



UNCOOLED MINI-DIL PUMP LASER

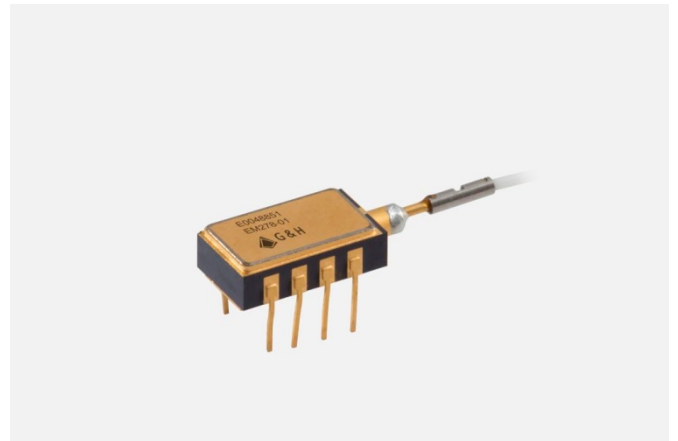
976 nm, 200 mW Rated Kink-Free Output Power, FBG Stabilized

EM278 SERIES

The Gooch & Housego 278 single-mode, uncooled 976 nm pump laser simplifies next generation erbium-doped fiber amplifier (EDFA) designs by eliminating the need for large, less efficient, and costlier electric supplies.

It is wavelength stabilized by a fiber Bragg grating (FBG) which maintains stable performance over temperature ranges of 10 to 75°C and power ranges of 50 to 200 mW. The hermetically sealed 8-pin mini-DIL package includes thermistor, monitor photodiode and UniDry™ getter.

The fiber Bragg grating precisely locks the center wavelength over extended power and temperature range. By eliminating the thermoelectric cooler, next generation erbium-doped fiber amplifier (EDFA) designs, particularly the thermal and control circuitry, benefit from the pump modules smaller size.



Features

- High power: up to 200 mW
- Low power dissipation
- mini-DIL form factor
- PM fiber
- Ruggedized for harsh conditions

Applications

- FOGs
- SDH/single channel EDFAs
- Small form factor amplifiers
- Gain blocks

Data tables

$T_{OP}=25^{\circ}\text{C}$, $T_{grating}=23\pm 3^{\circ}\text{C}$, and beginning of life unless otherwise specified.

Optical Characteristics	Sym	Condition	Min	Typ	Max	Unit
Operating chip temperature	T_{CHIP}		10		75	$^{\circ}\text{C}$
Operating power	P_{OP}		50		200	mW
KINK Power	P_{KINK}	$I=I_{KINK}$	200			mW
Center wavelength	λ_c	$P=P_{OP}$	975	976	977	nm
Spectral shift with temperature	$\Delta\lambda/\Delta T$	with FBG		0.02		nm/ $^{\circ}\text{C}$
Side mode suppression	SMSR	$P=P_{OP}$	30			dB
External return reflection					-50	dB
Power in band		@ $\lambda_c\pm 1\text{nm}$, $P>50\text{ mW}$	90			%

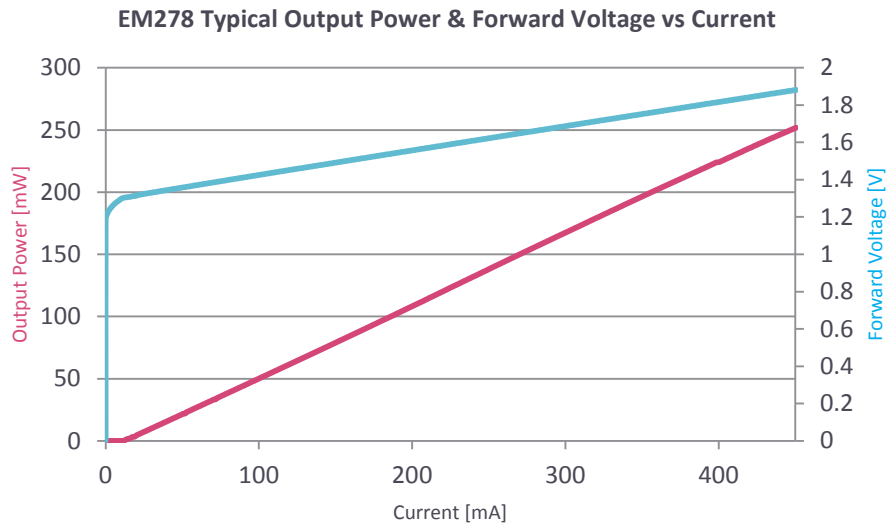
Electrical Characteristics	Sym	Condition	Min	Typ	Max	Unit
Threshold current	I_{TH}				55	mA
Laser drive current	I_{OP}	$P=P_{OP}=200\text{ mW}$		500	600	mA
KINK Current	I_{KINK}	$P=P_{KINK}$	600			mA
Laser forward voltage	V_F	$I=I_{max}$			2.1	V
Monitor photo diode current	I_{PD}		0.1		6.0	mA
Monitor photo diode dark current	I_D				100	nA
Thermistor resistance	R_{TH}	$T=25^{\circ}\text{C}$	9500	10000	10500	Ω
Thermistor β coefficient	β	0 / 50°C		3892		

Fiber Characteristics	Min	Typ	Max	Unit
Fiber type, jacket material	PM, 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
Proof strength	100			kpsi

