

MA5801-FL16-H1 Product Datasheet

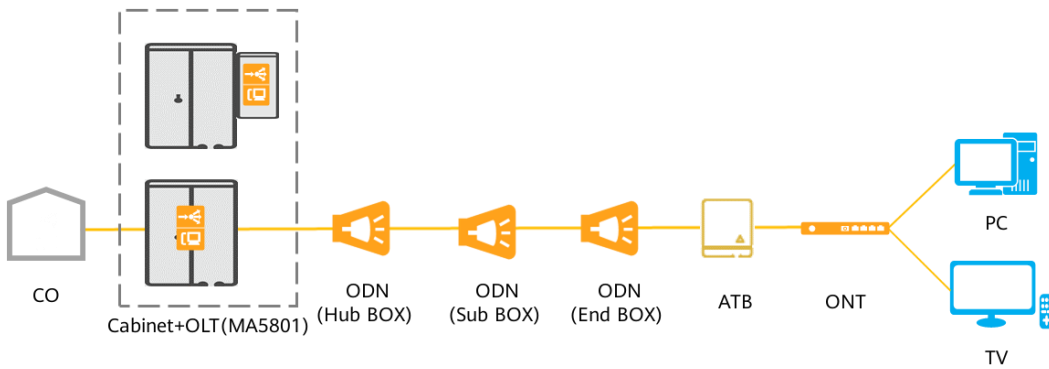
The MA5801-FL16-H1 is a compact and low-density box-shaped OLT. It provides multiple fiber to the home (FTTH) solutions to meet the requirements of economical and efficient network construction.



Product Overview

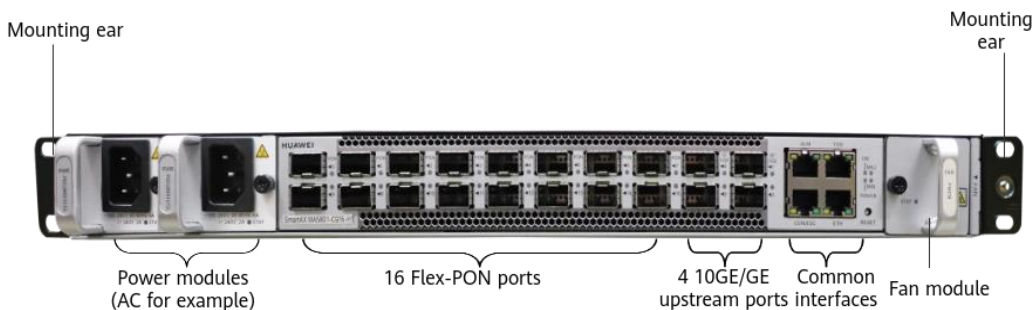
With the continuous promotion of new services, such as 4K/VR videos, home networks, and network cloudification, optical fiber access has become an important means for countries around the world to popularize broadband networks. As optical fiber access nodes keep moving closer to end users, OLTs are closer to end users. Deployment scenarios are complex and diversified. In this case, network needs OLTs with small volume and low density.

The MA5801-FL16-H1 is a compact and low-density box-shaped OLT. It provides multiple fiber to the home (FTTH) solutions to meet the requirements of economical and efficient network construction. It can be flexibly deployed in fast fixed mobile convergence (FMC) scenario, national broadband coverage scenario, and enterprise's all-optical campus scenario.



Appearance and Structure

The product is a box-shaped OLT. It houses integrated control and service module, 1 pluggable fan module and 2 pluggable power modules. Its mounting ears are applicable to IEC specifications and ETSI specifications, and are used in racks or cabinets of different specifications.



Product Highlights

Lightweight and small size

The lightweight OLT weighs less than 5 kg and occupies 1 U installation space. It can be flexibly adapted to various scenarios.

High density, supporting 16 Flex-PON ports

Supports 16 Flex-PON service ports and works with Flex-PON optical modules to implement Flex-PON access.

