



NSDL Series

Nanosecond Pulsed Diode Lasers

Data Sheet



Overview

The NSDL Series Nanosecond Pulsed Diode Lasers provide tunable pulse widths from 10ns to 10ms with external triggering. Available from 375nm to 1550nm, the series offers high-frequency modulation, good beam quality, stable output, and a compact design for easy equipment integration.

Features

- Wavelengths from 375nm to 1550nm
- Pulse width tunable from 10ns to 10ms
- External trigger operation
- User trigger frequency up to 80MHz (model dependent)
- Software-adjustable output power
- High-frequency modulation
- Good beam profile
- Integrated electronics
- Compact design
- Easy system integration

Applications

- Microelectronics
- Material processing
- Solar energy
- Equipment integration
- Optical and scientific instrumentation

375-405 nm Specifications

Parameter	NSDL375		NSDL380		NSDL395	NSDL400	NSDL405	
Wavelength	375±5 nm		380±5 nm		395±5 nm	400±5 nm	405±5 nm	
Operating mode	Pulsed							
Peak power ⁽¹⁾	1-50 mW	50-100 mW	1-50 mW	50-100 mW	1-100 mW	1-200 mW	1-200 mW	200-300 mW
Power stability (rms, 4 hours ±3°C)	<2%, <1%, <0.5%							
Pulse width (FWHM)	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	12 ns-10 ms
Transverse mode	Near TEM ₀₀	Multimode	Near TEM ₀₀	Multimode	Near TEM ₀₀	Near TEM ₀₀	Near TEM ₀₀	
M ² factor					<1.2	<1.2	<1.2	
Beam diameter at the aperture (1/e ²)	~3.0 mm	<1.5x3.5 mm	~3.0 mm	<1.5x3.5 mm	~1.2 mm	~1.2 mm	~1.2 mm	
Beam divergence, full angle	<0.5 mrad	~2.3x0.2 mrad	<0.5 mrad	~2.3x0.2 mrad	<1.0 mrad	<1.0 mrad	<1.0 mrad	
Polarization ratio	>50:1 Horizontal ±5 degree							
Repetition rate ⁽²⁾	DC-25 MHz	DC-10 MHz	DC-25 MHz	DC-10 MHz	DC-10 MHz	DC-80 MHz	DC-80 MHz	DC-45 MHz
Rise time	<4 ns	<4 ns	<4 ns	<4 ns	<4 ns	<3 ns	<3 ns	<7 ns
Fall time	<3 ns							
Modulation depth (extinction ratio)	>1000000:1							
Warm-up time	<5 min							
Cooled method	Conduction cooled							
Operating temperature	10-35°C							
Expected lifetime	>10,000 hours							

Remarks:

1. Any power level can be selected within this range.
2. Both internal and external triggers are acceptable. The internal trigger supports a frequency range of DC-10MHz.
3. Specifications of the Q-switched pulsed laser are based on the laser pulsed at the specified repetition rate. If the laser is run at a different repetition rate, the output characteristics may change.
4. Specifications are subject to change without notice.



410-450 nm Specifications

Parameter	NSDL410		NSDL420	NSDL425	NSDL445	NSDL447	NSDL450
Wavelength	410±5 nm		420±5 nm	425±5 nm	445±5 nm	447±5 nm	450±5 nm
Operating mode	Pulsed						
Peak power ⁽¹⁾	1-200 mW	200-300 mW	1-100 mW	1-100 mW	1-80 mW	1-80 mW	1-80 mW
Power stability (rms, 4 hours ±3°C)	<2%, <1%, <0.5%						
Pulse width (FWHM)	10 ns-10 ms	12 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms
Transverse mode	Near TEM ₀₀						
M ² factor	<1.2						
Beam diameter at the aperture (1/e ²)	~1.2 mm						
Beam divergence, full angle	<1.0 mrad						
Polarization ratio	>50:1 Horizontal ±5 degree						
Repetition rate ⁽²⁾	DC-80 MHz	DC-45 MHz	DC-10 MHz	DC-10 MHz	DC-50 MHz	DC-50 MHz	DC-50 MHz
Rise time	<3 ns	<7 ns	<4 ns	<4 ns	<3 ns	<3 ns	<3 ns
Fall time	<3 ns						
Modulation depth (extinction ratio)	>1000000:1						
Warm-up time	<5 min						
Cooled method	Conduction cooled						
Operating temperature	10-35°C						
Expected lifetime	>10,000 hours						

