

Lumileds 4014R Series



Lumileds 4014R Series is a complementary portfolio with optimized performance and bin construction for the retrofit space. With an industry standard footprint, it provides the perfect balance between performance and cost efficiency for a variety of applications.

CHARACTERISTICS

- Flexible voltage configurations to comply with various different system solutions
- Industry standard footprint for drop-in replacement designs
- High maximum drive current to allow for reduction of LED count

Table of Contents

Table of Contents	2
Part Number Nomenclature.....	3
Lumen Maintenance	3
Environmental Compliance	3
Mass Production List of 4014R Series	4
Absolute Maximum Ratings (Ta=25°C).....	4
Electro-optical Characteristics (Ta=25°C).....	5
Reliability Test Items And Conditions.....	6
Failure Criteria	6
Typical Optical Characteristics Curves	7
Mechanical Dimensions	8
Product Bin and Labeling Definitions.....	9
Decoding Product Bin Labeling	9
Luminous Flux Bins	9
Forward Voltage Bins	10
Color Bin Definition.....	10
Requirements for Application and Reflow Soldering	11
About Lumileds	12

Part Number Nomenclature

Part numbers for the 4014R Series follow the convention below:

L 1 4 0 – **A A B B** R **A** 1 4 0 0 **D D D**

Where:

A A - designates nominal CCT (27=2700K, 30=3000K, 35=3500K, 40=4000K, 50=5000K, 57=5700K, 65=6500K)

B B - designates nominal CRI (70=70CRI, 75=75CRI, 80=80CRI and 90=90CRI)

A - designates voltage (A=3V, B=6V, C=9V, G=12V, D=18V, E=36V)

D D D - designates Lumileds internal code (0A1, 0B1, 0C1, etc.=shares the same base part)

Therefore, the following part number is used for a 4014R 3000K, 80CRI, 3V LED:

L 1 4 0 – **3 0 8 0** R **A** 1 4 0 0 **0 A 1**

Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long- term performance of this product.

Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. The 4014R Series is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

Mass Production List of 4014R Series

Product	Product Number	CCT	Ra Min	Φ (lm) Min	Φ (lm) Typ	Test conditions
4014R 3V	L140-2780RA14000G1	2700	80	22.5	24.5	25°C, IF=60mA
	L140-3080RA14000G1	3000	80	23	25	
	L140-3580RA14000G1	3500	80	23.5	25.5	
	L140-4080RA14000G1	4000	80	24.5	26.5	
	L140-4580RA14000G1	4500	80	24.5	26.5	
	L140-5080RA14000G1	5000	80	24.5	26.5	
	L140-5780RA14000G1	5700	80	24.5	26.5	
	L140-6580RA14000G1	6500	80	24.5	26.5	

Notes:

- 1.Tolerance of Color Rendering Index: ± 2 .
- 2.Tolerance of Luminous flux: $\pm 5\%$.

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Value	Unit	Test Condition
Power dissipation	Pd	250	mW	-
Forward current	IF	80	mA	-
Pulsed Forward Current	IPF	5	mA	Duty 1/10,pulse width 10ms
Operating temperature range	Top	-35~+85	°C	-
Storage temperature range	Tstg	-35~+85	°C	-
Heatresistance	Rth	35	°C/W	-
Junction temperature	Tj	120	°C	-
Electrostatic Discharge	ESD	2000	V	-

Electro-optical Characteristics (Ta=25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Forward voltage	V _f	2.8		3.3	V	IF=60mA
Luminous flux	Φ	22.5			lm	IF=60mA
Viewing Angle	2 θ 1/2		120		Deg	IF=60mA
Reverse current	I _R			10	μA	V _r =5V
Color Index	R _a	80				IF=60mA

NOTES:

- * The measurement of forward voltage maintains a tolerance of $\pm 0.05V$, flux maintains a tolerance of $\pm 5\%$.
- * R_a measurement tolerance is ± 2 .
- * R_{th j-sp} is the thermal resistance from LED junction to solder point on MCPCB with electrical power.
- * the product is not designed to be used under reverse voltage.

