

Approved	Approved	Charged
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Preliminary

Specification of Uncooled DFB-LD Module
for 10Gb/s Applications
(STM-64, OC192 and 10G Ethernet)

Module type : FU-480SDF

A	B	C	D
	x		
Date		Approved	
4,Dec,'01		A.Adachi	

MITSUBISHI ELECTRIC CORPORATION

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MITSUBISHI (OPTICAL DEVICES)

FU-480SDF

**1.3 mm UNCOOLED DFB-LD MODULE WITH SINGLEMODE FIBER PIGTAIL FOR 10Gb/s
(BIAS CIRCUIT INTEGRATED, DIGITAL APPLICATION)**

DESCRIPTION

Module type FU-480SDF is a 1.3 μ m Uncooled DFB-LD module with single-mode optical fiber. This module is suitable to a light source for use in 10Gb/s digital optical communication systems.

FEATURES

- Input impedance is 50 Ω , coplanar input
- Distributed feedback (DFB) Laser Diode
- Emission wavelength is the 1.3 μ m band
- Single-mode optical fiber pig-tail
- Built-in optical isolator
- Built-in thermistor and bias T
- With photodiode for optical output monitor

APPLICATION

- High speed transmission systems (~10Gb/s)

1. ABSOLUTE MAXIMUM RATINGS (T_c=25°C)

ITEM		SYMBOL	CONDITION	RATING	UNIT
Laser diode	Optical output power	Pf	CW	6	mW
	Forward current	If	CW	100	mA
	Reverse voltage	Vrl	-	2	V
Photo diode	Reverse voltage	Vrd	-	20	V
	Forward current	Ifd	-	2	mA
Operating case temperature		Tc	-	0 ~ 65	°C
Storage temperature		Tstg	-	-40 ~ 85	°C

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2. ELECTRICAL/ OPTICAL CHARACTERISTICS (Tc=0~65°C, unless otherwise noted)

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Threshold current	Ith	CW, Tc=25°C	-	10	25	mA
Optical output power at threshold current	Pth	CW, I _{bias} =Ith	-	-	50	μW
Operating current	Iop	CW, Pf=1mW, Tc=25°C	-	30	50	mA
Operating voltage	Vop	CW, Pf=1mW, Tc=25°C	-	1.2	1.8	V
Input impedance	Zin	-	-	50	-	Ω
Optical output power from fiber end	Pf	CW, nominal	-	1	-	mW
Light-emission central wavelength	λ _c	CW, Pf=1mW	1290	1310	1330	nm
Wavelength temperature coefficient	λ _{ct}	-	-	0.09	0.1	nm/°C
Spectral width (-20dB full width)	Δλ		-	-	0.8	nm
Side mode suppression ratio	Sr		35	45	-	dB
Extinction ratio	Ex		-	6.5	-	dB
Dispersion penalty	Pp	40ps/nm disp.	-	-	1.0	dB
Relative intensity noise	Nr	CW, Pf=1mW	-	-145	-130	dB/Hz
Tracking error [Note 1]	Er	CW, APC (I _{mon} =Const.)	-	0.5	1.25	dB
Differential efficiency	η	CW, Tc=25°C	0.005	-	0.15	mW/mA
Monitor current	I _{mon}	CW, Pf=1mW, V _{rd} =5V	0.05	-	1.5	mA
Optical isolation	Iso	-	20	-	-	dB
Dark current (PD)	I _d	V _{rd} =5V	-	-	0.1	μA
Capacitance (PD)	C _t	V _{rd} =5V, f=1MHz	-	-	10	pF
Thermistor resistance	R _{th}	Tc=25°C	9.5	10	10.5	kΩ
B constant of R _{th}	B	-	-	3950	-	K

[Note 1] Er=max | 10*log(Pf / Pf@25°C) |

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3. FIBER PIGTAIL SPECIFICATIONS

ITEM	SPECIFICATION	UNIT
Type	SM	-
Mode field diameter	9.3 ± 1	μm
Cladding diameter	125 ± 2	μm
Jacket diameter	0.9 ± 0.1	mm
Connector	See Table 1.	-
Optical return loss of connector	40 (min)	dB

Table 1.

Type number	Connector type	Optical fiber length (Note 3)	Optical conector length (Note 3)
FU-480SDF-1M1	None	1000+200/-0	-
FU-480SDF-V1M1	FC/PC	1000+200/-0	28.4
FU-480SDF-W1M1	SC/PC	1000+200/-0	34.5

Note 3) Typical value.

Note 4) There are some cases where a connector for testing is shipped with the product.

Then the fiber length not including the connector is more than 1000mm.

