Rev : 003

Product Family Data Sheet

LC112A – COB(Chip On Board) LED

Introduction

Features

- 6.4W COB LED : 18.0 x 13.5 x 6.4 (mm)
- InGaN/GaN MQW LED with long-time reliability
- Lead (Pd) free product - RoHS compliant

Applications

- Spot / Down light
- 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) ..... 220 mA
2) Flash Mode Peak Pulsed Forward Current ..... 250 mA
(Pulse width t≤10msec, Duty ratio=0.06, T_a=25°C)
3) Thermal Resistance ($R_{th,j-c}$) ..... 1.9°C/W
4) LED Junction Temperature (T_J) ..... 150°C
5) Operating Temperature Range (T_{opr}) ..... -40°C ~ 85°C
6) Storage Temperature Range (T_{stg}) ..... -40°C ~ 120°C

2. Characteristics

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

Item	Unit	Condition	Rank			Min	Typ	Max
Luminous Flux[2]	lm	I_F = 175 mA[1]	2700K	AB	AA	550	-	605
					BA	605	-	
			5000K	CD	CB	650	-	740
					EB	740	-	-
Forward Voltage	V[3]	I_F = 175 mA	YG			34	36.5	37.5
CRI		I_F = 175 mA	2700K			80	-	-
			5000K			70		
View Angle[5]	°	I_F = 175 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 ±10% tolerance of flux measurements.
3) Samsung LED has ±5% tolerance of forward voltage measurements.
4) Samsung LED has ±5% tolerance of CCT measurements.
5) Samsung LED has ±0.15 mm tolerance on device dimensions.
6) Samsung LED has ±0.01 tolerance of CIE X, CIE Y measurements.

2) Current Sweep Characteristics

If (mA)	Vf (V)	CCT	Flux (Lm)	Lm/W	CRI
	Typ		Typ	Typ	Min
30	32.75	2700K	106	109	80
		5000K	138	141	70
60	33.64	2700K	211	105	80
		5000K	274	136	70
90	34.37	2700K	311	101	80
		5000K	404	131	70
120	35.02	2700K	407	97	80
		5000K	529	126	70
150	35.63	2700K	499	93	80
		5000K	649	121	70
180	36.21	2700K	589	90	80
		5000K	765	117	70
210	36.75	2700K	675	87	80
		5000K	877	114	70

Note :

1) These values on the table are for reference only.

3. Binning Structure

(Condition : I_F = 175 mA, T_a : 25°C)

1) Color Binning

CCT	Product Code	Color Rank	Chromaticity Bins
2700K	SPHWWTHDD835YG**WT**AB	WT	Whole Bin
5000K	SPHCWTHDD833YG**RT**CD	RT	Whole Bin

2) Luminous Flux Binning

CCT	Product Code	Flux Rank	Flux Bin	Range (lm)	
				Min	Max
2700K	SPHWWTHDD835YGWT**AB**	AB	AA	550	605
			BA	605	
5000K	SPHCWTHDD833YGRT**CD**	CD	CB	650	740
			EB	740	

4. Chromaticity Coordinates

(Condition : I_F = 175 mA, T_a : 25°C)

1) 2700K

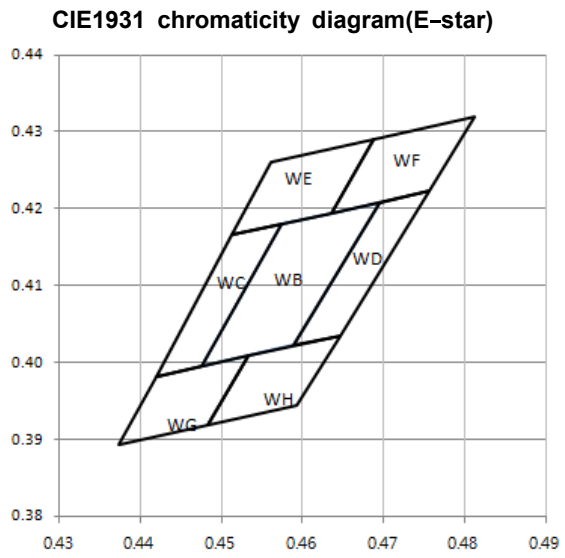


Table	CIE X	CIE Y
WB	0.4696	0.4208
	0.4574	0.4180
	0.4476	0.3996
	0.4590	0.4022
WC	0.4574	0.4180
	0.4513	0.4166
	0.4419	0.3982
	0.4476	0.3996
WD	0.4756	0.4223
	0.4696	0.4208
	0.4590	0.4022
	0.4647	0.4035
WE	0.4688	0.4290
	0.4562	0.4260
	0.4513	0.4166
	0.4635	0.4194

Table	CIE X	CIE Y
WF	0.4813	0.4319
	0.4688	0.4290
	0.4635	0.4194
	0.4756	0.4223
WG	0.4533	0.4009
	0.4419	0.3982
	0.4373	0.3893
	0.4483	0.3919
WH	0.4647	0.4035
	0.4533	0.4009
	0.4483	0.3919
	0.4593	0.3944

2) 5000K

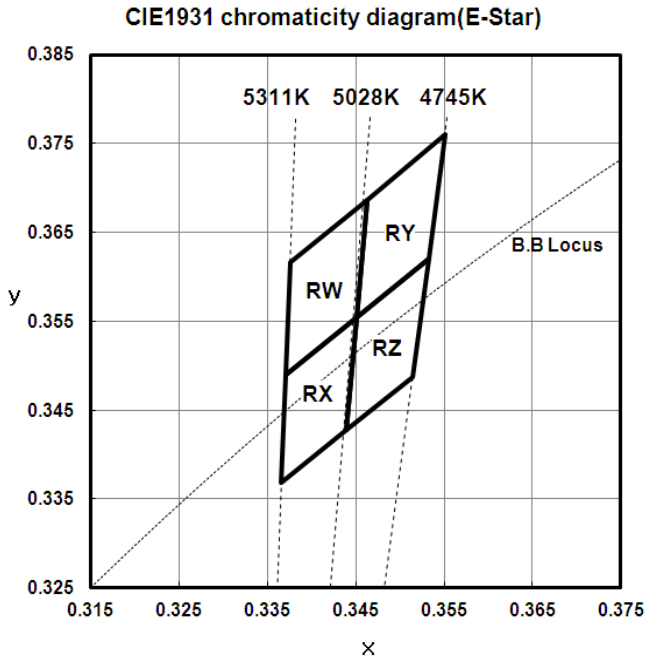


Table	CIE X	CIE Y
RW	0.3376	0.3616
	0.3463	0.3687
	0.3451	0.3554
	0.3371	0.3490
RX	0.3371	0.3490
	0.3451	0.3554
	0.3440	0.3428
	0.3366	0.3369
RY	0.3463	0.3687
	0.3551	0.3760
	0.3533	0.3620
	0.3451	0.3554
RZ	0.3451	0.3554
	0.3533	0.3620
	0.3515	0.3487
	0.3440	0.3428

