

EYP-DFB-0795-00015-1500-BFY12-0005

Revision 0.93

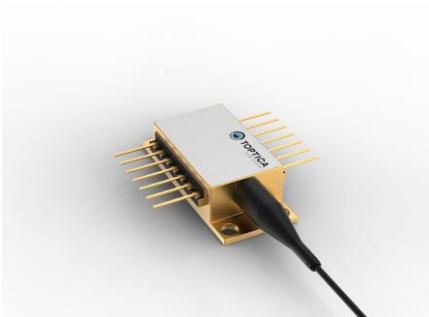
2025-02-05

SINGLE FREQUENCY LASER DFB Laser



General Product Information

Product	Application
795 nm DFB Laser	Spectroscopy (Rb D1 line)
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	
with integrated μ -Isolator, PM Fiber and APC Connector	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-15		70
Operational Temperature at Chip	T_{chip}	$^{\circ}\text{C}$	5		50
Forward Current	I_F	mA			170
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			20
TEC Current	I_{TEC}	A			1.4
TEC Voltage	V_{TEC}	V			4.8

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	5		60
Operational Temperature at Chip	T_{chip}	$^{\circ}\text{C}$	10		45
Forward Current	I_F	mA			160
Output Power	P_{opt}	mW	5		15

Measurement Conditions / Comments

measured by integrated Thermistor

Distributor



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SINGLE FREQUENCY LASER DFB Laser



Characteristics Tchip = 25° at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	794	795	796
Target Wavelength	λ_T	nm		794.98	
Linewidth	$\Delta\lambda$	MHz		0.6	1.0
Mode-hop free Tuning Range	$\Delta\lambda_{\text{tune}}$	pm	25		
Sidemode Suppression Ratio	SMSR	dB	30	45	
Temp. Coefficient of Wavelength	$d\lambda / dT$	nm/K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm/mA		0.003	
Laser Current	I_{LD}	mA			160
Slope Efficiency	η	mW/mA		0.2	
Threshold Current	I_{th}	mA			70
Polarization Extinction Ratio	PER	dB		20	

Measurement Conditions / Comments

Tchip = 10° ... 45° C at Popt = 15 mW

Popt = 15 mW

> 10 GHz, at target wavelength

Popt = 15 mW

Popt = 15 mW

Popt = 15 mW

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{of}	μA/mW	2		40

Measurement Conditions / Comments

5 V

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		1.3	
Power Dissipation (total loss at case)	P_{loss}	W		0.4	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

Popt = 15 mW, $\Delta T = 20$ KPopt = 15 mW, $\Delta T = 20$ KPopt = 15 mW, $\Delta T = 20$ KPopt = 15 mW, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	kΩ		10	
Beta Coefficient	b			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

Tchip = 25° C

 $R_1/R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at Tchip = 0° ... 50° C $1/T = A + B(\ln R) + C(\ln R)^3$

T: Temperature in Kelvin

R: resistance at T in Ω

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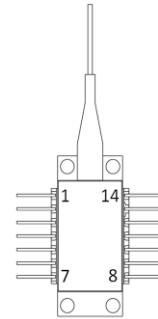
SINGLE FREQUENCY LASER DFB Laser



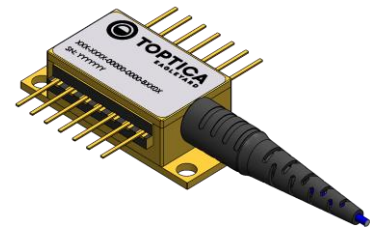
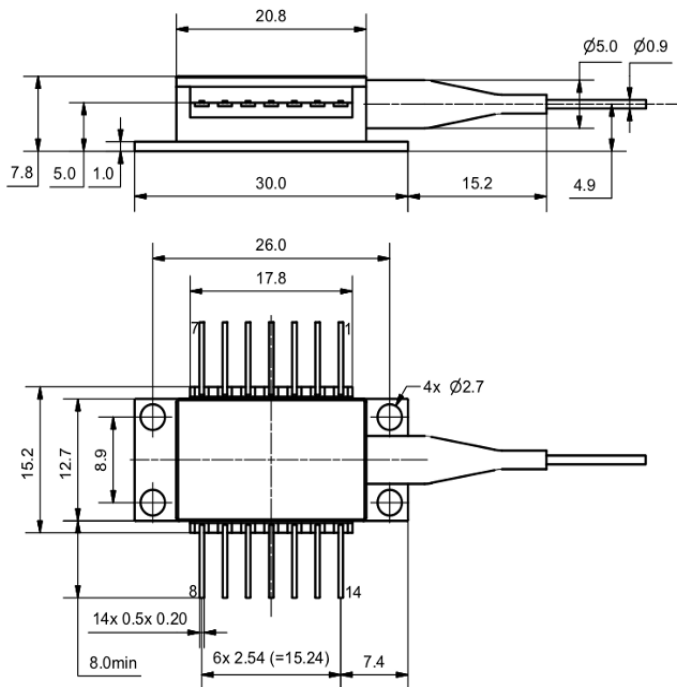
Pin Assignment

1 Thermoelectric Cooler (+)	14 Thermoelectric Cooler (-)
2 Thermistor	13 Case
3 Photo Diode Anode	12 not connected
4 Photo Diode Cathode	11 Laser Diode Cathode
5 Thermistor	10 Laser Diode Anode
6 not connected	9 not connected
7 not connected	8 not connected

Top View



Package Drawings



AIZ-16-0222-1415

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2025-02-05

SINGLE FREQUENCY LASER DFB Laser



Fiber and Connector Type (Output)	
Parameter	
PM Fiber	900 / 125 / 5.5 μm, UV/Polyester-elastomer Coating (l = 1 +/-0.1 m)
Connector	FC/APC (narrow key / 2mm)

Measurement Conditions / Comments	

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SINGLE FREQUENCY LASER DFB Laser



Unpacking, Installation and Laser Safety

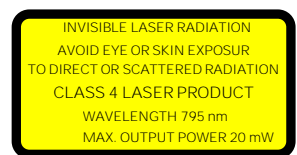
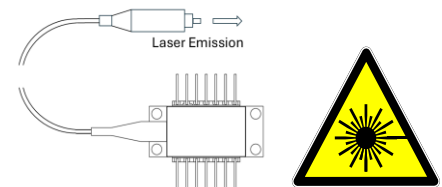
Unpacking the laser diodes should only be done at electrostatic safe workstations (EPA). Though protection against electro static discharge (ESD) is implemented in the laser package, charges may occur at surfaces. Please store this product in its original package at a dry, clean place until final use.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

A laser diode 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing 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.

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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EYP-DFB-0760-00012-1500-BFY12-0005

Revision 0.90

2023-05-25

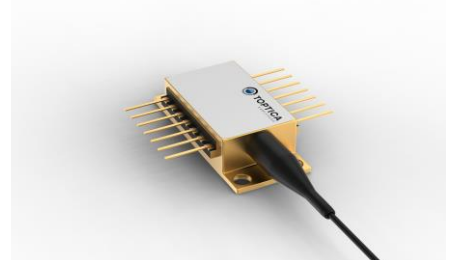
SINGLE FREQUENCY LASER

DFB Laser



General Product Information

Product	Application
Tunable 760 nm DFB Laser	Spectroscopy
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	Oxygen Detection
with PM Fiber, integrated μ -Isolator and Angled Physical Contact (APC)	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-15		70
Operational Temperature at Chip	T_{chip}	$^{\circ}\text{C}$	10		50
Forward Current	I_F	mA			180
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			14
TEC Current	I_{TEC}	A			1,4
TEC Voltage	V_{TEC}	V			4,8

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	5		60
Operational Temperature at Chip	T_{chip}	$^{\circ}\text{C}$	10		35
Forward Current	I_F	mA			170
Output Power	P_{opt}	mW	4		12

Measurement Conditions / Comments

ex fiber

Characteristics = 25 $^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	759,9	760,9	761,9
Target Wavelength	λ_T	nm		760,9	
Mode-hop free Tuning Range	$\Delta\lambda_{\text{tune}}$	pm	40		
Sidemode Suppression Ratio	SMSR	dB	30	45	
Temp. Coefficient of Wavelength	$d\lambda / dT$	nm/K		0,06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm/mA		0,002	

Measurement Conditions / Comments

reached between 15 $^{\circ}$ and 35 $^{\circ}$ C at P = 12 mW
at target wavelength

Popt = 12 mW

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SINGLE FREQUENCY LASER

DFB Laser



Characteristics = 25° C at BOL

Parameter	Symbol	Unit	min	typ	max
Laser Current	I_{LD}	mA			170
Slope Efficiency	η	mW/mA		0,1	
Threshold Current	I_{th}	mA			70
Polarization Extinction Ratio	PER	dB		20	

Measurement Conditions / Comments

Popt = 12 mW

Popt = 12 mW

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{of}	$\mu A/mW$	10		800

Measurement Conditions / Comments

5 V

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0,4	
Voltage	U_{TEC}	V		1,5	
Power Dissipation (total loss at case)	P_{loss}	W		0,5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

Popt = 12 mW, $\Delta T = 30$ KPopt = 12 mW, $\Delta T = 30$ KPopt = 12 mW, $\Delta T = 30$ KPopt = 12 mW, $\Delta T = |T_{case} - TLD|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	k Ω		10	
Beta Coefficient	b			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

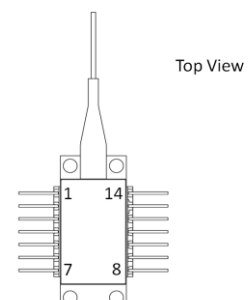
Measurement Conditions / Comments

25° C

0° ... 50° C

Pin Assignment

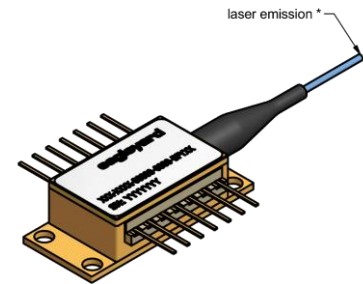
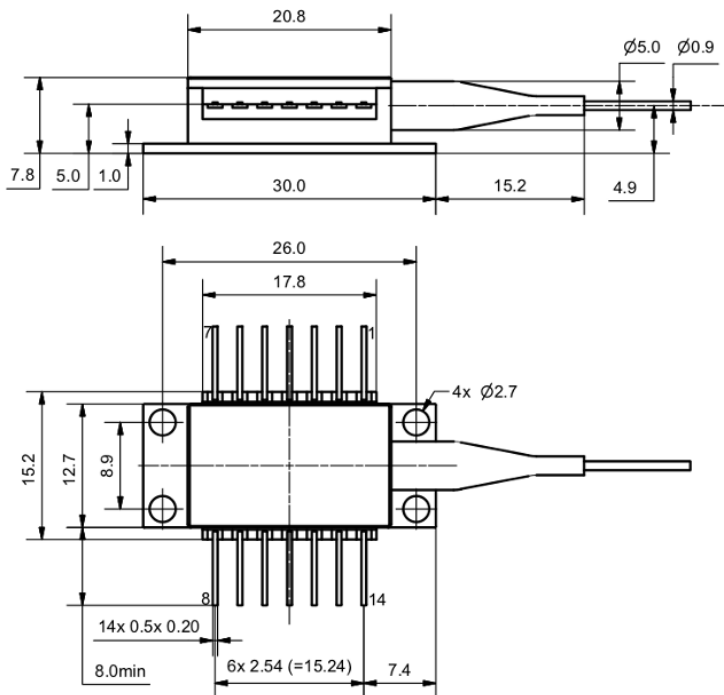
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photo Diode Anode	12	not connected
4	Photo Diode Cathode	11	Laser Diode Cathode
5	Thermistor	10	Laser Diode Anode
6	not connected	9	not connected
7	not connected	8	not connected



SINGLE FREQUENCY LASER



Package Drawings



AIZ-16-0222-1415

Fiber and Connector Type (Output)

Parameter	
PM Fiber	900 / 125 / 5.5 μ m, UV/Polyester-elastomer Coating (l = 1 +/-0.1 m)
Connector	FC/APC (narrow key / 2mm)

Measurement Conditions / Comments

EYP-DFB-0760-00012-1500-BFY12-0005

Revision 0.90

2023-05-25

SINGLE FREQUENCY LASER DFB Laser



Unpacking, Installation and Laser Safety

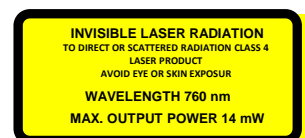
Unpacking the laser diodes should only be done at electrostatic safe workstations (EPA). Though protection against electro static discharge (ESD) is implemented in the laser package, charges may occur at surfaces. Please store this product in its original package at a dry, clean place until final use.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

A laser diode 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.

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

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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.



IEC-60825-1



Complies with 21 CFR 1040.10 and 1040.40

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Revision 0.94

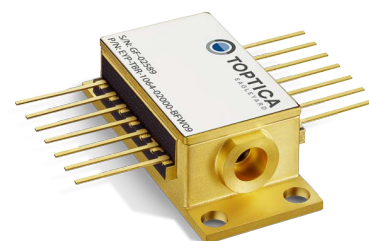
2020-11-11

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
Tunable 760 nm DFB Laser	Spectroscopy
with hermetic 14 Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	Oxygen Detection
with integrated Beam Collimation	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	°C	-40		85
Operational Temperature at Case	T_C	°C	-40		85
Operational Temperature at Laser Chip	T_{LD}	°C	10		50
Forward Current	I_F	mA			130
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			50
TEC Current	I_{TEC}	A			1.1
TEC Voltage	V_{TEC}	V			2.8

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	°C	-20		65
Operational Temperature at Laser Chip	T_{LD}	°C	10		35
Forward Current	I_F	mA			120
Output Power	P_{opt}	mW	10		40

Measurement Conditions / Comments

measured by integrated thermistor

Characteristics at $T_{LD} = 25^\circ\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	759.9	760.9	761.9
Target Wavelength	λ_T	nm		760.9	
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	40		
Sidemode Suppression Ratio	SMSR	dB	30	50	

Measurement Conditions / Comments

reached within $T_{LD} = 10^\circ$ and 35°C at 40 mW

$P_{opt} = 40\text{ mW}$

at target wavelength

$P_{opt} = 40\text{ mW}$

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Revision 0.94

2020-11-11

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.002	
Laser Current @ $P_{opt} = 40\text{ mW}$	I_{LD}	mA			120
Slope Efficiency	η	W / A	0.6	0.8	1.3
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	$^{\circ}$		0.1	
Divergence perpendicular (FWHM)	Θ_{\perp}	$^{\circ}$		0.1	
Beam Diameter horizontal	$d_{ }$	mm		1.0	1.2
Beam Diameter vertical	d_{\perp}	mm		0.8	1.2
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments

parallel to the base plate of the housing (see p. 3)
perpendicular to base plate of the housing (see p. 3)
parallel to the base plate of the housing (see p. 3)
perpendicular to base plate of the housing (see p. 3)
 $P_{opt} = 40\text{ mW}$; E field perpendicular to base plate

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	3		60

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		1.3	
Power Dissipation (total loss at case)	P_{loss}	W		0.4	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

$P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 40\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

$T_{LD} = 25^{\circ}\text{C}$
 $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$
 $1/T = A + B(\ln R) + C(\ln R)^3$
T: temperature in Kelvin
R: resistance at T in Ohm

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Revision 0.94

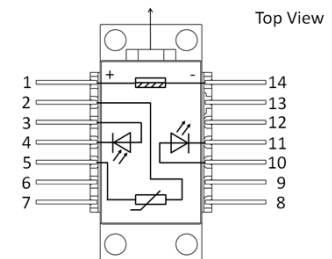
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SINGLE FREQUENCY LASER DIODES

