



Optoelectronic Components Catalogue

2019-2020



GUARANTEED TO SHINE

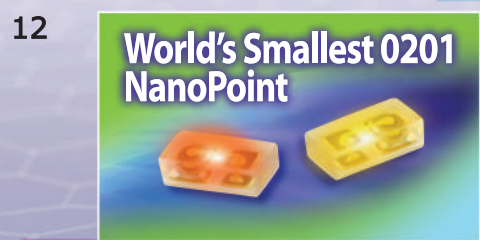
IATF16949 Automotive • ISO9001 Quality • ISO14001 Environmental

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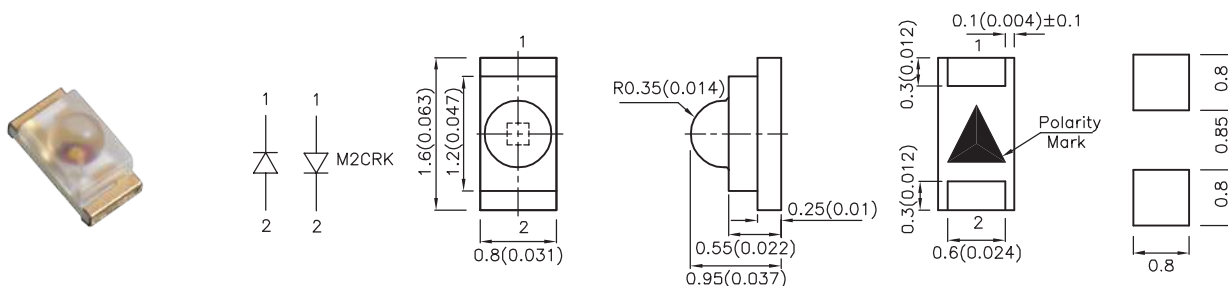
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Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=2\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**1.6x0.8x0.95mm
(0603 Dome Lens)**

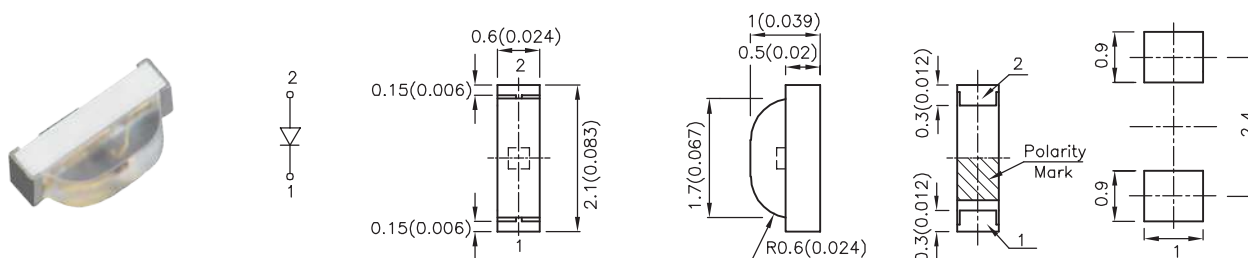


Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006)$ "

Recommended Soldering Pattern

XZCM2CRK53WA-8VF	AlGaInP(Red)	640	50	118	60°	Water Clear
XZCDGK53W-8VF	InGaN(Green)	515	250	417	60°	Water Clear
XZCFB53W-8VF	InGaN(Blue)	465	30	64	40°	Water Clear

**2.1x1.0x0.6mm
(Right Angle)**

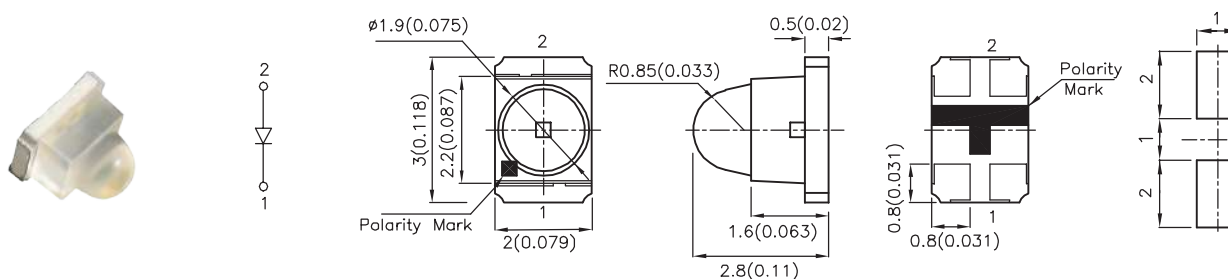


Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$ "

Recommended Soldering Pattern

XZCFB74W-3VU	InGaN(Blue)	465	10	19	170°	Water Clear
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**3.0x2.8x2.0 mm
(Dome Lens Right Angle)**



Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$ "

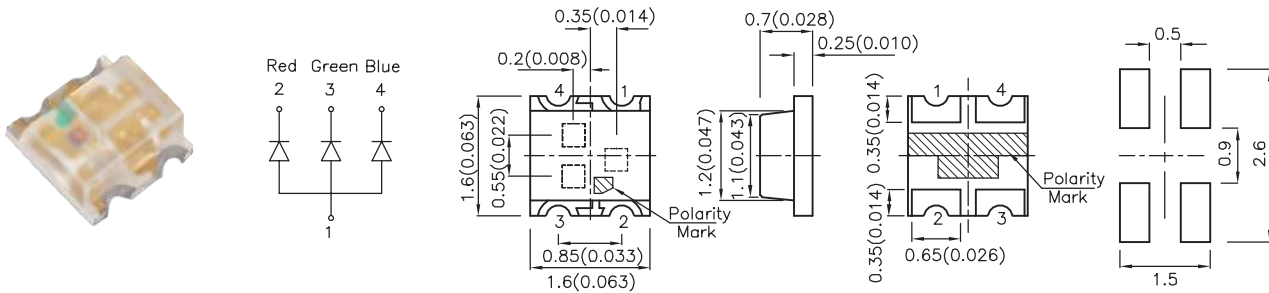
Recommended Soldering Pattern

XZCDGK50W-3VU	InGaN(Green)	515	700	1495	10°	Water Clear
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- Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.
- Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
- We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=2mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**1.6x1.6x0.7mm
(Full Color)**

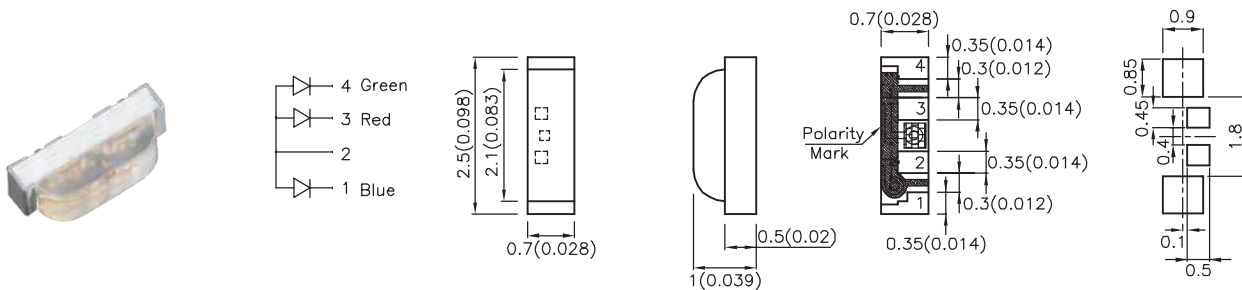


Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$ "

Recommended Soldering Pattern

XZCMEDGCB110W	 AlGaInP(Red)	630	6	14	130°	Water Clear
	 InGaN(Green)	515	20	49		
	 InGaN(Blue)	460	6	13		

**2.5x1.0x0.7mm
(Right Angle, Full Color)**

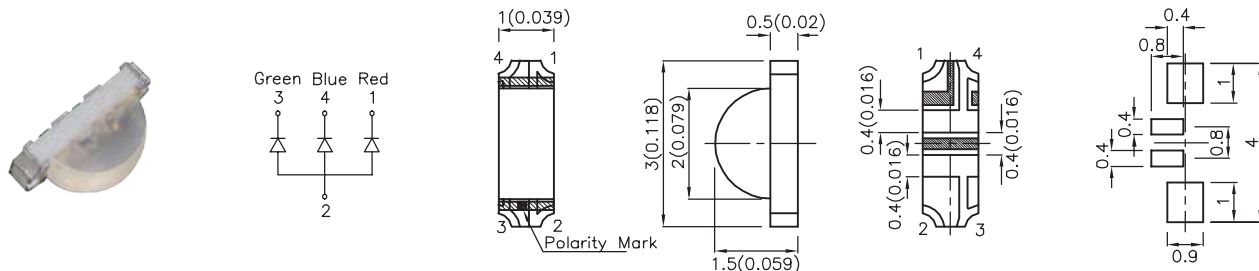


Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006)$ "

Recommended Soldering Pattern

XZCCBDMEDGK161W	 InGaN(Blue)	460	4	9	130°	Water Clear
	 AlGaInP(Red)	630	6	9		
	 InGaN(Green)	515	20	59		

**3.0x1.5x1.0mm
(Right Angle, Full Color)**



Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$ "

Recommended Soldering Pattern

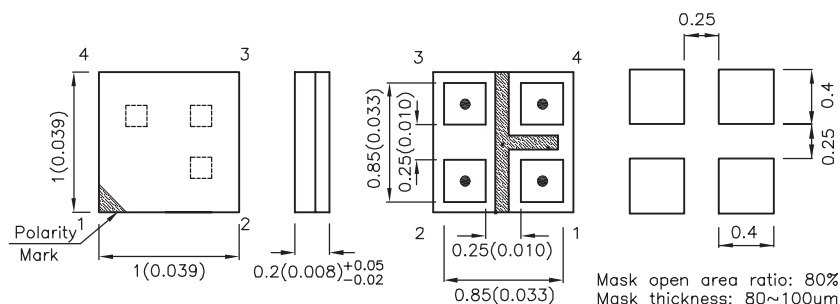
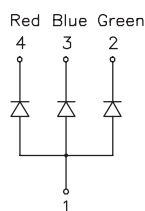
XZCMEDGCB56W	 AlGaInP(Red)	630	6	14	150°	Water Clear
	 InGaN(Green)	515	20	59		
	 InGaN(Blue)	460	4	9		

1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1mm$.
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=5\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

1.0x1.0x0.2mm (Full Color)



Mask open area ratio: 80%
Mask thickness: 80~100um

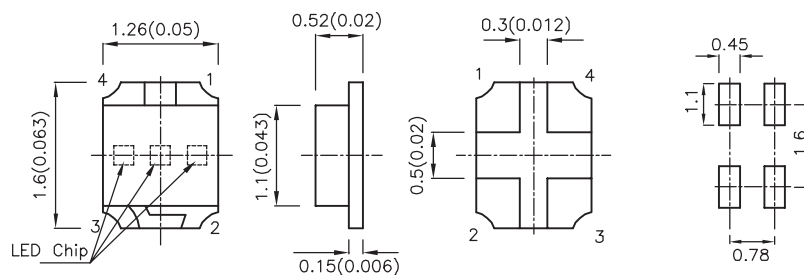
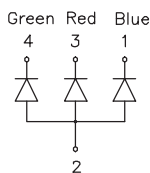
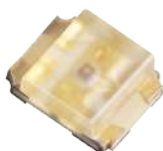
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

Recommended Soldering Pattern

XZBGRBBRMERK150W	◆ InGaP(Green)	518	50	79	150°	Water Clear
	◆ InGaP(Blue)	461	10	22		
	◆ AlGaInP(Red)	632	15	29		

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

1.6x1.26x0.52mm (Full Color)



Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZCBDMKDG62W-2	◆ InGaP(Blue)	460	40	69	140°	Water Clear
	◆ AlGaInP(Red)	645	40	79		
	◆ InGaP(Green)	515	400	597		

0404 Super-Thin RGB SMD LED

XZBGRBBRMERK150W

1.0mm x 1.0mm x 0.20mm

XZBGRBBRMERK150W – 0404 Super-Thin RGB SMD LED

PRODUCT HIGHLIGHT

SunLED's XZBGRBBRMERK150W 1.0mm x 1.0mm x 0.20mm (0404) full-color surface mount LED is ideal for an indicator light on handheld products

SunLED's XZBGRBBRMERK150W measures 1.0mm x 1.0mm x 0.20mm. This package manages to maintain a consistent intensity in each color to meet any design specification. To provide a next-generation RGB solution for a discrete SMD in the smallest possible size, SunLED has brought the future into today with the super thin 0404 RGB SMD LED, XZBGRBBRMERK150W. This LED allows engineers and designers to reduce the footprint size dedicated during design phases while providing the wide array of colors necessary to increase product functionality.

The 0.2 mm package height allows for low ceiling designs coupled with a wide viewing angle of 150° to generate a uniform light pattern. With a forward current of 5 mA, the XZBGRBBRMERK150W operates with high efficiency to provide engineers a cost-efficient solution to RGB designs. Some applications include backlighting and indication in handheld devices, consumer electronics, wearable technology, medical equipment, and security devices.

PRODUCT APPLICATIONS

- Icon and text backlighting
- Wearable electronics
- White goods
- Mobile devices and handheld products
- Consumer electronics
- Medical and healthcare
- Safety and security
- Instrumentation
- Audio and video
- Home automation

PRODUCT FEATURES

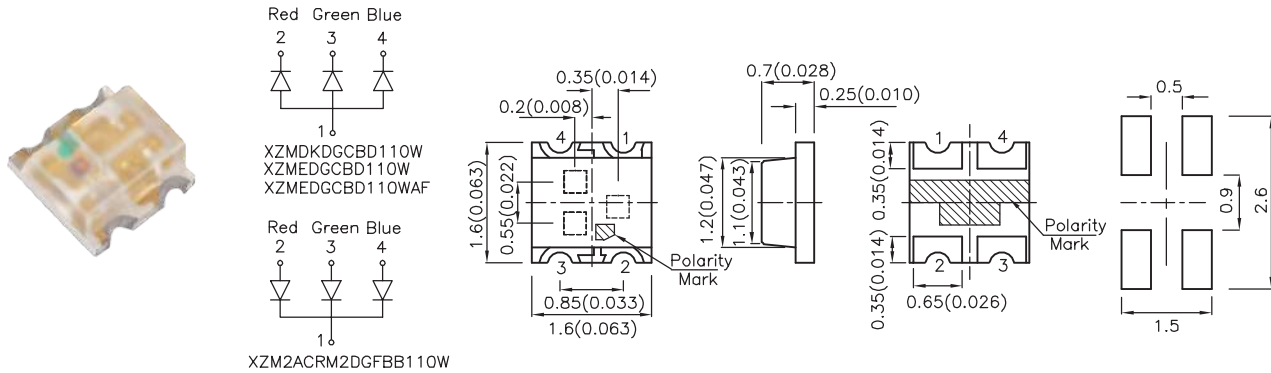
- Super compact package: 1.0mm x 1.0mm x 0.20mm
- Full-color illumination for flexible designs
- Cost efficient and high intensity
- Low current: 5 mA operation
- Wide viewing angle: 150°
- Moisture sensitivity level (MSL): 3

1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

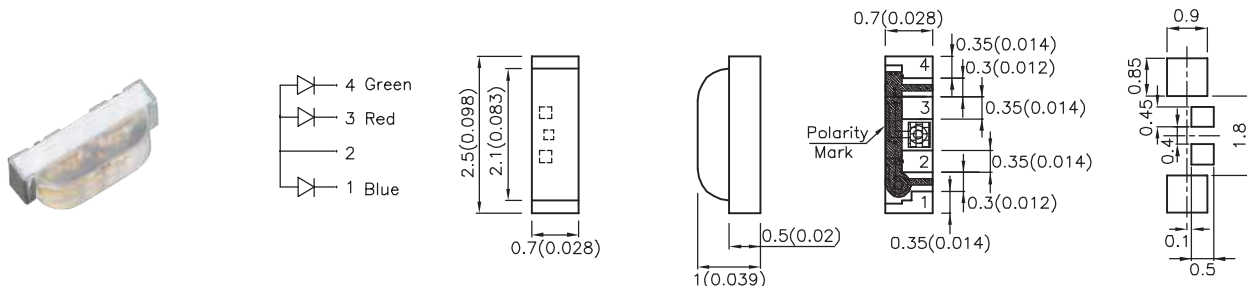
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

1.6x1.6x0.7mm
(Full Color)
Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZMDKDCBD110W	◆ AlGaInP(Red)	645	40	79	130°	Water Clear
	◆ InGaN(Green)	515	120	278		
	◆ InGaN(Blue)	460	40	69		
XZMEDGCB110W	◆ AlGaInP(Red)	630	55	108	130°	Water Clear
	◆ InGaN(Green)	515	120	278		
	◆ InGaN(Blue)	460	40	69		
XZMEDGCB110WAF	◆ AlGaInP(Red)	630	55	108	130°	Water Clear
	◆ InGaN(Green)	515	120	278		
	◆ InGaN(Blue)	460	40	69		
XZM2ACRM2DGFBB110W	◆ AlGaInP(Red)	640	200	357	130°	Water Clear
	◆ InGaN(Green)	520	500	745		
	◆ InGaN(Blue)	465	80	138		

2.5x1.0x0.7mm
(Right Angle, Full Color)
Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006)$

Recommended Soldering Pattern

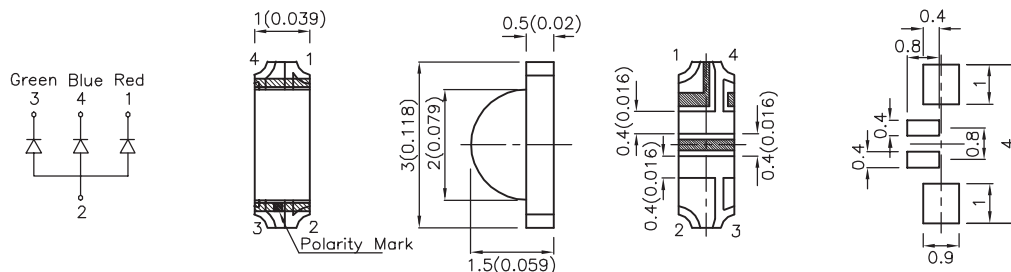
XZCBDMEDGK161W	◆ InGaN(Blue)	460	40	64	130°	Water Clear
	◆ AlGaInP(Red)	630	80	108		
	◆ InGaN(Green)	515	300	497		

- Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.
- Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
- We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

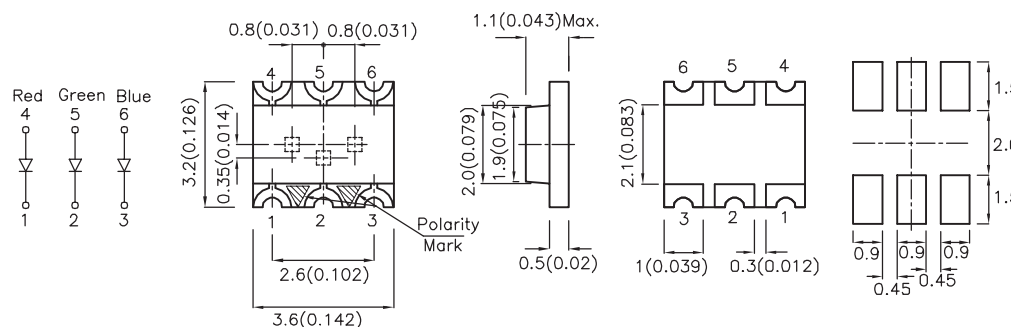
3.0x1.5x1.0mm (Right Angle, Full Color)

Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZMEDGCBDS6W	AlGaInP(Red)	630	80	138	150°	Water Clear
	InGaIn(Green)	515	300	497		
	InGaIn(Blue)	460	40	69		
XZMDKGCBDS6W	AlGaInP(Red)	645	55	79	150°	Water Clear
	InGaIn(Green)	515	300	497		
	InGaIn(Blue)	460	40	69		

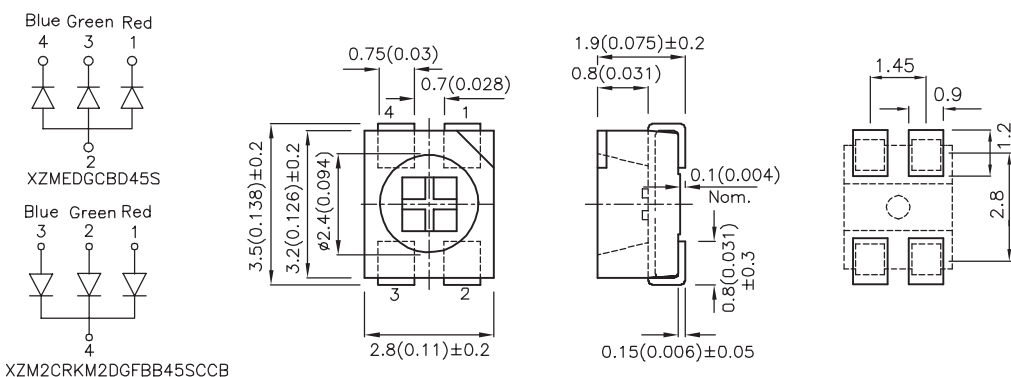
3.2x3.6x1.1mm (Full Color)

Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZMEDGKCBDS61W	AlGaInP(Red)	630	80	138	150°	Water Clear
	InGaIn(Green)	515	200	327		
	InGaIn(Blue)	460	40	69		

3.5x2.8x1.9mm (PLCC4 Full Color)

Dimension Unit: mm(inches), Tolerance : $\pm 0.25\text{mm}(0.01")$

Recommended Soldering Pattern

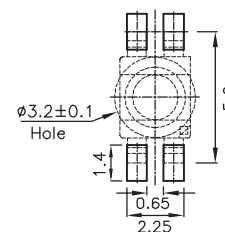
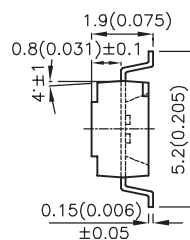
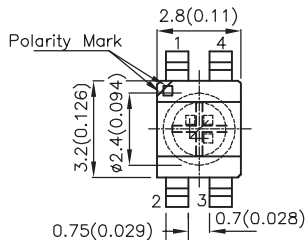
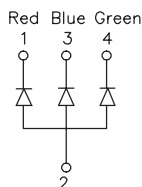
XZMEDGCBDS45S	AlGaInP(Red)	630	120	218	120°	Water Clear
	InGaIn(Green)	515	400	497		
	InGaIn(Blue)	460	55	98		
XZM2CRKM2DGFBB45SCCB	AlGaInP(Red)	640	400	497	120°	Water Clear
	InGaIn(Green)	520	1000	1590		
	InGaIn(Blue)	465	200	327		

1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

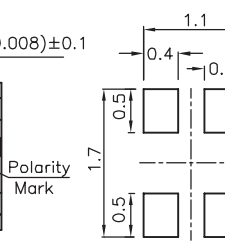
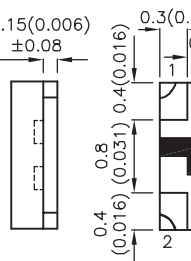
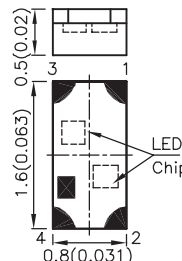
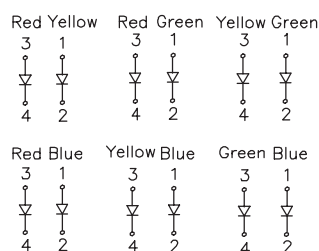
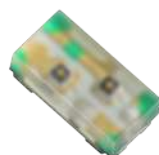
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**3.2x2.8x1.9mm
(Reverse Mount, Full Color)**
Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008")$

Recommended Soldering Pattern

XZMDKCBDDG45S-9	◆ AlGaInP(Red)	645	55	108	120°	Water Clear
	◆ InGaN(Blue)	460	55	98		
	◆ InGaN(Green)	515	400	497		

**1.6x0.8x0.5mm
(0603 Bi-Color)**
Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006")$

Recommended Soldering Pattern

XZMYKMDK53W-9	◆ AlGaInP(Yellow)	590	80	148	130°	Water Clear
	◆ AlGaInP(Red)	645	40	89		
	◆ InGaN(Green)	515	200	347		
XZDGKMDK53W-9	◆ AlGaInP(Red)	645	40	89	130°	Water Clear
	◆ AlGaInP(Green)	574	20	49		
XZVGMYK53W-9	◆ AlGaInP(Yellow)	590	80	148	130°	Water Clear
	◆ AlGaInP(Green)	574	20	49		
XZVGMDK53W-9	◆ AlGaInP(Red)	645	40	89	130°	Water Clear
	◆ InGaN(Blue)	460	40	69		
XZCBDMK53W-9	◆ AlGaInP(Red)	645	40	89	130°	Water Clear
	◆ InGaN(Blue)	460	40	69		
XZCBDMYK53W-9	◆ AlGaInP(Yellow)	590	80	148	130°	Water Clear
	◆ InGaN(Blue)	460	40	69		
XZCBVGS3W-9	◆ AlGaInP(Green)	574	20	49	130°	Water Clear


**Reverse-Mount
RGB PLCC SMD**
PLCC4 RGB LED

XZMDKCBDDG45S-9



3.5mm x 2.8mm x 1.9mm

XZMDKCBDDG45S-9 - Reverse-Mount RGB PLCC SMD LED
PRODUCT HIGHLIGHT

SunLED's next generation reverse-mount PLCC RGB SMD LED maintains the same size as the most popular PLCC package

Traditional top emitting PLCC packages in the industry standard 3.5 mm x 2.8 mm package have been diversely used across many design platforms over the years. The vast demands for discrete backlighting while maintaining high intensities with wide viewing angle emission requirements have allowed SunLED to design the next generation reverse-mount PLCC RGB SMD LED, the XZMDKCBDDG45S-9. This LED maintains the same package size and footprint as the most popular PLCC package; however, it is engineered for reverse-mount use.

