

# SPECIFICATION

MODEL : SLHNNWH629T0S0Q2U3

[Rank :  $V_F(S1, S2)$  , CIE(Q0, R0) ,  $\phi_v(U1, V1, W1)$ ]

## HIGH POWER LED – SUNNIX6

CUSTOMER		
CHECKED	CHECKED	APPROVED
<b>Preliminary</b>		

SAMSUNG LED			
DRAWN	CHECKED(Sales)	CHECKED(Quality)	APPROVED

SAMSUNG LED CO.,LTD.  
314, MAETAN3-DONG, YEONGTONG-GU,  
SUWON-SI, GYEONGGI-DO, KOREA, 443-743

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# 1. Product Outline

## 1) Features

- Plastic Molded Lead Frame Type : 8.0 mm, 8.0 mm, 3.9 mm
- High Flux LED
- Built In 9 LED Chips
- Beam View Angle( $\Delta\theta$ ) : 120 °
- Lead(Pb) Free Product : RoHS Compliant

## 2) Applications

- General Illumination
- Down Lighting
- Decorative Lighting

# 2. Absolute Maximum Rating

- Operation Forward Current ..... 250 mA
- Peak Pulsed Forward Current ..... 350 mA
- Reverse Voltage ..... 16.5 V
- Thermal Resistance ( $R_{th\ J-S}$ ) .....  $\cong 5\text{ }^{\circ}\text{C/W}$
- Operating Temperature Range ( $T_{OPR}$ ) .....  $-40\text{ }^{\circ}\text{C} \sim 85\text{ }^{\circ}\text{C}$
- Storage Temperature Range ( $T_{STG}$ ) .....  $-40\text{ }^{\circ}\text{C} \sim 110\text{ }^{\circ}\text{C}$
- LED Junction Temperature ( $T_J$ ) ..... 120 °C

# 3. Characteristics

## 1) Electrical properties ( $T_a = 25\text{ }^{\circ}\text{C}$ )

Parameter	Symbol	Condition	Rank	Min.	Typ.	Max.	Unit
Reverse Voltage	$V_R$	$I_F = 5\text{ mA}$	-	12.0	-	16.5	V
Forward Voltage	$V_F$	$I_F = 180\text{ mA}$	S0	S1	8.9	10.0	V
				S2	10.0	11.0	

## 2) Luminous Flux ( $T_a = 25\text{ }^{\circ}\text{C}$ )

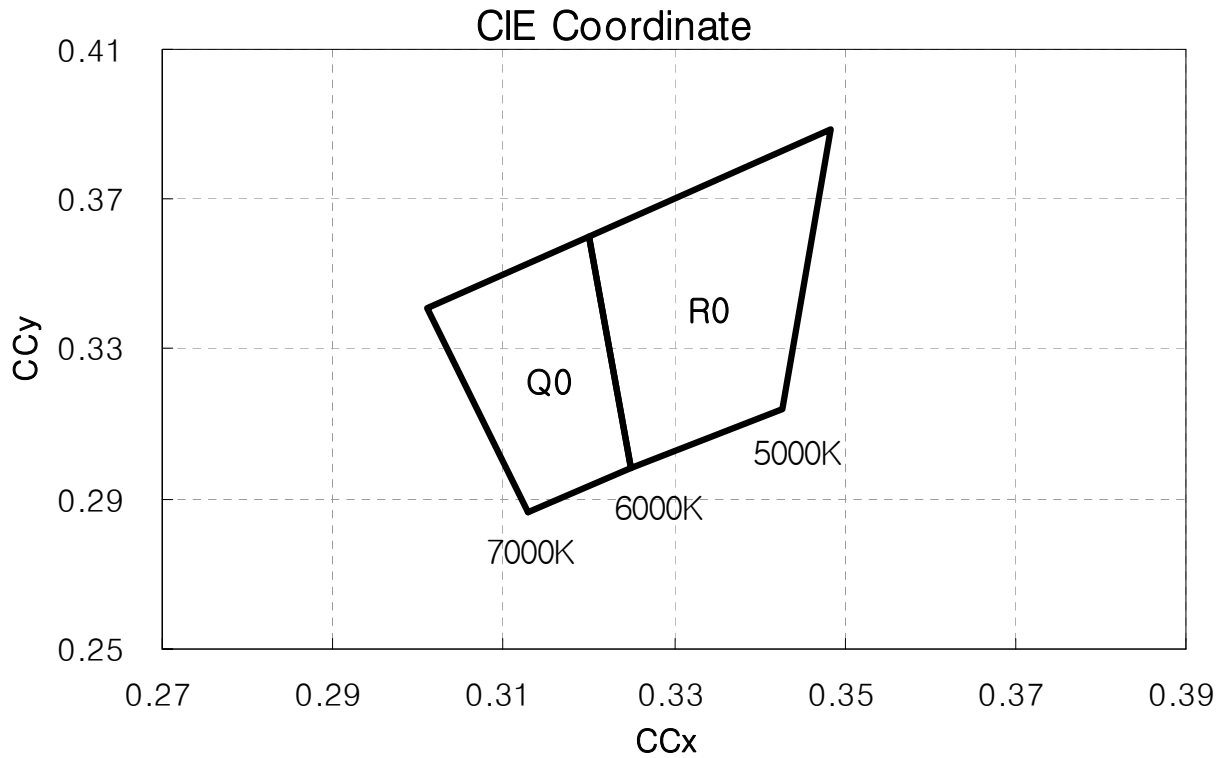
Rank	Symbol	Condition	Min.	Typ.	Max.	Unit
U3	U1	$I_F = 180\text{ mA}$	130	-	150	lm
	V1		150	-	170	
	W1		170	-	190	

### 3) Chromaticity Coordinates ( $T_a = 25 \text{ }^\circ\text{C}$ )

Rank		CCT(K)	Condition	CCx				CCy			
Q2	Q0	6000~7000	$I_F = 180 \text{ mA}$	0.3128	0.3250	0.3200	0.3011	0.2864	0.2981	0.3600	0.3407
	R0	5000~6000		0.3250	0.3428	0.3484	0.3200	0.2981	0.3138	0.3885	0.3600