NOTE

Flex-PON is a flexible PON solution developed by Huawei for GPON and XG(S)-PON. It implements smooth network evolution through the integrated Flex-PON service board. The ports of the Flex-PON service board can work in multiple modes, including:

- GPON

- XG-PON
- XGS-PON
- GPON&XG-PON Combo
- GPON&XGS-PON Combo

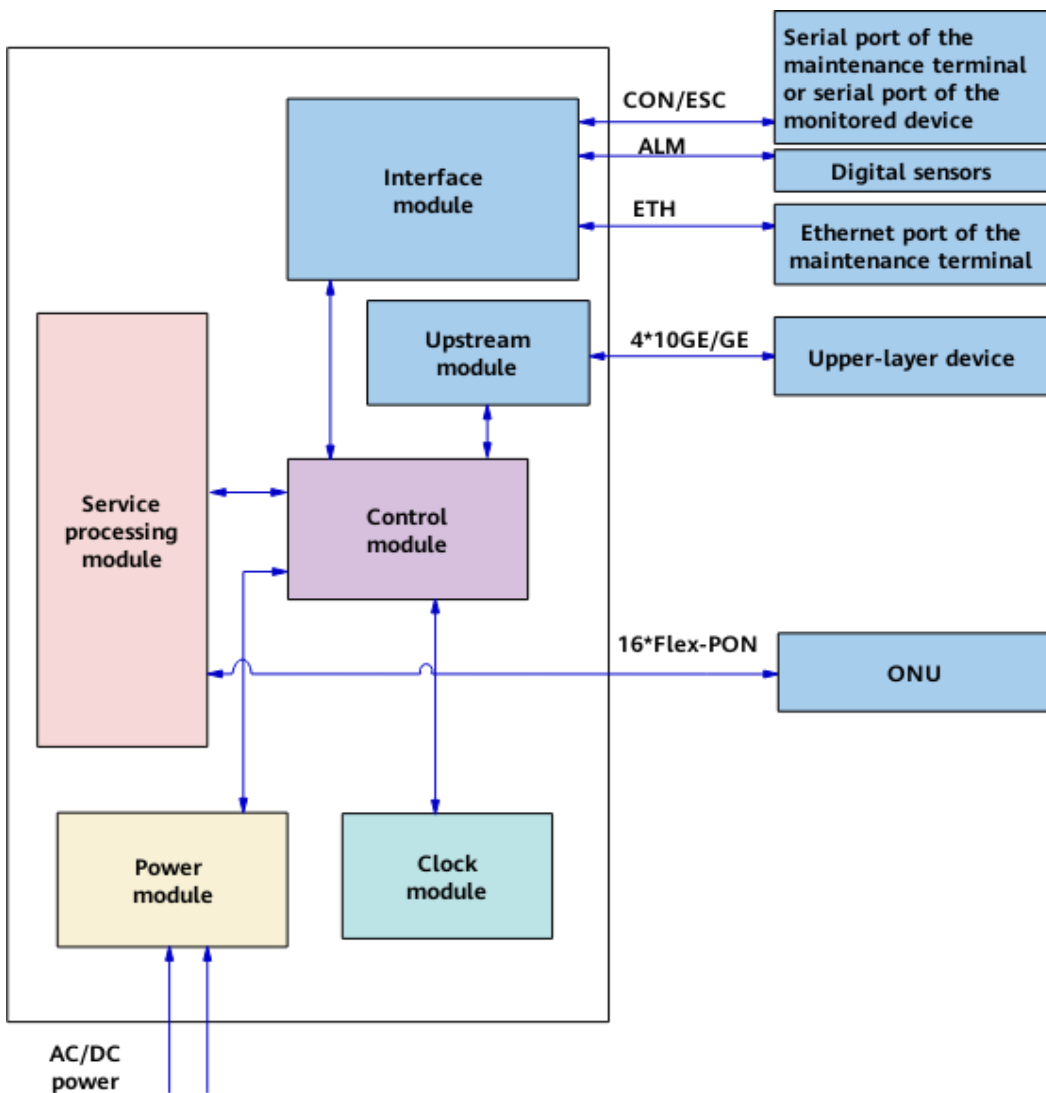
Dual power supplies, high reliability

Supports dual AC or DC power supplies, providing flexible power supply and high reliability.

