

1,550nm Continuous Wave DFB Laser

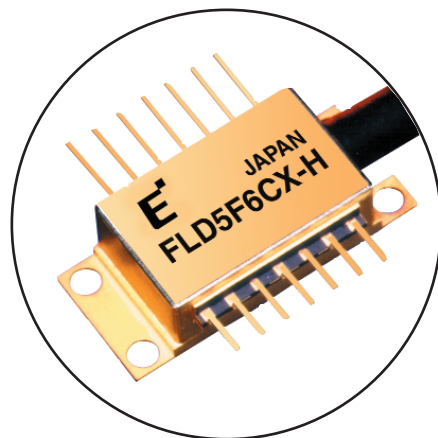
FLD5F6CX-H

FEATURES

- Continuous Wave (CW) Light Source for DWDM System
- Output Power: 10mW
- Available at C-band ITU-T Wavelengths between 1527.99 to 1562.05nm
- Built-in TEC, Thermistor, Monitor PIN PD and Optical Isolator
- Polarization maintaining (PANDA) fiber

APPLICATIONS

2.5 and 10 Gb/s Long Haul DWDM Transmission Systems



DESCRIPTION

The laser is for a high power (10mW) CW operation, at selected C-band ITU-T grid wavelengths. The module includes an optical isolator monitor photodiode, thermistor and a thermo-electric cooler. This laser is designed for use with external modulation components (such as LiNbO₃ modulators). The device comes in “butterfly” type, 14-pin package, and operates between -20 to 70°C.

ABSOLUTE MAXIMUM RATINGS (T_{op}=25°C, unless otherwise specified)

Parameter	Symbol	Condition	Rating		Unit
			Min.	Max.	
Storage Temperature	T _{stg}	-	-40	+85	°C
Operating Case Temperature	T _{op}	-	-20	+70	°C
Optical Output Power	P _f	CW	-	15	mW
LD Forward Current	I _F	CW	-	150	mA
LD Reverse Voltage	V _R	CW	-	2	V
PD Forward Current	-	-	-	10	mA
PD Reverse Voltage	V _{DR}	-	-	20	V
Cooler Voltage	V _C	Cooling	-	+2.5	V
		Heating	-2.5	-	
Cooler Current	I _C	Cooling	-	+1.4	A
		Heating	-0.9	-	
Thermistor Temperature	T _{th}	ATC Operation	-20	+70	°C
Lead Soldering Time	-	260°C	-	10	sec

Note 1: Heatsink thickness shall be 10mm min. (refer to note on thermal precaution).

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

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Laser Set Temperature	T_{set}	-	+20	-	+35	$^{\circ}\text{C}$
Optical Output Power	P_f	CW, $T_c=-20$ to $+70^{\circ}\text{C}$	10	-	-	mW
Threshold Current	I_{th}	CW	3	-	40	mA
Forward Voltage	V_F	CW, $I_F=30$ mA, pin 3,13	-	-	1.5	V
Slope Efficiency	η	CW, $P_f=10$ mW, ORL>40dB	0.09	0.16	-	mW/mA
Operating Current	I_{op}	CW, $P_f=10$ mW	-	-	110	mA
Peak Wavelength	λ_p	CW, $P_f=10$ mW, ORL>40dB	Note (4)			nm
Wavelength Drift	-	after 20 years	-0.2	-	0.2	nm
Wavelength Stability with Case Temperature	-	-	-	-	+/-1	pm/ $^{\circ}\text{C}$
Spectral Width (-3dB)	$\Delta\lambda$	CW, $P_f=10$ mW, ORL>40dB	-	8	50	MHz
Side Mode Suppression	S_r	CW, $P_f=10$ mW, ORL>40dB	30	33	-	dB
Monitor Current	I_m	$P_f=10$ mW	0.04	-	1.0	mA
Monitor Dark Current	I_{dm}	$V_{PD}=5$ V	-	-	100	nA
Monitor Capacitance	C_t	$V_{PD}=5$ V, $f=1$ MHz	-	-	10	pF
Tracking Error (Note 2)	TE	$I_m=\text{constant}$, $P_f(T_c=25^{\circ}\text{C})=10$ mW, $T_c=-20$ to $+70^{\circ}\text{C}$	-	-	+/-0.5	dB
Optical Isolation	S22	$T_c=-20$ to $+70^{\circ}\text{C}$	25	-	-	dB
Polarization Extinction Ratio	PER	CW, $P_f=10$ mW	20	-	-	dB
Relative Intensity Noise	RIN	CW, $P_f=10$ mW, ORL>40dB, $f=0.5$ GHz	-	-	-157	dB/Hz
Cooler Current	I_c	$T_L=T_{set}$, $T_c=+70^{\circ}\text{C}$, $P_f=10$ mW	-	-	1.0	A
Cooler Voltage	V_c	$T_L=T_{set}$, $T_c=+70^{\circ}\text{C}$, $P_f=10$ mW	-	-	2.4	V
Thermistor Resistance	R_{th}	$T_L=25^{\circ}\text{C}$	9.5	10.0	10.5	k Ω
Thermistor B Constant (Note 2)	B	-	3,270	3,450	3,630	K

