FEATURES

- Single fiber bi-directional data links TX 9.953 Gbps, Burst Mode RX 9.953G/2.488 Gbps application
- Single fiber bi-directional data links TX 2.488 Gbps, Burst Mode RX 1.244 Gbps application
- 3.3V power supply
- SFP-DD package with SC Receptacle connector
- Hot-pluggable capability
- High power 1577nm EML LD and 1490nm DFB LD
- High sensitivity 1270nm APD &1310nm APD
- Support 20km transmission distance with SMF
- XGSPON RX_SD indication
- GPON RX_LOS indication
- Low EMI and excellent ESD protection
- Digital diagnostic monitor interface
- RoHS10 compliance

APPLICATIONS

- XGS-PON OLT
- GPON OLT
-

STANDARDS

- Complies with SFF-8472
- Complies with ITU G.987.2
- Complies with ITU G.9807.1
- Complies with FCC 47 CFR Part 15, Class B
- Complies with FDA 21 CFR 1040.10 and 1040.11

Note:

Some manufacturer's OLT equipment need to verify the EEPROM information of transceiver, otherwise it can't work normally. If this happens to you, please contact us.

Jeanny Tang
Email: jeanny@superxon.com
Mobile: (+86) 18382192187

ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Ambient Temperature	T_{STG}	-40	85	°C	
Operating Case Temperature	T_C	0 -40	70 85	°C	Commercial Industrial
Relative Storage Humidity	RHs	5	85	%	
VCC3 Power Supply Voltage	VCC3	0	3.6	V	

RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	Tc	0 -40		70 85	°C	Commercial Industrial
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Power Supply Consumption	P			3.3	W	
TX Data Rate			9.953 2.488		Gbps Gbps	
RX Data Rate			9.953/2.488 1.244		Gbps Gbps	
Operating current				1000	mA	

XGS-PON TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	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	
Transmitter and Dispersion Penalty	TDP			1	dB	Transmit on 20km SMF
Average Launch Optical Power	AOP	1 5		4 8	dBm	B+ C+
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF
Extinction Ratio	ER	8.2			dB	PRBS2^{31}-1 @9.953Gbps
Optical Waveform Diagram	Compliant with ITU G.9807.1					Figure 1, Mask Margin>5%
Tolerance to Transmitter Incident Light		-15			dB	

XGS-PON TRANSMITTER ELECTRICAL CHARACTERISTICS

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Data Input Differential Swing			100		850	mV	CML input, AC coupled
Input Differential Impedance		Zin	90	100	110	Ω	
TX Disable	Disable		2		VCC+0.3	V	
	Enable		-0.3		0.8	V	

XGS-PONTRANSMITTER EYE MASK DEFINITIONS AND TEST PROCEDURE

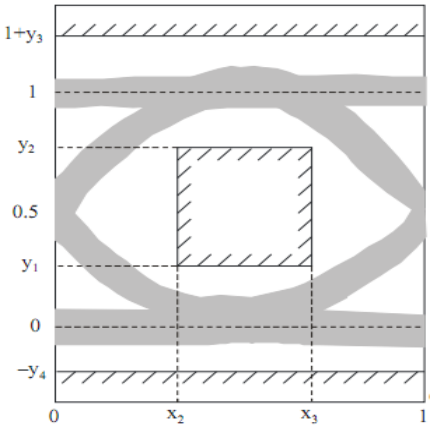

Figure 1 XGPON Transmitter Eye Mask Definitions

X3-X2	Y1	Y2	Y3	Y4	Unit
0.2	0.25	0.75	0.25	0.25	UI

GPON TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Center Wavelength	λ_C	1480		1500	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$			0.9	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power	AOP	1.5 3		5 7	dBm	B+ C+
Transmitter and Dispersion Penalty	TDP			1	dB	Transmit on 20km SMF
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF
Extinction Ratio	ER	8.2			dB	PRBS 2^{23}-1+72CID@2.488Gbps
Optical Waveform Diagram	Compliant with ITU-T G.984.2					Figure 2,Mask Margin>5%
Tolerance to Transmitter Incident Light		-15			dB	
Total Jitter	TJ p-p			0.2	UI	

