



ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
DEVICES



Features

- Super high flux output and high luminance.
- Designed for high current operation.
- Low thermal resistance.
- Silicone resin with glass lens.
- Compatible with IR-reflow processes.
- ESD protection .
- Package : 500pcs / reel.
- RoHS compliant.

Applications

- Substitution of micro incandescent lamps.
- Portable light source.
- Signal and symbol luminaire for orientation.
- Marker lights (e.g. steps, exit ways, etc).
- Decorative and entertainment lighting.
- Commercial and residential lighting.
- Emergency-vehicle lighting.

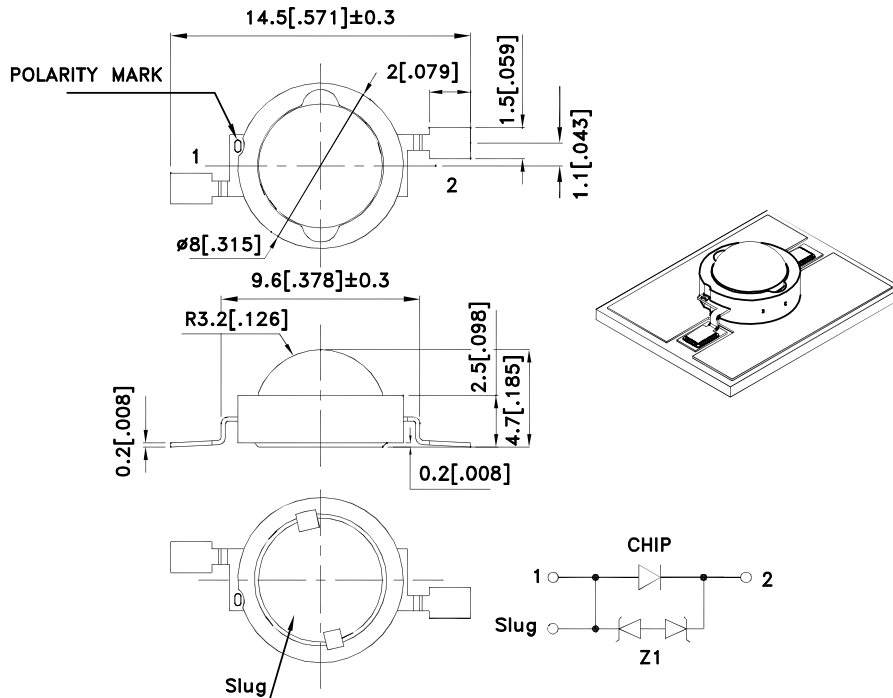
Application Note

Static electricity and surge damage the LEDs.

It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.

All devices, equipment and machinery must be electrically grounded.

Package Dimensions



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25(0.01^*)$ unless otherwise noted.
3. Specifications are subject to change without notice.
4. The device has a single mounting surface. The device must be mounted according to the specifications.



Flux Characteristics at 700mA Ambient Temperature, $T_a = 25^\circ\text{C}$

| Erp | Color | Part No. | Luminous Flux (lm) @ 700mA [1] | | | Typical Luminous Flux (lm) [1] |
|------------|-----------------------|----------------------|--------------------------------|------|------|--------------------------------|
| | | | Code. | Min. | Max. | Typ. |
| 1201200318 | Cool White (InGaN) | AADG18080QR412S/3-C1 | C2 | 120 | 140 | 160 |
| | | | C3 | 140 | 160 | |
| | | | C4 | 160 | 180 | |
| | | | C5 | 180 | 210 | |
| 1201200326 | Neutral White (InGaN) | AADG18080QR412S/3-N1 | C1 | 100 | 120 | 140 |
| | | | C2 | 120 | 140 | |
| | | | C3 | 140 | 160 | |
| | | | C4 | 160 | 180 | |
| 1201200328 | Warm White (InGaN) | AADG18080QR412S/3-W2 | C1 | 100 | 120 | 140 |
| | | | C2 | 120 | 140 | |
| | | | C3 | 140 | 160 | |
| | | | C4 | 160 | 180 | |

Note:

1. Minimum luminous flux performance guaranteed within published operating conditions. Kingbright maintains tolerance of +/-15% on flux.

