

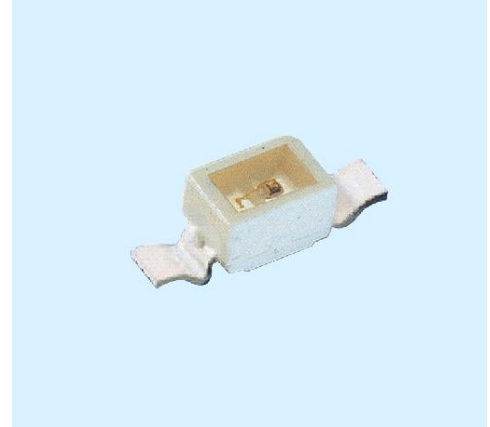
## Technical Data Sheet

### Mini Top LEDs (Reverse Gull Wing) (Preliminary)

#### 65-21/GVC-AK2M1Z/3AA

#### Features

- White SMT package.
- Optical indicator.
- Wide viewing angle.
- Soldering methods: IR reflow soldering.
- Available on tape and reel.
- Pb-free
- The product itself will remain within RoHS compliant version.



#### Descriptions

- The 65-21 series is available in soft orange, green, blue, and yellow. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. Besides, LED is mounted top down and emits through the PCB. This feature makes the SMT TOP LED ideal for light pipe application.

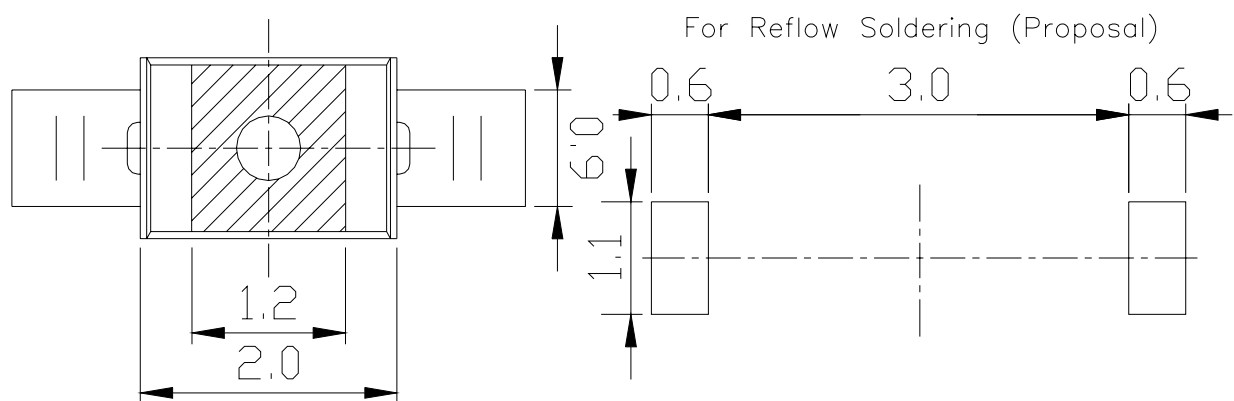
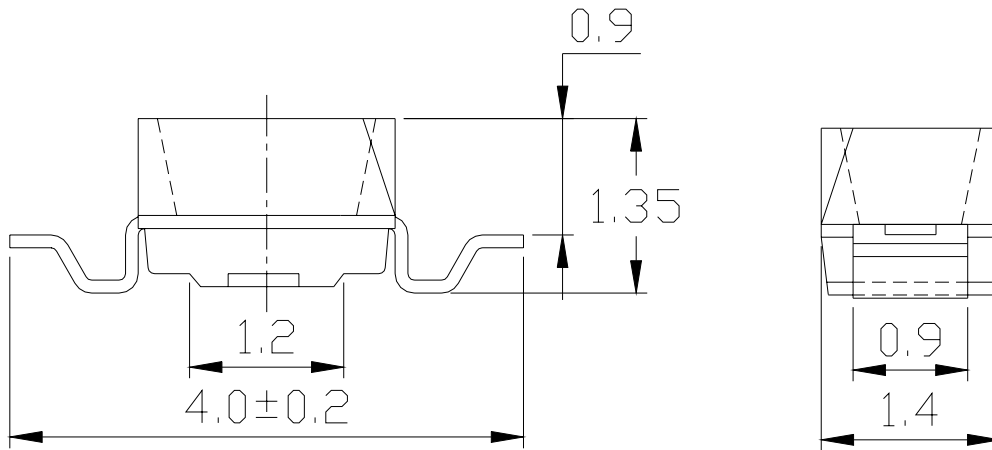
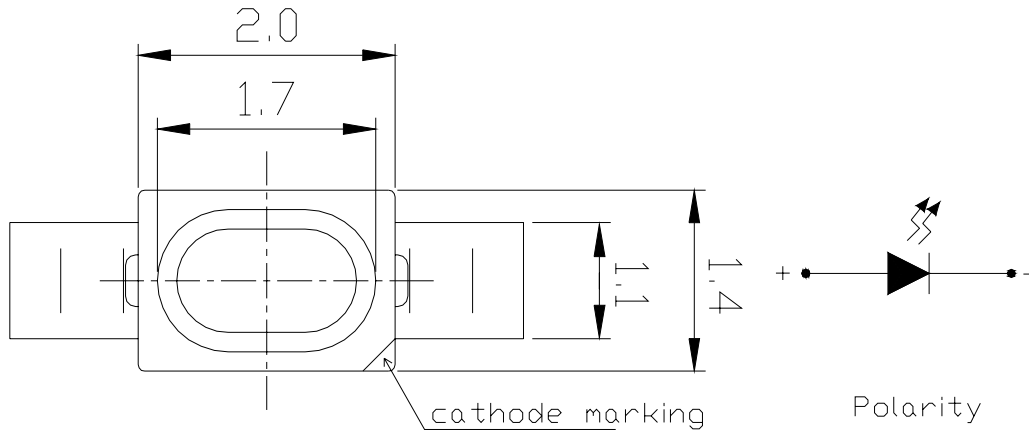
#### Applications

- Optical indicators.
- Coupling into light guides.
- Backlighting (LCD, cellular phones, switches, keys, displays, illuminated advertising, general lighting).
- Coupling into light guides; Interior automotive lighting (e.g. dashboard backlighting, etc.).

#### Device Selection Guide

Chip	Emitted Color	Resin Color
Material		
AlGaInP	Green	Water Clear

**Package Outline Dimensions**



**Notes:** All dimensions are in millimeters.

Tolerances unspecified are  $\pm 0.1$ mm.

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

Parameter	Symbol	Rating	Unit
Reverse Voltage	V <sub>R</sub>	5	V
Forward Current	I <sub>F</sub>	25	mA
Peak Forward Current (Duty 1/10 @1KHz)	I <sub>FP</sub>	60	mA
Power Dissipation	P <sub>d</sub>	60	mW
Electrostatic Discharge(HBM)	ESD	2000	V
Operating Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-40 ~ +90	°C
Soldering Temperature	Tsol	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 <sub>v</sub>	9.0	-----	22.5	mcd	I <sub>F</sub> =10mA
Viewing Angle	2θ 1/2	-----	120	-----	deg	I <sub>F</sub> =10mA
Peak Wavelength	λ <sub>p</sub>	-----	568	-----	nm	I <sub>F</sub> =10mA
Dominant Wavelength	λ <sub>d</sub>	563.5	-----	571.5	nm	I <sub>F</sub> =10mA
Spectrum Radiation Bandwidth	Δλ	-----	20	-----	nm	I <sub>F</sub> =10mA
Forward Voltage	V <sub>F</sub>	-----	2.0	2.4	V	I <sub>F</sub> =10mA
Reverse Current	I <sub>R</sub>	-----	-----	10	μA	V <sub>R</sub> =5V

**Notes:**

- 1.Tolerance of Luminous Intensity ±11%**
- 2.Tolerance of Dominant Wavelength ±1nm**

**65-21/GVC-AK2M1Z/3AA****Bin Range of Dominant Wavelength**

Group	Bin Code	Min	Max	Unit	Condition
A	C13	563.5	565.5	mcd	I <sub>F</sub> =10mA
	C14	565.5	567.5		
	C15	567.5	569.5		
	C16	569.5	571.5		

