

VFDP35AW5FFH03Z4

- ◆ Outline : 3.5*3.5*2.0mm
- ◆ High efficiency
- ◆ Good thermal dissipation & optical uniformity

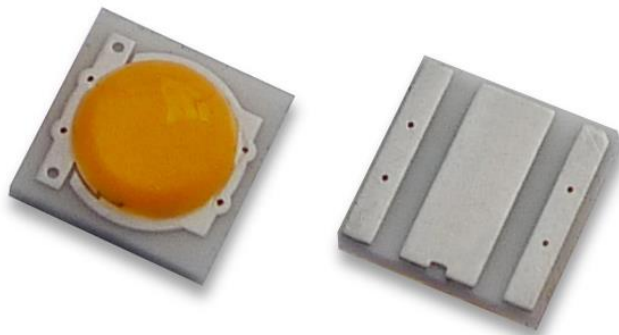


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Features

- Binning based on ANSI C78.377
- RoHS and REACH-compliant
- MSL2 qualified according to J-STD 020
- InGaN based phosphor-converted LED
- 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 – W5FF – H – 0 – 3 – Z – 4

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①	②	③	④	⑤
Process type	Category	Specification	Lens code	Dice wavelength & Luminous rank
V: Eutectic process	F: Flip Chip LED	DP35: Ceramic 3535	A: 120°	W5XX: Warm White

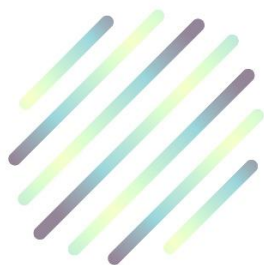
⑥	⑦	⑧	⑨	⑩
Support code	Zener & High CRI	Cap color code	Module & Lens code	Current code
H: HTCC	0: None Zener	3: Series No.	Z: Molding	4: 350mA

■ Product list

Color	Luminous Flux (Lm)					Typical CCT (K)	Forward Voltage (V)		Viewing Angle	Part Number
	Basic order code @350mA			Calculated Min. @85°C			Min.	Max.		
	Group	Min. @25°C	Min. @85°C	700 mA	1000 mA					
Warm white	B32	90	76	133	167	1700	2.8	3.4	120°	VFDP35AW5FFH03Z4
	B33	100	85	148	187					

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.

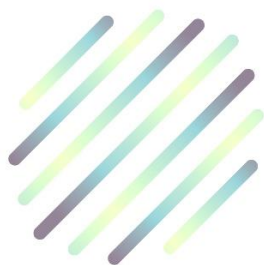


■ Maximum Rating (Ta : 25°C)

Characteristics	Symbol	Min.	Typical	Max.	Unit
DC Forward Current ¹	I_F		350	1000	mA
Pulse Forward Current ²	I_{PF}			1500	mA
Reverse Voltage	V_R			-5	V
Reverse Current (5V)	I_R			10	μA
Junction Temperature ³	T_j			150	°C
Thermal Resistance Junction / Solder Point	R_{th}		10		°C/W
Storage Temperature Range	T_{stg}	-40	–	100	°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

