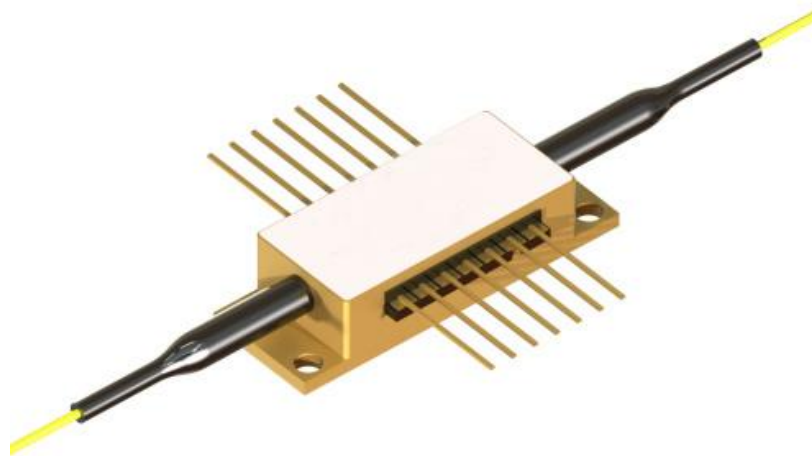


# 1310nm 24dBm BOA Fiber-Coupled Booster

## Semiconductor Optical Amplifier



### ● Product Description

Semiconductor Optical Amplifier (SOA) / Booster Optical Amplifier (BOA) Booster Optical Amplifiers (BOA) are amplifiers that employ semiconductors as the gain medium. They feature a structure similar to Fabry-Pérot laser diodes, with anti-reflection design structures on the end facets. Modern designs adopt anti-reflection coatings, tilted waveguides and window regions, which can reduce facet reflectivity to below 0.001%. This results in higher cavity power loss than gain, preventing the amplifier from lasing.



- **Product features**

Fiber-coupled design; high output power; low-noise amplification; wide wavelength optimization; stable and reliable

- **Part Number**

MP-BOA-1310-200-50-XA

- **Application area**

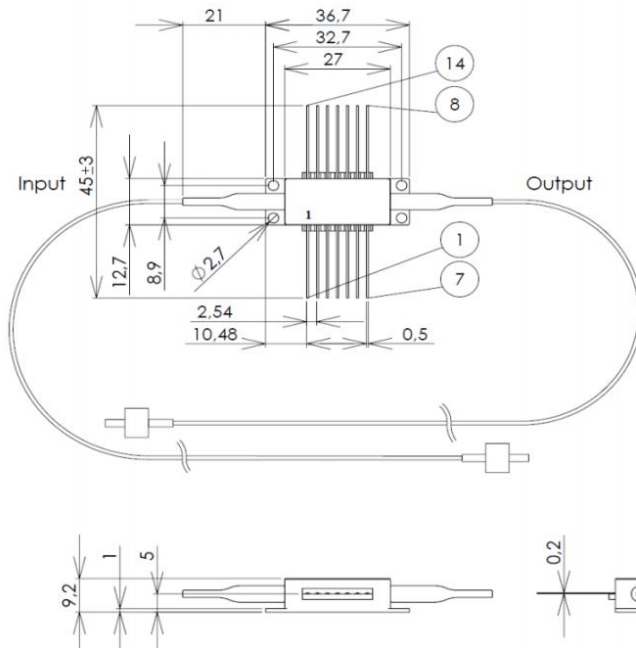
Fiber Communication | LiDAR | Sensing Network | Medical Laser | Industrial Processing

- **Core parameters**

Center Wavelength	Saturated Output Power@-3dB	Bandwidth@-3dB
1310nm	24dBm	50nm



## ● Dimension Drawing



### Pin identification:

1. TEC " + "
2. Thermistor
- 3.
- 4.
5. Thermistor
- 6.
- 7.
- 8.
- 9.
10. BOA anode (+)
11. BOA cathode (-)
- 12.
13. Case ground
14. TEC " - "

