Product Specification

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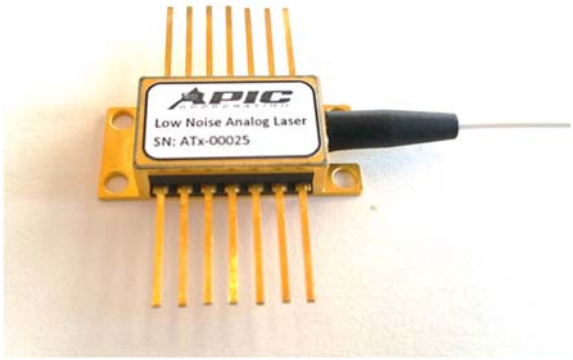
Low Relative Intensity Noise Analog DFB Laser Module

AL-*Pxx*-*WLxx*-165-1-*FC*

PRODUCT FEATURES

- High power, low noise laser source
- Capable of CW operation or direct modulation up to 1 GHz
- 14 pin, standard butterfly package
- Design optimized for low RIN
- Low threshold current
- Narrow linewidth
- High sidemode suppression ratio (SMSR)



APPLICATIONS

- Broadband RF over fiber links with external/remote modulator
- Wireless networking and network backbone using DWDM
- Sensing applications requiring high power, low noise laser sources
- OEM applications in optical communications, networking, and sensors
- Cable TV networks
- Other applications requiring high power and low RIN lasers

DESCRIPTION

This ultra-low noise, high power DFB laser uses a proprietary epitaxy design that has been optimized to eliminate relaxation oscillations and suppress noise. When biased at its nominal operating current, the laser exhibits no measurable relative intensity noise (RIN) and operates in the shot noise limit. In addition to CW operation, the laser can also be direct modulated with RF frequencies up to 1 GHz. It is hermetically sealed in a standard 14 pin butterfly package with an internal thermo-electric cooler (TEC) and photodiode for power monitoring. The laser is available at customer-selected DWDM C-Band ITU wavelengths.

ABSOLUTE MAXIMUM RATINGS

Parameter	Minimum	Maximum	Units	Condition/Comments
Operating Case Temperature	-20	75	°C	With TEC, at operating current
Storage Temperature	-40	85	°C	
Laser Forward Current		600	mA	
Laser Max Forward Voltage		2.5	V	
PD Reverse Voltage		10	V	
TEC Current	-1.9	+1.9	A	
ESD	-500	500	V	

OPTICAL AND ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition/Comments
Operational Wavelength	λ	1530		1565	nm	On standard 100 GHz ITU channel grid
Optical Output Power	P_O	40			mW	For AL-40
		60				For AL-60
		80				For AL-80
		100				For AL-100
		120				For AL-120
Laser Threshold Current	I_{th}		14	25	mA	
Maximum Operating Current	I_{op}			600	mA	For 120 mW laser only. Lower power lasers have lower max. current.
Forward voltage	V_f			2.5	V	At operating bias
Linewidth	Δλ		250	500	KHz	At operating drive current with clean input power
Optical Return Loss	ORL	30	45		dB	
Relative Intensity Noise	RIN		-165	-155	dB/Hz	At operating current For up to 10 GHz frequency
Sidemode Suppression Ratio	SMSR	35	45		dB	At operating current
Polarization Extinction Ratio	PER		19		dB	

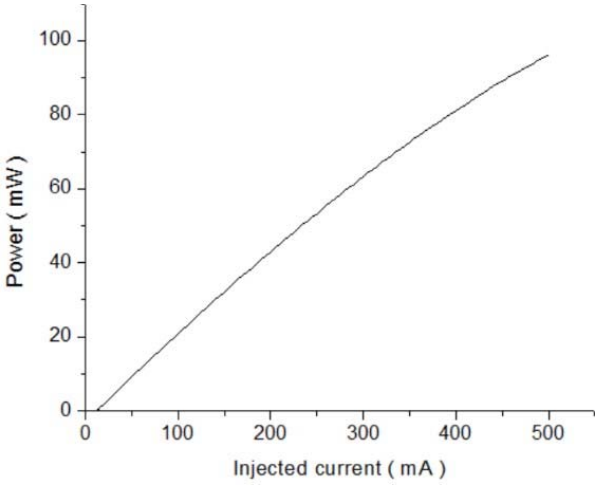
MECHANICAL SPECIFICATIONS

Parameter	Symbol	Minimum	Maximum	Units	Condition/Comments
Dimensions	L x W x H	20.83 x 12.7 x 7		mm	
Fiber Pigtail Length	FL	0.95	1.05	m	Standard is 1 m; other lengths available subject to lead time and order minimums

