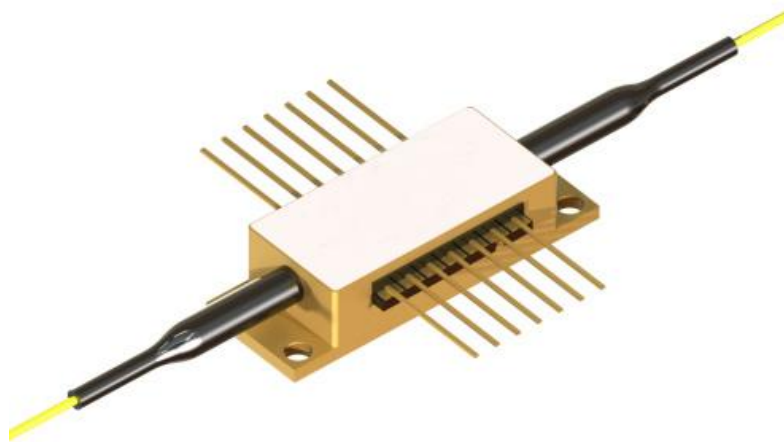


780nm 32dB High-Gain Semiconductor Optical Amplifier



● Product Description

Semiconductor optical amplifiers (SOAs), including booster optical amplifiers (BOAs), are amplifiers that use semiconductors as the gain medium. They have a structure similar to Fabry-Pérot laser diodes but incorporate anti-reflection design elements at their facets. Recent designs feature anti-reflection coatings, tilted waveguides, and window regions, which can reduce facet reflections to below 0.001%. Since this causes the power loss in the cavity to exceed the gain, it prevents the amplifier from functioning as a laser.

● Product features

Ultra-high gain; Low polarization sensitivity; Wide bandwidth; Low power consumption; Industrial-grade reliability

● Part Number

MP-SOA-780-32db-20-PA

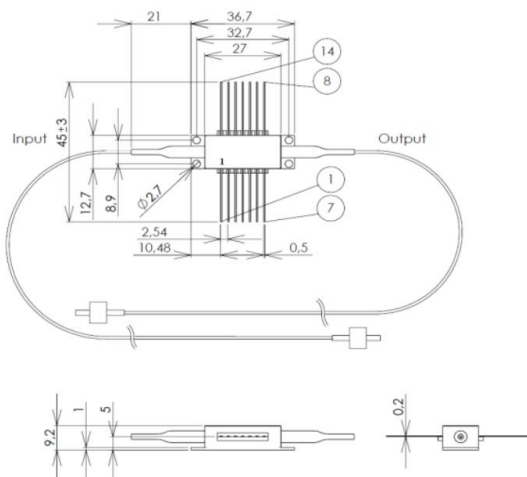
● Application area

Ultrafast laser amplification | LiDAR | Biomedical imaging | Industrial processing | Space communications

● Core parameters

Center Wavelength	Output power
775nm	15dBm

● Dimension Drawing



Pin identification:

- 1 TEC "+"
- 2 Thermistor
- 3 -
- 4 -
- 5 Thermistor
- 6 -
- 7 -
- 8 -
- 9 -
- 10 SOA anode "+"
- 11 SOA cathode "-"
- 12 -
- 13 Case
- 14 TEC "-"



● General Parameters

Detailed parameters

Specifications:

Test Instructions: Continuous operation, chip temperature 25°C, shell installed on room temperature heat sink

Parameters	Min. value	Typical values	Max. value	unit
Operating current (IOP).		300	400	mA
Forward voltage @ IOP		1.9	2.1	V
gain				
Small signal gain ^{1 2}	28	32		dB
Gain average wavelength ¹	770	775	790	nm
Gain bandwidth ¹ @ -3dB	15	20		nm
Gain saturation output power ² @ -3dB	12	15		dBm
Noise figure ^{3 ***}		6.5		dB
Amplify spontaneous radiation				
ASE optical power per port	5	7		mW
ASE average wavelength	770	775	790	nm
ASE bandwidth @ -3dB	12	15		nm



