Optical Components

Rev. 3 [10. 2008]

OF3249N-MS

10Gbps APD-TIA/AGC receiver module

1. DESCRIPTION

OF3249N-MS is an APD receiver module for the digital transmission system up to 10.7Gbps. It incorporates an InGaAs/InP avalanche photodiode with an integrated trans-impedance and AGC amplifier in a hermetically sealed package. OF3249N-MS adopts compact surface mount package, minimizing the space on PCB. The outline is based on a multi-source agreement (MSA) that defines small footprint coplanar OC-192 receivers.

2. FEATURES

Power supply (TIA): 3.3V
Typical sensitivity: -27.0dBm Typ.
Differential transimpedance: 0.2 to 7.0kΩ
Power consumption: 0.2W Typ.
Surface-mount and hermetically sealed package
Small footprint co-planar output

3. APPLICATION

SONET OC-192/SDH STM-64 applications
WDM applications

4.OPTICAL AND ELECTRICAL CHARACTERISTICS

(Wavelength=1550nm , Tc =25°C , V_{CC}=+3.3V, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Wavelength	λ	-	1250	- -	1620	nm
APD Breakdown Voltage	VBR	ID=10μA	20	27	35	V
Temperature Coefficient of VBR	γ	-	0.03	0.05	0.07	V/°C
APD Responsivity	RAPD	λ=1.55μm	0.75	0.85	- -	A/W
		λ=1.31μm	0.7	0.80	- -	
Dark Current	ID	VB=0.9xVBR	- -	- -	100	nA
Maximum Transimpedance	Ztmax	Differential, Pin=0mW	- -	7.0	- -	kΩ
Minimum Transimpedance	Ztmin	Differential, Overload condition	- -	0.2	- -	kΩ
Bandwidth	BW	f-3dB, RL=50Ω Pin=-25dBm, M=9	6.5	8.0	- -	GHz
Sensitivity	Prmin	9.95328Gbps, NRZ, BER=10^{-12}, PRBS2^{31}–1, Rext.=12dB, M=Mopt.	- -	-27	-26	dBm
Group Delay Deviation	GD	130MHz to 8GHz	- -	- -	± 40	
Low Frequency Cutoff	f_{LOW}	f-3dB from 130MHz	- -	45	- -	kHz
Overload	Prmax	9.95328Gbps, NRZ, BER=10^{-12}, PRBS2^{31}–1 M=Mopt.	-6	-3	- -	dBm
Output Voltage Swing	Vout	Differential	- -	350	- -	mV
Supply Current	Icc		- -	60	- -	mA
Recommended TIA Supply Voltage	VCC	-	3.1	3.3	3.5	V
Output Return Loss	ERL	10MHz to 10GHz Differential S22	- -	- -	-8	dB
Optical Return Loss	ORL	-	- -	- -	-27	dB
Thermistor Resistance	Rth	Tthm=25°C	9	10	11	kΩ
Thermistor B Constant*1	B	---	3180	3380	3580	K

*1) Optional B constant of 3900+/-100K is available.

5.ABSOLUTE MAXIMUM RATING

(Tc = +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
APD Reverse Current (cw)	IR	2	mA
Input Optical Power	Pin	+0	dBm
Operating Case Temparature	Tc	-20 to 85	°C
Storage Temparature	Tstg	-40 to 85	°C
Soldering Temperature	- -	260 (10s)	°C

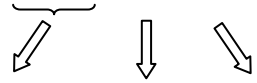
*1) at all times including power up/down.

6. CONNECTOR AND FIBER SPECIFICATIONS

Parameter	Specifications	Unit
Type	SM	- -
Flame Rating	UL94 V-0	- -
	UL1581 VW-1	- -
Mode Field Diameter	10	μm
Cladding Diameter	125	μm
Jacket Diameter	900	μm
Length	1	M
Standard Connector	SC/SPC	- -
Standard Fiber Color	White	- -