A redesign of the winged leads provides a more solid and robust soldering area. The wide viewing angle of 120° delivers a uniform light pattern while allowing a better color mixture when multiple colors are activated. This well-constructed design is an ideal package for backlighting, medical equipment, security devices, home automation, white goods, and consumer electronics.

PRODUCT APPLICATIONS

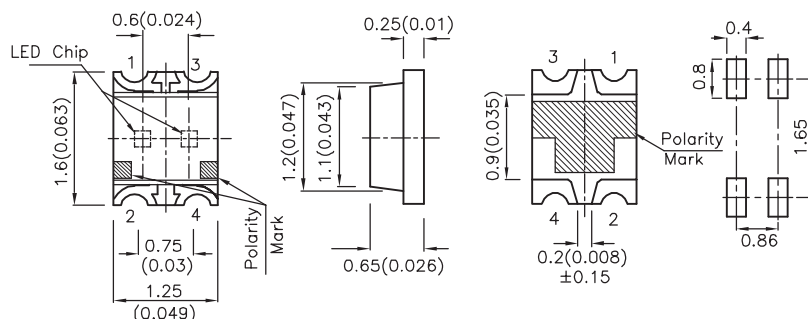
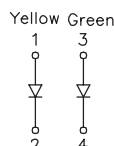
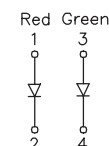
- Icon and text backlighting
- Audio and video
- White goods
- Mobile devices and handheld products
- Consumer electronics
- Medical and healthcare
- Safety and security
- Instrumentation
- Automotive backlighting
- Home automation

PRODUCT FEATURES

- Reverse-mount version of industry standard PLCC footprint
- Red, green, blue in single package - full color illumination
- High intensity and cost efficient
- Low current: 20 mA operation
- Wide viewing angle: 120°
- Moisture sensitivity level (MSL): 3

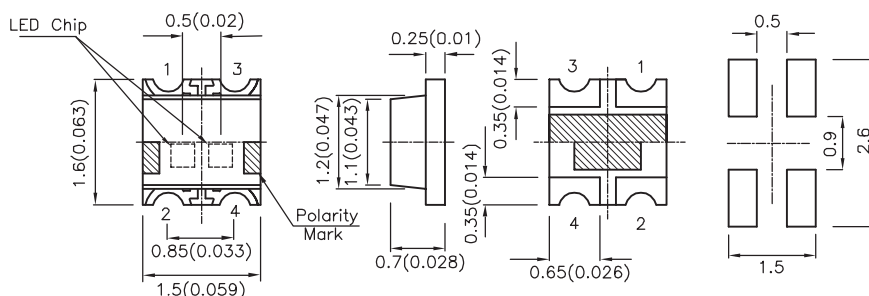
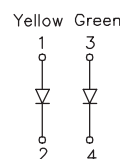
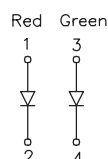
1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1mm$.
 2. Luminosity intensity value and wavelength are in accordance with CIE127-2007 standards.
 3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**1.6x1.25x0.65mm
(Bi-Color)**Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

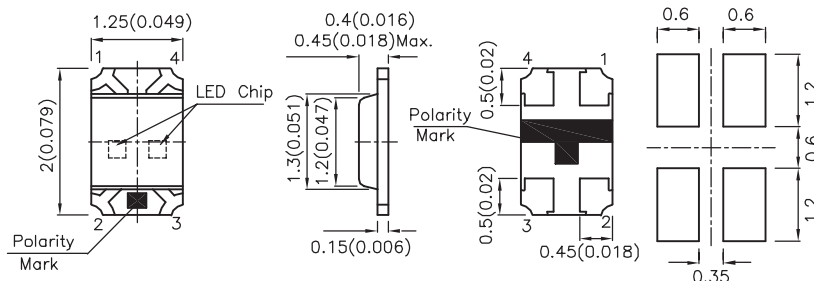
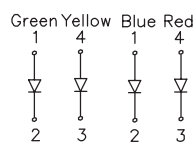
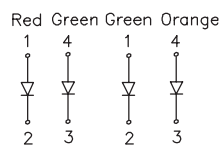
Recommended Soldering Pattern

XZMDKVG62W-1	◆ AlGaInP(Red)	645	40	79	150°	Water Clear
	◆ AlGaInP(Green)	574	20	49		
XZMYKVG62W-1	◆ AlGaInP(Yellow)	590	80	118	150°	Water Clear
	◆ AlGaInP(Green)	574	20	49		

**1.6x1.5x0.7mm
(Bi-Color)**Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZMDKVG59W-1	◆ AlGaInP(Red)	645	40	79	150°	Water Clear
	◆ AlGaInP(Green)	574	20	49		
XZMYKVG59W-1	◆ AlGaInP(Yellow)	590	80	118	150°	Water Clear
	◆ AlGaInP(Green)	574	20	49		

**2.0x1.25x0.45mm
(0805 Bi-Color)**Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

Recommended Soldering Pattern

XZMDKVG54W-4	◆ AlGaInP(Red)	645	40	79	120°	Water Clear
	◆ AlGaInP(Green)	574	20	49		
XZMDKDGK54W-4	◆ AlGaInP(Red)	645	40	79	120°	Water Clear
	◆ InGaIn(Green)	515	200	278		
XZVGMOK54W-4	◆ AlGaInP(Green)	574	20	49	120°	Water Clear
	◆ AlGaInP(Orange)	610	80	178		
XZVGMKY54W-4	◆ AlGaInP(Green)	574	20	49	120°	Water Clear
	◆ AlGaInP(Yellow)	590	80	118		
XZCBDMDK54W-4	◆ InGaIn(Blue)	460	40	79	120°	Water Clear
	◆ AlGaInP(Red)	645	40	79		

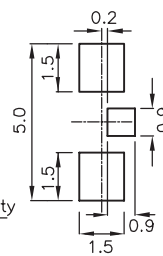
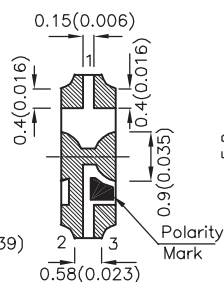
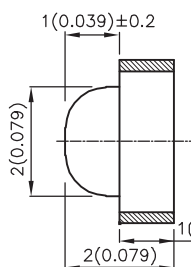
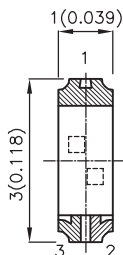
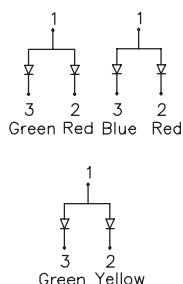
1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1mm$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) I _f =20mA		Viewing Angle 2θ1/2	Lens
			Min.	Typ.		

3.0x2.0x1.0mm
(Right Angle, Bi-Color)

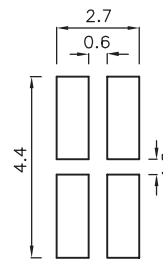
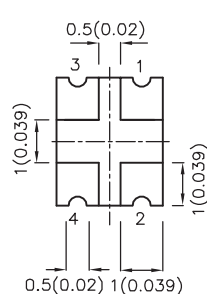
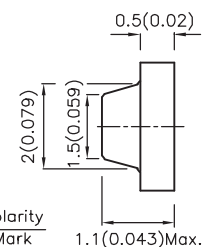
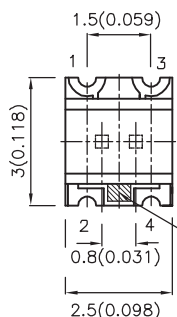
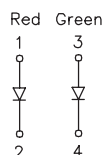


Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006")$

Recommended Soldering Pattern

Dimension Unit: mm(Inches); Tolerance : 0.25(0.010)					Recommended Soldering Pattern	
XZMDKVG56W	◆ AlGaInP(Red)	645	40	79	140°	Water Clear
	◆ IGaInP(Green)	574	40	69		
XZMDKCB56W	◆ AlGaInP(Red)	645	40	79	140°	Water Clear
	◆ InGaN(Blue)	460	40	89		
XZMYKVG56W	◆ AlGaInP(Yellow)	590	80	118	140°	Water Clear
	◆ AlGaInP(Green)	574	40	69		

**3.0x2.5x1.1mm
(Bi-Color)**

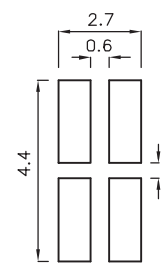
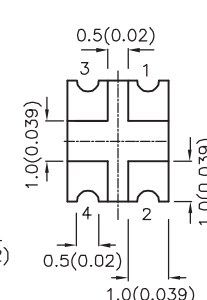
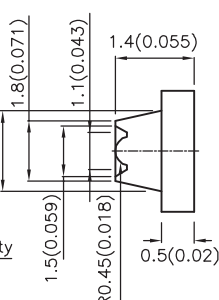
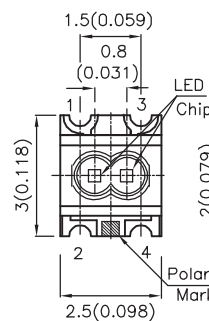
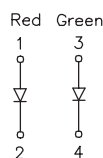


Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZMDKVG57W	◆ AlGaInP (Red)	645	40	69	160°	Water Clear
	◆ AlGaInP (Green)	574	20	59		

**3.0x2.5x1.4mm
(Bi-Color)**



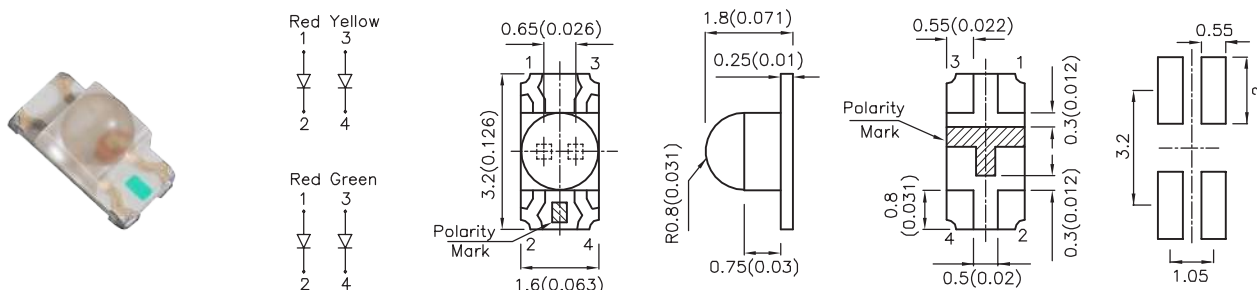
Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$ "

Recommended Soldering Pattern

Dimension Unit: mm (inches), Tolerance: ±0.2 (0.008)					Recommended Soldering System	
XZMDKVG57W-1	◆ AlGaInP (Red)	645	120	297	50°	Water Clear
	◆ AlGaInP (Green)	574	80	148		

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

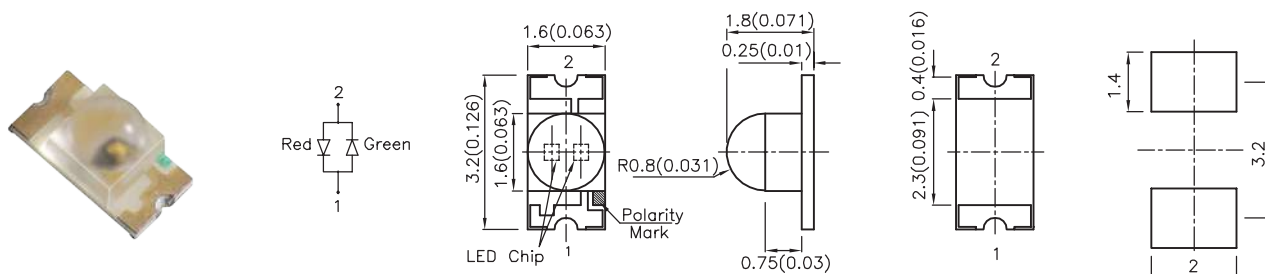
3.2x1.6x1.8mm (1206 Dome Lens Bi-Color)

Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008")$

Recommended Soldering Pattern

XZMDKMYK55W-8	◆ AlGaInP(Red)	645	300	597	30°	Water Clear
	◆ AlGaInP(Yellow)	590	200	447		
XZMDKVG55W-8	◆ AlGaInP(Red)	645	300	597	30°	Water Clear
	◆ AlGaInP(Green)	574	120	248		

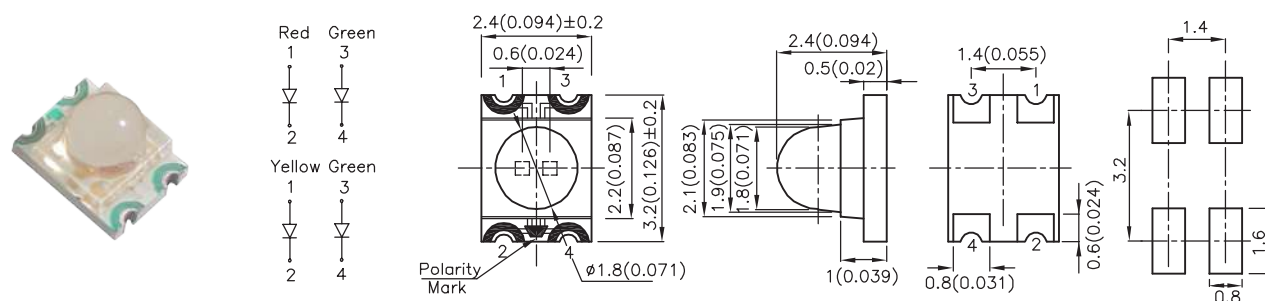
3.2x1.6x1.8mm (1206 Dome Lens Bi-Color)

Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004")$

Recommended Soldering Pattern

XZMDKVG55W-7	◆ AlGaInP(Red)	645	300	597	30°	Water Clear
	◆ AlGaInP(Green)	574	120	248		

3.2x2.4x2.4mm (Dome Lens Bi-Color)

Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004")$

Recommended Soldering Pattern

XZMDKVG78W	◆ AlGaInP(Red)	645	120	397	20°	Water Clear
	◆ AlGaInP(Green)	574	80	278		
XZMYKVG78W	◆ AlGaInP(Yellow)	590	400	795	20°	Water Clear
	◆ AlGaInP(Green)	574	80	278		

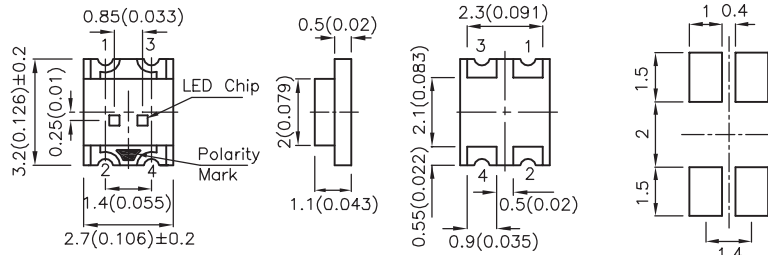
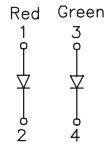
1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1mm$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**3.2x2.7x1.1mm
(Bi-Color)**

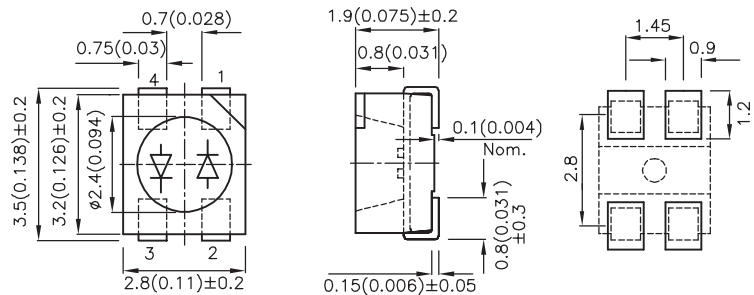
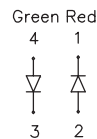


Dimension Unit: mm(inches), Tolerance: $\pm 0.1(0.004)$

Recommended Soldering Pattern

XZMDKVG98W	◆ AlGaInP(Red)	645	40	79	140°	Water Clear
	◆ AlGaInP(Green)	574	20	54		

**3.5x2.8x1.9mm
(PLCC4 Bi-Color)**

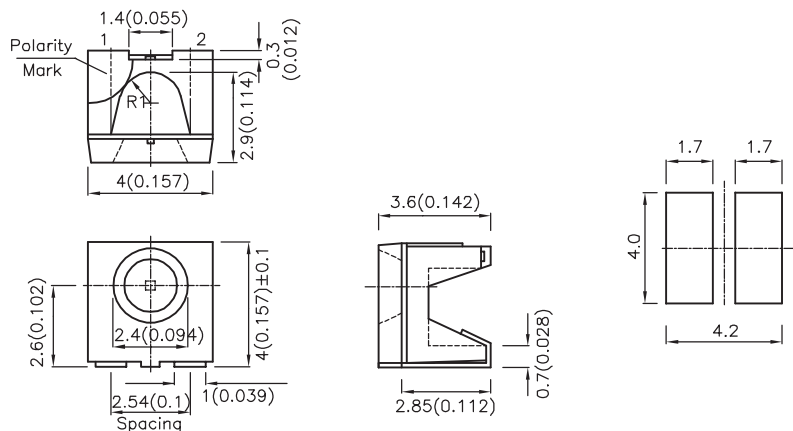
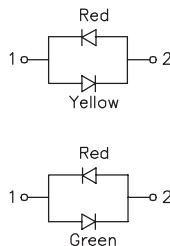


Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm(0.01)$

Recommended Soldering Pattern

XZMDKV45WT	◆ AlGaInP(Red)	645	55	98	120°	Water Clear
	◆ AlGaInP(Green)	574	40	79		

**4.0x4.0x3.6mm
(PLCC2 Right Angle Bi-Color)**



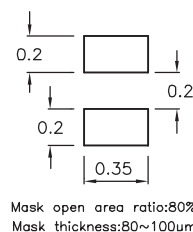
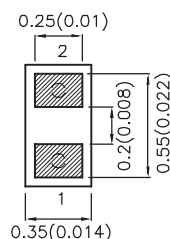
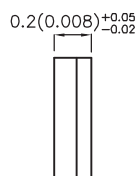
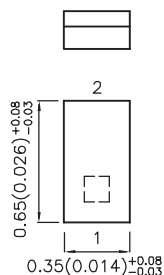
Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm(0.01)$

Recommended Soldering Pattern

XZMRMYK67WTR	◆ GaAlAs(Red)	655	20	59	120°	Water Clear
	◆ AlGaInP(Yellow)	590	100	248		
XZMRVG67STR	◆ GaAlAs(Red)	655	20	59	120°	Water Clear
	◆ AlGaInP(Green)	574	40	89		

1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1mm$.
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

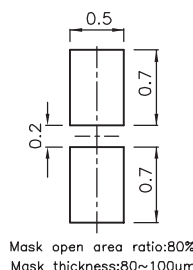
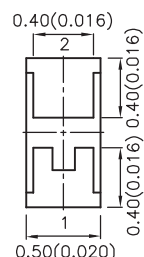
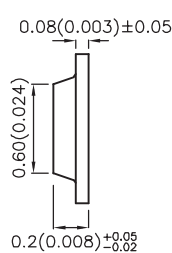
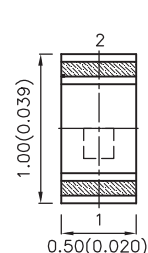


**0.65x0.35x0.2mm
(0201)**

Dimension Unit: mm(inches), Tolerance : ±0.1(0.004")

Recommended Soldering Pattern

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10mA, 5mA^*$		Viewing Angle 2θ1/2	Lens
			Min.	Typ.		
XZMDR155W	◆ AlGaInP(Red)	639	10	34	140°	Water Clear
XZVGR155W	◆ AlGaInP(Green)	572	6	14	140°	Water Clear
XZBBR155W5MAV	◆ InGaN(Blue)	461	*15	*24	140°	Water Clear
XZBWR155F5MAV	◇ InGaN(White)	x=0.31 y=0.31	*50	*118	140°	Yellow Fluorescent

**1.0x0.5x0.2mm
(0402 Super Thin)**

Dimension Unit: mm(inches), Tolerance : ±0.1(0.004")

Recommended Soldering Pattern

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA, 5mA^*$		Viewing Angle 2θ1/2	Lens
			Min.	Typ.		
XZVGR68W-3	◆ AlGaInP(Green)	572	12	34	120°	Water Clear
XZBGR68W5MAV-3	◆ InGaN(Green)	518	*30	*69	140°	Water Clear
XZBBR68W5MAV-3	◆ InGaN(Blue)	461	*20	*27	140°	Water Clear

NanoPoint-0201 – World's Smallest SMD LED**PRODUCT HIGHLIGHT**

SunLED offers its 0.65 mm x 0.35 mm x 0.2 mm SMD chip type LEDs in a variety of colors

SunLED announces the NanoPoint-0201 series LED, providing the world's smallest LED footprint currently available, the 0201. As new product designs become smaller and more compact, the need for smaller components has become more prevalent. The optoelectronics industry has gone from a 1206 sized LED down to a 0402 size, where footprint reduction technology has stalled for many years.

With a footprint of 0.65 mm x 0.35 mm and a mere 0.20 mm height, the NanoPoint-0201 LED offers over 50% size reduction compared to the 0402, shattering all restraints tying down product designs. A full spectrum of colors is readily available providing a brilliant output for the miniscule size of the LED, making this product a versatile solution for any design.

PRODUCT APPLICATIONS

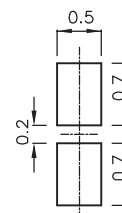
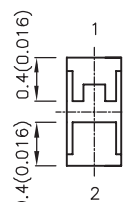
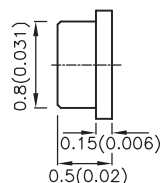
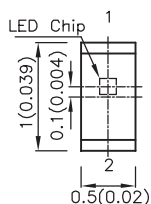
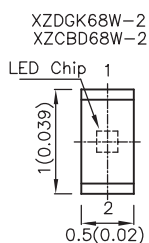
- Audio and video
- Icon and text backlighting
- Membrane switches
- Mobile devices and hand-held products
- Consumer electronics
- Instrumentation
- Networking / telecommunications
- Fitness wearables
- Medical and healthcare
- Safety and security

PRODUCT FEATURES

- World's smallest LED - 0201 footprint
- Dimensions: 0.65 mm x 0.35 mm x 0.20 mm (L x W x H)
- DFN style package: dual flat no-leads
- Available colors: red, orange, yellow, green, true green, and blue
- Low current, 10 mA operation
- Wide dispersion angle of 140°
- SMD moisture sensitivity level (MSL): 2
- Cost competitive

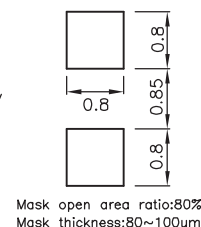
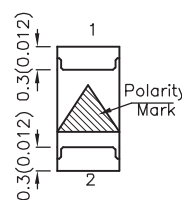
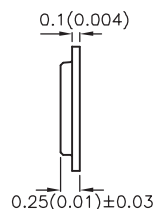
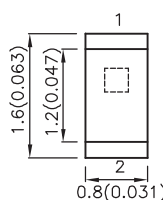
1. Soldering Pattern Dimension Unit : mm Tolerance : ±0.1mm.
 2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
 3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**1.0x0.5x0.5mm
(0402)**
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

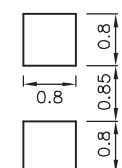
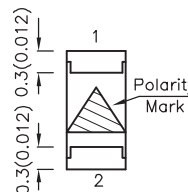
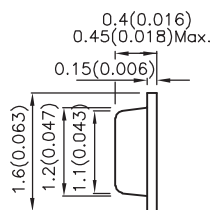
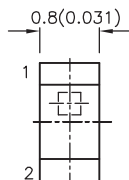
Recommended Soldering Pattern

XZMDK68W-2	AlGaInP(Red)	645	40	69	120°	Water Clear
XZMOK68W-2	AlGaInP(Orange)	610	80	148	120°	Water Clear
XZMYK68W-2	AlGaInP(Yellow)	590	80	148	120°	Water Clear
XZVG68W-2	AlGaInP(Green)	574	20	49	120°	Water Clear
XZDGK68W-2	InGaN(Green)	515	400	547	140°	Water Clear
XZCBD68W-2	InGaN(Blue)	460	40	59	140°	Water Clear

**1.6x0.8x0.25mm
(0603 Super Thin)**
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

Recommended Soldering Pattern

XZMDKT53W-6	AlGaInP(Red)	645	55	108	120°	Water Clear
XZMOK53W-6	AlGaInP(Orange)	610	55	98	120°	Water Clear
XZMYKT53W-6	AlGaInP(Yellow)	590	55	118	120°	Water Clear
XZVGT53W-6	AlGaInP(Green)	574	20	49	120°	Water Clear
XZDGK53W-6	InGaN(Green)	515	300	397	130°	Water Clear
XZCBD53W-6	InGaN(Blue)	460	40	98	130°	Water Clear

**1.6x0.8x0.45mm
(0603)**
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

Recommended Soldering Pattern

XZMDK53W-3	AlGaInP(Red)	645	40	79	120°	Water Clear
XZMOK53W-3	AlGaInP(Orange)	610	80	178	120°	Water Clear
XZMYK53W-3	AlGaInP(Yellow)	590	80	148	120°	Water Clear
XZVG53W-3	AlGaInP(Green)	574	20	49	120°	Water Clear
XZFB53W-3	InGaN(Blue)	465	120	178	130°	Water Clear
XZCBD53W-3	InGaN(Blue)	460	40	98	130°	Water Clear

