# L2+ 24-Port 100/1000X SFP + 8-Port Shared TP Managed Switch

Multi Port / Flexible Dual-speed Fiber Optic Connectivity for Long-reach Distance Solution

PLANET's latest Layer 2+ Managed Core Fiber Switches, GS-5220-16S8C and GS-5220-16S8CR, provide high-density performance and support IPv4 and IPv6 hardware Layer 3 static routing and 24 100/1000Base-X dual-speed SFP slots in a 1U case. With these ideal features, they are able to cross over different VLANs and different IP addresses for the purpose of having a highly-secured, flexible management and long-reach networking application. As a fiber backbone switch, they can flexibly work with suitable SFP transceivers to have a long connection of up to 120km via optic fiber cabling. They are well suited for SMBs, campuses and enterprises for their backbone and workgroup network applications by providing affordability, high performance, long distance and stable transmission quality.

Reset Button   **RJ45 Type Console Port**

8 x Gigabit TP/SFP Combo Port   **24 x 100/1000X SFP Port**
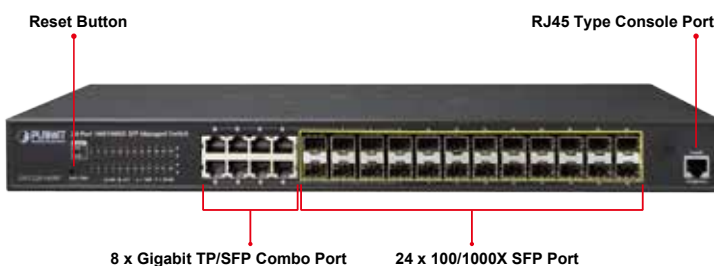
Intelligent SFP Diagnostic Mechanism

The GS-5220-16S8C and GS-5220-16S8CR SFP slots support dual-speed, 1000Base-SX / LX or 100Base-FX fiber transceivers; the distance can be extended from 550 meters to 2 kilometers (multi-mode fiber) and up to 10/20/30/40/50/70/120 kilometers (single-mode fiber or WDM fiber). They also support 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.

Physical Port

- 24 100/1000Base-X mini-GBIC/SFP slots
- 8-port 10/100/1000Base-T Gigabit Ethernet RJ-45, shared with Port-1 to Port-8
- RJ-45 to RS-232 DB9 console interface for basic management and setup

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 / Unicast / Unknown Unicast
- Supports VLAN
  - IEEE 802.1Q tagged VLAN
  - Up to 255 VLANs groups, out of 4095 VLAN IDs
  - Provider Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
  - Private VLAN Edge (PVE)
  - Protocol-based VLAN
  - MAC-based VLAN
  - IP Subnet-based VLAN
  - Voice VLAN
- Supports Spanning Tree Protocol
  - STP, IEEE 802.1D Spanning Tree Protocol
  - RSTP, IEEE 802.1w Rapid Spanning Tree Protocol
  - MSTP, IEEE 802.1s Multiple Spanning Tree Protocol, spanning tree by VLAN
  - BPDU Guard
- Supports Link Aggregation
  - 802.3ad Link Aggregation Control Protocol (LACP)
  - Cisco ether-channel (Static Trunk)
  - Maximum 12 trunk groups, up to 8 ports per trunk group
  - Up to 16Gbps bandwidth (full duplex mode)
- Provides Port Mirror (many-to-1)
- Port Mirroring to monitor the incoming or outgoing traffic on a particular port
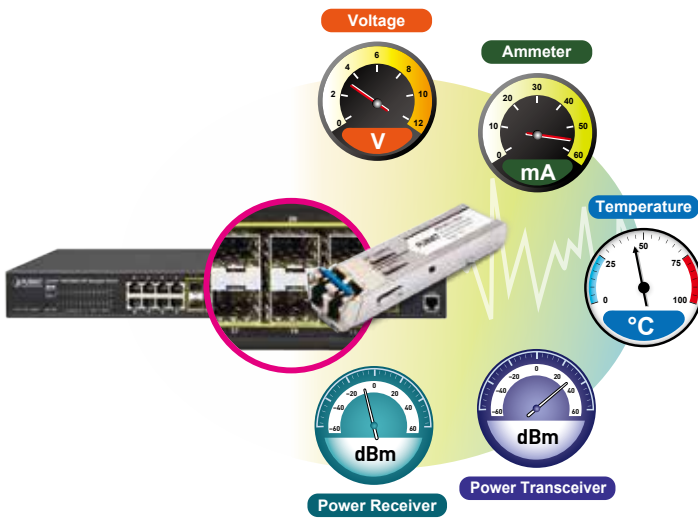- Loop protection to avoid broadcast loops

