KD4-402ARB / KD4-402CRB

0.40-inch (10.20 mm) 4-Digit Seven-Segment Clock Display

Red Through-Hole Four-Digit LED Numeric Clock Display

Technical Data Sheet

Features



- High reliability and long operational life
- Low power consumption
- Uniform segment illumination
- Clear and consistent numeric display
- Easy PCB and socket mounting
- RoHS compliant

Description

KD4-402ARB (Common Anode) and KD4-402CRB (Common Cathode) are 0.40-inch (10.20 mm) four-digit seven-segment LED displays. Both versions feature a black surface with white diffused segments for uniform illumination and clear numeric indication. The displays support operation from 3mA to 10mA per segment, allowing the drive current to be selected according to the required brightness and power consumption.

Applications

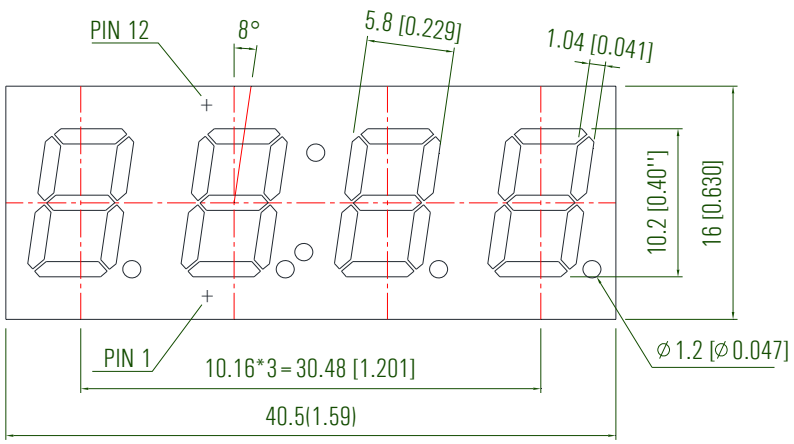
- Industrial instrumentation
- Control panels and operator interfaces
- Test and measurement equipment
- Automation and process control systems
- Power supplies and monitoring equipment
- Electronic counters timers and numeric indicators

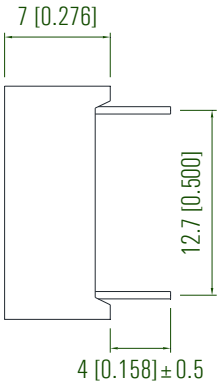
Device Selection Guide

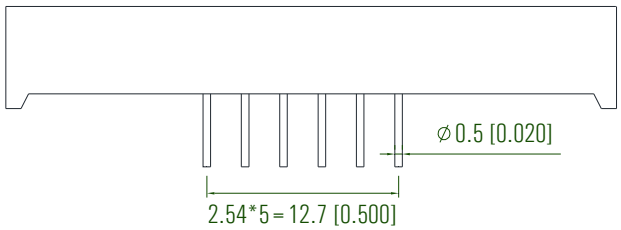
Part No.	Emitting Color	Circuit Type
KD4-402ARB	Red	Common Anode
KD4-402CRB	Red	Common Cathode

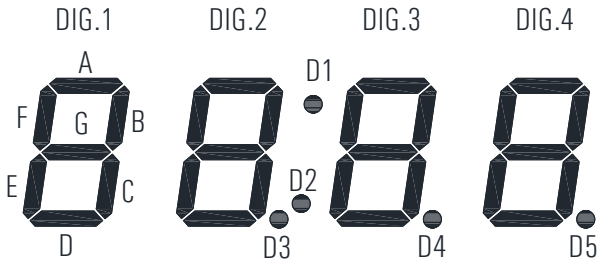
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Package Dimensions