GPON TRANSMITTER ELECTRICAL CHARACTERISTICS

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Data Input Differential Swing			100		850	mV	CML input, AC coupled
Input Differential Impedance		Zin	90	100	110	Ω	
TX Disable	Disable		2		VCC+0.3	V	
	Enable		-0.3		0.8	V	

GPON TRANSMITTER EYE MASK DEFINITIONS AND TEST PROCEDURE

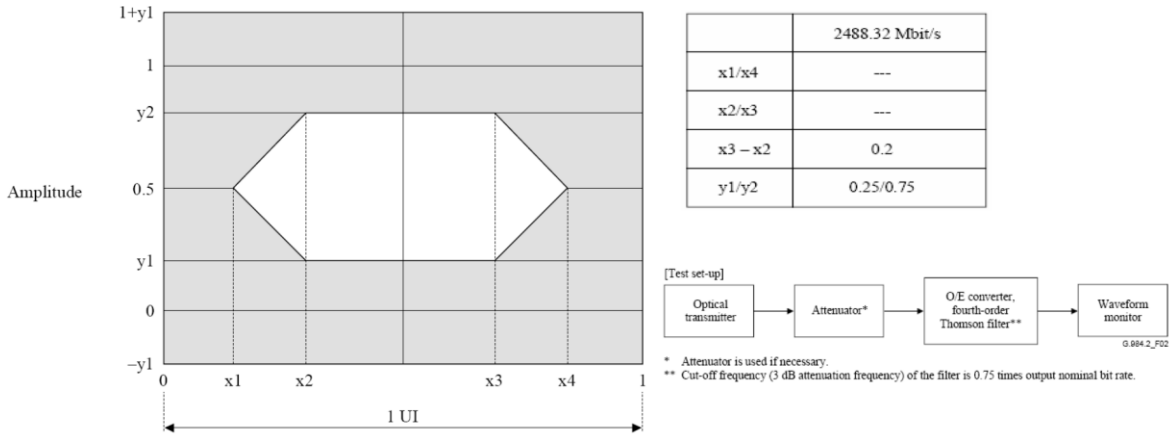

Figure 2GPON Transmitter Eye Mask Definitions

XGS-PON RECEIVER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength		1260		1280	nm	
Sensitivity	SEN			B+: -25 C+: -29	dBm	PRBS2^{31}-1@9.953Gbps BER ≤1×10^{-3}, ER≥6dB
Overload	OL	B+: -4 C+: -8			dBm	PRBS2^{31}-1@9.953Gbps BER ≤1×10^{-3}, ER≥6dB
Max Input power		0			dBm	
SD Assert Level				SEN-0.5	dBm	
SD De-Assert Level		-43			dBm	
Hysteresis		0.5			dB	
Receiver reflectance				-12	dB	

XG-PON RECEIVER OPTICAL CHARACTERISTICS

Parameter	Symbo	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength		1260		1280	nm	
Sensitivity	SEN			B+：-26.5 C+：-30.5	dBm	PRBS 2^{23}-1@2.488Gbps BER ≤1×10^{-4}, ER≥8.2dB
Saturation Optical Power	SAT	B+：-6 C+: -10			dBm	PRBS 2^{23}-1@2.488Gbps BER ≤1×10^{-4}, ER≥8.2dB
Max Input power		0			dBm	
SD Assert Level				SEN-0.5	dBm	
SD De-Assert Level		-43			dBm	
Hysteresis		0.5			dB	
Receiver reflectance				-12	dB	

XGS/XG-PON RECEIVER ELECTRIAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Output Differential Swing		300		800	mV	DC coupled, CML output
Output Differential Impedance	Zout	90	100	110	Ω	
SD Voltage - Low		-0.3		0.4	V	
SD Voltage - High		2.4		VCC+0.3	V	
RSSI Trigger-Low		-0.3		0.8	V	
RSSI Trigger-High		2.0		VCC+0.3	V	
CID		72			Bit	