Layer 3 IP Routing Features

- Supports maximum 128 static routes and route summarization

Quality of Service

- Ingress Shaper and Egress Rate Limit per port bandwidth control

Digital Diagnostic Monitor (DDM)

### Redundant AC / DC Power Supply to Ensure Continuous Operation

The GS-5220-16S8CR is particularly equipped with one 100~240V AC power supply unit and one 36~60V DC power supply unit to provide an enhanced reliable and scalable redundant power supply installation. The continuous power system is specifically designed to fulfill the demands of high tech facilities requiring the highest power integrity. With the 36~60V DC power supply, the GS-5220-16S8CR is able to act as a telecom level device that can be located in the electronic room.

Effective Alarm Alert for Better Protection

The GS-5220-16S8C and GS-5220-16S8CR support 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 to find where the problem is. It will help to save time and human resource.

Fault Alarm Feature
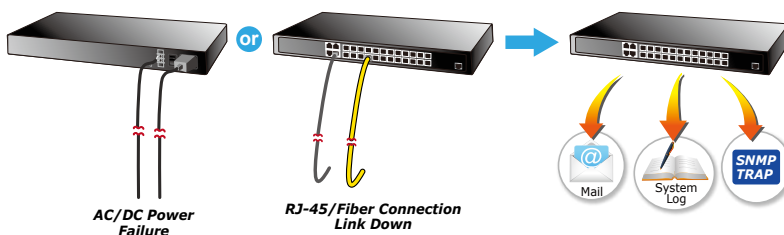
Solution for IPv6 Networking

Faced with the increasingly large number of IP cameras and wireless APs installed and deployed in all kinds of applications, more and more network facilities start to support the IPv6 protocol for the next-generation networking. By supporting both the IPv4 and IPv6, and numerous management functions with easy and friendly management interfaces, the GS-5220-16S8C and GS-5220-16S8CR are the best choices for IP surveillance and wireless service providers to connect with the IPv6 network.

- 8 priority queues on all switch ports
- Traffic classification
  - IEEE 802.1p CoS
  - TOS / DSCP / IP Precedence of IPv4/IPv6 packets
  - IP TCP/UDP port number
  - Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- 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
- IEEE 802.1X Authentication with Guest VLAN
- Built-in RADIUS client to cooperate with the RADIUS servers
- RADIUS / TACACS+ users access authentication
- IP-based Access Control List (ACL)
- MAC-based Access Control List (ACL)
- 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, v2c, and v3 switch management
  - SSH / SSL secure access
- Four RMON groups (history, statistics, alarms and events)
- IPv6 Address / NTP management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- Firmware upload / download via HTTP / TFTP
- DHCP Relay and Option 82
- User Privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP)
- SFP-DDM (Digital Diagnostic Monitor)
- Cable Diagnostic technology provides the mechanism to detect and report potential cabling issues for TP ports
- ICMPv6 / ICMPv4 Remote Ping

Layer 3 IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

The GS-5220-16S8C and GS-5220-16S8CR switches not only provide ultra high transmission performance, and excellent layer 2 and layer 4 technologies, but also layer 3 IPv4/IPv6 VLAN routing feature which allows to cross over different VLANs and different IP addresses for the purpose of having a highly-secured, flexible management and simpler networking application.

Robust Layer 2 Features

The GS-5220-16S8C and GS-5220-16S8CR can be programmed for advanced switch management functions such as dynamic port link aggregation, Q-in-Q VLAN, private VLAN, Multiple Spanning Tree protocol (MSTP), Layer 2 to Layer 4 QoS, bandwidth control and IGMP/MLD Snooping. Via the link aggregation of supporting ports, the GS-5220-16S8C and GS-5220-16S8CR allow the operation of a high-speed trunk combining multiple fiber ports and support fail-over as well.

