

CUSTOMER : Not Fixed .

DATE : 2017.03.07 .

REV : E .

SPECIFICATIONS FOR APPROVAL



Vertical UV-A Chip

MODEL NAME : LEUV-V624A6



APPROVAL	REMARK	APPENDIX

DESIGNED	CHECKED	APPROVED
2017.03.07	2017.03.07	2017.03.07

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1. Features

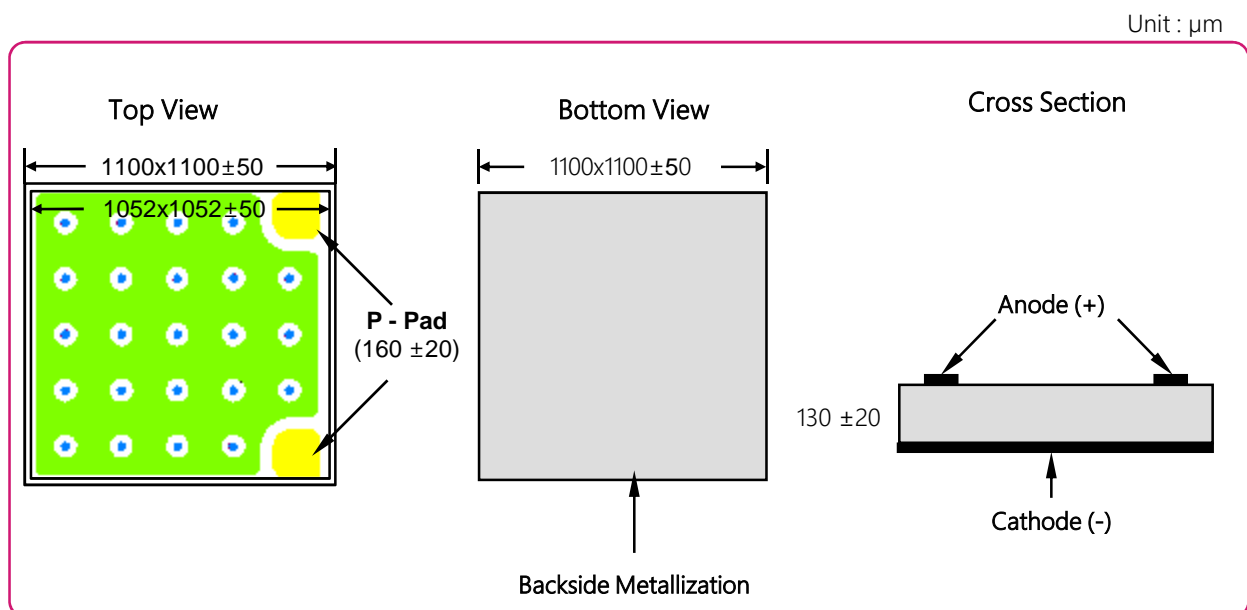
- AlGaIn/InGaIn-based thin-film vertical LED chip technology
- High brightness and efficiency
- Excellent thermal management capability with metal alloy support
- Compatible with silver epoxy, solder paste, solder preform.
- Long operation lifetime
- Lambertian radiation

2. Applications

- UV curing system
- UV inspection system
- Industrial machine vision system
- Photolithography system

3. Mechanical Dimensions

- Chip size : $1100 \times 1100 \pm 50\mu\text{m}$
- P-N Junction size : $1052 \times 1052 \pm 50\mu\text{m}$
- Total thickness : $130 \pm 20\mu\text{m}$
- Bond pad : $160 \pm 20\mu\text{m}$
- Backside metallization with Gold



4. Absolute Maximum Ratings (Ta = 25°C) ^{Note 1}

Items	Symbols	Rating	Unit
DC Forward Current ^{Note 2}	If	1250	mA
Peak Forward Current ^{Note 3}	Ifp	1500	mA
LED Junction Temperature	Tj	130	°C
Reverse Voltage	Vr	15	V
Operating Temperature		-10 ~ 100	°C
Storage Temperature (Bare Chip)		-40 ~ 100	°C
Assembly Processing Temperature		325 (< 5sec)	°C

5. Electrical / Optical Characteristics (Ta = 25°C)

Items	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage ^{Note 4}	Vf	500mA	3.25		3.6	V
		1000mA	3.55		3.95	V
Turn-On Voltage	Von	0.5mA	2.55		3.1	V
Peak Wavelength ^{Note 5}	Wp	500mA	390		400	nm
Radiant Flux ^{Note 6}	Po	500mA	780		960	mW
		1000mA	1440		1800	mW

