

PART NUMBER*	DESCRIPTION
TX004 - SFF	4 Gbps Small Form Factor Dual Fiber Optic Transmitter

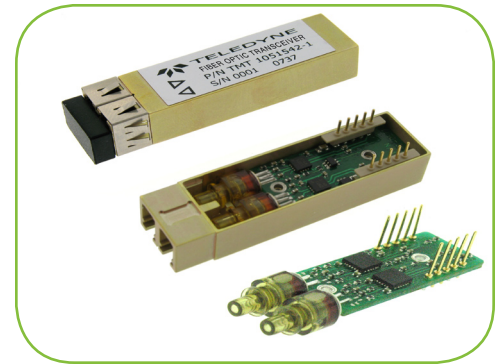
DESCRIPTION

TX004 - SFF is a dual channel fiber optic transmitter specially developed for high data rate communication used in environmentally rugged applications. This is accomplished using High Reliability Industrial Parts (HRIP). This product complies with the 2x5 standard package defined by the Small Form Factor (SFF) Multi-Source Agreement (MSA). In addition to the common properties offered by existing commercial products, TX004 - SFF provides the following three unique features which are particularly adapted for high performance utilization:

1. Extended operational temperature range from -40°C to +95°C;
2. Conformal coating for moisture resistance; and
3. Able to withstand shock and vibration testing for harsh environmental usage.

FEATURES

- Dual channel fiber optic transmitter operating at up to 4.25 GBPS
- 850 nm Oxide VCSEL laser with lens integrated in the optical head
- MSA-compliant 2 x 5 pin SFF footprint adaptable to customer's special application
- Transmitter Disable function
- Single 3.3 V power supply and low nominal power consumption
- Standard multi-mode LC receptacle and hot pluggable
- All-metal housing for superior EMI performance
- Enhanced enclosure structure for superior shock and vibration performance per RTCA/DO-160E
- Parylene type C conformal coating (MIL-I-46058C) for protection against contamination, corrosion, deterioration and physical damage
- Operating temperature range from -40°C to +95°C



BETTER THAN INDUSTRY STANDARDS

1. Extended operational temperature range from -40°C to +95°C;
2. Conformal coating for moisture resistance; and
3. Withstands shock and vibration testing for harsh environmental usage.

CUSTOMIZABLE OPTIONS

- Higher Data Rates
- Form Factor, Size, and Interface
- Hermetic
- Pigtail Connector
- Screening and Testing

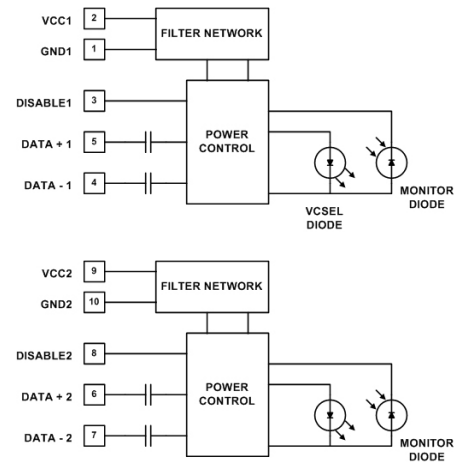
TRANSMITTER ELECTRICAL / OPTICAL SPECIFICATIONS

Parameters	Symbol	Min	Typ	Max	Units	Notes
Operating Temperature	T _{op}	-40		+95	°C	
Supply Voltage	V _{cc}	3.0	3.3	3.6	V	
Supply Current (per channel)	I _{cc}		75		mA	
Input Differential Impedance	Z _{diff}	90	100	120	Ω	1
Data Rate	BR	0.05		4.25	GBPS	
Single Ended Data Input Swing	V _{in, PP}	250		1200	mV	
Transmitter Disable Voltage	V _D	V _{cc} -1.3		V _{cc}	V	
Transmitter Enable Voltage	V _{EN}	V _{ee}		V _{ee} +0.8	V	2
Bit Error Rate	BER			10 ⁻¹²		3
Optical Output Power	P _{out}	-7.0	-3.7	-2.0	mW	4, 7
Optical Wavelength	λ	830	850	860	nm	
Optical Modulation Amplitude	OMA		650		μW	5, 8
Total Jitter Contribution	TX ΔDJ		30		ps	6, 8
Extinction Ratio	ER		8.0		dB	

NOTES

- AC coupled.
- Or open circuit
- Tested with PRBS 2⁷ - 1 test pattern
- Class 1 Laser Safety per FDA/CDRH, EN (IEC) 60825 laser safety regulations
- Equivalent extinction ratio specification for Fiber Channel. Allows smaller ER at higher average power
- If measured with DJ-free data input signal, 10⁻¹² BER. In actual application, output TJ will be given by:
 $TJ_{out} = DJ_{in} + \Delta DJ + \sqrt{(TJ_{in} - DJ_{in})^2 + (\Delta TJ - \Delta DJ)^2}$
- Specifications are for standard 50 micrometer or 62.5 micrometer fiber multimode fiber
- @ 3.1 Gbps

**FIGURE 1:
TRANSMITTER BLOCK DIAGRAM**

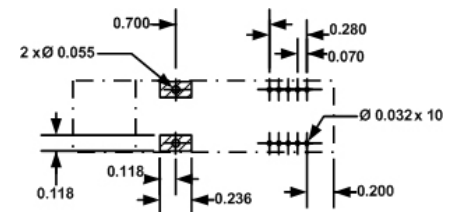
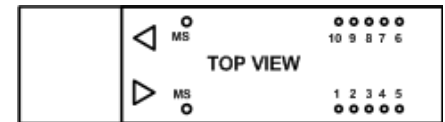


TRANSMITTER MECHANICAL SPECIFICATIONS

Pin	Description	Notes
MS	Mounting Studs are for mechanical attachment.	
1	Transmitter 1 Ground	
2	Transmitter 1 Vcc	
3	Transmitter 1 Disable	
4	Transmitter 1 DATA NOT input	(AC coupled)
5	Transmitter 1 DATA input	(AC coupled)
6	Transmitter 2 DATA input	(AC coupled)
7	Transmitter 2 DATA NOT input	(AC coupled)
8	Transmitter 2 Disable	
9	Transmitter 2 Vcc	
10	Transmitter 1 Ground	

**FIGURE 2:
MECHANICAL CONFIGURATION**

TX004 - SFF DUAL TRANSMITTER COMPLIES WITH THE STANDARD DIMENSIONS DEFINED BY THE SMALL FORM FACTOR MULTI-SOURCE AGREEMENT (MSA)



NOTES

- RECOMMENDED CIRCUIT BOARD LAYOUT.
- SHADED AREAS ARE RESERVED FOR MOUNTING STUDS
- UNITS ARE IN INCHES.

ABSOLUTE MINIMUM AND MAXIMUM RATINGS

Parameters	Symbol	Min	Max	Units
Supply Voltage	V _{cc}	-0.5	4.0	V
Total Module Power Dissipation	P _{diss}		1.0	W
Relative Humidity	RH	0	90	%
Storage Temperature	T _s	-45	+ 110	°C
Lead Soldering Temperature / Time	T _h		260/10	°C / s