Kingbright

Optoelectronic Components

2022-2024

About KINGBRIGHT

An Innovative LED Solution Provider

Kingbright is a Taiwanese LED solution provider built on over 40 years of expertise, innovation and collaboration.

We are deeply ingrained in the pursuit of excellence, manufacturing the most comprehensive, reliable and highest quality LEDs in both visible and invisible spectrums to meet various engineering needs in all industries for customers around the globe.

Our commitments to technological innovation and quality excellence ensure continuous improvement to products and customer satisfaction with the superior support of our sales offices and warehouses in the US, Europe and across Asia.

Kingbright

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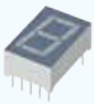

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SMD LED

SMD stands for Surface Mount Device, a special type of high intensity LED lights. With no wires, SMDs have tiny conductive contacts that provide seamless application and can be directly soldered onto circuit boards.
Kingbright's vast selection of SMDs are available in variety of size, viewing angles, and color combinations. Our SMD LEDs are energy efficient and provide excellent intensity performance.

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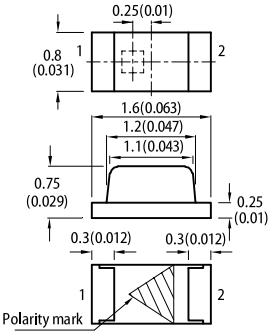
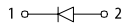
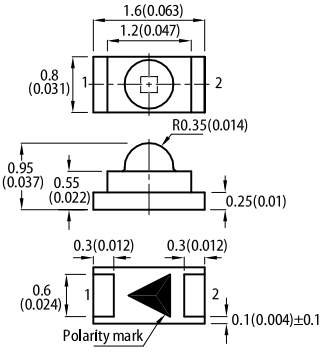
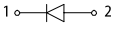
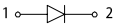
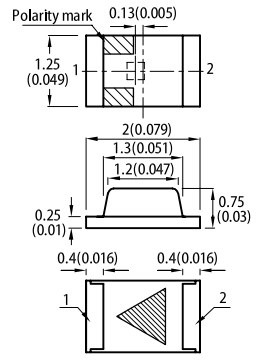
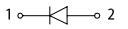
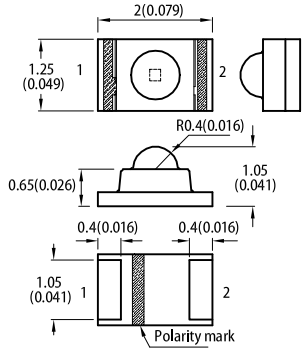
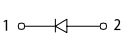
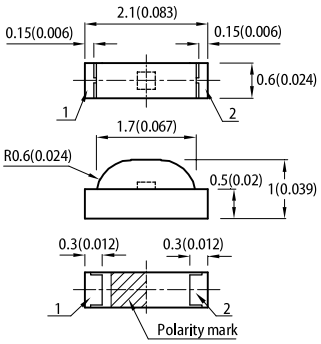
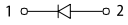
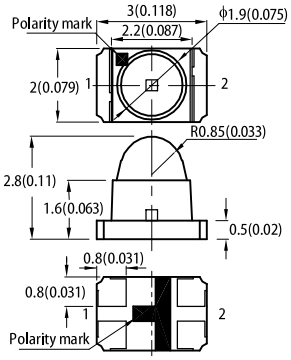
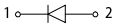
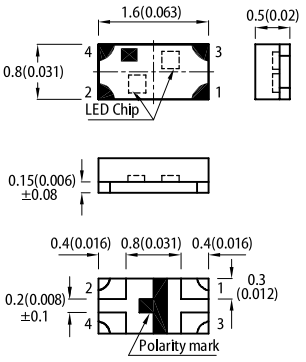
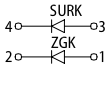
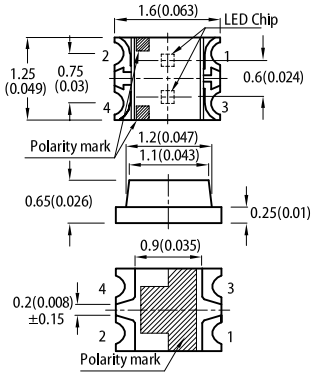
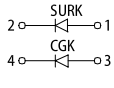
LOW CURRENT LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @2mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPT-1608LZGCK-3.0U	InGaN	525	water clear	50	100	130°	1.6mm x 0.8mm x 0.75mm (0603)   KPT-1608L  Units: mm (inch) Tolerance: ± 0.1 (0.004)
KPTD-1608LSECK-J3-PF-2.1U	AlGaInP	625	water clear	50	120	60°	1.6mm x 0.8mm x 0.95mm (0603 Dome Lens)   KPTD-1608L  KPTD-1608XXX-PF  Units: mm (inch) Tolerance: ± 0.15 (0.006)
KPTD-1608LZGCK-3.1VFU	InGaN	525	water clear	250	420	60°	
KPTD-1608LVBC-D-3.0U	InGaN	470	water clear	30	65	40°	
KPT-2012LZGCK-3.0U	InGaN	525	water clear	50	100	140°	2.0mm x 1.25mm x 0.75mm (0805)   KPT-2012L  Units: mm (inch) Tolerance: ± 0.1 (0.004)
KPTD-2012LSURCK-2.1VFU	AlGaInP	630	water clear	20	50	40°	2.0mm x 1.25mm x 1.05mm (0805 Dome Lens)   KPTD-2012L  Units: mm (inch) Tolerance: ± 0.15 (0.006)
KPTD-2012LCGCK-2.1VFU	AlGaInP	570	water clear	20	40	40°	

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

LOW CURRENT LED

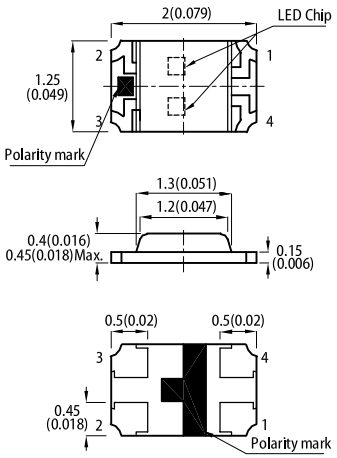
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @2mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPA-2107LZGCK-3.0U	InGaN	525	water clear	50	100	170°	2.1mm x 1.0mm x 0.6mm (Right Angle)   KPA-2107L  Units: mm (inch) Tolerance: ± 0.1 (0.004)
KPA-2107LVBC-D-3.0U	InGaN	470	water clear	10	20	170°	
KPDA-3020LZGCK-3.0U	InGaN	525	water clear	700	1500	10°	3.0mm x 2.8mm x 2.0mm (Right Angle)   KPDA-3020L  Units: mm (inch) Tolerance: ± 0.2 (0.008)
KPHB-1608LZGKSURKC-GX	InGaN	525	water clear	20	40	130°	1.6mm x 0.8mm x 0.5mm (0603 Bi-Color)   KPHB-1608L  Units: mm (inch) Tolerance: ± 0.15 (0.006)
	AlGaInP	630		2	8		
KPTB-1612LSURKCGKC	AlGaInP	630	water clear	4	9	150°	1.6mm x 1.25mm x 0.65mm (Bi-Color)   KPTB-1612L  Units: mm (inch) Tolerance: ± 0.2 (0.008)
	AlGaInP	570		1.2	3		
KPTB-1612LSURKZGKC	AlGaInP	630	water clear	4	9	150°	
	InGaN	525		30	50		

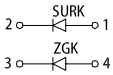
NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

LOW CURRENT LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @2mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPHBM-2012LSURKZGKC	AlGaInP	630	water clear	6	15	120°	2.0mm x 1.25mm x 0.45mm (0805 Super Thin, Bi-Color)
	InGaN	525		50	90		


KPHBM-2012L



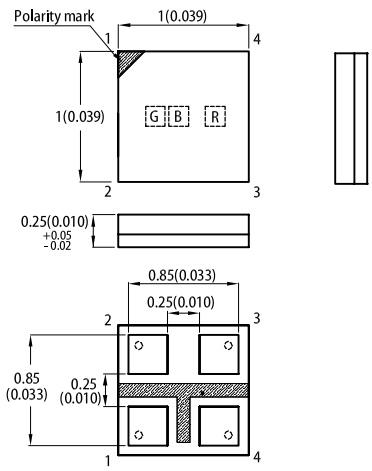


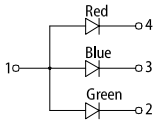
Units: mm (inch)
Tolerance: ± 0.1 (0.004)

RGB SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA *5mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPGF-1012GBRC-07	InGaN	525	water clear	*80	*220	150°	1.0mm x 1.0mm x 0.25 mm (Full Color)
	InGaN	465		*10	*23		
	AlGaInP	624		*15	*30		


KPGF-1012

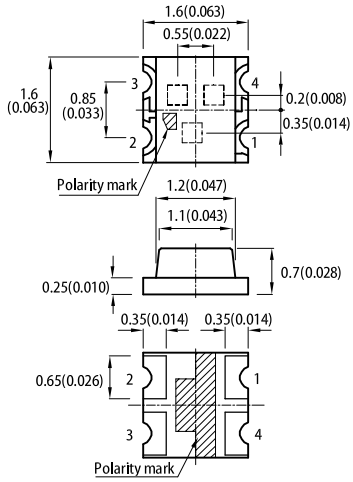


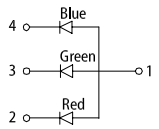


Units: mm (inch)
Tolerance: ± 0.1 (0.004)

KPTF-1616RGBC-11	AlGaInP	621	water clear	55	110	130°	1.6mm x 1.6mm x 0.7mm (Full Color)
	InGaN	525		120	280		
	InGaN	465		40	70		


KPTF-1616

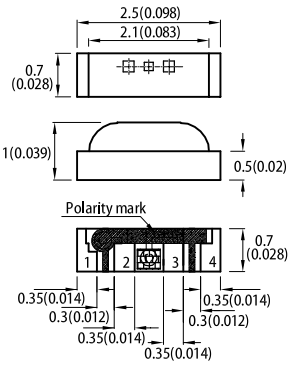
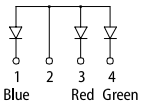
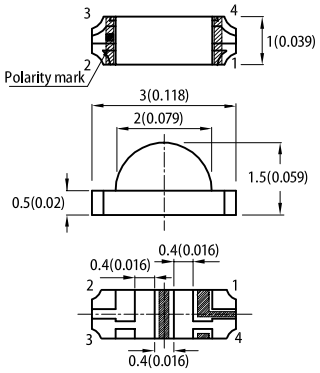
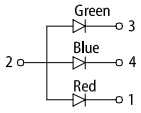
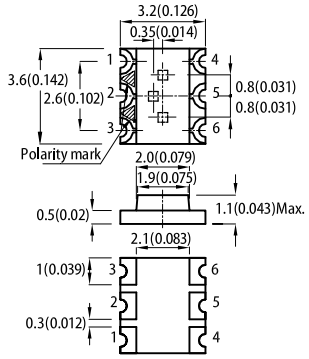
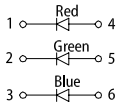
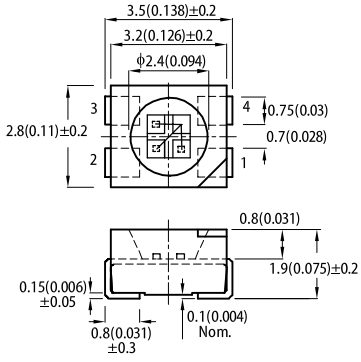
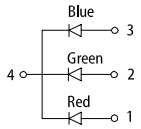




Units: mm (inch)
Tolerance: ± 0.2 (0.008)

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

RGB SMD LED

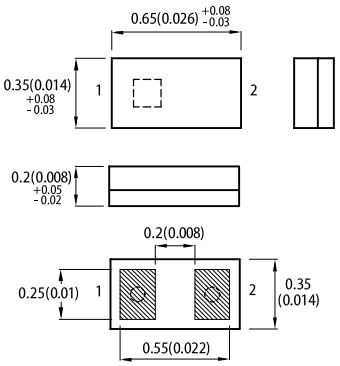
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPFA-2507BRGC-11	InGaN	465	water clear	40	65	130°	2.5mm x 1.0mm x 0.7mm (Right Angle, Full Color)   KPFA-2507  Units: mm (inch) Tolerance: ± 0.15 (0.006)
	AlGaInP	621		80	110		
	InGaN	525		300	500		
KPFA-3010RGBC-11	AlGaInP	621	water clear	80	140	150°	3.0mm x 1.5mm x 1.0mm (Right Angle, Full Color)   KPFA-3010  Units: mm (inch) Tolerance: ± 0.2 (0.008)
	InGaN	525		300	500		
	InGaN	465		40	70		
KPF-3236RGBC-11	AlGaInP	621	water clear	80	140	150°	3.2mm x 3.6mm x 1.1mm (Full Color)   KPF-3236  Units: mm (inch) Tolerance: ± 0.2 (0.008)
	InGaN	525		200	330		
	InGaN	465		40	70		
KAA-3528RGBS-K11-C8-CC	AlGaInP	625	water clear	400	500	120°	3.5mm x 2.8mm x 1.9mm (Full Color)   KAA-3528  Units: mm (inch) Tolerance: ± 0.25 (0.01)
	InGaN	525		1000	1600		
	InGaN	470		200	330		

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

TOP-EMITTING CHIP SMD LED

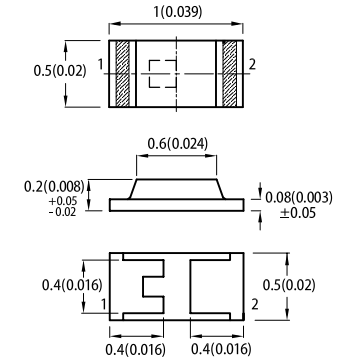
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA *10mA **5mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPG-0603SURC-TT	AlGaInP	631	water clear	*10	*35	140°	0.65mm x 0.35mm x 0.2mm (0201)
KPG-0603CGC-TT	AlGaInP	571	water clear	*6	*15	140°	
KPG-1005CGC-TT	AlGaInP	571	water clear	12	35	120°	1.0mm x 0.5mm x 0.2mm (0402)
KPG-1005ZGC-5MAV	InGaN	525	water clear	**120	**280	140°	
KPG-1005VBC-A1-5MAV	InGaN	468	water clear	**20	**60	140°	
KPHHS-1005SURCK	AlGaInP	630	water clear	40	70	120°	1.0mm x 0.5mm x 0.5mm (0402)
KPHHS-1005SECK	AlGaInP	605	water clear	80	150	120°	
KPHHS-1005SYCK	AlGaInP	590	water clear	80	150	120°	
KPHHS-1005CGCK	AlGaInP	570	water clear	20	50	120°	
KPHHS-1005ZGC-V	InGaN	525	water clear	400	600	140°	
KPHHS-1005QBC-D-V	InGaN	465	water clear	40	60	140°	
KPG-1608SURKC-T	AlGaInP	630	water clear	55	110	120°	1.6mm x 0.8mm x 0.25mm (0603)
KPG-1608SEKC-T	AlGaInP	601	water clear	55	100	120°	
KPG-1608SYKC-T	AlGaInP	590	water clear	55	120	120°	
KPG-1608CGKC-T	AlGaInP	570	water clear	20	50	120°	
KPG-1608ZGC	InGaN	525	water clear	300	450	130°	
KPG-1608QBC-D	InGaN	465	water clear	40	100	130°	

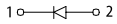

KPG-0603



Units: mm (inch)
Tolerance: ± 0.1 (0.004)

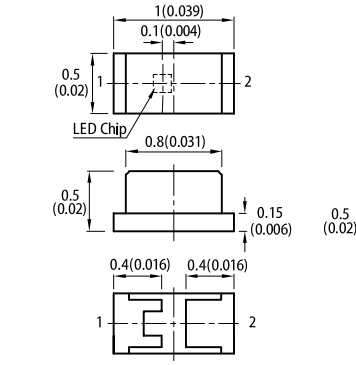

KPG-1005

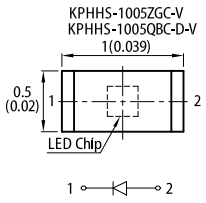




Units: mm (inch)
Tolerance: ± 0.1 (0.004)

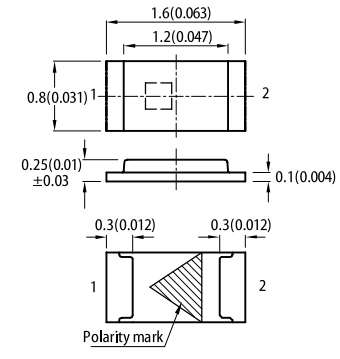

KPHHS-1005

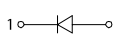




Units: mm (inch)
Tolerance: ± 0.1 (0.004)


KPG-1608

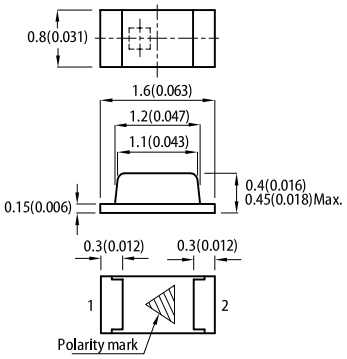
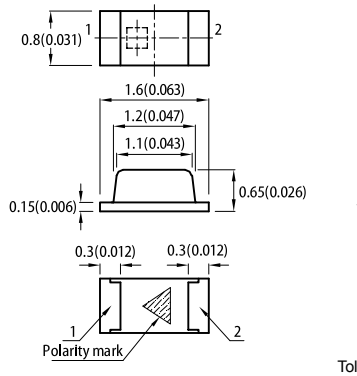
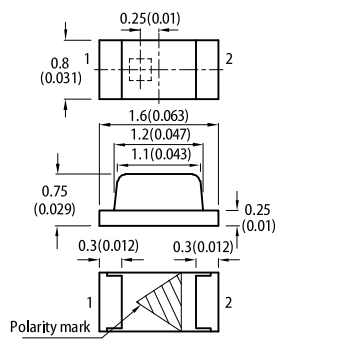
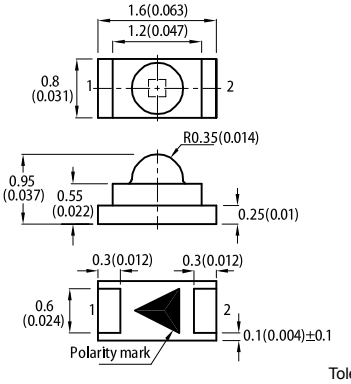




Units: mm (inch)
Tolerance: ± 0.1 (0.004)

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

TOP-EMITTING CHIP SMD LED

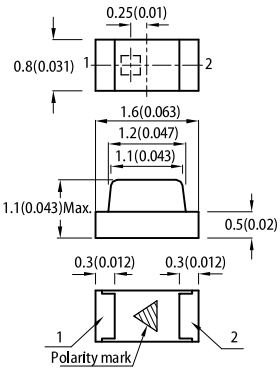
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPHM-1608SURCK	AlGaInP	630	water clear	40	80	120°	1.6mm x 0.8mm x 0.45mm (0603)  KPHM-1608  Units: mm (inch) Tolerance: ± 0.1 (0.004)
KPHM-1608SYCK	AlGaInP	590	water clear	80	150	120°	
KPHM-1608CGCK	AlGaInP	570	water clear	20	50	120°	
KPHM-1608QBC-D	InGaN	465	water clear	40	100	130°	
KPH-1608SURCK	AlGaInP	630	water clear	40	80	120°	1.6mm x 0.8mm x 0.65mm (0603)  KPH-1608  Units: mm (inch) Tolerance: ± 0.1 (0.004)
KPH-1608SYCK	AlGaInP	590	water clear	80	150	120°	
KPH-1608CGCK	AlGaInP	570	water clear	20	50	120°	
KPT-1608SURCK	AlGaInP	630	water clear	40	80	120°	1.6mm x 0.8mm x 0.75mm (0603)  KPT-1608  Units: mm (inch) Tolerance: ± 0.1 (0.004)
KPT-1608SECK	AlGaInP	605	water clear	80	180	120°	
KPT-1608SYCK	AlGaInP	590	water clear	80	150	120°	
KPT-1608CGCK	AlGaInP	570	water clear	20	50	120°	
KPT-1608ZGC	InGaN	525	water clear	300	600	130°	
KPT-1608VBC-D	InGaN	470	water clear	120	180	130°	
KPT-1608QBC-D	InGaN	465	water clear	40	100	130°	
KPTD-1608SURCK	AlGaInP	630	water clear	80	250	60°	1.6mm x 0.8mm x 0.95mm (0603 Dome Lens)  KPTD-1608  Units: mm (inch) Tolerance: ± 0.15 (0.006)
KPTD-1608SECK	AlGaInP	605	water clear	200	500	60°	
KPTD-1608SYCK	AlGaInP	590	water clear	300	600	60°	
KPTD-1608CGCK	AlGaInP	570	water clear	80	190	60°	
KPTD-1608ZGC	InGaN	525	water clear	700	1300	60°	
KPTD-1608ZGC-G	InGaN	525	water clear	1000	1500	60°	
KPTD-1608VBC-D	InGaN	470	water clear	200	350	40°	
KPTD-1608QBC-D	InGaN	465	water clear	80	200	40°	

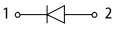
NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

TOP-EMITTING CHIP SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KP-1608SURCK	AlGaInP	630	water clear	40	80	120°	1.6mm x 0.8mm x 1.1mm (0603)
KP-1608SECK	AlGaInP	605	water clear	80	180	120°	
KP-1608SYCK	AlGaInP	590	water clear	80	150	120°	
KP-1608CGCK	AlGaInP	570	water clear	20	50	120°	
KP-1608ZGC	InGaN	525	water clear	300	600	130°	
KP-1608QBC-D	InGaN	465	water clear	40	100	130°	
KPHCM-2012SURCK	AlGaInP	630	water clear	40	80	140°	2.0mm x 1.25mm x 0.4mm (0805)
KPHCM-2012SECK	AlGaInP	605	water clear	80	180	140°	
KPHCM-2012SYCK	AlGaInP	590	water clear	80	150	140°	
KPHCM-2012CGCK	AlGaInP	570	water clear	20	50	140°	
KPHCM-2012ZGC	InGaN	525	water clear	300	600	140°	
KPHCM-2012QBC-D	InGaN	465	water clear	40	100	140°	
KPT-2012SURCK	AlGaInP	630	water clear	40	80	140°	2.0mm x 1.25mm x 0.75mm (0805)
KPT-2012SECK	AlGaInP	605	water clear	80	180	140°	
KPT-2012SYCK	AlGaInP	590	water clear	80	150	140°	
KPT-2012CGCK	AlGaInP	570	water clear	20	50	140°	
KPT-2012ZGC	InGaN	525	water clear	300	600	140°	
KPT-2012VBC-D	InGaN	470	water clear	120	180	140°	
KPT-2012QBC-D	InGaN	465	water clear	40	100	140°	
KP-2012SURCK	AlGaInP	630	water clear	40	80	140°	2.0mm x 1.25mm x 1.1mm (0805)
KP-2012SECK	AlGaInP	605	water clear	80	180	140°	
KP-2012SYCK	AlGaInP	590	water clear	80	150	140°	
KP-2012CGCK	AlGaInP	570	water clear	20	50	140°	
KP-2012ZGC	InGaN	525	water clear	300	600	140°	
KP-2012QBC-D	InGaN	465	water clear	40	100	140°	

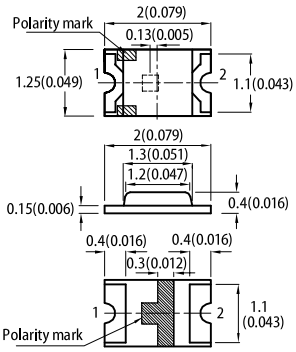

KP-1608

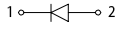




Units: mm (inch)
Tolerance: ± 0.1 (0.004)

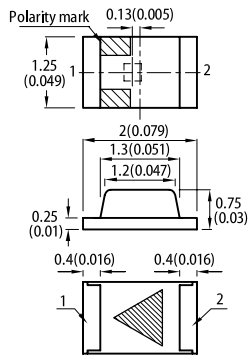

KPHCM-2012

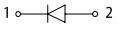




Units: mm (inch)
Tolerance: ± 0.1 (0.004)

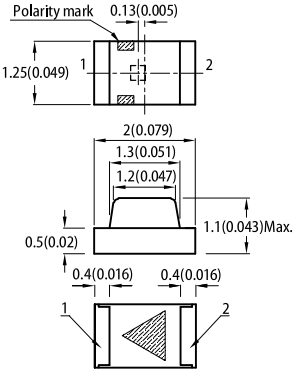

KPT-2012

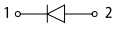




Units: mm (inch)
Tolerance: ± 0.1 (0.004)


KP-2012





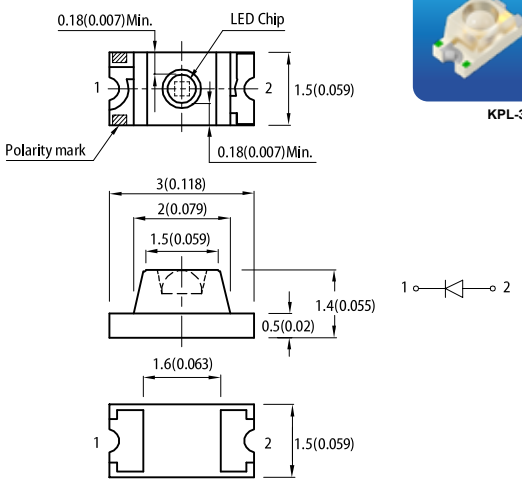
Units: mm (inch)
Tolerance: ± 0.1 (0.004)

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

TOP-EMITTING CHIP SMD LED

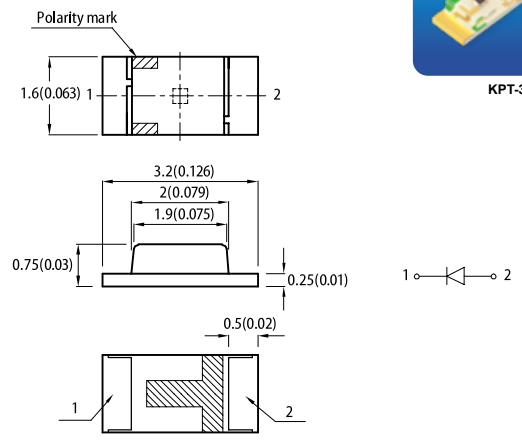
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPL-3015SURCK	AlGaInP	630	water clear	120	180	70°	3.0mm x 1.5mm x 1.4mm
KPL-3015SECK	AlGaInP	605	water clear	120	350	70°	
KPL-3015SYCK	AlGaInP	590	water clear	200	350	70°	
KPL-3015CGCK	AlGaInP	570	water clear	55	120	70°	
KPL-3015ZGC	InGaN	525	water clear	1000	1500	50°	
KPT-3216SURCK	AlGaInP	630	water clear	40	80	140°	3.2mm x 1.6mm x 0.75mm (1206)
KPT-3216SECK	AlGaInP	605	water clear	80	180	140°	
KPT-3216SYCK	AlGaInP	590	water clear	80	150	140°	
KPT-3216CGCK	AlGaInP	570	water clear	20	50	140°	
KPT-3216ZGC	InGaN	525	water clear	300	600	150°	
KPT-3216QBC-D	InGaN	465	water clear	40	100	150°	
KP-3216SURCK	AlGaInP	630	water clear	40	80	140°	3.2mm x 1.6mm x 1.1mm (1206)
KP-3216SECK	AlGaInP	605	water clear	80	180	140°	
KP-3216SYCK	AlGaInP	590	water clear	80	150	140°	
KP-3216CGCK	AlGaInP	570	water clear	20	50	140°	
KP-3216ZGC	InGaN	525	water clear	300	600	150°	
KP-3216QBC-D	InGaN	465	water clear	40	100	150°	


KPL-3015



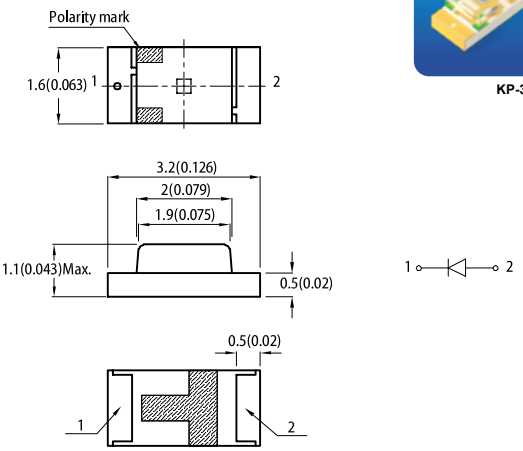
Units: mm (inch)
Tolerance: ± 0.2 (0.008)


KPT-3216



Units: mm (inch)
Tolerance: ± 0.2 (0.008)


KP-3216



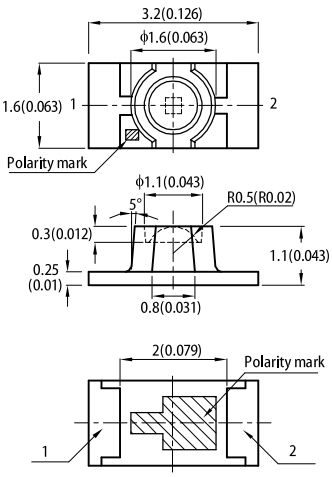
Units: mm (inch)
Tolerance: ± 0.2 (0.008)

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

TOP-EMITTING CHIP SMD LED

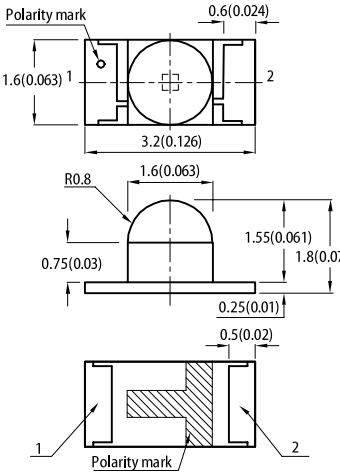
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPTL-3216SURCK	AlGaInP	630	water clear	120	230	80°	3.2mm x 1.6mm x 1.1mm (1206)
KPTL-3216SECK	AlGaInP	605	water clear	200	350	80°	
KPTL-3216SYCK	AlGaInP	590	water clear	200	350	80°	
KPTL-3216CGCK	AlGaInP	570	water clear	55	100	80°	
KPTL-3216ZGC	InGaN	525	water clear	700	1100	80°	
KPTL-3216QBC-D	InGaN	465	water clear	120	250	80°	
KPTD-3216SURCK	AlGaInP	630	water clear	300	800	40°	3.2mm x 1.6mm x 1.8mm (1206 Dome Lens)
KPTD-3216SECK	AlGaInP	605	water clear	500	1000	40°	
KPTD-3216SYCK	AlGaInP	590	water clear	700	800	40°	
KPTD-3216CGCK	AlGaInP	570	water clear	120	300	40°	
KPTD-3216ZGC	InGaN	525	water clear	2700	4200	30°	
KPTD-3216ZGC-G	InGaN	525	water clear	3600	6000	30°	
KPTD-3216QBC-D	InGaN	465	water clear	300	700	30°	
KPD-3224SURCK	AlGaInP	630	water clear	700	1500	20°	3.2mm x 2.4mm x 2.4mm (Dome Lens)
KPD-3224SECK	AlGaInP	605	water clear	1000	1600	20°	
KPD-3224SYCK	AlGaInP	590	water clear	1000	1300	20°	
KPD-3224CGCK	AlGaInP	570	water clear	500	900	20°	
KPD-3224ZGC	InGaN	525	water clear	3600	7000	20°	
KPD-3224QBC-D	InGaN	465	water clear	500	900	20°	


KPTL-3216



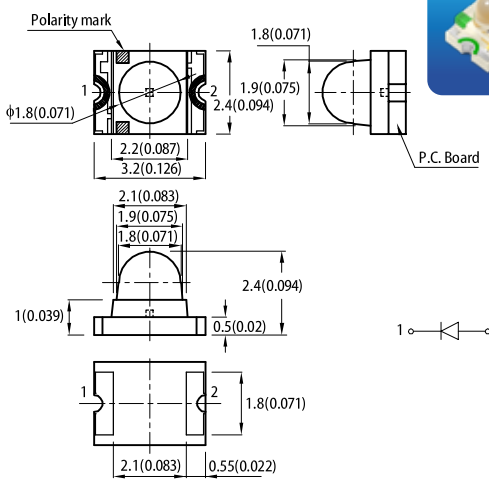
Units: mm (inch)
Tolerance: ± 0.1 (0.004)


KPTD-3216



Units: mm (inch)
Tolerance: ± 0.2 (0.008)


KPD-3224



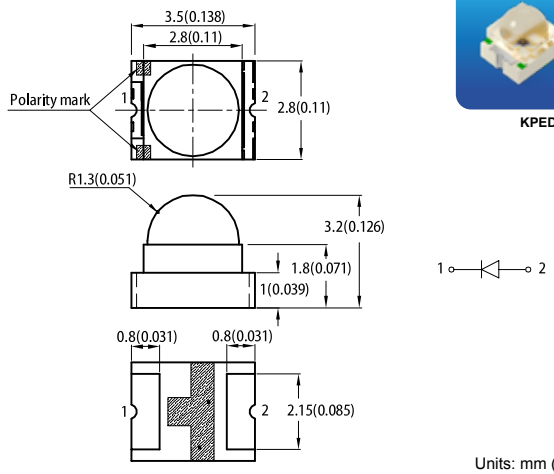
Units: mm (inch)
Tolerance: ± 0.1 (0.004)

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

TOP-EMITTING CHIP SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPED-3528SURCK	AlGaInP	630	water clear	120	250	70°	3.5mm x 2.8mm x 3.2mm (Dome Lens)
KPED-3528SECK	AlGaInP	605	water clear	400	700	70°	
KPED-3528CGCK	AlGaInP	570	water clear	80	200	70°	


KPED-3528

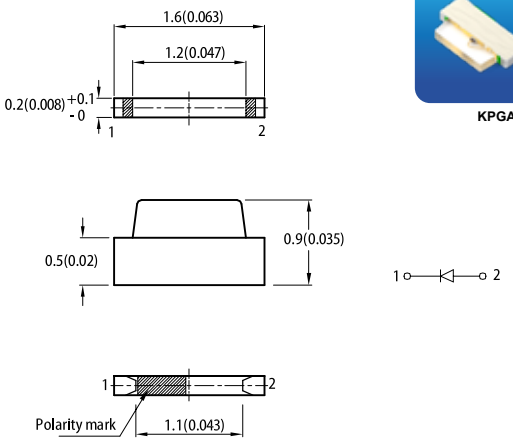


Units: mm (inch)
Tolerance: ± 0.2 (0.008)

RIGHT ANGLE SMD LED

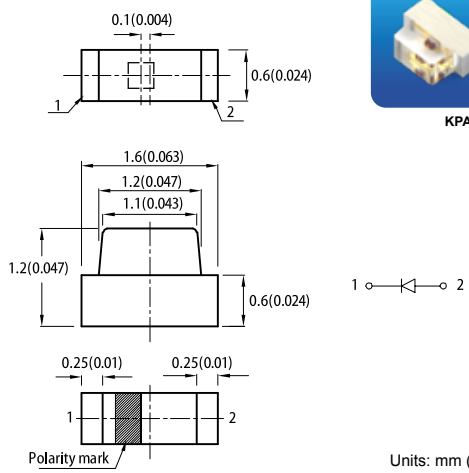
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPGA-1602CGC-KA	AlGaInP	571	water clear	12	30	150°	1.6mm x 0.9mm x 0.2mm (Right Angle)
KPA-1606SURCK	AlGaInP	630	water clear	40	80	110°	1.6mm x 1.2mm x 0.6mm (Right Angle)
KPA-1606SECK	AlGaInP	605	water clear	80	180	110°	
KPA-1606SYCK	AlGaInP	590	water clear	80	150	110°	
KPA-1606CGCK	AlGaInP	570	water clear	20	50	110°	
KPA-1606ZGC	InGaN	525	water clear	200	400	110°	
KPA-1606VBC-D	InGaN	470	water clear	120	200	110°	
KPA-1606QBC-D	InGaN	465	water clear	40	80	110°	


KPGA-1602



Units: mm (inch)
Tolerance: ± 0.1 (0.004)


KPA-1606

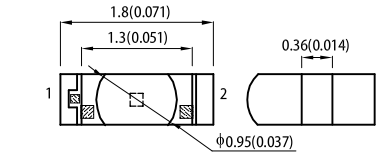


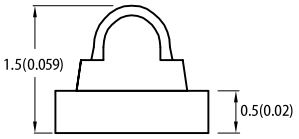
Units: mm (inch)
Tolerance: ± 0.1 (0.004)

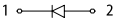
NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

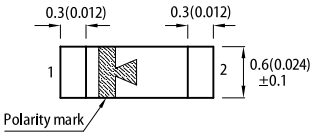
RIGHT ANGLE SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPDA-1806ZGCK	InGaN	525	water clear	1900	3200	25°	1.8mm x 1.5mm x 0.6 mm (Right Angle)
KPDA-1806VBC-D	InGaN	470	water clear	400	800	25°	
KPA-2107SURCK	AlGaInP	630	water clear	40	80	140°	2.1mm x 1.0mm x 0.6mm (Right Angle)
KA-2810ASURSK	AlGaInP	630	water clear	40	100	110°	2.8mm x 1.2mm x 0.8mm (Right Angle)
KA-2810ASESK-J3	AlGaInP	625	water clear	300	500	110°	
KA-2810ACGSK	AlGaInP	570	water clear	40	70	110°	
KA-2810AZGS	InGaN	525	water clear	500	850	110°	
KA-2810AZGS-G	InGaN	525	water clear	1000	1400	110°	
KA-2810AVBS-D	InGaN	470	water clear	200	350	110°	

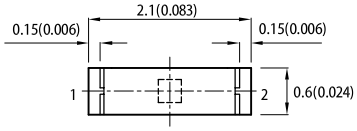


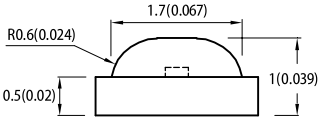


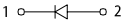


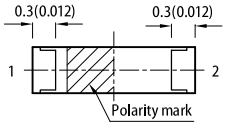


Units: mm (inch)
Tolerance: ± 0.15 (0.006)

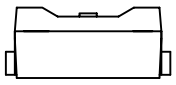


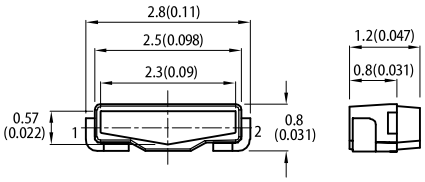


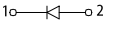


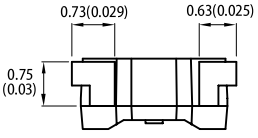


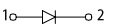
Units: mm (inch)
Tolerance: ± 0.1 (0.004)







