

\*Customer:

# SPECIFICATION

<b>ITEM</b>	<b>TOP LED DEVICE</b>
<b>MODEL</b>	<b>SSC-PHBMGSRT722</b>

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## 1. Features

- Pb-free Reflow Soldering application
- RoHS Compliant
- Material : InGaN(Blue) / InGaN(Green) / AlGaInP(Red)
- 6-Pin (R,G,B separate) type
- Suitable for all SMT assembly methods ; Suitable for all soldering methods
- White colored SMT package and colorless clear window
- Encapsulating Resin : Epoxy Resin

## 2. Application

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

## 3. Absolute Maximum Ratings <sup>\*1</sup>

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

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

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

\*2  $I_{FM}$  was measured at  $T_w \leq 0.1\text{msec}$  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.

#### 4. Electro-Optical Characteristics

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

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	Red	$V_F$	$I_F=20\text{mA}$	1.6	2.2	2.5	V
	Green		$I_F=20\text{mA}$	2.8	3.3	4.0	
	Blue		$I_F=20\text{mA}$	2.8	3.3	3.8	
Reverse Current	Red	$I_R$	$V_R=5\text{V}$ (per die)	-	-	10	$\mu\text{A}$
	Green			-	-	10	
	Blue			-	-	10	
Luminance Intensity *1	Red	$I_V$	$I_F=20\text{mA}$	100	200	-	mcd
	Green		$I_F=20\text{mA}$	400	800	-	
	Blue		$I_F=20\text{mA}$	100	195	-	
Peak Wavelength	Red	$\lambda_P$	$I_F=20\text{mA}$	-	634	-	nm
	Green		$I_F=20\text{mA}$	-	520	-	
	Blue		$I_F=20\text{mA}$	-	459	-	
Dominant Wavelength	Red	$\lambda_d$	$I_F=20\text{mA}$	617	625	631	nm
	Green		$I_F=20\text{mA}$	519	527	537	
	Blue		$I_F=20\text{mA}$	464	470	477	
Spectral Bandwidth	Red	$\Delta\lambda$	$I_F=20\text{mA}$	-	20	-	nm
	Green		$I_F=20\text{mA}$	-	35	-	
	Blue		$I_F=20\text{mA}$	-	26	-	
Viewing Angle *2	R, G, B	$2\theta_{1/2}$	$I_F=20\text{mA}$ (per die)	-	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.  
Luminous Intensity Measurement allowance is  $\pm 10\%$

\*2  $2\theta_{1/2}$  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.

## 5. Rank of PHBMGSRT722

### 1) Special binning (White balance)

X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>
Iv	Iv	λd	W-Color Rank	

### 2) General binning (RGB balance binning)

X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>
Iv	Iv	λd

### ▣ Luminous Intensity [Iv]

Rank Name	R		Rank Name	G		Rank Name	B		Rank Name	Total Iv	
	MIN	MAX		MIN	MAX		MIN	MAX		MIN	MAX
N	100	140	N	400	590	N	100	150	TN	600	880
O	140	210	O	590	820	O	150	210	TO	880	1240
P	210	300	P	820	1200	P	210	290	TP	1240	1790

Mix Rank Name	R	G	B
NN	N	N	N
OO	O	O	O
PP	P	P	P
NO	O	N	N
	N	O	N
	N	N	O
ON	N	O	O
	O	N	O
	O	O	N
OP	P	O	O
	O	P	O
	O	O	P
PO	O	P	P
	P	O	P
	P	P	O

Mix Rank Name	R	G	B
NP	P	N	N
	N	P	N
	N	N	P
PN	N	P	P
	P	N	P
	P	P	N
XX	N	O	P
	P	N	O
	O	P	N

### ▣ Dominant Wavelength [λd]

Rank Name	R		G		B	
	MIN	MAX	MIN	MAX	MIN	MAX
A	617	631	520	527	467.5	472
B	617	631	530	537	472.5	477
C	617	631	520	537	465	477

