1310/1550nm Digital Transceiver

(bidirectional link over a single fiber, DFB laser &PIN detector, WDM diplexer, 1, 2, 5, 10 GHz)

DATASHEET

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This series of Digital Transceivers is designed to provide an optical communication link between two points via a single strand of fiber with a data rate of up to 10GHz. Each transceiver consists of a DFB laser transmitter and a PIN detector receiver pair. They are available in wavelengths of 1310nm, 1490nm, and 1550nm, offering versatile wavelength division multiplexing (WDM) capability. For instance, bidirectional communication can be established using a single fiber link by employing two different wavelength transceivers along with matching WDM diplexer cable adaptors. One common setup involves pairing a 1310nm laser with a 1550nm detector at one end combined using a WDM diplexer, and a 1550nm laser with a 1310nm detector at the other end combined by a diplexer. Another application involves transmitting three communication channels through a single fiber link by combining three transceivers of different wavelengths with our WDM cable adaptors.

Features

- MQW DFB LD
- Low Threshold Current
- With isolator
- High Output Power
- Built-in InGaAsP Monitor PD
- Wide Temperature Range Operation

Applications

- Wireless GSM/CDMA
- Fiber-Optical Repeaters GSM/CDMA

Specifications

Transmitter Parameter (2GHz)	Min	Typical	Max	Unit
Central Wavelength	1310	1495	1550	nm
Wavelength Bandwidth		30		nm
Threshold Current (CW, 25°C)		10	15	mA
Spectral Width		0.1		nm
Output Power	4			dBm
RF Transmitter Input Power	-10		+10	dBm
Operating Voltage		1.1	1.5	V
Rise/ Fall Time		0.3	0.7	ns
Monitor Current	0.1	0.25		mA
Side Mode Suppression Ratio	30	40		dB
Optical Isolation (25°C)	30			dB
Tracking Error	-1.0		1.0	dB
Modulation Bandwidth (Po=2mW)		2.5		GHz
Relative Intensity Noise		-135		dBm/Hz
Third-Order Intermodulation		-60		dBc
Gian (@2.5GHz)	-15		-11	dB
Reverse Voltage			2	V
Operating Temperature	-40		+85	°C
Storage Temperature	-40		+100	°C
Soldering Temperature/Time			260/10	°C/s

Receiver Parameter (2GHz)	Min	Typical	Max	Unit
Central Wavelength	900		1600	nm
Responsivity [2]	0.7	0.9		A/W
Input Power	-45		17	dBm
PDL [3]		0.03	0.05	dB
Polarization extinction ratio [4]	18	23		dB
Dark Current at 23°C		0.4	1.0	nA
Capacitance		0.2	0.9	pF
Reverse Voltage			5	V
Rise/Fall Time		0.3		ns
Cut-Off Frequency		2		GHz
Operating Temperature	-5		75	°C
Storage Temperature	-40		85	°C

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

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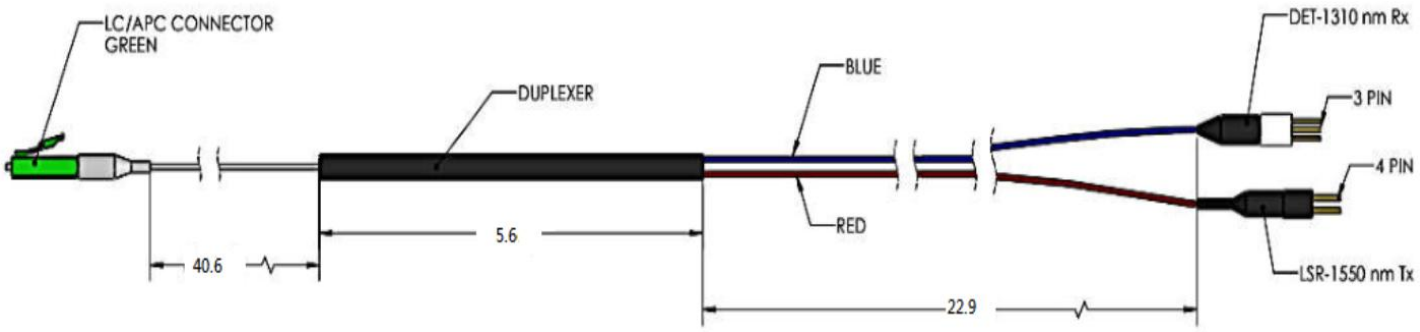
Mechanical Dimensions (Unit: cm)



