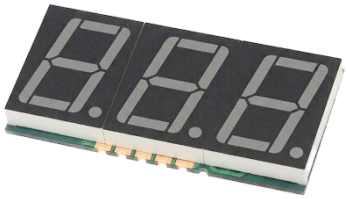
KD3-S561AWB / KD3-S561CWB

0.56-inch (14.20 mm) 3-Digit Seven-Segment Display

White Surface-Mount Three-Digit LED Numeric Display

LuckyLight
Innovative Optoelectronic Solutions

Technical Data Sheet



Features

- High reliability
- Low current operation
- Low profile and light weight (for space-saving designs)
- Packaged in tape and reel for automated SMT assembly
- Compatible with IR-reflow soldering
- Excellent character appearance
- RoHS compliant

Descriptions

KD3-S561AWB (Common Anode) and KD3-S561CWB (Common Cathode) are 0.56-inch (14.20 mm) character height surface-mount (SMD) white 3-digit seven-segment displays. These devices provide excellent readability at distances up to 7 meters and offer stable performance under high ambient light conditions. The standard version features a black surface with white segments; a gray surface version is also available as an option.

Applications

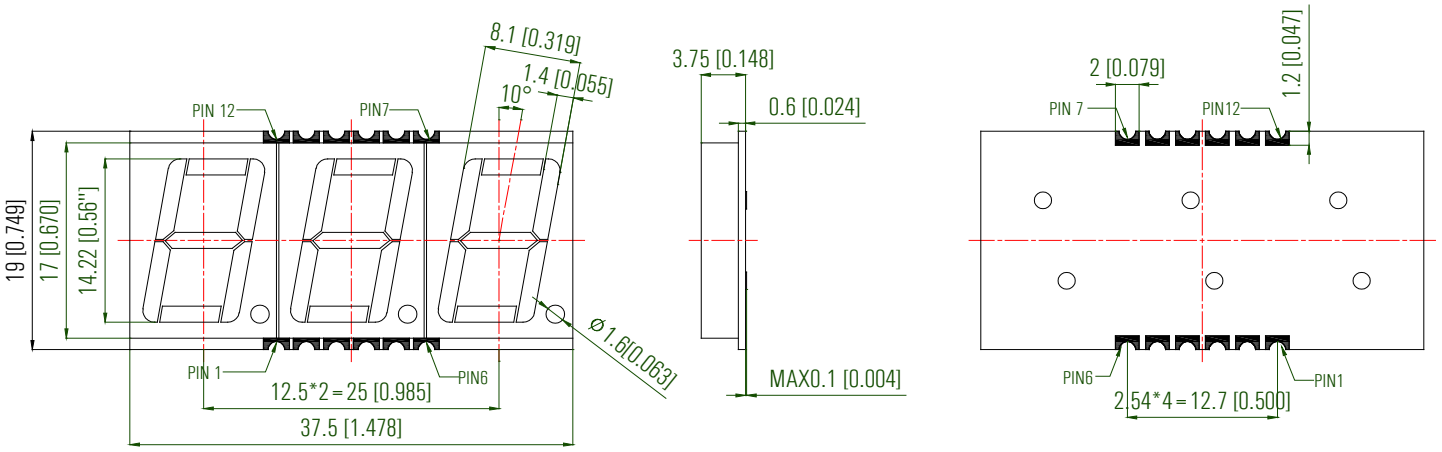
- **Consumer Electronics:** Home appliances, Game console systems
- **Commercial Terminals:** Point-of-sale terminals
- **General Use:** Digital readout displays
- **Industrial Equipment:** Instrumentation panels, Test and measurement equipment**,** Control systems

