

0.28inch (7.00mm), Red**Single Digit 7-segment Surface Mount LED Display****Technical Data Sheet**

Features

- 0.28inch (7.00mm) digit height.
- The thickness is thinner than traditional display.
- Packaged in tape and reel for SMT manufacturing.
- Low current operation.
- Excellent character appearance.
- Categorized for luminous intensity.
- Available in CA and CC.
- The product itself will remain within RoHS compliant Version.

Descriptions

- The KW1-S284AVA/ KW1-S284CVA is a 0.28inch (7.00mm) height single digit display.
- The display provides excellent reliability in bright ambient light.
- The device is made with white segments and gray surface.

Applications

- Home appliances
- Game machine
- Instrument panels
- Digital readout displays

Device Selection Guide

Part No.	Emitting Color	Polarity
KW1-S284AVA	Red	Common Anode
KW1-S284CVA	Red	Common Cathode

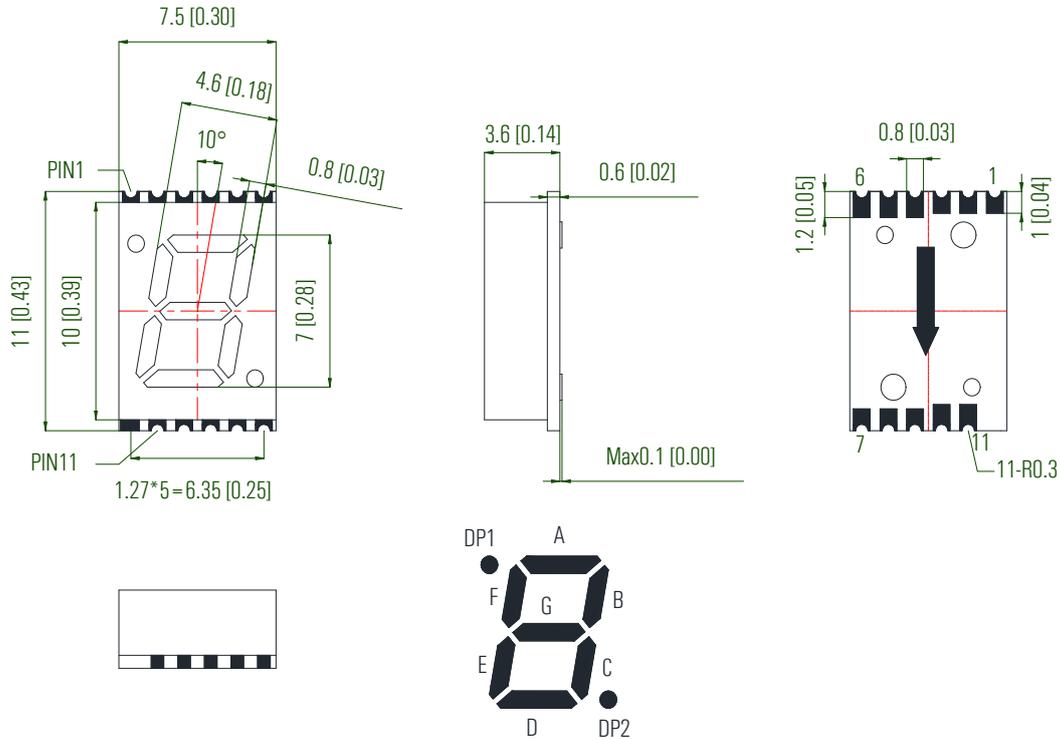
KW1-S284AVA/KW1-S284CVA

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Package Dimension

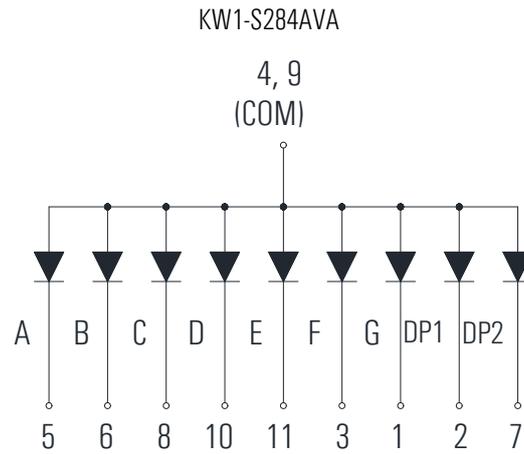


Notes:

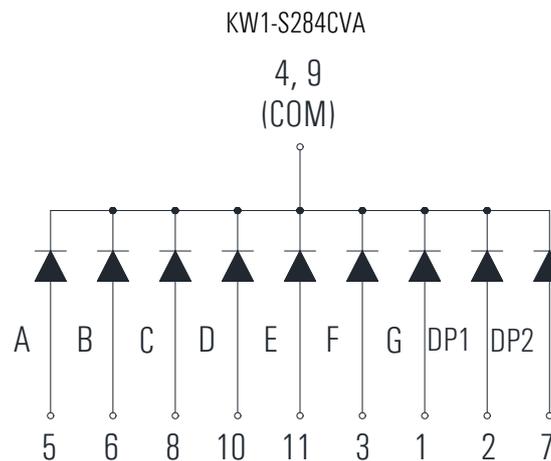
1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010") unless otherwise noted.
3. The gap between the reflector and PCB shall not exceed 0.25mm.

Internal Circuit Diagram:

Internal Circuit Diagram (Common Anode)



Internal Circuit Diagram (Common Cathode)



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Parameters	Symbol	Max	Unit
Power Dissipation Per Segment	P_d	48	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width)	I_{FP}	100	mA
Forward Current Per Segment	I_F	20	mA
Reverse Voltage Per Segment	V_R	5	V
Operating Temperature Range	T_{opr}	-40°C to +100°C	
Storage Temperature Range	T_{stg}	-40°C to +105°C	
Soldering Temperature	T_{sld}	260°C for 5 Seconds	

Electrical Optical Characteristics at Ta=25°C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Average Luminous Intensity	I_v	7.0	14.0	---	mcd	IF = 10mA (Note a)
Luminous Intensity Matching Ratio	I_{v-m}	---	---	2:1		IF = 10mA
Peak Emission Wavelength	λ_p	---	632	---	nm	IF = 20mA
Dominant Wavelength	λ_d	---	624	---	nm	IF = 20mA (Note b)
Spectral Line Half-Width	$\Delta \lambda$	---	20	---	nm	IF = 20mA
Forward Voltage Per Segment	V_F	---	2.0	2.4	V	IF = 20mA
Reverse Current Per Segment	I_R	---	---	50	μA	VR = 5V

Notes:

- a. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- b. The dominant wavelength (λ_d) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

