



## DX Air-Cooled UV/Green Series Nanosecond Lasers [www.photonix.com](http://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 50W\* at 355nm and Green product selection from 2W to 100W\* at 532nm.

With its new revolutionary packaging, our new DX Air-Cooled Series has smaller form factor, higher performance and shorter pulse widths compared to its ancestor, the DCH series, providing the most compact UV output powers from 1W to 10W and Green output powers from 2W to 15W. The DX Air-Cooled Series lasers provide the highest average power from one of the smallest footprint, lightest weight short pulse width, high peak power air-cooled industrial ns lasers commercially available in UV and Green.

Owing to key patented technologies, intracavity harmonic generation is inherently a more efficient harmonic conversion that provides unmatched superior beam quality, as well as better beam pointing stability in a simple, compact laser configuration making this laser the perfect tool for precision manufacturing.

Standard feature-rich packed software allowing for adjustable output power using real-time TTL and/or analog control signals enables high quality process optimization all with ease of handling, high throughput, uncompromised process quality and long-term stability in 24/7 applications with a low Cost of Ownership (COO).



### Features – *The Advantage of Photonics Industries*

- ▶ **High power** air-cooled UV and Green ns laser
- ▶ The **most compact, most efficient** air-cooled laser
- ▶ The **highest wall plug efficiency** ranging from ~20% to 50% more efficient depending on the specific model.
- ▶ **Shortest pulse width** w/ rep rates up to 500 kHz
- ▶ Patented **intracavity** UV and Green generation
- ▶ **Highest pulse energy laser in the market**
- ▶ Power consumption <50 W
- ▶ Excellent TEM<sub>00</sub> beam with typical M<sup>2</sup><1.1
- ▶ **Superior pulse stability**, typically ~1%
- ▶ **Exceptional beam pointing stability** < 20 μrad
- ▶ **Monolithic All-In-One (AIO)** ns UV/Green Laser
- ▶ Water-cooled option available

### Applications

- ▶ Laser Trimming of Embedded Passives
- ▶ Glass Marking
- ▶ Laser Direct ITO/TCO Patterning
- ▶ LED and Medical Package Marking
- ▶ Solar P1 to P3 Processing
- ▶ Thin-film Scribing ▶ Thin-film Annealing
- ▶ Rapid Prototyping/Stereolithography
- ▶ PCB Drilling and Structuring
- ▶ Markings of Plastic ▶ Cutting of Metals
- ▶ LIDAR ▶ MALDI



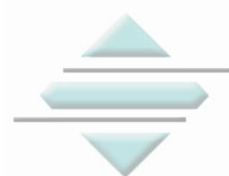
# System Specifications – UV Series

| Specifications                         | Model   |                                  |                                   |                                    |
|--|---|----------------------------------|-----------------------------------|------------------------------------|
|  | DX-355-1  | DX-355-5                         | DX-355-8                          | DX-355-10                          |
| <b>Output Characteristics</b>          |   |                                  |                                   |                                    |
| Wavelength (nm)                        | 355 nm  |                                  |                                   |                                    |
| Average Power (W)                      | 0.8 W at 20 kHz,<br>1 W at 50 kHz                                       | 5 W at 50 kHz,<br>4 W at 100 kHz | 8 W at 50 kHz,<br>7 W at 100 kHz, | 10 W at 50 kHz,<br>8 W at 100 kHz, |
| Pulse Energy ( $\mu$ J)                | ~20   | ~100                             | ~150                              | ~200                               |
| Pulse Width (ns)<br>(nominal)          | < 15 at 50 kHz<br>20 at 100 kHz   |                                  |                                   |                                    |
| Repetition Rate                        | Single shot to 200 kHz (Option to 300 kHz)                              |                                  |                                   |                                    |
| Pulse to Pulse Stability†              | < 2% rms  |                                  |                                   |                                    |
| Long Term Stability‡†                  | < 2% rms  |                                  |                                   |                                    |
| <b>Beam Characteristics</b>            |   |                                  |                                   |                                    |
| Polarization Ratio                     | Horizontal; 100:1   |                                  |                                   |                                    |
| Beam Diameter at exit                  | ~0.3 mm   | ~0.45 mm                         |                                   |                                    |
| Beam Divergence (Full Angle Far Field) | < 2.5 mrad  |                                  |                                   |                                    |
| Beam Circularity                       | ~90%  |                                  |                                   |                                    |
| Spatial Mode (M2)                      | TEM <sub>00</sub> M <sup>2</sup> <1.1                                   |                                  |                                   |                                    |
| Beam Pointing Stability                | < 20 urad   |                                  |                                   |                                    |
| <b>Operating Specifications</b>        |   |                                  |                                   |                                    |
| Interface                              | Ethernet / RS 232 / GUI / External TTL Triggering                       |                                  |                                   |                                    |
| Warm-up Time                           | < 10 min  |                                  |                                   |                                    |
| Electrical Requirement                 | 100 to 240 V AC   |                                  |                                   |                                    |
| Line Frequency                         | 50 to 60 Hz   |                                  |                                   |                                    |
| Power Consumption (Typical)            | ~50 W   | ~130 W                           |                                   |                                    |
| Ambient Temperature**                  | 10°C to 30°C (50°F to 86°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      |                                  |                                   |                                    |