Remarks:

- Any power level can be selected within this range.
- Both internal and external triggers are acceptable. The internal trigger supports a frequency range of DC-10MHz.
- Specifications of the Q-switched pulsed laser are based on the laser pulsed at the specified repetition rate. If the laser is run at a different repetition rate, the output characteristics may change.
- Specifications are subject to change without notice.



488-635 nm Specifications

Parameter	NSDL488	NSDL505	NSDL510	NSDL520	NSDL633	NSDL635
Wavelength	488±5 nm	505±5 nm	510±5 nm	520±10 nm	633±3 nm	635+7/-5 nm
Operating mode	Pulsed					
Peak power ⁽¹⁾	1-50 mW	50-100 mW	1-20 mW	1-20 mW	1-50 mW	50-100 mW
Power stability (rms, 4 hours ±3°C)	<2%, <1%, <0.5%					
Pulse width (FWHM)	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	15 ns-10 ms	10 ns-10 ms
Transverse mode	Near TEM ₀₀					
M ² factor	<1.2					
Beam diameter at the aperture (1/e ²)	~1.0 mm	~1.2 mm	~1.2 mm	~1.2 mm	~1.2 mm	~1.2 mm
Beam divergence, full angle	<1.0 mrad					
Polarization ratio	>50:1 Horizontal ±5 degree					
Repetition rate ⁽²⁾	DC-25 MHz	DC-10 MHz	DC-10 MHz	DC-50 MHz	DC-40 MHz	DC-20 MHz
Rise time	<4 ns	<4 ns	<4 ns	<3 ns	<10 ns	<4 ns
Fall time	<3 ns	<3 ns	<3 ns	<2 ns	<4 ns	<3 ns
Modulation depth (extinction ratio)	>1000000:1					
Warm-up time	<5 min					
Cooled method	Conduction cooled					
Operating temperature	10-35°C					
Expected lifetime	>10,000 hours					

Remarks:

- Any power level can be selected within this range.
- Both internal and external triggers are acceptable. The internal trigger supports a frequency range of DC-10MHz.
- Specifications of the Q-switched pulsed laser are based on the laser pulsed at the specified repetition rate. If the laser is run at a different repetition rate, the output characteristics may change.
- Specifications are subject to change without notice.



637-660 nm Specifications

Parameter	NSDL637		NSDL640		NSDL642		NSDL655		NSDL660	
Wavelength	637±5 nm		640±5 nm		642±5 nm		655±10 nm		660±5 nm	
Operating mode	Pulsed									
Peak power ⁽¹⁾	1-100 mW	100-200 mW	1-100 mW	100-200 mW	1-100 mW	100-200 mW	1-100 mW	100-180 mW	1-100 mW	100-180 mW
Power stability (rms, 4 hours ±3°C)	<2%, <1%, <0.5%									
Pulse width (FWHM)	10 ns-10 ms		10 ns-10 ms		10 ns-10 ms		10 ns-10 ms	15 ns-10 ms	10 ns-10 ms	15 ns-10 ms
Transverse mode	Near TEM ₀₀									
M ² factor	<1.2									
Beam diameter at the aperture (1/e ²)	~1.2 mm									
Beam divergence, full angle	<1.0 mrad									
Polarization ratio	>50:1 Horizontal ±5 degree									
Repetition rate ⁽²⁾	DC-40 MHz	DC-25 MHz	DC-40 MHz	DC-25 MHz	DC-40 MHz	DC-25 MHz	DC-30 MHz		DC-30 MHz	
Rise time	<4 ns	<10 ns	<4 ns	<10 ns	<4 ns	<10 ns	<4 ns	<10 ns	<4 ns	<10 ns
Fall time	<3 ns									
Modulation depth (extinction ratio)	>1000000:1									
Warm-up time	<5 min									
Cooled method	Conduction cooled									
Operating temperature	10-35°C									
Expected lifetime	>10,000 hours									

Remarks:

1. Any power level can be selected within this range.
2. Both internal and external triggers are acceptable. The internal trigger supports a frequency range of DC-10MHz.
3. Specifications of the Q-switched pulsed laser are based on the laser pulsed at the specified repetition rate. If the laser is run at a different repetition rate, the output characteristics may change.
4. Specifications are subject to change without notice.



