

# BDCOM S3928GX-B Hardware Installation Manual



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# Chapter 1 BDCOM S3928GX-B Switch

The document describes the characteristics and parameters of BDCOM S3928GX-B and gives an overview of BDCOM S3928GX-B.

## 1.1 Standard Configuration

The standard ports of BDCOM S3928GX-B are formed of 24 gigabit optical ports, 4 electric RJ45 ports (which are also members of 24 gigabit optical ports), 4 10G SFP+ optical ports (which are realized through the expansion slots) and 1 console port. For details, see the following list.

Table 1-1 Attributes of the necessary port

Port	Attribute
Gigabit-Ethernet electric port	Electric port: 10/100/1000M auto-adaptation, MDI/MDIX auto-identification, UTP(RJ45) port and the LINK/ACT indicators
Gigabit-Ethernet optical port	SFP port: having LINK/ACT indicators
10G-Ethernet optical port	SFP+ port: having 10Gbps and the LINK/ACTIVE indicators
Console port	An RJ45 port with a rate of 9600 bps

Moreover, a 10G expansion slot is reserved at the back of BDCOM S3928GX-B, and a grounding column, a power socket and a power-source switch are provided.

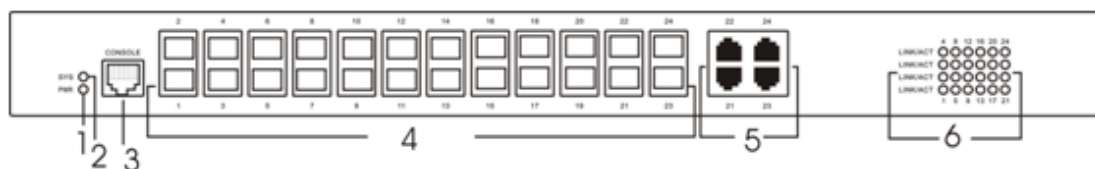


Figure 1-1 Front template of the BDCOM S3928GX-B switch

Table 1-2 Parts at the front template of the BDCOM S3928GX-B switch

No.	Abbrev.	Name	Remarks
1	PWR	Power indicator	If the switch is powered on, the indicator is on.
2	SYS	System indicator	If the indicator is always on, the system is being started. If the indicator flickers, the system works normally.
3	CONSOLE	Console port	Manages the switch locally.

4	None	24个SFP端口24 SFP ports	Forwards the 1000M-Ethernet optical signals.
5	None	4 RJ45 ports	Forwards the 10/100/1000M electric signals and multiplexed with SFP optical ports from 21 to 24.
6	None	Four SFP+ optical ports	Forwards the 10G-Ethernet optical signals.
7	LINK/ACT	Link/ACT indicators for each port	If the indicator is always on, the link on the port is normal. If the indicator flickers, the data is received or transmitted through the port.



Figure 1-2 Back template of the BDCOM S3928GX-B switch

Table 1-3 Parts at the back template of the BDCOM S3928GX-B switch

No.	Abbrev.	Name	Remarks
1	None	Grounding column	The grounding must be fine.
2	None	Power switch	Pressing upward means opening power, while pressing downward means cutting off the power.
3	None	AC power socket	AC100-240V
4	None	Expanded slot	10G expansion module
5	REMOTE POWER SUPPLY	RPS socket	It connects the RP power from the machine room.
6	RPS-ON	RPS working indicator	If it is on, the RPS is working.
7	RPS	RPS location indicator	If it is on, the RPS is connected.

