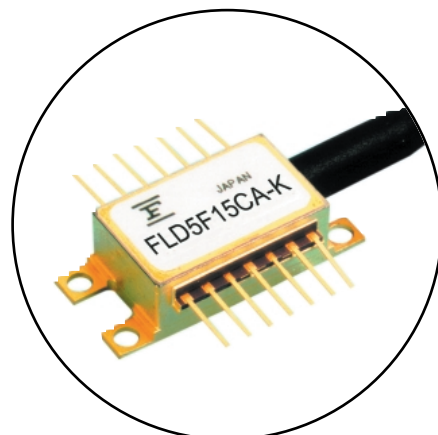


FEATURES:

- CW light source with integrated wavelength locker
- 13dBm (min.) output power
- Tunable over 4 ITU-T grid channels (2.4nm)
- Available at C Band ITU-T grid wavelengths between 1528.77-1569.99nm
- Wavelength stability better than +/-25pm drift over 20 years operation and (0 - 70°C) case temperature variation
- Built-in optical isolator, Thermistor, TEC, Wavelength Monitor Pin, Power Monitor Pin
- Polarization preserving (PANDA) fiber



APPLICATIONS:

Long haul DWDM
Metropolitan DWDM applications at 10 Gbs
Optical Test Equipment

DESCRIPTION:

The Fujitsu Tunable LD module with Wavelength Locker (FLD5F15CA-K) is a high power CW laser (13dBm) with polarization maintaining fiber. It 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 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 120mA 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	30	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)	4.8	V

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

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Laser Set Temperature	T_{set}	-	11	-	51	$^\circ\text{C}$
Optical Output Power	P_f	CW, $T_c=0$ to $+70^\circ\text{C}$	20	-	-	mW
Threshold Current	I_{th}	CW	3	-	45	mA
Forward Voltage	V_F	CW, $I_F=30$ mA, pin 3,13	-	-	2.2	V
Slope Efficiency	η	CW, $P_f=20$ mW, ORL>40dB	-	0.2	-	mW/mA
Operating Forward Current	I_{op}	-	-	120	200	mA
Peak Wavelength	λ_p	CH. 1-CH.4, ORL>40dB	Note (3)			nm
Wavelength Stability with Case Temperature	-	$I_{m1}=\text{constant}$, $I_{m2}=\text{constant}$, $T_c=0-70^\circ\text{C}$, 20 years	-25	-	25	pm
Spectral Width (-3dB)	$\Delta\lambda$	CW, $P_f=20$ mW, ORL>40dB	-	3	10	MHz
Side Mode Suppression	S_r	CW, $P_f=20$ mW, ORL>40dB	33	-	-	dB
Monitor Current	I_{m1}	$P_f=20$ mW	0.1	-	1.8	mA
Wavelength Monitor Current	I_{m2}	$P_f=20$ mW, WL Locked	0.1	-	1.8	mA
Tracking Error (Note 1)	TE	$I_m=\text{constant}$, $P_f(T_c=25^\circ\text{C})=20$ mW, $T_c=0$ to $+70^\circ\text{C}$	-0.5	-	+1.0	dB
Optical Isolation	I_S	$T_c=0$ to $+70^\circ\text{C}$	22	-	-	dB
Extinction Ratio	TE/TM	CW, $P_f=20$ mW	20	-	-	dB
Relative Intensity Noise	RIN	CW, $P_f=20$ mW, ORL>40dB, $f=\text{DC}-7.5$ GHz	-	-	-140	dB/Hz
Cooler Current	I_c	$T_L=T_{set}$, $T_c=+70^\circ\text{C}$, $P_f=20$ mW	-	-	1.8	A
Cooler Voltage	V_c	$T_L=T_{set}$, $T_c=+70^\circ\text{C}$, $P_f=20$ mW	-	-	4.6	V
Thermistor Resistance	R_{th}	T_c , $T_L=+25^\circ\text{C}$	9.5	10.0	10.5	$k\Omega$
Thermistor B Constant (Note 2)	B	T_c , $T_L=+25^\circ\text{C}$	3,270	3,450	3,630	K

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

Note 2. Relation between resistance and temperature ($^\circ\text{K}$) is:

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

Note 3. Reference Figure 5 Wavelength Table

Fig. 1 Forward Current vs Output Power

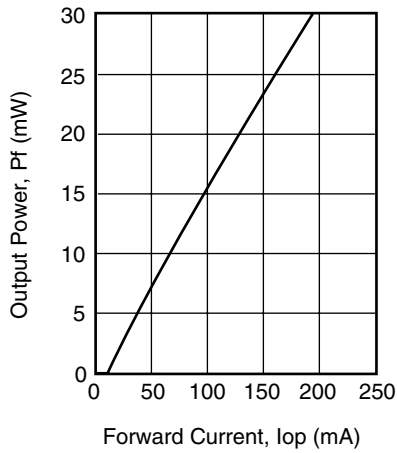


Fig. 2 Temperature Dependence of Wavelength(ACC Operation)

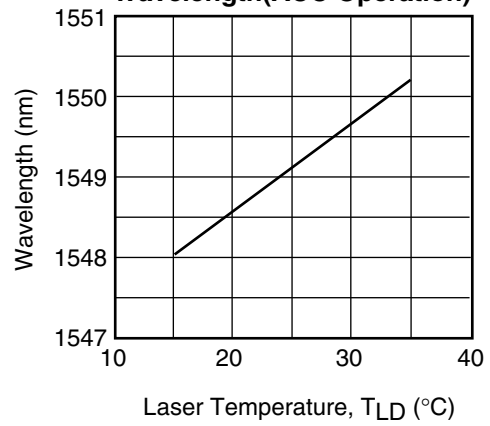


Fig. 3 Cooler Voltage -Current

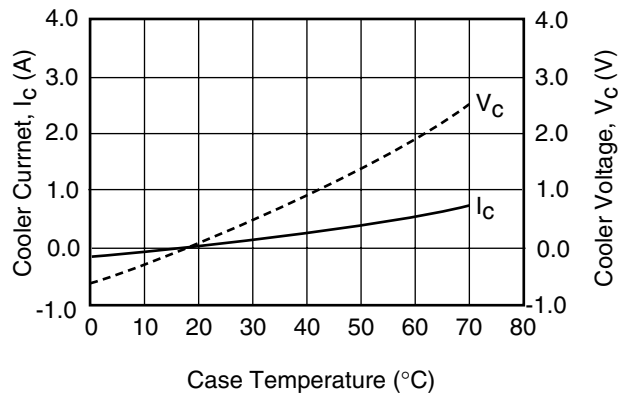


Fig.4 Spectrum

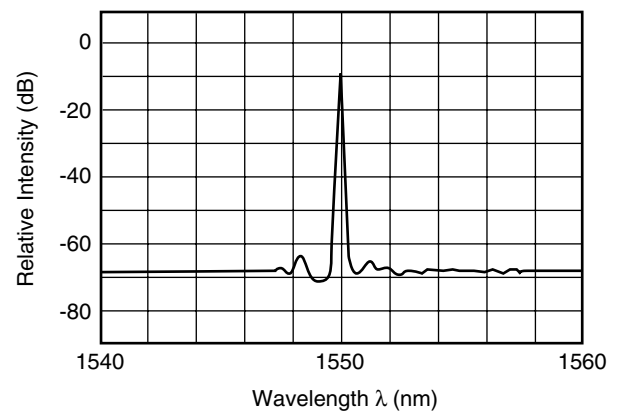


Fig. 5 Filter Curve

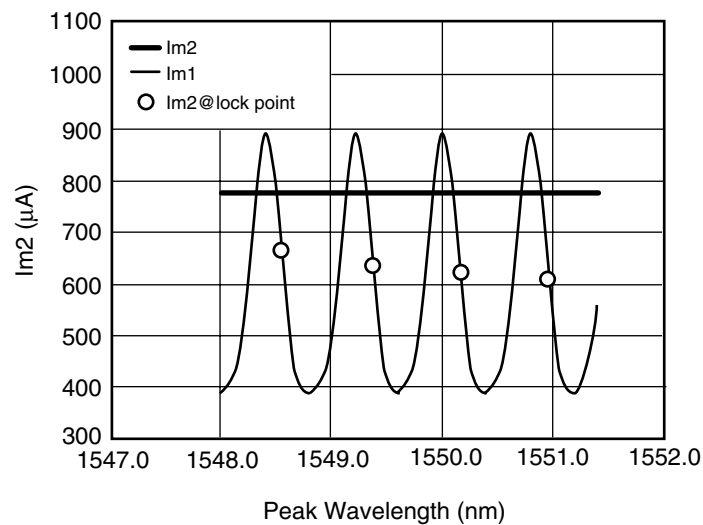


Fig. 6 Wavelength Table

Part Number	Wavelength (nm) (TL=Tset) (in vacuum)	Tolerance (nm)
FLD5F15CA-K9610	1528.773	±0.01
	1529.553	±0.01
	1530.334	±0.01
	1531.116	±0.01
FLD5F15CA-K9605	1529.163	±0.01
	1529.944	±0.01
	1530.725	±0.01
	1531.507	±0.01
FLD5F15CA-K9570	1531.898	±0.01
	1532.681	±0.01
	1533.465	±0.01
	1534.250	±0.01
FLD5F15CA-K9565	1532.290	±0.01
