

2.5 Gb/s DFB Laser for DWDM: 2-10 mW ITU C-band and L-band

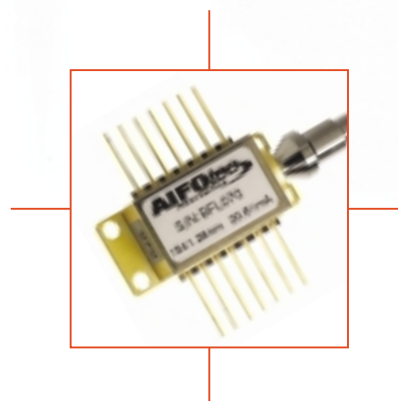


Application

- High Speed 2.5 Gb/s, long haul optical DWDM networks
- SONET/SDH OC-48/STM16 links, Metro-WDM-Networks

Features

- Industry standard 14 pin butterfly package
- InGaAsP/InP DFB Laser Diode
- TEC, isolator, monitor PD
- Full ITU C-band and L-band (1528,77 nm - 1603,17 nm) available
- Wide operating temperature range -10°C to +70°C



Technical Specifications

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings may cause permanent damage to the device. Exposure to absolute maximum ratings for extended periods can affect the device reliability. The specified performance can be achieved at the operating conditions, listed in this datasheet.

Parameter	Symbol	Conditions	Rating	Unit
LD forward current	I_f	CW	120	mA
LD reverse voltage	V_{rl}		2	V
PD reverse voltage	V_{rd}		10	V
TEC current	I_{TEC}		1.5	A
TEC voltage	V_{TEC}		3	V
Operating case temperature	T_c		-10 - +70	°C
Storage temperature	T_{stg}		-40 - +85	°C

Electrical/Optical Characteristics

Parameters are specified over operating case temperature. A heat sink or ventilation may be needed to ensure operation within the above limits. Typical values are measured at $T_{case} = 25^\circ\text{C}$, unless otherwise noted. Typical values are for information purposes only and not part of the testing requirements.

AIFOtec supports four different versions at following rated power levels (P_{rated}): L (low): $P_{rated} = 2$ mW, M (medium): $P_{rated} = 4$ mW, H (high): $P_{rated} = 8$ mW, XH (xtra high): $P_{rated} = 10$ mW.

Parameter	Conditions	Symbol	Min	Typ.	Max	Unit
Threshold current	CW	I_{th}		10	20	mA
Slope efficiency	L : CW, Note 1	η	30	50	65	mW/A
	M : CW, Note 1		60	80	100	mW/A
	H : CW, Note 1		95	110	200	mW/A
	XH : CW, Note 1		120	140	200	mW/A
Optical output power at threshold current	L : CW, $I_f = I_{th}$	P_{th}			50	μW
	M : CW, $I_f = I_{th}$				100	μW
	H/XH : CW, $I_f = I_{th}$				200	μW
Operating current	L/M : CW, $P_f = P_{rated}$	I_{op}		50	80	mA
	H/XH : CW, $P_f = P_{rated}$			80	100	mA
Operating voltage	CW, $P_f = P_{rated}$	V_{op}			1.8	V
Input impedance	$I_f > I_{th}$	Z_{in}		25		Ω
Central wavelength	CW	λ_c	1528,77		1603,17	nm
			See extra wavelength table			
Wavelength drift with case temperature	$T_c = -10$ to $+70^\circ\text{C}$, ATC conditions	$\Delta\lambda_c/\Delta T_c$		0.2	0.5	pm/°C
Laser chip operating temperature	-	T_{set}	20		30	°C
Wavelength temperature tuning coefficient	-			0.09		nm/°C
Spectral width	Note 2, @ 3 dB	$\Delta\lambda$		0.1	0.3	nm
	Note 2, @ 20 dB			0.3	1	nm
Side mode suppression ratio	Note 2	S_r	33	40		dB
Dispersion penalty	(Note 2, 3)	DP			2	dB
Optical Isolation	$T_{TEC} = 25^\circ\text{C}$	iso	30			dB
Monitor current (PD)	CW, $P_f = P_{rated}$, $V_{rd} = 5\text{V}$	I_{mon}	0.5		10	mA
Dark current (PD)	$V_{rd} = 5\text{V}$, $T_c = -10$ to $+70^\circ\text{C}$	I_d			0.1	μA
Capacitance (PD)	$V_{rd} = 5\text{V}$, $f = 1\text{MHz}$	C_{PD}		4	10	pF

Note 1: Slope efficiency is average dP/dI curve measured from $I_{th} + 5$ mA to P_{rated} .

