

# P#: BH-ESM-8P-10-100

## Ethernet Switch Module



### *Product Introduction*



This is a high-performance 8-port (1 to 8 ports, use as many as needed) 10/100Mbps/1000Mbps Ethernet switch module. It provides a simple network connection to your workgroup or server, offering plug-and-play convenience. This flexible, non-blocking architecture allows users to operate without bandwidth or media network limitations. Each port of this 8-port 10/100Mbps/1000Mbps Ethernet switch module supports auto-sensing. It provides an economical, practical, and cost-effective 10/100Mbps/1000Mbps LAN sharing device, offering stable, high-throughput data transmission to every end user connected to the LAN. Each port uses store-and-forward mode, effectively isolating broadcast storms, reducing packet errors and misinterpretations, and avoiding network congestion and conflicts. All ports of this switch support half-duplex flow control and full-duplex backpressure standards to improve compatibility with bandwidth servers and network protocols. Furthermore, LED indicators diagnose the power supply status of the entire system; this product is energy-efficient and environmentally friendly.

**Applications:** This switch module is a dedicated Ethernet connector for data extension, cabling distance extension, and data conversion. Its mini design is popular with many domestic customers.

#### ➤ *Product features*

- i. Compliant with IEEE 802.3, IEEE 802.3u, and IEEE 802.3ab standards
- ii. RoHS compliant manufacturing process
- iii. Eight 10/100Mbps/1000Mbps auto-sensing RJ45 ports
- iv. All ports support IEEE 802.3x half-duplex flow control and full-duplex backpressure mode
- v. Non-blocking switching architecture, full-line-speed forwarding, and maximum throughput packet filtering
- vi. Supports MAC address learning, automatically adjusting transmission mode and rate
- vii. LED power indicator, providing simple power status indication and troubleshooting.
- viii. Mini's wiring dimensions, PCB size: 68 x 68 x 12mm
- ix. External power supply supports wide DC voltage input (4.5V to 18V). The external power supply supports wide DC voltage input and can support various standard power supplies between 4.5V and 18V, including 5V, 7V, 9V, 12V and other standard power supplies.

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### ➤ Specifications:

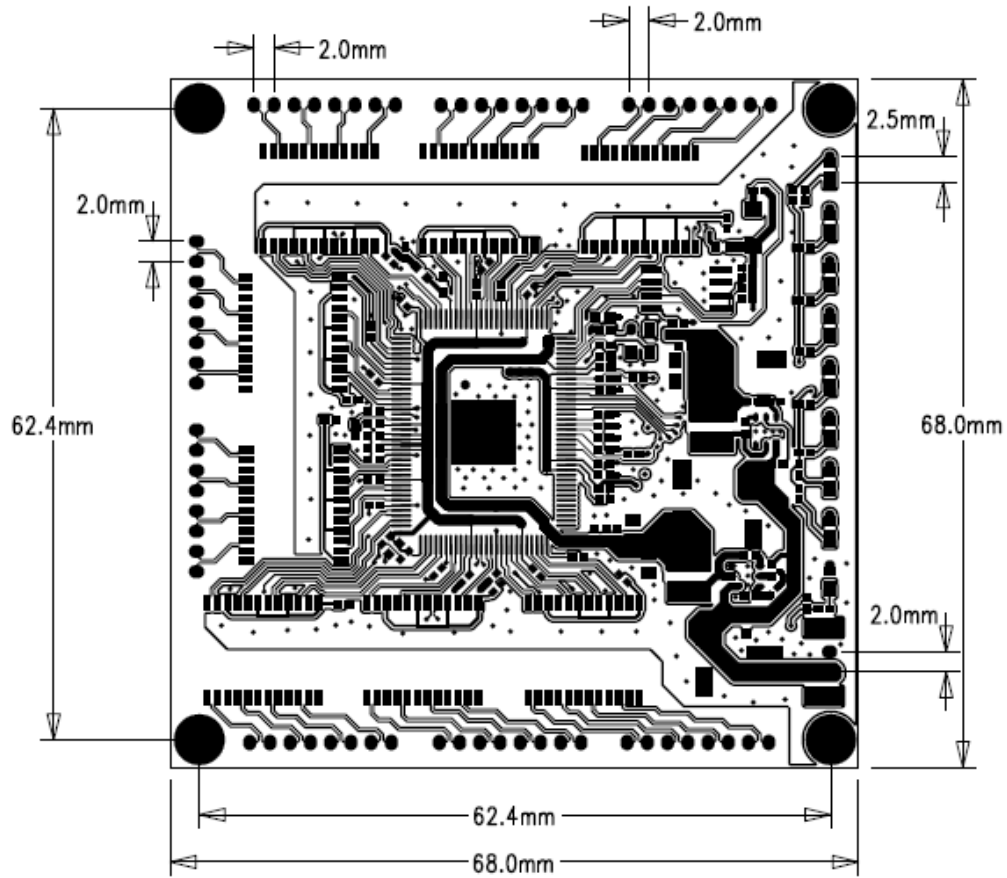
Parameter	Description
standard	IEEE 802.3 10Base-T Ethernet  IEEE 802.3u 100Base-TX Fast Ethernet  IEEE 802.3ab 1000Base-Tx Gigabit Ethernet  IEEE 802.3x Flow Control
protocol	CSMA/CD
Forwarding rate	Ethernet 10Mbps (half-duplex) 20Mbps (full-duplex), 10Mbps: 14,880pps Fast Ethernet 100Mbps (half-duplex), 200Mbps (full-duplex), 100Mbps: 148,800pps Gigabit Ethernet 2000Mbps (full-duplex), 1000Mbps: 1,488,000pps
Topology	star shape
Network medium	10Base-T: UTP of 3 or more classes (≤100m)  100Base-TX: UTP of 5 or more classes (≤100m)  1000Base-TX: UTP of 5A or more classes (≤100m)
Number of ports	8 10/100/1000M RJ45 ports
Cascade	All ports can be used as UP-LINK ports.
Forwarding mode	store and forward
Temperature	Operating temperature: -35°C to 80°C (actual measurement) Storage temperature: -40°C to 70°C (-40°F to 158°F)
Humidity	Operating humidity: 10%~90% (non-condensing) Storage humidity: 5%~95% (non-condensing)
LED indication	1 power indicator (power indicator: green or blue) 8 data indicators (Link/Act: green)
Product dimensions (W x H x D)	68*68*12 mm
Apply power	External power supply DC 5V 1A-12A 0.5A
Shell material	None
Certification	CE ROHS

