TOPTICA EAGLEYARD

EYP-BAL-0905-00010-1040-TOE02-0010

BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



General Product Information

Product	Application
905 nm Broad Area Laser (Single Emitter)	Sensing
for Pulse Mode Operation	Metrology
sealed TO-18 Housing (MIL qualified)	



Absolute Maximum Ratings

	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Storage Temperature	T_S	°C	-45		90	Every condition of the Absolute Maximum Ratings has to be kept during operation
Operational Temperature at Case	T_C	°C	-45		90	
Peak Current	$I_{F\ Peak}$	A			25	see Pulse Mode Conditions
Reverse Voltage	V_R	V			1	
Peak Output Power	$P_{opt\ Peak}$	W			15	f/1.7
Forward Voltage at Peak	V_F	V			12	see Pulse Mode Conditions

Recommended Operational Conditions (Pulse Mode)

	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Operational Temperature at Case	T_C	°C	-40		80	
Forward Current	$I_{F\ Peak}$	A		17		under max. Pulse Mode Conditions
Output Power	$P_{opt\ Peak}$	W			10	f/1.7

Characteristics at T_{amb} 25 °C, Pulse Mode, Begin Of Life

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Center Wavelength	λ_C	nm	850	905	920	
Spectral Width (FWHM)	$\Delta\lambda$	nm		10		
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.3		
Output Power	P_{ave}	mW		7		
Peak Output Power @ I_F = 17 A	$P_{opt\ Peak}$	W	10			f/1.7, under max.Pulse Mode Conditions
Threshold Current	I_{th}	A		1.5		under Pulse Mode Conditions
Cavity Length	L	µm			1000	

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BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



Characteristics at T_{amb} 25 °C, Pulse Mode, Begin Of Life

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Stripe width	Ws	µm		400		one emitter only
Divergence parallel (FWHM)	$\Theta_{\|\|}$	°	7	10	13	
Divergence perpendicular (FWHM)	$\Theta_{\perp}$	°	25	30	35	
Polarization				TE		E field perpendicular to plane B (see drawing on p. 3)
Spectral Mode (longitudinal)				Multi Mode		

Pulse Mode Conditions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Pulse Length	t_p	ns	50		200	
Pulse Repetition Rate	RR	s^{-1}	1		3000	
Duty Cycle	D	%			0.06	

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BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



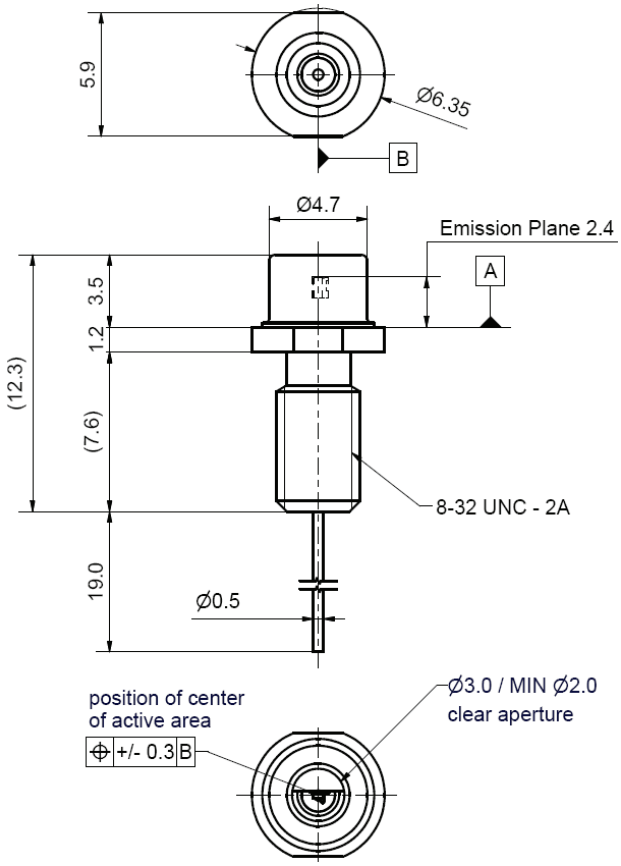
Package Dimensions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Height of Emission Plane	d_{EP}	mm		2.4		reference plane A: top side of TO header
Excentricity of Emission Center	R	mm			0.2	reference B: center of outer diameter of header
Pin Length	l	mm		19.0		

