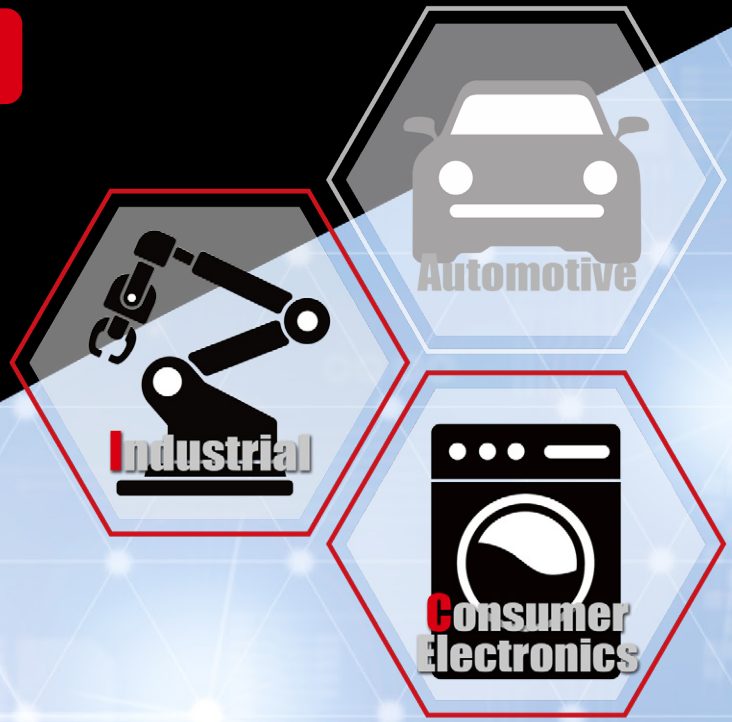
Featured Products

Electronics for the Future

ROHM SEMICONDUCTOR

Dramatically improves LiDAR performance by reducing wavelength temperature dependence by 66%

905nm Invisible Pulsed
120W High Power Laser Diode



RLD90QZW8

Overview of 905nm Invisible Pulsed 120W High Power Laser Diode

The RLD90QZW8 is a 120W infrared high power laser diode developed for distance measurement and spatial recognition applications such as LiDAR. Extremely low wavelength temperature dependence together with excellent luminous performance allow for high-definition, power-efficient, long-distance detection.

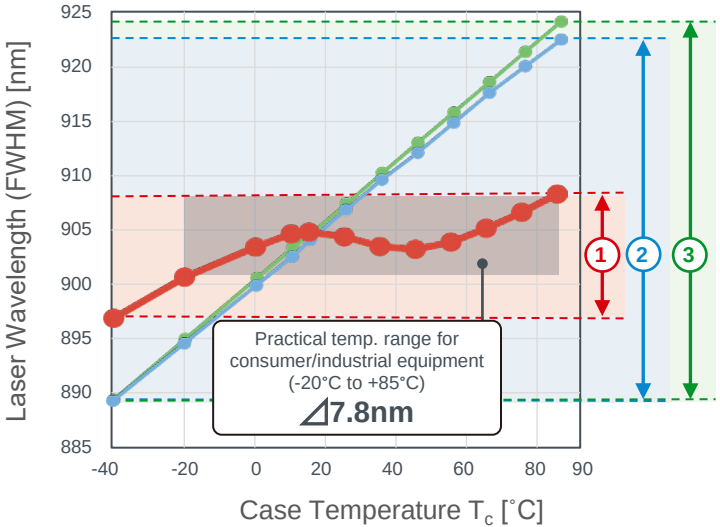
Features

- **Minimal wavelength temperature dependence improves overall LiDAR performance**
  Narrower wavelength bandpass filter increases the S/N ratio
- **Superior light emission performance enables high resolution detection over long distances**
  Thin uniform light emission of 270μm achieves narrower pixel spot and high definition to the edge
- **High PCE performance contributes to lower power consumption**
  Achieves a PCE of 20% even at high temperatures (T_c=85°C) where efficiency is reduced

RLD90QZW8
Φ5.6mm CAN

Minimal Wavelength Temperature Dependence Improves Overall LiDAR Performance

Comparison of Laser Wavelength Temperature Dependence: RLD90QZW8 vs Standard Product