Note :

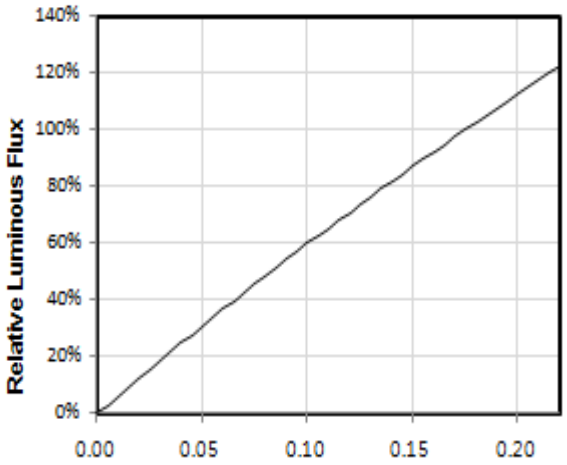
1) The Chromaticity Coordinates refers to ANSI C78.377-2008

5. Typical Characteristics Graph

*** These graphs show typical values. (Ta : 25°C)**

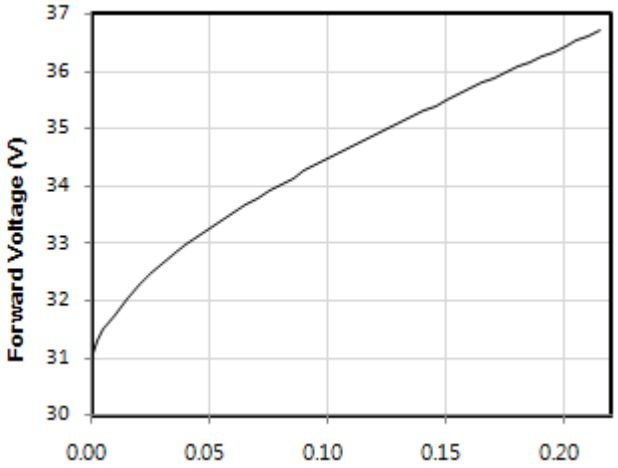
Forward Current vs. Relative Luminous Flux

Tc = 25℃



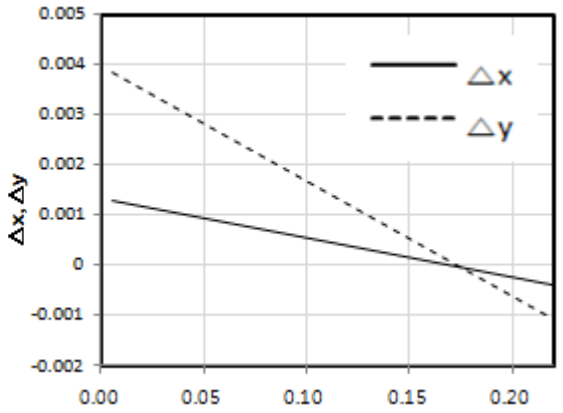
Forward Current vs. Forward Voltage

Tc = 25℃



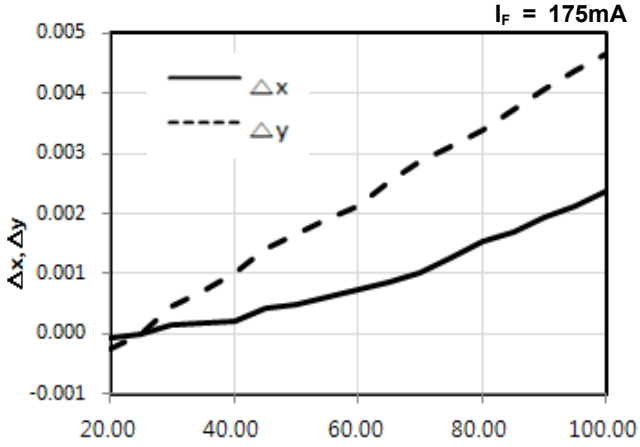
Forward current vs. Chromaticity Coordination