GPON RECEIVER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength		1290	1310	1330	nm	
Sensitivity	SEN			B+: -28 C+: -32	dBm	ER≥10dB, PRBS 2^{23}-1@1.244Gbps BER ≤1×10^{-10} for B+, BER ≤1×10^{-4} for C+
Saturation Optical Power	SAT	B+: -8 C+: -12			dBm	ER≥10dB, PRBS 2^{23}-1@1.244Gbps BER ≤1×10^{-10} for B+, BER ≤1×10^{-4} for C+
Max Input power		0			dBm	
SD Assert Level				SEN-0.5	dBm	
SD De-Assert Level		-43			dBm	
Hysteresis		0.5			dB	
Receiver reflectance				-12	dB	

GPON RECEIVER ELECTRIAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Output Differential Swing		600		1000	mV	DC coupled, CML output
Output Differential Impedance	Zout	90	100	110	Ω	
SD Voltage - Low		-0.3		0.4	V	
SD Voltage - High		2.4		VCC+0.3	V	
RSSI Trigger-Low		-0.3		0.8	V	
RSSI Trigger-High		2.0		VCC+0.3	V	
CID		72			Bit	

RECOMMENDED XGS/XGPON Receiver Timing Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Guard time	Tg	25	50		ns	Figure 3
Reset Pulse Width	Tr		25.6		ns	
Data Recovery Time	Ts		50	100	ns	
Preamble time	T_p	100	150		ns	
SD De-Assert Time	T_{SDD}			50	ns	
SD Assert Time	T_{SDA}			50	ns	

Note: *Vendor recommends providing a Reset signal at the end of the optional packet*

XGSPON TIMING PARAMETER DEFINITIONS IN BURST MODE SEQUENCE

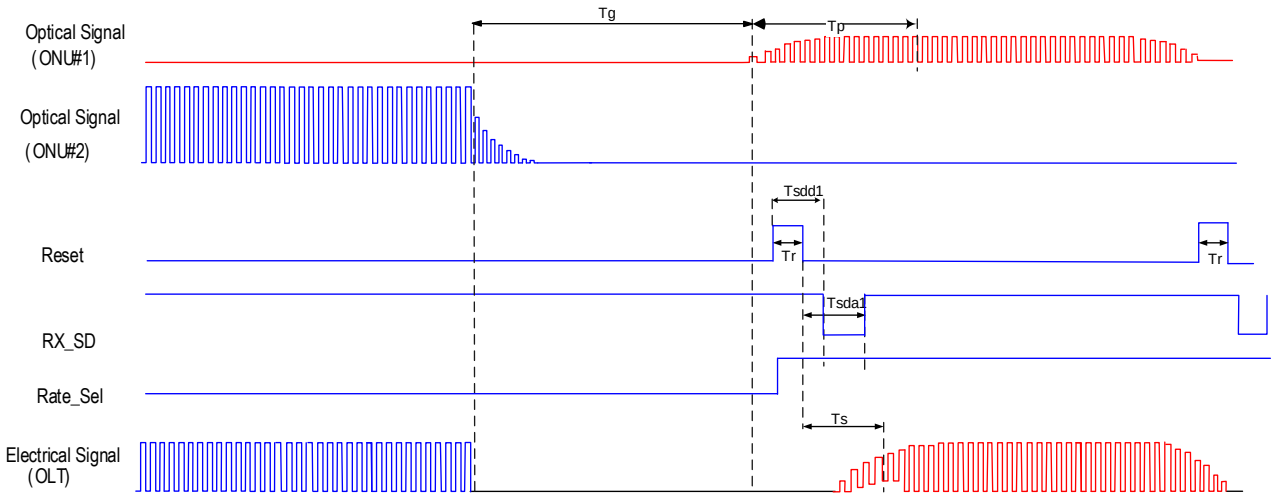

Figure 3 Timing Parameter Definitions of Normal Mode& Ranging Mode

Note: *Rate selection completes switching between the end of the previous frame and the end of reset*

RECOMMENDED GPONReceiver Timing Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Notes
Guard time	Tg	25	50		ns	Figure 4
Reset Pulse Width	Tr		25.6		ns	
Data Recovery Time	Ts			100	ns	
Preamble time	Tp	100	150		ns	
SD De-Assert Time	T_{SDD}			150	ns	
SD Assert Time	T_{SDA}			50	ns	
Time to Un-squelch	T_{RN}			200	ns	

