

**Technical Data Sheet****Top View LEDs****45-21/GHC-HV2W2G/2T****Features**

- P-LCC-2 package.
- White package.
- Optical indicator.
- Colorless clear window.
- Wide viewing angle.
- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes.
- Computable with automatic placement equipment.
- Available on tape and reel (8mm Tape).
- Pb-free.
- The product itself will remain within RoHS compliant version.

**Descriptions**

- Due to the package design, 45-11 has wide viewing angle , low power consumption and white LEDs are devices which are materialized by combing Blue LEDs and special phosphors . This feature makes the LED ideal for light guide application.

**Applications**

- LCD Back Light.
- Mobile phones .
- Indicators.
- Illuminations.
- Switch Lights.

**Device Selection Guide**

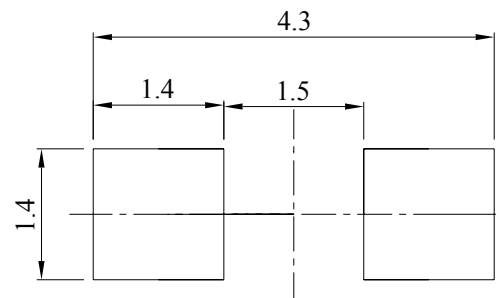
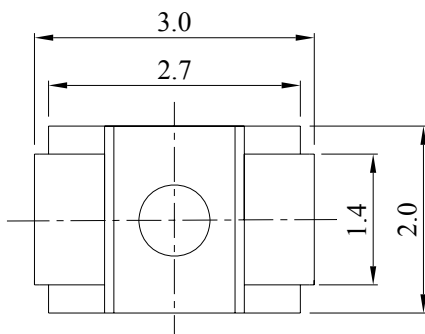
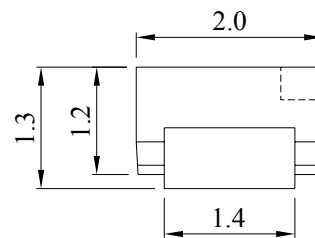
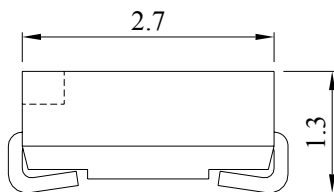
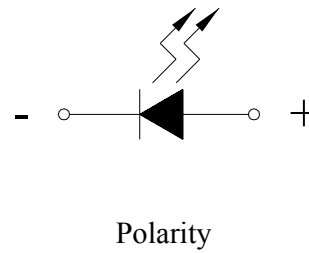
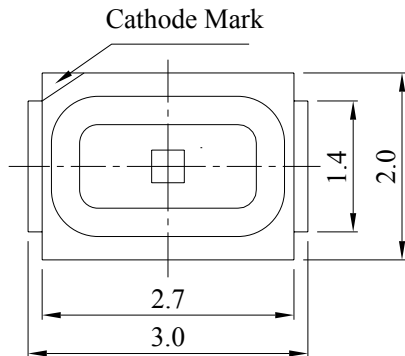
Chip	Emitted Color	Resin Color
Material		
InGaN	Brilliant Green	Water Clear

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Top View LEDs

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Package Outline Dimensions



Recommended soldering pad design

**Note:** The tolerances unless mentioned is:  $\pm 0.1\text{mm}$ ; Unit = mm

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

Parameter	Symbol	Rating	Unit
Reverse Voltage	$V_R$	5	V
Forward Current	$I_F$	30	mA
Peak Forward Current (Duty 1/10 @1KHz)	$I_{FP}$	100	mA
Power Dissipation	$P_d$	120	mW
Electrostatic Discharge(HBM)	ESD	2000	V
Operating Temperature	$T_{opr}$	-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +90	°C
Soldering Temperature	$T_{sol}$	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	$I_V$	900	-----	1800	mcd	$I_F=20mA$
Viewing Angle	2θ1/2	-----	120	-----	deg	$I_F=20mA$
Peak Wavelength	$\lambda_p$	-----	518	-----	nm	$I_F=20mA$
Dominant Wavelength	$\lambda_d$	525.0	-----	535.0	nm	$I_F=20mA$
Spectrum Radiation Bandwidth	$\Delta\lambda$	-----	35	-----	nm	$I_F=20mA$
Forward Voltage	$V_F$	2.70	-----	3.70	V	$I_F=20mA$
Reverse Current	$I_R$	-----	-----	50	μA	$V_R=5V$

