Photonics Industries
International, Inc.

SN Series Sub-Nanosecond Lasers

www.photonix.com

Photonics Industries' SN Series sub-nanosecond lasers provide market-leading high pulse energies and specifiable low pulse widths (from 5 ns down to ~300 ps), within an all-in-one (AIO), compact form factor. Microprocessing applications as well as scientific applications, like airborne laser ranging (LIDAR), can incorporate the advantages of the SN Series.

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

- High single pulse energy:
  > 3mJ at 15 kHz with 1064 nm output available
- Unique sub-ns pulse widths:
  Specifiable pulse width within range ~300 ps to 5 ns
- Wide range of wavelengths:
  1064 nm, 532 nm, 355 nm
  MWB, MWS, & 266 nm options on request
- Smallest, all-in-one (AIO), high power sub-nanosecond laser on the market:
  Up to 160 W IR, 100 W GRN, or 50 W UV,
- Highest efficiency sub-nanosecond laser with the lowest power consumption available commercially.
  ~3x lower power consumption from leading competitors.
- Excellent TEM00 beam, and Pointing Stability:
  Typical M^2 < 1.2; < 25 µrad
- Exceptionally low timing jitter
  < 500 ps
- Total 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.
  POD (Pulse-On-Demand) pulse bursts can be triggered internally, externally, or continuously, while maintaining constant pulse energy.

	SN-1064-10	SN-1064-40	SN-1064-100	SN-1064-160
Beam and output specifications				
Wavelength⊕	1064 nm			
Output power[1]	10 W	40W	100 W	160 W
Long term power stability[2]	≤ 1% rms			
Pulse width[3]	500 ps to 5 ns range			
Pulse repetition rate[4]	Single shot to 2 MHz			
Pulse-to-pulse stability[5]	< 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[8]
Power consumption[6]	< 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)[7]	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.] Standard power optimization is at 1 MHz. Output power is specifiable at different pulse repetition rates. Pulse energy varies depending on the repetition rate optimization and specified pulse width. > 3 mJ single pulse energy optimization is available. [2.] Measured over 8 hours ± 1°C. [3.] Specifiable pulse width. Pulse energy varies depending on the specified pulse width. [4.] Lower pulse repetition rate operation, down to single shot, achieved by utilizing PSO or POD features. Higher pulse repetition rates are available [5.] Measured at ambient temperature ± 2°C. [6.] Power consumption data does not include an external chiller's power consumption. [7.] SN Series sub-nanosecond 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. [8.] 60V/20A and 32V/28A two connections between laser head and PSU. [NB] All specifications at the optimized repetition rate and pulse width.

⊕ **Options**		
Multi-wavelength	Multi-wavelength output, blended or selectable	[MWB], [MWS]
Rad-cooling™	Rad-cooling™ system instead of air-cooling fans	[RC]

Format	SN-1064	-	xx		[xxx]

	SN-532-5	SN-532-25	SN-532-70	SN-532-100
Beam and output specifications				
Wavelength⊕	532 nm			
Output power[1]	5 W	25 W	70 W	100 W
Long term power stability[2]	≤ 1% rms			
Pulse width[3]	350 ps to 5 ns range			
Pulse repetition rate[4]	Single shot to 2 MHz			
Pulse-to-pulse stability[5]	< 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[8]
Power consumption[6]	< 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)[7]	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.] Standard power optimization is at 1 MHz. Output power is specifiable at different pulse repetition rates. Pulse energy varies depending on the repetition rate optimization and specified pulse width. [2.] Measured over 8 hours ± 1°C. [3.] Specifiable pulse width. Pulse energy varies depending on the specified pulse width. [4.] Lower pulse repetition rate operation, down to single shot, achieved by utilizing PSO or POD features. [5.] Measured at ambient temperature ± 2°C. [6.] Power consumption data does not include an external chiller's power consumption. [7.] SN Series sub-nanosecond 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. [8.] 60V/20A and 32V/28A two connections between laser head and PSU. [NB] All specifications at the optimized repetition rate and pulse width.