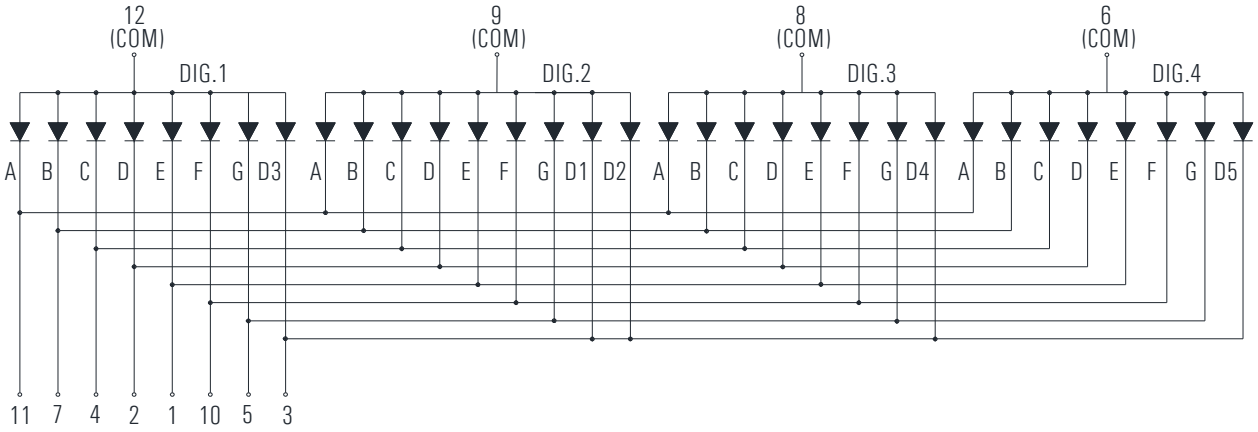
Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25mm (.010″) unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.

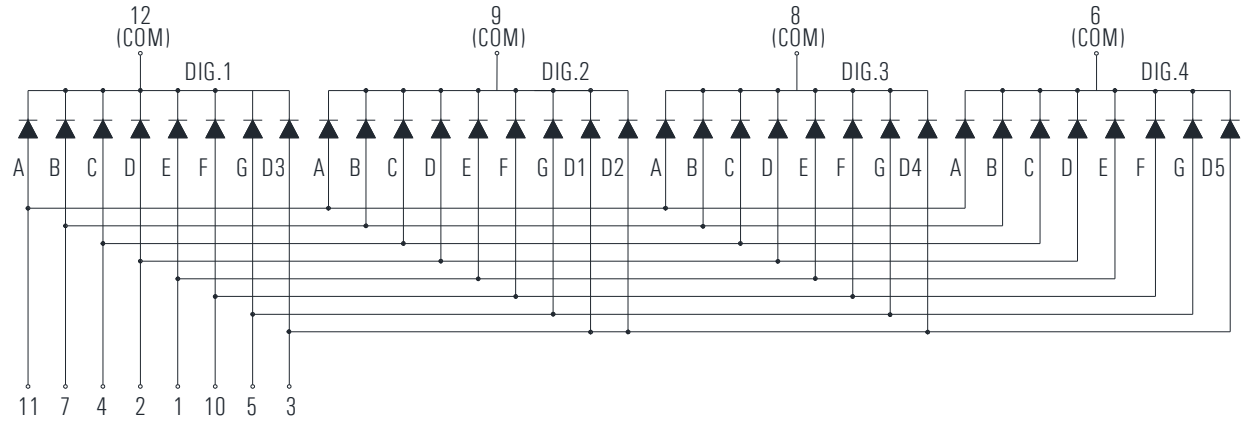
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Internal Circuit Diagram

KD4-402ARB (Common Anode)

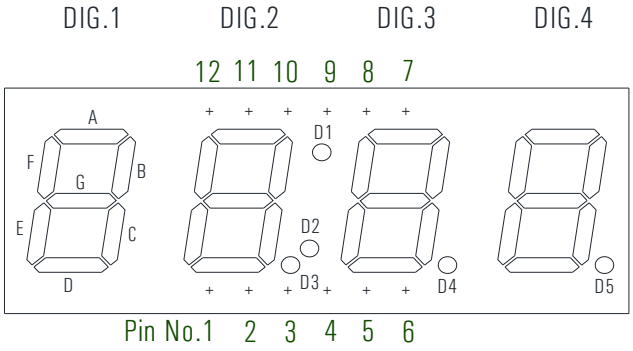


KD4-402CRB (Common Cathode)



