

RF Over Fiber Analog/Digital Link 6GHz

(5MHz to 6GHz)

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DATASHEET



Features

- Up to 6GHz
- SM28 Fiber
- Low Loss
- Low Cost
- Stable

Applications

- GSM Repeater
- CDMA Repeater
- WCDMA Repeater
- PHS Repeater
- Digital TV Repeater
- Broadcast Repeater

The RF over Fiber (RFOF) system is designed to create a high-performance RF link between two locations using fiber optic cables. It offers strong immunity to electromagnetic interference, wide bandwidth, low signal loss over long distances, minimal distortion, low power consumption, and high reliability, all in a simple, easy-to-deploy format. The system operates by converting an input RF signal into an optical signal using a high-linearity DFB laser transmitter, and then reconverts it back into an RF signal at the receiver end using a high-linearity photodiode integrated with a low-noise amplifier. This transmitter-receiver pair forms a transparent RF fiber link. RFOF units are available in 1310 nm and 1550 nm wavelengths, enabling wavelength-division multiplexing (WDM) for added flexibility. For example, bidirectional RF communication can be achieved over a single fiber using two transceivers at different wavelengths and WDM cable adapters. Additionally, up to three channels can be transmitted through one fiber using three transceivers at different wavelengths with our matching WDM adapters. Modules are available in both rackmount enclosures and ruggedized outdoor aluminum housings, with built-in temperature compensation in the transmitter for improved stability. To form an RF link, a matched pair of transmitter and receiver (same wavelength) is required. For bidirectional communication over a single fiber, two such pairs are used in conjunction with either WDM fiber patch cables (e.g., 1310 nm and 1550 nm) or circulator-based patch cables (same wavelength). We offer plug-and-play 3-port patch cables that connect directly to the transceivers and the main fiber line.

Typical applications include telecommunications, satellite ground stations, radio telescopes, distributed antenna systems, broadcast audio/video transport, and timing synchronization. Use cases include point-to-point RF transmission over distances ranging from meters to many kilometers, remote antenna connectivity for base stations, and satellite antenna extensions to remote facilities.

Specifications

Parameter	Min	Typical	Max	Unit
Optical Wavelength	1310 ± 20		1550 ± 20	
Transmitter Output Power	0	3		mW
Optical Input Power	-15		+2	dBm
Receiver Sensitivity			-20	dBm
RF Frequency Range	5 MHz		6 GHz	
Gain Flatness (p-p)			± 3	dB
RF Output Power	-30		-10	dBm
Input RF Return Loss	10		14	dB
RF Input Power			10	dBm
Spurious Free Dynamic Range	100			dBm/H ^{2/3}
Noise Floor (EIN)			-130	dBm/Hz
Input/Output VSWR		1.7:1	2:1	dB
Input Third Order Intercept (IIP3)		33		dBm
Link Gain		-8	15	dB
Gain Change Over Temperature *		± 2		dB
Fiber Type		SM28		
Fiber Connector Type		FC/APC		
RF Impedance		50		Ω
RF Connector		SMA		
Power Consumption	3			W
Weight	0.5			kg
Operating Temperature	-20		50	°C
Storage Temperature	-45		85	°C
Power Supply Voltage	4.8	5	5.2	V
Power Supply Current		100		mA

* -10 to 70°C



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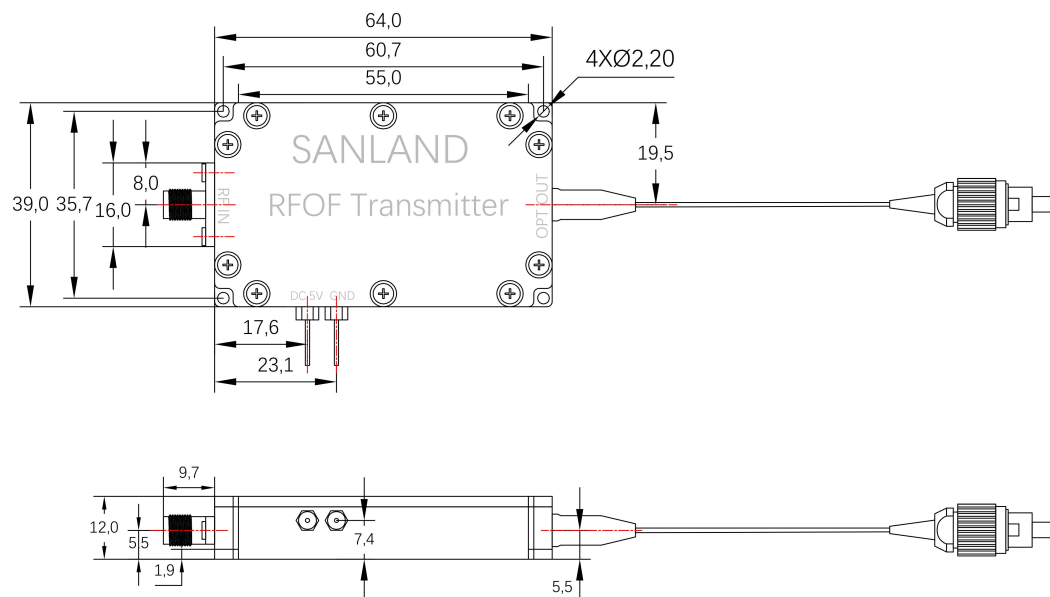
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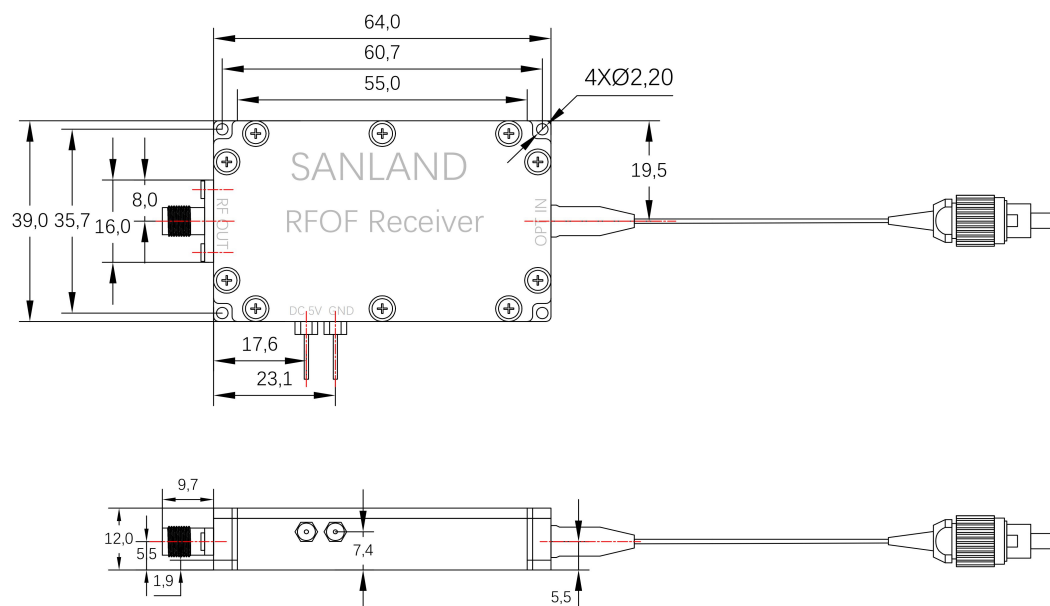
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Dimensions (Unit: mm)

