

FU-48SDF-30M14D/15D/16D/17D

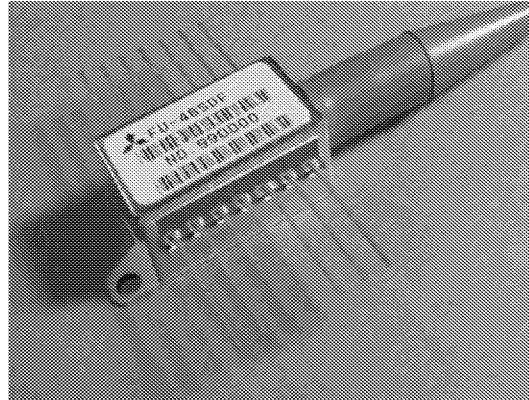
1.3 μ m DFB-LD MODULE WITH SINGLEMODE FIBER PIGTAIL(CATV)

DESCRIPTION

Module type FU-48SDF-30M series has been developed for coupling a singlemode optical fiber and a 1.3 μ m wavelength InGaAsP DFB LD (Laser diode). The module is suitable to light source for use in multi-channel long haul AM CATV systems.

FEATURES

- Distributed Feedback Laser Diode Module
- Suitable light source for CATV application
- High-power
- Emission wavelength is in the 1.3 μ m band
- Built-in optical isolator
- Built-in thermal electric cooler
- Butterfly package



APPLICATION

CATV

ABSOLUTE MAXIMUM RATINGS (T_{id}=25°C)

Parameter		Symbol	Conditions	Rating	Unit
Laser diode	Optical output power from fiber end	P _f	CW	20	mW
	Forward current	I _f	CW	150	mA
	Reverse voltage	V _{ri}	-	2	V
Photodiode for monitoring	Reverse voltage	V _{rd}	-	20	V
	Forward current	I _{fd}	-	2	mA
Cooler	Cooler voltage	V _{pe}	-	2.4	V
(Note)	Cooler current	I _{pe}	-	1.2	A
Operating case temperature		T _c	-	-20~+65	°C
Storage temperature		T _{stg}	-	-40~+70	°C

Note. Even if the thermo-electric cooler (TEC) is operated within the rated conditions, uncontrolled current loading or operation without 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-30M14D/15D/16D/17D**1.3 μ m DFB-LD MODULE WITH SINGLEMODE FIBER PIGTAIL(CATV)****ELECTRICAL/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	-	10	30	mA
Operating Current	I _{op}	CW, I _f =I _{op} (Note1)	-	45	70	mA
Modulation Current	I _{mod}	I _{mod} =I _{op} -I _{th}	-	35	50	mA
Operating Voltage	V _{op}	CW, I _f =I _{op}	-	1.3	1.8	V
Input impedance	Z _{in}	I _f = I _{op}	-	25	-	Ω
Output Power from Fiber End	P _f	CW, I _f =I _{op} -30M14D	6	8	10	mW
		-30M15D	8	10	12	mW
		-30M16D	9	12	15	mW
		-30M17D	12	13	15	mW
Central Wavelength	λ_c	CW, I _f =I _{op}	1290	1310	1330	nm
Side Mode Suppression Ratio	S _r	CW, I _f =I _{op}	30	35	-	dB
Cut-off Frequency (-1.5dB)	f _c	I _f = I _{op}	2	3	-	GHz
Composite Second Order	CSO	79 channel loading 55.25MHz-547.25MHz (6MHz spacing) Optical loss=12dB I _f =I _{op} (Note2)	-	-	-60	dBc
Composite Triple Beat	CTB		-	-	-65	dBc
Carrier to Noise Ratio	CNR	-30M14D	48.5	49.5	-	dBc
		-30M15D	49.5	50.5	-	dBc
		-30M16D	50.5	51.5	-	dBc
		-30M17D	51	52	-	dBc
Optical Modulation Depth	m		3.0	3.5	5	%
RIN (Note 3)	Nr2	CW, I _f =I _{op} f=55.25MHz	-	-160	-155	dB/Hz
	Nr78	f=547.25MHz	-	-160	-155	dB/Hz
Tracking Error (Note 4)	E _r	T _c = -20~65°C, APC, ATC	-	0.3	0.5	dB
Differential Efficiency	η	-30M14D	0.2	0.27	-	mW/mA
		-30M15D	0.2	0.3	-	mW/mA
		-30M16D	0.2	0.3	-	mW/mA
		-30M17D	0.24	0.33	-	mW/mA
Monitor Current	I _{mon}	CW, I _f =I _{op} , V _{rd} =5V	0.1	-	3	mA
Dark current(PD)	I _d	V _{rd} =5V	-	0.1	1	mA
Capacitance (PD)	C _t	V _{rd} =5V, f=1MHz	-	10	20	pF
Isolation	I _{so}	T _c = 0~65°C	25	37	-	dB

Note 1. I_f : LD forward current

Note 2. Detailed test conditions;

12dB Optical loss includes 26.5km fiber loss.

Receiver responsivity=0.9A/W

Input equivalent noise current=7pA/(Hz)^{1/2}

Optical return loss of the connectors should be greater than 50dB in order to get the specified performance.

Note 3. Relative intensity noise does not include shot noise of receiver.

Note 4. E_r=MAX[10×log(P_f(T_c)/P_f(25°C))]

FU-48SDF-30M14D/15D/16D/17D

1.3 μm DFB-LD MODULE WITH SINGLEMODE FIBER PIGTAIL(CATV)

THERMAL CHARACTERISTICS (T_{ld}=25°C, T_c=-20~+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 thermistor resistance	B	-	-	3950	-	K
Cooling capacity	ΔT	T _c =65°C	40	-	-	°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	SM	-
Mode field dia.	9.5 $\pm$ 1	μm
Cladding dia.	125 $\pm$ 2	μm
Jacket dia.	0.9 typ.	mm

