SmartAX MA5898

Multi-service Access Module

V800R017C10

Product Overview

The SmartAX MA5898 multi-service access module (MA5898 for short) is an optical network unit (ONU) developed by Huawei.

The MA5898 is a 1 U-high box-shaped device in which some service boards are mountable. It mainly applies in enterprise private line access.

Product Highlights

10G GPON Upstream Transmission

- 10G PON ports allow higher access bandwidth and meet high-bandwidth service requirements.
- 10G GPON networks can coexist with the current PON networks to fully use the existing optical distribution network (ODN) resources.
- The 10G GPON transmission complies with ITU-T Recommendation G.987 and ITU-T Recommendation G.988.

High-precision Clock and Time Synchronization

- Supports GPON/10G PON clock and tine synchronization.
- Supports clock and time output.

Superior Maintainability and Manageability

- One-stop deployment and PnP: Supports offline deployment and PnP when PON is used for upstream transmission; supports configuration obtainment from the NMS, automatic configuration validity, and automatic connection and report to the NMS.
- Supports remote batch upgrades.
- Precise fault locating and remote troubleshooting.
- Network performance monitoring: network optimization and user monitoring.

Carrier-Class Reliability Design

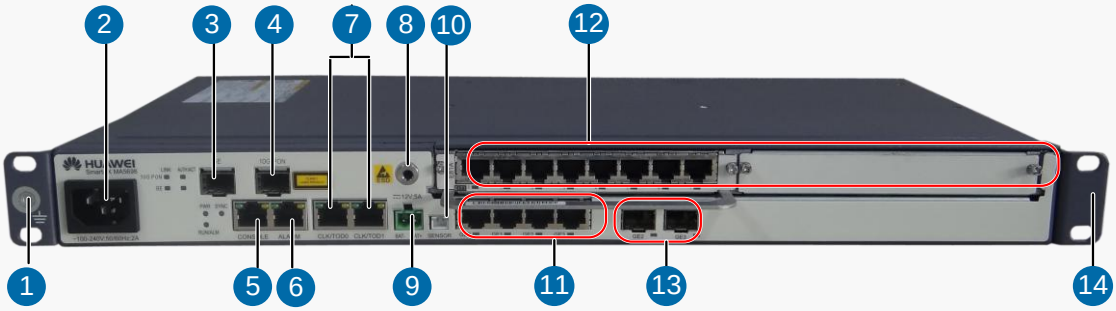
- The hardware has passed the electrostatic discharge (ESD) test.

- Surge protection capability
  - Powered port: 6 kV in both common and differential modes.
  - User LAN port: 4 kV in common mode.
- Supports power supply using batteries when the AC power supply is cut off in AC+battery power backup mode.

Product Hardware

Based on the power port, the MA5898 devices are classified into 2 types: AC-powered MA5898 and DC-powered MA5898.

Type 1: AC-powered MA5898



1. Grounding point
2. AC power port
3. GE cascading port
4. Upstream optical port
5. Commissioning serial port/environment monitoring port
6. Environment monitoring parameter port
7. Clock or time output ports
8. ESD jack
9. Battery port
10. Temperature sensor port for batteries
11. GE electrical ports
12. Service board slot
13. GE optical port
14. Mounting ears

Type 2: DC-powered MA5898

The following figure shows the layout of the MA5898 subrack.