† Measured at ambient temperature of  $\pm 2^\circ\text{C}$

\*\*For operation outside this temperature range, contact us

‡ 8 hours  $\pm 1^\circ\text{C}$

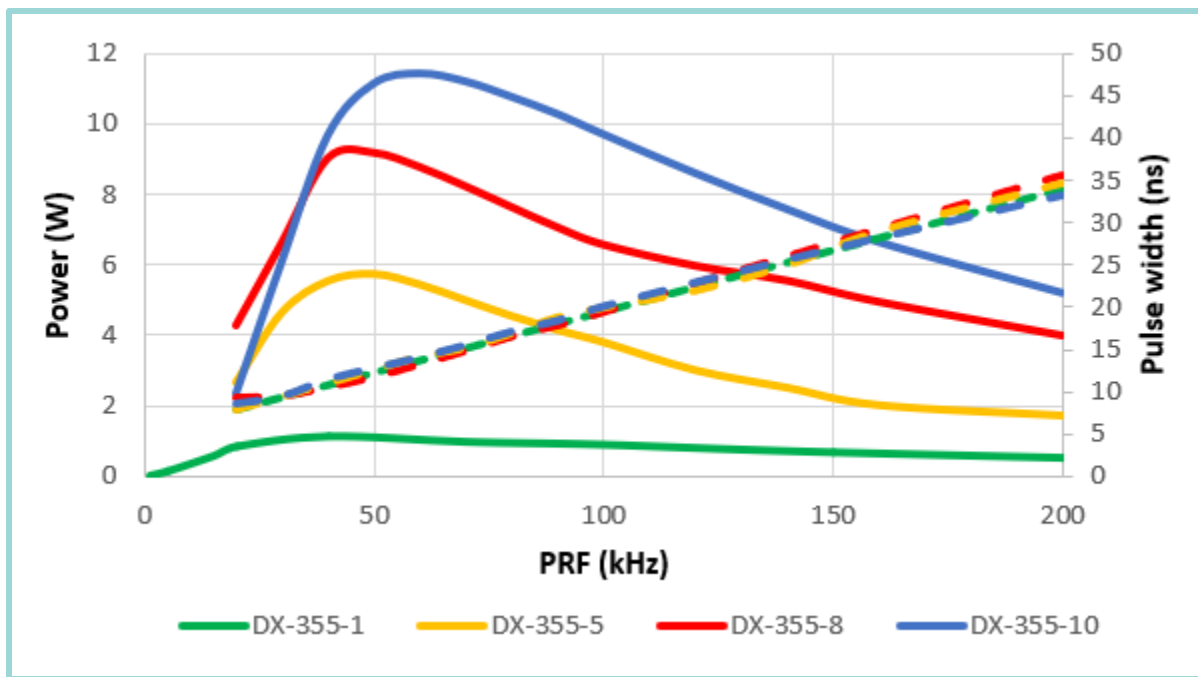


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International, Inc.

|                                 | DX-355-1              | DX-355-5            | DX-355-8 | DX-355-10 |
|---------------------------------|-----------------------|---------------------|----------|-----------|
| <b>Physical Characteristics</b> |                       |                     |          |           |
| Dimensions*                     | 3.38 in x 5 in x 9 in | 5 in x 5 in x 11 in |          |           |
| Weight                          | ~10 lbs               | ~15.5 lbs           |          |           |
| Cooling System                  | Air-Cooled            |                     |          |           |

\*Dimensions include air-cooled heatsinks. Water-cooled heatsink options are available (see dimensional drawings)

## Performance Curves – UV Series



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# System Specifications – Green Series

