Product Family Data Sheet

LC026B – COB(Chip on Board) LED

Introduction

Features

· 26W COB LED : 21.5 x 21.5 x t 1.9 (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

http://www.samsungled.com

Contents

1. Absolute Maximum Rating

1) Operation Forward Current (T_a = 25°C) 1,300mA

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	27	2510	-	2710
					28	2710	-	2920
					29	2920	–	3130
					30	3130	–	3340
			3000K	2F	27	2680	-	2890
					28	2890	-	3110
					29	3110	–	3330
					30	3330	–	3550
			3500K	2F	27	2780	–	3000
					28	3000	–	3220
					29	3220	–	3440
					30	3440	–	3660
			4000K	2F	27	2850	–	3080
					28	3080	–	3310
					29	3310	–	3540
					30	3540	–	3770
			5000K	3F	31	2890	-	3130
					32	3130	-	3360
					33	3360	–	3590
					34	3590	–	3820
Forward Voltage	V[3]	I_F = 720 mA	YH			32.5	35.5	38.5
CRI[4]		I_F = 720 mA	-			80	-	-
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	SPHWW1HDNC25**YH**W32F	YH	32.5	35.5	38.5
3000K	SPHWW1HDNC25**YH**V32F	YH	32.5	35.5	38.5
3500K	SPHWW1HDNC25**YH**U32F	YH	32.5	35.5	38.5
4000K	SPHWW1HDNC25**YH**T32F	YH	32.5	35.5	38.5
5000K	SPHCW1HDNC25**YH**RT3F	YH	32.5	35.5	38.5

2) Color Binning

CCT	Product Code	Color Rank	Chromaticity Bins
2700K	SPHWW1HDNC25YH**W3**2F	W3	WA
3000K	SPHWW1HDNC25YH**V3**2F	V3	VA
3500K	SPHWW1HDNC25YH**U3**2F	U3	UA
4000K	SPHWW1HDNC25YH**T3**2F	T3	TA
5000K	SPHCW1HDNC25YH**RT**3F	RT	RW, RX, RY, RZ

3) Luminous Flux Binning

CCT	Product Code	Flux Rank	Flux Bin	Range (lm)		
				Min	Typ	Max
2700K	SPHWW1HDNC25YHW3**2F**	2F	27	2510	-	2710
			28	2710	-	2920
			29	2920	–	3130
			30	3130	–	3340
3000K	SPHWW1HDNC25YHV3**2F**	2F	27	2680	-	2890
			28	2890	-	3110
			29	3110	–	3330
			30	3330	–	3550
3500K	SPHWW1HDNC25YHU3**2F**	2F	27	2780	–	3000
			28	3000	–	3220
			29	3220	–	3440
			30	3440	–	3660
4000K	SPHWW1HDNC25YHT3**2F**	2F	27	2850	–	3080
			28	3080	–	3310
			29	3310	–	3540
			30	3540	–	3770
5000K	SPHCW1HDNC25YHRT**3F**	3F	31	2890	-	3130
			32	3130	-	3360
			33	3360	–	3590
			34	3590	–	3820

4. Chromaticity Coordinates

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

1) 2700K

CIE1931 chromaticity diagram(E-Star)
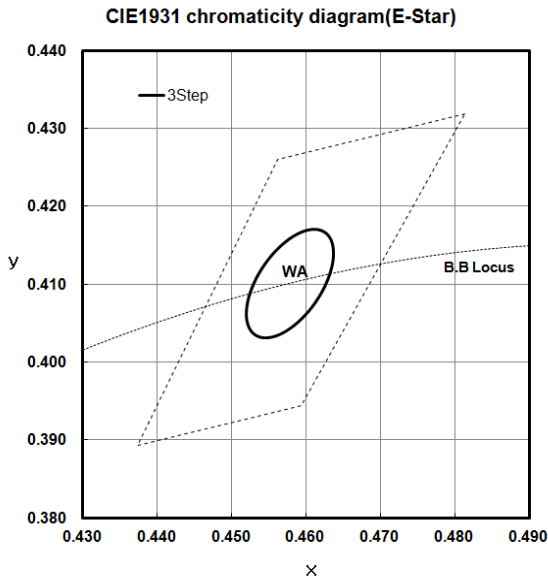
Macadam Ellipse 3step (WA)				
x	y	θ	a	b
0.4578	0.4101	53.7	0.0081	0.0042

2) 3000K

CIE1931 chromaticity diagram(E-Star)
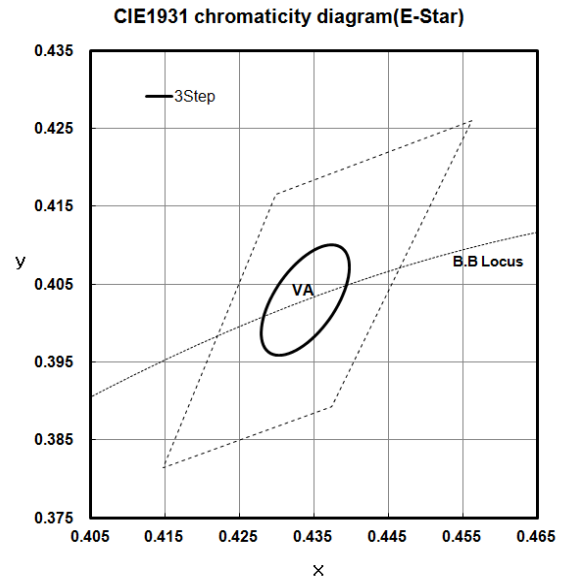
Macadam Ellipse 3step (VA)				
x	y	θ	a	b
0.4338	0.4030	53.22	0.0083	0.0041

3) 3500K

CIE1931 chromaticity diagram(E-Star)
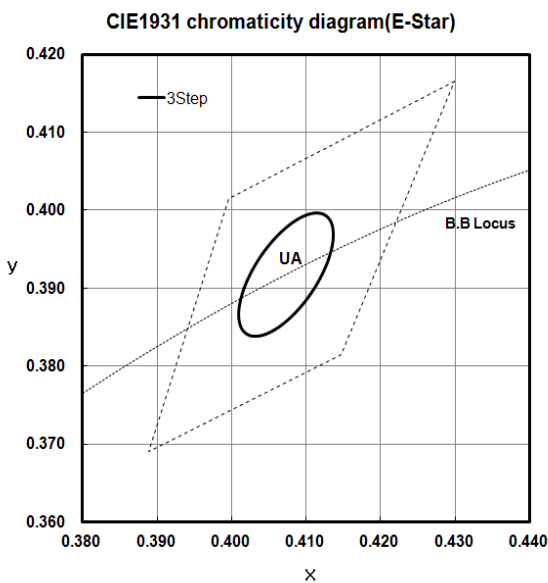
Macadam Ellipse 3step (UA)				
x	y	θ	a	b
0.4037	0.3917	54.0	0.0093	0.0041

