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Product Specifications

L2+ Industrial 4-Port 10/100/1000T + 2-Port 100/1000X SFP Managed Ethernet Switch

IGS-5225-4T2S

Version 1.0

Change History:

Revision	Date	Author	Change List
Version 1.0	2016/12/20	Calvin Chao	Initial release

Author	Calvin Chao	Editor:	Calvin Chao
Reviewed by:		Approved by:	Kent Kang

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1. PRODUCT DESCRIPTION

Environmentally Hardened Design

PLANET Industrial Managed Gigabit Ethernet Switch, IGS-5225-4T2S, is equipped with a rugged IP30 metal case for stable operation in heavy industrial demanding environments. Thus, the IGS-5225-4T2S provides a high level of immunity against electromagnetic interference and heavy electrical surges which are usually found on plant floors or in curbside traffic control cabinets.

Being able to operate under wide temperature range from -40 to 75 degrees C, the IGS-5225-4T2S can be placed in almost any difficult environment. The IGS-5225-4T2S also allows either DIN rail or wall mounting for efficient use of cabinet space.
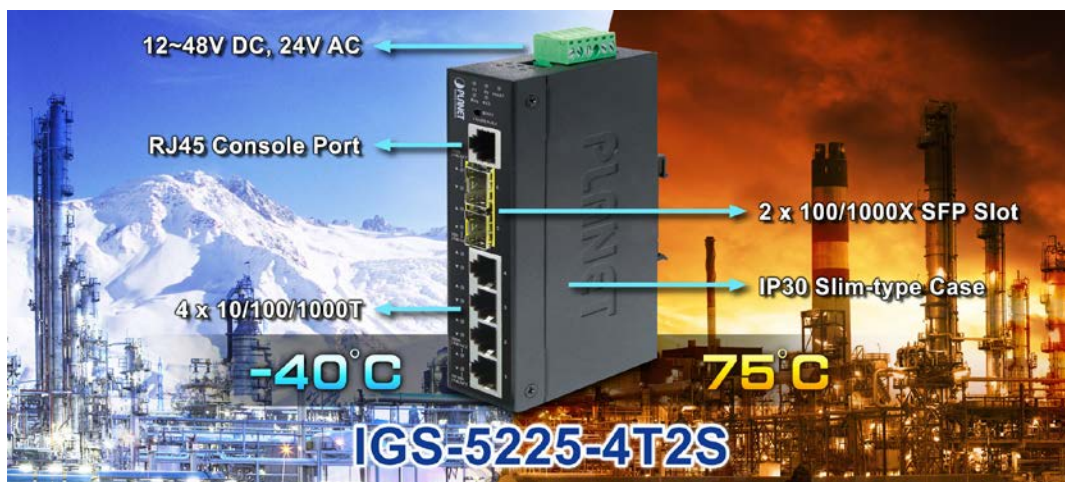

Full Management, Slim-type Design

Redundant Ring, Fast Recovery for Critical Network Applications

The IGS-5225-4T2S supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** technology, Spanning Tree Protocol (802.1s MSTP), and **redundant power** input

