

RX IR/Green/UV Series High Power Picosecond Lasers www.photonix.com

Overview

With patented pulse selection and over a thousand picosecond lasers shipped worldwide, the RX Series lasers, with its new revolutionary packaging has smaller form factor and higher performance compared to its ancestor, the RGH series. The RX now provides from 10W* to 100W of IR, 5W* to 70W of Green and 3W* to 45W of UV output powers on the simplest, most compact AIO (All-in-One) platform from single shot to 2MHz (optional to 8MHz).

Proprietary technologies enable the RX Series lasers to provide twice as much pulse energy as comparable competitors' systems. Such high pulse energies allow for process efficiency optimization by spatial scaling, since the beam can be split numerous times to simultaneously feed multiple work stations yielding the lowest Cost of Ownership (COO).

The user-friendly control interface allows Total Pulse Control and Burst Mode operation, where a user selectable number of up to 10 ps pulses with adjustable 14 ns incremental separation and programable amplitude can be released in an envelope, further enabling ablation rate increases on many materials. With adjustable repetition rate from single shot to 8MHz, the user can change the operating PRF and change the operating power or pulse energy through PEC (Power or Pulse Energy Control) function on the fly to maximize process flexibility.

Photronics Industries picosecond lasers have proven their robustness for even the most demanding industrial manufacturing environments for applications ranging from metal engraving/marking, LED dicing, thin film removal, small feature structuring, glass, sapphire and ceramics cutting, drilling, etc. to 3D LIDAR.



Features

- ◆ *High Pulse Energy picosecond laser at ~1mJ in IR, over 400µJ in Green, and ~200µJ in UV.*
- ◆ *High power laser (to 100 W in IR) with short pulse (< 10ps for IR, ~7ps for Green and UV)*
- ◆ *Wide range of wavelengths: 1064 nm, 532 nm, 355 nm. 266 nm available upon request.*
- ◆ *The most compact, rugged, All-in-One ps laser*
- ◆ *The highest efficiency ps laser with power consumption < 600 W typical*
- ◆ *Repetition rates from single shot up to 8MHz*
- ◆ *Excellent TEM₀₀ beam with typical M² ≤ 1.2*
- ◆ *Exceptional Beam Pointing Stability < 20 µrad*
- ◆ *PEC (Power or Pulse Energy Control)*
- ◆ *PSO (Position Synchronized Output) support for external triggering to any arbitrary PRF while maintaining a constant, stable pulse energy with low jitter.*
- ◆ *Burst Mode for individually controllable bursts of up to 10 pulses with a separation of 14 ns.*
- ◆ *POD (Pulse-On-Demand), where a burst of pulses with separation equal to the PRF, can be triggered internally, externally, or continuously, while maintaining constant pulse energy.*

Applications

- ◆ *Cutting/scribing display glass and functional foils for FPDs*
- ◆ *Glass and sapphire cutting and drilling*
- ◆ *Semiconductor scribing and dicing*
- ◆ *PCB processing*
- ◆ *Solar cell scribing and drilling*
- ◆ *LED scribing, dicing and patterning*
- ◆ *Metal and Ceramic cutting, drilling and marking*
- ◆ *Medical device cutting, drilling and marking*
- ◆ *Glass Reinforced Plastic & Carbon Fiber Cutting*
- ◆ *Ink-Jet Nozzle Drilling* ◆ *Printing & Embossing Tools*
- ◆ *Nanotexturing*