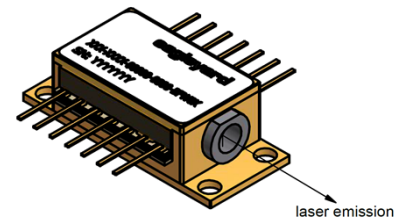
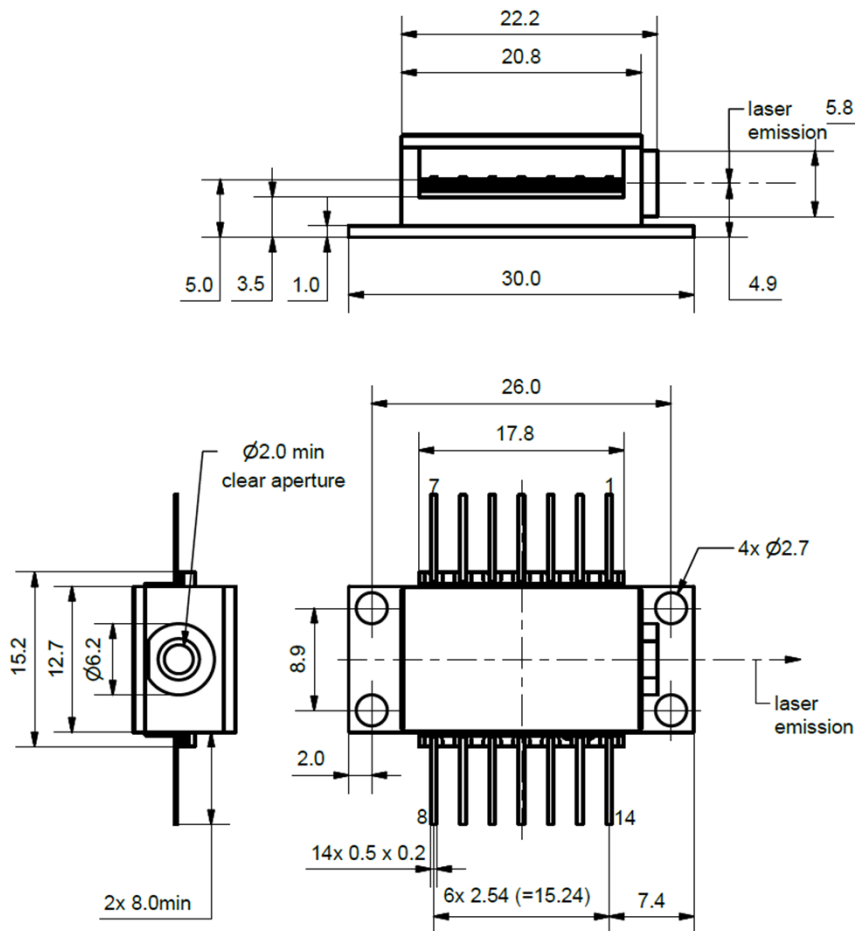
Distributed Feedback Laser

Pin Assignment

1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



Package Drawings



Caution. Excessive mechanical stress on the package can lead to a damage of the laser.

See [instruction manual](#) on www.eagleyard.com

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Revision 0.94

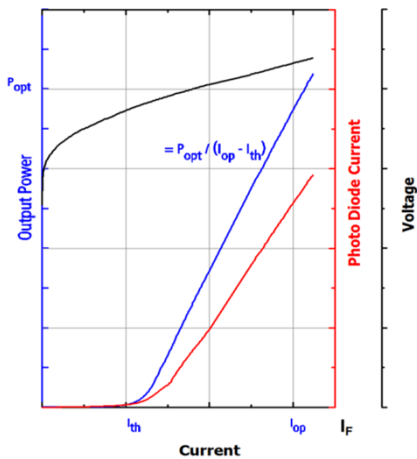
2020-11-11

SINGLE FREQUENCY LASER DIODES

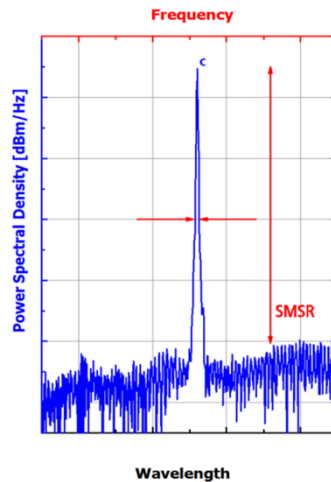
Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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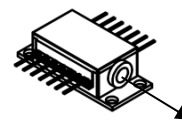
Unpacking, Installation and Laser Safety

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.

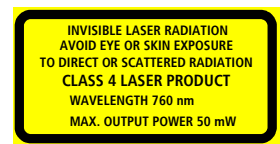
The DFB laser is sensitive against optical feedback, so an optical isolator may be required in order to avoid any disturbance of the emission spectrum. Operating at moderate temperatures on proper heat sinks will contribute to a long lifetime of the diode.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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Laser Emission



IEC-60825-1



Complies with 21 CFR 1040.10 and 1040.40

EYP-DFB-0760-00040-1500-TOC03-0005

Revision 1.08

2020-04-30

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
Tunable 760 nm DFB Laser	Spectroscopy
with hermetic 8-Pin TO Package (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	Oxygen Detection

Absolute Maximum Ratings

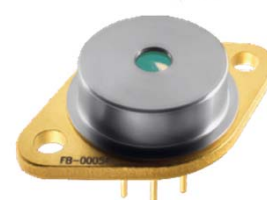
Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-20		75
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	10		50
Forward Current	I_F	mA			130
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			50
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	-20		65
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	10		35
Forward Current	I_F	mA			120
Output Power	P_{opt}	mW	10		40

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	759.9	760.9	761.9
Target Wavelength	λ_T	nm		760.9	
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Sidemode Suppression Ratio	SMSR	dB	30	50	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.002	
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	40		



Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Measurement Conditions / Comments

measured by integrated thermistor

Measurement Conditions / Comments

see images on page 4

reached within $T_{LD} = 10^{\circ}\text{C}$ and 35°C at 40 mW

$P_{opt} = 40\text{ mW}$

$P_{opt} = 40\text{ mW}$

at target wavelength

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Revision 1.08

2020-04-30

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ} \text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Laser Current @ $P_{opt} = 40 \text{ mW}$	I_{LD}	mA			120
Slope Efficiency	η	W / A	0.6	0.8	1.3
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	°		8	
Divergence perpendicular (FWHM)	Θ_{\perp}	°		21	
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments

parallel to short axis of the housing (see p. 3)

parallel to long axis of the housing (see p. 3)

 $P_{opt} = 40 \text{ mW}$; E field parallel to long axis of housing

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A}/\text{mW}$	1.5		50

Measurement Conditions / Comments

 $U_R = 5 \text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.8	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

 $P_{opt} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{opt} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{opt} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{opt} = 40 \text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ} \text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ} \text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

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SINGLE FREQUENCY LASER DIODES

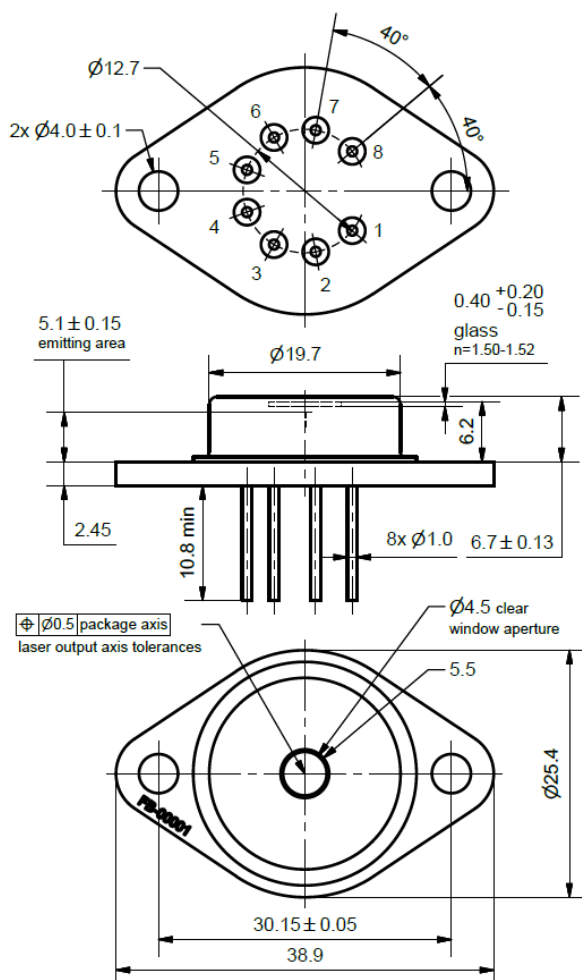
Distributed Feedback Laser

Pin Assignment

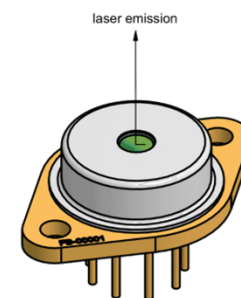
1 Thermoelectric Cooler (+)	5 Laser Diode Anode
2 Thermistor	6 Monitor Diode Anode
3 Thermistor	7 Photo Diode Cathode
4 Laser Diode Cathode	8 Thermoelectric Cooler (-)

All 8 pins are isolated from case.

Package Drawings



AIZ-16-311-1543-B



EYP-DFB-0760-00040-1500-TOC03-0005

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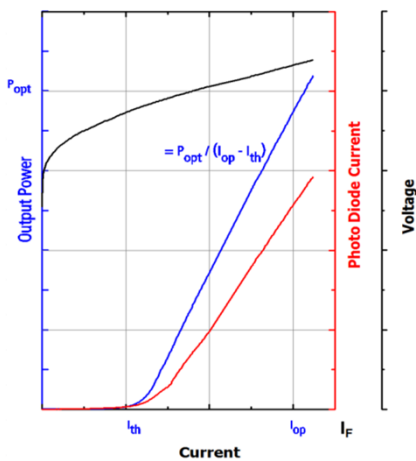
2020-04-30

SINGLE FREQUENCY LASER DIODES

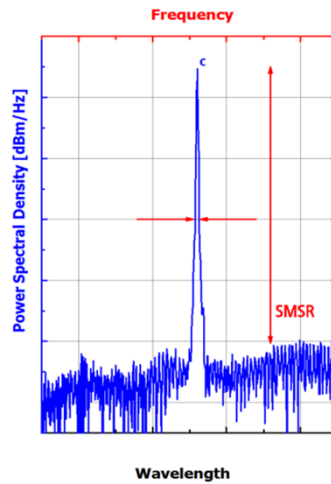
Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

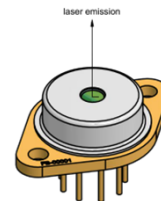
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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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Complies with 21 CFR 1040.10 and 1040.40

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Revision 0.82

2020-04-30

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
760 nm DFB Laser	Oxygen Detection
with hermetic 8 Pin TO Package	
including Monitor Diode, Thermoelectric Cooler and Thermistor	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-20		75
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	10		50
Forward Current	I_F	mA			130
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			60
TEC Current	I_{TEC}	A			1.0
TEC Voltage	V_{TEC}	V			1.0

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	-20		65
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	10		35
Forward Current	I_F	mA			120
Output Power	P_{opt}	mW	10		40

Measurement Conditions / Comments

measured by integrated thermistor

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	759.9	760.9	761.9
Target Wavelength	λ_T	nm		760.9	
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Sidemode Suppression Ratio	SMSR	dB	30	50	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.002	

Measurement Conditions / Comments

see images on page 4

reached within $T_{LD} = 10^{\circ}\text{C}$ and 35°C at 40 mW

$P_{opt} = 40\text{ mW}$

$P_{opt} = 40\text{ mW}$

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SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ} \text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Mode-hop free Tuning Range	$\Delta\lambda_{\text{tune}}$	pm	40		
Laser Current @ $P_{\text{opt}} = 40 \text{ mW}$	I_{LD}	mA			120
Slope Efficiency	η	W / A	0.6	0.8	1.3
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	$^{\circ}$		8	
Divergence perpendicular (FWHM)	Θ_{\perp}	$^{\circ}$		21	
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments

at target wavelength

parallel to Pin 1 - Pin 6 plane (see p. 3)

perpendicular to Pin 1 - Pin 6 plane (see p. 3)

 $P_{\text{opt}} = 40 \text{ mW}$; E field perpendicular to Pin 1 - 6 plane

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	$I_{\text{mon}} / P_{\text{opt}}$	$\mu\text{A/mW}$		2	

Measurement Conditions / Comments

 $U_R = 5 \text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.4	
Power Dissipation (total loss at case)	P_{loss}	W		0.4	
Temperature Difference	ΔT	K			40

Measurement Conditions / Comments

 $P_{\text{opt}} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{\text{opt}} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{\text{opt}} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{\text{opt}} = 40 \text{ mW}$, $\Delta T = |T_{\text{case}} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	k Ω		10	
Beta Coefficient	β			3930	
Steinhart & Hart Coefficient A	A			1.029×10^{-3}	
Steinhart & Hart Coefficient B	B			2.510×10^{-4}	
Steinhart & Hart Coefficient C	C			1.051×10^{-7}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ} \text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ} \text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

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Revision 0.82

2020-04-30

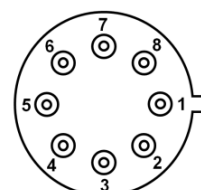
SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Pin Assignment

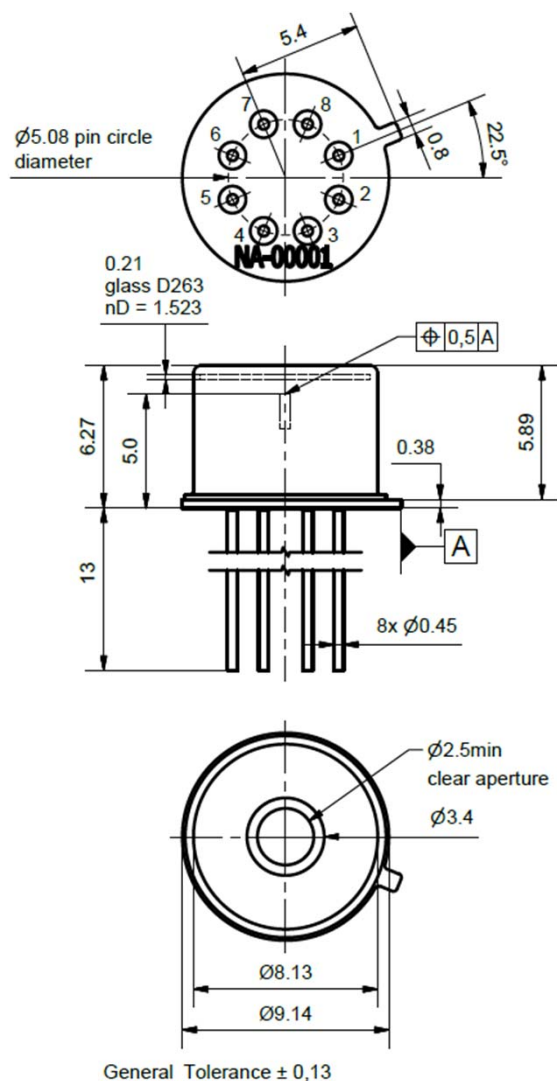
1 Laser Diode Anode	5 Thermistor
2 Laser Diode Cathode	6 Thermistor
3 Thermoelectric Cooler (-)	7 Photo Diode Anode
4 Thermoelectric Cooler (+)	8 Photo Diode Cathode

All 8 pins are isolated from case.



