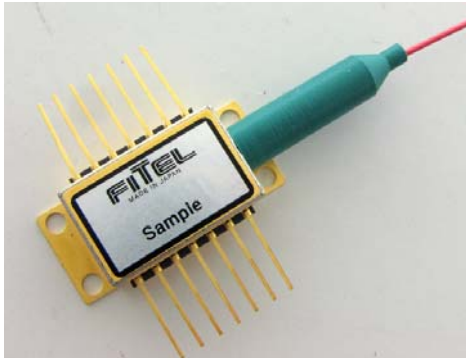


Wavelength Selected CW DFB Laser Module



Applications

- OC-192/STM-64 Transmission Systems
- Probe Light Source

Descriptions

- FRL15DCWx-A8x-Wxxxx series of DFB laser module is designed for OC-192/STM-64 applications with external intensity modulator and probe light source.
- 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.
- A strained multi-quantum well DFB laser diode chip is integrated with optical isolator, thermo-electric cooler (TEC), thermistor and power monitor photodiode in an industry standard hermetically sealed 14 pin butterfly package.
- This laser module complies with telecom requirements described in Telcordia™ GR-468 and is manufactured in an ISO™9001 certified production line.

Features

- High optical output power up to 40mW
- High side mode suppression ratio(SMSR)
- Selected wavelength between 1530nm and 1610nm available
- Narrow linewidth available
- RoHS compliant package

Absolute Maximum Ratings

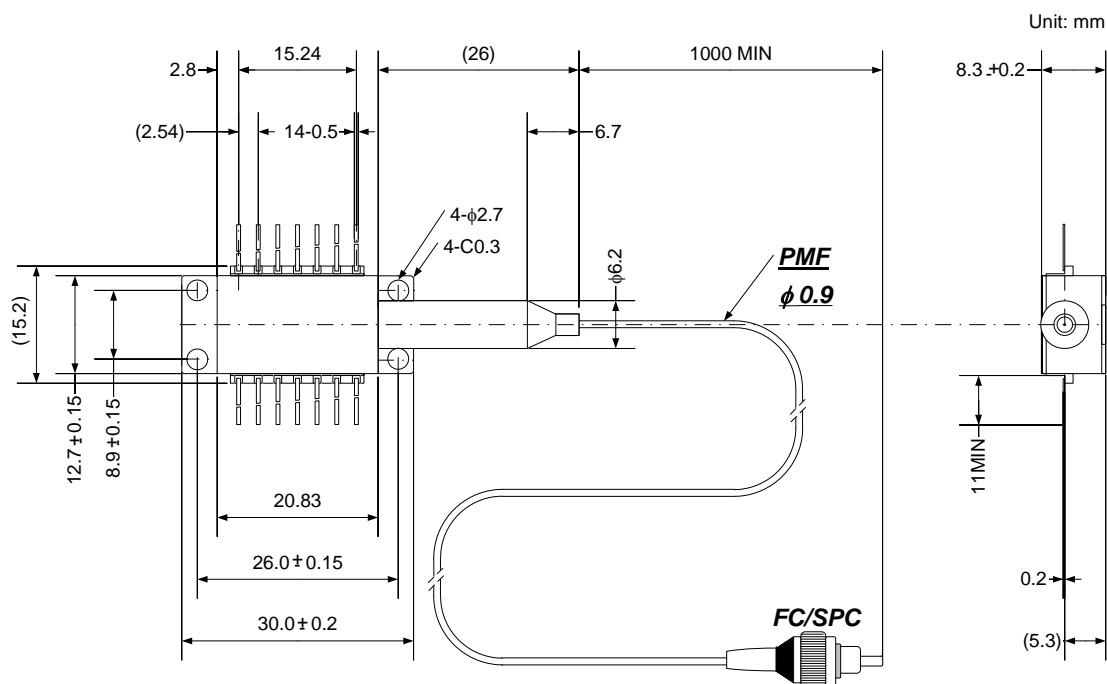
Parameters	Sym.	Min.	Max.	Unit	Parameters	Sym.	Min.	Max.	Unit
Storage Temperature	T _{stg}	-40	85	°C	PD Reverse Voltage	V _{rPD}	-	20	V
Operating Case Temperature	T _c	-5	70	°C	PD Forward Current	I _{fPD}	-	5	mA
LD Reverse Voltage	V _{rLD}	-	2	V	TEC Current	I _{tec}	-	1.6	A
LD Forward Current	I _{fLD}	-	350	mA	TEC Voltage	V _{tec}	-	2.6	V
LD Operating Temperature	T _{LD}	20	35	°C	Lead Soldering	-	-	260	°C
Relative Humidity	RH	0	85	%	Lead Soldering Duration	-	-	10	sec
Fiber Bend Radius	-	30	-	mm	Torque Force	-	-	0.1	Nm
Fiber Axial Pull Force	-	-	9.8	N	(Flatness : <20μm)	-	-	-	-

Specifications ($T_c=25^\circ\text{C}$, BOL*¹ unless otherwise specified)