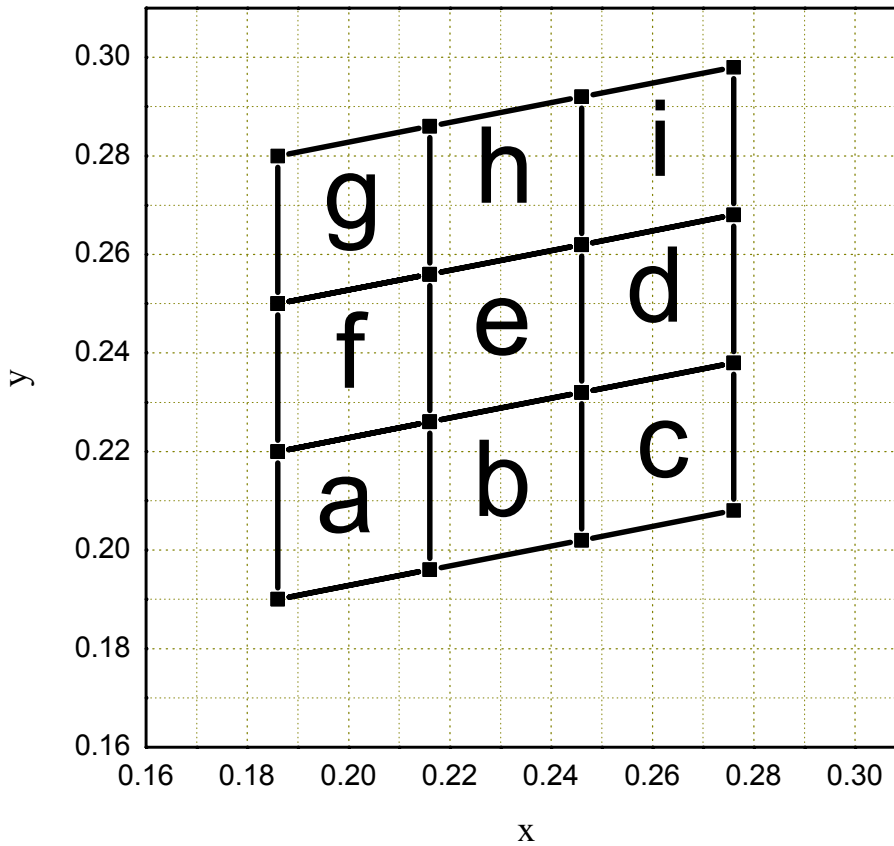
### ▣ Forward Voltage

R		G		B	
MIN	MAX	MIN	MAX	MIN	MAX
1.6	2.5	2.8	4.0	2.8	3.9

## 6. White balance Color Rank

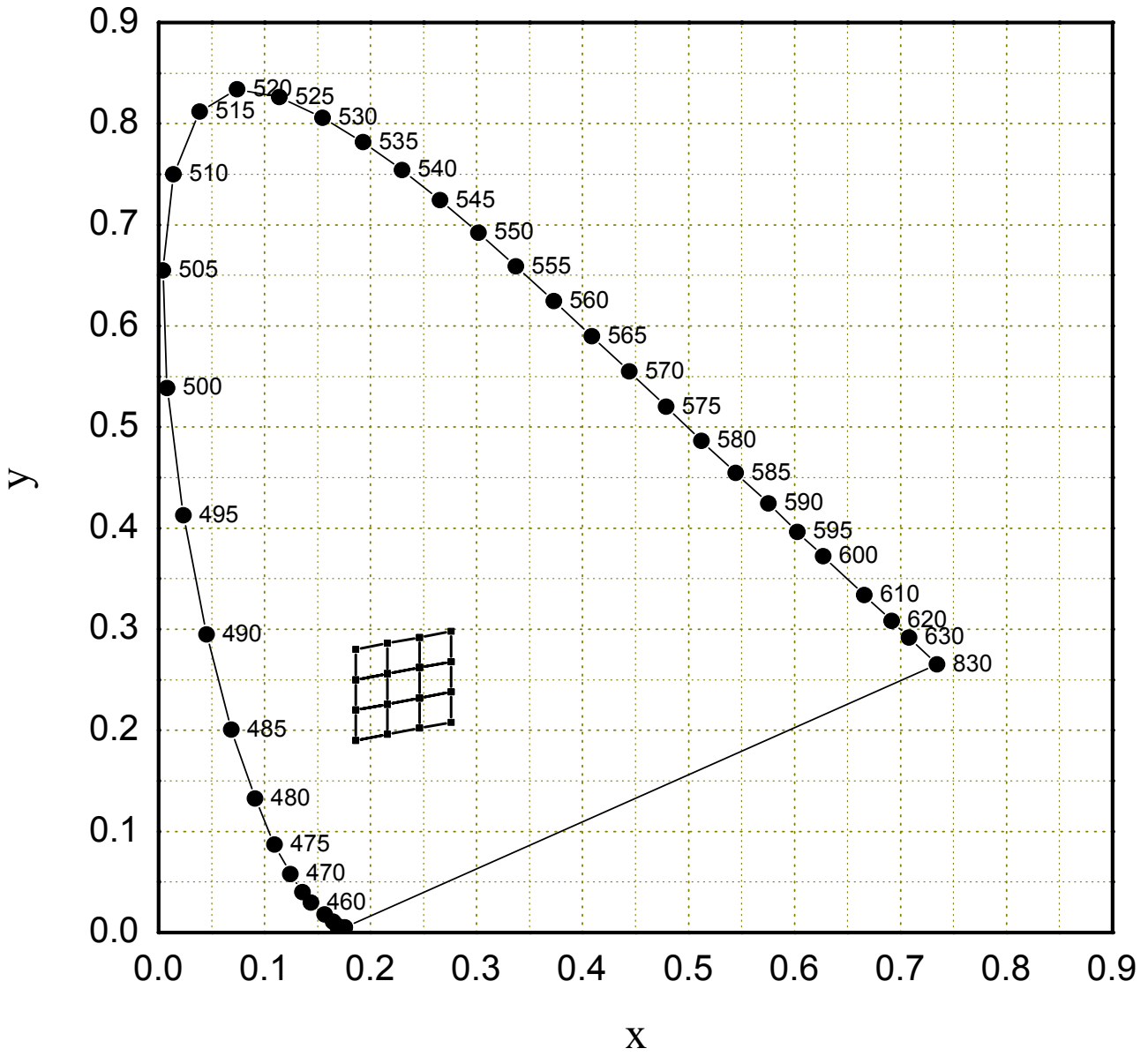
### ◆ Default Group (Select Group) : Bluish White

