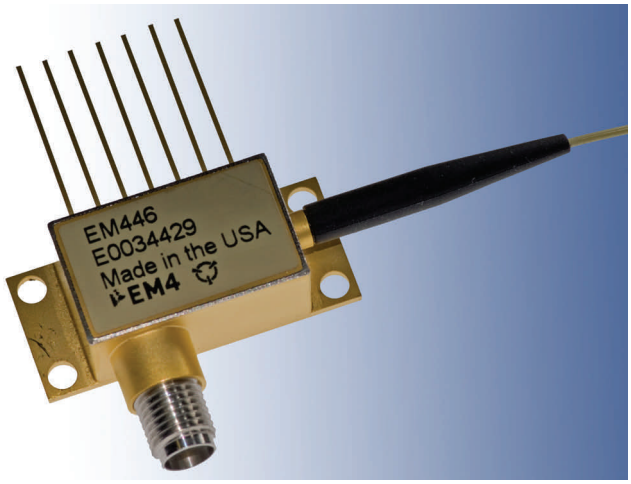
1310nm High Bandwidth DFB Laser

Features

- 18mW output power
- High bandwidth
- Built in isolator
- Ultrafast pulsing capability
- Laser welded, epoxy free and hermetically sealed
- Built in TEC, thermistor and monitor detector
- Rugged to shock and vibration



Applications

- Analog RF links
- High speed pulsing

General Description

The EM446, 1310nm distributed feedback laser (DFB) is a InGaAsP/InP multi-quantum well (MQW) laser diode. The module is ideal in applications where high bandwidth, mode stability, low RIN and stable output power is needed. The module contains a cooler, thermistor, monitor detector and bias-T. The module is designed and built using EM4's high reliability platform for defense components.

Ordering Information

EM446-XX-YY

Bias-T
- 00 : K connector used as high speed low ohm input
- 25 : 25Ω matching resistor
- 50 : 50Ω matching resistor

Fiber type
- SM : SMF28
- PM : Polarization Maintaining

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			150	mA
Laser Reverse Voltage	V_R			2	V
Photo Diode Forward Current	I_{PD}			10	mA
Photo diode Reverse Voltage	V_{PD}			20	V
TEC Current	I_{TEC}			3.0	A
TEC Voltage	V_{TEC}			4.0	V
Thermistor Current				2	mA
Thermistor Voltage				5	V
Lead Soldering Time				10	s
Lead Soldering Temperature				250	°C
RF Input Power	P_{IN}			20	dBm
ESD		HBM		500	V

Optical And Electrical Characteristics

T_{OP}=25°C, continous wave and beginning of life unless otherwise specified.

Parameter	Sym.	Condition	Min	Typ.	Max	Unit
Operating Chip Temperature	T_{CHIP}		15		35	°C
Threshold Current	I_{TH}		8		20	mA
Laser Drive Current	I_{OP}			75	100	mA
Laser Forward Voltage	V_F	I= I_{MAX}		1.6	2	V
Output Power	P_{OP}	I=I_{OP}	10(PM) 18(SM)			mW
Center Wavelength	λ	P=P_{OP}		1310		nm
Linewidth	Δ υ	CW		1		MHz
Relative Intensity Noise	RIN	P=P_{OP}, 0.2GHz→3GHz		-150		dB/Hz
Side Mode Suppression	SMSR	P=P_{OP}	30			dB
Optical Isolation	ISO		30	35		dB
Polarization Extinction Ratio	PER	PM fiber option.	17	19		dB
Monitor Photo Diode Current	I_{PD}	P=P_{OP}	50			μA
Monitor Photo Diode Dark Current	I_D				100	nA
Tracking Error		P=P_{OP}	-0.5		0.5	dB
Modulation Bandwidth	F	50Ω bias-T option	10			GHz
Electrical Back Reflection	S_{11}	50Ω bias-T option			-10	dB
Modulation Input Matching	Z_{IN}	Bias-T option 00		-		Ω
		Bias-T option 25		25		
		Bias-T option 50		50		
TEC Current		T_{OP}=70°C, P=P_{OP}, T_{CHIP}=25°C			2.0	A
TEC Voltage		T_{OP}=70°C, P=P_{OP}, T_{CHIP}=25°C			2.5	V
Thermistor Resistance	R_{TH}	T=25°C	9500	10000	10500	Ω
Thermistor β coefficient	β	0 / 50°C		3892		

Fiber Specification

Parameter	Typ.	Unit
Fiber Type	PM / SM dependent on option	-
Connector Type	FC/APC	-
Buffer Diameter PM Option	250	μm
Buffer Diameter SM Option	900	μm
Buffer Material PM Option	Acrylate	-
Buffer Material SM Option	Hytrel	-
Minimum Pigtail Length	1	m
Minimum Bend Radius	35	mm

