

# APL-Series Narrow Linewidth DPSS Laser for High Vibration Environments

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**NORTHROP GRUMMAN**



**Northrop Grumman – Cutting Edge Optronics**  
(636) 916-4900 / Email: [st-ceolaser-info@ngc.com](mailto:st-ceolaser-info@ngc.com)

# Narrow Linewidth Pulsed DPSS Laser System



- Injection Seeded EO Q-Switched Nd:YAG
- >65 mJ at 355 nm, 30 Hz
- Scalable to higher laser repetition rates and output energy
- Narrow linewidth of < 400 MHz
- Novel method of injection seeding
- Highly resistant to loss of seeding due to vibration
- Tested at C-130 vibration levels



New method of injection seeding – Less susceptible to vibration

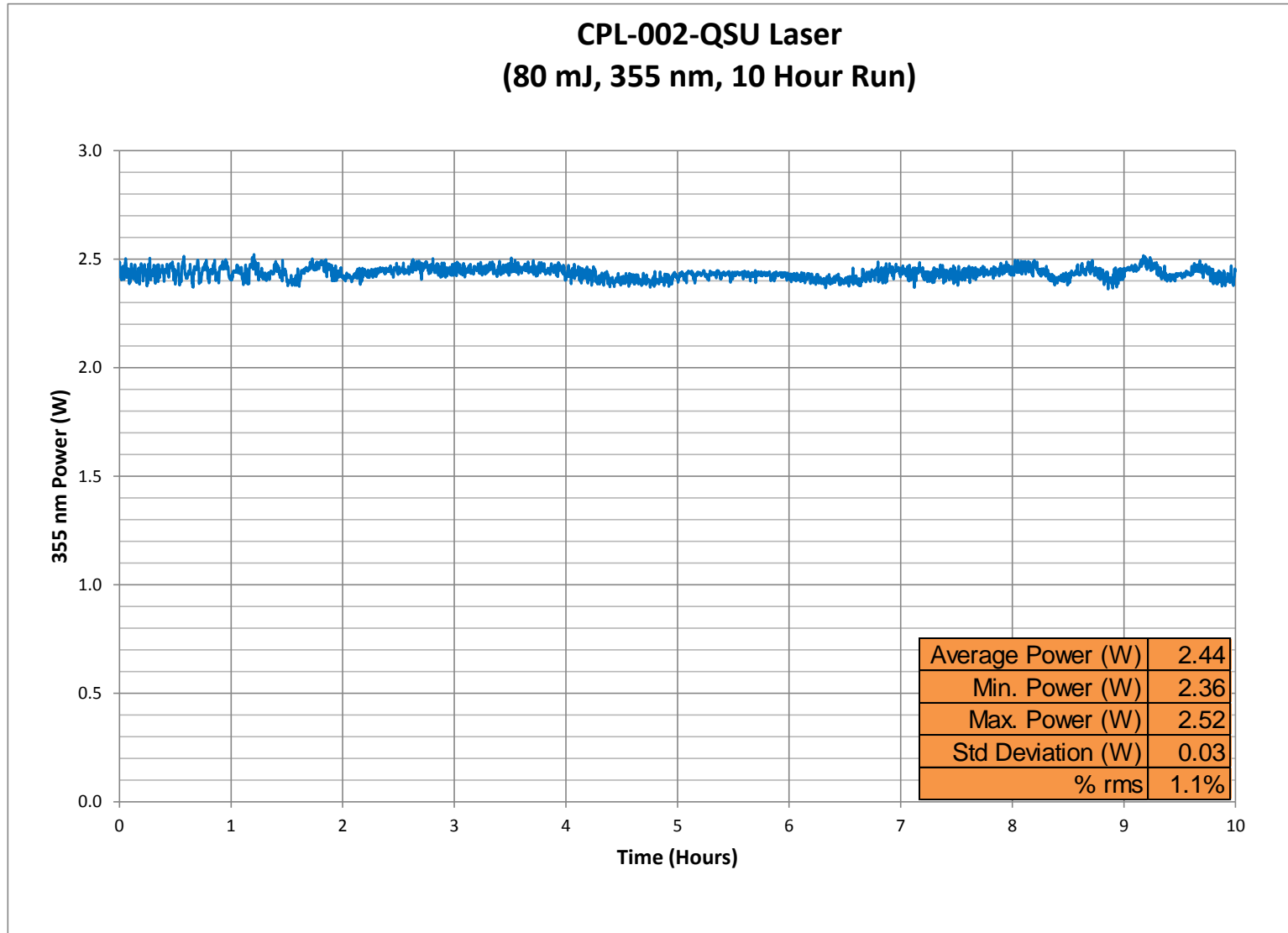
# Specifications

Specifications				
Parameters	Configurations			Units
Model	APL-005-QSI	APL-003-QSG	APL-002-QSU	
Laser Type	DPSS Nd:YAG	DPSS Nd:YAG	DPSS Nd:YAG	
Wavelength	1064	532	355	nm
Output Energy	166	80	65	mJ
Repetition Rate	30			Hz
Beam Quality	< 3			M <sup>2</sup>
Linewidth	< 400 MHz			MHz
Pulse Width	< 10			nsec
Power Stability	< 2% (over 8 hrs), < 5 % (during vibration)			rms
Timing Jitter*	≤ 1 nsec			
Operating Temperature	15 to 35 (non condensing)			°C
Vibration**	MIL-STD-810G, Method 514.6, Annex D, C-130, Model H3			
Warm-up Time	20			min
Input Power	115 VAC, 60 Hz			

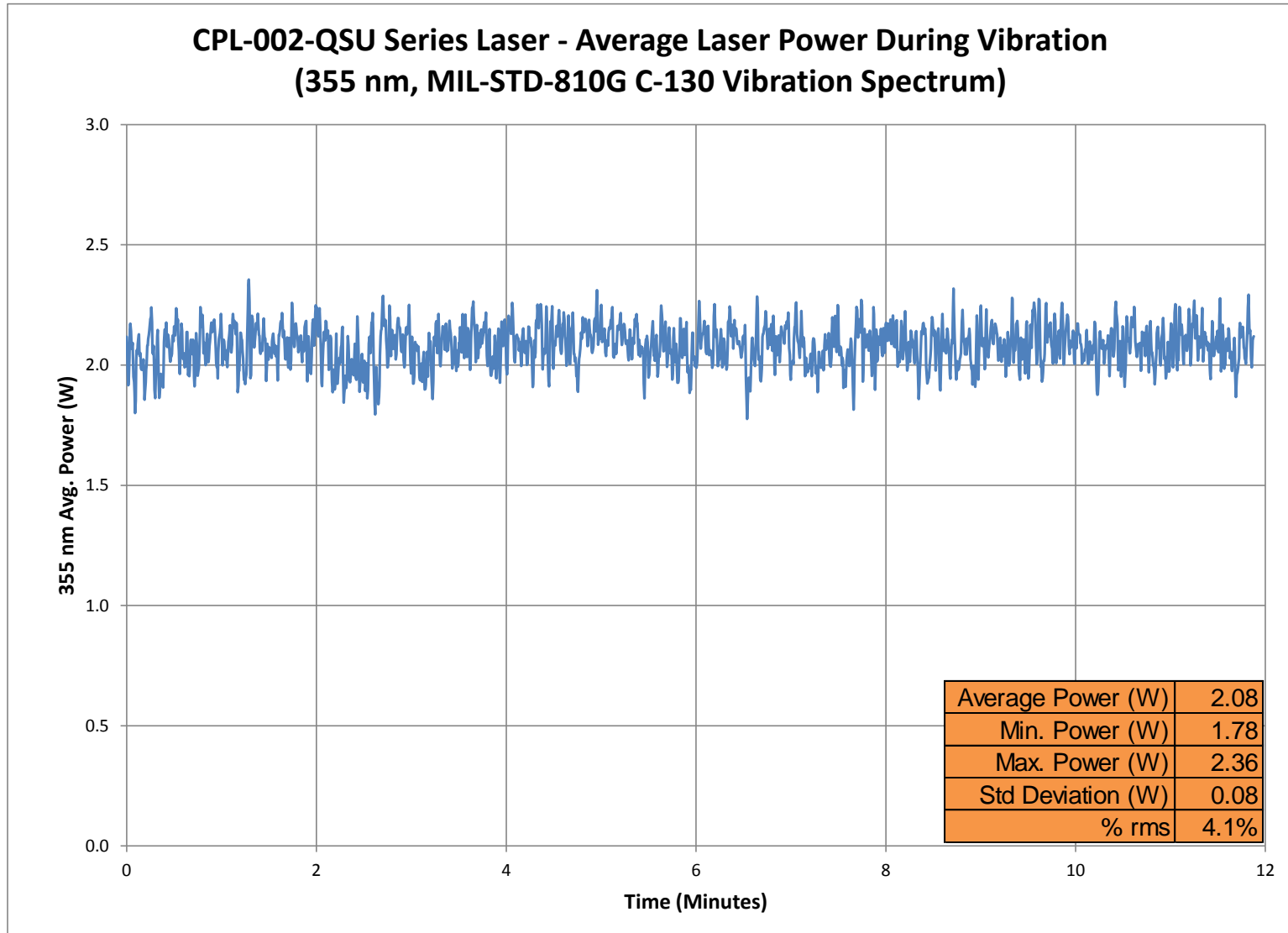
\* Measured from Q-Switch trigger to laser pulse out

