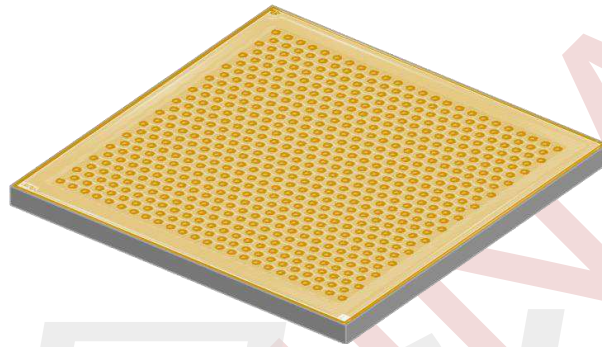


PRELIMINARY

850nm High Power Array VCSEL (10W)

850M-0000-AP04



Near Infra-Red Vertical Cavity Surface Emitting Laser (VCSEL)

Model: Multi Mode Array VCSEL

Specifically designed for high power multi mode applications above 8 Watt optical operating power.

Applications

- Automotive Sensing
- 3D Scanning
- Motion Control
- Time of Flight
- Gesture Recognition

Package Details: Packaging options for the VCSEL die are currently being designed. However, samples of bare die are available for evaluation.



COMPLIES WITH IEC 60825-1, 2nd Edition 2007.

COMPLIES WITH 21 CFR 1040.10 AND 1040-10.11 EXCEPT FOR DEVIATIONS PURSUANT TO LASER NOTICE NO.50 DATED 27 MAY 2001.



Absolute Maximum Ratings

Parameter	Symbol	Rating	Notes
Storage temperature		-40 to 100 °C	
Operating temperature (VCSEL)	Tv	-20 to 90 °C	
Lead solder temperature		260°C, 10 seconds	
Maximum Current (QCW)		20A	Quasi-Continuous Wave Operation: Pulse Width < 1ms, <10% duty cycle
Maximum pulsed current		30A	<20µs pulse width, 0.04% duty cycle, T=25°C (Note 1)

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated for extended periods of time may affect device reliability.

Electro-Optical Characteristics

VCSEL Operating Temp (Tv) =25°C & Operating Current=12A QCW unless otherwise stated)

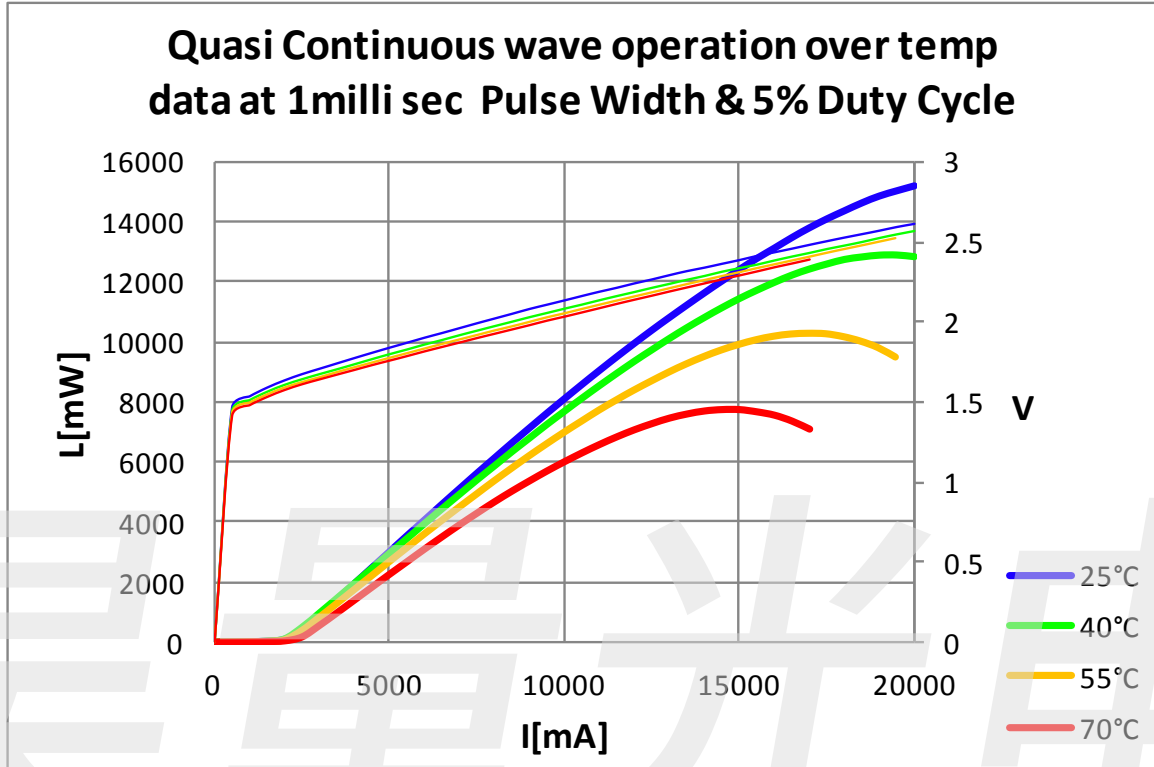
Parameter	Symbol	Units	Minimum	Typical	Maximum	Notes
Threshold current	Ith	A	--	2.0	--	
Operating voltage	Vf	Volts	--	2.25	--	
Slope efficiency	SE	W/m	--	0.98	--	
Optical output power	Lop	W	--	10	--	T=25°C
Reverse breakdown voltage	V		10	--	--	Ir ≤ 1nA
Operating wavelength	λop	nm	840	850	860	
Power Conversion Efficiency	PCE	%	37	40		
Beam divergence FWHM	FWHM	deg	--	25	--	Whole angle
ESD Survival		V	1000	--	--	(Notes 2, 3)