## 1.2 Characteristic Parameters of BDCOM S3928GX-B

Protocol standard	Supported standard	IEEE 802.1d Spanning Tree Protocol IEEE 802.1p Class of Service IEEE 802.1q tagged VLAN IEEE 802.3x Flow control IEEE 802.3ad Link aggregation
	Standard of IP routing protocol	RFC 1058 RIP RFC 1723 RIP v2 RFC 1583 OSPF v2
	Network management standard	RFC 1157 SNMP v1/v2 RFC 1213 MIB II RFC 1757 RMON 1,2,3,9
	Memory	EPROM: 512K Bytes Flash Memory: 8M Bytes SDRAM: 128Mbytes, expandable to 512Mbytes
	Standard configuration	One Console port 24 gigabit optical ports 4 fixed 10/100/1000MBASE-T interfaces 4 10G SFP+ optical ports
	Slot-match cards	LS-2TE-SFP+
	Specifications	442.5mm×315mm×44mm
	Working temperature/humidity	0℃-60℃; 10%-85% no condensation
	Storage temperature/humidity	-40℃-80℃; 5%-95% no condensation
	Power source's characteristics	Input voltage: AC100-240V Input frequency: 47-63Hz Input current: 1A/230V
	Power consumption	Up to 80W

## 1.3 ROHS Description

Parts	Toxic or harmful substances or elements					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Chasis	O	O	O	O	O	O
Rack	O	O	O	O	O	O
Baseboard	O	O	O	O	O	O
Module	O	O	O	O	O	O
Interface Card	O	O	O	O	O	O
O: The toxic or harmful substances' levels in each homogeneous materials of each part, are under the limitation of SJ/T 11363—2006 regulation X: The toxic or harmful substances' levels at least in one homogeneous materials of one part, exceed the limitation of SJ/T 11363—2006 regulation						



## Chapter 2 Installation Preparation

### 2.1 Cautions

Similar to other electronic products, the semiconductor chip easily gets damaged if you power on and off abruptly and frequently. To restart up the switch of BDCOM S3928GX-B, you have to open the power on-off three or five seconds after the power is cut off.

Avoid severe collision or falling down from the height to protect the parts in the switch.

Use correct outside ports to connect the switch of BDCOM S3928GX-B. Do not insert the Ethernet plug into the console port (RJ45 8-line socket). Similarly, do not insert the console cable into the console port (RJ45 8-line socket).

### 2.2 Safety Advice

#### 2.2.1 Safety Principles

- Keep dustless and clean during or after the installation.
- Put the cover at the safe place.
- Put tools at the right place where they are not easily falling down.
- Put on relatively tight clothes, fasten the tie or scarf well and roll up the sleeve, avoiding stumbling the chassis.
- Put on the protective glasses if the environment may cause damage to your eyes.
- Avoid incorrect operations that may cause damage to human or devices.

#### 2.2.2 Safety Notices

The safety notices mentioned here means that improper operation may lead to body damage.

- Read the installation guide carefully before you operate the system.
- Only professionals are allowed to install or replace the switch.
- Pull out the AC power socket and close the direct-current power before operating on the chassis or working beside the power source.
- The final configuration of products must comply with relative national laws and regulations.

### 2.2.3 Safety Principles for Live Working

When you work under electricity, following the following principles:

- Put off ornaments, such as ring, necklace, watch and bracelet, before you operate under live working. When metal articles connect the power to the ground, short circuit happens and components may be damaged.
- Pull out the AC power socket and close the direct-current power before operating on the chassis or working beside the power source.
- When the power is on, do not touch the power.
- Correctly connect the device and the power socket.
- Only professionals are allowed to operate and maintain the device.
- Read the installation guide carefully before the system is powered on.

**Note:**

- 1) Check potential dangers, such as the humid floor, ungrounded extensible power line and tatty power line.
- 2) Install the emergent on-off at the working room for turning off the power when trouble happens.
- 3) Turn off the power on-off of the switch and plug off the power line before installing or uninstalling the chassis or working beside the power.
- 4) Do not work alone if potential dangers exist.
- 5) Cut off the power before checkout.
- 6) If trouble happens, take the following measures:
  - A. Cut off the system's power.
  - B. Alarm
  - C. Take proper measures to help persons who are hit by the disaster. Artificial respiration is needed if necessary.
  - D. Seek for medical help, or judge the loss and seek for available help.

### 2.2.4 Electrostatic Discharge Prevention

Electrostatic discharge may damage devices and circuits. Improper treatment may cause the switch to malfunction completely or discontinuously.

Move or locate the devices according to the measures of electrostatic discharge prevention, ensuring the chassis connects the ground. Another measure is to wear the static-proof hand ring. If there is no hand ring, use the metal clip with the metal cable to clip the unpainted metal part of the chassis. In this case, the static is discharged to the



ground through the metal cable of the clip. You can also discharge the static to the ground through your body.

