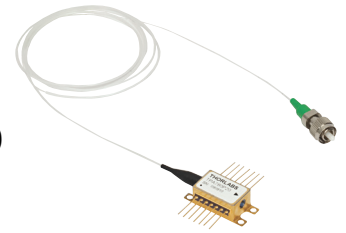


TPA780P20



Description

Thorlabs' TPA780P20 780 nm Tapered Amplifier consists of an optical amplifier integrated into an industry-standard, 14-pin butterfly package. This modular tapered amplifier is easy to integrate into larger systems. The output of the amplifier is free space. Thorlabs recommends using an optical isolator (Item # IO-3-780-HP) to prevent back reflections from damaging the amplifier.

Specifications

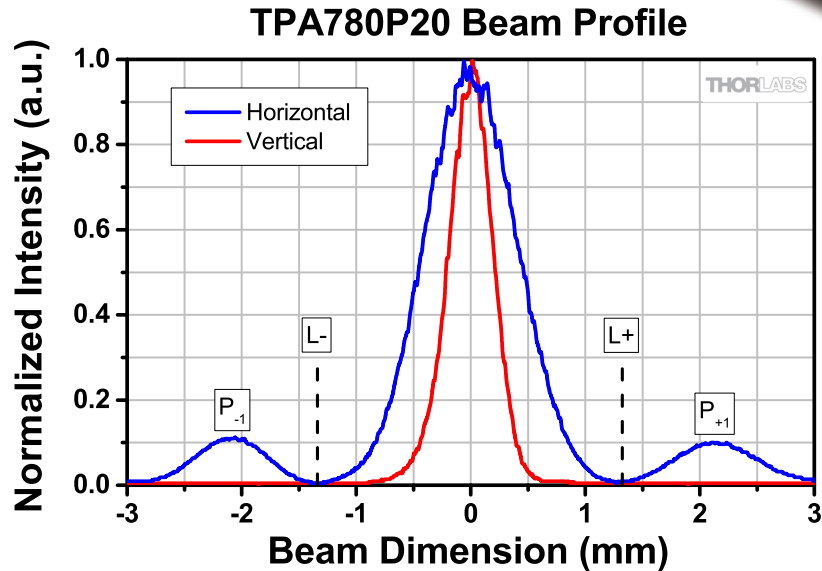
| TPA780P20 | | |
|---|-------------|--|
| | Symbol | Typical |
| Center Wavelength | λ_c | 780 nm |
| Small Signal Gain ^a | G_{ss} | 20 dB |
| Amplification Bandwidth | BW | ± 5 nm |
| Operating Current ^b | I_{op} | 2.5 A |
| Output Power ^c | P_{out} | 2 W |
| Output Polarization State ^d | Pol | TM |
| Case Operating Temperature ^e | T_{case} | 10 to 40 °C |
| Fiber ^f | - | PM780-HP |
| Fiber Length | - | 1 m |
| Connector | - | FC/APC, 2.0 mm Key |
| TEC Operating Current ($T_{case} = 25$ °C) | I_{TEC} | 2 A |
| TEC Operating Voltage ($T_{case} = 25$ °C) | V_{TEC} | 3 V |
| Internal Package Thermistor | - | 10 kOhm |
| Steinhart-Hart Coefficients | - | A: 1.1292E-3 B: 2.3411E-4 C: 8.7755E-8 |
| Laser Class | - | 4 |
| Compatible Controller | - | LDC2500B |



$T_{CHIP} = 25$ °C, Drive current = 2.5 A, Seed Input Level ≥ 5 mW

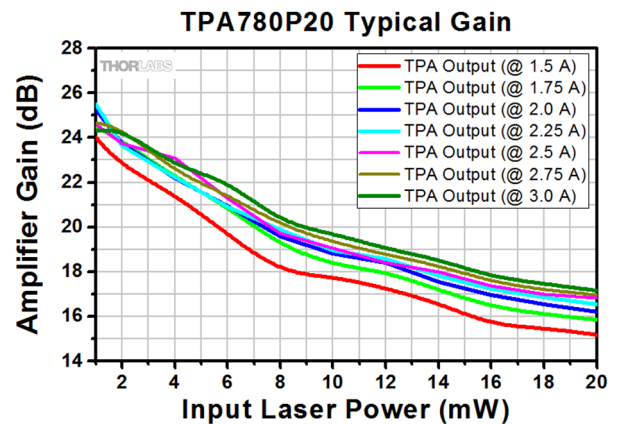
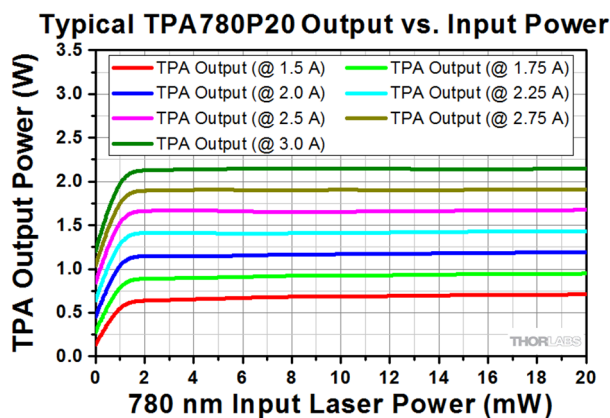
- At 2 mW seed power, falling to 14 dB at 20 mW seed due to amplifier saturation.
- At lower currents, chip astigmatism will cause increasing beam quality degradation.
- Typical only, up to 3 A drive may be required.
- The polarization is perpendicular to package's base.
- Requires an adequate heat sink and non-condensing atmosphere.
- Fiber protected by 900 μ m diameter loose tube.

