

## 1. Descriptions

The KP5450F00E6F is a Full Color LED consisting of small and thin form plastic leaded chip carrier (PLCC) 6-pin package, AlGaInP red chip, GaN Green, InGaN blue chip.

## 2. Features

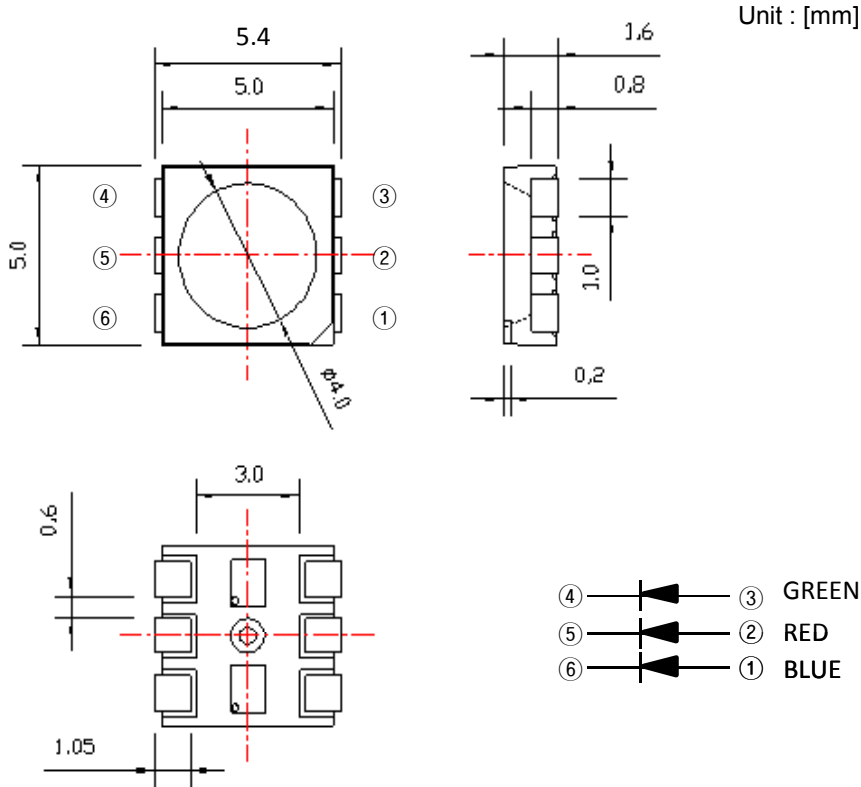
- ◆ Small Footprint Surface Mount Package ( 5.4 L × 5.0 W × 1.6 H [mm<sup>3</sup>])
- ◆ Typical Forward Voltage(V<sub>F</sub>) : Blue : 3.3V @ Forward Current(I<sub>F</sub>)=20mA  
Green : 3.2V @ Forward Current(I<sub>F</sub>)=20mA  
Red : 2.2V @ Forward Current(I<sub>F</sub>)=20mA
- ◆ Operation Temperature from -40°C to +85°C
- ◆ Soldering methods : IR reflow soldering
- ◆ Taping : 12mm conductive black carrier tape & antistatic clear cover tape

## 3. Applications

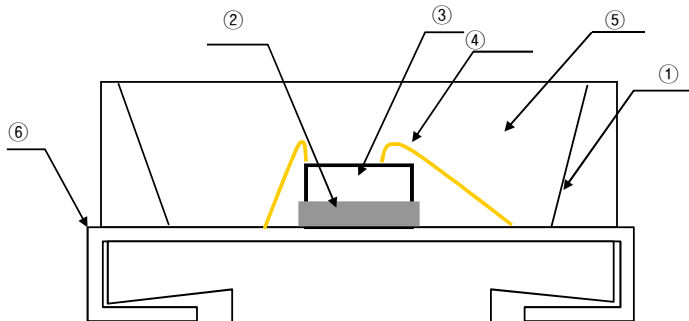
- ◆ LCD Backlighting
- ◆ Out Door/ In Door Display
- ◆ Front panel indicator lamp
- ◆ Symbol Backlighting

