PRODUCT DATASHEET

Enhanced Vertical™ EV-U80T-U

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

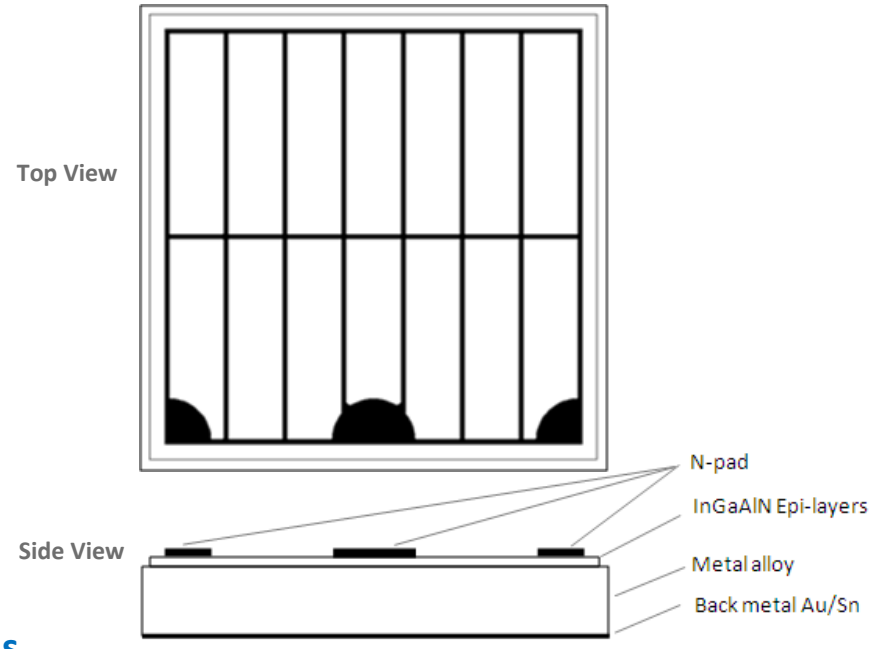
Features

Metal alloy device . . . . . High thermal conductivity
Thickness 145 µm . . . . . Consolidated metal alloy
P-N junction high at 140 µm . . . . . Silver epoxy and solder 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
AuSn bottom metallization . . . . . 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	1930 µm X 1930 µm	± 20 µm
Base area	2090 µm X 2090 µm	± 50 µm
Chip thickness	145 µm	± 15 µm
Corner bond pad size	220 µm X 215 µm	± 15 µm
Center bond pad size	220 µmX 390 µm	± 15 µm
Bond pad thickness	7.7 µm	± 0.5 µm
Junction height	140 µm	± 15 µm
Anode metallization thickness (AuSn)	3 µm	± 0.5 µm

Note: The corner bond pad size is designed for single wire bonding per pad. The center 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 extend outside of the pad area.

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Optical and Electrical Characteristics at 1,000 mA, T_a at 25℃

Parameter	Symbol	Min	Typ	Max	Remark
Forward voltage:	Vf		3.3	3.6	Volt
Spectra half width	Δλ		12	25	nm

Measured by SemiLEDs on bare chip and is only given for information.

Absolute Maximum Ratings, T_a at 25℃

Forward Current (DC)	3,000 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.

Radiant Power Characteristic, T_a at 25℃

Wd	*Radiometric Power (mW) Factor			
	1000mA	1500mA	2000mA	3000mA
380~420nm	1.00	1.51	1.97	2.82

*Power factors are typical value and are for reference only.

BIN Table (Output Power at 1000mA, T_a at 25℃)

IS(mW)/Wp(nm)	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420
800-900	UEH0	UFH0	UGH0	UHH0	UJH0	UKH0	ULH0	UMH0
900-1000	UEJ0	UFJ0	UGJ0	UHJ0	UJJ0	UKJ0	ULJ0	UMJ0
1000-1100	UEK0	UFK0	UGK0	UHK0	UJK0	UKK0	ULK0	UMK0
1100-1200	UEL0	UFL0	UGL0	UHL0	UJL0	UKL0	ULL0	UML0
1200-1300	UEM0	UFM0	UGM0	UHM0	UJM0	UKM0	ULM0	UMM0

