



PART NUMBER 0405L-15A  
 ITEM NAME 405 NM LASER (DIODE; PM FIBER)

## PRODUCT DATASHEET



### DESCRIPTION

Polarization-maintaining fiber-coupled 405 nm diode laser features extreme brightness combined with perfect beam shape and virtually perfect Gaussian intensity distribution. 405 nm is efficiently used in UV stereo-lithography, otherwise - 3D printing. Small footprint and flexible fiber delivery make this laser easy to integrate into compact stereolithography machines. Other applications of this laser include fluorescence spectroscopy or imaging, photobleaching, and many more.

405 nm lasers are assembled into an ultra-compact turn-key package with TEC cooling and digital electronics.

#### Note:

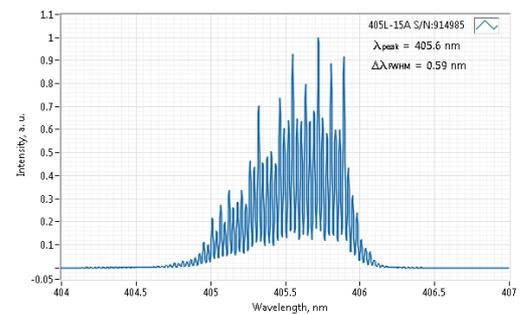
An end-cap is provided against degradation of the fiber tip inside and outside of the module thus, up 100 mW of power can be coupled into the fiber. However, direct mating of such fiber is not possible and collimators must set to compensate the end-cap.

### SPECIFICATIONS

Specifications updated: 1 October 2020

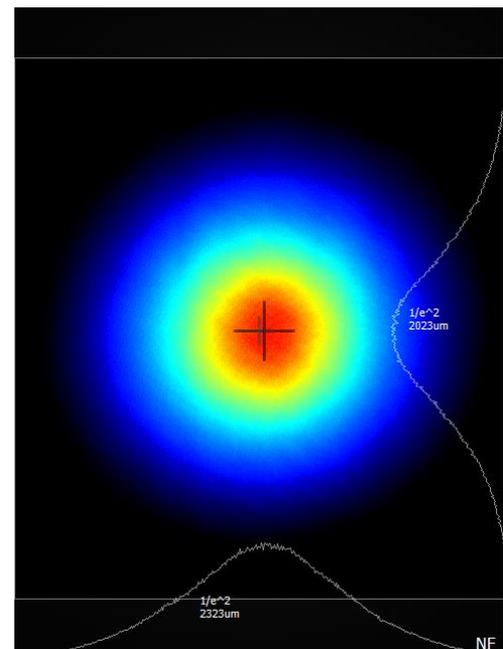
Parameter	Minimum Value	Typical Value	Maximum Value
Central Wavelength, nm	400	405	410
Longitudinal modes	-	Multiple	-
Spectral line width FWHM, nm	0.01	0.5	1
Output power, mW	-	100 <sup>1</sup>	150
Power stability, % (RMS, 8 hrs)	0.02	0.2 <sup>2</sup>	0.5
Power stability, % (peak-to-peak, 8 hrs)	0.1	0.5 <sup>3</sup>	3
Noise, % (RMS, 20 Hz to 20 MHz)	0.05	0.25 <sup>4</sup>	0.6
Transversal modes	-	TEM00	-
M <sup>2</sup> effective	-	1.05	1.1
Polarization direction	-	Aligned within the slow axis of the PM fiber and the key position.	-
Polarization extinction ratio (from PM fiber), dB	13	20 <sup>5</sup>	30
Control interface type	-	UART <sup>6</sup>	-
Operation mode	-	APC (CW)	-
Modulation bandwidth, MHz	-	10 <sup>7</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 <sup>8</sup>	-
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

### TYPICAL SPECTRUM



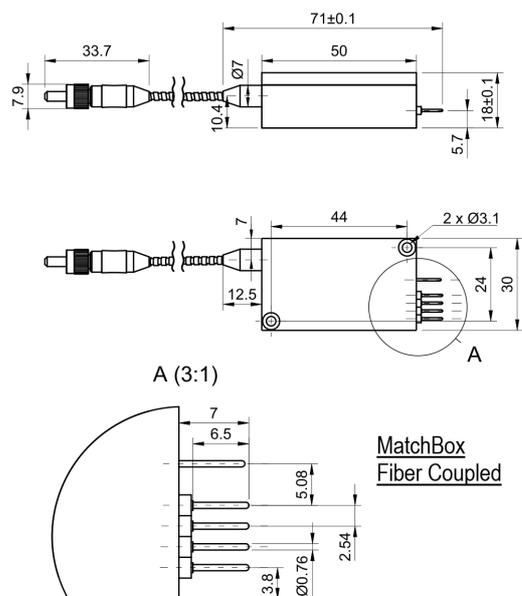
Typical spectrum of 0405 nm diode laser. Measured with 10 pm resolution.

### TYPICAL NEAR FIELD



Temperature stabilization	-	Internal TEC	-
External fan control	-	No <sup>9</sup>	-
Overheat protection	-	Yes	-
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>10</sup>	-
RoHS	-	Yes	-
CE compliance	-	- General Product Safety Directive (GPSD) 2001/95/EC - (EMC) Directive 2004/108/EC	-
Laser Safety Class	-	3B	-
OEM lasers are not compliant with	-	IEC60825-1:2014 (compliant using additional accessories)	-
Country of origin	-	Lithuania	-

## DRAWING



<sup>1</sup> Max. optical power can be reached only for the default fiber configuration with an end-cap. 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>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 °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> Noise level is measured with a fast photodiode connected to an oscilloscope. The overall system bandwidth is from 2 kHz to 20 MHz.

<sup>5</sup> Fiber bi / end-cap protection is included.

<sup>6</sup> Break-out-boxes AM-C8 and AM-C3 can be used for conversion of UART communication to either USB or RS232.

<sup>7</sup> TTL digital modulation up to 10 MHz.

<sup>8</sup> Excluding control interface pins and an output window/fiber assembly.

<sup>9</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>10</sup> Whichever occurs first. The laser has an integrated operational hours counter.

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