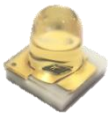
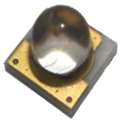
YELLOW STONE CORP.

3535 UVA LED



30D



60D

120D

Table of contents

Features

- ROHS and REACH-compliant
- MSL 3 qualified according to J-STD 020
- ESD 8KV

Applications

- UV Curing
- Medical applications
- Industrial facility applications

3535 UVA LED

■ Maximum rating (Ta : 25℃)

Characteristics	Symbol	Min.	Typical	Max.	Unit
DC Forward Current[1]	I_F	---	500	1,000	mA
Pulse Current(@1/10 duty) [2]	Ip	---	---	1,200	mA
Forward Voltage	VF	3.1	---	3.9	V
Reverse Voltage	VR	---	---	-5	V
Leakage Current (5V)	IR	---	---	10	μA
Junction Temperature[3]	Tj	---	--	85	℃
Storage Temperature Range	Tsto	-40	–	100	℃
Soldering Temperature	Tsol		---	260	℃
Thermal Resistance Junction / Solder Point	Rth	---	10	---	℃/W
Beam Angle	2θ1/2	---	30 60 120	---	Deg

✧ **Notes:**

1. For other ambient, limited setting of current will depend on de-rating curves.
2. D=0.01s duty 1/10.
3. When driving at maximum current the Tj must be kept below 85℃
4. Viewing angle($2\theta_{1/2}$) ± 10°

3535 UVA LED

■ Product list

Peak Wavelength Range	Beam Angle	Part Number
365~370nm	30°	3535A36503F000
	60°	3535C36503F000
	120°	3535F36503F000
380~390nm	30°	3535A38503F000
	60°	3535C38503F000
	120°	3535F38503F000
390~400nm	30°	3535A39503F000
	60°	3535C39503F000
	120°	3535F39503F000
400~410nm	30°	3535A40503F000
	60°	3535C40503F000
	120°	3535F40503F000
410~420nm	30°	3535A41503F000
	60°	3535C41503F000
	120°	3535F41503F000
420~430nm	30°	3535A42503F000
	60°	3535C42503F000
	120°	3535F42503F000

■ Peak-wavelength binning

3535 UVA LED

Peak Wavelength		unit: nm@500mA
Bin Code	Min	Max
R1	365.0	370.0
S1	380.0	382.5
S2	382.5	385.0
S3	385.0	387.5
S4	387.5	390.0
T1	390.0	392.5
T2	392.5	395.0
T3	395.0	397.5
T4	397.5	400.0
U1	400.0	402.5
U2	402.5	405.0
U3	405.0	407.5
U4	407.5	410.0
W1	410.0	412.5
W2	412.5	415.0
W3	415.0	417.5
W4	417.5	420.0
X1	420.0	422.5
X2	422.5	425.0
X3	425.0	427.5
X4	427.5	430.0

✧ **Notes:**

1.Binning current is 500mA

2.Wavelength tolerance ± 2nm

3535 UVA LED

■ Voltage binning

Voltage			unit: V@500mA
Peak Wavelength	**Bin Code**	**Min**	**Max**
365nm	V2	3.3	3.4
	V3	3.4	3.5
	V4	3.5	3.6
	V5	3.6	3.7
	V6	3.7	3.8
385nm	V1	3.2	3.3
	V2	3.3	3.4
	V3	3.4	3.5
	V4	3.5	3.6
	V5	3.6	3.7
395nm	V1	3.2	3.3
	V2	3.3	3.4
	V3	3.4	3.5
	V4	3.5	3.6
	V5	3.6	3.7
405nm	V1	3.2	3.3
	V2	3.3	3.4
	V3	3.4	3.5
	V4	3.5	3.6
	V5	3.6	3.7
415nm	V1	3.2	3.3
	V2	3.3	3.4
	V3	3.4	3.5
	V4	3.5	3.6
	V5	3.6	3.7
425nm	V1	3.2	3.3
	V2	3.3	3.4
	V3	3.4	3.5
	V4	3.5	3.6
	V5	3.6	3.7

