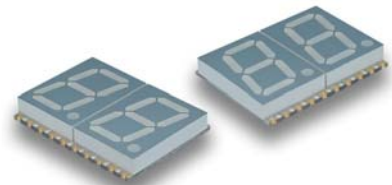


## ACDC56-41QBWA/D-F01

### Surface Mount Display



### DESCRIPTIONS

- The Blue source color devices are made with InGaN 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: 200 pcs / reel
- Moisture sensitivity level: 2a
- RoHS compliant

### APPLICATIONS

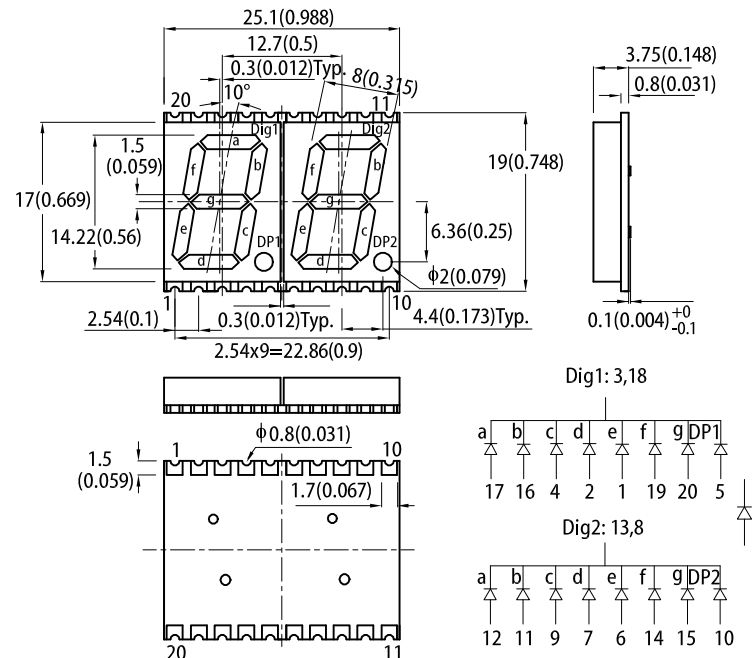
- Home and smart appliances
- Display time and digital combination
- Industrial and instrumental applications
- Numeric status

### ATTENTION

Observe precautions for handling electrostatic discharge sensitive devices

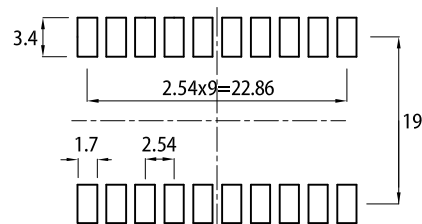


### PACKAGE DIMENSIONS



### RECOMMENDED SOLDERING PATTERN

(units: mm; tolerance:  $\pm 0.15$ )



#### 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 <sup>[1]</sup> |       | Description                      |
|---------------------|---------------------------|----------------|--------------------------------|-------|----------------------------------|
|                     |                           |                | Min.                           | Typ.  |                                  |
| ACDC56-41QBWA/D-F01 | Blue (InGaN)              | White Diffused | 5600                           | 15000 | Common Cathode, Rt. Hand Decimal |

Notes:  
 1. Luminous intensity / luminous Flux:  $\pm 1-15\%$ .  
 2. Luminous intensity value is traceable to CIE127-2007 standards.

**ELECTRICAL / OPTICAL CHARACTERISTICS at T<sub>A</sub>=25°C**

| Parameter                                                         | Symbol                        | Emitting Color | Value |      | Unit |
|-------------------------------------------------------------------|-------------------------------|----------------|-------|------|------|
|                                                                   |                               |                | Typ.  | Max. |      |
| Wavelength at Peak Emission I <sub>F</sub> = 10mA                 | $\lambda_{\text{peak}}$       | Blue           | 460   | -    | nm   |
| Dominant Wavelength I <sub>F</sub> = 10mA                         | $\lambda_{\text{dom}}^{[1]}$  | Blue           | 465   | -    | nm   |
| Spectral Bandwidth at 50% $\Phi$ REL MAX<br>I <sub>F</sub> = 10mA | $\Delta\lambda$               | Blue           | 25    | -    | nm   |
| Capacitance                                                       | C                             | Blue           | 100   | -    | pF   |
| Forward Voltage I <sub>F</sub> = 10mA                             | V <sub>F</sub> <sup>[2]</sup> | Blue           | 3.0   | 3.5  | V    |
| Reverse Current (V <sub>R</sub> = 5V)                             | I <sub>R</sub>                | Blue           | -     | 50   | uA   |