## 2.3 Requirements for Common Locations

This part describes the requirements for the installation locations.

### 2.3.1 Environment

The switch can be installed on the desk or the cabinet. The location of the chassis, cabinet planning and indoor cabling are very important for normal system's function. Short distance between devices, bad ventilation and untouchable control plate will cause maintenance problems, systematic faulty and breakdown.

For location planning and device locating, refer to section 2.3.2 "Location Configuration Prevention".

### 2.3.2 Location Configuration Prevention

The following preventive measures assist you to design the proper environment for the switch.

- Make sure that the workshop is well-ventilated, the heat of electrical devices is well-discharged and sufficient air circulation is provided for device cooling.
- Avoid to damage devices by following the electrostatic discharge prevention procedure.
- Put the chassis at the place where cool air can blow off the heat inside the chassis. Make sure the chassis is sealed because the opened chassis will reverse the cool air flow.

### 2.3.3 Cabinet Configuration

The following content assists you to make a proper cabinet configuration:

- Each device on the cabinet gives off heat when it runs. Therefore, the sealed cabinet must have the heat-discharge outlet and the cooling fan. Do not put the devices too close, avoiding bad ventilation.
- When you install the chassis at the open cabinet, prevent the frame of the cabinet from blocking the airway of the chassis.
- Ensure that nice ventilation is provided for the devices installed at the bottom of the cabinet.
- The clapboard separates exhaust gas and inflow air, and boost the cool air to flow in the chassis. The best location of the clapboard is decided by the air flow mode in the chassis, which can be obtained through different location tests.

## 2.3.4 Power Requirements

Make sure that the power supply has nice grounding and the power at the input side of the switch is reliable. The voltage control can be installed if necessary. At least a 240 V, 10A fuse or a breaker is provided in the phase line if you prepare the short-circuit prevention measures for a building.

**Caution:**

If the power supply system does not have good grounding, or the input power disturbs too much and excessive pulses exist, the error code rate of communication devices increases and even the hardware system will be damaged.

## 2.4 Installation Tools and Device

The tools and devices to install the BDCOM S3928GX-B switch are not provided by the BDCOM S3928GX-B switch. You yourself need to prepare them. The following are the tools and devices needed for the typical installation of the BDCOM S3928GX-B switch:

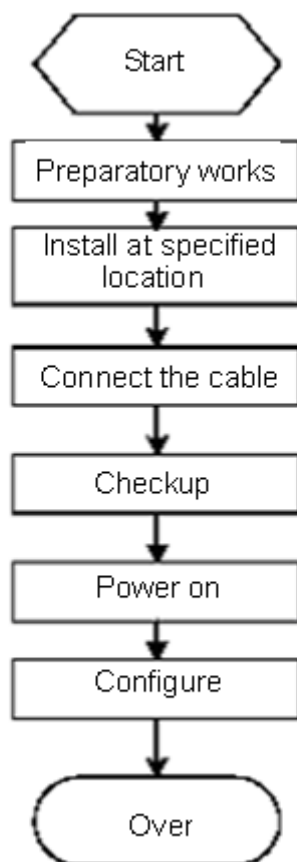
- Screwdriver
- Static armguard
- Bolt
- Ethernet cable
- Other Ethernet terminal devices
- Control terminal

## Chapter 3 Installing the BDCOM S3928GX-B Switch

### Caution:

Only professionals are allowed to install or replace the devices of the router.

### 3.1 Installation Flow of BDCOM S3928GX-B



### 3.2 Installing the Chassis of the Switch

The chassis of the router can be installed on the desk or can be fixed to other cabinets. Your network installation requirements can be met if you conduct the operations according to the following procedure. It can be described in the following two parts:

- Installing the Machine Box on the Desk
- Installing the Chassis on the Cabinet

### 3.2.1 Installing the Machine Box on the Desk

The BDCOM S3928GX-B switch can be directly put on the smooth and safe desk.

**Note:**

Do not put things weighing 4.5 kg or over 4.5 kg on the top of the switch.

