



RX Series Picosecond Lasers

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Photonics Industries' RX Series picosecond lasers offer high performance, high precision, and robust form factor for the most demanding industrial as well as scientific applications. Photonics Industries is proven, with over a thousand picosecond lasers shipped worldwide, to meet and fulfill precision needs in manufacturing, scientific research, and new, emerging requirements in the ultrafast regime.



Applications

- Cutting/Drilling/Scribing Thin Metal/Metal Foil, Ceramic, Glass, Ultra-Thin Glass (UTG), Plastic, Glass-reinforced Plastic
- Flat Panel Display, LCD/LED/OLED Repair/Microprocessing
- Ink-Jet Nozzle Hole Drilling, Laser Milling Ink-Jet Nozzle Holes, Laser Ablation Ink-Jet Nozzle Holes
- Brittle Material Microprocessing
- Medical Stents, Medical Device Laser Microprocessing
- Low- κ Dielectric Wafers, Silicon Wafers, Sapphire Cutting, Flexible Printed Circuit Boards (FPCB), Printed Circuit Boards (PCB) Microprocessing
- Hydrophobic Material Manufacturing, Hydrophilic Material Manufacturing, Ultrafast Laser Assisted Etching (ULAE) Systems

Features

- High energy at high pulse repetition rate:
Up to ~ 1 mJ single pulse energy at 100 kHz
- Short pulse laser:
 ~ 10 ps for IR, ~ 7 ps for Green & UV
Option up to ~ 30 ps available
- Wide range of wavelengths:
1064 nm, 532 nm, 355 nm
MWB, MWS, & 266 nm options on request
- Smallest, all-in-one (AIO), high power picosecond laser on the market:
Up to 160 W IR, 100 W GRN, or 50 W UV,
- Highest efficiency picosecond laser with the lowest power consumption available commercially.
 $\sim 3x$ lower power consumption from leading competitors.
- High repetition rates:
Options up to 15 MHz or ~ 32 MHz
- Excellent TEM00 beam, and Pointing Stability:
Typical $M^2 < 1.2$; $< 25 \mu\text{rad}$
- Exceptional and Versatile Pulse Control:
PEC (Power or Pulse Energy Control).
PSO (Position Synchronized Output) mode for external triggering to any arbitrary PRF while maintaining a constant, stable pulse energy with low jitter.
Burst Mode for individually controllable pulses in burst envelopes of up to 10 pulses with intra-burst pulse separation of ~ 31 ns. Burst energy up to > 1.1 mJ.
POD (Pulse-On-Demand) pulse bursts can be triggered internally, externally, or continuously, while maintaining constant pulse energy.

Specifications – **RX Series Picosecond Lasers**, IR Models

	RX-1064-10	RX-1064-40	RX-1064-100	RX-1064-160
Beam and output specifications				
Wavelength [Ⓢ]	1064 nm			
Output power	10 W	40W	100 W	160 W
Maximum single pulse energy	> 50 μJ	> 300 μJ	> 600 μJ	> 900 μJ
Long term power stability ¹	≤ 1% rms			
Pulse width [Ⓢ]	~10 ps			
Pulse repetition rate ^{2,Ⓢ}	Single shot to 2 MHz (option up to 15 MHz)			
Pulse-to-pulse stability ³	< 1% rms			
Beam spatial mode	TEM ₀₀ M ² ~1.2			
Beam pointing stability	< 25 μrad			
Beam divergence	< 2 mrad			
Beam roundness	> 90%			
Beam bore sight accuracy	≤ 1 mm lateral (to specified exit location), ≤ 5 mrad angular (to specified exit direction)			
Polarization	Vertical >100:1			

Operational and system characteristics

Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 15 minutes			
Electrical requirement	100-240 V AC, Line Frequency 50-60 Hz			
	15 V DC, 13 A	32 V DC, 15 A	32 V DC, 28 A	60/32 V DC, 20/18 A ⁶
Power consumption ⁴	< 200 W	< 500 W	< 900 W	< 1300 W
Climate	Ambient 15°C to 30°C (59°F to 86°F) Operating Range, RH 90% Maximum, non-condensing			
Dimensions (LxWxH) ⁵	16 x 8.9 x 4.5 in.	21 x 8.5 x 3.75 in.	20 x 8.5 x 4.5 in.	20 x 10 x 4.5 in.
Vibrational tolerance	Up to 3g			
Cooling system [Ⓢ]	Air-cooled	Water-cooled		

Ⓢ See options in below table.

