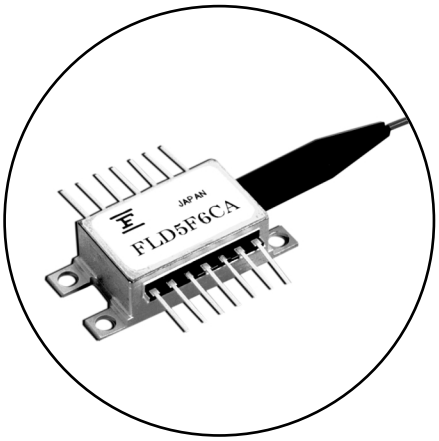
Tunable LD Module with Wavelength Locker — *FLD5F6CA-C*

FEATURES:



- Wavelength Locker, Integrated CW light source
- Tunable Range : 2.4nm or more with 2 channel ITU-T grid selectable (with 100GHz spacing)
- Wavelengths available to ITU-T standard 100GHz spacing
  52 (=13 x 4) channels (C-band : 1528.77 - 1569.59nm)
- Operating Temperature range : 0 - 70°C
- Fiber output power : 13dBm typical
- LD driving current : 80mA typical, less than 200mA
- Built-in optical isolator
- Polarization preserving (PANDA) fiber
- Monitor current : more than 35µA (for APC) greater than 25µA (for wavelength monitor)
- Wavelength stability : less than +/-40pm drift during 20years operation and case temperature change (0 - 70°C)
- Comes in standard 14-pin butterfly package

APPLICATIONS:

Long haul DWDM applications at all bit rates
Metropolitan DWDM applications at 10 Gbs

DESCRIPTION:

The Fujitsu Tunable LD module with Wavelength Locker (FLD5F6CA-C) is a high power CW laser (13dBm) with polarization maintaining fiber that is intended for use with an external modulator. The laser can be wavelength tuned across a 2.4nm range (4 ITU-T 100Ghz spaced channels) via adjustment of the chip temperature with the included TEC. The tuned wavelength can then be locked onto the desired ITU-T grid channel via use of the included fabry-perot etalon. This laser is available at any of the 52 ITU-T wavelengths in the C band (1528.77-1569.59nm). The device comes in a standard 14 pin butterfly package, operates between 0-70°C, and requires 80mA of drive current (typical).

ABSOLUTE MAXIMUM RATINGS (T_C=25°C)

Parameter	Symbol	Condition	Ratings	Unit
Storage Temperature	T_{stg}	-	-40 to +85	°C
Operating Case Temperature	T_{op}	-	0 to +70	°C
Optical Output Power	P_f	CW	50	mW
Laser Reverse Voltage	V_R	-	2	V
Laser Forward Current	I_F	CW	250	mA
Photodiode Reverse Voltage	V_{DR}	-	20	V
Photodiode Forward Current	I_{PF}	-	10	mA
Cooler Current	I_c	-	2.0	A
Cooler Voltage	V_c	Note (1)	5.0	V
Lead Soldering Time	T_{sold}	<260°C	10	sec

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OPTICAL AND ELECTRICAL CHARACTERISTICS AT (T_L=T_{set}, T_C=25°C, BOL, unless otherwise specified)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Laser Set Temperature	T_{set}	-	11	-	+35	°C
Optical Output Power	P_f	CW, Tc=-20 to +65°C	20	-	-	mW
Threshold Current	I_{th}	CW	3	-	45	mA
Forward Voltage	V_F	CW, I_F=30 mA, pin 3,13	-	-	2.5	V
Slope Efficiency	η	CW, Pf=10mW, ORL>40dB	-	0.2	-	mW/mA
Peak Wavelength	λ_p	CH. 1-CH.2, ORL>40dB	Note (3)			nm
Wavelength Stability with Case Temperature	-	Im1=constant, Im2=constant, Tc=0-70°C, 20 years	-40	-	40	pm
Spectral Width (-3dB)	$\Delta\lambda$	CW, Pf=20mW, ORL>40dB	-	3	10	MHz
Side Mode Suppression	Sr	CW, Pf=20mW, ORL>40dB	33	-	-	dB
Monitor Current	I_m	Pf=20mW	0.035	-	.35	mA
Monitor Dark Current	Idm	V_{PD}=5V	-	-	100	nA
Monitor Capacitance	C_t	V_{PD}=5V, f=1 MHz	-	-	10	pF
Tracking Error (Note 2)	TE	Im=constant, Pf(Tc=25°C)=20mW, Tc=0 to +70°C	-0.5	-	+1.0	dB
Optical Isolation	I_S	Tc=0 to +70°C	22	-	-	dB
Extinction Ratio	TE/TM	CW, Pf=20mW	20	-	-	dB
Relative Intensity Noise	RIN	CW, Pf=20mW, ORL>40dB, f=DC-7.5GHz	-	-	-140	dB/Hz
Cooler Current	Ic	T_L=Tset, Tc=+70°C, Pf=20mW	-	-	1.4	A
Cooler Voltage	Vc	T_L=Tset, Tc=+70°C, Pf=20mW	-	-	4.5	V
Thermistor Resistance	Rth	Tc, T_L=+25°C	9.5	10.0	10.5	kΩ
Thermistor B Constant (Note 2)	B	Tc, T_L=+25°C	3,270	3,450	3,630	K

