Product Specification

L2+ 24-Port Gigabit Managed Switch with Hardware Layer3 IPv4/IPv6 Static Routing

GS-5220-16S8C / GS-5220-16S8CR

Version 1.0

Change History:

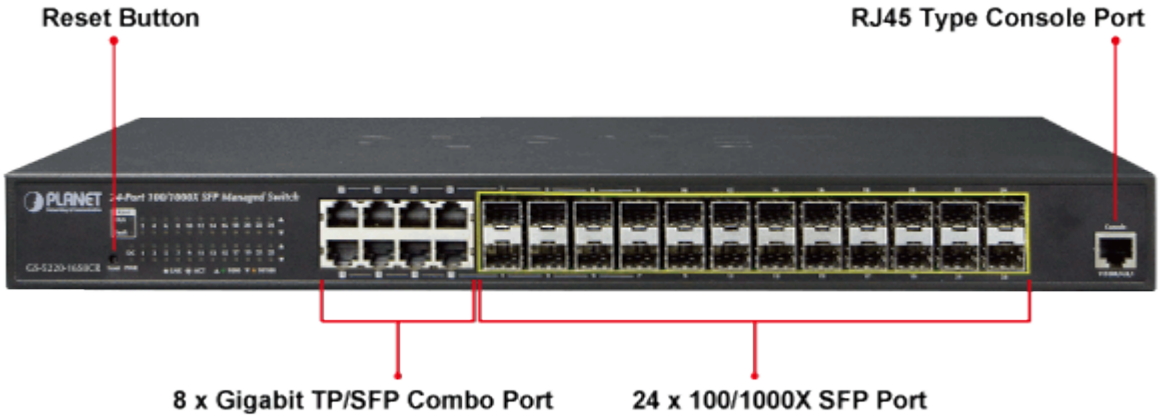
Revision:	Date:	Author:	Change List
Version 1.0	2014/7/3	Bryant Wu	Initial Release

Author:	Bryant Wu	**Editor:**	Bryant Wu
Reviewed By:	Kent Kang	**Approved By:**	Tom Shih

1. PRODUCT DESCRIPTION

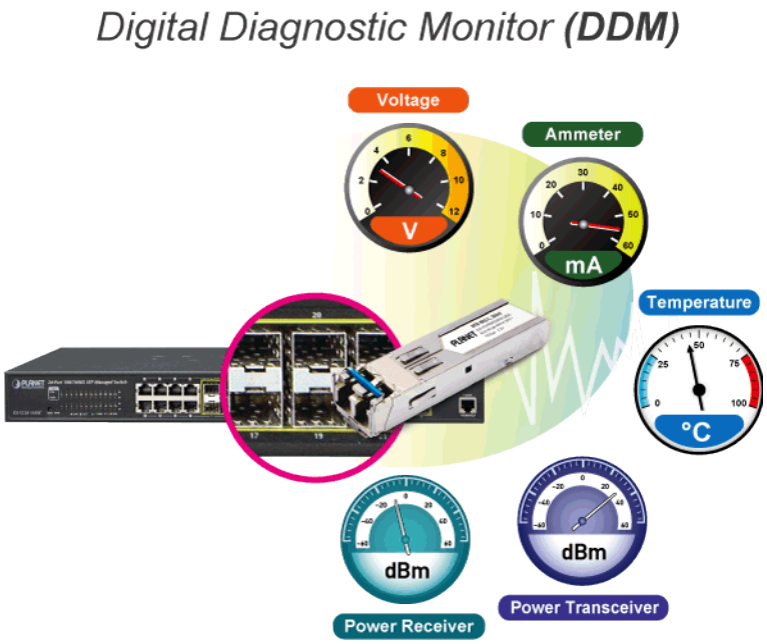
Multi Port / Flexible Dual-Speed Fiber Optic Connectivity for Long-Reach Distance Extension Solution

The FTTx network applications are part of our life particularly for the business and home use today. To carry out the long-distance networking deployment for FTTx and Metro system, PLANET introduces the latest Layer 2+ Managed Core Fiber Switches, GS-5220-16S8C and GS-5220-16S8CR, which provide high density performance and support IPv4 and IPv6 Layer 3 static routing and SFP slots with multiple ports in a 1U case. Each of the SFP slot supports dual-speed, 1000Base-SX / LX or 100Base-FX; the distance can be extended from 550 meters to 2 kilometers (multi-mode fiber) and up to above 10/20/30/40/50/70/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications within the enterprise data centers and distributions. That means, the administrator now can flexibly choose the suitable SFP transceiver according to not only the transmission distance but also the transmission speed required. PLANET GS-5220-16S8C and GS-5220-16S8CR Fiber Switches are designed to help ISPs, campuses and enterprises improve their backbone and workgroup network applications by providing high performance, long distance and stable transmission quality.



