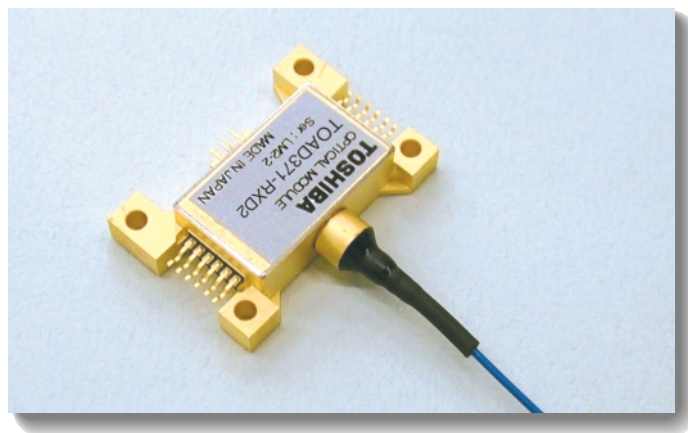


# Optical Communication Devices

## 10 Gb/s Optical Receiver

### TOAD371-RXD2 Series



#### APPLICATION

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

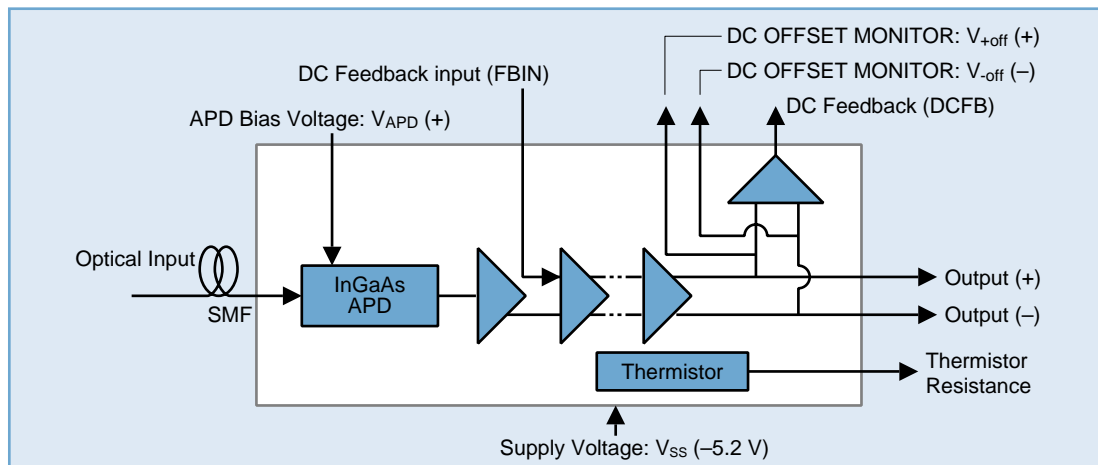
#### FEATURES

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- InGaAs APD and TIA
- Differential output
- Sensitivity:  $-24$  dBm (typ. @ BER =  $1 \times 10^{-12}$ , PRBS  $2^{31}-1$ )
- Overload :  $-6$  dBm (min @ BER =  $1 \times 10^{-12}$ , PRBS  $2^{31}-1$ )
- Transimpedance:  $1000 \Omega$  (typ.)
- Cutoff frequency:  $8.0$  GHz (typ.)

## TOAD371-RXD2 Series

### BLOCK DIAGRAM



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

Item	Symbol	Rating	Unit
Storage temperature	Tstg	-40 to +85	°C
Operating case temperature	Tc	0 to +70	°C
APD forward current	If	1	mA
APD reverse current	Ir	2	mA
APD reverse voltage	VAPD	0 to Vb	V
Supply voltage	Vss	-6 to 0	V
DC feedback input(FBIN)voltage	Vfbin	-3 to +0.3	V
Soldering temperature / time	Tsol / tsol	260 / 5	°C / s

### ELECTRICAL AND OPTICAL CHARACTERISTICS (Tc = 0 to 70 °C, λ = 1.55 μm, Vss = -5.2 V, Note 1)

Item	Symbol	Condition	Min	Typ.	Max	Unit
Responsivity	R1.55	Pin = -20 dBm, M = 1	0.65	0.70	—	A/W
APD breakdown voltage	Vb	Id = 100 μA	20	—	40	V
Temperature coefficient of Vb	γ	Note 2	—	0.05	—	V / °C
Transimpedance (AC)	Zt	RL = 50 Ω, f = 10 MHz	700	1000	—	Ω
Cutoff frequency	fc	3 dB down from 130 MHz M= 10, Pin = -20 dBm, RL = 50 Ω	7.0	8.0	—	GHz
Amplitude deviation	DG	10 MHz to fc	—	—	3	dB
Sensitivity	Ps	Note 3	—	-24	-23	dBm
Overload	Po	Note 3	-6	—	—	dBm
DC Feedback input voltage	FBIN	Voutpvt (+), DC = Voutpvt (-), DC	-3	—	-0.2	V
Optical return loss	ORL	—	27	—	—	dB
Power supply current	Iss	—	—	110	135	mA
Power supply voltage	Vss	—	-5.46	-5.2	-4.94	V
Thermistor resistance	Rth	Tc = 25 °C	9.5	10	10.5	kΩ
Thermistor B constant	B	Tc = 25 °C	3800	3900	4000	K