Note 1. TE=10*log[Pf(Tc)/Pf(25)]
Note 2. Relation between resistance and temperature (°K) is:
Rth (T) = Rth (25)*exp[B(1/T-1/298)]
Note 3. Reference Figure 5 Wavelength Table

Fig. 1 Forward Current vs Output Power

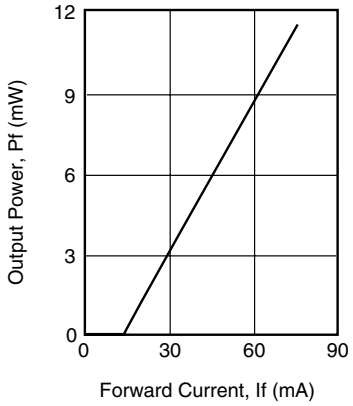

Fig. 2 Temperature Dependance of Wavelength

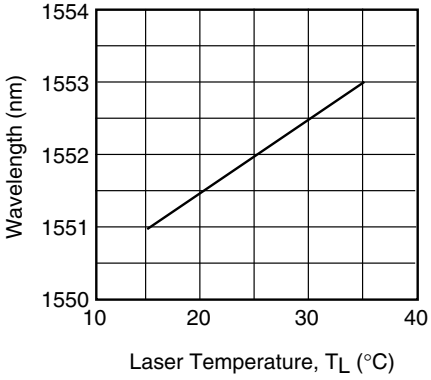

Fig. 3 Cooler Voltage -Current

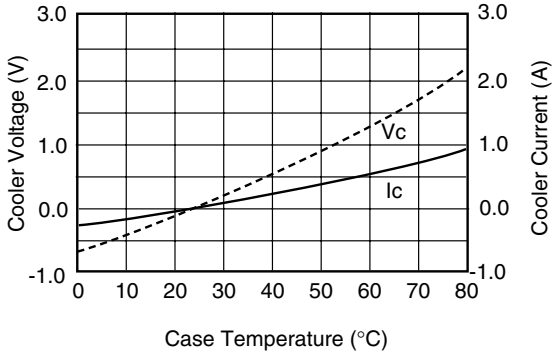

Fig.4 Spectrum

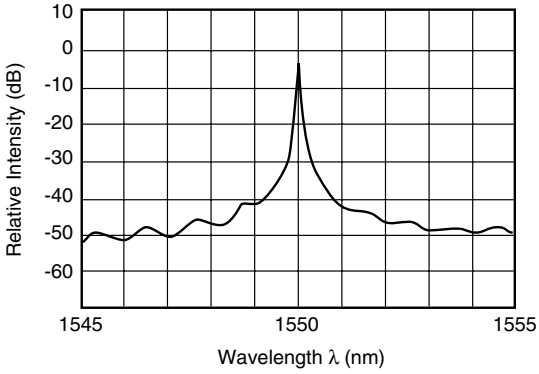

Fig. 5 Wavelength Table

Part Number	Wavelength (nm) (TL=Tset) (in vacuum)	Tolerance (nm)
FLD5F6CA-C9610	1528.773	±0.01
	1529.553	±0.01
FLD5F6CA-C9590	1530.334	±0.01
	1531.116	±0.01
FLD5F6CA-C9570	1531.898	±0.01
	1532.681	±0.01
FLD5F6CA-C9550	1533.465	±0.01
	1534.250	±0.01
FLD5F6CA-C9530	1535.036	±0.01
	1535.822	±0.01
FLD5F6CA-C9510	1536.609	±0.01
	1537.397	±0.01
FLD5F6CA-C9490	1538.186	±0.01
	1538.976	±0.01
FLD5F6CA-C9470	1539.766	±0.01
	1540.557	±0.01
FLD5F6CA-C9450	1541.349	±0.01
	1542.142	±0.01
FLD5F6CA-C9430	1542.936	±0.01
	1543.730	±0.01
FLD5F6CA-C9410	1544.526	±0.01
	1545.322	±0.01
FLD5F6CA-C9390	1546.119	±0.01
	1546.917	±0.01
FLD5F6CA-C9370	1547.715	±0.01
	1548.515	±0.01