Note 2. $TE=10 \cdot \log[P_f(T_c)/P_f(25)]$ Note 3. Relation between resistance and temperature ($^{\circ}\text{K}$) is:

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

Note 4. The selected wavelengths available are listed in Table 1

Fig. 1 Forward Current vs Output Power

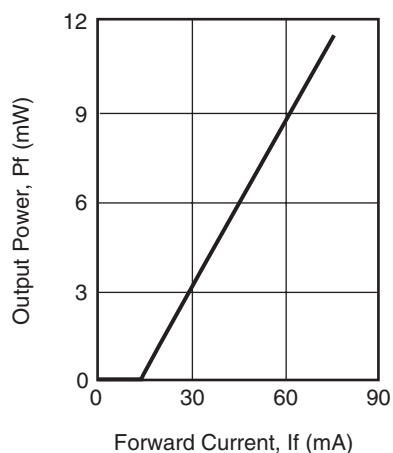


Fig. 2 Temperature Dependence of Wavelength (ACC Operation)

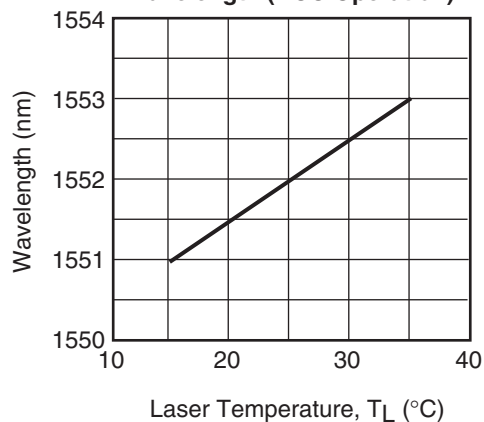


Fig. 3 Cooler Voltage -Current

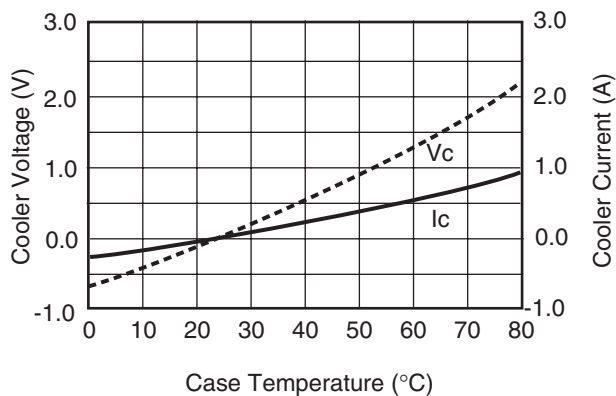


Fig.4 Spectrum

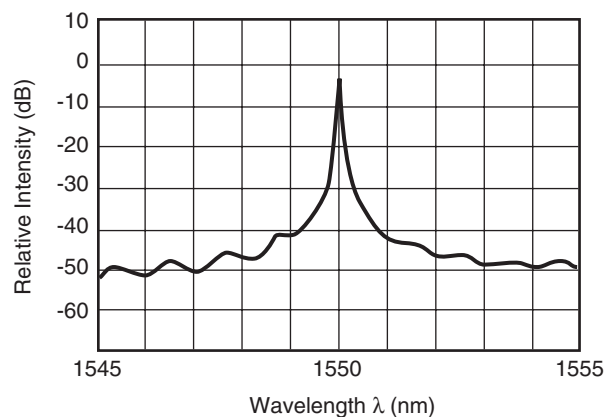


Table 1 Wavelength Table

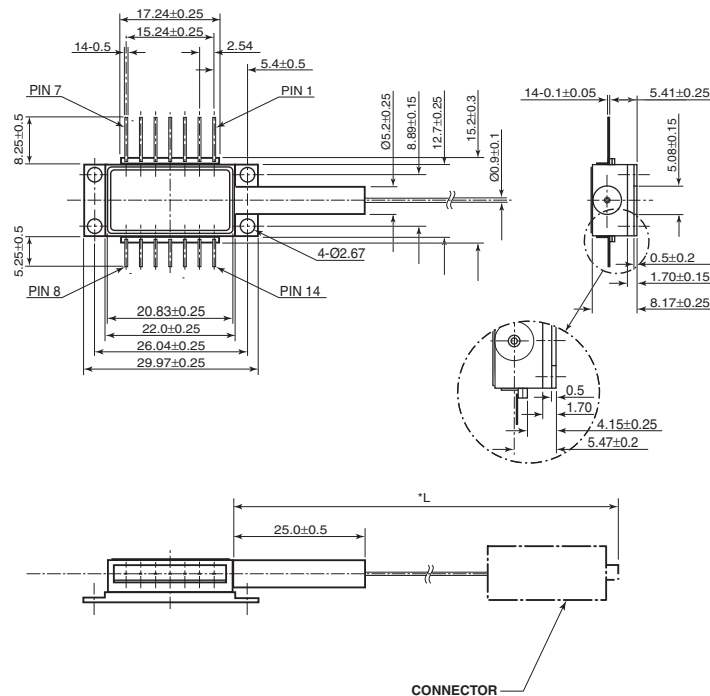
Part Number	Wavelength (nm) (TL=Tset) (in vacuum)	Tolerance (nm)
FLD5F6CX-H62	1527.99	±0.1
-H61	1528.77	±0.1
-H60	1529.55	±0.1
-H59	1530.33	±0.1
-H58	1531.12	±0.1
-H57	1531.90	±0.1
-H56	1532.68	±0.1
-H55	1533.47	±0.1
-H54	1534.25	±0.1
-H53	1535.04	±0.1
-H52	1535.82	±0.1
-H51	1536.61	±0.1
-H50	1537.40	±0.1
-H49	1538.19	±0.1
-H48	1538.98	±0.1
-H47	1539.77	±0.1