665-780 nm Specifications

Parameter	NSDL665		NSDL685	NSDL705	NSDL730	NSDL780
Wavelength	665±10 nm		685±5 nm	705±10 nm	730±10 nm	780±10 nm
Operating mode	Pulsed					
Peak power ⁽¹⁾	1-100 mW	100-180 mW	1-20 mW	1-25 mW	1-30 mW	1-80 mW
Power stability (rms, 4 hours ±3°C)	<2%, <1%, <0.5%					
Pulse width (FWHM)	10 ns-10 ms	15 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms	10 ns-10 ms
Transverse mode	Near TEM ₀₀					
M ² factor	<1.2		<1.2	<1.5	<1.5	<1.5
Beam diameter at the aperture (1/e ²)	~1.2 mm		~1.2 mm	~3.0 mm	~3.0 mm	~4.0 mm
Beam divergence, full angle	<1.0 mrad					
Polarization ratio	>50:1 Horizontal ±5 degree					
Repetition rate ⁽²⁾	DC-30 MHz		DC-20 MHz	DC-10 MHz	DC-10 MHz	DC-30 MHz
Rise time	<4 ns	<10 ns	<4 ns	<4 ns	<4 ns	<4 ns
Fall time	<3 ns					
Modulation depth (extinction ratio)	>1000000:1					
Warm-up time	<5 min					
Cooled method	Conduction cooled					
Operating temperature	10-35°C					
Expected lifetime	>10,000 hours					

Remarks:

- Any power level can be selected within this range.
- Both internal and external triggers are acceptable. The internal trigger supports a frequency range of DC-10MHz.
- Specifications of the Q-switched pulsed laser are based on the laser pulsed at the specified repetition rate. If the laser is run at a different repetition rate, the output characteristics may change.
- Specifications are subject to change without notice.



785-915 nm Specifications

Parameter	NSDL785	NSDL808	NSDL830	NSDL852	NSDL905	NSDL915
Wavelength	785±5 nm	808±10 nm	830±10 nm	852±10 nm	905±10 nm	915±10 nm
Operating mode	Pulsed					
Peak power ⁽¹⁾	1-100 mW	1-100 mW	1-120 mW	1-150 mW	1-150 mW	1-200 mW
Power stability (rms, 4 hours ±3°C)	<2%, <1%, <0.5%					
Pulse width (FWHM)	10 ns-10 ms					
Transverse mode	Near TEM ₀₀					
M ² factor	<1.5					
Beam diameter at the aperture (1/e ²)	~4.0 mm	~3.5 mm	~3.0 mm	~4.0 mm	~3.5 mm	~3.5 mm
Beam divergence, full angle	<1.0 mrad					
Polarization ratio	>50:1 Horizontal ±5 degree					
Repetition rate ⁽²⁾	DC-30 MHz	DC-40 MHz	DC-20 MHz	DC-30 MHz	DC-10 MHz	DC-30 MHz
Rise time	<4 ns	<3 ns	<3 ns	<4 ns	<4 ns	<3 ns
Fall time	<3 ns					
Modulation depth (extinction ratio)	>1000000:1					
Warm-up time	<5 min					
Cooled method	Conduction cooled					
Operating temperature	10-35°C					
Expected lifetime	>10,000 hours					

Remarks:

1. Any power level can be selected within this range.
2. Both internal and external triggers are acceptable. The internal trigger supports a frequency range of DC-10MHz.
3. Specifications of the Q-switched pulsed laser are based on the laser pulsed at the specified repetition rate. If the laser is run at a different repetition rate, the output characteristics may change.
4. Specifications are subject to change without notice.



