

CWDM 40KM SFP+ TRANSCEIVERS

TPC1XGJERxG



Product Description

The TPC1XGJERxG is an enhanced small form factor pluggable (SFP+) fiber optic transceiver with digital diagnostics monitoring functionality (DDM). Supporting Ethernet and Fiber Channel standards makes it ideally suited for high capacity data-com and storage area network applications. DDM functionality (alarm and warning features) is integrated into the design via an I²C serial interface per the Multi-Source Agreement (MSA) SFF-8472, Rev. 10.4.

Each transceiver utilizes an electro absorption modulator integrated laser (EML) with an operating wavelength with 100GHz (0.8nm) spacing per the ITU-grid. The transceiver supports data rates ranging from 11.3Gbps down to 8Gbps. It provides an excellent solution for data transmission at CWDM wavelength over up to 40km single mode fiber. The low power consumption and excellent EMI performance enable system design with high port density. The product is RoHS compliant and is designed and tested in accordance with industry safety standards. The transceiver is Class I Laser product per U.S. FDA/CDRH and international IEC-60825 standards.

The TPC1XGJERxG transceiver connects to standard 20-pad SFP+ connectors for hot plug capability. This allows the system designer to make configuration changes or maintenance by simply plugging in different transceivers without removing the power supply from the host system. The transmitter and receiver DATA interfaces are internally AC-coupled. LV-TTL Transmitter Disable control input and Loss of Signal (LOS) output interfaces are also provided. The transceiver has bail-type latch, which offers an easy and convenient way to release the modules.

The transceiver operates from a single +3.3V power supply over an operating case temperature range of -5°C to +70°C (Commercial), or -5°C to +85°C (Extended) or -40°C to +85°C (Industrial).



Features

- Temperature-stabilized CWDM EML transmitter
- Multi-rate for Ethernet & Fiber Channel
- Transmission distance up to 40km (SM Fiber)
- Low power consumption
- Wide case operating temperature range
- Compliant with SFP+ Electrical MSA SFF-8431
- Compliant with SFP+ Mechanical MSA SFF-8432
- Compliant with 10GBASE-E specifications
- Digital Diagnostics Monitoring (DDM) through Serial Interface comply with SFF-8472, Rev. 10.4
- RoHS 6/6 Compliant
- Laser Class 1 IEC/CDRH compliant

Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Storage Temperature Range	T_{ST}	- 40	+ 85	°C
Operating Case Temperature ¹	"Commercial"	- 5	+ 70	°C
	"Extended"	- 5	+ 85	
	"Industrial"	- 40	+ 85	
Operating Relative Humidity ²	RH	0	85	%
Supply Voltage Range	V_{CC}	- 0.5	+ 3.6	V

¹ Measured on top side of SFP+ module at the front center vent hole of the cage.

² Non condensing

Transmitter Performance Characteristics (Over Operating Case Temperature. $V_{CC} = 3.13$ to $3.47V$)

Parameter	Symbol	Minimum	Typical	Maximum	Units
Data Rate	B	8.0	-	11.3	Gb/s
Center Wavelength	λ_c	See Ordering Information Table			nm
Center Wavelength Tolerance	-	-6.5	-	+6.5	nm
Spectral Width (-20dB)	$\Delta\lambda_{20}$	-	-	1.0	nm
Average Optical Output Power ¹	P_{Avg}	-1	-	+4	dBm
Extinction Ratio	ER	4.5	-	-	dB
Relative Intensity Noise in OMA	$RIN_{21,OMA}$	-	-	-128	dB/Hz
Side Mode Suppression Ratio	$SMSR$	30	-	-	dB
Optical Return Loss Tolerance	-	-	-	-21	dB
Transmitter and Dispersion Penalty @ 10.3125Gb/s	TDP	-	-	3	dB
Optical Output Eye	<i>Compliant with IEEE 802.3ae</i>				

¹ Average power figures are informative only, per IEEE 802.3ae.

Receiver Performance Characteristics (Over Operating Case Temperature. $V_{CC} = 3.13$ to $3.47V$)

Parameter	Symbol	Minimum	Typical	Maximum	Units
Data Rate	B	8.0	-	11.3	Gb/s
Wavelength of Operation	λ	1450	-	1620	nm
Receiver Sensitivity @ 10.3125Gb/s ¹	P_{min}	-	-	-14.0	dBm
Maximum Input Power (10 ⁻¹² BER)	P_{max}	-1	-	-	dBm
Receiver Reflectance	-	-	-	-26	dB
LOS Hysteresis	-	0.5	-	-	dB
LOS Thresholds	Increasing Light Input	P_{los+}	-	-16	dBm
	Decreasing Light Input	P_{los-}	-30	-	

¹ Specified with BER < 1x10⁻¹² and PRBS 2³¹-1.

Note: The specified characteristics are met within the recommended range of operation. Unless otherwise noted typical data are quoted at nominal voltage and +25°C ambient temperature.

