Fiber Optical Analog Transmitter/ Receiver

100Mhz – 3GHz, RF-over-Fiber Tx/Rx Pair with RF Fiber Break

DATASHEET

Return to the Webpage

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 100 MHz to 3 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 100-3000MHz 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

RoHS COMPLIANT

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
RF Transmitter Input Power	-10		+10	dBm
Average Rx Sensitivity	-20			dBm
Optical Isolation	35			dB
Connector Type		FC/APC		
Frequency Range	100		3000	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]:

Rev 06/25/26

P +1 781-935-1200 E sales@agiltron.com W www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

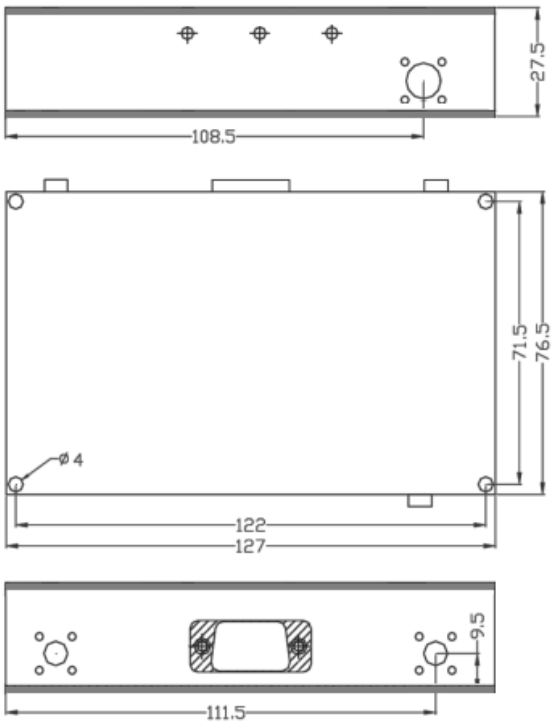
Fiber Optical Analog Transmitter/ Receiver

100Mhz – 3GHz, RF-over-Fiber Tx/Rx Pair with RF Fiber Break

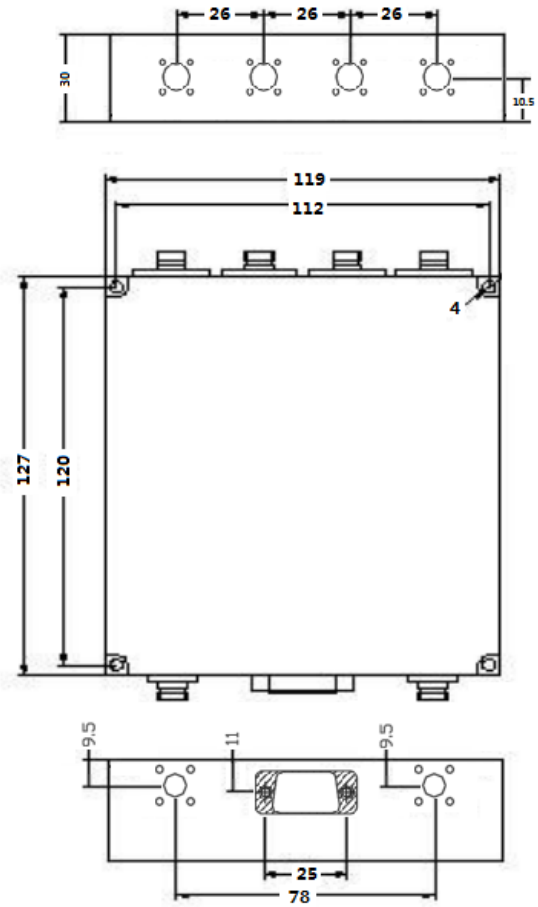
DATASHEET

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.

