



1.6 x 0.8 mm Full-Color Surface Mount LED KPHF-1608RBGC-11-GX

DESCRIPTIONS

- The Hyper Red source color devices are made with AlGaInP on GaAs substrate Light Emitting Diode.
- The Blue source color devices are made with InGaN Light Emitting Diode.
- The Green source color devices are made with InGaN on Sapphire 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

- 1.6 x 0.8 mm SMD LED, 0.5 mm thickness.
- Low power consumption.
- Package in 8mm tape on 7" diameter reel, 4000 pcs / reel.
- Can produce any color in visible spectrum, including white light.
- Moisture sensitivity level: 3
- RoHS compliant.

APPLICATIONS

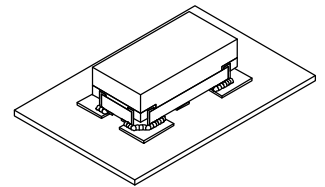
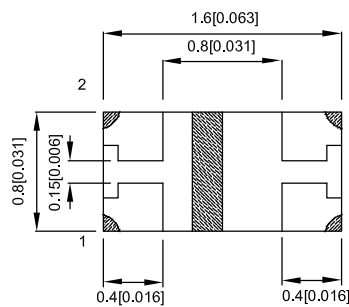
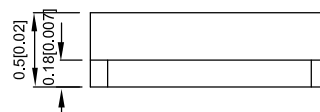
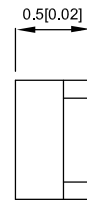
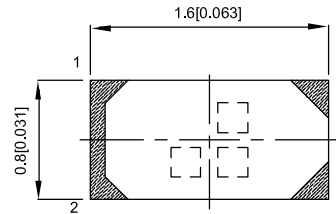
- Backlighting in dashboard and switch.
- indicator and backlighting in telephone and fax.
- Flat backlight for LCD, switch.

ATTENTION

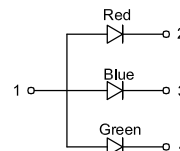
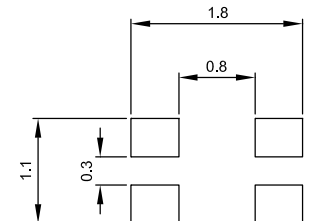
Observe precautions for handling electrostatic discharge sensitive devices



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 ^[2]		Viewing Angle ^[1]
			Min.	Typ.	2θ1/2
KPHF-1608RBGC-11-GX	Hyper-Red (AlGaInP)	Water Clear	40	120	140°
	Blue (InGaN)		20	60	140°
	Green (InGaN)		200	480	140°

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%.
 3. Luminous intensity value is traceable to CIE127-2007 standards.

ELECTRICAL / OPTICAL CHARACTERISTICS at Ta=25°C

Parameter	Symbol	Emitting Color	Value			Unit
			Min.	Typ.	Max.	
Wavelength at Peak Emission If=20mA	λ peak	Hyper-Red Blue Green	-	630 460 515	-	nm
Dominant Wavelength If=20mA	λ dom ^[1]	Hyper-Red Blue Green	-	621 465 525	-	nm
Spectral Bandwidth at 50%Φ REL MAX If=20mA	$\Delta\lambda$	Hyper-Red Blue Green	-	20 25 35	-	nm
Capacitance	C	Hyper-Red Blue Green	-	25 100 45	-	pF
Forward Voltage If=20mA	V _F ^[2]	Hyper-Red Blue Green	1.6 2.8 2.7	2 3.3 3.3	2.5 4.0 4.1	V
Reverse Current (V _R = 5V)	I _R	Hyper-Red Blue Green	-	-	10 50 50	uA
Temperature Coefficient of λ peak If=20mA, -10°C ≤ T ≤ 85°C	TC λ peak	Hyper-Red Blue Green	-	0.13 0.04 0.05	-	nm/°C
Temperature Coefficient of λ dom If=20mA, -10°C ≤ T ≤ 85°C	TC λ dom	Hyper-Red Blue Green	-	0.06 0.03 0.03	-	nm/°C
Temperature Coefficient of V _F If=20mA, -10°C ≤ T ≤ 85°C	TC _V	Hyper-Red Blue Green	-	-1.9 -2.9 -2.9	-	mV/°C

Notes:

1. The dominant wavelength (λ d) above is the setup value of the sorting machine. (Tolerance λ d : ±1nm.)
2. Forward voltage: ±0.1V.
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 Ta=25°C

