

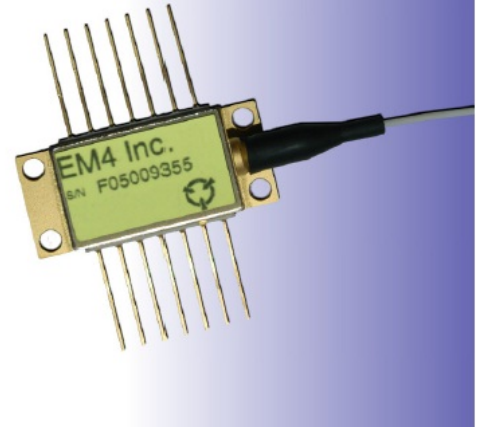
## High-Power 14-Pin 1064 nm DFB Laser

### Features

- Up to 50mW output power
- Polarization-maintaining fiber, with or without furcation tubing
- Hermetically sealed
- Built in optical isolator, TEC, thermistor, and monitor detector
- Optional Bias Tee

### Applications

- Master Oscillator
- Pulsing
- Sensing
- Defense
- Mode-hop free tuning



### General Description

The EM4 high-power 1064 nm 14-pin distributed feedback laser (DFB) is ideal for applications requiring a single-mode fiber-coupled 1064 nm device. These packaged laser diodes can be pulsed electrically and incorporate a built-in thermoelectric cooler with thermistor, back facet monitor detector, and an optional bias tee with a choice of matching impedances. Standard fibers can be supplied with optional protective furcation tubing and terminated with a variety of connectors.

### Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and operation of the device at these or conditions beyond these is not implied. Exposure to absolute maximum ratings for extended periods of time may affect device reliability.

Parameter	Sym.	Condition	Min	Max	Unit
Storage Temperature	$T_{STG}$		-40	+85	°C
Operating Case Temperature	$T_{OP}$		-20	+70	°C
Laser Forward Current	$I_F$			500	mA
Laser Reverse Voltage	$V_R$			2	V
Photo Diode Photo Current	$I_{PD}$			10	mA
Photo Diode Reverse Voltage	$V_{PD}$			20	V
TEC Current	$I_{TEC}$			4	A
TEC Voltage	$V_{TEC}$			4	V
Thermistor Current				2	mA
Thermistor Voltage				5	V
Lead Soldering Time				10	s
Lead Soldering Temperature				250	°C
Fiber Pull Force				5	N
Fiber Bend Radius			25		mm

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### Optical Characteristics

$T_{OP}=25^{\circ}\text{C}$ , continuous wave and beginning of life unless otherwise specified.

Parameter	Sym.	Condition	Min	Typ	Max	Unit
Operating Chip Temperature	$T_{CHIP}$		20		40	$^{\circ}\text{C}$
Output Power	$P_{OP}$	$I=I_{OP}$	50			mW
Center Wavelength	$\lambda_c$	$I=I_{OP}$	1062	1064	1066	nm
Spectral Shift w/ Die Temperature	$\Delta\lambda/\Delta T$			0.08		nm/ $^{\circ}\text{C}$
Spectral Width					0.1	nm
Side Mode Suppression Ratio			40			
Optical Isolation	ISO		30	35		dB
Polarization Extinction Ratio	PER		17	21		dB