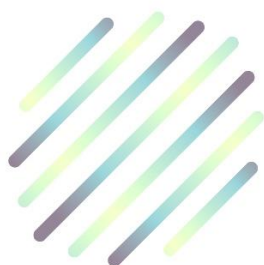


■ Intensity Binning

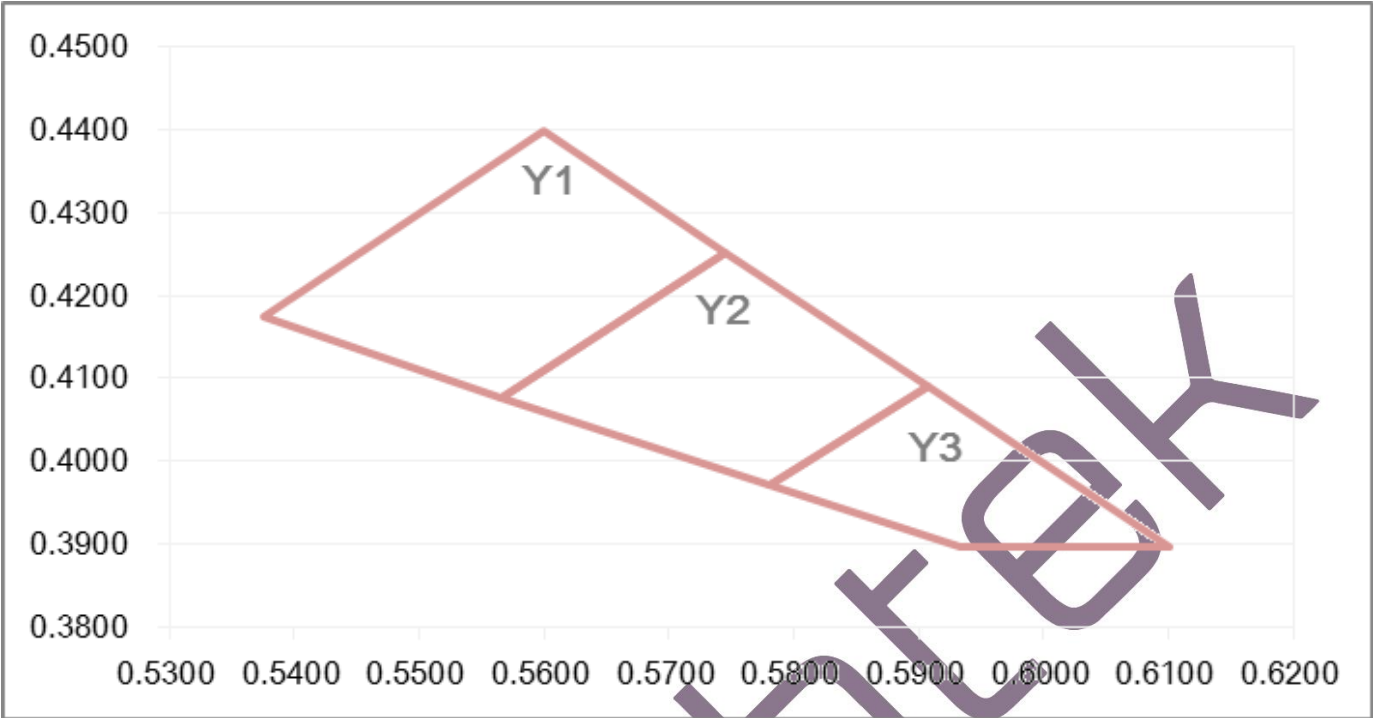
Bin code (350mA)	Min. Φ_v (Lm)	Max. Φ_v (Lm)
B32	90	100
B33	100	110

■ 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



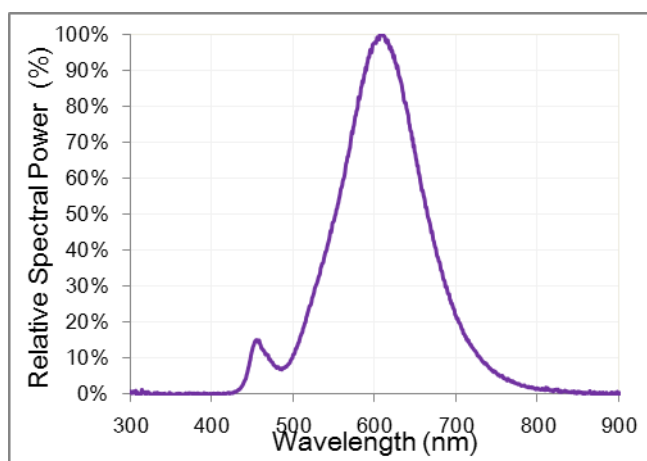
■ Color coordinate binning



BIN	CIE X	CIE Y	BIN	CIE X	CIE Y	BIN	CIE X	CIE Y
Y1	0.5600	0.4400	Y2	0.5745	0.4253	Y3	0.5908	0.4090
	0.5375	0.4174		0.5566	0.4076		0.5780	0.3972
	0.5566	0.4076		0.5780	0.3972		0.5933	0.3896
	0.5745	0.4253		0.5908	0.4090		0.6100	0.3896

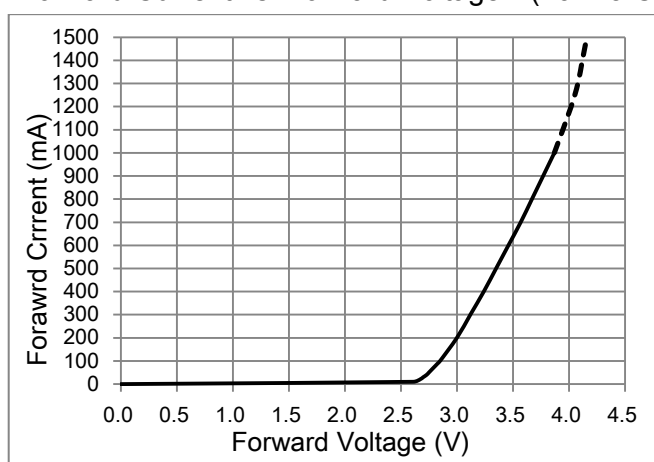
Notes : Chromaticity (CIE_x, CIE_y) ±0.007