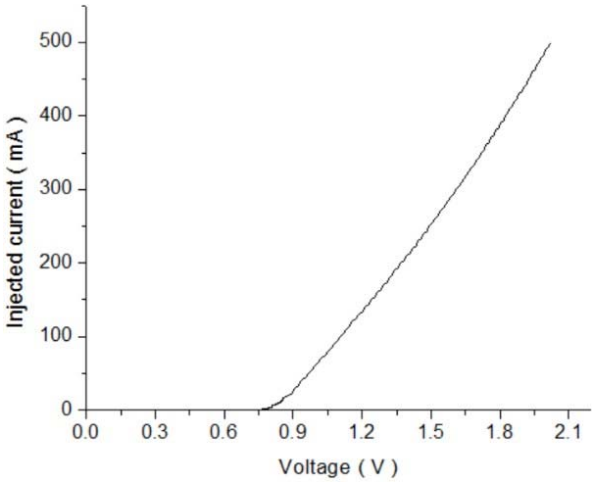
Pigtail Termination					FC/APC, with PM single mode fiber (FC/PC not recommended)

LASER CHARACTERISTICS

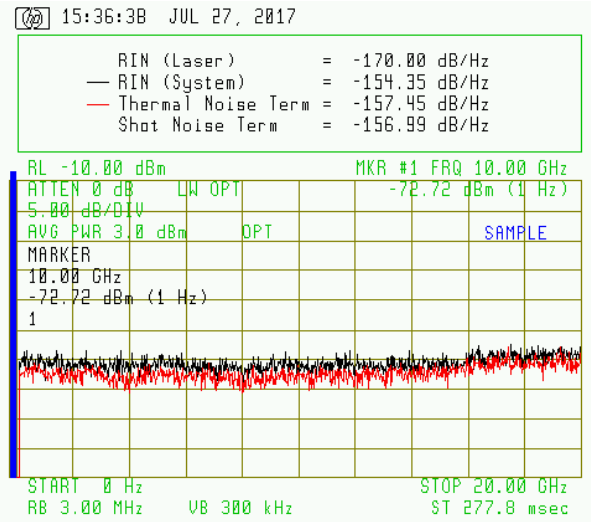
The typical test data for laser module output power as a function of injected current (P-I), injected current as a function of forward voltage (I-V), relative intensity noise (RIN), and laser optical spectrum are shown below.



