

## Technical Data Sheet

### Top View LEDs

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#### 45-21SCUM2C/L1720NE6/TR8-T

#### Features

- Top view white LED
- High luminous flux output
- High current capability
- White package
- Wide viewing angle
- Pb-free
- ESD protection
- The product itself will remain within RoHS compliant version.



#### Descriptions

- Due to the package design, 45-21Shas wide viewing angle, and white LEDs are devices which are materialized by combing blue chip and special phosphor. This feature makes the LED ideal for light guide application.

#### Applications

- Backlight for LCD Monitor/TV
- Light pipe application
- Indicator and backlight in office and family equipment
- General use

#### Device Selection Guide

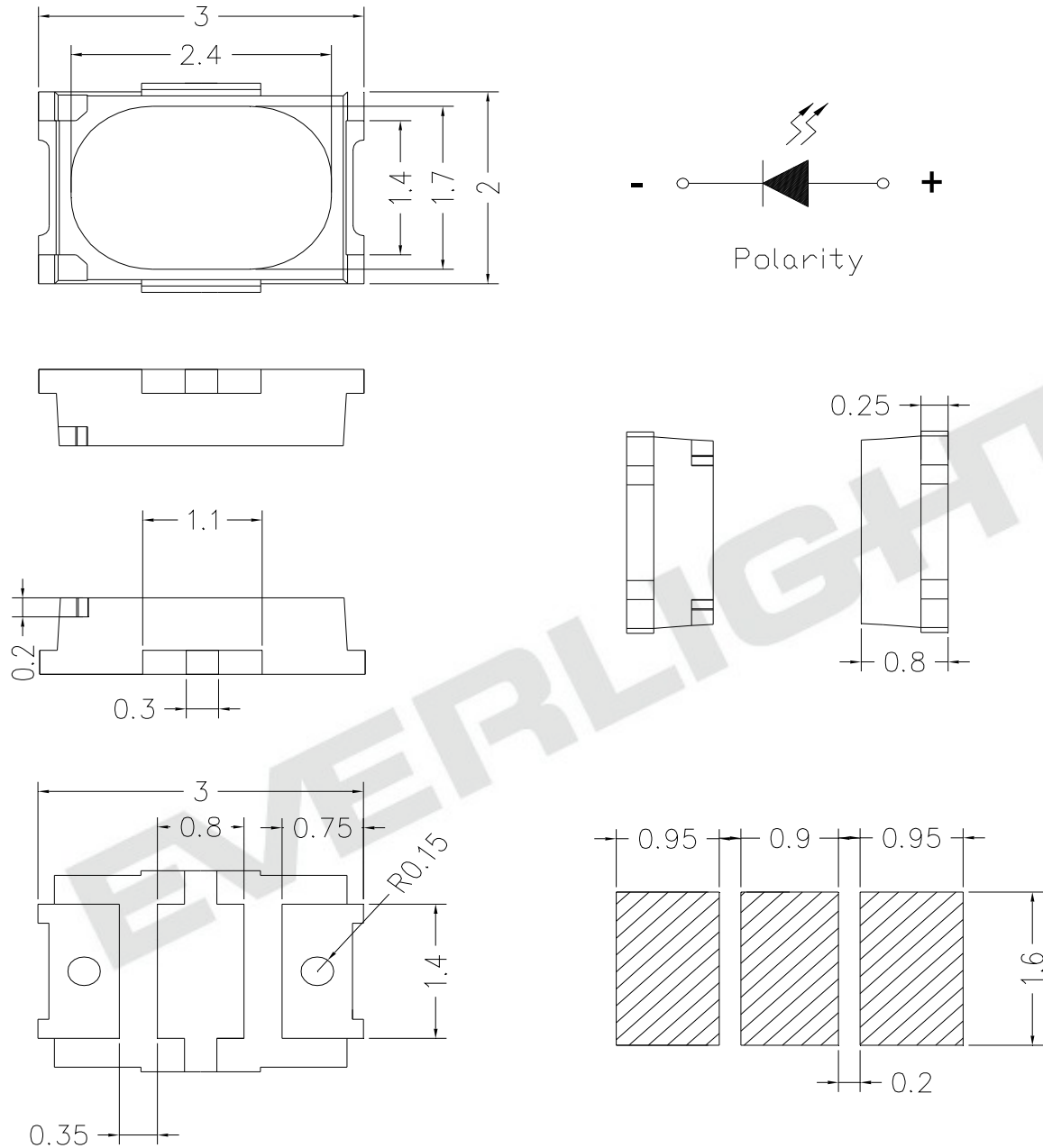
Chip	Emitted Color	Resin Color
Material		
InGaN	Cold White	Water Clear

