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FTTH Solutions >> GE-PON Solution >> U9264H-EPON

Overview

The ubiQuoss U9264H is a high density, high capacity, and multi-functional GE-PON FTTH Optical Line Terminal. U9264H, built on a high capacity Layer 3 switch platform, is an efficient and cost effective solution optimized for service providers to offer reliable TPS services over GE-PON network.

U9264H has total 14 slots that can accommodate 2 SCUs(Switch & Control units), 2 PSUs(Power Supply Units), 2 LIUs(Line Interface Units), and 8 PIUs(PON Interface Units). The LIU slots of U9264H can accept 8-port 1G card, 2-port 10G card, or 4-port 10G card up to 2 slot cards, meanwhile the PIU slots can accept 8-port 1.25G GE-PON up to 8 slot cards.

U9264H adapts full redundancy design of SCU and PSU to improve availability and reliability of system. On top of that, U9264H offers Layer 2 switching, Layer 3 routing, QoS, OAM, Security and IPv6 features as well.

U9264H can accommodate maximum 4096 subscribers in a typical GE-PON deployment with 1:64 splits, since it can support total 64 PON ports.

- Easy and flexible deployment
- 19″ Chassis with 8 RU Height, 14 slots
- All Front Access
- Non-blocking architecture
- Packet processing functionalities for IP-based "Triple Play Service" delivery
- 960Gbps switching capacity, 10GE based next generation platform
- Full Redundancy design (SCU, PSU, PIU)
- Max. 64 GE-PON

Features

- System Architecture
  - 14 slots, 8RU, 19″ mounting
  - 3 FAN Module
  - AC / DC Power Module(Redundancy)
- Module based High Capacity L3 switching GE-PON Common Platform
  - 2 slots Power Supply Unit (PSU)
  - 8 slots PON Interface Unit (PIU)
  - 2 slots Line Interface Unit (LIU)
  - 2 slots Switch & Control Module (SCU)
- Switching capacity: 960Gbps/357Mpps
- Switching Fabric: 80G per slot
- Subscriber capacity: 64 GE-PON Max. 4096 subscribers(1:64 splits)
- All Cards and Modules support Hot-swapping
- PON interface
  - Max. 8 slots: up to 64 PONs
  - 8-port GE-PON module (Up to 64 GE-PON ports, 8 slots)
- Network interface
  - Max. 2 slots available for below slot cards:
    - ▪ 8-port 1GE card with 1000Base-T interface
    - ▪ 8-port 1GE card with 1000Base-X interface
    - ▪ 2-port 10GE card
    - ▪ 4-port 10GE card
- Fully Redundant System
  - Switch & Control Card(SCU)
  - AC/DC Power Supply Unit(PSU)
  - Any two PON ports from any two PIU cards
- Support Various SFP/XFP transceiver
- Management:1-port 100Base-Tx & RS-232
- IPv4 / IPv6(planned)
- 10Km/20Km at different splits (32) at -22dBM(Basic) or -27dBM(Optional)
- S/W Upgrade without service interruption
- Loop-Back Test Function
- RSSI (Received Signal Strength Indicator)
  - Detects (Senses) and indicates EPON signal strength by checking Rx/Tx signal of ONTs.
- Automatic Laser Diode Shutdown (in case of ONT fault)
  - Detects any ONT working in continuous mode and shutdown the laser diode of the ONT to prevent service failure over PON network.

Specification

Hardware

Product Specification	
Slot capacity	14 slots
Full-duplex Switching Capacity	960Gbps
System Throughput	357.3 Mpps
Full-duplex Capacity per slot	80G per slot
Physical Dimension	437mm(W) x 354.4mm(H) x 295mm(D) : 19 inch Rack Mount, 8 RU height
Chassis per rack	4 chassis(2200mm : 45RU)
Electrical specifications (AC/DC)	
Total power Consumption	Max. 800W
Rated input voltage	210~240VAC(47~63Hz), -48VDC
Environmental conditions	
Temperature	-20 ~ 60°C
Humidity	90%
Management Interfaces	RS-232C, 10/100 Base-T

Software

Features	Description
PON Features	Max 4 bidirectional unicast LLID per ONU Max 256 bidirectional unicast LLID per OLT port Wire speed processing 1.25 Gbps upstream/downstream rate 128-bit Advanced Encryption Standard (AES) encryption engine for PON security and privacy with up to 128 unique keys Forward Error Correction(FEC) encoding and decoding Flexible optical transceiver interface for multiple vendor support Hardware-based configurable Dynamic Bandwidth Allocation (DBA) IEEE 802.1D bridging: 8K MAC Address learning and aging on local interface IEEE 802.1p with four priority queues IEEE 802.1Q VLAN mapping Supports Local and Remote Loop-back test
L2 Features	Max 32K Mac Address Table Limiting No. of MAC Address per Subscriber Enable/Disable MAC Learning Configurable Learned MAC aging time Max 4K VLANs, 802.1Q Support Private VLAN 802.1ad Q-in-Q Tagging/Stacking Port to VLAN Mapping

	Service to VLAN Mapping
	802.3ad Link Aggregation
	Load-balancing based on source and destination MAC/IP
	802.1d Spanning Tree Protocol(STP)
	802.1w Rapid STP(RSTP)
	802.1s Multiple STP(MSTP)
	Rapid Per VLAN Spanning Tree Plus(RPVST+)
	IGMP v1/v2/v3, snooping
	Max 4K Group Support
	Static Mac Address
	Ethernet Jumbo Frame
	Port Mirroring
L3 Features	Static Routing
	RIPv2(IPv4)
	RIPng(IPv6)
	OSPFv2(IPv4)/v3(IPv6)
	BGP4(IPv4)/4+(IPv6)
	VRRPv2(IPv4)/v3(IPv6)
	PBR(Policy Based Routing)
	ECMP Max 8 Routes
	Max 12K Routing Entries
	PIM-SM
	PIM-SSM
	IGMP v2/v3
	IGMP Proxy
	Max 1K Group Support
	IGMP snooping
	IGMP Join/Leave
	PIM-ECMP Support
	IGMP Join Filter/Count Limit
	DHCP Server/Relay
	Blocks illegal IP users
	DHCP option82
	DHCP Snooping
	DAI(Dynamic ARP Inspection)
QoS Features	DBA(Dynamic Bandwidth Allocation)
	Support LLID for GEPON
	Layer 2: Source/Destination MAC Address, VLAN ID, 802.1p Field
	Layer 3: Source/Destination IP Address, DSCP
	Layer 4: Source/Destination TCP/UDP Port
	Flow Classification through CoS, VLAN CoS

	Marking/Remarking: DSCP, 802.1p
	    based on IEEE 802.1p bit support 8 priority levels or equivalent
	    based on TOS (IP Precedence/DSCP)

	Packet Drop
	Mirroring/Redirect to Port
	Metering, Rate Limiting with 64Kbps unit

	Rate Limit per subscriber
	Rate Limit per service per subscriber
	Peak Information Rate (PIR)
	Sustained Information Rate (CIR)
	8 queues per port
	SPQ, DWRR, Hybrid (SPQ+DWRR)
	Egress rate shaping per port/queue with 64Kbps unit
Security Features	Netbios, NBT filtering
	DHCP filtering
	Packet filtering with ACLs
	Destination MAC address
	Ether type VLAN ID
	Destination/Source IP address
	Enable/Disable data encryption upstream/downstream
	Illegal Source MAC address block
	ALL 0's, 1's, System Mac, Default G/W Mac
	Illegal Source IP address block
	Broadcast, DLF, Multicast packet rate control
	Source MAC based excessive traffic Block
	ONU/ONT auto discovery
	Static Mac address
	Mac filtering
	Max Mac Number limit
	Port based Self Loop Detect
	IP anti-spoofing
	ARP packet traffic limit
	Blocking of user-to-user flows
	Subscriber Isolation
	MAC Address Anti Spoofing
	ARP spoofing / ARP cache poisoning
	IP spoofing
	DHCP spoofing
	Broadcast flooding
	MAC address spoofing
	MAC flooding
	802.1Q tagging
System Security Features	RADIUS,
	TACACS+
	Telnet, SNMP with ACL
	DHCP, 82/60 option DHCP, PPPoE(option105) and static IP
	CPU Packet Filtering with ACL
	CPU overload Packet traffic sender block
	TCP sync attack protection with sync cookies
	CPU packet rate-limit
	Management packet priority control
	Gratuitous ARP
Management Features	Telnet, SSH, SNMP v1/v2/v3
	GUI Based Management through EMS

	Remote OS Upgrade using TFTP, FTP
	Dual Flash Image
	Remote Configuration Data Download
	NTP
	Packet monitoring with TCPDUMP
	RMON, Syslog
	Type based Port, CPU Packet statistics

FTTH Solutions >> GE-PON Solution >> U9016B-EPON

Overview

U9016B is designed to be placed anywhere which can be powered by either DC or AC source. It has compact 2U box type form factor which enables all front access.

U9016B comprises of SCU(Switching & CPU Unit), PSU(Power Supply Unit), and PIU(PON Interface Unit) along with the 2U chassis. The unit has 2 slots for PIU which has 8(eight) 1.25G EPON ports on the card. And the SCU of U9016B has 4-ports of 1000Base-X (SFP) and 2-ports of 10GBase-R (SFP+) itself for uplink interfaces. The PSUs are hot swappable regardless of powering types.

The PIUs for U9016B are fully compatible with U9264H, which will be a great benefit in reducing CAPEX and OPEX when customer build a PON network with multiple sets of U9016B and U9264H.

Features

- 19" Rack mountable Shelf structure
- 3 Card Slots
- Hot Swappable Cards
- 1G x 4 PORT(SFP), 10G x 2 PORT(SFP+)
- 1.25G GE-PON 8 Ports per Card
- 1 FAN Interface Module
- Dual Power Supply(AC, DC), Hot Swappable

Specification

Hardware

Item	Description
Number of PON Interface	8 Ports Hot-Swappable card Max 2 Cards
Network Interfaces	4-port 1000Base-X (SFP), 2-port 10GBase-R(SFP+)
Management Interfaces	10/100Base-TX, RS-232 (Console)
Power Supply	AC type: 100-240VAC, 50/60Hz
	DC type : -48VDC
Dimension (WxDxH)	Main body: 482mm x 88.8mm x 295mm
Operating Temperature	-20~60°C

Software

Features	Description
PON Features	Max 4 bidirectional unicast LLID per ONU Max 256 bidirectional unicast LLID per OLT port Wire speed processing 1.25 Gbps upstream/downstream rate 128-bit Advanced Encryption Standard (AES) encryption engine for PON security and privacy with up to 128 unique keys. AES-128 Downstream Encryption Forward Error Correction(FEC) encoding and decoding Flexible optical transceiver interface for multiple vendor support. Hardware-based configurable Dynamic Bandwidth Allocation (DBA) IEEE 802.1D bridging: 8K MAC Address learning and aging on local interface IEEE 802.1p with four priority queues IEEE 802.1Q VLAN mapping Supports Local and Remote Loop-back test
L2 Features	802.1Q, Max 4K VLANs, 4K VLAN IDs Private VLAN 802.3ad Link Aggregation Load-balancing based on source and destination MAC/IP 802.1d Spanning Tree Protocol 802.1w Rapid STP Per VLAN STP IGMP v1/v2, Snooping Max 1K Group Support Static Mac Address Port Mirroring
L3 Features	Static Routing RIP, OSPF, BGP Default Gateway VRRP ECMP Max 8 paths PBR (Policy Based Routing)