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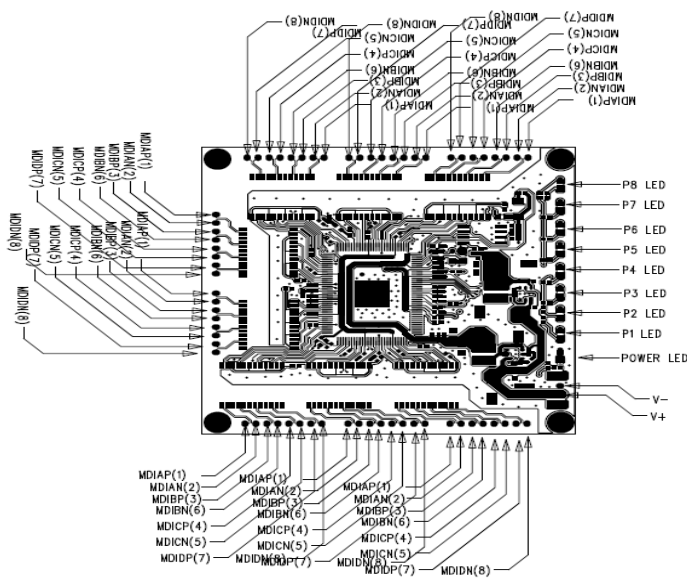
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### Dimensions and structure:



### Pin definition diagram:



( )The number in parentheses represents the corresponding network port PIN.

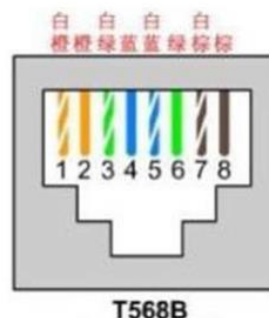
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### Definition of RJ45 standard signal for five network ports:

The RJ45 interface has 8 wires, which are usually arranged in the order of 568B: ① white-orange, ② orange, ③ white-green, ④ blue, ⑤ white-blue, ⑥ green, ⑦ white-brown, ⑧ brown.