**Technical Data Sheet**

**Top View LEDs**

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**Package Outline Dimensions**



**Note:** The tolerance unless mentioned is  $\pm 0.1$ , unit = mm.

**Technical Data Sheet**

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**Absolute Maximum Ratings (Ta=25 )**

Parameter	Symbol	Rating	Unit
Reverse Voltage	V <sub>R</sub>	5	V
Forward Current	I <sub>F</sub>	80	mA
Pulse Forward Current (Duty 1/10 @1KHz)	I <sub>FP</sub>	240	mA
Power Dissipation	P <sub>d</sub>	280	mW
Electrostatic Discharge(HBM)* <sup>1</sup>	ESD	2000	V
LED Junction Temperature	T <sub>j</sub>	115	
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	
Storage Temperature	T <sub>stg</sub>	-40 ~ +90	
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering: 260 for 10sec. Hand Soldering: 350 for 3sec.	

**Electro-Optical Characteristics (Ta=25 )**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	Φ	17	---	21	lm	I <sub>F</sub> =60mA
Viewing Angle	2θ <sub>1/2</sub>	---	120	---	deg	I <sub>F</sub> =60 mA
Forward Voltage	V <sub>F</sub>	2.95	---	3.45	V	I <sub>F</sub> =60 mA
Reverse Current	I <sub>R</sub>	---	---	50	uA	V <sub>R</sub> =5V

**Notes:**

1. Tolerance of Luminous Flux: ±7%
2. Tolerance of Forward Voltage: ±0.05V

## Technical Data Sheet

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#### 45-21SCUM2C/L1720NE6/TR8-T

#### Bin Range of Luminous Flux

Bin Code	Min.	Max.	Unit	Condition
17	17	18	lm	I <sub>F</sub> =60mA
18	18	19		
19	19	20		
20	20	21		

**Note:** Tolerance of Luminous Flux:  $\pm 7\%$

#### Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
6-1	2.95	3.05	volt	I <sub>F</sub> =60mA
6-2	3.05	3.15		
7-1	3.15	3.25		
7-2	3.25	3.35		
8-1	3.35	3.45		

**Note:** Tolerance of Forward Voltage:  $\pm 0.05V$

**Technical Data Sheet**

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**Chromaticity Coordinates Bin Code**

Bin code	CIE_x	CIE_y	Bin code	CIE_x	CIE_y	Condition
NA0-3-2	0.2805	0.2600	NA0-3-4	0.2840	0.2550	I <sub>F</sub> =60mA
	0.2770	0.2650		0.2805	0.2600	
	0.2820	0.2720		0.2850	0.2670	
	0.2850	0.2670		0.2880	0.2620	
NA0-4-1	0.2850	0.2670	NA0-4-2	0.2893	0.2743	
	0.2820	0.2720		0.2865	0.2795	
	0.2865	0.2795		0.2910	0.2870	
	0.2893	0.2743		0.2935	0.2815	
NA0-4-3	0.2880	0.2620	NA0-4-4	0.2920	0.2690	
	0.2850	0.2670		0.2893	0.2743	
	0.2893	0.2743		0.2935	0.2815	
	0.2920	0.2690		0.2960	0.2760	
NB5-3-1	0.2935	0.2815	NB5-3-2	0.2975	0.2885	
	0.2910	0.2870		0.2950	0.2940	
	0.2950	0.2940		0.2990	0.3010	
	0.2975	0.2885		0.3015	0.2955	
NB5-3-3	0.2960	0.2760	NB5-3-4	0.3000	0.2830	
	0.2935	0.2815		0.2975	0.2885	
	0.2975	0.2885		0.3015	0.2955	
	0.3000	0.2830		0.3040	0.2900	