940-1060 nm Specifications

Parameter	NSDL940		NSDL975		NSDL976		NSDL980		NSDL1060	
Wavelength	940±5 nm		975±10 nm		976±10 nm		980±10 nm		1060±10 nm	
Operating mode	Pulsed									
Peak power ⁽¹⁾	1-100 mW	100-300 mW	1-100 mW	100-200 mW	1-100 mW	100-200 mW	1-100 mW	100-200 mW	1-100 mW	100-280 mW
Power stability (rms, 4 hours ±3°C)	<2%, <1%, <0.5%									
Pulse width (FWHM)	10 ns-10 ms		10 ns-10 ms		10 ns-10 ms		10 ns-10 ms		10 ns-10 ms	15 ns-10 ms
Transverse mode	Near TEM ₀₀									
M ² factor	<1.5									
Beam diameter at the aperture (1/e ²)	~3.5 mm									
Beam divergence, full angle	<1.0 mrad									
Polarization ratio	>50:1 Horizontal ±5 degree									
Repetition rate ⁽²⁾	DC-40 MHz	DC-30 MHz	DC-40 MHz	DC-30 MHz	DC-40 MHz	DC-30 MHz	DC-40 MHz	DC-30 MHz	DC-40 MHz	DC-25 MHz
Rise time	<3 ns	<5 ns	<3 ns	<5 ns	<3 ns	<5 ns	<3 ns	<5 ns	<3 ns	<6 ns
Fall time	<3 ns									
Modulation depth (extinction ratio)	>1000000:1									
Warm-up time	<5 min									
Cooled method	Conduction cooled									
Operating temperature	10-35°C									
Expected lifetime	>10,000 hours									

Remarks:

- Any power level can be selected within this range.
- Both internal and external triggers are acceptable. The internal trigger supports a frequency range of DC-10MHz.
- Specifications of the Q-switched pulsed laser are based on the laser pulsed at the specified repetition rate. If the laser is run at a different repetition rate, the output characteristics may change.
- Specifications are subject to change without notice.



