RFOptic
Optical RF Solutions

40GHz RF over Fiber Mini High SFDR

Key Features:

- Frequency Range: 2-40GHz
- Best Cost Performance
- High SFDR 112 dB/Hz
- Excellent Phase Noise

Configurations:

- Standard (stand-alone)
- 1U Generic enclosure (4 units)
- 1U Removable panel enclosure (2/4 units)
- Outdoor (2/4 units)

Applications:

- Distributed Antenna
- Satcom
- Radio telescopes
- Telecommunication:
  - Antenna Remoting
  - Long RF links via fiber
- EW

Options:

- Extended Frequency range
- Customized RF Gain, P1dB, Noise Figure by adding Pre & Post amplifier(s)
- Extended low frequency bandwidth.

RFOptic's analog RFoF compact modules enable long distance transport of wideband RF signals. The Tx unit, uses an optical transmitter, converts wideband RF signals to an Optical signal and the Rx unit converts the Optical signal back to RF signal. The two units are connected by the customer's fiber.

In general, a wide range of spurious-free dynamic range (SFDR) is desirable when multiple signals of very different power levels are expected. High SFDR transmission RFoF simplifies signal conditioning requirements intended to avoid signal saturation and subsequent consequences such as power level adjustment, and ALC and power range switching by attenuators. During e.g., antenna testing, radar or communications system testing, high SFDR is essential due to the typical large amplitude ratios between main and side lobes or close and distant targets. The same applies to DF/ELINT systems which have to handle strong jammers concurrent with weak signals of interest.

RFOptic's high SFDR 18, 20, 30 and 40 GHz RFoF solutions provide high SFDR of minimum 112 dB/Hz. Due to their improved NF, an additional preamplifier may not be needed anymore. Among the current customers that are using our RFoF high frequency product line are civil and defense systems integrators, space program companies, communications companies and more.

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RFoF-40GHz-Q0-Mini High SFDR specifications:

RF Parameter RF TX-Rx Link	Unit	Specification typical
Frequency Range	GHz	2 - 40
RF Gain [1,2]	dB	-28
Gain Flatness for 1-40 GHz bandwidth	dB	≤ ±4.5
Gain Flatness at any 10GHz bandwidth	dB	≤ ±1.5
1dB Input compression point [2]	dBm	18
Noise Figure [1,2]	dB	34
SFDR (calculated) [2,3]	$dB/Hz^{2/3}$	112
Maximum RF input level	dB	23
VSWR Input	-	2.2:1
VSWR Output	-	2.2:1
Spurious	dBc	≤-80
Phase Noise at 10KHz offset	dBc/Hz	≤-100
Input / Output impedance	Ohm	50
Optical and Electrical and Environmental (Tx, Rx)		
Laser diode optical wavelength	µm	1.55
Receiver photodiode optical wavelength	µm	1.50-1.58
Operating temperature range	°C	0 to +70
Storage temperature	°C	-40 to +85
LED status indicators (Tx/Rx)	-	Green/Red
Input voltage	VDC	5
Power consumption Tx module	Watt	2.5
Power consumption Rx module	Watt	0.5
Mechanical (Tx/Rx)		
Dimensions Tx/Rx unit	mm	75*155*33
RF Input / Output connectors	mm	2.92 (F)
Optical Connector	-	FC/APC
Power connector and Data connector	-	DB15

[1] Excluding customer fiber loss.

[2] Measured at 20 GHz.

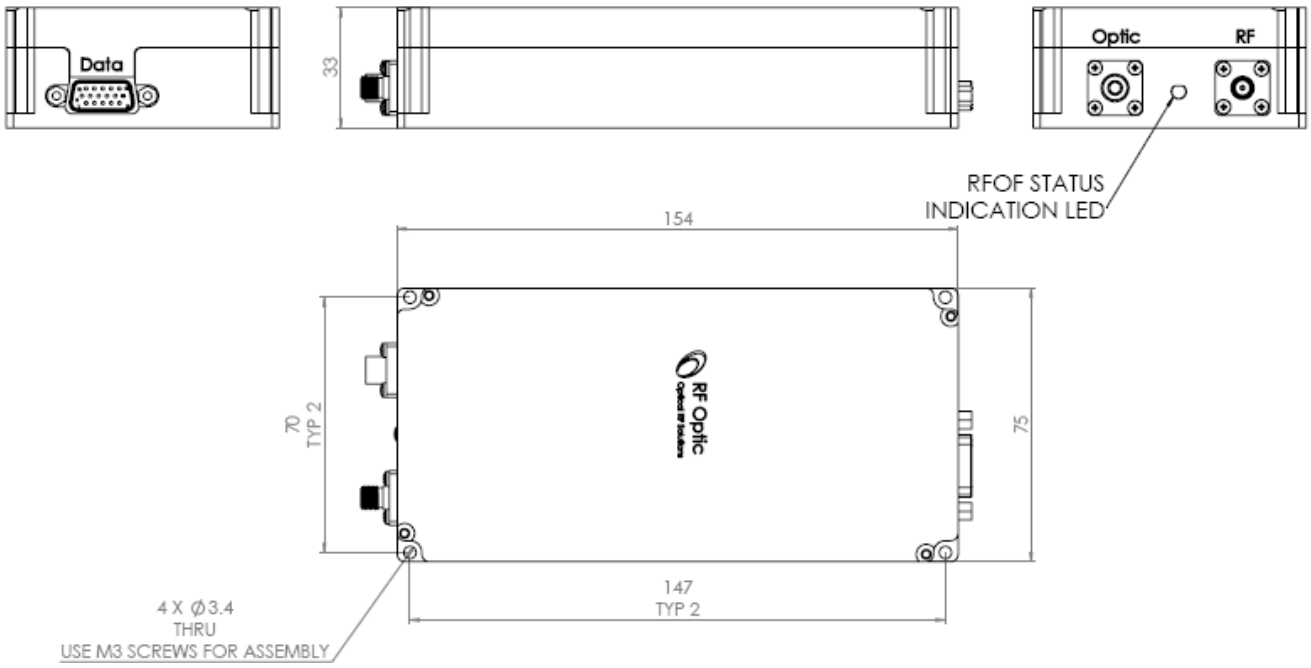
[3] Calculated. Excluding in-band harmonics. SFDR=2/3(IP3+174-NF) $dB/Hz^{2/3}$

