

CUSTOMER : \_\_\_\_\_.




DATE : 2013. 1. 15.

# SPECIFICATIONS FOR APPROVAL

## NUV LED Chip

MODEL NAME : LEUV-V512A6

APPROVAL	REMARK	APPENDIX

Designed	Checked	Approved
		

## SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	2 / 12

## Change History of Revision

[illegible]

SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	3 /12

CONTENTS

1. Features	-----	4/12
2. Applications	-----	4/12
3. Outline Dimensions	-----	4/12
4. Absolute Maximum Ratings	-----	5/12
5. Electrical Characteristics	-----	5/12
6. Rank Sorting Method	-----	5/12
7. Mechanical Specifications	-----	6/12
8. Typical Characteristics Curve	-----	7-8/12
9. Packaging	-----	9/12
10. Marking of Products(Labeling)	-----	10/12
11. Handling	-----	11/12
12.Die Attachment	-----	12/12
13.Wire Bonding	-----	12/12
14.Others	-----	12/12

SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	4 / 12

1. Features

- AlGaN Technology
- High Brightness and High Efficiency
- Lambertian Radiation
- Long Operation Lifetime
- Thin 90um Chip
- Compatible with Silver Epoxy, Solder Paste, Solder Preform, or Flux Eutectic Attach
- 100% Tested and Sorted by Peak Wavelength, Optical Output Power, and Forward Voltage

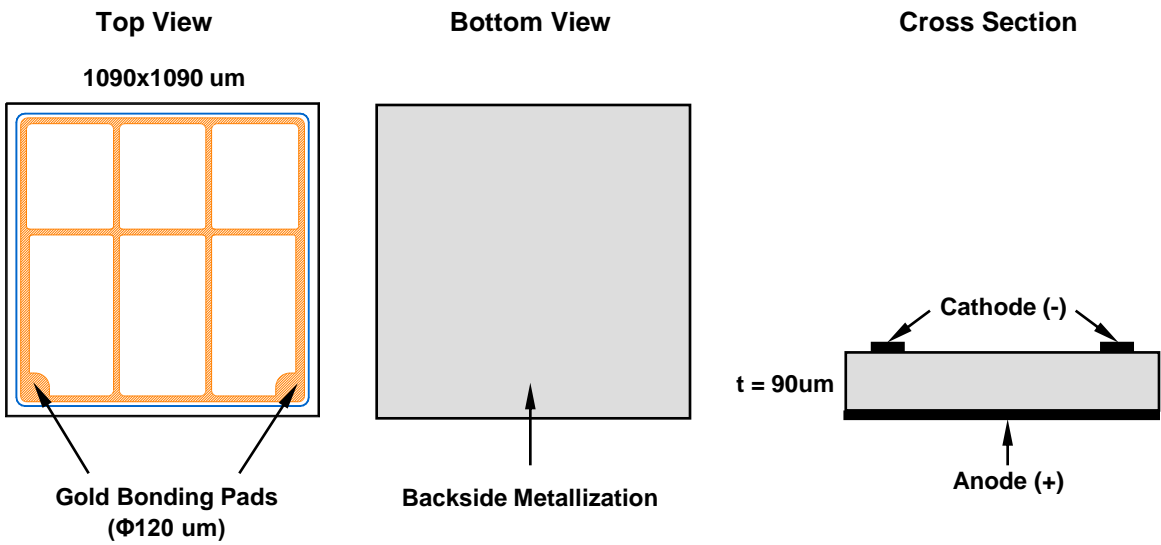
2. Applications

- UV Curing System

3. Outline Dimensions

- Backside Metallization(Au on Backside)

( unit :  $\mu\text{m}$  )



## SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	5 / 12

### 4. Absolute Maximum Ratings Note1)

( Ta=25℃ )

Parameter	Symbols	Conditions	Ratings	Unit
DC Forward Current	$I_F$	$T_j=125^{\circ}\text{C}$	500	mA
Peak Forward Current	$I_{FP}$	1/10 duty cycle @ 1kHz	700	mA
Junction Temperature	$T_j$		125	℃
Reverse Voltage	$V_R$		5	V
Operating Temperature Range			-40~+85	℃
Storage Temperature Range			40~+100	℃
Assembly Processing Temperature			325(<5sec)	℃

### 5. Electrical/Optical Characteristics

( Ta=25℃ )

