# 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=$10^{-12}$, PRBS$2^{31}$–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=$10^{-12}$, PRBS$2^{31}$–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 |

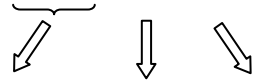
*1) at all times including power up/down.

## 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

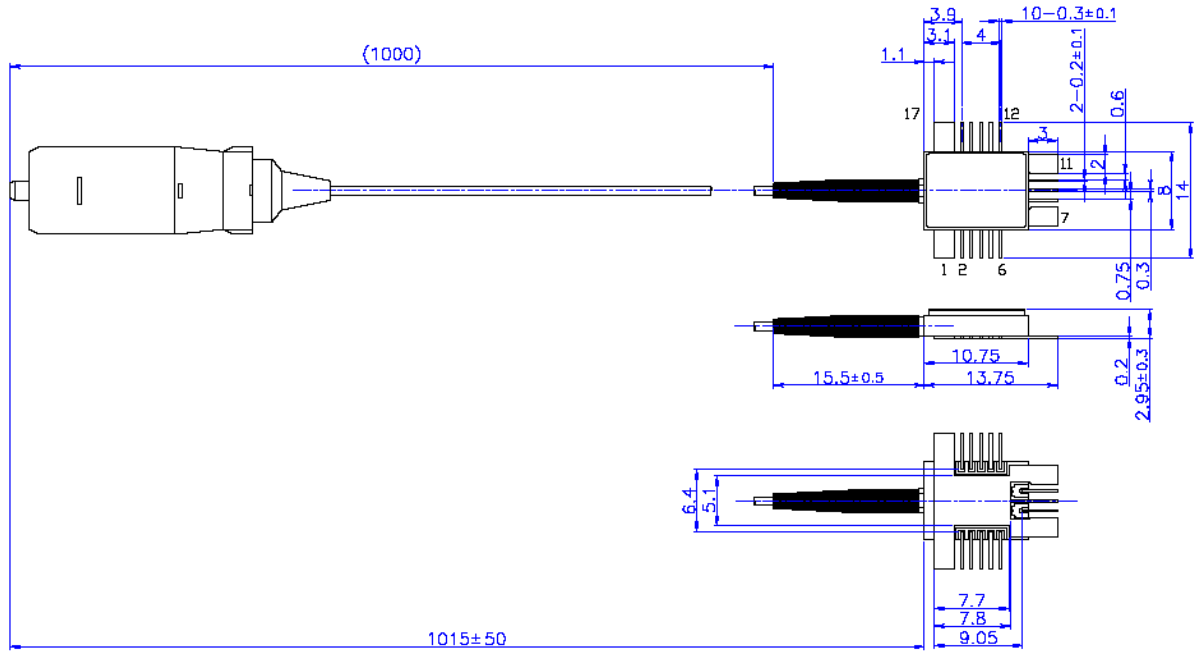
# OF3249N - MS - _ _ _ _



| 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 | | | |

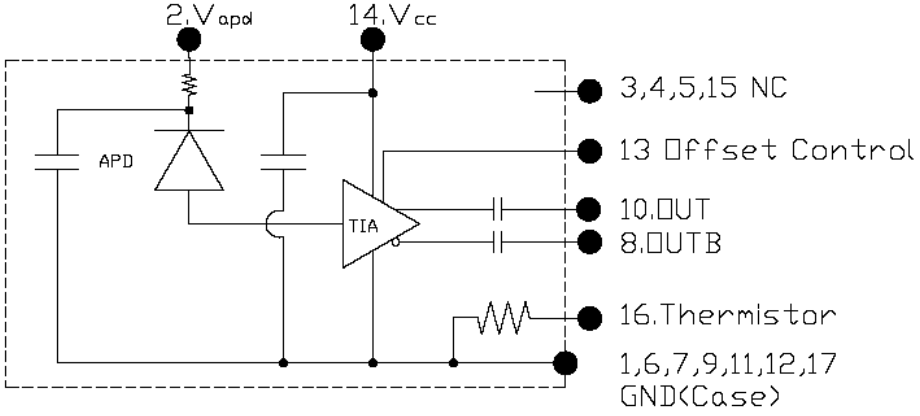
## 8.OUTLINE DRAWING

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

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