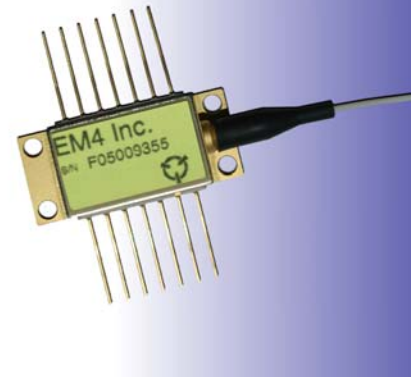


## Features

- Qualified according to Telcordia GR-468-CORE
- Optional Bragg grating
- Internal cooler and thermistor

## Applications

- Telecom
- CATV
- Defense
- Life Science



## General Description

The EM4 P161 line of single mode, cooled 980 nm pump lasers deliver up to 600mW of fiber-coupled power. The modules are packaged using the unique, patent pending technology Uniline™ for permanent fiber alignment. Uniline™ provides superior end-of-life optical and electrical performance, achieved by maintaining a highly stable, all-axis alignment lock between the laser chip and the tip of the single-mode fiber.

The hermetically sealed 14 pin butterfly package is available with a fiber Bragg grating and includes thermoelectric cooler, thermistor, monitor photodiode and UniDry™ getter. The fiber Bragg grating precisely locks the center wavelength over extended power and temperature range. Center wavelengths in the range of 976 nm to 980 nm are available with tight wavelength control. EM4's Uniline™ family of pump lasers are qualified to meet the requirements outlined in Telcordia GR-468-CORE.

## 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 <sub>STG</sub>		-40	85	°C
Operating Case Temperature	T <sub>OP</sub>		-20	75	°C
Laser Forward Current	I <sub>F</sub>			1.2	A
Laser Reverse Voltage	V <sub>R</sub>			2.5	V
Photo Diode Forward Current	I <sub>PD</sub>			10	mA
Photo diode Reverse Voltage	V <sub>PD</sub>			20	V
TEC Current	I <sub>TEC</sub>			6.0	A
TEC Voltage	V <sub>TEC</sub>			4.0	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
ESD		HBM		500	V

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# 600mW Single Mode Pump Laser

## Optical And Electrical Characteristics

T<sub>OP</sub>=25°C, continuous wave and beginning of life unless otherwise specified.

Parameter	Sym.	Condition	Min	Typ.	Max	Unit
Operating Chip Temperature	T <sub>CHIP</sub>		20		35	°C
Threshold Current	I <sub>TH</sub>				55	mA
Laser Drive Current	I <sub>OP</sub>		See ordering information			mA
Laser Forward Voltage	V <sub>F</sub>	I=I <sub>MAX</sub>			2.7	V
KINK Power	P <sub>OP</sub>	P161-600-YYYYZ, I=I <sub>KINK</sub>	600			mW
		P161-550-YYYYZ, I=I <sub>KINK</sub>	550			
		P161-500-YYYYZ, I=I <sub>KINK</sub>	500			
		P161-450-YYYYZ, I=I <sub>KINK</sub>	450			
Center Wavelength	λ <sub>C</sub>	P=P <sub>OP</sub>	See ordering information			nm
Wavelength Tolerance	Δλ	With Fiber Bragg Grating	1		1	nm
		Without Fiber Bragg Grating	-5		5	
Spectral Shift With Temperature	Δλ/ΔT	With Fiber Bragg Grating			0.02	nm/°C
		Without Fiber Bragg Grating		0.35		
Power In Band		@λ <sub>C</sub> ±1nm, P>50mW	90			%
Monitor Photo Diode Current	I <sub>PD</sub>	P=P <sub>OP</sub>	0.1		6.0	mA
Monitor Photo Diode Dark Current	I <sub>D</sub>				100	nA
TEC Current		ΔT=25°C, P=P <sub>OP</sub>			3.5	A
TEC Voltage		ΔT=25°C, P=P <sub>OP</sub>			3.5	V
Thermistor Resistance	R <sub>TH</sub>	T=25°C	9500	10000	10500	Ω
Thermistor β coefficient	β	0 / 50°C		3892		

