

## Features

- 915, 940, 960 or 975nm center wavelength
- 0.15 or 0.22NA 105µm core multimode fiber pigtail
- Laser welded and epoxy free
- Hermetically sealed
- Built in thermistor
- Telcordia GR-468 Core / MIL-Std 883 compliant

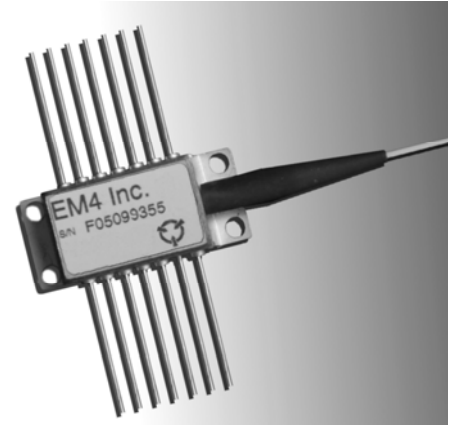
## Applications

- Fiber lasers
- Yb laser pumping
- Marking
- Material processing
- Defense

## General Description

The EM4 high power laser (HPL) has high brightness with a fiber-coupled output power typical 5W. The HPL is ideal for use in a variety of applications where brightness is essential with a reliable and robust packaging.

The high power laser device is hermetically sealed into an industry standard 14 pin butterfly metal ceramic package. The butterfly package has a Peltier cooler for chip temperature control and thermistor for temperature monitoring. The high power laser is pigtailed using a step index fiber with a 0.15 or 0.22 numerical aperture, 105 micron core diameter and sheathed with a 900 micron loose tube jacket.



## Ordering Information

Part	$\lambda_c$ [nm]	Fiber NA
EM330	915	0.15
EM331	915	0.22
EM332	940	0.15
EM333	940	0.22
EM334	960	0.15
EM335	960	0.22
EM336	975	0.15
EM337	975	0.22

## 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 are 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	$I_F$			11	A
Laser Reverse Voltage	$V_R$			2	V
PD Forward Current	$I_{PD}$			20	mA
PD Reverse Voltage	$V_{PD}$			20	V
TEC Current	$I_{TEC}$			5	A
TEC Voltage	$V_{TEC}$			6	V
Thermistor Current				2	mA
Thermistor Voltage				5	V
Fiber Pull Force				5	N
Fiber Bend Radius			35		mm
ESD		HBM		500	V

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# 5W 14 Pin Cooled Multimode Pump Laser

## Absolute Maximum (continued)

Parameter	Sym	Condition	Min	Max	Unit
Lead Soldering Time				10	s
Lead Soldering temperature				250	°C

## Optical And Electrical Characteristics

T<sub>C</sub>=25°C unless otherwise specified.

