PLANET
Networking & Communication

Product Specifications

L2+ 24-Port 10/100/1000T + 4-Port Shared SFP + 2-Port 10G SFP+
Managed Stackable Switch

SGS-5220-24T2X

Version 1.0

Change History:

Revision:	Date:	Author:	Change List
Version 1.0	2014/8/14	Jos Li	Initial Release

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Reviewed By:	Kent Kang	**Approved By:**	Tom Shih

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1. PRODUCT DESCRIPTION

High-Density, Resilient Deployment Switch Solution for Gigabit Networking of Enterprise, Campus and Data Center

For the growing Gigabit network and IoT (Internet of Things) demand, PLANET has launched a new-generation Stackable Gigabit Switch solution, the SGS-5220 switch series, to meet the needs of enterprises, telecoms and campuses for a large-scale network deployment. The SGS-5220-24T2X is Layer 2+ Managed Stackable Gigabit Switch, which supports both **IPv4 and IPv6 protocols and hardware Layer 3 static routing** capability, and provides **24 10/100/1000Mbps Gigabit Ethernet ports**, **4 shared Gigabit SFP slots**, **2 10G SFP+ uplink slots** and another **2 dedicated 10G SFP+ stacked interfaces** for stacking with the series of switches. Up to 16 units, 384 Gigabit Ethernet ports and 32 10Gbps SFP+ slots can be managed by a stacking group and you can add ports and functionality as needed.
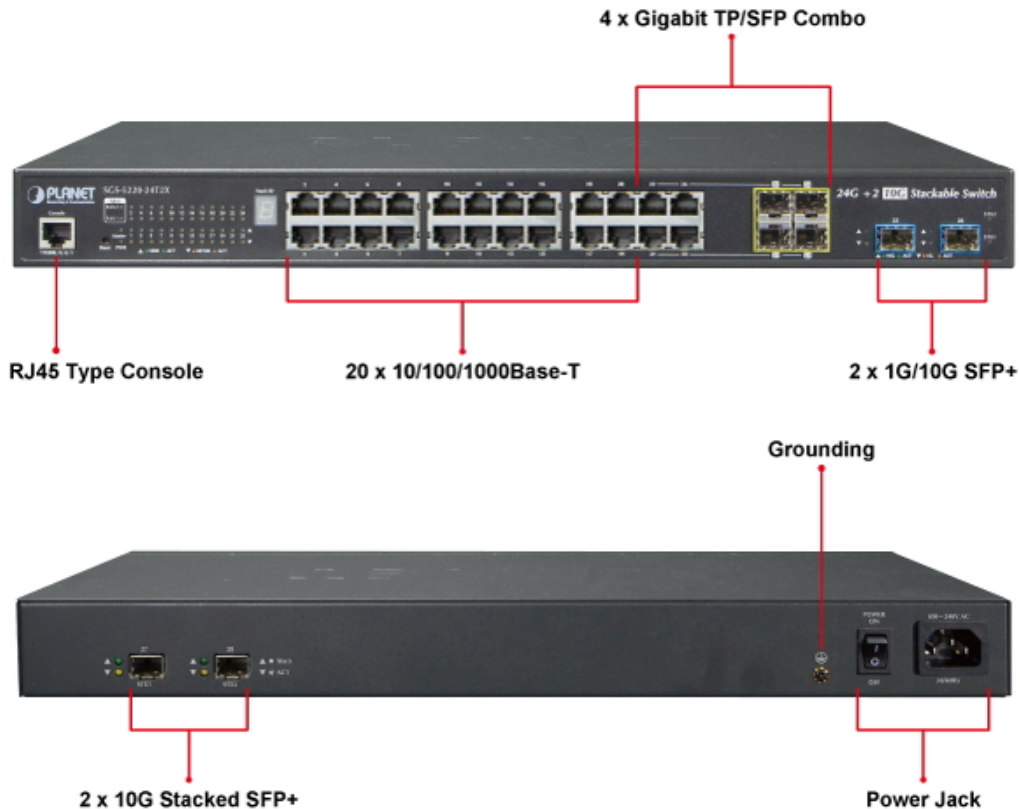
Efficient Single IP Management

