

## APHB1608SGEC 1.6 x 0.8 x 0.5 mm Bi-Color Surface Mount LED

### DESCRIPTIONS

- The Super Bright Green source color devices are made with Gallium Phosphide Green Light Emitting Diode
- The High Efficiency Red source color devices are Made with Gallium Arsenide Phosphide on Gallium Phosphide Orange Light Emitting Diode

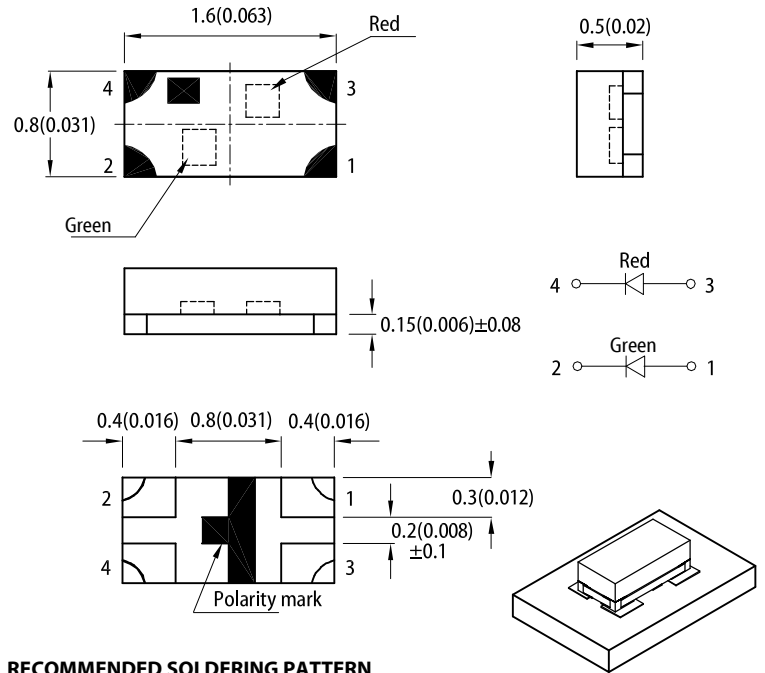
### FEATURES

- 1.6 x 0.8 mm SMD LED, 0.5 mm thickness
- Compatible with reflow soldering
- Available in various color combination
- Package: 2000 pcs / reel
- Moisture sensitivity level: 3
- Tinned pads for improved solderability
- Halogen-free
- RoHS compliant

### APPLICATIONS

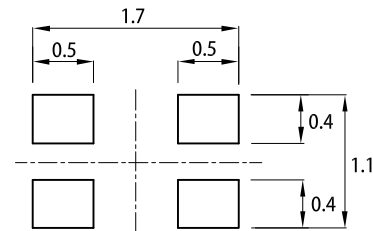
- Backlight
- Status indicator
- Home and smart appliances
- Wearable and portable devices
- Healthcare applications

### PACKAGE DIMENSIONS



### RECOMMENDED SOLDERING PATTERN

(units : mm; tolerance : ± 0.1)



#### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.15(0.006") unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
4. The device has a single mounting surface. The device must be mounted according to the specifications.

### SELECTION GUIDE

Part Number	Emitting Color (Material)	Lens Type	Iv (mcd) @ 20mA <sup>[2]</sup>		Viewing Angle <sup>[1]</sup>
			Min.	Typ.	2θ1/2
APHB1608SGEC	<span style="color: green;">■</span> Super Bright Green (GaP)	Water Clear	5	15	130°
			*5	*15	
	<span style="color: red;">■</span> High Efficiency Red (GaAsP/GaP)		7	15	
			*5	*12	

Notes:  
 1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.  
 2. Luminous intensity / luminous flux: +/-15%.  
 \* Luminous intensity value is traceable to CIE127-2007 standards.

