



RX IR/Green/UV Series Picosecond Lasers

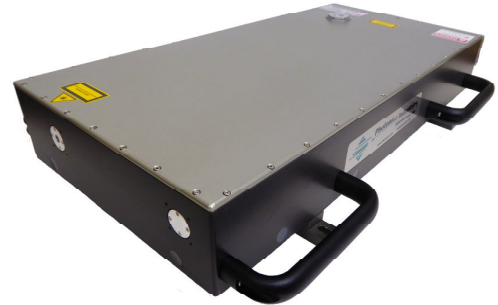
High Power ps Lasers

With patented pulse selection and 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 providing 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 10 ps pulses with 14 ns separation 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.

Photonics 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.



PI Advantages

- ❖ The Highest Pulse Energy ps laser in the market ~1mJ in IR, over 400uJ in Green and ~200uJ in UV
- ❖ High Power (to 100W in IR) short pulse (~10ps) laser
- ❖ The most compact rugged All-in-One ps laser
- ❖ The highest efficiency ps laser with the lowest power consumption < 600 W typical
- ❖ High repetition rates up to 8MHz
- ❖ Excellent TEM₀₀ beam with typical M² ≤ 1.3
- ❖ Exceptional Beam Pointing Stability < 20 μrad
- ❖ PEC (Power or Pulse Energy Control) and Burst Mode capability

Applications

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



Photonics Industries
International, Inc.

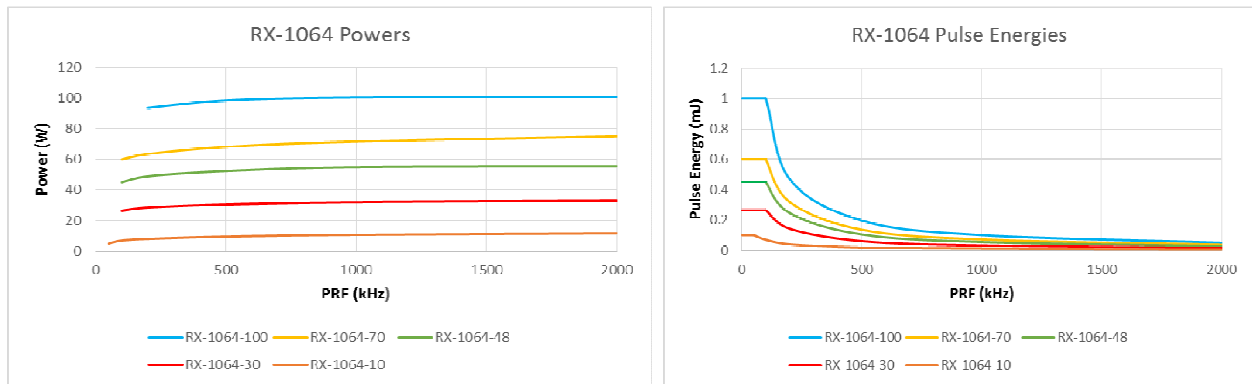
System Specifications @ 1064nm

| Model | RX-1064-10 | RX-1064-30 | RX-1064-48 | RX-1064-70 | RX-1064-100 |
|---------------------------------------|---|-------------------------|----------------------------|-------------|--------------|
| Output Characteristics | | | | | |
| Average Power | 10W @ 1 MHz | 30W @ 1 MHz | 48W @ 1 MHz | 70W @ 1 MHz | 100W @ 1 MHz |
| Max Pulse Energy | 100µJ@50kHz | 250µJ@100kHz | 420µJ@100kHz | up to 600µJ | ~1mJ** |
| Pulse Width | ~10 ps | | | | |
| Repetition Rate† | Single Shot to 2 MHz (Option to 8MHz) | | | | |
| Pulse to Pulse Stability @ 1MHz | ~1% rms | | | ~2% rms | |
| Long Term Power Stability (8h ±3°C) | ≤ 1% rms | | | | |
| Beam Characteristics | | | | | |
| Spatial Mode | TEM ₀₀ M ² ≤1.3 | | | | |
| 4σ Beam Diameter @ exit (nominal) | ~1.5mm | | | ~2mm | |
| Beam Pointing Stability | < 20 µrad | | | | |
| Operating Specifications | | | | | |
| Interface | Ethernet / RS 232 / GUI / External TTL Triggering | | | | |
| Warm Up Time | < 15 min | | | | |
| Electrical Requirement | 100 to 240V AC | | | | |
| Line Frequency | 50 to 60 Hz | | | | |
| Relative Humidity | Non-condensing, 90% Max | | | | |
| Power Consumption (excluding chiller) | < 600 W | | | | |
| Ambient Temperature | 15°C to 30°C (59° to 86°F) Operating Range | | | | |
| Physical Characteristics | | | | | |
| Dimensions (W x H x L) | 10 in x 3.75 in x 24 in | 12 in x 3.75 in x 26 in | 12 in x 3.75 in x 29.12 in | | |
| Weight | ~58lbs | ~74lbs | ~90lbs | | |
| Vibration | Up to 3g | | | | |
| Cooling | Closed Loop Chiller | | | | |

