

# Diode Pumped Sub-Nanosecond Passively Q-Switched Laser

## MPL1310

### FEATURES

- > Up to **1 mJ** pulse energy at **1064 nm**
- > Short pulse duration **< 350 ps**
- > Variable up to **100 Hz** repetition rate
- > Ultra-compact
- > Passively Q-switched
- > Average power **100 mW**
- > High peak power **2.8 MW**
- > Guaranteed **> 3 Gshot** lifetime
- > Other wavelengths (e.g. 1053 nm, 1342 nm, 671 nm, 447 nm) are available

### APPLICATIONS

- > Laser-Induced Breakdown Spectroscopy (LIBS)
- > Time resolved fluorescence measurements
- > DNA analysis
- > Pollution monitoring
- > Remote sensing
- > Supercontinuum generation
- > Ignition of gas mixtures

**MPL1310** series DPSS passively Q-switched sub-nanosecond lasers deliver high peak powers at 100 Hz repetition rate. Short laser cavity is fixed on thermo-stabilized and controlled baseplate which gives extremely stable output parameters performance. Small footprint is welcome point for integration into OEM lasers. Sub-nanosecond pulse duration of < 350 ps, high pulse energy more than 1 mJ and variable repetition rate from 1 Hz to 100 Hz covers many applications like pollution monitoring, DNA analysis, supercontinuum generation and many others. Due to short pulse duration and high pulse energy laser delivers high peak power which is up to 2.8 MW. Optional conversion to green (532 nm) and ultraviolet (355 nm, 266 nm) is also available.



# Specifications <sup>1)</sup>

MODEL	MPL1310	MPL1310-MO
Pulse energy		
at 1064 nm	1 mJ	0.2 mJ
at 532 nm	0.5 mJ	0.1 mJ
at 355 nm	0.25 mJ	0.05 mJ
at 266 nm	0.15 mJ	–
Typical pulse duration	< 350 ps <sup>2)</sup>	< 250 ps <sup>2)</sup>
Pulse to pulse energy stability (RMS)		
at 1064 nm		< 1 % <sup>3)</sup>
at 532 nm		< 2.5 % <sup>3)</sup>
at 355 nm		< 3.5 % <sup>3)</sup>
at 266 nm		< 5.0 % <sup>3)</sup>
Power drift		± 3.0 % <sup>4)</sup>
Pulse repetition rate <sup>5)</sup>	1 – 100 Hz	
Beam profile	Close to Gaussian	
Beam divergence <sup>6)</sup>	< 6 mrad	
Polarization	Linear, horizontal at 1064 nm	
Spectral linewidth	SLM	
Beam pointing stability <sup>7)</sup>	< 40 μrad	
Typical beam diameter <sup>8)</sup>	1.5 mm	1 mm
Jitter	~ 2 μs RMS <sup>9)</sup>	

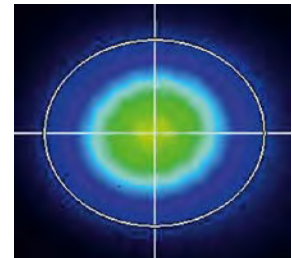
## DIMENSIONS

Laser head (W×L×H)	113 × 162.5 × 45.5 mm
Controller unit (W×L×H)	75 × 200 × 70 mm (OEM version)
Power adapter (W×L×H)	119 × 179 × 30 mm (OEM version)