- Color Coordinates (typ.): x 0.231 , y 0.244
- IF Condition = 16mA for Red / 16mA for Green / 16mA for Blue
- Color Rank : a, b, c, d, e, f, g, h, i (9 BIN)
  - \*1Bin Cell Size : x0.03, y0.036
  - \*9Bin Total Cell Size : x0.09, y0.108



a		b		c		d		e	
x	y	x	y	x	y	x	y	x	y
0.186	0.190	0.216	0.196	0.246	0.202	0.246	0.232	0.216	0.226
0.216	0.196	0.246	0.202	0.276	0.208	0.276	0.238	0.246	0.232
0.216	0.226	0.246	0.232	0.276	0.238	0.276	0.268	0.246	0.262
0.186	0.220	0.216	0.226	0.246	0.232	0.246	0.262	0.216	0.256

f		g		h		i	
x	y	x	y	x	y	x	y
0.186	0.220	0.186	0.250	0.216	0.256	0.246	0.262
0.216	0.226	0.216	0.256	0.246	0.262	0.276	0.268
0.216	0.256	0.216	0.286	0.246	0.292	0.276	0.298
0.186	0.250	0.186	0.280	0.216	0.286	0.246	0.292



## 7. Rank Name Table

### 1) Special binning (White balance)

<b>X<sub>1</sub></b>	<b>X<sub>2</sub></b>	<b>X<sub>3</sub></b>	<b>X<sub>4</sub></b>
<b>Mix Iv</b>	<b>Mix Iv</b>	<b>Mix λd</b>	<b>W-Color Rank</b>

<b>Label Name</b>	<b>Rank Name</b>	<b>Label Name</b>	<b>Rank Name</b>	<b>Label Name</b>	<b>Rank Name</b>
<b>1</b>	<b>TNCa</b>	<b>10</b>	<b>TOCa</b>	<b>19</b>	<b>TPCa</b>
<b>2</b>	<b>TNCb</b>	<b>11</b>	<b>TOCb</b>	<b>20</b>	<b>TPCb</b>
<b>3</b>	<b>TNCc</b>	<b>12</b>	<b>TOCc</b>	<b>21</b>	<b>TPCc</b>
<b>4</b>	<b>TNCd</b>	<b>13</b>	<b>TOCd</b>	<b>22</b>	<b>TPCd</b>
<b>5</b>	<b>TNCe</b>	<b>14</b>	<b>TOCe</b>	<b>23</b>	<b>TPCe</b>
<b>6</b>	<b>TNCf</b>	<b>15</b>	<b>TOCf</b>	<b>24</b>	<b>TPCf</b>
<b>7</b>	<b>TNCg</b>	<b>16</b>	<b>TOCg</b>	<b>25</b>	<b>TPCg</b>
<b>8</b>	<b>TNCh</b>	<b>17</b>	<b>TOCh</b>	<b>26</b>	<b>TPCh</b>
<b>9</b>	<b>TNCi</b>	<b>18</b>	<b>TOCi</b>	<b>27</b>	<b>TPCi</b>

