

# 5311XP



## 5311XP XGS-PON SFP+ ONT

XGS-PON ONT for Bridging Applications in a Standard SFP Enclosure

### Features & Benefits

- + Compliant with ITU-T G.9807.1 XGS-PON Standard
- + Supports Symmetrical 10Gbps Data Rates.
- + MSA-Compliant SFP+ Footprint with SC/APC receptacle.
- + Ideal for FTTH, Mobile Backhaul, and Business Deployments
- + IEEE 1588v2 and Y.1731 Support
- + Triple-Play QoS and Multicast Video

The DZS 5311XP is a complete XGS-PON ONT in an SFP (Small Form-factor Pluggable) package. Bridging applications are now easier to deploy with this MSA-compliant XGS-PON SFP inserted into a suitable host device. The 5311XP SFP ONT delivers a full range of advanced IP voice, data, and video services over an all-optical broadband access network.

The 5311XP SFP ONT is ideal for converting the network side of a device from a legacy Ethernet connection to a high-speed XGS-PON link. Ethernet switches, routers, set-top boxes, and DZS V1 Velocity Ethernet access products are just some of the devices that may host the 5311XP SFP ONT in their on-board SFP port. The customer side presents a full-duplex 10Gb link with wire-speed throughput. No external power supply is required for the 5311XP SFP ONT.

Dying-Gasp support alerts the network operator of loss of power to the host device, or removal of the 5311XP SFP ONT, helpful for problem identification in remote areas. The 5311XP SFP ONT is hot-pluggable and easy to install. Its small footprint makes it ideal for use where space or physical access to AC power is difficult. Compliant with standard OMCI definitions, the 5311XP ONT is manageable at remote sites and supports the full range FCAPS functions including supervision, monitoring, and maintenance. Provisioning may be accomplished using Dynamic OMCI or DZS Xtreme Access Management System.

## Service Scenario

The XGS-PON network consists of an Optical Line Termination (OLT) located at the Central Office, and a set of residential Single-Family Unit (SFU) and Multi Dwelling Unit (MDU) locations with Optical Network Terminals (ONTs). Between them is the optical distribution network (ODN) comprised of fibers, passive optical splitters, and couplers.

The 5311XP ONT supports 10 Gigabit symmetrical data using the XGS-PON standard. Services include High-Speed Internet (HIS), Packet Voice, IPTV, OTT video, and cloud-enabled services to multi-media devices.

## Key Service Attributes

- + FSAN ITU-T G.9807.1 XGS-PON compliant
- + 10Gbps symmetrical services
- + MTU jumbo frame 9216-byte support
- + IPTV multicast, IGMPv2 and IGMPv3 services
- + Any-port, Any-service data model
- + Traffic management including Q-in-Q tagging, 802.1Q VLANs, multiple subscriber VLANs, per-port rate limiting
- + 802.1p priority bits, DiffServ and priority queues based on services types.
- + IEEE 1588v2 and Y.1731 Support
- + Dying-gasp notification

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## Product Specifications

### Dimensions

- + MSA-compliant SFP+ enclosure
- + 72mm L x 14mm W x 12mm H
- + Length beyond SFP cage: 24mm

### Weight

- + 31g (with dust cover)
- + 48g (packaged in giftbox)

### Power

- + Input: 3.3VDC +/- 5%, 900mA max.
- + Power Consumption (25C): 2.5W typ.

### Interfaces

- + WAN: XGS-PON SC/APC receptacle
- + System: 10G SFI, 1000BaseX, 2500BaseX

### XGS-PON

- + Compliant with ITU-T G.9807.1 XGS-PON Standard
- + Bi-directional 9.953Gbps
- + Transmitter: Burst-mode, 1270nm, +4.0 to +9 dBm launch power
- + Receiver: Continuous-mode, 1577nm, -28 dBm sensitivity
- + Forward Error Correction (FEC) per G.989.3
- + Dying Gasp

### Quality of Service

- + HW-based internal IEEE 802.1p (CoS)
- + Strict Priority (SP)
- + 802.1Q (VLAN tag) QoS mapping ToS/CoS
- + 8 queues per port
- + Classified traffic can be tagged with VLAN ID and Ethernet Priority bit, and can be assigned to priority queues
- + Classify packets into different IEEE 802.1p priority queues according to DSCP values (RFC 2475)
- + The range of traffic shaping or rate-limit shall between 64 Kbps to the maximum port rate with 64kbps granularity. The accuracy error shall be less than ±10%.
- + DSCP IP CoS (RFC 2475)