- • Reset button for system reboot or reset to factory default
- • SMTP / Syslog / SNMP Trap remote alarm
- • System Log
- • PLANET Smart Discovery Utility for deploy management

Redundant Power System (GS-5220-16S8CR)

- • Redundant 100~240V AC / 36-60V DC dual power
- • Active-active redundant power failure protection
- • Backup of catastrophic power failure on one supply
- • Fault tolerance and resilience
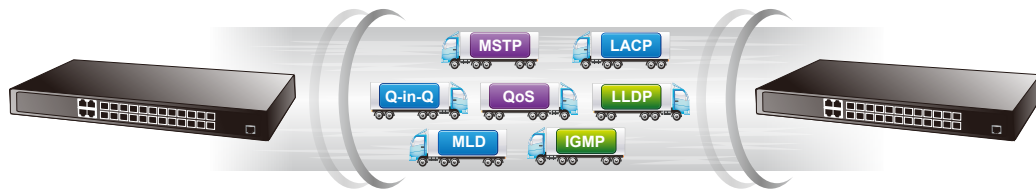
Enhanced Security

The GS-5220-16S8C and GS-5220-16S8CR offer a 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. Furthermore, the GS-5220-16S8C and GS-5220-16S8CR provide DHCP Snooping, IP Source Guard and Dynamic ARP Inspection functions to prevent IP snooping from attack and discard ARP packets with invalid MAC address. The network administrators can now construct highly-secured corporate networks with considerably less time and effort than before.

Efficient and Secure Management

The GS-5220-16S8C and GS-5220-16S8CR Managed Switches are equipped with console, Web and SNMP management interfaces. With the built-in Web-based management interface, the GS-5220-16S8C and GS-5220-16S8CR offer an easy-to-use, platform-independent management and configuration facility. The GS-5220-16S8C and GS-5220-16S8CR support standard Simple Network Management Protocol (SNMP) and can be managed via any management software that supports SNMP protocol. For text-based management, the GS-5220-16S8C and GS-5220-16S8CR can be accessed via Telnet. The console port with Cisco-like command line interface allows the users to make it work more easily. Moreover, the GS-5220-16S8C and GS-5220-16S8CR offer secure, remote management by supporting SSH, SSL and SNMPv3 connections which encrypt the packet content at each session.
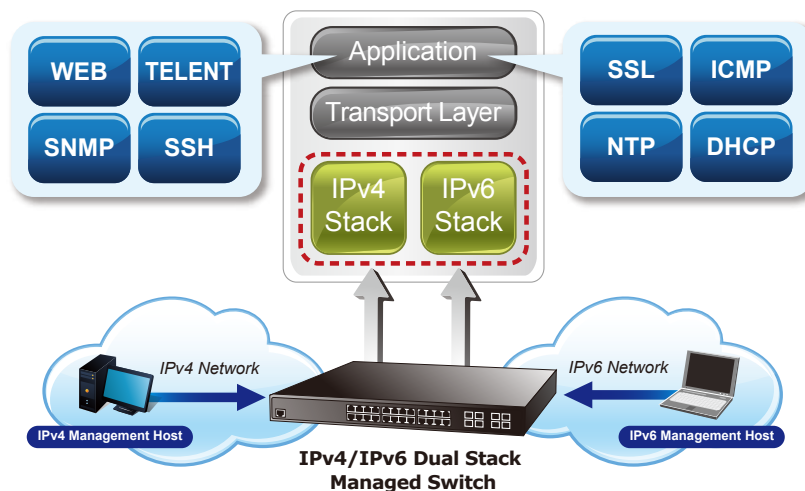
Applications

