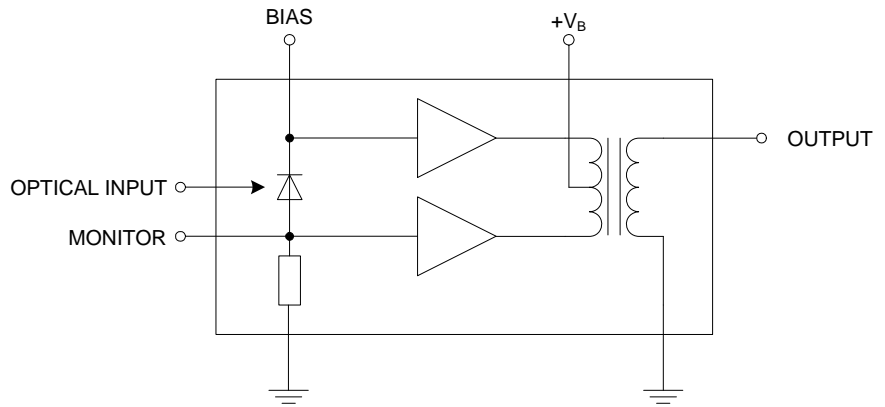


### Features

- Superior Return Loss Performance
- Extremely Low Distortion
- Optimal Reliability
- Very Low EINC
- 31dB(A/W) Minimum at 1200MHz
- 260mA Max. at 24V<sub>DC</sub>

### Applications

- 45MHz to 1200MHz CATV Amplifier Systems



Functional Block Diagram

### Product Description

The RFOS601X is a hybrid high dynamic range optical receiver amplifier module. Two of the module pins are for connection to 24V (DC), one for amplifier supply voltage, the other for the PIN diode bias. The module contains a single mode optical input suitable for wavelengths from 1290nm to 1600nm, a terminal to monitor the PIN diode current, and an electrical output with an impedance of 75Ω.

### Ordering Information

RFOS6012	45 MHz to 1200MHz GaAs Optical Receiver with FC/APC Connector
RFOS6013	45 MHz to 1200MHz GaAs Optical Receiver with SC/APC Connector

### Optimum Technology Matching® Applied

- |   |                                      |  |                                    |
|---|--------------------------------------|--|------------------------------------|
| <input type="checkbox"/> GaAs HBT               | <input type="checkbox"/> SiGe BiCMOS | <input checked="" type="checkbox"/> GaAs pHEMT | <input type="checkbox"/> GaN HEMT  |
| <input checked="" type="checkbox"/> GaAs MESFET | <input type="checkbox"/> Si BiCMOS   | <input type="checkbox"/> Si CMOS               | <input type="checkbox"/> BiFET HBT |
| <input type="checkbox"/> InGaP HBT              | <input type="checkbox"/> SiGe HBT    | <input type="checkbox"/> Si BJT                | <input type="checkbox"/> LDMOS     |

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## Absolute Maximum Ratings

Parameter	Rating	Unit
Optical Input Power	5	mW
DC Supply Over-Voltage (5 Minutes)	30	V
ESD Sensitivity according to MIL-Standard 1686C (Human Body Model; R=1.5kΩ, C=100pF)	500	V
Storage Temperature	-40 to +85	°C
Operating Mounting Base Temp	-20 to +85	°C
Minimum Fiber Bending Radius	35	mm
Maximum Tensile Strength	5	N



