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RF Over Fiber Analog/Digital Link System

(10MHz ~ 100GHz)

This rack-mount RF-over-Fiber (RFOF) system transports analog and digital RF signals with high fidelity over distances up to 500 km and frequencies up to 100 GHz. Electrical RF inputs are converted to optical signals using either cost-effective directly modulated EML transmitters or high-linearity $LiNbO_3$ external modulators for superior SFDR. At the receiver, a high-linearity photodiode couple with a low-noise RF amplifier recover the RF signal with minimal distortion. For fiber-limited deployments, a bidirectional optical option halves fiber usage, and optional WDM enables 100+ optical channels over a single fiber using telecom-grade components. Designed for network-grade reliability in a rugged rack-mount chassis, the system supports telecom, satellite, radio astronomy, DAS, and broadcast applications where low noise, long reach, and wide bandwidth are required, with optional RF and optical amplification as well as chromatic compensation available to optimize link performance.

Features

- 0.01 ~ 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	0.01		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)*	-90		-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

* Adding a low noise RF amplifier can reduce the noise figure by about 15dB

RoHS COMPLIANT

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Dimensions (mm) 1U, 2U, 4U

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

Operation Instruction

- Connect the optical connector on the front
- Connect the RF connector on the front
- Connect AC power (110-240VA) using the accompanied power cord
- Turn on the power rock switch on the back panel
- The system should function smoothly
- Any issues, please email us

Ordering Information (Part N

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Prefix	**Max RF Frequency**	**# of Tx [1]**	**# of Rx [1]**	**# of Fiber [2]**	**Link Length**	**Transmitter [3]**	**Fiber Connector[4]**	**RF Connector[4]**
RFOF-	2GHz = L2 6GHz = L6 10GHz = 10 15GHz = 15 20GHz = 20 30GHz = 30 35GHz = 35 40GHz = 40 100MHz = 01 500MHz = 05 800MHz = 08 Special = 00	1 = 01 2 = 02 3 = 03 4 = 04 5 = 05 ……	1 = 01 2 = 02 3 = 03 4 = 04 5 = 05 ……	1 = 1 2 = 2 3 = 3 4 = 4 5 = 5 ……	< 1km = 01 5km = 05 10km = 10 20km = 20	EML = 1 LiNbO3 = 2 1310nm =3	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:

[1] Number of transmitter/receiver in one box. Two boxes are needed at each end of the fiber link.

[2] Number of fibers used in the link.

[3] EML is lower cost. LiNbO3 modulator has lower noise and high fidelity.

[4]. 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 Example 1 – Satellite RF over Fiber Link