

APPROVAL SHEET

MODEL NAME	High CRI White Top View LED
PART NUMBER	YL-3535F(120)-W
CUSTOMER NAME	
DATE	2017. 02. 28
REMARK	Rev. 2

[CUSTOMER APPROVAL]

APPROVAL NO.				
APPROVAL DATE				
APPROVAL	INSPECTOR	CHECK	APPROVAL	COMMENT

[VENDOR APPROVAL]

APPROVAL NO.				
APPROVAL DATE				
APPROVAL	SALES	R&D	PRODUCTION	QC

1. Revision note

Date	Revision	Page	Remark
2015-10-21	Initiate Document	-	Rev.0
2017-01-15	Add the Flux Value (All CCT)	5	Rev.1
2017-02-28	Change the Absolute Maximum Ratings	4	Rev.2

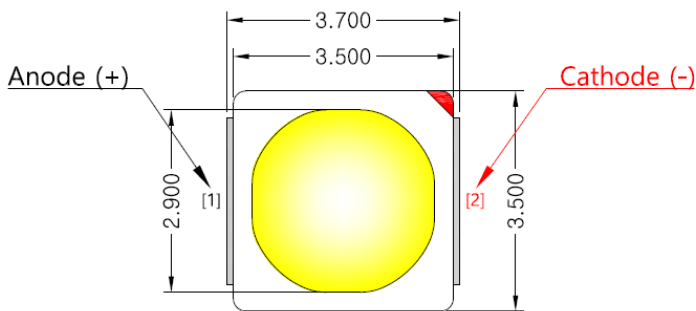
2. DATA SHEET

PART NUMBER	YL-3535F(120)-W
TYPE	PLCC Type
COLOR	White
Application	Down Bulb, MR, Par – Retrofit Lamp Flat, Down Light – Indoor Lighting Industry Lighting – Outdoor Lighting

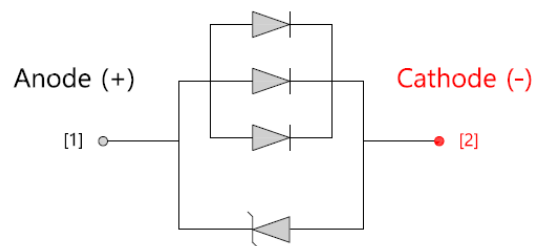
1) Features and Dimension

Type : 3535 PLCC

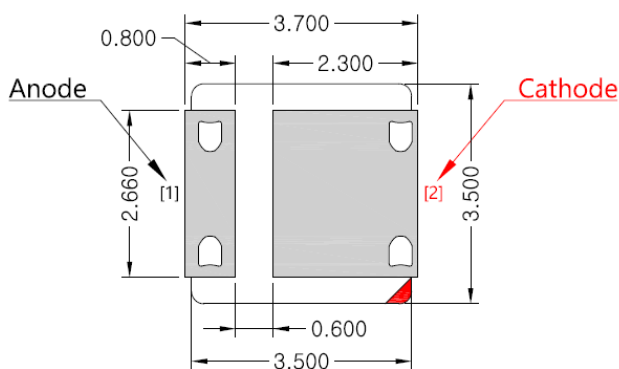
- High brightness Cool white-color surface mount LED.
- 120° viewing angle.
- Small package outline (LxWxH) of 3.5 x 3.5 x 1.1 mm. (± 0.1)
- Qualified according to JEDEC moisture sensitivity Level 2.
- Compatible to both IR reflow soldering and TTW soldering.



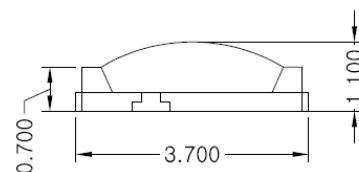
[Top view]



[Circuit diagram]



[Bottom view]



[Side view]

2) Material Composition

Item	Material
LED Chip	InGaN base
Wire	Au gold wire
Lead-Frame	Cu alloy with Ag plating
Encapsulation	Silicone
Package Polymer	Heat-resistant Thermal plastic

3) Absolute Maximum Ratings.

