



# Specification CFT732-S

*Preliminary*

SSC		CUSTOMER
Drawn	Approval	Approval

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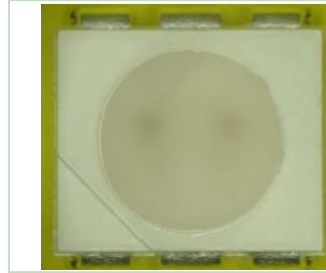
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# CFT732-S

## Description

This surface-mount LED comes in PLCC standard package dimension. It has a substrate made up of a molded plastic reflector sitting on top of a bent lead frame. The die is attached within the reflector cavity and the cavity is encapsulated by epoxy or silicone.

The package design coupled with careful selection of component materials allow these products to perform with high reliability in a larger temperature range  $-40^{\circ}\text{C}$  to  $100^{\circ}\text{C}$ . The high reliability feature is crucial to Automotive interior and Indoor ESS.



# CFT732-S

## Features

- Pb-free Reflow Soldering application
- RoHS Compliant
- 6-Pin
- White colored SMT package and diffused (milky color)
- Suitable for all SMT assembly methods
- ESD-withstand voltage : up to 1 kV (MIL-STD-883D)
- High Reliability (silicone resin)

## Applications

- Indoor and outdoor displays
- LCD Backlights etc.
- R G B – displays
- Automotive
- Signage and Channel letter
- Indicator

## 2. Absolute maximum ratings

(Ta=25°C)

Parameter	Symbol	Value				Unit
		Red	Green	Blue	Yellow	
Forward Current	$I_F$	30	30	30	30	mA
Forward Peak Surge Current *2	$I_{FM}$	100	100	100	100	mA
Reverse Voltage (per die)	$V_R$	5				V
Power Dissipation	$P_d$	81*3	120*3	114*3	252*3	mW
		263*4				
Operating Temperature	$T_{opr}$	-40 ~ +85				°C
Storage Temperature	$T_{stg}$	-40 ~ +100				°C

\*1 Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

\*2 IFM was measured at  $TW \leq 1\text{msec}$  of pulse width and  $D \leq 1/10$  of duty ratio.

\*3 The value for one LED device.(Single color)

\*4 The value for total power dissipation when two and more devices are lit simultaneously.

### 3. Electric & Optical characteristics

(Ta=25°C)

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	R, Y	$V_F$	$I_F=20\text{mA}$ (per chip)	1.8	2.2	2.5	V
	G, B			3.0	3.2	3.5	
Reverse Current	R, Y, G, B	$I_R$	$V_R=10\text{V}$ (per die)	-	-	1	$\mu\text{A}$
Luminance Intensity *1	Red	$I_V$	$I_F=20\text{mA}$ (per chip)	-	700	-	mcd
	Yellow			-	370	-	
	Green			-	1200	-	
	Blue			-	400	-	
Luminance Flux *1	Red	$\Phi_V$	$I_F=20\text{mA}$ (per chip)	-	1.7	-	lm
	Yellow			-	1.0	-	
	Green			-	3.0	-	
	Blue			-	0.9	-	
Peak Wavelength	Red	$\lambda_P$	$I_F=20\text{mA}$ (per chip)	-	632	-	nm
	Yellow			-	590	-	
	Green			-	518	-	
	Blue			-	453	-	
Dominant Wavelength	Red	$\lambda_d$	$I_F=20\text{mA}$ (per chip)	620	623	625	nm
	Yellow			586	590	596	
	Green			520	527	535	
	Blue			455	460	465	
Spectral Bandwidth	Red	$\Delta\lambda$	$I_F=20\text{mA}$ (per chip)	-	15	-	nm
	Yellow			-	14	-	
	Green			-	33	-	
	Blue			-	23	-	
Viewing Angle *3	R, G, B, Y	$2\theta_{1/2}$	$I_F=20\text{mA}$ (per die)	-	110	-	deg.
Optical Efficiency	Red	$\eta_{op}$	$I_F=20\text{mA}$ (per chip)	-	0.015	-	lm/W
	Yellow			-	0.01	-	
	Green			-	0.19	-	
	Blue			-	0.006	-	

\*1 The luminous intensity  $I_V$  was measured at the peak of the spatial pattern which may not be aligned with the mechanical axis of the LED package. Luminous Intensity Measurement allowance is  $\pm 10\%$

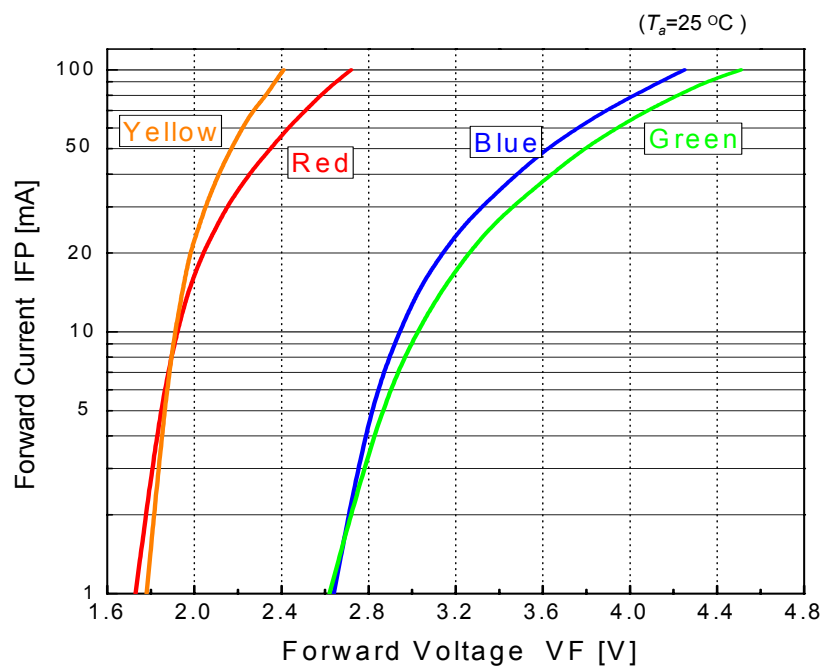
\*2 Please refer to CIE 1931 chromaticity diagram

\*3  $2\theta_{1/2}$  is the off-axis where the luminous intensity is 1/2 of the peak intensity.

