![DASAN Networks logo]

Datasheet

V2224G-OP

Version 1.1

Issue History

Version	Date of Issue	Reason for Update
V1.0	04/2012	Initial release
V1.1	09/2012	Issue 2
		- product picture added
		- optional uplink modules added.
		- removes the features not supported. (ERP, VLAN translation)
		- switching capacity, throughput, operating temperature updated.
		- dual DC power type removed.

1 Product Overview

Dasan Networks' V2224G-OP is one RU height single-board Layer 2 Gigabit Ethernet switch which has been designed as ultra-compact customer premise equipment.

The V2224G-OP provides 24-port of 100/1000Base-X interfaces (SFP) with two mounting slots for the optional uplink modules. It also has a non-blocking architecture and interfaces providing wire-speed and full-duplex packet traffic on all ports. For the uplink interface unit, there are 1-Port 1000Base-X (SFP) / E-PON / 10GBase-R (SFP+) and 2-Port 1000Base-X (SFP) modular type unit. Each uplink module can be inserted into two front slots.

The console interface is located on the most left of the front panel with embedded LED for TX/RX indication. It is for use of equipment management via remote access or CLI.

It is an effective product to network environment of entry-level enterprise, mid-market and branch office networks, a large scale place of business and ISP (Internet Service Provider) to support high-speed internet service than existing Ethernet products. It offers flexible interface to make up diversity network services and benefit of network extension.

The V2224G-OP is a non-blocking Layer 2 gigabit switch which helps to eliminate network traffic bottlenecks. Once more, Link aggregation via IEEE 802.3ad allows administrators to group any number of copper or fiber ports together to form an ultra-high bandwidth pipe that greatly expands bandwidth capacity to the network backbone.

Depending on a type of optional uplink modules, the V2224G-OP can be used as E-PON Optical Network Unit (ONU)/Multi Dwelling Unit (MDU).
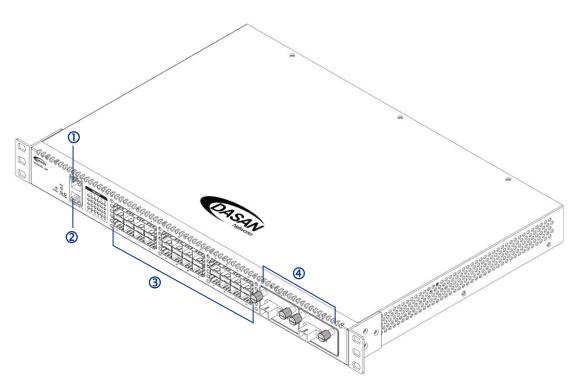
The PON technology adds new features and functionality targeted at improving performance and interoperability, and adds support for new applications, services, and deployment scenarios. Among these changes are improvements in data rate and reach performance, diagnostics, and stand-by mode, to name a few.

The V2224G-OP introduces a point-to-multipoint concept with the PON technology, which enables a cost-effective FTTx service. The reason why PON is considered as a cost-effective solution is its usage of a passive splitter rather than an active switching system.

The benefits of the passive splitter are as follows:
• No power supply / maintenance is needed.
• The splitter does not need any fiber optic transceiver. The number of fiber optic transceivers in the network is minimized.

Figure 1 Front View of V2224G-OP

Name	Function	Connector Type
① MGMT	Out-of-band TMN-OS Interface	RJ45
② CONSOLE	CLI access to configure the functions for system operation	RJ45 (RS232)
③ Service GE i/f	24 x 100/1000Base-X interfaces	SFP
④ Uplink i/f slot	2 x Mounting slots for optional uplink unit	1 Port of 1000Base-X (SFP) E-PON (10km, SC/PC-type) 10GBase-R (SFP+) 2-Port of 1000Base-X (SFP)

Table 1 Front Access Interfaces of V2224G-OP

The V2224G-OP provides a fixed single power supply connector (AC type or DC type) on the rear panel, so you can choose proper power supply according to installation environment. The power is supplied to the switch through DC/DC or AC/DC converter located in the switch which converts the input power to the proper voltages.
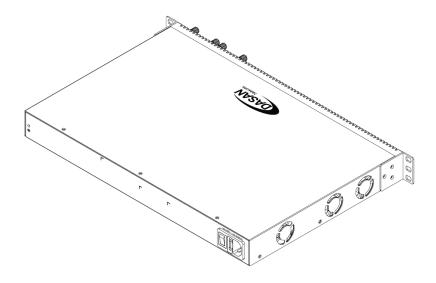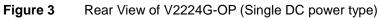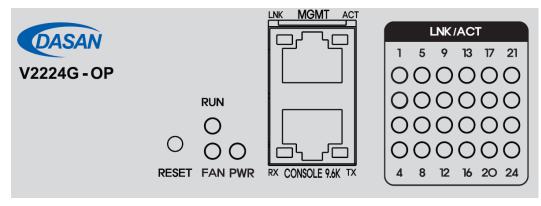
Figure 2　　Rear View of V2224G-OP (Single AC power type)

