DX UV/Green Short Pulse Nanosecond Lasers

www.photonix.com

Overview

A pioneer of intracavity generation with 28+ years of manufacturing experience and tens of thousands of shipments worldwide, Photonics Industries offers the broadest nanosecond (ns) UV product selection from 1W* to 55W at 355nm and Green product selection from 2W* to 100W at 532nm.

Our DX Series Short Pulse Nanosecond Lasers have smaller form factor, higher performance and shorter pulse widths compared to its ancestor, the DSH series, providing the most compact UV output powers from 15W to 55W and Green output powers from 30W to 100W with short pulse width—in addition to longer pulse versions** (i.e. -LP, -HLP).

Owing to key patented technologies that provide non-consumable THG crystals with no indexing required, intracavity harmonic generation is an inherently more efficient harmonic conversion that provides better pulse-to-pulse stability and mode quality in a simple, compact laser configuration.

With standard Total Pulse Control features such as PEC and Duty Control, pulse energy and pulse width, which can be held constant over wide ranges of repetition rates for tight process control at fast speeds. Higher power and faster throughput contribute to a low cost of operation.

The All-In-One (AIO) design combines common optical, electrical and command interfaces in a rugged industrial package for simple integration into 24/7 precision micromachining in extended production cycle environments.

Features – *The Advantage of Photonics Industries*

- **High power (up to 55W) UV and (up to 100W) green laser**
- **The most compact, rugged, All-In-One ns laser**
- **The highest wall plug efficiency ns laser ranging from ~10% for UV to ~17% for green**
- **Widest selection of pulse widths from 10ns to >200ns**, differing from any other commercially available single laser platform**
- **Patented intracavity UV and green generation**
- **Highest pulse energy UV ns laser in the market at >1mJ at 50kHz**
- **Excellent TEM_{00} beam with typical M^2<1.1**
- **Superior pulse stability, typically <2%**
- **Exceptional beam pointing stability <25 µrad**
- **Total pulse control (PEC, Duty Control, etc.)**

Applications

- **ITO Patterning**
- **Flex PCB de-paneling, cutting and PCB drilling**
- **Via Hole Drilling**
- **Ceramic scribing, cutting, and drilling**
- **Solar Cell Scribing and PERC Processing**
- **Silicon Wafer Scribing and Singulation (Full cut wafer dicing, Low-k dielectric grooving)**
- **UV reel to reel on the fly Converting process**
- **Metal foil cutting and Copper processing**
- **Glass and ceramic processing, cutting**
- **UV Welding Carbon Fiber (CFRP)**

* For lower power models, please see the DX Air-Cooled Series

** For longer pulse width models, please see the DX Series Long Pulse Nanosecond Lasers

System Specifications – UV Series

Specifications	Model				
	DX-355-15	DX-355-20	DX-355-28	DX-355-40	DX-355-50
Output Characteristics					
Wavelength (nm)	355 nm				
Average Power (W)	**15 at 50kHz** 10 at 100 kHz 4 at 200 kHz	**20 at 50kHz** 18 at 100 kHz 10 at 200 kHz	**28 at 60kHz** 23 at 100 kHz 18 at 200 kHz	**40 at 60kHz** 40 at 100 kHz 22 at 200 kHz	**50 at 70kHz** 50 at 100 kHz 30 at 200 kHz
Pulse Energy (mJ)	~0.3	~0.4	~0.6	~1	~1
Pulse Width (ns) (nominal)	12±3 at 50 kHz 20±3 at 100 kHz		12±3 at 50 kHz 20±4 at 100 kHz		
Repitition Rate*	Single shot to 300 kHz (Option to >500 kHz)				
Pulse to Pulse Stability	< 2% rms				
Long Term Stability‡	< ±2%				
Beam Characteristics					
Polarization Ratio	Horizontal; > 100:1				
Beam Diameter at exit	~0.6 mm**			~2.5 mm	
Beam Divergence	< 1.5 mrad				
Beam Circularity	>95%				
Spatial Mode (M2)	TEM_{00} M^2<1.1		TEM_{00} M^2<1.2		
Beam Pointing Stability	< 25 µrad				
Operating Specifications					
Interface	Ethernet / RS 232 / GUI / External TTL Triggering				
Warm-up Time	< 15 min from stanby, < 30 minutes from cold start				
Electrical Requirement	100 to 240 V AC; or 32 V DC, 15 A				
Line Frequency	50 to 60 Hz				
Power Consumption (Typical) (w/o Chiller)	< 240 W		< 320 W	< 420 W	< 600 W
Ambient Temperature	15°C to 35°C (59°F to 95°F) Operating Range, RH 90% Max, non-condensing				
Storage Conditions	-10°C to 40°C; Sea Level to 12,000 m; 0% to 90% RH, non-condensing				
Physical Characteristics					
Dimensions	7.5 in x 3.75 in x 18 in				8.5 in x 3.75 in x 20 in
Weight	29 lbs				43 lbs
Cooling System	Water-Cooled				

