

PART NUMBER *	DESCRIPTION
2307052-x TX	Broadband Micro Form Factor (MFF) Fiber Optic Transmitter (100 Mbps to 4.25 Gbps)
2307042-x RX	Broadband Micro Form Factor (MFF) Fiber Optic Receiver (100 Mbps to 4.25 Gbps)

\*The -x suffix designates the fiber optic connector type

Teledyne's family of optical communication devices provides reliability when it is needed the most. Our Micro Form Factor (MFF) Fiber Optic Transmitters and Receivers are ideal for harsh environment networking and critical communication applications requiring high data rates, in a very lightweight, low profile form factor.

#### PRODUCT DESCRIPTION

The 2307052-1 TX and 2307042-1 RX are miniaturized fiber optic transmitters and receivers for data communication applications in the high reliability industrial, aviation and military market segments. These devices are intended for the physical layer of the data link performing the E/O and O/E conversions.

#### PERFORMANCE FEATURES

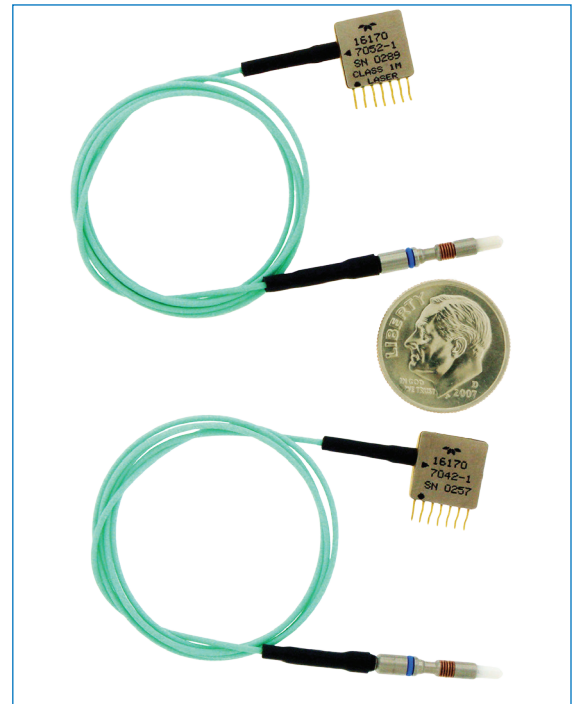
- Broadband performance range of 100 Mbps up to 4.25 Gbps
- Operating temperature range from -40°C to +95°C
- Withstands shock and vibration in harsh environments
- Single 3.3 V power supply and low nominal power consumption
- Transmitter disable function
- Receiver signal detect monitor
- Receiver GaAs PIN photodetector

#### PACKAGE AND FIBER FEATURES

- Small package size .38 x .38 x .1"
- Rugged Kovar housing
- Readily scalable for higher data rate requirements
- Easily arrayed for multi-channel applications
- Moisture resistant
- Pigtailed with MM fiber cable (Corning® ClearCurve® OM3 for improved bend performance)
- Flexible terminus with standard fiber connectors or customer specified termination

*For custom high-reliability fiber optic devices for the military, aerospace and space markets, we offer innovative design capabilities, optical/microwave modeling, production and testing.*

*With our extensive expertise in beam profiling and fiber lensing, processing of fiber arrays, electronics to optical measurement and testing, as well as optoelectronics to microwave integration, we provide a complete optical communications solution.*



#### COMPATIBLE WITH NETWORK PROTOCOLS:

- Fibre Channel – 1GFC, 2GFC, 4GFC
- Fast Ethernet – 100 Mbps (100 Base-SX)
- Gigabit Ethernet – 1000 Mbps (1000 Base-SX)
- sFPDP – 1.0625 Gbps, 2.125 Gbps, 2.5 Gbps

#### FACILITY ACCREDITATIONS:

- AS9100, ISO 9001:2008
- MIL-PRF-38534, Class H and K
- DoD Microelectronics Trusted Source for Microelectronics Packaging, Assembly and Test Services

