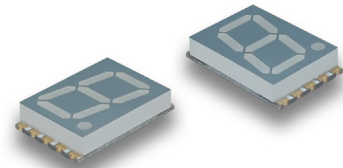


ACSA56-41CGKWA-F01

Surface Mount Display



DESCRIPTIONS

- The Green 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

- 0.56 inch digit height
- Low current operation
- Excellent character appearance
- Mechanically rugged
- Gray face, white segment
- Package: 400 pcs / reel
- Moisture sensitivity level: 2a
- RoHS compliant

APPLICATIONS

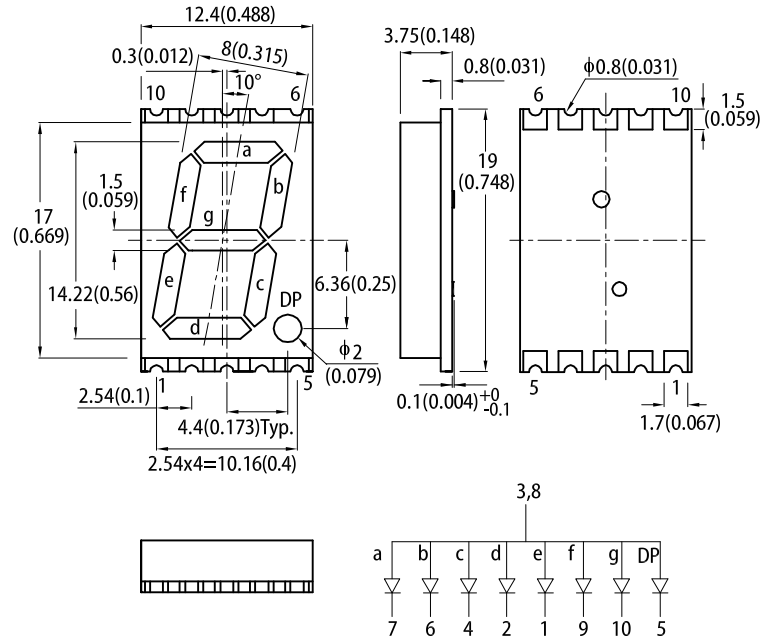
- Home and smart appliances
- Display time and digital combination
- Industrial and instrumental applications
- Numeric status

ATTENTION

Observe precautions for handling electrostatic discharge sensitive devices

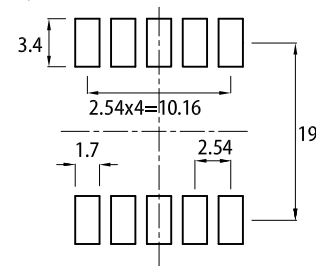


PACKAGE DIMENSIONS



RECOMMENDED SOLDERING PATTERN

(units: mm; tolerance: ± 0.15)



Notes:

1. All dimensions are in millimeters (inches). Tolerance is $\pm 0.25(0.01")$ unless otherwise noted.
2. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
3. The gap between the reflector and PCB shall not exceed 0.25mm.

SELECTION GUIDE

| Part Number | Emitting Color (Material) | Lens Type | Iv (ucd) @ 10mA ^[1] | | Description |
|--------------------|---------------------------|----------------|--------------------------------|-------|--------------------------------|
| | | | Min. | Typ. | |
| ACSA56-41CGKWA-F01 | Green (AlGaInP) | White Diffused | 9000 | 25000 | Common Anode, Rt. Hand Decimal |
| | | | *2200 | *4600 | |

Notes:
 1. Luminous intensity / luminous Flux: $\pm 15\%$.
 * Luminous intensity 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 = 10mA | λ_{peak} | Green | 574 | - | nm |
| Dominant Wavelength I _F = 10mA | $\lambda_{\text{dom}}^{[1]}$ | Green | 570 | - | nm |
| Spectral Bandwidth at 50% Φ REL MAX I _F = 10mA | $\Delta\lambda$ | Green | 20 | - | nm |
| Forward Voltage I _F = 10mA | V _F ^[2] | Green | 2.0 | 2.45 | V |
| Reverse Current (V _R = 5V) | I _R | Green | - | 10 | μA |

