

# The UV LED Company

## Applications of FoxUV™ LEDs



UV LEDs are currently used in photo-physical, photo-chemical and photo-biological applications spanning over several market verticals. Numerous new applications are being enabled as the technology progresses

### 1. Medical

- a. Dermatology
  - i. Psoriasis Treatment
  - ii. Skin care Products
- b. Biosensors
- c. Blood Serum Analysis
- d. DNA Sequencing & Microarrays
- e. Corneal Treatment

### 2. Military & Homeland Security

- a. Currency Verification
- b. Anthrax Detection
- c. Passport and ID control
- d. Forensic Investigations

### 3. Industrial Curing

- a. Inks
- b. Adhesives
- c. Coatings
- d. Encapsulants

### 4. Beauty Products

- a. Teeth Whitening
- b. Tanning Beds

### 5. Fluorescence Disclosing

- a. Die Tracing
- b. Ink
- c. Various Leakage Detections
- d. Spectro-Fluorometry

### 6. Sterilization & Purification

- a. Toothbrush sterilizer
- b. Photo-deodorizing Air
  - i. Road Vehicles
  - ii. Planes
- c. Bacteria
- d. Other Contaminants

### 7. Vision

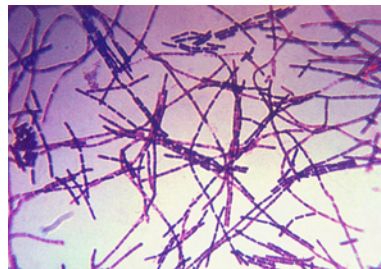
- a. Machine Vision
- b. Insect Vision Manipulation
- c. Insect Attraction

### 8. Hobby & Sporting Uses

- a. Scorpion Detection
- b. Fishing Lures
- c. Aquarium Lighting
- d. Mineral & Coral Fluorescence



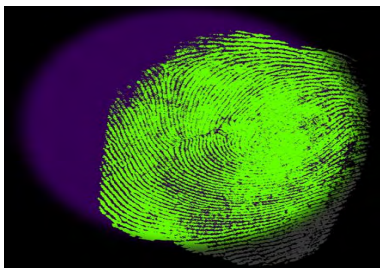
- Consistency and Lifetime enable instrumentation applications such as spectrometers



- Wavelength specificity targets medical and forensic applications such as anthrax detection



- Wavelength specific UV LEDs are used in insect attraction as well as scorpion and mineral detection



- Forensics enabled form factor and robustness of packages



- Safe & Efficient tanning due to lifetime, and wavelength consistency and specificity



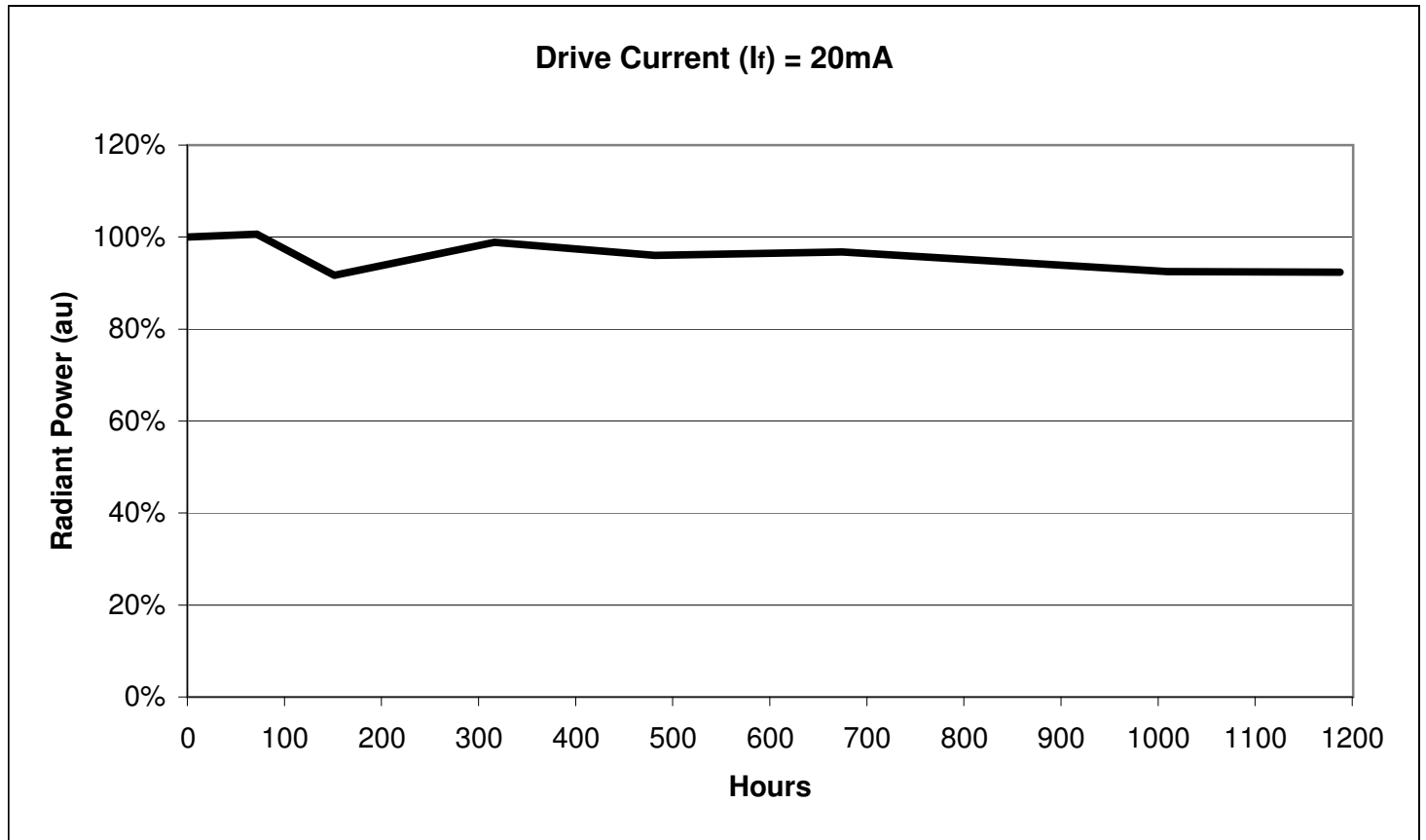
- 360nm is the ideal wavelength for currency verification



