

## Q-Switched IR Laser

### M110 Series



#### Key Features

- 1047 nm output
- Short pulse duration
- Superior pulse stability
- Pulse equalization mode
- Burst mode
- Reliability
- Compact efficient package

#### Applications

- Seeder for OPO
- Frequency generation
- Optical Time Domain Reflectometry (OTDR)
- Memory repair
- Thin film trimming
- Ranging
- Marking

The JDSU M110 lasers are mini Q-switched, air-conduction-cooled devices employing an Nd:YLF gain material, a laser pump source, and pulse-on-demand system control capabilities. The patented cavity design features a high-optical-power density laser pump efficiently and compactly coupled to the laser cavity, Brewster-angled intracavity surfaces, proprietary mounting of optical elements, and minimal use of optical coatings. These design features ensure highly efficient operation and minimal feedback. As a result, diode power can be decreased, significantly lengthening the diode's life.

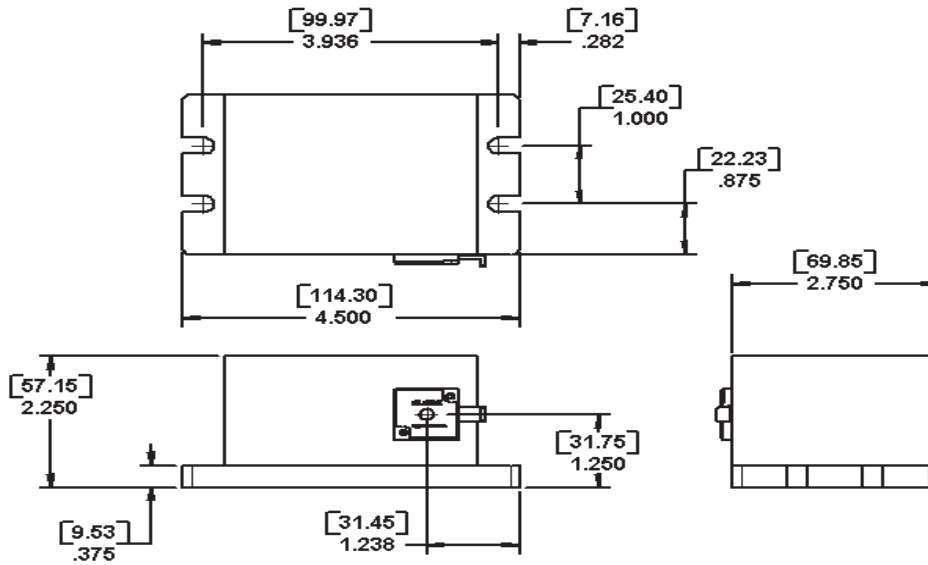
The M110 lasers operate many times above lasing threshold, so a large number of longitudinal modes are present and significant averaging occurs while reducing spiking and improving pulse energy stability. The Nd:YLF gain medium is also advantageous in this respect, since it has a broader emission bandwidth than Nd:YAG, thereby supporting more longitudinal modes. The net result is excellent energy stability, typically <1.0% rms. The pulse-energy equalization feature allows user to specify the highest repetition rate at which the laser will operate, and it then keeps the pulse shape constant for lower repetition rates. First-pulse suppression eliminates unwanted large pulses at the beginning of a burst of pulses to insure no damage to laser, user optics, or material in process.

The M110 laser series also provides three operational modes: continuous wave (CW), internal trigger, and external trigger. Several pulse width versions are available.

## 2

## M110 Laser Head

(Specifications in inches [mm] unless otherwise noted.)



## 3

**Specifications**

Parameter	M110-1047-050	M110-1047-100
Wavelength	1047 nm	
Spatial mode	TEM <sub>00</sub>	
Repetition rate range		
Externally triggered	0 to 100 kHz	
Internally triggered	1 Hz to 100 kHz	
Performance at 1 KHz		
Energy per pulse	>50 µJ	>100 µJ
Pulse width	<7 ns	<5 ns
Energy stability	<1% rms	<1% rms
Timing stability w.r.t.		
External trigger signal	±15 ns at 1 kHz	
Internal trigger signal	±1 ns at 1 kHz	
Polarization	>100:1, horizontal	
Beam roundness	<10% elliptical	
Waist location		
Inside laser head, from window	1 cm nominal	
Beam diameter at window, 1/e <sup>2</sup>	0.2 mm nominal	
Beam divergence, full angle	8 mrad nominal	
Warm-up time		
From cold start	<15 minutes	
From standby	<1 minute	
<b>Input and Ambient</b>		
Operating base temperature	15 to 35 °C	
Relative humidity, non-condensing	10 to 80%	
Dimension (W x H x L)	12 x 6 x 7 cm	
Weight	3.09 lbs (1.4 kg)	

## 4

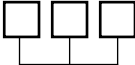
**M110 Power Supply****Parameter****Specification**

User interface	On-off switch
Weight	7.72 lbs (3.5 kg)
Dimension (W x H x L)	26 x 11 x 27 cm
<b>Input and Ambient</b>	
Voltage	90 to 285 V AC
Frequency	47 to 63 Hz
Input power, maximum	100 W
Operating ambient temperature	15 to 35 °C
Relative humidity, non-condensing	10 to 80%

**Ordering Information**

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at [customer.service@jdsu.com](mailto:customer.service@jdsu.com).

**Sample: M110-1047-050**

**M110-1047-** 

Code	Energy per Pulse <sup>1</sup>
050	50 µJ at 1 kHz
100	100 µJ at 1 kHz

1. Other outputs at 1321, 1343, and 1053 nm are available upon request.

**Compliance with Regulatory Requirements**

The lasers are Class IIIb lasers as defined by the Federal Register 21 CFR 1040.10 Laser Safety Standard. The Standard requires that certain performance features and laser safety labels be provided on the product.


**Warranty**

JDSU diode-pumped M110 series laser systems are warranted to be free of defects in materials and workmanship for thirteen months from the date of shipment.

**Patent Information**

The M110 laser systems are manufactured under several US patents including 4455657, 457893, 4731787, 4734912, 4739507, 4749842, 4752931, 4764933, 4797896, 4809291, 4827485, 4829532, 4909612, 4947402, 4998255, 5027361, 5076678, 5103457, 5130995, 5226051, 5237584, 5299222 and/or 5329539. Additional patents pending.

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