

## Data Sheet

FOL15DCWD-A\*\*-\*\*\*\*\*-\*/ 40mW 1550nm CW DFB Laser Module  
 Date February 16, 2005 ODC-2R002E



# 40mW 1550nm CW DFB Laser Module



## Applications

- OC-192/STM-64 DWDM Transmission Systems

## Features

- Low Driving Current, High Slope Efficiency
- High Side Mode Suppression Ratio
- Selected Wavelength According to ITU-T Grid, C and L-band Available (See Table.1)
- 50GHz Spacing Available
- Narrow Linewidth Available

## Descriptions

FOL15DCWD series of DFB laser module is designed for long haul DWDM applications with external intensity modulator. The polarization maintaining fiber pigtail enables to directly connect a modulator without polarization control. The polarization state of output laser beam is maintained to a consistent orientation. The module is housed in an industry standard hermetically sealed 14-pin butterfly package, which contains optical isolator, thermoelectric cooler, power monitor photodiode. Precise wavelength selection is available according to ITU-T grid with 100GHz spaced wavelength allocation. 50GHz spacing is also available.

## Absolute Maximum Ratings

Parameter	Sym	Min	Max	Unit	Conditions
Storage Temperature	T <sub>stg</sub>	-40	85	°C	-
Operating Case Temperature	T <sub>c</sub>	-5	70	°C	-
LD Reverse Voltage	V <sub>rLD</sub>	-	2	V	-
LD Forward Current	I <sub>fLD</sub>	-	350	mA	-
PD Reverse Voltage	V <sub>rPD</sub>	-	20	V	-
PD Forward Current	I <sub>fPD</sub>	-	5	mA	-
TEC Current	I <sub>tec</sub>	-	1.6	A	-
TEC Voltage	V <sub>tec</sub>	-	2.6	V	-

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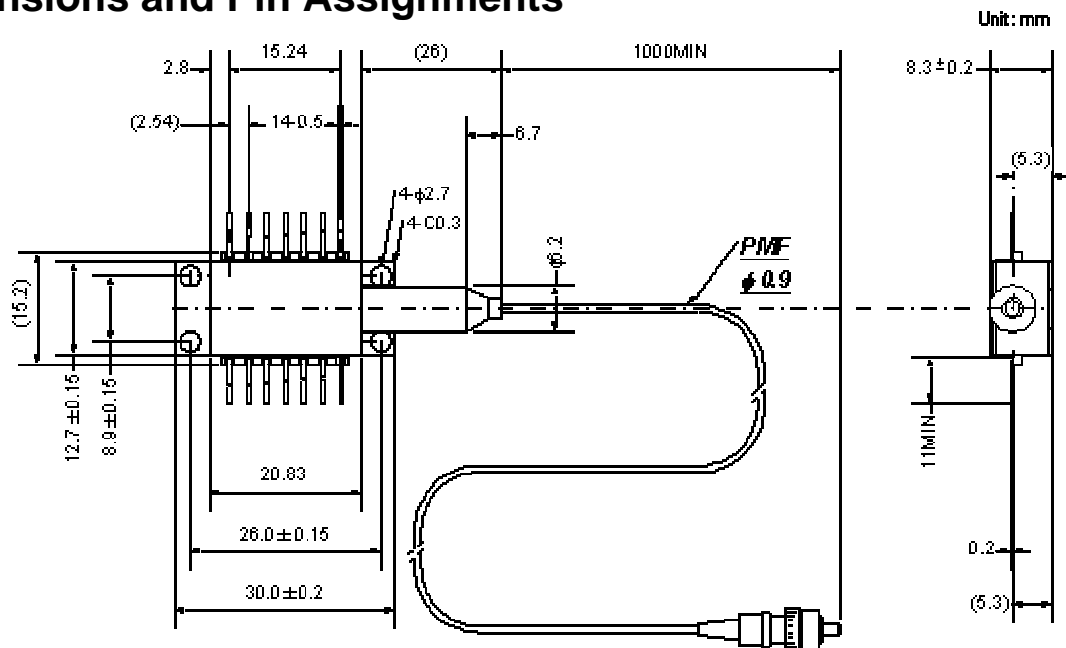
## Optical Characteristics (TLD=Tset, Tc=25°C, unless otherwise specified)

