승 인 원

APPLICATION FOR APPROVAL

Product : Topview 5630 Infra-Red SMD LED

Part No. : IWS-S5234-SI-K1

Date : 2013. 11. 15 Ver. 0.1

Customer : Neumüller

Checked By	Checked By	Checked By	Checked By	Checked By	Approval

Manufacturer : ITSWELL Co., LTD.

Checked By	Checked By	Checked By	Checked By	Checked By	Approval
Approved					

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1. Features

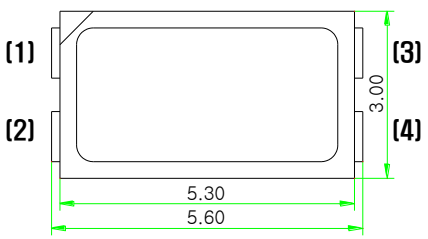
- 1 Chip High-Luminosity SMD LED
- 5.6 x 3.0 x 0.9 mm (L x W x H), 4-Pin, Small Size Surface Mount Type
- Wide Viewing Angle
- Long Operating Life
- MSL 3

2. Applications

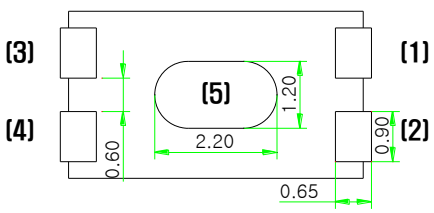
- IR Communication
- Emitting Sensor
- Detector

3. Outline Drawing and Dimension

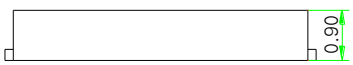
Unit : mm, Tolerance : ±0.1mm



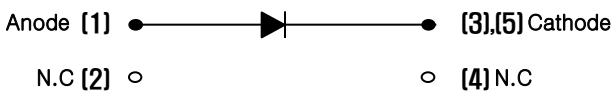
[Top view]



[Bottom view]



[Side view]



[Circuit diagram]

Note

1. All dimensions are in millimeters
2. All dimensions without tolerances are for reference only

4. Absolute Maximum Ratings(T_a = 25 ℃)

Parameter	Symbol	Value	Unit
Power Dissipation	P_d	440	mW
Continuous Forward Current	I_F	200	mA
Peak Forward Current ※1	I_{FP}	1000	mA
Operating Temperature	T_{opr}	-30 ~ 85	℃
Storage Temperature	T_{stg}	-40 ~100	℃
Soldering Temperature	T_{sol}	260 (5sec)	℃

※1 Duty ratio = 1/10, Pulse width = 0.1ms

5. Electro-optical Characteristics(T_a = 25 ℃)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit.
Forward Voltage ※2	V_F	I_F = 60 mA	1.6	-	2.2	V
Reverse Current	I_R	V_R = 5 V	-	-	10	μA
Radiant Intensity ※3	I_e	I_F = 60 mA	6	-	13	mW/sr
Peak Wavelength ※4	W_P	I_F = 60 mA	720	-	740	nm
Viewing Angle ※5	$2\theta_{1/2}$	I_F = 60 mA	-	125	-	º

※2 Forward Voltage has a tolerance of ±0.05 V.

※3 Radiant Intensity is tested by a tester calibrated by CAS 140B(CIE LED_B) and has an accuracy of 10%

※4 Peak Wavelength has an accuracy of ±0.01.

※5 Viewing Angle is the angle until 50% of brightness measured from the front part of LED.