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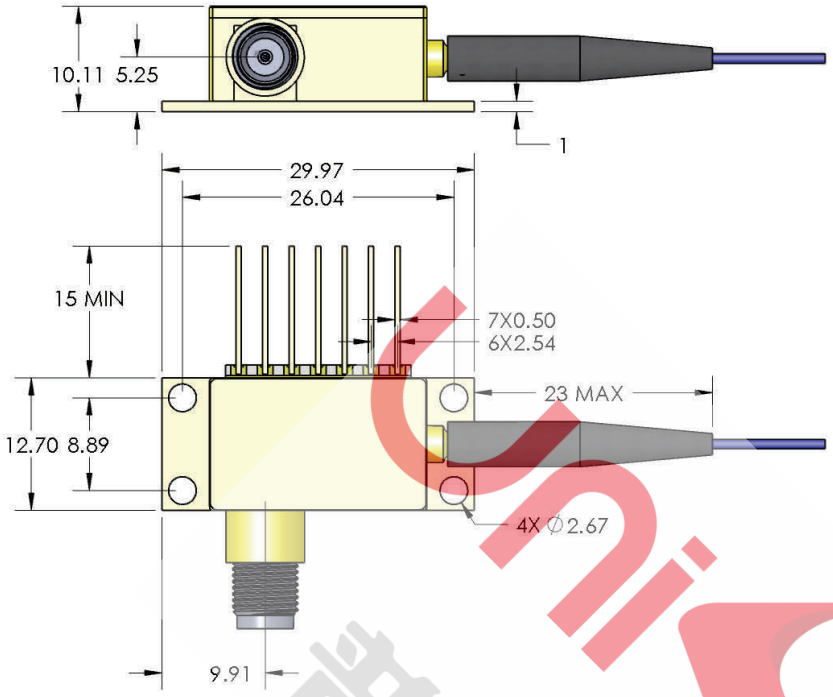
Mechanical Drawing

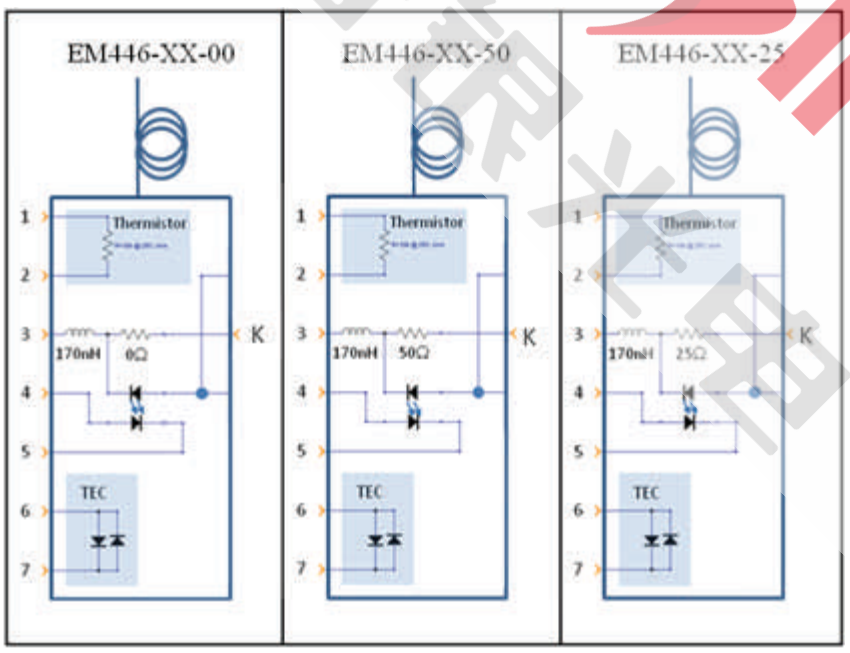
All units in mm



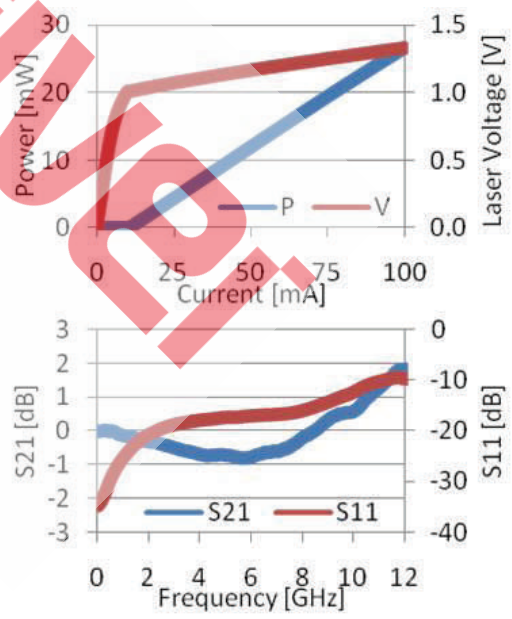
Pinning

Pin	Description
1	Thermistor
2	Thermistor
3	Laser Cathode (Bias)
4	Monitor PD Anode
5	Monitor PD Cathode
6	TEC +
7	TEC -
K	RF Input

Ordering Information (Continued)



Typical Measurement Data



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.