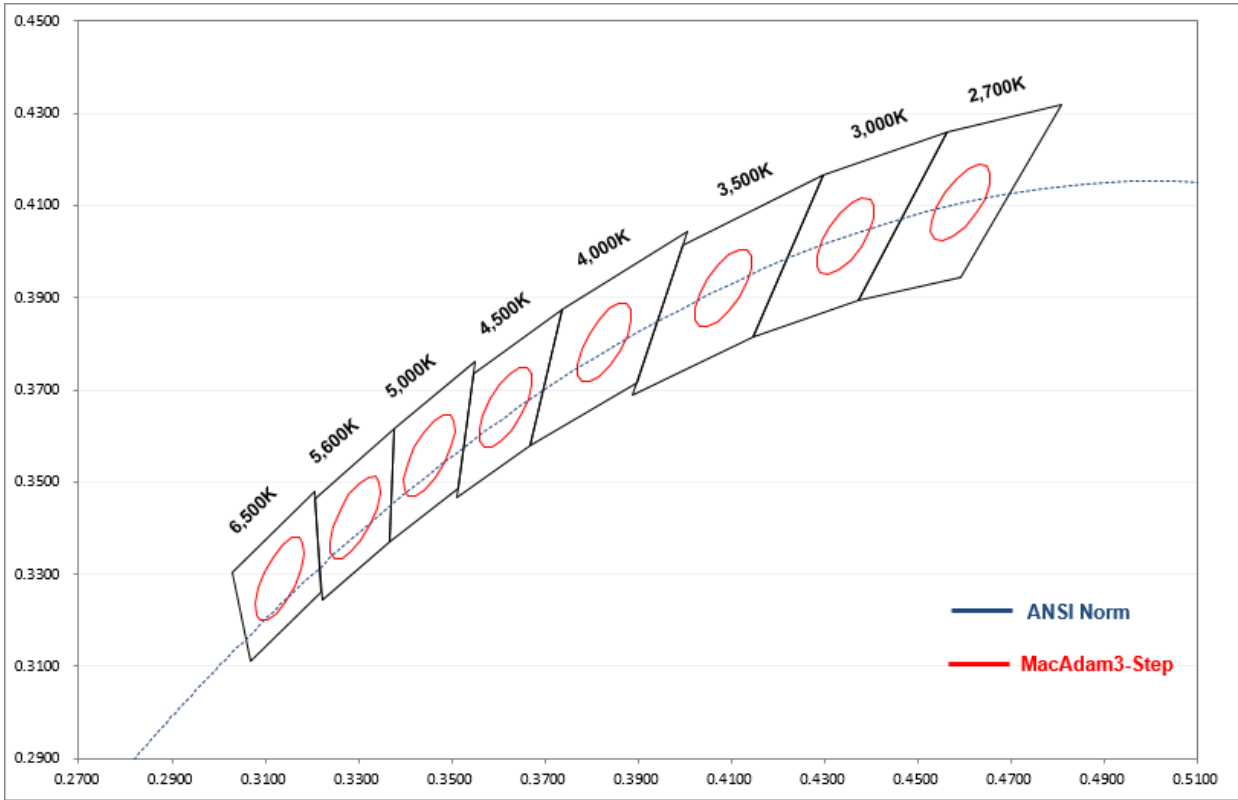
Parameters	Symbol	Maximum Value	Unit
		White	
DC forward current	IF	350	mA
Pulse current; (tp ≤ 10 ms, Duty cycle = 1/10)	IFP	400	mA
Power dissipation (at room temperature)	PDL	1.26	W
ESD Sensitivity	ESD	4,000	V
Operating temperature.	TOPR	-30 ~ +85	C
Storage temperature.	TSTG	-40 ~ +100	C
Soldering Temperature	TSOL	Reflow Soldering :260°C /10s Hand Soldering : 350°C /3s	C
junction temperature.	Tj	110	C

4) Electrical Properties Characteristics at Ta=25°C.

