사 양 서
SPECIFICATION

Product : IR Top-View SMD LED (3528)

Part No. : IWS-S3512-I85-F

Date : 2011. 03. 22 Ver. 0.2

Proposed By	Checked By	Checked By	Checked By	Approval

Comment

ITSWELL

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1. Features

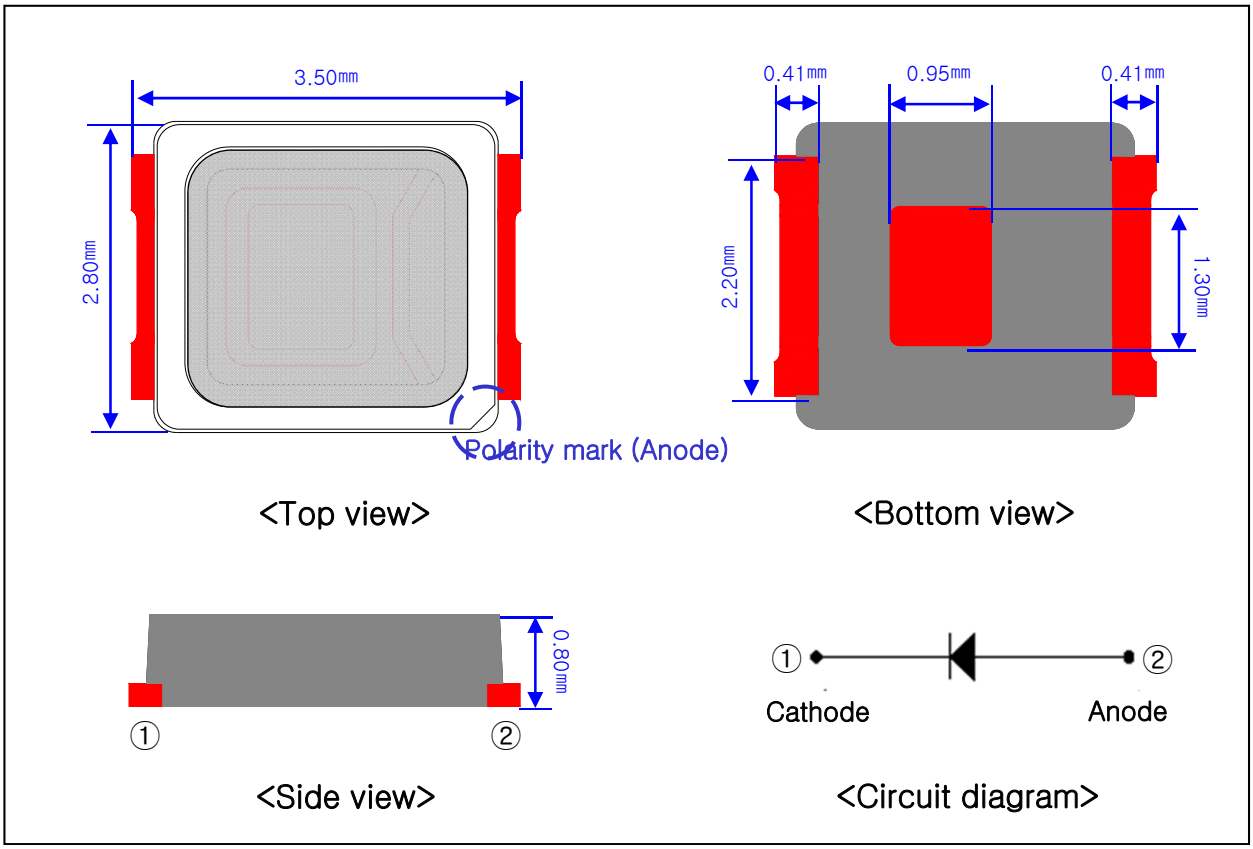
- High-Optical Power SMD LED
- 3.5 mm x 2.8 mm x 0.8 mm (L x W x H) Small Size Surface Mount Type
- Long Operating Life