bottom view

Package Drawings



AIZ-19-0129-1426B

EYP-DFB-0760-00040-1500-TOV01-0005

Revision 0.82

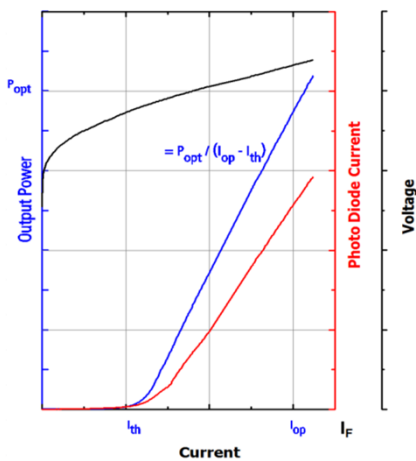
2020-04-30

SINGLE FREQUENCY LASER DIODES

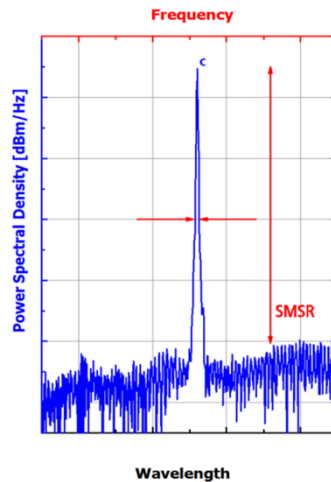
Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

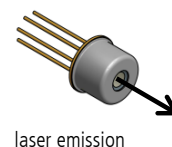
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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Revision 1.00

2022-12-20

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser



General Product Information

Product	Application
780 nm DFB Laser	Spectroscopy (Rb D2 line)
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	THz Generation
with PM Fiber, integrated μ -Isolator and Angled Physical Contact (APC)	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-15		70
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	5		50
Forward Current	I_F	mA			220
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			20
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	5		60
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	5		45
Forward Current	I_F	mA			200
Output Power	P_{opt}	mW	5		20

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Target Wavelength	λ_T	nm		780.24	
Linewidth (FWHM)	$\Delta\lambda$	MHz		0.6	1
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	20		
Sidemode Suppression Ratio	SMSR	dB	30	45	

Measurement Conditions / Comments

see images on page 4

reached within $T_{LD} = 5^{\circ} \dots 45^{\circ}\text{C}$ at 20 mW

$P_{opt} = 20\text{ mW}$

> 10 GHz, at target wavelength

$P_{opt} = 20\text{ mW}$

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser



Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Laser Current @ $P_{opt} = 20\text{ mW}$	I_{LD}	mA			200
Slope Efficiency	η	W / A		0.2	
Threshold Current	I_{th}	mA			70
Polarization Extinction Ratio	PER	dB		20	

Measurement Conditions / Comments

exfiber

 $P_{opt} = 20\text{ mW}$

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	5		100

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		1.5	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			55

Measurement Conditions / Comments

 $P_{opt} = 20\text{ mW}$, $\Delta T = 30\text{ K}$ $P_{opt} = 20\text{ mW}$, $\Delta T = 30\text{ K}$ $P_{opt} = 20\text{ mW}$, $\Delta T = 30\text{ K}$ $P_{opt} = 20\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	k Ω		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}\text{C}$ $R_1 / R_2 = e^{\beta (1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

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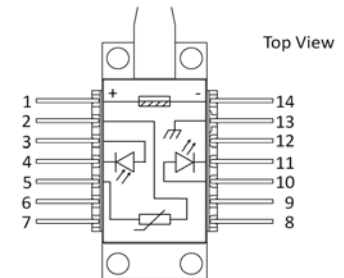
SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

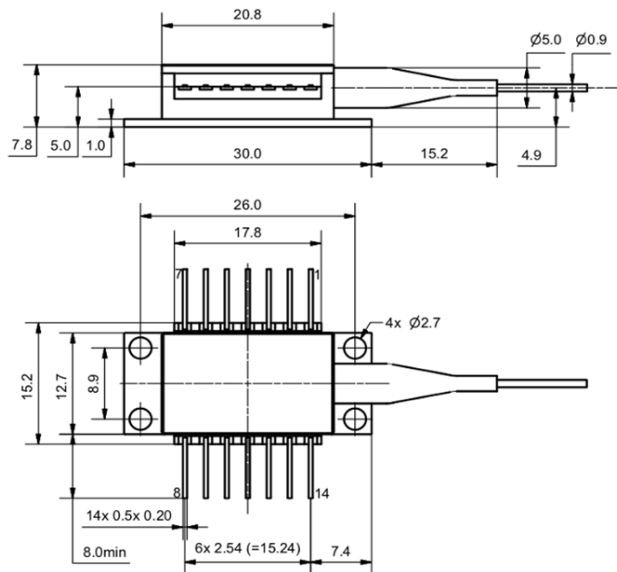


Pin Assignment

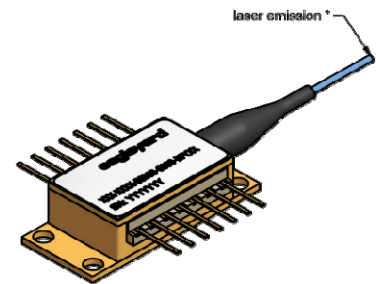
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



Package Drawings



AIZ-16-0222-1415



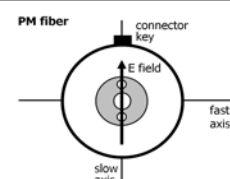
Caution. Excessive mechanical stress on the package can lead to a damage of the laser.

See [instruction manual](#) on www.eagleyard.com

Fiber and Connector Type

PM Fiber	900 / 125 / 5.5 μ m, UV/Polyester-elastomer Coating (l = 1 +/-0.1 m)
Connector	FC/APC (narrow key / 2mm) other types on request

Measurement Conditions / Comments



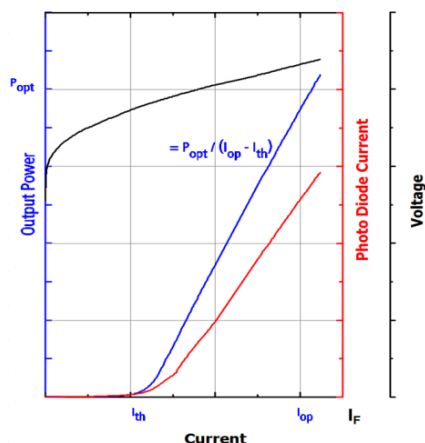
SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

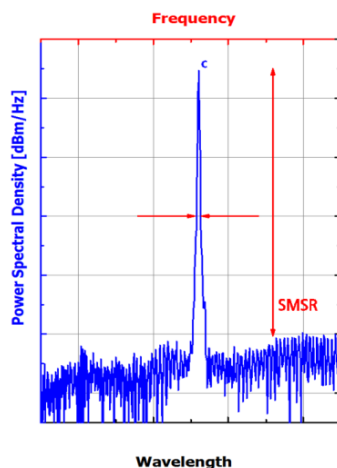


Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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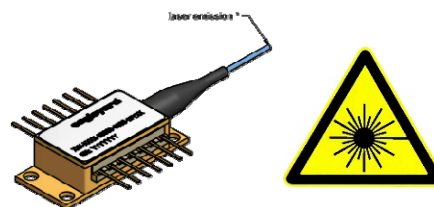
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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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Revision 0.92

2022-01-19

SINGLE FREQUENCY LASER DIODES Distributed Feedback Laser

General Product Information

Product	Application
780 nm DFB Laser	Spectroscopy (Rb D2 line)
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	THz Generation
with integrated μ Isolator and Beam Collimation	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-40		85
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	5		50
Forward Current	I_F	mA			190
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			50
TEC Current	I_{TEC}	A			1.1
TEC Voltage	V_{TEC}	V			2.8

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	-20		65
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	5		45
Forward Current	I_F	mA			180
Output Power	P_{opt}	mW	10		40

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Target Wavelength	λ_T	nm		780.24	
Linewidth (FWHM)	$\Delta\lambda$	MHz		0.6	1
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	25		
Sidemode Suppression Ratio	SMSR	dB	30	50	

Measurement Conditions / Comments

see images on page 4

reached within $T_{LD} = 5^{\circ} \dots 45^{\circ}\text{C}$ at 40 mW

$P_{opt} = 80\text{ mW}$

> 10 GHz, at target wavelength

$P_{opt} = 40\text{ mW}$

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Revision 0.92

2022-01-19

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Laser Current @ $P_{opt} = 40\text{ mW}$	I_{LD}	mA			180
Slope Efficiency	η	W / A	0,3	0,4	0.6
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	°		0.1	
Divergence perpendicular (FWHM)	Θ_{\perp}	°		0.1	
Beam Diameter horizontal	$d_{ }$	mm		1.0	1.2
Beam Diameter vertical	d_{\perp}	mm		0.8	1.2
Degree of Polarization	DOP	%		95	

Measurement Conditions / Comments

parallel to the base plate of the housing (see p. 3)
 perpendicular to base plate of the housing (see p. 3)
 parallel to the base plate of the housing (see p. 3)
 perpendicular to base plate of the housing (see p. 3)
 $P_{opt} = 40\text{ mW}$; slant polarization (45°), see p. 3

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	2		40

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		1.3	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

 $P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 40\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	k Ω		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}\text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

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Revision 0.92

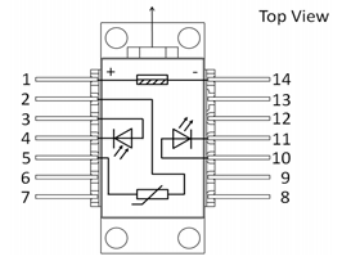
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SINGLE FREQUENCY LASER DIODES

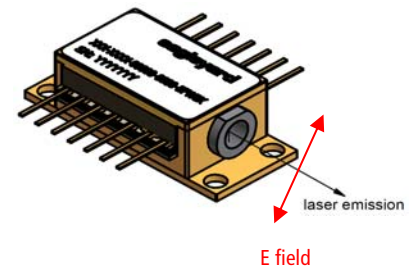
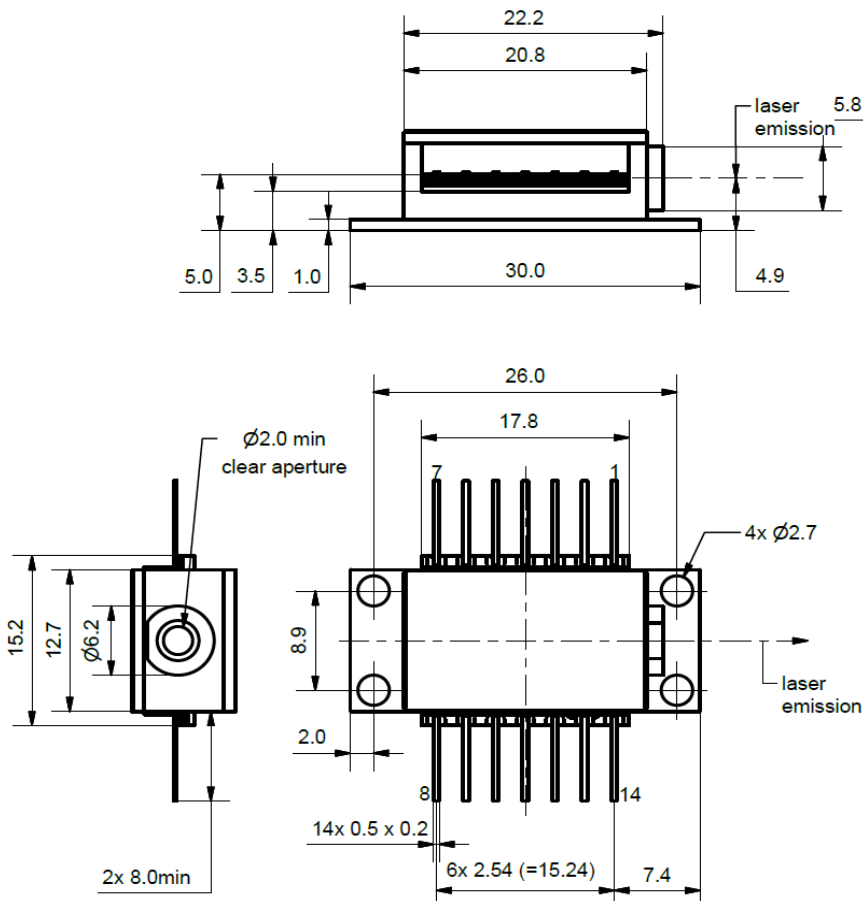
Distributed Feedback Laser

Pin Assignment

1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



Package Drawings



Caution. Excessive mechanical stress on the package can lead to a damage of the laser.

See [instruction manual](#) on www.eagleyard.com

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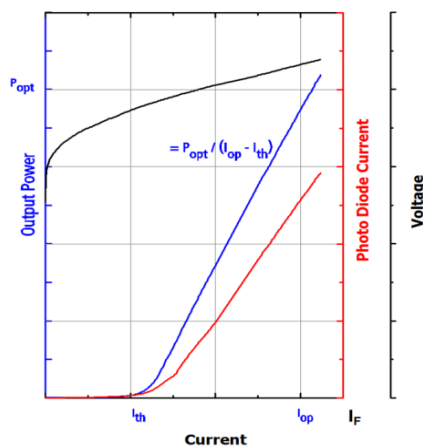
Revision 0.92

2022-01-19

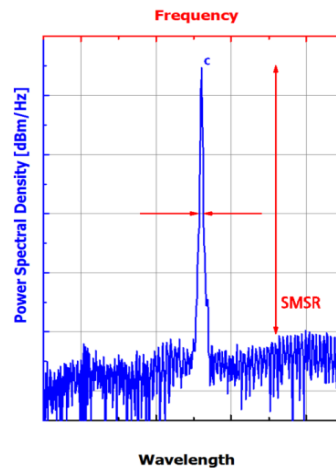
SINGLE FREQUENCY LASER DIODES Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

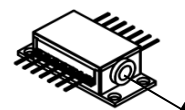
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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.