5.1 Radiant Intensity Rank

Rank	Radiant Intensity (mW/sr)
0	6 ~ 8
1	8 ~ 10
2	10 ~ 13

5.2 Forward Voltage Rank

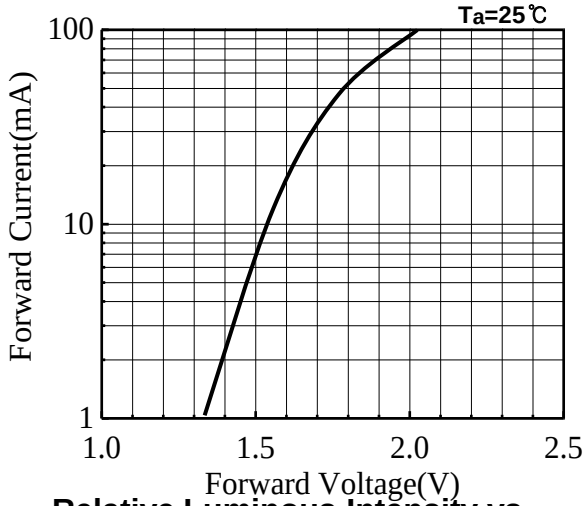
Rank	Forward Voltage (V)
1	1.6 ~ 2.2

5.3 Peak Wavelength Rank

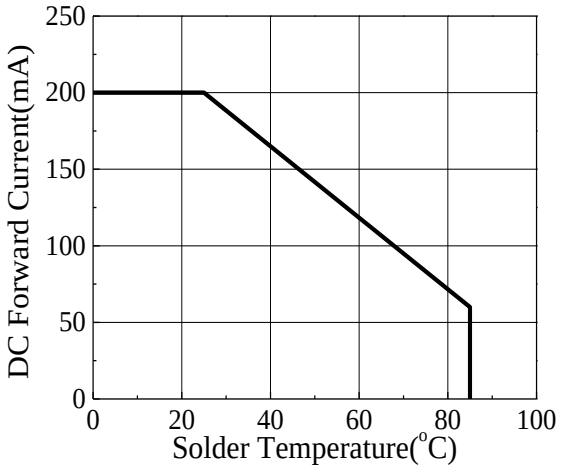
Rank	Peak Wavelength [nm]
A	720 ~ 740

6. Typical Characteristics Curves

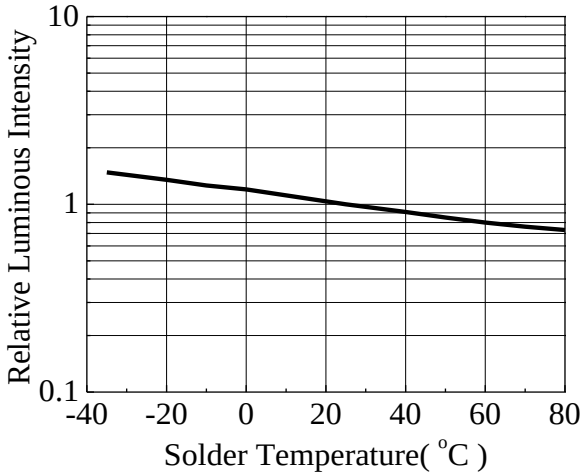
Forward Current vs. Forward Voltage



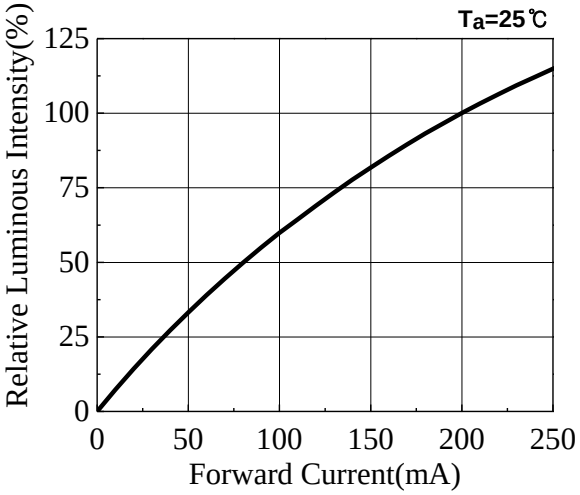
Forward Current vs. Solder Temperature



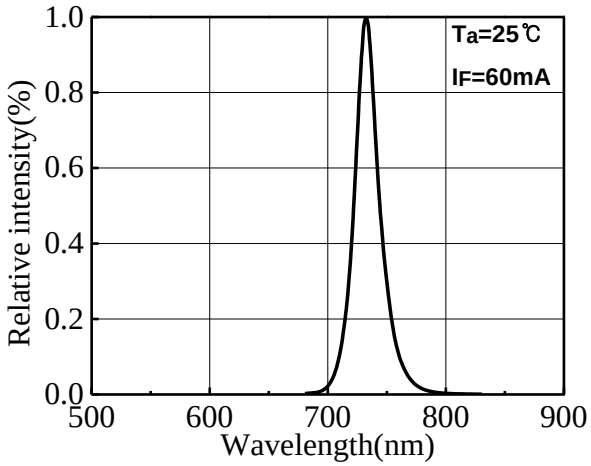
Relative Luminous Intensity vs. Solder Temperature



