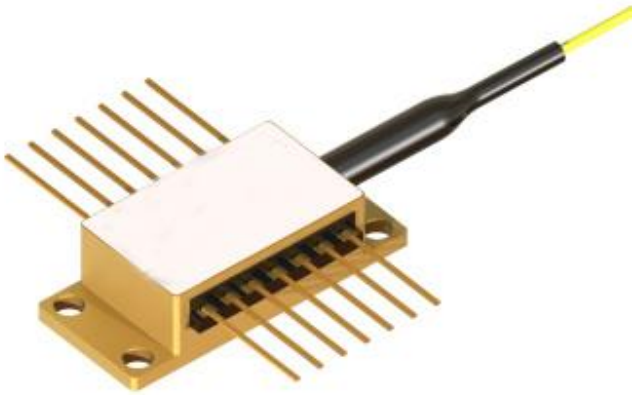
1020nm 50mW SM DFB laser diode



Product Description

Distributed Feedback (DFB) and Distributed Bragg Reflector (DBR) laser diodes are light sources emitting an extremely narrow spectral line with a bandwidth below 5 MHz and a typical Side-Mode Suppression Ratio (SMSR) > 40 dB. Based on GaAs, idealphotonics' DFB and DBR lasers utilize InGaAs Quantum Well (QW) or InAs/GaAs Quantum Dot (QD) active regions and proprietary chip designs, covering the 970–1330 nm spectral range.To date, DFB and DBR lasers are common laser types, especially for use in scientific research and operations. Both laser types operate in a single longitudinal mode and are highly reliable in terms of efficiency, spectral purity, and long-term performance across various applications.

Product features

Precise wavelength; stable output; single longitudinal mode narrow linewidth; low noise design; industrial-grade package

Part Number

MP-DFB-1020-50-A81-14BF-SA

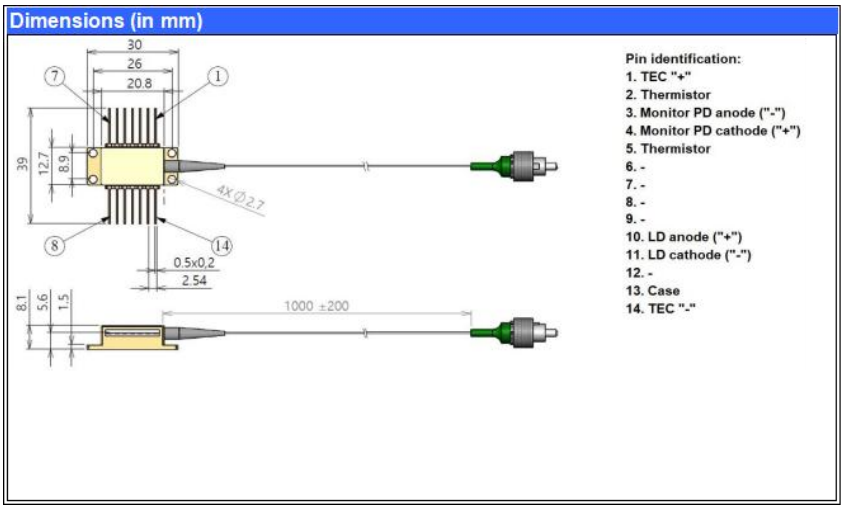
Application area

Fiber laser pumping | Biomedical imaging | Spectral analysis | Cold atom physics | Industrial sensing

Core parameters

Central Wavelength	Output Power
1020nm	50mW

Dimension Drawing



General Parameters

@ CW, Module mounted on heat sink at room temperature

Parameter	Min.	Typ.	Max.	Unit
Chip Temperature	20	25*	40	°C
Forward Current	—	200	220	mA
Output Power**	5	—	50	mW

