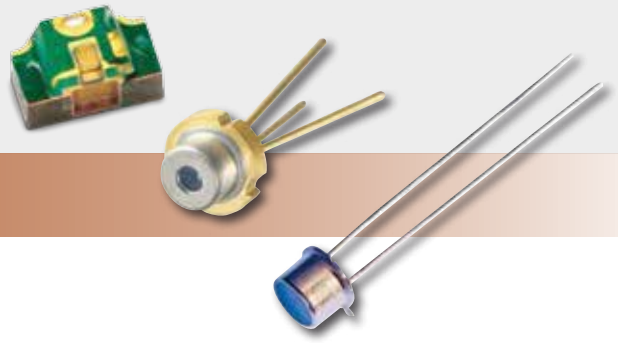
High Power Laser Diode

For Range Finding



Pulsed Laser Diodes – PGA – PGEW Series

Applications

- Range finders
- Safety light curtains
- Adaptive cruise control
- Autonomous vehicles
- LIDAR
- Laser therapy

Features and Benefits

- Multi-cavity lasers concentrate emitting source size
- Quantum well structure
- High peak pulsed power into aperture
- Excellent power stability with temperature
- Customization available upon request

Product Description

Pulsed semiconductor lasers in the near IR are commonly used for long-distance time-of-flight or phase-shift range-finder or LIDAR systems. Excelitas offers a broad range of ideally-suited pulsed 905 nm laser designs including multi-cavity monolithic structures with up to 4 active areas per chip resulting in up to 100 W of peak optical output power. Physical stacking of laser chips is also possible, resulting in up to 300 W of peak optical output power.

Chip-on-board assemblies are available for hybrid integration. A selection of 6 metal, hermetically-sealed package types are available for harsh environment applications. A molded epoxy resin TO-18 type package and a surface-mount overmoulded chip-on-ceramic package are available for high-volume applications.

Critical parameters are pulse-width and rise/fall times. The pulse width may be reduced allowing for increased current drive and resulting in higher peak optical power. Quantum-well laser design offers rise and fall times of <1ns but the drive circuit lay-out and package inductance play the greater role in determining rise/fall times, and should be designed accordingly. Excelitas offers a variety of package types with different inductance values to assist to this end.

Our core competencies include: MOVPE wafer growth; wafer processing of the grown GaAs wafers; assembly using either epoxy or solder die attach; epoxy encapsulation of lasers mounted on lead frame; hermetically-sealed product qualification to MIL STD and custom requirements.

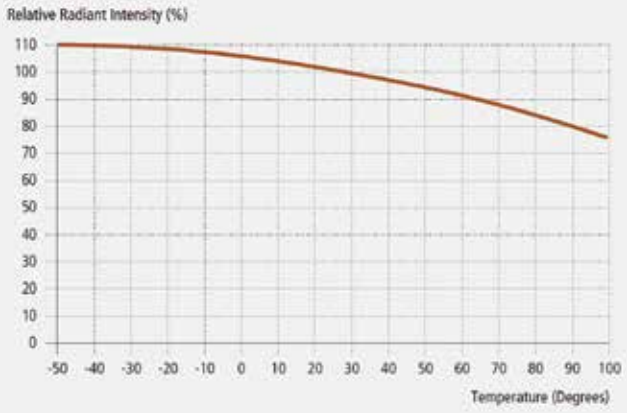
Product Table

PGA Pulsed Laser Family Selection Table, Typ. Wavelength 905 nm, 5 mm Spectral Width

Device (X = pkg) (H = RoHS Compliance)	Description		Emitting Area		Typical Peak Power at 10 A, 100 ns	Typical Peak Power at 30 A, 100 ns	Beam Spread Parallel to Junction (FWHM)	Beam Spread Perpendicular to Junction (FWHM)	Typical Temperature Coefficient	Preferred Packages		
	# of Chips	Total # of Emitting Stripes	Width µm	Height µm	75 µm (3 mils) Stripe Width	225 µm (9 mils) Stripe Width	Θ_{II}	$\Theta^{\perp}$	nm / °C	"S" Metal Can TO-18	"LU" High Volume Metal TO-56	"D" Epoxy Encapsulated SMT
PGAx1S03H	1	1	75	1	8 W		10	25	0.25	✓		✓
PGAx1S09H	1	1	225	1		25 W	10	25	0.25	✓		✓
DPGAx1S03H	1	2	75	5	16 W		10	25	0.25	✓	✓	✓
DPGAx1S09H	1	2	225	5		50 W	10	25	0.25	✓		✓
TPGAx1S03H	1	3	75	10	23 W		10	25	0.25	✓	✓	✓
TPGAx1S09H	1	3	225	10		75 W	10	25	0.25	✓	✓	✓
QPGAx1S03H	1	4	75	15	30 W		10	25	0.25	✓	✓	✓
QPGAx1S09H	1	4	225	15		90 W	10	25	0.25	✓		✓
TPGAx2S03H	2	6	75	175	45 W		10	25	0.25	✓		
TPGAx2S09H	2	6	225	175		150 W	10	25	0.25	✓		
QPGAx2S03H	2	8	75	225	58 W		10	25	0.25	✓		
QPGAx2S09H	2	8	225	225		175 W	10	25	0.25	✓		
QPGAx3S03H	3	12	75	450	85 W		10	25	0.25	✓		
QPGAx3S09H	3	12	225	450		255 W	10	25	0.25	✓		

