



Pulse-Diode-Pumped Nd:YAG Lasers

Series LDPP

Since 1996, the lamp-pumped Series 600 Pulse Nd:YAG Lasers have become popular lasers for high-speed micromachining applications such as the manufacture of **Stencil Masks** for use in SMT, and medical **Stent** devices. Designed with the same industrial-grade ruggedness of our highly successful Series 800 CW (continuous-wave) and Q-switched Nd:YAG Lasers, the Series 600 brings Lee Laser performance reliability to heavier-duty applications of thin metal and gasket cutting and micro-drilling.

Now, Lee Laser introduces a pulse-pumped Nd:YAG laser with similar performance capabilities, but in a diode-pumped format. The new Model LDPP-50M offers the following performance capabilities:

- Average power up to 50 Watts
- Pulse energy up to 40 mJ (Watt-seconds)
- Pulse width range 20 to 100 μ s
- Pulse rate up to 2000 pps

Diode pumping brings a new, higher level of performance to pulse-pumped Nd:YAG lasers. When compared with the highly regarded lamp-pumped Model 650M/CD laser, the Model LDPP-50M provides the following advantages:

1. Pulse build-up time of the LDPP-50M is only 20 μ s compared with 70 μ s for the Model 650M/CD.
2. As a result, lase pulse rise-time is much faster than for the 650M/CD.
3. Very fast diode current decay time. Much faster than lamp-pump current decay.
4. Very fast resulting pulse fall time. This will greatly reduce HAZ effects with the longer decay of the 650M/CD pulse.
5. Unlike the 650M/CD laser, total extinction of the lase pulse occurs well before the extinction of the diode current pulse.
6. The beam quality is slightly better than the 650M/CD laser at comparable output power levels. Typical divergence for the 650M/CD is 3 mr at 19 Watts and 5 mr at 40 Watts.

The table below summarizes the differences with both lasers operating at 40 Watts, 1 kHz and 100- μ s pulse width.

<u>Parameter</u>	<u>650M/CD</u>	<u>LDPP-50M</u>
Lamp/Diode Current Rise Time	170 μ s	120 μ s
Lase Pulse Build-up Time	90 μ s	20 μ s
Lase Pulse Rise Time	80 μ s	100 μ s
Lamp/Diode Current Decay Time	10 μ s	80 μ s
Lase Pulse Fall Time	120+ μ s	20 μ s
Beam Quality (M^2) at 40 Watts	9.0	6.0

The power station cabinet measures 24" wide x 34" deep (including particle filter and DI water filter) x 33" high. Drawing No. 130366 shows the outline dimensions.

The oscilloscope traces below illustrate a comparison of the diode current and lase pulse timing.

1. 50- μ s Pulse Width

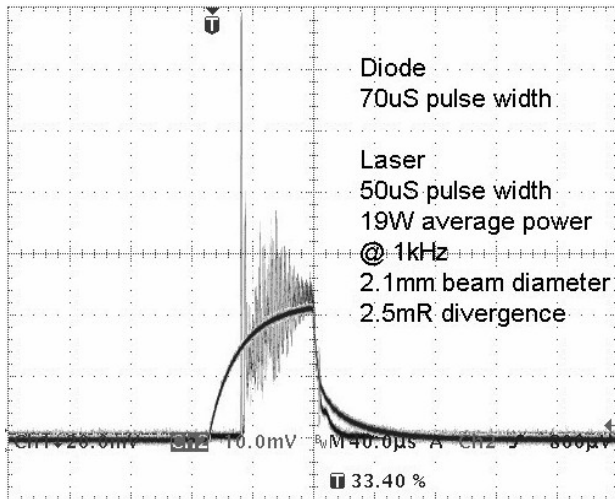


Fig. 1, Diode Current and Lase Pulses Superimposed

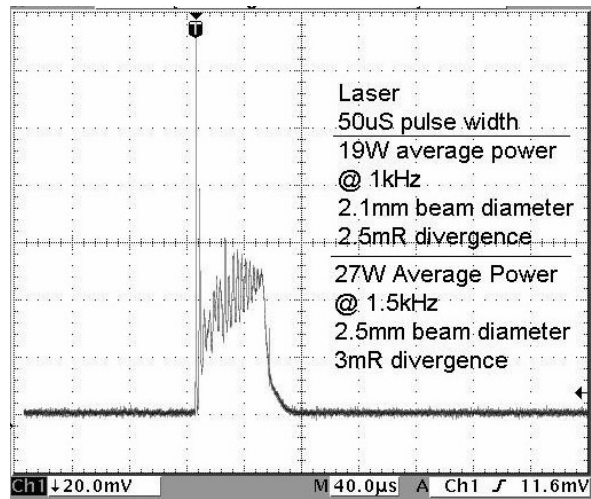


Fig. 2, Lase Pulse Only 18-19 mJ at 50 μ s pulse width

2. 100- μ s Pulse Width

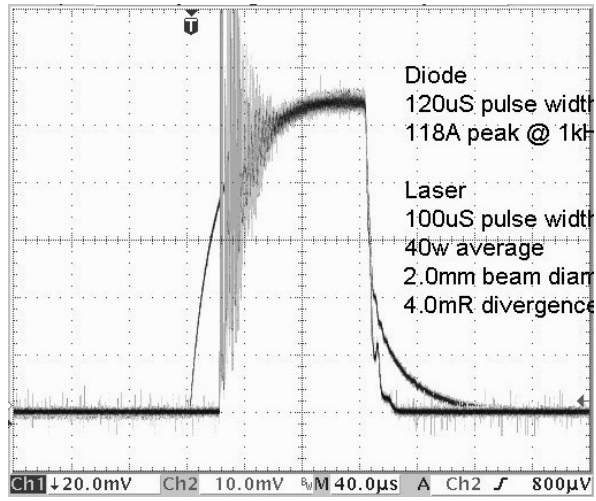


Fig. 3, Diode Current and Lase Pulses Superimposed

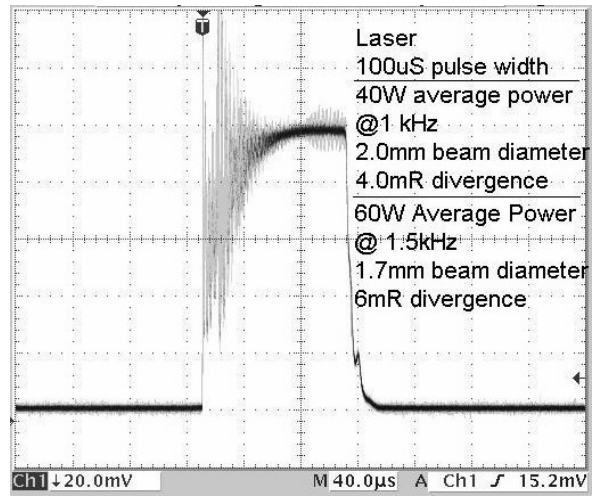


Fig. 4, Lase Pulse Only
40 mJ at 100 μ s pulse width