Multi Fiber Routing Switch for Wide-coverage PoE IP Surveillance Applications

With 24 SFP fiber interfaces with 8 shared Gigabit ports and Layer 3 IP static routing capability, the GS-5220-16S8C and GS-5220-16S8CR provide a cost-effective and high-performance solution for enterprises, network service providers, campuses and telecoms.
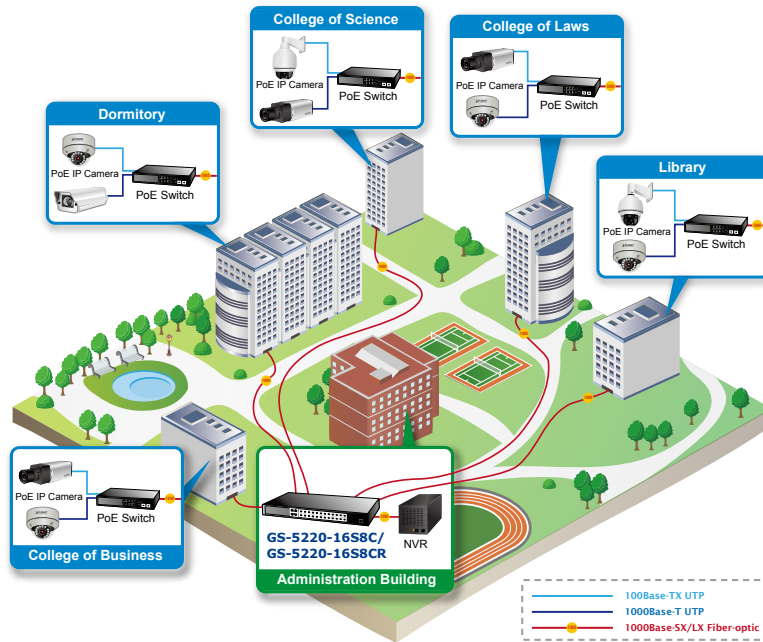
Layer 2+ VLAN Static Routing

With the built-in robust IPv4 / IPv6 Layer 3 traffic routing protocols, the GS-5220-16S8C and GS-5220-16S8CR ensure reliable routing between VLANs and network segments. The routing protocols can be applied by VLAN interface with up to 128 routing entries. The GS-5220-16S8C and GS-5220-16S8CR are certainly a cost-effective and ideal solution for enterprises.

VLAN Routing + Fiber Applications
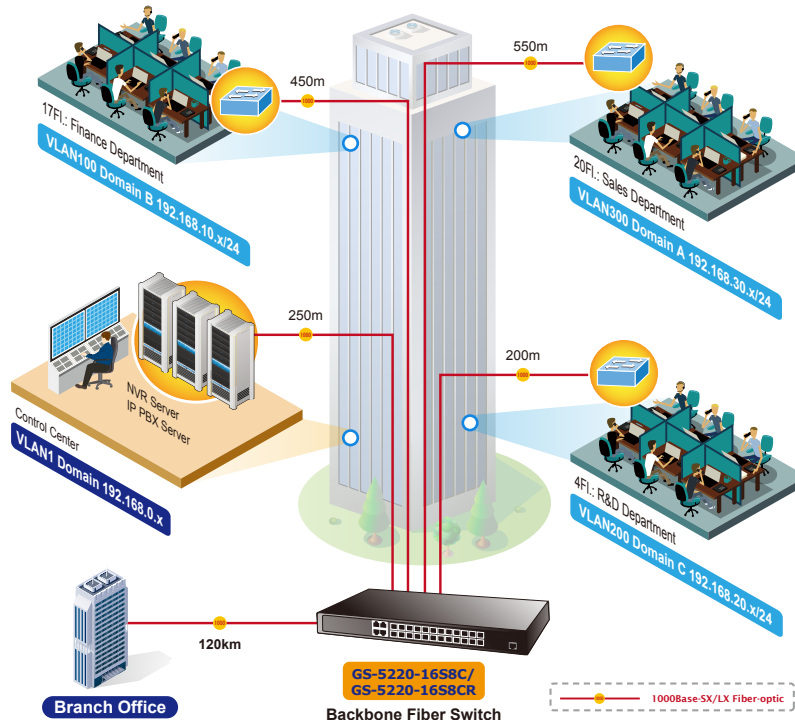
Specifications