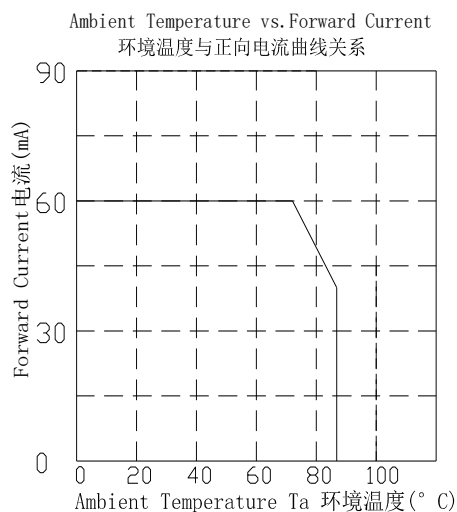
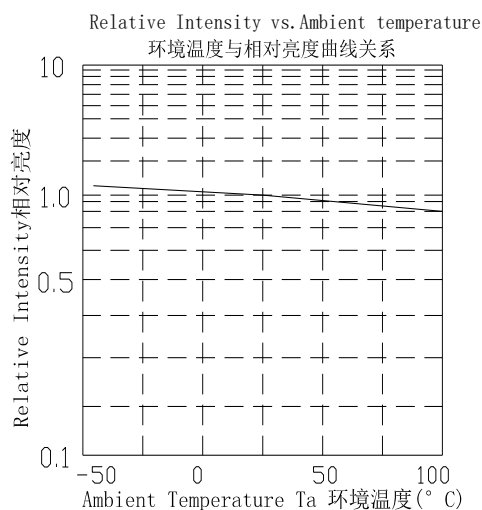
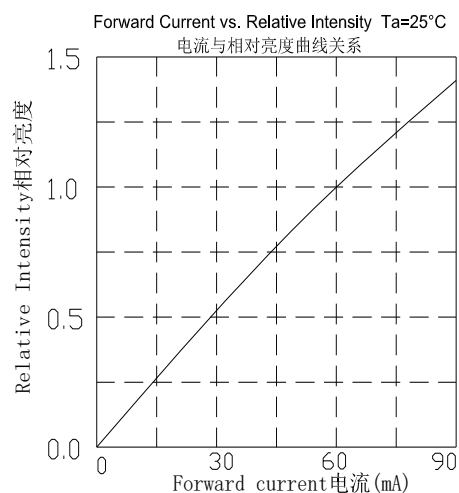
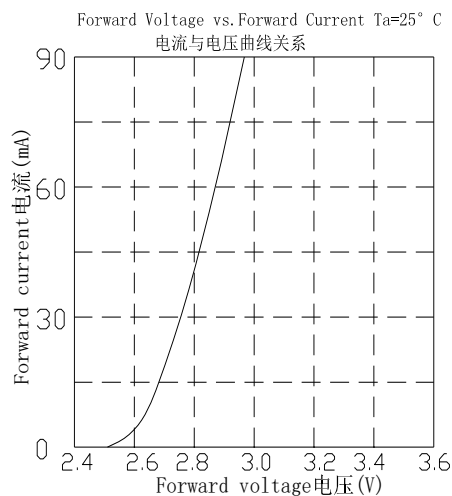
Reliability Test Items And Conditions

Test Items	Test condition	Time	Quantity	Ac/Re
Reflow Soldering	Temp. :260°C/10sec.	6Min.	22pcs	0/22
Thermal Shock	-40~125C, 15min dwell, 10sec transfer	100Cycles	22pcs	0/22
High Temperature High Humidity life Test	85°C,85%RH, IF=60mA	1000Hrs.	10pcs	0/10
Low Temperature Storage	Ta=-40°C	1000Hrs.	10pcs	0/10
High Temperature Storage	Ta=100°C	1000Hrs.	10pcs	0/10
High Temperature Operation Life Test	Ta=85°C, IF =60mA.	1000Hrs.	10pcs	0/10