4) 4000K

CIE1931 chromaticity diagram(E-Star)
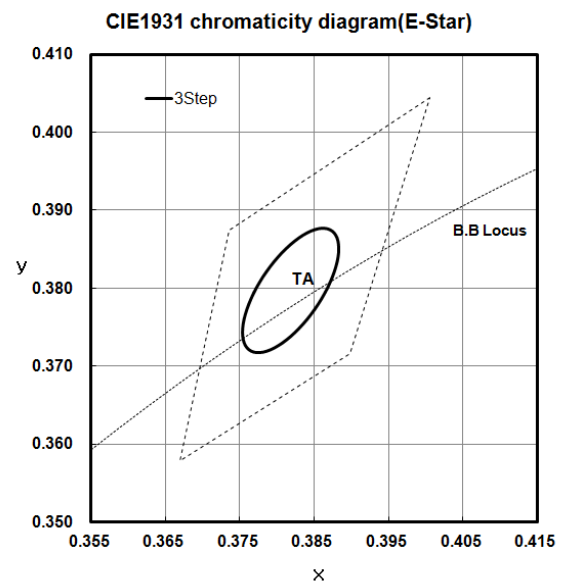
Macadam Ellipse 3step (TA)				
x	y	θ	a	b
0.3818	0.3797	53.72	0.0094	0.0040

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5) 5000K

CIE1931 chromaticity diagram(E-Star)
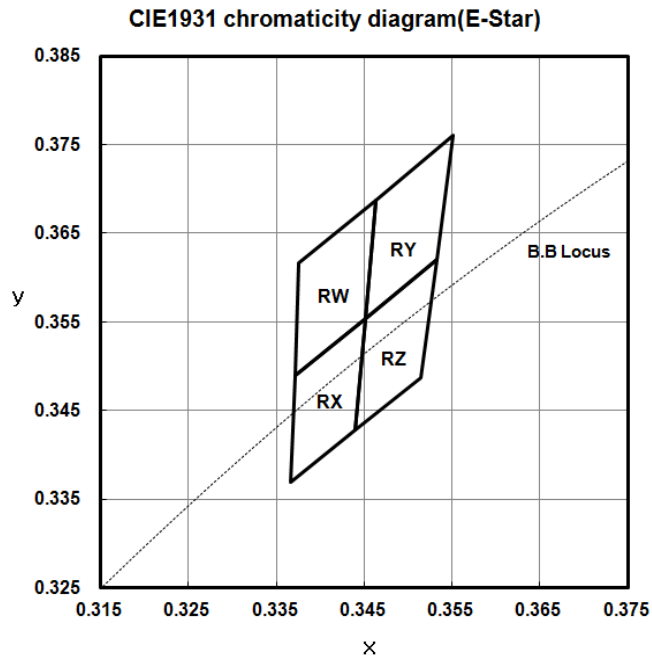
Table	CIE X	CIE Y
RW	0.3376	0.3616
	0.3463	0.3687
	0.3451	0.3554
	0.3371	0.3490
RX	0.3371	0.3490
	0.3451	0.3554
	0.3440	0.3428
	0.3366	0.3369
RY	0.3463	0.3687
	0.3551	0.3760
	0.3533	0.3620
	0.3451	0.3554
RZ	0.3451	0.3554
	0.3533	0.3620
	0.3515	0.3487
	0.3440	0.3428

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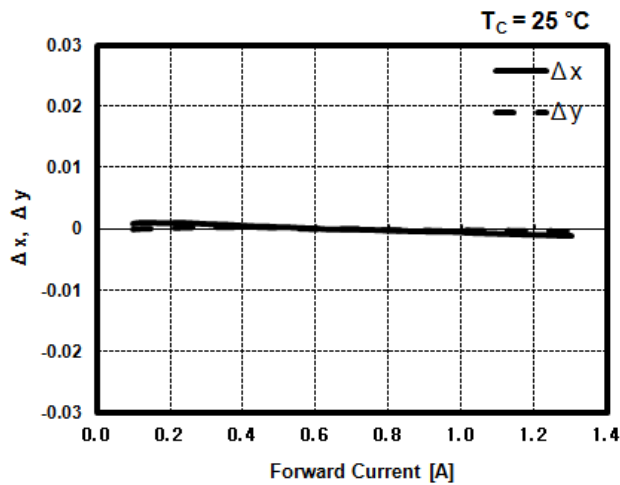
5. Typical Characteristics Graph

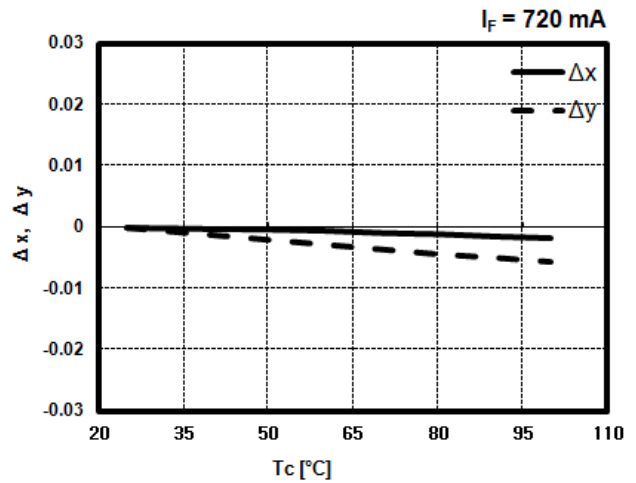### Forward Current vs. Relative Luminous Flux

$T_C = 25\ °C$
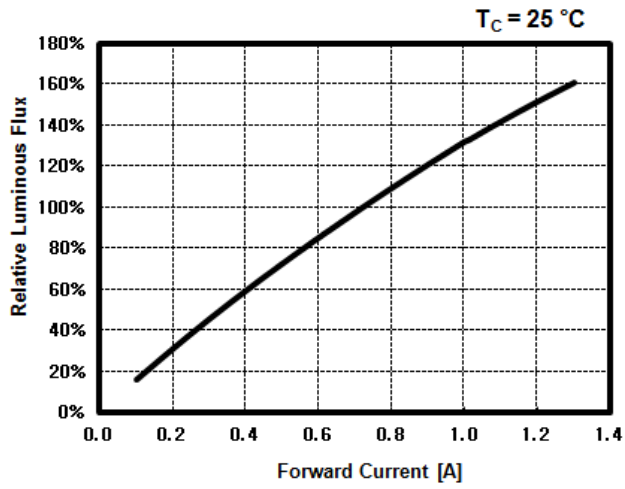
Forward Current vs. Forward Voltage