Laser Emission



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Revision 1.01

2017-03-02

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
780 nm DFB Laser	Spectroscopy
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	
with PM Fiber and angle-polished Connector (APC)	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-40		85
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	10		50
Forward Current	I_F	mA			160
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			50
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	-20		65
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$		25	
Forward Current	I_F	mA			140
Output Power	P_{opt}	mW		40	

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics at $T_{LD} = 25^{\circ}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Sidemode Suppression Ratio	SMSR	dB	30	45	

Measurement Conditions / Comments

see images on page 4

40 mW

$P_{opt} = 40 \text{ mW}$

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Revision 1.01

2017-03-02

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}$ at BOL cont'd

Parameter	Symbol	Unit	min	typ	max
Laser Current @ $P_{opt} =$ mW	I_{LD}	mA			140
Slope Efficiency	η	W / A	0.15	0.5	0.8
Threshold Current	I_{th}	mA			70
Polarization Extinction Ratio	PER	dB		15	

Measurement Conditions / Comments

ex fiber

 $P_{opt} = 40$ mW

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu A / mW$	1		20

Measurement Conditions / Comments

 $U_R = 5$ V

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.8	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

 $P_{opt} = 40$ mW, $\Delta T = 20$ K $P_{opt} = 40$ mW, $\Delta T = 20$ K $P_{opt} = 40$ mW, $\Delta T = 20$ K $P_{opt} = 40$ mW, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	k Ω		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}$ C $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}$ C $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

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Revision 1.01

2017-03-02

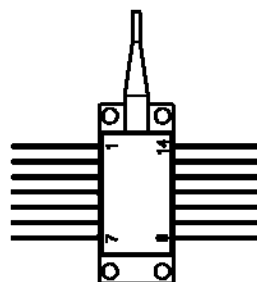
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Distributed Feedback Laser

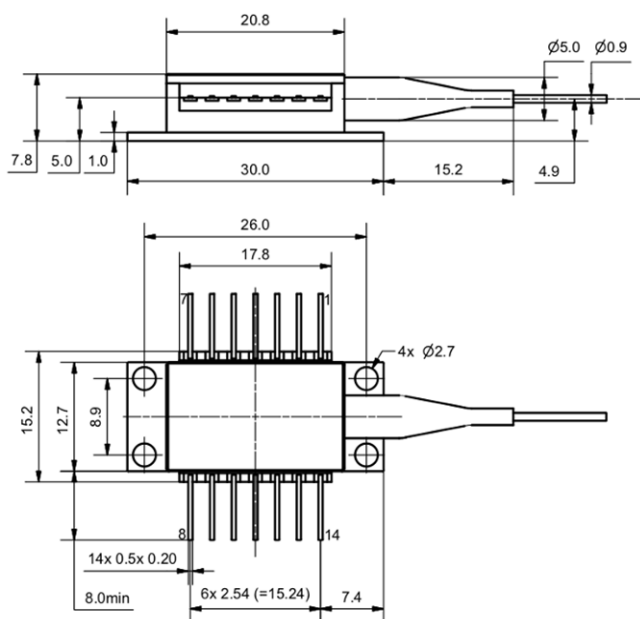
Pin Assignment

1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected

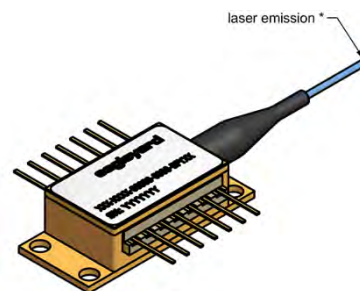
All 14 pins are isolated from case.



Package Drawings



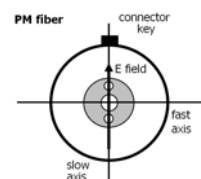
AIZ-16-0222-1415



Fiber and Connector Type

PM Fiber	900 / 125 / 5.5 μm , UV/Polyester-elastomer Coating ($l = 1 \pm 0.1 \text{ m}$)
Connector	different variants available

Measurement Conditions / Comments



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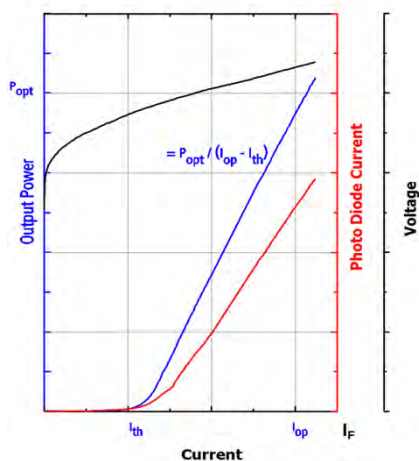
2017-03-02

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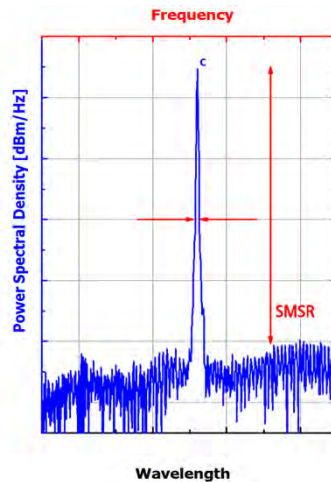
Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

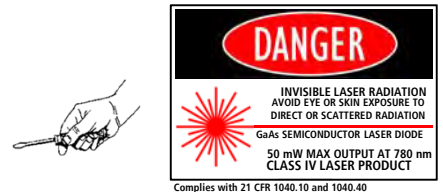
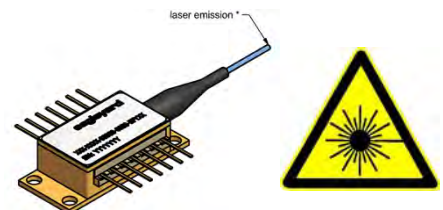
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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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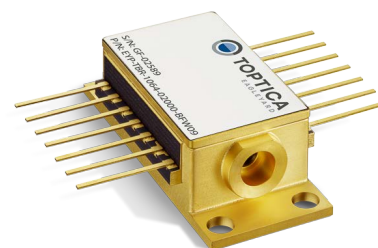
2020-11-11

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
Tunable 780 nm DFB Laser	Spectroscopy
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	THz Generation
with integrated Beam Collimation	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-40		85
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	10		50
Forward Current	I_F	mA			190
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			90
TEC Current	I_{TEC}	A			1.1
TEC Voltage	V_{TEC}	V			2.8

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	-20		65
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	15		45
Forward Current	I_F	mA			180
Output Power	P_{opt}	mW	20		80

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm		1500	
Sidemode Suppression Ratio	SMSR	dB	30	50	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	

Measurement Conditions / Comments

see images on page 4

$P_{opt} = 80\text{ mW}$

reached by temperature modulation

$P_{opt} = 80\text{ mW}$

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2020-11-11

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Mode-hop free Temperature Range	T_{LD}	$^{\circ}\text{C}$	15		40
Mode-hop free Power Range	P_{opt}	mW	20		80
Laser Current @ $P_{opt} = 80\text{ mW}$	I_{LD}	mA			180
Slope Efficiency	η	W / A	0.6	0.8	1.1
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	$^{\circ}$		0.1	
Divergence perpendicular (FWHM)	Θ_{\perp}	$^{\circ}$		0.1	
Beam Diameter horizontal ($1/e^2$)	$d_{ }$	mm		1.0	1.2
Beam Diameter vertical ($1/e^2$)	d_{\perp}	mm		0.8	1.2

Measurement Conditions / Comments

Temperature at Laser Chip

parallel to the base plate of the housing (see p. 3)

perpendicular to base plate of the housing (see p. 3)

parallel to the base plate of the housing (see p. 3)

perpendicular to base plate of the housing (see p. 3)

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	1		20

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		1.3	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

 $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}\text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

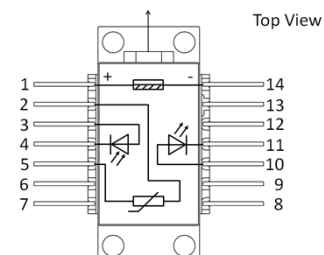
SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

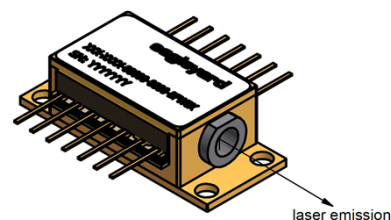
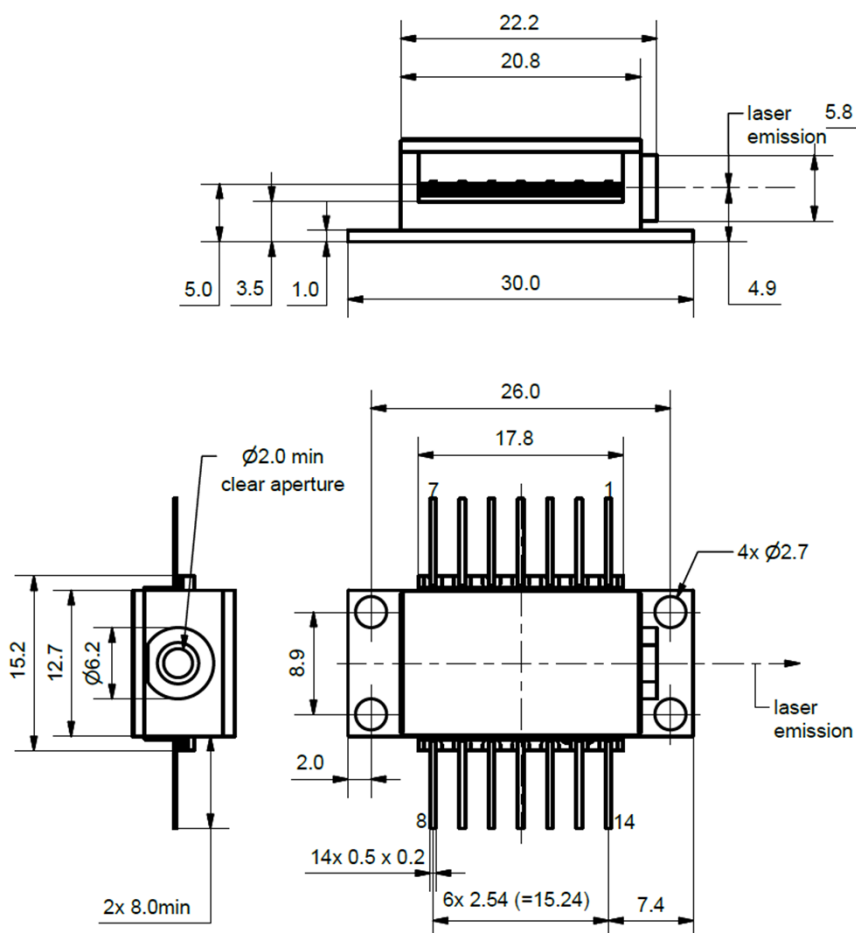
Pin Assignment

1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected

Pins are isolated from case unless noted otherwise.



Package Drawings



Caution. Excessive mechanical stress on the package can lead to a damage of the laser.

See [instruction manual](#) on www.eagleyard.com

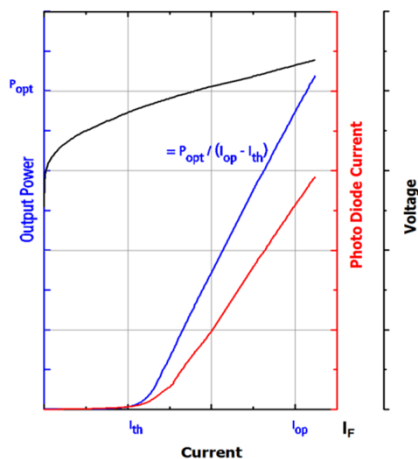
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SINGLE FREQUENCY LASER DIODES

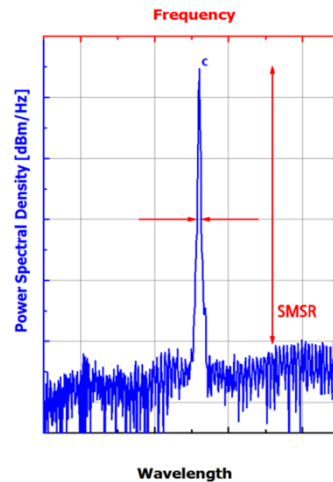
Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

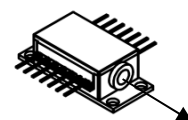
Unpacking, Installation and Laser Safety

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.

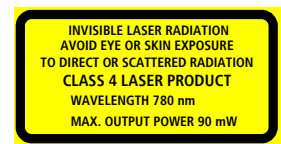
The DFB laser is sensitive against optical feedback, so an optical isolator may be required in order to avoid any disturbance of the emission spectrum. Operating at moderate temperatures on proper heat sinks will contribute to a long lifetime of the diode.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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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SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

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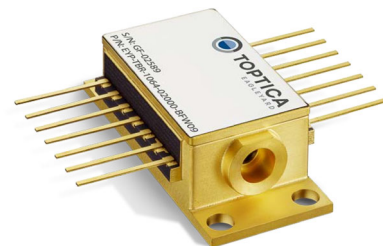
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General Product Information

Product	Application
780 nm DFB Laser	Spectroscopy (Rb D2 line)
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	THz Generation
with integrated Beam Collimation	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	°C	-40		85
Operational Temperature at Case	T_C	°C	-40		85
Operational Temperature at Laser Chip	T_{LD}	°C	5		50
Forward Current	I_F	mA			190
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			90
TEC Current	I_{TEC}	A			1.1
TEC Voltage	V_{TEC}	V			2.8

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	°C	-20		65
Operational Temperature at Laser Chip	T_{LD}	°C	5		45
Forward Current	I_F	mA			180
Output Power	P_{opt}	mW	20		80

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics at $T_{LD} = 25^\circ\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Target Wavelength	λ_T	nm		780.24	
Linewidth (FWHM)	$\Delta\lambda$	MHz		0.6	1
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	25		
Sidemode Suppression Ratio	SMSR	dB	30	50	

Measurement Conditions / Comments

see images on page 4

reached within $T_{LD} = 5^\circ \dots 45^\circ\text{C}$ at 80 mW

$P_{opt} = 80\text{ mW}$

> 10 GHz, at target wavelength

$P_{opt} = 80\text{ mW}$

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2022-01-19

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Laser Current @ $P_{opt} = 80\text{ mW}$	I_{LD}	mA			180
Slope Efficiency	η	W / A	0.6	0.8	1.1
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	°		0.1	
Divergence perpendicular (FWHM)	Θ_{\perp}	°		0.1	
Beam Diameter horizontal	$d_{ }$	mm		1.0	1.2
Beam Diameter vertical	d_{\perp}	mm		0.8	1.2
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments

parallel to the base plate of the housing (see p. 3)
 perpendicular to base plate of the housing (see p. 3)
 parallel to the base plate of the housing (see p. 3)
 perpendicular to base plate of the housing (see p. 3)
 $P_{opt} = 80\text{ mW}$; E field perpendicular to the base plate

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	1		20

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		1.3	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

$P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 80\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

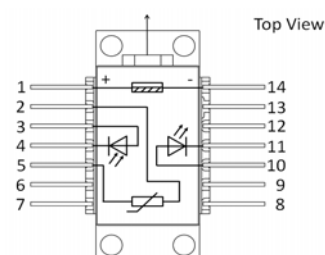
Measurement Conditions / Comments

$T_{LD} = 25^{\circ}\text{C}$
 $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$
 $1/T = A + B(\ln R) + C(\ln R)^3$
 T: temperature in Kelvin
 R: resistance at T in Ohm

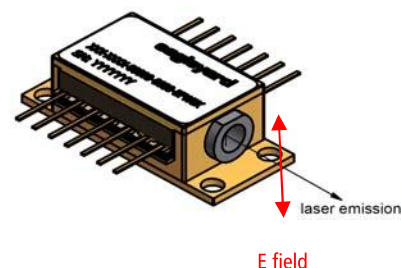
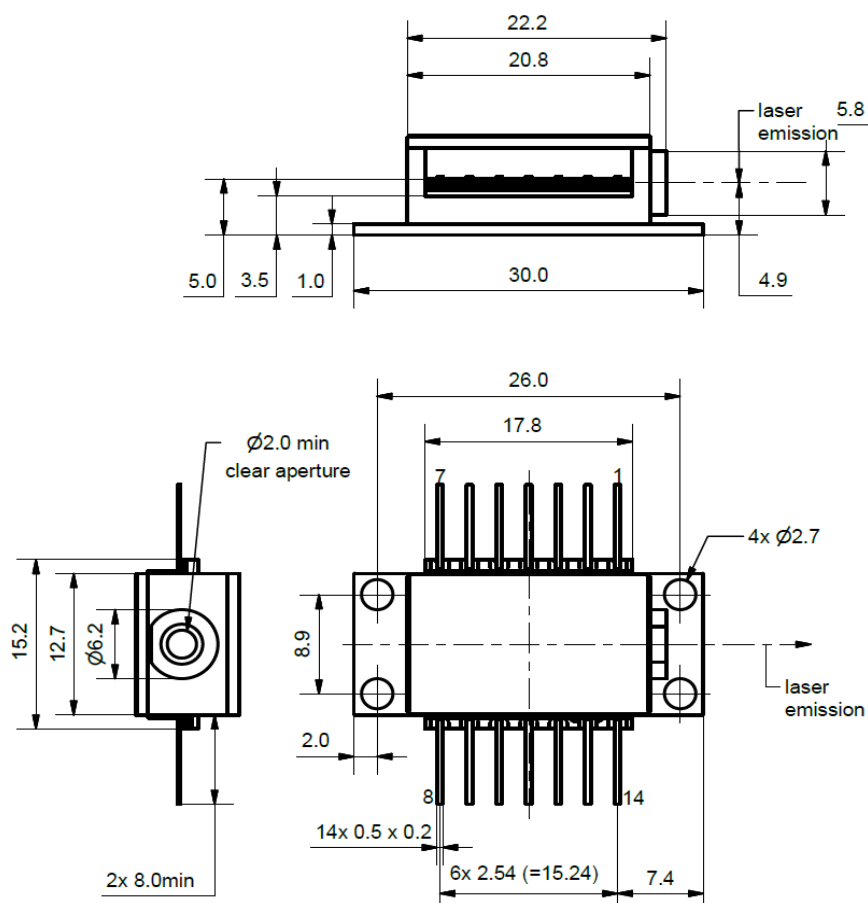
SINGLE FREQUENCY LASER DIODES

Pin Assignment

1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



Package Drawings



Caution. Excessive mechanical stress on the package can lead to a damage of the laser.