### 3.2.2 Installing the Chassis on the Cabinet

The chassis of the switch is fixed on the cabinet through the brackets. When you fix the brackets, the front template of the switch faces forward. The detailed operations are shown in Figure 3-1.



Figure 3-1 Fixing the machine box of the switch

After the brackets are installed, install the switch on the cabinet. See Figure 3-2.

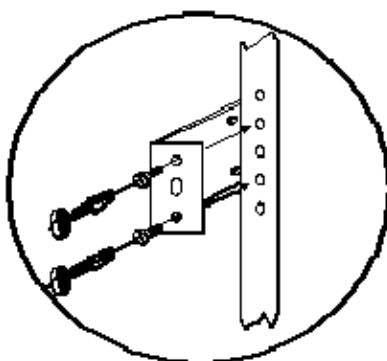


Figure 3-2 Installing the switch on the cabinet

## 3.3 Connecting the Port

### 3.3.1 Connecting the Console Port

The switch of BDCOM S3928GX-B has a Console port.

The rate of the console port is a value ranging from 1200bps to 115200bps. It has a standard RJ45 plug. After you connect the console port to the serial port of PC through a console cable, you can configure and monitor the switch of BDCOM S3928GX-B by running a terminal emulation software, such as super Windows terminal. The cable is

provided according to the host. The communication parameters of the terminal serial port can be set to a rate of 9600bps, eight data bits, one stop bit, no sum check bit and traffic control.

The RJ45 connector of the console port is shown in the following figure. The RJ45 plug corresponds to the RJ45 socket, whose pins can be aligned from left to right with the value from 1 to 8.

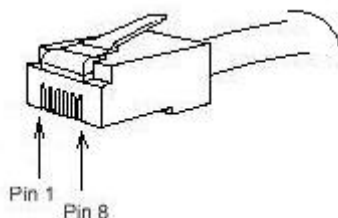


Figure 3-3 RJ-45 connector of the console port

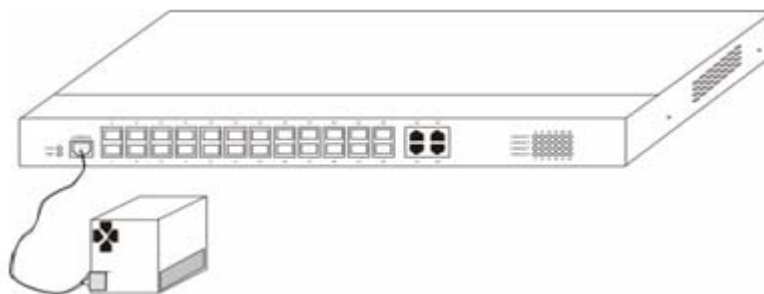


Figure 3-4 Connecting the console port of BDCOM S3928GX-B and computer

Table 3-1 Definition of the pins of the UTP port

No.	Name	Symbol	Remarks
1	Carrier Detecting	CD	No connect
2	Data receiving	RXD	Input
3	Data-line device ready	DSR	No connect
4	Data transmitting	TXD	Output
5	Transmission requesting	RTS	No connect
6	Response transmitting	CTS	No connect
7	Data terminal ready	DTR	No connect
8	Signal ground	SG	GND

**Note:**

The console port of the BDCOM S3928GX-B switch does not support traffic control. Therefore, you must set the option **data traffic control** to **none** when you configure the switch with the super terminal. Otherwise, the single-pass problem will arise on the super terminal.

Otherwise, the single-pass problem will arise on the super terminal. The cable is used to connect the console port of the BDCOM S3928GX-B switch and the outside console terminal device. One end of the cable is a 8-pin RJ45 plug and the other end is a 9-hole plug (DB9). The inner line connection in the cable is shown in figure 3-1. The console cable is numbered as RLC0301.



Figure 3-5 Cable connection at the console port

### 3.3.2 Connecting 1000M-Ethernet Electric Port

BDCOM S3928GX-B provides 24 gigabit SFP ports, and the last four gigabit SFP ports are multiplexed with the 10/100/1000Base-T ports. Each port has a corresponding indicator for showing the LINK/ACT state of them. You can connect other Ethernet terminal devices to the UTP port through the cut-through or cross network cable. The numbering order of the pins in the UTP port is the same as the console port.