# FoxUV™ LED, 360nm, 5mm Round FG360-R5--WC015



Radiometric Power Maintenance Chart ( $T_{\text{ambient}} = 21^{\circ}\text{C}$ )



Typical Radiant Power Maintenance >90% past 1200 hours

March 2007

# FG360-R5--WC015 360nm 5mm Round

## FEATURES AND APPLICATIONS

- Deep UV wavelength, highly consistent
- HVPE epitaxy process, patent protected, unique in the industry
- UV lamps for industrial curing applications and medical/biomedical uses

## SPECIFICATIONS

### Absolute Maximum Rating (Ta = 25°C)

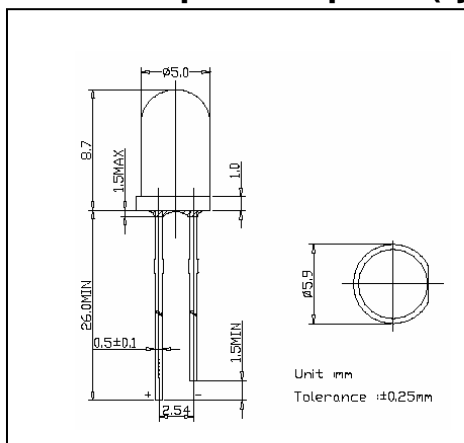
Item	Symbol	Maximum Rating	Unit
DC Forward Current	I <sub>f</sub>	30	mA
Pulse Forward Current*	I <sub>fp</sub>	80	mA
Reverse Voltage	V <sub>r</sub>	5	V
Operating Temperature	T <sub>opr</sub>	-20 to +80	°C
Storage Temperature	T <sub>stg</sub>	-40 to +100	°C

\*Condition: Duty Cycle: 1/10, Pulse Width: 10msec

### Optical and Electrical Characteristics (Ta = 25°C)

Item	Symbol	Condition	Min	Typ.	Max	unit
Forward Voltage	V <sub>f</sub>	I <sub>f</sub> =20mA	3.6	3.8	4.0	V
Reverse Current	I <sub>r</sub>	V <sub>r</sub> =5V	-	-	100	μA
Peak Wavelength	λ <sub>p</sub>	I <sub>f</sub> =20mA	360	361	363	nm
Viewing Angle		I <sub>f</sub> =20mA	-	15	-	deg.
Output Power/Flux	P <sub>o</sub>	I <sub>f</sub> =20mA	300	750	1200	μW