	1533.073	±0.01
	1533.858	±0.01
	1534.643	±0.01
FLD5F15CA-K9530	1535.036	±0.01
	1535.822	±0.01
	1536.609	±0.01
	1537.397	±0.01
FLD5F15CA-K9525	1535.429	±0.01
	1536.216	±0.01
	1537.003	±0.01
	1537.792	±0.01
FLD5F15CA-K9490	1538.186	±0.01
	1538.976	±0.01
	1539.766	±0.01
	1540.557	±0.01
FLD5F15CA-K9485	1538.581	±0.01
	1539.371	±0.01
	1540.162	±0.01
	1540.953	±0.01
FLD5F15CA-K9450	1541.349	±0.01
	1542.142	±0.01
	1542.936	±0.01
	1543.730	±0.01
FLD5F15CA-K9445	1541.746	±0.01
	1542.539	±0.01
	1543.333	±0.01
	1544.128	±0.01
FLD5F15CA-K9410	1544.526	±0.01
	1545.322	±0.01
	1546.119	±0.01
	1546.917	±0.01
FLD5F15CA-K9405	1544.924	±0.01
	1545.720	±0.01
	1546.518	±0.01
	1547.316	±0.01
FLD5F15CA-K9370	1547.715	±0.01
	1548.515	±0.01
	1549.315	±0.01
	1550.116	±0.01
FLD5F15CA-K9365	1548.115	±0.01
	1548.915	±0.01
	1549.715	±0.01
	1550.517	±0.01