Easy installation and flexible deployment

The matching small outdoor cabinet can be installed on a pole, tower, or wall, facilitating installation and reducing engineering costs.

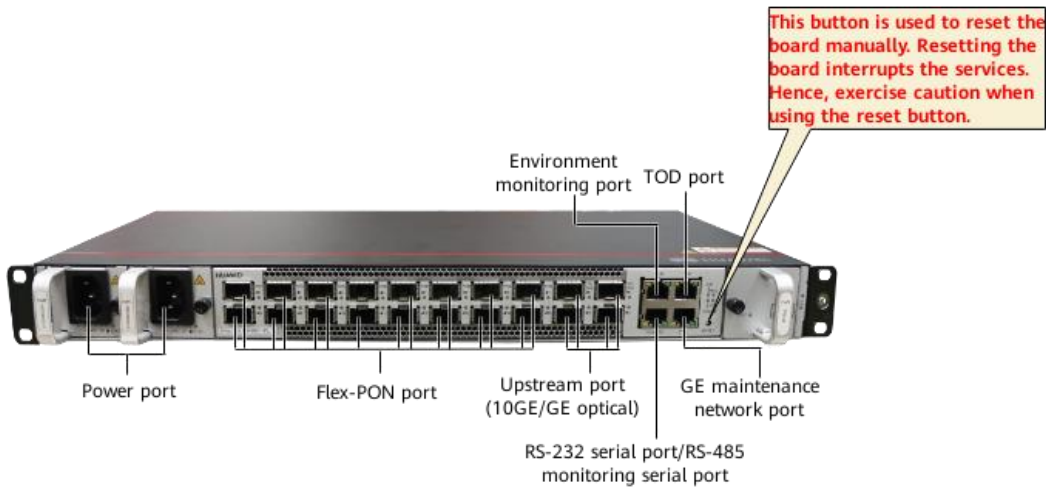
Working Principle



- **Control module:** It is the core of the system control and service switching and aggregation. It can also function as the management and control core of the integrated network management system (NMS).
- **Upstream module:** It can provide four 10GE/GE upstream ports.
- **Service processing module:** It works together with the optical network unit (ONU) to provide Flex-PON access services.
- **Interface module:** It supports functions such as input and output of alarm digital parameters.
- **Power module:** It supplies power to each functional module of the board.

- **Clock module:** It provides clock signals for each functional module of the board.

External Ports



NOTE

The product provides 2 slots for power boards so that 1 or 2 power modules can be configured as required. If only one power module is configured, a filler panel must be installed in the other slot. AC and DC are incompatible.

Port Name	Silk Screen	Number of Ports	Function
DC power port	–	2	Connects to –48/–60 V DC power.
AC power port	–	2	Connects to 110/220 V AC power.
Reset button	RESET	1	This button is used to reset the board manually. Resetting the board interrupts the services. Hence, exercise caution when using the reset button.
Flex-PON port	PON: 0–15	16	Provides 16 Flex-PON ports for Flex-PON service access.
Upstream port (10GE/GE optical)	10GE/GE: 0–3	4	Provides 4 10GE/GE ports for upstream transmission.
GE maintenance network port	ETH	1	10/100/1000M BASE-T maintenance port. Connected to the Ethernet port of the maintenance terminal.
RS-232 serial port/RS-485 monitoring serial port	CON/ESC	1	Connected to the serial port of the maintenance terminal/Connected to the serial port of the monitored device.
TOD port	TOD	1	Reserved.
Environment monitoring port	ALM	1	Connected to digital sensors.

