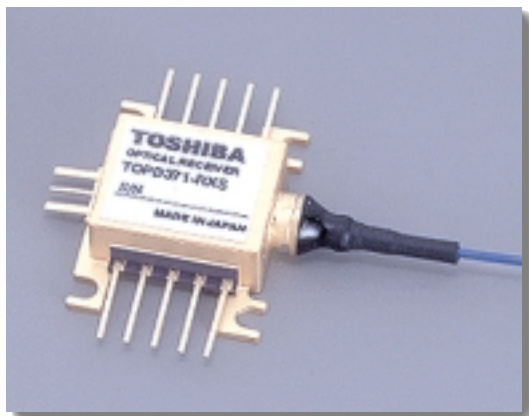


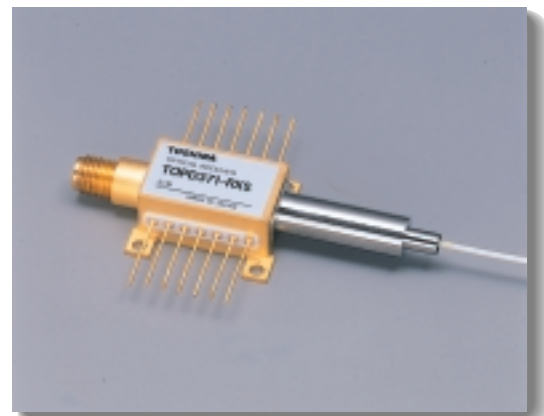
Optical Communication Devices

10 Gb/s Optical Receiver

TOPD371-RXS Series



(Lead output type: TOPD371-RXSCPW)



(SMA connector output type: TOPD371-RXSSMA)

APPLICATION

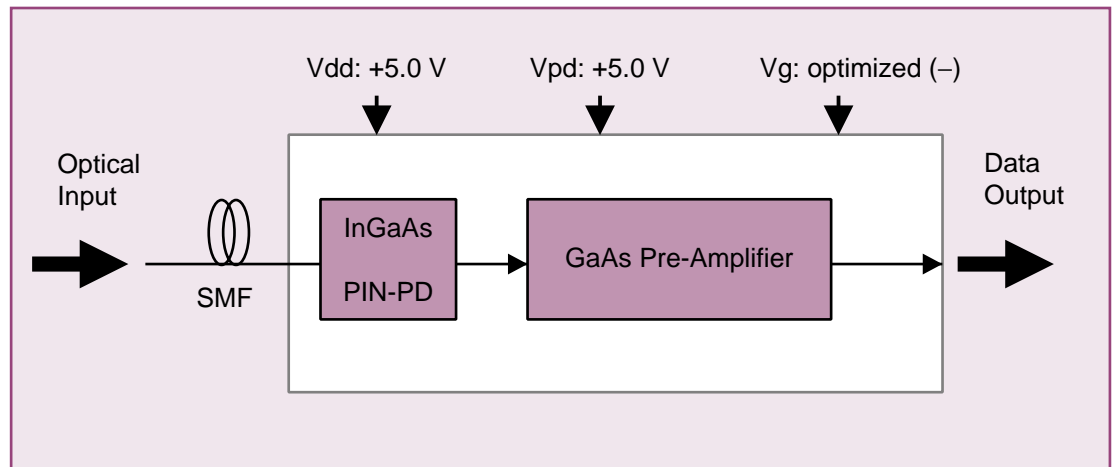
- SONET / SDH (OC-192 / STM-64) applications

FEATURES

- PIN-PD and Pre-Amplifier
- Lead output type : TOPD371-RXSCPW
- SMA connector output type: TOPD371-RXSSMA
- Sensitivity: -20 dBm (Typ. @ BER = 1×10^{-10} , PRBS $2^{31}-1$)
- Overload: 0 dBm (Min @ BER = 1×10^{-10} , PRBS $2^{31}-1$)
- Transimpedance: 700 Ω (Typ.)
- Package size
 - TOPD371-RXSCPW: 12.7 mm (W) x 16.0 mm (D) x 7.0 mm (H)
 - TOPD371-RXSSMA: 12.7 mm (W) x 20.8 mm (D) x 9.5 mm (H)

TOPD371-RXS Series

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C)

| Item | Symbol | Rating | Unit |
|-------------------------------------|-------------|------------|--------|
| Storage temperature | Tstg | -40 to +85 | °C |
| Operating ambient temperature | Ta | 0 to +70 | °C |
| PD forward current | If | 3 | mA |
| PD reverse current | Ir | 2 | mA |
| PD reverse voltage | Vpd | 0 to +15 | V |
| Positive voltage | Vdd | 0 to +6 | V |
| Positive current | Idd | 100 | mA |
| Gate voltage (Gain control voltage) | Vg | -3 to 0 | V |
| Soldering temperature / time | Tsol / tsol | 260 / 5 | °C / s |

