

### Description

Thorlabs' BOA980P Booster Optical Amplifier (BOA) is designed to amplify polarized optical signals around 980 nm. The semiconductor device is housed in a standard 14-pin butterfly package with FC/APC connectors. Polarization-maintaining fiber (PM980-XP) is used on both input and output sides. An integrated TEC and thermistor provide temperature control to stabilize the gain and optical spectrum.

### Specifications

CW;  $T_{CHIP} = 25\text{ }^{\circ}\text{C}$ ;  $T_{CASE} = 0 - 70\text{ }^{\circ}\text{C}$

BOA980P Specifications				
	Symbol	Min	Typical	Max
Center Wavelength <sup>a</sup>	$\lambda_C$	940 nm	960 nm	980 nm
Operating Current	$I_{OP}$	-	700 mA	750 mA
Optical 3 dB Bandwidth	BW	60 nm	72 nm	-
Small Signal Gain @ $P_{IN} = -20\text{ dBm}^{b,c}$	G	23 dB	27 dB	-
Saturation Output Power (@ -3 dB) <sup>b,c</sup>	$P_{SAT}$	18 dBm	19.5 dBm	-
Gain Ripple (RMS) <sup>b,d</sup>	$\delta G$	-	0.02 dB	0.3 dB
Noise Figure <sup>b,c</sup>	NF	-	6.0 dB	9.5 dB
Forward Voltage <sup>b</sup>	$V_F$	-	1.9 V	2.4 V
TEC Operation (Typical/Max @ $T_{CASE} = 25\text{ }^{\circ}\text{C} / 70\text{ }^{\circ}\text{C}$ )				
TEC Current	$I_{TEC}$	-	0.5 A	1.5 A
TEC Voltage	$V_{TEC}$	-	0.7 V	4.0 V
Thermistor Resistance	$R_{TH}$	-	10 k $\Omega$	-



- This is the center wavelength of the amplified spontaneous emission (ASE), and is not necessarily the operating wavelength. An operating wavelength of 976 nm was selected for testing to yield the specified saturated output power ( $P_{SAT}$ ).
- At  $I_{OP}$ .
- At 976 nm
- Water absorption dips in the spectrum contribute to ripple. RMS ripple is used instead of peak-to-peak ripple in order to reduce the effect of water absorption on the accuracy of this calculation. Actual ripple may be smaller if water absorption is excluded.