TX Module



RX Module



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



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Ordering Information

	06G	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prefix	High RF Frequency	Wavelength	TX/RX	Package	Bidirectional ^[2]	Fiber Connector	Low RF Frequency
RFOF-	6GHz = 06G Special = 000	1550 nm = 1 1310 nm = 3 1490 nm = 4 Special = 0	Receiver = 1 Transmitter = 2 Pair ^[1] = 3	Module = 1 Rack = 2 Special = 0	None = 1 Yes = 2 Special = 0	FC/APC = 2 FC/UPC = 3 SC/APC = 4 SC/UPC = 5 LC/APC = A LC/UPC = U Special = 0	100MHz = 1 500kHz = 5

Note:
[1]. Pair = Receiver + Transmitter
[2]. 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.

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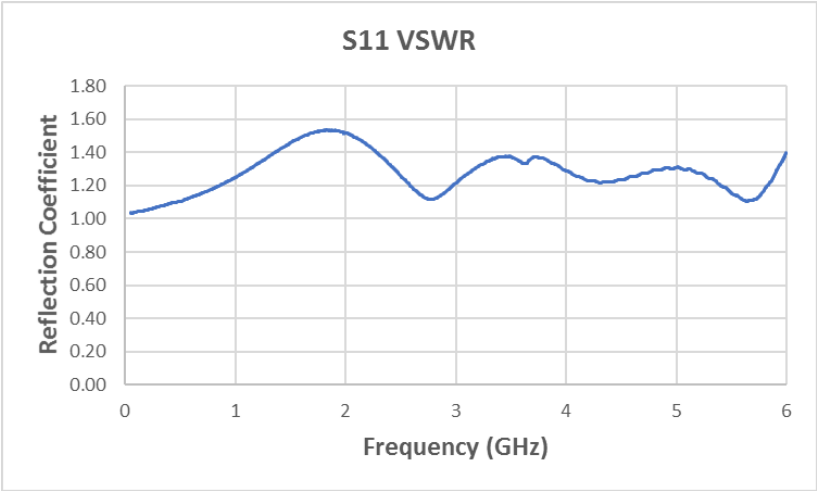
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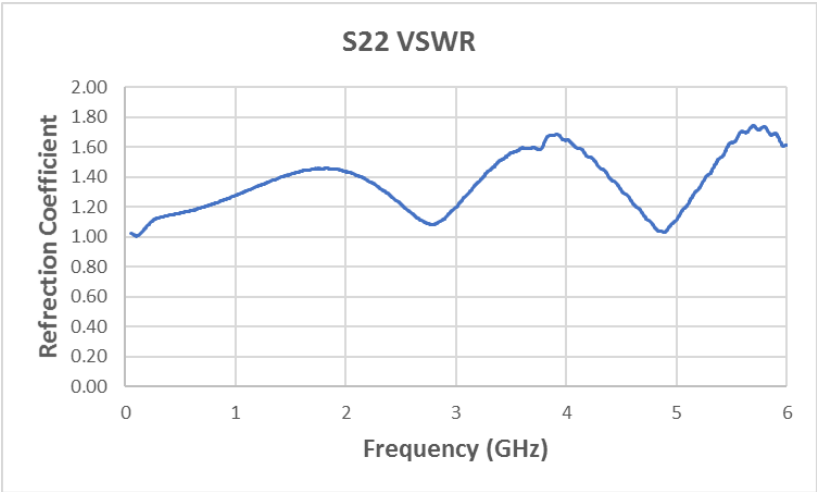
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Typical Response

■ S11



■ S22



■ S21