Parameter	Symbols	Conditions	Min	Typ	Max	Unit
Forward Voltage	$V_F$	$I_F=350\text{mA}$	3.2	3.5	3.8	V
Peak Wavelength	$W_P$		390	395	400	nm
Radiant Flux	$P_O$		380	440	500	mW

### 6. Standard Binning Table

( Ta=25℃ )

Parameter	Conditions	Min	Max	Unit
Forward Voltage	I <sub>F</sub> =350mA	3.2	3.3	V
		3.3	3.4	
		3.4	3.5	
		3.5	3.6	
		3.6	3.8	
Peak Wavelength		390	400	nm
Radiant Flux		470	500	mW
		440	470	
		410	440	
		380	410	

Note:

1.Maximum ratings are strongly package dependent

## SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	6 /12

## 7. Mechanical Specifications

Parameter	Dimensions	Tolerance	Unit
Chip Size	1090 X 1090	$\pm 20$	$\mu\text{m}$
p-n Junction Area	1020 X1020	$\pm 10$	
Chip Thickness	90	$\pm 5$	
Top Gold Bonding PAD	$\Phi 120$	$\pm 5$	
Top Gold Bonding PAD Thickness	2.4	$\pm 0.5$	
Back Contact Metal Area	1090 X 1090	$\pm 20$	nm
Back Side Thickness(Au)	300	$\pm 50$	

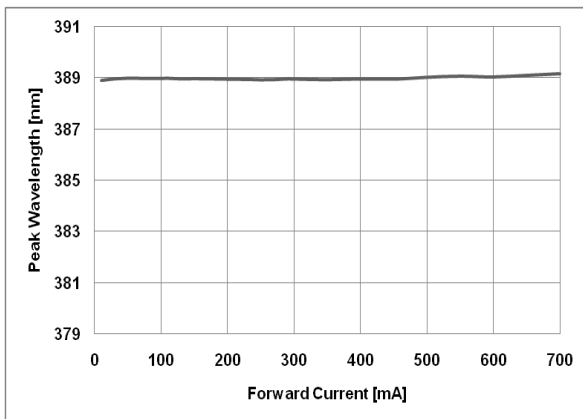
## SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	7 / 12

## 8. Typical Characteristic Curves

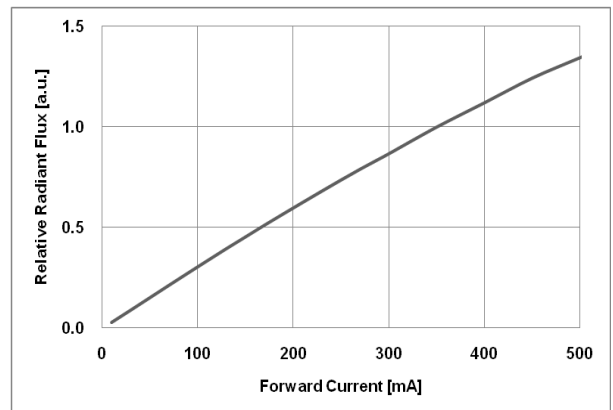
### ■ Forward Current vs. Peak Wavelength

(Ta=25°C)



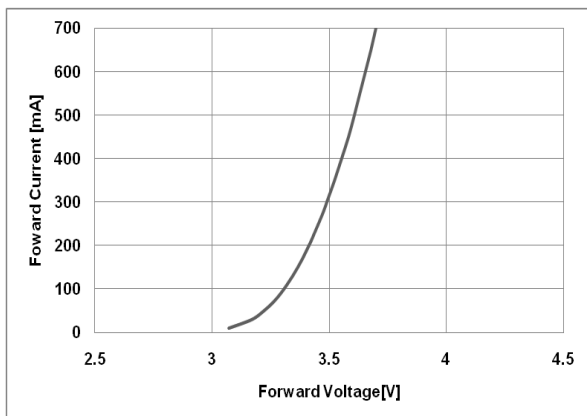
### ■ Forward Current vs. Relative Radiant Flux

(Ta=25°C)



