

10GEPON-OLT-XAS

10G EPON OLT Asymmetric XFP PRX30 Transceiver



Product Features

- ❖ Single fiber bi-directional data links TX 10.3125Gbps/ Burst Mode RX1.25Gbps application
- ❖ Single fiber bi-directional data links TX 1.25Gbps/ Burst Mode RX1.25Gbps application
- ❖ 3.3V, 5V power supply
- ❖ XFP package with SC Receptacle connector
- ❖ Hot-pluggable capability
- ❖ High power temperature-stabilized 1577nm EML LD

- ❖ High power 1490nm DFB LD
- ❖ High sensitivity 1310nm APD
- ❖ Support 20km transmission distance over SMF
- ❖ Low EMI and excellent ESD protection
- ❖ Digital diagnostic monitor interface
- ❖ RoHS-6 compliance for SOEX6376-XSGB
- ❖ 0 to 70°C operating case temperature

Applications

- ❖ 10GEPON PRX30 OLT
- ❖ GEAPON PX20+ OLT

Standards

- ❖ Complies with INF-8077i
- ❖ Complies with IEEE 802.3av
- ❖ Complies with IEEE 802.3ah
- ❖ Complies with China Telecom EPON equipment technology requirement V2.1
- ❖ Complies with FCC 47 CFR Part 15, Class B
- ❖ Complies with FDA 21 CFR 1040.10 and 1040.11

Absolute Maximum Rating

Parameter	Symbol	Min	Max	Unit	Notes
Storage Ambient Temperature	T _{STG}	-40	85	°C	
Operating Case Temperature	T _C	0	70	°C	
Operating Humidity	OH	5	95	%	
VCC3 Power Supply Voltage	VCC	0	3.6	V	
VCC5 Power Supply Voltage	VCC	0	5.5	V	

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	T _c	0		+70	°C
VCC3 Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V
VCC5 Power Supply Voltage	V _{CC}	4.75	5	5.25	V
VCC3 Power Supply Current	I _{CC}			700	mA
VCC5 Power Supply Current	I _{CC}			250	mA
Date Rate			10.3125/1.25		Gbps
Date Rate Drift		-100		+100	PPM

10G EPON Transmitter Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Center Wavelength	λ_C	1575		1580	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power	AOP	+2.5		+5	dBm	Launched into SMF
Power-OFF Transmitter Optical Power				-39	dBm	
Extinction Ratio	ER	7			dB	PRBS2 ³¹ -1 @10.3125Gbps
Total Jitter	TJ			0.39	UI	PRBS2 ³¹ -1 @10.3125Gbps
Transmitter Reflectance				-10	dB	
Transmitter and Dispersion Penalty	TDP			1.5	dB	Transmit on 20km SMF
Optical Waveform Diagram	Compliant with IEEE Std 802.3av					Figure 1, Mask Margin>5%

10G EPON Transmitter Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Data Input Differential Swing		120		820	mV	CML input, AC coupled
Input Differential Impedance		90	100	110	Ω	
Transmitter Disable Voltage - Low		0		0.8	V	
Transmitter Disable Voltage - High		2.0		V _{CC}	V	