- ※ Tolerance :  $V_F : \pm 0.1$ ,  $\Phi_v : \pm 10 \%$ , CCx CCy :  $\pm 0.02$
- ※ Luminous Flux (1W) : Typ. 103 lm/W (@120 mA)
- ※ Color Rendering Index (Ra) : Typ. 62

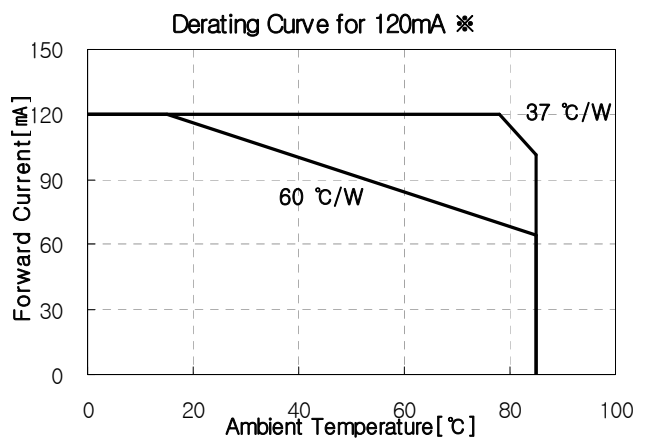
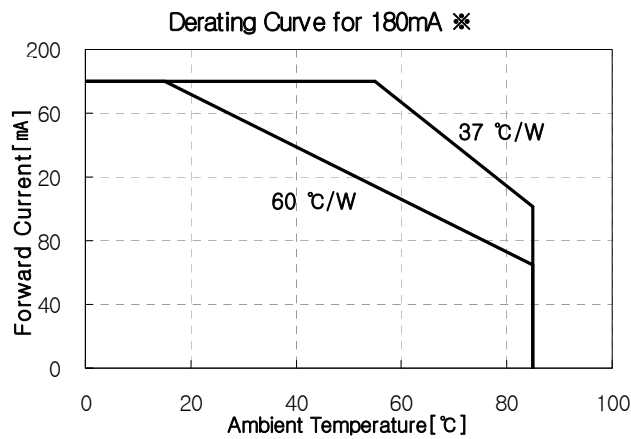
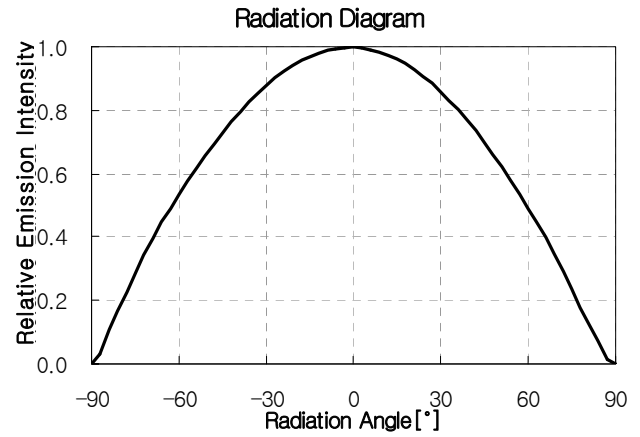
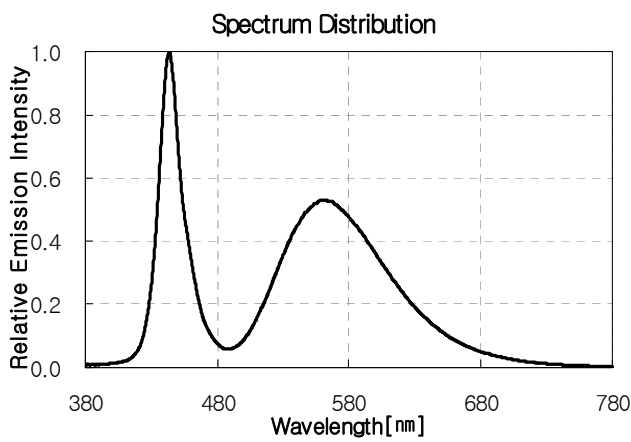
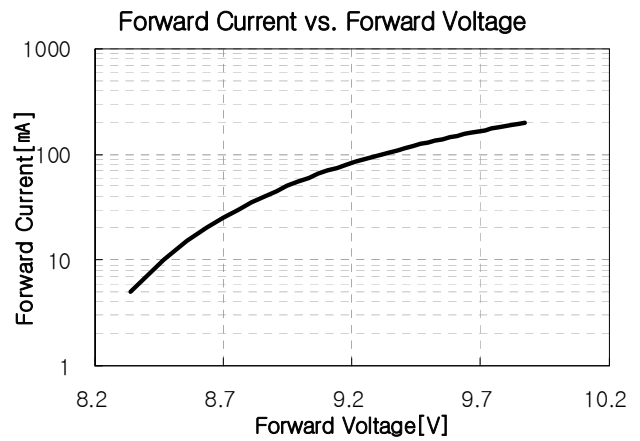
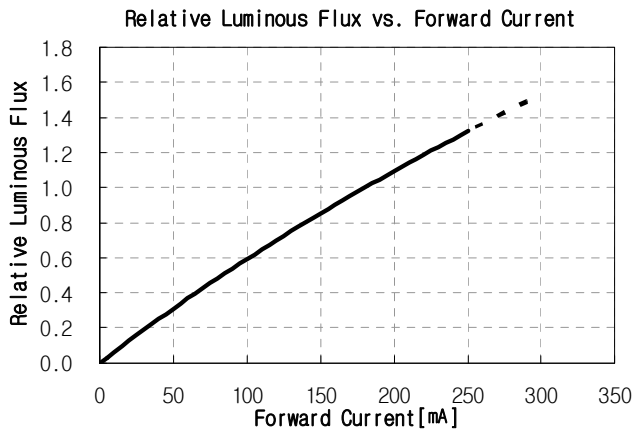
### 4. Chromaticity Diagram



