

Kingbright

Optoelectronic Components



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TABLE OF CONTENTS



HIGH BRIGHTNESS LED

0.5W High Brightness LED	03
1W High Brightness LED	03
1.5W High Brightness LED	03



SMD LED

Top-Emitting PLCC SMD LED	05
Top-Emitting Chip SMD LED	06
Right Angle SMD LED	09
Multi-Color SMD LED	11
Subminiature SMD LED	15
Reverse Mount SMD LED	17
SOT-23 SMD LED	17



THROUGH-HOLE LED

Round LED	19
Oval LED	23
Rectangular LED	23
Cylindrical LED	25
Multi-Color LED	25
Resistor LED	28
Blinking LED	29
Low Current LED	29



SMD DISPLAY

7-Segment SMD Display	31
Alphanumeric SMD Display	33



THROUGH-HOLE DISPLAY

Single Digit 7-Segment Through-Hole Display	35
Dual Digit 7-Segment Through-Hole Display	39
Three Digit 7-Segment Through-Hole Display	42
Four Digit 7-Segment Through-Hole Display	42
Alphanumeric Through-Hole Display	43
Dot Matrix	44
Bar Graph Array	48
Light Bar	48



CIRCUIT BOARD INDICATOR

Single-Level CBI	53
Bi-Level CBI	56
Tri-Level CBI	59
Quad-Level CBI	60
SMD CBI	60
Panel Mount CBI	61

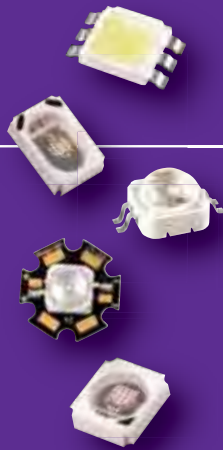


INFRARED & PHOTOTRANSISTOR

Infrared Emitting Diode	63
Phototransistor	65

TECHNICAL NOTES

SMD Tape Specifications	67
Recommended Soldering Pattern	73
Technical Data	77
Bin Code Systems	91
Index	93
Application Notes	94
CIE Chromaticity Diagram	98



HIGH BRIGHTNESS LED

0.5 W High Brightness LED	03
1 W High Brightness LED	03
1.5 W High Brightness LED	03

Description

Kingbright's High Brightness LEDs offer ultimate design solutions for high brightness needs. Packages are available in various sizes and power outputs based on InGaN and AlInGaP technology. The cutting-edge package design comprises a low thermal resistance providing great heat dissipating capability. The distinctive element encompasses a built-in zener diode that can withstand ESD voltage up to 8000V providing superior protection against ESD (ElectroStatic Discharge) damages at the production line.

Features and Benefits

- High luminous flux and low power consumption
- High maximum junction temperature
- Low thermal resistance
- Wide operating temperature range
- Available in various colors including RGB
- Available in various sizes of SMD package suitable for different design needs
- Excellent product quality and reliability
- Compatible with reflow soldering process
- Automation-friendly tape-and-reel package to increase productivity and reduce assembly cost

HIGH BRIGHTNESS LED

0.5W HIGH BRIGHTNESS LED

Part Number	Material	λ_D (nm)	Lens Type	Φ_v (lm) @150mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
AA3535SEL1Z1S	AlGaInP	618	Water Clear	7.2	9	120°	3.5mm x 3.5mm x 1.15mm
AA3535SYL1Z1S	AlGaInP	590	Water Clear	6	8	120°	
AA3535ZG25Z1S	InGaN	525	Water Clear	17	24	120°	
AA3535QB25Z1S	InGaN	450	Water Clear	3.5	5	120°	

1W HIGH BRIGHTNESS LED

Part Number	Material	λ_D (nm)	Lens Type	Φ_v (lm) @350mA		Viewing Angle 2 θ 1/2	Dimension
				Typ.	2 θ 1/2		
AT2520SE9ZS-350MA	AlGaInP	623	Water Clear	23	130°	2.5mm x 2.0mm x 0.8mm 	
AT2520SY9ZS-350MA	AlGaInP	591	Water Clear	18	130°		
AT2520ZG10ZS-350MA	AlGaInN	530	Water Clear	50	120°		
AT2520QB10ZS-350MA	AlGaInN	458	Water Clear	14	120°		
AT3228SE9ZS-RV	AlGaInP	623	Water Clear	20	120°	3.2mm x 2.8mm x 0.8mm 	
AT3228SY9ZS-RV	AlGaInP	591	Water Clear	17	120°		
AT3228ZG10ZS-RV	AlGaInN	530	Water Clear	55	120°		
AT3228QB10ZS-RV	AlGaInN	458	Water Clear	12	120°		

1.5W HIGH BRIGHTNESS LED

Part Number	Material	λ_D (nm)	Lens Type	Φ_v (lm) @150mA *120mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
AAAF5051-03	InGaN	450	Water Clear	3.5	5	120°	5.0mm x 5.0mm x 1.3mm (Full Color)
	AlGaInP	624		*7.2	*10		
	InGaN	525		14	20		

SMD LED



Top-Emitting PLCC SMD LED	05
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Reverse Mount SMD LED	17
SOT-23 SMD LED	17

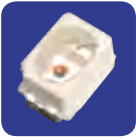
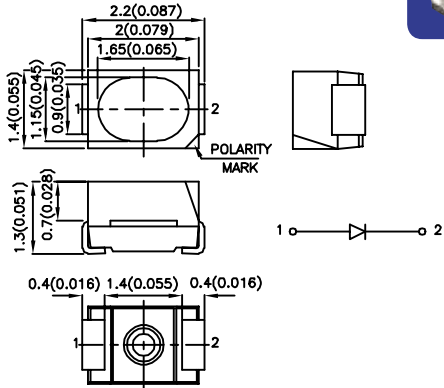
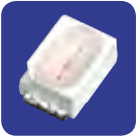
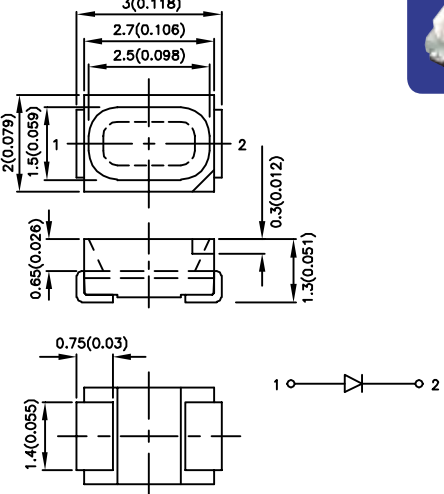

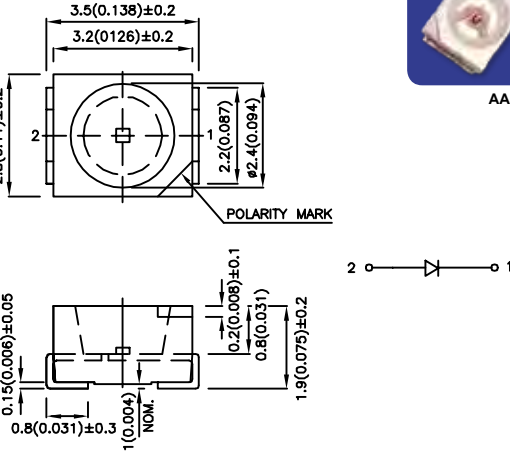
Description

Kingbright offers an extensive selection of small size and high-efficient SMD LEDs to fulfill demands of various surface-mount requirements. SMD LED packages are available in popular PLCC, chip type, and subminiature with different feature options in size, shape, viewing angle, color combination, and mounting type. Kingbright SMD LEDs are packaged in automation-friendly tape-and-reel to increase productivity and reduce assembly cost.

Features and Benefits

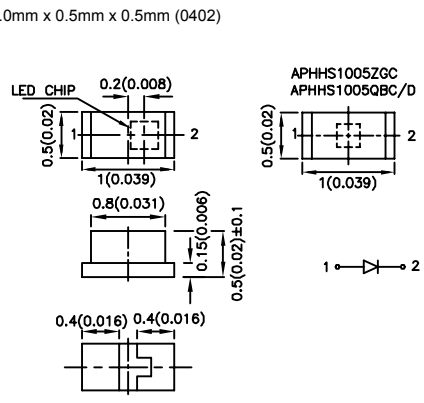
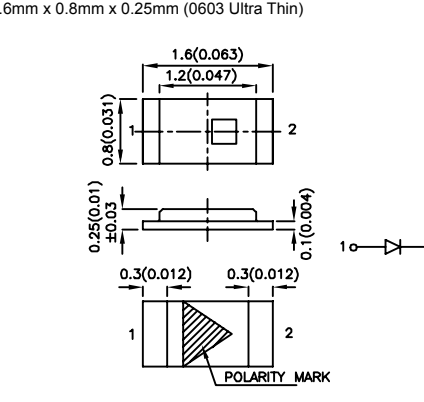
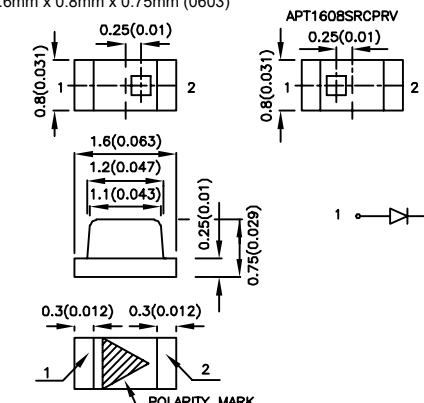
- PLCC, chip type and subminiature options.
- Compact size including industry standard foot-prints 0402, 0603, 0805, 1206, and many other options.
- Packages with different viewing angle options of 15 degree to 130 degree for different design needs
- Colors are available in blue, green, yellow, orange, red, and others
- Mounting options including top-mount, right angle mount and reversed-mount
- Capable of single-color, bi-color, tri-color combinations
- Automation-friendly tape-and-reel package to increase productivity and reduce assembly cost
- High reliability with competitive lead time

TOP-EMITTING PLCC SMD LED


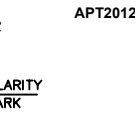
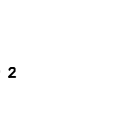




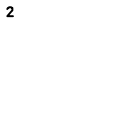
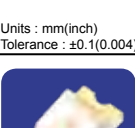

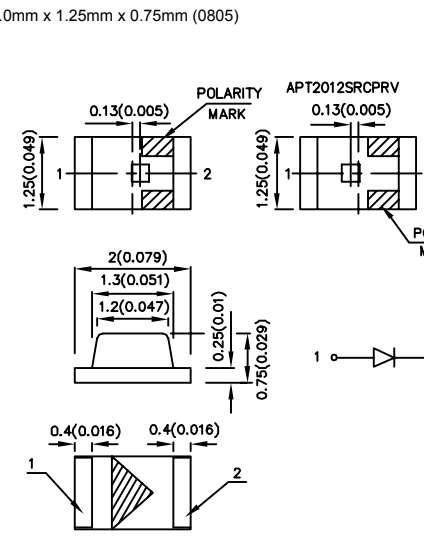

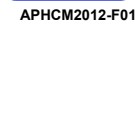
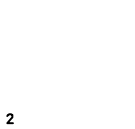


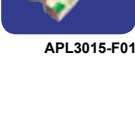
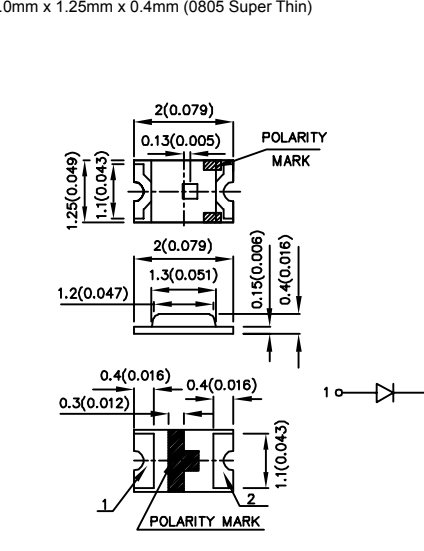


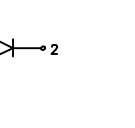


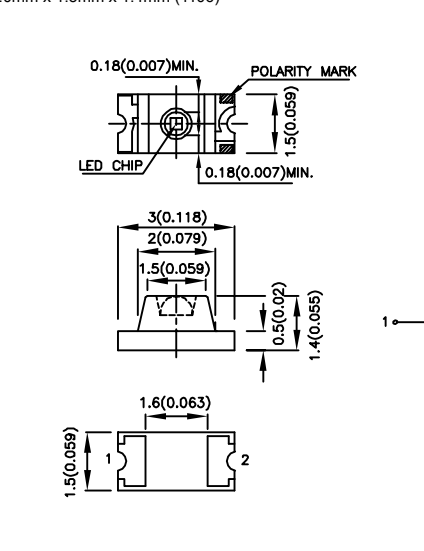
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimension
				Min.	Typ.		
AA2214SURSK	AlGaInP	630	Water Clear	180	350	120°	2.2mm x 1.4mm x 1.3mm  AA2214  Units : mm(inch) Tolerance : ±0.2(0.008)
AA2214SESK	AlGaInP	601	Water Clear	280	400	120°	
AA2214SYSK	AlGaInP	590	Water Clear	120	250	120°	
AA2214CGSK	AlGaInP	570	Water Clear	50	80	120°	
AA2214ZGS	InGaN	525	Water Clear	380	600	120°	
AA2214QBS/D	InGaN	470	Water Clear	80	150	120°	
AA3021ES	GaAsP/GaP	625	Water Clear	10	30	125°	3.0mm x 2.0mm x 1.3mm  AA3021  Units : mm(inch) Tolerance : ±0.2(0.008)
AA3021SURSK	AlGaInP	630	Water Clear	180	320	125°	
AA3021SESK	AlGaInP	601	Water Clear	200	350	125°	
AA3021YS	GaAsP/GaP	588	Water Clear	8	15	125°	
AA3021SYSK	AlGaInP	590	Water Clear	110	200	125°	
AA3021SGS	GaP	568	Water Clear	10	30	125°	
AA3021CGSK	AlGaInP	570	Water Clear	40	80	125°	
AA3021ZGS	InGaN	525	Water Clear	500	900	125°	
AA3021QBS/D	InGaN	470	Water Clear	120	230	125°	
AA3528ES	GaAsP/GaP	625	Water Clear	12	25	120°	3.5mm x 2.8mm x 1.9mm  AA3528  Units : mm(inch) Tolerance : ±0.25(0.01)
AA3528SURSK	AlGaInP	630	Water Clear	150	350	120°	
AA3528SESK	AlGaInP	601	Water Clear	200	350	120°	
AA3528YS	GaAsP/GaP	588	Water Clear	10	20	120°	
AA3528SYSK	AlGaInP	590	Water Clear	80	200	120°	
AA3528SGS	GaP	568	Water Clear	12	25	120°	
AA3528CGSK	AlGaInP	570	Water Clear	40	100	120°	
AA3528ZGS	InGaN	525	Water Clear	400	600	120°	
AA3528QBS/D	InGaN	470	Water Clear	90	150	120°	
AA3528VBS/D	InGaN	470	Water Clear	300	450	120°	

TOP-EMITTING CHIP SMD LED

SMD LED ■ TOP-EMITTING CHIP SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
APHHS1005SURCK	AlGaInP	630	Water Clear	110	220	120°	1.0mm x 0.5mm x 0.5mm (0402) 
APHHS1005SECK	AlGaInP	601	Water Clear	120	220	120°	
APHHS1005SYCK	AlGaInP	590	Water Clear	70	150	120°	
APHHS1005CGCK	AlGaInP	570	Water Clear	30	55	120°	
APHHS1005ZGCK	InGaN	525	Water Clear	300	450	120°	
APHHS1005QBC/D	InGaN	470	Water Clear	60	100	120°	
APG1608SURKC/T	AlGaInP	630	Water Clear	200	350	120°	1.6mm x 0.8mm x 0.25mm (0603 Ultra Thin) 
APG1608SEKC/T	AlGaInP	601	Water Clear	120	300	120°	
APG1608SYKC/T	AlGaInP	590	Water Clear	70	120	120°	
APG1608CGKC/T	AlGaInP	570	Water Clear	36	70	120°	
APG1608ZGCK	InGaN	525	Water Clear	280	500	120°	
APG1608QBC/D	InGaN	470	Water Clear	50	100	120°	
APT1608EC	GaAsP/GaP	625	Water Clear	8	15	120°	1.6mm x 0.8mm x 0.75mm (0603) 
APT1608SRCPRV	GaAlAs	640	Water Clear	55	100	120°	
APT1608SURCK	AlGaInP	630	Water Clear	120	230	120°	
APT1608SECK	AlGaInP	601	Water Clear	120	250	120°	
APT1608YC	GaAsP/GaP	588	Water Clear	5	8	120°	
APT1608SYCK	AlGaInP	590	Water Clear	80	150	120°	
APT1608SGC	GaP	568	Water Clear	8	15	120°	
APT1608CGCK	AlGaInP	570	Water Clear	20	50	120°	
APT1608MGC	AlGaInP	570	Water Clear	36	70	120°	
APT1608ZGCK	InGaN	525	Water Clear	280	450	120°	
APT1608QBC/D	InGaN	470	Water Clear	55	100	120°	
APTD1608SURCK	AlGaInP	630	Water Clear	400	800	60°	
APTD1608SEC/J3	AlGaInP	625	Water Clear	2300	3000	60°	
APTD1608SECK	AlGaInP	601	Water Clear	400	700	60°	
APTD1608SYCK	AlGaInP	590	Water Clear	280	450	60°	
APTD1608SYC/J3	AlGaInP	589	Water Clear	500	900	60°	
APTD1608CGCK	AlGaInP	570	Water Clear	100	200	60°	
APTD1608ZGCK	InGaN	525	Water Clear	500	1000	60°	
APTD1608QBC/D	InGaN	470	Water Clear	100	200	40°	

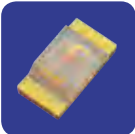
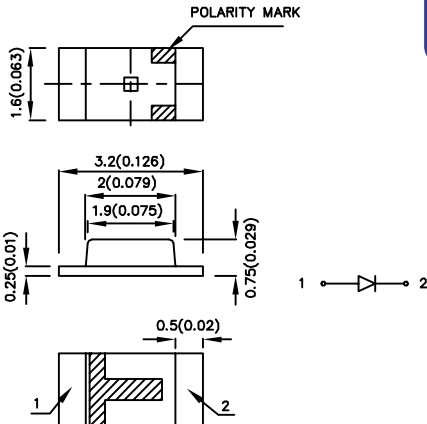

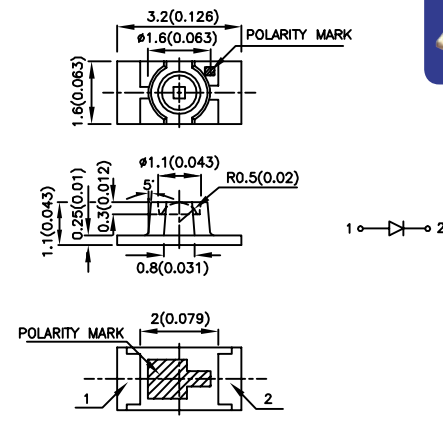

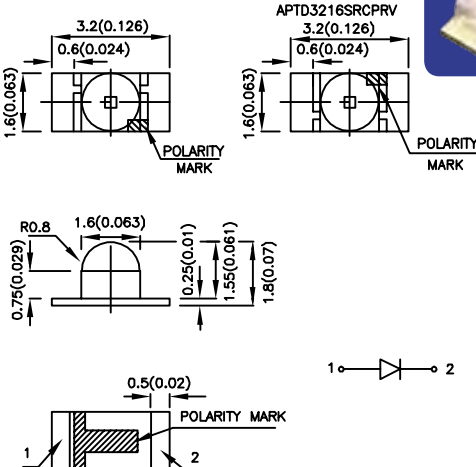
TOP-EMITTING CHIP SMD LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimension	
				Min.	Typ.			
APT2012EC	GaAsP/GaP	625	Water Clear	8	15	120°	2.0mm x 1.25mm x 0.75mm (0805)  APT2012  APT2012SRCPRV  APT2012SURCK  APT2012SECK  APT2012YC  APT2012SYCK  APT2012SGC  APT2012CGCK  APT2012ZGC  APT2012QBC/D  Units: mm(inch) Tolerance: ±0.1(0.004)	
APT2012SRCPRV	GaAlAs	640	Water Clear	55	100	120°		
APT2012SURCK	AlGaInP	630	Water Clear	120	230	120°		
APT2012SECK	AlGaInP	601	Water Clear	120	250	120°		
APT2012YC	GaAsP/GaP	588	Water Clear	5	8	120°		
APT2012SYCK	AlGaInP	590	Water Clear	80	150	120°		
APT2012SGC	GaP	568	Water Clear	8	15	120°		
APT2012CGCK	AlGaInP	570	Water Clear	20	50	120°		
APT2012MGC	AlGaInP	570	Water Clear	36	70	120°		
APT2012ZGC	InGaN	525	Water Clear	280	450	120°		
APT2012QBC/D	InGaN	470	Water Clear	55	100	120°		
APHCM2012SURCK-F01	AlGaInP	630	Water Clear	120	230	110°		2.0mm x 1.25mm x 0.4mm (0805 Super Thin)  APHCM2012-F01  APHCM2012SECK-F01  APHCM2012SYCK-F01  APHCM2012CGCK-F01  APHCM2012ZGC-F01  APHCM2012QBC/D-F01  Units: mm(inch) Tolerance: ±0.1(0.004)
APHCM2012SECK-F01	AlGaInP	601	Water Clear	120	250	110°		
APHCM2012SYCK-F01	AlGaInP	590	Water Clear	80	150	110°		
APHCM2012CGCK-F01	AlGaInP	570	Water Clear	20	50	110°		
APHCM2012ZGC-F01	InGaN	525	Water Clear	280	450	110°		
APHCM2012QBC/D-F01	InGaN	470	Water Clear	55	100	110°		
APL3015EC-F01	GaAsP/GaP	625	Water Clear	12	25	70°	3.0mm x 1.5mm x 1.4mm (1106)  APL3015-F01  APL3015SRCPRV-F01  APL3015SURCK-F01  APL3015SECK-F01  APL3015SYCK-F01 APL3015SGC-F01 APL3015CGCK-F01 APL3015MGC-F01 APL3015ZGC-F01 APL3015QBC/D-F01  Units: mm(inch) Tolerance: ±0.2(0.008)	
APL3015SRCPRV-F01	GaAlAs	640	Water Clear	120	150	70°		
APL3015SURCK-F01	AlGaInP	630	Water Clear	300	600	70°		
APL3015SECK-F01	AlGaInP	601	Water Clear	350	600	70°		
APL3015SYCK-F01	AlGaInP	590	Water Clear	180	350	70°		
APL3015SGC-F01	GaP	568	Water Clear	12	25	70°		
APL3015CGCK-F01	AlGaInP	570	Water Clear	70	120	70°		
APL3015MGC-F01	AlGaInP	570	Water Clear	100	180	70°		
APL3015ZGC-F01	InGaN	525	Water Clear	500	800	70°		
APL3015QBC/D-F01	InGaN	470	Water Clear	120	200	70°		

NOTE: AP series custom-made is available upon request.

TOP-EMITTING CHIP SMD LED

SMD LED ■ TOP-EMITTING CHIP SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
APT3216EC	GaAsP/GaP	625	Water Clear	8	15	120°	3.2mm x 1.6mm x 0.75mm (1206)  APT3216  Units : mm(inch) Tolerance : ±0.2(0.008)
APT3216SRCPRV	GaAlAs	640	Water Clear	55	100	120°	
APT3216SURCK	AlGaInP	630	Water Clear	120	230	120°	
APT3216SECK	AlGaInP	601	Water Clear	120	250	120°	
APT3216YC	GaAsP/GaP	588	Water Clear	5	8	120°	
APT3216SYCK	AlGaInP	590	Water Clear	80	150	120°	
APT3216SGC	GaP	568	Water Clear	8	15	120°	
APT3216CGCK	AlGaInP	570	Water Clear	20	50	120°	
APT3216MGC	AlGaInP	570	Water Clear	36	70	120°	
APT3216ZGC	InGaN	525	Water Clear	280	450	120°	
APT3216QBC/D	InGaN	470	Water Clear	55	100	120°	
APTL3216SURCK	AlGaInP	630	Water Clear	380	550	70°	3.2mm x 1.6mm x 1.1mm (1206)  APTL3216  Units : mm(inch) Tolerance : ±0.1(0.004)
APTL3216SECK	AlGaInP	601	Water Clear	380	600	70°	
APTL3216SYCK	AlGaInP	590	Water Clear	180	350	70°	
APTL3216CGCK	AlGaInP	570	Water Clear	70	120	70°	
APTL3216ZGC	InGaN	525	Water Clear	600	1100	70°	
APTL3216QBC/D	InGaN	470	Water Clear	120	250	70°	
APTD3216EC	GaAsP/GaP	625	Water Clear	30	55	40°	3.2mm x 1.6mm x 1.8mm (1206 Dome Lens)  APTD3216  Units : mm(inch) Tolerance : ±0.2(0.008)
APTD3216SRCPRV	GaAlAs	640	Water Clear	200	400	50°	
APTD3216SURCK	AlGaInP	630	Water Clear	700	1500	50°	
APTD3216SECK	AlGaInP	601	Water Clear	700	1600	50°	
APTD3216YC	GaAsP/GaP	588	Water Clear	20	40	40°	
APTD3216SYCK	AlGaInP	590	Water Clear	450	800	50°	
APTD3216SGC	GaP	568	Water Clear	30	55	40°	
APTD3216CGCK	AlGaInP	570	Water Clear	180	400	50°	
APTD3216MGC	AlGaInP	570	Water Clear	200	450	50°	
APTD3216ZGC	InGaN	525	Water Clear	1800	2500	50°	
APTD3216QBC/D	InGaN	470	Water Clear	380	700	40°	

TOP-EMITTING CHIP SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimension
				Min.	Typ.		
APD3224EC-F01	GaAsP/GaP	625	Water Clear	55	100	20°	3.2mm x 2.4mm x 2.4mm (Dome Lens)
APD3224SURCK-F01	AlGaInP	630	Water Clear	1300	2700	20°	
APD3224SECK-F01	AlGaInP	601	Water Clear	1500	2700	20°	
APD3224YC-F01	GaAsP/GaP	588	Water Clear	20	50	20°	
APD3224SYCK-F01	AlGaInP	590	Water Clear	800	1300	20°	
APD3224SGC-F01	GaP	568	Water Clear	55	100	20°	
APD3224CGCK-F01	AlGaInP	570	Water Clear	400	600	20°	
APD3224ZGC-F01	InGaN	525	Water Clear	1900	3000	20°	
APD3224QBC/D-F01	InGaN	470	Water Clear	450	800	20°	
APETD3528SEC	AlGaInP	601	Water Clear	500	900	60°	3.5mm x 2.8mm x 3.2mm (Dome Lens)
APETD3528SEC/J3-PRV	AlGaInP	625	Water Clear	3500	4200	60°	
APETD3528SYC/J3-PRV	AlGaInP	589	Water Clear	700	1500	60°	
APETD3528CGCK	AlGaInP	570	Water Clear	80	200	60°	
APETD3528ZGC	InGaN	525	Water Clear	1000	1800	60°	
APETD3528QBC/D	InGaN	470	Water Clear	300	400	60°	
							Units : mm(inch) Tolerance : ±0.2(0.008)

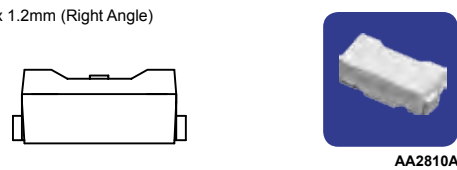
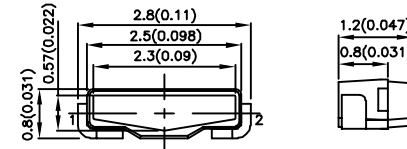
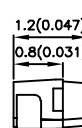
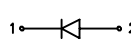
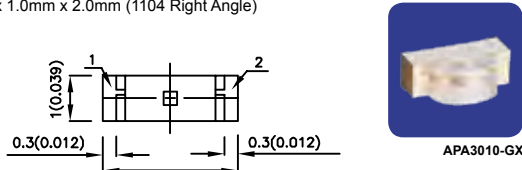
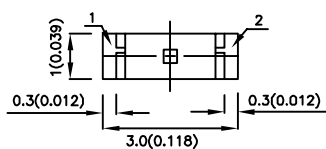
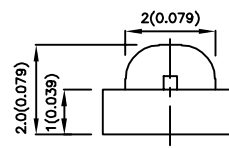
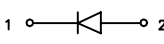
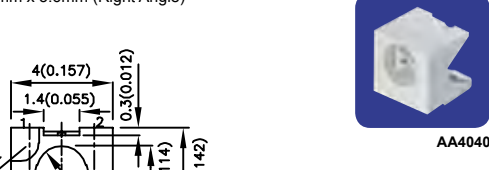
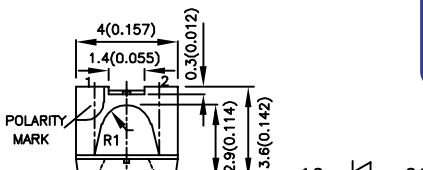
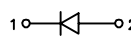
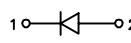
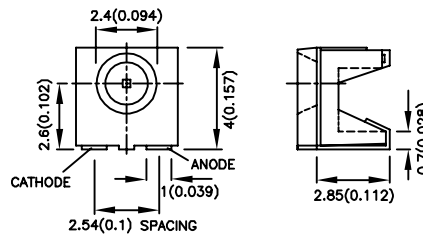
RIGHT ANGLE SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimension
				Min.	Typ.		
APA1606SURCK	AlGaInP	630	Water Clear	110	220	110°	1.6mm x 0.6mm x 1.2mm (0602 Right Angle)
APA1606SECK	AlGaInP	601	Water Clear	110	250	110°	
APA1606SYCK	AlGaInP	590	Water Clear	80	150	110°	
APA1606SGC	GaP	568	Water Clear	8	15	110°	
APA1606CGCK	AlGaInP	570	Water Clear	40	60	110°	
APA1606ZGC	InGaN	525	Water Clear	200	400	110°	
APA1606QBC/D	InGaN	470	Water Clear	50	80	110°	
							Units : mm(inch) Tolerance : ±0.1(0.004)
APA2106SRCPRV	GaAlAs	640	Water Clear	55	100	120°	2.1mm x 0.6mm x 1.0mm (0802 Right Angle)
APA2106SURCK	AlGaInP	630	Water Clear	110	220	120°	
APA2106SECK	AlGaInP	601	Water Clear	110	250	120°	
APA2106SYCK	AlGaInP	590	Water Clear	80	150	120°	
APA2106CGCK	AlGaInP	570	Water Clear	40	60	120°	
APA2106MGC	AlGaInP	570	Water Clear	50	80	120°	
APA2106ZGC	InGaN	525	Water Clear	200	400	120°	
APA2106QBC/D	InGaN	470	Water Clear	50	80	120°	

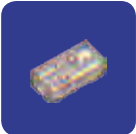
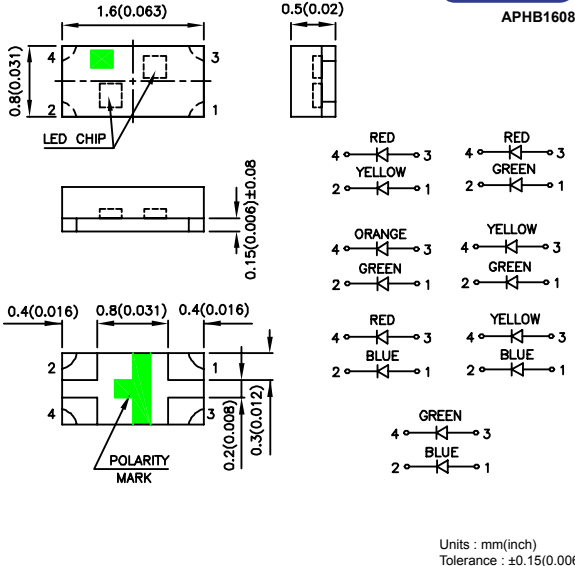
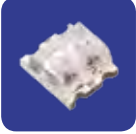
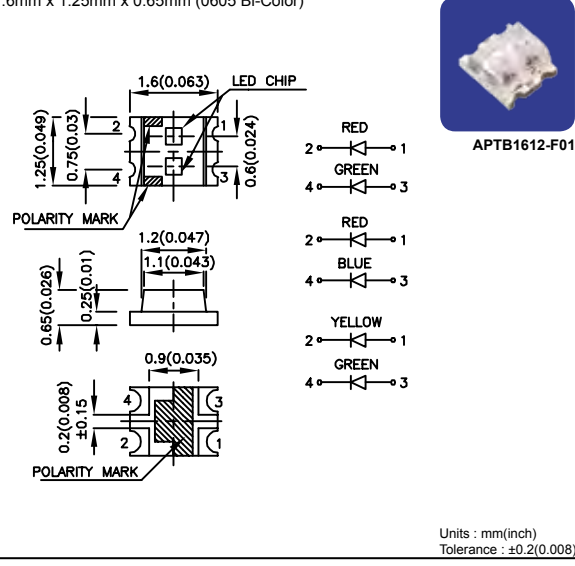

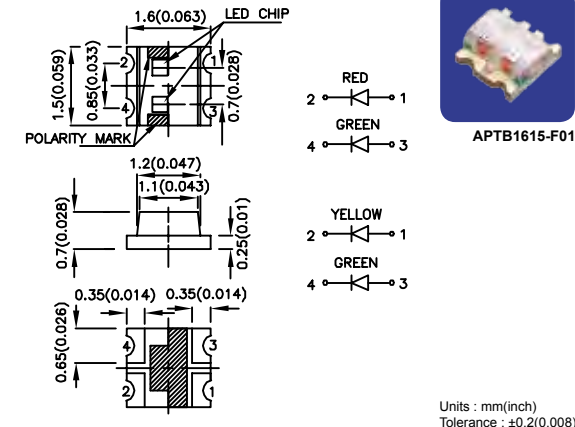
NOTE: AP series custom-made is available upon request.