	PIM-SM, IGMP v2
	Max 1K Group Support
	DHCP Server/Relay
	Blocking of illegal IP users
	DAI (Dynamic ARP Inspection)
QoS Features	Layer 2: Source/Destination MAC Address, VLAN ID, COS Field
	Layer 3: Source/Destination IP address, DSCP
	Layer 4: Source/Destination TCP/UDP port
	TCP control flag
	Marking/Remarking: DSCP, COS
	Packet Drop
	Mirroring to Port, Redirect to Port
	Metering, Rate Limiting with 1Mbps unit
	COS – Queue
	DSCP - Queue
	8 queues per port
	SPQ, DWRR, Hybrid (SPQ+DWRR)
	Egress rate shaping per port/queue with 1Mbps unit
Security Features	Netbios, NBT filtering
	DHCP filtering
	Packet filtering with ACLs
	Block the illegal Source MAC address
	ALL 0's, 1's, System Mac, Default G/W Mac
	Block the illegal Source IP address
	Broadcast, DLF, Multicast packet rate control
	Cut-off of illegal traffic per Source MAC
	Static Mac address
	Mac filtering
	Limitation on Maximum Mac counts
	Port based Self Loop Detect
System Security Features	RADIUS,
	TACACS+
	Telnet, SNMP with ACL
	CPU Packet Filtering with ACL
	Isolate the users who generate overly CPU-intensive Packet
	TCP sync attack protection with sync cookies
	CPU packet rate-limit
	Management packet priority control
	Gratuitous ARP

FTTH Solutions >> GE-PON Solution >> P3624FG

GEPON ONU based on FE L2 switch
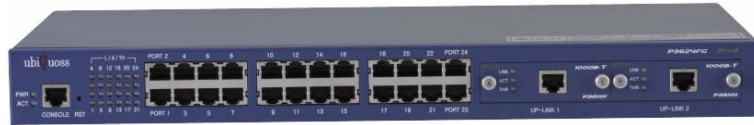
Overview

P3624FG is an L2 switch devised as a GEPON MDU providing FTTx broadband multimedia service. With its rack mount design and ease of installation, the P3624FG provides a cost effective way in supporting broadband connection to end users. When the switch is equipped with EPON(passive optical network) expansion module, the reach distance of uplinks can be from 10Km up to 20Km. Besides the PON expansion module P3624FG can also have optional 2-port 1000BASE-X module or optional 1000BASE-TX for the active optical network connectivity. P3624FG can have twenty-four 10/100base-TX (UTP) ports as its service interface toward end users.

The qualities of service features facilitate the deployment of triple play services such as VoIP, IPTV, and high-speed internet access as much as desirable. All ports of P3624FG switch support full duplex communication. B

P3624FG adopts a high speed non-blocking switch fabric. This chipset makes internal delay as little as possible by processing the arriving packets in parallel manner. And it maximizes data integrity through Store-and-Forward switching method. In other words every packet that arrives at any port will be stored in the buffer of the port and checked up for integrity before transferred to destination port. Therefore it can prevent some data error from being spread over the network.

P3624FG supports IPv6, hardware-based bandwidth management and Quality of Service functionality, which enables corporate users and ISPs to provide differentiated internet services in the environment of next generation network.

Features

- Up to 24 10/100Base-TX ports
- 2 Option Module Slots: GEPON module along with 100Base-FX, 1000Base-Tx and 1000Base-X
  Power : AC/DC
- 12.8 Gbps Non-Blocking Switch Fabric
- Max 6.5 Mpps L2 Switching, 64MB Main Memory, 16MB Flash Memory
- Up to 16K MAC Address Support for Switching
- Up to 256 VLANs Support
- Filtering : DHCP, NetBios, NBT, Mac, Broadcast Storm, IP Packet Filtering, IP-Subnetwork range blocking, Selective handling of specified IP address, Detection of IP address collision
- Secure Network : DoS prevention, Warm virus Filtering
- IEEE 802.1p, IEEE802.1Q, IEEE802.1D, IEEE802.3x
- Rate Limit : @ 1Mbps (100M & Gigabit port)
- Egress Traffic Shaping (Rate Limit) per Port
- Ingress Traffic policing per flow/packet
- VLAN, Multi VLAN, STP, RSTP, IGMP snooping & query
- Port Trunking, Link Aggregation(802.3ad), Port enable/disable, Stacking
- TFTP, CLI, Telnet, Syslog, SNMP Ⅰ/Ⅱ, RMON, Port Mirroring.
- IPv6 Enabled

Application

- Dynamic and Distributed Service, Contents and Applications Delivery to the MAN
- Enabling ISPs to construct broadband access networks

- Support intra-network environment for business and/or home user
- Virtual Private Leased Line Service, Client-Server Network, SOHO Network
- FTTx GPON/EPON ONU as a Multi Dwelling Unit
- Stacking Configuration Available

Specification

P3624FG Specification	
System Architecture & Console	24 fixed 10/100Base-TX ports (Auto-negotiation, Auto-Sensing, Auto MDI/MDIX) 2 Expansion Module : 1 Port per Option Module 100Base-FX, 1000Base-X(GBIC), 1000Base-X(SFP), 1000Base-TX, GPON, EPON RS-232C Serial Port (RJ-45 type)
Memory	64MB Main Memory 16MB Flash Memory
Physical Dimension	19″ Rack Mount Type 44mm(H)x482.6mm(W)x260mm(D) Max 4Kg
Environment Conditions	
Power	AC, DC
Input power and frequency	110~220 VAC / 50~60 Hz, -44 ~ -52 VDC
Power consumption	Max 16.64 W
Operating temperature	0℃ ~ +60℃
Storage temperature	-20℃ ~ +70℃
Performance	
Switching Fabric	12.8 Gbps non-blocking
Throughput	6.5 Mpps wire-speed L2 Switching
IPv6	Enabled
Capacity	
MAC Address	Up to 16K MAC Management
VLAN	Up to 256 VLAN Private Edge VLAN, 8021.Q Tag Vlan (Max 256 Tag Vlan) Link Aggregation (802.3ad) : 13 group, Max 8 port/group
Services and Features	
Filtering, Security, QoS	IEEE 802.1p QoS, Diff-serv support Congestion Management Filtering : Mac address, Mac address Count limit, Netbios, NBT, DHCP, Broadcast Storm, Selective handling of specified IP address, IP Packet filtering, Detection of IP address collision, IP Sub-network range blocking Virus Filtering : DoS prevention, Warm virus Filtering Subscriber Traffic control by ACLs (Access Control Lists)
Bandwidth Management	Hardware-based Rate Limiting Rate Limiting : 1Mbps per Ethernet port Rate Limiting : 1Mbps per Gigabit port Egress Traffic Shaping per Port Ingress Traffic Policing per Flow/Packet Hardware Based Symmetric & Asymmetric Rate Limiting

Management	SNMP v1/v2, RMON, MIB-I/II Remote S/W Upgrade, Telnet, TFTP, FTP, Port Mirroring CLI, Syslog, Access level control for administrator, RADIUS
Functions	STP(802.1D), RSTP(802.1w) DHCP relay/DHCP snooping NTP (Network Time protocol) Client Jumbo Frame packet support : 9022byte Stacking & IP Clustering : Max 8 Stacking
Multicasting Protocol	IGMP v2.0, IGMP snooping, IGMP proxy-reporting

Standards

IEEE Standards	802.1D Spanning Tree Protocol 802.1w RSTP 802.1p Priority Control 802.1Q VLAN 802.3 10Base-T Ethernet 802.3u 100Base-X Fast Ethernet 802.3x Flow Control 802.3ad Link Aggregation 802.3z 1000Base-X Gigabit Ethernet
IETF Standards	RFC 768 UDP RFC 791 IP RFC 903 TCP RFC 2131 DHCP Relay RFC 2236 IGMP v2 RFC 1112 IGMP
Management Standards & MIB	RFC 783 TFTP RFC 854 Telnet RFC 1157 SNMP v1 RFC 1213 MIB-I I RFC 1493 Bridge-MIB RFC 1757 RMON-MIB RFC 1902 SNMP v2 RFC 1907 SNMP-MIB RFC 1643 Ethernet-like Internet MIB

FTTH Solutions >> GE-PON Solution >> E3208E

GEPON ONU based on Mini L2 switch
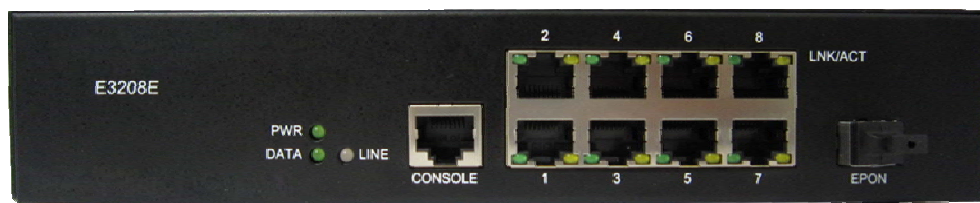
Overview

E3208E is a Fast Ethernet L2 switch used in access network segments to provide broadband multimedia service. It can provide high performance switching service to subscribers. It can be also deployed economically because it is based on 100Mbps downlink speed as FE and an uplink port as GE-PON.

E3208E is the best solution for medium size networks with high traffic volumes. E3208E also provides advanced network management and switching functions that follow the world standard. E3208E consists of eight FE ports and one Uplink module as GE-PON port.

Features

- 8 ports 100Base-TX (Fixed)
- Uplink : 1-port EPON 1.25G
- Power: 110~220 VAC / 50~60 Hz
- 12.8Gbps Switching Capacity
- 1.19Mpps throughput
- Max. 16K MAC Address Support for Switching
- 256 VLANs Support (VLAN ID range 1 ~ 4094)
- Filtering: DHCP, NetBios, NBT, Mac, IP Packet Filtering, IP-Subnetwork range blocking, Selective handling of specified IP address, Detection of IP address collision
- Alert when traffic/CPU load threshold reached
- Multicast/broadcast flooding prevention
- Secure Network: DoS prevention
- IEEE 802.1p, IEEE802.1Q, IEEE802.1D
- Rate Limit: @ 1Mbps (100M port)
- Ingress Traffic Policing per flow/packet
- VLAN, Multi VLAN, STP, RSTP, IGMP snooping & query
- Max. 128 ACL for QoS standards and filtering
- IGMP v1/v2, IGMP Snooping, IGMP Snooping Proxy Reporting supported
- SNMP trap for up/down linking and system initialization
- CLI, Telnet, Syslog, SNMP I/II, RMON, Port Mirroring
- OS upgrade with TFTP or FTP
- IPv6 support
- Backup(switch-over) upon AC power failure
- Over-charge and over-current prevention for battery
- Protection from voltage fluctuations for battery
- Battery charger included as part of the device/unit(4.5AH battery not incl.)
- Seamless failover to DC upon AC going down
- Shutting off the switch if Battery is powering the switch and voltage falls below 10.5V to ensure long life.
- Circuit handles 100V to 300V