10G EPON Transmitter Eye Mask Definitions and Test Procedure

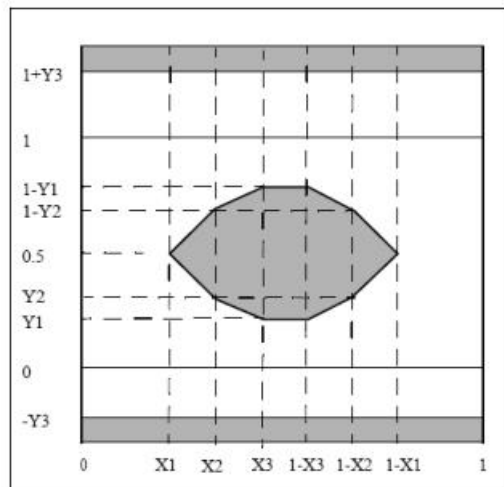


Figure 1: 10G EPON Transmitter Eye Mask Definitions

X1	X2	X3	Y1	Y2	Y3	Unit
0.25	0.40	0.45	0.25	0.28	0.40	UI

GEAPON Transmitter Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Center Wavelength	λ_C	1480		1500	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$		-	1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power	AOP	+3		+7	dBm	Launched into SMF
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF
Extinction Ratio	ER	9			dB	PRBS 2 ⁷ -1 test pattern @1.25Gbit/s
Total Jitter	TJ			0.43	UI	PRBS 2 ⁷ -1 test pattern @1.25Gbit/s
Rise/Fall Time (20%-80%)	T _R /T _F			260	ps	Bessel-Thompson Filter OFF.
Optical Return Loss Tolerance				15	dB	
Transmitter Reflectance				-10	dB	
Transmitter and Dispersion Penalty	TDP			2.3	dB	Transmit on 20km SMF
Optical Waveform Diagram	Compliant with IEEE Std 802.3ah™-2004					Figure 2, Mask Margin>5%

GEAPON Transmitter Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Data Input Differential Swing		500		1200	mV	LVPECL input, AC coupled
Input Differential Impedance		90	100	110	Ω	
Transmitter Disable Voltage - Low		0		0.8	V	
Transmitter Disable Voltage - High		2.0		V _{CC}	V	

GEPON Transmitter Eye Mask Definitions and Test Procedure

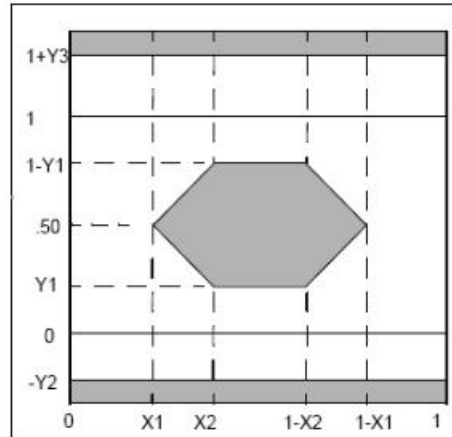


Figure 2: GEPON Transmitter Eye Mask Definitions

X1	X2	Y1	Y2	Y3	Unit
0.22	0.375	0.20	0.20	0.30	UI

Receiver Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Wavelength		1260		1360	nm	
Sensitivity	SEN			-31	dBm	PRBS 2 ⁷ -1 @1.25Gbps BER ≤ 1 × 10 ⁻¹²
Saturation Optical Power	SAT	-8			dBm	
Loss Of Signal De-assert Level				-33	dBm	
Loss Of Signal Assert Level		-40			dBm	
Loss Of Signal Hysteresis		0.5		6	dBm	
Receiver Reflectance				-12	dB	

Receiver Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Threshold Settling Time	$T_{SETTLING}$			300	ns	Figure 3
Data Output Differential Swing		400		1600	mV	LVPECL output, DC Couple
Loss Of Signal Assert Time				512	ns	
Loss Of Signal Deassert Time				512	ns	
Loss Of Signal Voltage - Low		0		0.4	V	
Loss Of Signal Voltage - High		2.4		VCC	V	