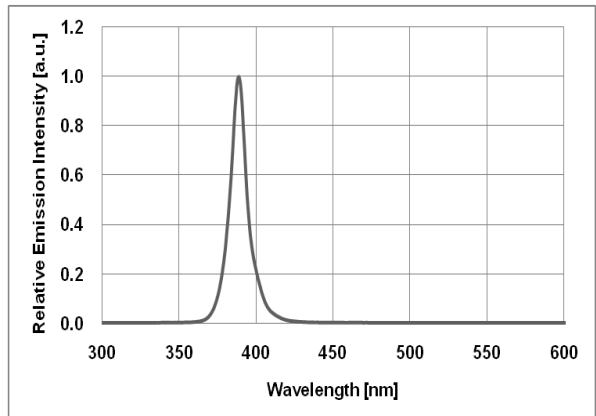
### ■ Forward Current vs. Forward Voltage

(Ta=25°C)



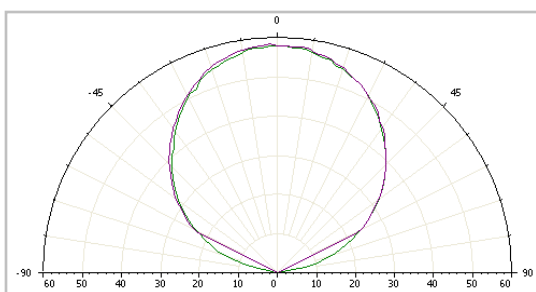
### ■ Spectrum

(Ta=25°C, I<sub>F</sub>=350mA)



### ■ Directivity

(Ta=25°C, I<sub>F</sub>=350mA)

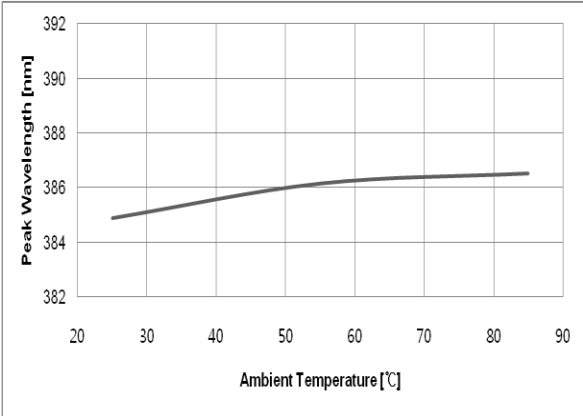


\* Tested with LGIT standard circuit board.

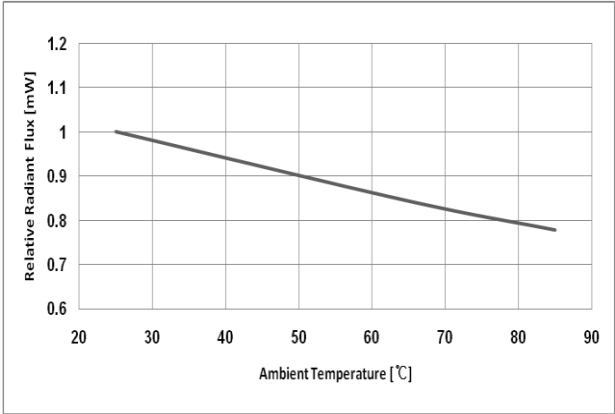
SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	8 /12

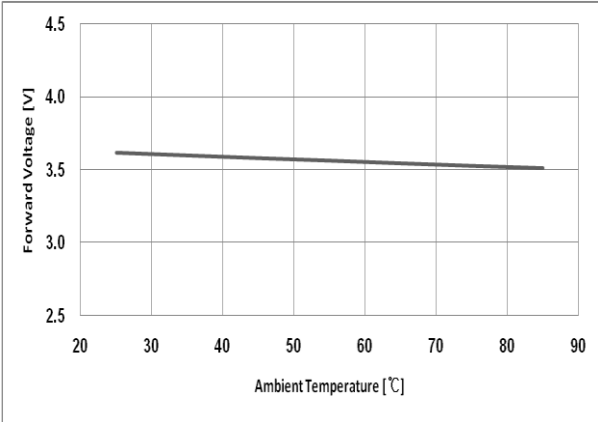
■ Ambient Temperature vs.  
Peak Wavelength



