

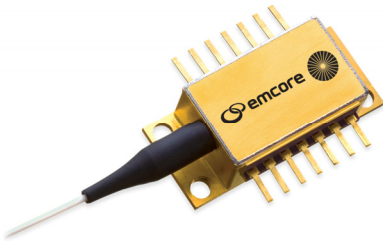
# 1618A 1310 nm DFB Laser Module

6.5 GHz Bandwidth

emcore®

DATASHEET | NOVEMBER 2017

WIRELESS



## Applications

- 1310 nm Transmission
- Next-Gen Wireless/DAS Applications
- Long Distances
- High Optical Output

## Features

- 6.5 GHz Bandwidth
- Ultra-Linear Operation
- Teledia Technologies™ 468 Compliant
- Industrial Temperature Range – Stable Even in Harsh Environments

The 1618A, 6.5GHz, 1310 nm DFB laser modules are specifically designed for both wireless and distributed antenna system applications. This highly-linear cooled butterfly laser delivers superior optical performance over enhanced operating temperature range of -40°C to +85°C.

## Performance Highlights

Parameter	Min	Typical	Max	Units
Wavelength	1300	-	1320	nm
Slope Efficiency	0.2	-	-	mW/mA
Temperature Range	-40	-	+85	°C
Frequency Range	5	-	6500	MHz
Second Order Intercept	35	-	-	dB
Third Order Intercept	34	-	-	dB

## Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symb	Condition	Min	Max	Unit
Operating Temperature Range	$T_c$	Continuous	-40	+85	°C
Storage Temperature Range	$T_{STG}$	-	-40	+85	°C
Laser Forward dc Current	-	-	-	150	mA
Photodiode Reverse Voltage	$V_{RPD}$	-	-	10	V
Laser Reverse Voltage, dc	-	-	-	2	V
ESD	-	HBM: R = 1500 Ohm, C = 100pF	-500	500	V
TEC Current	$I_{TEC}$	Continuous	-1.9	1.9	A
Input RF Power	$P_{in}$	Continuous	-	20	dBm



## Electrical/Optical Characteristics

Laser Temperature (TL) = 25°C, I = I<sub>bb</sub>, Beginning of Life (BOL)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Wavelength	-	-	1300	-	1320	nm
Slope Efficiency	n	I <sub>bb</sub>	0.2	-	-	mW/mA
Output Power	P	I <sub>bb</sub>	6	-	25	mW
Optical Isolation	ISO	-	30	-	-	dB
Optical Return Loss	ORL	T <sub>c</sub>	40	-	-	dB
Side Mode Suppression Ratio	SMSR	-	35	-	-	dB
Threshold Current	I <sub>TH</sub>	-	-	-	20	mA
Operating Current	I <sub>OP</sub>	-	-	-	120	mA
Monitor PD Responsivity	r <sub>PD</sub>	V <sub>RM</sub> =5V	10	-	200	μA/mW
Thermistor Resistance	R <sub>TH</sub>	T <sub>OP</sub> = 25 °C	9.5	10	10.5	KOhm
Thermistor Temp. Coefficient	TC <sub>TH</sub>	T <sub>OP</sub> = 25 °C	-	-4.4	-	%/°C
TEC Current	I <sub>TEC</sub>	-40<T <sub>C</sub> <+85°C, I = 100 mA	-1.5	-	1.6	A
Fiber Length	-	-	1.0	1.5	-	m
Fiber Buffer	-	-	-	900	-	μm
Fiber Core / Cladding	-	-	-	9/125	-	μm

## RF Characteristic

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Frequency Range	F	-	5	-	6500	MHz
Response Flatness	S21	5 MHz to 6500 MHz I <sub>bb</sub> , T <sub>OP</sub> = 25°C	-	-	±2	dB
Relative Intensity Noise	RIN	See Note 1	-	<-155	-140	dB/Hz
Second Order Intercept	IIP2	See Note 2	35	-	-	dBm
Third Order Intercept	IIP3	See Note 2	34	-	-	dBm
Noise Figure	NF	See Note 2	-	-	48	dB
RF Return Loss	S11	I = I <sub>bb</sub> , 50MHz - 3GHz, See Note 1	14	-	-	dB
		I = I <sub>bb</sub> , 3GHz - 6.5GHz, See Note 1	10	-	-	dB

