



Description

The DFB-1610-DP-XX-5P-AAF-SA-X-X-185 series of Bi-Directional modules have been designed specifically for full-duplex communication over a single fiber.

The devices are particularly suited for ONU application, with 1610-nm DFB transmit and 1550-nm receive functionality.

The modules are designed to be compliant with FSAN PON applications.

Features

- 1610-nm DFB Laser Diode with Multi-Quantum Well structure, suitable for burst-mode transmission
- I550-nm PIN Photodiode
- Operation in wide temperature range
- Cost-effective Uncooled Laser Technology

Applications

□ 1.25 Gbps upstream and 2.5 Gbps analog downstream reception



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Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Condition			
Module								
Operating Case Temperature	Тор	-20	+85	°C				
Storage Temperature	Tstg	-40	+85	°C				
Solderability	Stemp		350°C for 5+/-0.5s	°C, s	ANSI/J-STD-002			
			260(<10s)	°C				
Laser diode								
Forward Current	If		120	mA	CW			
Reverse Voltage	Vf		2	V				
Output Power	Ро		10	mW	CW			
Monitor PD Forward Current	Imf		2	mA				
Monitor PD Reverse Voltage	Vmf		10	V				
Reverse Voltage (Analog PD)	VfAP		25	V				
Reverse Current (Analog PD)	IfAP		4	mA				

Electrical and Optical Characteristics 1550nm Analog Receiver

Parameters are at 25 °C unless otherwise noted.

Parameter	Symbol	Condition	Min	Тур.	Max.	Unit	
Input Wavelength	λpd		1540	1550	1565	nm	
Responsivity	R	CW, λ=1540-1545nm 0.80					
		CW, λ=1550nm	0.85			A A A /	
		CW, λ=1555-1560nm	0.80			A/VV	
		CW, λ=1565nm	0.70				
Bandwidth(-3dB)	BW		2.5			GHz	
Capacitance	Cpd	Vr=5V, f=1MHz, Popt=0uW			0.8	рF	
Dark Current	ld	Vr=5V			5	nA	
Optical Return Loss	ORL	λ=1550nm	35			dB	
Second Order Inter-Modulation Distortion	IMD2	Note 1*			-70	dBc	
Composite Triple Beat	IMD3	Note 1**			-80	dBc	
Optical Isolation from		λ=1260nm–1360nm	30			dB	
External Source	λ=1480nm–1500nm						
Optical Crosstalk from Internal LASER	Xopt	Note 2			-30	dB	

Note: 1. Two tone two laser test (f1=109.25MHz, f2=349.25MHz,f3=439.25MHz), OMI=40%, 0.5mW per laser.

*fm=548.5MHz, f1=109.25, f2=439.25

** fm=529.25MHz, f1=349.25, f2=439.25

2. Xopt=10xlog{(Ixopt/R)/Pf}. Ixopt is photo current at Pf=3dBm.



1610nm DFB Laser Transmitter

Parameters are at 25 °C unless otherwise noted.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ	1607	1610	1613	nm	T=25 °C Po=2mW
Side-mode Suppression Ratio	SMSR	30	40		dB	Po=2mW
Spectral Width(-20dB)	Δλ			1	nm	Po=2mW
Output Power	Ро	2			mW	lop≪45mA at 25 °C lop≪85mA at 85 °C
Slope Efficiency	SE	0.06			W/A	
Output Power Tracking Error	TE	-1.5		1.5	dB	Over temperature range
Operation Voltage, BOL to EOL	Vop		1.2	1.6	V	Measured at maximum Po
Threshold Current, BOL to EOL	Ith	0.5		60	mA	Over temperature range
Monitor Diode Current	Im	100		1000	uA	Popt=2mW,Vr=5V
Monitor Dark Current	Imd			200	nA	Popt=0mW,Vr=5V
Monitor PD Terminal Capacitance	Ct			20	pF	At Vr=5V at f=1MHz



Dimensions and Pin assignment

Unit: mm Tolerance: +/-0.3 mm





Ordering Options





Safety Information

All versions of this laser are Class 1M laser products per IEC¹/EN² 60825-1:2001-08. Users should observe safety precautions such as those recommended by ANSI³ Z136.1-2000, ANSI Z36.2-1997 and IEC 60825-1:2001-08.

Notes about Laser Safety Class:

The Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) in the USA has decided to harmonize their requirements with 21 CFR 1040.10 and 1040.11 with the IEC/EN 60825-1 and IEC/EN 60601-2-22 standards. This process has not yet happened and in the interim, the CDRH agency has released <u>'Laser Notice No.50'</u> to reduce the regulatory burden. This notice allows IEC/EN classification and labeling of lasers within the USA.

IEC¹/EN² 60825-1 Laser Class

Class 1M: laser is safe for all conditions of use except when passed through magnifying optics such as microscopes and telescopes. Class 1M lasers produce large-diameter beams, or beams that are divergent. The MPE for a Class 1M laser cannot normally be exceeded unless focusing or imaging optics are used to narrow the beam. If the beam is refocused, the hazard of Class 1M lasers may be increased and the product class may be changed. A laser can be classified as Class 1M if the total output power is below (IEC/EN) class 3B but the power that can pass through the pupil of the eye is within Class 1.

FDA Laser Class

Class IIIB: moderate power lasers (cw: 5-500 mW, pulsed: 10 J/cm² or the diffuse reflection limit, whichever is lower). In general Class IIIB lasers will not be a fire hazard, nor are they generally capable of producing a hazardous diffuse reflection. Specific controls are recommended.

This product does not conform to 21 CFR 1040.10 and 1040.11. Consequently, this laser module is only intended for use as a component by manufacturers of electronic products and equipment.

Wavelength =1270 – 1610 nm Maximum Power = 75mW Single-mode fiber pigtail Fiber Numerical Aperture = 0.14

Labeling is not affixed to the laser module due to size constraints; rather, labeling is placed on the outside of the shipping box.

This product is not shipped with a power supply.

Caution: use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



classified in accordance with IEC 60825-1: 2001-08

(1) IEC is a registered trademark of the International Electrotechnical Commission

(2) Within Europe the IEC standard has been adopted as a European Normative standard known as EN 60825, and each European country will have its own version of this standard, for example, the British Standards version known as BS EN 60825. There can be small differences between the different countries versions of EN 60825, and these are in part caused by the process of translating the standard into the native language of that country.

(3) ANSI is a registered trademark of the American National Standards Institute

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