Note: *Vendor recommends providing a Reset signal at the end of the optional packet*

GPON TIMING PARAMETER DEFINITIONS IN BURST MODE SEQUENCE

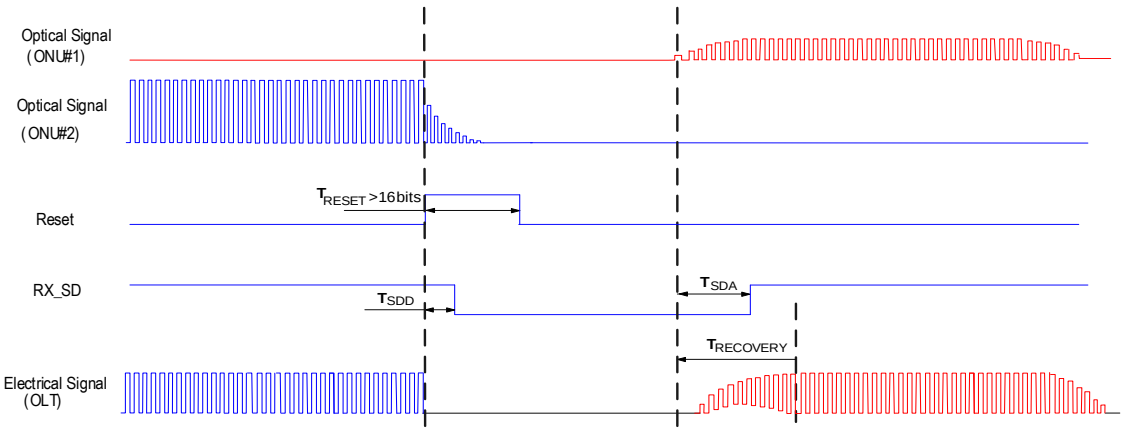

Figure 4 Timing Parameter Definitions of Normal Mode& Range Mode

RSSI TIMING SEQUENCE

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Notes
Optical Signal Duriation Time	T_{opt}	1200			ns	
RSSI Trigger w idth	T_W	500			ns	
RSSI Trigger Delay	T_D	150			ns	
I^2C Access Prohibited Time	T_S	500			μs	
I^2C Bus Frequency			100	400	KHz	