#### Approved Rank

Symbol	$V_F$	CIE	$\Phi_v$
Rank	S1, S2	Q0, R0	U1, V1, W1

## 5. Typical Characteristic Graphs



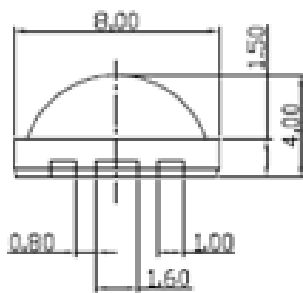
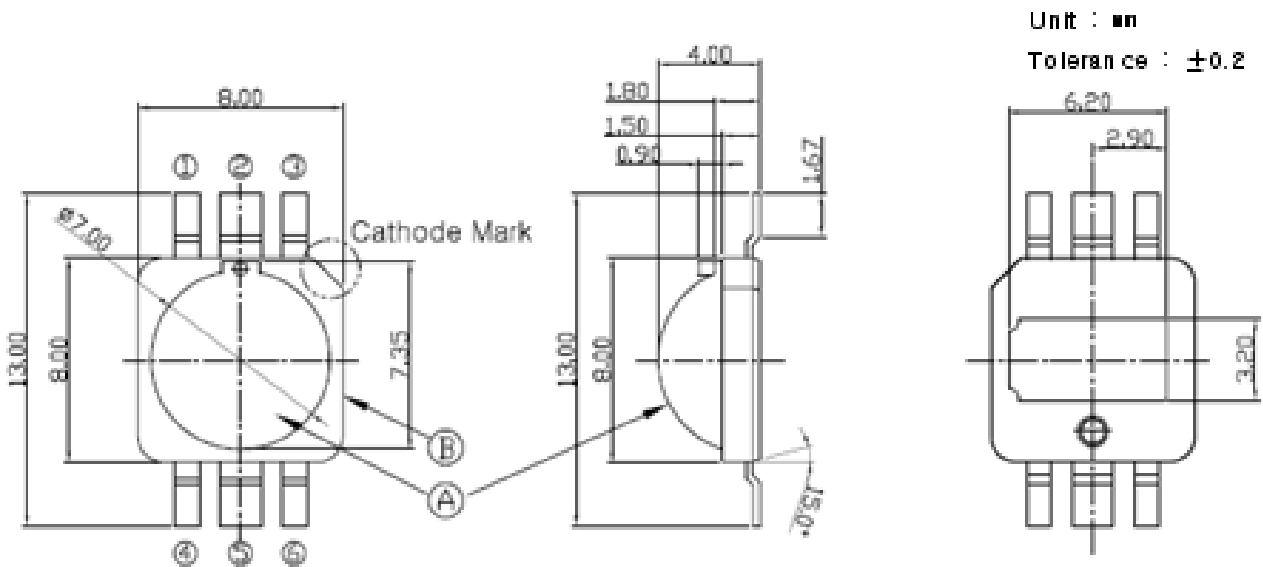
※ Thermal Resistance Test Conditions

- Junction to ambient thermal resistance
- JEDEC Standard JESD 51-2,3

JESD 51-2 : Integrated Circuits Thermal Test Method Environmental Conditions  
 - Natural Convection (Still Air)

JESD 51-3 : Low Effective Thermal Conductivity Test Board for Leaded Surface Mount Package