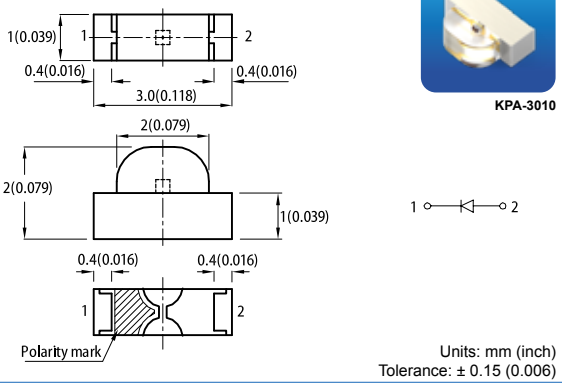
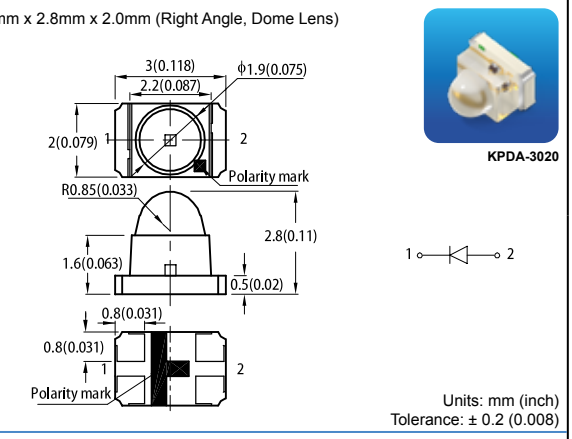
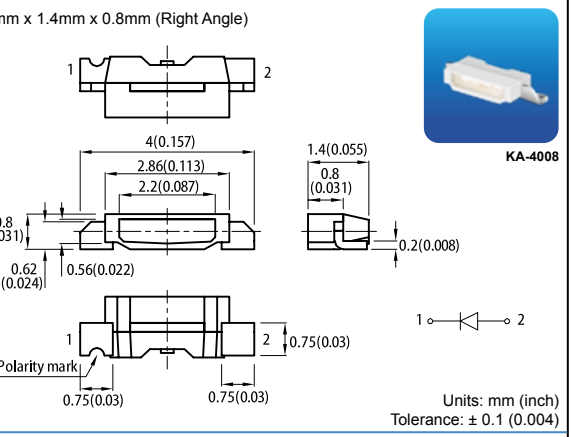
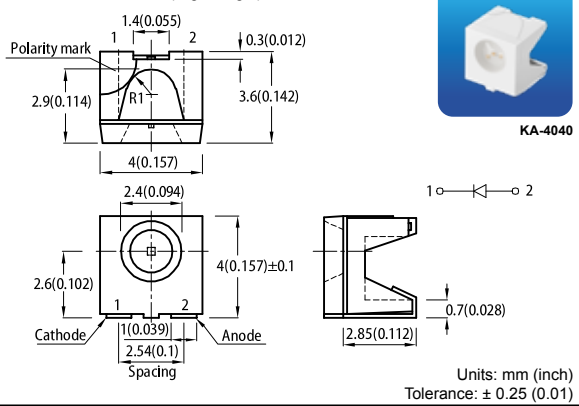




Units: mm (inch)
Tolerance: ± 0.1 (0.004)

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

RIGHT ANGLE SMD LED

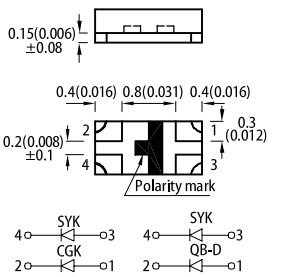
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPA-3010SURCK	AlGaInP	630	water clear	40	80	120°	3.0mm x 2.0mm (Right Angle)  KPA-3010 Units: mm (inch) Tolerance: ± 0.15 (0.006)
KPA-3010SECK	AlGaInP	605	water clear	80	180	120°	
KPA-3010SYCK	AlGaInP	590	water clear	80	150	120°	
KPA-3010CGCK	AlGaInP	570	water clear	20	50	120°	
KPA-3010ZGC	InGaN	525	water clear	200	400	120°	
KPA-3010QBC-D	InGaN	465	water clear	40	80	120°	
KPDA-3020SECK-J3-PF	AlGaInP	625	water clear	2300	3800	10°	3.0mm x 2.8mm x 2.0mm (Right Angle, Dome Lens)  KPDA-3020 Units: mm (inch) Tolerance: ± 0.2 (0.008)
KPDA-3020SYCK-J3-PF	AlGaInP	590	water clear	3600	7000	10°	
KA-4008VBS-D	InGaN	470	water clear	300	450	120°	4.0mm x 1.4mm x 0.8mm (Right Angle)  KA-4008 Units: mm (inch) Tolerance: ± 0.1 (0.004)
KA-4040QBS-D	InGaN	465	water clear	80	220	120°	4.0mm x 4.0mm x 3.6mm (Right Angle)  KA-4040 Units: mm (inch) Tolerance: ± 0.25 (0.01)

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

MULTI-COLOR SMD LED

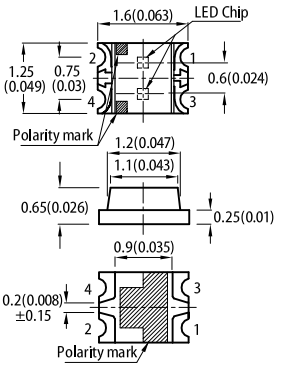
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPHB-1608SYKSURKC-GX	AlGaInP	590	water clear	80	150	130°	1.6mm x 0.8mm x 0.5mm (0603 Bi-Color)
	AlGaInP	630		40	90		
KPHB-1608CGKSURKC-GX	AlGaInP	570	water clear	20	50	130°	
	AlGaInP	630		40	90		
KPHB-1608CGKSEKC-GX	AlGaInP	570	water clear	20	50	130°	
	AlGaInP	605		80	200		
KPHB-1608CGKSYKC-GX	AlGaInP	570	water clear	20	50	130°	
	AlGaInP	590		80	150		
KPHB-1608ZGSURKC-GX	InGaN	525	water clear	200	400	130°	
	AlGaInP	630		40	90		
KPHB-1608ZGSYKC-GX	InGaN	525	water clear	200	400	130°	
	AlGaInP	590		80	150		
KPHB-1608QBDSURKC-GX	InGaN	465	water clear	40	70	130°	
	AlGaInP	630		40	90		
KPHB-1608QBDSYKC-GX	InGaN	465	water clear	40	70	130°	
	AlGaInP	590		80	150		
KPTB-1612SURKSYKC	AlGaInP	630	water clear	40	80	150°	1.6mm x 1.25mm x 0.65mm (Bi-Color)
	AlGaInP	590		80	120		
KPTB-1612SURKCGKC	AlGaInP	630	water clear	40	80	150°	
	AlGaInP	570		20	50		
KPTB-1612SYKCGKC	AlGaInP	590	water clear	80	120	150°	
	AlGaInP	570		20	50		
KPTB-1615SURKCGKC	AlGaInP	630	water clear	40	80	150°	1.6mm x 1.5mm x 0.7mm (Bi-Color)
	AlGaInP	570		20	50		
KPTB-1615SYKCGKC	AlGaInP	590	water clear	80	120	150°	
	AlGaInP	570		20	50		
KPHBM-2012SURKCGKC	AlGaInP	630	water clear	40	80	120°	2.0mm x 1.25mm x 0.45mm (0805 Super Thin, Bi-Color)
	AlGaInP	570		20	50		
KPHBM-2012CGKSEKC	AlGaInP	570	water clear	20	50	120°	
	AlGaInP	605		80	180		
KPHBM-2012CGKSYKC	AlGaInP	570	water clear	20	50	120°	
	AlGaInP	590		80	120		
KPHBM-2012QBDSURKC	InGaN	465	water clear	40	80	120°	
	AlGaInP	630		40	80		


KPHB-1608



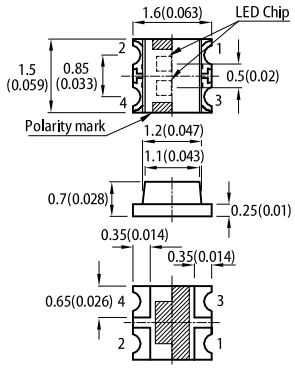
Units: mm (inch)
Tolerance: ± 0.15 (0.006)


KPTB-1612



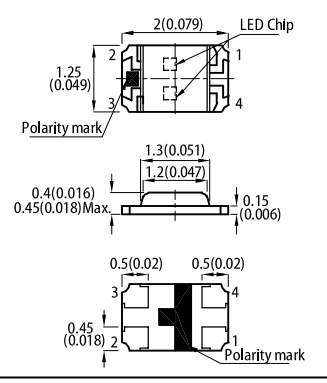
Units: mm (inch)
Tolerance: ± 0.2 (0.008)


KPTB-1615



Units: mm (inch)
Tolerance: ± 0.2 (0.008)


KPHBM-2012



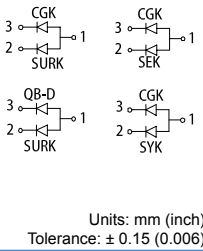
Units: mm (inch)
Tolerance: ± 0.1 (0.004)

NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

MULTI-COLOR SMD LED

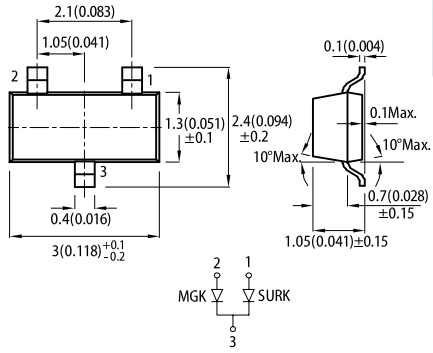
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPBA-3010SURKCGKC	AlGaInP	630	water clear	40	80	140°	3.0mm x 2.0mm x 1.0mm (Right Angle, Bi-Color)
	AlGaInP	570		40	70		
KPBA-3010SURKQBDC	AlGaInP	630	water clear	40	80	140°	
	InGaN	465		40	90		
KPBA-3010SEKCGKC	AlGaInP	605	water clear	80	150	140°	
	AlGaInP	570		40	70		
KPBA-3010SYKCGKC	AlGaInP	590	water clear	80	120	140°	
	AlGaInP	570		40	70		
KM-23SURKMGKC	AlGaInP	630	water clear	40	60	160°	SOT-23 Surface Mount LED Lamp (3mm x 1.3mm)
	AlGaInP	570		20	55		
KPB-3025SURKCGKC	AlGaInP	630	water clear	40	70	160°	3.0mm x 2.5mm x 1.1mm (Bi-Color)
	AlGaInP	570		20	60		
KPB-3025SURKSYKC	AlGaInP	630	water clear	40	70	160°	
	AlGaInP	590		80	120		
KPBL-3025SURKCGKC	AlGaInP	630	water clear	120	300	50°	3.0mm x 2.5mm x 1.4mm (Bi-Color)
	AlGaInP	570		80	150		


KPBA-3010



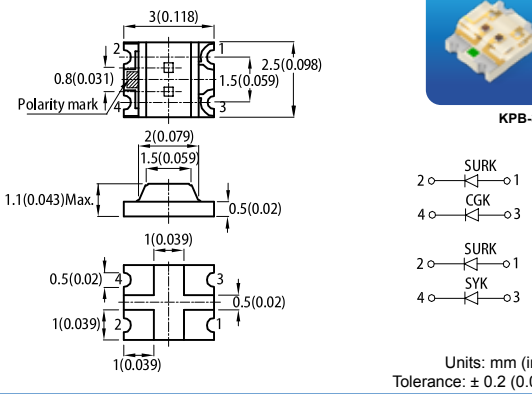
Units: mm (inch)
Tolerance: ± 0.15 (0.006)


KM-23



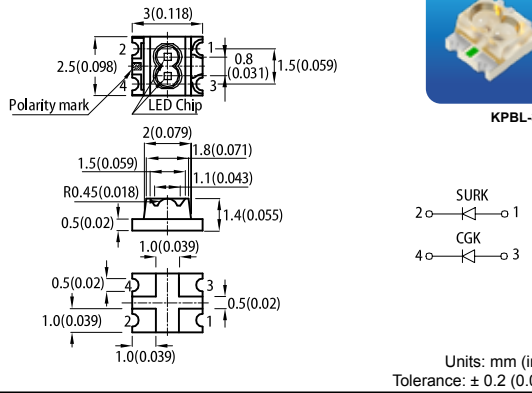
Units: mm (inch)
Tolerance: ± 0.25 (0.01)


KPB-3025



Units: mm (inch)
Tolerance: ± 0.2 (0.008)


KPBL-3025



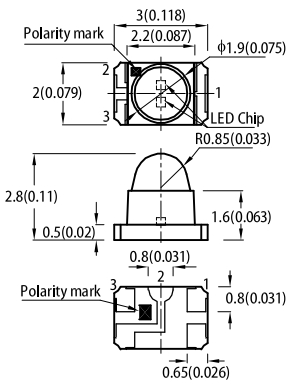
Units: mm (inch)
Tolerance: ± 0.2 (0.008)

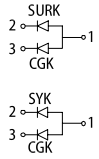
NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

MULTI-COLOR SMD LED

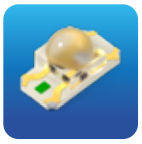
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPBDA-3020SURKCGKC-PF	AlGaInP	630	water clear	120	300	15°	3.0mm x 2.8mm x 2.0mm (Right Angle, Dome Lens)
	AlGaInP	570		120	300		
KPBDA-3020SYKCGKC-PF	AlGaInP	590	water clear	500	900	15°	
	AlGaInP	570		120	300		
KPTBD-3216SURKCGKC	AlGaInP	630	water clear	300	600	30°	3.2mm x 1.6mm x 1.8mm (Bi-Color)
	AlGaInP	570		120	250		
KPBD-3224SURKCGKC	AlGaInP	630	water clear	120	400	20°	3.2mm x 2.4mm x 2.4mm (Dome Lens)
	AlGaInP	570		80	280		
KPBD-3224SURKZGC	AlGaInP	630	water clear	120	400	20°	
	InGaN	525		500	950		
KPBD-3224SYKCGKC	AlGaInP	590	water clear	400	800	20°	
	AlGaInP	570		80	280		
KPB-3227SURKCGKC	AlGaInP	630	water clear	40	80	140°	3.2mm x 2.7mm x 1.1mm (Bi-Color)
	AlGaInP	570		20	55		

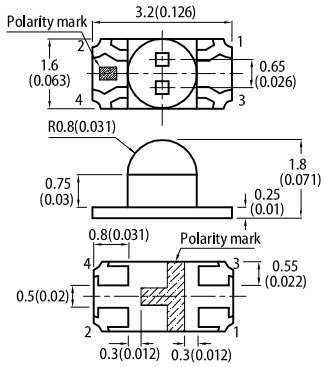

KPBDA-3020

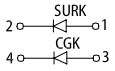




Units: mm (inch)
Tolerance: ± 0.2 (0.008)

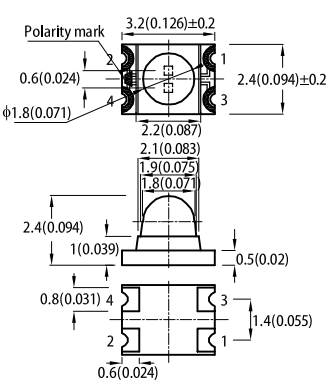

KPTBD-3216

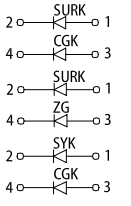




Units: mm (inch)
Tolerance: ± 0.2 (0.008)

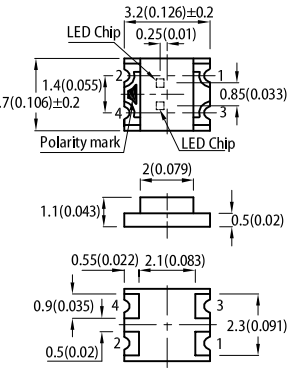

KPBD-3224

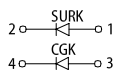




Units: mm (inch)
Tolerance: ± 0.1 (0.004)


KPB-3227





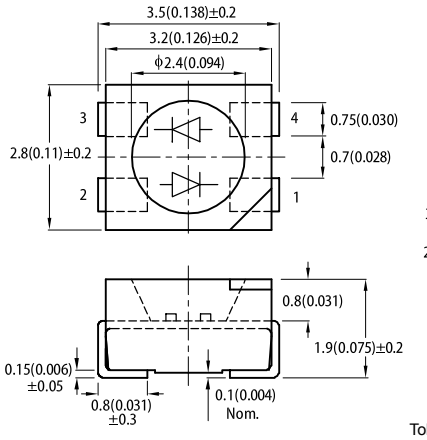
Units: mm (inch)
Tolerance: ± 0.1 (0.004)

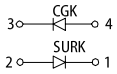
NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

MULTI-COLOR SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KAA-3528SURKCGKCT	AlGaInP	630	water clear	55	100	120°	3.5mm x 2.8mm x 1.9mm (Bi-Color)
	AlGaInP	570		40	80		


KAA-3528



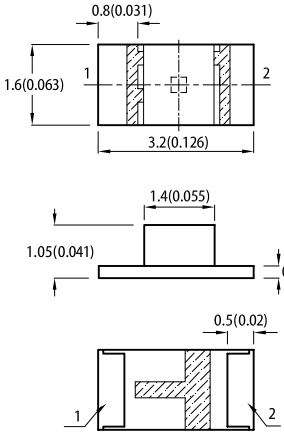


Units: mm (inch)
Tolerance: ± 0.25 (0.01)

REVERSE MOUNT SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KPTR-3216SURCK	AlGaInP	630	water clear	40	80	140°	3.2mm x 1.6mm x 1.05mm (1206 Reverse Mount)
KPTR-3216SECK	AlGaInP	605	water clear	80	180	140°	
KPTR-3216SYCK	AlGaInP	590	water clear	80	150	140°	
KPTR-3216CGCK	AlGaInP	570	water clear	20	50	140°	
KPTR-3216ZGC	InGaN	525	water clear	300	600	140°	
KPTR-3216QBC-D	InGaN	465	water clear	40	100	140°	


KPTR-3216

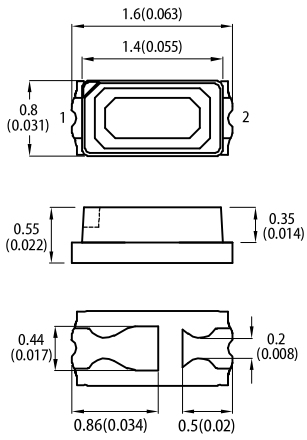


Units: mm (inch)
Tolerance: ± 0.2 (0.008)

TOP-EMITTING PLCC SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA*10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KA-1608SURSK	AlGaInP	630	water clear	40	160	120°	1.6mm x 0.8mm x 0.55mm (0603)
KA-1608SYSK	AlGaInP	590	water clear	55	240	120°	
KA-1608CGSK	AlGaInP	570	water clear	12	75	120°	
KA-1608VBS-A1-10MAV	InGaN	468	water clear	*50	*160	120°	


KA-1608



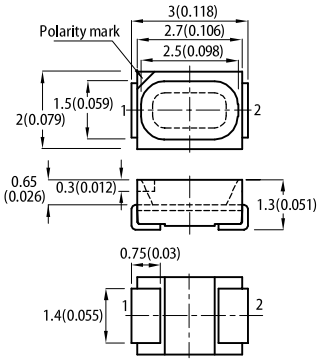
Units: mm (inch)
Tolerance: ± 0.15 (0.006)

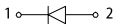
NOTES:
1. KP series custom-made is available upon request.
2. Luminous intensity value is traceable to CIE127-2007 standards.

TOP-EMITTING PLCC SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KA-3021SURSK	AlGaInP	630	water clear	40	90	120°	3.0mm x 2.0mm x 1.3mm
KA-3021CGSK	AlGaInP	570	water clear	40	80	120°	
KA-3021ZGS	InGaN	525	water clear	400	800	120°	
KA-3021QBS-D	InGaN	465	water clear	80	120	120°	
KA-3528SURCKT	AlGaInP	630	water clear	55	100	120°	3.5mm x 2.8mm x 1.9mm
KA-3528SECKT	AlGaInP	605	water clear	120	230	120°	
KA-3528SYCKT	AlGaInP	590	water clear	120	250	120°	
KA-3528CGCKT	AlGaInP	570	water clear	40	100	120°	
KA-3528ZGCKT	InGaN	525	water clear	500	1000	120°	
KA-3528VBS-D	InGaN	470	water clear	300	450	120°	
KA-3528QBS-D	InGaN	465	water clear	80	150	120°	

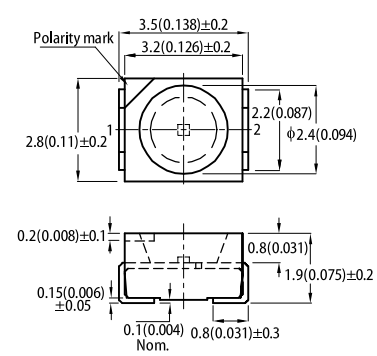

KA-3021

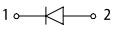




Units: mm (inch)
Tolerance: ± 0.2 (0.008)


KA-3528



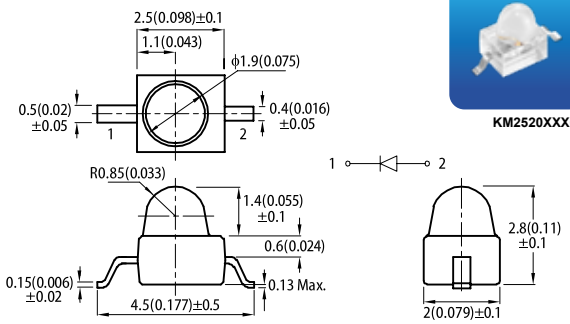


Units: mm (inch)
Tolerance: ± 0.25(0.01)

SUBMINIATURE SMD LED

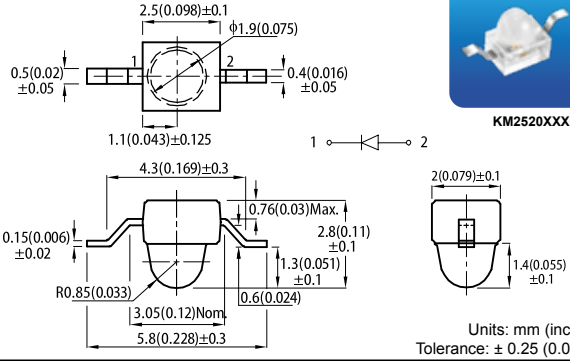
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @ 20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KM2520SURCK03	AlGaInP	630	water clear	700	1200	20°	Subminiature Solid State Lamps Gull Wing Lead
KM2520SYCK03	AlGaInP	590	water clear	1600	2700	20°	
KM2520CGCK03	AlGaInP	570	water clear	500	1000	20°	
KM2520ZGC03	InGaN	525	water clear	2700	6000	20°	
KM2520QBC-D03	InGaN	465	water clear	500	1300	20°	
KM2520SURCK09	AlGaInP	630	water clear	700	1200	20°	Subminiature Solid State Lamps Z-Bend Lead
KM2520SECK09	AlGaInP	605	water clear	1900	3500	20°	
KM2520CGCK09	AlGaInP	570	water clear	500	1000	20°	
KM2520QBC-D09	InGaN	465	water clear	500	1300	20°	


KM2520XXX03



Units: mm (inch)
Tolerance: ± 0.25 (0.01)


KM2520XXX09



Units: mm (inch)
Tolerance: ± 0.25 (0.01)

NOTE:
1. Luminous intensity value is traceable to CIE127-2007 standards.

Through-Hole LED

Kingbright through-hole LEDs are available with a variety of sizes, shapes, viewing angles, color combinations, lens types and brightness. Our extensive selection fulfills virtually any need in through-hole LED applications.

21 /
Round LED

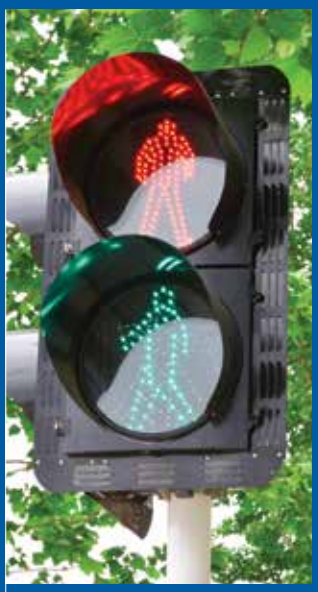
24 /
Oval LED

25 /
Flat Top LED

25 /
Rectangular LED

26 /
Cylindrical LED

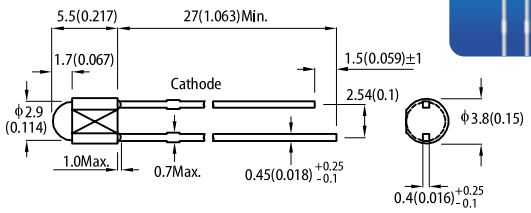
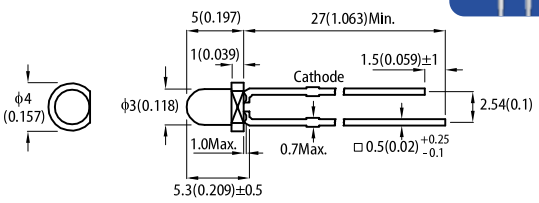
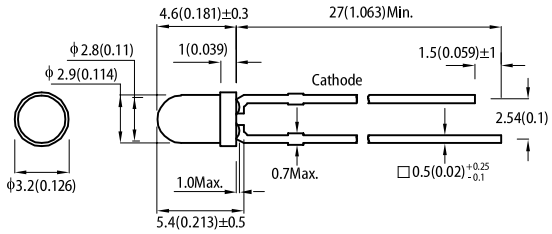
27 /
Multi-Color LED



29 /
Resistor LED

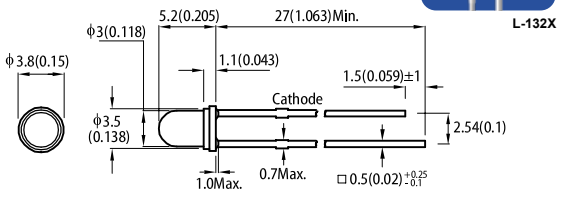
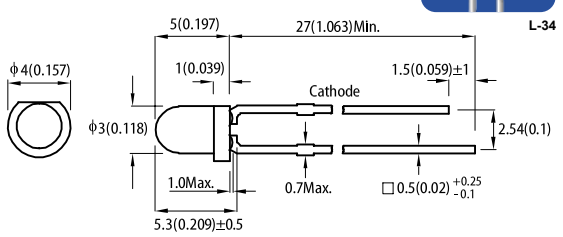
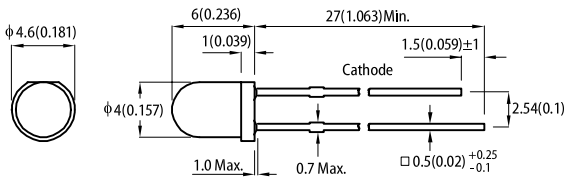
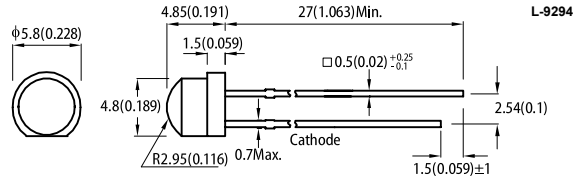
29 /
Low Current LED

ROUND LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-908A8ID	GaAsP/GaP	617	red diffused	6	15	60°	T-1 (3mm) Round  L-908A8 
L-908A8GD	GaP	568	green diffused	10	25	60°	
L-1154ID	GaAsP/GaP	617	red diffused	6	15	60°	T-1 (3mm) Round  L-1154 
L-1154SURDK	AlGaInP	630	red diffused	*120	*200	60°	
L-1154YD	GaAsP/GaP	588	yellow diffused	5	15	60°	
L-1154GD	GaP	568	green diffused	10	25	60°	
L-1154CGDK	AlGaInP	570	green diffused	*80	*120	60°	
L-7104ID	GaAsP/GaP	617	red diffused	10	20	50°	T-1 (3mm) Round  L-7104 
L-7104EC	GaAsP/GaP	617	water clear	12	30	30°	
L-7104ND	GaAsP/GaP	602	orange diffused	10	20	50°	
L-7104NC	GaAsP/GaP	602	water clear	12	30	30°	
L-7104YD	GaAsP/GaP	588	yellow diffused	8	15	50°	
L-7104GD	GaP	568	green diffused	10	25	50°	
L-7104GC	GaP	568	water clear	12	40	30°	
L-7104SRD-J4	AlGaInP	640	red diffused	*200	*500	50°	
L-7104SRC-J4	AlGaInP	640	water clear	*1000	*1500	30°	
L-7104SURDK	AlGaInP	630	red diffused	*120	*240	50°	
L-7104SURCK	AlGaInP	630	water clear	*400	*900	30°	
L-7104SURC-E	AlGaInP	630	water clear	*500	*1100	30°	
L-7104SECK-J3	AlGaInP	625	water clear	*2300	*3600	30°	
L-7104SECK	AlGaInP	605	water clear	*700	*1400	30°	
L-7104SECK-J4	AlGaInP	605	water clear	*3600	*6000	30°	
L-7104SYDK	AlGaInP	590	yellow diffused	*400	*800	50°	
L-7104SYCK	AlGaInP	590	water clear	*700	*1500	30°	
L-7104SYCK-J3	AlGaInP	590	water clear	*1900	*3000	30°	
L-7104SGD	GaP	568	green diffused	*18	*40	50°	
L-7104SGC	GaP	568	water clear	*30	*60	30°	
L-7104CGDK	AlGaInP	570	green diffused	*80	*250	50°	
L-7104CGCK	AlGaInP	570	water clear	*200	*500	30°	
L-7104ZGCK	InGaN	525	water clear	*8000	*14000	30°	
L-7104ZGC-G	InGaN	525	water clear	*10500	*16500	30°	
L-7104VBC-D	InGaN	470	water clear	*2100	*3700	30°	
L-7104QBC-D	InGaN	465	water clear	*900	*1600	30°	

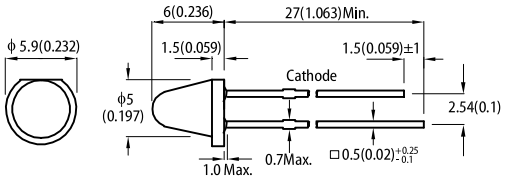
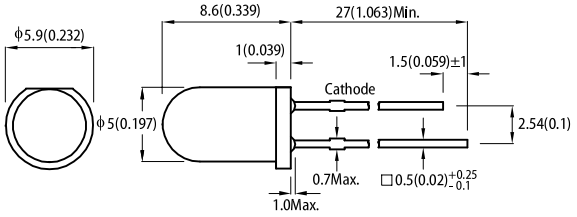
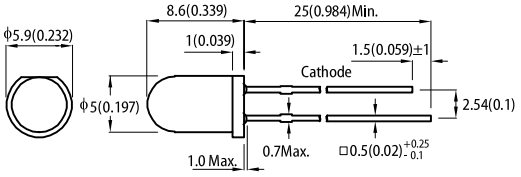
NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

ROUND LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-132XID	GaAsP/GaP	617	red diffused	8	16	60°	T-1 (3mm) Round  
L-132XSURTK	AlGaInP	630	red transparent	*200	*400	50°	
L-132XND	GaAsP/GaP	602	orange diffused	8	16	60°	
L-132XNT	GaAsP/GaP	602	orange transparent	10	20	50°	
L-132XYD	GaAsP/GaP	588	yellow diffused	6	15	60°	
L-132XYT	GaAsP/GaP	588	yellow transparent	10	20	50°	
L-132XGD	GaP	568	green diffused	15	25	60°	
L-34ID	GaAsP/GaP	617	red diffused	6	15	60°	T-1 (3mm) Round  
L-34SURDK	AlGaInP	630	red diffused	*100	*250	60°	
L-34YD	GaAsP/GaP	588	yellow diffused	8	15	60°	
L-34GD	GaP	568	green diffused	12	25	60°	
L-34CGCK	AlGaInP	570	water clear	*150	*400	50°	
L-34ZGC	InGaN	525	water clear	*4200	*6500	30°	
L-34QBC-D	InGaN	465	water clear	*800	*1500	30°	
L-43ID	GaAsP/GaP	617	red diffused	4	10	80°	4mm Round  
L-43YD	GaAsP/GaP	588	yellow diffused	5	10	80°	
L-43GD	GaP	568	green diffused	8	16	80°	
L-9294SURCK	AlGaInP	630	water clear	*100	*180	70°	5mm Round  
L-9294VBC-D	InGaN	470	water clear	*500	*1100	70°	

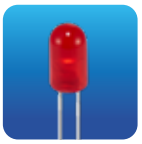
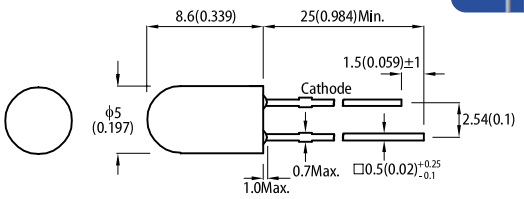
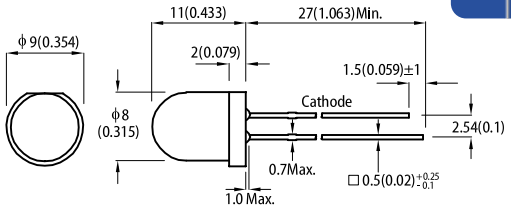
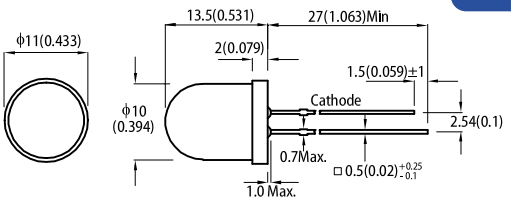
NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

ROUND LED

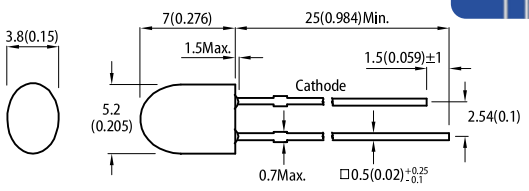
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-63ID	GaAsP/GaP	617	red diffused	8	12	60°	T-1 3/4 (5mm) Round  L-63 
L-63IT	GaAsP/GaP	617	red transparent	10	30	30°	
L-63GD	GaP	568	green diffused	8	16	60°	
L-7113ID	GaAsP/GaP	617	red diffused	18	40	30°	T-1 3/4 (5mm) Round  L-7113 
L-7113ED	GaAsP/GaP	617	orange diffused	18	40	30°	
L-7113EC	GaAsP/GaP	617	water clear	40	100	20°	
L-7113YD	GaAsP/GaP	588	yellow diffused	10	25	30°	
L-7113YC	GaAsP/GaP	588	water clear	30	80	20°	
L-7113GD	GaP	568	green diffused	15	30	30°	
L-7113GC	GaP	568	water clear	25	80	20°	
L-7113SRD-J4	AlGaInP	640	red diffused	*300	*600	30°	
L-7113SRC-J4	AlGaInP	640	water clear	*3300	*5000	20°	
L-7113SURDK	AlGaInP	630	red diffused	*300	*650	30°	
L-7113SURCK	AlGaInP	630	water clear	*900	*1300	20°	
L-7113SEC-J3	AlGaInP	625	water clear	*5000	*8000	20°	
L-7113SECK	AlGaInP	605	water clear	*1300	*2100	20°	
L-7113SYDK	AlGaInP	590	yellow diffused	*500	*1000	30°	
L-7113SYCK	AlGaInP	590	water clear	*1800	*3000	20°	
L-7113SYCK-J3	AlGaInP	590	water clear	*5000	*7800	20°	
L-7113SYC-J3	AlGaInP	590	water clear	*5100	*8000	20°	
L-7113CGDK	AlGaInP	570	green diffused	*50	*140	30°	
L-7113CGCK	AlGaInP	570	water clear	*700	*1400	20°	
L-7113ZGCK	InGaN	525	water clear	*14000	*26000	20°	
L-7113ZGC	InGaN	525	water clear	*15000	*27000	20°	
L-7113ZGC-G	InGaN	525	water clear	*18000	*30000	20°	
L-7113VBC-D	InGaN	470	water clear	*4300	*7000	20°	
L-7113QBC-D	InGaN	465	water clear	*3100	*4500	20°	
L-7143SURCK	AlGaInP	630	water clear	*500	*900	30°	T-1 3/4 (5mm) Round  L-7143 
L-7143SGC	GaP	568	water clear	*120	*300	30°	
L-7143VBC-D	InGaN	470	water clear	*1900	*3100	30°	
L-7143QBC-D	InGaN	465	water clear	*1600	*2700	30°	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

ROUND LED

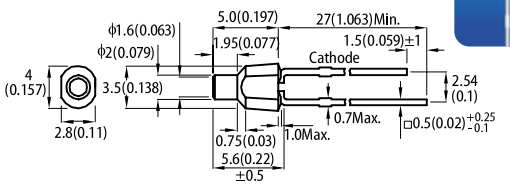
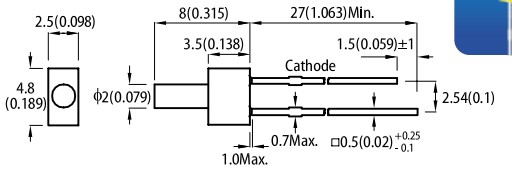
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-1503ID	GaAsP/GaP	617	red diffused	12	40	30°	T-1 3/4 (5mm) Round  L-1503 
L-1503SRC-J4	AlGaInP	640	water clear	*2500	*4300	20°	
L-1503SURDK	AlGaInP	630	red diffused	*400	*700	30°	
L-1503YD	GaAsP/GaP	588	yellow diffused	15	30	30°	
L-1503GD	GaP	568	green diffused	15	30	30°	
L-1503CGDK	AlGaInP	570	green diffused	*100	*200	30°	
L-793ID	GaAsP/GaP	617	red diffused	*30	*60	30°	8mm Round  L-793 
L-793GD	GaP	568	green diffused	*30	*60	30°	
L-813ID	GaAsP/GaP	617	red diffused	*36	*80	30°	10mm Round  L-813 
L-813SRC-J4	AlGaInP	640	water clear	*2500	*4000	15°	
L-813YD	GaAsP/GaP	588	yellow diffused	*18	*50	30°	
L-813GD	GaP	568	green diffused	*20	*60	30°	