Item	Symbol	Rank	Min.	Typ.	Max.	Condition	Unit
Luminous Intensity (Luminous Flux)	K	2,700K	27.5 (82.5lm)	31.5 (94.5lm)	-	IF=350mA	cd (lm)
		3,000K	28.5 (85.5lm)	32.5 (97.5lm)	-		
		3,200K	29.5 (88.5lm)	33.5 (100.5lm)	-		
		4,000K	31.0 (93.0lm)	35.0 (105.0lm)	-		
		5,000K	32.5 (97.5lm)	36.5 (109.5lm)	-		
		5,600K	34.0 (102.0lm)	38.0 (114.0lm)	-		
		6,500K	34.0 (102.0lm)	38.0 (114.0lm)	-		
CRI	Ra	W	95.0	-	-	IF=350mA	Ra
Viewing Angle	2θ1/2	ALL	-	120	-	IF=350mA	Deg
Forward Voltage	VF	1	2.90		3.00	IF=350mA	V
		2	3.00		3.10		
		3	3.10		3.20		
		4	3.20		3.30		
		5	3.30		3.40		

- Luminous intensity is measured by CAS-140CT of instrument system Co., Ltd.
- Luminous intensity is measured with an accuracy of $\pm 10\%$
- Forward voltage, Vf is measured with an accuracy of ± 0.05 V
- Color Rendering Index, CRI is measured with an accuracy of ± 2.0
- Color Rendering Index : R9 > 90 , R12 > 90

5) Chromaticity diagram



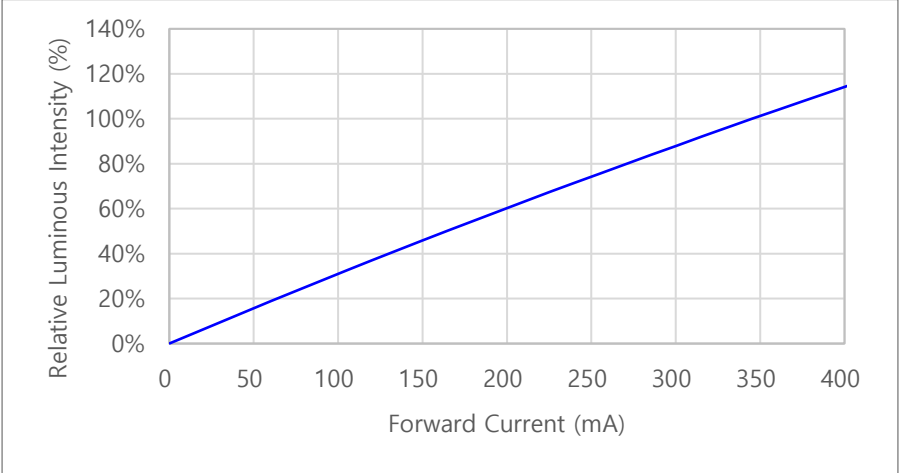
- Chromaticity coordinate groups are measured with an accuracy of ± 0.01 .