2. Applications

- Infrared Illumination for CMOS Camera
- Sensor Technology
- Data Transmission
- General Use

3. Outline Drawing and Dimension

(Unit : mm, Tolerance : ±0.1)



Note

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

4. Absolute Maximum Ratings (Ta = 25 ℃)

Items	Symbols	Ratings	Unit
Maximum DC Forward Current*1	I_{FMax}	130	mA
Peak Pulsed Forward Current*2	I_{PF}	1	A
Reverse Voltage	V_R	5	V
Operating Temperature Range	T_{Op}	-30 ~ +85	℃
Storage Temperature Range	T_S	-40 ~ +100	℃
Soldering Temperature	T_{SOL}	260±5	℃

• *1 Itswell can guarantee the max DC current 130mA for unit PKG (Ta = 25℃)
• *2 Duty ratio = 1/10, Pulse width = 0.1ms

5. Electrical & Optical Characteristics (Ta = 25℃)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit.
Forward Voltage*3	V_F	I_F = 90 mA	1.5	-	1.8	V
Reverse Current	I_R	V_R = 5 V	-	-	10	uA
Radiant Intensity*4	I_E	I_F = 90 mA	14	16	18	mW/sr
Peak Wavelength*5	Wp	I_F = 90 mA	840	845	850	nm
Viewing Angle*6	ΔΘ	I_F = 90 mA	-	120	-	º

• *3 Forward Voltage is tested by a tester calibrated by KEITHLEY and has an accuracy of ±0.1 V.
• *4 Radiant Intensity is tested by a tester calibrated by CAS 140CT(CIE LED_B) and has an accuracy of 10%.
• *5 Peak wavelength has an accuracy of ±1nm.
• *6 Viewing angle is the angle until 50% of brightness measured from the front part of LED.

5.1 Radiant Intensity Rank(@90mA)

Rank	Radiant Intensity (mW/sr)
A	14 ~ 18

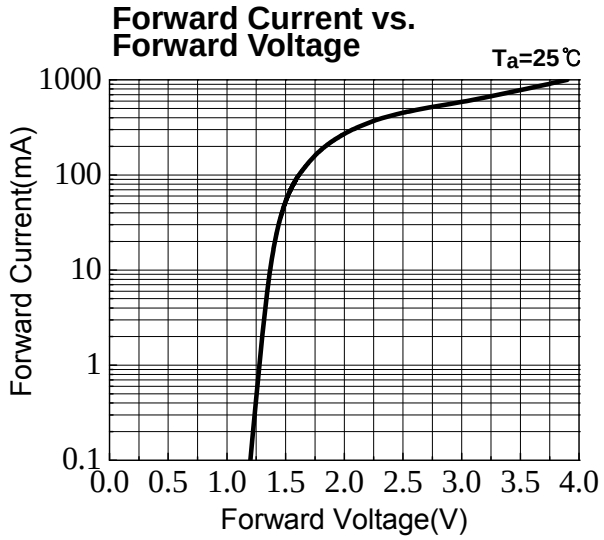
5.2 Forward Voltage Rank (@90mA)