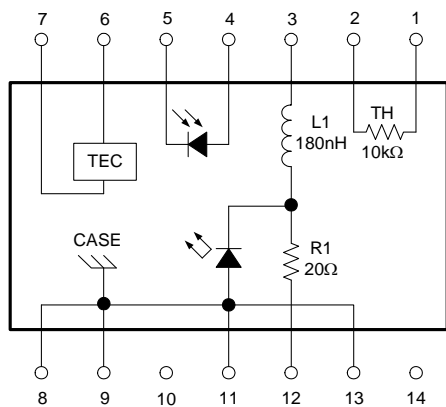
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Optical Output Power						
FRL15DCWA	Pf	10	-	-	mW	CW
FRL15DCWB		20	-	-		
FRL15DCWD		40	-	-		
LD Forward Current						
FRL15DCWA	If	-	-	80	mA	Rated power, CW
FRL15DCWB		-	-	150		
FRL15DCWD		-	-	300		
LD Operating Temperature	T_{LD}	-	25	-	$^\circ\text{C}$	Rated power, CW
LD Forward Voltage						
FRL15DCWA, B	Vf	-	-	1.8	V	Rated power, CW
FRL15DCWD		-	-	2.5		
Threshold Current	I_{th}	-	15	40	mA	
Wavelength	λ	1530	-	1610	nm	Rated power, CW
Wavelength tolerance	$\Delta\lambda$	$\lambda-3$	λ	$\lambda+3$	nm	Rated power, CW
Linewidth (-3dB fullwidth)						
Standard	$\Delta\nu$	-	-	10	MHz	Rated Power, CW Option C is available only for FRL15DCWD.
Option A		-	-	5		
Option B		-	-	2		
Option C		-	-	1		
Side Mode Suppression Ratio	SMSR	35	45	-	dB	Rated power, CW
Optical Isolation	Iso	30	-	-	dB	
Relative Intensity Noise						
FRL15DCWA	RIN	-	-	-133	dB/Hz	Rated power, CW $O_{pRL} < -25\text{dB}^{*2}$ $100\text{MHz} < f < 10\text{GHz}$
FRL15DCWB		-	-	-138		
FRL15DCWD		-	-	-140		
Monitor Current						
FRL15DCWA	Im	0.05	-	1	mA	Rated power, CW $V_{rPD}=5\text{V}$
FRL15DCWB		0.1	-	2		
FRL15DCWD		0.15	-	3		
Monitor Dark Current	I_d	-	-	100	nA	$V_{rPD}=5\text{V}$
Tracking Error	TE	-0.5	-	0.5	dB	$I_m=\text{constant}$, $T_c=-5$ to 70°C
TEC Current	I_{tec}	-	-	1.2	A	$T_c=70^\circ\text{C}$, Rated power, CW
TEC Voltage	V_{tec}	-	-	2.4	V	$T_c=70^\circ\text{C}$, Rated power, CW
Thermistor B constant	B	-	3900	-	K	
Thermistor Resistance	R	9.5	-	10.5	$\text{k}\Omega$	$T_{LD}=25^\circ\text{C}$
Polarization Extinction Ratio	E_r	20	-	-	dB	Rated power, CW

*¹ BOL : Beginning of Life*² O_{pRL} : Optical Return Loss

Dimensions and Pin Assignments

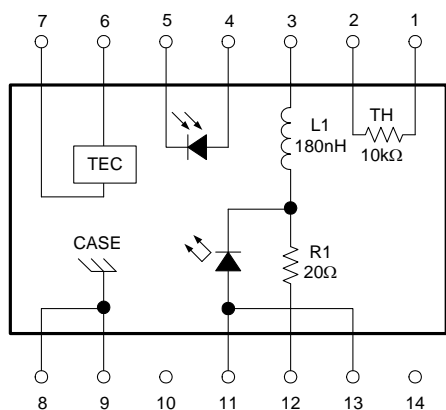


LD Anode Ground



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

LD Anode Float

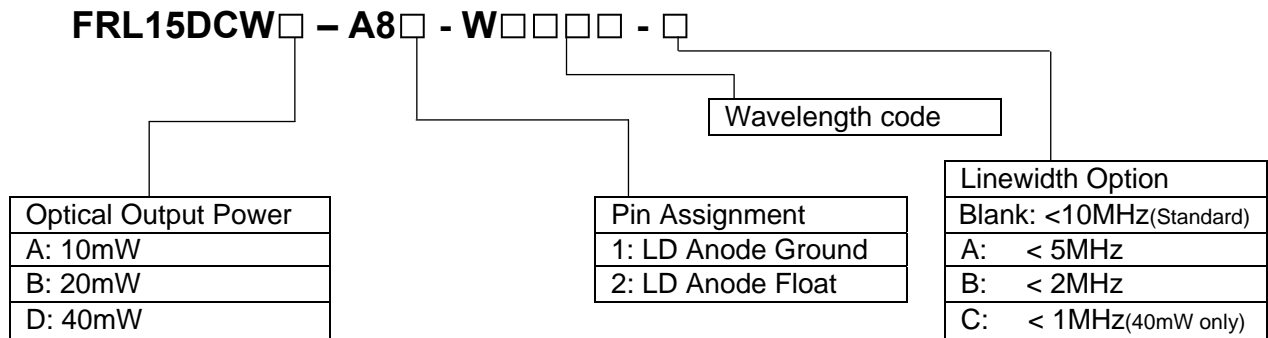


PIN No.	Function	PIN No.	Function
1	Thermistor	8	Case Ground
2	Thermistor	9	Case Ground
3	LD Cathode(-)	10	No Connect
4	Monitor Anode(-)	11	LD Anode(+)
5	Monitor Cathode(+)	12	LD Cathode(RF)
6	TEC(+)	13	LD Anode(+)
7	TEC(-)	14	No Connect

Optical Fiber Pigtail Specifications

Parameters	Specification	Unit
Fiber Type	Polarization maintaining(PANDA) fiber Frame retardant Hytrel™ coating(φ0.9mm)	-
Nominal Fiber Length	Min.1,000	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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ISO is a trademark of The International Organization for Standardization.
Hytrel is a trademark of DuPont.

Furukawa Electric reserves the right to improve, enhance and modify the features and specifications of FITELE products without prior notifications.

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