**Notes:**

- 1.Tolerance of Luminous Intensity: ±11%
- 2.Tolerance of Dominant Wavelength: ±1nm
- 3.Tolerance of Forward Voltage: ±0.1V

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**Bin Range of Luminous Intensity**

Bin Code	Min.	Max.	Unit	Condition
V2	900	1120	mcd	I <sub>F</sub> =20mA
W1	1120	1420		
W2	1400	1800		

**Bin Range of Dom. Wavelength**

Group	Bin Code	Min.	Max.	Unit	Condition
H	Y	525.0	530.0	nm	I <sub>F</sub> =20mA
	Z	530.0	535.0		

**Bin Range of Forward Voltage**

Group	Bin Code	Min	Max	Unit	Condition
G	34	2.70	2.80	V	I <sub>F</sub> =20mA
	35	2.80	2.90		
	36	2.90	3.00		
	37	3.00	3.10		
	38	3.10	3.20		
	39	3.20	3.30		
	40	3.30	3.40		
	41	3.40	3.50		
	42	3.50	3.60		
	43	3.60	3.70		

**Notes:**

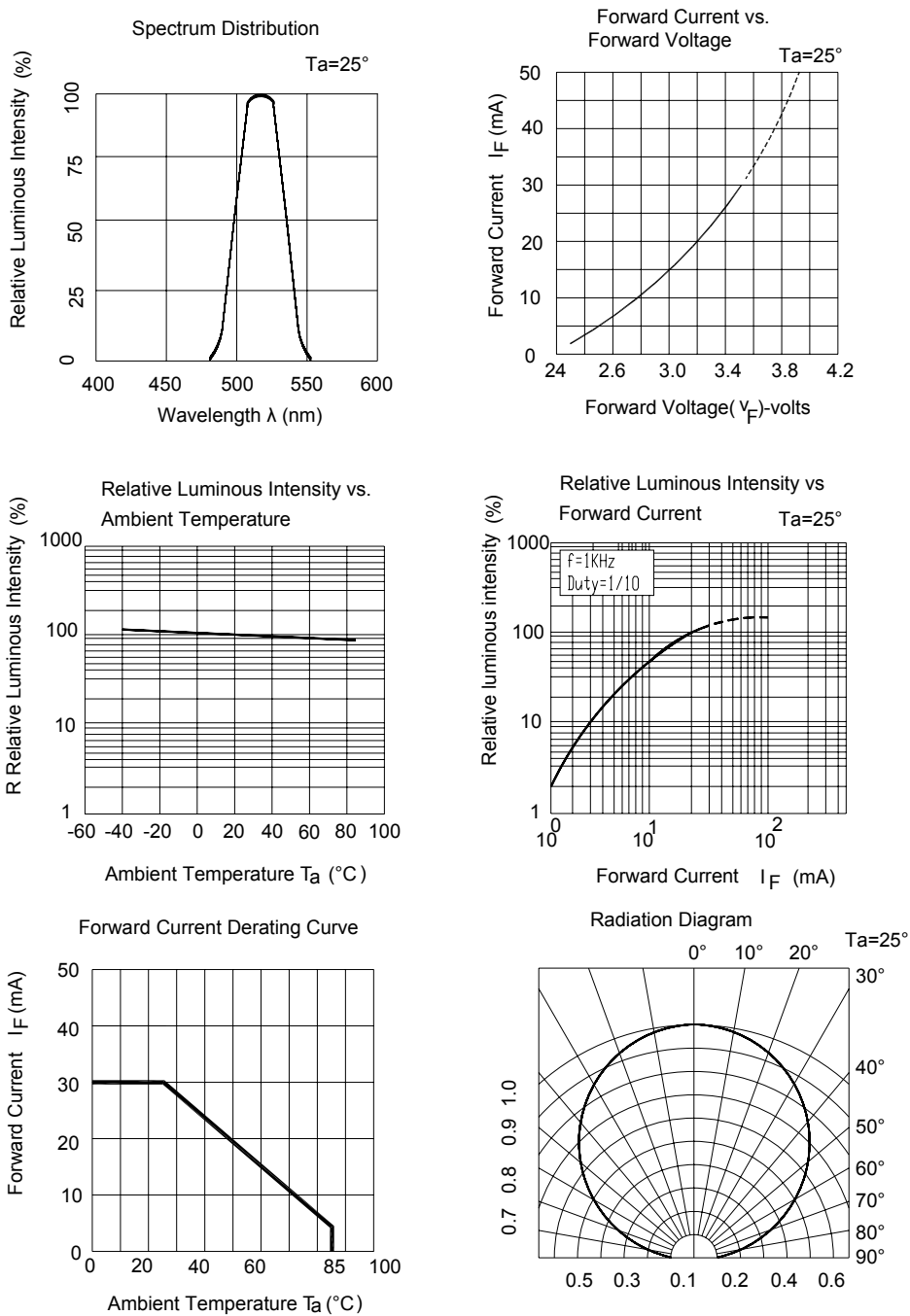
- 1.Tolerance of Luminous Intensity: ±11%
- 2.Tolerance of Dominant Wavelength: ±1nm
- 3.Tolerance of Forward Voltage: ±0.1V