Package Pinout

Laser Anode (+)	Pin
Laser Cathode (-)	Case

Package Drawings



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

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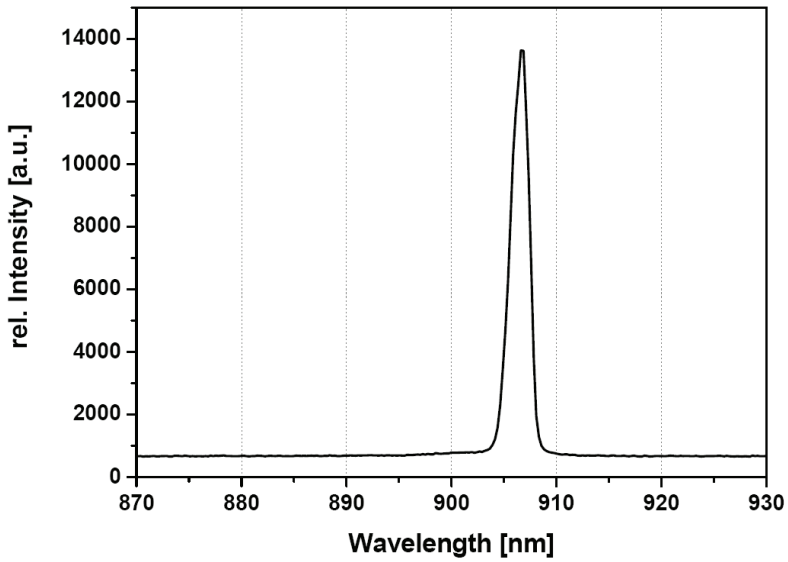
BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



Typical Measurement Results

Spectrum



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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 BAL diode type is known to be sensitive against thermal stress. Operating at moderate temperatures on propper heat sinks willl 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.

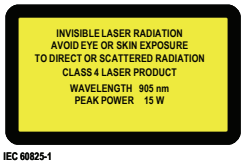
Each laser diode will come with an individual test protocol verifying the parameters given in this document.



Laser Emission







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Complies with 21 CFR 1040.10 and 1040.40

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BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



General Product Information

Product	Application
905 nm Broad Area Laser (Dual Emitter)	Sensing
for Pulse Mode Operation	Metrology
sealed TO-18 Housing (MIL qualified)	



Absolute Maximum Ratings

	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Storage Temperature	T_S	°C	-45		90	Every condition of the Absolute Maximum Ratings has to be kept during operation
Operational Temperature at Case	T_C	°C	-45		90	
Peak Current	$I_{F\ Peak}$	A			80	see Pulse Mode Conditions
Reverse Voltage	V_R	V			1	
Peak Output Power	$P_{opt\ Peak}$	W			65	f/1.7
Forward Voltage at Peak	V_F	V			15	see Pulse Mode Conditions

Recommended Operational Conditions (Pulse Mode)

	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Operational Temperature at Case	T_C	°C	-40		80	
Forward Current	$I_{F\ Peak}$	A		72		under max. Pulse Mode Conditions
Output Power	$P_{opt\ Peak}$	W		56		f/1.7

Characteristics at T_{amb} 25 °C, Pulse Mode, Begin Of Life

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Center Wavelength	λ_C	nm	850	905	920	
Spectral Width (FWHM)	$\Delta\lambda$	nm		10		
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.3		
Output Power	P_{ave}	mW		30		
Peak Output Power @ I_F = 78 A	$P_{opt\ Peak}$	W	50			f/1.7, under max.Pulse Mode Conditions
Threshold Current	I_{th}	A		3.0		under Pulse Mode Conditions
Operational Current @ $P_{opt\ Peak}$ = 50 W	I_{op}	A		70	78	under max. Pulse Mode Conditions

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BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



Characteristics at T_{amb} 25 °C, Pulse Mode, Begin Of Life

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Cavity Length	L	µm			1000	
Stripe width	Ws	µm		400		one emitter only
Spacing between Emitters	$W_{spacing}$	µm		200		
Stripe Pitch	W_{pitch}	µm		600		center to center of the dual emitters
Dual Emitter Width	W_{total}	µm		1000		total width of the dual emitter
Divergence parallel (FWHM)	$\Theta_{\parallel}$	°	7	10	13	
Divergence perpendicular (FWHM)	$\Theta_{\perp}$	°	25	30	35	
Polarization				TE		E field perpendicular to plane B (see drawing on p. 3)
Spectral Mode (longitudinal)				Multi Mode		