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system into customer's industrial automation network to enhance system reliability and uptime in harsh factory environments. In a certain simple Ring network, the recovery time of data link can be as fast as 20ms.
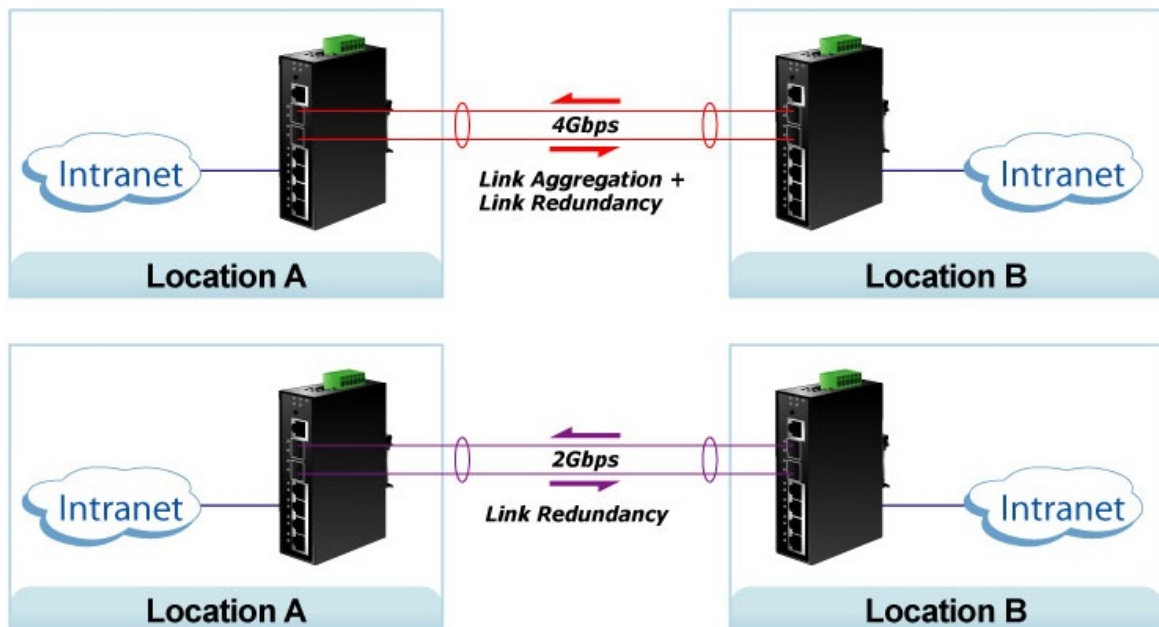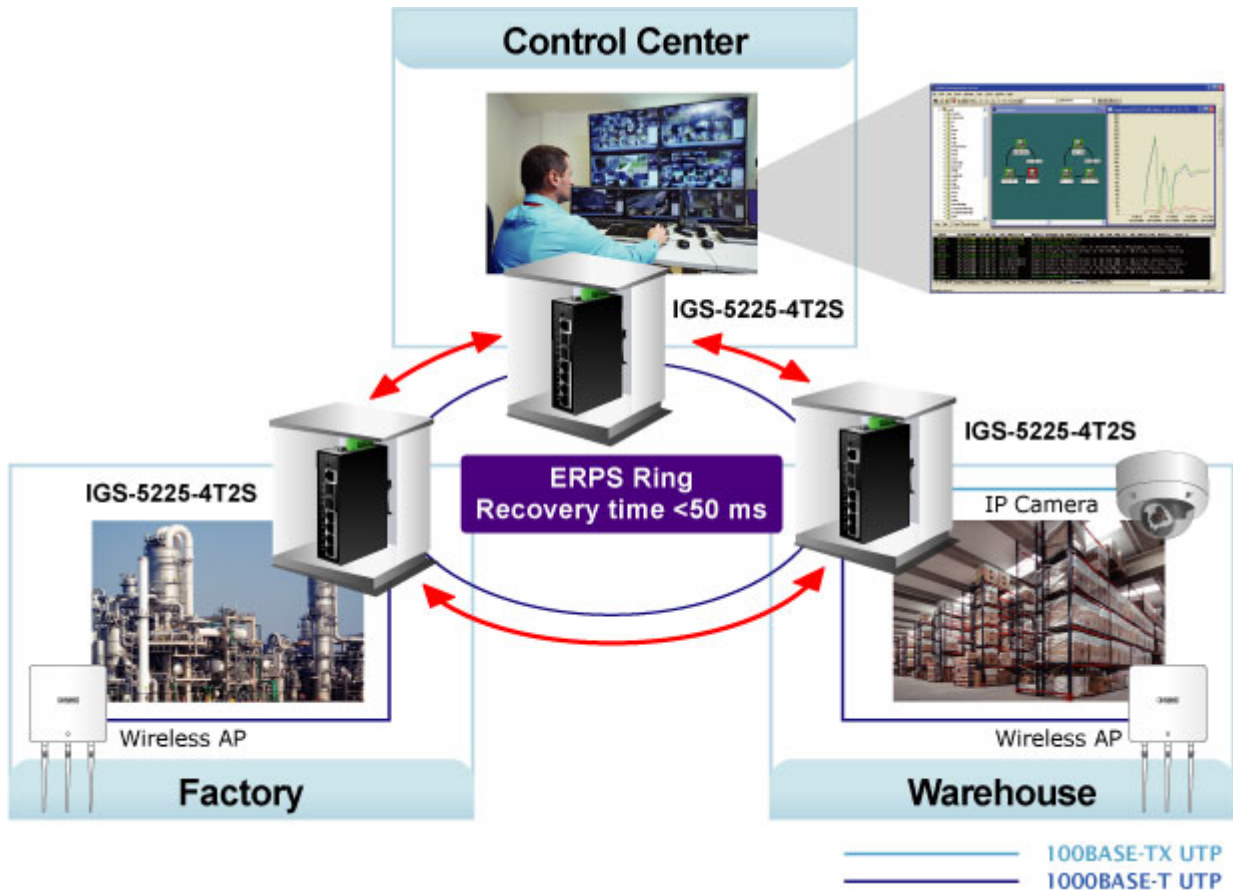
SMTP/SNMP Trap Event Alert

The IGS-5225-4T2S provides event alert function to help to diagnose the abnormal device owing to whether or not there is a break of the network connection, or the rebooting response.

Effective Alarm Alert for Better Protection

The IGS-5225 series supports a Fault Alarm feature which can alert the users when there is something wrong with the switches. With this ideal feature, the users would not have to waste time finding where the problem is. It will help to save time and human resource.
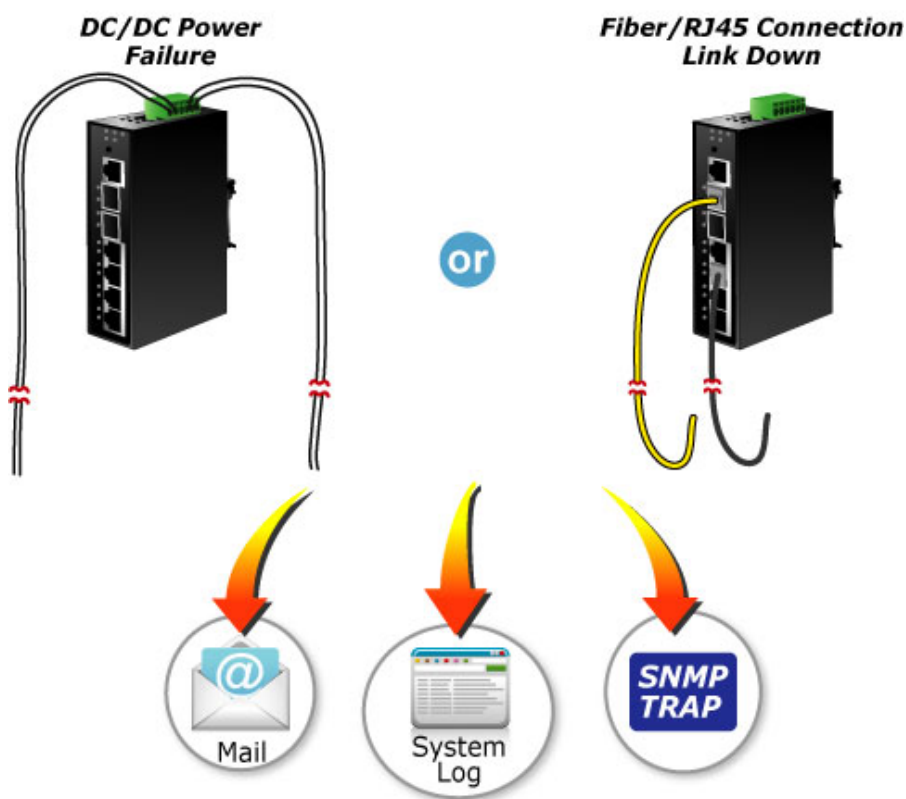
Layer 3 IPv4 and IPv6 Software VLAN Routing for Secure and Flexible Management