Optical Characteristics at 700mA Ambient Temperature, $T_a = 25^\circ\text{C}$

| Color | Correlated Color Temperature CCT | | | Typical Viewing Angle [1] (degrees) $2\theta_{1/2}$ |
|---------------|----------------------------------|-------|-------|---|
| | Min. | Typ. | Max. | |
| Cool White | 5310K | 6000K | 7040K | 100° |
| Neutral White | 3710K | 4500K | 5310K | 100° |
| Warm White | 2580K | 3000K | 3710K | 100° |

Note:

1. Viewing angle is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.

Electrical Characteristics at 700mA Ambient Temperature, $T_a = 25^\circ\text{C}$

| Part No. | Forward Voltage V_f [1] (V) | | | Typical Temperature Coefficient of Forward Voltage [2] (mV/ $^\circ\text{C}$) $\Delta V_f / \Delta T$ | Typical Thermal Resistance ($^\circ\text{C}/\text{W}$) $R_{th \text{ j-slug}}$ |
|----------------------|----------------------------------|------|------|---|--|
| | Min. | Typ. | Max. | | |
| AADG18080QR412S/3-C1 | - | 4.6 | 5.2 | -4.3 | 7 |
| AADG18080QR412S/3-N1 | - | 4.6 | 5.2 | -4.3 | 7 |
| AADG18080QR412S/3-W2 | - | 4.6 | 5.2 | -4.3 | 7 |

Notes:

- Kingbright maintains a tolerance of +/- 0.1V on forward voltage measurements.
- Measured between $25^\circ\text{C} < T_J < 130^\circ\text{C}$ at $I_F = 700 \text{ mA}$.

Absolute Maximum Ratings

| Parameter | Cool White / Neutral White / Warm White |
|---|---|
| DC Forward Current (mA) [1] | 700 |
| Peak Pulsed Forward Current (mA) | 1000 |
| Average Forward Current (mA) | 700 |
| Reverse Voltage (V) | 5 |
| ESD Sensitivity | 8000V HBM |
| LED Junction Temperature ($^\circ\text{C}$) | 130 |
| Operation Temperature ($^\circ\text{C}$) | -40 to+100 |
| Storage Temperature ($^\circ\text{C}$) | -40 to+110 |
| Soldering Temperature ($^\circ\text{C}$) | 260 For 5 Seconds |

Notes:

- Proper current derating must be observed to maintain junction temperature below the maximum.

Moisture Sensitivity

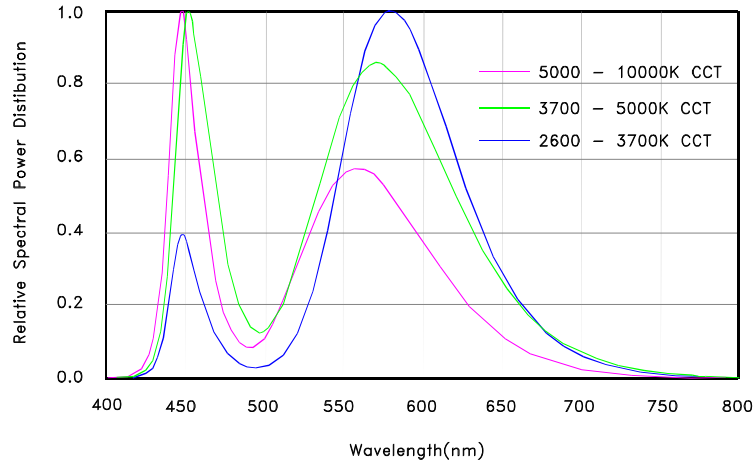
AADG18080 LEDs are packaged in airtight and moisture-resistant bags to prevent moisture absorption which may lead to catastrophic failure in reflow soldering process. Kingbright recommends that the devices must be baked before soldering if they are removed from the original package, and are exposed to environmental conditions for longer than the durations (unit: days) defined in the table below. Recommended baking conditions are 24 hours at 80°C .

