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PART NUMBER 0638L-11A
ITEM NAME 638 NM LASER (DIODE; FREE-SPACE)

PRODUCT DATASHEET

DESCRIPTION

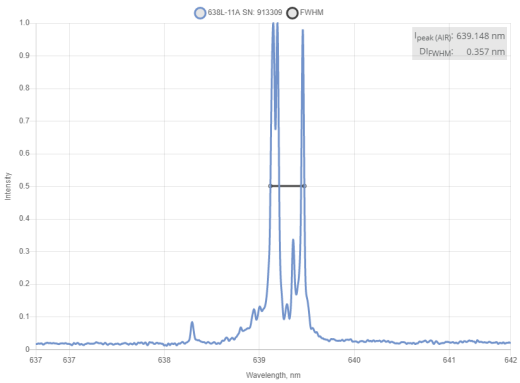
638 nm is one of the key wavelengths in fluorescence imaging and flow cytometry. The diode-based laser module emits red radiation with high wavelength and power stability, high polarization contrast, and up to 10 MHz modulation frequency. A 200 mW laser diode at 638 nm is used in this module and we leave some headroom for an extended lifetime. Slight wavelength tunability is also possible with an inbuilt Peltier element.

SPECIFICATIONS

Specifications updated: *2 February 2023*

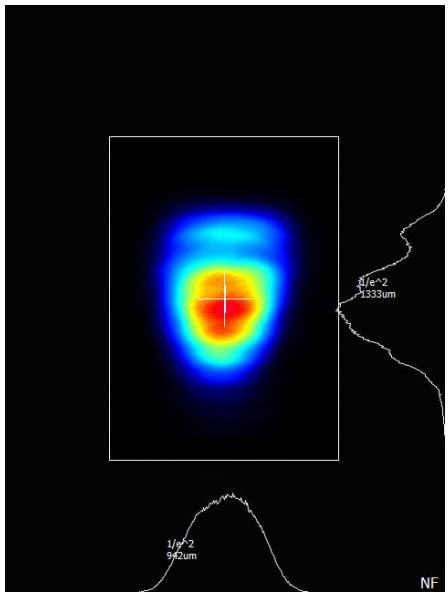
Parameter	Minimum Value	Typical Value	Maximum Value
Central Wavelength, nm	635	638	641
Longitudinal modes	-	Multiple	-
Spectral line width FWHM, nm	0.02	0.7	1
Output power, mW	-	170 [1]	-
Power stability, % (RMS, 8 hrs)	0.01	0.05 [2]	0.1
Power stability, % (peak-to-peak, 8 hrs)	0.05	0.1 [3]	0.5
Intensity noise, % (RMS, 20 Hz to 20 MHz)	0.05	0.25 [4]	0.6
Transversal modes	-	TEM00	-
Beam width (1/e2), mm	-	1 [5]	1.3
Beam height (1/e2), mm	-	1.2	1.6
Horizontal beam divergence, mrad	-	1.2	1.5
Vertical beam divergence, mrad	-	0.6	1
M^2 horizontal axis	-	1.1	1.3
M^2 vertical axis	-	1.1	1.3
M^2 effective	-	1.15	1.3
Polarization direction	-	Horizontal [6]	-
Polarization contrast	1000	2000	5000
Control interface type	-	UART [7]	-
Operation mode	-	APC (CW)	-
Modulation bandwidth, MHz	-	10 [8]	-
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 [9]	-

TYPICAL SPECTRUM



Typical spectrum of 0638 nm diode laser. Measured with 20 pm resolution.

TYPICAL NEAR FIELD



Typical near field (0.45 m from output aperture) beam profile. Non-circularized beam of a 0638 nm direct diode laser.

Beam height from the base, mm	9.9	10.4	10.9
Heat-sinking requirement, °C/W	-	1	-
Optimum heatsink temperature, °C	15	20	30
Warm up time, mins (cold start)	-	10	-
Temperature stabilization	-	Internal TEC	-
External fan control	-	No [10]	-
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) [11]	-
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	-

[1] 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.

[2] 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.

[3] 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.

[4] Noise level is measured with a fast photodiode connected to an oscilloscope. The overall system bandwidth is from 2 kHz to 20 MHz.

[5] Beam width and height are measured at 0.4 m from output aperture.

[6] For lasers without integrated optical isolators.

[7] Break-out-boxes AM-C8 and AM-C3 can be used for conversion of UART communication to either USB or RS232.

[8] TTL digital modulation up to 10 MHz.

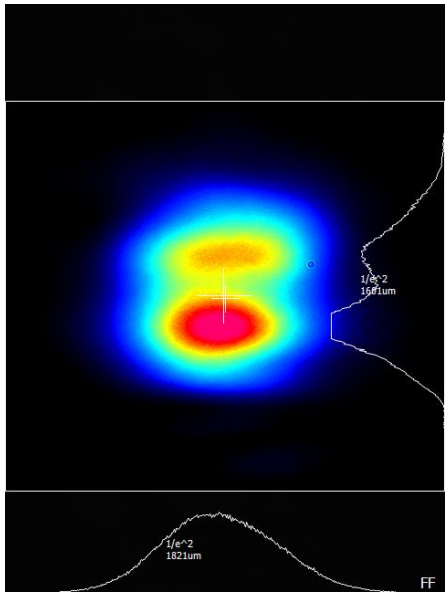
[9] Excluding control interface pins and an output window/fiber assembly.

[10] This function can be enabled in hardware only if the fast modulation option is disabled. The customer must specify this before ordering the laser.

[11] 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.

TYPICAL FAR FIELD



Typical far field (1 m from output aperture) beam profile. Non-circularized beam of a 0638 nm direct diode laser.

DRAWING