

I-core™ (IC) LED

SL-V-B15AK

High Brightness BLUE LED

BLUE LED

Introduction

The advantages of SemiLEDs' patented and proprietary I-core MvpLED™ design, especially in thermal management, and optical efficacy, are realized in light quality, lifetime, color consistency, reliability and overall efficiency of the luminaire. The sleek new design of the I-core™ LED provides significant improvements in brightness while maintaining very low forward voltage. Suitable for a wide array of applications including general illumination, digital camera flash lights and mobile phone LCD backlights, the new SL-V-B15AK I-core LED is a vertically structured chip that combines exceptional value with remarkable performance.

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 while consuming no Sapphire. 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

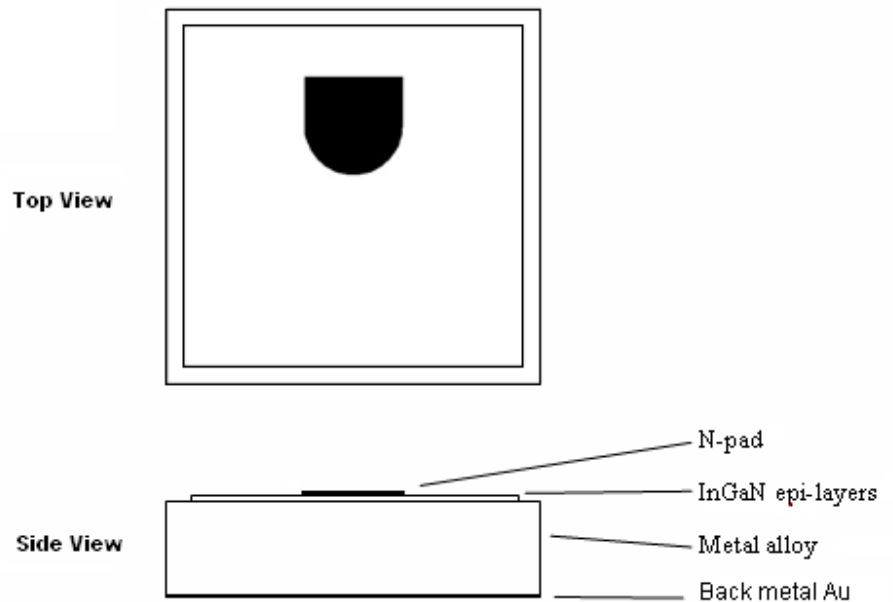
Feature

Metal alloy device-----	Low cost high thermal conductivity
Thickness 80 μm -----	Less thermal distance
P-N junction high at 75 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

Illumination
 Outdoor Video Display Board
 Mobile phone LCD backlight
 Digital Camera Flash light
 Automotive lighting
 Signalling
 Signage
 Miniature Light Engine

Chip Mechanical Diagram



Mechanical Specifications

P-N junction area	340 μm X 340 μm	± 20 μm
Base area	400 μm X 400 μm	± 25 μm
Chip thickness	80 μm	± 15 μm
Bond pad size	115 μm	± 10 μm
Bond pad thickness	2.5 μm	± 0.5 μm
Junction high	75 μm	± 15 μm

Optical and Electrical Characteristics at 20mA, Ta at 25°C

Parameter	Symbol	Min	Typ	Max	Remark
Forward voltage:	Vf		3.2	3.5	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)	50 mA
Peak Forward Current (1/10 duty cycle @ 1KHz)	120 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

Note: 1. 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 20mA, Ta at 25°C)

Wd Range(nm)	20-24mW	24-29mW	29-35mW
450-452.5	AC	AD	AE
452.5-455	BC	BD	BE
455-457.5	CC	CD	CE
457.5-460	DC	DD	DE
460-462.5	EC	ED	EE
462.5-465	FC	FD	FE
465-467.5	BC	GD	
467.5-470	HC	HD	
470-472.5	IC	ID	
475.2-475	JC	JD	

Note:

a. 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 purposes.

b. 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 over 120lm/W. In December 2008 The World Economic Forum recognized SemiLEDs innovations with the 2009 Technology Pioneer Award.



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