Photonics Industries
International, Inc.

DX Short Pulse Series Nanosecond Lasers

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Photonics Industries' DX Series short pulse nanosecond lasers provide industrial systems with the most ideal compact form factor, short pulse width[1] (down to ~10 ns), high power, high repetition rate (up to 1 MHz) Q-switched DPSS laser for high production throughput and precision quality. Specially patented intracavity harmonic generation, with no damaging indexing on the harmonic crystals, allows for higher performance and higher reliability, fulfilling demanding production criteria.

Applications

- Cutting, drilling, welding, scribing, marking, intra-marking, patterning, dielectric grooving, de-paneling, annealing, repair
- Reel to reel on-the-fly Converting Process Micromachining
- PCB/FPCB cutting, drilling, de-paneling
- Silicon Wafer Scribing and Singulation, Low-k dielectric grooving
- Solar Cell Scribing and PERC processing
- Via Hole Drilling, Laser Trepanning, Laser Percussion Drilling
- Laser Lift-Off (LLO), Laser Debonding Systems, Semiconductor Microprocessing
- Selective Transfer of Light-emitting diodes (LED), µLED transfer assembly systems
- LIDAR Systems
  - Autonomous Systems, 3-D Scanning Systems, Airborne Laser Swath Mapping Systems, Laser Altimetry Systems

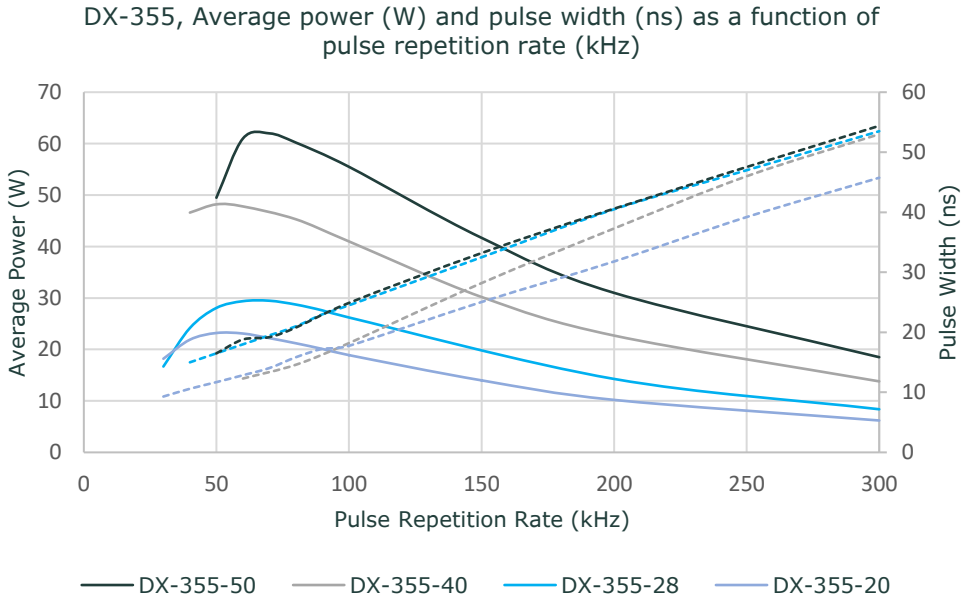
Features

- Short pulse[1] at high powers:
  - Up to 50 W UV, ~12 ns,
  - Up to >80 W Green, ~14 ns
- High pulse energy:
  - Up to 1 mJ UV
- Most versatile repetition rate range:
  - Single shot up to 1 MHz Green,
  - Single shot up to >0.5 MHz UV
- Reliable, low COO, non-consumable design
  - Patented intracavity harmonic UV & Green generation, no damaging indexing of the harmonic crystals
- Industrialized, small form factor, ideal for compact integration
- Excellent TEM00 beam quality:
  - Typical M2 ≤ 1.1
- Superior pulse stability:
  - Typical < 2 %
- Total Pulse Control for ultimate integrability into systems:
  - Duty Control to change output power while allowing for longer pulse widths than the standard operating values
  - PEC (Power or Pulse Energy Control)