RIGHT ANGLE SMD LED

SMD LED ■ RIGHT ANGLE SMD LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2θ1/2	Dimension	
				Min.	Typ.			
AA2810ASURSK	AlGaInP	630	Water Clear	150	300	110°	<p>2.8mm x 0.8mm x 1.2mm (Right Angle)</p>  <p>AA2810A</p>    <p>Units : mm(inch) Tolerance : ±0.1(0.004)</p>	
AA2810ASES/J3	AlGaInP	625	Water Clear	1300	1800	110°		
AA2810ASESK	AlGaInP	601	Water Clear	150	250	110°		
AA2810ASYS/J3	AlGaInP	589	Water Clear	400	600	110°		
AA2810ACGSK	AlGaInP	570	Water Clear	40	60	110°		
AA2810AZGS	InGaN	525	Water Clear	400	700	110°		
AA2810AQBS/D	InGaN	470	Water Clear	110	150	110°		
APA3010SRCPRV-GX	GaAlAs	640	Water Clear	55	100	120°	<p>3.0mm x 1.0mm x 2.0mm (1104 Right Angle)</p>  <p>APA3010-GX</p>    <p>Units : mm(inch) Tolerance : ±0.15(0.006)</p>	
APA3010SURCK-GX	AlGaInP	630	Water Clear	110	220	120°		
APA3010SECK-GX	AlGaInP	601	Water Clear	110	250	120°		
APA3010SYCK-GX	AlGaInP	590	Water Clear	80	150	120°		
APA3010CGCK-GX	AlGaInP	570	Water Clear	40	60	120°		
APA3010ZGC-GX	InGaN	525	Water Clear	200	400	120°		
APA3010QBC/D-GX	InGaN	470	Water Clear	50	80	120°		
AA4040SRS	GaAlAs	640	Water Clear	80	200	120°	<p>4.0mm x 4.0mm x 3.6mm (Right Angle)</p>  <p>AA4040</p>    <p>Units : mm(inch) Tolerance : ±0.25(0.01)</p>	
AA4040SURSK	AlGaInP	630	Water Clear	200	430	120°		
AA4040SESK	AlGaInP	601	Water Clear	200	450	120°		
AA4040YS	GaAsP/GaP	588	Water Clear	10	15	120°		
AA4040SYSK	AlGaInP	590	Water Clear	100	250	120°		
AA4040SGS	GaP	568	Water Clear	15	30	120°		
AA4040CGSK	AlGaInP	570	Water Clear	40	90	120°		
AA4040MGS	AlGaInP	570	Water Clear	55	120	120°		
AA4040ZGS	InGaN	525	Water Clear	400	800	120°		
AA4040QBS/D	InGaN	470	Water Clear	110	220	120°		
								 <p>CATHODE ANODE 2.54(0.1) SPACING</p>

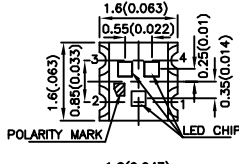
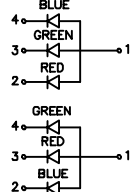
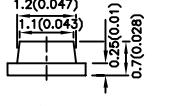
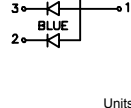
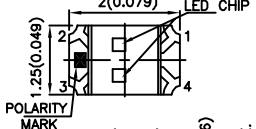

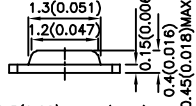

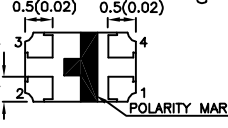
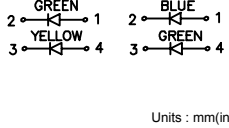
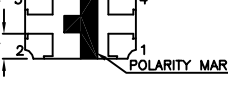



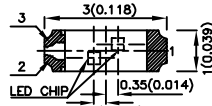

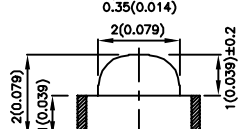
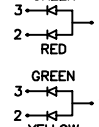
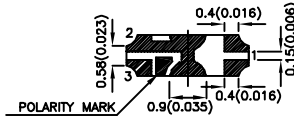

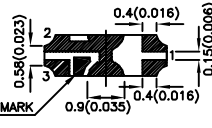

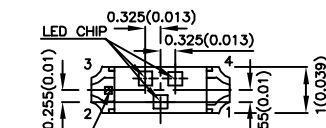
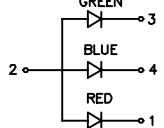
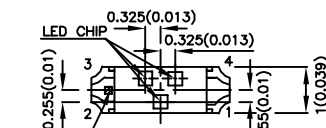
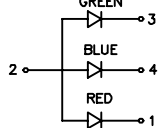
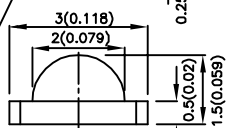
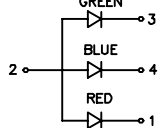
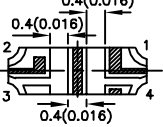
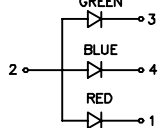
MULTI-COLOR SMD LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2 θ 1/2	Dimension	
				Min.	Typ.			
APHB1608SYKSURKC	AlGaInP	590	Water Clear	80	150	130°	 <p>APHB1608</p>  <p>Units: mm(inch) Tolerance: $\pm 0.15(0.006)$</p>	
	AlGaInP	630		120	250			
APHB1608SGEC	GaP	568	Water Clear	7	15	130°		
	GaAsP/GaP	625		7	15			
APHB1608CGKSURKC	AlGaInP	570	Water Clear	12	40	130°		
	AlGaInP	630		120	250			
APHB1608ZGSURKC	InGaIn	525	Water Clear	200	350	130°		
	AlGaInP	630		120	250			
APHB1608SGNC	GaP	568	Water Clear	7	15	130°		
	GaAsP/GaP	610		7	15			
APHB1608SGYC	GaP	568	Water Clear	7	15	130°		
	GaAsP/GaP	588		3	5			
APHB1608CGKSYKC	AlGaInP	570	Water Clear	12	40	130°		
	AlGaInP	590		80	150			
APHB1608ZGSYKC	InGaIn	525	Water Clear	200	350	130°		
	AlGaInP	590		80	150			
APHB1608QBDSURKC	InGaIn	470	Water Clear	50	70	130°		
	AlGaInP	630		120	250			
APHB1608QBDSYKC	InGaIn	470	Water Clear	50	70	130°		
	AlGaInP	590		80	150			
APHB1608QBDCGKC	InGaIn	470	Water Clear	50	70	130°		
	AlGaInP	570		12	40			
APTB1612ESGC-F01	GaAsP/GaP	625	Water Clear	8	15	120°	 <p>APTB1612-F01</p>  <p>Units: mm(inch) Tolerance: $\pm 0.2(0.008)$</p>	
	GaP	568		8	15			
APTB1612SURKCGKC-F01	AlGaInP	630	Water Clear	120	200	120°		
	AlGaInP	570		20	55			
APTB1612SURKQBDC-F01	AlGaInP	630	Water Clear	120	200	120°		
	InGaIn	470		50	80			
APTB1612YSGC-F01	GaAsP/GaP	588	Water Clear	5	8	120°		
	GaP	568		8	15			
APTB1612SYKCGKC-F01	AlGaInP	590	Water Clear	80	120	120°		
	AlGaInP	570		20	55			
APTB1615ESGC-F01	GaAsP/GaP	625	Water Clear	8	15	120°		 <p>APTB1615-F01</p>  <p>Units: mm(inch) Tolerance: $\pm 0.2(0.008)$</p>
	GaP	568		8	15			
APTB1615SURKCGKC-F01	AlGaInP	630	Water Clear	120	200	120°		
	AlGaInP	570		20	55			
APTB1615YSGC-F01	GaAsP/GaP	588	Water Clear	5	8	120°		
	GaP	568		8	15			
APTB1615SYKCGKC-F01	AlGaInP	590	Water Clear	80	120	120°		
	AlGaInP	570		20	55			

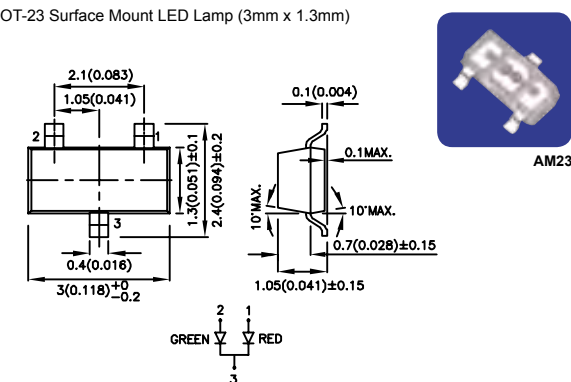
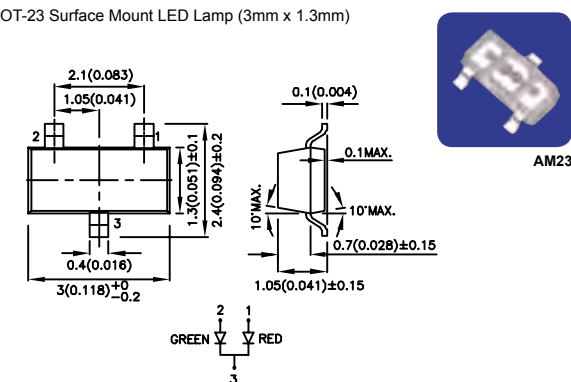
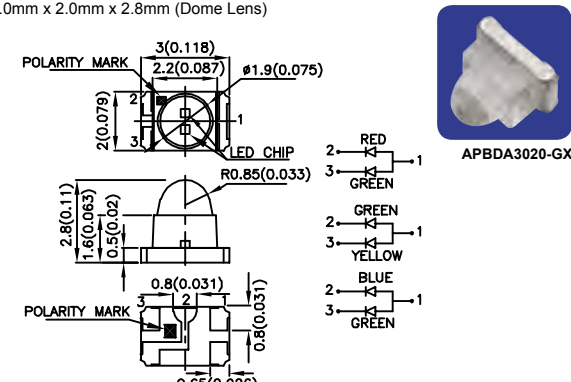
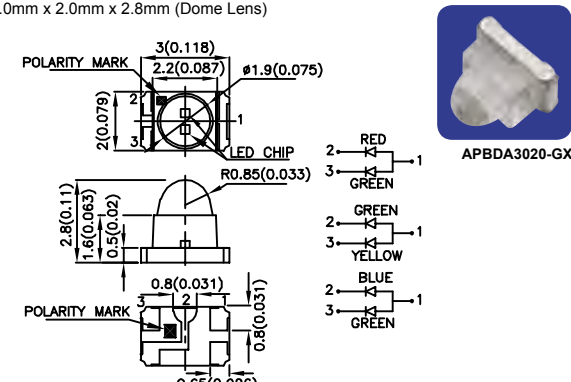
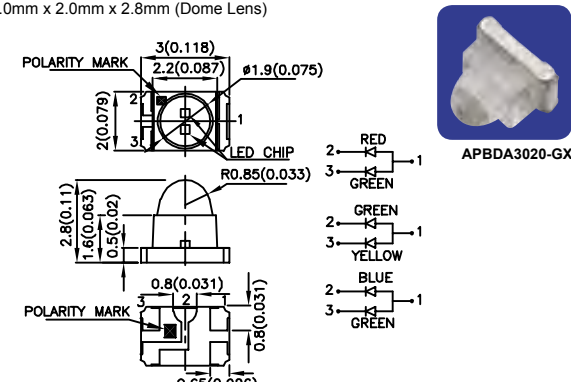
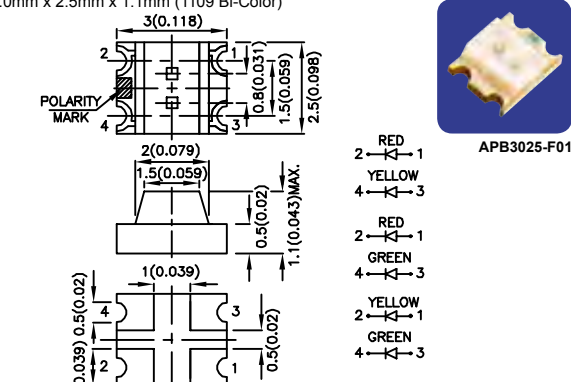
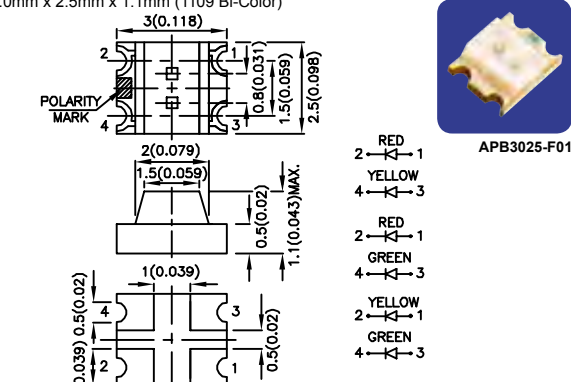
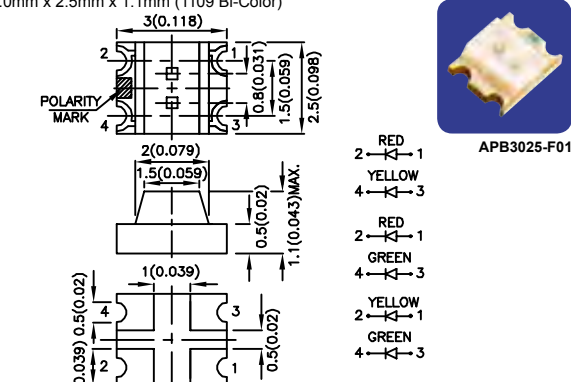
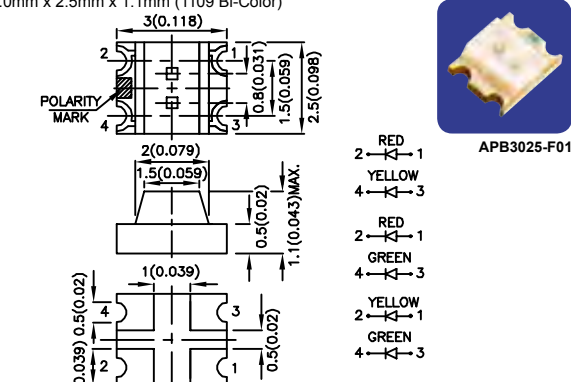
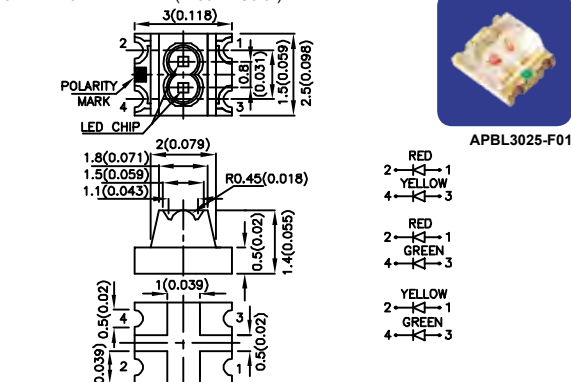
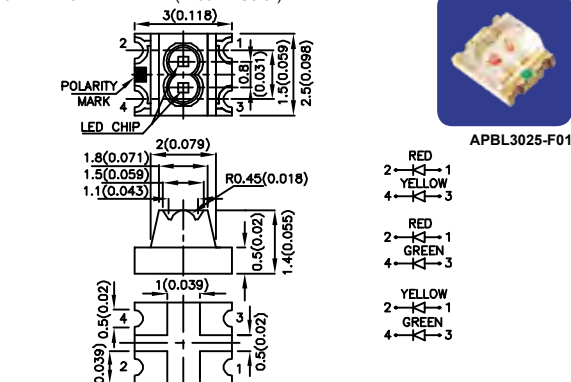
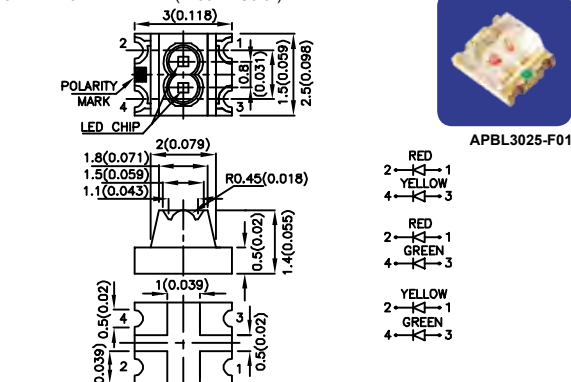
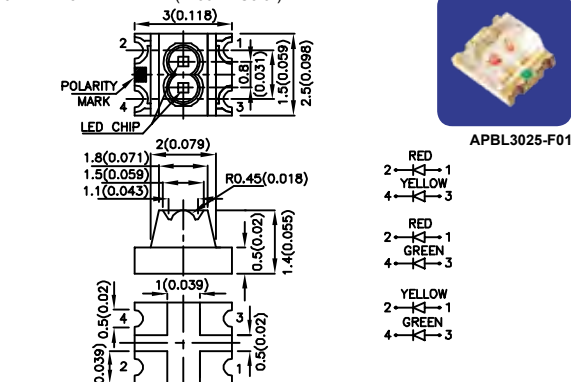
NOTE: AP series custom-made is available upon request.

MULTI-COLOR SMD LED

SMD LED ■ MULTI-COLOR SMD LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
APTF1616SEEZQBDC	AlGaInP	621	Water Clear	200	400	120°	1.6mm x 1.6mm x 0.7mm (Full Color)   APTF1616 Units: mm(inch) Tolerance: $\pm 0.2(0.008)$
	InGaN	525		200	350		
	InGaN	470		55	80		
APTF1616QBDSURKCGKC	InGaN	470	Water Clear	55	80	120°	  Units: mm(inch) Tolerance: $\pm 0.2(0.008)$
	AlGaInP	630		120	250		
	AlGaInP	570		30	55		
APHBM2012SURKCGKC	AlGaInP	630	Water Clear	120	250	120°	2.0mm x 1.25mm x 0.45mm (0805 Super Thin, Bi-Color)   APHBM2012 Units: mm(inch) Tolerance: $\pm 0.1(0.004)$
AlGaInP	570	30		55			
APHBM2012CGKSEKC	AlGaInP	570	Water Clear	30	55	120°	  Units: mm(inch) Tolerance: $\pm 0.1(0.004)$
	AlGaInP	601		150	250		
APHBM2012CGKSYKC	AlGaInP	570	Water Clear	30	55	120°	  Units: mm(inch) Tolerance: $\pm 0.1(0.004)$
	AlGaInP	590		80	120		
APHBM2012QBDSURKC	InGaN	470	Water Clear	50	80	120°	  Units: mm(inch) Tolerance: $\pm 0.1(0.004)$
	AlGaInP	630		120	250		
APHBM2012QBDCGKC	InGaN	470	Water Clear	50	80	120°	  Units: mm(inch) Tolerance: $\pm 0.1(0.004)$
	AlGaInP	570		30	55		
APBA3010EYC-GX	GaAsP/GaP	625	Water Clear	8	15	140°	3.0mm x 1.0mm x 2.0mm (1104 Right Angle, Bi-Color)   APBA3010-GX Units: mm(inch) Tolerance: $\pm 0.15(0.006)$
	GaAsP/GaP	588		5	8		
APBA3010ESGC-GX	GaAsP/GaP	625	Water Clear	8	15	140°	  Units: mm(inch) Tolerance: $\pm 0.15(0.006)$
	GaP	568		8	15		
APBA3010SURKCGKC-GX	AlGaInP	630	Water Clear	120	300	140°	  Units: mm(inch) Tolerance: $\pm 0.15(0.006)$
	AlGaInP	568		40	70		
APBA3010YSGC-GX	GaAsP/GaP	588	Water Clear	5	8	140°	  Units: mm(inch) Tolerance: $\pm 0.15(0.006)$
	GaP	568		8	15		
APBA3010SYKCGKC-GX	AlGaInP	590	Water Clear	80	120	140°	  Units: mm(inch) Tolerance: $\pm 0.2(0.008)$
	AlGaInP	570		40	70		
APFA3010SURKCGKQBDC	AlGaInP	630	Water Clear	120	220	120°	3.0mm x 1.0mm x 1.5mm (1104 Right Angle, Full Color)   Units: mm(inch) Tolerance: $\pm 0.2(0.008)$
	AlGaInP	570		30	50		
	InGaN	470		55	100		
APFA3010SURCGKQBDC	AlGaInP	630	Water Clear	150	250	120°	  Units: mm(inch) Tolerance: $\pm 0.2(0.008)$
	AlGaInP	570		30	50		
APFA3010SEEZQBDC	AlGaInP	630	Water Clear	150	250	120°	  Units: mm(inch) Tolerance: $\pm 0.2(0.008)$
	InGaN	525		200	400		
	InGaN	470		55	100		

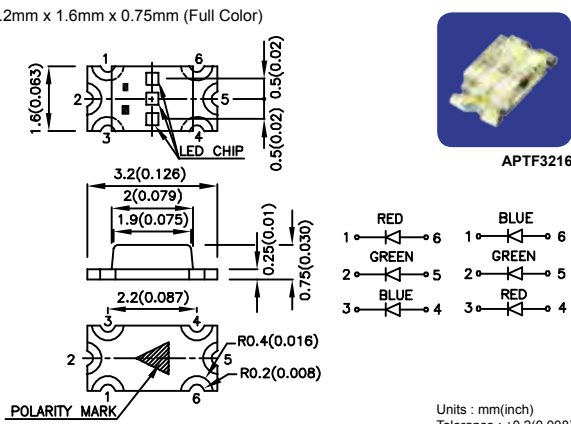
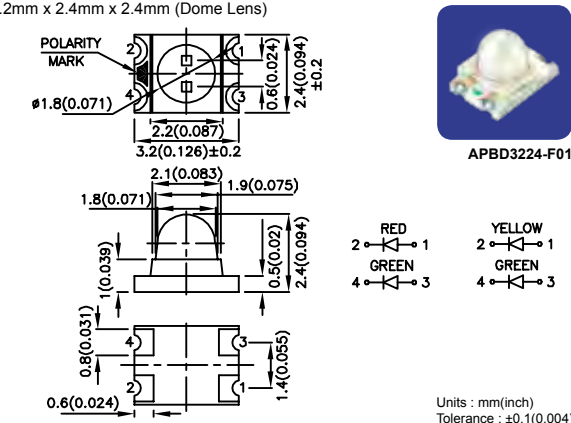
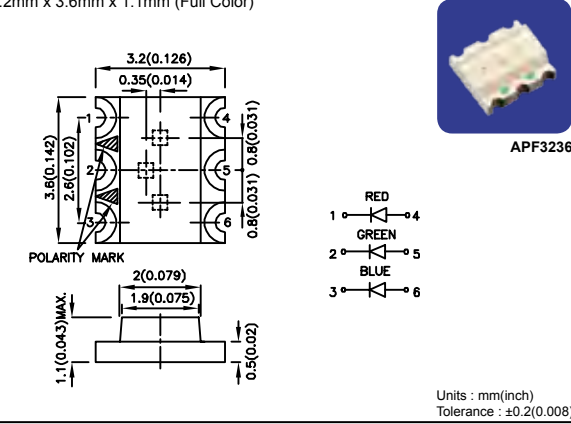
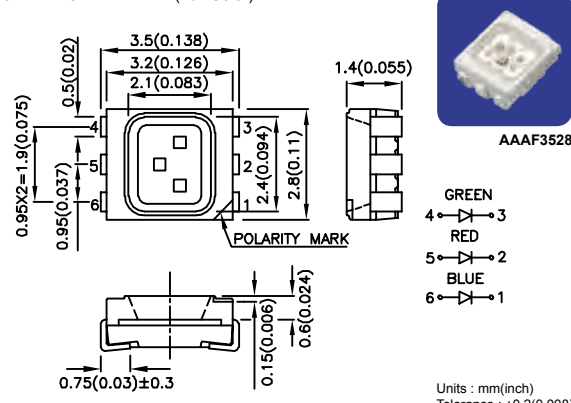
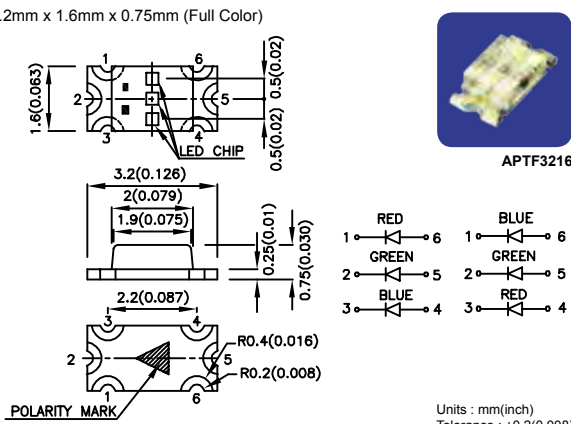
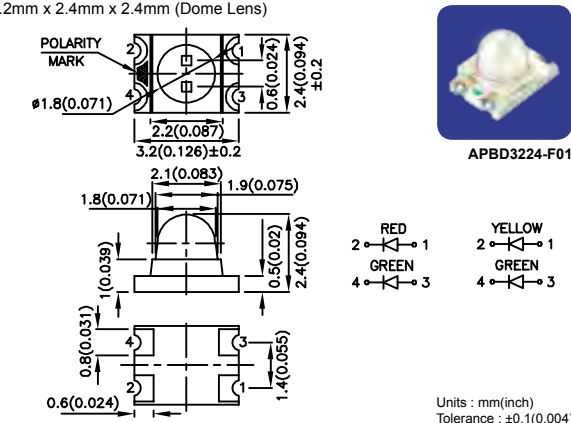
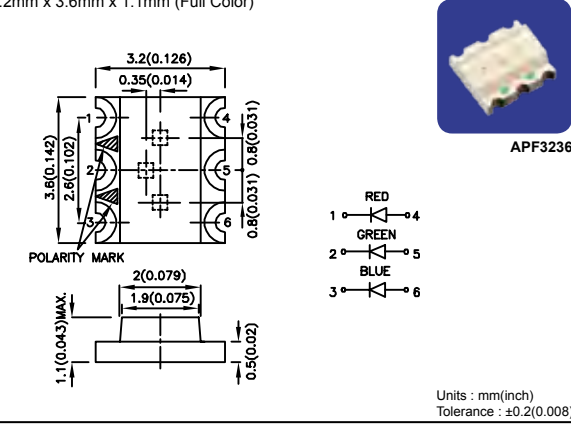
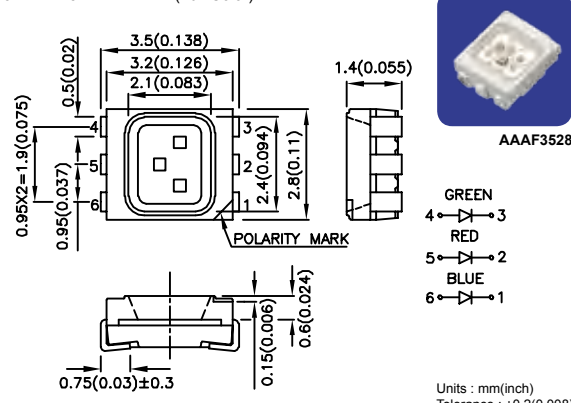
MULTI-COLOR SMD LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimension
				Min.	Typ.		
AM23ESGC	GaAsP/GaP	625	Water Clear	5	12	140°	SOT-23 Surface Mount LED Lamp (3mm x 1.3mm) 
	GaP	568		4	10		
AM23ESGW	GaAsP/GaP	625	White Diffused	5	12	140°	
	GaP	568		4	10		
APBDA3020SURKCGKC-GX	AlGaInP	630	Water Clear	500	900	15°	3.0mm x 2.0mm x 2.8mm (Dome Lens) 
	AlGaInP	570		180	320		
APBDA3020CGKSYKC-GX	AlGaInP	570	Water Clear	150	320	15°	
	AlGaInP	590		480	700		
APBDA3020QBDCGKC-GX	InGaIn	470	Water Clear	120	300	15°	
	AlGaInP	570		180	320		
APB3025EYC-F01	GaAsP/GaP	625	Water Clear	8	15	120°	3.0mm x 2.5mm x 1.1mm (1109 Bi-Color) 
	GaAsP/GaP	588		5	10		
APB3025ESGC-F01	GaAsP/GaP	625	Water Clear	8	15	120°	
	GaP	568		8	15		
APB3025SURKCGKC-F01	AlGaInP	630	Water Clear	100	200	120°	
	AlGaInP	570		30	60		
APB3025YSGC-F01	GaAsP/GaP	588	Water Clear	5	10	120°	
	GaP	568		8	15		
APBL3025EYC-F01	GaAsP/GaP	625	Water Clear	12	20	100°	3.0mm x 2.5mm x 1.4mm (1109 Bi-Color) 
	GaAsP/GaP	588		6	15		
APBL3025ESGC-F01	GaAsP/GaP	625	Water Clear	12	20	100°	
	GaP	568		12	20		
APBL3025SURKCGK-F01	AlGaInP	630	Water Clear	400	600	100°	
	AlGaInP	570		80	120		
APBL3025YSGC-F01	GaAsP/GaP	588	Water Clear	6	15	100°	
	GaP	568		12	20		

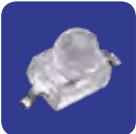
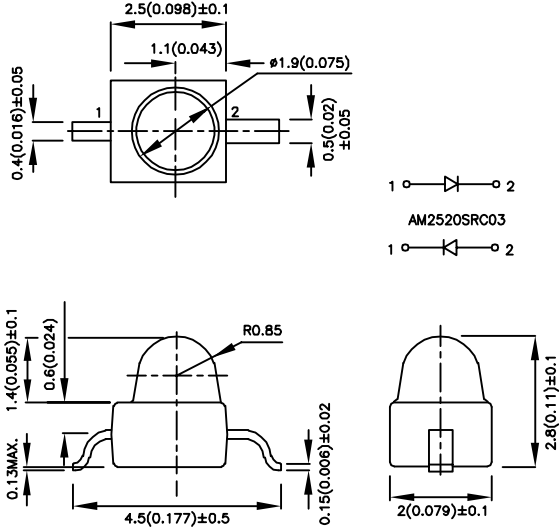
NOTE: AP series custom-made is available upon request.

