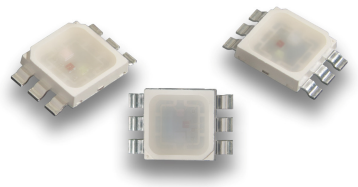
Kingbright



AAAF5051-05

5.0 x 5.0 mm Full-Color Surface Mount LED Lamp

DESCRIPTIONS

- The Blue source color devices are made with InGaN on Sapphire-substrate Light Emitting Diode
- The Reddish-Orange source color devices are made with AlGaInP on Si-substrate Light Emitting Diode
- The Green source color devices are made with InGaN on Sapphire-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

- Suitable for all SMD assembly and solder process
- Available on tape and reel
- White SMD package, silicone resin
- Package: 500 pcs / reel
- Moisture sensitivity level: 3
- Halogen-free
- RoHS compliant

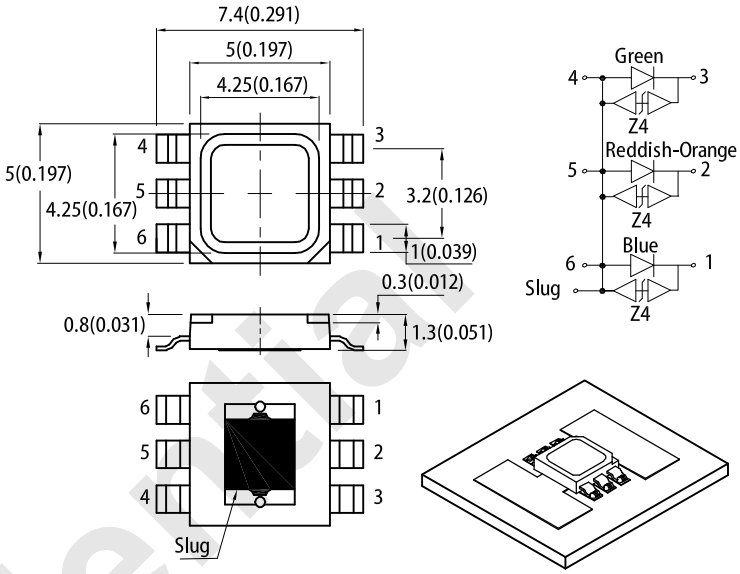
APPLICATIONS

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

ATTENTION

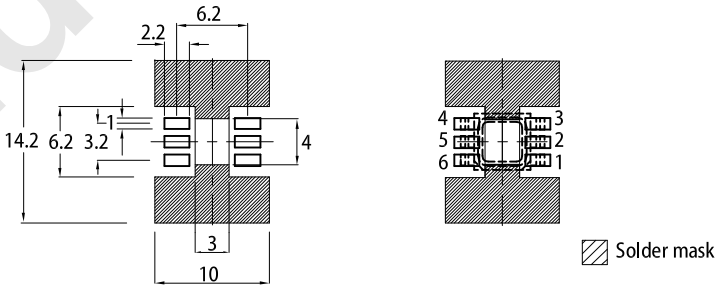
Observe precautions for handling electrostatic discharge sensitive devices

PACKAGE DIMENSIONS



RECOMMENDED SOLDERING PATTERN

(units : mm; tolerance : ± 0.1)



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) @ 150mA [2]		Φv (lm) @ 150mA* [2]		Viewing Angle [1]
			Min.	Typ.	Min.	Typ.	2θ1/2
AAAF5051-05	Blue(InGaN)	Water Clear	1600	2300	5*	7.2*	120°
	Reddish-Orange (AlGaInP)		1900	4000	8.6*	14*	
	Green(InGaN)		7000	9000	20*	28*	

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%.*LEDs are binned according to their luminous flux.*
3. Luminous intensity / luminous Flux value is traceable to CIE127-2007 standards..

