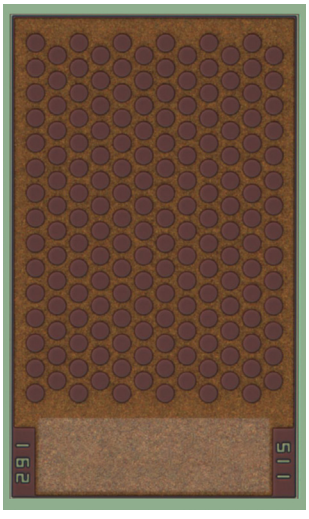
LUMENTUM

90 W 940 nm Multi-Junction VCSEL Array

M54-110



The M54-110, a 90 W 940 nm multi-junction VCSEL array, is part of the Lumentum automotive and industrial 3D sensing portfolio for next-generation applications. Lumentum's first 940 nm VCSEL product for LiDAR applications delivers high output power and efficiency within a small 350µm-wide emission area. With its small chip size and high-power density, the M54-110 is well suited for short- to long-range LiDAR and can be modularly assembled for easily customizable illumination configurations.

M54-110 is part of the M Series VCSEL products that are optimized for tomorrow's LiDAR, providing high-quality, cost-effective solutions for automotive and industrial environments.

All M Series products are based on Lumentum's decades of large-scale consumer manufacturing and deliver advantages in efficiency, scalability, and reliability.

Key Features
- 0.29 mm^2 chip size
- 940 nm wavelength
- Optical power: 90W @ 15A/16.7V
- 6.3 W/A typical slope efficiency
- IATF-16949 certified manufacturing and chip-level AEC-Q102 qualified

Benefits
- High power density with small form factor
- Best-in-class peak power enables short- to long-range LiDAR

Applications
- Automotive and industrial 3D sensing
- Short- to long-range LiDAR
- Advanced robotics
- ADAS blind-spot detection

Electrical and Optical Characteristics

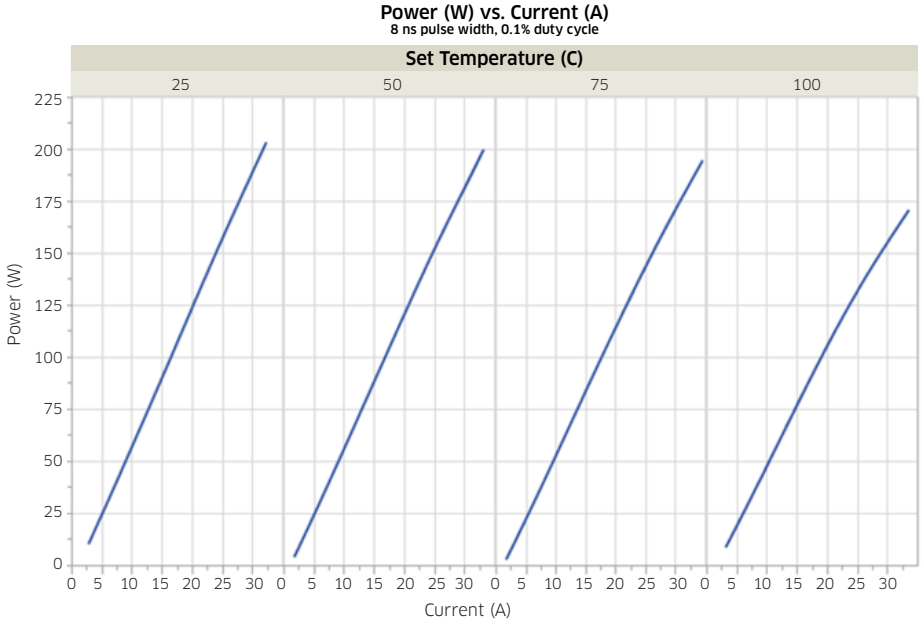
	Units	Minimum	Typical	Maximum	Comments
Electrical					
Operating temperature	°C	0	25	105	Ambient temperature
Operating current	A	-	15	20	25°C
Operating voltage	V	-	16.7	-	25°C
Peak power	W	81	90	-	25°C
Pulse duration	ns	-	8	12	Pulse width used for specification; Chip may be drive under other conditions
Duty cycle	%	-	0.1	0.2	
Power conversion efficiency	%	30	36	-	25°C
Slope efficiency	W/A	-	6.3	-	Ith to Iop, 25°C
Differential resistance	ohm	-	0.3	-	20% to 100% Iop, 25°C
Optical					
Divergence (FW D86)	deg	16	-	25	25°C
Center wavelength	nm	934	940	946	25°C
Spectral width	nm	-	1.6	4	25°C, FWHM