✧ **Notes:**

1. Binning current is 500mA
2. Voltage tolerance ± 0.06 mm

3535 UVA LED

■ Radiant flux (Power) binning

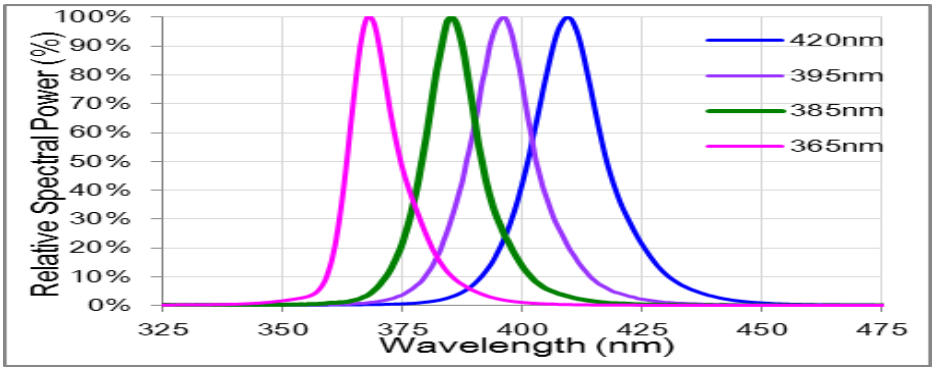
Peak Wavelength	Radiant flux (Power) -001 unit: mw@500mA			Radiant flux (Power) -000 unit: mw@500mA		
	Bin Code	Min	Max	Bin Code	Min	Max
365nm	B2	700	740	A4	420	460
	B3	740	780	A5	460	500
	B4	780	820	A6	500	540
	B5	820	860	A7	540	580
	B6	860	900	A8	580	620
	B7	900	940	A9	620	660
385nm	B8	1000	1080	B5	820	860
	B9	1080	1160	B6	860	900
	B10	1160	1240	B7	900	1000
	B11	1240	1320	B8	1000	1080
	B12	1320	1400	B9	1080	1160
395nm	B8	1000	1080	B5	820	860
	B9	1080	1160	B6	860	900
	B10	1160	1240	B7	900	1000
	B11	1240	1320	B8	1000	1080
	B12	1320	1400	B9	1080	1160
405nm	B8	1000	1080	B5	820	860
	B9	1080	1160	B6	860	900
	B10	1160	1240	B7	900	1000
	B11	1240	1320	B8	1000	1080
	B12	1320	1400	B9	1080	1160
415nm	B8	1000	1080	B5	820	860
	B9	1080	1160	B6	860	900
	B10	1160	1240	B7	900	1000
	B11	1240	1320	B8	1000	1080
	B12	1320	1400	B9	1080	1160
425nm	B8	1000	1080	B5	820	860
	B9	1080	1160	B6	860	900
	B10	1160	1240	B7	900	1000
	B11	1240	1320	B8	1000	1080
	B12	1320	1400	B9	1080	1160