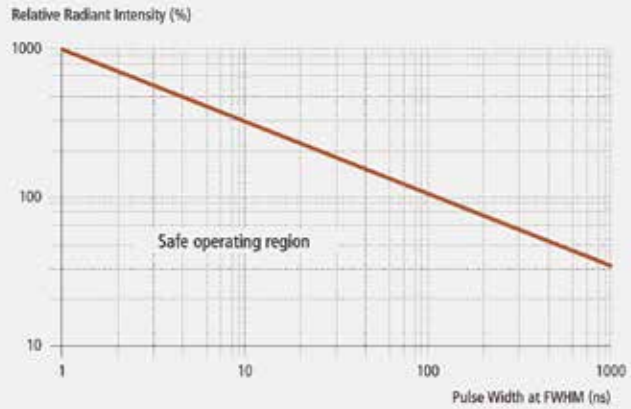
Graph 1

Peak Radiant Intensity vs. Temperature



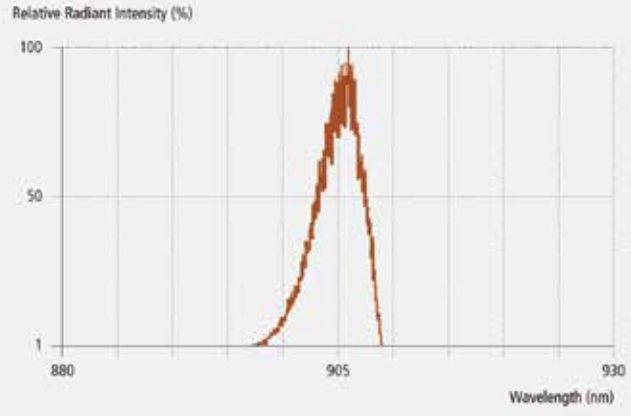
Graph 4

Radiant Intensity vs. Pulse Width for Safe Operation



Graph 3

Spectral Plot Distribution



Graph 6

Center Wavelength vs. Temperature

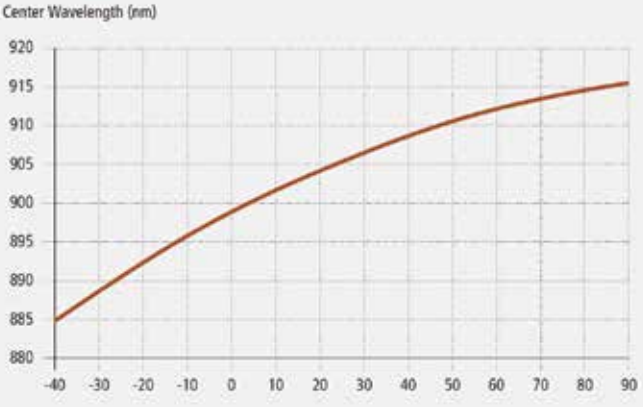
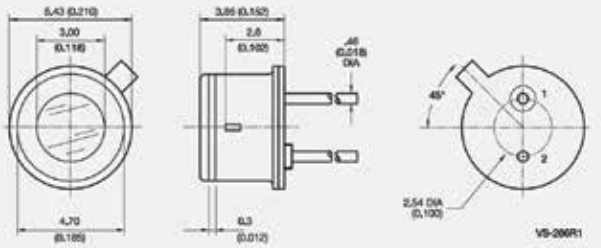
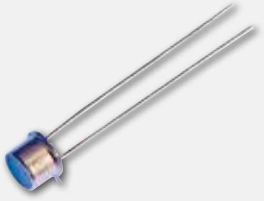