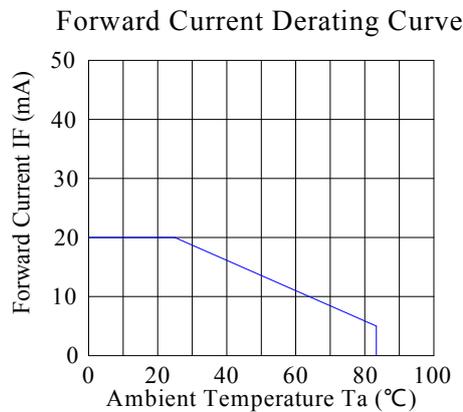
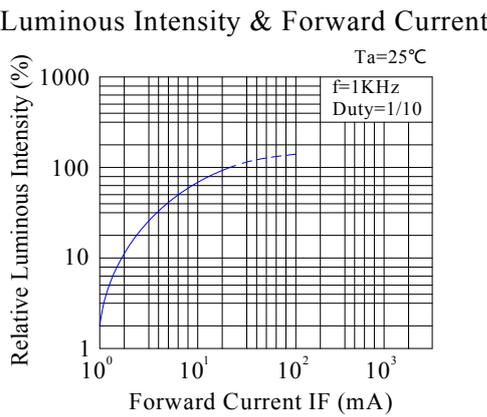
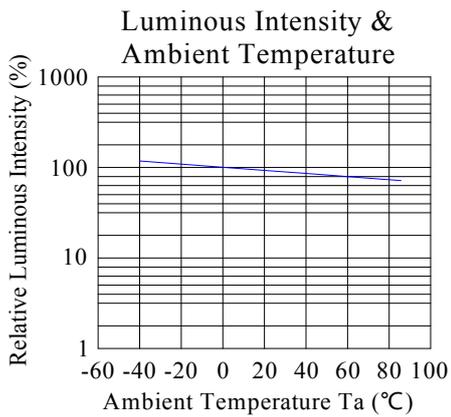
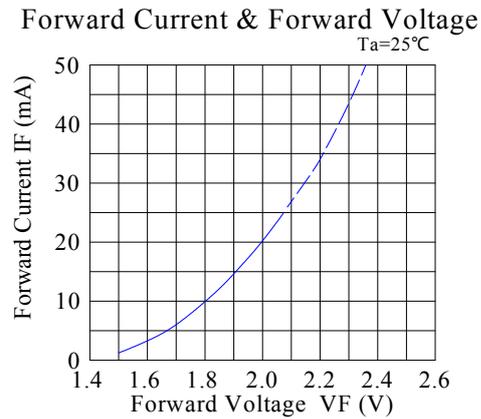
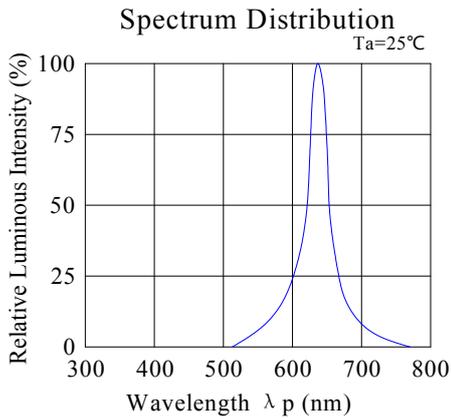
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Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)



