

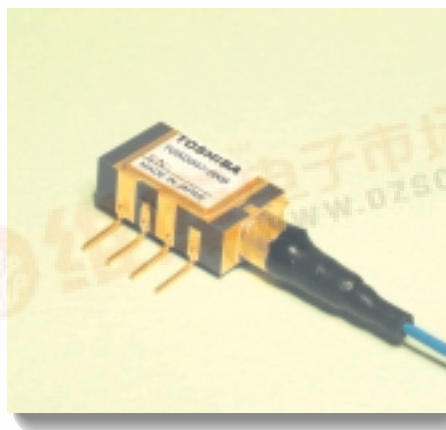
TOSHIBA

September 2001

Optical Communication Devices

2.5 Gb/s Optical Receiver

TOAD347-RXB/TOAD347-RXC Series



APPLICATION

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

FEATURES

- APD and TIA
- TOAD347-RXB: Mini-DIL package without thermistor
- TOAD347-RXC: Mini-DIL package with thermistor
- Differential data output
- Single power supply voltage: +3.3 V to +5 V
- Sensitivity: -33 dBm (Typ. @ BER = 1×10^{-10})
- Overload: -8 dBm (Typ. @ BER = 1×10^{-10})
- Operating case temperature range: -40 to +85 °C
- Package size: 7.4 (W) x 13.2 (D) x 4.6 (H) mm

TOAD347-RXB/TOAD347-RXC Series

TOAD347-RXB/TOAD347-RXC Series

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	500	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 = 10 μA, Tc = 25°C)	35	—	85	V	
Dark current (M = 12, Tc = 25°C)	—	40	100	nA	
Sensitivity	—	−33	—	dBm	(1)
Overload	—	−8	—	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	15	—	500	mVpp	(5)
Electrical return loss	10	—	—	dB	(6)
	9	—	—	dB	(7)
Thermistor resistance (TOAD347-RXC, Tc = 25°C)	9.5	10.0	10.5	kΩ	(8)

- Notes:
(1) 2.48832 Gb/s, NRZ, PRBS 2³¹−1, BER = 1 × 10^{−10}, 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) 3 kΩ (typ.) available