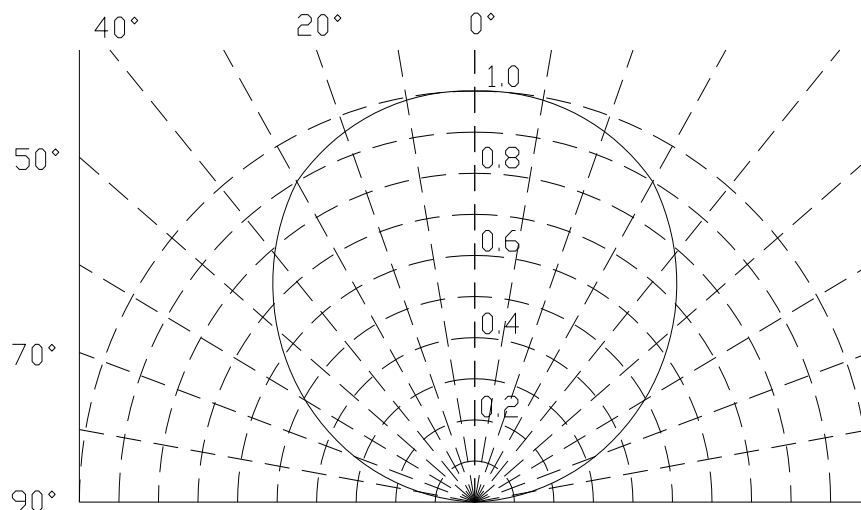
Failure Criteria

Item	Symbol	Failure Criteria
Luminous Flux	Lm	>70%
Forward voltage	VF	±10%
Colour	CIE_X CIE_y	±0.01

Typical Optical Characteristics Curves



Curves of beam angle and relative brightness

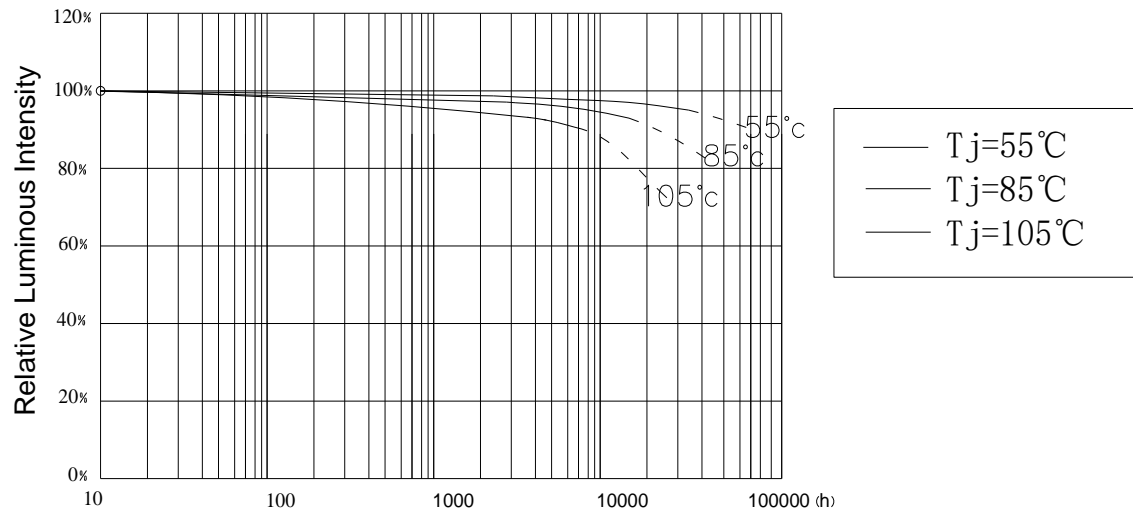


life test:

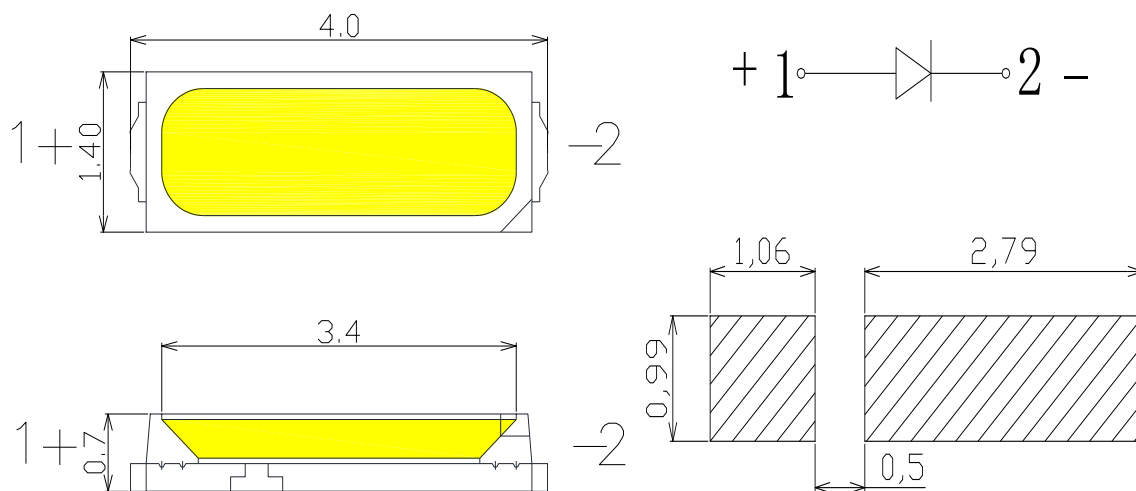
Affect of T_j on Luminous Maintenance

(I_f=60mA)

(Dot line: Expected Life)



Mechanical Dimensions



For reflow soldering

Product Bin and Labeling Definitions

Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

4014R Series LEDs are labeled using a 5-digit alphanumeric CAT code following the format below

Where:

A B C D E

A - designates luminous flux bin (example: B=24 to 26 lumens, G=26 to 28 lumens)

B C D - designates correlated color bin (example: 27A, 30A, 35A, 40A, 50A, 57A, 65A)

E - designates forward voltage bin (example: A=2.6 to 2.7V, B=2.7 to 2.8V)

Therefore, a 4014R LED with a lumen range of 24 to 26, color bin of 27A and a forward voltage range of 2.6 to 2.7V has the following CAT code:

B 2 7 A A

Luminous Flux Bins

Luminous flux bin definitions for 4014R Series at rated current, Ta=25°C .

Product Number	Bin	Min	Max
L140-XXXXRA14000G1	H	22	24
	I	24	26
	P	26	28
	Q	28	30

Notes

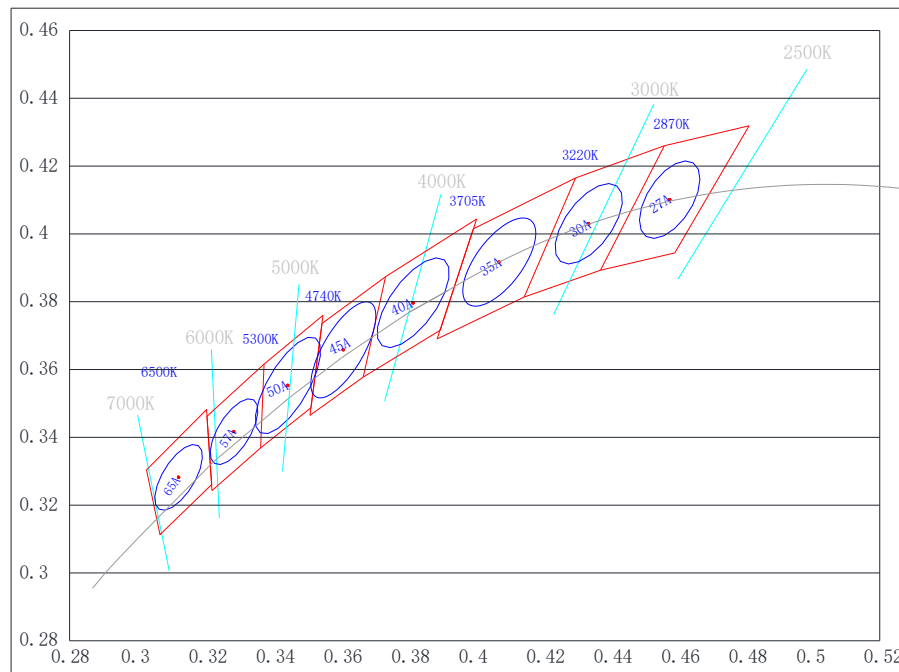
Lumileds Maintains a tolerance of $\pm 5\%$ on luminous flux measurements

Forward Voltage Bins

Forward voltage bin definitions for 4014R Series at rated current, $T_a=25^{\circ}\text{C}$.