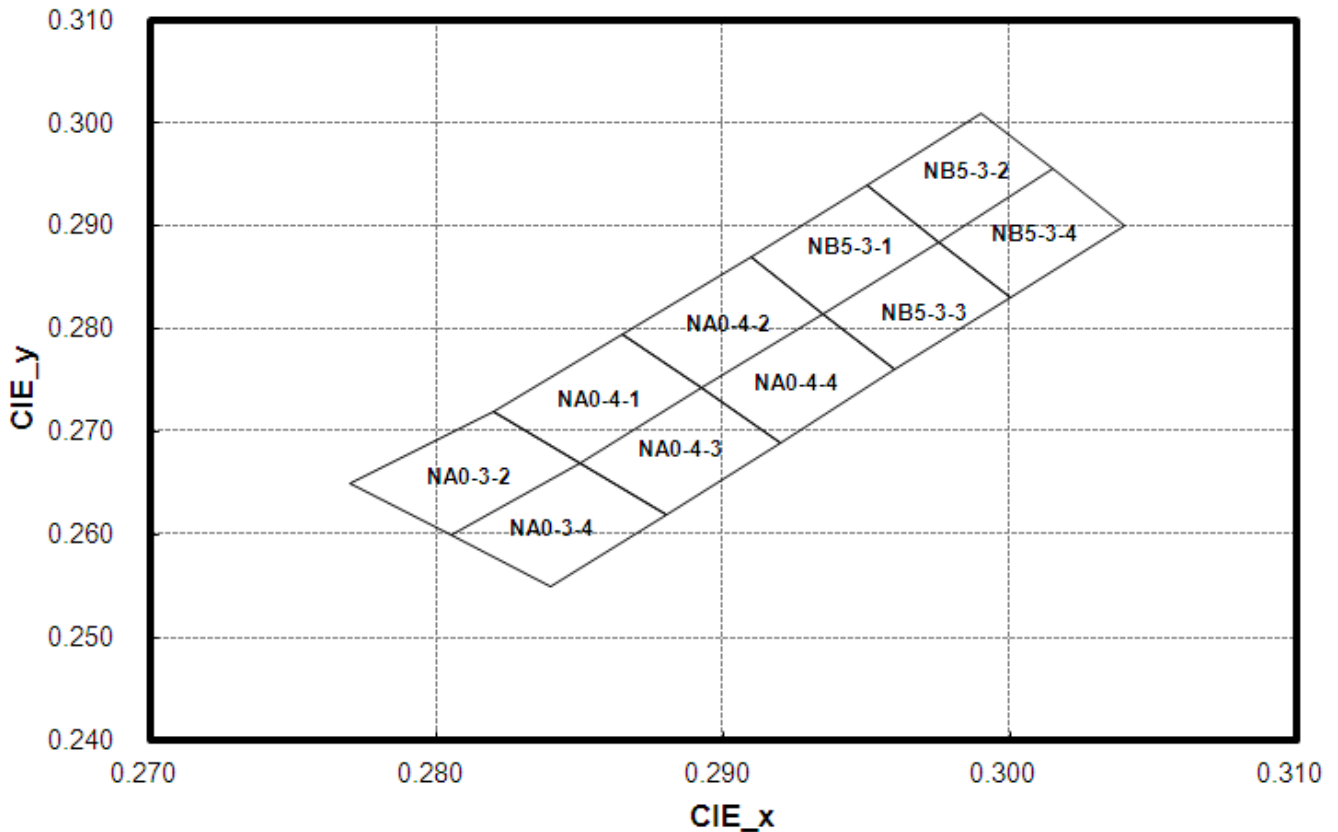
**Note:** Tolerance of Chromaticity Coordinates: ±0.005

**Technical Data Sheet**

**Top View LEDs**

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**The C.I.E. 1931 Chromaticity Diagram**