ELECTRICAL / OPTICAL CHARACTERISTICS at  $T_A=25^\circ\text{C}$ 

Parameter	Symbol	Emitting Color	Value		Unit
			Typ.	Max.	
Wavelength at Peak Emission $I_F = 20\text{mA}$	$\lambda_{\text{peak}}$	Super Bright Green High Efficiency Red	565 627	-	nm
Dominant Wavelength $I_F = 20\text{mA}$	$\lambda_{\text{dom}}^{[1]}$	Super Bright Green High Efficiency Red	568 617	-	nm
Spectral Bandwidth at 50% $\Phi$ REL MAX $I_F = 20\text{mA}$	$\Delta\lambda$	Super Bright Green High Efficiency Red	30 45	-	nm
Capacitance	C	Super Bright Green High Efficiency Red	15 15	-	pF
Forward Voltage $I_F = 20\text{mA}$	$V_F^{[2]}$	Super Bright Green High Efficiency Red	2.2 2	2.5 2.5	V
Reverse Current ( $V_R = 5\text{V}$ )	$I_R$	Super Bright Green High Efficiency Red	-	10 10	$\mu\text{A}$
Temperature Coefficient of $\lambda_{\text{peak}}$ $I_F = 20\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$TC_{\lambda_{\text{peak}}}$	Super Bright Green High Efficiency Red	0.12 0.13	-	$\text{nm}/^\circ\text{C}$
Temperature Coefficient of $\lambda_{\text{dom}}$ $I_F = 20\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$TC_{\lambda_{\text{dom}}}$	Super Bright Green High Efficiency Red	0.08 0.06	-	$\text{nm}/^\circ\text{C}$
Temperature Coefficient of $V_F$ $I_F = 20\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$TC_V$	Super Bright Green High Efficiency Red	-2.0 -1.9	-	$\text{mV}/^\circ\text{C}$

## Notes:

- The dominant wavelength ( $\lambda_d$ ) above is the setup value of the sorting machine. (Tolerance  $\lambda_d: \pm 1\text{nm}$ .)
- Forward voltage:  $\pm 0.1\text{V}$ .
- Wavelength value is traceable to CIE127-2007 standards.
- Excess driving current and / or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

ABSOLUTE MAXIMUM RATINGS at  $T_A=25^\circ\text{C}$ 

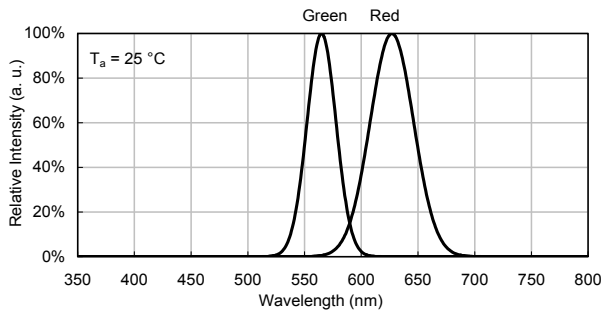
Parameter	Symbol	Value		Unit
		Super Bright Green	High Efficiency Red	
Power Dissipation	$P_D$	62.5	75	mW
Reverse Voltage	$V_R$	5	5	V
Junction Temperature	$T_j$	110	125	$^\circ\text{C}$
Operating Temperature	$T_{\text{op}}$	-40 to +85		$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to +85		$^\circ\text{C}$
DC Forward Current	$I_F$	25	30	mA
Peak Forward Current	$I_{\text{FM}}^{[1]}$	140	160	mA
Electrostatic Discharge Threshold (HBM)	-	8000	8000	V
Thermal Resistance (Junction / Ambient)	$R_{\text{th JA}}^{[2]}$	550	560	$^\circ\text{C}/\text{W}$
Thermal Resistance (Junction / Solder point)	$R_{\text{th JS}}^{[2]}$	420	420	$^\circ\text{C}/\text{W}$

## Notes:

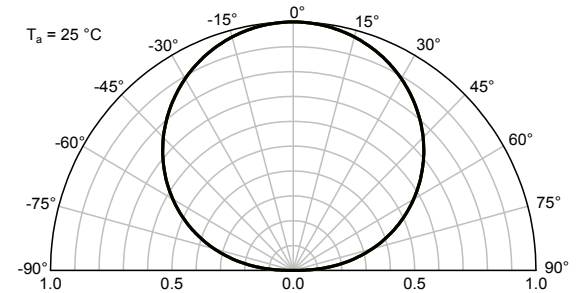
- 1/10 Duty Cycle, 0.1ms Pulse Width.
- $R_{\text{th JA}}$ ,  $R_{\text{th JS}}$  Results from mounting on PC board FR4 (pad size  $\geq 16\text{mm}^2$  per pad).
- Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.

