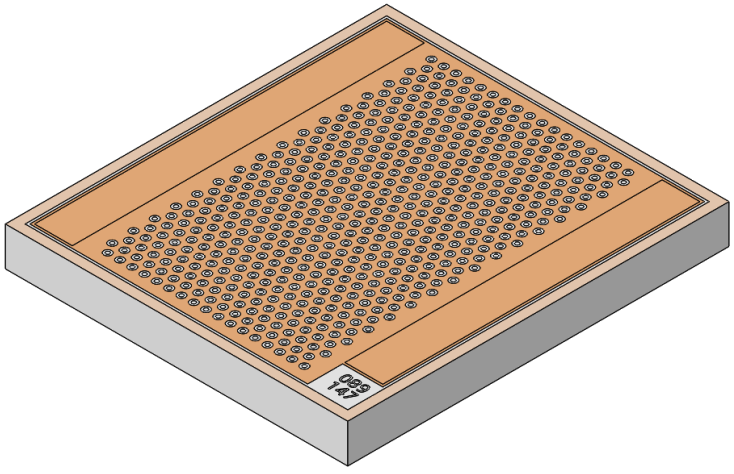
LUMENTUM

Automotive-Grade 2.3 W 940 nm VCSEL Array for In-Cabin Applications



Lumentum high-power VCSEL array is designed to meet automotive-grade standard for in-cabin 3D sensing applications. This product is manufactured at an IATF-16949 certified foundry. With a high optical power and reliability, this product is a perfect solution for driver monitoring systems and gesture control for in-cabin applications.

Key Features

- Operating temperature from -40°C to 105°C
- High efficiency and reliability
- Double-bond pad design
- Completed AEC-Q102 qualification for automotive in-cabin applications - qualified in a packaged solution

Applications

- Time of flight (ToF) 3D sensing
- Vehicle in-cabin monitoring system
- Driver monitoring system
- Occupancy monitoring system
- Gesture recognition and control

Product Specifications

	Units	Minimum	Typical	Maximum	Comments
Electro-Optical @ 2.7 A					
Operating temperature	°C	-10	50	85	Proposed, note will not meet all the same spec limits as 60°C
Operating temperature – extended range	°C	-40		105	Extended operation for 1% of operating time
Operating current	A	–	2.7	2.7	
Operating voltage	V	1.8	2	2.3	2.7A, 50°C chip backside temperature
Peak power	W	2.0	2.3	2.5	2.7A, 50°C chip backside temperature
Threshold current	A	–	0.3	0.4	2.7A, 50°C chip backside temperature
Wall-plug efficiency	%	38%	43%	50%	2.7A, 50°C chip backside temperature
Slope efficiency	W/A	–	0.87	–	2.7A, 50°C chip backside temperature
Series resistance	ohm	–	0.2	0.26	2.7A, 50°C chip backside temperature
Beam Quality @ 2.7 A					
Far-field profile		–	M-Shape	–	2.7A, 50°C chip backside temperature
Divergence (FW D86)	deg	18.0	21.0	24.0	2.7A, 50°C chip backside temperature
Center wavelength	nm	934	940	946	2.7A, 50°C chip backside temperature
Spectral width (-8.5 dB from peak)	nm	–	1.8	4	2.7A, 50°C chip backside temperature
Pulsed Operation					
50% duty cycle modulation	MHz	10	50	100	Simulated die test condition for actual ToF Burst– Specifications Apply for this Range of operating conditions
Pulsed duration	nS	10	20	100	
Burst duration	mS	0.1	1.0	3.0	
Rise/fall time	pS	–	–	500	Driver/module limited, VCSEL array guaranteed by design
Maximum Rating					
Forward voltage V_{max}	V	–	–	2.6	At 1 to 3ms, 2% - 15% duty cycle, to prevent power drop > 10%
Forward current I_{max1}	A	–	–	4.5	At 1 to 3ms, 2% - 15% duty cycle, to prevent power drop > 10%
Junction temperature T_{jmax}	°C	–	–	150	Under any drive conditions

