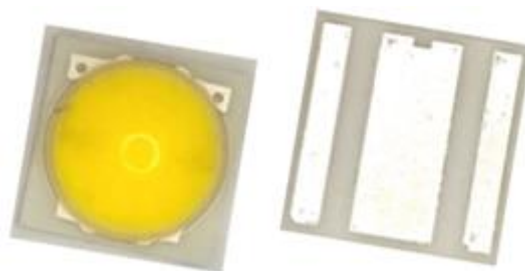


VFDP35AW3FFH04Z4



- ◆ Outline : 3.5*3.5*2.22mm
- ◆ High efficiency
- ◆ Good thermal dissipation & optical uniformity

Table of Contents :

Features-----	1
Product Code-----	2
Typical Product Characteristics-----	3
Maximum Rating-----	4
Intensity binning-----	5
Forward Voltage Binning-----	5
Color coordinate binning -----	6
Relative Spectral Power Distribution-----	7
Electronic-Optical Characteristics-----	7
Typical spatial distribution-----	7
Thermal Design for De-rating-----	8
Dimensions-----	9
Suggest Stencil Pattern-----	9
Packing-----	10
Reflow Profile-----	12
Precautions-----	13
Test items and results of reliability-----	16

Features

- Binning based on ANSI C78.377
- RoHS2.0 and REACH-compliant
- MSL2 qualified according to J-STD 020
- ESD 2KV (HBM : MIL-STD-883 Class 2)

Applications

- Portable lighting
- Outdoor lighting
- Indoor lighting
- Commercial lighting
- Industrial lighting
- Decorative lighting
- Automobile lighting
- Street and tunnel lighting



■ Product Code

V – F – DP35 – A – W3FF – H – 0 – 4 – Z – 4

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①	②	③	④	⑤
Process type	Category	Specification	Lens Angle code	Dice wavelength & Luminous rank
V: Eutectic process	F: Flip Chip LED	DP35: Ceramic 3535	A: 120°	W3XX: Cool White

⑥	⑦	⑧	⑨	⑩
Support code	Zener & High CRI	Cap color code	Module & Lens code	Current code
H: HTCC	0: None Zener	4: 6000K	Z: Molding	4: 350mA



■ Typical Product Characteristics(Ta=25°C)

Luminous Flux (lm) @350mA			Typical CCT (K)	Forward Voltage (V) @350mA		Viewing Angle
Group	Min.	Max.		Min.	Max.	
B35	120	130	5710-6530	2.8	3.4	120°
B36	130	140				
B37	140	150				
B38	150	160				

Notes:

1. Forward voltage (V_F) $\pm 0.05V$; Luminous flux (Φ_V) $\pm 7\%$; CRI ± 2 Viewing angle($2\theta_{1/2}$) $\pm 10^\circ$
2. IS standard testing.

■ **Maximum Rating (Ta : 25°C)**

Characteristics	Symbol	Min.	Typical	Max.	Unit
DC Forward Current ¹	I _F			1000	mA
Pulse Forward Current ²	I _{PF}			1500	mA
Reverse Voltage	V _R			5	V
Reverse Current	I _R			10	μA
Junction Temperature ³	T _j			150	°C
Thermal Resistance Junction / Solder Point	R _{th}		10		°C/W
Operation Temperature Range	T _{opr}	-40	–	105	°C
Storage Temperature Range	T _{stg}	-40	–	105	°C
Soldering Temperature	T _{sol}			250	°C

Notes:

1. For other ambient, limited setting of current will depend on de-rating curves.
2. D=0.01s duty 1/10.
3. When drive on maximum current , T_j must be kept below 150°C