To help customers stay on top of their businesses, the IGS-5225 series not only provides ultra high transmission performance and excellent Layer 2 technologies, but also IPv4/IPv6 software VLAN routing feature which allows to crossover different VLANs and different IP addresses for the purpose of having a highly-secure, flexible management and simpler networking application.

Robust Layer 2 Features

The IGS-5225 series can be programmed for advanced switch management functions such as dynamic port link aggregation, Q-in-Q VLAN, private VLAN, Rapid Spanning Tree Protocol, Layer 2 to Layer 4 QoS, bandwidth

control and IGMP snooping. The IGS-5225 series provides 802.1Q tagged VLAN, and the VLAN groups allowed will be maximally up to 255. Via aggregation of supporting ports, the IGS-5225-4T2S allows the operation of a high-speed trunk combining multiple ports. It enables a maximum of up to 4 trunk groups with 4 ports per trunk group, and supports fail-over as well.
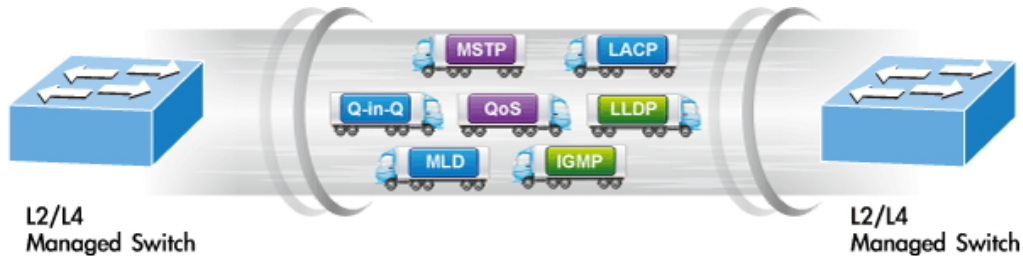
Efficient Management

For efficient management, the IGS-5225 Managed Ethernet Switch series is equipped with console, Web and SNMP management interfaces. With the built-in Web-based management interface, the IGS-5225 series offers an easy-to-use, platform-independent management and configuration facility. For text-based management, the IGS-5225 series can be accessed via Telnet and the console port. Moreover, it also offers secure remote management via any standard-based management software by supporting SNMPv3 connection which encrypts the packet content at each session.

Powerful Security

The IGS-5225 series offers comprehensive Layer 2 to Layer 4 Access Control List (ACL) for enforcing security to the edge. It can be used to restrict network access by denying packets based on source and destination IP address, TCP/UDP ports or defined typical network applications. Its protection mechanism also comprises 802.1X Port-based and MAC-based user and device authentication. With the private VLAN function, communication between edge ports can be prevented to ensure user privacy. The network administrators can now construct highly-secure corporate networks with considerably less time and effort than before.

Flexibility and Extension Solution

The additional two mini-GBIC slots built in the IGS-5225-4T2S support dual speed, 100BASE-FX and 1000BASE-SX/LX SFP (Small Form-factor Pluggable) fiber-optic modules, meaning the administrator now can flexibly choose the suitable SFP transceiver according to not only the transmission distance but also the transmission speed required. The distance can be extended from 550 meters (multi-mode fiber) to 10/50/70/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications within the enterprise data centers and distributions.

Intelligent SFP Diagnosis Mechanism

The IGS-5225 series supports SFP-**DDM** (Digital Diagnostic Monitor) function that greatly helps network administrator to easily monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