See [instruction manual](#) on www.eagleyard.com

AIZ-20-1029-0928

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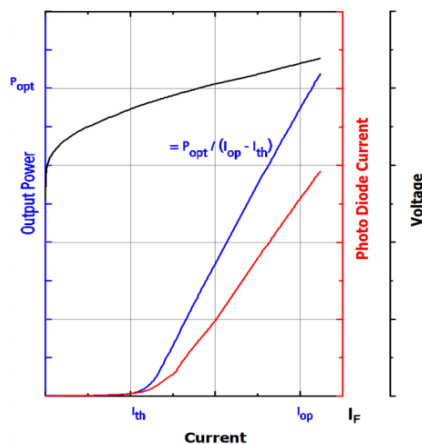
Revision 0.92

2022-01-19

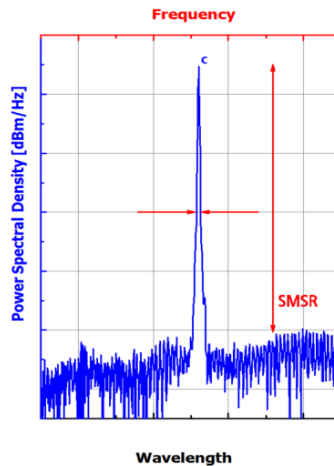
SINGLE FREQUENCY LASER DIODES Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

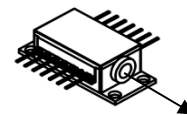
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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.



Laser Emission



IEC-60825-1



Distributor



amSTECHNOLOGIES
where technologies meet solutions

info@amstechnologies.com
www.amstechnologies-webshop.com

Contact us 

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Revision 1.02

2018-03-21

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
780 nm DFB Laser	Spectroscopy
with hermetic 8-Pin TO Package (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	THz Generation

Absolute Maximum Ratings

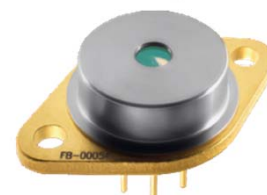
Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-20		75
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	0		50
Forward Current	I_F	mA			200
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			100
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	-20		65
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	5		40
Forward Current	I_F	mA			180
Output Power	P_{opt}	mW	20		80

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Sidemode Suppression Ratio	SMSR	dB	30	45	



Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Measurement Conditions / Comments

measured by integrated Thermistor

Measurement Conditions / Comments

see images on page 4

$P_{opt} = 80\text{ mW}$

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SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Laser Current @ $P_{opt} = 80\text{ mW}$	I_{LD}	mA			180
Slope Efficiency	η	W / A	0.6	0.8	1.1
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	°		8	
Divergence perpendicular (FWHM)	Θ_{\perp}	°		21	
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments

parallel to short axis of the housing (see p. 3)
parallel to long axis of the housing (see p. 3)
80 mW; E field parallel to long axis of housing

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A}/\text{mW}$	1		20

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.8	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

$P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$
 $P_{opt} = 80\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

$T_{LD} = 25^{\circ}\text{C}$
 $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$
 $1/T = A + B(\ln R) + C(\ln R)^3$
T: temperature in Kelvin
R: resistance at T in Ohm

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SINGLE FREQUENCY LASER DIODES

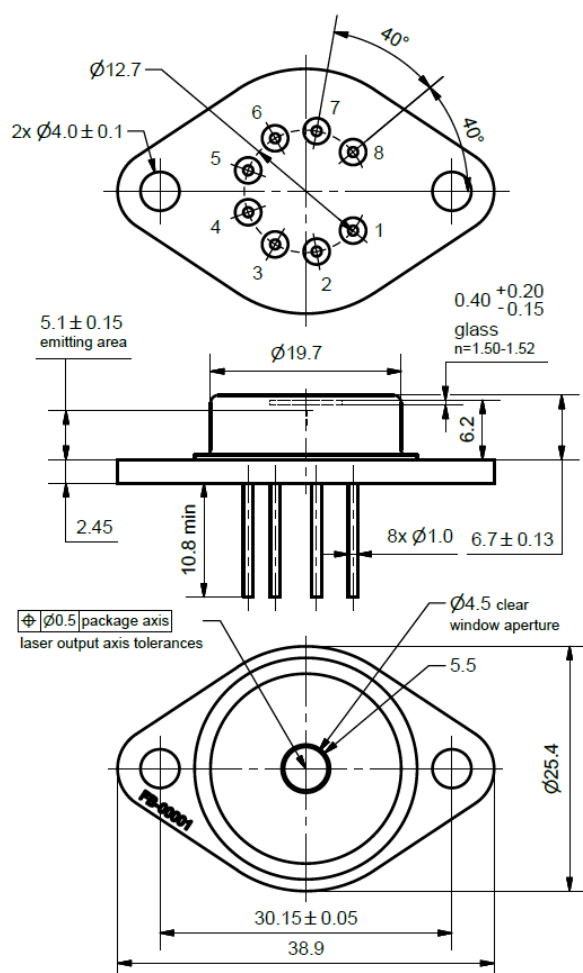
Distributed Feedback Laser

Pin Assignment

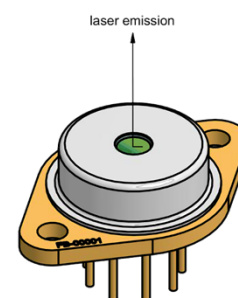
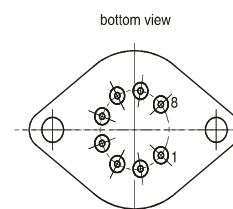
1 Thermoelectric Cooler (+)	5 Laser Diode Anode
2 Thermistor	6 Monitor Diode Anode
3 Thermistor	7 Photo Diode Cathode
4 Laser Diode Cathode	8 Thermoelectric Cooler (-)

All 8 pins are isolated from case.

Package Drawings



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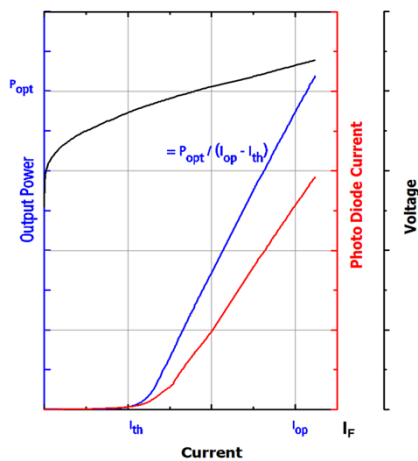
2018-03-21

SINGLE FREQUENCY LASER DIODES

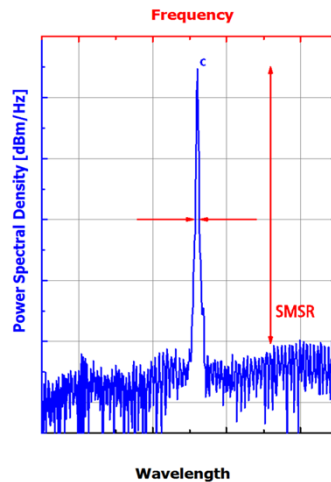
Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

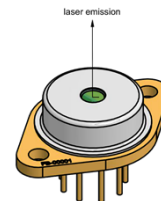
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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.



IEC-60825-0



Complies with 21 CFR 1040.10 and 1040.40

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SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
Tunable 780 nm DFB Laser	Spectroscopy
with hermetic 8-Pin TO Package (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	THz Generation

Absolute Maximum Ratings

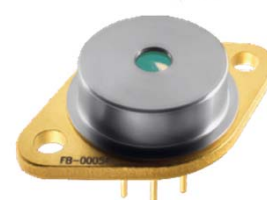
Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-20		75
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	0		50
Forward Current	I_F	mA			200
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			100
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	-20		65
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	5		40
Forward Current	I_F	mA			180
Output Power	P_{opt}	mW	20		80

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm		1500	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Sidemode Suppression Ratio	SMSR	dB	30	45	



Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Measurement Conditions / Comments

measured by integrated Thermistor

Measurement Conditions / Comments

see images on page 4

reached by temperature modulation

$P_{opt} = 80\text{ mW}$

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SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL cont'd

Parameter	Symbol	Unit	min	typ	max
Mode-hop free Temperature Range	T_{LD}	$^{\circ}\text{C}$	15		40
Mode-hop free Power Range	P_{opt}	mW	20		80
Laser Current @ $P_{opt} = 80\text{ mW}$	I_{LD}	mA			180
Slope Efficiency	η	W / A	0.6	0.8	1.1
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	$^{\circ}$		8	
Divergence perpendicular (FWHM)	Θ_{\perp}	$^{\circ}$		21	
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments

Temperature at Laser Chip

parallel to short axis of the housing (see p. 3)

parallel to long axis of the housing (see p. 3)

80 mW; E field parallel to long axis of housing

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A}/\text{mW}$	1		20

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.8	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

 $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	k Ω		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}\text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

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SINGLE FREQUENCY LASER DIODES

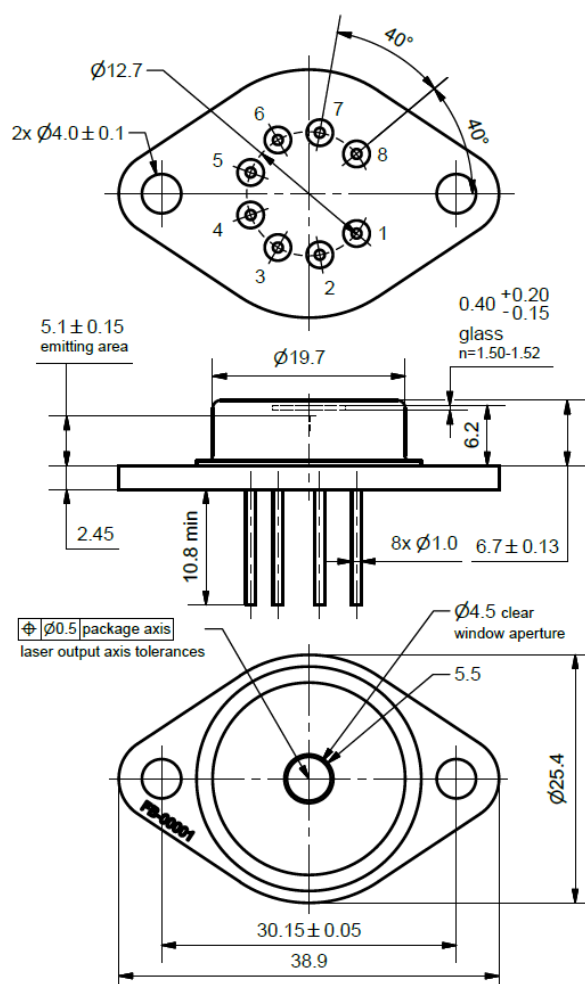
Distributed Feedback Laser

Pin Assignment

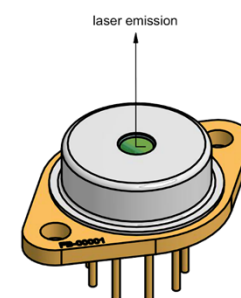
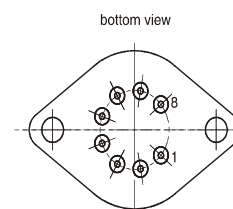
1 Thermoelectric Cooler (+)	5 Laser Diode Anode
2 Thermistor	6 Monitor Diode Anode
3 Thermistor	7 Photo Diode Cathode
4 Laser Diode Cathode	8 Thermoelectric Cooler (-)

All 8 pins are isolated from case.

Package Drawings



AIZ-16-311-1543-B



EYP-DFB-0780-00080-1500-TOC03-0002

Revision 1.02

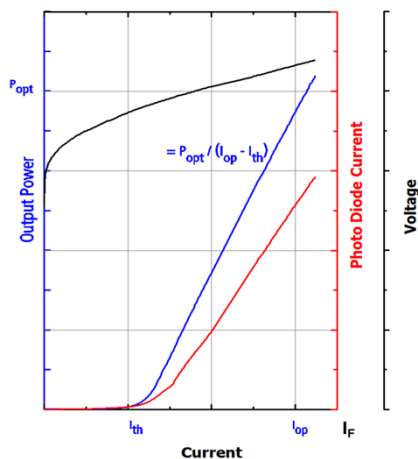
2018-03-21

SINGLE FREQUENCY LASER DIODES

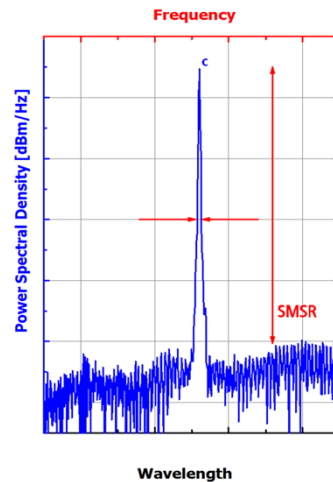
Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

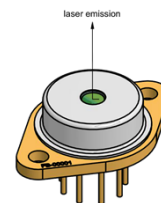
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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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Revision 1.03

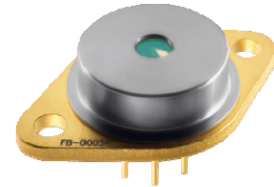
2022-01-19

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
780 nm DFB Laser	Spectroscopy (Rb D2 line)
with hermetic 8-Pin TO Package (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	THz Generation



Absolute Maximum Ratings

Parameter	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	0		50
Forward Current	I_F	mA			200
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			100
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	°C	-20		65
Operational Temperature at Laser Chip	T_{LD}	°C	5		40
Forward Current	I_F	mA			180
Output Power	P_{opt}	mW	20		80

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics at $T_{LD} = 25^\circ\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Target Wavelength	λ_T	nm		780.24	
Linewidth (FWHM)	$\Delta\lambda$	MHz		0.6	1
Sidemode Suppression Ratio	SMSR	dB	30	45	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	25		

Measurement Conditions / Comments

see images on page 4

reached within $T_{LD} = 5^\circ \dots 45^\circ\text{C}$ at 80 mW

$P_{opt} = 80\text{ mW}$

$P_{opt} = 80\text{ mW}$

> 10 GHz, at target wavelength

EYP-DFB-0780-00080-1500-TOC03-0005

Revision 1.03

2022-01-19

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Laser Current @ $P_{opt} = 80\text{ mW}$	I_{LD}	mA			180
Slope Efficiency	η	W / A	0.6	0.8	1.1
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	°		8	
Divergence perpendicular (FWHM)	Θ_{\perp}	°		21	
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments

parallel to short axis of the housing (see p. 3)

parallel to long axis of the housing (see p. 3)