Tc = 25℃

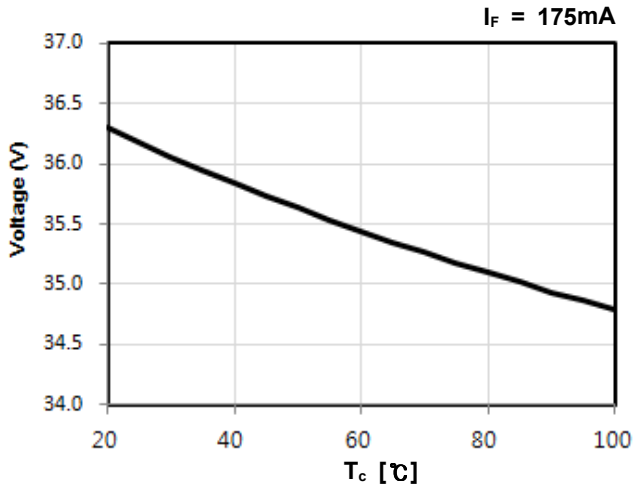


Temperature vs. Chromaticity Coordination

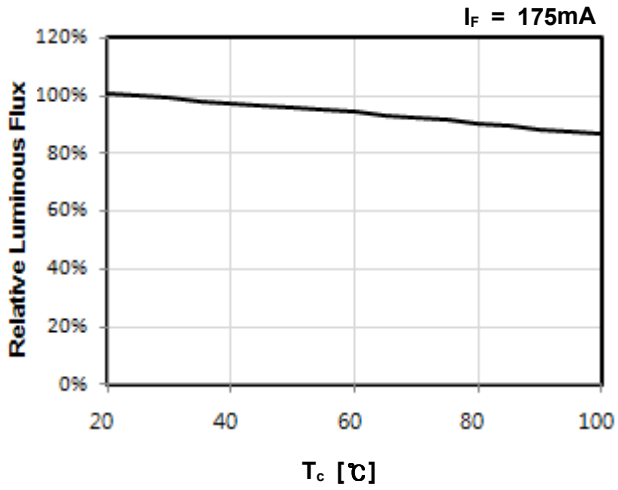
I_F = 175mA



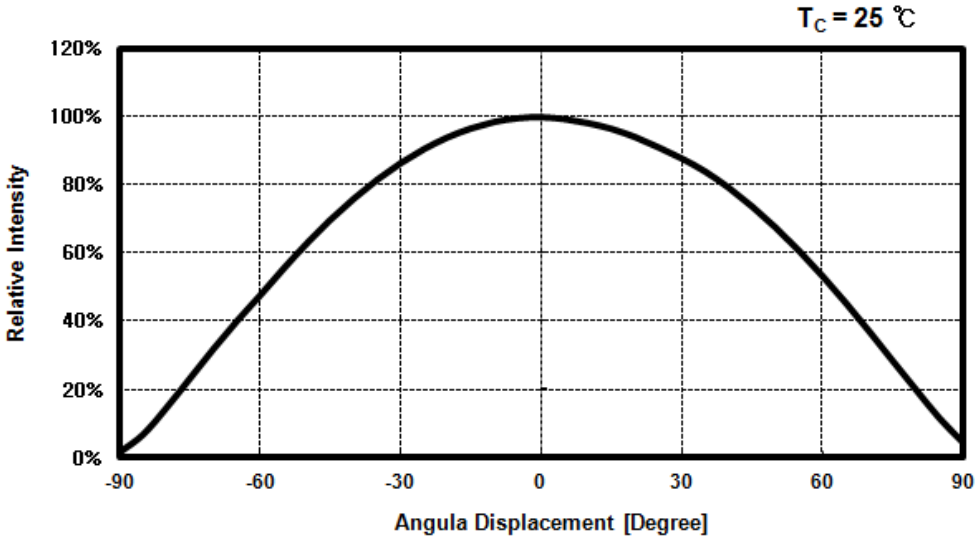
Temperature vs. Voltage



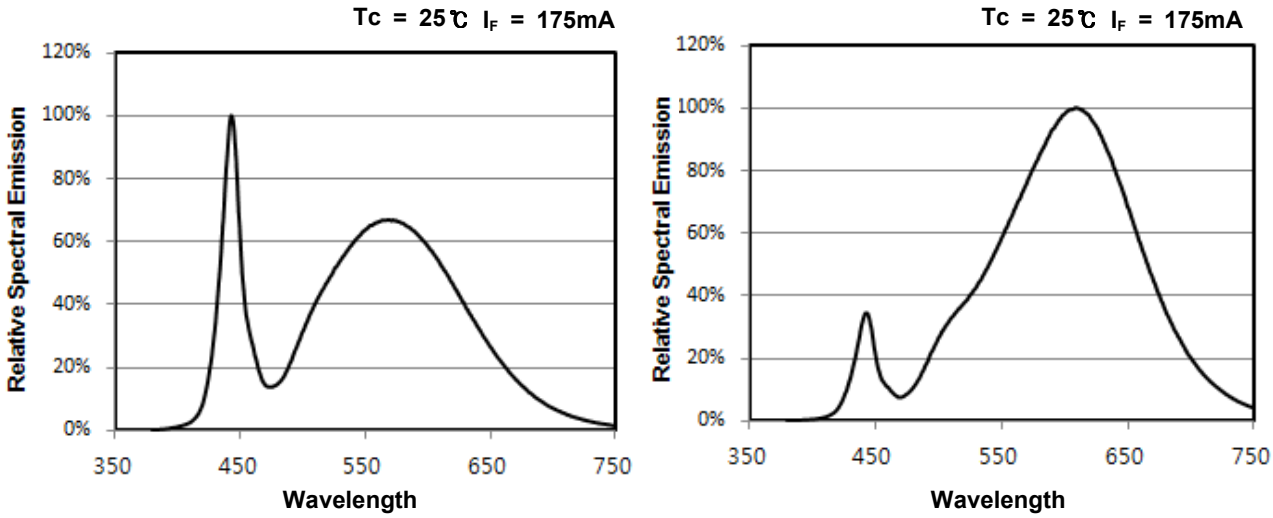
Temperature vs. Relative Luminous Flux



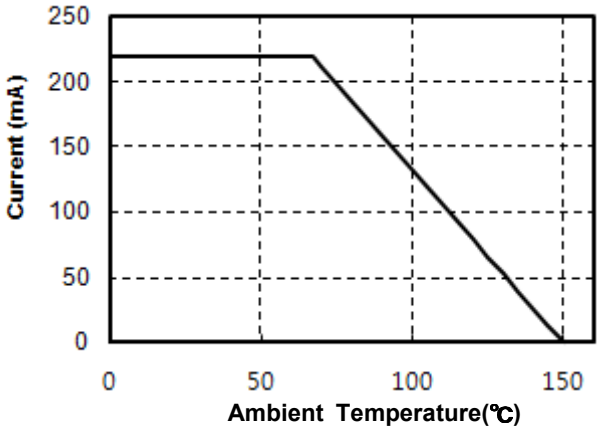
Radiation Pattern



Relative Spectral Emission

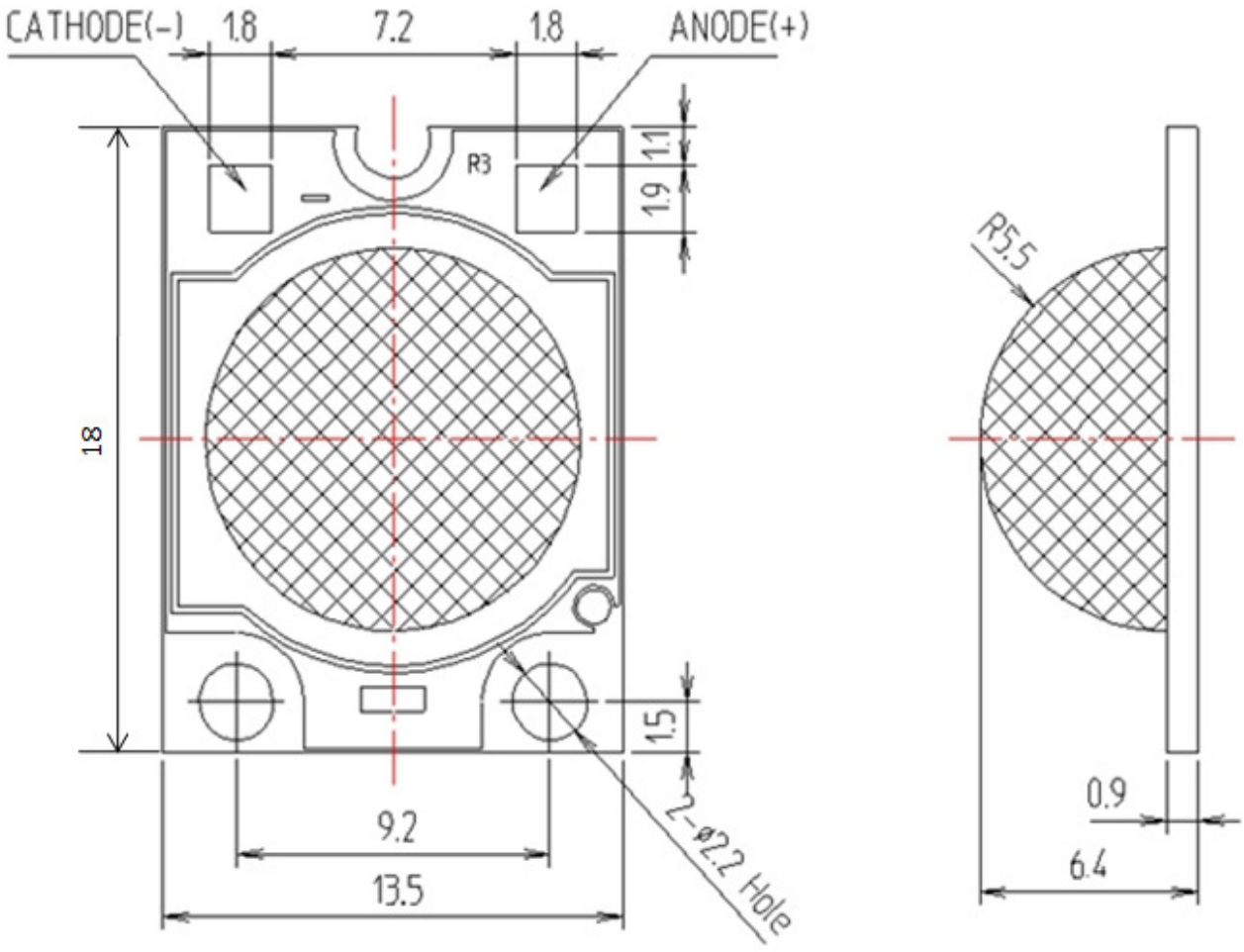


Derating Curve



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
MSL test	125°C 24h drying → MSL 2a(Sunnix5) 60°C, 60%RH 120h(drying after 2h) → 260°C 10sec 3time(each Cycle Room Temperature cooling, MSL after 15min during 4 h)	1 time