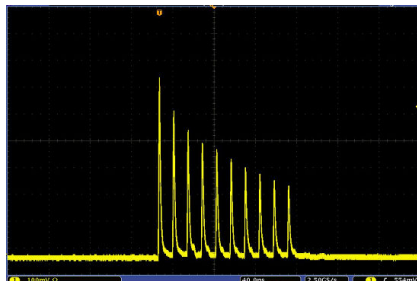
† Lower rep rates (down to single shot) achieved by selecting higher rep rate pulses with the AOM.

** In burst mode

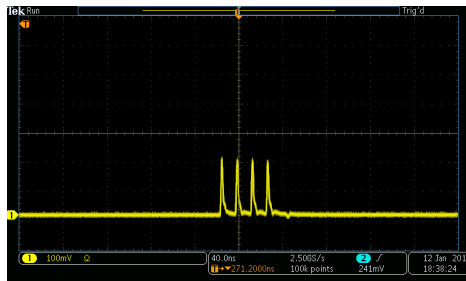
Performance Curves



Burst Mode



Flat Burst Mode



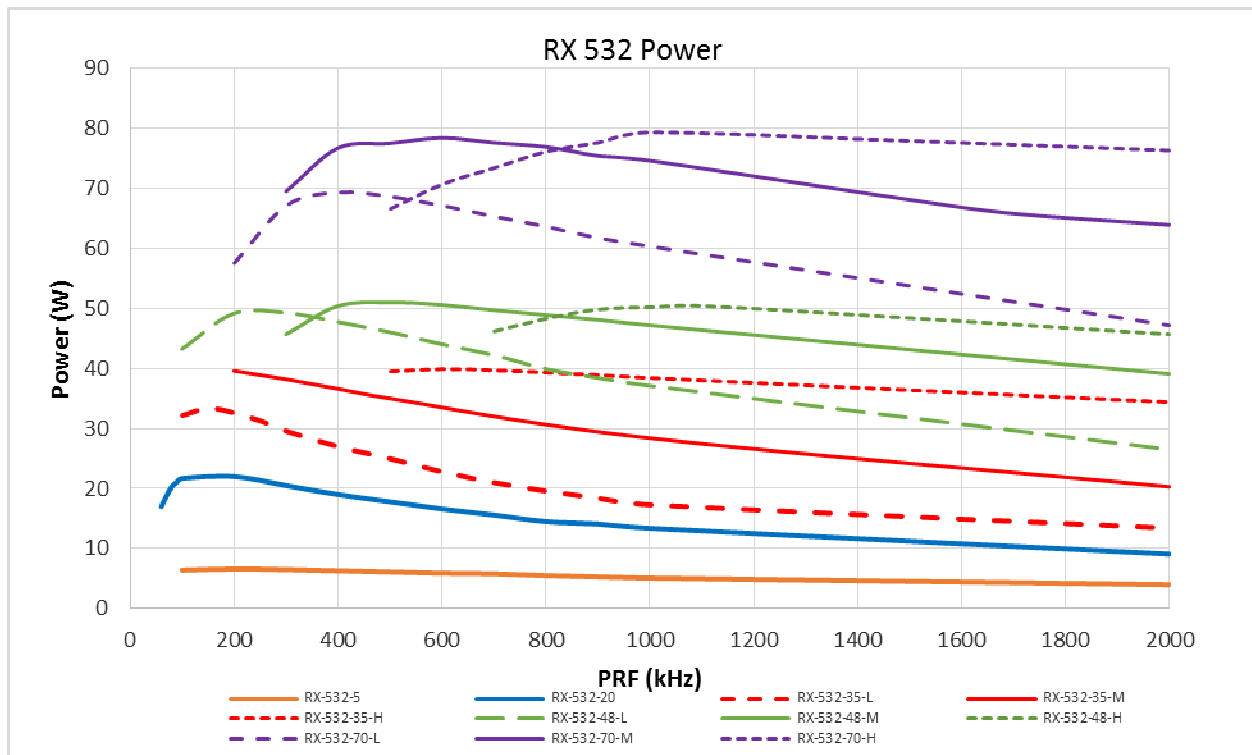
Burst mode pulses are
~14ns apart

System Specifications @ 532nm

| Model | RX-532-5 | RX-532-20 | RX-532-35 | RX-532-48 | RX-532-70 |
|---------------------------------------|---|-------------------------|-------------|----------------------------|-------------|
| Output Characteristics | | | | | |
| Average Power | 5W@100 kHz | 20W@100 kHz | | | |
| -L | | | 30W@200 kHz | 48W@200 kHz | 70W@400 kHz |
| -M | | | 35W@200 kHz | 48W@400 kHz | 70W@600 kHz |
| -H | | | 35W@800 kHz | 48W@1 MHz | 70W@1 MHz |
| Pulse Width | ~7ps | | | | |
| Repetition Rate† | Single Shot to 2 MHz (Option to 8MHz) | | | | |
| Pulse to Pulse Stability @ 1MHz | < 2% rms | | | | |
| Long Term Power Stability (8h ±3°C) | ≤ 1% rms | | | | |