## TECHNICAL DATA

### RELATIVE INTENSITY vs. WAVELENGTH

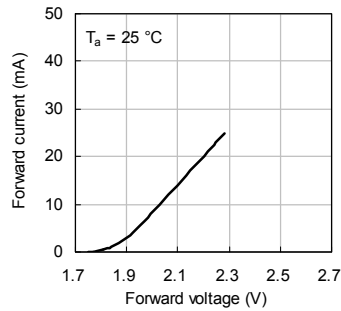


### SPATIAL DISTRIBUTION

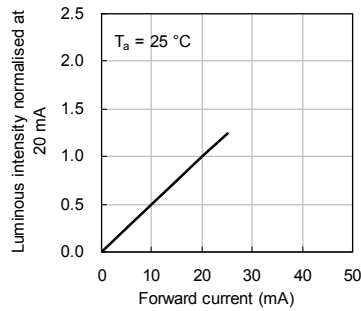


## SUPER BRIGHT GREEN

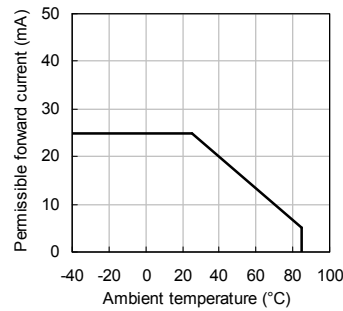
Forward Current vs. Forward Voltage



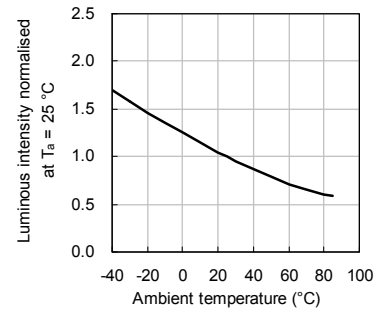
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

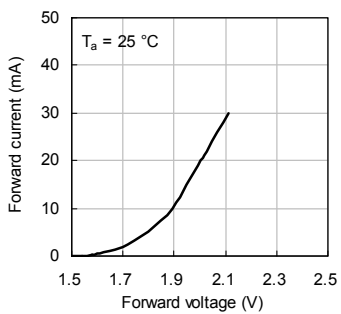


Luminous Intensity vs. Ambient Temperature

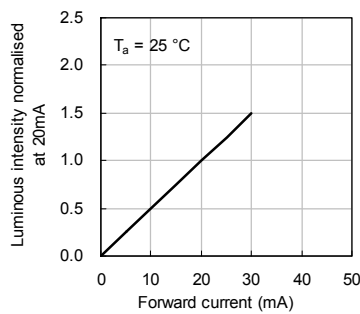


## HIGH EFFICIENCY RED

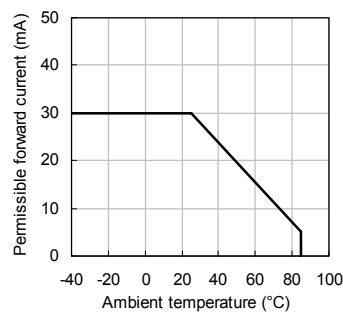
Forward Current vs. Forward Voltage



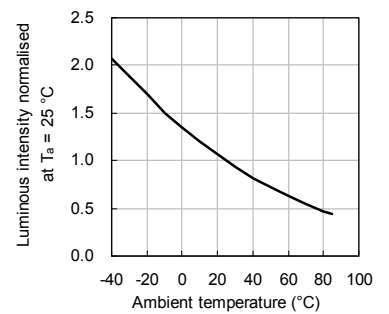
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