✧ **Notes:**

1. Binning current is 500mA
2. Power tolerance ± 50mw

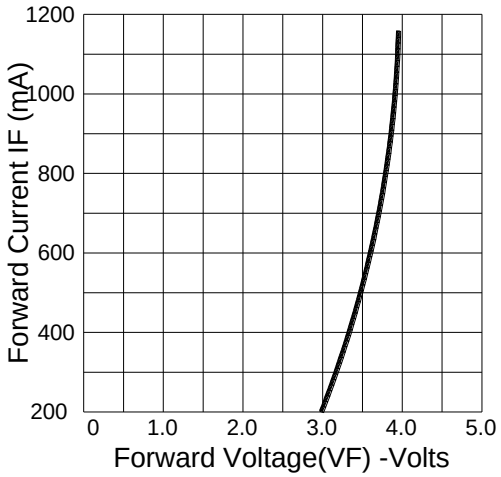
3535 UVA LED

■ Relative Spectral Power Distribution

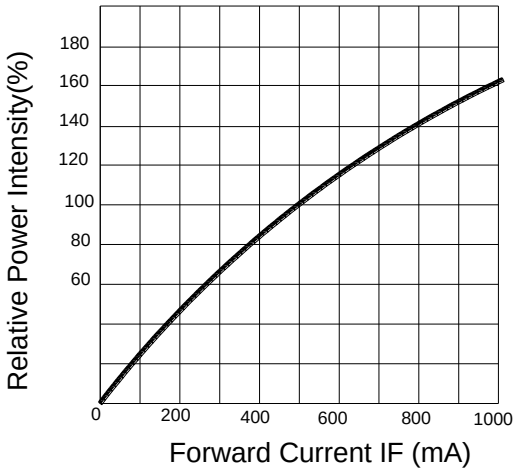


■ Electronic-optical characteristics

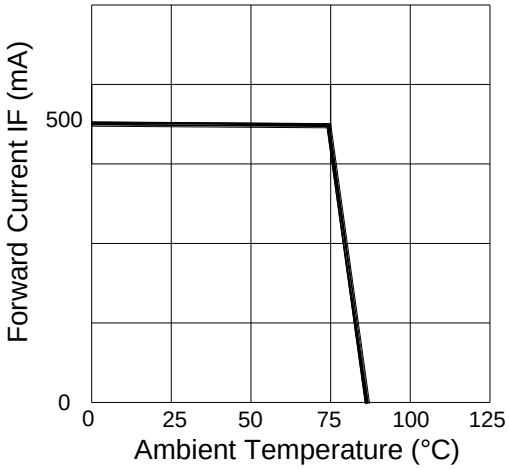
Forward Current VS. Forward Voltage



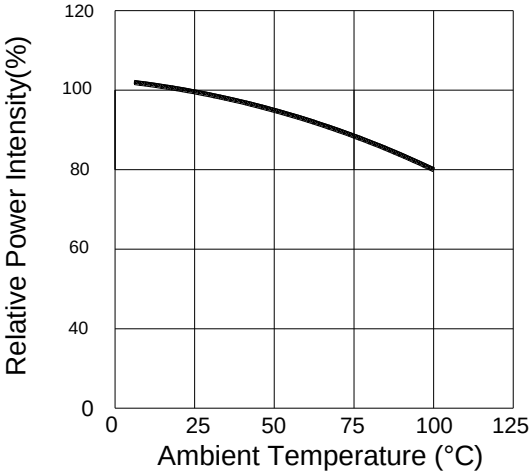
Luminous Intensity VS. Forward Current



Forward Current VS. Ambient Temperature

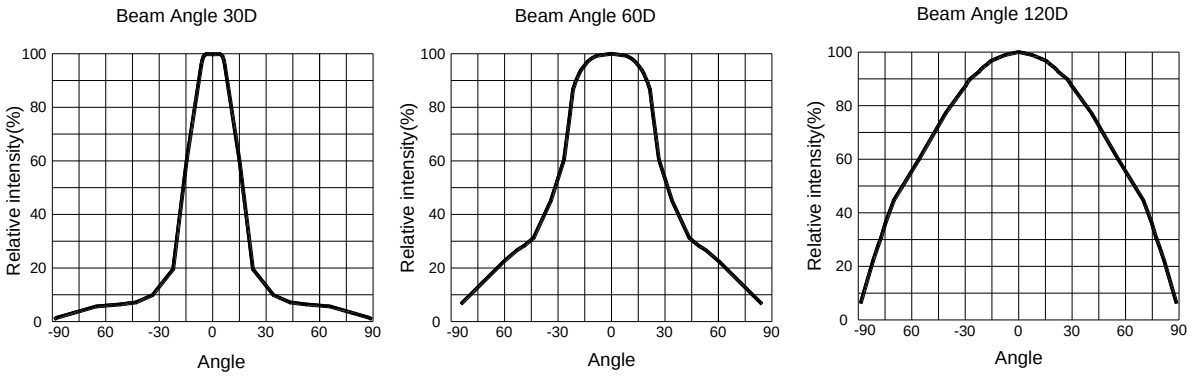


Radiant Power VS. Ambient Temperature



3535 UVA LED

■ Beam angle ($2\theta_{1/2}$)