**Caution!** ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

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Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
<b>Overall</b>					$V_B = 24V$ ; $T_{MB} = 30^\circ C$ ; $Z_L = 75\Omega$
Responsivity	2800	3000		V/W	$\lambda = 1310\text{nm}$ , $f = 1200\text{MHz}$
Slope <sup>1</sup>	0		2.0	dB	$f = 45\text{MHz}$ to $1200\text{MHz}$
Flatness of O/E response <sup>2</sup>		<0.7	1.0	dB	$f = 45\text{MHz}$ to $1200\text{MHz}$
Optical Return Loss	45.0			dB	
Output Return Loss	-16	-18		dB	$f = 45\text{MHz}$ to $400\text{MHz}$
	-14	-16		dB	$f = 400\text{MHz}$ to $1200\text{MHz}$
Equivalent Input Noise		4.5	5.0	pA/ $\sqrt{\text{Hz}}$	$f = 50\text{MHz}$ to $400\text{MHz}$
		5.0	5.5	pA/ $\sqrt{\text{Hz}}$	$f = 400\text{MHz}$ to $1000\text{MHz}$
		5.5	6.0	pA/ $\sqrt{\text{Hz}}$	$f = 1000\text{MHz}$ to $1200\text{MHz}$
Spectral Sensitivity	0.88			A/W	$\lambda = (1310 \pm 20)\text{nm}$
	0.90			A/W	$\lambda = (1550 \pm 20)\text{nm}$
Optical Wavelength	1290		1600	nm	
Total Current Consumption (DC)		255	260	mA	Module pin 4 and 5 connected to $V_B$
Pin Diode Bias Current		6.0	10.0	mA	
<b>Distortion data</b>					$V_B = 24V$ , $T_{MB} = 30^\circ C$ ; $Z_L = 75\Omega$
Second order distortion <sup>3</sup>		-75	-70	dBc	$f_m = 54\text{MHz}$ , $f_1 = 187.25\text{MHz}$ , $f_2 = 133.25\text{MHz}$
		-75	-68	dBc	$f_m = 446.5\text{MHz}$ , $f_1 = 97.25\text{MHz}$ , $f_2 = 349.25\text{MHz}$
		-70	-65	dBc	$f_m = 548.5\text{MHz}$ , $f_1 = 109.25\text{MHz}$ , $f_2 = 439.25\text{MHz}$
		-68	-63	dBc	$f_m = 746.5\text{MHz}$ , $f_1 = 133.25\text{MHz}$ , $f_2 = 613.25\text{MHz}$
		-68	-63	dBc	$f_m = 854.5\text{MHz}$ , $f_1 = 133.25\text{MHz}$ , $f_2 = 721.25\text{MHz}$

1. Slope is defined as the difference between the O/E response at the start frequency and the O/E response at the stop frequency.

2. Measured peak to valley.

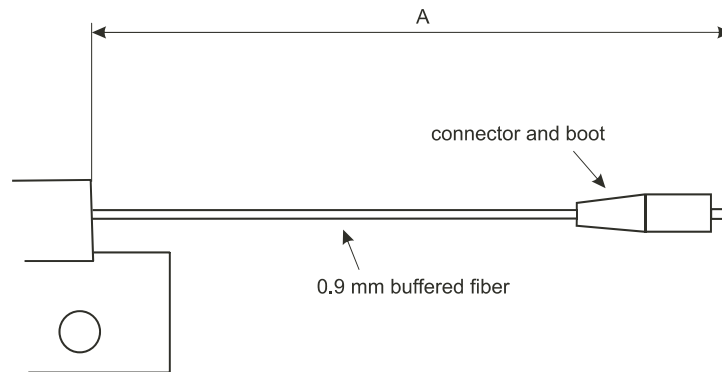
3. Two laser test, each laser with 40% OMI,  $P_{OPT} = 1\text{mW}$  (total).

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
<b>Distortion data</b>					$V_B=24V, T_{MB}=30^{\circ}C; Z_L=75\Omega$
Third order distortion <sup>[4]</sup>		-78	-75	dBc	$f_m=55.25\text{MHz}, f_1=109.25\text{MHz}, f_2=133.25\text{MHz}, f_3=187.25\text{MHz}$
		-78	-75	dBc	$f_m=445.25\text{MHz}, f_1=193.25\text{MHz}, f_2=349.25\text{MHz}, f_3=97.25\text{MHz}$
		-78	-75	dBc	$f_m=547.25\text{MHz}, f_1=217.25\text{MHz}, f_2=439.25\text{MHz}, f_3=109.25\text{MHz}$
		-78	-75	dBc	$f_m=745.25\text{MHz}, f_1=133.25\text{MHz}, f_2=265.25\text{MHz}, f_3=613.25\text{MHz}$
		-78	-75	dBc	$f_m=853.25\text{MHz}, f_1=133.25\text{MHz}, f_2=265.25\text{MHz}, f_3=721.25\text{MHz}$