1588 Time Protocol for Industrial Computing Networks

The IGS-5225 series is ideal for telecom and Carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.
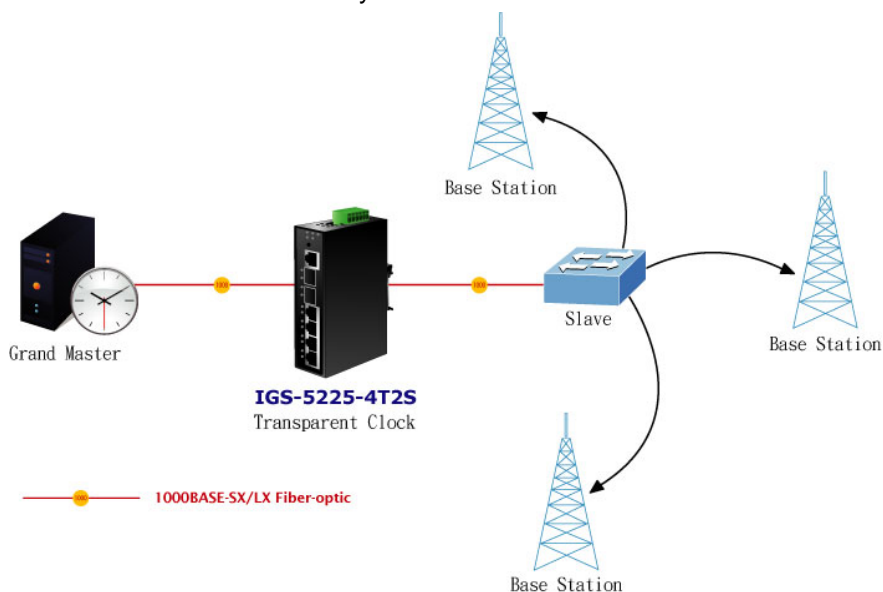
2. PRODUCT FEATURES

➢ **Physical Port**

- **4 10/100/1000BASE-T** Gigabit Ethernet RJ45 ports
- **2 100/1000BASE-X mini-GBIC/SFP** slots for SFP type auto detection
- One RJ45 console interface for basic management and setup

➢ **Industrial Case and Installation**

- IP30 metal case
- DIN rail and wall-mount design
- 12~48V DC, redundant power with polarity reverse protect function
- Supports 5000V DC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

➢ **Layer 2 Features**

- Prevents packet loss with back pressure (half-duplex) and IEEE 802.3x pause frame flow control (full-duplex)
- High performance of Store-and-Forward architecture, and runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Storm Control support
  - Broadcast/Multicast/Unicast
- Supports **VLAN**
  - IEEE 802.1Q tagged VLAN
  - Up to 255 VLANs groups, out of 4094 VLAN IDs
  - Provider Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
  - Private VLAN Edge (PVE)
  - Protocol-based VLAN
  - MAC-based VLAN
  - Voice VLAN
- Supports **Spanning Tree Protocol**
  - IEEE 802.1D Spanning Tree Protocol (STP)
  - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP), spanning tree by VLAN
  - BPDU Guard
- Supports **Link Aggregation**
  - 802.3ad Link Aggregation Control Protocol (LACP)
  - Cisco ether-channel (static trunk)
  - Maximum 4 trunk groups with 4 ports per trunk group
  - Up to 8Gbps bandwidth (duplex mode)
- Provides port mirror (1-to-1)

- Port mirroring to monitor the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops
- Supports ERPS (Ethernet Ring Protection Switching)

➢ **Layer 3 IP Routing Features**
- Supports maximum 32 static routes and route summarization

➢ **Quality of Service**
- Ingress Shaper and Egress Rate Limit per port bandwidth control
- 8 priority queues on all switch ports
- Traffic classification
  - IEEE 802.1p CoS
  - IP TOS/DSCP/IP precedence
  - IP TCP/UDP port number
  - Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- Supports QoS and In/Out bandwidth control on each port
- Traffic-policing policies on the switch port
- DSCP remarking

➢ **Multicast**
- Supports IGMP snooping v1, v2 and v3
- Supports MLD snooping v1 and v2
- Querier mode support
- IGMP snooping port filtering
- MLD snooping port filtering
- MVR (Multicast VLAN Registration)

➢ **Security**
- IEEE 802.1X Port-based/MAC-based network access authentication
- Built-in RADIUS client to cooperate with the RADIUS servers
- TACACS+ login users access authentication
- RADIUS/TACACS+ users access authentication
- IP-based Access Control List (ACL)
- MAC-based Access Control List
- Source MAC/IP address binding
- DHCP snooping to filter distrusted DHCP messages
- Dynamic ARP Inspection discards ARP packets with invalid MAC address to IP address binding

- IP Source Guard prevents IP spoofing attacks
- IP address access management to prevent unauthorized intruder

➢ **Management**
- Switch Management Interfaces
  - Console/Telnet Command Line Interface
  - Web switch management
  - SNMP v1 and v2c switch management
  - SSH/SSL and SNMP v3 secure access
- Four RMON groups (history, statistics, alarms, and events)
- **IPv6** IP address/NTP/DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- Firmware upload/download via HTTP/TFTP
- DHCP Relay
- DHCP Option 82
- User Privilege levels control
- Network Time Protocol (NTP)
- Link Layer Discovery Protocol (LLDP)
- SFP-**DDM** (Digital Diagnostic Monitor)
- Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
- Reset button for system reboot or reset to factory default
- PLANET Smart Discovery Utility for deployment management

3. PRODUCT SPECIFICATIONS

3.1 MAIN COMPONENT

Switch ASIC	Vitesse VSC7423XJG-02	x 1
CPU	MIPS 416MHz (integrated with VSC7423)	x 1
Flash Size	16M bytes	x 1
DRAM Size	128M bytes	x 1