Intelligent SFP Diagnosis Mechanism

The GS-5220-16S8C and GS-5220-16S8CR 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.

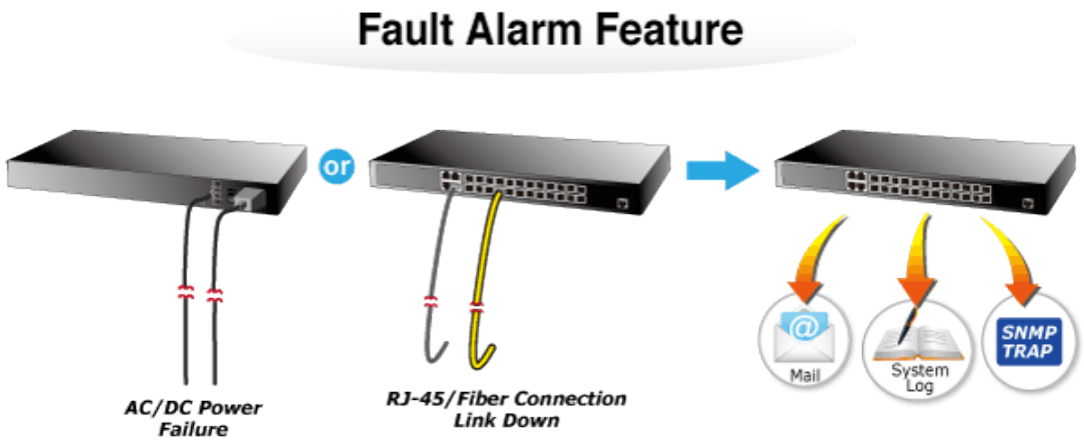


AC / DC Power Redundant to Ensure Continuous Operation

The GS-5220-16S8CR is particularly equipped with one 100~240V AC power supply unit and one DC 36~60V 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.



Solution for IPv6 Networking

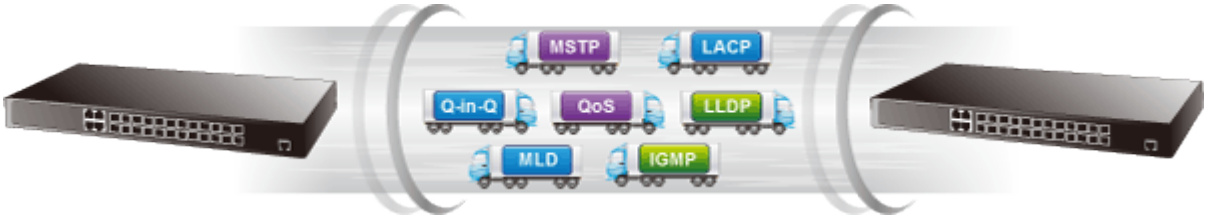
Faced with the increasingly large number of IP cameras and wireless APs installed and deployed in all kinds of applications, more and more network facilities start to support the IPv6 protocol for the next-generation networking. By supporting both the IPv4 and IPv6 and plenty of management functions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

IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

To help customers stay on top of their businesses, the GS-5220-16S8C and GS-5220-16S8CR switches not only provides ultra high transmission performance and excellent layer 2 technologies, but also offers 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**. The GS-5220-16S8C and GS-5220-16S8CR also provide **802.1Q Tagged VLAN**, and the VLAN groups allowed will be maximally up to 255. Via the aggregation of supporting ports, the GS-5220-16S8C and GS-5220-16S8CR allow the operation of a high-speed trunk combining multiple ports and support fail-over as well.



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 of **802.1x Port-base**d 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 and the console port. Moreover, the GS-5220-16S8C and GS-5220-16S8CR offer secure remote management by supporting **SSH**, **SSL** and **SNMPv3** connection which encrypt the packet content at each session.

2. PRODUCT FEATURES

➢ **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
- RJ45 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
- 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
- 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)**

- 100~240V AC / 36-60V DC Dual power redundant
- Active-active redundant power failure protection
- Backup of catastrophic power failure on one supply
- Fault tolerance and resilience.