### 2) General binning (RGB balance binning)

<b>X<sub>1</sub></b>	<b>X<sub>2</sub></b>	<b>X<sub>3</sub></b>
<b>Mix Iv</b>	<b>Mix Iv</b>	<b>Mix λd</b>

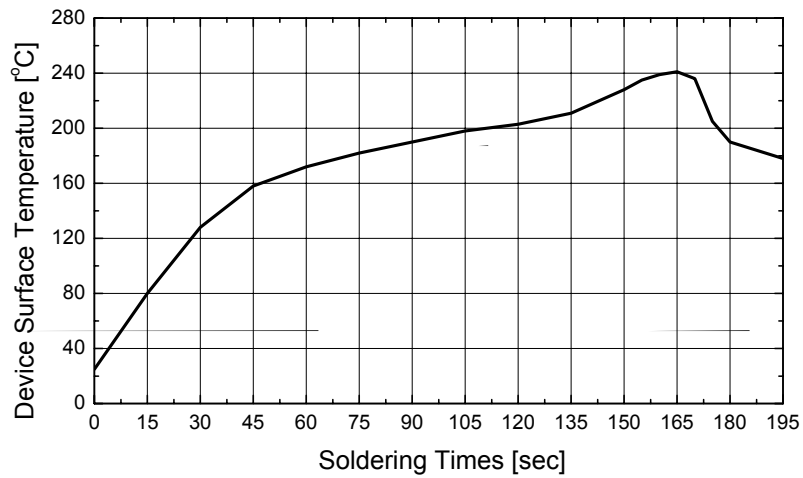
<b>Label Name</b>	<b>Rank Name</b>	<b>Label Name</b>	<b>Rank Name</b>	<b>Label Name</b>	<b>Rank Name</b>
<b>28</b>	<b>NNA</b>	<b>38</b>	<b>NNB</b>	<b>48</b>	<b>NNC</b>
<b>29</b>	<b>OOA</b>	<b>39</b>	<b>OOB</b>	<b>49</b>	<b>OOC</b>
<b>30</b>	<b>PPA</b>	<b>40</b>	<b>PPB</b>	<b>50</b>	<b>PPC</b>
<b>31</b>	<b>NOA</b>	<b>41</b>	<b>NOB</b>	<b>51</b>	<b>NOC</b>
<b>32</b>	<b>ONA</b>	<b>42</b>	<b>ONB</b>	<b>52</b>	<b>ONC</b>
<b>33</b>	<b>OPA</b>	<b>43</b>	<b>OPB</b>	<b>53</b>	<b>OPC</b>
<b>34</b>	<b>POA</b>	<b>44</b>	<b>POB</b>	<b>54</b>	<b>POC</b>
<b>35</b>	<b>NPA</b>	<b>45</b>	<b>NPB</b>	<b>55</b>	<b>NPC</b>
<b>36</b>	<b>PNA</b>	<b>46</b>	<b>PNB</b>	<b>56</b>	<b>PNC</b>
<b>37</b>	<b>XXA</b>	<b>47</b>	<b>XXB</b>	<b>57</b>	<b>XXC</b>

## 8. Soldering Profile

### (1) Reflow Soldering Conditions / Profile

~~Preliminary heat to be at maximum 210°C for maximum 2 minutes.~~

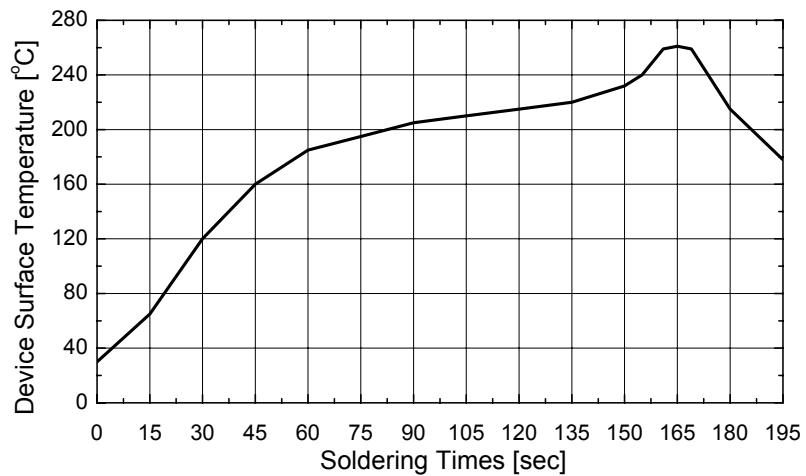
Soldering heat to be at maximum 240°C for maximum 10 seconds.