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Top View LEDs

**45-21/GHC-HV2W2G/2T**

Typical Electro-Optical Characteristics Curves





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Top View LEDs

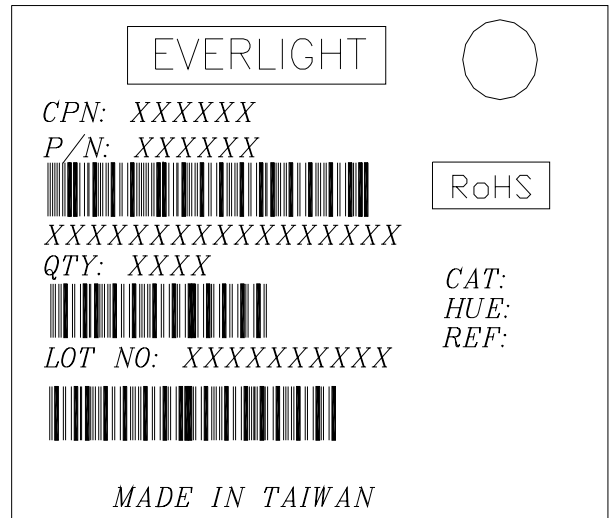
**45-21/GHC-HV2W2G/2T**

**Label Explanation**

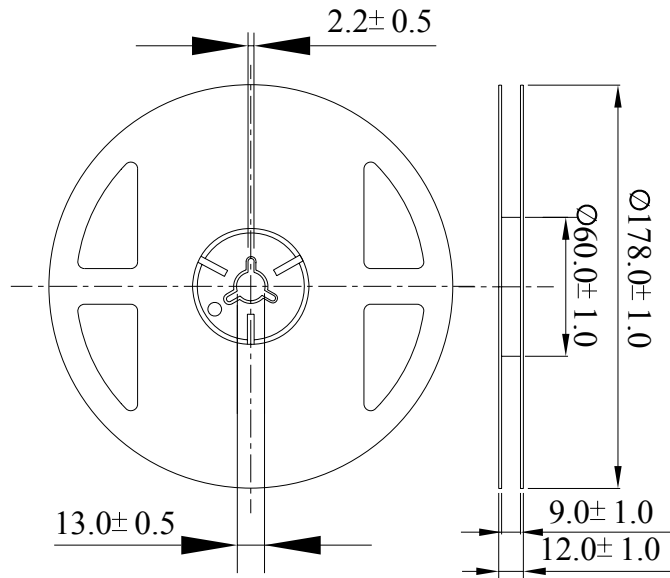
CAT: Luminous Intensity Rank

HUE: Chromaticity Coordinates

REF: Forward Voltage Rank