| Beam Characteristics | | | | | |
| Spatial Mode | TEM ₀₀ M ² ≤1.3 | | | | |
| 4σ Beam Diameter @ exit (nominal) | ~1mm | | | ~1.5mm | |
| Beam Pointing Stability | < 20 urad | | | | |
| Operating Specifications | | | | | |
| Interface | Ethernet / RS 232 / GUI / External TTL Triggering | | | | |
| Warm Up Time | < 15 min | | | | |
| Electrical Requirement | 100 to 240V AC | | | | |
| Line Frequency | 50 to 60 Hz | | | | |
| Relative Humidity | Non-condensing, 90% Max | | | | |
| Power Consumption (excluding chiller) | < 600 W | | | | |
| Ambient Temperature | 15°C to 30°C (59° to 86°F) Operating Range | | | | |
| Physical Characteristics | | | | | |
| Dimensions (W x H x L) | 10 in x 3.75 in x 24 in | 12 in x 3.75 in x 26 in | | 12 in x 3.75 in x 29.12 in | |
| Weight | ~58lbs | ~74lbs | | ~90lbs | |
| Vibration | Up to 3g | | | | |
| Cooling | Closed Loop Chiller | | | | |

† Lower rep rates (down to single shot) achieved by selecting higher rep rate pulses with the AOM.