Absolute Maximum Characteristics

	Units	Minimum	Typical	Maximum	Comments
Absolute Maximum Rating					
Forward voltage Vmax	V	-	-	30	25°C, <12 ns pulse duration, <0.2% duty-cycle
Forward current I	A	-	-	30	
Active region temperature	°C	-	-	150	Under any drive conditions

LI Curve Characteristics:

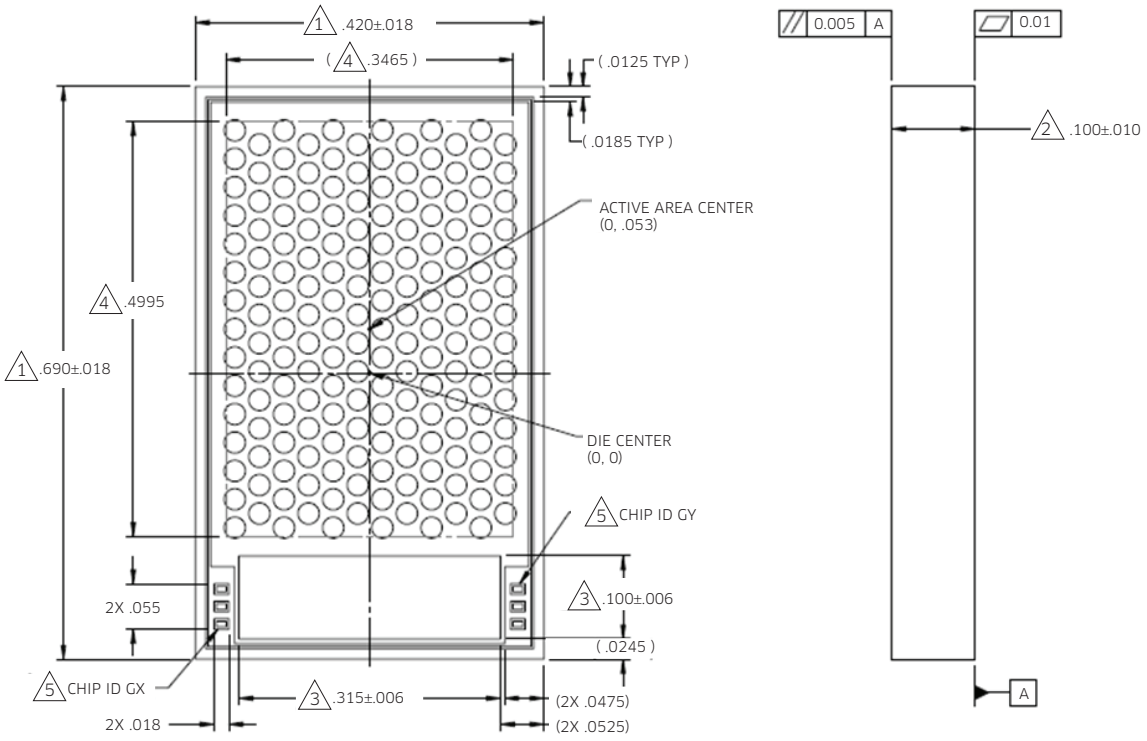
8 ns pulse width, 0.1% duty cycle



Mechanical Characteristics:

NOTE: UNLESS OTHERWISE SPECIFIED

1. DIE SIZE: X=420µm±18µm
   Y=690µm±18µm
2. DIE THICKNESS=100µm±10µm
3. BONDPAD ZONE A SIZE : X=315µm±6µm
   Y=100µM±6µM
4. ACTIVE AREA : 346.5µm X 499.5µm
5. CHIP ID: 18µm X 55µm



Laser Safety

Notes:
1. This component requires the provision of drive and control electronics before emitting laser radiation.
2. Laser classification depends upon the system control circuit and any laser safety features provided.
3. Both IEC 60825-1 and FDA/CDRH certifications are system-level requirements.
4. Compliance with 21CFR 1040.10 and/or IEC 60825- 1:2014 will need to be determined at the system level

Ordering Information
For more information on this or other products and their availability, please contact your local Lumentum account manager or Lumentum directly at customer.service@lumentum.com.

Description	Ordering Number
90 W 940 nm Multi-Junction Array, M54-110	22290469

LUMENTUM

North America
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Outside North America
Toll Free: 800 000 LITE (5483)

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