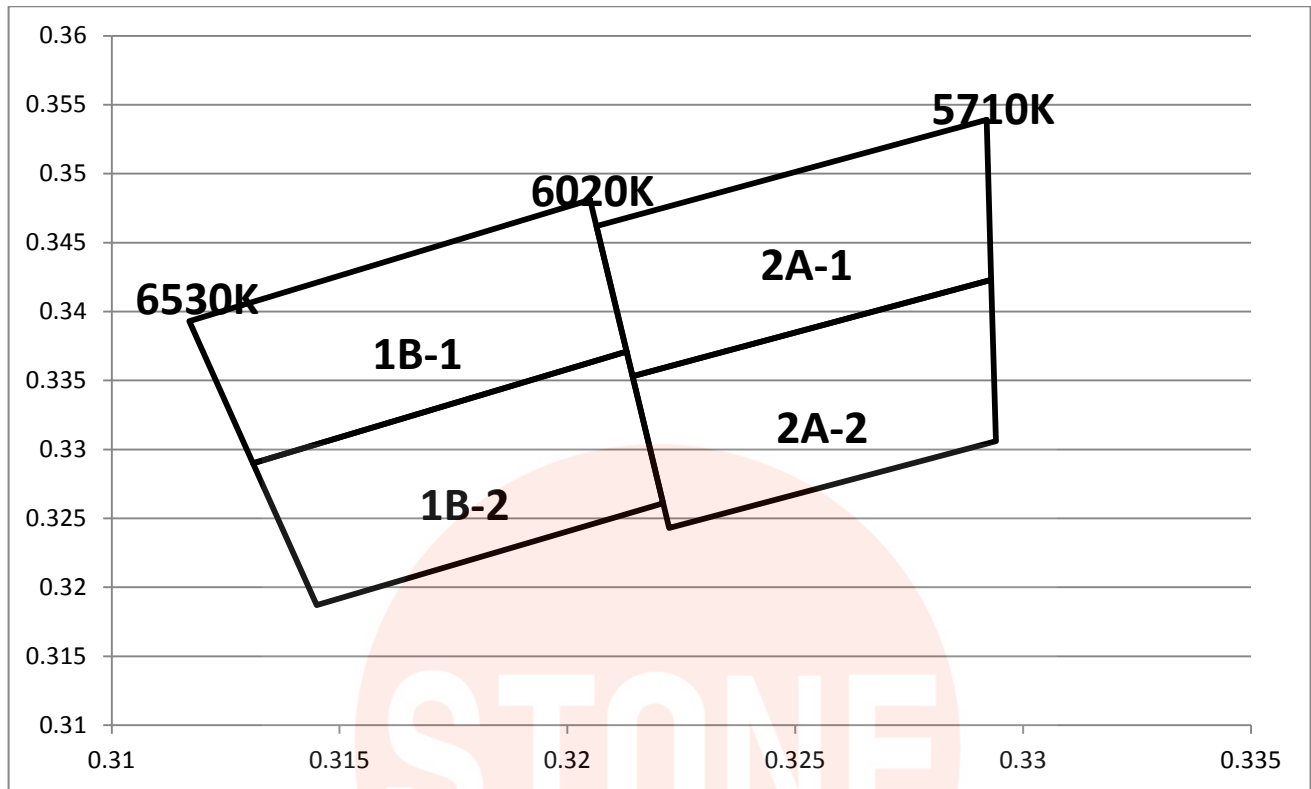
■ Intensity Binning

Bin code (350mA)	Min. Φ_v (Lm)	Max. Φ_v (Lm)
B35	120	130
B36	130	140
B37	140	150
B38	150	160

■ Forward Voltage Binning

Bin code (350mA)	Min. V_F (V)	Max. V_F (V)
V2830	2.8	3.0
V3032	3.0	3.2
V3234	3.2	3.4

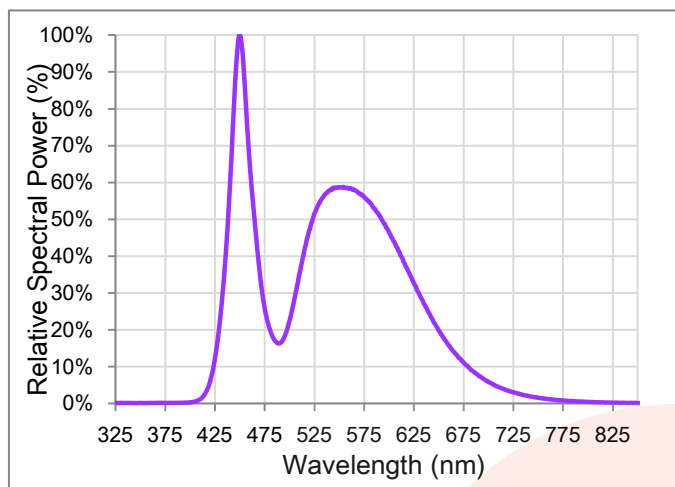
■ Color coordinate binning



BIN	CIE X	CIE Y	BIN	CIE X	CIE Y	BIN	CIE X	CIE Y	BIN	CIE X	CIE Y
1B-1	0.3205	0.3481	1B-2	0.3213	0.3371	2A-1	0.3292	0.3539	2A-2	0.3293	0.3423
	0.3117	0.3393		0.3131	0.3290		0.3207	0.3462		0.3215	0.3353
	0.3131	0.3290		0.3145	0.3187		0.3215	0.3353		0.3222	0.3243
	0.3213	0.3371		0.3221	0.3261		0.3293	0.3423		0.3294	0.3306

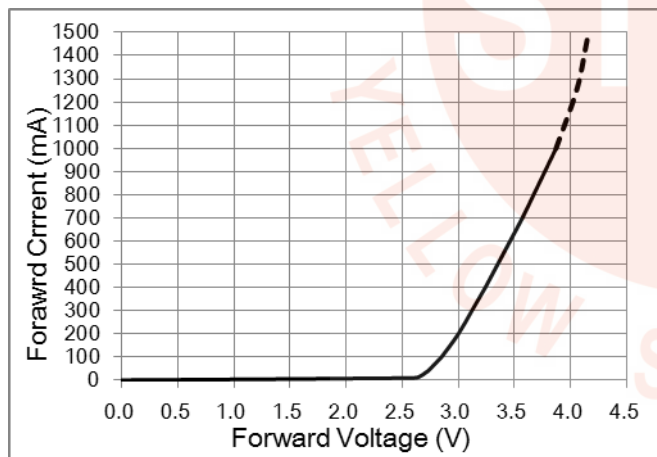
Notes : Chromaticity (CIE_x, CIE_y) ± 0.007

■ Relative spectral power distribution

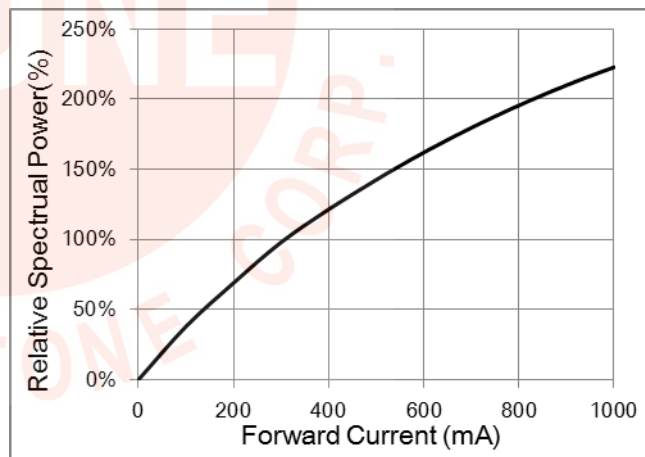


■ Electronic-Optical Characteristics

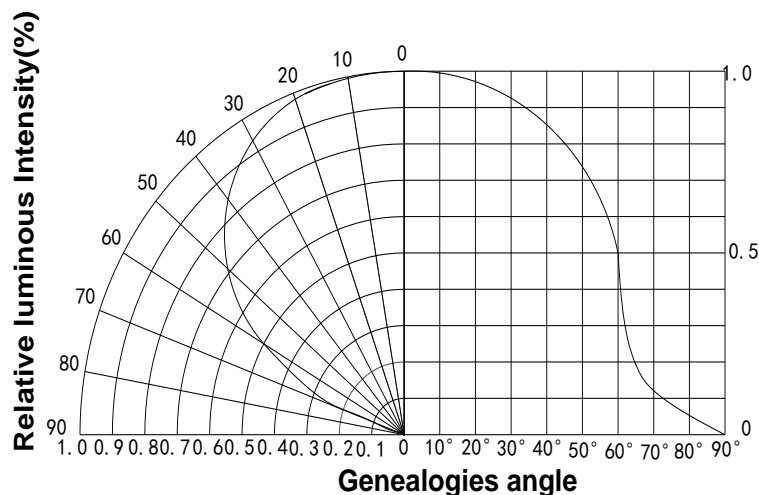
Forward Current vs. Forward Voltage ($T_a=25^\circ\text{C}$)



Relative luminous Flux vs. Forward Current ($T_a=25^\circ\text{C}$)

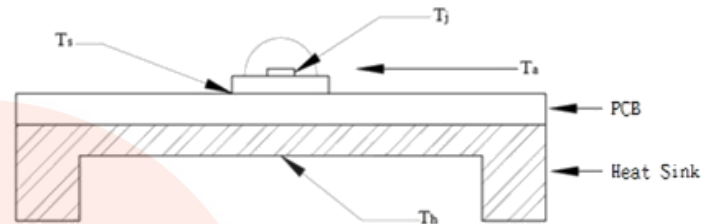
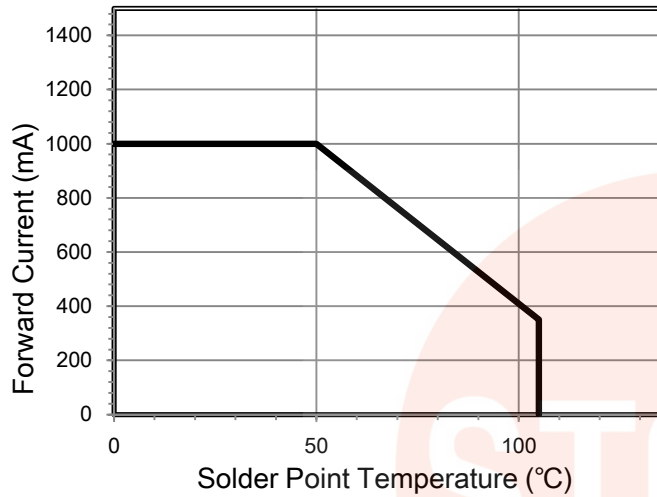


■ Typical Spatial Distribution



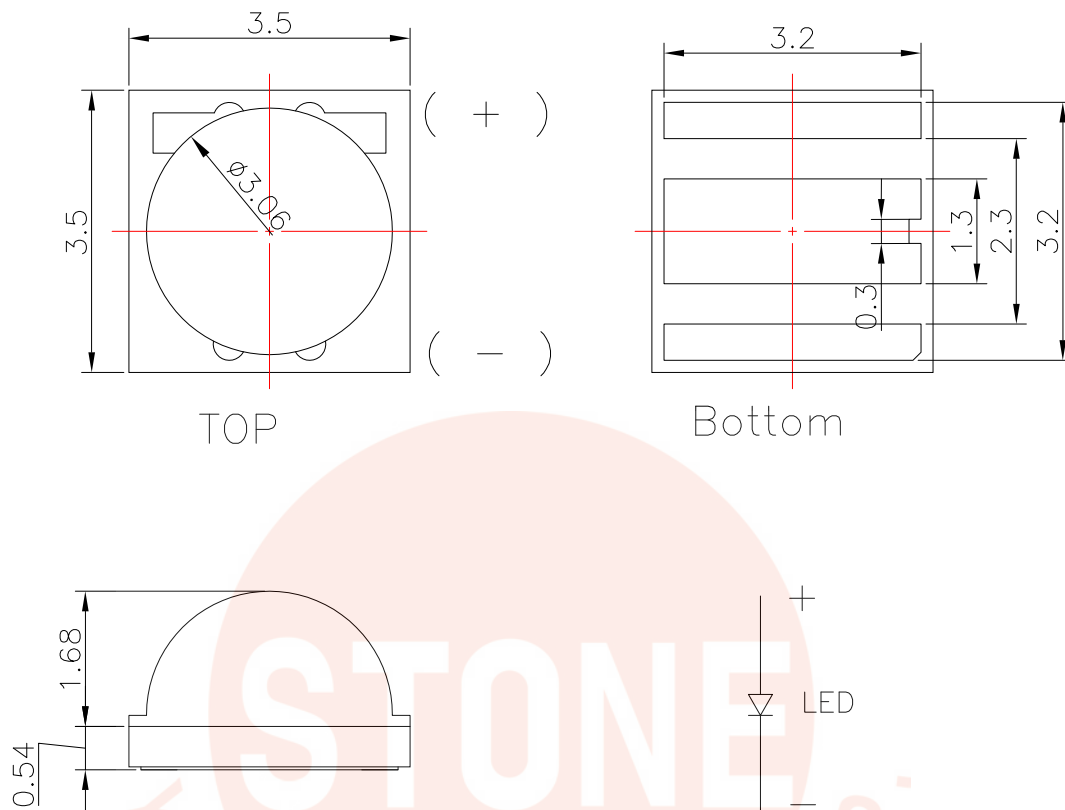
■ Thermal Design for De-rating

The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.



T_j : LED junction Temp.
 T_s : Solder Point Temp.
 T_h : Heat Sink Temp.
 T_a : Ambient Temp.
 R_{j-a} : Thermal Resistance from T_j to T_a

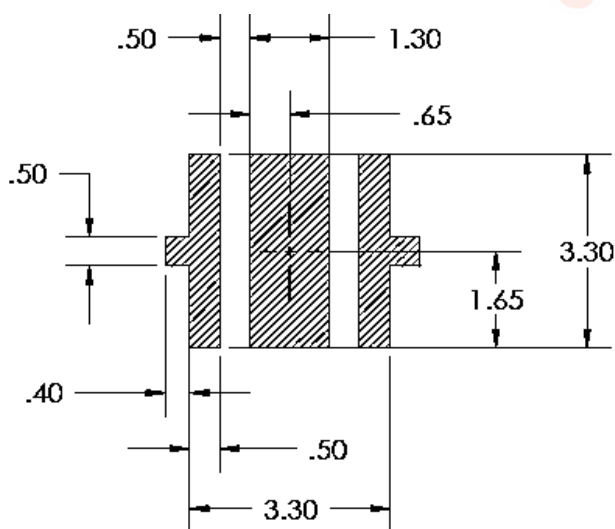
■ Dimensions



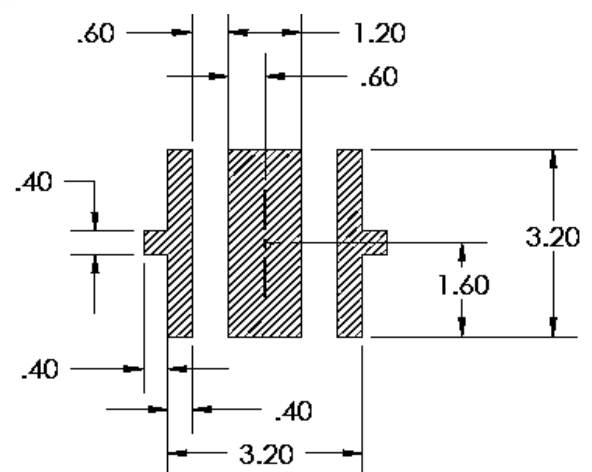
§ All dimensions are in millimeters.

§ Tolerance is ± 0.13 mm unless other specified.

■ Suggest Stencil Pattern (Recommendations for reference)



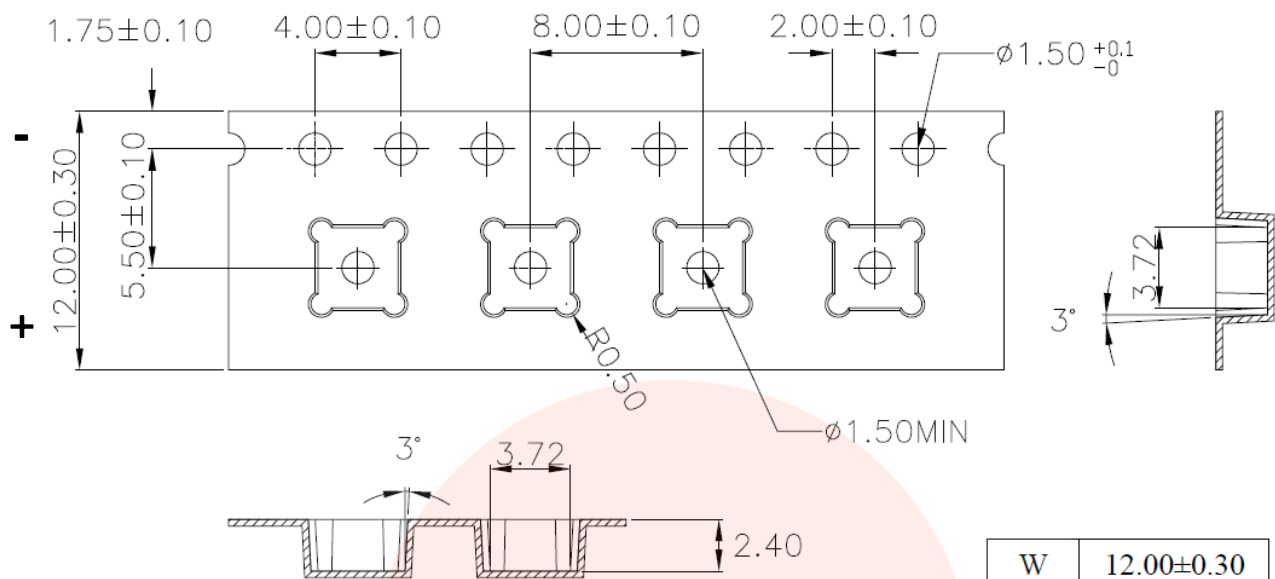
RECOMMENDED PCB SOLDER PAD



RECOMMENDED STENCIL PATTERN
(HATCHED AREA IS OPENING)

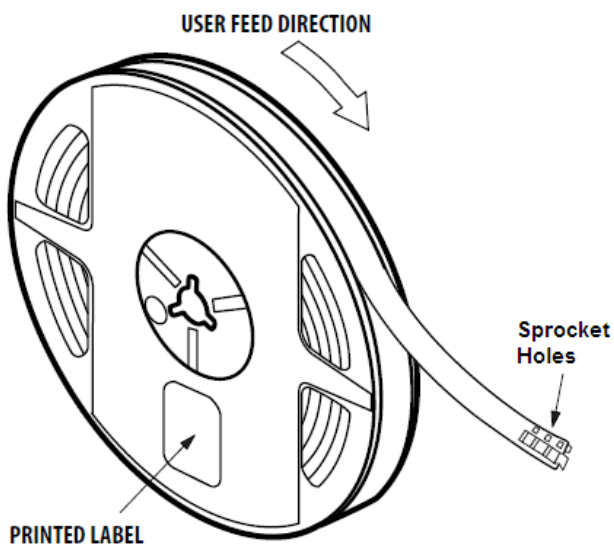
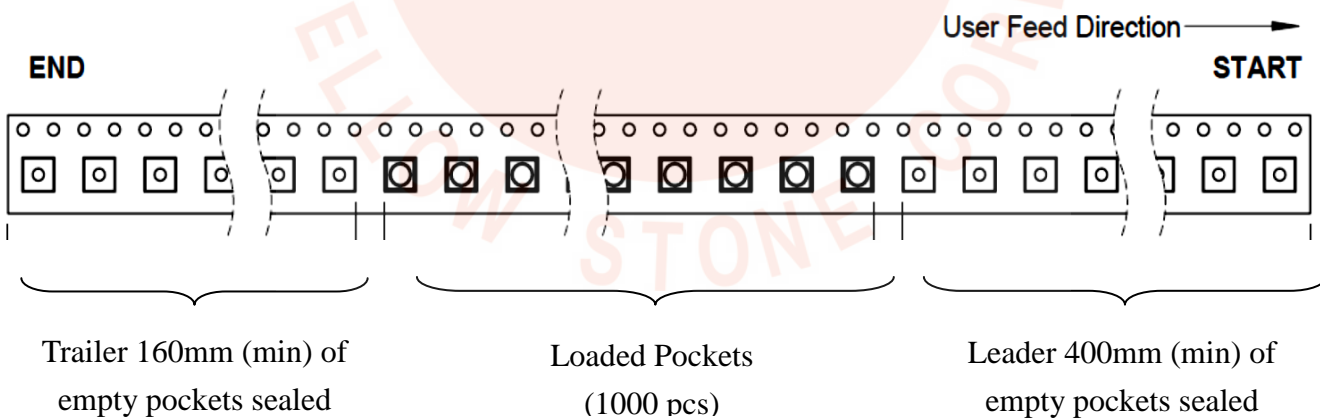
§ Suggest stencil $t = 0.12$ mm

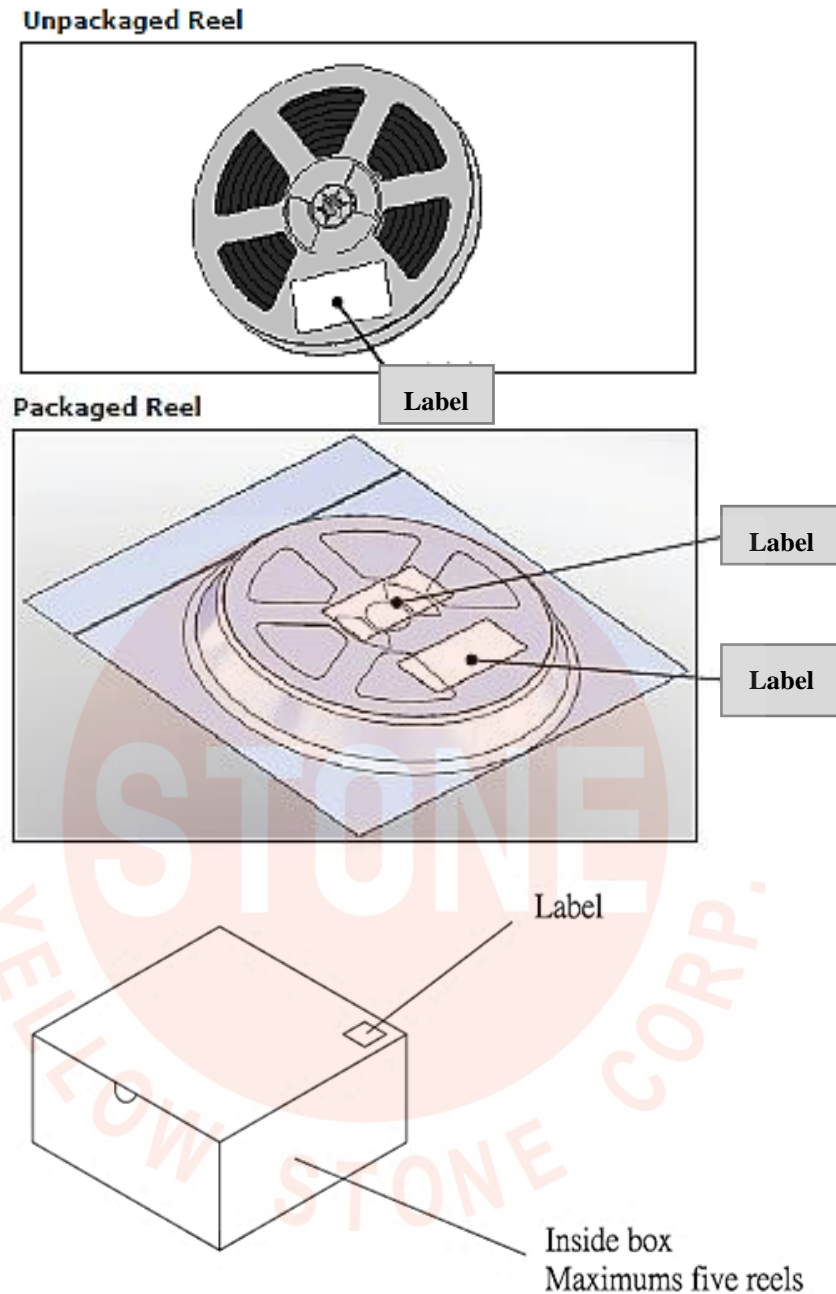
■ Packing



1. 10 sprocket hole pitch cumulative tolerance ± 0.20 .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30 ± 0.05 mm.