⊕ **Options**		
Multi-wavelength	Multi-wavelength output, blended or selectable	[MWB], [MWS]
Rad-cooling™	Rad-cooling™ system instead of air-cooling fans	[RC]

Format	SN-532	-	xx		[xxx]

	SN-355-3	SN-355-10	SN-355-28	SN-355-50
Beam and output specifications				
Wavelength⊕	355 nm			
Output power[1]	3 W	10 W	28 W	50 W
Long term power stability[2]	≤ 1% rms			
Pulse width[3]	300 ps to 5 ns range			
Pulse repetition rate[4]	Single shot to 2 MHz			
Pulse-to-pulse stability[5]	< 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[8]
Power consumption[6]	< 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)[7]	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.] Standard power optimization is at 1 MHz. Output power is specifiable at different pulse repetition rates. Pulse energy varies depending on the repetition rate optimization and specified pulse width. [2.] Measured over 8 hours ± 1°C. [3.] Specifiable pulse width. Pulse energy varies depending on the specified pulse width. [4.] Lower pulse repetition rate operation, down to single shot, achieved by utilizing PSO or POD features. [5.] Measured at ambient temperature ± 2°C. [6.] Power consumption data does not include an external chiller's power consumption. [7.] SN Series sub-nanosecond 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. [8.] 60V/20A and 32V/28A two connections between laser head and PSU. [NB] All specifications at the optimized repetition rate and pulse width.

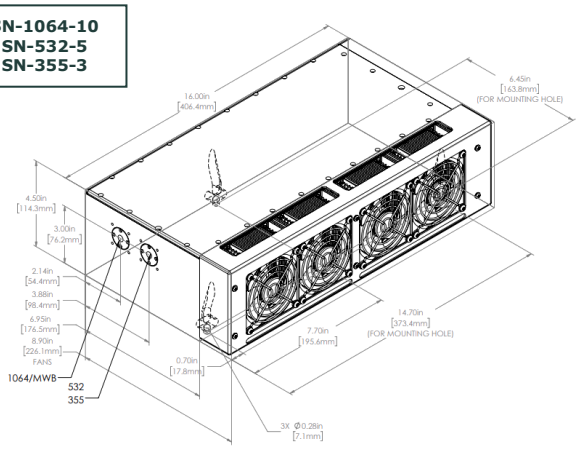
⊕ **Options**		
Multi-wavelength	Multi-wavelength output, blended or selectable	[MWB], [MWS]
Rad-cooling™	Rad-cooling™ system instead of air-cooling fans	[RC]

Format	SN-355	-	xx		[xxx]

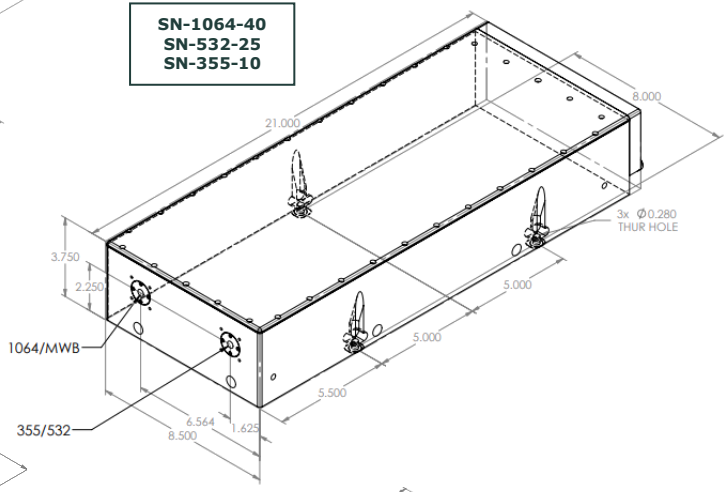
Dimensional Drawings

Photonics Industries SN Series sub-nanosecond 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.

