

SPECIFICATION

Product : RED Top-View SMD LED (3528)

Part No. : IWS-P351-UR

Date : 2008. 10. 27 Ver. 1.0

Proposed By	Checked By	Checked By	Checked By	Approval

Comment



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Topview 3528 SMD LED

IWS-P351-UR



1. Features

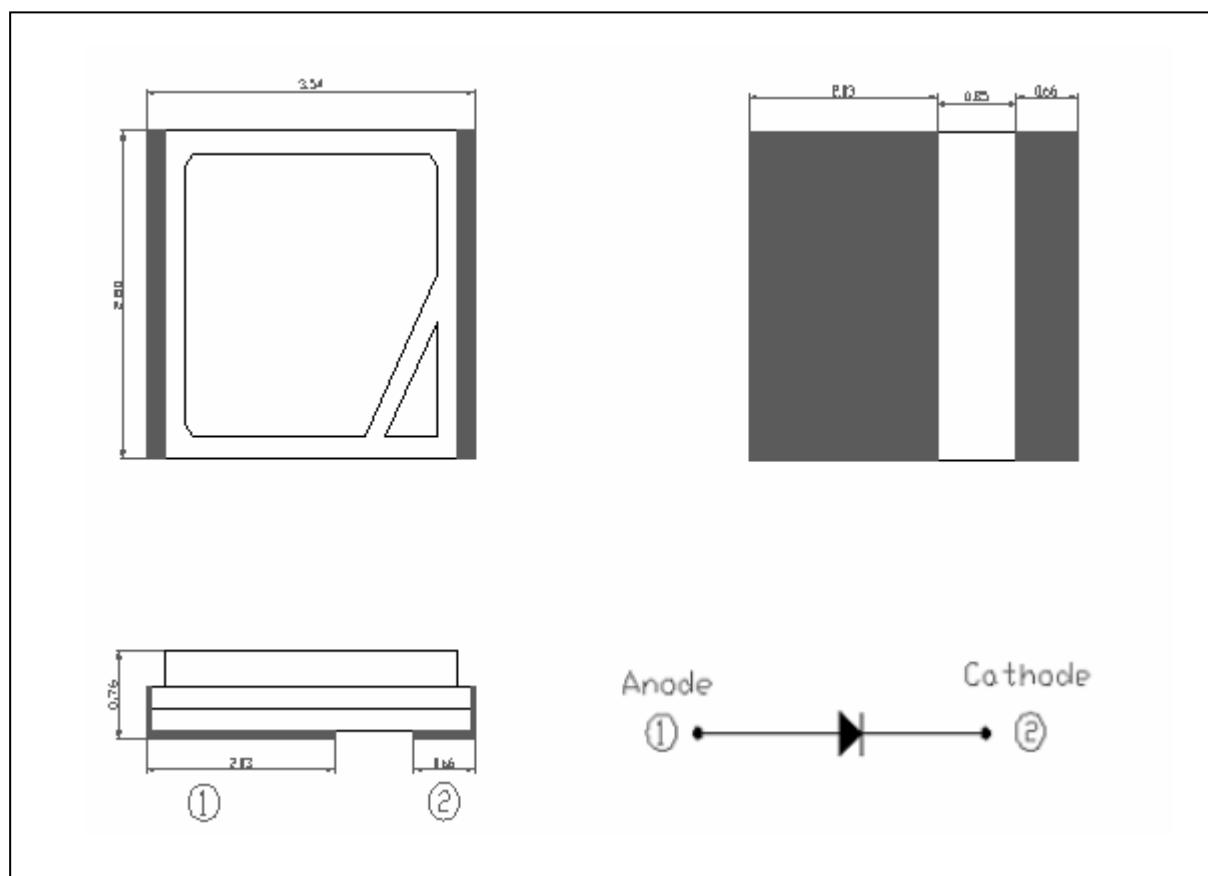
- 1chip High-Luminosity Chip LED
- 3.5 mm x 2.8 mm x 0.76 mm (L x W x H) small size surface mount type
- Wide Viewing angle
- Long operating life