6) Color Correlated Temperature Ranges

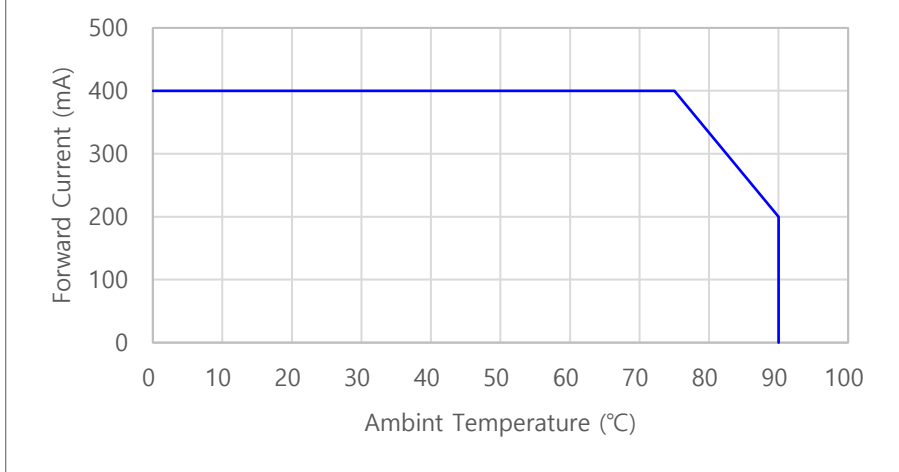
2,700K		3,000K		3,500K		4,000K	
x	y	x	y	x	y	x	y
0.4810	0.4319	0.4562	0.4260	0.4299	0.4165	0.4006	0.4044
0.4562	0.4260	0.4299	0.4165	0.3996	0.4015	0.3736	0.3874
0.4373	0.3893	0.4147	0.3814	0.3889	0.3690	0.3670	0.3578
0.4593	0.3944	0.4373	0.3893	0.4147	0.3814	0.3898	0.3716
4,500K		5,000K		5,600K		6,500K	
x	y	x	y	x	y	x	y
0.3736	0.3874	0.3552	0.3760	0.3376	0.3616	0.3205	0.3481
0.3548	0.3736	0.3376	0.3616	0.3207	0.3462	0.3028	0.3304
0.3511	0.3465	0.3366	0.3369	0.3222	0.3243	0.3068	0.3113
0.3670	0.3578	0.3514	0.3487	0.3366	0.3369	0.3221	0.3261

7) Optical and electrical characteristics

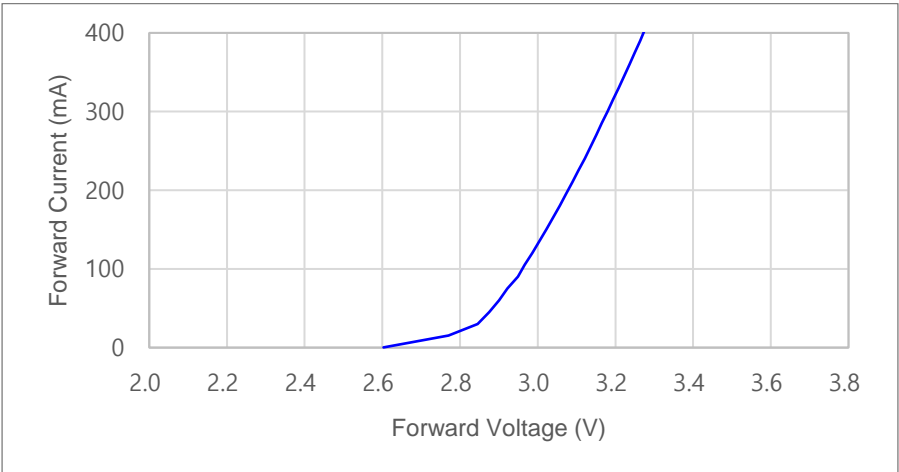
i. Relative luminous flux vs. Forward current



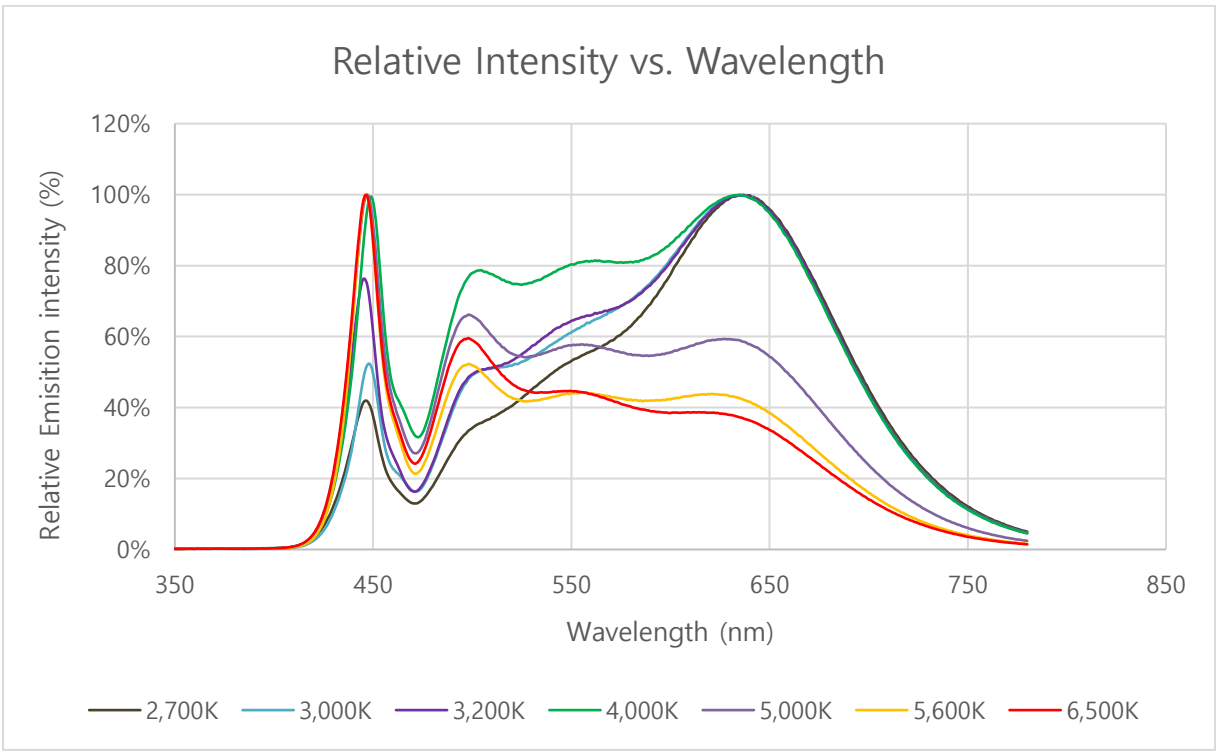
ii. Relative Forward current vs. Ambient temperature



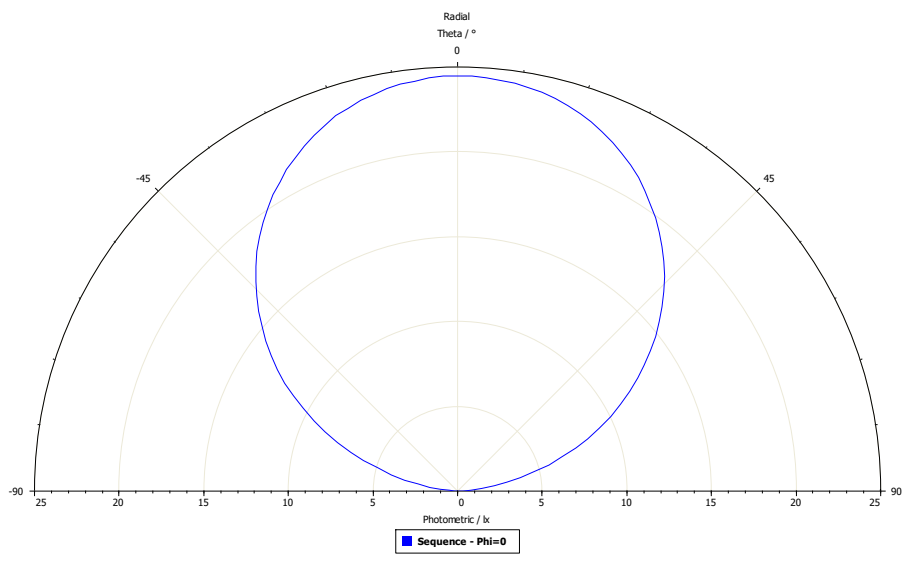
iii. Relative Forward current vs. Forward voltage