 $P_{opt} = 80\text{ mW}$; E field parallel to long axis of housing

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	1		20

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.8	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

 $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 80\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	k Ω		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}\text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

EYP-DFB-0780-00080-1500-TOC03-0005

Revision 1.03

2022-01-19

SINGLE FREQUENCY LASER DIODES

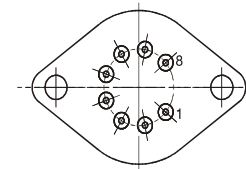
Distributed Feedback Laser

Pin Assignment

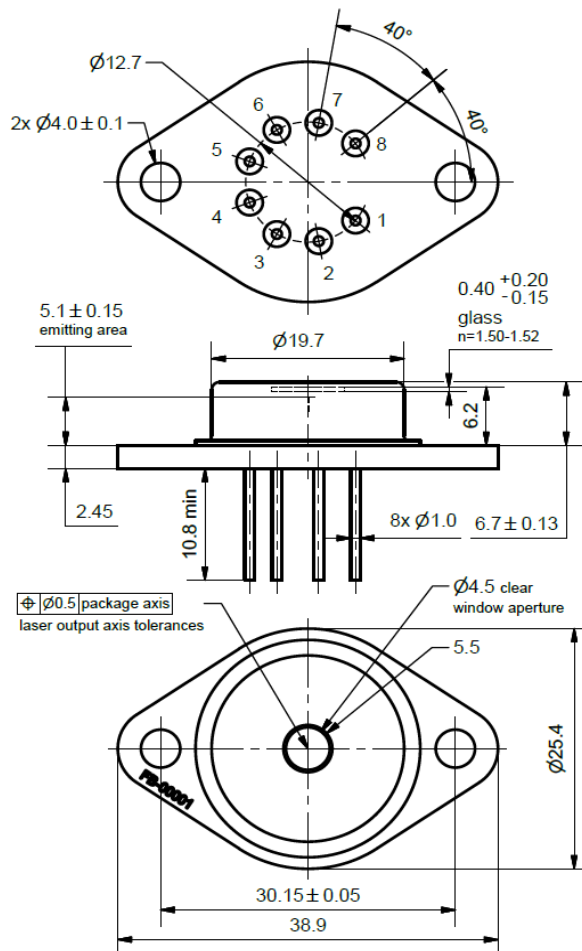
1 Thermoelectric Cooler (+)	5 Laser Diode Anode
2 Thermistor	6 Monitor Diode Anode
3 Thermistor	7 Photo Diode Cathode
4 Laser Diode Cathode	8 Thermoelectric Cooler (-)

All 8 pins are isolated from case.

bottom view

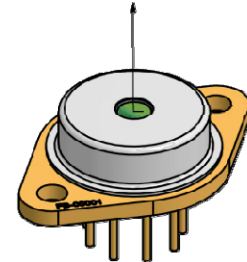


Package Drawings



AIZ-16-311-1543-8

laser emission



EYP-DFB-0780-00080-1500-TOC03-0005

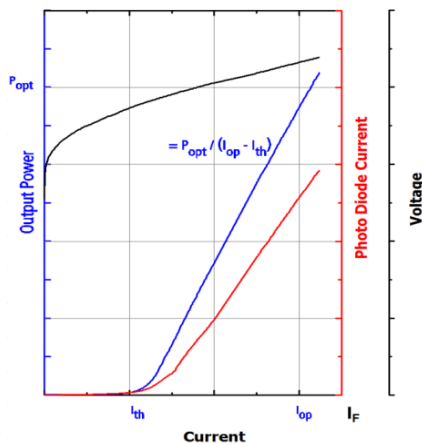
Revision 1.03

2022-01-19

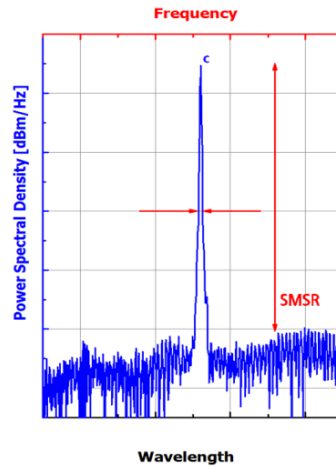
SINGLE FREQUENCY LASER DIODES Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

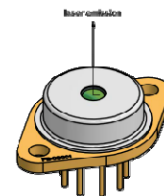
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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.



INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
CLASS 4 LASER PRODUCT
WAVELENGTH 780 nm
MAX. OUTPUT POWER 100 mW

IEC-60825-1



DANGER
INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
GaAs SEMICONDUCTOR LASER DIODE
100 mW MAX OUTPUT AT 780 nm
CLASS IV LASER PRODUCT
Complies with 21 CFR 1040.10 and 1040.40

EYP-DFB-0780-00080-1500-TOV01-0005

Revision 0.81

2022-01-19

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser



General Product Information

Product	Application
780 nm DFB Laser	Spectroscopy (Rb D2 line)
with hermetic 8-Pin TO Package (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	THz Generation

Absolute Maximum Ratings

Parameter	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	0		50
Forward Current	I_F	mA			200
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			100
TEC Current	I_{TEC}	A			1.0
TEC Voltage	V_{TEC}	V			1.0

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	°C	-20		65
Operational Temperature at Laser Chip	T_{LD}	°C	5		45
Forward Current	I_F	mA			180
Output Power	P_{opt}	mW	20		80

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics at $T_{LD} = 25^\circ\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	779	780	781
Target Wavelength	λ_T	nm		780.24	
Linewidth (FWHM)	$\Delta\lambda$	MHz		0.6	1
Sidemode Suppression Ratio	SMSR	dB	30	45	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	

Measurement Conditions / Comments

see images on page 4

reached within $T_{LD} = 5^\circ \dots 45^\circ\text{C}$ at 80 mW

$P_{opt} = 80\text{ mW}$

$P_{opt} = 80\text{ mW}$

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Revision 0.81

2022-01-19

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Mode-hop free Tuning Range	$\Delta\lambda_{\text{tune}}$	pm	25		
Laser Current @ $P_{\text{opt}} = 80\text{ mW}$	I_{LD}	mA			180
Slope Efficiency	η	W / A	0.6	0.8	1.1
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	°		8	
Divergence perpendicular (FWHM)	Θ_{\perp}	°		21	
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments

> 10 GHz, at target wavelength

parallel to Pin 1 - Pin 6 plane (see p. 3)

perpendicular to Pin 1 - Pin 6 plane (see p. 3)

 $P_{\text{opt}} = 80\text{ mW}$; E field perpendicular to Pin 1 - 6 plane

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	$I_{\text{mon}} / P_{\text{opt}}$	$\mu\text{A/mW}$		t.b.d.	

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.4	
Power Dissipation (total loss at case)	P_{loss}	W		0.4	
Temperature Difference	ΔT	K			40

Measurement Conditions / Comments

 $P_{\text{opt}} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{\text{opt}} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{\text{opt}} = 80\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{\text{opt}} = 80\text{ mW}$, $\Delta T = |T_{\text{case}} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	k Ω		10	
Beta Coefficient	β			3930	
Steinhart & Hart Coefficient A	A			1.029×10^{-3}	
Steinhart & Hart Coefficient B	B			2.510×10^{-4}	
Steinhart & Hart Coefficient C	C			1.051×10^{-7}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}\text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

EYP-DFB-0780-00080-1500-TOV01-0005

Revision 0.81

2022-01-19

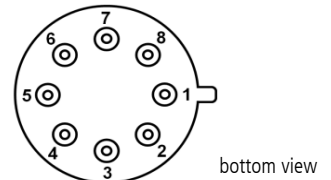
SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

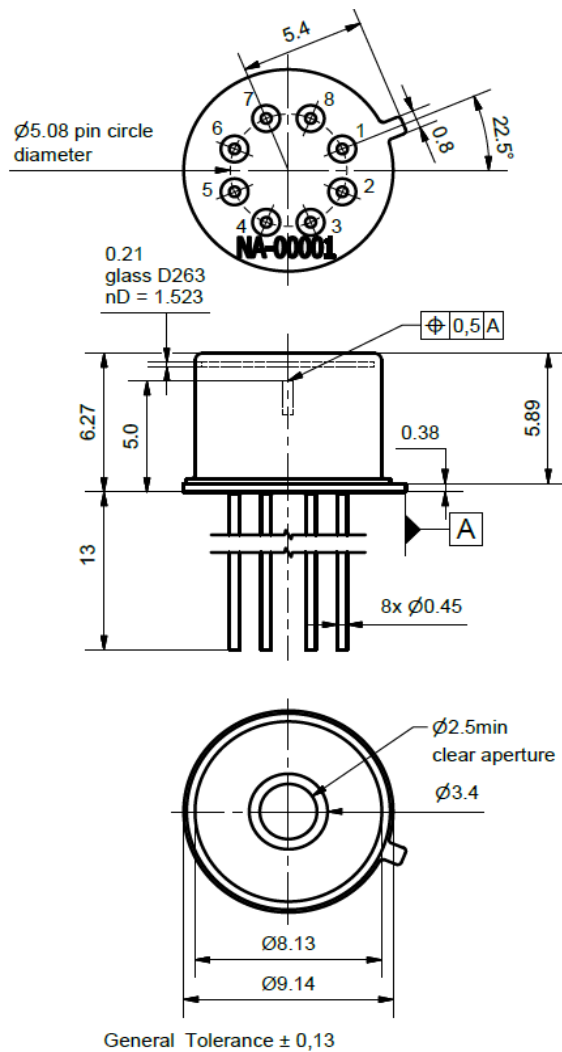
Pin Assignment

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

All 8 pins are isolated from case.



Package Drawings



AIZ-19-0129-14268

EYP-DFB-0780-00080-1500-TOV01-0005

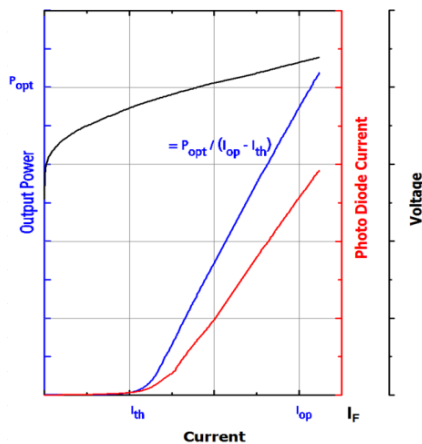
Revision 0.81

2022-01-19

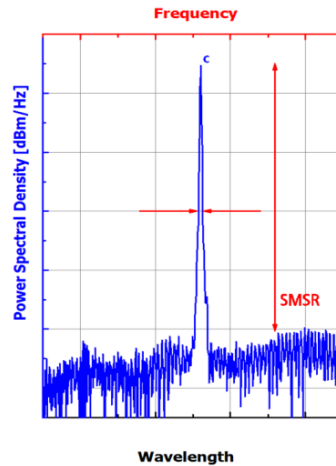
SINGLE FREQUENCY LASER DIODES Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

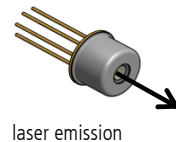
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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.



laser emission



IEC-60825-1



EYP-DFB-0785-00040-1500-BFY02-0000

Revision 0.94

2021-02-05

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
785 nm DFB Laser	Spectroscopy
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	
with PM Fiber and Angled Physical Contact (APC)	

Absolute Maximum Ratings

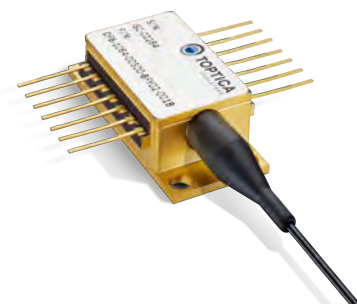
Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	°C	-40		85
Operational Temperature at Case	T_C	°C	-40		85
Operational Temperature at Laser Chip	T_{LD}	°C	10		50
Forward Current	I_F	mA			170
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			45
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	°C	-20		65
Operational Temperature at Laser Chip	T_{LD}	°C	15		45
Forward Current	I_F	mA			150
Output Power	P_{opt}	mW	10		40

Characteristics at $T_{LD} = 25^\circ \text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	784	785	786
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Sidemode Suppression Ratio	SMSR	dB		50	



Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Measurement Conditions / Comments

measured by integrated Thermistor

ex fiber

Measurement Conditions / Comments

see images on page 4

$P_{opt} = 40 \text{ mW}$

$P_{opt} = 40 \text{ mW}$

EYP-DFB-0785-00040-1500-BFY02-0000

Revision 0.94

2021-02-05

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Mode-hop free Temperature Range	T_{LD}	$^{\circ}\text{C}$			
Mode-hop free Power Range	P_{opt}	mW			
Laser Current @ $P_{opt} = 40\text{ mW}$	I_{LD}	mA			150
Slope Efficiency	η	W / A	0.2	0.4	0.7
Threshold Current	I_{th}	mA			70
Polarization Extinction Ratio	PER	dB		15	

Measurement Conditions / Comments

 $P_{opt} = 40\text{ mW}$

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	1		20

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.8	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

 $P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 40\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 40\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}\text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

EYP-DFB-0785-00040-1500-BFY02-0000

Revision 0.94

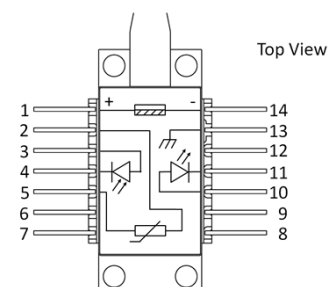
2021-02-05

SINGLE FREQUENCY LASER DIODES

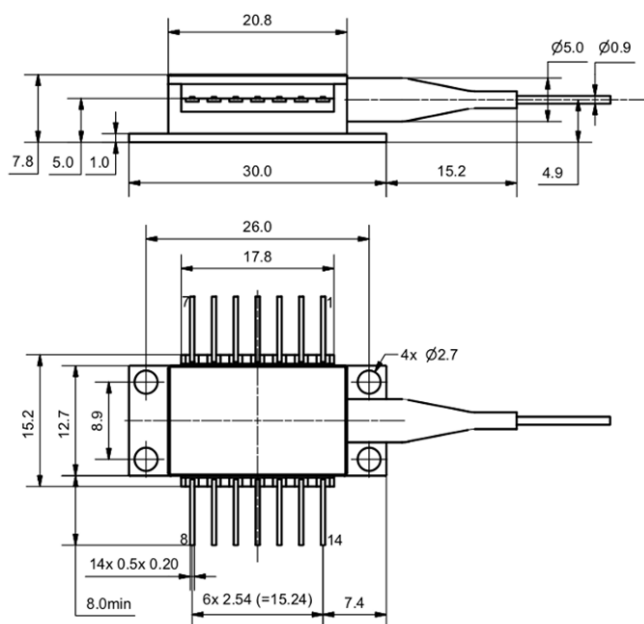
Distributed Feedback Laser

Pin Assignment

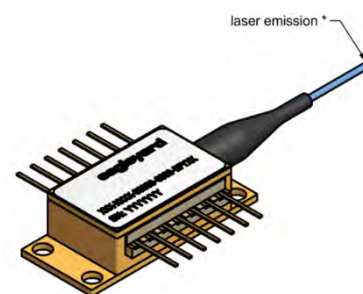
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



Package Drawings



AIZ-16-0222-1415



Caution. Excessive mechanical stress on the package can lead to a damage of the laser.