$T_C = 25\ °C$
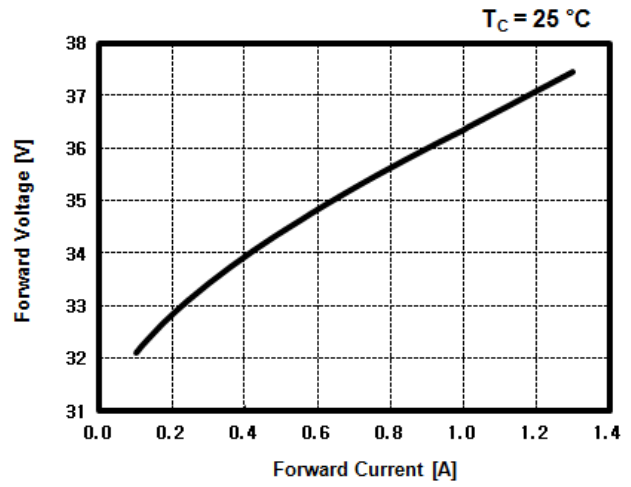
Forward current vs. Chromaticity Coordination

$T_C = 25\ °C$

Temperature vs. Chromaticity Coordination

$I_F = 720\ mA$

Temperature vs. Voltage

$I_F = 720\ mA$
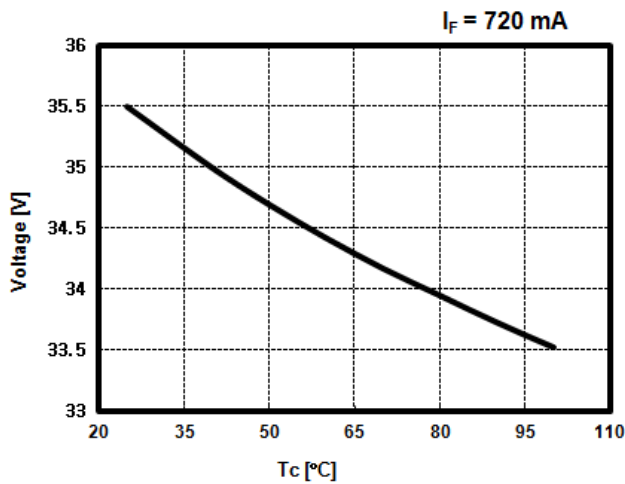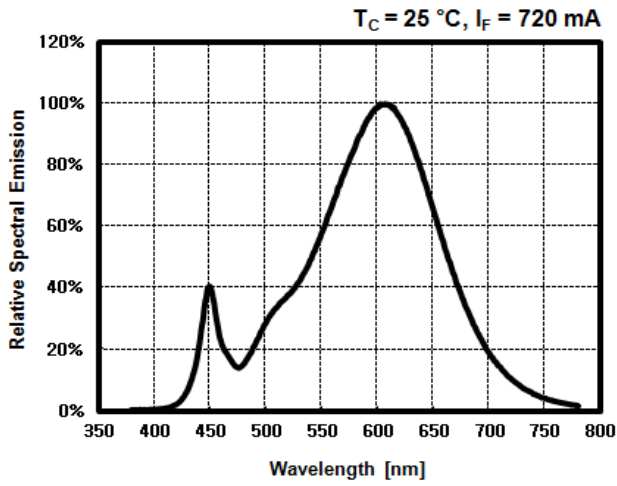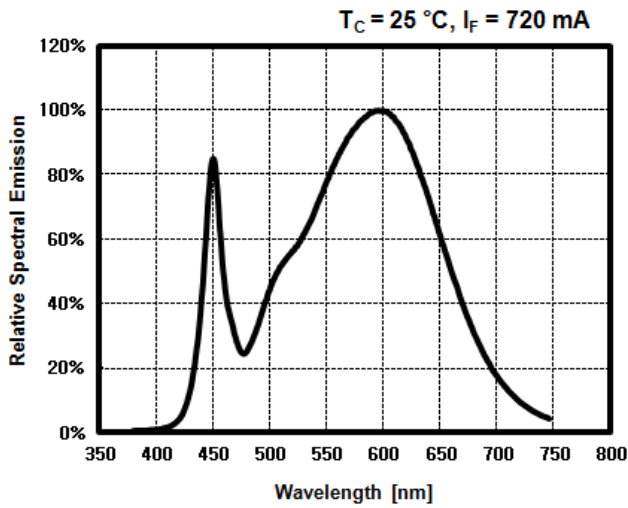

Temperature vs. Relative Luminous Flux

$I_F = 720\ mA$
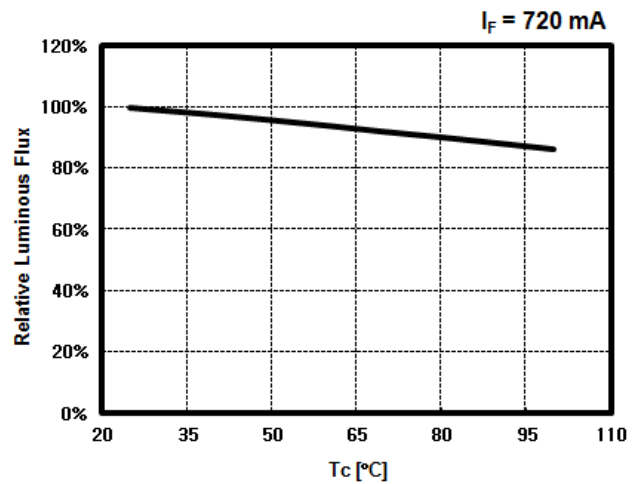
Relative Spectral Emission