Specification

E3208E Hardware Specification	
System Architecture & Console	8 fixed 100Base-TX ports (Auto-negotiation, Auto-Sensing, Auto MDI/MDIX) 1 Fixed Uplink EPON 1 port RS-232C Serial Console Port (RJ-45 type)
Physical Dimension	268 x 44 x 128 mm (W x H x D)
Environment Conditions	
Power	AC
Input power & frequency	110~220 VAC / 50~60 Hz
Power consumption	Max. 16.9W
Operating temperature	0℃ ~ 50℃
Storage temperature	-20℃ ~ 60℃
Performance	
Switching Fabric	12.8Gbps non-blocking
Throughput	1.19Mpps wire-speed L2 Switching
Capacity	
MAC Address	Up to 16K MAC Management
VLAN	Up to 256 VLAN (VLAN ID range 1~4094) Private Edge VLAN, 8021.Q Tagged-VLAN Link Aggregation (802.3ad): 8 group, Max 8 port/group
Services and Features	
Filtering, Security & QoS	IEEE 802.1p QoS, Diff-serv support, Congestion Management Filtering: Mac address, Netbios, NBT, Mac Address Count Limit, Broadcast Storm, selective handling of specified IP address, IP Packet filtering, DoS Attack Prevention Subscriber Traffic control by ACLs (Access Control Lists) Queue: 8, SPQ, WRR, WFQ Service differentiation for Control Packet (Ping, Telnet, SNMP, FTP, TFTP, etc)
Management	SNMP v1/v2, RMON, MIB-I/II, log flash, Subscriber (Block/unblock), Last Mac Management, Remote S/W Upgrade with TFTP or FTP, Telnet, Port Mirroring, CLI, Syslog, Access level control for administrator Radius, TACAS+, Remote power reset, Auto-reset(software diagnosis)
Functions	STP(802.1D), RSTP(802.1w), Self-Loop controlled Storm-control (L2DLF,Broadcast,Multicast), CPU Flood-Guard (pps control), CPU Filter(IP+TCP/UDP PORT NO) NTP (Network Time protocol) Client
Multicasting Protocol	IGMPv1/v2, IGMP snooping, 255 snoop Table, IGMP query, IGMP /Leave Suppression, IGMP Fast Leave, IGMP Static Join, IGMP proxy reporting IGMPv3 aware
Support IPv6	
IPv6 Multicast Protocol	MLDv1 MLD snooping, 255 snoop Table, MLD query, MLD Report/Done Suppression, MLD Fast Leave, MLD Static Join, MLD proxy reporting

	MLDv2 aware
Etc	Classification: IPv6 header field
	Configuration: IPv6 address and IPv6 default gateway

Standards

IEEE Standards	802.1D Spanning Tree Protocol
	802.1w RSTP
	802.1p Priority Control
	802.1Q VLAN
	802.3 10Base-T Ethernet
	802.3u 100Base-X Fast Ethernet
	802.3x Flow Control
	802.3ad Link Aggregation
IETF Standards	RFC 768 UDP
	RFC 791 IP
	RFC 903 TCP
	RFC 1112 IGMP
	RFC 2236 IGMP v2
	RFC 2710 MLD v1
Management Standards & MIB	RFC 783 TFTP
	RFC 854 Telnet
	RFC 1157 SNMP v1
	RFC 1213 MIB-I I
	RFC 1493 Bridge-MIB
	RFC 1757 RMON-MIB
	RFC 1902 SNMP v2
	RFC 1907 SNMP-MIB
	RFC 1643 Ethernet-like Internet MIB

FTTH Solutions >> GE-PON Solution >> E5024

GEPON ONU based on GE L2 switch

Overview

E5024 is an Gigabit Ethernet L2 switch devised as a GEPON MDU providing high-speed high-capacity broadband multimedia service of up to 1Gbps.   E5024 can be applied to FTTB or FTTC based network users enabling high performance switching service economically by using of 1000Mbps link speed.

E5024 can have up to twenty-four 1000base-T (UTP RJ-45) ports and two optional modules that support either up to two GEPON ports as well as 1000Base-T or 1000Base-X /100Base-FX (SFP) ports.

Besides LAN switching functionalitis, E5024 also provides QoS and multicasting and has increased the level of security with 802.1x.

E5024 is capable of supporting IPv6, hardware-based bandwidth management and Quality of Service functionality, which enable corporate users and ISPs to provide differentiated internet services in the environment of next generation network.

Features

- 24 ports 1000Base-T (Fixed)
- 2 Optional Slot Uplink Module(Hot-Swappable) : 100Base-FX, 1000Base-Tx, 1000Base-X
- Uplink Module
    - 1 port Combo : 100Base-FX/1000Base-X (SFP) or 1000Base-T (RJ-45)
    - 1 port EPON 1.25G
- Power: 110~220 VAC / 50~60 Hz
- 56Gbps Non-Blocking Switch Fabric
- 38Mpps Throughput
- 128MB Main Memory, 32MB Flash Memory
- Max. 16K MAC Address Support for Switching
- 256 VLANs Support
- Filtering: DHCP, NetBios, NBT, Mac, IP Packet Filtering, IP-Subnetwork range blocking, Selective handling of specified IP address, Detection of IP address collision
- Alert when traffic/CPU load threshold reached
- MAC address falsification & flooding prevention (static MAC, MAC count)
- Multicast/broadcast flooding prevention (broadband controlled & auto-lift after a period of time)
- Secure Network: DoS prevention, Warm virus Filtering
- IEEE 802.1p, IEEE802.1Q, IEEE802.1D
- Rate Limit: @ 1Mbps (100M & Gigabit port)
- Egress Traffic Shaping (Rate Limit) per port
- Ingress Traffic Policing per flow/packet
- VLAN, Multi VLAN, STP, RSTP, IGMP snooping & query
- Max. 128 ACL for QoS standards and filtering
- Gateway IP Address Resolution Protocol (GARP)
- IGMP v1/v2, IGMP Snooping, IGMP Snooping Proxy Reporting supported
- SNMP trap for up/down linking and system initialization
- TFTP, CLI, Telnet, Syslog, SNMP I/II, RMON, Port Mirroring
- Hardware based IPv6

Application

- L2 Workgroup Switch over Metro Ethernet Network
- MDU over FTTH PON network
- Dynamic and Distributed Service, Contents and Applications Delivery to the MAN
- Enabling ISPs to construct Wireless broadband access networks
- Support intra-network environment for business and/or factory where power supply is not prepared.

Specification

E5024 Hardware Specification	
System Architecture & Console	24 fixed 1000Base-T ports & 2 uplink slots (Expansion Module) (Auto-negotiation, Auto-Sensing, Auto MDI/MDIX) 2 Expansion Module: 1 Port per Module - 100Base-FX/1000Base-X (SFP) or 1000Base-T(RJ-45) RS-232C Serial Console Port (RJ-45 type)
Memory	128MB Main Memory 32MB Flash Memory
Physical Dimension	19" Rack Mount Type, 1RU 44mm(H)x482.6mm(W, Rack Guide included)x220mm(D)
Environment Conditions	
Power	110~220 VAC / 50~60 Hz
Power consumption	Max. 40W
Operating temperature	0℃ ~ 50℃ (-20~60℃)
Storage temperature	-30℃ ~ 70℃
Performance	
Switching Fabric	56Gbps non-blocking
Throughput	38Mpps wire-speed L2 Switching
IPv6	H/W based supported
Capacity	
MAC Address	Up to 16K MAC Management
VLAN	256 VLAN (VLAN ID range 1~4094) Private Edge VLAN, 8021.Q Tagged-VLAN Link Aggregation (802.3ad): 13 group, Max 8 port/group
Services and Features	
Filtering, Security & QoS	IEEE 802.1p QoS, Diff-serv support, Congestion Management Filtering: Mac address, Mac address Count limit, Netbios, NBT,TCP Sync cookies, TCP RST-UNKnown, Martian-Filter, DHCP, Broadcast Storm, selective handling of specified IP address, IP Packet filtering, detection of IP address collision Virus Filtering: DoS prevention, Warm virus Filtering Subscriber Traffic control by ACLs (Access Control Lists) Queue: 8, SPQ, WRR, SPQ+WFO Service differentiation for Control Packet (Ping, Telnet, SNMP, FTP, TFT, etc)
Management	SNMP v1/v2, RMON, MIB-I/II, log flash, Subscriber (Block/unblock), Last MAC Management, Remote S/W Upgrade, Telnet, TFTP, FTP, Port Mirroring, CLI, Syslog, Access level control for administrator Radius, TACAS+
Functions	STP(802.1D), RSTP(802.1w), Self-Loop controlled DHCP relay/DHCP snooping, DHCP option 82 Storm-control (L2DLF,Broadcast,Multicast),

	Flood-Guard (pps control), CPU Filter(IP+TCP/UDP PORT NO)
	NTP (Network Time protocol) Client
	Jumbo Frame packet support: 9022byte
	Stacking & IP Clustering: 8 Clustering
Multicasting Protocol	IGMP v2.0,
	IGMP snooping, 255 snoop Table, IGMP query, IGMP Join/Leave Suppression, IGMP Fast Leave,
	IGMP Static Join, IGMP proxy reporting

Standards

IEEE Standards	802.1D Spanning Tree Protocol
	802.1w RSTP
	802.1p Priority Control
	802.1Q VLAN
	802.3 10Base-T Ethernet
	802.3u 100Base-X Fast Ethernet
	802.3x Flow Control
	802.3ad Link Aggregation
	802.3z 1000Base-X Gigabit Ethernet
IETF Standards	RFC 768 UDP
	RFC 791 IP
	RFC 903 TCP
	RFC 2131 DHCP Relay
	RFC 2236 IGMP v2
	RFC 1112 IGMP
Management Standards & MIB	RFC 783 TFTP
	RFC 854 Telnet
	RFC 1157 SNMP v1
	RFC 1213 MIB-I I
	RFC 1493 Bridge-MIB
	RFC 1757 RMON-MIB
	RFC 1902 SNMP v2
	RFC 1907 SNMP-MIB
	RFC 1643 Ethernet-like Internet MIB

FTTH Solutions >> GE-PON Solution >> E5016

GEPON ONU based on GE L2 switch

Overview

E5016 is an Gigabit Ethernet L2 switch devised as a GEPON MDU providing high-speed high-capacity broadband multimedia service of up to 1Gbps. E5016 can be applied to FTTB or FTTC based network users enabling high performance switching service economically by using of 1000Mbps link speed.

E5016 can have up to twenty-four 1000base-T (UTP RJ-45) ports and two optional modules that support either up to two GEPON ports as well as 1000Base-T or 1000Base-X /100Base-FX (SFP) ports.

Besides LAN switching functionalitis, E5016 also provides QoS and multicasting and has increased the level of security with 802.1x.

E5016 is capable of supporting IPv6, hardware-based bandwidth management and Quality of Service functionality, which enable corporate users and ISPs to provide differentiated internet services in the environment of next generation network.

Features

- 16 ports 1000Base-T (Fixed)
- 1 Optional Slot Uplink Module(Hot-Swappable) : 100Base-FX, 1000Base-Tx, 1000Base-X
- Uplink Module
  - 1 port Combo : 100Base-FX/1000Base-X (SFP) or 1000Base-T (RJ-45)
  - 1 port GEPON 1.25G
- Power: 110~220 VAC / 50~60 Hz
- 56Gbps Non-Blocking Switch Fabric
- 38Mpps Throughput
- 128MB Main Memory, 32MB Flash Memory
- Max. 16K MAC Address Support for Switching
- 256 VLANs Support
- Filtering: DHCP, NetBios, NBT, Mac, IP Packet Filtering, IP-Subnetwork range blocking, Selective handling of specified IP address, Detection of IP address collision
- Alert when traffic/CPU load threshold reached
- MAC address falsification & flooding prevention (static MAC, MAC count)
- Multicast/broadcast flooding prevention (broadband controlled & auto-lift after a period of time)
- Secure Network: DoS prevention, Warm virus Filtering
- IEEE 802.1p, IEEE802.1Q, IEEE802.1D
- Rate Limit: @ 1Mbps (100M & Gigabit port)
- Egress Traffic Shaping (Rate Limit) per port
- Ingress Traffic Policing per flow/packet
- VLAN, Multi VLAN, STP, RSTP, IGMP snooping & query
- Max. 128 ACL for QoS standards and filtering
- Gateway IP Address Resolution Protocol (GARP)
- IGMP v1/v2, IGMP Snooping, IGMP Snooping Proxy Reporting supported
- SNMP trap for up/down linking and system initialization
- TFTP, CLI, Telnet, Syslog, SNMP I/II, RMON, Port Mirroring

- Hardware based IPv6

Application

- L2 Workgroup Switch over Metro Ethernet Network
- MDU over FTTH PON network
- Dynamic and Distributed Service, Contents and Applications Delivery to the MAN
- Enabling ISPs to construct Wireless broadband access networks
- Support intra-network environment for business and/or factory where power supply is not prepared.