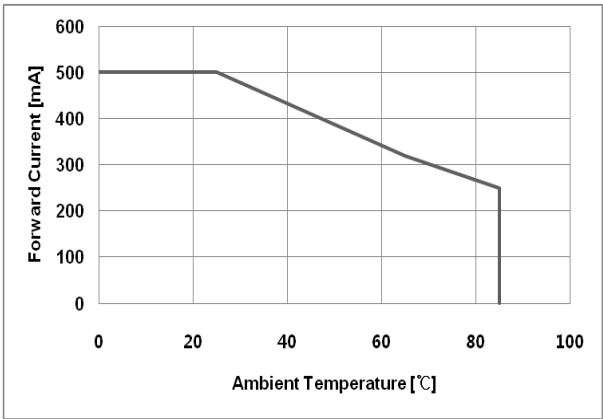
■ Ambient Temperature vs.  
Relative Radiant Flux



■ Ambient Temperature vs.  
Forward Voltage



■ Ambient Temperature vs.  
Allowable Forward Current



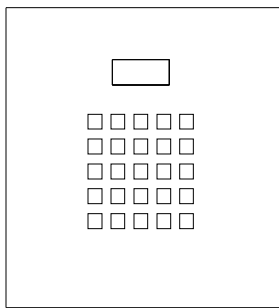


## SPECIFICATION

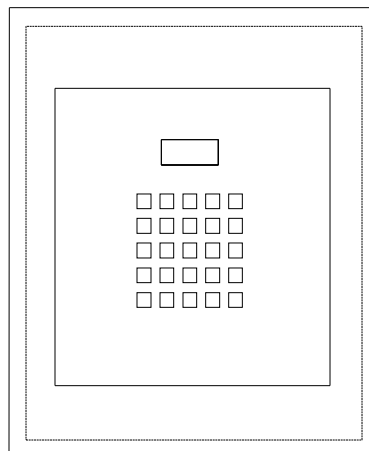
MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	9 /12

## 9. Packaging

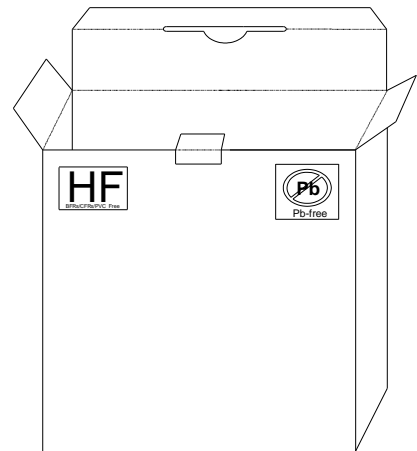
The product to be delivered to the customer is packaged in an Anti-Electrostatic Polyethylene Bag, which like its name is intended to protect the product from electrostatic. The product inside the bag is placed in a box to shield it from external damage or shock. The label on the box provides information on the product model, chip size, manufacture date, and recipient.



(a)



(b)



(c)

### **(a)Chip Sheet**

The chips are evenly spaced and arranged upon a blue sheet. A label provides information on the chip model, rank, manufacturing company, and properties.

### **(b)Anti-Electrostatic Polyethylene Bag**

To protect the customer's product from electrostatic, it is packaged in an Anti-Electrostatic Polyethylene Bag.

### **(c)Paper-based Box**

To ensure protection of the product (inside the Anti-Electrostatic Polyethylene Bag), a paper-based box is used for final packaging. Inside the box is material(air bags) to further protect the product from external shock.

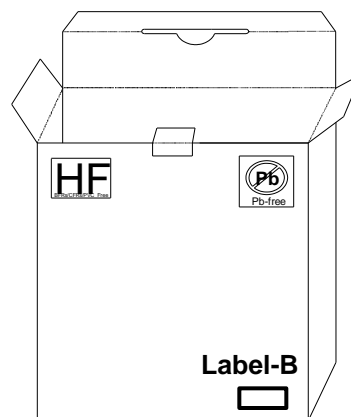
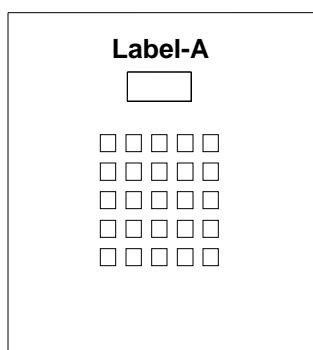
## SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	10 /12

## 10. Marking of Products(Labeling)

The final product is packaged in a box, which has two types of labels.