Note 2: Modulated at 2.5 Gb/s NRZ, $P_{f, peak} = P_{rated}$, extinction ratio > 9 dB.

Note 3: BER = 10^{-10} , dispersion: +1800 ps/nm

Thermal Characteristics

Parameter	Conditions	Symbol	Min	Typ.	Max	Unit
Thermistor resistance	$T_{ld} = 25^{\circ}\text{C}$	R_{th}	9.5	10	10.5	$\text{K}\Omega$
B constant of Rth	-	B	-	3892	-	K
Cooling capacity	$P_f = P_{rated}, T_c = 70^{\circ}\text{C}$	ΔT	50	-	-	$^{\circ}\text{C}$
Cooler current	$P_f = P_{rated}, T_c = 70^{\circ}\text{C}$	I_{pe}	-	0.7	1.0	A
Cooler voltage	$P_f = P_{rated}, T_c = 70^{\circ}\text{C}$	V_{pe}	-	1.2	1.8	V

Fiber Pigtail Specification

Parameter	Limits	Unit
Fiber type	SM	
Mode field diameter	9.5 ± 1	μm
Cladding diameter	125 ± 2	μm
Secondary coating outer diameter	0.9 ± 0.1	mm
Connector	See ordering info	
Optical return loss of connector	40 (min)	dB

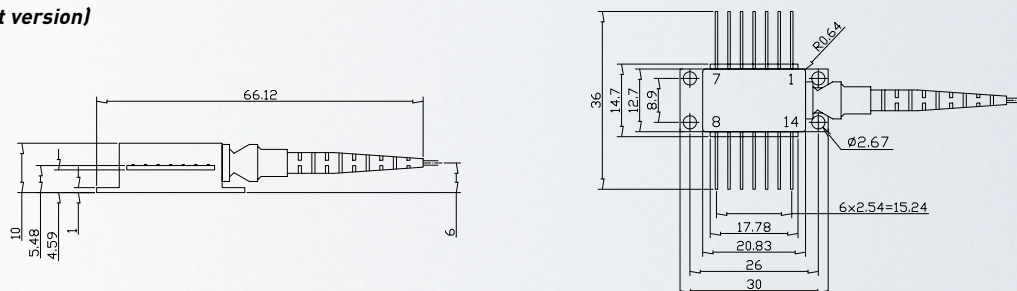
Pin Allocation

Pin	Function	Pin	Function
1	Thermistor	8	Not Connected
2	Thermistor	9	Not Connected
3	LD Cathode	10	Not Connected
4	PD Anode	11	LD Anode (GND)
5	PD Cathode	12	LD RF (Modulation)
6	TE-Cooler +	13	LD Anode (GND)
7	TE-Cooler -	14	Not Connected

All dimensions in mm

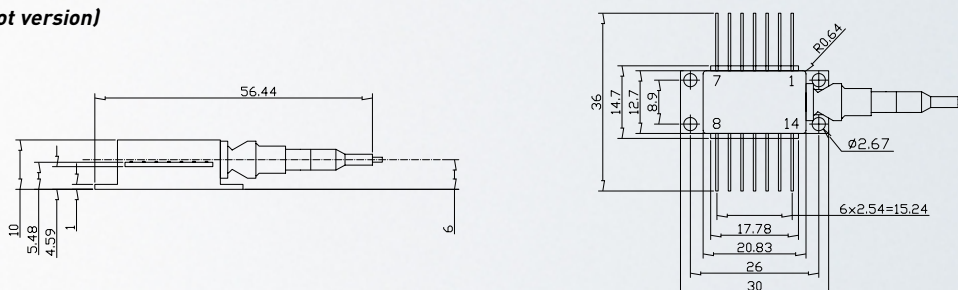
Outline Drawing of Type F0x (horizontal flange)

Version A (long boot version)



Outline Drawing of Type F0x (horizontal flange)

Version B (short boot version)



Wavelength Table (C-band: 1528,77 nm-1563,86 nm)