■ Relative spectral power distribution

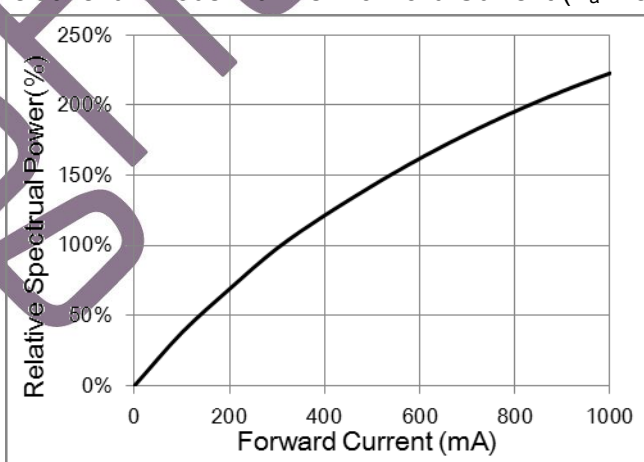


■ Electronic-Optical Characteristics

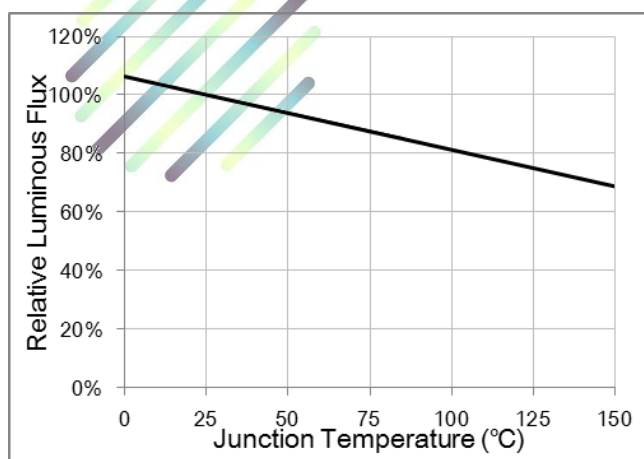
Forward Current vs. Forward Voltage ($T_a=25^\circ\text{C}$)



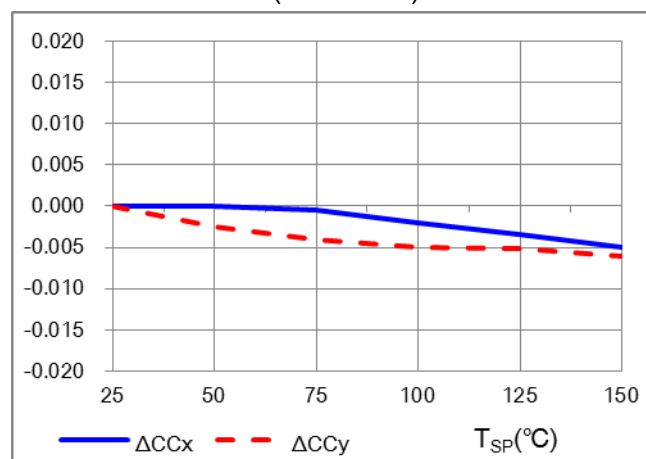
Relative Luminous Flux vs. Forward Current ($T_a=25^\circ\text{C}$)



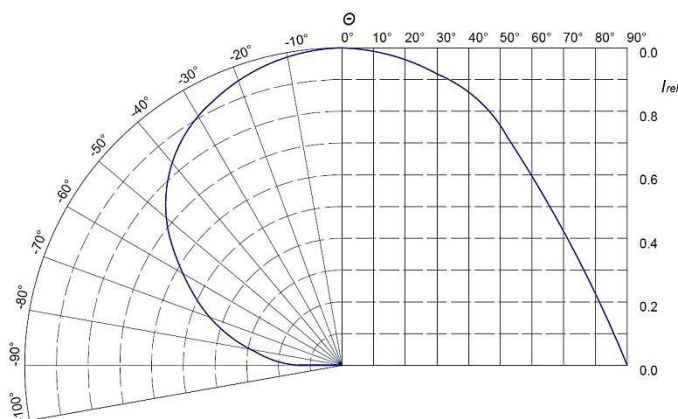
Relative Flux vs. Junction Temperature ($I_F=350\text{mA}$)



Relative Chromaticity vs. Ambient temperature
($I_F=350\text{mA}$)