### Lamp Description (typical)

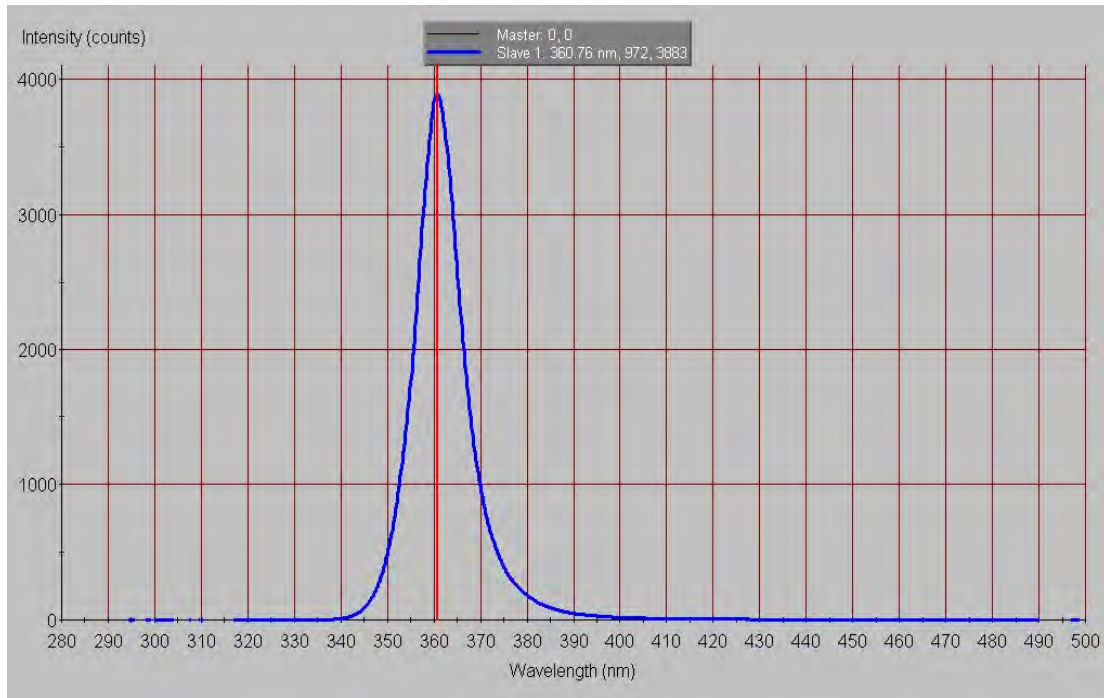


- Round epoxy lens, 5 mm (T-1 3/4 package), UV resistant
- Water clear

Rev.E, Pqx02034

# FG360-R5--WC015 360nm 5mm Round

## Typical Spectrum



## Warnings and Handling Instructions

- UV LEDs emit intense but mainly invisible ultraviolet radiation when in operation, which may be harmful to eyes, even for brief periods.
- **\* DO NOT LOOK DIRECTLY INTO THE UV LED DURING OPERATION \***
- **\* BE SURE THAT YOU AND ALL PERSONS IN THE VICINITY WEAR SAFETY GOGGLES THAT PROVIDE SUITABLE UV PROTECTION WHEN A UV LED IS OPERATING \***
- **\* KEEP CHILDREN AWAY FROM THE OPERATING VICINITY \***
- **\* KEEP UV LEDs OUT OF THE REACH OF CHILDREN \***
- If you incorporate a UV LED into a product, be sure to provide appropriate cautionary labels and instructions.
- Please follow all standard procedures for storing, handling, cleaning, mounting, soldering, disposal, or otherwise handling LED dies or packaged LEDs, including static electricity protection.

Rev.C, Nov. 2012

# FG360-3228WC110 360nm PLCC-2

## FEATURES AND APPLICATIONS

- Low UV-A wavelength, highly consistent
- HVPE epitaxy process, patent protected, unique in the industry
- UV lamps for industrial curing applications and medical/biomedical uses

## SPECIFICATIONS

### Absolute Maximum Rating (Ta = 25°C)

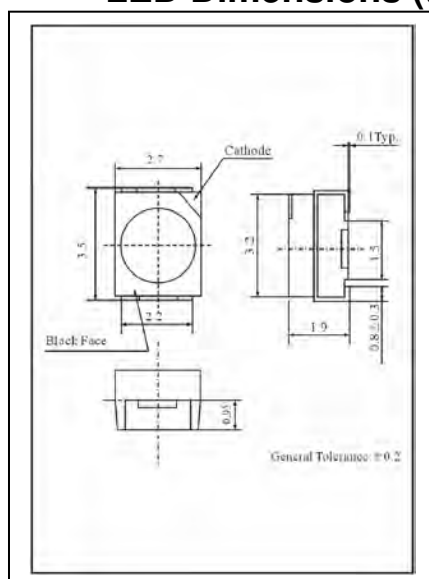
Item	Symbol	Maximum Rating	Unit
DC Forward Current	I <sub>f</sub>	30	mA
Pulse Forward Current*	I <sub>fp</sub>	80	mA
Reverse Voltage	V <sub>r</sub>	5	V
Operating Temperature	T <sub>opr</sub>	-20 to +80	°C
Storage Temperature	T <sub>stg</sub>	-40 to +100	°C

