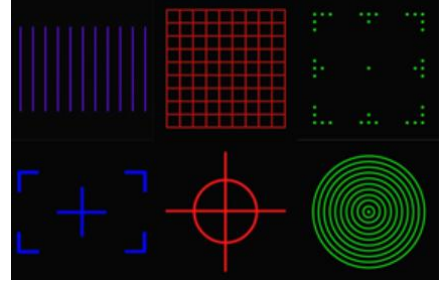


DOE Series Diode Lasers

A Diffractive Optical Element(DOE) utilizes a surface with a complex micro-structure for various optical patterns. CNI offer laser modules with such patterns, the beam's shape can be controlled and changed flexibly according to customer' requirement, the housing can be as same as PGL-L1 and MDL-L series laser.



SYSTEM SPECIFICATIONS*

Wavelength	nm	450	520	635	660	785	808	850	980
Wavelength tolerance	nm	±5	±5	±10	±10	±10	±10	±10	±10
Output power	mW	1-80	1-100	1-150	1-150	1-100	1-100	1-100	1-200
Graphic scheme	please refer to the list								
Laser operation mode	CW								
Expected lifetime	hours	10,000							
Warranty	years	1							

ELECTRICAL SPECIFICATIONS

Operating voltage(internal PCB)	DC 5V
Modulation	TTL (>30KHZ) or Analog (0~3V/0~5V)

ENVIRONMENTAL CONDITIONS

Operating temperature	°C	-10°C to +45°C
Storage temperature	°C	-20°C to +80°C
Humidity	%	< 90 %, non-condensing
Dissipated heat	W	< 1 W

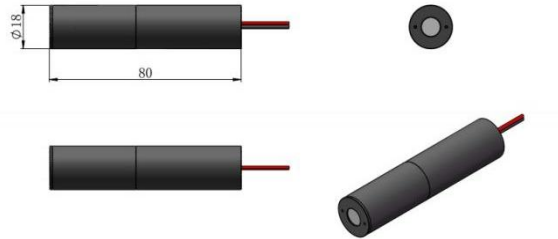
MECHANICAL SPECIFICATIONS

Model		PGL-L1	MDL-L
Diameter head Ø	mm	18 mm	19 mm
Length	mm	80 mm	109 mm
Material	Aluminum		

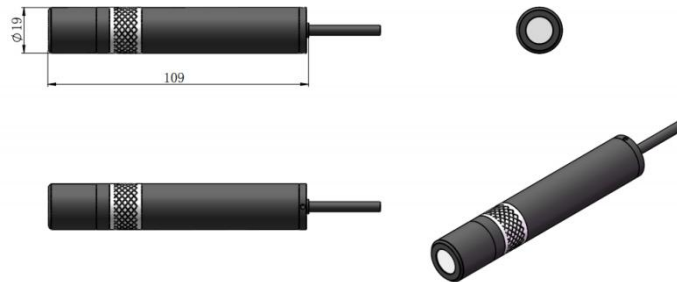
CNI also offers customization for smaller models and other wavelengths and patterns.

*All testing data under the conditions of temperature 25°C.

Dimensions of PGL1(fixed-focus) (mm):

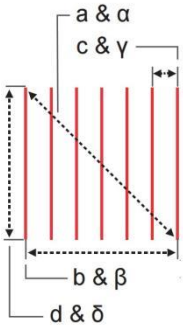


Dimensions of MDL-L(adjustable-focus) (mm):