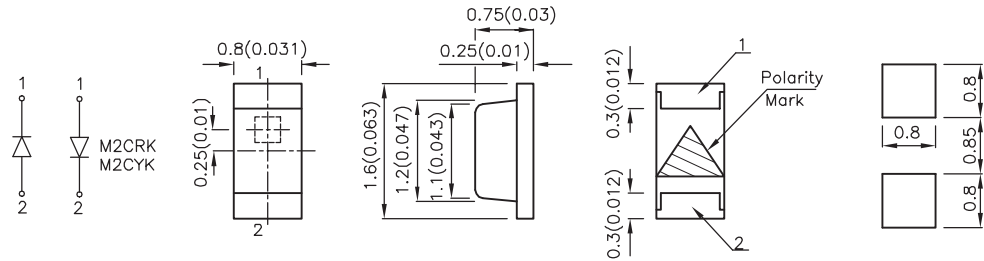
1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

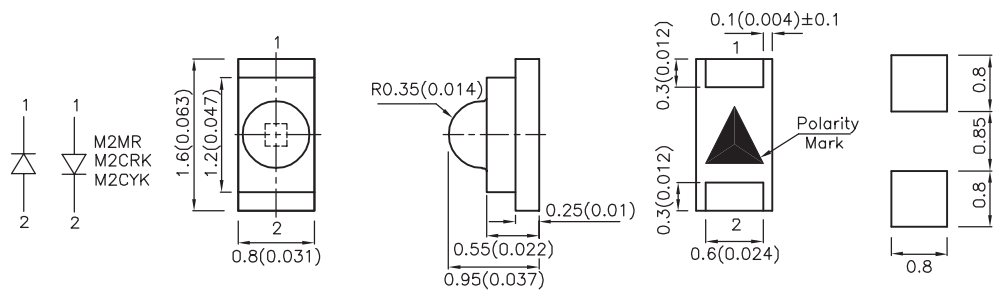


Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**1.6x0.8x0.75mm
(0603)**Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

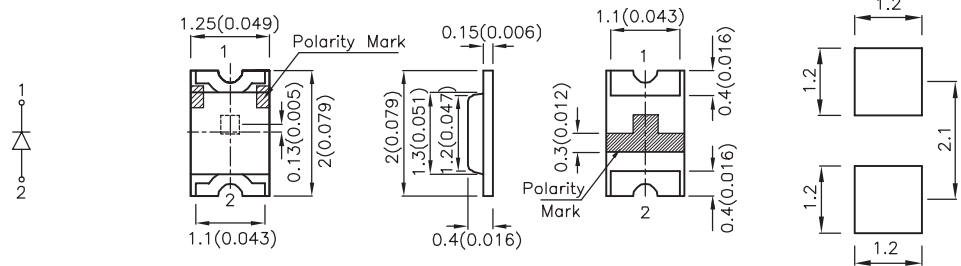
Recommended Soldering Pattern

XZMDK53W-1	◆ AlGaInP(Red)	645	40	79	120°	Water Clear
XZM2CRK53W-1	◆ AlGaInP(Red)	640	200	347	120°	Water Clear
XZMOK53W-1	◆ AlGaInP(Orange)	610	80	178	120°	Water Clear
XZMYK53W-1	◆ AlGaInP(Yellow)	590	80	148	120°	Water Clear
XZM2CYK53W-1	◆ AlGaInP(Yellow)	590	200	317	120°	Water Clear
XZVG53W-1	◆ AlGaInP(Green)	574	20	49	120°	Water Clear
XZM2DG53W-1	◆ InGaN(Green)	520	500	795	130°	Water Clear
XZDGK53W-1	◆ InGaN(Green)	515	300	547	130°	Water Clear
XZFB53W-1	◆ InGaN(Blue)	465	120	178	130°	Water Clear
XZCBD53W-1	◆ InGaN(Blue)	460	40	98	130°	Water Clear

**1.6x0.8x0.95mm
(0603 Dome Lens)**Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006)$

Recommended Soldering Pattern

XZM2MR53W-8	◆ AlGaInP(Red)	660	200	317	60°	Water Clear
XZMDK53W-8	◆ AlGaInP(Red)	645	80	248	60°	Water Clear
XZM2CRK53W-8	◆ AlGaInP(Red)	640	500	895	60°	Water Clear
XZMOK53W-8	◆ AlGaInP(Orange)	610	200	497	60°	Water Clear
XZMYK53W-8	◆ AlGaInP(Yellow)	590	300	597	60°	Water Clear
XZM2CYK53W-8	◆ AlGaInP(Yellow)	590	500	845	60°	Water Clear
XZVG53W-8	◆ AlGaInP(Green)	574	80	188	60°	Water Clear
XZM2DG53W-8	◆ InGaN(Green)	520	1000	1495	60°	Water Clear
XZDGK53W-8	◆ InGaN(Green)	515	700	1195	60°	Water Clear
XZFB53W-8	◆ InGaN(Blue)	465	200	347	40°	Water Clear
XZCBD53W-8	◆ InGaN(Blue)	460	80	198	40°	Water Clear

**2.0x1.25x0.4mm
(0805)**Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

Recommended Soldering Pattern

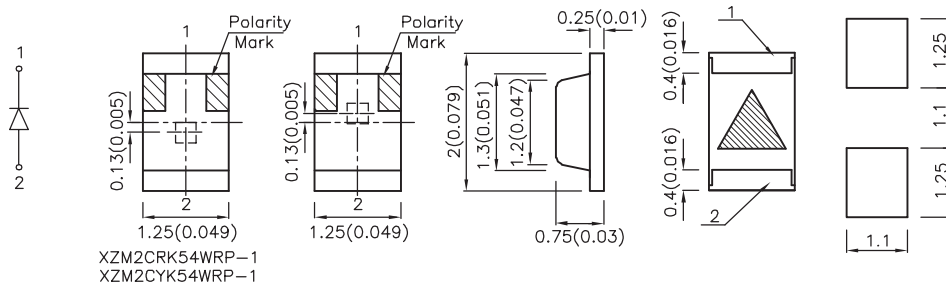
XZMDK54W-4	◆ AlGaInP(Red)	645	40	79	140°	Water Clear
XZMOK54W-4	◆ AlGaInP(Orange)	610	80	179	140°	Water Clear
XZMYK54W-4	◆ AlGaInP(Yellow)	590	80	148	140°	Water Clear
XZVG54W-4	◆ AlGaInP(Green)	574	20	49	140°	Water Clear
XZCBD54W-4	◆ InGaN(Blue)	460	40	99	140°	Water Clear

1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

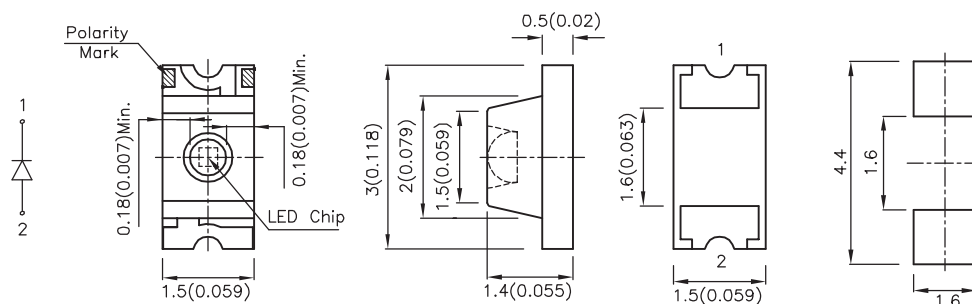
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Max.		

**2.0x1.25x0.75mm
(0805)**
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)''$

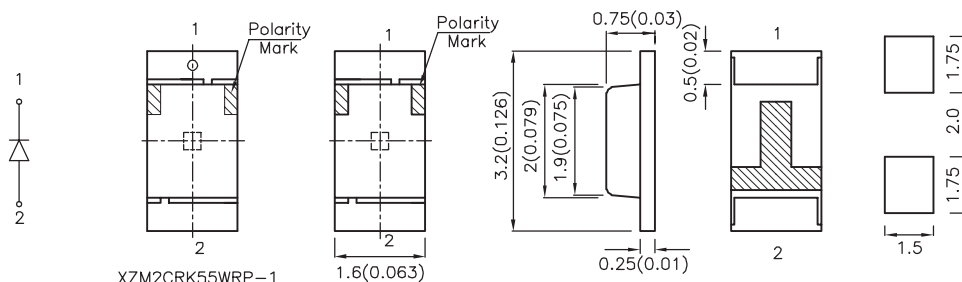
Recommended Soldering Pattern

XZMDK54W-1	AlGaInP(Red)	645	40	79	140°	Water Clear
XZM2CRK54WRP-1	AlGaInP(Red)	640	200	347	140°	Water Clear
XZMOK54W-1	AlGaInP(Orange)	610	80	178	140°	Water Clear
XZMYK54W-1	AlGaInP(Yellow)	590	80	148	140°	Water Clear
XZM2CYK54W-1	AlGaInP(Yellow)	590	200	317	140°	Water Clear
XZM2CYK54WRP-1	AlGaInP(Yellow)	590	200	317	140°	Water Clear
XZVG54W-1	AlGaInP(Green)	574	20	49	140°	Water Clear
XZDGK54W-1	InGaN(Green)	515	300	547	140°	Water Clear
XZFB54W-1	InGaN(Blue)	465	120	178	140°	Water Clear
XZCBD54W-1	InGaN(Blue)	460	40	98	140°	Water Clear

**3.0x1.5x1.4mm
(Inner Dome Lens)**
Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)''$

Recommended Soldering Pattern

XZMDK60W	AlGaInP(Red)	645	120	178	70°	Water Clear
XZMYK60W	AlGaInP(Yellow)	590	200	347	70°	Water Clear
XZVG60W	AlGaInP(Green)	574	55	118	70°	Water Clear

**3.2x1.6x0.75mm
(1206)**
Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)''$

Recommended Soldering Pattern

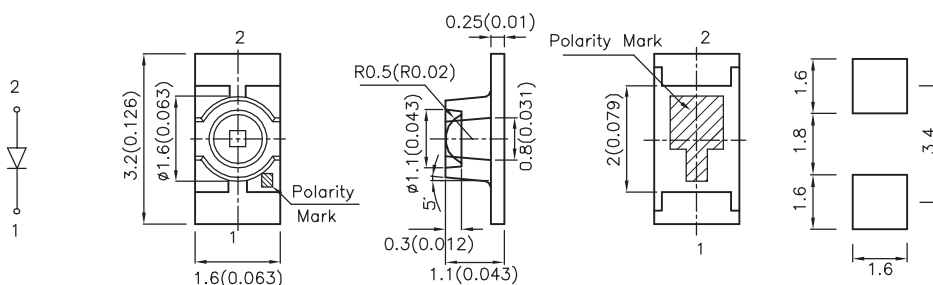
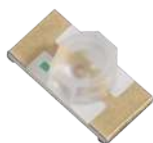
XZMDK55W-1	AlGaInP(Red)	645	40	79	140°	Water Clear
XZM2CRK55WRP-1	AlGaInP(Red)	640	200	347	140°	Water Clear
XZMOK55W-1	AlGaInP(Orange)	610	80	178	140°	Water Clear
XZMYK55W-1	AlGaInP(Yellow)	590	80	148	140°	Water Clear
XZVG55W-1	AlGaInP(Green)	574	20	49	140°	Water Clear
XZCBD55W-1	InGaN(Blue)	460	40	98	150°	Water Clear

- Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1mm$.
- Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
- We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

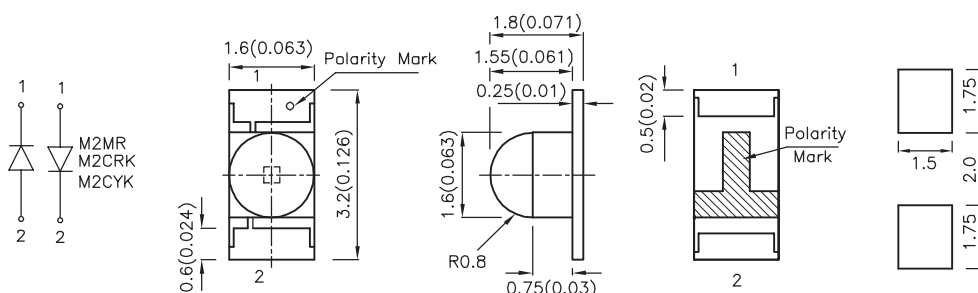
3.2x1.6x1.1mm (1206 Inner Dome Lens)

Dimension Unit: mm(inches), Tolerance: $\pm 0.1\text{mm}$ (0.004")

Recommended Soldering Pattern

XZMDK55W-A2	AlGaInP(Red)	645	120	228	80°	Water Clear
XZMOK55W-A2	AlGaInP(Orange)	610	200	347	80°	Water Clear
XZMYK55W-A2	AlGaInP(Yellow)	590	200	347	80°	Water Clear
XZVG55W-A2	AlGaInP(Green)	574	55	98	80°	Water Clear
XZCBD55W-A2	InGaN(Blue)	460	120	248	80°	Water Clear

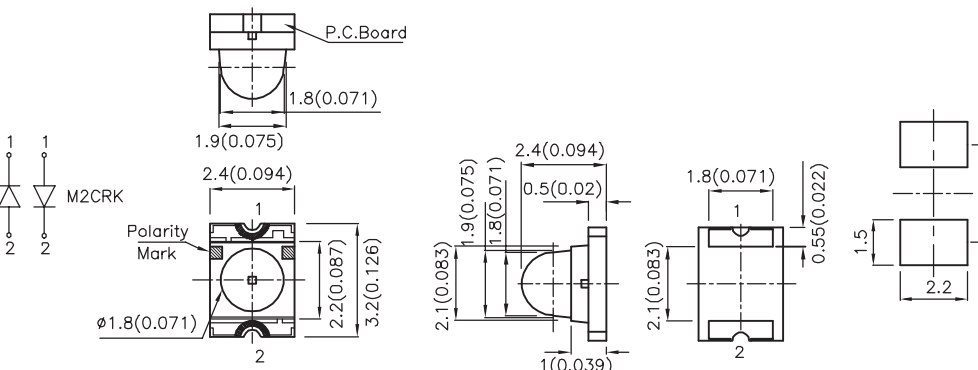
3.2x1.6x1.8mm (1206 Dome Lens)

Dimension Unit: mm(inches), Tolerance: $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZM2MR55W-3	AlGaInP(Red)	660	700	1095	40°	Water Clear
XZMDK55W-3	AlGaInP(Red)	645	300	795	40°	Water Clear
XZM2CRK55W-3	AlGaInP(Red)	640	1600	2490	40°	Water Clear
XZMOK55W-3	AlGaInP(Orange)	610	500	995	40°	Water Clear
XZMYK55W-3	AlGaInP(Yellow)	590	700	795	40°	Water Clear
XZM2CYK55W-3	AlGaInP(Yellow)	590	1300	1690	40°	Water Clear
XZVG55W-3	AlGaInP(Green)	574	120	297	40°	Water Clear
XZM2DG55W-3	InGaN(Green)	520	3600	5990	30°	Water Clear
XZDGK55W-3	InGaN(Green)	515	2700	3990	30°	Water Clear
XZFB55W-3	InGaN(Blue)	465	700	1195	30°	Water Clear
XZCBD55W-3	InGaN(Blue)	460	300	695	30°	Water Clear

3.2x2.4x2.4mm (Dome Lens)

Dimension Unit: mm(inches), Tolerance: $\pm 0.1\text{mm}$ (0.004")

Recommended Soldering Pattern

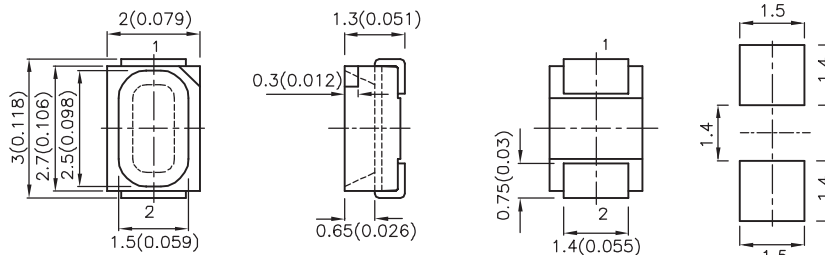
XZMDK78W	AlGaInP(Red)	645	700	1495	20°	Water Clear
XZM2CRK78W	AlGaInP(Red)	640	3100	4990	20°	Water Clear
XZMOK78W	AlGaInP(Orange)	610	1000	1590	20°	Water Clear
XZMYK78W	AlGaInP(Yellow)	590	1000	1295	20°	Water Clear
XZVG78W	AlGaInP(Green)	574	500	895	20°	Water Clear
XZDGK78W	InGaN(Green)	515	3600	6790	20°	Water Clear
XZFB78W	InGaN(Blue)	465	1600	1990	20°	Water Clear
XZCBD78W	InGaN(Blue)	460	500	895	20°	Water Clear

1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

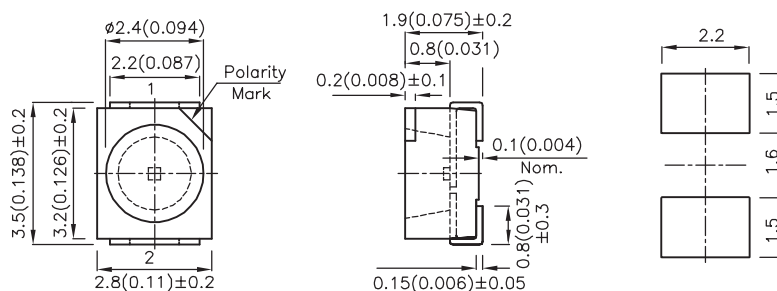
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**3.0x2.0x1.3mm
(PLCC2)**
Dimension Unit: mm(inches), Tolerance: $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZMDK105S	AlGaInP(Red)	645	40	89	120°	Water Clear
XZMYK105S	AlGaInP(Yellow)	590	120	198	120°	Water Clear
XZVG105S	AlGaInP(Green)	574	40	79	120°	Water Clear
XZCBD105S	InGaN(Blue)	460	80	118	120°	Water Clear

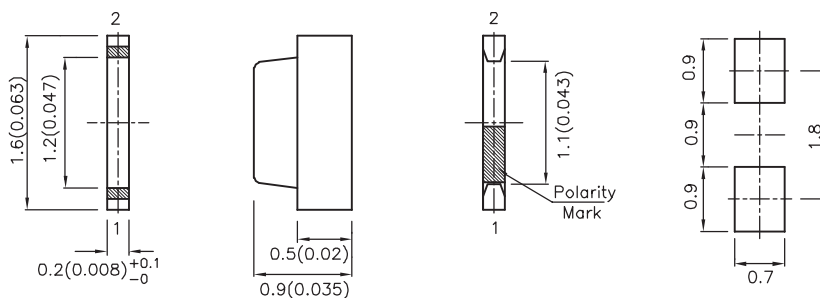
**3.5x2.8x1.9mm
(PLCC2)**
Dimension Unit: mm(inches), Tolerance: $\pm 0.25\text{mm}(0.01)$

Recommended Soldering Pattern

XZMDK45WT	AlGaInP(Red)	645	55	98	120°	Water Clear
XZMOK45WT	AlGaInP(Orange)	610	120	228	120°	Water Clear
XZMYK45WT	AlGaInP(Yellow)	590	120	248	120°	Water Clear
XZVG45WT	AlGaInP(Green)	574	40	98	120°	Water Clear
XZDGK45WT	InGaN(Green)	515	500	995	120°	Water Clear
XZFBB45S	InGaN(Blue)	465	300	447	120°	Water Clear
XZCBD45S	InGaN(Blue)	460	80	148	120°	Water Clear

SIDE EMITTING

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**1.6x0.9x0.2mm
(Super Thin Right Angle)**
Dimension Unit: mm(inches), Tolerance: $\pm 0.1(0.004)$

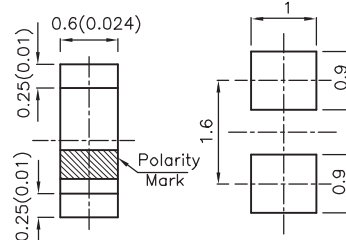
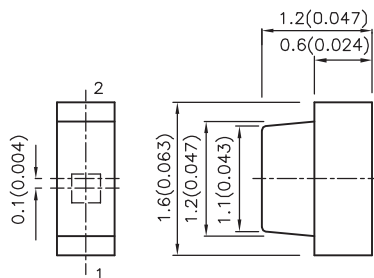
Recommended Soldering Pattern

XZVGF151W	AlGaInP(Green)	573	12	29	150°	Water Clear
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- Soldering Pattern Dimension Unit: mm Tolerance: $\pm 0.1\text{mm}$.
- Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
- We reserve the right to make changes at any time to enhance the design and / or performance of the product.

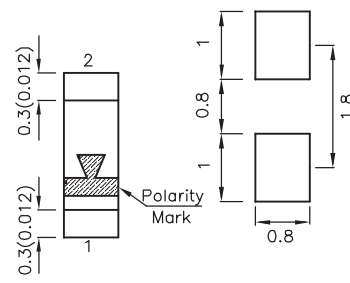
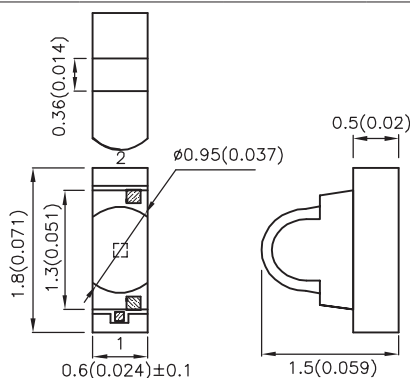


Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**1.6x1.2x0.6mm
(Right Angle)**Dimension Unit: mm(Inches), Tolerance : $\pm 0.1(0.004)$

Recommended Soldering Pattern

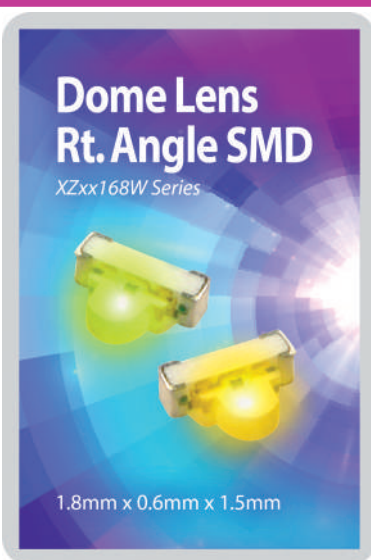
XZMDK87W	AlGaInP(Red)	645	40	79	110°	Water Clear
XZMOK87W	AlGaInP(Orange)	610	80	178	110°	Water Clear
XZMYK87W	AlGaInP(Yellow)	590	80	148	110°	Water Clear
XZVG87W	AlGaInP(Green)	574	20	49	110°	Water Clear
XZFB87W	InGaN(Blue)	465	120	198	110°	Water Clear
XZCBD87W	InGaN(Blue)	460	40	79	110°	Water Clear

**1.8x1.5x0.6mm
(Dome Lens Right Angle)**Dimension Unit: mm(Inches), Tolerance : $\pm 0.15(0.006)$

Recommended Soldering Pattern

XZM2CRK168WA	AlGaInP(Red)	640	1300	2590	25°	Water Clear
XZM2CYK168WA	AlGaInP(Yellow)	590	700	1790	25°	Water Clear
XZDGK168W	InGaN(Green)	515	1900	3190	25°	Water Clear
XZFB8168W	InGaN(Blue)	465	400	795	25°	Water Clear

PRODUCT HIGHLIGHT

**XZxx168W Series – Dome Lens Right Angle SMD LED****PRODUCT HIGHLIGHT**

SunLED's industry leading product line is able to achieve increased intensity over traditional right angle LEDs

SunLED provides a solution to dome lens LED applications that offers more flexibility in the design industry. The LEDs measure in at 1.8mm x 0.6mm x 1.5mm. With the introduction of this series, SunLED offers an industry leading option of focused intensity in a 25° degree viewing angle for brighter illumination in the desired region. This product line is able to achieve up to 15 times increased intensity over traditional right-angle LEDs.

Narrower angles come with the benefit of eliminating light bleeding which further increases design appeal. This series is especially suited for light pipe applications due to a lower angle of incidence. Light rays can be reflected more efficiently, and a brighter illuminated region results in stronger back-light and a more defined user interface. A full-color spectrum is available for a wide range of applications.