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	85°C, DC Derating I_F = Max	1,000 h
Low Temperature life test	-40°C, DC 220 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 175 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 ㏁, R2 : 1.5 ㏀, C : 100 pF	5 times (± 5 kV)
ESD(MM)	R1 : 10 ㏁, R2 : 0 ㏀, C : 200 pF	5 times (± 0.5 kV)
Vibration	20~80㎐(Displacement:0.06inch, Max 20G) 80~2㎑ (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

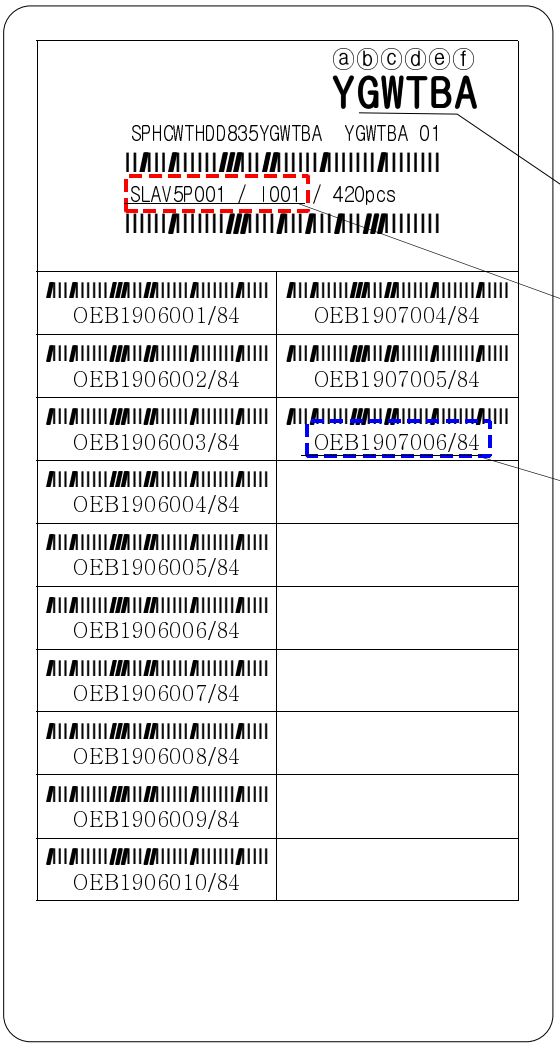
2) Criteria for Failure

Item	Symbol	Test Condition [T_a = 25°C]	Limit	
			Min.	Max.
Forward Voltage	V_F	175 mA	L.S.L. × 0.9	U.S.L. × 1.1
Luminous flux	Im	175 mA	L.S.L. × 0.7	U.S.L. × 1.3

