Preliminary Data Sheet

# 940nm Multi Mode High Power VCSEL Array

## APS6101010001

II-VI Laser Enterprise's multimode high power VCSEL arrays are designed to meet stringent specifications for a broad range of optical 3D sensing applications. This product offers output powers of typically 0.9W with high efficiency and a rotation symmetrical beam profile. It is optimized for high volume consumer applications.

**Features:**

- Optical output power of 0.9W (QCW) at 940nm
- High efficiency and reliability
- Multi transverse mode emission
- Doughnut shaped, symmetrical farfield
- Non-hermetic operation
- Surface mountable

**Applications**

- High volume time-of-flight (ToF) 3D sensing
- Illumination
- Industrial

## Electro-Optical Characteristics

All Electro-Optical parameters are specified at 25°C, pulsed (0.5ms on, 2.2ms period), unless otherwise noted.

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| Threshold Current | $I_{th}$ | | | 120 | 160 | mA |
| Operating Current | $I_{op}$ | $P_{op}$ =0.9W | | 1.1 | 1.3 | A |
| Operating Voltage | $U_{op}$ | $I=I_{op}$ | 2.1 | 2.3 | 2.5 | V |
| Differential Resistance[1] | $R_{diff}$ | $I=I_{op}$ | 0.6 | 0.8 | 1.0 | Ohm |
| Power Conversion Efficiency | $PCE_{op}$ | $I=I_{op}$ | 31 | 35 | | % |
| Optical Output Power 60°C | $P_{50C}$ | T=60°C, $I=I_{op}$ | 0.7 | 0.76 | 0.95 | W |
| Centre Wavelength | $\lambda_{center}$ | $I=I_{op}$ | 930 | 940 | 950 | nm |
| Spectral Width | $\Delta\lambda_{-10dB}$ | $I=I_{op}$ | | 3 | | Nm |
| Beam Divergence[2] | $\theta_{FW1/e2}$ | $I=I_{op}$ | | 25 | 30 | ° |

[1] Defined as slope around operating current

[2] FW1/e2 = full width 1/e2

## Absolute Maximum Ratings

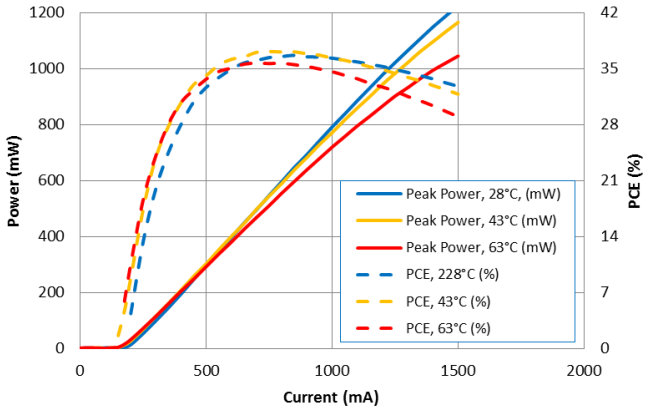
| Parameter | Ratings | Unit | Condition |
|---|---|---|---|
| Continuous Operating Current | 0.8 | A | max 10 seconds |
| Continuous Reverse Voltage | 5 | V | max 10 seconds |
| Peak Operating Current | 1.5 | A | Pulsed (0.3ms on, 2.2ms period) |
| PCB Solder or Reflow Temperature | 260 | °C | max 10 seconds |

## Environmental Exposure Ratings

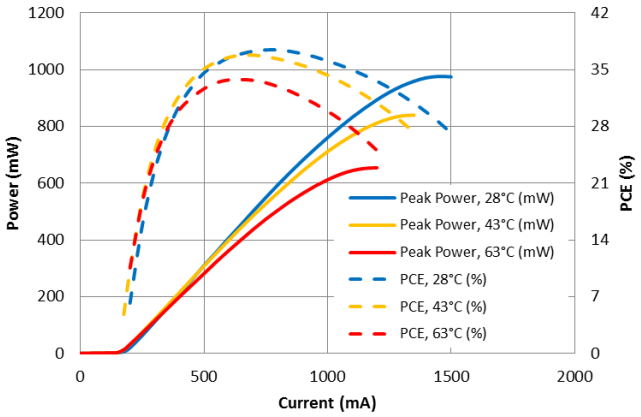
| Parameter | Min | Max | Unit | Condition |
|---|---|---|---|---|
| **Operating Environment** | | | | |
| Operating Temperature | 0 | 50 | °C | |
| Operating Humidity | 0 | 80 | %rH | non-condensing |
| **Storage and Transport Environment** | | | | |
| Storage & Transport Temperature | -40 | 100 | °C | |
| Storage & Transport Humidity | 0 | 80 | %rH | non-condensing |

