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PART NUMBER 0975L-13A ITEM NAME 975 NM LASER (DIODE; SM FIBER)

# PRODUCT DATASHEET



### DESCRIPTION

975 nm laser module is fiber-coupled into a single-mode (SM) fiber and, as a standard, provided with FC/PC connector. Up to 60 mW output power could be reached with such a module.

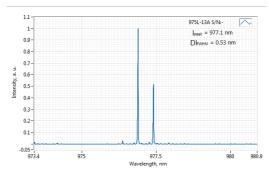
By default, this type of laser is built with FC/PC connector, but other fiber terminations are available upon request. Details about non-standard connector and the fiber used with it should be discussed with the Integrated Optics sales team.

### **SPECIFICATIONS**

Specifications updated: 11 June 2021

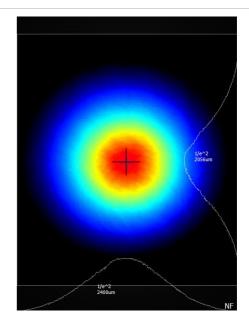
Central Wavelength, nm         967         972         977           Longitudinal modes         -         Multiple         -           Spectral line width FWHM, nm         0.02         0.5         1.5           Output power, mW         -         50 ¹         60           Power stability, % (RMS, 8 hrs)         0.01         0.05 ²         0.25           Power stability, % (peak-to-peak, 8 hrs)         0.05         0.23         1           Intensity noise, % (RMS, 20 Hz to 20         0.05         0.25         0.6           MHz)         -         TEM00         -           Transversal modes         -         TEM00         -           M² effective         -         1.05         1.1           Control interface type         -         UART 4         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 ⁵         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 ⁶         -           Fiber Length, m         0.95         1	Parameter	Minimum Value	Typical Value	Maximum Value
Spectral line width FWHM, nm         0.02         0.5         1.5           Output power, mW         -         50 1         60           Power stability, % (RMS, 8 hrs)         0.01         0.05 2         0.25           Power stability, % (peak-to-peak, 8 hrs)         0.05         0.2 3         1           Intensity noise, % (RMS, 20 Hz to 20 MHz)         0.05         0.25         0.6           M1+2)         TEM00         -         -           M 2 effective         -         1.05         1.1           Control interface type         -         UART 4         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 5         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)	Central Wavelength, nm	967	972	977
Output power, mW         -         50 ¹         60           Power stability, % (RMS, 8 hrs)         0.01         0.05 ²         0.25           Power stability, % (peak-to-peak, 8 hrs)         0.05         0.2 ³         1           Intensity noise, % (RMS, 20 Hz to 20 MHz)         0.05         0.25         0.6           M 2 effective         -         TEM00         -           M 2 effective         -         1.05         1.1           Control interface type         -         UART 4         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 ⁵         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization	Longitudinal modes	-	Multiple	-
Power stability, % (RMS, 8 hrs)         0.01         0.05 ²         0.25           Power stability, % (peak-to-peak, 8 hrs)         0.05         0.2³         1           Intensity noise, % (RMS, 20 Hz to 20 MHz)         0.05         0.25         0.6           Mransversal modes         -         TEM00         -           Transversal modes         -         TEM00         -           M² effective         -         1.05         1.1           Control interface type         -         UART 4         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10⁵         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization	Spectral line width FWHM, nm	0.02	0.5	1.5
Power stability, % (peak-to-peak, 8 hrs)         0.05         0.2³         1           Intensity noise, % (RMS, 20 Hz to 20 MHz)         0.05         0.25         0.6           Transversal modes         -         TEM00         -           M² effective         -         1.05         1.1           Control interface type         -         UART ⁴         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 ⁵         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 ⁶         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No ²         -	Output power, mW	-	50 <sup>1</sup>	60
Intensity noise, % (RMS, 20 Hz to 20 MHz)         0.05         0.25         0.6           Transversal modes         -         TEM00         -           M² effective         -         1.05         1.1           Control interface type         -         UART 4         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 5         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No 7         -	Power stability, % (RMS, 8 hrs)	0.01	0.05 <sup>2</sup>	0.25
MHz)         Transversal modes         -         TEM00         -           M² effective         -         1.05         1.1           Control interface type         -         UART 4         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 5         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No 7         -	Power stability, % (peak-to-peak, 8 hrs)	0.05	0.23	1
M ² effective         -         1.05         1.1           Control interface type         -         UART 4         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 5         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No 7         -		0.05	0.25	0.6
Control interface type         -         UART 4         -           Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 5         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No 7         -	Transversal modes	-	TEM00	-
Operation mode         -         APC (CW)         -           Modulation bandwidth, MHz         -         10 5         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No 7         -	M <sup>2</sup> effective	-	1.05	1.1
Modulation bandwidth, MHz         -         10 5         -           Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No 7         -	Control interface type	-	UART <sup>4</sup>	-
Input voltage, VDC         4.8         5         5.3           External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No 7         -	Operation mode	-	APC (CW)	-
External power supply requirement         -         +5 V DC, 1.5 A         -           Dimensions, mm         -         50 x 30 x 18 6         -           Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No 7         -	Modulation bandwidth, MHz	-	10 <sup>5</sup>	-
Dimensions, mm         -         50 x 30 x 18 6 -           Fiber Length, m         0.95 1 1.1           Heat-sinking requirement, °C/W - 1 - 1 -         -           Optimum heatsink temperature, °C 15 20 30           Warm up time, mins (cold start) 0.1 0.5 1           Temperature stabilization - Internal TEC -           External fan control - No 7 -	Input voltage, VDC	4.8	5	5.3
Fiber Length, m         0.95         1         1.1           Heat-sinking requirement, °C/W         -         1         -           Optimum heatsink temperature, °C         15         20         30           Warm up time, mins (cold start)         0.1         0.5         1           Temperature stabilization         -         Internal TEC         -           External fan control         -         No <sup>7</sup> -	External power supply requirement	-	+5 V DC, 1.5 A	-
Heat-sinking requirement, °C/W - 1 - 1 - Optimum heatsink temperature, °C 15 20 30  Warm up time, mins (cold start) 0.1 0.5 1  Temperature stabilization - Internal TEC - External fan control - No 7 -	Dimensions, mm	-	50 x 30 x 18 <sup>6</sup>	-
Optimum heatsink temperature, °C 15 20 30  Warm up time, mins (cold start) 0.1 0.5 1  Temperature stabilization - Internal TEC -  External fan control - No 7 -	Fiber Length, m	0.95	1	1.1
Warm up time, mins (cold start)  Temperature stabilization  - Internal TEC  External fan control  - No 7  -	Heat-sinking requirement, °C/W	-	1	-
Temperature stabilization - Internal TEC -  External fan control - No 7 -	Optimum heatsink temperature, °C	15	20	30
External fan control - No <sup>7</sup> -	Warm up time, mins (cold start)	0.1	0.5	1
	Temperature stabilization	-	Internal TEC	-
Overheat protection - Yes -	External fan control	-	No <sup>7</sup>	-
	Overheat protection	-	Yes	-