Timing Parameter Definitions in Burst Mode Sequence

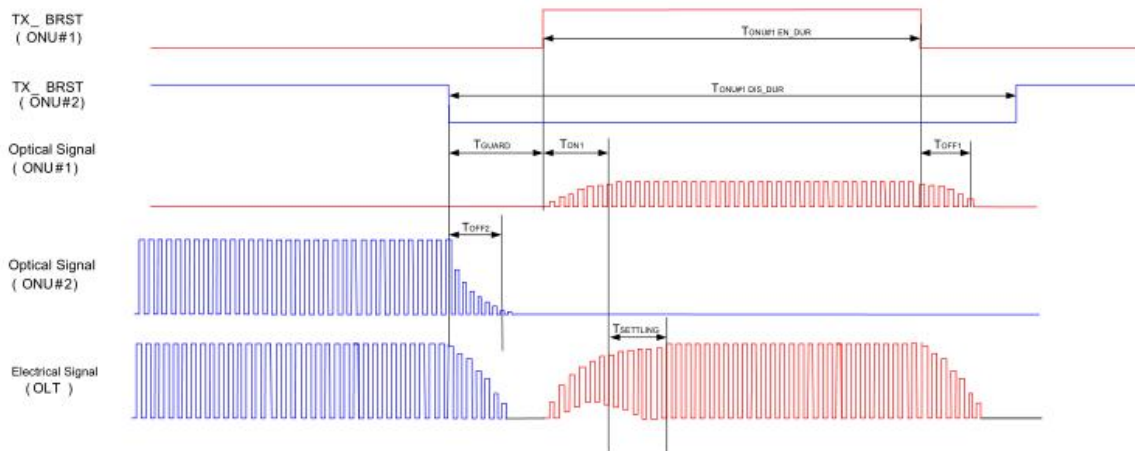


Figure 3: Timing Parameter Definitions in Burst Mode Sequence

Burst Mode Receiver Dynamic Range

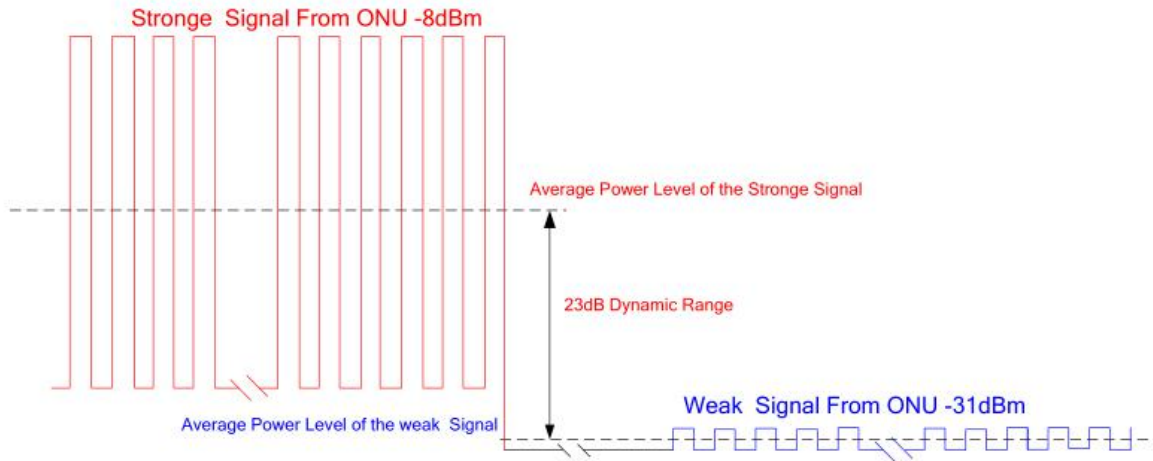


Figure 4: Burst Mode Receiver Dynamic Range in GEPON System

RSSI Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
RSSI Trigger-Low		0		0.8	V	
RSSI Trigger-High		2.0		Vcc	V	
RSSI Trigger Width	T _w		500		ns	Figure 5
RSSI Trigger Delay	T _D		300		ns	Refer To First Bit Of The Preamble
Optical Signal During Time	T _{ONT}		1500		ns	For RSSI Measurement
I ² C Access Prohibited Time				500	μs	