Part Number	Wavelength (nm) (TL=Tset) (in vacuum)	Tolerance (nm)
FLD5F6CA-C9350	1549.315	±0.01
	1550.116	±0.01
FLD5F6CA-C9330	1550.918	±0.01
	1551.721	±0.01
FLD5F6CA-C9310	1552.524	±0.01
	1553.329	±0.01
FLD5F6CA-C9290	1554.134	±0.01
	1554.940	±0.01
FLD5F6CA-C9270	1555.747	±0.01
	1556.555	±0.01
FLD5F6CA-C9250	1557.363	±0.01
	1558.173	±0.01
FLD5F6CA-C9230	1558.983	±0.01
	1559.794	±0.01
FLD5F6CA-C9210	1560.606	±0.01
	1561.419	±0.01
FLD5F6CA-C9190	1562.223	±0.01
	1563.047	±0.01
FLD5F6CA-C9170	1563.863	±0.01
	1564.679	±0.01
FLD5F6CA-C9150	1565.496	±0.01
	1566.314	±0.01
FLD5F6CA-C9130	1567.133	±0.01
	1567.952	±0.01
FLD5F6CA-C9110	1568.773	±0.01
	1569.594	±0.01

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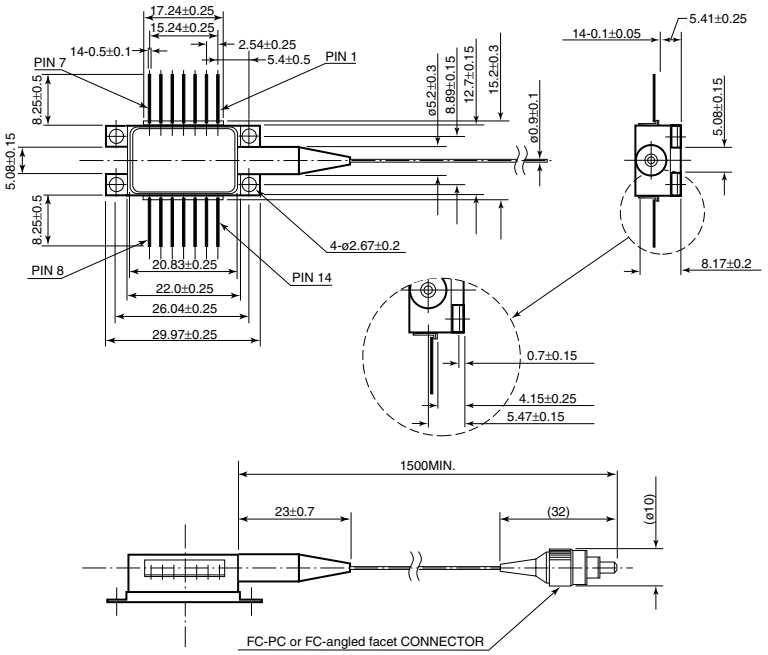

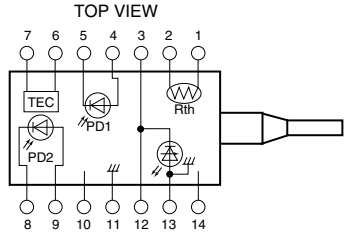

#	PIN DESIGNATIONS
1	TEMPERATURE MONITOR
2	TEMPERATURE MONITOR
3	LASER CATHODE
4	POWER MONITOR (ANODE)
5	POWER MONITOR (CATHODE)
6	TEHP (+)
7	TEHP (-)
8	PD2(WAVE LENGTH MONITOR) CATHODE
9	PD2(WAVE LENGTH MONITOR) ANODE
10	NC
11	GROUND
12	LASER CATHODE
13	LD ANODE, GROUND
14	NC

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- **Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.**

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