| Temperature | Maximum Percent Relative Humidity | | | | | | |
|--------------------|-----------------------------------|-----|-----|-----|-----|-----|-----|
| | 30% | 40% | 50% | 60% | 70% | 80% | 90% |
| 30°C | 9 | 5 | 4 | 3 | 1 | 1 | 1 |
| 25°C | 12 | 7 | 5 | 4 | 2 | 1 | 1 |
| 20°C | 17 | 9 | 7 | 6 | 2 | 2 | 1 |

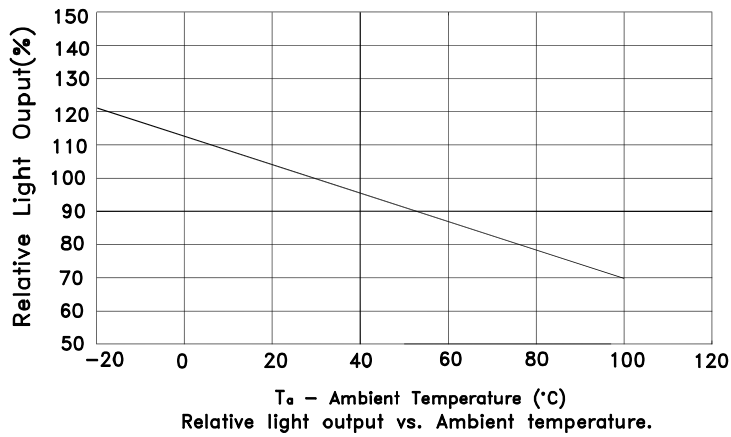
Storage Conditions

After being removed from the original sealed package, AADG18080 LEDs should be stored at a temperature of 25°C with a relative humidity lower than 10%. Under such conditions, storage duration is excluded from the exposure duration as defined in the Moisture Sensitivity section.