ELECTRICAL / OPTICAL CHARACTERISTICS at T_A=25°C

Parameter	Symbol	Emitting Color	Value		Unit
			Typ.	Max.	
Wavelength at Peak Emission I_F = 150mA	λ_{peak}	Blue Reddish-Orange Green	452 633 515	-	nm
Dominant Wavelength I_F = 150mA	λ_{dom} [1]	Blue Reddish-Orange Green	460 624 525	-	nm
Spectral Bandwidth at 50% Φ REL MAX I_F = 150mA	Δλ	Blue Reddish-Orange Green	25 20 30	-	nm
Forward Voltage I_F = 150mA	V_F [2]	Blue Reddish-Orange Green	3.3 2.3 3.3	3.8 2.8 3.8	V
Allowable Reverse Current	I_R	Blue Reddish-Orange Green	-	85 85 85	mA
Temperature Coefficient of λ_{peak} I_F = 150mA, -10°C ≤ T ≤ 100°C	$TC_{\lambda peak}$	Blue Reddish-Orange Green	0.04 0.13 0.05	-	nm/°C
Temperature Coefficient of λ_{dom} I_F = 150mA, -10°C ≤ T ≤ 100°C	$TC_{\lambda dom}$	Blue Reddish-Orange Green	0.03 0.06 0.03	-	nm/°C
Temperature Coefficient of V_F I_F = 150mA, -10°C ≤ T ≤ 100°C	TC_V	Blue Reddish-Orange Green	-3.0 -2.0 -3.0	-	mV/°C

Notes:
1. The dominant wavelength (λd) above is the setup value of the sorting machine. (Tolerance λd : ±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.

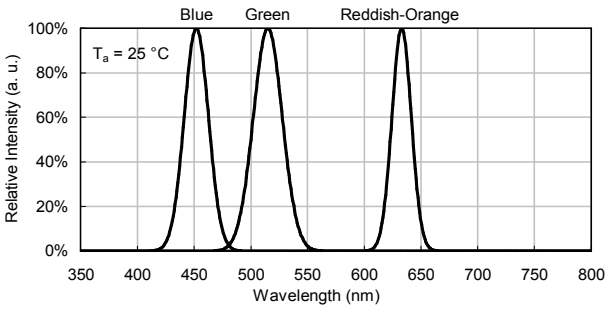
ABSOLUTE MAXIMUM RATINGS at T_A=25°C

Parameter	Symbol	Value			Unit
		Blue	Reddish-Orange	Green	
Power Dissipation	P_D	0.57	0.42	0.57	W
Reverse Voltage	V_R	5	5	5	V
Junction Temperature	T_j	125	115	125	°C
Operating Temperature	T_{op}	-40 to +85			°C
Storage Temperature	T_{stg}	-40 to +85			°C
DC Forward Current	I_F [1]	150	150	150	mA
Peak Forward Current	I_{FM} [2]	300	300	300	mA
Electrostatic Discharge Threshold (HBM)	-	8000	8000	8000	V
Thermal Resistance (Junction / Ambient)	$R_{th\ JA}$ [1]	120	120	180	°C/W
Thermal Resistance (Junction / Solder point)	$R_{th\ JS}$ [1]	70	60	110	°C/W

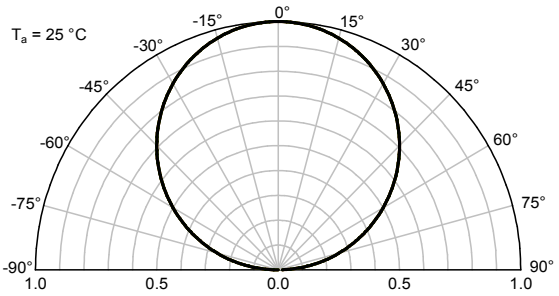
Notes:
1. Results from mounting on Aluminum Board.
2. 1/10 Duty Cycle, 0.1ms Pulse Width.
3. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.

TECHNICAL DATA

RELATIVE INTENSITY vs. WAVELENGTH

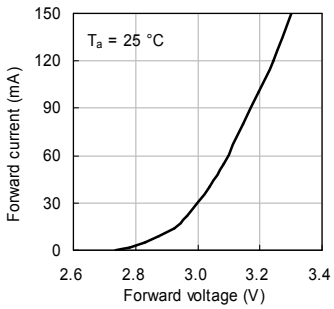


SPATIAL DISTRIBUTION

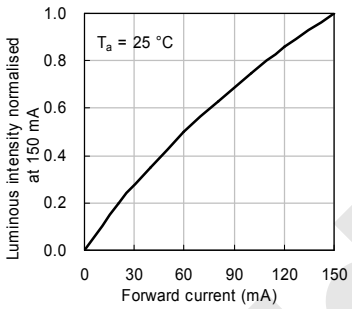


BLUE

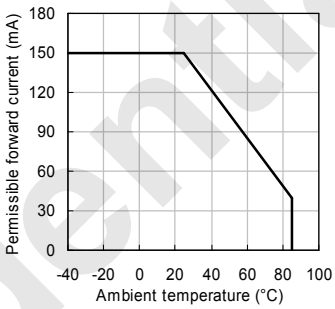
Forward Current vs. Forward Voltage



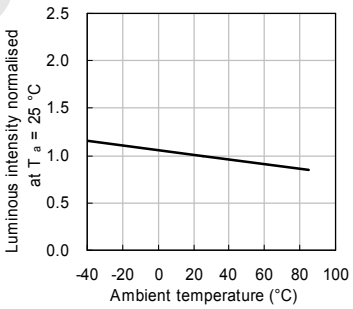
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