3.2 Functional Specifications

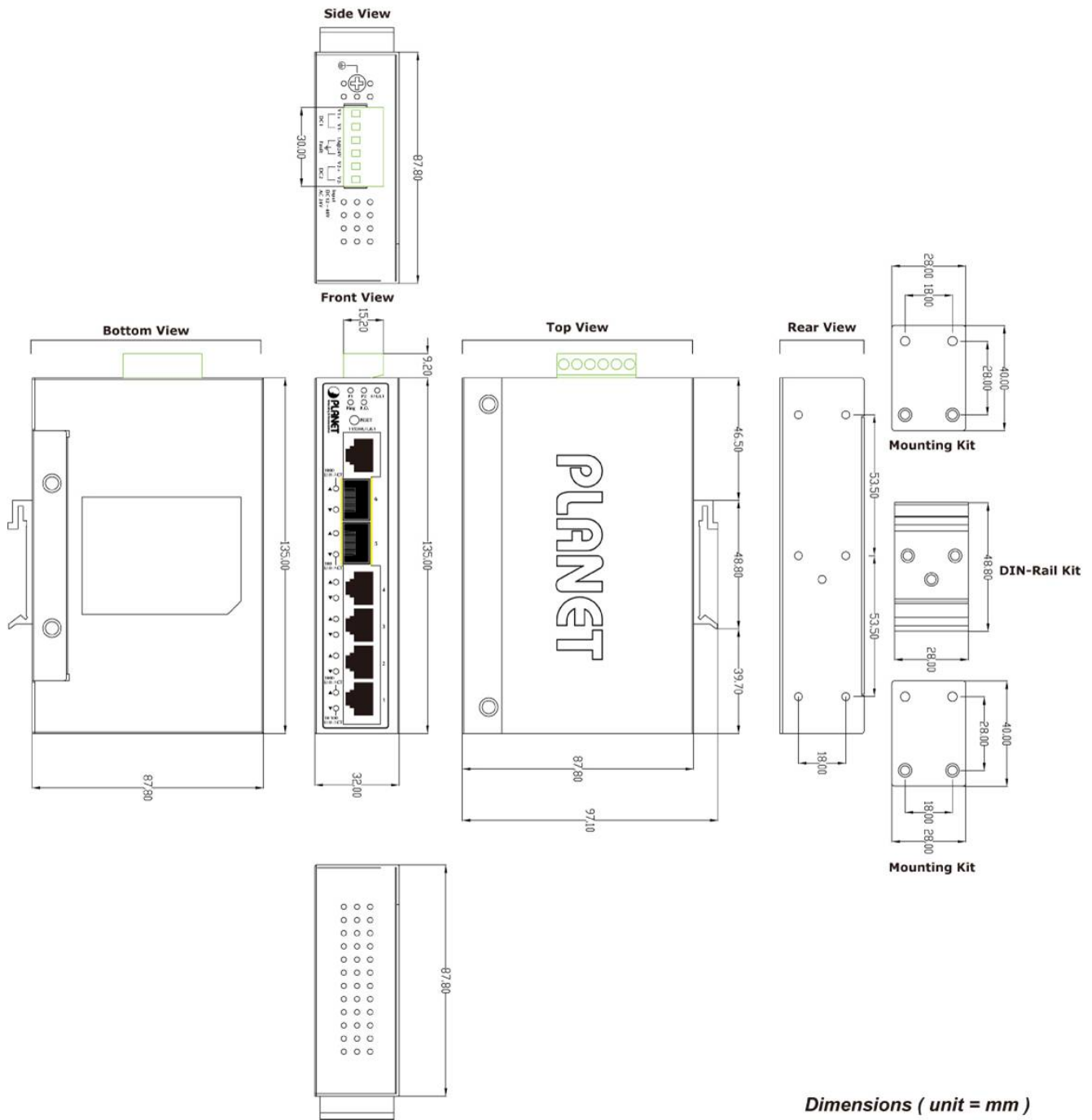| Product	IGS-5225-4T2S
Hardware Specifications	
Copper Ports	4 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports
SFP/mini-GBIC Slots	2 1000BASE-SX/LX/BX SFP interfaces (Port-5 to Port-6) Compatible with 100BASE-FX SFP
Console	1 x RJ45-to-RS232 serial port (115200, 8, N, 1)
Switch Architecture	Store-and-Forward
Switch Fabric	12Gbps/non-blocking
Throughput (packet per second)	8.9Mpps@ 64 bytes packet
Address Table	8K entries, automatic source address learning and aging
Shared Data Buffer	4Mbits
Flow Control	IEEE 802.3x pause frame for full-duplex Back pressure for half-duplex
Jumbo Frame	9Kbytes
Reset Button	< 5 sec: System reboot > 5 sec: Factory default
ESD Protection	5KV DC
Enclosure	IP30 aluminum case
Installation	DIN rail kit and wall-mount kit
Connector	Removable 6-pin terminal block for power input Pin 1/2 for Power 1, Pin 3/4 for fault alarm, Pin 5/6 for Power 2
Alarm	One relay output for power failure. Alarm relay current carry ability: 1A @ 24V DC

LED Indicator	System:
	   Power 1 (Green)
	   Power 2 (Green)
	   Fault Alarm (Red)
	   Ring (Green)
	   Ring Owner (Green)
	Per 10/100/1000T RJ45 Ports:

	10/100Mbps LNK/ACT (Orange)
	1000 LNK/ACT (Green)
	Per SFP Interface:
	   100 LNK/ACT (Orange)
	   1000 LNK/ACT (Green)

