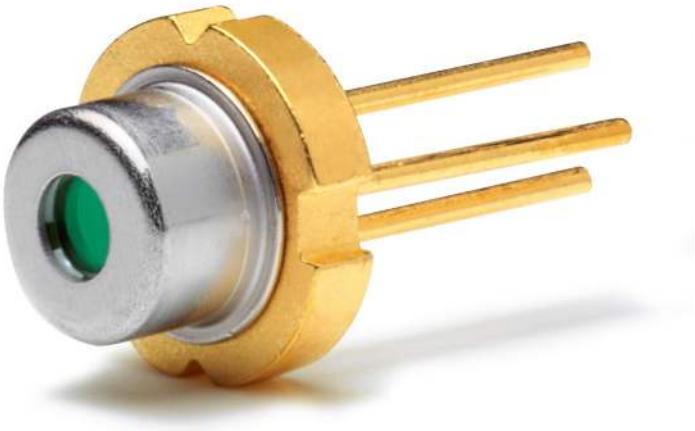
Optoelectronic Devices

PACKAGED LIDAR LASER DIODE

905 nm ns Pulsed Multi-junction Laser Diode Chip in TO-can Metal Package

The Coherent ST905A13-TO-01 edge emitting laser diode series in TO-56 metal can has been designed to provide high peak output power in ns range from a triple-junction quantum well structure as source for next generation LiDAR applications in automotive, industrial and consumer.



FEATURES

- Typically 95 W peak power (1E emission configuration)
- Short pulse operation up to 100 ns, 0.1% duty cycle
- 905 nm wavelength emission
- Highly reliable triple-junction epitaxial structure
- Emitting area of 200 µm x 10 µm
- Chip cavity length of 600 µm
- RoHS compliant

APPLICATIONS

- Industrial and Consumer LIDAR applications
- Range finding in industrial and consumer
- Surveillance and safety
- Automotive applications (no AEC-Q qual applied)

COHERENT

Specification

Electro-Optical Characteristics

Conditions, unless otherwise stated:
Operating current = 40 A (max); Pulse width = 100 ns; f = 1 kHz, Duty Cycle = 0.01%, Operating T = 25 °C;

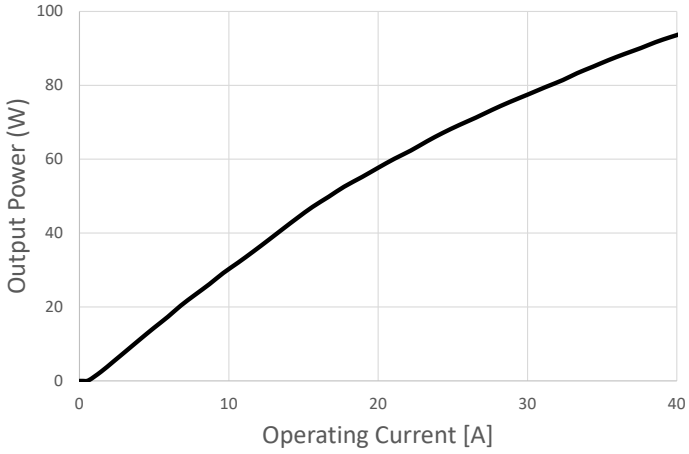
Parameter	Min	Typ	Max	Unit
Optical Power @ 30A	65	75		W
Optical Power @ 40A	80	95		W
Operating Current		30	40	A
Threshold Current		0.5		A
Operating Voltage		13		V
Centroid Wavelength	895	905	915	nm
Spectral Width (FWHM) @ 40A		9		nm
Divergence Parallel (FWHM)		10		deg
Divergence Perpendicular (FWHM)		25		deg
Temperature Coefficient (-40 - 85 °C) for Centroid Wavelength		0.3		nm/K
Temperature Coefficient for Optical Power		-0.3		%/K
Typical Switching Time (rise/fall-time, tr/tf)		1		ns
Thermal resistance junction solder point		38		K/W

Absolute Maximum Ratings

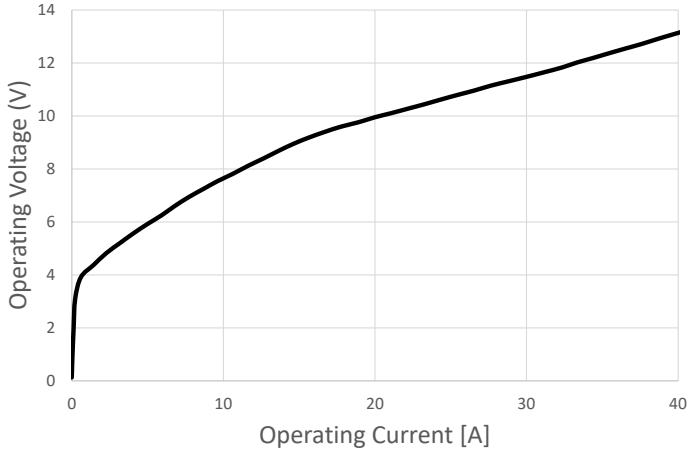
Parameter	Min	Max	Unit
Operating Temperature (T)	-40	85	°C
Storage Temperature (T)	-40	100	°C
Pulse Width ($T_{ambient}$ = -40 °C to 85 °C)		100	ns
Duty Cycle ($T_{ambient}$ = -40 °C to 85 °C)		0.1	%
Maximum Current ($T_{ambient}$ = -40 °C to 85 °C)		40	A
Maximum Power ($T_{ambient}$ = -40 °C to 85 °C)		110	W
Reverse Voltage ($T_{ambient}$ = 25 °C)		5	V
Maximum Junction Temperature		125	°C
Soldering Temperature (for 10 sec max, 2mm from bottom edge of case)		260	°C