Timing Parameter Definitions in RSSI Trigger

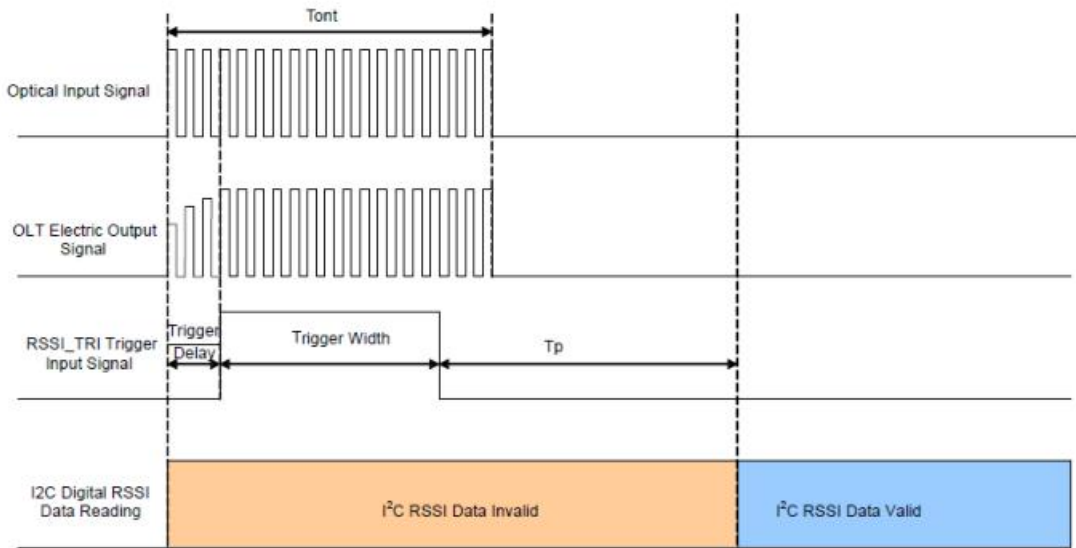


Figure 5: Timing Parameter Definitions in RSSI Trigger

Pin Out Drawing

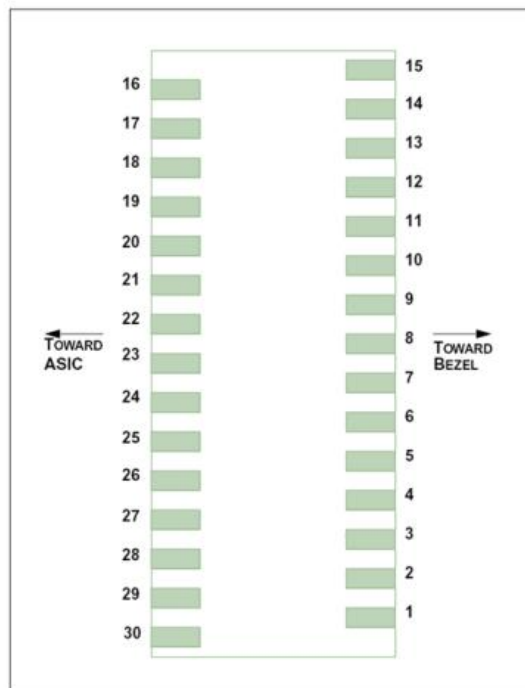


Figure 6: Pin Out Drawing

Pin Description

PIN	Name	Description	Notes
1	GND	Module Ground	
2	TX-1G-Pa	Non-Inverted Transmit Data in	LVPECL input, AC coupled
3	TX-1G-Na	Inverted Transmit Data in	LVPECL input, AC coupled
4	GND	Module Ground	
5	TX_DIS	Transmitter Disable	LVTTTL Input, Low: transmitter on
6	VCC5	+5V Power Supply	
7	GND	Module Ground	
8	VCC3_TX	Transmitter 3.3V Power Supply	
9	VCC3_RX	Receiver 3.3V Power Supply	
10	SCL	The clock line	The clock line of two wire serial interface
11	SDA	The data line	The data line of two wire serial interface
12	MOD_ABS	Indicates Module is not present	Grounded in the Module
13	NC	Not be Connected in the transceiver	
14	RX_LOS	Loss of signal	LVTTTL output. High: loss of signal
15	GND	Module Ground	
16	GND	Module Ground	
17	N.C.	Not be Connected in the transceiver	
18	N.C.	Not be Connected in the transceiver	
19	GND	Module Ground	
20	RD_1G_N	Inverted Received Data Out	LVPECL Output, DC Coupled
21	RD_1G_P	Non-inverted Received Data Out	LVPECL Output, DC Coupled
22	NC	Not be Connected in the transceiver	
23	RSSI_TRIG	Module Ground	

24	N.C.	Not be Connected in the transceiver	
25	N.C.	Not be Connected in the transceiver	
26	N.C.	Not be Connected in the transceiver	
27	GND	Module Ground	
28	TX_10G_N-	Inverted Transmit Data in	CML input, AC coupled
29	TX_10G_P	Non-Inverted Transmit Data in	CML input, AC coupled
30	GND	Module Ground	