\*Condition: Duty Cycle: 1/10, Pulse Width: 10msec

### Optical and Electrical Characteristics (Ta = 25°C)

Item	Symbol	Condition	Min	Typ.	Max	unit
Forward Voltage	V <sub>f</sub>	I <sub>f</sub> =20mA	3.6	3.8	7.0	V
Reverse Current	I <sub>r</sub>	V <sub>r</sub> =5V	-	-	100	uA
Peak Wavelength	λ <sub>p</sub>	I <sub>f</sub> =20mA	360	361	363	nm
Viewing Angle		I <sub>f</sub> =20mA	-	120	-	deg.
Output Power/Flux	P <sub>o</sub>	I <sub>f</sub> =20mA	300	500	1000	μW

## LED Dimensions (typical)



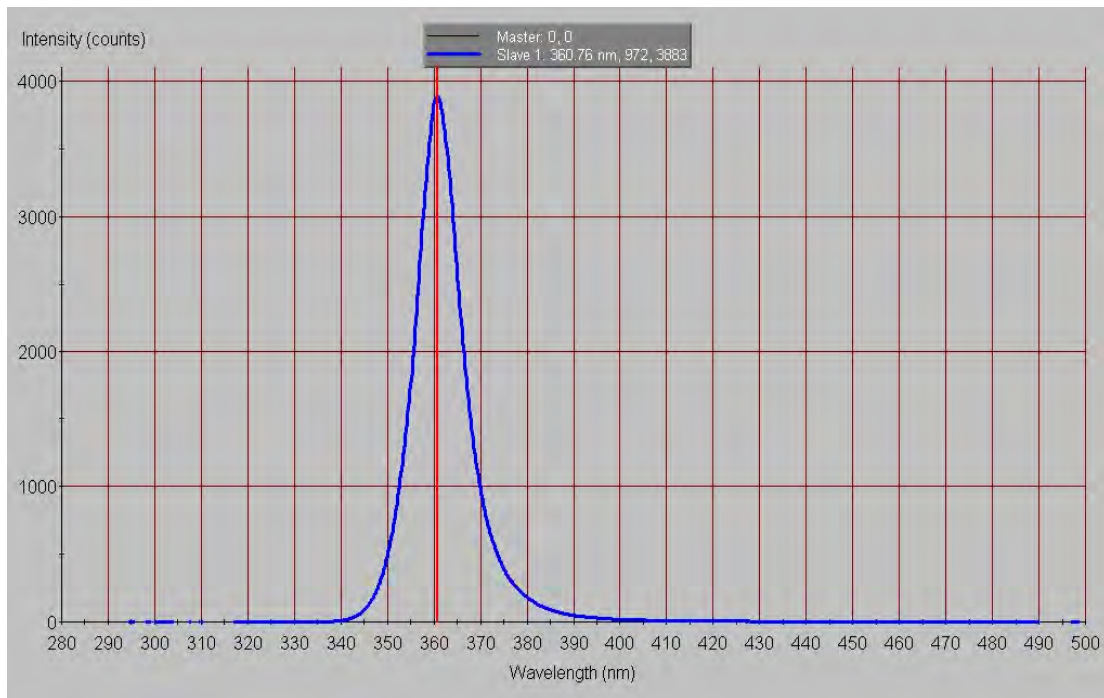
- PLCC-2 mount (also called 3228)
- Epoxy or silicone encapsulant lens
- Surface mount design flexibility and convenience
- Other SMD mounts available – please contact us with your needs

Rev. D, Pqx02034

# FG360-3228WC110 360nm PLCC-2



## Typical Spectrum



## Warnings and Handling Instructions






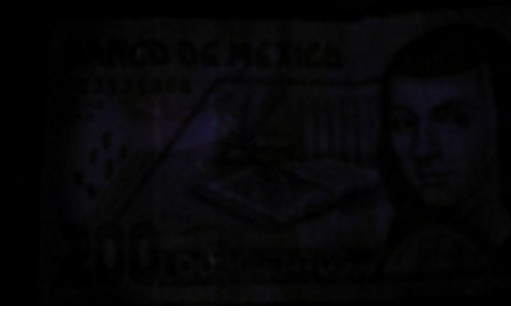


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Rev.B, Nov. 2012

# Currency Verification

390nm UV LED (12mW Output) vs. Fox 360nm UV LED 1mW Output)



Fox Group 360nm (1mW)	390nm (12mW)
<p data-bbox="690 254 781 289"><i>USD</i></p> 	<p data-bbox="1252 254 1343 289"><i>USD</i></p> 
<p data-bbox="699 632 790 667"><i>CAD</i></p> 	<p data-bbox="1235 632 1326 667"><i>CAD</i></p> 
<p data-bbox="686 1056 794 1092"><i>MXN</i></p> 	<p data-bbox="1235 1056 1343 1092"><i>MXN</i></p> 
<p data-bbox="683 1480 774 1516"><i>LBP</i></p> 	<p data-bbox="1232 1480 1323 1516"><i>LBP</i></p> 

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