ASE** spectral ripple ³ (RMS in the 1nm range, 10pm resolution)		0.03	0.2	dB
ASE rise time		0.15		ns
ASE decline time		0.5		ns
Polarization extinction ratio (PER) per ASE port	10	14		dB

1. The input optical power is -25dBm

* No input light

2. In the gain Max. wavelength

** Output ports

3. In ASEMax. It is at the wavelength

*** $2 NF = 10 \log_{10}(\rho_{ASE} / Gh\nu)(D)$. Baney et al., Fiber Optic Technology 6, 122 (2000)]

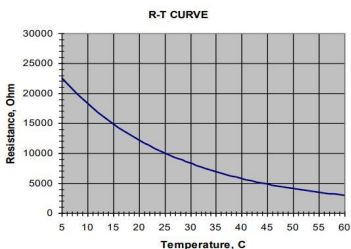
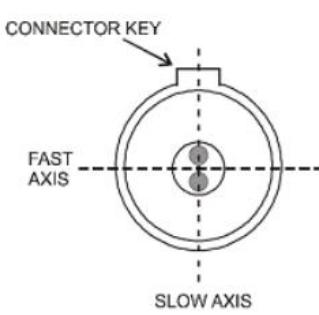
<p>Typical SOA parameters and operating current Test conditions: continuous operation, input signal 25dBm, chip temperature 25°C, chassis temperature 25°C</p>				
Operating current, mA	Gain, dB	Gain bandwidth @ -3dB, nm	Saturated output power @ -3dB, dBm	Ripple RMS, dB
200	23	22	14	0.02



300	31	20	15	0.03
400	35	17	17	0.04

Absolute Max. Rated parameters			
Parameters	Min. value	Max. value	unit
SOA reverse voltage	-	2	V
SOA CW forward current	-	400	mA
Input optical power	-	10	dBm
thermoelectric cooler current	-	3	A
Thermoelectric cooler voltage	-	4	V
Fiber bending radius	3	-	cm
Chip operating temperature range	10	40	°C
Enclosure operating temperature range	0	70	°C
Storage temperature range	-40	85	°C

Thermistor specifications			Fiber Specifications			
Parameters	Numerical values	unit	Parameters	HI780	PM780	unit

Type	NTC	-	NA typical	0.14	0.12	
Resistance @25°C	10 ± 0.1	kOhm	Cut-off wavelength	720±50	710±60	nm
Beta 25-85°C	3435±1%	K	The diameter of the mold field is @780nm	4.6±0.5	4.6±1.0	µm
			Cladding diameter	125±1	125±1	µm
			Coating diameter	245±15	245±15	µm
			Loose Tube Diameter(optional)	900		µm
			interface	FC/APC(narrow key)		
			<p>Connector alignment Panda type fiber:</p>  <p>The output light is polarized along the slow axis of the PM fiber.</p>			

General parameters

Fiber Optic Coupling Boost Semiconductor Optical Amplifier-BOA (New).

Part number	Gain average wavelength	Gain bandwidth FWHM ¹	Output power ¹	Saturation output power ²	ASE ripple RMS ³	Polarization extinction ratio PER	Operating current
	nm	nm	mW	dBm	dB	dB	mA
MP-BOA-1060-80-Y Y-120mW	1060	80	120	20	0.01	20	400
MP-BOA-1310-50-Y Y-200mW	1305	50	250	21	0.1	18	1000

Typical parameters of fiber-coupled semiconductor optical amplifiers (SOAs).