* For lower power models, please see the RX Low Power Series

System Specifications

Model	RX 1064-60	RX 1064-80	RX 1064-100
Output Characteristics			
Wavelength (nm)	1064		
Average Power (W)	60 W @ 2 MHz	80 W @ 2 MHz	100 W @ 2 MHz
Maximum Pulse Energy (μJ) ^a	400 @ 100 kHz	~600 ^b	~1000 ^b
Pulse Width (ps)	< 10		
Repetition Rate ^c	Single shot to 2 MHz (Option to 8 MHz)		
Pulse to Pulse Stability	~1% rms at 1 MHz		
Long Term Stability ^d	≤ 1% rms		
Beam Characteristics			
Beam Diameter at exit	~2 mm		
Spatial Mode (M^2)	TEM ₀₀ $M^2 < 1.2$		
Beam Pointing Stability	< 20 μrad		
Beam Circularity	≥ 90%		
Beam Divergence	< 2 mrad		
Beam Bore Sight Accuracy	≤ 1 mm Lateral (to specified exit location); ≤ 6 mrad Angular (to specified exit direction)		
Operating Specifications			
Interface	Ethernet / RS 232 / GUI / External TTL Triggering		
Warm-up Time	< 15 min		
Electrical Requirement	100 to 240 V AC; or 32 V DC, 15 A		
Power Consumption	< 600 W (Excluding Chiller)		
Ambient Temperature	15°C to 30°C (59°F to 86°F) Operating Range, RH 90% Max, non-condensing		
Physical Characteristics			
Dimensions	12 in x 3.75 in x 26 in (WxLxH)		
Weight	~74 lbs		
Vibration	Up to 3g		
Cooling System	Closed Loop Chiller		

a) High PRF options will change the minimum PRF and maximum pulse energy.

b) In burst mode.

c) Lower repetition rates, down to single shot, achieved by utilizing PSO or POD.

d) 8 hours \pm 3°C



Model		RX 532-40	RX 532-50	RX 532-70
Output Characteristics				
Wavelength (nm)		532		
Average Power (W)	-L	35 W @ 200 kHz	50 W @ 200 kHz	70 W @ 400 kHz
	-M	40 W @ 200 kHz	50 W @ 400 kHz	70 W @ 600 kHz
	-H	40 W @ 800 kHz	50 W @ 1 MHz	70 W @ 1 MHz
Pulse Width (ps)		~7		
Repetition Rate ^a		Single shot to 2 MHz (Option to 8 MHz)		
Pulse to Pulse Stability		< 2% rms at 1 MHz		
Long Term Stability ^b		≤ 1% rms		
Beam Characteristics				
Beam Diameter at exit		~1.5 mm		
Spatial Mode (M ²)		TEM ₀₀ M ² ≤ 1.2		
Beam Pointing Stability		< 20 μrad		
Beam Circularity		≥ 90%		
Beam Divergence		≤ 1 mrad		
Beam Bore Sight Accuracy		≤ 1 mm Lateral (to specified exit location); ≤ 6 mrad Angular (to specified exit direction)		
Operating Specifications				
Interface		Ethernet / RS 232 / GUI / External TTL Triggering		
Warm-up Time		< 15 min		
Electrical Requirement		100 to 240 V AC; or 32 V DC, 15 A		
Power Consumption		< 600 W (Excluding Chiller)		
Ambient Temperature		15°C to 30°C (59°F to 86°F) Operating Range, RH 90% Max, non-condensing		
Physical Characteristics				
Dimensions		12 in x 3.75 in x 26 in (WxLxH)		
Weight		~74 lbs		
Vibration		Up to 3g		
Cooling System		Closed Loop Chiller		

a) Lower repetition rates, down to single shot, achieved by utilizing PSO or POD.