*Lower rep rates (<30 kHz) performance achieved by pulse energy capping

**Larger beam diameters (up to ~2.5mm) available with expansion option ‡ 8 hours ± 1°C

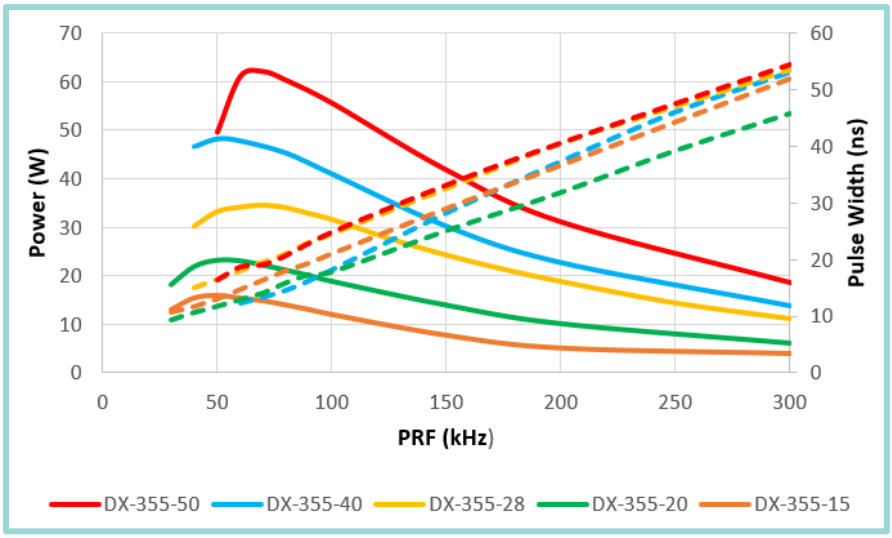
System Specifications – Green Series

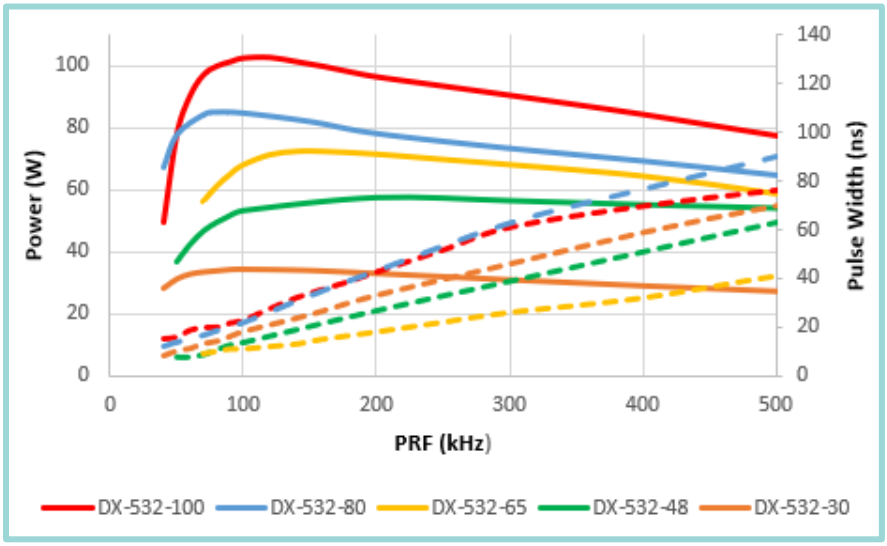
Specifications	Model				
	DX-532-30	DX-532-48	DX-532-65	DX-532-80	DX-532-100
Output Characteristics					
Wavelength (nm)	532 nm				
Average Power (W)	**30 at 100 kHz** 30 at 200 kHz 27 at 300 kHz 25 at 400 kHz 22 at 500 kHz	**48 at 100 kHz** 48 at 200 kHz 48 at 300 kHz 48 at 400 kHz 48 at 500 kHz	**65 at 100 kHz** 65 at 200 kHz 63 at 300 kHz 60 at 400 kHz 57 at 500 kHz	**80 at 100 kHz** 75 at 200 kHz 65 at 300 kHz 60 at 400 kHz 55 at 500 kHz	**100 at 100 kHz** 95 at 200 kHz 85 at 300 kHz 80 at 400 kHz 75 at 500 kHz
Pulse Energy (mJ)	~0.5	~0.6	~0.7	~0.8	~1
Pulse Width (ns) (nominal)	11±2 at 100 kHz <25 at 250 kHz	11±2 at 100 kHz <25 at 250 kHz	11±2 at 100 kHz <25 at 250 kHz	15±3 at 50 kHz 25±3 at 100 kHz	25±3 at 100 kHz