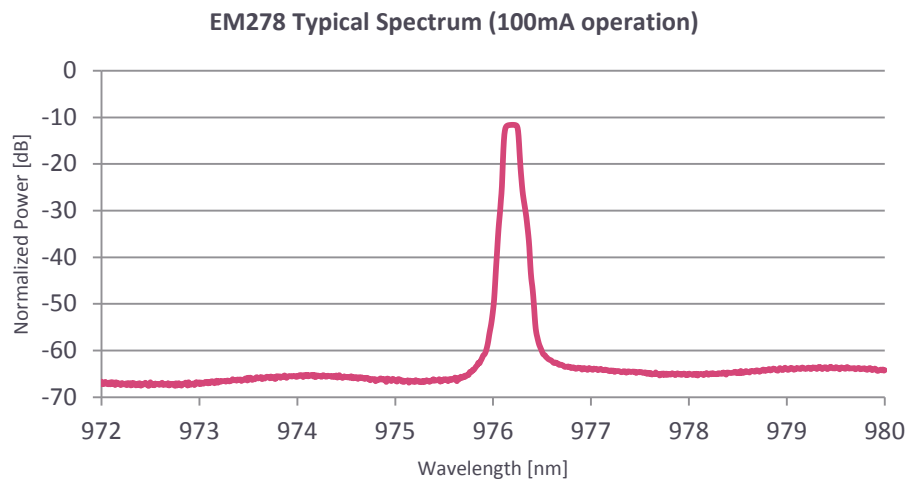
Typical Operating Characteristics

$T_{OP} = 25^{\circ}\text{C}$

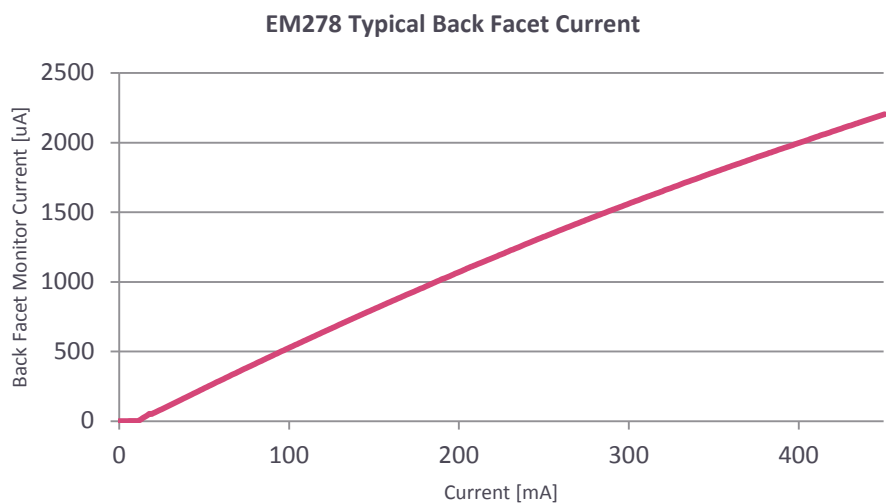
Output power and voltage vs laser diode input current.



Typical spectrum

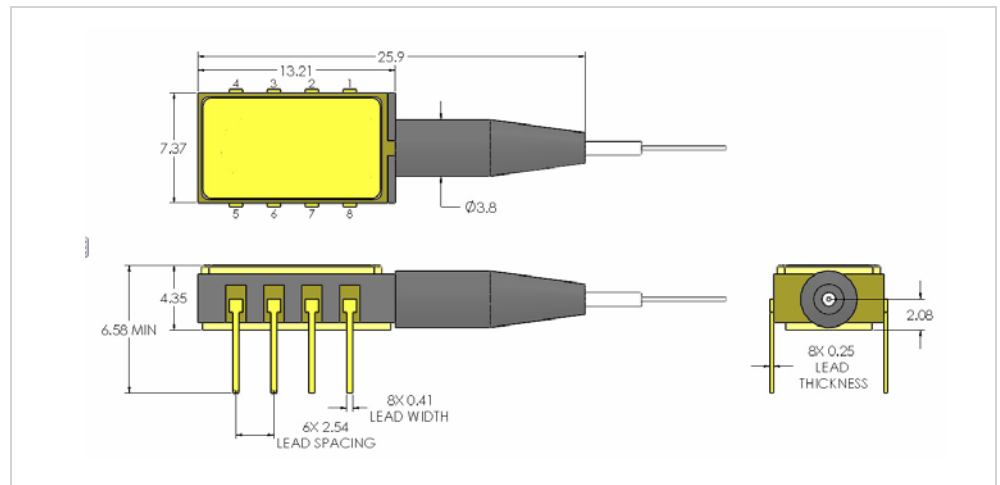


Typical back facet photodiode monitor current vs input current



Pinout and Mechanical Drawing

Pin	Description
1	Thermistor
2	Thermistor
3	Case GND
4	Monitor PD cathode
5	Monitor PD anode
6	Laser cathode
7	Laser anode
8	NC



Absolute Maximum Ratings*

	Sym	Min	Max	Unit
Storage temperature	T_{STG}	-40	+85	°C
Operating case temperature	T_{OP}	-5	+75	°C
Laser forward current	I_F		780	mA
Laser reverse voltage	V_R		2.0	V
Photo diode photo current	I_{PD}		10	mA
Photo diode reverse voltage	V_{PD}		20	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 (human body model)			500	V

* 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 or beyond these conditions is not implied. Exposure to absolute maximum ratings for extended periods of time may affect device reliability.

Order code

E	M	2	7	8	-	
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①	Model	Standard (no boot)	Standard (with boot)	Wide temp (no boot)
	Code	01	02	03

For further information

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EM278 SERIES SINGLE-MODE PUMP LASER