**Reel Dimensions**



**Note:**

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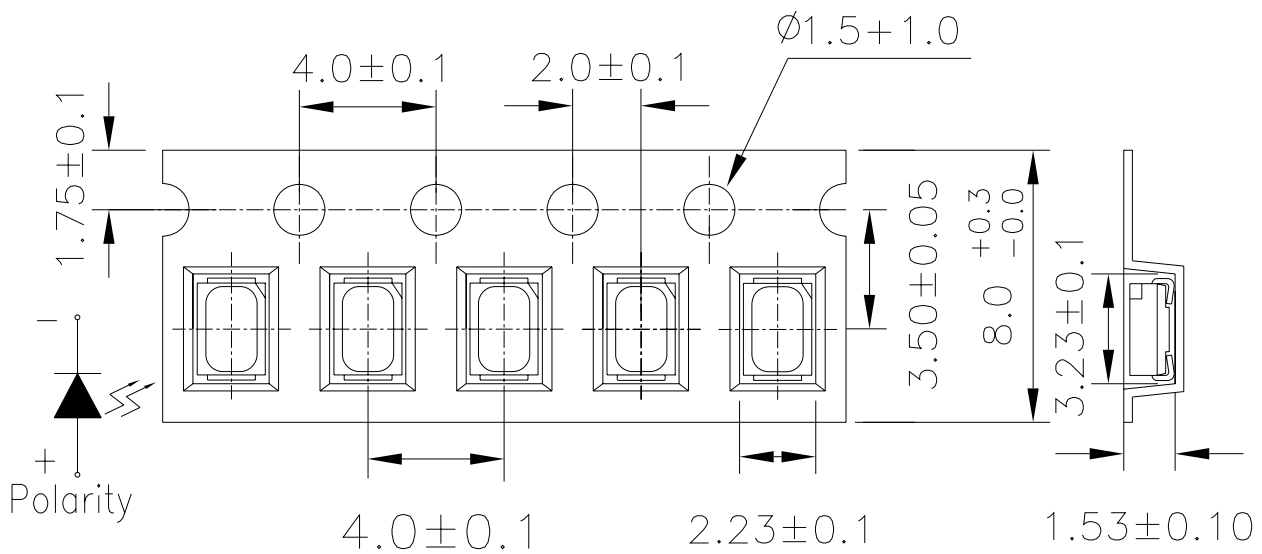
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Top View LEDs

**45-21/GHC-HV2W2G/2T**

Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel

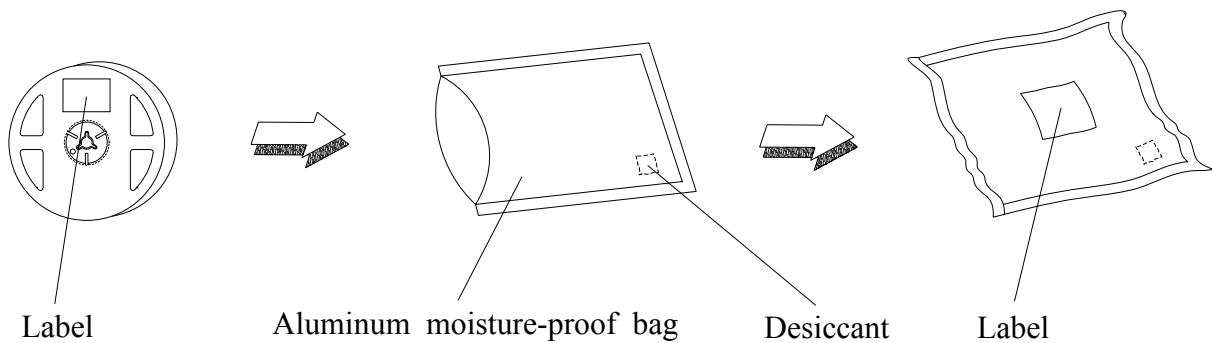
Progressive direction



**Note:**

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**Moisture Resistant Packaging**