<2700K>
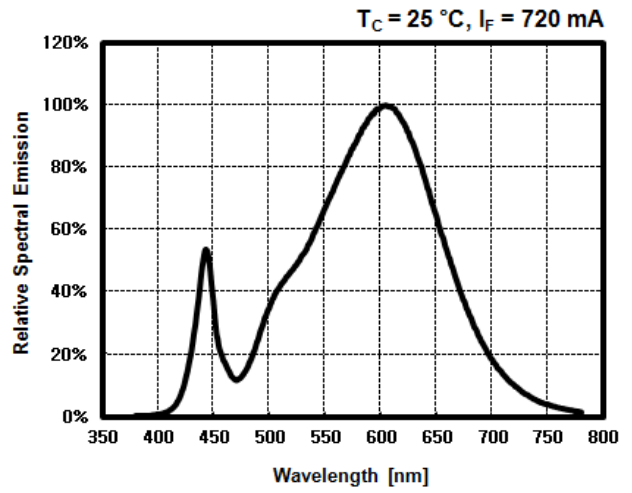
<3000K>

<3500K>
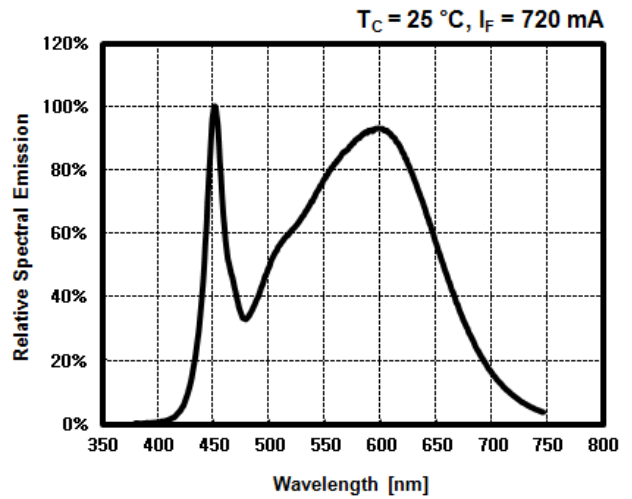
<4000K>

<5000K>

Radiation Pattern

Derating Curve

$T_C = 25\ ℃$

6. Outline Drawing & Dimension

Unit : mm
Tolerance : ± 0.15

(T$_C$ point)
Cathode(−)

21.50
(10.75)
8.75
8.75
21.50
Ø17
4−Ø3.30 hole
Anode(+)
2.00
2.00

18.60±0.2
1.90±0.2
0.90
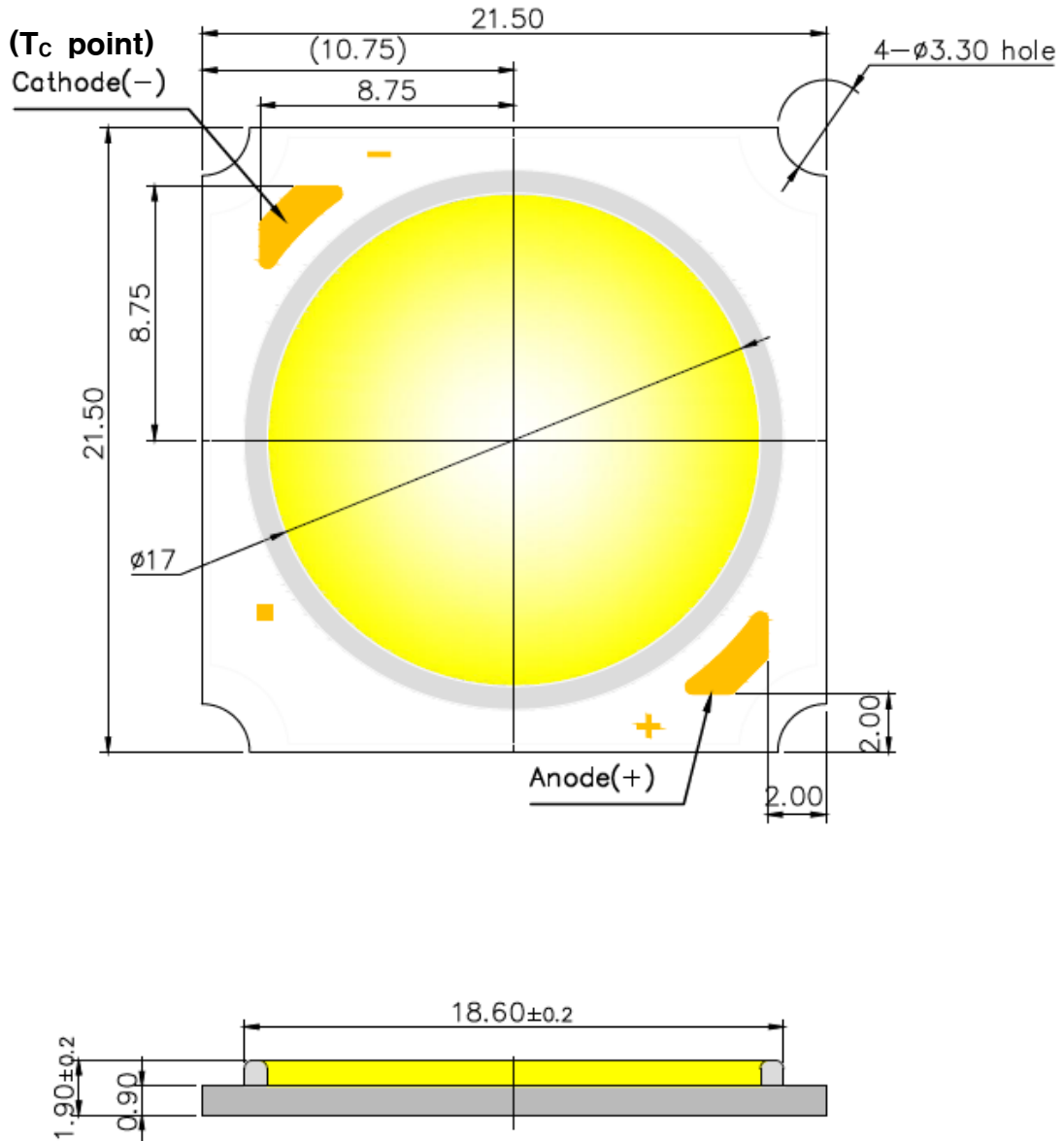
7. Reliability Test Items and Conditions