-H46	1540.56	±0.1
-H45	1541.35	±0.1
-H44	1542.14	±0.1
-H43	1542.94	±0.1
-H42	1543.73	±0.1
-H41	1544.53	±0.1
-H40	1545.32	±0.1
-H39	1546.12	±0.1
-H38	1546.92	±0.1
-H37	1547.72	±0.1
-H36	1548.51	±0.1
-H35	1549.32	±0.1
-H34	1550.12	±0.1
-H33	1550.92	±0.1
-H32	1551.72	±0.1
-H31	1552.52	±0.1
-H30	1553.33	±0.1
-H29	1554.13	±0.1
-H28	1554.94	±0.1
-H27	1555.75	±0.1
-H26	1556.55	±0.1
-H25	1557.36	±0.1
-H24	1558.17	±0.1
-H23	1558.98	±0.1
-H22	1559.79	±0.1
-H21	1560.61	±0.1
-H20	1561.42	±0.1
-H19	1562.23	±0.1
-H18	1563.05	±0.1

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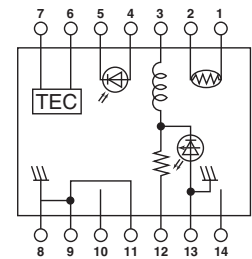
FLD5F6CX-H

"CX" PACKAGE

UNIT: mm



Grounded Type	
PIN #	FUNCTION
1.	Thermistor
2.	Thermistor
3.	Laser DC Bias (-)
4.	Monitor (Anode)
5.	Monitor (Cathode)
6.	Thermoelectric Cooler (+)
7.	Thermoelectric Cooler (-)
8.	Case Ground
9.	Case Ground
10.	N.C.
11.	Case Ground
12.	Laser Modulation (-)
13.	Case Ground
14.	N.C.



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