

MvpLED™ SL-M-B40AC

High Power BLUE LED

BLUE LED

Introduction

The advantages of the patented and proprietary MvpLED™ design especially in Thermal management, and Optical efficacy, are realized in light quality, lifetime, color consistency, reliability and overall efficiency of the luminaire. Available in Blue, Green and UV SemiLEDs high efficiency chips bring real benefits to any lamp or luminaire manufacturer.

Among pure metals at room temperature, copper has the second highest electrical and thermal conductivity after silver. Furthermore, due to the high thermal conductivity of the copper alloy layer, the heat generated in our device is effectively conducted. This is a major advantage for any lamp or luminaire manufacturer. No matter how good a thermal design is, if the contact material to the junction is a poor conductor then the cooling effects of the heat-sink are significantly reduced.

Using a proprietary surface texturing technique, SemiLEDs LEDs maximize light extraction and efficiency. Coupled with a minimal use of Sapphire and a 90% efficient Reflective Layer, SemiLEDs chips exhibit an almost perfect Lambertian radiation pattern.

SemiLEDs' patented and unique process uses a limited amount of Sapphire, which can be recycled and reused multiple times, significantly reducing the Carbon footprint. The reduced dependence on Sapphire also removes a thermal management bottleneck while providing the most environmentally friendly LED on the market.

RoHS and REACH Compliant

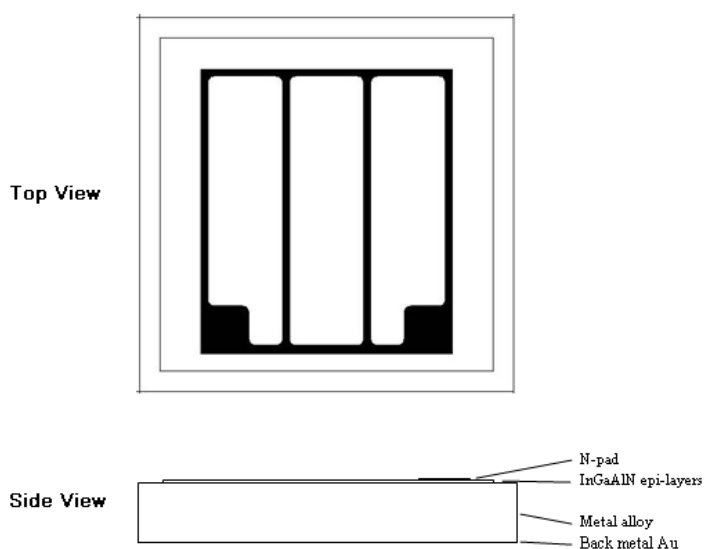
Feature

| | |
|---|--|
| Metal alloy device----- | Low cost high thermal conductivity |
| Thickness 145 μm ----- | Consolidated metal alloy |
| P-N junction high at 140 μm ----- | Silver epoxy die attachment compatible |
| One pad structure----- | Low package cost |
| Nearly Perfect Lambertian emission pattern----- | Ideal for white light design |
| Patterned surface ----- | Maximum light extraction |

Applications

LCD backlight
 Digital Camera Flash light
 High Power LED
 Automotive lighting
 Signalling
 Signage
 Light Engine

Chip Mechanical Diagram



Mechanical Specifications

| | | |
|--------------------|---|-----------------------|
| P-N junction area | 970 μm X 970 μm | $\pm 20 \mu\text{m}$ |
| Base area | 1070 μm X 1070 μm | $\pm 50 \mu\text{m}$ |
| Chip thickness | 145 μm | $\pm 15 \mu\text{m}$ |
| Bond pad size | 140 μm | $\pm 15 \mu\text{m}$ |
| Bond pad thickness | 2.5 μm | $\pm 0.5 \mu\text{m}$ |
| Junction high | 140 μm | $\pm 15 \mu\text{m}$ |

Optical and Electrical Characteristics at 350mA, Ta at 25°C

| Parameter | Symbol | Min | Typ | Max | Remark |
|--------------------|-----------------|-----|-----|-----------|------------|
| Forward voltage: | Vf | | 3.1 | 3.3 | Volt |
| Spectra half width | $\Delta\lambda$ | | 20 | 40 | nm |
| Reverse current | Ir | | | 2 μ A | Vr= 5 Volt |

Measured by SemiLEDs on bare chip

Absolute Maximum Ratings, Ta at 25°C

| | |
|---|-----------------|
| Forward Current (DC) | 500 mA |
| Peak Forward Current (1/10 duty cycle @ 1KHz) | 800 mA |
| LED Junction Temperature | 125°C |
| Reverse Voltage | 5 V |
| Operating Temperature | -40°C to +110°C |
| Storage Temperature | -40°C to +110°C |
| Temperature during packaging (reflow) | 280°C < 10 sec |

Maximum ratings are strongly package dependent and may differ between different packaged devices. The values given were collected by SemiLEDs' in-house package.