Part number	Gain average wavelength	Gain bandwidth	Small signal gain	Saturation output power ²	Noise figure	Gain Max. wavelength	Gain spectrum decrease	ASE power	ASE ripple RMS ³	Polarization extinction ratio PER	Operating current
		FWHM ¹	nm ¹	nm ¹	dBm ²	dB	nm	dB	dB	dB	mA



	nm	nm	dB	dBm	dB	nm	dB	mW	dB	dB	mA
MP-SOA-780-20-YY-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-1020-110-YY-27dB	1020	110	27	15	7.5	970, 1040	4	15	0.02	20	450
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-1140-90-YY-24dB	1140	90	24	17	4.5	1110, 1170	5	1	0.01	20	400



MP-SOA-1190 -90-YY-20dB	1190	90	20	15	6.5	1160, 1225	5	0. 7	0.02	20	300
MP-SOA-1250 -110-YY-27dB	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

1 - @ - 25dBm input signal, Max. Gain₂

2- @ - 3dB, Max. Gain₃

3- @ASE Max. value, RMS in the 1 nm range, 10pm resolution

Characteristic curves

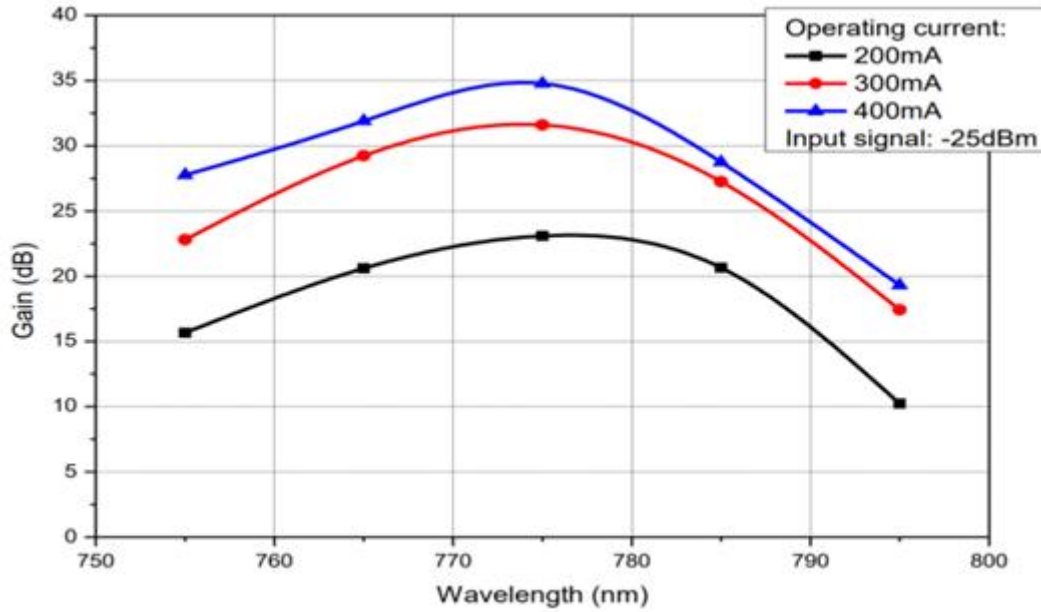
Typical performance

For reference only, test conditions: continuous operation, chip temperature 25°

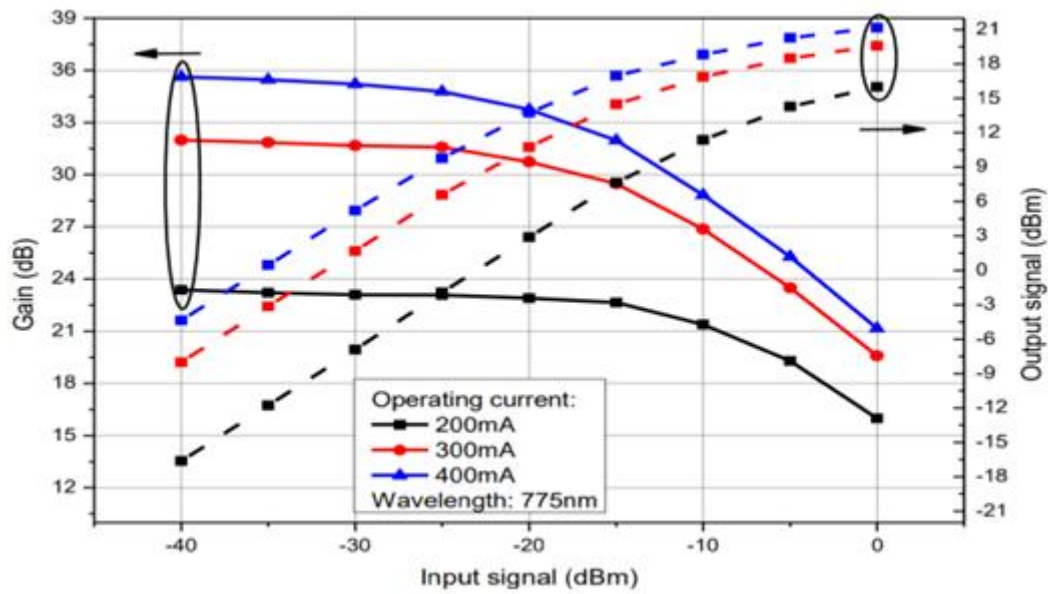
C, shell installed on room temperature heat sink