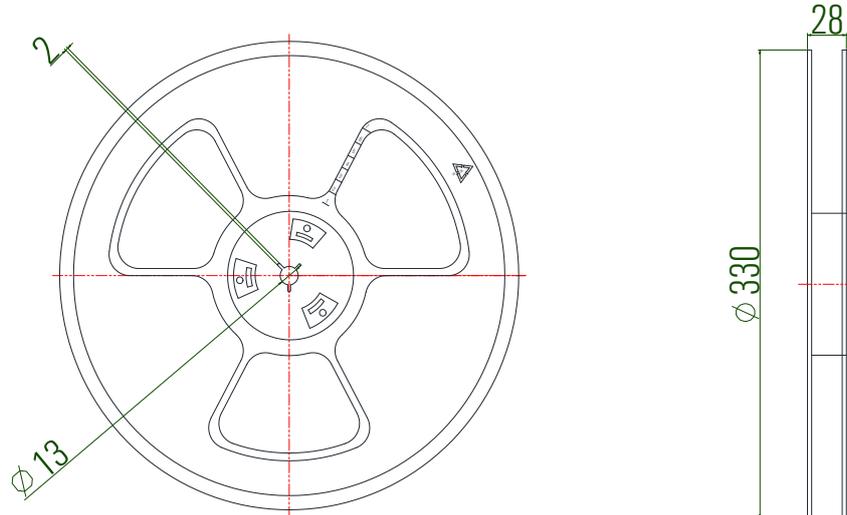
KW1-S284AVA/KW1-S284CVA

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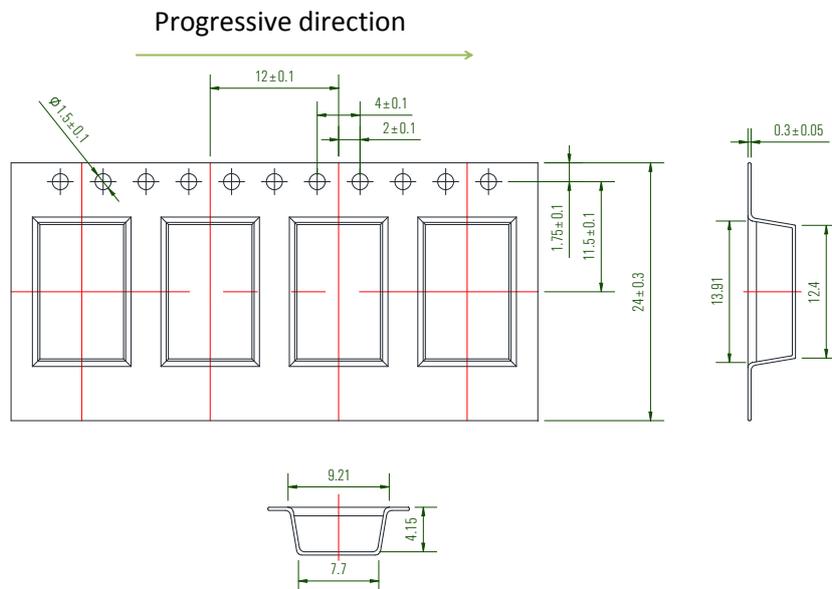
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Reel Dimensions (units: mm)



Carrier Tape Dimensions (units: mm)



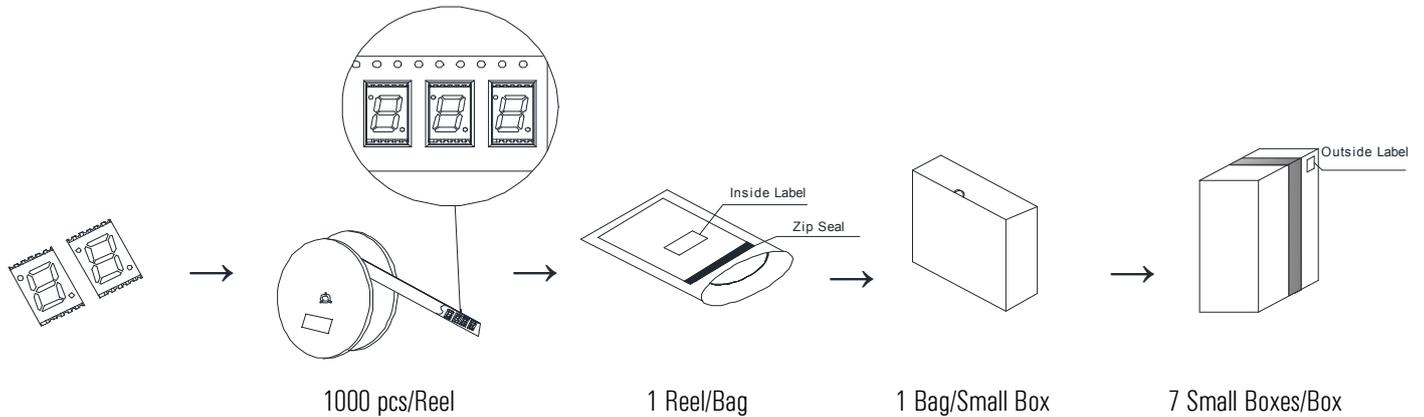
Note: Tolerances unless mentioned ± 0.25 mm.