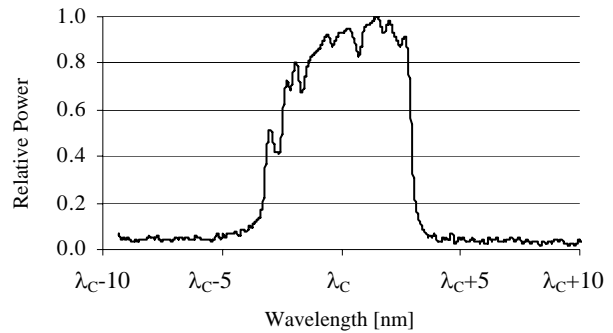
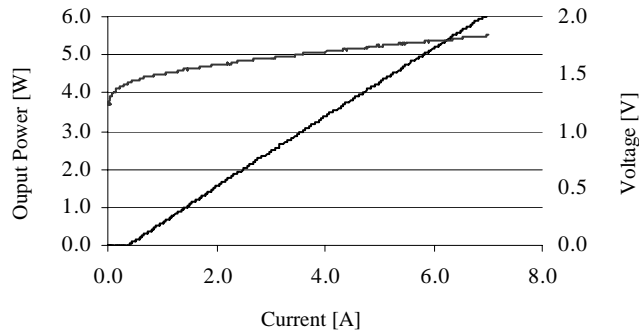
Parameter	Sym	Condition	Min	Typ.	Max	Unit
Center Wavelength	$\lambda_C$	EM330, EM331, I=I <sub>OP</sub>	905	915	925	nm
		EM332, EM333, I=I <sub>OP</sub>	930	940	950	
		EM334, EM335, I=I <sub>OP</sub>	950	960	970	
		EM336, EM337, I=I <sub>OP</sub>	965	975	985	
Operating Current	I <sub>OP</sub>	P=P <sub>OP</sub>			6.5	A
Operating Voltage	V <sub>OP</sub>	I=I <sub>OP</sub>			2.2	V
Output Power	P <sub>OP</sub>		5			W
Threshold Current	I <sub>TH</sub>			0.4	0.6	A
Wavelength Drift vs. T <sub>C</sub>	$\delta\lambda/\delta T_C$			0.3		nm/°C
Spectral Width	$\Delta\lambda$	17dB down from peak		6		nm
PD Reverse Voltage	V <sub>PD</sub>				20	V
PD Current	I <sub>PD</sub>		0.1			mA
TEC Current	I <sub>TEC</sub>	$\Delta T=45^\circ\text{C}$ , P=P <sub>OP</sub>			4	A
TEC Voltage	V <sub>TEC</sub>	$\Delta T=45^\circ\text{C}$ , P=P <sub>OP</sub>			5	V
Operating Case Temperature	T <sub>C</sub>		0		70	°C
Thermistor Resistance	R <sub>TH</sub>	T=25°C	9500	10000	10500	Ω
Thermistor β coefficient	β	0 / 50°C		3892		

## Fiber Specification

Parameter	Sym	Condition	Min	Typ.	Max	Unit
Fiber Type			Step Index			
Jacket Material			PVDF			
Numerical Aperture		EM330, EM332, EM334, EM336		0.15	0.17	
		EM331, EM333, EM335, EM337		0.22	0.24	
Core Diameter			102	105	108	μm
Cladding Diameter			123	125	128	μm
Buffer Diameter			235	250	265	μm
Jacket Diameter				900		μm
Jacket Length From End Of Boot			75		95	mm
Pigtail Length			1			m

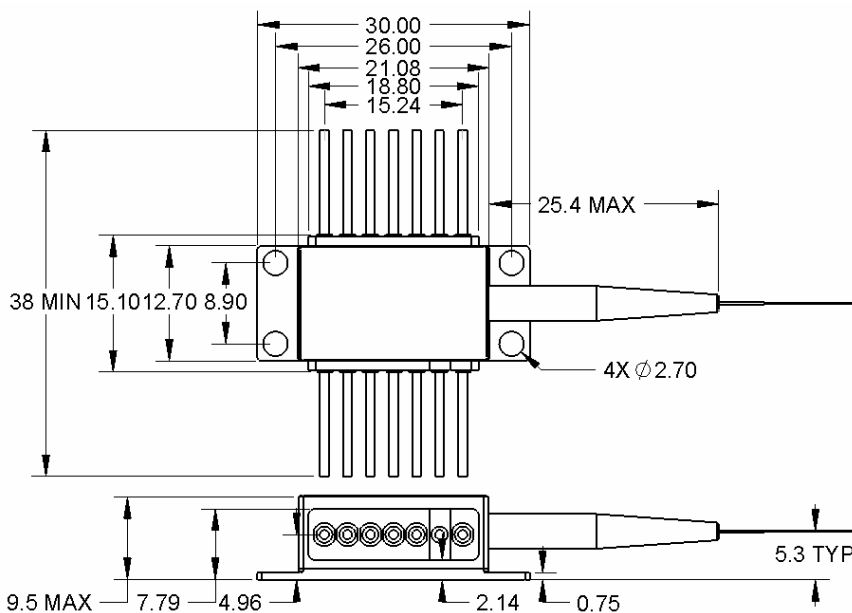
## Typical Operating Characteristics

$T_c=25^\circ\text{C}$



## Mechanical Drawing

All units in mm



## Pinning

Pin	Description
1	TEC+
2	Thermistor
3	Monitor Anode
4	Monitor Cathode
5	Thermistor
6	Monitor Cathode
7	Monitor Anode
8	NC
9	Laser Cathode
10	Laser Anode
11	Laser Cathode
12	NC
13	Case GND
14	TEC-



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.

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