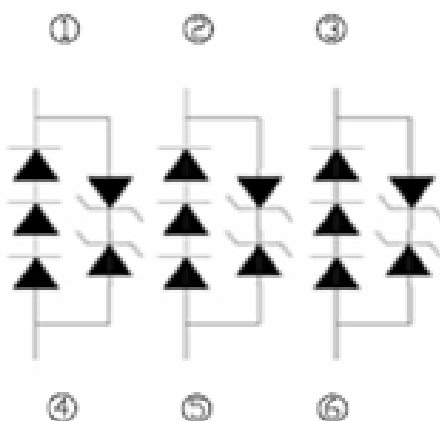
## 6. Outline Drawing and Dimension



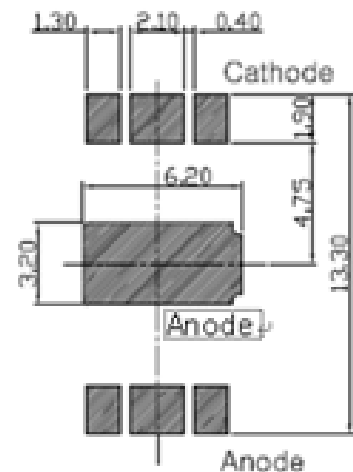
### Pick and Place

1. Do not place pressure on the encapsulating resin ('A')
2. The maximum compressing force is 15N on the polymer ('B')

### Circuit



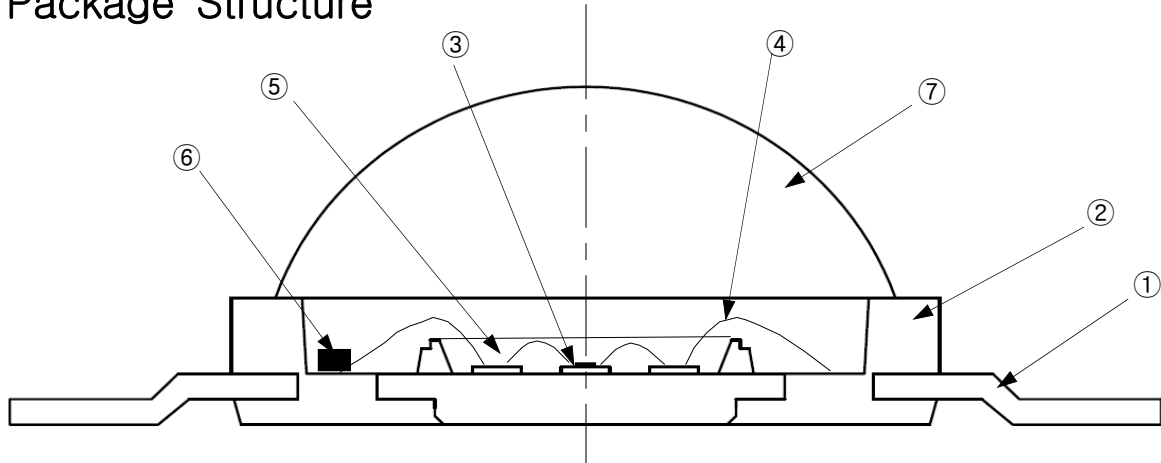
### Solder Pattern for Surface Mount



### Remarks

Make sure that the heat sink is electrically connected to the Anode.  
Heat sink is to be soldered, If not, use the heat conductive adhesive.

## 7. Package Structure

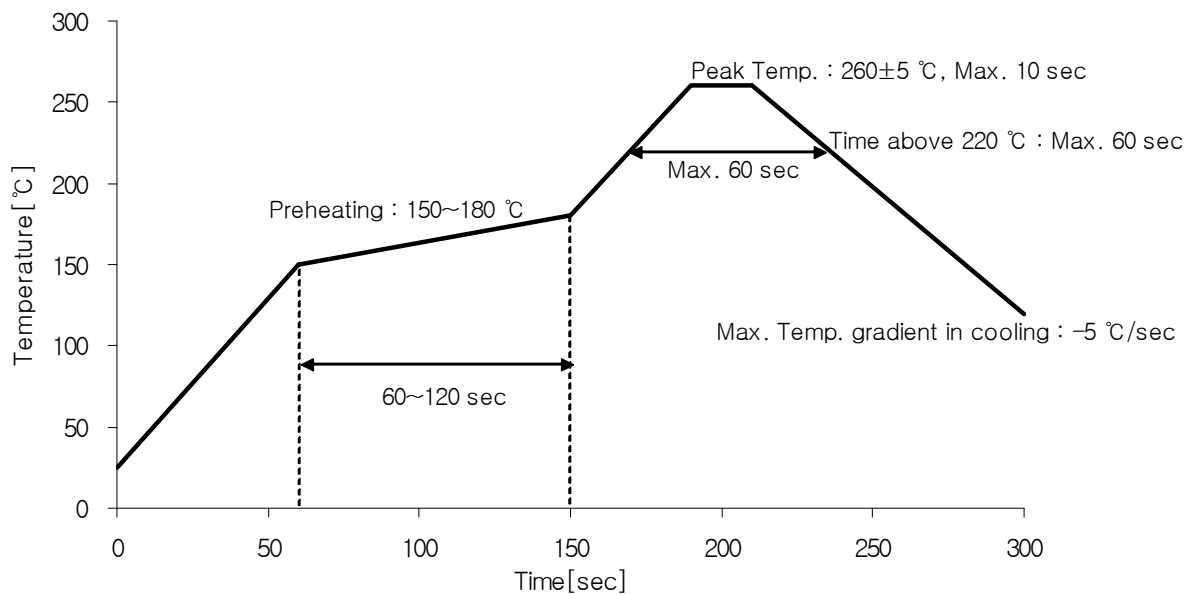


No	Component	Material
①	Frame	Copper frame(Silver plated)
②	Package	Heat-resistant polymer
③	LED chip	GaN/Al <sub>2</sub> O <sub>3</sub>
④	Wire	Gold wire
⑤	Encapsulant	Silicone + Phosphor
⑥	Zener diode	Si
⑦	Lens	Silicone

## 8. Solder Conditions

### 1) Reflow Conditions (Pb-Free)

Reflow Frequency : 2 time max.

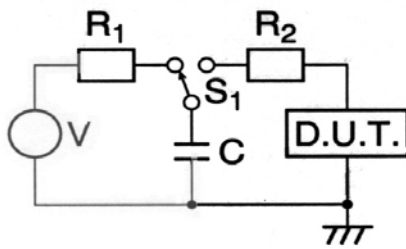


### 2) For Manual Soldering

Not more than 5 seconds @Max. 300 °C, under soldering iron.

## 9. Reliability Test Items and Conditions

### 1) Test Items

Test Items	Test Conditions	Test Hours/Cycles
Room Temperature life test	25 °C, $I_F = \text{Max DC}^*$	1,000 h
High Temperature humidity life test	85 °C, 60 % RH, $I_F = \text{Max DC}^*$	1,000 h
High Temperature life test	85 °C, $I_F = \text{Max DC}^*$	1,000 h
Low Temperature life test	-40 °C, $I_F = \text{Max DC}^*$	1,000 h
High Temperature Storage	110 °C	1,000 h
Low Temperature Storage	-40 °C	1,000 h
Thermal Shock	-40 / 120 °C, each 30 min	200 cycles
Temperature humidity Cycle On/Off test	-40 / 85 °C, each 20 min, 100 min transfer Power On/off each 5 min, DC 180 mA	100 cycles
Reflow (Pb-Free)	Peak 260±5 °C for 10 sec	3 times
ESD(HBM)	 <p>R1 : 10 MΩ , R2 : 1.5 kΩ , C : 100 pF</p>	3 times (± 5 kV)

\* Max. DC current is depending on maximum current derating curve.

