

Technical Data Sheet

Top View LEDs

45-21/KK2C-BX50702C4CB2/2T

Features

- Top view white LEDs
- White SMT package.
- Lead frame package with individual 2 pins.
- Wide viewing angle.
- Soldering methods: IR reflow soldering.
- Pb-free.
- The product itself will remain within RoHS compliant version.



Descriptions

- Due to the package design, 45-21 has wide viewing angle, low power consumption and white LEDs are devices which are materialized by combining 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

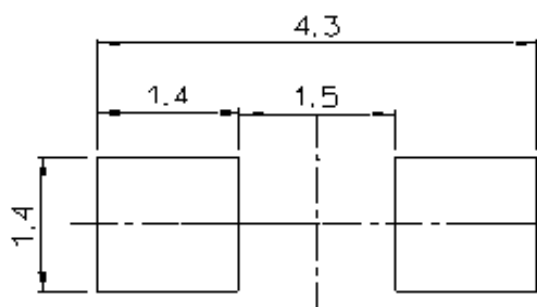
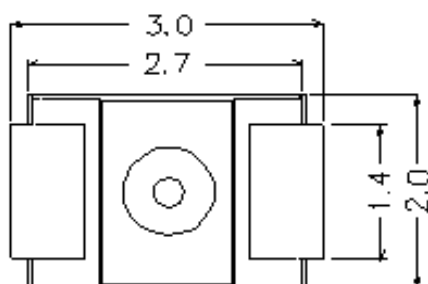
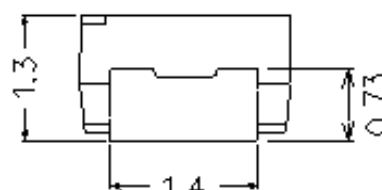
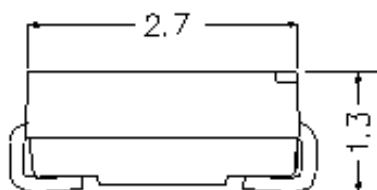
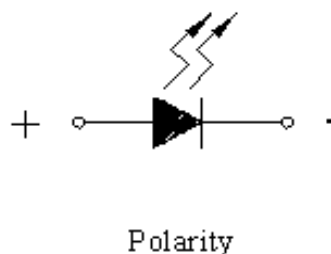
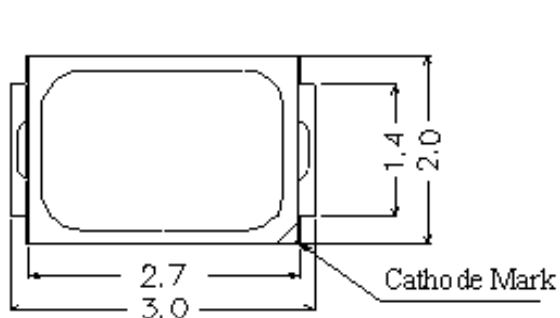
Chip	Emitted Color	Resin Color
Material		
InGaN	White	Water Clear

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Package Outline Dimensions



Recommended soldering pad design

Note: 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	110	mW
Electrostatic Discharge(HBM)	ESD	1000	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.	

Note: The products are sensitive to static electricity and must be carefully taken when handling products.

Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I _v	2000	-----	2400	mcd	I _F =20mA
Viewing Angle	2θ _{1/2}	---	120	---	deg	I _F =20mA
Forward Voltage	V _F	2.9	-----	3.6	V	I _F =20mA
Reverse Current	I _R	---	---	50	μA	V _R =5V
Color Rendering Index	Ra	80	----	----	----	I _F =20mA

Notes:

1. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Forward Voltage: ±0.05V
3. Tolerance Color Rendering Index : ± 2

**Technical Data Sheet****Top View LEDs****45-21/KK2C-BX50702C4CB2/2T****Bin Range of Luminous Intensity**

Bin Code	Min.	Max.	Unit	Conduction
2C	2000	2200	mcd	$I_F=20\text{mA}$
4C	2200	2400		