## Electro-Optical Characterization

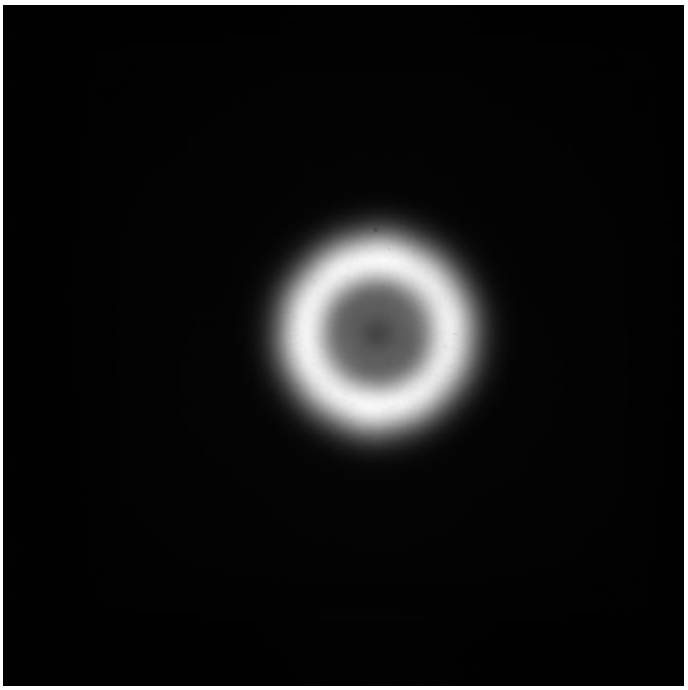
All measurements are performed with the chips soldered on AlN surmounts. Those measurements are indicative of performance only. The specification table details what performance can be expected.



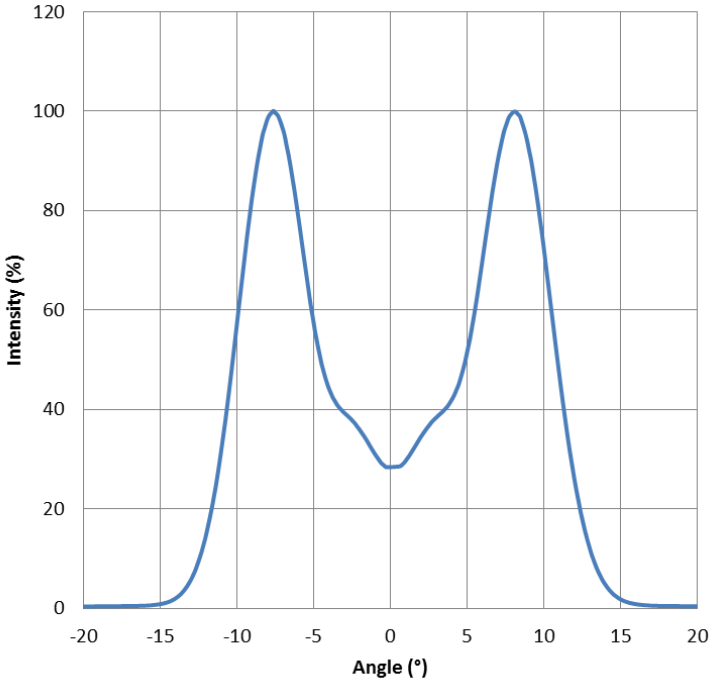

Power vs. Current (solid lines) and Power Conversion Efficiency (dashed line) vs. Current measured at 0.5ms pulse length, 2.2ms pulse period




Power vs. Current (solid lines) and Power Conversion Efficiency (dashed line) vs. Current measured in Continuous Wave (CW) mode



Far Field profile measured at 18°C 1A, 0.5ms pulse length, 2.2ms pulse period

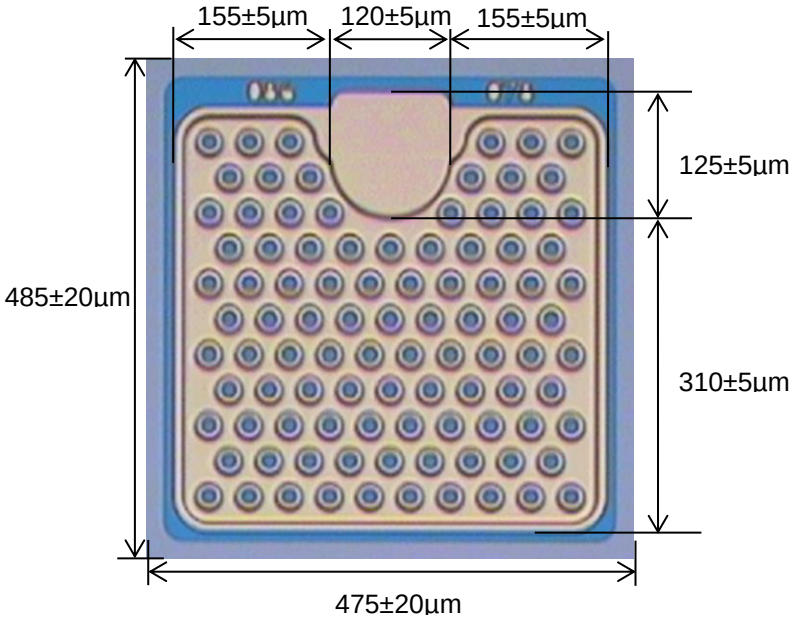



Far Field cross section measured at 18°C 1A, 0.5ms pulse length, 2.2ms pulse period

## Packaging and Supply

- Sawn wafer on adhesive tape
- Wafer map files describing positions of good dice

## Chip Dimensions




Chip thickness: 150±15µm

## RoHS Compliance

II-VI Laser Enterprise is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

## Ordering Information

| Product Code | Description |
|---|---|
| APS6101010001 | 940nm Multi Mode High Power VCSEL Array |

## Contact Information

**www.laserenterprise.com**

## Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by II-VI Laser Enterprise before they become applicable to any particular order or contract. In accordance with the II-VI Laser Enterprise policy of continuous improvement specifications may change without notice. Further details are available from any II-VI Laser Enterprise sales representative.