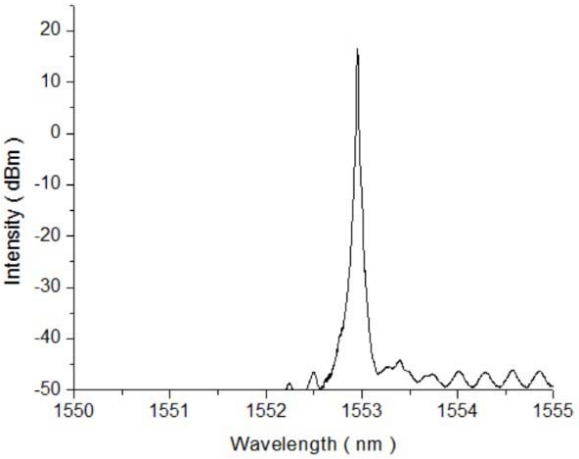
Laser P-I



Laser I-V

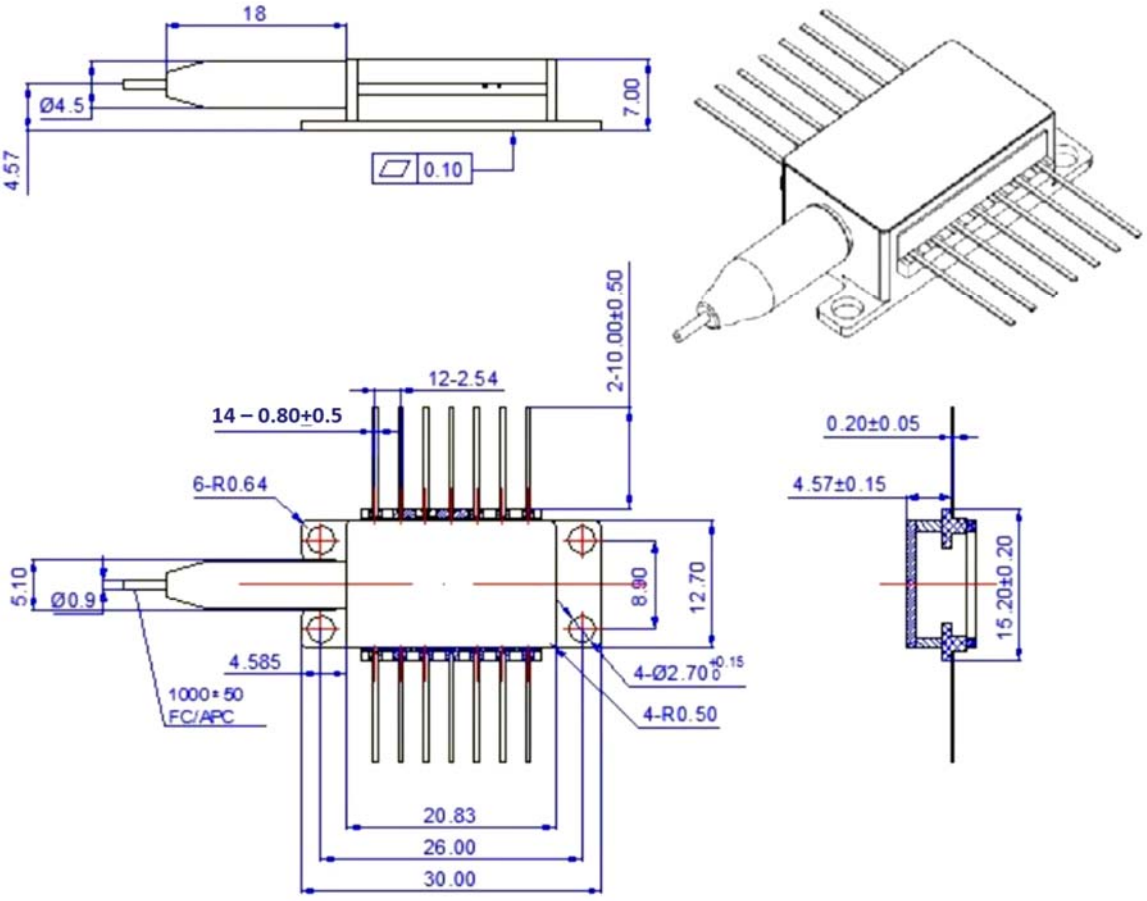


Laser RIN

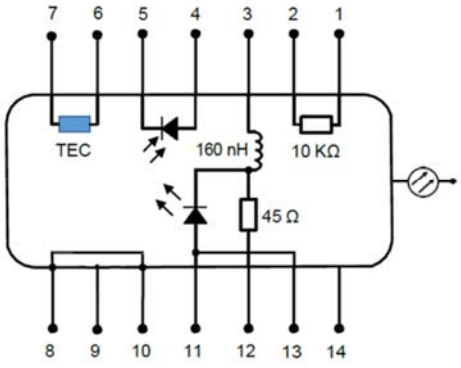


Laser Optical Spectrum

PACKAGE DRAWING



PIN ASSIGNMENTS



Pin Number	Pin function
1	Thermistor
2	Thermistor
3	Laser Cathode
4	PD Anode
5	PD Cathode
6	TEC (+)
7	TEC(-)
8	Case GND
9	NC
10	Case GND
11	Laser Anode (RF GND if used)
12	RF input (if used)
13	RF GND (if used)
14	NC

ORDERING INFORMATION