## Notes:

1. The dominant wavelength ( $\lambda_d$ ) above is the setup value of the sorting machine. (Tolerance  $\lambda_d$  :  $\pm 1\text{nm}$ .)
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<sub>A</sub>=25°C**

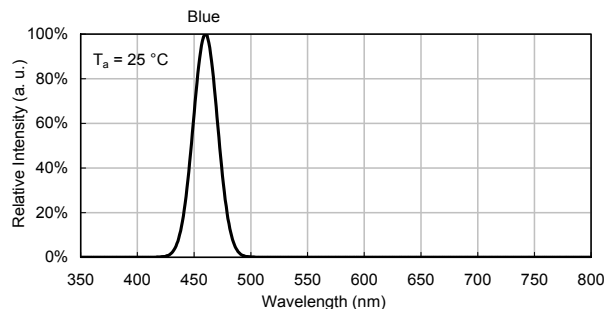
| Parameter                               | Symbol                         | Value      | Unit |
|-----------------------------------------|--------------------------------|------------|------|
| Power Dissipation                       | P <sub>D</sub>                 | 120        | mW   |
| Reverse Voltage                         | V <sub>R</sub>                 | 5          | V    |
| Junction Temperature                    | T <sub>j</sub>                 | 115        | °C   |
| Operating Temperature                   | T <sub>op</sub>                | -40 to +85 | °C   |
| Storage Temperature                     | T <sub>stg</sub>               | -40 to +85 | °C   |
| DC Forward Current                      | I <sub>F</sub>                 | 30         | mA   |
| Peak Forward Current                    | I <sub>FM</sub> <sup>[1]</sup> | 150        | mA   |
| Electrostatic Discharge Threshold (HBM) | -                              | 250        | 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.

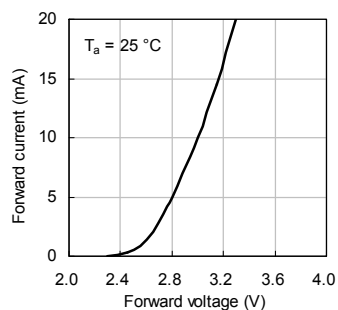
## TECHNICAL DATA

### RELATIVE INTENSITY vs. WAVELENGTH

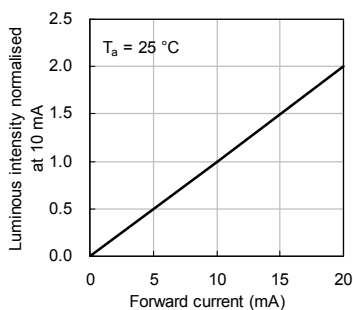


## BLUE

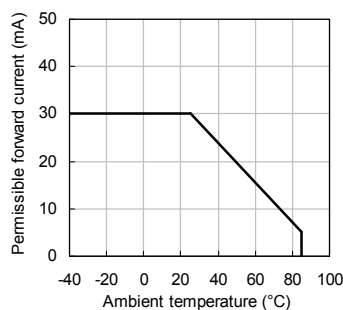
Forward Current vs. Forward Voltage



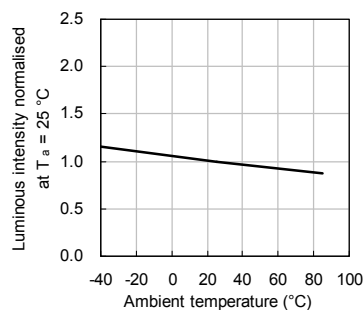
Luminous Intensity vs. Forward Current



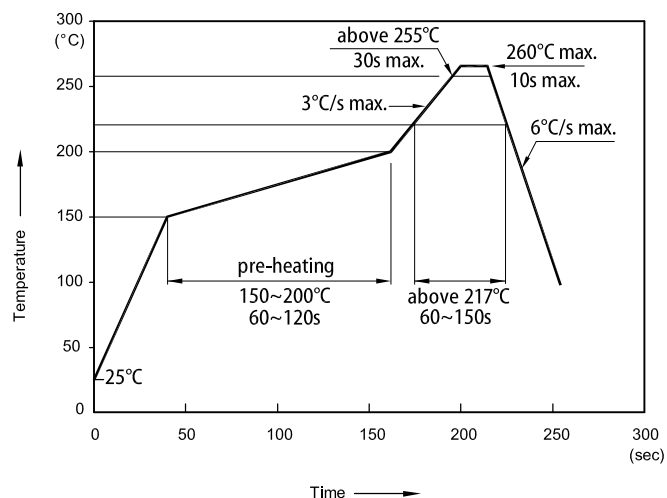
Forward Current Derating Curve



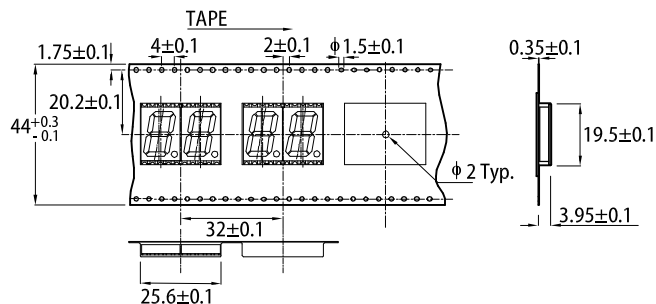
Luminous Intensity vs. Ambient Temperature



