

PD-LD Inc. offers a complete selection of CWDM DFB Lasers for the O+E+S+C+L+B regions. These units are available in ready-to-use, fiber-coupled packages, including FC, ST, and SC receptacles, as well as fiber-pigtailed units.

The InGaAsP laser diodes offered by PD-LD are of proven design and manufacture; the standard wavelengths are centered at 1310, 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590 and 1610nm. Fiber-coupled CW (continuous-wavelength) output powers range from 0.1 - 2 mW, depending on the fiber type and desired performance level. Tracking error over OTR -40 to +85C is +/- 1.0 dB maximum .

The introduction by leading optical fiber manufacturers of new fiber varieties suited for operations from 1310 to 1610 nm require the use of the complete spectrum of CWDM lasers. Using these new fibers with PD-LD's offering of all 16 CWDM wavelengths provides 50% more spectrum than previously available. The elimination of the water peak at 1390 nm now makes possible the use of all 16 wavelengths in these new fibers for optimum performance in local/access metro networks. PD-LD's lasers are excellent sources for cost effective coarse wave division multiplexing, using directly modulated lasers and relaxing stringent DWDM filter specifications, which reduce the overall system cost.

PD-LD's CWDM lasers are suitable for both digital and analog modulation . The intrinsically fast rise and fall time of 150 psec allow them to be used in digital applications require data rates of 3.125GB/s or in analog schemes which must operate at 3 GHz.



Features

- **Internal Monitor Photo Detector**
- **Compact, reliable receptacle & coax fiber-coupled package**
- **0.1 - 2.0 mW singlemode (9/125)**
- **30dB minimum side mode suppression**
- **0.2nsec typical rise/fall time**
- **0.1nm/degree C wavelength stability**
- **Internal Dual Stage Optical Isolator**

The standard lasers are specified for a center wavelength tolerance of +/-3 nm at 25 degrees C. These DFB lasers have a wavelength temperature coefficient of 0.10 nm/ degree C.

PD-LD coaxially fiber pigtailed laser diodes are assembled using X-Y-Z active alignment to ensure consistent optical coupling efficiency. Each module is constructed using at least 18 laser weld points so that mechanical stability is precisely maintained. Using this assembly approach guarantees that fiber to chip alignment is constant despite changes in ambient temperature from -40 to +85 C.

Fiber pigtailed modules are available with all industry style connectors: FC, SC, ST, LC in both PC and APC polish. Special connectors are also available upon request.

Optional board- or panel -mount flanges are available for pigtailed devices; contact PD-LD Sales. Also, PD-LD Inc. will package these lasers with optical isolators if desired. Isolation is typically 45 dB at 25C, and 20 dB min over -40 to 85C. PD-LD assemblies are built using an active micro-positioning system and laser welding process ensuring a reliable and well constructed product.

PD-LD offers two popular pin-outs for DFB lasers to address various existing PCB layouts.



CWDM 1.3~1.6 um Band Laser Diode Modules

PD-LD Part No. ¹	Wavelength (nm)			Pin-out	Threshold Current (mA)		Operating Current (mA)		Monitor PD Current (mA)	
	Min.	Typ.	Max.		Typ.	Max.	Typ.	Max.	Min.	Typ.
Continuous Wavelength InGaAsP Lasers @ 25C 2mW . Isolated units have 40dB min. isolation at 25C.										
PL13BN0021FCA-0-1-01	1307	1310	1313	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL13BP0021FCA-0-1-01	1327	1330	1333	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL13BQ0021FCA-0-1-01	1347	1350	1353	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL13BR0021FCA-0-1-01	1367	1370	1373	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL13BS0021FCA-0-1-01	1387	1390	1393	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL14AE0021FCA-0-1-01	1407	1410	1413	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL14AA0021FCA-0-1-01	1427	1430	1433	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL14AB0021FCA-0-1-01	1447	1450	1453	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL14AC0021FCA-0-1-01	1467	1470	1473	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL14AD0021FCA-0-1-01	1487	1490	1493	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL15BK0021FCA-0-1-01	1507	1510	1513	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL15BL0021FCA-0-1-01	1527	1530	1533	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL15BM0021FCA-0-1-01	1547	1550	1553	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL15BN0021FCA-0-1-01	1567	1570	1573	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL15BP0021FCA-0-1-01	1587	1590	1593	"T"	10	15	40	55	InGaAs 0.1 0.8	
PL16J0021FCA-0-1-01	1607	1610	1613	"T"	10	15	40	55	InGaAs 0.1 0.8	

¹Examples only; most device/package combinations available. Changes to specifications may be made without notice. 02-10 CWDM13~16. Rev.5