| Specifications                         | Model   |                                    |                                    |
|--|---|------------------------------------|------------------------------------|
|  | DX-532-2  | DX-532-10                          | DX-532-15                          |
| <b>Output Characteristics</b>          |   |                                    |                                    |
| Wavelength (nm)                        | 532 nm  |                                    |                                    |
| Average Power (W)                      | 2 W at 50 kHz,<br>2 W at 100 kHz  | 10 W at 50 kHz,<br>10 W at 100 kHz | 15 W at 50 kHz,<br>15 W at 100 kHz |
| Pulse Energy ( $\mu$ J)                | ~40   | ~200                               | ~300                               |
| Pulse Width (ns)                       | ~15 at 50 kHz<br>~20 at 100 kHz   |                                    |                                    |
| Repetition Rate                        | Single shot to 300 kHz (Option to 500 kHz)                              |                                    |                                    |
| Pulse to Pulse Stability†              | < 2% rms  |                                    |                                    |
| Long Term Stability‡†                  | < 2% rms  |                                    |                                    |
| <b>Beam Characteristics</b>            |   |                                    |                                    |
| Polarization Ratio                     | Vertical; 100:1   |                                    |                                    |
| Beam Diameter at exit                  | ~0.3 mm   | ~0.45 mm                           |                                    |
| Beam Divergence (Full Angle Far Field) | < 3 mrad  | < 2.5 mrad                         |                                    |
| Beam Circularity                       | ~90%  |                                    |                                    |
| Spatial Mode (M2)                      | TEM <sub>00</sub> M <sup>2</sup> <1.1                                   |                                    |                                    |
| Beam Pointing Stability                | < 20 urad   |                                    |                                    |
| <b>Operating Specifications</b>        |   |                                    |                                    |
| Interface                              | Ethernet / RS 232 / GUI / External TTL Triggering                       |                                    |                                    |
| Warm-up Time                           | < 10 min  |                                    |                                    |
| Electrical Requirement                 | 100 to 240 V AC   |                                    |                                    |
| Line Frequency                         | 50 to 60 Hz   |                                    |                                    |
| Power Consumption (Typical)            | ~50 W   | ~130 W                             |                                    |
| Ambient Temperature**                  | 10°C to 30°C (50°F to 86°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      |                                    |                                    |

† Measured at ambient temperature of  $\pm 2^\circ\text{C}$

\*\*For operation outside this temperature range, contact us

‡ 8 hours  $\pm 1^\circ\text{C}$

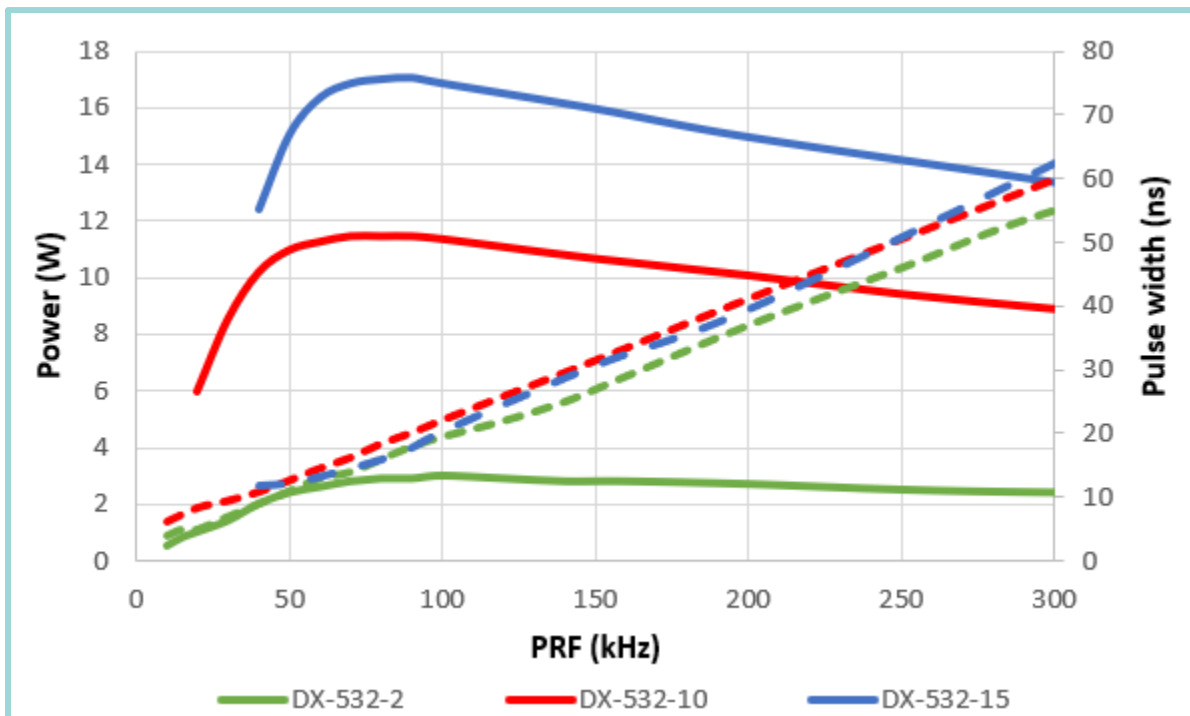


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|                                 | DX-532-2              | DX-532-10           | DX-532-15 |
|---------------------------------|-----------------------|---------------------|-----------|
| <b>Physical Characteristics</b> |                       |                     |           |
| Dimensions*                     | 3.38 in x 5 in x 9 in | 5 in x 5 in x 11 in |           |
| Weight                          | ~10 lbs               | ~15.5 lbs           |           |
| Cooling System                  | Air-Cooled            |                     |           |

