



Laser Diodes for dust detecting, leveling, ranging, barcode reader and any sensors

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Optical module Business Unit
Photonics Div.
Product Development Dept. 1

LD Lineups for sensor, leveling, ranging and etc.



Main new product are high power IR LDs for motion sensing and ranging

λ Power	630-640 nm	650-670nm	780-800nm	800-950nm		
						LiDAR
>1W		PM2.5 Detect (Air Conditioner)		 Ranging for longer distance		
100-500mW	Leveling 		General sensor 	RLD82N/ZJ1 RLD82P/ZJ1	RLD84N/ZJ2 RLD84P/ZJ2	RLD90Q/ZW* 25~120W
20mW	RLD63N/ZPC8 50°C Ranging for shorter distance		RLD78N/ZM7 RLD78M/ZM7 RLD78P/ZM7	 Motion sensing		
15mW	RLD63N/ZPC7 50°C		SLAM (Robot cleaner) 	 Interactive projector (Laser Curtain)		
9-12mW	RLD63N/ZPC6 50°C	RLD65P/ZX3	 Barcode scanner			
	RLD63N/ZCA 50°C	RLD65N/ZX1 80/85°C				
~5mW	RLD63P/ZCA 50°C	RLD65N/ZX2 RLD65P/ZX2	RLD78N/ZM5			
	RLD63N/ZCA 50°C	RLD65M/ZT7				
	RLD63N/ZPC5 40°C		RLD78M/ZA6 Multi-mode			

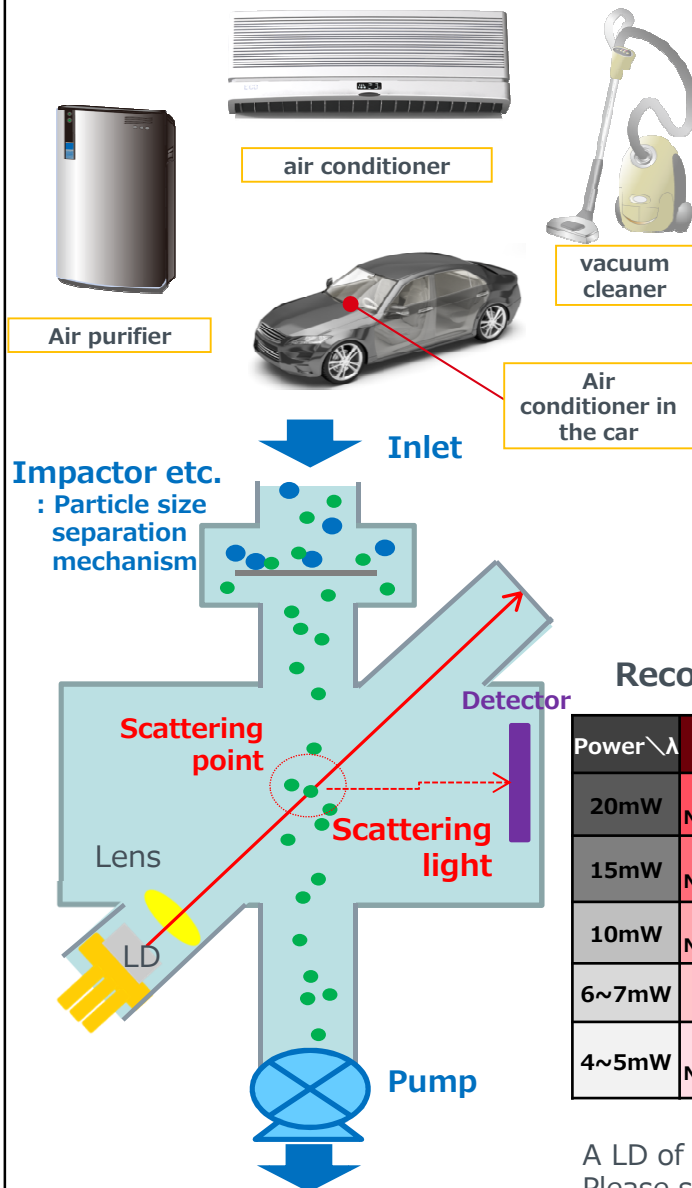
Package
shown by the seventh character from the left of the name