Specification

E5016 Hardware Specification	
System Architecture & Console	16 fixed 1000Base-T ports (Auto-negotiation, Auto-Sensing, Auto MDI/MDIX) 1 Expansion Module: 1 Port per Module - 100Base-FX/1000Base-X (SFP) or 1000Base-T(RJ-45) RS-232C Serial Console Port (RJ-45 type)
Memory	128MB Main Memory 32MB Flash Memory
Physical Dimension	19″ Rack Mount Type, 1RU 44mm(H)x482.6mm(W, Rack Guide included)x220mm(D)
Environment Conditions	
Power	110~220 VAC / 50~60 Hz
Power consumption	Max. 40W
Operating temperature	0℃ ~ 50℃ (-20~60℃)
Storage temperature	-30℃ ~ 70℃
Performance	
Switching Fabric	56Gbps non-blocking
Throughput	38Mpps wire-speed L2 Switching
IPv6	H/W based supported
Capacity	
MAC Address	Up to 16K MAC Management
VLAN	256 VLAN (VLAN ID range 1~4094) Private Edge VLAN, 8021.Q Tagged-VLAN Link Aggregation (802.3ad): 13 group, Max 8 port/group
Services and Features	
Filtering, Security & QoS	IEEE 802.1p QoS, Diff-serv support, Congestion Management Filtering: Mac address, Mac address Count limit, Netbios, NBT,TCP Sync cookies, TCP RST-UNKnown, Martian-Filter, DHCP, Broadcast Storm, selective handling of specified IP address, IP Packet filtering, detection of IP address collision Virus Filtering: DoS prevention, Warm virus Filtering Subscriber Traffic control by ACLs (Access Control Lists) Queue: 8, SPQ, WRR, SPQ+WFO Service differentiation for Control Packet (Ping, Telnet, SNMP, FTP, TFT, etc)
Management	SNMP v1/v2, RMON, MIB-I/II, log flash, Subscriber (Block/unblock), Last MAC Management, Remote S/W Upgrade, Telnet, TFTP, FTP, Port Mirroring, CLI,

	Syslog, Access level control for administrator
	Radius, TACAS+
Functions	STP(802.1D), RSTP(802.1w), Self-Loop controlled
	DHCP relay/DHCP snooping, DHCP option 82
	Storm-control (L2DLF,Broadcast,Multicast),
	Flood-Guard (pps control), CPU Filter(IP+TCP/UDP PORT NO)
	NTP (Network Time protocol) Client
	Jumbo Frame packet support: 9022byte
	Stacking & IP Clustering: 8 Clustering
Multicasting Protocol	IGMP v2.0,
	IGMP snooping, 255 snoop Table, IGMP query, IGMP Join/Leave Suppression, IGMP Fast Leave, IGMP Static Join, IGMP proxy reporting
Standards	
IEEE Standards	802.1D Spanning Tree Protocol
	802.1w RSTP
	802.1p Priority Control
	802.1Q VLAN
	802.3 10Base-T Ethernet
	802.3u 100Base-X Fast Ethernet
	802.3x Flow Control
	802.3ad Link Aggregation
	802.3z 1000Base-X Gigabit Ethernet
IETF Standards	RFC 768 UDP
	RFC 791 IP
	RFC 903 TCP
	RFC 2131 DHCP Relay
	RFC 2236 IGMP v2
	RFC 1112 IGMP
Management Standards & MIB	RFC 783 TFTP
	RFC 854 Telnet
	RFC 1157 SNMP v1
	RFC 1213 MIB-I I
	RFC 1493 Bridge-MIB
	RFC 1757 RMON-MIB
	RFC 1902 SNMP v2
	RFC 1907 SNMP-MIB
	RFC 1643 Ethernet-like Internet MIB

FTTH Solutions >> GE-PON Solution >> C524W

GEPON ONT 4-port FE + 2-port FXS + Wi-Fi (n) + EPON (Routing mode)

Overview

The C524W is an EPON Optical Network Terminal designed for SFU (Single Family Unit) used in home and small office environment. It provides subscriber with rich, individualized, and comfortable triple-play services including video (IPTV), voice and high speed internet access. It has a glossy appearance and green, energy-saving advantage.

It supports 4 Fast Ethernet (UTP, RJ45) ports, 2 FXS (RJ 11) ports, and Wi-Fi (802.11 b/g/n) interface to the subscriber. It is connected to GEPON OLT and RN (Remote Node) via a fiber optic cable to provide TPS (Triple Play Service).

By adopting the state-of-the-art E-PON technology, C524W supports various features including Quality of Service (QoS) function, management function enabling prompt reactions against the problems in the system or a subscriber line, security function protecting subscriber information safe, and subscriber management function sheltering user information from illegal users.

Features

- 4FE Downlink Interface
- 2 FXS Telephone Line(RJ-11) Interface for VoIP service
- Wireless LAN (802.11b/g/n)
- NAT/NAPT
- DHCP Function
- Multicast Function
- QoS Features
- IPv4/IPv6 Compatibility
- Maximum 1514 byte Ethernet frame (without VLAN)
- 128 MAC address learning for R end in FTTC scenario.
- Compliant with 1000BASE-PX10 according to YD/T 1475-2006 - EPON.
- Uplink throughput: no less than 360Mbps.
- Downlink throughput: 380Mbps.

- ONU queue priority: no less than 4.
- Power consumption: less than 12W

Specification

Item		Description
Type		Standalone type
Interface	PON	1000Base-PX20
	LAN	10/100BaseTx (RJ-45: 4 ports), MDI/MDIX Auto-Negotiation
	VoIP	FXS Interface(RJ-11: 2 ports)
	Power Switch	On/Off
	Power(DC)	DC 12V 1.5A
	Reset Switch	Reset to factory
	WPS Switch	Wi-Fi Protected Setup
	ANT	Fixed Wireless LAN Antenna
Front Panel LED	Power	Power On/Off status
	PON	Logical Link status of PON, Loss Of Signal
	DATA	PON Link and Data Transmission status
	LAN 1/2/3/4	LAN Link and Data Transmission status
	VoIP	VoIP Link and Voice Call status
	Wireless	WLAN Link and Data Transmission status
	TEL 1/2	VoIP Link and Voice Call Status
Accessories		UTP Cat.5 Ethernet Cable(RJ-45, Straight)
		Power Adaptor (Input - AC: 100 ~ 220V (± 20%))
		User Manual

Network Features

- Wire-speed WAN and LAN
- Full-duplex Mode WAN and LAN
- Auto MDI/MDIX (Medium Dependent Interface Cross) WAN and LAN
- IEEE 802.1q VLAN(Tagged, untagged by port) for WAN port
- Maximum 16 Active VLAN
- VLAN ID range of 1~4094
- 4K MAC Address

Multicast Features

- IGMPv2
- IGMPv3
- IGMP Snooping
- IGMP Join/Leave Suppression
- IGMP Fast Leave
- IGMP Proxy
- 32 Multicast Group entry
- Multicast throughput: 400M.
- Multicast delay < 1.5ms。
- Multicast address capacity: no less than 8.

VoIP Features

- G.711A/u, G.729, G.723, G.722 etc.
- T.38 Fax

- Support different signals: dialing tone, ring back tone, etc.
- Support SIP
- Support MGCP
- RTP / RTCP Support RFC 3550 & RFC 3551
- Support call waiting
- Support call holding
- Support call forwarding
- Three Party Service
- Support caller ID display (Type 1 and 2)
- Support DTMF

DHCP Feature

- DHCP Client
- DHCP Server
- In NAT mode, IP will be assigned from the IP Pool of the device, and in Bridge mode, the IP will be assigned from the DHCP server in the network

NAT/NAPT

- Selectable between NAT mode and bridge mode
- Dynamic/static private IP in NAT mode
- Wire-speed for bi-directional packets of more than 256 Byte in NAT/NAPT
- Port Forwarding and DMZ Host function
- Minimum 500 bi-directional concurrent sessions

QoS Feature

- Rate limiting (±10%)
- QoS for both upstream and downstream

Item	Detail	Remark
Classification	Physical port 802.1p SRC/DST IP address TOS/DSCP TCP/UDP SRC/DST port	Layer 1, 2, 3, 4
Marking	802.1p DSCP	Layer 2, 3
Scheduling	SPQ	3 Queues per interface

Security

- Broadcast storm control
- MAC filtering

WiFi Features

- IEEE 802.11b/g/n
- Functional condition
- Automatic Fallback
- 4-level adjustable channel Transmission Output
- Manual or automatic selectable channel
- Setting and changing of number of CPEs that can access at one time
- Mixed use of 802.11b, 802.11g, 802.11n
- Encryption (Keys such as Hex, ASCII, special character should be supported)
- 64/128bit Static WEP Key
- WPA

- WPA2
- WPA-PSK
- WPA-PSK2(Option)
- 4 or more Virtual AP (Multi SSID), and each SSID supports different encryption
- SSID should support alphabet, numeric, special character
- Hidden SSID
- Wireless LAN QoS function: IEEE 802.11e(WMM)
- Traffic classification by 802.1p and DSCP field value
- IEEE 802.1x
- EAP MD5/EAP TTLS
- PEAP
- RADIUS Client function
- TR-069
- Session Timeout function.
- Upon re-authentication due to Session Timeout, it should be managed by the same Session ID
- Idle Timeout
- Session Timeout value and Idle Timeout value shall be obtained from Authentication system
- Web Redirection upon authentication failure
- Session termination upon wireless link down
- Account termination transmission function

Acct-Terminate-Cause	Value	Description
User Request	1	User logoff
Lost Carrier	2	Wireless link down for specific time period
Lost Service	3	When the previous AP sends Acct-stop in roaming mode
Idle Timeout	4	Idle Timeout termination
Session Timeout	5	Session Timeout termination
Admin Reset	6	When admin stops specific Session
Admin Reboot	7	When admin reboots the AP

Operating & Management

- OAM
- System or module LED.
- SNMP v1, v2 MIB.
- Memory structure that allows to save or modify Configuration File
- Memory should keep the contents of the memory even when power supply is stopped.
- Local and remote Firmware Upgrade (The existing Image should be kept when upgrade fails).
- Normal session for system management even when CPU overload
- Remote Management
- Remote access through Telnet(RFC 854, 855)
- CPE Management Server
- Device Reset
- LAN port reset
- Setting and changing Config
- Firmware download only through Web Server by TR069
- VLAN ID change
- MAC Filtering
- Time sync through NTP Server
- Device status and performance management

Interface Configuration

Name	Spec.	Description
ON/OFF		Power On / Off
Power Jack DC 5V2A		The input terminal that a power adaptor is connected to.

LAN 1/2/3/4	RJ-45	Connected through a LAN port UTP cable.
TEL 1/2	RJ-11	Connected through a FXS port RJ-11 cable.
WiFi	802.11b/g/n	Wi-Fi Interface with WPS button (Optional)
Line	SC/APC	EPON port (need to be kept clean)

FTTH Solutions >> GE-PON Solution >> C504W

GEPON ONT 4-port FE + Wi-Fi (n) + EPON (Routing mode)

Overview

The C504W is an EPON Optical Network Terminal designed for SFU (Single Family Unit) used in home and small office environment. It provides subscriber with rich, individualized, and comfortable triple-play services including video (IPTV), voice and high speed internet access. It has a glossy appearance and green, energy-saving advantage.