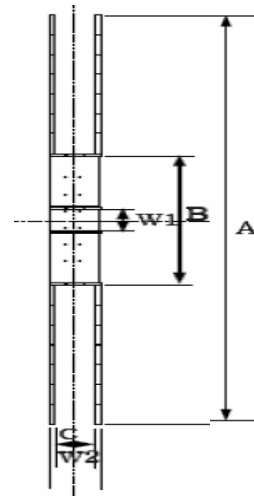
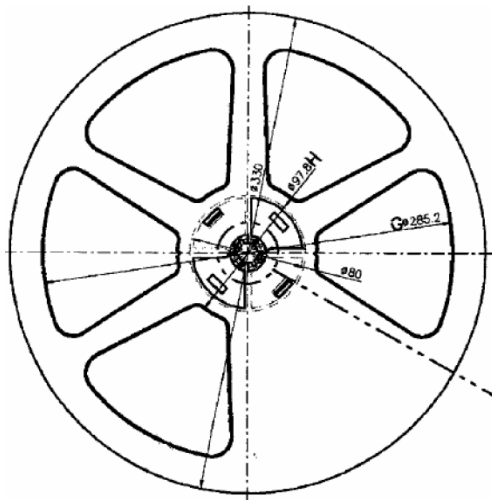
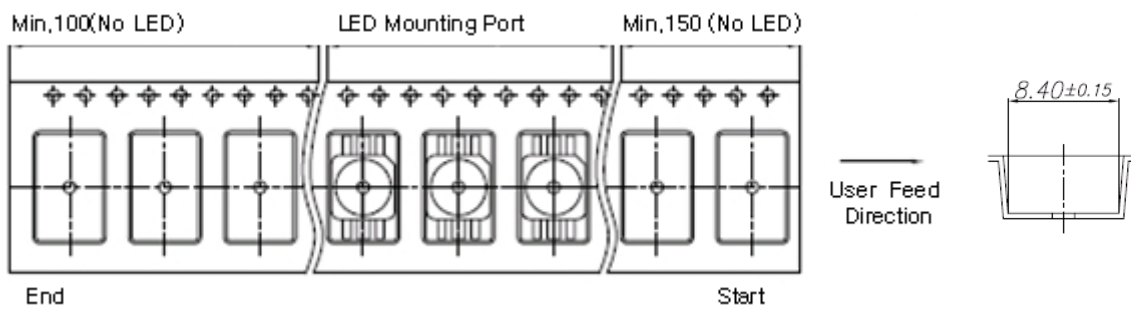
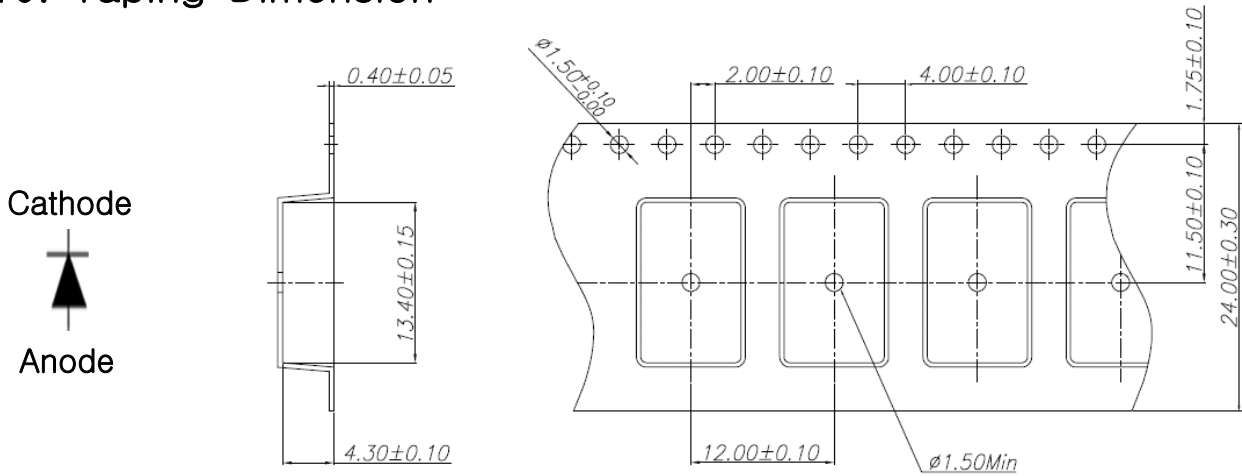
### 2) Criteria for Judging the Damage

Item	Symbol	Test Condition	Limit	
			Min	Max
Forward Voltage	$V_F$	$I_F = 180 \text{ mA}$	-	U.S.L.*1.2
Luminous Flux	$\Phi_V$	$I_F = 180 \text{ mA}$	L.S.L.*0.5	-
Reverse Voltage	$V_R$	$I_R = 5 \text{ mA}$	-	U.S.L.*2.0

\* U.S.L : Upper Standard Level, L.S.L : Lower Standard Level



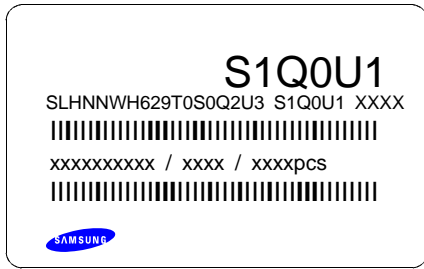
# 10. Taping Dimension



Symbol	A	B	C	W1	W2
Dimension(mm)	330 ± 1	80 ± 1	25 ± 0.5	13 ± 0.3	29.5 ± 1

- (1) Quantity : 1,000 Pcs / 13" Reel.
- (2) Cumulative Tolerance : Cumulative Tolerance/10 pitches is less than ±0.2 mm
- (3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1–0.7N when the cover tape is turned off from the carrier tape at 10 °C angle to be the carrier tape.
- (4) Packaging : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package

## 11. Label Structure



### Rank Code

/S1/ : VF Rank (refer to page 3)

/Q0/ : Chromaticity Coordinate Rank, CIE (refer to page 4)

/U1/ : Luminous Flux (refer to page 3)

## 12. Lot Number

The Lot number is composed of the following characters

●◎◇◆□■△△△ / |▲▲▲ / 1000PCS

● : Production Site (S:SEMCO, G:Gosin China, L:SOLLEDS)

◎ : L (LED)

◇ : Product State (A:Normality, B:Bulk, C:First Production, R:Reproduction, S:Sample)

◆ : Year (S:2008, T:2009, U:2010...)