Beam Profile



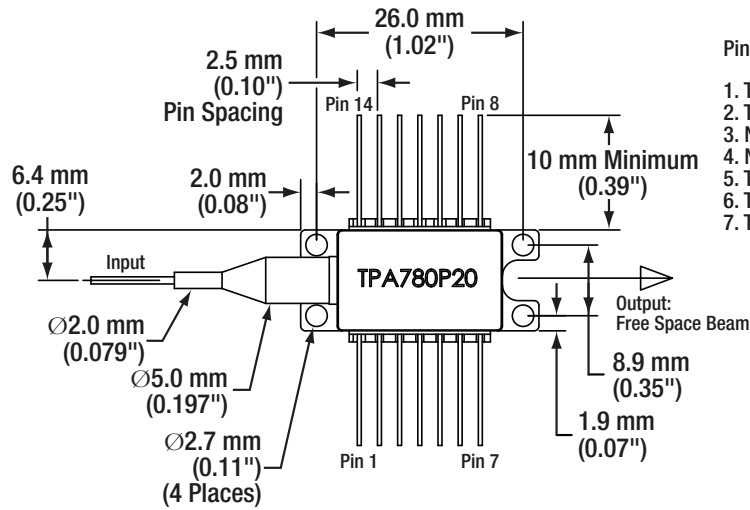
The beam profile was measured at 2.5 A drive current and 600 mm from package output window. Over 60% of the total measured beam power^a is contained within L- and L+ (lines at first minima). The beam ellipticity has a typical value of 2, when driven at 2.5 A. Note that the beam properties are optimized at a drive current of 2.5 A; at currents above 2.5 A, the side lobes' height can increase. At currents below 2.5 A, astigmatism in the chip will cause degradation in the beam quality so that multiple intensity lobes will become visible.

Performance Plots



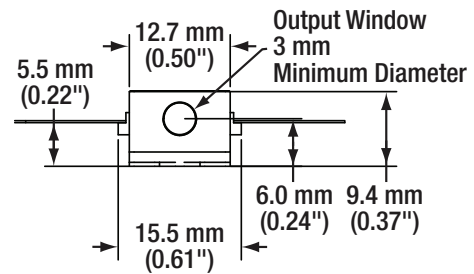
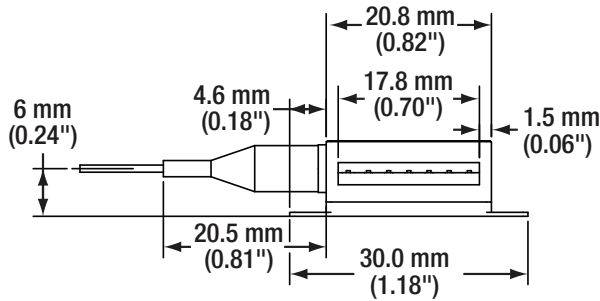
^a Total power collected in a 6 mm diameter power sensor placed at 600 mm from the package output window.

Drawings



Pin Identification

- | | |
|----------------------|-----------------|
| 1. TEC+ | 14. TEC- |
| 2. Thermistor (Chip) | 13. Case |
| 3. NC | 12. NC |
| 4. NC | 11. Dev Cathode |
| 5. Thermistor (Chip) | 10. Dev Anode |
| 6. Thermistor (Case) | 9. NC |
| 7. Thermistor (Case) | 8. NC |



Notes:

1. Device is provided with a 1000 mm length fiber tail terminated in an FC/APC connector; the fiber is Thorlabs PM780-HP fiber protected by 900 um diameter loose tube.