

# 445nm 3.5W

## PRODUCT SPECIFICATION SHEET



### SPECIFICATIONS

<b>Module series:</b>	Monolith
<b>Model Nr.:</b>	M-445LM-3.5k
<b>Optical power:</b>	3500 mW
<b>Laser class according to IEC 60825-1 standard:</b>	4
<b>Center wavelength:</b>	445 nm
<b>Center wavelength tolerance:</b>	$\pm 5$ nm
<b>Spectral width:</b>	$< 2$ nm
<b>Center wavelength thermal drift:</b>	0.8 nm per 10 °C
<b>Beam size (<math>1/e^2</math>):</b>	3 x 4 mm
<b>Beam divergence (half angle):</b>	1.4 x 0.2 mrad
<b>Linear polarization:</b>	Y
<b>Polarization ratio:</b>	100:1
<b>Polarization azimuth tolerance:</b>	$\pm 5$ degree
<b>Mode structure:</b>	Multi-mode
<b><math>M^2</math> (horizontal/vertical):</b>	TBD
<b>Power stability (over 1 hour, CW operation, after warm-up and <math>\pm 3^\circ\text{C}</math>):</b>	$< 0.5$ %
<b>Pointing stability (over 1 hour, CW operation, after warm-up and <math>\pm 3^\circ\text{C}</math>):</b>	$< \pm 100$ $\mu\text{rad}$
<b>Output window beam centering:</b>	$< \pm 1$ mm
<b>Beam perpendicularity:</b>	$< \pm 1$ degree
<b>Warm-up time:</b>	$< 5$ minute

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<b>Laser power control modes:</b>	Analog, TTL, USB, potentiometer
<b>Analog input signal:</b>	0 - 5V (0.5 - 4.5 V with TCCO* on)
<b>TTL input signal:</b>	0 - 0.8 V: low 2 - 5 V: high
<b>Bandwidth (analog input, 3 dB cut-off frequency):</b>	240 kHz (252 kHz with TCCO* off)
<b>Rise time (10% - 90%):</b>	700 - 900 ns (signal dependent)
<b>Fall time (90% - 10%):</b>	1 - 2 $\mu$ S (signal dependent)
<b>Phase shift:</b>	0.6 - 4 $\mu$ s (signal dependent)
<b>Analog/TTL input impedance:</b>	5 k $\Omega$
<b>Connection cable (laser head to control box):</b>	HDMI 1.4 or higher, max. length 1m
<b>Communication with PC:</b>	USB-C (control box port only)
<b>USB interface protocol</b>	
<b>Interlock:</b>	Shorted: emission enabled (3.3V, 10 k $\Omega$ ) Opened: emission disabled
<b>Operating base plate temperature range:</b>	< 50 °C
<b>Operating ambient temperature range:</b>	5 - 40 °C (heat sink dependent)
<b>Storage temperature range:</b>	(-10) - 80°C
<b>Ingress protection (laser head only):</b>	IP64
<b>Power consumption:</b>	typ. 20W max. 50W
<b>Input voltage (Type PD):</b>	min. 20V
<b>Input voltage connector type:</b>	USB-C (laser head port only)
<b>Laser head dimensions (LxWxH):</b>	70(84) x 120 x 46 mm

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<b><i>Laser head weight:</i></b>	0.7 kg
<b><i>Control box dimensions (LxWxH):</i></b>	53 x 29 x 36 mm (without connectors)
<b><i>Control box weight:</i></b>	40 g
<b><i>Expected lifetime:</i></b>	> 10 000 hours