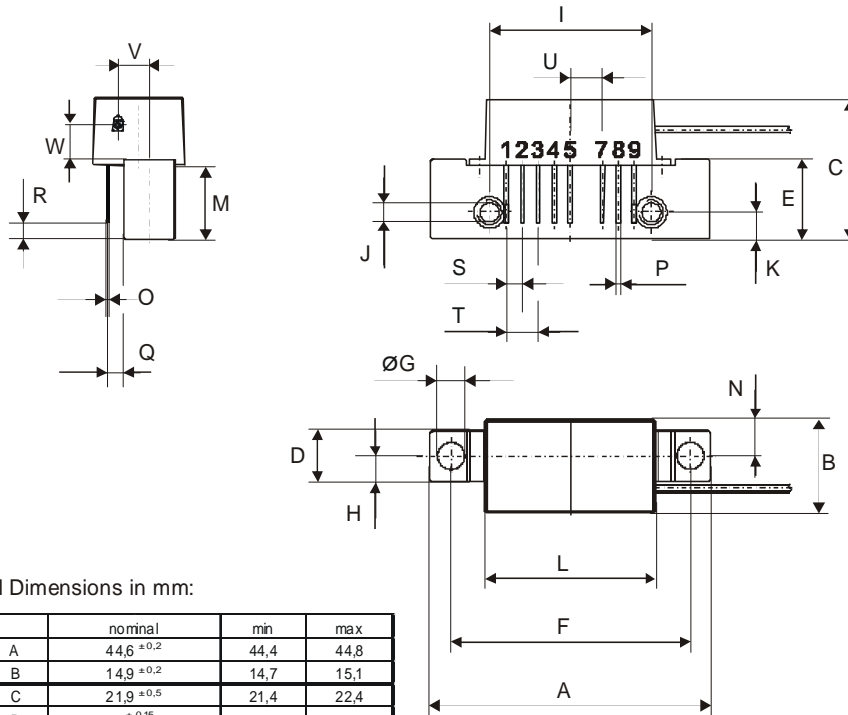
4. Three laser test, each laser with 60% OMI,  $P_{OPT}=1\text{mW}$  (total).

**Cable Lengths and Connector Types**

Type	Dimension A				Optical Connector Type
	Inches	Tolerance	mm	Tolerance	
RFOS6012	33.4	-4 to +0.5	848	-102 to +13	FC/APC
RFOS6013	33.4	-4 to +0.5	848	-102 to +13	SC/APC



## Package Drawing



All Dimensions in mm:

	nominal	min	max
A	44,6 ±0,2	44,4	44,8
B	14,9 ±0,2	14,7	15,1
C	21,9 ±0,5	21,4	22,4
D	8 ±0,15	7,85	8,15
E	12,6 ±0,15	12,45	12,75
F	38,1 ±0,1	38,0	38,2
G	4 +0,2 / -0,05	3,95	4,2
H	4 ±0,2	3,8	4,2
I	25,4 ±0,2	25,2	25,6
J	UNC 6-32	-	-
K	4,2 ±0,2	4,0	4,4
L	28,7 ±0,2	28,5	28,9
M	11,6 ±0,5	11,1	12,1
N	5,8 ±0,4	5,4	6,2
O	0,25 ±0,02	0,23	0,27
P	0,45 ±0,03	0,42	0,48
Q	2,54 ±0,3	2,24	2,84
R	2,54 ±0,5	2,04	3,04
S	2,54 ±0,25	2,29	2,79
T	5,08 ±0,25	4,83	5,33
U	5,08 ±0,25	4,83	5,33
V	5,0 ±0,2	4,8	5,2
W	5,35		

Pinning:

1	PHOTODIODE CURRENT MONITOR
2	GND
3	GND
4	PHOTODIODE BIAS
5	+VB
6	
7	GND
8	GND
9	OUTPUT

Notes:

