

## 3mm Round White LED

PART NO.: L-03W4D2E444C12-01-A



**ATTENTION**  
OBSERVE PRECAUTIONS  
FOR HANDLING  
ELECTROSTATIC  
DISCHARGE  
SENSITIVE  
DEVICES

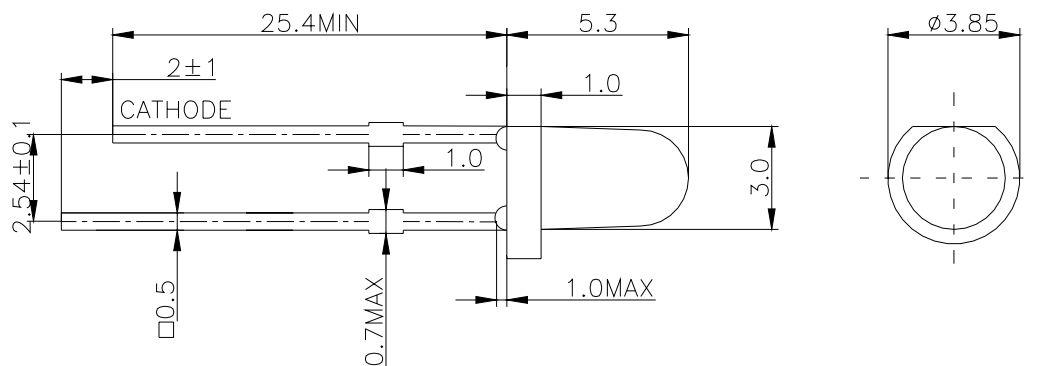
### Features

- Low power consumption
- Excellent product quality and reliability
- Lead-free device.

### Applications

- Electronic signs and signals
- Bright ambient lighting conditions
- Backlights
- General purpose indicators

### ◆ Package Dimensions



#### Notes:

1. All dimensions are in millimeters.
2. Tolerance is  $\pm 0.25$  unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.

◆ **Device Selection Guide**

Part No.	Chip		Lens color
<b>L-03W4D2E444C12-01-A</b>	Material	Emitted color	Water Clear
	InGaN	White	

◆ **Absolute Maximum Ratings at TA=25°C**

Parameter	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	120	mW
Forward Current	I <sub>F</sub>	30	mA
Peak Forward Current*1	I <sub>FP</sub>	100	mA
Reverse Voltage	V <sub>R</sub>	5	V
Operating Temperature	T <sub>opr</sub>	-40°C To +85°C	
Storage Temperature	T <sub>stg</sub>	-40°C To +85°C	
Soldering Temperature*2	T <sub>sol</sub>	260°C For 5 Seconds	

Notes:

\*1: Pulse width≤0.1ms, Duty cycles≤1/10

\*2: 1.6mm below package base.

◆ **Electrical / Optical Characteristics at TA=25°C**

Parameter	Symbol	Min.	Typ.	Max	Unit	Test Conditions
Forward Voltage	V <sub>F</sub>	—	3.20	—	V	I <sub>F</sub> =20mA
Reverse Current	I <sub>R</sub>	—	—	10	μA	V <sub>R</sub> =5V
Chromaticity Coordinates	X	—	0.435	—	—	I <sub>F</sub> =20mA
	Y	—	0.430	—	—	I <sub>F</sub> =20mA
Luminous Intensity	I <sub>v</sub>	—	8000	—	mcd	I <sub>F</sub> =20mA
Power Angle	2θ <sub>1/2</sub>	—	40	—	Deg.	I <sub>F</sub> =20mA

Remarks:

If special sorting is required (e.g. binning based on forward voltage, luminous intensity, or dominant wavelength), the typical accuracy of the sorting process is as follows:

1. Dominant Wavelength: +/-1nm
2. Chromatic Coordinates: +/-0.01
3. Luminous Intensity: +/-15%
4. Forward Voltage: +/-0.1V
5. The design and working Current for Led is not less than 2mA.

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◆ VF Rank

Rank	VF(V)		Condition
	Min	Max	
F	2.8	3.0	IF=20mA
G	3.0	3.2	
H	3.2	3.4	
I	3.4	3.6	

**Tolerance:**±0.1V

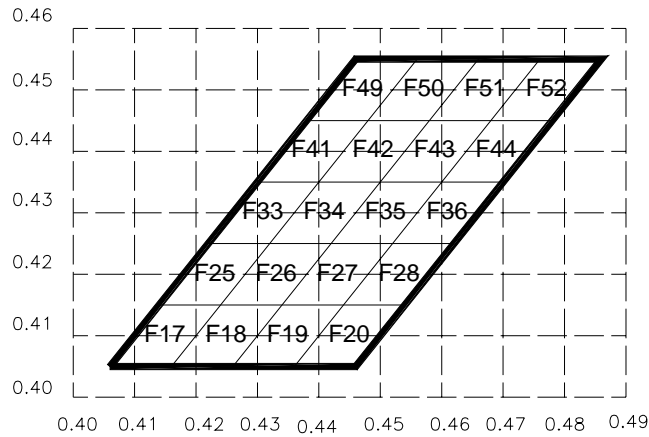
◆ IV Rank

Rank	IV(mcd)		Condition
	Min	Max	
Q	5700	8000	IF=20mA
R	8000	12000	

**Tolerance:**±15%

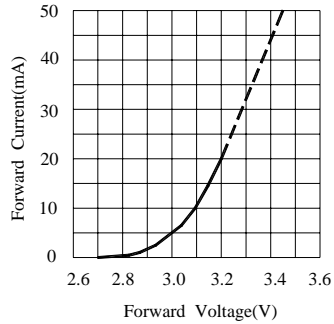
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◆ X Y Rank