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



SN-1064-40
SN-532-25
SN-355-10



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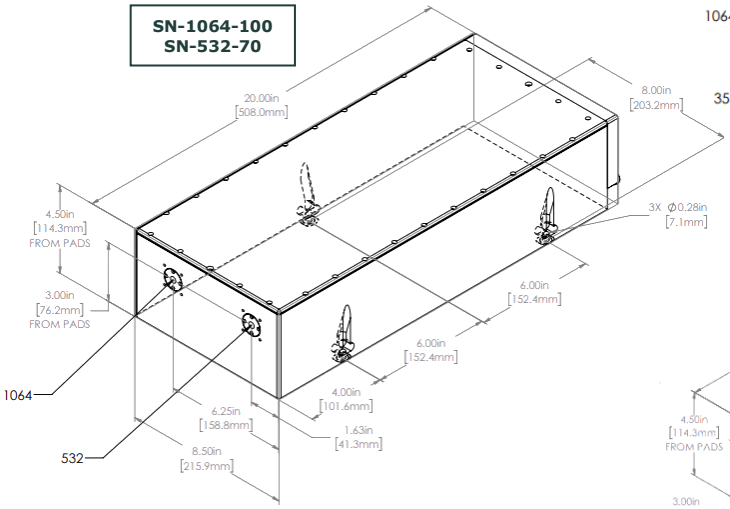
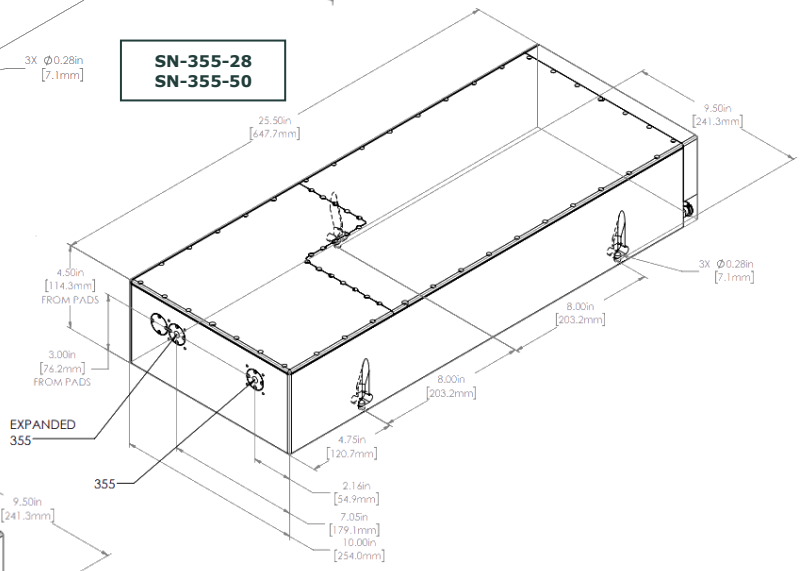
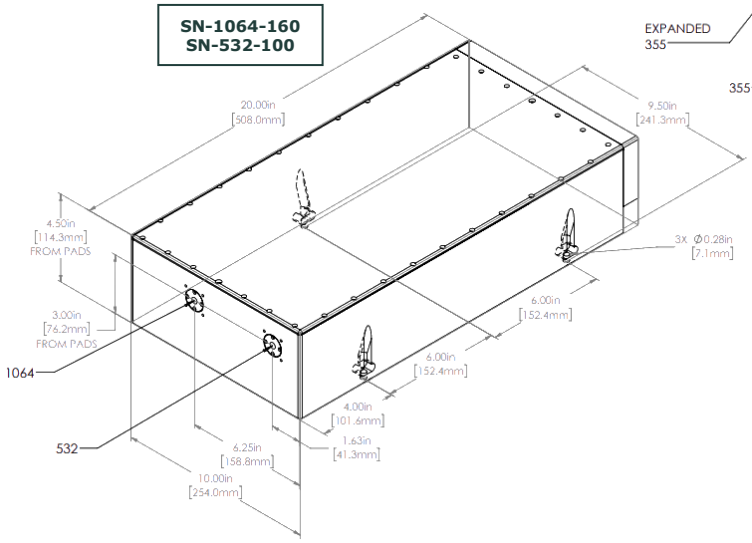
SN-532-70



SN-355-28
SN-355-50



SN-1064-160
SN-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, sub-nanosecond 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

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