Performance Curves



System Specifications @ 355nm

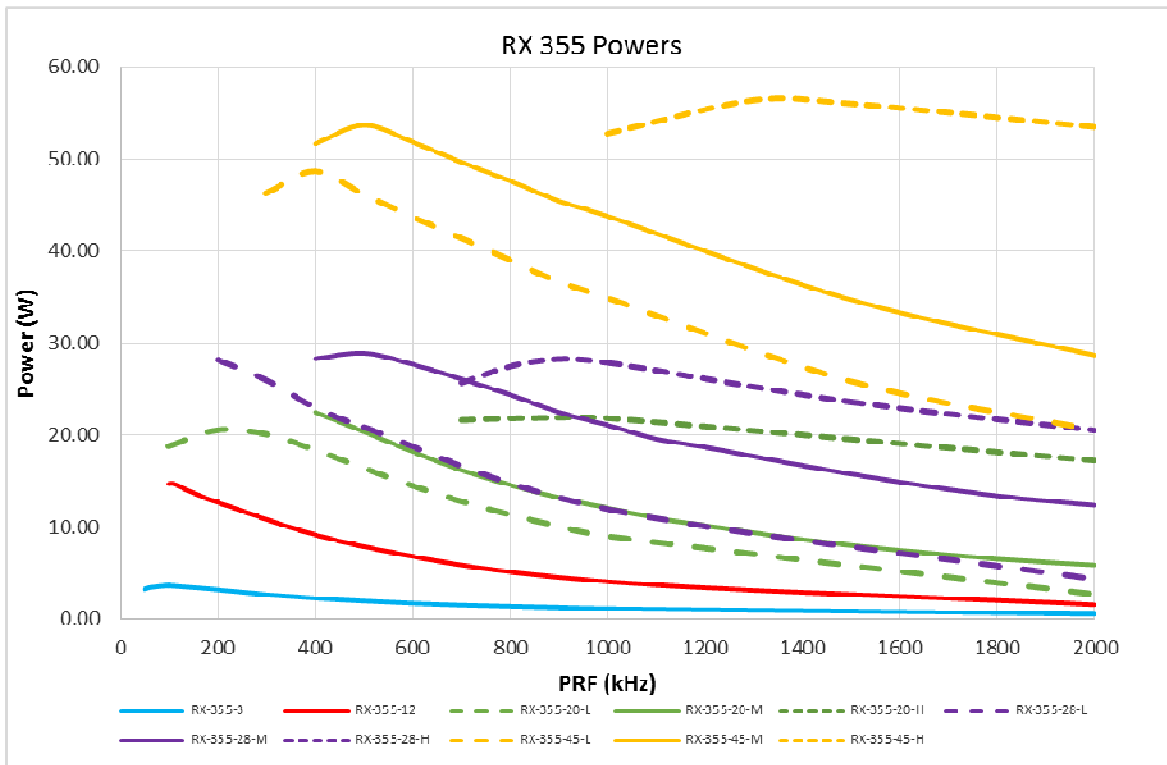
| Model | RX-355-3 | RX-355-12 | RX-355-20 | RX-355-28 | RX-355-45 |
|---------------------------------------|---|-------------------------|-------------|----------------------------|-------------|
| Output Characteristics | | | | | |
| Average Power | 3W@100kHz | 12W@100kHz | | | |
| -L | | | 20W@200 kHz | 28W@200 kHz | 45W@400 kHz |
| -M | | | 20W@400 kHz | 28W@400 kHz | 45W@600 kHz |
| -H | | | 20W@1 MHz | 28W@1 MHz | 45W@1 MHz |
| Pulse Width | ~7ps‡ | | | | |
| Repetition Rate† | Single Shot to 2 MHz (Option to 8MHz) | | | | |
| Pulse to Pulse Stability @ 1MHz | < 3% rms | | | | |
| Long Term Power Stability (8h ±3°C) | ≤ 1% rms | | | | |
| Beam Characteristics | | | | | |
| Spatial Mode | TEM ₀₀ M ² ≤1.3 | | | | |
| 4σ Beam Diameter** @ exit (nominal) | ~1mm | | | | |
| Beam Pointing Stability | < 20 urad | | | | |
| Operating Specifications | | | | | |
| Interface | Ethernet / RS 232 / GUI / External TTL Triggering | | | | |
| Warm Up Time | < 15 min | | | | |
| Electrical Requirement | 100 to 240V AC | | | | |
| Line Frequency | 50 to 60 Hz | | | | |
| Relative Humidity | Non-condensing, 90% Max | | | | |
| Power Consumption (excluding chiller) | < 600 W | | | | |
| Ambient Temperature | 15°C to 30°C (59° to 86°F) Operating Range | | | | |
| Physical Characteristics | | | | | |
| Dimensions (W x H x L) | 10 in x 3.75 in x 24 in | 12 in x 3.75 in x 26 in | | 12 in x 3.75 in x 29.12 in | |
| Weight | ~58lbs | ~74lbs | | ~90lbs | |
| Vibration | Up to 3g | | | | |
| Cooling | Closed Loop Chiller | | | | |

† Lower rep rates (down to single shot) achieved by selecting higher rep rate pulses with the AOM.