Figure 3　　Rear View of V2224G-OP (Single DC power type)

1.1   LEDs on V2224G-OP

Figure 4   LEDs on the V2224G-OP

Label	Color	Status	Description
RUN	Green	On	The system is starting up to boot.
		Blinking	The system is running with no errors.
		Off	The system is turned off.
	Amber	Blinking	CPU load is high.
PWR	Green	On	Power is supplied in the normal operating condition.
		Off	Power supply is failed.
FAN	Green	On	FAN is in the normal operating condition.
		Off	FAN is failed.
RS232 TX	Green	Blinking	A transmit activity is present on the console.
		Off	No transmit activity is present on the console.
RS232 RX		Blinking	A receive activity is present on the console.
		Off	No receive activity is present on the console.
MGMT LNK	Green	On	Link is up
		Off	Link is down
MGMT ACT	Amber	On	A transmit or receive activity is present on the MGMT interface.
		Off	No transmit or receive activity is present on the MGMT interface.

Table 2   Operating Status LEDs on the V2224G-OP

Label	Color	Status	Description
LNK/ACT (Port 1-24)	Green	On	Link Up
		Blinking	A transmit or receive activity is present on the network interface.
		Off	Link Down

Table 3   Link Status LEDs on Optical GE Interface

1.2 FTTx Service Scenario

PON & Optical Distribution Network

A PON consists of an Optical Line Termination (OLT) located at the Central Office and a set of Multi Dwelling Units (MDUs)/Optical Network Units (ONUs) or Optical Network Terminals (ONTs) located at the customer's premises. Between them is the Optical Distribution Network (ODN) comprising of fibers and passive optical splitters or couplers. A splitter is a device that divides an optical signal into two or more signals. OLT connects the PON to the IP network, controls and manages the PON clients. MDU connects the user specific network to PON. The ONT can be occupied by a single subscriber and also can be a gateway of the local network.
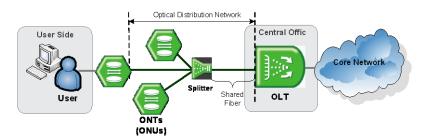

Figure 5   Optical Distribution Network by PON Architecture

E-PON MDU

When you install the E-PON uplink module into a slot on the V2224G-OP, this system can be used as E-PON MDU for FTTB (fiber to the Building) deployment. The E-PON MDU system is one element of PON network solution. Depending on the subscriber type and desired topology to the network, the operator may adopt: FTTH (fiber to the Home) and FTTB (fiber to the Building).
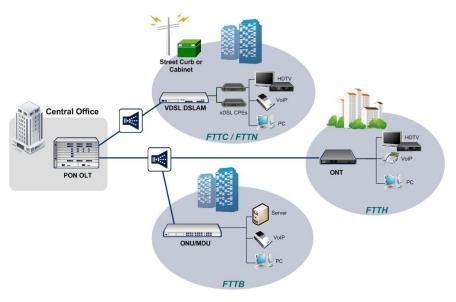

Figure 6   FTTx Service Deployments

2 Product Specification

2.1 System Feature

The V2224G-OP supports the following system features:

- 88 Gbps switching capacity and 65.5 Mpps throughput
- 24 subscriber interface ports
    - 24-Port 100/1000Base-X Gigabit Ethernet i/f
- 2 optional expansion slots for uplink modules
    - 1000Base-X (SFP) 1-Port uplink module per slot
    - 1000Base-X (SFP) 2-Port uplink module per slot
    - E-PON (SC/PC-type, 10km) 1-Port uplink module per slot
    - 10GBase-R (SFP+) 1-Port uplink module per slot
- LED indicators
- Console command line interface (CLI) via RS232
- Out-of-band management via 10/100Base-TX
- Fixed fans for internal cooling

2.2 Functionalities

Layer 2 Switch
- Standard Ethernet Bridging
- Managing 16K MAC addresses in MAC table
- IEEE 802.1Q tagged frame supporting 4K VLANs
- Port/MAC/Subnet/Protocol-based VLAN
- VLAN stacking
- Independent VLAN learning (IVL)
- Spanning tree (STP/RSTP/MSTP/PVSTP/PVRSTP)
- 802.3ad link aggregation
- Port mirroring
- Flow control
- Jumbo frame support
- FTTx deployments for various applications with PON uplink interfaces

Multicast
- IGMP v1/v2/v3
- IGMP snooping
- MVR

QoS
- Rate limiting
- Diff Serv
- Traffic scheduling (SP, WRR, DRR)
- Four queues per port