MULTI-COLOR SMD LED

SMD LED ■ MULTI-COLOR SMD LED


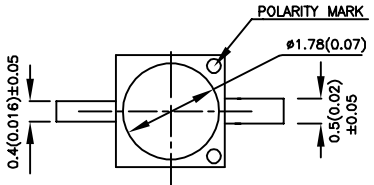
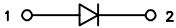
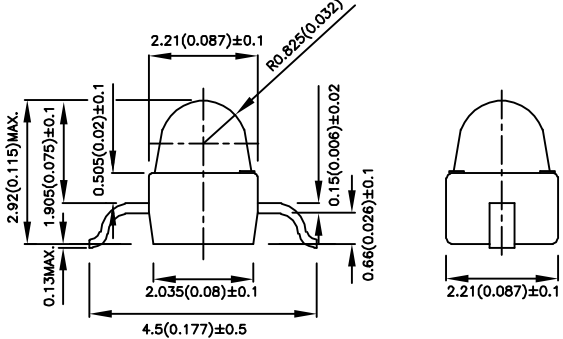
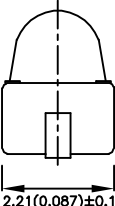

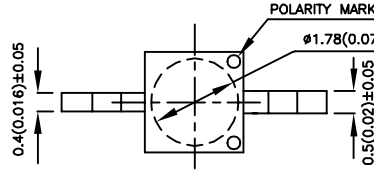
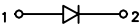
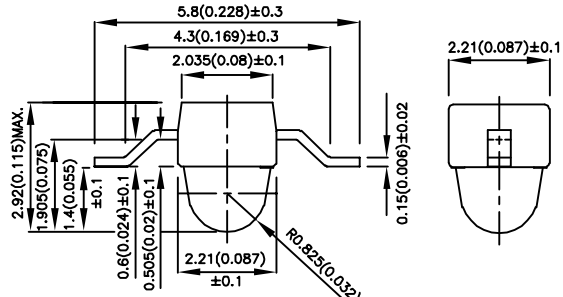
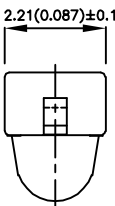
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
APTF3216SURKCGQBDC	AlGaInP	630	Water Clear	120	250	120°	3.2mm x 1.6mm x 0.75mm (Full Color) 
	AlGaInP	570		30	55		
	InGaN	470		55	80		
APTF3216SEEZGQBDC	AlGaInP	621	Water Clear	200	400	120°	3.2mm x 2.4mm x 2.4mm (Dome Lens) 
	InGaN	525		200	350		
	InGaN	470		55	80		
APTF3216QBDZGSURKC	InGaN	470	Water Clear	55	80	120°	3.2mm x 3.6mm x 1.1mm (Full Color) 
	InGaN	525		200	350		
	AlGaInP	630		120	250		
APBD3224ESGC-F01	GaAsP/GaP	625	Water Clear	30	70	20°	3.5mm x 2.8mm x 1.4mm (Full Color) 
	GaP	568		20	55		
APBD3224SURKCGKC-F01	AlGaInP	630	Water Clear	700	1300	20°	3.2mm x 2.4mm x 2.4mm (Dome Lens) 
	AlGaInP	570		120	300		
APBD3224SYKCGKC-F01	AlGaInP	590	Water Clear	450	800	20°	3.2mm x 2.4mm x 2.4mm (Dome Lens) 
	AlGaInP	570		120	300		
APF3236SURKZGQBDC	AlGaInP	630	Water Clear	120	250	120°	3.2mm x 3.6mm x 1.1mm (Full Color) 
	InGaN	525		200	350		
	InGaN	470		50	80		
AAAF3528QBFSEJ3ZGW	InGaN	465	White Diffused	110	200	120°	3.5mm x 2.8mm x 1.4mm (Full Color) 
	AlGaInP	625		900	1700		
	InGaN	525		480	900		

SUBMINIATURE SMD LED


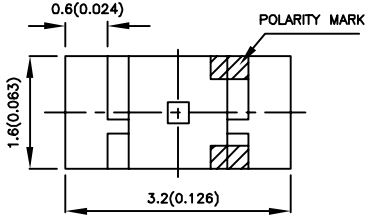
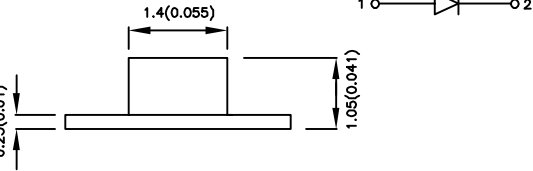
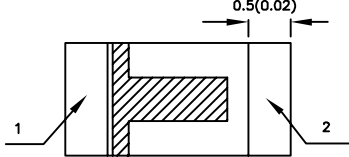
Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
AM2520EC03	GaAsP/GaP	625	Water Clear	50	100	20°	Subminiature Solid State Lamps Gull Wing Lead  AM2520xxx03  Units : mm(inch) Tolerance : $\pm 0.25(0.01)$
AM2520SRC03	GaAlAs	640	Water Clear	600	800	20°	
AM2520SURCK03	AlGaInP	630	Water Clear	1500	2400	20°	
AM2520SECK03	AlGaInP	601	Water Clear	1800	2700	20°	
AM2520YC03	GaAsP/GaP	588	Water Clear	20	50	20°	
AM2520SYCK03	AlGaInP	590	Water Clear	1400	2300	20°	
AM2520SGC03	GaP	568	Water Clear	50	100	20°	
AM2520CGCK03	AlGaInP	570	Water Clear	400	600	20°	
AM2520MGC03	AlGaInP	570	Water Clear	500	800	20°	
AM2520ZGC03	InGaN	525	Water Clear	1900	2700	20°	
AM2520QBC/D03	InGaN	470	Water Clear	350	600	20°	
AM2520EC09	GaAsP/GaP	625	Water Clear	50	100	20°	
AM2520SRC09	GaAlAs	640	Water Clear	600	800	20°	
AM2520SURCK09	AlGaInP	630	Water Clear	1500	2400	20°	
AM2520SECK09	AlGaInP	601	Water Clear	1800	2700	20°	
AM2520YC09	GaAsP/GaP	588	Water Clear	20	50	20°	
AM2520SYCK09	AlGaInP	590	Water Clear	1400	2300	20°	
AM2520SGC09	GaP	568	Water Clear	50	100	20°	
AM2520CGCK09	AlGaInP	570	Water Clear	400	600	20°	
AM2520MGC09	AlGaInP	570	Water Clear	500	800	20°	
AM2520ZGC09	InGaN	525	Water Clear	1900	2700	20°	
AM2520QBC/D09	InGaN	470	Water Clear	350	600	20°	

SUBMINIATURE SMD LED

SMD LED ■ SUBMINIATURE SMD LED


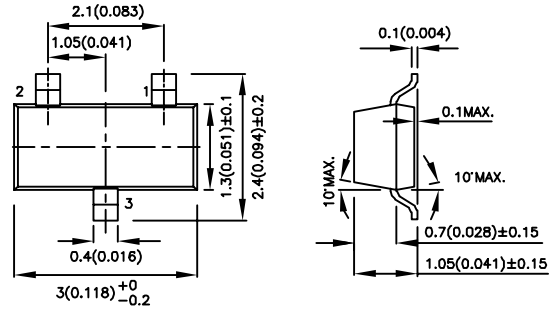
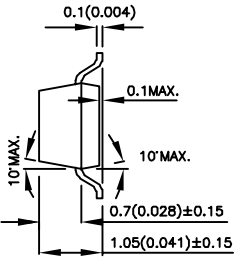
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2θ1/2	Dimension	
				Min.	Typ.			
AM27EC03	GaAsP/GaP	625	Water Clear	50	100	20°	<p>Subminiature Solid State Lamps Gull Wing Lead</p>  <p>AM27xxx03</p>     <p>Units : mm(inch) Tolerance : ±0.25(0.01)</p>	
AM27SURCK03	AlGaInP	630	Water Clear	1500	2400	20°		
AM27SECK03	AlGaInP	601	Water Clear	1800	2700	20°		
AM27YC03	GaAsP/GaP	588	Water Clear	20	50	20°		
AM27SYCK03	AlGaInP	590	Water Clear	1400	2300	20°		
AM27SGC03	GaP	568	Water Clear	50	100	20°		
AM27CGCK03	AlGaInP	570	Water Clear	400	600	20°		
AM27MGC03	AlGaInP	570	Water Clear	500	800	20°		
AM27ZGC03	InGaN	525	Water Clear	1900	2700	20°		
AM27QBC/D03	InGaN	470	Water Clear	350	600	20°		
AM27EC09	GaAsP/GaP	625	Water Clear	50	100	20°		<p>Subminiature Solid State Lamps Z-Bend Lead</p>  <p>AM27xxx09</p>     <p>Units : mm(inch) Tolerance : ±0.25(0.01)</p>
AM27SURCK09	AlGaInP	630	Water Clear	1500	2400	20°		
AM27SECK09	AlGaInP	601	Water Clear	1800	2700	20°		
AM27YC09	GaAsP/GaP	588	Water Clear	20	50	20°		
AM27SYCK09	AlGaInP	590	Water Clear	1400	2300	20°		
AM27SGC09	GaP	568	Water Clear	50	100	20°		
AM27CGCK09	AlGaInP	570	Water Clear	400	600	20°		
AM27MGC09	AlGaInP	570	Water Clear	500	800	20°		
AM27ZGC09	InGaN	525	Water Clear	1900	2700	20°		
AM27QBC/D09	InGaN	470	Water Clear	350	600	20°		

REVERSE MOUNT SMD LED

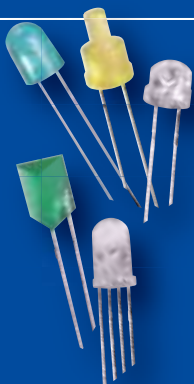
Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
APTR3216EC	GaAsP/GaP	625	Water Clear	8	15	120°	3.2mm x 1.6mm x 1.05mm (1206 Reverse Mount)  APTR3216    Units : mm(inch) Tolerance : $\pm 0.2(0.008)$
APTR3216SRCPRV	GaAlAs	640	Water Clear	55	100	120°	
APTR3216SURCK	AlGaInP	630	Water Clear	120	230	120°	
APTR3216SECK	AlGaInP	601	Water Clear	120	250	120°	
APTR3216YC	GaAsP/GaP	588	Water Clear	5	8	120°	
APTR3216SYCK	AlGaInP	590	Water Clear	80	150	120°	
APTR3216SGC	GaP	568	Water Clear	8	15	120°	
APTR3216CGCK	AlGaInP	570	Water Clear	20	50	120°	
APTR3216ZGC	InGaN	525	Water Clear	280	450	120°	
APTR3216QBC/D	InGaN	470	Water Clear	55	100	120°	

NOTE: AP series custom-made is available upon request.

SOT-23 SMD LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
AM23ID-F	GaAsP/GaP	625	Red Diffused	5	12	140°	SOT-23 Surface Mount LED Lamp (3mm x 1.3mm)  AM23-F   1 ANODE 2 N.C. 3 CATHODE Units : mm(inch) Tolerance : $\pm 0.25(0.01)$
AM23EC-F	GaAsP/GaP	625	Water Clear	5	12	140°	
AM23YD-F	GaAsP/GaP	588	Yellow Diffused	3	8	140°	
AM23YC-F	GaAsP/GaP	588	Water Clear	4	8	140°	
AM23SYD-F	AlGaInP	590	Yellow Diffused	70	120	140°	
AM23SYC-F	AlGaInP	590	Water Clear	80	130	140°	
AM23SGD-F	GaP	568	Green Diffused	3	8	140°	
AM23SGC-F	GaP	568	Water Clear	4	10	140°	

THROUGH-HOLE LED



Round LED	19
Oval LED	23
Rectangular LED	23
Cylindrical LED	25
Multi-Color LED	25
Resistor LED	28
Blinking LED	29
Low Current LED	29

Description

Kingbright through-hole LEDs are offered in a variety of packages in different sizes, shapes, viewing angles, color combinations, lens types, and brightness. The extensive selections virtually fulfill all the needs in through-hole LED applications.

With Kingbright's advanced production process in through-hole LEDs, products are manufactured in excellent quality and reliability also delivering in competitive lead time.

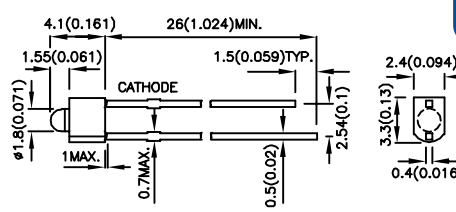
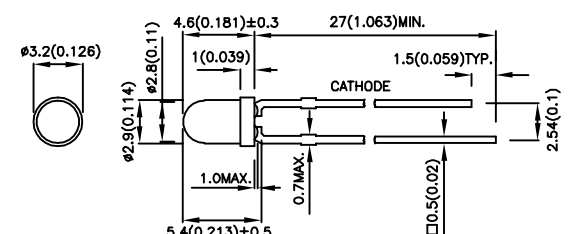
Kingbright can also provide value added processes such as customized lead forming/cutting, tape-and-reel/tape-and-box packaging for automated insertion process.

Features and Benefits

- High volume, robust reliability, cost-efficient solution
- Shape options including round, oval, cylindrical, rectangular with various sizes available in each type
- Lens types available in water clear, color transparent, white or color diffused
- Colors are available in blue, green, yellow, orange, red, and others
- Special options featuring resistor LED, blinking LED, current/voltage sorted LED, and customized lead forming/cutting
- Wire version is available for panel mounting
- Available in bulk pack, tape-and-reel, tape-and-box

THROUGH-HOLE LED


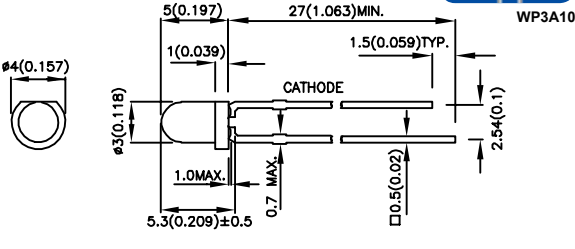
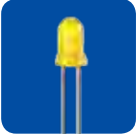
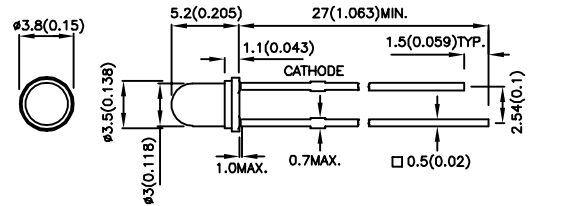

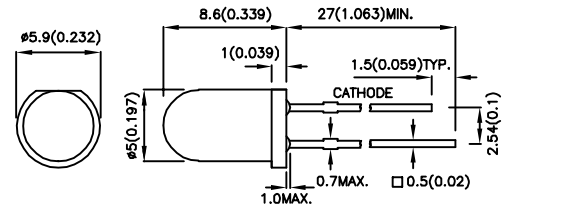
ROUND LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
WP4060ID	GaAsP/GaP	625	Red Diffused	8	15	70°	1.8mm Round 
WP4060SRD	GaAlAs	640	Red Diffused	*100	*250	70°	
WP4060ED	GaAsP/GaP	625	Orange Diffused	8	15	70°	
WP4060YD	GaAsP/GaP	588	Yellow Diffused	4	8	70°	
WP4060GD	GaP	568	Green Diffused	6	12	70°	
WP710A10ID	GaAsP/GaP	625	Red Diffused	15	30	40°	T-1 (3mm) Round 
WP710A10IT	GaAsP/GaP	625	Red Transparent	20	60	34°	
WP710A10ED	GaAsP/GaP	625	Orange Diffused	20	30	40°	
WP710A10EC	GaAsP/GaP	625	Water Clear	25	50	34°	
WP710A10ND	GaAsP/GaP	610	Orange Diffused	15	30	40°	
WP710A10NT	GaAsP/GaP	610	Orange Transparent	25	50	34°	
WP710A10NC	GaAsP/GaP	610	Water Clear	25	50	34°	
WP710A10YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP710A10YT	GaAsP/GaP	588	Yellow Transparent	10	30	34°	
WP710A10YC	GaAsP/GaP	588	Water Clear	10	30	34°	
WP710A10GD	GaP	568	Green Diffused	15	30	40°	
WP710A10GT	GaP	568	Green Transparent	20	60	34°	
WP710A10GC	GaP	568	Water Clear	20	60	34°	
WP710A10PGD	GaP	555	Green Diffused	4	8	40°	
WP710A10PGT	GaP	555	Green Transparent	8	20	34°	
WP710A10PGC	GaP	555	Water Clear	10	20	34°	
WP710A10SRC/D	GaAlAs	640	Water Clear	*500	*700	34°	
WP710A10SRC/E	GaAlAs	640	Water Clear	*700	*900	34°	
WP710A10SRD/D	GaAlAs	640	Red Diffused	*200	*420	40°	
WP710A10SRD/E	GaAlAs	640	Red Diffused	*210	*450	40°	
WP710A10SRD/F	GaAlAs	640	Red Diffused	*250	*460	40°	
WP710A10SRD/J	GaAlAs	640	Red Diffused	*1000	*1300	40°	
WP710A10SURC/E	AlGaInP	630	Water Clear	*1600	*2500	34°	
WP710A10SED	AlGaInP	601	Orange Diffused	*500	*1100	40°	
WP710A10SET	AlGaInP	601	Orange Transparent	*1600	*2700	34°	
WP710A10SEC	AlGaInP	601	Water Clear	*1600	*2700	34°	
WP710A10SEC/E	AlGaInP	621	Water Clear	*1700	*2800	34°	
WP710A10SEC/J3	AlGaInP	625	Water Clear	*4000	*7000	34°	
WP710A10SYD	AlGaInP	590	Yellow Diffused	*600	*1100	40°	
WP710A10SYT	AlGaInP	590	Yellow Transparent	*900	*1500	34°	
WP710A10SYC	AlGaInP	590	Water Clear	*900	*1500	34°	
WP710A10SYC/J3	AlGaInP	589	Water Clear	*1800	*2800	34°	
WP710A10SGD	GaP	568	Green Diffused	*18	*40	40°	
WP710A10SGC	GaP	568	Water Clear	*70	*150	34°	
WP710A10CGCK	AlGaInP	570	Water Clear	*180	*400	34°	
WP710A10ZGC	InGaN	525	Water Clear	*6000	*9000	34°	
WP710A10ZGC/G	InGaN	525	Water Clear	*8000	*14000	34°	
WP710A10QBC/D	InGaN	470	Water Clear	*1400	*2000	20°	
WP710A10VBC/D	InGaN	470	Water Clear	*2300	*4000	20°	

NOTES: 1. All dimensions are in millimeters (inches).
 2. Tolerance is ±0.25mm (0.01") unless otherwise noted.

THROUGH-HOLE LED


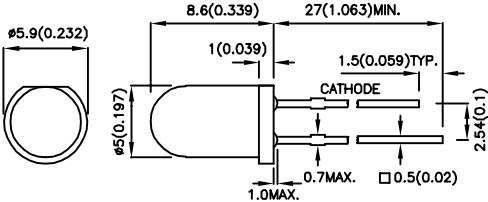

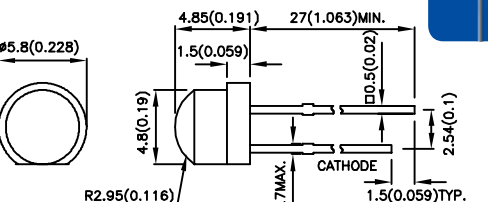
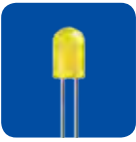
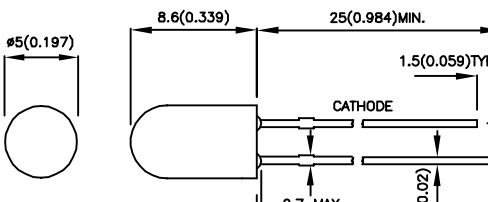
ROUND LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
WP3A10HD	GaP	660	Red Diffused	1	3	60°	T-1 (3mm) Round  
WP3A10ID	GaAsP/GaP	625	Red Diffused	14	30	60°	
WP3A10YD	GaAsP/GaP	588	Yellow Diffused	8	15	60°	
WP3A10GD	GaP	568	Green Diffused	14	30	60°	
WP132XID	GaAsP/GaP	625	Red Diffused	10	25	60°	T-1 (3mm) Round  
WP132XIT	GaAsP/GaP	625	Red Transparent	20	60	50°	
WP132XND	GaAsP/GaP	610	Orange Diffused	15	30	60°	
WP132XNT	GaAsP/GaP	610	Orange Transparent	20	50	50°	
WP132XNC	GaAsP/GaP	610	Water Clear	20	50	50°	
WP132XYD	GaAsP/GaP	588	Yellow Diffused	6	15	60°	
WP132XYT	GaAsP/GaP	588	Yellow Transparent	10	20	50°	
WP132XYC	GaAsP/GaP	588	Water Clear	10	25	50°	
WP132XGD	GaP	568	Green Diffused	15	25	60°	
WP132XGT	GaP	568	Green Transparent	15	40	50°	
WP132XGC	GaP	568	Water Clear	20	40	50°	
WP132XPGD	GaP	555	Green Diffused	4	10	60°	
WP132XPGT	GaP	555	Green Transparent	6	15	50°	
WP132XPGC	GaP	555	Water Clear	6	15	50°	
WP7113ID	GaAsP/GaP	625	Red Diffused	25	50	30°	T-1 3/4 (5mm) Round  
WP7113IT	GaAsP/GaP	625	Red Transparent	80	180	20°	
WP7113ED	GaAsP/GaP	625	Orange Diffused	20	60	30°	
WP7113EC	GaAsP/GaP	625	Water Clear	80	200	20°	
WP7113ND	GaAsP/GaP	610	Orange Diffused	20	45	30°	
WP7113NT	GaAsP/GaP	610	Orange Transparent	50	100	20°	
WP7113NC	GaAsP/GaP	610	Water Clear	50	100	20°	
WP7113YD	GaAsP/GaP	588	Yellow Diffused	10	25	30°	
WP7113YT	GaAsP/GaP	588	Yellow Transparent	30	80	20°	
WP7113YC	GaAsP/GaP	588	Water Clear	30	80	20°	
WP7113GD	GaP	568	Green Diffused	15	30	30°	
WP7113GT	GaP	568	Green Transparent	25	80	20°	
WP7113GC	GaP	568	Water Clear	25	80	20°	
WP7113PGD	GaP	555	Green Diffused	4	8	30°	
WP7113PGT	GaP	555	Green Transparent	20	50	20°	
WP7113PGC	GaP	555	Water Clear	20	50	20°	

THROUGH-HOLE LED ■ ROUND LED

THROUGH-HOLE LED

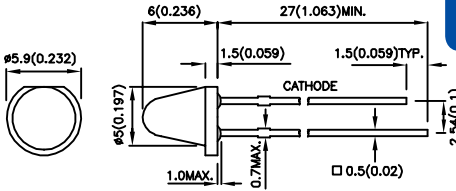

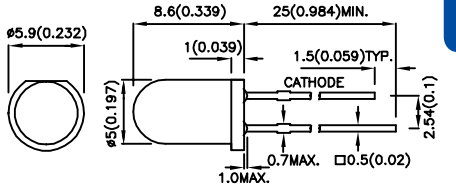

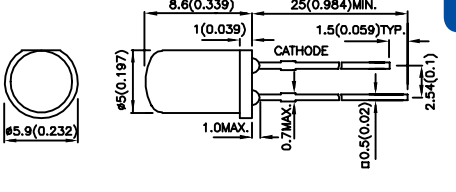

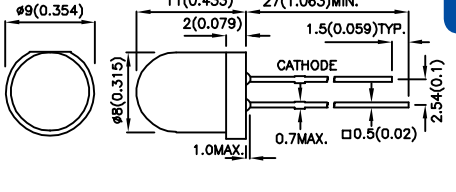

ROUND LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
WP7113SRC/DU	GaAlAs	640	Water Clear	*1000	*1300	20°	T-1 3/4 (5mm) Round  WP7113 
WP7113SRC/DV	GaAlAs	640	Water Clear	*1300	*1600	20°	
WP7113SRC/DW	GaAlAs	640	Water Clear	*1600	*1900	20°	
WP7113SRD/D	GaAlAs	640	Red Diffused	*400	*600	30°	
WP7113SRD/E	GaAlAs	640	Red Diffused	*500	*700	30°	
WP7113SRD/F	GaAlAs	640	Red Diffused	*600	*800	30°	
WP7113SURC	AlGaInP	630	Water Clear	*2900	*3800	20°	
WP7113SURC/E	AlGaInP	630	Water Clear	*3000	*4200	20°	
WP7113SED	AlGaInP	601	Orange Diffused	*1000	*1600	30°	
WP7113SET	AlGaInP	601	Orange Transparent	*2700	*4200	20°	
WP7113SEC	AlGaInP	601	Water Clear	*2700	*4200	20°	
WP7113SEC/E	AlGaInP	621	Water Clear	*3000	*4500	20°	
WP7113SEC/J3	AlGaInP	625	Water Clear	*7000	*11000	20°	
WP7113SYD	AlGaInP	590	Yellow Diffused	*650	*1200	30°	
WP7113SYT	AlGaInP	590	Yellow Transparent	*1900	*3100	20°	
WP7113SYC	AlGaInP	590	Water Clear	*1900	*3100	20°	
WP7113SYC/J3	AlGaInP	589	Water Clear	*4200	*6000	20°	
WP7113SGD	GaP	568	Green Diffused	*18	*40	30°	
WP7113SGC	GaP	568	Water Clear	*200	*400	20°	
WP7113CGCK	AlGaInP	570	Water Clear	*400	*700	20°	
WP7113ZGC	InGaN	525	Water Clear	*8000	*14000	20°	
WP7113ZGC/G	InGaN	525	Water Clear	*12000	*19000	20°	
WP7113QBC/D	InGaN	470	Water Clear	*1900	*3000	16°	
WP7113VBC/D	InGaN	470	Water Clear	*5000	*8400	20°	
WP9294SEC/J3	AlGaInP	625	Water Clear	*700	*1000	130°	5mm Round  WP9294 
WP9294SYC/J3	AlGaInP	589	Water Clear	*400	*700	130°	
WP9294ZGC/G	InGaN	525	Water Clear	*1900	*2600	60°	
WP9294QBC/G	InGaN	465	Water Clear	*400	*700	60°	
WP1503ID	GaAsP/GaP	625	Red Diffused	25	50	60°	T-1 3/4 (5mm) Round  WP1503 
WP1503IT	GaAsP/GaP	625	Red Transparent	50	100	30°	
WP1503EC	GaAsP/GaP	625	Water Clear	50	100	30°	
WP1503SRD	GaAlAs	640	Red Diffused	*500	*1000	60°	
WP1503SRC/D	GaAlAs	640	Water Clear	*1500	*2000	30°	
WP1503SRC/E	GaAlAs	640	Water Clear	*3100	*5000	30°	
WP1503SRC/F	GaAlAs	640	Water Clear	*3600	*5200	30°	
WP1503YD	GaAsP/GaP	588	Yellow Diffused	15	30	60°	
WP1503YT	GaAsP/GaP	588	Yellow Transparent	20	50	30°	
WP1503YC	GaAsP/GaP	588	Water Clear	20	50	30°	
WP1503GD	GaP	568	Green Diffused	25	50	60°	
WP1503GT	GaP	568	Green Transparent	50	100	30°	
WP1503GC	GaP	568	Water Clear	50	100	30°	
WP1503SGT	GaP	568	Green Transparent	*80	*200	30°	
WP1503SGC	GaP	568	Water Clear	*100	*200	30°	

NOTES: 1. All dimensions are in millimeters (inches).
 2. Tolerance is ±0.25mm (0.01") unless otherwise noted.