‡ derived from IR and green

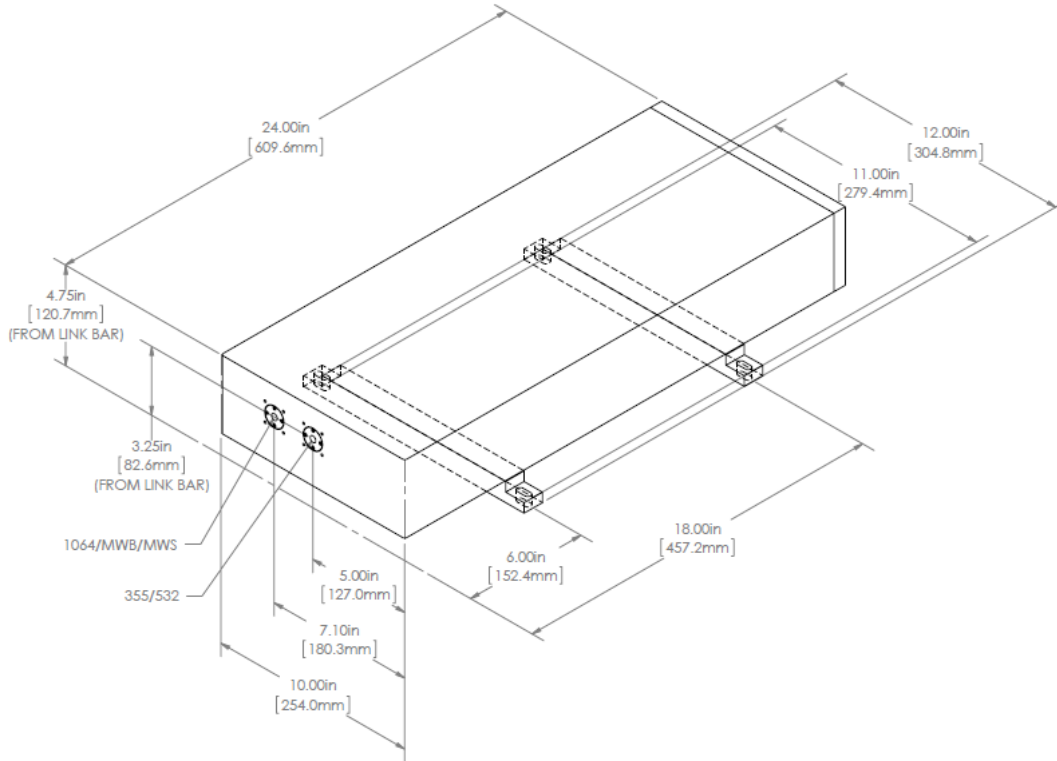
** Larger beam diameters (up to ~5mm) available with expansion option