1) Test Items

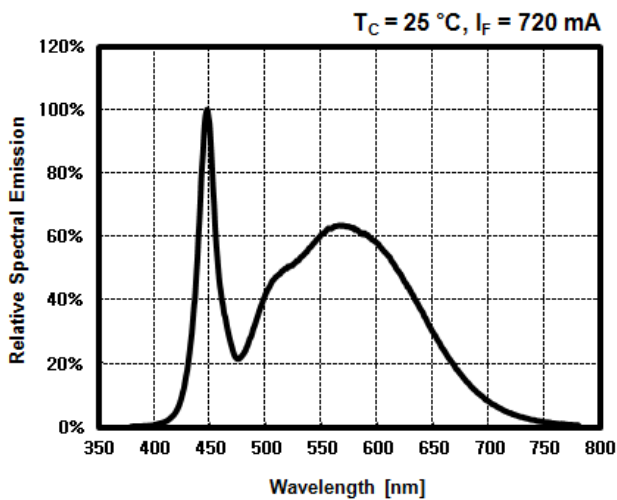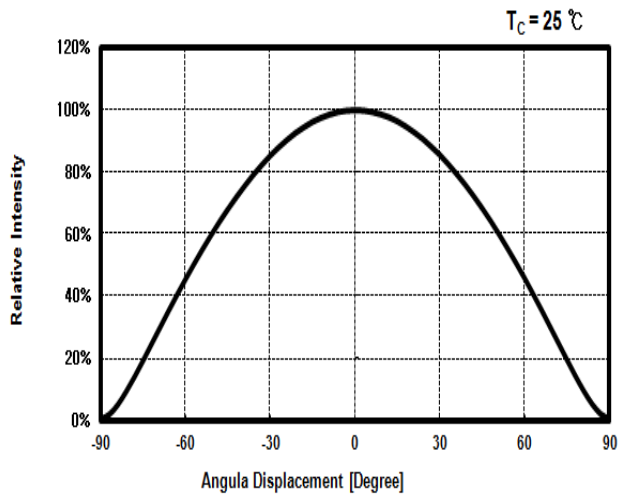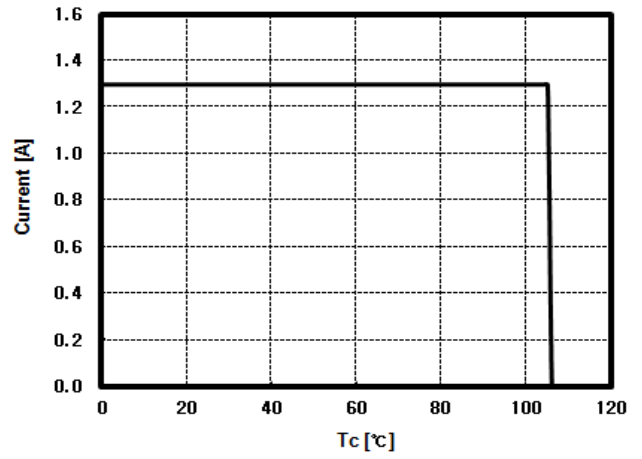| Test Items	Test Conditions	Test Hours/Cycles
Room Temperature life test	25°C, I_F = Max	1,000 h
High Temperature humidity life test	85°C, 85% RH, DC Derating I_F = Max	1,000 h
High Temperature life test	105°C, DC Derating I_F = Max	1,000 h
Low Temperature life test	-40°C,　DC 1300 mA	1,000 h
High Temperature 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 ㏁, R2 : 1.5 ㏀, C : 100 ㎊	5 times (± 5 ㎸)
ESD(MM)	R1 : 10 ㏁, R2 : 0 ㏀, C : 200 ㎊	5 times (± 0.5 ㎸)
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	1300 mA	L.S.L. × 0.9	U.S.L. × 1.1
Luminous flux	lm	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

ⓐ ⓑ ⓒ ⓓ ⓔ ⓕ
YHRT3F
SPHCWTH1NC25YHRT3F   YHRT3F 01

●◎◇◆□■△△△ / I▲▲▲ / XXX PCS

OEB1906001/40	
OEB1906002/40	
OEB1906003/40	
OEB1906004/40	
OEB1906005/40	

Rank Code

Lot number

Tray number /Q'ty

* Box

YHRT3F
SPHCWTH1NC25YHRT3F   YHRT3F 01

●◎◇◆□■△△△ / I▲▲▲ / XXX PCS

OEB1906001/40	OEB1906011/40
OEB1906002/40	OEB1906012/40
OEB1906003/40	OEB1906013/40
OEB1906004/40	
OEB1906005/40	
OEB1906006/40	
OEB1906007/40	
OEB1906008/40	
OEB1906009/40	
OEB1906010/40	

[Box Label]

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

●◎◇◆□■△△△ / l▲▲▲ / 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)

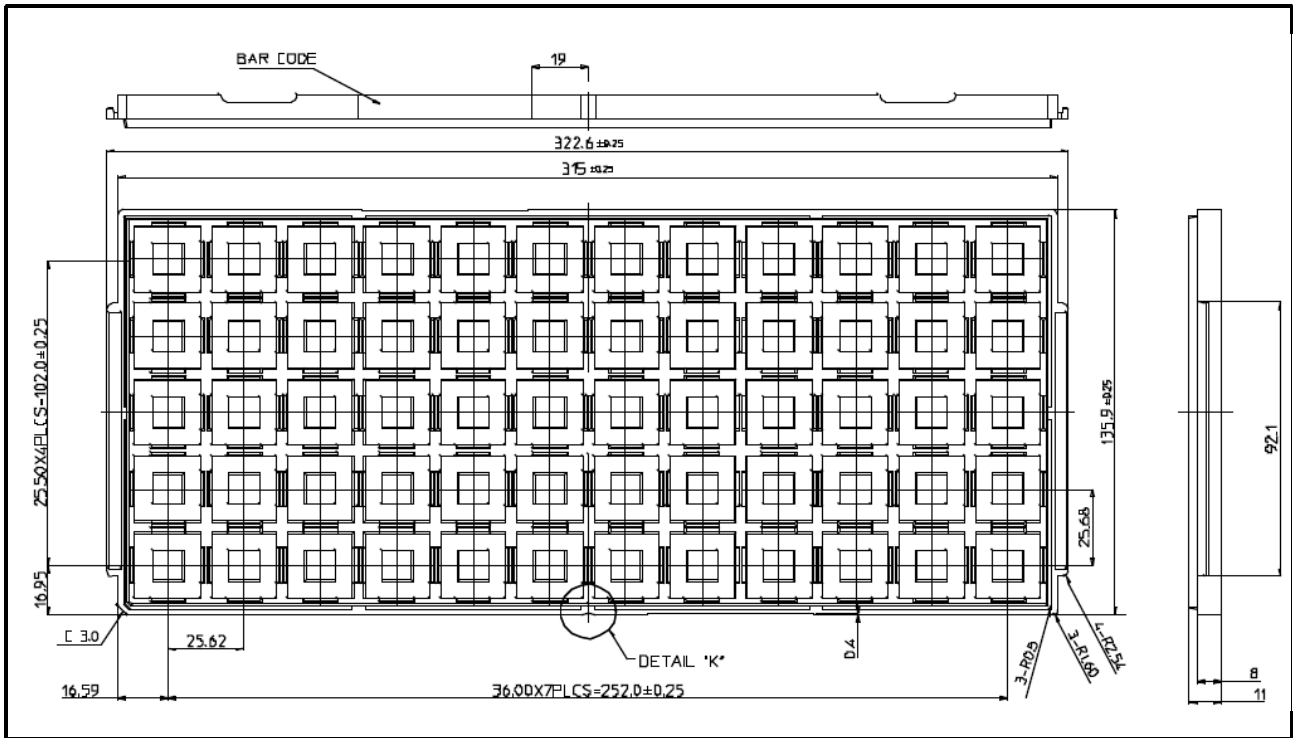◆ : Year (U:2010, V:2011, W:2012, X:2013...)
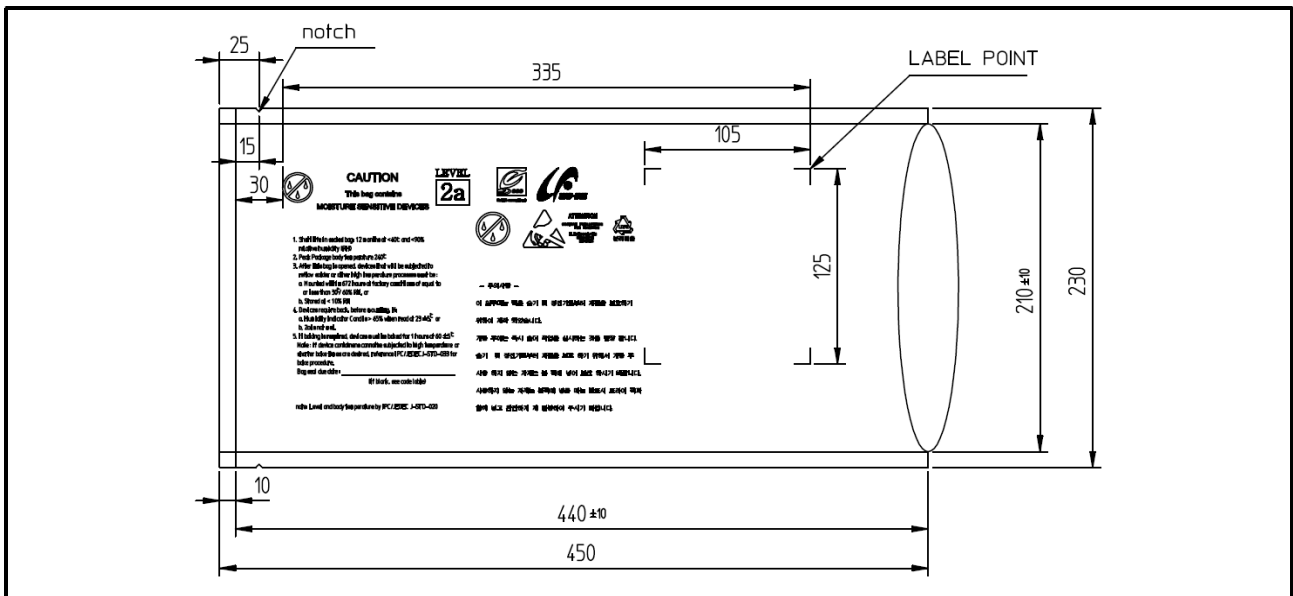
□ : Month (1 ~ 9, A~C)