Wavelength Characteristics $T_a = 25^\circ\text{C}$



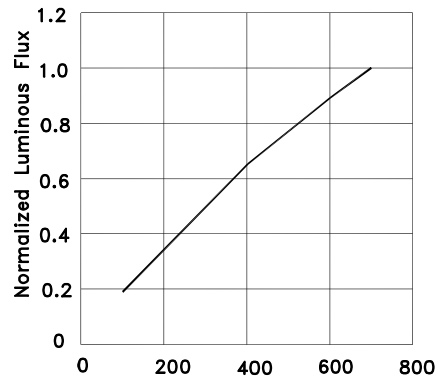
Light Output Characteristics



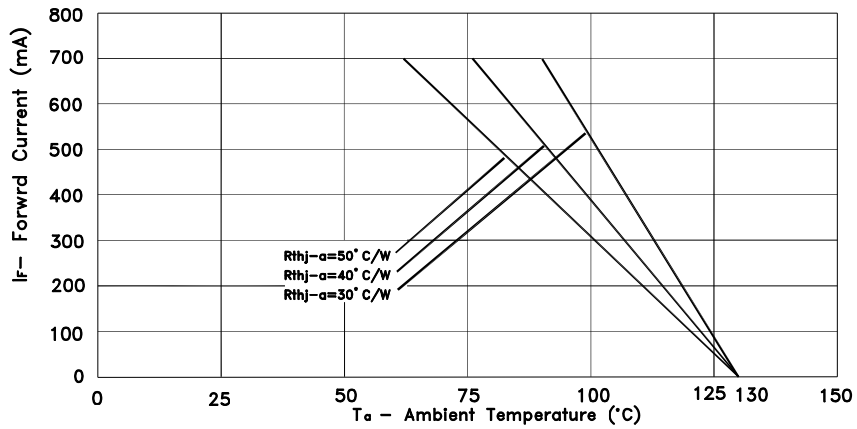
Kingbright



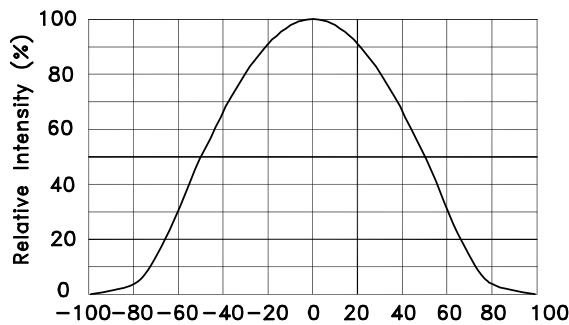
VF-Forward Voltage (V)
 Forward current vs.
 Forward voltage



IF-Forward Current (mA)
 Relative luminous vs.
 Forward current

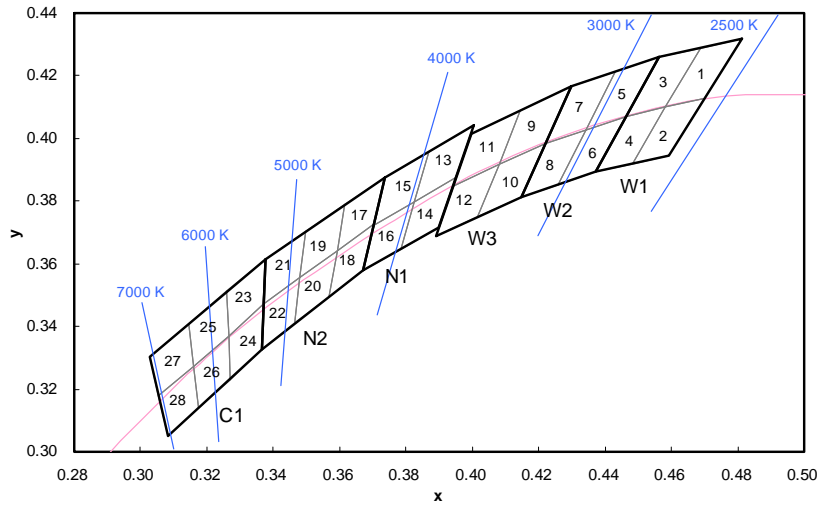


Maximum forward current vs. Ambient temperature, based on $T_{max} = 130^{\circ}C$.



Angular Displacement(Degrees)
 Representative Typical Spatial Radiation Pattern.

CCT 2500-7000 K Bin Code



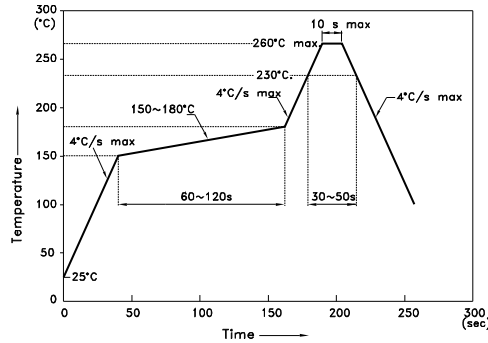
| Color | Group | Chromaticity Regions | CCT (K) | | |
|---------------|-------|------------------------|---------|------|------|
| | | | Min. | Typ. | Max. |
| Warm White | W1 | 1, 2, 3, 4 | 2580 | 2700 | 2870 |
| | W2 | 5, 6, 7, 8 | 2870 | 3000 | 3220 |
| | W3 | 9, 10, 11, 12 | 3220 | 3500 | 3710 |
| Neutral White | N1 | 13, 14, 15, 16 | 3710 | 4000 | 4260 |
| | N2 | 17, 18, 19, 20, 21, 22 | 4260 | 4700 | 5310 |
| Cool White | C1 | 23, 24, 25, 26, 27, 28 | 5310 | 6000 | 7040 |