### Software Features

- + IEEE802.1D and IEEE802.1Q
- + Address learning with auto aging-L2/BPDU Filter
- + Support 4096 MAC learning addresses
- + Multiple T-CONTs/GEM ports per device
- + Flexible mapping between GEM port and T-CONT
- + Priority queues and scheduling on upstream
- + Activation with automatic discovered serial Number and password
- + Multicast: IGMP v2, v3, IGMP snooping

### PtP and SLA

- + IEEE 1588v2
- + ITU-T Y.1731

### Environmental

- + Operating case and storage temperature: -40~185°F (-40~85°C)
- + Operating humidity 10 to 95% (non-condensing)
- + Altitude: -200 to 10,000 feet (-61 to 3,048 m) above sea level

### Management

- + ITU-T 984.1/G988 compliant OMCI interface
- + CLI over telnet
- + Web GUI

### Compliance

- + FCC Part 15 Class B
- + ICES-003 Class B
- + EN55022, EN55024
- + IEC 62368-1
- + FDA IEC 60825-1
- + RoHS 2015/863/EU

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## Detailed Specifications

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40		85	°C	
Storage Ambient Humidity	HA	5		85	%	
Power Supply Voltage	VCC	-0.3		3.7	V	
Signal Input Voltage		-0.3		Vcc+0.3	V	
Receiver Damage Threshold		+3			dBm	
Lead Soldering Temperature	TSOLD			260	°C	
Lead Soldering Time	TSOLD			10	sec	

### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature <sup>1</sup>	Tcase	-40		85	°C	I-TEMP
Ambient Humidity	HA	5		70	%	Non-condensing
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC			900	mA	
Power dissipation				3	W	
Power Supply Noise Rejection				100	mVp-p	100Hz to 1MHz
Data Rate			9.953/9.953		Gbps	Tx Rate/Rx Rate
Transmission Distance				20	km	
Coupled fiber	Single mode fiber					9/125um

### Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Average Launched Power	PO	4		9	dBm	
Extinction Ratio	ER	6			dB	
Center Wavelength	$\lambda$ C	1260	1270	1280	nm	DFB Laser
Side mode suppression ratio	SMSR	30			dB	
Spectrum Bandwidth (-20dB)				1	nm	
Transmitter OFF Output Power	POff			-45	dBm	
Tx Burst on time	Ton			50	ns	
Tx Burst off time	Toff			50	ns	
Differential line input Impedance	RIN	90	100	110	Ohm	
Differential Data Input Swing	VDT	200		1600	mVp-p	
Input Common Mode Voltage	VCM	1.4		Vcc-0.2	V	
Output Eye Mask	Compliant With ITU-T G.987.2					

## Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Input Optical Wavelength	$\lambda_{IN}$	1575		1580	nm	CW APD
Receiver Sensitivity	$P_{IN}$			-28.5	dBm	Note (1)
Input Saturation Power (Overload)	$P_{SAT}$	-8			dBm	
Signal Detect- Assert Power	PA	-42			dBm	
Signal Detect-Deassert Power	PD			-29	dBm	Note (2)
Signal Detect- Hysteresis	PA-PD	0.5		5	dB	
Differential Data Output Swing	VDR	350		850	mVp-p	AC-Coupled CML
Signal Detect Output Voltage-High	VLOSH	2.4		VCC	V	LVTTL
Signal Detect Output Voltage-Low	VLOSL	0		0.4	V	
Signal Detect- Assert/Deassert Time				100	us	
RSSI range		-29		-8	dBm	Accuracy +/- 3dB

Note (1): Measured with PRBS 2<sup>31</sup>-1 test pattern @9.953Gbit/s, BER  $\leq 1 \times 10^{-3}$ .

Note (2): When SD de-asserted, the data output is signal output.