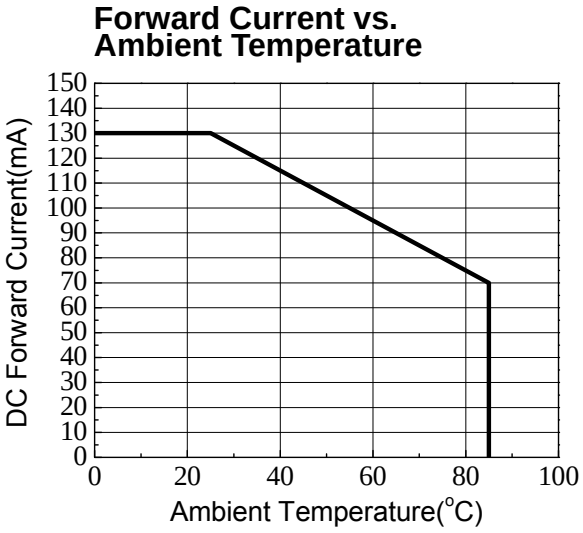
Rank	Forward Voltage (V)
a	1.5 ~ 1.8

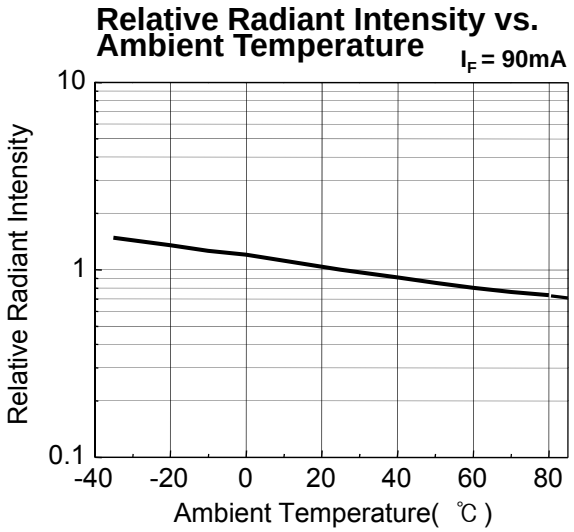
5.3 Peak Wavelength Rank (@90mA)