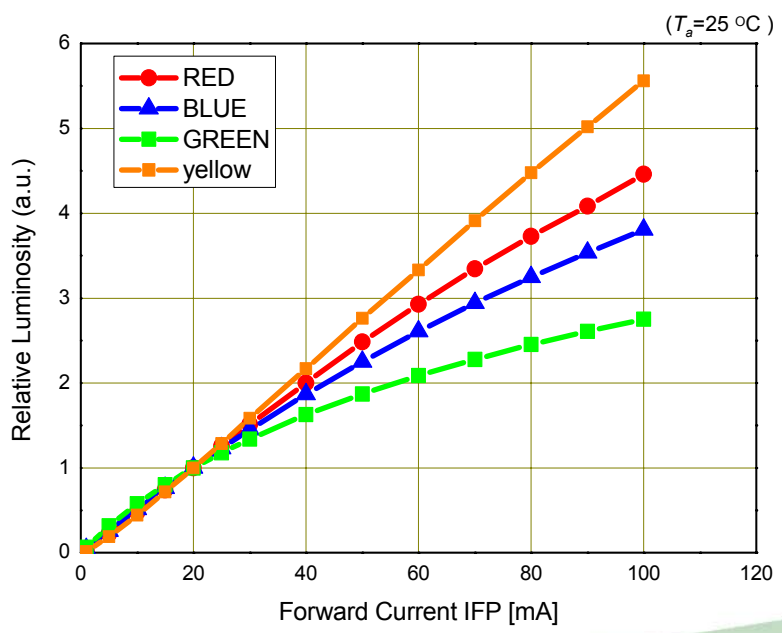
[Note] All measurements were made under the standardized environment of SSC.

### 4. Optical characteristics

Forward Current vs. Forward Voltage (per die)

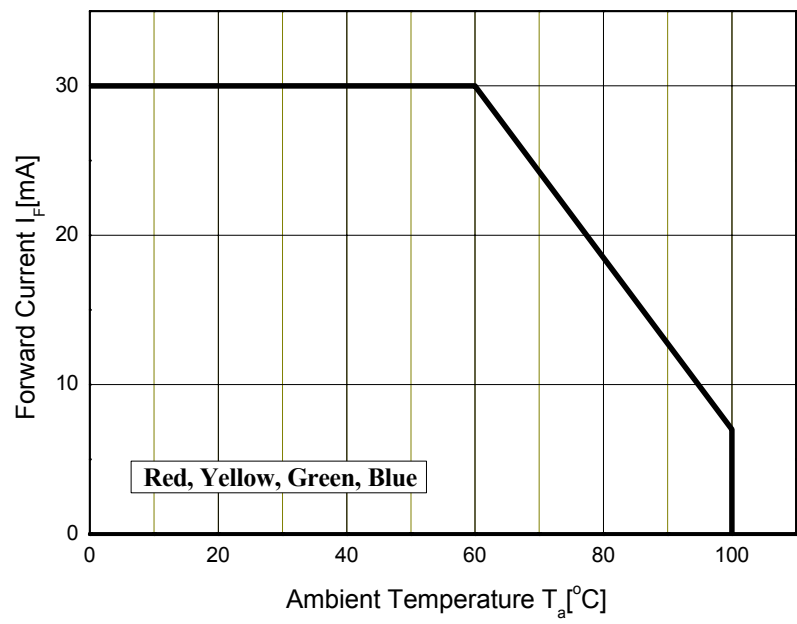


Relative Luminous Intensity vs Forward Current

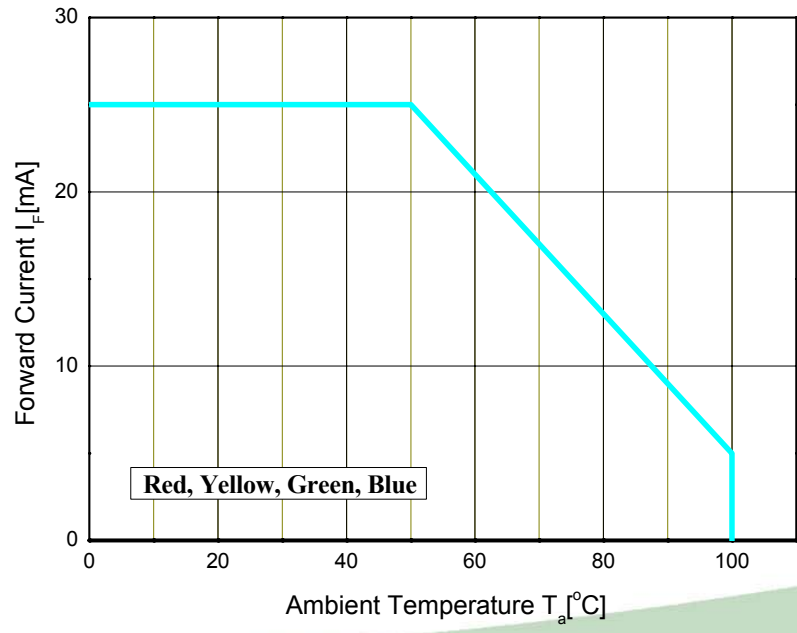


### 4. Optical characteristics

Forward Current Derating Curve : 1 Chip on

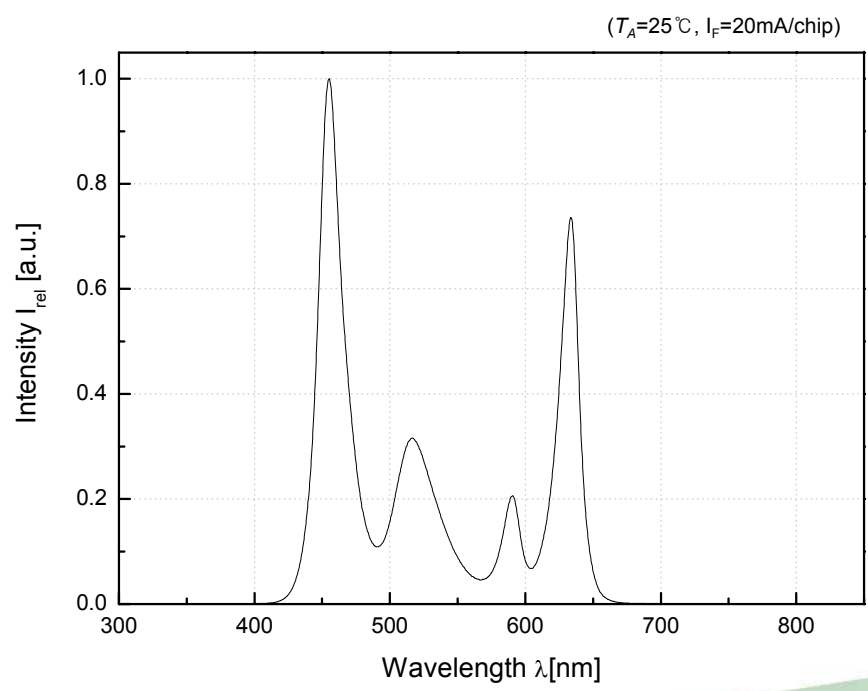
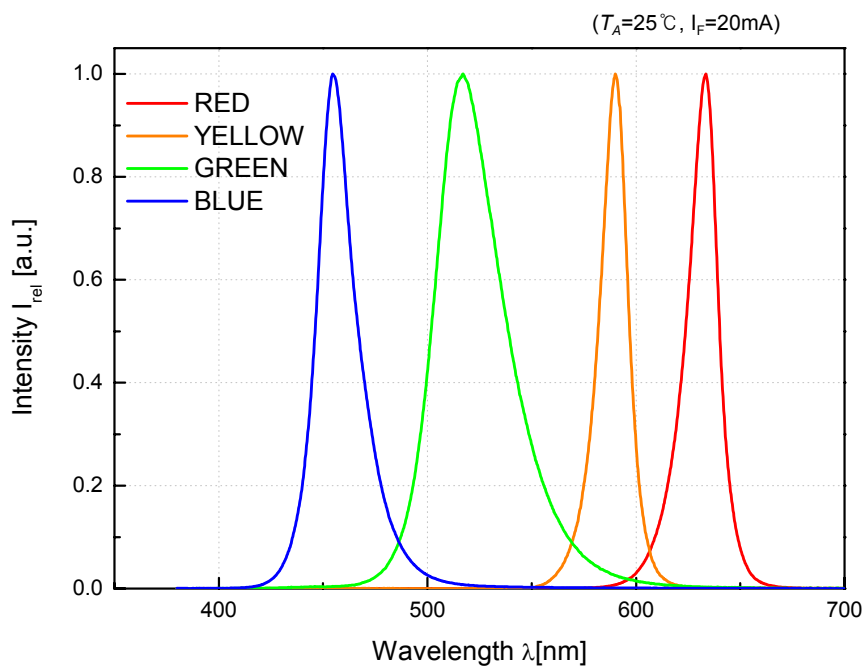