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Performance Diagrams

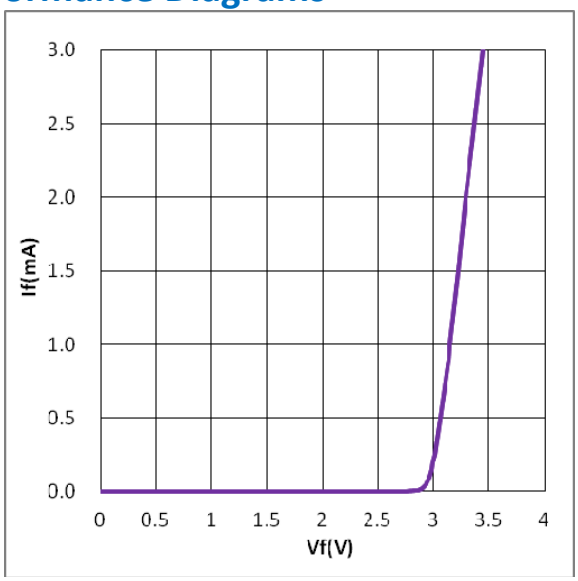

Fig-1 Forward Current vs. Forward Voltage

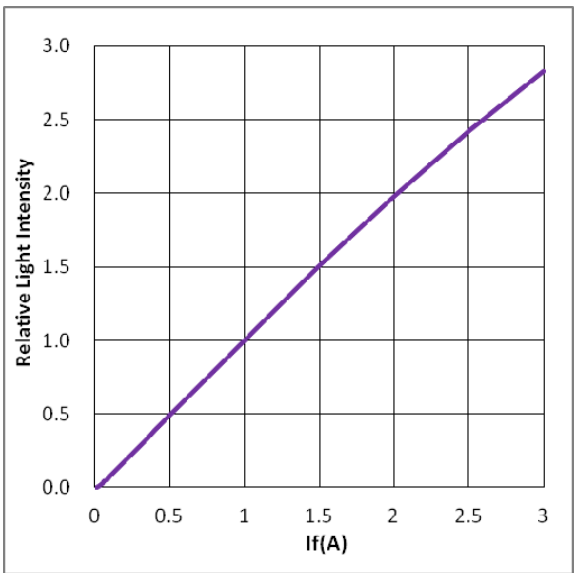

Fig-2 Relative Intensity vs. Forward Current

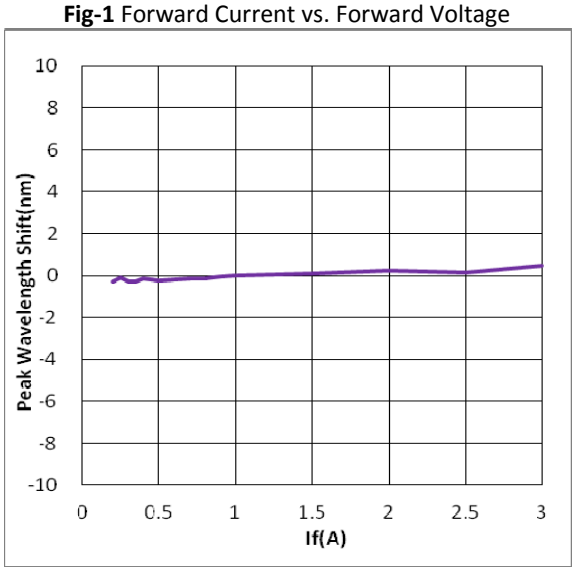

Fig-3 Peak Wavelength Shift vs. Forward Current

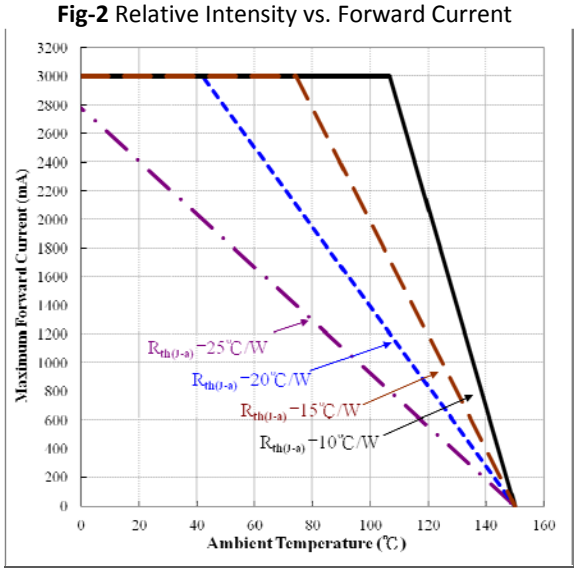

Fig-4 Maximum Forward Current vs. Ambient Temperature

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.

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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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