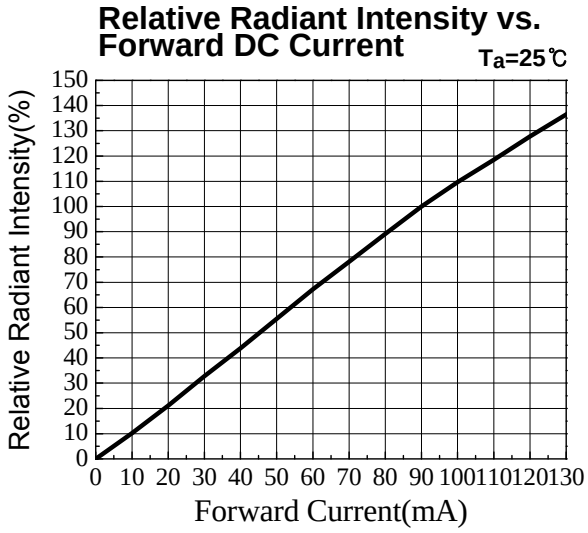
Rank	Peak Wavelength (nm)
1	840 ~ 850

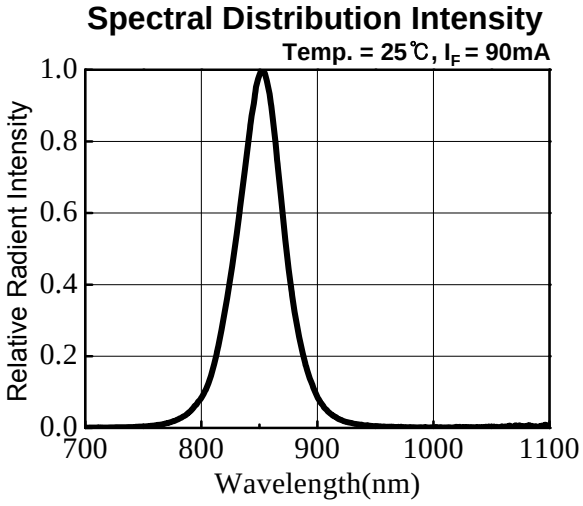
6. Typical Characteristic Curve

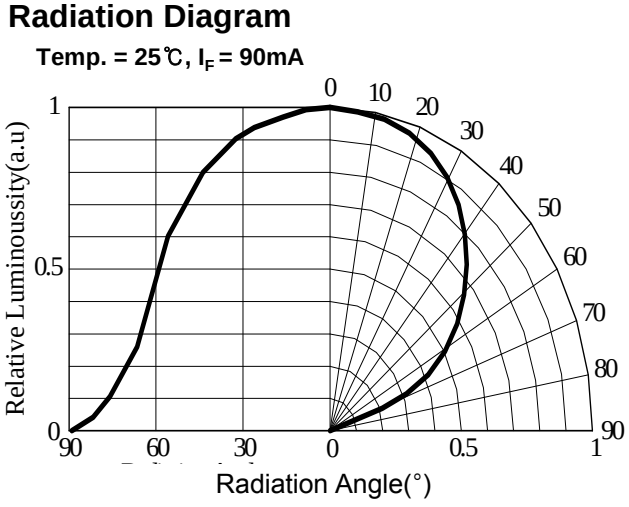








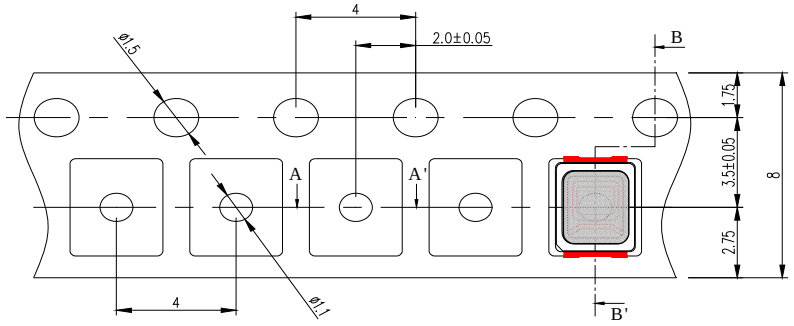


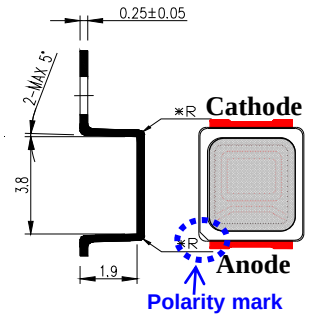


7. Dimension of Tape / Reel

7.1 Tape Dimension

(Unit : mm, Tolerance : ±0.1)





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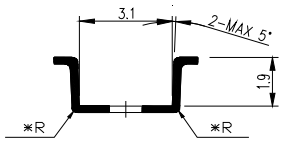

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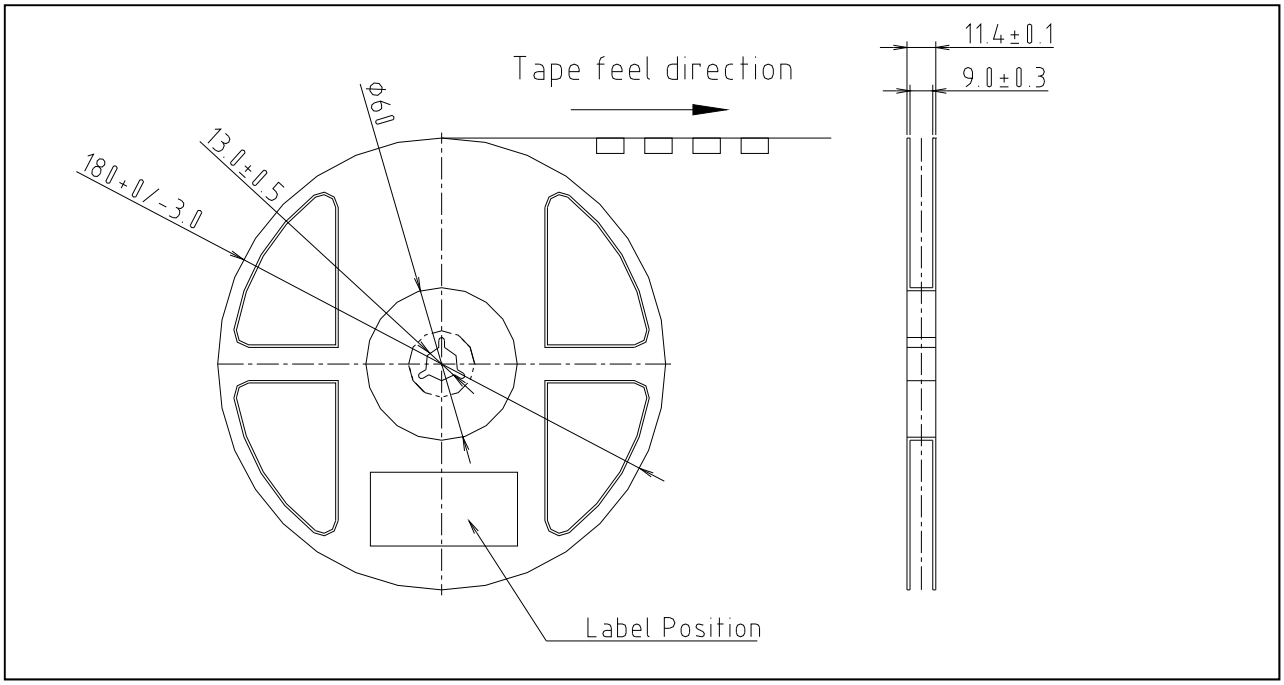
Tolerance ±0.1 , Unit: mm