Forward Current Derating Curve : 4 Chip on



### 4. Optical characteristics

Spectrum

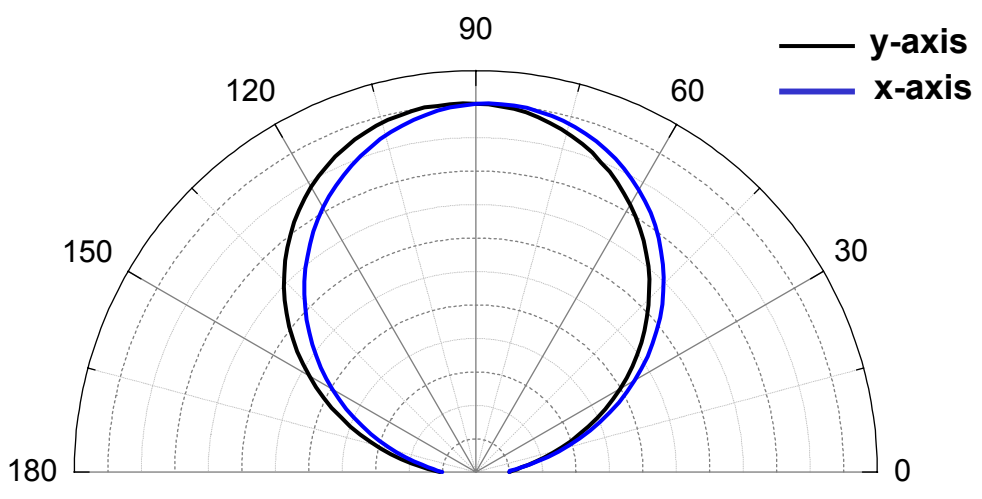




### 4. Optical characteristics

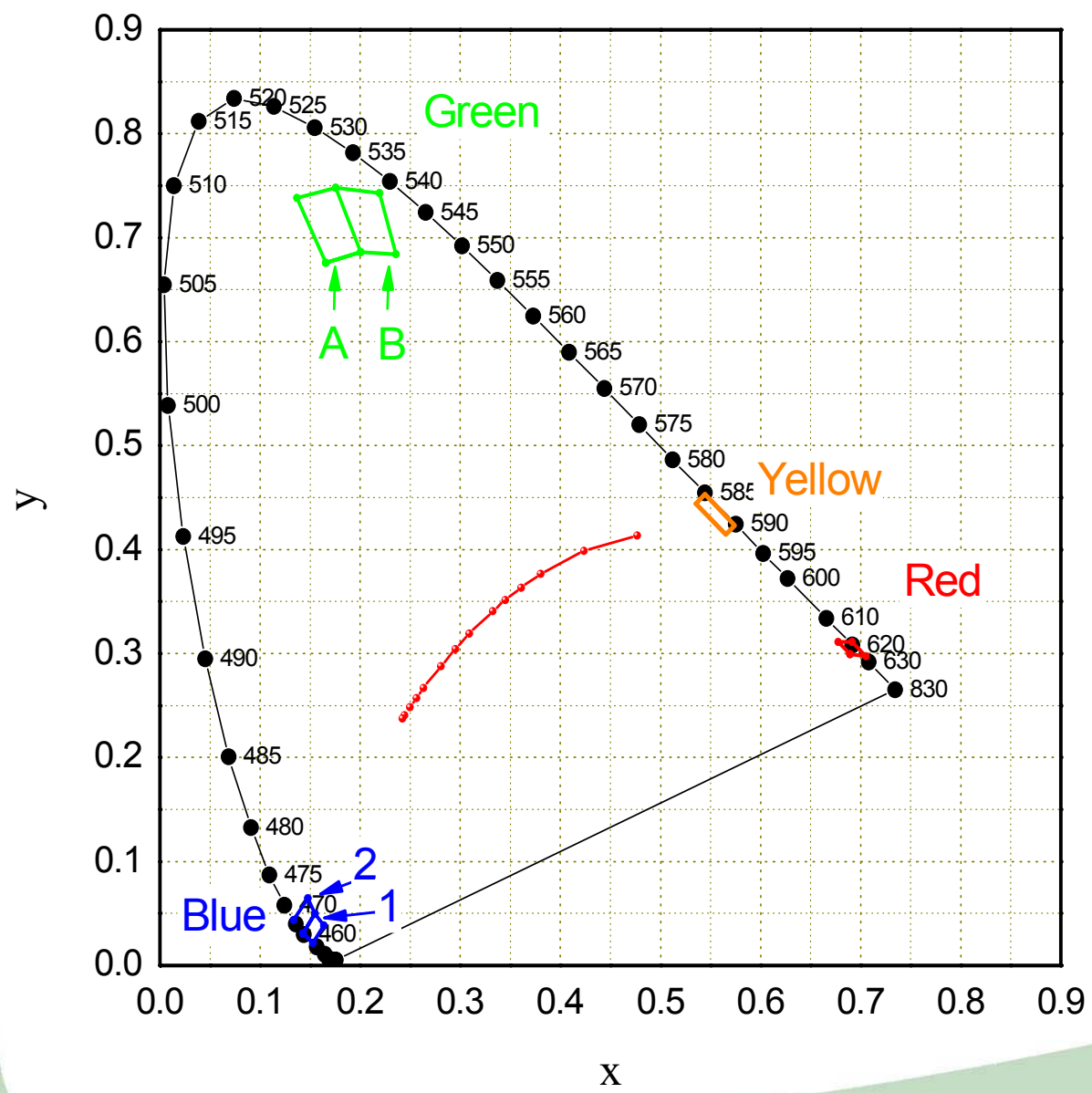
Radiation Diagram

( $T_a=25\text{ }^\circ\text{C}$ )