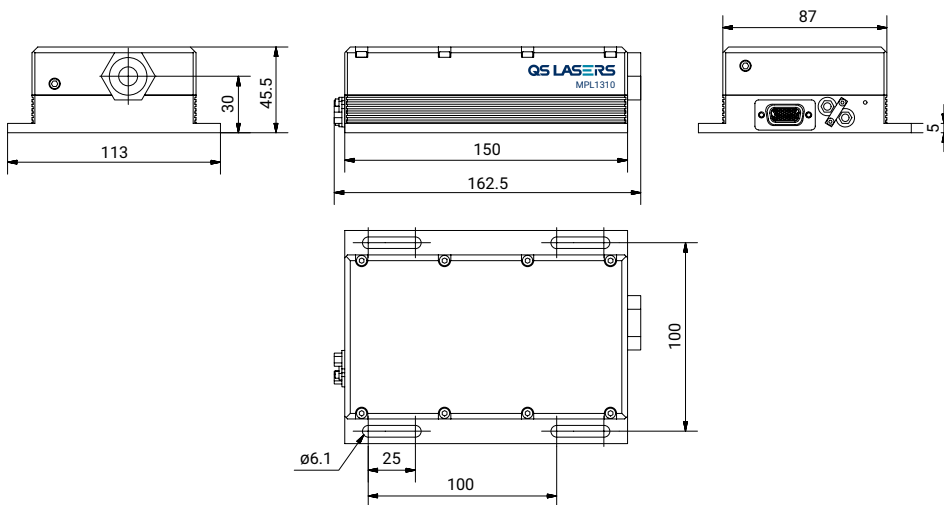
## OPERATING REQUIREMENTS

Cooling requirements	Air cooled
Ambient temperature	15 – 30 °C
Relative humidity (non-condensing)	10 – 80 %
Mains voltage	90 – 230 VAC, single phase, 47 – 63 Hz <sup>10)</sup>
Power consumption	< 20 W

- <sup>1)</sup> Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 1064 nm.
- <sup>2)</sup> FWHM level at 1064 nm. Other pulse duration is available by request. Please inquire for detailed specifications.
- <sup>3)</sup> Averaged from 60 seconds time interval in 5 series.
- <sup>4)</sup> Over 8-hour period after max 5 minutes of warm-up when ambient temperature variation is less than ±2 °C.
- <sup>5)</sup> Factory-set pulse repetition rate is fixed at 100 Hz repetition rate. Higher repetition rates are available, please inquire for more details.
- <sup>6)</sup> Full angle measured at the 1/e<sup>2</sup> level.
- <sup>7)</sup> RMS value measured from 1000 shots.
- <sup>8)</sup> Beam diameter is measured 20 cm from laser output at the 1/e<sup>2</sup> level.
- <sup>9)</sup> In respect to Q-switch triggering rising edge pulse.
- <sup>10)</sup> Laser can be powered from appropriate 12 VDC power source. Inquire for details.



Typical beam intensity profile (20 cm from laser output) of MPL1310 series lasers



MPL1310 laser head dimensions (in mm)

# Diode Pumped Sub-Nanosecond Passively Q-Switched Laser

## MPL1510

### FEATURES

- > Up to **1 mJ** pulse energy at **1064 nm**
- > Short pulse duration **< 500 ps**
- > Variable up to **100 Hz** repetition rate
- > Ultra-compact
- > Passively Q-Switched
- > Average power **100 mW**
- > High peak power **2 MW**
- > Guaranteed **> 3 Gshot** lifetime
- > Other wavelengths (e.g. 1053 nm, 1342 nm, 671 nm, 447 nm) are available

### APPLICATIONS

- > Laser induced breakdown spectroscopy (LIBS)
- > Time resolved fluorescence measurements
- > DNA analysis
- > Pollution monitoring
- > Remote sensing
- > Supercontinuum generation
- > Ignition of gas mixtures

**MPL1510** series DPSS passively Q-switched sub-nanosecond lasers deliver high peak powers at 100 Hz repetition rate. Short laser cavity is fixed on thermo-stabilized and controlled baseplate which gives extremely stable output parameters performance. Small footprint is welcome point for integration into OEM lasers. Sub-nanosecond pulse duration of < 500 ps, high pulse energy more than 1 mJ and variable repetition rate from 1 Hz to 100 Hz covers many applications like pollution monitoring, DNA analysis, supercontinuum generation and many others. Due to short pulse duration and high pulse energy laser delivers high peak power which is up to 2.8 MW. Optional conversion to green (532 nm) and ultraviolet (355 nm, 266 nm) is also available.



# Specifications <sup>1)</sup>

MODEL	MPL1510
Pulse energy	
at 1064 nm	1 mJ
at 532 nm	0.5 mJ
at 355 nm	0.25 mJ
at 266 nm	0.15 mJ
Typical pulse duration	< 500 ps <sup>2)</sup>
Pulse to pulse energy stability (RMS)	
at 1064 nm	< 1 % <sup>3)</sup>
at 532 nm	< 2.5 % <sup>3)</sup>
at 355 nm	< 3.5 % <sup>3)</sup>
at 266 nm	< 5.0 % <sup>3)</sup>
Power drift	± 3.0 % <sup>4)</sup>
Pulse repetition rate <sup>5)</sup>	1 – 100 Hz
Beam profile	Close to Gaussian
Beam divergence <sup>6)</sup>	< 6 mrad
Polarization	Linear, horizontal at 1064 nm
Spectral linewidth	SLM
Beam pointing stability <sup>7)</sup>	< 40 µrad
Typical beam diameter <sup>8)</sup>	2 mm
Jitter	~ 2 µs RMS <sup>9)</sup>