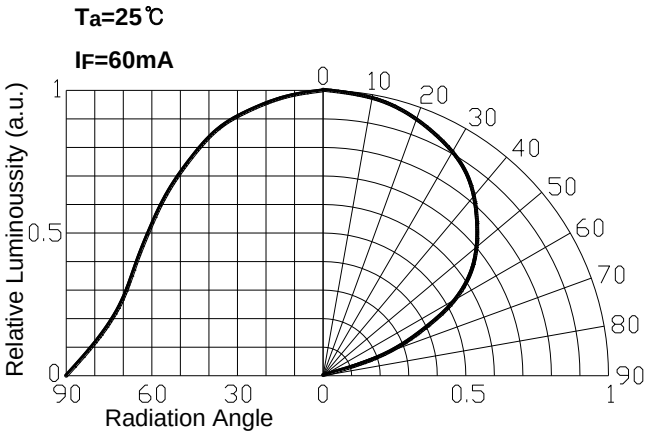
Relative Luminous Intensity vs. Forward Current



Relative Intensity vs. Wavelength

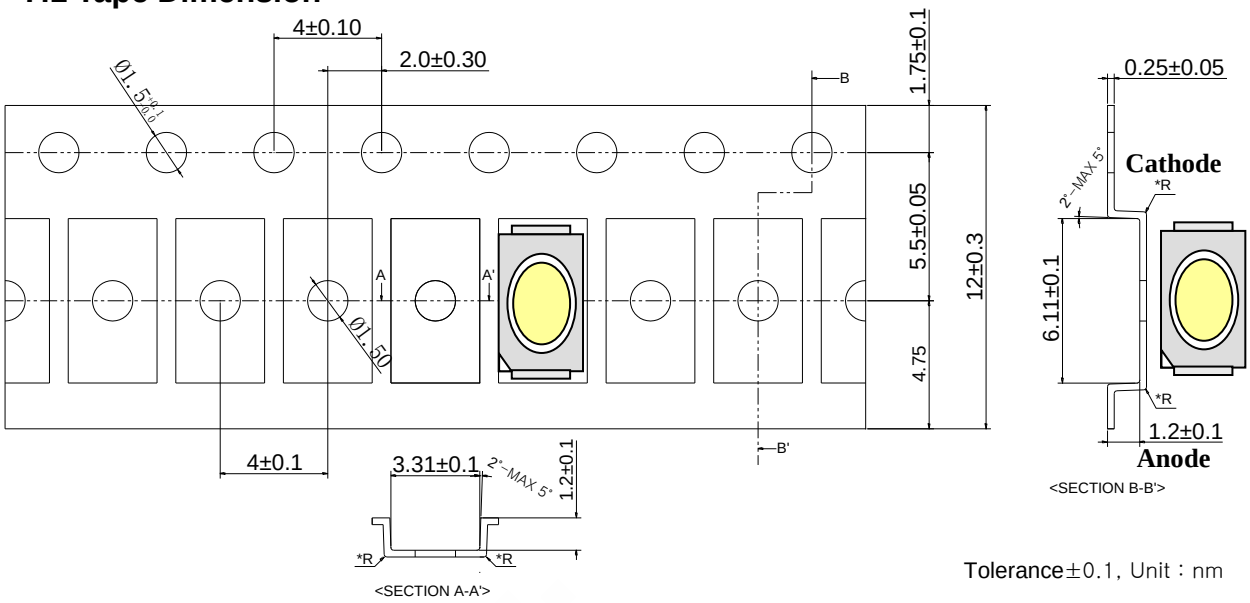


Radiation Diagram



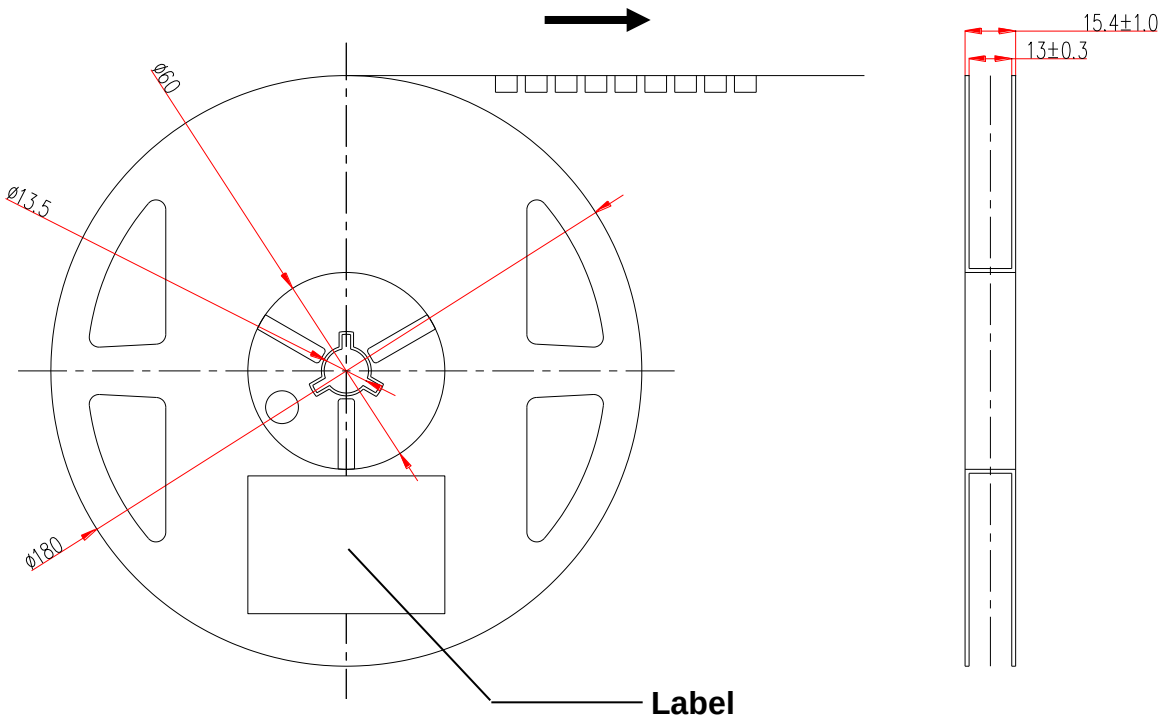
7. Dimension of Tape / Reel

7.1 Tape Dimension



Tolerance±0.1, Unit：nm

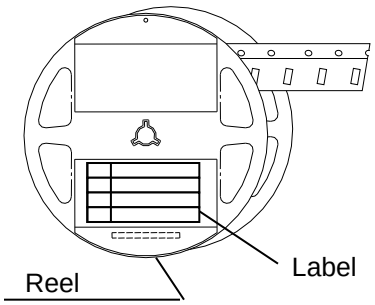