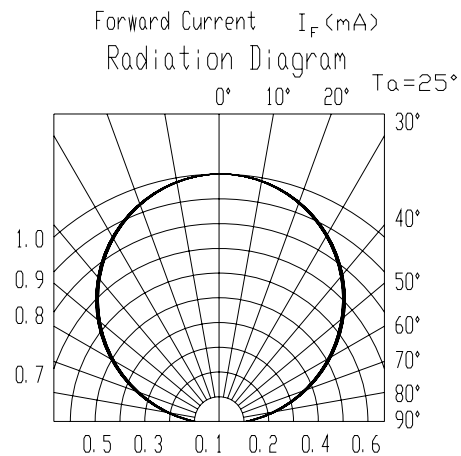
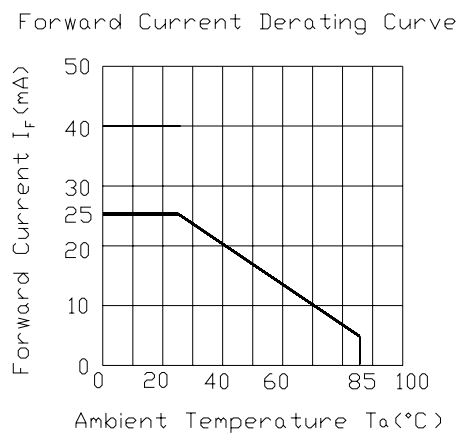
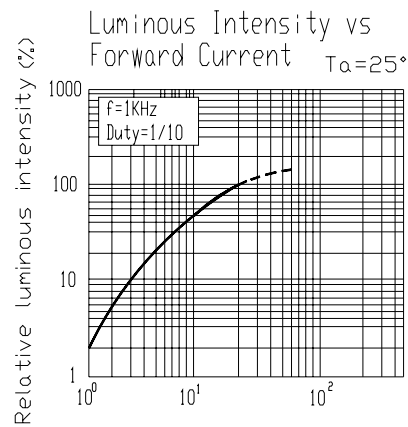
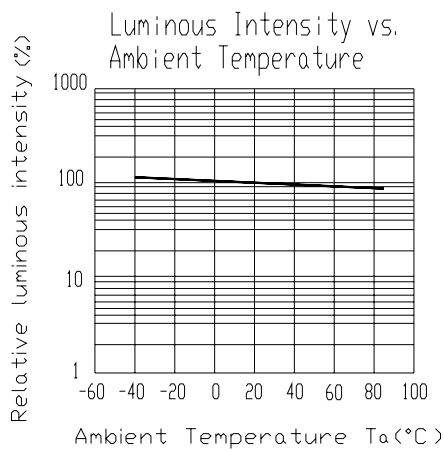
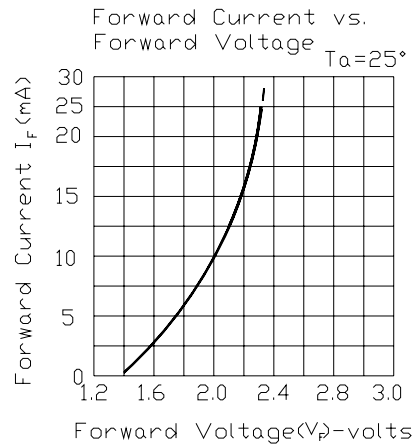
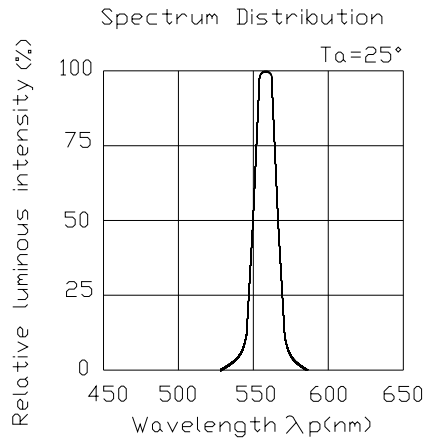
**Bin Range of Luminous Intensity**

Bin Code	Min	Max	Unit	Condition
K2	9.0	11.5	mcd	I <sub>F</sub> =10mA
L1	11.5	14.5		
L2	14.5	18.0		
M1	18.0	22.5		

**Notes:**

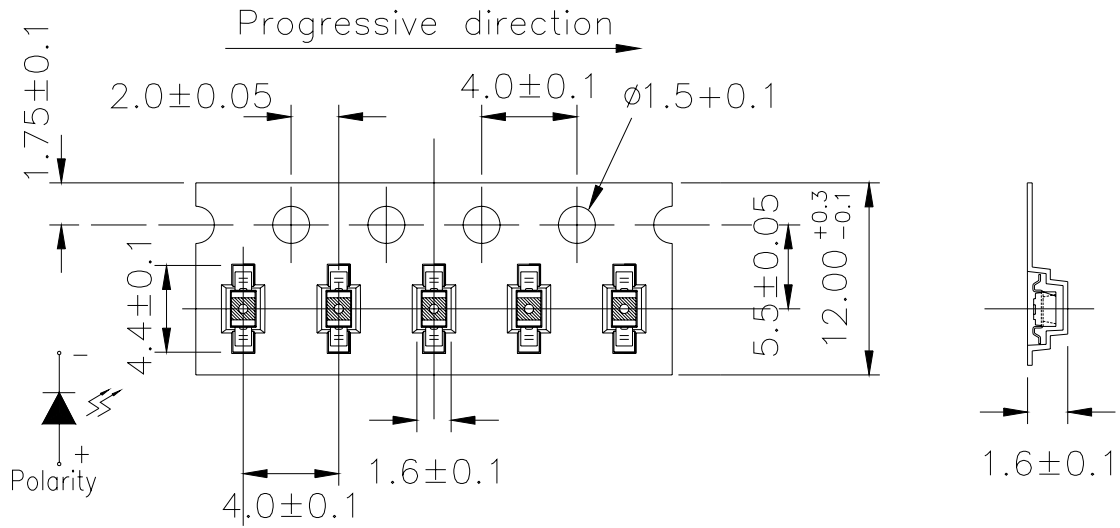
- 1.Tolerance of Luminous Intensity  $\pm 11\%$**
- 2.Tolerance of Dominant Wavelength  $\pm 1\text{nm}$**

