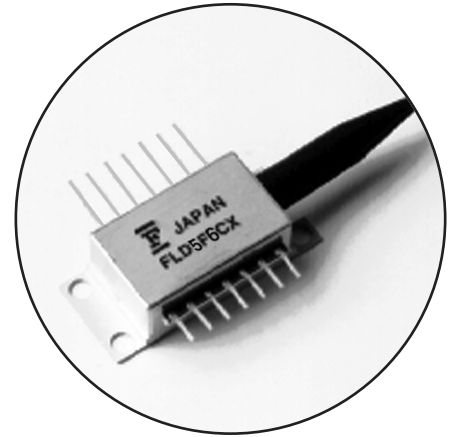


FEATURES

- Continuous Wave (CW) MQW DFB Laser
- Built-in TEC, Thermistor and Monitor PD
- 14-Pin Butterfly Type Module
- 10mW Output Power
- Selected wavelengths according to ITU-T grid available
- Polarization preserving (PANDA) fiber

APPLICATIONS

This MQW laser is intended for use in 2.5 and 10 Gb/s long haul DWDM transmission systems.



DESCRIPTION

The Multiple Quantum Well (MQW) Laser has high power CW operation. It is packaged in a “butterfly” type module. This module has high optical coupling efficiency through an optical isolator. This module also includes a monitor photodiode, a thermoelectric cooler (TEC) and thermistor. This laser is designed for use with external modulation components (such as LiNbO₃ modulators).

NOTE

This device is not available with an axis aligned connector.

The Fujitsu connector is attached only for the convenience of measuring the extinction ratio at incoming inspection of the customer. A fusion splice is the recommended method for connecting this laser to an external modulator.

ABSOLUTE MAXIMUM RATINGS (T_c=25°C)

Parameter	Symbol	Condition	Ratings	Unit
Storage Temperature	T _{stg}	-	-40 to +70	°C
Operating Case Temperature	T _{op}	-	-20 to +70	°C
Optical Output Power	P _f	CW	15	mW
Laser Reverse Voltage	V _R	-	2	V
Laser Forward Current	I _F	CW	150	mA
Photodiode Reverse Voltage	V _{DR}	-	20	V
Photodiode Forward Current	I _{PF}	-	10	mA
Cooler Current	I _c	-	1.4	A
Cooler Voltage	V _c	Note (1)	2.5	V
Lead Soldering Time	T _{sold}	<260°C	10	sec

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

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}	-	+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
Peak Wavelength	λ_p	CW, $P_f=10$ mW, ORL>40dB	Note (4)			nm
Wavelength Drift	-	after 20 years	-	-	0.2	nm
Wavelength Stability with Case Temperature	-	-	-	-	+/-2	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
Extinction Ratio	TE/TM	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}	$T_L=+20$ to $+35^\circ\text{C}$	6.3	-	12.7	k Ω
Thermistor B Constant (Note 2)	B	$T_L=+20$ to $+35^\circ\text{C}$	3,270	3,450	3,630	K

Note 2. $TE=10*\log[P_f(T_c)/P_f(25)]$

Note 3. Relation between resistance and temperature ($^\circ\text{K}$) is:

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

Note 4. The selected wavelength is available which is listed in Figure 5.