ELECTRICAL AND OPTICAL CHARACTERISTICS

(Ta = 0 to +70 °C, λ = 1.3/1.55 μm, Vdd = +5 V, Vpd = +5 V) (Note 1)

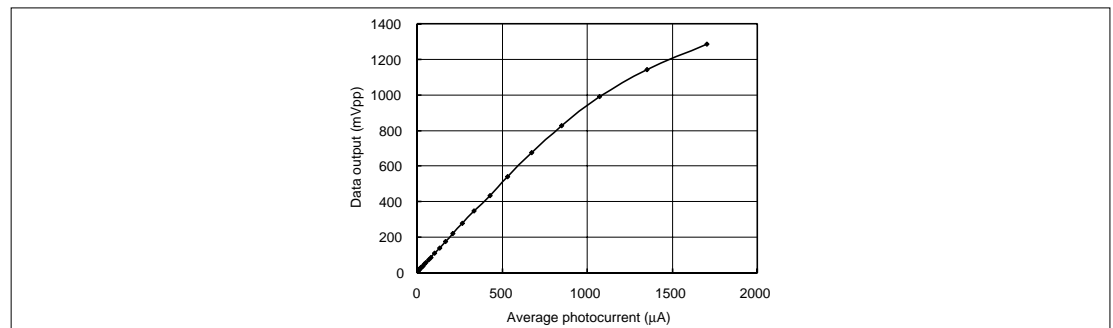
| Item | Symbol | Condition | Min | Typ. | Max | Unit |
|---------------------|--------|-----------------------|-----|------|-----|------|
| Positive current | Idd | Vg=0V | — | 50 | 100 | mA |
| Responsivity | R1.55 | -10dBm | 0.6 | 0.75 | — | A/W |
| Dark current | Id | — | — | — | 10 | nA |
| Cutoff frequency | fc | 3 dB down from 10 MHz | 8.0 | 9.0 | — | GHz |
| Amplitude deviation | — | 10 MHz to fc | — | — | 3 | dB |
| Transimpedance | Zt | — | 500 | 700 | — | Ω |
| Sensitivity | Ps | Note 2 | — | -20 | -18 | dBm |
| Overload | Po | Note 2 | 0 | — | — | dBm |
| Optical return loss | Ro | — | 27 | — | — | dB |

Note 1: To optimize frequency response, Vg should be controlled by using Vsm.

See a recommended gain control circuit shown on the next page.

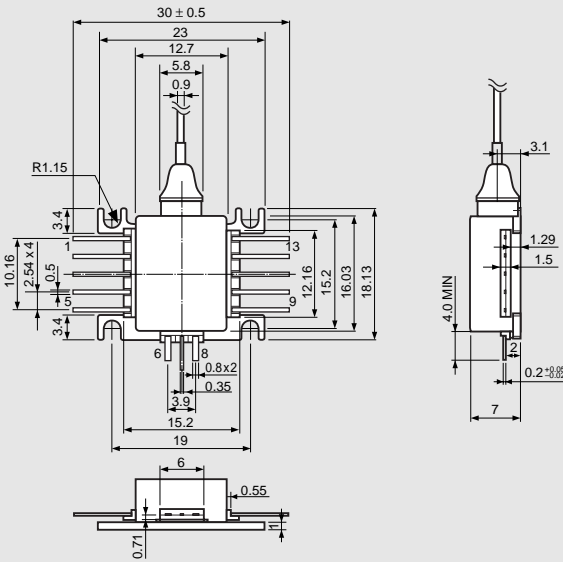
Note 2: 9.95328 Gb/s, NRZ, PRBS 2³¹-1, BER = 1 x 10⁻¹⁰

