

# 半导体泵浦风冷Q开关激光器

DIODE PUMPED AIR-COOLED Q-SWITCHED LASER

## Q1 系列

### 产品特点

Up to 45 mJ 脉冲能量输出, up to 0.5 W 平均输出功率

Up to 50 Hz 可调脉冲重复频率

风冷型 (water-free)

7 - 10 ns 脉宽

重量 < 5 kg, 含电源

> 2 G shot 超长半导体泵浦寿命

内建同步脉冲发生器与外部设备协同工作

通过内置以太网控制界面实现远程监测与控制

可选配PC控制电机衰减器

可选配脉冲能量监测器

可选配光纤耦合输出

可选配独立的 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or 5<sup>th</sup> 谐波发生器

### 应用领域

激光诱导击穿等离子发射光谱 (LIBS)

激光烧蚀(Laser ablation)

飞行时间质谱 (TOFS)

激光诱导荧光(LIF) 光谱

非线性激光光谱学

闪光光解(Flash photolysis)

光声学(Photoacoustics)

计量学(Metrology)

### 可选附件

可选配可使输出波长下探至211nm的独立谐波发生器

可选配作用于基本波长的电动衰减器

可选配带有模拟和/或数字输出的脉冲能量监测器



DPSS

Q1是一款紧凑, 节能, 半导体泵浦, 风冷型Q开关激光器, 可广泛应用于需要高峰值功率脉冲的应用场合。

激光器可在10Hz重复频率下产生高达45mJ的脉冲能量或在50Hz重复频率下产生高达10mJ的脉冲能量。激光束发散度低使其配合H1系列谐波发生器模块可有效转换为谐波波长。

激光器可配置为单独通过Nd:YLF晶体发射1053nm波长的激光或通过Nd:YAG晶体发射1064nm波长的激光。

由于Nd:YLF晶体的无热化特性, 使得激光器在1053波长下, 从单发脉冲提升至最大重复脉冲频率而不会发生明显的发散角或光斑轮廓变化。

创新的激光器设计方案人性化的整合性系统使得激光器几乎无需维护。

没有额外的水冷装置和笨重的电源系统占用额外的空间。

激光器元件高度集成化在一个腔体内, 外部只有一个集成了控制界面和12VDC电源适配器的轻量化控制盒。激光器总重量不超过5kg。

激光器通过内置服务器经以太网端口进行监控。电脑手机与浏览器均可用于控制Q1。作用于用户设备的低抖动触发脉冲可提供300μs的内触发模式。在外触发模式下, 激光脉冲可由延迟发生器外部触发。并提供可用于与用户设备集成的API。

可通过多种可选附属设备进一步扩展激光器功能:

- > 通过单独的H1系列谐波发生器最高可输出五次谐波
- > 通过作用于基本波长激光束的电动衰减器可对脉冲能量进行调整
- > 通过具备模拟和/或数字输出的附加脉冲能量监测器可对脉冲能量进行监测
- > 提供光纤耦合输出定制服务。详细规格请联系咨询。

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### 规格参数<sup>1)</sup>

型号	Q1									
	-B10	-C10	-D10	-E10	-B20	-C20	-D20	-50	-A50	-B50
波长, nm	1053 or 1064			1064	1053	1053 or 1064				
脉冲重复频率 <sup>2)</sup> , Hz	Single-shot to 10				Single-shot to 20			Single-shot to 50		
脉冲宽度(FWHM) <sup>3)</sup> , ns	< 8		< 7		< 8			< 10	< 9	< 8
最高脉冲能量 <sup>4)</sup> , mJ										
1053 / 1064 nm	10	20	35	45	8	15	25	2.5	5	10
526.5 / 532 nm	5	10	17	22	4	7.5	12.5	1.2	2.5	5
351 / 355 nm	3	6	10	13	2.5	5	7.5	0.6	1.5	3
263 / 266 nm	1.5	3	5	7	1	1.8	3	0.3	0.7	1.5
211 / 213 nm	0.5	1	2	2.5	0.4	0.7	1.2	0.1	0.2	0.5
峰值脉冲能量稳定性 <sup>5)</sup>										
1053 / 1064 nm	<0.5 % RMS									
526.5 / 532 nm	<2.5 % RMS									
351 / 355 nm	<3.5 % RMS									
263 / 266 nm	<4 % RMS									
211 / 213 nm	<5 % RMS									
功率输出漂移 <sup>6)</sup>	± 3.0 %									
光束模式	Bell-shaped, >75 % fit to Gaussian							Nearly TEM <sub>00</sub> , >80 % fit to Gaussian		
光束发散 <sup>7)</sup>	<1 mrad				<1.5 mrad					
光束指向稳定性 <sup>8)</sup>	< 10 μrad				< 20 μrad					
Polarization	Linear, horizontal									
典型光束直径 <sup>9)</sup> , mm	1.7	2.5	3.5		1.7	2.0	2.5	1.0	1.3	1.5
Jitter <sup>10)</sup>	< 0.5 ns RMS									
可选配衰减器 <sup>11)</sup>										
输出能量范围	0.5 – 95 %				1 – 95 %					
外形尺寸(W×L×H), mm <sup>3</sup>	Laser head:110 × 231× 112, Controller unit:108× 191 × 59 Power adapter <sup>12)</sup> :50 × 125 × 31, Harmonic generator <sup>13)</sup> :110 × 242 × 112									
运行要求										
冷却需求	风冷									
工作环境	T:15~30°C;H:10%~80%(non-condensing)									
电源	90 – 230 VAC, single phase, 47 – 63 Hz <sup>14)</sup>									
平均功耗, W	15	25	30		30			40		

- Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at fundamental wavelength and maximum pulse repetition rate. The parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture.
- Factory-set pulse repetition rate is fixed at max repetition rate shown in the table. Smoothly variable pulse repetition rate is possible when laser is externally triggered. In internal triggering mode repetition rate can be divided by integer number down to f/2, f/3, f/4,.. 1 Hz.
- At FWHM level at fundamental wavelength, measured with 350 ps rise time photodiode.
- Pulse energies for harmonic wavelengths are maximum possible values available from H1 series harmonic generator module. See datasheets of H1 for details.
- Measured during 30 seconds operation after warm-up.
- Over 8 hour period after 20 minutes of warm-up when ambient temperature variation is less than ± 2 °C.
- Full angle measured at the 4σ level.
- Peak to peak value, measured for 30 seconds of operation after laser warm up.
- Beam diameter is measured 20 cm from laser output at the 4σ level.
- In respect to falling edge of pump diode triggering pulse.
- Motorized attenuator intended to be attached to the laser housing. Transmission can be changed remotely through laser web-server control interface.
- Power adapter dimensions might differ from indicated here, depending on model.
- Q1 laser is compatible all models of stand-alone H1 harmonics generator. Please refer to harmonic generator datasheets for detailed specifications.
- Laser can be powered from appropriate 12 VDC power source. Please inquire for details.

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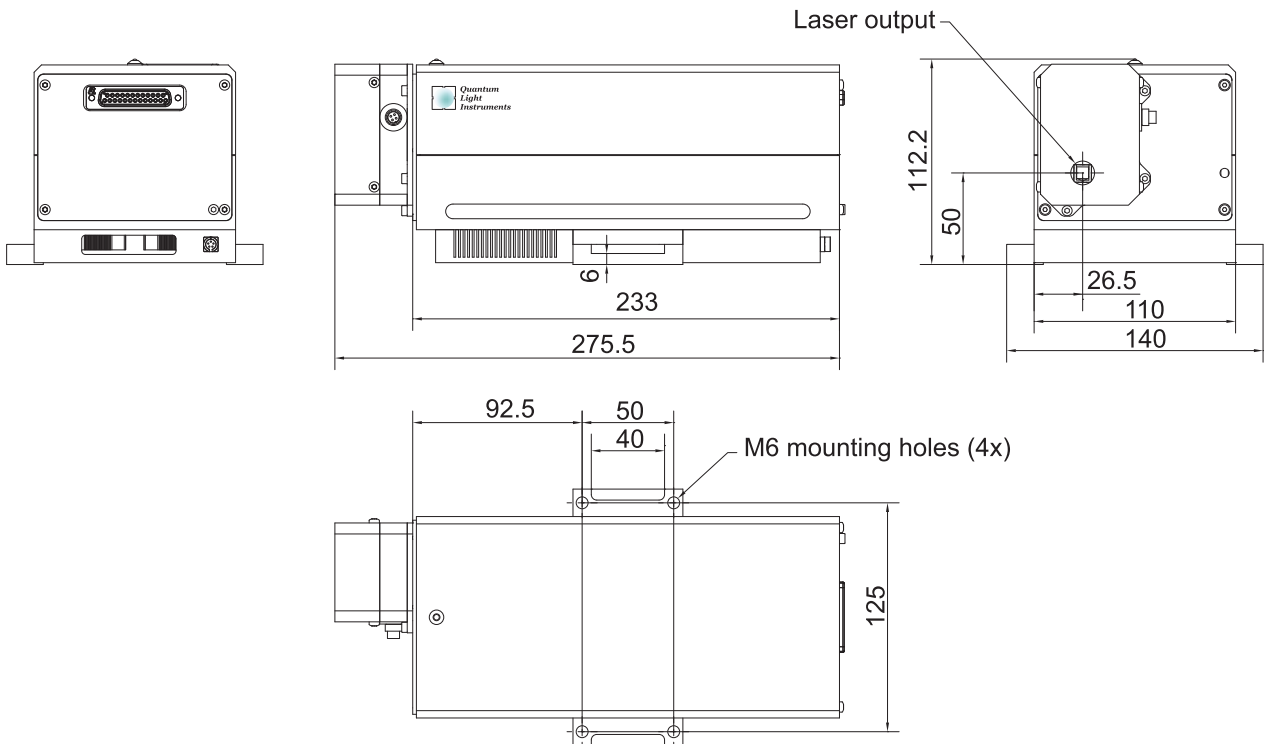
Laser head Q1 with attached harmonic generator module H1



Laser head Q1 with controller unit

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## DRAWINGS



Laser head with attachable motorized attenuator dimensions (in mm)