■ : Day (1 ~ 9, A, B ~ V)

△ : SAMSUNG LED Product number (1 ~ 999)

▲ : Tray Number (1 ~ 999)

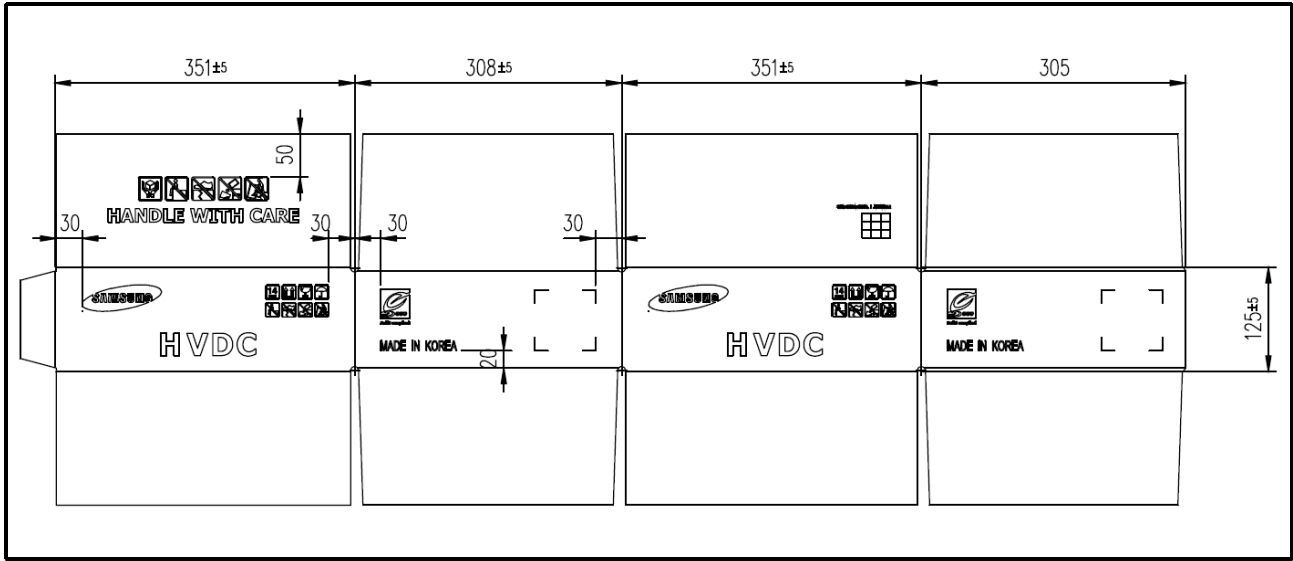# 10. Tray Dimension

11. Aluminum Bag Dimension

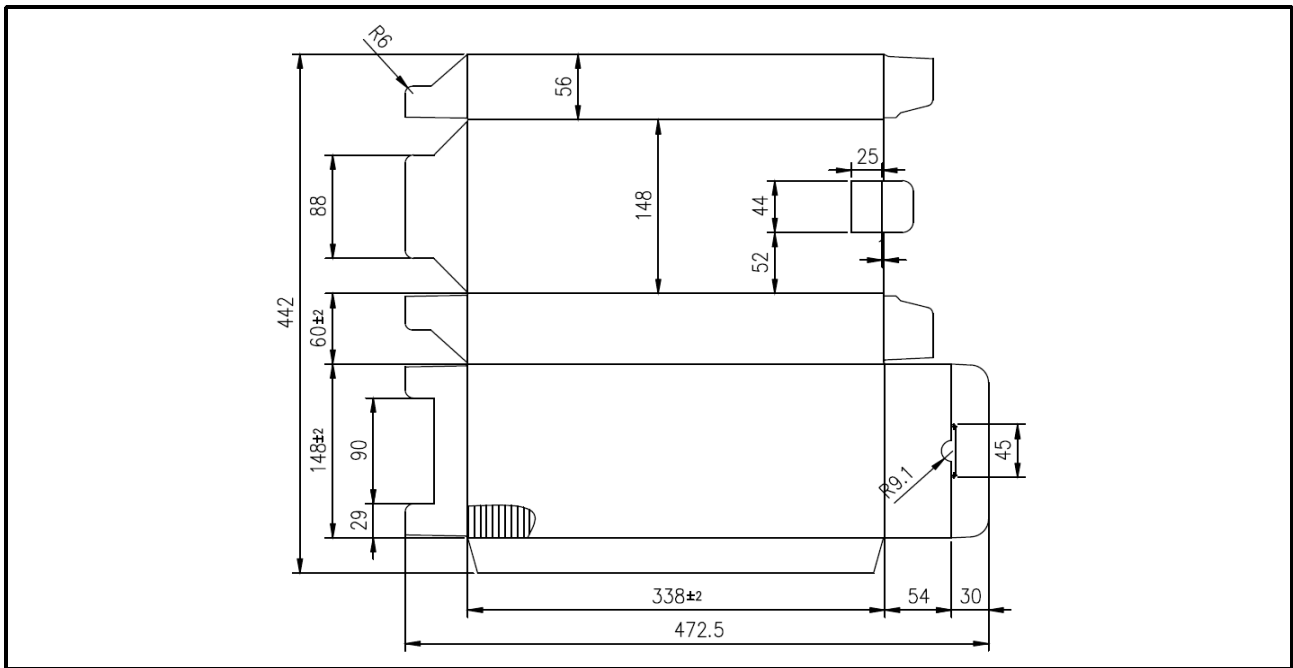## Silica gel & Humidity Indicator Card in Aluminum Bag