Figure 1

Package Drawing



Package S (TO-18)



Pin out
1. LD Anode (+),
2. LD Cathode (-) Case,
Inductance 5.2 nH

Figure 2

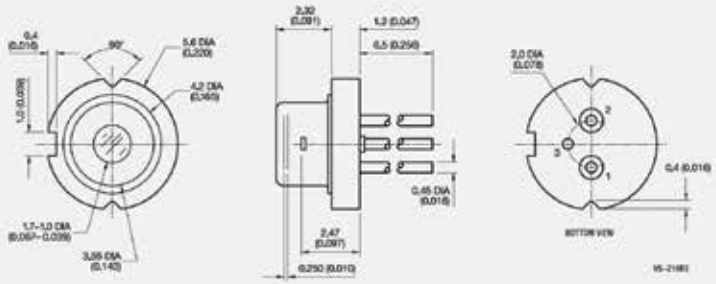
Package Drawing

Package D (Surface Mount)

Inductance 1.6 nH

Figure 2

Package Drawing

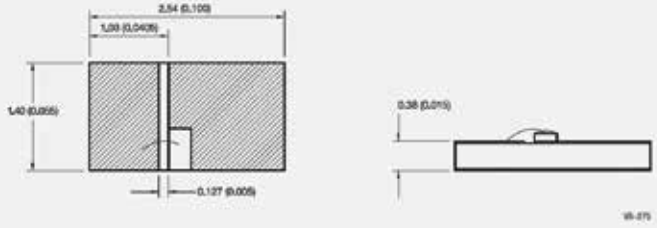


Package U (5 mm CD)

Pin out
1. LD Anode (+),
2. NC,
3. LD Cathode (-) Case,
Inductance 5.0 nH

Figure 3

Housing / Package Drawing • Laser Chip on Board

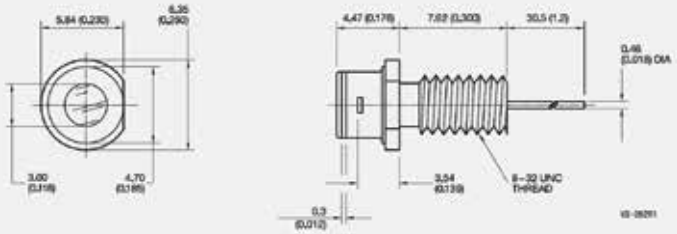


Package Y (Chip on Carrier)

Pin out
1. LD Cathode (-)
chip bottom,
2. LD Anode (+)
chip top,
Inductance 1.6 nH

Figure 4

Package Drawing

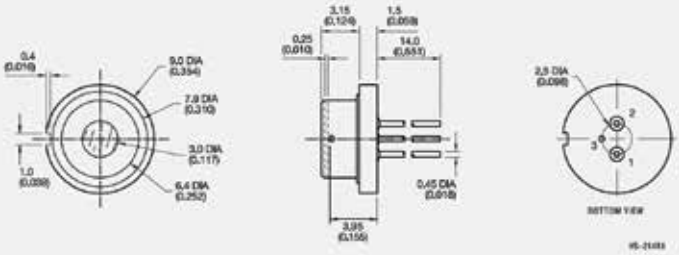


Package C (8–32 Coax)

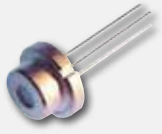
Pin out
1. LD Anode (+),
2. LD Cathode (-) Case,
Inductance 12 nH

Figure 5

Package Drawing



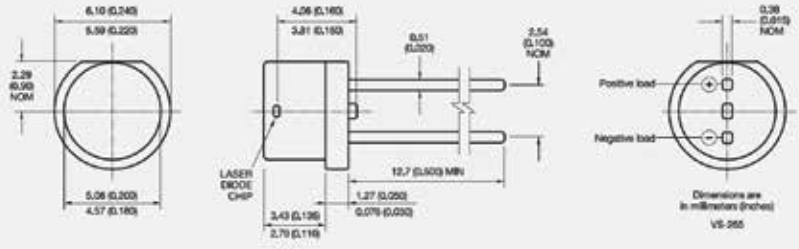
Package R (9 mm CD)



Pin out
1. LD Anode (+),
2. NC,
3. LD Cathode (-) Case,
Inductance 6.8 nH

Figure 6

Housing / Package Drawing • TO-18-"W" Plastic Package (1S Devices Only)



Package W (TO-18 Plastic)

Pin out
1. (Pkg Flat)
LD Anode (+),
2. LD Cathode (-),
Inductance 5.0 nH