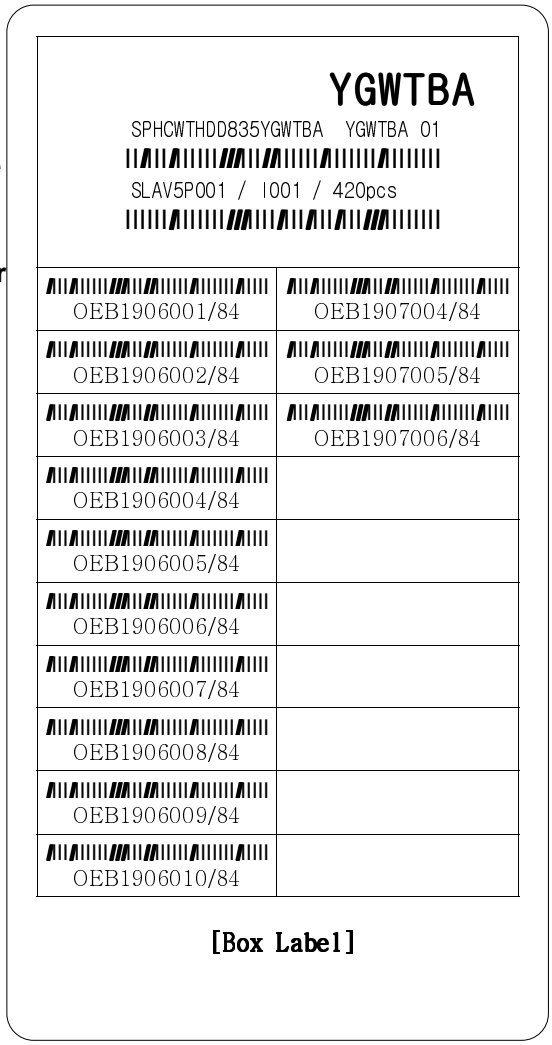
* U.S.L. : Upper Standard Level L.S.L. : Lower Standard Level

8. Label Structure

* Bag & Inner box



* Box



[Box Label]

N.B) Denoted rank is the only example.

Rank Code

ⓐⓑ : Forward Voltage (V_F) Rank (refer to page. 3)

ⓒⓓ : Chromaticity Coordinate Rank (refer to page. 6)

ⓔⓕ : Luminous Flux (Φ_V) Rank (refer to page. 3)

*.8)

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 (S:2008, T:2009, U:2010, V:2011...)

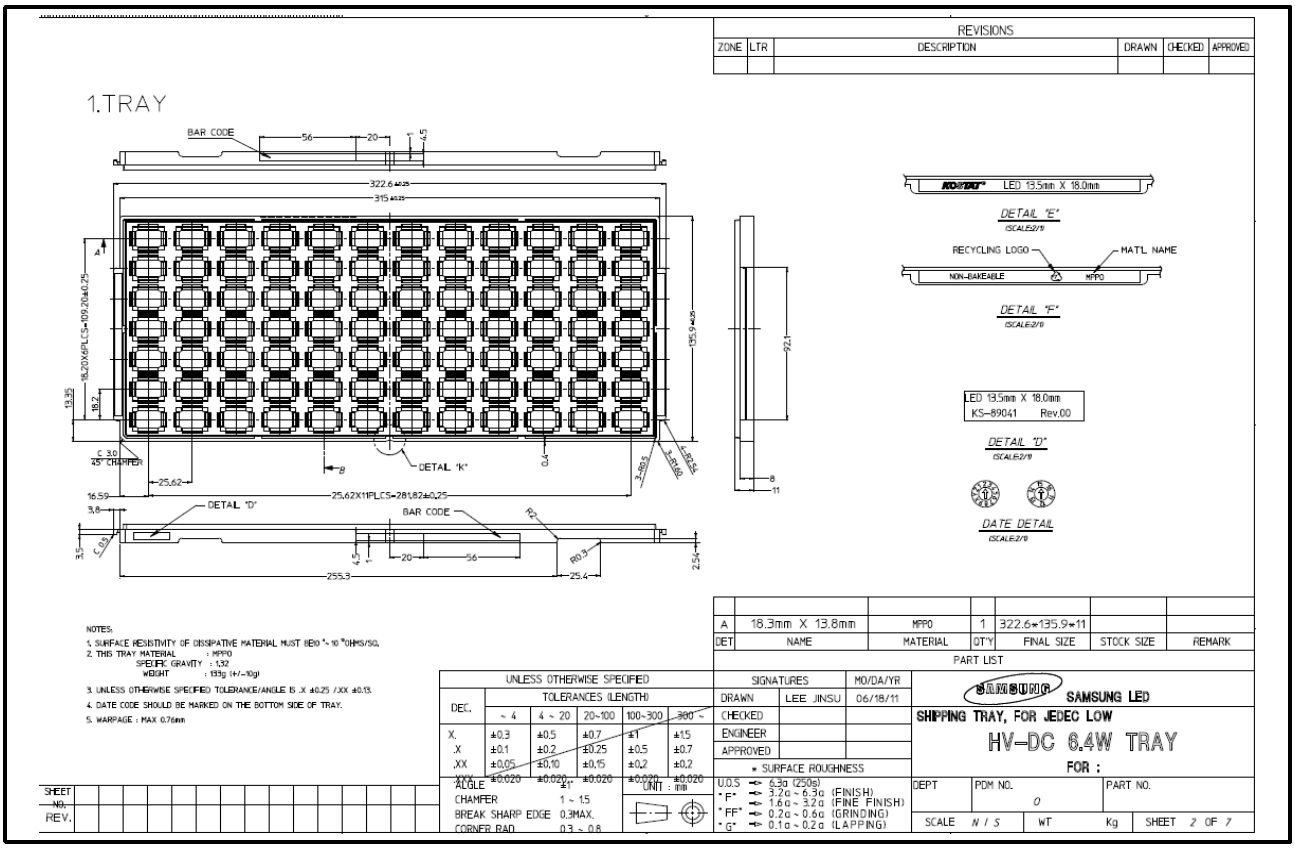
□ : Month (1 ~ 9, A~C)

■ : Day (1 ~ 9, A, B ~ V)