**Technical Data Sheet**

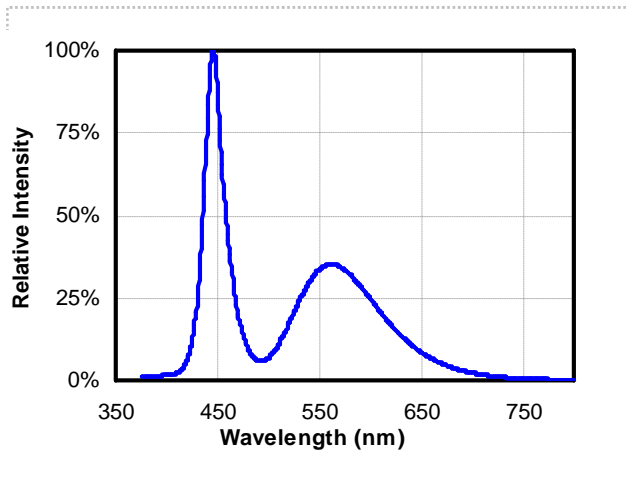
**Top View LEDs**

**45-21SCUM2C/L1720NE6/TR8-T**

**Typical Electro-Optical-Thermal Characteristics Curves**

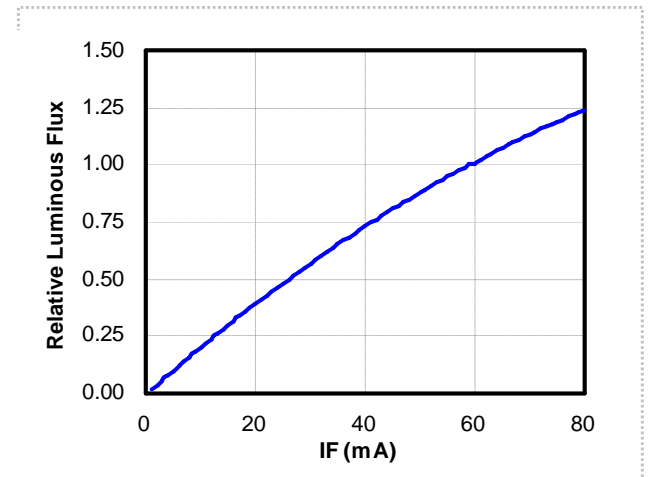
1. Spectrum Distribution

( $T_A=25^\circ\text{C}$ ,  $I_F=60\text{mA}$ )



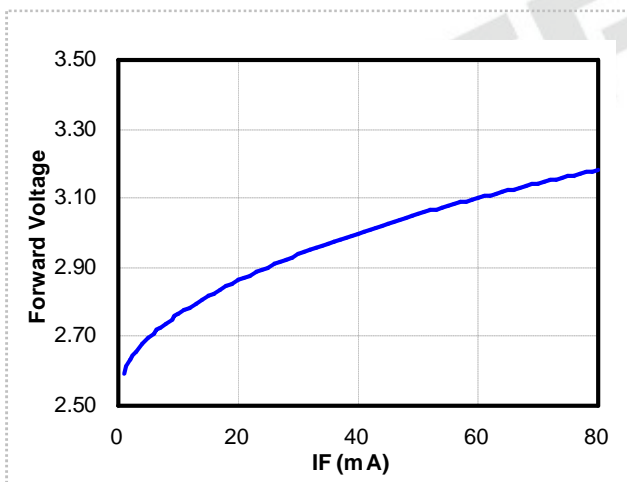
2. Relative Luminous Flux vs. Forward Current

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



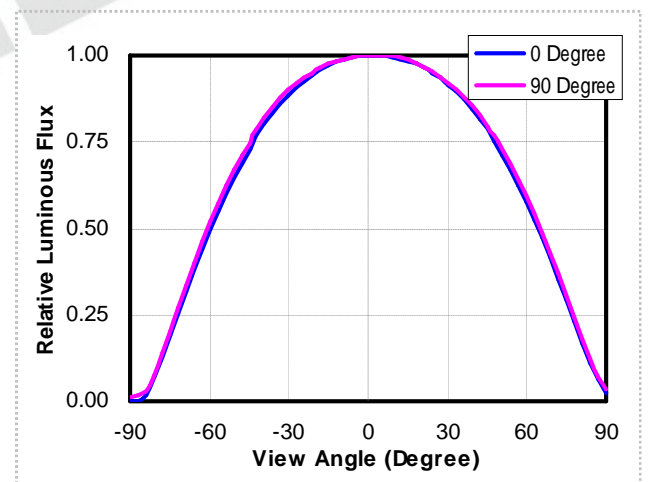
3. Relative Forward Voltage vs. Forward Current