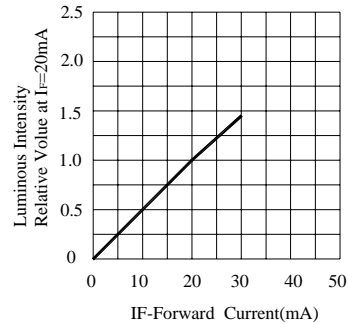


F17	X	0.406	0.414	0.424	0.416	F35	X	0.442	0.450	0.460	0.452
	Y	0.405	0.415	0.415	0.405		Y	0.425	0.435	0.435	0.425
F18	X	0.416	0.424	0.434	0.426	F36	X	0.452	0.460	0.470	0.462
	Y	0.405	0.415	0.415	0.405		Y	0.425	0.435	0.435	0.425
F19	X	0.426	0.434	0.444	0.436	F41	X	0.430	0.438	0.448	0.440
	Y	0.405	0.415	0.415	0.405		Y	0.435	0.445	0.445	0.435
F20	X	0.436	0.444	0.454	0.446	F42	X	0.440	0.448	0.458	0.450
	Y	0.405	0.415	0.415	0.405		Y	0.435	0.445	0.445	0.435
F25	X	0.414	0.422	0.432	0.424	F43	X	0.450	0.458	0.468	0.460
	Y	0.415	0.425	0.425	0.415		Y	0.435	0.445	0.445	0.435
F26	X	0.424	0.432	0.442	0.434	F44	X	0.460	0.468	0.478	0.470
	Y	0.415	0.425	0.425	0.415		Y	0.435	0.445	0.445	0.435
F27	X	0.434	0.442	0.452	0.444	F49	X	0.438	0.446	0.456	0.448
	Y	0.415	0.425	0.425	0.415		Y	0.445	0.455	0.455	0.445
F28	X	0.444	0.452	0.462	0.454	F50	X	0.448	0.456	0.466	0.458
	Y	0.415	0.425	0.425	0.415		Y	0.445	0.455	0.455	0.445
F33	X	0.422	0.430	0.440	0.432	F51	X	0.458	0.466	0.476	0.468
	Y	0.425	0.435	0.435	0.425		Y	0.445	0.455	0.455	0.445
F34	X	0.432	0.440	0.450	0.442	F52	X	0.468	0.476	0.486	0.478
	Y	0.425	0.435	0.435	0.425		Y	0.445	0.455	0.455	0.445

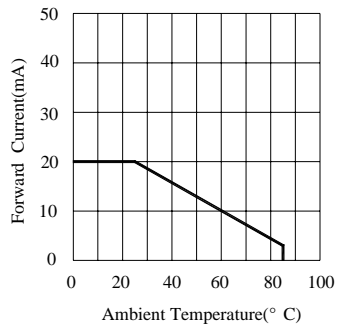
◆ Typical Electrical/Optical Characteristics Curves  
 ( Ta=25°C Unless Otherwise Noted )



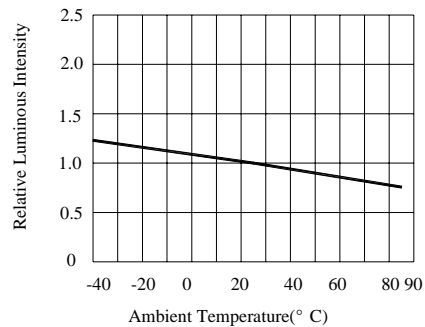
FORWARD CURRENT Vs. FORWARD VOLTAGE



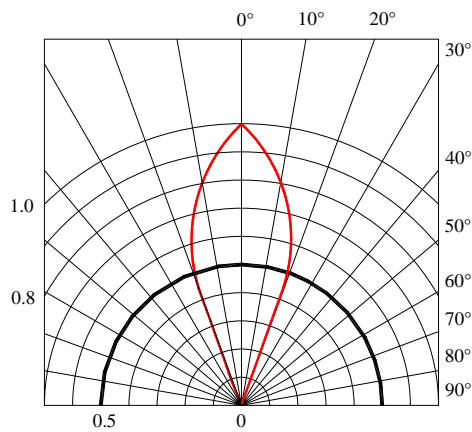
LUMINOUS INTENSITY Vs. FORWARD CURRENT



FORWARD CURRENT DERATING CURVE



LUMINOUS INTENSITY Vs. AMBIENT TEMPERATURE



SPATIAL DISTRIBUTION

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◆ **CAUTIONS:**

**1. Lead Forming & Assembly**

- Any lead forming or bending must be done before soldering, at normal temperature.
- When forming leads, there must be a minimum of 3mm clearance between the base of the LED lens and the lead bend.
- Do not use the base of the lead frame as a fulcrum during lead forming.
- Avoid bending the leads at the same point more than once.
- During assembly onto PCB, the lead pitch of the LED must match the pitch of the mounting holes on the PCB during component placement.

**2. Cleaning:**

- Isopropyl alcohol or deionized water are recommended solvents for cleaning. When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the resin or not.

**3. Storage**

- The storage ambient for the LEDs should not exceed 30°C temperature or 70% relative humidity.
- It is recommended that LEDs out of their original packaging are used within three months. For extended storage out of their original packaging, it is recommended that the LEDs be stored in a sealed container with appropriate desiccant or in desiccators with nitrogen ambient.

**4. ESD ( Electrostatic Discharge)**

Static Electricity or power surge will damage the LED.

The following procedures may decrease the possibility of ESD damage.

- All production machinery and test instruments must be electrically grounded.
  - Use a conductive wrist band or anti-electrostatic glove when handling these LEDs.
  - Maintain a humidity level of 50% or higher in production areas.
  - Use anti-static packaging for transport and storage.
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