□ : Month (1 ~ 9, A, B)

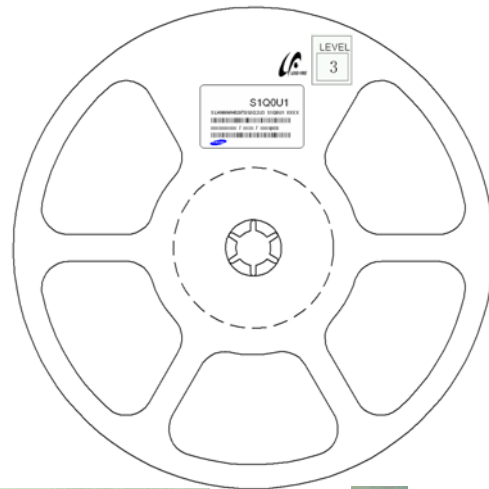
■ : Day (1 ~ 9, A, B ~ V)

△ : SEMCO. Product number (1 ~ 999)

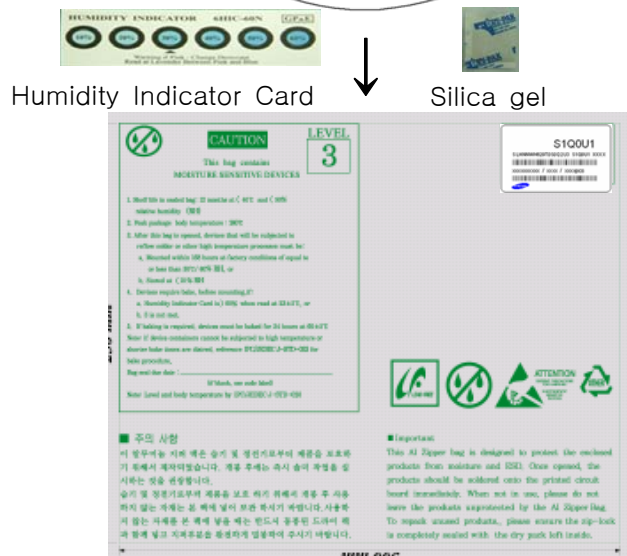
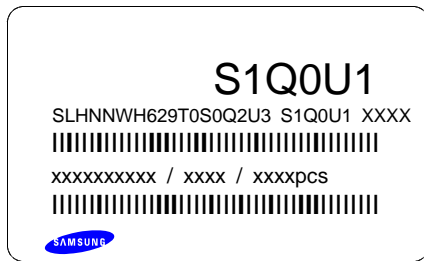
▲ : Reel Number (1 ~ 999)

### 13. Reel Packing Structure

#### 1) Reel



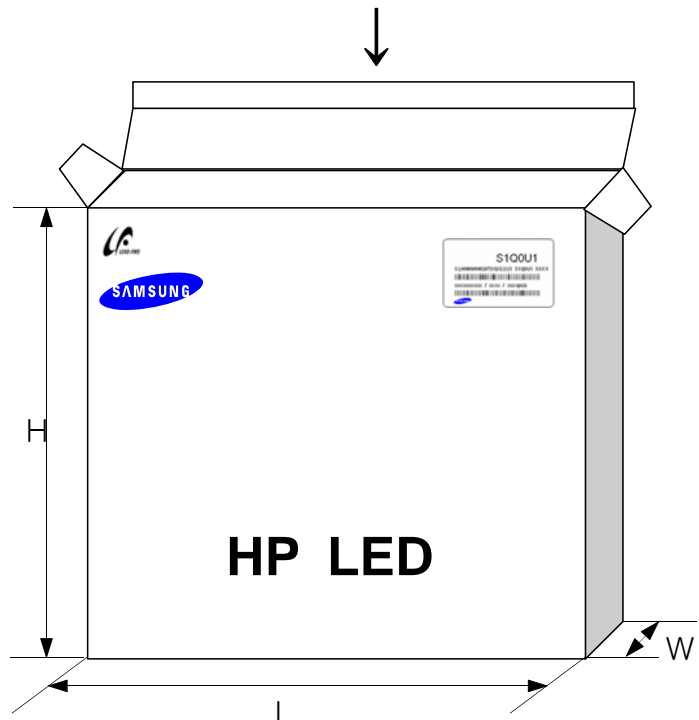
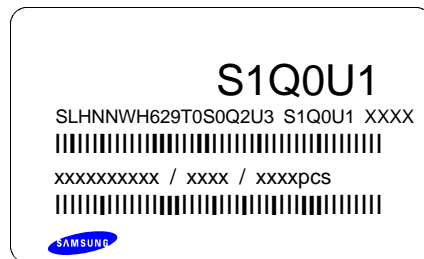
#### 2) Aluminum Bag



#### 3) Inner Box

Material : Paper(SW3B(B))

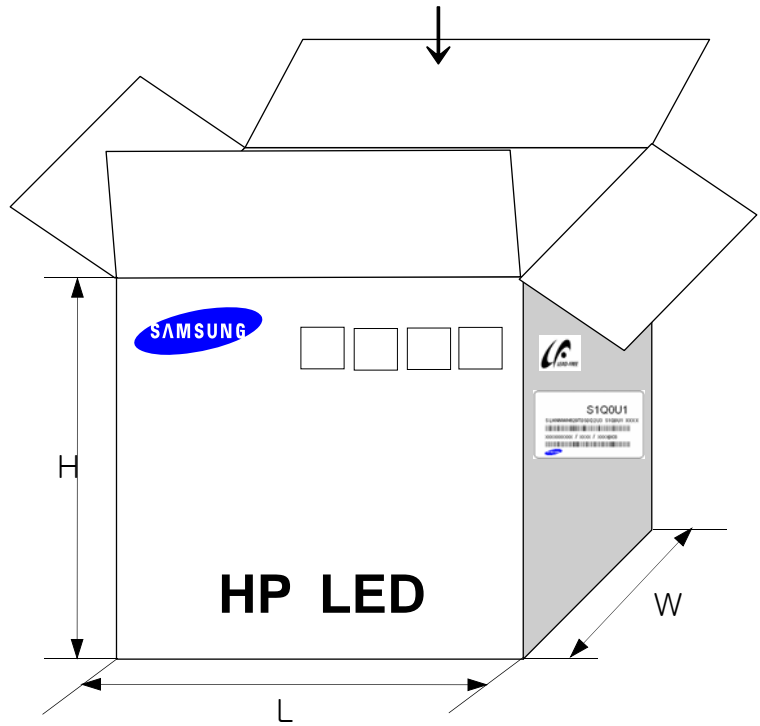
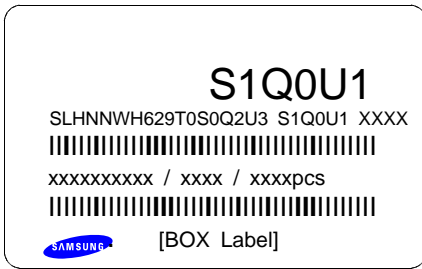
TYPE	SIZE(mm)		
	L	W	H
13inch	335	45	335