## ● General Parameters

### Detailed Specifications

### Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Unit
Operating Current	—	1000	1500	mA
Forward Voltage	—	1.6	1.8	V
Thermistor Temperature	20	25	35	°C

## Gain Characteristics

@ CW, recommended operating point

Parameter	Min.	Typ.	Max.	Unit
Output Power <sup>1 • 2</sup>	200	250	—	mW
Average Wavelength <sup>2</sup>	1290	1305	1320	nm
Bandwidth <sup>2</sup> @ Ppeak/PASE>95% (ref. graph 1)	—	50	—	nm
Small-Signal Gain <sup>1 • 3</sup>	36	39	—	dB
Saturated Output Power <sup>1</sup> @ -3 dB	18	21	—	dBm

<sup>1</sup> At maximum gain wavelength <sup>2</sup> At input signal of +10 dBm <sup>3</sup> At input signal of -25 dBm

## Amplified Spontaneous Emission (ASE) Characteristics

Each device tested @ CW, recommended operating point, no optical input

Parameter	Min.	Typ.	Max.	Unit
Optical Power per Port (Fiber-coupled)	—	60	—	mW
Average Wavelength	—	1300	—	nm



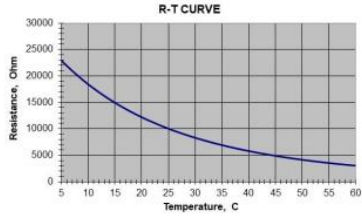
Bandwidth <sup>2</sup> @ -3 dB	—	17	—	nm
Spectral Ripple <sup>2</sup> (RMS within 1 nm span, 10 pm resolution)	—	0.1	0.3	dB
Polarization Extinction Ratio (PER) per Port	15	18	—	dB
ASE Rise Time	—	0.5	—	ns
ASE Fall Time	—	0.5	—	ns

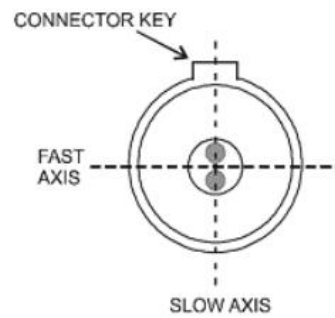
## Absolute Maximum Ratings

Parameter	Min.	Max.	Unit
BOA Reverse Voltage	—	2	V
BOA CW Forward Current	—	600	mA
Input Optical Power	—	20	dBm
TEC Current	—	3	A
TEC Voltage	—	4	V
Fiber Bending Radius	3	—	cm
Chip Operating Temperature Range	10	40	°C



<b>Housing Operating Temperature Range</b>	<b>0</b>	<b>70</b>	<b>°C</b>
<b>Storage Temperature Range</b>	<b>-40</b>	<b>85</b>	<b>°C</b>

Thermistor Specifications			Fiber Specifications			
Parameter	Value	Unit	Parameter	PM980	HI1060	Unit
Thermistor Type	NTC	—	Numerical Aperture, typical	0.12	0.14	—
Resistance @ 25 °C	10 ± 0.1	kΩ	Cutoff Wavelength	900 ± 70	920 ± 50	Nm
Beta (25-85 °C)	3434 ± 1%	K	Mode Field Diameter (@ 1060 nm)	6.6 ± 0.3	6.2 ± 0.3	μm
			Cladding Diameter	125 ± 1	125 ± 1	μm
			Coating Diameter	245 ± 15	245 ± 15	μm
			Loose Tube Diameter (Optional)	900	900	μm
			Connector	FC/APC (narrow key)		
			Connector Alignment aligned with PANDA fiber			



Output light is polarized along the slow axis of the PM fiber.

