

InGaAs PIN photodiode with preamp

G10342-14/-54

ROSA type, 1.3/1.55 μm , 10 Gbps



Features

- Compatible with 10 Gbps Miniature Device (XMD-MSA)
- High-speed response: 11.3 Gbps
- Low power supply voltage: $V_{cc}=V_{pd}=3.3\text{ V}$
- Differential output
- Sensitivity: +3 to -20.5 dBm
- High trans-impedance gain: 6 k Ω
- Low optical return loss: 35 dB Typ.
- Isolation type: Housing and signal ground are electrically isolated.
- Flex board interface (G10342-54)

Applications

- SDH/SONET (STM-64/OC-192)
- 10 Gigabit Ethernet
- XFP transceiver

Absolute maximum ratings

| Parameter | Symbol | Value | Unit |
|------------------------------|-----------|------------|--------------------|
| Supply voltage | V_{cc} | -0.5, +3.7 | V |
| Reverse voltage (photodiode) | V_R | 7 | V |
| Storage temperature *1 | T_{stg} | -40 to +90 | $^{\circ}\text{C}$ |

Recommended operating conditions

| Parameter | Symbol | Value | Unit |
|------------------------------|-----------|---------------------|--------------------|
| Case temperature *1 | T_c | -20 to 90 | $^{\circ}\text{C}$ |
| Supply voltage | V_{cc} | 3.05 to 3.53 | V |
| Reverse voltage (photodiode) | V_{pd} | 3.05 to 5.0 | V |
| Spectral response range | λ | 1.26 to 1.57 | μm |
| Load resistance *2 | R_L | 50 | Ω |
| Bit rate | - | 9 to 11.1 | Gbps |
| Bit pattern | - | NRZ, Mark ratio=1/2 | - |

*1: No condensation

*2: Capacitive coupling

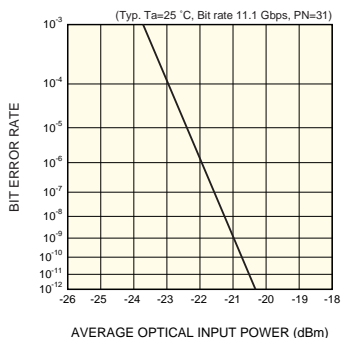
Electrical and optical characteristics (recommended operating conditions, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------|------------|---|------|-------|-------|---------------------|
| Responsivity | R | $\lambda=1.31\ \mu\text{m}$ | 0.75 | 0.85 | - | A/W |
| | | $\lambda=1.55\ \mu\text{m}$ | 0.8 | 0.9 | - | |
| Supply current | I_{cc} | Dark state, $R_L=\infty$ | - | 32 | 45 | mA |
| Cut-off frequency | f_c | $\lambda=1.55\ \mu\text{m}$, -3 dB | 7.0 | 9.0 | - | GHz |
| Low cut-off frequency | f_{c-L} | $\lambda=1.55\ \mu\text{m}$, -3 dB | - | 10 | 50 | kHz |
| Noise equivalent power *3 | NEP | Dark state, to 7.5 GHz | - | 1.0 | - | μW_{rms} |
| Trans-impedance *3 | T_z | $R_L=50\ \Omega$, $f=100\ \text{MHz}$ | 4 | 6 | - | k Ω |
| Minimum receivable sensitivity | P_{min} | $\lambda=1.55\ \mu\text{m}$, PRBS=2 ³¹ -1, BER=10 ⁻¹² , Extinction ratio=14 dB | - | -20.5 | -18.5 | dBm |
| Maximum receivable sensitivity | P_{max} | | +1 | +3 | - | |
| Output amplitude | V_{omax} | Differential | 300 | 450 | 650 | mVpp |
| Dark current | I_D | Dark state, $T_c=25\ ^{\circ}\text{C}$, $V_{pd}=3.3\ \text{V}$ | - | 0.05 | 0.5 | nA |
| Optical return loss | ORL | $\lambda=1.31/1.55\ \mu\text{m}$ | 27 | 35 | - | |