#### 4) Carton Box

Material : Paper(SW3B(B))

TYPE	SIZE(mm)		
	L	W	H
13inch	350	350	350



## 14. Precaution for Use

- 1) For over-current-proof function, customers are recommended to apply resistors to prevent sudden change of the current caused by slight shift of the voltage.
- 2) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When washing is required, IPA is recommended to use.
- 3) When the LEDs illuminate, operating current should be decided after considering the ambient maximum temperature.
- 4) LEDs must be stored in a clean environment.  
If the LEDs are to be stored for 3 months or more after being shipped from SEMCO, they should be packed by a sealed container with nitrogen gas injected. (Shelf life of sealed bags : 12 months, temp. 0~40°C, 20~70%RH)
- 5) After storage bag is open, device subjected to soldering, solder reflow, or other high temperature processes must be:
  - a. Mounted within 168 hours (7days) at an assembly line with a condition of no more than 30°C/60%RH,
  - b. Stored at <10% RH.
- 6) Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.
- 7) Devices require baking before mounting, if humidity card reading is >60% at 23±5°C.
- 8) Devices must be baked for 24hours at 65±5°C, if baking is required.
- 9) The LEDs are sensitive to the static electricity and surge. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.  
If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices.  
Damaged LEDs may show some unusual characteristics such as increase in leak current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.

## 14. Precaution for Use (취급상 주의사항)

- 1) For over-current-proof function, customers are recommended to apply resistors to prevent sudden change of the current caused by slight shift of the voltage.  
과전류 방지를 위해 전압의 미세한 이동에 의해 야기되는 전류의 순간 변화를 방지하기 위해 저항 등의 설치를 권장함.
- 2) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When washing is required, IPA is recommended to use.  
제품은 물, 오일, 유기물과 같은 액체 타입에서의 사용은 제한되며, 세정이 필요할 시에는 IPA 사용을 권장함.
- 3) When the LEDs illuminate, operating current should be decided after considering the ambient maximum temperature.  
LED의 발광 시, 동작 전류는 주변 최고온도를 고려하여 결정되어야 함.
- 4) LEDs must be stored in a clean environment.  
If the LEDs are to be stored for 3 months or more after being shipped from SEMCO, they should be packed by a sealed container with nitrogen gas injected. (Shelf life of sealed bags : 12 months, temp. 0~40°C, 20~70%RH)  
LED의 보관은 청정한 환경에서 보존되어야 하며, 만약 삼성전기로부터 공급받는 후 3개월 또는 그 이상 보관이 필요하다면 질소 가스를 동봉한 보존용기에 보관되어야 함. (보존 bag의 수명 : 12 개월, 보존 온도 0~40°C, 습도 20~70%RH)
- 5) After storage bag is open, device subjected to soldering, solder reflow, or other high temperature processes must be:  
보존 Bag이 개봉된 후에, 납땀이나 reflow등의 높은 온도에 노출되는 제품은 다음의 사항에 부합되어야 함.
  - a. Mounted within 168 hours (7days) at an assembly line with a condition of no more than 30°C/60%RH,  
a. 제품은 30°C/60%RH보다 같거나 낮은 조립조건에서 168시간(7일) 이내에 조립되어야 함.
  - b. Stored at <10% RH.  
b. 10% 이하의 상대습도에서 보관되어야 함.
- 6) Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.  
사용하지 않은 제품은 방습팩에 넣어 개봉 부위를 닫아서 다시 포장한 후, 건조한

장소에서 보관할 것을 권장함

- 7) Devices require baking before mounting, if humidity card reading is  $>60\%$  at  $23\pm 5^{\circ}\text{C}$ .  
 만약 습도표시카드의 수치가  $23\pm 5^{\circ}\text{C}$ 에서 60% 이상이라면, 제품 실장 전에 baking하여야 함.
- 8) Devices must be baked for 24hours at  $65\pm 5^{\circ}\text{C}$ , if baking is required.  
 만약 baking이 필요하다면, 제품은  $65\pm 5^{\circ}\text{C}$ 에서 24시간 정도 baking 되어야 함.
- 9) The LEDs are sensitive to the static electricity and surge. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.  
 LED는 정전기 및 서지에 민감한 제품이므로, LED 제품을 다룰 시에는 정전기 방지장갑이나 손목밴드를 사용하기를 권장함.  
 If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices.  
 만약 절대 허용치를 초과하는 전압이 LED에 가해지면, LED 소자는 파괴되거나 손상될 수 있음.  
 Damaged LEDs may show some unusual characteristics such as increase in leak current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.  
 손상된 제품은 누설전류의 증가, Turn on 전압의 저하, 저 전류에서의 점등불량 등의 이상 거동을 보일 수 있음.

## 14. Precaution for Use

- 1) For over-current-proof function, customers are recommended to apply resistors to prevent sudden change of the current caused by slight shift of the voltage.

