

## LuLeey LL-XS1025 10G XGSPON Stick SFP+ ONU

### SC UPC/APC Receptacle

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#### Features

- Single fiber bi-directional data links symmetric TX 9.953 Gb/s / RX 9.953 Gb/s with MAC function
- SFP package with SC UPC/APC receptacle
- Single 3.3 V power supply
- Hot-pluggable capability
- High power 1270 nm DML DFB LD and high sensitivity 1577 nm APD
- Support 20 km transmission distance with SMF
- CML compatible data input/output interface
- Low power dissipation < 3 W
- Low EMI and excellent ESD protection
- Digital diagnostic monitor interface
- RoHS-6 compliance
- Case temperature range:  
Commercial: 0 °C to 70 °C
- Support of GPON/XGS-PON/NGPON2 standards
- 256 GEM/XGEM ports, 64 T-CONTs or 16 LLIDs
- Carrier Grade QoS Engine
- Advanced loopback and diagnostic capabilities
- Supports Synchronous Ethernet (SyncE)

#### Applications

- Residential home gateway
- Network switch/router, VDSL MDU, and G.fast DPU
- Mobile backhaul

#### Standard

- Complies with ITU-T G.987.2
  - Complies with ITU-T G.9807.1, G.9807.2
  - ITU-T G.988 OMCI L2 MAC Bridge (Up to 64 L2 bridges)
  - G.8275/Y.1369/IEEE 1588v2
  - IEEE 802.1ag and ITU-T Y.1731 Ethernet OAM delay & loss measurement hardware support
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**1. Absolute Maximum Ratings**

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Ambient Temperature	TSTG	-40	85	°C	
Operating Humidity	OH	5	95	%	
Supply Voltage	Vcc	0	3.6	V	

**2. Recommended Operating Conditions**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	Tc	0		70	°C	Commercial
		-40		85	°C	Industrial
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Power Supply Current	Icc			1200	mA	
Nominal Upstream Line Rate			9.953		Gb/s	
Nominal Downstream Line Rate			9.953		Gb/s	

**3. Transmitter Optical Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Average Launch Optical Power	Pout	4		9	dBm	
Power-OFF Transmitter Optical	Poff			-45	dBm	
Extinction Ratio	ER	6			dB	
Centre Wavelength	$\lambda_c$	1260	1270	1280	nm	
Spectral Width (-20 dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Mode	SMSR	30			dB	
Eye Diagram						Compliant With 802.3av

**4. Transmitter Electrical Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Input Differential Impedance	ZIN	90	100	110	$\Omega$	
Data Input Swing Differential	VIN	200		1000	mV	
Burst Disable		2.0		Vcc	V	
Burst Enable		0		0.8	V	
Tx-Fault Voltage - Low		0		0.8	V	
Tx-Fault Voltage - HIGH		2.0		Vcc	V	

**5. Receiver Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Optical Center Wavelength	$\lambda_c$	1575	1577	1580	nm	
Sensitivity	SEN			-29	dBm	
Receiver Overload	OL	-9			dBm	
LOS Assert	SDA	-40			dBm	
LOS De-Assert	SDD			-29	dBm	
LOS Hysteresis		0.5		5	dB	
Data Output Swing Differential	Vout	300		1200	mV	
LOS	High	2.0		Vcc	V	
	Low	0		0.8	V	

**6. Pin Description**

1	VeeT	Module Transmitter Ground	Host pull-up 4.7 K $\Omega$ –10 K $\Omega$
2	Tx_Fault	Module Transmitter Fault	Low = normal, High = abnormal, Host pull-up 4.7 K $\Omega$ – 10 K $\Omega$
3	Tx-Disable	Transmitter Disable; turns off transmitter laser	
4	Mod-Def(2)	SDA I2C Data line	2 wire serial ID interface, SDA, Host pull-up 4.7 K $\Omega$ – 10 K $\Omega$
5	Mod-Def(1)	SCL I2C Clock line	2 wire serial ID interface, SCL, Host pull-up 4.7 K $\Omega$ – 10 K $\Omega$
6	Mod-Def(0)	Module Absent, connected to VeeR	Connected to VeeT or VeeR in the module, Host pull-up 4.7 K $\Omega$ – 10 K $\Omega$
7	Rate Select	For Dying Gasp detect, input low active	
8	LOS	Loss of Signal	High = loss of signal, Low = normal operation, Host pull-up 4.7 K $\Omega$ – 10 K $\Omega$
9	VeeR	Module Receiver Ground	
10	VeeR	Module Receiver Ground	
11	VeeR	Module Receiver Ground	
12	RD-	Inverted Received Data Out	Internally AC-coupled
13	RD+	Non-inverted Received Data Out	Internally AC-coupled
14	VeeR	Module Receiver Ground	
15	VccR	Module Receiver 3.3 V Supply	
16	VccT	Module Transmitter 3.3 V Supply	
17	VeeT	Module Transmitter Ground	
18	TD+	Non-Inverted Transmit Data in	Internally AC-coupled
19	TD-	Inverted Transmit Data in	Internally AC-coupled
20	VeeT	Module Transmitter Ground	