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



4. Radiation Diagram

( $T_A=25^\circ\text{C}$ ,  $I_F=60\text{mA}$ )



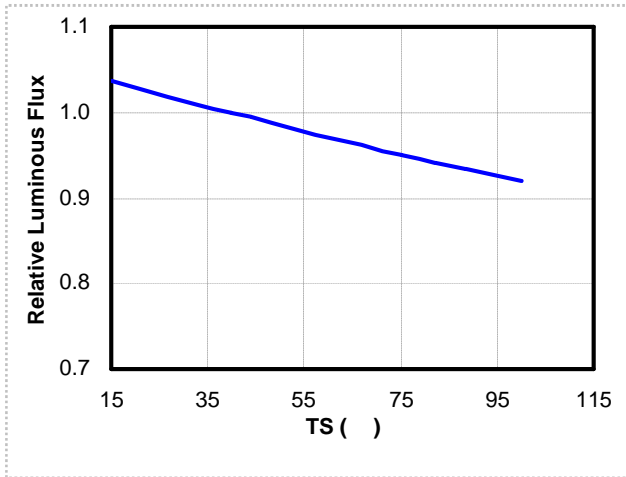
**Technical Data Sheet**

**Top View LEDs**

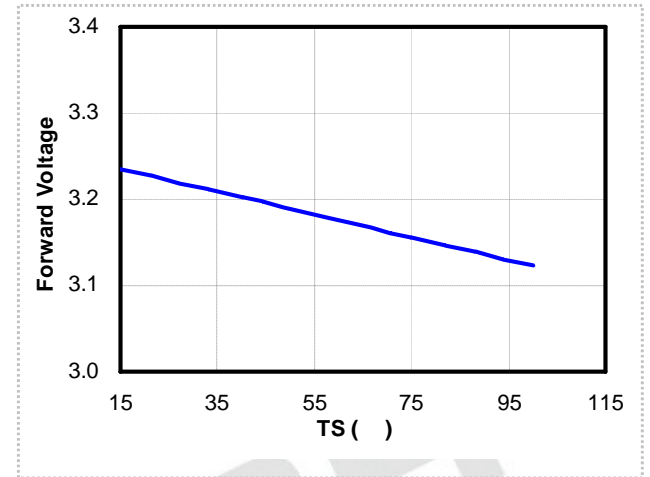
**45-21SCUM2C/L1720NE6/TR8-T**

**Typical Electro-Optical-Thermal Characteristics Curves**

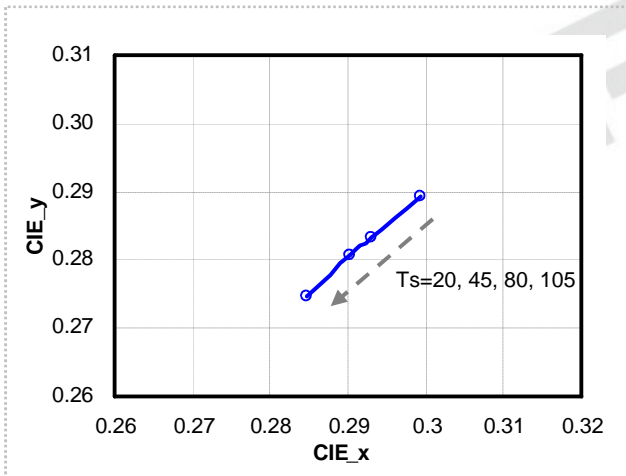
5. Relative Luminous Flux vs.  $T_s$  ( $I_F=60mA$ )