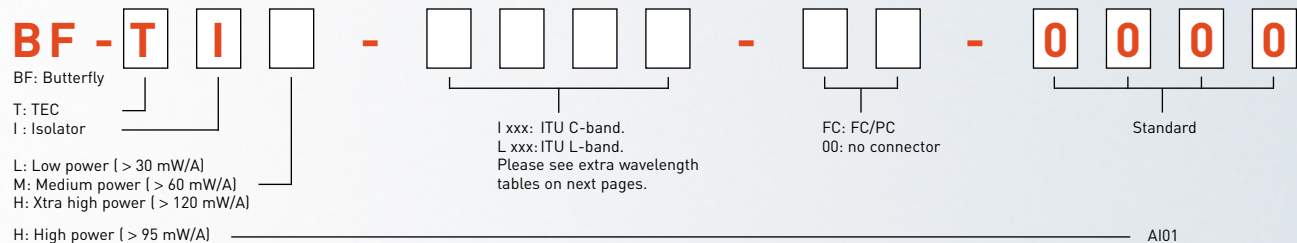
Full Part Number (with FC/PC connector)	ITU channel	Wavelength (nm)	Frequency (THz)
BF-T I □-I017-FC-□ □ □ □	17	1563.86	191.7
BF-T I □-I018-FC-□ □ □ □	18	1563.05	191.8
BF-T I □-I019-FC-□ □ □ □	19	1562.23	191.9
BF-T I □-I020-FC-□ □ □ □	20	1561.42	192.0
BF-T I □-I021-FC-□ □ □ □	21	1560.61	192.1
BF-T I □-I022-FC-□ □ □ □	22	1559.79	192.2
BF-T I □-I023-FC-□ □ □ □	23	1558.98	192.3
BF-T I □-I024-FC-□ □ □ □	24	1558.17	192.4
BF-T I □-I025-FC-□ □ □ □	25	1557.36	192.5
BF-T I □-I026-FC-□ □ □ □	26	1556.55	192.6
BF-T I □-I027-FC-□ □ □ □	27	1555.75	192.7
BF-T I □-I028-FC-□ □ □ □	28	1554.94	192.8
BF-T I □-I029-FC-□ □ □ □	29	1554.13	192.9
BF-T I □-I030-FC-□ □ □ □	30	1553.33	193.0
BF-T I □-I031-FC-□ □ □ □	31	1552.52	193.1
BF-T I □-I032-FC-□ □ □ □	32	1551.72	193.2
BF-T I □-I033-FC-□ □ □ □	33	1550.92	193.3
BF-T I □-I034-FC-□ □ □ □	34	1550.12	193.4
BF-T I □-I035-FC-□ □ □ □	35	1549.32	193.5
BF-T I □-I036-FC-□ □ □ □	36	1548.51	193.6
BF-T I □-I037-FC-□ □ □ □	37	1547.72	193.7
BF-T I □-I038-FC-□ □ □ □	38	1546.92	193.8
BF-T I □-I039-FC-□ □ □ □	39	1546.12	193.9
BF-T I □-I040-FC-□ □ □ □	40	1545.32	194.0
BF-T I □-I041-FC-□ □ □ □	41	1544.53	194.1
BF-T I □-I042-FC-□ □ □ □	42	1543.73	194.2
BF-T I □-I043-FC-□ □ □ □	43	1542.94	194.3
BF-T I □-I044-FC-□ □ □ □	44	1542.14	194.4
BF-T I □-I045-FC-□ □ □ □	45	1541.35	194.5
BF-T I □-I046-FC-□ □ □ □	46	1540.56	194.6
BF-T I □-I047-FC-□ □ □ □	47	1539.77	194.7
BF-T I □-I048-FC-□ □ □ □	48	1538.98	194.8
BF-T I □-I049-FC-□ □ □ □	49	1538.19	194.9
BF-T I □-I050-FC-□ □ □ □	50	1537.40	195.0
BF-T I □-I051-FC-□ □ □ □	51	1536.61	195.1
BF-T I □-I052-FC-□ □ □ □	52	1535.82	195.2
BF-T I □-I053-FC-□ □ □ □	53	1535.04	195.3
BF-T I □-I054-FC-□ □ □ □	54	1534.25	195.4
BF-T I □-I055-FC-□ □ □ □	55	1533.47	195.5
BF-T I □-I056-FC-□ □ □ □	56	1532.68	195.6
BF-T I □-I057-FC-□ □ □ □	57	1531.90	195.7
BF-T I □-I058-FC-□ □ □ □	58	1531.12	195.8
BF-T I □-I059-FC-□ □ □ □	59	1530.33	195.9
BF-T I □-I060-FC-□ □ □ □	60	1529.55	196.0
BF-T I □-I061-FC-□ □ □ □	61	1528.77	196.1