**Typical Electro-Optical Characteristics Curves**



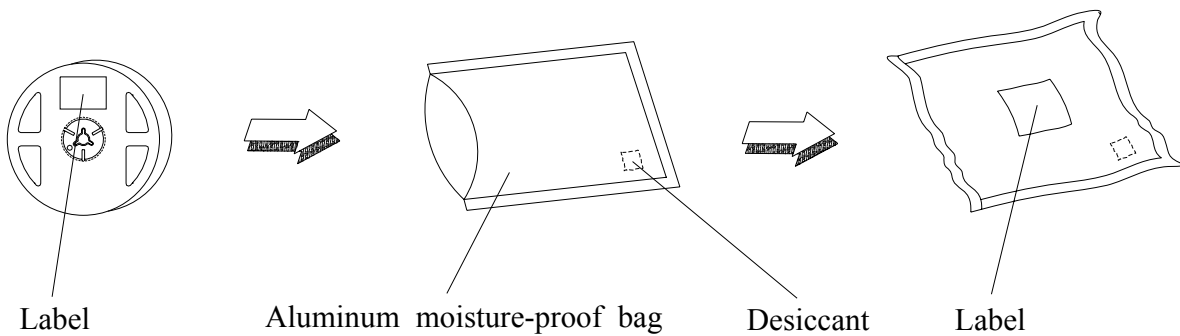


**Carrier Tape Dimensions; Loaded quantity per reel 3000 PCS/reel**



**Note:** The tolerances unless mentioned is  $\pm 0.1$ mm ,Unit = mm

**Moisture Resistant Packaging**



**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. 5sec.	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	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85°C / 85%RH	1000 Hrs.	22 PCS.	0/1



## 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.

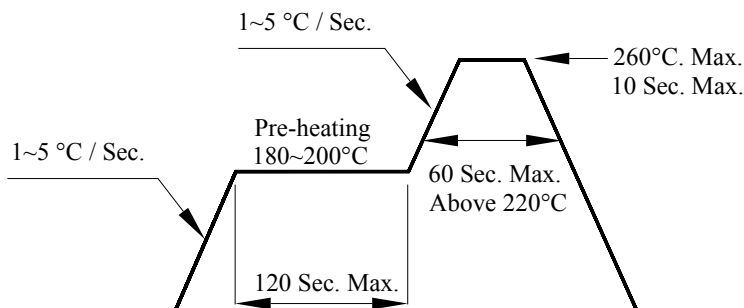
2.3 After opening the package: The LED's floor life is 1 year under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

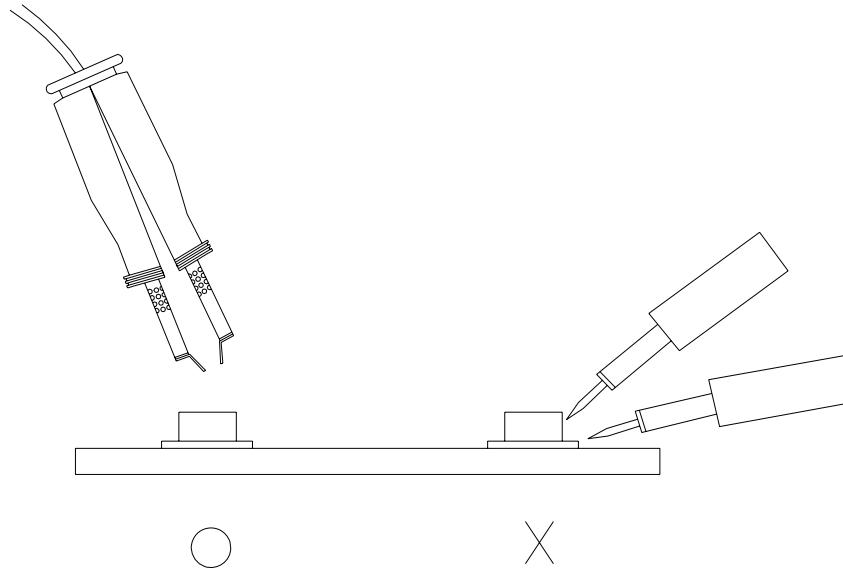
3.4 After soldering, do not warp the circuit board.

### 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.

**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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