4. Outline Dimensions and Material Descriptions

◆ Outline Dimensions



◆ Material Descriptions



No.	Item	Material
①	Package	PPA
②	Die Adhesive	Clear Silicone
③	LED Chip	InGaN, Gap, AlGaInP
④	Wire	Au
⑤	Encapsulant	Silicone
⑥	Lead	Cu Alloy

**5. Absolute Maximums**

Parameter	Symbol	Ratings			Unit
		Red	Green	Blue	
Forward current	$I_F$	30	30	30	mA
Pulse forward current <sup>*1</sup>	$I_{FP}$	90	100		mA
Power dissipation	$P_D$	80	110	110	mW
Operating temperature	$T_{opr.}$	-30 ~ +85			°C
Storage temperature	$T_{stg.}$	-40 ~ +100			°C
Soldering Temperature <sup>*2</sup>	$T_{sol.}$	260			°C

\*1. IFP was measured at  $T_w \leq 1$  msec of pulse width and  $D \leq 1/10$  of duty ratio.

\*2. Soldering time : 5 Sec

**6. Electro-Optical Characteristics ( $T_A = 25^\circ\text{C}$ )**

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Forward voltage	Red	$V_F$	$I_F=20\text{mA}$	1.8	-	2.5	V
	Green			2.8	-	3.6	
	Blue			2.8	-	3.6	
Dominant Wavelength	Red	$W_D$	$I_F=20\text{mA}$	615	-	630	nm
	Green			510	-	530	
	Blue			455	-	475	
Luminous Intensity	Red	$I_v$	$I_F=20\text{mA}$	200	-	600	mcd
	Green			600	-	1800	
	Blue			120	-	400	
Luminous intensity <sup>*1,3</sup>	R,G,B	$I_v$	700	1000	1500	mcd	Red_ $I_F=12\text{mA}$ , Green_ $I_F=10\text{mA}$ , Blue_ $I_F=7\text{mA}$
Chromaticity coordiante <sup>*3</sup>	R,G,B	x	0.250	-	0.350	-	Red_ $I_F=12\text{mA}$ , Green_ $I_F=10\text{mA}$ , Blue_ $I_F=7\text{mA}$
		y	0.250	-	0.350	-	
Reverse Current		$I_R$	$V_R=5\text{V}$	-	-	10	uA
Half angle <sup>*2</sup>		$2\Delta\theta_{1/2}$	$I_F=60\text{mA}$	-	120	-	deg.

\*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.