The SGS-5220 series applies the advantage of the stacking technology to managing the stack group with one single IP address, which helps network managers to easily manage a stack of switches instead of connecting and setting each unit one by one. The stacking technology also enables the chassis-based switches to be integrated into the SGS-5220 Managed Switch series at an inexpensive cost.
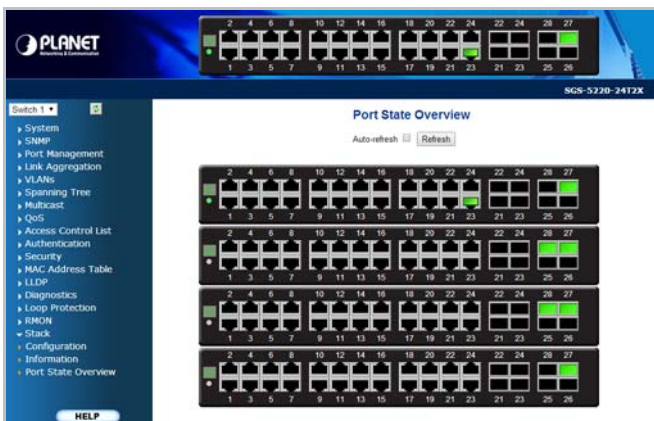
Highly-reliable Stacking Ability

Through its up to 40Gbps, bi-directional high bandwidth tunnel and stacking technology, the SGS-5220-24T2X gives the enterprises, service providers and telecoms flexible control over port density, uplinks and switch stack performance. The stack redundancy of the SGS-5220-24T2X ensures that data integrity is retained even if one switch in the stack fails. You can even hot-swap switches without disrupting the network, which greatly simplifies the tasks of upgrading the LAN for catering to increasing bandwidth demands.
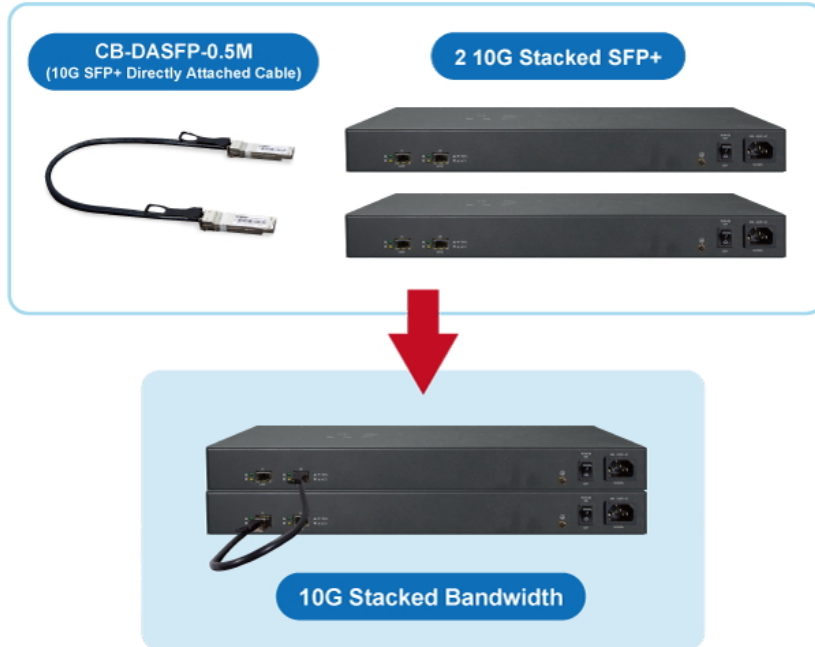

Cost-effective 10Gbps Uplink Capacity

10G Ethernet is a big leap in the evolution of Ethernet. The two 10G SFP+ slot of the SGS-5220-24T2X supports **Dual-speed**, **10GBase-SR/LR** or **1000Base-SX/LX**, meaning the administrator now can flexibly choose the suitable SFP/SFP+ transceiver according to the transmission distance or the transmission speed required to extend the network efficiently. They greatly support SMB network to achieve 10Gbps high performance in a cost-effective way because 10GbE interface usually could be available in Layer 3 Switch but Layer 3 Switch could be too expensive to SMBs.

