

### Mid-IR Interband Cascade Laser

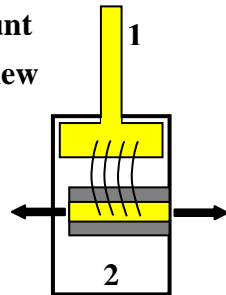
The FI3 model devices are Fabry-Perot multi-mode interband cascade (IC) lasers designed for operation between 3.0 and 4.0  $\mu\text{m}$ .

#### Device: FI3-M412F

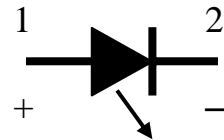
The 15.5- $\mu\text{m}$ -wide by 2.00-mm long cavity-length device is a Fabry-Perot multimode IC laser with uncoated facets. The laser is indium-soldered onto a standard C-mount for convenient mounting onto a customer-supplied heat sink. The device emits radiation at wavelengths between 3.63 and 3.68  $\mu\text{m}$  when operated under cw conditions at a nominal heat sink temperature of 80 K.



**C-Mount  
Top View**



Invisible laser  
radiation is emitted  
from both facets  
**AVOID EXPOSURE**



#### FI3-M412F CW Operating Characteristics at 80 K (nominal):

Operating Characteristic	Symbol	Value	Unit	Comments
Threshold Temperature	$T(I_{th})$	81.5	K	see note
Threshold Current	$I_{th}$	$2.2 \pm 0.1$	mA	LN2 cooling, see note
Operating Current	$I_{op}$	100	mA	
Operating Voltage	$V_{op}$	6.52	Volts	at $I_{op} = 100$ mA
Differential Resistance	$R_d$	$2.0 \pm 0.5$	$\Omega$	$I > I_{th}$
Output Power	P	$37 \pm 2$	mW	single facet power $I_{op} = 100$ mA, $T_{op} = 82$ K
Wavelength	$\lambda_{peak}$	$3.66 \pm 0.05$	$\mu\text{m}$	peak emission $I_{op} = 100$ mA, $T_{op} = 82$ K

**FI3-M412F CW Operating Characteristics at 80 K (nominal):**

Operating Characteristic	Symbol	Value	Unit	Comments
Output Power Slope	$dP/dI$	0.443	W / Amp	between $I_{th}$ and 15 mA at $T_{op} = 81.5$ K
Typical Temperature Tuning Rate	$d\lambda/dT$	$9.6 \pm 0.1$	$\text{\AA} / K$	estimated

**Note:** The device can be operated over a wide temperature range and under a variety of operating conditions. However, the user is advised to contact Maxion for advice prior to using this device under conditions other than those described on this data sheet. Operating characteristics provided above were obtained under the following conditions:

The device was operated in a vacuum cryostat due to the low temperatures involved.

In cw mode, liquid nitrogen (LN2) was used for cooling. A resistive heater and temperature sensor were used in a feedback configuration to control the temperature at the bottom of the cryostat's cold-finger near the thermally bonded heat sink. A second temperature sensor, mounted on the heat sink and very close to the C-mount, was used to measure the device temperature at threshold  $T(I_{th})$ .

**Safety Information**

Wavelength = 3.6 – 3.7  $\mu\text{m}$

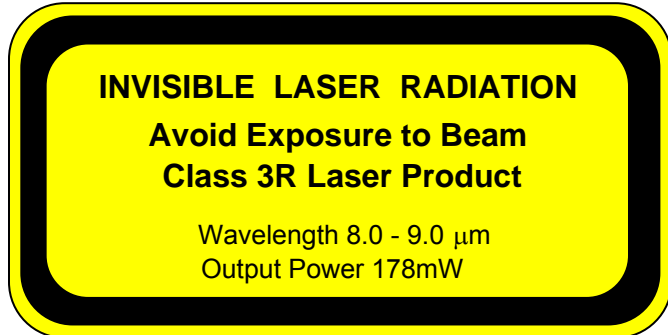
Maximum Power = 37 mW (In CW mode at about 80 K)

The FI3 series lasers are Class 3R laser products per IEC\* 60825-1:2000, and should be treated as a potential eye hazard. Users of these lasers should observe standard good practice safety precautions such as those recommended by ANSI\*\* Z136.1-2000, ANSIZ36.2-1997 and IEC 60825-1:2001.

The FI3 series lasers do not conform to 21CFR1040.10 and 1040.11. Therefore, this laser module is intended only for use as a component by manufacturers of electronic products and equipment.

Laser safety warning labels are not affixed to the laser module due to size constraints. Laser safety warnings are placed on the outside of the shipping container.

This laser product is shipped without a power supply.



classified in accordance with IEC 60825-1:2001-08

\*IEC is a registered trademark of the International Electrotechnical Commission

\*\*ANSI is a registered trademark of the American National Standards Institute

