



## SN Series Subnanosecond Lasers

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Photonics Industries' SN Series sub-nanosecond lasers provide uniquely in market need for high pulse energies and specifiable low pulse widths (from 5 ns down to  $\sim 100$  ps), within an all-in-one (AIO), compact form factor. Microprocessing applications as well as scientific applications, like LIDAR, can incorporate the aforementioned benefits with the high achievable repetition rates (up to 8 MHz) for optimal and versatile fulfillment of system requirements.



### Applications

- Cutting, drilling, welding, scribing, marking, intra-marking, patterning
- High Repetition Rate PERC Solar Cell Processing
- LIDAR Systems
- 3D LIDAR Scanning Systems, Airborne Laser Swath Mapping Systems, Laser Altimetry Systems, Coastal Zone Mapping and Imaging Lidar (CZMIL) Systems, Bathymetry LIDAR Systems, Cryosphere Measurements, Laser Triangulation Systems
- Laser Induced Breakdown Spectroscopy (LIBS), Mass Spectroscopy Systems
- Laser-Capture Microdissection (LCM), Laser-Induced Forward Transfer (LIFT), DNA/RNA/Protein Analysis Methods
- Sample Preparation for Microstructure Diagnostics/Failure Analysis

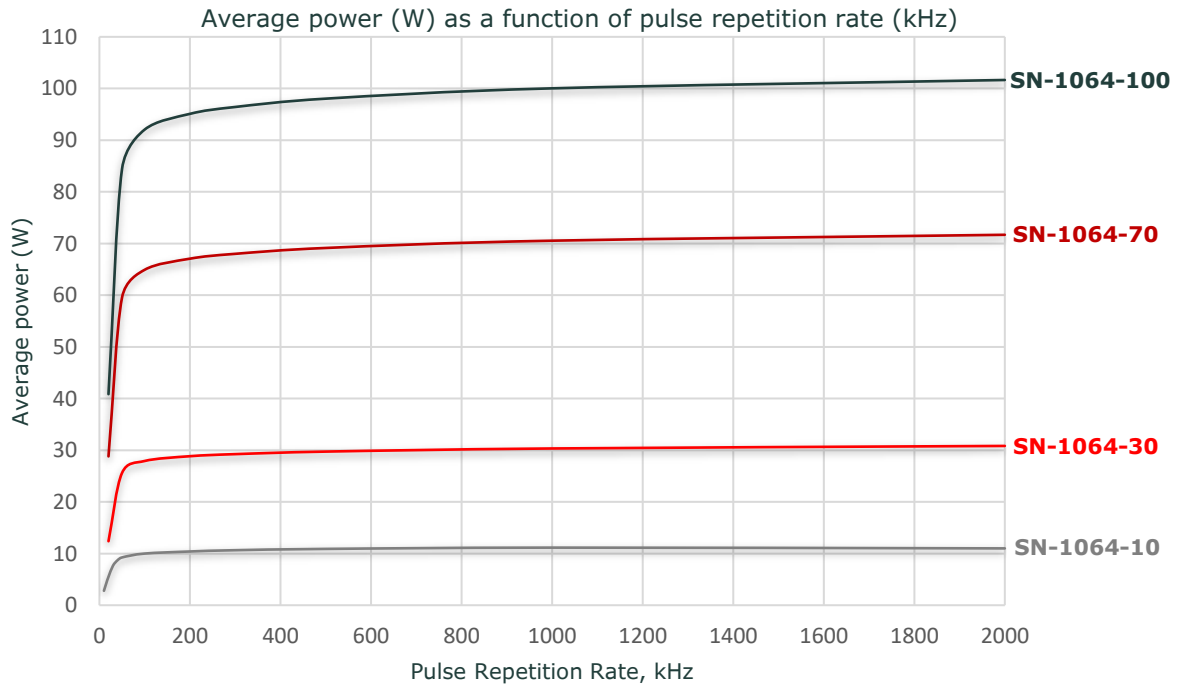
### Features

- Uniquely designed ns/ps DPSS laser  
Unique in the market for sub-ns needs  
Specifiable pulse width from  $\sim 100$  ps to 5 ns
- High power and high pulse energy  
Up to 100 W IR  
Up to 10 W IR air-cooled
- High pulse repetition rates  
Up to 8 MHz
- Very low power consumption for air-cooled models  
 $\sim 120$  W
- Exceptionally low timing jitter  
< 500 ps
- Exceptional and Versatile Pulse Control:  
PEC (Power or Pulse Energy Control)  
Burst Mode for individually controllable bursts of up to 2 pulses with a variable separation of 20-30 ns  
POD (Pulse-On-Demand) pulse bursts can be triggered internally, externally, or continuously, while maintaining constant pulse energy