Indicators

Indicator on The Panel Indicators

Indicator	Name	Color	Status	Description
RUN/ALM	Running status indicator	Green	Blinking slowly (on for 1s and off for 1s repeatedly)	The board functions properly.
		Green	Blinking quickly (on for	Indicates that program loading is in

Indicator	Name	Color	Status	Description
			0.25s and off for 0.25s repeatedly)	progress.
		Orange	Blinking	A high-temperature alarm is generated.
		Red	On	The board is faulty.
		Red	Blinking (on for 0.25s and off for 0.25s repeatedly)	The board is starting.
CRI	Alarm indicators	Red	On	The system has generated a critical alarm.
MAJ	Alarm indicators	Orange	On	The system has generated a major alarm.
MIN	Alarm indicators	Yellow	On	The system has generated a minor alarm.
PON 0–15	Link/data status indicator	Green	On	The ONT connected to the related PON port is online.
		Green	Blinking	The optical module does not take effect.
		-	Off	The ONT connected to the related PON port is not offline.

Indicator on The Upstream Port

Ports	Name	Color	Status	Description
Upstream optical port	Link/data status indicator	Green	On	A connection is set up on the port.
		Green	Blinking	Data is being transmitted.
		-	Off	No connection is set up on the port.

Indicator on DC Power

Indicator	Name	Color	Status	Description
STAT	Power indicator	Green	On	The input/output is normal.
		Green	Blinking	The power supply is in hiccup protection mode.
		-	Off	The power input is abnormal (no input, input overvoltage or undervoltage), and the power output is abnormal (undervoltage, overvoltage, or short circuit).

Indicator on AC Power

Indicator	Name	Color	Status	Description
STAT	Power indicator	Green	On	The input/output is normal.
		Green	Blinking	The power supply is in hiccup protection mode.
		-	Off	The power input is abnormal (no input, input overvoltage or undervoltage), and the power output is abnormal (undervoltage, overvoltage, or short circuit).

Indicator on Fan

Indicator	Color	Status	Meaning	Operation Description
STATUS	Yellow	Blinking (on for 0.25s and off for 0.25s repeatedly)	The fan module is not registered.	If the fan module is not registered, no action is required.
	Green	Blinking (on for 1s and off for 1s repeatedly)	The fan module works in the normal state.	No action is required.
	Red	Blinking (on for 0.25s and off for 0.25s repeatedly)	The fan module is faulty.	Replace the faulty fan module.

Primary Features

Layer 2 features

VLAN+MAC forwarding	SVLAN+CVLAN forwarding
PPPoE+	DHCP option82

Layer 3 features

Static route	RIP/RIPng
OSPF/OSPFv3	IS-IS
BGP/BGP4+	ARP
DHCP relay	VRF

Multicast

IGMP v2/v3	IGMP Proxy/Snooping
MLD v1/v2	MLD Proxy/Snooping
VLAN-based IPTV multicast	IPv4 PIM and PIM-SSM

QoS

Traffic classification	Priority processing
trTCM-based traffic policing	WRED
Traffic shaping	HQoS
PQ/WRR/PQ+WRR	ACL

IPv6

IPv4/IPv6 dual stack	IPv6 L2 and L3 forwarding
DHCPv6 relay	

System reliability

xPON Type B/Type C protection	ERPS (G.8032)
2 power boards for redundancy protection	In-service board fault detection and rectification

Aggregation

Aggregation management	
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Product Specifications