\*Dimensions include air-cooled heatsinks. Water-cooled heatsink options are available (see dimensional drawings)

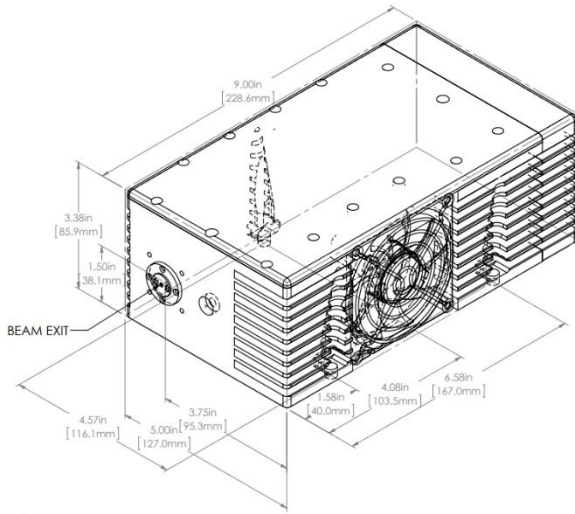
## Performance Curves – Green Series



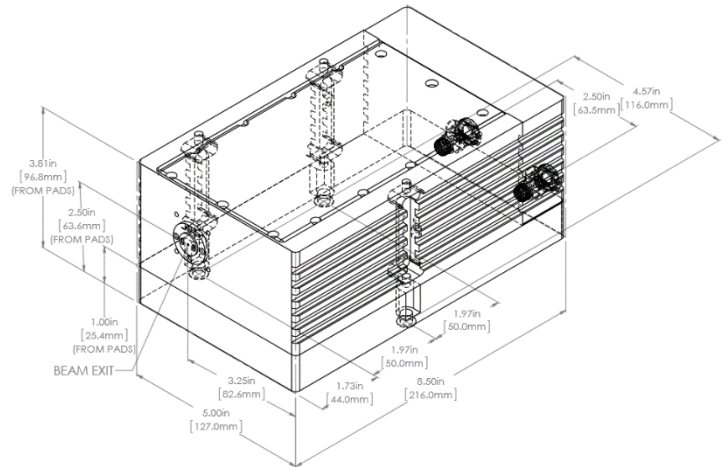
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# Dimensional Drawings

## DX-355-1 & DX-532-2

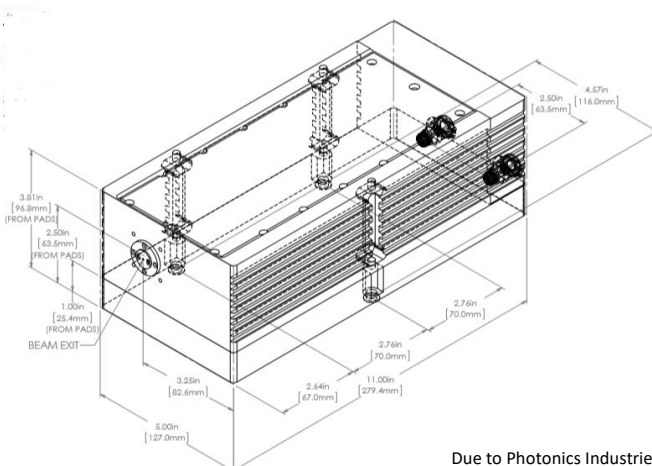


W/ Air-Cooled Heatsink

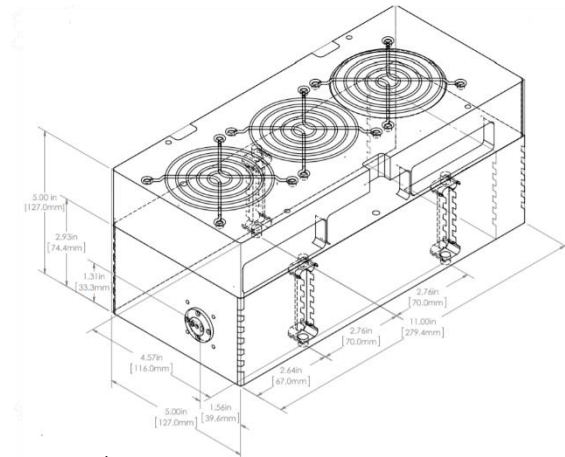


W/ Water-Cooled Version

## DX-355-5, 8 & 10; DX-532-10 & 15



W/ Water-Cooled Heatsink



W/ Air-Cooled Heatsink

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: 9,531,147, 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, 6,690,692, 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

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