## General Specifications

### Fiber-Coupled Booster Semiconductor Optical Amplifier – BOA

Part Number	Average Gain Wavelength(nm)	Gain Bandwidth FWHM <sup>1</sup> (nm)	Output Power <sup>1</sup> (mW)	Saturated Output Power <sup>2</sup> (dBm)	ASE Ripple RMS <sup>3</sup> (dB)	Polarization Extinction Ratio PER(dB)	Operating Current(mA)
MP-BOA-106 0-120-80-YY	1060	80	120	20	0.01	20	400
MP-BOA-131 0-250-50-YY	1305	50	250	21	0.1	18	1000



## Typical Parameters of Fiber-Coupled Semiconductor Optical Amplifier (SOA)

Part Number	Average Gain Wave length (nm)	Gain Bandwidth (nm)	Small-Signal Gain (dB)	Saturated Output Power (dBm)	Noise Figure (dB)	Peak Gain Wave length (nm)	Gain Spectrum Tilt (dB)	ASE Power (mW)	ASE Ripple (dB)	PE R (dB)	Operating Current (mA)
MP-SOA-780-20-Y-30dB	775	20	32	15	6.5	775	-	7	0.03	14	300
MP-SOA-1000-100-YY-30dB	1000	100	33	18	6.5	960, 1030	1	25	0.02	20	600
MP-SOA-1020	1020	110	27	15	7.5	970,	4	15	0.02	20	450



1020-11 0-YY-27d B						1040						
MP-SOA- 1030-20- YY-40dB	1030	20	40	18	8	1030	-	70	0.03	20	400	
MP-SOA- 1060-20- YY-40dB	1060	22	40	18	8	1065	-	60	0.02	20	400	
MP-SOA- 1060-90- YY-30dB	1060	90	30	18	5	1060	-	7	0.02	20	400	
MP-SOA- 1080-20- YY-40dB	1080	27	38	17	7	1085	-	40	0.02	20	400	
MP-SOA- 1130-20- YY-35dB	1125	25	35	15	10	1125	-	30	0.03	20	600	
MP-SOA- 1140	1140	90	24	17	4.5	1110,	5	1	0.01	20	400	



1140-90- YY-24dB						1170						
MP-SOA- 1190-90- YY-20dB	1190	90	20	15	6.5	1160, 1225	5	0. 7	0.02	20	300	
MP-SOA- 1250-11 0-YY-27d B	1250	110	27	15	7.5	1210, 1280	6	5	0.05	20	900	
MP-SOA- 1290-40- YY-25dB	1285	45	24	12	7.5	1290	-	1	0.02	20	400	

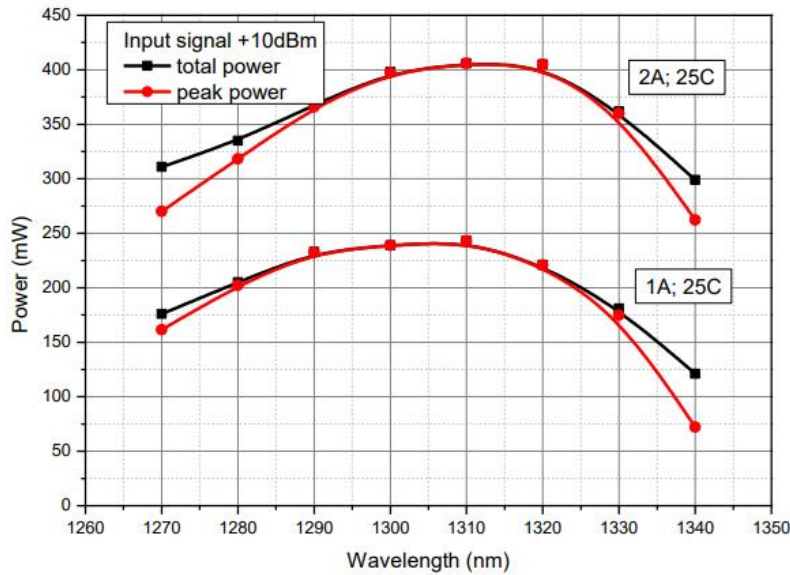
<sup>1</sup> @ -25 dBm input signal, at peak gain<sup>2</sup> @ -3 dB compression, at peak gain<sup>3</sup>

