

## 67GHz RF over Fiber Mini-L Low Noise High SFDR



### Key Features:

- Frequency Range: 1 - 67GHz
- Low Noise RFoF HSFDR version
- Low spurious level
- High SFDR 114 dB/Hz
- Excellent phase linearity
- Excellent Phase Noise

### Configurations:

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

### Applications:

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

### Options:

- Customized RF Gain, P1dB, Noise Figure by adding internal 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 the 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. This Low Noise RFoF HSFDR link offers improved Noise Figure performance. High SFDR transmission RFoF simplifies signal conditioning requirements intended to avoid signal saturation and subsequent consequences such as power level adjustment. 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 that have to handle strong jammers concurrent with weak signals of interest.

RFOptic's 12, 18, 20, 30, 40, and 67GHz RFoF solutions provide high SFDR of minimum 114 dB/Hz. Due to their improved NF, an additional pre-amplifier may not be needed. These high-performance products are used in applications such as civil communication, antenna remoting, telemetry, defense systems, satellite communications, and more.

## RFoF-67GHz-L0-Mini Low Noise High SFDR Specifications

RF Parameter Tx-Rx Link	Unit	Specification (typical)
Frequency Range	GHz	1 – 67
RF Gain at 40GHz <sup>[1,2]</sup>	dB	-27
Gain Flatness for every 5GHz bandwidth	dB	±1.5
1dB Input gain compression point at 40GHz <sup>[2]</sup>	dBm	17
Noise Figure at 40GHz <sup>[2]</sup>	dB	29
SFDR (calculated) <sup>[2,3]</sup>	dB/Hz <sup>2/3</sup>	114
Maximum RF input level (No damage)	dBm	20
VSWR Input	-	2:1
VSWR Output	-	2:1
Spurious <sup>[4]</sup>	dBc	≤-90
Phase Noise at 40GHz at 10KHz Offset	dBc/Hz	-130
Input / Output impedance	Ohm	50
<b>Optical and Electrical and Environmental (Tx, Rx)</b>		
Laser diode optical wavelength	μm	1.55
Receiver photodiode optical wavelength	μm	1.5-1.58
Operating temperature range	°C	0 to +70
Storage temperature	°C	-40 to +85
LED status indicators (Tx/Rx)	-	Blue/Green/Red
Input voltage <sup>[5]</sup>	VDC	5
Power consumption Tx module	Watt	2
Power consumption Rx module	Watt	0.25
<b>Mechanical (Tx/Rx)</b>		
Dimensions Tx/Rx unit	mm	75*154*33
Weight Tx/Rx unit	grams	450
RF Input / Output connectors	-	1.85
Optical Connector	-	FC/APC
Power connector and Data/monitor connector <sup>[6]</sup>	-	DB15

[1] Excluding customer fiber loss.

[2] Measured at 40GHz.

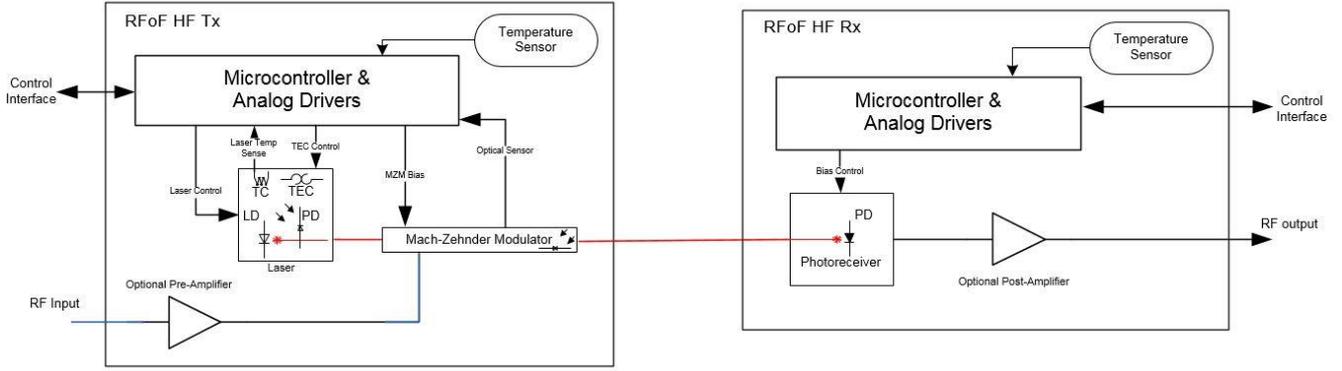
[3] SFDR (calculated)  $\approx 2/3x[(IP1dB+10)+174-NF]$  dB/Hz<sup>2/3</sup>; Excluding in-band harmonics.