Connection relationship between this module and the RJ45 standard network cable

### Regarding the board's thermal design:

The entire board design, including the main chip, is industrial-grade (operating temperature range -40~85 degrees Celsius), capable of withstanding high temperatures; no special treatment is needed at -40 degrees Celsius. However, the chip itself has complex functions, high integration, and a small area, so some heat generation is normal.

During use, it is recommended to configure heat sinks and fans to minimize heat concentration on the board. If the customer has designed a metal casing, it is recommended to guide the heat from the chip to the casing through thermal silicone and metal bumps for faster heat dissipation. If the board will operate at high temperatures for extended periods, please use a large heat sink (a high-performance metal casing can be used as a substitute, or an external fan can be added). The factory-configured mini ultra-thin heat sink is suitable for environments with temperatures not exceeding 80 degrees Celsius.

### Regarding the positive and negative terminals of the input power supply:

During use, please ensure that the positive and negative terminals of the input power supply are not reversed. Please strictly follow the silkscreen markings on the back of the module for power supply connection. Otherwise, there is a possibility of damaging the module or even causing the device to explode (although our circuit design already includes reverse insertion protection and overcurrent protection circuits, please operate with caution to ensure your personal and property safety).

### Regarding network cable selection:

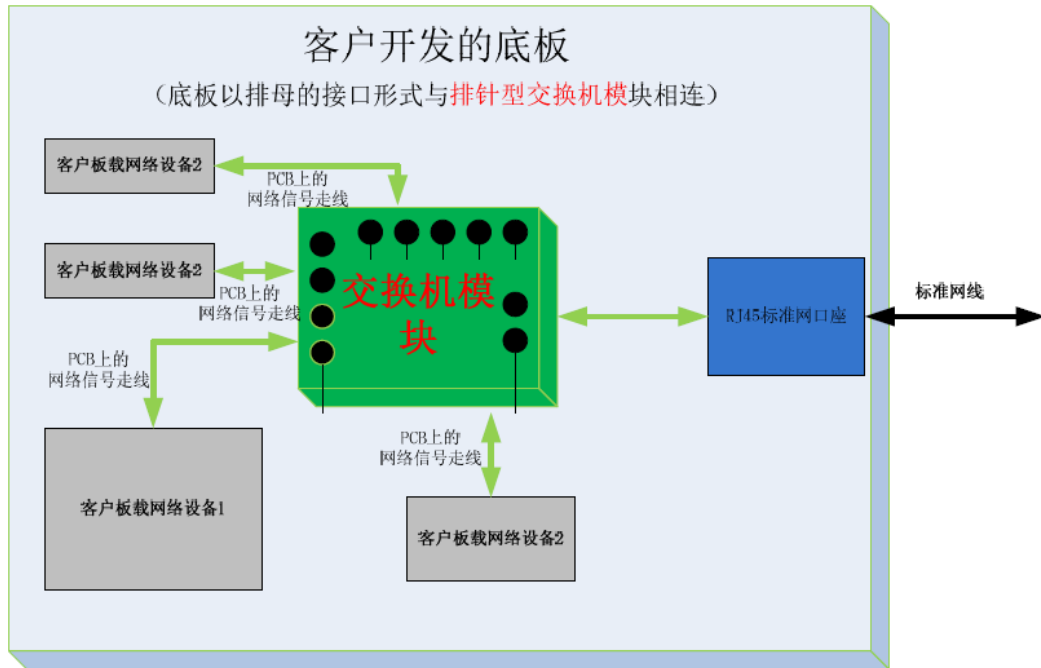
To ensure network communication signal quality, it is recommended to choose a standard Category 6 high-quality network cable.

### Module Integration Methods:

Customers can integrate this module into their products in three ways: pin connectors, sockets, and RJ45 adapter modules.

