

# I-Do AK MvpLED™

## SL-V-B45AK

### High Power BLUE LED

## BLUE LED

### Introduction

The second generation of SemiLEDs patented and proprietary I-Core™ LED chip series, the I-Do AK MvpLED™, is an innovative design ideal for high quality and high performance applications. With advantages in thermal management and optical efficacy, I-Do AK™ LED has longer lifetimes, stable color consistency, and reliability that will contribute to better overall efficiency of a luminaire. The I-Do AK LED delivers significant improvements in brightness through its robust design optimized for higher current operations and maximum light extraction. It features the signature I-Core series electrode pattern for convenient wire bonding, the I-Do AK™ LED is available in Blue.

SemiLEDs chips have a patented Copper-Alloy base that is a better conductor of heat than any other substrate on the market. This is a major advantage for any lamp or luminaire manufacturer. No matter how good a luminaire 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

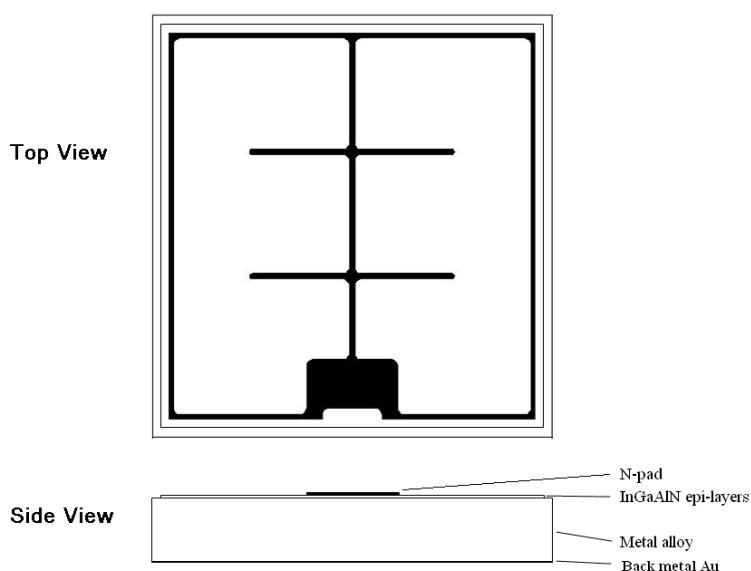
## Feature

Metal alloy device-----	Low cost, high thermal conductivity
Thickness 145 $\mu\text{m}$ -----	Consolidated metal alloy
P-N junction high at 140 $\mu\text{m}$ -----	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  
 Miniature Light Engine

## Chip Mechanical Diagram



## Mechanical Specifications

P-N junction area	1050 $\mu\text{m}$ X 1050 $\mu\text{m}$	$\pm 20 \mu\text{m}$
Base area	1200 $\mu\text{m}$ X 1200 $\mu\text{m}$	$\pm 50 \mu\text{m}$
Chip thickness	145 $\mu\text{m}$	$\pm 15 \mu\text{m}$
Bond pad size	140 $\mu\text{m}$ X 280 $\mu\text{m}$	$\pm 15 \mu\text{m}$
Bond pad thickness	2.5 $\mu\text{m}$	$\pm 0.5 \mu\text{m}$
Junction height	140 $\mu\text{m}$	$\pm 15 \mu\text{m}$

Note: The bond pad size is designed for single wire or two wire bonding. We recommend using gold ball bonding as an electrical connection. The gold ball must not contact the surface outside the pad area. We recommend controlling the gold ball size  $\leq 120\mu\text{m}$ .

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

Parameter	Symbol	Typ	Max	Remark
Forward voltage:	Vf	3.2	3.6	Volt
Spectra half width	$\Delta\lambda$	20	40	nm
Reverse current	Ir		2 $\mu$ 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 and measured in SemiLEDs' in-house package.

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

Wd Range (nm)	600-650mW	650-700mW
450-452.5	AK	AL
452.5-455	BK	BL
455-457.5	CK	CL
457.5-460	DK	DL
460-462.5	EK	
462.5-465	FK	

## Performance Diagram

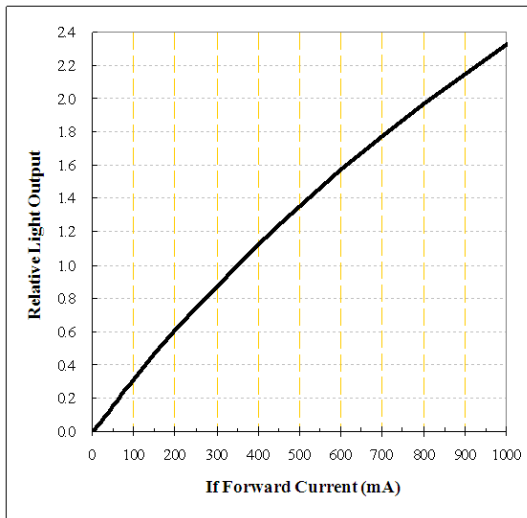


Fig-1 Relative Light Output vs. Forward Current.