The labels indicate the product's model, rank, date, and quantity information



### Label-A : Model, Rank, Making Company, Properties

\*9LEB BV 541 T G6\*

Lot No :

Model : LEUV-V512A6

Q`ty : 000[pcs] 9999

LG Innotek CO.,LTD

[X28]

Rank Type :

Rank Ver

	Min	Avg.	Max
VF (num)	(num)	(num)	(num)
Wp (num)	(num)	(num)	(num)
Po (num)	(num)	(num)	(num)

### Label-B : Model, Chip Size, Customer, Quantity, Date

Model	LEUV-V512A6
Chip Size	1090X1090
Customer	TBD
BoxID	TBD
Total Q`ty	[PCS]
Date	num
LG Innotek CO., LTD	*9LG6*

## SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	11 /12

## 11. Handling

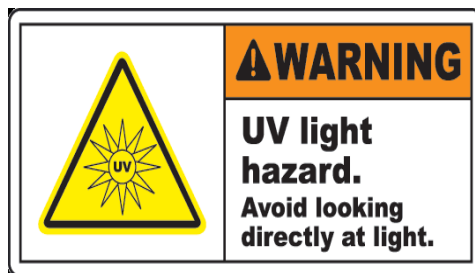
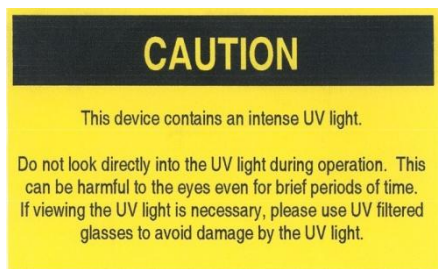
General Precautions for LEUV-V512A6:

- \* Applying too much pressure on the product by handling it with a metallic tool(tweezer) may cause damage to its edges.
- \* It is best to avoid putting tape or adhesive substance on the surface of the device, or using sharp tools to handle the product. Stain or damage to the surface may have a degrading effect to performance level of the product.
- \* When handling the product, a anti-electrostatic tool must be used to minimize and prevent damage caused by electrostatic.

### Precautions for LEUV-V512A6

Handling Precautions for UV Light LED LEUV-V512A6:

- \* When LEUV-V512A6 is in contact with an electric current, UV Light is emitted, which may cause severe damage to the bare skin or eyes. When handling the product, one must use protective wear to protect bare skin. Protective UV-goggles must be worn to prevent harm to the eyes.



### Storing LEUV-V512A6

Precautions for handling LEUV-V512A6 inside the Anti-Electrostatic Polyethylene Bag.

- \* Before opening bag

Store the product in an atmosphere of 25℃~35℃ in a Desiccator with N2 atmosphere.

The term for use of the product is limited to one year.

- \* After opening the bag

After using some of the product, the remainder must be stored in a Desiccator which can maintain proper temperature and humidity level.

The product should be kept in a protective bag to shield it from humidity.

## SPECIFICATION

MODEL	LEUV-V512A6	DOCUMENT No	
REG.DATE	2012.11.22	REV.No	0.1
REV.DATE	2013.01.15	PAGE	12 /12

## 12. Die Attachment

LEUV-V512A6 can be attached to the lead frame of the package by using solder paste. There are 3 steps to die attach the chip: (1) apply sufficient amount of solder paste to the bottom of the lead frame, (2) attach the bottom of the chip to chip, (3) Be careful when handling the chip so that there is no damage applied.

The thickness of the solder paste must not exceed 10% of the chip's height.

## 13. Wire Bonding

Use the bond pad, which is made out of Au for maximum compatibility, to inject currents to the LEUV-V512A6 device. The bond pad is designed to be compatible with Au wires. When wire bonding, place the ball precisely on the center of the bonding pad. The diameter of the bonding pad is 120um.

Precautions for Wire Bonding:

- \* Set the wire bonding force and ultra sonic power to minimal levels
- \* During the wire bonding process make caution to maintain the standard level of temperature, bonding force, ultra sonic power.
- \* Please avoid the strong pressure on chip because the materials of collect may cause chip damage by mechanical stress.

## 14. Others

\*LG Innotek will not be held responsible for any damage to the user that may result from accidents or any other reasons during operation of the user's unit if use to exceed the absolute maximum ratings. Or not keep the matters that demand special attention.

\*The customer shall not reverse engineer by disassembling or analysis of the LEDs without having prior written consent from LG Innotek. When defective LEDs are found, the customer shall inform LG Innotek disassembling or analysis.

\*The appearance and specification of the product may be modified for improvement without notice.