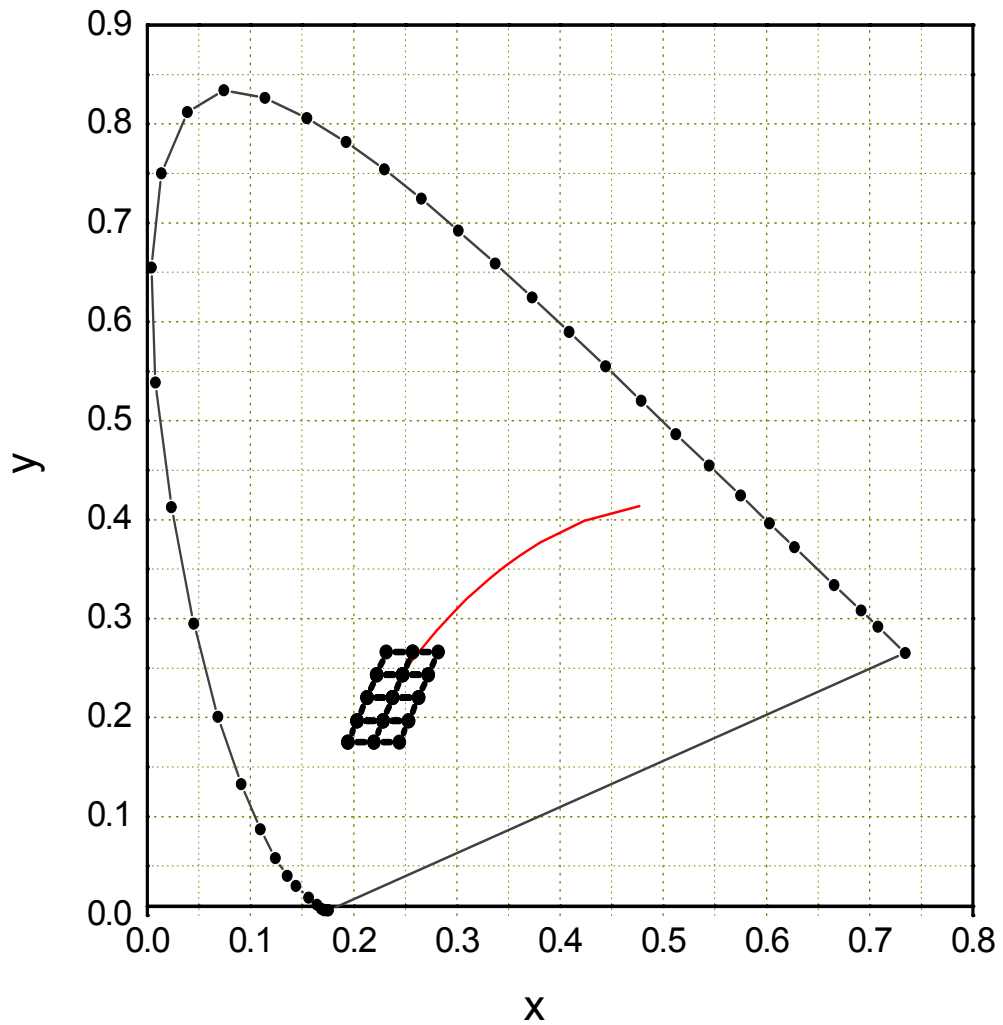


### 5. Color & Binning (Standard Binning)

Red		Yellow		Green				Blue			
				A		B		1		2	
X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
0.69	0.3	0.536	0.445	0.166	0.677	0.201	0.687	0.153	0.022	0.143	0.031
0.706	0.298	0.545	0.454	0.201	0.687	0.236	0.685	0.164	0.039	0.155	0.05
0.692	0.312	0.575	0.424	0.176	0.749	0.22	0.744	0.155	0.05	0.148	0.065
0.678	0.312	0.566	0.415	0.137	0.739	0.176	0.749	0.143	0.031	0.134	0.044