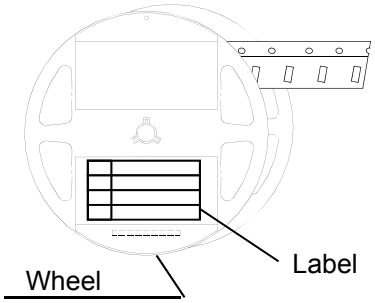
7.2 Reel Dimension

(Unit : mm, Tolerance : ±0.1)

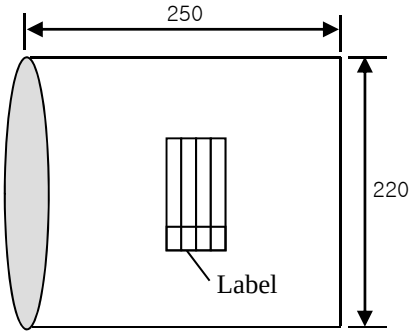


8. Packing Dimension

(Unit : mm, Tolerance : ±0.1)



Bake: 60°C, 48hrs



Diameter : 180 mm
Width : 12 mm
S351 Series ⇒ 3,000 pcs/Reel

Shield Bag(Polyester/Al/LDPE)
1 Reel/Bag (T = 0.1 mm) with Silica gel

Al Pack Label, Reel Label (70 × 37)

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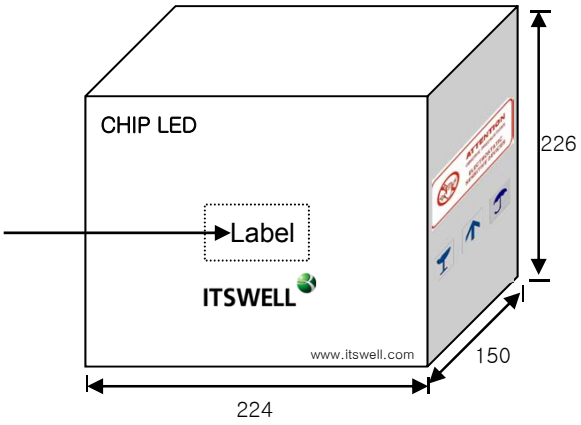
Lot : IWS-S3512-I85-F

	MIN	AVG	MAX	STD
V_F[volt]				
W_P[nm]				
I_E[mW/sr]				