0 Control board		1 FE/E1/Filler panel	2 FE/E1/Filler panel
		3 4GE(electric)+2GE(optical)	

Port Description

Port Name	Silk Screen	Number of Ports	Function
AC or dual-DC power port	-	1	Introduces 220 V AC or dual –48 V DC power.
Upstream optical port	10G PON	1	Supports 10G GPON and GPON upstream transmission.
GE cascading port	GE	1	Supports device cascading using a GE optical port.
Serial port or environment monitoring port	CONSOLE	1	• Supports local and remote maintenance. Through this port, users can configure the MA5898 using tools, such as HyperTerminal, in CLI mode. • Can connect to an environment monitoring unit (EMU), which reports monitored environment parameters to the control board. The port can also be used for communication between the MA5898 and Fe-lithium batteries.
Environment monitoring parameter port	ALARM	1	Supports the connection to four digital sensors for monitoring door status, surge protection, main distribution frame (MDF), and smoke status. In addition, this port supports user-defined monitoring parameters.
Clock or time output port	CLK/TOD0 and CLK/TOD1	2	Inputs and outputs clock or time signals. CLK/TOD0 supports 2.048 MHz clock input/output and 1 PPS+TOD time input/output. CLK/TOD1 supports 2.048 MHz clock input/output and 1 PPS+TOD time output.
GE electrical port	GE0, GE1, GE2, and GE3	4	Provides the access service for users. The GE2 and GE3 electrical ports can be used as alternatives to GE optical ports GE2 and GE3. Specifically, the MA5898 provides either electrical ports GE2 and GE3, or optical ports GE2 and GE3, at a time.
GE optical port	GE2 and GE3	2	Provides the access service for users. The GE2 and GE3 optical ports can be used as alternatives to GE electrical ports GE2 and GE3.
Battery port	AC-powered: BAT- and BAT+ DC-powered: AUX	1	• AC-powered: connects to power cables of batteries. • DC-powered: reserved.
Battery temperature sensor port	AC-powered: SENSOR DC-powered: AUX	1	• Supports external temperature sensors in AC+lead-acid battery power backup mode. • Activates Fe-lithium batteries in AC+Fe-lithium battery power backup mode. • This port is unavailable in DC power supply mode.
Service board	-	-	Supports 2 slots for service boards EIUC and E81A. • EIUC: provides 8 FE ports. • E81A: provides 8 E1 ports.

Product Specifications

Technical Specifications

Dimensions			
Weight	**Width**	**Depth**	**High**
Empty ≤ 3.7 kg	442 mm (without mounting ears) 482.6 mm (with mounting ears for the 19-inch subrack)	245mm	43.6mm

Environment Specifications			
perating Environment Temperature	**Operating Environment Humidity**	**Atmospheric Pressure**	**Altitude**
-40℃ ~ +65℃*	5%RH ~ 95%RH	70kPa ~ 106kPa	< 4000 m**

*The MA5898 is able to start up at a lowest temperature of –25ºC and run at a lowest temperature of –40ºC.
**The air density varies with the altitude, which affects the heat dissipation capability of the MA5898. Therefore, the operating temperature of the MA5898 changes with the altitude.

Power Consumption			
Typical Configurations	**Static Power Consumption**	**Typical Power Consumption**	**Maximum Power Consumption**
MA5898 (4 GE+16 FE, AC-powered) equipped with two FE boards	22W	23W	27W
MA5898 (4 GE+16 E1, DC-powered) equipped with two E1 boards	28W	28W	31W

In static power consumption, no broadband port is activated. In typical power consumption, a half of broadband ports are activated. In maximum power consumption, all broadband ports are activated.

Power Specifications		
Power Supply Mode	**Operating Voltage Range**	**Maximum Input Current**
AC power supply (220 V AC)+power backup (–12 V DC)	90 V AC to 264 V AC	2 A
DC power supply (–48 V DC, dual-DC)	–38.4 V DC to –72 V DC	2 A

Performance and Capacity	
System switching capacity: 6 Gbit/s	System packet forwarding rate: 8.688 Mpps

PON Port Indicators

ParameterParameter	GPON	10G GPON
Port working mode	Single-mode	N/A
Connector type	SC/UPC（PC）	SC/UPC（PC）
Maximum transmission reach	20km	60km
Extinction ratio	10dB	8.2dB
Rx sensitivity	-27dBm	-28dBm
Overload optical power	-8dBm	-8dBm
Center wavelength	Rx：1490nm Tx：1310nm	Rx：1577nm Tx：1270nm
Tx optical power	0.5dBm～5.0dBm	2dBm～7dBm