	Wavelength Shift Amount* (Ave. Shift per 1°C)
① RLD90QZW8	⊿11.6nm (Avg. 0.10nm/°C)
② Standard Product A	⊿33.4nm (Avg. 0.26nm/°C)
③ Standard Product B	⊿34.6nm (Avg. 0.28nm/°C)

66% lower than Standard Product B

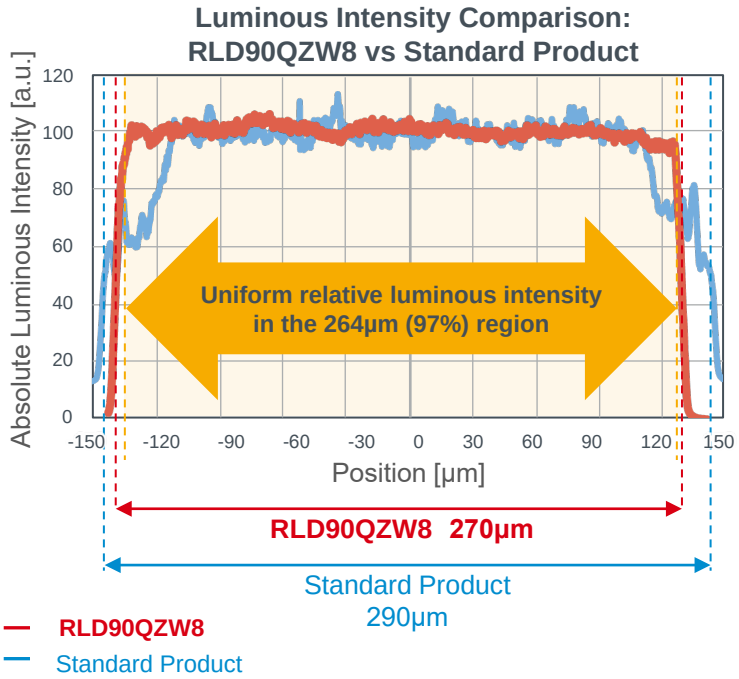
*Wavelength shift from -40℃ to +85℃

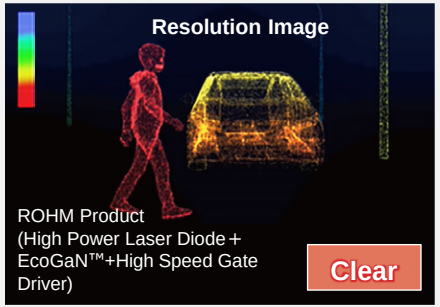
Narrowing the wavelength range of the bandpass filter while reducing wavelength-temperature dependence vs standard products improve the S/N ratio by reducing the effects of sunlight and other ambient light

- **Same distance: Achieves low optical output and power consumption**
- **Same optical output: Achieves longer measurement distance**

Enable the extends LiDAR detection range or reducing power consumption

Superior Light Emission Performance Enables High Resolution Detection Over Long Distances





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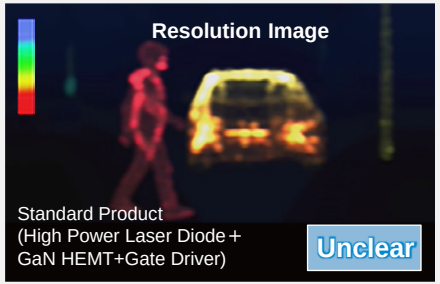


Narrower width along with uniform emission contribute to high-definition LiDAR performance

High PCE Contributes to Lower Power Consumption

PCE Comparison: RLD90QZW8 vs Standard Product

Measurement Conditions: 120W
(Pulse width: 50nm, Duty ratio: 0.05%, Iop: 38A)

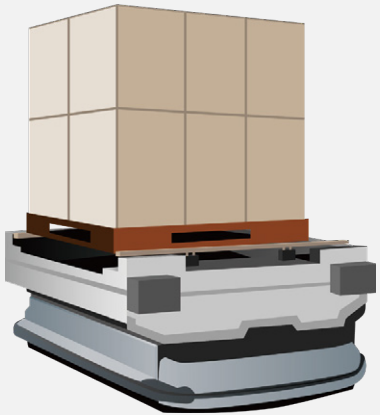
PCE value equal to or higher than that of standard products