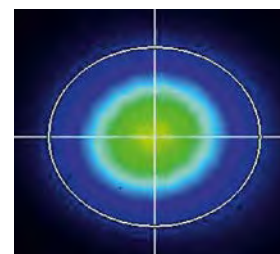
## DIMENSIONS

Laser head (W×L×H)	113 × 162.5 × 45.5 mm
Controller unit (W×L×H)	75 × 200 × 70 mm (OEM version)
Power adapter (W×L×H)	119 × 179 × 30 mm (OEM version)

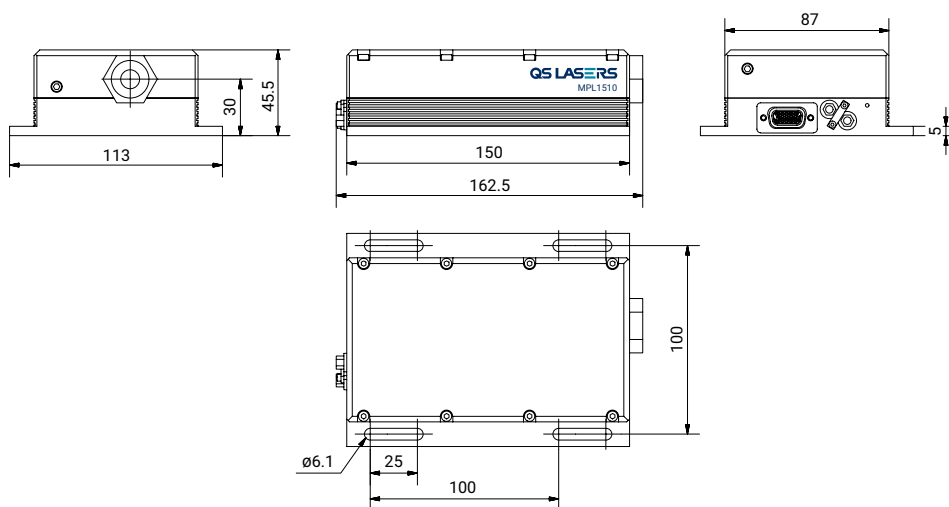
## OPERATING REQUIREMENTS

Cooling requirements	Air cooled
Ambient temperature	15 – 30 °C
Relative humidity (non-condensing)	10 – 80 %
Mains voltage	90 – 230 VAC, single phase, 47-63 Hz <sup>10)</sup>
Power consumption	< 20 W

- <sup>1)</sup> Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 1064 nm.
- <sup>2)</sup> FWHM level at 1064 nm. Shorter pulse duration (< 350 ps) is available by request. Please inquire for detailed specifications.
- <sup>3)</sup> Averaged from 60 seconds time interval in 5 series.
- <sup>4)</sup> Over 8-hour period after max 5 minutes of warm-up when ambient temperature variation is less than ±2 °C.
- <sup>5)</sup> Factory-set pulse repetition rate is fixed at 100 Hz repetition rate. Higher repetition rates are available, please inquire for more details.
- <sup>6)</sup> Full angle measured at the 1/e<sup>2</sup> level.
- <sup>7)</sup> RMS value measured from 1000 shots.
- <sup>8)</sup> Beam diameter is measured 20 cm from laser output at the 1/e<sup>2</sup> level.
- <sup>9)</sup> In respect to Q-switch triggering rising edge pulse.
- <sup>10)</sup> Laser can be powered from appropriate 12 VDC power source. Inquire for details.



Typical beam intensity profile (20 cm from laser output) of MPL1510 series lasers



MPL1510 laser head dimensions (in mm)

# Diode Pumped Sub-Nanosecond Actively Q-Switched Laser

## MPL15100

### FEATURES

- > More than **0.5 mJ** pulse energy at **1064 nm**
- > Short pulse duration < **700 ps**
- > **1000 Hz** repetition rate
- > **532 nm, 355nm, 266 nm** wavelengths as standard option
- > Actively Q-Switched
- > High Peak Power **0.7 MW**
- > Other wavelengths (e.g. 1053 nm, 1342 nm, 671 nm, 447 nm) are available

### APPLICATIONS

- > OLED repair
- > Marking
- > Nonlinear Optics
- > Seeding laser amplifiers
- > Pollution Monitoring
- > Remote sensing