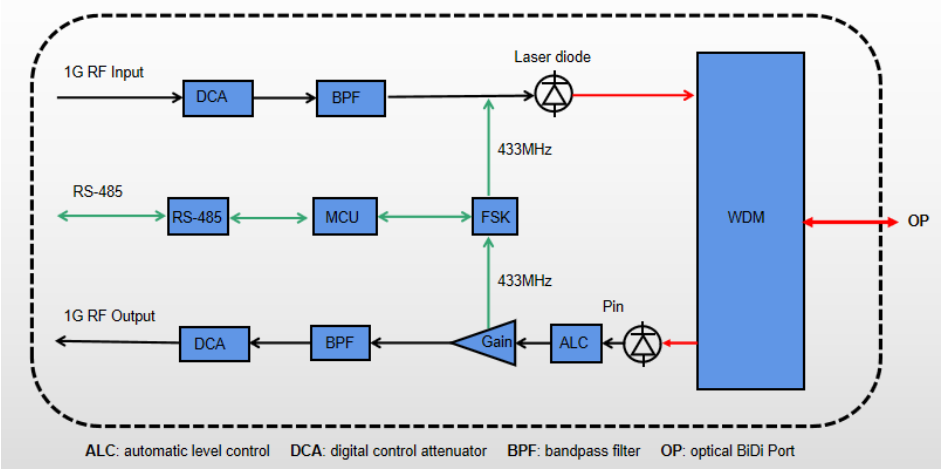
Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber Optical Analog Transmitter/ Receiver

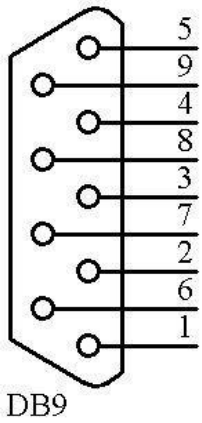
100Mhz – 3GHz, RF-over-Fiber Tx/Rx Pair with RF Fiber Break

DATASHEET

Function Diagram



Electrical Interface



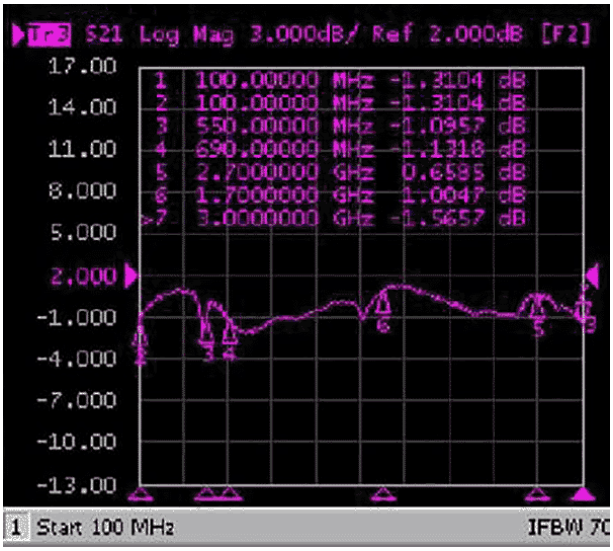
Pin	Descriptions	Pin Function
1	NC	
2	GND	Ground
3	VCC	+12V
4	TXD1	RS232/485 DATA IN
5	RXD1	RS232/485 DATA OUT
6	RXD0	RS232/485 DATA OUT
7	LD ALM	TTL Output, Hight for Alarm
8	TXD0	RS232/485 DATA IN
9	PD ALM	TTL Output, Hight for Alarm

(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

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

S21 Measurement



Operation Instructions

1. Connect the optical fiber input port on the receiver to the signal source.
2. Connect the RF output port on the receiver to the RF input port of the transmitter.
3. Connect the RF output port of the transmitter to the readout instrument.
4. Plug in the provided power supply to power the device. The LED will turn on (CW for the receiver, blinking for the transmitter).
5. The unit will operate with the performance specified in the test report.
6. If the device does not function as expected, contact us via the sales email. **Do not open the enclosure — doing so will invalidate the one-year warranty.**

