

EYP-TPA-0780-03000-4006-CMT04-0000

Revision 1.01

2017-11-22

TAPERED AMPLIFIERS

Semiconductor Optical Amplifier



General Product Information

| Product | Application |
|--------------------------|--------------|
| 780 nm Tapered Amplifier | Spectroscopy |
| C-Mount Package | |
| | |
| | |



Absolute Maximum Ratings

| Parameter | Symbol | Unit | min | typ | max |
|---|-----------|------|-----|-----|-----|
| Storage Temperature (non condensing) | T_S | °C | -40 | | 85 |
| Operational Temperature at Case (non cond.) | T_C | °C | 0 | | 50 |
| Forward Current | I_F | A | | | 5 |
| Reverse Voltage | V_R | V | | | 2 |
| Output Power | P_{opt} | W | | | 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_C | °C | 5 | | 40 |
| Forward Current | I_F | A | | | 4.5 |
| Input Power | P_{input} | mW | 10 | | 50 |
| Output Power | P_{opt} | W | | | 3.0 |
| | | | | | |

Measurement Conditions / Comments

non condensing

with proper injection from a seed laser

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

| Parameter | Symbol | Unit | min | typ | max |
|--|-----------------|---------------|-----|------|-----|
| Design Wavelength | λ_C | nm | | 780 | |
| Gain Width (FWHM) | $\Delta\lambda$ | nm | | 20 | |
| Temperature Coefficient of Wavelength | $d\lambda / dT$ | nm / K | | 0.3 | |
| Operational Current @ $P_{opt} = 3.0\text{ W}$ | $I_{op\ Gain}$ | A | | | 4.5 |
| Output Power | P_{opt} | W | 3.0 | | |
| Amplification | G | dB | | 23 | |
| Cavity length | L_C | μm | | 4000 | |
| | | | | | |

Measurement Conditions / Comments

with proper injection from a seed laser

at recommended maximum forward current

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

| Parameter | Symbol | Unit | min | typ | max |
|---|---------------------|------|-----|--------------------|--------------------|
| Reflectivity at Front Facet | R_{ff} | | | 3·10 ⁻⁴ | 1·10 ⁻³ |
| Reflectivity at Rear Facet | R_{rf} | | | 3·10 ⁻⁴ | 1·10 ⁻³ |
| Input Aperture (at rear side) | d_{in} | μm | | 3 | |
| Output Aperture (at front side) | d_{out} | μm | | 210 | |
| Astigmatism | A | μm | | 720 | |
| Input Divergence parallel ($1/e^2$) | $\Theta_{in }$ | ° | | 23 | |
| Input Divergence perpendicular ($1/e^2$) | $\Theta_{in\perp}$ | ° | | 40 | |
| Output Divergence parallel ($1/e^2$) | $\Theta_{out }$ | ° | | 18 | |
| Output Divergence perpendicular ($1/e^2$) | $\Theta_{out\perp}$ | ° | | 40 | |
| Polarization | | | | TM | |

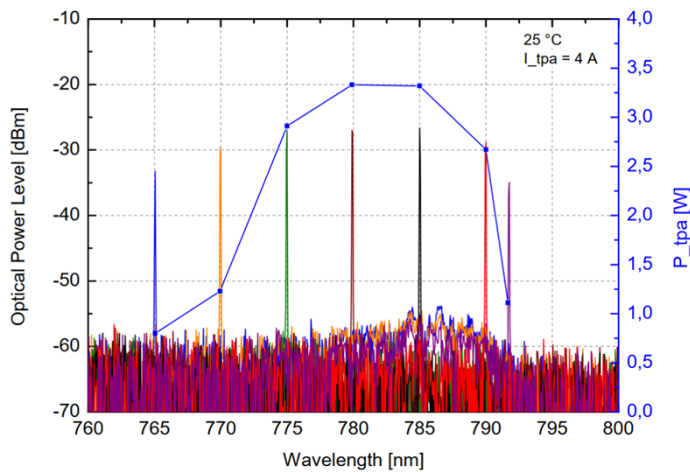
Measurement Conditions / Comments

estimated at recommended maximum forward current

E field perpendicular to junction plane

Typical Measurement Results

Output power at various wavelengths



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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Package Dimensions

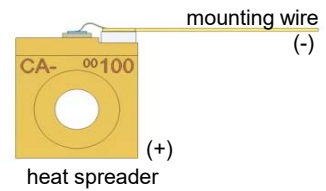
| Parameter | Symbol | Unit | min | typ | max |
|--------------------------|--------|------|------|------|------|
| Height of Emission Plane | h | mm | 7.05 | 7.10 | 7.20 |
| C-Mount Thickness | t | mm | | 4.05 | |

Measurement Conditions / Comments

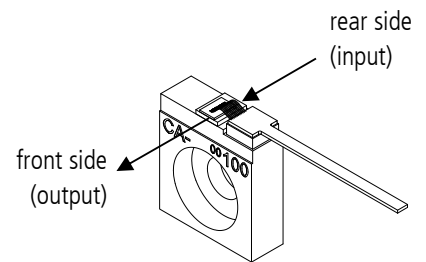
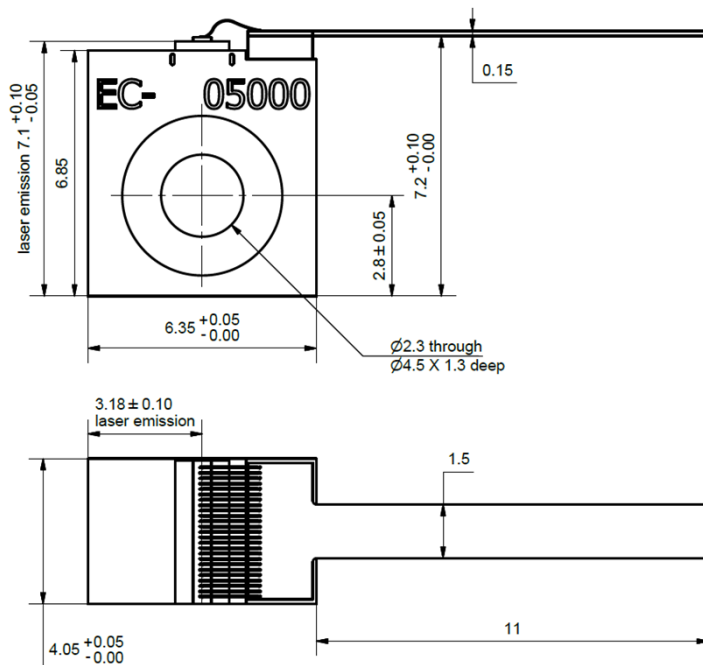
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|--|
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| |
| |

Package Pinout

| | |
|---------------|-------------|
| Mounting Wire | Cathode (-) |
| Housing | Anode (+) |



Package Drawings



AIZ-18-0413-1535

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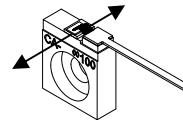
Unpacking, Installation and Laser Safety

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 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. The chip should be protected against moisture. A water vapor content below 5000 ppm is recommended for applications with high reliability requirements.

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.

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



Laser Emission



IEC-60825-0



Complies with 21 CFR 1040.10 and 1040.40