[1.] Measured over 8 hours ± 1°C. [2.] Lower pulse repetition rate operation, down to single shot, achieved by utilizing PSO or POD features. [3.] Measured at ambient temperature ± 2°C. [4.] Power consumption data does not include an external chiller's power consumption. [5.] RX Series picosecond lasers are all-in-one (AIO) and do not require a separate controller or utility module. All connections for operation and control of the laser can be found on the back panel of the AIO laser. [6] 60V/20A and 32V/28A two connections between laser head and PSU. [NB] All specifications at the optimized repetition rate.

Ⓢ Options

Long pulse	Fixed pulse width of ~30 ps	[LP]
High PRR	Up to 15 MHz operational pulse repetition rate	[15M]
Quasi-CW	~32 MHz fixed pulse repetition rate	[QCW]
Multi-wavelength	Multi-wavelength output, blended or selectable	[MWB], [MWS]
Rad-cooling™	Rad-cooling™ system instead of air-cooling fans	[RC]
Format	RX-1064	- xx [xxx]



	RX-532-5	RX-532-25	RX-532-70	RX-532-100
Beam and output specifications				
Wavelength [®]	532 nm			
Output power ¹	5 W	25 W	70 W	100 W
Maximum single pulse energy	> 50 µJ	> 125 µJ	> 350 µJ	> 500 µJ
Long term power stability ²	≤ 1% rms			
Pulse width [®]	~7 ps			
Pulse repetition rate ^{3,®}	Single shot to 2 MHz (option up to 15 MHz)			
Pulse-to-pulse stability ⁴	< 2% rms			
Beam spatial mode	TEM ₀₀ M ² ~1.2			
Beam pointing stability	< 20 µrad			
Beam divergence	< 1.5 mrad			
Beam roundness	> 90%			
Beam bore sight accuracy	≤ 1 mm lateral (to specified exit location), ≤ 5 mrad angular (to specified exit direction)			
Polarization	Horizontal >100:1			

Operational and system characteristics

Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 15 minutes			
Electrical requirement	100-240 V AC, Line Frequency 50-60 Hz			
	15 V DC, 13 A	32 V DC, 15 A	32 V DC, 28 A	60/32 V DC, 20/18 A ⁷
Power consumption ⁵	< 200 W	< 500 W	< 900 W	< 1300 W
Climate	Ambient 15°C to 30°C (59°F to 86°F) Operating Range, RH 90% Maximum, non-condensing			
Dimensions (LxWxH) ⁶	16 x 8.9 x 4.5 in.	21 x 8.5 x 3.75 in.	20 x 8.5 x 4.5 in.	20 x 10 x 4.5 in.
Vibrational tolerance	Up to 3g			
Cooling system [®]	Air-cooled	Water-cooled		

⊕ See options in below table.

[1.] Output power is specifiable at different pulse repetition rates. See typical performance curves below for details. [2.] Measured over 8 hours ± 1°C. [3.] Lower pulse repetition rate operation, down to single shot, achieved by utilizing PSO or POD features. [4.] Measured at ambient temperature ± 2°C. [5.] Power consumption data does not include an external chiller's power consumption. [6.] RX Series picosecond lasers are all-in-one (AIO) and do not require a separate controller or utility module. All connections for operation and control of the laser can be found on the back panel of the AIO laser. [7.] 60V/20A and 32V/28A two connections between laser head and PSU. [NB] All specifications at the optimized repetition rate.

⊕ Options

Long pulse	Fixed pulse width of ~20 ps	[LP]
High PRR	Up to 15 MHz operational pulse repetition rate	[15M]
Quasi-CW	~32 MHz fixed pulse repetition rate	[QCW]
Multi-wavelength	Multi-wavelength output, blended or selectable	[MWB], [MWS]
Rad-cooling™	Rad-cooling™ system instead of air-cooling fans	[RC]
Format	RX-532	- xx [xxx]

Specifications – **RX Series Picosecond Lasers, UV Models**

	RX-355-3	RX-355-10	RX-355-28	RX-355-50
Beam and output specifications				
Wavelength [Ⓢ]	355 nm			
Output power ¹	3 W	10 W	28 W	50 W
Maximum single pulse energy	> 25 μJ	> 50 μJ	> 70 μJ	
Long term power stability ²	≤ 1% rms			
Pulse width [Ⓢ]	~7 ps			
Pulse repetition rate ^{3,Ⓢ}	Single shot to 2 MHz (option up to 15 MHz)			
Pulse-to-pulse stability ⁴	< 2% rms			
Beam spatial mode	TEM ₀₀ M ² < 1.2			
Beam pointing stability	< 25 μrad			
Beam divergence	< 1.5 mrad			
Beam roundness	> 90%			
Beam bore sight accuracy	≤ 1 mm lateral (to specified exit location), ≤ 5 mrad angular (to specified exit direction)			
Polarization	Vertical >100:1		Horizontal >100:1	