Specifications – SN Series Subnanosecond Lasers, IR Models

IR Models	SN-1064-10	SN-1064-30	SN-1064-70	SN-1064-100
<b>Beam and output specifications</b>				
Wavelength	1064 nm			
Average power <sup>1</sup>	10 W at 1 MHz	30 W at 1 MHz	70 W at 1 MHz	100 W at 1 MHz
Pulse width <sup>2</sup>	~500 ps to 5 ns			
Pulse repetition rate <sup>3</sup>	Single shot to 2 MHz (option up to 8 MHz)			
Pulse-to-pulse stability <sup>4</sup>	≤ 1% rms	< 2% rms		
Long term power stability <sup>5</sup>	≤ 1% rms			
Beam diameter, at exit	~1.7 mm			
Beam spatial mode	TEM <sub>00</sub> M <sup>2</sup> < 1.3			
Beam roundness	≥ 90%			
Beam divergence	< 3 mrad			
Beam pointing stability	< 20 μrad	< 50 μrad		
Beam bore sight accuracy	≤ 1 mm lateral (to specified exit location), ≤ 5 mrad angular (to specified exit direction)			
<b>Operational specifications and system characteristics</b>				
Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 20 minutes	≤ 30 minutes		
Electrical requirement	100-240 V AC; or 32 V DC, 15 A			
Line frequency	50-60 Hz			
Climate	Ambient 15°C to 30°C (59°F to 86°F) Operating Range, Relative Humidity 90% Maximum, non-condensing			
Power consumption <sup>6</sup>	~120 W	< 600 W		< 800 W
Dimensions (LxWxH) <sup>7</sup>	15 x 8.615 x 3.75 in.	21 x 8.5 x 3.75 in.	25 x 10 x 3.75 in.	
Weight	~31 lbs	~58 lbs	~74 lbs	
Vibration	Up to 3g			
Cooling system	Air-cooled	Closed-loop chiller		

1. Average power data is taken at nominal pulse width.
2. Specifiable pulse width. Pulse width down to ~100 ps available on request.
3. Lower repetition rates, down to single shot, achieved by selecting higher pulse repetition rate pulses with the AOM.
4. Measured at a pulse repetition rate of 1 MHz, and at an ambient temperature of ± 2°C.
5. Measured over 8 hours ± 1°C.
6. Power consumption data does not include the power consumption of a separate chiller unit.
7. SN Series subnanosecond 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.



Specifications – **SN Series Subnanosecond Lasers**, GRN Models

GRN Models	SN-532-5	SN-532-16	SN-532-40	SN-532-60
<b>Beam and output specifications</b>				
Wavelength	532 nm			
Average power <sup>1</sup>	5 W at 50 kHz 5 W at 100 kHz	16 W at 1 MHz	40 W at 1 MHz	60 W at 1 MHz
Maximum pulse energy <sup>1</sup>	~100 µJ	16 µJ	40 µJ	60 µJ
Pulse width <sup>2</sup>	~350 ps to 5 ns			
Pulse repetition rate <sup>3</sup>	Single shot to 2 MHz (option up to 8 MHz)			
Pulse-to-pulse stability <sup>4</sup>	≤ 1% rms	< 2% rms		
Long term power stability <sup>5</sup>	≤ 1% rms	< 2% rms		
Beam diameter, at exit	~1 mm			
Beam spatial mode	TEM <sub>00</sub> M <sup>2</sup> < 1.3			
Beam roundness	≥ 90%			
Beam divergence	< 3 mrad			
Beam pointing stability	< 20 µrad	< 50 µrad		
Beam bore sight accuracy	≤ 1 mm lateral (to specified exit location), ≤ 5 mrad angular (to specified exit direction)			
<b>Operational specifications and system characteristics</b>				
Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 20 minutes	≤ 30 minutes		
Electrical requirement	100-240 V AC; or 32 V DC, 15 A			
Line frequency	50-60 Hz			
Climate	Ambient 15°C to 30°C (59°F to 86°F) Operating Range, Relative Humidity 90% Maximum, non-condensing			
Power consumption <sup>6</sup>	~120 W	< 600 W		< 800 W
Dimensions (LxWxH) <sup>7</sup>	15 x 8.615 x 3.75 in.	21 x 8.5 x 3.75 in.		25 x 10 x 3.75 in.
Weight	~31 lbs	~58 lbs		~74 lbs
Vibration	Up to 3g			
Cooling system	Air-cooled	Closed-loop chiller		