TYPICAL DATA OUTPUT AMPLITUDE VS. PIN PD PHOTOCURRENT



DIMENSIONAL OUTLINE AND PIN ASSIGNMENT

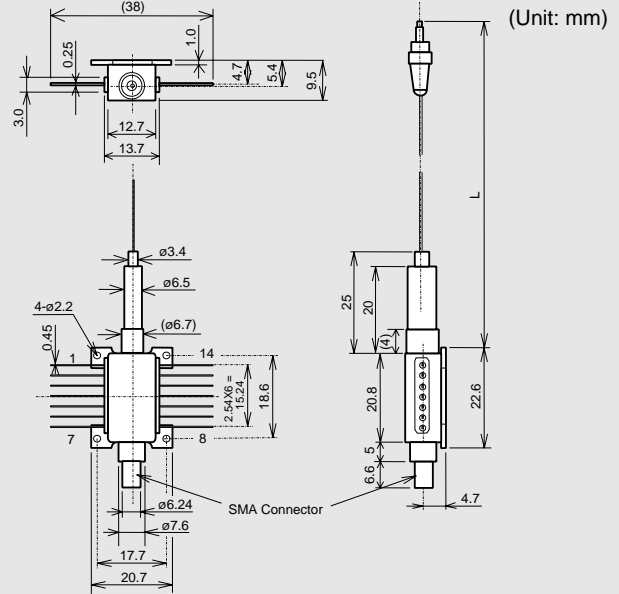
TOPD371-RXSCPW: Lead output type



Pin Assignment

| Pin | Function | Pin | Function |
|-----|-------------|-----|------------------------------|
| 1 | GND | 8 | GND |
| 2 | Vpd (+5 V) | 9 | GND |
| 3 | GND | 10 | Vsm (Source voltage monitor) |
| 4 | GND | 11 | GND |
| 5 | Vdd (+5 V) | 12 | Vg (Gain control voltage) |
| 6 | GND | 13 | GND |
| 7 | Data Output | | |

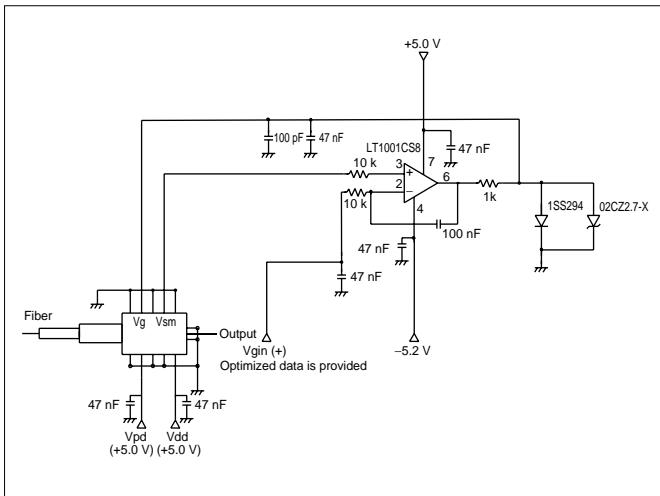
TOPD371-RXSSMA: SMA connector output type



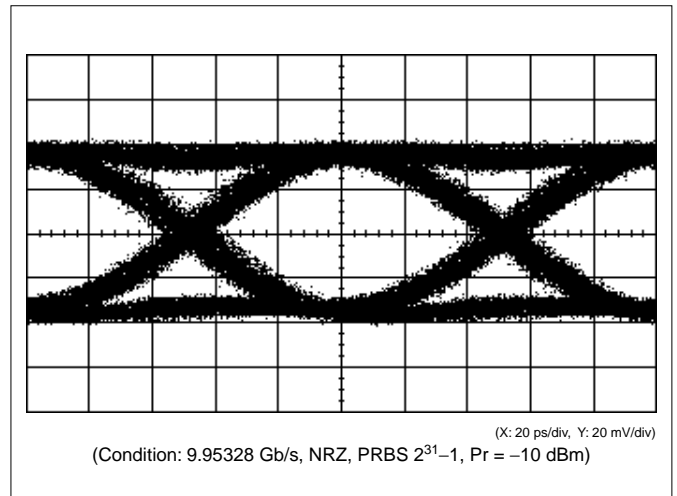
Pin Assignment

| Pin | Function | Pin | Function |
|-----|--------------|-----|------------------------------|
| 1 | GND | 8 | GND |
| 2 | Vpd (+5.0 V) | 9 | GND |
| 3 | NC | 10 | GND |
| 4 | NC | 11 | Vsm (Source voltage monitor) |
| 5 | Vdd (+5.0 V) | 12 | GND |
| 6 | GND | 13 | Vg (Gain control voltage) |
| 7 | GND | 14 | GND |

RECOMMENDED GAIN CONTROL CIRCUIT



EYE DIAGRAM



PRECAUTIONS

- (a) Power supply: Transient electric spike may cause a damage to the photodiode or IC chips. A surge-free power supply and a slow starter circuit should be used. To avoid causing an electrical surge, pins should not be connected or disconnected on the test fixture before turning power off.
- (b) The product should be grounded for obtaining the performance.

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TOSHIBA

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