***May vary depending on selected wavelength in some cases**

****No kinking over full operating range**

Characteristics

@ CW, 25°C*, 200 mA

Parameter	Min.	Typ.	Max.	Unit
Output Power @ 220 mA	50	—	—	mW
Forward Voltage	—	1.7	3.5	V
Threshold Current	—	30	80	mA
Peak Wavelength** (customer selectable)	1020	—	1200	nm
Peak Wavelength Tolerance	—	—	±1	nm
Wavelength Tuning vs. Temperature	—	100	—	pm/°C
Wavelength Tuning vs. Current	—	2	—	pm/mA
Side Mode Suppression Ratio (SMSR)	40	55	—	dB

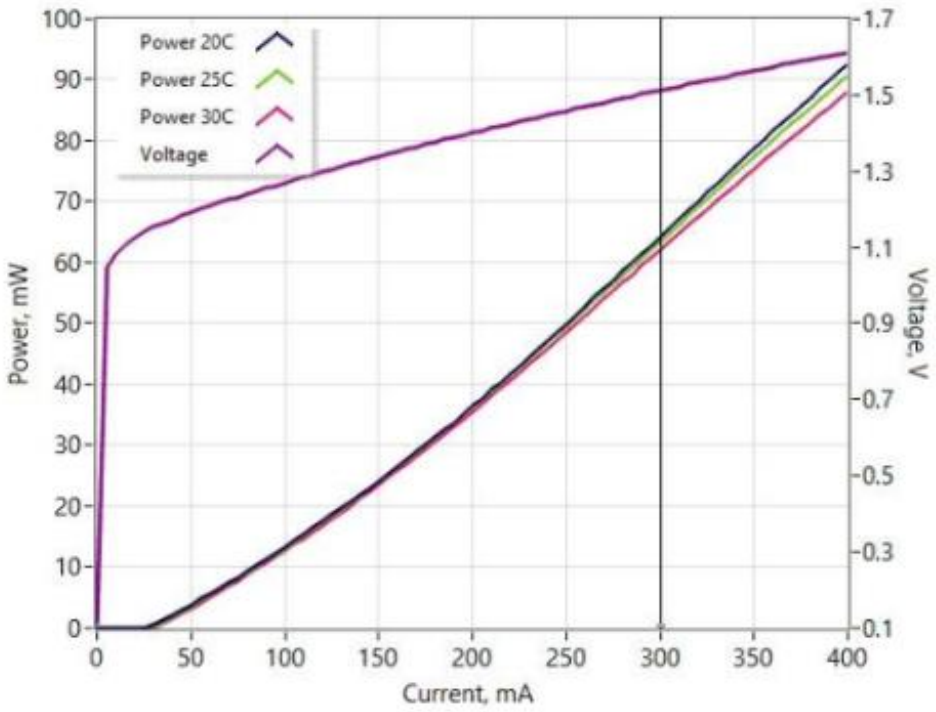
Parameter	Min.	Typ.	Max.	Unit
Linewidth (self-heterodyne @ 80 MHz)	—	1	5	MHz
Polarization Extinction Ratio (PER)	15	18	—	dB
Polarization	—	TE	—	—

***Temperature may vary from 20 to 40°C depending on selected wavelength in some cases**

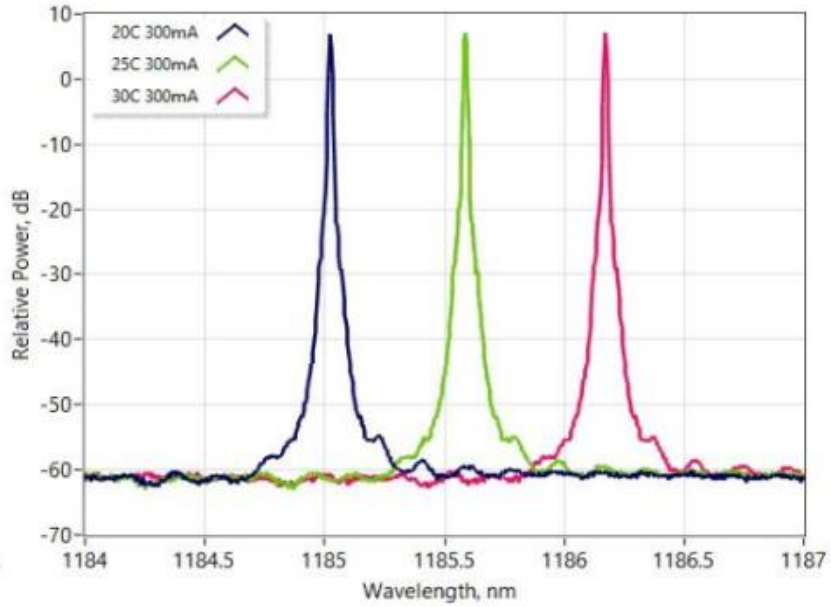
****Achievable within wavelength tolerance at output power > 50 mW**

