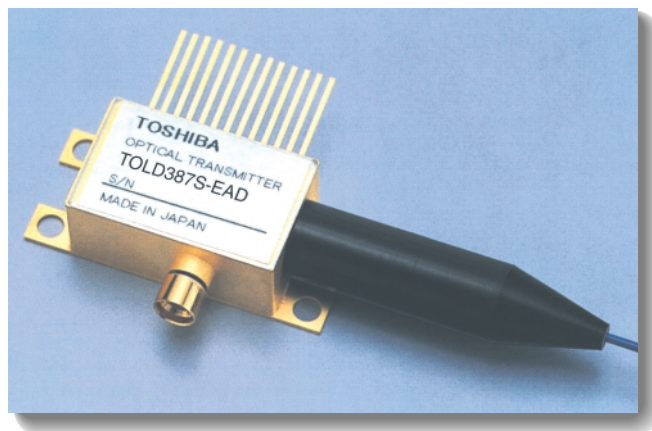


# Optical Communication Devices

## 10 Gb/s Optical Transmitter

### TOLD387S-EAD Series



### APPLICATIONS

- SONET / SDH (OC-192 / STM-64) applications
  - TOLD387S-EAD1: 1-64. 2, 25-km application
  - TOLD387S-EAD2: S-64. 2b, 40-km application
  - TOLD387S-EAD3: 60-km or longer application

### FEATURES

- 1.55  $\mu\text{m}$  EML and Driver IC
- Optical isolator and thermoelectric cooler
- GPO compatible RF input
- Dispersion penalty: < 2 dB
- Fiber output power
  - TOLD387S-EAD1: -5 dBm (min), -1 dBm (max)
  - TOLD387S-EAD2: -1 dBm (min), +2 dBm (max)
  - TOLD387S-EAD3: -3 dBm (min)

# TOLD387S-EAD Series

## 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
Monitor diode (PIN-PD) bias voltage	Vm	-15	+2	V
Supply voltage to the driver IC	Vss	-6.5	+0.3	V
Cross-point reference voltage	Vref	Vss-4.8	Vss+2.4	V
Cross-point control voltage	Vxp	(Min: -6.5)	(Max: 0.3)	V
Output amplitude control voltage	Voa	-6.5	Vss+1.2 (Max: 0.3)	V
Output bias control voltage	Vob	-6.5	Vss+2.4 (Max: 0.3)	V
Input data amplitude	Vin	—	1.6	Vpp
Soldering temperature	Tsol	—	260	°C
Soldering time	tsol	—	5	s

Note: Case temperature should be measured on heat spreader directly.

## ELECTRICAL AND OPTICAL CHARACTERISTICS (Case temperature: Tc = -5 to +70 °C, Tset = 25 °C unless otherwise specified.)

Item	Symbol	Min	Typ.	Max	Unit	Note
Threshold current	Ith	—	15	40	mA	
Operating current	Iop	50	—	100	mA	
Laser diode forward voltage	Vf	—	—	2	V	
RF input impedance	Zin	—	50	—	Ω	
Input data amplitude	Vin	0.5	—	1.0	Vpp	
Supply voltage to the driver IC	Vss	-5.5	-5.2	-5.0	V	
Supply current to the driver IC	Iss	—	0.2	0.3	A	
Cross-point reference voltage	Vref	Vss+1.1	Vss+1.3	Vss+1.5	V	(1)
Cross-point control voltage	Vxp	Vref-0.3	—	Vref+0.3	V	(1)
Output amplitude control voltage	Voa	Vss	—	Vss+1.0	V	(2)
Output bias control voltage	Vob	Vss	—	Vss+2.2	V	(3)
Peak wavelength	λ	1530	—	1565	nm	(4)
Side mode suppression ratio	SMSR	30	—	—	dB	(4)
Extinction ratio	ER	9	—	—	dB	(4)
RF Return Loss (up to 7GHz)	S <sub>11</sub>	10	—	—	dB	
Monitor diode current	Im	0.05	—	—	mA	
Thermoelectric cooler current (Tc = 70°C)	Itec	—	—	1.3	A	
Thermoelectric cooler voltage (Tc = 70°C)	Vtec	—	—	2.6	V	
Thermistor resistance	Rth	9.5	10.0	10.5	kΩ	