It supports 4 Fast Ethernet (UTP, RJ45) ports and Wi-Fi (802.11 b/g/n) interface to the subscriber. It is connected to GEPON OLT and RN (Remote Node) via a fiber optic cable to provide TPS (Triple Play Service).

By adopting the state-of-the-art E-PON technology, C504W supports various features including Quality of Service (QoS) function, management function enabling prompt reactions against the problems in the system or a subscriber line, security function protecting subscriber information safe, and subscriber management function sheltering user information from illegal users.

Features

- 4FE Downlink Interface
- Wireless LAN
- NAT/NAPT
- DHCP Function
- Multicast Function
- QoS Features
- IPv4/IPv6 Compatibility

Specification

Item		Description
Type		Standalone type LED: Power,PON,DATA,LAN1,LAN2,LAN3,LAN4,Wireless
Interface	PON	1000Base-PX20
	LAN	10/100BaseTx (RJ-45: 4port), MDI/MDIX Auto-Negotiation
	Power Switch	On/Off
	Power(DC)	DC 5V 2A
	Reset Switch	Return to initial factory settings
	WPS Switch	Wi-Fi Protected Setup
	ANT	Fixed Wireless LAN Antenna
Front Panel LED	Power	Power On/Off status
	PON	Logical Link status of PON, Loss of Optical Signal
	DATA	PON Link and Data Transmission status
	LAN	LAN Link and Data Transmission status
	Wireless	WLAN Link and Data Transmission status
Accessories		UTP Cat.5 Ethernet Cable(RJ-45, Straight) Power Adaptor (Input - AC: 100 ~ 220V (± 20%)) User Manual

Network Features

- Wire-speed WAN and LAN
- Full-duplex Mode WAN and LAN
- Auto MDI/MDIX (Medium Dependent Interface Cross) WAN and LAN
- IEEE 802.1q VLAN(Tagged, untagged by port) for WAN port
- Maximum 16 Active VLAN
- VLAN ID range of 1~4094
- 4K MAC Address

Multicast Features

- IGMPv2
- IGMPv3
- IGMP Snooping
- IGMP Join/Leave Suppression
- IGMP Fast Leave
- IGMP Proxy
- 32 Multicast Group entry

DHCP Feature

- DHCP Client
- DHCP Server
- In NAT mode, IP will be assigned from the IP Pool of the device, and in Bridge mode, the IP will be assigned from the DHCP server in the network

NAT/NAPT

- Selectable between NAT mode and bridge mode
- Dynamic/static private IP in NAT mode
- Wire-speed for bi-directional packets of more than 256 Byte in NAT/NAPT.
- Port Forwarding and DMZ Host function

- Minimum 500 bi-directional concurrent sessions

QoS Feature

- Rate limiting (±10%)
- QoS for both upstream and downstream

Item	Detail	Remark
Classification	Physical port 802.1p SRC/DST IP address TOS/DSCP TCP/UDP SRC/DST port	Layer 1, 2, 3, 4
Marking	802.1p DSCP	Layer 2, 3
Scheduling	SPQ	3 Queues per interface

Security

- Broadcast storm control
- MAC filtering

WiFi Features

- IEEE 802.11b/g/n
- Functional condition
- Automatic Fallback
- 4-level adjustable channel Transmission Output
- Manual or automatic selectable channel
- Setting and changing of number of CPEs that can access at one time.
- Mixed use of 802.11b, 802.11g, 802.11n
- Encryption (Keys such as Hex, ASCII, special character should be supported).
- 64/128bit Static WEP Key
- WPA
- WPA2
- WPA-PSK
- WPA-PSK2(Option)
- 4 or more Virtual AP (Multi SSID), and each SSID supports different encryption.
- SSID should support alphabet, numeric, special character
- Hidden SSID
- Wireless LAN QoS function: IEEE 802.11e(WMM)
- Traffic classification by 802.1p and DSCP field value
- IEEE 802.1x
- EAP MD5/EAP TTLS
- PEAP
- RADIUS Client function
- TR-069
- Session Timeout function.
- Upon re-authentication due to Session Timeout, it should be managed by the same Session ID.
- Idle Timeout
- Session Timeout value and Idle Timeout value shall be obtained from Authentication system.
- Web Redirection upon authentication failure
- Session termination upon wirelss link down
- Account termination transmission function

Acct-Terminate-Cause	Value	Description
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Lost Carrier	2	Wireless link down for specific time period	
Lost Service	3	When the previous AP sends Acct-stop in roaming mode	
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Admin Reboot	7	When admin reboots the AP	

Operating & Management

- OAM
- System or module LED.
- SNMP v1, v2 MIB.
- Memory structure that allows to save or modify Configuration File
- Memory should keep the contents of the memory even when power supply is stopped.
- Local and remote Firmware Upgrade(The existing Image should be kept when upgrade fails).
- Normal session for system management even when CPU overload
- Remote Management
- Remote access through Telnet(RFC 854, 855)
- CPE Management Server
- Device Reset
- LAN port reset
- Setting and changing Config
- Firmware download Only through Web Server by TR069
- VLAN ID change
- MAC Filtering
- Time sync through NTP Server
- Device status and performance management

Interface Configuration

Name	Spec.	Description
ON/OFF	-	Power On / Off
Power Jack DC 5V2A	-	The input terminal that a power adaptor is connected to.
LAN1/2/3/4	RJ-45	Connected through a LAN port UTP cable.
WiFi	802.11b/g/n	Wi-Fi Interface with WPS button
Line	SC/APC	EPON port (need to be kept clean)

FTTH Solutions >> GE-PON Solution >> C504LL

Overview

The C504LL is an EPON Optical Network Terminal designed for SFU (Single Family Unit) used in home and small office environment. It provides subscriber with rich, individualized, and comfortable triple-play services including video (IPTV), voice and high speed internet access. It has a small form factor and green, energy-saving advantage.

It supports 4 Gigabit Ethernet (UTP, RJ45) ports to subscriber. It is connected to GEPON OLT and RN (Remote Node) via a fiber optic cable to provide TPS (Triple Play Service).

By adopting the state-of-the-art E-PON technology, C504LL supports various features including Quality of Service (QoS) function, management function enabling prompt reactions against the problems in the system or a subscriber line, security function protecting subscriber information safe, and subscriber management function sheltering user information from illegal users.

Features

- Four ports Gigabit Ethernet for downstream
- Bridge mode operation
- Multicast Support for IPTV Service
- Power Saving Mode Support
- LD Shutdown Function
- QoS Features
- IPv4/IPv6 Compatibility
- Support up to 256 MAC addresses
- Compliant with 1000BASE-PX10 according to YD/T 1475-2006-EPON.
- Uplink throughput: no less than 360Mbps.
- Downlink throughput: 380Mbps.
- ONU queue priority: no less than 4.
- Low Power consumption: less than 15W

Specification

Hardware

Item	Description		
Type	Standalone type		
Interface	Line	PON, 1000Base-PX20 (SC/APC), need to be kept clean	
	LAN 1/2/3/4	Four 10/100/1000BaseTx ports, MDI/MDIX Auto-Negotiation	

	PWR	Power Switch, On/Off
	Input Power	DC 5V 2A
Front Panel LED	PWR	Power On/Off status
	Line	Logical Link status of PON, Loss of Optical Signal
	Data	PON Link and Data Transmission status
	LAN 1/2/3/4	LAN Link and Data Transmission status
Accessories	UTP Cat.5 Ethernet Cable(RJ-45, Straight) Power Adaptor (Input - AC: 100 ~ 220V (± 20%)) User Manual	

Software

Item		Description
Standard		IEEE 802.3ah
Function and Performance	EPON	IEEE802.3ah MPCP, OAM compliant 802.1Q VLAN Per LLID Filtering/Classification Supports up to four Logical Link IDs (LLID) AES-128 Downstream decryption Dying Gasp Automatic Plug and Play function for WAN PON Port (Discovery and Authorization)
	L2 Features	IEEE802.1Q VLAN IEEE802.1D Spanning Tree Protocol Support up to 256 MAC Address
	Multicasting	IGMP v1/v2, IGMP proxy/snooping for IPTV service
	QoS	IEEE802.1P Packet classification and marking (802.1P) Rate limiting
	Security & filtering	MAC address limiting
Technical Standard and Protocol		IEEE Std 802.3™-2002 Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications IEEE Std 802.1D, 1998 Edition Media Access Control (MAC) Bridges IEEE Std 802.1Q, 2003Edition Virtual Bridged Local Area Networks IEEE Std 802.1w-2001 Media Access Control (MAC) Bridges — Amendment 2: Rapid Reconfiguration IEEE Std 802.1s™-2002 Virtual Bridged Local Area Networks— Amendment 3: Multiple Spanning Trees IEEE Std 802.1X-2001 Port-Based Network Access Control IEEE Std 802.3ah.-2004 Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment: Media Access Control Parameters, Physical Layers, and

	Management Parameters for Subscriber Access Networks
	IEEE P802.1ad/D6.0 Draft Standard for Local and Metropolitan Area Networks—Virtual
	Bridged Local Area Networks — Amendment 4: Provider Bridges

FTTH Solutions >> GE-PON Solution >> C501LL

Overview

The C501LL is an EPON Optical Network Terminal designed for SFU (Single Family Unit) used in home and small office environment. It provides subscriber with rich, individualized, and comfortable triple-play services including video (IPTV), voice and high speed internet access. It has a small form factor and green, energy-saving advantage.

It supports 1(one) Gigabit Ethernet (UTP, RJ45) ports to subscriber. It is connected to GEPON OLT and RN (Remote Node) via a fiber optic cable to provide TPS (Triple Play Service).

By adopting the state-of-the-art E-PON technology, C501LL supports various features including Quality of Service (QoS) function, management function enabling prompt reactions against the problems in the system or a subscriber line, security function protecting subscriber information safe, and subscriber management function sheltering user information from illegal users.

Features

- One port Gigabit Ethernet for downstream
- Bridge mode operation
- Multicast Support for IPTV Service
- LD Shutdown Function when ONT occurs the fault. (Automatic Shutdown Function)
- QoS Features
- IPv4/IPv6 Compatibility
- Compliant with 1000BASE-PX10 according to YD/T 1475-2006-EPON.
- ONU queue priority: no less than 4.
- Low Power consumption: less than 5W

Specification

Hardware

Item		Description
Type		Standalone type
Interface	Line	1000Base-PX10 (SC/APC), need to be kept clean
	LAN	One 10/100/1000BaseTx port, MDI/MDIX Auto-Negotiation
	PWR	Power Switch, On/Off
	Input Power	Input Power, DC 5V 2A
Front Panel LED	PWR	Power On/Off status
	Line	Logical Link status of PON, Loss of Optical Signal
	Data	PON Link and Data Transmission status
	LAN	LAN Link and Data Transmission status

Accessories	UTP Cat.5 Ethernet Cable(RJ-45, Straight)
	Power Adaptor (Input - AC: 100 ~ 220V (± 20%))
	User Manual

Software

Item		Description
Standard		IEEE 802.3ah
Function and Performance	EPON	IEEE802.3ah MPCP, OAM compliant
		802.1Q VLAN
		Per LLID Filtering/Classification
		Supports up to four Logical Link IDs (LLID)
		AES-128 Downstream decryption
		Dying Gasp
		Automatic Plug and Play function for WAN PON Port (Discovery and Authorization)
	L2 Features	IEEE802.1Q VLAN
		IEEE802.1D Spanning Tree Protocol
		Support up to 256 MAC Address
	Multicasting	IGMP v1/v2, IGMP proxy/snooping for IPTV service
	QoS	IEEE802.1P
		Packet classification and marking (802.1P)
		Rate limiting
	Security & filtering	MAC address limiting
Technical Standard and Protocol		IEEE Std 802.3™-2002 Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications
		IEEE Std 802.1D, 1998 Edition Media Access Control (MAC) Bridges
		IEEE Std 802.1Q, 2003Edition Virtual Bridged Local Area Networks
		IEEE Std 802.1w-2001 Media Access Control (MAC) Bridges — Amendment 2: Rapid Reconfiguration
		IEEE Std 802.1s™-2002 Virtual Bridged Local Area Networks— Amendment 3: Multiple Spanning Trees
		IEEE Std 802.1X-2001 Port-Based Network Access Control
		IEEE Std 802.3ah.-2004 Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment:
		Media Access Control Parameters, Physical Layers, and Management Parameters for Subscriber Access Networks
		IEEE P802.1ad/D6.0 Draft Standard for Local and Metropolitan Area Networks—Virtual
		Bridged Local Area Networks — Amendment 4: Provider Bridges

FTTH Solutions >> GPON Solution >> U9264H-GPON

Overview

The ubiQuoss U9264H is a high density, high capacity, and multi-functional GPON FTTH Optical Line Terminal. U9264H, built on a high capacity Layer 3 switch platform, is an efficient and cost effective solution optimized for service providers to offer reliable TPS services over GPON network.