b) 8 hours ± 3°C

Model		RX 355-20	RX 355-28	RX 355-45
Output Characteristics				
Wavelength (nm)		355		
Average Power (W)	-L	20 W @ 200 kHz	28 W @ 200 kHz	45 W @ 400 kHz
	-M	20 W @ 400 kHz	28 W @ 400 kHz	45 W @ 600 kHz
	-H	20 W @ 1 MHz	28 W @ 1 MHz	45 W @ 1 MHz
Pulse Width (ps) ^a		~7		
Repetition Rate ^b		Single shot to 2 MHz (Option to 8 MHz)		
Pulse to Pulse Stability		< 3% rms at 1 MHz		
Long Term Stability ^c		≤ 1% rms		
Beam Characteristics				
Beam Diameter at exit ^d		~1 mm		
Spatial Mode (M ²)		TEM ₀₀ M ² ≤ 1.2		
Beam Pointing Stability		< 20 μrad		
Beam Circularity		≥ 90%		
Beam Divergence		≤ 1 mrad		
Beam Bore Sight Accuracy		≤ 1 mm Lateral (to specified exit location); ≤ 6 mrad Angular (to specified exit direction)		
Operating Specifications				
Interface		Ethernet / RS 232 / GUI / External TTL Triggering		
Warm-up Time		< 15 min		
Electrical Requirement		100 to 240 V AC; or 32 V DC, 15 A		
Power Consumption		< 600 W (Excluding Chiller)		
Ambient Temperature		15°C to 30°C (59°F to 86°F) Operating Range, RH 90% Max, non-condensing		
Physical Characteristics				
Dimensions		12 in x 3.75 in x 26 in (WxLxH)		
Weight		~74 lbs		
Vibration		Up to 3g		
Cooling System		Closed Loop Chiller		

a) Derived from IR and Green

b) Lower repetition rates, down to single shot, achieved by utilizing PSO or POD.

c) 8 hours ± 3°C

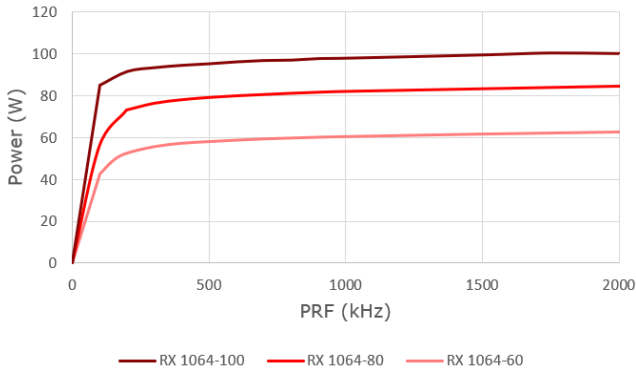
d) Expanded beam diameters (~6 mm) available upon request.



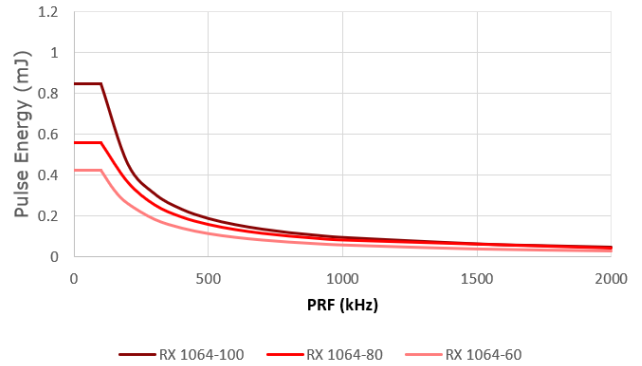
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System Performance & Features