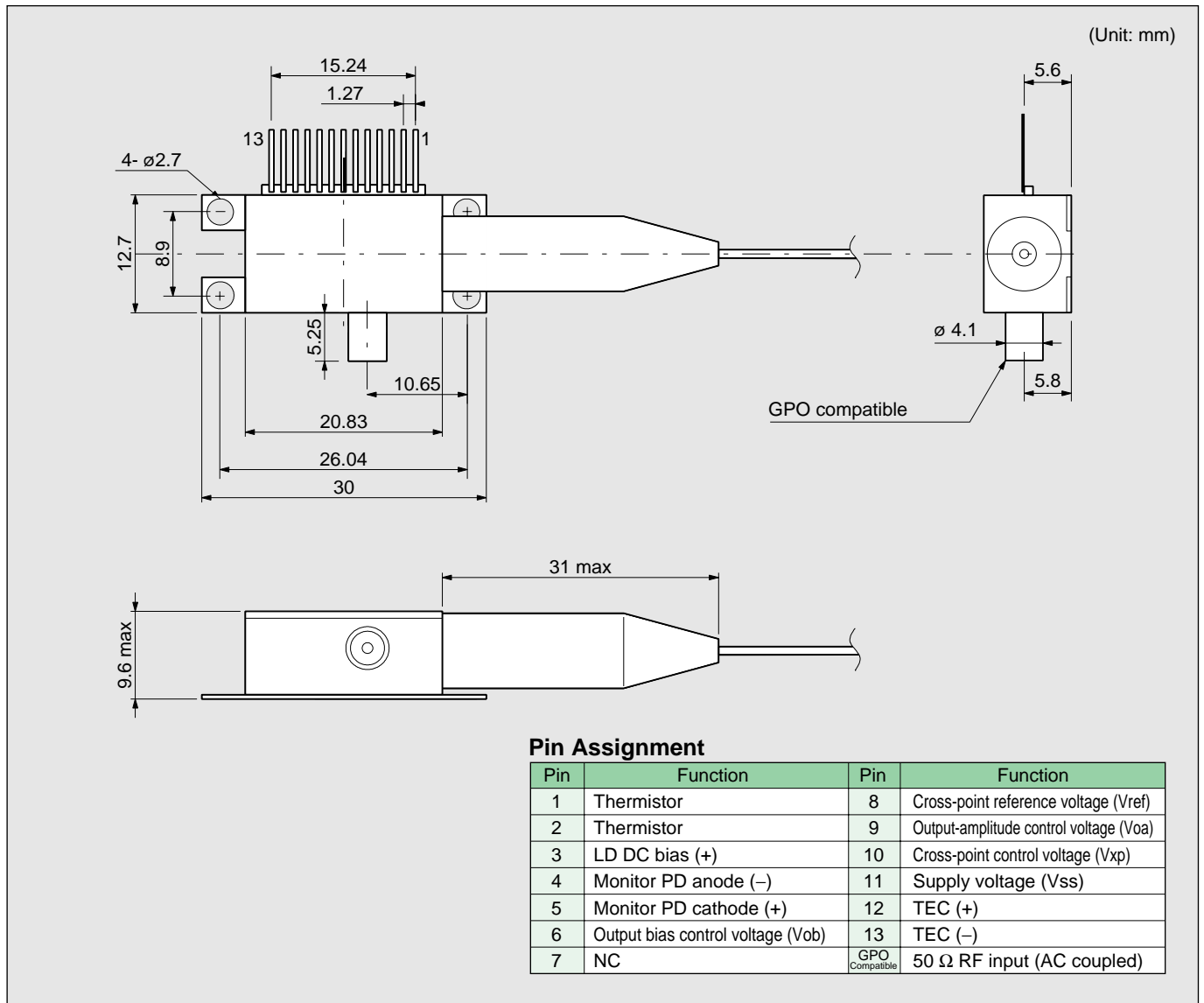
Notes:

- (1) When Vref is open, self-bias voltage of about Vss+1.3V is applied to Vref. To prevent dependence of Vref on the supply voltage Vss, use a regulated voltage source for Vref, or control the voltage of Vxp, so that the voltage difference, Vxp-Vref, is constant.
- (2) To prevent dependence of the output amplitude on the supply voltage Vss, control the voltage of Voa, so that the voltage difference, Voa-Vss, is constant.
- (3) To prevent dependence of the output bias level on the supply voltage Vss, control the voltage of Vob, so that the voltage difference, Vob-Vss, is constant.
- (4) 10Gb/s, NRZ, PRBS 2<sup>23</sup>-1 modulated

## TOLD387S-EAD series products lineup

Part Number	Fiber Output Power (dBm)		Maximum Dispersion (ps / nm)	Target Distance (km)	Dispersion Penalty (dB)	Application
	Min	Max				
TOLD387S-EAD1	-5	-1	500	25	< 2	I-64.2
TOLD387S-EAD2	-1	+2	800	40	< 2	S-64.2b
TOLD387S-EAD3	-3	-	1200	60	< 2	-

## DIMENSIONAL OUTLINE AND PIN ASSIGNMENT



Note: The body of the module has to be grounded.

## PRECAUTIONS

- 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.
- The product should be grounded for obtaining the performance.
- Safety: The laser emits invisible light harmful to the human eyes. Direct viewing should be avoided.

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(As of August, 2001)

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