U9264H has total 14 slots that can accommodate 2 SCUs (Switch & Control units), 2 PSUs (Power Supply Units), 2 LIUs (Line Interface Units), and 8 PIUs (PON Interface Units). The LIU slots of U9264H can accept 8-port 1G card, 2-port 10G card, or 4-port 10G card up to 2 slot cards, meanwhile the PIU slots can accept 8-port 2.5G GPON up to 8 slot cards.

U9264H adapts full redundancy design of SCU and PSU to improve availability and reliability of system. On top of that, U9264H offers Layer 2 switching, Layer 3 routing, QoS, OAM, Security and IPv6 features as well.

U9264H can accommodate maximum 4096 subscribers in a typical GPON deployment with 1:64 splits, since it can support total 64 PON ports.

- Future broadband capable platform of multi slot chassis
- Easy and flexible deployment
- Non-blocking architecture
- All Front Access
- Packet processing functionalities for IP-based "Triple Play Service" delivery
- 19" Chassis with 8 RU Height, 14 slots
- 960Gbps switching capacity, 10GE based next generation platform
- 64 GPON ports
- 2 x SCU(Switch & CONTROL Unit), 8 x PIU(PON Interface Unit), 2 x LIU(Line Interface Unit), 2 x PSU(Power Supply Unit)
- GPON Optic : Support of Laser Class B+/C+
- PON Ranging : typical 20Km / Max 60Km
- IPv4/IPv6 Dual Stack Operations

Features

- System Architecture
  - 14 slots, 8RU, 19″ mounting
  - 3 FAN Module
  - AC / DC Power Module(Redundancy)
- Module based High Capacity L3 switching GPON Common Platform
  - 2 slots Power Supply Unit (PSU)
  - 8 slots PON Interface Unit (PIU)
  - 2 slots Line Interface Unit (LIU)
  - 2 slots Switch & Control Module (SCU)
- Switching capacity: 960Gbps/357Mpps
- Switching Fabric: 80G per slot
- Subscriber capacity: 64 GPON Max. 4096 subscribers(1:64 splits)
- All Cards and Modules support Hot-swapping
- PON interface
  - Max. 8 slots: up to 64 PONs
  - 8-ports GPON module (Up to 64 GPON ports, 8 slots)
- Network interface
  - Max. 2 slots available for below slot cards:
    - 8-port 1GE card with 1000Base-T interface
    - 8-port 1GE card with 1000Base-X interface
    - 2-port 10GE card
    - 4-port 10GE card
- Fully Redundant System
  - Switch & Control Card(SCU)
  - AC/DC Power Supply Unit(PSU)
  - Any two PON ports from any two PIU cards
- Support Various SFP/XFP transceiver
- Management:1-port 100Base-Tx & RS-232
- IPv4 / IPv6(planned)
- 10Km/20Km at different splits (32) at -22dBM(Basic) or -27dBM(Optional)
- S/W Upgrade without service interruption
- Loop-Back Test Function
- RSSI (Received Signal Strength Indicator)
  - Detects (Senses) and indicates GPON signal strength by checking Rx/Tx signal of ONTs.
- Automatic Laser Diode Shutdown (in case of ONT fault)
  - Detects any ONT working in continuous mode and shutdown the laser diode of the ONT to prevent service failure over PON network.

Specification

Hardware

U9264H Specification	
Slot capacity	14 slots
Full-duplex Switching Capacity	960G
System Throughput	357Mpps
Full-duplex Capacity per slot	80G per slot
Physical	437mm(W) x 354.4mm(H) x 295mm(D) : 19inch Rack Mount, 8RU height
Chassis per rack	4 chassis(2200mm : 45RU)
Electrical specifications for the AC/DC power	
Total power Consumption	Max. 800W
Rated input voltage	210~240VAC(47~63Hz), -48VDC
Environmental conditions	

Temperature	0 ~ 50°C
Humidity	90%
Management Interfaces	RS-232C, 10/100 Base-T

Software

Features	Description
PON Features	Full ITU-T G.984.x GPON OLT functionality. 4K port-ID and 1K alloc-ID Support ITU-T G.984.4 ONT OMCI Multiple T-CONTs per ONU (ONT) Wire speed processing On-chip embedded reassembly buffer per GPON channel 2.5 Gbps downstream rate on each PON channel 1.25 Gbps upstream rate on each PON channel Supports up to 512 Alloc-IDs per GPON channel Internal GPON SERDES and Burst CDR 128-bit Advanced Encryption Standard (AES) encryption engine for PON security and privacy with up to 128 unique keys. Flexible optical transceiver interface for multiple vendor support. ITU-T G.984 compliant Forward Error Correction (FEC) encoding and decoding for an improved link budget. Hardware-based configurable Dynamic Bandwidth Allocation (DBA) IEEE 802.1D bridging: 8K MAC Address learning and aging on local interface IEEE 802.1p with four priority queues IEEE 802.1Q VLAN mapping
L2 Features	TR-156 Compliant Max 32K Mac Address Table Max 4K VLANs, 802.1Q Support Private VLAN 802.3ad Link Aggregation Load-balancing based on source and destination MAC/IP 802.1d Spanning Tree Protocol(STP) 802.1w Rapid STP(RSTP) 802.1s Multiple STP(MSTP) Rapid Per VLAN Spanning Tree Plus(RPVST+) IGMP v1/v2/v3, snooping Max 4K Group Support Static Mac Address Port Mirroring
L3 Features	Static Routing RIPv2(IPv4) RIPng(IPv6) OSPFv2(IPv4)/v3(IPv6) IS-IS BGP4(IPv4)/4+(IPv6) VRRPv2(IPv4)/v3(IPv6) PBR(Policy Based Routing) ECMP Max 8 Routes

	Max 12K Routing Entries
	PIM-SM
	PIM-SSM
	IGMP v2/v3
	IGMP Proxy
	Max 1K Group Support
	PIM-ECMP Support
	IGMP Join Filter/Count Limit
	DHCP Server/Relay
	Blocks illegal IP users
	DHCP Snooping
	DAI(Dynamic ARP Inspection)
QoS Features	Layer 2: Source/Destination MAC Address, VLAN ID, 802.1p Field
	Layer 3: Source/Destination IP Address, DSCP
	Layer 4: Source/Destination TCP/UDP Port
	Marking/Remarking: DSCP, 802.1p
	Packet Drop
	Mirroring/Redirect to Port
	Metering, Rate Limiting with 64Kbps unit
	8 queues per port
	SPQ, DWRR, Hybrid (SPQ+DWRR)
	Egress rate shaping per port/queue with 64Kbps unit
Security Features	Netbios, NBT filtering
	DHCP filtering
	Packet filtering with ACLs
	Illegal Source MAC address block
	ALL 0's, 1's, System Mac, Default G/W Mac
	Illegal Source IP address block
	Broadcast, DLF, Multicast packet rate control
	Source MAC based excessive traffic Block
	Static Mac address
	Mac filtering
	Max Mac Number limit
	Port based Self Loop Detect
System Security Features	RADIUS,
	TACACS+
	Telnet, SNMP with ACL
	CPU Packet Filtering with ACL
	CPU overload Packet traffic sender block
	TCP sync attack protection with sync cookies
	CPU packet rate-limit
	Management packet priority control
	Gratuitous ARP
Management Features	Telnet, SSH, SNMP v1/v2/v3
	GUI Based Management through EMS
	Remote OS Upgrade using TFTP, FTP
	Dual Flash Image
	Remote Configuration Data Download

	NTP
	Packet monitoring with TCPDUMP
	RMON, Syslog
	Type based Port, CPU Packet statistics
Synchronization (Optional)	BITS Clock : 2.048MHz
	Support of 1588v2 Slave and Master
	ITU-T G.8261 / ITU-T G.8262 Compliant
	E1/T1 Timing source : 2.048MHz / 1.544MHz / 8KHz
	SyncE Timing source : 156.25MHz or 125MHz

FTTH Solutions >> GPON Solution >> U9016B-GPON

Overview

U9016B is designed to be placed anywhere which can be powered by either DC or AC source. It has compact 2U box type form factor which enables all front access.

U9016B comprises of SCU(Switching & CPU Unit), PSU(Power Supply Unit), and PIU(PON Interface Unit) along with the 2U chassis. The unit has 2 slots for PIU which has 8(eight) 2.5GPON ports on the card. And the SCU of U9016B has 4-ports of 1000Base-X (SFP) and 2-ports of 10GBase-R (SFP+) itself for uplink interfaces. The PSUs are hot swappable regardless of powering types.

The PIUs for U9016B are fully compatible with U9264H, which will be a great benefit in reducing CAPEX and OPEX when customer build a PON network with multiple sets of U9016B and U9264H.