Item	Value
Dimensions (W x D x H) (mm)	Excluding mounting ears: 442 x 220 x 43.6 Including IEC mounting ears: 482.6 x 220 x 43.6 Including ETSI mounting ears: 531 x 220 x 43.6
Maximum fully-loaded weight	5 kg
Power supply mode	<ul style="list-style-type: none"> DC power supply (dual backup) AC power supply (dual backup)
Working voltage range	<ul style="list-style-type: none"> DC power supply: –38.4 V to –72 V AC power supply: 100–240 V
Rated voltage	<ul style="list-style-type: none"> DC power supply: –48 V/–60 V AC power supply: 110 V/220 V
Maximum input current	<ul style="list-style-type: none"> DC power supply: 6 A AC power supply: 2.5 A
Ambient temperature	–40°C to +65°C The device can start up at a lowest temperature of –25°C. NOTE The +65°C temperature refers to the highest temperature measured at the air intake vent of a service subrack.
Ambient humidity	5%–95% RH
Atmospheric pressure	70–106 kPa
Altitude	< 4000 m. The air density varies with the altitude and will affect the heat dissipation of a device. Therefore, the working environment temperature of the device varies with the altitude.
System switching capacity	240 Gbit/s
MAC addresses	32768
Access ONT	2048
IPv4 routing table	8192
IPv6 routing table	4096
ARP table	16384
Bit error rate (BER) in full load	When FEC is enabled, the GPON BER is less than 10 e-10, and the XG(S)-PON BER is less than 10 e-12.
Upstream ports	4 GE/10GE
Service ports	16 Flex-PON
System reliability specifications	System availability for the typical configuration: > 99.999% Mean time between failures (MTBF): about 45 years NOTE Due to different network environments and different boards used by devices, the preceding MTBF (45 years) of the MA5801 is only for reference. The preceding values are only for reference. For details, contact the related Huawei engineers.

Item	Value
Power consumption	<p>DC power supply:</p> <ul style="list-style-type: none"> • Static power consumption: 72W • Typical power consumption: 127W • Maximum power consumption: 228W <p>AC power supply:</p> <ul style="list-style-type: none"> • Static power consumption: 73W • Typical power consumption: 128W • Maximum power consumption: 229W <p>NOTE</p> <p>The power consumption of a product is tested in the following conditions:</p> <ul style="list-style-type: none"> • Static power consumption: 25°C, no optical module in optical ports, and no service. • Typical power consumption: 25°C, 4 x 10GE(10kM) upstream ports, 16 x Flex-PON(XGS Combo C+) ports on the user side, full services, and maximum traffic. • Maximum power consumption: 65°C, 4 x 10GE(10kM) upstream ports, 16 x Flex-PON(XGS Combo C+) ports on the user side, full services, and maximum traffic.

Supported Optical Modules

One-channel Two-fiber Bidirectional GE Optical Module

Type	One-channel two-fiber bidirectional optical module	
No.	1	2
Reach	10 km	40 km
Operating Wavelength	1310 nm	1310 nm
Encapsulation Type	eSFP	eSFP
Port Rate	1.25 Gbit/s	1.25 Gbit/s
Minimum Output Optical Power	-9 dBm	-5 dBm
Maximum Output Optical Power	-3 dBm	0 dBm
Maximum Receiver Sensitivity	-20 dBm	-23 dBm
Optical Connector Type	LC	LC
Optical Fiber Type	Single-mode	Single-mode
Overload Optical Power	-3 dBm	-3 dBm
Extinction Ratio	9 dB	9 dB

One-channel One-fiber Bidirectional GE Optical Module

Type	One-channel one-fiber bidirectional optical module			
No.	1	2	3	4

Reach	10 km	10 km	40 km	40 km
Operating Wavelength	Tx: 1310 nm Rx: 1490 nm	Tx: 1490 nm Rx: 1310 nm	Tx: 1310 nm Rx: 1490 nm	Tx: 1490 nm Rx: 1310 nm
Encapsulation Type	eSFP	eSFP	eSFP	eSFP
Port Rate	1.25 Gbit/s	1.25 Gbit/s	1.25 Gbit/s	1.25 Gbit/s
Minimum Output Optical Power	-9 dBm	-9 dBm	-2 dBm	-2 dBm
Maximum Output Optical Power	-3 dBm	-3 dBm	3 dBm	3 dBm
Maximum Receiver Sensitivity	-19.5 dBm	-19.5 dBm	-23 dBm	-23 dBm
Optical Connector Type	LC	LC	LC	LC
Optical Fiber Type	Single-mode	Single-mode	Single-mode	Single-mode
Overload Optical Power	-3 dBm	-3 dBm	-3 dBm	-3 dBm
Extinction Ratio	6 dB	6 dB	9 dB	9 dB

