Datasheet

EYP-TPA-0670-01000-3004-BTU02-0000

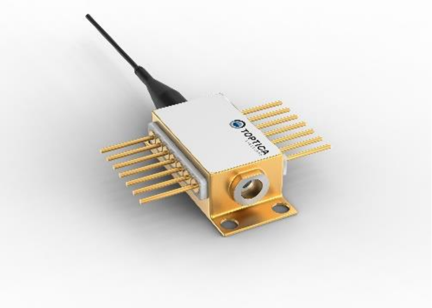
Revision 0.50

2024-04-03

TAPERED AMPLIFIER
Semiconductor Optical Amplifier

General Product Information

Product	Application
670 nm Tapered Amplifier	Spectroscopy
14 Pin Butterfly Package	
with PM Fiber and FC/APC Connector (Input)	
and collimated Output Beam	



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
Forward Current	I_F	A			2.2
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	W			1.2
TEC Current	I_{TEC}	A			5
TEC Voltage	V_{TEC}	V			7

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	Measurement Conditions / Comments
Operational Temperature at Case	T_{case}	°C	0		50	
Operational Temperature at Chip	T_{chip}	°C	10	20	30	measured with integrated thermistor
Forward Current	I_F	A			2	seeding required above 1 A
Input Power	P_{opt}	mW	10		50	Insertion loss ≤ 0.3 dB
Output Power	P_{opt}	W		0.8	1.0	with proper injection from a seed laser

Characteristics Tcase = 20° C at BOL

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Wavelength	λ	nm		670		
Gain Width (FWHM)	$\Delta\lambda$	nm		10		
Operational Current	$I_{Op\ Gain}$	A			1.8	Popt = 0.8 W
Output Power	P_{opt}	W		0.8		
Polarization				TE		E fieldparallel to base plate
Amplification	G	dB		15		at recommended maximum forward current
Temp. Coefficient of Wavelength	$d\lambda / dT$	nm/K		0.25		
Beam Diameter	d	mm		1		$1/e^2$, at Popt
Input Divergence parallel	$\Theta_{out\|\|}$	mrad		3		$1/e^2$ (full angle), at Popt

Thermoelectric Cooler

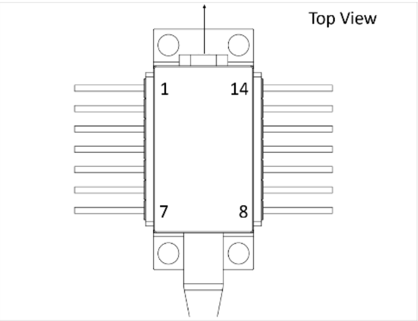
Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Current	I_{TEC}	A		1.2		Popt = 0.8 W; ΔT = 20 K
Voltage	U_{TEC}	V		2.0		Popt = 0.8 W; ΔT = 20 K
Power Dissipation (total loss at case)	P_{loss}	W		8		Popt = 0.8 W; ΔT = 20 K
Temperature Difference	ΔT	K			40	Popt = 0.8 W

Thermistor (Standard NTC Type)

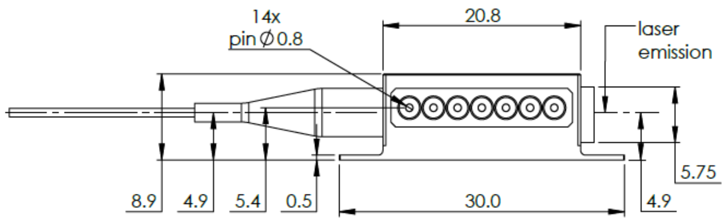
Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Resistance	R	kOhm		10		25°C
Beta Coefficient	b			3892		0°C ... 50°C
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}		
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}		
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}		

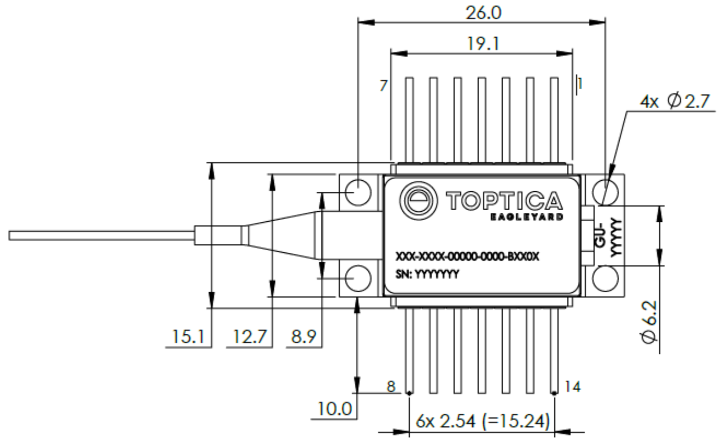
Pin Assignment

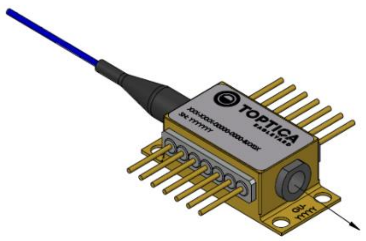
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	not connected
3	not connected	12	not connected
4	not connected	11	Amplifier (Cathode)
5	Thermistor	10	Amplifier (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



Package Drawings







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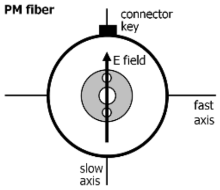
Fiber and Connector Type (Input)

Parameter		Measurement Conditions / Comments
PM Fiber	900 / 125 / 4.5 µm, UV/Polyester-elastomer Coating	
	length: 1 +/-0.1 m	
Connector	FC/APC narrow key / 2 mm	



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Unpacking, Installation and Laser Safety

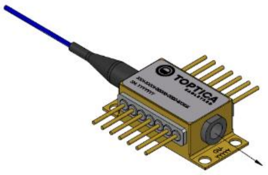
Unpacking the taperd amplifier should only be done at electrostatic safe workstations (EPA). Though protection against electro static discharge (ESD) is implemented in the laser package, charges may occur at surfaces. Please store this product in its original package at a dry, clean place until final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

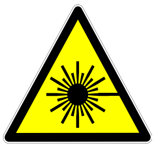
The TPA diode type is known to be sensitive against thermal stress. It should not be operated without appropriate injection from a seed laser. Operating at moderate temperatures on proper heat sinks willl contribute to a long lifetime of the diode.

This amplifier is designed for the setup of MOPA systems. Appropriate seed lasers are DFB lasers of the type EYP-DFB-xxxx-xxxxx-1500-BFY12-000x with matching wavelengths. An external fiber isolator should be used between seed laser and amplifier in order to suppress backreflections that may disturb the emission spectrum of the seed laser and may cause mode-hops in case of wavelength tuning.

The laser emission from this diode is close to the invisible infrared region of the electromagnetic spectrum. Avoid direct and/or indirect exposure to the free running beam. Collimating the free running [illegible]

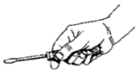
Each tapered amplifier will come with an individual test protocol verifying the parameters given in this document.





INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSUR
TO DIRECT OR SCATTERED RADIATION
CLASS 4 LASER PRODUCT
WAVELENGTH 670 nm
MAX. OUTPUT POWER 1.2 W

IEC-60825-1



DANGER
INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
GaAs SEMICONDUCTOR LASER DIODE
1.2 W MAX OUTPUT AT 670 nm
CLASS IV LASER PRODUCT

Complies with 21 CFR 1040.10 and 1040.40