EYP-RWS-0633-00010-2000-TOC03-0000

We focus on power.

STABILIZED RIDGE WAVEGUIDE LASER

Wavelength Stabilized
GaAs Semiconductor Laser Diode

General Product Information

Product	Application
633 nm Wavelength Stabilized Laser	Metrology
with narrow Linewidth (< 0.1 pm)	Replacement of HeNe Lasers
sealed TO Housing	
with Monitor Diode, Thermoelectric Cooler and Thermistor	

Absolute Maximum Ratings

	Symbol	Unit	min	typ	max
Storage Temperature	T_S	°C	-40		85
Operational Temperature at Case	T_C	°C	-20		75
Operational Temperature at Laser Chip	T_{LD}	°C	10		18
Forward Current	I_F	mA			170
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			12
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Stress in excess of one of the Absolute Maximum Ratings can cause permanent damage to the device. Please note that a damaging optical power level may occur although the maximum current is not reached.

Recommended Operational Conditions

	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Operational Temperature at Case	T_{case}	°C	-20		65	
Operational Temperature at Laser Chip	T_{LD}	°C	12		15	
Forward Current	I_F	mA			150	
Output Power	P_{opt}	mW	2		10	total output power measured with integrating sphere

Characteristics at T_{LD} = 15° C

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Center Wavelength	λ_C	nm	628	633	638	tighter wavelength specification available on request
Selectable Line Width	$\Delta\lambda$	pm			0.1	single mode operation (see p. 4)
Overall Line Width	$\Delta\lambda$	nm			0.2	multi mode operation (see p. 4)
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.045		
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.001		

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Characteristics at 25° C at Begin Of Life cont'd

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Output Power @ I_F = 150 mA	P_{opt}	mW	10			measured with integrating sphere
Slope Efficiency	S	W / A	0.15	0.4		
Threshold Current	I_{th}	mA		90		
Divergence parallel (FWHM)	$\Theta_{\parallel}$	°		6		parallel to short axis of housing (see p. 3)
Divergence perpendicular (FWHM)	$\Theta_{\perp}$	°		31		parallel to long axis of housing (see p. 3)
Sidemode Supression Ratio	SMSR	dB	30			under single mode condition
Degree of Polarization	DOP	dB		10		P_{opt} = 10 mW; E field parallel to long axis of housing
Spatial Mode (transversal)				TEM_{00}		fundamental mode

Monitor Diode

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Monitor Detector Responsivity	I_{mon} / P_{opt}	µA / mW	1		200	U_R = 5 V
Reverse Voltage Monitor Diode	$U_{R\ MD}$	V	3		5	

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Current	I_{TEC}	A		0.4		P_{opt} = 10 mW, ΔT = 20 K
Voltage	U_{TEC}	V		0.8		P_{opt} = 10 mW, ΔT = 20 K
Power Dissipation (total loss at case)	P_{loss}	W		0.5		P_{opt} = 10 mW, ΔT = 20 K
Temperature Difference	ΔT	K			50	P_{opt} = 10 mW, $\Delta T = I\ T_{case} - T_{LD}\ I$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Resistance	R	kOhm		10		
Beta Coefficient	β			3976		

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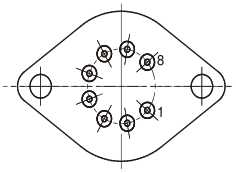
Package Dimensions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Height of Laser Output above Header	H_L	mm		5.1		
Housing Dimension	l x w x h	mm^3		38.9 x 25.4 x 9.3		
Pin Length	L	mm	10.8			

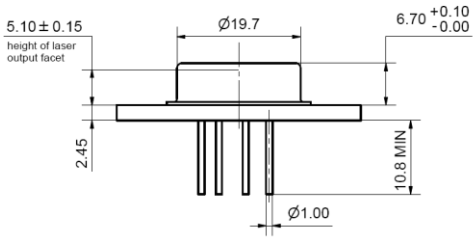
Package Pinout

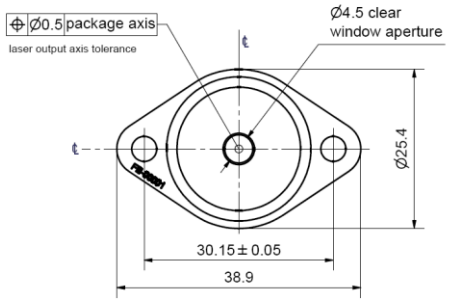
1	Thermoelectric Cooler (+)	5	Laser Diode (Anode)
2	Thermistor	6	Photo Diode (Anode)
3	Thermistor	7	Photo Diode (Cathode)
4	Laser Diode (Cathode)	8	Thernoelectric Cooler (-)