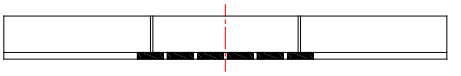
Device Selection Guide

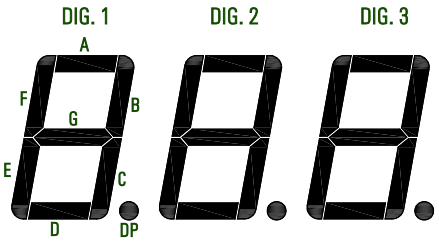
Part No.	Emitting Color	Circuit Type
KD3-S561AWB	White	Common Anode
KD3-S561CWB	White	Common Cathode

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Package Dimension







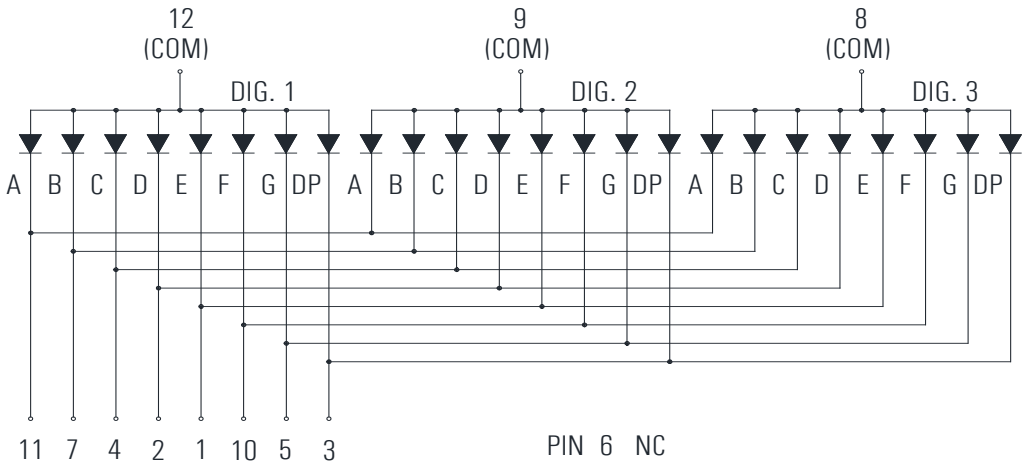
Notes:

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.*

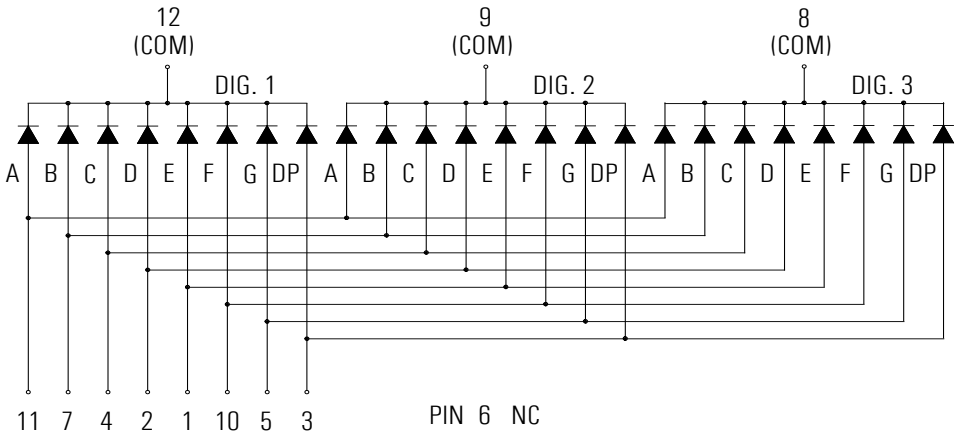
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Internal Circuit Diagram:

KD3-S561AWB (Common Anode)

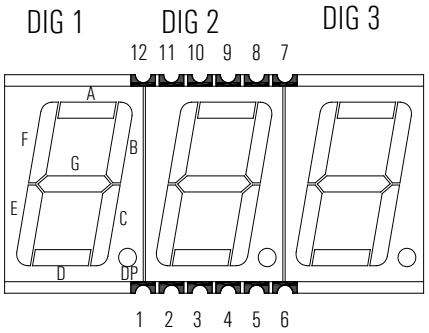


KD3-S561CWB (Common Cathode)