6. Mechanical Specifications

Items	Dimension	Tolerance	Unit
Chip Area	1100 x 1100	±50	μm
P-N Junction Area	1052 x 1052	±50	
Chip Thickness	130	±20	
Bond Pad	160	±20	
Bond Pad Thickness	1.1	±0.11	
Backside Metal Area	1100 x 1100	±50	
Backside Metal Thickness	0.15	±0.015	

Notes:

- Maximum ratings are strongly package-dependent. The above ratings were determined using a LGIT SMT package and Ag epoxy die attach for characterization. Ratings for other packages may differ.
- Under the maximum junction temperature.
- 1/10 duty cycle @ 1 kHz.
- Forward voltage tolerance is within ±0.1V.
- Wavelength tolerance is within ±1nm.
- Radiant flux is based on LGIT internal standard of the optical measurement and may differ from that measured by the others. Typical tolerance of the radiant flux is ±5%.

7. Standard Binning Table (If = 500mA, Ta = 25°C) ^{Note 1}

Wp (nm)	Forward Voltage (V)	Radiant Flux (mW)				
		780~820	820~860	860~880	880~920	920~960
390~395	3.25 ~ 3.35	X01	X02	X03	X04	X05
	3.35 ~ 3.45	X06	X07	X08	X09	X10
	3.45 ~ 3.55	X11	X12	X13	X14	X15
	3.55 ~ 3.60	X16	X17	X18	X19	X20
395~400	3.25 ~ 3.35	X21	X22	X23	X24	X25
	3.35 ~ 3.45	X26	X27	X28	X29	X30
	3.45 ~ 3.55	X31	X32	X33	X34	X35
	3.55 ~ 3.60	X36	X37	X38	X39	X40