	PCE	
	T_c: 25°C	T_c: 85°C
RLD90QZW8	**24%**	**20%**
Standard Product A	24%	18%
Standard Product B	15%	13%

Achieves a PCE of 20% even at T_c=85°C where efficiency deteriorates

Ensures stable output even under harsh environments, contributing to higher application efficiency

RLD90QZW8: Application Examples



AGVs
(Automated Guided Vehicles)

Robot Vacuums

Service Robots

Other

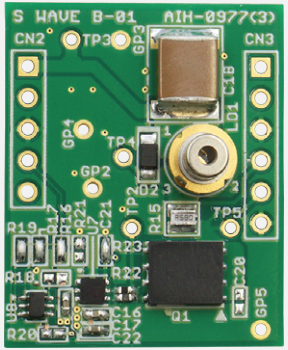
- Laser rangefinders for accurately measuring the distances to target objects
- 3D monitoring systems installed on station platforms

and more...

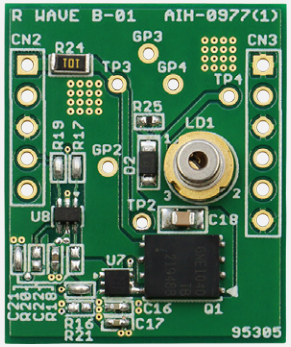
Supports a wide range of applications – including LiDAR

RLD90QZW8: Reference Designs and Supporting Contents

High Power Laser Diode for LiDAR, Reference Design for GaN HEMT Drive

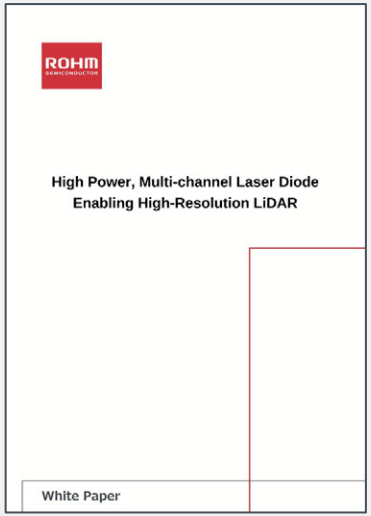


[REFLD002-1]
Square wave circuit
Built-in 120W RLD90QZW8



[REFLD002-2]
Resonant circuit
Built-in 75W RLD90QZW3

For more information, visit ROHM's website



RLD90QZW8 Design Support Contents

- Application Notes
- White Papers
- Simulations
- SPICE Models
- Ray Files

905nm Invisible Pulsed High Power Laser Diode Lineup (ROHM's Mass Production Plants are IATF16949 Certified, with Automotive-Grade Products Under Development)

Part No.	Absolute Max Rating (T_c=25°C)				Electrical/Optical Characteristics (T_c=25°C)							Package Size
	I_F [A]	P_o [W]	V_R [V]	Operating Temp Range [°C]	I_F Conditions [A]	P_o [W]	V_F [V]	Vertical Beam Diffusion Angle Θ⊥ [deg]	Horizontal Beam Diffusion Angle Θ// [deg]	Peak Wavelength [nm]	Luminous Area [μm×μm]	
New RLD90QZW8	46	145	10	−40 to +85	38	120	13	20	11	905	270×10	 Φ5.6mm CAN
RLD90QZW3	28	90	2		23	75	11	25	12		225×10	
RLD90QZWD	13	40	2		12	35	11	25	13		100×10	
RLD90QZWB	11	25	2		9	25	13	25	14		50×10	
RLD90QZW5	9	25	2		9	25	14	25	12		70×10	
RLD90QZWC	11	30	2		9	25	11	25	13		70×10	
RLD90QZWJ	9	25	2		9	25	15	20	14		50×10	
RLD90QZWA	6	17	2		5	15	13	20	14		35×10	

Click on the icon to access the product page and the icon to view the datasheet on ROHM's website.

Notes

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