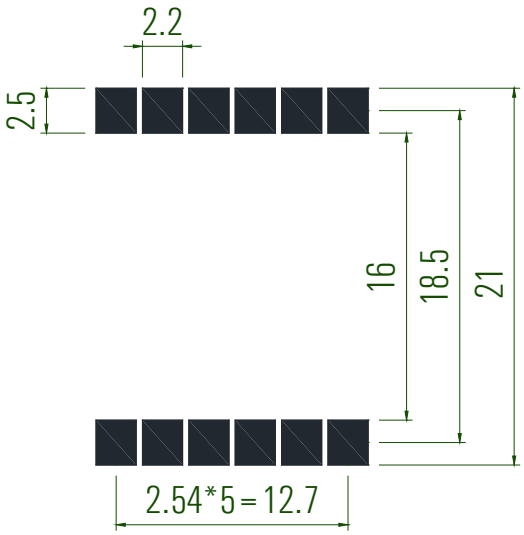
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Pin Connection



Pin No.	Function
1	Segment E
2	Segment D
3	Segment DP
4	Segment C
5	Segment G
6	No connect
7	Segment B
8	Digit3 Common
9	Digit2 Common
10	Segment F
11	Segment A
12	Digit1 Common

Recommended Soldering Pattern



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Absolute Maximum Ratings at T_a=25℃

Parameters	Symbol	Max	Unit
Power Dissipation (Per Chip)	P_d	64	mW
Peak Forward Current (Per Segment) (1/10 Duty Cycle, 0.1ms pulse width)	I_{FP}	40	mA
Forward Current (Per Segment)	I_F	20	mA
Reverse Voltage (Per Chip)	V_R	5	V
Operating Temperature Range	T_{opr}	-40℃ to +80℃	
Storage Temperature Range	T_{stg}	-40℃ to +85℃	
Soldering Temperature	T_{sld}	260℃ for 5 Seconds	

Electrical Optical Characteristics at T_a=25℃

Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Average Luminous Intensity	Iv	28.0	55.0	---	mcd	IF=5mA (Note a)
		55.0	110.0	---	mcd	IF=10mA (Note a)
Luminous Intensity Matching Ratio	I_{v-m}	---	---	2:1		IF=20mA
Chromaticity Coordinates	x	---	0.30	---	nm	IF=20mA
	y	---	0.31	---	nm	IF=20mA (Note b)
Forward Voltage (Per Segment)	V_F	---	3.0	3.2	V	IF=20mA (Note c)
Reverse Current (Per Segment)	I_R	---	---	50	μA	VR=5V

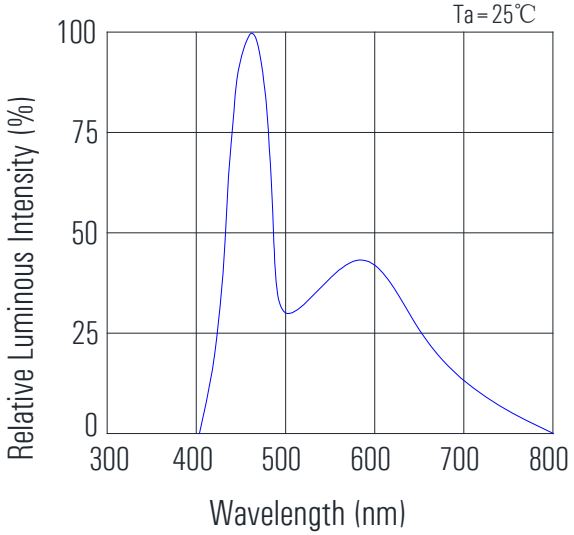
Notes:

1. *Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve. Tolerance of Luminous Intensity: ± 10%.*
2. *Excess driving current and / or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.*
3. *The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram.*
4. *Tolerance of Forward Voltage: ± 0.1V.*