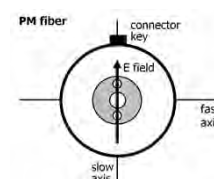
See [instruction manual](#) on www.eagleyard.com

Fiber and Connector Type

PM Fiber 900 / 125 / 5.5 μ m, UV/Polyester-elastomer Coating ($l = 1 \pm 0.1$ m)

Connector FC/APC (narrow key / 2mm)

Measurement Conditions / Comments



EYP-DFB-0785-00040-1500-BFY02-0000

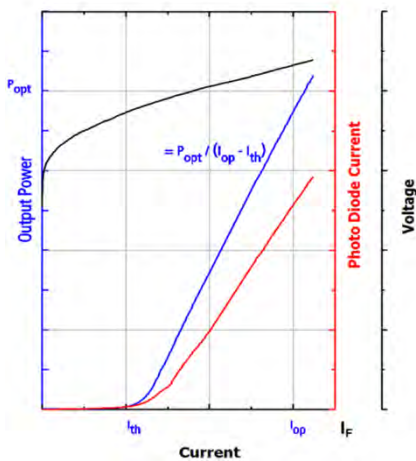
Revision 0.94

2021-02-05

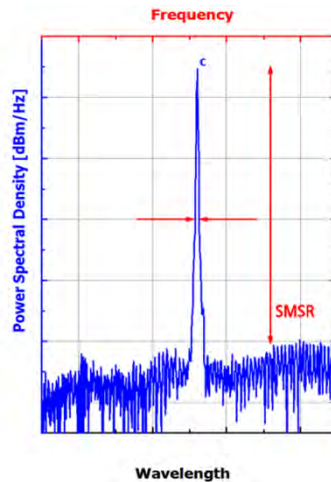
SINGLE FREQUENCY LASER DIODES Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

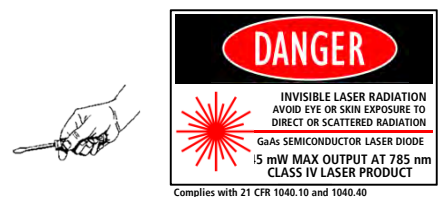
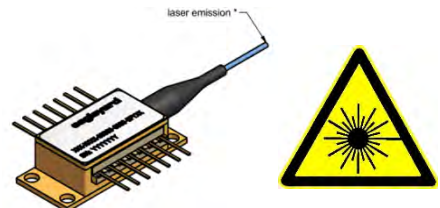
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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.



EYP-DFB-0785-00040-1500-BFY02-0002

Revision 0.94

2021-02-05

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
Tunable 785 nm DFB Laser	Spectroscopy
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	
with PM Fiber and Angled Physical Contact (APC)	

Absolute Maximum Ratings

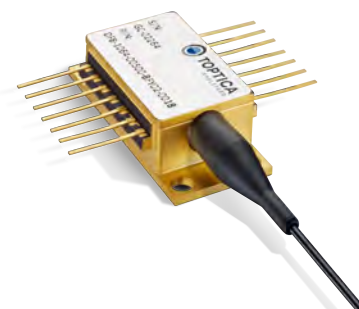
Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	°C	-40		85
Operational Temperature at Case	T_C	°C	-40		85
Operational Temperature at Laser Chip	T_{LD}	°C	10		50
Forward Current	I_F	mA			170
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			45
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	°C	-20		65
Operational Temperature at Laser Chip	T_{LD}	°C	15		45
Forward Current	I_F	mA			150
Output Power	P_{opt}	mW	10		40

Characteristics at $T_{LD} = 25^\circ \text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	784	785	786
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm		1500	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Sidemode Suppression Ratio	SMSR	dB		50	



Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Measurement Conditions / Comments

measured by integrated Thermistor

ex fiber

Measurement Conditions / Comments

see images on page 4

$P_{opt} = 40 \text{ mW}$

see note 1)

$P_{opt} = 40 \text{ mW}$

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser



Characteristics at $T_{LD} = 25^{\circ} \text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Mode-hop free Temperature Range	T_{LD}	$^{\circ} \text{C}$	15		45
Mode-hop free Power Range	P_{opt}	mW	10		40
Laser Current @ $P_{opt} = 40 \text{ mW}$	I_{LD}	mA			150
Slope Efficiency	η	W / A	0.2	0.4	0.7
Threshold Current	I_{th}	mA			70
Polarization Extinction Ratio	PER	dB		15	

Measurement Conditions / Comments

Temperature at Laser Chip

 $P_{opt} = 40 \text{ mW}$

1) This variant allows wavelength tuning by temperature or current variation; in case of external backreflections small mode-hops of 100 MHz or less may appear. The use of a BFW01 or TOC03 package variants and effective optical isolation is recommended for spectroscopic application requiring absolutely mode-hop-free tuning. A butterfly package with integrated isolator (BFY1x or BFW1x) is also available for some lasers.

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	1		20

Measurement Conditions / Comments

 $U_R = 5 \text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.8	
Power Dissipation (total loss at case)	P_{loss}	W		0.5	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments

 $P_{opt} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{opt} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{opt} = 40 \text{ mW}$, $\Delta T = 20 \text{ K}$ $P_{opt} = 40 \text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ} \text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ} \text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

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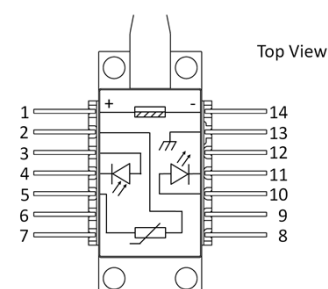
2021-02-05

SINGLE FREQUENCY LASER DIODES

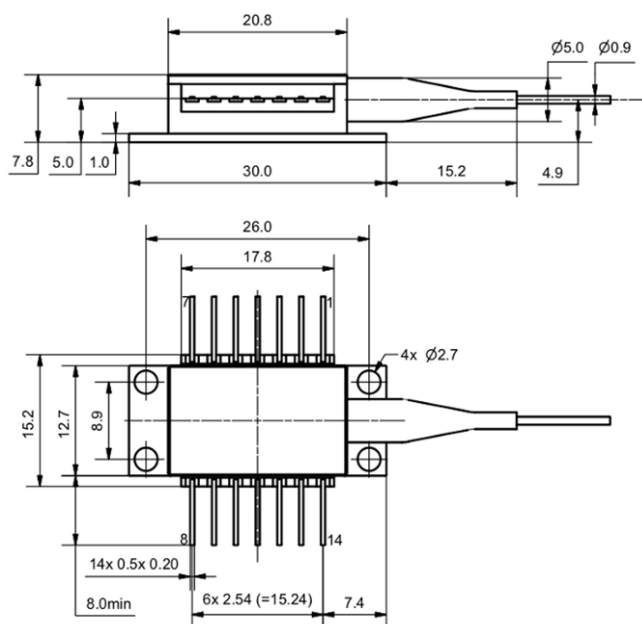
Distributed Feedback Laser

Pin Assignment

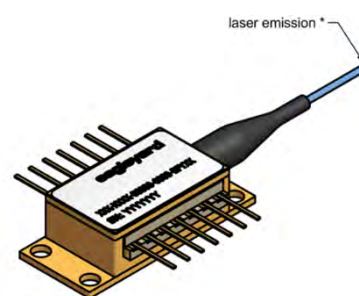
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



Package Drawings



AIZ-16-0222-1415



Caution. Excessive mechanical stress on the package can lead to a damage of the laser.

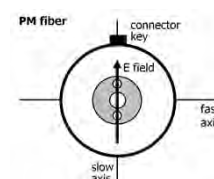
See [instruction manual](#) on www.eagleyard.com

Fiber and Connector Type

PM Fiber 900 / 125 / 5.5 μm , UV/Polyester-elastomer Coating ($l = 1 \pm 0.1 \text{ m}$)

Connector FC/APC (narrow key / 2mm)

Measurement Conditions / Comments



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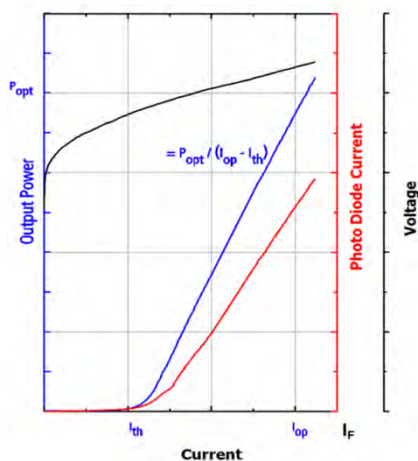
2021-02-05

SINGLE FREQUENCY LASER DIODES

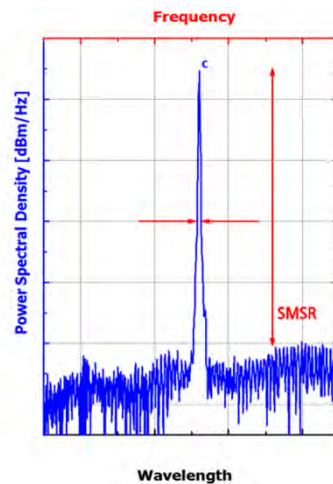
Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

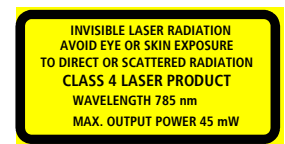
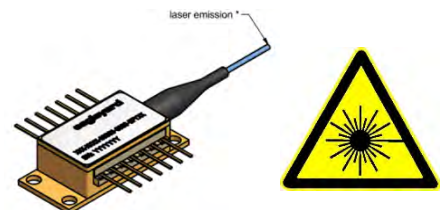
Unpacking, Installation and Laser Safety

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 DFB 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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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Complies with 21 CFR 1040.10 and 1040.40

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Revision 0.91

2021-01-07

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
785 nm DFB Laser	Raman Spectroscopy
with hermetic TO Package (RoHS compliant)	Metrology
including Monitor Diode	Interferometry



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	$^{\circ}\text{C}$	-40		85
Operational Temperature at Case	T_C	$^{\circ}\text{C}$	-20		75
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	0		50
Forward Current	I_F	mA			190
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			110
TEC Current	I_{TEC}	A			1.0
TEC Voltage	V_{TEC}	V			1.0

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	$^{\circ}\text{C}$	-20		65
Operational Temperature at Laser Chip	T_{LD}	$^{\circ}\text{C}$	15		40
Forward Current	I_F	mA			170
Output Power	P_{opt}	mW	20		100

Measurement Conditions / Comments

measured with integrating sphere

Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	784	785	786
Linewidth (FWHM)	$\Delta\lambda$	MHz		2	
Sidemode Suppression Ratio	SMSR	dB		50	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	

Measurement Conditions / Comments

$P_{opt} = 100\text{ mW}$

$P_{opt} = 100\text{ mW}$

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SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser



Characteristics at $T_{LD} = 25^{\circ}\text{C}$ at BOL

cont'd

Parameter	Symbol	Unit	min	typ	max
Laser Current @ $P_{opt} = 100\text{ mW}$	I_{LD}	mA			170
Slope Efficiency	η	W / A	0.6	0.8	1.4
Threshold Current	I_{th}	mA			70
Divergence parallel (FWHM)	$\Theta_{ }$	°		5	
Divergence perpendicular (FWHM)	Θ_{\perp}	°		18	
Degree of Polarization	DOP	%		80	

Measurement Conditions / Comments

parallel to Pin 1 - Pin 6 plane (see p. 3)

perpendicular to Pin 1 - Pin 6 plane (see p. 3)

 $P_{opt} = 100\text{ mW}$; E field perpendicular to Pin 1 - 6 plane

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	1	t.b.d.	100

Measurement Conditions / Comments

 $U_R = 5\text{ V}$

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0.4	
Voltage	U_{TEC}	V		0.4	
Power Dissipation (total loss at case)	P_{loss}	W		0.4	
Temperature Difference	ΔT	K			40

Measurement Conditions / Comments

 $P_{opt} = 100\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 100\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 100\text{ mW}$, $\Delta T = 20\text{ K}$ $P_{opt} = 100\text{ mW}$, $\Delta T = |T_{case} - T_{LD}|$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3930	
Steinhart & Hart Coefficient A	A			1.029×10^{-3}	
Steinhart & Hart Coefficient B	B			2.510×10^{-4}	
Steinhart & Hart Coefficient C	C			1.051×10^{-7}	

Measurement Conditions / Comments

 $T_{LD} = 25^{\circ}\text{C}$ $R_1 / R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at $T_{LD} = 0^{\circ} \dots 50^{\circ}\text{C}$ $1/T = A + B(\ln R) + C(\ln R)^3$

T: temperature in Kelvin

R: resistance at T in Ohm

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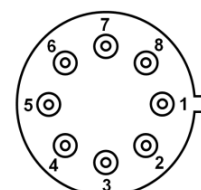
SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

Pin Assignment

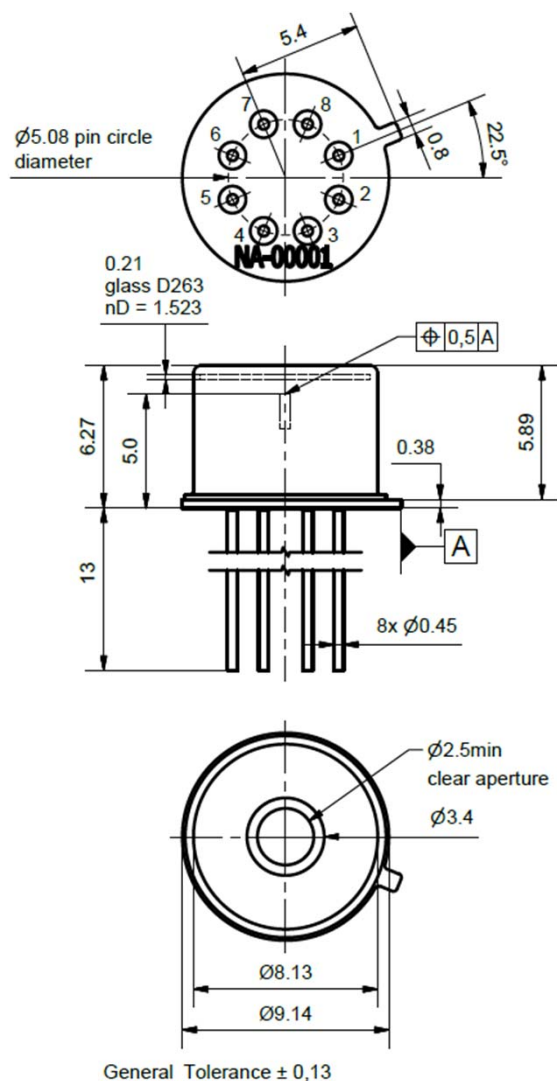
1 Laser Diode Anode	5 Thermistor
2 Laser Diode Cathode	6 Thermistor
3 Thermoelectric Cooler (-)	7 Photo Diode Anode
4 Thermoelectric Cooler (+)	8 Photo Diode Cathode

All 8 pins are isolated from case.



bottom view

Package Drawings



AIZ-19-0129-1426B

EYP-DFB-0785-00100-1500-TOV01-0000

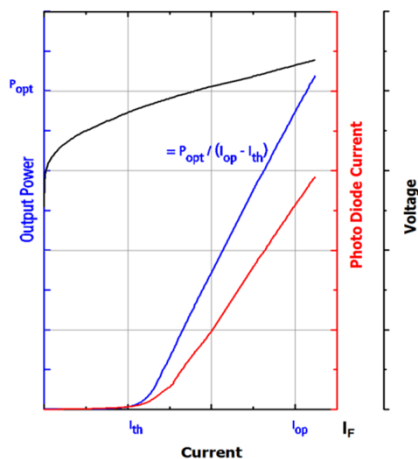
Revision 0.91

2021-01-07

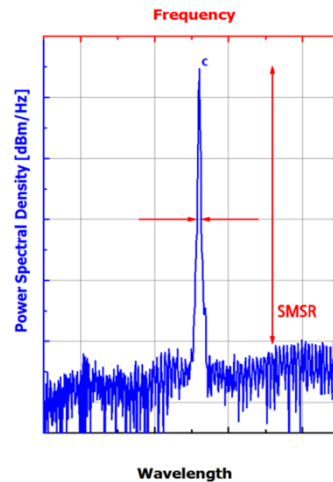
SINGLE FREQUENCY LASER DIODES Distributed Feedback Laser

Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



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.