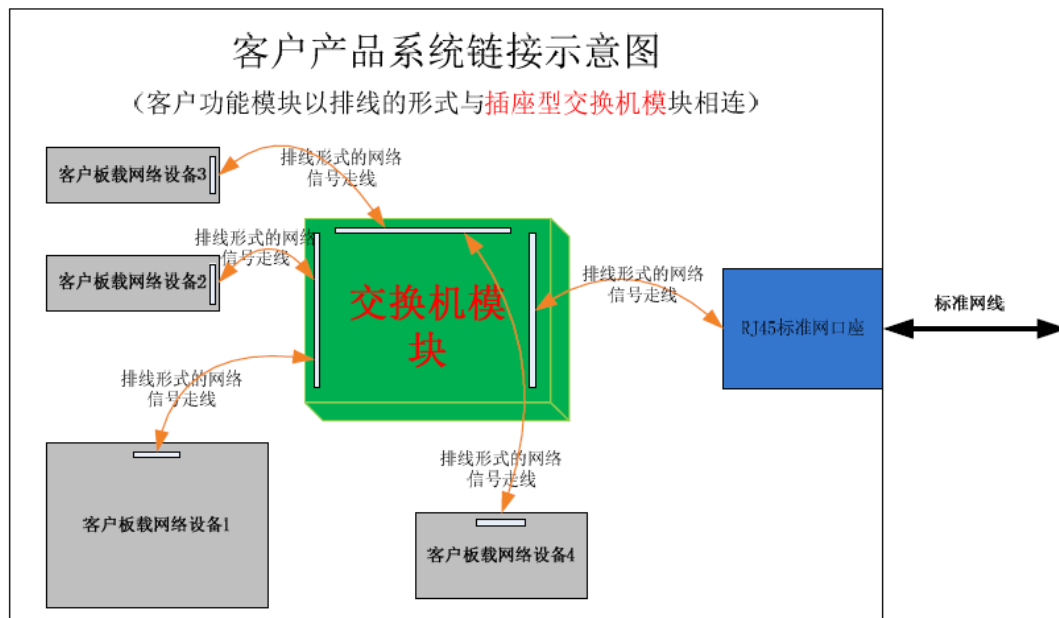
#### 1) Pin-mount solution:

This is the most reliable and our most recommended method. Using pin-mounts (the switch module connects to the customer's backplane via header pins), the system connection reliability is high, making it our top choice. The drawback is that the customer needs to customize their own backplane.



### 2) Socket Solution:

This option allows customers to minimize the overall system size, but requires them to fabricate non-standard signal connection cables. Customers will fabricate a standard network cable (assuming they are using a standard network cable; the wiring principle is similar for other signal cables) to connect to the socket on this module. The signal wires of the standard network cable can be integrated into the spring-loaded plug, or the ribbon cable signals can be directly connected to the corresponding signals on the customer's network devices according to the wiring instructions.

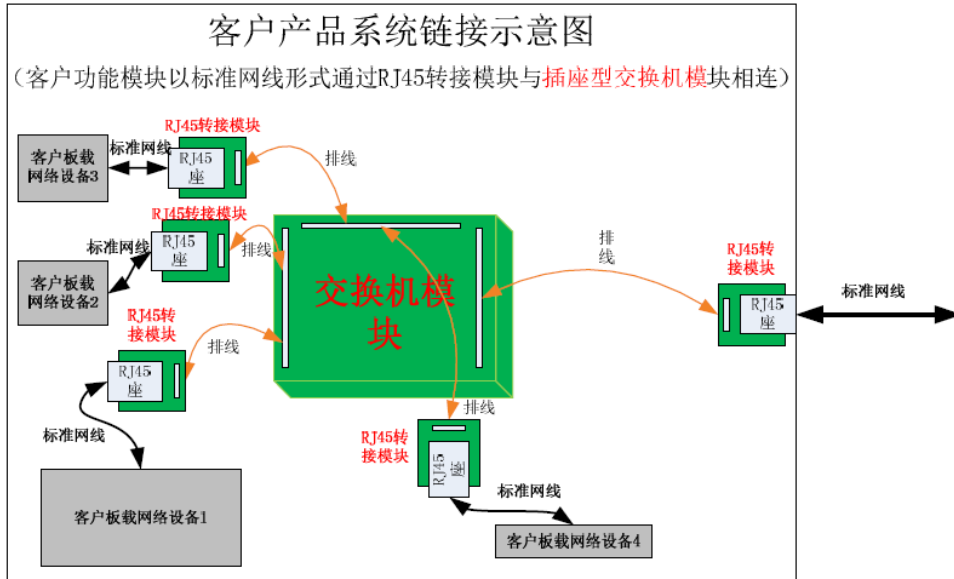


### 3) RJ45 Standard Ethernet Adapter Module:

This method is the simplest and most efficient. It is suitable for rapid functional testing and verification during the initial functional verification phase. Simply purchase the adapter (ribbon cable to RJ45 standard Ethernet adapter) sold by our company, and then connect it to the switch module and other network device interfaces of the customer.

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### Operating system:

Supports Windows/macOS/Netware/Linux operating systems  
Patented product, beware of imitations