# TYPICAL SPECTRUM



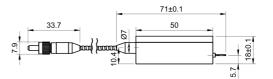
Typical spectrum of 0975 nm diode laser. Measured with 20 pm resolution.

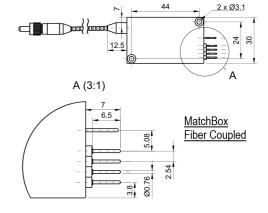
# TYPICAL NEAR FIELD



Storage temperature, °C (non-condensing)	-10	-	50
Net weight, kg	0.1	0.12	0.14
Max. power consumption, W	0.4	2	10
Warranty, months (op. hrs)	-	14 (10000) <sup>8</sup>	-
Laser Safety Class	-	3B	-
RoHS	-	Yes	-
CE compliance	-	- General Product Safety Directive (GPSD) 2001/95/EC - (EMC) Directive 2004/108/EC	-
OEM lasers are not compliant with	-	IEC60825- 1:2014 (compliant using additional accessories)	-
Country of origin	-	Lithuania	-

#### **DRAWING**





Note: Product specifications are subject to change without prior notice to improve reliability, function or design or otherwise.

<sup>&</sup>lt;sup>1</sup> The optical power can be tuned from virtually 0% to 100%. However, other specifications, such as central wavelength, power stability, noise, polarization ratio, beam shape, quality and circularity are not guaranteed at power levels other than factory preset power. Significantly worse power stability is to be expected at very low power levels, e.g. <3% from specified nominal power.

<sup>&</sup>lt;sup>2</sup>The long term power test is carried out at constant laser body temperature (+/-0.1 °C) using an optical power meter with an input bandwidth of 10 Hz. The actual measurement rate has a period of about 20 seconds to 1 minute.

 $<sup>^3</sup>$  The long term power test is carried out at constant laser body temperature (+/-0.1  $^{\circ}$ C) using an optical power meter with an input bandwidth of 10 Hz. The actual measurement rate has a period of about 20 seconds to 1 minute.

 $<sup>^4</sup>$  Break-out-boxes AM-C8 and AM-C3 can be used for conversion of UART communication to either USB or RS232.  $^5$  TTL digital modulation up to 10 MHz.

 $<sup>^{\</sup>rm 6}\,\rm Excluding$  control interface pins and an output window/fiber assembly.

 $<sup>^7</sup>$  This function can be enabled in hardware only if the fast modulation option is disabled. The customer must specify this before ordering the laser.

 $<sup>^{\</sup>rm 8}\,\rm Whichever$  occurs first. The laser has an integrated operational hours counter.