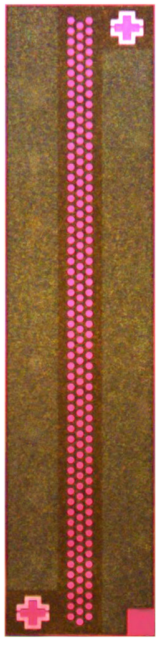
LUMENTUM

100 W 905 nm Multi-Junction VCSEL Array

M52-100



The M52-100, a 100 W 905 nm VCSEL array, is part of the Lumentum automotive and industrial 3D sensing portfolio for next-generation applications. With a 63µm-wide emission area, the automotive-qualified M52-100 delivers high power and fit-for-purpose functionality in a tiny package. This narrow emission area makes the M52-100 a power-dense product ideal for time-of-flight line-scanning LiDAR solutions.

M52-100 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

- 0.63 mm^2 chip size
- 115 W typical peak optical power at 25°C (10 ns PW, 0.1% DC, I_{op}=32 A)
- 3.6 W/A typical slope efficiency
- IATF-16949 certified manufacturing and AEC-Q102 qualified

Benefits

- High power density with small form factor
- Best-in-class peak power enables short- to long-range LiDAR
- Enables high power line scanning LiDAR

Applications

- Automotive and industrial 3D sensing
- Advanced robotics
- Short- to long-range LiDAR
- Mechanical LiDAR
- Line scanning LiDAR

Electrical and Optical Characteristics

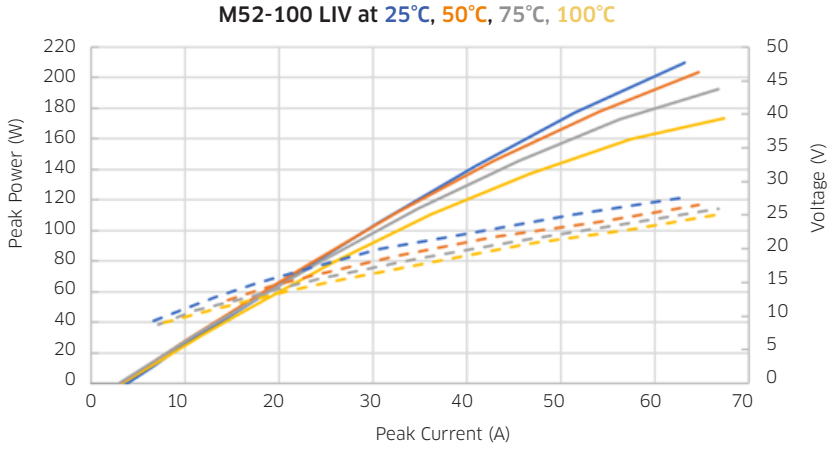
	Units	Minimum	Typical	Maximum	Comments
Electrical					
Operating temperature	°C	-40	25	125	Junction temperature
Operating current	A	-	32	42	-40°C–125°C
Operating voltage	V	-	21	-	25°C
Peak power	W	88	115	-	-40°C–125°C
Pulse duration	ns	-	8	12	Pulse width used for specification; Chip may be driven under other conditions
Duty cycle	%	-		0.1	
Power conversion efficiency	%	-	18	-	25°C
Slope efficiency	W/A	-	3.6	-	25°C
Differential resistance	ohm	-	-	0.5	-40°C–125°C
Optical					
Divergence (FW D86)	deg	-	20	24	-40°C–125°C
Central wavelength	nm	897	905	913	25°C
Spectral width (-8.5 dB from peak)	nm	-	2.0	4.0	25°C

Absolute Maximum Characteristics

	Units	Minimum	Typical	Maximum	Comments
Absolute Maximum Rating					
Forward voltage V_{max1}	V	-	-	25	25°C, <12 ns pulse duration, < 0.1% duty-cycle
Forward current I_{max1}	A	-	-	55	
Active region temperature	°C	-	-	150	Under any drive conditions

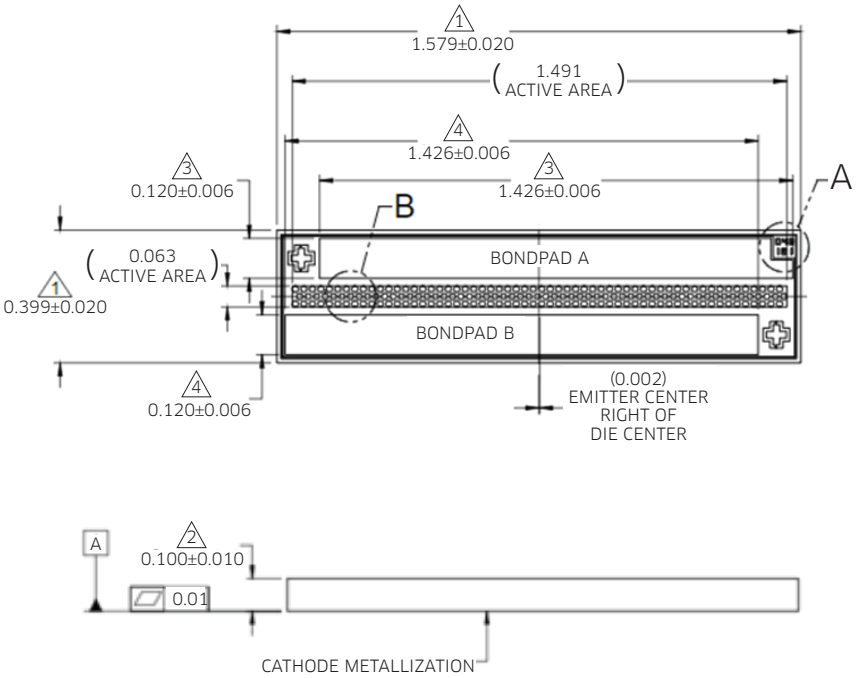
LIV Characteristics:

8 ns pulse, 0.1% duty cycle; Temperatures mentioned are heat sink temperatures



Mechanical Characteristics:

NOTE: UNLESS OTHERWISE SPECIFIED
1. DIE SIZE: X=1579µm±20µm
Y=399µm±20µm
2. DIE THICKNESS=100µm±10µm
3. BONDPAD ZONE A SIZE : X=1426µm±6µm
Y=120µm±6µm
4. BONDPAD ZONE B SIZE : X=1426µm±6µm
Y=120µm±6µm



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
100 W 905 nm Multi-Junction VCSEL Array, M52-100	22184906

LUMENTUM

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Toll Free: 800 000 LITE (5483)

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