Fiber Optical Analog Transmitter/ Receiver

10 – 2600MHz, RF-over-Fiber Tx/Rx Pair with RF Fiber Break

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The RFOF Transmitter (Tx) and Receiver (Rx) pair is designed to transmit analog or digital RF signals over optical fiber, delivering a secure, low-loss, high-fidelity link between two locations. Optimized for high-security and critical infrastructure applications, the system ensures signal integrity across a broad frequency range of 10MHz to 2.7 GHz, with an exceptionally flat frequency response for analog signal transmission formats. An optional RF Fiber Break configuration supports unidirectional RF transmission over a single fiber, blocking return-path signals to enable true one-way communication. This feature enhances security and isolation, making it suitable for military-grade deployments. The system is plug-and-play, featuring compact, lightweight enclosures with wall-pluggable power supplies for rapid deployment and minimal setup. An optical power warning function is available on both the Tx and Rx units. The warning signal outputs have two formats of RS485 with a DB9 connection and PNP format: when a warning is triggered, +5V is actively sourced (current flows out) on the two designated output pins, allowing easy interface with external alarms or monitoring systems.

Features

- Support 10-2800MHz Bandwidth
- Uncooled 1310 or 1550nm DFB Laser diode
- Single Fiber Bi-Directional Operation
- Up to 8 Optical BiDi Ports in Master
- WDM Module Inside
- Very good isolation between Tx and Rx
- High Dynamic Range, Low Noise
- Monitoring and Alarm Capability
- Signal level (MGA) Manual Gain Adjustment

Applications

- FTTH (Fiber To The Home) Networks
- Tetra, Walkie Talkie, GPS Indoor Coverage
- Bi-Directional Amplifiers, Distributed Antenna Systems

Specifications

Parameter	Min	Typical	Max	Unit
Master Optical Wavelength		1550 ± 10		nm
Master Optical Power		3 dBm [M1]; -3 dBm [M4]; -5 dBm [M8]		dBm
Slave Optical Wavelength		1310 ± 10		nm
Slave Optical Power	3			dBm
Maximum Input Power		+7		dBm
Average Rx Sensitivity	-20			dBm
Optical Isolation	35			dB
Connector Type		FC/APC		
Frequency Range	600		2800	MHz
Flatness @ any 100 MHz			+1	dB
Input/Output Impedance		50		Ω
Input/Output VSWR			1.5 : 1	
Maximum Input without Damage		+10		dB
Gain Control Adjusting	-15		+10	dBm
RF Isolation	60			dB
Link Gain		0 ± 10		dB
Third Order Modulation Output			-60	dBc
Noise Figure			-135	dBm/Hz
RF Connector		SMA-Female		
Power Supply Connector		DB9 RS-232/485		
RS232 Transmission Speed		4.8 - 19.2		kbit/s
Operating Current		+12 VDC @ 300 mA		
Operating Temperature Range	-10		70	°C
Storage Temperature Range	-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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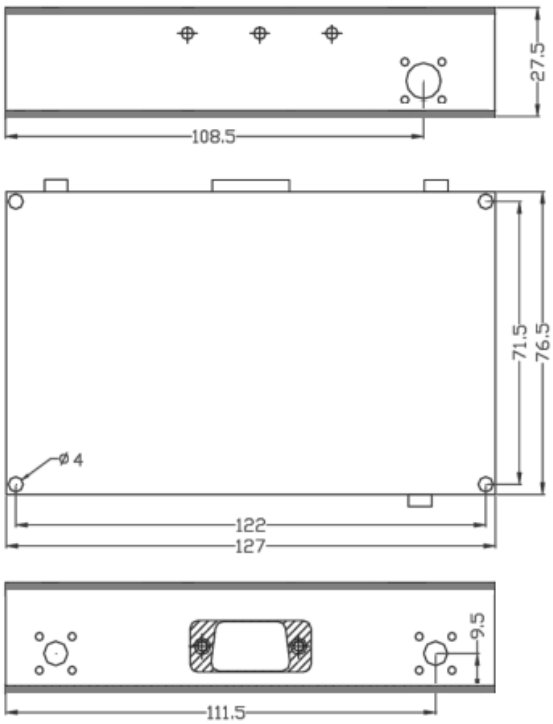
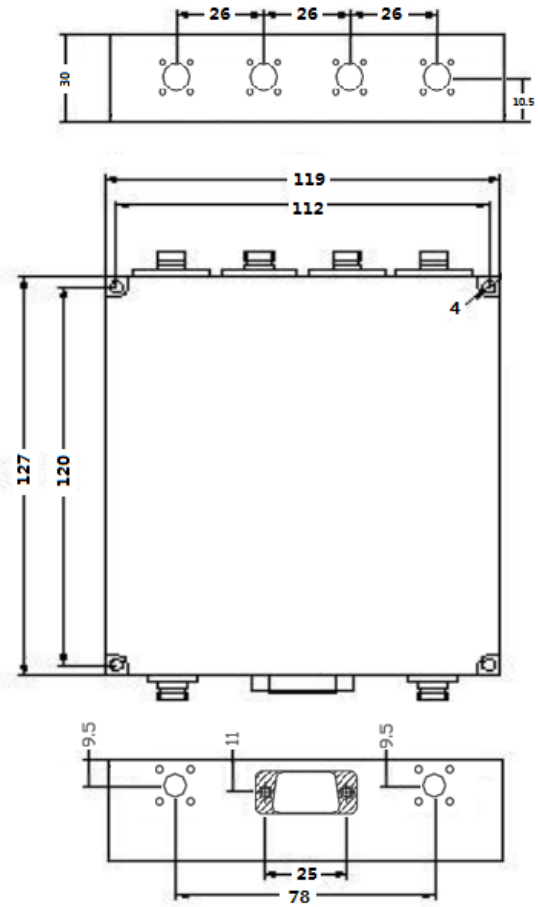
Mechanical Dimensions (mm)