OVAL LED

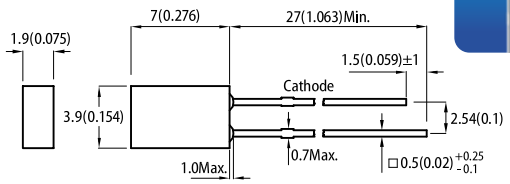
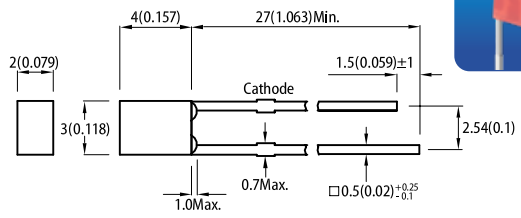
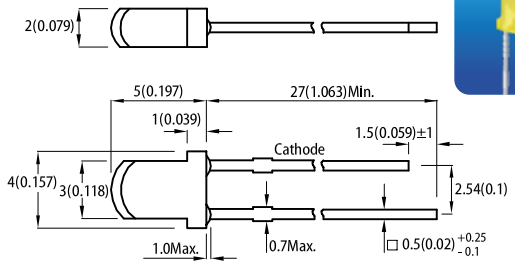
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-5603SURCK	AlGaInP	630	water clear	400	800	70°(H) 30°(V)	5.2mm Oval  L-5603 
L-5603SIDL/SD-J3	AlGaInP	625	red semi diffused	800	1400	80°(H) 40°(V)	
L-5603SYCK	AlGaInP	590	water clear	1000	1600	70°(H) 30°(V)	
L-5603ZGT	InGaN	525	green transparent	4200	7000	50°(H) 30°(V)	
L-5603QBC-D	InGaN	465	water clear	700	1400	50°(H) 30°(V)	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

FLAT TOP LED

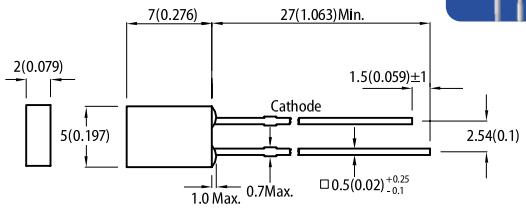
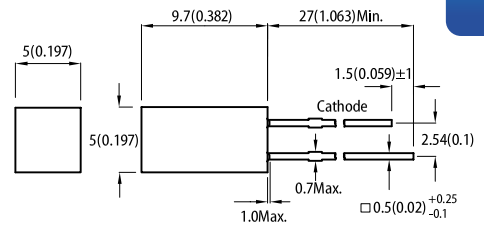
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-1034IDT	GaAsP/GaP	617	red diffused	2	4	140°	2mm Flat Top   L-1034
L-1034GDT	GaP	568	green diffused	2	5	140°	
L-13SURDK	AlGaInP	630	red diffused	*80	*200	50°	2mm Flat Top   L-13
L-13SYDK	AlGaInP	590	yellow diffused	*80	*200	50°	
L-13CGDK	AlGaInP	570	green diffused	*20	*40	50°	

RECTANGULAR LED

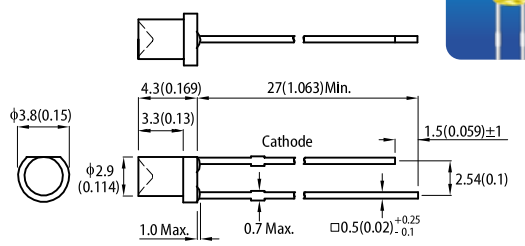
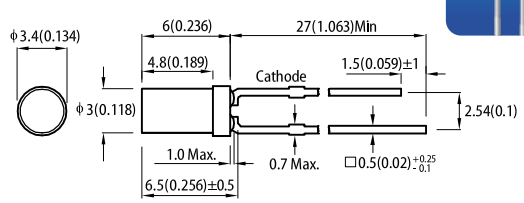
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-144IDT	GaAsP/GaP	617	red diffused	1.2	3	140°	1.9mm x 3.9mm Rectangular   L-144
L-144GDT	GaP	568	green diffused	2	6	140°	
L-914IDT	GaAsP/GaP	617	red diffused	1.2	4	140°	2mm x 3mm Rectangular   L-914
L-914GDT	GaP	568	green diffused	3	6	140°	
L-169XID	GaAsP/GaP	617	red diffused	8	14	60°	2mm x 3mm Rectangular   L-169X
L-169XYD	GaAsP/GaP	588	yellow diffused	5	10	60°	
L-169XGD	GaP	568	green diffused	8	15	60°	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

RECTANGULAR LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-113IDT	GaAsP/GaP	617	red diffused	2	4	140°	2mm x 5mm Rectangular  
L-113YDT	GaAsP/GaP	588	yellow diffused	1.2	4	140°	
L-113SYDTK	AlGaInP	590	yellow diffused	*70	*120	140°	
L-113GDT	GaP	568	green diffused	1.2	5	140°	
L-113CGDTK	AlGaInP	570	green diffused	*10	*30	140°	
L-1553IDT	GaAsP/GaP	617	red diffused	2	5	140°	5mm x 5mm Square  
L-1553YDT	GaAsP/GaP	588	yellow diffused	1.5	5	140°	
L-1553SYDTK	AlGaInP	590	yellow diffused	*80	*180	140°	
L-1553GDT	GaP	568	green diffused	3	6	140°	

CYLINDRICAL LED

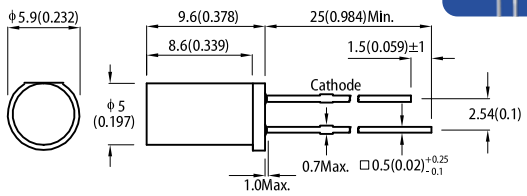
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-47XEC	GaAsP/GaP	617	water clear	4	8	100°	T-1 (3mm) Cylindrical  
L-47XYT	GaAsP/GaP	588	yellow transparent	2	4	100°	
L-424IDT	GaAsP/GaP	617	red diffused	1.2	4	140°	T-1 (3mm) Cylindrical  
L-424YDT	GaAsP/GaP	588	yellow diffused	1.2	3	140°	
L-424GDT	GaP	568	green diffused	2	6	140°	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

CYLINDRICAL LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-483IDT	GaAsP/GaP	617	red diffused	1.2	4	140°	T-1 3/4 (5mm) Cylindrical
L-483YDT	GaAsP/GaP	588	yellow diffused	1.2	3	140°	
L-483GDT	GaP	568	green diffused	1.5	3	140°	

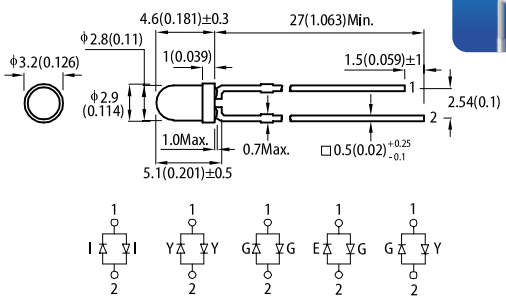
L-483



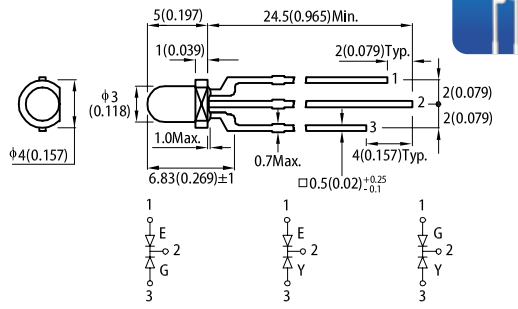
MULTI-COLOR LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-937IID	GaAsP/GaP	617	red diffused	2	4	60°	T-1 (3mm) Round
	GaAsP/GaP	617		2	4		
L-937YYD	GaAsP/GaP	588	yellow diffused	3	9	60°	
	GaAsP/GaP	588		3	9		
L-937GGD	GaP	568	green diffused	4	10	60°	
	GaP	568		4	10		
L-937EGW	GaAsP/GaP	617	white diffused	4	10	60°	
	GaP	568		6	14		
L-937GYW	GaP	568	white diffused	6	14	60°	
	GaAsP/GaP	588		4	8		
L-115VEGW-BBTS	GaAsP/GaP	617	white diffused	8	20	60°	T-1 (3mm) Round
	GaP	568		10	30		
L-115VEYW-BBTS	GaAsP/GaP	617	white diffused	8	20	60°	
	GaAsP/GaP	588		10	24		
L-115VGYW-BBTS	GaP	568	white diffused	10	30	60°	
	GaAsP/GaP	588		10	24		
L-3VEGW	GaAsP/GaP	617	white diffused	10	30	60°	T-1 (3mm) Round
	GaP	568		20	40		
L-3VGYW-DTS	GaP	568	white diffused	15	40	60°	
	GaAsP/GaP	588		10	15		
L-3VSURKCGKC	AlGaInP	630	water clear	100	400	30°	
	AlGaInP	570		200	400		

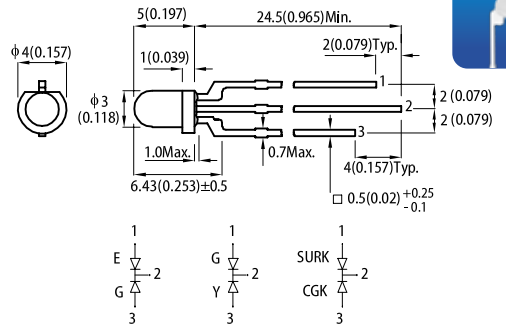
L-937



L-115V

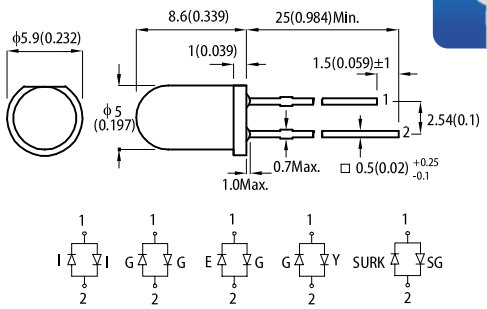
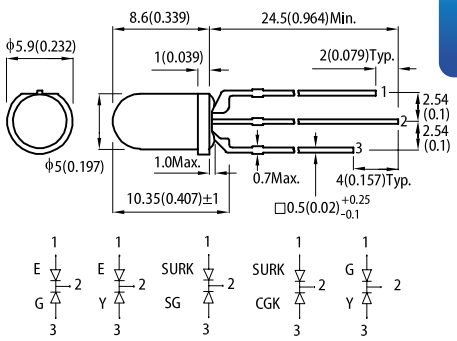
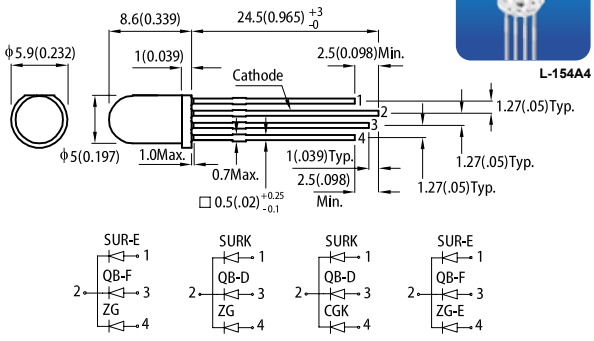
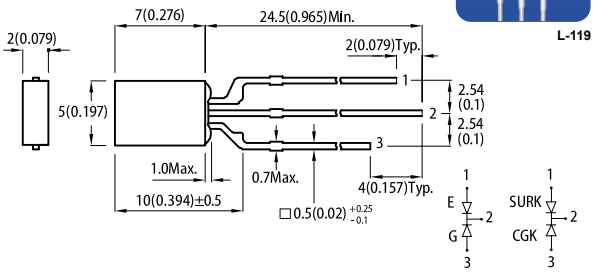


L-3V



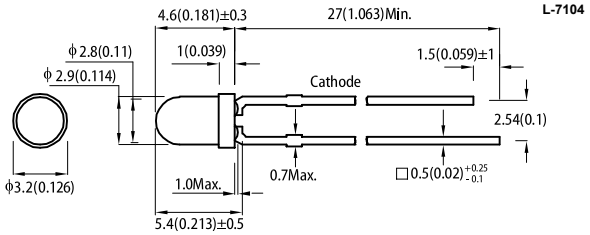
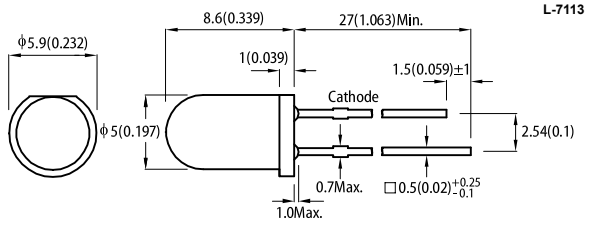
NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

MULTI-COLOR LED

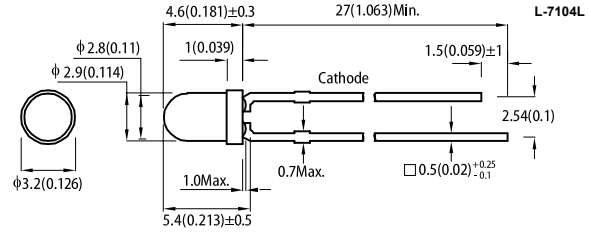
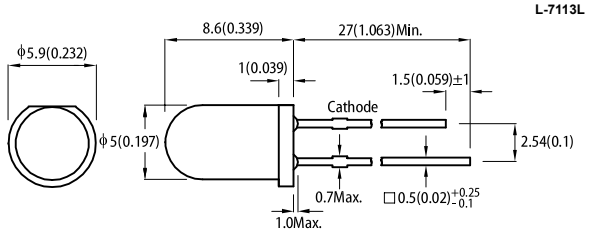
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-57IID	GaAsP/GaP	617	red diffused	4	12	30°	T-1 3/4 (5mm) Round  L-57 
	GaAsP/GaP	617		4	12		
L-57GGD	GaP	568	green diffused	8	20	30°	
	GaP	568		8	20		
L-57EGW	GaAsP/GaP	617	white diffused	6	14	30°	
	GaP	568		12	30		
L-57GYW	GaP	568	white diffused	12	30	30°	
	GaAsP/GaP	588		4	10		
L-57SURKSGW	AlGaInP	630	white diffused	80	150	30°	
	GaP	568		12	30		
L-59EGW	GaAsP/GaP	617	white diffused	20	40	30°	T-1 3/4 (5mm) Round  L-59 
	GaP	568		20	60		
L-59EYW	GaAsP/GaP	617	white diffused	20	40	30°	
	GaAsP/GaP	588		20	40		
L-59SURKSGW	AlGaInP	630	white diffused	200	400	30°	
	GaP	568		20	60		
L-59SURKCGKW	AlGaInP	630	white diffused	200	400	30°	
	AlGaInP	570		80	180		
L-59EGC	GaAsP/GaP	617	water clear	50	100	20°	
	GaP	568		50	120		
L-59GYC	GaP	568	water clear	50	120	20°	
	GaAsP/GaP	588		40	80		
L-59SURKSGC	AlGaInP	630	water clear	600	1200	20°	
	GaP	568		50	120		
L-154A4SUREQBFZGC	AlGaInP	630	water clear	200	400	50°	T-1 3/4 (5mm) Full color  L-154A4 
	InGaN	465		400	900		
	InGaN	525		1900	3600		
L-154A4SURKQBDZGW	AlGaInP	630	white diffused	100	200	60°	
	InGaN	465		120	300		
	InGaN	525		600	1300		
L-154A4SURKQBDCGKW	AlGaInP	630	white diffused	100	200	60°	
	InGaN	465		120	300		
	AlGaInP	570		80	150		
L-154A4SUREQBFZGEW	AlGaInP	630	white diffused	120	250	60°	
	InGaN	465		300	500		
	InGaN	525		900	1700		
L-119EGWT	GaAsP/GaP	617	white diffused	4	10	140°	2mm x 5mm Rectangular  L-119 
	GaP	568		3	9		
L-119SURKCGKWT	AlGaInP	630	white diffused	30	55	140°	
	AlGaInP	570		15	30		

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

RESISTOR LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) V=5V *V=12V		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-7104ID-5V	GaAsP/GaP	617	red diffused	6	14	50°	T-1 (3mm) Round  
L-7104ID-12V	GaAsP/GaP	617	red diffused	*2	*5	50°	
L-7104GD-5V	GaP	568	green diffused	12	25	50°	
L-7104GD-12V	GaP	568	green diffused	6*	*15	50°	
L-7113ID-5V	GaAsP/GaP	617	red diffused	12	25	30°	T-1 3/4 (5mm) Round  
L-7113ID-12V	GaAsP/GaP	617	red diffused	*10	*20	30°	
L-7113GD-5V	GaP	568	green diffused	15	25	30°	
L-7113GD-12V	GaP	568	green diffused	*8	*20	30°	

LOW CURRENT LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @2mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-7104LID	GaAsP/GaP	617	red diffused	0.5	1.2	50°	T-1 (3mm) Round  
L-7104LYD	GaAsP/GaP	588	yellow diffused	0.8	3	50°	
L-7104LGD	GaP	568	green diffused	1	3	50°	
L-7113LID	GaAsP/GaP	617	red diffused	0.7	2	30°	T-1 3/4 (5mm) Round  
L-7113LYD	GaAsP/GaP	588	yellow diffused	1	3	30°	
L-7113LGD	GaP	568	green diffused	1.2	3	30°	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

SMD Display

Kingbright's SMD LED display products are designed for applications that require character and text displays. Whether an ultra thin, 7-segment, or alphanumeric SMD display is required for healthcare, consumer electronics, industrial devices or handheld devices, our products will meet your needs.

Through-Hole Display

Through-hole displays have been a widely adopted solution for message displaying and status level indication.
Kingbright's options for through-hole displays include 7-segment, dot-matrix, light bar, and bar graph.
With a variety of sizes and color selections available in each option, Kingbright through-hole displays are able to fulfill various design needs.

31 /
7-Segment
SMD Display

34 /
Alphanumeric
SMD Display

35 /
Single Digit 7-Segment
Through-Hole Display

37 /
Dual Digit 7-Segment
Through-Hole Display

37 /
Dot Matrix

38 /
Bar Graph Array

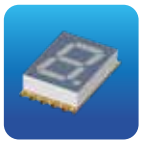
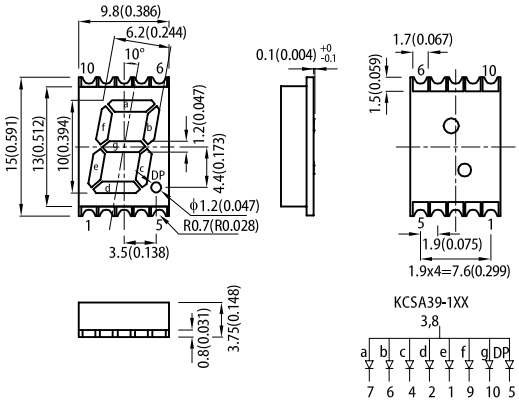
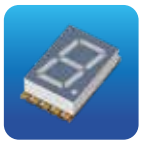
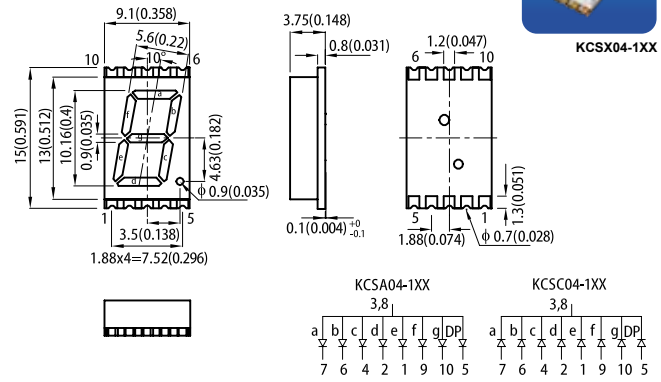
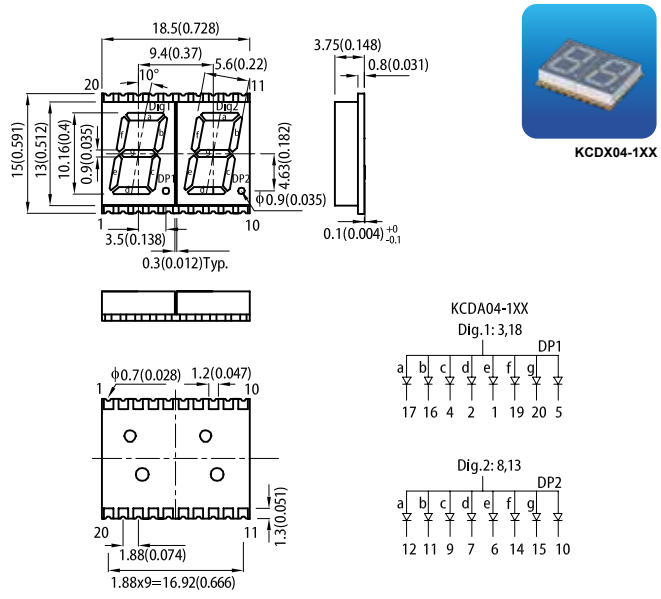
38 /
Light Bar

7-SEGMENT SMD DISPLAY

Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimensions
Common Anode	Common Cathode			Min.	Typ.	
KCSA02-105 KCDA02-105	KCSC02-105 KCDC02-105	AlGaInP	630	3600	8100	0.2 inch (5.08mm), Gray Face, White Segment
KCDA02-107	/	AlGaInP	590	5600	15000	
KCSA02-123 KCDA02-123	KCSC02-123 KCDC02-123	AlGaInP	570	2200	4300	
KCSA03-105 KCDA03-105	KCSC03-105 KCDC03-105	AlGaInP	630	3600	6400	0.3 inch (7.62mm), Gray Face, White Segment
KCSA03-106 KCDA03-106	KCSC03-106	AlGaInP	605	5600	11000	
KCSA03-107	KCDC03-107	AlGaInP	590	5600	13000	
KCSA03-123 KCDA03-123	KCSC03-123	AlGaInP	570	1400	3100	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

7-SEGMENT SMD DISPLAY

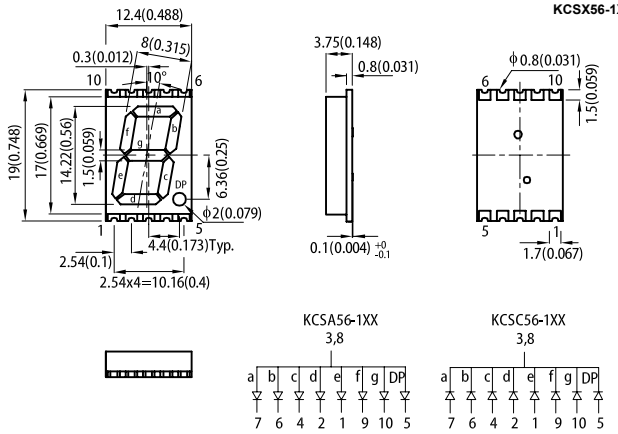
Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimensions
Common Anode	Common Cathode			Min.	Typ.	
KCSA39-105	/	AlGaInP	630	3600	9000	0.39 inch (10mm), Gray Face, White Segment  KCSA39-1XX 
KCSA04-105 KCDA04-105	KCSC04-105	AlGaInP	630	9000	20000	0.4 inch (10.16mm) Gray Face, White Segment  KCSX04-1XX 
KCSA04-106 KCDA04-106	KCSC04-106	AlGaInP	605	9000	15000	
KCSA04-107	/	AlGaInP	590	9000	23000	 KCDX04-1XX 
KCSA04-123 KCDA04-123	KCSC04-123	AlGaInP	570	2200	4100	
KCSA04-131 KCDA04-131	/	InGaN	465	3600	8800	

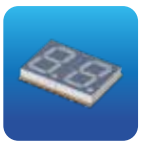
NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

7-SEGMENT SMD DISPLAY

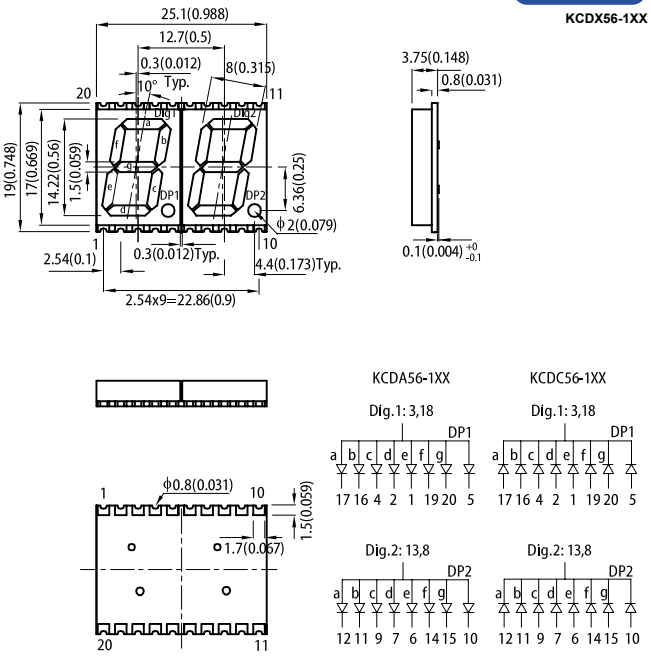
Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimensions
Common Anode	Common Cathode			Min.	Typ.	
KCSA56-105 KCDA56-105	KCSC56-105 KCDC56-105	AlGaInP	630	14000	29000	0.56 inch (14.22mm), Gray Face, White Segment
KCSA56-106 KCDA56-106	KCSC56-106	AlGaInP	605	14000	23000	
KCSA56-107	KCSC56-107	AlGaInP	590	14000	29000	
KCSA56-123 KCDA56-123	KCSC56-123	AlGaInP	570	2200	4600	
KCSA56-131 KCDA56-131	KCSC56-131	InGaN	465	5600	15000	

KCSX56-1XX





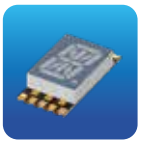
KCDX56-1XX

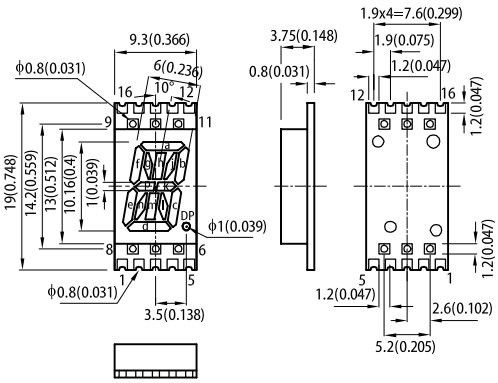


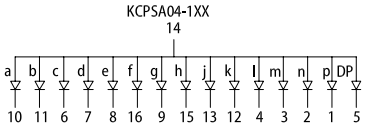
NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

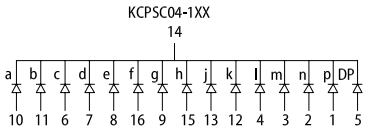
ALPHANUMERIC SMD DISPLAY

Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimensions
Common Anode	Common Cathode			Min.	Typ.	
KCPSA04-105 KCPDA04-105	KCPSC04-105	AlGaInP	630	3600	8300	0.4 inch (10.16mm), Gray Face, White Segment
/	KCPSC04-106	AlGaInP	605	5600	13000	
KCPSA04-107	/	AlGaInP	590	5600	12000	
/	KCPDC04-123	AlGaInP	570	1400	3100	

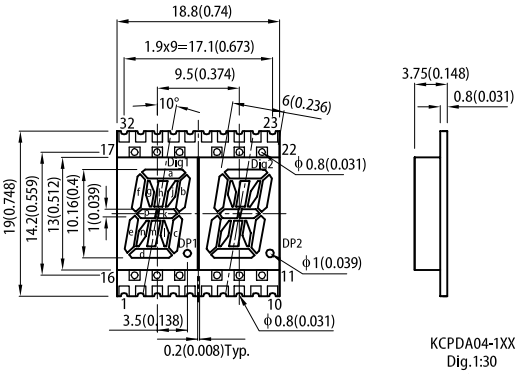

KCPSX04-1XX

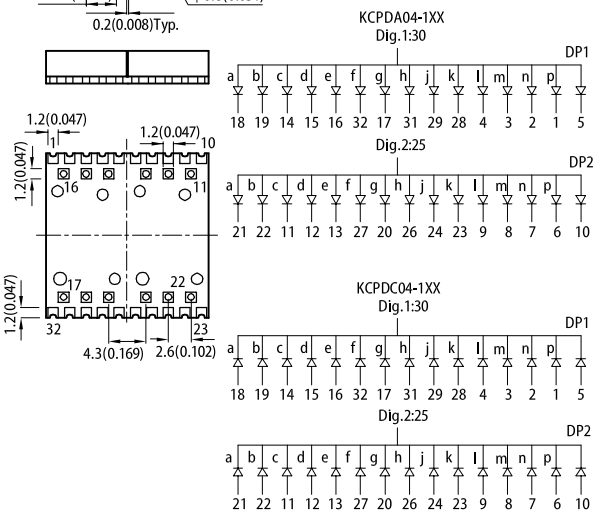







KCPDX04-1XX

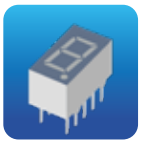


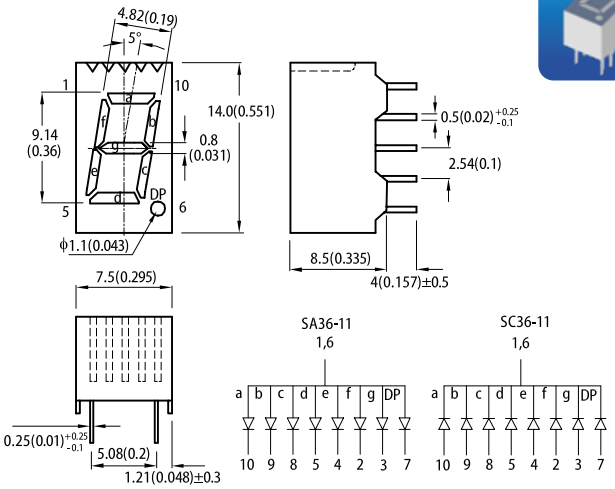


NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

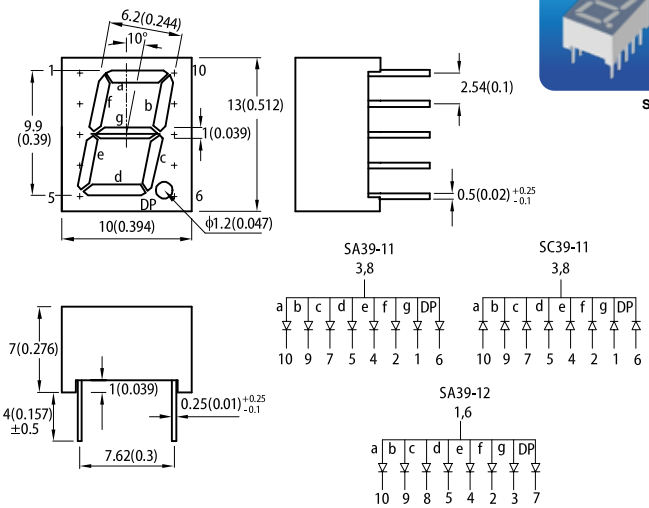
SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

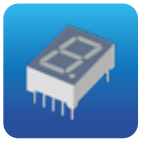
Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimensions
Common Anode	Common Cathode			Min.	Typ.	
SA36-11SEKWA	SC36-11SEKWA	AlGaInP	605	5600	14000	0.36 inch (9.14mm), Gray Face, White Segment
SA36-11SURKWA	SC36-11SURKWA	AlGaInP	630	3600	9000	
SA36-11CGKWA	SC36-11CGKWA	AlGaInP	570	1400	3700	
SA39-11SURKWA SA39-12SURKWA	SC39-11SURKWA	AlGaInP	630	5600	12000	0.39 inch (9.9mm), Gray Face, White Segment
SA52-11SEKWA	/	AlGaInP	605	21000	48000	0.52 inch (13.2mm), Gray Face, White Segment
SA52-11SURKWA	/	AlGaInP	630	14000	32000	

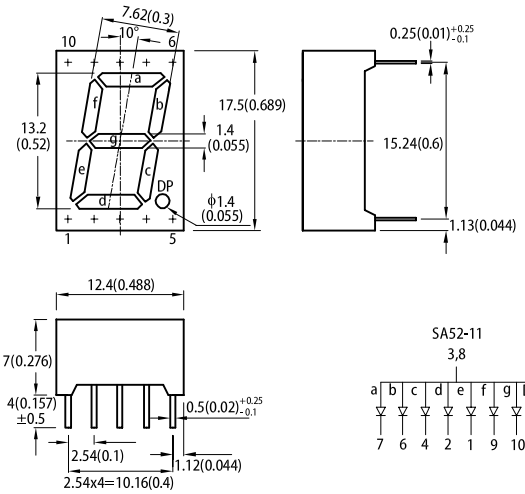

SX36




SX39

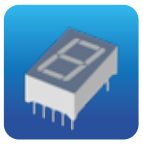
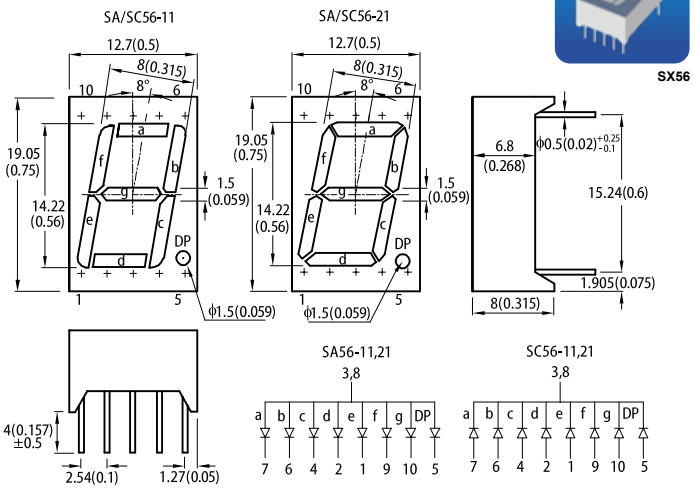
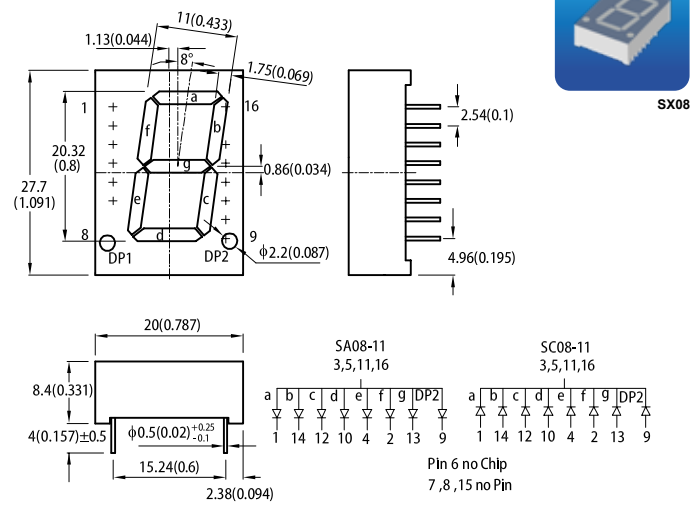
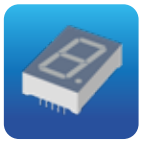
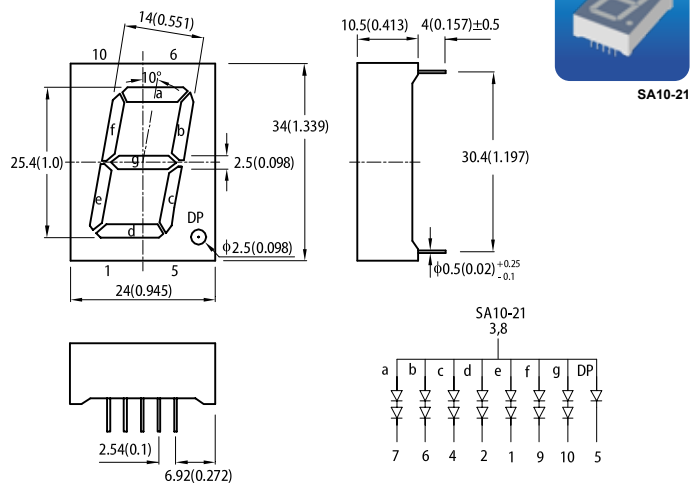



SA52-11



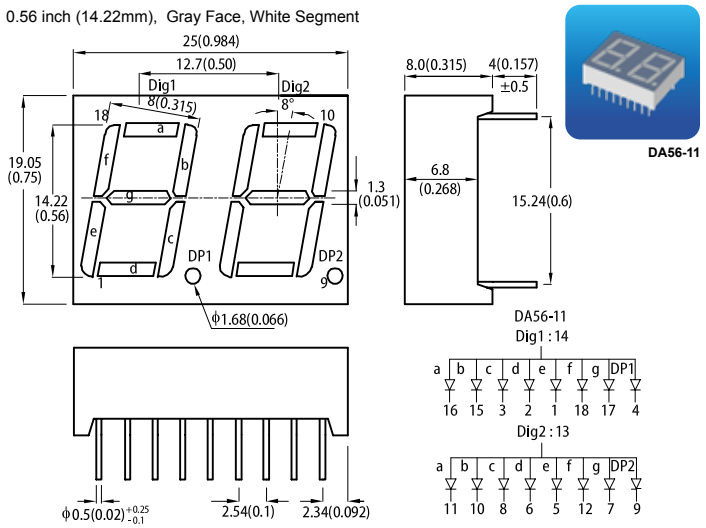
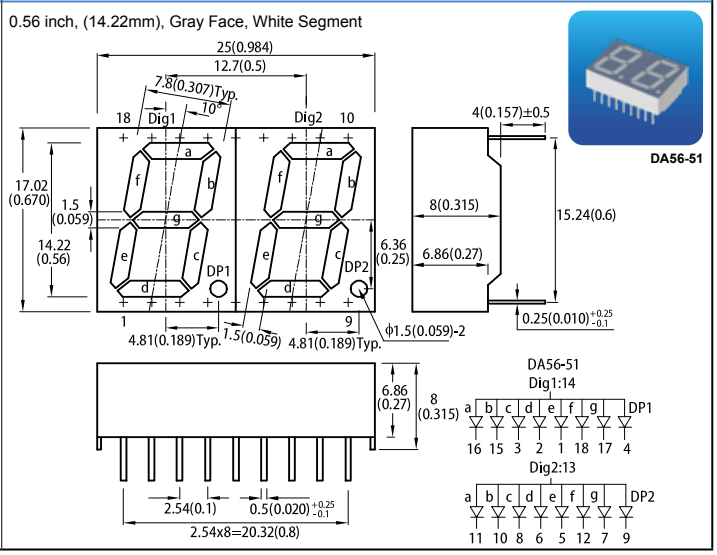
NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