DOCUMENTATION

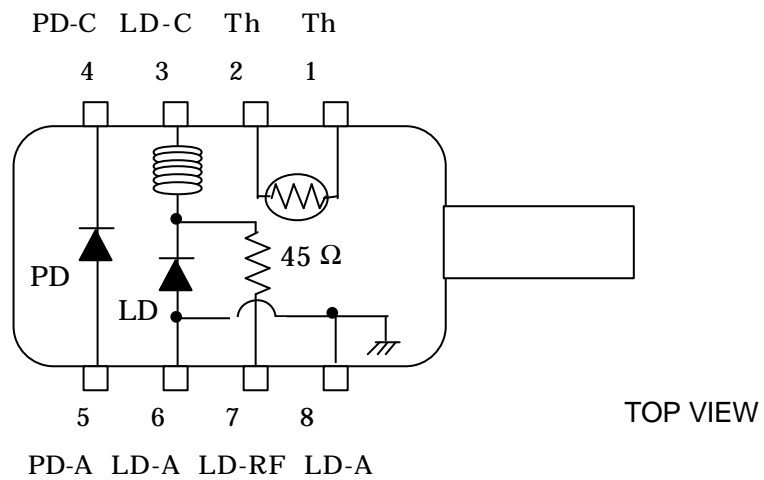
- Threshold current (I_{th}) at $T_c=25, 65^\circ\text{C}$
- Operating current (I_{op}) at $T_c=25, 65^\circ\text{C}$
- Operating voltage (V_{op}) at $T_c=25^\circ\text{C}$
- Light-emission central wavelength (λ_c) at $T_c=25^\circ\text{C}$
- Monitor current (I_{mon}) at $T_c=25^\circ\text{C}$
- Optical output power from fiber end (P_f)

MITSUBISHI (OPTICAL DEVICES)

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4. Pin configuration



Pin No.	Symbol	Connection
1	Th	Thermistor
2	Th	Thermistor
3	LD-C	LD Cathode (DC bias input)
4	PD-C	PD Cathode
5	PD-A	PD Anode
6	LD-A	LD Anode, Case GND
7	LD-RF	LD Cathode (RF input)
8	LD-A	LD Anode, Case GND

MITSUBISHI (OPTICAL DEVICES)

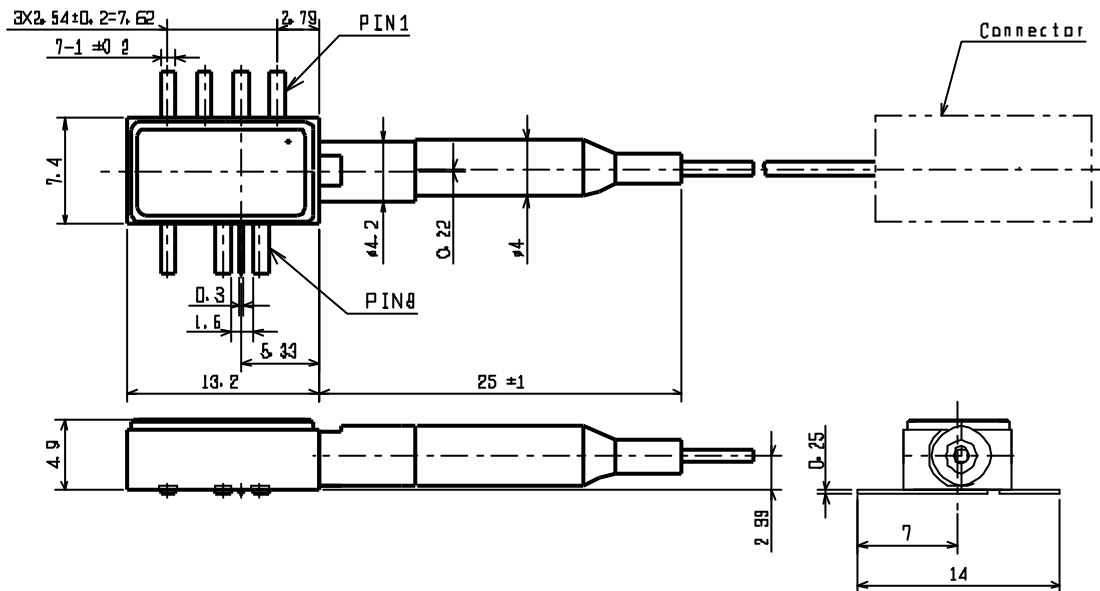
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OUTLINE DIAGRAM

(Unit : mm)

NOTES 1. TOLERANCES UNLESS NOTED ±0.3



FU-480SDF