One-channel Two-fiber Bidirectional 10GE Optical Module

Type	One-channel two-fiber bidirectional optical module		
No.	1	2	3
Reach	0.3 km	10 km	40 km
Operating Wavelength	850 nm	1310 nm	1550 nm
Encapsulation Type	SFP+	SFP+	SFP+
Port Rate	10 Gbit/s	10 Gbit/s	9.95-11.1 Gbit/s
Minimum Output Optical Power	-7.3 dBm	-8.2 dBm	-4.7 dBm
Maximum Output Optical Power	-1 dBm	0.5 dBm	4 dBm
Maximum Receiver Sensitivity	-9.9 dBm	-12.6 dBm	-14.1 dBm
Optical Connector Type	LC	LC	LC
Optical Fiber Type	Multi-mode	Single-mode	Single-mode
Overload Optical Power	-1 dBm	0.5 dBm	0.5 dBm
Extinction Ratio	3 dB	3.5 dB	3 dB

One-channel One-fiber Bidirectional 10GE Optical Module

Type	One-channel one-fiber bidirectional optical module			
No.	1	2	3	4
Reach	10km	10km	40km	40km
Operating	Tx:1270nm	Tx:1330nm	Tx:1330nm	Tx:1270nm

Wavelength	Rx:1330nm	Rx:1270nm	Rx:1270nm	Rx:1330nm
Encapsulation Type	SFP+	SFP+	SFP+	SFP+
Port Rate	2.5Gbit/s–11.3Gbit/s	2.5Gbit/s–11.3Gbit/s	9.95Gbit/s–10.3Gbit/s	9.95Gbit/s–10.3Gbit/s
Minimum Output Optical Power	-8.2dBm	-8.2dBm	0dBm	0dBm
Maximum Output Optical Power	0.5dBm	0.5dBm	5dBm	5dBm
Maximum Receiver Sensitivity	-14.4dBm	-14.4dBm	-18dBm	-18dBm
Optical Connector Type	LC	LC	LC	LC
Optical Fiber Type	Single-mode	Single-mode	Single-mode	Single-mode
Overload Optical Power	0.5dBm	0.5dBm	-9dBm	-9dBm
Extinction Ratio	3.5dB	3.5dB	3.5dB	3.5dB

GPON Optical Module

Type	One-fiber bidirectional optical module, class B+	One-fiber bidirectional optical module, class C+	One-fiber bidirectional optical module, class C++
No.	1	2	3
Operating Wavelength	Tx: 1490 nm Rx: 1310 nm	Tx: 1490 nm Rx: 1310 nm	Tx: 1490 nm Rx: 1310 nm
Encapsulation Type	SFP	SFP	SFP
Port Rate	Tx: 2.488 Gbit/s Rx: 1.244 Gbit/s	Tx: 2.488 Gbit/s Rx: 1.244 Gbit/s	Tx: 2.488 Gbit/s Rx: 1.244 Gbit/s
Minimum Output Optical Power	1.5 dBm	3 dBm	6 dBm
Maximum Output Optical Power	5 dBm	7 dBm	10 dBm
Maximum Receiver Sensitivity	-28 dBm	-32 dBm	-35 dBm
Optical Connector Type	SC	SC	SC
Optical Fiber Type	Single-mode	Single-mode	Single-mode
Overload Optical Power	-8 dBm	-12 dBm	-15 dBm
Extinction Ratio	8.2 dB	8.2 dB	8.2 dB

Combo PON Optical Module (XG-PON&GPON)

