

MITSUBISHI (OPTICAL DEVICES)

FU-48SDF-1

1.3 μ m DFB-LD MODULE WITH SINGLEMODE FIBER PIGTAIL
(BIAS CIRCUIT INTEGRATED. DIGITAL APPLICATION)

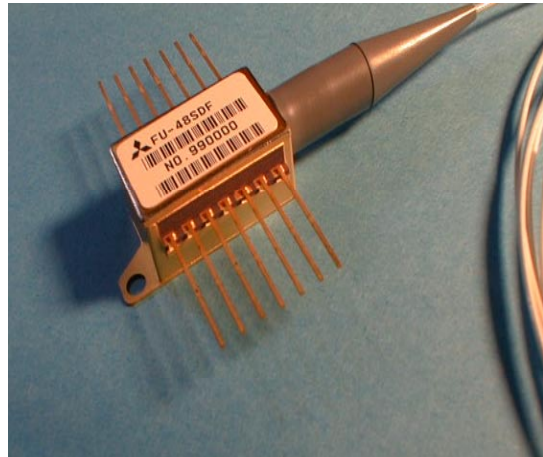
DESCRIPTION

Module type FU-48SDF-1 is a 1.3 μ m DFB-LD module with single-mode optical fiber.

This module is suitable to a light source for use in 2.5Gb/s digital optical communication systems.

FEATURES

- Multi quantum wells(MQW) DFB Laser Diode module
- Input impedance is 25 Ω
- Emission wavelength is in 1.3 μ m band
- High-speed response
- Built-in optical isolator
- Built-in thermal electric cooler
- Butterfly package
- With photodiode for optical output monitor



APPLICATION

High speed transmission systems(to 2.5Gb/s)

ABSOLUTE MAXIMUM RATINGS (Tc=25°C)

Parameter		Symbol	Conditions	Rating	Unit
Laser diode	Optical output power from fiber end	Pf	CW	10	mW
	Forward current	If	CW	150	mA
	Reverse voltage	Vrl	-	2	V
Photodiode for monitoring	Reverse voltage	Vrd	-	20	V
	Forward current	Ifd	-	2	mA
Cooler (Note)	Cooler voltage	Vpe	-	2.4	V
	Cooler current	Ipe	-	1.2	A
Operating case temperature		Tc	-	-20 to +65	°C
Storage temperature		Tstg	-	-40 to +70	°C

Note. Even if the thermo-electric cooler (TEC) is operated within the rated conditions, uncontrolled current loading or operation with heatsink may easily damage the module by exceeding the storage temperature range.

Thermistor resistance should be properly monitored by the feedback circuit during TEC operation to avoid the catastrophic damage.

FU-48SDF-1**1.3 μ m DFB-LD MODULE WITH SINGLEMODE FIBER PIGTAIL
(BIAS CIRCUIT INTEGRATED. DIGITAL APPLICATION)****OPTICAL CHARACTERISTICS**(T_{ld}=25°C, T_c=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Threshold current	I _{th}	CW	-	15	40	mA
Operating current	I _{op}	CW	-	48	80	mA
Operating voltage	V _{op}	CW, I _f =I _{op} (Note 1)	-	1.3	1.8	V
Input impedance	Z _{in}	I _f =I _{op}	-	25	-	W
Optical output power form fiber end	P _f	CW, I _f =I _{op}	4	6		mW
Light-emission central wavelength	λ_c	CW, I _f =I _{op}	1290	1310	1330	nm
Spectral Width (-20dB full width)	$\Delta\lambda$ (-20dB)	2.5Gb/s, NRZ Mark ratio 50% I _{f_peak} =I _{op} Extinction ratio 8% (Note 2)	-	0.4	-	nm
Side Mode Suppression Ratio	SMSR	CW, I _f =I _{op}	33	-	-	dB
Cutoff frequency (-1.5dB optical)	f _c	I _f =I _{op}	3.5	40	-	dB
Rise and Fall time	t _r ,t _f	2.5Gb/s, NRZ Mark ratio 50% I _{f_peak} =I _{op} Extinction ratio 8% (Note 2)	-	-	150	ps
Relative intensity noise	N _r	CW, I _f =I _{op}	-	-155	-145	dB/Hz
Tracking error (Note 3)	E _r	T _c =-20 ~ +65°C, APC, ATC	-	0.3	-	dB
Differential Efficiency	η	-	0.1	0.17	0.35	mW/mA
Monitor Current	I _{mon}	CW, I _f =I _{op} , V _{rd} =5V	0.1	-	-	mA
Dark Current (PD)	I _d	V _{rd} =5V	-	0.1	1	μ A
Capacitance (PD)	C _t	V _{rd} =5V, f=1MHz	-	10	-	pF