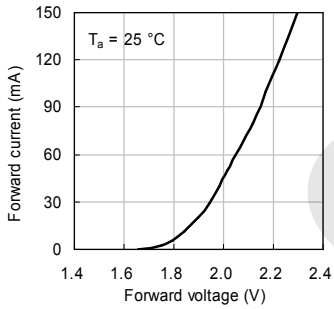


Luminous Intensity vs. Ambient Temperature

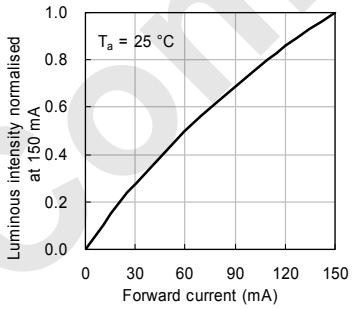


REDDISH-ORANGE

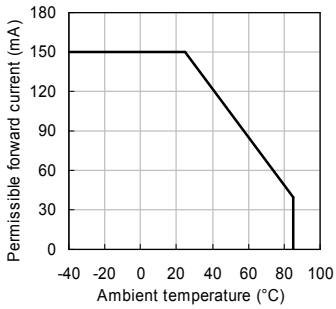
Forward Current vs. Forward Voltage



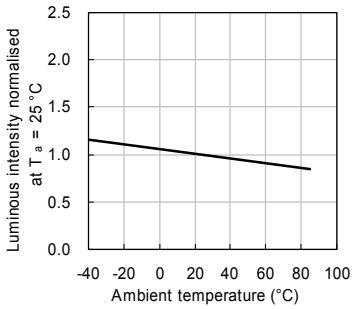
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