Dimensions (W x D x H)	32 x 87x 135 mm
Weight	456g
Power Requirements	Dual 12~48V DC
Power Consumption	Max. 6.3 watts/21.6 BTU (Power on without any connection) Max. 8.5 watts/29.2 BTU (Full loading)
Layer 2 Function	
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSH, SSL, SNMP v3
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable Power saving mode control
Port Status	Display each port's speed duplex mode, link status, flow control status, auto negotiation status, trunk status
Port Mirroring	TX/RX/both 1 to 1 monitor
VLAN	802.1Q tagged based VLAN, up to 255 VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN MVR (Multicast VLAN Registration) Up to 255 VLAN groups, out of 4094 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk Supports 4 trunk groups with 4 ports per trunk group

QoS	Traffic classification based, strict priority and WRR
	8-level priority for switching
	  - Port number
	  - 802.1p priority
	  - 802.1Q VLAN tag
	  - DSCP/TOS field in IP packet

IGMP Snooping	IGMP (v1/v2/v3) snooping, up to 255 multicast groups IGMP querier mode support
MLD Snooping	MLD (v1/v2) snooping, up to 255 multicast groups MLD querier mode support
Access Control List	IP-based ACL/MAC-based ACL Up to 123 entries
Bandwidth Control	Per port bandwidth control

	Ingress: 500Kb~1000Mbps Egress: 500Kb~1000Mbps
SNMP MIBs	RFC 1213 MIB-II IF-MIB RFC 1493 Bridge MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2819 RMON MIB (Groups 1, 2, 3 and 9) RFC 2737 Entity MIB RFC 2618 RADIUS Client MIB RFC 2933 IGMP-STD-MIB RFC 3411 SNMP-Frameworks-MIB IEEE 802.1X PAE LLDP MAU-MIB
Layer 3 Function	
IP Interfaces	Max. 8 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 software static routing IPv6 software static routing
Standards Conformance	
Regulatory Compliance	FCC Part 15 Class A, CE
Stability Testing	IEC60068-2-32 (free fall) IEC60068-2-27 (shock) IEC60068-2-6 (vibration)
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000T IEEE 802.3x flow control and back pressure IEEE 802.3ad port trunk with LACP IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol IEEE 802.1p Class of Service IEEE 802.1Q VLAN tagging IEEE 802.1X Port Authentication Network Control IEEE 802.1ab LLDP RFC 768 UDP RFC 793 TFTP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP v1 RFC 2236 IGMP v2
Environment	

Operating Temperature	-40 ~ 75 degrees C
Storage Temperature	-40 ~ 85 degrees C
Humidity	5 ~ 95% (non-condensing)

3.3 Physical Specifications

■ **Dimensions:**

32 x 87x 135 mm (D x W x H)

■ **Weight:**

456 g

■ **Diagrams:**

Dimensions (unit = mm)

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■ **Front Panel**

The Front Panel of the IGS-5225-4T2S Industrial Switch is shown below:

System Power 1 and Power 2 LEDs

RJ45-to-RS232 serial port

Two 100/1000BASE-X SFP slots

Four 10/100/1000BASE-T RJ45 ports

RJ45 Copper LED
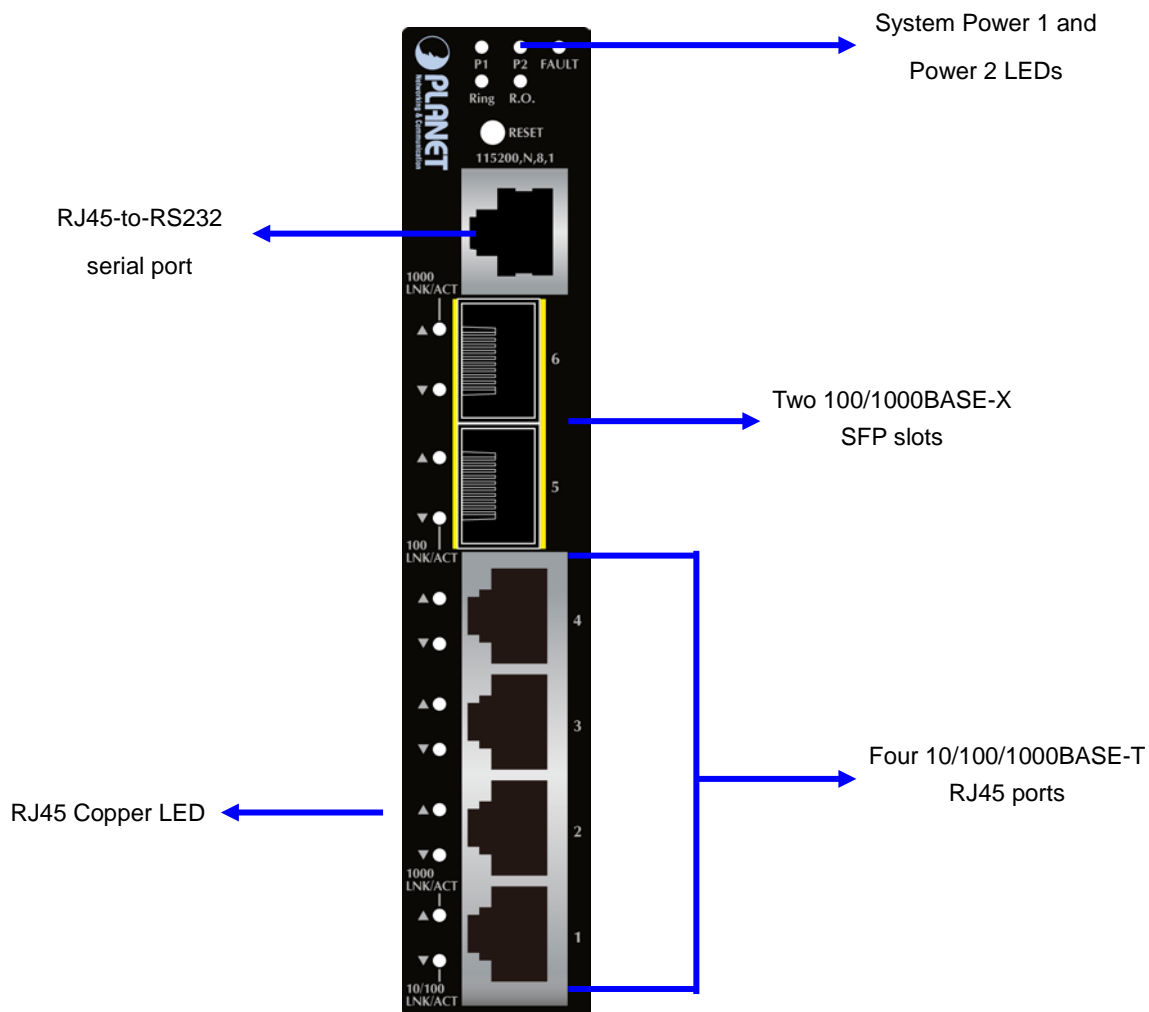
■ **LED Definition**

➢ **System**

LED	Color	Function
P1	Green	When lit, it indicates power 1 has power.
P2	Green	When lit, it indicates power 2 has power.
FAULT	Red	When lit, it indicates either power 1 or power 2 has no power.

➢ **10/100/1000BASE-T Interfaces**

LED	Color	Function
10/100 LNK/ACT	Orange	When lit, it indicates the Switch is successfully connecting to the network at 10Mbps or 100Mbps.
		When blinking, it indicates that the Switch is actively sending or receiving data over that port.

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LED	Color	Function
1000 LNK/ACT	**Green**	When lit, it indicates the Switch is successfully connecting to the network at 1000Mbps.
		When blinking, it indicates that the Switch is actively sending or receiving data over that port.

➢ **100/1000BASE-X SFP Interfaces**

| LED	Color	Function
100 LNK/ACT	**Orange**	When lit, it indicates the Switch is successfully connecting to the network at 10Mbps or 100Mbps.
		When blinking, it indicates that the Switch is actively sending or receiving data over that port.
1000 LNK/ACT	**Green**	When lit, it indicates the Switch is successfully connecting to the network at 1000Mbps.
		When blinking, it indicates that the Switch is actively sending or receiving data over that port.

■ **Top View**

The upper panel of the Industrial Gigabit Ethernet Switch consists of one terminal block connector within two DC power inputs.
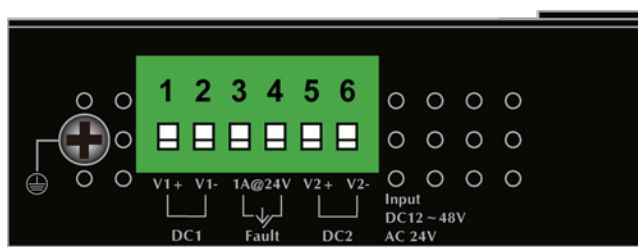
■ **Fault Alarm Contact**
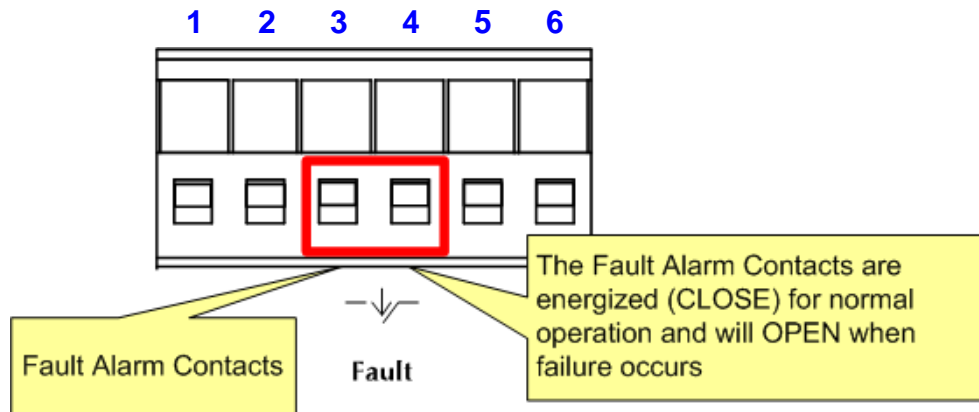
3.4 Environmental Specifications

Operating

Temperature: -40~75 degrees C

Relative Humidity: 5~90% RH (non-condensing)

Storage

Temperature: -40~75 degrees C

Relative Humidity: 5~90% RH (non-condensing)

3.5 Electrical Specifications

Power Requirement: 12~48V DC or 24V AC, redundant power with polarity reverse protection function