### 5. Color & Binning (Special Binning )

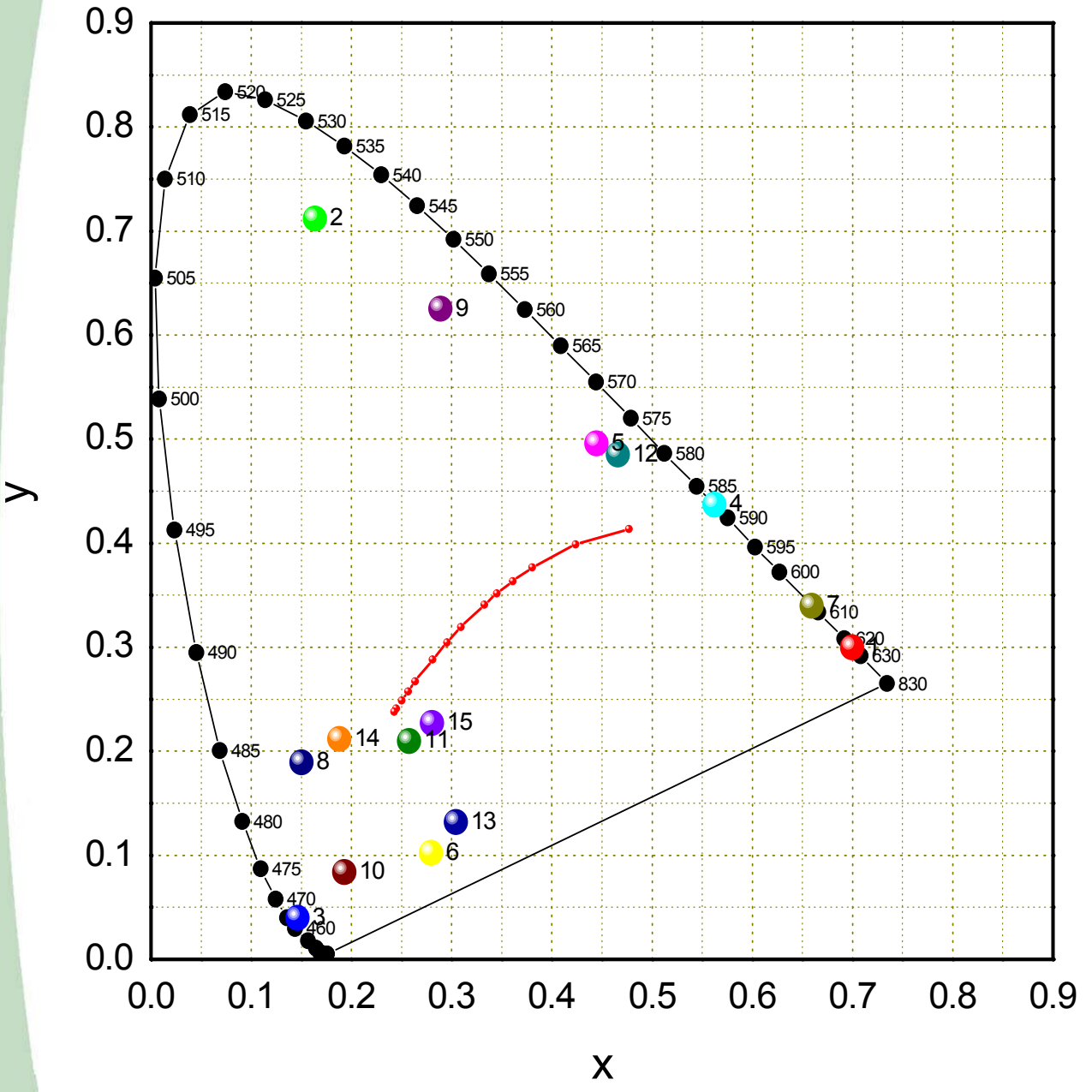


- ◆ Target of Color : Bluish White (Cool White)
- Color Coordinates (typ.): x 0.237 , y 0.217
- **I<sub>F</sub> Condition**  
 => 10mA for Red / 20mA for Yellow / 20mA for Green / 20mA for Blue
- 1 Bin, Cell Size = x 0.0341 , y 0.0217
- 9 Bin, Total Cell Size = x 0.088 , y 0.091
- Color Rank : a, b, c, d, e, f, g, h (8 BIN)

## 6. Colors of CFT732-S (Standard Color)

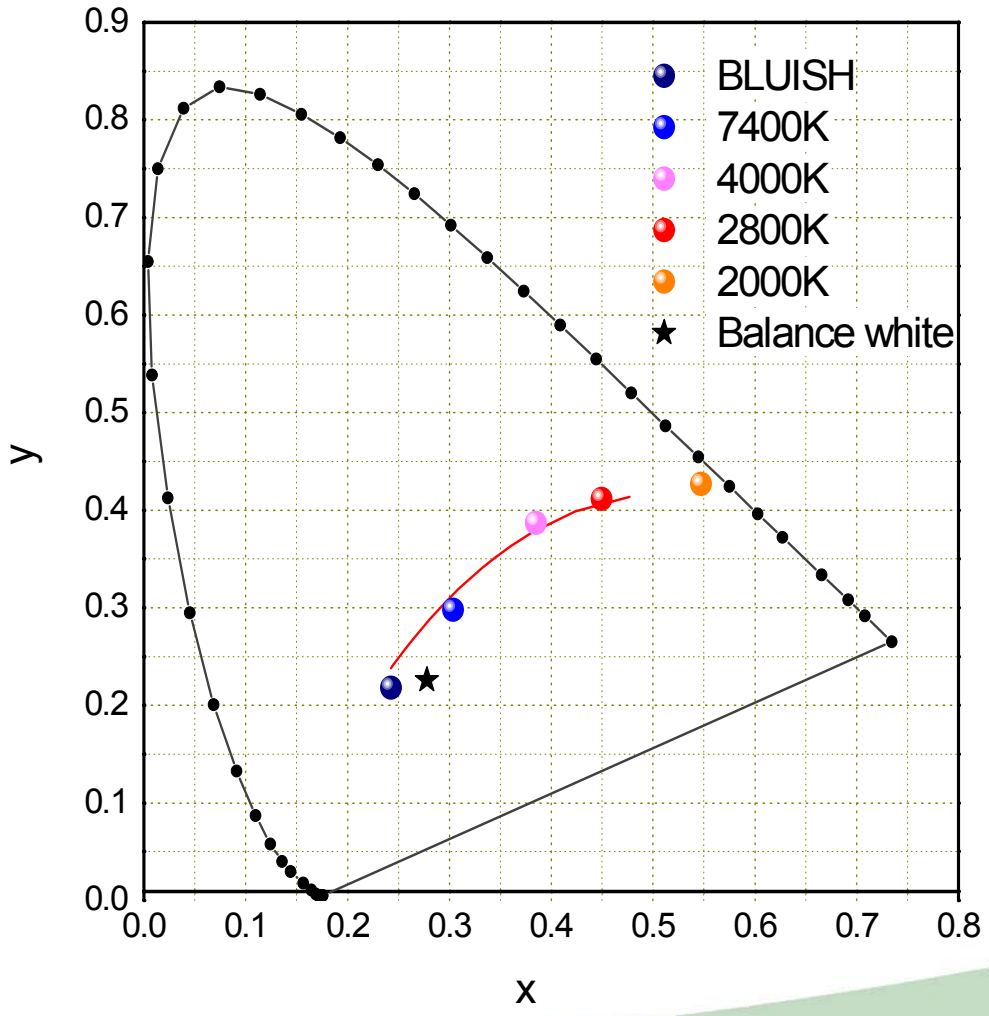
Step	Color (20mA per Chip)		Color Coordinate(Typ.)	
	Symbol	Color Name	X	Y
<b>1</b>	R	Red	0.700	0.300
<b>2</b>	G	Green	0.164	0.712
<b>3</b>	B	Blue	0.146	0.040
<b>4</b>	Y	Yellow	0.562	0.437
<b>5</b>	RG	Greenish Yellow	0.445	0.496
<b>6</b>	RB	Violet	0.279	0.102
<b>7</b>	RY	Redish Orange	0.660	0.340
<b>8</b>	GB	Bluish Green	0.150	0.190
<b>9</b>	GY	Yellowish Green	0.289	0.625
<b>10</b>	BY	Purpleish Blue	0.193	0.084
<b>11</b>	RGB	Bulish White	0.258	0.210
<b>12</b>	RGY	Greenish Yellow	0.466	0.485
<b>13</b>	RBV	Purple	0.304	0.132
<b>14</b>	GBV	Greenish Blue	0.188	0.212
<b>15</b>	RGBV	Bulish White	0.281	0.227