iv. Spectrum Distribution



v. Radiation pattern



8) Reliability Test Items and Conditions

Item	Reference	Test Conditions	Duration / Cycle
Thermal Shock	EIAJ ED-4701	Ta = -40°C (30min) ~ 100°C (30min)	150 Cycle
Operating Endurance Test	Internal Reference	Ta = 25°C, IF = 350mA	1000 Hours
High Temperature High Humidity Life Test	Internal Reference	Ta = 60°C, RH=90%, IF = 350mA	500 Hours
High Temperature Life Test	Internal Reference	Ta = 70°C, IF = 350mA	500 Hours
ESD(HBM)	MIL-STD- 883D	1KV at 1.5kΩ; 100pF	3 Time
Reflow	Tso	260°C < 10sec. Reflow Soldering	3 Time

◆ CRITERIA FOR JUDGING THE DAMAGE

Item	Symbol	Condition	Criteria for Judgment	
			MIN	MAX
Forward Voltage	V _F	I _F = 350mA	-	USL (1) × 1.2
Luminous Intensity	I _v	I _F = 350mA	LSL (2) × 0.7	-

** Note

(1) USL : Upper Standard Level

(2) LSL : Lower Standard Level

9) Recommended Soldering Temperature – Time Profile (Reflow Soldering)

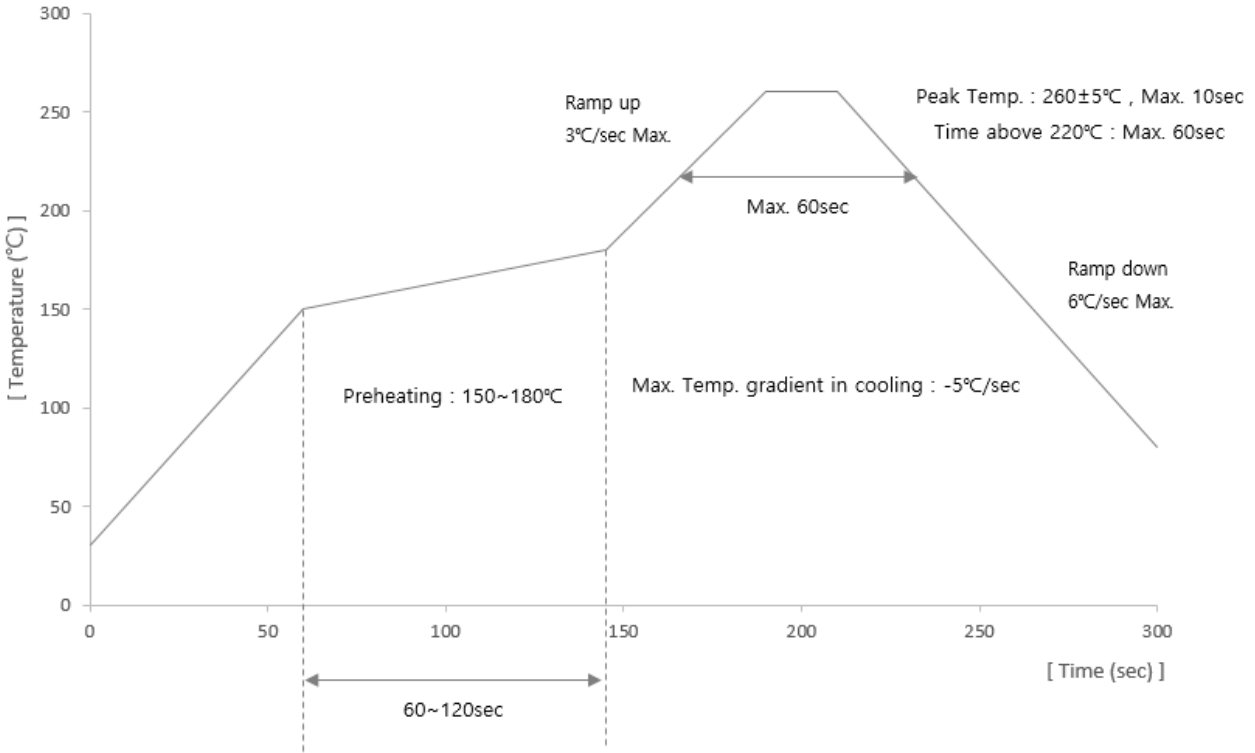
(1) Surface Mounting Condition

In automatic mounting of the SMD LEDs on printed circuit boards, any bending, expanding and pulling forces or shock against the SMD LEDs should be kept minimum to prevent them from electrical failures and mechanical damages of the devices.