Mark	Package	Mark	Package
Z	5.6φ 3Pin With glass W	N	5.6φ 4Pin With glass W
P	5.6φ 3Pin Without glass W		

Polarity
Shown by the sixth character from the left of the name

Mark	LD common	PD common
M	cathode	cathode
N	anode	cathode
P	cathode	anode
Q	cathode	No
S	floating	No

Dust (PM2.5, Pollen, Others) detection light source



The dusts in air which is inhaled from inlet are separated by impactor.
The particles of the size to be measured are transferred into chamber.

↓
The light from LD is thrown to particles, then the light is scattered

↓
By measuring the scattered light, available to count the number of particle.

Benefits of using LD

- available to receive a scattered light(easy to separate from direct light)
- high light density on scattering point (High S/N ratio)
- LD light is stable with APC(Auto Power Control)
- narrow wavelength range(stable signal)

Recommended products

Power\λ	635nm	650nm	780nm
20mW	RLD63NPC8 No cover glass		RLD78MZM7 RLD78NZM7 RLD78PZM7
15mW	RLD63NPC7 No cover glass		
10mW	RLD63NPC6 No cover glass	RLD65PZX3	
6~7mW		RLD65NZX1	RLD78NZM5
4~5mW	RLD63NPC5 No cover glass	RLD63NZCA RLD63PZCA	RLD65MZT7 RLD65NZX2 RLD65PZX2 RLD78MZA6

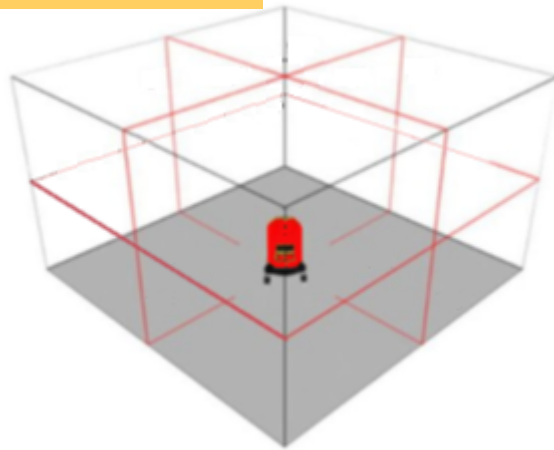
A LD of every wavelength is theoretically available.
Please select according to the spectral sensitivity of the detector.

Under development

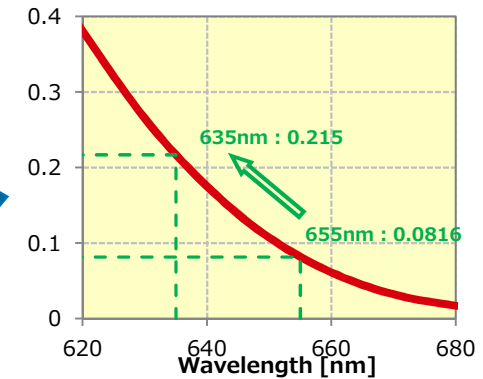
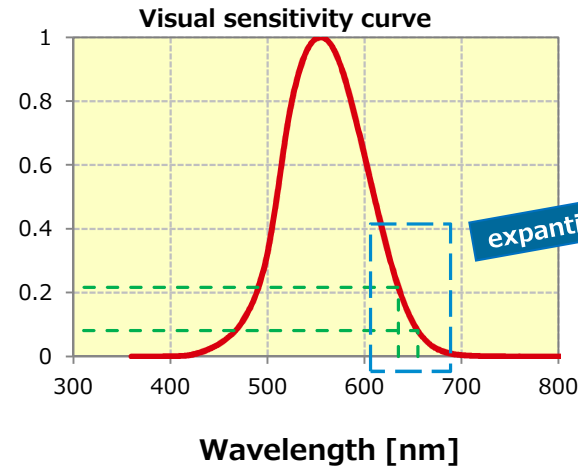
Leveling and line marker light source