1. For longer pulse width models, please see the DX Long Pulse Series Nanosecond Lasers brochure

	DX-355-20	DX-355-28	DX-355-40	DX-355-50
Beam[5] and output specifications				
Wavelength	355 nm			
Average power	20 W at 50 kHz 18 W at 100 kHz 10 W at 200 kHz	28 W at 50 kHz 23 W at 100 kHz 12 W at 200 kHz	40 W at 50 kHz 40 W at 100 kHz 25 W at 200 kHz	50 W at 50 kHz 50 W at 100 kHz 30 W at 200 kHz
Pulse energy	~0.4 mJ	~0.6 mJ	~1 mJ	~1 mJ
Pulse width	12±3 ns at 50 kHz 20±4 ns at 100 kHz			
Pulse repetition rate[1]	Single shot to 300 kHz (option up to >500 kHz)			
Pulse-to-pulse stability[2]	< 2% rms			
Long term power stability[3]	< ±2% rms			
Beam spatial mode	TEM_{00} M^2 < 1.1			TEM_{00} M^2 < 1.2
Beam pointing stability	< 25 µrad			
Beam divergence	< 1.5 mrad			
Beam roundness	~90%			
Beam diameter[4], at exit	~0.6 mm		~2.5 mm	
Polarization ratio	Horizontal; >100:1			
Operational specifications and system characteristics				
Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 15 minutes from standby, < 30 minutes from cold start			
Electrical requirement	100-240 V AC; or 32 V DC, 15 A			
Line frequency	50-60 Hz			
Ambient temperature	Ambient 15°C to 35°C (59°F to 95°F) Operating Range, Relative Humidity 90% Max., non-condensing			
Storage conditions	-10°C to 40°C; Sea Level to 12,000 m; 0% to 90% Relative Humidity, non-condensing			
Power consumption	< 240 W	< 320 W	< 420 W	< 600 W
Dimensions (LxWxH)	18 x 7.5 x 3.75 in			
Weight	29 lbs (13.2 kg)			
Cooling system	Water-cooled			

[1.] Lower pulse repetition rates (down to < 30 kHz) performance achieved by pulse energy capping. [2.] Measured at ambient temperature ± 2°C. [3.] Measured over 8 hours ± 1°C. [4.] Larger beam diameters at the exit (up to ~2.5 mm) are available with the expansion option. [5] Beam parameters are specified at pulse repetition rate of 70 kHz.



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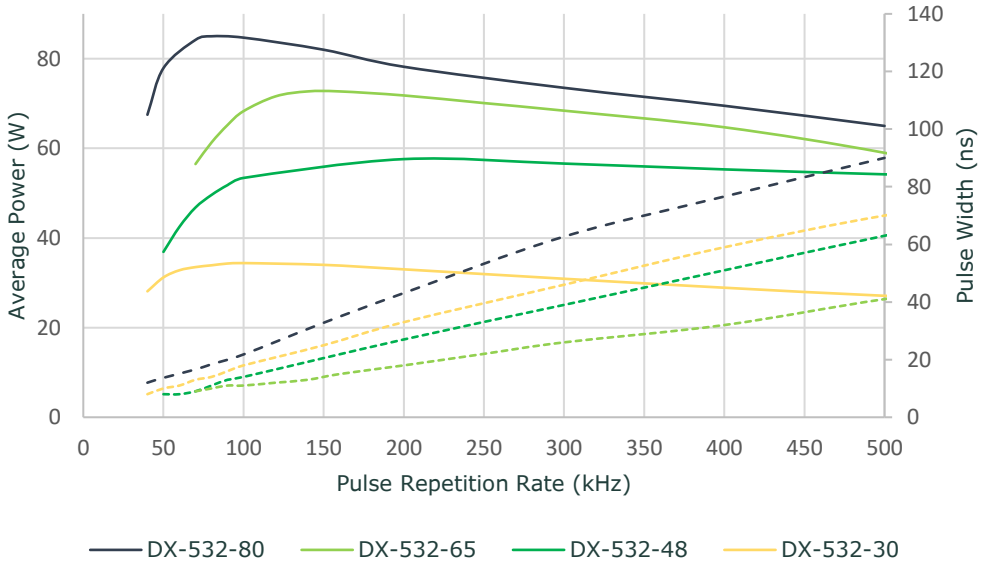
	DX-532-30	DX-532-48	DX-532-65	DX-532-80
Beam and output specifications				
Wavelength	532 nm			
Average power	30 W, 100-200 kHz 27 W at 300 kHz 25 W at 400 kHz 22 W at 500 kHz	48 W, 100-500 kHz	65 W, 100-200 kHz 63 W at 300 kHz 60 W at 400 kHz 57 W at 500 kHz	>80 W, 100-200 kHz 65 W at 300 kHz 60 W at 400 kHz 55 W at 500 kHz
Pulse energy	~0.5 mJ	~0.6 mJ	~0.7 mJ	~0.8 mJ
Pulse width	10±2 ns at 50 kHz < 25 ns at 200 kHz		14±2 ns at 100 kHz < 25 ns at 200 kHz	20±5 ns at 100 kHz
Pulse repetition rate[1]	Single shot to 500 kHz (option up to 1 MHz)			
Pulse-to-pulse stability[2]	< 2% rms			
Long term power stability[3]	< ±2% rms			
Beam spatial mode	TEM_{00} M^2 < 1.1		TEM_{00} M^2 < 1.2	
Beam pointing stability	< 25 µrad			
Beam divergence	< 2.5 mrad			
Beam roundness	~90%			
Beam diameter, at exit	~0.7 mm		~1 mm	
Polarization ratio	Vertical; >500:1			
Operational specifications and system characteristics				
Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 15 minutes from standby, < 30 minutes from cold start			
Electrical requirement	100-240 V AC; or 32 V DC, 15 A			
Line frequency	50-60 Hz			
Ambient temperature	Ambient 15°C to 35°C (59°F to 95°F) Operating Range, Relative Humidity 90% Max., non-condensing			
Storage conditions	-10°C to 40°C; Sea Level to 12,000 m; 0% to 90% Relative Humidity, non-condensing			
Power consumption	< 240 W		< 320 W	< 420 W
Dimensions (LxWxH)	16 x 7.5 x 3.75 in			18 x 7.5 x 3.75 in
Weight	29 lbs (13.2 kg)			
Cooling system	Water-cooled			