THROUGH-HOLE LED

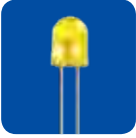
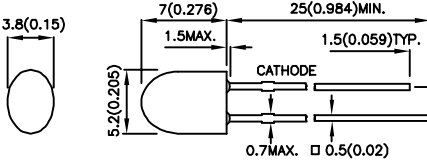
ROUND LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
WP63ID	GaAsP/GaP	625	Red Diffused	15	25	60°	T-1 3/4 (5mm) Round  
WP63IT	GaAsP/GaP	625	Red Transparent	30	80	30°	
WP63SRD	GaAlAs	640	Red Diffused	*150	*300	60°	
WP63SRT	GaAlAs	640	Red Transparent	*400	*800	30°	
WP63SRC	GaAlAs	640	Water Clear	*500	*800	30°	
WP63YD	GaAsP/GaP	588	Yellow Diffused	5	10	60°	
WP63YT	GaAsP/GaP	588	Yellow Transparent	20	70	30°	
WP63GD	GaP	568	Green Diffused	10	20	60°	
WP63GT	GaP	568	Green Transparent	30	80	30°	
WP7143SRC/D	GaAlAs	640	Water Clear	*900	*1500	30°	T-1 3/4 (5mm) Round  
WP7143SURC/E	AlGaInP	630	Water Clear	*1800	*2600	30°	
WP7143SGC	GaP	568	Water Clear	*80	*150	30°	
WP7083SED/J3	AlGaInP	625	Orange Diffused	*1900	*2700	60°	T-1 3/4 (5mm) Round  
WP7083SYD/J3	AlGaInP	589	Yellow Diffused	*500	*1000	60°	
WP7083ZGD/G	InGaN	525	Green Diffused	*1900	*2700	60°	
WP7083QBD/G	InGaN	465	Blue Diffused	*200	*400	60°	
WP793ID	GaAsP/GaP	625	Red Diffused	*50	*100	30°	8mm Round  
WP793SRC/D	GaAlAs	640	Water Clear	*1300	*2000	15°	
WP793SRC/E	GaAlAs	640	Water Clear	*1900	*2700	15°	
WP793SRC/F	GaAlAs	640	Water Clear	*2800	*3800	15°	
WP793SRD/D	GaAlAs	640	Red Diffused	*280	*400	30°	
WP793SRD/E	GaAlAs	640	Red Diffused	*380	*500	30°	
WP793SRD/F	GaAlAs	640	Red Diffused	*600	*1000	30°	
WP793SRD/G	GaAlAs	640	Red Diffused	*700	*1500	30°	
WP793SRD/H	GaAlAs	640	Red Diffused	*1000	*1800	30°	
WP793ED	GaAsP/GaP	625	Orange Diffused	*60	*100	30°	
WP793YD	GaAsP/GaP	588	Yellow Diffused	*20	*50	30°	
WP793GD	GaP	568	Green Diffused	*30	*60	30°	
WP813ID	GaAsP/GaP	625	Red Diffused	*55	*100	30°	
WP813SRC/D	GaAlAs	640	Water Clear	*1500	*2500	15°	
WP813SRC/E	GaAlAs	640	Water Clear	*3100	*4500	15°	
WP813SRC/F	GaAlAs	640	Water Clear	*3600	*5000	15°	
WP813SRD/D	GaAlAs	640	Red Diffused	*300	*420	30°	
WP813SRD/E	GaAlAs	640	Red Diffused	*350	*550	30°	
WP813SRD/F	GaAlAs	640	Red Diffused	*500	*900	30°	
WP813SRD/G	GaAlAs	640	Red Diffused	*1000	*2000	30°	
WP813SRD/H	GaAlAs	640	Red Diffused	*1100	*2200	30°	
WP813ED	GaAsP/GaP	625	Orange Diffused	*55	*100	30°	
WP813YD	GaAsP/GaP	588	Yellow Diffused	*18	*50	30°	
WP813GD	GaP	568	Green Diffused	*20	*60	30°	

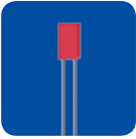
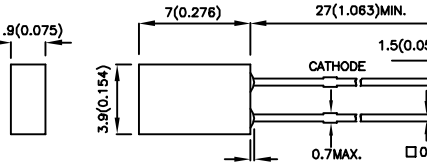

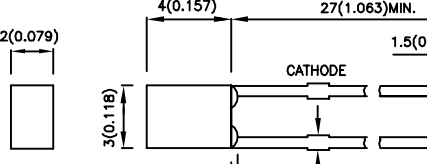

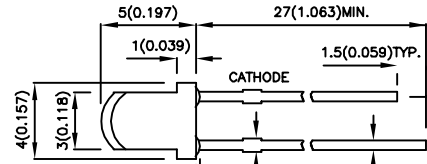
THROUGH-HOLE LED ■ ROUND LED

THROUGH-HOLE LED

OVAL LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP5603SIDL/SD/J3	AlGaInP	625	Red Semi Diffused	1600	2500	80°(H) 40°(V)	5.2mm Oval  WP5603 
WP5603SYDL/SD/J3	AlGaInP	589	Yellow Semi Diffused	1000	1600	80°(H) 40°(V)	
WP5603ZGDL/SD/G	InGaN	525	Green Semi Diffused	2300	3200	80°(H) 40°(V)	
WP5603QBDL/SD/G	InGaN	465	Blue Semi Diffused	700	1200	80°(H) 40°(V)	


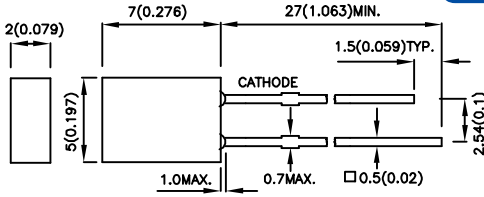
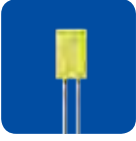
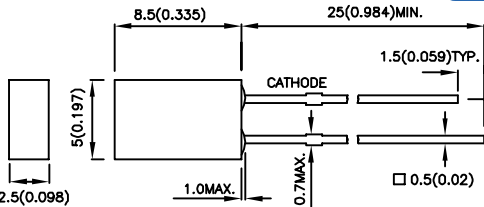
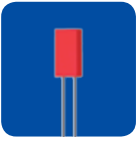
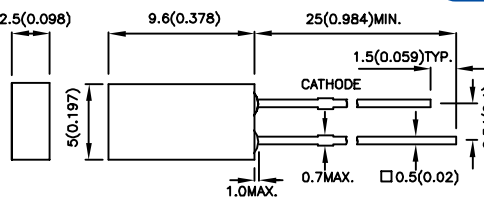
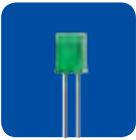
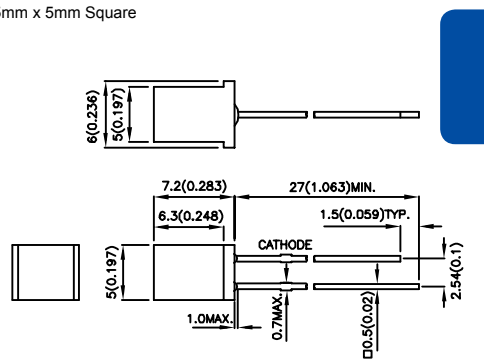
RECTANGULAR LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP144HDT	GaP	660	Red Diffused	0.4	1	110°	1.9mm x 3.9mm Rectangular  WP144 
WP144IDT	GaAsP/GaP	625	Red Diffused	3	6	110°	
WP144SRDT	GaAlAs	640	Red Diffused	*40	*80	110°	
WP144EDT	GaAsP/GaP	625	Orange Diffused	4	8	110°	
WP144YDT	GaAsP/GaP	588	Yellow Diffused	1.5	4	110°	
WP144GDT	GaP	568	Green Diffused	2	6	110°	2mm x 3mm Rectangular  WP914 
WP914HDT	GaP	660	Red Diffused	0.2	1	100°	
WP914HT	GaP	660	Red Transparent	0.4	1	90°	
WP914IDT	GaAsP/GaP	625	Red Diffused	3	8	100°	
WP914IT	GaAsP/GaP	625	Red Transparent	4	8	90°	
WP914EDT	GaAsP/GaP	625	Orange Diffused	1.8	6	100°	
WP914ET	GaAsP/GaP	625	Orange Transparent	3	8	90°	
WP914GDT	GaP	568	Green Diffused	3	6	100°	
WP914GT	GaP	568	Green Transparent	3	8	90°	
WP914PGT	GaP	555	Green Transparent	0.8	2	90°	
WP169XID	GaAsP/GaP	625	Red Diffused	10	15	60°	2mm x 3mm Rectangular  WP169X 
WP169XYD	GaAsP/GaP	588	Yellow Diffused	5	10	60°	
WP169XGD	GaP	568	Green Diffused	8	15	60°	

NOTES: 1. All dimensions are in millimeters(inches).
 2. Tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.

THROUGH-HOLE LED

RECTANGULAR LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP113HDT	GaP	660	Red Diffused	0.5	1	110°	2mm x 5mm Rectangular  
WP113IDT	GaAsP/GaP	625	Red Diffused	4	7	110°	
WP113SRDT	GaAlAs	640	Red Diffused	*50	*100	110°	
WP113EDT	GaAsP/GaP	625	Orange Diffused	4	8	110°	
WP113YDT	GaAsP/GaP	588	Yellow Diffused	1.2	4	110°	
WP113GDT	GaP	568	Green Diffused	2	6	110°	
WP513HDT	GaP	660	Red Diffused	0.4	1	110°	2.5mm x 5mm Rectangular  
WP513IDT	GaAsP/GaP	625	Red Diffused	2	6	110°	
WP513EDT	GaAsP/GaP	625	Orange Diffused	3	6	110°	
WP513YDT	GaAsP/GaP	588	Yellow Diffused	1.2	3	110°	
WP513GDT	GaP	568	Green Diffused	1.2	3	110°	
WP513SGDT	GaP	568	Green Diffused	*7	*10	110°	
WP383HDT	GaP	660	Red Diffused	0.5	1	110°	2.5mm x 5mm Rectangular  
WP383IDT	GaAsP/GaP	625	Red Diffused	3	6	110°	
WP383SRDT	GaAlAs	640	Red Diffused	*55	*100	110°	
WP383EDT	GaAsP/GaP	625	Orange Diffused	3	6	110°	
WP383YDT	GaAsP/GaP	588	Yellow Diffused	2	4	110°	
WP383GDT	GaP	568	Green Diffused	1.2	4	110°	
WP503HDT	GaP	660	Red Diffused	0.4	0.8	110°	5mm x 5mm Square  
WP503IDT	GaAsP/GaP	625	Red Diffused	3	6	110°	
WP503YDT	GaAsP/GaP	588	Yellow Diffused	1	3	110°	
WP503GDT	GaP	568	Green Diffused	1.5	3	110°	

THROUGH-HOLE LED ■ RECTANGULAR LED

THROUGH-HOLE LED

CYLINDRICAL LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP424HDT	GaP	660	Red Diffused	0.4	1	100°	T-1 (3mm) Cylindrical
WP424IDT	GaAsP/GaP	625	Red Diffused	4	8	100°	
WP424SRDT	GaAlAs	640	Red Diffused	*55	*100	100°	
WP424EDT	GaAsP/GaP	625	Orange Diffused	5	10	100°	
WP424YDT	GaAsP/GaP	588	Yellow Diffused	2	4	100°	
WP424GDT	GaP	568	Green Diffused	2	6	100°	
WP483HDT	GaP	660	Red Diffused	0.4	1	100°	T-1 3/4 (5mm) Cylindrical
WP483IDT	GaAsP/GaP	625	Red Diffused	4	7	100°	
WP483EDT	GaAsP/GaP	625	Orange Diffused	4	8	100°	
WP483YDT	GaAsP/GaP	588	Yellow Diffused	1.2	3	100°	
WP483GDT	GaP	568	Green Diffused	1.5	4	100°	

MULTI-COLOR LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP937IID	GaAsP/GaP	625	Red Diffused	7	20	60°	T-1 (3mm) Round
	GaAsP/GaP	625					
WP937YYD	GaAsP/GaP	588	Yellow Diffused	4	10	60°	
	GaAsP/GaP	588					
WP937GGD	GaP	568	Green Diffused	7	20	60°	
	GaP	568					
WP937EYW	GaAsP/GaP	625	White Diffused	8	20	60°	
	GaAsP/GaP	588					
WP937EGW	GaAsP/GaP	625	White Diffused	8	20	60°	
	GaP	568					
WP937GYW	GaP	568	White Diffused	8	20	60°	
	GaAsP/GaP	588					
WP115VEYW	GaAsP/GaP	625	White Diffused	20	50	60°	
	GaAsP/GaP	588					
WP115VEGW	GaAsP/GaP	625	White Diffused	20	50	60°	
	GaP	568					
WP115VGYW	GaP	568	White Diffused	18	50	60°	
	GaAsP/GaP	588					

NOTES: 1. All dimensions are in millimeters(inches).
2. Tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.

THROUGH-HOLE LED


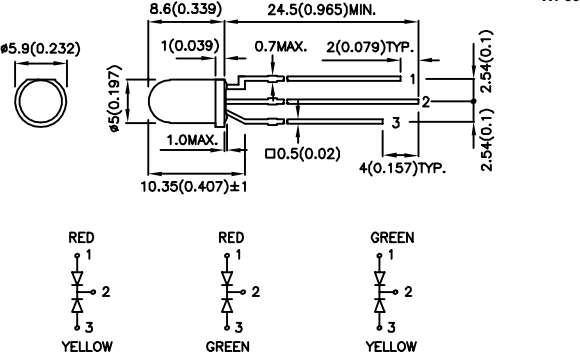

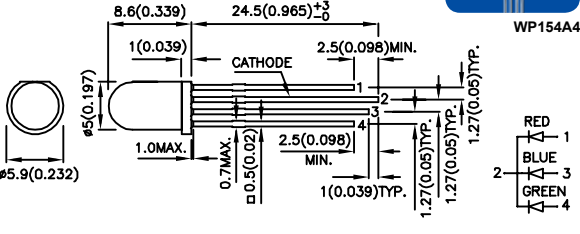

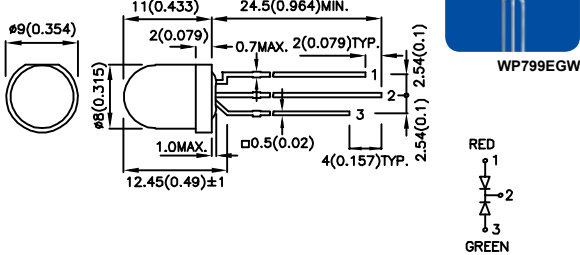
MULTI-COLOR LED

THROUGH-HOLE LED ■ MULTI-COLOR LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimension		
				Min.	Typ.				
WP115WEYW	GaAsP/GaP	625	White Diffused	20	40	60°	<p>T-1 (3mm) Round</p> <p>WP115W</p>		
	GaAsP/GaP	588		10	20				
WP115WEGW	GaAsP/GaP	625	White Diffused	20	40	60°			
	GaP	568		20	40				
WP115WGYW	GaP	568	White Diffused	15	40	60°			
	GaAsP/GaP	588		10	20				
WP3VEYW	GaAsP/GaP	625	White Diffused	15	40	60°		<p>T-1 (3mm) Round</p> <p>WP3V</p>	
	GaAsP/GaP	588		10	15				
WP3VEGW	GaAsP/GaP	625	White Diffused	15	40	60°			
	GaP	568		20	40				
WP3VGYW	GaP	568	White Diffused	15	40	60°			
	GaAsP/GaP	588		10	15				
WP7113SRSGW	GaAlAs	640	White Diffused	120	300	35°	<p>T-1 3/4 (5mm) Round</p> <p>WP7113SRSGW</p>		
	GaP	568		20	60				
WP57IID	GaAsP/GaP	625	Red Diffused	10	30	60°			<p>T-1 3/4 (5mm) Round</p> <p>WP57</p>
	GaAsP/GaP	625		10	30				
WP57YYD	GaAsP/GaP	588	Yellow Diffused	6	12	60°			
	GaAsP/GaP	588		6	12				
WP57GGD	GaP	568	Green Diffused	8	30	60°			
	GaP	568		8	30				
WP57EYW	GaAsP/GaP	625	White Diffused	12	30	60°			
	GaAsP/GaP	588		4	10				
WP57EGW	GaAsP/GaP	625	White Diffused	12	30	60°			
	GaP	568		12	30				
WP57GYW	GaP	568	White Diffused	12	30	60°			
	GaAsP/GaP	588		4	10				

THROUGH-HOLE LED

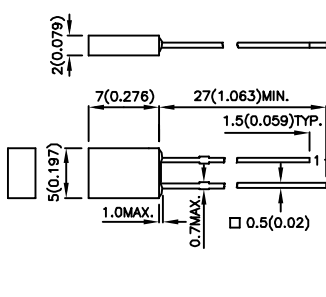
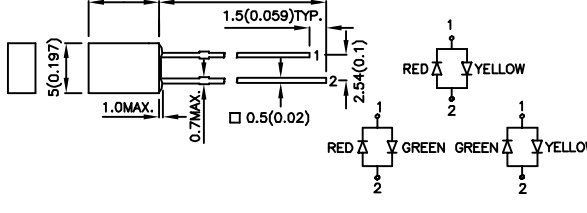
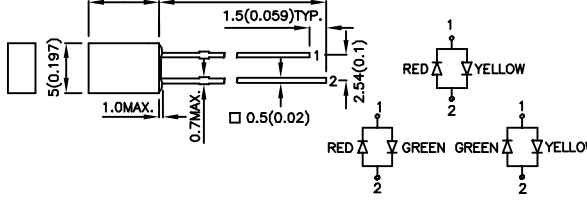
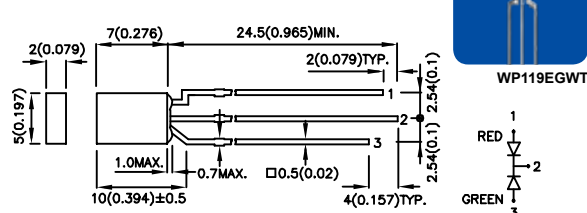
MULTI-COLOR LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimension	
				Min.	Typ.			
WP59EYW	GaAsP/GaP	625	White Diffused	50	100	60°	<p>T-1 3/4 (5mm) Round</p>  <p>WP59</p>  <p>RED 1 YELLOW 2 GREEN 3</p>	
	GaAsP/GaP	588		20	40			
WP59EGW	GaAsP/GaP	625	White Diffused	50	100	60°		
	GaP	568		20	60			
WP59GYW	GaP	568	White Diffused	50	100	60°		
	GaAsP/GaP	588		20	40			
WP59SURKCGKW	AlGaInP	630	White Diffused	600	1200	60°		
	AlGaInP	570		80	200			
WP59EYC	GaAsP/GaP	625	Water Clear	80	200	24°		
	GaAsP/GaP	588		55	120			
WP59EGC	GaAsP/GaP	625	Water Clear	80	200	24°		
	GaP	568		80	200			
WP59GYC	GaP	568	Water Clear	80	200	24°		
	GaAsP/GaP	588		55	120			
WP154A4SUREQBFGZC	AlGaInP	630	Water Clear	650	1300	50°	<p>T-1 3/4 (5mm) Full color</p>  <p>WP154A4</p>  <p>RED 1 BLUE 2 GREEN 3 GREEN 4</p>	
	InGaIn	465		500	1100			
	InGaIn	525		1000	1700			
WP154A4SUREQBFGZW	AlGaInP	630	White Diffused	400	1000	60°		
	InGaIn	465		300	500			
	InGaIn	525		600	1300			
WP799EGW	GaAsP/GaP	625	White Diffused	40	80	50°		<p>8mm Round</p>  <p>WP799EGW</p>  <p>RED 1 GREEN 2 GREEN 3</p>
	GaP	568		20	50			
WP819EGW	GaAsP/GaP	625	White Diffused	40	80	50°		
	GaP	568		15	50			

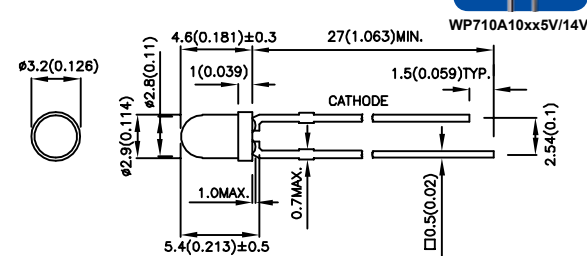
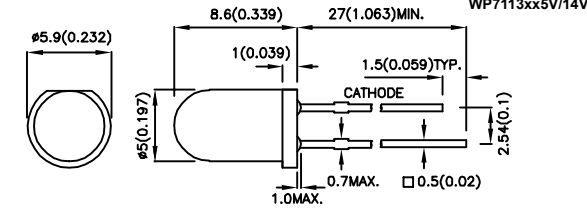
NOTES: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (0.01") unless otherwise noted.

THROUGH-HOLE LED

MULTI-COLOR LED


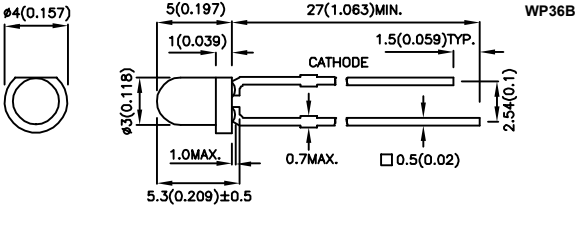

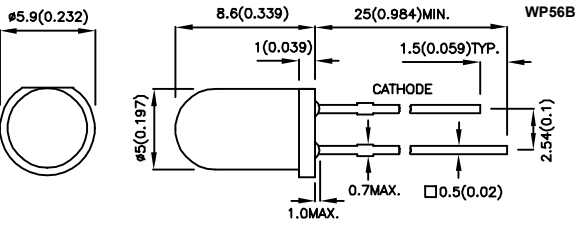
Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
WP117EYWT	GaAsP/GaP	625	White Diffused	4	10	110°	2mm x 5mm Rectangular 
	GaAsP/GaP	588		3	6		
WP117EGWT	GaAsP/GaP	625	White Diffused	4	10	110°	2mm x 5mm Rectangular 
	GaP	568		4	10		
WP117GYWT	GaP	568	White Diffused	4	10	110°	2mm x 5mm Rectangular 
	GaAsP/GaP	588		3	6		
WP119EGWT	GaAsP/GaP	625	White Diffused	8	20	110°	2mm x 5mm Rectangular 
	GaP	568		8	20		

RESISTOR LED

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) V=5V*V=14V		Viewing Angle 2θ1/2	Dimension
				Min.	Typ.		
WP710A10ID5V	GaAsP/GaP	625	Red Diffused	12	25	40°	T-1 (3mm) Round 
WP710A10ID14V	GaAsP/GaP	625	Red Diffused	*10	*20	40°	
WP710A10SRD5V	GaAlAs	640	Red Diffused	100	180	40°	
WP710A10SRD14V	GaAlAs	640	Red Diffused	*70	*100	40°	
WP710A10YD5V	GaAsP/GaP	588	Yellow Diffused	7	15	40°	
WP710A10YD14V	GaAsP/GaP	588	Yellow Diffused	*6	*11	40°	
WP710A10GD5V	GaP	568	Green Diffused	12	25	40°	
WP710A10GD14V	GaP	568	Green Diffused	*8	*20	40°	
WP710A10SGD5V	GaP	568	Green Diffused	10	25	40°	
WP710A10SGD14V	GaP	568	Green Diffused	*8	*20	40°	
WP7113ID5V	GaAsP/GaP	625	Red Diffused	20	40	30°	T-1 3/4 (5mm) Round 
WP7113ID14V	GaAsP/GaP	625	Red Diffused	*18	*35	30°	
WP7113SRD5V	GaAlAs	640	Red Diffused	220	320	30°	
WP7113SRD14V	GaAlAs	640	Red Diffused	*180	*300	30°	
WP7113YD5V	GaAsP/GaP	588	Yellow Diffused	10	22	30°	
WP7113YD14V	GaAsP/GaP	588	Yellow Diffused	*8	*20	30°	
WP7113SGD5V	GaP	568	Green Diffused	15	25	30°	
WP7113SGD14V	GaP	568	Green Diffused	*10	*22	30°	


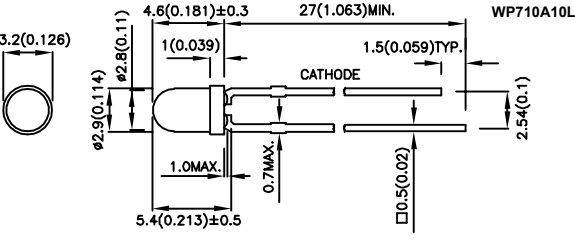
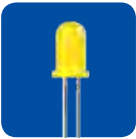
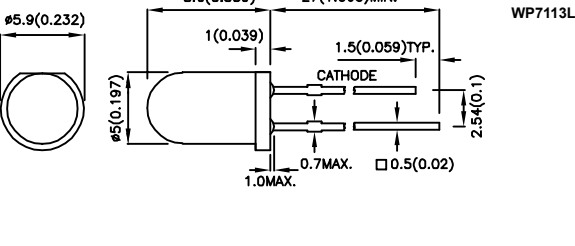
THROUGH-HOLE LED

BLINKING LED

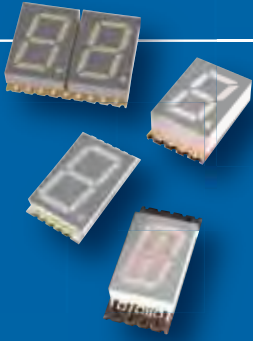
Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) V=9V		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP36BHD	GaP	660	Red Diffused	2	6	60°	T-1 (3mm) Round  
WP36BID	GaAsP/GaP	625	Red Diffused	15	30	60°	
WP36BSRD/B	GaAlAs	640	Red Diffused	180	300	60°	
WP36BYD	GaAsP/GaP	588	Yellow Diffused	5	10	60°	
WP36BGD	GaP	568	Green Diffused	20	50	60°	
WP56BHD	GaP	660	Red Diffused	1.2	4	60°	T-1 3/4 (5mm) Round  
WP56BID	GaAsP/GaP	625	Red Diffused	18	40	60°	
WP56BSRD/B	GaAlAs	640	Red Diffused	120	200	60°	
WP56BYD	GaAsP/GaP	588	Yellow Diffused	12	20	60°	
WP56BGD	GaP	568	Green Diffused	15	30	60°	

THROUGH-HOLE LED ■ BLINKING LED, LOW CURRENT LED

LOW CURRENT LED

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @2mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP710A10LID	GaAsP/GaP	625	Red Diffused	1	3	40°	T-1 (3mm) Round  
WP710A10LSRD	GaAlAs	640	Red Diffused	15	25	40°	
WP710A10LYD	GaAsP/GaP	588	Yellow Diffused	1	2	40°	
WP710A10LGD	GaP	568	Green Diffused	1	2	40°	
WP7113LID	GaAsP/GaP	625	Red Diffused	2	5	30°	T-1 3/4 (5mm) Round  
WP7113LSRD	GaAlAs	640	Red Diffused	10	20	30°	
WP7113LYD	GaAsP/GaP	588	Yellow Diffused	1	3	30°	
WP7113LGD	GaP	568	Green Diffused	1.2	3	30°	

NOTES: 1. All dimensions are in millimeters (inches).
 2. Tolerance is $\pm 0.25\text{mm}$ ($0.01''$) unless otherwise noted.



SMD DISPLAY

7-Segment SMD Display	31
Alphanumeric SMD Display	33

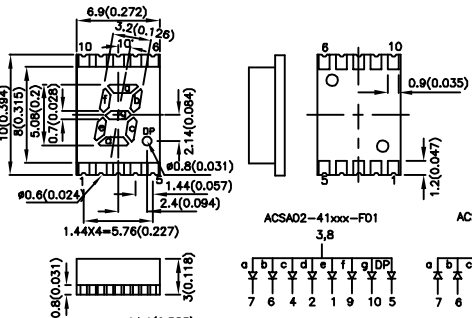
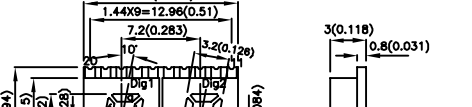
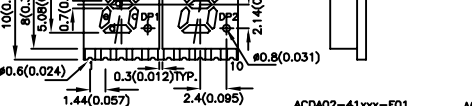
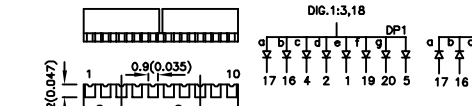
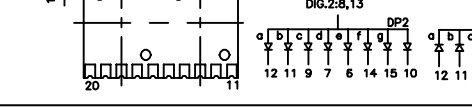
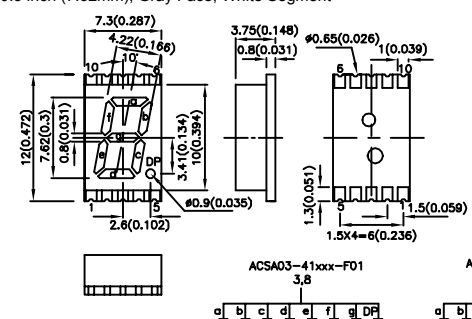
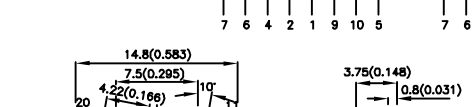
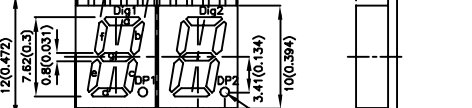
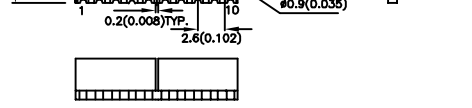
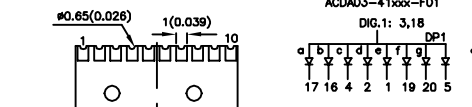
Description

As pioneer of SMD Display technology, Kingbright continues to advance its SMD Display products by developing new ultra-thin displays in various sizes to meet different design requirements. The SMD Display's lightweight and low profile design coupled with its vivid and crisp displaying capability allow designers of various applications to create smaller, lighter, and flashier devices.

