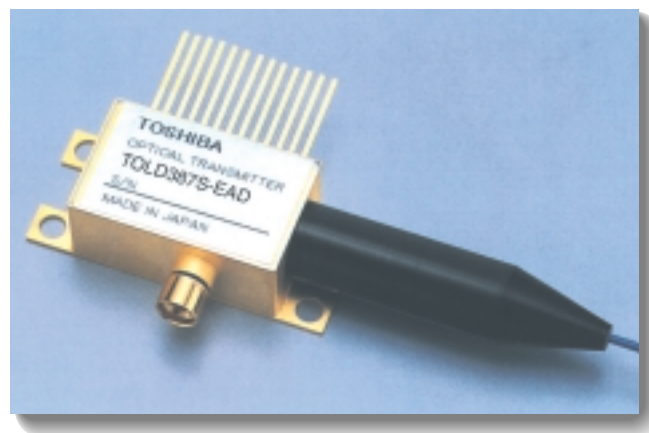


Optical Communication Devices

10 Gb/s Optical Transmitter

TOLD387S-EAD Series



APPLICATIONS

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

FEATURES

- 1.55 μm DFB-LD with Electro-Absorption Modulator
- Driver IC
- Optical isolator and thermoelectric cooler
- GPO compatible RF input

TOLD387S-EAD

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min	Max	Unit
Storage temperature	Tstg	-40	85	°C
Operating case temperature	Tc	-5	70	°C
Laser forward current	If	—	150	mA
Laser reverse voltage	Vr	—	2	V
Supply voltage	Vss	-6.5	0.3	V
Input data amplitude	Vin	—	1.6	Vpp
Monitor diode bias voltage	Vm	-15	2	V

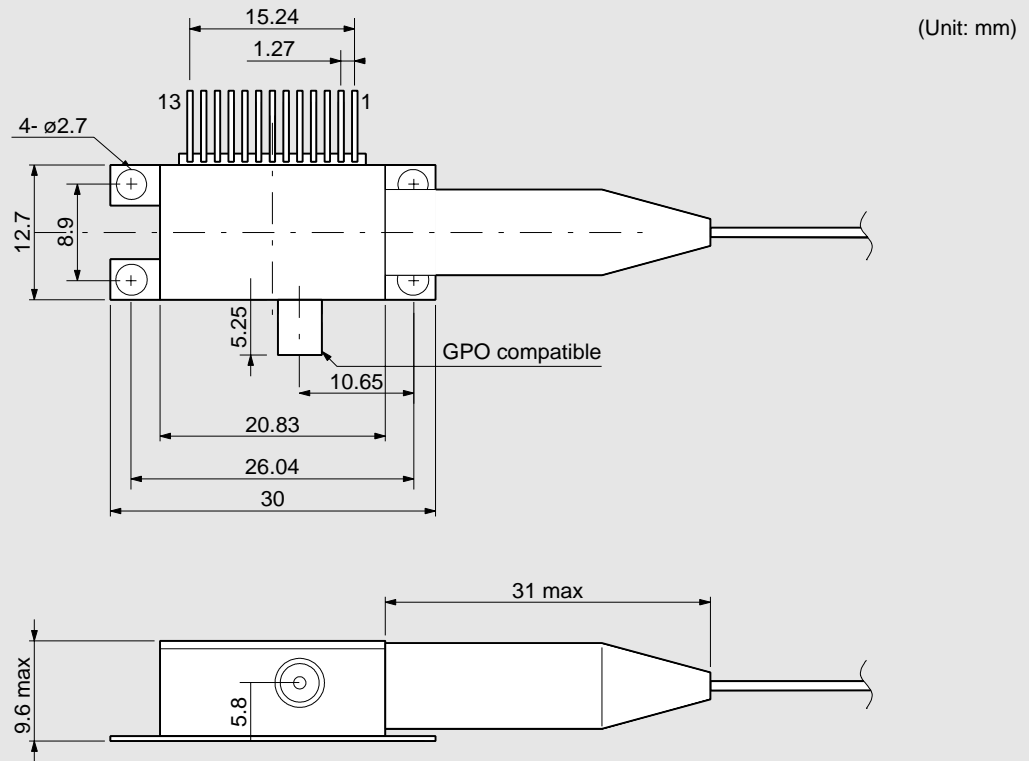
Note: Case temperature shall be measured on heat spreader which the case is attached to.

ELECTRICAL AND OPTICAL CHARACTERISTICS (Tc = -5 to +70 °C, Tset = 25 °C)

Item	Min	Typ.	Max	Unit
Threshold current	—	15	40	mA
Operating current	50	75	100	mA
Input data amplitude	0.5	—	1.0	Vpp
Supply voltage (Vss)	-5.5	-5.2	-5.0	V
Supply current (Iss)	—	0.2	0.3	A
Cross-point reference voltage (Vref)	Vss+1.1	Vss+1.3	Vss+1.5	V
Cross-point control voltage (Vxp)	Vref-0.3	—	Vref+0.3	V
Output amplitude control voltage (Voa)	Vss	—	Vss+1.0	V
Output bias control voltage (Vob)	Vss	—	Vss+2.2	V
Average output power	-4	—	—	dBm
Peak wavelength	1530	—	1565	nm
Side mode suppression ratio	30	—	—	dB
Extinction ratio	9	—	—	dB
RF return loss (up to 7GHz)	10	—	—	dB
Monitor diode current	0.05	—	—	mA
TEC current	—	—	1.3	A
TEC voltage	—	—	2.6	V
Thermistor resistance	9.5	10.0	10.5	kΩ
Dispersion penalty (SMF 40 km, BER = 10 ⁻¹²)	—	—	2	dB

Notes: Data rate = 10Gb/s, NRZ, PRBS 2²³-1

DIMENSIONAL OUTLINE AND PIN ASSIGNMENT



Pin Assignment

Pin	Function	Pin	Function
1	Thermistor	8	Cross-Point Reference Voltage (Vref)
2	Thermistor	9	Output-Amplitude Control Voltage (Voa)
3	LD DC Bias (+)	10	Cross-Point Control Voltage (Vxp)
4	Monitor PD Anode (-)	11	Supply Voltage (Vss)
5	Monitor PD Cathode (+)	12	TEC (+)
6	Output Bias Control Voltage (Vob)	13	TEC (-)
7	N/C	GPO	50 Ω RF input (AC coupled)

PRECAUTIONS

- (a) Power supply: Transient electric spike may cause a damage to the laser, 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) Safety: The laser emits invisible light harmful to the human eyes. Direct viewing should be avoided.

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,
1-20041 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.
Gallium arsenide (GaAs) is a substance used in some of the products described in this documents. GaAs dust and fumes are toxic. Do not break, cut or pulverize the products, or use chemicals to dissolve them.
When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

Website: <http://doc.semicon.toshiba.co.jp/indexus.htm>

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