2. Applications

- Automotive: Backlight in dashboard and switch
- Lighting device: Indicator, lighting
- Camera flash, Hand Carrier Flash
- 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 °C)

Parameter	Symbol	Value	Unit
Power Dissipation per chip	P_d	182	mW
Continuous Forward Current	I_F	70	mA
Peak Forward Current ^{※1}	I_{FP}	100	mA
Operating Temperature	T_{opr}	-30 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C
Soldering Temperature	T_{sol}	260 (5sec)	°C

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

5. Electrical & Optical Characteristics (Ta : 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit.
Forward Voltage	V_F	$I_F = 70\text{mA}$	2.2	-	2.6	V
Reverse Current	I_R	$V_R = 5\text{V}$	-	-	10	uA
Dominant Wavelength ^{※2}	W_d	$I_F = 70\text{mA}$	620	-	630	nm
Luminous Intensity ^{※3}	I_V	$I_F = 70\text{mA}$	1,600	-	3,500	mcd
Luminous Flux ^{※4}	Φ_V	$I_F = 70\text{mA}$	5	-	15	lm
View angle ^{※5}	$2\theta_{1/2}$	$I_F = 70\text{mA}$	-	140	-	deg

※2 Dominant Wavelength has an accuracy of $\pm 1\text{nm}$

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

※4 Luminous Flux is measured with an integrating sphere and has an accuracy of 10%.

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

5.1 Luminous Intensity Rank (IF=70mA)

Rank	Luminous Intensity (mcd)
M	1,600 ~ 2,100
N	2,100 ~ 2,700
P	2,700 ~ 3,500

5.2 Luminous Flux Rank (IF=70mA)

Rank	Luminous Flux (lm)
4	5 ~ 15

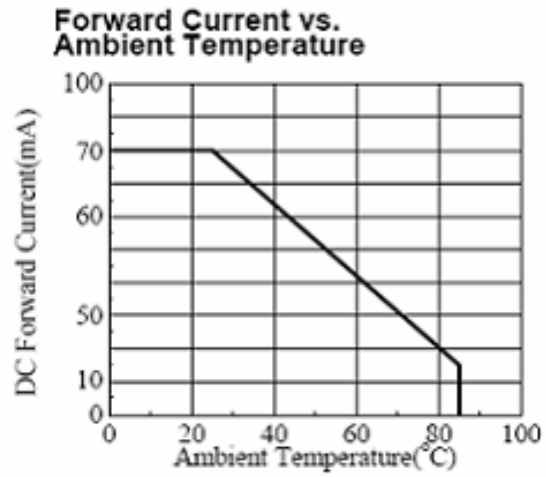
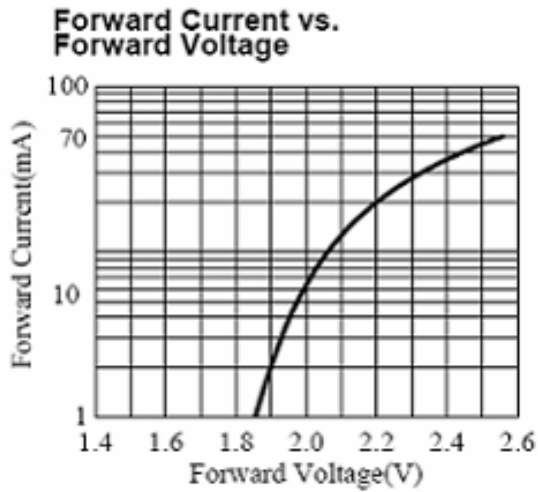
5.3 Dominant Wavelength (IF=70mA)