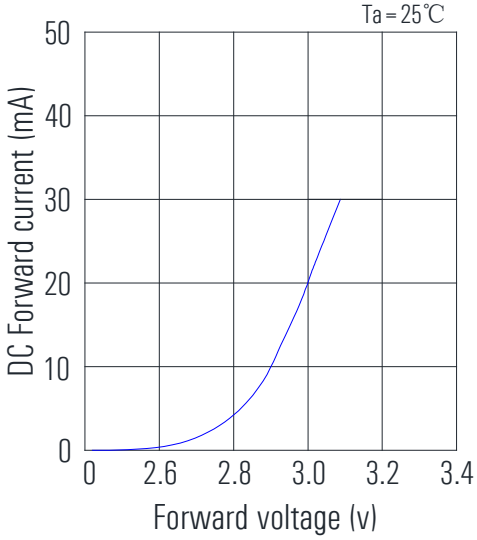
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Typical Electrical/Optical Characteristics Curves (T_a=25 ℃)

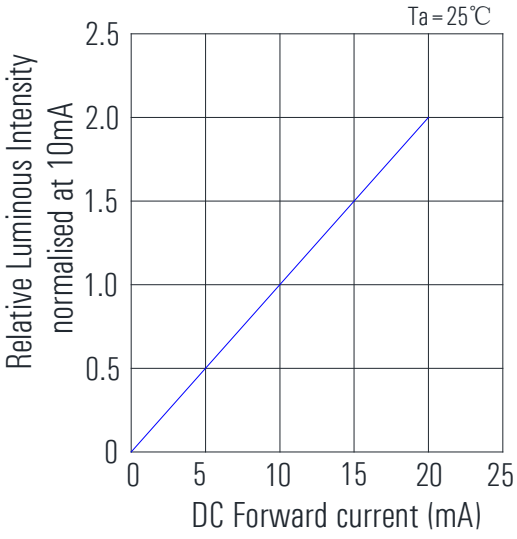
Relative Luminous Intensity Vs Wavelength