Type	One-fiber bidirectional optical module, class C+	One-fiber bidirectional optical module, class D
No.	1	2
Operating Wavelength	<ul style="list-style-type: none"> GPON channel: <ul style="list-style-type: none"> Tx: 1490 nm Rx: 1310 nm XG-PON channel: <ul style="list-style-type: none"> Tx: 1577 nm Rx: 1270 nm 	<ul style="list-style-type: none"> GPON channel: <ul style="list-style-type: none"> Tx: 1490 nm Rx: 1310 nm XG-PON channel: <ul style="list-style-type: none"> Tx: 1577 nm Rx: 1270 nm
Encapsulation Type	SFP+	SFP+
Port Rate	<ul style="list-style-type: none"> GPON channel: <ul style="list-style-type: none"> Tx: 2.488 Gbit/s Rx: 1.244 Gbit/s XG-PON channel: <ul style="list-style-type: none"> Tx: 9.953 Gbit/s Rx: 2.488 Gbit/s 	<ul style="list-style-type: none"> GPON channel: <ul style="list-style-type: none"> Tx: 2.488 Gbit/s Rx: 1.244 Gbit/s XG-PON channel: <ul style="list-style-type: none"> Tx: 9.953 Gbit/s Rx: 2.488 Gbit/s
Minimum Output Optical Power	<ul style="list-style-type: none"> GPON channel: 4.5 dBm XG-PON channel: 5 dBm 	<ul style="list-style-type: none"> GPON channel: 6 dBm XG-PON channel: 8 dBm
Maximum Output Optical Power	<ul style="list-style-type: none"> GPON channel: 8.5 dBm XG-PON channel: 9 dBm 	<ul style="list-style-type: none"> GPON channel: 10 dBm XG-PON channel: 11 dBm
Maximum Receiver Sensitivity	<ul style="list-style-type: none"> GPON channel: -32 dBm XG-PON channel: -30.5 dBm 	<ul style="list-style-type: none"> GPON channel: -35 dBm XG-PON channel: -33.5 dBm
Optical Connector Type	SC	SC
Optical Fiber Type	Single-mode	Single-mode
Overload Optical Power	<ul style="list-style-type: none"> GPON channel: -12 dBm XG-PON channel: -10 dBm 	<ul style="list-style-type: none"> GPON channel: -15 dBm XG-PON channel: -13 dBm
Extinction Ratio	8.2 dB	8.2 dB

XGS-PON Optical Module (SFP+)

Type	One-fiber bidirectional optical module, N1	One-fiber bidirectional optical module, N2
No.	1	2
Operating Wavelength	Tx: 1577 nm Rx: 1270 nm	Tx: 1577 nm Rx: 1270 nm
Encapsulation Type	SFP+	SFP+
Port Rate	Tx: 9.953 Gbit/s Rx: 9.953/2.488 Gbit/s	Tx: 9.953 Gbit/s Rx: 9.953/2.488 Gbit/s
Minimum Output Optical Power	2 dBm	4 dBm
Maximum Output Optical Power	5 dBm	7 dBm

Maximum Receiver Sensitivity	<ul style="list-style-type: none"> • XG-PON channel: -27.5 dBm • XGS-PON channel: -26 dBm 	<ul style="list-style-type: none"> • XG-PON channel: -29.5 dBm • XGS-PON channel: -28 dBm
Optical Connector Type	SC	SC
Optical Fiber Type	Single-mode	Single-mode
Overload Optical Power	<ul style="list-style-type: none"> • XG-PON channel: -7 dBm • XGS-PON channel: -5 dBm 	<ul style="list-style-type: none"> • XG-PON channel: -9 dBm • XGS-PON channel: -7 dBm
Extinction Ratio	8.2 dB	8.2 dB

Combo PON Optical Module (XGS-PON&GPON)