Bin Range of Forward Voltage

Group	Bin Code	Min.	Max.	Unit	Condition
B2	36	2.9	3.0	V	$I_F=20\text{mA}$
	37	3.0	3.1		
	38	3.1	3.2		
	39	3.2	3.3		
	40	3.3	3.4		
	41	3.4	3.5		
	42	3.5	3.6		

Notes:

1. Tolerance of Luminous Intensity: $\pm 11\%$
2. Tolerance of Forward Voltage: $\pm 0.05\text{V}$

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Bin Range of Chromaticity Coordinates

 $I_F=20\text{mA}$

CCT	Bin Code	CIE_x	CIE_y	CCT	Bin Code	CIE_x	CIE_y
5650K~ 6300K	W5	0.3148	0.3444	5000K~ 5650K	V5	0.3288	0.3569
		0.3288	0.3569			0.3469	0.3717
		0.3290	0.3451			0.3458	0.3592
		0.3160	0.3332			0.3290	0.3451
	W6	0.3160	0.3332		V6	0.3290	0.3451
		0.3290	0.3451			0.3458	0.3592
		0.3292	0.3313			0.3444	0.3442
		0.3175	0.3204			0.3292	0.3313

CCT	Bin Code	CIE_x	CIE_y
7000K ~6300K	X5	0.3031	0.3327
		0.3148	0.3444
		0.3160	0.3332
		0.3052	0.3224
	X6	0.3052	0.3224
		0.3160	0.3332
		0.3175	0.3204
		0.3076	0.3108

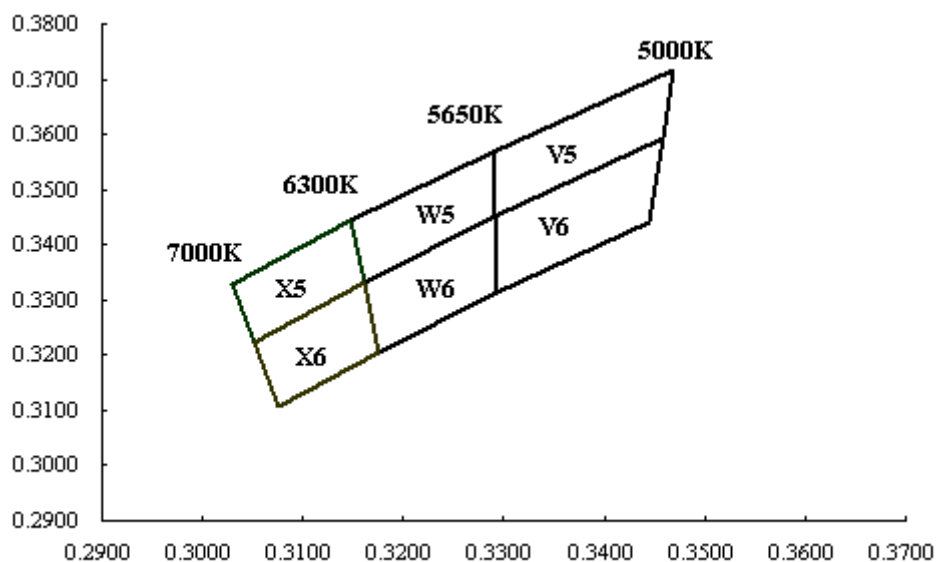
Note: Tolerance of Chromaticity Coordinates: ± 0.01

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The C.I.E. 1931 Chromaticity Diagram