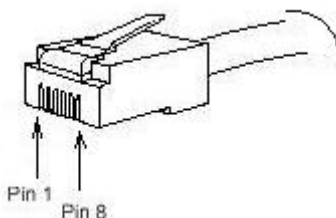


Figure 3-6 RJ-45 connector of the console port

Because four 10/100/1000Base-T ports of BDCOM S3928GX-B support the MDI/MDIX auto-identification of the cable, BDCOM S3928GX-B can adopt five classes of direct-through/cross network cables when it connects other Ethernet terminals.

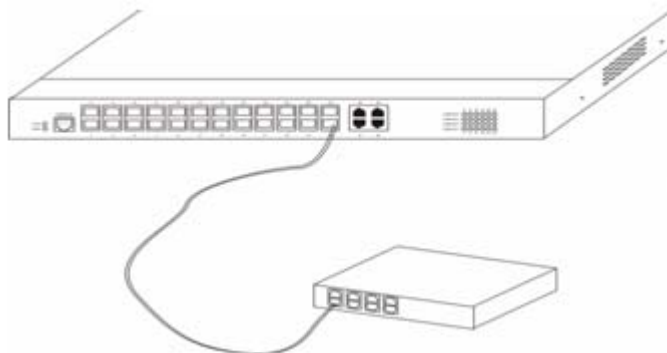


Figure 3-7 Connecting the 10/100/1000Base-T port and other Ethernet terminals

Table 3-2 Definition of the pins of the 1000M RJ45 port

No.	Pin Name	Symbol
1	Sending and receiving the normal phase of data 0	TP0+
2	Sending and receiving the paraphase of data 0	TP0-
3	Sending and receiving the normal phase of data 1	TP1+
4	Sending and receiving the paraphase of data 1	TP1-
5	Sending and receiving the normal phase of data 2	TP2+
6	Sending and receiving the paraphase of data 2	TP2-
7	Sending and receiving the normal phase of data 3	TP3+
8	Sending and receiving the paraphase of data 3	TP3-

The direct-through or cross network cable has the function of auto-identification, so the five classes of direct-through/cross network cables can be used to connect other Ethernet devices.

### 3.3.3 Connecting Ethernet-1000M Electric Port

BDCOM S3928GX-B provides 24 gigabit SFP optical ports. Each port corresponds to an indicator, which shows the LINK/ACT state of a port. When the indicator is always on, the link is normal; if the indicator flickers, the port is forwarding data. To use the electric port, you need insert the RJ45 module to the port and then connect other Ethernet devices through the network cable. If the port is inserted with the RJ45 module, the corresponding optical port cannot be used.

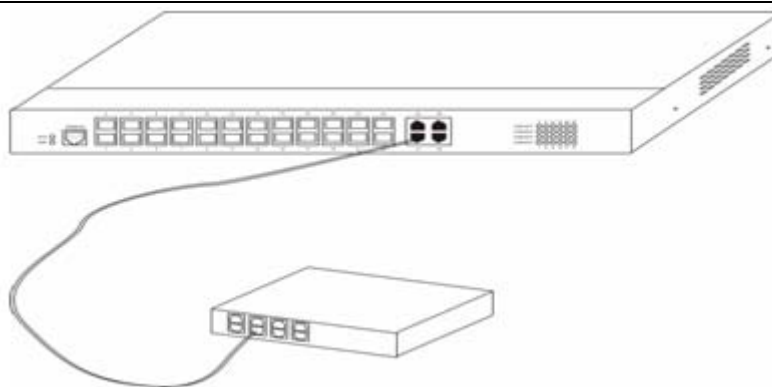


Figure 3-8 Connecting the 1000M electric port and other switches

### 3.4 Connecting 10G Optical Ports

BDCOM 3928GX-B can provide up to 4 10G SFP+ optical ports (TE1, TE2, TE3 and TE4), and each port has an indicator to show the LINK/ACT state. You can insert the SFP+ optical module and then connect it to other Ethernet terminal devices through the optical fiber if you want to use the SFP+ optical port.