PRODUCT APPLICATIONS

- Light pipe applications
- Consumer electronics
- Icon and text backlighting
- Mobile devices and hand-held products
- Home automation
- Safety and security
- Instrumentation
- White goods
- Audio and video
- Medical and healthcare

PRODUCT FEATURES

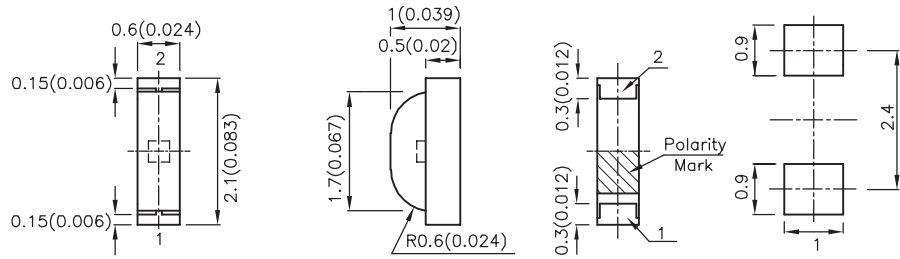
- Up to 1,500% increase in intensity over traditional right angle LEDs
- Dome lens right angle SMD in a 1.8mm x 0.6mm x 1.5mm package
- Moisture sensitivity level (MSL): 3
- Low current: 20mA operation
- Narrow viewing angle: 25°

1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

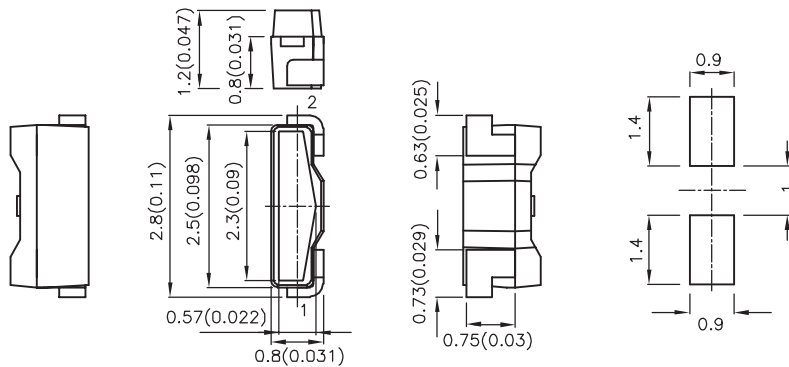
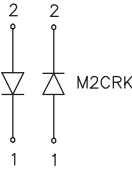
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**2.1x1.0x0.6mm
(Right Angle)**Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

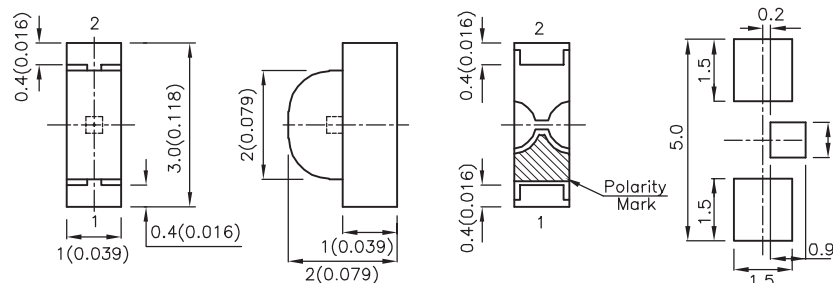
Recommended Soldering Pattern

XZMDK74W	AlGaInP(Red)	645	40	79	140°	Water Clear
XZMYK74W	AlGaInP(Yellow)	590	80	148	140°	Water Clear
XZVG74W	AlGaInP(Green)	574	20	49	140°	Water Clear

**2.8x1.2x0.8mm
(Right Angle)**Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$

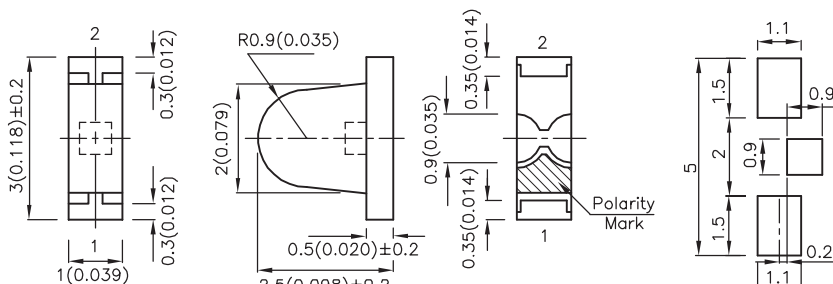
Recommended Soldering Pattern

XZMDK81FS	AlGaInP(Red)	645	40	98	110°	Water Clear
XZM2CRK81FS	AlGaInP(Red)	640	300	497	110°	Water Clear
XZMYK81FS	AlGaInP(Yellow)	590	120	198	110°	Water Clear
XZVG81FS	AlGaInP(Green)	574	40	69	110°	Water Clear
XZM2DG81FS	InGaN(Green)	520	1000	1395	110°	Water Clear
XZFBB81FS	InGaN(Blue)	465	200	347	110°	Water Clear

**3.0x2.0x1.0mm
(Right Angle)**Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006)$

Recommended Soldering Pattern

XZMDK56W	AlGaInP(Red)	645	40	79	120°	Water Clear
XZMOK56W	AlGaInP(Orange)	610	80	178	120°	Water Clear
XZMYK56W	AlGaInP(Yellow)	590	80	148	120°	Water Clear
XZVG56W	AlGaInP(Green)	574	20	49	120°	Water Clear
XZCBD56W	InGaN(Blue)	460	40	79	120°	Water Clear

**3.0x2.5x1.0mm
(Right Angle)**Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006)$

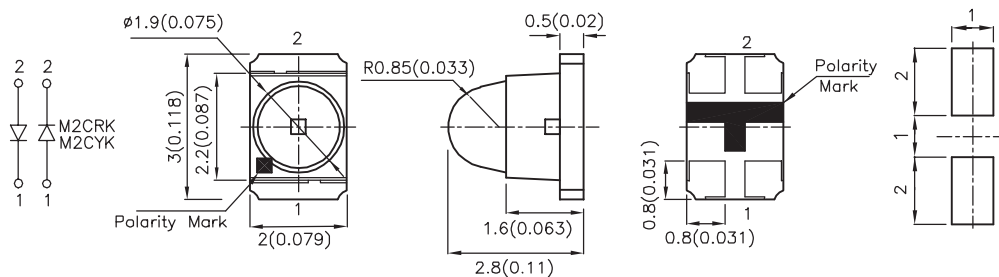
Recommended Soldering Pattern

XZVG56W-1	AlGaInP(Green)	574	80	148	30°	Water Clear
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- Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.
- Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
- We reserve the right to make changes at any time to enhance the design and / or performance of the product.

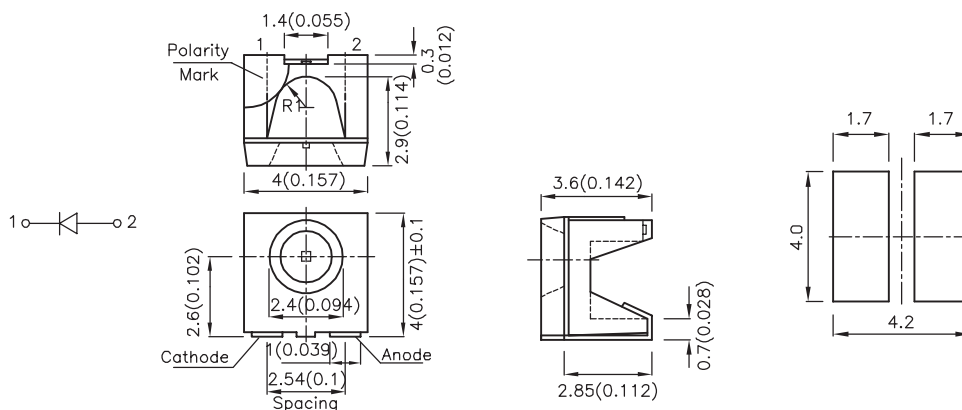


Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

3.0x2.8x2.0 mm
(Dome Lens Right Angle)
Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZM2CRK50W-2RP	AlGaInP(Red)	640	2300	3790	10°	Water Clear
XZM2CYK50W-2RP	AlGaInP(Yellow)	590	3600	6990	10°	Water Clear
XZMG50W-2RP	GaP(Green)	565	55	98	10°	Water Clear
XZBBA50W-2	InGaN(Blue)	468	300	597	10°	Water Clear

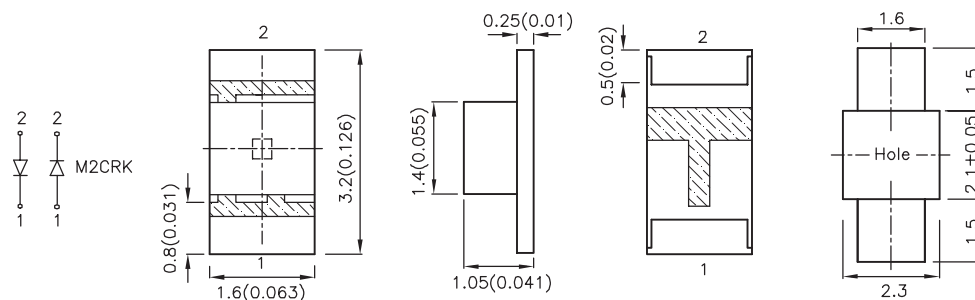
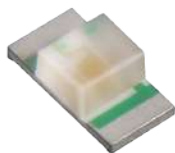
4.0x4.0x3.6mm
(PLCC2 Right Angle)
Dimension Unit: mm(inches), Tolerance: $\pm 0.25\text{mm}(0.01")$

Recommended Soldering Pattern

XZMDK67WT	AlGaInP(Red)	645	80	148	120°	Water Clear
XZVG67WT	AlGaInP(Green)	574	40	89	120°	Water Clear
XZCBD67S	InGaN(Blue)	460	80	218	120°	Water Clear

REVERSE MOUNT

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

3.2x1.6x1.05mm
(1206 Reverse Mount)
Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$

Recommended Soldering Pattern

XZMDK55W-2	AlGaInP(Red)	645	40	79	140°	Water Clear
XZM2CRK55W-2	AlGaInP(Red)	640	200	347	140°	Water Clear
XZMOK55W-2	AlGaInP(Orange)	610	80	178	140°	Water Clear
XZMYK55W-2	AlGaInP(Yellow)	590	80	148	140°	Water Clear
XZVG55W-2	AlGaInP(Green)	574	20	49	140°	Water Clear
XZM2DG55W-2	InGaN(Green)	520	500	795	140°	Water Clear
XZDGK55W-2	InGaN(Green)	515	300	547	140°	Water Clear
XZCBD55W-2	InGaN(Blue)	460	40	98	140°	Water Clear

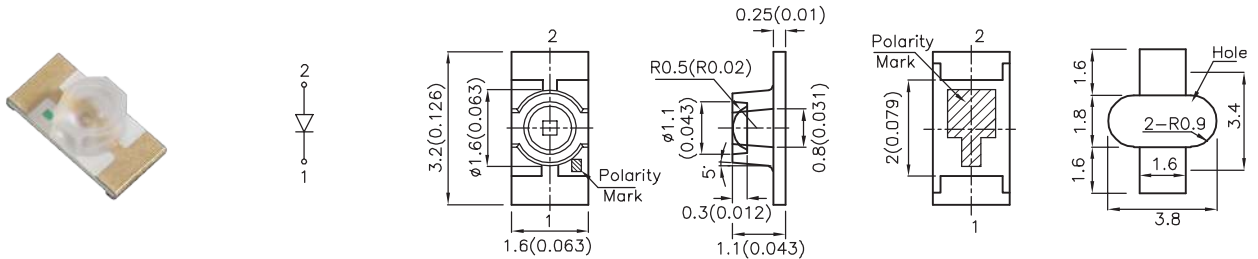
1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1\text{mm}$.

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

3.2x1.6x1.1mm (1206 Inner Dome Lens Reverse Mount)

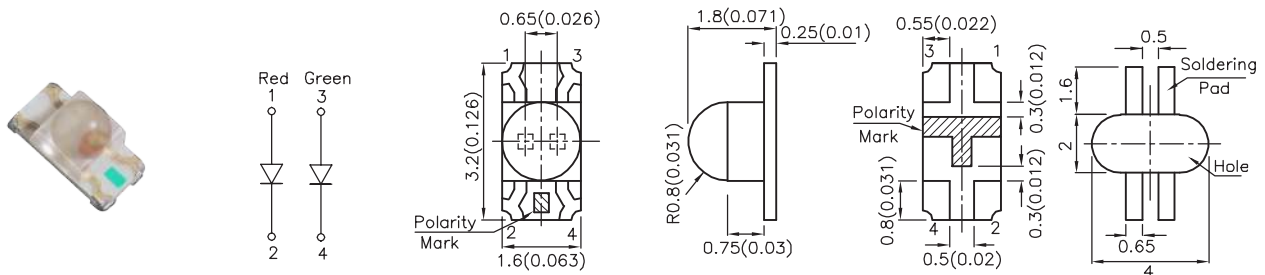


Dimension Unit: mm(inches), Tolerance: $\pm 0.1(0.004)$ "

Recommended Soldering Pattern

XZMDK55W-A2RT	AlGaInP(Red)	645	120	228	80°	Water Clear
XZMYK55W-A2RT	AlGaInP(Yellow)	590	200	347	80°	Water Clear
XZVG55W-A2RT	AlGaInP(Green)	574	55	98	80°	Water Clear
XZCBD55W-A2RT	InGaN(Blue)	460	120	248	80°	Water Clear

3.2x1.6x1.8mm (1206 Dome Lens Reverse-Mount Bi-Color)

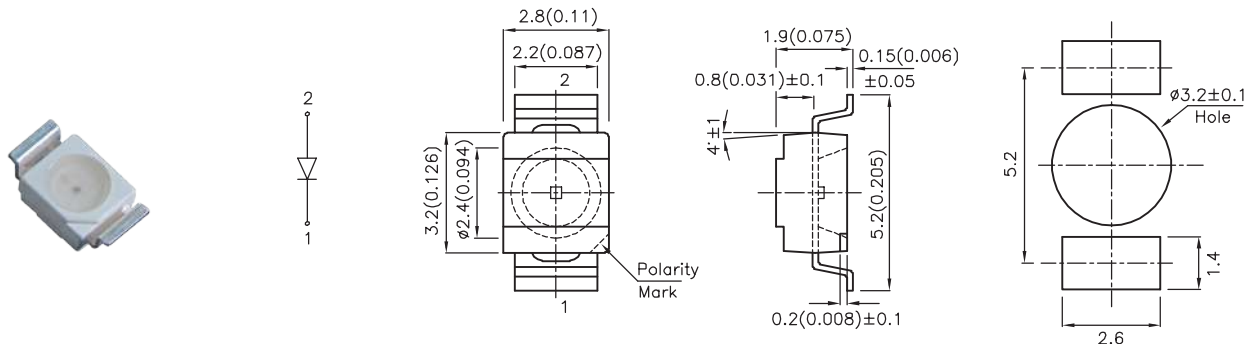


Dimension Unit: mm(inches), Tolerance: $\pm 0.2(0.008)$ "

Recommended Soldering Pattern

XZMDKDGK55W-8RT	AlGaInP(Red)	645	300	597	30°	Water Clear
	InGaN(Green)	515	400	647		

3.2x2.8x1.9mm (PLCC2 Reverse Mount)



Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm(0.01)$ "

Recommended Soldering Pattern

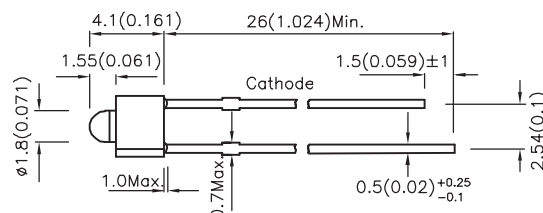
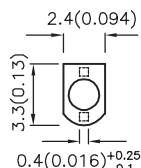
XZMDK45WT-9	AlGaInP(Red)	645	55	98	120°	Water Clear
XZMYK45WT-9	AlGaInP(Yellow)	590	120	248	120°	Water Clear
XZDGK45WT-9	InGaN(Green)	515	500	995	120°	Water Clear
XZFBB45S-9	InGaN(Blue)	465	300	447	120°	Water Clear

1. Soldering Pattern Dimension Unit: mm Tolerance: $\pm 0.1mm$.
2. Luminosity intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



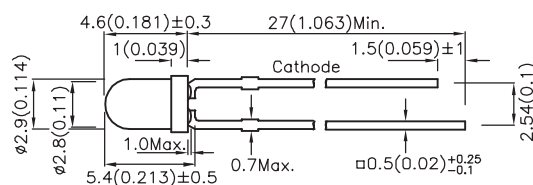
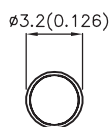
Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA, 10mA^*$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

1.8mm



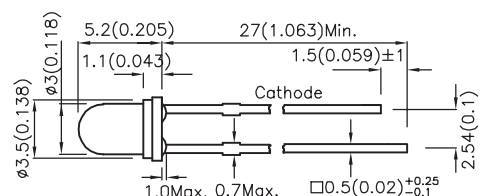
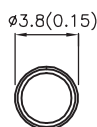
XLUR61D-A	◆ GaAsP/GaP(Red)	627	*4	*7	70°	Red Diffused
XLUY61D-A	◆ GaAsP/GaP(Yellow)	590	*4	*7	70°	Yellow Diffused
XLUG61D-A	◆ GaP(Green)	565	*6	*11	70°	Green Diffused

3mm



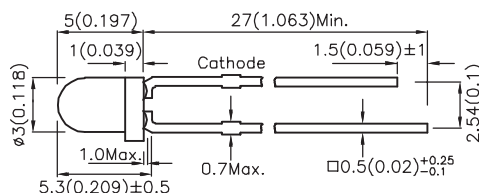
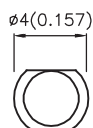
XLUR11D	◆ GaAsP/GaP(Red)	627	*10	*19	50°	Red Diffused
XLUY11D	◆ GaAsP/GaP(Yellow)	590	*8	*14	50°	Yellow Diffused
XLUG11D	◆ GaP(Green)	565	*10	*24	50°	Green Diffused
XLM2MR11D	◆ AlGaInP(Red)	660	200	497	50°	Red Diffused
XLM2MR11W	◆ AlGaInP(Red)	660	1000	1495	30°	Water Clear
XLMDK11D	◆ AlGaInP(Red)	645	120	238	50°	Red Diffused
XLMDK11W	◆ AlGaInP(Red)	645	400	895	30°	Water Clear
XLM2CRK11W	◆ AlGaInP(Red)	640	2300	3590	30°	Water Clear
XLM2MOK11W	◆ AlGaInP(Orange)	611	3600	5990	30°	Water Clear
XLMDK11W	◆ AlGaInP(Orange)	610	700	1395	30°	Water Clear
XLMYK11D	◆ AlGaInP(Yellow)	590	400	795	50°	Yellow Diffused
XLMYK11W	◆ AlGaInP(Yellow)	590	700	1495	30°	Water Clear
XLM2CYK11W	◆ AlGaInP(Yellow)	590	1900	2990	30°	Water Clear
XLM2DG11W	◆ InGaN(Green)	520	10500	16490	30°	Water Clear
XLDGK11W	◆ InGaN(Green)	515	8000	13990	30°	Water Clear
XLFB11W	◆ InGaN(Blue)	465	2100	3690	30°	Water Clear
XLCBD11D	◆ InGaN(Blue)	460	480	995	50°	Blue Diffused
XLCBD11W	◆ InGaN(Blue)	460	900	1590	30°	Water Clear

3mm



XLUR65D	◆ GaAsP/GaP(Red)	627	*8	*15	60°	Red Diffused
XLUY65D	◆ GaAsP/GaP(Yellow)	590	*6	*14	60°	Yellow Diffused
XLUG65D	◆ GaP(Green)	565	*15	*24	60°	Green Diffused

3mm

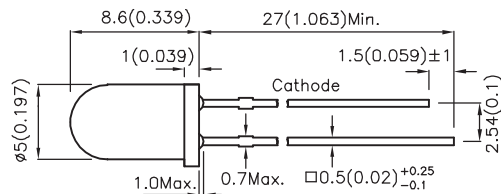
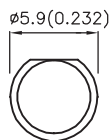


XLHR34D	◆ GaP(Red)	700	*0.6	*1.6	60°	Red Diffused
XLUR34D	◆ GaAsP/GaP(Red)	627	*6	*14	60°	Red Diffused
XLUY34D	◆ GaAsP/GaP(Yellow)	590	*8	*14	60°	Yellow Diffused
XLUG34D	◆ GaP(Green)	565	*12	*24	60°	Green Diffused

1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").
 2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
 3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

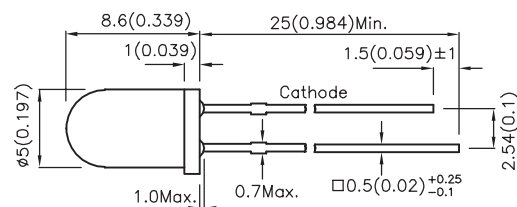
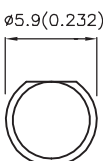
Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA, 10mA^*$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

5mm



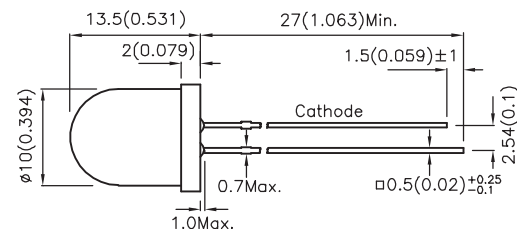
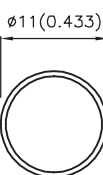
XLUR12D	◆ GaAsP/GaP(Red)	627	*18	*39	30°	Red Diffused
XLUY12D	◆ GaAsP/GaP(Yellow)	590	*10	*24	30°	Yellow Diffused
XLUG12D	◆ GaP(Green)	565	*15	*29	30°	Green Diffused
XLM2MR12D	◆ AlGaInP(Red)	660	300	597	30°	Red Diffused
XLM2MR12W	◆ AlGaInP(Red)	660	3300	4990	20°	Water Clear
XLMDK12D	◆ AlGaInP(Red)	645	300	647	30°	Red Diffused
XLMDK12W	◆ AlGaInP(Red)	645	900	1295	20°	Water Clear
XLM2CRK12W	◆ AlGaInP(Red)	640	3600	5990	20°	Water Clear
XLM2MOK12W	◆ AlGaInP(Orange)	611	5000	8890	20°	Water Clear
XLMOK12W	◆ AlGaInP(Orange)	610	1300	2090	20°	Water Clear
XLMYK12D	◆ AlGaInP(Yellow)	590	500	995	30°	Yellow Diffused
XLMYK12W	◆ AlGaInP(Yellow)	590	1800	2990	20°	Water Clear
XLM2CYK12W	◆ AlGaInP(Yellow)	590	5000	7790	20°	Water Clear
XLM2DG12W	◆ InGaN(Green)	520	18000	29990	20°	Water Clear
XLDGK12W	◆ InGaN(Green)	515	14000	25990	20°	Water Clear
XLFB12W	◆ InGaN(Blue)	465	4300	6990	20°	Water Clear
XLCBD12D	◆ InGaN(Blue)	460	600	995	30°	Blue Diffused
XLCBD12W	◆ InGaN(Blue)	460	3100	4490	20°	Water Clear

5mm



XLM2CRK14W	◆ AlGaInP(Red)	640	1500	2890	30°	Water Clear
XLFB14W	◆ InGaN(Blue)	465	1900	3090	30°	Water Clear

10mm



XLMR01DE	◆ GaAlAs(Red)	655	120	198	30°	Red Diffused
XLUR01D	◆ GaAsP/GaP(Red)	627	36	79	30°	Red Diffused
XLUY01D	◆ GaAsP/GaP(Yellow)	590	18	49	30°	Yellow Diffused
XLUG01D	◆ GaP(Green)	565	20	59	30°	Green Diffused

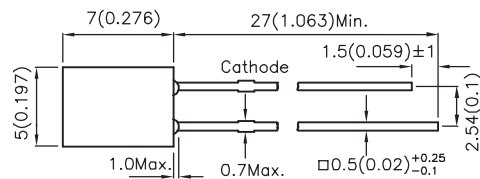
1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

2x5mm

2(0.079)



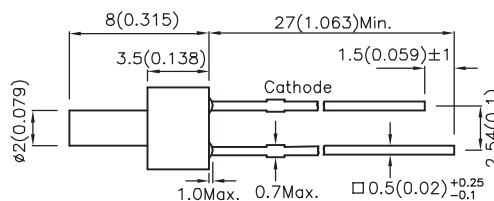
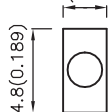
XSUR18D	◆ GaAsP/GaP(Red)	627	2	3.8	140°	Red Diffused
XSUY18D	◆ GaAsP/GaP(Yellow)	590	1.2	3.8	140°	Yellow Diffused
XSUG18D	◆ GaP(Green)	565	1.2	4.8	140°	Green Diffused

FLAT TOP

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

2mm

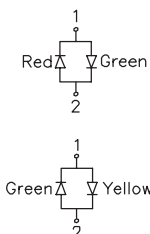
2.5(0.098)



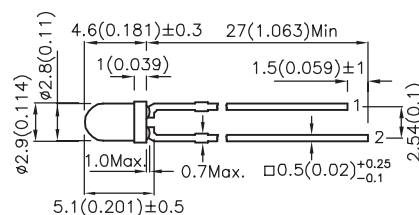
XLUR13D	◆ GaAsP/GaP(Red)	627	6	11	50°	Red Diffused
XLUY13D	◆ GaAsP/GaP(Yellow)	590	4	7	50°	Yellow Diffused
XLUG13D	◆ GaP(Green)	565	6	11	50°	Green Diffused

BI-COLOR & BI-POLAR

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

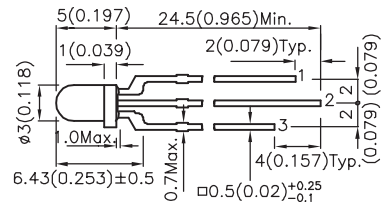
3mm Round

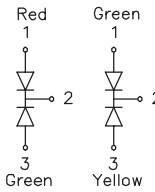
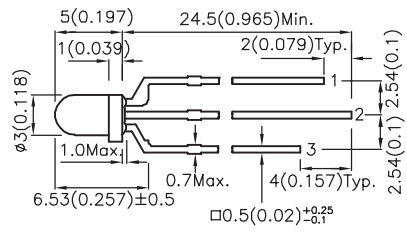
ø3.2(0.126)