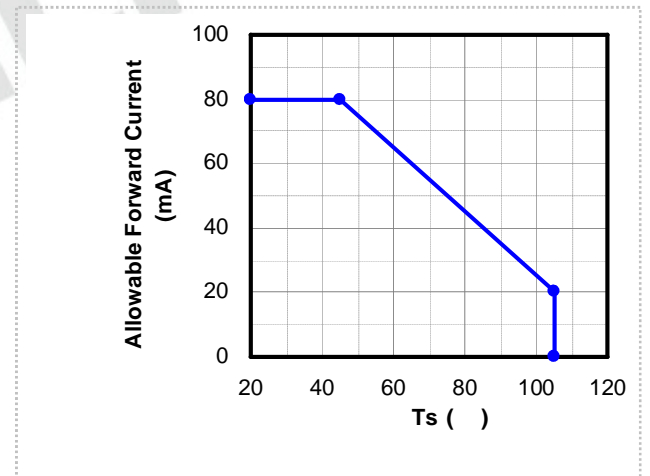
6. Forward Voltage vs.  $T_s$  ( $I_F=60mA$ )



7. Chromaticity Coordinates vs.  $T_s$  ( $I_F=60mA$ )



8. Forward Current De-rating Curve





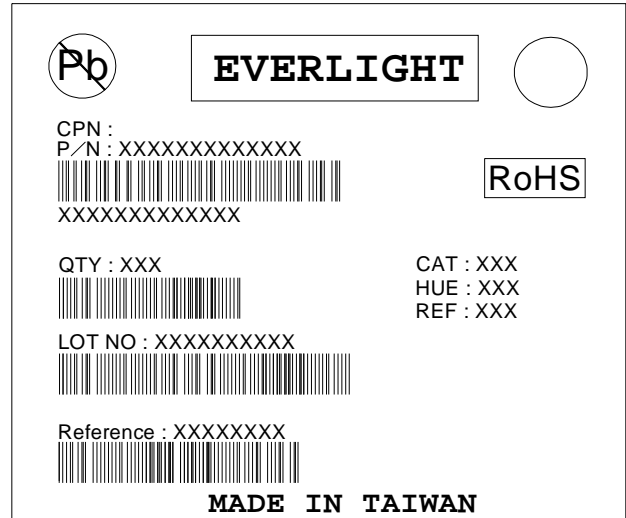
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### Top View LEDs

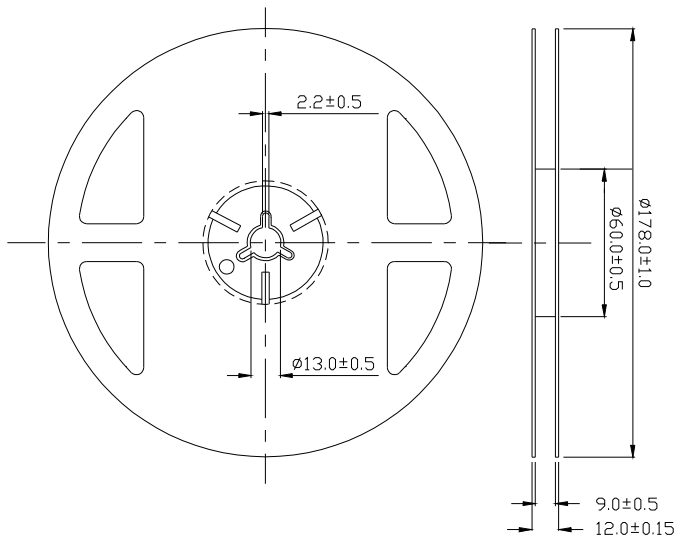
### 45-21SCUM2C/L1720NE6/TR8-T

#### Label Explanation

CAT: Luminous Flux Rank  
 HUE: Chromaticity Coordinates  
 REF: Forward Voltage Rank