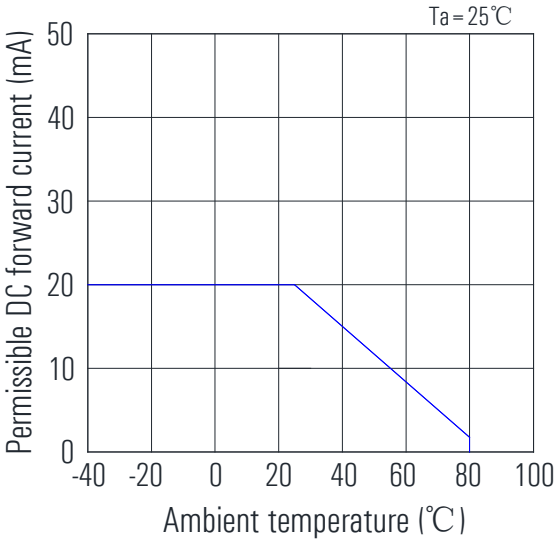
Forward Current vs Forward Voltage



Relative Luminous Intensity vs Forward Current



Forward Current Derating Curve



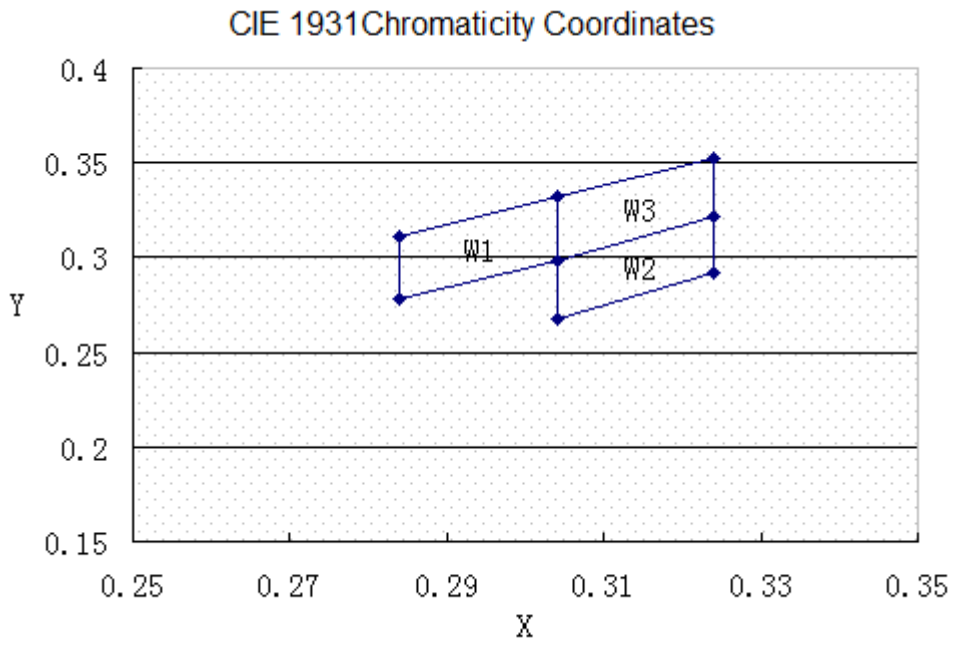
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Chromaticity Coordinates Specifications for Bin Rank

Color Bin at IF = 10mA

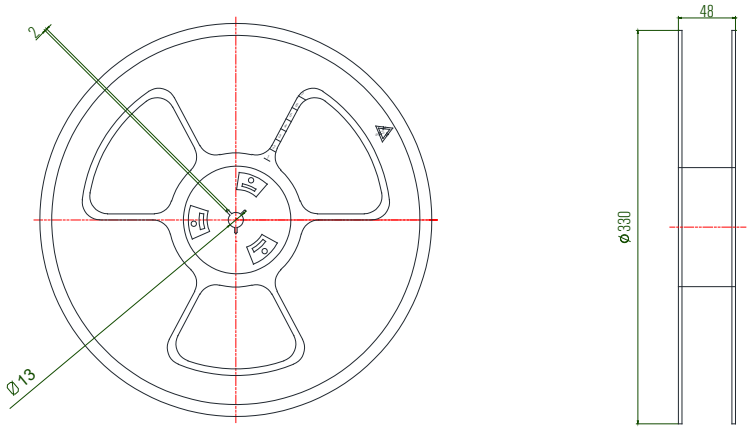
Bin Code	CIE 1931 Chromaticity Coordinates				
W1	x	0.284	0.284	0.304	0.304
	y	0.278	0.311	0.332	0.298
W2	x	0.304	0.304	0.324	0.324
	y	0.268	0.298	0.322	0.292
W3	x	0.304	0.304	0.324	0.324
	y	0.298	0.332	0.352	0.322

Tolerance on each Hue (x, y) bin is +/- 0.01.