\*\* Vibration isolation mounts are recommended between laser mounting plate and aircraft structure

# Long Term Stability

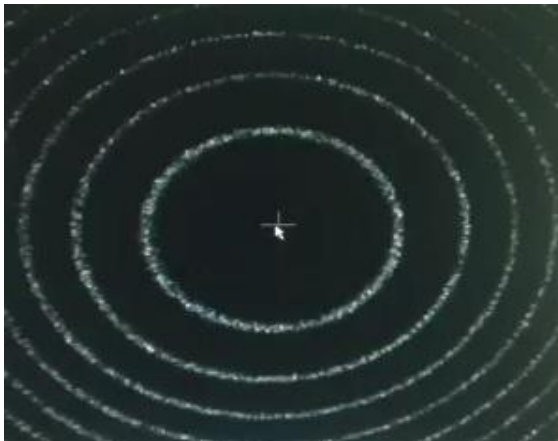
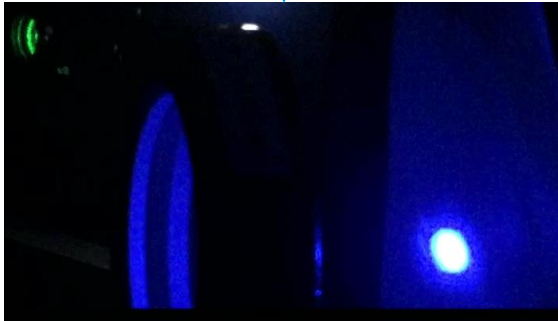


# Laser Stability During Vibration



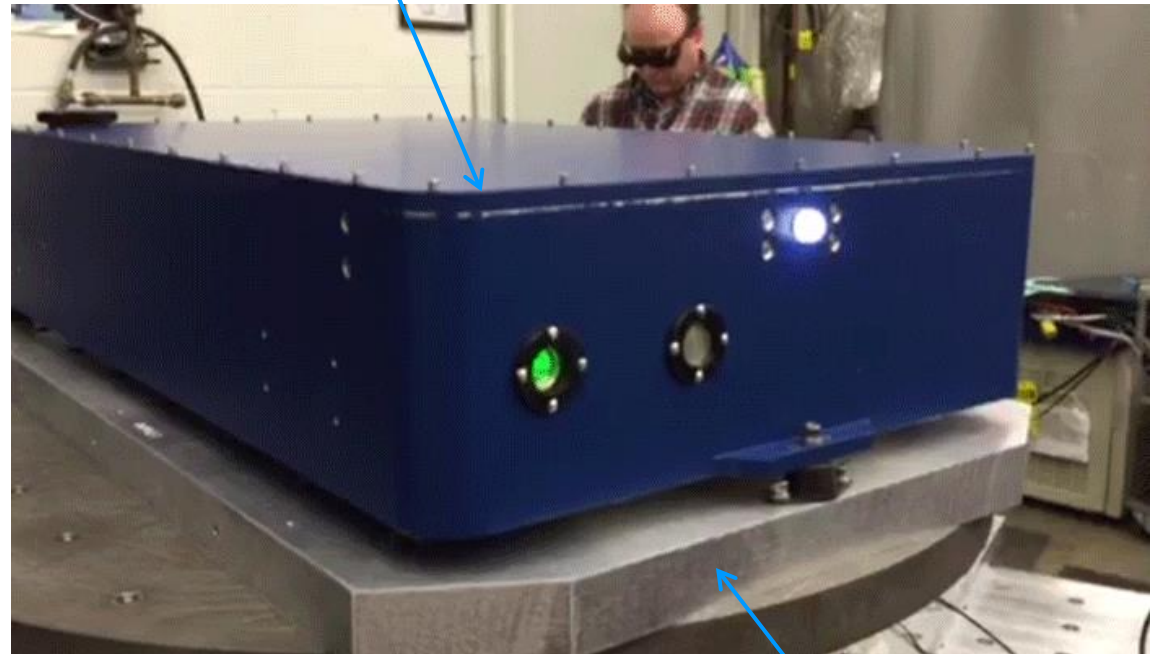
# Laser During Vibration Testing

Z-Axis Vibration Testing



Narrow Linewidth Measurement  
Etalon Ring Image

Laser



Vibration Table



- APL-002-QSU laser outputs > 65 mJ at 355 nm, 30 Hz
- Narrow linewidth of < 400 MHz
- Superior long-term stability
- Long life, energy efficient diode pumping (2 yr/10,000 hr diode warranty)
- Scalable to >100 Hz and higher energy
- Highly resistant to seeding disruption due to vibration
- This novel method of injection seeding is just one method used by CEO to produce narrow linewidth output. This method may not be ideal for all applications

Contact CEO to discuss which method will work best for your specific application

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