Operational and system characteristics

Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 15 minutes			
Electrical requirement	100-240 V AC, Line Frequency 50-60 Hz			
	15 V DC, 13 A	32 V DC, 15 A	32 V DC, 28 A	60/32 V DC, 20/18 A ⁷
Power consumption ⁵	< 200 W	< 500 W	< 900 W	< 1300 W
Climate	Ambient 15°C to 30°C (59°F to 86°F) Operating Range, RH 90% Maximum, non-condensing			
Dimensions (LxWxH) ⁶	16 x 8.9 x 4.5 in.	21 x 8.5 x 3.75 in.	25.5 x 10 x 4.5 in.	25.5 x 10 x 4.5 in.
Vibrational tolerance	Up to 3g			
Cooling system [Ⓢ]	Air-cooled	Water-cooled		

Ⓢ See options in below table.

[1.] Output power is specifiable at different pulse repetition rates. See typical performance curves below for details. [2.] Measured over 8 hours ± 1°C. [3.] Lower pulse repetition rate operation, down to single shot, achieved by utilizing PSO or POD features. [4.] Measured at ambient temperature ± 2°C. [5.] Power consumption data does not include an external chiller's power consumption. [6.] RX Series picosecond lasers are all-in-one (AIO) and do not require a separate controller or utility module. All connections for operation and control of the laser can be found on the back panel of the AIO laser. [7.] 60V/20A and 32V/28A two connections between laser head and PSU. [NB] All specifications at the optimized repetition rate.

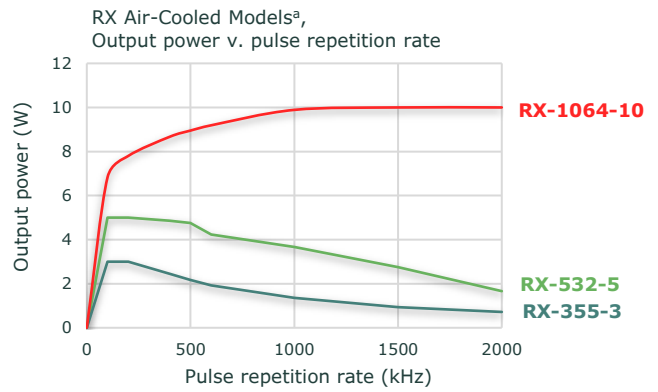
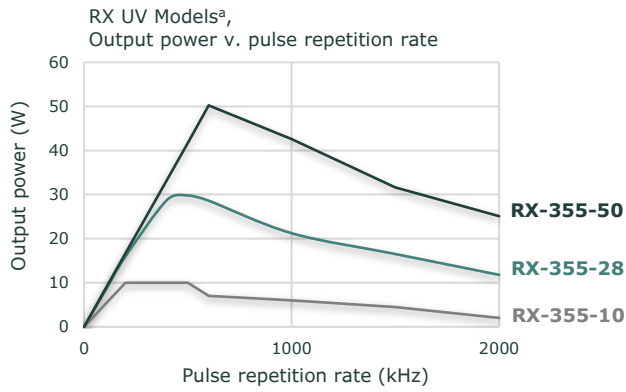
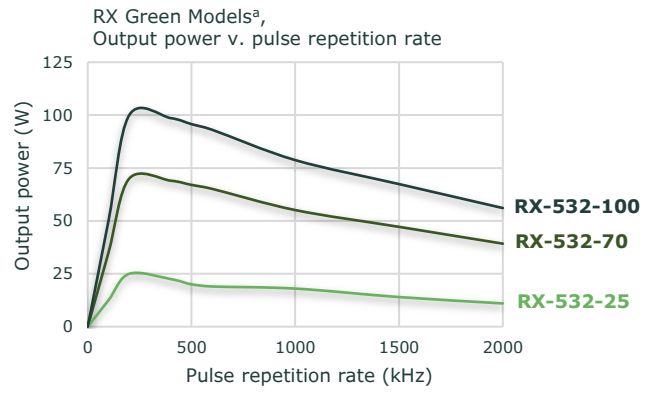
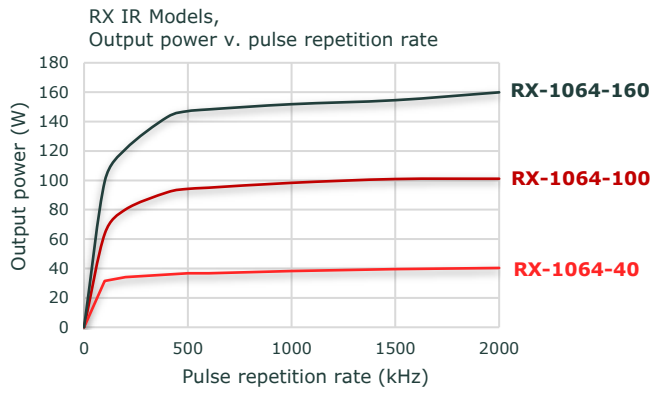
⊕ Options