7.2 Reel Dimension



8. Packing Dimension

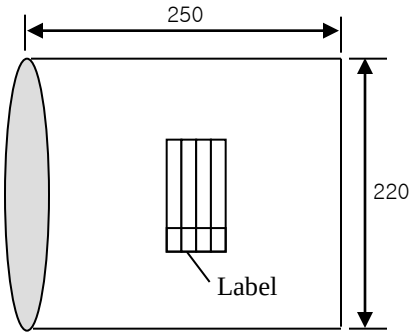
Unit :mm

Reel



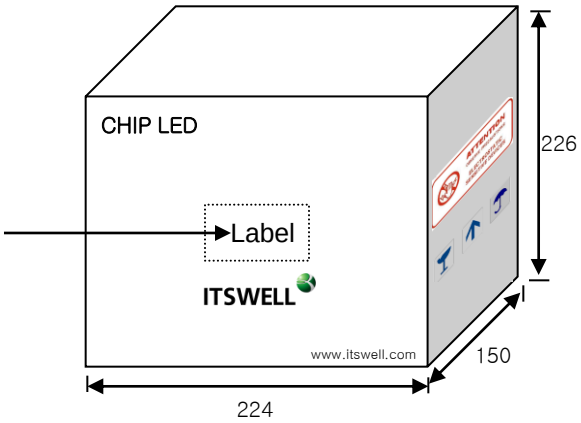
Bake: 60°C, 48hrs

Aluminum Shield Bag



Inclouding Silica gel in a bag

Card Board Box



Al Pack Label, Reel Label (70 × 37)

ITSWELL

Lot : IWS-S5234-SI-K1

	MIN	AVG	MAX	STD
V_F [Volt]				
I_e [mW/sr]				
Wp [nm]				

