

Optical Components

OF3647R

Rev. 10 [11. 2009]

10Gbps APD with High Gain TIA receiver optical sub-assembly (ROSA)

1. DESCRIPTION

OF3647R is a high sensitivity APD-TIA receiver optical sub-assembly (ROSA). It includes a high speed InGaAs avalanche photodiode with a high gain TIA in a hermetically sealed coaxial package. It incorporates LC/SC receptacle and a flexible printed circuit (FPC). The signal GND and a receptacle are electrically isolated in this ROSA.

2. FEATURES

Power supply (TIA): 3.3V
 High sensitivity: -27.5dBm Typ.
 Differential transimpedance: 12k Ω Typ.
 Low power consumption: 0.1W Typ.
 Electrical isolation between signal GND and a receptacle
 Adjustable DC offset (Eye cross-point control)
 PKG outline compatible with XMD-MSA



3. APPLICATION

SONET /SDH
 GbE

4. ABSOLUTE MAXIMUM RATING

(T_c = +25 °C, unless otherwise specified)

Parameter	Symbol	Rating	Unit
APD Supply Voltage	VB	0 to VBR	V
TIA Supply Voltage	Vcc	0 to +3.7	V
DC Offset Adjustment Voltage	Vth	Vcc-1.0 to Vcc+0.5* ¹⁾	V
Vth Current	Ith	-1 to 1	mA
APD Reverse Current (cw)	IR	2	mA
Input Optical Power	Pin	+0	dBm
Operating Case Temperature	Tc	-5 to 85	°C
Storage Temperature	Tstg	-40 to 85	°C
Soldering Temperature	--	260 (10s)	°C

*1) at all times including power up/down.

5.OPTICAL AND ELECTRICAL CHARACTERISTICS

(Wavelength=1550nm, Tc=25°C, VCC=+3.3V, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Wavelength	λ	-	1250	--	1600	nm
APD Breakdown Voltage	VBR	ID=10μA	22	29	36	V
Temperature Coefficient of VBR	γ	-	0.03	0.05	0.07	V/°C
APD Responsivity	RAPD	$\lambda=1.55\mu\text{m}$	0.7	0.8	--	A/W
		$\lambda=1.31\mu\text{m}$	0.7	0.8	--	
Dark Current	ID	VB=0.9xVBR	--	--	200	nA
Transimpedance	Zt	Pin= -27dBm Differential	10	12	--	kΩ
Bandwidth	BW	f-3dB, RL=50Ω M=9	6.0	8.0	--	GHz
Group Delay Deviation	GD	130MHz to 7.5GHz	--	±40	--	ps
Low Frequency Cutoff	f _{LOW}	f-3dB from 130MHz	--	45	--	kHz
Sensitivity	Prmin	9.95328Gbps, NRZ, BER=10 ⁻¹² , PRBS2 ³¹ -1, Rext.=12dB, M=Mopt.	--	-27.5	-26.5	dBm
Overload	Prmax	9.95328Gbps, NRZ, BER=10 ⁻¹² , PRBS2 ³¹ -1 M=Mopt.	-6	-3	--	dBm
Maximum Output Swing	Vout	Differential	--	450	650	mV
Supply Current	Icc	-	--	32	--	mA
Recommended TIA Supply Voltage	Vcc	-	+3.1	+3.3	+3.5	V
Output Return Loss	ERL	130MHz to 7.5GHz Differential S22	--	--	-8	dB
Optical Return Loss	ORL	-	--	--	-27	dB
Thermistor Resistance	Rth	Tthermistor=25°C	9.5	10	10.5	kΩ
Thermistor B Constant	B	Tc=+25 to +50°C	3800	3900	4000	K

