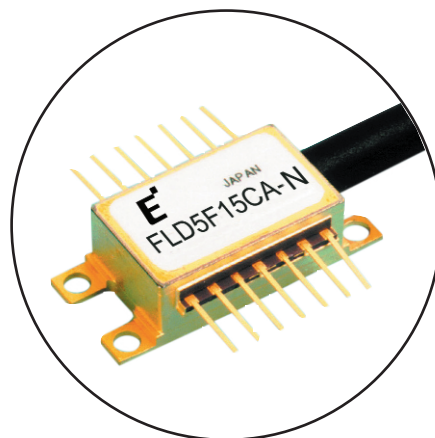


FEATURES:

- CW light source with integrated wavelength locker
- Output Power: 13dBm (min.)
- Tunable over 4 ITU-I 100GHz spaced channels (2.4nm)
- Available at L-band ITU-T grid wavelengths between 1570.416 to 1607.035nm
- Wavelength stability better than $\pm 25\text{pm}$ drift over 20 years operation and (0 to 70°C) case temperature variation
- Built-in optical isolator, Thermistor, TEC, Wavelength Monitor PIN-PD, Power Monitor PIN-PD
- Polarization maintaining (PANDA) fiber



APPLICATIONS:

Long haul DWDM transmission system
Metropolitan DWDM transmission system
Optical Test Equipment

DESCRIPTION:

The Eudyna Tunable LD module with Wavelength Locker (FLD5F15CA-N) is a high power CW laser (13dBm) with polarization maintaining fiber. It is intended for use with an external modulator. The oscillation wavelength can be tuned across a 2.4nm range (4 ITU-T 100GHz spaced channels) via adjustment of the chip temperature with the built-in TEC. The tuned wavelength can be locked onto the desired ITU-T grid channel via use of the built-in Wavelength Monitor. This laser is available at any of the 88 ITU-T wavelengths in the L-band (1570.416 to 1607.035nm). The device comes in a standard 14-pin butterfly package, and operates between 0 to 70°C.

ABSOLUTE MAXIMUM RATINGS ($T_c=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Condition	Rating		Unit
			Min.	Max.	
Storage Temperature	T_{stg}	-	-40	+85	$^\circ\text{C}$
Operating Case Temperature	T_{op}	-	0	+70	$^\circ\text{C}$
Optical Output Power	P_f	CW	-	30	mW
Laser Forward Current	I_F	CW	-	250	mA
Laser Reverse Voltage	V_R	CW	-	2	V
PD Reverse Voltage	V_{DR}	-	-	20	V
PD Forward Current	I_{PF}	-	-	10	mA
Cooler Voltage	V_c	Cooling	-	+5.00	V
		Heating	-2.50	-	
Cooler Current	I_c	Cooling	-	+1.85	A
		Heating	-0.60	-	
Thermistor Temperature	T_{th}	ATC Operation	-	+70	$^\circ\text{C}$
Lead Soldering Time	-	260°C	-	10	sec