Parameter	Sym	Min	Typ	Max	Unit	Conditions
Optical Output Power	Pf	40	-	-	mW	CW
LD Forward Current	If	-	-	300	mA	Pf=40mW,CW,BOL* <sup>1</sup>
Submount Temperature	Tset	20	-	35	°C	Pf=40mW,CW
LD Forward Voltage	Vf	-	-	2.5	V	Pf=40mW,CW
Threshold Current	I <sub>th</sub>	-	15	40	mA	BOL
Wavelength	λ	1529.55	-	1611.79	nm	Pf=40mW,CW See Table.1
Linewidth (-3dB fullwidth)	Δν	-	-	10	MHz	Pf=40mW,CW
		-	-	5	MHz	Pf=40mW,CW,Optional (-A)
		-	-	2	MHz	Pf=40mW,CW,Optional (-B)
		-	-	1	MHz	Pf=40mW,CW,Optional (-C)
Side Mode Suppression Ratio	SMSR	35	45	-	dB	Pf=40mW,CW
Optical Isolation	Iso	25	-	-	dB	
Relative Intensity Noise	RIN	-	-	-138	dB/Hz	Pf=40mW,CW,O <sub>pRL</sub> <-25dB* <sup>2</sup> 100MHz<f<10GHz
Monitor Current	Im	0.15	-	3	mA	Pf=40mW,CW, V <sub>TPD</sub> =5V
Monitor Dark Current	Id	-	-	100	nA	V <sub>TPD</sub> =5V
Tracking Error	TE	-0.5	-	0.5	dB	Im=constant, Tc=-5 to 70°C
TEC Current	I <sub>tec</sub>	-	-	1.2	A	Tc=70°C,Pf=40mW,CW
TEC Voltage	V <sub>tec</sub>	-	-	2.4	V	Tc=70°C,Pf=40mW,CW
Thermistor B constant	B	-	3900	-	K	Tset=25°C
Thermistor Resistance	R	9.5	-	10.5	kΩ	Tset=25°C
Extinction Ratio	Er	20	-	-	dB	Pf=40mW,CW

\*<sup>1</sup> BOL : Beginning of Life

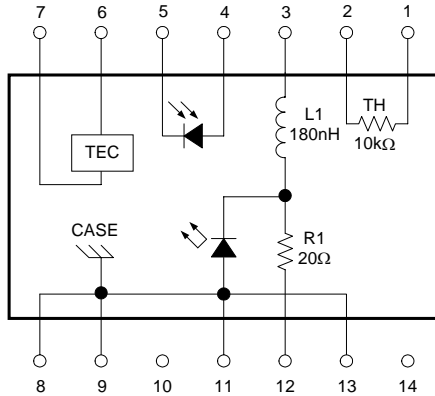
\*<sup>2</sup> O<sub>pRL</sub> : Optical Return Loss

## Dimensions and Pin Assignments



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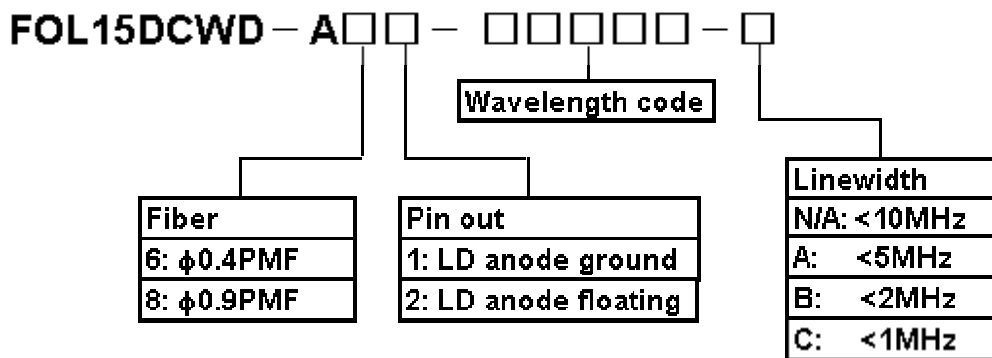
PIN No.	Object	PIN No.	Object
1	Thermistor	8	Case Ground
2	Thermistor	9	Case Ground
3	LD Cathode(-)	10	No Connect
4	Monitor Anode(-)	11	Laser Anode(+), Case Ground*
5	Monitor Cathode(+)	12	Laser RF
6	TEC(+)	13	Laser Anode(+), Case Ground*
7	TEC(-)	14	No Connect

\*LD anode float pin assignment is available.