Long pulse	Fixed pulse width of ~20 ps	[LP]
High PRR	Up to 15 MHz operational pulse repetition rate	[15M]
Quasi-CW	~32 MHz fixed pulse repetition rate	[QCW]
Multi-wavelength	Multi-wavelength output, blended or selectable	[MWB], [MWS]
Beam expansion	Increase beam diameter to ~4 mm	[BEX]
Rad-cooling™	Rad-cooling™ system instead of air-cooling fans	[RC]

Format	RX-355	-	xx	[xxx]
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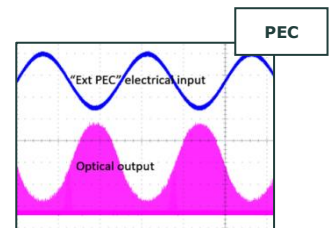
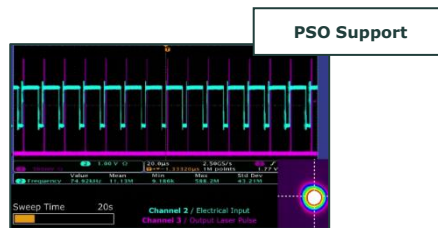
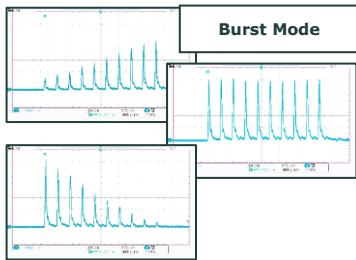


Performance curves (typical)



[a] Harmonic models are specified in the performance curves at high pulse energy optimization. Other optimizations are available.

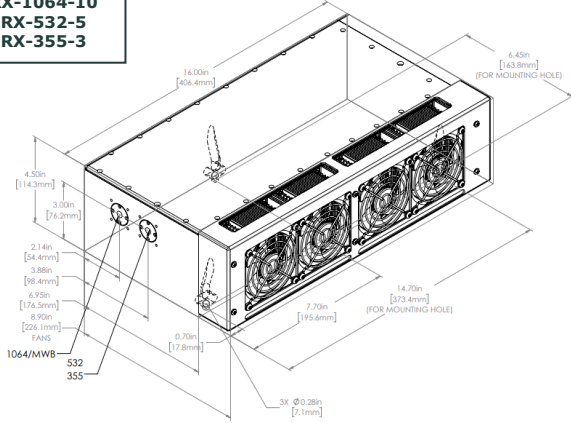
Features



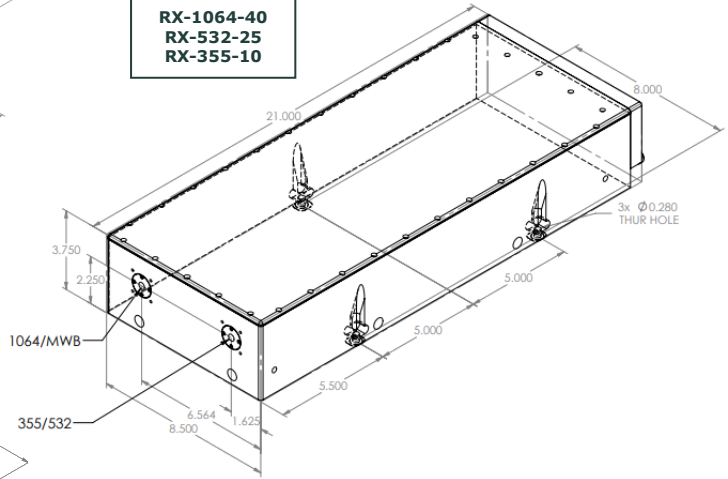
Dimensional Drawings

Photonics Industries RX Series picosecond lasers are all-in-one (AIO) and do not require a separate controller or utility module. All connections for operation and control of the laser can be found on the back panel of the AIO laser.