Pulse Mode Conditions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Pulse Length	t_p	ns	50		200	
Pulse Repetition Rate	RR	s^{-1}	1		3000	
Duty Cycle	D	%			0.06	

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BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



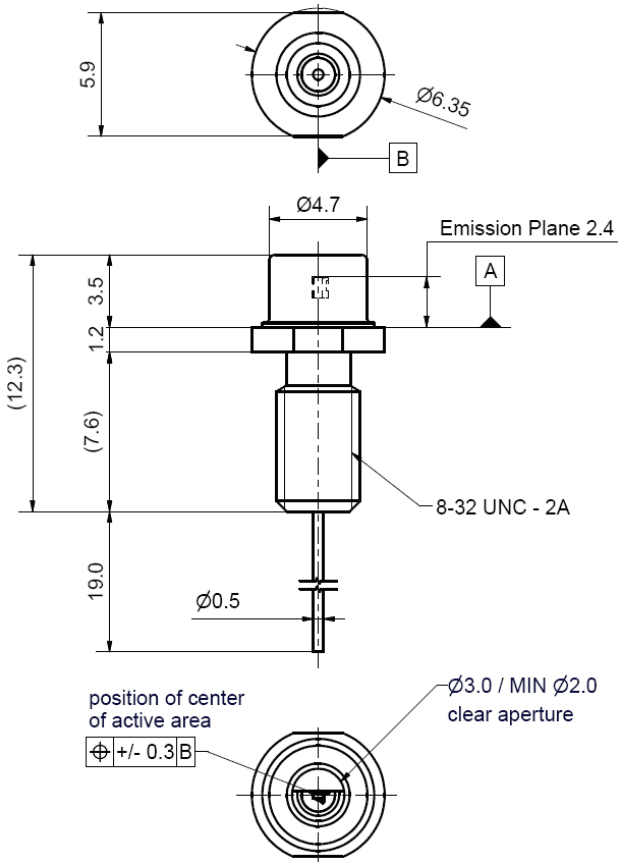
Package Dimensions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Height of Emission Plane	d_{EP}	mm		2.4		reference plane A: top side of TO header
Excentricity of Emission Center	R	mm			0.2	reference B: center of outer diameter of header
Pin Length	l	mm		19.0		

Package Pinout

Laser Anode (+)	Pin
Laser Cathode (-)	Case

Package Drawings



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

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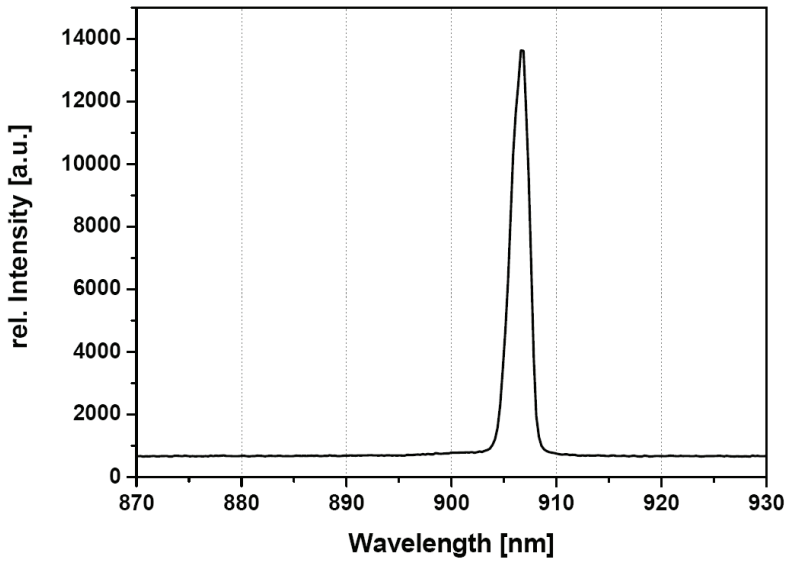
BROAD AREA LASER
GaAs Semiconductor Laser Diode
Single Emitter Structure



Typical Measurement Results

Spectrum



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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 BAL diode type is known to be sensitive against thermal stress. Operating at moderate temperatures on propper heat sinks willl 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.

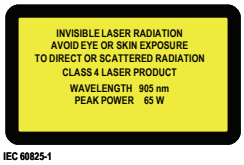
Each laser diode will come with an individual test protocol verifying the parameters given in this document.



