

## 1645 nm Q-switched Diode-Pumped Solid State Laser

The Princeton Lightwave Q-switched diode-pumped solid-state laser (Q-DPSSL) provides high-energy mJ-class optical pulses at an eye-safe short-wave infrared wavelength of 1645 nm. This laser employs resonant pumping of an Er:YAG gain medium using technology pioneered by Princeton Lightwave. Resonant pumping is achieved by pumping at a wavelength close to the output wavelength of the laser, providing a very small “quantum defect”. This approach to solid state laser design minimizes heating of the gain medium and results in superior beam quality, higher peak power levels, higher electro-optical efficiency, and enhanced reliability. Pumping is established using an integrated high-power, single-emitter pump module assembly based on Princeton Lightwave’s industry-leading InGaAs/InP diode laser technology. This Q-DPSSL architecture affords significant advantages in terms of thermal management and laser reliability.

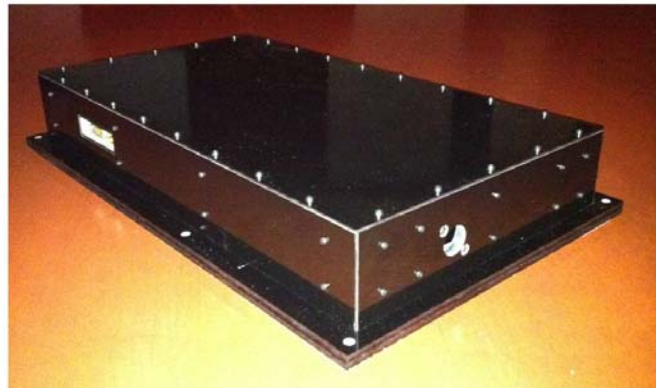
This product is available in two versions:

The **PML-664HE** provides high energy at low repetition rate (~50 Hz)

The **PML-664HR** provides high power at high repetition rate (~1000 Hz)

### Features

- “Eye-safe” operating wavelength at 1645 nm
- Pulse repetition frequencies ranging from CW to 2000 Hz
- mJ-class output pulse energies
- Low dissipation resonant pumping
- High peak power
- High electro-optical efficiency
- Superior beam quality
- Excellent atmospheric transmittance
- Enhanced reliability



### Applications

- Range-finders
- LIDAR/LADAR systems
- Materials processing
- Scientific equipment
- Medical/cosmetic treatments

#### Laser interfaces

- Pump laser driver electronics: power supplied to chassis input connector
- Acousto-optic modulator driver electronics: pulse input via chassis SMA connector
- Thermal management: input signals at chassis input connector

**Options: PLI can provide electronics for all laser interfaces for a complete turn-key system**

**Specifications subject to change without notice**

Princeton Lightwave high power laser products and associated technical data may be subject to the controls of the US Export Administration Regulations (EAR).

