

## iWave

Single-Mode

Single Frequency

Tunable

## iWave

## High Power – Narrow Linewidth UV/Blue Diode Laser

Various linewidth sensitive applications share the same requirements with respect to lasers: best beam quality, high power, blue/violet wavelength and, on top of that, a narrow linewidth. Until recently, customers were forced to decide between 13 mW at 405 nm with superb coherence length (up to 100 m) and 120 mW at short coherence length (some microns). If neither option was acceptable, they had to resort to bulky gas lasers.

**Best of Both Worlds**

For the very first time, the new iWave comprises all requirements, offering a unique approach based on TOPTICA's proprietary know-how in providing narrow linewidth diode lasers:

- Permanent narrow linewidth ( $< 0.08 \text{ nm} \hat{=} 5 \text{ cm}^{-1}$  resp. 150 GHz) for high resolution or contrast
- High power (50 mW @ 405 nm)
- Diffraction-limited beam ( $\text{TEM}_{00}$ ) to achieve focus diameters in the sub-micron range

Typical applications are Raman microscopy of non-fluorescent specimen or

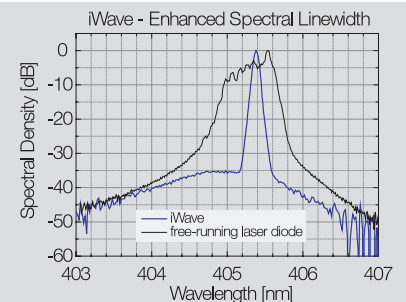
simply any beam propagation setup with linewidth-sensitive beam deflection (e.g. AOD).

**Matching OEM Requirements**

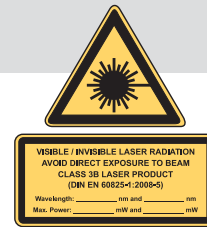
Based on the matured iBeam series, the iWave achieves MTBF values of several thousand hours. Hands-off operation is the nature of the unique iWave. Operators receive full remote control via the RS 232 interface. A circular beam diameter of approximately 1 mm eliminates the need for telescopes when switching from gas lasers to the convenient iWave. Finally, the excellent power and beam pointing stability emphasize its position as a OEM laser source.

**Evolution**

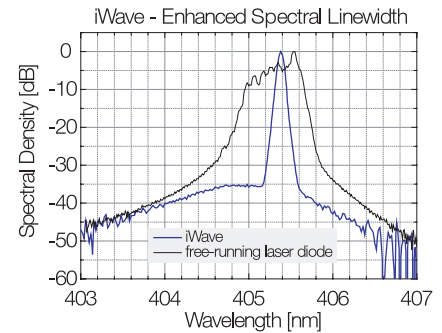
The iWave is available in a 375 nm and a 405 nm version, further wavelengths are soon to come (e.g. 445 nm or 488 nm). TOPTICA already offers narrow linewidth diode laser systems for Raman microscopy in the near infrared spectrum (XTRA, dfBeam). Now the iWave complements this product family and supports both existing and new OEM customers.

**Applications**

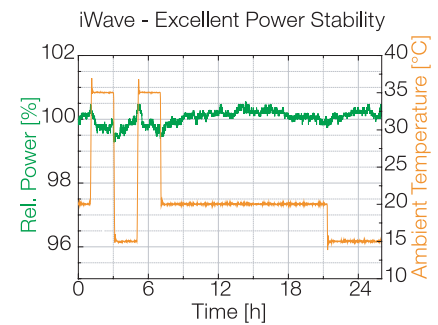
- Raman microscopy
- Raman spectroscopy
- Applications with linewidth sensitive deflection (AOM, f-theta lenses, etc.)



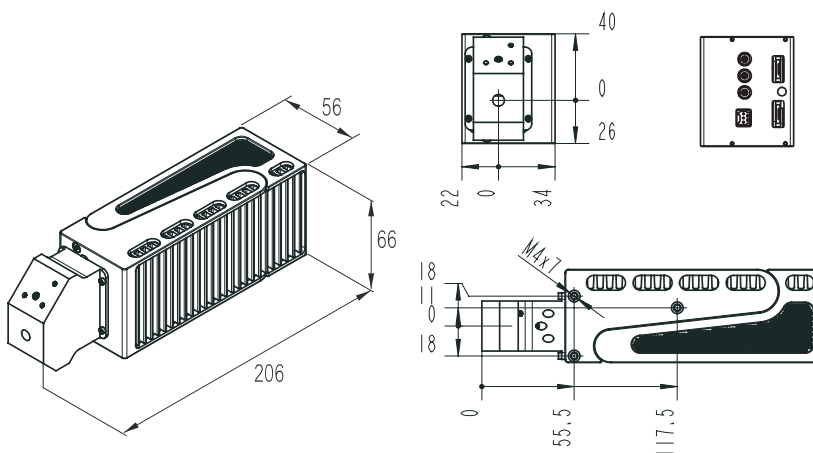
Laser Specifications	
Available wavelength	375 nm, 405 nm (others e.g. 445 nm, 488 nm on request)
Spectral linewidth	< 150 GHz ( $\Delta \lambda$ 0.08 nm resp. 5 $\text{cm}^{-1}$ )
Coherence length (typ.)	1 mm
ASE suppression	> 30 dB
Power (free-beam)	Up to 50 mW (@ 405 nm)
Power stability (48 h)*	< 0.5 %
Noise (10 Hz - 20 MHz)	< 0.5 % RMS
Spatial mode	TEM <sub>00</sub>
Beam diameter @ 1/e <sup>2</sup> (typ.)	1.2 mm
Ellipticity	< 10 %
Beam divergence (full angle)	< 0.6 mrad
Wavefront error	< 0.05 $\lambda$
M <sup>2</sup>	≤ 1.2
Polarization	linear, > 100:1
Pointing stability	< 10 $\mu\text{rad/K}$
Static alignment**	± 0.5 mm, ± 1 mrad angular
General and Environmental Specifications	
Qualified	CE
CDRH qualification	Class IIIb
ESD protection	Level 4
DC input requirements	12 V DC, 2A
Power consumption	< 24 W (typ. < 5 W)
Digital communication interface	RS 232, ≤ 115.200 baud
Operating temperature range	15 .. 40 °C
Storage temperature range	-10 .. 60 °C
Operating relative humidity	< 90 % non condensing
Dimensions (L x W x H)	206 x 56 x 66 mm <sup>3</sup>
Weight	1250 g
*At constant ambient conditions	
**Static alignment tolerances are relative to the center axes of exit aperture	



Linewidth of iWave is strongly reduced compared to a free-running LD



Power stability during a 24 h temperature cycle



All dimensions given in mm