Features

- 19" Rack mountable Shelf structure
- 3 Card Slots
- Hot Swappable Cards
- 1G x 4PORT(SFP), 10G x 2PORT(SFP+)
- 1.25G GE-PON 8 PORT per Card
- 2.5G GPON 8 PORT per Card
- 1 FAN Interface Module
- Dual Power Supply(AC, DC), Hot Swappable

Specification

Hardware

Item	Description
Number of PON Interface	8 Ports Hot-Swappable card Max 2 Cards
Network Interfaces	4-port 1000Base-X (SFP), 2-port 10GBase-R(SFP+)
Management Interfaces	10/100Base-TX, RS-232 (Console)
Power Supply	AC type: 100-240VAC, 50/60Hz
	DC type : -48V
Dimension (WxDxH)	Main body: 482mm x 88.8mm x 295mm
Operating Temperature	-20~60°C

Software

Features	Description
PON Features	Full ITU-T G.984.x GPON OLT functionality. 4K port-ID and 1K alloc-ID Support ITU-T G.984.4 ONT OMCI Multiple T-CONTs per ONU (ONT) Wire speed processing On-chip embedded reassembly buffer per GPON channel 2.5 Gbps downstream rate on each PON channel 1.25 Gbps upstream rate on each PON channel Supports up to 512 Alloc-IDs per GPON channel Internal GPON SERDES and Burst CDR 128-bit Advanced Encryption Standard (AES) encryption engine for PON security and privacy with up to 128 unique keys. Flexible optical transceiver interface for multiple vendor support. ITU-T G.984 compliant Forward Error Correction (FEC) encoding and decoding for an improved link budget. Hardware-based configurable Dynamic Bandwidth Allocation (DBA) IEEE 802.1D bridging: 8K MAC Address learning and aging on local interface IEEE 802.1p with four priority queues IEEE 802.1Q VLAN mapping
L2 Features	802.1Q, Max 4K VLANs, 4K VLAN IDs Private VLAN 802.3ad Link Aggregation Load-balancing based on source and destination MAC/IP 802.1d Spanning Tree Protocol 802.1w Rapid STP Per VLAN STP IGMP v1/v2, Snooping Max 1K Group Support Static Mac Address Port Mirroring
L3 Features	Static Routing

	RIP, OSPF, BGP
	Default Gateway
	VRRP
	ECMP Max 8 paths
	PBR (Policy Based Routing)
	PIM-SM, IGMP v2
	Max 1K Group Support
	DHCP Server/Relay
	Blocking of illegal IP users
	DAI (Dynamic ARP Inspection)
QoS Features	Layer 2: Source/Destination MAC Address, VLAN ID, COS Field
	Layer 3: Source/Destination IP address, DSCP
	Layer 4: Source/Destination TCP/UDP port
	TCP control flag
	Marking/Remarking: DSCP, COS
	Packet Drop
	Mirroring to Port, Redirect to Port
	Metering, Rate Limiting with 1Mbps unit
	COS – Queue
	DSCP - Queue
	8 queues per port
	SPQ, DWRR, Hybrid (SPQ+DWRR)
	Egress rate shaping per port/queue with 1Mbps unit
Security Features	Netbios, NBT filtering
	DHCP filtering
	Packet filtering with ACLs
	Block the illegal Source MAC address
	ALL 0's, 1's, System Mac, Default G/W Mac
	Block the illegal Source IP address
	Broadcast, DLF, Multicast packet rate control
	Cut-off of illegal traffic per Source MAC
	Static Mac address
	Mac filtering
	Limitation on Maximum Mac counts
	Port based Self Loop Detect
System Security Features	RADIUS,
	TACACS+
	Telnet, SNMP with ACL
	CPU Packet Filtering with ACL
	Isolate the users who generate overly CPU-intensive Packet
	TCP sync attack protection with sync cookies
	CPU packet rate-limit
	Management packet priority control
	Gratuitous ARP

FTTH Solutions >> GPON Solution >> P3424GP

GPON ONU based on FE L2 switch

Overview

P3424GP is an L2 switch devised as a GPON MDU providing FTTx broadband multimedia service. With its rack mount design and ease of installation, the P3424GP provides a cost effective way in supporting broadband connection to end users. When the switch is equipped with PON(passive optical network) expansion module, the reach distance of uplinks can be from 10Km up to 20Km. Besides the PON expansion module P3424GP can also have optional 2-port 1000BASE-X module or optional 100/1000BASE-TX for the active optical network connectivity. The qualities of service features facilitate the deployment of triple play services such as VoIP, IPTV, and high-speed internet access as much as desirable.

As one of the preparation for the future network enhancement, Premier 3424GP is designed to support IPv6 and is capable of adapt itself to IPv6 network environment easily.

The P3424GP supports comprehensive OAM functions for remote administration with SNMP v1/v2/v3 and provides easy-to-use management interface of Cisco-alike CLI through the Telnet and console.

Features

- Up to 24 10/100Base-TX ports (Fixed)
- 2 Option Module Slots: GPON module along with 100Base-FX, 1000Base-Tx and 1000Base-X
- Fully compliant of G.984.x set of standards
- Power : AC/DC
- 12.8 Gbps Non-Blocking Switch Fabric
- Max 6.5 Mpps L2 Switching, 64MB Main Memory, 16MB Flash Memory
- Up to 16K MAC Address Support for Switching
- Up to 256 VLANs Support
- Filtering : DHCP, NetBios, NBT, Mac, Broadcast Storm, IP Packet Filtering, IP-Subnetwork range blocking, Selective handling of specified IP address, Detection of IP address collision
- Secure Network : DoS prevention, Warm virus Filtering
- IEEE 802.1p, IEEE802.1Q, IEEE802.1D, IEEE802.3x
- Rate Limit : @ 1Mbps (100M & Gigabit port)
- Egress Traffic Shaping (Rate Limit) per Port
- Ingress Traffic policing per flow/packet
- VLAN, Multi VLAN, STP, RSTP, IGMP snooping & query
- Port Trunking, Link Aggregation(802.3ad), Port enable/disable, Stacking
- TFTP, CLI, Telnet, Syslog, SNMP I / II , RMON, Port Mirroring.
- Hardware based IPv6

Specification

P3424GP Specification	
System Architecture & Console	24 fixed 10/100Base-TX ports (Auto-negotiation, Auto-Sensing, Auto MDI/MDIX) 2 Expansion Module for uplink RS-232C Serial Port (RJ-45 type)
UP Link Interface	GPON Optical Interface 10/100BASE-TX (RJ-45) 1000BASE-TX (RJ-45) 1000BASE-SX (SC Type) 1000BASE-LX (SC Type) 1000BASE-LH (SC Type) 100BASE-FX (SC Type)
Memory	64MB Main Memory 16MB Flash Memory
Physical Dimension	19″ Rack Mount Type 44mm(H)x482.6mm(W)x260mm(D) Max 4Kg

Environment Conditions	
Power	AC, DC
Input power and frequency	110~220 VAC / 50~60 Hz, -44 ~ -52 VDC
Power consumption	Max 16.64 W
Operating temperature	0℃~ +50℃
Storage temperature	-20℃~ +60℃

Performance	
Switching Fabric	12.8 Gbps non-blocking
Throughput	6.5 Mpps wire-speed L2 Switching
IPv6	Enabled
Capacity	
MAC Address	Up to 16K MAC Management
VLAN	Up to 256 VLAN Private Edge VLAN, 802.1Q Tag Vlan (Max 256 Tag Vlan) Link Aggregation (802.3ad) : 13 group, Max 8 port/group

Services and Features	
Filtering, Security & QoS	IEEE 802.1p QoS, Diff-serv support Congestion Management Filtering : Mac address, Mac address Count limit, Netbios, NBT, DHCP, Broadcast Storm, Selective handling of specified IP address, IP Packet filtering, Detection of IP address collision, IP Sub-network range blocking Virus Filtering : DoS prevention, Warm virus Filtering Subscriber Traffic control by ACLs (Access Control Lists)
Bandwidth Management	Hardware-based Rate Limiting Rate Limiting : 1Mbps per Ethernet port Rate Limiting : 1Mbps per Gigabit port Egress Traffic Shaping per Port Ingress Traffic Policing per Flow/Packet Hardware Based Symmetric & Asymmetric Rate Limiting
Management	SNMP v1/v2, RMON, MIB-I/II Remote S/W Upgrade, Telnet, TFTP, FTP, Port Mirroring CLI, Syslog, Access level control for administrator, RADIUS
Functions	STP(802.1D), RSTP(802.1w) DHCP relay/DHCP snooping NTP (Network Time protocol) Client Jumbo Frame packet support : 9022byte Stacking & IP Clustering : Max 8 Stacking
Multicasting Protocol	IGMP v2.0,

	IGMP snooping, IGMP proxy-reporting
Standards	
IEEE Standards	802.1D Spanning Tree Protocol 802.1w RSTP 802.1p Priority Control 802.1Q VLAN 802.3 10Base-T Ethernet 802.3u 100Base-X Fast Ethernet 802.3x Flow Control 802.3ad Link Aggregation 802.3z 1000Base-X Gigabit Ethernet
IETF Standards	RFC 768 UDP RFC 791 IP RFC 903 TCP RFC 2131 DHCP Relay RFC 2236 IGMP v2 RFC 1112 IGMP
Management Standards & MIB	RFC 783 TFTP RFC 854 Telnet RFC 1157 SNMP v1 RFC 1213 MIB-I I RFC 1493 Bridge-MIB RFC 1757 RMON-MIB RFC 1902 SNMP v2 RFC 1907 SNMP-MIB RFC 1643 Ethernet-like Internet MIB
ITU Standards	G.984.1: General characteristics for Gigabit-capable Passive Optical Networks (GPON) G.984.2: Gigabit-capable Passive Optical Networks (GPON): Physical Media Dependent (PMD) layer specification G.984.3: Gigabit-capable Passive Optical Networks (G PON): Transmission convergence layer specification G.984.3

FTTH Solutions >> GPON Solution >> C604G

GPON ONT 4-Ports GE

Overview

C604G is an GPON Optical Network Terminal designed for SFU (Single Family Unit) used in home and small office environment. It provides subscriber with high performance, individualized, and feature rich services including video (IPTV), voice and high speed internet access. It has a glossy appearance with eco friendly and energy-saving advantage.

It supports 4 Gigabit Ethernet (UTP, RJ45) interfaces to the subscriber. It is connected to GPON OLT and RN (Remote Node) via a fiber optic cable to provide TPS (Triple Play Service).

C604G basically operates at bridge mode providing complimentary features like Q-in-Q, VLAN translation, VLAN trunking and VLAN tagging/detagging per Ethernet port which will give network operator versatility to construct network per its own requirement. Besides, the OAM features based upon standard compliant OMCI facilitate more convenient and effective network operation.

Features

- ITU-T G.984 GPON compliant
- 4 Ethernet LAN ports supported 10/100/1000Base-T ports
- Bridge Mode
- OMCI
- DHCP Server
- QoS, CoS
- Dying Gasp support
- -10℃ ~ 60℃ Operating Temperature
- 5% ~ 95% Humidity(Non-Condensing)

Specification

Item	Description
SYSTEM HW ARCHITECTURE	4 Port 10/100/1000 Base-T Ethernet data interfaces Ethernet port auto negotiation or manual configuration MDI/MDIX automatic sensing AC Adapter input 100 ~ 240 volts , 50/60 Hz Power Input 12V, 1.5A (feed via external AC/DC adapter) 180mm(W) x 135mm(D) x 40mm(H) SFU-Type Dimension -10℃~60℃ (32°F~140 °F) Operating Temperature Dying Gasp support
NETWORK FEATURES	Bridge Mode Support Up to 256 MAC address and 4 VLAN group VLAN stacking (Q-in-Q), VLAN translation, VLAN trunking VLAN tagging/detagging per Ethernet port IGMP v2/v3 snooping
PON FEATURES	ITU-T G.984 GPON compliant (984.1/.2/.3/.4)

	Compliant to FSAN G.984.2 specifications 1310nm Tx, 1490nm Rx 1244Mbps Tx / 2488Mbps Rx asymmetric data rate Burst mode upstream transmission 20km reach GR-468-CORE compliant SC/APC connector Multiple T-CONTs, Multiple Port-IDs NSR/SR DBA Upstream and Downstream FEC AES-128 decryption 512 Port-Ids 8 Transmission Container Maximum 2.488 Gbps Downlink/1.244 Gbps Uplink
QoS / Security FEATURES	IP ToS/DSCP to 802.1p mapping CoS based on VLAN-ID, 802.1p bit, ToS/DSCP Marking/remarking of 802.1p QoS Support with 4-traffic classed based on arrival port, IEEE802.1p, Ipv4 TOS Mac Address Limit for Mac Spoofing Attack Static Mac Address
OAM	Standards-compliant OMCI as defined in ITU-T G.984.4 and G.983.2 Management Information Base (MIB) manipulation over OMCI by Create, Delete, Set, Get and Get Next commands Provisioning for all services including Ethernet, IPTV, etc. Alarming and AVC report, performance monitoring Remote image download over OMCI, as well as activation and rebooting Holds two F/W banks for image integrity and rollback

FTTH Solutions >> GPON Solution >> C604GR

GPON ONT 4-Ports GE + RF Port

Overview

C604GR is an RF featured GPON Optical Network Terminal which comprises of 1 RF video port and 4 Gigabit Ethernet (UTP, RJ45) ports as its service interfaces. It provides subscriber with high performance, individualized, and feature rich services including video (IPTV), voice, high speed internet and CATV analog video service. It is connected to GPON OLT and RN (Remote Node) via a fiber optic cable to provide TPS (Triple Play Service) and digitalized RF signal.