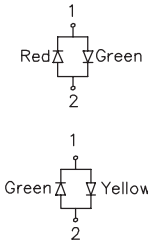
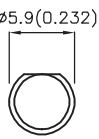
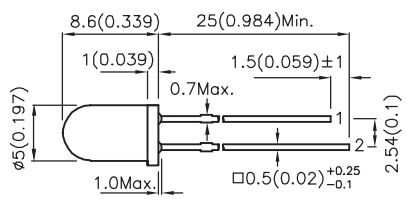


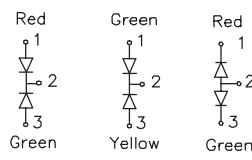
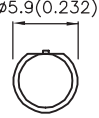
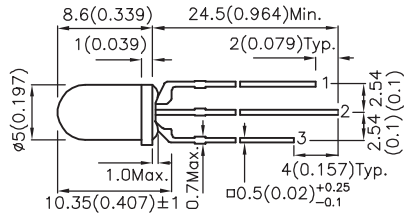
XLUGR37M	◆ GaAsP/GaP(Red)	627	4	9	60°	White Diffused
	◆ GaP(Green)	565	6	13		
XLUGY37M	◆ GaP(Green)	565	6	13	60°	White Diffused
	◆ GaAsP/GaP(Yellow)	590	4	7		

1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25\text{mm}$ (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		
3mm Round						
 Red 1 2 3 Green Green 1 2 3 Yellow  						
XLUGR29M	◆ GaAsP/GaP(Red)	627	10	29	60°	White Diffused
	◆ GaP(Green)	565	20	39		
XLUGY29M	◆ GaP(Green)	565	15	39	60°	White Diffused
	◆ GaAsP/GaP(Yellow)	590	10	14		

3mm Round    						
XLUGR34M	◆ GaAsP/GaP(Red)	627	8	15	60°	White Diffused
	◆ GaP(Green)	565	20	39		
XLMDKVG34M	◆ AlGaInP(Red)	645	80	158	60°	White Diffused
	◆ AlGaInP(Green)	574	60	158		
XLUGY34M	◆ GaP(Green)	565	15	29	60°	White Diffused
	◆ GaAsP/GaP(Yellow)	590	10	19		

5mm Round    						
XLUGR58M	◆ GaAsP/GaP(Red)	627	6	13	30°	White Diffused
	◆ GaP(Green)	565	12	29		
XLUGY58M	◆ GaP(Green)	565	12	29	30°	White Diffused
	◆ GaAsP/GaP(Yellow)	590	4	9		

5mm Round    						
XLUGR59M	◆ GaAsP/GaP(Red)	627	20	39	30°	White Diffused
	◆ GaP(Green)	565	20	59		
XLMDKVG59M	◆ AlGaInP(Red)	645	200	397	30°	White Diffused
	◆ AlGaInP(Green)	574	80	178		
XLMDKVG59MCA	◆ AlGaInP(Red)	645	18	39	60°	White Diffused
	◆ AlGaInP(Green)	574	8	19		
XLUGY59M	◆ GaP(Green)	565	50	98	30°	White Diffused
	◆ GaAsP/GaP(Yellow)	590	20	39		

1. Dimension Unit: mm(inches), Tolerance: ±0.25mm (0.01").

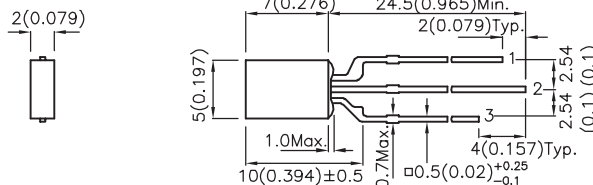
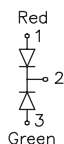
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

2x5mm Rectangular

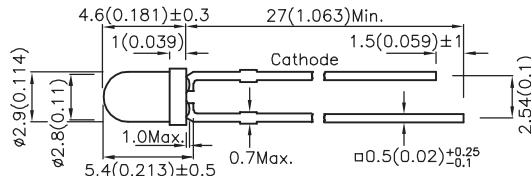
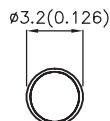


XSUGR47M	◆ GaAsP/GaP(Red)	627	4	9	140°	White Diffused
	◆ GaP(Green)	565	3	8		
XSMDKVG47M	◆ AlGaInP(Red)	645	30	54	140°	White Diffused
	◆ AlGaInP(Green)	574	15	29		

LOW CURRENT

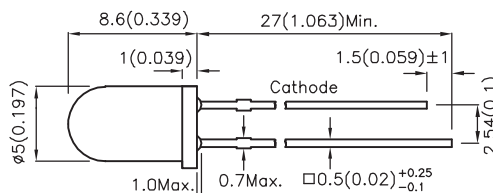
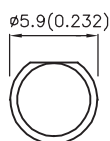
Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=2mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

3mm



XCUR32D	◆ GaAsP/GaP(Red)	627	0.5	1	50°	Red Diffused
XCUG32D	◆ GaP(Green)	565	1	2.8	50°	Green Diffused

5mm

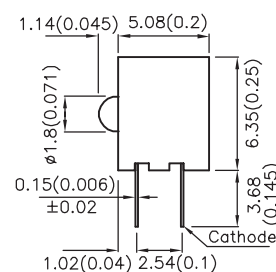
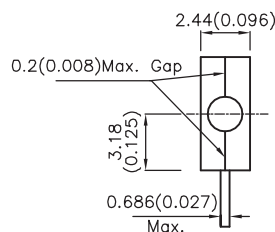


XCMR53D	◆ GaAlAs(Red)	655	4	7	30°	Red Diffused
XCUR53D	◆ GaAsP/GaP(Red)	627	0.7	1.8	30°	Red Diffused
XCUY53D	◆ GaAsP/GaP(Yellow)	590	1	2.8	30°	Yellow Diffused
XCUG53D	◆ GaP(Green)	565	1.2	2.8	30°	Green Diffused

1. Dimension Unit: mm(inches), Tolerance: ±0.25mm (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

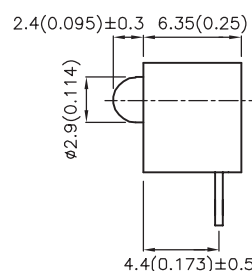
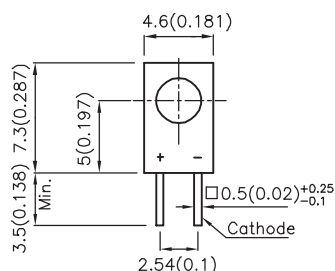
Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10\text{mA}, 20\text{mA}^*$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

1.8mm



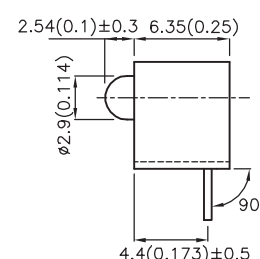
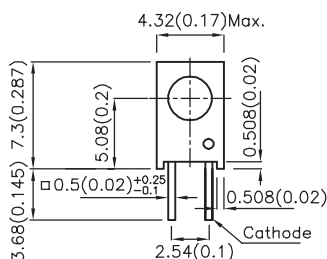
XNH1ZUR46D	◆ GaAsP/GaP(Red)	627	*8	*15	40°	Red Diffused
XNH1ZUY46D	◆ GaAsP/GaP(Yellow)	590	*5	*9	40°	Yellow Diffused
XNH1ZMG46D	◆ GaP(Green)	565	*5	*11	40°	Green Diffused

3mm



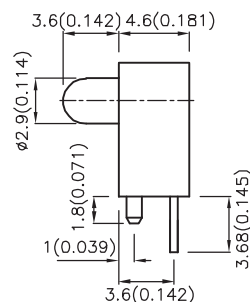
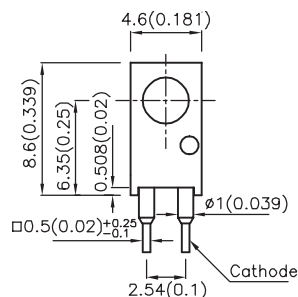
XVB1LUR11D	◆ GaAsP/GaP(Red)	627	10	19	50°	Red Diffused
XVB1LUY11D	◆ GaAsP/GaP(Yellow)	590	8	14	50°	Yellow Diffused
XVB1LUG11D	◆ GaP(Green)	565	10	24	50°	Green Diffused

3mm



XNK1LUR11D	◆ GaAsP/GaP(Red)	627	10	19	50°	Red Diffused
XNK1LUY11D	◆ GaAsP/GaP(Yellow)	590	8	14	50°	Yellow Diffused
XNK1LUG11D	◆ GaP(Green)	565	10	24	50°	Green Diffused

3mm



XPV1LUR11D	◆ GaAsP/GaP(Red)	627	10	19	50°	Red Diffused
XPV1LUY11D	◆ GaAsP/GaP(Yellow)	590	8	14	50°	Yellow Diffused
XPV1LUG11D	◆ GaP(Green)	565	10	24	50°	Green Diffused

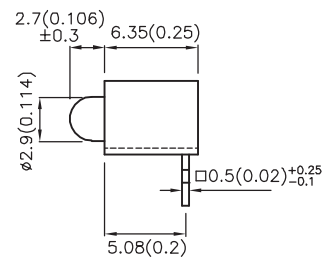
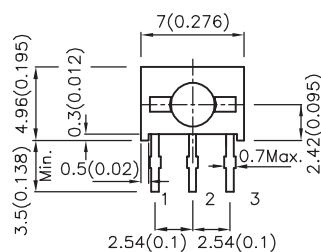
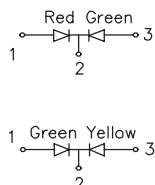
1. Dimension Unit: mm(inches), Tolerance: ±0.25mm (0.01").

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

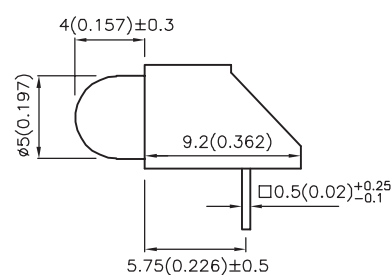
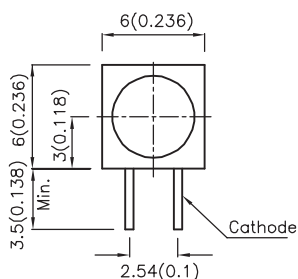
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10\text{mA}, 20\text{mA}^*$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**3mm
(Bi-Color)**

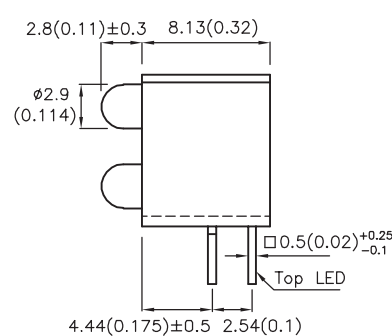
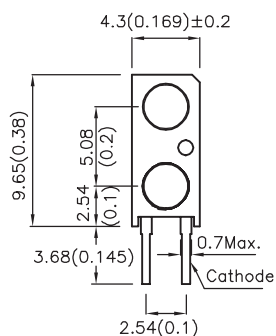
XNN1LUGR86M	◆ GaAsP/GaP(Red)	627	*10	*23	60°	White Diffused
	◆ GaP(Green)	565	*12	*29		
XNN1LUGY86M	◆ GaP(Green)	565	*18	*39	60°	White Diffused
	◆ GaAsP/GaP(Yellow)	590	*10	*19		

5mm

XVB1LUR50D	◆ GaAsP/GaP(Red)	627	12	39	30°	Red Diffused
XVB1LUY50D	◆ GaAsP/GaP(Yellow)	590	15	29	30°	Yellow Diffused
XVB1LUG50D	◆ GaP(Green)	565	15	29	30°	Green Diffused

TWO POSITION

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10\text{mA}, 20\text{mA}^*$		Viewing Angle 2 θ 1/2	Lens
			Min	Typ		

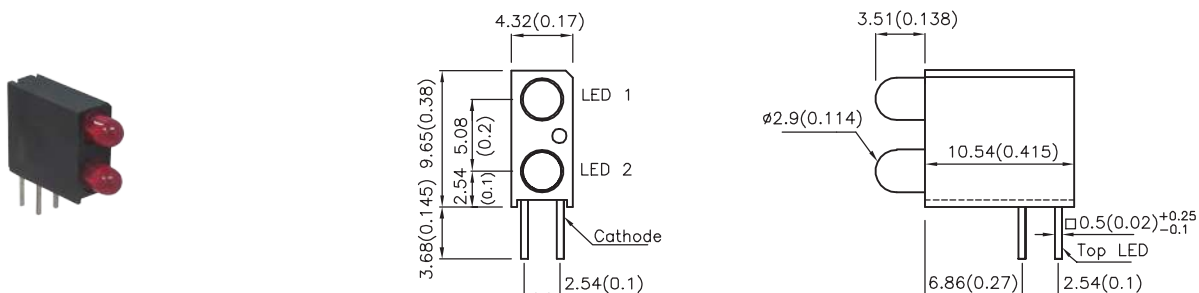
3mm

XPC2LMR11D	◆ GaAlAs(Red)	655	*50	*98	50°	Red Diffused
XPC2LUR11D	◆ GaAsP/GaP(Red)	627	10	19	50°	Red Diffused
XPC2LUY11D	◆ GaAsP/GaP(Yellow)	590	8	14	50°	Yellow Diffused
XPC2LUG11D	◆ GaP(Green)	565	10	24	50°	Green Diffused

1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25\text{mm}$ (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10mA, 20mA^*$		Viewing Angle 2 θ 1/2	Lens
			Min	Typ		

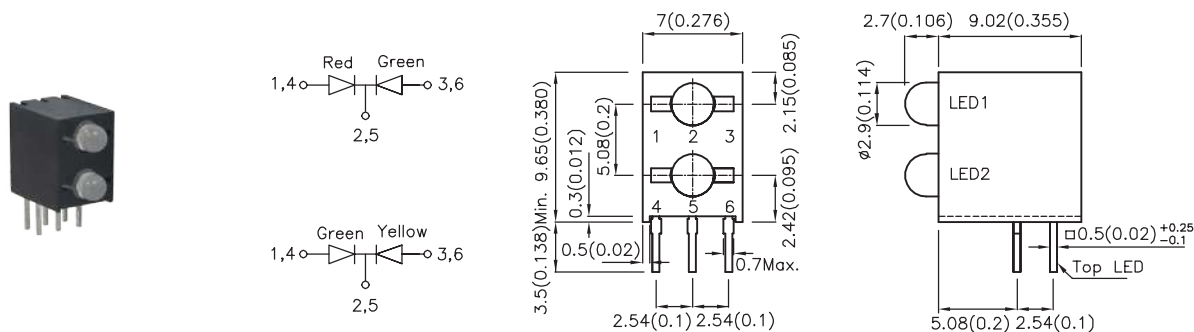
3mm



XP2LUR11D	◆ GaAsP/GaP(Red)	627	10	19	50°	Red Diffused
XP2LUY11D	◆ GaAsP/GaP(Yellow)	590	8	14	50°	Yellow Diffused
XP2LUG11D	◆ GaP(Green)	565	10	24	50°	Green Diffused

3mm

(Bi-Color)

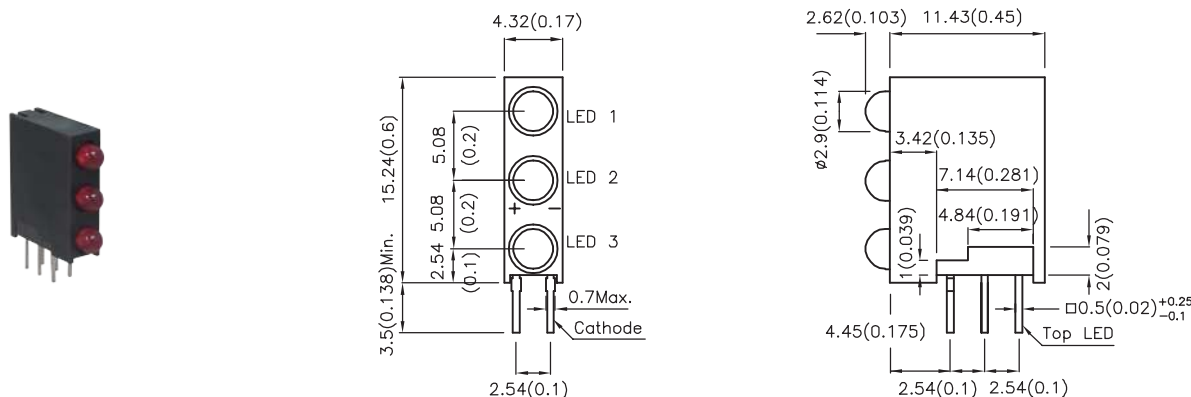


XVO2LUGR86M	◆ GaAsP/GaP(Red)	627	*10	*23	60°	White Diffused
	◆ GaP(Green)	565	*12	*29		
XVO2LUGY86M	◆ GaP(Green)	565	*18	*39	60°	White Diffused
	◆ GaAsP/GaP(Yellow)	590	*10	*19		

THREE POSITION

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

3mm

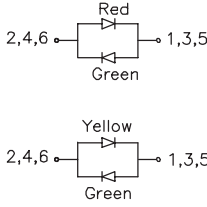


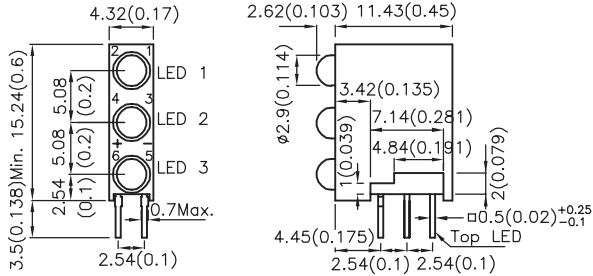
XP23LUR11D	◆ GaAsP/GaP(Red)	627	10	19	50°	Red Diffused
XP23LUY11D	◆ GaAsP/GaP(Yellow)	590	8	14	50°	Yellow Diffused
XP23LUG11D	◆ GaP(Green)	565	10	24	50°	Green Diffused

1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=20mA$		Viewing Angle 2 θ 1/2	Lens
			Min	Typ		

**3mm
(Bi-Color)**

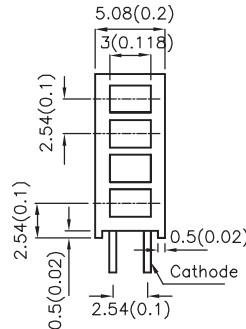


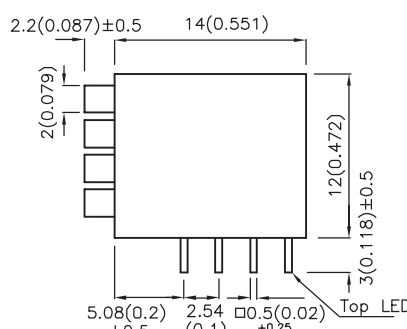
XPZ3LUGR37M	◆ GaAsP/GaP(Red)	627	4	9	60°	White Diffused
	◆ GaP(Green)	565	6	13		
XPZ3LUYG37M	◆ GaAsP/GaP(Yellow)	590	4	7	60°	White Diffused
	◆ GaP(Green)	565	6	13		

FOUR POSITION

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

2x3mm

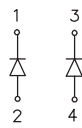


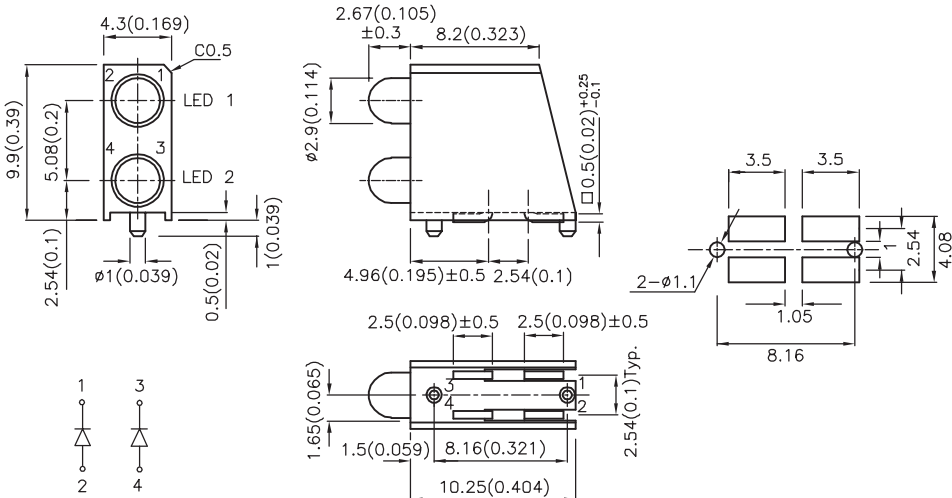
XVX4SUR36D	◆ GaAsP/GaP(Red)	627	1.2	3.8	140°	Red Diffused
XVX4SUY36D	◆ GaAsP/GaP(Yellow)	590	1.5	3.8	140°	Yellow Diffused
XVX4SUG36D	◆ GaP(Green)	565	3	5	140°	Green Diffused

SMD CBI

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

**3mm
(Two-Position SMD)**

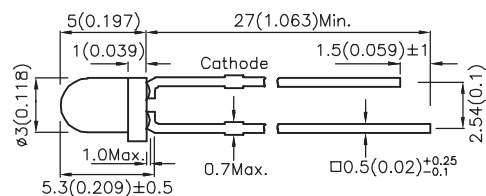
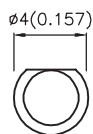


XRS2LUG11D	◆ GaP(Green)	565	10	24	50°	Green Diffused
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1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

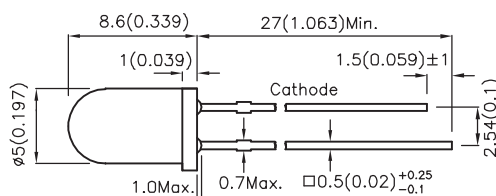
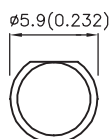
Part Number	Chip Structure	λ_{peak} (nm)	Po(mW/sr) $I_f=20mA, 50mA^*$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

3mm



XTNI30W	GaAs	940	3	7	50°	Water Clear
			*8	*14		
XTHI30W	GaAlAs	880	3	15	50°	Water Clear
			*5	*19		

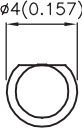
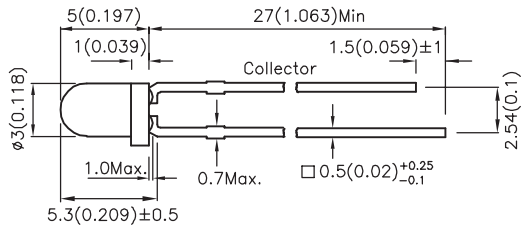
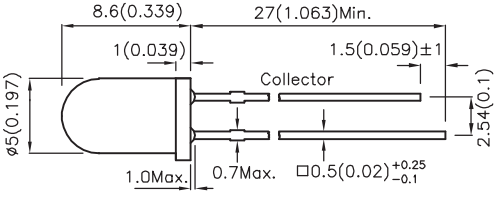
5mm



XTNI12W	GaAs	940	8	19	20°	Water Clear
			*25	*49		
XTNI12BF	GaAs	940	8	19	20°	Blue Transparent
			*25	*49		
XTHI12W	GaAlAs	880	6	14	20°	Water Clear
			*12	*24		
XTHI12W850	GaAlAs	850	12	29	20°	Water Clear
			*40	*89		

1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").
2. Radiant intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number	Lens	Description
3mm		
		