FLD5F15CA-N Tunable LD Module with Wavelength Locker

OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_L=T_{set}$, (CH.1 to CH.8) $T_c=25^\circ\text{C}$, BOL, unless otherwise specified)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Laser Set Temperature (BOL)	T_{set}	-	11	-	47	$^\circ\text{C}$
Laser Set Temperature (EOL)	T_{set}	-	10	-	48	$^\circ\text{C}$
Optical Output Power	P_f	-	20	-	-	mW
Threshold Current	I_{th}	-	3	-	45	mA
Forward Voltage	V_F	-	-	-	2.2	V
Slope Efficiency	η	-	-	0.2	-	mW/mA
Operating Forward Current	I_{op}	-	-	-	200	mA
Peak Wavelength	λ_p	CH.1 to CH.8, ORL>40dB	Note (4)			nm
Wavelength Stability with Case Temperature and Aging	-	$I_{m1}, I_{m2}=\text{constant}$, $T_c=0$ to 70°C , 20 years	-25	-	+25	pm
Wavelength Stability with LD Current Change	-	$TLD=T_{set}$	-	-	+25	pm/mA
Spectral Width (-3dB)	$\Delta\lambda$	ORL>40dB	-	3	10	MHz
Side Mode Suppression	S_r		33	-	-	dB
Power Monitor Current	I_{m1}	$P_f=20\text{mW}$	0.1	-	1.8	mA
Power Monitor Dark Current	I_{dm1}	$V_{pd}=5\text{V}$	-	-	100	nA
Power Monitor Capacitance	C_{t1}	$V_{pd}=5\text{V}$, $f=1\text{MHz}$	-	-	10	pF
Wavelength Monitor Current	I_{m2}	$P_f=20\text{mW}$	0.1	-	1.8	mA
Wavelength Monitor Dark Current	I_{dm2}	$V_{pd}=5\text{V}$	-	-	100	nA
Wavelength Monitor Capacitance	C_{t2}	$V_{pd}=5\text{V}$, $f=1\text{MHz}$	-	-	10	pF
Wavelength difference between lock point and $I_{m2\text{peak}}$ (Note 2)	$\Delta\lambda_{\text{locked}}$		6.0	-	33.0	GHz
I_{m2} peak/bottom Ratio	$I_{m2\text{peak}}/I_{m2\text{bottom}}$		1.0	-	4.5	dB
Tracking Error (Note 3)	TE	$I_{m1}, I_{m2}=\text{constant}$, $T_c=0$ to $+70^\circ\text{C}$	-0.5	-	+1.0	dB
Optical Isolation	I_S	$T_c=0$ to $+70^\circ\text{C}$	22	-	-	dB
Polarization Extinction Ratio	PER		20	-	-	dB
Relative Intensity Noise	RIN	CW, ORL>40dB average of $f=\text{DC}$ to 7.5GHz	-	-	-140	dB/Hz
Cooler Current	I_c	$T_L=T_{set}$, $T_c=+70^\circ\text{C}$	-	-	1.05	A
Cooler Voltage	V_c		-	-	3.80	V
Cooler Power	P_c		-	-	4.00	W
Thermistor Resistance	R_{th}	$T_L=25^\circ\text{C}$, $T_c=+25^\circ\text{C}$	9.5	10.0	10.5	k Ω
Thermistor B Constant (Note 4)	B		3,270	3,450	3,630	K

Note 1. $TE=10*\log[P_f(T_c)/P_f(25)]$

Note 2. Relation between resistance and temperature ($^\circ\text{K}$) is: $R_{th}(T) = R_{th}(25^\circ\text{C}) * \exp[B(1/T - 1/298)]$

Note 3. At the shortest wavelength of each sub-band, wavelength at lock point is longer than I_{m2} peak. (Increasing wavelength shall give a decrease in wavelength monitor current) The value is written in frequency: $f=c/\lambda_p$, $c=2.99792458*10^8\text{m/s}$

Note 4. Reference Table 1 for Wavelength Table

Fig. 1 Forward Current vs Output Power

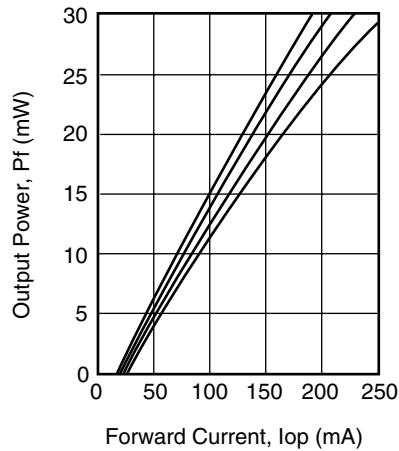


Fig. 2 Temperature Dependence of Wavelength(ACC Operation)