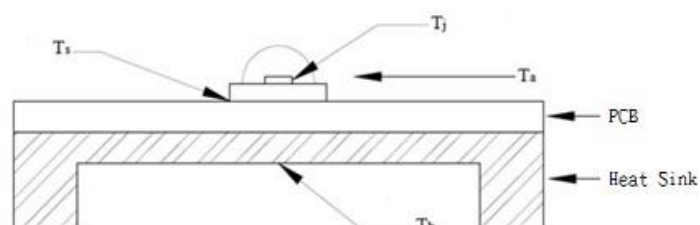
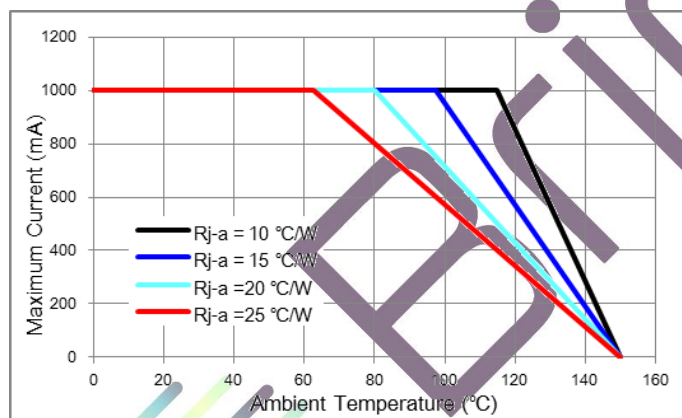


■ Typical Spatial Distribution

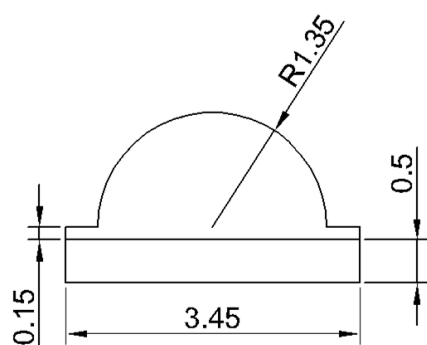
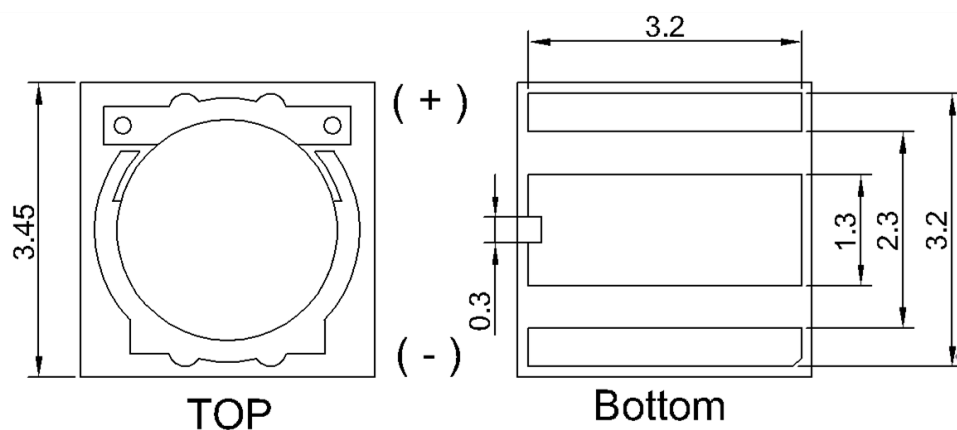


■ Thermal Design for De-rating

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.