Features and Benefits

- Extensive selection including sizes in 0.2", 0.3", 0.4", 0.56", 0.8"
- Colors are available in blue, green, red, yellow, and orange.
- Packages are available in single-digit, dual-digit, and alphanumeric
- Advanced chip-on-board technology
- Pin-out configuration complies with industry standard
- Standard surface color is gray while also available in black, red, and green upon request
- Automation-friendly tape-and-reel package
- Moisture Sensitivity Level (MSL) rating of 2a with longer floor time of 4 weeks

7-SEGMENT SMD DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
ACSA02-41SURKWA-F01 ACDA02-41SURKWA-F01	ACSC02-41SURKWA-F01 ACDC02-41SURKWA-F01	AlGaInP	630	14000	30000	0.2 inch (5.08mm), Gray Face, White Segment     
ACSA02-41SEKWA-F01 ACDA02-41SEKWA-F01	ACSC02-41SEKWA-F01 ACDC02-41SEKWA-F01	AlGaInP	601	21000	37000	
ACSA02-41SYKWA-F01 ACDA02-41SYKWA-F01	ACSC02-41SYKWA-F01 ACDC02-41SYKWA-F01	AlGaInP	590	21000	50000	
ACSA02-41SGWA-F01 ACDA02-41SGWA-F01	ACSC02-41SGWA-F01 ACDC02-41SGWA-F01	GaP	568	1400	3900	
ACSA02-41CGKWA-F01 ACDA02-41CGKWA-F01	ACSC02-41CGKWA-F01 ACDC02-41CGKWA-F01	AlGaInP	570	3600	12000	
ACSA02-41SGWA-F01 ACDA02-41SGWA-F01	ACSC02-41SGWA-F01 ACDC02-41SGWA-F01	GaP	568	1400	3900	
ACSA03-41SRWA-F01 ACDA03-41SRWA-F01	ACSC03-41SRWA-F01 ACDC03-41SRWA-F01	GaAlAs	640	5600	9800	0.3 inch (7.62mm), Gray Face, White Segment     
ACSA03-41SURKWA-F01 ACDA03-41SURKWA-F01	ACSC03-41SURKWA-F01 ACDC03-41SURKWA-F01	AlGaInP	630	14000	27000	
ACSA03-41SEKWA-F01 ACDA03-41SEKWA-F01	ACSC03-41SEKWA-F01 ACDC03-41SEKWA-F01	AlGaInP	601	21000	46000	
ACSA03-41SYKWA-F01 ACDA03-41SYKWA-F01	ACSC03-41SYKWA-F01 ACDC03-41SYKWA-F01	AlGaInP	590	21000	36000	
ACSA03-41SGWA-F01 ACDA03-41SGWA-F01	ACSC03-41SGWA-F01 ACDC03-41SGWA-F01	GaP	568	1400	3500	
ACSA03-41CGKWA-F01 ACDA03-41CGKWA-F01	ACSC03-41CGKWA-F01 ACDC03-41CGKWA-F01	AlGaInP	570	3600	12000	

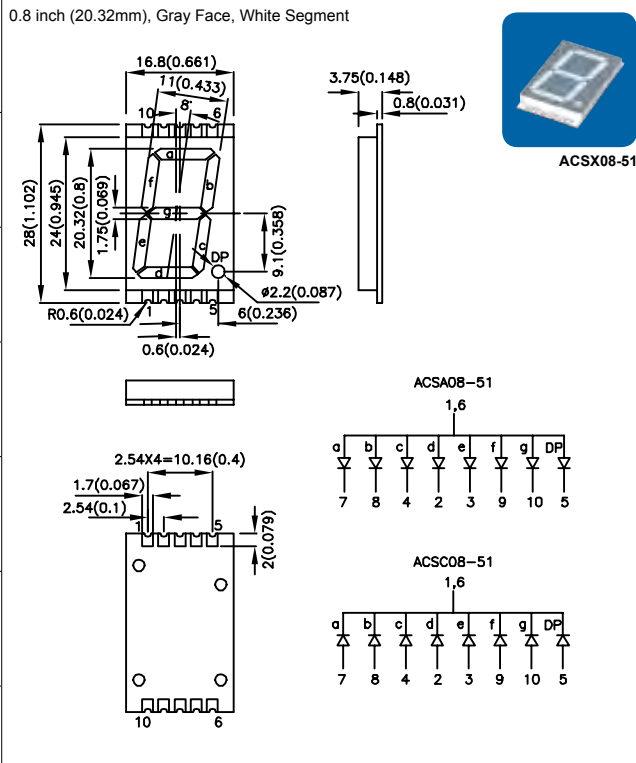
NOTES: 1. All dimensions are in millimeters (inches).
 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

7-SEGMENT SMD DISPLAY

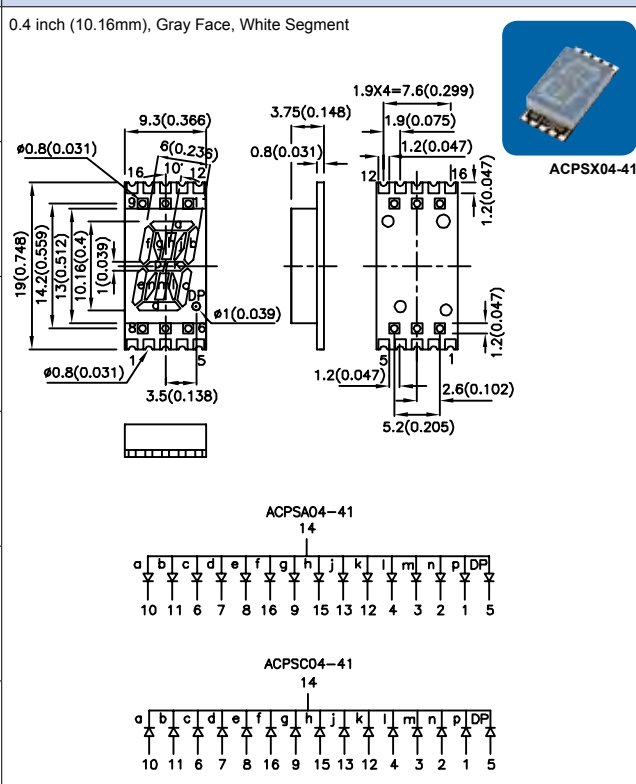
Part Number		Material	λ_D (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
ACSA04-41SRWA-F01 ACDA04-41SRWA-F01	ACSC04-41SRWA-F01 ACDC04-41SRWA-F01	GaAlAs	640	5600	14000	<p>0.4 inch (10.16mm), Gray Face, White Segment</p>
ACSA04-41SURKWA-F01 ACDA04-41SURKWA-F01	ACSC04-41SURKWA-F01 ACDC04-41SURKWA-F01	AlGaInP	630	14000	27000	
ACSA04-41SEKWA-F01 ACDA04-41SEKWA-F01	ACSC04-41SEKWA-F01 ACDC04-41SEKWA-F01	AlGaInP	601	21000	60000	
ACSA04-41SYKWA-F01 ACDA04-41SYKWA-F01	ACSC04-41SYKWA-F01 ACDC04-41SYKWA-F01	AlGaInP	590	21000	35000	
ACSA04-41SGWA-F01 ACDA04-41SGWA-F01	ACSC04-41SGWA-F01 ACDC04-41SGWA-F01	GaP	568	2200	4700	
ACSA04-41CGKWA-F01 ACDA04-41CGKWA-F01	ACSC04-41CGKWA-F01 ACDC04-41CGKWA-F01	AlGaInP	570	5600	11000	
ACSA04-41SRWA-F01 ACDA04-41SRWA-F01	ACSC04-41SRWA-F01 ACDC04-41SRWA-F01	GaAlAs	640	9000	26000	<p>0.56 inch (14.22mm), Gray Face, White Segment</p>
ACSA56-41SURKWA-F01 ACDA56-41SURKWA-F01	ACSC56-41SURKWA-F01 ACDC56-41SURKWA-F01	AlGaInP	630	21000	44000	
ACSA56-41SEKWA-F01 ACDA56-41SEKWA-F01	ACSC56-41SEKWA-F01 ACDC56-41SEKWA-F01	AlGaInP	601	31000	78000	
ACSA56-41SYKWA-F01 ACDA56-41SYKWA-F01	ACSC56-41SYKWA-F01 ACDC56-41SYKWA-F01	AlGaInP	590	31000	76000	
ACSA56-41SGWA-F01 ACDA56-41SGWA-F01	ACSC56-41SGWA-F01 ACDC56-41SGWA-F01	GaP	568	3600	6000	
ACSA56-41CGKWA-F01 ACDA56-41CGKWA-F01	ACSC56-41CGKWA-F01 ACDC56-41CGKWA-F01	AlGaInP	570	9000	25000	
ACSA56-41ZGWA-F01 ACDA56-41ZGWA-F01	ACSC56-41ZGWA-F01 ACDC56-41ZGWA-F01	InGaN	525	88000	220000	
ACSA56-41QBWA/D-F01 ACDA56-41QBWA/D-F01	ACSC56-41QBWA/D-F01 ACDC56-41QBWA/D-F01	InGaN	470	5600	15000	

SMD DISPLAY ■ 7-SEGMENT SMD DISPLAY

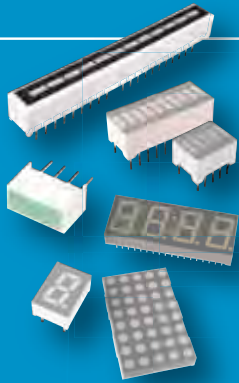
7-SEGMENT SMD DISPLAY

Part Number		Material	λ_D (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
ACSA08-51SURKWA	ACSC08-51SURKWA	AlGaInP	630	21000	47000	0.8 inch (20.32mm), Gray Face, White Segment 
ACSA08-51SEKWA	ACSC08-51SEKWA	AlGaInP	601	31000	84000	
ACSA08-51SYKWA	ACSC08-51SYKWA	AlGaInP	590	31000	76000	
ACSA08-51SGWA	ACSC08-51SGWA	GaP	568	3600	7400	
ACSA08-51CGKWA	ACSC08-51CGKWA	AlGaInP	570	9000	22000	
ACSA08-51ZGWA	ACSC08-51ZGWA	InGaIn	525	52000	160000	
ACSA08-51QBWA/D	ACSC08-51QBWA/D	InGaIn	470	5600	12000	

ALPHANUMERIC SMD DISPLAY

Part Number		Material	λ_D (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
ACPSA04-41SRWA	ACPSC04-41SRWA	GaAlAs	640	5600	15000	0.4 inch (10.16mm), Gray Face, White Segment 
ACPSA04-41SURKWA	ACPSC04-41SURKWA	AlGaInP	630	14000	36000	
ACPSA04-41SEKWA	ACPSC04-41SEKWA	AlGaInP	601	21000	44000	
ACPSA04-41SYKWA	ACPSC04-41SYKWA	AlGaInP	590	21000	46000	
ACPSA04-41SGWA	ACPSC04-41SGWA	GaP	568	1400	2900	
ACPSA04-41CGKWA	ACPSC04-41CGKWA	AlGaInP	570	5600	11000	

NOTES: 1. All dimensions are in millimeters(inches).
2. Tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.



THROUGH-HOLE DISPLAY

Single Digit 7-Segment Through-Hole Display	35
Dual Digit 7-Segment Through-Hole Display	39
Three Digit 7-Segment Through-Hole Display	42
Four Digit 7-Segment Through-Hole Display	42
Alphanumeric Through-Hole Display	43
Dot Matrix	44
Bar Graph Array	48
Light Bar	48

Description


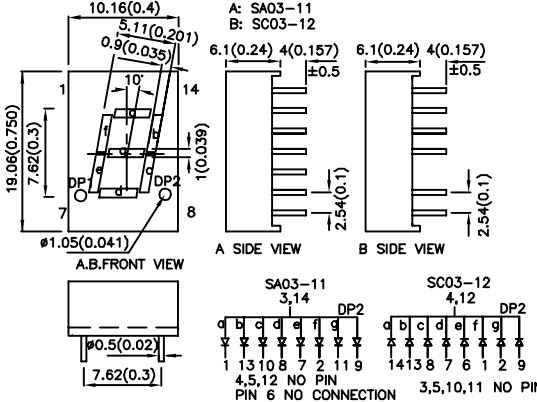

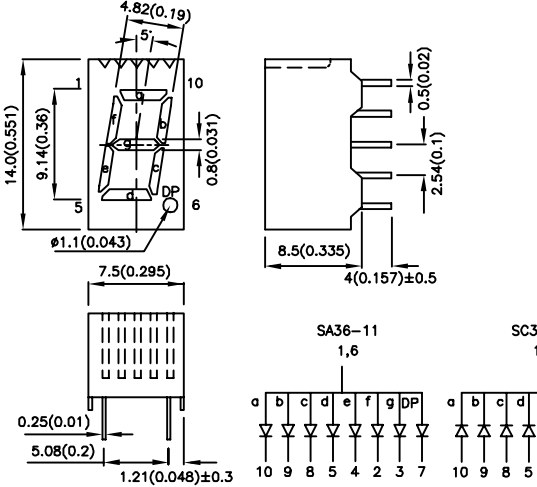

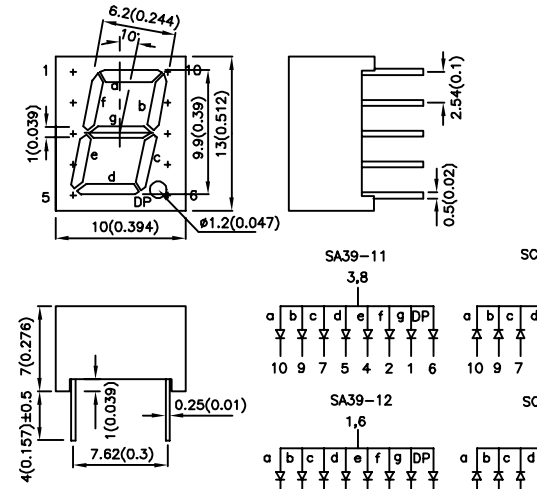
Through-hole displays have been a widely adopted solution for message displaying and status level indication. Kingbright's options for through-hole displays include 7-segment, alphanumeric, dot-matrix, light bar, and bar graph. With a variety of sizes and color selections available in each option, Kingbright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

Features and Benefits

- Display types including 7-segment, alphanumeric, dot-matrix, light bar, bar graph
- Pin-out configuration complies with industry standard
- Single-color and bi-color options
- Advanced chip-on-board technology
- Uniform light emitting surface
- Standard surface color is gray while also available in black, white, red, and green
- Special pin length and right-angle packages are available
- High reliability with competitive lead time

THROUGH-HOLE DISPLAY


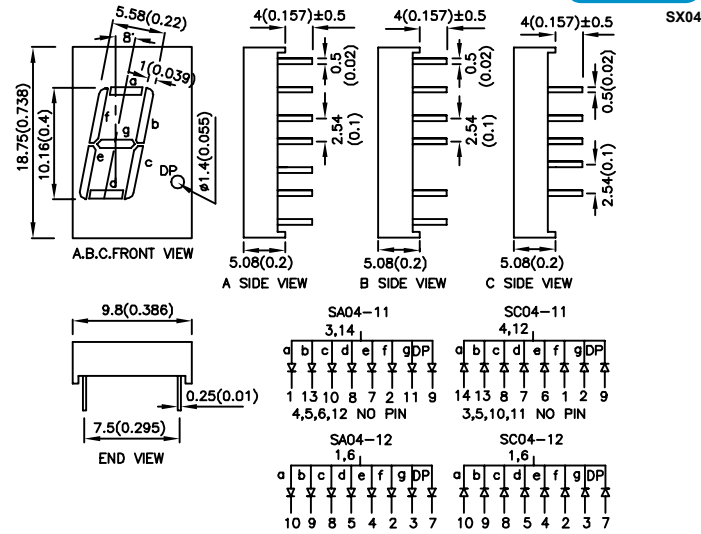

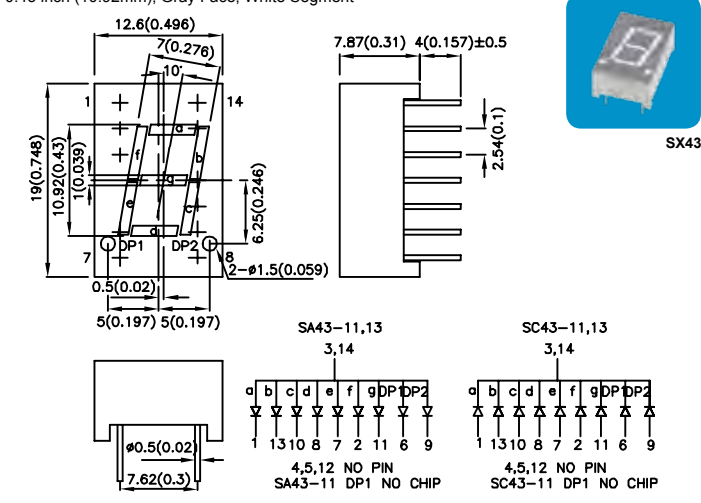

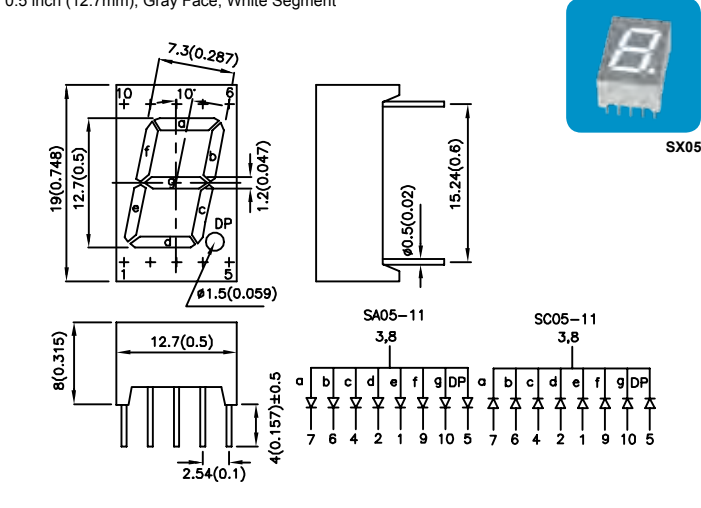
SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
SA03-11EWA	SC03-12EWA	GaAsP/ GaP	625	3600	8100	<p>0.3 inch (7.62mm), Gray Face, White Segment</p>  <p>SX03</p>  <p>A: SA03-11 B: SC03-12</p> <p>A SIDE VIEW B SIDE VIEW</p> <p>A,B.FRONT VIEW</p> <p>SA03-11 SC03-12</p> <p>3,14 4,12</p> <p>DP2 DP2</p> <p>a b c d e f g DP2 a b c d e f g DP2</p> <p>1 13 10 8 7 2 11 9 14 13 8 7 6 1 2 9</p> <p>4,5,12 NO PIN 3,5,10,11 NO PIN</p> <p>PIN 6 NO CONNECTION</p>
SA03-11SRWA	SC03-12SRWA	GaAlAs	640	21000	42000	
SA03-11YWA	SC03-12YWA	GaAsP/ GaP	588	3600	6400	
SA03-11GWA	SC03-12GWA	GaP	568	5600	11000	
SA36-11EWA	SC36-11EWA	GaAsP/ GaP	625	900	2100	<p>0.36 inch (9.14mm), Gray Face, White Segment</p>  <p>SX36</p>  <p>A: SA36-11 B: SC36-11</p> <p>A SIDE VIEW B SIDE VIEW</p> <p>A,B.FRONT VIEW</p> <p>SA36-11 SC36-11</p> <p>1,6 1,6</p> <p>DP2 DP2</p> <p>a b c d e f g DP2 a b c d e f g DP2</p> <p>10 9 8 5 4 2 3 7 10 9 8 5 4 2 3 7</p>
SA36-11SRWA	SC36-11SRWA	GaAlAs	640	5600	10000	
SA36-11YWA	SC36-11YWA	GaAsP/ GaP	588	1400	2600	
SA36-11GWA	SC36-11GWA	GaP	568	1400	3500	
SA39-11EWA SA39-12EWA	SC39-11EWA SC39-12EWA	GaAsP/ GaP	625	1400	4100	<p>0.39 inch (9.9mm), Gray Face, White Segment</p>  <p>SX39</p>  <p>A: SA39-11 B: SC39-11</p> <p>A SIDE VIEW B SIDE VIEW</p> <p>A,B.FRONT VIEW</p> <p>SA39-11 SC39-11</p> <p>3,8 3,8</p> <p>DP2 DP2</p> <p>a b c d e f g DP2 a b c d e f g DP2</p> <p>10 9 7 5 4 2 1 6 10 9 7 5 4 2 1 6</p> <p>SA39-12 SC39-12</p> <p>1,6 1,6</p> <p>DP2 DP2</p> <p>a b c d e f g DP2 a b c d e f g DP2</p> <p>10 9 8 5 4 2 3 7 10 9 8 5 4 2 3 7</p>
SA39-11SRWA SA39-12SRWA	SC39-11SRWA SC39-12SRWA	GaAlAs	640	9000	17000	
SA39-11YWA SA39-12YWA	SC39-11YWA SC39-12YWA	GaAsP/ GaP	588	1400	3000	
SA39-11GWA SA39-12GWA	SC39-11GWA SC39-12GWA	GaP	568	2200	6400	

NOTES: 1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

THROUGH-HOLE DISPLAY

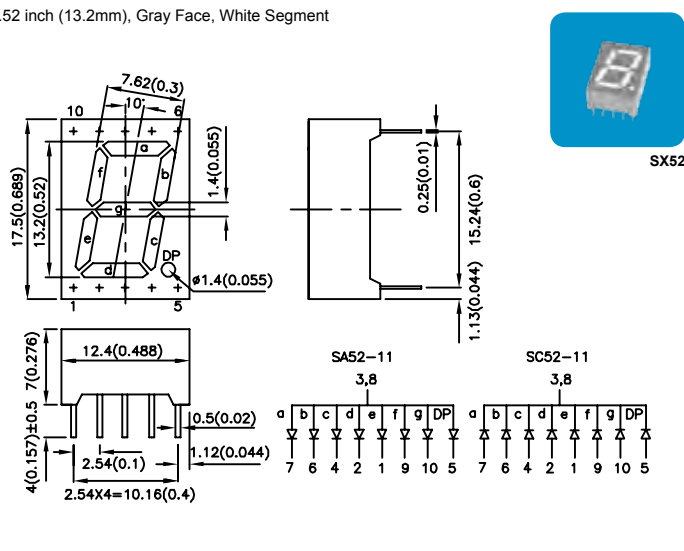
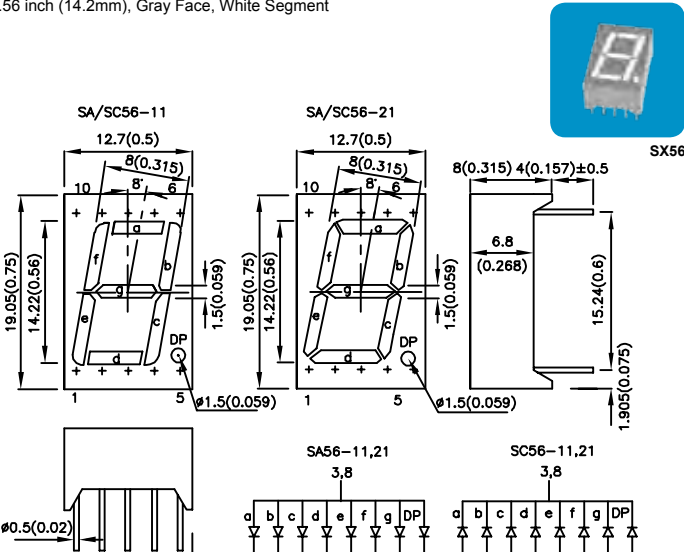
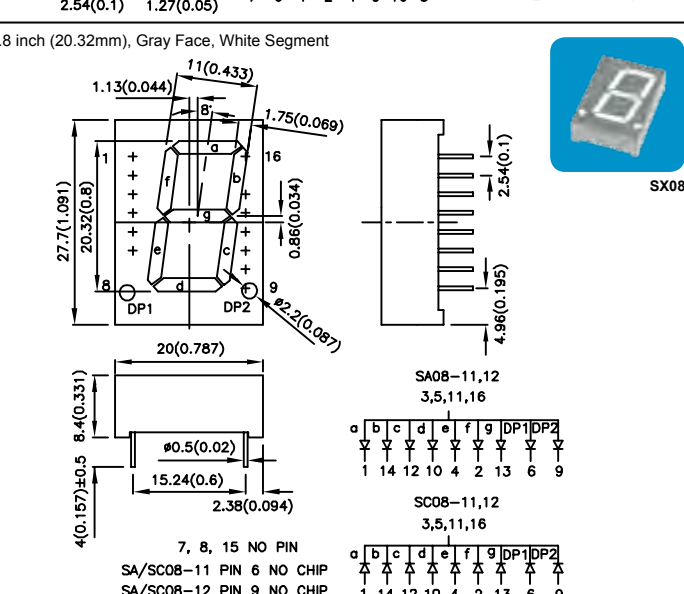
SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
SA04-11EWA SA04-12EWA	SC04-11EWA SC04-12EWA	GaAsP/ GaP	● 625	2200	5600	0.4 inch (10.16mm), Gray Face, White Segment  SX04 A: SA04-11 B: SC04-11 C: SA/SC04-12 
SA04-11SRWA SA04-12SRWA	SC04-11SRWA SC04-12SRWA	GaAlAs	● 640	14000	30000	
SA04-11YWA SA04-12YWA	SC04-11YWA SC04-12YWA	GaAsP/ GaP	● 588	3600	6300	
SA04-11GWA SA04-12GWA	SC04-11GWA SC04-12GWA	GaP	● 568	3600	8600	
SA43-11EWA SA43-13EWA	SC43-11EWA SC43-13EWA	GaAsP/ GaP	● 625	3600	6900	0.43 inch (10.92mm), Gray Face, White Segment  SX43 
SA43-11SRWA SA43-13SRWA	SC43-11SRWA SC43-13SRWA	GaAlAs	● 640	21000	42000	
SA43-11YWA SA43-13YWA	SC43-11YWA SC43-13YWA	GaAsP/ GaP	● 588	3600	6500	
SA43-11GWA SA43-13GWA	SC43-11GWA SC43-13GWA	GaP	● 568	5600	10000	
SA05-11EWA	SC05-11EWA	GaAsP/ GaP	● 625	3600	7600	0.5 inch (12.7mm), Gray Face, White Segment  SX05 
SA05-11SRWA	SC05-11SRWA	GaAlAs	● 640	14000	34000	
SA05-11YWA	SC05-11YWA	GaAsP/ GaP	● 588	2200	6100	
SA05-11GWA	SC05-11GWA	GaP	● 568	3600	10000	

THROUGH-HOLE DISPLAY ■ SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

THROUGH-HOLE DISPLAY

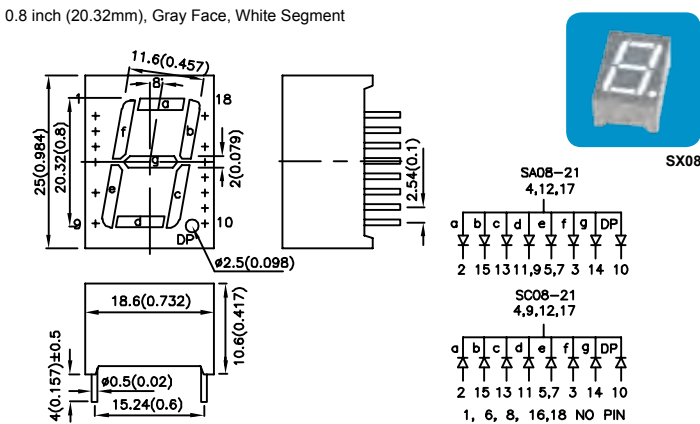
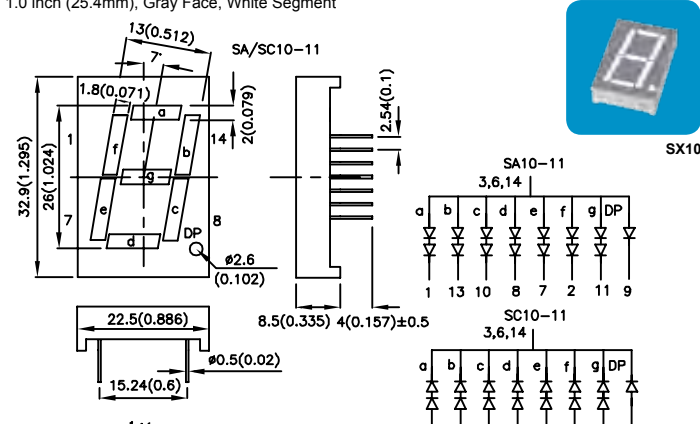
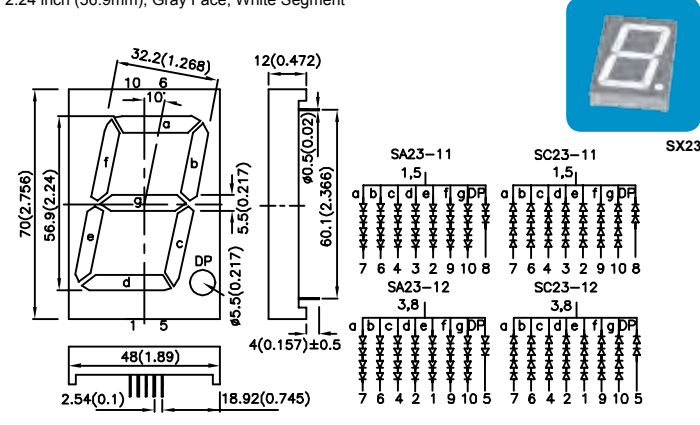
SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
SA52-11EWA	SC52-11EWA	GaAsP/ GaP	625	3000	6400	0.52 inch (13.2mm), Gray Face, White Segment 
SA52-11SRWA	SC52-11SRWA	GaAlAs	640	21000	34000	
SA52-11GWA	SC52-11GWA	GaP	568	5600	10500	
SA56-11EWA SA56-21EWA	SC56-11EWA SC56-21EWA	GaAsP/ GaP	625	3600	6400	0.56 inch (14.2mm), Gray Face, White Segment 
SA56-11SRWA SA56-21SRWA	SC56-11SRWA SC56-21SRWA	GaAlAs	640	14000	34000	
SA56-11YWA SA56-21YWA	SC56-11YWA SC56-21YWA	GaAsP/ GaP	588	2200	6500	
SA56-11GWA SA56-21GWA	SC56-11GWA SC56-21GWA	GaP	568	3600	11000	
SA08-11EWA SA08-12EWA	SC08-11EWA SC08-12EWA	GaAsP/ GaP	625	3600	8000	0.8 inch (20.32mm), Gray Face, White Segment 
SA08-11SRWA SA08-12SRWA	SC08-11SRWA SC08-12SRWA	GaAlAs	640	14000	36000	
SA08-11YWA SA08-12YWA	SC08-11YWA SC08-12YWA	GaAsP/ GaP	588	3600	7900	
SA08-11GWA SA08-12GWA	SC08-11GWA SC08-12GWA	GaP	568	5600	13000	