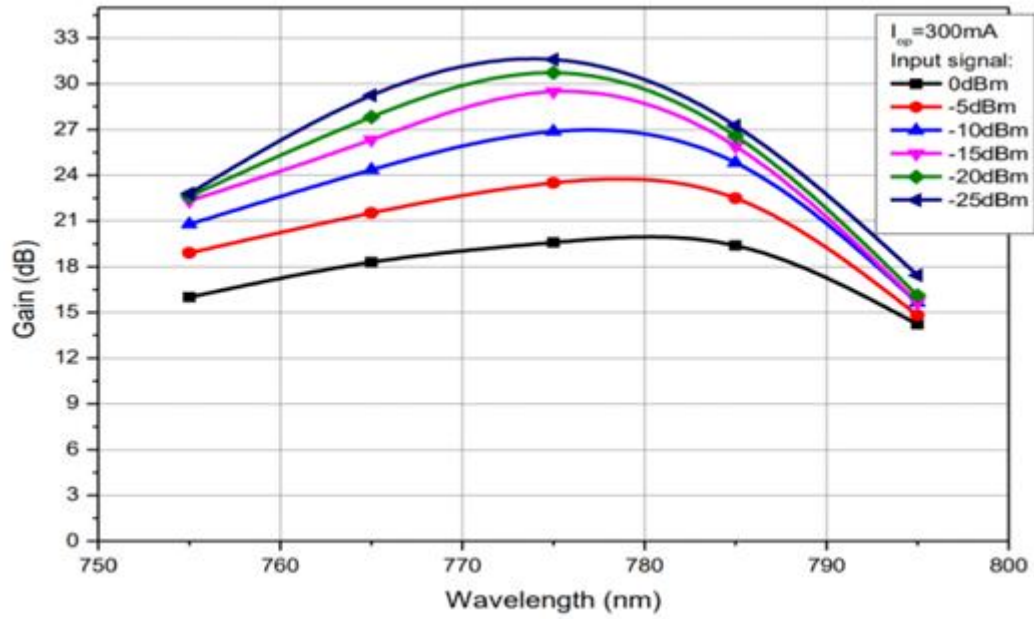
Gain Spectra at different currents



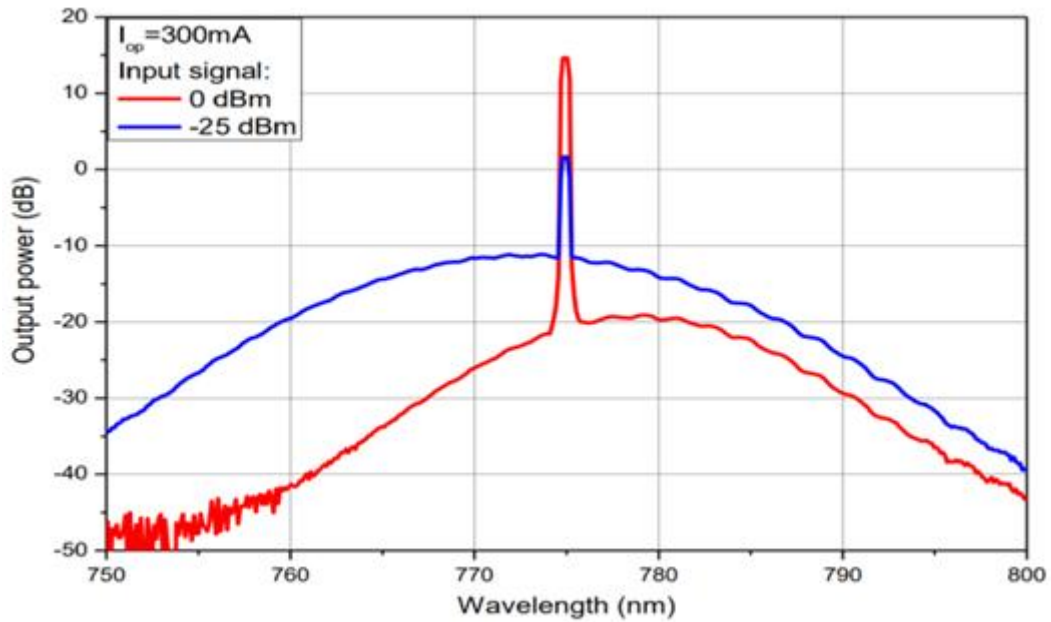
Gain and Output power vs. Input signal



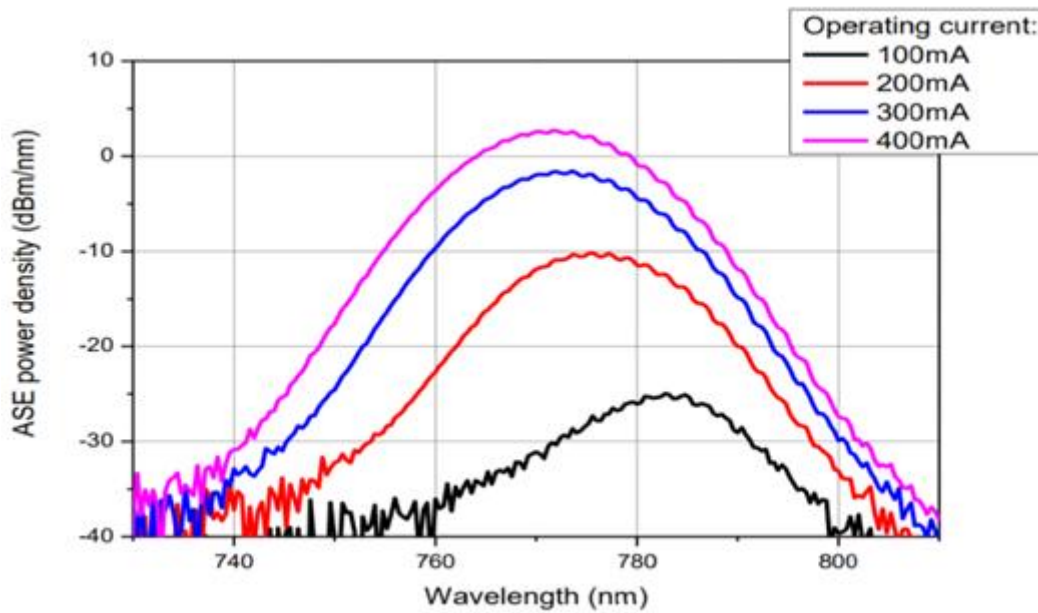
Gain spectra at different input signals



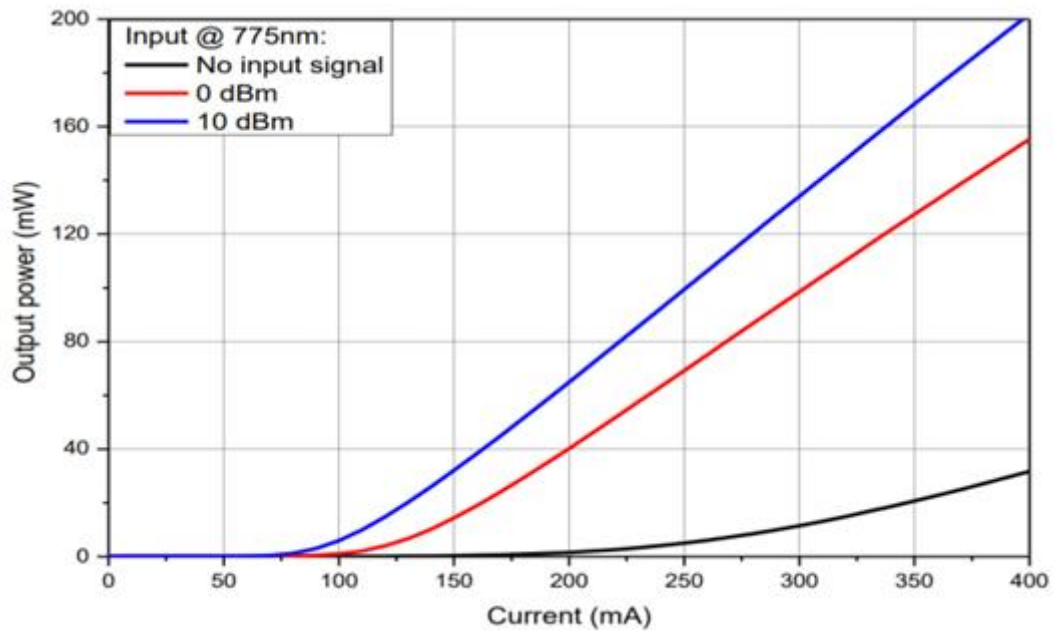
Spectra of amplified optical signal



ASE Spectra(no input signal)



Output power at differnet input signals



1. Absorption of line-polarized 100uW broadband SLD radiation (SOA short circuit). Measured after the SOA output port polarizer.



2. Absorption of line-polarized single-frequency laser radiation (SOA short circuit). Measured after the SOA output port polarizer.

Operating instructions

Safety and Operational Guidelines