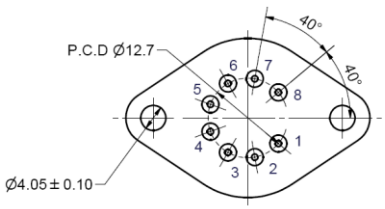
bottom view



Package Drawings







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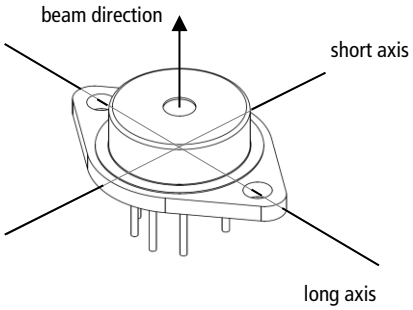
Polarization:
E field parallel to long axis of housing



hermetically sealed Package:
Leak Rate < $5 \cdot 10^{-8}$ atm.cc./s
acc. MIL-STD-883E

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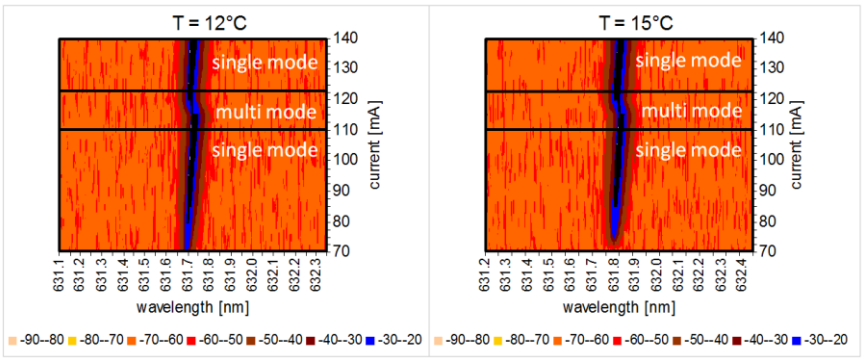
Typical Measurement Results

Spectral maps at 12° C and 15° C



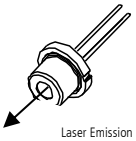
The spectral maps show the power spectral density at different operating modes. The graphs illustrate that the laser exhibits single and multi mode behavior under different operational conditions. The spectral maps may differ from part to part. Single mode operation can be achieved by selecting the appropriate laser current and temperature.

Ordering Information:

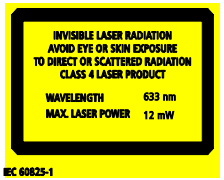
XSoptix
800 Village Walk #316
Guilford, CT 06437
Ph: 203-401-8093
Email orders to: sales@xsoptix.com
Fax orders to: 800-878-7282

Unpacking, Installation and Laser Safety

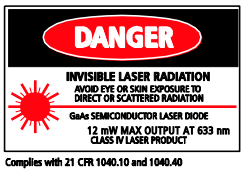
Unpacking the laser diodes should only be done at electrostatic safe workstations (EPA). Though protection against electro static discharge (ESD) is implemented in the laser package, charges may occur at surfaces. Please store this product in its original package at a dry, clean place until final use. During device installation, ESD protection has to be maintained.



The RWS laser is sensitive against optical feedback, so an optical isolator may be required in order to avoid any disturbance of the emission spectrum. Operating at moderate temperatures on proper heat sinks will contribute to a long lifetime of the diode.



The laser emission from this diode is close to the invisible infrared region of the electromagnetic spectrum. Avoid direct and/or indirect exposure to the free running beam. Collimating the free running beam with optics as common in optical instruments will increase threat to the human eye.



Each laser diode will come with an individual test protocol verifying the main parameters given in this document. It does not include the detailed spectral maps which are shown above in order to illustrate the spectral behavior of this laser type.

Performance figures, data and any illustrative material provided in this specification are typical and must be specifically confirmed in writing by eagleyard Photonics before they become applicable to any particular order or contract. In accordance with the eagleyard Photonics policy of continuous improvement specifications may change without notice.

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GL Systems Certification