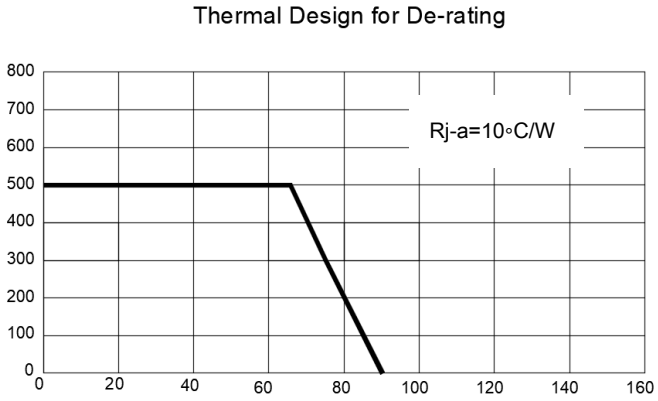


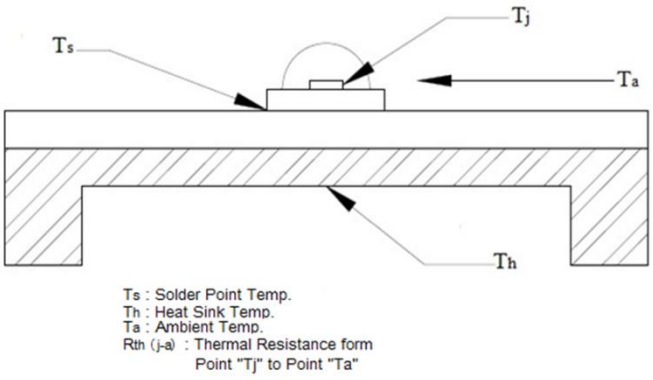
✧ **Notes:**

Viewing angle($2\theta_{1/2}$) ± 10°

■ Thermal design for de-rating

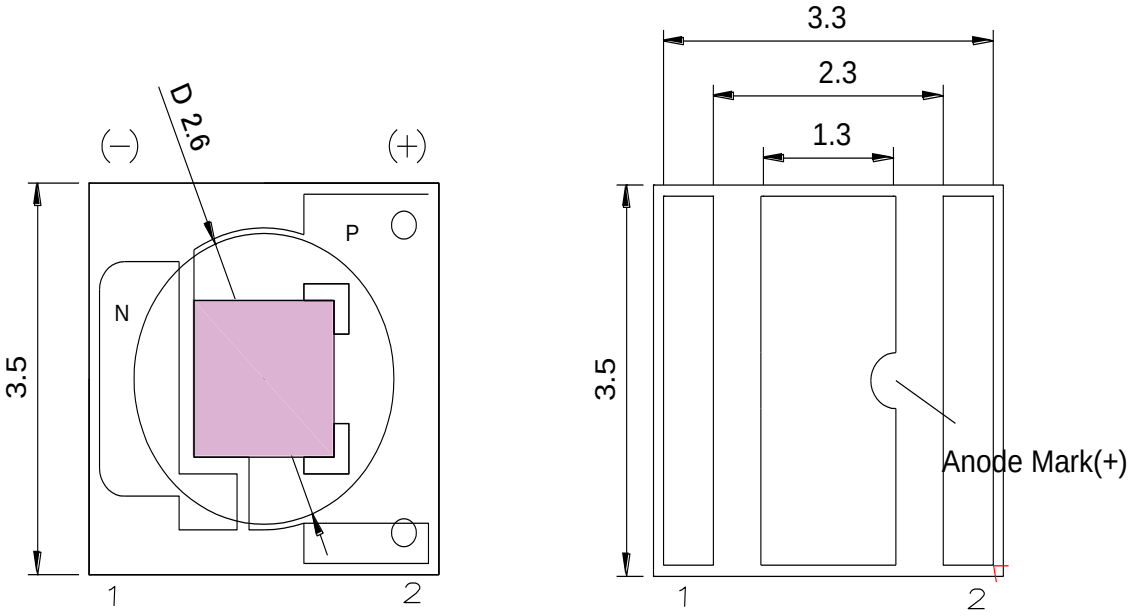
The maximum forward current is determined by the thermal resistance between the LED junction and solder point. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the junction to the solder point order to optimize LED life and optical characteristics.