Laser Emission







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EYP-BAL-0905-00090-1040-TOE22-0010

Revision 0.70

20.01.2017

MULTI MODE LASER DIODES
Broad Area Laser

General Product Information

Product	Application
905 nm Broad Area Laser (Dual Emitter)	Sensing
for Pulse Mode Operation	Metrology
sealed TO-18 Housing (MIL qualified)	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Storage Temperature	T_S	°C	-45		90	Every condition of the Absolute Maximum Ratings has to be kept during operation
Operational Temperature at Case	T_C	°C	-45		90	
Peak Current	$I_{F\ Peak}$	A			110	see Pulse Mode Conditions
Reverse Voltage	V_R	V			1	
Peak Output Power	$P_{opt\ Peak}$	W			95	see Pulse Mode Conditions
Forward Voltage at Peak	V_F	V			15	see Pulse Mode Conditions

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Operational Temperature at Case	T_C	°C	-40		80	
Forward Current	$I_{F\ Peak}$	A		100		under Pulse Mode Conditions
Output Power	$P_{opt\ Peak}$	W		90		

Characteristics at 25° C at Begin Of Life

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Center Wavelength	λ_C	nm	850	905	920	see Pulse Mode Conditions
Spectral Width (FWHM)	$\Delta\lambda$	nm		10		
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.3		
Peak Output Power @ I_F = 100 A	$P_{opt\ Peak}$	W		90		under Pulse Mode Conditions
Threshold Current	I_{th}	A		3.0		under Pulse Mode Conditions
Operational Current @ $P_{opt\ Peak}$ = 90 W	I_{op}	A		100	110	under Pulse Mode Conditions
Cavity Length	L	µm			1000	

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MULTI MODE LASER DIODES
Broad Area Laser

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

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Stripe width	W_s	µm		400		one emitter only
Spacing between Emitters	$W_{spacing}$	µm		200		
Stripe Pitch	W_{pitch}	µm		600		
Dual Emitter Width	W_{total}	µm		1000		
Divergence parallel (FWHM)	$\Theta_{\parallel}$	°	7	10	13	
Divergence perpendicular (FWHM)	$\Theta_{\perp}$	°	25	30	35	
Polarization				TE		E field perpendicular to Plane B (see drawing on p.3)
Spectral Mode (longitudinal)				Multi Mode		

Pulse Mode Conditions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Pulse Length	t_p	ns		40		
Pulse Repetition Rate	RR	Hz		100		

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MULTI MODE LASER DIODES
Broad Area Laser

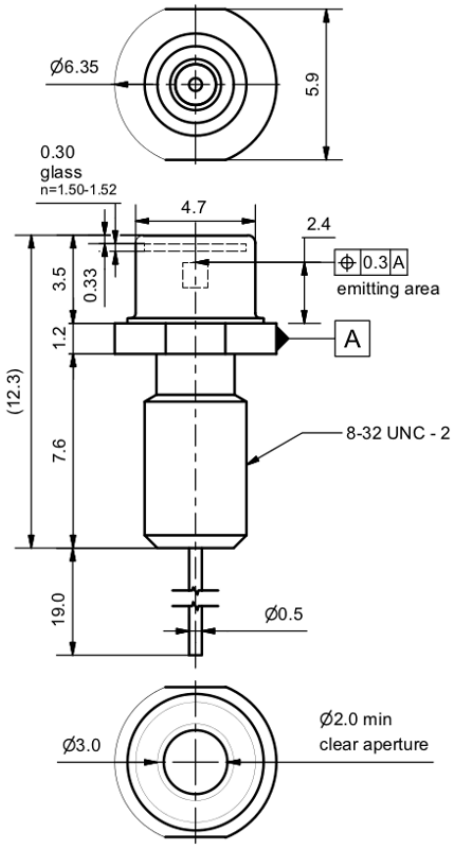
Package Dimensions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Height of Emission Plane	d_{EP}	mm		2.4		reference plane A: top side of TO header
Excentricity of Emission Center	R	mm			0.3	reference B: center of outer diameter of header
Pin Length	l	mm		19		

Package Pinout

Laser Diode Anode (+)	Pin
Laser Diode Cathode (-)	Case

Package Drawings



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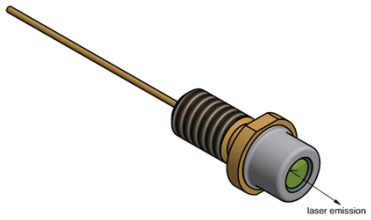