Q'ty : yyyy/mm/dd

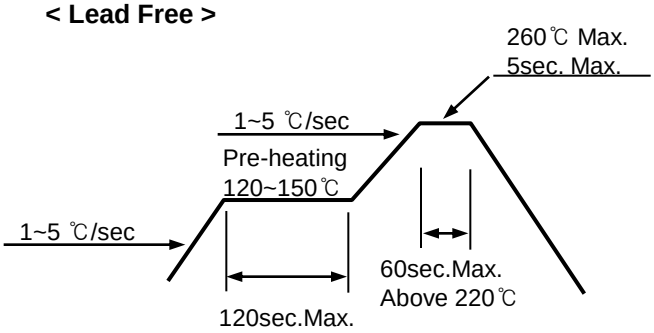
	Dimensions (mm)	Reel / Box	Total Q'ty / Box(pcs)
Reel	Φ180mm, 15mm Width	–	3,000 Max
Al Shield Bag	250x220	–	3,000 Max
Card Board Box	224x150x226	9 Max	27,000 Max

9. Precaution in use

9.1 Soldering Conditions

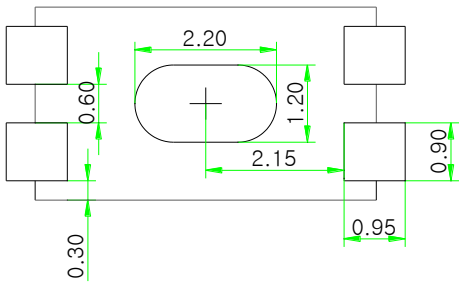
- When soldering Power SMD, Heat may affect the electrical and optical characteristics of the LEDs.
- In soldering, do not stress the lead frame and the resin part under the high temperature.
- The silicone part should be protected from mechanical stress or vibration until the Power SMD return to room temperature after soldering.
- Preliminary heating to be at 120~150 ℃ max. for 120 Seconds max.
- Soldering heat to be at 260 ℃ max. for 5 sec. Max.
- For manual Soldering is Not more than 3 sec @MAX 350 ℃, under soldering iron
- Do not assemble at atmosphere containing of humidity, condensation, chlorine and Volatile Organic Compounds.
- Recommend assembling the LEDs in last order to prevent delamination when implementing surface mounting technology
- When bifacially implementing surface mounting technology, LEDs assembling should be completed within 12 hours.
- When the LEDs containing moisture may vaporize and expand during soldering, it may cause delamination and optical degradation of the LEDs.
- The use of flux in soldering material may make the LEDs discolored by thermal and lighting acceleration factor. so, recommend to clean a residual flux with Isopropyl Alcohol after soldering.

< Lead Free >



<Recommendable soldering pattern>

<Unit: mm>



9.2 Cleaning

- If user needs cleaning of the LEDs, use that Isopropyl Alcohol or Ethylene Alcohol is recommended in 5 minutes at room temperature. and dry at room temperature for 15 minutes before use. If user uses other than Isopropyl Alcohol or Ethylene Alcohol as cleaning material, it should be not dissolve the LEDs.
- Do not use unspecified chemical such as any type of fluid like water, oil, organic solvent, etc. may cause crack or haze on the surface of the epoxy resin.
- Do not use any type of fluid like water, oil, organic solvent, etc.
- Before cleaning, a pre-test should be done to confirm whether any damage to the LED will occur.
- Freon solvents should not be used to clean the LEDs because of worldwide regulations.

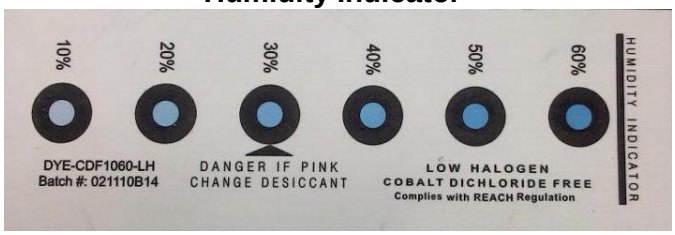
9.3 Heat Generation

- When the LEDs are illuminating, operating current should be decided after being considering the ambient maximum temperature.
- Please consider the heat generation of the LED when it is designed the PCB.