1064-1550 nm Specifications

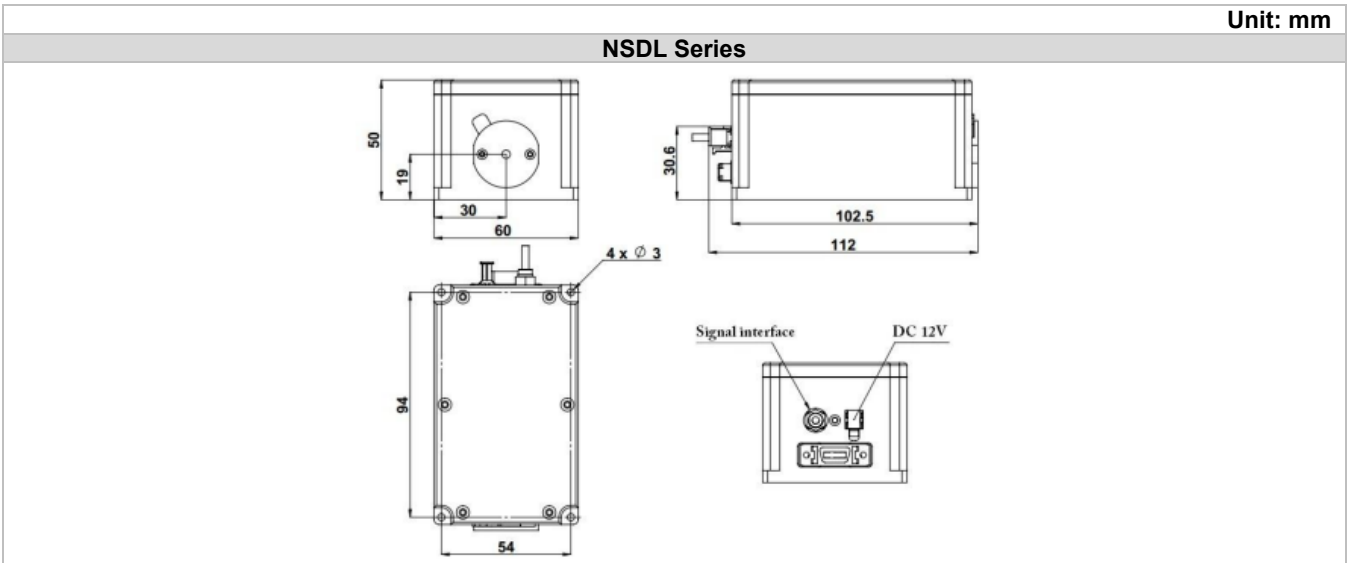
Parameter	NSDL1064		NSDL1310	NSDL1550
Wavelength	1064±10 nm		1310±20 nm	1550±10 nm
Operating mode	Pulsed			
Peak power ⁽¹⁾	1-100 mW	100-280 mW	1-10 mW	1-10 mW
Power stability (rms, 4 hours ±3°C)	<2%, <1%, <0.5%			
Pulse width (FWHM)	10 ns-10 ms	15 ns-10 ms	10 ns-10 ms	10 ns-10 ms
Transverse mode	Near TEM ₀₀			
M ² factor	<1.5			
Beam diameter at the aperture (1/e ²)	~3.5 mm		~1.5 mm	~1.5 mm
Beam divergence, full angle	<1.0 mrad		<2.0 mrad	<3.0 mrad
Polarization ratio	>50:1 Horizontal ±5 degree			
Repetition rate ⁽²⁾	DC-40 MHz	DC-25 MHz	DC-30 MHz	DC-10 MHz
Rise time	<3 ns	<6 ns	<5 ns	<5 ns
Fall time	<3 ns		<3 ns	<5 ns
Modulation depth (extinction ratio)	>1000000:1			
Warm-up time	<5 min			
Cooled method	Conduction cooled			
Operating temperature	10-35°C			
Expected lifetime	>10,000 hours			

Remarks:

1. Any power level can be selected within this range.
2. Both internal and external triggers are acceptable. The internal trigger supports a frequency range of DC-10MHz.
3. Specifications of the Q-switched pulsed laser are based on the laser pulsed at the specified repetition rate. If the laser is run at a different repetition rate, the output characteristics may change.
4. Specifications are subject to change without notice.

