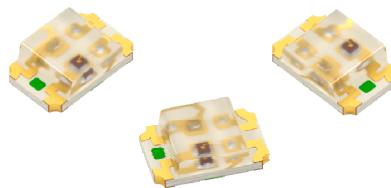


## APHBM2012QBDSURKC

2.0 x 1.25 mm SMD Chip LED Lamp



### DESCRIPTIONS

- The Blue source color devices are made with InGaN Light Emitting Diode
- The Hyper Red source color devices are made with AlGaInP on GaAs substrate Light Emitting Diode
- Electrostatic discharge and power surge could damage the LEDs
- It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs
- All devices, equipments and machineries must be electrically grounded

### FEATURES

- 2.0 mm x 1.25 mm SMD LED, 0.45 mm max. thickness
- Low power consumption
- Wide viewing angle
- Ideal for backlight and indicator
- Package: 2000 pcs / reel
- Moisture sensitivity level: 3
- Halogen-free
- RoHS compliant

### APPLICATIONS

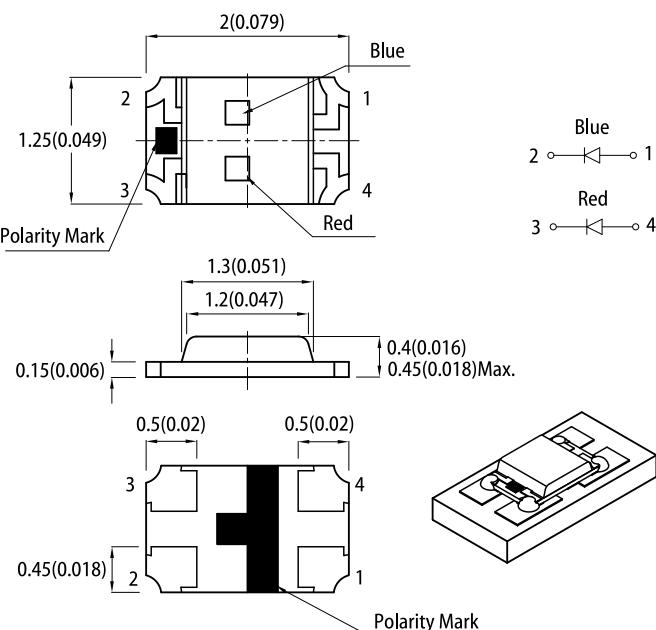
- Backlight
- Status indicator
- Home and smart appliances
- Wearable and portable devices
- Healthcare applications

### ATTENTION

Observe precautions for handling electrostatic discharge sensitive devices

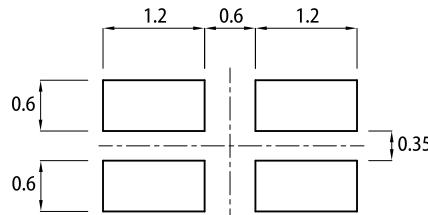


### PACKAGE DIMENSIONS



### RECOMMENDED SOLDERING PATTERN

(units : mm; tolerance :  $\pm 0.1$ )



Notes:

- All dimensions are in millimeters (inches).
- Tolerance is  $\pm 0.1(0.004")$  unless otherwise noted.
- The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
- 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.	
APHBM2012QBDSURKC	Blue (InGaN)	Water Clear	40	80	120°
	*40		*40	*80	
	Hyper Red (AlGaInP)		120	250	
			*40	*80	

Notes:

1.  $\theta/2$  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 $I_F = 20\text{mA}$	$\lambda_{\text{peak}}$	Blue Hyper Red	460 645	-	nm
Dominant Wavelength $I_F = 20\text{mA}$	$\lambda_{\text{dom}}^{[1]}$	Blue Hyper Red	465 630	-	nm
Spectral Bandwidth at 50% $\Phi$ REL MAX $I_F = 20\text{mA}$	$\Delta\lambda$	Blue Hyper Red	25 28	-	nm
Forward Voltage $I_F = 20\text{mA}$	$V_F^{[2]}$	Blue Hyper Red	3.3 1.95	4.0 2.5	V
Reverse Current ( $V_R = 5\text{V}$ )	$I_R$	Blue Hyper Red	-	50 10	$\mu\text{A}$
Temperature Coefficient of $\lambda_{\text{peak}}$ $I_F = 20\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$\text{TC}_{\lambda_{\text{peak}}}$	Blue Hyper Red	0.04 0.14	-	$\text{nm}/^\circ\text{C}$
Temperature Coefficient of $\lambda_{\text{dom}}$ $I_F = 20\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$\text{TC}_{\lambda_{\text{dom}}}$	Blue Hyper Red	0.03 0.05	-	$\text{nm}/^\circ\text{C}$
Temperature Coefficient of $V_F$ $I_F = 20\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$\text{TC}_V$	Blue Hyper Red	-3.0 -1.9	-	$\text{mV}/^\circ\text{C}$