Chip Characterization in TO-Metal Can

Optical Output Power & Forward Voltage

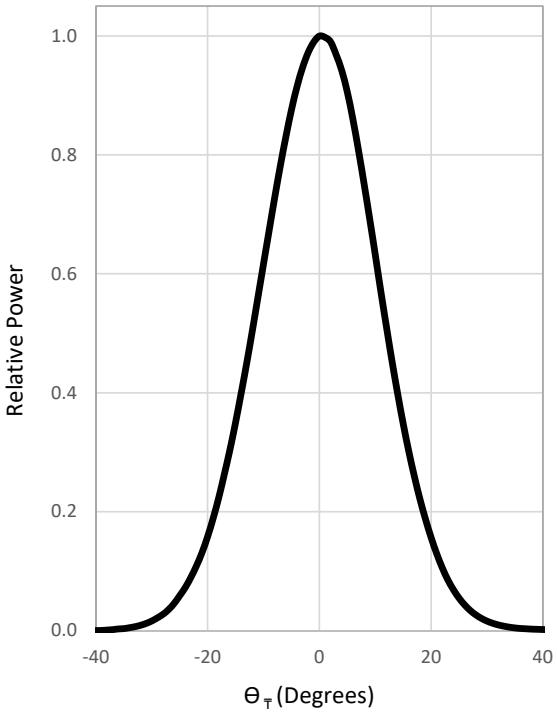


Typical Optical Output Power versus operating current measured at $T_{ambient}$ = 25 °C, 100 ns, 0.01% DC

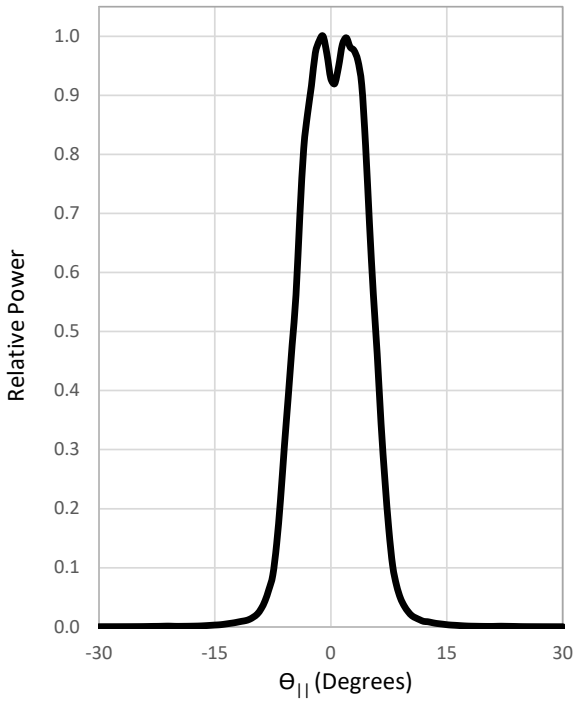


Typical operating voltage versus operating current measured at $T_{ambient}$ = 25 °C, 100 ns, 0.01% DC

Far-Field Distribution

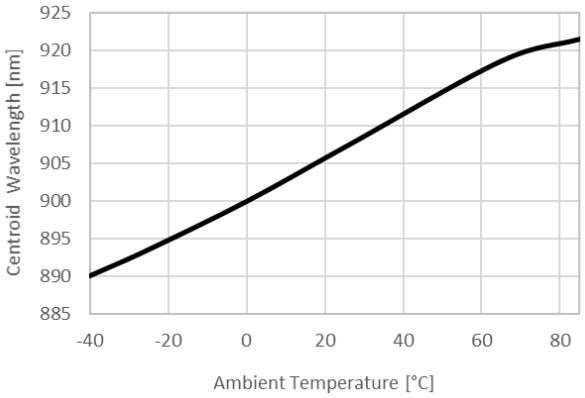


Far-Field perpendicular to p/n junction, 40 A, $T_{ambient}$ = 25 °C, 100 ns, 0.01% DC