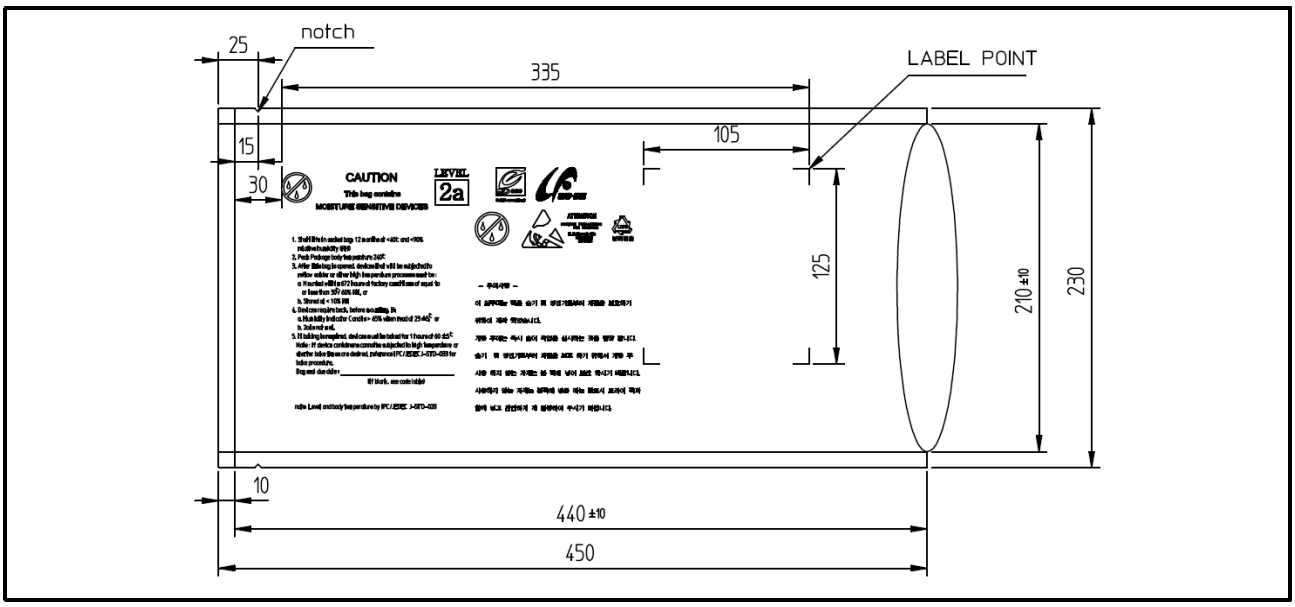
△ : SAMSUNG LED Product number (1 ~ 999)

▲ : Tray Number (1 ~ 999)