Product Number	Bin	Min	Max
L140-XXXXRA14000G1	B	2.7	2.8
	C	2.8	2.9
	D	2.9	3.0
	E	3.0	3.1
	F	3.1	3.2
	G	3.2	3.3

Color Bin Definition



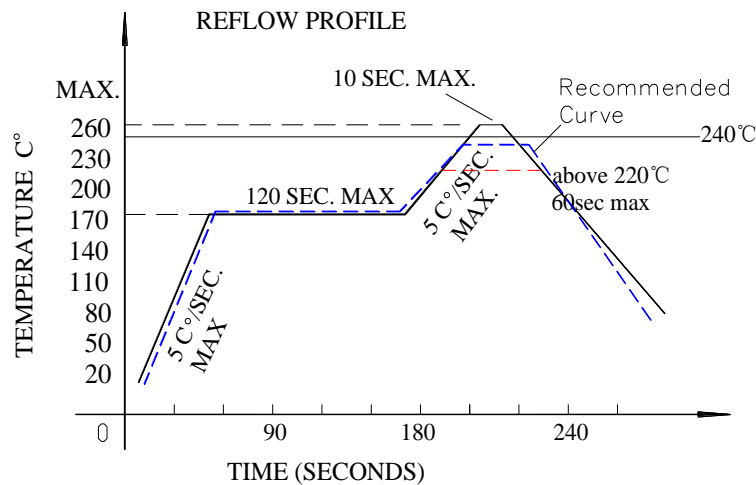
Correlated color temperature bin definitions for 4014R Series at rated current, $T_a=25^{\circ}\text{C}$

Nominal ANSI CCT	Target Center Point		Major Axis a	Major Axis b	Ellipse Rotation Angle
典型色温	X	Y	主轴 a	主轴 b	椭圆旋转角度
27A	0.4578	0.4101	0.012889	0.006685	57.28°
30A	0.4338	0.403	0.013910	0.006831	53.16°
35A	0.4073	0.3917	0.015452	0.006899	52.96°
40A	0.3818	0.3797	0.015644	0.006725	54°
45A	0.3611	0.3658	0.016183	0.006000	59.62°
50A	0.3447	0.3553	0.016183	0.006000	59.62°
57A	0.3287	0.3417	0.011029	0.004758	58.38°
65A	0.3123	0.3282	0.011029	0.004758	58.38°

Notes

Tester tolerance: ± 0.01 in x and y coordinates

Requirements for Application and Reflow Soldering



Reflow soldering curve

(Product is highest resistant to 260°C reflow but suggested the highest temperature of 240°C within)

■ Notes for reflow soldering :

1. No more than twice for reflow soldering.
2. To ensure the quality of our LEDs, we encapsulate them with silica gels. So please do not put pressure on the LEDs.
3. Please choose the right nozzle(try to learn from the plastic products parts) to avoid the damage to products due to the pressure.
4. Please put on the antistatic hand loop during the use. The worktable should be with antistatic finish. The equipments must be contacted with ground.

■ Handwork soldering:

1. During the soldering, the electronic soldering iron must be kept under the temperature of 300°C and the soldering time must not be beyond 3 seconds. No touch between the electronic soldering iron and colloid.
2. Handwork soldering is only allowed once. We won't take responsibility for more than that.
3. Avoid using sharp objects to compress products Colloidal Part directly.
4. Please put on the antistatic hand loop during the use. The worktable should be with antistatic finish. The equipments must be contacted with ground.

About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit lumileds.com

Lumileds 2835R Product Datasheet

©2022 Lumileds Holding B.V. All rights reserved.

Neither Lumileds Holding B.V. nor its affiliates shall be liable for any kind of loss of data or any other damages, direct, indirect or consequential, resulting from the use of the provided information and data. Although Lumileds Holding B.V. and/or its affiliates have attempted to provide the most accurate information and data, the materials and services information and data are provided “as is,” and neither Lumileds Holding B.V. nor its affiliates warrants or guarantees the contents and correctness of the provided information and data. Lumileds Holding B.V. and its affiliates reserve the right to make changes without notice. You as user agree to this disclaimer and user agreement with the download or use of the provided materials, information and data. A listing of Lumileds product/patent coverage may be accessed at lumileds.com/patents.