Product Family Data Sheet

LC026B – Ra90+

Introduction

Features

- 26W COB LED : 21.5 x 21.5 x t 1.5 (mm)
- InGaN/GaN MQW LED with long-time reliability
- Lead (Pd) free product - RoHS compliant

Applications

- Spot / Downlighting
- LED Retrofit Bulbs
- Outdoor illumination
- Other applications

SAMSUNG ELECTRONICS
95, Samsung2-Ro, Giheung-Gu,
Yongin-City, Gyeonggi-Do 446-711, KOREA

Contents

1. Absolute Maximum Rating

1) Operation Forward Current (T_a = 25°C) ..... 1,300 mA
2) LED Junction Temperature (T_J) ..... 150°C
3) Operating Temperature Range (T_{opr}) ..... -40°C ~ 105°C
4) Storage Temperature Range (T_{stg}) ..... -40°C ~ 120°C
5) Power Dissipation (P_D) 50W

2. Characteristics

1) Electro-Optical characteristics (T_a : 25°C)

Item	Unit	Condition	Rank			Min	Typ	Max
Luminous Flux[1]	lm[2]	I_F = 720 mA	2700K	2F	21	2110	-	2345
					22	2345	-	2580
					23	2580	-	2815
					24	2815	-	3050
			3000K	2F	21	2150	-	2390
					22	2390	-	2630
					23	2630	-	2870
					24	2870	-	3110
			3500K	2F	21	2220	-	2465
					22	2465	-	2710
					23	2710	-	2955
					24	2955	-	3200
			4000K	2F	21	2285	-	2535
					22	2535	-	2785
					23	2785	-	3035
					24	3035	-	3285
Forward Voltage	V[3]	I_F = 720 mA	YH			32.5	35.5	38.5
CRI[4]		I_F = 720 mA	-			90	-	-
Thermal Resistance ($R_{th,j-c}$)	℃/W	-	-				0.9	
View Angle	°	I_F = 720 mA	-			-	115°	-

Note :

1) Samsung LED tested in pulsed condition. T_J=25°C, pulse width is 10ms at rated test current.
2) Samsung LED has ±7% tolerance of flux measurements.
3) Samsung LED has ±5% tolerance of forward voltage measurements.
4) Samsung LED has ±1 tolerance of CRI measurements.

3. Binning Structure

(Condition : I_F = 720 mA, T_a : 25°C)

1) VF Binning

CCT	Product Code	VF Rank	VF (V)		
			Min	Typ	Max
2700K	SPHWW1HDNC27**YH**W32F	YH	32.5	35.5	38.5
3000K	SPHWW1HDNC27**YH**V32F	YH	32.5	35.5	38.5
3500K	SPHWW1HDNC27**YH**U32F	YH	32.5	35.5	38.5
4000K	SPHWW1HDNC27**YH**T32F	YH	32.5	35.5	38.5

2) Color Binning

CCT	Product Code	Color Rank	Chromaticity Bins
2700K	SPHWW1HDNC27YH**W3**2F	W3	WA
3000K	SPHWW1HDNC27YH**V3**2F	V3	VA
3500K	SPHWW1HDNC27YH**U3**2F	U3	UA
4000K	SPHWW1HDNC27YH**T3**2F	T3	TA

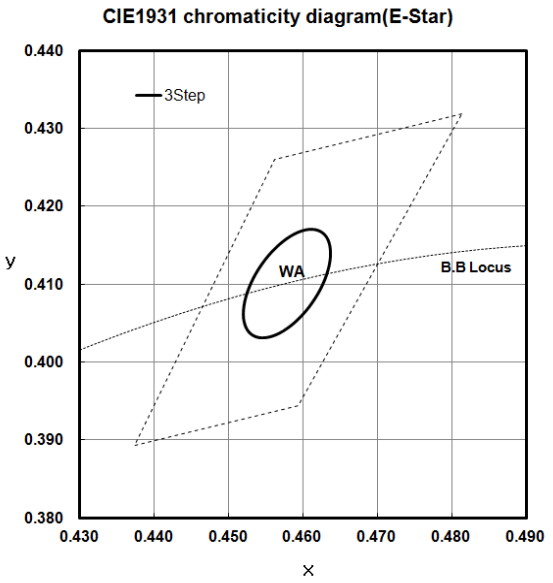
3) Luminous Flux Binning

CCT	Product Code	Flux Rank	Flux Bin	Range (lm)		
				Min	Typ	Max
2700K	SPHWW1HDNC27YHW3**2F**	2F	21	2110	-	2345
			22	2345	-	2580
			23	2580	-	2815
			24	2815	-	3050
3000K	SPHWW1HDNC27YHV3**2F**	2F	21	2150	-	2390
			22	2390	-	2630
			23	2630	-	2870
			24	2870	-	3110
3500K	SPHWW1HDNC27YHU3**2F**	2F	21	2220	-	2465
			22	2465	-	2710
			23	2710	-	2955
			24	2955	-	3200
4000K	SPHWW1HDNC27YHT3**2F**	2F	21	2285	-	2535
			22	2535	-	2785
			23	2785	-	3035
			24	3035	-	3285

4. Chromaticity Coordinates

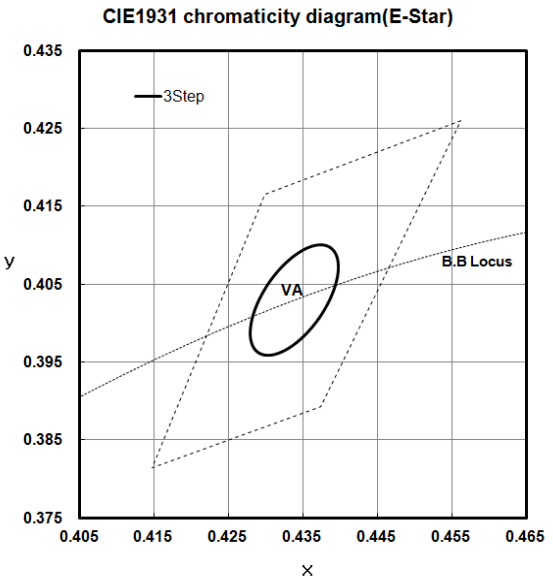
(Condition : I_F = 720 mA, T_a : 25°C)

1) 2700K



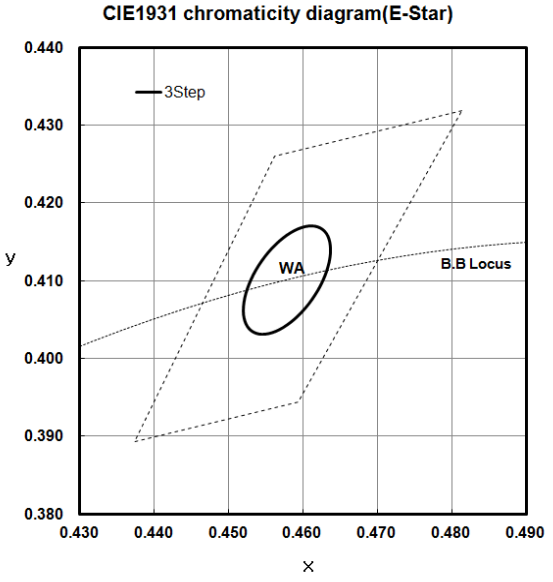
Macadam Ellipse 3step (WA)				
x	y	θ	a	b
0.4578	0.4101	53.7	0.0081	0.0042