Note 1) I_f : LD forward current

Note 2) Optical return loss of the connectors should be greater than 40dB in order to get the specified.

Note 3) E_r=max|10 \times log(P_f/P_{f@25°C})|**THERMAL CHARACTERISTICS** (T_{ld}=T_{set}, T_c=-20 to 65°C)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Thermistor resistance	R _{th}	T _{ld} =25°C	9.5	10	10.5	k Ω
B constant of R _{th}	B	-	-	3950	-	K
Cooling capacity	ΔT	T _c =65°C	45	-	-	°C
Cooler current	I _{pe}	ΔT =40°C	-	0.6	1	A
Cooler voltage	V _{pe}	ΔT =40°C	-	1.2	2	V

OPTICAL FIBER SPECIFICATION

Parameter	Limits	Unit
Type	Single Mode	---
Mode field dia.	9.5 \pm 1	μ m
Cladding dia.	125 \pm 2	μ m
Jacket dia.	0.9typ.	mm

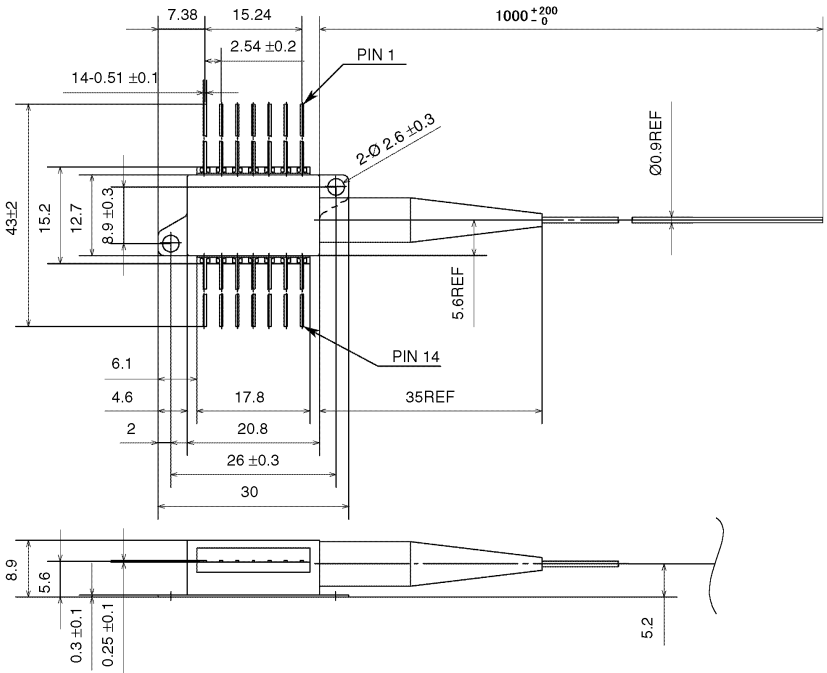
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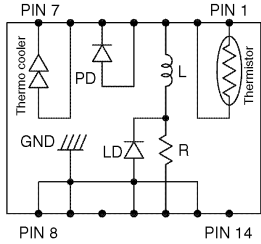
OUTLINE DIAGRAM

(Unit : mm)

NOTE. TOLERANCE UNLESS NOTED ±0.5



PIN	FUNCTION
1	THERMISTOR
2	THERMISTOR
3	LD BIAS (-)
4	PD ANODE
5	PD CATHODE
6	COOLER ANODE
7	COOLER CATHODE
8	GND
9	GND
10	NC
11	LD ANODE, GND
12	LD RF
13	LD ANODE, GND
14	NC



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