NOTES: 1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

THROUGH-HOLE DISPLAY


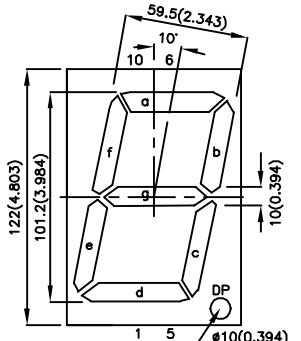
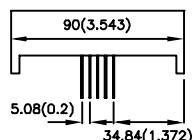
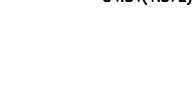
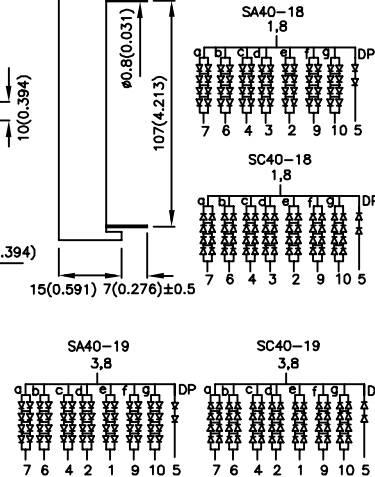
SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
SA08-21EWA	SC08-21EWA	GaAsP/GaP	625	3600	8000	0.8 inch (20.32mm), Gray Face, White Segment 
SA08-21SRWA	SC08-21SRWA	GaAlAs	640	14000	36000	
SA08-21YWA	SC08-21YWA	GaAsP/GaP	588	3600	7900	
SA08-21GWA	SC08-21GWA	GaP	568	5600	13000	
SA10-11EWA SA10-21EWA	SC10-11EWA SC10-21EWA	GaAsP/GaP	625	14000	23000	1.0 inch (25.4mm), Gray Face, White Segment 
SA10-11SRWA SA10-21SRWA	SC10-11SRWA SC10-21SRWA	GaAlAs	640	52000	120000	
SA10-11YWA SA10-21YWA	SC10-11YWA SC10-21YWA	GaAsP/GaP	588	9000	23000	
SA10-11GWA SA10-21GWA	SC10-11GWA SC10-21GWA	GaP	568	14000	37000	
SA23-11EWA SA23-12EWA	SC23-11EWA SC23-12EWA	GaAsP/GaP	625	31000	57000	2.24 inch (56.9mm), Gray Face, White Segment 
SA23-11SRWA SA23-12SRWA	SC23-11SRWA SC23-12SRWA	GaAlAs	640	88000	190000	
SA23-11YWA SA23-12YWA	SC23-11YWA SC23-12YWA	GaAsP/GaP	588	21000	40000	
SA23-11GWA SA23-12GWA	SC23-11GWA SC23-12GWA	GaP	568	31000	65000	


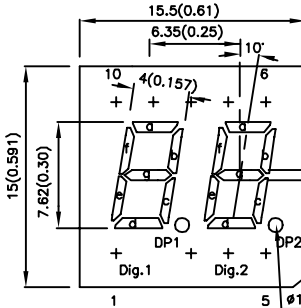
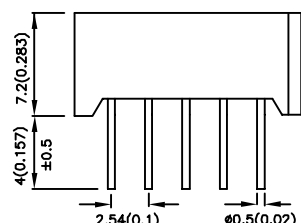
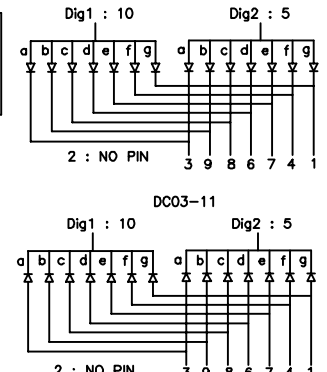
THROUGH-HOLE DISPLAY ■ SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

THROUGH-HOLE DISPLAY

SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
SA40-18EWA SA40-19EWA	SC40-18EWA SC40-19EWA	GaAsP/ GaP	625	14000	23000	3.984 inch (101.2mm), Gray Face, White Segment  SX40    
SA40-18SRWA SA40-19SRWA	SC40-18SRWA SC40-19SRWA	GaAlAs	640	52000	110000	
SA40-18YWA SA40-19YWA	SC40-18YWA SC40-19YWA	GaAsP/ GaP	588	9000	22000	
SA40-18GWA SA40-19GWA	SC40-18GWA SC40-19GWA	GaP	568	14000	36000	

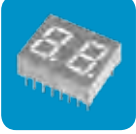
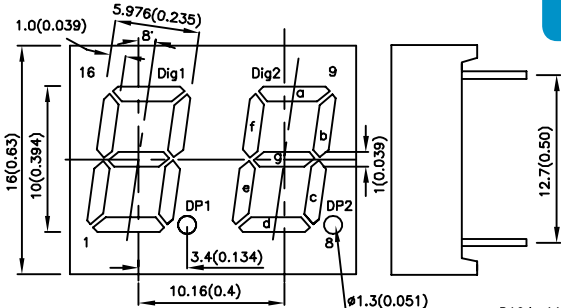
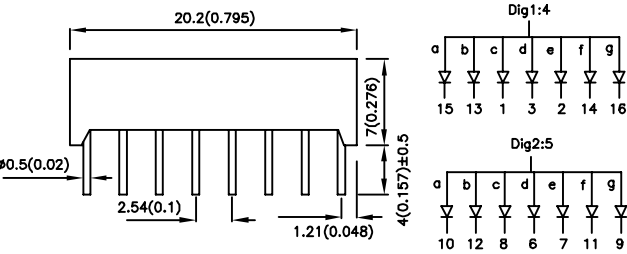
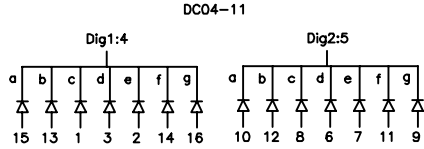
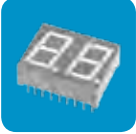
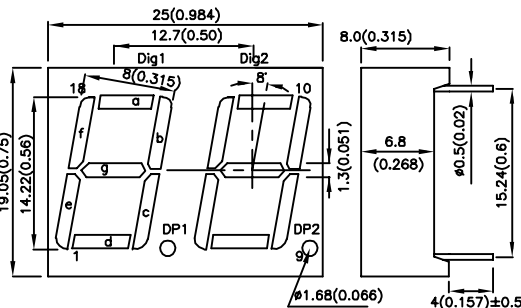
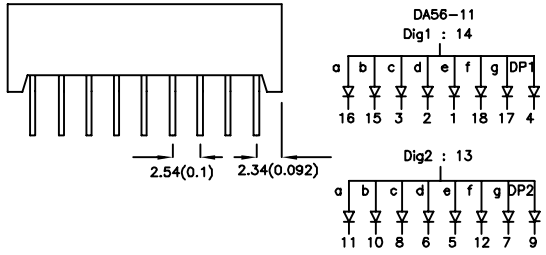
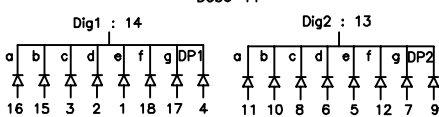
DUAL DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
DA03-11EWA	DC03-11EWA	GaAsP/ GaP	625	1400	3100	0.3 inch (7.62mm), Gray Face, White Segment  DX03   
DA03-11SRWA	DC03-11SRWA	GaAlAs	640	9000	15000	
DA03-11YWA	DC03-11YWA	GaAsP/ GaP	588	900	2200	
DA03-11GWA	DC03-11GWA	GaP	568	1400	4000	

NOTES: 1. All dimensions are in millimeters(inches).
2. Tolerance is ± 0.25 mm(0.01") unless otherwise noted.


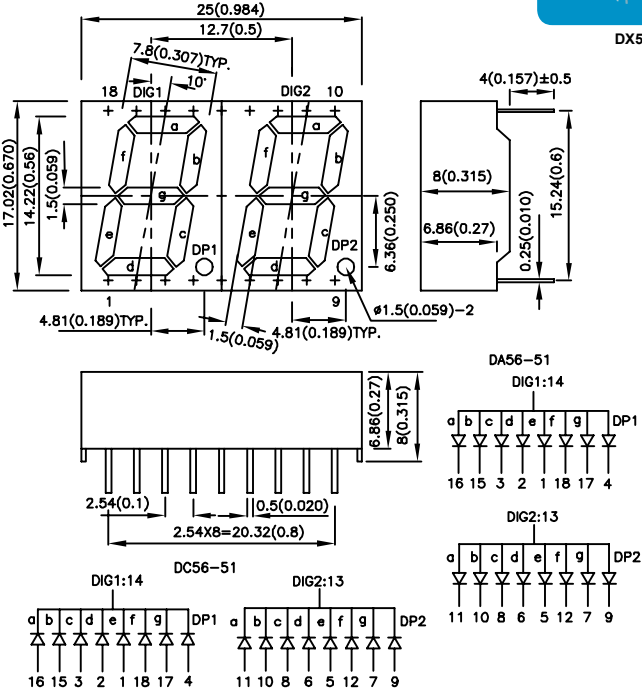
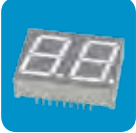
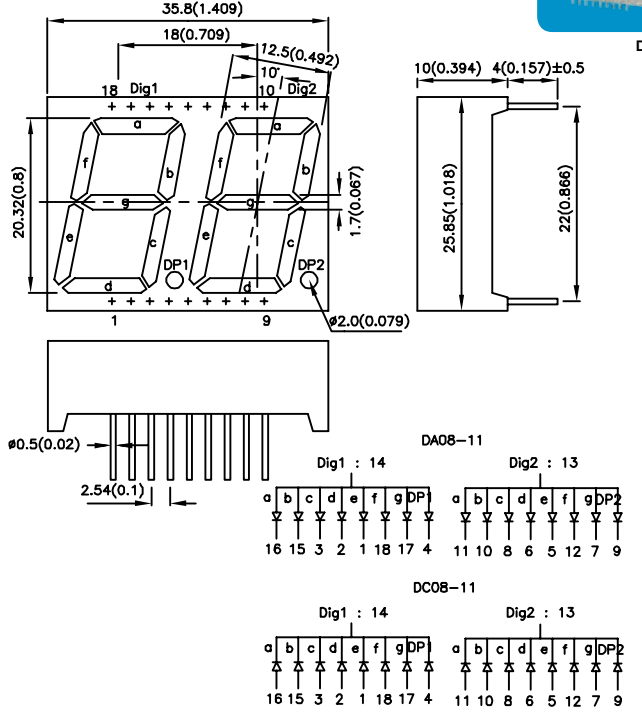
THROUGH-HOLE DISPLAY

DUAL DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
DA04-11EWA	DC04-11EWA	GaAsP/ GaP	625	3600	6400	<p>0.394 inch (10mm), Gray Face, White Segment</p>  <p>DX04</p>   
DA04-11SRWA	DC04-11SRWA	GaAlAs	640	14000	29000	
DA04-11YWA	DC04-11YWA	GaAsP/ GaP	588	2200	5800	
DA04-11GWA	DC04-11GWA	GaP	568	3600	8000	
DA56-11EWA	DC56-11EWA	GaAsP/ GaP	625	3600	8000	<p>0.56 inch (14.22mm), Gray Face, White Segment</p>  <p>DX56-11</p>   
DA56-11SRWA	DC56-11SRWA	GaAlAs	640	14000	28000	
DA56-11YWA	DC56-11YWA	GaAsP/ GaP	588	2200	6500	
DA56-11GWA	DC56-11GWA	GaP	568	3600	11000	

THROUGH-HOLE DISPLAY ■ DUAL DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY


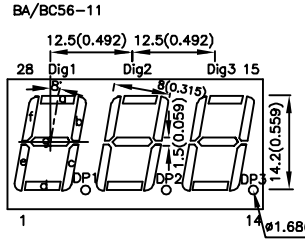
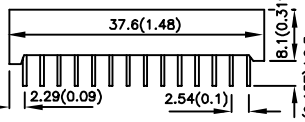
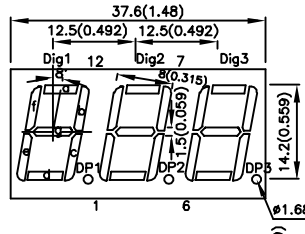
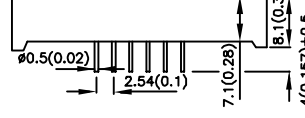
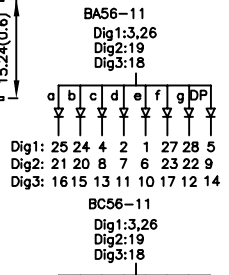
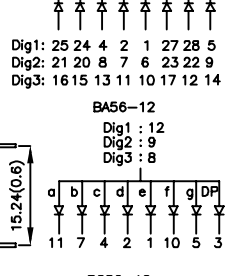
DUAL DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
DA56-51EWA	DC56-51EWA	GaAsP/ GaP	625	3600	6400	0.56 inch, (14.22mm), Gray Face, White Segment  
DA56-51YWA	DC56-51YWA	GaAsP/ GaP	588	3600	8100	
DA56-51GWA	DC56-51GWA	GaP	568	5600	11000	
DA08-11EWA	DC08-11EWA	GaAsP/ GaP	625	3600	8800	0.8 inch (20.32mm), Gray Face, White Segment  
DA08-11SRWA	DC08-11SRWA	GaAlAs	640	14000	32000	
DA08-11YWA	DC08-11YWA	GaAsP/ GaP	588	3600	7700	
DA08-11GWA	DC08-11GWA	GaP	568	5600	11000	


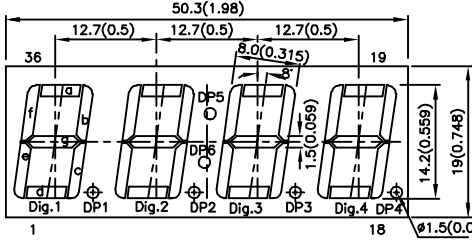
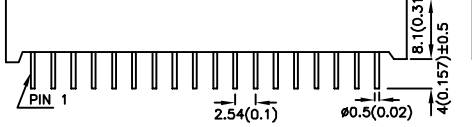
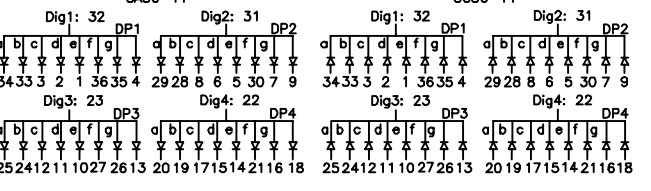
NOTES: 1. All dimensions are in millimeters (inches).
 2. Tolerance is ±0.25mm (0.01") unless otherwise noted.

THROUGH-HOLE DISPLAY

THREE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY


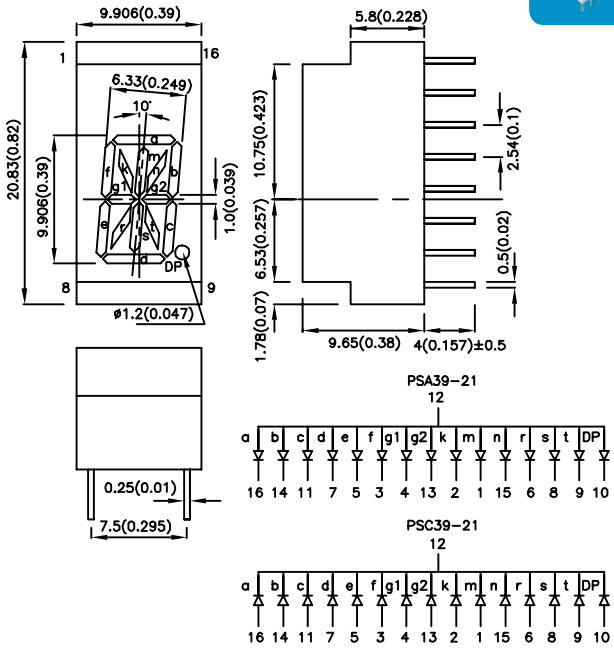

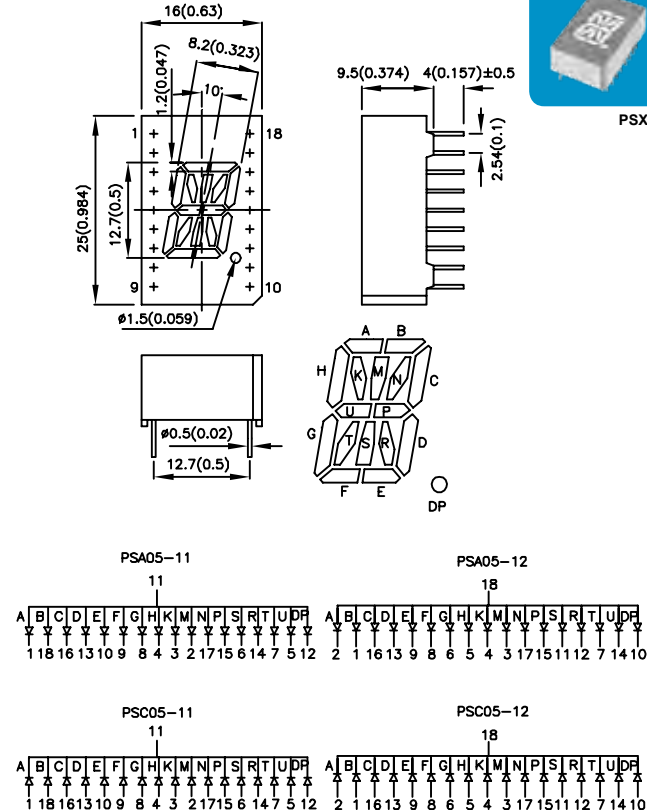
Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
BA56-11EWA BA56-12EWA	BC56-11EWA BC56-12EWA	GaAsP/ GaP	625	2200	5800	0.56 inch (14.22mm), Gray Face, White Segment  BX56      
BA56-11SRWA BA56-12SRWA	BC56-11SRWA BC56-12SRWA	GaAlAs	640	14000	34000	
BA56-11YWA BA56-12YWA	BC56-11YWA BC56-12YWA	GaAsP/ GaP	588	2200	6500	
BA56-11GWA BA56-12GWA	BC56-11GWA BC56-12GWA	GaP	568	3600	8600	

FOUR DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
CA56-11EWA	CC56-11EWA	GaAsP/ GaP	625	3600	5800	0.56 inch (14.22mm), Gray Face, White Segment  CX56   
CA56-11SRWA	CC56-11SRWA	GaAlAs	640	14000	40000	
CA56-11YWA	CC56-11YWA	GaAsP/ GaP	588	2200	6500	
CA56-11GWA	CC56-11GWA	GaP	568	5600	11000	

THROUGH-HOLE DISPLAY


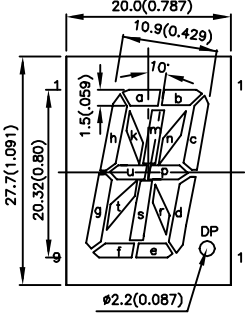
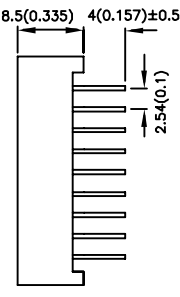
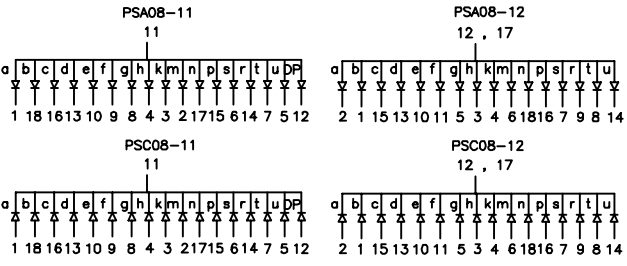
ALPHANUMERIC THROUGH-HOLE DISPLAY

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
PSA39-21EWA	PSC39-21EWA	GaAsP/ GaP	● 625	1400	3700	0.39 inch (9.9mm), Gray Face, White Segment  PSX39 
PSA39-21SRWA	PSC39-21SRWA	GaAlAs	● 640	5600	14000	
PSA39-21YWA	PSC39-21YWA	GaAsP/ GaP	● 588	900	2300	
PSA39-21GWA	PSC39-21GWA	GaP	● 568	1400	4400	
PSA05-11EWA PSA05-12EWA	PSC05-11EWA PSC05-12EWA	GaAsP/ GaP	● 625	3600	7600	0.5 inch (12.7mm), Gray Face, White Segment  PSX05 
PSA05-11SRWA PSA05-12SRWA	PSC05-11SRWA PSC05-12SRWA	GaAlAs	● 640	21000	37000	
PSA05-11YWA PSA05-12YWA	PSC05-11YWA PSC05-12YWA	GaAsP/ GaP	● 588	1400	4800	
PSA05-11GWA PSA05-12GWA	PSC05-11GWA PSC05-12GWA	GaP	● 568	5600	10000	

NOTES: 1. All dimensions are in millimeters (inches).
 2. Tolerance is ±0.25mm (0.01") unless otherwise noted.

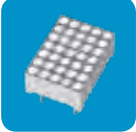
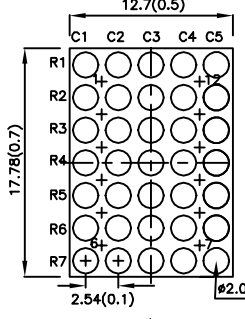
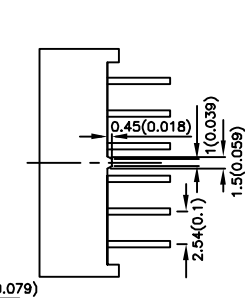
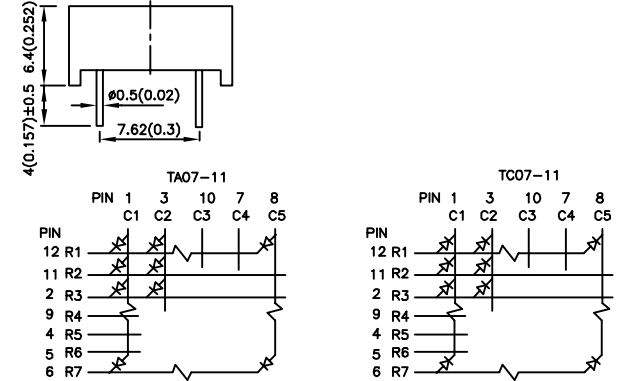
THROUGH-HOLE DISPLAY

ALPHANUMERIC THROUGH-HOLE DISPLAY

Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimension
Common Anode	Common Cathode			Min.	Typ.	
PSA08-11EWA PSA08-12EWA	PSC08-11EWA PSC08-12EWA	GaAsP/ GaP	625	3600	7700	0.8 inch (20.32mm), Gray Face, White Segment  PSX08   
PSA08-11SRWA PSA08-12SRWA	PSC08-11SRWA PSC08-12SRWA	GaAlAs	640	14000	27000	
PSA08-11YWA PSA08-12YWA	PSC08-11YWA PSC08-12YWA	GaAsP/ GaP	588	2200	5200	
PSA08-11GWA PSA08-12GWA	PSC08-11GWA PSC08-12GWA	GaP	568	5600	11000	

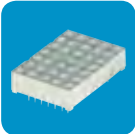
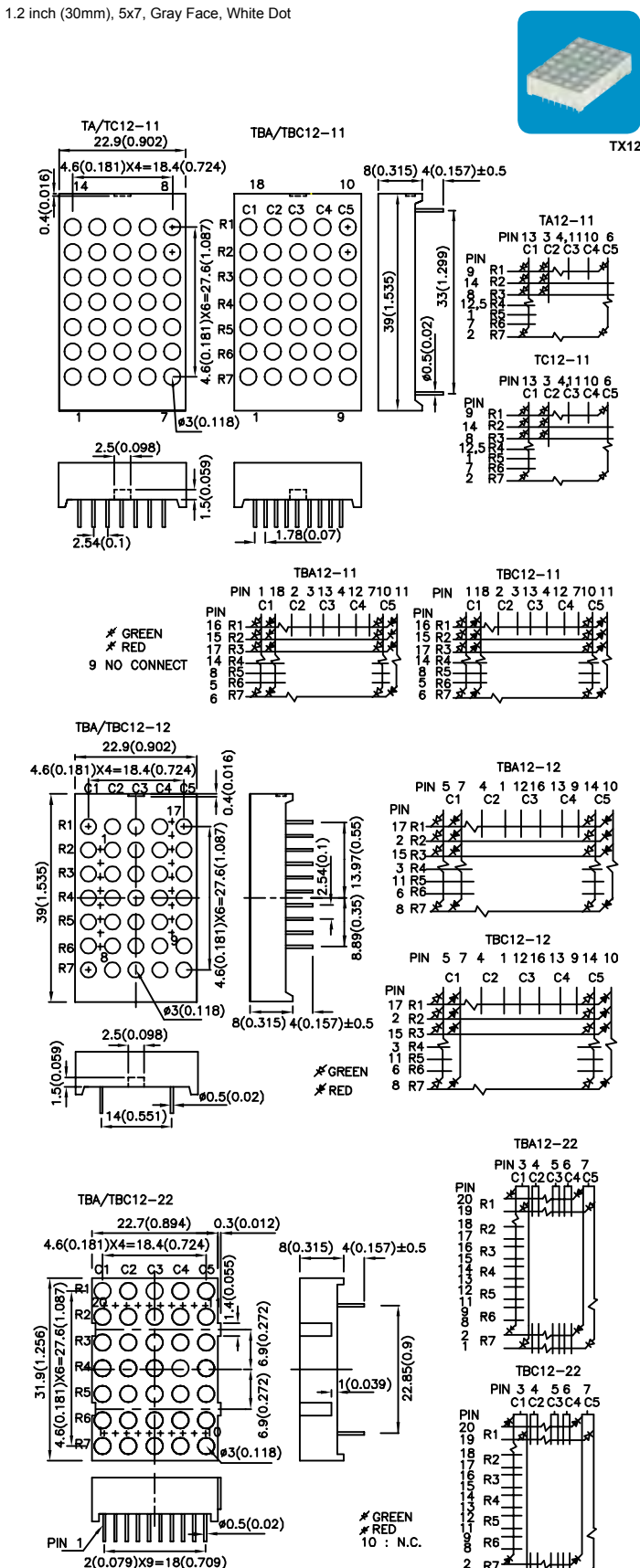
THROUGH-HOLE DISPLAY ■ ALPHANUMERIC THROUGH-HOLE DISPLAY, DOT MATRIX

DOT MATRIX

Part Number		Material	λ D (nm)	Iv (ucd) @10mA		Dimension
Column Anode	Column Cathode			Min.	Typ.	
TA07-11EWA	TC07-11EWA	GaAsP/ GaP	625	3600	8200	0.7 inch (18mm), 5x7, Gray Face, White Dot  TX07   
TA07-11SRWA	TC07-11SRWA	GaAlAs	640	14000	34000	
TA07-11YWA	TC07-11YWA	GaAsP/ GaP	588	3600	6400	
TA07-11GWA	TC07-11GWA	GaP	568	5600	12000	

THROUGH-HOLE DISPLAY

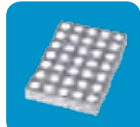
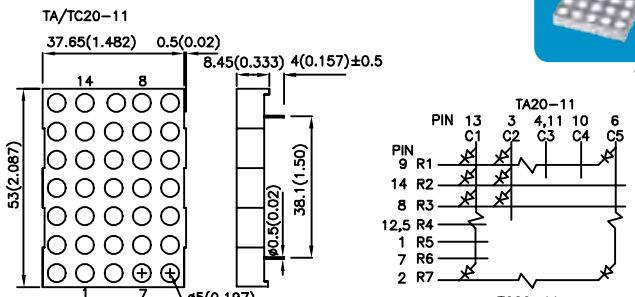
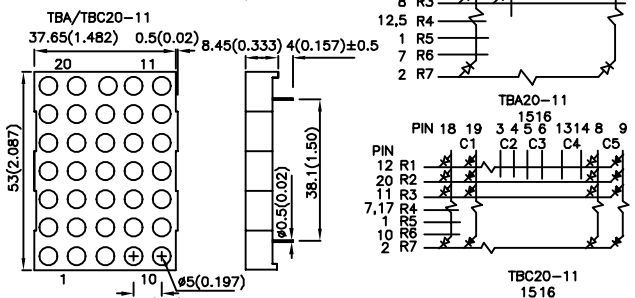
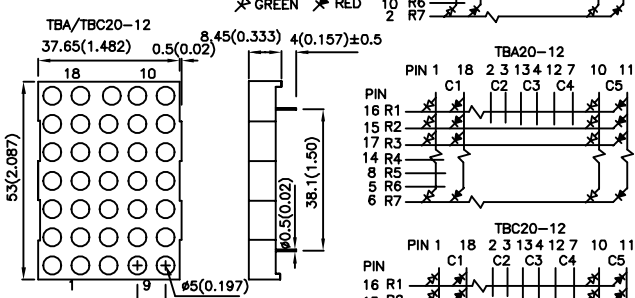
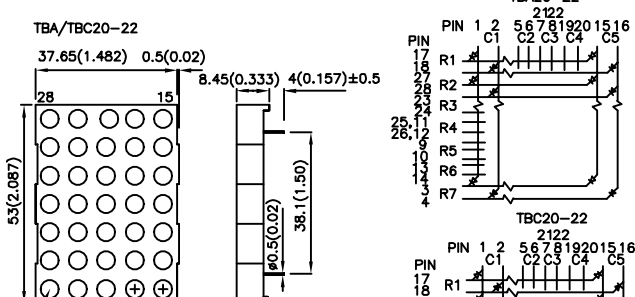
DOT MATRIX

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Column Anode	Column Cathode			Min.	Typ.	
TA12-11EWA	TC12-11EWA	GaAsP/ GaP	● 625	5600	14000	1.2 inch (30mm), 5x7, Gray Face, White Dot  TX12 
TA12-11SRWA	TC12-11SRWA	GaAlAs	● 640	21000	45000	
TA12-11YWA	TC12-11YWA	GaAsP/ GaP	● 588	5600	13000	
TA12-11GWA	TC12-11GWA	GaP	● 568	9000	16000	
TBA12-11EGWA	TBC12-11EGWA	GaAsP/ GaP	● 625	5600	14000	
		GaP	● 568	9000	16000	
TBA12-12EGWA	TBC12-12EGWA	GaAsP/ GaP	● 625	5600	14000	
		GaP	● 568	9000	16000	
TBA12-22EGWA	TBC12-22EGWA	GaAsP/ GaP	● 625	5600	14000	
		GaP	● 568	9000	16000	

NOTES: 1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm (0.01") unless otherwise noted.