2) 3000K



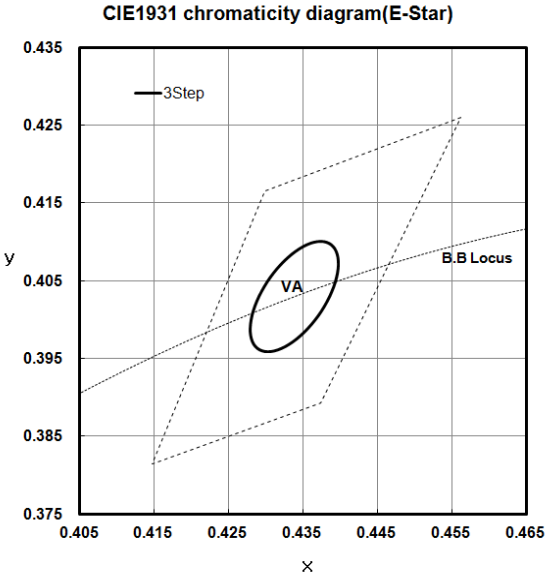
Macadam Ellipse 3step (VA)				
x	y	θ	a	b
0.4338	0.4030	53.22	0.0083	0.0041

3) 3500K



Macadam Ellipse 3step (UA)				
x	y	θ	a	b
0.4073	0.3917	54.0	0.0093	0.0041

4) 4000K



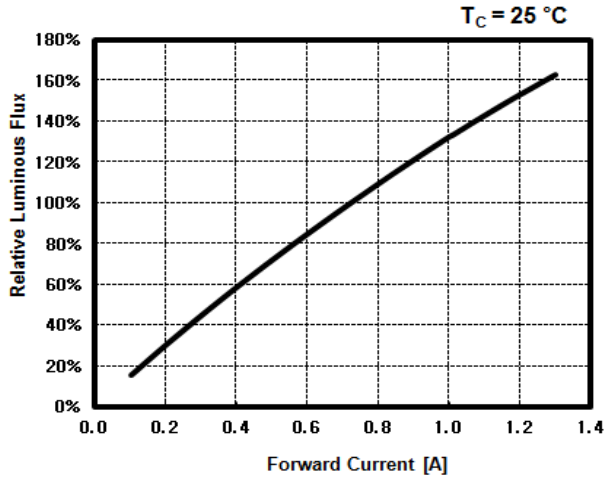
Macadam Ellipse 3step (TA)				
x	y	θ	a	b
0.3818	0.3797	53.72	0.0094	0.0040

Note :

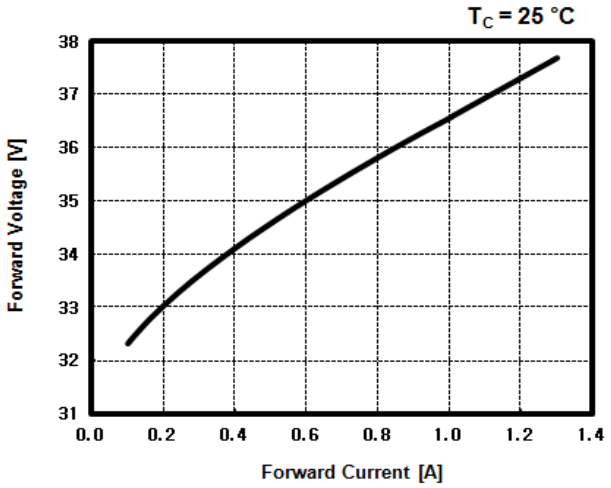
1) The Chromaticity Coordinates refers to ANSI C78.377-2008
2) Samsung LED has ±0.005 tolerance of chromaticity(x,y).

5. Typical Characteristics Graph

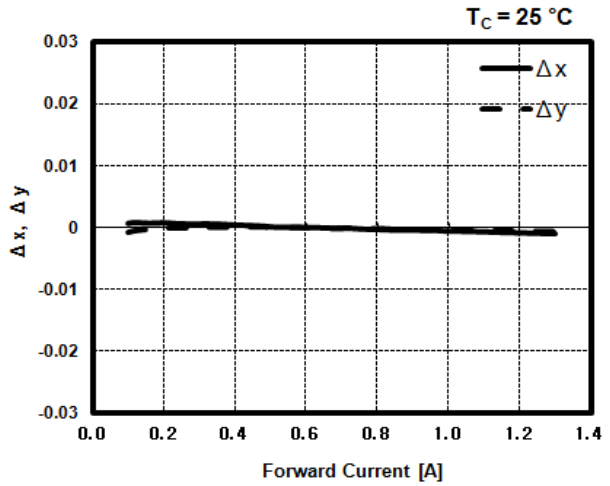
Relative Luminuous Flux vs. Forward Current



