PRODUCT DATASHEET

Enhanced Vertical™ EV-U40A

High Power UV LED

Introduction

Market applications using UV LEDs are diverse and represent a significant opportunity for any LED packager or integrator. Traditional mercury lamps have many disadvantages that limit UV applications, and mercury is a notorious pollutant. Features of the LED including form factor, wavelength and lifetime, add flexibility to UV applications. SemiLEDs' portfolio of mercury free UV products will enhance and in some cases revolutionize the way applications are built in UV market segments such as Curing, Currency/Document Verification, Tanning, Medical, and Sterilization.

The Enhanced Vertical (EV™) LED series is the latest innovation in high brightness LED chips, an ideal light source for UV applications requiring high power density. Featuring SemiLEDs' vertical chip structure on a patented metal alloy substrate and manufactured with our proprietary process, the EV LEDs offer advantages in excellent optical output and high thermal conductivity, thereby achieving greater light quality, high efficiency, and reliability. Further design advances of the EV LED structure, offer higher thermal endurance for process temperatures up to 325° Celsius and maximum suggested junction temperature of 150° Celsius.

SemiLEDs' patented and unique process uses a limited quantity 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

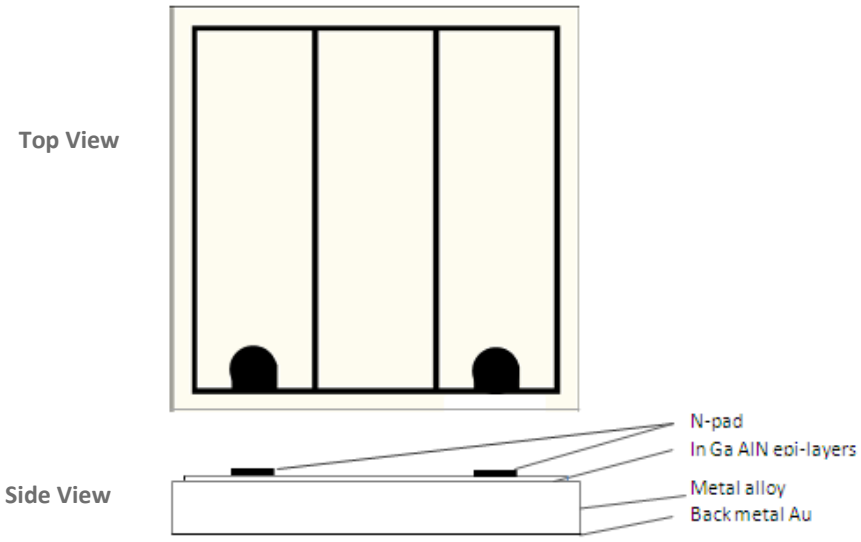
Features

Metal alloy device . . . . . High thermal conductivity
Thickness 145 µm . . . . . Consolidated metal alloy
P-N junction high at 140 µm . . . . . Silver epoxy die attachment compatible
Optimized N-pad design . . . . . Better current spreading
Nearly Perfect Lambertian emission pattern . . . . . Ideal for high output density
Patterned Surface . . . . . Maximum light extraction
High Thermal Endurance . . . . . Eutectic die attach compatible

Applications

LED phosphor lighting
UV air purifier
Medical applications
UV activated applications
Counterfeit detection
Special chemical detection
High resolution optics

Chip Mechanical Diagram



Mechanical Specifications

P-N junction area	970 µm X 970 µm	± 20 µm
Base area	1070 µm X 1070 µm	± 50 µm
Chip thickness	145 µm	± 15 µm
Bond pad size	120 µm X 120 µm	± 15 µm
Bond pad thickness	7.7 µm	± 0.5 µm
Junction height	140 µm	± 15 µm

Note: The bond pad size is designed for single wire bonding per pad. We recommend using gold ball bonding as an electrical connection. The gold ball must not extend outside of the pad area.