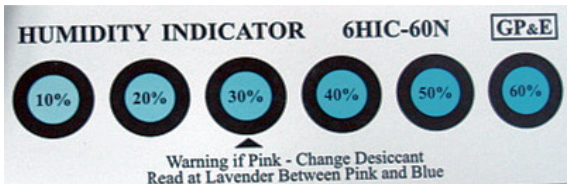
10. Tray Dimension



11. Aluminum Bag Dimension

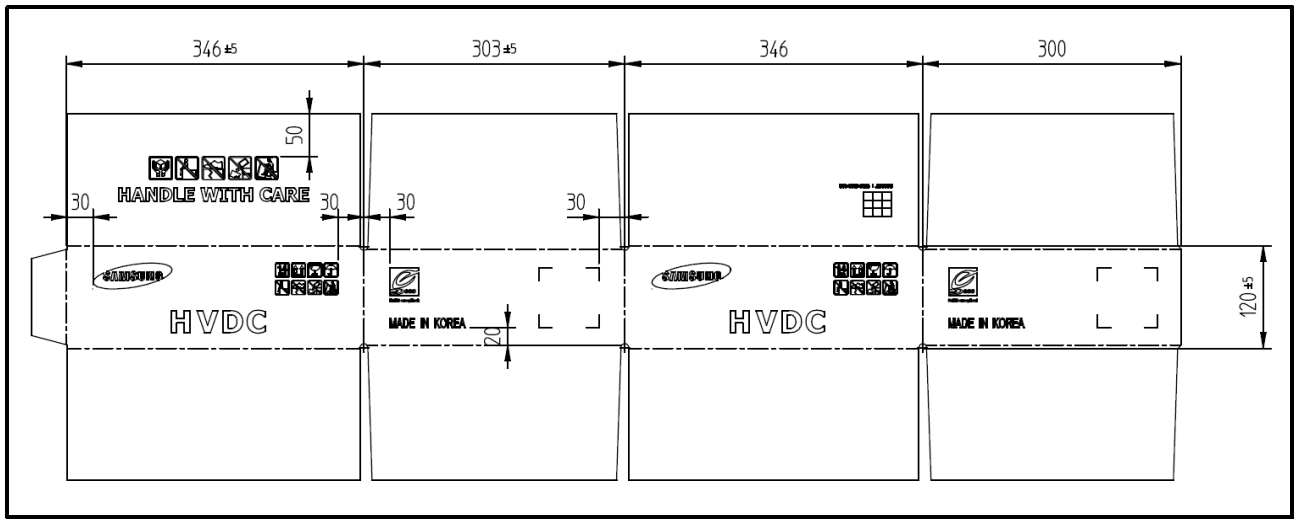


Silica gel & Humidity Indicator Card in Aluminum Bag

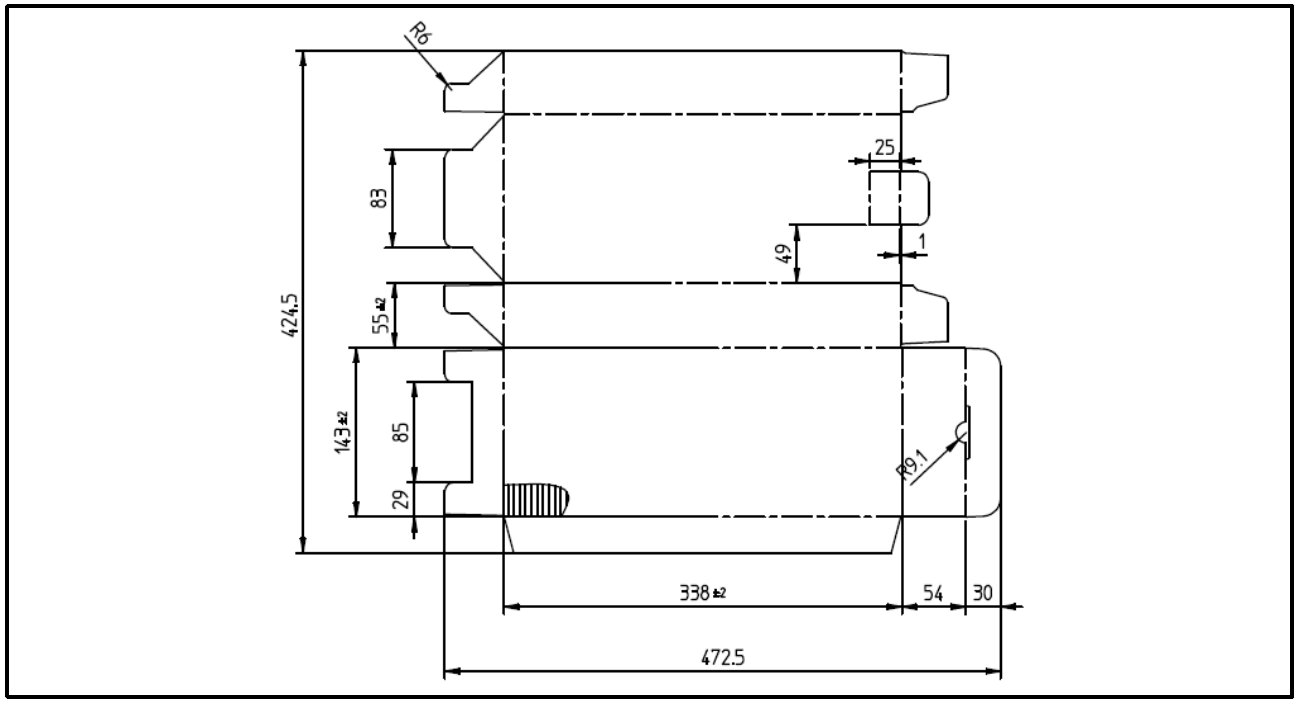


12. Box & Pad Dimension

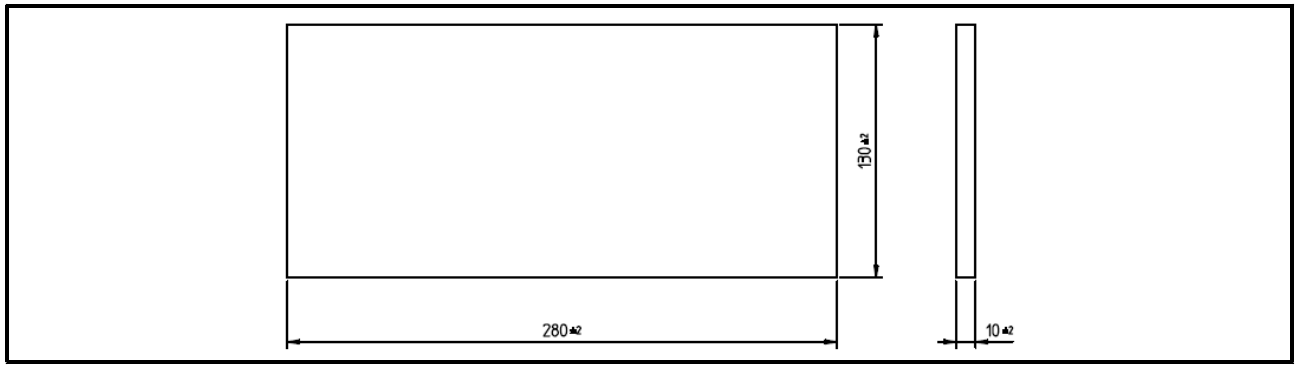
1) Out BOX



2) Inner BOX



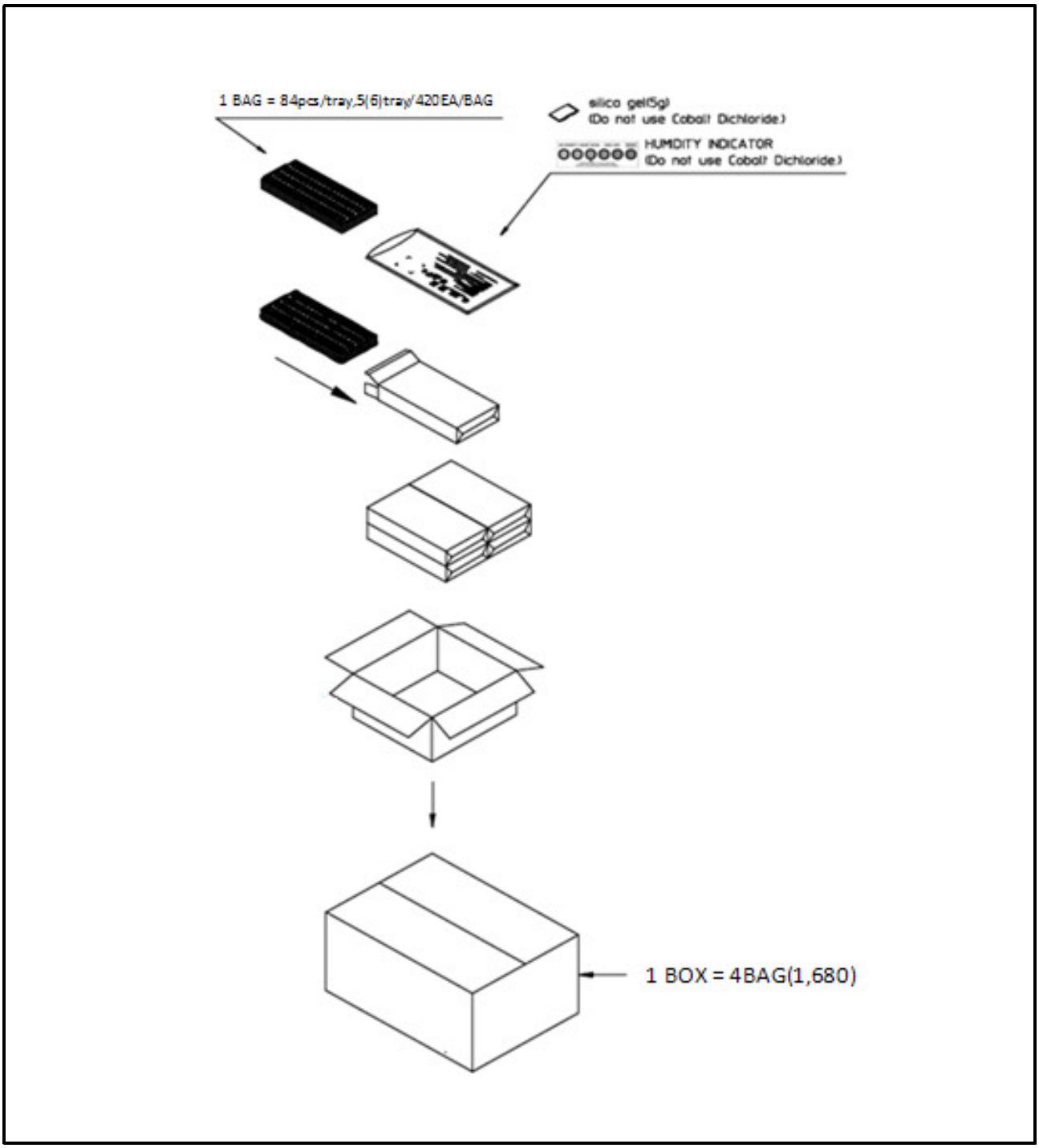
3) Pe-foam PAD



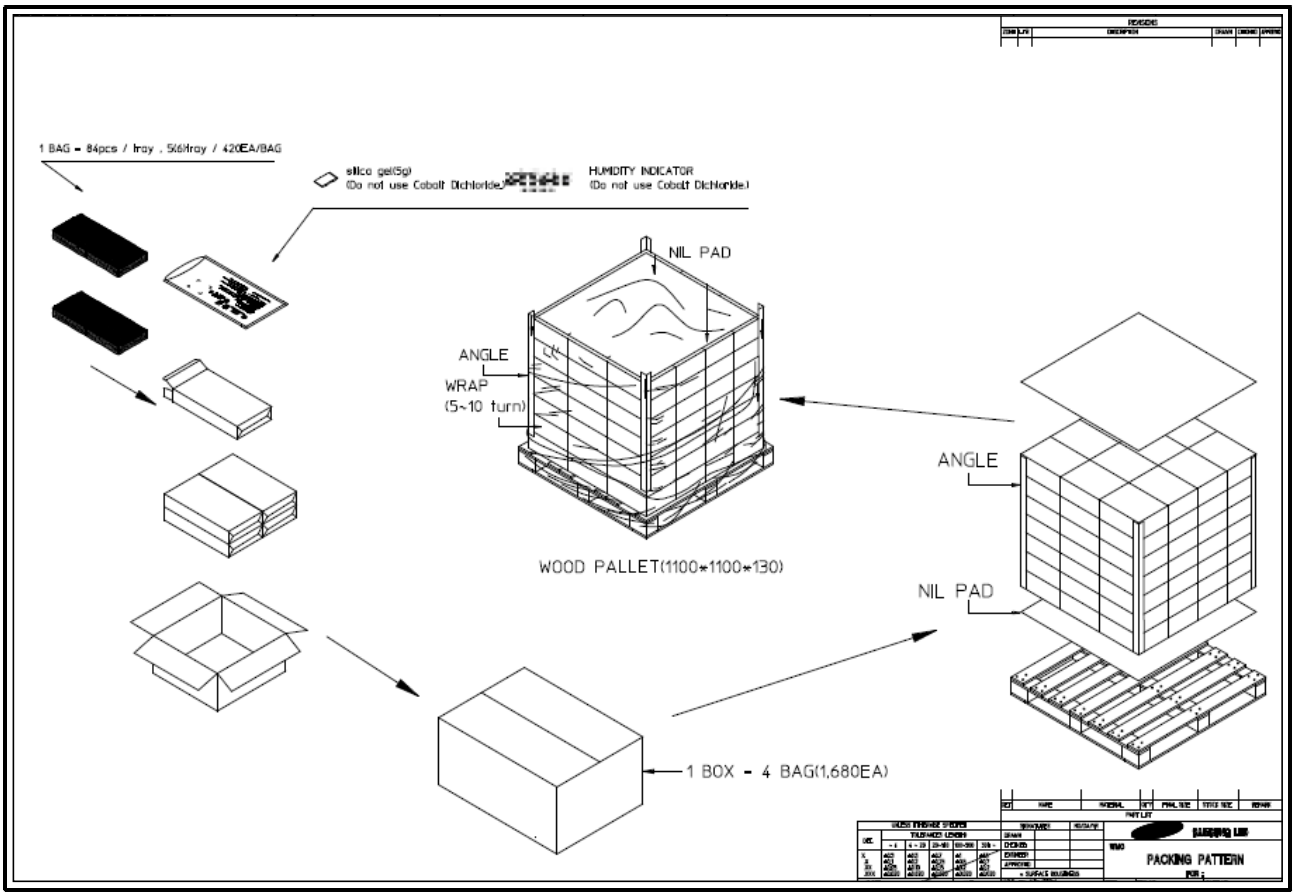
13. Packing Structure

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

Max Amount(pcs)		
Tray	Al Bag	Box
84	420	1,680