Security
- SSH v1/v2
- RADIUS, TACACS+ Authentication
- MAC/port based authentication according to 802.1x
- Ethernet type / L4-based ACL (Access Control List)
- Storm Control
- DHCP Filtering
- MAC Filtering

Management
- Serial/Telnet (CLI)
- SNMPv1/v2/v3
- DHCP server, relay agent with option82
- RMON
- Syslog
- Software Download/ Upgrade
- Configuration Download/ Upload
- DNS

E-PON MDU Features (optional uplink i/f)
The following table shows the key features of E-PON uplink module of V2224G-OP:
- Ethernet PON ONU/MDU based on IEEE802.3ah standard
- Fiber Transceiver (SFF SC/PC Type)
- Support the following data rates:
  - 1.25 Gbps (Downstream/Upstream)
- Support 1000Base-PX10
- 128 bit AES encryption-upstream and downstream
- QoS support: IP ToS classification and VLAN/LLID prioritization
- Advanced classification engine with support for VLAN, IP, TCP & UDP to provide true "triple-play" services
- Advanced threshold and queue level reporting to support high quality of service DBA algorithms

2.3 Physical Specification

Mechanics

Dimensions (W x H x D)	440 x 44 x 300 mm (17.3 x 1.7 x 11.8 in)
Minimum free space above shelf	50 mm
Minimum free space below shelf	25 mm
Operating Temperature	-4 ~ 140°F (-20 ~ 60°C)
Storage Temperature	-40~158° F (-40 ~ 70°C)
Operating Humidity Range	0% to 90% Non-condensing

Power Supply

AC power voltage (Single AC)	100-240VAC, 50/60Hz
DC power voltage (Single DC)	-48/60VDC
Power Consumption	37W

Operating Indicators

System LEDs	RUN, PWR, FAN
Service Optical GE i/f LEDs	LNK / ACT
Uplink i/f LEDs	LNK / ACT
Console	RX, TX
MGMT	LNK / ACT

Interface Parameter

Gigabit Ethernet i/f	24 x 100/1000Base-X (SFP)
Uplink i/f Slots	2 x 1-Port 1000Base-X (SFP)
(1-port module per slot)	E-PON (SC/PC-type)
	10GBase-R (SFP+)
	2-Port 1000Base-X (SFP)
Ethernet i/f for local management	10/100Base-TX
Serial i/f, Console	1-Port (RS232)

3 Uplink Module & Connector Specification

3.1 Uplink Interface Options

The following different uplink modules are available and can be inserted into the dedicated slots. Each uplink module contains one port.

Uplink Module	Description
1SFPM-1G-S	1-Port 1G SFP Uplink Module
1GPM-10(T)-A	1-port GE-PON (PX10U, SC/PC-type, IEEE802.3ah) service interface (Teknovus) for V2724G -. LD Shutdown, Remote Reset
1GPM-10(P)-A	1-port GE-PON (PX10U, SC/PC-type, IEEE802.3ah) service interface (PMC-Sierra) for V2724G -. LD Shutdown, Remote Reset
2SFPM-S	2-Port SFP Uplink Module DDM (Digital Diagnostic Monitoring) support for V2224G - 100/1000Base-X SFP
1SFPXM	1-Port SFP+ Uplink Module DDM (Digital Diagnostic Monitoring) support for V2208G, V2216G, V2224G - 10GBase- R SFP+
Uplink Blank Panel	Uplink Blank Panel

Table 4 Uplink Modules

i Other types of uplink module can be also available upon customer request.
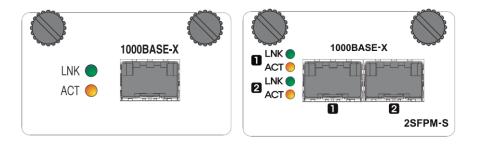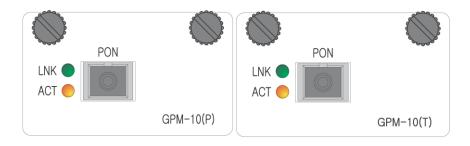

Figure 7 1G SFP uplink modules

Figure 8 E-PON uplink modules
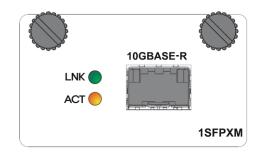
Figure 9   10GbE SFP+ uplink module

3.2   E-PON ONU Optical Transceiver

The followings are the features of E-PON MDU/ONU Transceiver.