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

**7. Ranks**

◆  $I_v$ , Color Rank Table<sup>\*1</sup>

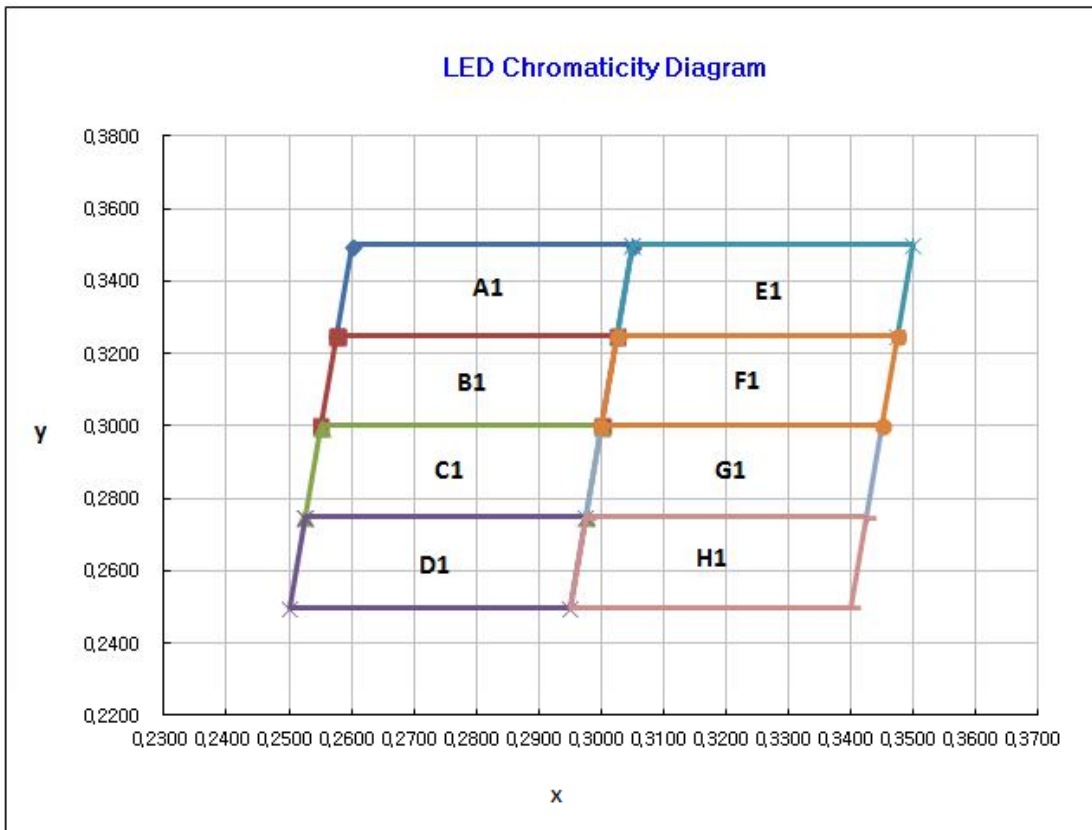
$I_v$ , Color Rank @ Red <sub>I<sub>F</sub></sub> = 12 mA, Green <sub>I<sub>F</sub></sub> = 10 mA, Blue <sub>I<sub>F</sub></sub> = 7 mA			
Luminous Intensity [mcd]	Chromaticity		-
T : 700 ~ 1000	A1	E1	-
U : 1000 ~ 1200	B1	F1	-
V : 1200 ~ 1500	C1	G1	-
-	D1	H1	-

\*1. KP5450F00E6F marked as TA1( $I_v$ , Color Rank) has the  $I_v$  range 0.7~1.0cd and Color range A1 area.

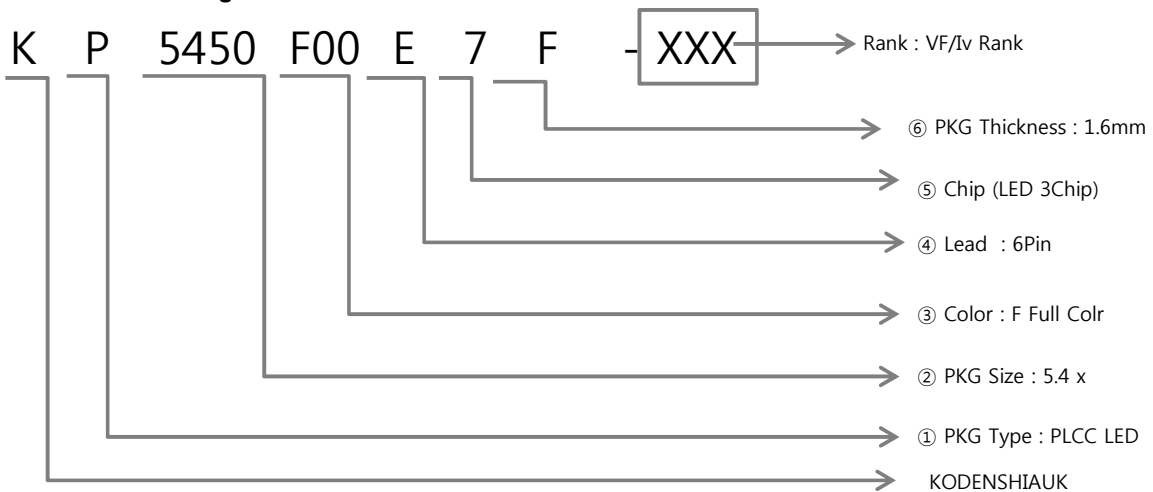
◆ Color Coordinate Rank

A1		B1		C1		D1	
x	y	x	y	x	y	x	y
0.2600	0.3500	0.2575	0.3250	0.2550	0.3000	0.2525	0.2750
0.2575	0.3250	0.2550	0.3000	0.2525	0.2750	0.2500	0.2500
0.3025	0.3250	0.3000	0.3000	0.2975	0.2750	0.2950	0.2500
0.3050	0.3500	0.3025	0.3250	0.3000	0.3000	0.2975	0.2750
E1		F1		G1		H1	
x	y	x	y	x	y	x	y
0.2525	0.2250	0.3025	0.3250	0.3000	0.3000	0.2975	0.2750
0.2650	0.2250	0.3000	0.3000	0.2975	0.2750	0.2950	0.2500
0.2800	0.2550	0.3450	0.3000	0.3425	0.2750	0.3400	0.2500
0.2675	0.2550	0.3475	0.3250	0.3450	0.3000	0.3425	0.2750

◆ The CIE(x, y) Chromaticity Diagram

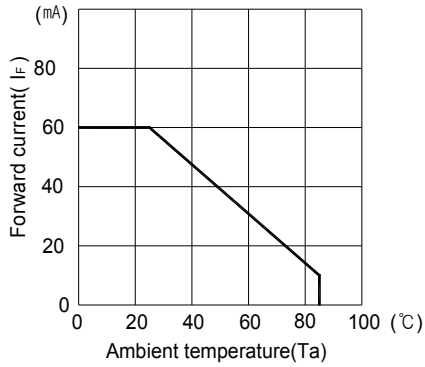


8. Part Numbering

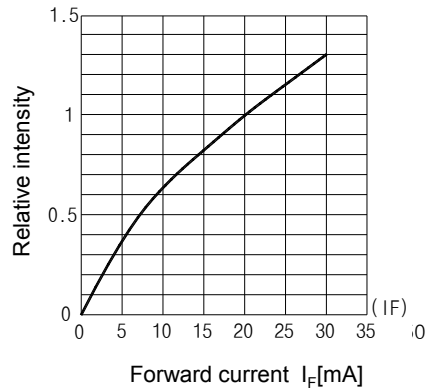


9. Characteristic Graphs

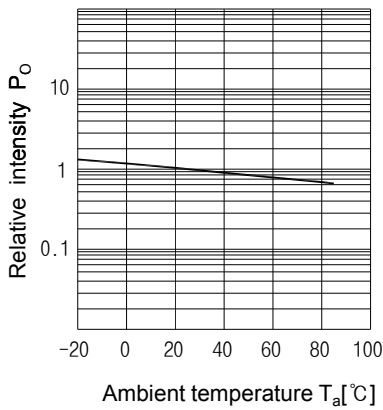
**Forward current vs. Ambient temperature**



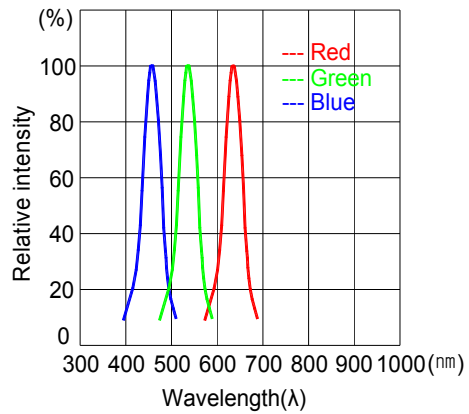
**luminous Intensity vs. Forward current**



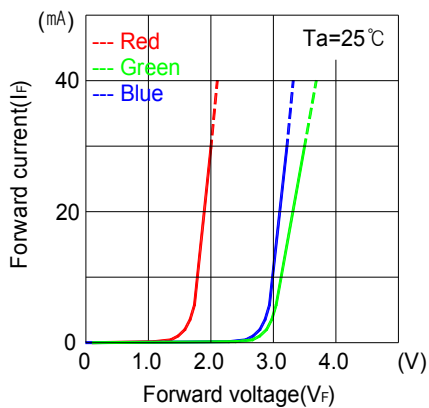
**Relative luminous intensity vs. Ambient temperature**



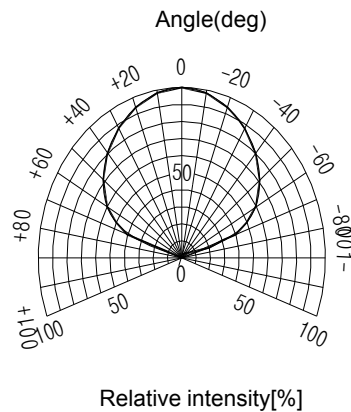
**Relative intensity vs. Wavelength**



**Forward current vs. Forward voltage**



**Radiant Pattern**



**10. Reliability Test**

◆ Criteria

ITEM	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	$V_F$	$I_F = 60\text{mA}$	-	U.S.L. $\times 1.2$
Reverse Current	$I_R$	$V_R = 5\text{V}$	-	U.S.L. $\times 2.0$
Luminous Intensity	$I_V$	$I_F = 60\text{mA}$	L.S.L. $\times 0.5$	-

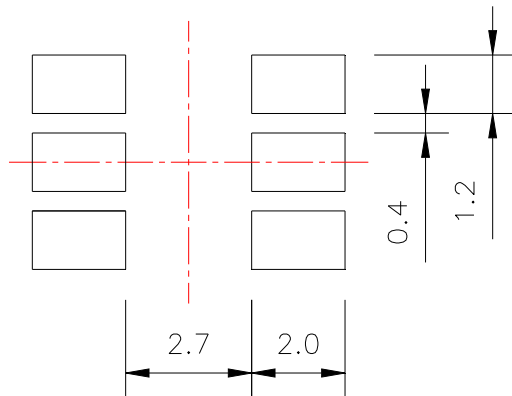
U.S.L. : Upper Standard Level

L.S.L. : Lower Standard Level

◆ Test Conditions

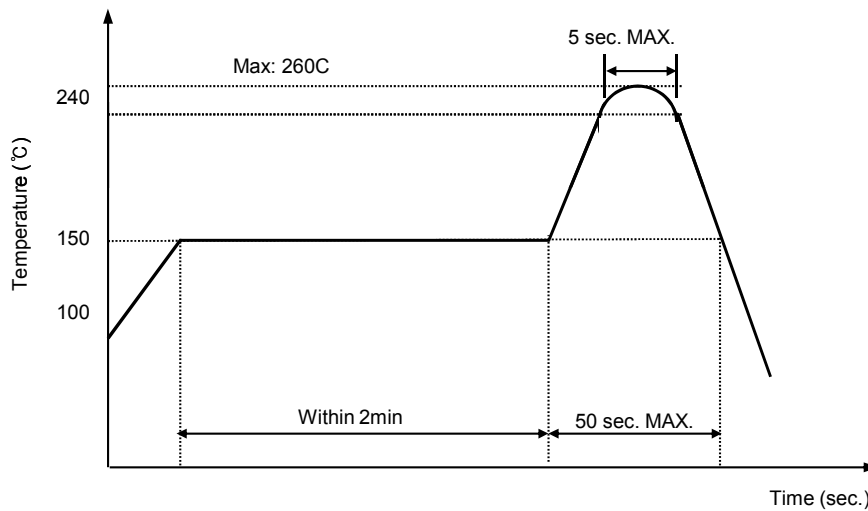
No.	Test ITEM	Standard Test Method	Test Conditions	Note	#of Damaged/ Test No.
1	Resistance to Solder Heat (Reflow Soldering)	$T_{\text{slid}} = 260^\circ\text{C}$ , 10sec.	6 Min	22 PCS	0/1
2	Temperature Cycle	H : $+100^\circ\text{C}$ 15min ↓ 5 min L : $-40^\circ\text{C}$ 15min	300 Cycles	22 PCS	0/1
3	Thermal Shock	H : $+100^\circ\text{C}$ 5min ↓ 10 sec L : $-10^\circ\text{C}$ 5min	300 Cycles	22 PCS	0/1
4	High Temperature Storage	$T_a = 100^\circ\text{C}$	1000 hrs.	22 PCS	0/1
5	Low Temperature Storage	$T_a = -40^\circ\text{C}$	1000 hrs.	22 PCS	0/1
6	DC Operating Life	$25^\circ\text{C}$ , $I_F = 60\text{mA}$	1000 hrs.	22 PCS	0/1
7	High Temperature / High Humidity	$85^\circ\text{C} / 85\%\text{RH}$	1000 hrs.	22 PCS	0/1

**11. Recommended Soldering Pattern**



Unit : [mm]

**12. Reflow Soldering Profile**



**13. Manual Soldering Codition**

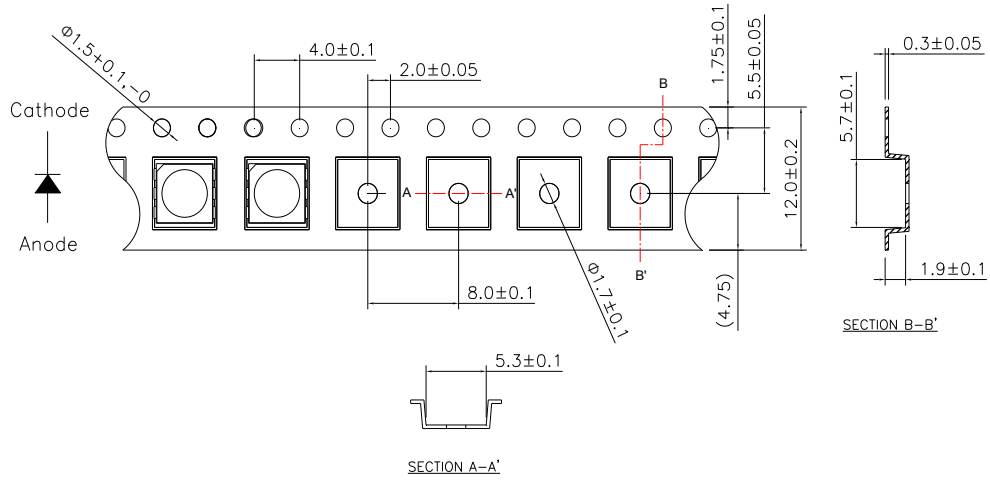
For manual soldring, you have to complete soldering within 3 seconds under 260°C.  
 (The temperature at tip of solder iron).