Optical and Electrical Characteristics at 350mA, Ta at 25℃

Parameter	Symbol	Min	Typ	Max	Remark
Forward voltage:	Vf		3.2	3.6	Volt
Spectra half width	Δλ		12	25	nm

Absolute Maximum Ratings, Ta at 25℃

Forward Current (DC)	800 mA
LED Junction Temperature	150℃
Reverse Voltage	Note 2
Operating Temperature	-40℃ to +110℃
Storage Temperature (Chip)	-40℃ to +110℃
Storage Temperature (Chip on tape)	-20℃to + 65 ℃
Temperature during packaging (reflow)	325℃(<5sec)

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 and are only given for information.
2. UV LEDs should never be operated with reverse bias.

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

IS(mW)/Wp(nm)	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425
140-160	UEA4	UFA4							
160-180	UEA6	UFA6							
180-200	UEA8	UFA8							
200-220	UEB0	UFB0	UGB0	UHB0					
220-240	UEB2	UFB2	UGB2	UHB2					
240-260	UEB4	UFB4	UGB4	UHB4					
260-280	UEB6	UFB6	UGB6	UHB6	UJB6	UKB6	ULB6	UMB6	UNB6
280-300	UEB8	UFB8	UGB8	UHB8	UJB8	UKB8	ULB8	UMB8	UNB8
300-320	UEC0	UFC0	UGC0	UHC0	UJC0	UKC0	ULC0	UMC0	UNC0
320-340	UEC2	UFC2	UGC2	UHC2	UJC2	UKC2	ULC2	UMC2	UNC2
340-360	UEC4	UFC4	UGC4	UHC4	UJC4	UKC4	ULC4	UMC4	UNC4
360-380	UEC6	UFC6	UGC6	UHC6	UJC6	UKC6	ULC6	UMC6	UNC6
380-400	UEC8	UFC8	UGC8	UHC8	UJC8	UKC8	ULC8	UMC8	UNC8
400-420	UED0	UFD0	UGD0	UHD0	UJD0	UKD0	ULD0	UMD0	UND0
420-440	UED2	UFD2	UGD2	UHD2	UJD2	UKD2	ULD2	UMD2	UND2
440-460	UED4	UFD4	UGD4	UHD4	UJD4	UKD4	ULD4	UMD4	UND4
460-480	UED6	UFD6	UGD6	UHD6	UJD6	UKD6	ULD6	UMD6	UND6
480-500			UGD8	UHD8	UJD8	UKD8	ULD8	UMD8	UND8
500-525			UGE0	UHE0	UJE0	UKE0	ULE0	UME0	UNE0
525-550			UGE2	UHE2	UJE2	UKE2	ULE2	UME2	UNE2

Performance Diagrams

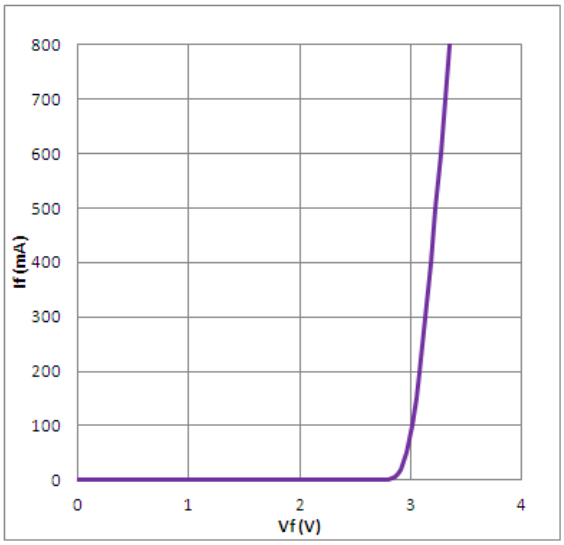


Fig-1 Forward Current vs. Forward Voltage

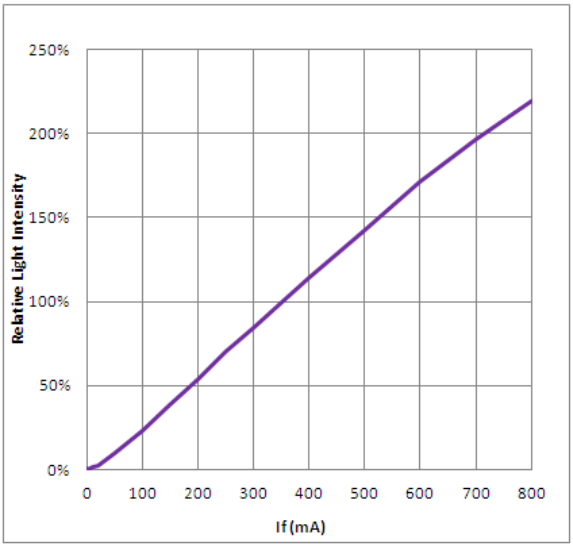


Fig-2 Relative Intensity vs. Forward Current

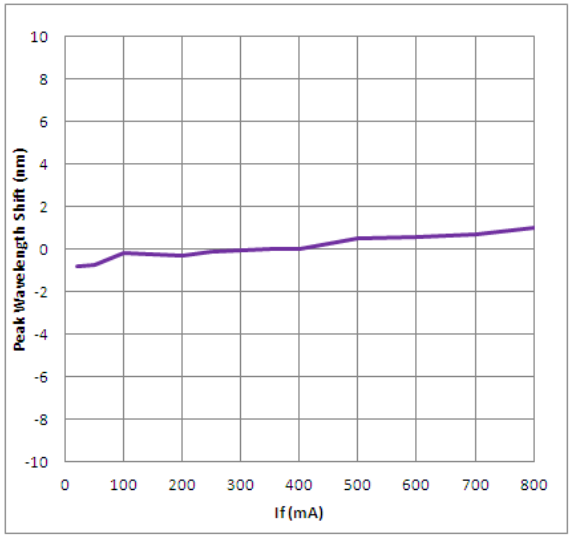


Fig-3 Peak Wavelength Shift vs. Forward Current

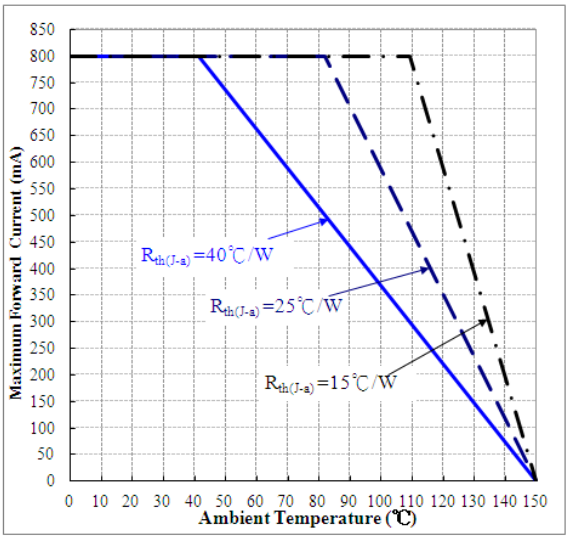


Fig-4 Maximum Forward Current vs. Ambient Temperature

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 reference.

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.

c. These devices emit high intensity UV/NUV light. Necessary precautions must be taken during operation. Do not look directly into the light or look through the optical system when in operation. Protective eyewear should be worn at all times during operation.

d. Lens discoloration may occur with prolonged exposure to UV/NUV light. Lens material will need to be tested for UV/NUV light compatibility and durability.

Caution: Users are requested to comply with the laws and public regulations concerning safety.

About Us

SemiLEDs Corporation is a US company that develops and manufactures ultra-high brightness LED chips and components for general lighting, including street lights and commercial, industrial and residential lighting, along with specialty industrial applications such as UV curing, medical/cosmetic, counterfeit detection and horticulture. 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. The World Economic Forum recognized SemiLEDs innovations with the 2009 Technology Pioneer Award. SemiLEDs is fully ISO 9001:2008 and ISO 9001:2004 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**.

For further company or product information, please visit us at **www.semileds.com** or please contact **sales@ semileds.com**.

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