- RoHS compliant

- IEEE802.3ah Gigabit Ethernet compliant

- SFF package with SC Receptacle

- 1310nm Burst Mode 1.25Gbps transmitter, and 1490nm Continuous Mode 1.25Gbps receiver

- Integrated with WDM filter to cut 1550nm and 1650nm optical signal off

- Single +3.3V power supply

- LVPECL electrical signal interface, LVTTL Bias Control input and Rx Signal Detect output

- Laser Class 1 Product which comply with the requirements of IEC 60825-1 and IEC 60825-2

Optical Connector	Package	Wavelength	Data Rate	Rx sensitivity	Saturation Optical power	Optical Tx Power	Reach
SC/PC	SFF	1310 nm (TX) 1490 nm (RX)	1.25Gb/s US 1.25Gb/s DS	< -26dBm	> -3dBm	-0.5 ~ +4.5dBm	10 km

Table 5   Specification of E-PON ONU transceiver

3.3   SFP Options

The following different optical SFP modules are available and can be inserted into the dedicated modules.

SFP Module	Description
SFP-GE-SX	SFP GE SX - Wavelength: 850 nm / Distance: 550 m / Mode: multi-mode - Connector: LC / Data rate: 1.25 Gbit/s / Core type: Dual Core - Operating Temperature: 0 °C ~ 70 °C
SFP-GE-LX10	SFP GE LX10 - Wavelength: 1310 nm / Distance: 10 km / Mode: single-mode - Connector: LC / Data rate: 1.25 Gbit/s / Core type: Dual Core - Operating Temperature: 0 °C ~ 70 °C

SFP Module	Description
SFP-GE-LX20	SFP GE LX20 - Wavelength: 1310 nm / Distance: 20 km / Mode: single-mode - Connector: LC / Data rate: 1.25 Gbit/s / Core type: Dual Core - Operating Temperature: 0 °C ~ 70 °C
SFP-GE-LX40	SFP GE LX40 - Wavelength: 1310 nm / Distance: 40 km / Mode: single-mode - Connector: LC / Data rate: 1.25 Gbit/s / Core type: Dual Core - Operating Temperature: 0°C ~ 70 °C

Table 6   SFP Modules

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Other types of SFP module can be also available upon customer request.

3.4   SFP+ Options

The following different optical SFP+ modules are available and can be inserted into the dedicated modules.

SFP+ Module	Description
SFPP-10GE-SR	SFP+ 10GE SR -. Wavelength : 850nm / Distance : 300m / Mode : Multimode -. Connector: LC / Data rate: 10.3125 Gbit/s / Core type: Dual Core -. Tx Power: -5 ~ -1 dBm, Rx sensitivity: -11.1 dBm -. Operating Temperature : 0°C ~ 70 °C -. 10GBASE-SR (10G)
SFPP-10GE-LR	SFP+ 10GE LR -. Wavelength : 1310nm / Distance : 10Km / Mode :Singlemode -. Connector : LC / Data rate : 10.3125 Gbit/s / Core type : Dual Core -. Tx Power: -8.2 ~ +0.5 dBm, Rx sensitivity: -12.6 dBm -. Operating Temperature : -5°C ~ 70 °C -. 10GBASE-LR (10G)
SFPP-10GE-ER	SFP+ 10GE ER -. Wavelength : 1550nm / Distance : 40Km / Mode :Singlemode -. Connector : LC / Data rate : 10.3125 Gbit/s / Core type : Dual Core -. Tx Power: -4.7 ~ +4.0 dBm, Rx sensitivity: -14.1 dBm -. Operating Temperature : 0°C ~ 70 °C -. 10GBASE-ER (10G)
SFPP-10GE-ZR	SFP+ 10GE ZR -. Wavelength : 1310nm / Distance : 70Km / Mode :Singlemode -. Connector : LC / Data rate : 10.3125 Gbit/s / Core type : Dual Core -. Tx Power: +3 ~ +6 dBm, Rx sensitivity: -22 dBm -. Operating Temperature : 0°C ~ 70 °C -. 10GBASE-ZR (10G)

Table 7   SFP+ Modules

4 Ordering Information

Bases
<u>V2224G-OP</u> – Fixed single AC power Fixed 24-Port 100/1000Base-X, 2 modular uplink slot, 32MB Flash, and 256MB SDRAM, Fixed single AC power (SMPS), Uplink module & SFP compatible with V2724G <u>V2224G-OP</u> – Fixed single DC power Fixed 24-Port 100/1000Base-X, 2 modular uplink slot, 32MB Flash, and 256MB SDRAM, Fixed single DC power (SMPS), Uplink module & SFP compatible with V2724G
Uplink Interface Options
1SFPM-1G-S, 1GPM-10(T)-A, 1GPM-10(P)-A, 2SFPM-S, 1SFPXM
SFP Options
SFP-GE-SX, SFP-GE-LX10, SFP-GE-LX20, SFP-GE-LX40
SFP+ Options
SFP+ 10GE-SR, SFP+ 10GE-LR, SFP+ 10GE-ER, SFP+ 10GE-ZR