### 3.5 Expansion Module for 10G Optical Ports

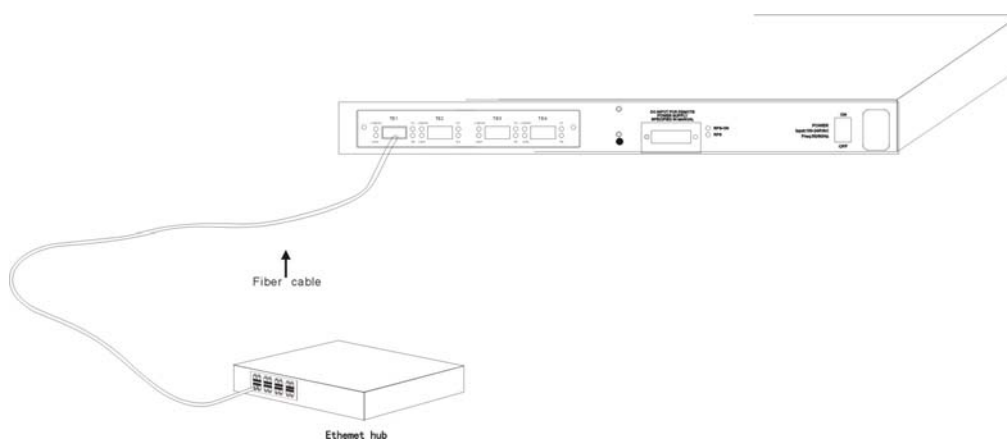


Figure 3-9 Connecting the SFP+ port of BDCOM S3928GX-B and other switches

BDCOM S3928GX-B can provide the 10G optical ports, and each optical port has a pair of indicators, which show the LINKEN/LINK/TX/RX state. You can insert the SFP+ optical module into the port and then connect the module to other Ethernet terminal devices through the optical fiber if you want to use the SFP+ port.

Table 3-3 Numbering of the optional card modules of BDCOM S3928GX-B

No.	Module	Remarks
1	LS-1TE-SFP+	10G optical SFP+ port
2	LS-2TE-SFP+	10G optical SFP+ port



## 3.6 Checking After Installation

Before electrically starting up the switch, perform the following checkups after the switch is installed:

- If the switch is installed on the cabinet, check whether the installation point between the cabinet and the switch is strong. If the switch is installed on the desk, check whether there is enough space for the switch to discharge its heat and whether the desk is stable.
- Check whether the connected power meets the power requirements of the switch.
- Check whether the grounding line is correctly connected.
- Check whether the switch is correctly connected to other terminal devices.

## Chapter 4 Maintaining the Switch

### **Caution:**

- 1) Before opening the chassis, make sure that you have released the static you carried and then turn off the power on-off of the switch. Before operating any step in Appendix B, read the section "Safety Advice".
- 2) Before performing operations beside the power source or on the chassis, turn off the power on-off and plug out the power cable.

### 4.1 Opening the Chassis

This section describes how to open the cover of the switch, required tools and operation methods.

### **Caution:**

When the power cable still connects the power source, do not touch it.

When you open the cover the switch, you may use the following tools: These tools are:

- Crossed screwdriver
- Static armguard

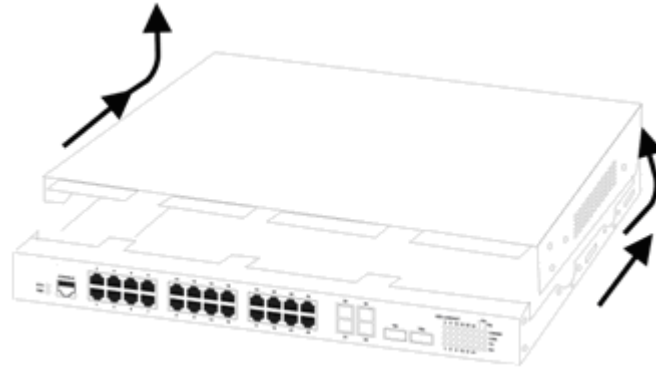
Perform the following steps to open the cover of the switch:

- (1) Turn off the power on-off of the switch.
- (2) Plug out all cables connected the back of the switch.
- (3) Take out the bolt from the chassis with the screwdriver.