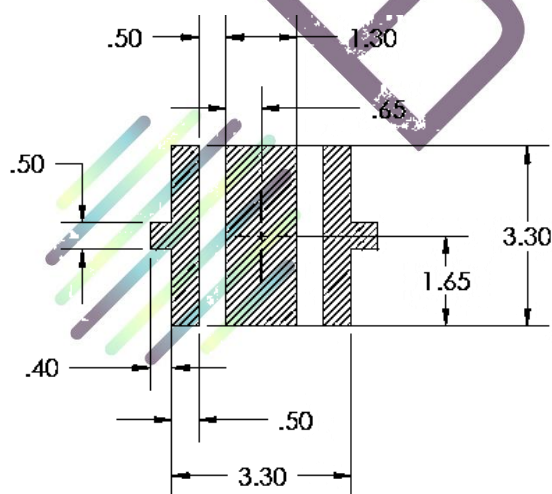
■ Dimensions



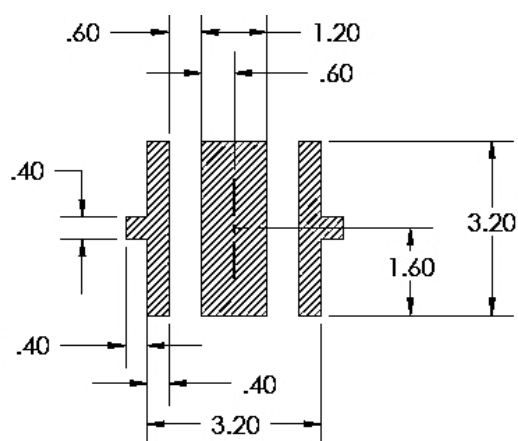
§ All dimensions are in millimeters.

§ Tolerance is ± 0.13 mm unless other specified.

■ Suggest Stencil Pattern (Recommendations for reference)



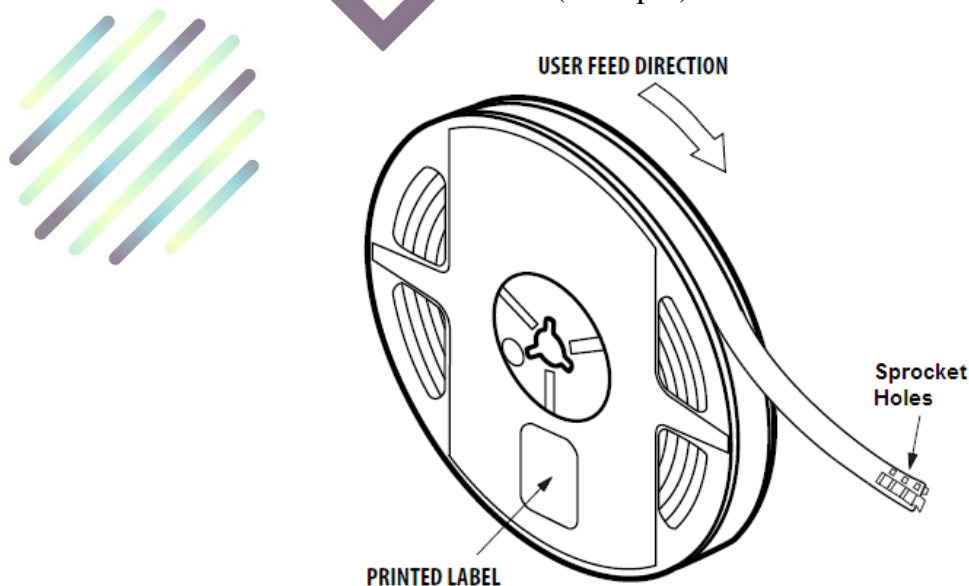
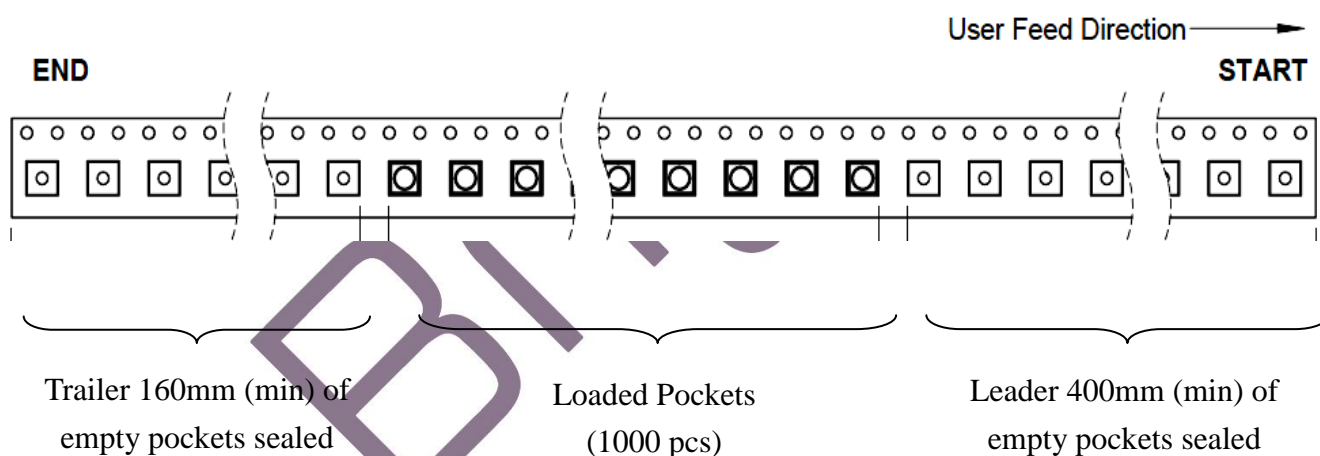
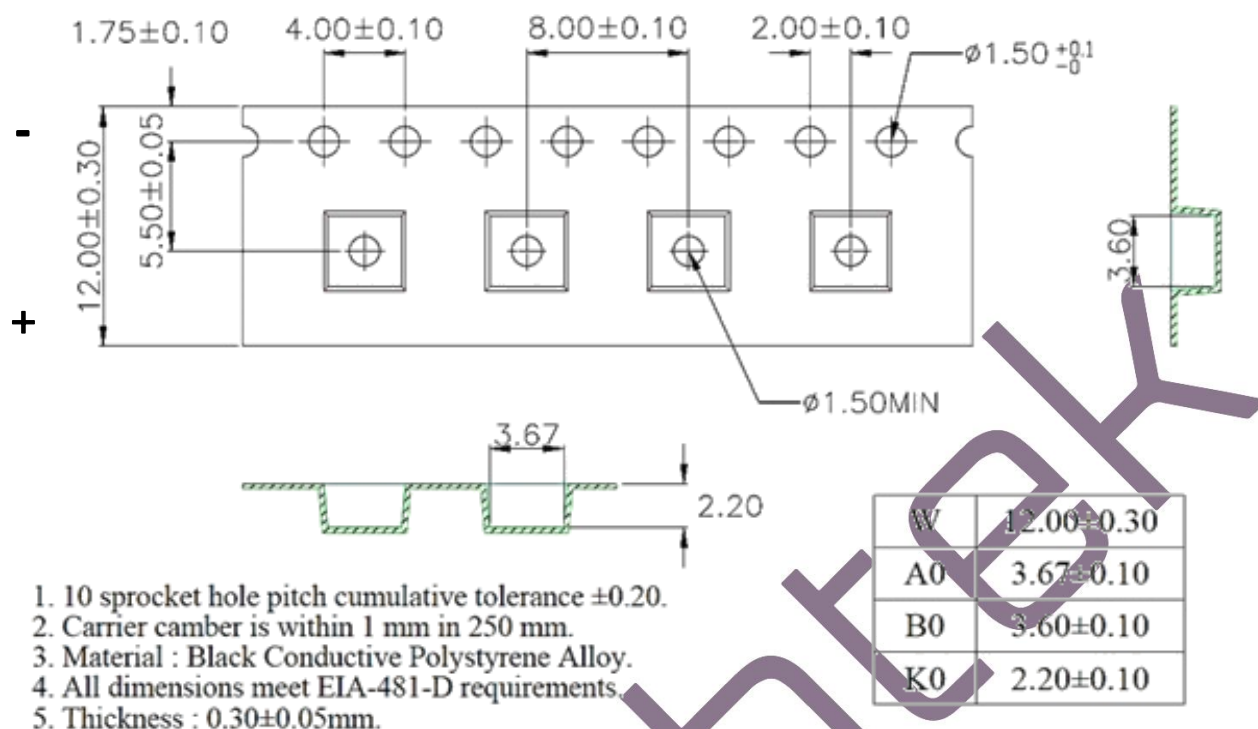
RECOMMENDED PCB SOLDER PAD