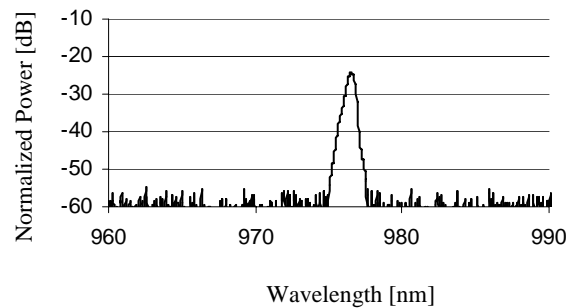
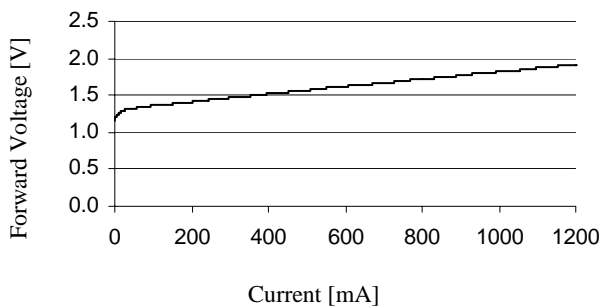
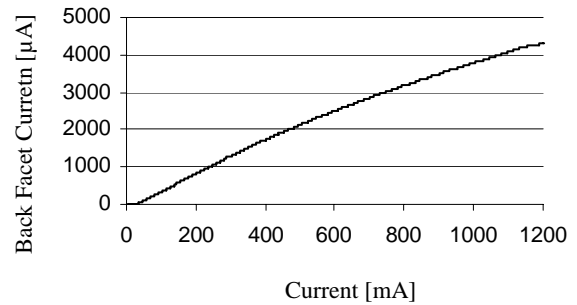
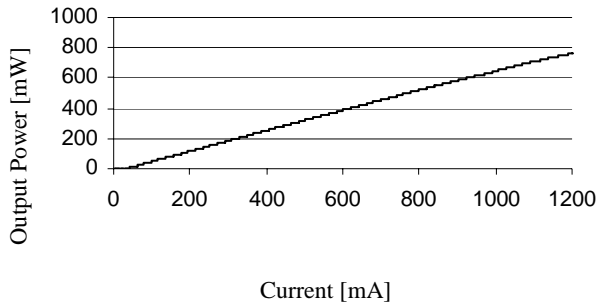
## Fiber Specification

Parameter	Sym	Condition	Min	Typ.	Max	Unit
Fiber Type			PM			
Jacket Material			Hytrel Acrylate			
Core Diameter			5.6	6.6	7.6	μm
Cladding Diameter			123	125	127	μm
Buffer Diameter			230	245	260	μm
Pigtail Length With Grating			1.5	3		m
Pigtail Length Without Grating			1.0	1.3	m	
Proof Strength			120			kpsi

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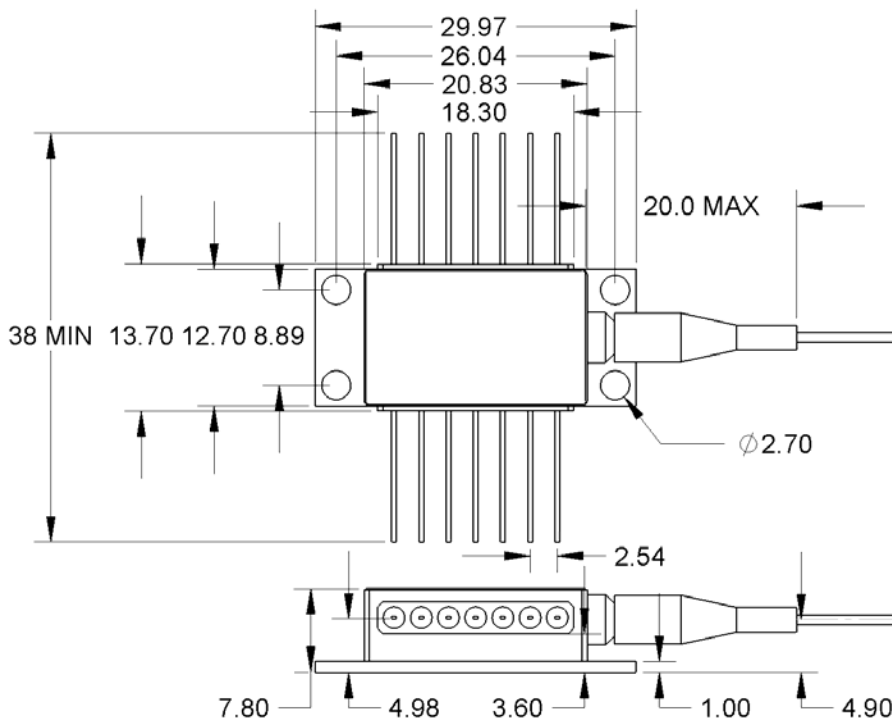
## Typical Operating Characteristics

T<sub>C</sub>=25°C



## Mechanical Drawing

All units in mm

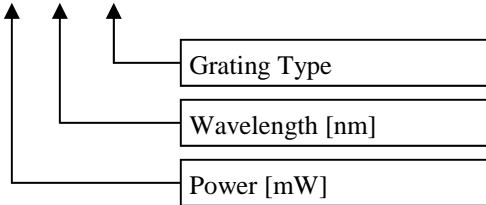


## Pinning

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

## Ordering Information

P161-XXX-YYYYZ



## Available Wavelengths

Ordering Code	Wavelength [nm]
976	976
978	978
980	980

## Available Gratings

Grating	Description
A	SM Grating
M	PM Grating
B	No Grating (Free running)

## Available Output Powers

Part	Max Kink Free Power [mW]	Typical Kink Current [mA]	Typical Operating Power [mW]	Typical Operating Current [mA]
P161-600-YYYYZ	600	1000	540	900
P161-550-YYYYZ	550	900	500	810
P161-500-YYYYZ	500	800	450	720
P161-450-YYYYZ	450	730	410	650



OBSERVE PRECAUTIONS  
FOR HANDLING  
ELECTROSTATIC  
DEVICES

**DANGER**



INVISIBLE LASER RADIATION  
AVOID DIRECT EXPOSURE TO BEAM

MAXIMUM POWER: 0.5 WATT  
WAVELENGTH: 950-1000 nm

CLASS 3B LASER PRODUCT  
COMPLIES WITH 21 CFR 1040

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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