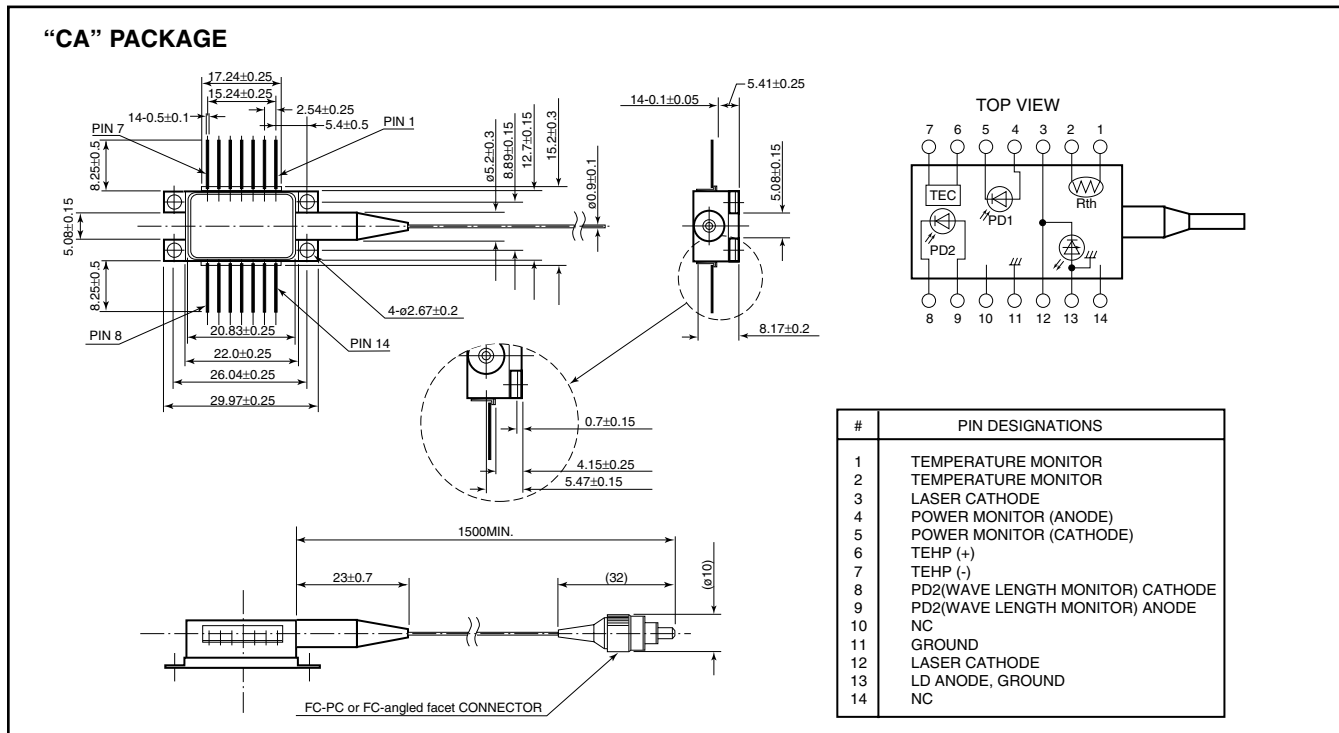
Part Number	Wavelength (nm) (TL=Tset) (in vacuum)	Tolerance (nm)
FLD5F15CA-K9330	1550.918	±0.01
	1551.721	±0.01
	1552.524	±0.01
	1553.329	±0.01
FLD5F15CA-K9325	1551.319	±0.01
	1552.122	±0.01
	1552.926	±0.01
	1553.731	±0.01
FLD5F15CA-K9290	1554.134	±0.01
	1554.940	±0.01
	1555.747	±0.01
	1556.555	±0.01
FLD5F15CA-K9285	1554.537	±0.01
	1555.343	±0.01
	1556.151	±0.01
	1556.959	±0.01
FLD5F15CA-K9250	1557.363	±0.01
	1558.173	±0.01
	1558.983	±0.01
	1559.794	±0.01
FLD5F15CA-K9245	1557.768	±0.01
	1558.578	±0.01
	1559.389	±0.01
	1560.200	±0.01
FLD5F15CA-K9210	1560.606	±0.01
	1561.419	±0.01
	1562.233	±0.01
	1563.047	±0.01
FLD5F15CA-K9205	1561.013	±0.01
	1561.826	±0.01
	1562.640	±0.01
	1563.455	±0.01
FLD5F15CA-K9170	1563.863	±0.01
	1564.679	±0.01
	1565.496	±0.01
	1566.314	±0.01
FLD5F15CA-K9165	1564.271	±0.01
	1565.087	±0.01
	1565.905	±0.01
	1566.723	±0.01
FLD5F15CA-K9130	1567.133	±0.01
	1567.952	±0.01
	1568.773	±0.01
	1569.594	±0.01
FLD5F15CA-K9125	1567.542	±0.01
	1568.362	±0.01
	1569.183	±0.01
	1570.005	±0.01

NOTE

This device is not available with a fiber polarization axis aligned connector. The attached Fujitsu connector is only for use at incoming inspection. A fusion splice is the recommended method for connecting this laser to an external modulator.

Tunable LD Module with Wavelength Locker

FLD5F15CA-K



For further information please contact:

FUJITSU COMPOUND SEMICONDUCTOR, INC.

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

FUJITSU QUANTUM DEVICES EUROPE LTD.

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

FUJITSU QUANTUM DEVICES SINGAPORE PTE LTD.

Hong Kong Branch
Rm. 1101, Ocean Centre, 5 Canton Rd. Tsim Sha Tsui,
Kowloon, Hong Kong
TEL: +852-23770226
FAX: +852-23763269

CAUTION

Fujitsu Compound Semiconductor 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.

FUJITSU QUANTUM DEVICES LIMITED

Business Development Division
11th Floor, Hachioji Daiichi-Seimei Bldg.
3-20-6 Myojin-cho
Hachioji-city, Tokyo 192-0046, Japan
TEL: +81-426-43-5885
FAX: +81-426-43-5582

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

© 2001 FUJITSU COMPOUND SEMICONDUCTOR, INC. Printed in U.S.A. FCSI0101M200