14. Tape and Reel Specifications

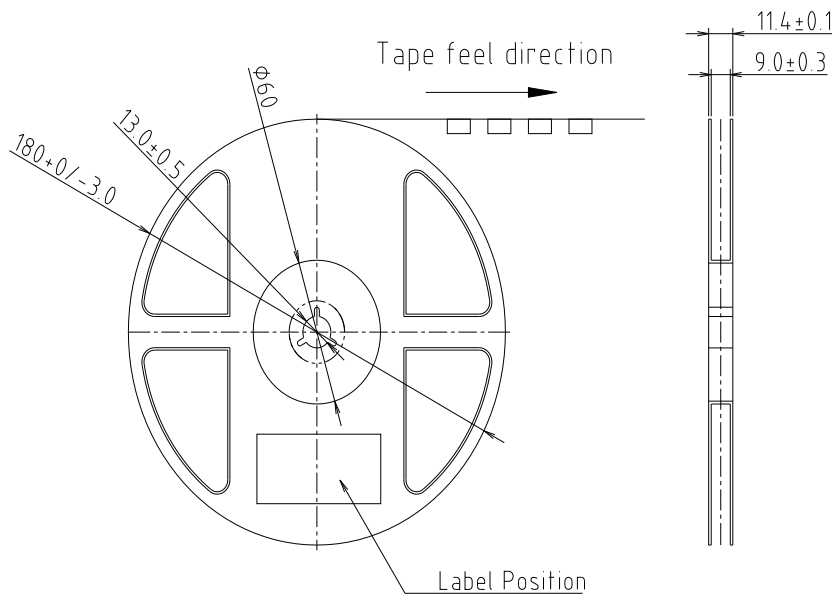
◆ Tape

UNIT : [mm]



◆ Reel

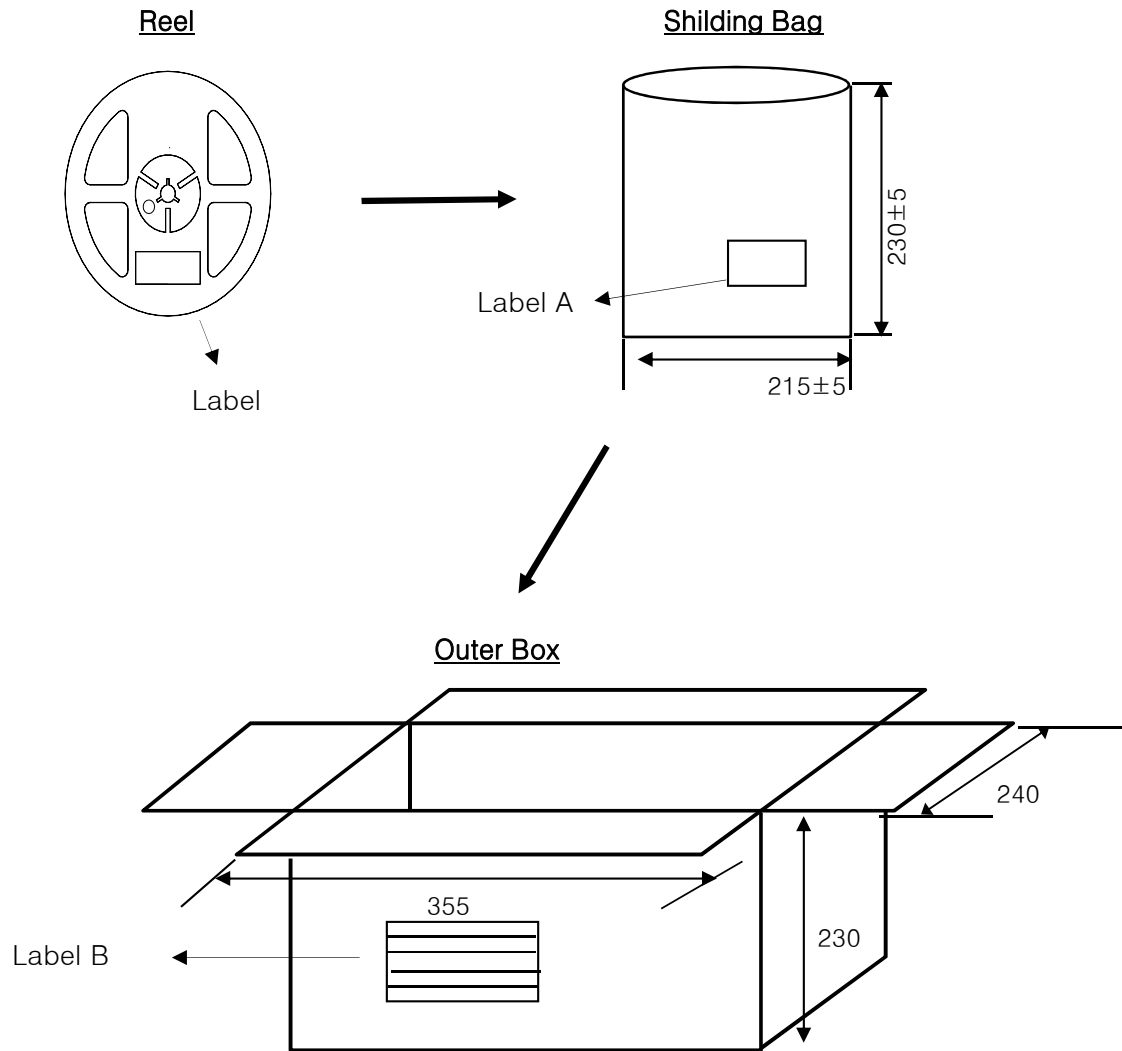
UNIT : [mm]