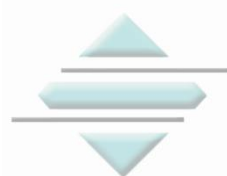
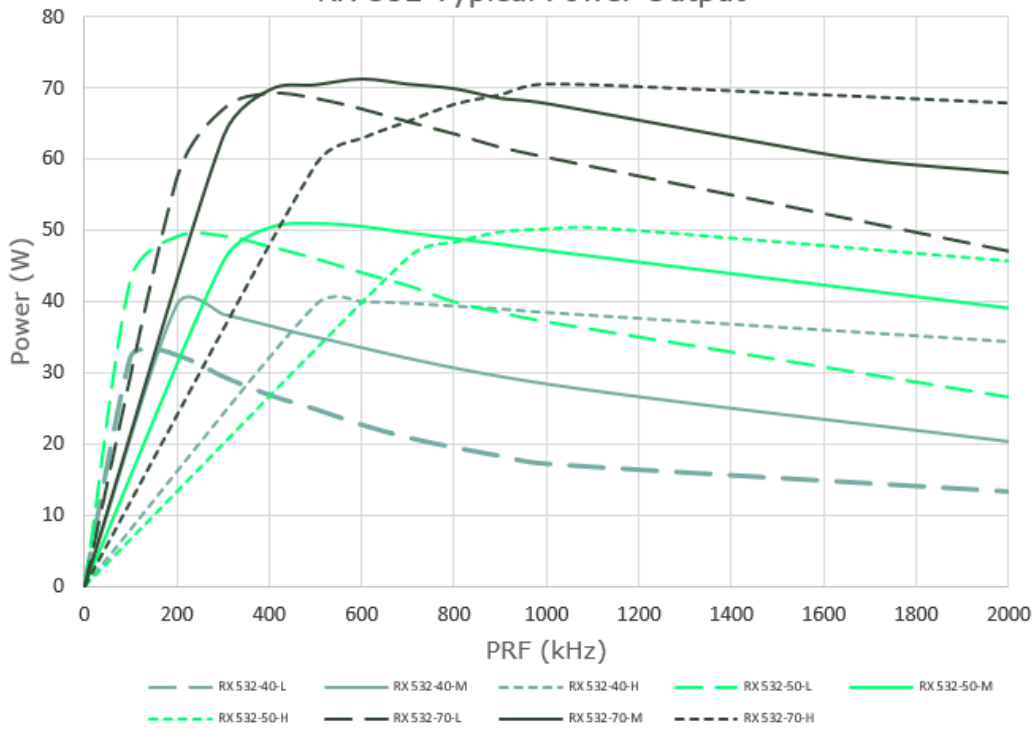
RX 1064 Typical Power Output