### 6. Colors of CFT732-S (Standard Color)

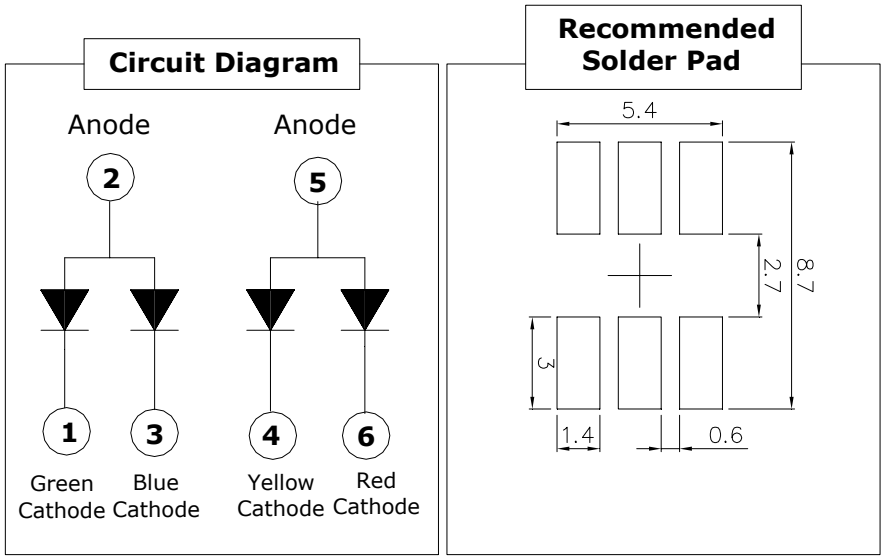
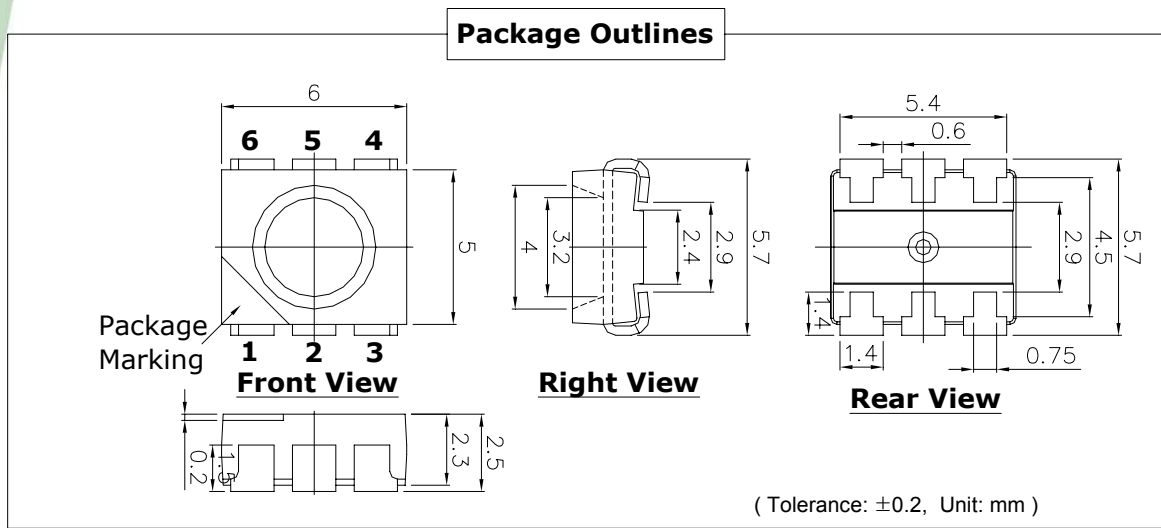


### 6. Colors of CFT732-S (Special Color )

Step	Full White Color	CCT	Color Coordinates (Typ.)		Balance Current $I_{F_{bal}}$ [mA]			
			X	Y	R	Y	G	B
0	Balance White	28000K	0.2778	0.2256	20	20	20	20
1	Bulish White	Undefined	0.243	0.218	10	20	20	20
2	Pure White	7400K	0.303	0.298	15	20	20	10
3	Natural White	4000K	0.385	0.387	20	15	20	4
4	Warm White	2800K	0.449	0.412	20	20	14	2
5	Candle Light	2000K	0.547	0.427	20	6	7	0



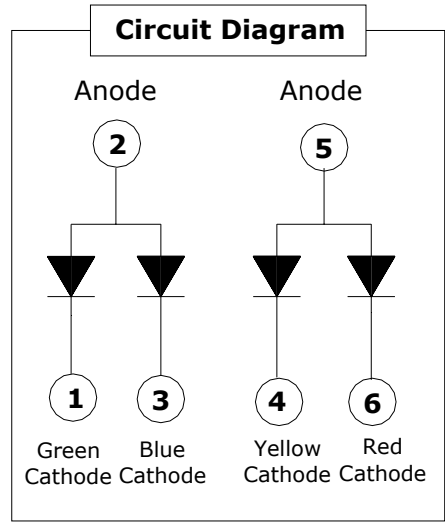
### 7.Outline Dimension



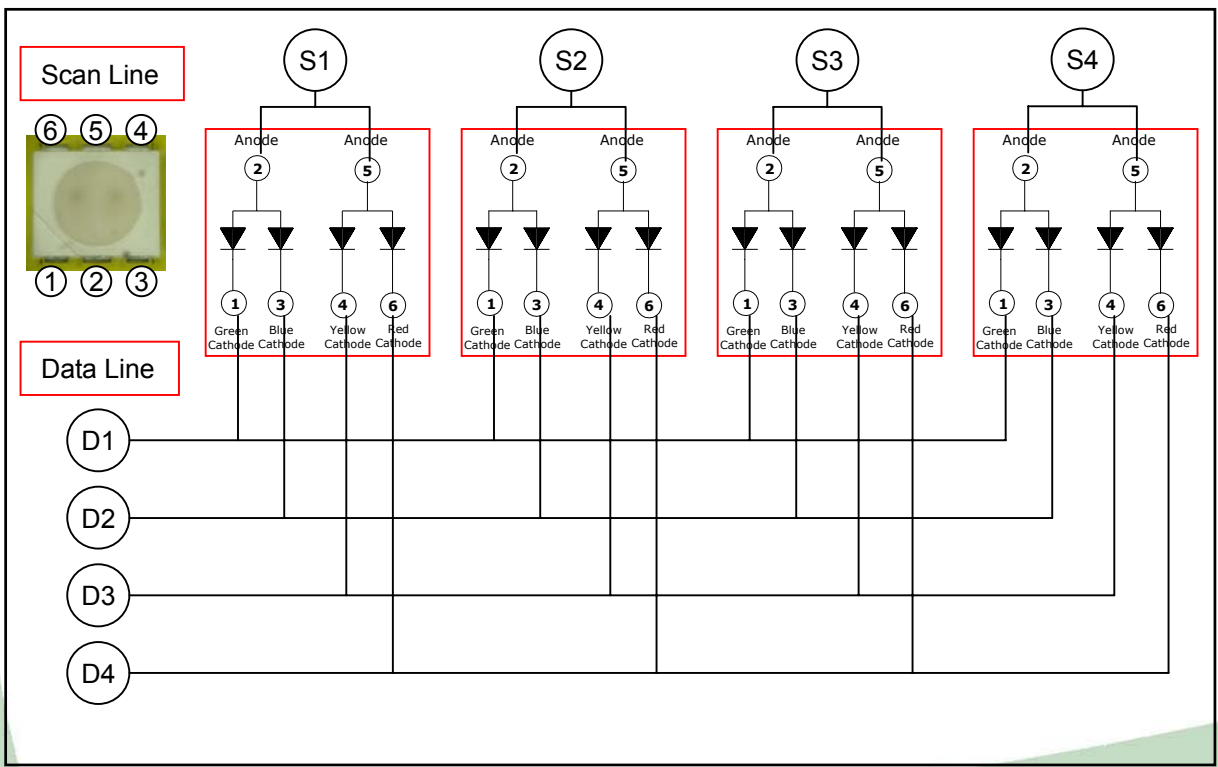
**\* MATERIALS**

PARTS	MATERIALS
Package	Heat-Resistant Polymer
Encapsulating Resin	Silicone Resin (Diffused)
Electrodes	Ag Plating Copper Alloy