## Notes:

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

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

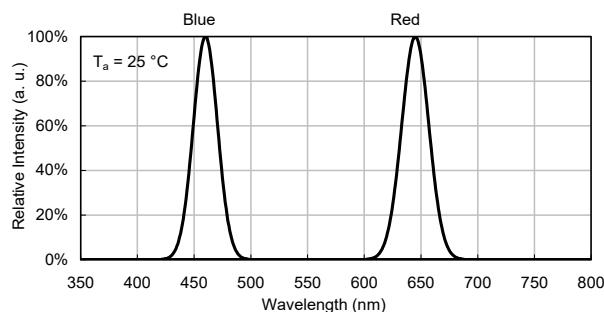
Parameter	Symbol	Value		Unit
		Blue	Hyper Red	
Power Dissipation	$P_D$	120	75	mW
Reverse Voltage	$V_R$	5	5	V
Junction Temperature	$T_j$	115	115	$^\circ\text{C}$
Operating Temperature	$T_{\text{op}}$	-40 to +85		$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to +85		$^\circ\text{C}$
DC Forward Current	$I_F$	30	30	mA
Peak Forward Current	$I_{FP}^{[1]}$	150	185	mA
Electrostatic Discharge Threshold (HBM)	-	250	3000	V
Thermal Resistance (Junction / Ambient)	$R_{\text{th JA}}^{[2]}$	710	750	$^\circ\text{C}/\text{W}$
Thermal Resistance (Junction / Solder point)	$R_{\text{th JS}}^{[2]}$	540	620	$^\circ\text{C}/\text{W}$

## Notes:

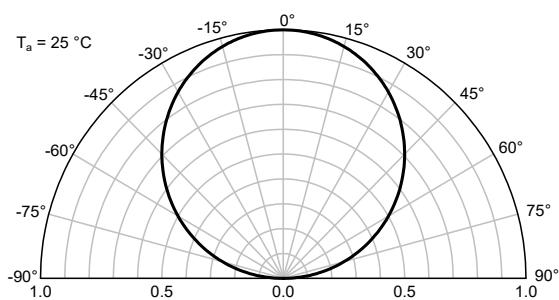
1. 1/10 Duty Cycle, 0.1ms Pulse Width.
2.  $R_{\text{th JA}}, R_{\text{th JS}}$  Results from mounting on PC board FR4 (pad size  $\geq 16\text{ mm}^2$  per pad).
3. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity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

## TECHNICAL DATA

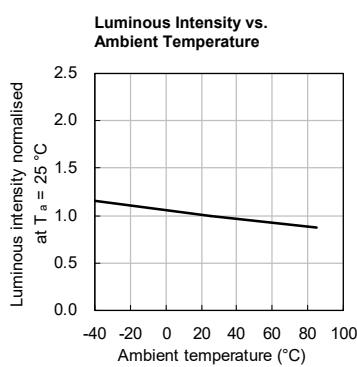
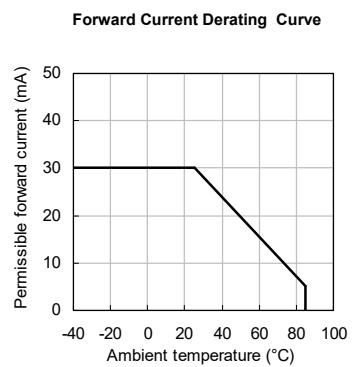
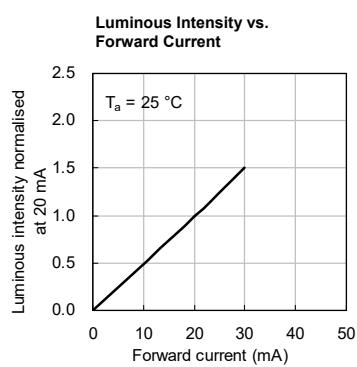
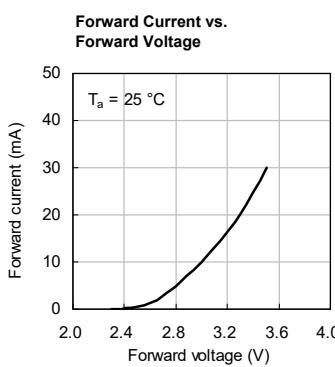
## RELATIVE INTENSITY vs. WAVELENGTH



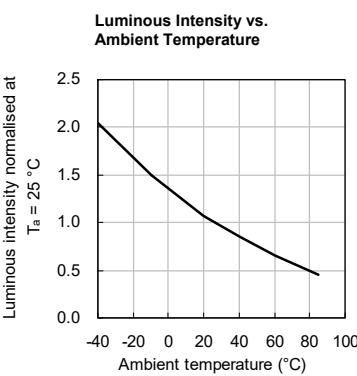
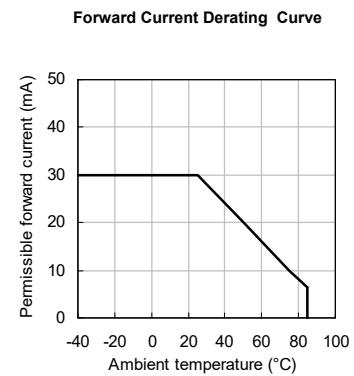
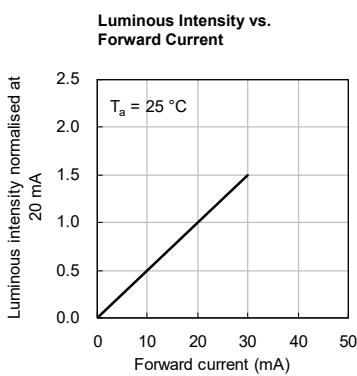
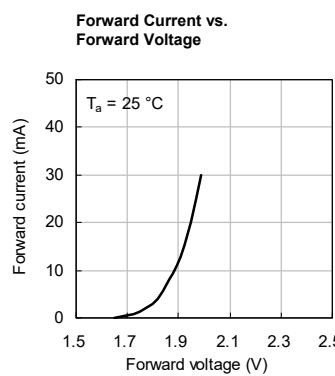
## SPATIAL DISTRIBUTION