## Optical Fiber Pigtail Specifications

Parameter	Specification	Unit
Fiber Type	FUJIKURA PANDA PM,SM15-P-8/125 UV/UV 400 or equivalent UV coating (0.4mm φ) or Hytrel coating(0.9mmφ)	-
Nominal Fiber Length	Min.1,000 (Boot edge (fiber side) to connector edge)	mm
Connector Type	FC/SPC Connector	-
Polarization Axis	Slow Axis	-

## Ordering Information



## Safety Information



This product complies with 21 CFR 1040.10 and 1040.11, Class 3b laser product. Invisible laser radiation is emitted from the end of the fiber or connector. Avoid direct exposure to the beam

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Table 1

$\lambda$ [nm]	ITU Freq. [THz]	Wavelength Code	$\lambda$ [nm]	ITU Freq. [THz]	Wavelength Code	$\lambda$ [nm]	ITU Freq. [THz]	Wavelength Code	$\lambda$ [nm]	ITU Freq. [THz]	Wavelength Code
1529.55	196.0	19600	1550.12	193.4	19340	1571.24	190.8	19080	1592.95	188.2	18820
1530.33	195.9	19590	1550.92	193.3	19330	1572.06	190.7	19070	1593.79	188.1	18810
1531.12	195.8	19580	1551.72	193.2	19320	1572.89	190.6	19060	1594.64	188.0	18800
1531.90	195.7	19570	1552.52	193.1	19310	1573.71	190.5	19050	1595.49	187.9	18790
1532.68	195.6	19560	1553.33	193.0	19300	1574.54	190.4	19040	1596.34	187.8	18780
1533.47	195.5	19550	1554.13	192.9	19290	1575.37	190.3	19030	1597.19	187.7	18770
1534.25	195.4	19540	1554.94	192.8	19280	1576.20	190.2	19020	1598.04	187.6	18760
1535.04	195.3	19530	1555.75	192.7	19270	1577.03	190.1	19010	1598.89	187.5	18750
1535.82	195.2	19520	1556.55	192.6	19260	1577.86	190.0	19000	1599.75	187.4	18740
1536.61	195.1	19510	1557.36	192.5	19250	1578.69	189.9	18990	1600.60	187.3	18730
1537.40	195.0	19500	1558.17	192.4	19240	1579.52	189.8	18980	1601.46	187.2	18720
1538.19	194.9	19490	1558.98	192.3	19230	1580.35	189.7	18970	1602.31	187.1	18710
1538.98	194.8	19480	1559.79	192.2	19220	1581.18	189.6	18960	1603.17	187.0	18700
1539.77	194.7	19470	1560.61	192.1	19210	1582.02	189.5	18950	1604.03	186.9	18690
1540.56	194.6	19460	1561.42	192.0	19200	1582.85	189.4	18940	1604.88	186.8	18680
1541.35	194.5	19450	1562.23	191.9	19190	1583.69	189.3	18930	1605.74	186.7	18670
1542.14	194.4	19440	1563.05	191.8	19180	1584.53	189.2	18920	1606.60	186.6	18660
1542.94	194.3	19430	1563.86	191.7	19170	1585.36	189.1	18910	1607.47	186.5	18650
1543.73	194.2	19420	1564.68	191.6	19160	1586.20	189.0	18900	1608.33	186.4	18640
1544.53	194.1	19410	1565.50	191.5	19150	1587.04	188.9	18890	1609.19	186.3	18630
1545.32	194.0	19400	1566.31	191.4	19140	1587.88	188.8	18880	1610.06	186.2	18620
1546.12	193.9	19390	1567.13	191.3	19130	1588.73	188.7	18870	1610.92	186.1	18610
1546.92	193.8	19380	1567.95	191.2	19120	1589.57	188.6	18860	1611.79	186.0	18600
1547.72	193.7	19370	1568.77	191.1	19110	1590.41	188.5	18850			
1548.51	193.6	19360	1569.59	191.0	19100	1591.26	188.4	18840			
1549.32	193.5	19350	1570.42	190.9	19090	1592.10	188.3	18830			

Wavelength values are referenced to vacuum. 50GHz spacing is also available.

Other ITU wavelengths may be available. Please ask to the regional contacts.

Wavelength ( $\lambda$ ) and ITU frequency (f) have a relationship of  $\lambda[\text{nm}] = 299792458 / f[\text{THz}] / 1000$ .

FITEL code is expressed as a 5-digit integer rounded from  $100 \times f$  [THz].

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