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.

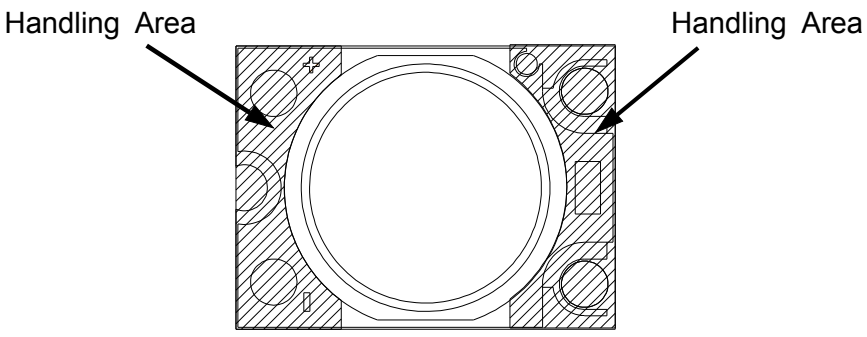
3) After this bag is opened, devices that will be subjected to reflow solder or other high temperature processes must be :
   a. Mounted within 672 hours at factory conditions of equal to or less than 30˚C / 60% RH, or
   b. Stored at < 10% RH

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.



Revision History

Date	Revision History	Writer	
		Drawn	Approved
2012.02.17	New Version	KY.OH	HK.KIM
2012.03.29	1st Version	KY.OH	HK.KIM
2012.11.26	2st Version	KY.OH	HK.KIM