3. PRODUCT SPECIFICATION

3.1 MAIN COMPONENT

Switch ASIC:	VITESSE VSC7431	X 1
Gigabit PHY:	VITESSE VSC8504	X 2
CPU:	MIPS 416MHz (integrated with VSC7431)	X 1
Flash:	MXIC MX25L1284SEMI-10G (16M Bytes/128M-bit)	X 1
DDR RAM:	Micro D9LHQ (128M Bytes/1024-bit)	X 1

3.2 FUNCTION SPECIFICATIONS

Product	**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	
Share 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 (**Greed**) 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	AC 100~240V, 50/60Hz	AC 100~240V, 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 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 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)

3.3 PHYSICAL SPECIFICATIONS:

- **Dimensions:**

  440 x 200 x 44.5 mm (W x D x H), 1U height

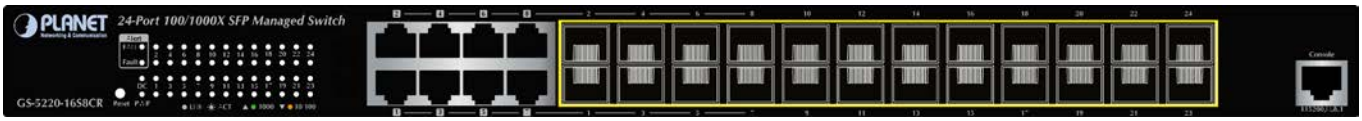
- **Weight:**

  2.75kg

GS-5220-16S8C Front Panel

GS-5220-16S8C Rear Panel

GS-5220-16S8CR Front Panel



GS-5220-16S8CR Rear Panel

- **LED Definition**
- **System**

LED	Color	Function
PWR	**Green**	Lights to indicate that the Switch has AC power input.
DC	**Green**	Lights to indicate that the Switch has DC power input. (GS-5220-16S8CR Only)

- **Alert**

LED	Color	Function
FAN	**Red**	Lights to indicate fan failure.
Fault	**Red**	Lights to indicate ports 1~24 or power input failure.

- **Per 10/100/1000Mbps RJ45 port (Port-1 to Port-8)**

LED	Color	Function	
1000 LNK/ACT	**Green**	**Lights**:	To indicate the port is running in 1000Mbps speed and successfully established.
		Blink:	To indicate that the switch is actively sending or receiving data over that port.
10/100 LNK/ACT	**Orange**	**Lights**:	To indicate the port is running in 10/100Mbps speed and successfully established.
		Blink:	To indicate that the switch is actively sending or receiving data over that port.

■ **Per 100/1000Base-X SFP Interface (Port-1 to Port-24)**

LED	Color	Function	
1000 LNK/ACT	**Green**	**Lights**.	To indicate the port is successfully established at 1000Mbps.
		Blink:	To indicate that the Switch is actively sending or receiving data over that port.
100 LNK/ACT	**Orange**	**Lights**:	To indicate the port is successfully established at 100Mbps.
		Blink:	To indicate that the Switch is actively sending or receiving data over that port.

3.4 ENVIRONMENTAL SPECIFICATIONS

Operating:

Temperature: 0 ~ 50 degrees C

Relative Humidity: 5% ~ 95% (non-condensing)

Storage:

Temperature: -10 ~ 70 degrees C

Relative Humidity: 5% ~ 95% (non-condensing)

3.5 ELECTRICAL SPECIFICATION

	GS-5220-16S8C	GS-5220-16S8CR
AC / DC dual power supplies :	--	Supports Power Redundant
AC Power Input Voltage:	100 ~ 240VAC, 50 / 60Hz, Auto-sensing.	100 ~ 240VAC, 50 / 60Hz, Auto-sensing.
DC Power Input Voltage:	--	48V DC @ 0.6A Range: 36V~ 60V
Power Consumption(System on):	110V: **12** Watts 220V: **13** Watts	110V: **12** Watts 220V: **13**Watts
Power Consumption(Full Load):	110V: **45** Watts 220V: **44.5** Watts	110V: **45.5** Watts 220V: **45** Watts

3.6 REGULATORY COMPLIANCE

EMI:

EN 55022 CLASS A:2006

EN61000-3-2:2006

EN61000-3-3: 1995+1A:2001+A2:2005

EMS:

EN 55024:1998+A1:2001+A2:2003

IEC 61000-4-2:2001

IEC 61000-4-3:2008

IEC 61000-4-4:2004

IEC 61000-4-5:2005

IEC 61000-4-6:2008

IEC 61000-4-8:2001

IEC 61000-4-11:2004

IEC/EN 60950-1

3.7 REALIABILITY

MTBF > 50,000 hrs @ 25 degrees C

3.8 BASIC PACKAGING

☑ The GS-5220-16S8C / GS-5220-16S8CR	x1
☑ Quick Installation Guide	x1
☑ Power Cord	x1
☑ RJ45 to RS-232 Console Cable	x1
☑ SFP Dust Cap	x24
☑ Rubber Feet	x4
☑ Rack Mount Accessory Kit	x1

3.9 PACKING DIMENSION

Dimension:	580mm (W) x 510mm (D) x 330mm (H)
Weight:	TBD KG (Gross Weight)
	5 pcs in one carton