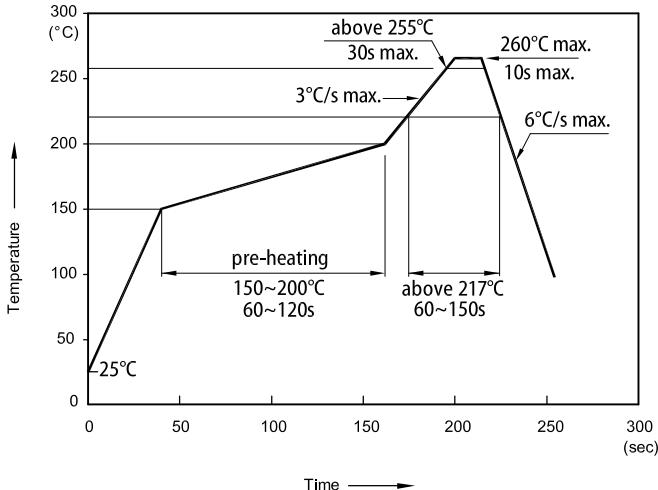
## BLUE



## HYPER RED



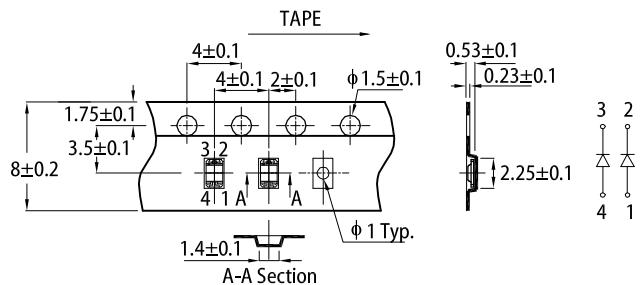
## REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS



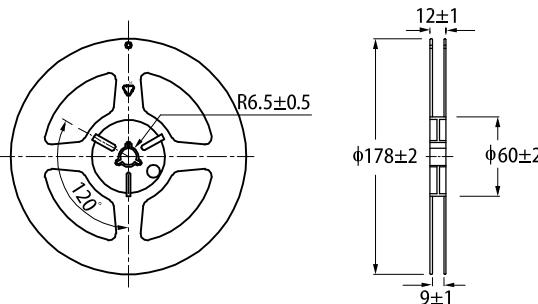
**Notes:**

1. Don't cause stress to the LEDs while soldering.
2. The maximum number of reflow soldering cycles is 3.
3. Reflow soldering is recommended. Overheating may cause damage to the product.

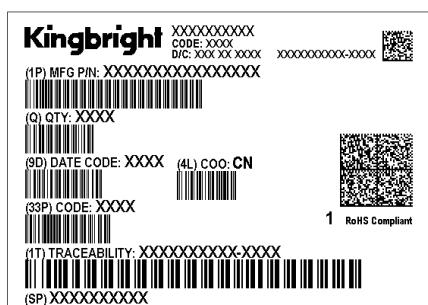
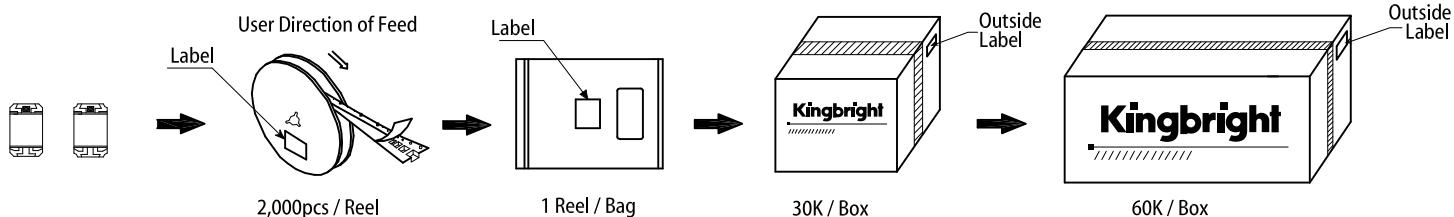
## TAPE SPECIFICATIONS (units : mm)



**REEL DIMENSION** (units : mm)



## PACKING & LABEL SPECIFICATIONS



## PREFACE

**PREFACE/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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