Note 1: For details refer to the Vixar Application Note "Operation of VCSELs Under Pulsed Conditions".
(<http://www.vixarinc.com/technology/applicationnotes.html>)

Note 2: For details refer to the Vixar Application Note "VCSEL EOS/ESD Considerations and Lifetime Optimization".
(<http://www.vixarinc.com/technology/applicationnotes.html>)

Note 3: Applies only to parts that include an ESD diode. ESD diodes cannot be used if the device is being modulated at rates higher than ~ 35MHz. VCSEL shall survive 3 ESD events applied in both the positive and negative polarity. ESD failures are defined as more than a 15% drop in output power or a 10% increase in reverse leakage current. This test is considered destructive and shall not be conducted on prototype or production parts that are shipped for use by the customer.

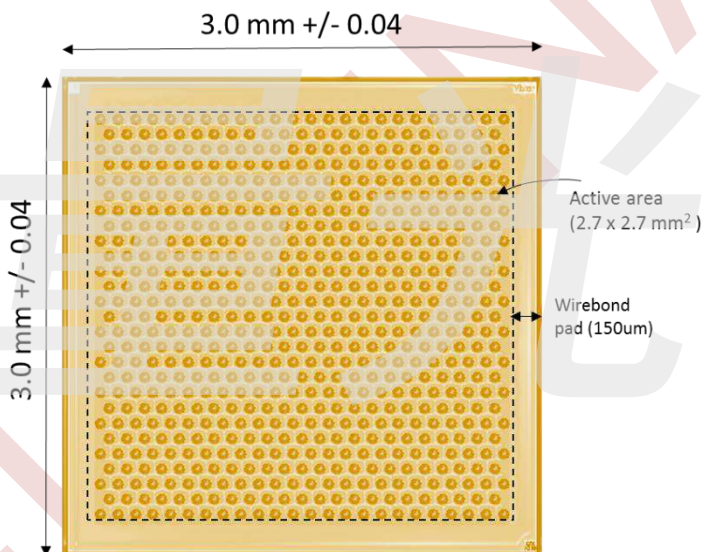
TYPICAL PERFORMANCE CURVES:



Note: Quasi-continuous wave operation assumes pulse durations shorter than 1.0 ms and less than 10% average duty cycle

Die Layout:

Substrate: GaAs
Footprint: 3.0 mm x 3.0 mm
Thickness: 0.15mm +/- 0.01 mm
Orientation: Topside wire-bondable Anode contact
Bottom side solderable gold cathode





ORDERING INFORMATION

Description	Package	Part Number
850nm high efficiency power array VCSEL, 10W	Die	850M-0000-AP04
850nm high efficiency power array VCSEL, 10W package in development	TBD	TBD

Additional notes about bare die

- This array die needs to have good thermal conductivity for the best performance
For Instance, Vixar suggests solder attach instead of silver epoxy attachment of die to a package



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