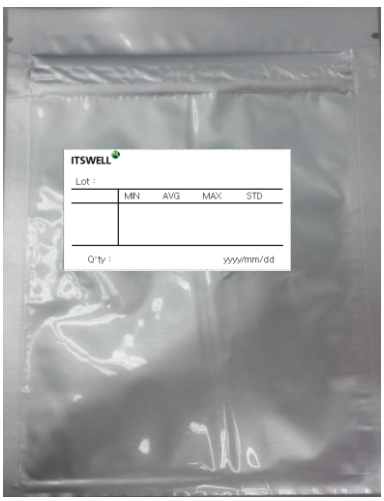
9.4 Storage

- The LEDs must be stored in a clean environment.
- Do not expose the LEDs to direct sunlight.
- Before opening the package, the LEDs should be kept at 30℃ or less and 60%RH or less.
- The LEDs should be used within 168 hours (1 week) after opening the package.
- The LEDs should be used within a year.
- In case of the LEDs is used 3 months later since user received the LEDs, the LEDs is recommended to be stored in the nitrogen chamber. and user should inspect discolored appearance before using the LEDs
- After opening the package, the LEDs should be kept at 30℃ or less and 20%RH or less.
- If the moisture absorbent material (silica gel) has faded away or the LED have exceeded the storage time, baking treatment should be performed using the following conditions.
  - Baking treatment: 60℃±5 for 48 hours.
- When restoring unused the LEDs with anti-electrostatic bag, seal off the anti-electrostatic bag so that no gas and humidity can get it.
- When storage the LEDs in the corrugated cardboard, it may make the LEDs discolored because of minute sulfur gas from the corrugated cardboard.
- Do not use over 10 days in case of using corrugated cardboard.
- Recommend corrugated cardboard containing sulfur less than 850ppm when It is Inevitable use of corrugated cardboard.
- Recommend using material type of PP or PET tray to storage the PCBs or assemblies containing the LEDs. and Insert the silica gel into each of tray.
- Use the anti-electrostatic box with anti-electrostatic cover to prevent Volatile Organic Compounds, sulfur gas and humidity when storing the bundle of the PCBs or assemblies containing the LEDs.
- Do not stack the PCBs or assemblies containing LEDs at shorter distance than 2 centimeters.
- Do not use bubble wrap directly on top of LEDs. It may cause damage the LEDs.
- Do not use rubber band.

<Humidity Indicator>



<Bulk Packing>



<Taping Packing>

9.5 Static Electricity

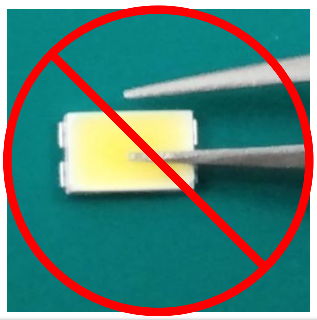
- Static electricity or surge voltage damages the Power SMD . It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.
- A tip soldering iron is requested to be grounded. An ionizer should also be installed where risk of static.
- All devices, equipment and machinery must be properly grounded (via 1MΩ). It is recommended that measures be taken against surge voltage to the equipment that mounts the Power SMD.
- If the LEDs is applied at voltage over maximum value, it may cause damage or destruction of the LEDs.
- The LEDs damaged or destructed by anything may cause an increase in leak current, lowered turn on forward voltage, or the LEDs at low forward current.
- It is important to eliminate the possibility of surge current when user designs circuit.

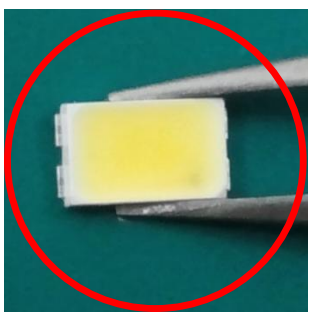
9.6 Exposure to Specific Material

- When the LEDs are exposed to specific material such as oxidizing material, rubber, paper, solder cream, sulfur, chlorine or other halogen compound, LEDs surface in silver-plating part of Lead Frame can be discolored.
- If LEDs surface in silver-plating part of Lead Frame are discolored, it can cause intensity degradation, change of color coordinates and open circuit.
- Recommend user to use adhesive type of silicone in minimum quantity. it because that epoxy used as adhesive(sealing) material easily makes the LEDs discolored by gas than silicone material.
- When user designs the LEDs assembly, consider about free air ventilation to avoid discoloration and outgas Volatile Organic Compounds easily.
- When user designs products containing the LEDs, do not use oxidizing raw and subsidiary materials such as sulfur, chlorine, other halides, gaseous or corrosive materials or substances. Because the LEDs contain silver-plating part that may discolor over time when exposed to these materials. It may cause corroded or contaminated silver-plating of the LEDs may cause an open circuit.