Notes:
 Shipment may contain more than one chromaticity regions.
 Orders for single chromaticity region are generally not accepted.
 Measurement tolerance of the chromaticity coordinates is ± 0.02 .

| | x | y | | x | y | | x | y | | x | y |
|---|--------|--------|----|--------|--------|----|--------|--------|----|--------|--------|
| 1 | 0.4582 | 0.4099 | 8 | 0.4147 | 0.3814 | 15 | 0.3702 | 0.3722 | 22 | 0.3481 | 0.3557 |
| | 0.4687 | 0.4289 | | 0.4221 | 0.3984 | | 0.3736 | 0.3874 | | 0.3370 | 0.3472 |
| | 0.4813 | 0.4319 | | 0.4342 | 0.4028 | | 0.3869 | 0.3958 | | 0.3364 | 0.3328 |
| | 0.4700 | 0.4126 | | 0.4259 | 0.3853 | | 0.3825 | 0.3798 | | 0.3466 | 0.3411 |
| 2 | 0.4483 | 0.3919 | 9 | 0.4080 | 0.3916 | 16 | 0.3670 | 0.3578 | 23 | 0.3376 | 0.3616 |
| | 0.4582 | 0.4099 | | 0.4146 | 0.4089 | | 0.3702 | 0.3722 | | 0.3260 | 0.3512 |
| | 0.4700 | 0.4126 | | 0.4299 | 0.4165 | | 0.3825 | 0.3798 | | 0.3265 | 0.3371 |
| 3 | 0.4593 | 0.3944 | 10 | 0.4221 | 0.3984 | 17 | 0.3783 | 0.3646 | 24 | 0.3370 | 0.3472 |
| | 0.4465 | 0.4071 | | 0.4017 | 0.3751 | | 0.3616 | 0.3788 | | 0.3265 | 0.3371 |
| | 0.4562 | 0.4260 | | 0.4080 | 0.3916 | | 0.3592 | 0.3641 | | 0.3270 | 0.3230 |
| | 0.4687 | 0.4289 | | 0.4221 | 0.3984 | | 0.3703 | 0.3726 | | 0.3364 | 0.3328 |
| 4 | 0.4582 | 0.4099 | 11 | 0.4147 | 0.3814 | 18 | 0.3703 | 0.3726 | 25 | 0.3260 | 0.3512 |
| | 0.4483 | 0.3919 | | 0.3941 | 0.3848 | | 0.3592 | 0.3641 | | 0.3144 | 0.3408 |
| | 0.4465 | 0.4071 | | 0.3996 | 0.4015 | | 0.3568 | 0.3495 | | 0.3160 | 0.3274 |
| | 0.4582 | 0.4099 | | 0.4146 | 0.4089 | | 0.3670 | 0.3578 | | 0.3265 | 0.3371 |
| 5 | 0.4483 | 0.3919 | 12 | 0.4080 | 0.3916 | 19 | 0.3616 | 0.3788 | 26 | 0.3265 | 0.3371 |
| | 0.4342 | 0.4028 | | 0.3889 | 0.3690 | | 0.3496 | 0.3702 | | 0.3160 | 0.3274 |
| | 0.4430 | 0.4212 | | 0.3941 | 0.3848 | | 0.3481 | 0.3557 | | 0.3175 | 0.3139 |
| | 0.4562 | 0.4260 | | 0.4080 | 0.3916 | | 0.3592 | 0.3641 | | 0.3270 | 0.3230 |
| 6 | 0.4465 | 0.4071 | 13 | 0.4017 | 0.3751 | 20 | 0.3592 | 0.3641 | 27 | 0.3144 | 0.3408 |
| | 0.4373 | 0.3893 | | 0.3825 | 0.3798 | | 0.3481 | 0.3557 | | 0.3028 | 0.3304 |
| | 0.4342 | 0.4028 | | 0.3869 | 0.3958 | | 0.3466 | 0.3411 | | 0.3055 | 0.3177 |
| | 0.4465 | 0.4071 | | 0.4006 | 0.4044 | | 0.3568 | 0.3495 | | 0.3160 | 0.3274 |
| 7 | 0.4373 | 0.3893 | 14 | 0.3950 | 0.3875 | 21 | 0.3496 | 0.3702 | 28 | 0.3160 | 0.3274 |
| | 0.4221 | 0.3984 | | 0.3783 | 0.3646 | | 0.3496 | 0.3702 | | 0.3055 | 0.3177 |
| | 0.4299 | 0.4165 | | 0.3825 | 0.3798 | | 0.3376 | 0.3616 | | 0.3081 | 0.3049 |
| | 0.4430 | 0.4212 | | 0.3950 | 0.3875 | | 0.3370 | 0.3472 | | 0.3081 | 0.3049 |
| | 0.4342 | 0.4028 | | 0.3898 | 0.3716 | | 0.3481 | 0.3557 | | 0.3175 | 0.3139 |