#### Reel Dimensions



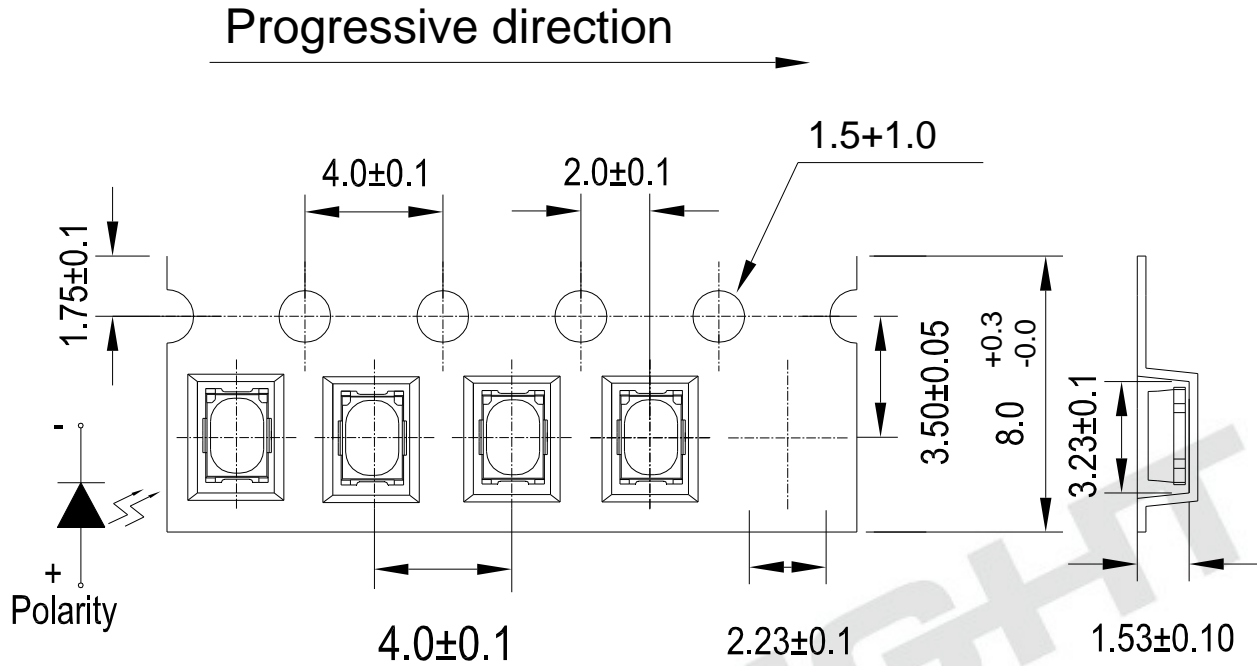
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**Top View LEDs**

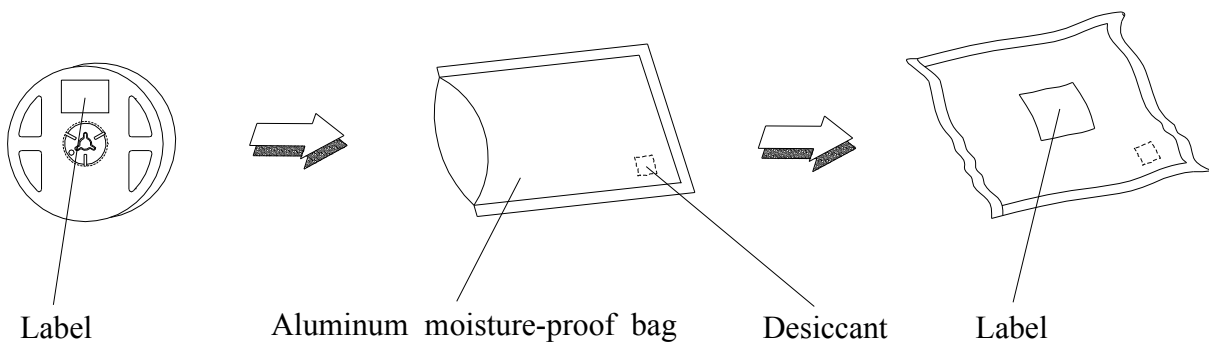
**45-21SCUM2C/L1720NE6/TR8-T**

**Carrier Tape Dimensions: Loaded Quantity 2000 , 1000 , 500 , 250 pcs Per Reel**



**Note:** The tolerance unless mentioned is  $\pm 0.1$ , unit = mm.

**Moisture Resistant Packaging**



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#### Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