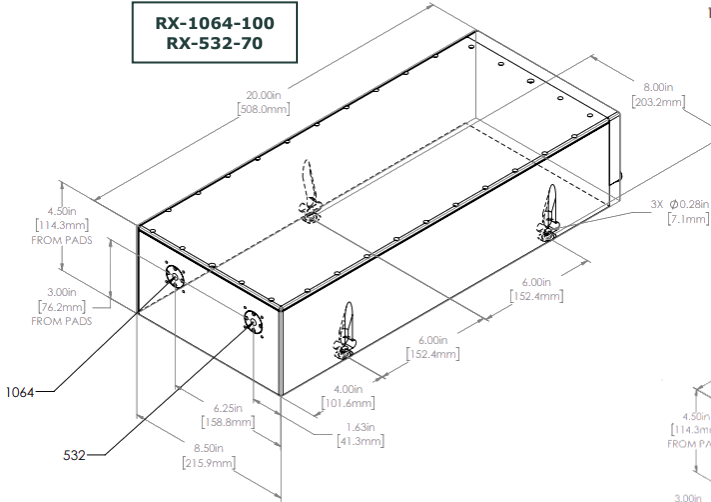
**RX-1064-10
RX-532-5
RX-355-3**



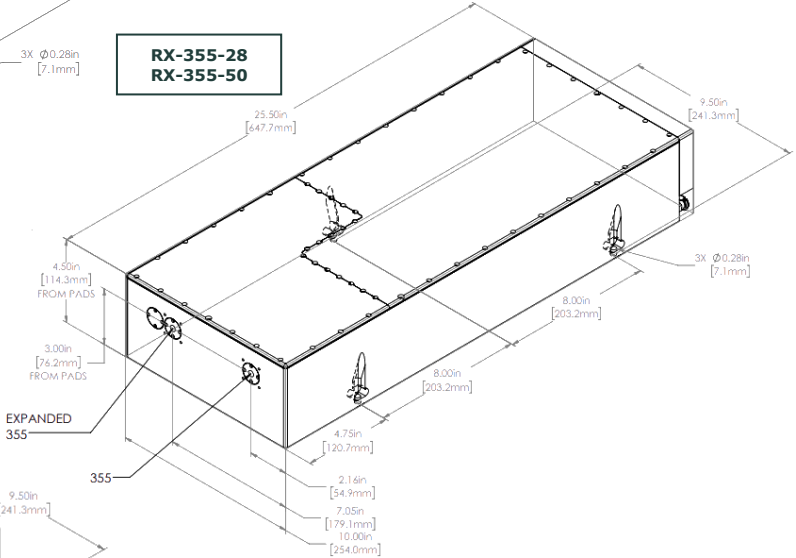
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RX-532-25
RX-355-10**



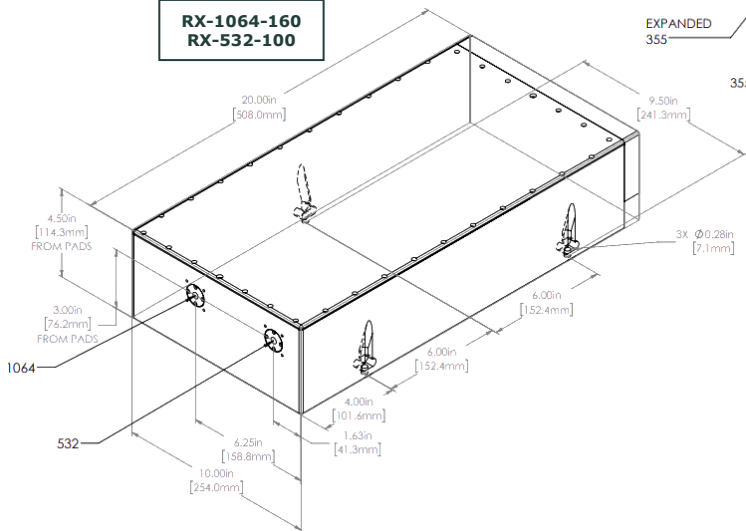
**RX-1064-100
RX-532-70**



**RX-355-28
RX-355-50**



**RX-1064-160
RX-532-100**



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: 9,531,147, 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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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.

光と人をつなぐ

Rayture Systems



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