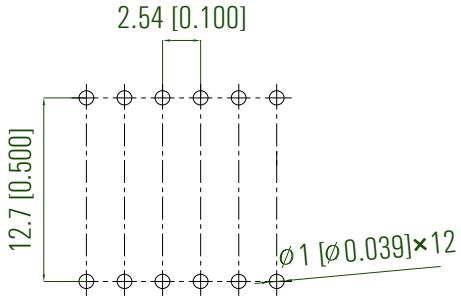
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Pin Connection



Pin No.	Function
1	Segment E
2	Segment D
3	D1,D2,D3,D4,D5
4	Segment C
5	Segment G
6	Digit 4 Common
7	Segment B
8	Digit 3 Common
9	Digit 2 Common
10	Segment F
11	Segment A
12	Digit 1 Common

Recommended PCB Layout



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Absolute Maximum Ratings at T_A=25℃

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}	40	mA
Forward Current (Per Segment)	I_F	20	mA
Reverse Voltage (Per Segment)	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 TA=25℃

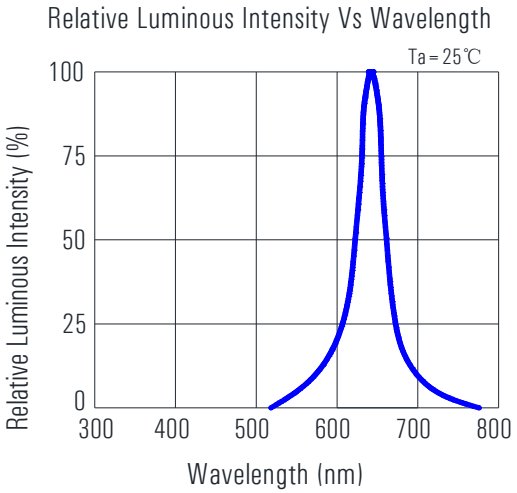
Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Average Luminous Intensity (Per Segment)	I_v	4.0	8.0	---	mcd	I_F=5mA (Note 1)
		8.0	16.0	---	mcd	I_F=10mA (Note 1)
Peak Emission Wavelength	λp	---	645	---	nm	I_F=10mA
Dominant Wavelength	λd	---	630	---	---	I_F=10mA (Note 2)
Spectral Line Half-Width	△λ	---	20	---	nm	I_F=10mA
Forward Voltage (Per Segment)	V_F	---	1.9	2.3	V	I_F=10mA (Note 3)
Reverse Current (Per Segment)	I_R	---	---	50	μA	V_R=5V

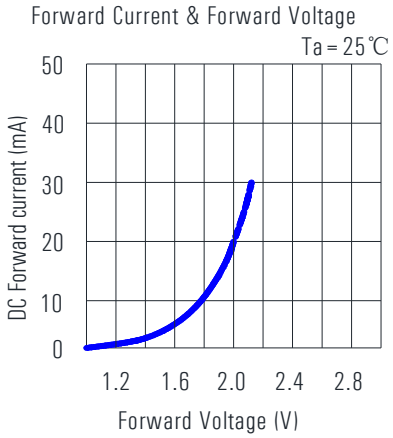
Notes:

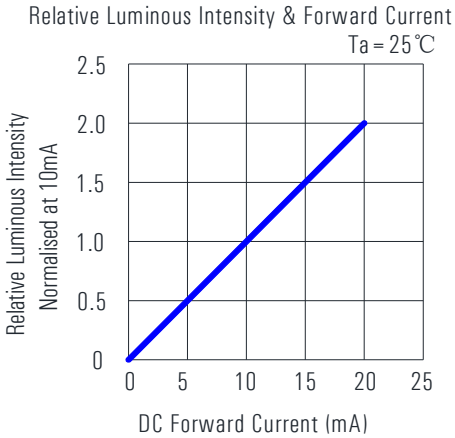
1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve. Tolerance of Luminous Intensity: ± 10%.
2. The dominant wavelength (λd) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
3. Tolerance of Forward Voltage: ± 0.1V.