Rank	Dominant Wavelength(nm)
a	620 ~ 630

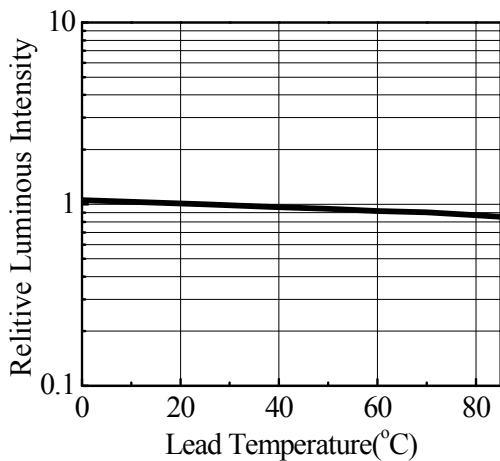
5.4 Forward Voltage Rank (IF=70mA)

Rank	Forward Voltage (V)
a	2.2 ~ 2.6

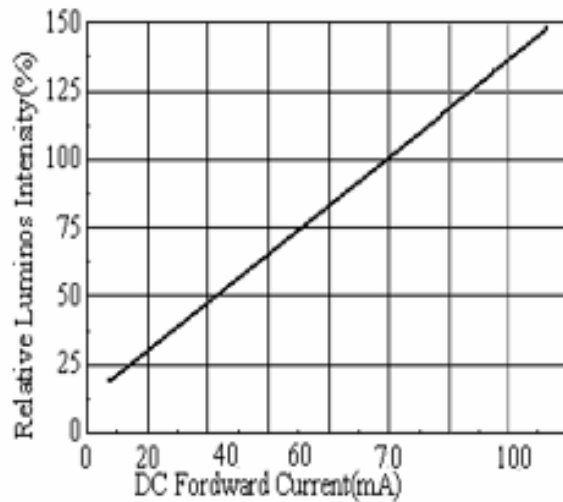
6. Typical Characteristic Curve



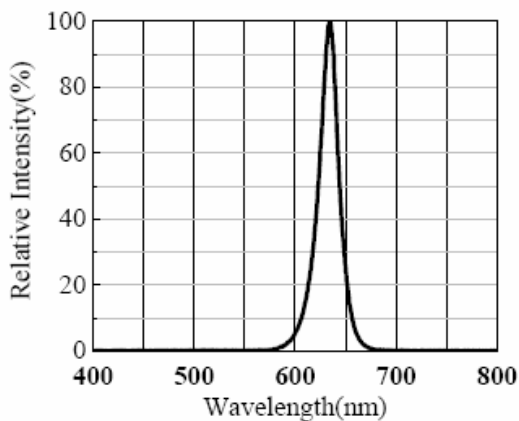
Relative Luminous Intensity vs. Ambient Temperature



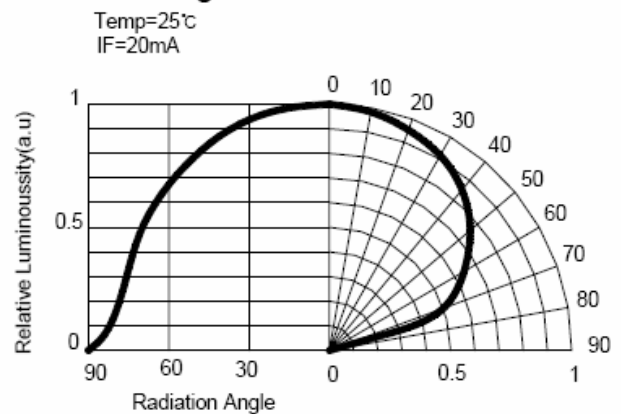
Relative Luminous Intensity vs. Forward Current