Dash No -x	FO Connector Type
-1	ARINC 801
-2	ST/PC
-3	FC
-4	LC
-5	M29504/15-4181C

Alternate fiber optic connectors are available upon customer request, contact [microelectronics@teledyne.com](mailto:microelectronics@teledyne.com) for a quotation

**MFF ELECTRICAL/OPTICAL SPECIFICATIONS**

Parameters	Symbol	TRANSMITTER			RECEIVER			Units	Notes
		Min	Typ	Max	Min	Typ	Max		
Operating Temperature	T <sub>op</sub>	-40		+95	-40		+95	°C	
Supply Voltage	V <sub>cc</sub>	3.0	3.3	3.6	3.0	3.3	3.6	V	
Supply Current (per channel)	I <sub>cc</sub>		55	100		78	100	mA	
Input Differential Impedance	Z <sub>diff</sub>	90	100	120		NA		Ω	1
Data Rate	BR	0.100		4.25	0.100		4.25	GBPS	
Single Ended Data Input Swing	V <sub>in,PP</sub>	250		1200		NA		mV	
Single Ended Data Output Swing	V <sub>out,PP</sub>		NA		300	375	600	mV	
Transmitter Disable Voltage	V <sub>D</sub>	V <sub>cc</sub> -1.3		V <sub>cc</sub>		NA		V	
Transmitter Enable Voltage	V <sub>EN</sub>	0		+0.8		NA		V	2
Signal Detect Assert	SD		NA			-17.5	-16	dBm	
Signal Detect De-Assert	SD		NA		-31	-19.5		dBm	
Bit Error Rate	BER			10 <sup>-12</sup>			10 <sup>-12</sup>		3
Optical Output Power	P <sub>out</sub>	-4.0	-2.0	0		NA		dBm	4, 7
Optical Wavelength	λ	830	850	860		NA		nm	
Optical Modulation Amplitude	OMA	414	650	1400		NA		μW	5, 8
Receiver Sensitivity	R <sub>Sens</sub>		NA			-18	-16	dBm	3
Total Jitter Contribution	ΔDJ		20	40		30	50	ps	6, 8
Extinction Ratio	ER	5.0	8.0	12.0		NA		dB	3

**NOTES:**

1. AC coupled
2. Or open circuit
3. Tested with PRBS 2<sup>7</sup> - 1 test pattern
4. Class I Laser Safety per FDA/CDRH, EN (IEC) 60825 laser safety regulations
5. Equivalent extinction ratio specification for Fiber Channel. Allows smaller ER at higher average power
6. If measured with DJ-free data input signal, 10<sup>-12</sup> BER. In actual application, output TJ will be given by:  

$$TJ_{out} = DJ_{in} + \Delta DJ + \sqrt{[(TJ_{in} - DJ_{in})^2 + (\Delta TJ - \Delta DJ)^2]}$$
7. Specifications are for standard 50 micrometer or 62.5 micrometer fiber multimode fiber
8. @ 4.25 Gbps

**ENVIRONMENTAL QUALIFICATION**

Teledyne's MFF Fiber Optic products are screened and qualified to our High Reliability Industrial Part (HRIP) Plan that is comparable to the RTCA DO-160 and MIL-STD-883 standards:

- Temperature cycling from -55°C to +125°C for 110 cycles
- Mechanical shock of 5 shocks in positive and negative direction for each X, Y, and Z axis (1500g level peak, 0.5 ms pulse duration, half-sine pulse)
- Variable frequency vibration from 20 to 2,000 Hz with a peak acceleration of 20g's
- Moisture resistance testing for 10 continuous cycles at >90% humidity
- Steady state life test biased for 1000 hours at +95°C