BIN Table (Output Power at 350mA, Ta at 25°C)

| Wd Range(nm) | 350-400mW | 400-450mW | 450-500mW | 500-550mW |
|--------------|-----------|-----------|-----------|-----------|
| 450-452.5 | AF | AG | AH | AI |
| 452.5-455 | BF | BG | BH | BI |
| 455-457.5 | CF | CG | CH | CI |
| 457.5-460 | DF | DG | DH | DI |
| 460-462.5 | EF | EG | EH | EI |
| 462.5-465 | FF | FG | FH | FI |
| 465-467.5 | GF | GG | GH | |
| 467.5-470 | HF | HG | HH | |
| 470-472.5 | IF | IG | IH | |
| 472.5-475 | JF | JG | JH | |

Performance Diagram

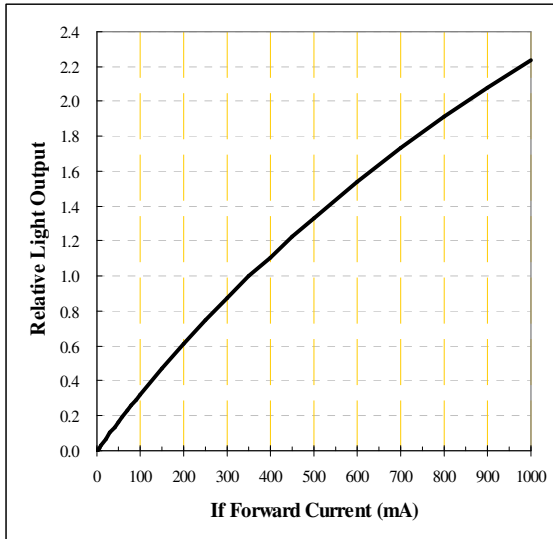


Fig-1 Relative Light Output vs. Forward Current.

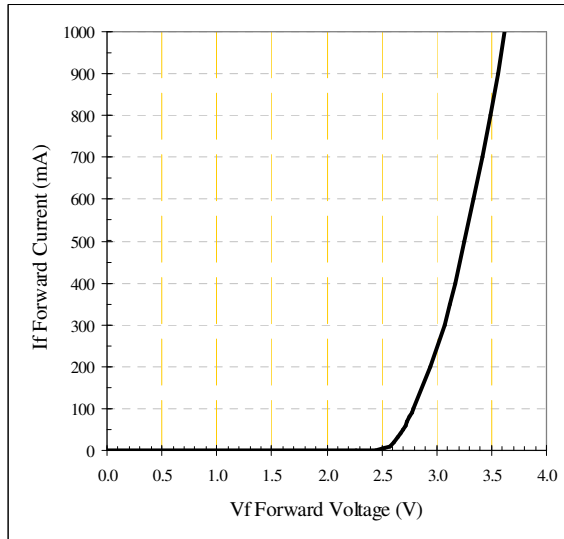


Fig-2 Forward Current vs. Forward Voltage.

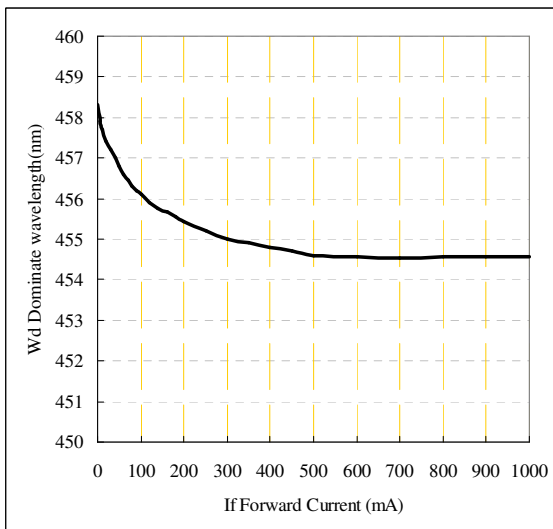


Fig-3 Forward Dominate Wavelength vs. Forward Current.

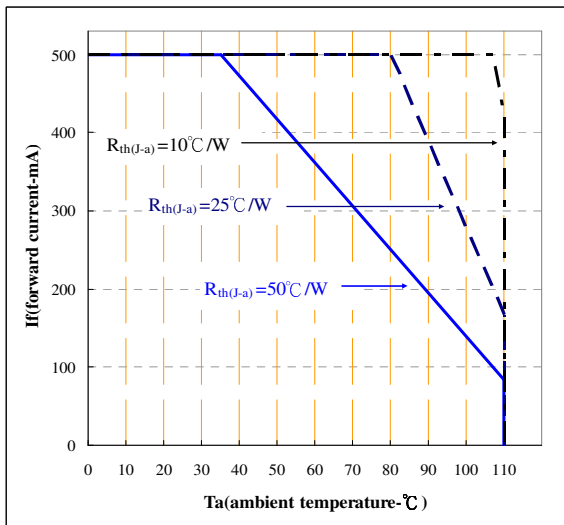


Fig-4 Maximum Driving Forward DC Current vs. Ambient Temperature.

Note:

- Minimum and maximum value refers to the limits and set up of SemiLEDs' testers. All other measurement data are defined as long-term production mean values and are only given for information.
- A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system. Life support devices or systems are intended (i) to be implanted in the human body, or (ii) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered. Components used as a critical component must be approved in writing by SemiLEDs.

About Us

SemiLEDs is a manufacturer of ultra-high bright LED chips with state of the art fabrication facilities in Hsinchu Science Park, Taiwan. SemiLEDs specializes in the development and manufacturing of metal alloy vertical LED chips in blue (white), green and UV using our patented and proprietary MvpLED™ technology. This unique design allows for higher performance and longer lumen maintenance. SemiLEDs new high power I-core MvpLEDs can deliver 120lm/W. In December 2008 The World Economic Forum recognized SemiLEDs' innovations with the 2009 Technology Pioneer Award.



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