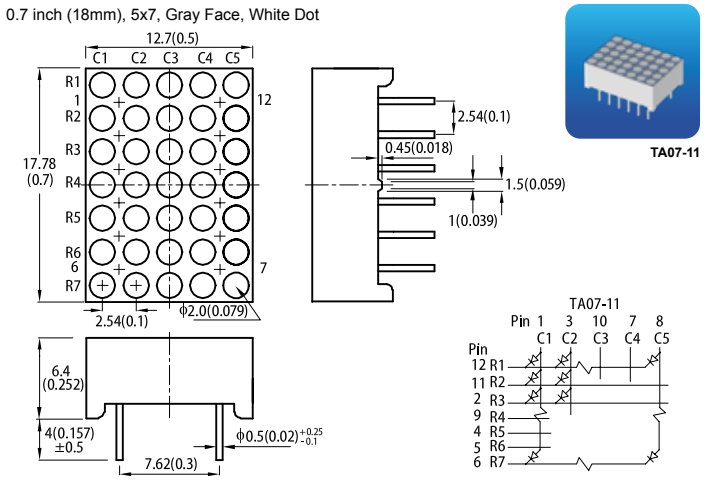
Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimensions
Common Anode	Common Cathode			Min.	Typ.	
SA56-11SURKWA SA56-21SURKWA	SC56-11SURKWA SC56-21SURKWA	AlGaInP	630	14000	27000	0.56 inch (14.2mm), Gray Face, White Segment  SX56 
／	SC56-11SYKWA SC56-21SYKWA	AlGaInP	590	21000	48000	
SA56-11CGKWA	SC56-11CGKWA	AlGaInP	570	5600	12000	
SA08-11SURKWA	SC08-11SURKWA	AlGaInP	630	9000	19000	0.8 inch (20.32mm), Gray Face, White Segment  SX08 
／	SC08-11SYKWA	AlGaInP	590	9000	18000	
SA08-11CGKWA	／	AlGaInP	570	3600	8700	
SA10-21SURKWA	／	AlGaInP	630	31000	70000	1.0 inch (25.4mm), Gray Face, White Segment  SA10-21 
SA10-21CGKWA	／	AlGaInP	570	14000	33000	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

DUAL DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

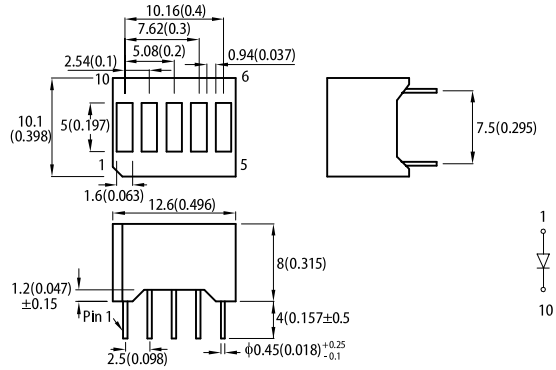
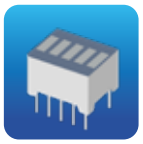
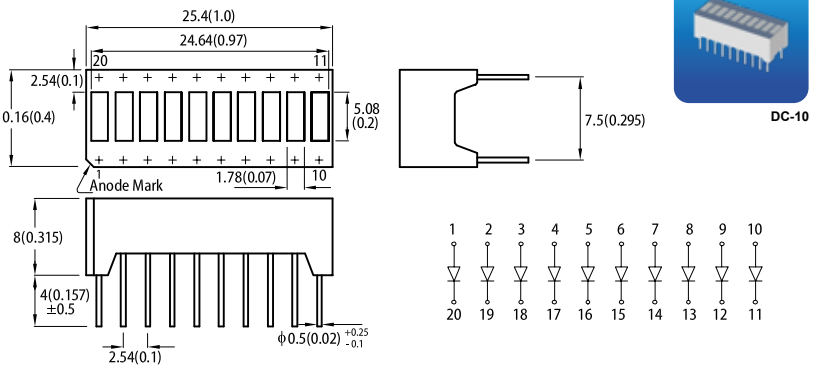
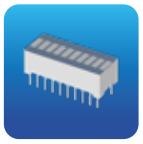
Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimensions
Common Anode	Common Cathode			Min.	Typ.	
DA56-11SYKWA	/	AlGaInP	590	21000	40000	0.56 inch (14.22mm), Gray Face, White Segment 
DA56-51SURKWA	/	AlGaInP	630	14000	30000	0.56 inch, (14.22mm), Gray Face, White Segment 

DOT MATRIX

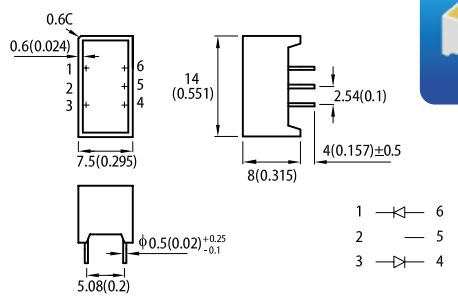
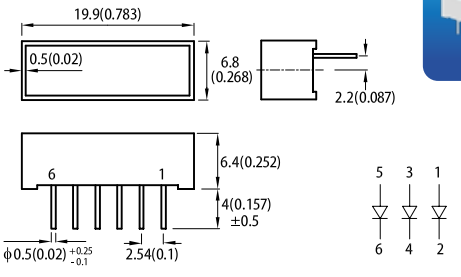
Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimensions
Column Anode	Column Cathode			Min.	Typ.	
TA07-11SEKWA	/	AlGaInP	605	21000	42000	0.7 inch (18mm), 5x7, Gray Face, White Dot 
TA07-11SURKWA	/	AlGaInP	630	14000	24000	
TA07-11CGKWA	/	AlGaInP	570	5600	12000	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

BAR GRAPH ARRAY

Part Number	Material	λD (nm)	Iv (ucd) @10mA Min.	Iv (ucd) @10mA Typ.	Dimensions
DC-05YWA	GaAsP/GaP	588	900	2400	5 Segments, Bar Graph Array, Gray Face, White Segment   DC-05
DC-05GWA	GaP	568	1400	4000	
DC-10SURKWA	AlGaInP	630	9000	25000	10 Segments, Bar Graph Array, Gray Face, White Segment   DC-10
DC-10SYKWA	AlGaInP	590	9000	21000	
DC-10CGKWA	AlGaInP	570	3600	8000	

LIGHT BAR

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA Min.	Iv (mcd) @20mA Typ.	Dimensions
DE/2SYKD	AlGaInP	590	yellow diffused	120	300	7.5mm x 14mm   DE/2
DF-3SURKD	AlGaInP	630	red diffused	80	160	6.8mm x 19.9mm   DF-3
DF-3CGKD	AlGaInP	570	green diffused	55	94	

NOTES:
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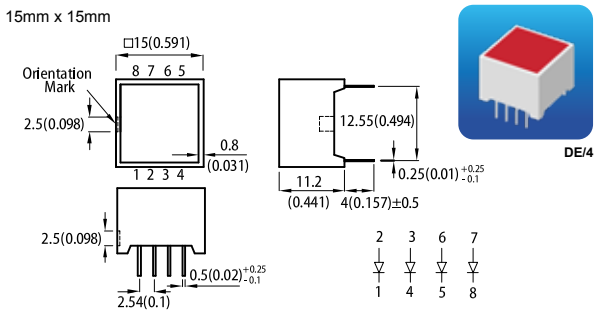
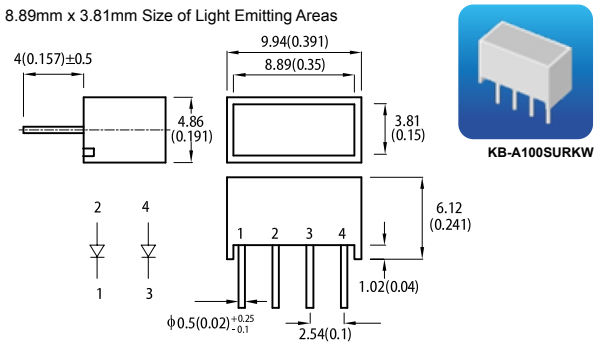
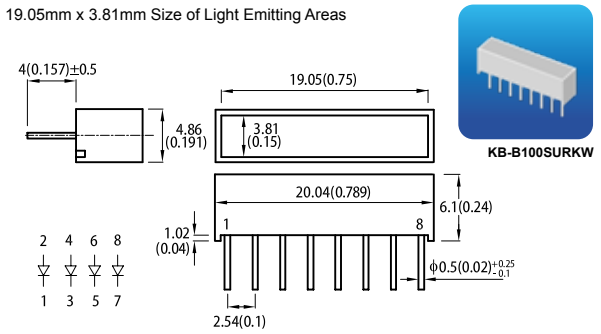
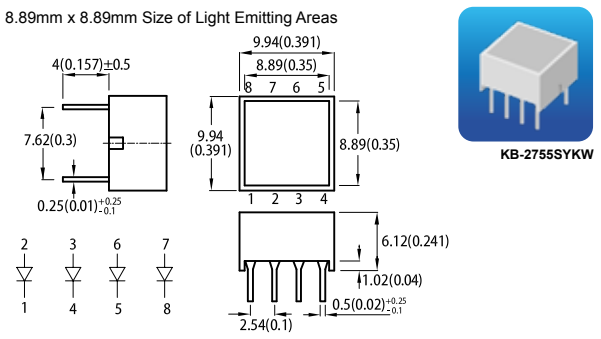
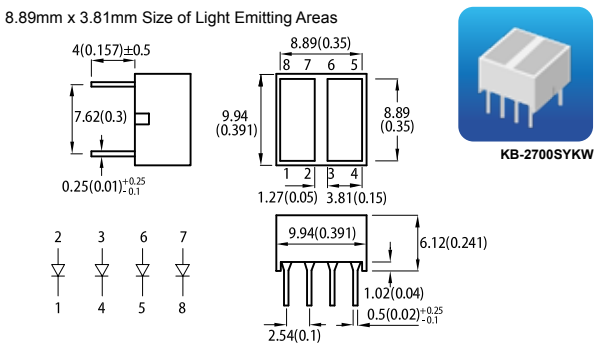
3. Luminous intensity value is traceable to CIE127-2007 standards.

LIGHT BAR

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Dimensions
				Min.	Typ.	
DE/4SURKD	AlGaInP	630	red diffused	120	250	15mm x 15mm  DE/4
DE/4SYKD	AlGaInP	590	yellow diffused	120	250	
DE/4CGKD	AlGaInP	570	green diffused	40	77	
KB-A100SURKW	AlGaInP	630	white diffused	40	75	8.89mm x 3.81mm Size of Light Emitting Areas  KB-A100SURKW
KB-2400SYKW	AlGaInP	590	white diffused	40	80	
KB-B100SURKW	AlGaInP	630	white diffused	55	100	19.05mm x 3.81mm Size of Light Emitting Areas  KB-B100SURKW
KB-2755SYKW	AlGaInP	590	white diffused	80	220	8.89mm x 8.89mm Size of Light Emitting Areas  KB-2755SYKW
KB-2855CGKD	AlGaInP	570	green diffused	20	48	
KB-2700SYKW	AlGaInP	590	white diffused	55	120	8.89mm x 3.81mm Size of Light Emitting Areas  KB-2700SYKW

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

Circuit Board Indicator

Commonly used as panel or diagnostic indicators, Kingbright's circuit board indicators are perfect for any number of applications ranging from diagnostic, industrial equipment, and data storage applications. Each circuit board indicator comes in a variety of configurations and colors that meets the specifications of your application.

41 /
Single-Level CBI

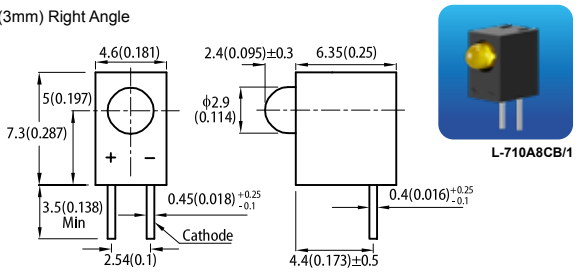
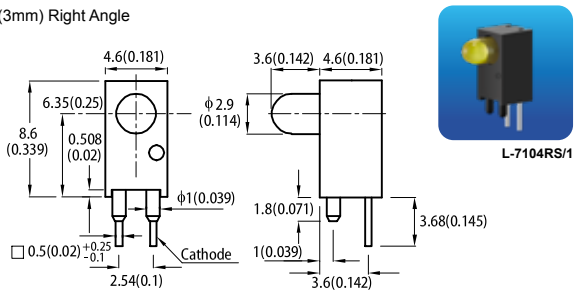
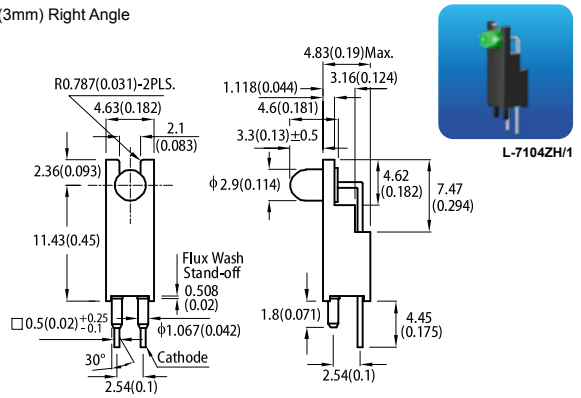
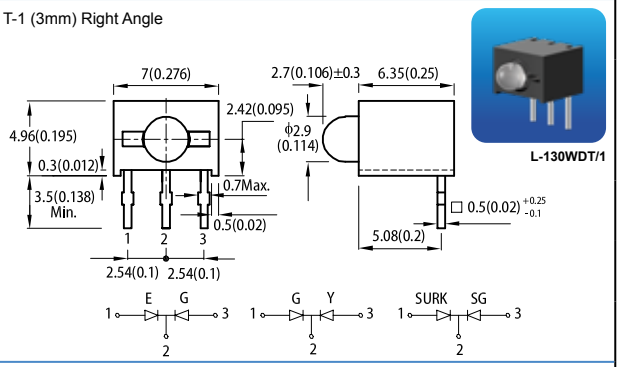
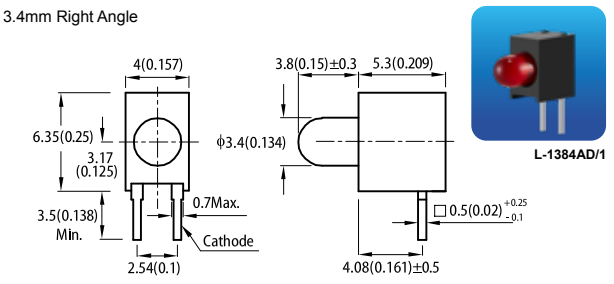
42 /
Bi-Level CBI

44 /
Tri-Level CBI

45 /
Quad-Level CBI

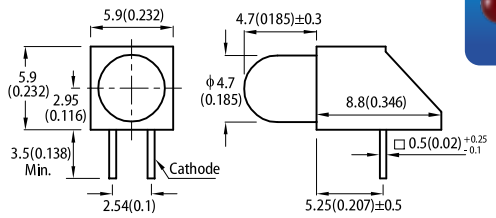
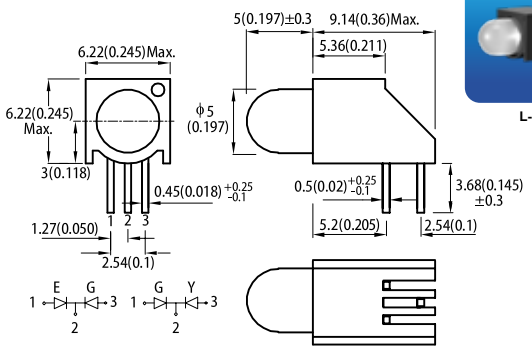
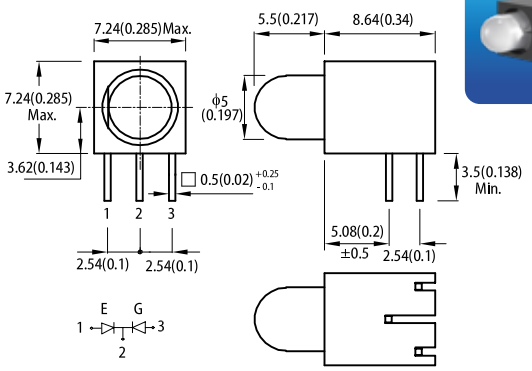
45 /
SMD CBI

SINGLE-LEVEL CBI

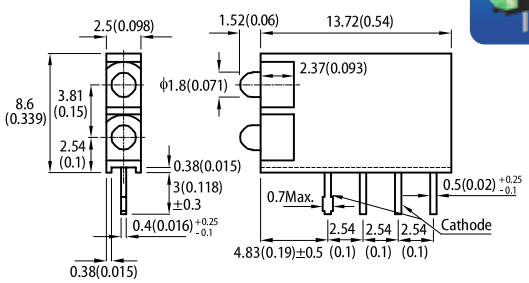
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-710A8CB/1ID	GaAsP/GaP	617	red diffused	6	12	50°	T-1 (3mm) Right Angle 
L-710A8CB/1YD	GaAsP/GaP	588	yellow diffused	6	15	50°	
L-710A8CB/1GD	GaP	568	green diffused	8	25	50°	
L-7104RS/1YD	GaAsP/GaP	588	yellow diffused	8	15	50°	T-1 (3mm) Right Angle 
L-7104RS/1GD	GaP	568	green diffused	10	25	50°	
L-7104ZH/1ID	GaAsP/GaP	617	red diffused	10	20	50°	T-1 (3mm) Right Angle 
L-7104ZH/1YD	GaAsP/GaP	588	yellow diffused	8	15	50°	
L-7104ZH/1GD	GaP	568	green diffused	10	25	50°	
L-130WDT/1EGW	GaAsP/GaP	617	white diffused	*10	*24	60°	T-1 (3mm) Right Angle 
	GaP	568		*12	*30		
L-130WDT/1GYW	GaP	568	white diffused	*18	*40	60°	
	GaAsP/GaP	588		*10	*20		
L-130WDT/ 1SURKSGW-DTS	AlGaInP	630	white diffused	*100	*200	60°	
	GaP	568		*12	*30		
L-1384AD/1ID	GaAsP/GaP	617	red diffused	8	16	60°	3.4mm Right Angle 
L-1384AD/1YD	GaAsP/GaP	588	yellow diffused	8	15	60°	
L-1384AD/1GD	GaP	568	green diffused	10	20	60°	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

SINGLE-LEVEL CBI

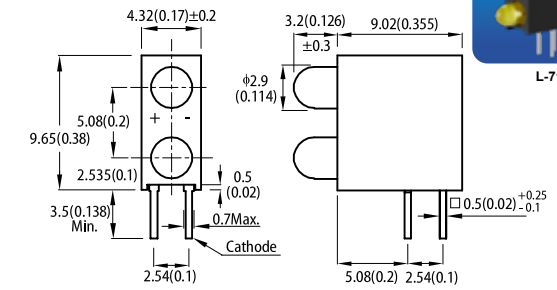
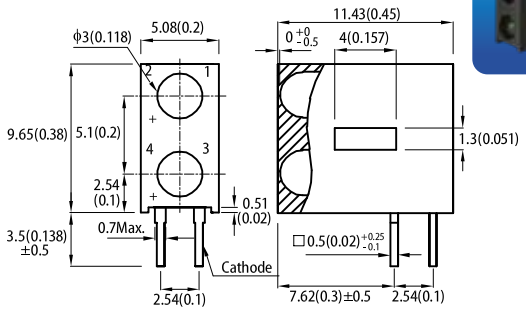
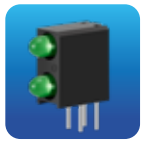
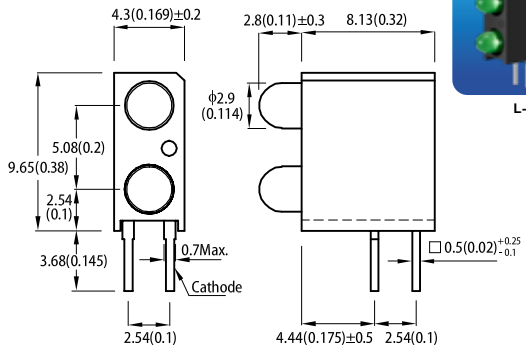
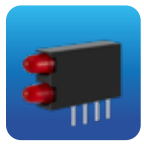
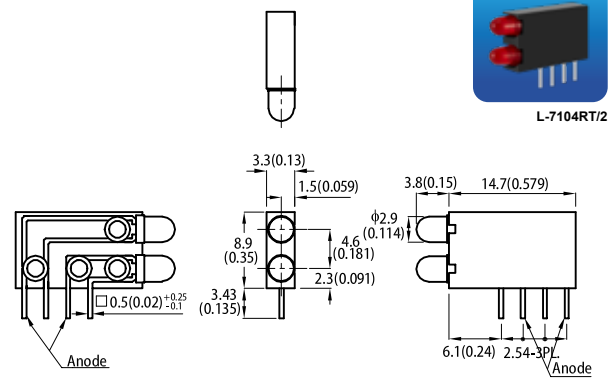
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-1533BQ/1ID	GaAsP/GaP	617	red diffused	12	30	30°	4.7mm Right Angle  
L-1533BQ/1GD	GaP	568	green diffused	20	50	30°	
L-150A9VS/1EGW	GaAsP/GaP	617	white diffused	*12	*30	40°	T-1 3/4 (5mm) Right Angle  
	GaP	568		*18	*50		
L-150A9VS/1GYW	GaP	568	white diffused	*18	*50	40°	
	GaAsP/GaP	588		*8	*20		
L-59BL/1EGW	GaAsP/GaP	617	white diffused	*20	*40	30°	T-1 3/4 (5mm) Right Angle  
	GaP	568		*20	*60		

BI-LEVEL CBI

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-4060VH/2ID	GaAsP/GaP	617	red diffused	4	8	70°	1.8mm Bi-Level  
L-4060VH/2YD	GaAsP/GaP	588	yellow diffused	4	8	70°	
L-4060VH/2GD	GaP	568	green diffused	6	12	70°	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

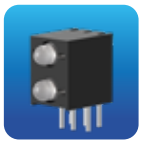
BI-LEVEL CBI

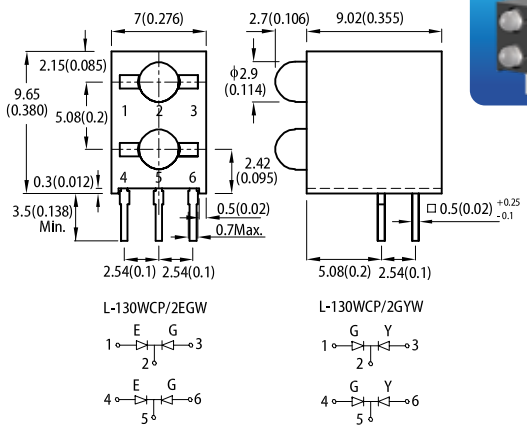
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-7104EB/2ID	GaAsP/GaP	617	red diffused	10	20	50°	T-1 (3mm) Bi-Level  L-7104EB/2 
L-7104EB/2YD	GaAsP/GaP	588	yellow diffused	8	15	50°	
L-7104EB/2GD	GaP	568	green diffused	10	25	50°	
L-7104GO/2GD	GaP	568	green diffused	10	25	50°	T-1 (3mm) Bi-Level  L-7104GO/2 
L-7104MD/1G1ID	GaP	568	green diffused	10	25	50°	T-1 (3mm) Bi-Level  L-7104MD/2 
	GaP	617	red diffused	10	20	50°	
L-7104MD/2YD	GaAsP/GaP	588	yellow diffused	8	15	50°	
L-7104MD/2GD	GaP	568	green diffused	10	25	50°	
L-7104RT/2ID	GaAsP/GaP	617	red diffused	10	20	50°	T-1 (3mm) Bi-Level  L-7104RT/2 
L-7104RT/1G1YD	GaP	568	green diffused	10	25	50°	
	GaAsP/GaP	588	yellow diffused	8	15	50°	

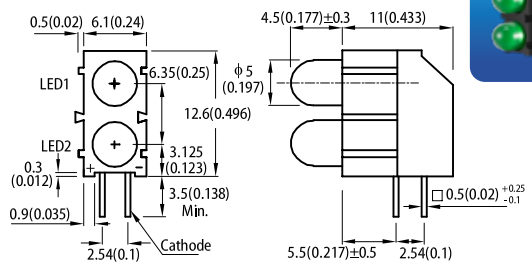
NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

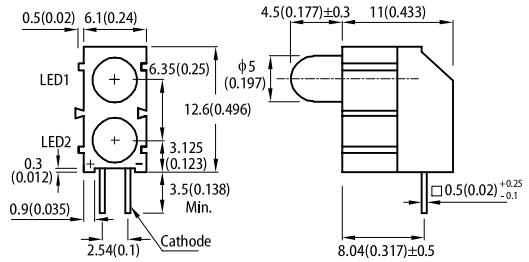
BI-LEVEL CBI

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA *20mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-130WCP/2EGW	GaAsP/GaP	617	white diffused	*10	*24	60°	T-1(3mm) Bi-Level
	GaP	568		*12	*30		
L-130WCP/2GYW	GaP	568	white diffused	*18	*40	60°	
	GaAsP/GaP	588		*10	*20		
L-1503EB/1I1YD	GaAsP/GaP	617	red diffused	12	40	30°	T-1 3/4 (5mm) Bi-Level
	GaAsP/GaP	588	yellow diffused	15	30	30°	
L-1503EB/1G1XD	GaP	568	green diffused	15	30	30°	L-1503EB/1G1XD
L-1503EB/2GD	GaP	568	green diffused	15	30	30°	



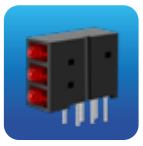


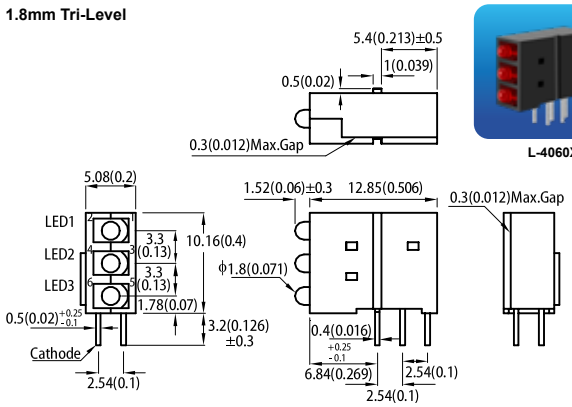




TRI-LEVEL CBI

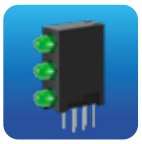
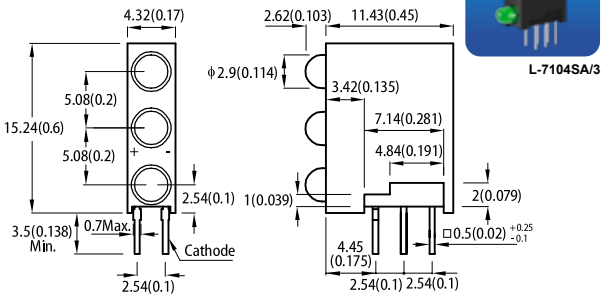
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-4060XHA/3ID	GaAsP/GaP	617	red diffused	4	8	70°	1.8mm Tri-Level
L-4060XHA/3YD	GaAsP/GaP	588	yellow diffused	4	8	70°	
L-4060XHA/3GD	GaP	568	green diffused	6	12	70°	



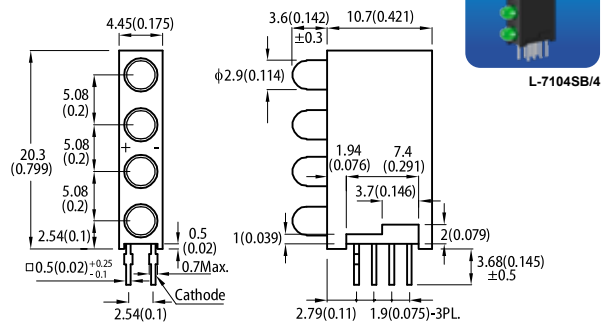


NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

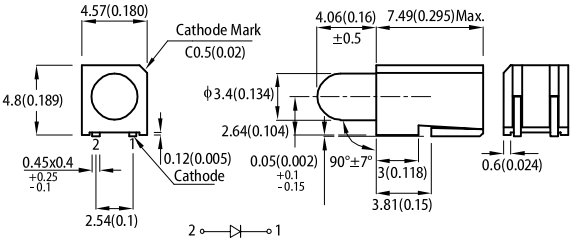
TRI-LEVEL CBI

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-7104SA/2G1ID	GaP	568	green diffused	10	25	50°	T-1 (3mm) Tri-Level  L-7104SA/3 
	GaAsP/GaP	617	red diffused	10	20	50°	
L-7104SA/3GD	GaP	568	green diffused	10	25	50°	

QUAD-LEVEL CBI

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-7104SB/1G1Y1G1YD	GaP	568	green diffused	10	25	50°	T-1 (3mm) Quad-Level  L-7104SB/4 
	GaAsP/GaP	588	yellow diffused	8	15	50°	
L-7104SB/4GD	GaP	568	green diffused	10	25	50°	

SMD CBI

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-138A8QMP/1ID	GaAsP/GaP	617	red diffused	4	10	40°	3.4mm Right Angle  L-138A8QMP/1 
L-138A8QMP/1YD	GaAsP/GaP	588	yellow diffused	4	8	40°	
L-138A8QMP/1GD	GaP	568	green diffused	6	12	40°	

NOTES:
1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.
3. Luminous intensity value is traceable to CIE127-2007 standards.

Infrared & Phototransistor

Kingbright's selection of infrared emitting diode products are suitable for consumer applications, home automation, computer peripherals and industrial applications. Selections are available in both SMD and through-hole packages.

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Infrared Emitting Diode

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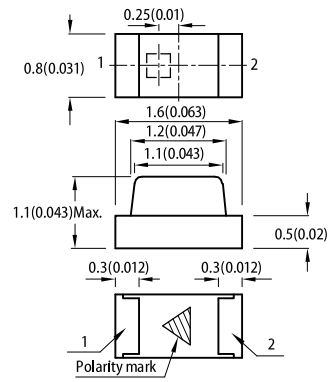
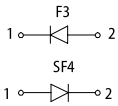
Phototransistor

INFRARED EMITTING DIODE

Part Number	Material	λP (nm)	Lens Type	Po (mW/sr) @20mA *50mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
KP-1608F3C	GaAs	940	water clear	0.8	2	150°	1.6mm x 0.8mm x 1.1mm (0603)
KP-1608SF4C	GaAlAs	880	water clear	0.8	1.5	150°	
KP-2012F3C	GaAs	940	water clear	0.8	2	160°	2.0mm x 1.25mm x 1.1mm (0805)
KP-2012SF4C	GaAlAs	880	water clear	0.8	1.5	160°	
KPA-3010F3C	GaAs	940	water clear	0.8	2	160°	3.0mm x 2.0mm x 1.0mm (Right Angle)
KM2520F3C03	GaAs	940	water clear	3	8	20°	2mm Subminiature IR Emitter
				*8	*16		

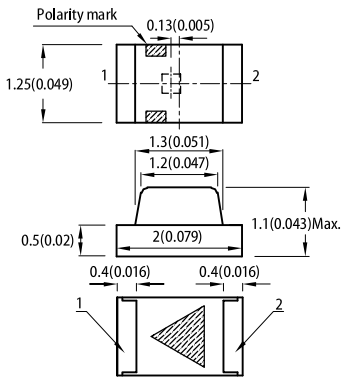

KP-1608

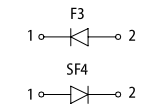




Units: mm (inch)
Tolerance: ± 0.1 (0.004)

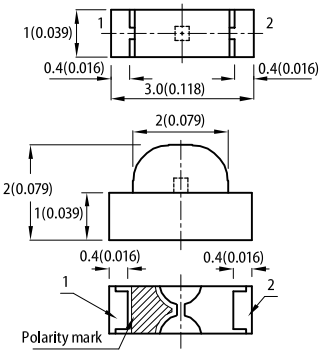

KP-2012





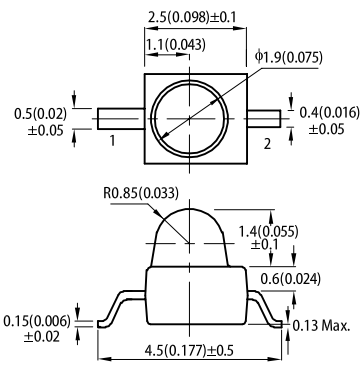
Units: mm (inch)
Tolerance: ± 0.1 (0.004)

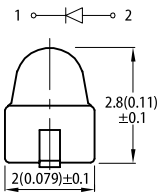

KPA-3010



Units: mm (inch)
Tolerance: ± 0.15 (0.006)


KM2520F3C03

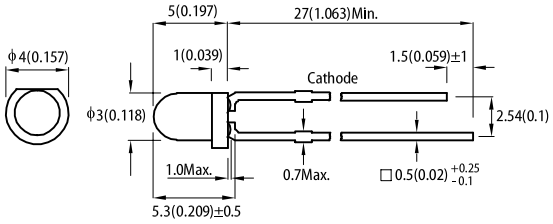
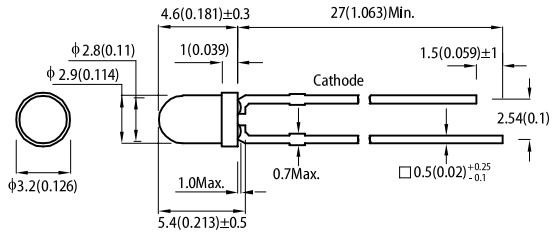
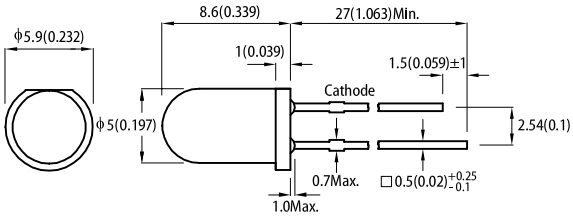




Units: mm (inch)
Tolerance: ± 0.25 (0.01)

NOTE:
1. Radiant intensity value is traceable to CIE127-2007 standards.

INFRARED EMITTING DIODE

Part Number	Material	λP (nm)	Lens Type	Po (mW/sr) @20mA *50mA		Viewing Angle	Dimensions
				Min.	Typ.	2θ1/2	
L-34F3C	GaAs	940	water clear	3	8	50°	T-1 (3mm) Round  L-34 
				*8	*15		
L-34SF4C	GaAlAs	880	water clear	3	16	50°	
				*5	*20		Units: mm (inch) Tolerance: ± 0.25 (0.01)
L-7104F3C	GaAs	940	water clear	3	8	30°	T-1 (3mm) Round  L-7104 
				*12	*25		
L-7104F3BT	GaAs	940	blue transparent	3	8	30°	
				*12	*25		Units: mm (inch) Tolerance: ± 0.25 (0.01)
L-7113F3C	GaAs	940	water clear	8	20	20°	T-1 3/4 (5mm) Round  L-7113 
				*25	*50		
L-7113F3BT	GaAs	940	blue transparent	8	20	20°	
				*25	*50		
L-7113SF4C	GaAlAs	880	water clear	6	15	20°	
				*12	*25		
L-7113SF6C	GaAlAs	860	water clear	18	40	20°	
				*55	*100		
L-7113SF7C	GaAlAs	850	water clear	12	30	20°	
				*40	*90		Units: mm (inch) Tolerance: ± 0.25 (0.01)

NOTE:
1. Radiant intensity value is traceable to CIE127-2007 standards.