DOE Graphic Scheme SPECIFICATIONS

Description	Design Wavelength	Pattern Size @ 100 mm Distance, Values: mm				Pattern Angles (@ Design Wavelength)				Optimum Wavelength Range(s)	
		a	b	c	d	α	β	γ	δ		
Multi Lines											
11 Lines (Square)	635nm	76.7	54.4	5.4	54.4	42.0	30.4	3.0	30.4	● 530-670 nm	
7 Lines (Square)	635nm	54.0	38.2	6.4	38.2	30.2	21.6	3.6	21.6	● 530-670 nm	
5 Lines (Rectangular)	660nm	55.0	10.9	2.7	53.9	30.8	6.2	1.6	30.2	● 590-670 nm	
7 Lines (Rectangular)	650nm	15.5	9.0	1.5	12.6	8.9	5.2	0.8	7.2	● 590-730 nm	
5 Lines (Square)	635nm	42.7	30.2	7.5	30.2	24.1	17.2	4.3	17.2	● 530-670 nm	
11 Lines (Sq., Thin Lines)	635nm	76.4	54.0	5.4	54.0	41.8	30.2	3.0	30.2	● 530-670 nm	
25 Lines (Square)	660nm	68.4	48.3	2.0	48.3	37.7	27.2	1.1	27.2	● 530-670 nm	
65 Lines (Square, Central Line Thicker)	660nm	45.6	32.2	0.5	32.2	25.7	18.3	0.3	18.3	● 530-670 nm	
41 Lines (Rectangular)	660nm	133.4	104.0	2.6	78.0	67.4	54.9	1.4	42.6	● 600-700 nm	
10 Lines (Rectangular)	650nm	125.5	90.0	10.0	87.5	64.2	48.5	5.4	47.3	● 600-700 nm	
15 Lines (Rectangular)	520nm	65.5	42.1	3.0	50.2	36.3	23.8	1.7	28.2	● 480-550 nm	
11 Lines (Rectangular)	850nm	155.6	41.5	4.15	150	75.8	23.5	2.3	74	● 830-880 nm	
3 Lines (Rectangular)	520nm	50.7	8.0	4.0	50.0	28.4	4.6	2.3	28.1	● 490-550 nm	
5 Lines (Rectangular)	520nm	50.7	8.0	2.0	50.0	28.4	4.6	1.15	28.1	● 480-560 nm	
81 Lines (Rectangular)	650nm	156.0	124.8	1.6	93.6	75.9	63.9	0.8	50.2	● 600-700 nm	
3 Lines (Rectangular)	660nm	54.7	10.8	5.4	53.6	30.6	6.2	3.1	30.0	● 600-700 nm	



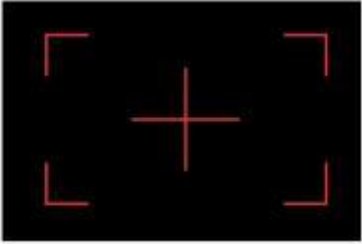
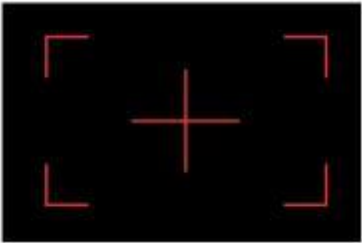
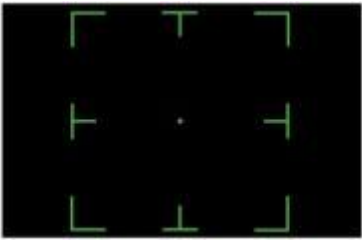
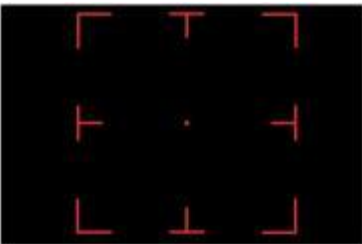