- ◆ Quantity : 1,000pcs/Reel
- ◆ Cover Tape Adhesion : 0.1 ~ 0.7N for 45° pulling up.

15. Packing Specifications

UNIT : [mm]

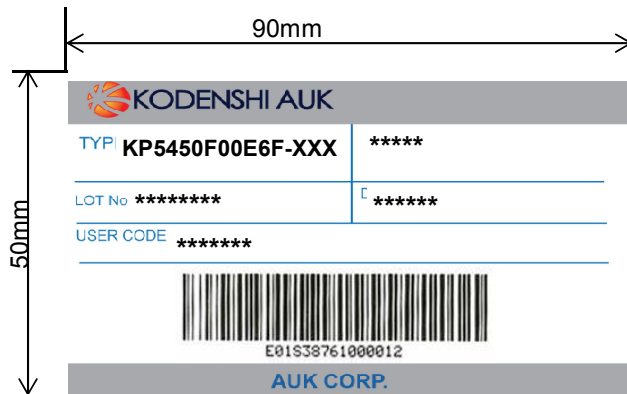


◆ Specifications of Carrier Tape, Reel and Shilding Bag

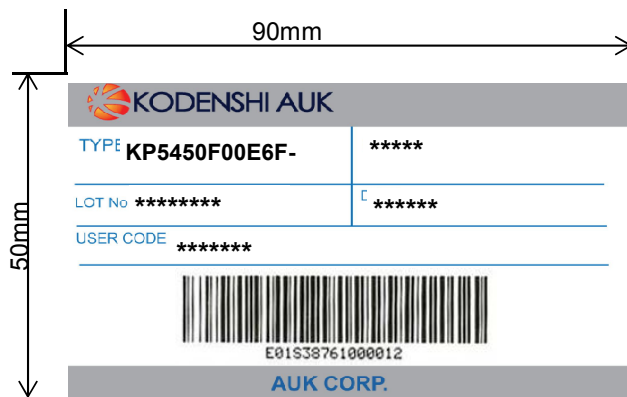
Item	Carrier Tape	Reel	Shilding Bag	
			Outside	Inside
Surface Conductivity	$1 \times 10^4 \sim 1 \times 10^6$	$1 \times 10^8$	$1 \times 10^{10} \sim 1 \times 10^{12}$	$1 \times 10^{11} \sim 1 \times 10^{13}$

16. Label

◆ Label A



◆ Label B



## 17. Cautions

### ◆ Cautions in Usage

- Store and use where there is no exterior force that will cause change in shape.
- Store and use where there is no Hydrogen Sulfide gas, or any other corrosive gas.
- Once the package is opened, the products should be used within 3 days.  
Otherwise, they should be kept in a damp proof box with desiccant agent.  
Considering the tape life, we suggest our customers to use our products within a year(from production date)
- If opened more than 3 days in an atmosphere 5 °C ~35 °C, RH 60%, they should be treated at 60 °C ±5 °C for 15 hrs.
- Solder the lead pin under conditions of the absolute maximum rating chart and do not apply force on the solder pin after soldering.

### ◆ Guarantee Period and Scope

- Period  
One year after delivery to the desired place.
- Scope  
Replacement of products will be done if any problems lie in our company's products.  
However, we are not liable for your damage due to lack of caution.

### ◆ Others

- Any doubts concerning this specification should be discussed fully by both parties.