GE Optical Port Indicators

Parameter	GE Single-mode Optical Port				10GE Single-mode Optical Port
Optical module type	Single-fiber bidirectional transmission	Single-fiber bidirectional transmission	Dual-fiber bidirectional transmission	Dual-fiber bidirectional transmission	Dual-fiber bidirectional transmission
Connector type	LC	LC	LC	LC	LC
Transmission reach	10km	10km	10km	40km	0.5km
Center wavelength	Rx：1490nm Tx：1310nm	Rx：1310nm Tx：1490nm	1310nm	1310nm	850nm
Tx optical power	-9dBm～-3dBm	-9dBm～-3dBm	-11.5dBm～-3dBm	-5dBm～0dBm	-9.5dBm~0dBm
Extinction ratio	6dB	6dB	9dB	9dB	9dB
Maximum Rx sensitivity	-19.5dBm	-19.5dBm	-19dBm	-23dBm	-17dBm

Cable Indicators

Item	AC Power Cable	DC Power Cable	PGND Cable	Local Maintenance Serial Port Cable	Network Cable/Clock/Time Interface Cable	Local Maintenance and Environment Monitoring Integrated Cable
Connector type	PI straight male/C13 straight female	Cord end	OT/OT	DB-9 female + 8-pin RJ45/DB-25 female	RJ45 connector	MP8-VI+MP8-VI+DB9 female
Cable type	External power cable	Electronic and electrical cable	Electronic and electrical cable	Symmetrical twisted-pair cable	Cat 5 unshielded twisted pair (UTP-5)	Symmetrical twisted pair-100 ohms-4 pairs or symmetrical twisted pair-100 ohms-2 pairs
Characteristic impedance	N/A	N/A	N/A	N/A	100.Ω	N/A
Core diameter	N/A	N/A	N/A	N/A	0.51mm	0.48mm
Wire gauge	1.0 mm^2	18 AWG (cross-sectional area ≈ 0.82 mm2)	10 AWG (cross-sectional area ≈ 5.2 mm2)	28 AWG (cross-sectional area ≈ 0.08 mm2)	N/A	26 AWG
Direct current resistance of the inner conductor	N/A	21.8Ω/km	N/A	N/A	93.8Ω/km	N/A
Frequency range	N/A	N/A	N/A	N/A	0 ~ 100MHz	N/A
Frequency attenuation	N/A	N/A	N/A	N/A	22dB/100m @100MHz	N/A

Primary Function List

Layer 2 Management

- MAC address management
- VLAN attribute management
- Flow bundle
- VLAN+MAC forwarding
- S-VLAN+C-VLAN forwarding
- Layer 2 isolation
- Layer 2 interoperation
- 1:1 VMAC
- Transparent transmission of protocol packets

QoS

- Traffic classification policy
- Priority-based processing
- Traffic policing
- Congestion management
- ACL rules

TDM E1 service bearing

- Native TDM
- TDM PWE3, including SAToP and CESoP

Emulation Service

- PPPoE dialup emulation
- DHCP dialup emulation
- Multicast service emulation

Layer 3 Features

- DHCP client
- ARP
- DNS client
- Static route

Multicast Features

- IGMP v2/v3 proxy
- IGMP snooping
- Multicast log
- Multicast CAC

IPv6

- IPv6 traffic classification
- IPv6 ACL
- DHCPv6 L2
- Basic IPv6 protocol stack
- Basic IPv6 routing
- IPv6 ND
- IPv6 security
- IPv6 MLD

User Security

- PITP
- DHCP option 82
- 802.1x authentication
- RAIO
- MAC address anti-duplication
- MAC address anti-spoofing
- IP address anti-spoofing
- Ring check

System Security

- MAC address filtering
- DoS anti-attack
- ICMP/IP packet anti-attack
- Source route filtering
- Firewall
- Blacklist
- Permitted/Denied IP address segment
- Service overload control

OAM

- Ethernet OAM CFM
- Ethernet OAM EFM

Environment monitoring

- Power4830 power monitoring
- MiniESC
- SMU
- One monitoring port for monitoring four Boolean parameters; flexible Boolean parameter configurations; default Boolean parameters: door status, surge protection, MDF, and smoke status