## (2) Lead-free solder

Preliminary heating to be at maximum 220°C for maximum 2 minutes.

Soldering heat to be at maximum 260°C for maximum 10 seconds.



## (3) Hand Soldering conditions

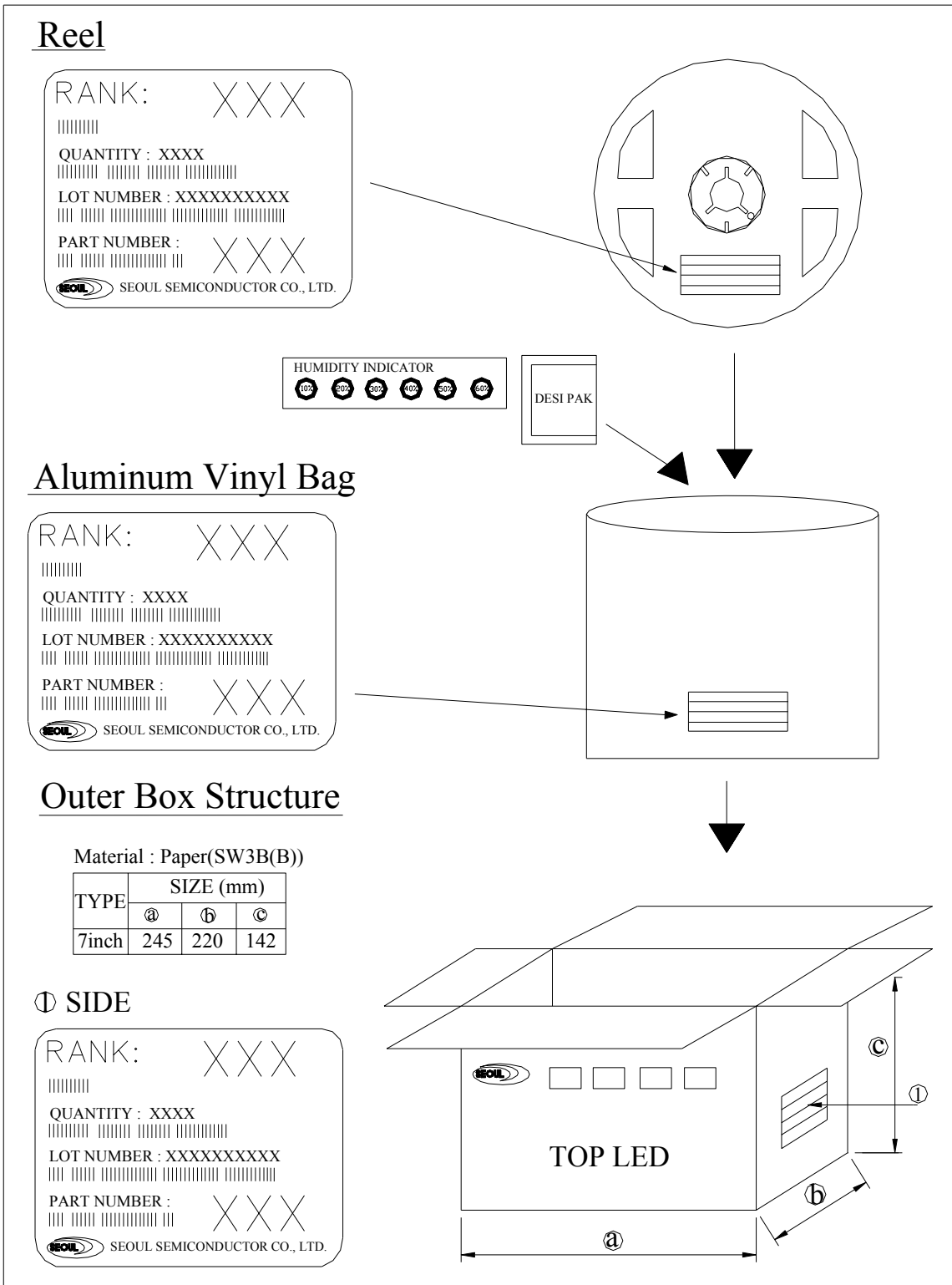
Do not exceed 3 seconds at maximum 300°C under soldering iron.