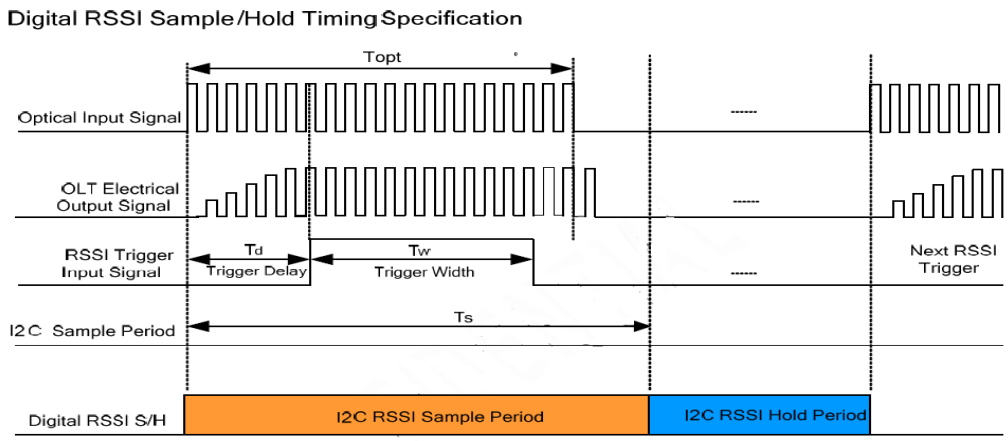

Figure 5 Timing Parameter Definitions in RSSI Trigger

PIN OUT DRAWING

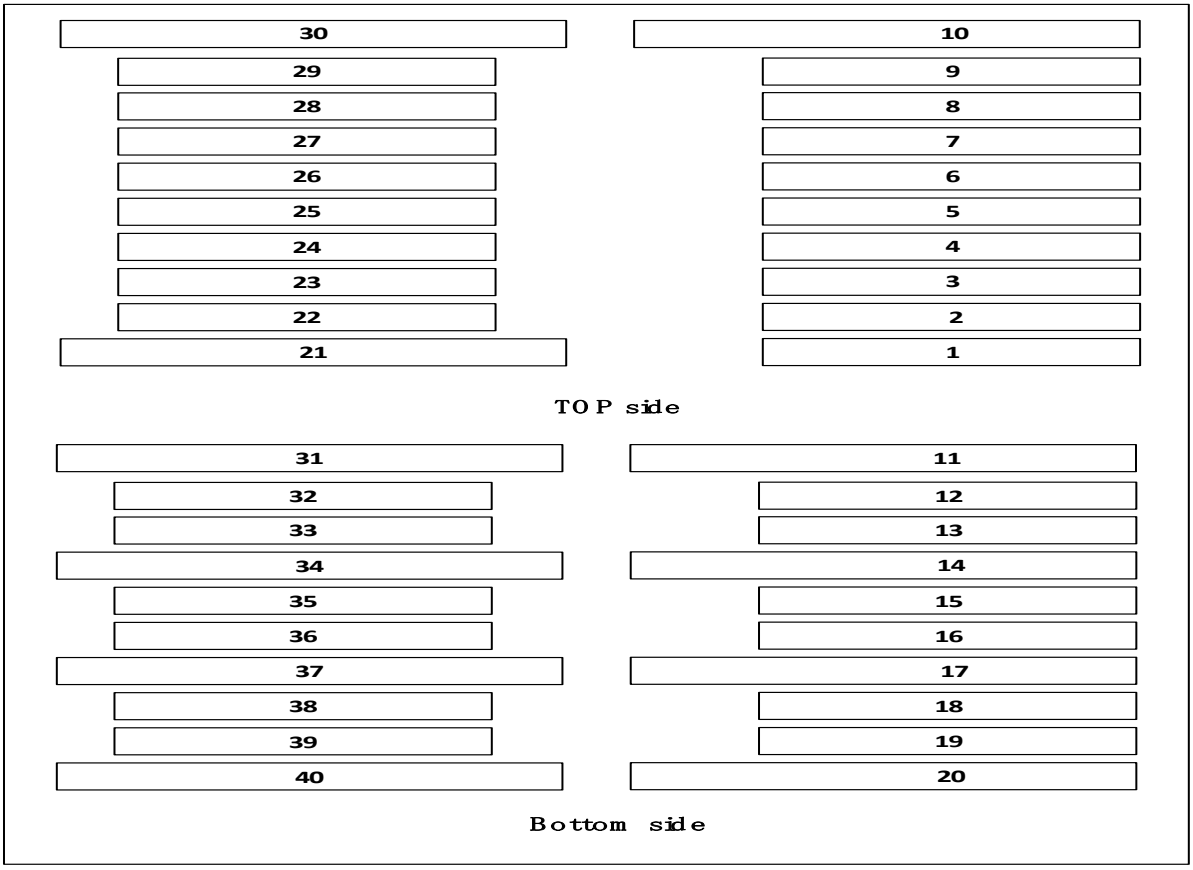

Figure 6 Pin Out Drawing

PIN DESCRIPTION

PIN	Name	Type	Description	Notes
1	Ratesel		Rate select	Low :9.953Gbps,High:2.488Gbps
2	NC		NC	
3	Tx_DIS1	LVTTL-I	Transmit Disable Channel 1	Low = Normal, High = Disable
4	SDA	LVTTL-IO	I2C data	
5	SCL	LVTTL-I	I2C clock	
6	MOD_ABS	Ground	Module absent indication	Pull-up on host PCB, internally pulled to GND
7	Rst1	LVTTL-1	Optical Reset (XGS)	Active High
8	SD	LVTTL-O	Signal Detect Channel 1	Low : Lost Signal, High: Signal Detected
9	RSSI1	LVTTL-I	Receive strength Trigger Channel 1	Active High
10	GND		Module Ground	
11	GND		Module Ground	
12	RX1n	LVCML-O	Receive Channel 1 DC coupled.	Coupling caps are placed on host PCB, Common mode muting
13	RX1p	LVCML-O	Receive Channel 1 DC coupled.	
14	GND		Module Ground	
15	VCC	+3.3v	Pow er	
16	VCC	+3.3v	Pow er	