PHOTOTRANSISTOR

Part Number	Lens Type
KP-1608P1C	water clear
KP-2012P3C	water clear
KP-3216P3C	water clear
KPA-3010P3C	water clear
L-3DP3BT	blue transparent
L-7113P3C	water clear

Electrical and Radiant Characteristics T_A =25°C

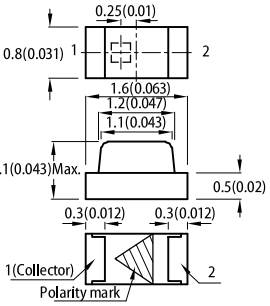
Parameter	Symbol	Part Number	Min.	Typ.	Max.	Unit	Test Condition
Collector-to-Emitter Breakdown Voltage	$V_{BR\ CEO}$	-	30	-	-	V	I_C=100μA Ee=0mW/cm²
Emitter-to-Collector Breakdown Voltage	$V_{BR\ ECO}$	-	5	-	-	V	I_E=100μA Ee=0mW/cm²
Collector-to-Emitter Saturation Voltage	$V_{CE\ (SAT)}$	-	-	-	0.8	V	I_C=2mA Ee=20mW/cm²
Collector Dark Current	I_{CEO}	-	-	-	100	nA	V_{CE}=10V Ee=0mW/cm²
Rise Time (10% to 90%)	T_R	-	-	15	-	μs	V_{CE}=5V I_C=1mA R_L=1KΩ
Fall Time (90% to 10%)	T_F	-	-	15	-	μs	
On State Collector Current	$I_{(ON)}$	KP-1608P1C	0.1	0.3	-	mA	V_{CE}=5V, Ee=1mW/cm² λ=940nm
		KP-2012P3C	0.2	0.4			
		KP-3216P3C	0.2	0.4			
		KPA-3010P3C	0.2	0.4			
		L-3DP3BT	0.1	0.2			
		L-7113P3C	0.5	2.5			

Absolute Maximum Rating T_A =25°C

Parameter	Maximum Ratings
Collector-to-Emitter Voltage	30V
Emitter-to-Collector Voltage	5V
Power Dissipation at (or below) 25°C Free Air Temperature	100mW
Operating Temperature Range	-40°C~ +85°C
Storage Temperature Range	-40°C~ +85°C
L-3DP3BT L-7113P3C Lead Soldering Temperature (>5mm For 5 sec)	260°C

Dimensions

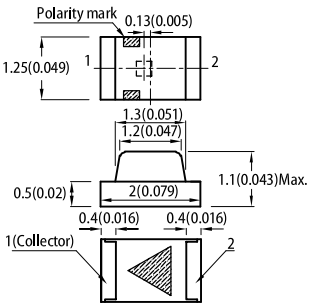
1.6mm x 0.8mm x 1.1mm (0603)




KP-1608

Units: mm (inch)
Tolerance: ± 0.1 (0.004)

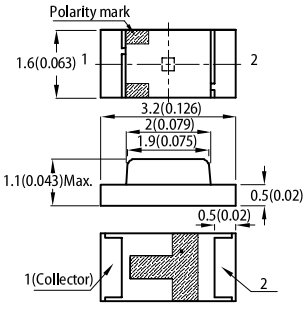
2.0mm x 1.25mm x 1.1mm (0805)




KP-2012

Units: mm (inch)
Tolerance: ± 0.1 (0.004)

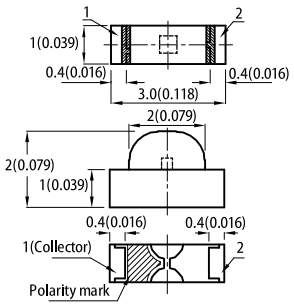
3.2mm x 1.6mm x 1.1mm (1206)




KP-3216

Units: mm (inch)
Tolerance: ± 0.2 (0.008)

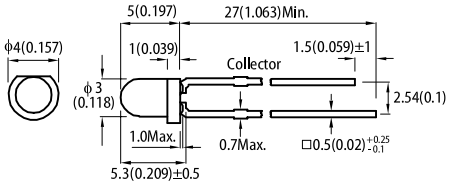
3.0mm x 2.0mm x 1.0mm (Right Angle)




KPA-3010

Units: mm (inch)
Tolerance: ± 0.15 (0.006)

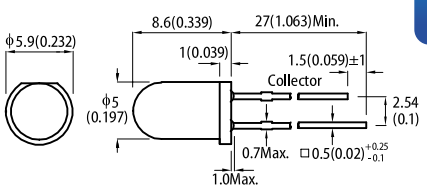
T-1 (3mm) Phototransistor




L-3D

Units: mm (inch)
Tolerance: ± 0.25 (0.01)

T-1 3/4 (5mm) Phototransistor




L-7113

Units: mm (inch)
Tolerance: ± 0.25 (0.01)

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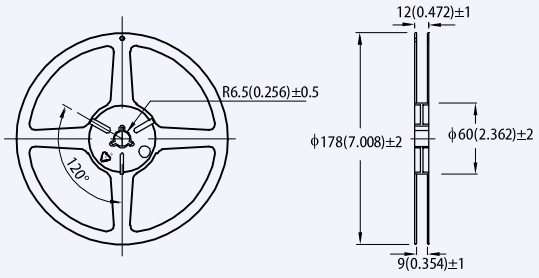
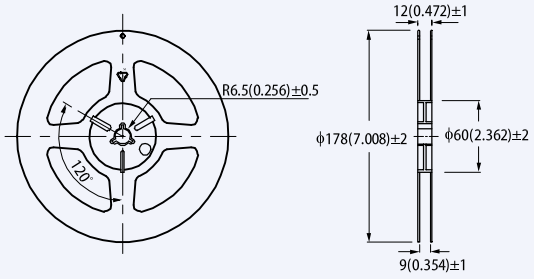
SMD TAPE SPECIFICATIONS

Reel Dimensions	Part Number	Reel Dimensions	Part Number		Reel Dimensions	Part Number	Reel Dimensions	Part Number
7" (for 8mm width tape) (black)	KA-1608 KP-1608 KPG-0603 KPG-1005 KPG-1608 KPGF-1012 KPH-1608 KPHB-1608 KPHHS-1005 KPHM-1608 KPT-1608 KPTB-1612 KPTD-1608	7" (for 8mm width tape) (white)	KA-2810A KA-3021 KM-23XXX KP-2012 KP-3216 KPA-1606 KPA-2107 KPA-3010 KPB-3025 KPB-3227 KPBA-3010 KPBD-3224 KPBDA-3020-PF KPBL-3025 KPD-3224 KPDA-1806	KPDA-3020 KPFA-2507 KPFA-3010 KPGA-1602 KPHBM-2012 KPHCM-2012 KPL-3015 KPT-2012 KPT-3216 KPTB-1615 KPTBD-3216 KPTD-2012 KPTD-3216 KPTF-1616 KPTL-3216 KPTR-3216	7" (for 12mm width tape)	KA-3528 KA-4008 KA-4040 KAA-3528 KAA-3528-C8-CC KM2520XXX03 KM2520XXX09 KPED-3528 KPF-3236	13" (for 24mm width tape)	KCDX02 KCDX03 KCSX02 KCSX03 KCSX04 L-138A8QMP/1
							13" (for 32mm width tape)	KCDX04 KCPDX04 KCPSX04 KCSX39 KCSX56
							13" (for 44mm width tape)	KCDX56

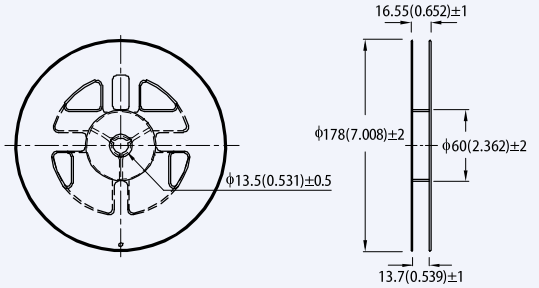
7"(for 8mm width tape)(black)



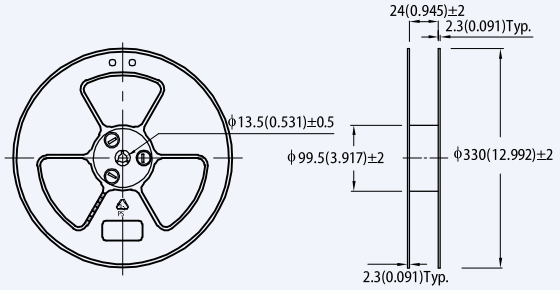
7"(for 8mm width tape)(white)



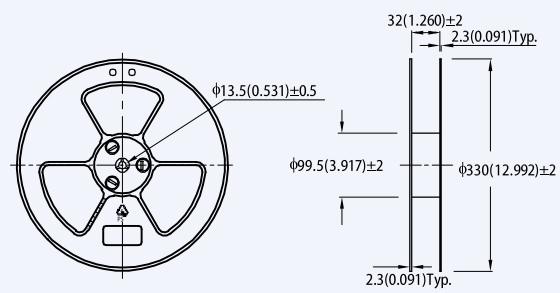
7"(for 12mm width tape)



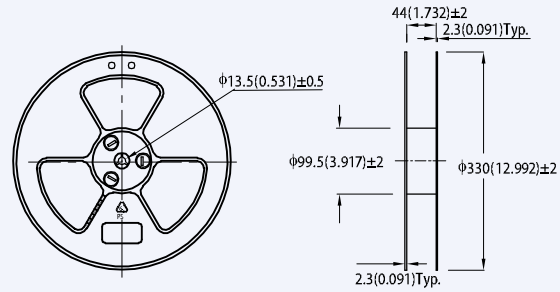
13"(for 24mm width tape)



13"(for 32mm width tape)



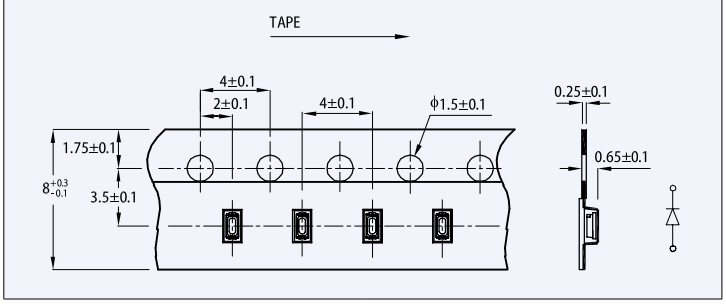
13"(for 44mm width tape)



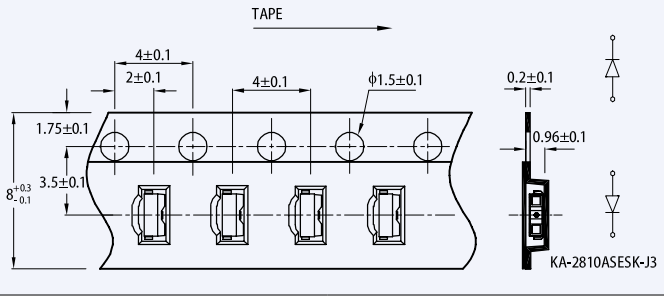
NOTE: 1. All dimensions are in millimeters(inches).

SMD TAPE SPECIFICATIONS

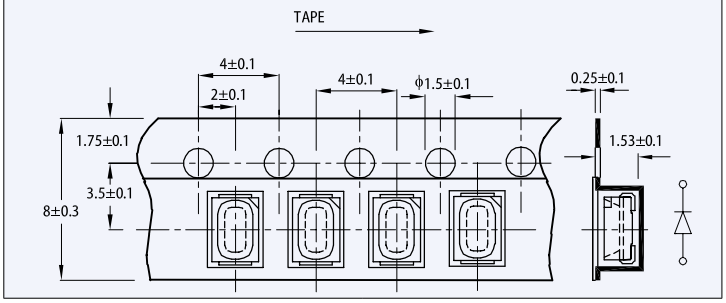
KA-1608	PACKAGE: 2000PCS / REEL



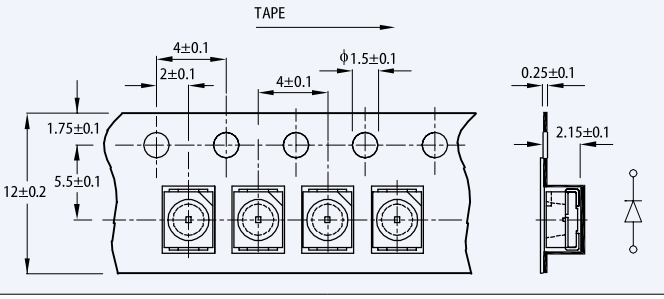
KA-2810A	PACKAGE: 2000PCS / REEL



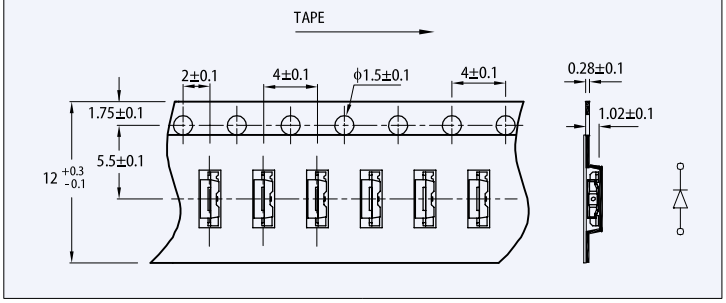
KA-3021	PACKAGE: 2000PCS / REEL



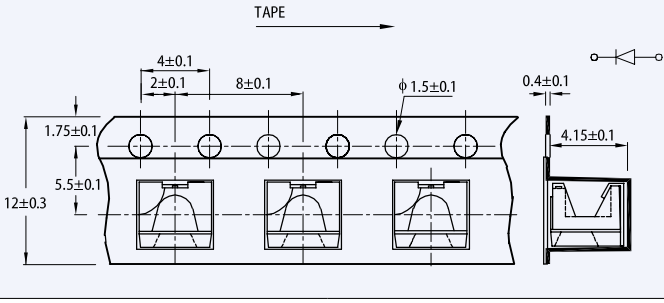
KA-3528	PACKAGE: 2000PCS / REEL



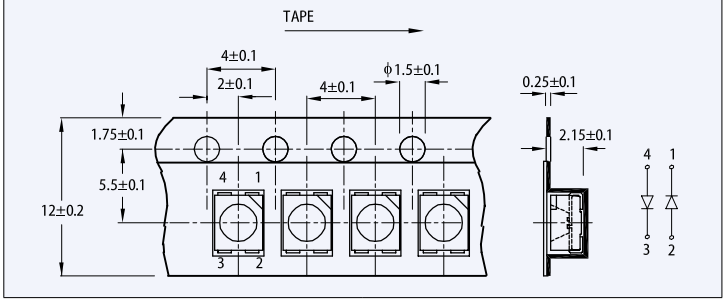
KA-4008	PACKAGE: 2000PCS / REEL



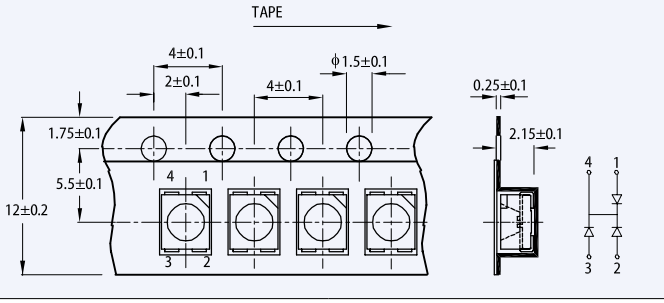
KA-4040	PACKAGE: 500PCS / REEL



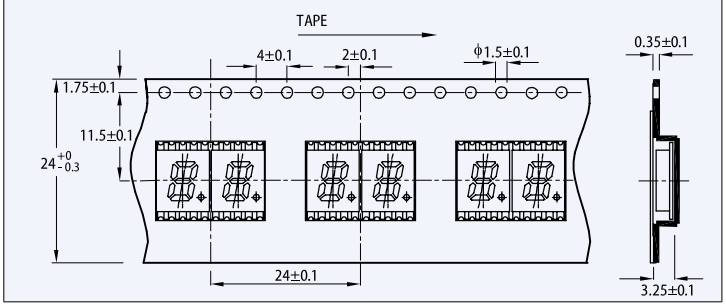
KAA-3528	PACKAGE: 2000PCS / REEL



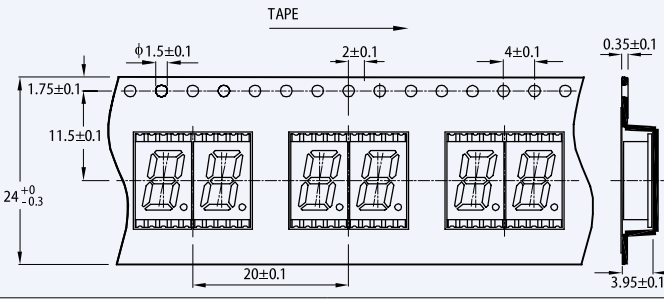
KAA-3528-C8-CC	PACKAGE: 2000PCS / REEL



KCDX02	PACKAGE: 300PCS / REEL



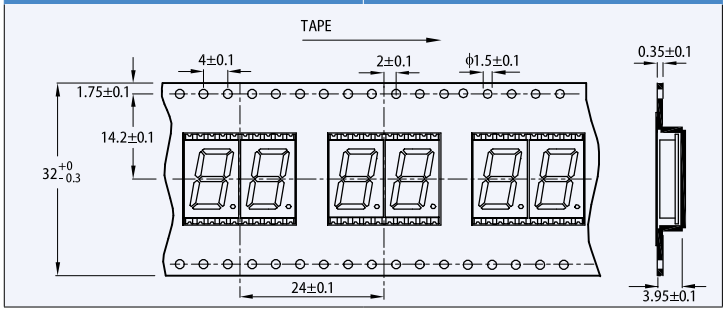
KCDX03	PACKAGE: 300PCS / REEL



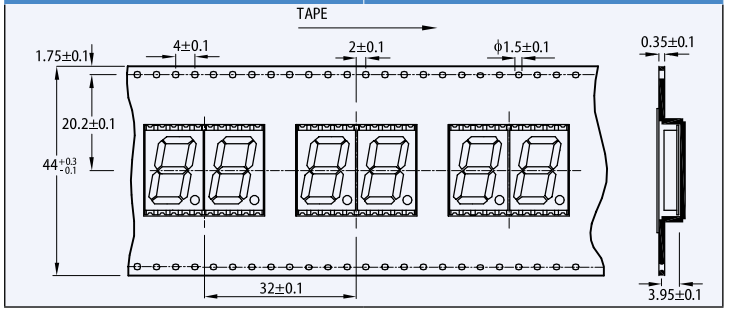
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

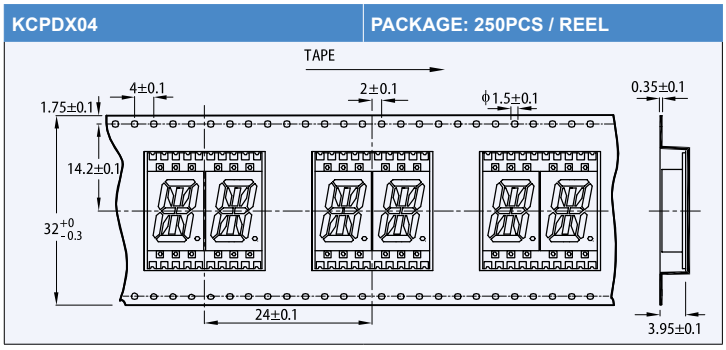
KCDX04 | PACKAGE: 250PCS / REEL



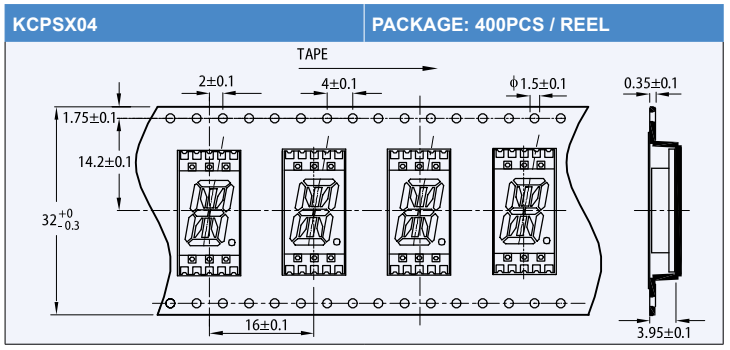
KCDX56 | PACKAGE: 200PCS / REEL



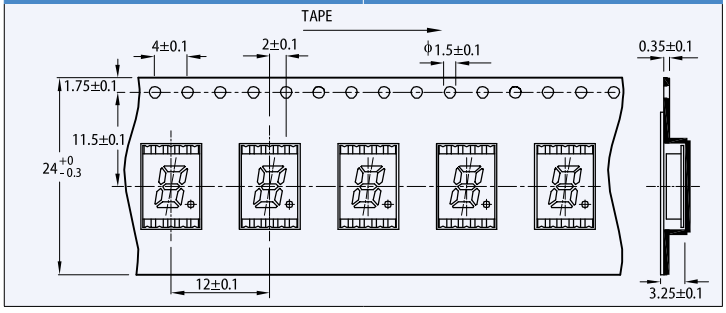
KCPDX04 | PACKAGE: 250PCS / REEL



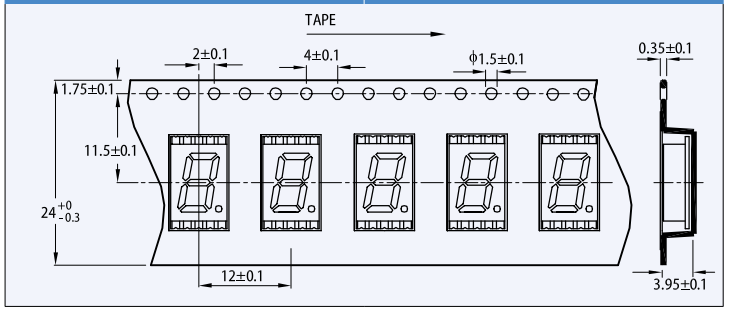
KCPSX04 | PACKAGE: 400PCS / REEL



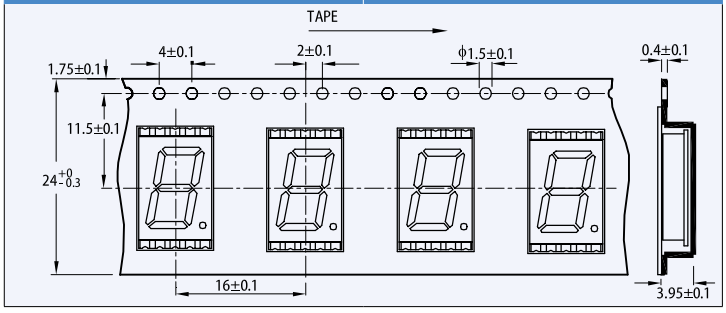
KCSX02 | PACKAGE: 650PCS / REEL



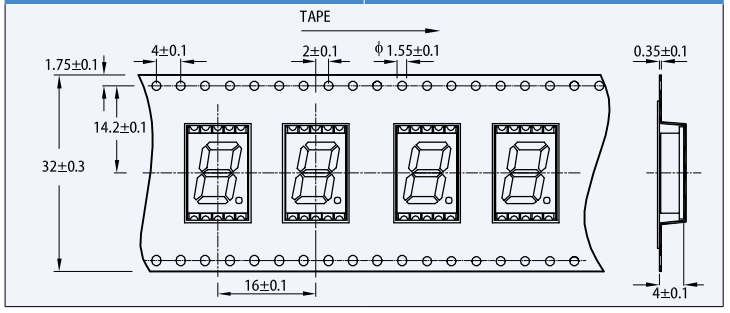
KCSX03 | PACKAGE: 550PCS / REEL



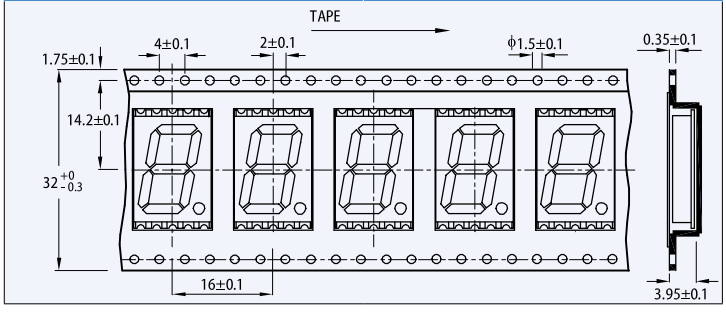
KCSX04 | PACKAGE: 400PCS / REEL



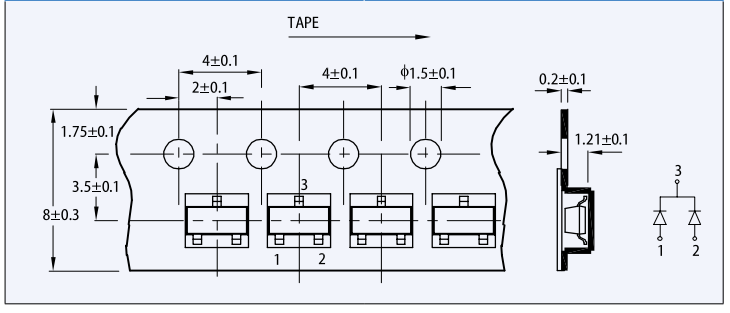
KCSX39 | PACKAGE: 400PCS / REEL



KCSX56 | PACKAGE: 400PCS / REEL



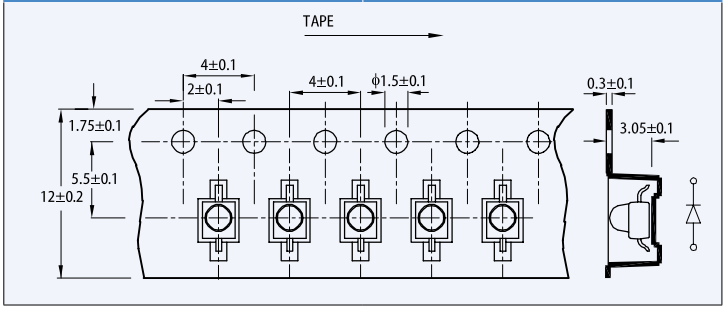
KM-23XXX | PACKAGE: 2000PCS / REEL



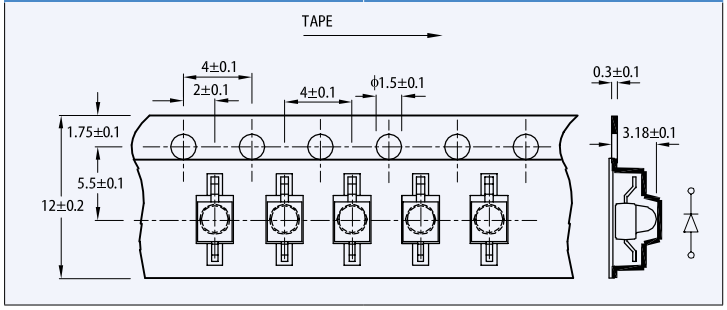
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

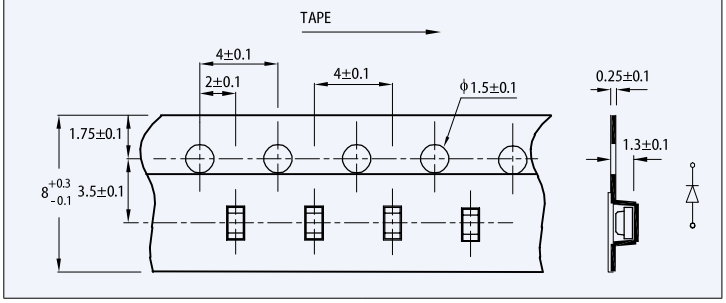
KM2520XXX03	PACKAGE: 1000PCS / REEL



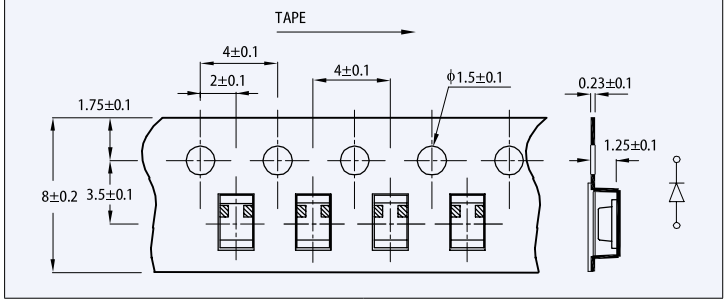
KM2520XXX09	PACKAGE: 1000PCS / REEL



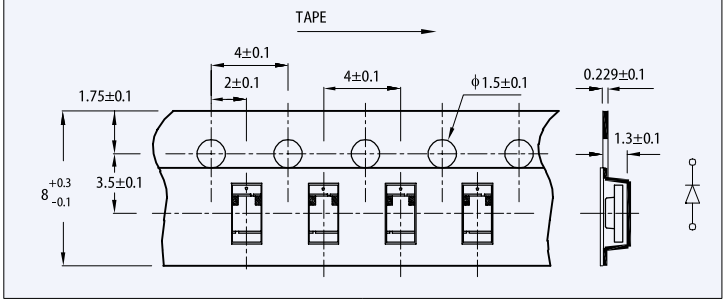
KP-1608	PACKAGE: 2000PCS / REEL



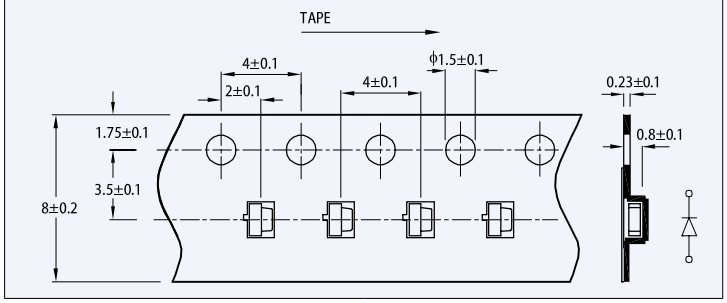
KP-2012	PACKAGE: 2000PCS / REEL



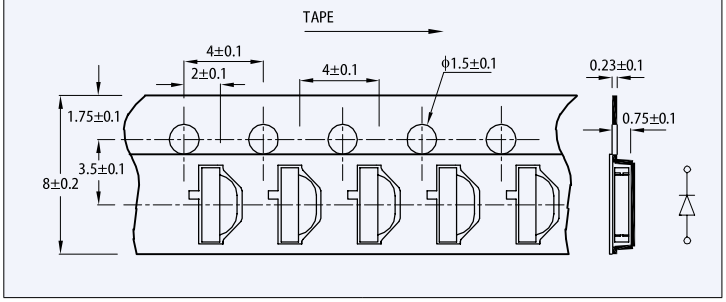
KP-3216	PACKAGE: 2000PCS / REEL



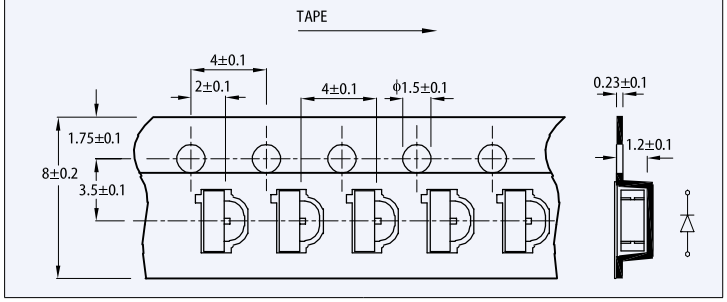
KPA-1606	PACKAGE: 2000PCS / REEL



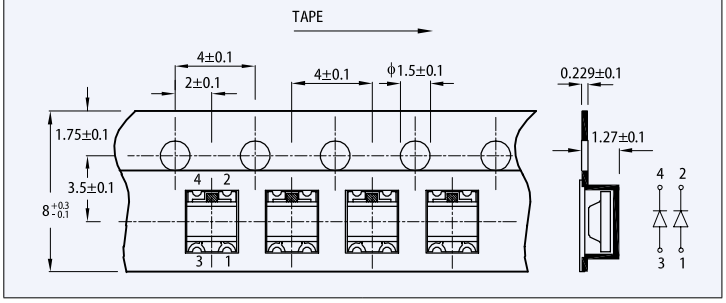
KPA-2107	PACKAGE: 2000PCS / REEL



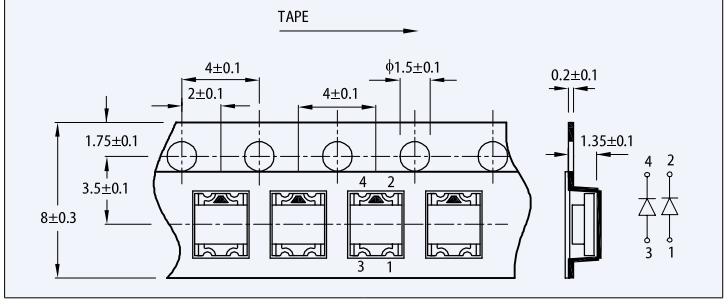
KPA-3010	PACKAGE: 2000PCS / REEL



KPB-3025	PACKAGE: 2000PCS / REEL



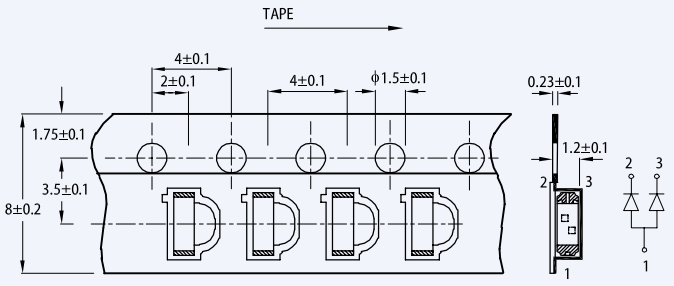
KPB-3227	PACKAGE: 2000PCS / REEL



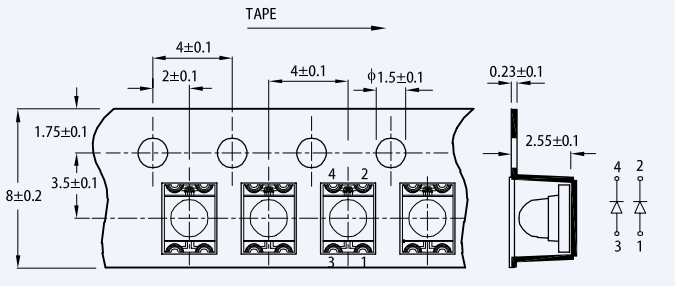
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

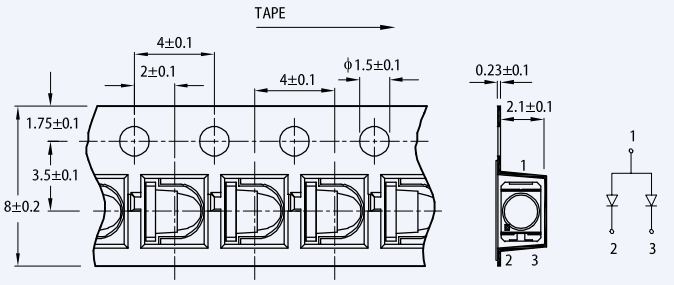
KPBA-3010	PACKAGE: 2000PCS / REEL



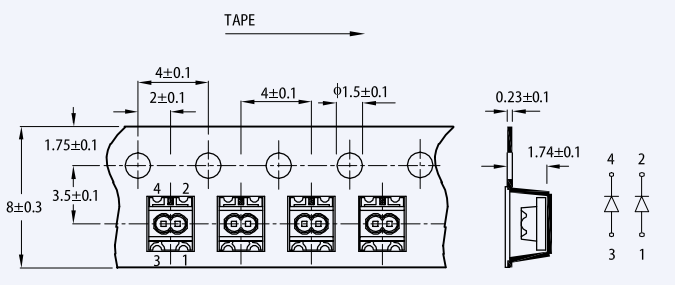
KPBD-3224	PACKAGE: 1500PCS / REEL



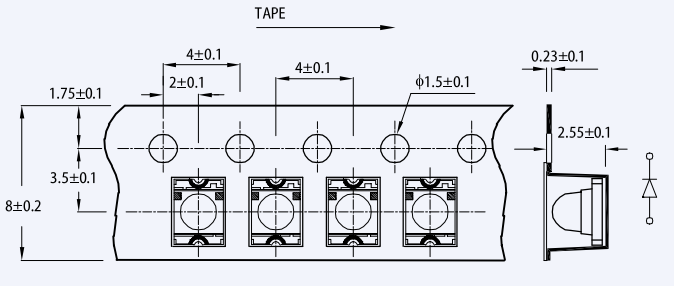
KPBDA-3020-PF	PACKAGE: 2000PCS / REEL



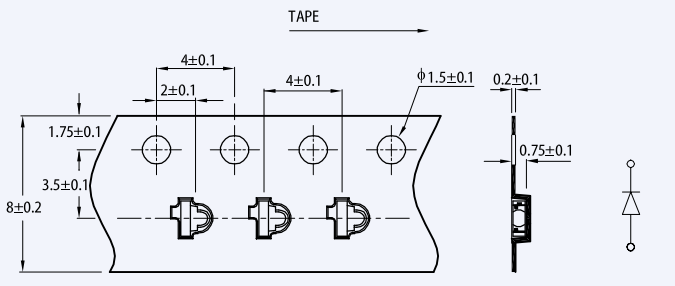
KPBL-3025	PACKAGE: 2000PCS / REEL



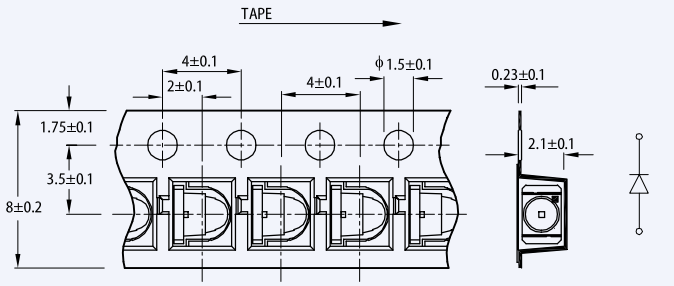
KPD-3224	PACKAGE: 1500PCS / REEL



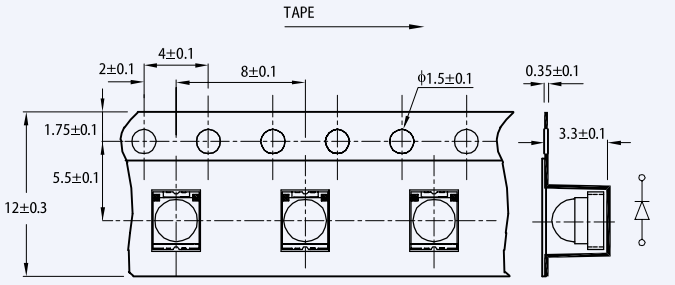
KPDA-1806	PACKAGE: 4000PCS / REEL



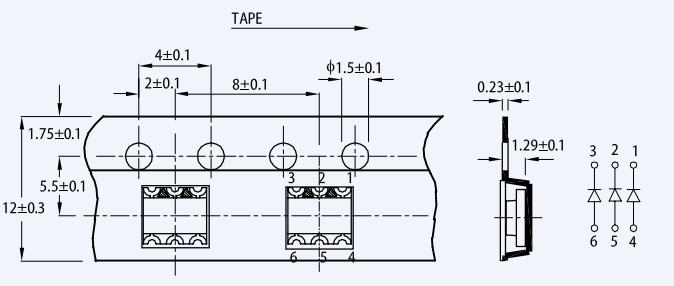
KPDA-3020	PACKAGE: 2000PCS / REEL



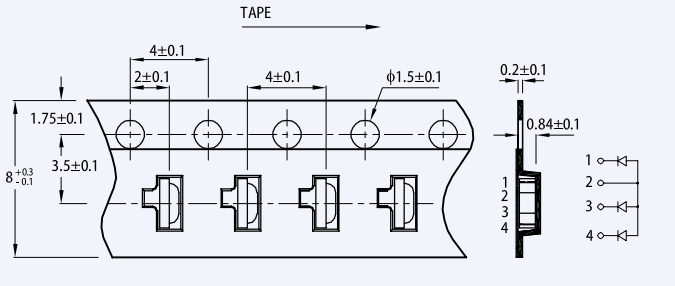
KPED-3528	PACKAGE: 500PCS / REEL



KPF-3236	PACKAGE: 1000PCS / REEL



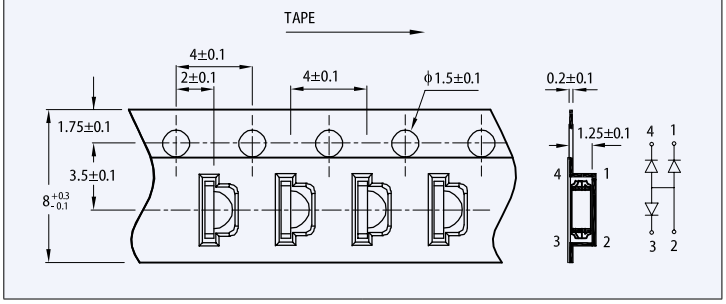
KPFA-2507	PACKAGE: 3000PCS / REEL



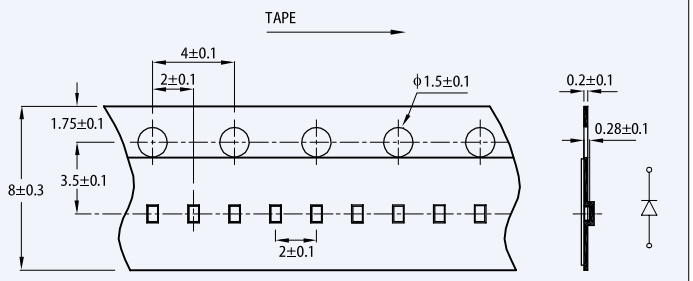
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