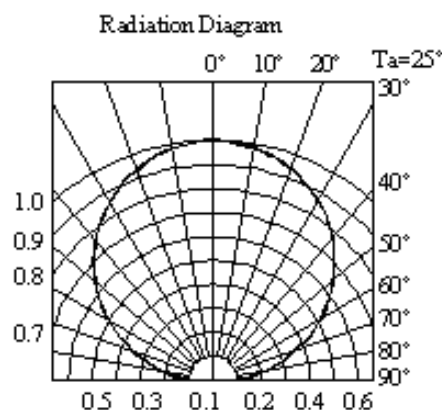
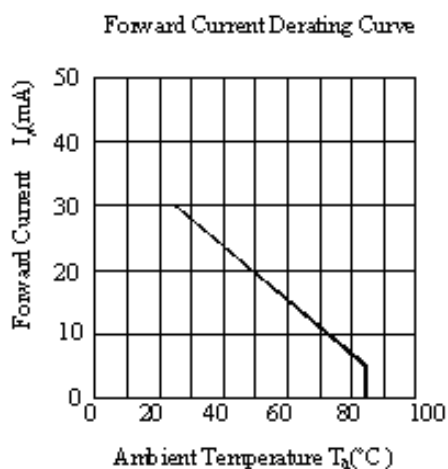
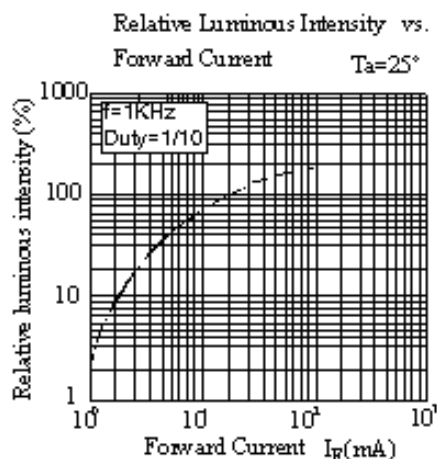
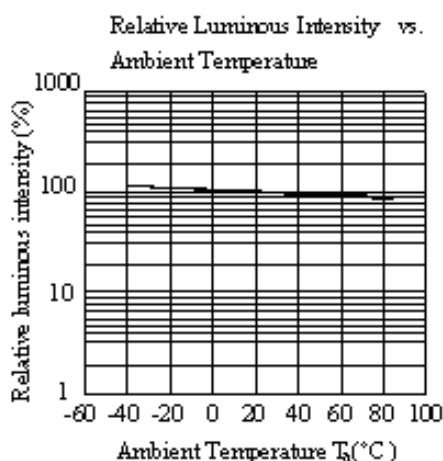
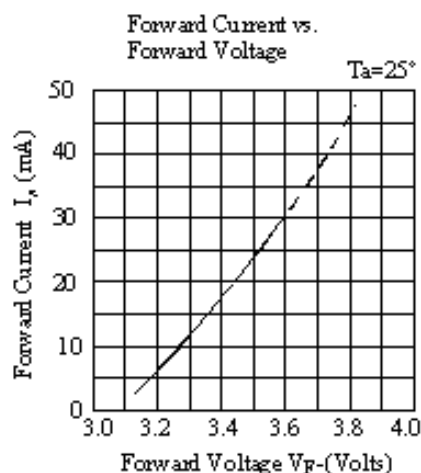
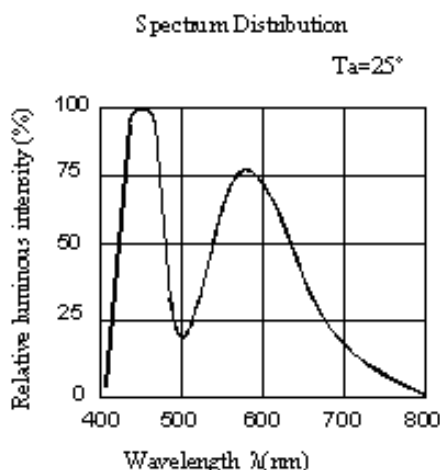


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Typical Electro-Optical Characteristics Curves



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Label Explanation

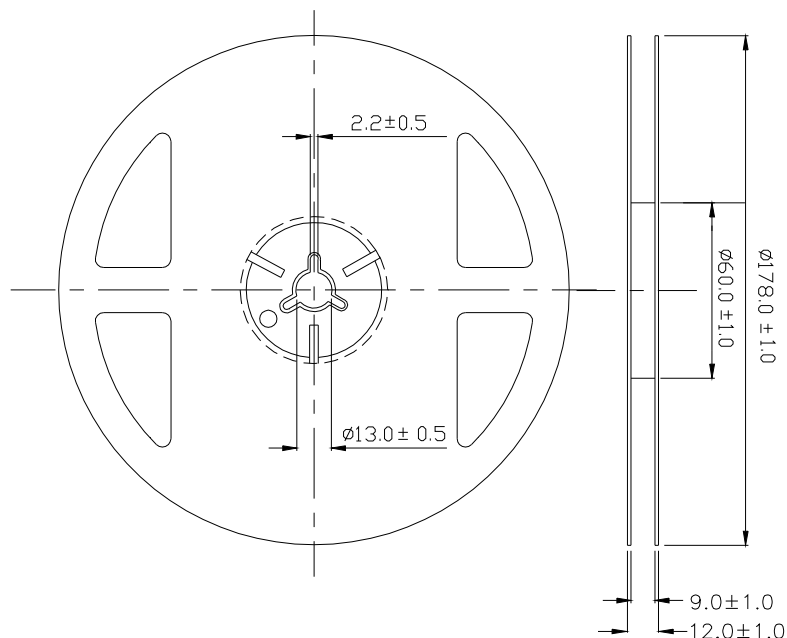
CAT: Luminous Intensity Rank

HUE: Chromaticity Coordinates

REF: Forward Voltage Rank



Reel Dimensions



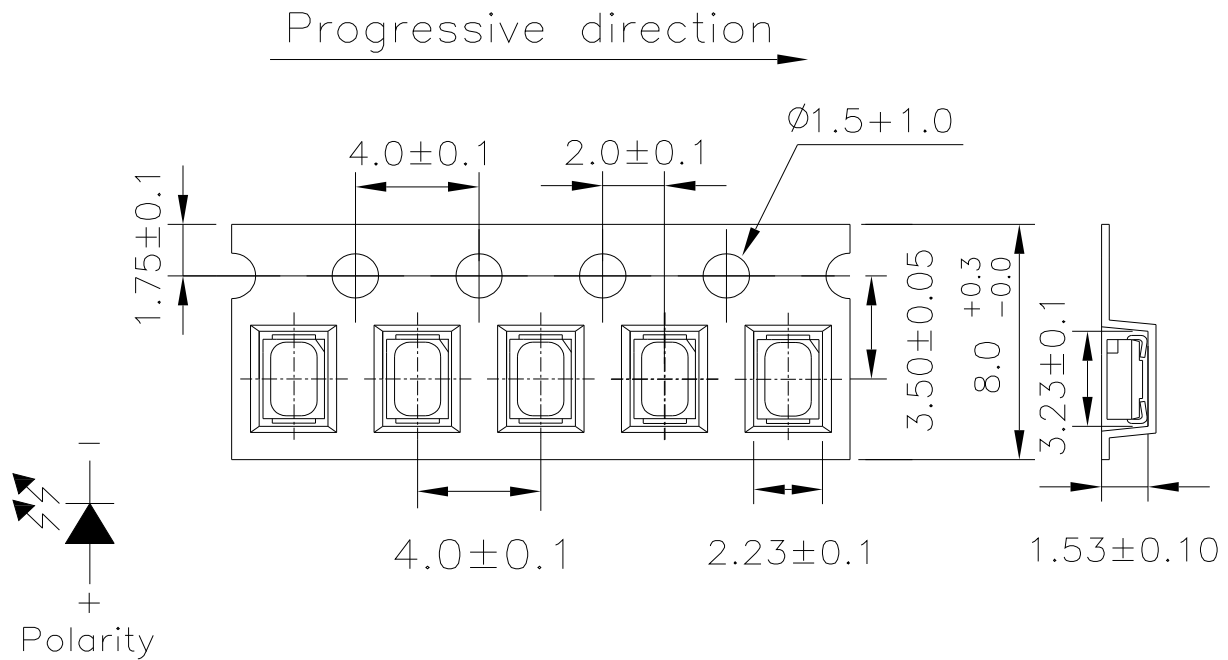
Note: Tolerance unless mentioned is ±0.1mm; Unit = mm