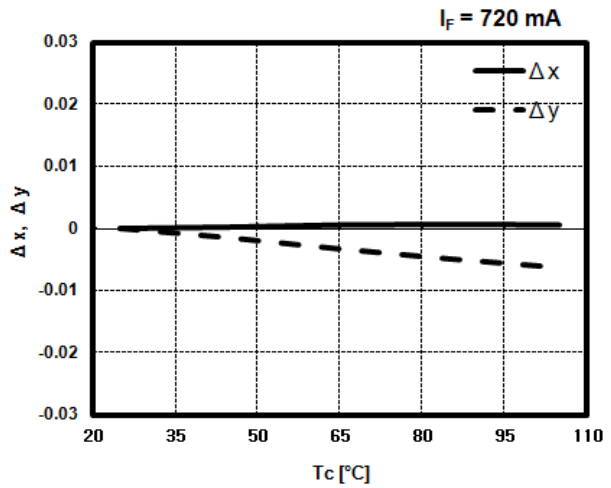
Forward Voltage vs. Forward Current



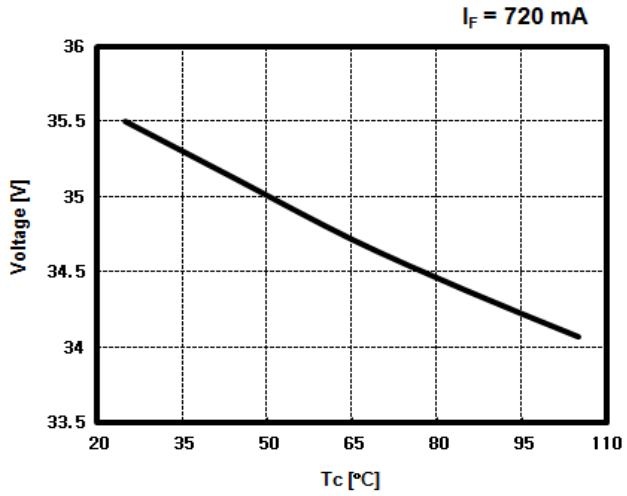
Chromaticity vs. Forward Current



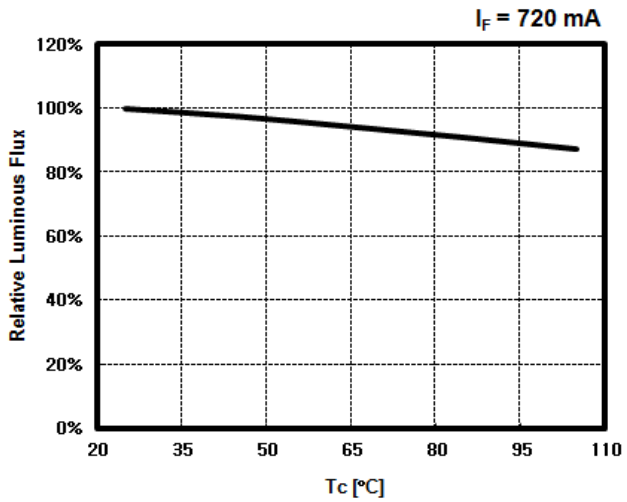
Chromaticity vs. Temperature



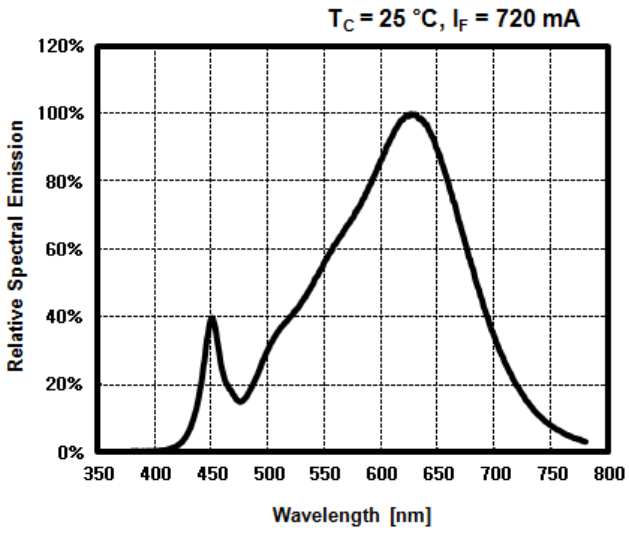
Forward Voltage vs. Temperature



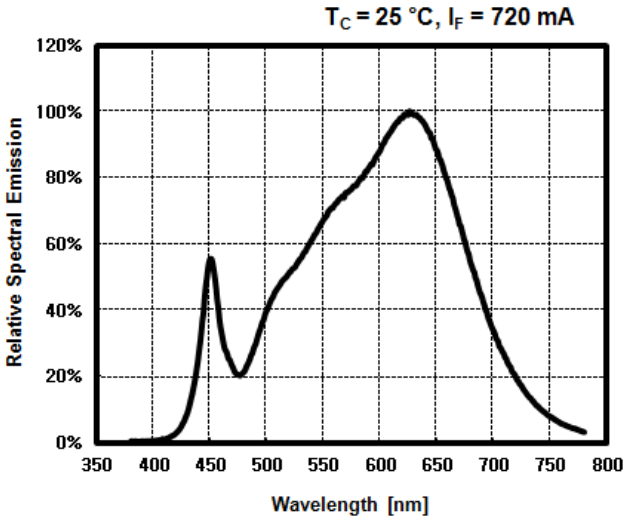
Relative Luminuous Flux vs. Temperature



Relative Spectral Emission



<2700K>



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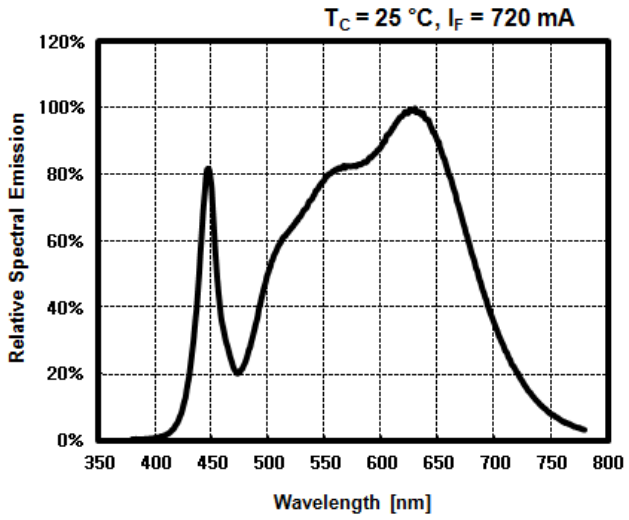

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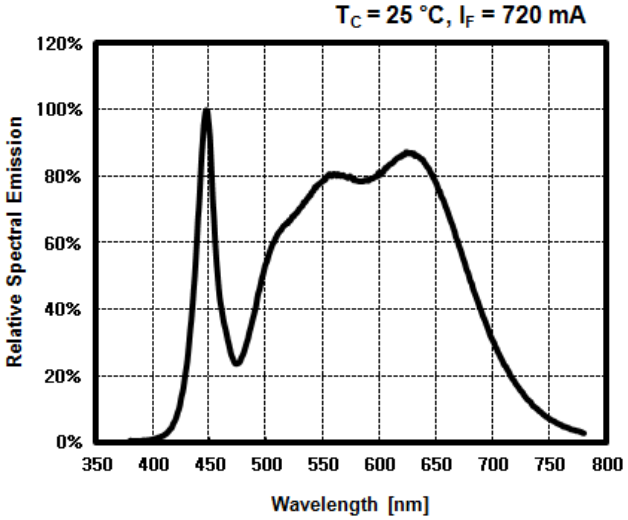
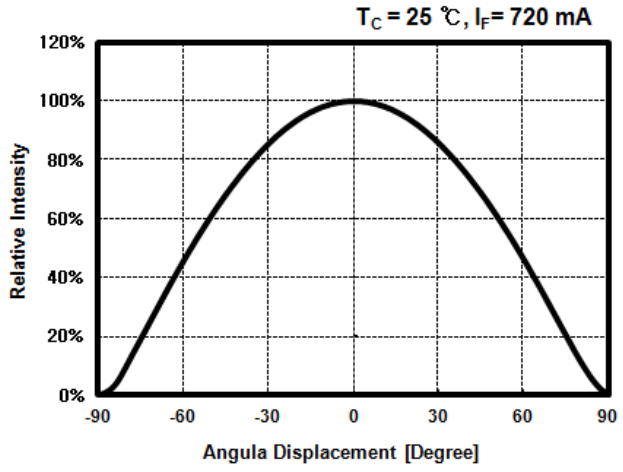
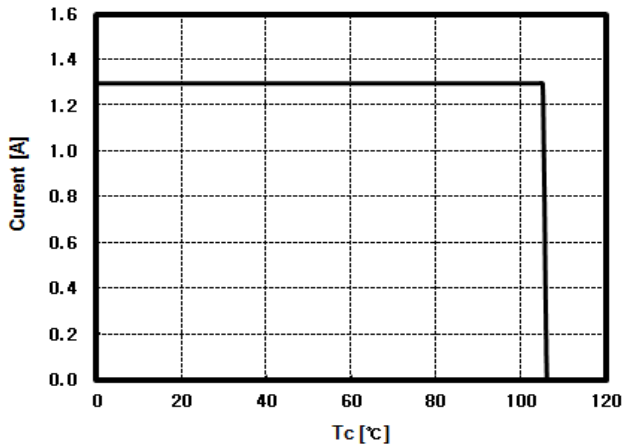


<4000K>

Radiation Pattern



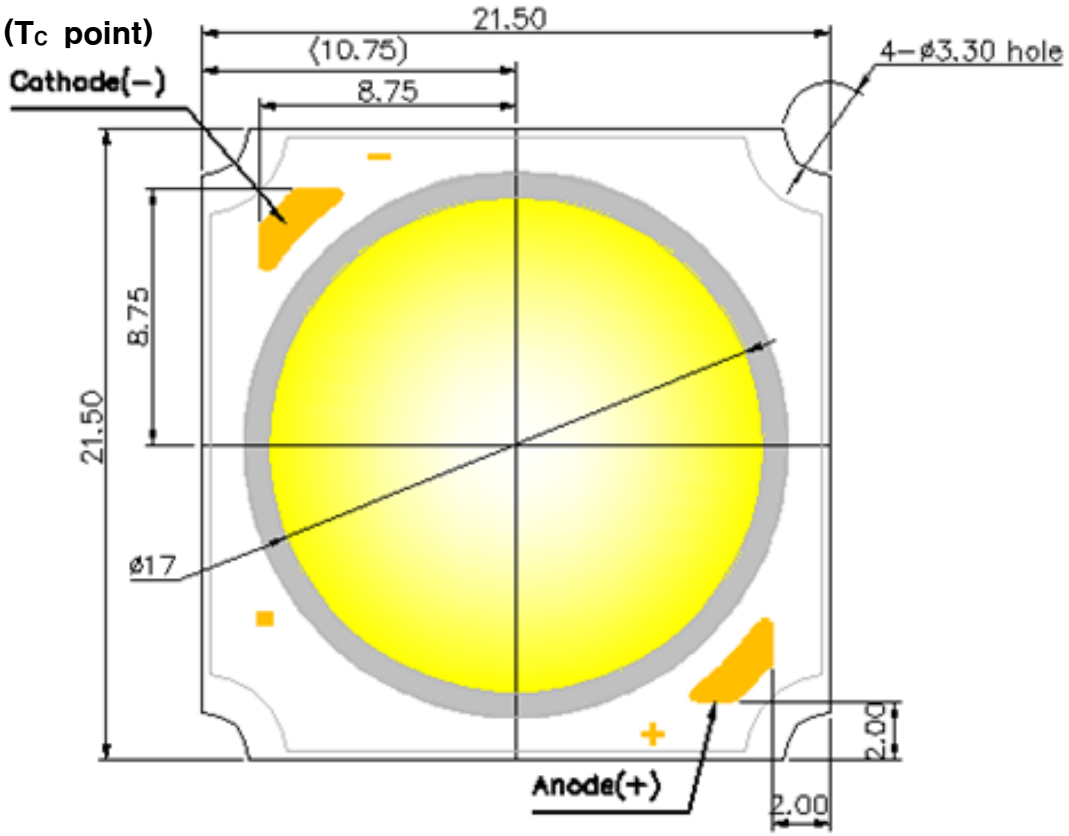
Derating Curve

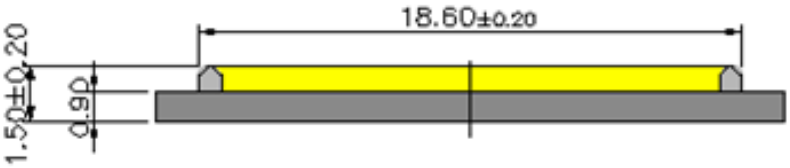


6. Outline Drawing & Dimension

unit : mm

Tolerance : ± 0.15





7. Reliability Test Items and Conditions

1) Test Items

Test Items	Test Conditions	Test Hours/Cycles
Room Temperature life test	25°C, I_F = Max	1,000 h
High Temperature humidity life test	85°C, 85% RH, DC Derating I_F = Max	1,000 h
High Temperature life test	105°C, DC Derating I_F = Max	1,000 h
Low Temperature life test	-40°C, DC 1300 mA	1,000 h
High Temperature Storage	120°C	1,000 h
Low Temperature Storage	-40°C	1,000 h
Thermal Shock	-45°C/15min → 125°C/15min Temperature changes in 5min.	200 cycles
Temperature Cycle On/Off test	-40 / 85°C, each 20min, 100min transfer Power On/off each 5min, DC 720 mA	100 cycles
Temperature humidity Cycle Storage	-10°C↔25°C, 95%RH ↔ 85°C, 95%RH [24h/1Cycle]	100 cycles
ESD(HBM)	R1 : 10 MΩ, R2 : 1.5 kΩ, C : 100 pF	5 times (± 5 kV)
ESD(MM)	R1 : 10 MΩ, R2 : 0 kΩ, C : 200 pF	5 times (± 0.5 kV)
Vibration	20~80Hz(Displacement:0.06inch, Max 20G) 80~2KHz (Max 20G) Min. Frequency ↔ Max. Frequency 4min transfer	4 times
Shock	1500G, 0.5ms, Every 6faces (3axis X 2faces)	5 times
Salt Spray	35°C, salt water 5% 8h spray → 16h leaving alone	2 cycles