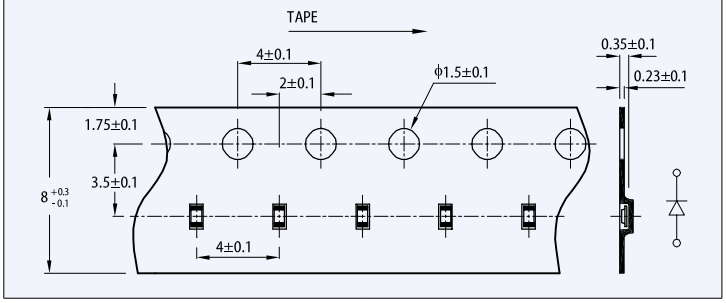
KPFA-3010	PACKAGE: 2000PCS / REEL



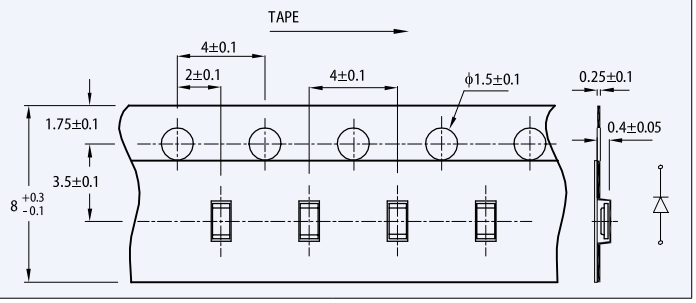
KPG-0603	PACKAGE: 4000PCS / REEL



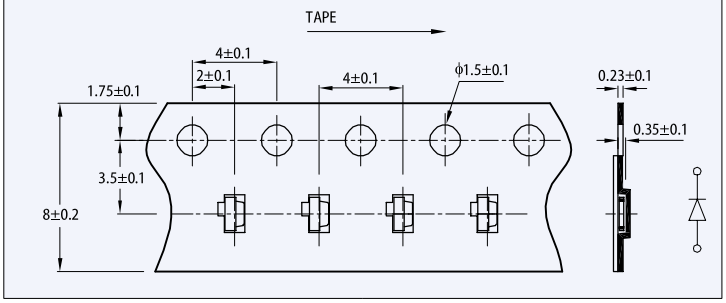
KPG-1005	PACKAGE: 4000PCS / REEL



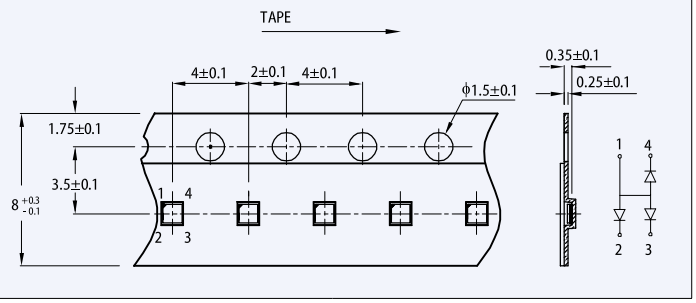
KPG-1608	PACKAGE: 4000PCS / REEL



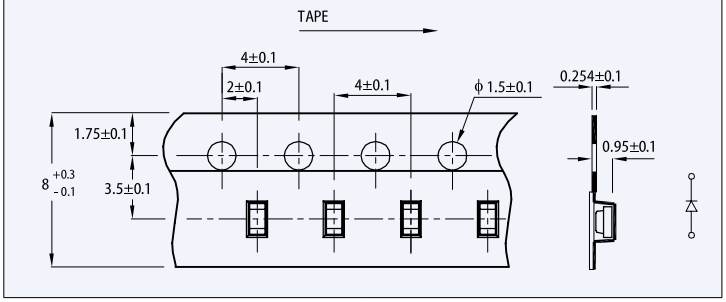
KPGA-1602	PACKAGE: 4000PCS / REEL



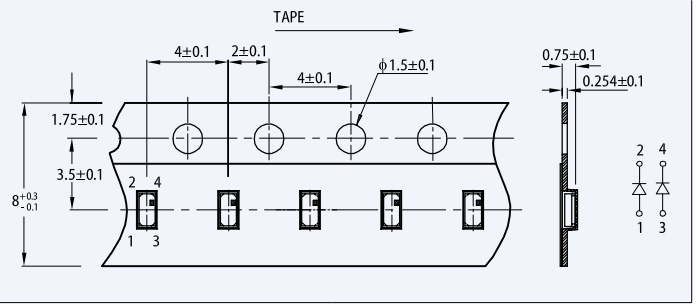
KPGF-1012	PACKAGE: 4000PCS / REEL



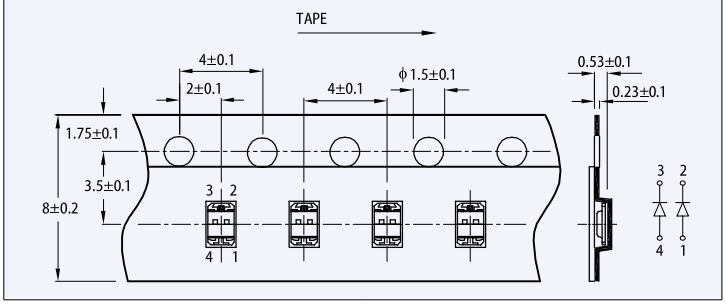
KPH-1608	PACKAGE: 2000PCS / REEL



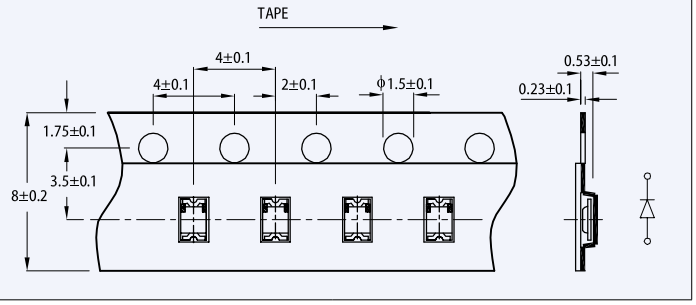
KPHB-1608	PACKAGE: 2000PCS / REEL



KPHBM-2012	PACKAGE: 2000PCS / REEL



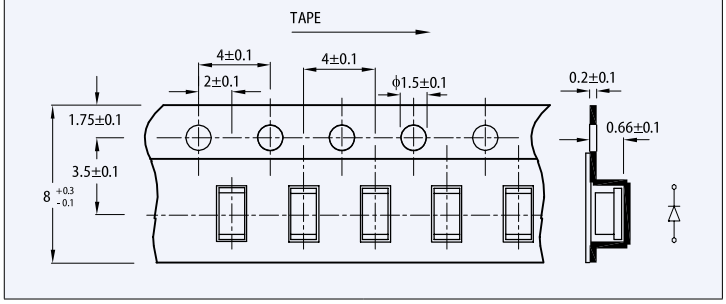
KPHCM-2012	PACKAGE: 2000PCS / REEL



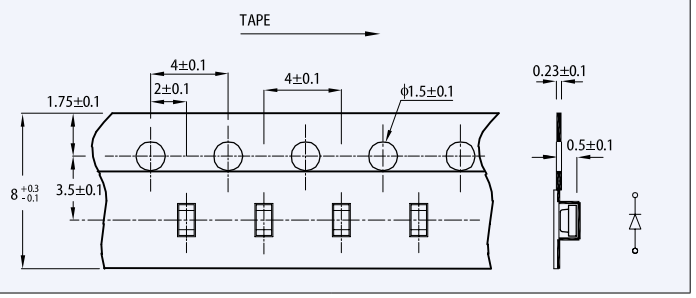
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

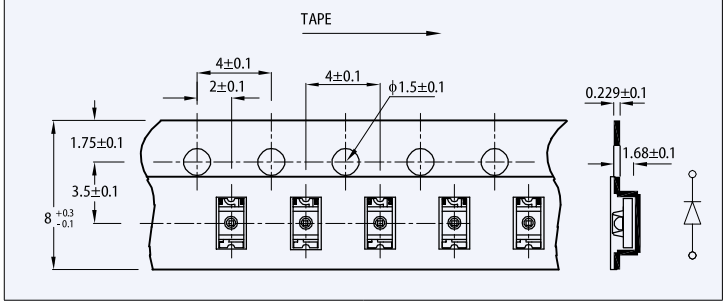
KPHHS-1005	PACKAGE: 2000PCS / REEL



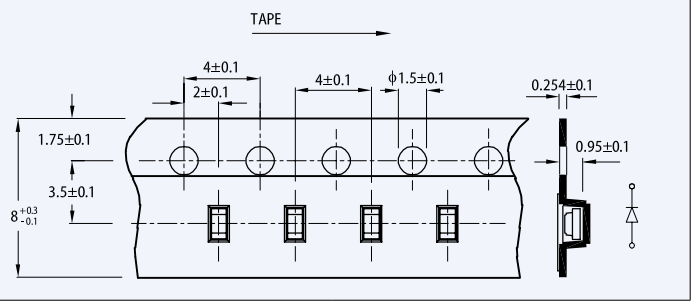
KPHM-1608	PACKAGE: 2000PCS / REEL



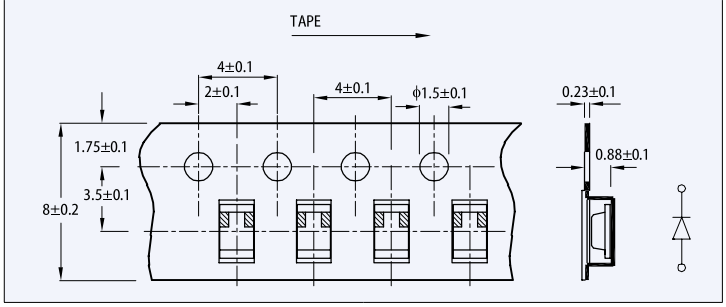
KPL-3015	PACKAGE: 2000PCS / REEL



KPT-1608	PACKAGE: 2000PCS / REEL



KPT-2012	PACKAGE: 2000PCS / REEL



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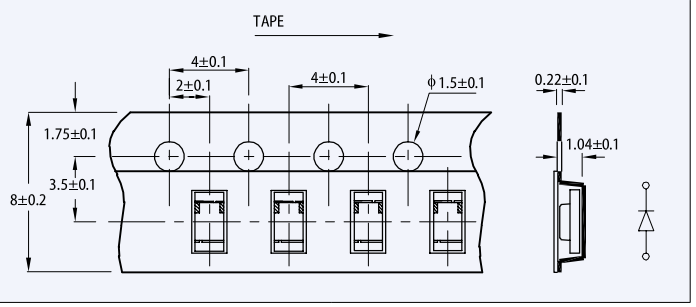
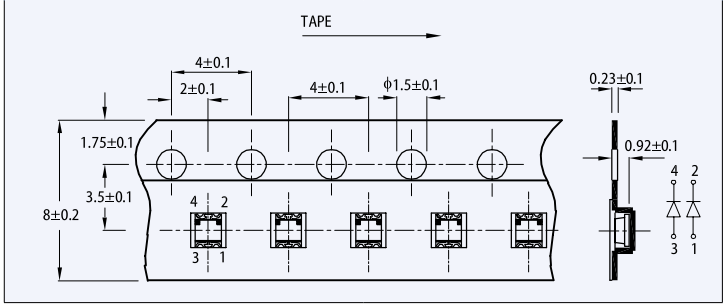


KPTB-1612	PACKAGE: 2000PCS / REEL



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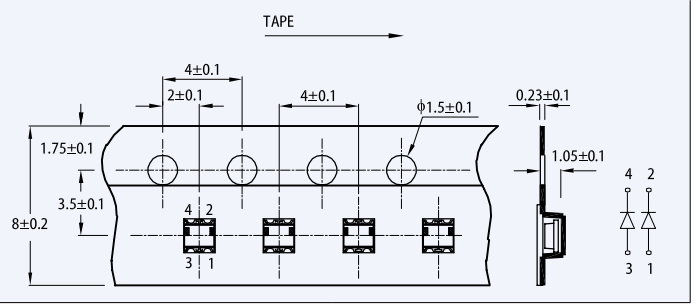
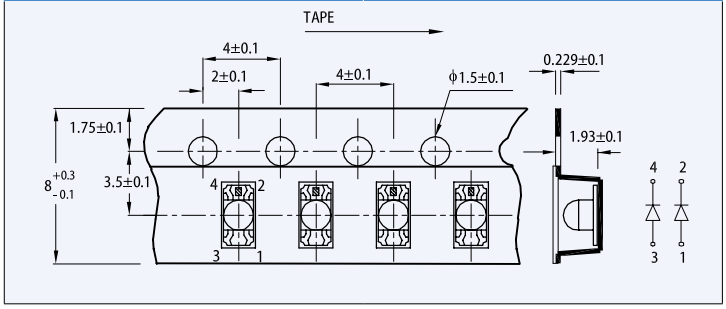
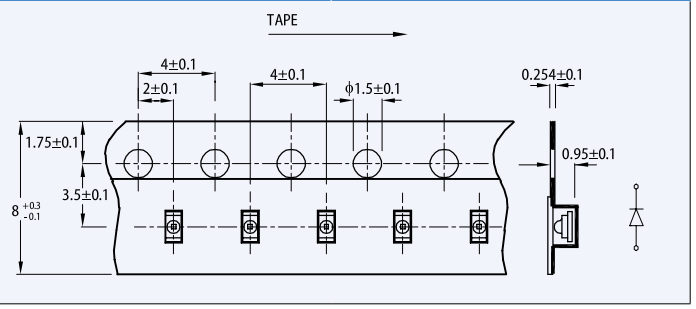


KPTBD-3216	PACKAGE: 2000PCS / REEL



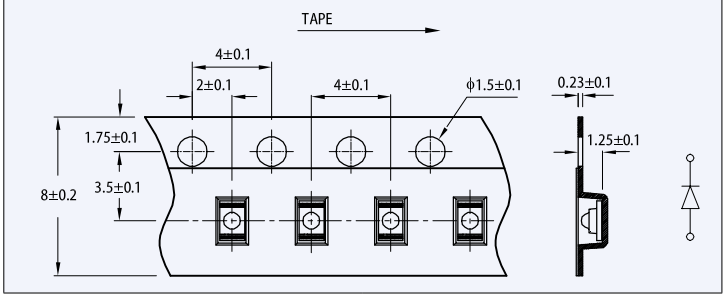
KPTD-1608	PACKAGE: 2000PCS / REEL



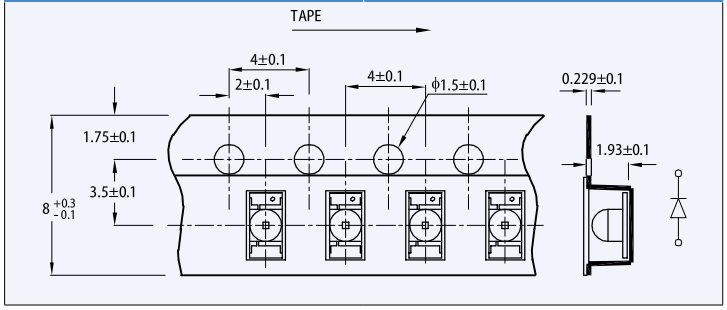
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

KPTD-2012 | PACKAGE: 3000PCS / REEL



KPTD-3216 | PACKAGE: 2000PCS / REEL



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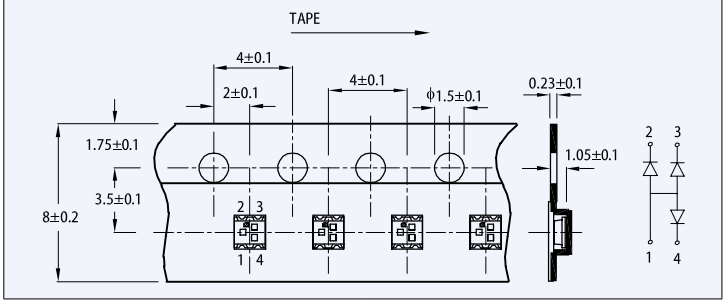
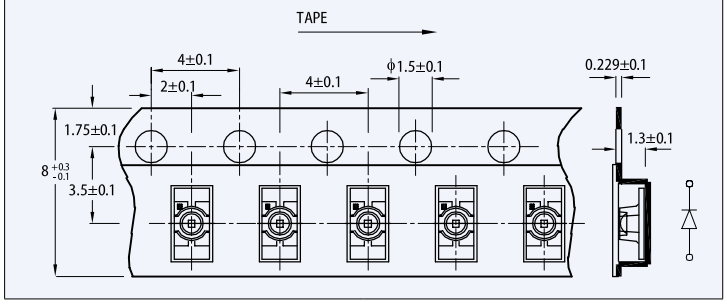
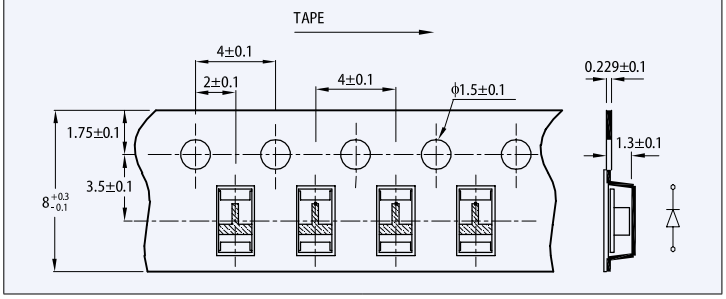


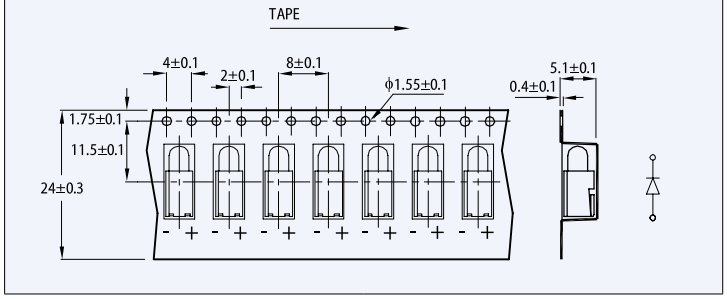
KPTL-3216 | PACKAGE: 2000PCS / REEL



KPTR-3216 | PACKAGE: 2000PCS / REEL

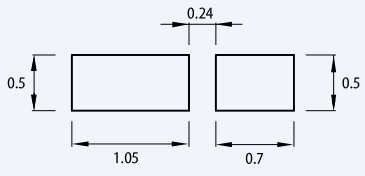


L-138A8QMP/1 | PACKAGE: 1000PCS / REEL

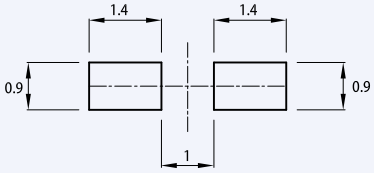


RECOMMENDED SOLDERING PATTERN

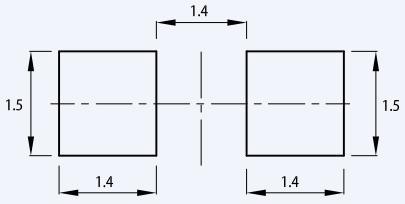
KA-1608



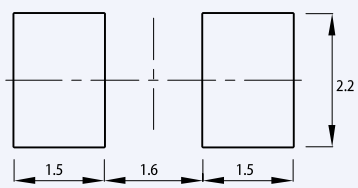
KA-2810A



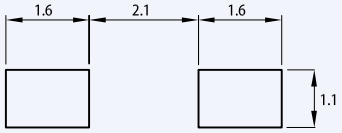
KA-3021



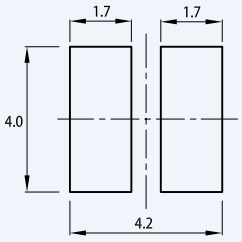
KA-3528



KA-4008



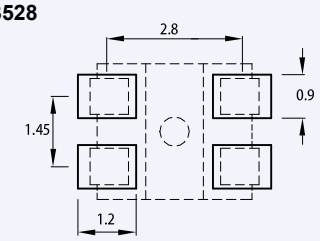
KA-4040



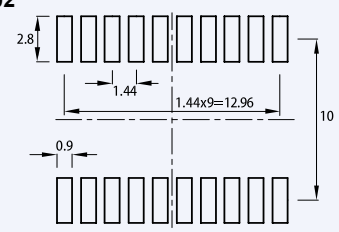
NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted.

RECOMMENDED SOLDERING PATTERN

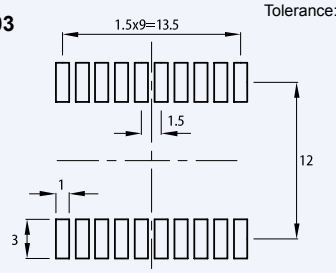
KAA-3528



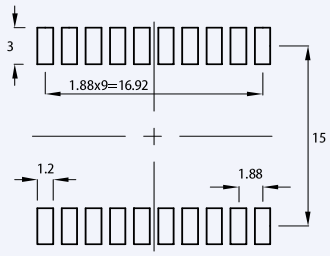
KCDX02 Tolerance: ± 0.15



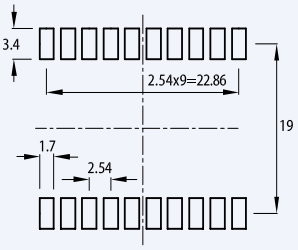
KCDX03 Tolerance: ± 0.15



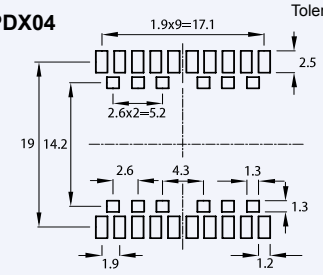
KCDX04 Tolerance: ± 0.15



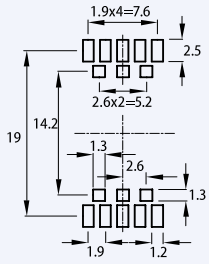
KCDX56 Tolerance: ± 0.15



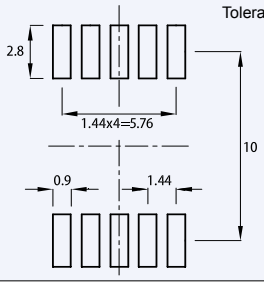
KCPDX04 Tolerance: ± 0.15



KCPSX04 Tolerance: ± 0.15



KCSX02 Tolerance: ± 0.15



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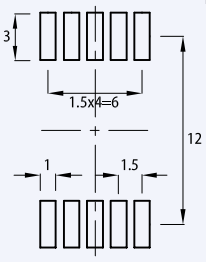
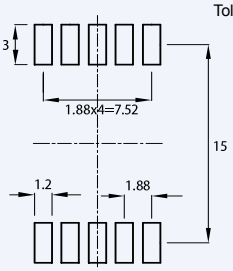
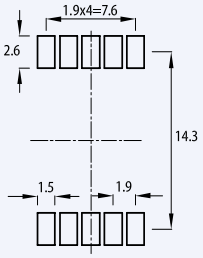


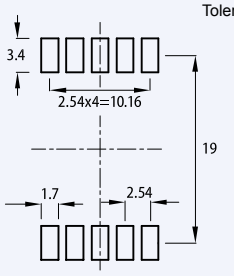
KCSX04 Tolerance: ± 0.15



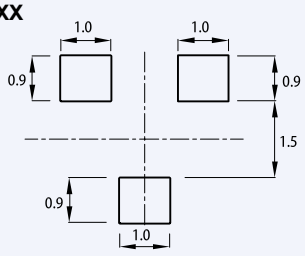
KCSX39 Tolerance: ± 0.15



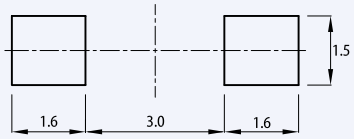
KCSX56 Tolerance: ± 0.15



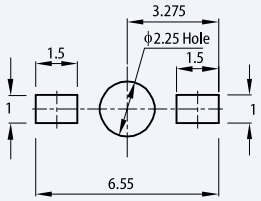
KM-23XXX



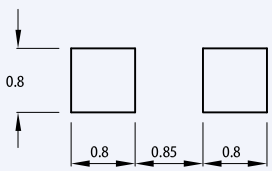
KM2520XXX03



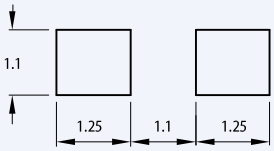
KM2520XXX09



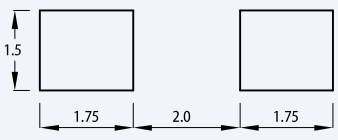
KP-1608



KP-2012, KPT-2012



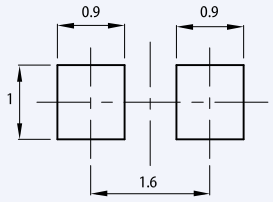
KP-3216, KPT-3216, KPTD-3216



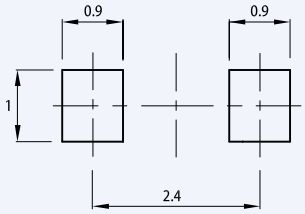
NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted.

RECOMMENDED SOLDERING PATTERN

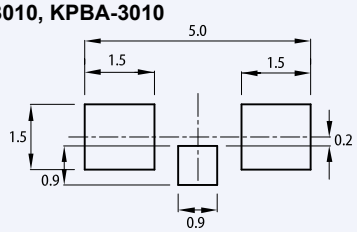
KPA-1606



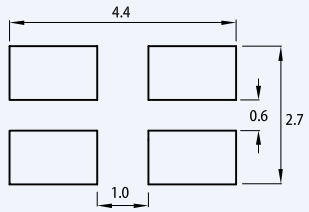
KPA-2107



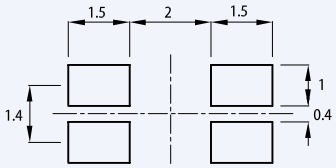
KPA-3010, KPBA-3010



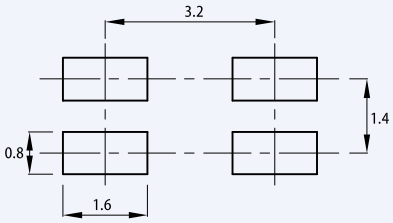
KPB-3025, KPBL-3025



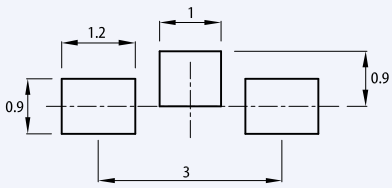
KPB-3227



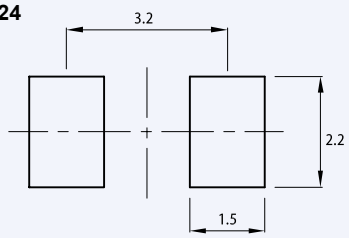
KPBD-3224



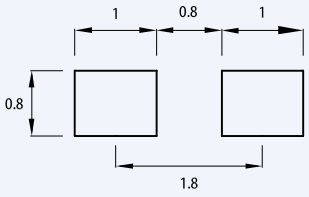
KPBDA-3020-PF



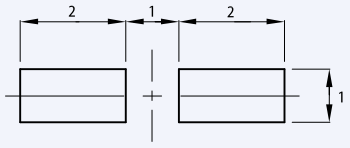
KPD-3224



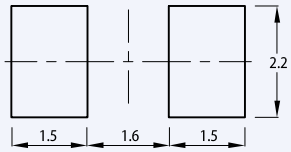
KPDA-1806



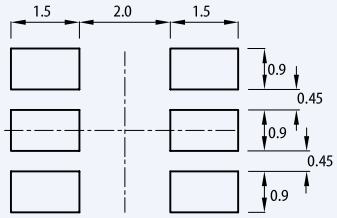
KPDA-3020



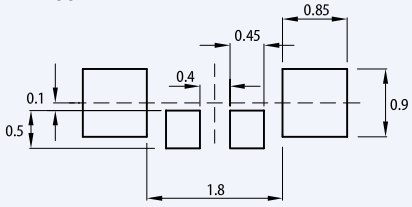
KPED-3528



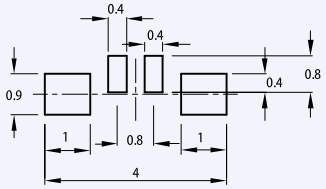
KPF-3236



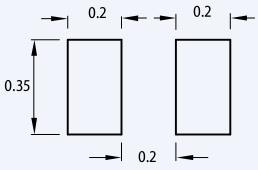
KPFA-2507



KPFA-3010

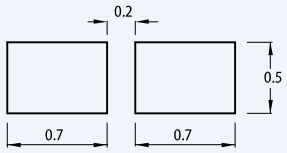


KPG-0603



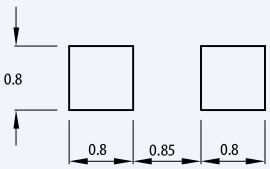
Mask open area ratio:80%
Mask thickness:80~100um

KPG-1005



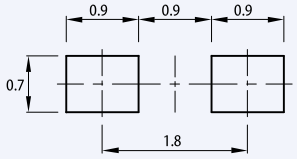
Mask open area ratio:80%
Mask thickness:80~100um

KPG-1608



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

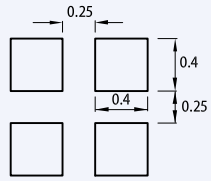
KPGA-1602



NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted.

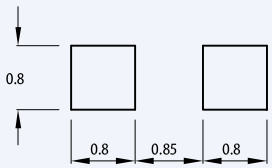
RECOMMENDED SOLDERING PATTERN

KPGF-1012



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

KPH-1608



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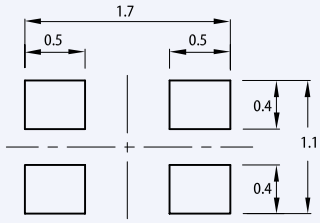

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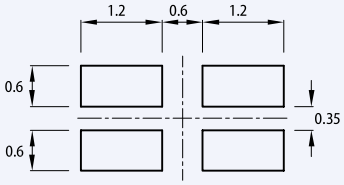

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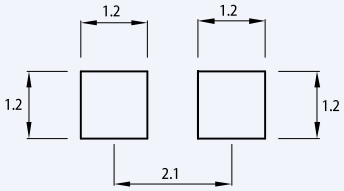

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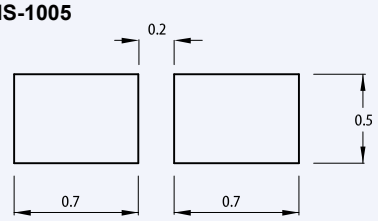

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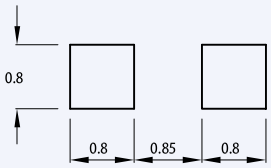

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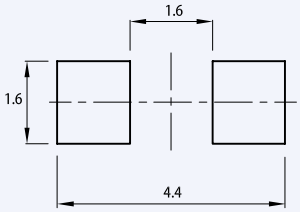

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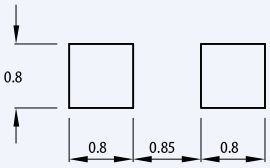

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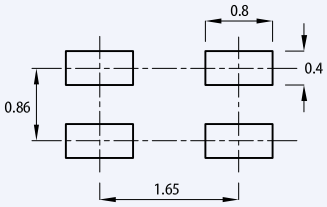

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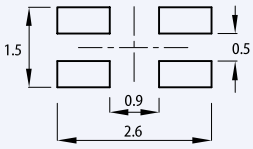

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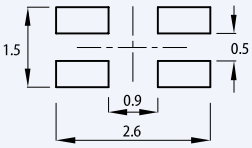

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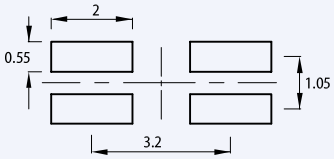

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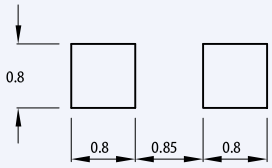

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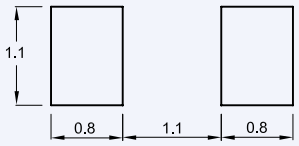

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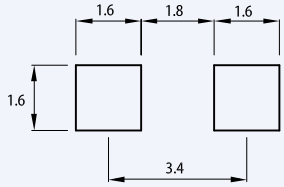

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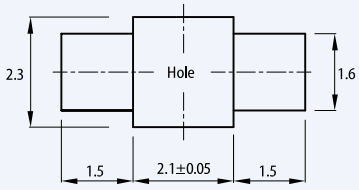

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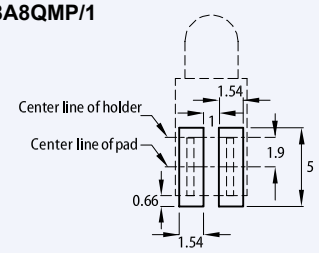


NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted.

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		E, I Hi.Eff.Red Orange (GaAsP/GaP)	SR-J4 Super Bright Red (AlGaInP)	SURK Hyper Red (AlGaInP)	SURK-T Hyper Red (AlGaInP)	SUR-E Hyper Red (AlGaInP)	SEK-J3 Hyper Red (AlGaInP)	Unit
		●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	V
Forward current	I_F	30	30	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	160	150	185	150	200	150	mA
Power dissipation	P_D	75	75	75	75	75	84	mW
LED LAMPS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		E, I Hi.Eff.Red Orange (GaAsP/GaP)	SR-J4 Super Bright Red (AlGaInP)	SURK Hyper Red (AlGaInP)	SURK-T Hyper Red (AlGaInP)	SUR-E Hyper Red (AlGaInP)	SEK-J3 Hyper Red (AlGaInP)	Unit
		●	●	●	●	●	●	
Forward voltage (typ.)								
I_F=20mA		2.0	2.1	1.95	2.0	1.9	2.2	
I_F=10mA	V_F	1.9	1.8	1.85	1.85	1.8	2.0	V
I_F=2mA		1.7	1.65	1.75	1.75	1.7	1.8	
Forward voltage (max.)								
I_F=20mA		2.5	2.5	2.5	2.5	2.5	2.8	
I_F=10mA	V_F	2.3	2.3	2.35	2.25	2.35	2.3	V
I_F=2mA		2.1	2.1	2.2	2.15	2.2	2.15	
Reverse current V_R=5V	I_R	10	10	10	10	10	10	μA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	627	660	645	645	645	640	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	617	640	630	630	630	625	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	45	20	28	20	25	20	nm
Capacitance V_F=0V,f=1MHZ	C	15	45	35	35	45	27	pF

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		SE-J3 Hyper Red (AlGaInP)	SE-E Hyper Red (AlGaInP)	SEK-J4 Super Bright Orange (AlGaInP)	N Pure Orange (GaAsP/GaP)	SEK Super Bright Orange (AlGaInP)	SEK-T Super Bright Orange (AlGaInP)	G,SG Green, Super Bright Green (GaP)	Unit
		●	●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	5	V
Forward current	I_F	30	30	30	25	30	30	25	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	150	195	150	145	195	150	140	mA
Power dissipation	P_D	84	75	84	62.5	75	75	62.5	mW
LED LAMPS:									
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:									
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		SE-J3 Hyper Red (AlGaInP)	SE-E Hyper Red (AlGaInP)	SEK-J4 Super Bright Orange (AlGaInP)	N Pure Orange (GaAsP/GaP)	SEK Super Bright Orange (AlGaInP)	SEK-T Super Bright Orange (AlGaInP)	G,SG Green, Super Bright Green (GaP)	Unit
		●	●	●	●	●	●	●	
Forward voltage (typ.)									
I_F=20mA		2.2	2.0	2.2	2.05	2.1	2.05	2.2	
I_F=10mA	V_F	2.0	1.9	2.0	1.95	2.0	1.95	2.0	V
I_F=2mA		1.8	1.8	1.8	1.85	1.85	1.8	1.9	
Forward voltage (max.)									
I_F=20mA		2.8	2.5	2.8	2.5	2.5	2.5	2.5	
I_F=10mA	V_F	2.3	2.3	2.4	2.3	2.35	2.3	2.4	V
I_F=2mA		2.15	2.1	2.2	2.1	2.2	2.2	2.25	
Reverse current V_R=5V	I_R	10	10	10	10	10	10	10	μA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	640	630	611	607	610	610	565	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	625	621	605	602	605	601	568	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	25	20	17	35	29	17	30	nm
Capacitance V_F=0V,f=1MHZ	C	27	25	27	15	15	15	15	pF

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		CG-KA Green (AlGaInP)	CGK Green (AlGaInP)	CGK-T Green (AlGaInP)	MGK Mega Green (AlGaInP)	ZGK Green (InGaN)	ZG Green (InGaN)	ZG-E Green (InGaN)	Unit
		●	●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	5	V
Forward current	I_F	20	30	30	30	25	25	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	100	150	150	150	150	150	100	mA
Power dissipation	P_D	48	75	78	75	102.5	102.5	120	mW
LED LAMPS:									
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:									
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		CG-KA Green (AlGaInP)	CGK Green (AlGaInP)	CGK-T Green (AlGaInP)	MGK Mega Green (AlGaInP)	ZGK Green (InGaN)	ZG Green (InGaN)	ZG-E Green (InGaN)	Unit
		●	●	●	●	●	●	●	
Forward voltage (typ.)									
I_F=20mA		2.05	2.1	2.1	2.1	3.3	3.3	3.2	
I_F=10mA	V_F	2.0	2.0	1.95	2.0	3.0	3.0	3.05	V
I_F=2mA		1.92	1.9	1.8	1.9	2.65	2.65	2.8	
Forward voltage (max.)									
I_F=20mA		2.4	2.5	2.6	2.5	4.1	4.1	4.0	
I_F=10mA	V_F	2.35	2.45	2.4	2.45	3.4	3.4	3.4	V
I_F=2mA		2.25	2.3	2.3	2.3	3.1	3.1	3.1	
Reverse current V_R=5V	I_R	10	10	10	10	50	50	50	μA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	573	574	574	574	515	515	520	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	571	570	570	570	525	525	525	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	15	20	15	20	35	30	35	nm
Capacitance V_F=0V,f=1MHZ	C	15	15	15	15	45	45	100	pF

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		ZG-G Green (InGaN)	Y Yellow (GaAsP/GaP)	SYK Super Bright Yellow (AlGaInP)	SYK-T Super Bright Yellow (AlGaInP)	SYK-J3 Super Bright Yellow (AlGaInP)	SY-J3 Super Bright Yellow (AlGaInP)	QB-D Blue (InGaN)	VB-D Blue (InGaN)	Unit
		●	●	●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	5	5	V
Forward current	I_F	30	30	30	30	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	100	140	175	150	140	140	150	100	mA
Power dissipation	P_D	120	75	75	75	75	75	120	120	mW
LED LAMPS:										
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:										
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		ZG-G Green (InGaN)	Y Yellow (GaAsP/GaP)	SYK Super Bright Yellow (AlGaInP)	SYK-T Super Bright Yellow (AlGaInP)	SYK-J3 Super Bright Yellow (AlGaInP)	SY-J3 Super Bright Yellow (AlGaInP)	QB-D Blue (InGaN)	VB-D Blue (InGaN)	Unit
		●	●	●	●	●	●	●	●	
Forward voltage (typ.)										
I_F=20mA		3.2	2.1	2.0	2.05	2.0	2.0	3.3	3.3	
I_F=10mA	V_F	3.05	1.95	1.95	1.95	1.95	1.95	3.0	3.0	V
I_F=2mA		2.8	1.85	1.85	1.8	1.85	1.85	2.65	2.65	
Forward voltage (max.)										
I_F=20mA		4.0	2.5	2.5	2.5	2.5	2.5	4.0	4.0	
I_F=10mA	V_F	3.4	2.4	2.35	2.3	2.4	2.4	3.5	3.4	V
I_F=2mA		3.1	2.2	2.2	2.2	2.2	2.2	3.1	3.1	
Reverse current V_R=5V	I_R	50	10	10	10	10	10	50	50	μA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	520	590	590	590	590	590	460	465	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	525	588	590	590	590	590	465	470	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	35	35	20	15	20	20	25	22	nm
Capacitance V_F=0V,f=1MHZ	C	100	20	20	25	45	45	100	100	pF

TECHNICAL DATA 5V/12V WITH INTERNAL RESISTANCE

Absolute maximum ratings (T_A=25°C)		I Hi.Eff.Red (GaAsP/GaP)	G Green (GaP)	Unit
		●	●	
Reverse voltage	V_R	5	5	V
Forward voltage (Max.) for 5V	V_F	6	6	V
Forward voltage (Max.) for 12V	V_F	14	14	V
Power dissipation for 5V	P_D	85	85	mW
Power dissipation for 12V	P_D	120	120	mW
LED LAMPS:				
Operating temperature	T_A	- 40~+70	- 40~+70	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	°C
LED DISPLAYS:				
Operating temperature	T_A	- 40~+70	- 40~+70	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	°C