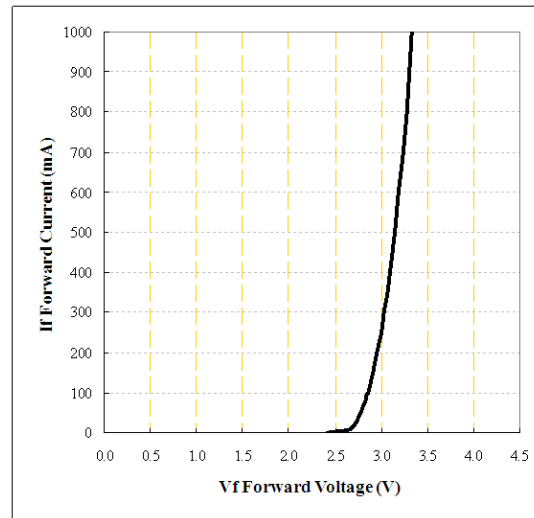


Fig-2 Forward Current vs. Forward Voltage.

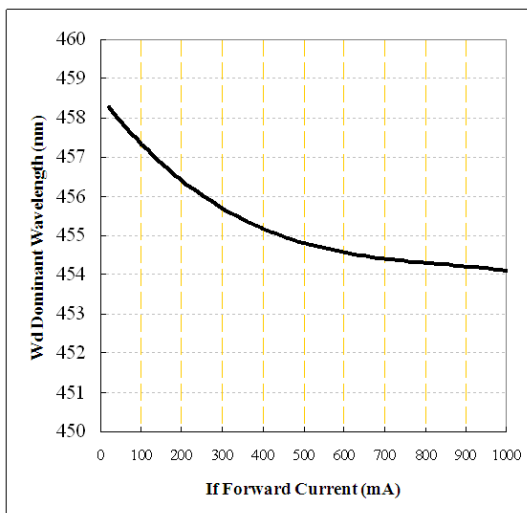


Fig-3 Dominant Wavelength vs. Forward Current.

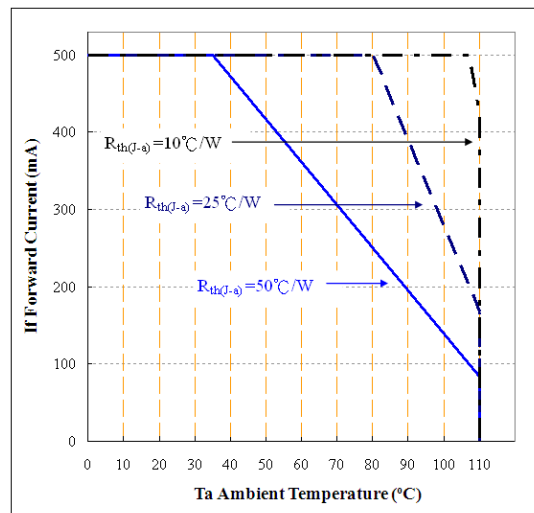


Fig-4 Maximum Driving Forward DC Current vs. Ambient Temperature.

### Note:

- Minimum and maximum value refers to the limits and set up for SemiLEDs' testers. All other measurement data are defined as long-term production mean values and are only given as guidelines
- 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. SemiLEDs LEDs used as critical component must be approved in writing by SemiLEDs.

## About Us

**SemiLEDs Corporation** is a US based manufacturer of ultra-high brightness LED chips with state of the art fabrication facilities in Hsinchu Science Park, Taiwan. SemiLEDs specializes in the development and manufacturing of vertical LED chips in blue (white), green, and UV using a patented copper alloy base. This unique design allows for higher performance and longer lumen maintenance. In December 2008, The World Economic Forum recognized SemiLEDs innovations with the 2009 Technology Pioneer Award. SemiLEDs is fully ISO 9001 Certified

SemiLEDs is a publicly traded company on NASDAQ Global Select Market (stock symbol "LEDS"). For investor information, please contact us at [investors@semileds.com](mailto:investors@semileds.com).

For further company or product information, please visit us at [www.semileds.com](http://www.semileds.com) or please contact [sales@semileds.com](mailto:sales@semileds.com).



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