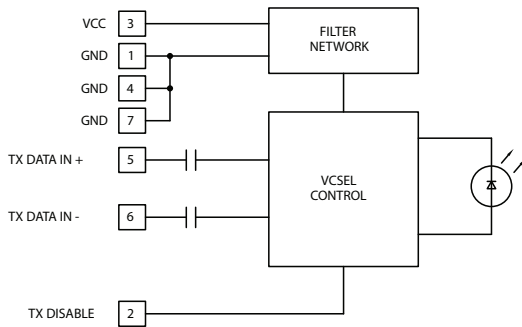
**PIN SPECIFICATIONS**

Pin	Transmitter	Receiver	Notes
1	Ground	Ground	
2	TX Disable	RX Signal Detect	TTL/CMOS
3	Vcc	Vcc	
4	Ground	Ground	
5	TX Data Input +	RX Data Output +	AC Coupled
6	TX Data Input -	RX Data Output -	AC Coupled
7	Ground	Ground	

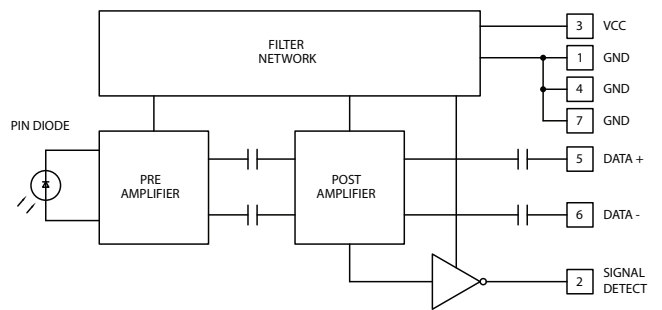
**ABSOLUTE MINIMUM AND MAXIMUM RATINGS**

Parameters	Symbol	Min	Max	Units
Supply Voltage	V <sub>cc</sub>	-0.5	4.0	V
Total Module Power Dissipation	P <sub>diss</sub>		1.0	W
Relative Humidity	RH	0	90	%
Storage Temperature	T <sub>s</sub>	-55	+ 110	°C
Lead Soldering Temperature / Time	T <sub>h</sub>		260/10	°C / s