Measured at ASE peak, RMS within 1 nm span, 10 pm resolution

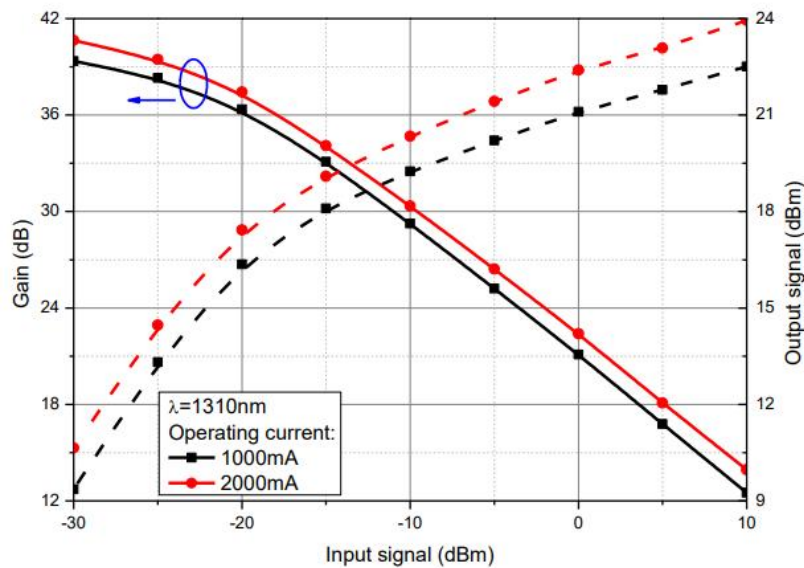
# Characteristic Curves

Typical performance (for reference only)@ CW, chip temperature 25 °C, housing mounted on room-temperature heat sink.