Fig. 1 Forward Voltage vs Output Power

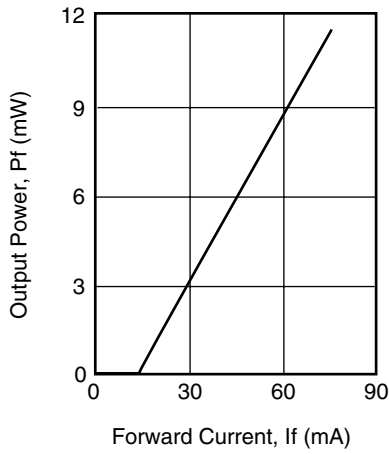


Fig. 2 Temperature Dependence of Wavelength

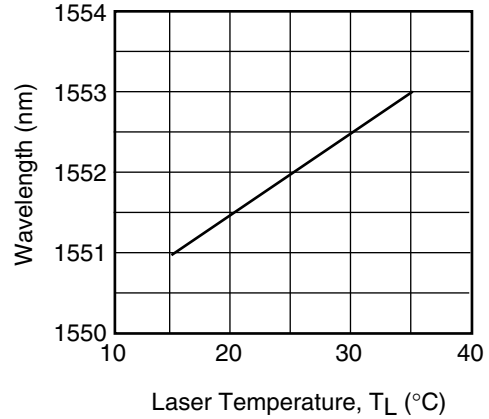


Fig. 3 Cooler Voltage -Current

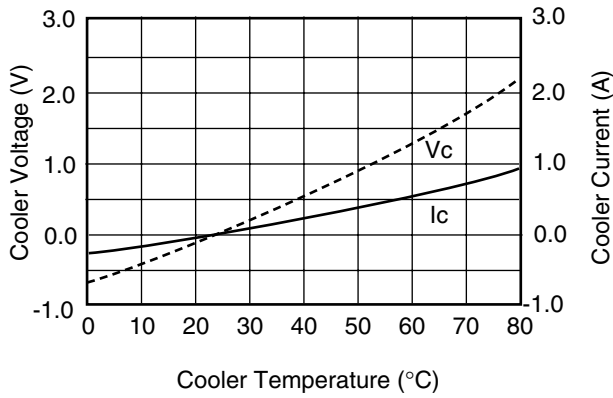


Fig.4 Spectrum

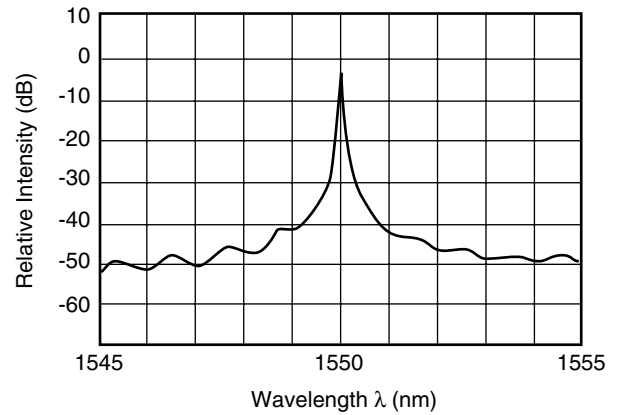


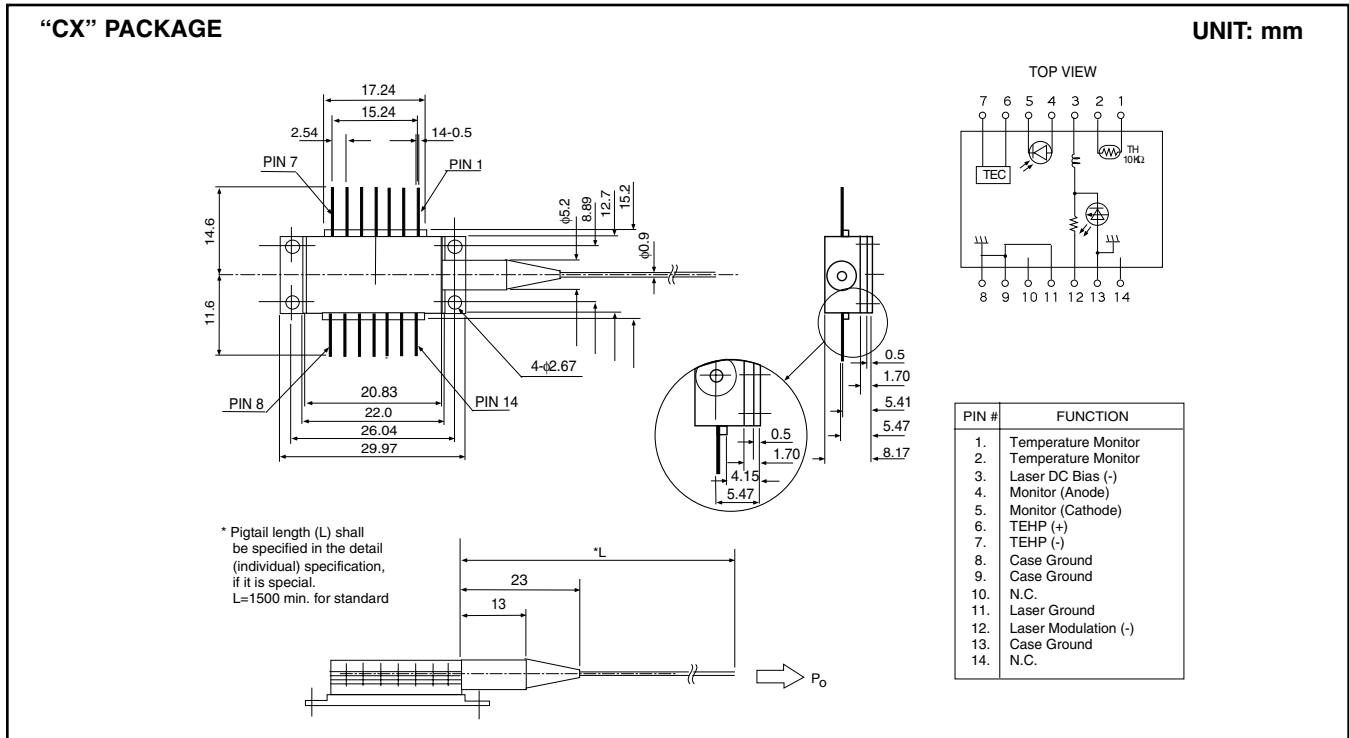
Fig. 5 Wavelength Table

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

1,550nm MQW-DFB Continuous Wave Laser

FLD5F6CX-H



For further information please contact:

FUJITSU COMPOUND SEMICONDUCTOR, INC. Americas & R.O.W.

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

55 Schanck Road,
Suite A-2
Freehold, NJ 07728-2964, U.S.A.
Phone: (732) 303-0282
FAX: (732) 431-3393

www.fcsi.fujitsu.com

FUJITSU MIKROELCTRONIK GmbH

Quantum Devices Division
Network House
Norreys Drive
Maidenhead, Berkshire SL6 4FJ, UK
Phone: +44 (0)1628 504800
FAX: +44 (0)1628 504888

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.

© 1999 FUJITSU COMPOUND SEMICONDUCTOR, INC.
Printed in U.S.A. FCSI0199M200

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, LTD. Asia & Japan

2-7-1, Nishi Shinjuku
Shinjuku-ku, Tokyo 163-0721
Japan
Phone: 3-5322-3356
FAX: 3-5322-3398