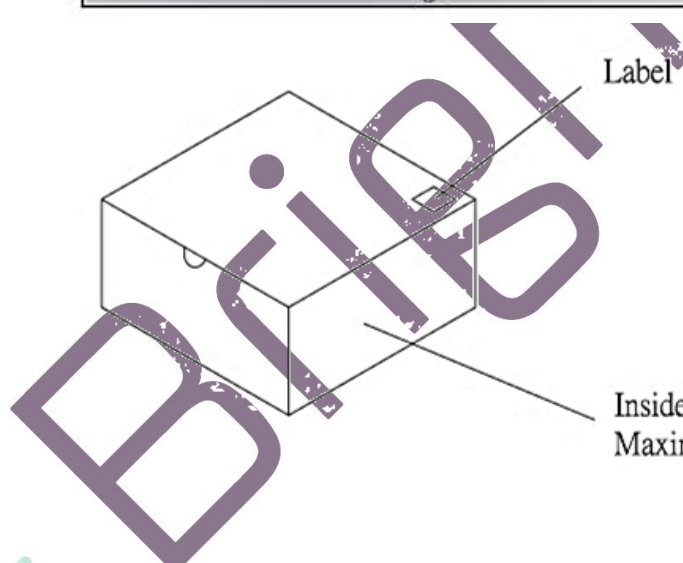


**RECOMMENDED STENCIL PATTERN
(HATCHED AREA IS OPENING)**

§ Suggest stencil $t = 0.12$ mm

■ Packing





Each reel (minimum 1000 ft) is packed in a moisture resistant card.

