

Pigtailed Analog DFB-LD for CWDM TAD#xxx Series



- CWDM InGaAsP LD with
Optical Isolator
- SMQW Structure
- SMF Pigtailed, SC or FC Connector
- Analog application

Family Model

TADA20x TADB20x TADC20x TADD20x TAEA20x TAF20x TADG20x TADH20x
TADA30x TADB30x TADC30x TADD30x TAEA30x TAF30x TADG30x TADH30x

Features

- 1470nm~1610nm, 8 channels InGaAsP SMQW DFB laser diode
- Low threshold, high slope efficiency and high output power LD
- Cost-effective uncooled laser diode
- Operating temperature ; -20°C to +85°C
- Tested by TERADIAN's Reliability and Qualification Program

Description

The TAD#xxx series, pigtailed coaxial LD module consists of an uncooled, reliable strained MQW InGaAsP laser(DFB) and a back-facet InGaAs PIN photodiode.

The parts of pigtailed LD module – single-mode fiber, lens and laser diode - are actively aligned by high power YAG laser welding method. This packaging guarantees high coupling efficiency, high slope efficiency, low operating current and low tracking error over a wide temperature range.

Applications

- CATV for Return-Path
- Analog and digital modulation systems
- Video link
- Wireless fiber-optic repeaters

Absolute Maximum Ratings

Parameters	Symbol	Unit	Min.	Max.	Remarks
Ambient Operating Temperature	T_{op}	°C	0 -20	70 85	Indoor use Extended Temp
Storage Temperature	T_{stg}	°C	-40	85	
Forward Current(LD)	I_{FL}	mA	-	150	
Reverse Voltage(LD)	V_{RL}	V	-	2	
Reverse Current(mPD)	I_{RP}	mA	-	2	
Reverse Voltage(mPD)	V_{RP}	V	-	20	
Lead Soldering Temp./Time		°C/sec		260/10	

Electrical and Optical Characteristics

($T_{op} = 25^{\circ}C$)

Parameters	Symbol	Condition	Unit	Min.	Typ.	Max.	Remarks
Threshold Current	I_{th}	CW	mA		10	15	
Operating Current	I_{op}	CW, @ P_f	mA			40	
Forward Voltage	V_f	CW, @ P_f	V			1.6	
Optical Output Power	P_f	CW, $I_{op}=I_{th} + 20mA$	mW		2.0 3.0		TAD#20X TAD#30X
Slope Efficiency	η	CW	mW/ mA	0.08 0.12	0.10 0.15		TAD#20X TAD#30X
Thermal Slope Efficiency	T_{η}	CW, $T_{\eta}(T)/T_{\eta}(25^{\circ}C)$ $T = -20 \sim +85^{\circ}C$		0.5			
Peak Wavelength	λ_c	CW, @ P_f	nm	1468 1488 1508 1528 1548 1568 1588 1608	1470 1490 1510 1530 1550 1570 1590 1610	1472 1492 1512 1532 1552 1572 1592 1612	TADAXXX TADBXXX TADCXXX TADDXXX TADEXXX TADFXXX TADGXXX TADHXXX
Spectral Linewidth	$\Delta\lambda$	CW, @ P_f	nm			1	
Side Mode Suppression Ratio	SMSR	CW	dB	30			
Wavelength Temperature Coefficient	-	CW, @ P_f	nm/ °C	0.07	0.1	0.12	
Tracking Error	γ	APC, $T_c=0 \sim +70^{\circ}C$ or $-20 \sim +85^{\circ}C$	dB	-1.0		1.0	$I_m = \text{const.}$
Optical Isolation	ISO		dB	30			
Dark Current(m-PD)	I_D	$V_{RP}=5V$	nA		1	10	
Monitor Current(m-PD)	I_m	$V_{RP}=5V, @P_f$	mA	0.08			
Capacitance(m-PD)		$V_{RP}=5V, f=1MHz$	pF			10	

RF Characteristics

(T_{op} = 25°C)

Parameters	Symbol	Condition	Unit	Min.	Typ.	Max.	Remark
Relative Intensity Noise	RIN	CW, @P _f Freq.=5MHz to 300MHz	dB /Hz			-145	
Modulation Bandwidth	f _{-3dB}	CW, @P _f	GHz	1.5			TAF3XX4
RF Bandpass Flatness	BF	Peak to valley, 5MHz to 300MHz	dB			1.0	
Carrier-to-Noise Ratio	CNR	@P _f , OMI=0.1, ref. to one-tone: 5MHz to 50MHz, 20km of fiber	dB	45			
Second-order Distortion	IMD2	@P _f , OMI=0.1, Two- tone test: f1=13MHz, f2=19MHz, f1±f2	dBc			-55	
Third-order Distortion	IMD3	@P _f , OMI=0.1, Two- tone test: f1=13MHz, f2=19MHz, all peaks from 5MHz to 50MHz meet this level.	dBc			-60	

! Handling Caution

The LD module can be damaged by overvoltage and current surges. Precautions should be taken for transient power supply.

This device is susceptible to damage as a result of electrostatic discharge(ESD). Take proper precautions during both handling and testing

The stress to the fiber pigtail may cause the damage on the performance. The fiber pigtail may snap off by dropping the module.

Laser Eye Safety

These LD modules have laser semiconductor product and are classified as AEL Class IIIb per U.S. FDA/CDRH 21CFR 1040 and class 3a per EN60825-1. These products comply with 21CFR, Chapter 1, Subchapter J(21CFR 1040.10 and 1040.11 laser safety requirements).