Laser Safety:

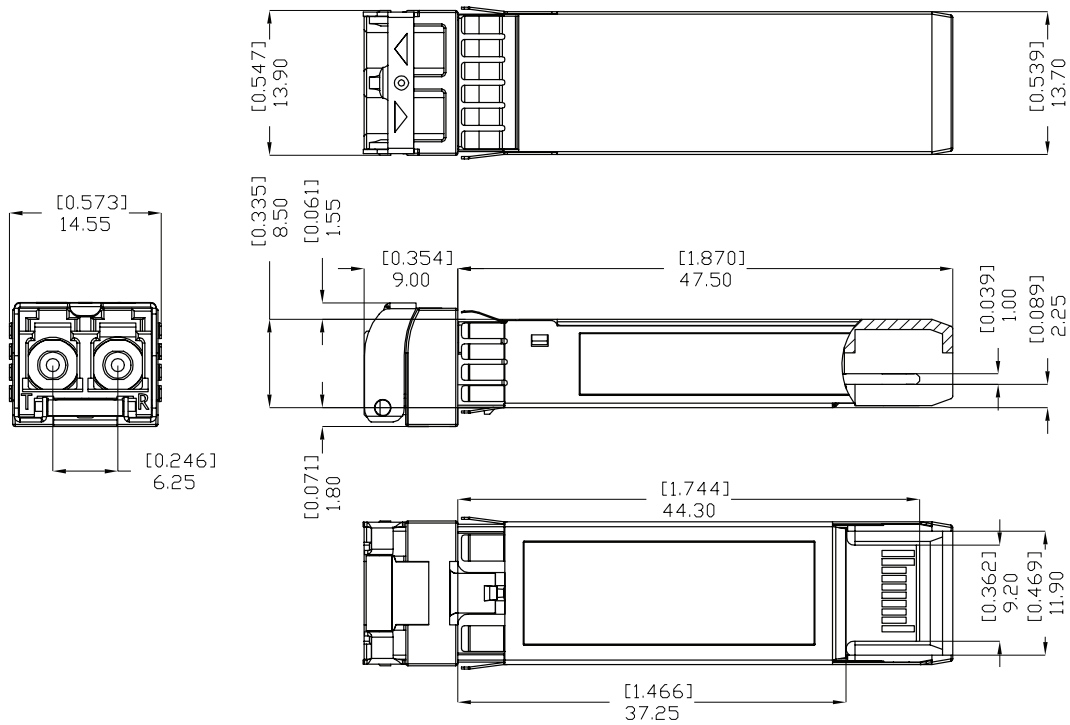
All transceivers are Class 1 Laser products per FDA/CDRH and IEC-60825 standards. They must be operated under specified operating conditions.



Oplink Communications, Inc.

This product complies with
21 CFR 1040.10 and 1040.11
Meets Class 1 Laser Safety Requirements

Package Outline



Dimensions in [inches] mm
 Millimeters are the primary units.
 Tolerances are in accordance with
 SFF-8432 Rev.5

Ordering Information

Oplink can provide a remarkable range of customized optical solutions. For detail, please contact Oplink’s Sales and Marketing for your requirements and ordering information (510) 933-7200 or Sales@oplink.com.

Model Name	Operating Temperature		Center Wavelength	Distance
	Min	Max		
TPC1XGJERC00010G	-5°C	+70°C	1471nm	40km
TPC1XGJERC00020G	-5°C	+70°C	1491nm	40km
TPC1XGJERC00030G	-5°C	+70°C	1511nm	40km
TPC1XGJERC00040G	-5°C	+70°C	1531nm	40km
TPC1XGJERC00050G	-5°C	+70°C	1551nm	40km
TPC1XGJERC00060G	-5°C	+70°C	1571nm	40km
TPC1XGJERC00070G	-5°C	+70°C	1591nm	40km
TPC1XGJERC00080G	-5°C	+70°C	1611nm	40km

Model Name	Operating Temperature		Center Wavelength	Distance
TPC1XGJERE00010G	- 5°C to +85°C	Extended	1471nm	40km
TPC1XGJERE00020G	- 5°C to +85°C	Extended	1491nm	40km
TPC1XGJERE00030G	- 5°C to +85°C	Extended	1511nm	40km
TPC1XGJERE00040G	- 5°C to +85°C	Extended	1531nm	40km
TPC1XGJERE00050G	- 5°C to +85°C	Extended	1551nm	40km
TPC1XGJERE00060G	- 5°C to +85°C	Extended	1571nm	40km
TPC1XGJERE00070G	- 5°C to +85°C	Extended	1591nm	40km
TPC1XGJERE00080G	- 5°C to +85°C	Extended	1611nm	40km
TPC1XGJERI00010G	- 40°C to +85°C	Industrial	1471nm	40km
TPC1XGJERI00020G	- 40°C to +85°C	Industrial	1491nm	40km
TPC1XGJERI00030G	- 40°C to +85°C	Industrial	1511nm	40km
TPC1XGJERI00040G	- 40°C to +85°C	Industrial	1531nm	40km
TPC1XGJERI00050G	- 40°C to +85°C	Industrial	1551nm	40km
TPC1XGJERI00060G	- 40°C to +85°C	Industrial	1571nm	40km
TPC1XGJERI00070G	- 40°C to +85°C	Industrial	1591nm	40km
TPC1XGJERI00080G	- 40°C to +85°C	Industrial	1611nm	40km