12. Box & Pad Dimension

1) Out BOX

2) Inner BOX

3) Pe-foam PAD

http://www.samsungled.com
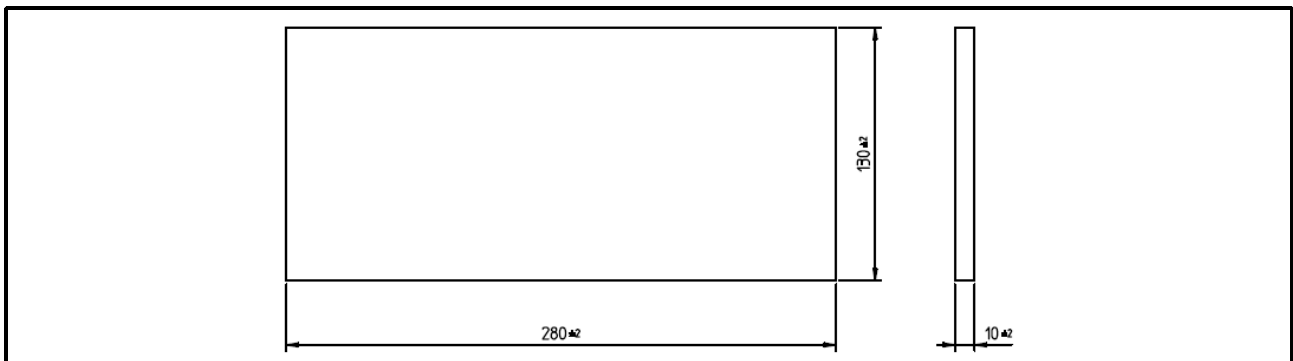
13. Packing Structure

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

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

1 BAG = 60pcs / tray , 5(6)tray / 300EA/BAG

silica gel(5g)
(Do not use Cobalt Dichloride.)

HUMIDITY INDICATOR
(Do not use Cobalt Dichloride.)