**Technical Data Sheet****Top View LEDs****45-21/GHC-HV2W2G/2T****Reliability Test Items And Conditions**

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

Confidence level : 90%

LTPD : 10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260°C±5°C Min. 5 sec.	6 Min.	22 PCS	0/1
2	Temperature Cycle	H : +100°C 15min ∫ 5 min L : -40°C 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100°C 5min ∫ 10 sec L : -10°C 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100°C	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40°C	1000 Hrs.	22 PCS.	0/1
6	DC Operating Life	I <sub>F</sub> = 20 mA / 25°C	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85°C/85%RH	1000 Hrs.	22 PCS.	0/1



**Technical Data Sheet****Top View LEDs****45-21/GHC-HV2W2G/2T****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. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

2.3 After opening the package: The LED's floor life is 1 year under 30°C or less and 60% RH or less.

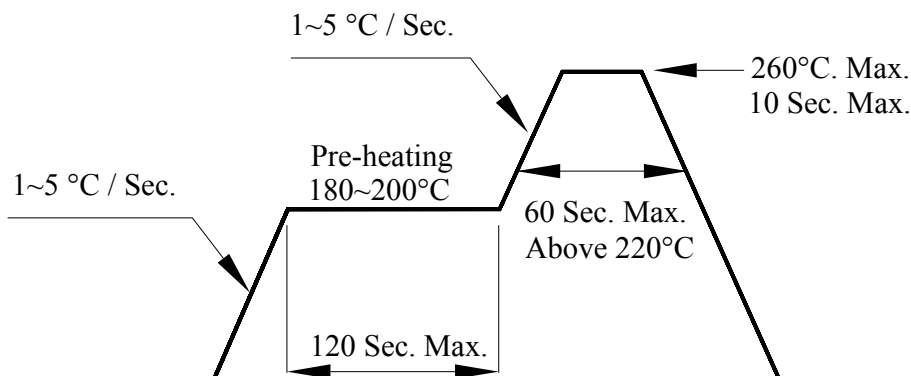
If unused LEDs remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment : 60±5°C for 24 hours.

## 3. Soldering Condition

## 3.1 Pb-free solder temperature profile



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

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

3.4 After soldering, do not warp the circuit board.

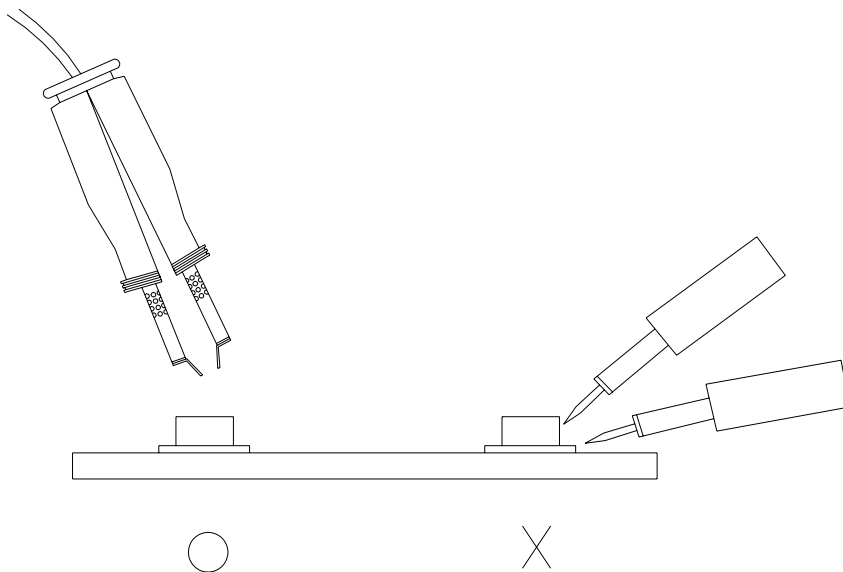
## 4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C 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.

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## 5. 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.



## 6. 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 compound

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