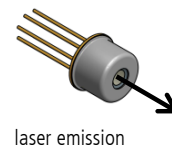
Unpacking, Installation and Laser Safety

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.

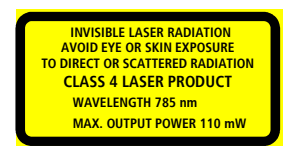
The DFB laser is sensitive against optical feedback, so an optical isolator may be required in order to avoid any disturbance of the emission spectrum. Operating at moderate temperatures on proper heat sinks will contribute to a long lifetime of the diode.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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.



laser emission



IEC-60825-1



Complies with 21 CFR 1040.10 and 1040.40

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SINGLE FREQUENCY LASER DFB Laser

Distributor

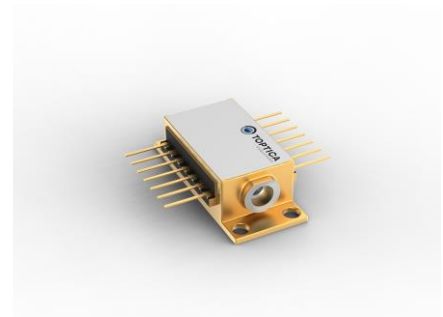
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General Product Information

Product	Application
795 nm DFB Laser	Spectroscopy (Rb D1 line)
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	
with integrated μ -Isolator and Beam Collimation	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	°C	-40		85
Operational Temperature at Case	T_C	°C	-40		85
Operational Temperature at Chip	T_{chip}	°C	5		50
Forward Current	I_F	mA			170
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			45
TEC Current	I_{TEC}	A			1,4
TEC Voltage	V_{TEC}	V			4,8

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	°C	-20		60
Operational Temperature at Chip	T_{chip}	°C	10		45
Forward Current	I_F	mA			160
Output Power	P_{opt}	mW	10		40

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics $T_{chip} = 25^\circ$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	794	795	796
Target Wavelength	λ_T	nm		794.98	
Linewidth	$\Delta\lambda$	MHz		0,6	1
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	25		
Sidemode Suppression Ratio	SMSR	dB	30	45	
Temp. Coefficient of Wavelength	$d\lambda / dT$	nm/K		0,06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm/mA		0,003	

Measurement Conditions / Comments

$T_{chip} = 10^\circ \dots 45^\circ$ C at $P_{opt} = 40$ mW

FWHM, $P_{opt} = 80$ mW

> 10 GHz, at target wavelength

$P_{opt} = 40$ mW

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Revision 0.92

2024-05-03

SINGLE FREQUENCY LASER

DFB Laser



Characteristics Tchip = 25° at BOL

Parameter	Symbol	Unit	min	typ	max
Mode-hop free Temperature Range	T _{chip}	° C	0		0
Laser Current	I _{LD}	mA			160
Slope Efficiency	η	mW/mA		0,4	
Threshold Current	I _{th}	mA			70
Divergence parallel	Θ	°		0,1	
Divergence perpendicular	Θ _⊥	°		0,1	
Beam Diameter horizontal	d	mm		1	1,2
Beam Diameter vertical	d _⊥	mm		0,8	1,2
Degree of Polarization	DOP	%		99	

Measurement Conditions / Comments
Popt = 40 mW
parallel to the base plate of the housing
perpendicular to base plate of the housing
parallel to the base plate of the housing
perpendicular to base plate of the housing
Popt = 40 mW; slant polarization (45°)

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I _{mon} / P _{of}	μA/mW	1		20

Measurement Conditions / Comments
5 V

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I _{TEC}	A		0,4	
Voltage	U _{TEC}	V		1,3	
Power Dissipation (total loss at case)	P _{loss}	W		0,4	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments
Popt = 40 mW, ΔT = 20 K
Popt = 40 mW, ΔT = 20 K
Popt = 40 mW, ΔT = 20 K
Popt = 40 mW, ΔT = Tcase - TLD

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	kΩ		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293 x 10 ⁻³	
Steinhart & Hart Coefficient B	B			2.3410 x 10 ⁻⁴	
Steinhart & Hart Coefficient C	C			8.7755 x 10 ⁻⁸	

Measurement Conditions / Comments
Tchip = 25° C
R ₁ /R ₂ = e ^{β(1/T₁ - 1/T₂)} at Tchip = 0° ... 50° C
1/T = A + B(ln R) + C(ln R) ³
T: Temperature in Kelvin
R: resistance at T in Ω

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Revision 0.92

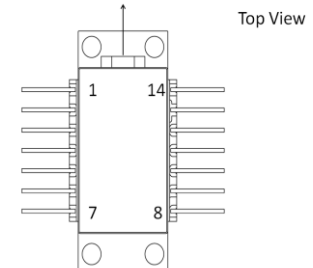
2024-05-03

SINGLE FREQUENCY LASER DFB Laser

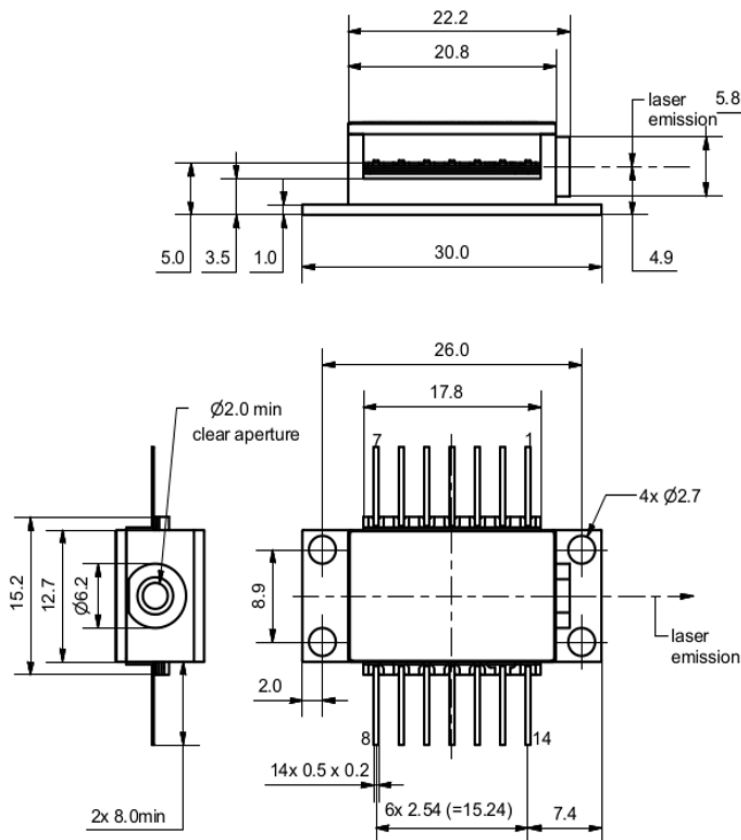
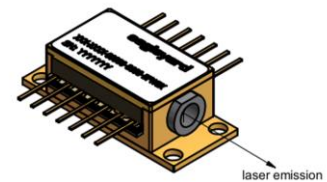


Pin Assignment

1 Thermoelectric Cooler (+)	14 Thermoelectric Cooler (-)
2 Thermistor	13 Case
3 Photo Diode Anode	12 not connected
4 Photo Diode Cathode	11 Laser Diode Cathode
5 Thermistor	10 Laser Diode Anode
6 not connected	9 not connected
7 not connected	8 not connected



Package Drawings



AIZ-20-1029-0928

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SINGLE FREQUENCY LASER DFB Laser



Unpacking, Installation and Laser Safety

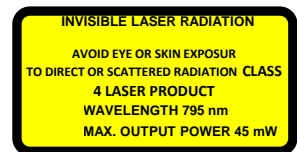
Unpacking the laser diodes should only be done at electrostatic safe workstations (EPA). Though protection against electro static discharge (ESD) is implemented in the laser package, charges may occur at surfaces. Please store this product in its original package at a dry, clean place until final use.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

A laser diode 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing 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.

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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Complies with 21 CFR 1040.10 and 1040.40



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SINGLE FREQUENCY LASER DFB Laser

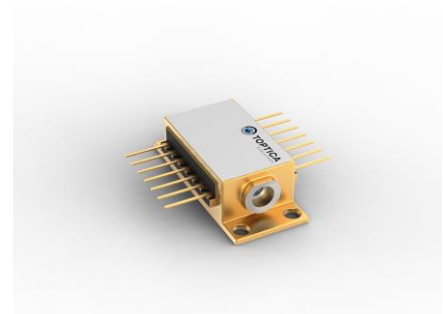


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General Product Information

Product	Application
795 nm DFB Laser	Spectroscopy (Rb D1 line)
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	
with integrated Beam Collimation	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	T_S	°C	-40		85
Operational Temperature at Case	T_C	°C	-40		85
Operational Temperature at Chip	T_{chip}	°C	5		50
Forward Current	I_F	mA			170
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			90
TEC Current	I_{TEC}	A			1,4
TEC Voltage	V_{TEC}	V			3,2

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_{case}	°C	-20		60
Operational Temperature at Chip	T_{chip}	°C	10		45
Forward Current	I_F	mA			160
Output Power	P_{opt}	mW	20		80

Measurement Conditions / Comments

measured by integrated Thermistor

Characteristics $T_{chip} = 25^\circ$ at BOL

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	794	795	796
Target Wavelength	λ_T	nm		794.98	
Linewidth	$\Delta\lambda$	MHz		0,6	1
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	25		
Sidemode Suppression Ratio	SMSR	dB	30	45	
Temp. Coefficient of Wavelength	$d\lambda / dT$	nm/K		0,06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm/mA		0,003	

Measurement Conditions / Comments

$T_{chip} = 10^\circ \dots 45^\circ$ C at $P_{opt} = 80$ mW

FWHM, $P_{opt} = 80$ mW

> 10 GHz, at target wavelength

$P_{opt} = 80$ mW

EYP-DFB-0795-00080-1500-BFW01-0005

Revision 0.93

2024-05-03

SINGLE FREQUENCY LASER

DFB Laser



Characteristics

Tchip = 25° at BOL

Parameter	Symbol	Unit	min	typ	max
Laser Current	I_{LD}	mA			160
Slope Efficiency	η	mW/mA		0,8	
Threshold Current	I_{th}	mA			70
Divergence parallel	$\Theta_{ }$	°		0,1	
Divergence perpendicular	Θ_{\perp}	°		0,1	
Beam Diameter horizontal	$d_{ }$	mm		1	1,2
Beam Diameter vertical	d_{\perp}	mm		0,8	1,2
Degree of Polarization	DOP	%		90	

Measurement Conditions / Comments
Popt = 80 mW
parallel to the base plate of the housing
perpendicular to base plate of the housing
parallel to the base plate of the housing
perpendicular to base plate of the housing
Popt = 80 mW; vertical polarization

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{of}	μA/mW	1		20

Measurement Conditions / Comments
5 V

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		0,4	
Voltage	U_{TEC}	V		1,3	
Power Dissipation (total loss at case)	P_{loss}	W		0,4	
Temperature Difference	ΔT	K			50

Measurement Conditions / Comments
Popt = 80 mW, $\Delta T = 20$ K
Popt = 80 mW, $\Delta T = 20$ K
Popt = 80 mW, $\Delta T = 20$ K
Popt = 80 mW, $\Delta T = T_{case} - T_{chip} $

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	kΩ		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}	
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}	
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}	

Measurement Conditions / Comments
Tchip = 25° C
$R_1/R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at Tchip = 0° ... 50° C
$1/T = A + B(\ln R) + C(\ln R)^3$
T: Temperature in Kelvin
R: resistance at T in Ω

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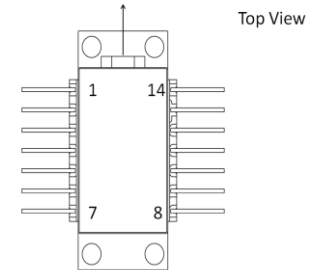
2024-05-03

SINGLE FREQUENCY LASER DFB Laser

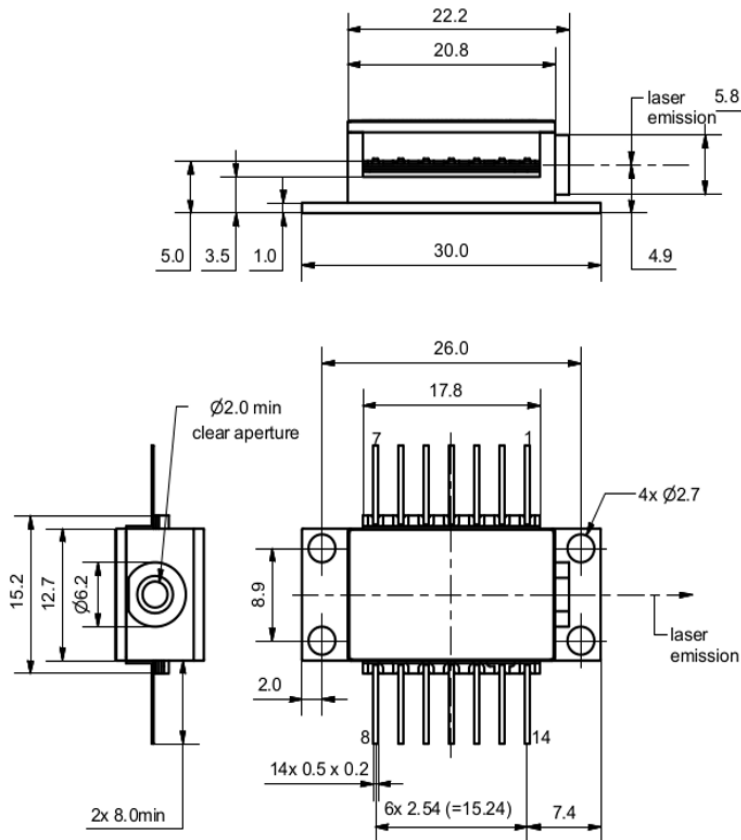
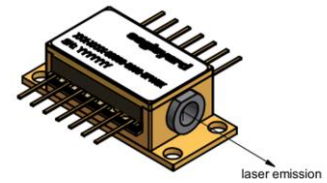


Pin Assignment

1 Thermoelectric Cooler (+)	14 Thermoelectric Cooler (-)
2 Thermistor	13 Case
3 Photo Diode Anode	12 not connected
4 Photo Diode Cathode	11 Laser Diode Cathode
5 Thermistor	10 Laser Diode Anode
6 not connected	9 not connected
7 not connected	8 not connected



Package Drawings



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Unpacking, Installation and Laser Safety

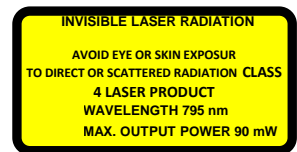
Unpacking the laser diodes should only be done at electrostatic safe workstations (EPA). Though protection against electro static discharge (ESD) is implemented in the laser package, charges may occur at surfaces. Please store this product in its original package at a dry, clean place until final use.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

A laser diode 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.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing 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.

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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Complies with 21 CFR 1040.10 and 1040.40



info@amstechnologies.com
www.amstechnologies-webshop.com