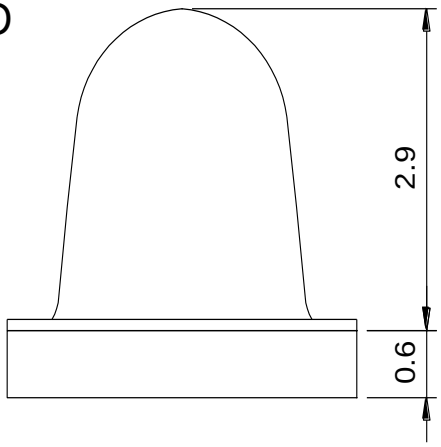


3535 UVA LED

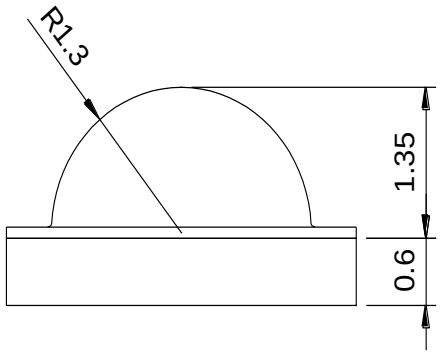
■ Dimensions



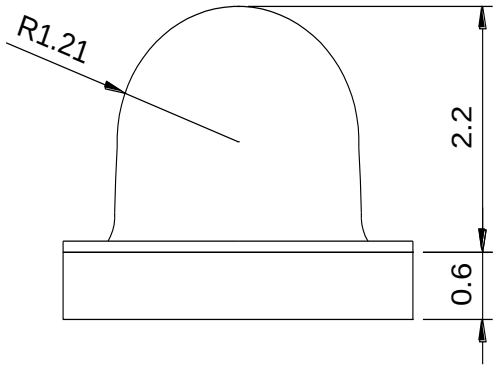
30D

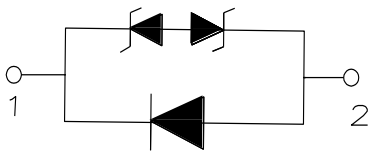


120D



60D





✧ **Notes:**

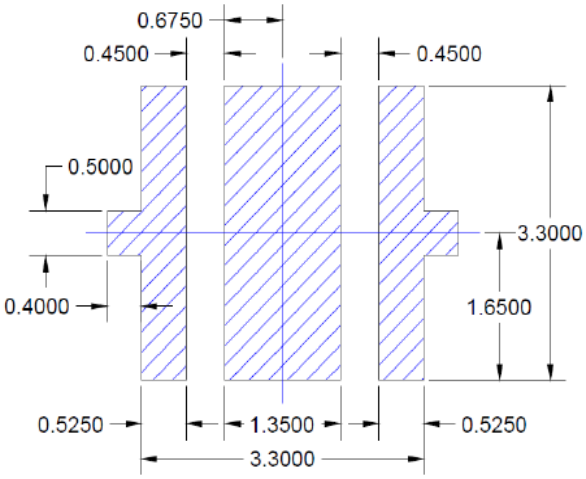
§ All dimensions are in millimeters.

§ Tolerance is ±0.13mm unless other specified.

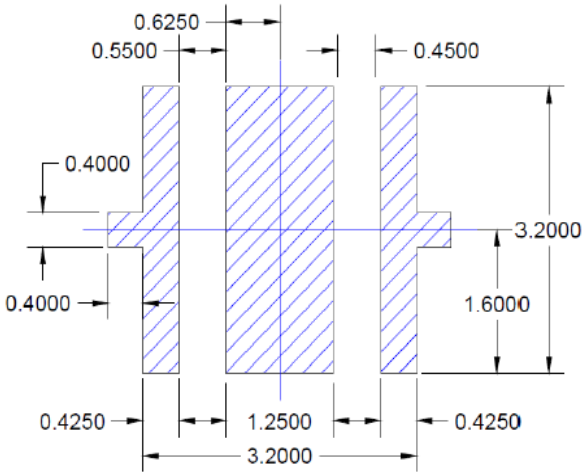
3535 UVA LED

■ Suggest stencil pattern (Recommendations for reference)

RECOMMENDED PCB SOLDER PAD



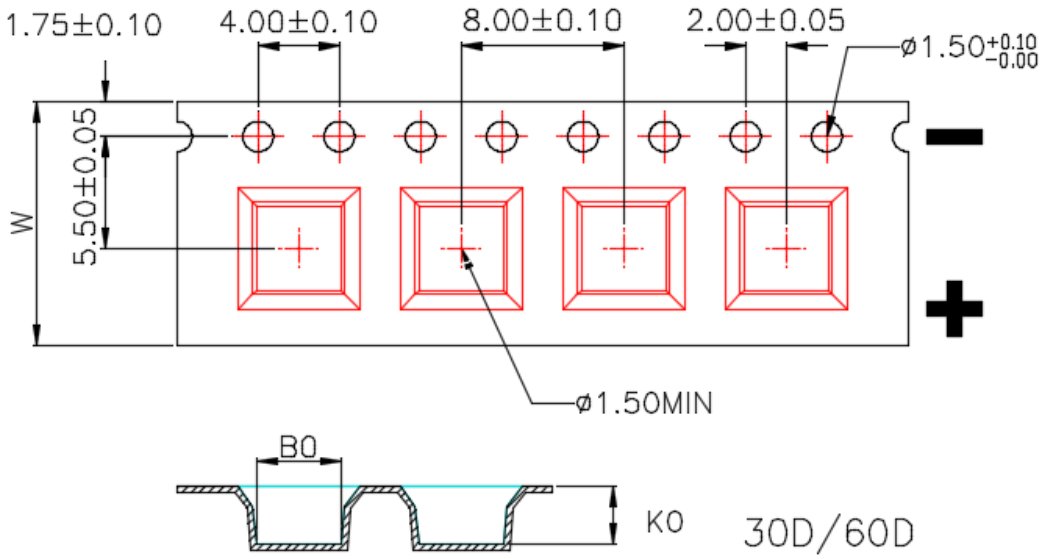
RECOMMENDED STENCIL PATTERN
(HATCHED AREA IS OPENING)



