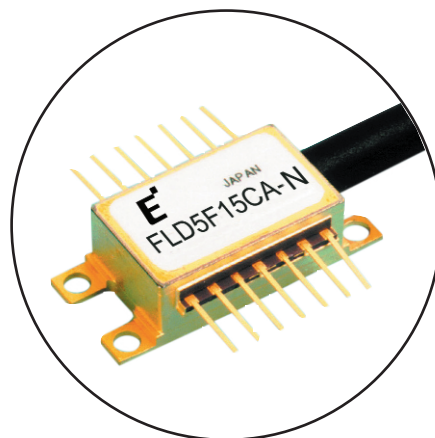


FEATURES:

- 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

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: $R_{th}(T) = R_{th}(25^\circ\text{C}) \cdot \exp[B(1/T - 1/298)]$

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: $f=c/\lambda_p$, $c=2.99792458 \times 10^8\text{m/s}$

Note 4. Reference Table 1 for Wavelength Table

Fig. 1 Forward Current vs Output Power

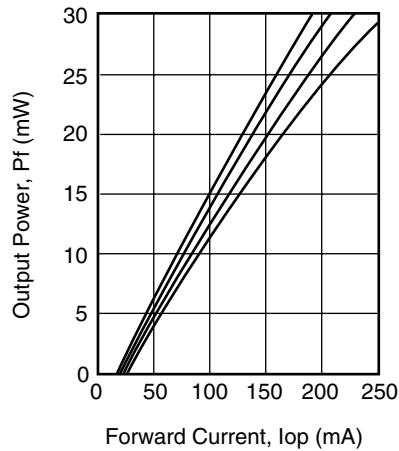


Fig. 2 Temperature Dependence of Wavelength(ACC Operation)

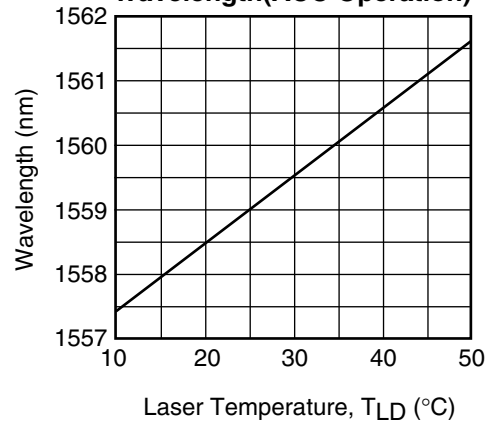


Fig. 3 Cooler Voltage -Current

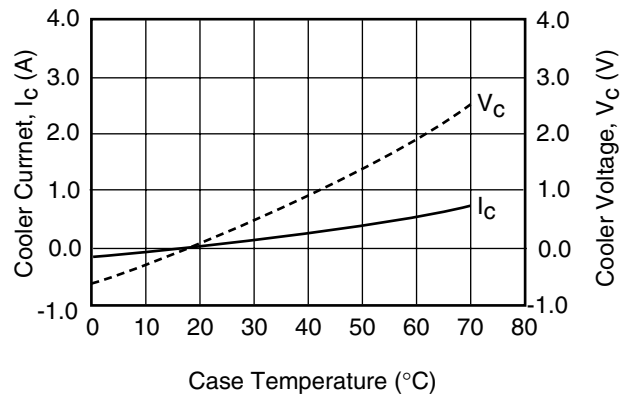


Fig.4 Spectrum

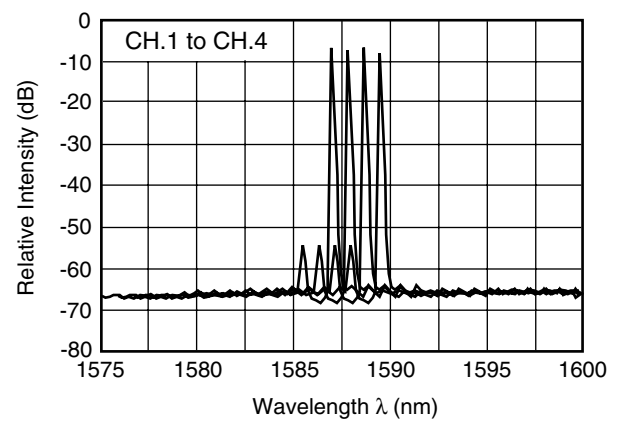
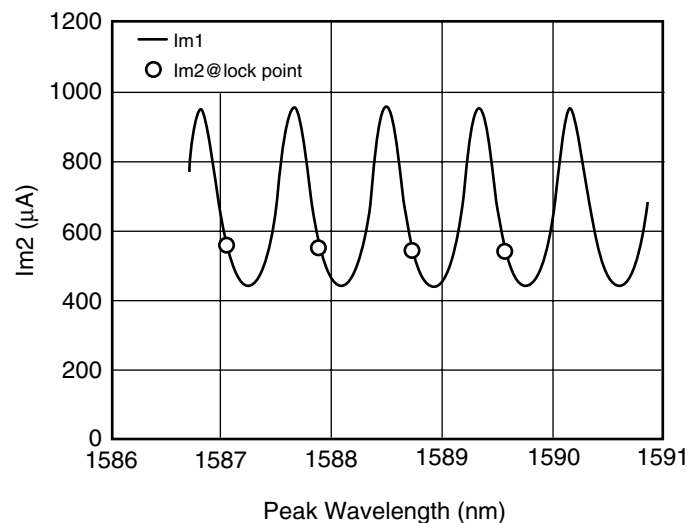