[4] Measured with input signal at 1p1dBc - 3dB at 1GHz.

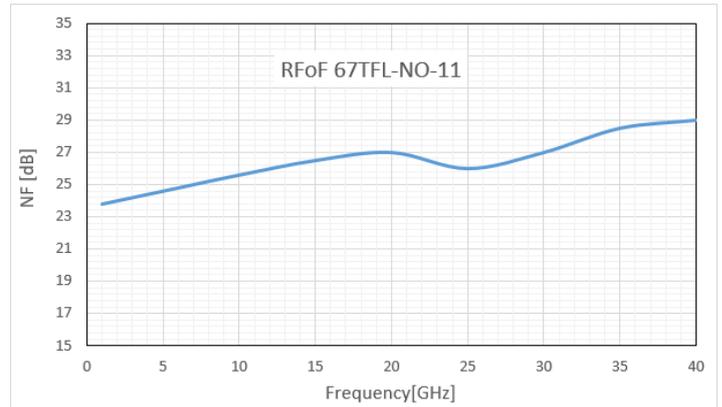
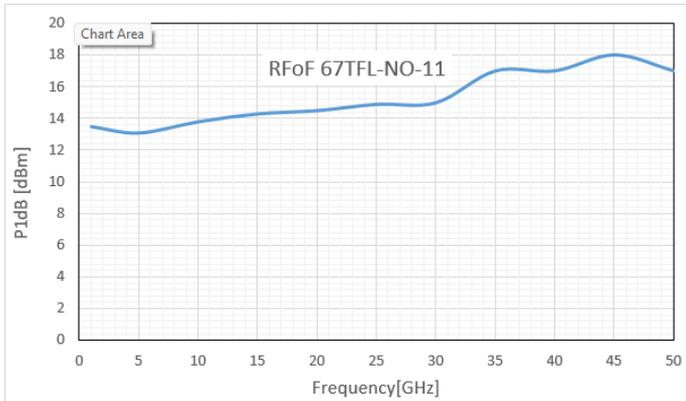
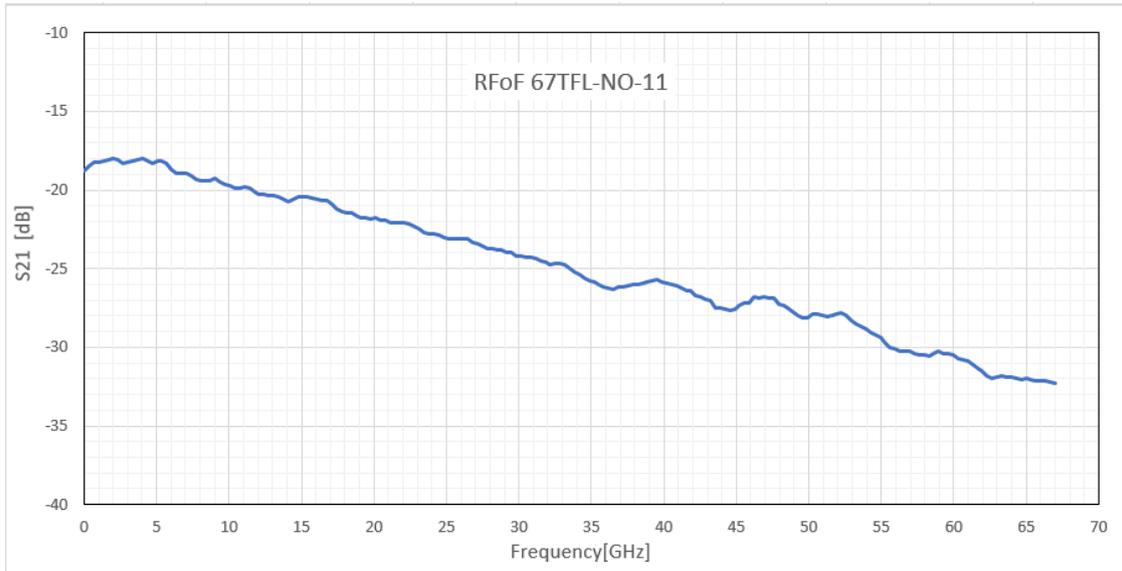
[5] Recommended Power Supplies: Meanwell P/N GSM25U05-P1J (USA); GSM25E05-P1J (Europe); GE40I05-P1J (all purpose).