Leveling machine

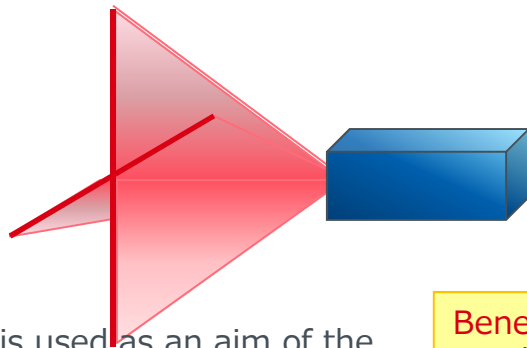


RED LDs are used 5-10pcs per 1 unit.



To the human eye, the 630nm band appears 2.5 times brighter than the 650nm band.

Laser line marker



This is used as an aim of the camera type bar-code reader.

Recommended products

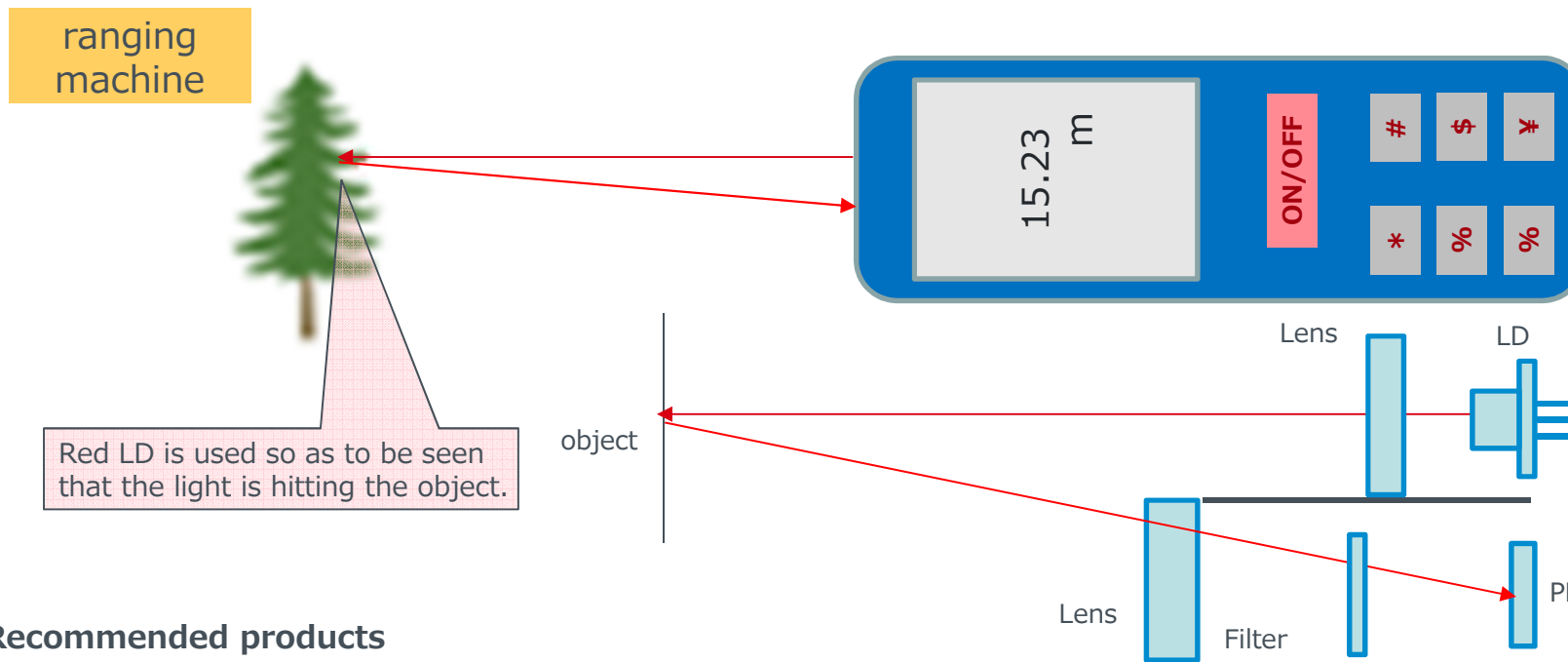
Power\λ		635nm			650nm		
20mW	RLD63NPC8 No cover glass						
15mW	RLD63NPC7 No cover glass						
10mW	RLD63NPC6 No cover glass						RLD65PZX3
6~7mW						RLD65NZX1	
4~5mW	RLD63NPC5 No cover glass	RLD63NZCA	RLD63PZCA	RLD65MZX7	RLD65NZX2	RLD65PZX2	

