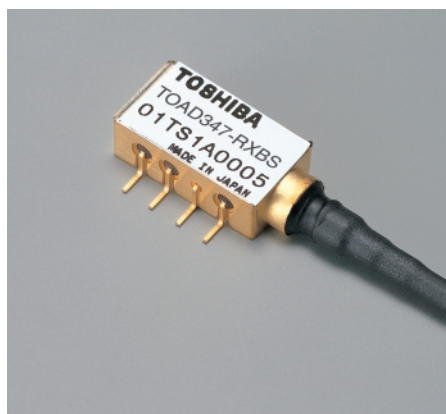


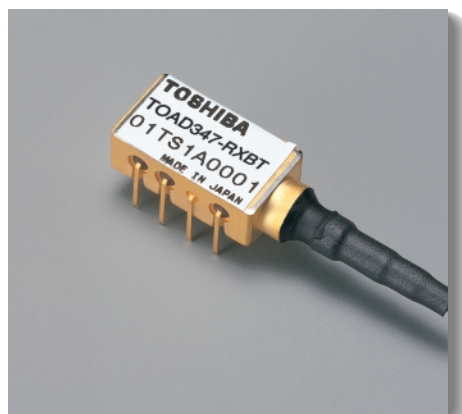
## Optical Communication Devices

### 2.5 Gb/s Optical Receiver

**TOAD347-RX Series :** TOAD347-RXBS/TOAD347-RXBT  
TOAD347-RXCS/TOAD347-RXCT



(SMD type : TOAD347-RXBS / TOAD347-RXCS)



(Through hole mount type : TOAD347-RXBT / TOAD347-RXCT)

#### APPLICATION

- SONET / SDH (OC-48 / STM-16) applications

#### FEATURES

- APD and TIA
- Package: SMD type, through hole mount type
- With thermistor (TOAD347-RXCS / T)
- Differential data outputs
- Single power supply voltage: +3.3 V to +5 V
- Sensitivity: -33 dBm (typ. @ BER =  $1 \times 10^{-10}$ )
- Overload : 0 dBm (typ. @ BER =  $1 \times 10^{-10}$ )
- Operating case temperature range: -40 to +85 °C
- Package size: 7.4 (W) x 13.2 (D) x 4.6 (H) mm

# TOAD347-RX Series : TOAD347-RXBS/TOAD347-RXBT TOAD347-RXCS/TOAD347-RXCT

## ABSOLUTE MAXIMUM RATINGS (Tc = 25 °C)

| Item                         | Symbol      | Rating     | Unit   |
|------------------------------|-------------|------------|--------|
| Storage temperature          | Tstg        | −40 to +85 | °C     |
| Operating case temperature   | Tc          | −40 to +85 | °C     |
| APD forward current          | If          | 1          | mA     |
| APD reverse current          | Ir          | 2000       | μA     |
| Positive supply voltage      | Vdd         | 0 to +6    | V      |
| Soldering temperature / time | Tsol / tsol | 260 / 5    | °C / s |

## ELECTRICAL AND OPTICAL CHARACTERISTICS (Tc = −40 to +85 °C, Vdd = +3.3 V to +5 V)

| Item                                       | Min | Typ. | Max  | Unit | Note    |
|--------------------------------------------|-----|------|------|------|---------|
| Positive supply current                    | –   | 50   | –    | mA   |         |
| Breakdown voltage (Id = 100 μA, Tc = 25°C) | 35  | –    | 85   | V    |         |
| Dark current (M = 12, Tc = 25°C)           | –   | 40   | 100  | nA   |         |
| Sensitivity                                | –   | −33  | –    | dBm  | (1)     |
| Overload                                   | −2  | 0    | —    | dBm  | (1)     |
| Bandwidth (−3 dB)                          | 1.4 | 2.0  | –    | GHz  | (2)     |
| Logic sense                                | –   | –    | –    | –    | (3)     |
| Skew, data out (+) to data out (−)         | −20 | –    | 20   | ps   |         |
| Optical return loss                        | –   | –    | −27  | dB   | (4)     |
| Output signal amplitude                    | 20  | –    | 250  | mVpp | (5)     |
| Electrical return loss                     | 10  | –    | –    | dB   | (6)     |
|                                            | 9   | –    | –    | dB   | (7)     |
| Thermistor resistance (Tc = 25°C)          | 9.5 | 10.0 | 10.5 | kΩ   | (8),(9) |

Notes:

(1) 2.48832 Gb/s, NRZ, PRBS 2<sup>31</sup>−1, BER = 1 × 10<sup>−10</sup>, λ = 1.55 μm

(2) Pf = −30 dBm, M = 12

(3) DATA OUT (+), Light ON = Vout Logic HIGH  
DATA OUT (−), Light ON = Vout Logic LOW

