Kingbright

KPGF-1011GBRC-120

1 x 1 x 0.2 mm Full-Color Surface Mount LED



DESCRIPTIONS

- The Green source color devices are made with InGaN on SiC substrate Light Emitting Diode
- The Blue source color devices are made with InGaN on SiC substrate 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

- 1.0 mm x 1.0 mm SMD LED, 0.2 mm thickness
- · Low power consumption
- Package: 4000 pcs / reel
- . Moisture sensitivity level: 3
- · Halogen-free
- · RoHS compliant

APPLICATIONS

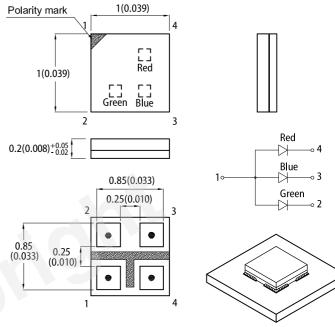
- Backlight
- · Status indicator
- · Home and smart appliances
- · Wearable and portable devices
- · Healthcare applications

ATTENTION

Observe precautions for handling Electrostatic discharge sensitive devices

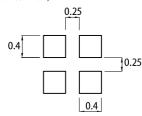


PACKAGE DIMENSIONS



RECOMMENDED SOLDERING PATTERN

(units: mm; tolerance: ± 0.1)



Mask open area ratio: 80% Mask thickness: 80~100um

- All dimensions are in millimeters (inches).
 Tolerance is ±0.1(0.004") unless otherwise noted.
- 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	lv (mcd) @ 5mA [2]		Viewing Angle [1]	
			Min.	Тур.	2θ1/2	
KPGF-1011GBRC-120	Green (InGaN)	Water Clear	50	80		
	■ Blue (InGaN)		10	23	150°	
	■ Hyper Red (AlGaInP)		15	30		

1. 61/2 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 T_A=25°C

Doubleston	Complete I	Funition Colon	Value		Unit
Parameter	Symbol	Emitting Color	Тур.	Тур. Мах.	
Wavelength at Peak Emission I _F = 5mA	λ_{peak}	Green Blue Hyper Red	518 461 632	-	nm
Dominant Wavelength I _F = 5mA	λ_{dom} [1]	Green Blue Hyper Red	527 467 624	-	nm
Spectral Bandwidth at 50% Φ REL MAX I _F = 5mA	Δλ	Green Blue Hyper Red	35 22 20	-	nm
Capacitance	С	Green Blue Hyper Red	100 110 25	-	pF
Forward Voltage I _F = 5mA	V _F ^[2]	Green Blue Hyper Red	3 2.9 1.95	3.2 3.1 2.3	V
Reverse Current (V _R = 5V)	I _R	Green Blue Hyper Red	-	50 50 10	μΑ
Temperature Coefficient of λ_{peak} I_F = 5mA, -10°C \leq T \leq 85°C	TC _{λpeak}	Green Blue Hyper Red	0.05 0.04 0.13	-	nm/°C
Temperature Coefficient of λ_{dom} I_F = 5mA, -10°C \leq T \leq 85°C	TC _{λdom}	Green Blue Hyper Red	0.03 0.03 0.06	-	nm/°C
Temperature Coefficient of V_F I_F = 5mA, -10°C \leq T \leq 85°C	TC _V	Green Blue Hyper Red	-3 -3 -1.9	-	mV/°C

Notes:

ABSOLUTE MAXIMUM RATINGS at T_A=25°C

Parameter.	Symbol	Value			
Parameter		Green	Blue	Hyper Red	Unit
Power Dissipation	P _D ^[1]	35			mW
Reverse Voltage	V _R	5	5	5	V
Junction Temperature	T _j	125	125	115	°C
Operating Temperature	T _{op}	-40 to +85			°C
Storage Temperature	T _{stg}	-40 to +100			°C
DC Forward Current	I _F ^[2]	10	10	10	mA
Peak Forward Current	I _{FM} ^[3]	50	50	50	mA
Electrostatic Discharge Threshold (HBM)	-	1000	1000	3000	V
Thermal Resistance (Junction / Ambient)	R _{th JA} [4]	580	430	640	°C/W
Thermal Resistance (Junction / Solder point)	R _{th JS} [4]	440	330	500	°C/W

Notes:

1. Within 35mW when multiple chips are lightened

2. 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
3. Duty Cycle ≤ 1/20 , Pulse Width = 1 ms.