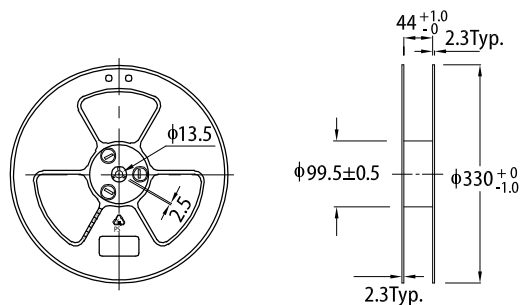
### REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS



### TAPE SPECIFICATIONS (units: mm)

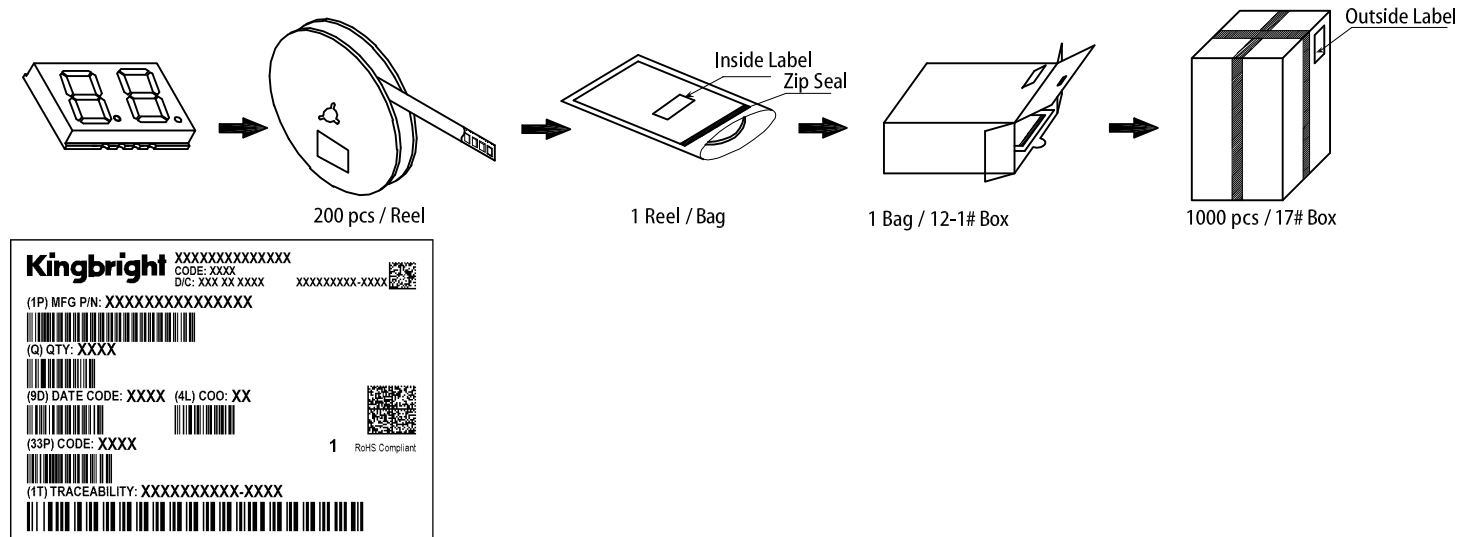


### REEL DIMENSION (units: mm)



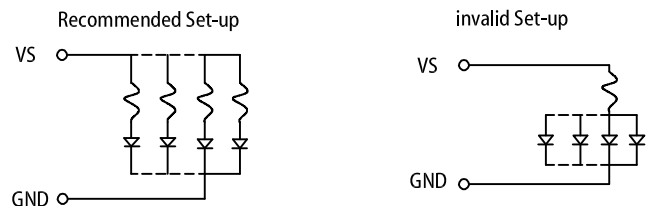
- Notes:
1. Don't cause stress to the LEDs while it is exposed to high temperature.
  2. The maximum number of reflow soldering passes is 2 times.
  3. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.

## PACKING & LABEL SPECIFICATIONS



## 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.
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