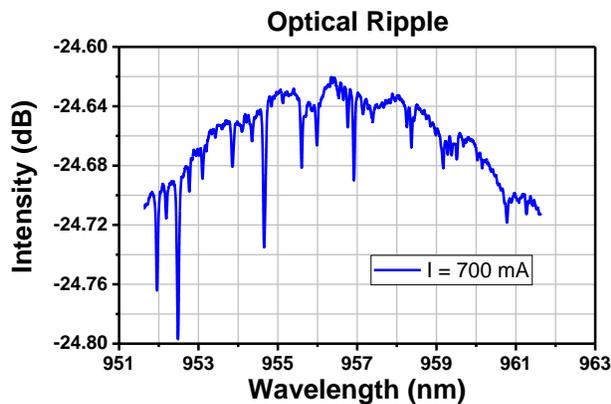
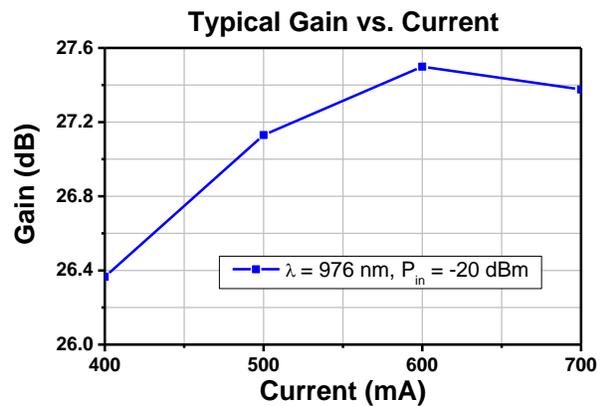
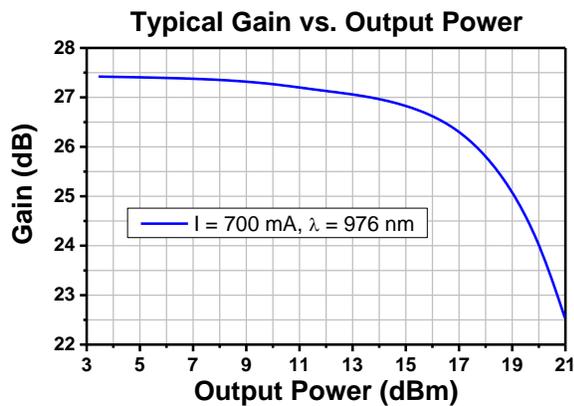
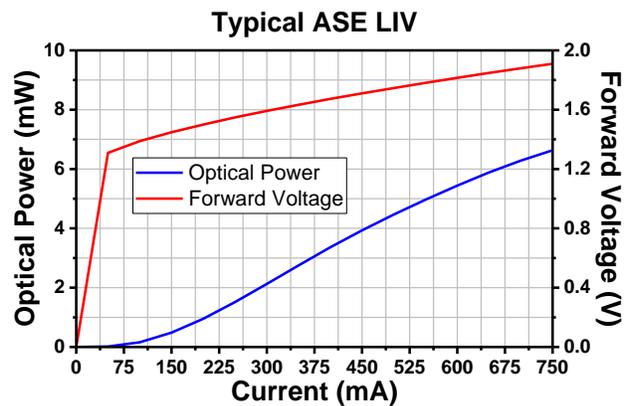
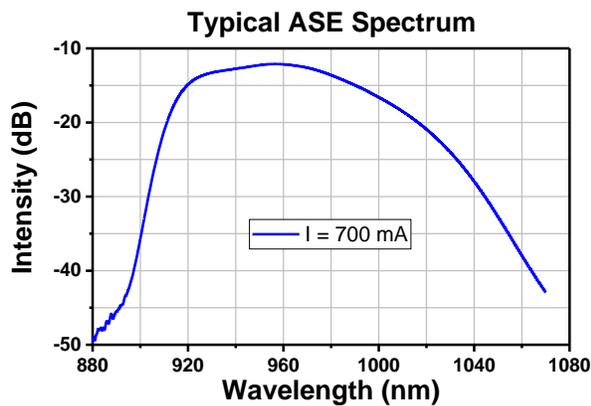
BOA980P Absolute Maximum Ratings <sup>a</sup>			
	Symbol	Min	Max
Operating Current	$I_{OP}$	-	750 mA
Optical Output Power, CW	$P_{Out}$	-	170 mW
Chip Temperature (TEC)	$T_{Chip}$	10 $^{\circ}\text{C}$	30 $^{\circ}\text{C}$
Case Temperature	$T_{Case}$	0 $^{\circ}\text{C}$	70 $^{\circ}\text{C}$

- Absolute maximum rating specifications should never be exceeded. Operating at or beyond these conditions can permanently damage the amplifier.

Fiber Specifications	
	Value
Fiber Type	PM980-XP
Mode Field Diameter <sup>a</sup>	6.6 ± 0.5 μm at 980 nm
Numeric Aperture	0.12
Fiber Pigtail Length	1.5 m
Connector	FC/APC, 2.0 mm Narrow Key

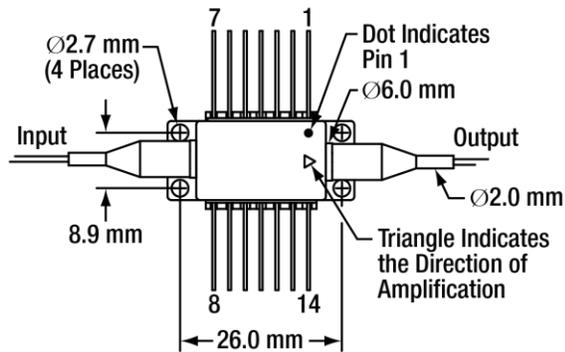
a. Mode Field Diameter is specified as a nominal value.

## Performance Plots



The sharp dips in the ripple spectrum are mostly caused by water absorption in the measurement setup.

## Drawings



### Pin Identification

- |               |                    |
|---------------|--------------------|
| 1. TEC +      | 14. TEC -          |
| 2. Thermistor | 13. Ground         |
| 3. Not Used   | 12. Not Used       |
| 4. Not Used   | 11. Device Cathode |
| 5. Thermistor | 10. Device Anode   |
| 6. Not Used   | 9. Not Used        |
| 7. Not Used   | 8. Not Used        |

Recommended mounting torque is 10 - 20 oz-in (0.07 - 0.14 N-m)

