RF Over Fiber Link

(0.045 ~ 40GHz, SM28 Fiber)

This series of RF over Fiber Links is designed to transmit both analog and digital RF signals with a wide bandwidth of up to 40GHz over an optical fiber link spanning distances of up to 20 km. It operates by converting an input electrical RF signal into an optical signal using a high linearity DFB laser (transmitter) and subsequently re-converting the optical signal back into the RF signal at the opposite end of the fiber link using a high linearity photodiode and low noise amplifier (receiver). This transmitter and receiver pair forms a transceiver that offers a transparent data transmission channel. Fiber optical amplifiers and chromatic dispersion compensators are integrated into the system for long-distance links to ensure signal fidelity. These RF over Fiber Links are available in 1310nm, 1490nm, and 1550nm wavelengths, providing versatile wavelength division multiplexing (WDM) capabilities. For instance, bidirectional RF communication can be established using a single fiber link by employing two different wavelength transceivers and compatible WDM cable adapters. Additionally, three communication channels can be transmitted through a single fiber link by combining three transceivers of different wavelengths with our WDM cable adapters. The module is housed in a ruggedized aluminum case, ensuring durability and reliability in various operational environments.

Features

- 0.045 ~ 40 GHz
- Up to 100 km
- Dispersion Compensation
- Loss Compensation
- Analog or Digital
- Low Distortion
- Stable

Applications

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

Specifications

Parameter	Min	Typical	Max	Unit
Optical Wavelength	1310 ± 20	1490 ± 20	1550 ± 20	nm
Optical Output Power	2	5	8	dBm
Optical Input Power	-16		-6	dBm
RF Frequency Range	0.045		40	GHz
Flatness		4	6	dB
RF Output Power (@-10dBm optical input)			-30	dBm
Input RF Return Loss	10	12		dB
RF Input Power	-45	-40	-30	dBm
RF AGC Variation		± 2		dB
IMD 2nd Order (two input tones at -20dBm)	32	50		dB
IMD 3nd Order (two input tones at -20dBm)	55			dB
Noise (0dB RF gain, 0dB optical decrease)	-130			dBm/Hz
Link Gain		0		dB
Delay	60			ns
Fiber Type	Single Mode	9μm /125μm		
RF Impedance		75		Ω
RF Connector		F-Type		
Power Consumption	3			W
Weight	0.5			kg
Operating Temperature	-20		50	°C
Storage Temperature	-45		85	°C

Rev 03/19/24

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Dimensions (mm)

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

Electrical/Computer Connection

Ordering Information (Part Number)

	☐☐	☐	☐	☐	☐☐	☐	☐
Prefix	**Type**	**Wavelength**	**Laser Power**	**Package**	**RF Frequency**	**WDM**	**Fiber Connector[1]**
RFOF-	Standard = 22 Special = 00	1310 nm = 1 1550 nm = 2 1490 nm = 3 Special = 0	Standard = 1 High Power = 2	Module = 1 Rack = 2 Special = 0	2GHz = L2 5GHz = L5 10GHz = 10 15GHz = 15 20GHz = 20 30GHz = 30 40GHz = 40	None = 1 Bidirectional = 2 2 Channel = 3 3 Channel = 4 Special = 0	FC/APC = 2 FC/UPC = 3 SC/APC = 4 SC/UPC = 5 LC/UPC = U Special = 0

Note:
red marked -- special order

[1]. The connector cannot be installed directly onto bare fiber, as it 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 can remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SM28 fiber and decreases further with smaller core fibers.

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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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