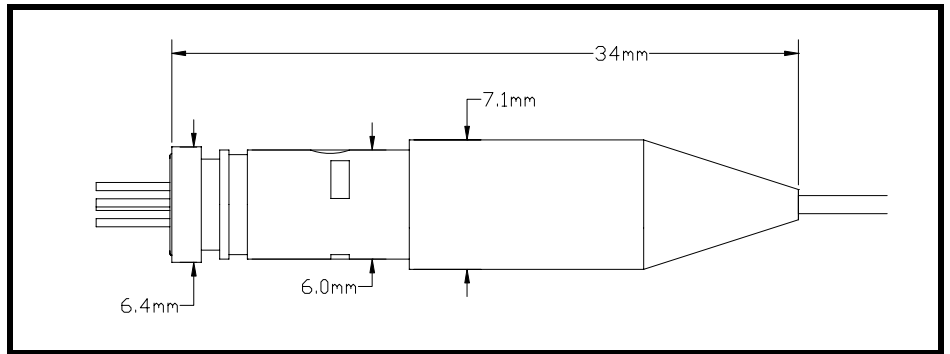


CWDM 1.3~1.6 um Band Laser Diode Modules

CWDM DFB Laser Diodes Electrical and Optical Characteristics 25 C 2 mW						
	Symbol	MIN.	TYP.	MAX	Units	Test Condition
Laser Diode						
Power	P_O	2.0	-	-	mW	$I_F = I_{OP}$
Threshold Current	I_{TH}	-	10	15	mA	25°C
Threshold Current @70C	I_{TH}		20	40	mA	
Operating Current	I_{OP}	-	40	55	mA	$I_F = I_{OP}$
Differential Efficiency		0.08	0.10		mW/mA	0 to 70°C
Operating Voltage	V_{OP}	-	1.2	1.5	V	$I_F = I_{OP}$
Peak Wavelength	Λ	$\Lambda-3$	Λ	$\Lambda+3$	nm	25°C
Side Mode Suppression, DFB	S_r	33	35	-	dB	CW, $P_0=2mW$
Temp. Coefficient DFB		-	-	<0.1	nm/°C	0 to 70°C
Rise/Fall Time	t_r, t_f	-	0.12	0.15	nsec	10~90%
Monitor Diode						
Output	I_{MD}	0.1	-	-	mA	$I_F = I_{OP}, P_O$
Dark Current	$I_{D(MD)}$	-	0.01	0.1	μA	$V_{R(MD)}=5V$
Capacitance	$C_{(MD)}$	-	6	15	pF	$V_{R(MD)}=5V, f=1MHz$
Tracking Error		-1		+1	dB	APC, 0 to 70°C
Absolute Maximums						
Operating Temp	T_{op}	0		70	°C	
Storage Temp	T_{stg}	-40		100	°C	
Fiber Output Power	$P_o \text{ Max}$			3.0	mW	
Forward Current LD	I_f			80	mA	At 70°C
Reverse Voltage LD	V_r			2	V	
Reverse Voltage PD	V_{rp}			15	V	
Forward Current PD	I_{pd}			2	mA	
Lead Soldering Temp	$Stemp$			260	°C	10 seconds max

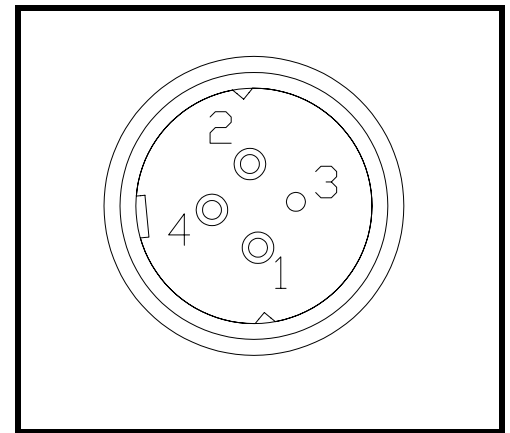
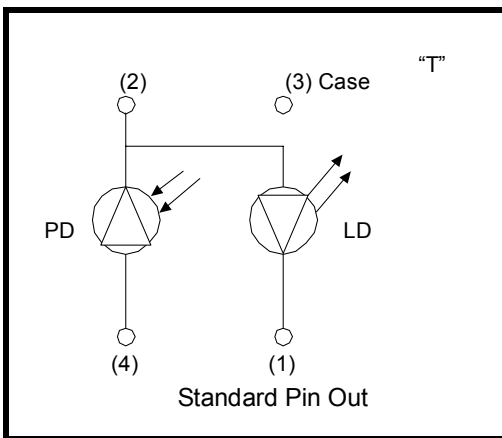
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Physical Dimensions (mm) & Pin Connection



Coaxial-Pigtailed Laser Diode Package

Consult PD-LD for Available Board Mount (10181 or 10198) or Panel Mount Brackets (10219)



Ordering Information

Lasers - Pigtailed & Receptacle

PLWWWPPPFCCB-0-V-LL PLWWWPPRRRF-O-V

L = Laser WWW=Wavelength and Pin-out

PPP = Fiber-Coupled Power

0.1 = 0.10 mW (100 μW) 0.8 = 0.8 mW (800 μW)
0.2 = 0.20 mW (200 μW) 001 = 1.0 mW
0.5 = 0.5 mW (500 μW) 002 = 2.0 mW

RRR= Receptacle Type

SC1= Scored/panel mount

V = Version

0 = Standard / No Isolator
 I = With Single Stage Isolator

F = Fiber Type

1 = 9/125 SMF
2 = 50/125 MMF
3 = 62.5/125 MMF
4 = 100/140 MMF
9 = Customer Supplied

B = Bracket Type

A = None
B = Panel Mount
G = Board Mount

O=Orientation

0=None
 A=Bracket Shipped Loose (pigtailed units only)
 Specify orientation as required
 S= Standard Receptacle orientation

LL = Length in meters (01,02,0.5 act.) (pigtailed devices only)

CC = Connector Type (pigtailed devices only)

ST = ST/PC TA = ST/APC SC = SCPC SA=SC/APC FC = FC/PC FA = FC/APC FU = FC/UPC
EA = E2000 D4 = D4 BC = Biconic MU style OO = No Connector

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