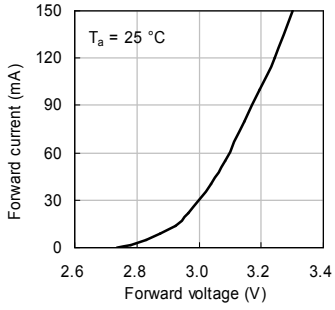


Luminous Intensity vs. Ambient Temperature

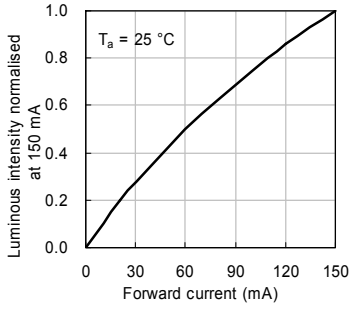


GREEN

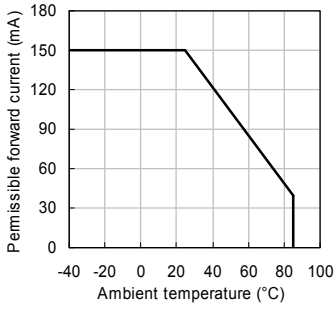
Forward Current vs. Forward Voltage



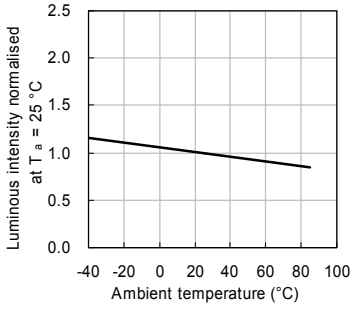
Luminous Intensity vs. Forward Current



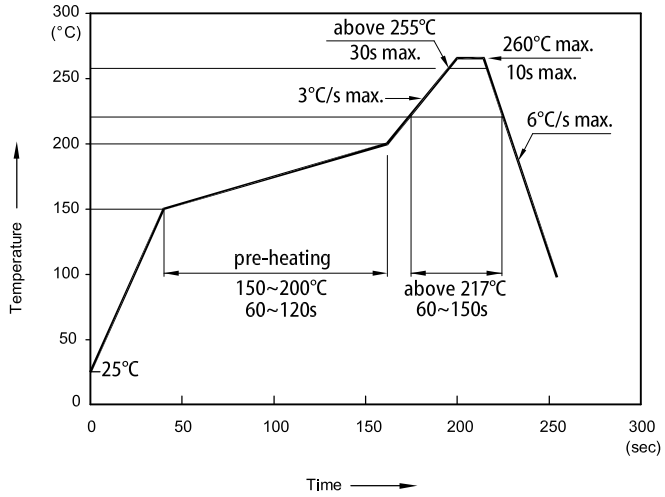
Forward Current Derating Curve



Luminous Intensity vs. Ambient Temperature

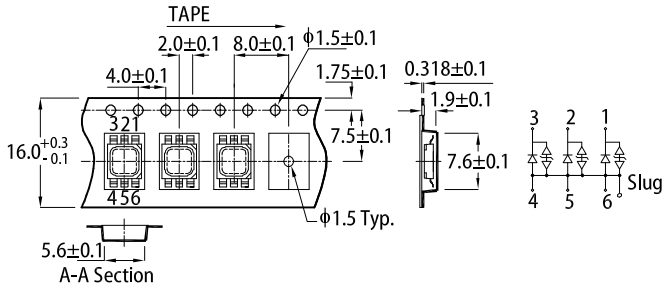


REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS

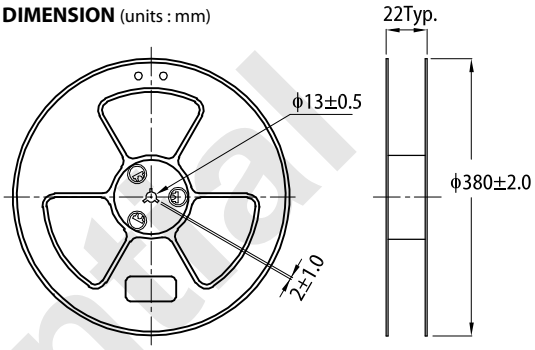


Notes:
1. Don't cause stress to the LEDs while it is exposed to high temperature.
2. The maximum number of reflow soldering passes is 2 times.
3. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.

TAPE SPECIFICATIONS (units : mm)



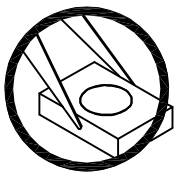
REEL DIMENSION (units : mm)



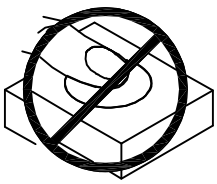
HANDLING PRECAUTIONS

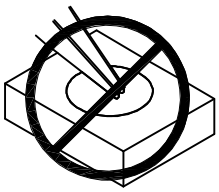
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force. As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

1. Handle the component along the side surfaces by using forceps or appropriate tools.

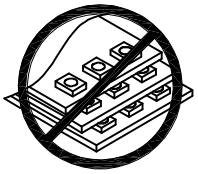


2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.

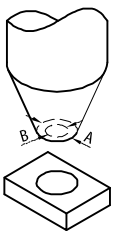




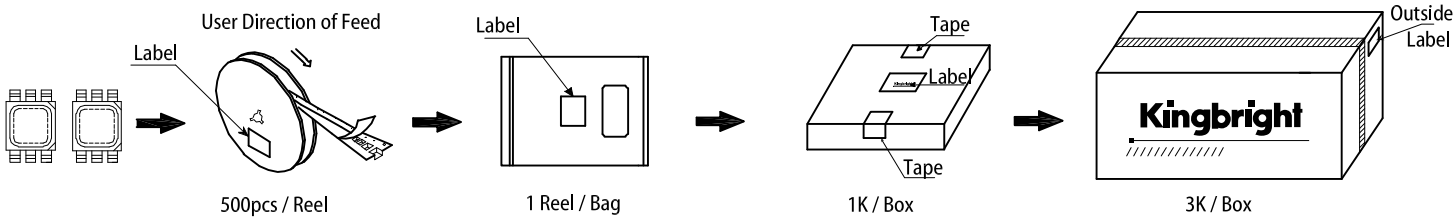
3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.

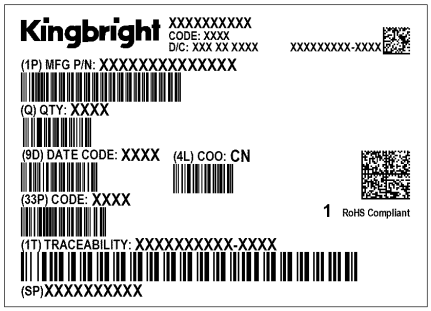


4-1. The inner diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks.
4-2. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup.
4-3. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.
5. As silicone encapsulation is permeable to gases, some corrosive substances such as H_2S might corrode silver plating of leadframe. Special care should be taken if an LED with silicone encapsulation is to be used near such substances.



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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