Repitition Rate*	Single shot to 500 kHz (Option to 1 MHz)				
Pulse to Pulse Stability	< 2% rms				
Long Term Stability‡	< ±2%				
Beam Characteristics					
Polarization Ratio	Vertical; > 500:1				
Beam Diameter at exit	~0.7 mm		~1 mm		
Beam Divergence	<2 mrad	<2.5 mrad			
Beam Circularity	>95%				
Spatial Mode (M2)	TEM_{00} M^2<1.1		TEM_{00} M^2<1.2		
Beam Pointing Stability	< 25 µrad				
Operating Specifications					
Interface	Ethernet / RS 232 / GUI / External TTL Triggering				
Warm-up Time	< 15 min from stanby, < 30 minutes from cold start				
Electrical Requirement	100 to 240 V AC; or 32 V DC, 15 A				
Line Frequency	50 to 60 Hz				
Power Consumption (Typical) (w/o Chiller)	< 240 W		< 320 W	< 420 W	
Ambient Temperature	15°C to 35°C (59°F to 95°F) Operating Range, RH 90% Max, non-condensing				
Storage Conditions	-10°C to 40°C; Sea Level to 12,000 m; 0% to 90% RH, non-condensing				
Physical Characteristics					
Dimensions	7.5 in x 3.75 in x 16 in			8.5 in x 3.75 in x 20 in	
Weight	29 lbs			43 lbs	
Cooling System	Water-Cooled				