Fig. 5 Filter Curve



FLD5F15CA-N ————— Tunable LD Module with Wavelength Locker

Table 1 Wavelength Table

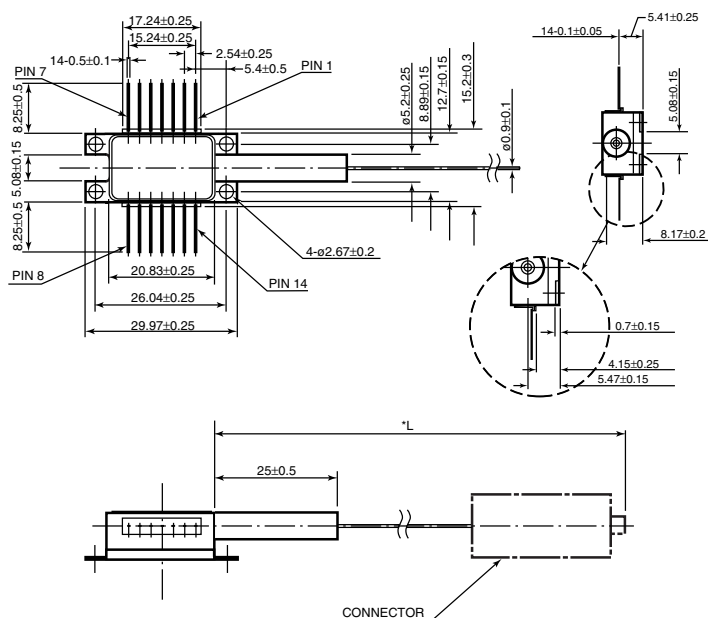
Part Number	Wavelength (nm) (TL=Tset) (in vacuum)	Tolerance (nm)	Part Number	Wavelength (nm) (TL=Tset) (in vacuum)	Tolerance (nm)
FLD5F15CA-N9090	1570.416	±0.01	FLD5F15CA-N8885	1587.463	±0.01
	1571.239	±0.01		1588.304	±0.01
	1572.063	±0.01		1589.146	±0.01
	1572.888	±0.01		1589.989	±0.01
FLD5F15CA-N9085	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

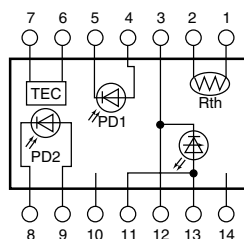
FLD5F15CA-N

"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

For further information please contact:

Eudyna Devices USA Inc.

2355 Zanker Rd.
San Jose, CA 95131-1138, U.S.A.
TEL: (408) 232-9500
FAX: (408) 428-9111
www.us.eudyna.com

Eudyna Devices Europe Ltd.

Network House
Norreys Drive
Maidenhead, Berkshire SL6 4FJ
United Kingdom
TEL: +44 (0) 1628 504800
FAX: +44 (0) 1628 504888

Eudyna Devices Asia Pte Ltd.

Hong Kong Branch
Rm. 1101, Ocean Centre, 5 Canton Rd.
Tsim Sha Tsui, Kowloon, Hong Kong
TEL: +852-2377-0227
FAX: +852-2377-3921

Eudyna Devices Inc.

Sales Division
1, Kanai-cho, Sakae-ku
Yokohama, 244-0845, Japan
TEL: +81-45-853-8156
FAX: +81-45-853-8170

CAUTION

Eudyna Devices Inc. products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment. For safety, observe the following procedures:

- Do not put this product into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- 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.

Eudyna Devices Inc. reserves the right to change products and specifications without notice. The information does not convey any license under rights of Eudyna Devices Inc. or others.

© 2004 Eudyna Devices USA Inc.
Printed in U.S.A.

Eudyna