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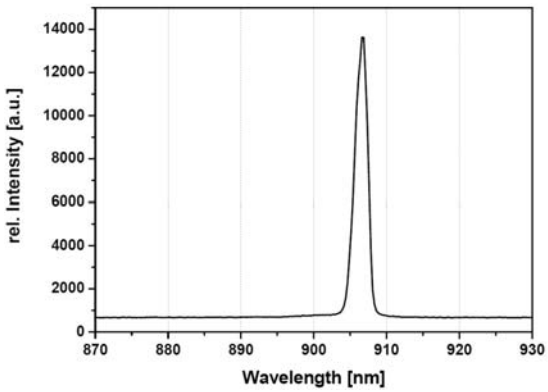
MULTI MODE LASER DIODES
Broad Area Laser

Typical Measurement Results

Spectrum



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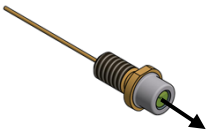
Unpacking, Installation and Laser Safety

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.

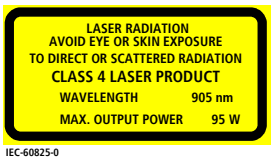


Laser Emission



The BAL diode type is known to be sensitive against thermal stress. Operating at moderate temperatures on propper heat sinks willl contribute to a long lifetime of the diode.





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 parameters given in this document.





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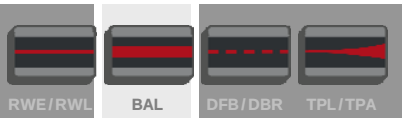
BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



PRELIMINARY SPECIFICATION

BA Laser

EYP-BAL-0980-08000-4020-CMT04-0000

General Product Information

Product	Application
980 nm Broad Area Laser	Material Processing
mounted on C-Mount	Medical



Absolute Maximum Ratings

	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Storage Temperature	T_S	°C	-40		85	non condensing
Operational Temperature at Case	T_C	°C	5		40	non condensing
Forward Current	I_F	A			15	Stress in excess of the Absolute Maximum Ratings can cause permanent damage to the device. Operation at the Absolute Maximum Rating for extended periods of time can adversely affect the device realibility and may lead to reduced operational life.
Reverse Voltage	V_R	V			0	
Output Power	P_{opt}	W			9	

Recommended Operational Conditions

	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Operational Temperature at Case	T_C	°C	15		30	measured at position A (see drawing on p. 3)
Forward Current	I_F	A			13	
Output Power	P_{opt}	W			8	

Characteristics at T_{amb} 25 °C at Begin Of Life

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Center Wavelength	λ_C	nm	965	980	995	see images on page 4
Spectral Width (FWHM)	$\Delta\lambda$	nm			6	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.4		
Output Power @ I_F = 13 A	P_{opt}	W	8			total output measured with integrating sphere
Slope Efficiency	η_d	W / A	0.6	0.7		
Threshold Current	I_{th}	A			2.5	

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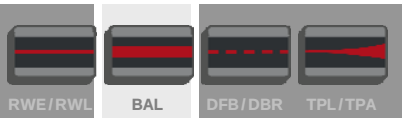
BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



PRELIMINARY SPECIFICATION

BA Laser

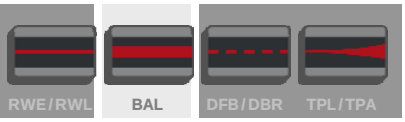
EYP-BAL-0980-08000-4020-CMT04-0000

Characteristics at T_{amb} 25 °C at Begin Of Life

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Operational Current @ P_{opt} = 8 W	I_{op}	A			13	
Stripe Width	W_s	µm		200		
Cavity Length	L	µm		4000		
Divergence parallel (FWHM)	$\Theta_{\parallel}$	°		10		
Divergence perpendicular (FWHM)	$\Theta_{\perp}$	°		30		
Spectral Mode (longitudinal)				Multi Mode		
Polarization				TE		Polarization in perpendicular plane