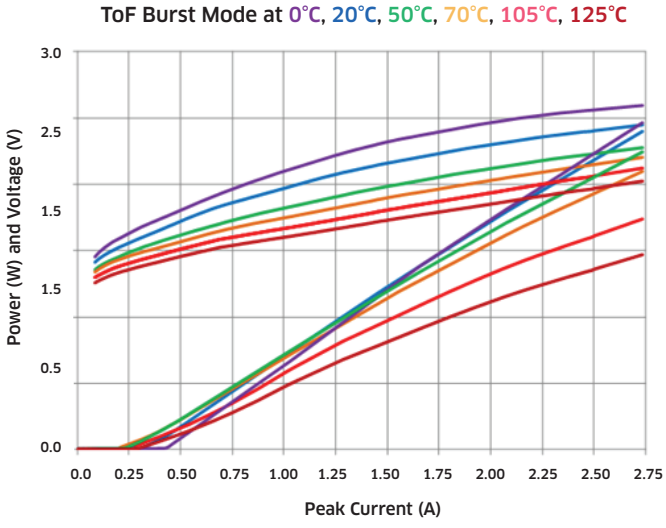
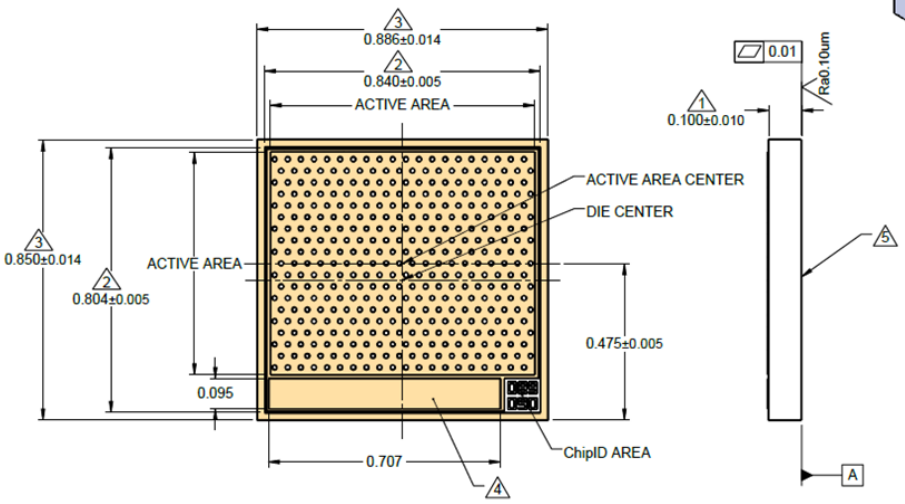


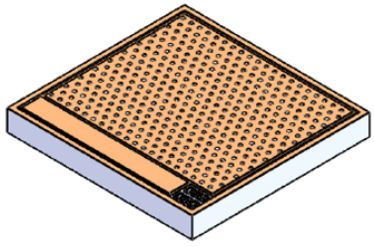
Figure 1: VCSEL LIV Performance

Mechanical Specifications

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIE THICKNESS = 100 um±10 um
2. METAL SIZE: X = 840 um±5 um
   Y = 804 um±5 um
3. CHIP SIZE: X = 886 um±14 um
   Y = 850 um±14 um
4. BOND PAD SIZE: 707um X 95um
   BOND PAD IS ANODE
5. BACK SIDE FULLY COVERED BY CATHODE METALLIZATION





ISO VIEW (SCALE 90:1)

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. Laser is registered with the FDA/CDRH as an OEM component. FDA accession number can be provided upon request.

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 Information
Automotive-Grade 2.3 W 940 nm VCSEL Array for In-Cabin Applications	22201222

LUMENTUM

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