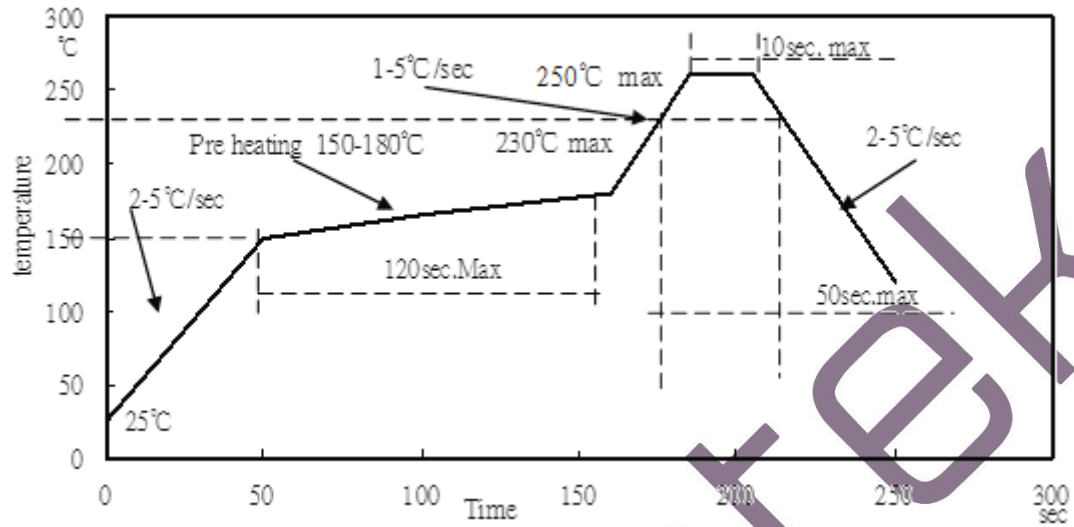
A maximum of 5 reels

- Each reel (minimum 1000 ft) is packed in a moisture resistant card.
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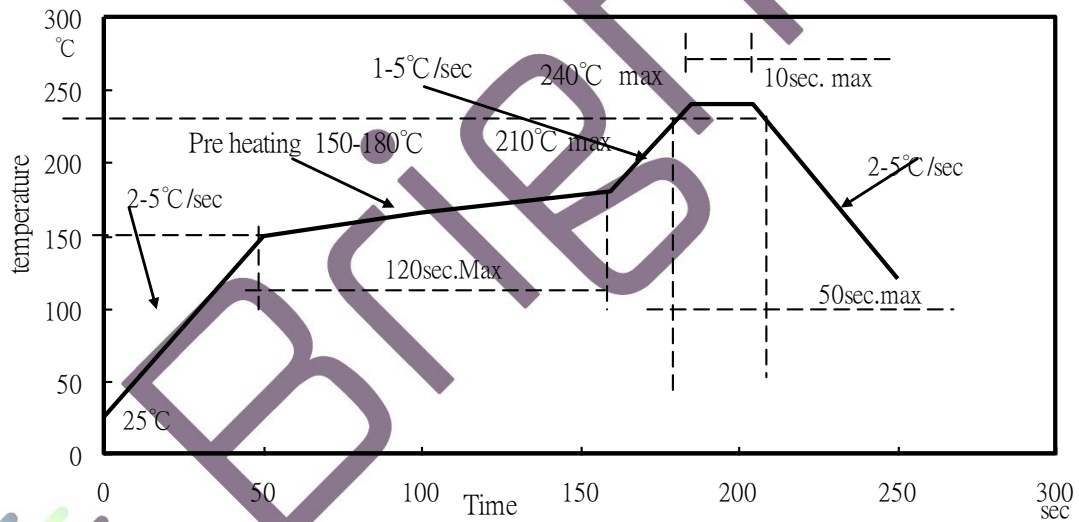
■ Reflow Profile

IR Reflow Soldering Profile

Lead Free solder



Lead solder



Notes:

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

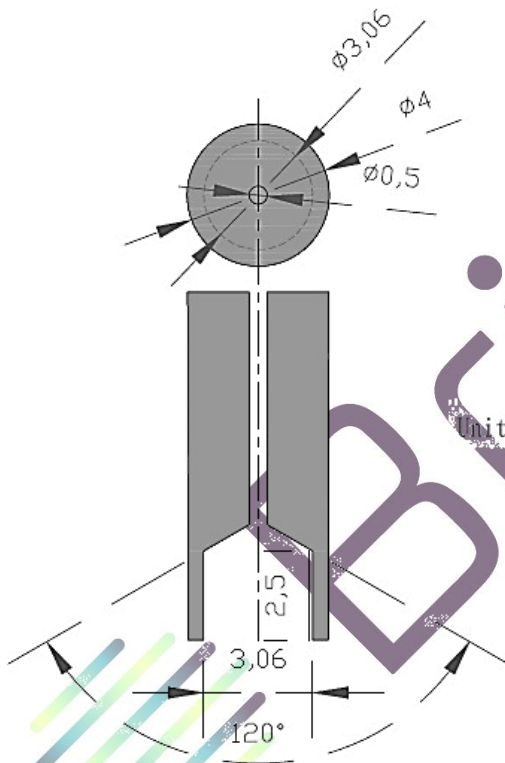
■ Precautions

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

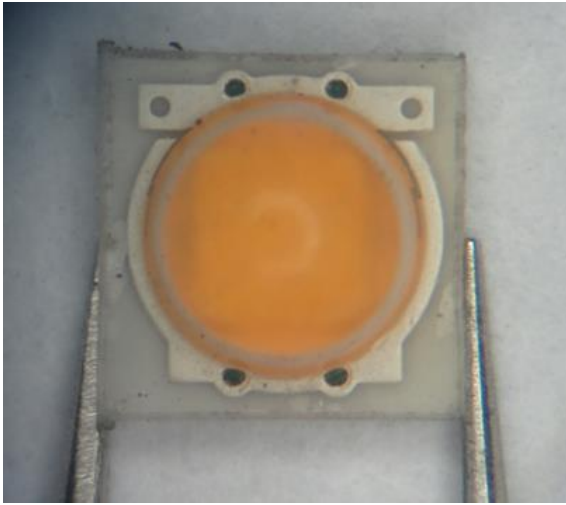
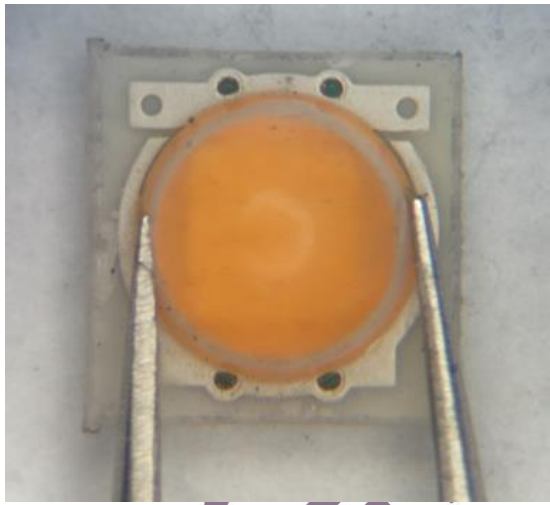
The pickup tool was recommended and shown as below



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 (400gw) directly onto the lens.

Correct (√)	Wrong (X)
	

4. Lens cleaning

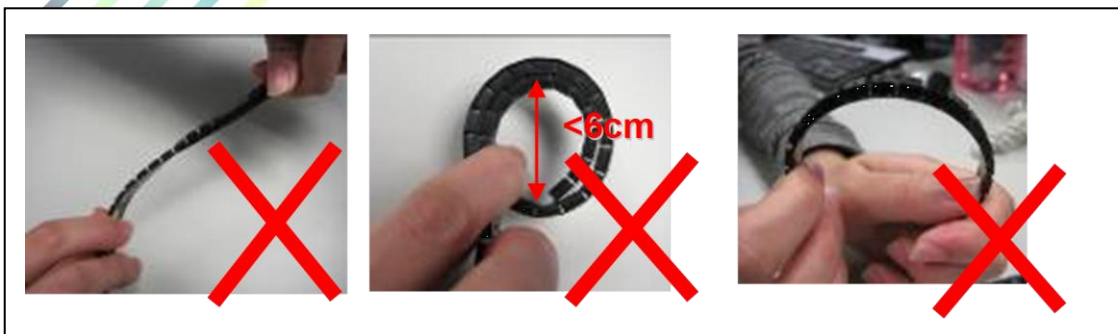
In the case which a small amount of dirt and dust particles remain on the lens surface, a suitable cleaning solution can be applied.

- 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.

Brightek



■ 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	100 cycles	0/22	AEC-Q101
High Temperature Storage	T _a =100°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