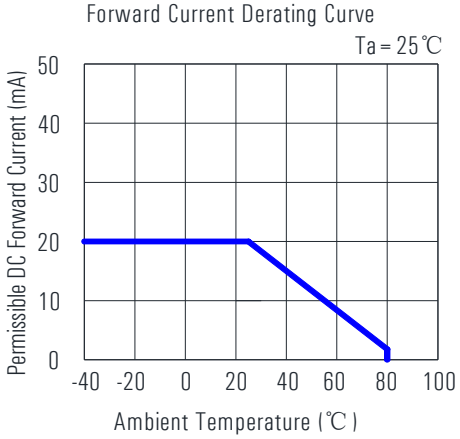
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Typical Electrical/Optical Characteristic Curves at TA = 25°C



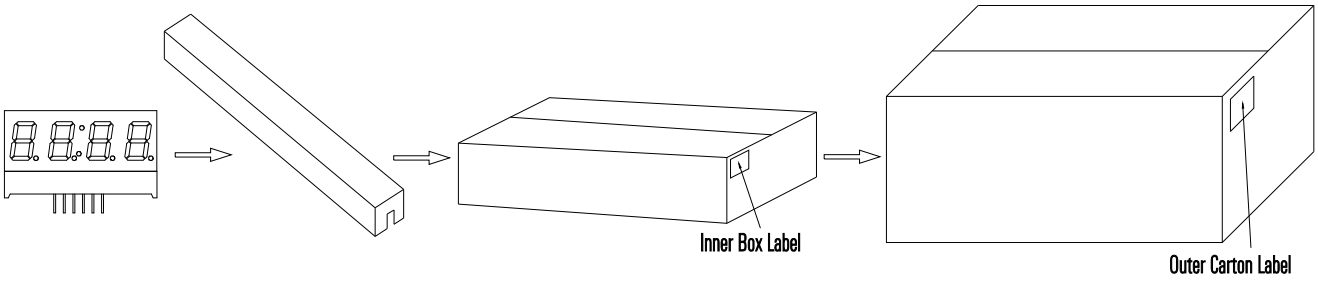




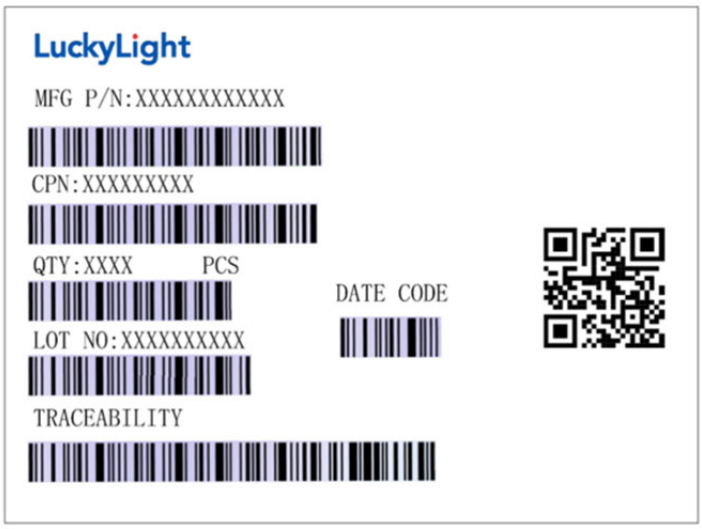


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Packing and Label Specifications



12 pcs per tube	48 tubes (576 pcs) per box	2 boxes (1152 pcs) per outer carton



Notes:

1. The packaging shown above represents the standard tube packaging for this product.
2. Alternative packaging, including tray or EPE foam packaging, may be available upon request.
3. Please confirm any special packaging requirements with LuckyLight before placing the order.