RFoF 40GHz module options:

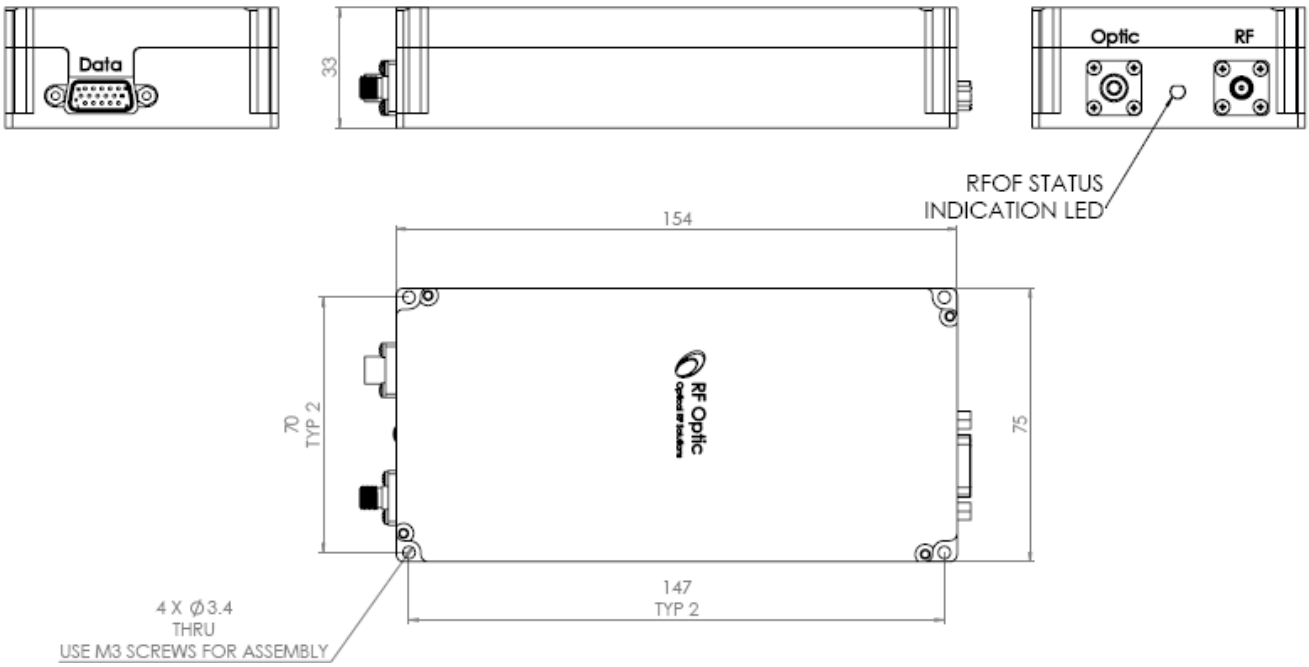
Parameter	P/N Unit	RFoF 40GHz High SFDR	RFoF 40GHz High SFDR w/ 14dB Pre Amp.	Amplifier RFoF 40GHz High SFDR w/14dB Post Amp. & Pre Amp.	RFoF 40GHz High SFDR w/ 30dB Post Amplifier
P/N	-	**RFoF-40GHz-Q0-Mini**	**RFoF-40GHz-Q1-Mini**	**RFoF-40GHz-Q2-Mini**	**RFoF-40GHz-Q0-Mini-P**
Gain [1]	dB	-28	-15	0	0
InP1dB [1]	dB	18	5	5	18
Noise Figure [1]	dB	34	21	21	34
SFDR [1]	dBc/Hz	112	112	112	112

Mechanical Outline Drawing: 40GHz RFoF Tx & Rx units

Tx unit



Rx unit



Ordering Information

RFoF-40G-Q0-Mini	Transceiver 40GHz, Tx/Rx 154X74X33 mm
RFoF-40G-Q1-Mini	Transceiver 40GHz, Tx/Rx 154X74X33 mm, with 14dB Pre-Amp.
RFoF-40G-Q2-Mini	Transceiver 40GHz, Tx/Rx 154X74X33 mm, with 1dB Pre-Amp. & 14 dB Post-Amp.
RFoF-40G-Q0-Mini-P	Transceiver 40GHz, Tx/Rx 154X74X33 mm, with 0dB Gain, 30dB Post-Amp.