Typical Interface Circuit

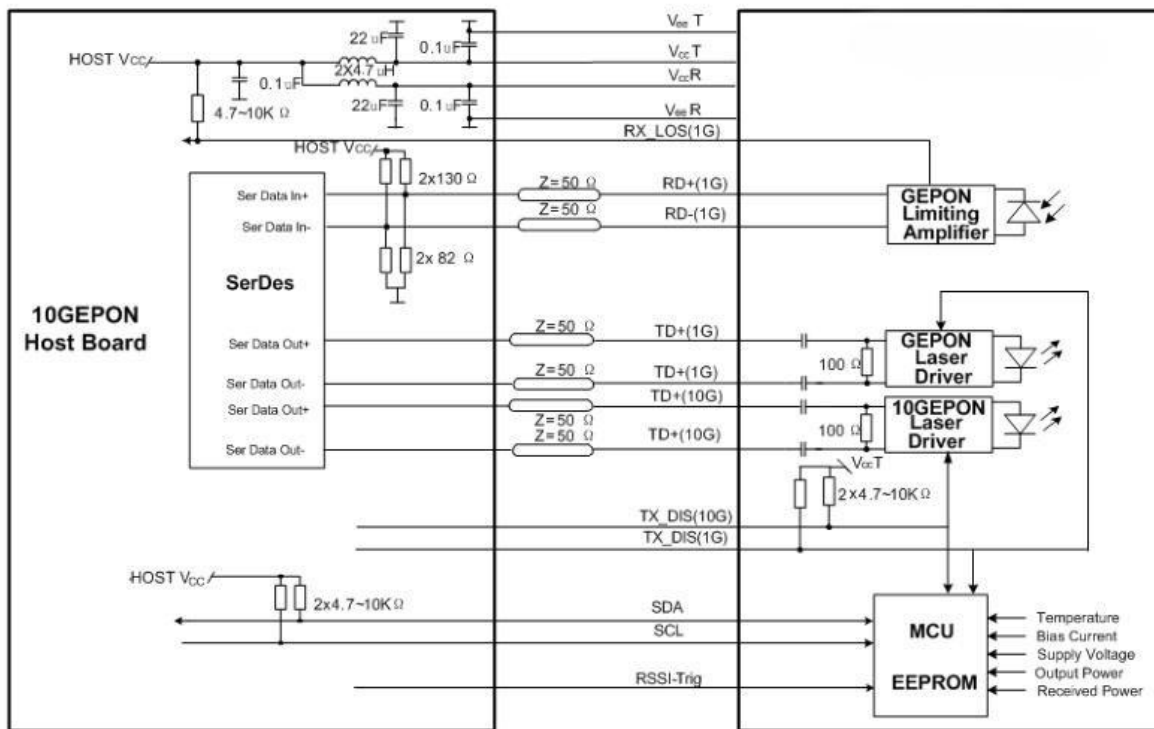


Figure 7: Typical Interface Circuit

EEPROM Information

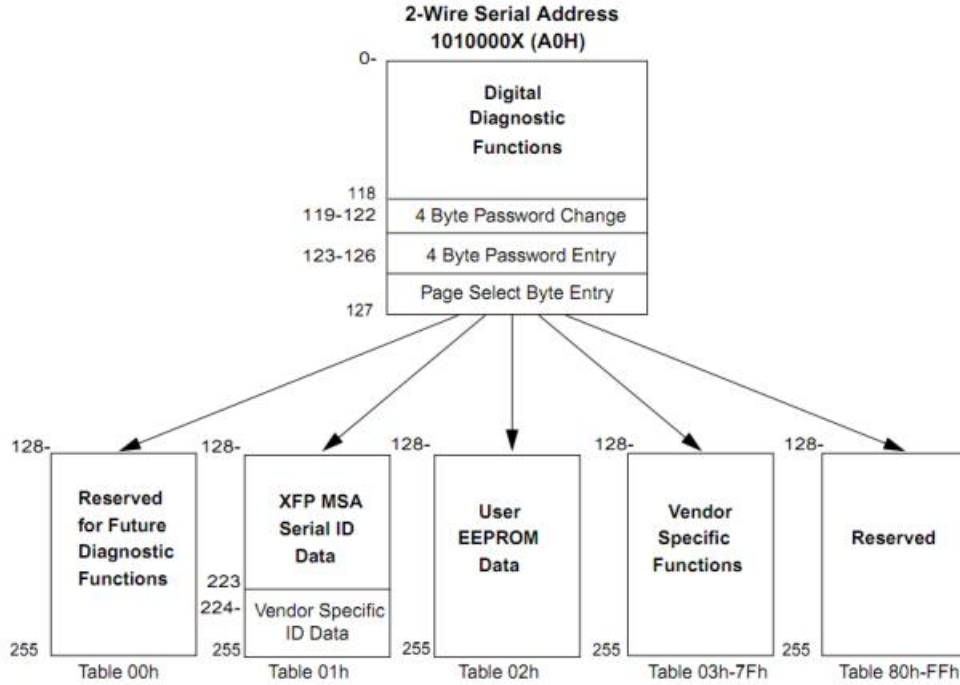


Figure 8: EEPROM Memory Map Specific Data Field Description

Digital Diagnostic Monitoring Interface

Seven transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

Parameter	Range	Accuracy	Calibration	Notes
Temperature	0 to 70°C	±3°C	Internal	
Voltage	2.97 to 3.63V	±3%	Internal	
Bias Current_1G	0 to 100mA	±10%	Internal	LSB: 4uA