Reflow soldering is recommended and the soldering profile is shown below.
Other soldering methods are not recommended as they might cause damage to the product.

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.

Heat Generation:

1. Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

2. Please determine the operating current with consideration of the ambient temperature local to the LED and refer to the plot of Permissible Forward current vs. Ambient temperature on CHARACTERISTICS in this specification. Please also take measures to remove heat from the area near the LED to improve the operational characteristics on the LED.

3. The equation ① indicates correlation between T_j and T_a , and the equation ② indicates correlation between T_j and T_s

$$T_j = T_a + R_{thj-a} * W \quad \text{①}$$

$$T_j = T_s + R_{thj-s} * W \quad \text{②}$$

T_j = dice junction temperature: °C

T_a = ambient temperature: °C

T_s = solder point temperature: °C

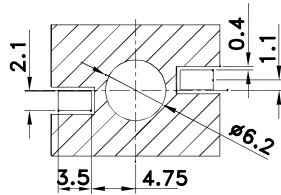
R_{thj-a} = heat resistance from dice junction temperature to ambient temperature : °C /W

R_{thj-s} = heat resistance from dice junction temperature to T_s measuring point : °C /W

W = inputting power (IFx VF) : W

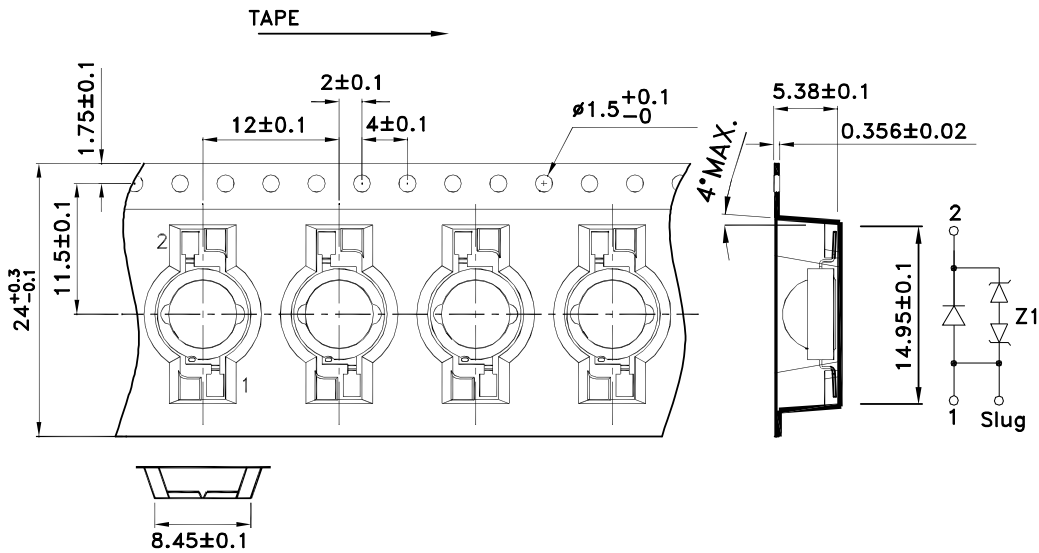
Kingbright

Recommended Soldering Pattern
(Units : mm ; Tolerance: ± 0.1)