1 BOX = 4 BAG(1,200EA)
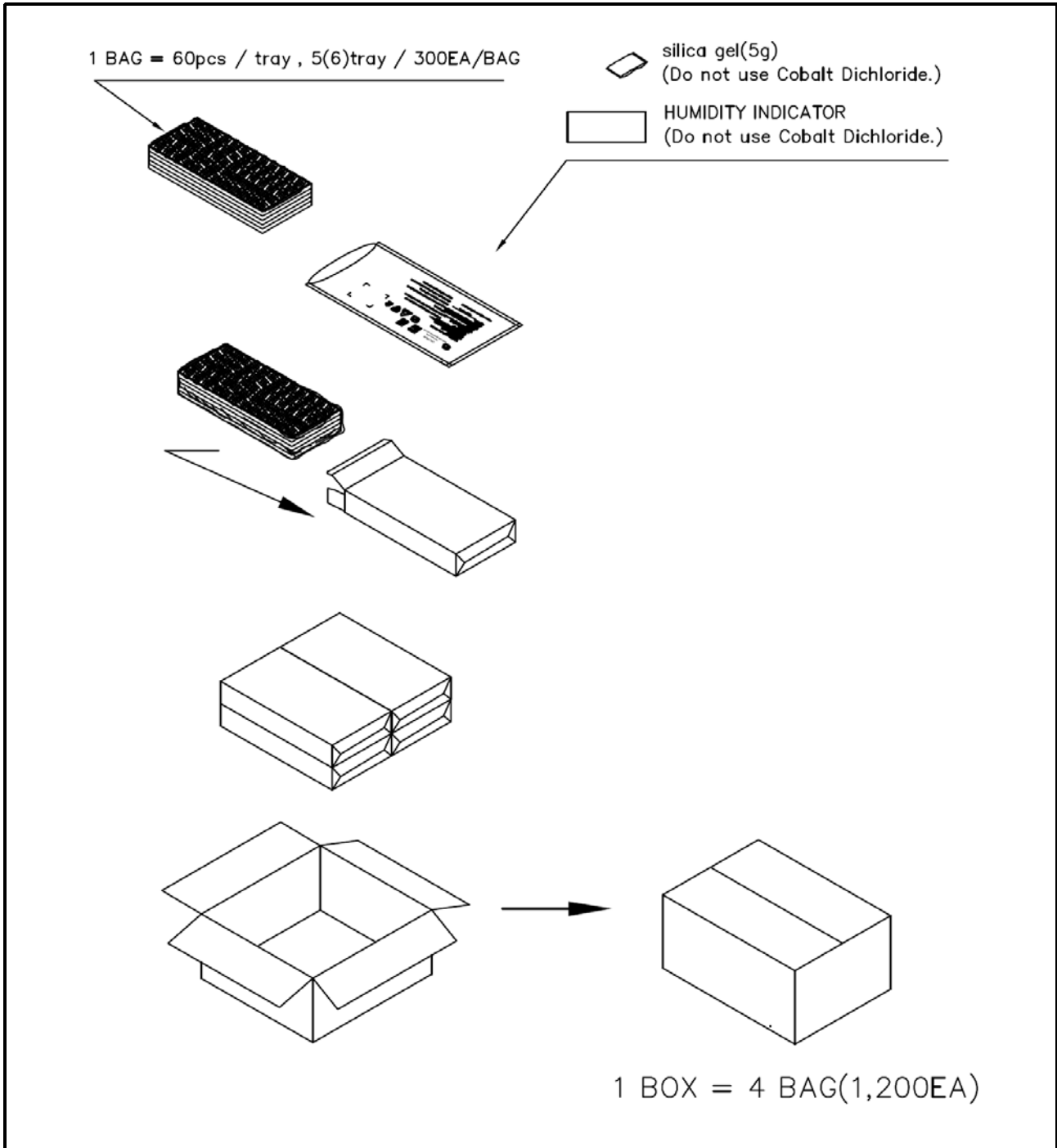
1-2). Tray Packing (When Less than 5 Trays)
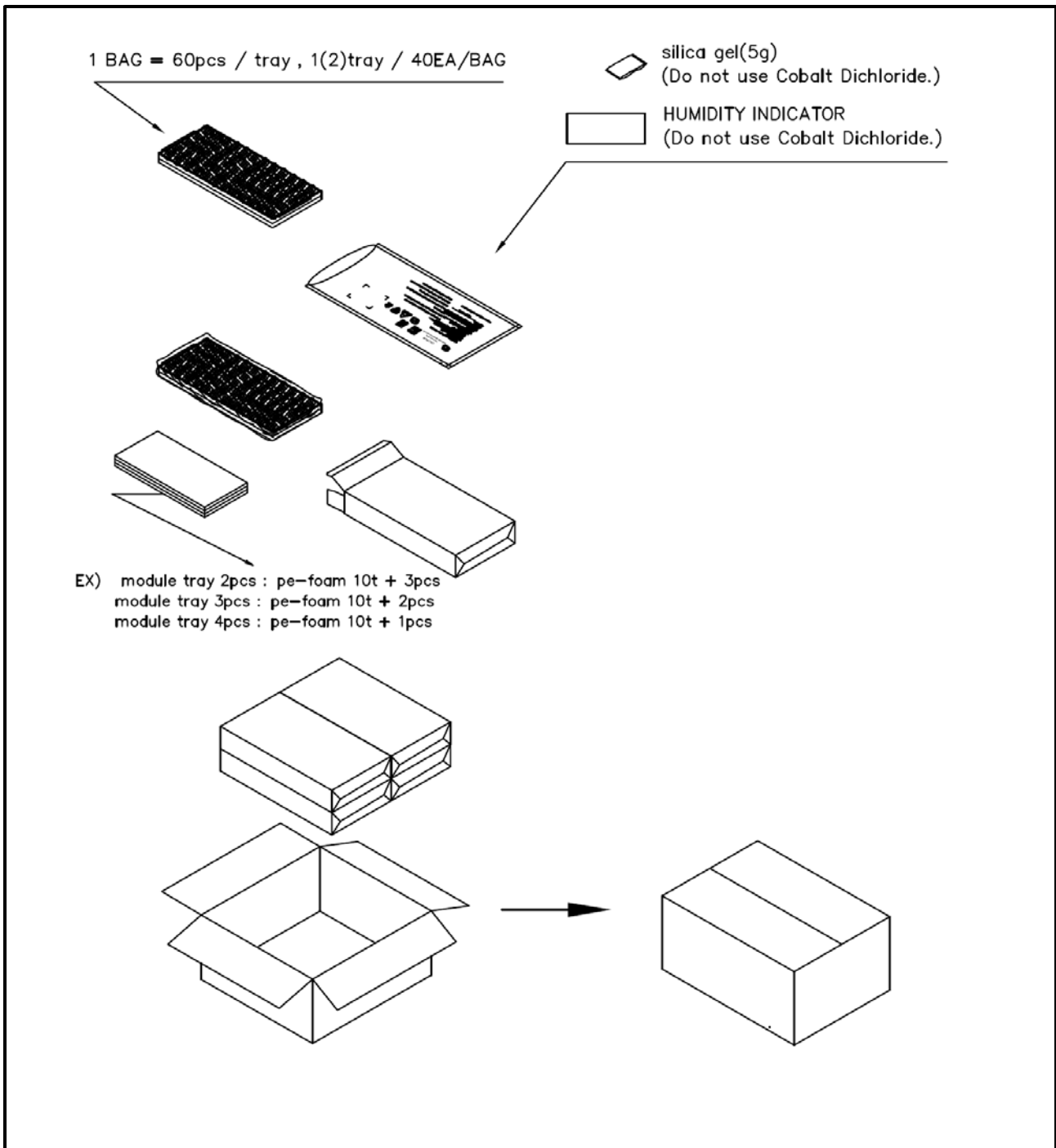
1 BAG = 60pcs / tray , 1(2)tray / 40EA/BAG

silica gel(5g)
(Do not use Cobalt Dichloride.)

HUMIDITY INDICATOR
(Do not use Cobalt Dichloride.)

EX)   module tray 2pcs : pe-foam 10t + 3pcs
module tray 3pcs : pe-foam 10t + 2pcs
module tray 4pcs : pe-foam 10t + 1pcs

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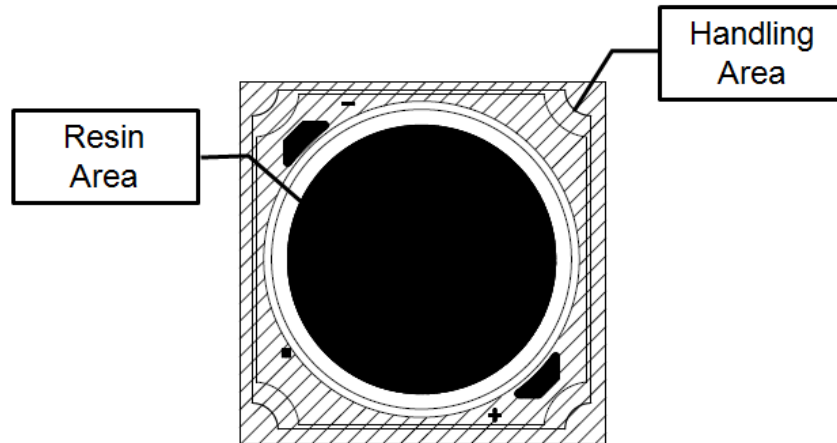
8) VOCs (volatile organic compounds) may be occurred by adhesives, flux, hardener or organic additives which is used in luminaires (fixture) and LED silicone bags are permeable to it. It may lead a discoloration when LED expose to heat or light.

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.

Revision History
(LC026B)

Date	Revision History	Writer	
		Drawn	Approved
2013.10.07	1st Version	SH.AN	HK.KIM
2013.10.21	2nd Version	SH.AN	HK.KIM
2013.10.31	3rd Version	SH.AN	HK.KIM
2014.01.08	4th Version	SH.AN	MY.SON
2014.02.19	5th Version	SH.AN	MY.SON