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





## 11. Reel Packing Structure



## 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 65%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;

a. After opened and mounted the soldering shall be quickly.

b. Keeping of a fraction

Temperature : 5 ~ 40°C Humidity : less than 30%

(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±5°C.

(4) In the case of that the components is humided, the components shall be dried;

24Hr at 80±5°C or 12Hr at 100±5°C.

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

(6) Quick cooling shall be avoided.

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

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

(9) 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.

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

(11) LEDs must be stored to maintain a clean atmosphere. If the LEDs are stored for 3 months or more after being shipped from SSC, a sealed container with a nitrogen atmosphere should be used for storage.

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

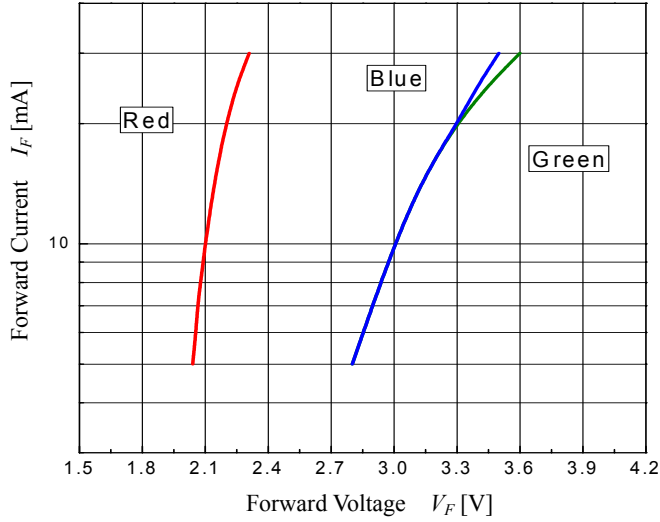
(13) Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.

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

### 13. Characteristic Diagram

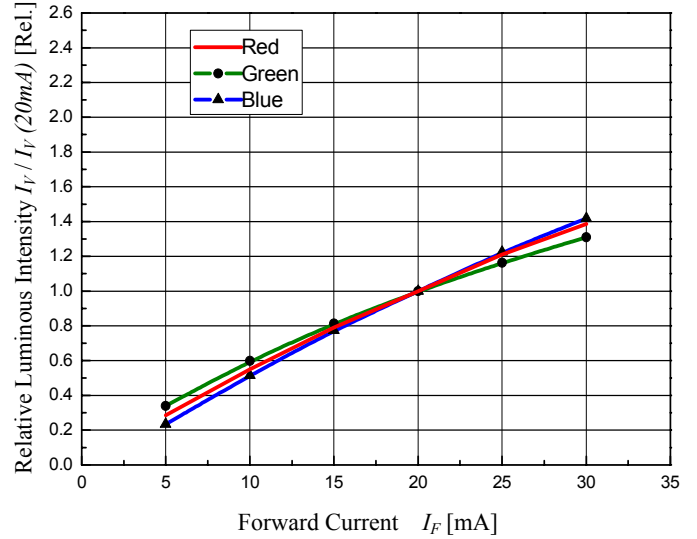
Forward Current vs. Forward Voltage

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

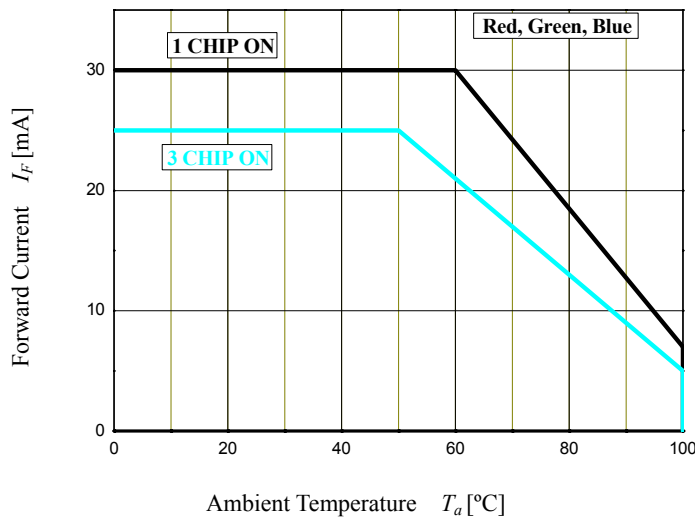


Relative Luminous Intensity vs. Forward Current

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



Forward Current Derating Curve



Radiation Diagram

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