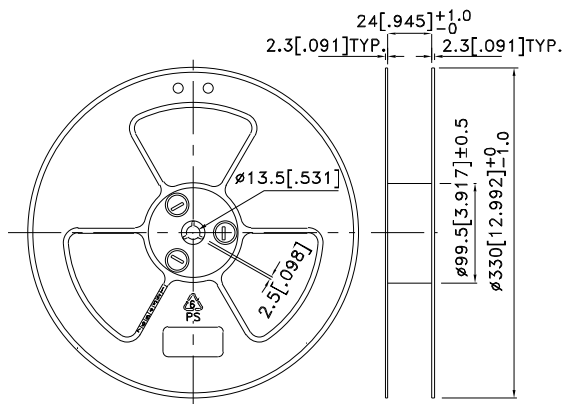


 Solder resist

Tape Dimensions
(Units : mm)



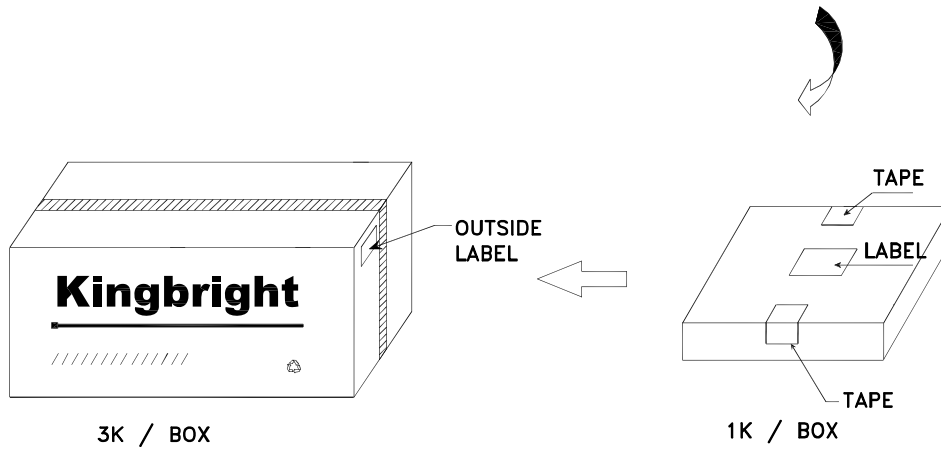
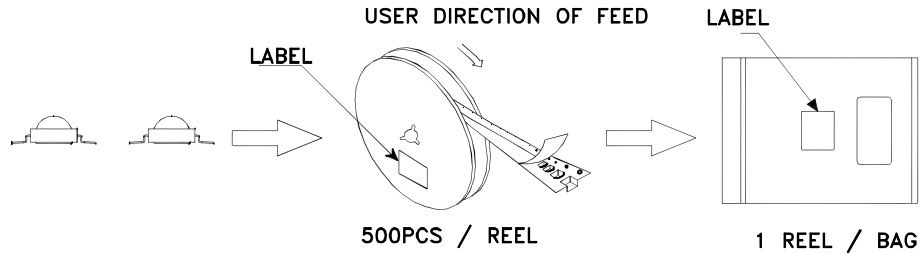
Reel Dimension




PACKING & LABEL SPECIFICATIONS

AADG18080QR412S/3

SERIES



| | |
|--|--|
| <h1>Kingbright</h1> | |
| P/NO: AADG18080xxx | |
| QTY: 500 pcs | Q.C. Q C XX XX XXXX PASSED |
| S/N: XXXX | |
| CODE: XXX | |
| LOT NO: | |
|  XXXXXXXXXXXX | |
| RoHS Compliant | |