4. R_{h. JA}, R_{th. JS} Results from mounting on PC board FR4 (pad size ≥ 16 mm² per pad).

5. 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.



Notes.

The dominant wavelength (\(\lambda\)d) above is the setup value of the sorting machine. (Tolerance \(\lambda\)d: \(\pm 1nm.\))

Forward voltage: \(\pm 2.1V.\)

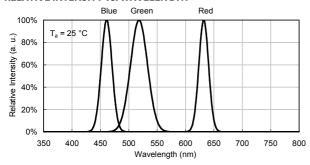
Wavelength value is traceable to CIE127-2007 standards.

Excess driving current and / or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

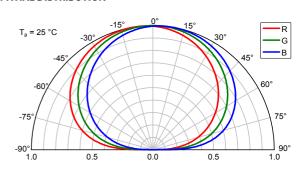


TECHNICAL DATA

RELATIVE INTENSITY vs. WAVELENGTH

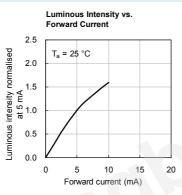


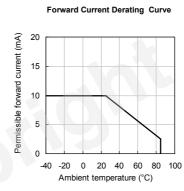
SPATIAL DISTRIBUTION

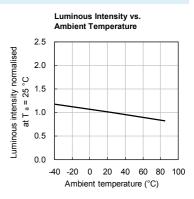


GREEN

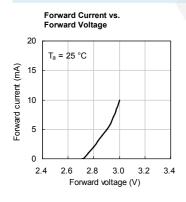
Forward Current vs. 20 T_a = 25 °C Forward current (mA) 15 10 5 2.2 2.4 2.6 2.8 3.0 Forward voltage (V)

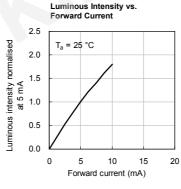


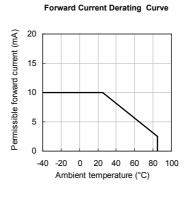


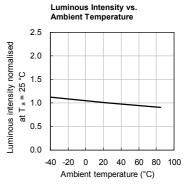


BLUE

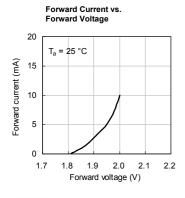


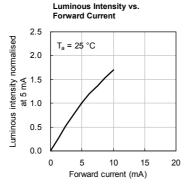


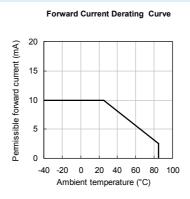


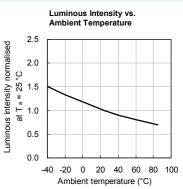


HYPER RED



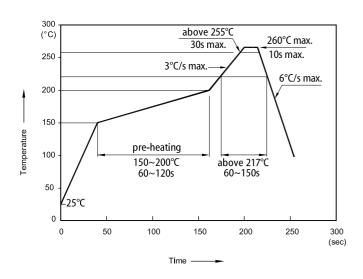




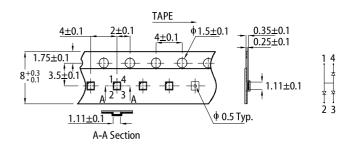


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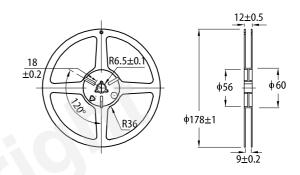
REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS



TAPE SPECIFICATIONS (units:mm)



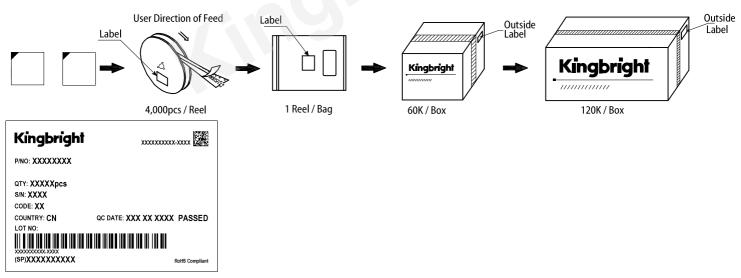
REEL DIMENSION (units: mm)



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



- The information included in this document reflects representative usage scenarios and is intended for technical reference only.

 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.

 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.

 The information in this document applies to typical usage in consumer electronics applications. If customer's application has special reliability requirements or have life-threatening
- liabilities, such as automotive or medical usage, please consult with Kingbright representative for further assistance.

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