Innolume GmbH
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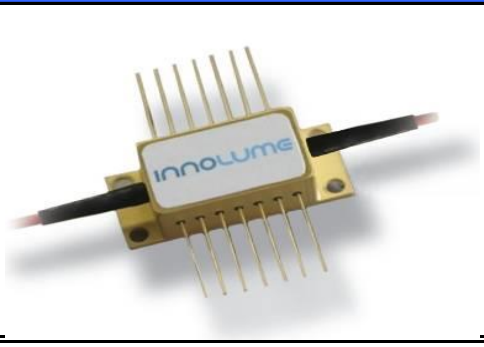
SOA-1060-90-YY-30dB

High-gain Semiconductor Optical Amplifier



Features:
- Broadband high gain (>30dB in 1010-1090nm range)
- Strong linear polarization
- RoHS compliance

Applications:
- Swept-source, tunable lasers
- Booster optical amplifiers
- Optical preamplifiers
- Optical coherence tomography (OCT)

SPECIFICATIONS

Test conditions: CW operation, chip temperature 25°C, the case is mounted on room temperature heatsink

Parameters	Min.	Typ.	Max.	Unit
Operating current (Iop)		400	500	mA
Forward voltage @ Iop		1.5	1.7	V
Gain				
Small signal gain[1] [2]	30	33		dB
Gain mean wavelength[1]	1045	1060	1075	nm
Gain bandwidth[1] @ -3dB	70	90		nm
Gain saturation output power[2] @ -3dB	15	18		dBm
Noise figure[3] ***		5		dB
Amplified Spontaneous Emission (ASE)*				
ASE optical power ex fiber from each port	5	7		mW
ASE mean wavelength	1035	1050	1065	nm
ASE bandwidth @ -3dB	70	90		nm
ASE** spectrum ripples[3] (RMS in 1nm range, 10pm resolution)		0.02	0.2	dB
ASE rise time		0.15		ns
ASE fall time		0.5		ns
ASE polarization extinction ratio (PER) at each port	15	19		dB

[1] at -25dBm input optical power
[2] at wavelength of gain maximum
[3] at wavelength of ASE maximum

* without input light
** from output port
*** $NF=10\log_{10}(2\rho_{ASE}/Ghv)$ [D.Baney *et al.* , Optical Fiber Techn. **6**, 122 (2000)]

TYPICAL SOA PARAMETERS vs. OPERATING CURRENT

Test conditions: CW operation, input signal -25dBm, chip temperature 25°C, case temperature 25°C

Operating Current, mA	Gain, dB	Gain bandwidth @ -3dB, nm	Saturation output power @ -3dB, dBm	Ripples RMS, dB
200	29	50	15	0.01
400	33	90	19	0.02
600	34	80	20	0.03

ABSOLUTE MAXIMUM RATINGS

Parameters	Min.	Max.	Unit
SOA reverse voltage	-	2	V
SOA CW forward current	-	800	mA
Input optical power	-	20	dBm
Thermo Electric Cooler current	-	3	A
Thermo Electric Cooler voltage	-	4	V
Fiber bend radius	3	-	cm
Chip operating temperature range	10	40	°C
Case operating temperature range	0	70	°C
Storage temperature range	-40	85	°C

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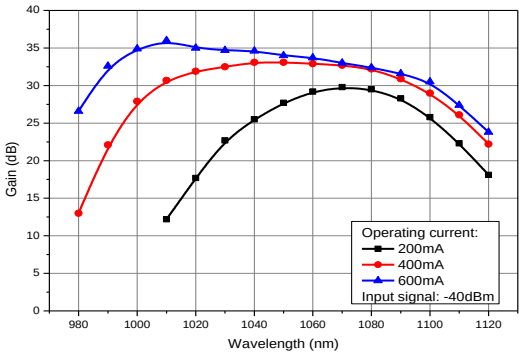
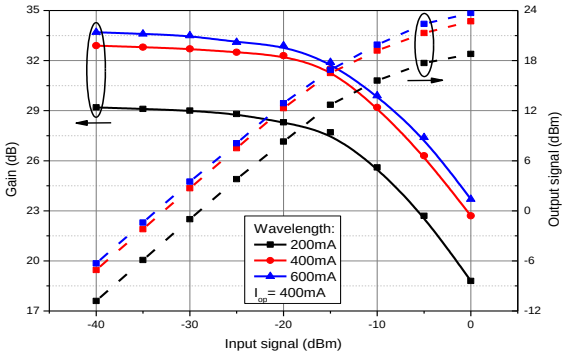
TYPICAL PERFORMANCE for reference only