Under development

Benefits of using LD

- Without the high linearity of light, which is a feature of semiconductor lasers, this application is not feasible.
- Due to the high visibility, red lasers are mainly used in the 635nm band.
- Since battery operation is standard for this application, red lasers are more often used than green lasers, which have a higher drive voltage.

Ranging machine light source



Recommended products

Power\λ	635nm			650nm		
20mW	RLD63NPC8 No cover glass					
15mW	RLD63NPC7 No cover glass					
10mW	RLD63NPC6 No cover glass					RLD65PZX3
6~7mW					RLD65NZX1	
4~5mW	RLD63NPC5 No cover glass	RLD63NZCA	RLD63PZCA	RLD65MZT7	RLD65NZX2	RLD65PZX2

Under development

You can measure distance by phase difference between the emitted light and the reflected light from the object.

(Time Of Flight method)

Benefits of using LD

- Without the high-coherence light characteristic of semiconductor lasers, this application is not feasible.
- Due to the high visibility, red lasers are mainly used in the 635nm band.
- Since battery operation is standard for this application, red lasers are more often used than green lasers, which have a higher drive voltage.

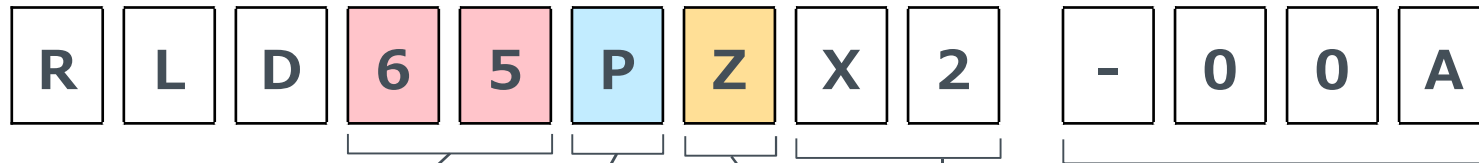
Parts List



Under development

Part No.	Wavelength λ_p (nm)	Absolute Maximum Ratings (Tc=25°C)		Electrical and Optical Characteristics (Tc=25°C)							
		P _o (mW)	Top Max. (°C)	P _o (mW)	I _{th} (mA)	I _{op} (mA)	η (W/A)	V _{op} (V)	I _m (mA)	$\theta_{\perp}$ (deg)	$\theta_{//}$ (deg)
RLD63NPC5	635	6	40	5	24	33	0.55	2.2	0.18	32.0	8.0
RLD63NPC6	638	12	50	10	28	43	0.70	2.3	0.15	32.0	8.0
RLD63NPC7	638	17	50	15	32	57	0.60	2.2	0.16	30.0	8.0
RLD63NPC8	638	24	50	20	32	65	0.60	2.25	0.20	30.0	8.0
RLD63NZCA	635	7	50	5	25	32	0.70	2.2	0.06	32.0	8.0
RLD63PZCA	638	7	50	5	28	33	0.80	2.2	0.08	32.0	8.0
RLD65MZT7	659	7	70	5	20	28	0.70	2.3	0.20	27.0	8.0
RLD65NZX1	663	10	80	7	15	24	0.85	2.3	0.30	27.0	9.0
RLD65NZX2	658	7	70	5	25	33	0.60	2.3	0.20	28.0	8.5
RLD65PZX2	658	7	70	5	25	33	0.60	2.3	0.20	28.0	8.5
RLD65PZX3	658	12	70	10	25	42	0.60	2.3	0.30	28.0	8.5
RLD78MZA6	790M	4.5	70	3	25	35	0.35	1.9	0.15	37.0	11.0
RLD78MZM7	792	20	60	15	11	33	0.65	1.8	0.50	24.0	8.5
RLD78NZM5	793	10	60	6	10	20	0.55	1.8	1.15	28.0	9.0