Operating Characteristics		I Hi.Eff.Red (GaAsP/GaP)	G Green (GaP)	Unit
		●	●	
Forward current (typ.) V_F=5V	I_F	13	11.5	mA
Forward current (typ.) V_F=12V	I_F	8.5	8.5	mA
Forward current (max.) V_F=5V	I_F	17.5	17.5	mA
Forward current (max.) V_F=12V	I_F	11.5	11.5	mA
Reverse current V_R=5V	I_R	10	10	μA
Peak Emission Wavelength V_F=5V,12V	λp	627	565	nm
Dominant Wavelength V_F=5V,12V	λD	617	568	nm
Spectral line half-width V_F=5V,12V	Δλ1/2	45	30	nm

TECHNICAL DATA FOR INFRARED

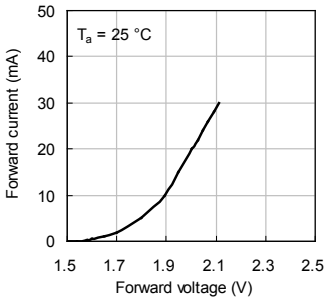
Absolute maximum ratings (T_A=25°C)		F3 (GaAs)	SF4 (GaAlAs)	SF6 (GaAlAs)	SF7 (GaAlAs)	Unit
		●	●	●	●	
Reverse voltage	V_R	5	5	5	5	V
Forward current	I_F	50	50	50	50	mA
Forward current (Peak) 1/100 Duty Cycle, 10μs Pulse Width	i_{FS}	1.2	1.2	1	1	A
Power dissipation	P_D	90	85	85	95	mW
LED LAMPS:						
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:						
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		F3 (GaAs)	SF4 (GaAlAs)	SF6 (GaAlAs)	SF7 (GaAlAs)	Unit
		●	●	●	●	
Forward voltage (typ.) I_F=20mA	V_F	1.2	1.3	1.35	1.4	V
Forward voltage (max.) I_F=20mA	V_F	1.6	1.6	1.6	1.6	V
Reverse current V_R=5V	I_R	10	10	10	10	μA
Peak Emission Wavelength I_F=20mA	λp	940	880	860	850	nm
Spectral line half-width I_F=20mA	Δλ1/2	50	50	50	50	nm
Capacitance VF=0V,f=1MHZ	C	90	90	30	30	pF

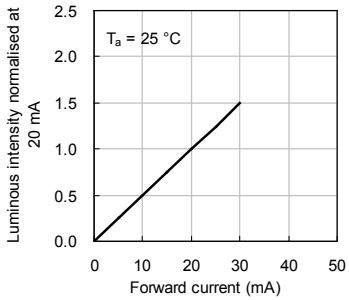
TECHNICAL DATA

High Efficiency Red

Forward Current vs. Forward Voltage

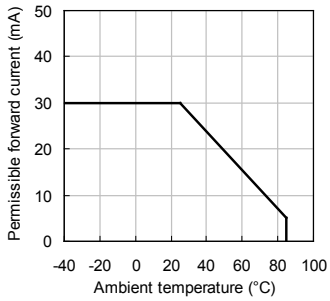


Luminous Intensity vs. Forward Current

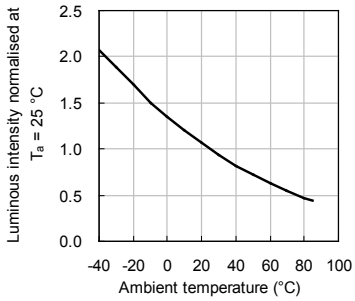


I : GaAsP/GaP

Forward Current Derating Curve

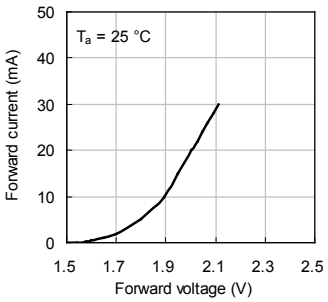


Luminous Intensity vs. Ambient Temperature

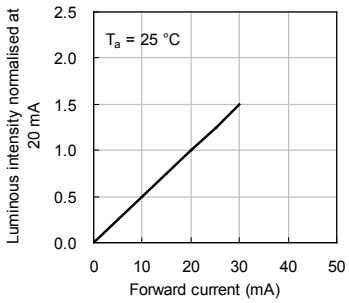


High Efficiency Red, Orange

Forward Current vs. Forward Voltage

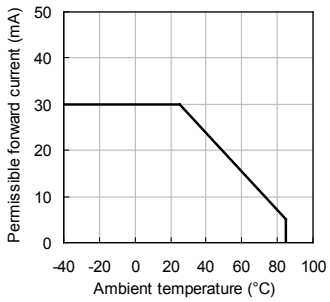


Luminous Intensity vs. Forward Current

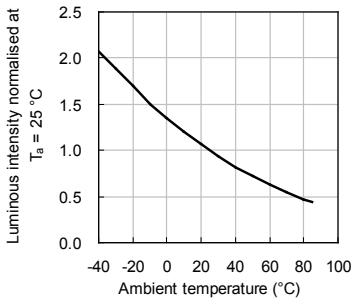


E : GaAsP/GaP

Forward Current Derating Curve

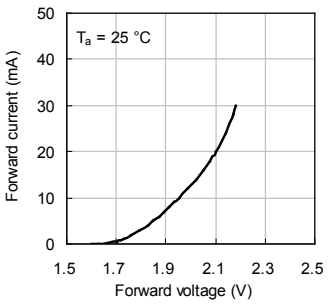


Luminous Intensity vs. Ambient Temperature

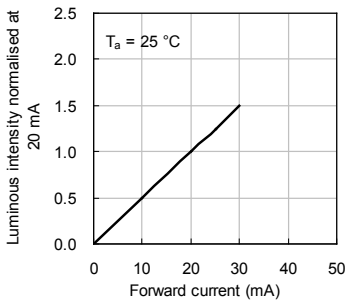


Super Bright Red

Forward Current vs. Forward Voltage

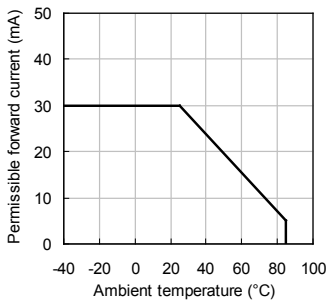


Luminous Intensity vs. Forward Current

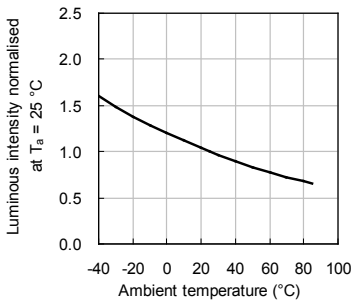


SR-J4 : AlGaInP

Forward Current Derating Curve

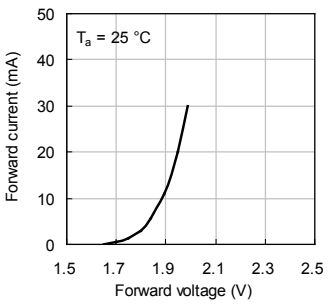


Luminous Intensity vs. Ambient Temperature

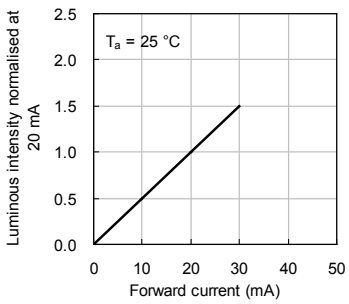


Hyper Red

Forward Current vs. Forward Voltage

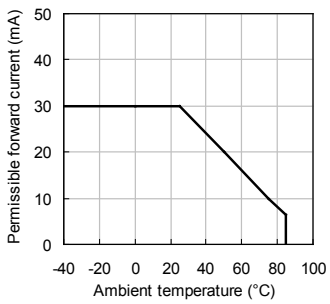


Luminous Intensity vs. Forward Current

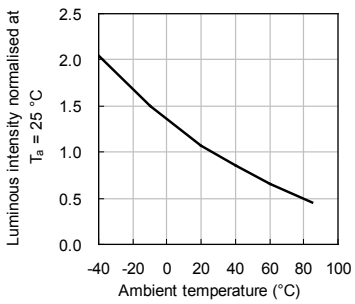


SURK : AlGaInP

Forward Current Derating Curve



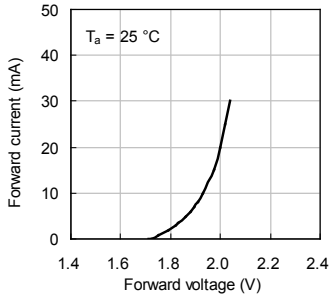
Luminous Intensity vs. Ambient Temperature



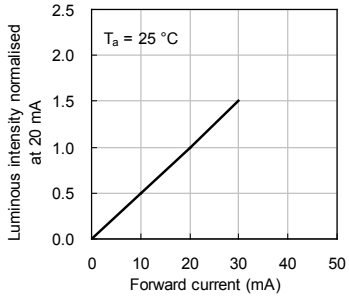
TECHNICAL DATA

Hyper Red — SURK-T : AlGaInP

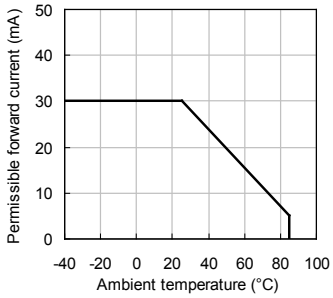
Forward Current vs. Forward Voltage



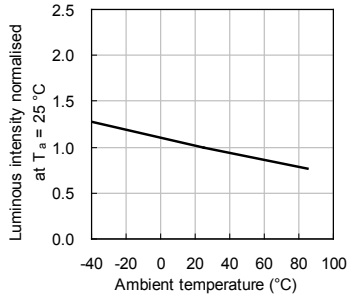
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

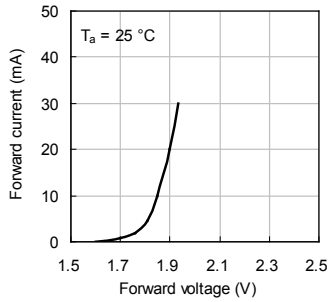


Luminous Intensity vs. Ambient Temperature

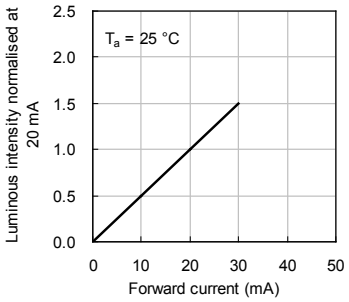


Hyper Red — SUR-E : AlGaInP

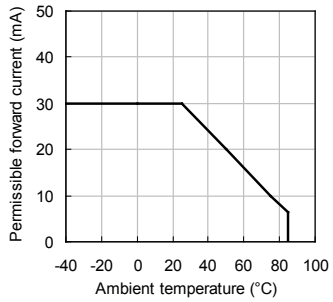
Forward Current vs. Forward Voltage



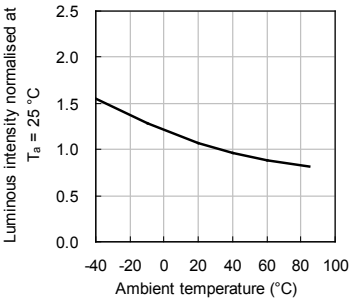
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

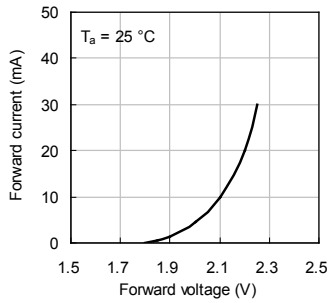


Luminous Intensity vs. Ambient Temperature

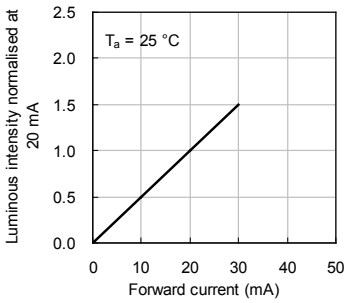


Hyper Red — SEK-J3, SE-J3 : AlGaInP

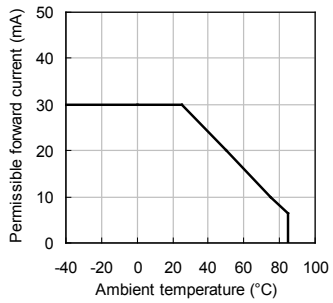
Forward Current vs. Forward Voltage



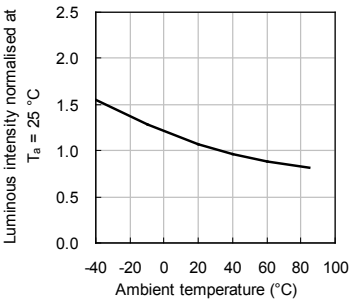
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

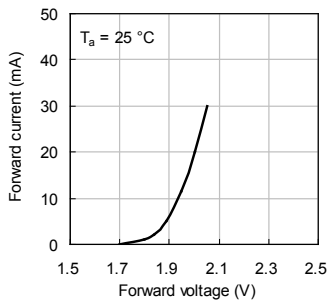


Luminous Intensity vs. Ambient Temperature

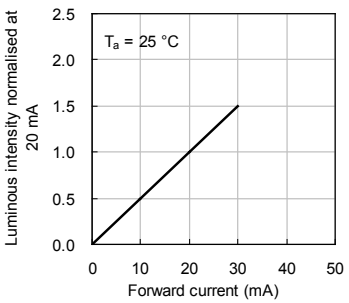


Hyper Red — SE-E : AlGaInP

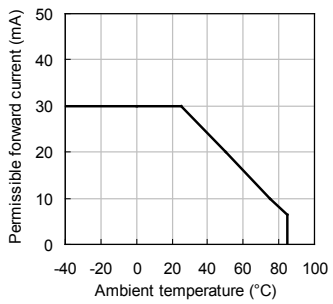
Forward Current vs. Forward Voltage



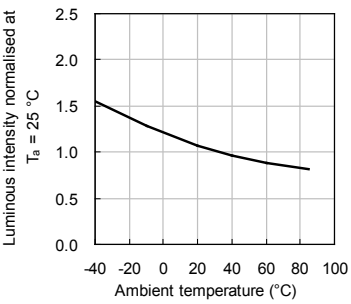
Luminous Intensity vs. Forward Current



Forward Current Derating Curve



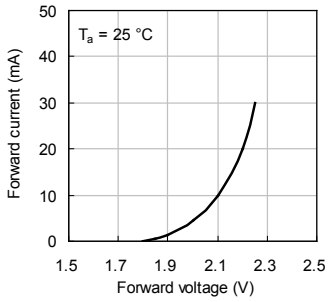
Luminous Intensity vs. Ambient Temperature



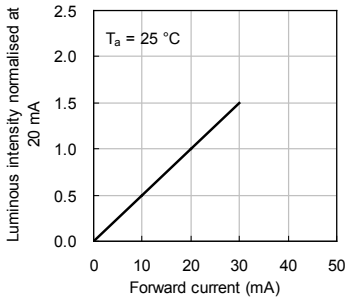
TECHNICAL DATA

Super Bright Orange — SEK-J4 : AlGaInP

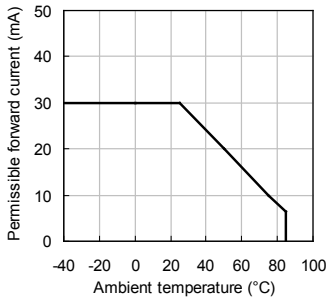
Forward Current vs. Forward Voltage



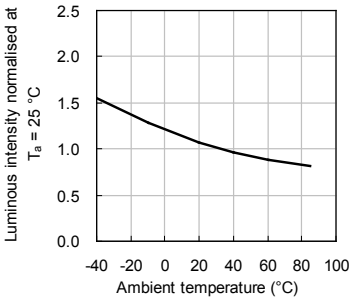
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

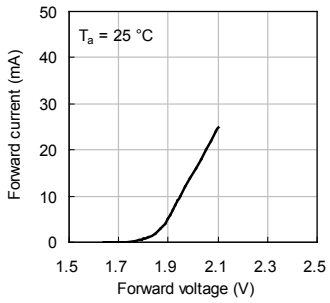


Luminous Intensity vs. Ambient Temperature

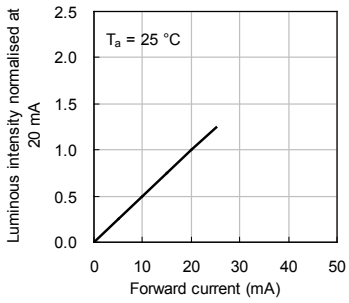


Pure Orange — N : GaAsP/GaP

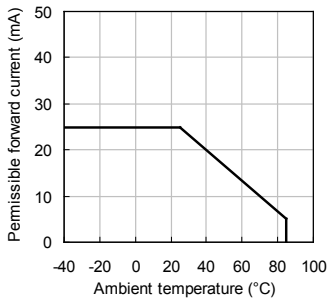
Forward Current vs. Forward Voltage



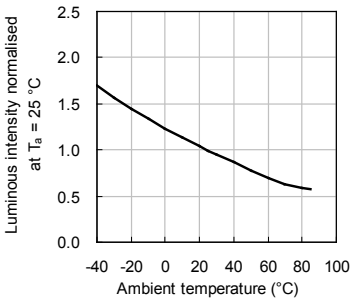
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

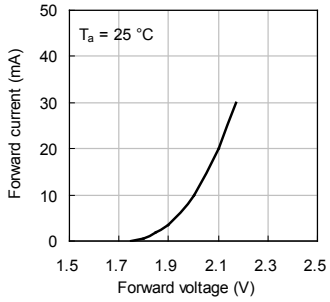


Luminous Intensity vs. Ambient Temperature

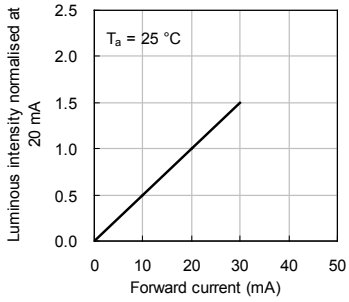


Super Bright Orange — SEK : AlGaInP

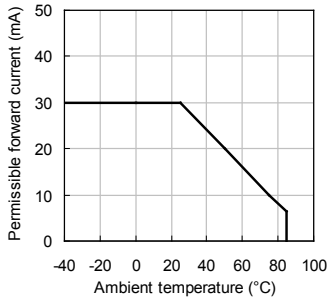
Forward Current vs. Forward Voltage



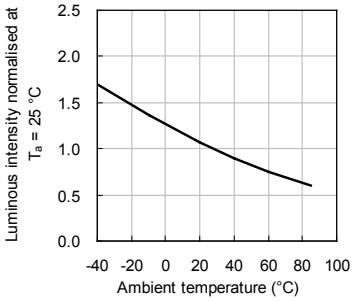
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

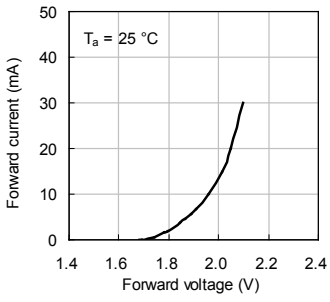


Luminous Intensity vs. Ambient Temperature

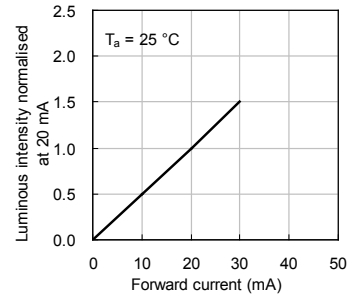


Super Bright Orange — SEK-T : AlGaInP

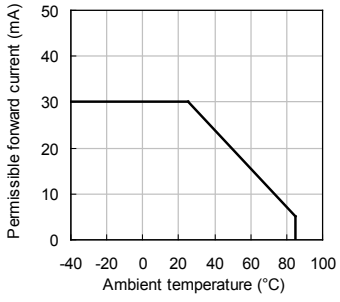
Forward Current vs. Forward Voltage



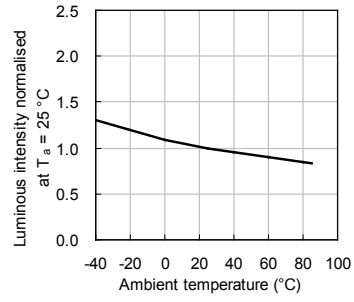
Luminous Intensity vs. Forward Current



Forward Current Derating Curve



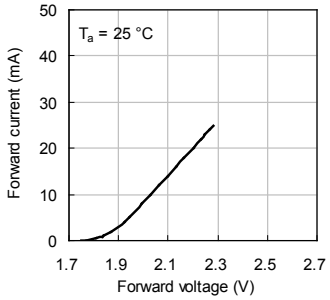
Luminous Intensity vs. Ambient Temperature



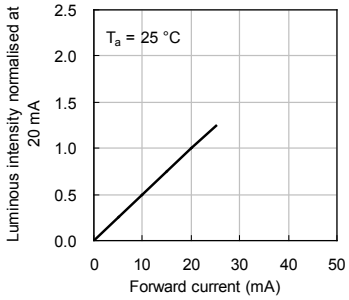
TECHNICAL DATA

Green/Super Bright Green — G, SG : GaP

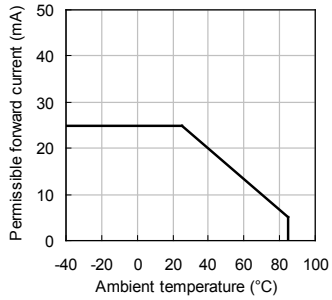
Forward Current vs. Forward Voltage



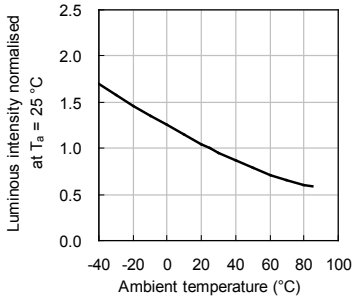
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

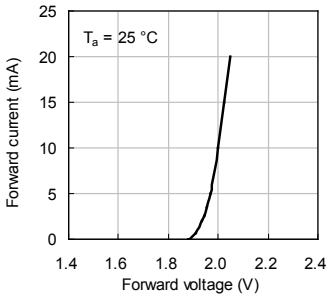


Luminous Intensity vs. Ambient Temperature

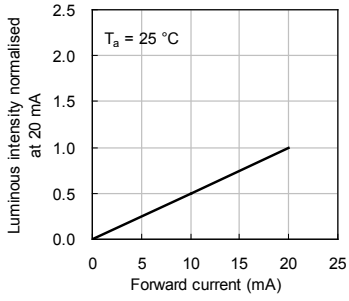


Green — CG-KA : AlGaInP

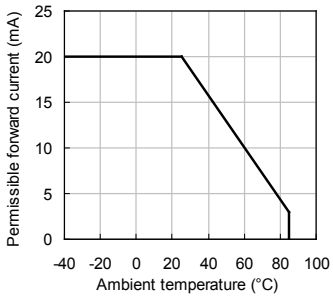
Forward Current vs. Forward Voltage



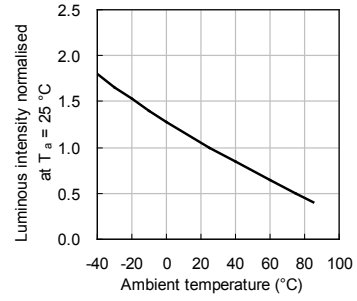
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

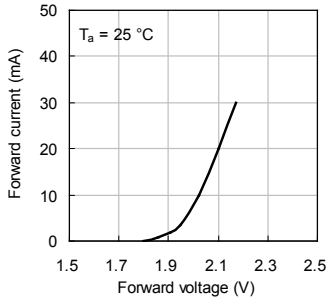


Luminous Intensity vs. Ambient Temperature

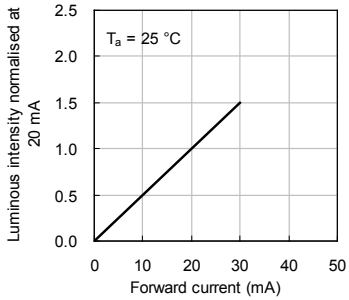


Green — CGK : AlGaInP

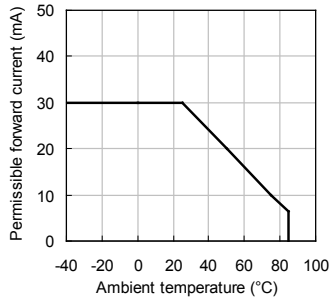
Forward Current vs. Forward Voltage



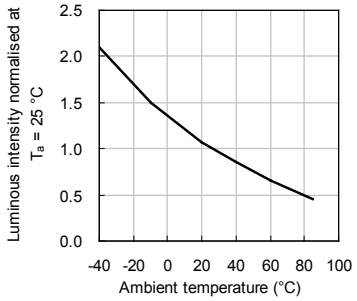
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

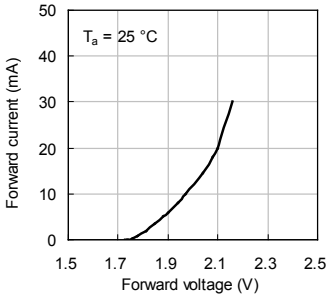


Luminous Intensity vs. Ambient Temperature

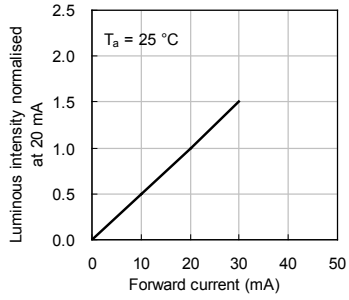


Green — CGK-T : AlGaInP

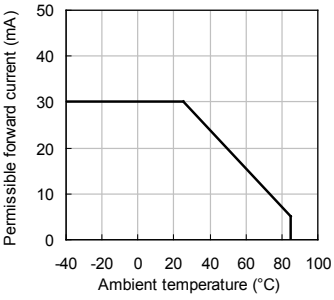
Forward Current vs. Forward Voltage



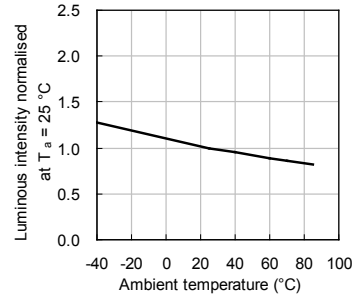
Luminous Intensity vs. Forward Current



Forward Current Derating Curve



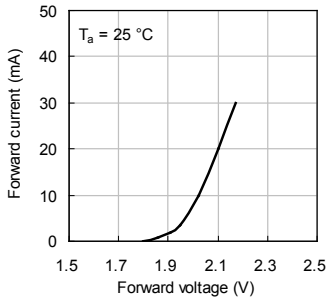
Luminous Intensity vs. Ambient Temperature



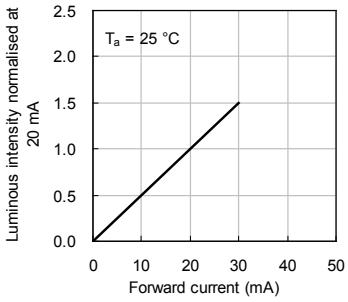
TECHNICAL DATA

Mega Green — MGK : AlGaInP

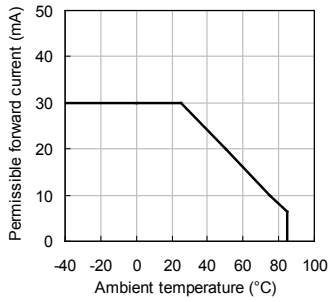
Forward Current vs. Forward Voltage



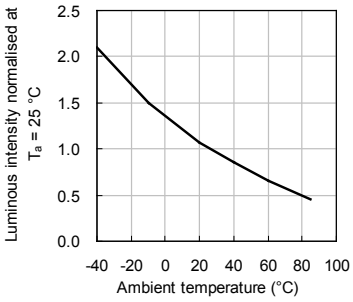
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

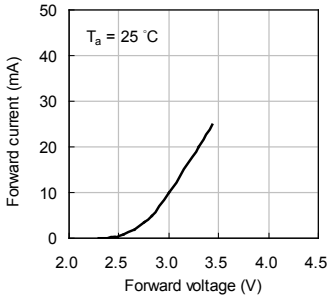


Luminous Intensity vs. Ambient Temperature

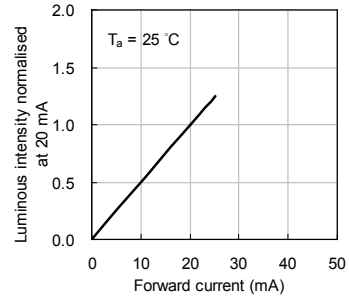


Green — ZGK : InGaN

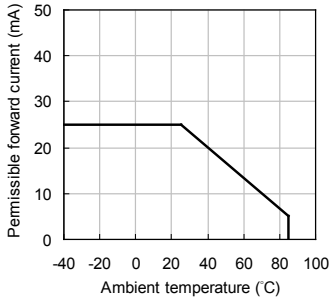
Forward Current vs. Forward Voltage



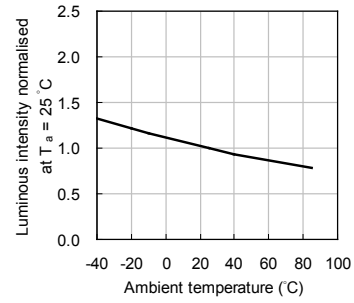
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

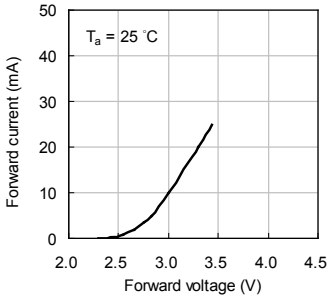


Luminous Intensity vs. Ambient Temperature

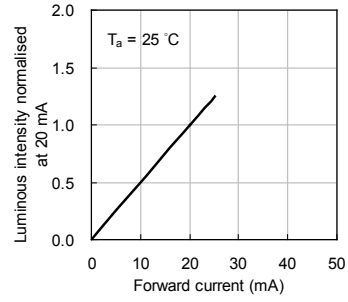


Green — ZG : InGaN

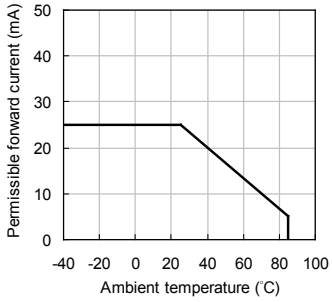
Forward Current vs. Forward Voltage



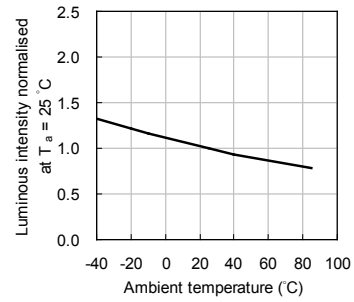
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

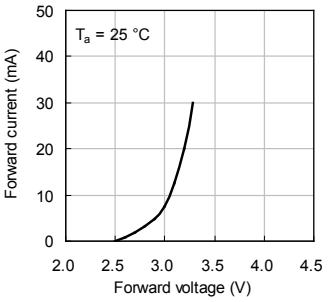


Luminous Intensity vs. Ambient Temperature

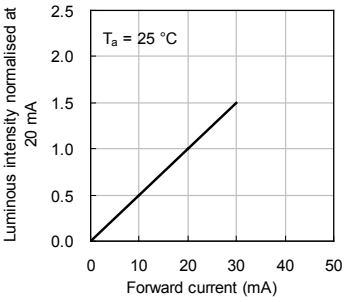


Green — ZG-E : InGaN

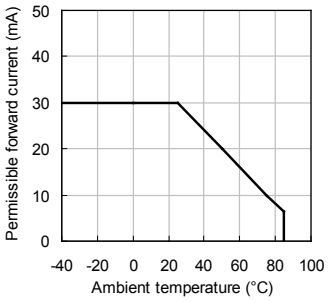
Forward Current vs. Forward Voltage



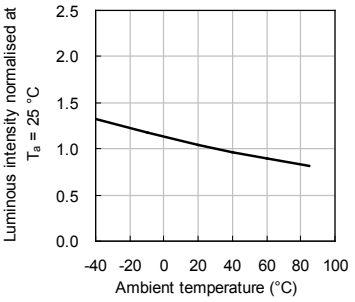
Luminous Intensity vs. Forward Current



Forward Current Derating Curve



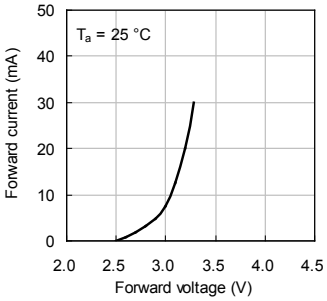
Luminous Intensity vs. Ambient Temperature



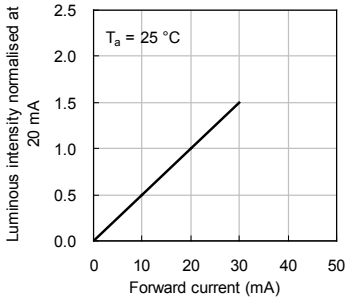
TECHNICAL DATA

Green — ZG-G : InGaN

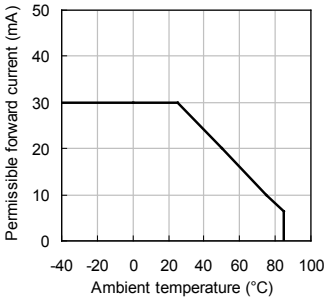
Forward Current vs. Forward Voltage



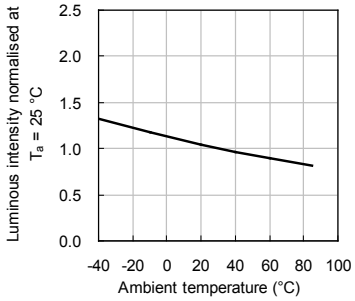
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

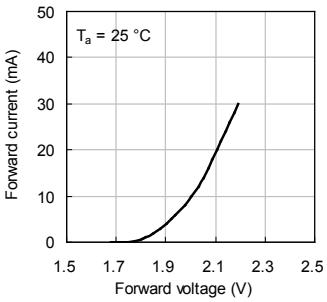


Luminous Intensity vs. Ambient Temperature

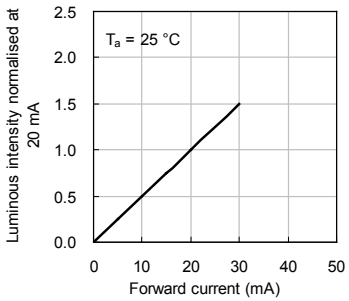


Yellow — Y : GaAsP/GaP

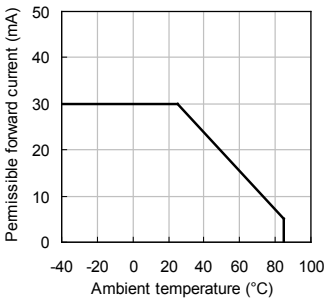
Forward Current vs. Forward Voltage



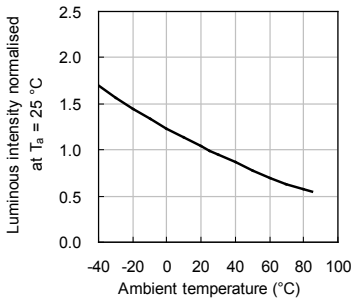
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

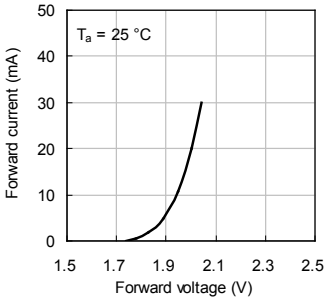


Luminous Intensity vs. Ambient Temperature

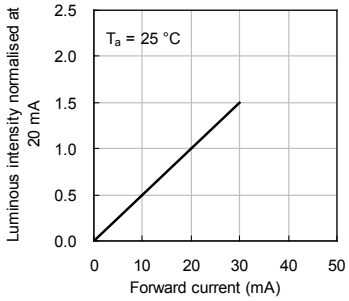


Super Bright Yellow — SYK : AlGaInP

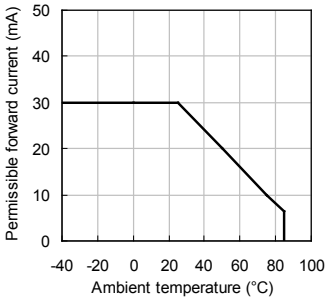
Forward Current vs. Forward Voltage



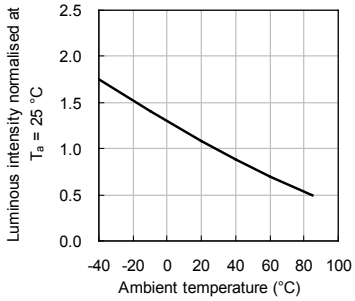
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

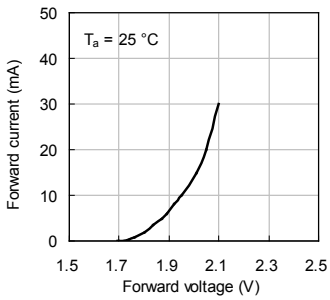


Luminous Intensity vs. Ambient Temperature

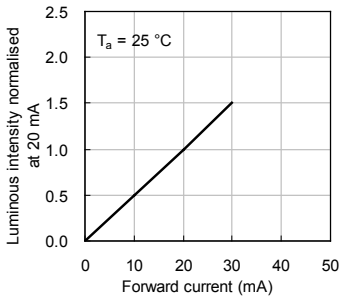


Super Bright Yellow — SYK-T : AlGaInP

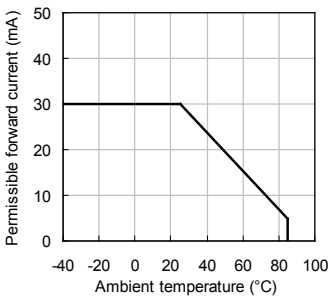
Forward Current vs. Forward Voltage



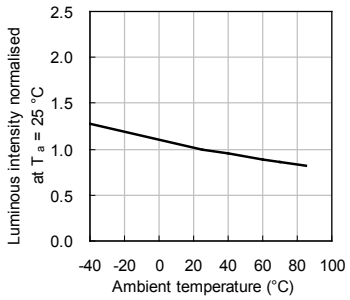
Luminous Intensity vs. Forward Current



Forward Current Derating Curve



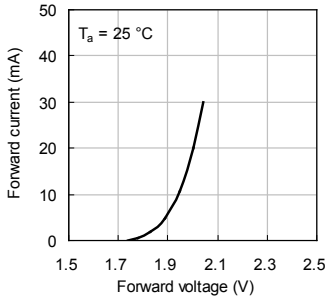
Luminous Intensity vs. Ambient Temperature