THROUGH-HOLE DISPLAY

DOT MATRIX

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Column Anode	Column Cathode			Min.	Typ.	
TA20-11EWA	TC20-11EWA	GaAsP/ GaP	● 625	5600	10000	<p>2.0 inch (50mm), 5x7, Gray Face, White Dot</p>  <p>TX20</p>    
TA20-11SRWA	TC20-11SRWA	GaAlAs	● 640	21000	48000	
TA20-11YWA	TC20-11YWA	GaAsP/ GaP	● 588	3600	9000	
TA20-11GWA	TC20-11GWA	GaP	● 568	5600	15000	
TBA20-11EGWA	TBC20-11EGWA	GaAsP/ GaP	● 625	5600	10000	
		GaP	● 568	5600	15000	
TBA20-12EGWA	TBC20-12EGWA	GaAsP/ GaP	● 625	5600	10000	
		GaP	● 568	5600	15000	
TBA20-22EGWA	TBC20-22EGWA	GaAsP/ GaP	● 625	5600	10000	
		GaP	● 568	5600	15000	

THROUGH-HOLE DISPLAY ■ DOT MATRIX

THROUGH-HOLE DISPLAY

DOT MATRIX

Part Number		Material	λD (nm)	Iv (ucd) @10mA		Dimension
Column Anode	Column Cathode			Min.	Typ.	
TA15-11EWA	TC15-11EWA	GaAsP/ GaP	● 625	5600	13000	<p>1.5 inch (38mm), 8x8, Gray Face, White Dot</p> <p>TX15</p>
TA15-11SRWA	TC15-11SRWA	GaAlAs	● 640	21000	49000	
TA15-11YWA	TC15-11YWA	GaAsP/ GaP	● 588	5600	10000	
TA15-11GWA	TC15-11GWA	GaP	● 568	9000	20000	
TBA24-11EGWA	TBC24-11EGWA	GaAsP/ GaP	● 625	9000	16000	<p>2.4 inch (60.8mm), 5x8, Gray Face, White Dot</p> <p>TX24</p>
		GaP	● 568	9000	19000	
TBA24-22EGWA	TBC24-22EGWA	GaAsP/ GaP	● 625	9000	16000	
		GaP	● 568	9000	19000	

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THROUGH-HOLE DISPLAY

BAR GRAPH ARRAY


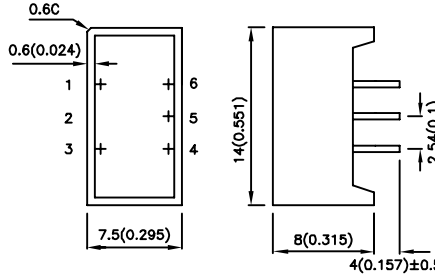
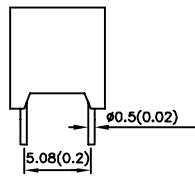
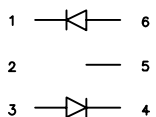

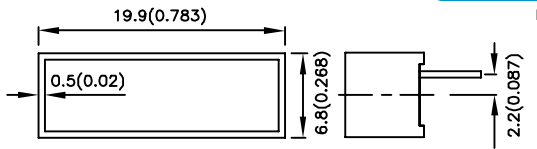
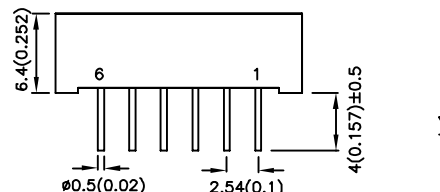
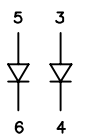

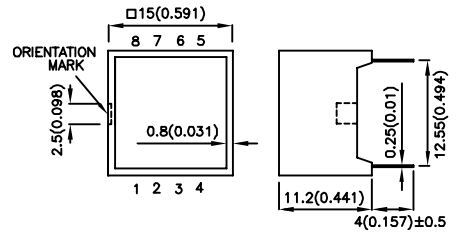
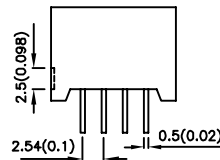
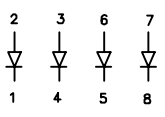
Part Number	Emitting Color + λ D (nm) + Material	Iv (ucd) @10mA		Description	Dimension
		Min.	Typ.		
DC10EWA	High Efficiency Red ● 625 GaAsP/GaP	3600	9000	10 Segments Bar graph-Display Gray Face White Segment	
DC10SRWA	Super Bright Red ● 640 GaAlAs	14000	30000		
DC10YWA	Yellow ● 588 GaAsP/GaP	2200	9000		
DC10GWA	Green ● 568 GaP	5600	12000		
DC7G3HWA	Green ● 568 GaP	5600	12000	10 Segments Bar graph-Display 7 x Green, 3 x Red Gray Face White Segment	
	Bright Red ● 660 GaP	900	1900		

LIGHT BAR

Part Number	Material	λD (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2θ1/2	Dimension	
				Min.	Typ.			
WP1043ID	GaAsP/GaP	● 625	Red Diffused	5	10	100°	3.65mm x 6.15mm 	
WP1043SRD	GaAlAs	● 640	Red Diffused	*40	*100	100°		
WP1043YD	GaAsP/GaP	● 588	Yellow Diffused	2	5	100°		
WP1043GD	GaP	● 568	Green Diffused	2	6	100°		
WP1043SGD	GaP	● 568	Green Diffused	*8	*16	100°		
WP835/2IDT	GaAsP/GaP	● 625	Red Diffused	5	8	120°		5mm x 10mm
WP835/2SRDT	GaAlAs	● 640	Red Diffused	*60	*120	120°		
WP835/2YDT	GaAsP/GaP	● 588	Yellow Diffused	2	4	120°		
WP835/2GDT	GaP	● 568	Green Diffused	3	6	120°		

THROUGH-HOLE DISPLAY

LIGHT BAR

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Dimension
				Min.	Typ.	
DE2ID	GaAsP/GaP	625	Red Diffused	9	31	7.5mm x 14mm    
DE2SRD	GaAlAs	640	Red Diffused	*70	*300	
DE2YD	GaAsP/GaP	588	Yellow Diffused	14	26	
DE2GD	GaP	568	Green Diffused	14	30	
DE2SGD	GaP	568	Green Diffused	*40	*66	
DF3ID	GaAsP/GaP	625	Red Diffused	14	27	6.8mm x 19.9mm    
DF3SRD	GaAlAs	640	Red Diffused	*120	*270	
DF3YD	GaAsP/GaP	588	Yellow Diffused	14	26	
DF3GD	GaP	568	Green Diffused	14	34	
DF3SGD	GaP	568	Green Diffused	*40	*60	
DE4ID	GaAsP/GaP	625	Red Diffused	21	33	15mm x 15mm    
DE4SRD	GaAlAs	640	Red Diffused	*200	*340	
DE4YD	GaAsP/GaP	588	Yellow Diffused	21	35	
DE4GD	GaP	568	Green Diffused	14	36	
DE4SGD	GaP	568	Green Diffused	*40	*64	

NOTES: 1. All dimensions are in millimeters (inches).
 2. Tolerance is $\pm 0.25\text{mm}$ (0.01") unless otherwise noted.

THROUGH-HOLE DISPLAY


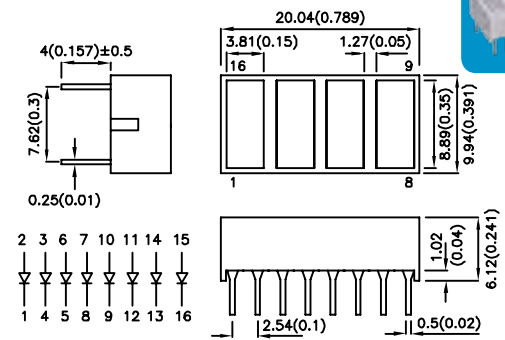

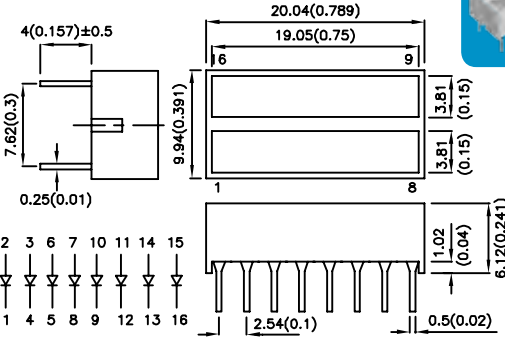

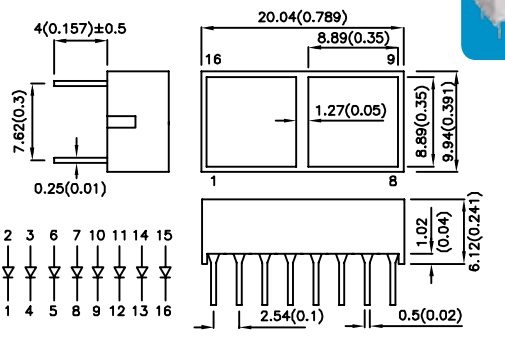

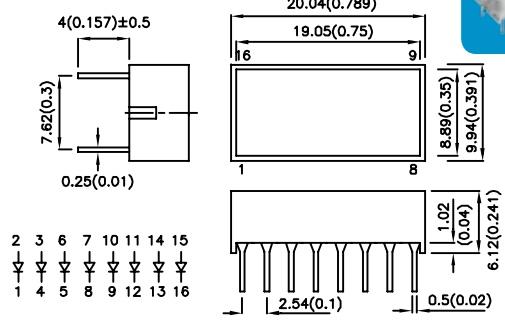
LIGHT BAR

Part Number	Emitting Color + Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Dimension
				Min.	Typ.	
KB2300EW	High Efficiency Red GaAsP/GaP	625	White Diffused	12	29	8.89mm x 3.81mm Size of Light Emitting Areas
KB-A100SRW	Super Bright Red GaAlAs	640	White Diffused	55	100	
KB2400YW	Yellow GaAsP/GaP	588	White Diffused	12	24	
KB2500SGD	Super Bright Green GaP	568	Green Diffused	12	26	
KB2350EW	High Efficiency Red GaAsP/GaP	625	White Diffused	20	50	19.05mm x 3.81mm Size of Light Emitting Areas
KB-B100SRW	Super Bright Red GaAlAs	640	White Diffused	80	180	
KB2450YW	Yellow GaAsP/GaP	588	White Diffused	12	44	
KB2550SGD	Super Bright Green GaP	568	Green Diffused	20	46	
KB2655EW	High Efficiency Red GaAsP/GaP	625	White Diffused	12	52	8.89mm x 8.89mm Size of Light Emitting Areas
KB-C100SRW	Super Bright Red GaAlAs	640	White Diffused	120	260	
KB2755YW	Yellow GaAsP/GaP	588	White Diffused	20	51	
KB2855SGD	Super Bright Green GaP	568	Green Diffused	20	54	
KB2600EW	High Efficiency Red GaAsP/GaP	625	White Diffused	12	35	8.89mm x 3.81mm Size of Light Emitting Areas
KB-D100SRW	Super Bright Red GaAlAs	640	White Diffused	55	120	
KB2700YW	Yellow GaAsP/GaP	588	White Diffused	12	23	
KB2800SGD	Super Bright Green GaP	568	Green Diffused	12	27	

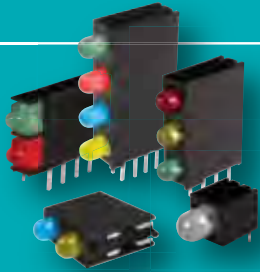
THROUGH-HOLE DISPLAY LIGHT BAR

THROUGH-HOLE DISPLAY

LIGHT BAR

Part Number	Emitting Color + Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Dimension
				Min.	Typ.	
KB2620EW	High Efficiency Red GaAsP/GaP	625	White Diffused	12	27	8.89mm x 3.81mm Size of Light Emitting Areas  
KB-E100SRW	Super Bright Red GaAlAs	640	White Diffused	55	100	
KB2720YW	Yellow GaAsP/GaP	588	White Diffused	12	23	
KB2820SGD	Super Bright Green GaP	568	Green Diffused	12	25	
KB2635EW	High Efficiency Red GaAsP/GaP	625	White Diffused	10	60	3.81mm x 19.05mm Size of Light Emitting Areas  
KB-F100SRW	Super Bright Red GaAlAs	640	White Diffused	55	100	
KB2735YW	Yellow GaAsP/GaP	588	White Diffused	12	23	
KB2835SGD	Super Bright Green GaP	568	Green Diffused	12	25	
KB2670EW	High Efficiency Red GaAsP/GaP	625	White Diffused	12	24	8.89mm x 8.89mm Size of Light Emitting Areas  
KB-G100SRW	Super Bright Red GaAlAs	640	White Diffused	55	120	
KB2770YW	Yellow GaAsP/GaP	588	White Diffused	10	50	
KB2870SGD	Super Bright Green GaP	568	Green Diffused	12	22	
KB2685EW	High Efficiency Red GaAsP/GaP	625	White Diffused	12	25	8.89mm x 19.05mm Size of Light Emitting Areas  
KB-H100SRW	Super Bright Red GaAlAs	640	White Diffused	55	110	
KB2785YW	Yellow GaAsP/GaP	588	White Diffused	12	24	
KB2885SGD	Super Bright Green GaP	568	Green Diffused	12	25	

NOTES: 1. All dimensions are in millimeters (inches).
 2. Tolerance is $\pm 0.25\text{mm}$ (0.01") unless otherwise noted.



CIRCUIT BOARD INDICATOR

Single-Level CBI	53
Bi-Level CBI	56
Tri-Level CBI	59
Quad-Level CBI	60
SMD CBI	60
Panel Mount CBI	61

Description

Kingbright offers high quality circuit board indicators to meet wide range of applications and requirements. Housing selections include single-level, bi-level, tri-level, and quad-level with LED featuring different sizes, shapes, lens types, and flexible color combinations. Surface mount type circuit board indicator is designed to simplify assembly process while reduce assembly cost and increase productivity.

Features and Benefits

- High quality and excellent reliability
- Available in through-hole and SMD type
- A wide variety of circuit board indicators in single-level, bi-level, tri-level, and quad-level are available
- LED type is available in round and rectangular
- Housing type is available in various size and shapes
- Choice of customized color combinations
- Package options with inter lock for easy stacking

CIRCUIT BOARD INDICATOR

SINGLE-LEVEL CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP934CB/ID	GaAsP/GaP	● 625	Red Diffused	15	30	40°	<p>T-1 (3mm) Right Angle</p>
WP934CB/SRD	GaAlAs	● 640	Red Diffused	*150	*400	40°	
WP934CB/YD	GaAsP/GaP	● 588	Yellow Diffused	8	15	40°	
WP934CB/GD	GaP	● 568	Green Diffused	15	30	40°	
WP934EW/ID	GaAsP/GaP	● 625	Red Diffused	15	30	40°	<p>T-1 (3mm) Right Angle</p>
WP934EW/SRD	GaAlAs	● 640	Red Diffused	*150	*400	40°	
WP934EW/YD	GaAsP/GaP	● 588	Yellow Diffused	8	15	40°	
WP934EW/GD	GaP	● 568	Green Diffused	15	30	40°	
WP934RS/ID	GaAsP/GaP	● 625	Red Diffused	15	30	40°	<p>T-1 (3mm) Right Angle</p>
WP934RS/SRD	GaAlAs	● 640	Red Diffused	*150	*400	40°	
WP934RS/YD	GaAsP/GaP	● 588	Yellow Diffused	8	15	40°	
WP934RS/GD	GaP	● 568	Green Diffused	15	30	40°	
WP934ZH/ID	GaAsP/GaP	● 625	Red Diffused	15	30	40°	<p>T-1 (3mm) Right Angle</p>
WP934ZH/SRD	GaAlAs	● 640	Red Diffused	*150	*400	40°	
WP934ZH/YD	GaAsP/GaP	● 588	Yellow Diffused	8	15	40°	
WP934ZH/GD	GaP	● 568	Green Diffused	15	30	40°	

NOTES: 1. All dimensions are in millimeters(inches).
2. Tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.


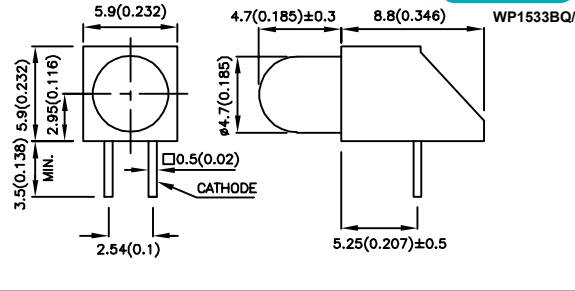

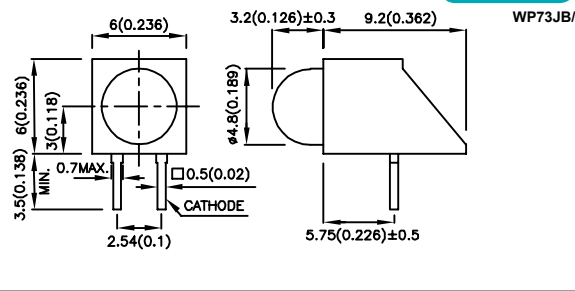

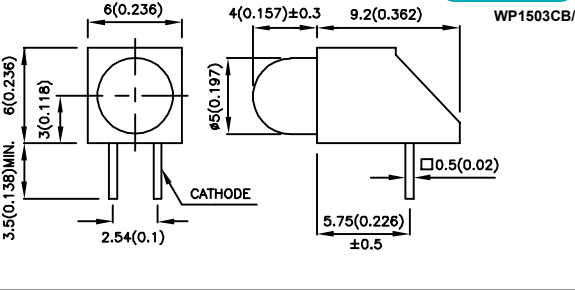

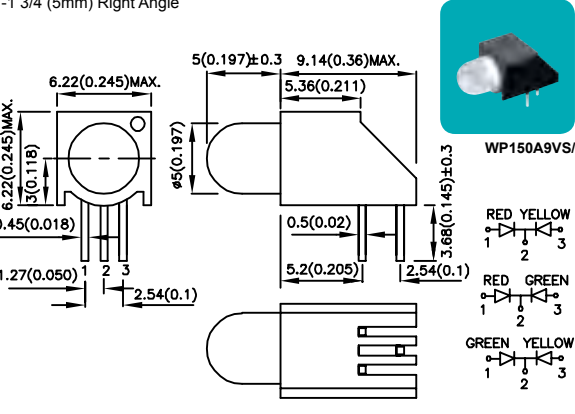
SINGLE-LEVEL CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle	Dimension
				Min.	Typ.		
WP130WDT/EYW	GaAsP/GaP	625	White Diffused	*12	*30	60°	T-1 (3mm) Right Angle
	GaAsP/GaP	588		*10	*20		
WP130WDT/EGW	GaAsP/GaP	625	White Diffused	*12	*30	60°	T-1 (3mm) Right Angle
	GaP	568		*12	*30		
WP130WDT/GYW	GaP	568	White Diffused	*18	*40	60°	T-1 (3mm) Right Angle
	GaAsP/GaP	588		*10	*20		
WP42WUM/EYW	GaAsP/GaP	625	White Diffused	*10	*20	100°	T-1 (3mm) Right Angle
	GaAsP/GaP	588		*3	*8		
WP42WUM/EGW	GaAsP/GaP	625	White Diffused	*10	*20	100°	T-1 (3mm) Right Angle
	GaP	568		*8	*20		
WP42WUM/GYW	GaP	568	White Diffused	*8	*13	100°	T-1 (3mm) Right Angle
	GaAsP/GaP	588		*3	*8		
WP1384AD/ID	GaAsP/GaP	625	Red Diffused	15	32	60°	3.4mm Right Angle
WP1384AD/SRD	GaAlAs	640	Red Diffused	*150	*300	60°	
WP1384AD/YD	GaAsP/GaP	588	Yellow Diffused	10	15	60°	
WP1384AD/GD	GaP	568	Green Diffused	15	32	60°	
WP1384AL/ID	GaAsP/GaP	625	Red Diffused	15	32	60°	3.4mm Right Angle
WP1384AL/SRD	GaAlAs	640	Red Diffused	*150	*300	60°	
WP1384AL/YD	GaAsP/GaP	588	Yellow Diffused	10	15	60°	
WP1384AL/GD	GaP	568	Green Diffused	15	32	60°	

CIRCUIT BOARD INDICATOR ■ SINGLE-LEVEL CBI

CIRCUIT BOARD INDICATOR

SINGLE-LEVEL CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle	Dimension
				Min.	Typ.		
WP1533BQ/ID	GaAsP/GaP	625	Red Diffused	25	70	60°	4.7mm Right Angle  
WP1533BQ/SRD	GaAlAs	640	Red Diffused	*400	*700	60°	
WP1533BQ/YD	GaAsP/GaP	588	Yellow Diffused	15	40	60°	
WP1533BQ/GD	GaP	568	Green Diffused	20	50	60°	
WP73JB/IDA	GaAsP/GaP	625	Red Diffused	15	40	60°	4.8mm Right Angle  
WP73JB/SRDA	GaAlAs	640	Red Diffused	*200	*300	60°	
WP73JB/YDA	GaAsP/GaP	588	Yellow Diffused	10	25	60°	
WP73JB/GDA	GaP	568	Green Diffused	15	40	60°	
WP1503CB/ID	GaAsP/GaP	625	Red Diffused	25	50	60°	T-1 3/4 (5mm) Right Angle  
WP1503CB/SRD	GaAlAs	640	Red Diffused	*500	*1000	60°	
WP1503CB/YD	GaAsP/GaP	588	Yellow Diffused	15	30	60°	
WP1503CB/GD	GaP	568	Green Diffused	25	50	60°	
WP150A9VS/EYW	GaAsP/GaP	625	White Diffused	*18	*50	30°	T-1 3/4 (5mm) Right Angle  
	GaAsP/GaP	588		*8	*20		
WP150A9VS/EGW	GaAsP/GaP	625	White Diffused	*18	*50	30°	
	GaP	568		*18	*50		
WP150A9VS/GYW	GaP	568	White Diffused	*18	*50	30°	
	GaAsP/GaP	588		*8	*20		

NOTES: 1. All dimensions are in millimeters(inches).
 2. Tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.

CIRCUIT BOARD INDICATOR

SINGLE-LEVEL CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @20mA		Viewing Angle	Dimension
				Min.	Typ.		
WP59BL/EYW	GaAsP/GaP	625	White Diffused	50	100	60°	T-1 3/4 (5mm) Right Angle
	GaAsP/GaP	588		20	40		
WP59BL/EGW	GaAsP/GaP	625	White Diffused	50	100	60°	T-1 3/4 (5mm) Right Angle
	GaP	568		20	60		
WP59BL/GYW	GaP	568	White Diffused	50	100	60°	T-1 3/4 (5mm) Right Angle
	GaAsP/GaP	588		20	40		
WP59CB/EYW	GaAsP/GaP	625	White Diffused	50	100	60°	T-1 3/4 (5mm) Right Angle
	GaAsP/GaP	588		20	40		
WP59CB/EGW	GaAsP/GaP	625	White Diffused	50	100	60°	T-1 3/4 (5mm) Right Angle
	GaP	568		20	60		
WP59CB/GYW	GaP	568	White Diffused	50	100	60°	T-1 3/4 (5mm) Right Angle
	GaAsP/GaP	588		20	40		

BI-LEVEL CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle	Dimension
				Min.	Typ.		
WP4060VH/2ID	GaAsP/GaP	625	Red Diffused	8	15	70°	1.8mm Bi-Level
WP4060VH/2SRD	GaAlAs	640	Red Diffused	*100	*250	70°	
WP4060VH/2YD	GaAsP/GaP	588	Yellow Diffused	4	8	70°	
WP4060VH/2GD	GaP	568	Green Diffused	6	12	70°	
WP934CA/2ID-90	GaAsP/GaP	625	Red Diffused	15	30	40°	T-1 (3mm) Bi-Level
WP934CA/2SRD-90	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934CA/2YD-90	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934CA/2GD-90	GaP	568	Green Diffused	15	30	40°	

CIRCUIT BOARD INDICATOR

BI-LEVEL CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP934EB/2ID	GaAsP/GaP	625	Red Diffused	15	30	40°	<p>T-1 (3mm) Bi-Level</p> <p>WP934EB/2</p>
WP934EB/2SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934EB/2YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934EB/2GD	GaP	568	Green Diffused	15	30	40°	
WP934FG/2ID	GaAsP/GaP	625	Red Diffused	15	30	40°	<p>T-1 (3mm) Bi-Level</p> <p>WP934FG/2</p>
WP934FG/2SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934FG/2YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934FG/2GD	GaP	568	Green Diffused	15	30	40°	
WP934GE/2ID	GaAsP/GaP	625	Red Diffused	15	30	40°	<p>T-1 (3mm) Bi-Level</p> <p>WP934GE/2</p>
WP934GE/2SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934GE/2YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934GE/2GD	GaP	568	Green Diffused	15	30	40°	
WP934GO/2ID	GaAsP/GaP	625	Red Diffused	15	30	40°	<p>T-1 (3mm) Bi-Level</p> <p>WP934GO/2</p>
WP934GO/2SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934GO/2YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934GO/2GD	GaP	568	Green Diffused	15	30	40°	

NOTES: 1. All dimensions are in millimeters(inches).
2. Tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.


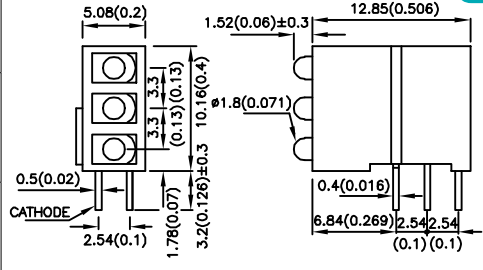

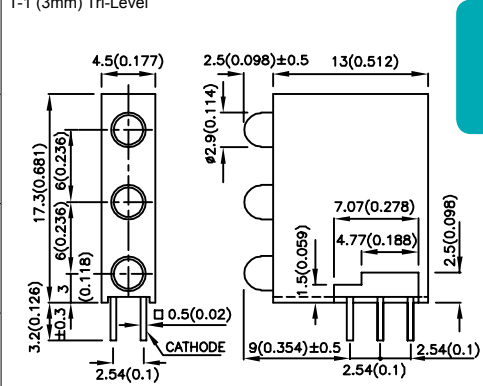

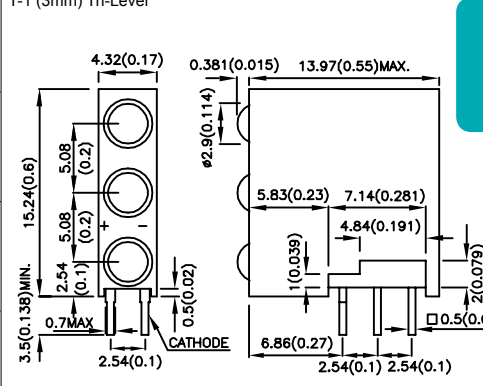

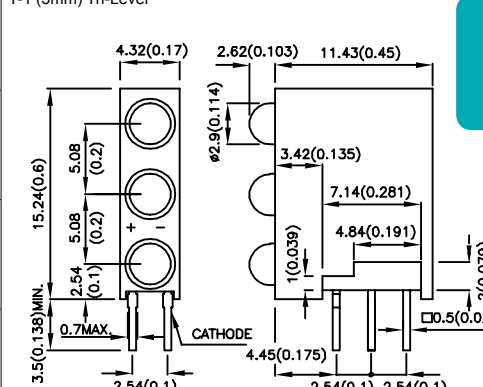
BI-LEVEL CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle	Dimension
				Min.	Typ.		
WP934MD/2ID	GaAsP/GaP	625	Red Diffused	15	30	40°	T-1 (3mm) Bi-Level
WP934MD/2SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934MD/2YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934MD/2GD	GaP	568	Green Diffused	15	30	40°	
WP130WCP/2EYW	GaAsP/GaP	625	White Diffused	*12	*30	60°	T-1(3mm) Bi-Level
	GaAsP/GaP	588		*10	*20		
WP130WCP/2EGW	GaAsP/GaP	625	White Diffused	*12	*30	60°	
	GaP	568		*12	*30		
WP130WCP/2GYW	GaP	568	White Diffused	*18	*40	60°	
	GaAsP/GaP	588		*10	*20		
WP73EB/2IDA	GaAsP/GaP	625	Red Diffused	15	40	60°	4.8mm Bi-Level
WP73EB/2SRDA	GaAlAs	640	Red Diffused	*200	*300	60°	
WP73EB/2YDA	GaAsP/GaP	588	Yellow Diffused	10	25	60°	
WP73EB/2GDA	GaP	568	Green Diffused	15	40	60°	
WP1503EB/2ID	GaAsP/GaP	625	Red Diffused	25	50	60°	T-1 3/4 (5mm) Bi-Level
WP1503EB/2SRD	GaAlAs	640	Red Diffused	*500	*1000	60°	
WP1503EB/2YD	GaAsP/GaP	588	Yellow Diffused	15	30	60°	
WP1503EB/2GD	GaP	568	Green Diffused	25	50	60°	

CIRCUIT BOARD INDICATOR ■ BI-LEVEL CBI


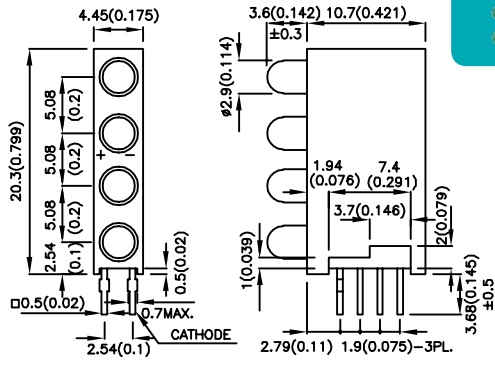

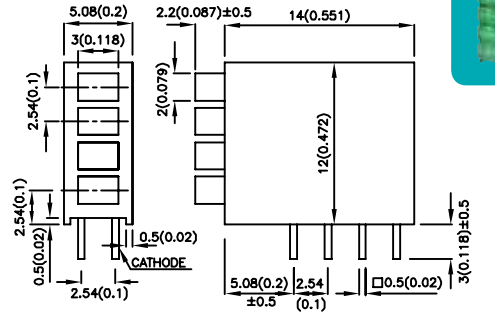
CIRCUIT BOARD INDICATOR

TRI-LEVEL CBI


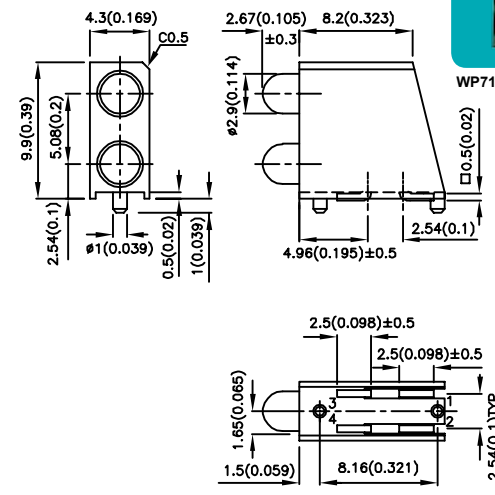
Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle	Dimension
				Min.	Typ.		
WP4060XH/3ID	GaAsP/GaP	625	Red Diffused	8	15	70°	<p>1.8mm Tri-Level</p>   <p>WP4060XH/3</p>
WP4060XH/3SRD	GaAlAs	640	Red Diffused	*100	*250	70°	
WP4060XH/3YD	GaAsP/GaP	588	Yellow Diffused	4	8	70°	
WP4060XH/3GD	GaP	568	Green Diffused	6	12	70°	
WP934PJ/3ID	GaAsP/GaP	625	Red Diffused	15	30	40°	<p>T-1 (3mm) Tri-Level</p>   <p>WP934PJ/3</p>
WP934PJ/3SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934PJ/3YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934PJ/3GD	GaP	568	Green Diffused	15	30	40°	
WP934RZ/3ID	GaAsP/GaP	625	Red Diffused	15	30	40°	<p>T-1 (3mm) Tri-Level</p>   <p>WP934RZ/3</p>
WP934RZ/3SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934RZ/3YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934RZ/3GD	GaP	568	Green Diffused	15	30	40°	
WP934SA/3ID	GaAsP/GaP	625	Red Diffused	15	30	40°	<p>T-1 (3mm) Tri-Level</p>   <p>WP934SA/3</p>
WP934SA/3SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934SA/3YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934SA/3GD	GaP	568	Green Diffused	15	30	40°	

NOTES: 1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.