6. CONNECTOR AND FIBER SPECIFICATIONS**OF3647R-LC-x (LC receptacle)**

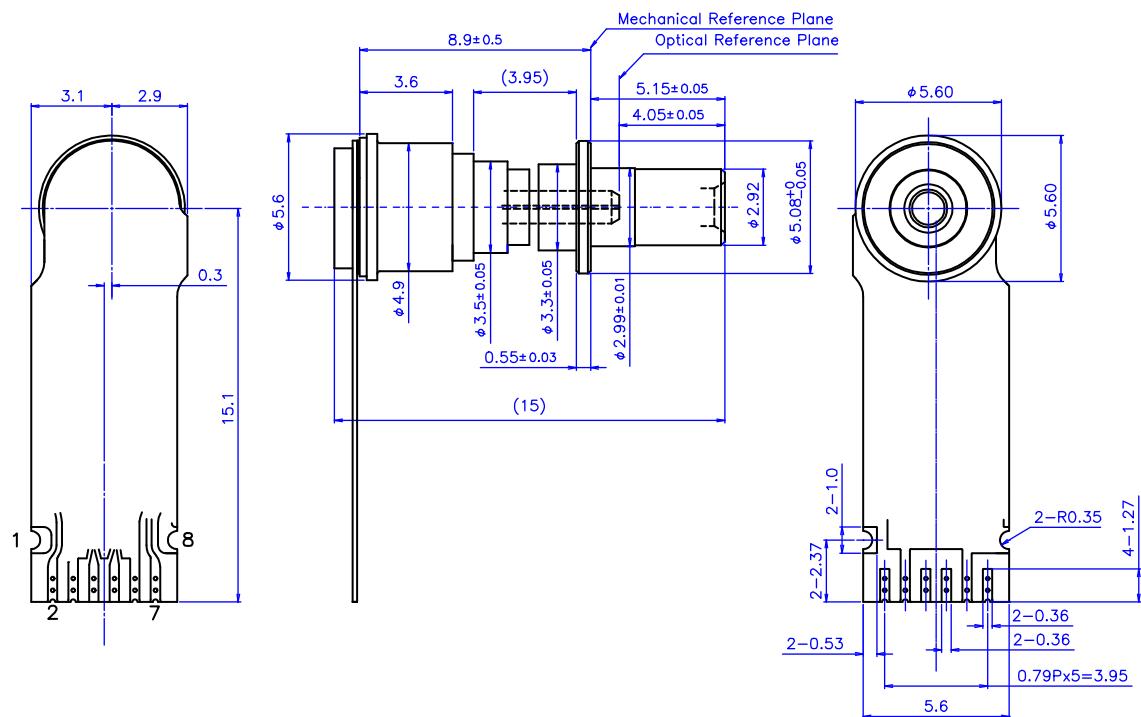
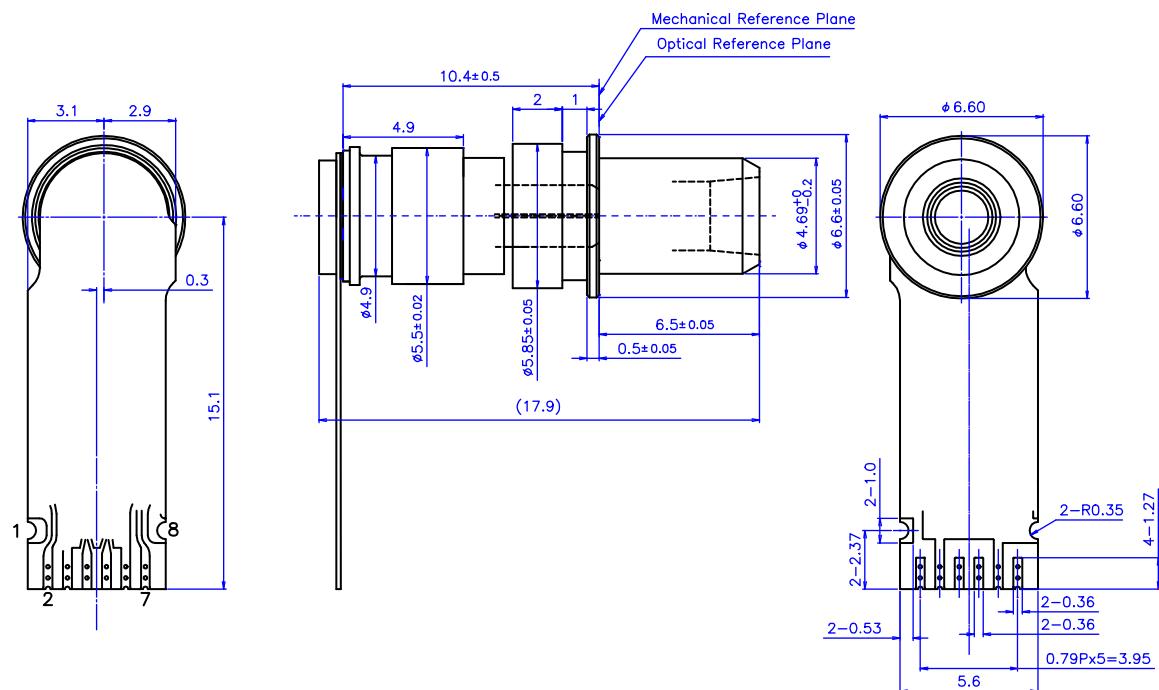
Parameter	Specifications	Unit
Applicable Optical Fiber	C-SMF	--
Core Diameter	9.5	um
Cladding Diameter	125	um
Ferrule Diameter	1.25	mm

