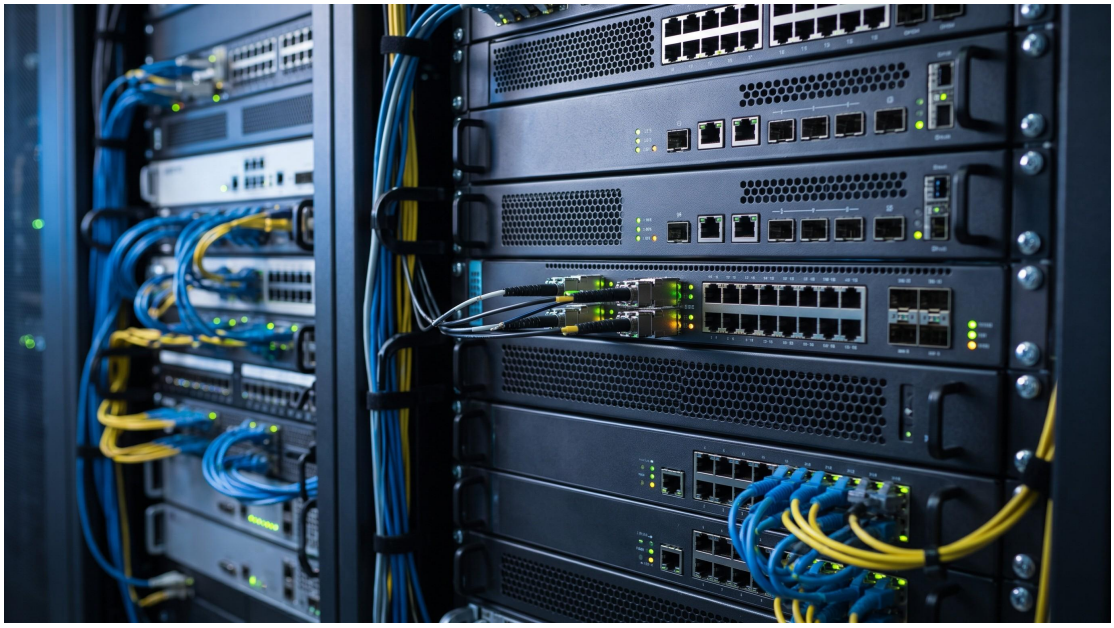
Huawei MA5671A SFP Optical Network Terminal - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

The Huawei MA5671A (Model H87MMA5671A2, Part Number 03031QHU) is a carrier-grade GPON SFP Optical Network Terminal designed to integrate directly into any standard SFP MSA compliant host port, eliminating the need for a standalone ONT enclosure and dedicated power supply . This whitepaper provides an authoritative technical reference for system architects, pre-sales engineers, and integration specialists, detailing the pinout configuration, operational register access methodology, and hardware-level performance envelope of the MA5671A platform.

Unlike conventional CPE-based ONTs, the MA5671A embeds the complete GPON MAC, bidirectional optical transceiver, and management agent within the compact SFP form factor. This architecture enables service providers and enterprises to deliver fiber-to-the-desk or fiber-to-the-appliance services by simply inserting the module into existing Ethernet switches, routers, or wireless backhaul equipment equipped with SFP receptacles. The device operates over a 20 km reach Class B+ optical budget, delivering asymmetric 2.488 Gbit/s downstream and 1.244 Gbit/s upstream throughput while maintaining full OMCI manageability per ITU-T G.988 .



HARDWARE ARCHITECTURE & SILICON

The MA5671A integrates a GPON System-on-Chip (SoC) that consolidates the GTC framing layer, GEM encapsulation engine, and embedded CPU subsystem responsible for OMCI processing and register-level hardware control. The optical front-end comprises a 1310 nm DFB laser transmitter with an APD-based receiver optimized for the 1480–1500 nm downstream window, achieving a receiver sensitivity of -27 dBm and an overload threshold of -8 dBm .