**MPL15100** series robust DPSS actively Q-switched sub-nanosecond lasers deliver multi-kW peak powers, less than 1 ns pulse duration at 1000 Hz repetition rate. Short innovative laser cavity with is fixed on thermo-stabilized baseplate which gives extremely stable output parameters performance. Small footprint is welcome point for integration into OEM lasers. Sub-nanosecond pulse duration of < 700 ps with near transform limited spectral linewidth at repetition rates up to 1 kHz with low timing jitter of <200 ps and energies more than 500  $\mu$ J covers broad spectrum of applications starting from LIBS, laser induced fluorescence to many others. Standard optional harmonics generator to green (532 nm) and ultraviolet (355 nm, 266 nm) is also available.



# Specifications <sup>1)</sup>

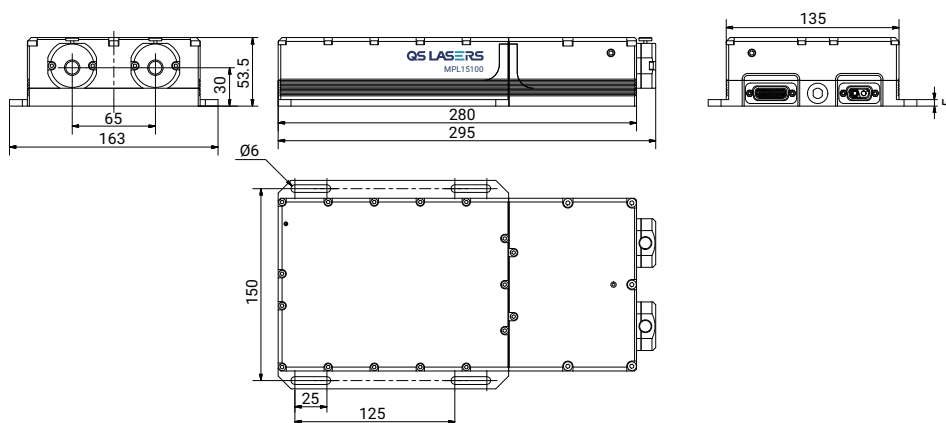
MODEL	MPL15100	MPL15100-1K
<b>Pulse energy:</b>		
at 1064 nm	0.5 mJ	
at 532 nm	0.25 mJ	
at 355 nm	0.15 mJ	
at 266 nm	0.05 mJ	
Typical pulse duration	< 700 ps	
<b>Pulse to pulse energy stability (RMS):</b>		
at 1064 nm	< 0.5 % <sup>2)</sup>	
at 532 nm	< 1.0 % <sup>2)</sup>	
at 355 nm	< 1.5 % <sup>2)</sup>	
at 266 nm	< 2.0 % <sup>2)</sup>	
Typical pulse duration	≤ 700 ps <sup>3)</sup>	
Power drift	± 3.0 % <sup>4)</sup>	
Pulse repetition rate <sup>5)</sup>	100 Hz	1000 Hz
Beam spatial profile	Close to Gaussian	
Beam divergence <sup>6)</sup>	< 4 mrad	
Polarization	Linear, horizontal at 1064 nm	
Spectral linewidth	SLM	
Beam pointing stability <sup>7)</sup>	< 50 μrad	
Typical beam diameter <sup>8)</sup>	1.2 mm	
Optical jitter	< 0.3 ns <sup>9)</sup>	

## DIMENSIONS

Laser head (W×L×H)	163 × 295 × 53.5 mm	
Controller unit (W×L×H)	257 × 271 × 153 mm	
Cable cord length	1 m	

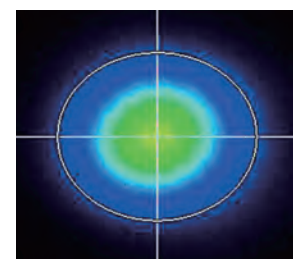
## OPERATING REQUIREMENTS

Cooling requirements	air cooled	
Ambient temperature	15 – 30 °C	
Relative humidity	10 – 80 % (non-condensing)	
Mains voltage	100 – 240 VAC, single phase, 50 – 60 Hz	
Power consumption	< 10 W	< 100 W



MPL15100 laser head dimensions with attached harmonics unit (in mm)