### Optical Fiber Specification

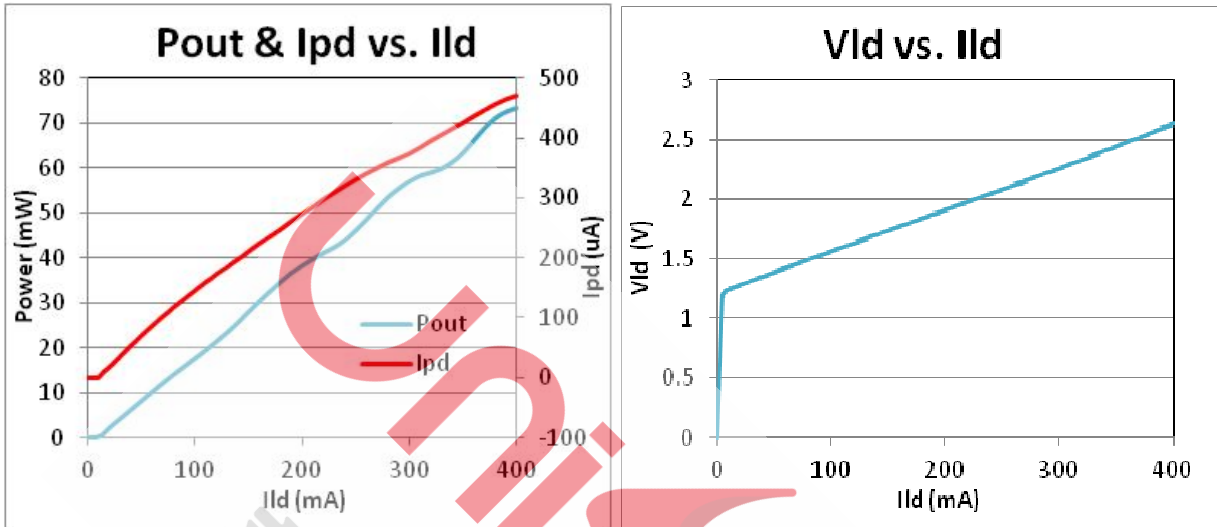
Parameter	Type	Unit
Fiber Type	panda-type Polarization Maintaining	-
Core Diameter	6.6( typ.)	$\mu\text{m}$
Cladding Diameter	125( typ.)	$\mu\text{m}$
Buffer Diameter	245( typ.)	$\mu\text{m}$
Buffer Material	Acrylate	-
Optional 900 $\mu\text{m}$ Loose Buffer Material	PVDF	-
Minimum Pigtail Length	1	m
Proof Strength	100	kpsi

### Electrical Characteristics

Parameter	Sym.	Condition	Min	Typ	Max	Unit
Threshold Current	$I_{TH}$			17		mA
Slope Efficiency	$\eta_{slope}$			0.2		W/A
Laser Drive Current	$I_{OP}$				400	mA
Laser Forward Voltage	$V_F$	$I=I_{F, MAX}$			3	V
Monitor Photo Diode Current	$I_{PD}$	$P=P_{OP}$	0.1			mA
Monitor Photo Diode Dark Current	$I_D$				100	nA
TEC Current		$T_{OP}=70^{\circ}\text{C}$ , $P=P_{OP}$ , $T_{CHIP}=25^{\circ}\text{C}$			3	A
TEC Voltage		$T_{OP}=70^{\circ}\text{C}$ , $P=P_{OP}$ , $T_{CHIP}=25^{\circ}\text{C}$			3	V
Thermistor Resistance	$R_{TH}$	$T=25^{\circ}\text{C}$	9500	10000	10500	$\Omega$
Thermistor $\beta$ Coefficient	$\beta$	0 / $50^{\circ}\text{C}$		3892		
Thermistor Steinhart-Hart Coeff.	A			1.1291e-3		
	B			2.3413e-4		
	C			8.7674e-8		

## High-Power 14-Pin 1064 nm DFB Laser

### Typical Operating Characteristics



### Ordering Information

AA1411-	FREQUE-	POW-	FIBuM-	CON-	BT	Parameter	Option	Description
↑	↑	↑	↑	↑	↑	Matching Impedance	NA	No Bias Tee
							00	Low Z (pulsed applications)
							25	25 Ohm
							50	50 Ohm
						Connector	FCA	FC/APC
							NOC	No Connector
						Fiber	PM250	PM Fiber, 250um Buffer
							PM900	PM Fiber, 900um Loose Buffer
						Power	50	50mW Output
						Frequency	281760	Frequency in GHz
						Product Family	AA1411	High-Power 14-pin 1064nm Laser

The component complies with all applicable portions of 21 CFR 1040.10, 21 CFR 1010.2 and 21 CFR 1010.3. Since this is a component, it does not comply with all of the requirements contained in 21 CFR 1040.10 and 21 CFR 1040.11 for complete laser products.

For pricing and delivery information, please contact EM4 inc. direct at +1 781 275 75 01, sales@em4inc.com or any of the representatives listed at www.em4inc.com. The information published in this datasheet is believed to be accurate and reliable. EM4, Inc. reserves the right to change without notice including but not limited to the design, specification, form, fit or function relating to the product herein. ©2012 EM4, Inc. All rights reserved.

## High-Power 14-Pin 1064 nm DFB Laser

### Pinout and Mechanical Drawing

Pin	Description	Pin	Description
1	Thermistor	14	Case
2	Thermistor	13	Laser Anode
3	Laser Cathode (Bias)	12	Laser Cathode (optional bias t)
4	Monitor PD Anode	11	Laser Anode
5	Monitor PD Cathode	10	Case
6	TEC+	9	Case
7	TEC-	8	Case