Solution for IPv6 Networking

By supporting IPv6 / IPv4 dual stack and plenty of management functions with easy and friendly management interfaces, the SGS-5220 series is the best choice for IP surveillance, VoIP and wireless service providers to connect with the IPv6 network. It also helps the SMB to step in the IPv6 era with the lowest investment but not necessary to replace the network facilities while the ISP constructs the IPv6 FTTx edge network.
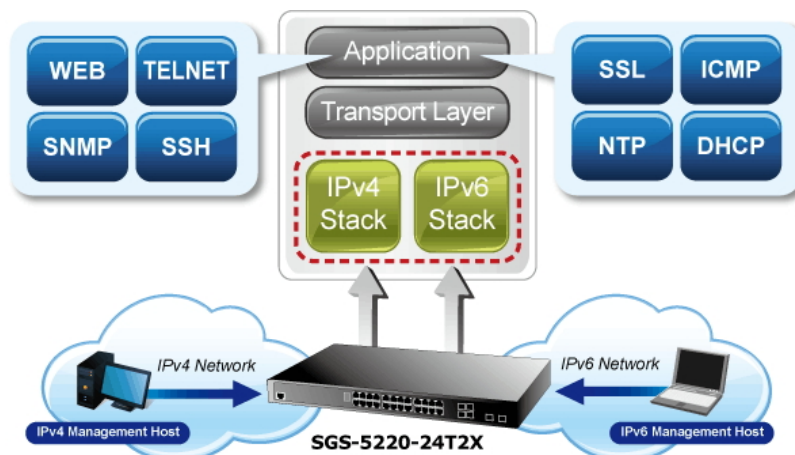
IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

To help customers stay on top of their businesses, the SGS-5220 switch series 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 Layer2 Features

The SGS-5220 series can be programmed for advanced switch management function, such as dynamic port link aggregation, **Q-in-Q VLAN**, **Multiple spanning tree protocol(MSTP)**, Layer 2/4 QoS, bandwidth control and **IGMP/MLD snooping**. The SGS-5220 series allows the operation of a high-speed trunk combining multiple ports. It enables up to 14 groups of 8 ports for trunk maximum and supports connection fail-over as well.

Powerful Security

The SGS-5220 series offers comprehensive **layer2 to layer4 access control list (ACL)** for enforcing security to the edge. It can be used to restrict to network access by denying packets based on source and destination IP address, TCP/UDP port number 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.

Enhanced Security and Traffic Control

The SGS-5220 series also provides **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 administrator can now construct highly secured corporate networks with considerably less time and effort than before.

User-friendly Secure Management

For efficient management, the SGS-5220 series managed switch series is equipped with console, web and SNMP management interfaces. With the built-in web-based management interface, the SGS-5220 series offers an easy-to-use, platform independent management and configuration facility. The SGS-5220 series supports SNMP and it can be managed via any management software based on standard of SNMP v1 and v2 protocol. For reducing product learning time, the SGS-5220 series offers Cisco-like command via Telnet or console port and customer doesn't need to learn new command from these switches. Moreover, the SGS-5220 series offers remote secure management by supporting **SSH**, **SSL** and **SNMPv3** connection which can be encrypted the packet content at each session.

Flexible and Extendable Solution

The 4 mini-GBIC SFP slots built in the SGS-5220-24T2X support dual speed as it features 100Base-FX and 1000Base-SX/LX SFP (Small Form-factor Pluggable) fiber-optic modules. Now the administrator 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 to 2km (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.

Intelligent SFP Diagnosis Mechanism

The SGS-5220-24T2X supports **SFP-DDM (Digital Diagnostic Monitor)** function that greatly helps network administrator to easily monitor real-time parameters of the SFP and SFP+ transceivers, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

2. PRODUCT FEATURES

➢ **Physical Port**
- 24-Port 10/100/1000Base-T RJ-45 copper
- 4 100/1000Base-X mini-GBIC/SFP slots, shared with Port-21 to Port-24 compatible with 100Base-FX SFP
- 2 10GBase-SR/LR SFP+ slots, compatible with 1000Base-SX/LX/BX SFP
- 2 10GBase-SR/LR SFP+ stackable slots
- RJ-45 console interface for basic management and setup

➢ **Stacking Features**
- Physical stacking up to 16 units, 384 Gigabit ports, 32 10 Gigabit ports
- **Single IP address stack management**
- Stacking architecture supports Chain and Ring mode
- Plug and Play connectivity
- Mirror across stack
- Link Aggregation groups spanning multiple switches in a stack
- Physical MAC address learning with MAC table synchronization across stack

➢ **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 / Unknown unicast
- Supports **VLAN**
  - IEEE 802.1Q tagged VLAN
  - Up to 255 VLANs groups, out of 4094 VLAN IDs
  - Supports provider bridging (VLAN Q-in-Q, IEEE 802.1ad)
  - Private VLAN Edge (PVE)
  - Protocol-based VLAN
  - MAC-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 10 trunk groups, up to 16 ports per trunk group
  - Up to 32Gbps 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
- ■ 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
- ■ Multicast VLAN Registration (MVR) support