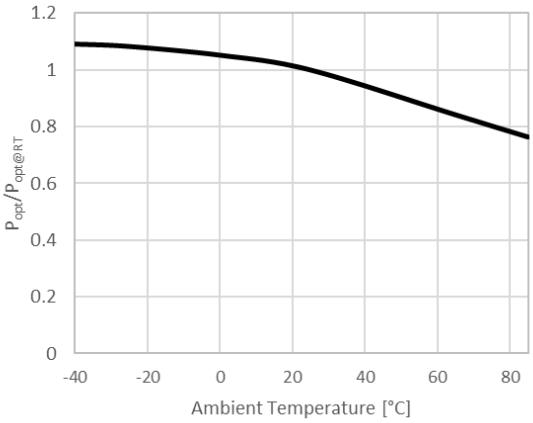


Far-Field parallel to p/n junction, 40 A, $T_{ambient}$ = 25 °C , 100 ns, 0.01% DC

Temperature Dependent Characteristics



Centroid wavelength versus temperature ($T_{ambient}$ = -40 - 85 °C), 40 A, 100 ns, 0.01% DC



$P/P_{25°C}$ versus temperature ($T_{ambient}$ = -40 - 85 °C), 40 A, 100 ns, 0.01% DC

Mechanical Drawing of TO-56 Package (mm)

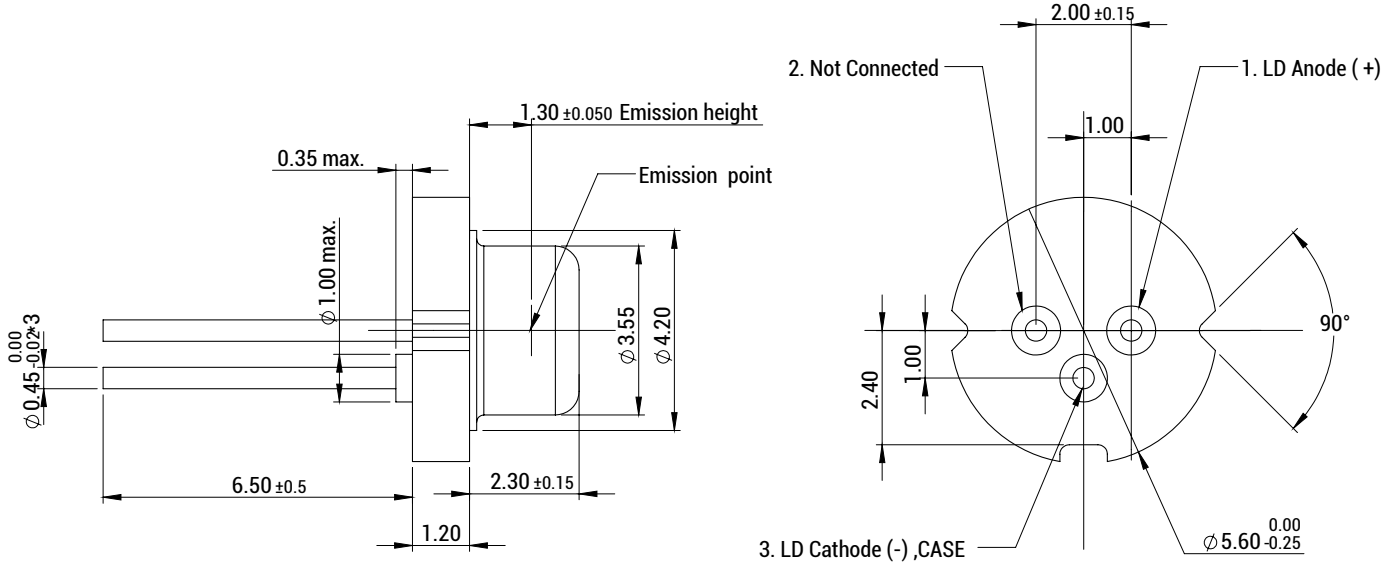


Figure 1: Technical drawing of TO-56 package including dimensions
left: side view, right: bottom view, General Tolerance +/- 0.1 mm, Lead finish Au

Delivery Specification

Product Code	Description	Shipment Packaging
ST905A13-TO-01	905 nm ns Pulsed Multi-junction Laser Diode Chip in TO-56 metal can	in Tray (w/ 200 units)

Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by Coherent before they become applicable to any particular order or contract. In accordance with the Coherent Laser Enterprise policy of continuous improvement specifications may change without notice. Further details are available from any Coherent Laser Enterprise sales representative.

ROHS and Reach Compliance

Coherent is fully committed to environment protection, human health and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS and REACH compliance is held as part of our controlled documentation for each of our compliant products.

Safety & Laser Radiation

Caution: Laser light emitted from this device is invisible and may be harmful to the human eye. Do not stare into the beam or view directly with optical instruments when the device is in operation. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1.

DANGER – LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION CLASS 4 LASER PRODUCT

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