W	12.00 ± 0.30
A0	3.72 ± 0.10
B0	3.72 ± 0.10
K0	2.40 ± 0.10



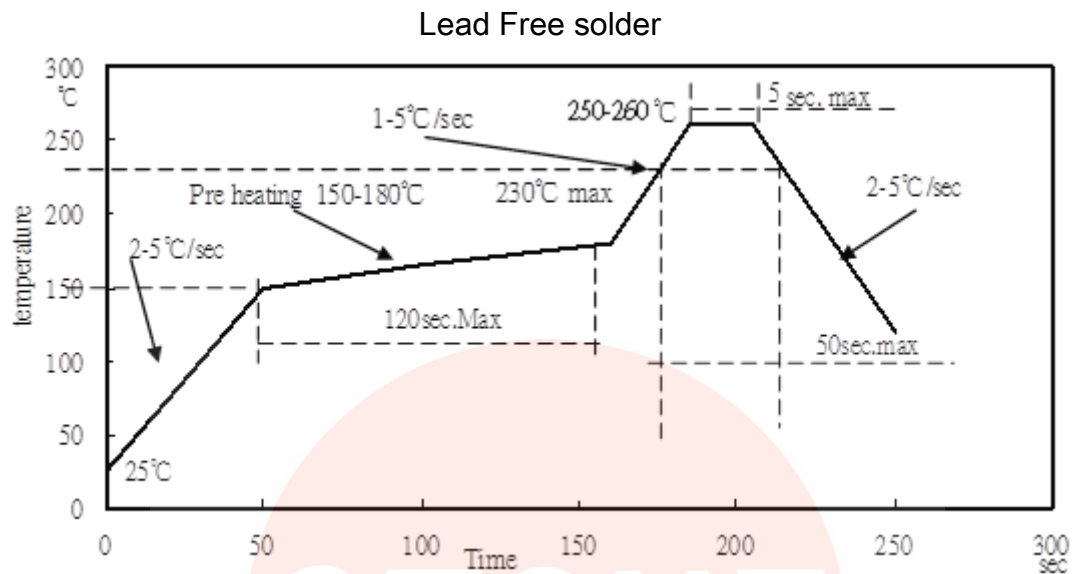


Notes:

1. Each reel (minimum number of pieces is 100 and maximum is 1000 for 120 degree product) is packed in a moisture-proof bag along with a packs of desiccant and a humidity indicator card.
2. A maximum of 5 moisture-proof bags are packed in an inner box (size: 260mm x 230mm x 100mm \pm 5mm).
3. A maximum of 4 inner boxes are put in an outer box (size: 480mm x 275mm x 215mm \pm 5mm).
4. Part No., Lot No., quantity should be indicated on the label of the moisture-proof bag and the cardboard box.

■ Reflow Profile

IR Reflow Soldering Profile



Notes:

1. The recommended reflow temperature is 240°C(±5°C). The maximum soldering temperature should be limited to 250-260°C.
2. Do not stress the silicone resin while it is exposed to high temperature.
3. The reflow process should not exceed 2 times.

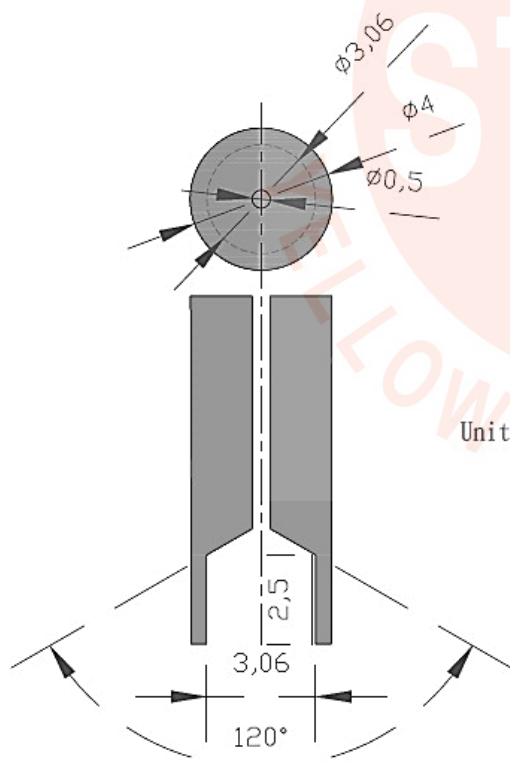
■ Precautions

1. Recommendation for using LEDs

- 1.1 The lens of LEDs should not be exposed to dust or debris. Excessive dust and debris may cause a drastic decrease in the luminosity.
- 1.2 Avoid mechanical stress on LED lens.
- 1.3 Do not touch the LED lens surface. It would affect the optical performance of the LED due to the LED lens' damage.
- 1.4 Pick & place tools are recommended for the remove of LEDs from the factory tape & reel packaging

2. Pick & place nozzle

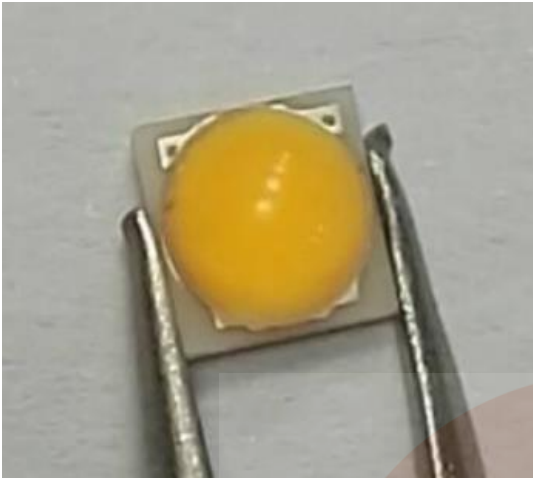
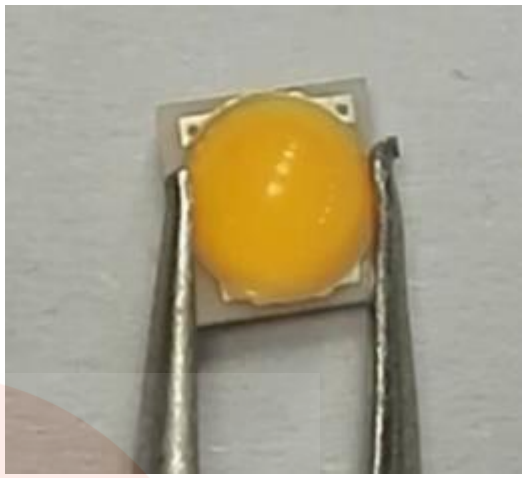
The pickup tool was recommended and shown as below