17	GND		Module Ground	
18	TX1p	LVCML-I	Transmit Channel 1 AC coupled	Internally AC coupled
19	TX1n	LVCML-I	Transmit Channel 1 AC coupled	Internally AC coupled
20	GND		Module Ground	
21	GND		Module Ground	
22	NC		NC	
23	Tx_DIS2	LVTTL-I	Transmit Disable Channel 2	Active High
24	NC		NC	
25	NC		NC	
26	NC		NC	
27	RST2	LVTTL-I	Optical Reset channel 2	Active High
28	LOS	LVTTL-O	Signal Detect Channel 2	High: Lost Signal , Low : Signal Detected
29	RSSI2	LVTTL-I	Receive strength Trigger Channel 2	Active High
30	GND		Module Ground	
31	GND		Module Ground	
32	RX2n	LVCML-O	Receive Channel 2 DC coupled.	Coupling caps are placed on host PCB, Un-squelch
33	RX2p	LVCML-O	Receive Channel 2 DC coupled.	
34	GND		Module Ground	
35	VCC	+3.3v	Pow er	
36	VCC	+3.3v	Pow er	

37	GND		Module Ground	
38	TX2p	LVCML-I	Transmit Channel 2 AC coupled	Internally AC coupled
39	TX2n	LVCML-I	Transmit Channel 2 AC coupled	Internally AC coupled
40	GND		Module Ground	