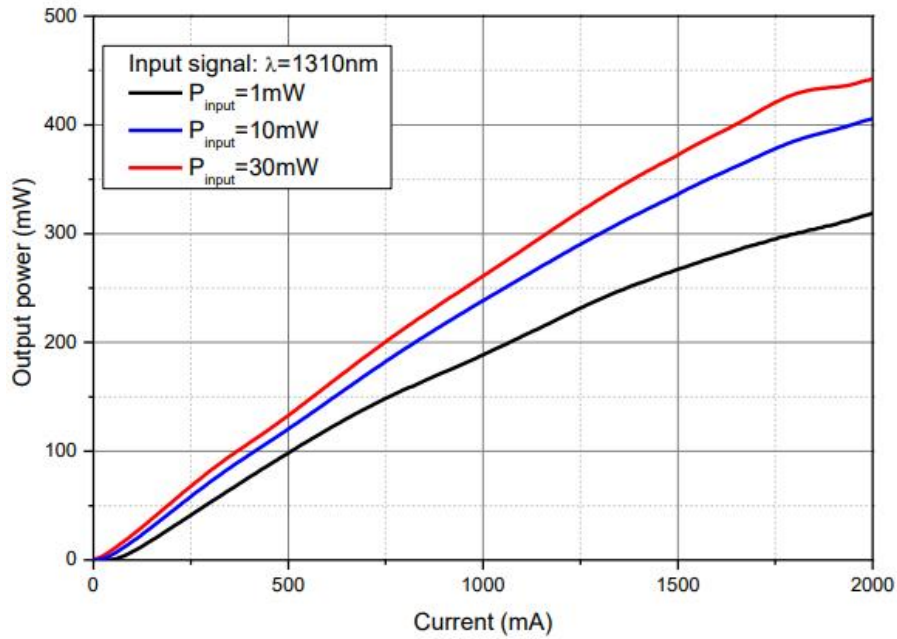
Power spectra at different currents



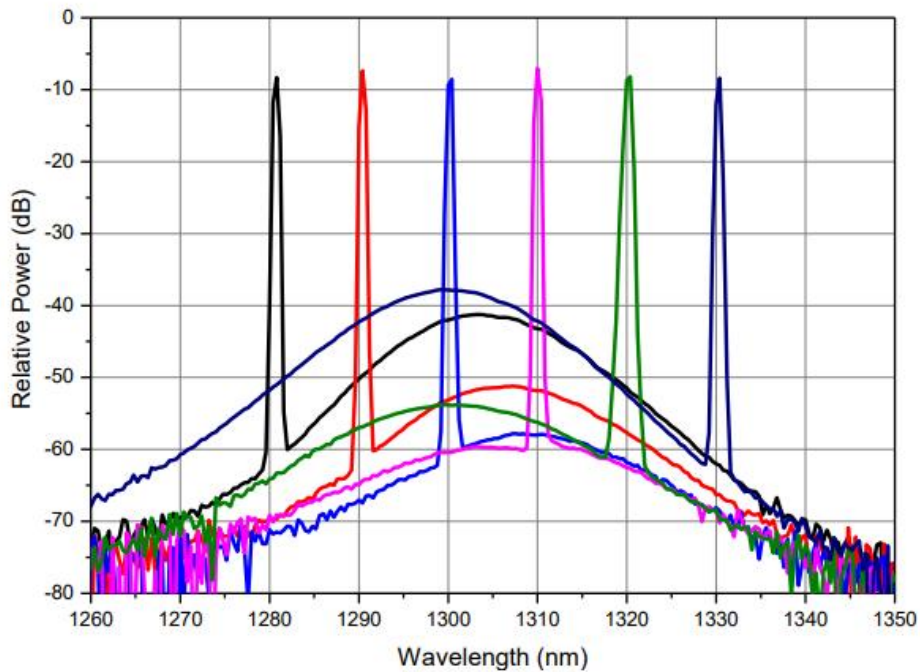
Gain vs. Output power



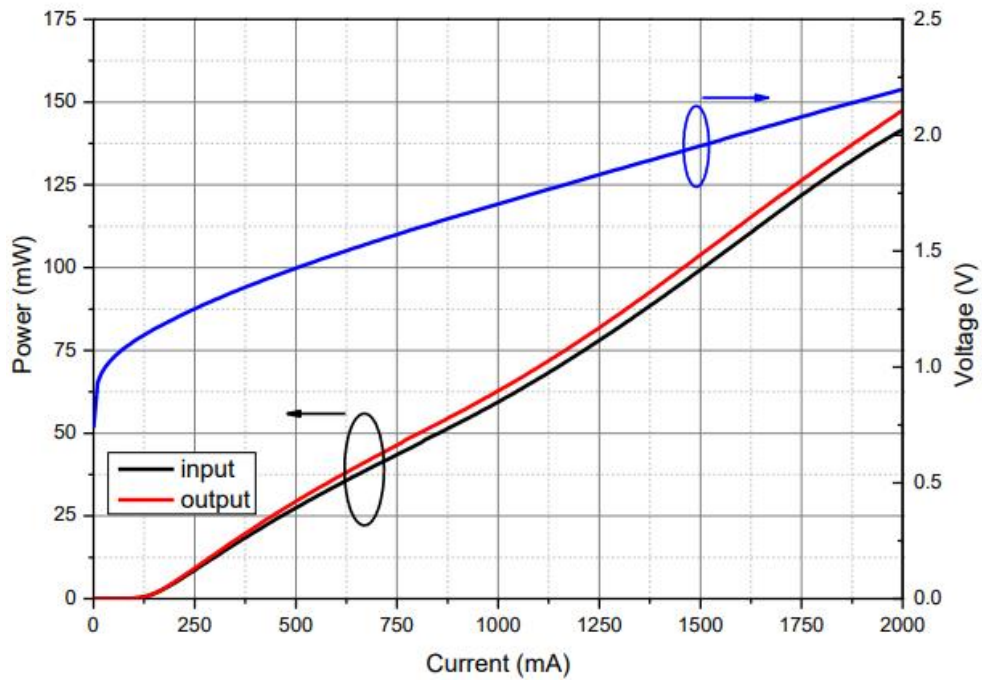
### Output power at different input signals