Performance Curves

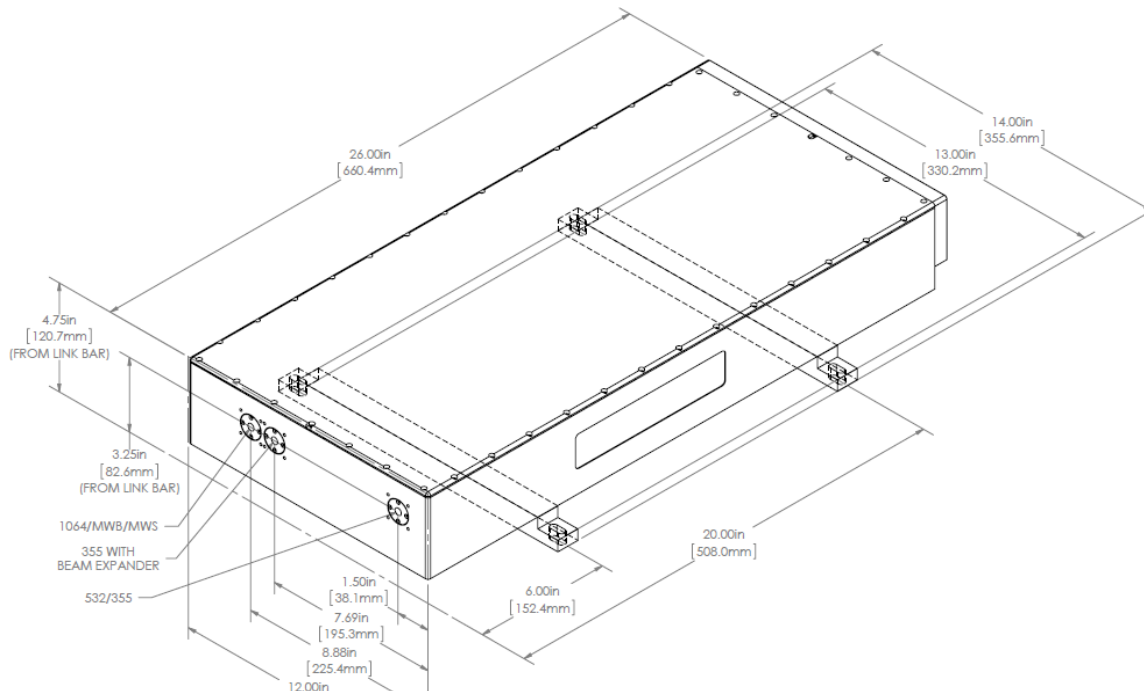


Dimensional Drawings

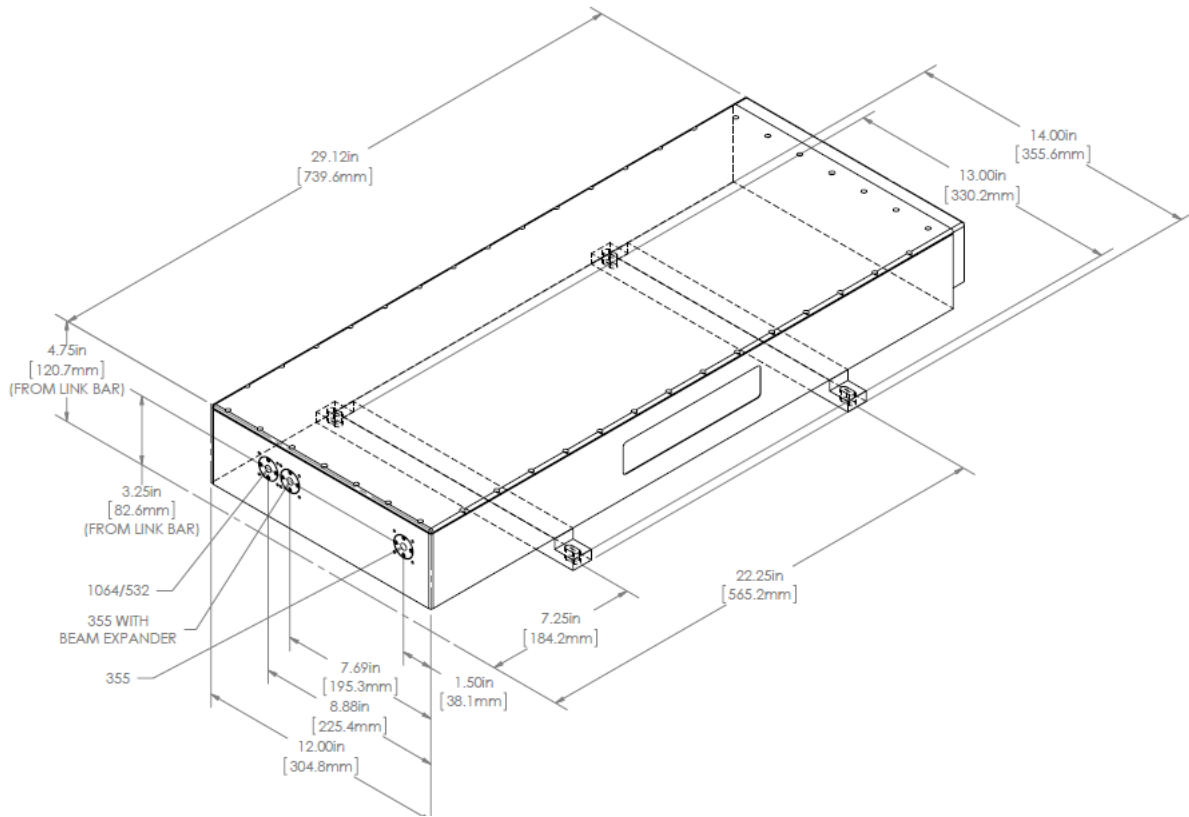
RX-1064-10, 532-5 & 355-3 Laser



RX-1064-30 & -48, 532-20 & -35 and 355-12 & -20 Laser



RX-1064-70 & -100, 532-48 & -70 and 355-28 & -45 Laser



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



Photonics Industries
International, Inc.

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

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