電圧の少しの変更により引き起こされる突然の電流変更を防ぐために過電流防止機能の抵抗器を適用するように勧めします。

- 2) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When washing is required, IPA is recommended to use. 本製品は、水、油、有機的な溶剤などの任意のタイプの流体の中で使用しないで下さい。洗浄が要求される場合、IPAを使用して下さい。

- 3) When the LEDs illuminate, operating current should be decided after considering the ambient maximum temperature.

LED発光の時、動作電流はLED周囲の温度条件により使用電流を決めてください。

- 4) LEDs must be stored in a clean environment.

If the LEDs are to be stored for 3 months or more after being shipped from SEMCO, they should be packed by a sealed container with nitrogen gas injected. (Shelf life of sealed bags : 12 months, temp. 0~40°C, 20~70%RH)

本製品は清潔な大気を維持する環境で保存して下さい。

LEDが送られた後に3か月以上保存される場合、窒素雰囲気~~を~~を備えた密封したコンテナ装置に保管して下さい。

(0~40°C以下、20~70%のRH以下とし12か月以内)

- 5) After storage bag is open, device subjected to soldering, solder reflow, or other high temperature processes must be:

開封後、Reflowハンダあるいは他の高温プロセスにさらされる場合は、

- a. Mounted within 168 hours (7days) at an assembly line with a condition of no more than 30°C/60%RH,

- a. 工場条件30°C/60%以下の条件で168時間（7日）以内にマウントを完了して下さい。

- b. Stored at <10% RH.

- b. また10%のRHで保存して下さい。

- 6) Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.

未使用のLEDが残った場合は、乾燥剤（シリカゲル）入り乾燥容器などで保管して下さい。なお当社防湿袋に戻し、再封印することを推奨します。



7) Devices require baking before mounting, if humidity card reading is  $>60\%$  at  $23\pm 5^{\circ}\text{C}$ .

以下の場合、マウントする前にbakeすることをお勧めします。

$23\pm 5^{\circ}\text{C}$ での湿度カードの表紙が60%以上の時

8) Devices must be baked for 24hours at  $65\pm 5^{\circ}\text{C}$ , if baking is required.

Bakingが要求される場合、 $65\pm 5^{\circ}\text{C}$ で24時間Bakeすることをお勧めします。

9) The LEDs are sensitive to the static electricity and surge. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.

本製品は静電気やサージ電圧に敏感で、素子の損傷や信頼性低下を起こすことがあります。本LEDの取り扱いに際しては、手首バンドまたは静電気防止グローブ等の静電気対策を十分行って下さい

If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices.

LEDに最大定格電圧値を超過される場合、LEDの損害を引き起こし、破壊する可能性があります。

Damaged LEDs may show some unusual characteristics such as increase in leak current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.

損傷したLEDには、漏洩電流が著しく大きくなり、順方向の立ち上がり電圧が低下したり低電流で発光しなくなる等の異常が現れます。

# 15. Hazard Substance Analysis



**Test Report No.** F690501/LF-CTSAYAA09-20355

**Issued Date:** July 17, 2009

**Page 1 of 4**

**To:** SAMSUNG LED CO.,LTD.  
 314, Maetan-dong  
 Yeongtong-gu  
 Suwon-city  
 GYEONGGI-DO  
 Korea

The following merchandise was submitted and identified by the client as :

**Product Name** : LED  
**SGS File No.** : AYAA09-20355  
**Received Date** : July 14, 2009  
**Test Performing Date** : July 15, 2009  
**Test Performed** : SGS Testing Korea tested the sample(s) selected by applicant with following results  
**Test Results** : For further details, please refer to following page(s)  
**Comments** : By the applicant's specific request, the sampling and testing was performed only for the part indicated in the photo without disassembly. The client has confirmed that the described item No.s/part No.s are the same with the sample submitted.

Pluto Kim  
 Cindy Park  
 Jinee Song/ Testing Person

SGS Testing Korea Co. Ltd.

Jeff Jang / Chemical Lab Mgr

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 Unless otherwise stated the results shown in this report apply only to the sample(s) tested and such sample(s) are retained for 180 days only.





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Sample No. : AYAA09-20355.001  
 Sample Description : LED  
 Item No./Part No. : SLHNNWWW629TD(SLHNNWH629TD)

**Halogen Contents**

Test Items	Unit	Test Method	MDL	Results
Fluorine(F)	mg/kg	BS EN 14582:2007 , IC	30	98
Chlorine(Cl)	mg/kg	BS EN 14582:2007 , IC	30	N.D.
Bromine(Br)	mg/kg	BS EN 14582:2007 , IC	30	N.D.
Iodine(I)	mg/kg	BS EN 14582:2007 , IC	50	N.D.

**Other(s)**

Test Items	Unit	Test Method	MDL	Results
PFOS(Perfluorooctane Sulfonates-Acid/Metal Salt/Amide)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D.

- NOTE: (1) N.D. = Not detected.(<MDL)  
 (2) mg/kg = ppm  
 (3) MDL = Method Detection Limit  
 (4) - = No regulation  
 (5) \*\* = Qualitative analysis (No Unit)  
 (6) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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F062 Version3

SGS Testing Korea Co.,Ltd.

322, The Ovalley, 595-0, Hoggae-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-000  
 T +82 (0)31 4608 000 F +82 (0)31 4608 050 <http://www.sgs.com> [www.kr.sgs.com](http://www.kr.sgs.com) [www.kr.sgs.com/greentab](http://www.kr.sgs.com/greentab)

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Picture of Sample as Received:



\*\*\* End \*\*\*

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) \* = Boiling-water-extraction:  
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SGS Testing Korea Co., Ltd.

322, The O valley, 595-9, Hogsy-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-030  
 t +82 (0)1 4828 050 f +82 (0)1 4826 059 <http://www.sgslab.co.kr> [www.kr.sgs.com/greenlab](http://www.kr.sgs.com/greenlab)

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