Laser Data

Wavelength : nm(Model :) / nm(Model :)

Measured Output power : mW(1310nm) / mW(1550nm)

Limited Power : mW(1310nm) / nW(1550nm)

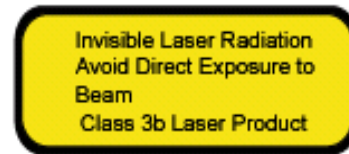
Caution

On operation, if optical connectors are unterminated, modules can emit invisible laser radiation. Radiation emitted by laser devices can be dangerous to the eyes. Avoided eye or skin exposure to direct or scattered radiation



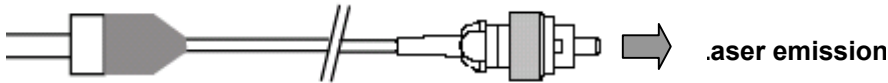
INVISIBLE LASER RADIATION
AVOID DIRECT EXPOSURE TO BEAM

Maximum Output Power : mW
Wavelength : nm
CLASS IIIb LASER PRODUCT



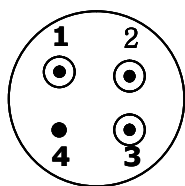
Ref : IEC60825

AVOID EXPOSURE - Invisible Laser radiation is emitted from this aperture.

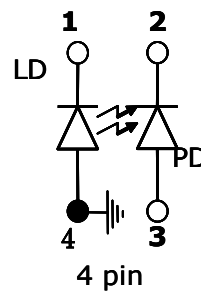
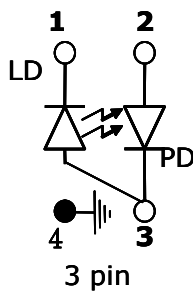


Pin Descriptions

Pin No.	Description	
	3 pin type	4 pin type
1	LD cathode	LD cathode
2	Backfacet PD anode	Backfacet PD cathode
3	LD anode & PD cathode	Backfacet PD anode
4	Case ground	LD anode & Case ground

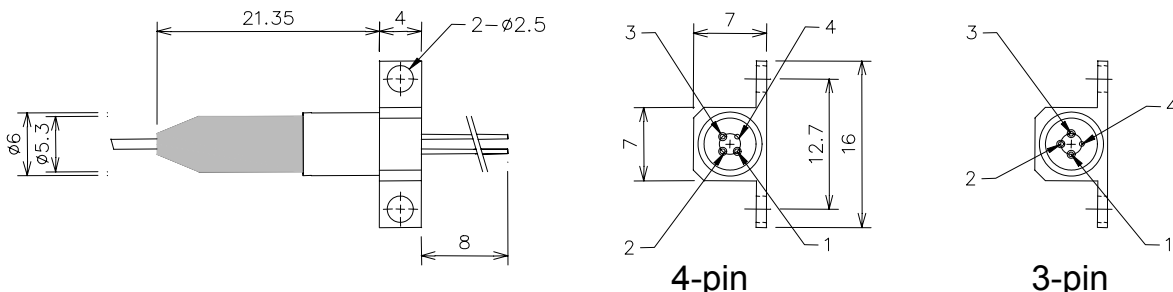


Bottom view



Outline Diagram

- TAD#20x-xxxH, TAD#30x-xxxH



- TAD#20x-xxxV, TAD#30x-xxxV

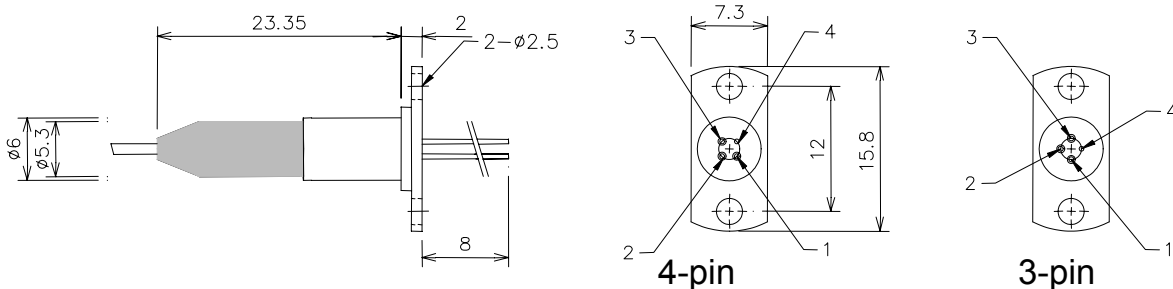


Fig.3 TAD series Dimensions [unit: mm]

Ordering Information

Com pany	Device Type		Wave- length	Supply Voltage	Pin	Temp. Range	Fiber	Conne ctor	Flange
T	A	D	C	20	4	E	S	S	N
TERA dian	A ; Analog App. (CATV Return- Path)	D ;DFB (with isolator)	A ;1470nm B ;1490nm C ;1510nm D ;1530nm E ;1550nm F ;1570nm G ;1590nm H ;1610nm	20 ; 2.0mW 30 ; 3.0mW	3 ; 3pin 4 ; 4pin	I ;Indoor Use (0~70℃) E ;Extended Temp (-20~85℃)	S ;SMF M ;MMF	N ;None S ;SC F ;FC T ;ST L ;LC	N ;None V ;Vertical H ;Hori- zontal

*Note 1 ; additional order information

- Connector type default is SC/PC and the default length of fiber is 1m
- If CATV Analog application, use the 4pin please.

More Information

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