[1.] Lower pulse repetition rates (down to < 30 kHz) performance achieved by pulse energy capping. [2.] Measured at ambient temperature ± 2°C. [3.] Measured over 8 hours ± 1°C.

DX-532, Average power (W) and pulse width (ns) as a function of pulse repetition rate (kHz)



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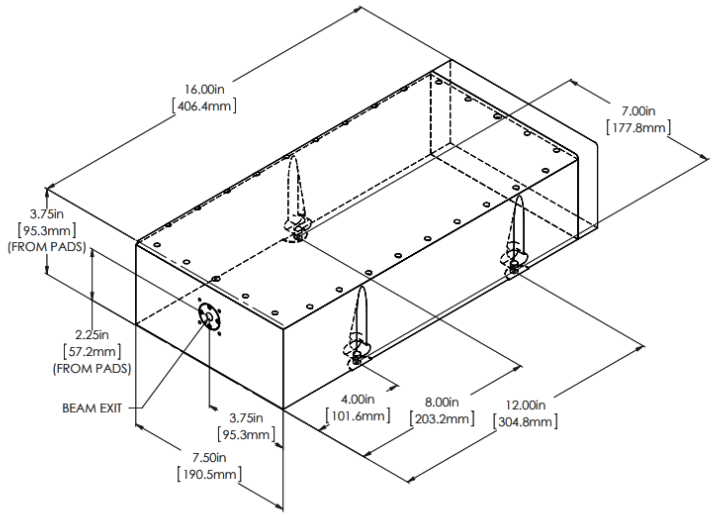
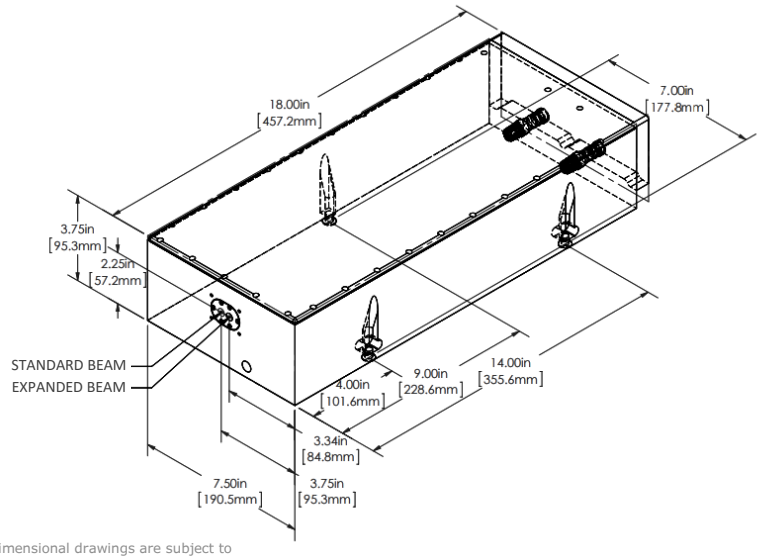
Dimensional Drawings

DX-532-30, DX-532-48, DX-532-65



DX-355-20, DX-355-28, DX-355-40, DX-355-50, DX-532-80



Product specifications, characteristics, and dimensional 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

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.

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Rayture Systems

レイチャーシステムズ株式会社
〒160-0006 東京都新宿区舟町７ ロクサンビル７Ｆ
TEL：03-3351-0717 FAX：03-3351-6771
URL：http://www.rayture-sys.co.jp
E-mail : laser@rayture-sys.co.jp