2) Criteria for Failure

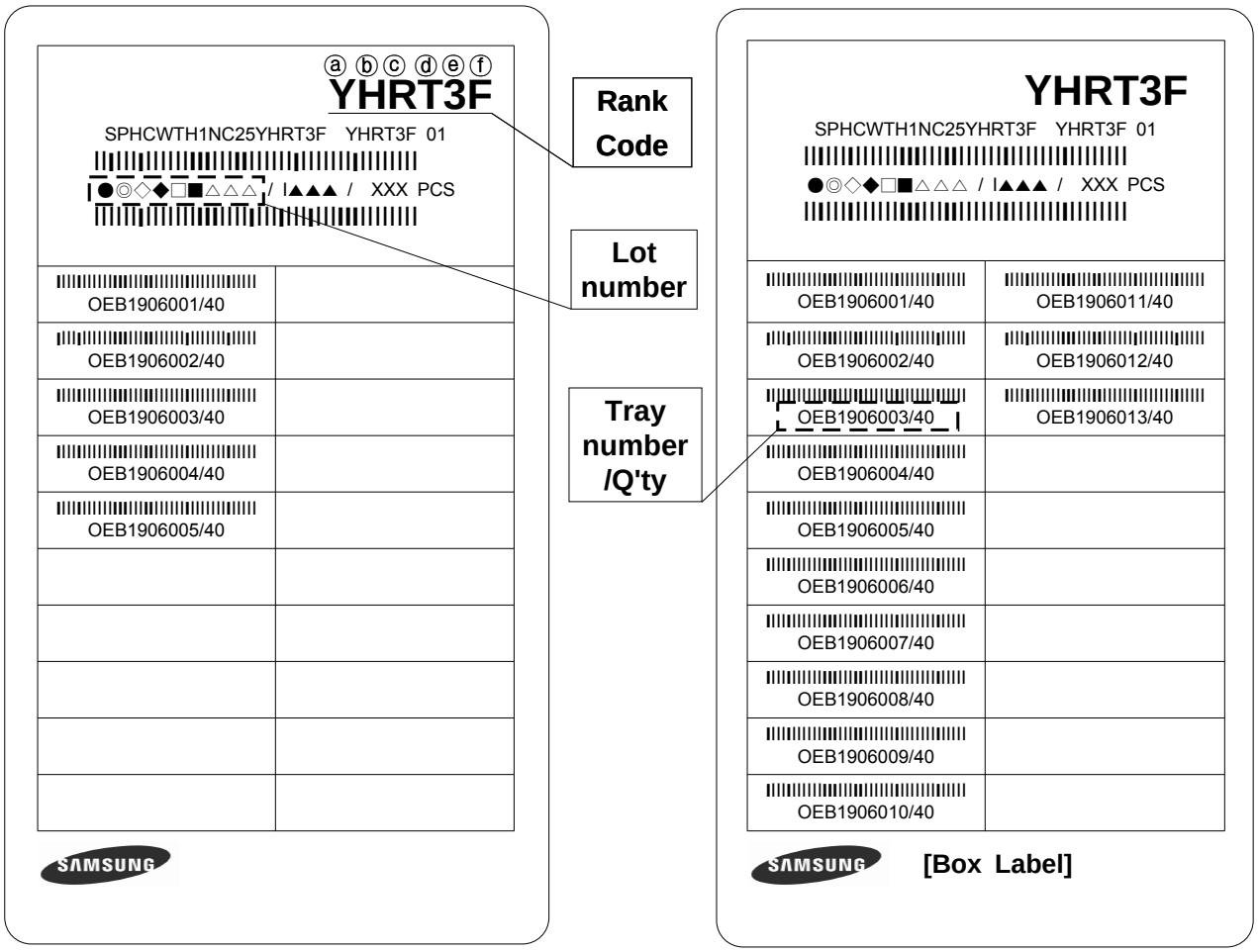
Item	Symbol	Test Condition [T_a = 25°C]	Limit	
			Min.	Max.
Forward Voltage	V_F	1300 mA	L.S.L. × 0.9	U.S.L. × 1.1
Luminous flux	Im	1300 mA	L.S.L. × 0.7	U.S.L. × 1.3

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

8. Label Structure

* Bag & Inner box

* Box



N.B) Denoted rank is the only example.

Rank Code

ⓐⓑ : Forward Voltage (V_F) Rank (refer to page. 4)

ⓒⓓ : Chromaticity Coordinate Rank (refer to page. 5)

ⓔⓕ : Luminous Flux (Φ_V) Rank (refer to page. 4)

9. Lot Number

The Lot number is composed of the following characters

●◎◇◆□■△△△ / I▲▲▲ / xxx PCS

● : Production Site (S:SAMSUNG ELECTRONICS, G:Gosin China, A:Aprosystems)

◎ : L (LED)

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

◆ : Year (U:2010, V:2011, W:2012, X:2013, Y:2014...)

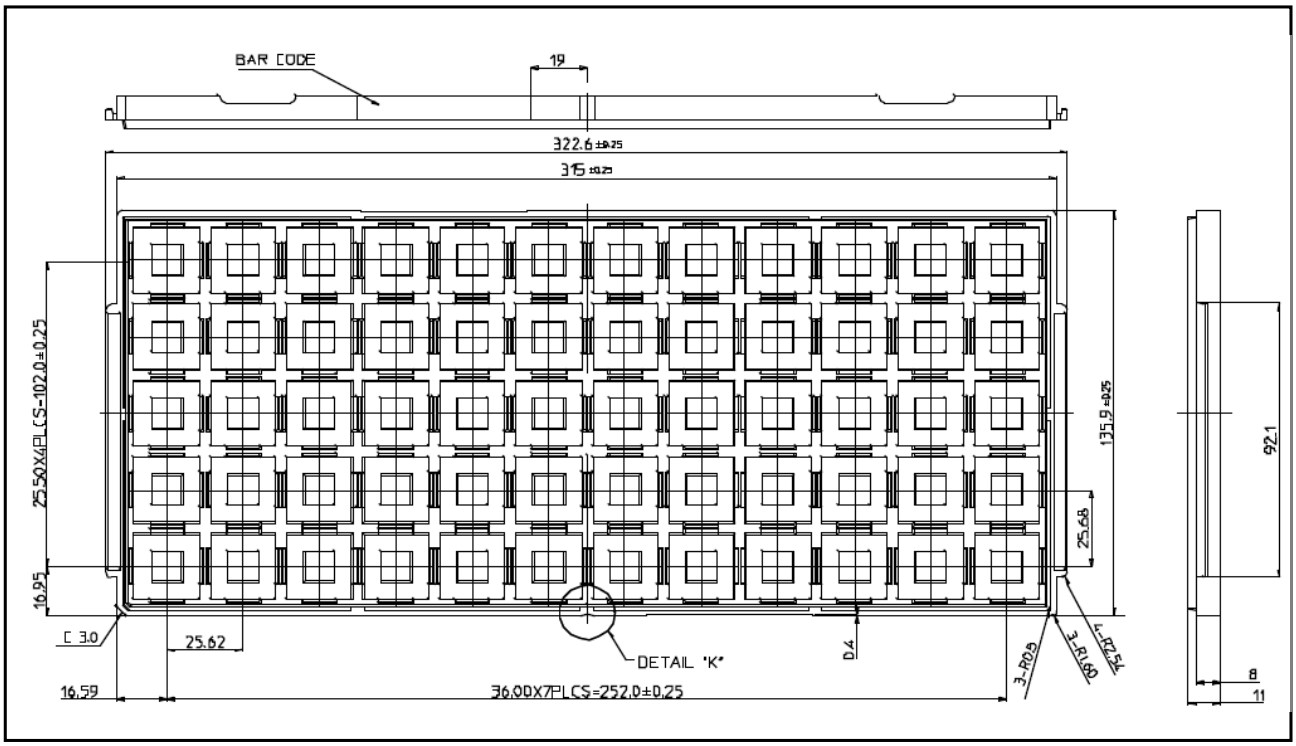
□ : Month (1 ~ 9, A~C)