[6] For USB monitor, download the software here: <https://rfoptic.com/software-download-rfof/>

### RFoF 67GHz – Simplified Block Diagram



### RFoF Low NF 67GHz – Typical Test Results



### RFoF Enclosure Options

Parameter	19" 1U Enclosure for RFoF	Outdoor Enclosure for RFoF
Dimensions (mm)	19" 1U Generic: 445(W)* 476(L)*44(H) 19" 1U Removable: 442(W)* 402(L)*44(H)	Small Outdoor: 270(W)*230(L)*85(H) Large Outdoor: 330(W)*350(L)*85(H)
RF Input / Output Connector	1.85mm female	1.85mm female
Optical Connector	FC/APC or SC/APC	MPO/APC 4/8 male <sup>[1]</sup>
Data Connector	USB2/RJ-45	RJ45 female <sup>[2]</sup>
Power Connector	HP Socket	DC female/ AC male <sup>[2,3]</sup>
Power	110/220 VAC	9-36DC / 110/220VAC <sup>[2,3]</sup>

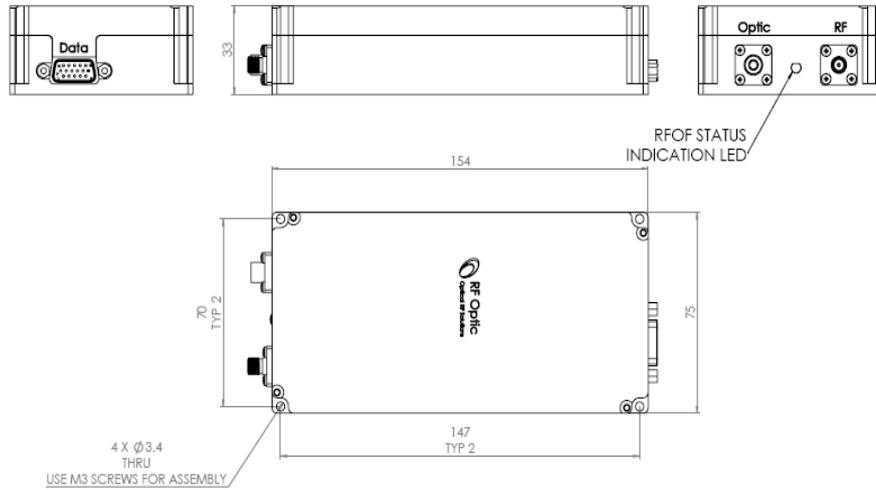
[1] MPO (F) 4/8 optical cable should be ordered according to the required length and conditions.

[2] IP-54 Data, AC and DC opposite connectors are provided as accessories with the module (cables are not included).

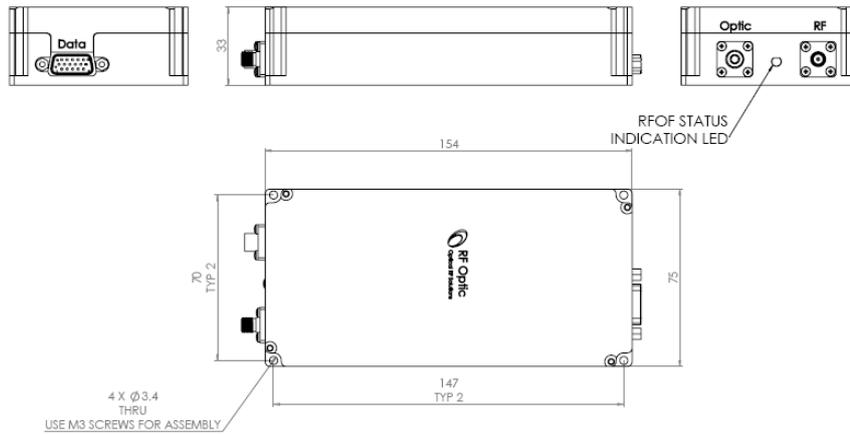
[3] DC and AC versions of the outdoor enclosure are available.

## Mechanical Outline Drawing - 67GHz RFoF Tx and Rx modules

### Tx module



### Rx module



## Ordering Information

P/N	Description	Tx	Rx
<b>RFoF-67G-L0-Mini</b>	Transceiver 67GHz, HSFDR	RFoF67TFL-N0-11	RFoF67RFL-N0-11
<b>HSFDR-Cable-Data-DC</b> <sup>[1]</sup>	2 X D15 to USB 150cm & D15 to DC 25cm special cable	For stand-alone HSFDR link	
<b>Outdoor Data &amp; AC set</b> <sup>[2]</sup>	Data and 110/220 AC opposite connectors – accessories	For outdoor enclosure with AC supply	
<b>Outdoor Data &amp; DC set</b> <sup>[2]</sup>	Data and 5VDC opposite connectors – accessories	For outdoor enclosure with DC supply	

[1] Cable supplied with the RFoF-67G-L0-Mini link.

[2] Connectors supplied with the RFoF-67G-L0-Mini link/s in Outdoor enclosure.