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber Optical Analog Transmitter/ Receiver

100Mhz – 3GHz, RF-over-Fiber Tx/Rx Pair with RF Fiber Break

DATASHEET

Ordering Information (Part Number)

	☐	☐☐	☐	☐	☐	☐	☐	☐
Prefix	**Low Frequency**	**High Frequency**	**Wavelength**	**TX/RX**	**Package**	**Directional ***	**Alarm**	**Fiber Connector[1]**
RFOF-	600Mhz = 6 100Mhz = 1 Special = 0	2.7GHz = 27 3.0GHz = 30	1550nm = 1 1310nm = 3 1490nm = 4 Special = 0	Receiver = 1 Transmitter = 2 Pair = 3	Module = 1 Rack = 2 Special = 0	Unidirectional = 1 Bidirectional = 2	Non = 1 RS485 = 4 PNP = P Special = 0	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

[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.

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.

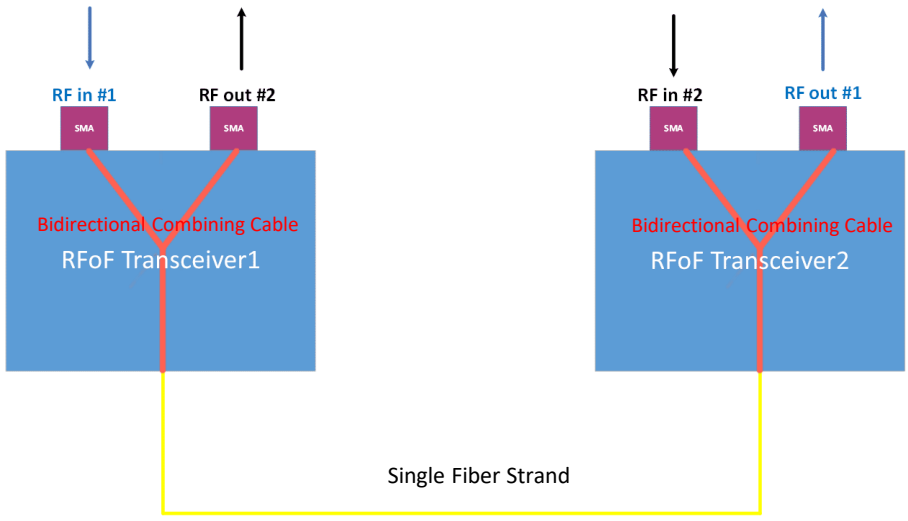
Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber Optical Analog Transmitter/ Receiver