No.	Item	Test Conition		Test Hours/ Times	Criteria (at std. IF)
		Temp./ Humidity	IF (mA)		
1	Reflow Soldering	Temp.: 260 ±5 Max. 10 sec.		2 times	Iv < ±10% VF < ±10%
2	Thermal Cycle	-40 ~ 100 30min. (5min.) 30min.		200 cycles	Iv > 70%, VF < 110%,
3	Thermal Shock	-10 ~ 100 20min. (<15sec.) 20min.		200 cycles	
4	Low Temp. Storage	TA=-40	--	1000 hrs	
5	High Temp. Storage	TA=100	--	1000 hrs	
6	Temp. Humidity Storage	TA=60 / 90%RH	--	1000 hrs	
7	Steady State Operating Life of Low Temp.	TA=-40	60	1000 hrs	
8	Steady State Operating Life Condition 1	TA=25 / Room Hum.	60	1000 hrs	
9	Steady State Operating Life Condition 2	TA=60	60	1000 hrs	
10	Steady State Operating Life of High Temp.	TA=85	20	1000 hrs	
11	Steady State Operating Life of High Humidity Heat	TA=60 / 90%RH	60	1000 hrs	

**Sampling for each test item: 22 (pcs.)**

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**Top View LEDs**

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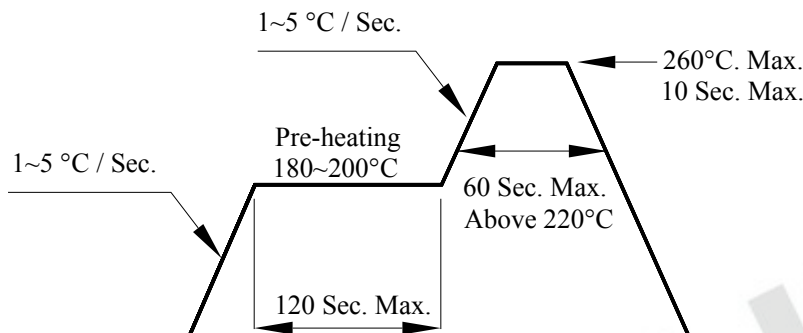
**Precautions for Use**

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change ( Burn out will happen ).

2. Soldering Condition

2.1 Pb-free solder temperature profile



2.2 Reflow soldering should not be done more than two times.

2.3 When soldering, do not put stress on the LEDs during heating.

2.4 After soldering, do not warp the circuit board.

**Technical Data Sheet**

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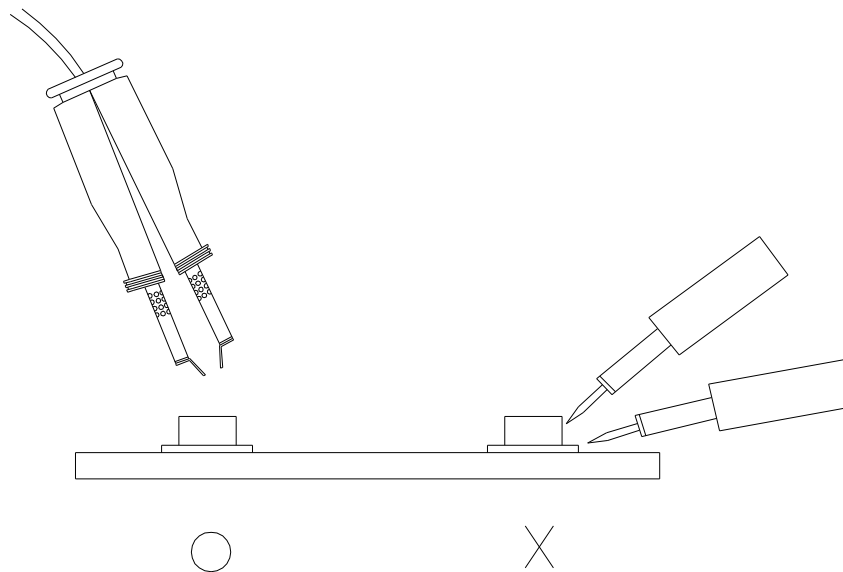
**45-21SCUM2C/L1720NE6/TR8-T**

3. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350 for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

4. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



5. Handling Indications

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 compou

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