Data for reference (If = 1A, Ta = 25 °C) ^{Note 2}

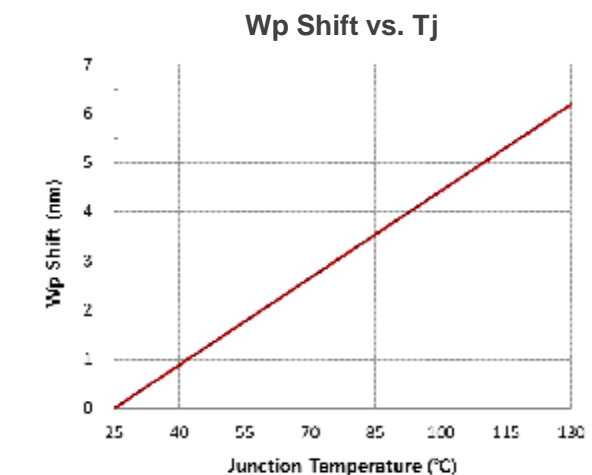
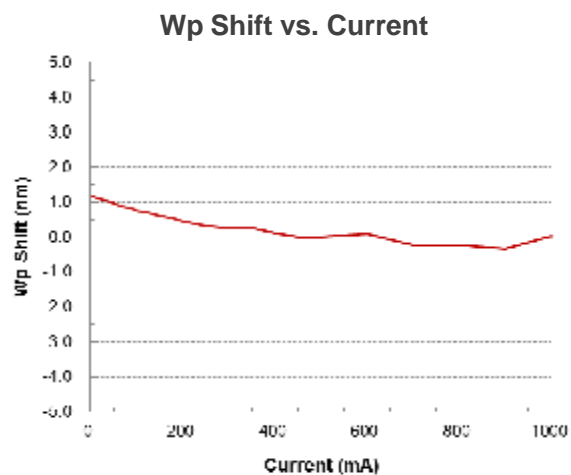
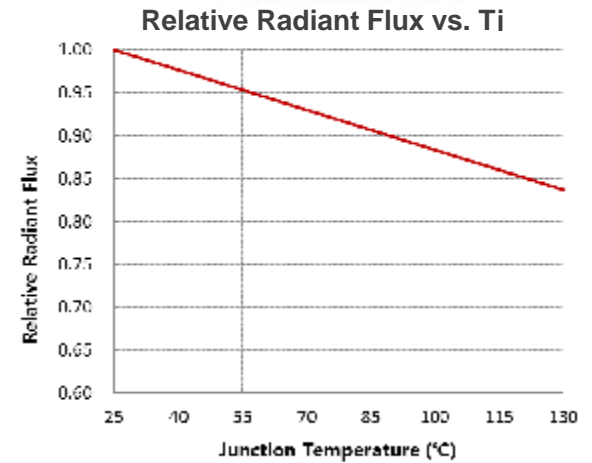
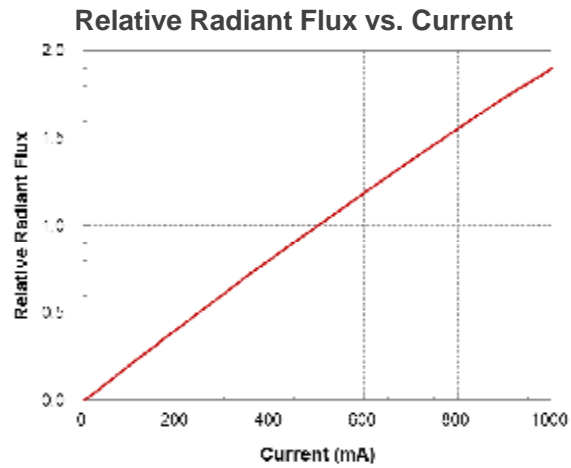
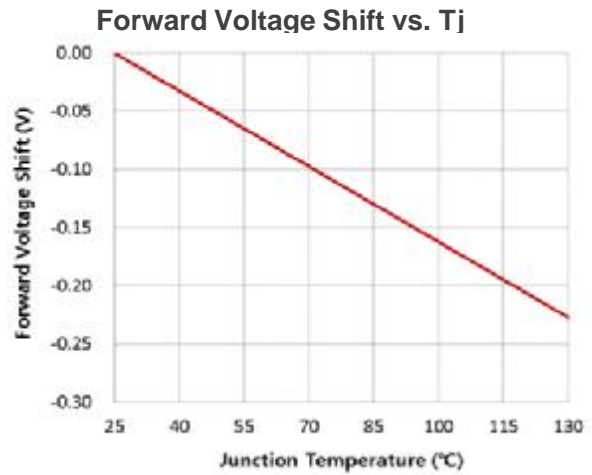
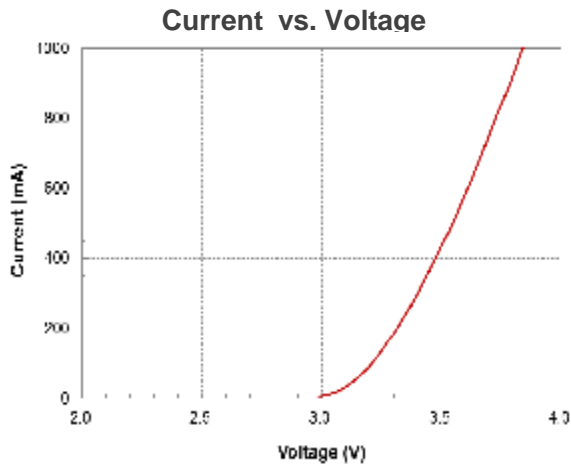
Wp (nm)	Forward Voltage (V)	Radiant Flux (mW)				
		1440~1520	1520~1600	1600~1640	1640~1720	1720~1800
390~395	3.55 ~ 3.65	X01	X02	X03	X04	X05
	3.65 ~ 3.75	X06	X07	X08	X09	X10
	3.75 ~ 3.85	X11	X12	X13	X14	X15
	3.85 ~ 3.95	X16	X17	X18	X19	X20
395~400	3.55 ~ 3.65	X21	X22	X23	X24	X25
	3.65 ~ 3.75	X26	X27	X28	X29	X30
	3.75 ~ 3.85	X31	X32	X33	X34	X35
	3.85 ~ 3.95	X36	X37	X38	X39	X40

※ Peak Wavelength: 390~400nm

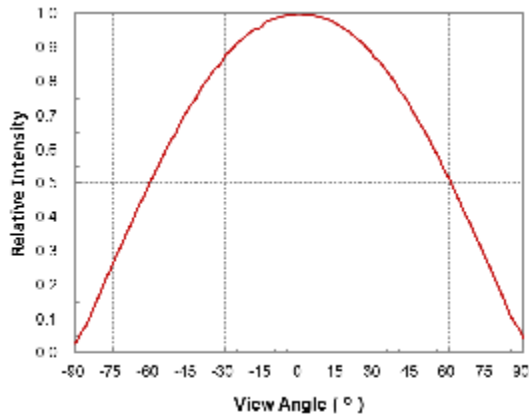
Notes:

- LEDs from above ranks in binning table will be shipped.
The rank combination ratio per shipment will be decided by LG innotek.
- Data for reference shows estimated values based on the actual measurement data at 1000mA.

