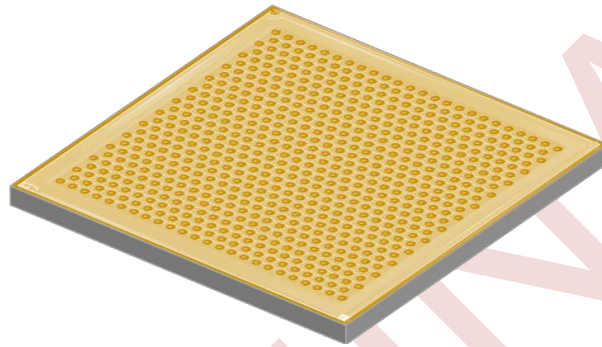


PRELIMINARY

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) | T _v | -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 (T_v) =25°C & Operating Current=12A QCW unless otherwise stated)

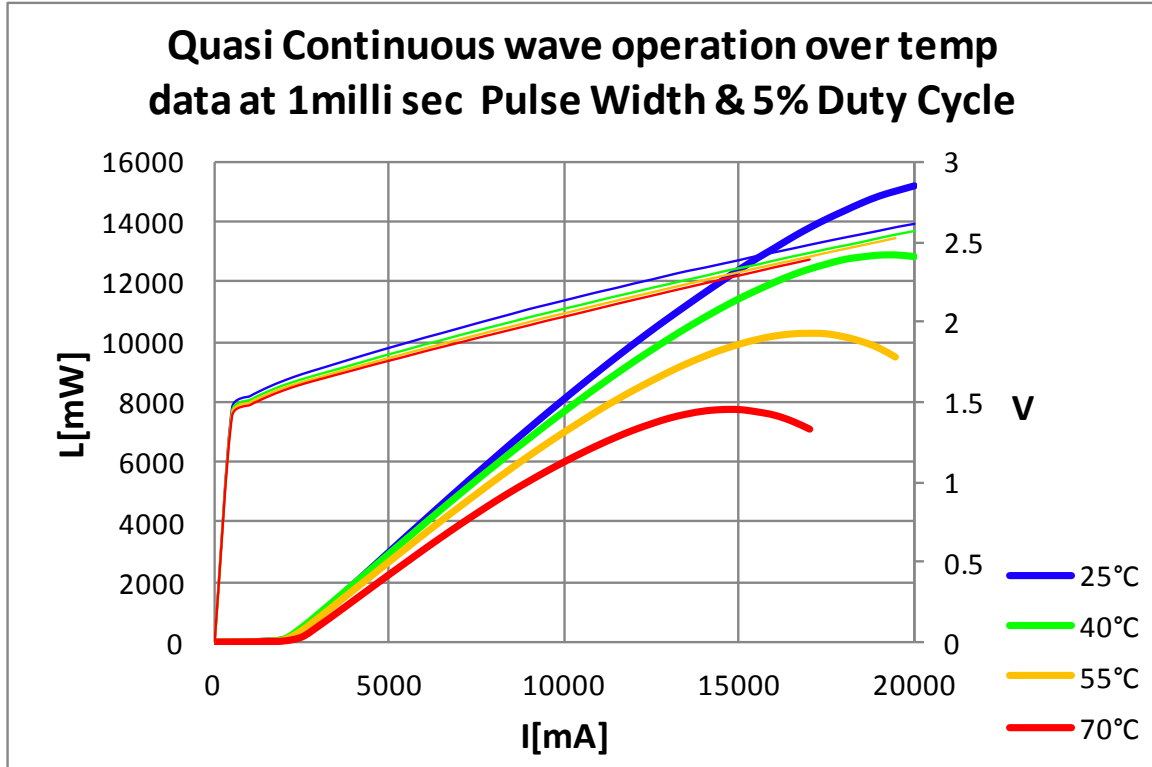
| Parameter | Symbol | Units | Minimum | Typical | Maximum | Notes |
|-----------------------------|-----------------|-------|---------|---------|---------|----------------------|
| Threshold current | I _{th} | A | -- | 2.0 | -- | |
| Operating voltage | V _f | Volts | -- | 2.25 | -- | |
| Slope efficiency | SE | W/m | -- | 0.98 | -- | |
| Optical output power | L _{op} | W | -- | 10 | -- | T=25°C |
| Reverse breakdown voltage | | V | 10 | -- | -- | I _r ≤ 1nA |
| Operating wavelength | λ _{op} | 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.

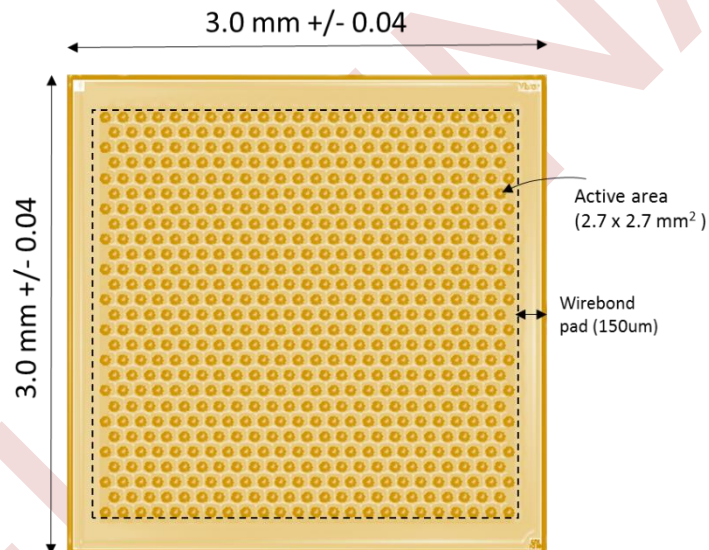
TYPICAL PERFORMANCE CURVES:



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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