Description	Design Wavelength	Pattern Size @ 100 mm Distance, Values: mm				Pattern Angles (@ Design Wavelength)				Optimum Wavelength Range(s)	
		a	b	c	d	α	β	γ	δ		
Dot Matrix											
	17 × 17 Dots	660nm	38.0	26.6	1.7	26.6	21.5	15.2	0.9	15.2	● 590-730 nm
	2 × 2 + 1 Dots	635nm	28.3	19.9	19.9	19.9	16.1	11.4	11.4	11.4	● 635&405 nm
	101 × 101 Dots	660nm	12.8	9.1	0.1	9.1	7.4	5.2	0.05	5.2	● 635-680 nm
	21 × 21 Dots	635nm	11.9	8.4	0.4	8.4	6.8	4.8	0.2	4.8	● 560-730 nm
	16 × 16 Dots	635nm	12.4	8.8	0.6	8.8	7.1	5.0	0.3	5.0	● 530-730 nm
	17 × 17 Dots	635nm	12.4	8.8	0.5	8.8	7.1	5.0	0.3	5.0	● 550-720 nm
	13 × 13 Dots	635nm	7.4	5.3	0.4	5.3	4.3	3.0	0.3	3.0	● 590-670 nm
	51 × 51 Dots	660nm	56.9	40.3	0.8	40.3	31.8	22.8	0.5	22.8	● 560-720 nm
	11 × 11 Dots	635nm	71.2	50.3	5.0	50.3	39.2	28.2	2.8	28.2	● 590-690 nm
	6 × 6 Dots	635nm	11.7	8.3	1.7	8.3	6.7	4.7	0.9	4.7	● 590-690 nm
	10 × 10 Dots	532nm	21.1	14.9	3.3	14.9	23.8	17.0	1.9	17.0	● 510-600 nm
	4 × 6 Dots	532nm	26.6	13.7	4.6	22.8	15.1	7.8	2.6	13.6	● 500-580 nm
	5 × 5 Dots	690nm	1.1	0.75	0.19	0.75	0.61	0.43	0.11	0.43	● 630-750 nm
	51 × 51 Dots	532nm	46.8	33.1	0.66	33.1	26.4	18.8	0.38	18.8	● 480-600 nm
	21 × 21 Dots	520nm	46.8	33.1	1.66	33.1	26.4	18.8	0.95	18.8	● 480-600 nm

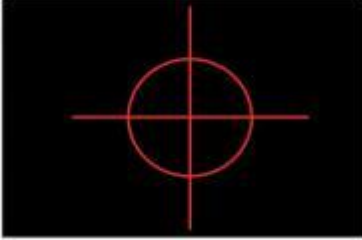
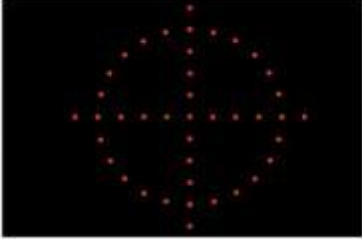
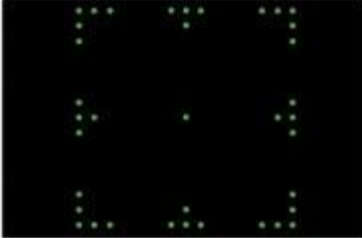



Description	Design Wavelength	Pattern Size @ 100 mm Distance, Values: mm			Pattern Angles (@ Design Wavelength)			Optimum Wavelength Range(s)	
		a	b	c	α	β	δ		
Crosshair									
	Cross - 5@650	650nm	8.7			5.0			● 580-660 nm
	Cross - 25@532	532nm	45.1			25.4			● 500-640 nm
	Cross - 2@645	645nm	3.4			2.0			● 600-645 nm
	Cross - 15@640	640nm	26.3			15.0			● 500-640 nm
	Cross - 5@520	520nm	8.7			5.0			● 488-600 nm
	Cross - 10@633	633nm	17.5			10.0			● 570-690 nm
	Cross with high contrast area	633nm	17.5			10.0			● 530-670 nm
	Cross - 25@645	645nm	44.3			25.0			● 600-800 nm
	Cross - 37@645	645nm	66.8			37.0			● 630-700 nm
	Cross - 45@633	633nm	83.0			45.0			● 620-700 nm
	Cross - 30@640	640nm	53.6			30.0			● 590-660 nm
	Cross - 60@635	635nm	115.5			60.0			● 580-690 nm
	Cross - 15@520	520nm	26.4			15.0			● 480-550 nm
	Cross - 75@650	650nm	153.5			75.0			● 600-700 nm
	Cross - 60@450	450nm	116.1			60.3			● 420-520 nm
	Cross - 52@515	515nm	97.6			52.0			● 440-540 nm
Cross - 30@450	450nm	53.6			30.0			● 440-480 nm	