BROAD AREA LASER

GaAs Semiconductor Laser Diode
Single Emitter Structure



PRELIMINARY SPECIFICATION

BA Laser

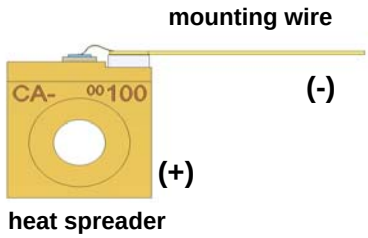
EYP-BAL-0980-08000-4020-CMT04-0000

Package Dimensions

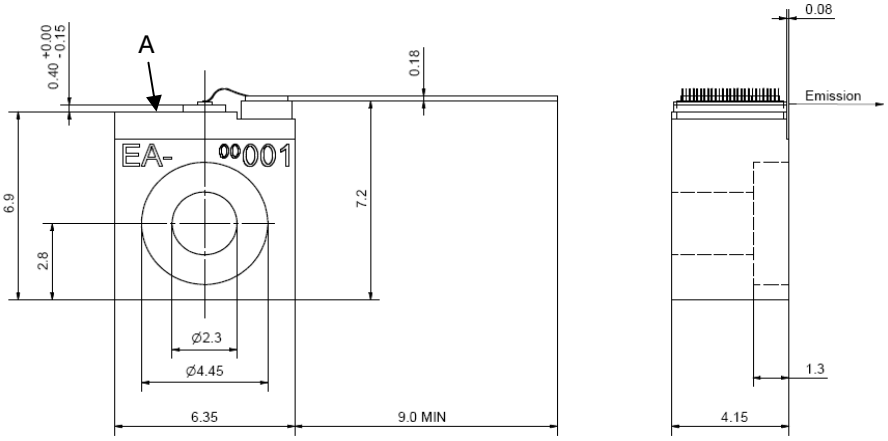
	Symbol	Unit	min	typ	max
Emission Plane	l	mm	7.05	7.20	7.35
C-Mount Thickness	d	mm		4	

Package Pinout

Cathode (-)	Mounting Wire
Anode (+)	Housing



Package Drawings



PRELIMINARY SPECIFICATION

BA Laser

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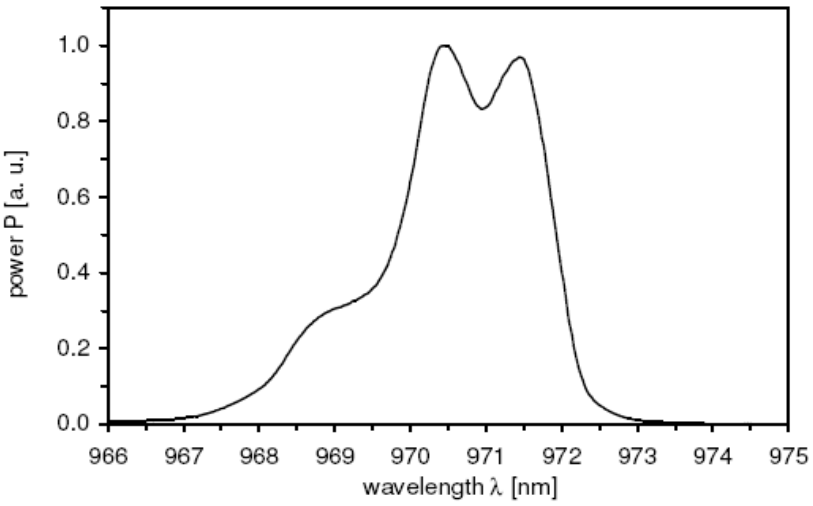
Typical Measurement Results

Spectrum at Specified Optical Output Power



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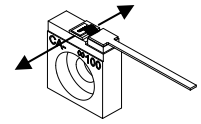
Unpacking the laser diodes should only be done at electrostatic safe workstations (EPA). Though protection against electro static discharge (ESD) is implemented in the laser package, charges may occur at surfaces. Please store this product in its original package at a dry, clean place until final use.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

The BAL diode type is known to be sensitive against thermal stress. Operating at moderate temperatures on propper heat sinks willl contribute to a long lifetime of the diode.

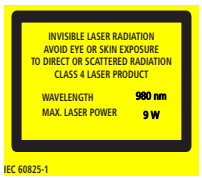
The laser emission from this diode is close to the invisible infrared region of the electromagnetic spectrum. Avoid direct and/or indirect exposure to the free running beam. Collimating the free running beam with optics as common in optical instruments will increase thread to the human eye.

Each laser diode will come with an individual test protocol verifying the parameters given in this document.













Complies with 21 CFR 1040.10 and 1040.40

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