The light emitted by such devices is invisible and can be harmful to the human eye. When operating the device, avoid looking directly at the fiber optic connector. Appropriate laser safety glasses must be worn during operation and the connector must be opened.

Due to its high rating on z only applies to BOA in the short term. Prolonged exposure to Max. rated or exposed to multiple Max. Rated values may cause damage to the device or affect the reliability of the equipment. More than Max. Rated operation of BOA may lead to equipment failure or safety hazards. The power supply used by the component must be ensured that it does not exceed Max.

Forward current.

BOA on the heatsink requires a suitable heat sink. The BOA must be mounted on the radiator with 4 screws (the bolts are fixed in an x-shaped way, the initial torque is set to 0.075Nm, and the final x-bolt is set at 0.15Nm) or clamps. The surface flatness deviation of the radiator is less than 0.05mm. Indium foil or thermally conductive soft material is recommended for the thermal interface between the bottom of the case and the heatsink. It is undesirable to use thermal grease.



Do not pull the fiber. Do not bend the fiber with a bending radius of less than 3cm. When operating BOA, use clean fiber optic connectors. Regularly inspect and clean the connectors if necessary. To clean the connector, simply use a cleanroom-compatible paper towel, apply some isopropyl alcohol, carefully clean the small side of the connector, or use a dedicated fiber cleaning tool.

When cleaning, turn off the BOA current.

Electrostatic discharge can cause equipment failure. Take necessary anti-static measures.