1. Average power data is taken at nominal pulse width.

2. Specifiable pulse width. Pulse width down to ~100 ps available on request.

3. Lower repetition rates, down to single shot, achieved by selecting higher pulse repetition rate pulses with the AOM.

4. Measured at a pulse repetition rate of 1 MHz, and at an ambient temperature of ± 2°C.

5. Measured over 8 hours ± 1°C.

6. Power consumption data does not include the power consumption of a separate chiller unit.

7. SN Series subnanosecond 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.

## Specifications – SN Series Subnanosecond Lasers, UV Models

UV Models	SN-355-3	SN-355-10	SN-355-25	SN-355-40
<b>Beam and output specifications</b>				
Wavelength	355 nm			
Average power <sup>1</sup>	3 W at 100 kHz	10 W at 1 MHz	25 W at 1 MHz	40 W at 1 MHz
Pulse width <sup>2</sup>	~300 ps to 5 ns			
Pulse repetition rate <sup>3</sup>	Single shot to 2 MHz (option up to 8 MHz)			
Pulse-to-pulse stability <sup>4</sup>	< 2% rms			
Long term power stability <sup>5</sup>	< 2% rms			
Beam spatial mode	TEM <sub>00</sub> M <sup>2</sup> < 1.3			
Beam roundness	≥ 90%			
Beam divergence	< 3 mrad			
Beam pointing stability	< 50 μrad			
Beam bore sight accuracy	≤ 1 mm lateral (to specified exit location), ≤ 5 mrad angular (to specified exit direction)			
<b>Operational specifications and system characteristics</b>				
Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 20 minutes	≤ 30 minutes		
Electrical requirement	100-240 V AC; or 32 V DC, 15 A			
Line frequency	50-60 Hz			
Climate	Ambient 15°C to 30°C (59°F to 86°F) Operating Range, Relative Humidity 90% Maximum, non-condensing			
Power consumption <sup>6</sup>	~120 W	< 600 W		< 800 W
Dimensions (LxWxH) <sup>7</sup>	15 x 8.615 x 3.75 in.	21 x 8.5 x 3.75 in.	25 x 10 x 3.75 in.	
Weight	~31 lbs	~58 lbs	~74 lbs	
Vibration	Up to 3g			
Cooling system	Air-cooled	Closed-loop chiller		

1. Average power data is taken at nominal pulse width.

2. Specifiable pulse width. Pulse width down to ~100 ps available on request.

3. Lower repetition rates, down to single shot, achieved by selecting higher pulse repetition rate pulses with the AOM.

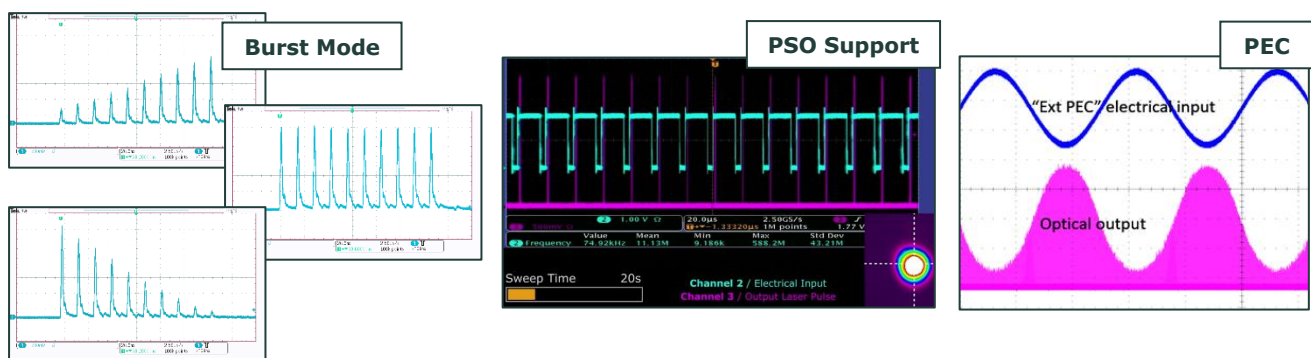
4. Measured at a pulse repetition rate of 1 MHz, and at an ambient temperature of ± 2°C.