3. Lens handling

Please follow the guideline to pick LEDs.

- 3.1 Use tweezers to pick LEDs.
- 3.2 Do not touch the lens by using tweezers.
- 3.3 Do not touch lens with fingers.
- 3.4 Do not apply more than 4N (400gw) directly onto the lens.

Correct (√)	Wrong (X)
	

4. Lens cleaning

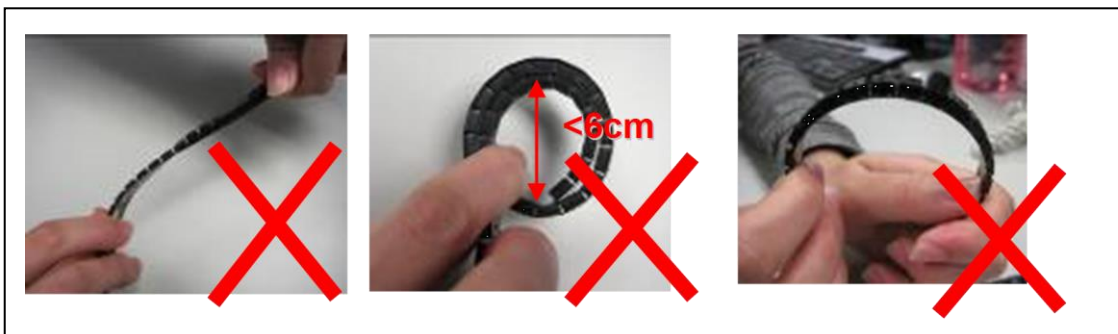
In the case which a small amount of dirt and dust particles remain on the lens surface, a suitable cleaning solution can be applied.

- 4.1 Try a gentle wiping with dust-free cloth.
- 4.2 If needed, use dust-free cloth and isopropyl alcohol to gently clean the dirt from the lens surface.
- 4.3 Do not use other solvents as they may directly react with the LED assembly.
- 4.4 Do not use ultrasonic cleaning which will damage the LEDs.

5. Carrier tape handling

The following items are recommended when handling the carrier tape of LEDs.

- 5.1 Do not twist the carrier tape.
- 5.2 The inward bending diameter should not be smaller than 6cm for each carrier tape.
- 5.3 Do not bend the tape outward.





6. Storage

6.1 The moisture-proof bag is sealed :

The LEDs should be stored at 30°C or less and 90%RH or less. And the LEDs are limited to use within one year, while the LEDs is packed in moisture-proof package with the desiccants inside.

6.2 The moisture-proof bag is opened :

The LEDs should be stored at 30°C or less and 60%RH or less. Moreover, the LEDs are limited to solder process within 168hrs. If the humidity indicator card shows the pink color in 10% even higher or exceed the storage limiting time since opened, that we recommended to baking LEDs at 60°C at least 24hrs. To seal the remainder LEDs return to the moisture-proof bag, it's recommended to be with workable desiccants.





■ Test Items and Results of Reliability

Test Item	Test Conditions	Duration/ Cycle	Number of Damage	Reference
Thermal Shock	-40°C 30min ↑ ↓ 5min 125°C 30min	1000 cycles	0/77	AEC-Q101
High Temperature Storage	T _a =105°C	1000 hrs	0/22	EIAJ ED-4701 200 201
Humidity Heat Storage	T _a =85°C RH=85%	1000 hrs	0/22	EIAJ ED-4701 100 103
Low Temperature Storage	T _a =-40°C	1000 hrs	0/22	EIAJ ED-4701 200 202
Life Test	T _a =25°C I _f =350mA	1000 hrs	0/22	
High Humidity Heat Operation	85°C RH=85% I _f =350mA	1000 hrs	0/22	
High Temperature Operation	T _a =85°C I _f =350mA	1000 hrs	0/22	
ESD(HBM)	2KV at 1.5kΩ;100pf	3 Times	0/22	MIL-STD-883

Failure Criteria				
Item	Symbol	Condition	Criteria for Judgment	
			Min	Max
Forward Voltage	V _F	I _f =350mA	-	USL ¹ ×1.1
Reverse Current	I _R	V _R =5V	-	100μA
Luminous Intensity	I _v	I _f =350mA	LSL ² ×0.7	-

Notes:

1. USL: Upper specification level
2. LSL: Lower specification level