➢ **Security**
- ■ IEEE 802.1x Port-based / MAC-based network access authentication
- ■ Built-in RADIUS client to co-operate 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 un-trusted DHCP messages
- ■ **Dynamic ARP Inspection** discards ARP packets with invalid MAC address to IP address binding
- ■ **IP Source Guard** prevents IP spoofing attacks
- ■ Auto DoS rule to defend DoS attack
- ■ 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** 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 Option82
- ■ User Privilege levels control
- ■ NTP (Network Time Protocol)
- ■ Link Layer Discovery Protocol (LLDP) Protocol

- 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 deploy management
- ICMPv6

3. PRODUCT SPECIFICATIONS

3.1 MAIN COMPONENTS

Switch ASIC:	VITESSE VSC7434	x1
Giga PHY:	VITESSE VSC8658	x3
10G PHY:	VITESSE VSC8488	x2
CPU:	MIPS 400MHz (integrated with VSC7460)	x1
Flash:	128Mbits	x1
DDR RAM:	1Gbits	x1
System AC-DC Open Frame Power Supply	L.T.E LTE45FS-S2 (MAX:50W)	x1

3.2 FUNCTION SPECIFICATIONS

Product	SGS-5220-24T2X
Hardware Specifications	
Copper Ports	24 10/ 100/1000Base-T RJ-45 Auto-MDI/MDI-X ports
10/100/1000Mbps / SFP Combo Interfaces	4 10/100/1000Mbps TP and SFP shared combo interfaces, SFP (Mini-GBIC) supports 100/1000Mbps Dual mode DDM, shared with Port-21 to Port-24
10Gbps Fiber Uplink Ports	2 1/10GBase-SR/LR SFP+ slots
10Gbps Fiber Stackable Ports	2 10GBase-SR/LR SFP+ slots
Console	1 x RJ-45 serial port (115200, 8, N, 1)
Switch Architecture	Store-and-Forward
Switch Fabric	128Gbps / non-blocking
Throughput	95.2Mpps@64Bytes
Address Table	16K entries, automatic source address learning and ageing
Shared Data Buffer	4 megabits
Flow Control	IEEE 802.3x pause frame for full-duplex Back pressure for half-duplex
Jumbo Frame	9K bytes
Reset Button	< 5 sec: System reboot > 5 sec: Factory Default

LED	System:
	  PWR (Green)
	  Master (Green)
	  Fan1 Alert (Green)
	  Fan2 Alert (Green)
	Ethernet Interfaces (Port 1 to Port 24):
	  1000 LNK/ACT (Green), 10/100 LNK/ACT (Orange)
	100/1000Mbps SFP Combo Interfaces (Port 21 to Port 24):
	  1000 (Green), 100 (Orange)

	1/10G SFP+ Interfaces (Port 25 to Port 26):
	    10G (Green), 1G (Orange)
	10G Stackable Interfaces (Port 27 to Port 28):
	    Stack (Green), LNK/ACT (Orange)

Power Requirements	100~240V AC, 50/60Hz, 2A
Power Consumption (Full Loading)	43 watts
ESD Protection	6KV DC
Dimensions (W x D x H)	440 x 200 x 44.5 mm, 1U high
Weight	2850g
Stacking Functions	
Stacking Ports	2 SFP+ slots
Stacking Numbers	16
Stacking Bandwidth	40Gbps full duplex
Stack ID Display	7-Segment LED display (1~9, A~F, 0)
Stack Topology	Ring / Chain / Back-to-Back
Layer2 Management 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
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, 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 10 groups of 16-Port trunk

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

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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
SNMP MIBs	RFC 1213 MIB-II RFC 2819 RMON MIB (Group 1, 2, 3 and 9) IF-MIB RFC 2618 RADIUS Client MIB RFC 1493 Bridge MIB RFC 3411 SNMP-Frameworks-MIB RFC 1643 Ethernet MIB IEEE 802.1X PAE RFC 2863 Interface MIB LLDP RFC 2665 Ether-Like MIB MAU-MIB RFC 2737 Entity MIB PoE-Ethernet MIB

Layer3 Function

IP Interfaces	Max. 128 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 hardware Static Routing IPv6 hardware Static Routing

Standards Conformance

Regulation Compliance	FCC Part 15 Class A, CE
Standards Compliance	IEEE 802.3 10Base-T IEEE 802.1Q VLAN tagging IEEE 802.3u IEEE 802.1x Port Authentication Network 100Base-TX/100Base-FX Control IEEE 802.3z 1000Base-SX/LX IEEE 802.1ab LLDP IEEE 802.3ab 1000Base-T IEEE 802.3af Power over Ethernet IEEE 802.3x flow control and back IEEE 802.3at Power over Ethernet PLUS pressure RFC 768 UDP IEEE 802.3ad port trunk with RFC 793 TFTP LACP RFC 791 IP IEEE 802.1D Spanning Tree RFC 792 ICMP protocol RFC 2068 HTTP IEEE 802.1w Rapid Spanning Tree RFC 1112 IGMP version 1 protocol RFC 2236 IGMP version 2 IEEE 802.1s Multiple Spanning RFC 3376 IGMP version 3 Tree protocol RFC 2710 MLD version 1 IEEE 802.1p Class of service FRC 3810 MLD version 2