## Notes:

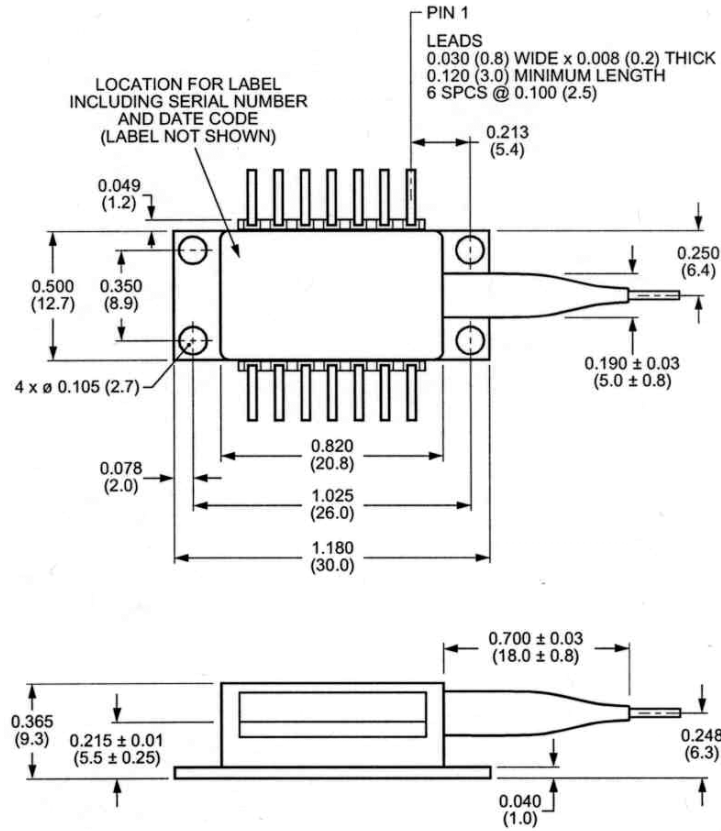
- I = I<sub>th</sub> + 45 mA
- I<sub>bb</sub> is the bias point at which simultaneously the laser at its best linearity and the optical power is within specification. Typically at 90mA with RF input 0dBm/tone for measurement.

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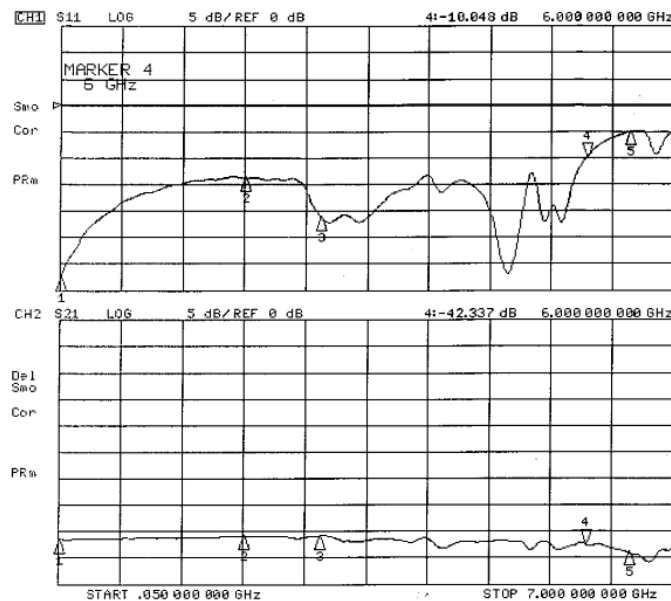
6.5 GHz Bandwidth



## Outline Drawing (dimensions are in inches & mm)



## Frequency Plot



Information contained herein is deemed reliable and accurate as of the issue date. EMCORE reserves the right to change the design or specification at any time without notice. EMCORE is a registered trademark of EMCORE Corporation in the U.S. and other countries.

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## Pin Definitions

Pin	Description
1	THERMISTOR
2	THERMISTOR
3	LASER DC BIAS (-)
4	MONITOR PHOTO DIODE ANODE
5	MONITOR PHOTO DIODE CATHODE
6	THERMOELECTRIC COOLER (+)*
7	THERMOELECTRIC COOLER (-)
8	NO CONNECT
9	NO CONNECT
10	NO CONNECT
11	RF GROUND
12	RF INPUT, LASER MODULATION
13	RF GROUND
14	CASE GROUND

\*A positive current into this pin cools the laser.

## Ordering Information

Part Number	Descriptions
1618A-SC-10	DFB 1310 nm, SC/APC Connector

## Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1 laser product. This device has been classified with the FDA/CDRH under accession number 0220191.

All Versions of this laser are Class 1 laser product, tested according to IEC 60825-1:2007/EN 60825-1:2007

Single-mode fiber pigtail with SC/APC connectors (standard).

Wavelength = 1.3  $\mu\text{m}$ .

Maximum power = 50 mW.

Because of size constraints, laser safety labeling (including an FDA class 1 label) is not affixed to the module, but attached to the outside of the shipping carton.

Product is not shipped with power supply.

**Caution: Use of controls, adjustments and procedures other than those specified herein may result in hazardous laser radiation exposure.**