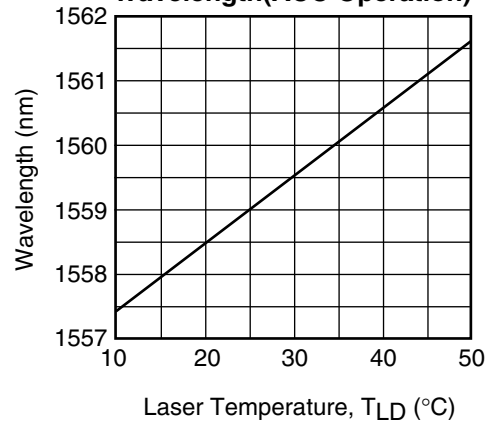


Fig. 3 Cooler Voltage -Current

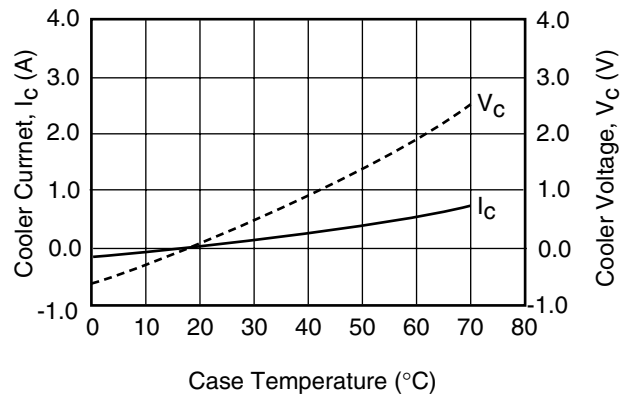


Fig.4 Spectrum

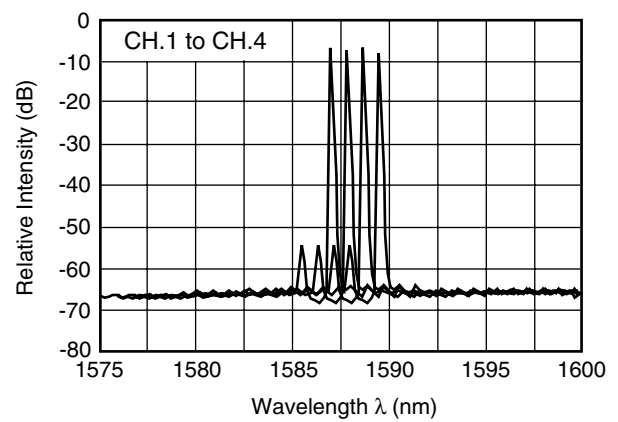
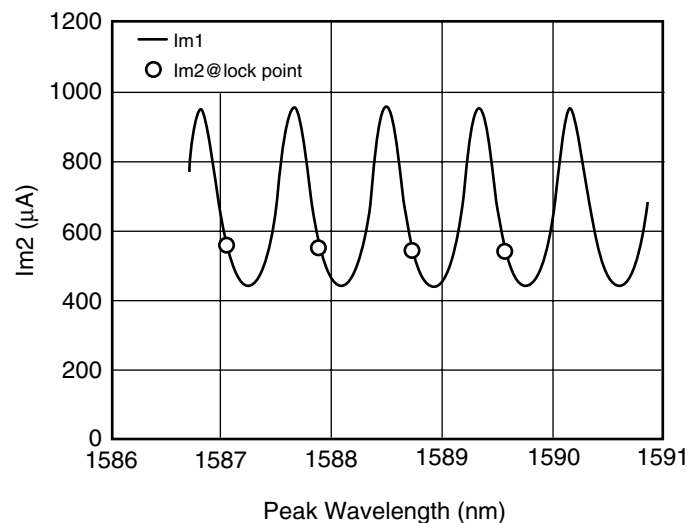