§ Suggest stencil t =0.12 mm

3535 UVA LED

■ Packing



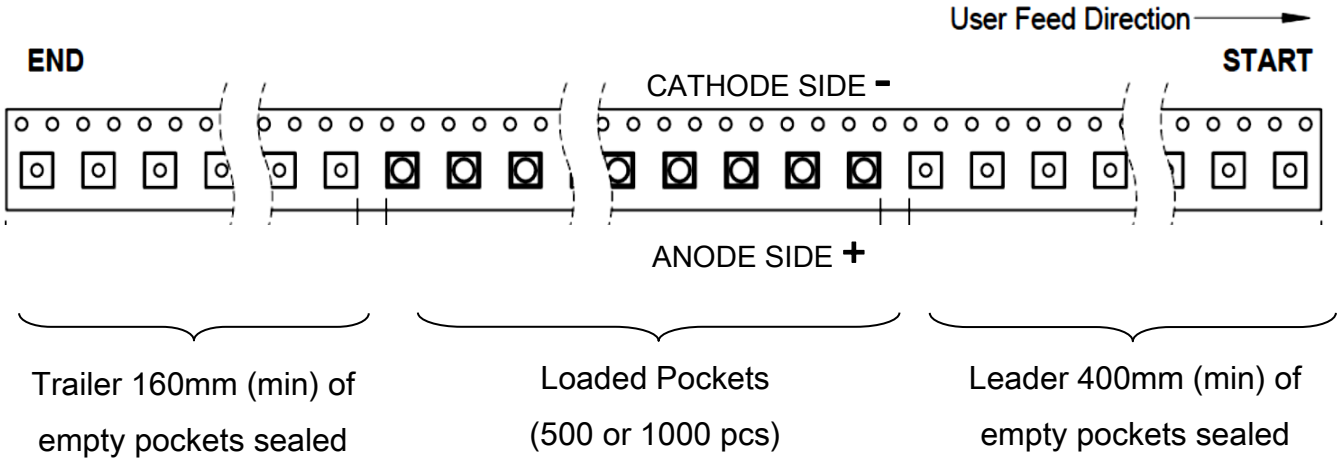
1. 10 sprocket hole pitch cumulative tolerance ±0.20.
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30±0.05mm.
6. Packing length per 22 " reel : 62.5 Meters(1:3).
7. Component load per 7" reel : 400~1000 pcs.

30D/60D

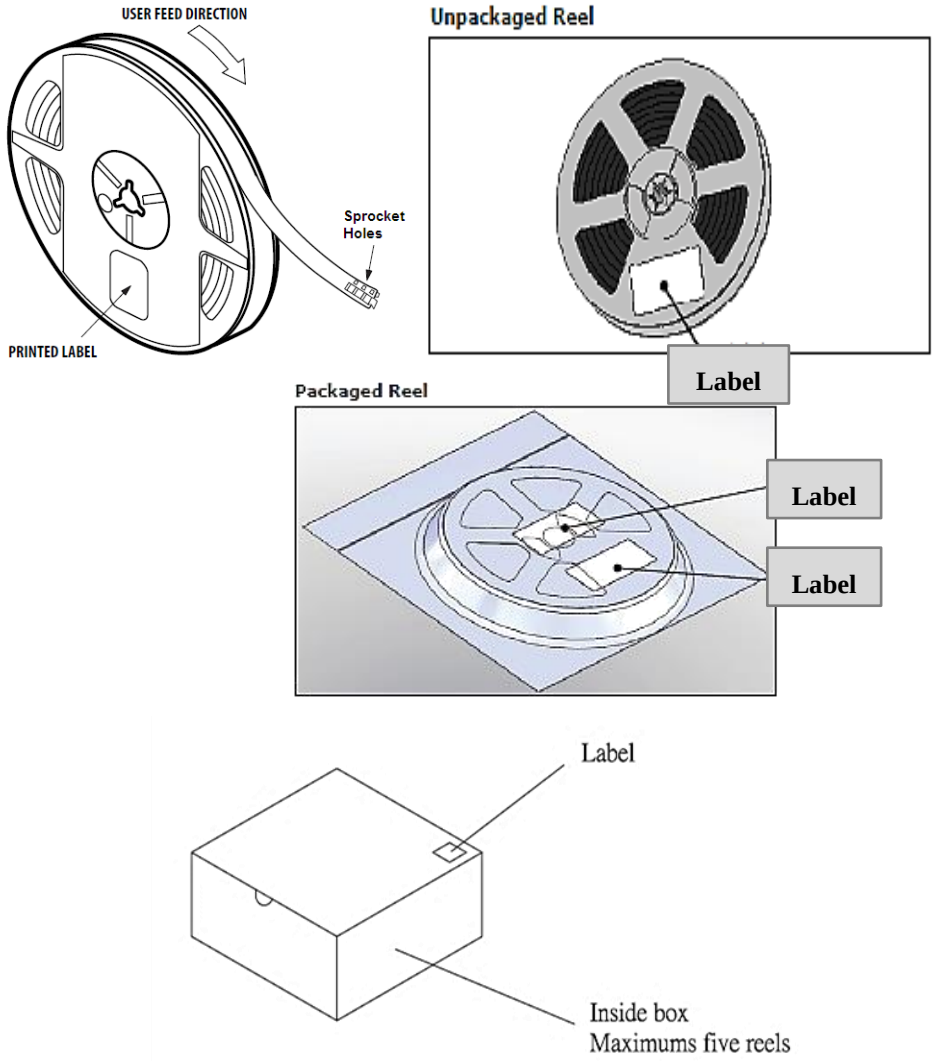
W	12.00±0.30
A0	3.70±0.10
B0	3.70±0.10
K0	3.15±0.10