Note 1: At an optimized DC feedback input voltage of FBIN

Note 2:  $\gamma = dV_b / dT_c$

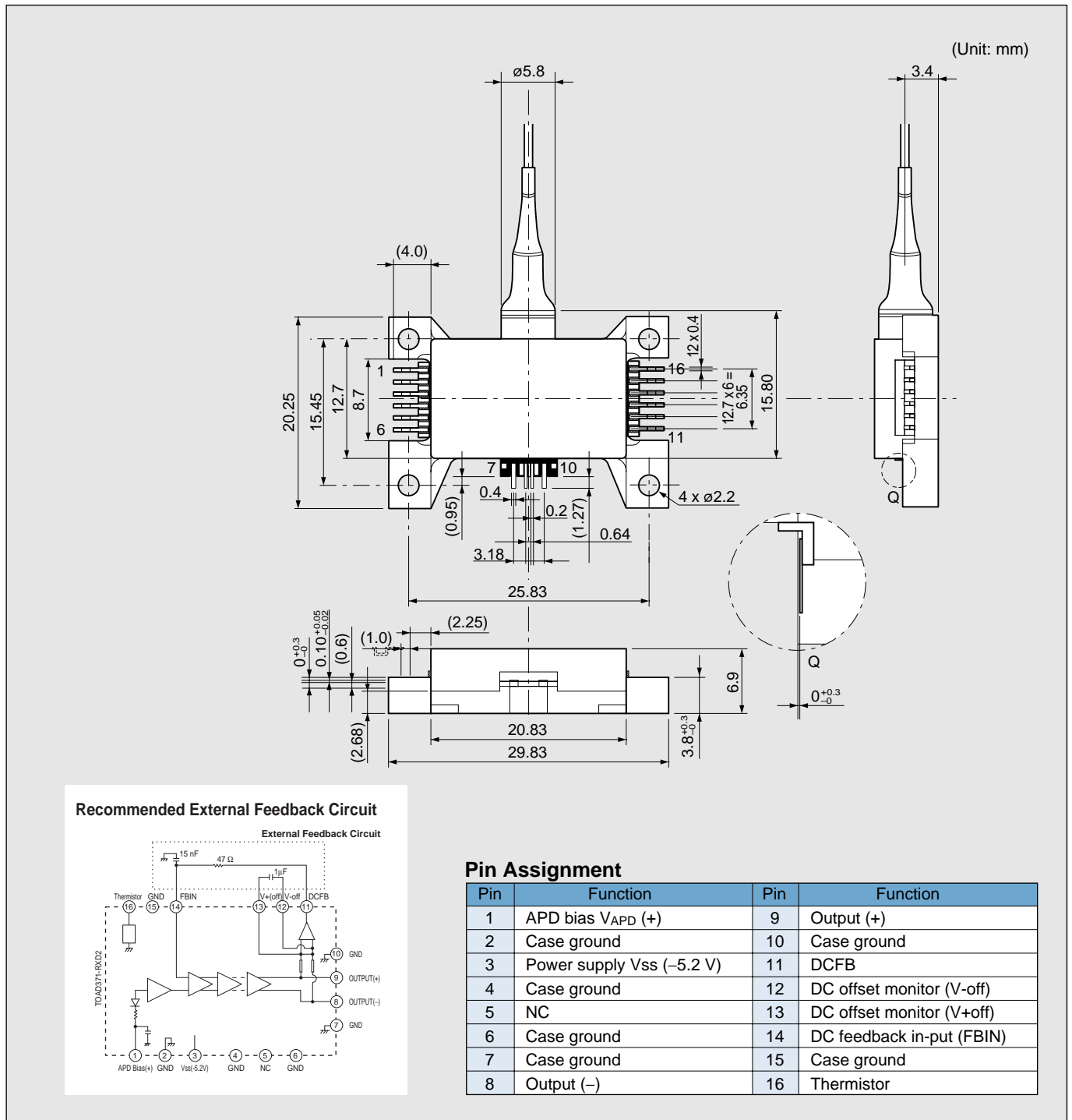
Note 3: 9.95328 Gb/s, NRZ, PRBS 2<sup>31</sup>-1, BER = 1 x 10<sup>-12</sup> optimized APD bias voltage (VAPD)

Note 4: Logic sense

Output (+) = 'High' when Optical Input is Light "ON"

Output (-) = 'Low' when Optical Input is Light "ON"

## DIMENSIONAL OUTLINE AND PIN ASSIGNMENT



## 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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