7. ORDERING INFORMATION

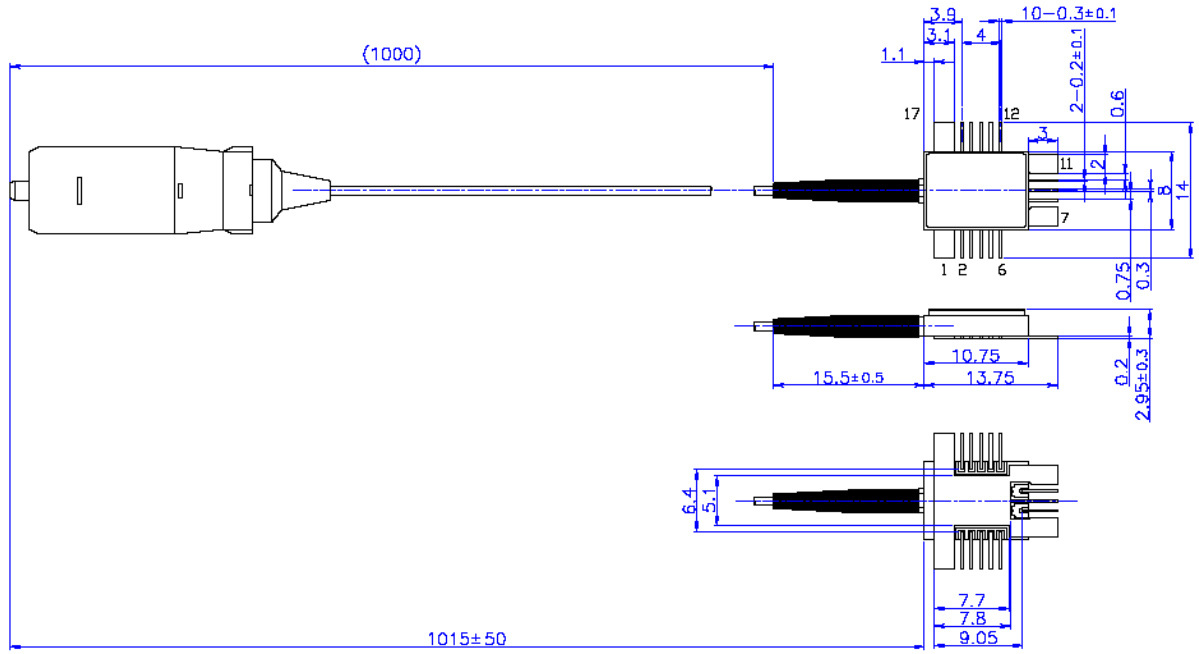
OF3249N - MS - _ _ _ _



Optical Connector	Fiber Color	Thermistor B constant	
- - : SC *	- - : White*	- - : 3380K*	
FC : FC	Y : Yellow	T : 3900K	* : Standard product: No need to indicate.
LC : LC	B : Blue		
MU : MU			

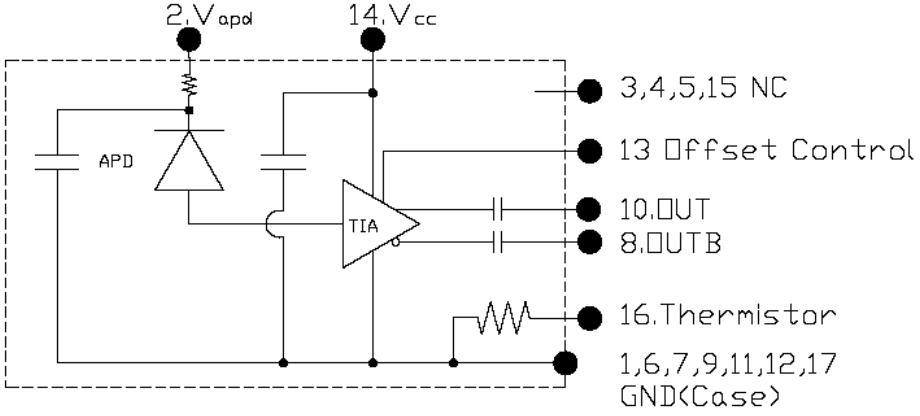
8.OUTLINE DRAWING

Package No. OF3249N-MS (Unit: mm)



Pin Connection			
1	Case GND	10	OUT (AC-coupled)
2	Vapd (APD Bias)	11	Case GND
3	NC	12	Case GND
4	NC	13	Vth (DC Offset Control)
5	NC	14	Vcc (TIA Power supply)
6	Case GND	15	NC
7	Case GND	16	Thermistor
8	OUTB(AC-coupled)	17	Case GND
9	Case GND		

9. BLOCK DIAGRAM



SAFETY 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 destory 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 handring the product.

Notice

No copying or reproduction of this document, in part or in whole, is permitted without the consent of LAPIS Semiconductor Co., Ltd.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing LAPIS Semiconductor's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from LAPIS Semiconductor upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, LAPIS Semiconductor shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. LAPIS Semiconductor does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by LAPIS Semiconductor and other parties. LAPIS Semiconductor shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While LAPIS Semiconductor always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. LAPIS Semiconductor shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). LAPIS Semiconductor shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.