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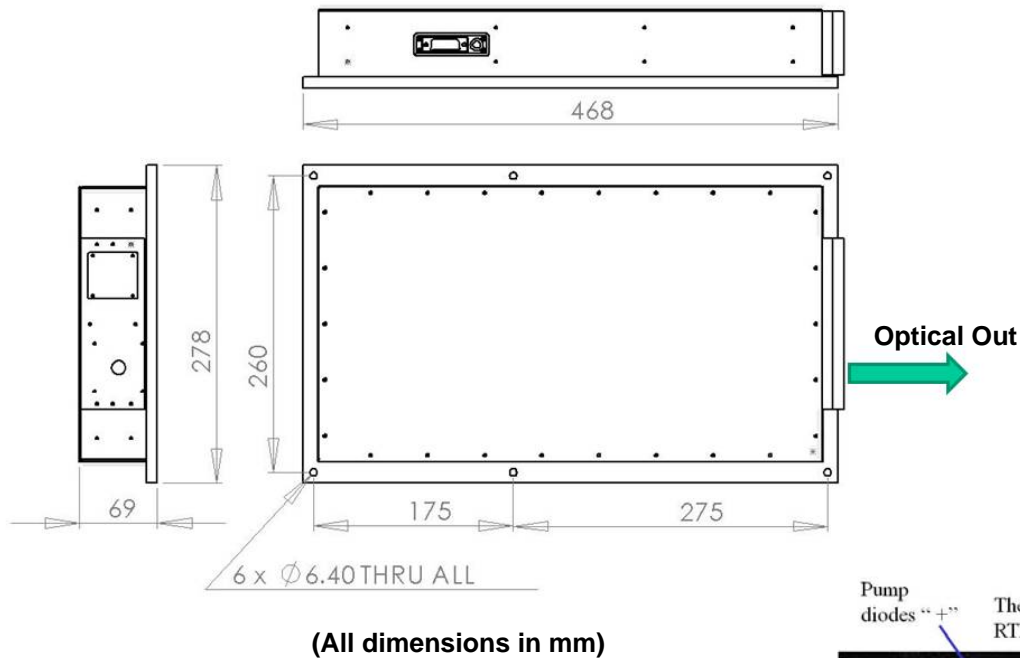
<http://www.princetonlightwave.com>  
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Rev. 1.0

## Part No. PML-664HE: 1645 nm High Energy Q-switched DPSSL

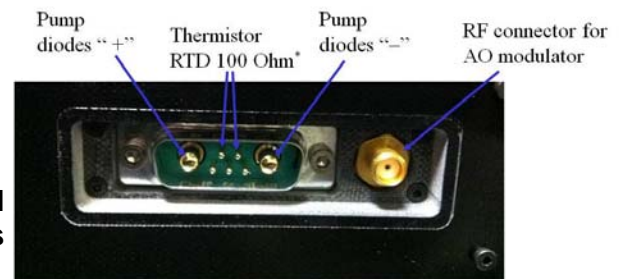
### SPECIFICATIONS

Operating Conditions: 15°C operating temperature, 50 Hz repetition rate, QCW pumping (unless specified otherwise)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Wavelength	$\lambda$			1645		nm
Average Power	$P_{avg}$			0.45		W
Pulse Repetition Rate	f		CW	50	150	Hz
Pulse Duration	T	at $E_{min}$		40	50	ns
Pulse Energy	E		8			mJ
Beam Parameter		at $E_{min}$		0.7	1	mm•mrad
Circularity		at $E_{min}$	90	95		%
Spatial Mode		at $E_{min}$		TEM <sub>00</sub>		
Output Power Stability		at $E_{min}$		±2		%
Operating Temperature	$T_{op}$	at baseplate bottom	15	20	25	°C
Dissipated Heat Load		at $E_{min}$ , at baseplate bottom		40	50	W
Warm Up-Time				5	15	min