C604GR basically operates at bridge mode providing complimentary features like Q-in-Q, VLAN translation, VLAN trunking and VLAN tagging/detagging per Ethernet port which will give network operator versatility to construct network per its own requirement. Besides, the OAM features based upon standard compliant OMCI facilitate more convenient and effective network operation.

Features

- ITU-T G.984 GPON compliant
- 4 Ethernet LAN ports supported 10/100/1000Base-T ports
- RF video port(Coaxial F-Connector) for CATV
- Bridge Mode
- OMCI
- DHCP Server / NAT / NAPT
- QoS, CoS
- Dying Gasp support
- -10℃~60℃ Operating Temperature
- 5% ~ 95% Humidity(Non-Condensing)
- FCC/ UL/ ETSL Certified

Specification

Item	Description
SYSTEM HW ARCHITECTURE	4 Port 10/100/1000 Base-T Ethernet data interfaces Ethernet port auto negotiation or manual configuration MDI/MDIX automatic sensing One coaxial interface (54Mhz–1GHz Frequency Range) AC Adapter input 100 ~ 240 volts, 50/60 Hz Power Input 12V, 1.5A (feed via external AC/DC adapter) 180mm(W) x 135mm(D) x 40mm(H) SFU-Type Dimension -10℃~60℃ (32°F~140 °F) Operating Temperature Dying Gasp support
NETWORK FEATURES	Bridge Mode Support 256 MAC address and 16 VLAN group VLAN stacking (Q-in-Q), VLAN translation, VLAN trunking VLAN tagging/detagging per Ethernet port IGMP v2/v3 snooping

PON FEATURES	ITU-T G.984 GPON compliant (984.1/.2/.3/.4) Single fiber, integrated triplexer transceiver Compliant to FSAN G.984.2 specifications Data/Video FTTx ONT/ONU applications 1310nm Tx, 1490nm Rx, 1555nm video Rx 1244Mbps Tx / 2488Mbps Rx asymmetric data rate Received Optical Power Min: -28dBm ~ -8dBm Burst mode upstream transmission Extinction Ratio: Min 10dB Average Optical Output Power: Min 0.5dBm ~ 5dBm 870MHz video bandwidth 20km reach GR-468-CORE compliant SC/APC connector Multiple T-CONTs, Multiple Port-IDs NSR/SR DBA Upstream and Downstream FEC AES-128 decryption 512 Port-Ids 8 Transmission Container Maximum 2.488 Gbps Downlink/1.244 Gbps Uplink
RFoG Specification	Frequency Range: Min 54MHz – Max 870MHz Receiver Wavelength: Min 1540nm – Max 1560nm Received Average Optical Power: Min -8dBm – Max 2dBm RF Output Level : Min 18dBmV/ch RF Output Impedance : 75 Ohm
QoS / Security FEATURES	IP ToS/DSCP to 802.1p mapping CoS based on VLAN-ID, 802.1p bit, ToS/DSCP Marking/remarking of 802.1p QoS Support with 4-traffic classed based on arrival port, IEEE802.1p, Ipv4 TOS Mac Address Limit for Mac Spoofing Attack Static Mac Address
OAM	Standards-compliant OMCI as defined in ITU-T G.984.4 and G.983.2 Management Information Base (MIB) manipulation over OMCI by Create, Delete, Set, Get and Get Next commands Provisioning for all services including Ethernet, IPTV, etc. Alarming and AVC report, performance monitoring Remote image download over OMCI, as well as activation and rebooting Holds two F/W banks for image integrity and rollback

FTTH Solutions >> GPON Solution >> C624WGB

GPON ONT 4-port GE + 2-port FXS + Wi-Fi(n) + USB2.0 Host

Overview

C624WGB is a GPON ONT designed for advanced triple-play service deployments. It supports QoS enabled features including VoIP and multicast video application on top of high speed internet access via either UTP line or WiFi interfaces.

C624WGB ONT is ideal for triple-play service deployments in FTTH/FTTB architecture. Industry standard SIP voice signaling provides reliable voice services. The four Giga-Ethernet ports can be separated into different services allowing the configuration of dedicated ports for IP video and data.

Compliant with standard OMCI definition, C624WGB is manageable from remote site and supports the full range FCAPS functions including supervision, monitoring and maintenance.

Features

- High level throughput
- MAC address learning per port: 64 per Ethernet port
- Affordable Voice quality: G.711A 20ms, PESQ average value > 3.9
- Available coding methods: G.711, G.729A, G.723.1, Delay (loopback delay)
- Input Power: 110-220VAC, 50/60Hz (Region dependent)
- Output Power: 12V DC, 1.5A (Switch)
- Dying Gasp: Supported
- Power Switch: Push button power on or off
- Reset Button: Reset to factory default
- WPS Button: enables Push button WPS function
- RF Switch Button: Push button WIFI on or off
- Operation Temperature of - 32°F to 104°F (0℃ to 40℃)
- Storage Temperature of - 4°F to 149°F (-20℃ to 70℃)
- Humidity of 5% ~ 95% non-condensing

Specification

Hardware
Key Components / Connectors / Performance

Flash Memory	16M Bytes (MAX support 256MB)
SDRAM for CPU	64M Bytes (DDR2 ,MAX support 2Gbit)
Console	Internal console port (4 pin)
LAN	4x 10/100/1000Base-TX MDI/MDIX RJ-45 port compliant with following standards: 1. IEEE 802.3/802.3u 2. Hardware based 10/100/1000, full/half, flow control auto negotiation 3. Non-blocking wire speed reception and transmission 4. Full duplex IEEE 802.3x flow control and half duplex back-pressure flow control 5. Broadcast storm protection 6. Automatic address learning, address aging and address migration 7. Integrated address Look-Up Engine, 1 K absolute MAC addresses supported
WAN	1x inner GPON port Data Rate: Downstream: up to 2.4Gbps; Upstream: up to 1.2Gbps Down wavelength: 1490 nm Up wavelength: 1310 nm Maximum transmission distance: 20 Km

Software

Feature Item	Feature	Detailed Description
GPON Compliance	ITU-T G.984.1, G.984.2, G.984.3, G.984.4	
	Fully ITU-T G.984 compliant framing	
	Support 8 T-CONTS and 32 GEM Ports	
	Multiple T-CONTs per device Multiple GEM Ports per device	
	Flexible mapping between GEM Ports and T-CONT	
	Activation with automatic discovered SN	
	and password in conformance with	
	ITU-T G.988	
	AES-128 Decryption with key generation and switching	
	FEC (Forward Error Correction)	
	DBA reporting in status indications in the PLOu, and by piggyback reports in the DBRu (mode 0)	
	802.1p service mapping profile on U/S	
	Mapping of GEM Ports into a T-CONT with priority queues based scheduling	
	Support for Multicast GEM Port	
Network Protocol	802.1q/1p VLAN over RFC2684 bridge encapsulation	
	PPPoE	Support AUTO, PAP, CHAP, MS-CHAP authentication. Auto or static IP address assignment.
	PPPoE passthrough	Supports concurrent PPPoE clients inside the modem and PPPoE clients on the LAN devices.
	PPPoE filtering of non-PPPoE packets between WAN and LAN	Support filtered non-PPPoE packets.
	Auto clean up of remote stalled PPP sessions	

	at BRAS	
	Transparent bridging between all LAN and WAN interfaces	
	WAN to WAN blocking in bridge mode	
	Ethernet as WAN	
Networking	Full Cone NAT	
	DMZ Host	
ALGs	FTP	
	TFTP	
	RTSP	
	Port Triggering	
	PPTP	
	IPSec and L2TP	
Firewall/Filtering	Stateful Inspection	
	Packet filtering	Packets can be blocked based on interface, mac address, IP address, protocol, and port number.
	LAN side firewall	By default, LAN side firewall is disabled
Parental Control	Time of day usage restriction	
	URL Filtering	Supports INCLUDE and EXCLUDE modes
QoS	IP/Bridge/802.1p	
	Rate Control on upstream traffic	
	Support SP, WRR	
Routing	RIP v1/v2	Enable RIP over multiple WAN interfaces
	Policy Routing	Routes packets based on criteria other than destination IP address
IGMP	Proxy and snooping	
	IGMP v2 and v3	
MLD		
IPv6	IPv6 Ready Logo Certified	
	IPv6 Firewall	
	IPv6 capable apps	telnetd, ftpd, sshd, httpd
USB	USB 2.0 "Host" Driver USB 2.0	
	USB storage	
	Access to mounted USB disk via FTP	
DHCP Server	Support for multiple subnets	
	Static IP lease	
	DHCP relay	
DHCP client		
LAN services	Second IP address on LAN interface	
DNS Proxy	Built in DNS server	
	Caching previous requests	
ACL		
WebUI	Protection against Cross Site Request Forgery attack	
TR - 069	Digest Authentication, SSL and Basic Authentication, SSL and Authentication Digest	

	Auto - launch and exit - on - idle	
	TR - 098	
	TR - 098 profile support	
	TR - 111 (part 1)	
	TR - 140	
	TR - 104	
TR - 064		
SNMP	v1/v2c agent	
	MIB - II	
UPnP	Internet Gateway Device (IGDv1.0) Finite(24 hour) duration of virtual server entries created using UPnP	
Security	Three level login(local admin, local user, remote support)	
	Service access based on incoming interface and/or source IP address	
	Automatic logout from CLI after inactivity	
Audit and Logging	Send log to remote syslog server	
Diagnostics	Interface Connectivity	Ethernet and USB.
	Internet Connectivity	ISP authentication, assigned IP address, default gateway/primary DNS server connectivity
Other Features	Dynamic DNS	
	sntp time synchronization	
	telnetD	
	Power Management	
WIFI Compliance	IEEE 802.11b/g/n	
	Support 2x2 antennas	
	Support 2-stream spatial multiplexing up to 270Mbps	(Can upgrade to 300Mbps)
	Support MCS 0-15 and MCS 32 modulation and coding rates channels	
	Support 20M and 40M	
	WEP encryption	Support 64, 128 Bit WEP encryption
Voip	802.1x	
	WPA/WPA2	
	WPA-PSK/WPA2-PSK	
	Mac Filter base on each SSID	
	Multiple SSID	Up to 4 SSID Support SSID hidden
	Support SSID hidden	
	SSID User Isolation	
	WPS	WPS Push and WPS PIN method supported Housing WPS push button (optional)
	Enable or disable WIFI through GUI	
	SIP/ MGCP/ H.248 Protocols	Support SIP or MGCP Protocols
	FXS	Support 2 FXS

	RTP (RFC 1889)/ RTCP (RFC 1890)	
	UDP (RFC 768)	
	SDP (RFC 2327)	
	Outbound Proxy	
	Multiple voice codec - G.711 (u/a-law), G.726, G.729 (A and B), G.723.1 etc	
	T.30 and T.38 Fax	
	DTMF In band & Out of bandTone Detection & generation (RFC2833)	
	Echo Cancelling, Silence suppression, VAD, CNG	
	Various CLASS services - Caller ID, Call Waiting, Call Forwarding, Call Transfer, etc.	