XRNI30W-1	Water Clear	3mm
5mm		
		
XRNI12W	Water Clear	5mm

Electrical & Radiant Characteristics $T_a = 25^\circ\text{C}$

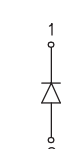
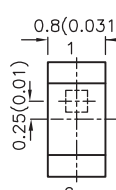
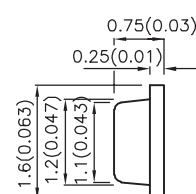
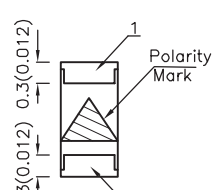
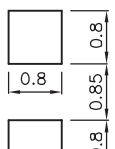
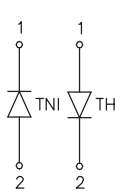
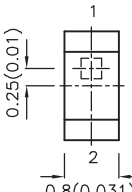
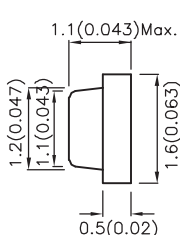
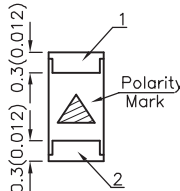
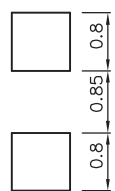
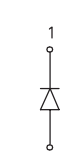
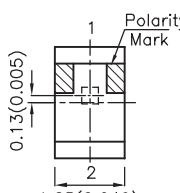
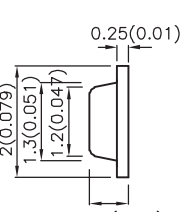
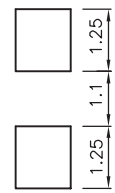
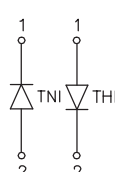
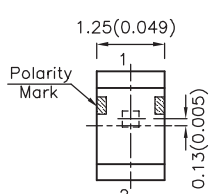
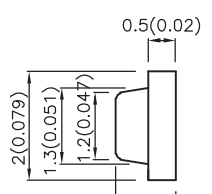
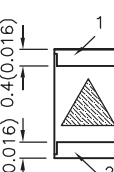
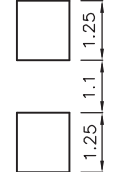
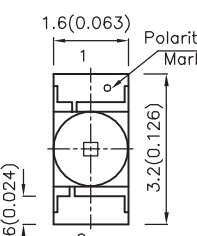
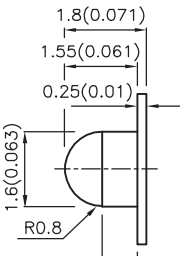
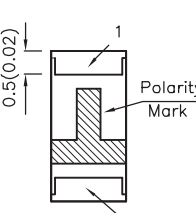
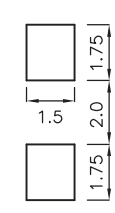
Symbol	Parameter	Part Number	Min.	Typ.	Max.	Unit	Test Condition
$I_{(ON)}$	On State Collector Current	XRNI30W-1	0.3	0.8	-	mA	$V_{CE}=5V$, $E_e=1\text{mW}/\text{cm}^2$, $\lambda=940\text{nm}$
		XRNI12W	0.5	2.5			
$V_{BR\ CE0}$	Collector-to-Emitter Breakdown Voltage	-	30	-	-	V	$I_C=100\mu\text{A}$, $E_e=0\text{mW}/\text{cm}^2$
$V_{BR\ EC0}$	Emitter-to-Collector Breakdown Voltage	-	5	-	-	V	$I_E=100\mu\text{A}$, $E_e=0\text{mW}/\text{cm}^2$
$V_{CE\ (SAT)}$	Collector-to-Emitter Saturation Voltage	-	-	-	0.8	V	$I_C=2\text{mA}$, $E_e=20\text{mW}/\text{cm}^2$
I_{CE0}	Collector Dark Current	-	-	-	100	nA	$V_{CE}=10V$, $E_e=0\text{mW}/\text{cm}^2$
T_R	Rise Time (10% to 90%)	-	-	15	-	μs	$V_{CE}=5V$, $I_C=1\text{mA}$, $R_L=1K\Omega$
T_F	Fall Time (90% to 10%)	-	-	15	-	μs	$V_{CE}=5V$, $I_C=1\text{mA}$, $R_L=1K\Omega$

Absolute Maximum Rating $T_a = 25^\circ\text{C}$

Collector-to-Emitter Voltage	30V	Operating Temperature Range	$-40^\circ\text{C} \sim +85^\circ\text{C}$
Emitter-to-Collector Voltage	5V	Storage Temperature Range	$-40^\circ\text{C} \sim +85^\circ\text{C}$
Power Dissipation at (or below) 25°C Free Air Temperature	100mW	Lead Soldering Temperature(>5mm For 5sec)	260°C

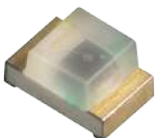
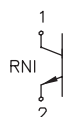
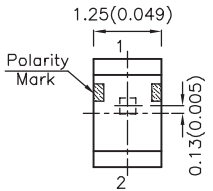
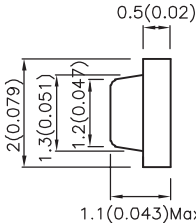
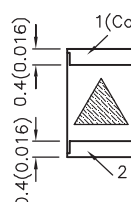
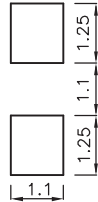
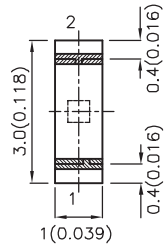
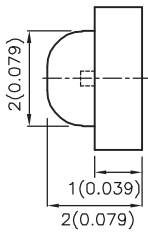
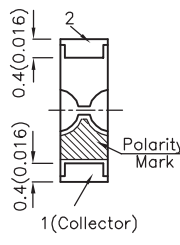
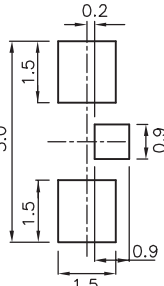
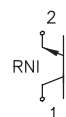
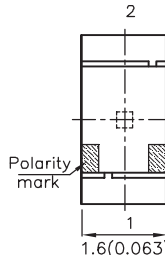
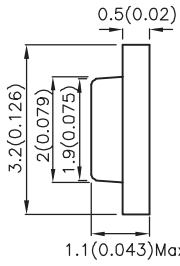
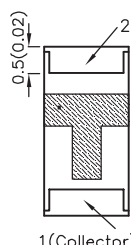
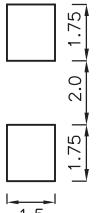
1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25\text{mm}$ (0.01").

2. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number	Chip Structure	λ_{peak} (nm)	Po(mW/sr) $I_f=20\text{mA}$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		
1.6x0.8x0.75mm (0603)						
						
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$						
XZTNI53W-1	GaAs	940	0.8	1.8	150°	Water Clear
1.6x0.8x1.1mm (0603)						
						
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$						
XZTNI53W	GaAs	940	0.8	1.8	150°	Water Clear
XZTHI53W	GaAlAs	880	0.8	1.3	150°	Water Clear
2.0x1.25x0.75mm (0805)						
						
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$						
XZTNI54W-1	GaAs	940	0.8	1.8	160°	Water Clear
2.0x1.25x1.1mm (0805)						
						
Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$						
XZTNI54W	GaAs	940	0.8	1.8	160°	Water Clear
XZTHI54W	GaAlAs	880	0.8	1.3	160°	Water Clear
3.2x1.6x1.8mm (1206 Dome Lens)						
						
Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$						
XZTNI55W-3	GaAs	940	2	4.8	40°	Water Clear

1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1mm$.
2. Radiant intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number	Lens	Description
2.0x1.25x1.1mm (0805)       Dimension Unit: mm(inches), Tolerance : $\pm 0.1(0.004)$" Recommended Soldering Pattern		
XZRNI54W	Water Clear	2.0x1.25x1.1mm
3.0x2.0x1.0mm (Right Angle)       Dimension Unit: mm(inches), Tolerance : $\pm 0.15(0.006)$" Recommended Soldering Pattern		
XZRNI56W	Water Clear	3.0x2.0x1.0mm
XZRNI56BF	Blue transparent	3.0x2.0x1.0mm
3.2x1.6x1.1mm (1206)       Dimension Unit: mm(inches), Tolerance : $\pm 0.2(0.008)$" Recommended Soldering Pattern		
XZRNI55W	Water Clear	3.2x1.6x1.1mm

Electrical & Radiant Characteristics $T_a = 25^\circ\text{C}$

Symbol	Parameter	Part Number	Min.	Typ.	Max.	Unit	Test Condition
$I_{(ON)}$	On State Collector Current	XZRNI54W	0.2	0.4	-	mA	$V_{CE}=5V$, $E_e=1mW/cm^2$, $\lambda=940nm$
		XZRNI56W	0.2	0.4			
		XZRNI56BF	0.1	0.3			
		XZRNI55W	0.2	0.4			
$V_{BR\ CE0}$	Collector-to-Emitter Breakdown Voltage	-	30	-	-	V	$I_C=100\mu A$, $E_e=0mW/cm^2$
$V_{BR\ EC0}$	Emitter-to-Collector Breakdown Voltage	-	5	-	-	V	$I_E=100\mu A$, $E_e=0mW/cm^2$
$V_{CE(SAT)}$	Collector-to-Emitter Saturation Voltage	-	-	-	0.8	V	$I_C=2mA$, $E_e=20mW/cm^2$
I_{CEO}	Collector Dark Current	-	-	-	100	nA	$V_{CE}=10V$, $E_e=0mW/cm^2$
T_R	Rise Time (10% to 90%)	-	-	15	-	μs	$V_{CE}=5V$, $I_C=1mA$, $R_L=1K\Omega$
T_F	Fall Time (90% to 10%)	-	-	15	-	μs	$V_{CE}=5V$, $I_C=1mA$, $R_L=1K\Omega$

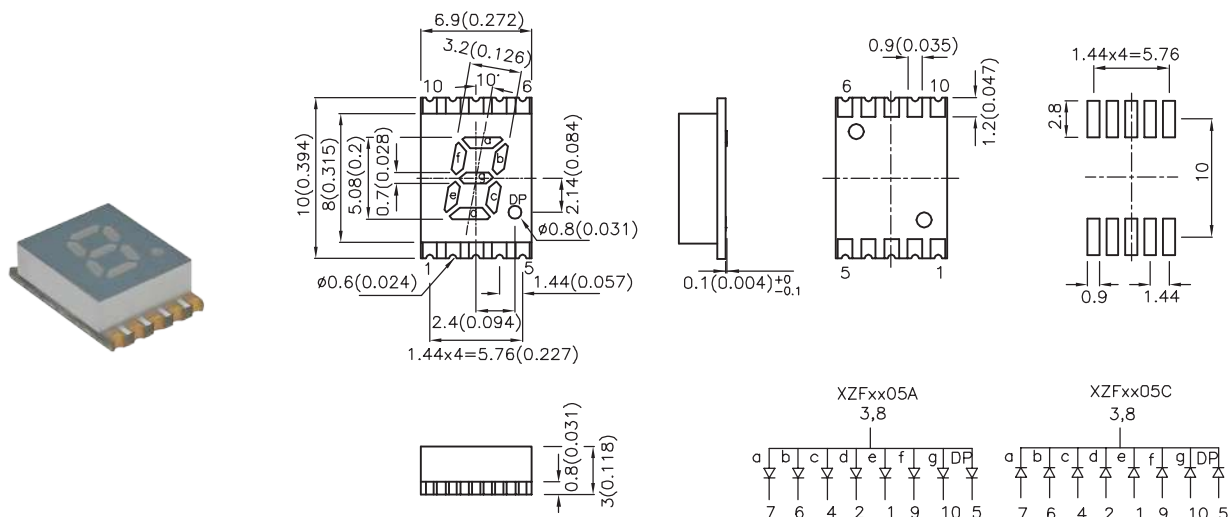
Absolute Maximum Rating $T_a = 25^\circ\text{C}$

Collector-to-Emitter Voltage	30V	Operating Temperature Range	$-40^\circ\text{C} \sim +85^\circ\text{C}$
Emitter-to-Collector Voltage	5V	Storage Temperature Range	$-40^\circ\text{C} \sim +85^\circ\text{C}$
Power Dissipation at (or below) 25°C Free Air Temperature	100mW		

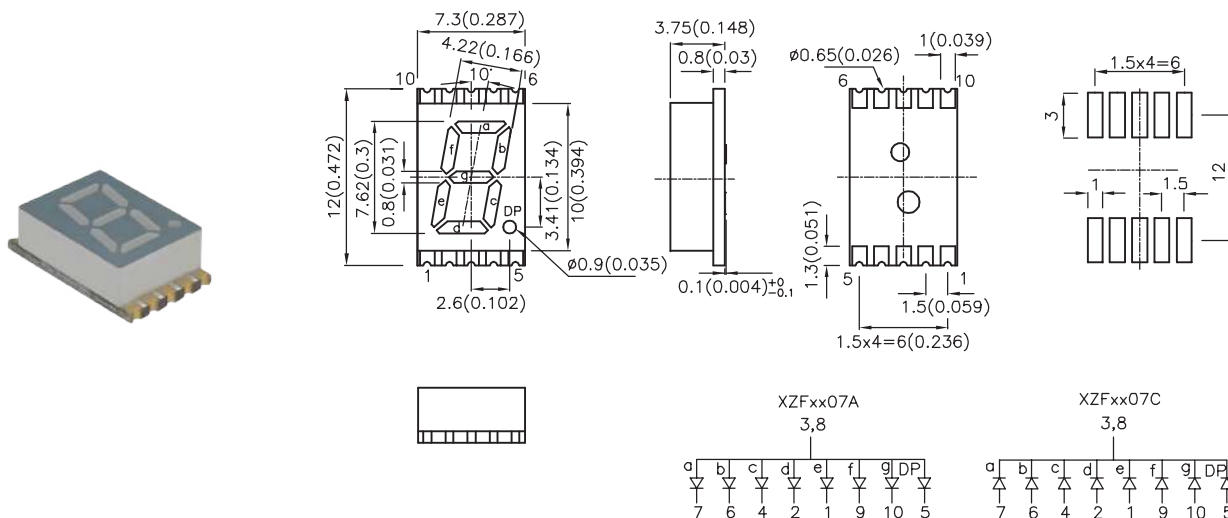
1. Soldering Pattern Dimension Unit : mm Tolerance : $\pm 0.1mm$.

2. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number		Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_p=10mA$	
Common Anode	Common Cathode			Min.	Typ.

0.2"(5.08mm)

XZFMKD05A	XZFMKD05C	◆ AlGaInP(Red)	645	3600	8090
XZFUR05A	XZFUR05C	◆ GaAsP/GaP(Red)	627	360	940
XZFGV05A	XZFGV05C	◆ AlGaInP(Green)	574	2200	4290
XZFMG05A	XZFMG05C	◆ GaP(Green)	565	560	1390

0.3"(7.62mm)

XZFMR07A	XZFMR07C	◆ GaAlAs(Red)	655	1400	2590
XZFMKD07A	XZFMKD07C	◆ AlGaInP(Red)	645	3600	6390
XZFUR07A	XZFUR07C	◆ GaAsP/GaP(Red)	627	360	690
XZFMOK07A	XZFMOK07C	◆ AlGaInP(Orange)	610	5600	10990
XZFMK07A	-	◆ AlGaInP(Yellow)	590	5600	12990
XZFGV07A	XZFGV07C	◆ AlGaInP(Green)	574	1400	3090
XZFMG07A	XZFMG07C	◆ GaP(Green)	565	560	1190
XZFBBA07A	-	◆ InGaN(Blue)	468	1400	2490

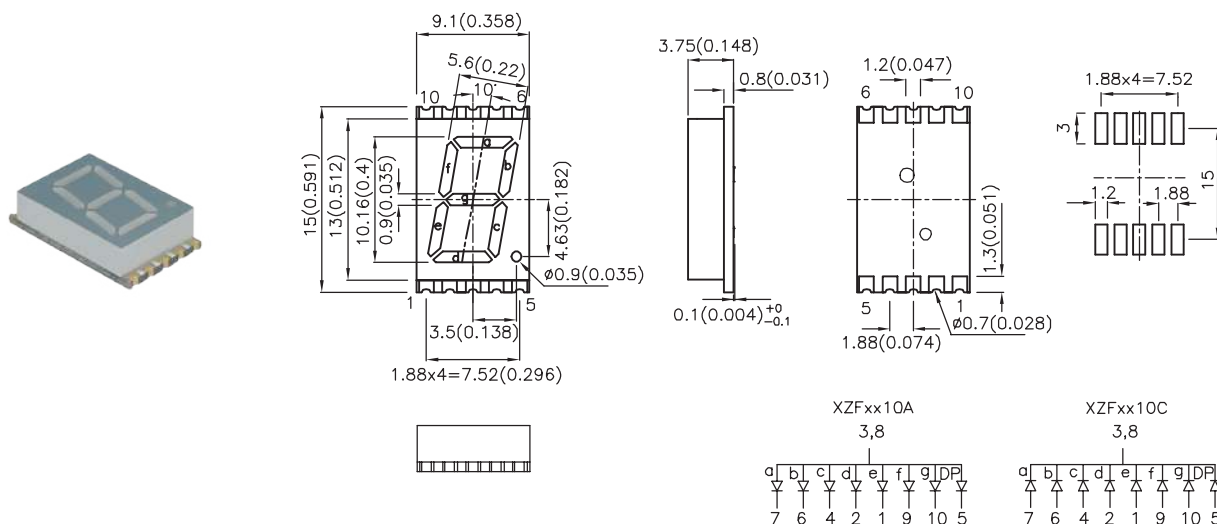
1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

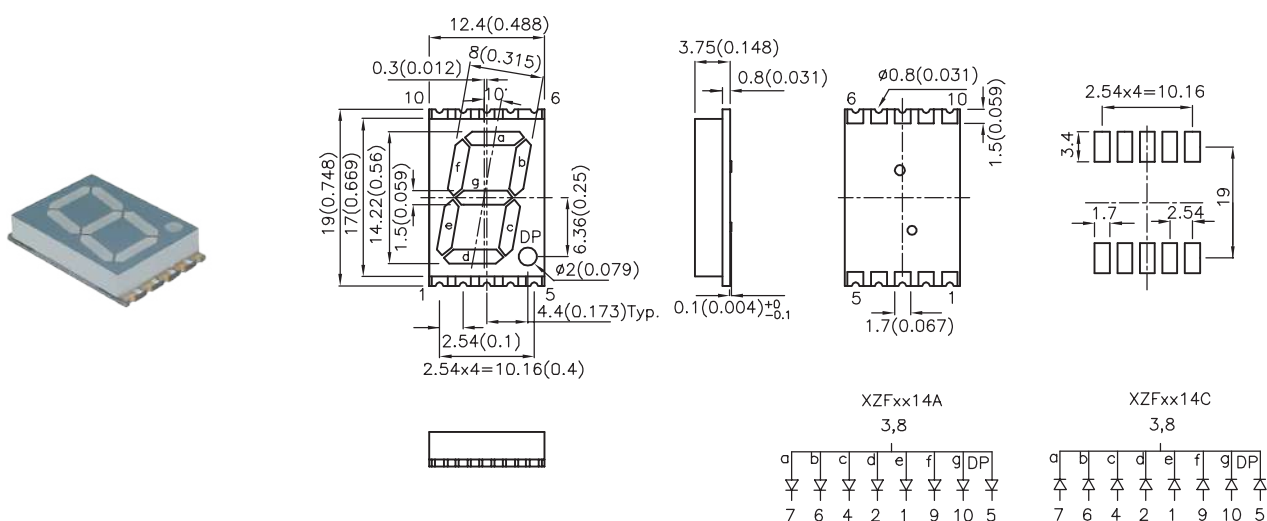
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



Part Number		Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$	
Common Anode	Common Cathode			Min.	Typ.

0.4"(10.16mm)

XZFMR10A	XZFMR10C	◆ GaAlAs(Red)	655	1400	3590
XZFMDK10A	XZFMDK10C	◆ AlGaInP(Red)	645	9000	19990
XZFMOK10A	-	◆ AlGaInP(Orange)	610	9000	14990
XZFMKY10A	-	◆ AlGaInP(Yellow)	590	9000	22990
XZFBG10A	XZFBG10C	◆ AlGaInP(Green)	574	2200	4090
XZFMG10A	-	◆ GaP(Green)	565	560	1190

0.56"(14.22mm)

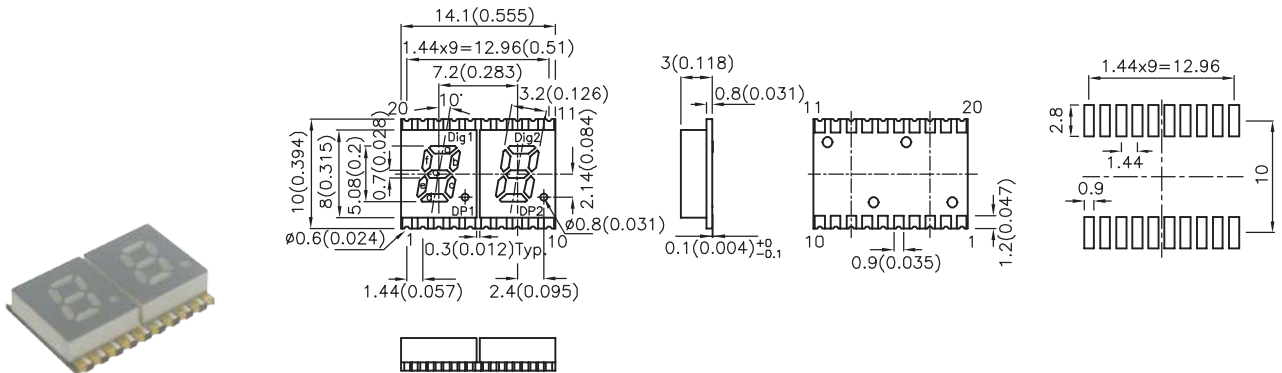
XZFMR14A	XZFMR14C	◆ GaAlAs(Red)	655	3600	7190
XZFMDK14A	XZFMDK14C	◆ AlGaInP(Red)	645	14000	28990
XZFUR14A	-	◆ GaAsP/GaP(Red)	627	900	1590
XZFMOK14A	-	◆ AlGaInP(Orange)	610	14000	22990
-	XZFMKY14C	◆ AlGaInP(Yellow)	590	14000	28990
XZFBG14A	-	◆ AlGaInP(Green)	574	2200	4590
XZFMG14A	XZFMG14C	◆ GaP(Green)	565	900	1790
-	XZFCBD14C	◆ InGaN(Blue)	460	5600	14990

1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

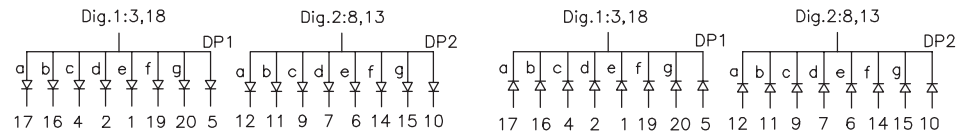
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number		Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_p=10mA$	
Common Anode	Common Cathode			Min.	Typ.

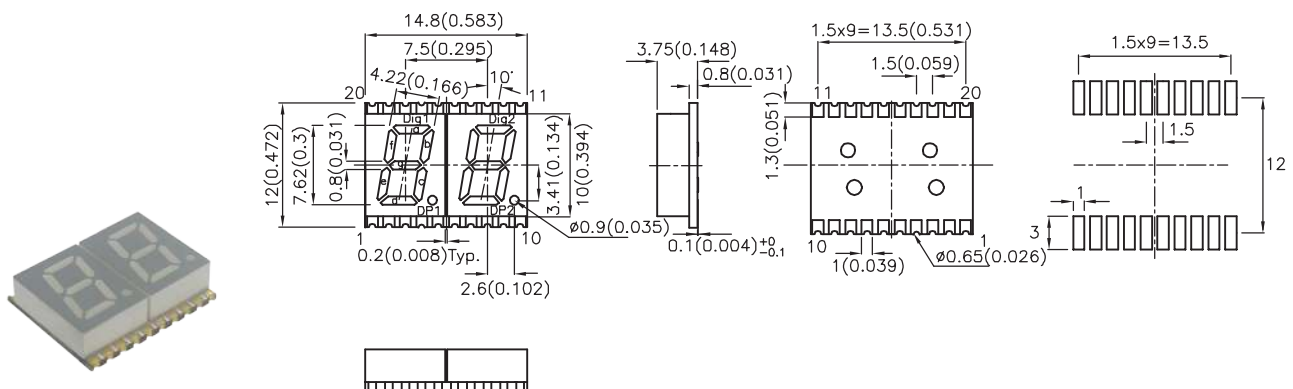
0.2"(5.08mm)

XZFxx05A2

XZFxx05C2

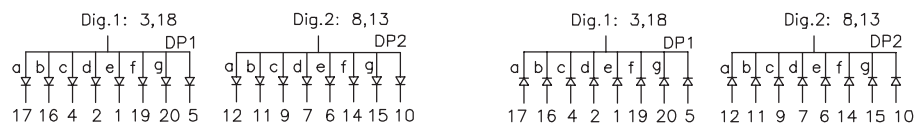


XZFMK05A2	XZFMK05C2	◆ AlGaInP(Red)	645	3600	8090
XZFUR05A2	-	◆ GaAsP/GaP(Red)	627	360	940
XZFMK05A2	-	◆ AlGaInP(Yellow)	590	5600	14990
XZFG05A2	XZFG05C2	◆ AlGaInP(Green)	574	2200	4290

0.3"(7.62mm)

XZFxx07A2

XZFxx07C2



XZFMK07A2	XZFMK07C2	◆ AlGaInP(Red)	645	3600	6390
-	XZFUR07C2	◆ GaAsP/GaP(Red)	627	360	690
XZFMK07A2	-	◆ AlGaInP(Orange)	610	5600	10990
XZFG07A2	-	◆ AlGaInP(Green)	574	1400	3090
XZFMG07A2	-	◆ GaP(Green)	565	560	1190

1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").

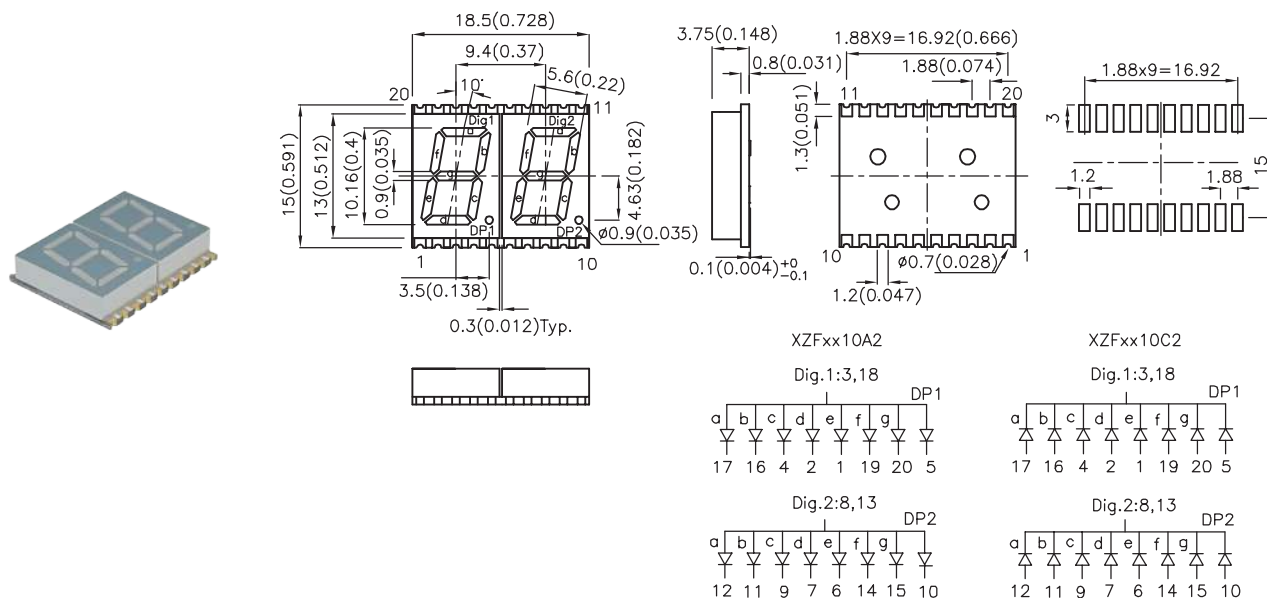
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.



