame	4. Cable management frame (including the rubber part)	5. Release button