PACKAGE OUTLINE

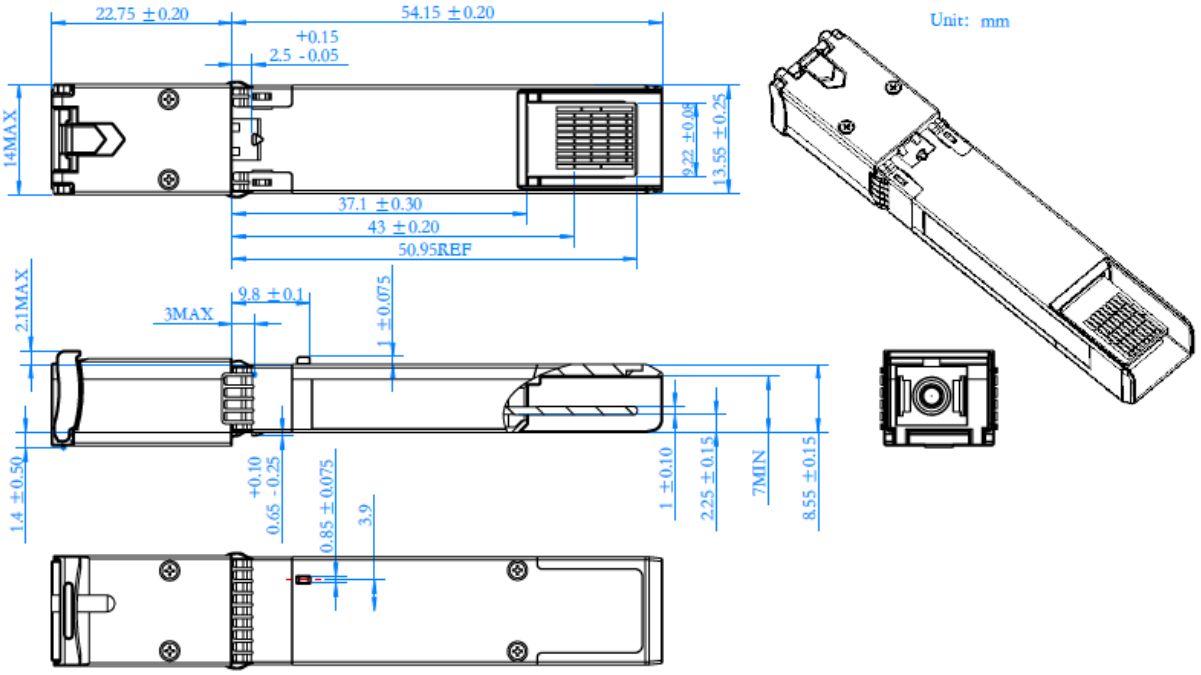

Figure 7 Package Outline

Note: The SFP-DD 10G OLT package is version.

XGS: DIGITAL DIAGNOSTIC MONITORING INTERFACE					
Parameter	**Range**	**Accuracy**	**Calibration**	**Address**	**NOTES**
Temperature	0 to 70°C	±3°C	Internal	Byte 96~97, Byte96 is MSB	LSB: 1/256C
Voltage	2.97 to 3.63V	±5%	Internal	Byte 98~99, Byte98 is MSB	LSB: 0.1mV
Bias Current_XGS	0 to 262mA	±10%	Internal	Byte 100~101, Byte100 is MSB	LSB: 4uA
TX Power_XGS	1 to 8dBm	±3dB	Internal	Byte 102~103, Byte102 is MSB	LSB:0.2uW
XGS-PON RX Power Monitor	Sensitivity to Overload	±3dB	Internal	Byte 104~105, Byte104 is MSB	LSB:0.1uW

GPON: DIGITAL DIAGNOSTIC MONITORING INTERFACE					
Parameter	**Range**	**Accuracy**	**Calibration**	**Address**	**NOTES**
Temperature	0 to 70°C	±3°C	Internal	Byte 96~97, Byte96 is MSB	LSB: 1/256C
Voltage	2.97 to 3.63V	±5%	Internal	Byte 98~99, Byte98 is MSB	LSB: 0.1mV
Bias Current_GPON	0 to 262mA	±10%	Internal	Byte 100~101, Byte100 is MSB	LSB: 4uA
TX Power_GPON	1 to 8dBm	±3dB	Internal	Byte 102~103, Byte102 is MSB	LSB:0.2uW
GPON RX Power Monitor	Sensitivity to Overload	±3dB	Internal	Byte 104~105, Byte104 is MSB	LSB:0.1uW

ORDERING INFORMATION

PN	Temperature Rating℃	ODN Class	Fiber Termination
SOGX6299-ISGE	0~70℃	B+	SC UPC
SOGX6299-ISIGE	-40~85℃	B+	SC UPC
SOGX6299-ISGF	0~70℃	C+	SC UPC
SOGX6299-ISIGF	-40~85℃	C+	SC UPC

WARNINGS

- Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

- Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

LEGAL NOTES

- All information contained in this document is subject to change without notice, at Superxon's sole and absolute discretion. Superxon Technology warrants performance of its products to current specifications only in accordance with the company's standard one-year warranty; however, specifications designated as "preliminary" are given to describe components only, and Superxon Technology expressly disclaims any and all warranties for said products, including express, implied, and statutory warranties, warranties of merchantability, fitness for a particular purpose, and non-infringement of proprietary rights. Please refer to the company's Terms and Conditions of Sale for further warranty information.
- Superxon Technology assumes no liability for applications assistance, customer product design, software performance, or infringement of patents, services, or intellectual property described herein. No license, either express or implied, is granted under any patent right, copyright, or intellectual property right, and Superxon Technology makes no representations or warranties that the product(s) described herein are free from patent, copyright, or intellectual property rights. Products described in this document are NOT intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. Superxon Technology customers using or selling products for use in such applications do so at their own risk and agree to fully defend and indemnify Superxon Technology for any damages resulting from such use or sale.
- THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROVIDED ON AN "AS IS" BASIS. Customer agrees that Superxon Technology is not liable for any actual, consequential, exemplary, or other damages arising directly or indirectly from any use of the information contained in this document. Customer must contact Superxon Technology to obtain the latest version of this publication to verify, before placing any order, that the information contained herein is current.
-