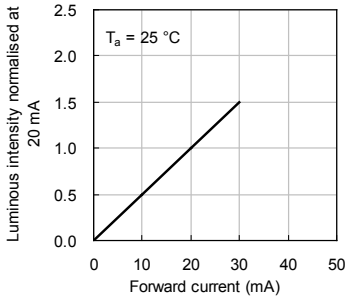
TECHNICAL DATA

Super Bright Yellow — SYK-J3 : AlGaInP

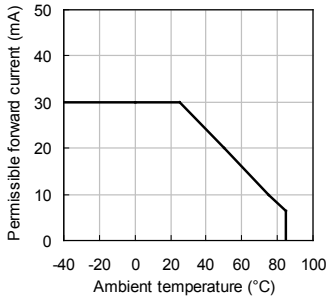
Forward Current vs. Forward Voltage



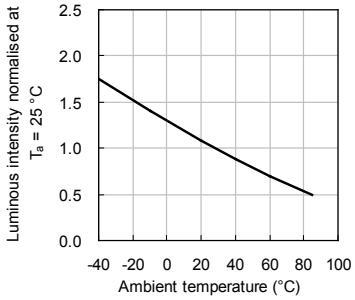
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

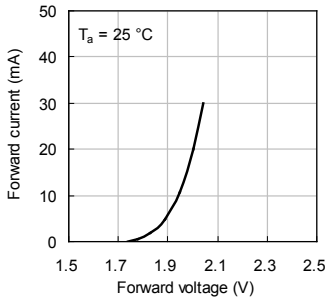


Luminous Intensity vs. Ambient Temperature

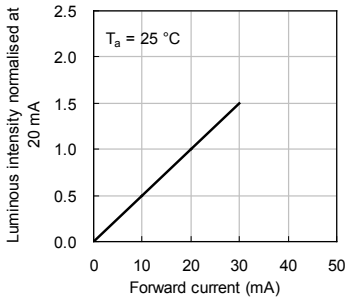


Super Bright Yellow — SY-J3 : AlGaInP

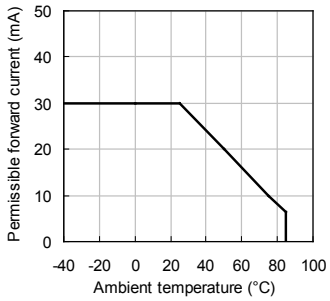
Forward Current vs. Forward Voltage



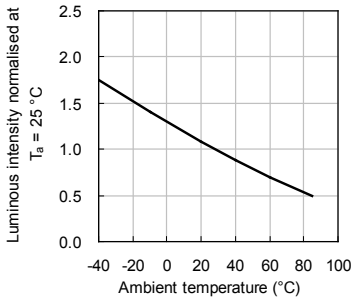
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

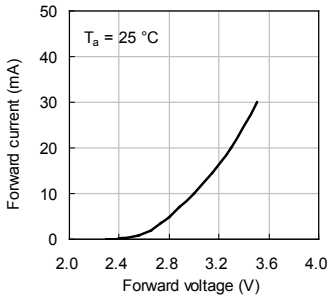


Luminous Intensity vs. Ambient Temperature

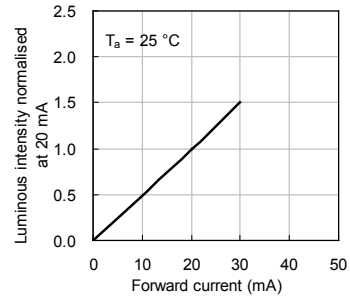


Blue — QB-D : InGaN

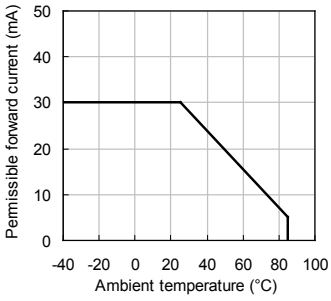
Forward Current vs. Forward Voltage



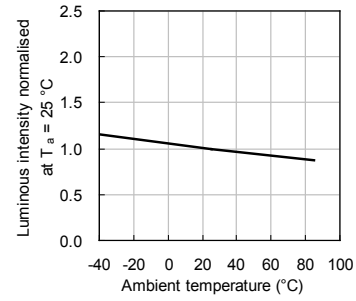
Luminous Intensity vs. Forward Current



Forward Current Derating Curve

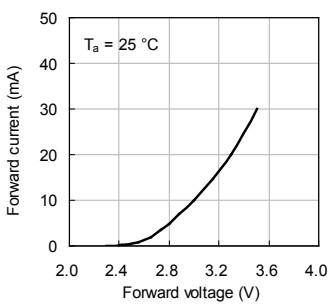


Luminous Intensity vs. Ambient Temperature

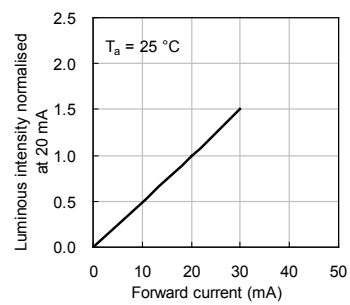


Blue — VB-D : InGaN

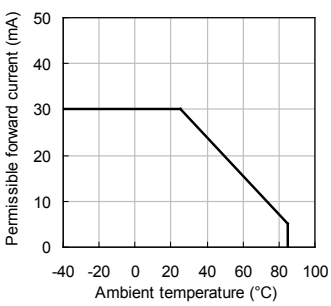
Forward Current vs. Forward Voltage



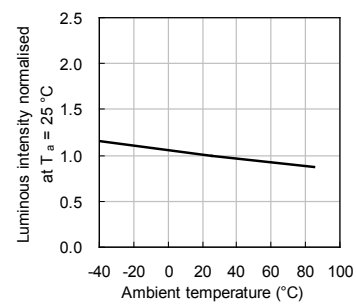
Luminous Intensity vs. Forward Current



Forward Current Derating Curve



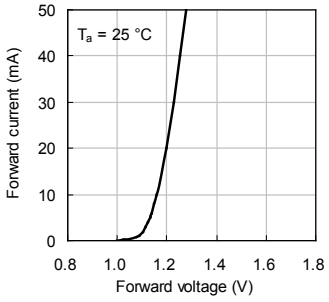
Luminous Intensity vs. Ambient Temperature



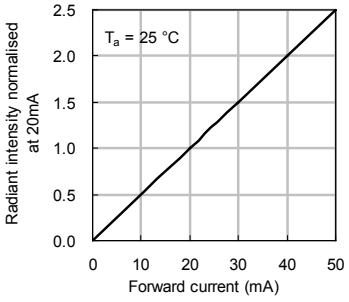
TECHNICAL DATA

Infrared — F3 : GaAs

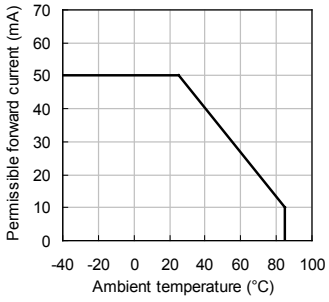
Forward Current vs. Forward Voltage



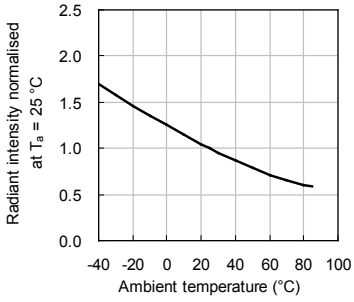
Radiant Intensity vs. Forward Current



Forward Current Derating Curve

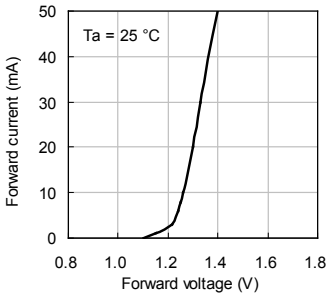


Radiant Intensity vs. Ambient Temperature

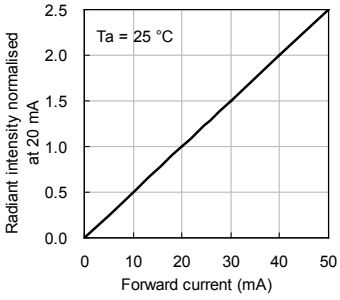


Infrared — SF4 : GaAlAs

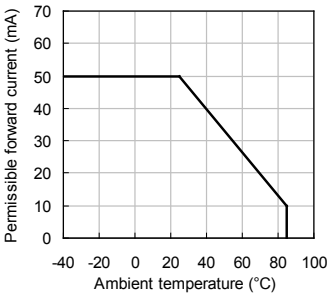
Forward Current vs. Forward Voltage



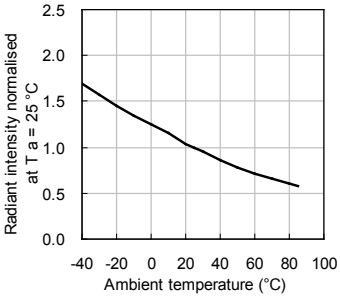
Radiant Intensity vs. Forward Current



Forward Current Derating Curve

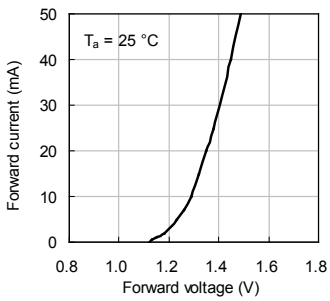


Radiant Intensity vs. Ambient Temperature

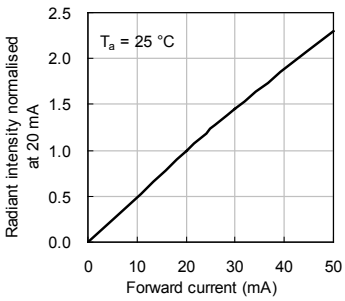


Infrared — SF6 : GaAlAs

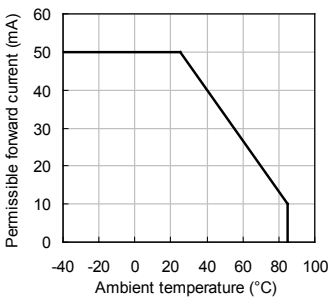
Forward Current vs. Forward Voltage



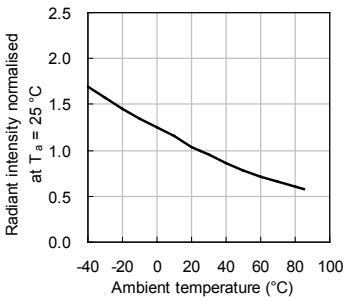
Radiant Intensity vs. Forward Current



Forward Current Derating Curve

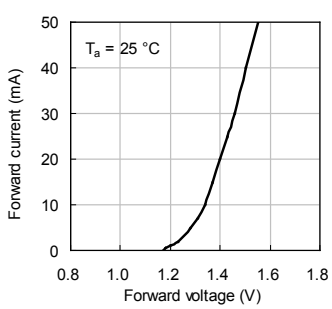


Radiant Intensity vs. Ambient Temperature

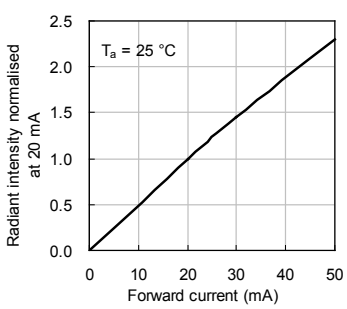


Infrared — SF7 : GaAlAs

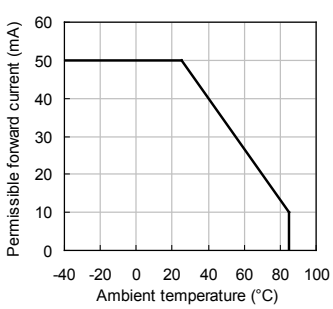
Forward Current vs. Forward Voltage



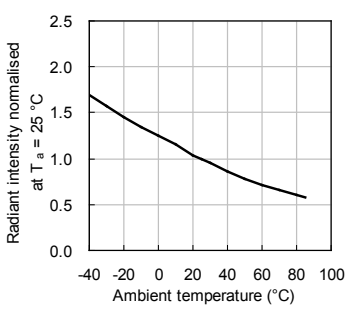
Radiant Intensity vs. Forward Current



Forward Current Derating Curve



Radiant Intensity vs. Ambient Temperature



BIN CODE SYSTEMS

SELECTION CODE FOR STANDARD AND LOW CURRENT LEDS
(T_A=25°C Tolerance +/-15% IF<15mA)

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

SELECTION CODE FOR NPN PHOTOTRANSISTORS
(T_A=25°C Tolerance +/-15%)

Group	Photocurrent(mA)		Group	Photocurrent(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	-	-	-

SELECTION CODE FOR INFRARED EMITTING DIODES
(T_A=25°C Tolerance +/-15%)

Group	Radiant intensity in mW/sr		Group	Radiant intensity in mW/sr	
	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

SELECTION CODE FOR SUPER BRIGHT LEDS
(T_A=25°C Tolerance +/-15% IF≥15mA)

Group	Light intensity in mcd		Group	Light intensity in mcd	
	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

SELECTION CODE FOR DISPLAYS
(T_A=25°C Tolerance +/-15% IF≤10mA)

Group	Light intensity in ucd		Group	Light intensity in ucd	
	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

BIN CODE SYSTEMS

SELECTION CODE FOR LUMINOUS FLUX (T_A=25°C; Tolerance: +/-15%)					
Group	Luminous Flux in lm		Group	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

COLOR CODE FOR GREEN LEDS + DISPLAYS (T_A=25°C; Tolerance: +/-1nm)				
Group	Dom. Wavelength (nm)			
	Min.	Max.	Min.	Max.
0	556	559	-	-
1	559	561	515	520
2	561	563	520	525
3	563	565	525	530
4	565	567	530	535
5	567	569	535	540
6	569	571	-	-
7	571	573	-	-
8	573	575	-	-

COLOR CODE FOR BLUE LEDS + DISPLAYS (T_A=25°C; Tolerance: +/-1nm)					
Group	Dom. Wavelength (nm)		Group	Dom. Wavelength (nm)	
	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

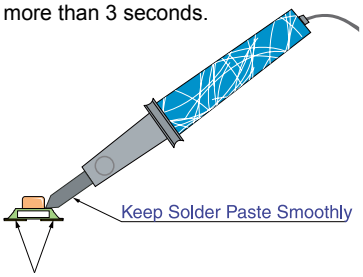
COLOR CODE FOR YELLOW LEDS + DISPLAYS (T_A=25°C; Tolerance: +/-1nm)					
Group	Dom. Wavelength (nm)		Group	Dom. Wavelength (nm)	
	Min.	Max.		Min.	Max.
1	581	584	5	590	592
2	584	586	6	592	594
3	586	588	7	594	597
4	588	590	8	597	600

SOLDERING INSTRUCTIONS						
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	<=260°C	3s	>=2mm	<=350°C	3s	>2mm
	<=260°C	5s	>=5mm	<=350°C	5s	>5mm
SMDS	-	-	-	<=350°C	3s (one time only)	-
DISPLAYS	*<=260°C	*3s	*>2mm	<=350°C	3s	>2mm

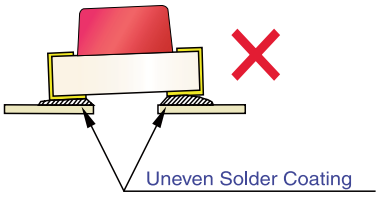
APPLICATION NOTES

General Notes

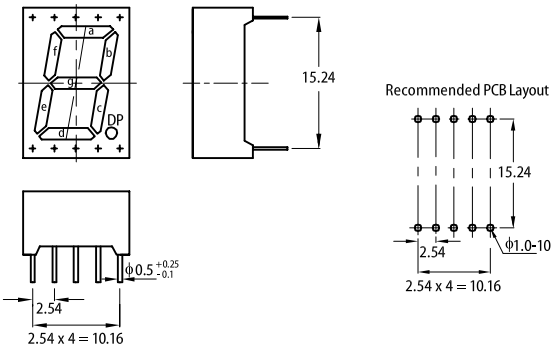
1. We recommend manual soldering operations only for repair and rework purposes. The soldering iron should be temperature-controlled to avoid damaging the component. The maximum soldering temperature is 300°C for Pb-Sn solder and 350°C for lead-free solder for normal lamps and displays. For blue (typ.:465nm), green (typ.:525nm), and all white LEDs, the maximum soldering iron temperature is 280°C. Do not place the soldering iron on the component for more than 3 seconds.



2. The tip of the soldering iron should never touch the epoxy lens.
3. Do not apply stress to the leads when the component is heated above 85°C, otherwise internal wire bonds may be damaged.
4. Through-Hole LEDs are incompatible with reflow soldering.
5. If the LED will undergo multiple soldering passes or face other processes where the part may be subjected to intense heat, please check with Kingbright for compatibility.
6. SMD products must be mounted according to specified soldering pad patterns. Refer to the product datasheet for details. Solder paste must be evenly applied to each soldering pad to insure proper bonding and positioning of the component.



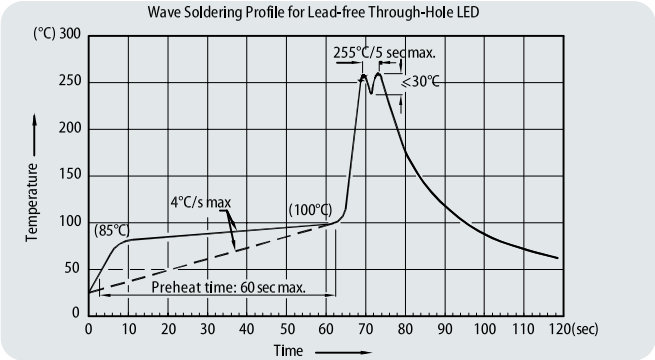
7. After soldering, allow at least three minutes for the component to cool down to room temperature before further operations.
8. Recommended PCB pin hole diameters for display products are listed below :
   Square pin type :Φ1mm
   Round pin type : 2 x pin diameters



9. Data subject to change without notice. For additional detail of application notes, product information, and disclaimers, please visit our website at https://www.kingbright.com/application_notes.

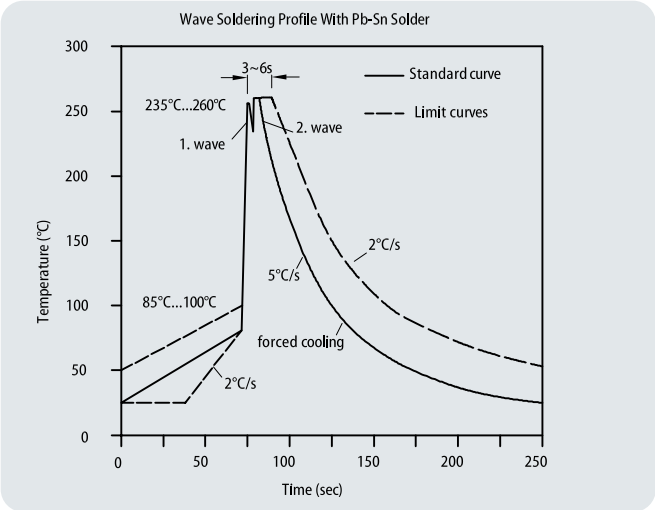
Recommended Wave Soldering Profiles For Kingbright Through-Hole Products

1. Lead-Free Wave Soldering Profile



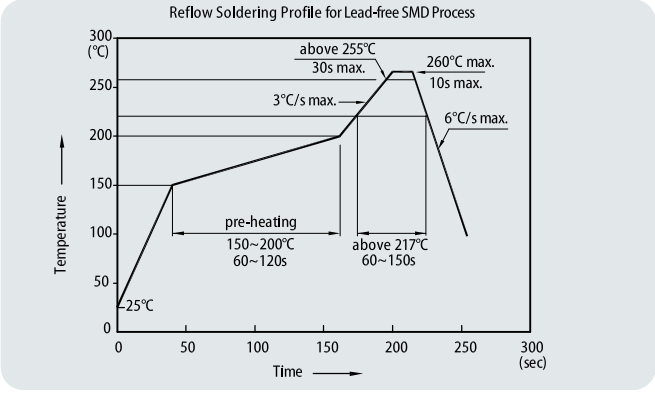
Notes:
1.Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C.
2.Peak wave soldering temperature between 245°C ~ 255°C for 3 sec (5 sec max).
3.Do not apply stress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

2. Wave Soldering Profile With Pb-Sn Solder



Recommended Reflow Soldering Profiles For Kingbright SMD Products

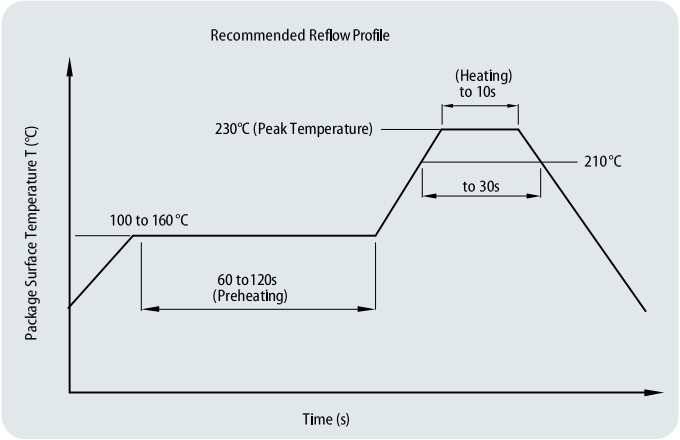
1. Lead-Free Reflow Soldering Profile



Notes:
1. Don't cause stress to the LEDs while it is exposed to high temperature.
2. The maximum number of reflow soldering passes is 2 times.

2. Reflow Soldering Profiles With Pb-Sn Solder

No more than two soldering passes with the recommended profile.



Static Electricity and Voltage Spikes in InGaN/GaN Products

InGaN/GaN products are sensitive to electrostatic discharge (ESD) and other transient voltage spikes. ESD and voltage spikes can affect the component's reliability, increase reverse current, and decrease forward voltage. This may result in reduced light intensity or cause component failure.

Kingbright InGaN/GaN products are stored in anti-static packaging for protection during transport and storage. Please note the anti-static measures below when handling Kingbright InGaN/GaN products.

Design Precautions

Products using InGaN/GaN components must incorporate protection circuitry to prevent ESD and voltage spikes from reaching the vulnerable component.

ESD Protection During Production

Static discharge can result when static–sensitive products come in contact with the operator or other conductors. The following procedures may decrease the possibility of ESD damage:

1. Minimize friction between the product and surroundings to avoid static buildup.
2. All manufacturing and testing equipment should be grounded.
3. All personnel in an ESD protected area should wear antistatic garments and wrist straps.
4. Set up ESD protection areas using grounded metal plating for component handling.
5. All workstations that handle IC and ESD-sensitive components must maintain an electrostatic potential of 150V or less.
6. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.
7. Use anti-static packaging for transport and storage.
8. All anti-static equipment and procedures should be periodically inspected and evaluated for proper functionality.

LED Mounting Method

1. The lead pitch of the LED must match the pitch of the mounting holes on the PCB during component placement. Lead-forming may be required to insure the lead pitch matches the hole pitch. Refer to (Fig.1) for proper lead forming procedures.

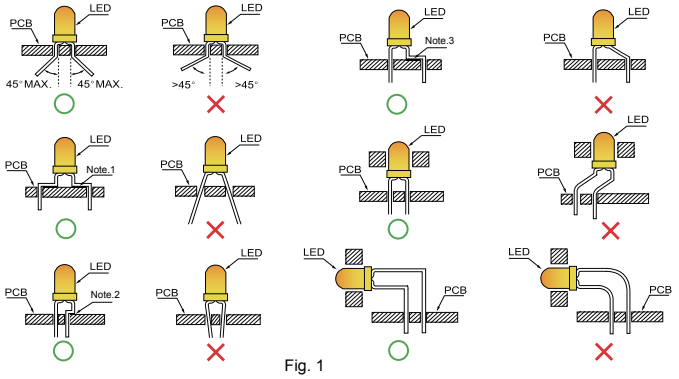


Fig. 1

"○" Correct mounting method "×" Incorrect mounting method

2. When soldering wires to the LED, each wire joint should be separately insulated with heat-shrink tube to prevent short-circuit contact. Do not bundle both wires in one heat shrink tube to avoid pinching the LED leads. Pinching stress on the LED leads may damage the internal structures and cause failure. (Fig.2)

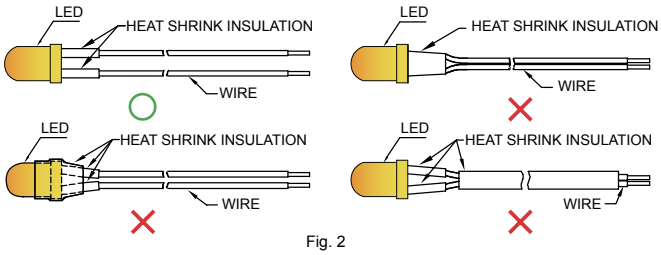


Fig. 2

3. Use stand-offs (Fig.3) or spacers (Fig.4) to securely position the LED above the PCB.

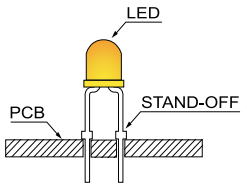


Fig.3

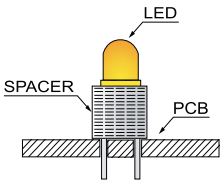


Fig.4

4. Do not route PCB trace in the contact area between the leadframe and the PCB to prevent short-circuits.

Lead Forming Procedures

1. Maintain a minimum of 3mm clearance between the base of the LED lens and the first lead bend. (Fig.5 and 6)

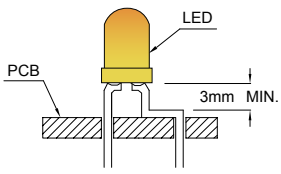


Fig. 5

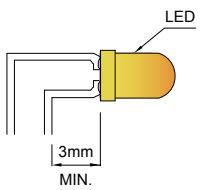


Fig. 6

2. Lead forming or bending must be performed before soldering, never during or after soldering.
3. Do not stress the LED lens during lead-forming in order to prevent fractures in the epoxy lens and damage the internal structures.
4. During soldering, component covers and holders should leave clearance to avoid placing damaging stress on the LED during soldering. (Fig.7)

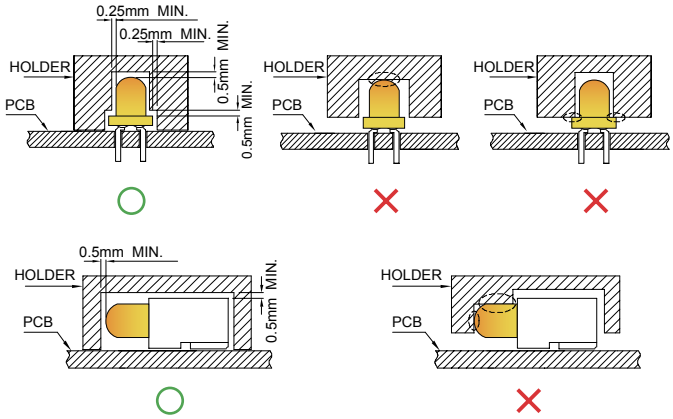


Fig. 7

5. During lead forming, use tools or jigs to hold the leads securely so that the bending force will not be transmitted to the LED lens and its internal structures. Do not perform lead forming once the component has been mounted onto the PCB. (Fig.8)

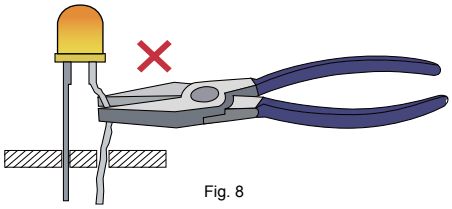


Fig. 8

6. Do not bend the leads more than twice. (Fig.9)

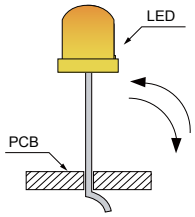


Fig. 9

7. After soldering or other high-temperature assembly, allow the LED to cool down to 50°C before applying outside force (Fig.10). In general, avoid placing excess force on the LED to avoid damage. For any questions, please consult with Kingbright representative for proper handling procedures.

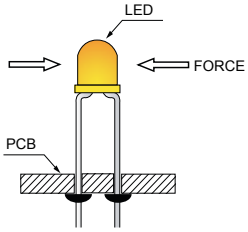


Fig. 10

Cleaning

For SMD and through-hole LEDs

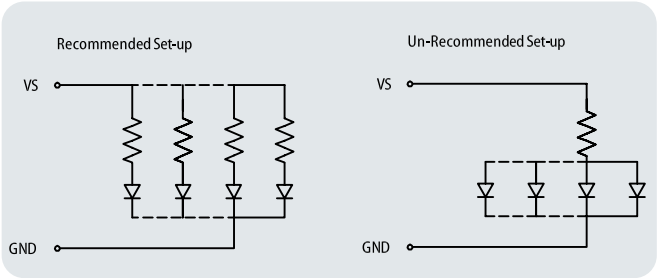
1. Isopropyl alcohol or deionized water are recommended for cleaning. Do not use acidic solvents or unknown chemicals, as they might cause corrosion or damage to the component.
2. Lightly wipe away any surface contaminants, and allow the component to dry under room temperature before further usage. Do not soak the component in solution.

For LED Displays

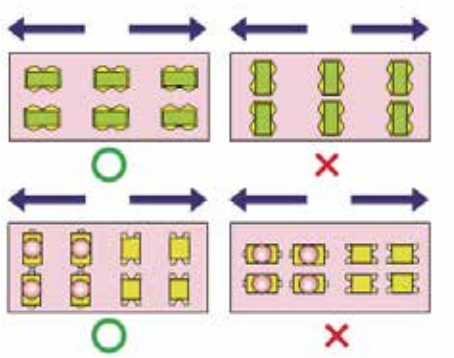
1. The component should be washed with only water, and immediately dried by forced-air to remove excess moisture. Do not use harsh organic solvents because they might damage the plastic parts.
2. The cleaning process should take place at room temperature and the component should not be washed for more than one minute.

Miscellaneous Design Notes

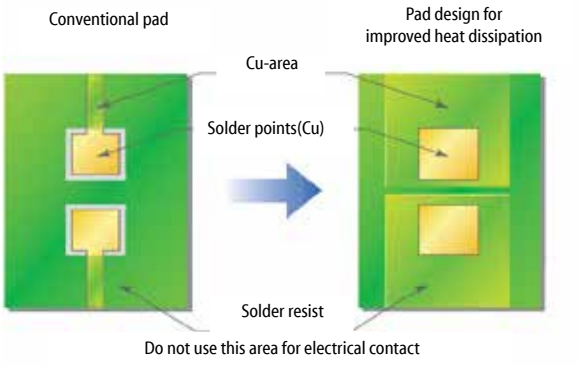
1. Protective current-limiting resistors may be necessary to operate the LEDs within the specified range.
2. LEDs mounted in parallel should each be placed in series with its own current-limiting resistor.



3. The driving circuit should be designed to avoid reverse voltages and transient voltage spikes when the circuit is powered up or shut down.
4. High temperatures can reduce device performance and reliability. Keep LED devices away from heat source for best performance.
5. The safe operation current should be chosen after considering the maximum ambient temperature of the operating environment.
6. During soldering, SMD components should be mounted such that the leads are placed perpendicular to the direction of PCB travel to ensure the solder on each lead melts simultaneously during reflow.

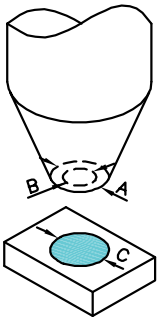


7. Optimal usage of high-power LED devices requires careful design by the end-user to optimize heat dissipation, such as increasing the size of the metal backing around the soldering pad. Refer to the product datasheet for specific design recommendations regarding heat dissipation.



Restrictions on Product Use

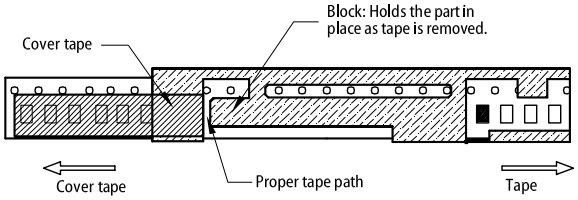
1. Not all devices and product families are available in every country.
2. The light output from UV, blue, white, and other high-power LEDs may cause injury to the human eye when viewed directly.
3. LED devices may contain gallium arsenide (GaAs) material. GaAs is harmful if ingested. GaAs dust and fumes are toxic. Do not break, cut, or pulverize LED devices. Do not dissolve LEDs in chemical solvents.
4. Semiconductor devices can fail or malfunction due to their sensitivity to electrical fluctuation and physical stress. It is the responsibility of the user to observe all safety standards when using Kingbright products, in order to avoid situations in which the malfunction or failure of a Kingbright product could cause injury, property damage, or the loss of human life. In developing designs, please insure that Kingbright products are used within specified operating conditions as set forth in the most recent product specification datasheet.
5. For LEDs with silicone encapsulation such as the KA series, the outer diameter of the pick-up nozzle must be longer than that of the LED's light emitting area. i. e. A >C, and B shall be shorter than the width of the LED.

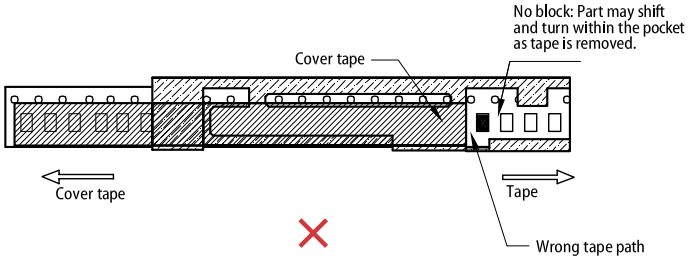


A is the outer diameter of the pick-up nozzle
B is the inner diameter of the pick-up nozzle
C is the diameter of lens

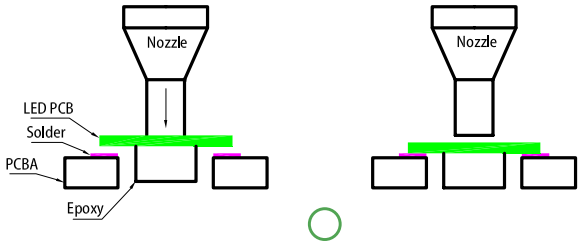
6. The size of the nozzle should be as large as possible if the tape is not involved.
7. The LEDs should not be exposed to an environment where high level of moisture or corrosive gases are present.
8. Prolonged reverse bias should be avoided, as it could cause metal migration, leading to an increase in leakage current or causing a short circuit.
9. Excess driving current and/or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.
10. It is not recommended to assemble LEDs of different color or intensity bins together, as there may be perceivable color or intensity variation. Each bag contains parts from the same bin code. The bin code is printed on the bag's label as below.

11. For the 0603, 1005 and 1608 series, an ESD ionizer should be used during SMT pick-and-place process to neutralize the charge and hence reduce electrostatic attraction.
12. Please do not apply stress directly to the LED during handling.
13. As silicone encapsulation is permeable to gases, some corrosive substances such as H_2S might corrode silver plating of leadframe. Special care should be taken if an LED with silicone encapsulation is to be used near such substances.
14. The LEDs should not be exposed to an environment where high level of moisture or corrosive gases are present.
15. Choosing the right feeder for small SMD components:
    - 15.1 When processing smaller SMD components (such as 0603, 1005, 1608, 1612, 1615, 2012), please use feeder with block to hold the part in place during cover tape removal, in order to prevent the component jumping or turning within the tape due to vibration or static cling.
    - 15.2 Feeder without block is more suitable for larger size components (such as 3216, 3528).
    - 15.3 Please insure the removed cover tape is properly threaded through the feeder as it is removed from the tape.

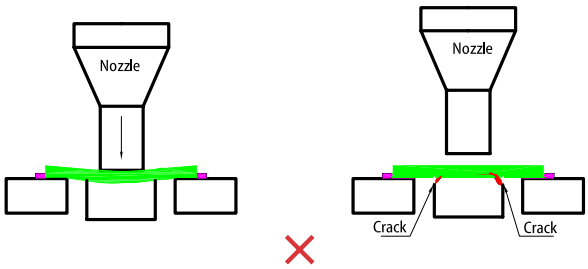




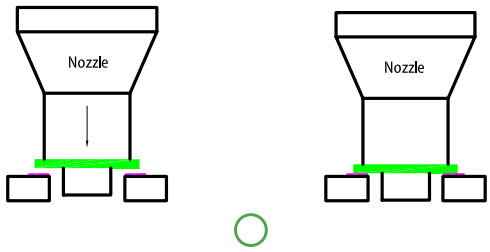
16. When placing reverse-mount LEDs, the nozzle must not place pressure on the part. Refer to the figures below, pressure on the LED will cause the LED to bend and potentially cause delamination or cracking between the component PCB and the epoxy lens. The damaged LED will be more prone to failure after undergoing high-temperature reflow soldering process.



Proper SMD placement. Nozzle does not press down on the LED.



Pressure from the nozzle can cause structural damage to the LED.



Consider using wider nozzles with diameter greater than the PCB hole opening. This will prevent pressure damage during placement.

Storage Control For SMD Products

1. Before a sealed moisture barrier bag (MBB) is opened, contained LEDs shall be kept in an environment with temperature below 40°C and humidity below 90% RH. MBB shall be kept sealed until LEDs contained in the bag are ready to be used. Once MBB is opened, it shall be stored in an environment with temperature range of 5°C~30°C and humidity below 60% RH.
2. After the MBB has been opened, the LEDs should be used according to the floor life specified in the table below.

IPC/JEDEC J-STD-020 Moisture Sensitivity Levels

Level	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 on Label (TOL)	≤30°C / 60% RH

3. If the Humidity Indicator Card (HIC)'s 10 % mark has changed, or the LEDs have not been used within the floor life specified, they should be baked with the following conditions to reset the floor life:

Type	Temperature	Humidity	Bake Time
When still in carrier tape	60±3°C	<5%RH	100H
When out of carrier tape	110°C	/	10H

* Not more than once

4. Do not store LEDs in an environment where high humidity or acidic/ basic chemicals are present, as they will degrade the LED's metallic surfaces.
5. LED leadframe and soldering pads (cathode and anode) are plated with gold, tin, or other metals. Under long-term exposure to open air, the exposed pins and pads may become oxidized causing poor solderability. Therefore opened but unused parts must be stored in sealed containers. Suggest to store unused parts in the original moisture barrier bag.
6. Moisture control for components already mounted on PCB: If the PCB will not undergo additional reflow soldering or high-temperature processes, then no special treatment is required for the mounted moisture-sensitive SMD components. If the PCB will undergo multiple reflow soldering or other high-temperature processes, including rework, then the SMD component's cumulative exposure time until the final high-temperature process must be controlled to within the specified time limit.

For Through-Hole Products

1. Avoid continued exposure to the condensing moisture environment and keep the product away from rapid transitions in ambient temperature.
2. LEDs should be stored with temperature ≤30°C and relative humidity < 60%.
3. Product in the original sealed package is recommended to be assembled within 72 hours of opening. Product in opened package for more than a week should be baked for 30 (+10/-0) hours at 85 ~ 100°C.
4. The LED leadframe surface is plated with silver. When the leadframe is stored under high-humidity environments, or exposed to certain chemical elements or gases, the surface may become discolored. Please maintain the cleanliness of the storage environment.
5. If the storage conditions do not meet specification standards, the component pins may become oxidized requiring re-plating and re-sorting before use. Suggest customers consume LEDs as soon as possible, and avoid long-term storage of large inventories.

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