*3: Single-ended (V_{out+}) measurement

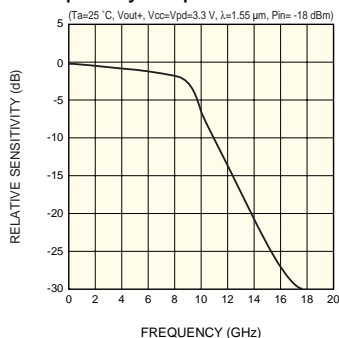
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Bit error rate



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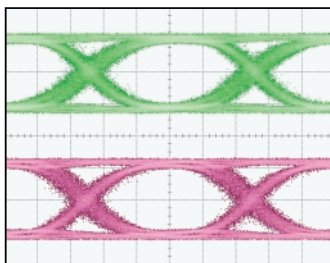
Frequency response



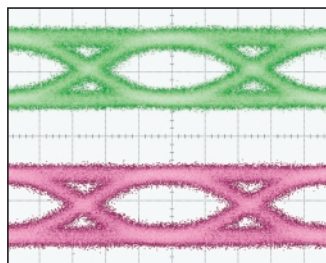
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Eye diagram

Bit rate 10 Gbps, PN=31, NRZ, $\lambda=1.55 \mu\text{m}$, Extinction ratio 14 dB, $V_{cc}=V_{pd}=3.3 \text{ V}$



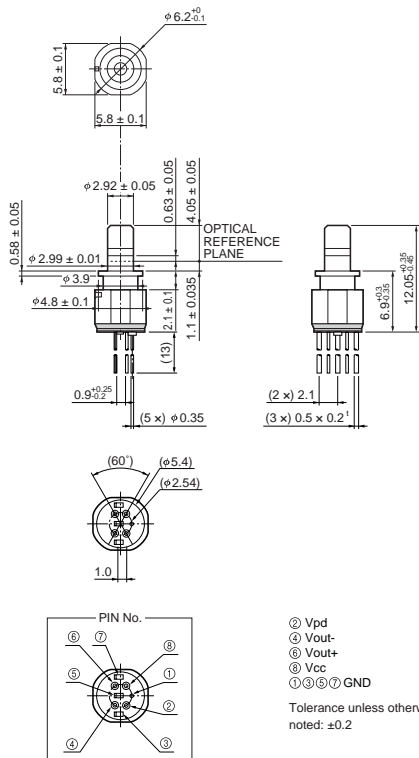
Pin = +2.5 dBm, 100 mV/div., 20 ps/div.



Pin = -20 dBm, 50 mV/div., 20 ps/div.

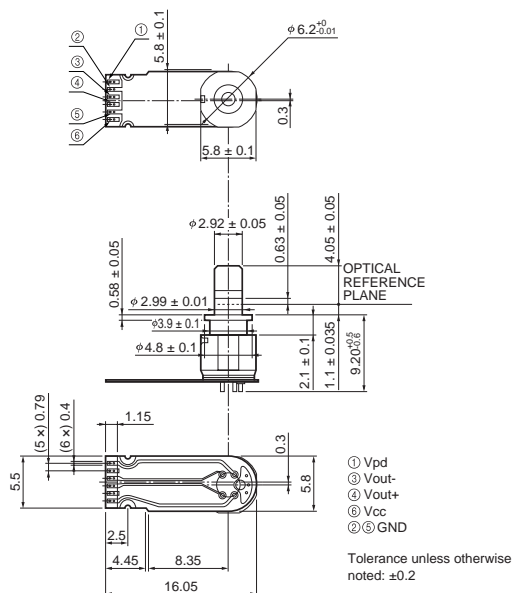
Dimensional outline (unit: mm)

G10342-14



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G10342-54



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