- <sup>1)</sup> Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 1064 nm.
- <sup>2)</sup> Averaged from 60 seconds time interval.
- <sup>3)</sup> FWHM level at 1064 nm.
- <sup>4)</sup> Over 8-hour period after max 5 minutes of warm-up when ambient temperature variation is less than ±2 °C.
- <sup>5)</sup> Factory-set pulse repetition rate is fixed at max repetition rate. Higher repetition rates are available, please inquire for details.
- <sup>6)</sup> Full angle measured at the 1/e<sup>2</sup> level.
- <sup>7)</sup> RMS value measured from 1000 shots.
- <sup>8)</sup> Beam diameter is measured 20 cm from laser output at the 1/e<sup>2</sup> level.
- <sup>9)</sup> In respect to Q-switch triggering rising edge pulse.



Typical beam intensity profile (20 cm from laser output) of MPL15100 series lasers



# High Energy DPSS Picosecond Passively Q-Switched Laser

## MPL300-YLF

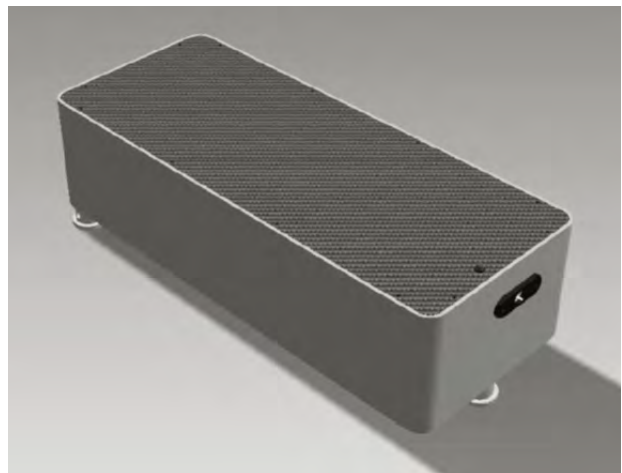
### FEATURES

- > Up to **50 mJ** pulse energy at **1053 nm**
- > Short pulse duration < **500 ps**
- > Up to **100 Hz** repetition rate
- > High peak power **100 MW**
- > Air or water cooled
- > Excellent **TEM<sub>00</sub>** and stable **SLM**
- > **527 nm, 351 nm, 263 nm**
- > Other wavelengths (1047 nm, 1064 nm, 1319 nm, 1338 nm, 1342 nm, 1079 nm, and its harmonic, etc.) available under request

### APPLICATIONS

- > Cleaning
- > Material ablation and deposition
- > Medical
- > OLED repair
- > Pollution Monitoring
- > Remote sensing
- > Supercontinuum Generation
- > LIBS

**MPL300-YLF** series high pulse energy, DPSS passively Q-switched picosecond lasers are ideal choice for applications where high peak powers are needed. Diode pumped passively Q-switched single longitudinal mode (SLM) oscillator is the core of the system. Short picosecond optical pulse of 500 ps is directed to multi-pass diode pumped power amplifier for amplification to up to more than 50 mJ pulse energy. The power amplifier(s) are based on novel pump technology (VCSEL), which allows long-life system operation up to 20 G shots (compared with standard LD pumping – by order of magnitude longer). Thermocontrolled harmonic generators available as standard options. Each wavelength has a separate output port. Set of extremely high-performance parameters covers many applications like surface cleaning, material analysis (LIBS), pollution monitoring



and many others. System is supplied with air or water cooling depends on repetition rate. Compact system footprint is welcome point for OEM integrators. Laser is controlled by supplied user-friendly software via PC USB port with application for Windows™ operating system.