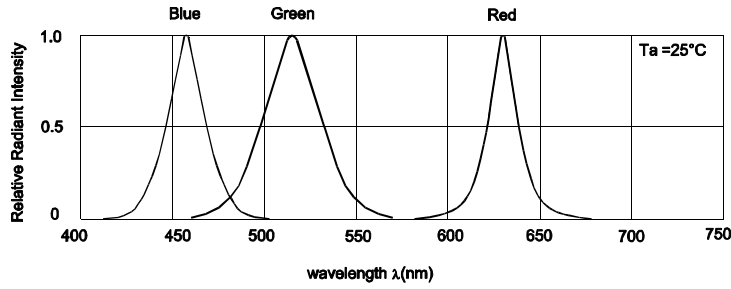
Parameter	Symbol	Value			Unit
		Hyper-Red	Blue	Green	
Power Dissipation	P _D ^[1]	75	80	82	mW
Reverse Voltage	V _R	5	5	5	V
Junction Temperature	T _J	110	110	110	°C
Operating Temperature	Top	-40 to +85			°C
Storage Temperature	T _{stg}	-40 to +85			°C
DC Forward Current	I _F ^[1]	30	20	20	mA
Peak Forward Current	I _{FM} ^[2]	195	100	100	mA
Electrostatic Discharge Threshold (HBM)	-	3000	250	450	V
Thermal Resistance (Junction / Ambient)	R _{th j-a} ^[3]	640	610	590	°C/W
Thermal Resistance (Junction / Solder point)	R _{th j-s} ^[3]	530	500	480	°C/W

Notes:

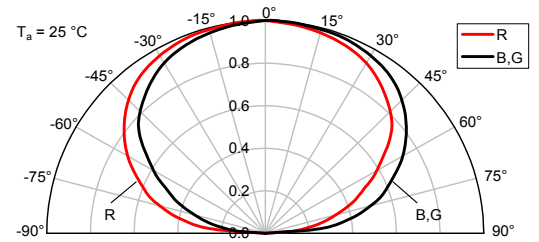
1. The maximum ratings are valid for the case of lighting a single chip
When two chips are lit at the same time, each chip should be driven at a current lower than 50% of the absolute maximum ratings
When three chips are lit at the same time, each chip should be driven at a current lower than 30% of the absolute maximum ratings
2. 1/10 Duty Cycle, 0.1ms Pulse Width
3. R_{th(j-a)}, R_{th(j-s)} Results from mounting on PC board FR4 (pad size ≥ 16 mm² per pad).
4. 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

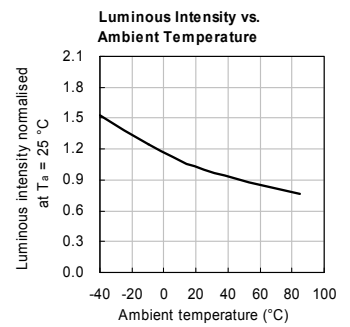
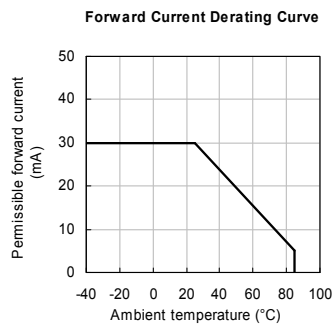
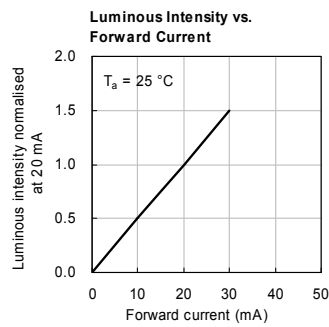
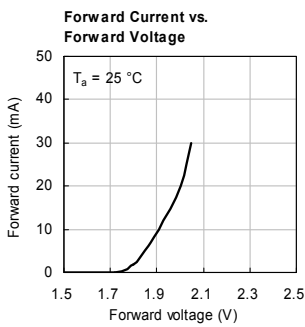
RELATIVE INTENSITY vs. WAVELENGTH



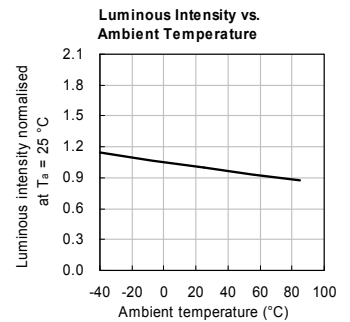
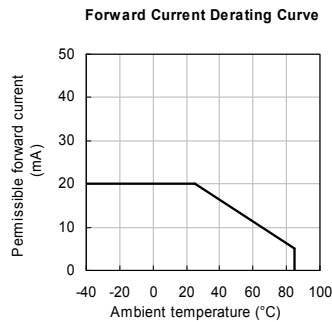
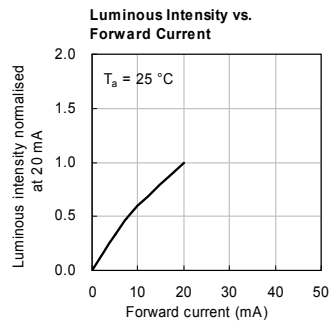
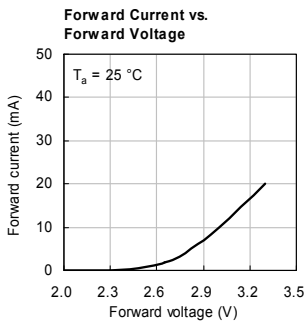
SPATIAL DISTRIBUTION