Relative Intensity vs. Wavelength

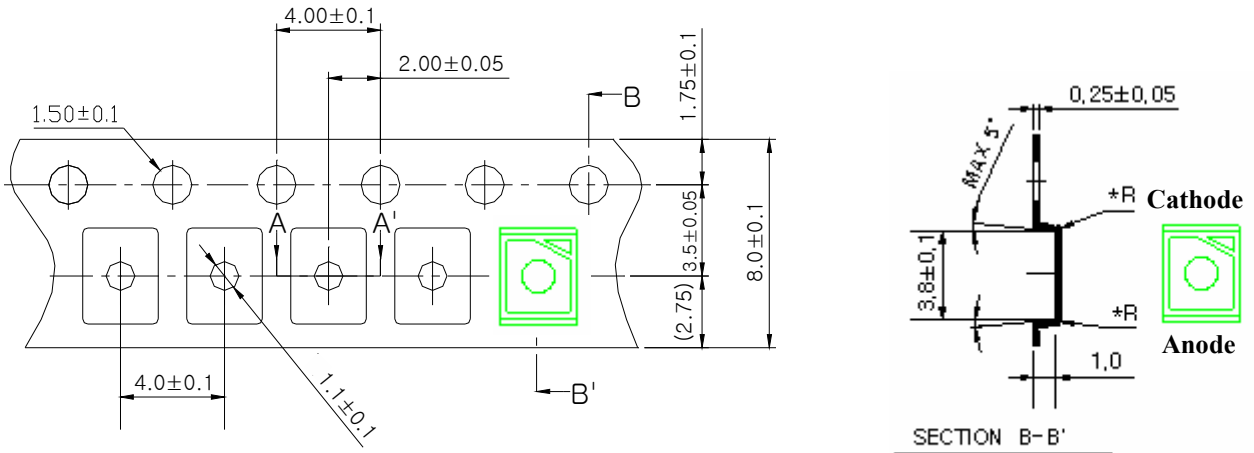


Radiation Diagram

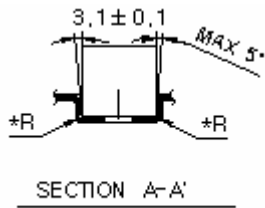


7. Dimension of Tape / Reel

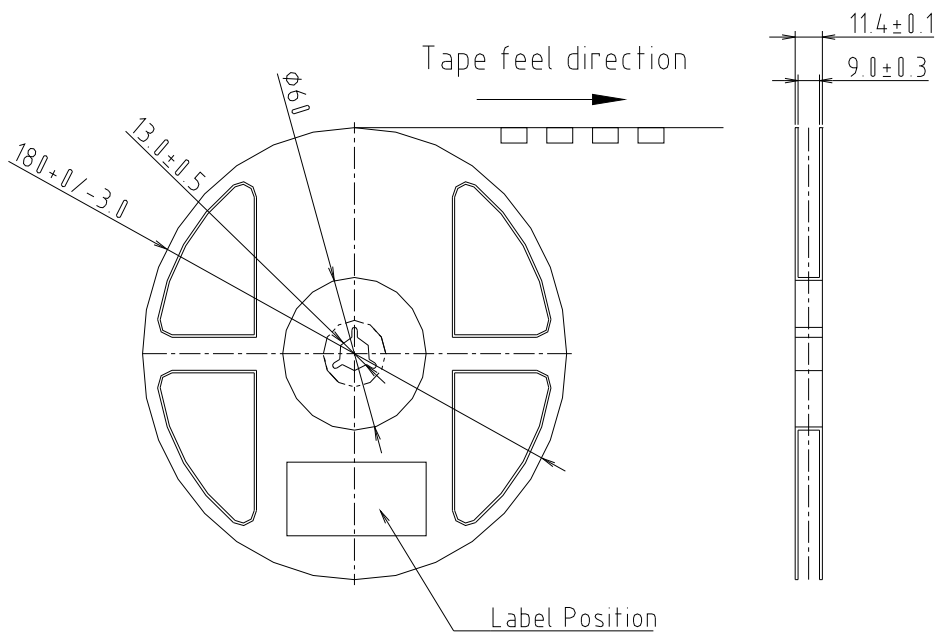
7.1 Tape Dimension



Tolerance ± 0.1 , Unit: mm



7.2 Reel Dimension

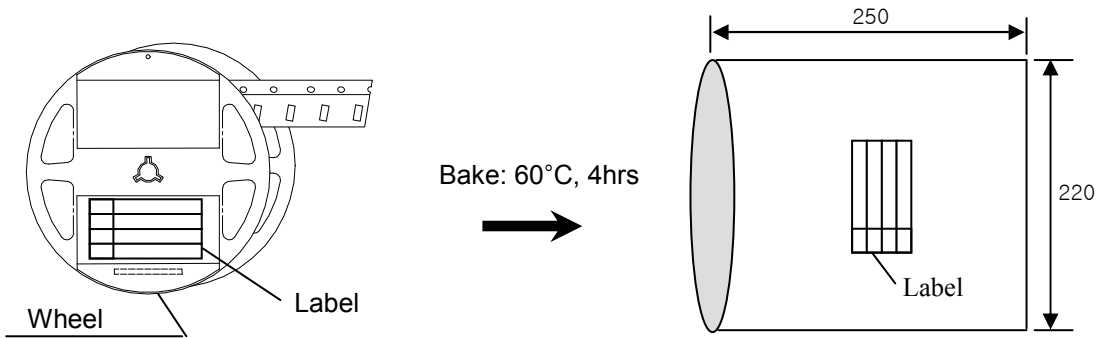


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8. Packing Dimension

Unit :mm

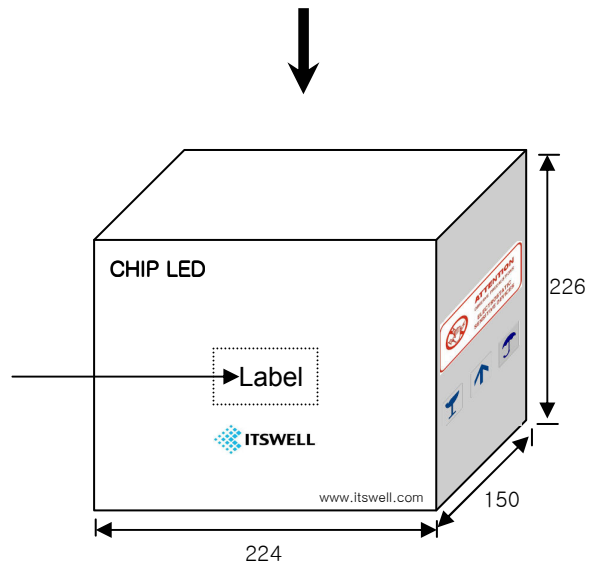


Diameter : 180 mm
Width : 12 mm
3528 ⇒ 3,000 pcs/Reel

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