TPRF-2000-M Dimensions 127 x 76.5 x 27.5 mm
weigh 280 grams



TPRF-2000-M4 Dimensions 119 x 127 x 30 mm
weigh 550 grams



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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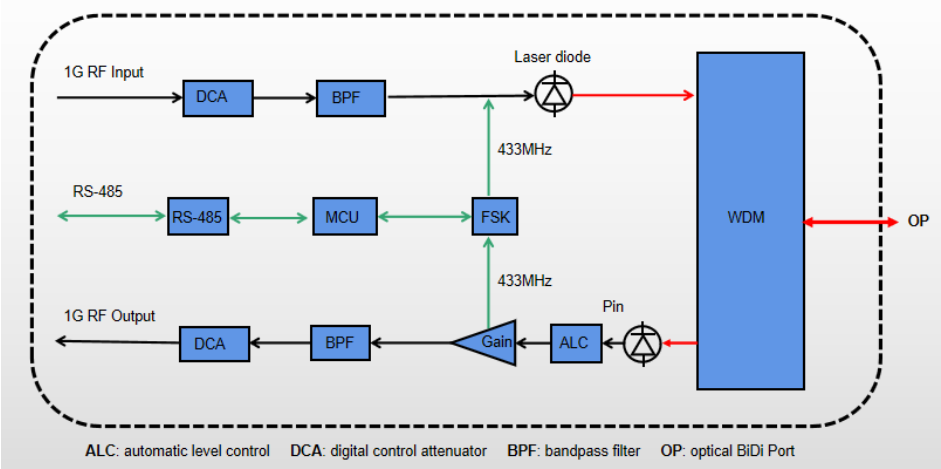
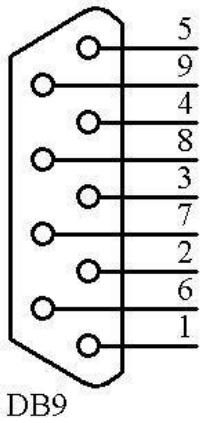
Function Diagram



Electrical Interface



Pin	Descriptions	Pin Function
1	NC	
2	GND	Ground
3	VCC	+12V
4	TXD1	RS232/485 DATA IN
5	RXD1	RS232/485 DATA OUT
6	RXD0	RS232/485 DATA OUT
7	LD ALM	TTL Output, Hight for Alarm
8	TXD0	RS232/485 DATA IN
9	PD ALM	TTL Output, Hight for Alarm

(Frequency Shift Keying) FSK Protocol For Digital Communication

- FSK Rate: 9.6k/bps
- Encoding: Sync Manchester encoding
- Carrier Frequency: 433MHz or 866MHz
- Data interfaces: RS232 or RS485
- Modulation Frequency: ±32kHz
- RF Receive Sensitivity: ≤-90dBm
- Optical Receive Sensitivity:: ≤-15dBm
- Error Frame Rate: ≤0.001

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Ordering Information

	☐☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Frequency**	**Power Alarm ***	**Wavelength**	**TX/RX**	**Package**	**Directional ***	**RF Fiber Breaker**	**Fiber Connector**
RFOF-	2.7GHz = 27 Special = 00	Non = 1 RS485 = 4 PNP = P Special = 0	1550nm = 1 1310nm = 3 1490nm = 4 Special = 0	Receiver = 1 Transmitter=2 Pair = 3	Module = 1 Rack = 2 Special = 0	Onedirectional = 1 Bidirectional = 2	Non = 1 Yes = 2	SC/UPC = 4 FC/APC = 2 FC/UPC = 3 SC/UPC = 5 LC/APC = A LC/UPC = U Special = 0

Note:

* Bidirectional means two-way communications via a single fiber link. The price is double since it comprises two pairs of transceivers and receivers with WDM (different wavelength) or circulator (same wavelength) cable jumpers.

Red marked -- Special order

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.