Test conditions: CW operation, chip temperature 25°C, the case is mounted on room temperature heatsink

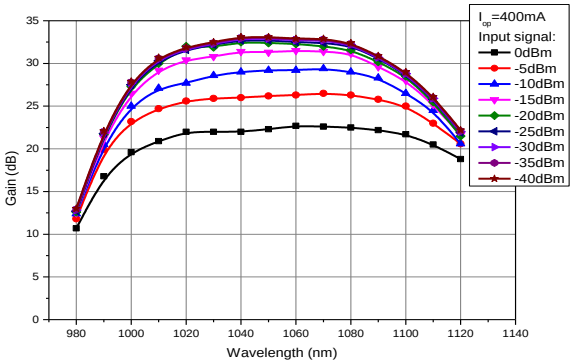
Gain spectra at different currents



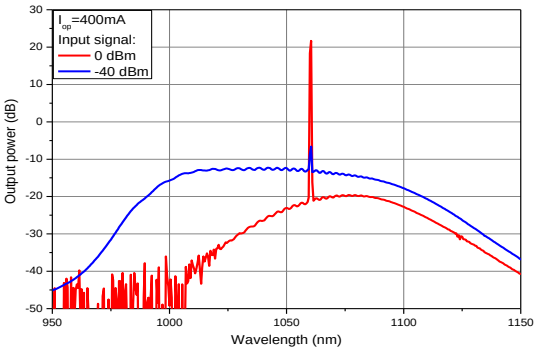
Gain and Output power vs. input signal



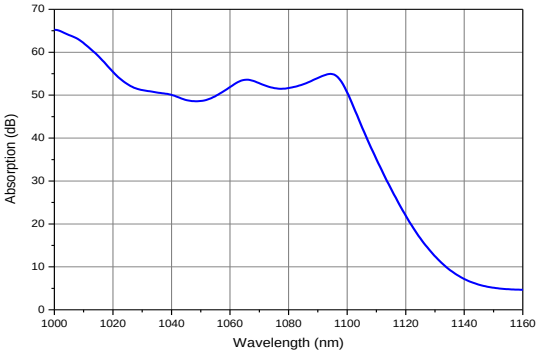
Gain spectra at different input signals



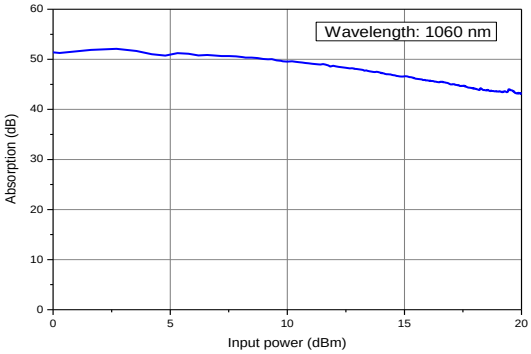
Spectra of amplified optical signal



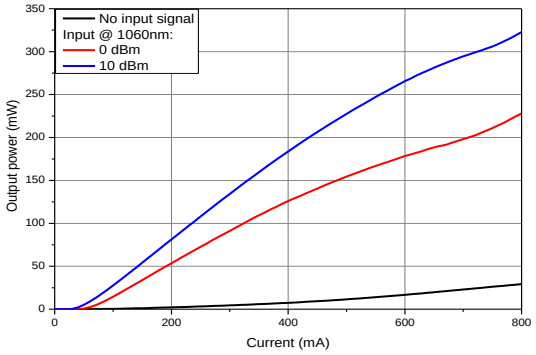
Absorption spectrum[1]



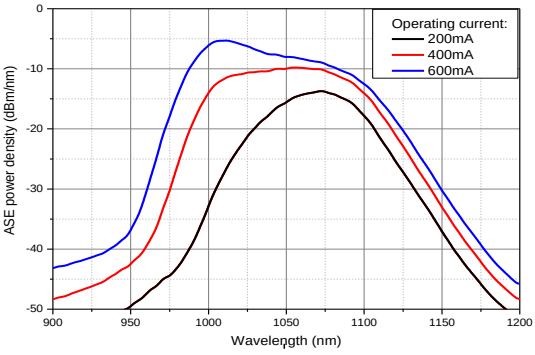
Absorption[2] vs. input signal



Output power at different input signals



ASE Spectra (no input signal)



[1] Absorption of linearly polarized 100uW broadband SLD radiation (SOA is short-circuited). Measured after polarizer at SOA output port.

[2] Absorption of linearly polarized single-frequency laser radiation (SOA is short-circuited). Measured after polarizer at SOA output port.