100Mhz – 3GHz, RF-over-Fiber Tx/Rx Pair with RF Fiber Break

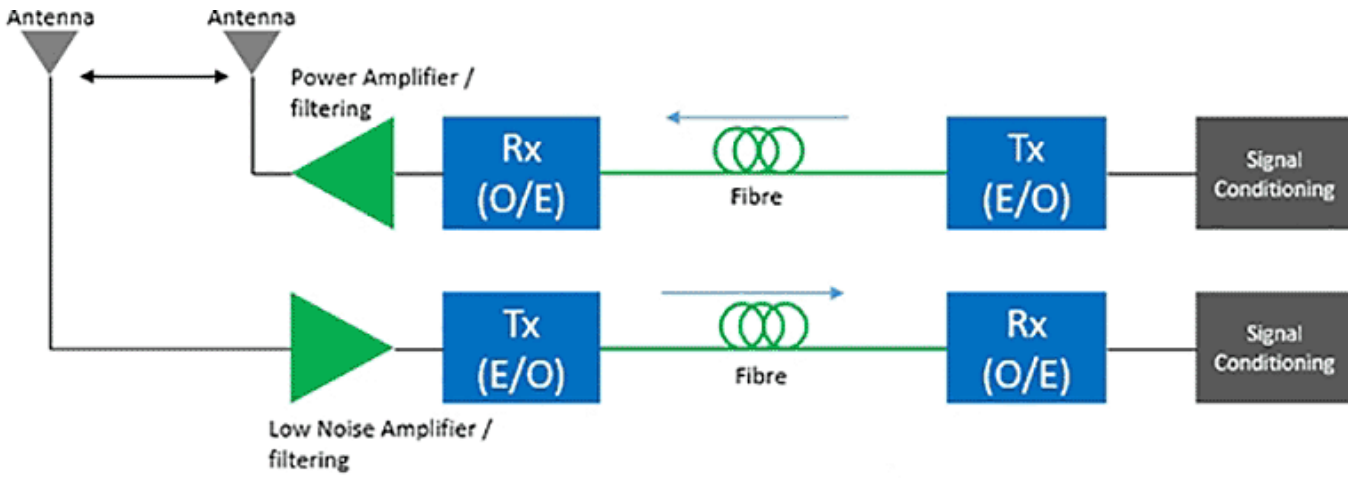
DATASHEET

Application Example 1 – Bidirectional RF Link via a Single Fiber



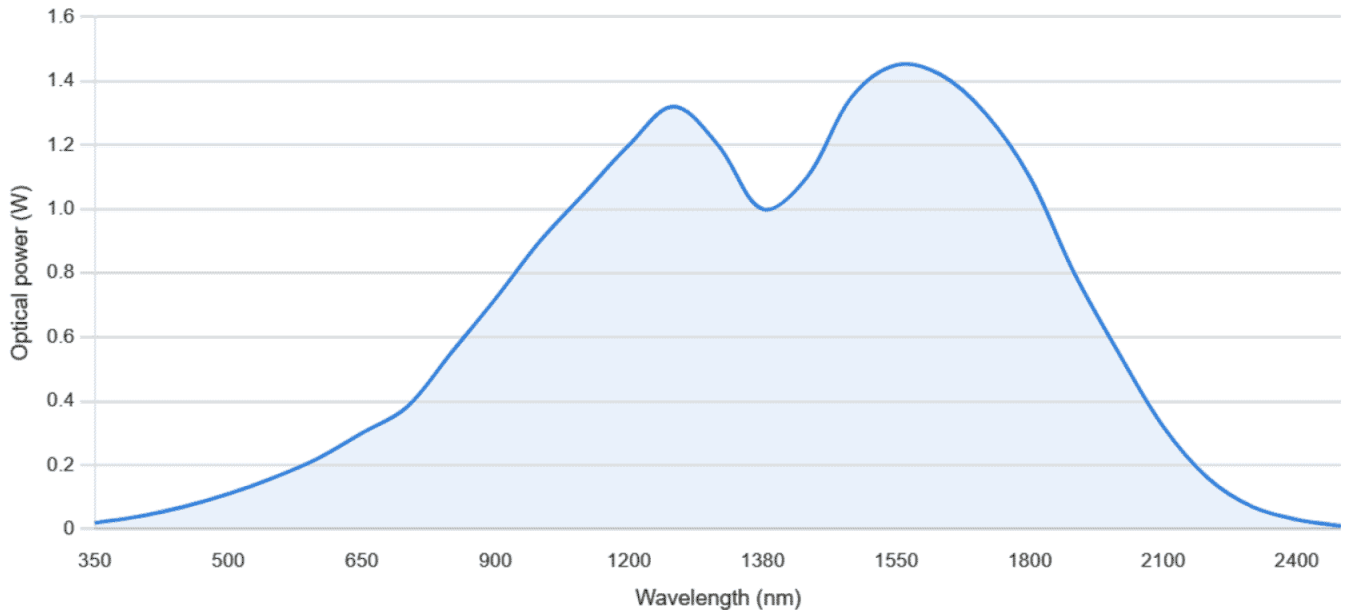
Bidirectional Combining Cable is based on fiber circulator $650 ea

Application Example – Satellite RF over Fiber Link



Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

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.

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.