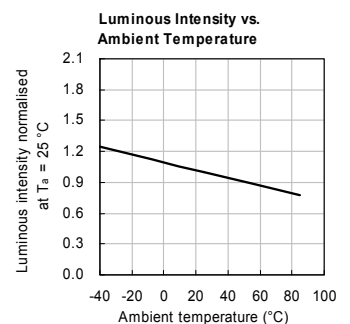
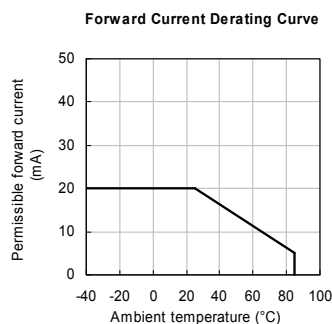
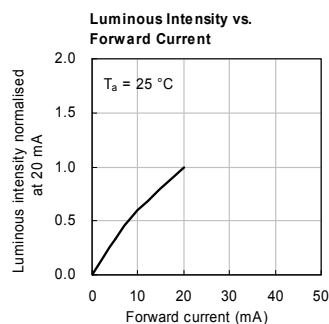
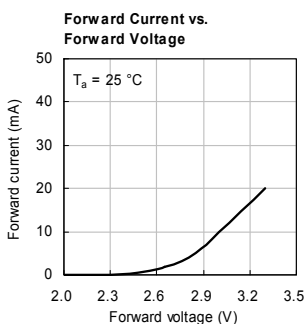
HYPER-RED



BLUE

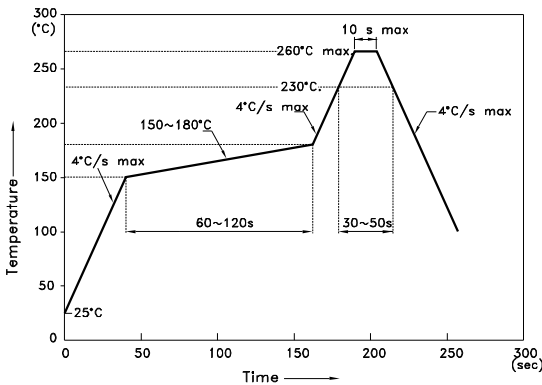


GREEN



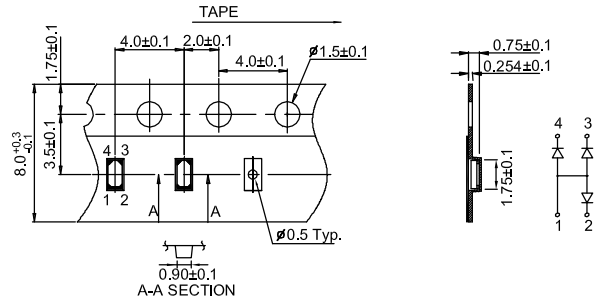
TECHNICAL DATA

REFLOW SOLDERING PROFILE for LEAD-FREE SMT PROCESS

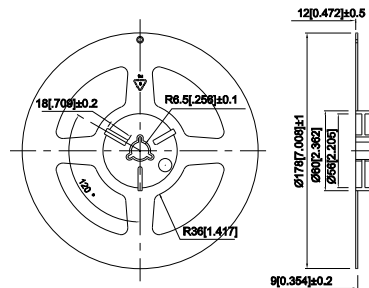


- Notes:
1. We recommend the reflow temperature 245°C (+/- 5°C). The maximum soldering temperature should be limited to 260°C.
 2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
 3. Number of reflow process shall be 2 times or less.
 4. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.

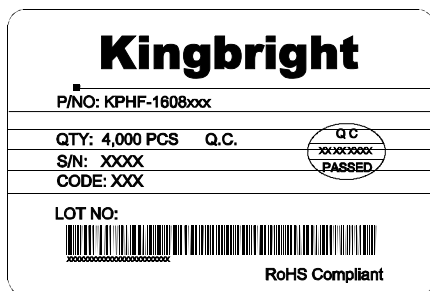
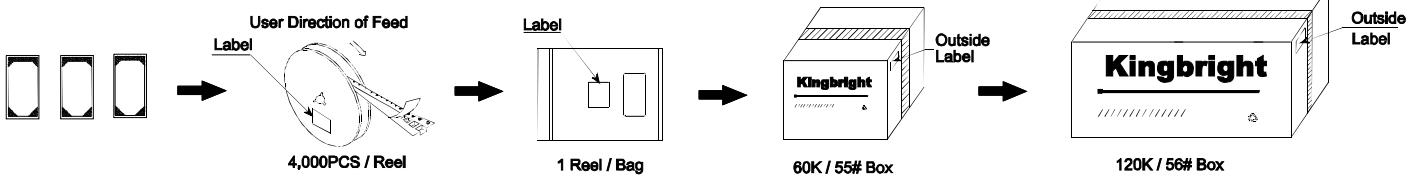
TAPE SPECIFICATIONS (units : mm)



REEL DIMENSION (units : mm)



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.
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