Part Number Identification

YY: Optical fiber type (PM – PM980 fiber; HI – HI1060 fiber)
Example: SOA-1060-90-PM-30dB

NOTE: Innolume product specifications are subject to change without notice

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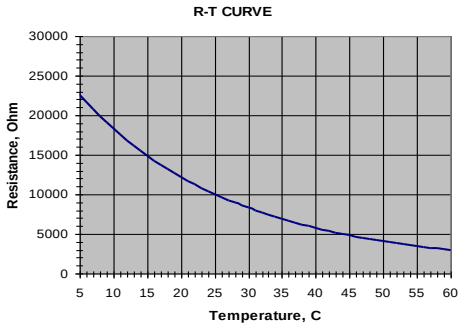
THERMISTOR SPECIFICATION

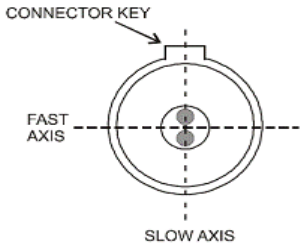
Parameters	Value	Unit
Thermistor type	NTC	-
Resistance @25°C	10 ± 0.1	kOhm
Beta 0-50°C	3375±1%	K



FIBER SPECIFICATION

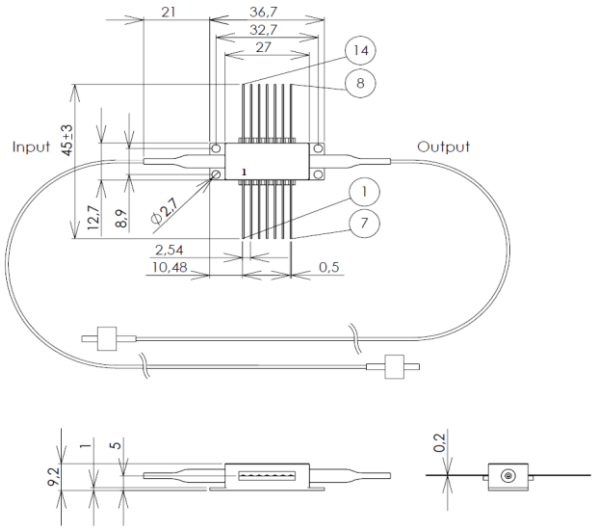
Parameters	HI1060	PM980	Unit
Numerical aperture (Typical)	0.14	0.12	
Cutoff wavelength	920±50	900±70	nm
Mode-field diameter @1060nm	6.2±0.3	6.6±0.3	μm
Cladding diameter	125±1	125±1	μm
Coating diameter	245±15	245±15	μm
Length (each port)	1.0 ± 0.1	1.0 ± 0.1	m
Connector	FC/APC (narrow key)		

Connector alignment to the PANDA fiber



The output light is polarized along the slow axis of PM fiber.

DIMENSIONS (in mm)



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 "-"

SAFETY AND OPERATING INSTRUCTIONS

The light emitted from this device is invisible and can be harmful to the human eye. Avoid looking directly into the fiber connector when the device is in operation. Proper laser safety eyewear must be worn during operation with open connector.

Absolute Maximum Ratings may be applied to the device for short period of time only. Exposure to maximum ratings for extended period of time or exposure to more than one maximum rating may cause damage or affect the reliability of the device. Operating the device outside of its maximum ratings may cause device failure or a safety hazard. Power supplies used with the component must be employed such that the maximum forward current cannot be exceeded.

A proper heatsink for the device on thermal radiator is required. The device must be mounted on radiator with 4 screws (bolt down in X-style fashion with initial torque set to 0.075Nm and final X-style bolt down at 0.15Nm) or with clamps. The deviation from flatness of radiator surface must be less than 0.05mm. It's recommended using of Indium foil or thermal conductive and soft material between bottom of the case and heatsink for thermal interface. It's undesirable to use thermal grease for this.

Avoid back reflection to the device. It may give impact on the device performance in aspects of spectrum and power stability. It also may cause fatal facet damage. Using of optical isolators is highly recommended to block back reflection.

Do not pull the fiber. Do not bend a fiber with a radius smaller than 3 cm. Fiber tip should always be protected from any contamination or damage during the process of installation. After removing the dust-preventing cap covered at fiber tip, carefully clean fiber tip by wiping through one direction using optical lens cleaning paper or cotton swab dabbed with Iso-Propanol or Ethyl alcohol. Operate the device with clean fiber connector only.

Electrostatic discharge is the primary cause of unexpected product failure. Take extreme precaution to prevent ESD. During device installation, ESD protection has to be maintained - use wrist straps, grounded work surfaces and rigorous antistatic techniques when handling the product.