Al Pack Label, Reel Label (70 × 37)

Lot :		IWS-P351-UR		
	MIN	AVG	MAX	STD
VF[volt]				
IV[mcd]				
WD[nm]				
Q'ty :		yyyy/mm/dd		



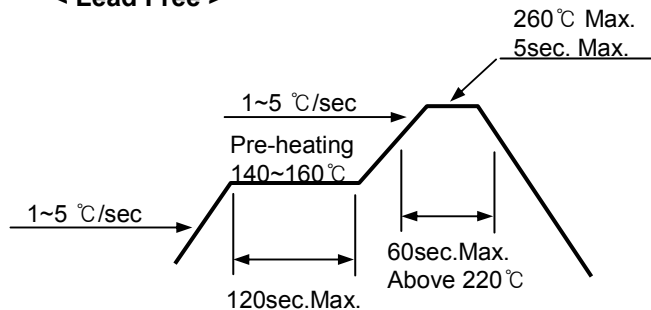
Maximum 10 Bags / 1Inner Box
3528 ⇒ 30,000 pcs / 1 Inner Box

9. Precaution in use

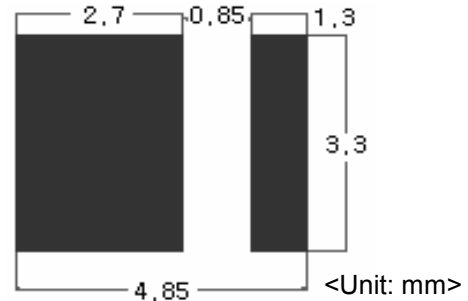
9.1 Soldering Conditions

- 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 °C max. for 120 Seconds max.
- Soldering heat to be at 260 °C max. for 5 sec. Max.
- For manual Soldering is Not more than 3 sec @MAX 350 °C, under soldering iron