# Specifications <sup>1)</sup>

MODEL	MPL300-YLF	MPL330-YLF	MPL350-YLF
<b>Pulse energy</b>			
1053 nm	1 mJ	30 mJ	50 mJ
526.5 nm	0.5 mJ	15 mJ	25 mJ
351 nm	0.25 mJ	7 mJ	15 mJ
263 nm	0.1 mJ	3 mJ	7 mJ
<b>Pulse energy stability (Std. Dev)</b>			
1053 nm	< 1 % <sup>2)</sup>		
526.5 nm	< 2 % <sup>2)</sup>		
351 nm	< 3.5 % <sup>2)</sup>		
263 nm	< 5% <sup>2)</sup>		
<b>Pulse duration (FWHM)</b>			
< 500 ps <sup>3)</sup>			
<b>Power drift</b>			
± 3 % <sup>4)</sup>			
<b>Pulse repetition rate</b>			
10 Hz or other fixed in the range 0 – 100 Hz <sup>5)</sup>			
<b>Polarization</b>			
vertical, > 99 % at 1064 nm			
<b>Beam profile</b>			
close to Gaussian in near and far fields			
<b>Beam divergence</b>			
	< 6 mrad <sup>6)</sup>	< 1.5 mrad <sup>6)</sup>	< 0.7 mrad <sup>6)</sup>
<b>Beam propagation ratio M<sup>2</sup></b>			
< 1.3			
<b>Beam pointing stability</b>			
≤ 20 μrad <sup>7)</sup>			
<b>Typical beam diameter</b>			
	~ 1 mm <sup>8)</sup>	~ 5 mm <sup>8)</sup>	~ 7 mm <sup>8)</sup>
<b>Optical jitter</b>			
~ 2 μs <sup>9)</sup>			

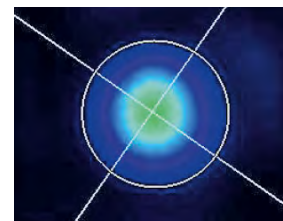
## DIMENSIONS

Laser head size (W × L × H)	113 × 163 × 46 mm	175 × 430 × 132 mm
Electrical cabinet size (W × L × H)	600 × 520 × 286 mm	440 × 420 × 286 mm
Umbilical length	2.5 m	

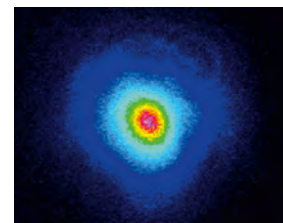
## OPERATING REQUIREMENTS

Cooling	air or water
Ambient temperature	15 – 30 °C
Relative humidity	10 – 80 % (non-condensing)
Mains voltage	100 – 240 VAC, single phase. 50 – 60 Hz
Power consumption	max 100 W

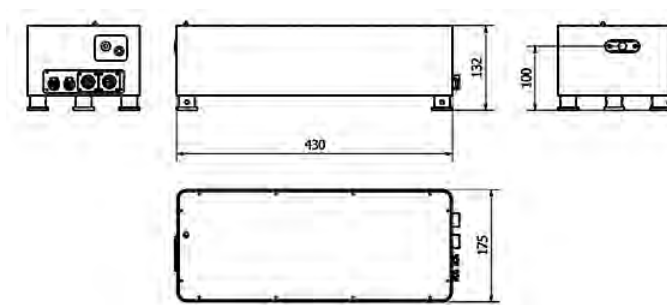
- <sup>1)</sup> Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 1053 nm.
- <sup>2)</sup> Averaged from pulses, emitted during 60 sec time interval.
- <sup>3)</sup> FWHM level at 1053 nm. Other pulse duration (from 300 ps to 20 ns) is available by request. Please inquire for detailed specifications.
- <sup>4)</sup> Over 8-hour period after max 5 minutes of warm-up when ambient temperature variation is less than ±2 °C.
- <sup>5)</sup> Factory-set pulse repetition rate is fixed at max repetition rate. Higher repetition rates are available, please inquire for details.
- <sup>6)</sup> Full angle measured at the 1/e<sup>2</sup> level.
- <sup>7)</sup> RMS value measured from 1000 shots.
- <sup>8)</sup> Beam diameter is measured 20 cm from laser output at the 1/e<sup>2</sup> level.
- <sup>9)</sup> In respect to Q-switch triggering rising edge pulse.



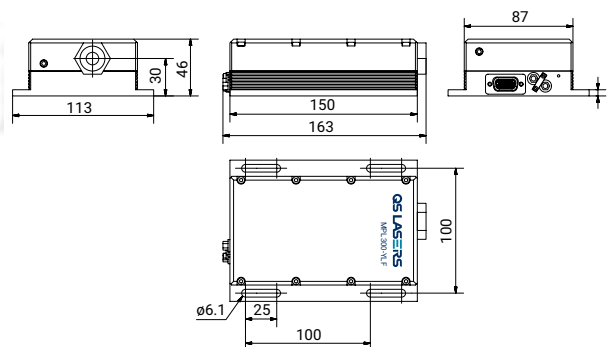
Typical beam profile of MPL300-YLF laser



Typical beam profile of MPL330-YLF and MPL350-YLF lasers



MPL330-YLF and MPL350-YLF laser model head dimensions (in mm)



MPL300-YLF laser model head dimensions (in mm)