TX Power_1G	2 to 7dBm	±3dB	Internal	LSB: 0.2uW
Bias Current_10G	0 to 150mA	±10%	Internal	LSB: 4uA
TX Power_10G	2 to 5dBm	±3dB	Internal	LSB: 0.2uW
RX Power Monitor	-31 to -8dBm	±2dB	Internal	

Package Outline

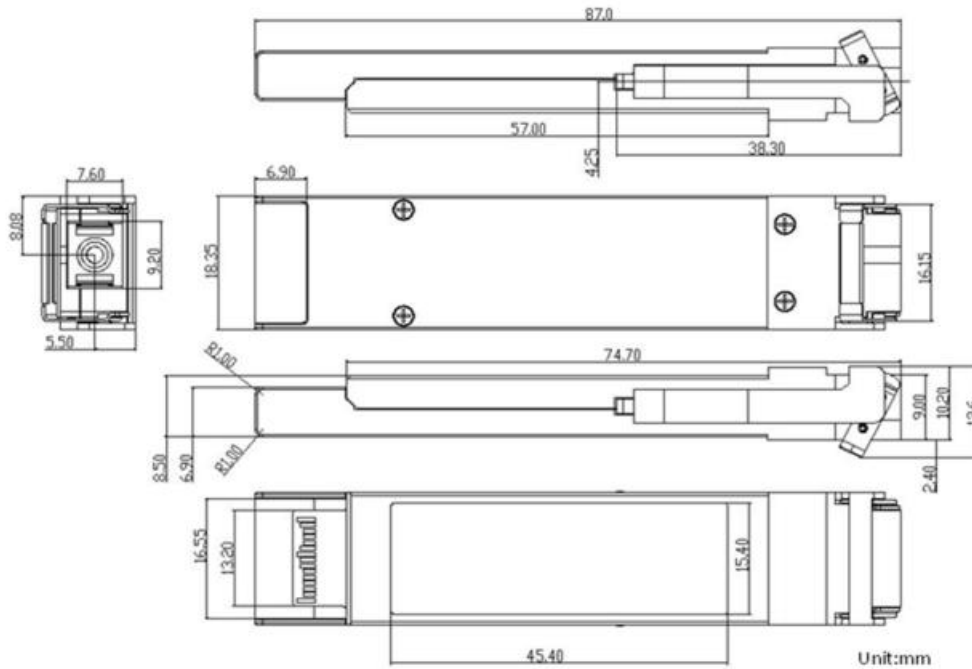


Figure 9: Package Outline

Ordering Information

Part Number	10GEPON-OLT-XAS
Application	Asymmetric 10GEPON OLT, 0°C~+70°C
Wavelength (nm)	1577T/1490T/1310R
Data Rate (Gb/s)	10.3T/1.25T/1.25R
ODN Class	PRX30
Package	XFP
Connector	SC