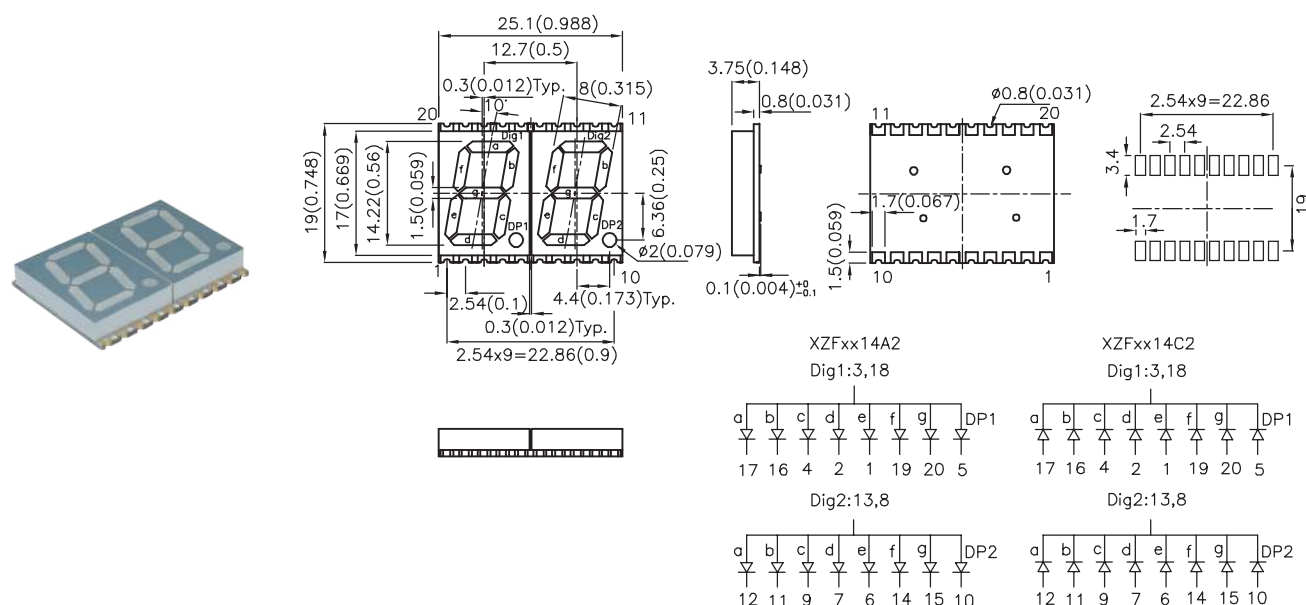
Part Number		Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$	
Common Anode	Common Cathode			Min.	Typ.

0.4"(10.16mm)



XZFMR10A2	-	◆ GaAlAs(Red)	655	1400	3590
XZFMDK10A2	-	◆ AlGaInP(Red)	645	9000	19990
XZFMOK10A2	-	◆ AlGaInP(Orange)	610	9000	14990
XZFGV10A2	XZFGV10C2	◆ AlGaInP(Green)	574	2200	4090

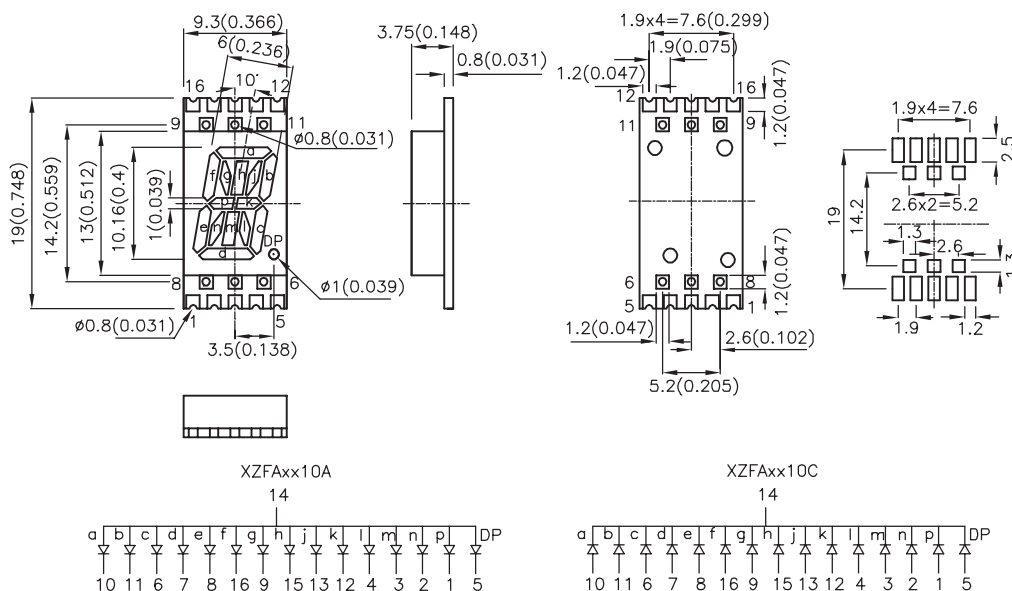
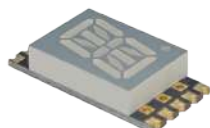
0.56"(14.22mm)



XZFMDK14A2	XZFMDK14C2	◆ AlGaInP(Red)	645	14000	28990
XZFGV14A2	-	◆ AlGaInP(Green)	574	2200	4590
XZFMG14A2	-	◆ GaP(Green)	565	900	1790

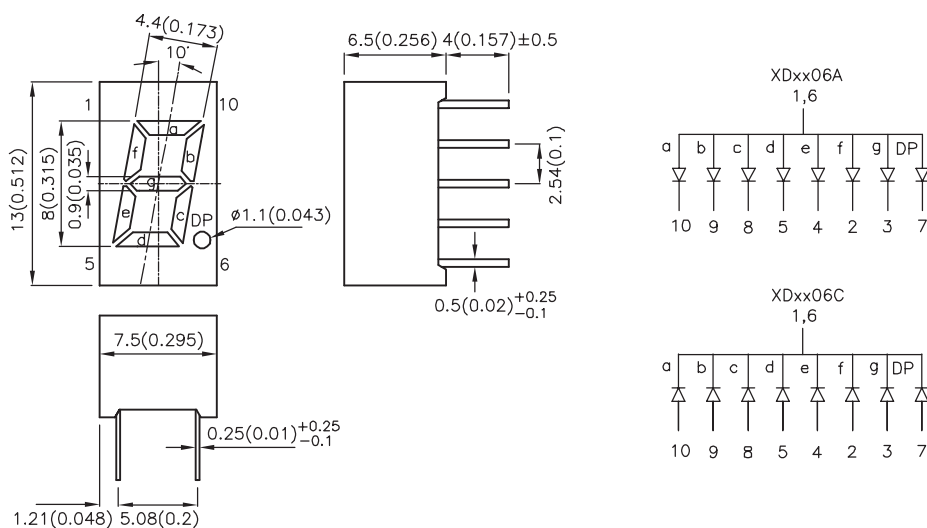
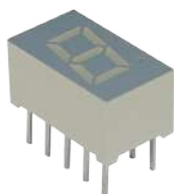
1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25mm$ (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

0.4"(10.16mm)



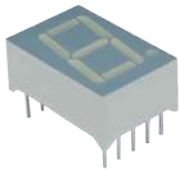
SINGLE DIGIT

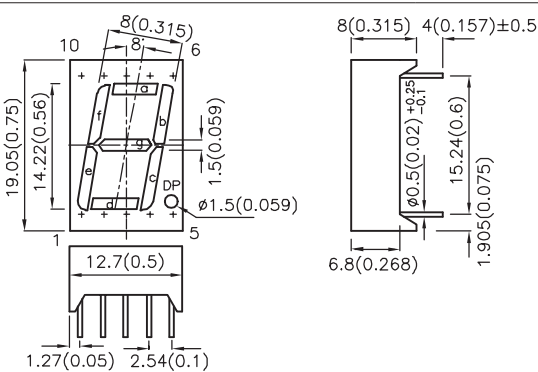
0.32" (8mm)

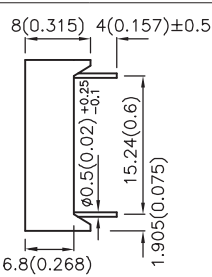


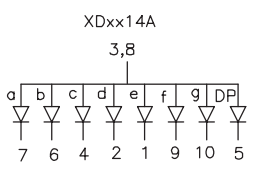
1. Dimension Unit: mm(inches), Tolerance: $\pm 0.25\text{mm}$ (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

Part Number		Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$	
Common Anode	Common Cathode			Min.	Typ.





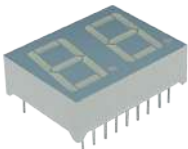


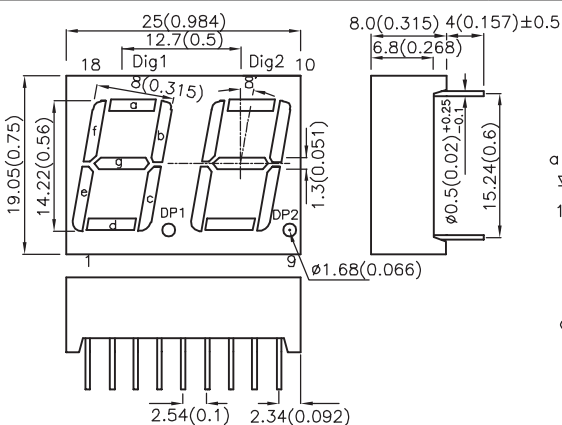


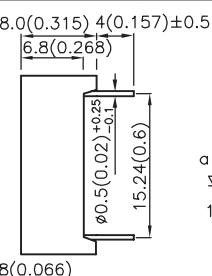
Part Number	Common Anode	Common Cathode	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$
XDMR14A	-	-	♦ GaAlAs(Red)	655	5600
XDMDK14A	-	-	♦ AlGaInP(Red)	645	14000
XDUR14A	-	-	♦ GaAsP/GaP(Red)	627	1400
XDUG14A	-	-	♦ GaP(Green)	565	2200
XDCBD14A	-	-	♦ InGaN(Blue)	460	9000

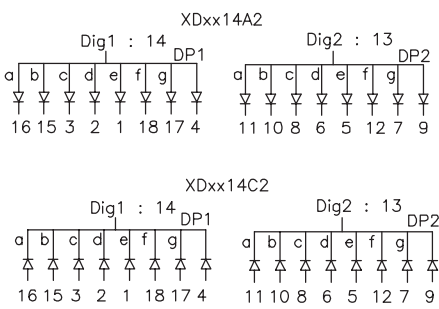
DUAL DIGIT

Part Number		Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$	
Common Anode	Common Cathode			Min.	Typ.





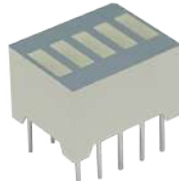


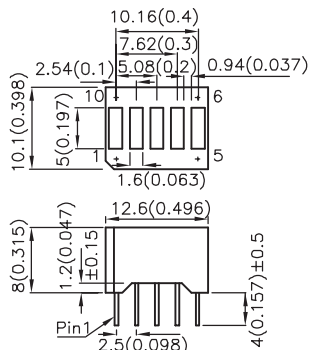


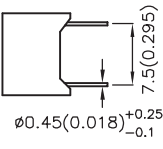
Part Number	Common Anode	Common Cathode	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$
XDMR14A2	-	-	♦ GaAlAs(Red)	655	5600
XDUR14A2	-	-	♦ GaAsP/GaP(Red)	627	1400
XDUG14A2	-	-	♦ GaP(Green)	565	2200

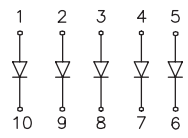
BAR GRAPH ARRAY

Part Number		Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$	
Common Anode	Common Cathode			Min.	Typ.









Part Number	Common Anode	Common Cathode	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$
XGUGX5D	-	-	♦ GaP(Green)	565	1400

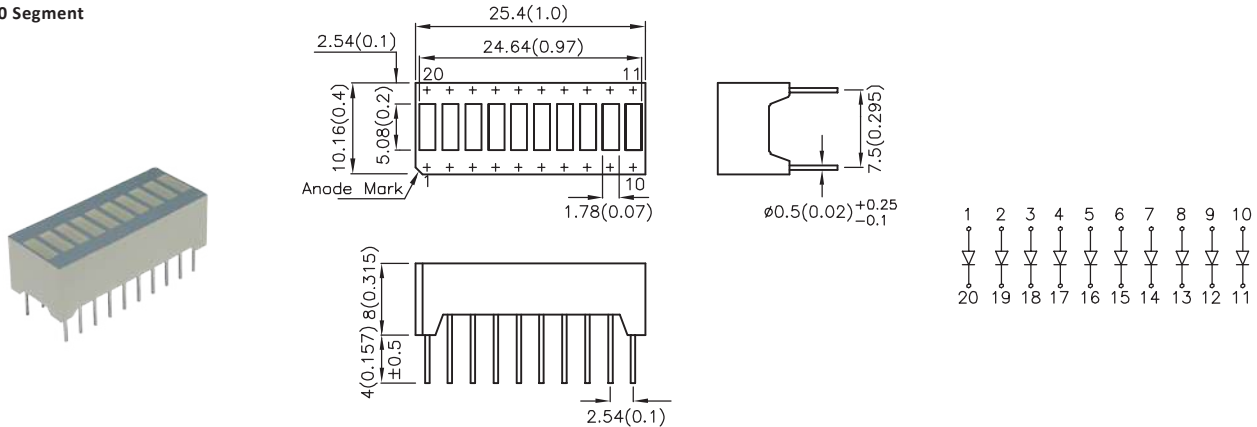
1. Dimension Unit: mm[inches], Tolerance: $\pm 0.25mm$ (0.01").

2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

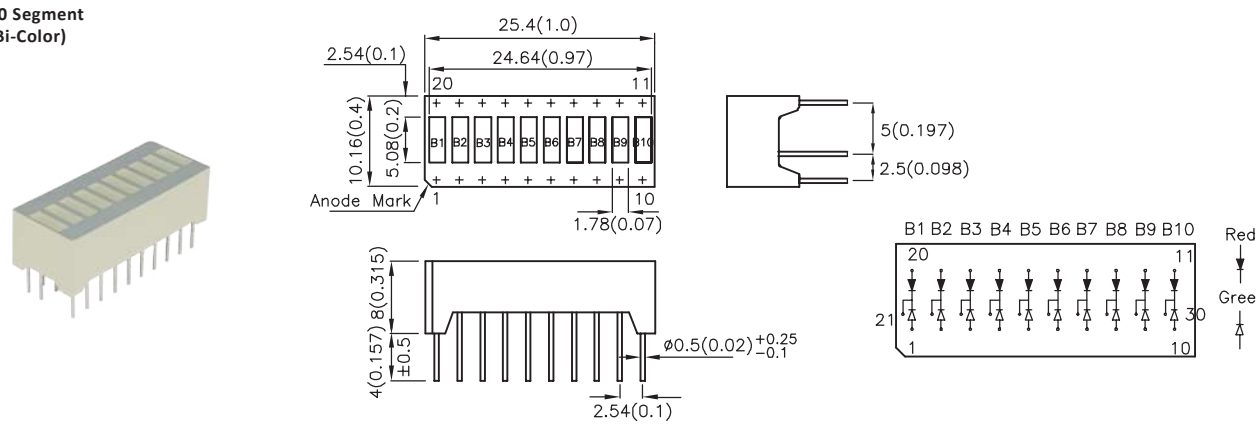
Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(ucd) $I_f=10mA$	
			Min.	Typ.

10 Segment



XGMRX10D	◆ GaAlAs(Red)	655	3600	7990
XGURX10D	◆ GaAsP/GaP(Red)	627	900	1990
XGUYX10D	◆ GaAsP/GaP(Yellow)	590	900	2390
XGUGX10D	◆ GaP(Green)	565	1400	3990

10 Segment (Bi-Color)

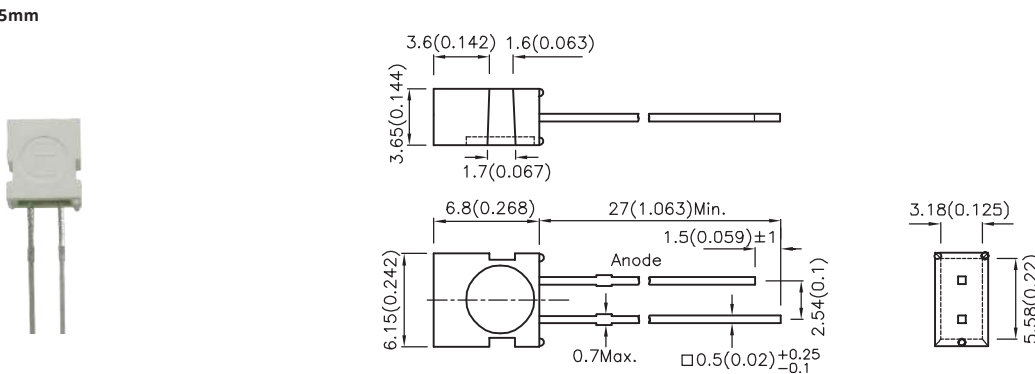


XGURUGX10D	◆ GaAsP/GaP(Red)	627	900	1990
	◆ GaP(Green)	565	1400	3990

LIGHT BAR

Part Number	Chip Structure (Emitted Color)	λ_{peak} (nm)	Intensity(mcd) $I_f=10mA$		Viewing Angle 2 θ 1/2	Lens
			Min.	Typ.		

3.65x6.15mm



XEUR21D	◆ GaAsP/GaP(Red)	627	2	3.8	140°	Red Diffused
XEUY21D	◆ GaAsP/GaP(Yellow)	590	2	4.8	140°	Yellow Diffused
XEUG21D	◆ GaP(Green)	565	2	5	140°	Green Diffused

1. Dimension Unit: mm (inches), Tolerance: $\pm 0.25mm$ (0.01").
2. Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.
3. We reserve the right to make changes at any time to enhance the design and / or performance of the product.

INTENSITY CODES

Intensity Code for Standard LEDs

(Ta=25°C Tolerance +/-15%)

Bin Code	Light intensity in mcd (IF<15mA)		Bin Code	Light intensity in mcd (IF<15mA)		Bin Code	Light intensity in mcd (IF<15mA)	
	min.	max.		min.	max.		min.	max.
F	0.1	0.2	R	15	20	ZB	550	700
G	0.2	0.35	S	20	30	ZC	700	1000
H	0.35	0.5	T	30	50	ZD	1000	1600
I	0.5	0.8	U	50	80	ZE	1600	2200
K	0.8	1.2	V	80	120	ZF	2200	2800
L	1.2	2	W	120	180	ZG	2800	3400
M	2	4	X	180	250	ZH	3400	4300
N	4	6	Y	250	320	ZM	4300	5200
P	6	10	Z	320	450	ZN	5200	6300
Q	10	15	ZA	450	550	ZP	6300	7400

Intensity Code for High Intensity LEDs

(Ta=25°C Tolerance +/-15%)

Bin Code	Light intensity in mcd (IF≥15mA)		Bin Code	Light intensity in mcd (IF≥15mA)	
	Min.	Max.		Min.	Max.
A	2	3	ZA	3100	3600
B	3	5	ZB	3600	4200
C	5	8	ZC	4200	5000
D	8	12	ZD	5000	6000
E	12	20	ZE	6000	7000
F	20	40	ZF	7000	8000
G	40	55	ZG	8000	9000
H	55	80	ZH	9000	11000
M	80	120	ZM	11000	14000
N	120	200	ZN	14000	18000
P	200	300	ZP	18000	22000
Q	300	400	ZQ	22000	27000
R	400	500	ZR	27000	35000
S	500	700	ZS	35000	43000
T	700	1000	ZT	43000	55000
U	1000	1300	ZU	55000	75000
V	1300	1600	ZV	75000	130000
W	1600	1900	ZW	130000	200000
X	1900	2300	ZX	200000	320000
Y	2300	2700	ZY	320000	490000
Z	2700	3100	ZZ	490000	800000

Intensity Code for Displays

(Ta=25°C Tolerance +/-15%)

Bin Code	Light intensity in ucd (IF≤10mA)		Bin Code	Light intensity in ucd (IF≤10mA)	
	min.	max.		min.	max.
C	70	140	P	14000	21000
D	140	240	Q	21000	31000
E	240	360	R	31000	52000
F	360	560	S	52000	88000
G	560	900	T	88000	150000
H	900	1400	U	150000	255000
I	1400	2200	V	255000	433000
K	2200	3600	W	433000	736000
L	3600	5600	X	736000	1251000
M	5600	9000	Y	1251000	2126000
N	9000	14000	Z	2126000	3614000

Intensity Codes for High Powered LEDs

(Ta=25°C Tolerance: +/-15%)

Bin Code	Luminous Flux in lm		Bin Code	Luminous Flux in lm	
	Min.	Max.		Min.	Max.
A1	0.5	0.6	B10	50	60
A2	0.6	0.7	B11	60	70
A3	0.7	0.8	B12	70	80
A4	0.8	1	B13	80	90
A5	1	1.2	B14	90	100
A6	1.2	1.4	C1	100	120
A7	1.4	1.7	C2	120	140
A8	1.7	2	C3	140	160
A9	2	2.4	C4	160	180
A10	2.4	2.9	C5	180	210
A11	2.9	3.5	C6	210	240
A12	3.5	4.2	C7	240	280
A13	4.2	5	C8	280	320
A14	5	6	C9	320	370
A15	6	7.2	C10	370	430
A16	7.2	8.6	C11	430	490
A17	8.6	10	C12	490	560
B1	10	12	C13	560	640
B2	12	14	C14	640	740
B3	14	17	C15	740	850
B4	17	20	C16	850	1000
B5	20	24	D1	1000	1200
B6	24	29	D2	1200	1400
B7	29	35	D3	1400	1600
B8	35	42	D4	1600	1800
B9	42	50	D5	1800	2100

INTENSITY CODES

Code for NPN Phototransistors (Ta=25°C Tolerance +/-15%)					
---	--	--	--	--	--

Bin Code	Photocurrent in mA		Bin Code	Photocurrent in mA	
	min.	max.		min.	max.
F	0.1	0.2	L	1.2	2
G	0.2	0.35	M	2	4
H	0.35	0.5	N	4	6
I	0.5	0.8	P	6	10
K	0.8	1.2			

Code for Infrared Emitting Diodes (Ta=25°C Tolerance +/-15%)					
---	--	--	--	--	--

Bin Code	Radiant intensity in mW/sr (IF=20mA)		Bin Code	Radiant intensity in mW/sr (IF=20mA)	
	min.	max.		min.	max.
AK	0.8	1.2	D	8	12
AL	1.2	2	E	12	20
A	2	3	F	20	40
B	3	5	G	40	55
C	5	8	H	55	80

WAVELENGTH CODES

Color Code for LEDs and Displays (Ta=25°C Tolerance: +/-1nm)								
--	--	--	--	--	--	--	--	--

Bin Code	Dominant Wavelength in nm							
	Green		Aqua Green		True Green		Yellow	
	min.	max.	min.	max.	min.	max.	min.	max.
0	556	559			510	515		
1	559	561	497	501	515	520	581	584
2	561	563	501	504	520	525	584	586
3	563	565	504	506	525	530	586	588
4	565	567	506	508	530	535	588	590
5	567	569	508	510	535	540	590	592
6	569	571	510	512			592	594
7	571	573	512	515			594	597
8	573	575					597	600

Color Code for LEDs and Displays (Ta=25°C Tolerance: +/-1nm)					
--	--	--	--	--	--

Bin Code	Dominant Wavelength in nm		Bin Code	Dominant Wavelength in nm	
	Blue			Blue	
	min.	max.		min.	max.
1	445	450	3A	471	473
2	450	455	3B	473	475
3	455	460	4A	475	477
1A	460	463	4B	477	479
1B	463	466	5A	479	481
2A	466	469	5B	481	483
2B	469	471	5C	483	486

SunLED white LEDs are color sorted based on either CIE (coordinates) or CCT (Kelvin). Refer to below diagram (Fig. 1).