Fig. 5 Filter Curve



FLD5F15CA-N Tunable LD Module with Wavelength Locker

Table 1 Wavelength Table

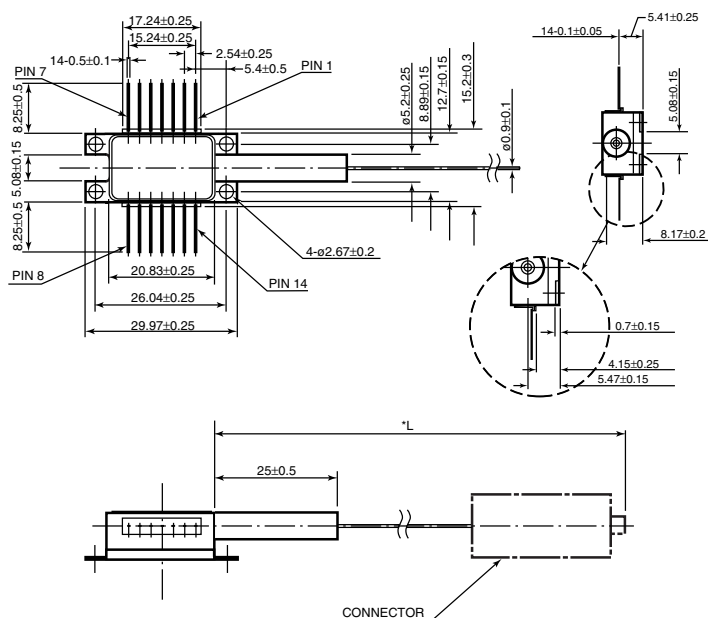
Part Number	Wavelength (nm) (TL-Tset) (in vacuum)	Tolerance (nm)	Part Number	Wavelength (nm) (TL-Tset) (in vacuum)	Tolerance (nm)
FLD5F15CA-N9090	1570.416	±0.01	FLD5F15CA-N8885	1587.463	±0.01
	1571.239	±0.01		1588.304	±0.01
	1572.063	±0.01		1589.146	±0.01
	1572.888	±0.01		1589.989	±0.01
FLD5F15CA-N9085	1570.828	±0.01	FLD5F15CA-N8850	1590.411	±0.01
	1571.651	±0.01		1591.255	±0.01
	1572.476	±0.01		1592.100	±0.01
	1573.301	±0.01		1592.946	±0.01
FLD5F15CA-N9050	1573.714	±0.01	FLD5F15CA-N8845	1590.833	±0.01
	1574.540	±0.01		1591.678	±0.01
	1575.368	±0.01		1592.523	±0.01
	1576.196	±0.01		1593.369	±0.01
FLD5F15CA-N9045	1574.127	±0.01	FLD5F15CA-N8810	1593.793	±0.01
	1574.954	±0.01		1594.641	±0.01
	1575.782	±0.01		1595.489	±0.01
	1576.610	±0.01		1596.339	±0.01
FLD5F15CA-N9010	1577.025	±0.01	FLD5F15CA-N8805	1594.217	±0.01
	1577.855	±0.01		1595.065	±0.01
	1578.686	±0.01		1595.914	±0.01
	1579.518	±0.01		1596.764	±0.01
FLD5F15CA-N9005	1577.440	±0.01	FLD5F15CA-N8770	1597.189	±0.01
	1578.270	±0.01		1598.041	±0.01
	1579.102	±0.01		1598.893	±0.01
	1579.934	±0.01		1599.746	±0.01
FLD5F15CA-N8970	1580.350	±0.01	FLD5F15CA-N8765	1597.615	±0.01
	1581.184	±0.01		1598.467	±0.01
	1582.018	±0.01		1599.320	±0.01
	1582.854	±0.01		1600.173	±0.01
FLD5F15CA-N8965	1580.767	±0.01	FLD5F15CA-N8730	1600.600	±0.01
	1581.601	±0.01		1601.455	±0.01
	1582.436	±0.01		1602.311	±0.01
	1583.271	±0.01		1603.168	±0.01
FLD5F15CA-N8930	1583.690	±0.01	FLD5F15CA-N8725	1601.028	±0.01
	1584.527	±0.01		1601.883	±0.01
	1585.365	±0.01		1602.740	±0.01
	1586.203	±0.01		1603.597	±0.01
FLD5F15CA-N8925	1584.108	±0.01	FLD5F15CA-N8690	1604.026	±0.01
	1584.946	±0.01		1604.885	±0.01
	1585.784	±0.01		1605.744	±0.01
	1586.623	±0.01		1606.605	±0.01
FLD5F15CA-N8890	1587.043	±0.01	FLD5F15CA-N8685	1604.455	±0.01
	1587.884	±0.01		1605.314	±0.01
	1588.725	±0.01		1606.174	±0.01
	1589.568	±0.01		1607.035	±0.01

Tunable LD Module with Wavelength Locker

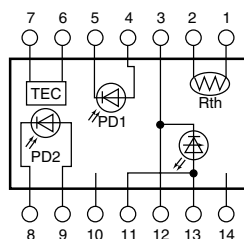
FLD5F15CA-N

"CA" PACKAGE

UNIT: mm



TOP VIEW



#	PIN DESIGNATIONS
1	Thermistor
2	Thermistor
3	LD Cathode
4	Power Monitor Anode
5	Power Monitor Cathode
6	Thermoelectric Cooler (+)
7	Thermoelectric Cooler (-)
8	Wavelength Monitor Cathode
9	Wavelength Monitor Anode
10	NC
11	LD Anode
12	LD Cathode
13	LD Anode
14	NC

* Pigtail length (L) and connector type are specified in the detail (individual) specification.
L = 1500MIN. for standard

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