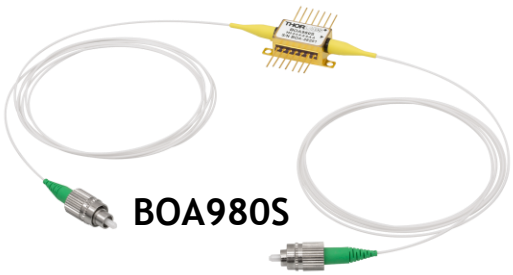
980 nm Booster Optical Amplifier, SM Fiber



Description

Thorlabs' BOA980S 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. Single mode fiber (HI1060) 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 °C; T_{CASE} = 0 - 70 °C

BOA980S Specifications				
	Symbol	**Min**	**Typical**	**Max**
Center Wavelength[a]	λ_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 dBm[b,c]	G	23 dB	27 dB	-
Saturation Output Power (@ -3 dB)[b,c]	P_{SAT}	18 dBm	19.5 dBm	-
Gain Ripple (RMS)[b,d]	δG	-	0.02 dB	0.3 dB
Noise Figure[b,c]	NF	-	6.0 dB	9.5 dB
Forward Voltage[b]	V_F	-	1.9 V	2.4 V
TEC Operation (Typical/Max @ T_{CASE} = 25 °C / 70 °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 kΩ	-

a. 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}).
b. At I_{OP}.
c. At 976 nm
d. 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.

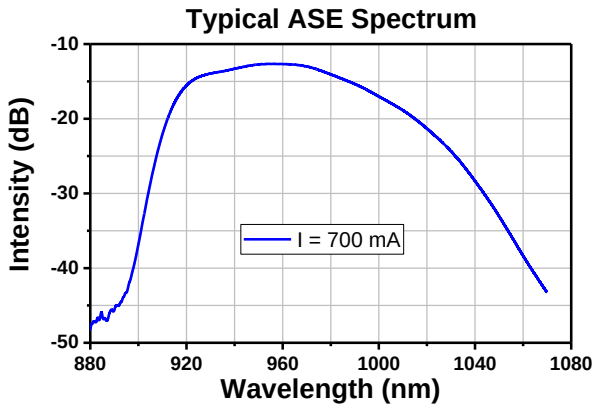
BOA980S Absolute Maximum Ratings[a]			
	Symbol	**Min**	**Max**
Operating Current	I_{OP}	-	750 mA
Optical Output Power, CW	P_{Out}	-	170 mW
Chip Temperature (TEC)	T_{Chip}	10 °C	30 °C
Case Temperature	T_{Case}	0 °C	70 °C

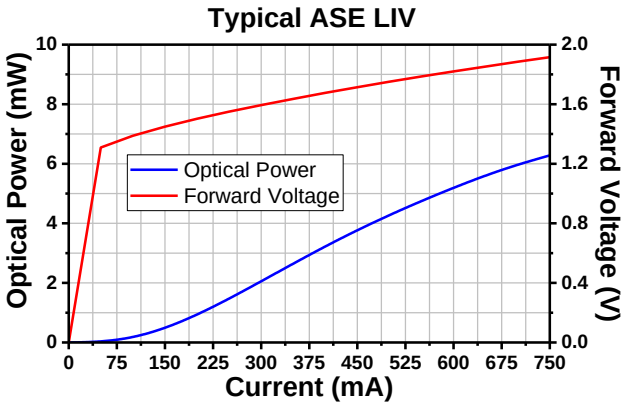
a. Absolute maximum rating specifications should never be exceeded. Operating at or beyond these conditions can permanently damage the amplifier.

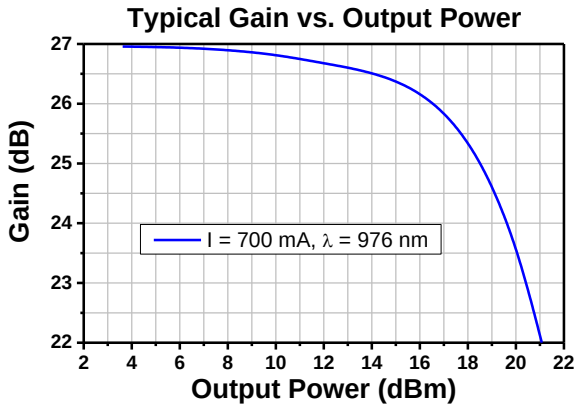
Fiber Specifications	
	Value
Fiber Type	HI1060
Mode Field Diameter[a]	5.9 ± 0.3 µm at 980 nm
Numeric Aperture	0.14
Fiber Pigtail Length	1.5 m
Connector	FC/APC, 2.0 mm Narrow Key

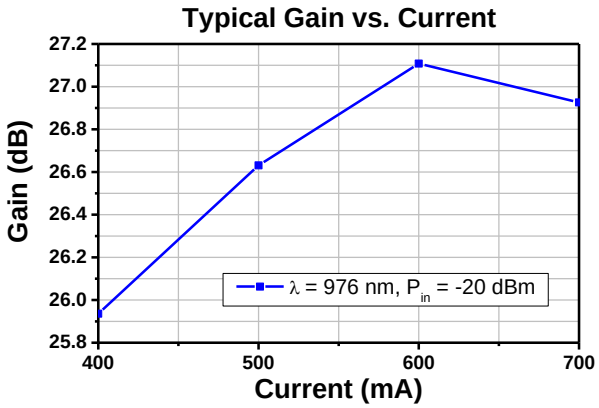
a. Mode Field Diameter is specified as a nominal value.

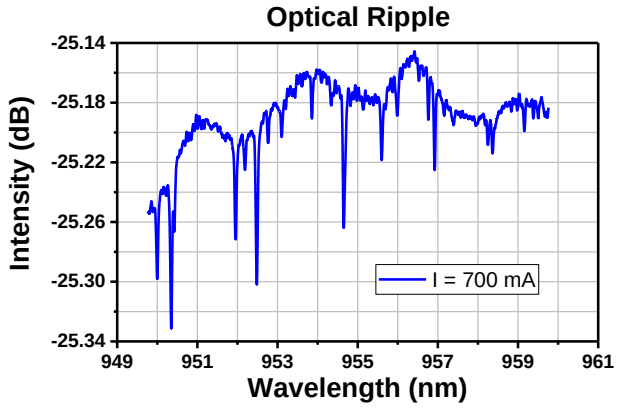
Performance Plots





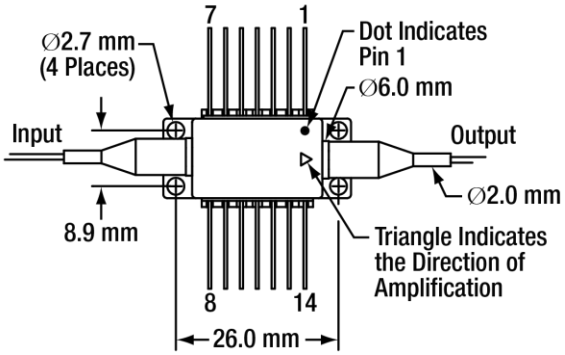






The sharp dips in the ripple spectrum are mostly caused by water absorption in the measurement setup.

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)