Notes:

1. The dominant wavelength (λ_d) above is the setup value of the sorting machine. (Tolerance λ_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°C

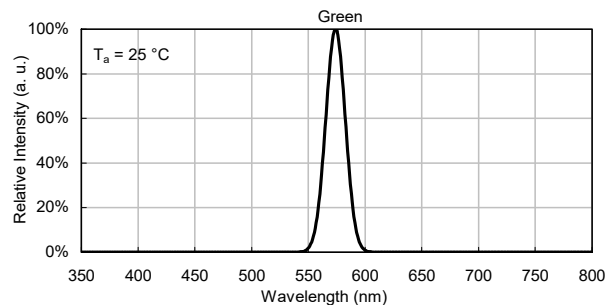
| Parameter | Symbol | Value | Unit |
|---|--------------------------------|------------|------|
| Power Dissipation | P _D | 75 | mW |
| Reverse Voltage | V _R | 5 | V |
| Junction Temperature | T _j | 115 | °C |
| Operating Temperature | T _{op} | -40 to +85 | °C |
| Storage Temperature | T _{stg} | -40 to +85 | °C |
| DC Forward Current | I _F | 30 | mA |
| Peak Forward Current | I _{FP} ^[1] | 150 | mA |
| Electrostatic Discharge Threshold (HBM) | - | 3000 | V |

Notes:

1. 1/10 Duty Cycle, 0.1ms Pulse Width.

2. 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.

RELATIVE INTENSITY vs. WAVELENGTH

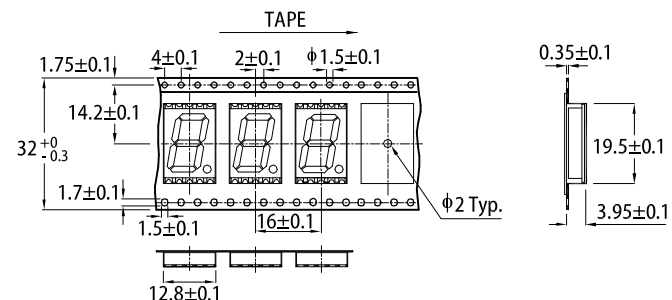
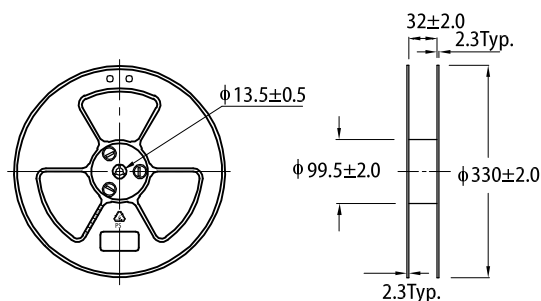


The figure consists of four graphs illustrating the characteristics of an LED:

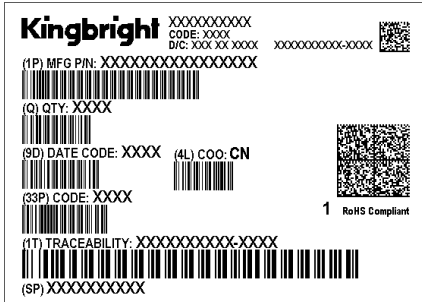
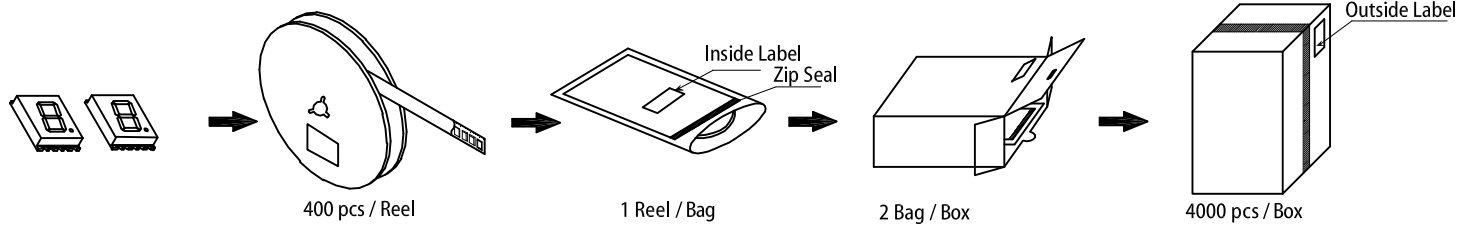
- Forward Current vs. Forward Voltage:** A graph showing Forward current (mA) on the y-axis (0 to 20) versus Forward voltage (V) on the x-axis (1.7 to 2.2). The curve shows an exponential relationship, starting near 0 mA at 1.8 V and rising sharply to 20 mA at approximately 2.05 V. The ambient temperature is $T_a = 25^\circ\text{C}$.
- Luminous Intensity vs. Forward Current:** A graph showing Luminous intensity normalised at 10 mA on the y-axis (0.0 to 2.5) versus Forward current (mA) on the x-axis (0 to 20). The relationship is linear, starting at (0, 0) and reaching 2.0 at 20 mA. The ambient temperature is $T_a = 25^\circ\text{C}$.
- Forward Current Derating Curve:** A graph showing Permissible forward current (mA) on the y-axis (0 to 50) versus Ambient temperature ($^\circ\text{C}$) on the x-axis (-40 to 100). The current is constant at 30 mA from -40 $^\circ\text{C}$ to 25 $^\circ\text{C}$, then derates linearly to 0 mA at 85 $^\circ\text{C}$.
- Luminous Intensity vs. Ambient Temperature:** A graph showing Luminous intensity normalised at $T_a = 25^\circ\text{C}$ on the y-axis (0.0 to 2.5) versus Ambient temperature ($^\circ\text{C}$) on the x-axis (-40 to 100). The intensity decreases linearly from approximately 2.1 at -40 $^\circ\text{C}$ to 0.4 at 85 $^\circ\text{C}$.

Figure 1 is a graph showing the temperature profile of a polymer solution during the synthesis of polyacrylonitrile. The Y-axis represents Temperature (°C) from 0 to 300, and the X-axis represents Time (sec) from 0 to 300. The profile starts at 25°C, rises to 150°C at 40s, then to 200°C at 160s (labeled "pre-heating 150~200°C 60~120s"). Above 200°C, the rate is 3°C/s max. It reaches a plateau above 255°C (30s max) and then a peak at 260°C max (10s max). The cooling rate is 6°C/s max. A region above 217°C is labeled "60~150s".

TAPE SPECIFICATIONS (units: mm)

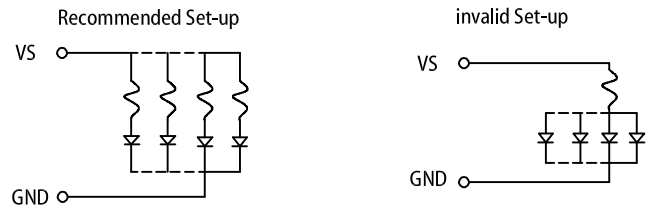
**REEL DIMENSION** (units: mm)

PACKING & LABEL SPECIFICATIONS



CIRCUIT DESIGN NOTES

1. Protective current-limiting resistors may be necessary to operate the LEDs within the specified range.
2. LEDs mounted in parallel should each be placed in series with its own current-limiting resistor.
3. The driving circuit should be designed to protect the LED against reverse voltages and transient voltage spikes when the circuit is powered up or shut down.
4. The safe operating current should be chosen after considering the maximum ambient temperature of the operating environment.
5. Prolonged reverse bias should be avoided, as it could cause metal migration, leading to an increase in leakage current or causing a short circuit.



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.
4. 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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6. When any special process such as potting is required for LED assembly, please consult with Kingbright representative before proceeding.
7. All design applications should refer to Kingbright application notes available at <https://www.KingbrightUSA.com/ApplicationNotes>