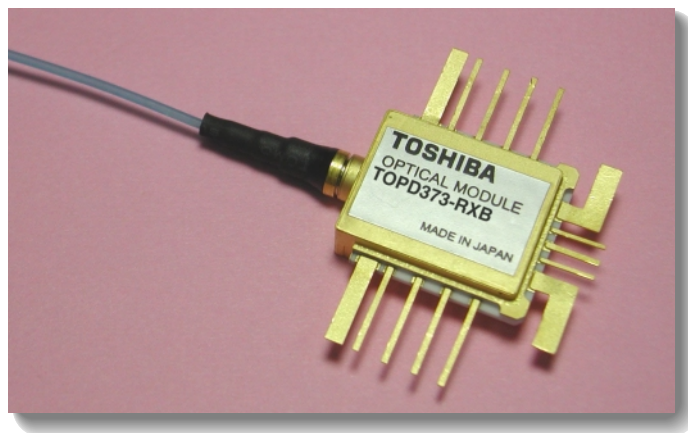


Optical Communication Devices

10 Gb/s Optical Receiver

TOPD373-RXB Series
(PRERIMINARY)



APPLICATION

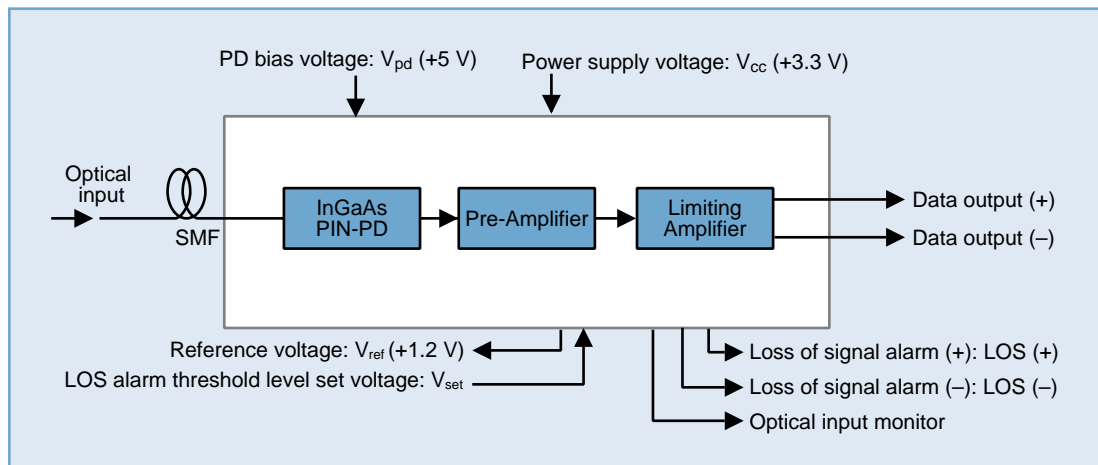
- SONET / SDH (OC-192 / STM-64) applications

FEATURES

- InGaAs PIN-PD and TIA with Limiting Amplifier
- 2R function included
- Differential output
- Sensitivity: -17 dBm (typ. @ BER = 1×10^{-11} , PRBS $2^{31}-1$)
- Overload: -3 dBm (min @ BER = 1×10^{-11} , PRBS $2^{31}-1$)
- Data output: 300 mVpp (typ. @ single output)
- Loss of signal (LOS) alarm
- Optical input monitor

TOPD373-RXB Series

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings	Unit
Storage temperature	Tstg	-40 to +85	°C
Operating case temperature	Tc	0 to +70	°C
PD forward current	If	3	mA
PD reverse current	Ir	2.5	mA
PD reverse voltage	Vpd	0 to 15	V
Source voltage	Vcc	-0.5 to 4	V
Soldering temperature	Tsol	260	°C
Soldering time	tsol	5	s

ELECTRICAL AND OPTICAL CHARACTERISTICS

(Tc = 0 °C to 70 °C, λ = 1.55 μm, Vcc = +3.3 V, Vpd = +5 V)

Item	Symbol	Condition	Min	Typ.	Max	Unit
Source current	Icc	—	—	60	—	mA
Responsivity	R _{1.55}	Pin = -10 dBm	0.68	0.85	—	A/W
Dark current	Id	—	—	—	10	nA
Cutoff frequency	fc	3dB down from 500 MHz	7	8.5	—	GHz
Transimpedance	Zt	—	8	12	16	kΩ
Sensitivity	Ps	Note 1	—	-17	—	dBm
Overload	Po	Note 1	-3	0	—	dBm
Optical return loss	ORL	—	27	—	—	dB
Data output voltage	Vout	single-ended	100	300	400	mVp-p
Data output offset	Vo-off	Differential	—	—	+/-50	mV
Reference voltage	Vref	Note 2	—	1.2	—	V
LOS output high	LOS(H)	Note 3	2.4	—	Vcc	V
LOS output low	LOS(L)	Note 3	—	—	5	V
LOS alarm threshold level set voltage range	Vset	Note 4,5	—	0.8 to 1.1	—	V
Optical input monitor output voltage range	Vmon	Note 6,7	—	1.4 to 1.6	—	V

Note 1: 10.664228 Gb/s, NRZ, PRBS2³¹-1, BER = 10⁻¹¹

Note 2: Vref: Reference voltage for Vset resistive divider (R1 and R2). See recommended application circuit.

