

EYP-TPA-0780-03000-4006-BTU02-0000

Revision 0.70

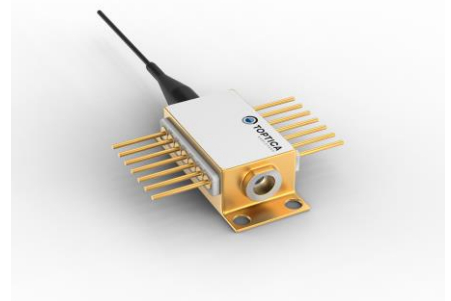
2023-01-18

TAPERED AMPLIFIER Semiconductor Optical Amplifier



General Product Information

Product	Application
780 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		-40		85
Operational Temperature at Case	T_C	°C	-20		75
Forward Current	I_F	A			5
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	W			3.2
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
Operational Temperature at Case	T_{case}	°C	0		50
Operational Temperature at Chip	T_{LD}	°C	10	25	35
Forward Current	I_F	A			4.5
Input Power	P_{opt}	mW	10		50
Output Power	P_{opt}	W			3

Measurement Conditions / Comments

measured with integrated thermistor
 seeding required above 2 A
 with proper injection from a seed laser

Characteristics at T_{LD}

Parameter	Symbol	Unit	min	typ	max
Wavelength	λ	nm		780	
Gain Width (FWHM)	$\Delta\lambda$	nm		20	
Operational Current	$I_{Op Gain}$	A			4.5
Output Power	P_{opt}	W	3		
Polarization				TM	
Amplification	G	dB		23	
Temp. Coefficient of Wavelength	$d\lambda / dT$	nm/K		0.3	

Measurement Conditions / Comments

3 W
 E field perpendicular to base plate
 at recommended maximum forward current

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Characteristics at T_{LD} cont'd

Parameter	Symbol	Unit	min	typ	max
Beam Diameter horizontal	$d_{ }$	mm		1	
Output Divergence parallel	$\Theta_{out }$	mrad		3	
Output Divergence perpendicular	$\Theta_{out\perp}$	mrad		3	

Measurement Conditions / Comments

1/e²

1/e² (full angle)

1/e² (full angle)

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I_{TEC}	A		1.2	
Voltage	U_{TEC}	V		2	
Power Dissipation (total loss at case)	P_{loss}	W		8	
Temperature Difference	ΔT	K			40

Measurement Conditions / Comments

P_{opt} '= 3 W; ΔT '= 20 K

P_{opt} '= 3 W; ΔT '= 20 K

P_{opt} '= 3 W; ΔT '= 20 K

P_{opt} '= 2 W

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Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R			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

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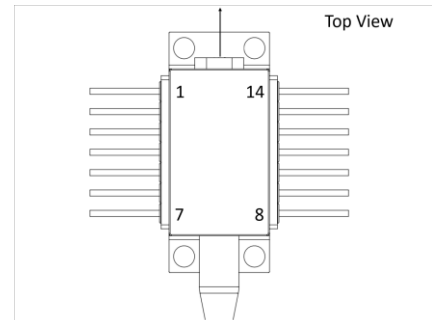
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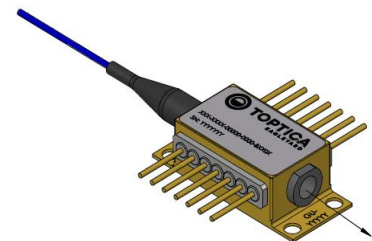
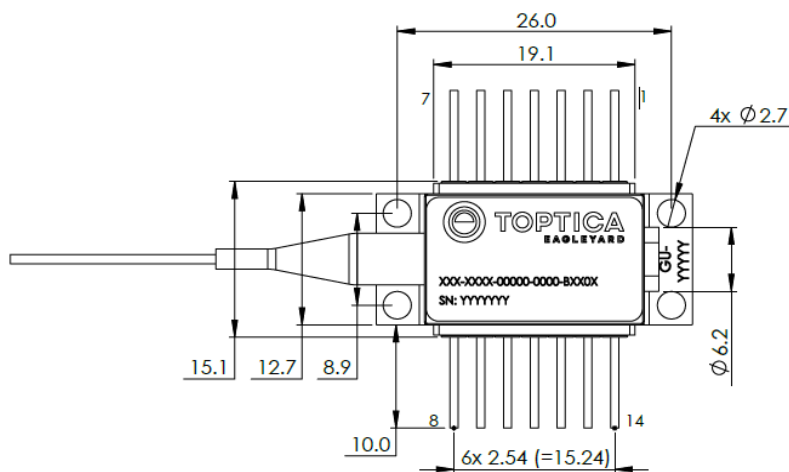
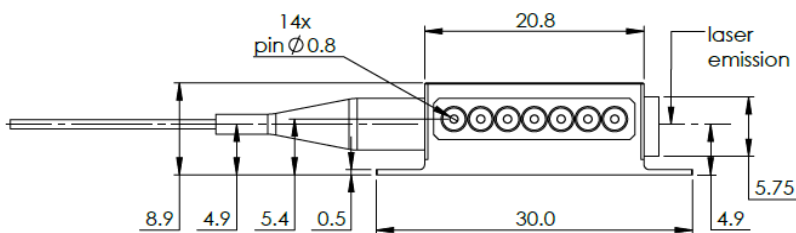


Pin Assignment

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



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

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

SWZ-23-0117-1237

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TAPERED AMPLIFIER Semiconductor Optical Amplifier



Fiber and Connector Type (Input)

Parameter

PM Fiber	900 / 125 / 5.5 μm, UV/Polyester-elastomer Coating length: 1 +/-0.1 m
Connector	FC/APC narrow key / 2 mm narrow key / 2 mm

Measurement Conditions / Comments

Unpacking, Installation and Laser Safety

Unpacking the tapered 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 will 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-xxxx-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

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