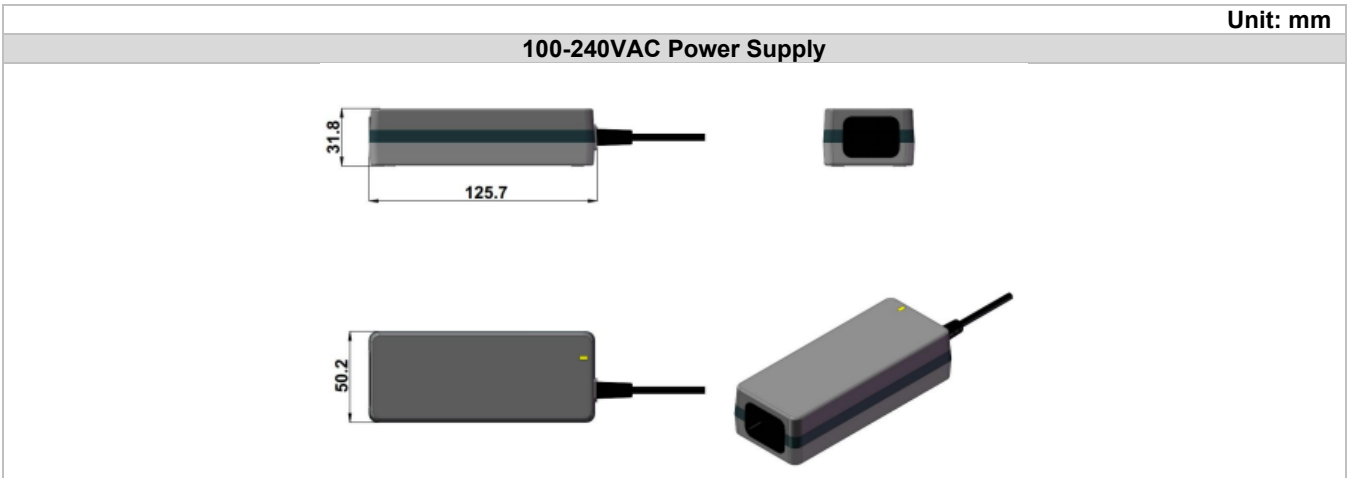


NSDL Series Laser Head Dimensions



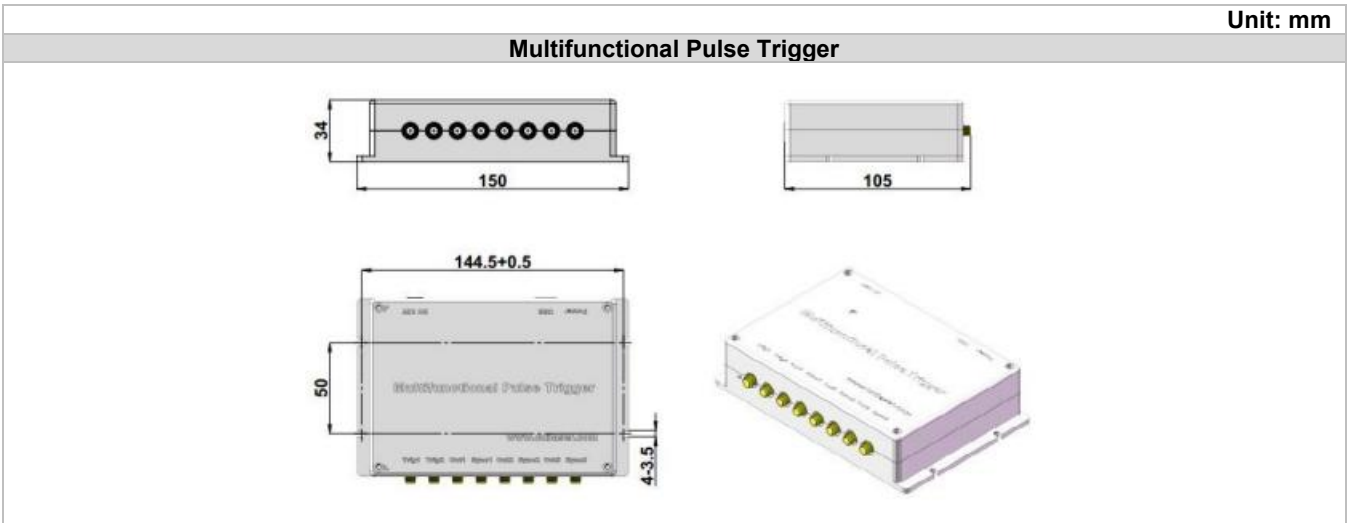
Parameter	NSDL Series
Dimensions	112(L) x60(W) x50(H) mm ³
Weight	0.5 kg
Beam height from base plate	19 mm
Beam exit (from side)	30 mm
Operating voltage	12V/3.34A

NSDL Series Power Supply Dimensions



Parameter	100-240VAC Power Supply
Dimensions	125.7(L) x50.2(W) x31.8(H) mm ³
Weight	0.3 kg
Input voltage	100-240 VAC

NSDL Series Optional Accessory Dimensions



Parameter	Multifunctional Pulse Trigger
Dimensions	150(L) x105(W) x34(H) mm ³
Weight	0.5 kg
Feature	Adjust pulse width

Ordering Information

For more information, please contact Lasermate directly at sales@lasermate.com.

Part Number Configuration NSDL[1]-[2][3][4]				
NSDL = Laser Model Series	[1] = Wavelength	[2] = Peak Power	[3] = Power Stability	[4] = Multifunctional Pulse Trigger
			2= <2% D= <1% S= <0.5%	Blank= Not included T= Included

Note: The above specifications are subject to change without notice.