90D/120D

W	12.00±0.30
A0	3.67±0.10
B0	3.60±0.10
K0	2.20±0.10



3535 UVA LED



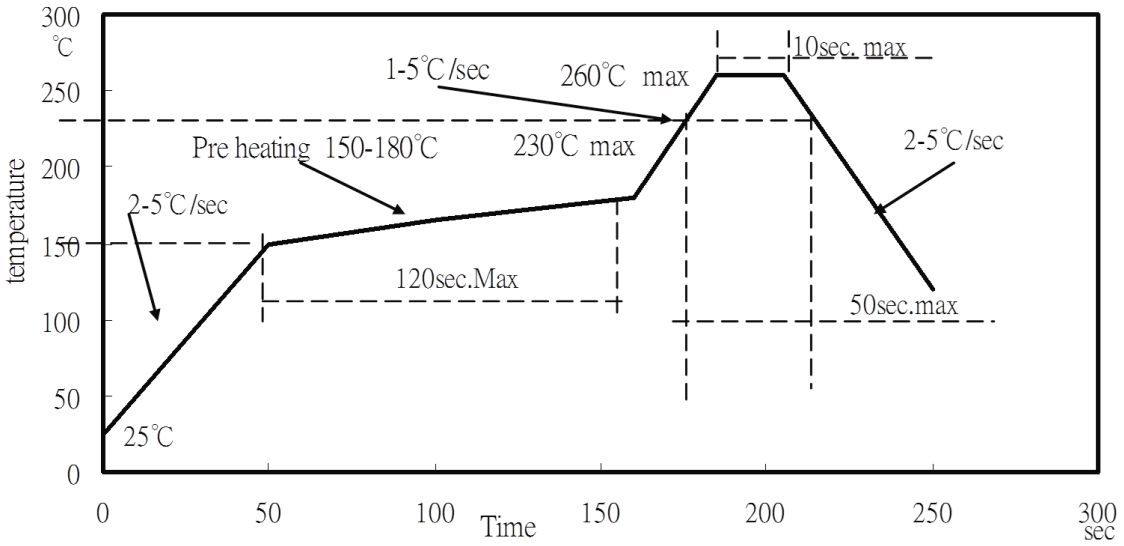
Notes:

1. Each Reel (minimum number of pieces is 100 and maximum is 500 (60D/30D)/1000 (90D/120D) is packed in a moisture-proof bag along with 1 packs of desiccant and a humidity indicator card;
2. A maximum of 6 moisture-proof bags are packed in an inner box (size: 240mm x 200mm x 105mm ±5mm)
3. A maximum of 4 inner boxes are put in an outer box (size: 410mm x 255mm x 230mm ±5mm)
4. Part No., Lot No., quantity should be indicated on the label of the moisture-proof bag and the cardboard box.