### **Note:**

The chassis comprises of two parts: cover and bottom.

- (4) Open the cover by holding two sides of the cover towards the direction of the arrow key shown in the following figure:



- (5) When the cover is opened, put it aside. The frame box of the system appears.

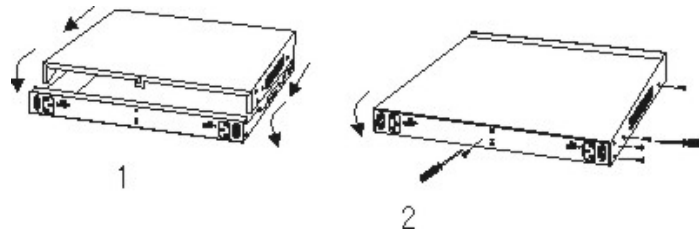
**Note:**

After taking off the cover, put it horizontally and avoid it to be crushed or collided. Otherwise, the chassis is hard to install.

## 4.2 Closing Chassis

The section mainly describes how to put the cover and close the chassis. Do as follows:

- (1) Put them well according to their locations and joint them together along their sides.



- (2) See the following figure.
- (3) When the cover and the bottom are closely tied, let the cover slide the slot of the front template at the bottom.
- (4) Nail the bolt and screw it tightly with the screwdriver.
- (5) Reinstall the switch on the cabinet or the desk.
- (6) Reconnect all cables of the switch.

## Chapter 5 Hardware Fault Analysis

The part describes how to remove the fault from the switch.

### 5.1 Fault Separation

The key for resolving the systematic faults is to separate the fault from the system. You can compare what the system is doing with what the system should do to detect the fault. You need to check the following subsystems:

- Power and cooling systems—power and fan
- Port, cable and connection—ports on the front template of the switch and the cables connecting these ports

#### 5.1.1 Faults Relative with Power and Cooling System

Do the following checkups to help remove the fault:

- When the power on-off is at the “ON” location, check whether the fan works normally. If the fan does not work well, check the fan.
- If the switch is too hot, check whether the air outlet and air inlet are clean and then do relative operations in section 2.3 “Requirements for Common Locations”. The working temperature of the switch is from 0 to 40 Celsius degrees.
- If the switch cannot be started and the PWR indicator is off, check the power.

#### 5.1.2 Faults Relative with Port, Cable and Connection

Do the following checkups to help remove the fault:

- If the port of the switch cannot be linked, check whether the cable is correctly connected and whether the peer connection is normal.
- If the power on-off is at the “ON” location, check the power source and the power cable.
- If the console port does not work after the system is started up, check whether the console port is set to a baud rate of 9600 bps, eight data bits, no sum check bit, one stop bit and no traffic control.

### 5.2 Indicator Description

The LED indicator shows that the switch is running. The following table shows the indicators of the BDCOM S3928GX-B switch and their description:

No.	Abbrev.	Name	Remarks
-----	---------	------	---------

1	PWR	Power indicator	If the switch is powered on, the indicator is on.
2	SYS	System indicator	If the indicator is always on, the system is being started.  If the indicator flickers, the system works normally.
3	LINK/ACT	State indicator for each port	If the indicator is always on, the link on the port is normal.  If the indicator flickers, the data is received or transmitted through the port.
4	LINKEN	LINKEN indicator of the 10G port	If the indicator is always on, the LINKEN of the port is normal.  If the indicator is off, the LINKEN of the port is unsuccessful.
5	LINK	LINK indicator of the 10G port	If the indicator is always on, the link of the port is normal.  If the indicator is off, the link of the port is unsuccessful.
6	TX	TX indicator of the 10G port	If the indicator is off, no data is received or transmitted through the port.  If the indicator flickers, the data is forwarded by the port.
7	RX	RX indicator of the 10G port	If the indicator is off, no data is received or transmitted through the port.  If the indicator flickers, the data is received or transmitted through the port.