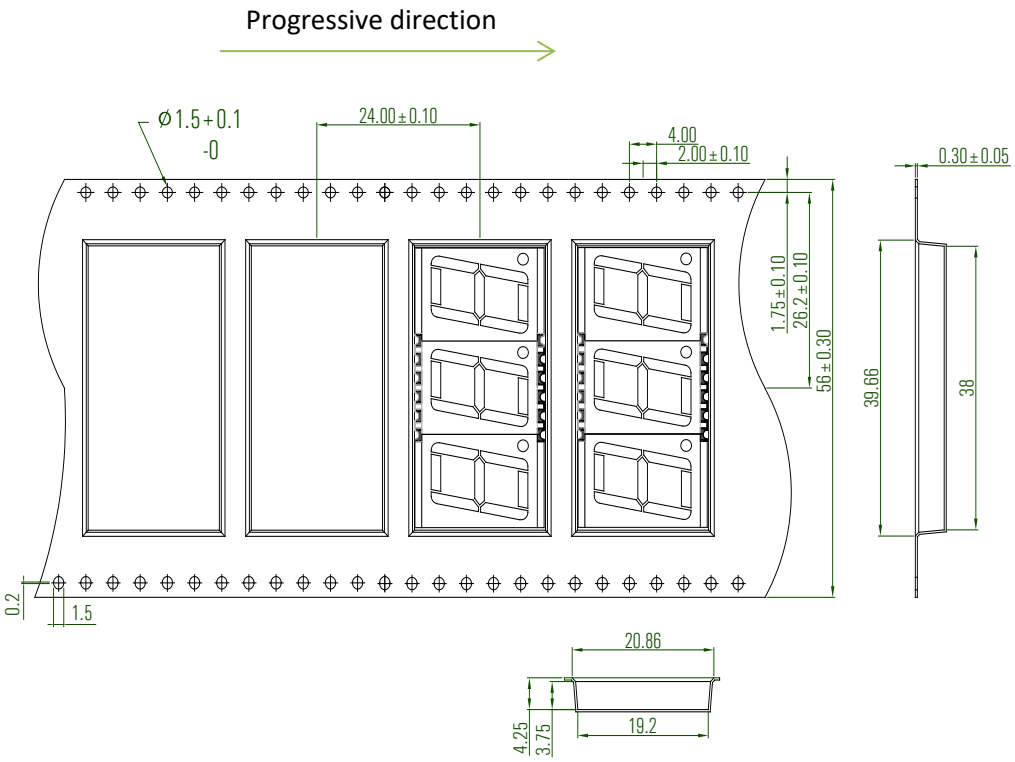


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Reel Dimensions *(units: mm)*