Wavelength Table (L-band: 1568,77 nm-1603,17 nm)

Full Part Number (with FC/PC connector)	ITU channel	Wavelength (nm)	Frequency (THz)
BF-T I □-L911-FC-□ □ □ □	911	1568.77	191.1
BF-T I □-L910-FC-□ □ □ □	910	1569.59	191.0
BF-T I □-L909-FC-□ □ □ □	909	1570.42	190.9
BF-T I □-L908-FC-□ □ □ □	908	1571.24	190.8
BF-T I □-L907-FC-□ □ □ □	907	1572.06	190.7
BF-T I □-L906-FC-□ □ □ □	906	1572.89	190.6
BF-T I □-L905-FC-□ □ □ □	905	1573.71	190.5
BF-T I □-L904-FC-□ □ □ □	904	1574.54	190.4
BF-T I □-L903-FC-□ □ □ □	903	1575.37	190.3
BF-T I □-L902-FC-□ □ □ □	902	1576.20	190.2
BF-T I □-L901-FC-□ □ □ □	901	1577.02	190.1
BF-T I □-L900-FC-□ □ □ □	900	1577.85	190.0
BF-T I □-L899-FC-□ □ □ □	899	1578.69	189.9
BF-T I □-L898-FC-□ □ □ □	898	1579.52	189.8
BF-T I □-L897-FC-□ □ □ □	897	1580.35	189.7
BF-T I □-L896-FC-□ □ □ □	896	1581.18	189.6
BF-T I □-L895-FC-□ □ □ □	895	1582.02	189.5
BF-T I □-L894-FC-□ □ □ □	894	1582.85	189.4
BF-T I □-L893-FC-□ □ □ □	893	1583.69	189.3
BF-T I □-L892-FC-□ □ □ □	892	1584.53	189.2
BF-T I □-L891-FC-□ □ □ □	891	1585.36	189.1
BF-T I □-L890-FC-□ □ □ □	890	1586.20	189.0
BF-T I □-L889-FC-□ □ □ □	889	1587.04	188.9
BF-T I □-L888-FC-□ □ □ □	888	1587.88	188.8
BF-T I □-L887-FC-□ □ □ □	887	1588.72	188.7
BF-T I □-L886-FC-□ □ □ □	886	1589.57	188.6
BF-T I □-L885-FC-□ □ □ □	885	1590.41	188.5
BF-T I □-L884-FC-□ □ □ □	884	1591.25	188.4
BF-T I □-L883-FC-□ □ □ □	883	1592.10	188.3
BF-T I □-L882-FC-□ □ □ □	882	1592.95	188.2
BF-T I □-L881-FC-□ □ □ □	881	1593.79	188.1
BF-T I □-L880-FC-□ □ □ □	880	1594.64	188.0
BF-T I □-L879-FC-□ □ □ □	879	1595.49	187.9
BF-T I □-L878-FC-□ □ □ □	878	1596.34	187.8
BF-T I □-L877-FC-□ □ □ □	877	1597.19	187.7
BF-T I □-L876-FC-□ □ □ □	876	1598.04	187.6
BF-T I □-L875-FC-□ □ □ □	875	1598.89	187.5
BF-T I □-L874-FC-□ □ □ □	874	1599.75	187.4
BF-T I □-L873-FC-□ □ □ □	873	1600.60	187.3
BF-T I □-L872-FC-□ □ □ □	872	1601.45	187.2
BF-T I □-L871-FC-□ □ □ □	871	1602.31	187.1
BF-T I □-L870-FC-□ □ □ □	870	1603.17	187.0

Listed wavelengths can be guaranteed by temperature tuning between $T_{\text{case}} = +20$ to $+30^{\circ}\text{C}$.
Values are wavelengths in vacuum, tolerance is $\lambda \pm 0.05$ nm, excluding any tolerances of the ATC circuitry which is applied.

Ordering Information



note: if a particular boot length is requested, please also mention the version (A or B) in your order.

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