*Lower rep rates (<30 kHz) performance achieved by pulse energy capping

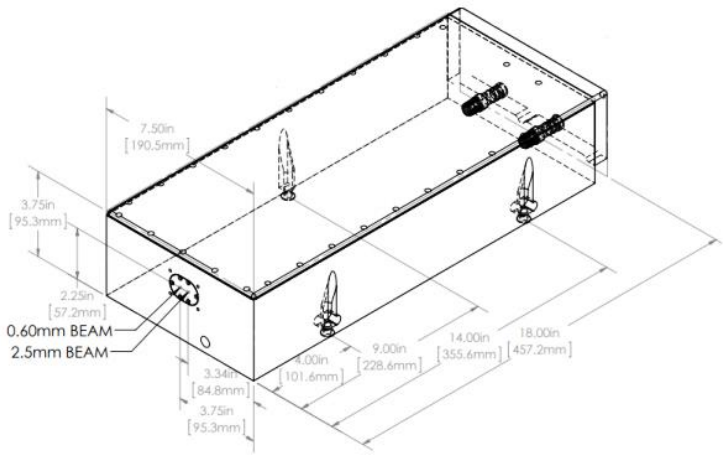
‡ 8 hours ± 1°C

Performance Curves – UV/Green

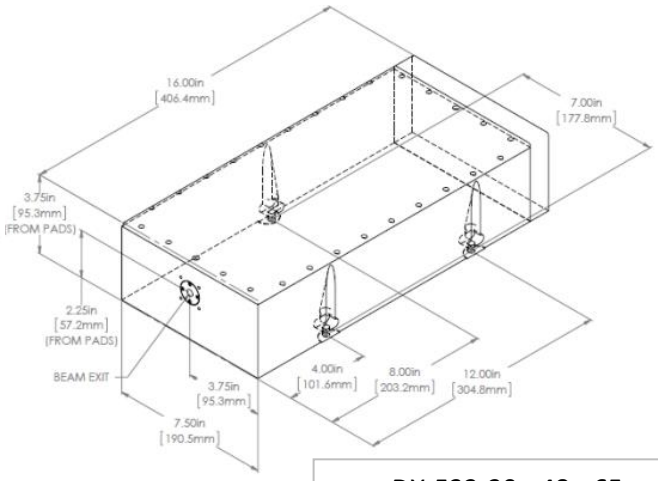




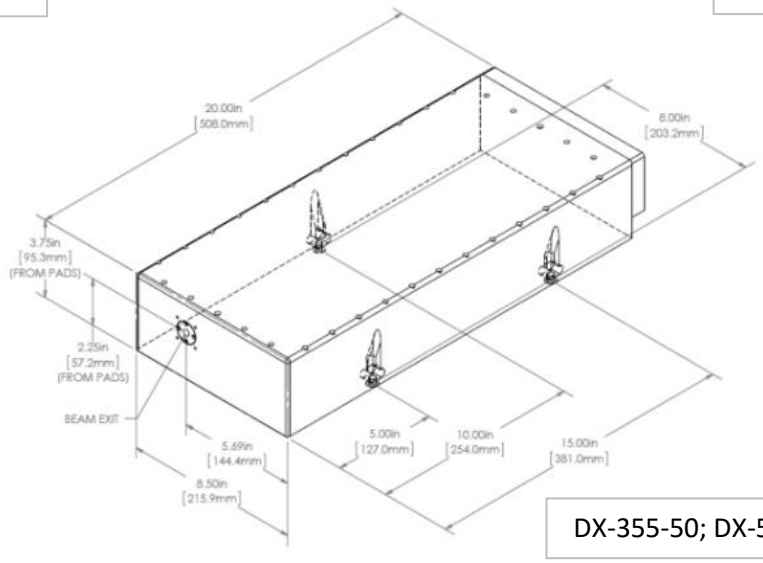
Dimensional Drawings



DX-355-15, -20, -28, -40



DX-532-30, -48, -65



DX-355-50; DX-532-80, -100

Due to Photonics Industries' commitment to continuous product improvement, specifications and drawings are subject to change without notice.

Photonics Industries conforms to provisions of US 21 CFR 1040.10 & 1040.11 and is made under one or more US patents listed below: 9,882,335, 9,531,147, 8,817,831, 7,869,471, 7,346,092, 7,082,149, 7,079,557, 6,999,483, 6,980,574, 6,961,355, 6,842,293, 6,762,405, 6,587,487, 6,584,134, 6,366,596, 6,356,578, 6,327,281, 6,246,707, 6,229,829, 6,108,356, 6,061,370, 6,028,620, 5,936,983, 5,898,717 and Pending Patents

Main Headquarters: 1800 Ocean Ave, Ronkonkoma, New York 11779, United States

Photonics Industries International is the pioneer of intracavity harmonic lasers and is at the forefront of developing, manufacturing and marketing a wide range of nanosecond, sub-nanosecond, picosecond and femtosecond lasers for industrial, scientific, defense, and medical industries. Check out our products and see how we can help you apply our lasers to your needs!

Website - Products - Applications - Company - Contact - International Network

Phone: (631) 218-2240 Fax: (631) 218-2275 E-Mail: info@photonix.com

Photonics Industries International, Inc.