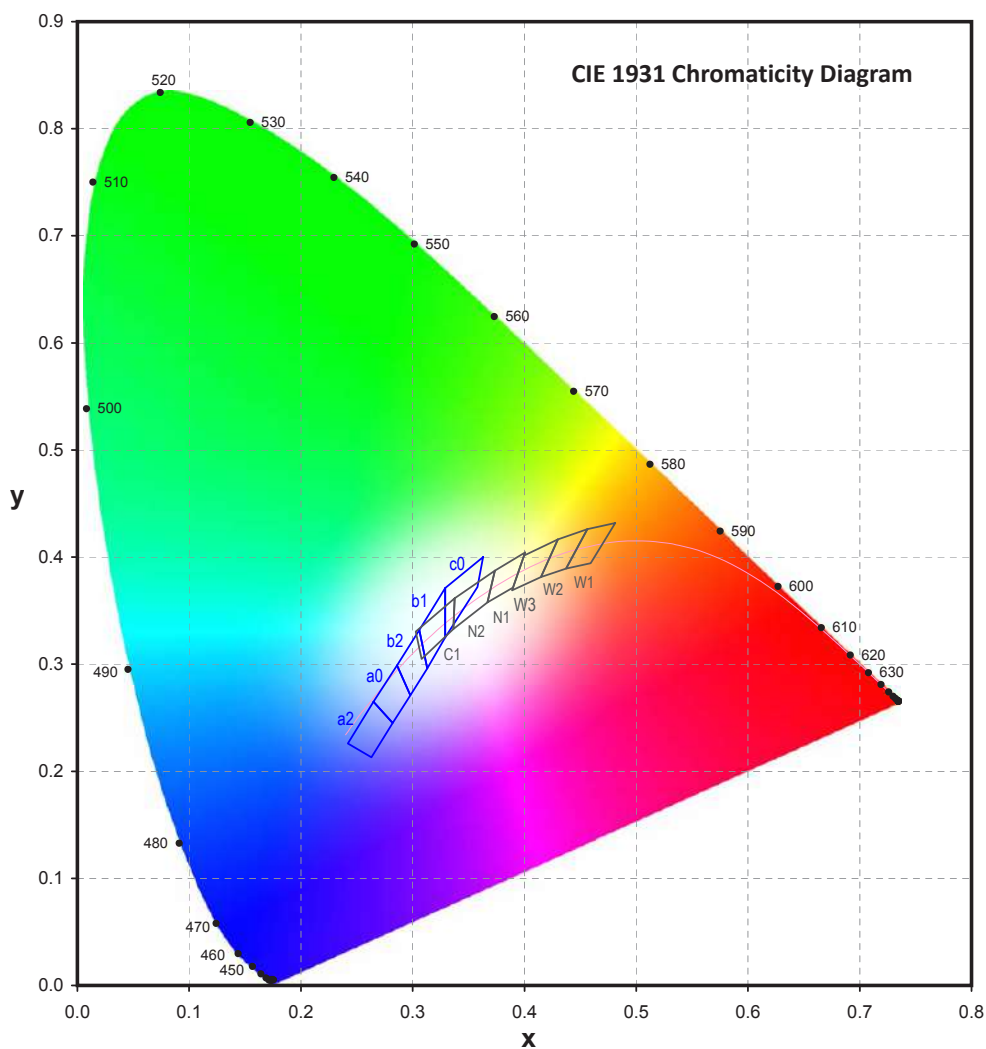


Fig. 1

a2

x	0.263	0.282	0.265	0.242
y	0.213	0.245	0.265	0.226

CCT: 15000K~

a0

x	0.282	0.298	0.286	0.265
y	0.245	0.271	0.299	0.265

CCT: 9000~15000K

b2

x	0.298	0.313	0.306	0.286
y	0.271	0.296	0.332	0.299

CCT: 6800~9000K

b1

x	0.313	0.329	0.329	0.306
y	0.296	0.325	0.371	0.332

CCT: 5600~6800K

c0

x	0.329	0.358	0.363	0.329
y	0.325	0.372	0.400	0.371

CCT: 4600~5600K

W1

x	0.4373	0.4593	0.4813	0.4562
y	0.3893	0.3944	0.4319	0.4260

CCT: 2580~2870K

W2

x	0.4147	0.4373	0.4562	0.4299
y	0.3814	0.3893	0.4260	0.4165

CCT: 2870~3220K

W3

x	0.3889	0.4147	0.4299	0.3996
y	0.3690	0.3814	0.4165	0.4015

CCT: 3220~3710K

N1

x	0.3670	0.3898	0.4006	0.3736
y	0.3578	0.3716	0.4044	0.3874

CCT: 3710~4260K

N2

x	0.3364	0.3670	0.3736	0.3376
y	0.3328	0.3578	0.3874	0.3616

CCT: 4260~5310K

C1

x	0.3081	0.3364	0.3376	0.3028
y	0.3049	0.3328	0.3616	0.3304

CCT: 5310~7040K

SMD LED Products

Test Item	Test Conditions	Description	Reference Standard
Continuous operating	Ta=25°C T=1000hrs	The purpose of this test is to determine the resistance of the device when operating under electrical stress	EIAJ ED-4701 100 101
	RH<75%RH, IF(Max)		
High temperature storage	Ta=100°C T=1000hrs	The purpose of this test is to evaluate the product durability after long-term storage in high temperature	EIAJ ED-4701 200 201
Low temperature storage	Ta=-40°C T=1000hrs	The purpose of this test is to evaluate the product durability after long-term storage in low temperature	EIAJ ED-4701 200 202
High temperature and humidity storage	Ta=60°C T=1000hrs	The purpose of this test is to evaluate product durability under long-term high temperature and high humidity storage	EIAJ ED-4701 100 103
	RH=90%RH		
High temperature and humidity operating	Ta=60°C T=1000hrs	The purpose of this test is to determine the resistance of the device under electrical and thermal stress	EIAJ ED-4701 100 102
	RH=90%RH, IF(Max)		
Solderability	Ta=245°C T=5sec	The purpose of this test is to evaluate solderability on leads of device	EIAJ ED-4701 300 303
Soldering resistance	Ta=260°C T=5sec	The purpose of this test is to determine the thermal resistance characteristics of the device to sudden exposures at extreme changes in temperature during Tin-dipping	EIAJ ED-4701 300 301
Temperature cycling	Ta=-40°C~25°C~100°C~25°C	The purpose of this test is to determine the resistance of the device to storage under extreme temperature for hours	EIAJ ED-4701 100 105
	T=(30min~5min~30min~5min)×10cycles		
Temperature cycling operating	Ta=-40°C~25°C~100°C~25°C IF(Max)	The purpose of this test is to determine the resistance of the device under extreme temperature for hours	N/A
	T=(30min~5min~30min~5min)×10cycles		
Thermal shock	Ta=0°C~100°C	The purpose of this test is to determine the resistance of the device to sudden extreme changes in high and low temperature	EIAJ ED-4701 300 307
	T=5min~5min×100cycles		

LED Displays

Test Item	Test Conditions	Description	Reference Standard
Continuous operating	Ta=25°C T=1000hrs	The purpose of this test is to determine the resistance of the device when operating under electrical stress	EIAJ ED-4701 100 101
	RH<75%RH, IF(Max)		
High temperature storage	Ta=100°C T=1000hrs	The purpose of this test is to evaluate the product durability after long-term storage in high temperature	EIAJ ED-4701 200 201
Low temperature storage	Ta=-40°C T=1000hrs	The purpose of this test is to evaluate the product durability after long-term storage in low temperature	EIAJ ED-4701 200 202
High temperature and humidity storage	Ta=60°C T=1000hrs	The purpose of this test is to evaluate product durability under long-term high temperature and high humidity storage	EIAJ ED-4701 100 103
	RH=90%RH		
Solderability	Ta=245°C T=5sec	The purpose of this test is to evaluate solderability on leads of device	EIAJ ED-4701 300 303
Soldering resistance	Ta=260°C T=5sec	The purpose of this test is to determine the thermal resistance characteristics of the device to sudden exposures at extreme changes in temperature during Tin-dipping	EIAJ ED-4701 300 301
Temperature cycling	Ta=-40°C~25°C~100°C~25°C	The purpose of this test is to determine the resistance of the device to storage under extreme temperature for hours	EIAJ ED-4701 100 105
	T=(30min~5min~30min~5min)×10cycles		
Thermal shock	Ta=0°C~100°C	The purpose of this test is to determine the resistance of the device to sudden extreme changes in high and low temperature	EIAJ ED-4701 300 307
	T=5min~5min×100cycles		



Through-Hole LEDs

Test Item	Test Conditions	Description	Reference Standard
Continuous operating	Ta=25°C T=1000hrs	The purpose of this test is to determine the resistance of the device when operating under electrical stress	EIAJ ED-4701 100 101
	RH<75%RH, IF(Max)		
High temperature storage	Ta=100°C T=1000hrs	The purpose of this test is to evaluate the product durability after long-term storage in high temperature	EIAJ ED-4701 200 201
Low temperature storage	Ta=-40°C T=1000hrs	The purpose of this test is to evaluate the product durability after long-term storage in low temperature	EIAJ ED-4701 200 202
High temperature and humidity storage	Ta=60°C T=1000hrs	The purpose of this test is to evaluate product durability under long-term high temperature and high humidity storage	EIAJ ED-4701 100 103
	RH=90%RH		
High temperature and humidity operating	Ta=60°C T=1000hrs	The purpose of this test is to determine the resistance of the device under electrical and thermal stress	EIAJ ED-4701 100 102
	RH=90%RH, IF(Max)		
Lead frame bending	Bend 90°C T=3 cycles	The purpose of this test is to evaluate products durability against mechanical stress applied to leads	N/A
Lead frame pulling	W=1kg T=30sec	The purpose of this test is to evaluate products durability against mechanical stress	N/A
Solderability	Ta=245°C T=5sec	The purpose of this test is to evaluate solderability on leads of device	EIAJ ED-4701 300 303
Soldering resistance	Ta=260°C T=5sec	The purpose of this test is to determine the thermal resistance characteristics of the device to sudden exposures at extreme changes in temperature during Tin-dipping	EIAJ ED-4701 300 302
Temperature cycling	Ta=-40°C~25°C~100°C~25°C	The purpose of this test is to determine the resistance of the device to storage under extreme temperature for hours	EIAJ ED-4701 100 105
	T=(30min~5min~30min~5min)×10cycles		
Temperature cycling operating	Ta=-40°C~25°C~100°C~25°C IF(Max)	The purpose of this test is to determine the resistance of the device under extreme temperature for hours	N/A
	T=(30min~5min~30min~5min)×10cycles		
Thermal shock	Ta=0°C~100°C	The purpose of this test is to determine the resistance of the device to sudden extreme changes in high and low temperature	EIAJ ED-4701 300 307
	T=5min~5min×100cycles		

- Manual soldering operations should only be for repairs and reworks unless otherwise noted on product specifications.
- Maximum soldering iron temperatures for manual soldering:
 - Pb-Sn solder: 300°C
 - Pb-Free solder: 350°C
 - All LEDs using InGaN material (e.g. Blue, Green, White): 280°C
- The soldering iron should never touch the epoxy lens. Contact duration with the component should not exceed 3 seconds.
- Do not apply stress or pressure to the leads when the component is heated above 80°C as possible damage to the internal wire bonds may occur.
- During soldering, component covers and holders should leave enough clearance to avoid any stress applied to the LED. Refer to below diagram (Fig. 2) for examples of proper method.

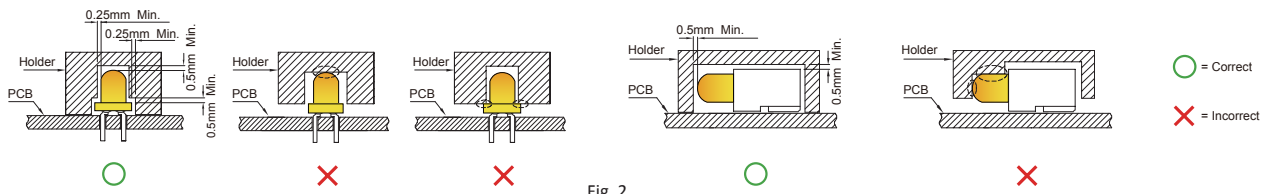


Fig. 2

- Refer to below diagrams for recommended soldering profiles.

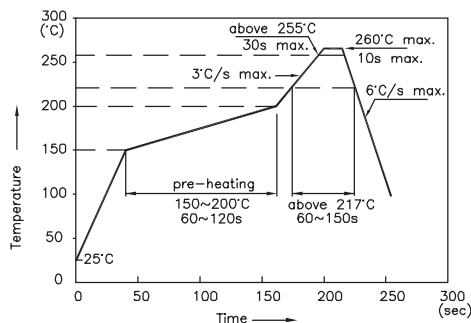
- SMD LEDs: Reflow Soldering – Pb-Free Solder (Fig. 3) | Pb-Sn Solder (Fig. 4)

-No more than two soldering passes except SMD CBIs which should not exceed one pass

- Through-hole LEDs: Wave Soldering – Pb-Free Solder (Fig. 5) | Pb-Sn Solder (Fig. 6)

-No more than one soldering pass

Reflow Soldering Profile for SMD Products (Pb-Free Components)



Notes:

- All temperatures refer to the center of the package, measured on the package body surface facing up during reflow.
- Do not apply any stress to the LED during high temperature conditions.
- Maximum number of soldering passes: 2

Fig. 3

Reflow Soldering Profile (Pb-Sn Solder)

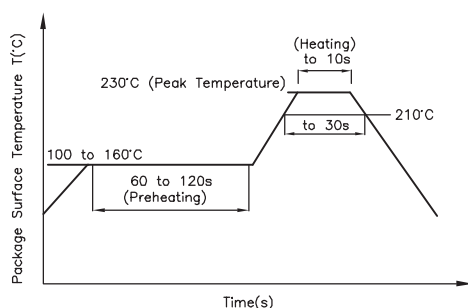
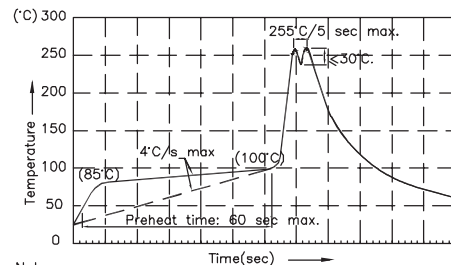


Fig. 4

Wave Soldering Profile (Pb-Free Solder)



Notes:

- Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C.
- Peak wave soldering temperature between 245°C ~ 255°C for 3 sec (5 sec max).
- Do not apply stress to the epoxy resin while the temperature is above 85°C.
- Fixtures should not incur stress on the component when mounting and during soldering process.
- SAC 305 solder alloy is recommended.
- No more than one wave soldering pass.
- During wave soldering, the PCB top-surface temperature should be kept below 105°C.

Fig. 5

Wave Soldering Profile (Pb-Sn Solder)

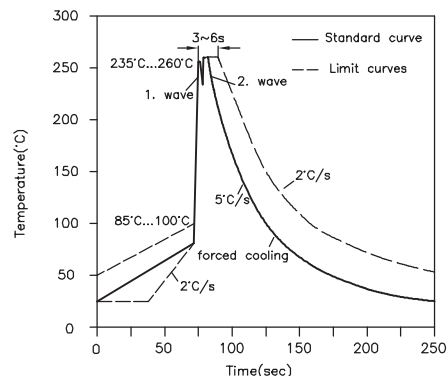


Fig. 6

7. Refer to the appropriate product datasheet for details on specific soldering pay layout. To ensure proper bonding and setting of the LED, solder paste must be evenly applied to each soldering pad. Refer to below diagram (Fig. 7) for example of improper solder application.

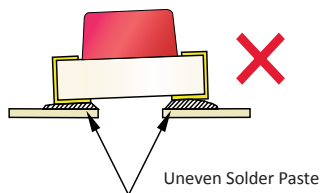


Fig. 7

8. After soldering, allow at least three minutes for the component to cool to room temperature before further processing.
9. Refer to below table for summary of soldering instructions for dip, wave, and manual solder. Note that these are considered general instructions and all soldering notes indicated above should take precedence.

Types	Dip soldering / *Wave Soldering			Iron soldering (with 1.5mm iron tip)		
	Temperature of the soldering bath	Maximum soldering time	Distance from solder joint to package	Temperature of soldering iron	Maximum soldering time	Distance from solder joint to package
LEDs	$\leq 260^{\circ}\text{C}$	3s	$\geq 2\text{mm}$	$\leq 350^{\circ}\text{C}$	3s	$> 2\text{mm}$
	$\leq 260^{\circ}\text{C}$	5s	$\geq 5\text{mm}$	$\leq 350^{\circ}\text{C}$	5s	$> 5\text{mm}$
SMDs	/	/	/	$\leq 350^{\circ}\text{C}$	3s (one time only)	/
DISPLAYs	$* \leq 260^{\circ}\text{C}$	$* 3\text{s}$	$* \geq 2\text{mm}$	$\leq 350^{\circ}\text{C}$	3s	$> 2\text{mm}$

APPLICATION NOTES

Cleaning

- Do not use harsh organic solvents such as acetone, trichloroethylene, Chlorsan, and/or diflon solvent for cleaning as they may cause damage or hazing to the LED lens.
- Do not use acidic solvents or unknown chemicals for cleaning as they may damage or degrade the LED. Always check the properties of the chemical to ensure it will not corrode or damage epoxy resin, silicone resin, silver plating, or organosilicates.
- Recommended solvents for cleaning: deionized water or isopropyl alcohol.
- Special attention should be taken if other chemicals are used for cleaning as they may damage the epoxy lens or housing.
- Any cleaning should take place at room temperature and the wash duration should not exceed one minute.
- Use forced-air drying immediately following water wash to remove excess moisture.

Lead Forming

- Any lead forming or bending must be done prior to soldering.
- Avoid bending leads at the same point more than once as it may compromise the integrity of the leads.
- Minimum clearance of 3mm is required between the base of the LED lens and the bend location. Refer to below diagram (Fig. 8).



Fig. 8

4. Lead forming should only be done with proper tools such as a jig and/or radio pliers. The upper section of the leads should be secured firmly such that the bending force is not exerted on the LED body. Refer to below diagram (Fig. 9) for recommended lead bending method.

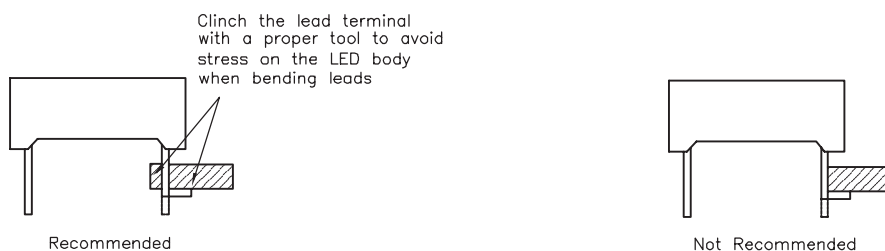


Fig. 9

ESD Precautions

InGaN/GaN material LEDs are sensitive to electrostatic discharge (ESD) and other transient voltage spikes. ESD and voltage spikes can affect the component's performance due to increased reverse current and/or decreased forward voltage. This may result in reduced light intensity and/or component failure. Static discharge may occur when static sensitive LEDs come in contact with the user or other conductive devices. ESD sensitive LEDs must incorporate protective circuitry to prevent ESD and to control voltage spikes in order to stay within the maximum voltage specified.

SunLED products are stored in anti-static bags for protection during transportation and storage. However, below anti-static measures should always be noted when handling static sensitive components.

1. Operators must wear anti-static wristbands.
2. Operators must wear anti-static suits when entering work areas with conductive machinery and materials.
3. All test instruments and production machinery must be grounded.
4. Avoid static build up by minimizing friction between the LED and its surroundings.
5. Relative Humidity between 40% ~ 60% is recommended in ESD-protected work areas to reduce static build up.
Reference JEDEC/J-STD-033 and JEDEC/JESD625-A standards.
6. All workstations that handle ESD sensitive components must maintain an electrostatic condition of 150V or less.
7. Anti-static material/packaging should be used when parts are being stored and/or transported.
8. All anti-static measures noted above should be periodically checked and inspected to ensure proper functionality.

Design Notes

1. Protective current-limiting resistors should be used in conjunction with LEDs to ensure parts are operating within specified current range.
2. The driving circuit should be designed to avoid reverse voltages and transient voltage spikes when the circuit is in both on & off states. Prolonged reverse bias may cause metal migration leading to an increase in leakage current or causing a short circuit.

3. Prevent exposure of LEDs to environments containing high moisture or corrosive gases.
4. Excess operating temperature and/or forward current should be avoided as it may lead to accelerated degradation or failure of the LED. Always refer to the most updated datasheet for driving conditions.
5. When LEDs are mounted in a parallel configuration, there should be individual current-limiting resistors in series with each LED. Refer to below diagram (Fig.10) for an example of a recommended set up.

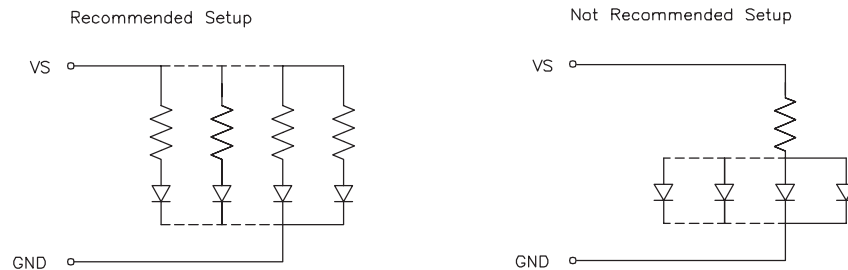


Fig. 10

6. Mounting direction of SMD components should be placed perpendicular to the direction of PCB travel. This will ensure the solder wets on each lead simultaneously during reflow and prevent shifting of LEDs. Refer to below diagram (Fig.11) for examples of recommended mounting direction.

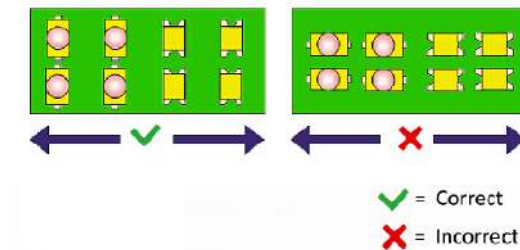


Fig. 11

7. High-power LED devices require optimization of heat dissipation. Increasing the size of metal mounting surface and proper application of thermal conductive paste will help improve heat dissipation. Refer to below diagram (Fig.12) and product datasheets for specific design recommendations.

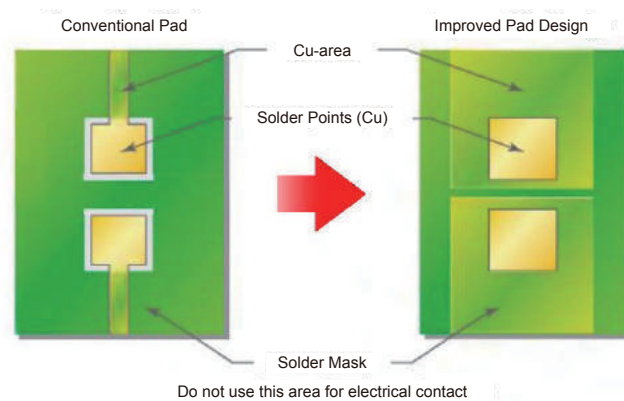


Fig. 12

8. High temperatures may reduce component's performance and reliability. Please refer to individual product datasheets for specific details on operable temperature range and effects of temperature on the LED.

Storage, MSL, and Humidity Conditions

SMD LEDs are considered moisture sensitive and storage/usage precautions must be taken to prevent damage to the internal materials. Excess moisture trapped within the component may cause internal vapor pressure during solder reflow leading to possible delamination of the die or wire bond.

1. Do not store or expose LEDs in an environment where high levels of moisture or corrosive gases are present and keep away from rapid transitions in ambient temperature.

Recommended storage conditions for each type of LED product as per below:

Product Type	Temperature	Humidity
SMD LED	< 40°C	< 90%RH
Through-hole LED	≤ 30°C	< 60%RH
LED Displays	5°C to 30°C	< 60%RH

Note: Above conditions are based on products in original sealed packaging

2. All SMD LEDs are packaged in moisture barrier bags (MBB) with a label indicating the moisture sensitivity level (MSL).

a. Storage conditions for unopened MBB: Temperature < 40°C, Humidity < 90%RH with shelf life of 24 months.

b. Floor life for opened MBB follows the corresponding MSL as per below:

IPC/JEDEC J-STD-020

MSL	Floor Life	
	Time	Conditions
1	Unlimited	≤30°C / 85%RH
2	1 Year	≤30°C / 60%RH
2a	4 Weeks	≤30°C / 60%RH
3	168 Hours	≤30°C / 60%RH
4	72 Hours	≤30°C / 60%RH
5	48 Hours	≤30°C / 60%RH
5a	24 Hours	≤30°C / 60%RH
6	Time indicated on label	≤30°C / 60%RH

3. All SMD LEDs are packaged with desiccants and a humidity indicator card (HIC). If the LEDs are not used within the specific floor life or if the HIC has indicated presence of moisture, the following baking procedure must be taken:

Condition	Temperature	Humidity	Bake Duration
LED inside carrier	60°C ± 3°C	<5% RH	100 hours
LED outside carrier tape	110°C	-	10 hours

*Not more than once

Additional Notes

1. LED devices may contain Gallium Arsenide (GaAs). GaAs dust and fumes are toxic and harmful if ingested. Do not expose LEDs to chemical solvents and/or break open LED devices.
2. The light output from UV, blue, and high-power LEDs may cause injury to the human eye when viewed directly.
3. Semiconductor devices can fail or malfunction due to their sensitivity to electrical fluctuation and physical stress. In design development, please make certain that SunLED products are used within the specified operating conditions as indicated on our most current product datasheets. The user is responsible to observe and follow all safety measures to avoid situations where the failure or malfunction of a SunLED product could cause injury, property damage, or the loss of human life.
4. Reference <https://www.SunLEDusa.com/TechnicalNotes.asp> for complete technical notes.



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