Model	GS-5220-16S8C	GS-5220-16S8CR
Hardware Specifications		
Copper Ports	8 10/100/1000Base-T RJ-45 Auto-MDI/MDI-X ports, shared with Port-1~Port-8	
SFP/mini-GBIC Slots	24 100/1000Base-X dual-speed SFP interfaces	
Console	1 x RS-232-to-RJ45 serial port (115200, 8, N, 1)	
Switch Architecture	Store-and-Forward	
Switch Fabric	48Gbps / non-blocking	
Throughput	35.7Mpps@64Bytes	
Address Table	16K entries, automatic source address learning and ageing	
Shared Data Buffer	16M bits	
Flow Control	IEEE 802.3x pause frame for full-duplex Back pressure for half-duplex	
Jumbo Frame	10K bytes	
Reset Button	< 5 sec: System reboot > 5 sec: Factory default	
Dimensions (W x D x H)	440 x 200 x 44.5 mm, 1U height	
Weight	2745g	
LED	**System:** PWR (Green) DC (Green) (GS-5220-16S8CR Only) Fault (Red) FAN (Red) **10/100/1000T RJ45 Interfaces** (Port 1 to Port 8): 1000Mbps LNK/ACT (Green) 10/100Mbps LNK/ACT (Orange) **100/1000Mbps SFP Interfaces** (Port 1 to Port 24): 1000Mbps LNK/ACT (Green) 100Mbps LNK/ACT (Orange)	
Power Requirements – AC	100~240V AC, 50/60Hz	100~240V AC, 50/60Hz
Power Requirements – DC	---	48V DC @ 0.6A Range: 36 ~ 60V
Power Consumption	45 watts / 153 BTU (max.)	
ESD Protection	6KV DC	
Layer 2 Functions		
Port Configuration	Port disable / enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable / enable	
Port Status	Display each port's speed duplex mode, link status, flow control status, auto-negotiation status, trunk status	
Port Mirroring	TX / RX / Both Many-to-1 monitor	
VLAN	802.1Q tagged based VLAN Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN IP Subnet-based VLAN MVR (Multicast VLAN Registration) Up to 255 VLAN groups, out of 4094 VLAN IDs	
Link Aggregation	IEEE 802.3ad LACP / Static Trunk 12 groups of 8-port trunk supported	
Spanning Tree Protocol	STP, IEEE 802.1D Spanning Tree Protocol RSTP, IEEE 802.1w Rapid Spanning Tree Protocol MSTP, IEEE 802.1s Multiple Spanning Tree Protocol	
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 256 entries	

Bandwidth Control	Per port bandwidth control Ingress: 100Kbps~1000Mbps Egress: 100Kbps~1000Mbps
Layer 3 Functions	
IP Interfaces	Max. 128 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 hardware Static Routing IPv6 hardware Static Routing
Management	
Basic Management Interfaces	Console / Telnet / Web browser / SNMP v1, v2c
Secure Management Interfaces	SSH, SSL, SNMP v3
SNMP MIBs	RFC 1213 MIB-II RFC 1493 Bridge MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2819 RMON MIB (Group 1, 2, 3 and 9) RFC 2737 Entity MIB RFC 2618 RADIUS Client MIB RFC 2863 IF-MIB RFC 2933 IGMP-STD-MIB RFC 3411 SNMP-Frameworks-MIB RFC 4292 IP Forward MIB RFC 4293 IP MIB RFC 4836 MAU-MIB IEEE 802.1X PAE LLDP
Standards Conformance	
Regulation Compliance	FCC Part 15 Class A, CE
Standards Compliance	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX/100Base-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000Base-T 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 version 1 RFC 2236 IGMP version 2 RFC 3376 IGMP version 3 RFC 2710 MLD version 1 FRC 3810 MLD version 2
Environment	
Operating	Temperature:0 ~ 50 degrees C Relative Humidity:5 ~ 95% (non-condensing)
Storage	Temperature:-10 ~ 70 degrees C Relative Humidity:5 ~ 95% (non-condensing)

Ordering Information

GS-5220-16S8C	L2+ 24-port 100/1000X SFP + 8-port Shared TP Managed Switch
GS-5220-16S8CR	L2+ 24-port 100/1000X SFP + 8-port Shared TP Managed Switch + Redundant AC/DC Power

Related SFP Modules

Fast Ethernet Transceiver (100Base-X SFP)

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 ~ 50
MFB-FB20	100	WDM (LC)	Single Mode	20km	1550nm	1310nm	0 ~ 50
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-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-TL70	1000	LC	Single Mode	70km	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

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