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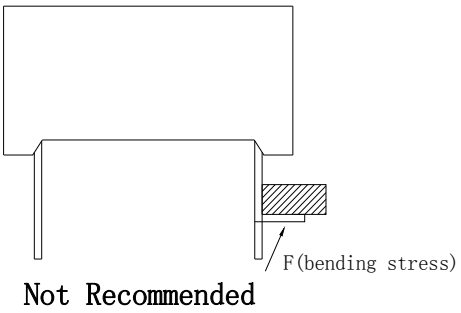
Precautions

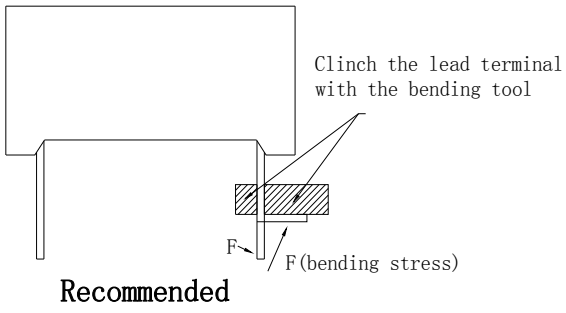
Through-Hole Digital Display Mounting Guidelines

1. Lead Forming

1.1. Do not bend the component leads by hand without proper tools.

1.2. The leads should be bent by clinching the upper part of the lead firmly so that the bending force is not exerted on the plastic body.

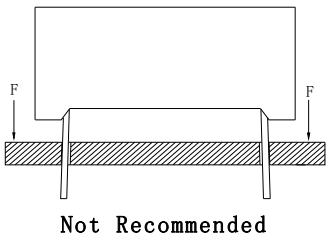


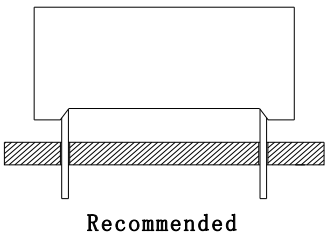


2. Installation

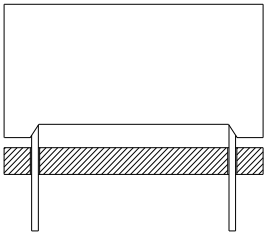
2.1. The installation process should not apply stress to the lead terminals.

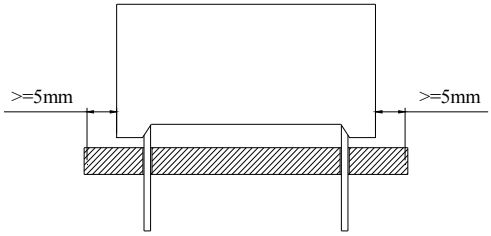
2.2. When inserting for assembly, ensure the terminal pitch matches the substrate board's hole pitch to prevent spreading or pinching of the lead terminals.