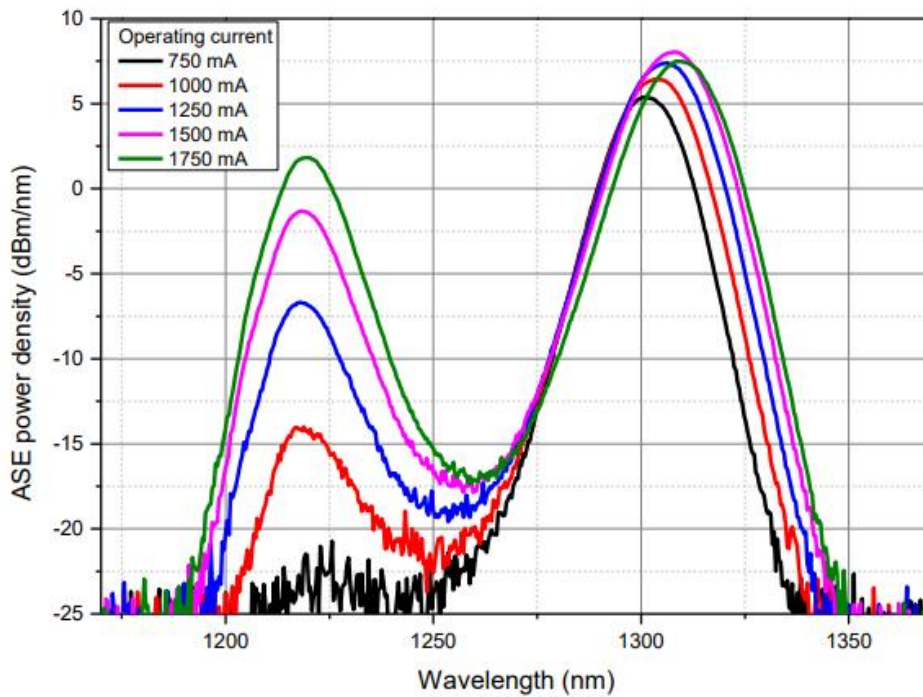
### Spectra of amplified optical signal



### ASE I-I-V characteristics



### ASE spectra





## Safety and Operating Guidelines

The light emitted by this device is invisible and may be harmful to human eyes.

Avoid direct viewing of the fiber connector during device operation. Appropriate laser safety goggles must be worn when operating with the connector uncovered.

The absolute maximum ratings apply to the BOA only for short-term operation.

Long-term operation under maximum ratings, or simultaneous exposure to multiple maximum ratings, may cause device damage and degrade reliability.

Operating the BOA beyond the maximum ratings may result in device failure and potential safety hazards. The matched power supply for the component must be used to ensure the maximum forward current is not exceeded.

The BOA mounted on a heat spreader requires a proper heat sink. The BOA shall be fixed to the heat sink with four screws (fastened in a cross pattern with an initial torque of  $0.075 \text{ N} \cdot \text{m}$  and a final torque of  $0.15 \text{ N} \cdot \text{m}$ ) or clamps. The flatness deviation of the heat sink surface shall be less than  $0.05 \text{ mm}$ . Indium foil or flexible thermal interface materials are recommended between the device base and the heat sink. Thermal grease is not recommended for this application.

Do not pull the optical fiber. Do not bend the fiber with a bending radius less than  $3 \text{ cm}$ . Always use clean fiber connectors when operating the BOA. Inspect and clean the connectors regularly if necessary. For cleaning, use



cleanroom-compatible wipes dampened with isopropyl alcohol to carefully clean the connector end-face, or use professional fiber cleaning tools. Turn off the BOA driving current before cleaning.

Electrostatic discharge (ESD) may cause permanent device failure. Necessary anti-static protection measures must be taken at all times.