Environments

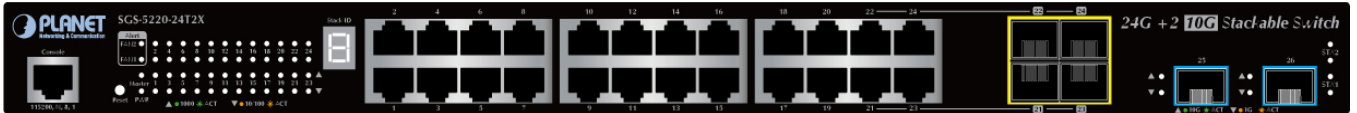|	
Operating	Temperature: 0 ~ 50 degrees C for AC power input Relative Humidity: 5 ~ 95% (non-condensing)
Storage	Temperature: -10 ~ 70 degrees C Relative Humidity: 5 ~ 95% (non-condensing)

3.3 PHYSICAL SPECIFICATIONS:

Dimensions:

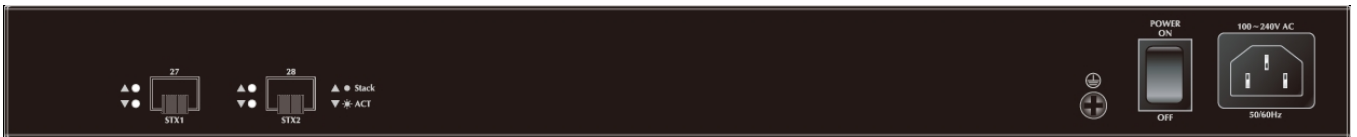440 x 200 x 44.5 mm (W x D x H), 1U high

Weight:

2850g

■ **Front Panel:**

■ **Rear Panel:**

■ **LED Definition**

➢ **System**

LED	Color	Function
PWR	**Green**	**Lights** to indicate that the Switch is powered on. **Blink** to indicate the System is running under booting procedure
Master	**Green**	**Lights** to indicate that the Switch is the Master of the stack group
FAN1	**Green**	**Lights** to indicate fan1 has failed.
FAN2	**Green**	**Lights** to indicate fan2 has failed.

➢ **Per 10/100/1000Base-T interfaces (Port-1 to Port-20)**

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

➢ **Per TP/SFP combo interface (Port-21 to Port-24)**

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

➢ **Per 10G uplink SFP+ interface (Port-25 to Port-26)**

LED	Color	Function

| 10G LNK/ACT | Green | **Lights** to indicate the port is running in **10Gbps** speed and successfully established.
Blink: indicate that the switch is actively sending or receiving data over that port. |
| 1G LNK/ACT | Orange | **Lights** to indicate the port is running in **1Gbps** speed and successfully established.
Blink: indicate that the switch is actively sending or receiving data over that port. |

➢ **Per 10G stackable SFP+ interface (Port-27 to Port-28)**

LED	Color	Function
Stack	Green	**Lights** to indicate the link through that SFP port is successfully established with speed 10Gbps **Off**: indicate that the port is link down
ACK	Orange	**Lights** to indicate that the switch is not sending or receiving data over that port. **Blink**: 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 SPECIFICATIONS

Input Voltage: 100 - 240V AC, 50 - 60Hz, 2A Auto-sensing.

Power Consumption (System on):   110V: 32 watts / 109 BTU (Roughly)
    220V: 33 watts / 113 BTU (Roughly)

Power Consumption (Ethernet Full Load):   110V: 42 watts / 143 BTU (Roughly)
    220V: 43 watts / 147 BTU (Roughly)

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

- SGS-5220-24T2X   X1
- Quick Installation Guide   X1
- Power Cord   X1
- RS232 to RJ-45 Cable   X1
- SFP Dust Caps   X8
- Rubber Feet   X4
- Two Rack-mounting Brackets with   X2
  Attachment Screws

3.9 PACKING DIMENSIONS

Dimensions:	565 (W) x 305 (D) x 95(H) mm
Weight:	TBD KG (Gross Weight)
	5pcs in one carton