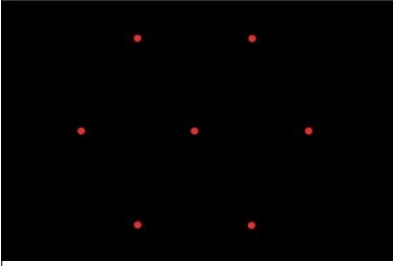
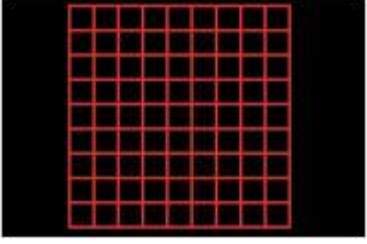
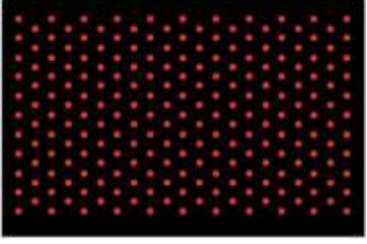
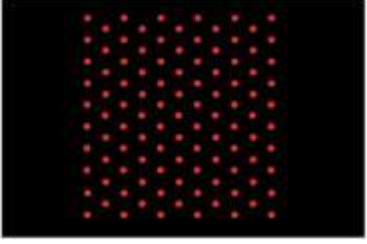


Description	Design Wavelength	Pattern Size @ 100 mm Distance, Values: mm			Pattern Angles (@ Design Wavelength)			Optimum Wavelength Range(s)	
		a	b	c	α	β	δ		
Dot Lines & Quasi-Contious Lines									
	1 : 5 Dot Line	635nm	10.5	2.6		6.0	1.5		● 450-700 nm
	1 : 9 Dot Line	670nm	1.6	0.2		0.9	0.1		● 630-780 nm
	1 : 19 Dot Line	650nm	24.0	1.3		13.7	0.8		● 500-540 & 630-690 nm
	QC - Line - 5@633	633nm	8.7	--		5.0	--		● 630-690 nm
	QC - Line - 30@532	532nm	53.8	--		30.1	--		● 470-560 nm
	1 : 11 Dot Line	650nm	28.9	2.9		16.5	1.6		● 600-730 nm
	1 : 99 Dot Line	660nm	33.7	0.3		19.1	0.2		● 600-700 nm
	QC - Line - 20@633	633nm	35.2	--		20.0	--		● 630-670 nm
	QC - Line - 30@660	660nm	54.6	--		30.5	--		● 600-700 nm
	QC - Line - 45@660	660nm	83.9	--		45.5	--		● 600-700 nm
	1 : 99 Dot Line	635nm	49.3	0.5		27.7	0.3		● 600-700 nm
	QC - Line - 45@940	940nm	83.0	--		45.0	--		● 890-980 nm
	QC - Line - 36@640	639nm	65.0	--		36.0	--		● 600-700 nm
	QC - Line - 51@840	840nm	95.0	--		50.6	--		● 790-880 nm

Description	Design	Pattern Size @ 100 mm Distance, Values: mm			Pattern Angles (@ Design Wavelength)			Optimum Wavelength Range(s)	
		Wavelength	a	b	c	α	β		δ
Circles & Dot Circles									
	Solid Line Circle	592nm	55.8	--		31.2	--		● 480-600 nm
	1 : 16 Dot Circle	515nm	81.9	16.1		44.5	9.2		● 480-532 nm
	1 : 72 Dot Circle	532nm	36.9	1.6		20.9	0.9		● 400-570 nm
	1 : 36 Dot Circle	532nm	6.1	0.5		3.5	0.3		● 480-560 nm
	Solid Line Circle	520nm	6.0	--		3.4	--		● 520-532 nm
	1 : 16 Dot Circle	635nm	18.9	3.7		10.8	2.1		● 530-700 nm
	Solid Line Circle	488nm	77.0	--		42.1	--		● 488-532 nm
Random Dot Patterns									
	33000-Dot Pseudo-Random	830nm*	136.9	114.6	76.3	68.8	59.6	41.7	● 820-850 nm
	33000-Dot Pseudo-Random	645nm*	101.3	84.8	56.4	53.7	45.9	31.5	● 630-660 nm
	40100-Dot Pseudo-Random	850nm*	135.6	114.9	72.0	68.3	59.7	39.6	● 825-870 nm
	31806-Dot Truly-Random	830nm*	146.9	118.5	86.9	72.6	61.3	47.0	● 800-890 nm
	47708-Dot Truly-Random	830nm*	146.9	118.5	86.9	72.6	61.3	47.0	● 800-890 nm
	29594-Dot Pseudo-Random	830nm*	146.7	118.5	86.5	72.5	61.3	46.8	● 810-850 nm
	51978-Dot Truly-Random	640nm*	162.8	97.5	130.4	78.3	52.0	66.2	● 610-660 nm
	101050-Dot Truly-Random	640nm*	167.4	100.4	133.9	79.9	53.3	67.6	● 610-660 nm