**7. Pin-out Drawing**

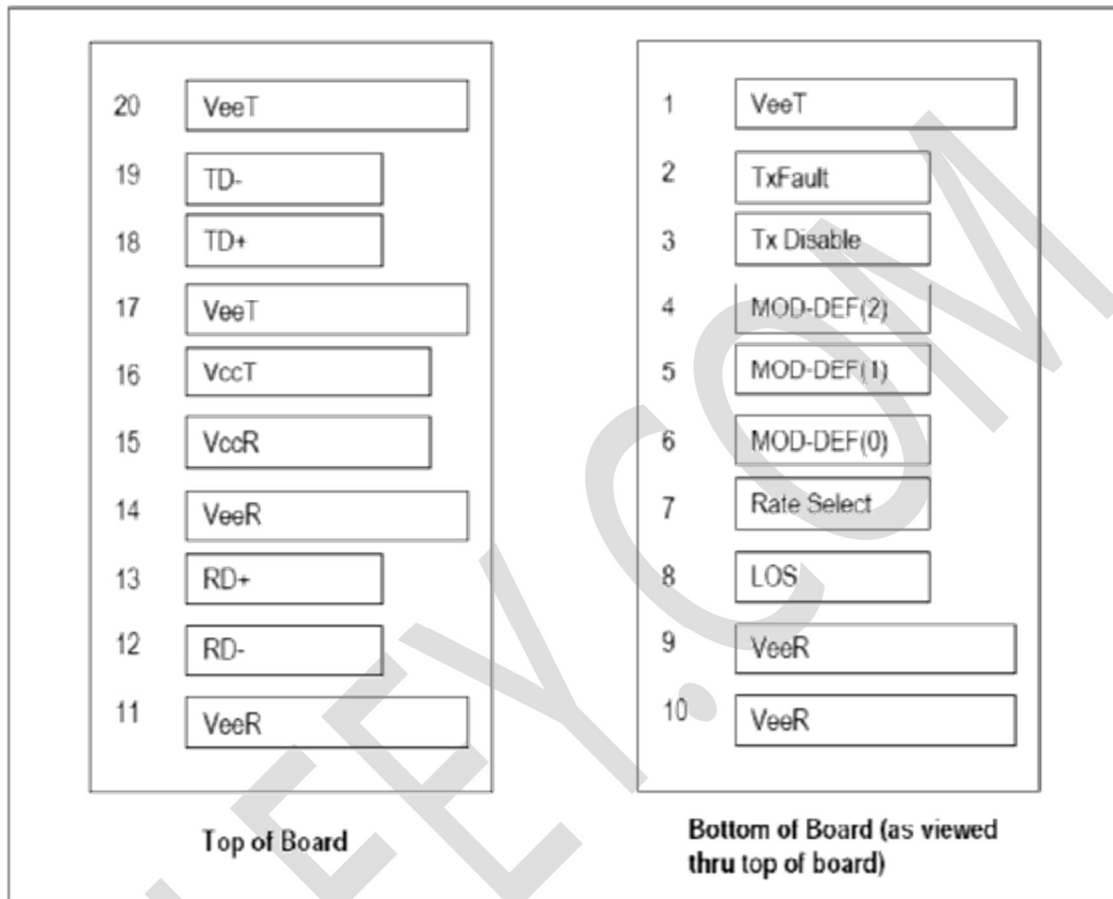


Figure 1. Pin-out Drawing

**8. Package Outline**

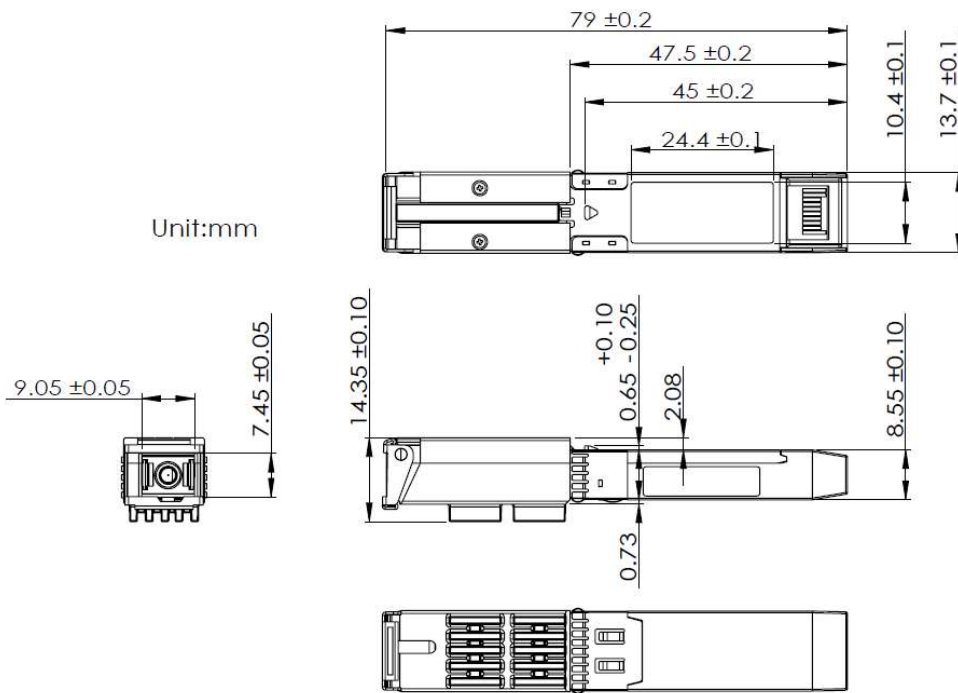


Figure 2. Package Outline

**9. EEPROM Block Diagram**

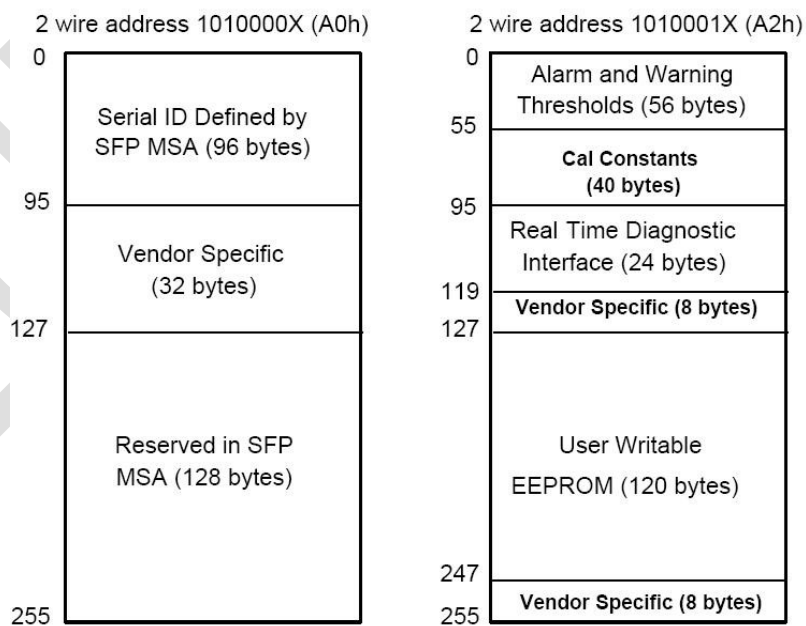


Figure 3. EEPROM Memory Map Specific Data Field Descriptions

**10. Digital Diagnostic Monitoring Interface**

Parameter	Range	Accuracy	Calibration	Notes
Temperature	0 to 70 °C	±3 °C	Internal	Commercial
Voltage	3 to 3.6 V	±3%	Internal	
Bias Current	0 to 131 mA	±10%	Internal	
TX Power	4 to 9 dBm	±3 dB	Internal	
RX Power monitor	-29 to -9 dBm	±3 dB	Internal	

**11. Ordering Information**

Part No.	Package	Data Rate	Reach	Wavelength	Temp.
XGSPON STICK	SFP+	TX: 9.953 Gb/s RX: 9.953 Gb/s	20 km	TX: 1270 nm RX: 1577 nm	0 to 70 °C

**12. 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.