

## Features

- Hermetic to MIL-Std 883
- Rugged laser welded construction
- Fast rise / fall time
- High throughput
- High contrast ratio
- High PER
- Wide operating temperature range

## Applications

- Fast optical shutter
- Optical switch
- Pulse picker
- Frequency shifter

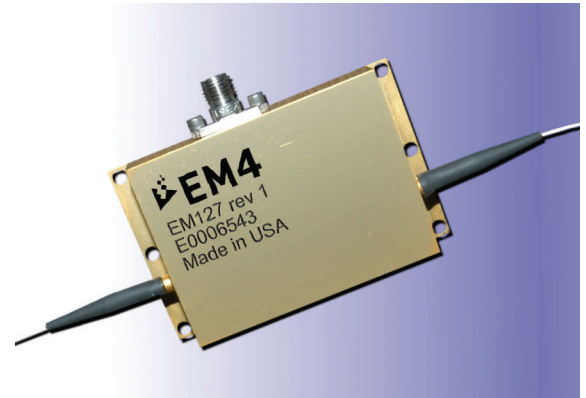
## General Description

The EM4 Fiber Coupled Acousto-Optic Modulator is a rugged, hermetic module that has been designed and built using technologies and processes developed for high reliability defense and telecommunications applications. It is pigtailed with polarization maintaining fiber on the input and output as required and contains internal circuitry for 50Ω RF matching. With rise/fall times of 15ns it can be used in fast pulse picking and switching applications.

## 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>		-40	85	°C
Humidity	I <sub>F</sub>	Non Condensing		90	%
Optical Input Power (Peak)	P <sub>PEAK</sub>	Less than 10ns		1000	W
Optical Input Power (Average)	P <sub>IN</sub>			5	W
RF Input Power	P <sub>RF</sub>	Less than 500ms		6	W
RF Input Power	P <sub>RF</sub>	Continuous		1.8	W
Fiber Bend Radius			30		mm
Fiber Pull Force				5	N
ESD		HBM		500	V



## Ordering Information

Part	$\lambda_c$ [nm]	Fiber
EM417	1550	PM

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# Acousto Optic Modulator

## Optical, Electrical & Environmental Characteristics

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

Parameter	Sym.	Condition	Min	Typ.	Max	Unit
Operating Wavelength	$\lambda_C$		1530	1550	1570	nm
Input Optical Power (Average)	P <sub>IN</sub>				1	W
Input Optical Power (Peak)	P <sub>PEAK</sub>				500	W
On State Transmission	T <sub>TRANS</sub>		45	50		%
Throughput change over temperature	$\Delta T$	Temp. range from 10 C to 60C, % change relative to 25C Transmission	-10		+10	%
Optical Return Loss	RL <sub>OPT</sub>	Both input and output signals	40			dB
Polarization Extinction Ratio	PER	PM input and output fiber	17	20		dB
Rise Time	t <sub>r</sub>	10% to 90% signal @1550nm			15	ns
Fall Time	t <sub>f</sub>	90% to 10% signal @1550nm			15	ns
Contrast Ratio	C <sub>r</sub>		45	50		dB
RF Matching	Z <sub>IN</sub>			50		$\Omega$
Electrical Return Loss	RL <sub>RF</sub>				-10	dB
RF Peak Power	P <sub>RF PK</sub>	To achieve Contrast Ratio	3.5	4.0	4.5	W
RF Average Power	P <sub>RF AVG</sub>			1.0	1.6	W
RF Center Frequency	RF <sub>CF</sub>			165		MHz
Operating Temperature			10		60	°C
Storage Temperature			-40		85	°C
Humidity		Non condensing			90	%
Air Pressure			700		1060	kPa
Hermeticity		MIL-Std 883			1E-6	ATM cc/s He

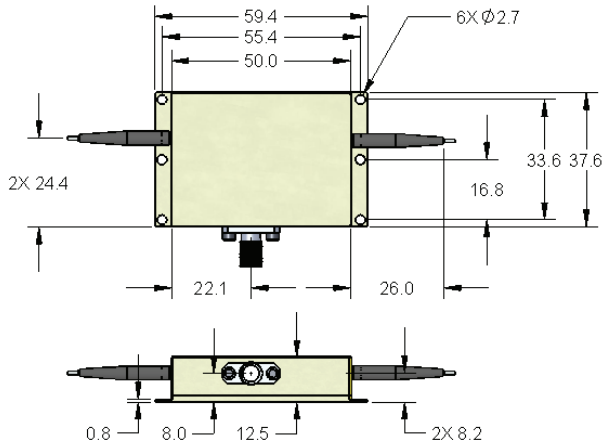
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## Mechanical

Parameter	Description
Package Body Material	Gold plated kovar or equivalent
RF Connector	SMA, female

All units in mm



## Reliability

Description	Requirement
Mechanical Shock	MIL-Std 883, Method 2002
Vibration	MIL-Std 883, Method 2007
Fiber Pull	GR-468, 0.5kg minimum strength
Temperature Cycling	GR-468, section 5:20



## Fiber Characteristics

Description	Specification	Min	Typ	Max	Unit
PM 1550 PANDA or SMF28					
Fiber bend radius		30			mm
Fiber length (input & output)			1		m
Connectors	None				
Fiber Jacket	Acrylate		245		µm
Stress Rod Alignment	Light aligned to slow axis of both input and output fibers				

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