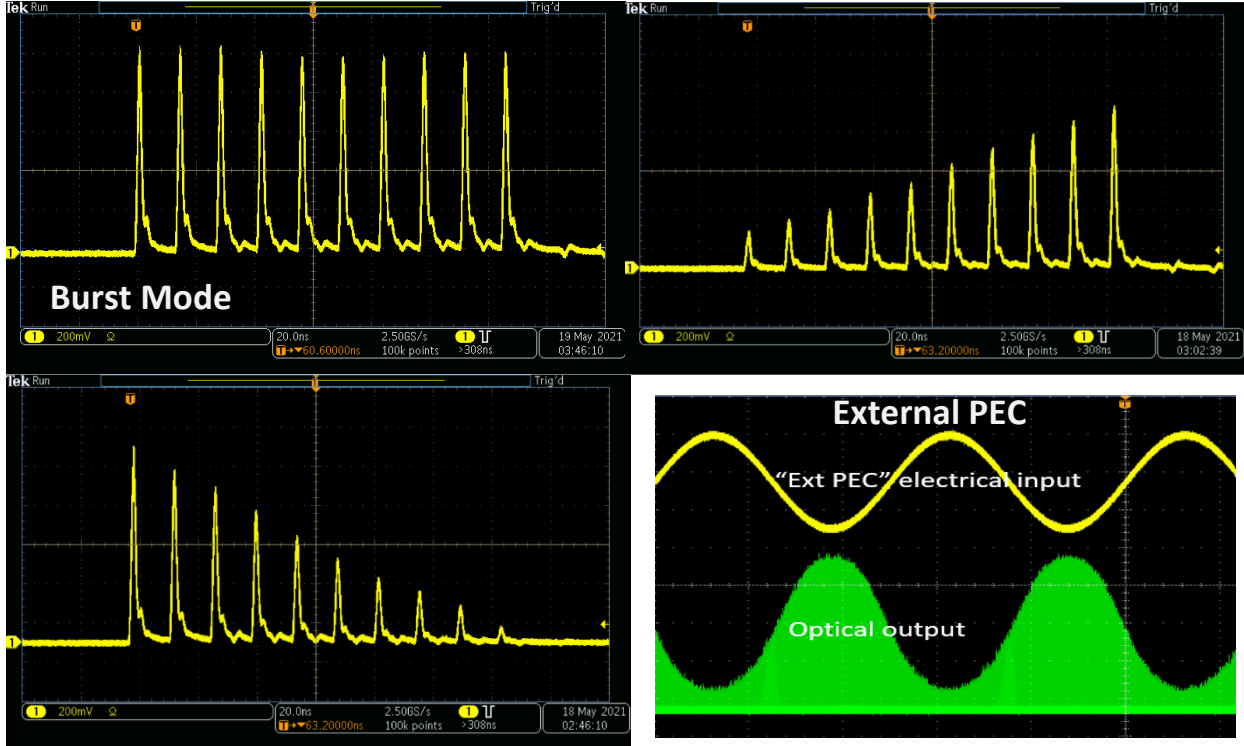
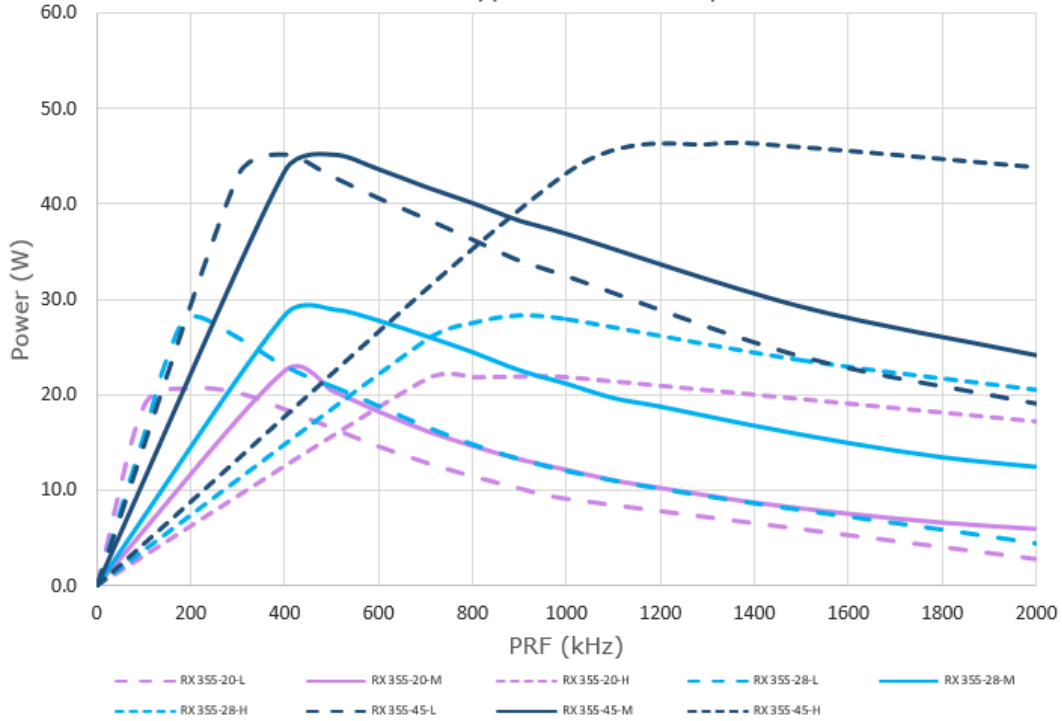
RX 1064 Typical Pulse Energy Output