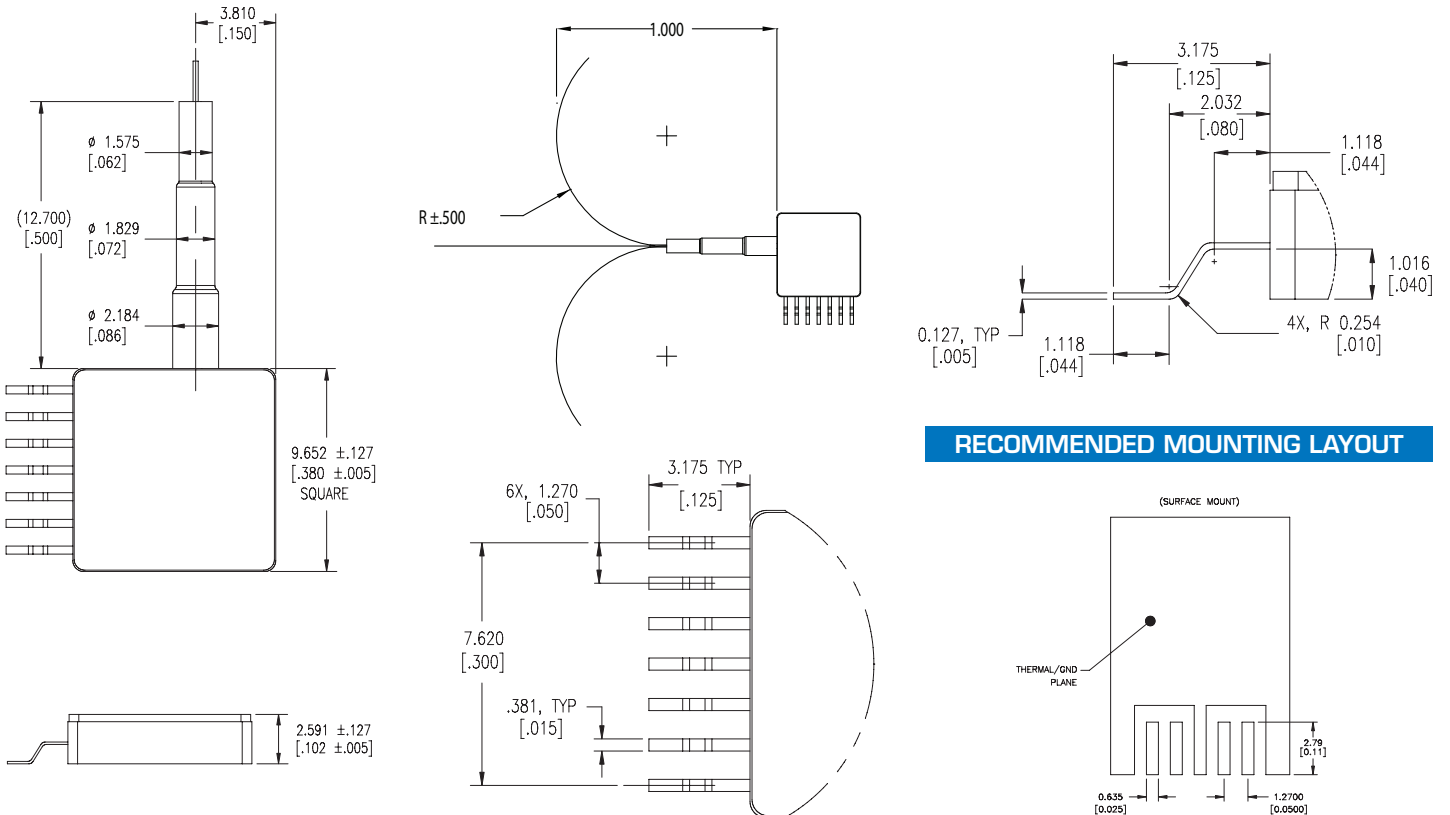
**TRANSMITTER BLOCK DIAGRAM**



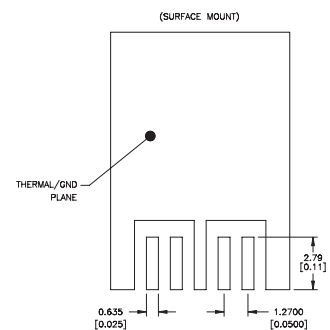
**RECEIVER BLOCK DIAGRAM**



**MECHANICAL DIMENSIONS**



**RECOMMENDED MOUNTING LAYOUT**



**NOTES:**

- Dimensions are in millimeters, with inches in brackets
- PIN material is Brass alloy with 10 micron inch Gold over 100 micron inch Nickel

# Teledyne Sales Contacts

## NORTH AMERICA

### Western U.S.

Harry Kellzi  
Tel: 310.990.9178  
Email: [harry.kellzi@teledyne.com](mailto:harry.kellzi@teledyne.com)

### Southeastern U.S.

Shannon Princiotta  
Tel: 310.869.6543  
Email: [shannon.princiotta@teledyne.com](mailto:shannon.princiotta@teledyne.com)

### Eastern U.S.

Jim Murray  
Tel: 931.842.0018  
Email: [jim.murray@teledyne.com](mailto:jim.murray@teledyne.com)

## EUROPE

Olivier Dilun  
Tel: 33 (0) 1 6405 8118  
Email: [olivier.dilun@teledyne.com](mailto:olivier.dilun@teledyne.com)

## ASIA

Harry Kellzi  
Tel: 310.990.9178  
Email: [harry.kellzi@teledyne.com](mailto:harry.kellzi@teledyne.com)



**TELEDYNE**  
MICROELECTRONIC TECHNOLOGIES  
Everywhereyoulook™

1425 Higgs Road, Lewisburg, Tennessee 37091 USA  
931.359.4531 | [microelectronics@teledyne.com](mailto:microelectronics@teledyne.com) | [www.teledynemicro.com](http://www.teledynemicro.com)