### 8. Recommend Circuit

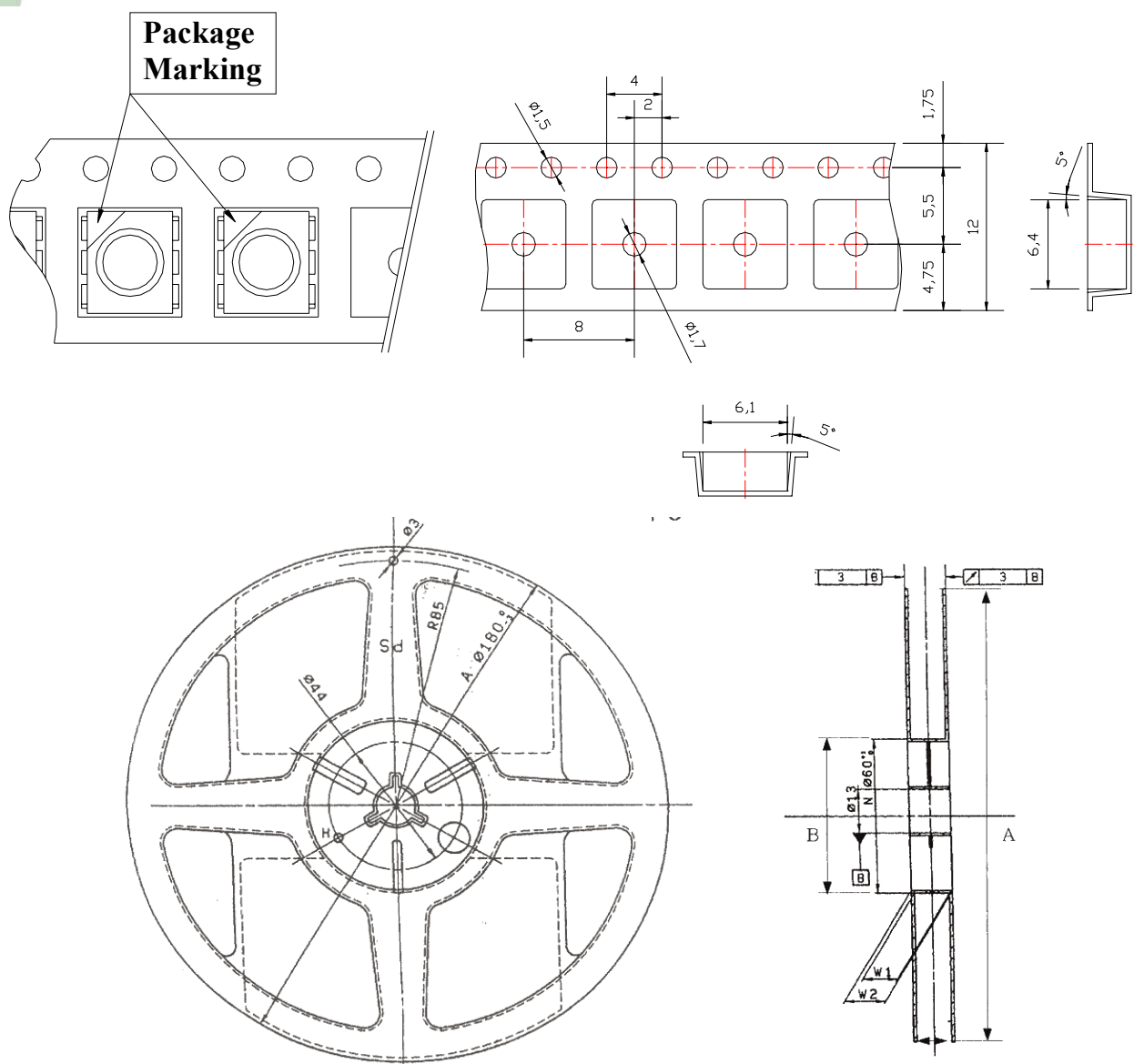


#### Circuit (Led Dot Matrix - Dynamic Drive)





### 9. Packing



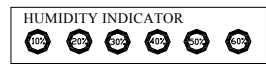
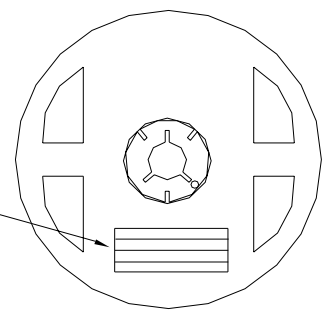
(Tolerance: ±0.2, Unit: mm)

- 1)Quantity : 700pcs/Reel
- 2)Cumulative Tolerance : Cumulative Tolerance/10 pitches to be ±0.2mm
- 3)Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at the angle of 10 to the carrier tape
- 4)Package : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package

● Reel Packing Structure

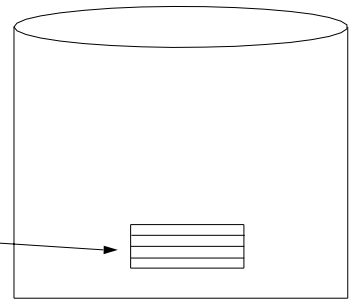
Reel

RANK: **XXX**  
 QUANTITY : XXXX  
 LOT NUMBER : XXXXXXXXXX  
 PART NUMBER : **XXXXXX**  
 SEOUL SEMICONDUCTOR CO., LTD.



Aluminum Vinyl Bag

RANK: **XXX**  
 QUANTITY : XXXX  
 LOT NUMBER : XXXXXXXXXX  
 PART NUMBER : **XXXXXX**  
 SEOUL SEMICONDUCTOR CO., LTD.