Typical Performance (For Reference Only)

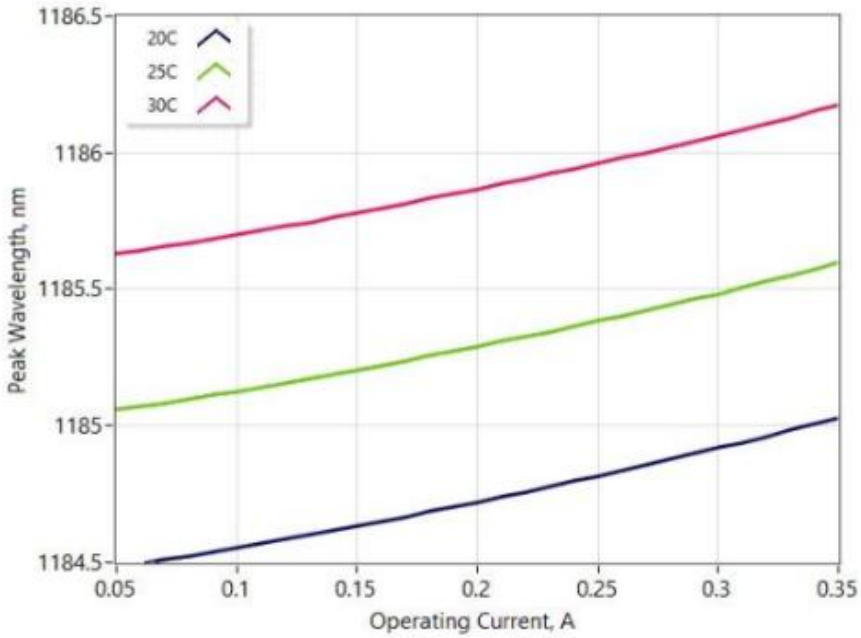
Light Current Voltage Characteristics



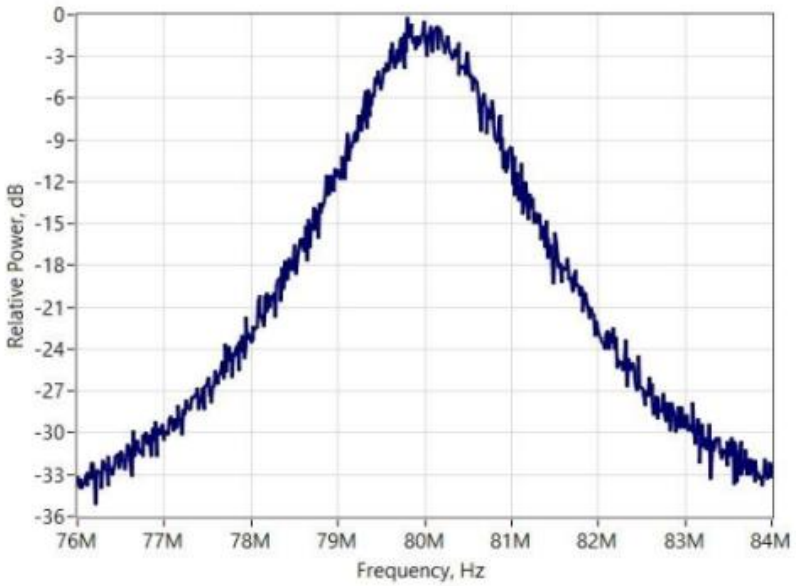
Optical Spectra vs temperature (resolution: 10 pm)