5. Measured over 8 hours ± 1°C.

6. Power consumption data does not include the power consumption of a separate chiller unit.

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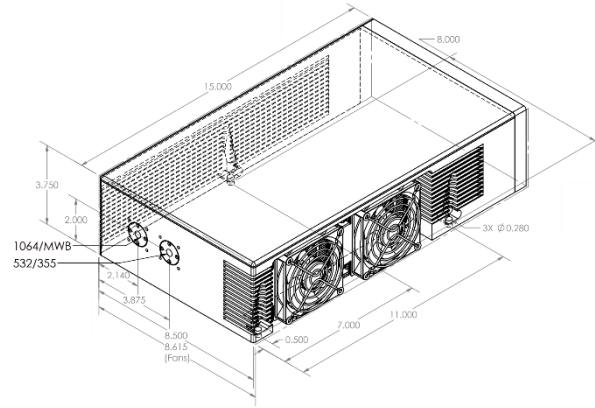
## Features



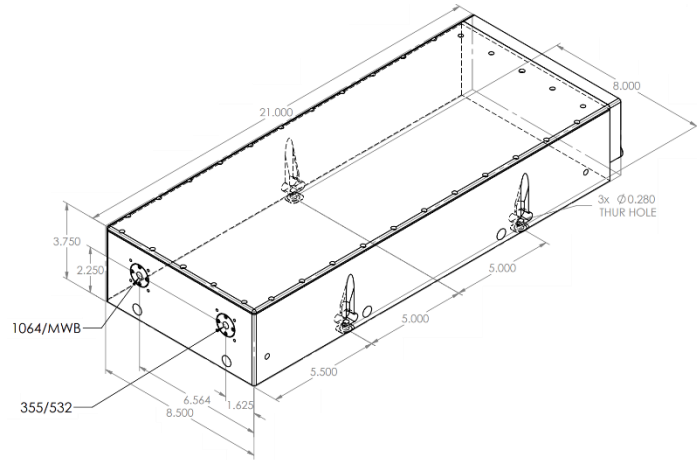
## Dimensional Drawings

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

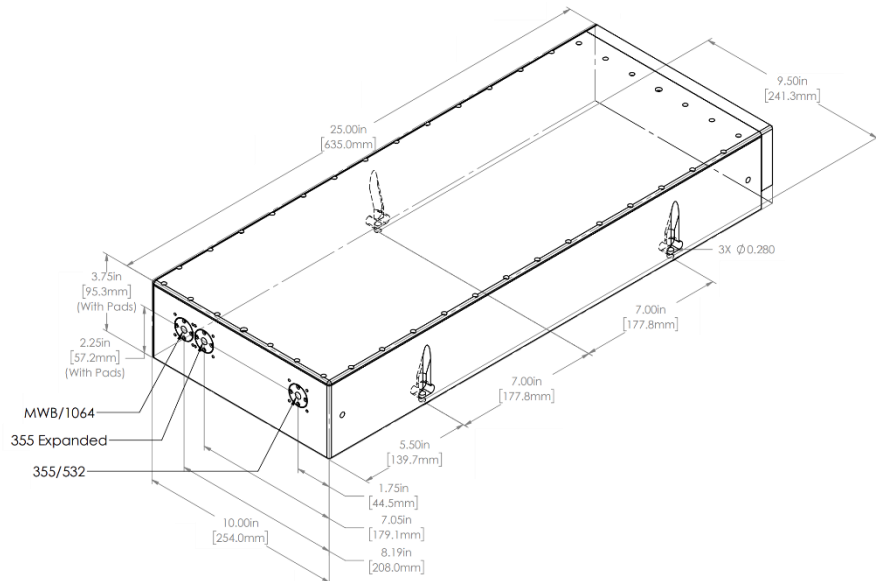
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**SN-1064-30, and SN-1064-70**  
**SN-532-16, and SN-532-40**  
**SN-355-10, and SN-355-25**



**SN-1064-100**  
**SN-532-60**  
**SN-355-40**



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 R.061622

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