

EYP-TPA-0895-02500-4006-BTU02-0000

Revision 0.70

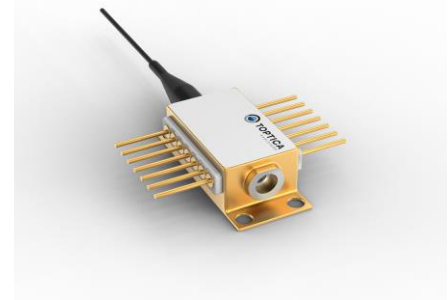
2023-01-17

TAPERED AMPLIFIER Semiconductor Optical Amplifier



General Product Information

Product	Application
895 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			4.5
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_{chip}	°C	10	25	35
Forward Current	I_F	A			4
Input Power	P_{opt}	mW	10		50
Output Power	P_{opt}	W			2.5

Measurement Conditions / Comments

seeding required above 2 A

with proper injection from a seed laser

Characteristics = 25 °C at BOL

Parameter	Symbol	Unit	min	typ	max
Wavelength	λ	nm		895	
Gain Width (FWHM)	$\Delta\lambda$	nm		20	
Output Power	P_{opt}		2.5		
Polarization				TE	
Amplification	G	dB		20	
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 = 25 °C at BOL

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 ²
1/e ² (full angle)
1/e ² (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} = 2 W; DT = 20 K
P _{opt} = 2 W; DT = 20 K
P _{opt} = 2 W; DT = 20 K
P _{opt} = 2 W

Thermistor (Standard NTC Type)

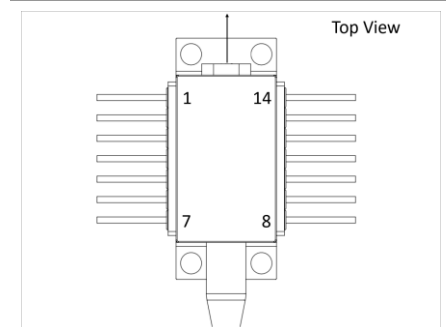
Parameter	Symbol	Unit	min	typ	max
Resistance	R			10	
Beta Coefficient	b			3892	
Steinhart & Hart Coefficient A	A			1.1293 x 10 ⁻³	
Steinhart & Hart Coefficient B	B			2.3410 x 10 ⁻⁴	
Steinhart & Hart Coefficient C	C			8.7755 x 10 ⁻⁸	

Measurement Conditions / Comments

25° C
0° ... 50° C

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



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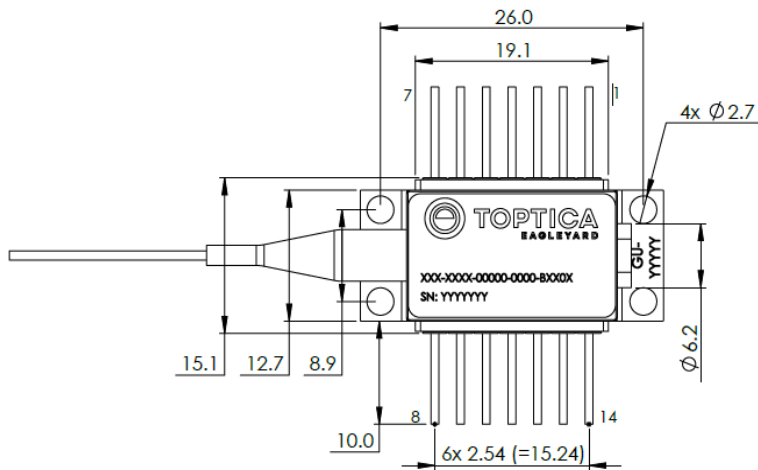
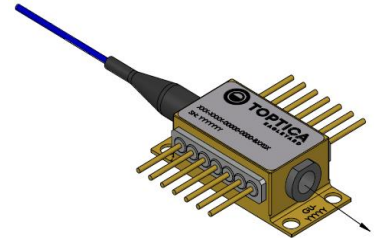
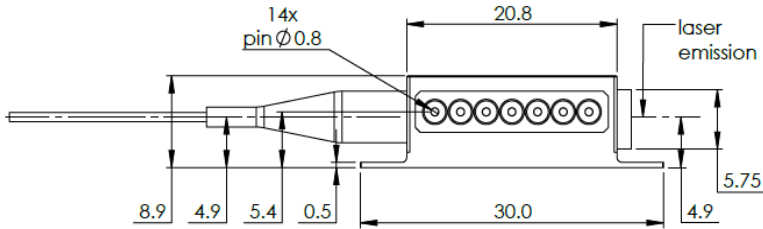
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Package Drawings



SWZ-23-0117-1237

Fiber and Connector Type (Input)

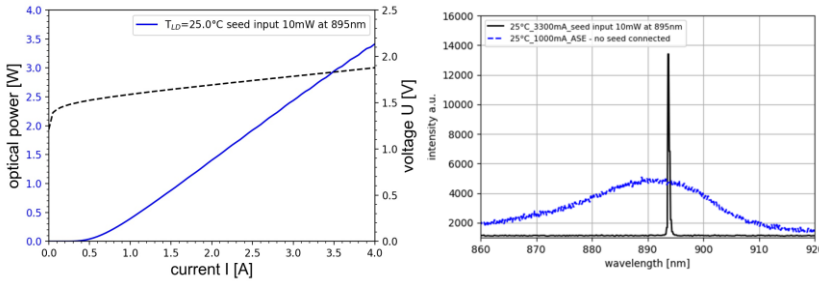
Parameter	
PM Fiber	900 / 125 / 5.5 μ m, UV/Polyester-elastomer Coating length: 1 +/-0.1 m
Connector	FC/APC narrow key / 2 mm narrow key / 2 mm

Measurement Conditions / Comments

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Typical Measurement Results



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-xxxxx-1500-xxxxx-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.

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

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