Q'ty : yyyy/mm/dd



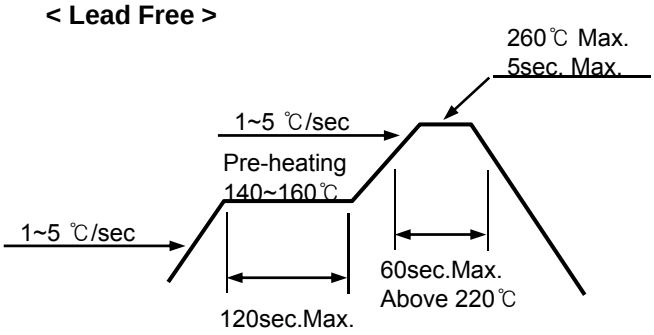
Maximum 10 Bags / 1Inner Box
S351 Series ⇒ 30,000 pcs / 1 Inner Box

9. Precaution in use

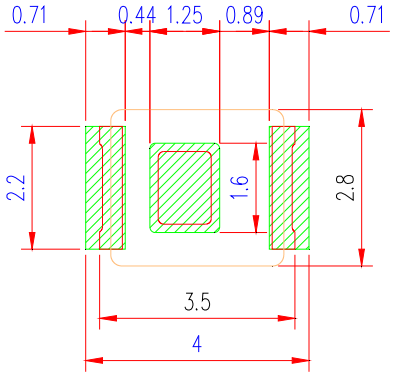
9.1 Soldering Conditions

- 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 160 ℃ Max. for 120 sec. 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

< Lead Free >



<Recommendable soldering pattern>



9.2 Storage

- Before opening the package, the LEDs should be kept at 30℃ or less and 90%RH or less.
- The LEDs should be used within a year.
- After opening the package, the LEDs should be kept at 30℃ or less and 70%RH or less.
- The LEDs should be used within 168 hours (7 day) after opening the package.
- If the moisture absorbent material (silicagel) 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.

9.3 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.

9.4 Cleaning

- Isopropyl Alcohol or Ethylene Alcohol is recommended in 5 minutes at room temperature. Don't use unspecified chemical may cause crack or haze on the surface of the epoxy resin.
- 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.

9.5 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.
- The LED's must be mounted on MCPCB or heat sink or applied thermal pad.

9.6 JEDEC Information

JEDEC has defined a moisture sensitivity classification. So that the users can properly store and Handle the devices and to avoid subsequent thermal and mechanical damage during the assembly reflow attachment or repair operation.
The present moisture sensitivity standard contains six levels, the lower the level, the longer the devices floor life.

Level	Floor Life		Soak Requirements				
			Standard		Accelerated Equivalent		
					0.40~0.48eV	0.40~0.48eV	condition
	Time	Condition	Time (hrs)	condition	Time (hrs)	Time (hrs)	
1	Unlimited	≤30℃/85% RH	168 +5/-0	85℃/85% RH	N/A	N/A	N/A
2	1 year	≤30℃/60% RH	168 +5/-0	85℃/60% RH	N/A	N/A	N/A
2a	4 week	≤30℃/60% RH	696 +5/-0	30℃/60% RH	120 +1/-0	168 +1/-0	60℃/60% RH
3	168 hrs	≤30℃/60% RH	192 +5/-0	30℃/60% RH	40 +1/-0	52 +5/-0	60℃/60% RH
4	72 hrs	≤30℃/60% RH	96 +5/-0	30℃/60% RH	20 +1/-0	24 +5/-0	60℃/60% RH
5	48 hrs	≤30℃/60% RH	72 +5/-0	30℃/60% RH	15 +1/-0	20 +5/-0	60℃/60% RH
5a	24 hrs	≤30℃/60% RH	48 +5/-0	30℃/60% RH	10 +1/-0	13 +5/-0	60℃/60% RH
6	Time On Level (TOL)	≤30℃/60% RH	TOL	30℃/60% RH	N/A	N/A	N/A

<Note>

1. The standard soak time includes a default value of 24 hour for semiconductor manufacture's exposure time between bake and bag, and includes the maximum time allowed out of the bag at the distributor's facility
2. Joint Electron Devices Engineering Councils (JEDEC) is the leading developer of standards for the solid-state industry. Almost 3100 participants, appointed by some 290 companies work together in 50 JEDEC committees to meet the needs of every segment of the industry, manufacturers and consumers alike. The publications and standards that they generate are accepted throughout the world. (http://www.jedec.org)