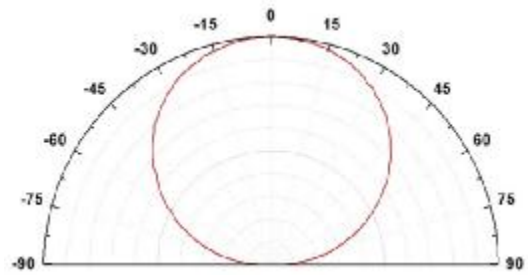
8. Typical Characteristic Curves ($T_a = 25^\circ\text{C}$)



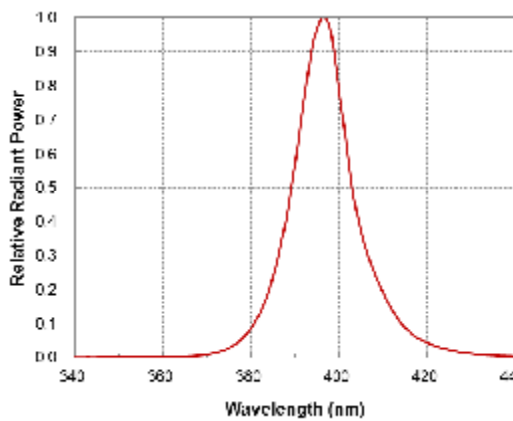
Radiation Pattern



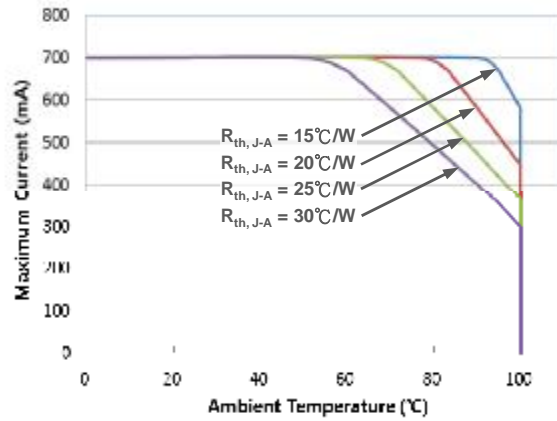
Typical Viewing Angle = 120°
(Lambertian Emission)