■ : Day (1 ~ 9, A, B ~ V)

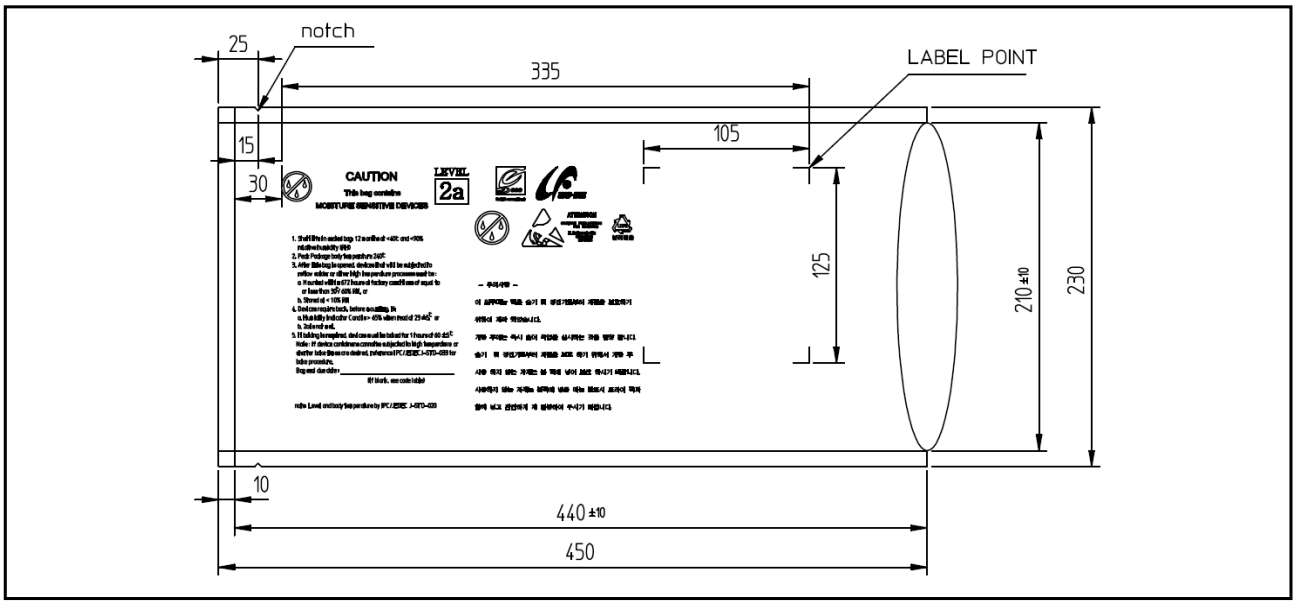
△ : SAMSUNG LED Product number (1 ~ 999)

▲ : Tray Number (1 ~ 999)

10. Tray Dimension



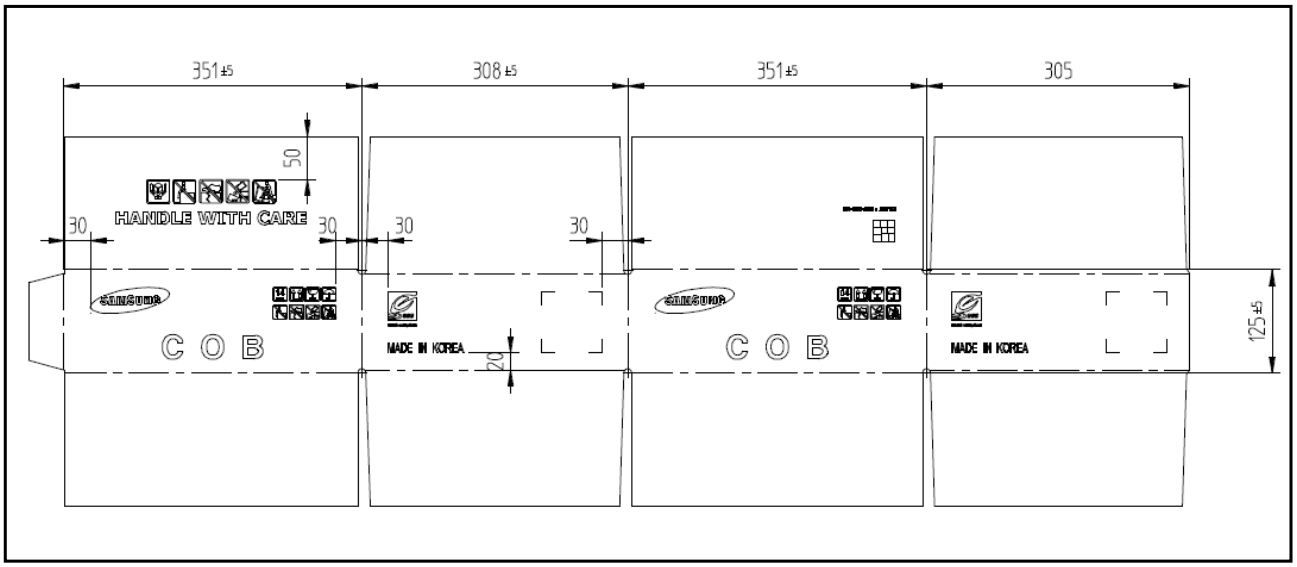
11. Aluminum Bag Dimension



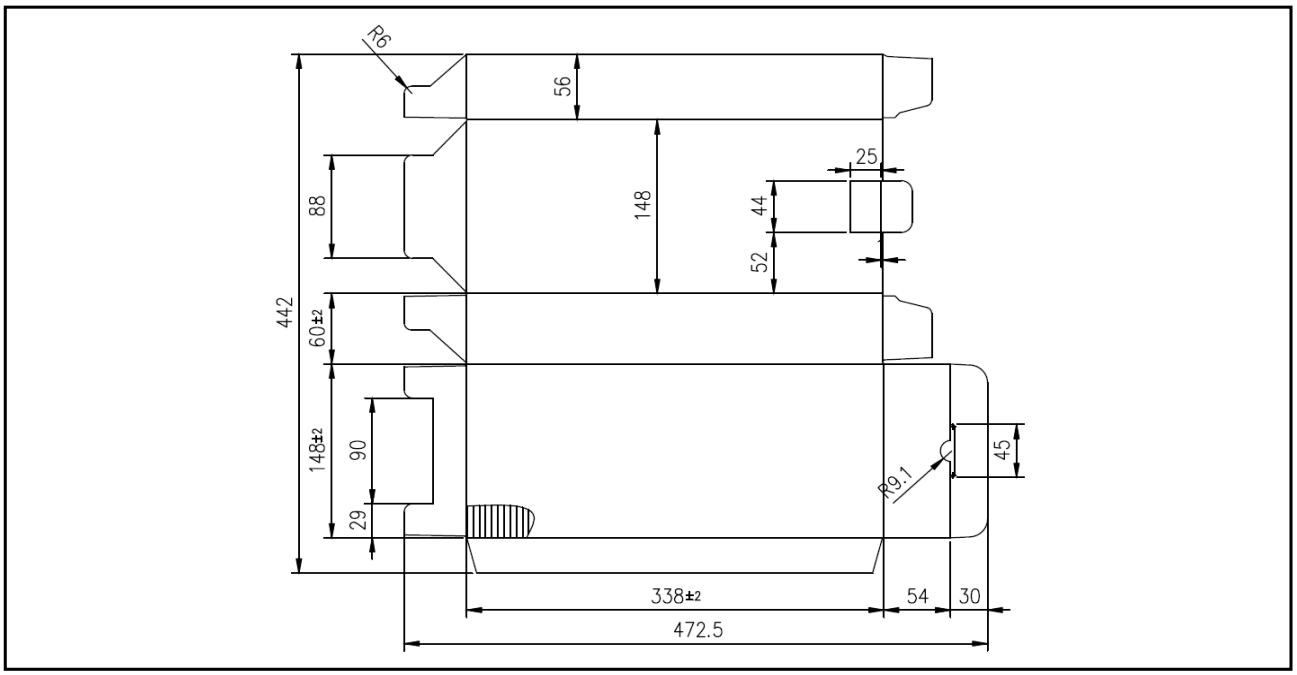
Silica gel & Humidity Indicator Card in Aluminum Bag