10. Reliability

10.1 Reliability Test Item

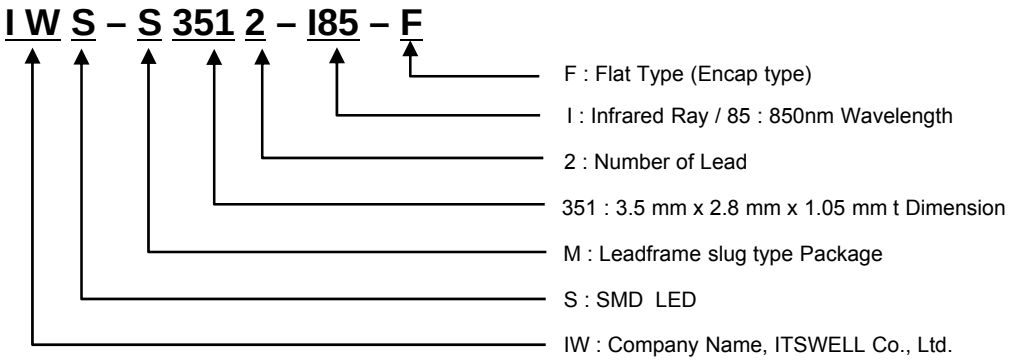
Test Items	Test Conditions	Notes
High Temperature Storage	Tc = 100℃, 1,000hrs.	0/25
Low Temperature Storage	Tc = -40℃, 1,000hrs.	0/25
Temp. Humidity Storage	Tc = 60℃, H = 90% RH, 1,000hrs.	0/25
Steady State Operating life	Tc = 25℃, I_F = 90mA , 1,000hrs.	0/25
High Temperature Operating Life	Tc = 85℃, I_F = 90mA, 1,000hrs.	0/25
Low Temperature Operating Life	Tc = -20℃, I_F = 90mA, 1,000hrs.	0/25
Steady State Operating life Of High Humidity Heat	Tc = 60℃, H = 90% RH, I_F=90mA, 1,000hrs.	0/25
Thermal Cycle	Tc = -45℃(30min)↔125℃(30min.), 100 cycles	0/20
Thermal Humidity Cycle	Tc = 25℃ ↔ 65℃/90% ↔ -10℃(1cycle), 10 cycles	0/20

10.2 Criteria for Judging the Damage

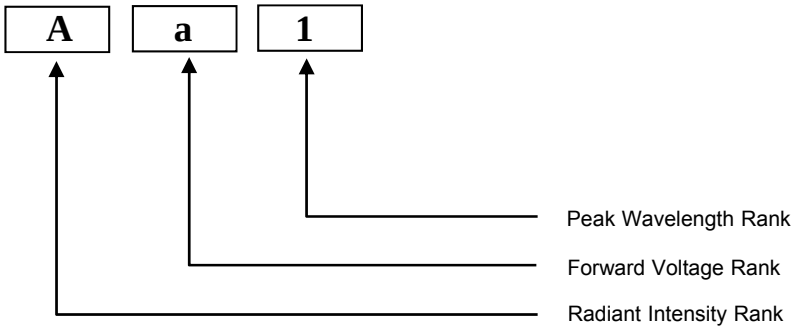
Items	Test Conditions	Criteria for judgment
Radiant Intensity (I_E)	I_F = 90mA	> 90% of S
Forward Voltage (V_F)	I_F = 90mA	Less than 110% of U

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

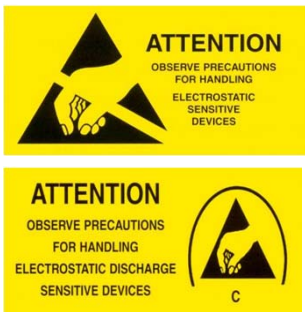
11. Part Name Description



12. Rank Description



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	2011.02.21	Establish	
Ver 0.2	2011.03.22	Changed Forward Current	