Spectral Power Distribution



Derating Curves ^{Note 1}



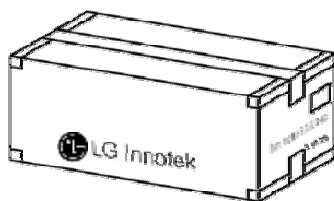
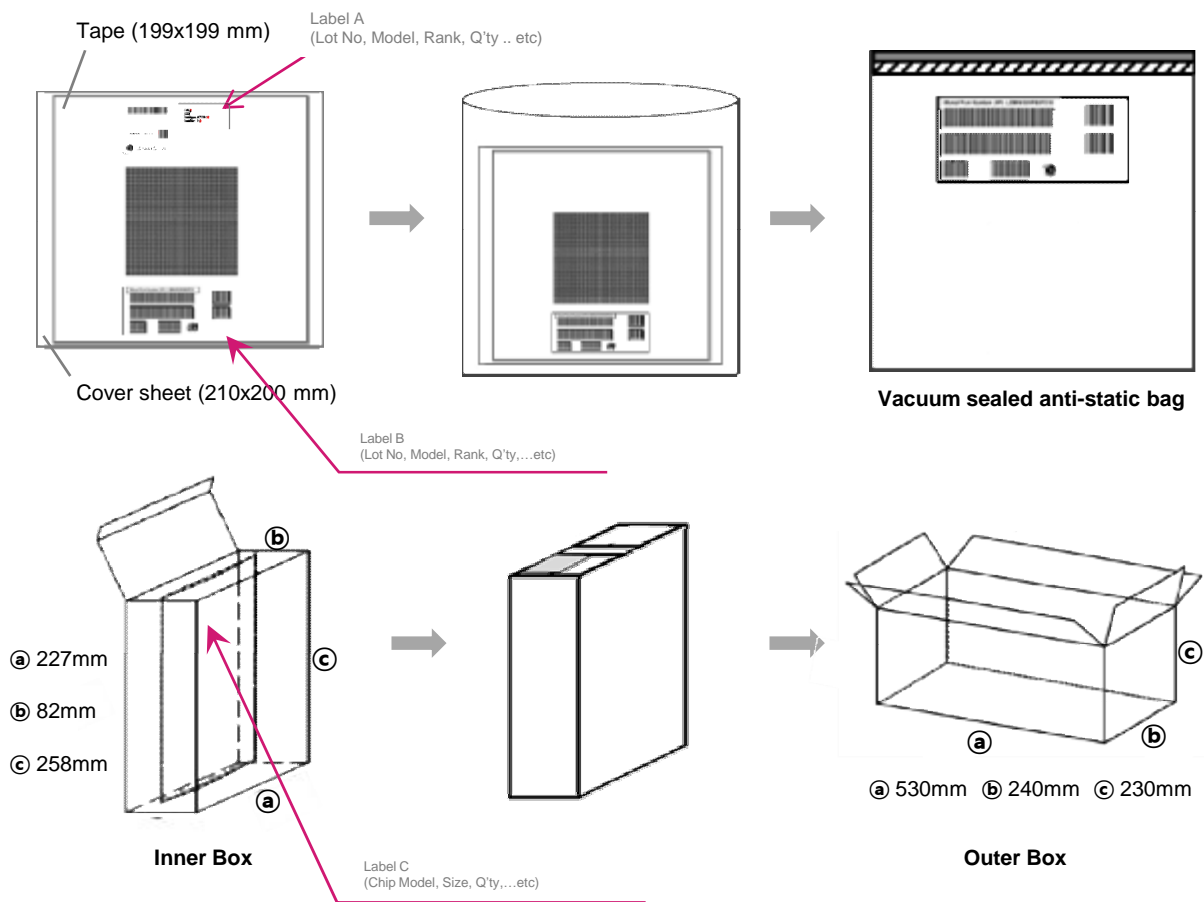
Notes:

1. The maximum forward current is determined by the thermal resistance (R_{J-A}) between the LED junction and ambient.

9. Packing and Labeling

Packing

LED chips are mounted on the adhesive tapes and contamination-free cover sheet with a square array. Those sheets are contained into an anti-electrostatic moisture-proof bag and the bag is sealed off.



Outer Box

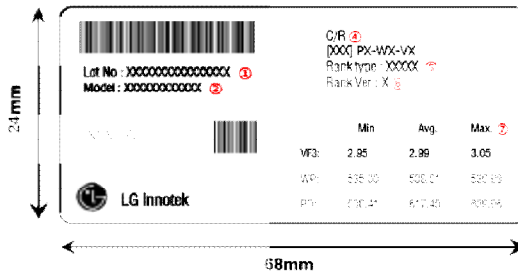
※ Typical arrangement of LED chips on the tape

Q'ty per sheet (pcs)	Array (Colum x Row)	Die Pitch (μm)
1800	60x30	400

Labeling

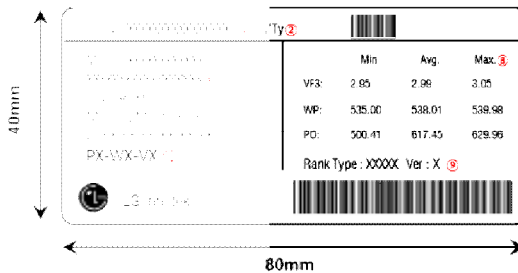
※ Label A

Specifying 'Lot Number ①', 'Model Number ②', 'Quantity ③', 'MRM Code (optional) ④', 'Rank type ⑤', 'Rank Ver ⑥' and 'Summary of Bin Characteristic ⑦'.



※ Label B

Specifying 'Lot Number ①', Quantity ②, 'Model Number ③', 'Chip size ④', 'Growth Number ⑤', 'Manufacturing Machine Number ⑥', 'Date ⑦', 'Summary of Bin Characteristic ⑧', 'Rank type and Ver.⑨' and 'MRM Code (optional) ⑩'.