DIMENSIONAL

Pin Assignme

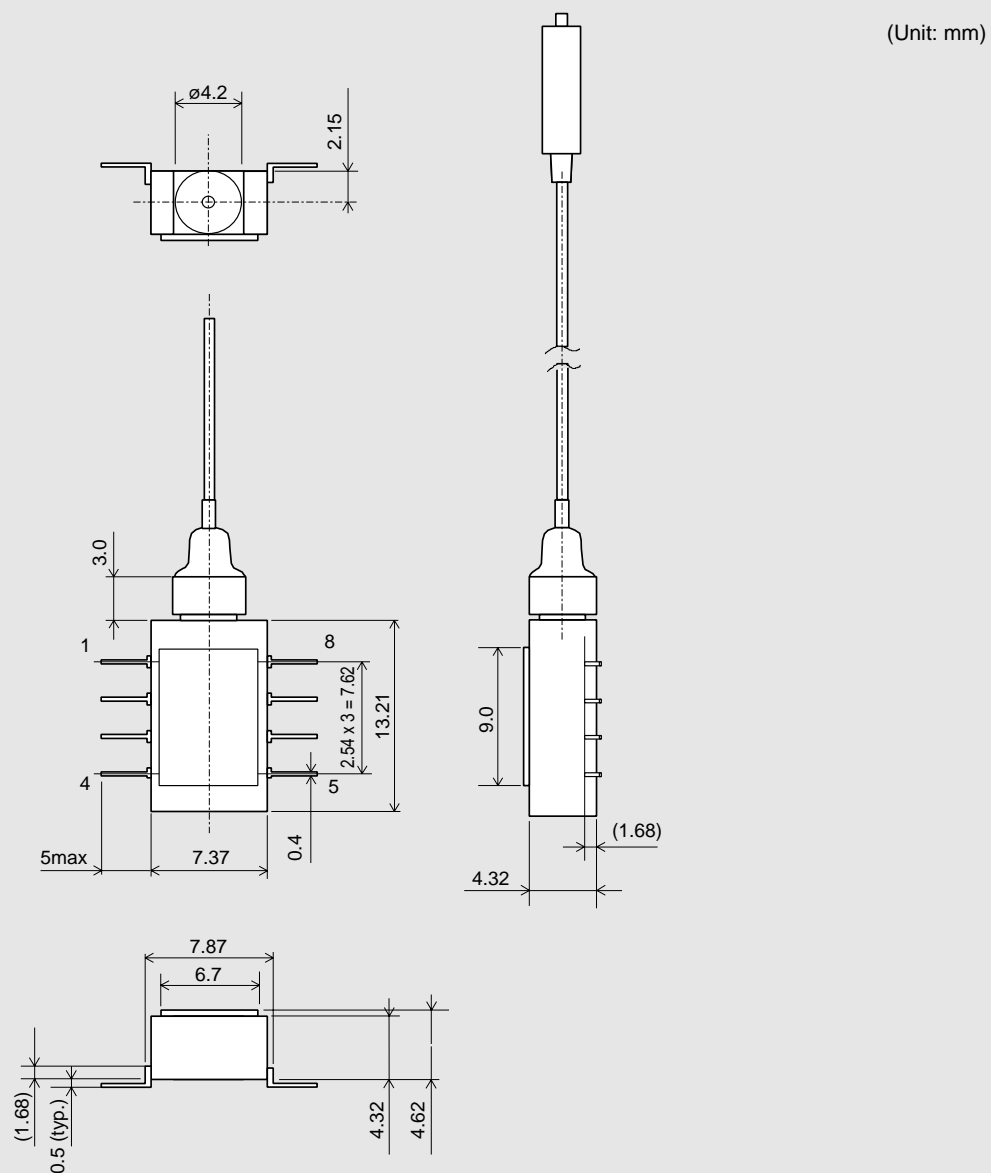
Pin	Fu
1	Vapd
2	GND
3	DATA OU
4	GND

PRECAUTION

- (a) Power suppl
A surge-free
To avoid cau
before turnin
(b) The product

DIMENSIONAL OUTLINE AND PIN ASSIGNMENT

Unit	Note
mA	
V	
nA	
dBm	(1)
dBm	(1)
GHz	(2)
	(3)
ps	
dB	(4)
nVpp	(5)
dB	(6)
dB	(7)
k Ω	(8)



Pin Assignment (TOAD347-RXB)

Pin	Function	Pin	Function
1	Vapd	5	GND
2	GND	6	DATA OUT (-)
3	DATA OUT (+)	7	GND
4	GND	8	Vdd (+3.3 V to +5 V)

Pin Assignment (TOAD347-RXC)

Pin	Function	Pin	Function
1	Vapd	5	Thermistor
2	GND	6	DATA OUT (-)
3	DATA OUT (+)	7	GND
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.

OVERSEAS SUBSIDIARIES AND AFFILIATES

010126 (X)

Toshiba America Electronic Components, Inc. Headquarters-Irvine, CA 9775 Toledo Way, Irvine, CA 92618, U.S.A. Tel: (949)455-2000 Fax: (949)859-3963 Deerfield, IL(Chicago) One Pkwy., North, Suite 500, Deerfield, IL 60015-2547, U.S.A. Tel: (847)945-1500 Fax: (847)945-1044 Edison, NJ 2035 Lincoln Hwy. Ste. #3000, Edison NJ 08817, U.S.A. Tel: (732)248-8070 Fax: (732)248-8030 Raleigh, NC 5511 Capitol Center Dr., #114, Raleigh, NC 27606, U.S.A. Tel: (919)859-2800 Fax: (919)859-2898 Richardson, TX(Dallas) 777 East Campbell Rd., Suite 650, Richardson, TX 75081, U.S.A. Tel: (972)480-0470 Fax: (972)235-4114 Wakefield, MA(Boston) 401 Edgewater Place, Suite #360, Wakefield, MA 01880-6229, U.S.A. Tel: (781)224-0074 Fax: (781)224-1095	Toshiba Electronics Europe GmbH Düsseldorf Head Office Hansaallee 181, D-40549 Düsseldorf Germany Tel: (0211)5296-0 Fax: (0211)5296-400 Toshiba Electronics Italiana S.R.L. Centro Direzionale Colleoni Palazzo Perseo Ingr. 2-Piano 6, Via Paracelso n.12, I-20041 Agrate Brianza Milan, Italy Tel: (039)68701 Fax: (039)6870205 Toshiba Electronics(UK) Limited Riverside Way, Camberley Surrey, GU15 3YA, U.K. Tel: (01276)69-4600 Fax: (01276)69-4800 Toshiba Electronics Scandinavia AB Gustavslundsvägen 12, 2nd Floor S-161 15 Bromma, Sweden Tel: (08)704-0900 Fax: (08)80-8459	Toshiba Electronics Asia, Ltd. Hong Kong Head Office Level 11, Top Glory Insurance Building, Grand Century Place, No.193, Prince Edward Road West, Mong Kok, Kowloon, Hong Kong Tel: 2375-6111 Fax: 2375-0969 Beijing Office Rm 714, Beijing Fortune Building, No.5 Dong San Huan Bei-Lu, Chao Yang District, Beijing, 100004, China Tel: (010)6590-8795 Fax: (010)6590-8791 Toshiba Electronics Korea Corporation Seoul Head Office 14/F, KEC B/D, 257-7 Yangjae-Dong, Seocho-ku, Seoul, Korea Tel: (02)589-4334 Fax: (02)589-4302 Toshiba Technology Development (Shanghai) Co., Ltd. 23F, Shanghai Senmao International Building, 101 Yin Cheng East Road, Pudong New Area, Shanghai, 200120, China Tel: (021)6841-0666 Fax: (021)6841-5002 Toshiba Electronics Taiwan Corporation Taipei Head Office 17F, Union Enterprise Plaza Bldg. 109 Min Sheng East Rd., Section 3, 0446 Taipei, Taiwan Tel: (02)514-9988 Fax: (02)514-7892
--	--	---

The information contained herein is subject to change without notice.

The information contained herein is presented only as a guide for the applications of our products.
No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.

TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..

The Toshiba products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.).
These Toshiba products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of Toshiba products listed in this document shall be made at the customer's own risk.

The products described in this document are subject to the foreign exchange and foreign trade laws.

Caution: Gallium arsenide (GaAs) is a substance used in some of the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the products, or use chemicals to dissolve them.

In Touch with Tomorrow
TOSHIBA

TOSHIBA CORPORATION
Electronic Devices Sales & Marketing Division
1-1, Shibaura 1-chome, Minato-ku, Tokyo, 105-8001, Japan
Tel: +81-3-3457-3405 Fax: +81-3-5444-9431