Peak Wavelength Tuning by Current



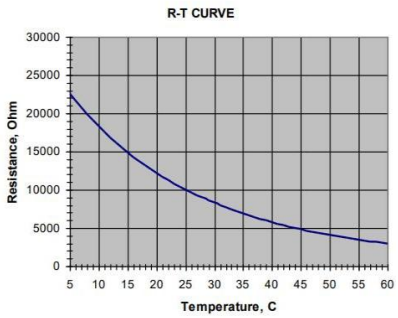
RF line spectrum

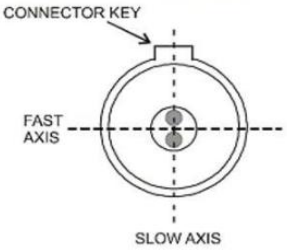


Absolute Maximum Ratings

Parameter	Min	Max	Unit
Forward Current	—	250	mA
Reverse Voltage	—	2	V
TEC Current	—	3	A
TEC Voltage	—	4	V
Chip Operating Temperature	5	50	℃
Case Operating Temperature	0	70	℃

Storage Temperature	-40	85	℃
Fiber Bend Radius	3	—	cm

Thermistor Specifications			Fiber Specifications			
Parameter	Value	Unit	Parameter	PM980	HI1060	Unit
Thermistor Type	NTC	—	Numerical Aperture, typical	0.12	0.14	—
Resistance @ 25 ℃	10 ± 0.1	kΩ	Cutoff Wavelength	900 ± 70	920 ± 50	Nm
Beta (25–85 ℃)	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 o f the PM fiber.

Typical Parameters of Fiber-Coupled DFB Laser Modules

Part Number	Integrated Optical Isolator[1]	Peak Wavelength Range[2]	Output Power	Operating Current	Threshold Current	SMSR	Wavelength Tuning vs. Temp	Wavelength Tuning vs. Current	PER
		nm	mW	mA	mA	dB	pm/K	pm/mA	dB
MP-DFB-9XX-YY-30		968 – 986	30	100	20	55	90	1.5	18

MP-DFB-10X X-YY-50		1020 – 1120	50	200	30	55	100	2	1 8
MP-DFB-10X X-YY-30-VO (New)	Yes	1020 – 1120	30	200	30	55	100	2	1 8
MP-DFB-11X X-YY-50		1120 – 1200	50	300	30	50	110	2	1 8
MP-DFB-11X X-YY-30-VO (New)	Yes	1120 – 1200	30	300	30	50	110	2	1 8
MP-DFB-12X X-YY-50		1200 – 1280	50	350	50	50	120	2	1 8
MP-DFB-12X X-YY-60-VO (New)	Yes	1200 – 1280	60	350	50	50	120	2	1 8
MP-DFB-13X		1280	50	350	50	50	120	2.5	1

X-YY-50		– 1330							8
MP-DFB-13X X-YY-60-VO (New)	Yes	1280 – 1330	60	350	50	50	120	2.5	1 8
MP-DFB-13X X-YY-100-VO (New)	Yes	1280 – 1330	100	800	60	50	120	4	1 8

Notes

1 Free-space optical design

2 Ay wavelength within this range is available with ±1 nm tolerance

Safety and Operating Instructions

The device emits invisible light that may be harmful to human eyes. Avoid direct eye exposure to the fiber connector during operation. When operating with the connector open, appropriate laser safety goggles must be worn.

Absolute maximum ratings shall be applied to the device only for short periods. Prolonged exposure to maximum ratings or exposure to more than one maximum rating may damage the device or degrade its reliability. Operation

beyond the absolute maximum ratings may result in device failure or safety hazards.

A suitable power supply must be used to ensure the maximum forward current is not exceeded.

The device requires a proper heat sink. It must be mounted using 4 screws (cross-tightened with an initial torque of 0.075 Nm and final torque of 0.15 Nm) or a clamp. Flatness deviation of the heat sink surface must be less than 0.05 mm. Indium foil or soft thermally conductive material is recommended as the thermal interface between the package base and heat sink. Thermal grease is not recommended.