(2) Soldering Reflow

- Soldering of the SMD LEDs should conform to the soldering condition in the individual specifications.
- SMD LEDs are designed for reflow soldering.
- In the reflow soldering, too high temperature and too large temperature gradient such as rapid heating/cooling may cause electrical & optical failures and damages of the devices.
- YESLED cannot guarantee the LEDs after they have been assembled using the solder dipping method.

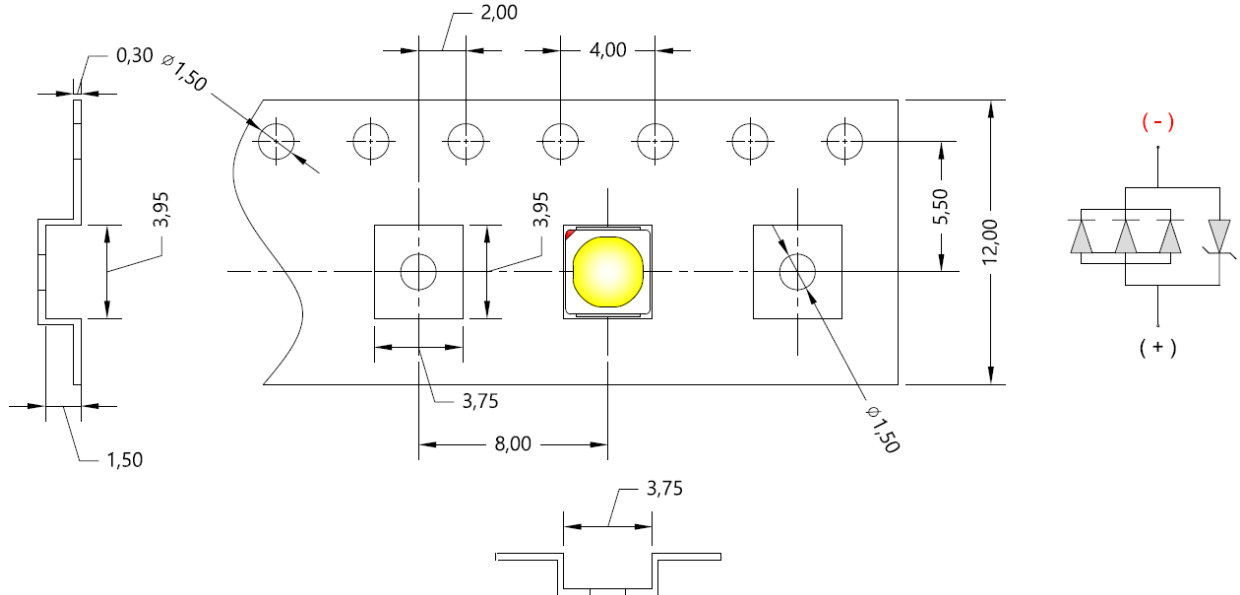
(3) Recommended Reflow Soldering Profile. (Pb free)