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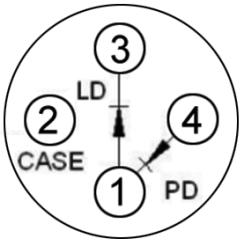
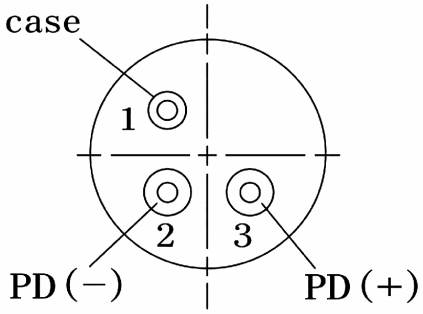
Package and Pinout (Bottom View)

Laser



Pin 1: Laser Anode/Monitor Diode Cathode
Pin 2 : Case Ground
Pin 3: Laser Cathode
Pin 4: Monitor Diode Anode

Detector



Ordering Information (Part Number) System

	☐	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Transmitter Wavelength**	**Receiver * Wavelength**	**Speed**	**Driver**	**Package**	**Fiber Type**	**Fiber Buffer**	**Fiber Length ****	**Connector [1]**
DLIN-	1310nm = 3 1550nm = 5 1490nm = 4 Special = 0	1310nm = 3 1550nm = 5 1490nm = 4 Special = 0	1GHz = 1 2GHz = 2 5GHz = 5 10GHz = A	No = 1 Yes = 2	Standard = 1 Special = 0	SM28 = 1 60.2/125 = 6 50/125 = 5 Special = 0	0.9mm Tube = 9 3mm Tube = 3 Special = 0	Standard = 1 0.5m = 2 1.0 m = 3 1.5 m = 5 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 LC/APC = 8 LC/UPC = U Special = 0

* Receiver wavelength needs to be different than the transmitter wavelength. Matching Duplexer is included.
** Total Transceiver Length
[1]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

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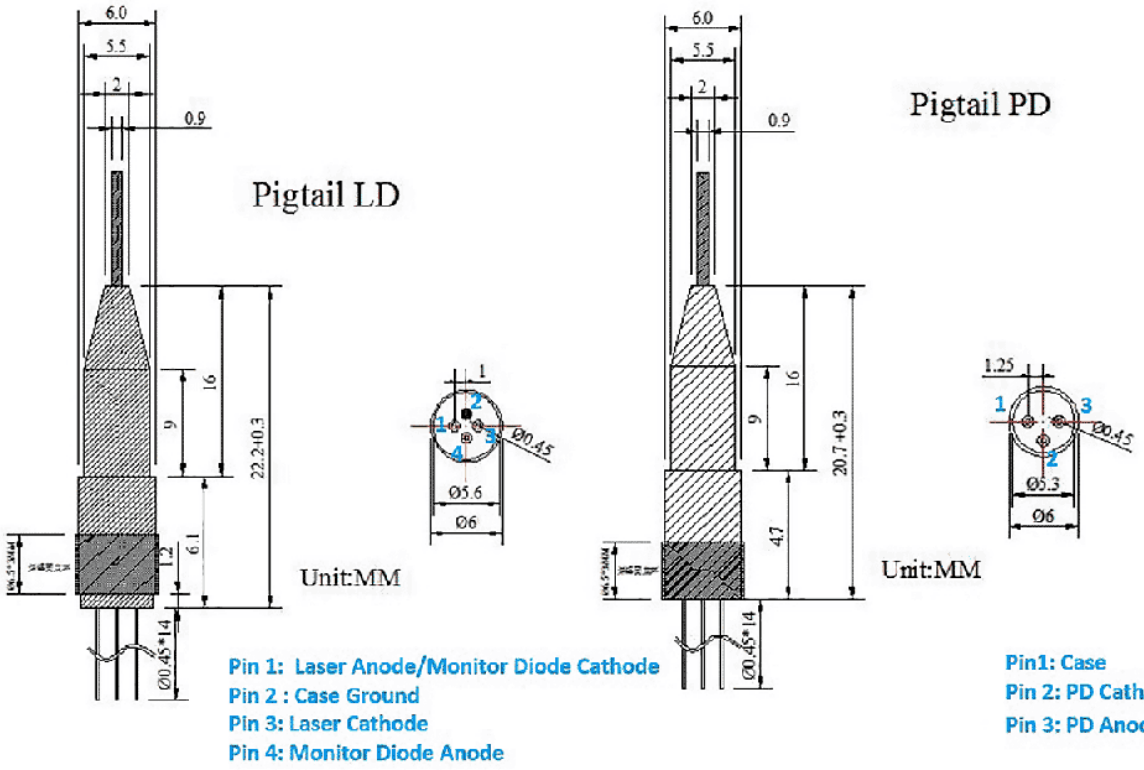