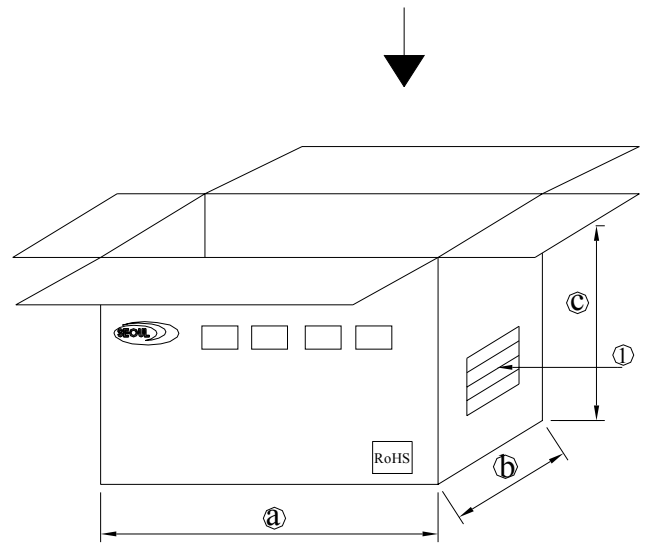
Outer Box Structure

Material : Paper(SW3B(B))

TYPE	SIZE (mm)		
	Ⓐ	Ⓑ	Ⓒ
7inch	245	220	142

① SIDE

RANK: **XXX**  
 QUANTITY : XXXX  
 LOT NUMBER : XXXXXXXXXX  
 PART NUMBER : **XXXXXX**  
 SEOUL SEMICONDUCTOR CO., LTD.



### 10. Lot Number

The lot number is composed of the following characters;

CFT□□□◎◎ # ~ #

CFT –First Part Name

○ – Year ( 6 for 2006, 7 for 2007, 8 for 2008 )

□□ – Month ( 01 for Jan., 02 for Feb., ..... 11 for Nov., 12 for Dec.)

◎◎ – Day ( 01, 02, 03, 04, ..... 28, 29, 30, 31.)

# ~# – The number of the internal quality control

RANK : **XXX**

|||||

QUANTITY : 700

||||| ||||| ||||| |||||

LOT NUMBER : CFT80426 01 512

|||| |||| ||||| ||||| ||||| |||||

PART NUMBER : CFT732-S

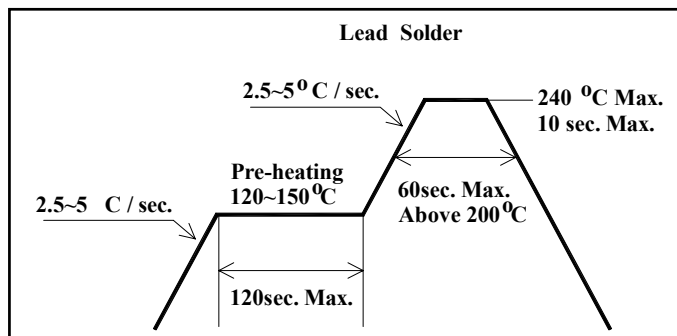
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 SEOUL SEMICONDUCTOR CO., LTD.

## 11. Soldering

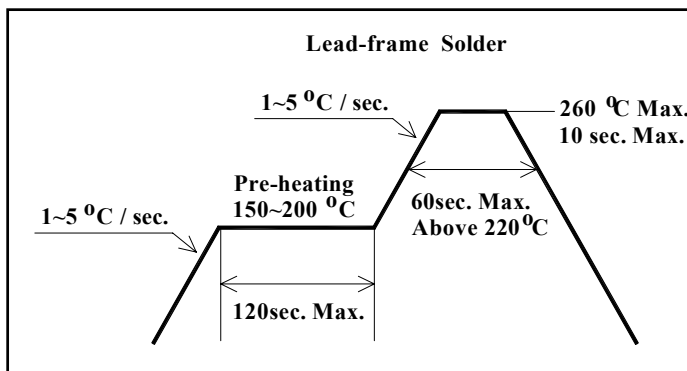
### (1) Lead Solder

Lead Solder	
Pre-heat	120~150 °C
Pre-heat time	120 sec. Max.
Peak-Temperature	240 °C Max.
Soldering time Condition	10 sec. Max.



### (2) Lead-Free Solder

Lead Free Solder	
Pre-heat	150~200 °C
Pre-heat time	120 sec. Max.
Peak-Temperature	260 °C Max.
Soldering time Condition	10 sec. Max.



### (3) Hand Soldering conditions

Do not exceed 4 seconds at maximum 315°C under soldering iron.

### (4) The encapsulated material of the LEDs is silicone.

Precautions should be taken to avoid the strong pressure on the encapsulated part.

So when using the chip mounter, the picking up nozzle that does not affect the silicone resin should be used.

Note : In case that the soldered products are reused in soldering process, we don't guarantee the products.

## 12. Precaution for use

### (1) Storage

In order to avoid the absorption of moisture, it is recommended to store in a dry box (or a desiccator) with a desiccant. Otherwise, to store them in the following environment is recommended.

Temperature : 5°C ~30°C Humidity : maximum 70%RH

### (2) Attention after open.

LED is correspond to SMD, when LED be soldered dip, interfacial separation may affect the light transmission efficiency, causing the light intensity to drop. Attention in followed;

Keeping of a fraction

Temperature : 5 ~ 40°C Humidity : less than 10%

(3) In the case of more than 1 week passed after opening or change color of indicator on desiccant, components shall be dried 10-12hr. at  $60 \pm 5^\circ\text{C}$ .

(4) Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temperature after soldering.

(5) Quick cooling shall be avoided.

(6) Components shall not be mounted on warped direction of PCB.

(7) Anti radioactive ray design is not considered for the products.

(8) This device should not be used in any type of fluid such as water, oil, organic solvent etc. When washing is required, IPA should be used.

(9) When the LEDs are illuminating, operating current should be decided after considering the ambient maximum temperature.

(10) The LEDs must be soldered within seven days after opening the moisture-proof packing.

(11) Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.

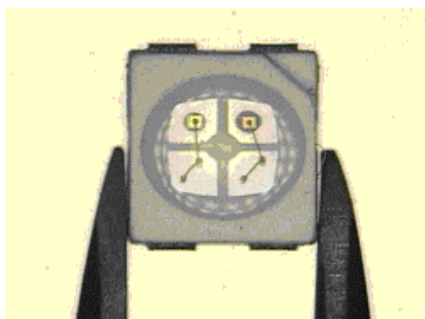
(12) The appearance and specifications of the product may be modified for improvement without notice.

### 13. Handling of Silicone Resin LEDs

(1) During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound.



(2) In general, LEDs should only be handled from the side. By the way, this also applies to LEDs without a silicone sealant, since the surface can also become scratched.



(3) When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevented.

This is assured by choosing a pick and place nozzle which is larger than the LED's reflector area.

(4) Silicone differs from materials conventionally used for the manufacturing of LEDs. These conditions must be considered during the handling of such devices. Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust.

As mentioned previously, the increased sensitivity to dust requires special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of components.

(5) SSC suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.