(4) λ = 1.3/1.55 μm

(5) −10 dBm > Pf > −30 dBm

(6) 0.13 GHz < F < 1.75 GHz

(7) 1.75 GHz < F < 2.5 GHz

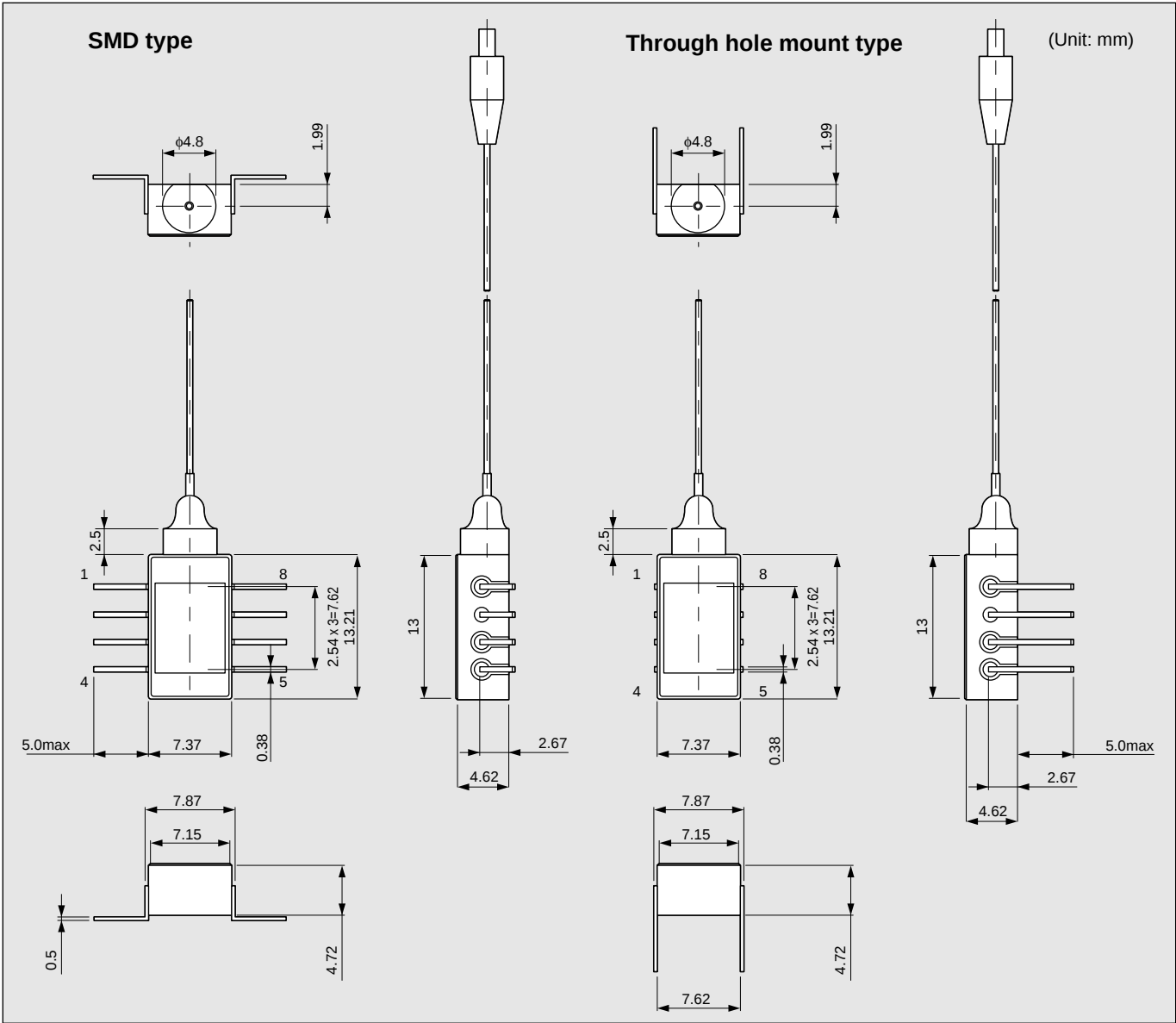
(8) TOAD347-RXCS, TOAD347-RXCT

(9) 3 kΩ (typ.) available

## PRODUCT LINE-UP

| Part Number  | Package Type       | Thermistor |
|--------------|--------------------|------------|
| TOAD347-RXBS | SMD                | Non        |
| TOAD347-RXBT | Through hole mount | Non        |
| TOAD347-RXCS | SMD                | Included   |
| TOAD347-RXCT | Through hole mount | Included   |

# DIMENSIONAL OUTLINE



# PIN ASSIGNMENT

| Pin Assignment for (TOAD347-RXBS/TOAD347RXBT) |              |     |                      | Pin Assignment for (TOAD347-RXCS/TOAD347-RXCT) |              |     |                      |
|-----------------------------------------------|--------------|-----|----------------------|------------------------------------------------|--------------|-----|----------------------|
| Pin                                           | Function     | Pin | Function             | Pin                                            | Function     | Pin | Function             |
| 1                                             | Vapd         | 5   | GND                  | 1                                              | Vapd         | 5   | Thermistor           |
| 2                                             | GND          | 6   | DATA OUT (-)         | 2                                              | GND          | 6   | DATA OUT (-)         |
| 3                                             | DATA OUT (+) | 7   | GND                  | 3                                              | DATA OUT (+) | 7   | GND                  |
| 4                                             | GND          | 8   | Vdd (+3.3 V to +5 V) | 4                                              | GND          | 8   | Vdd (+3.3 V to +5 V) |

# 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 the power off.
- (b) The product should be grounded for obtaining the performance.

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(As of May, 2002)

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