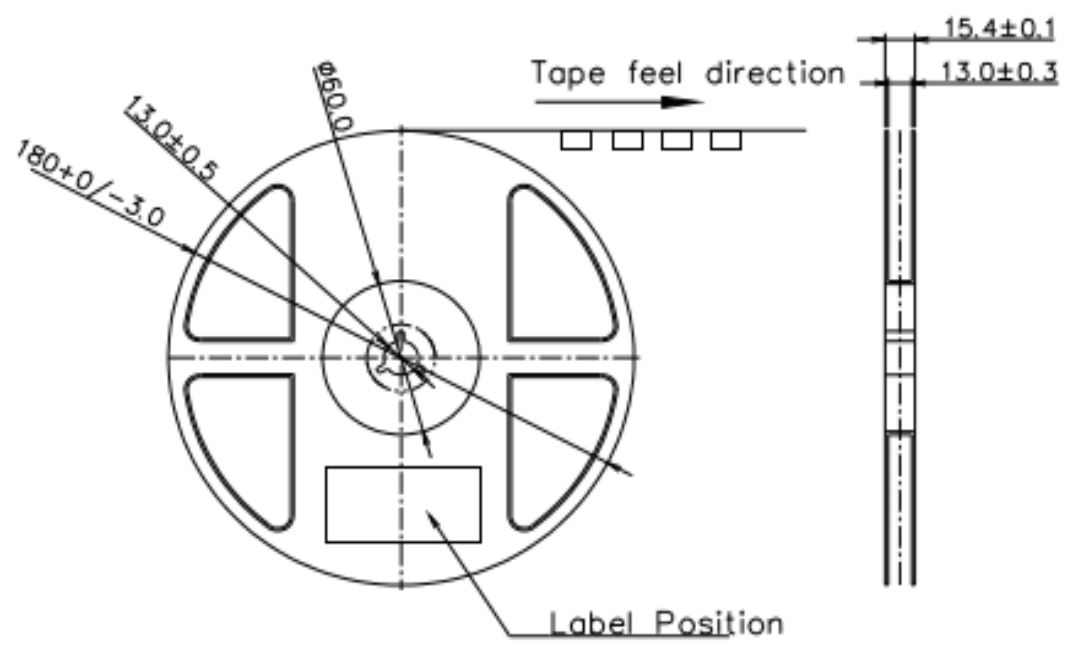
(4) Taping and Orientation

- 1) Moisture proof bag.
- 2) 1 Reel / bag.
- 3) Q'ty : 1,500 (Max) / Reel.

[Carrier Tape Dimension]



[Reel Dimension]



10) Cautions

1. Moisture-Proof Package
 - 1.1 When moisture is absorbed into the LED package it may vaporize and expand products during soldering. There is a possibility that this may cause exfoliation of the contacts and damage to the optical characteristics of the LEDs. For this reason, the moisture-proof package is used to keep moisture to a minimum in the package.
 - 1.2 A package of a moisture-absorbent material (silica gel) is inserted into the shielding bag. The humidity indicator card changes its color from blue to pink as it absorbs moisture.
2. Current limiting
 - 2.1 A resistor should be used to limit current spikes that can be caused by voltage fluctuations.
 - 2.2 Otherwise damage could occur.
3. Iron Soldering
 - 3.1 Hand soldering is not recommended for regular production. These guidelines are for rework only.
 - 3.2 Soldering iron tip should contact each terminal no more than 3 sec at 350°C, using soldering iron with nominal power less than 25W. Allow min. 2 sec. between soldering intervals.
4. Storage Conditions
 - 4.1 Before opening the package: The LEDs should be kept at 30°C or less and 60%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture-proof packaging with moisture-absorbent material (silica gel) is recommended.
 - 4.2 After opening the package: The LEDs should be kept at 30°C or less and 60%RH or less. The LEDs should be soldered within 168 hours (7 days) after opening the package. If unused LEDs remain, they should be stored in moisture-proof packages, such as sealed containers with packages of moisture-absorbent material (silica gel). It is also recommended to return the LEDs to the original moisture-proof bag and to reseal the moisture-proof bag again.
 - 4.3 If the package has been opened more than 4 week(MSL_2a) or the color of the desiccant changes, components should be dried for 10~24hr at 60±5°C
 - 4.4 YESLED LED electrode sections are comprised of a silver-plated copper alloy. The silver surface may be affected by environments which contain corrosive gases and so on. Please avoid condition which may cause difficulty environments during soldering operations. It is recommended that the User use the LEDs as soon as possible.
 - 4.5 Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.
5. Usage
 - 5.1 Do not exceed the values given in this specification.

NOTE :

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