

# EYP-TPA-0850-02000-4006-BTU02-0000

Revision 0.70

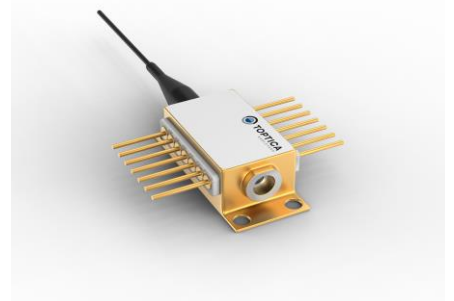
2023-01-17

## TAPERED AMPLIFIER Semiconductor Optical Amplifier



### General Product Information

Product	Application
850 nm Tapered Amplifier with hermetic 14-Pin Butterfly Housing (RoHS compliant) including Thermoelectric Cooler and Thermistor with PM fiber (input) and integrated beam collimation (output)	Spectroscopy



### 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			3.5
Reverse Voltage	$V_R$	V			2
Output Power	$P_{opt}$	W			2.2
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			3.2
Input Power	$P_{opt}$	mW	10		50
Output Power	$P_{opt}$	W			2

### Measurement Conditions / Comments

seeding required above 1.6 A

with proper injection from a seed laser

### Characteristics at $T_{LD} = 25\text{ °C}$ at BOL

Parameter	Symbol	Unit	min	typ	max
Wavelength	$\lambda$	nm		850	
Gain Width (FWHM)	$\Delta\lambda$	nm		20	
Output Power	$P_{opt}$		2		
Polarization				TE	
Amplification	G	dB		16	
Temp. Coefficient of Wavelength	$d\lambda / dT$	nm/K		0.3	

### Measurement Conditions / Comments

E field parallel to base plate

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

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

#### Measurement Conditions / Comments

1/e<sup>2</sup>

1/e<sup>2</sup> (full angle)

1/e<sup>2</sup> (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	$\Delta T$	K			40

#### Measurement Conditions / Comments

P<sub>opt</sub> ' = 2 W; DT ' = 20 K

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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			$1.1293 \times 10^{-3}$	
Steinhart & Hart Coefficient B	B			$2.3410 \times 10^{-4}$	
Steinhart & Hart Coefficient C	C			$8.7755 \times 10^{-8}$	

### Measurement Conditions / Comments

25° C

0° ... 50° C

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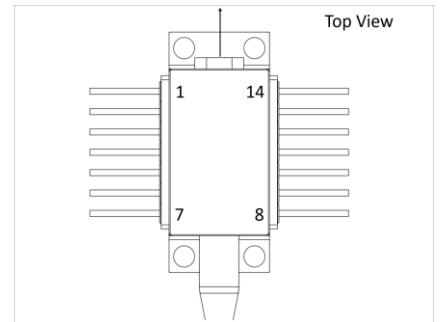
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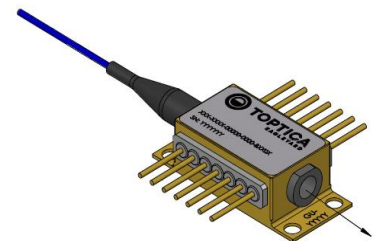
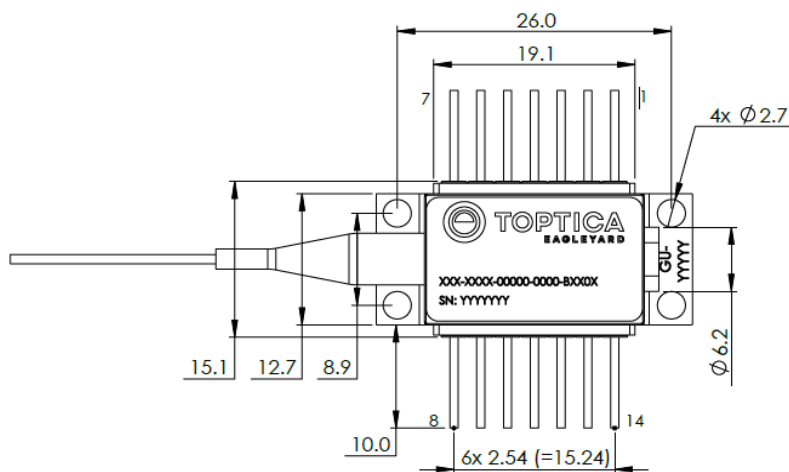
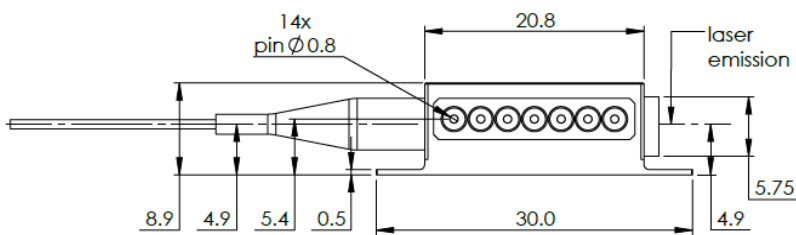


### Pin Assignment

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](http://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 $\mu\text{m}$ , UV/Polyester-elastomer Coating length: 1 +/-0.1 m
Connector	FC/APC narrow key / 2 mm narrow key / 2 mm

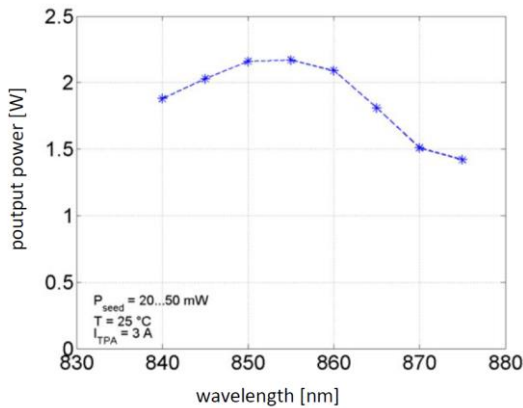
Measurement Conditions / Comments

## TAPERED AMPLIFIER Semiconductor Optical Amplifier



### Typical Measurement Results

output power with seeding at different wavelengths



### 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-xxxx-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.