9.7 Handling LED

- User's working and testing environment can be a important factor to discolor. because unclean testing chamber or working place with wet floor may cause discolor of the LEDs.
- When handling the LED with tools like tweezers or nipper, do not apply Mechanical Forces directly on LED’s Surface.
- Do not touch with hand LED surface directly . It may contaminate the surface and affect on optical characteristics.
- The LEDs should be handled from side because LED’s molding material may be damaged with scratching on surface, piercing molding material and broking wire.
- When doing surface mounting, If the encapsulation material of the LEDs is silicone, do not any stress or pressure that may cause that emitting surface area of the LEDs resin can be cut, chipped, delaminate or deformed, causing wire bonding breaks and destruction of the LEDs.
- Recommended that the picking up nozzle optimize wider than emitting surface area of the LEDs and setting so that it does not damage the silicone resin.
- Maintain cleanness of picking up nozzle.
- Dropping the LEDs may cause damage.
- Do not contaminate emitting surface area of the LEDs.



10. Reliability

10.1 Reliability Test Item

Test Items	Test Conditions	Notes
High Temperature Storage	100℃, 1,000hr.	0/25
Low Temperature Storage	-40℃, 1,000hr.	0/25
Temp. Humidity Storage	60℃, 90% RH, 1,000hr.	0/25
Steady State Operating life	25℃, 120mA , 1,000hr.	0/25
High Temperature Operating Life	85℃, 42mA, 1,000hr	0/25
Low Temperature Operating Life	-30℃, 100mA, 1,000hr.	0/25
Steady State Operating life Of High Humidity Heat	60℃, 90% RH, 75mA, 1,000hr.	0/25
Thermal Shock	-40℃(30min)→100℃(30min.), 100 cycle	0/20
ESD	HBM, 100 pF, 1.5K ohm, 3 times	0/20

10.2 Criteria for Judging the Damage

Items	Test Conditions	Criteria for judgment
Radiant Intensity (I_e)	I_F = 60mA	> 70% of S
Forward Voltage (V_F)	I_F = 60mA	Less than ± 110% of U

* U means the upper limit of specified characteristics, S means initial value.

11. Part Name Description

□□□ – □□□□□ – □□ – □□

- Information of Manufacturer
- Color: UV : Violet, UB : Blue, UC : Cyan, UG : Green, UY : Yellow, UO : Orange, UR : Red, DR : Deep Red, EI : IR 850nm, NI : IR 950nm; BW : 0.26이하, CW : 0.26<x<0.3, PW : 5000~8000K, NW : 3600~5000K, WW : 2600~3600K
- Number of leads: 2 : 2 leads, 4 : 4 leads, 6 : 6 leads
- Package Dimension: 351 : 3.5x2.8, 302 : 3.0x2.0, 505 : 5.4x5.0, 525 : 5.4x5.0 (2Pad/0.2W), 555 : 5.4x5.0 (0.5W), 5A5 : 5.4x5.0 (1W), 523 : 5.6x3.0 (0.2W), 533 : 5.6x3.0 (0.3W), 553 : 5.6x3.0 (0.5W), 80D : 8Φ (1W), 83D : 8Φ (3W)
- Frame type: P : PCB, M : Metal PCB, L : PLCC, C : Ceramic, S : Slug type
- S : SMD type LED package
- IW : ITSWELL Co., Ltd. (Company Name)

12. Rank Description

1	A	1

- Forward Voltage Rank
- Peak Wavelength
- Radiant Intensity Rank

13. Attention : Electric Static Discharge (ESD) Protection

The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs is based chips is still Necessary even though they are safe in low static-electric discharge. Material in AlInGaP, GaP, or/and InGaN based chips are STATIC SENSITIVE devices. ESD protection has to considered and taken in the initial design stage. If manual work/process is needed, please ensure the device is well protective from ESD during all the process.

■ Spec. Review History

Review Ver.	Date	Correction List	Etc.
Ver 0.1	2013.11.15	Established	