Note 3: Recommended pullup resistor value is 4.7 kΩ to 10 kΩ to Vcc.

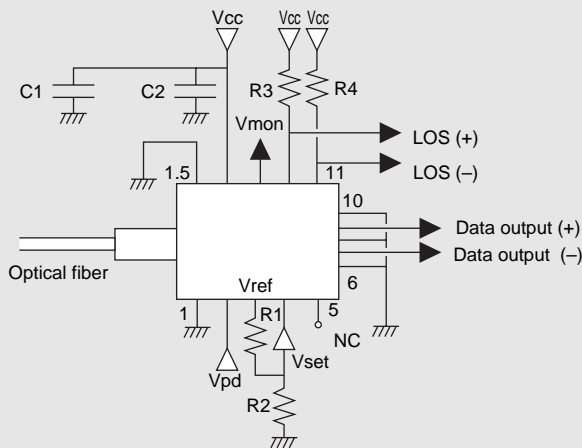
Note 4: Vset: LOS alarm threshold level is given by the voltage (Vset)
(See recommended Circuit)

Note 5: Photocurrent level is 15 μA to 100 μA

Note 6: Vmon: Voltage output corresponding to the peak to peak input photocurrent.

Note 7: Photocurrent level is 15 μA to 100 μA

RECOMMENDED APPLICATION CIRCUIT



Pin Assignment

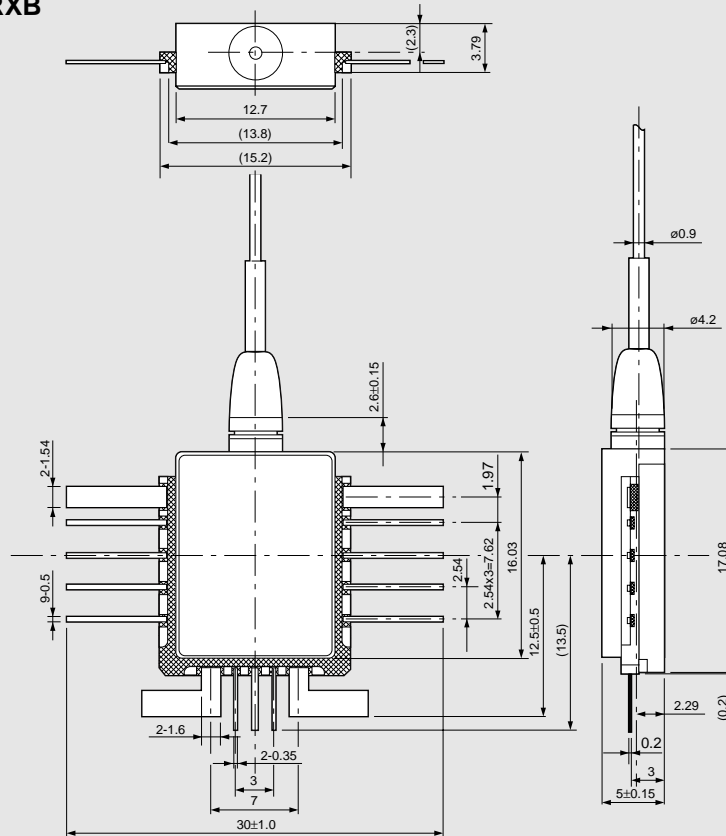
Designator	Description
C1	4.7 μ F, 6 V ceramic
C2	1 μ F, 6 V ceramic
R1	$R_1 = 50 \text{ k}\Omega - R_2$
R2	$R_2 = 50 \text{ k}\Omega \times (V_{set} / V_{ref})$
R3,R4	$4.7 \text{ k}\Omega \leq R_3, R_4 \leq 10 \text{ k}\Omega$

Note: LOS alarm threshold level can be determined by the voltage (Vset). Vset is flexibly set by the R1 and R2 which are inserted between Vref and Ground.

DIMENSIONAL OUTLINES AND PIN CONFIGURATION

TOPD373-RXB

(Unit: mm)



Pin Assignment

Pin	Function
1	GND
2	Vpd (+5 V)
3	Vref
4	Vset
5	NC
6	GND
7	Data output (-)
8	GND
9	Data output (+)
10	GND
11	LOS (-)
12	LOS (+)
13	Vmon
14	Vcc (+3.3 V)
15	GND

PRECAUTIONS

- 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.
- The product should be grounded for obtaining the performance.

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TOSHIBA

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