< Lead Free >



<Recommendable soldering pattern>



9.2 Storage

- Use within 7 days after opening packing. Store in 10 to 30 °C. Power SMD lead frames are plated silver. The silver surface may be affected by environment which contain corrosive gases and so on. Please avoid condition which may cause the Power SMD to corroded, tarnish or discolor.

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.

10. Reliability

10.1 Reliability Test Item

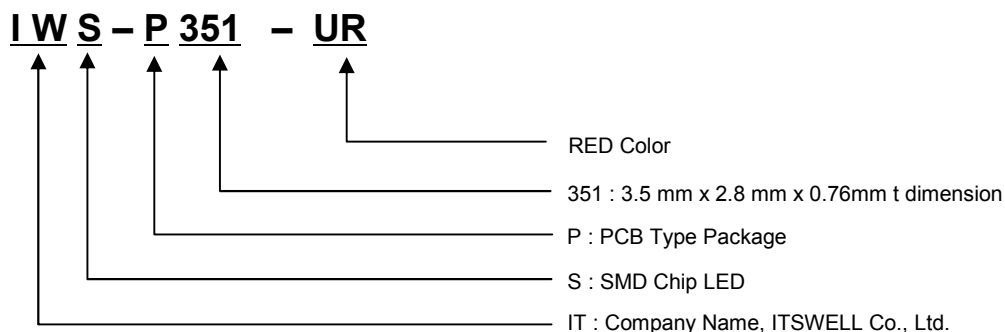
Test Items	Test Conditions	Notes
High Temperature Storage	100 °C, 1,000hr.	0/25
Low Temperature Storage	-40 °C, 1,000hr.	0/25
Temp. Humidity Storage	60 °C, 90% RH, 1,000hr.	0/25
Steady State Operating life	25 °C, 70mA/chip , 1,000hr.	0/25
High Temperature Operating Life	85 °C, 15mA, 1,000hr	0/25
Low Temperature Operating Life	-30 °C, 70mA, 1,000hr.	0/25
Steady State Operating life Of High Humidity Heat	60 °C, 90% RH, 50mA, 1,000hr.	0/25
Temperature Cycle	-40 °C(30min)→100 °C(30min.), 100 cycle	0/25
ESD	HBM, 100 pF, 1.5 kohm, 3 times	0/25

10.2 Criteria for Judging the Damage

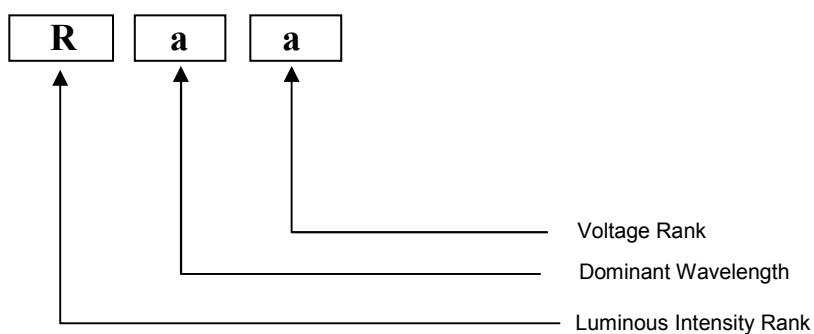
Items	Test Conditions	Criteria for judgment
Luminous Intensity (IV)	$I_F = 70\text{mA}$	> 70% of S
Forward Voltage (VF)	$I_F = 70\text{mA}$	Less than 110% of U

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

11. Part Name Description



12. Rank Description



■ Spec. Review History

Review Ver.	Date	Correction List	Etc.
Ver 1.0	2008.10.27	Establish	