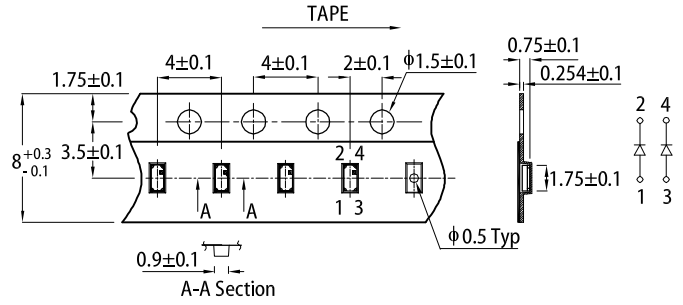
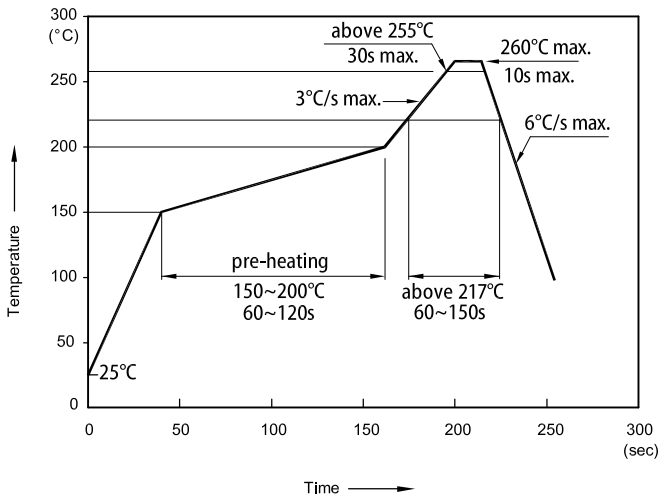


Luminous Intensity vs. Ambient Temperature

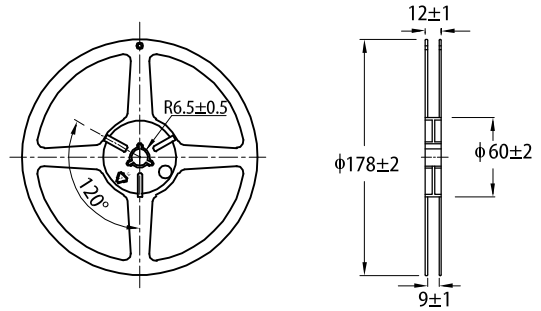


## REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS

## TAPE SPECIFICATIONS (units : mm)



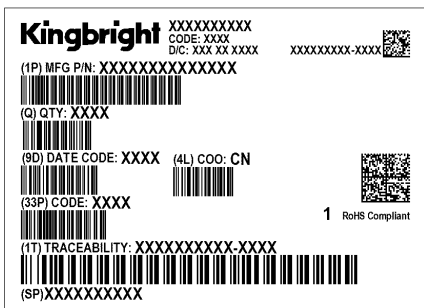
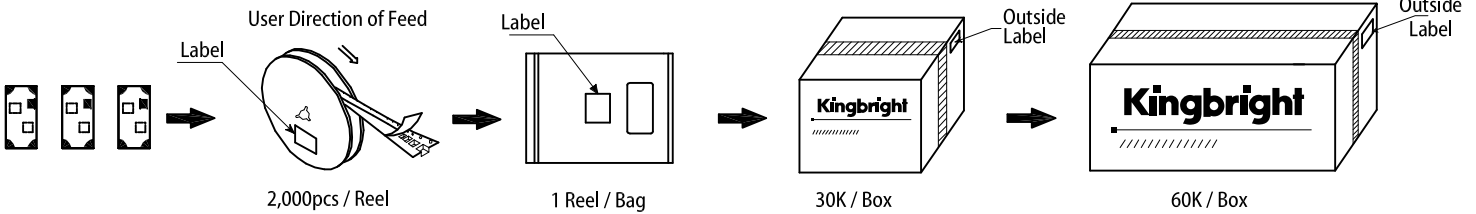
## REEL DIMENSION (units : mm)



### Notes:

1. Don't cause stress to the LEDs while it is exposed to high temperature.
2. The maximum number of reflow soldering passes is 2 times.
3. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.

## PACKING & LABEL SPECIFICATIONS



## PRECAUTIONARY NOTES

1. The information included in this document reflects representative usage scenarios and is intended for technical reference only.
2. The part number, type, and specifications mentioned in this document are subject to future change and improvement without notice. Before production usage customer should refer to the latest datasheet for the updated specifications.
3. When using the products referenced in this document, please make sure the product is being operated within the environmental and electrical limits specified in the datasheet. If customer usage exceeds the specified limits, Kingbright will not be responsible for any subsequent issues.
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