

MITSUBISHI (OPTICAL DEVICES)

FU-445SDF-WM1

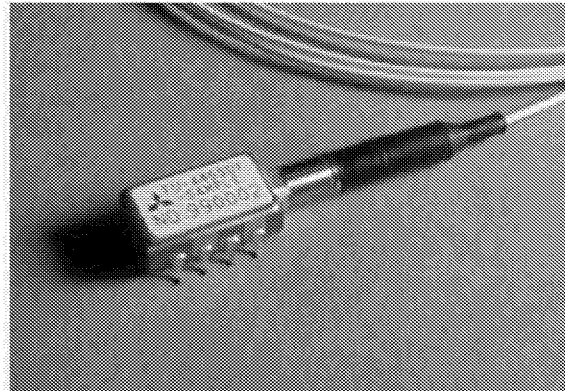
1.3 μm UNCOOLED DFB-LD MODULE WITH SINGLEMODE FIBER PIGTAIL
(BIAS CIRCUIT INTEGRATED, DIGITAL APPLICATION)

DESCRIPTION

Module type FU-445SDF-WM1 is a 1.3 μm Uncooled 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

- $\lambda/4$ shifted Multi quantum wells (MQW) DFB Laser Diode module
- Input impedance is 25 Ω
- Emission wavelength is in 1.3 μm band
- High-speed response
- Built-in optical isolator
- Built-in thermistor and bias T
- 8-pin Mini-DIL package with Gull wing leads
- With photodiode for optical output monitor



APPLICATION

High speed transmission systems (~2.5Gb/s)

ABSOLUTE MAXIMUM RATINGS (T_c=25°C)

Parameter		Symbol	Conditions	Rating	Unit
Laser diode	Optical output power	Pf	CW	6	mW
	Forward current	If	CW	100	mA
	Reverse voltage	Vri	—	2	V
Photodiode	Reverse voltage	Vrd	—	20	V
	Forward current	Ifd	—	2	mA
Operating case temperature		Tc	—	-10 ~ +85	°C
Storage temperature		Tstg	—	-40 ~ +85	°C

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ELECTRICAL/OPTICAL CHARACTERISTICS (Tc=-10~85°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Threshold current	Ith	CW, Tc=25°C	-	10	25	mA
		CW	2	-	40	
Optical output power at threshold current	Pth	CW, I _{bias} =Ith	-	-	50	μW
Operating current	Iop	CW, Pf=2mW, Tc=25°C	-	40	70	mA
		CW, Pf=2mW, Tc=85°C	-	60	90	
Operating voltage	Vop	CW, Pf=2mW	-	1.2	1.5	V
Input impedance	Zin	-	-	25	-	Ω
Optical output power from fiber end	Pf	CW, nominal	-	2	-	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	$\Delta\lambda$	(Note 1), -20dB	-	-	0.8	nm
Side mode suppression ratio	Sr	(Note 1)	30	45	-	dB
Cutoff frequency (-1.5dB optical)	fc	Pf=1mW	3.5	-	-	GHz
Rise and fall time (10~90%)	tr, tf	(Note 1)	-	125	150	psec
Dispersion penalty	Pp	(Note 1), -300ps/nm disp.	-	-	0.5	dB
Relative intensity noise	Nr	CW, Pf=1mW, f=1GHz	-	-150	-140	dB/Hz
Tracking error (Note 2)	Er	CW, APC (I _{mon} =Const.)	-	0.5	1.25	dB
Differential efficiency	η	CW, Tc=25°C	0.06	-	0.2	mW/
		CW	0.04	-	0.27	mA
Monitor current	I _{mon}	CW, Pf=1mW, V _{rd} =5V	0.05	-	1	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	k Ω
B constant of R _{th}	B	-	-	3950	-	K

Note 1) 2.48832Gb/s NRZ, 2²³-1, Pf_{ave}=1mW, I_{bias}=Ith, optical return loss of the connectors should be greater than 40dB in order to ensure the specified performance.

Note 2) Er=max{|10×log(Pf / Pf@25°C)|}

FIBER PIGTAIL SPECIFICATIONS

Parameter	Limits	Unit
Type	SM	-
Mode field diameter	9.5 ± 1	μm
Cladding diameter	125 ± 2	μm
Secondary coating outer diameter	0.9 ± 0.1	mm
Connector	SC/PC	-
Optical return loss of connector	40 (min)	dB

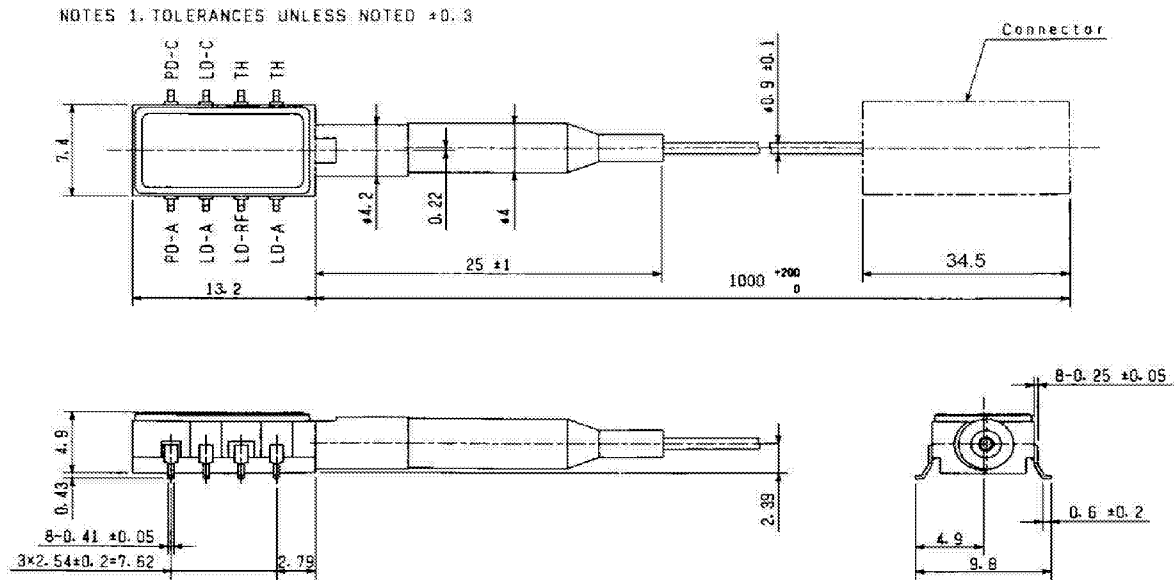
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OUTLINE DIAGRAM

(Unit: mm)



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