RX 532 Typical Power Output

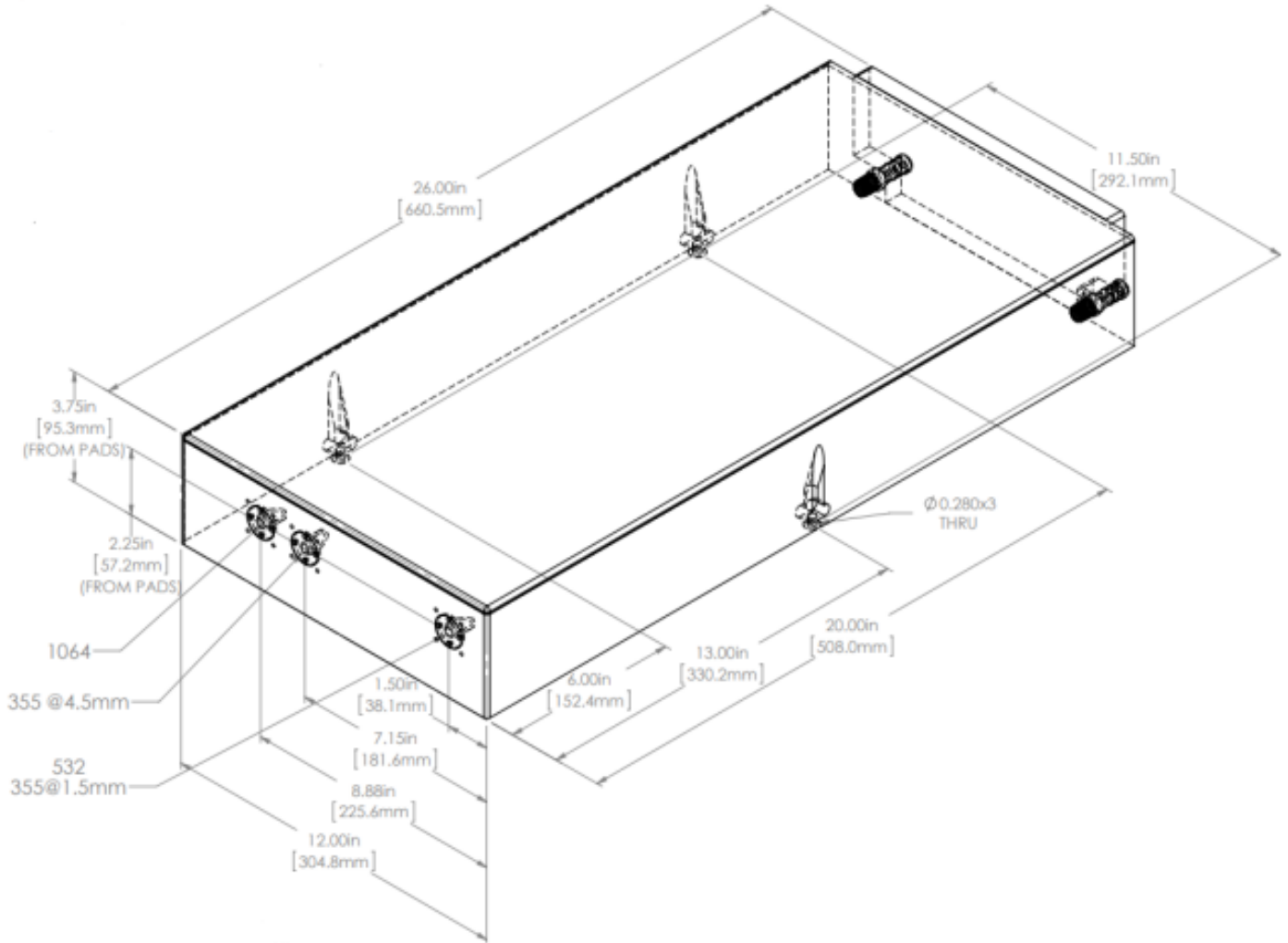


RX 355 Typical Power Output



Dimensional Drawings

RX 1064-60 / -80 / -100, 532-40 / -50 / -70, 355-20 / -28 / -45



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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