Description	Design Wavelength	Pattern Size@100 mm Distance (@DesignWavelength, Values: mm)	Pattern Angles (@Design Wavelength)	Optimum Wavelength Rang(s)
Viewfinder				
 Viewfinder	645nm	Width: 26.9 mm Height: 18.0 mm Diagonal: 32.6 mm	Width: 15.3° Height: 10.3° Diagonal: 18.5°	570-750nm
 Viewfinder	650nm	Width: 83.0 mm Height: 53.7 mm Diagonal: 98.9 mm	Width: 43.7° Height: 27.9° Diagonal: 52.6°	590-730nm
 Viewfinder	520nm	Width: 65.9 mm Height: 65.9 mm Diagonal: 93.2 mm	Width: 36.5° Height: 36.5° Diagonal: 50°	500-540nm
 Viewfinder (Lines Square)	633nm	Width: 60.6 mm Height: 60.6 mm Diagonal: 85.6 mm	Width: 33.7° Height: 33.7° Diagonal: 46.4°	590-730nm
 Viewfinder (Circle+Cross)	520nm	Width Cross: 49.9 mm Circle Ø: 24.6 mm	Width Cross: 28.0° Circle Ø: 14.0°	500-540nm

 Viewfinder (Circle+Cross)	645nm	Width Cross: 37.0 mm Circle Ø: 18.5 mm	Width Cross: 21.0° Circle Ø: 10.6°	570-750nm
 Viewfinder (Dot Circle+Cross)	635nm	Width Cross: 11.0 mm Circle Ø : 8.8 mm Dot Spacing: 1.1 mm	Width Cross: 6.3° Circle Ø: 5.0° Angle betw. Dots: 0.63°	570-750nm
 Viewfinder (Dot Square)	532nm	Width: 12.3 mm Height: 12.3 mm Diagonal: 17.4 mm Dot Spacing: 0.5 mm	Width: 7.0° Height: 7.0° Diagonal: 10.0° Angle betw. Dots: 0.3°	480-670nm
Special Patterns				
 Solid Line Square	633nm	Width: 63.1 mm Height: 63.1 mm Diagonal: 89.5 mm	Width: 35.0° Height: 35.0° Diagonal: 48.2°	530-650nm
 Square Grid 51 x 51 Lines	660nm	Width: 40.3 mm Height: 40.3 mm Diagonal: 56.9 mm Line Spacing: 0.8 mm	Width: 22.8° Height: 22.8° Diagonal: 31.8° Angle betw. Lines: 0.45°	530-660nm
 5 Rings	645nm	Width: 51.3 mm Line Spacing: 5.1 mm	Width: 28.8° Line Spacing: 2.9°	530-700nm

 <p>10 Rings</p>	515nm	Width: 96.2 mm Line Spacing: 4.8 mm	Width: 51.4° Line Spacing: 2.6°	488-532nm
 <p>Hexagon</p>	780nm	Width: 13.1 mm	Width: 7.5°	520-800nm
 <p>Square Grid 10 x 10 Lines</p>	658nm	Width: 72.8 mm Height: 72.8 mm Diagonal: 102.9 mm Line Spacing: 8.1 mm	Width: 40.0° Height: 40.0° Diagonal: 51.4° Angle betw. Lines: 4°	620-680nm
 <p>21x11 Hexagonal Array</p>	660nm	Width: 61.1 mm Height: 35.3 mm Diagonal: 70.5 mm Dot Spacing: 3.5 mm	Width: 34.0° Height: 20.0° Diagonal: 38.8° Angle betw. Dots: 2.0°	580-730nm
 <p>11x11 Hexagonal Array</p>	660nm	Width: 44.4 mm Height: 46.2 mm Diagonal: 64.1 mm Dot Spacing: 5.1 mm	Width: 25.1° Height: 26.0° Diagonal: 35.5° Angle betw. Dots: 2.9°	580-730nm