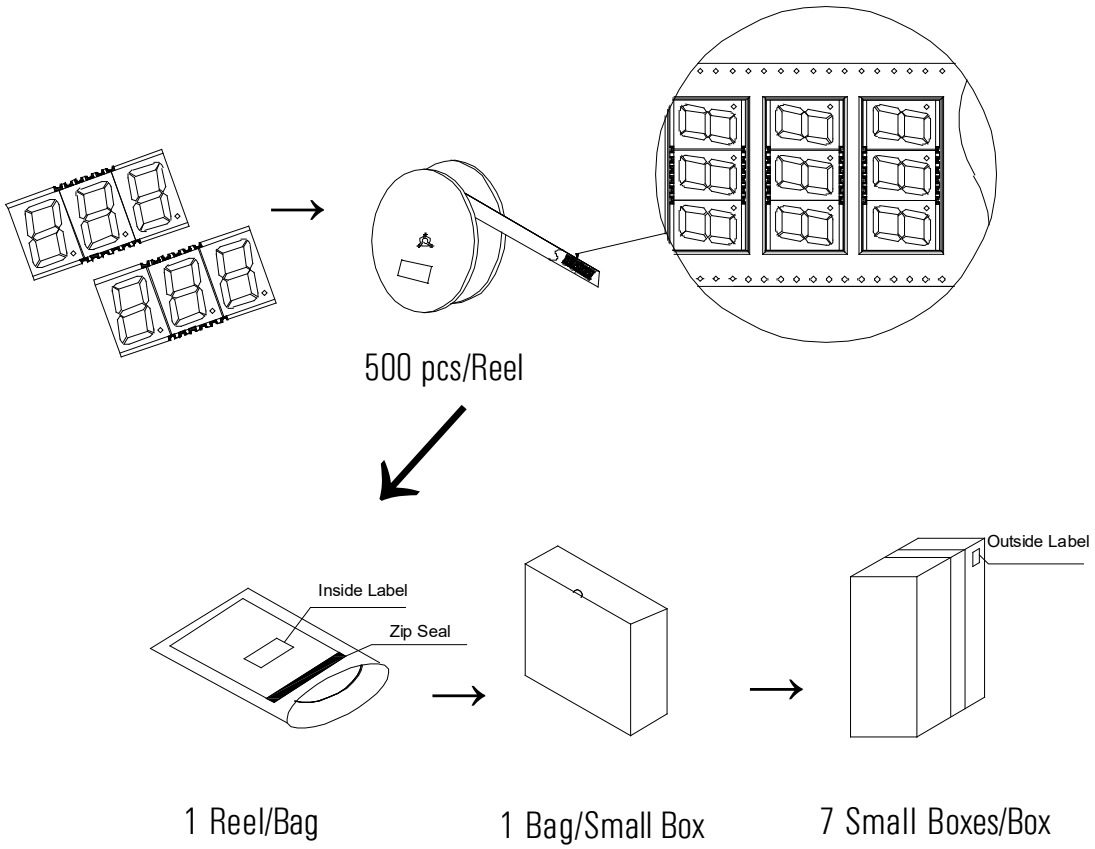
Tape Specifications (*units: mm):*



Note: Tolerances unless mentioned ±0.25mm.

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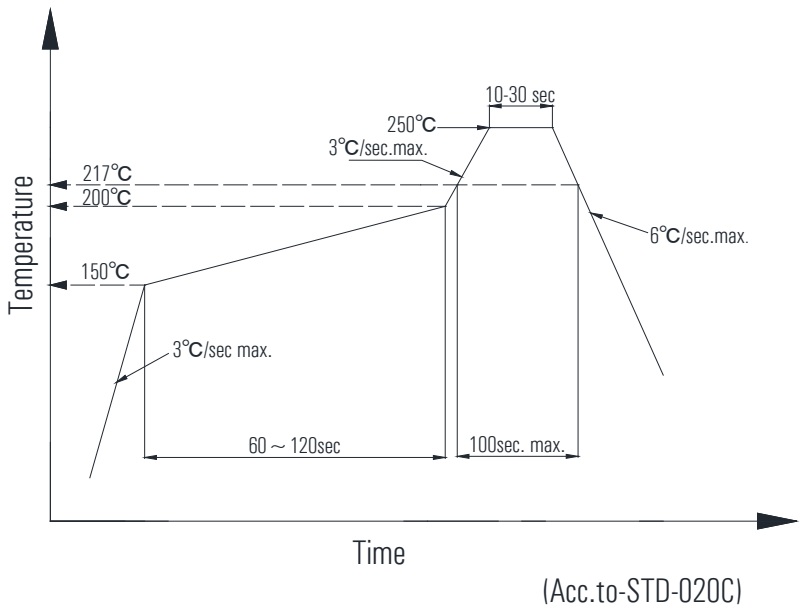
Packing & Label Specifications



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Precautions for Use

1. Pb-Free Reflow Soldering Profile.



(Acc.to-STD-020C)

Pre-heat		Other	
Temperature min	150 ℃	Liquidus Temperature	217℃
Temperature max	200 ℃	Time above Liquidus Temperature	100sec.max
Time	60-120sec	Peak Temperature	250℃
Average ramp-up rate	3 ℃/sec.max.	Ramp- Down Rate from Peak Temperature	6 ℃/sec. max.
		Reflow times	1 time

a. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.

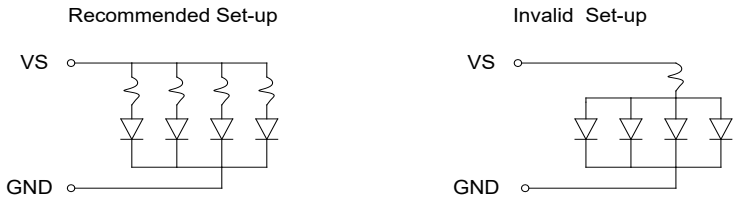
b. All parameters are maximum body case temperature values and cannot be considered as a soldering profile. The body case temperature was measured by soldering a thermal couple to the soldering point of LEDs.

c. No more than one reflows welding is recommended.

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2. 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.



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Revision History

Revision	Date	Contents	Page
Rev. 1	November 20, 2018	Original Version	/

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