RF Over Fiber Analog/Digital Link System

(0.045 ~ 40GHz, SM28 Fiber)

This series of RF Over Fiber Links transmits both analog and digital RF signals with high fidelity, covering a wide bandwidth of up to 40GHz over an optical fiber link spanning distances of up to 20 km. It accomplishes this by converting an input electrical RF signal into an optical signal through either a directly modulated laser or an external modulator (transmitter). At the other end of the fiber link, the optical signal is reconverted back into the RF signal using a high linearity photodiode and low noise amplifier (receiver). The transmitter and receiver pair form a transceiver, providing a transparent data transmission channel. These modules are available in wavelengths from 1310 to 1650nm, offering wavelength division multiplexing (WDM) capability. With WDM technology, multiple RF channels can be transmitted through a single fiber. Additionally, bidirectional RF communication can be established using WDM adaptors on a single fiber link. The system is packaged in a standardized, network-ruggedized rack case for convenient turnkey operation.

The RFOF modules find applications in telecommunications, satellites, radio telescopes, distribution antennas, broadcasting audio and video, and timing synchronization. For instance, point-to-point antennas can be connected from several meters to many kilometers away from the control room via fiber cables; base stations can be linked to remote sector antennas through fiber connections; and satellite antennas can be connected to remote sites using RF over Fiber solutions.

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	1		40	GHz
	20		800	MHz
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

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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

	☐	☐	☐	☐☐	☐☐	☐	☐	☐
Prefix	**Type**	**Wavelength**	**Laser Power**	**Link Length**	**Max RF Frequency**	**Channel #**	**Fiber Connector**	**RF Connector**
RFOF-	Standard = 2 Special = 0	1310 nm = 1 1550 nm = 2 Special = 0	Standard = 1 High Power = 2	< 5km = 01 5km = 05 10km = 10 15km = 15 20km = 20	2GHz = L2 5GHz = L5 10GHz = 10 15GHz = 15 20GHz = 20 30GHz = 30 40GHz = 40 100MHz = 01 500MHz = 05 800MHz = 08	1 Channel = 1 Bidirectional*=B 2 Channel = 2 3 Channel =3 4 Channel =4 N Channel=N Special=0	FC/APC = 2 FC/UPC = 3 SC/APC = 4 SC/UPC = 5 LC/APC = A LC/UPC = U Special = 0	SMA = 1 N type = 2 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

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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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