Type	One-fiber bidirectional optical module, class B+	One-fiber bidirectional optical module, class C+	One-fiber bidirectional optical module, class D
No.	1	2	3
Operating Wavelength	<ul style="list-style-type: none"> • GPON channel: <ul style="list-style-type: none"> - Tx: 1490 nm - Rx: 1310 nm • XG-PON channel: <ul style="list-style-type: none"> - Tx: 1577 nm - Rx: 1270 nm • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 1577 nm - Rx: 1270 nm 	<ul style="list-style-type: none"> • GPON channel: <ul style="list-style-type: none"> - Tx: 1490 nm - Rx: 1310 nm • XG-PON channel: <ul style="list-style-type: none"> - Tx: 1577 nm - Rx: 1270 nm • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 1577 nm - Rx: 1270 nm 	<ul style="list-style-type: none"> • GPON channel: <ul style="list-style-type: none"> - Tx: 1490 nm - Rx: 1310 nm • XG-PON channel: <ul style="list-style-type: none"> - Tx: 1577 nm - Rx: 1270 nm • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 1577 nm - Rx: 1270 nm
Encapsulation Type	SFP+	SFP+	SFP+
Port Rate	<ul style="list-style-type: none"> • GPON channel: <ul style="list-style-type: none"> - Tx: 2.488 Gbit/s - Rx: 1.244 Gbit/s • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 9.953 Gbit/s - Rx: 2.488 Gbit/s • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 9.953 Gbit/s - Rx: 9.953 Gbit/s 	<ul style="list-style-type: none"> • GPON channel: <ul style="list-style-type: none"> - Tx: 2.488 Gbit/s - Rx: 1.244 Gbit/s • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 9.953 Gbit/s - Rx: 2.488 Gbit/s • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 9.953 Gbit/s - Rx: 9.953 Gbit/s 	<ul style="list-style-type: none"> • GPON channel: <ul style="list-style-type: none"> - Tx: 2.488 Gbit/s - Rx: 1.244 Gbit/s • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 9.953 Gbit/s - Rx: 2.488 Gbit/s • XGS-PON channel: <ul style="list-style-type: none"> - Tx: 9.953 Gbit/s - Rx: 9.953 Gbit/s
Minimum Output Optical Power	<ul style="list-style-type: none"> • GPON channel: 1.5 dBm • XG-PON channel: 1 dBm • XGS-PON channel: 1 dBm 	<ul style="list-style-type: none"> • GPON channel: 3 dBm • XG-PON channel: 5 dBm • XGS-PON channel: 5 dBm 	<ul style="list-style-type: none"> • GPON channel: 6 dBm • XG-PON channel: 8 dBm • XGS-PON channel: 8 dBm
Maximum Output Optical Power	<ul style="list-style-type: none"> • GPON channel: 5 dBm • XG(S)-PON channel: 4 dBm 	<ul style="list-style-type: none"> • GPON channel: 7 dBm • XG(S)-PON channel: 8 dBm 	<ul style="list-style-type: none"> • GPON channel: 10 dBm • XG(S)-PON channel: 11 dBm
Maximum Receiver Sensitivity	<ul style="list-style-type: none"> • GPON channel: -28 dBm • XG-PON channel: -26.5 dBm • XGS-PON channel: -25 dBm 	<ul style="list-style-type: none"> • GPON channel: -32 dBm • XG-PON channel: -30.5 dBm • XGS-PON channel: -29 dBm 	<ul style="list-style-type: none"> • GPON channel: -35 dBm • XG-PON channel: -33.5 dBm • XGS-PON channel: -32 dBm

Optical Connector Type	SC	SC	SC
Optical Fiber Type	Single-mode	Single-mode	Single-mode
Overload Optical Power	<ul style="list-style-type: none"> • GPON channel: -8 dBm • XG-PON channel: -6 dBm • XGS-PON channel: -4 dBm 	<ul style="list-style-type: none"> • GPON channel: -12 dBm • XG-PON channel: -10 dBm • XGS-PON channel: -8 dBm 	<ul style="list-style-type: none"> • GPON channel: -15 dBm • XG-PON channel: -13 dBm • XGS-PON channel: -11 dBm
Extinction Ratio	8.2 dB	8.2 dB	8.2 dB

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