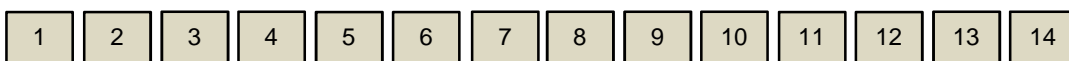


※ Label C

Specifying 'Chip Model ①', Chip Size ②, 'IN Box ID ③' and 'Total Q'ty ④'.



Box ID Indication



System	Area	Year	Month	Date	Seq	
Shipping : S Return : R	MES : M STK : S	Paju : P Huizhou : H	2015 ...	(01 - 12)	(01 - 31)	(001 - 999)
		2020				

10. Cautions on Use

Storage Environment

- The storage location should be kept at normal temperature and humidity, that is 25 to 35°C and 45 to 70% relative humidity. Care must be taken to avoid storage under temperature and humidity conditions that are significantly different from these.
- Avoid storage in a location with corrosive gas or a large amount of dust.
- Sudden temperature variations can cause condensation to form on devices and/or packing material, so avoid such an environment.
- Store devices in a location with free of radiation, static electricity and strong electromagnetic fields.

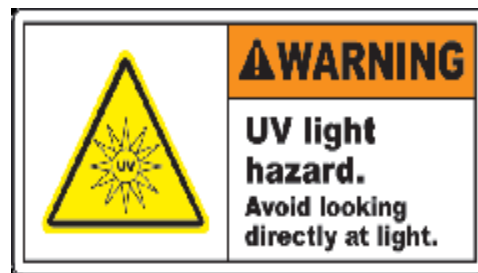
Electrostatic Discharge (ESD) Damage

- Caution is necessary in handling LED chips since they are generally susceptible to destruction due to electrostatic discharge.
- All equipment and human bodies must be properly grounded.
- Use wrist strap or anti-electrostatic gloves when manually handling the chips.
- It is recommended to use an ionizer (an air-ionizing blower) in handling the chips or the manufacturing processes.

Handling Precautions

- Minimize contact between metallic fixtures, tweezers, or other hard objects and the emitting surface. Applying excessive contact force can damage the junction and lead to increased leakage current as a consequence.
- If possible, avoid the use of tapes or adhesives to the emitting surface which is subject to be contaminated by tape residue. Contaminated surface leads to reduced light extraction.
- Rubber collets are strongly recommended during the die pick and place process. Harder plastic collets may also be used with minimized die bonding parameters (bonding pressure).
- Recommended minimum tip radius of ejector pins contacting the bottom surface of the chip during the die pick process is 75µm in order to prevent chip damage.
- Gold ball bonding is recommended as an electrical connection. Wire bonding parameters (pressure and ultrasonic power) should be chosen to prevent excess stress from damaging the bond pad and chip.

- When UV-Chip 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.



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.

11. Reliability

Test Items and Conditions

No	Test Item	Test Condition	Test Hours	Q'ty
1	Room Temp. Operating Life	Ta=25°C, If=1000mA	500hrs	30 pcs
2	High Temp. Operating Life	Ta=85°C, If=700mA	500hrs	30 pcs
3	Wet High Temp. Operating Life	Ta=60°C, RH=90%, If=450mA	500hrs	30 pcs
4	Low Temp. Operating Life	Ta=-10°C, If=500mA	500hrs	30 pcs

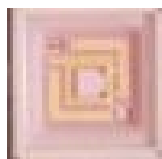
Criteria for Judging the Damage

Item	Symbol	Test Condition	Limit	
			Min	Max
Forward Voltage	Vf	If=500mA	-	Initial Value × 1.1
Turn-On Voltage	Von	If=0.5mA	2.3V	-
Radiant Flux	Po	If=500mA	Initial Value × 0.7	-

- Surface Mount type package is used for the reliability test of the chips.

Internal Use Only

Standard PCB for the reliability test



6.0x6.0x1.2mm
Surface Mount Type

12. Revision History

Revision	Date	Contents of Revision Change	Remark
Rev.A	2015.10.07	New establishment	
Rev.B	2016.03.15	Add to MRM code in label 'A, 'B'	
Rev.C	2016.08.11	Modification of packing information	
Rev.D	2016.10.25	Modification of cover design	
Rev.E	2017.03.07	Add Vf tolerance, Modification of Turn on voltage Min 2.3 -> 2.55 Modification of Vr Min 5 -> 15 Modification of Features -> delete eutectic attach	

Internal Use Only