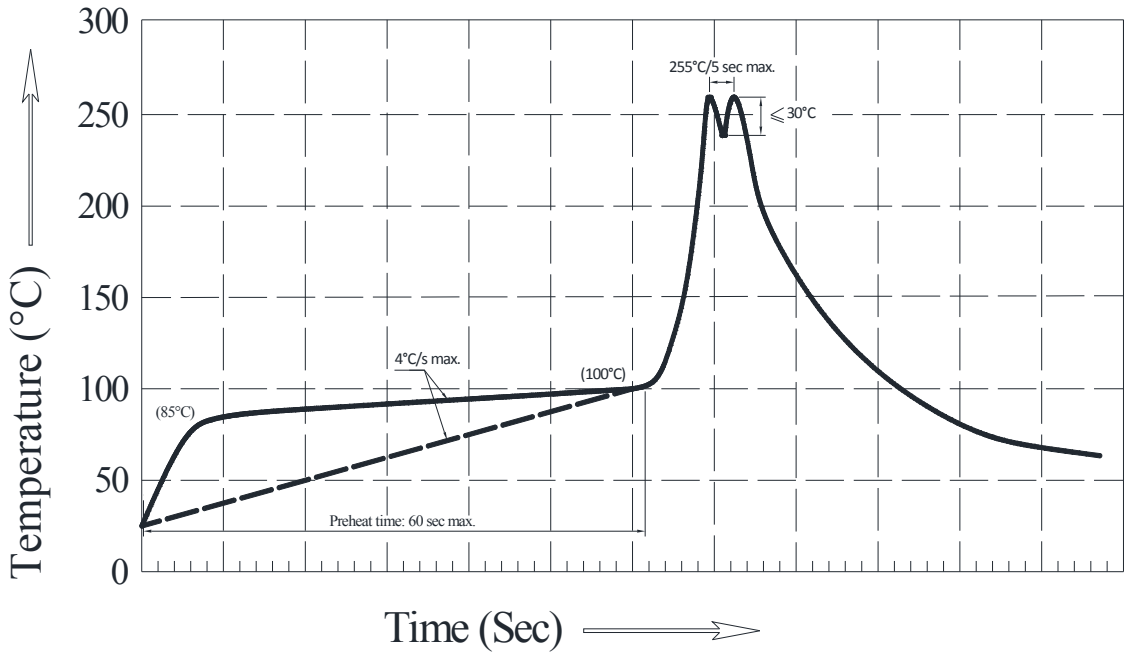
2.3. The component shall be placed at least 5mm from the edge of the PCB to avoid damage caused by excessive heat during wave soldering.





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3.Recommended Wave Soldering Profiles



Notes:

3.1. It is recommended to pre-heat at a temperature of 105°C or lower (measured using a thermocouple attached to the LED pins) before immersion in the solder wave, with a maximum solder bath temperature of 260°C.

3.2. The peak wave soldering temperature should be between 245°C to 255°C for 3 seconds (maximum of 5 seconds).

3.3. Avoid applying stress to the epoxy resin when the temperature exceeds 85°C.

3.4. Fixtures should not exert stress on the component during mounting and soldering processes.

3.5. Only one wave soldering pass is allowed.

3.6. Maintain the PCB top-surface temperature below 105°C during wave soldering.

4.Soldering General Notes

4.1. Through-hole LED digital displays are not suitable for reflow soldering.

4.2. If components will undergo multiple soldering processes or other high-heat treatments, please consult Luckylight for compatibility.

5.Cleaning

5.1. Mild "no-clean" fluxes are recommended for soldering purposes.

5.2. If cleaning is necessary, Luckylight suggests washing components with water only. Avoid using harsh organic solvents for cleaning as they can damage the plastic parts.

5.3. The cleaning process should occur at room temperature, and the devices should not be washed for more than one minute.

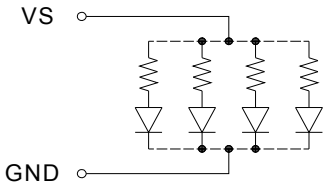
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5.4. After using water in the cleaning process, promptly remove excess moisture from the component by utilizing forced-air drying.

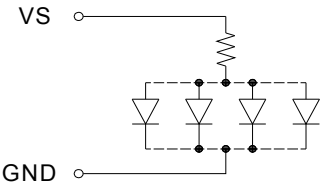
6.Circuit Design Notes

6.1. A suitable current-limiting resistor or constant-current driver must be used to ensure that each LED segment operates within the specified current range.
6.2. LEDs mounted in parallel should each be placed in series with its own current-limiting resistor.

Recommended Set-up



Invalid Set-up



6.3. 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.
6.4. The safe operating current should be selected by taking into account the maximum ambient temperature of the operating environment.
6.5. Extended reverse bias should be avoided as it may result in metal migration, leading to an escalation in leakage current or potential short circuits.

7.LED Storage Instructions

7.1. Store LEDs at or below 30℃ and 80% relative humidity (RH) before opening the package.
7.2. LEDs should be used within one year of purchase.
7.3. After opening the package, store LEDs at or below 30℃ and 60% RH.

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Revision History

Revision	Date	Contents	Page
Rev. 1	March 15, 2017	Initial Release	/

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