■ **Power Consumption:**

Operation Mode	Input Voltage	Power Consumption
System on	12V DC	4.2 watts/14.41 BTU
	24V DC	4.8 watts/16.47 BTU
	36V DC	5.5 watts/18.87 BTU
	48V DC	6.3 watts/21.62 BTU
Ethernet Full Loading	12V DC	6.6 watts/22.64 BTU
	24V DC	6.7 watts/23 BTU
	36V DC	7.5 watts/25.73 BTU
	48V DC	8.5 watts/29.16 BTU

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3.6 Regulatory Compliance

EMI:
- FCC Part 15 Class A
- CE

Stability Testing:
- IEC60068-2-32 (free fall)
- IEC60068-2-27 (anti-shock)
- IEC60068-2-6 (anti-vibration)

3.7 Basic Packaging

- ■ The Industrial Gigabit Ethernet   x 1
  Switch
- ■ DIN Rail Kit   x 1
- ■ Wall-mount Kit   x 1
- ■ SFP Dust Cap   x 2

3.8 PACKING DIMENSIONS

Dimensions: 585 (W) x 224 (D) x 312 mm (H)
Weight: TBD (gross weight)
Quantity: 12pcs in one carton

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APPENDIX A: Related SFP Transceivers

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MFB-FX	100	LC	Multi Mode	2km	1310nm	0 ~ 60℃
MFB-F20	100	LC	Single Mode	20km	1310nm	0 ~ 60℃
MFB-F40	100	LC	Single Mode	40km	1310nm	0 ~ 60℃
MFB-F60	100	LC	Single Mode	60km	1310nm	0 ~ 60℃
MFB-F120	100	LC	Single Mode	120km	1550nm	0 ~ 60℃
MFB-TFX	100	LC	Multi Mode	2km	1310nm	-40 ~ 75℃
MFB-TF20	100	LC	Single Mode	20km	1550nm	-40 ~ 75℃

Fast Ethernet Transceiver (100BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MFB-FA20	100	WDM(LC)	Single Mode	20km	1310nm	1550nm	0 ~ 60℃
MFB-FB20	100	WDM(LC)	Single Mode	20km	1550nm	1310nm	0 ~ 60℃
MFB-TFA20	100	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 75℃
MFB-TFB20	100	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 75℃
MFB-TFA40	100	WDM(LC)	Single Mode	40km	1310nm	1550nm	-40 ~ 75℃
MFB-TFB40	100	WDM(LC)	Single Mode	40km	1550nm	1310nm	-40 ~ 75℃

Gigabit Ethernet Transceiver (1000BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MGB-GT	1000	Copper	--	100m	--	0 ~ 60℃
MGB-SX	1000	LC	Multi Mode	550m	850nm	0 ~ 60℃
MGB-SX2	1000	LC	Multi Mode	2km	1310nm	0 ~ 60℃
MGB-LX	1000	LC	Single Mode	10km	1310nm	0 ~ 60℃
MGB-L30	1000	LC	Single Mode	30km	1310nm	0 ~ 60℃
MGB-L40	1000	LC	Single Mode	40km	1550nm	0 ~ 60℃
MGB-L50	1000	LC	Single Mode	50km	1550nm	0 ~ 60℃
MGB-L70	1000	LC	Single Mode	70km	1550nm	0 ~ 60℃
MGB-L120	1000	LC	Single Mode	120km	1550nm	0 ~ 60℃
MGB-TSX	1000	LC	Multi Mode	550m	850nm	-40 ~ 75℃
MGB-TLX	1000	LC	Single Mode	10km	1310nm	-40 ~ 75℃
MGB-TL30	1000	LC	Single Mode	30km	1310nm	-40 ~ 75℃
MGB-TL50	1000	LC	Single Mode	50km	1550nm	-40 ~ 75℃

Gigabit Ethernet Transceiver (1000BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-LA10	1000	WDM(LC)	Single Mode	10km	1310nm	1550nm	0 ~ 60℃
MGB-LB10	1000	WDM(LC)	Single Mode	10km	1550nm	1310nm	0 ~ 60℃
MGB-LA20	1000	WDM(LC)	Single Mode	20km	1310nm	1550nm	0 ~ 60℃
MGB-LB20	1000	WDM(LC)	Single Mode	20km	1550nm	1310nm	0 ~ 60℃
MGB-LA40	1000	WDM(LC)	Single Mode	40km	1310nm	1550nm	0 ~ 60℃
MGB-LB40	1000	WDM(LC)	Single Mode	40km	1550nm	1310nm	0 ~ 60℃
MGB-LA60	1000	WDM(LC)	Single Mode	60km	1310nm	1550nm	0 ~ 60℃
MGB-LB60	1000	WDM(LC)	Single Mode	60km	1550nm	1310nm	0 ~ 60℃
MGB-TLA10	1000	WDM(LC)	Single Mode	10km	1310nm	1550nm	-40 ~ 75℃
MGB-TLB10	1000	WDM(LC)	Single Mode	10km	1550nm	1310nm	-40 ~ 75℃
MGB-TLA20	1000	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 75℃
MGB-TLB20	1000	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 75℃
MGB-TLA40	1000	WDM(LC)	Single Mode	40km	1310nm	1550nm	-40 ~ 75℃
MGB-TLB40	1000	WDM(LC)	Single Mode	40km	1550nm	1310nm	-40 ~ 75℃
MGB-TLA60	1000	WDM(LC)	Single Mode	60km	1310nm	1550nm	-40 ~ 75℃
MGB-TLB60	1000	WDM(LC)	Single Mode	60km	1550nm	1310nm	-40 ~ 75℃