12. Box & Pad Dimension

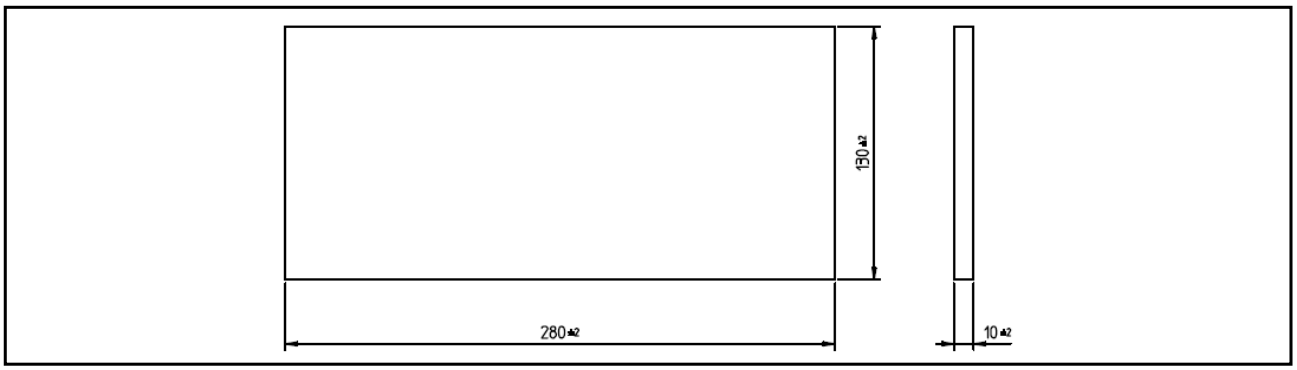
1) Out BOX



2) Inner BOX



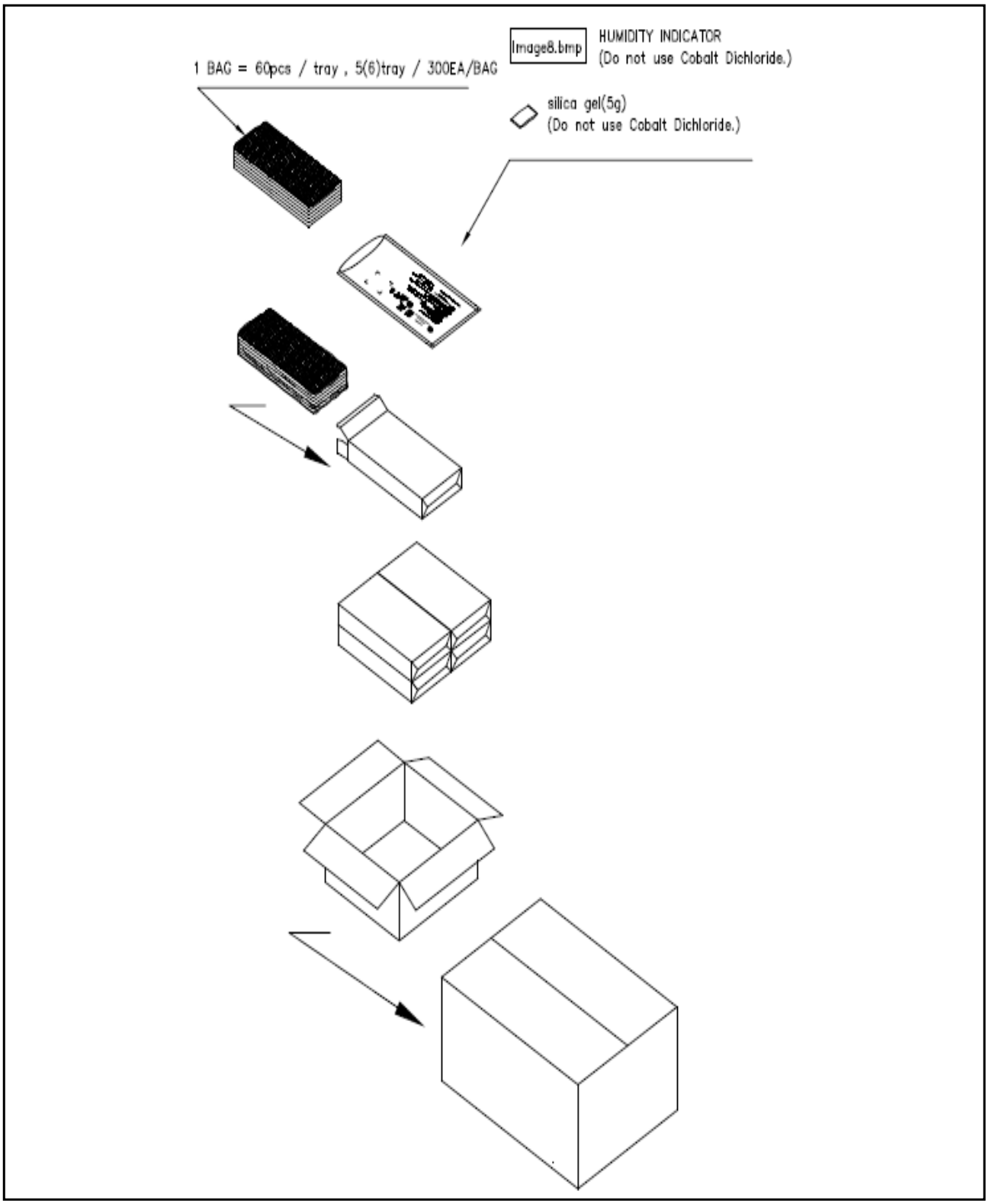
3) Pe-foam PAD



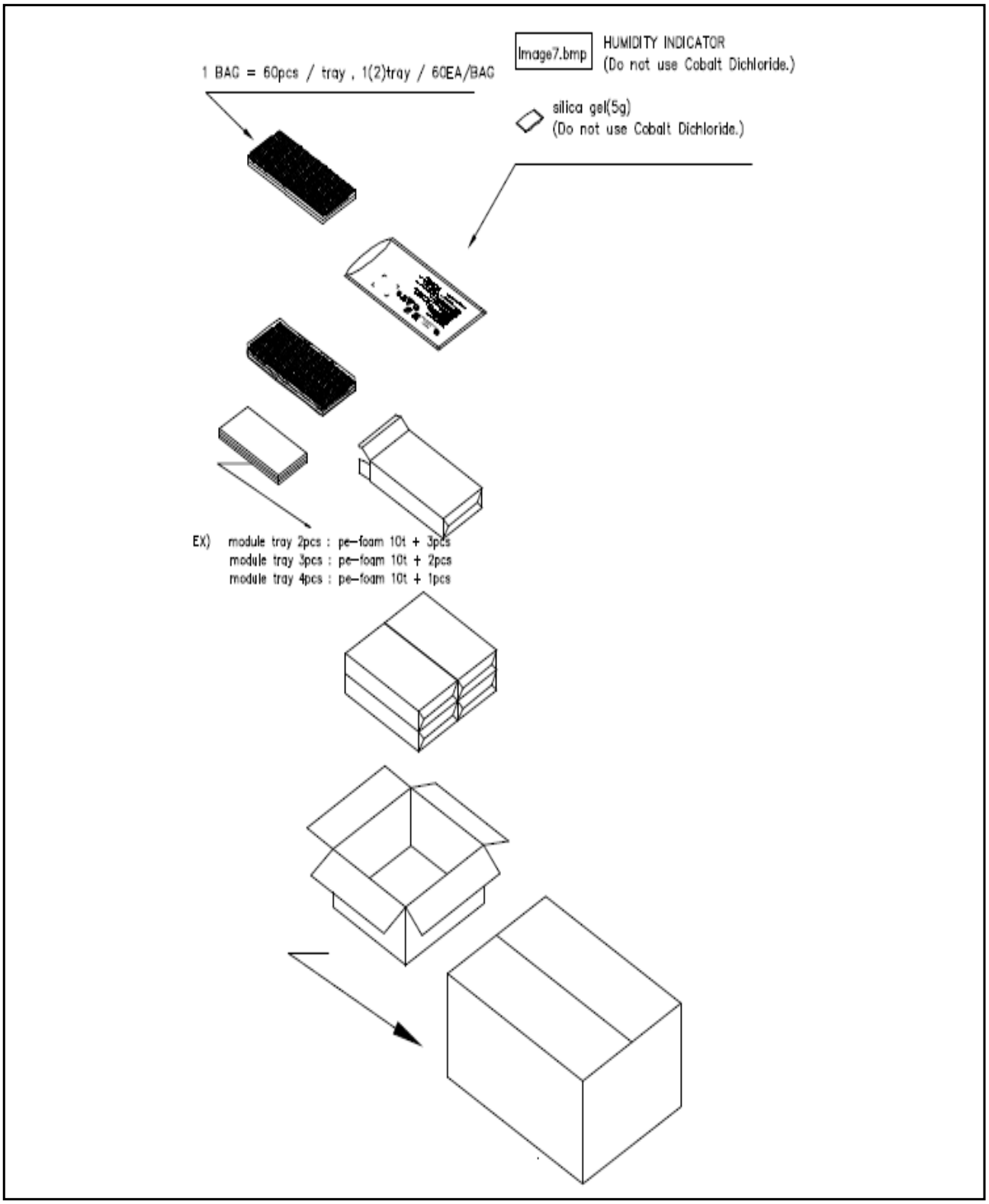
13. Packing Structure

1-1). Tray Packing (When 5 Trays)

Max Amount(pcs)		
Tray	Al Bag	Box
60	300	1200



1-2). Tray Packing (When Less than 5 Trays)



EX) Module tray 2pcs : Pe-foam(10t) * 3pcs
Module tray 3pcs : Pe-foam(10t) * 2pcs
Module tray 4pcs : Pe-foam(10t) * 1pcs

14. Precaution for use

1) Shelf life in sealed bag : 12 months at < 40˚C and < 90% relative humidity(RH)

2) Peak package body temperature : 240˚C.

3) After this bag is opened, devices that will be subjected to reflow solder or other high temperature processes must be :
   a. Mounted within 672 hours at factory conditions of equal to or less than 30˚C / 60% RH, or
   b. Stored at < 10% RH

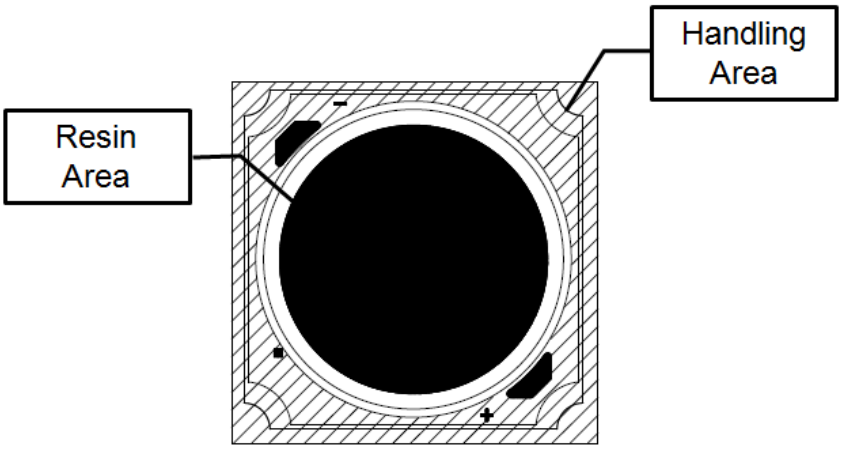
4) Devices require bake, before mounting, if :
   a. Humidity Indicator Card is > 65% when read at 23 ± 5˚C, or
   b. 2a is not met.

5) If baking is required, devices must be baked for 1 hours at 60 ± 5˚C
   Note : If device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC / JEDEC J-STD-033 for bake procedure.

6) The LEDs are sensitive to the static electricity and surge current. 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 leakage current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.

7) Please do not following behavior in resin area.
(Handling, Pressing, Touching, Rubbing, Contacting tweezers, Cleaning)
But it's ok in handling area.



8) VOCs (volatile organic compounds) may be occurred by adhesives, flux, hardener or organic additives which is used in luminaires (fixture) and LED silicone bags are permeable to it. It may lead a discoloration when LED expose to heat or light.

This phenomenon can give a significant loss of light emitted(output) from the luminaires (fixtures).

In order to prevent these problems, we recommend you to know the physical properties for the materials used in luminaires, It requires to select carefully.