TELEDYNE | FLIR Defense

VCSEL LASER ARRAY

Vertical-Cavity Surface-Emitting Laser (VCSEL) Diode Array

APPLICATIONS

LASER ILLUMINATION

LIDAR

UAS/UGV PROXIMITY AND NAVIGATION SYSTEMS

INDUSTRIAL AND MATERIALS PROCESSING

STRUCTURED LIGHT AND 3-D SENSING



Teledyne FLIR offers high-reliability Vertical-Cavity Surface-Emitting Laser (VCSEL) array in various levels of integrations, from die level to packaged header with optics and laser driver electronics. Teledyne FLIR's customer-specific solutions produce unmatched speckle-free and uniform beam quality, ideal for laser illumination, industrial and materials processing, LIDAR, and structured light applications such as gesture and scene recognition. Teledyne FLIR offers standard VCSEL arrays producing up to 650 mW of continuous wave optical output power in TO-46, TO-56, and TO-39 packages; however, custom power, wavelength, packages, and system integration are also available and are ready to support your mission.

FEATURES

ULTRA-HIGH RELIABILITY

Rigorously tested throughout the manufacturing process, VCSELs have combat-proven performance and the highest reliability our customers expect.

SPECKLE-FREE ILLUMINATION QUALITY

Spatially incoherent and comprised of numerous multimode VCSEL devices, VCSEL arrays provide superior speckle-free image quality for the ultimate capability in feature resolution and target discrimination.

THERMISTOR AND PHOTODIODE MONITORING

Integrated photodiodes and thermistors provide optical output power stability over temperature, ensuring consistent performance.

MICRO-LENSED ARRAYS FOR HIGH BRIGHTNESS AND LOW DIVERGENCE

Micro-lensed arrays ensure high brightness and provide customizable patterns and divergences tailored to your operational needs. Integrated systems with beam expander and focusing lenses achieve 0.5 mrad divergence.

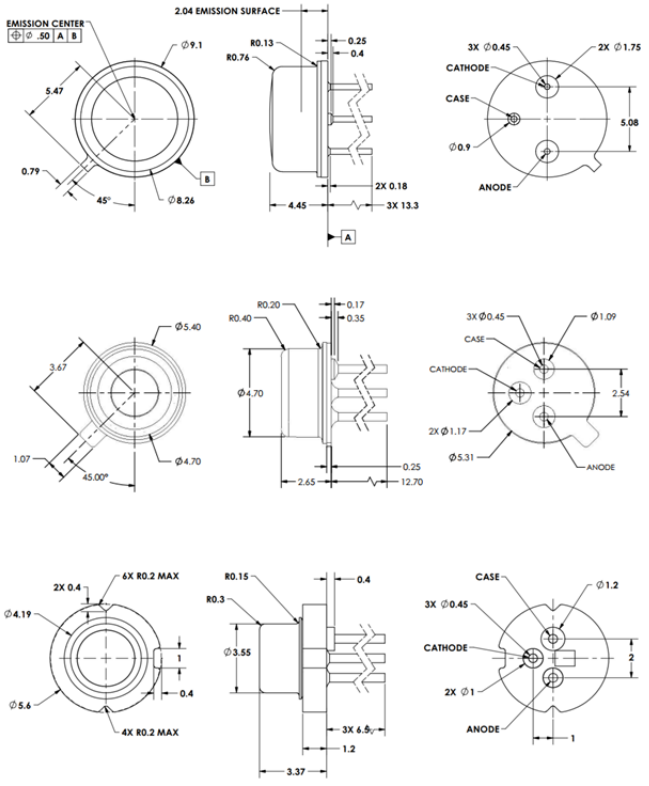
CIRCULAR BEAM SHAPE

Intrinsically circular beam reduces the complexity of system optical components.

For more information contact:
VCSEL@Teledyne.com

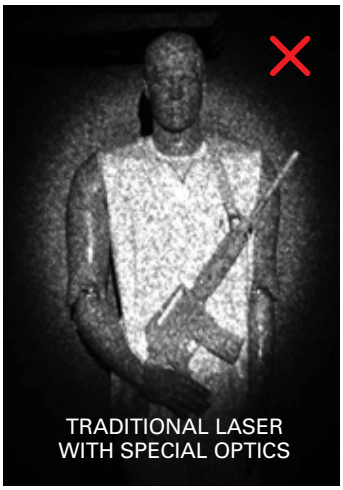
SPECIFICATIONS

VCSEL Chip Model	Conditions	100 mW	150 mW	650 mW
Optical Output Power, Pop (mW)	20°C	100	150	650
Wavelength (nm)	20°C, P_{op}	840, 860	860	860
Wall-Plug Efficiency (%)	20°C, P_{op}	33	35	29
Threshold Current (mA)	20°C, P_{op}	15	35	200
Drive Current (mA)	20°C, P_{op}	140	210	1000
Forward Voltage (V)	20°C, P_{op}	2.1	2.1	2.1
Slope Efficiency (W/A)	20°C, P_{op}	0.76	0.73	0.7
Beam Divergence (o)	20°C, P_{op}	28	28	28
Spectral Width (nm)	20°C, P_{op}	1	1	1
Wavelength Shift (nm/°C)	20°C, P_{op}	0.075	0.075	0.075
Emission Diameter (mm)		0.15	0.2	0.8
Thermistor Option Available		Y	Y	Y
Monitor Photodiode Option Available		Y	Y	Y
Operating Temp (°C)		-30 to 70	-30 to 70	-30 to 70
Storage Temp (°C)		-40 to 80	-40 to 80	-40 to 80
Package		TO-46 or TO-56	TO-46 or TO-56	TO-39

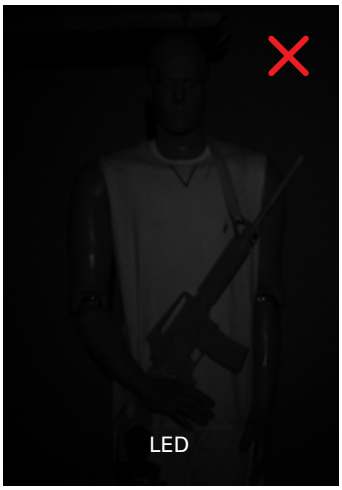


Specifications are subject to change without notice. For the most up-to-date specs, go to www.teledyneflir.com









This document does not contain any export-controlled information. Specifications are subject to change without notice.

This product is subject to United States export regulations and may require US authorization prior to export, reexport, or transfer to non-US persons or parties. Diversion contrary to US law is prohibited. ©2025 Teledyne FLIR Defense, Inc. All rights reserved.

Revised on 12/17/25
VCSEL_LaserArray Datasheet_LTR_25-1217

For more information contact:
VCSEL@Teledyne.com