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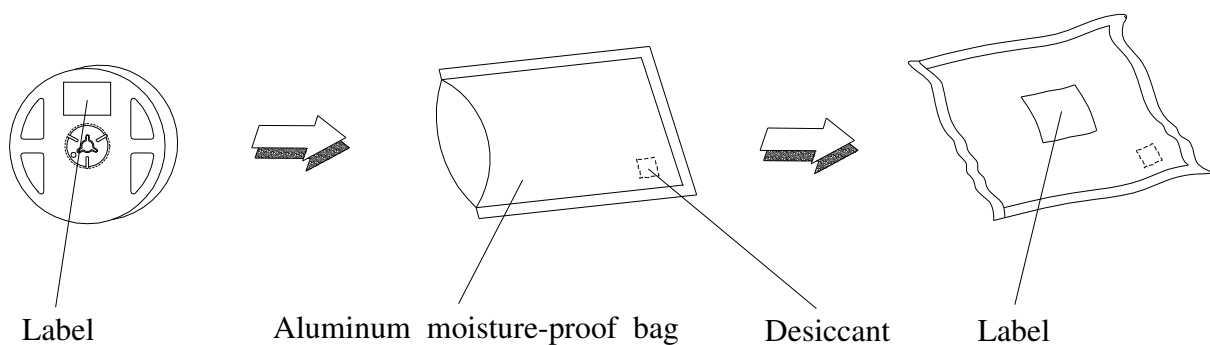
45-21/KK2C-BX50702C4CB2/2T

Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel



Note: Tolerance unless mentioned is ± 0.1 mm; 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.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260°C±5°C Min. 10 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 _F = 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

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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. 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.

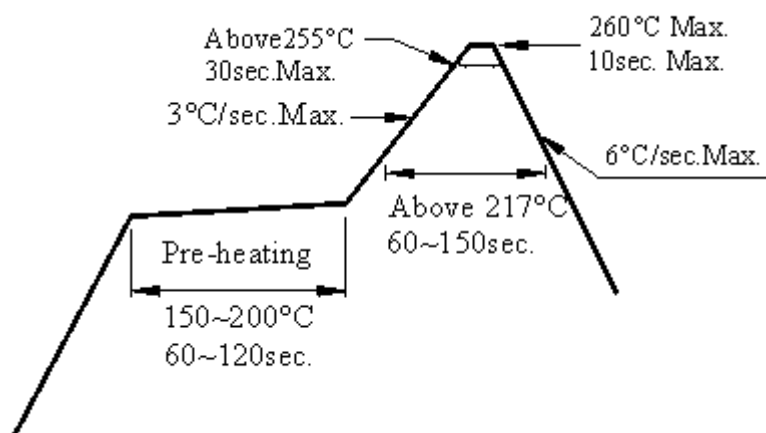
2.3 After opening the package: The LED's floor life is 1 year under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

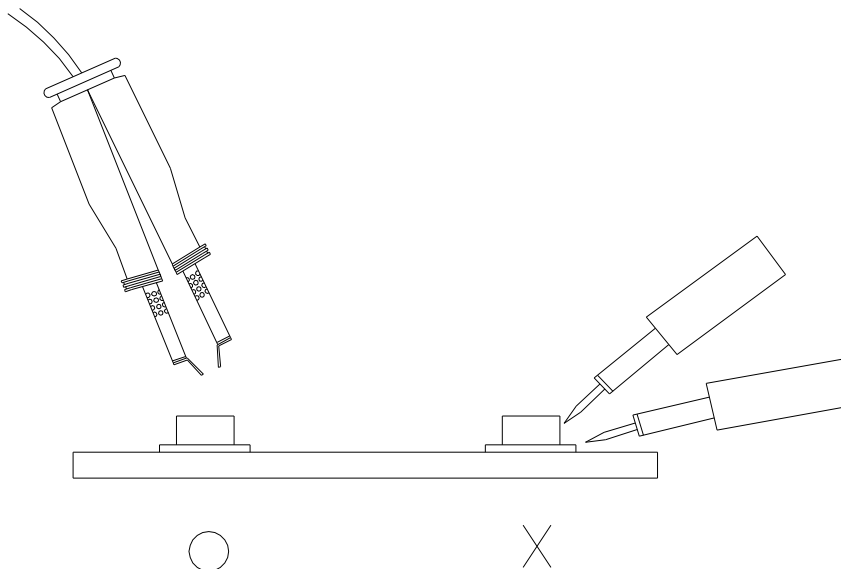
3.4 After soldering, do not warp the circuit board.

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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.

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.

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