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Packing & Label Specifications

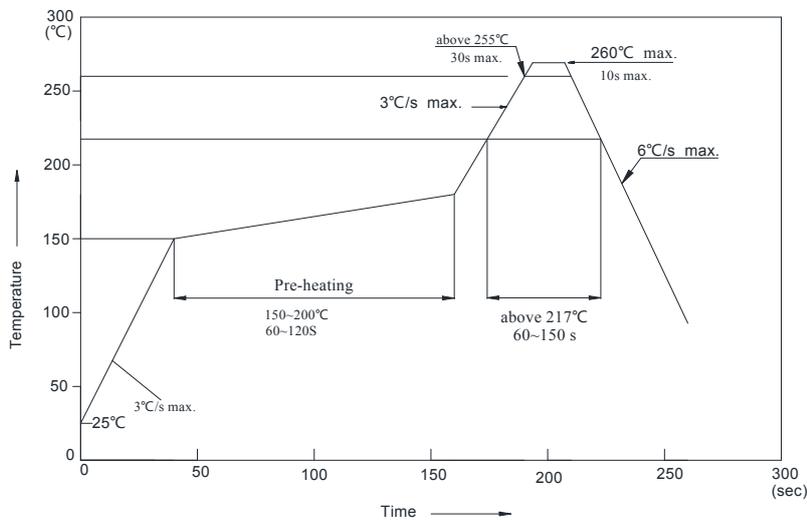


Precautions for Use

1. Caution in ESD

Static electricity and surge damages the LED. It is recommended to use a wrist band or anti-electrostatic glove when handling the LED. All devices equipment and machinery must be properly grounded.

2. SMT Soldering Condition



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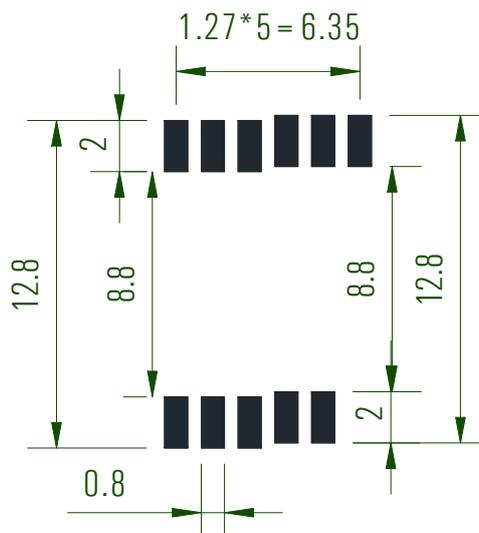
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Note:

Pre-heat	Other		
Temperature min	150 °C	Liquidus Temperature	217 °C
Temperature max	200 °C	Time above Liquidus Temperature	60-150s
Time	60-120s	Peak Temperature	260 °C
Average ramp-up rate	3 °C/s .max.	Time 25 °C to peak temperature	8 minutes max.
		Ramp- Down Rate from Peak Temperature	6 °C/s max.
		Reflow times	1 time

- a. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.
- b. All parameters are maximum body case temperature values and cannot be considered as a soldering profile. The body case temperature was measured by soldering a thermal couple to the soldering point of LEDs.

3. Recommended Soldering Pattern



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4. Circuit Design Notes:

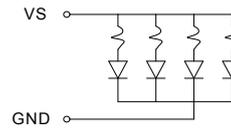
a. Protective current-limiting resistors may be necessary to operate the LEDs within the specified range.

b. LEDs mounted in parallel should each be placed in series with its own current-limiting resistor.

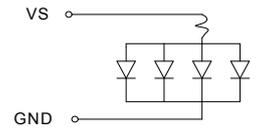
c. The driving circuit should be designed to protect the LED against reverse voltages and transient voltage spikes when the circuit is powered up or shut down.

d. The safe operating current should be chosen after considering the maximum ambient temperature of the operating environment.

Recommended Set-up



Invalid Set-up

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6. The LEDs should be operated with forward bias. The driving circuit must be designed so that the LEDs are not subjected to forward or reverse voltage while it is off. If reverse voltage is continuously applied to the LEDs, it may cause migration resulting in LED damage.