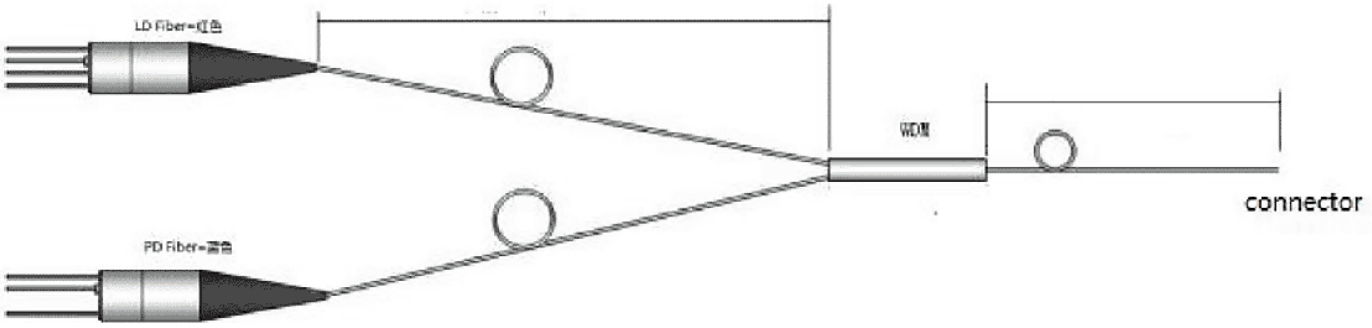

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Application Notes

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

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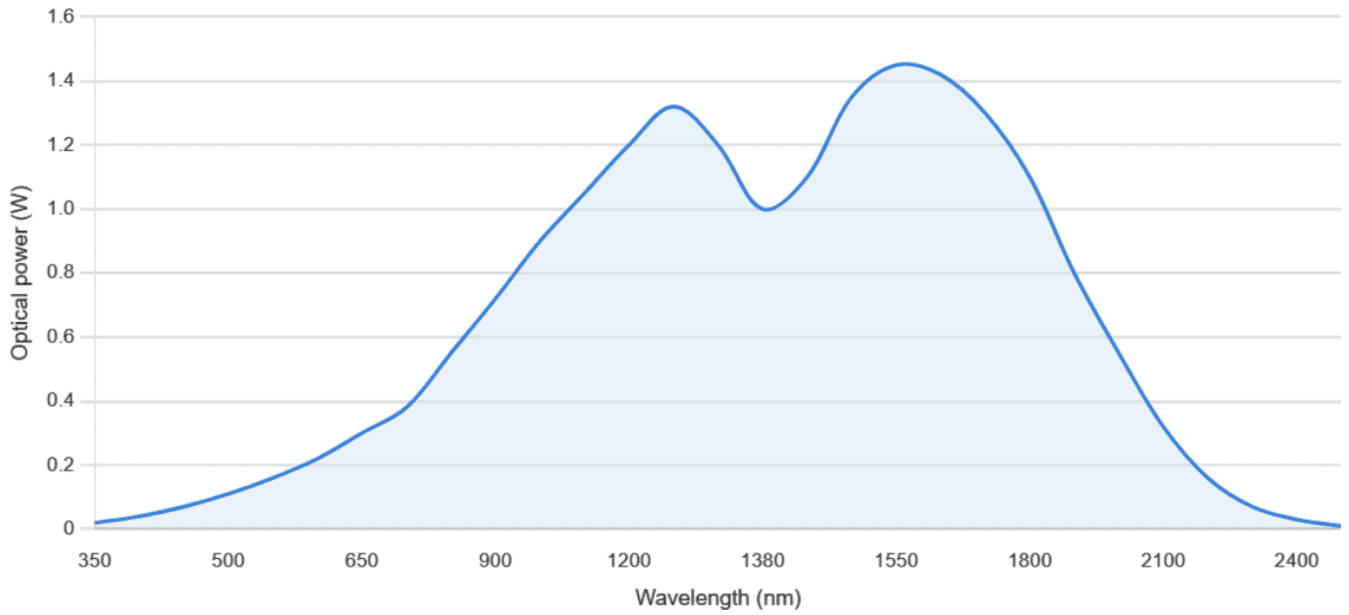
Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength



Single mode fiber optical power is limited by nonlinear effects in addition to absorption that increase loss and generate heat. The curve shows the approximate safe CW power envelope for standard single-mode fiber. Actual limits depend on fiber design, core size, length, and laser characteristics. Specialty fibers can significantly increase the power limit.

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