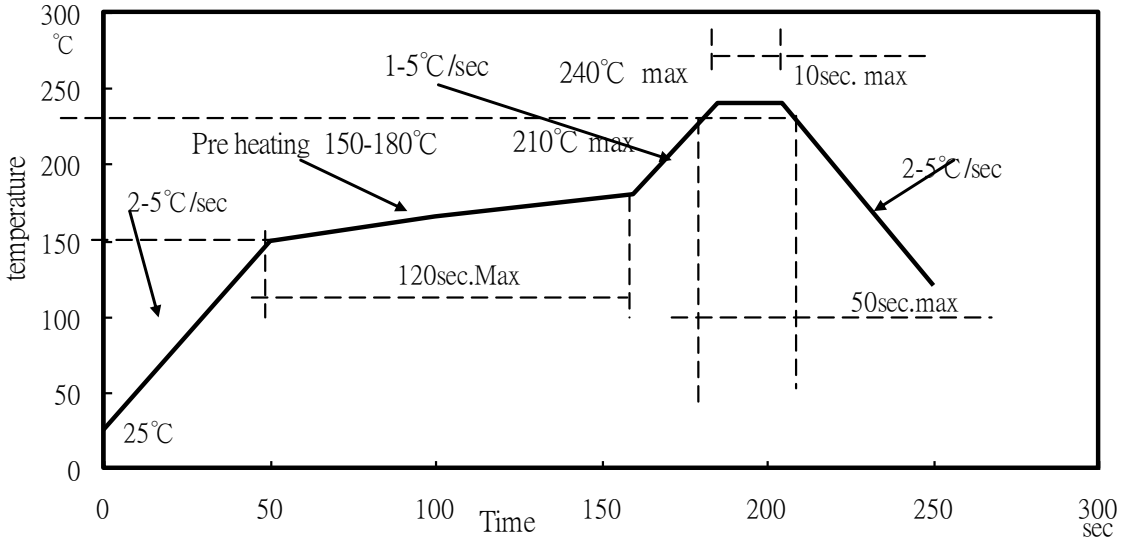
■ Reflow Profile

IR reflow soldering Profile

Lead Free solder



Lead solder



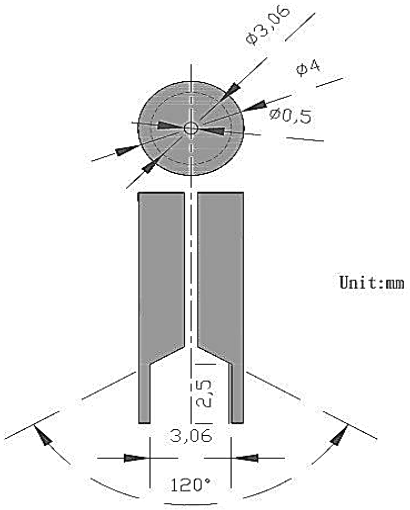
Notes:

1. The recommended reflow temperature is 240℃(±5℃). The maximum soldering temperature should be limited to 260℃.
2. Do not stress the silicone resin while it is exposed to high temperature.
3. The number of reflow process should not exceed 3 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 of lens (400g) directly onto the lens
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

■ Test Items and Results of Reliability

Test Item	Test Conditions	Duration/ Cycle	Number of Damage	Reference
Thermal Shock	–40℃ 30min ↑↓5min 125℃ 30min	100 cycles	0/22	AECQ101
High Temperature Storage	Ta=100℃	1000 hrs	0/22	EIAJ ED-4701 200 201
Humidity Heat Storage	Ta=85℃ RH=85%	1000 hrs	0/22	EIAJ ED-4701 100 103
Low Temperature Storage	Ta=-40℃	1000 hrs	0/22	EIAJ ED-4701 200 202
Life Test	Ta=25℃ If=500mA	1000 hrs	0/22	Tested with UVT standard
High Humidity Heat Life Test	85℃ RH=85% If=500mA	1000 hrs	0/22	Tested with UVT standard
High Temperature Life Test	Ta=85℃	1000 hrs	0/22	Tested with UVT standard
ESD(HBM)	8KV at 1.5kΩ;100pf	3 Times	0/22	MIL-STD-883

Criteria for Judging the Damage				
Item	Symbol	Condition	Criteria for Judgment	
			Min	Max
Forward Voltage	VF	If=500mA	LSL ×0.9	USL ×1.1
Reverse Current	IR	VR =5V	_	100μA
Luminous Intensity	Iv	If=500mA	LSL ×0.7	USL ×1.2

Notes:

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