OF3647R-SC-x (SC receptacle)

Parameter	Specifications	Unit
Applicable Optical Fiber	C-SMF	--
Core Diameter	9.5	um
Cladding Diameter	125	um
Ferrule Diameter	2.5	mm

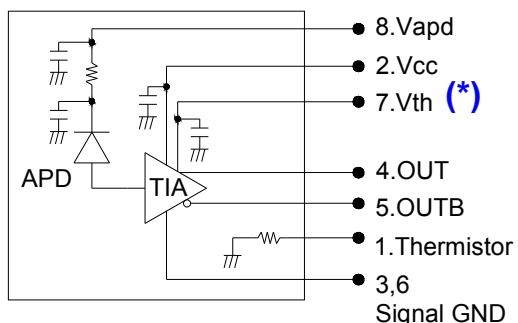
OF3647R

7. OUTLINE DRAWING All dimensions in millimeters(Unit: mm)
OF3647R-LC-x (LC receptacle)

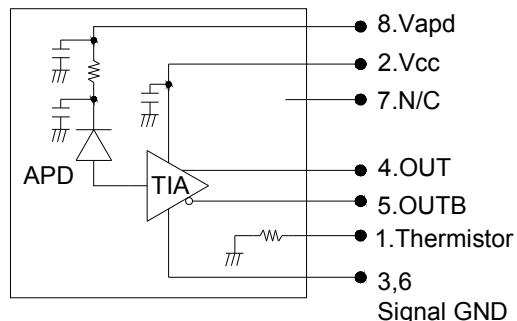
**OF3647R-SC-x (SC receptacle)**

8. BLOCK DIAGRAM

OF3647R-xx-B



OF3647R-xx-C (Compliant with XMD, w/o Vth)



Note (*)

When using without DC offset control, Vth terminal should be **NO CONNECTION**. And also, please make sure Vth voltage NOT to go to GND level during power-on or power-off transitions and after power on.

9. ORDERING INFORMATION

OF3647R - - - -

Receptacle Type	Assignment of Vth terminal
LC : LC	#7 : B
SC : SC	Not assigned : C

SAFETY AND HANDLING INFORMATION ON THIS PRODUCT

Caution GaAs Product	The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled, ingested or swallowed. Do not destroy or burn the product. Do not crush or chemically dissolve the product. Do not put the product in the mouth. Observe related laws and company regulations when discarding this product. The product should be excluded from general industrial waste or household garbage.
Caution Optical Fiber	A glass-fiber is attached on the product. Handle with care. When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.
Attention ESD sensitive	Appropriate precautions must be taken to avoid exposure to ESD and EOS during handling the product.

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