## Digital Diagnostic Monitor Interface (DDMI) Description

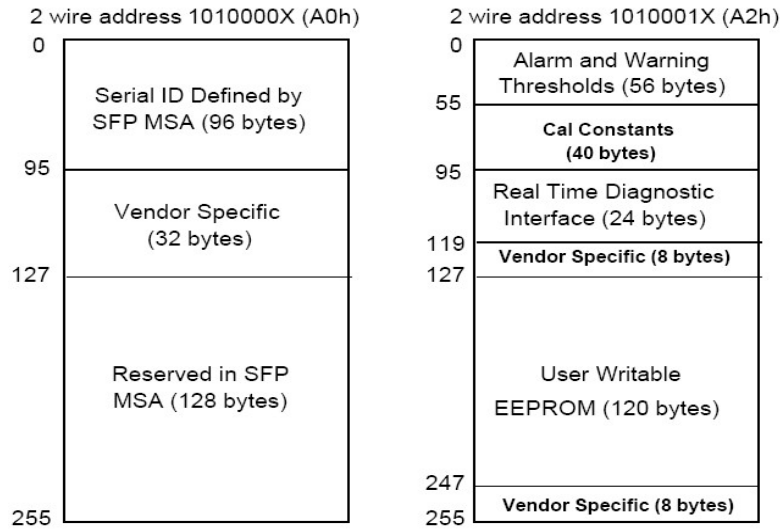
DDMI	Monitor scope	Monitor Error
TX power	4dBm ~9dBm	$\pm 2$ dBm
RX power	-8dBm~-29dBm	$\pm 3$ dBm
Bias	0mA~90mA	$\pm 10\%$
Temperature	-40°C~85°C	$\pm 3$ °C
Vcc	3.0V~3.6V	$\pm 3\%$

## Pin Definitions and Description

Pin No.	Pin Name	Description
1	VeeT	Tx Ground
2	SFP_Uart_Tx	SFP_Uart_Tx
3	Tx_Dis	LVTTL input. The default setting is that laser output is disabled when this pin is asserted HIGH and laser output is enabled when this pin is LOW.
4	MOD_DEF(2)	2-Wire Serial Data I/O Pin. (SDA)
5	MOD_DEF(1)	2-Wire Serial Clock Input. (SCL)
6	MOD_DEF(0)	Internally Grounded
7	Dying Gasp / Uart_Rx	Dying Gasp or SFP Uart Rx (controlled by software)
8	LOS/SD	Set LOS is that active high when signal is detected (LVTTL)
9	SFP_1PPS	1PPS
10	NC	NC
11	VeeR	Rx Ground
12	RXD-	Inverted Receiver Data Output (AC-Coupled internally)
13	RXD+	Non-Inverted Receiver Data Output (AC-Coupled internally)
14	VeeR	Rx Ground
15	Vcc_RX	Rx Vcc
16	Vcc_TX	Tx Vcc
17	Veet	Tx Ground
18	TXD+	Non-Inverted Transmitter Data Input (AC-Coupled)
19	TXD-	Inverted Transmitter Data Input (AC-Coupled)
20	Veet	Tx Ground

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## Digital Diagnostic Memory Map



Addr.	Size (Bytes)	Name of Field	Hex	Description
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	SFP function is defined by serial ID only
2	1	Connector	01	SC Connector
3-10	8	Transceiver	00 00 00 00 00 00 00 00	Transceiver Codes
11	1	Encoding	03	NRZ
12	1	BR, Nominal	63	99 *100MBd
13	1	Rate Identifier	00	Unspecified
14	1	Length (9um) km	14	Transceiver transmit distance
15	1	Length (9um) 100m	C8	Transceiver transmit distance
16	1	Length (50um OM2)	00	
17	1	Length (62.5um) 10m	00	Transceiver transmit distance
18	1	Length (Copper)	00	Not compliant
19	1	Length (50um OM3)	00	
20-35	16	Vendor name	43 5A 54 20 20 20 20 20 20 20 20 20 20 20 20 20	Vendor Name (ASCII)
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	
40-55	16	Vendor PN	20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20	Vendor Part Number
56-59	4	Vendor rev	56 31 2E 30	"V1.0" (ASCII)
60-61	2	Wavelength	04 F6	1270 nm

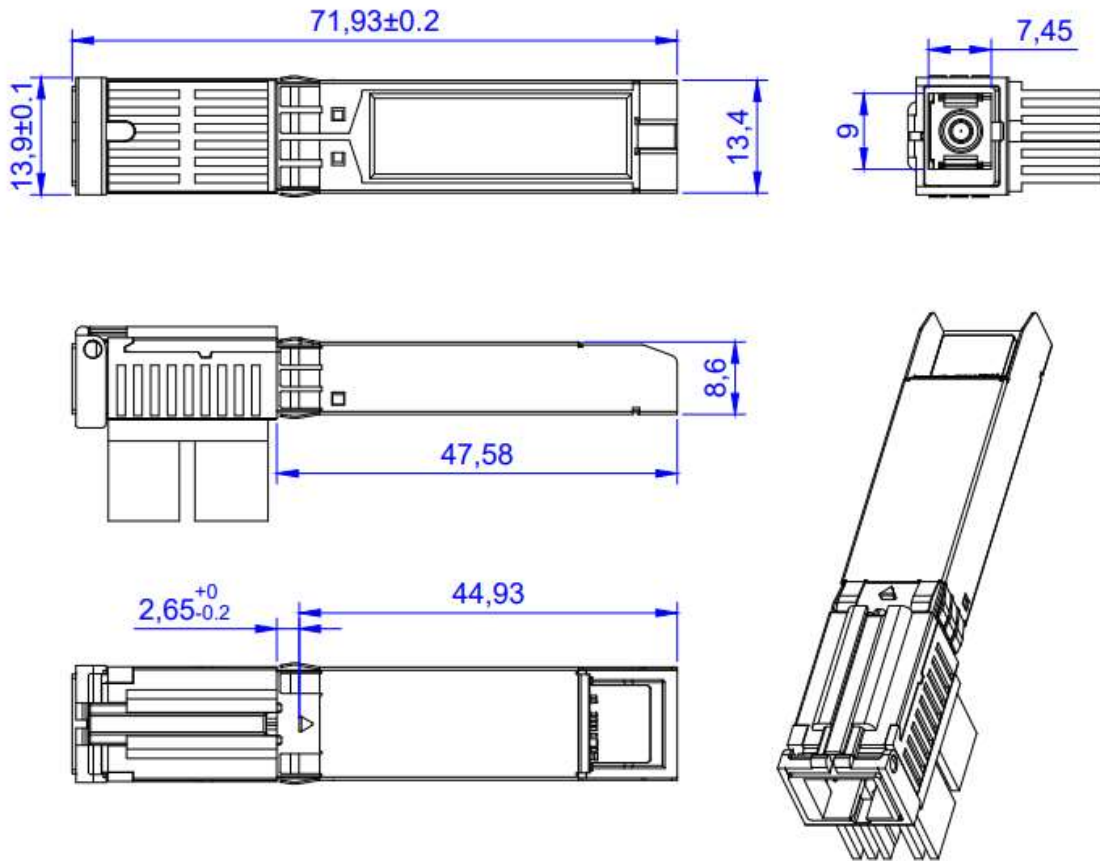
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Addr.	Size (Bytes)	Name of Field	Hex	Description
62	1	Reserved	00	
63	1	CC_BASE	D9	Check code for Base ID Fields
64-65	2	Options	00 1A	TX_DISABLE, TX_FAULT and Loss of Signal implemented.
66	1	BR,MAX	14	Not Specified
67	1	BR,MIN	14	Not Specified
68-83	16	Vendor SN	SN(Variable)	Serial Number of transceiver (ASCII).
84-91	8	Date code	DC(Variable)	Manufactory Date Code.
92	1	Diagnostic Monitoring Type	68	Digital diagnostic monitoring implemented, "Internally calibrated" is implemented
93	1	Enhanced Options	F0	Optional Soft TX Disable control and monitoring implemented, Optional Soft TX_FAULT monitoring implemented, Optional Soft RX_LOS monitoring implemented
94	1	SFF_8472 Compliance	03	Includes functionality described in Rev10.2 SFF-8472
95	1	CC_EXT	CS(Variable)	Check sum for Extended ID Field.
96-127	32	Vendor Specific	Read only	Programmed by Factory
128-255	128	Reserved	Read only	Programmed by Factory



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## Mechanical



# Ordering Information

Model	
HX-5311XP	XGSPON SFP+ ONT, SC/APC receptacle, 10Gbit SerDes Framing Interface, Indoor, 3.3V, -40/+85C

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