From a pinout and register-access perspective, the SFP 20-pin edge connector exposes the standard MSA-defined electrical interfaces including SGMII data lanes, I2C management bus (SDA/SCL), TX_DISABLE, TX_FAULT, and LOS. For

development and diagnostic purposes, the MA5671A provides a hidden UART access point mapped to SFP pins 2 and 7, corresponding to the TX_FAULT and RATE_SELECT positions on the connector, which can be utilized for serial console access to the embedded Linux environment when the module is operated outside standard host control . The module exposes its internal register space through the two-wire I2C interface compliant with SFF-8472, with A0h and A2h address spaces providing real-time optical telemetry, alarm thresholds, and calibration coefficients .

KEY FEATURES & ROUTING LOGIC

- **Integrated GPON MAC and Optics**: Single SFP module delivers full G.984.2 Class B+ ONT functionality without external power or host processing.
- **Standard MSA Footprint**: 20-pin SFP edge connector supports hot-swap insertion into any compliant SFP cage, with SGMII interface at 1 GE or 2.5 GE rates .
- **OMCI Management**: Complete ITU-T G.988 OMCI agent supports remote provisioning, alarm reporting, performance monitoring, and software image management from the OLT .
- **Digital Diagnostics (DDM)**: SFF-8472 compliant monitoring of TX power, RX power, temperature, Vcc, and bias current via I2C .
- **Industrial Thermal Envelope**: Operating case temperature range of -40°C

to +85 ° C supports deployment in unconditioned enclosures and outdoor cabinets .

- **Low Power Consumption**: Maximum 2 W power draw from the host SFP port, eliminating dedicated power provisioning .

COMPLIANCE & STANDARDS

The MA5671A is designed to meet the rigorous certification requirements of tier-1 carrier networks and enterprise infrastructure deployments. The module conforms to FSAN G.984.2 for GPON physical layer specifications, ITU-T G.988 for OMCI management, and SFF-8472 for digital diagnostic monitoring . Laser safety compliance is maintained under IEC 60825-1 Class 1, and electromagnetic emissions meet FCC Class B limits. The product is RoHS compliant and rated for ESD immunity at 500 V per the Human Body Model .

TECHNICAL SPECIFICATIONS

The following table summarizes the core hardware parameters of the MA5671A platform. All optical measurements are referenced to the SC/APC receptacle interface unless otherwise noted.

Parameter	**Specification**

Form Factor	SFP (eSFP), 20-pin MSA edge connector
Model / Part Number	H87MMA5671A2 / 03031QHU
GPON Class	Class B+ (FSAN G.984.2)
Transmission Rate	RX: 2.488 Gbit/s; TX: 1.244 Gbit/s
Connector Type	SC/APC (simplex, angled physical contact)
Fiber Type	Single-Mode Fiber (SMF)
TX Center Wavelength	1310 nm (range: 1290–1330 nm)
RX Wavelength Range	1480–1500 nm
TX Optical Power (AVG)	0.5 dBm to 5 dBm
RX Sensitivity (AVG)	-27 dBm
RX Overload (AVG)	-8 dBm
Extinction Ratio	≥ 10 dB
Target Reach	20 km
Management Interface	OMCI per ITU-T G.988; I2C per SFF-8472
DDM Options	SFF-8472 compliant
Operating Case Temperature	-40°C to +85°C
Maximum Power Consumption	2 W
Supply Voltage	+3.3 V DC (ripple/noise ≤ 100 mV)
Serial Console Access	SFP pins 2 (TX) and 7 (RX/GND

	reference)
Laser Safety	IEC 60825-1 Class 1
EMC / Safety	FCC Class B, RoHS
ESD (HBM1)	500 V
Bit Error Ratio	$< 1 \times 10^{-12}$

ORDERING SKU INFORMATION

| SKU Identifier | Description |

|---|---|

| 03031QHU | GPON ONU SFP, 1490nm RX / 1310nm TX, 20km, Industrial Temperature, SC/APC |

| H87MMA5671A2 | Model designation for the 03031QHU hardware variant |