RLD78NZM7	792	20	60	15	11	33	0.65	1.8	0.90	24.0	8.5
RLD78PZM7	792	20	60	15	11	33	0.65	1.8	0.65	24.0	8.5
RLD82NZJ1	822	220	60	200	50	255	0.95	2.4	0.30	17.0	9.5
RLD82PZJ1	822	220	60	200	50	255	0.95	2.4	0.30	17.0	9.5
RLD84NZJ2	842	220	60	200	40	250	0.95	2.4	0.40	19.0	9.5
RLD84PZJ2	842	220	60	200	40	250	0.95	2.4	0.40	19.0	9.5
RLD85NZJ4	852	220	60	200	40	250	0.95	2.4	0.40	18.0	9.5
RLD85PZJ4	852	220	60	200	40	250	0.95	2.4	0.40	18.0	9.5
RLD94NZJ5	942	285	65	200	55	325	0.75	2.2	0.90	30.0	35.0
RLD94NZJ7	942	220	60	200	40	260	0.9	2.4	1.00	17.0	9.5
RLD94PZJ5	942	285	65	200	55	325	0.75	2.2	0.90	30.0	35.0
RLD94PZJ7	942	220	60	200	40	260	0.9	2.4	1.00	17.0	9.5

Part Number Explanation



Wavelength

63	630nm
65	650nm
78	780nm
82	820nm
84	840nm
85	850nm
90	905nm
94	940nm

Polarity

Nark	LD Common	PD Common
M	Cathode	Cathode
N	Anode	Cathode
P	Cathode	Anode
Q	Cathode	PD-less
S	Floating	PD-less

Chip type

Package

Suffix No.

-00A, -01A: General products

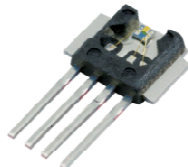
-00B, 10C and etc.: Customized products

Mark	Diameter	Pin	Glass Window	feature
Z	5.6φ	3	✓	
P	5.6φ	3	—	
N	5.6φ	4	✓	
R	5.6φ Resin	3	—	
F	Flat Resin	4	—	

Package Lineup



It can be identified by the seventh letter of the alphabet from the left of the shape name.

Mark	Z	N	P	R	F
	5.6Φ CAN With Glass		5.6Φ CAN Without Glass	5.6Φ RESIN Flame	FLAT Flame
Package					
	3 Pin	4Pin	3Pin	3Pin	4Pin
Merit	High reliability High dimensional accuracy High heat dissipation		High dimensional accuracy High heat dissipation	Optical compatibility with 5.6Φ CAN Low cost	Thin package Low cost High heat dissipation
Demerit	High cost		Open type Package •Contamination •Optical tweezers effect* High cost	Full open type Package •Contamination •Contact damage •Optical tweezers effect* Low heat dissipation Low dimensional accuracy Relatively small Im value	Full open type Package •Contamination •Contact damage •Optical tweezers effect* Relatively small Im value

*Optical tweezers effect is also called optical trap. The laser beam collected to the limit traps particles of about micrometer size. Due to the effect, fine dust and gas molecules gather at the light emitting point of the device and prevents the light emission.

→ The open type package can be used by shielding the lens barrel.