**Electrical connections**



**Specifications subject to change without notice**

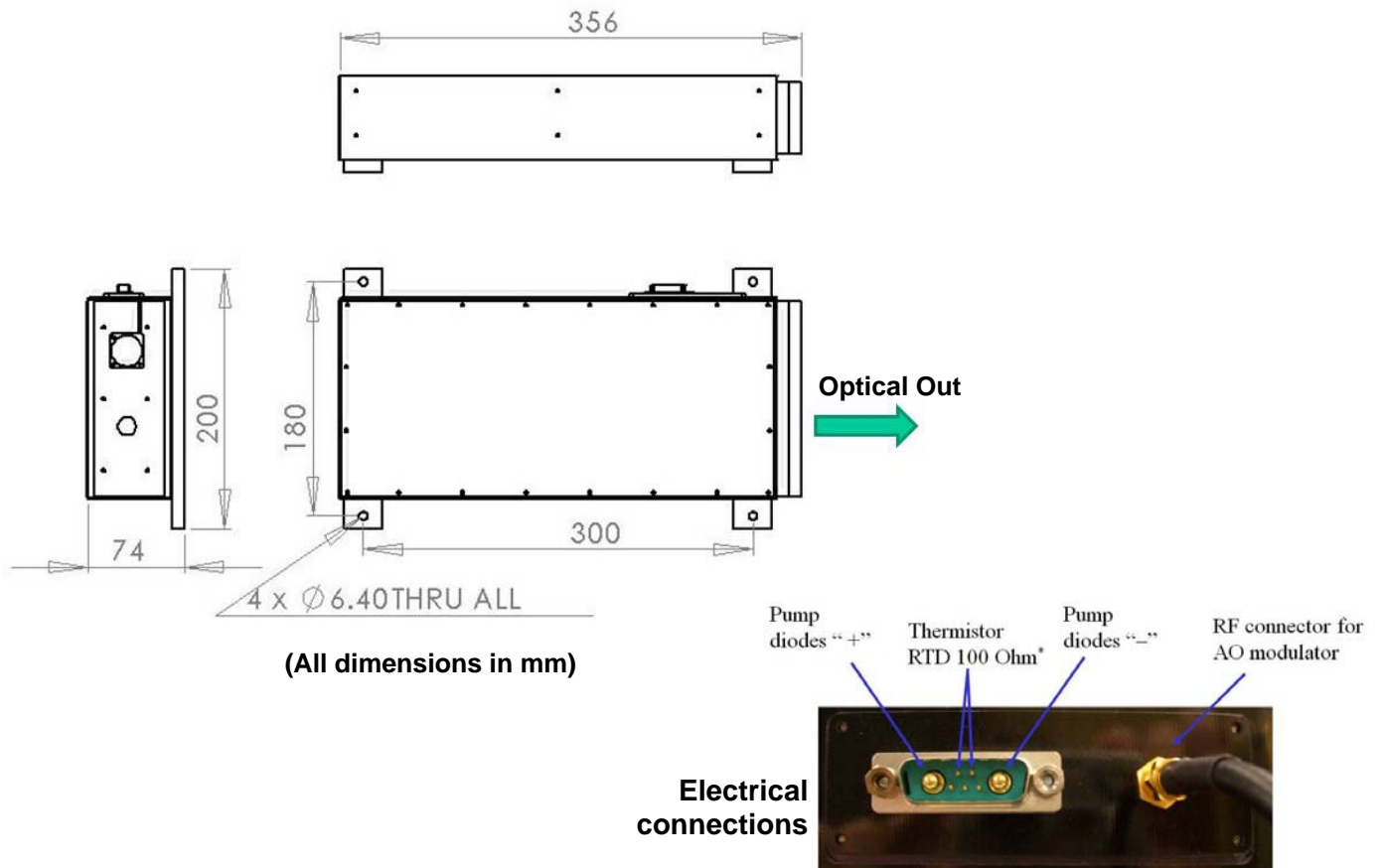
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## **Part No. PML-664HR: 1645 nm High Repetition Rate Q-switched DPSSL**

### **SPECIFICATIONS**

Operating Conditions: 15°C operating temperature, 1000 Hz repetition rate, CW pumping (unless specified otherwise)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Wavelength	$\lambda$			1645		nm
Average Power	$P_{avg}$			3		W
Pulse Repetition Rate	$f$		500	1000	2000	Hz
Pulse Duration	$T$	at $E_{min}$		70	80	ns
Pulse Energy	$E$		3			mJ
Beam Parameter		at $E_{min}$		0.7	1	mm·mrad
Circularity		at $E_{min}$	90	95		%
Spatial Mode		at $E_{min}$		TEM <sub>00</sub>		
Output Power Stability		at $E_{min}$		±2		%
Operating Temperature	$T_{op}$	at baseplate bottom	15	20	25	°C
Head Load		at $E_{min}$ , at baseplate bottom		160	180	W
Warm Up-Time				5	15	min



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