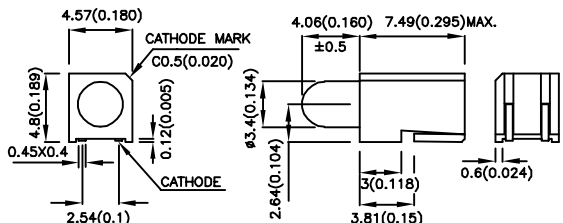
QUAD-LEVEL CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP934SB/4ID	GaAsP/GaP	625	Red Diffused	15	30	40°	T-1 (3mm) Quad-Level  WP934SB/4 
WP934SB/4SRD	GaAlAs	640	Red Diffused	*150	*400	40°	
WP934SB/4YD	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP934SB/4GD	GaP	568	Green Diffused	15	30	40°	
WP914CK/4IDT	GaAsP/GaP	625	Red Diffused	3	8	100°	2mm x 3mm Quad-Level  WP914CK/4 
WP914CK/4YDT	GaAsP/GaP	588	Yellow Diffused	1.5	4	100°	
WP914CK/4GDT	GaP	568	Green Diffused	3	6	100°	


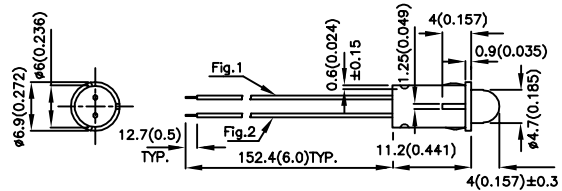
SMD CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP7104ALUP/2ID-0L	GaAsP/GaP	625	Red Diffused	15	30	40°	T-1 (3mm) Bi-level  WP7104ALUP/2-0L 
WP7104ALUP/2SRD-0L	GaAlAs	640	Red Diffused	*150	*400	40°	
WP7104ALUP/2YD-0L	GaAsP/GaP	588	Yellow Diffused	8	15	40°	
WP7104ALUP/2GD-0L	GaP	568	Green Diffused	15	30	40°	

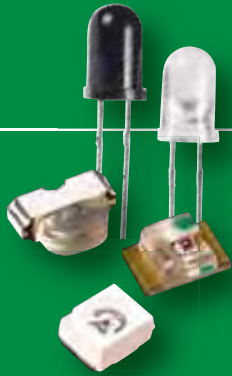
SMD CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @10mA*20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP138A8QMP/ID/TG	GaAsP/GaP	● 625	Red Diffused	10	20	60°	3.4mm Right Angle  WP138A8QMP/ 
WP138A8QMP/SRD/TG	GaAlAs	● 640	Red Diffused	*150	*300	60°	
WP138A8QMP/YD/TG	GaAsP/GaP	● 588	Yellow Diffused	8	15	60°	
WP138A8QMP/GD/TG	GaP	● 568	Green Diffused	10	20	60°	

PANEL MOUNT CBI

Part Number	Material	λ_D (nm)	Lens Type	Iv (mcd) @ V=14V *10mA**20mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP1533AA/ID-W152	GaAsP/GaP	● 625	Red Diffused	*25	*70	60°	4.7mm  WP1533AA/ Fig.1 : ANODE LEAD :RED INSULATION LEAD,24 AWG,UL#1007,Ø1.45mm, TINNED OVERCOATED WIRE , STRIP 12.7mm. Fig. 2 : CATHODE LEAD :BLACK INSULATION LEAD,24 AWG,UL#1007,Ø1.45mm, TINNED OVERCOATED WIRE , STRIP 12.7mm. Fig.3 : STAKING TO FIX THE HOLDER AND LED . 
WP1533AA/ID14V-W152	GaAsP/GaP	● 625	Red Diffused	15	50	60°	
WP1533AA/SRD-W152	GaAlAs	● 640	Red Diffused	**400	**700	60°	
WP1533AA/SRD14V-W152	GaAlAs	● 640	Red Diffused	150	300	60°	
WP1533AA/YD-W152	GaAsP/GaP	● 588	Yellow Diffused	*15	*40	60°	
WP1533AA/YD14V-W152	GaAsP/GaP	● 588	Yellow Diffused	6	15	60°	
WP1533AA/GD-W152	GaP	● 568	Green Diffused	*20	*50	60°	
WP1533AA/GD14V-W152	GaP	● 568	Green Diffused	10	25	60°	

NOTES: 1. All dimensions are in millimeters(inches).
 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.



INFRARED & PHOTOTRANSISTOR

Infrared Emitting Diode	63
Phototransistor	65

Description

The infrared technology is increasingly present in mainstream applications in form of wireless communication. Kingbright's diverse range of LED products includes Infrared & Phototransistor in one-stop shop. Available in SMD and Through-hole package, the LED offers various sizes, shapes, and viewing angles to fulfill specific design needs.


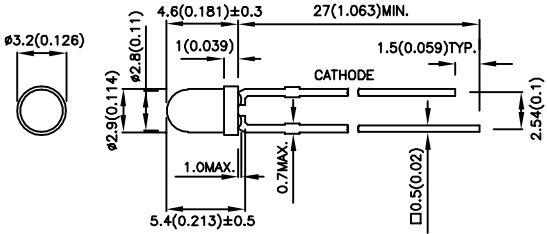

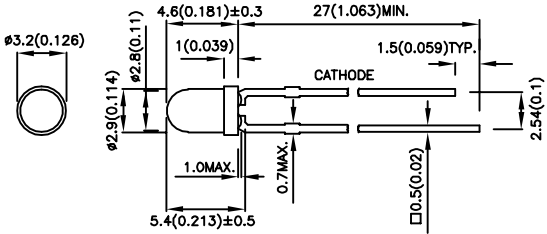

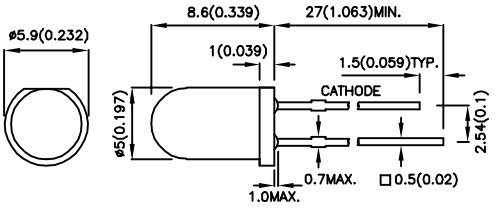

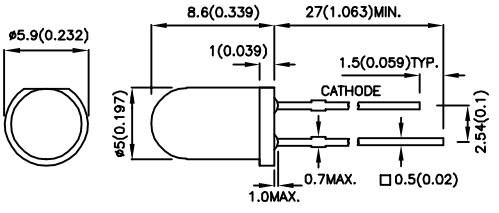
Features and Benefits

- Available in SMD and Through-hole package
- Various options in size, shape, and viewing angle
- Assorted wavelength selections on Infrared (standard 940nm, 880nm, and others)
- High quality and reliability
- Automation-friendly tape-and-reel package is available

INFRARED EMITTING DIODE

Part Number	Material	λ_P (nm)	Lens Type	Po (mW/sr) @20mA		Viewing Angle	Dimension
				Min.	Typ.		
APT1608F3C	GaAs	940	Water Clear	1.2	3	120°	<p>APT1608SF4C-PRV</p> <p>APT1608F3C</p> <p>Units : mm(inch) Tolerance : $\pm 0.1(0.004)$</p>
APT1608SF4C-PRV	GaAlAs	880	Water Clear	0.8	1.5	120°	<p>POLARITY MARK</p> <p>Units : mm(inch) Tolerance : $\pm 0.1(0.004)$</p>
APT2012F3C	GaAs	940	Water Clear	1.2	3	120°	<p>APT2012SF4C-PRV</p> <p>APT2012F3C</p> <p>Units : mm(inch) Tolerance : $\pm 0.1(0.004)$</p>
APT2012SF4C-PRV	GaAlAs	880	Water Clear	0.8	1.5	120°	<p>POLARITY MARK</p> <p>Units : mm(inch) Tolerance : $\pm 0.1(0.004)$</p>
APA3010F3C-GX	GaAs	940	Water Clear	1.2	3	120°	<p>APA3010F3C-GX</p> <p>Units : mm(inch) Tolerance : $\pm 0.15(0.006)$</p>
AA3528F3S	GaAs	940	Water Clear	1.6	4	120°	<p>POLARITY MARK</p> <p>AA3528F3S</p> <p>Units : mm(inch) Tolerance : $\pm 0.25(0.01)$</p>
AA3528SF4S-R	GaAlAs	880	Water Clear	1.2	2	120°	<p>POLARITY MARK</p> <p>Units : mm(inch) Tolerance : $\pm 0.25(0.01)$</p>

INFRARED EMITTING DIODE

Part Number	Material	λ_P (nm)	Lens Type	Po (mW/sr) @20mA*50mA		Viewing Angle 2 θ 1/2	Dimension
				Min.	Typ.		
WP710A10F3C	GaAs	940	Water Clear	10	25	34°	T-1 (3mm) Round  WP710A10F3C 
				*40	*80		
WP710A10SF4C	GaAlAs	880	Water Clear	7	12	34°	T-1 (3mm) Round  WP710A10SF4C 
				*12	*30		
WP7113F3C	GaAs	940	Water Clear	15	30	20°	T-1 3/4 (5mm) Round  WP7113F3C 
				*55	*100		
WP7113SF4C	GaAlAs	880	Water Clear	12	30	20°	T-1 3/4 (5mm) Round  WP7113SF4C 
				*20	*50		

INFRARED & PHOTOTRANSISTOR ■ INFRARED EMITTING DIODE

PHOTOTRANSISTOR

Part Number	Lens Type	Dimension
APT2012P3BT	Blue Transparent	2.0mm x 1.25mm x 0.75mm (0805)
APA3010P3BT-GX	Blue Transparent	
AA3528P3S	Water Clear	
WP3DP3BT	Blue Transparent	
WP7113P3BT	Blue Transparent	

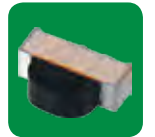
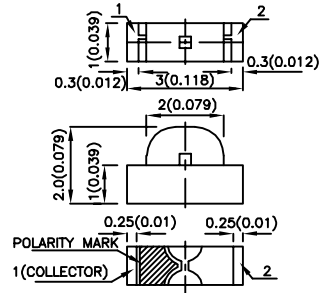
Electrical And Radiant Characteristics Ta =25°C

Parameter	Symbol	Part Number	Min.	Typ.	Max.	Unit	Test Condition
Collector-to-Emitter Breakdown Voltage	$V_{BR\ CE0}$	-	30	-	-	V	$I_C=100\mu A$ $E_e=0mW/cm^2$
Emitter-to-Collector Breakdown Voltage	$V_{BR\ ECO}$	-	5	-	-	V	$I_E=100\mu A$ $E_e=0mW/cm^2$
Collector-to-Emitter Saturation Voltage	$V_{CE(SAT)}$	-	-	-	0.8	V	$I_C=2mA$ $E_e=20mW/cm^2$
Collector Dark Current	I_{CEO}	-	-	-	100	nA	$V_{CE}=10V$ $E_e=0mW/cm^2$
Rise Time (10% to 90%)	T_R	-	-	15	-	μs	$V_{CE}=5V$ $I_C=1mA$ $R_L=1K\Omega$
Fall Time (90% to 10%)	T_F	-	-	15	-	μs	
On State Collector Current	$I_{(ON)}$	APT2012P3BT	0.1	0.3	-	mA	$V_{CE}=5V,$ $E_e=1mW/cm^2$ $\lambda=940nm$
		APA3010P3BT-GX	0.1	0.3			
		AA3528P3S	0.2	0.4			
		WP3DP3BT	0.2	0.5			
		WP7113P3BT	0.7	3			

Absolute Maximum Rating Ta =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
WP3DP3BT WP7113P3BT Lead Soldering Temperature (>5mm For 5sec)	260°C

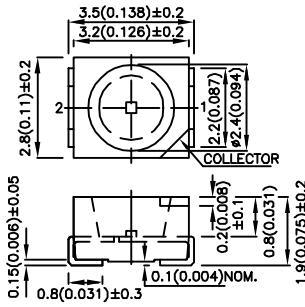
3.0mm x 1.0mm x 2.0mm (1104 Right Angle)



APA3010P3BT-GX

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

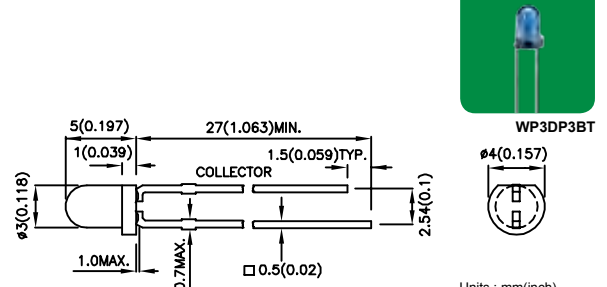
3.5mm x 2.8mm x 1.9mm



AA3528P3S

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

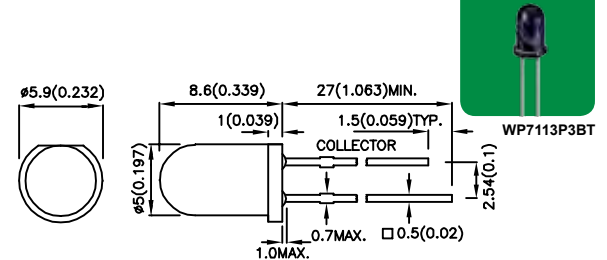
T-1 (3mm) Phototransistor



WP3DP3BT

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

T-1 3/4 (5mm) Phototransistor



WP7113P3BT

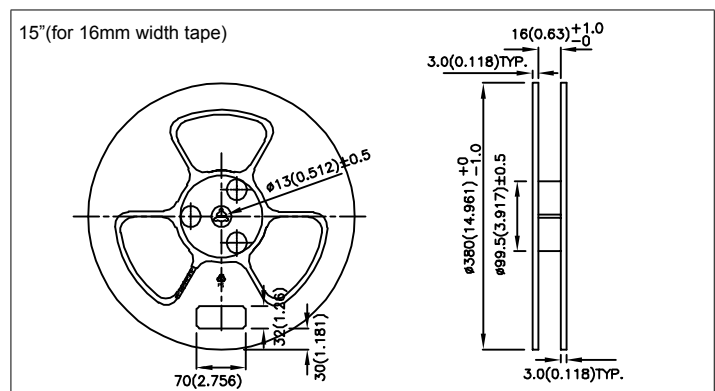
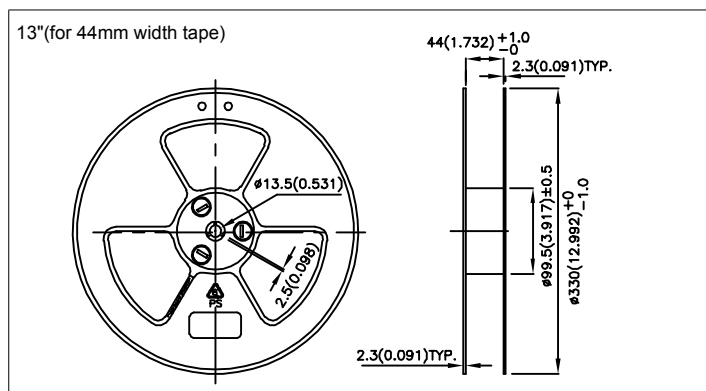
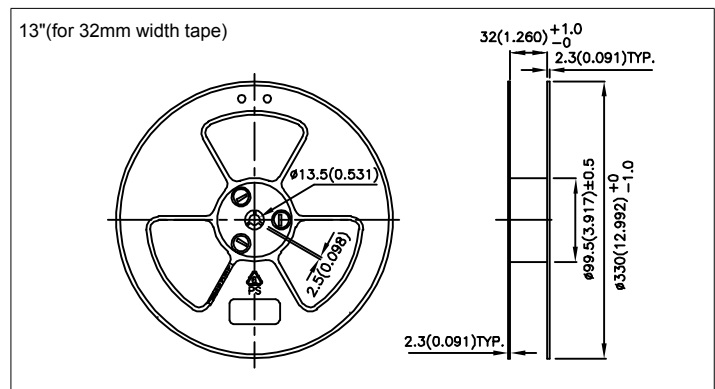
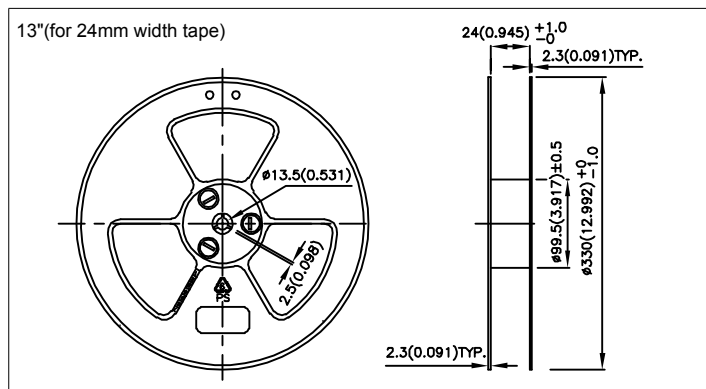
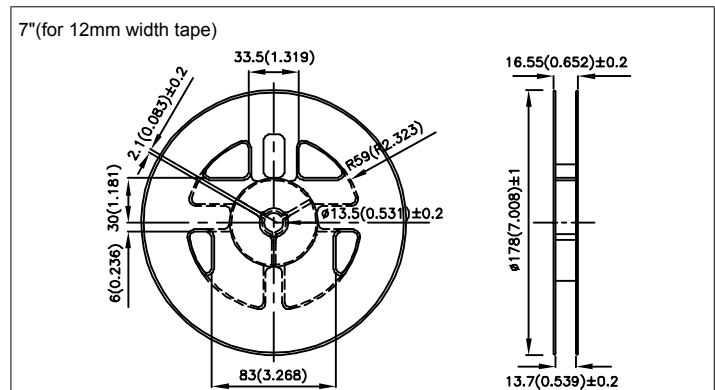
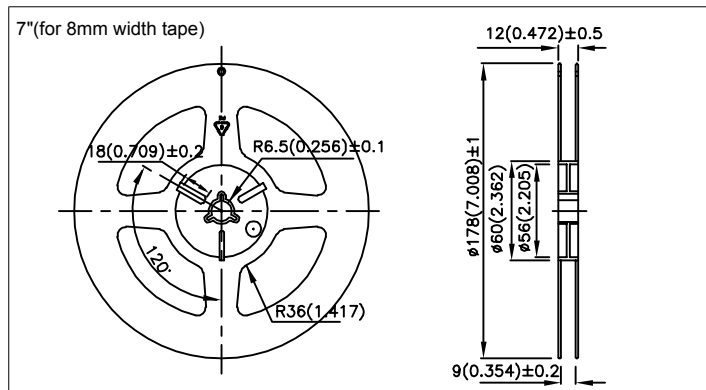
Units : mm(inch)
Tolerance : ±0.25(0.01)

TECHNICAL NOTES

SMD Tape Specifications	67
Recommended Soldering Pattern	73
Technical Data	77
Bin Code Systems	91
Index	93
Application Notes	94
CIE Chromaticity Diagram	98

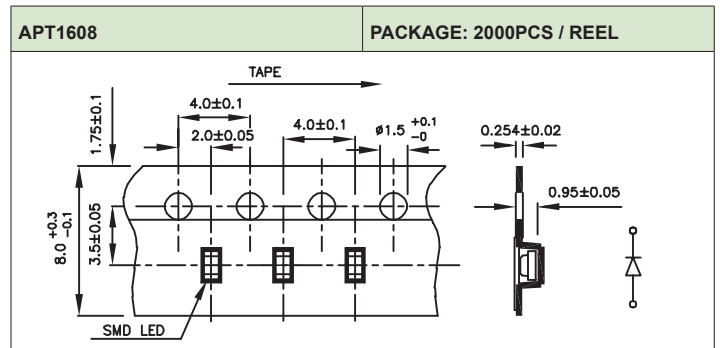
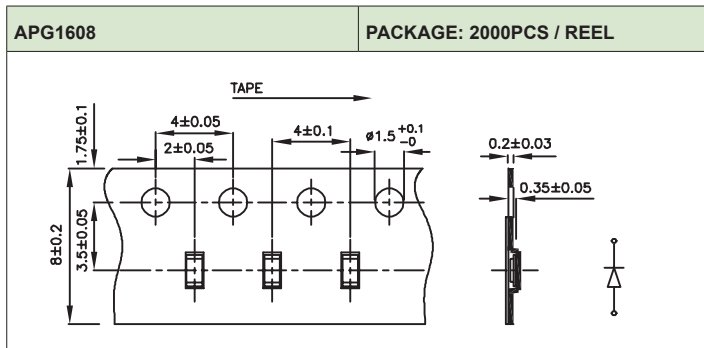
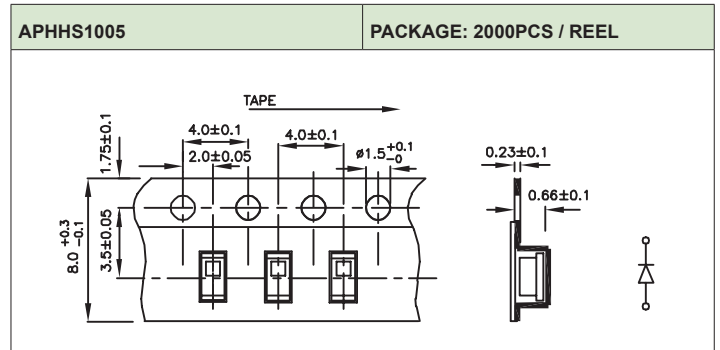
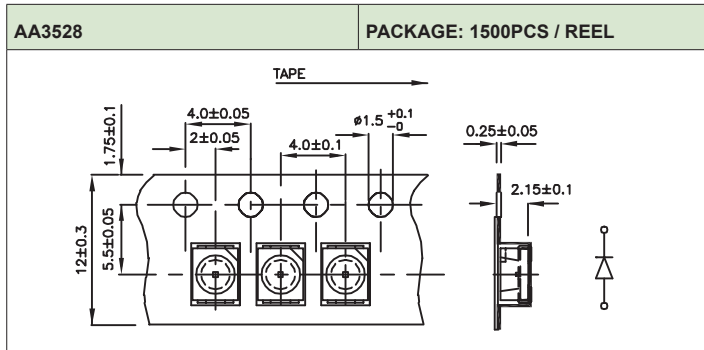
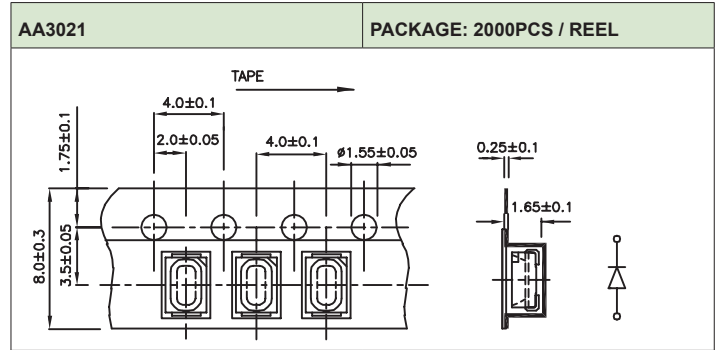
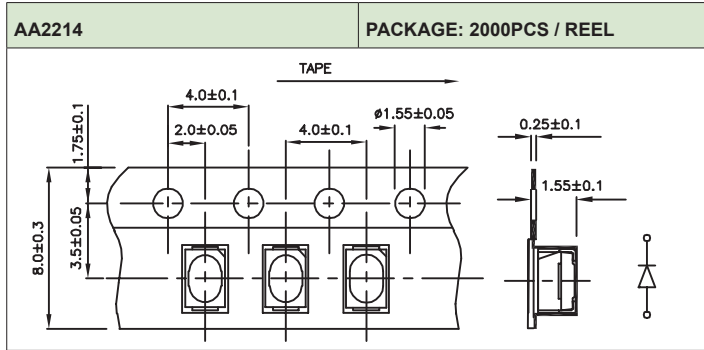
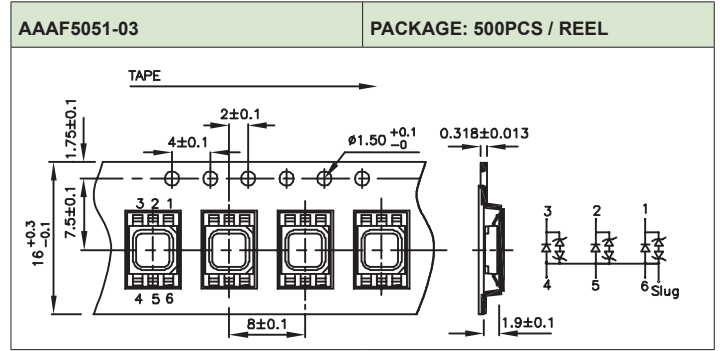
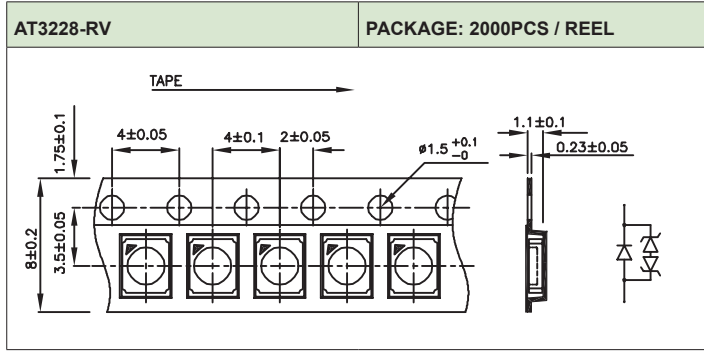
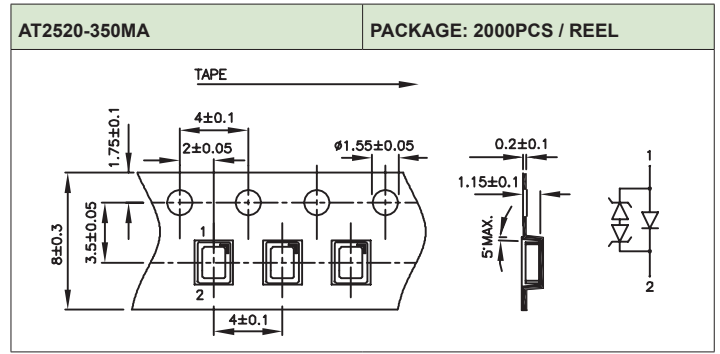
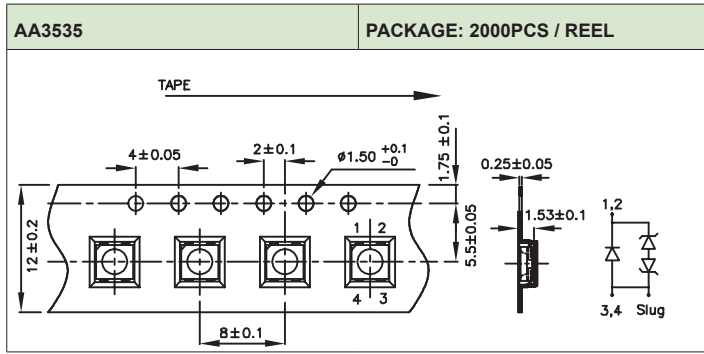
SMD TAPE SPECIFICATIONS

Reel Dimensions	Part Number		Reel Dimensions	Part Number	Reel Dimensions	Part Number	
7" (for 8mm width tape)	AA2214	APHCM2012-F01	7" (for 12mm width tape)	AA3535	13" (for 24mm width tape)	ACDX02-41xxx-F01	
	AA2810A	APHHS1005		AA3528		ACDX03-41xxx-F01	
	AA3021	APL3015-F01		AA4040		ACSX02-41xxx-F01	
	AM23	APT2012		AAAF3528		ACSX03-41xxx-F01	
	APA1606	APT3216		AM2520xxx03	13" (for 32mm width tape)	ACDX04-41xxx-F01	
	APA2106	APT61612-F01		AM2520xxx09		ACPSX04-41	
	APA3010	APT61615-F01		AM27xxx03		ACSX56-41xxx-F01	
	APB3025-F01	APTD1608		AM27xxx09		13" (for 44mm width tape)	ACDX56-41xxx-F01
	APBA3010	APTD3216		APETD3528	ACSX08-51		
	APBD3224-F01	APTF1616		APF3236	15" (for 16mm width tape)		AAAF5051-03
	APBDA3020	APTF3216					
	APBL3025-F01	APTL3216					
	APD3224-F01	APTR3216					
	APFA3010	APT1608					
	APG1608	AT2520-350MA					
	APHB1608	AT3228-RV					
	APHBM2012						

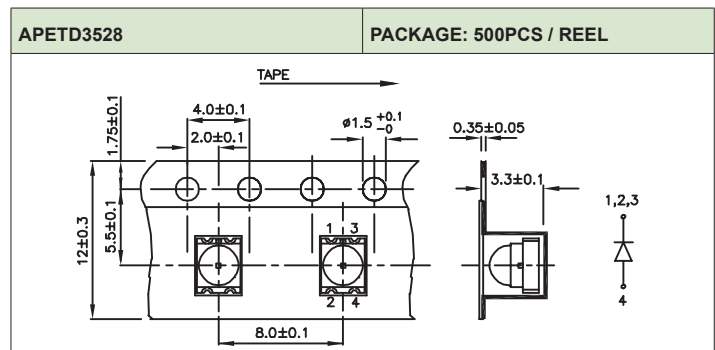
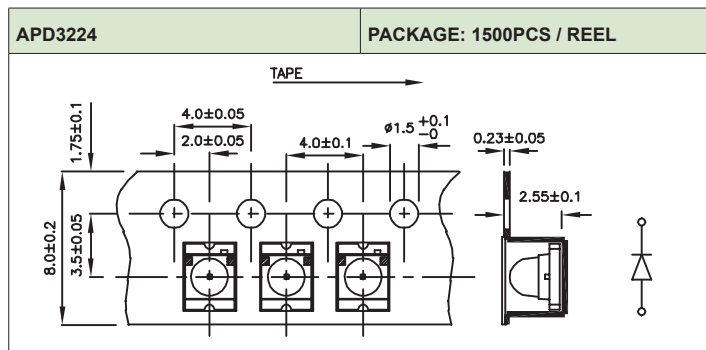
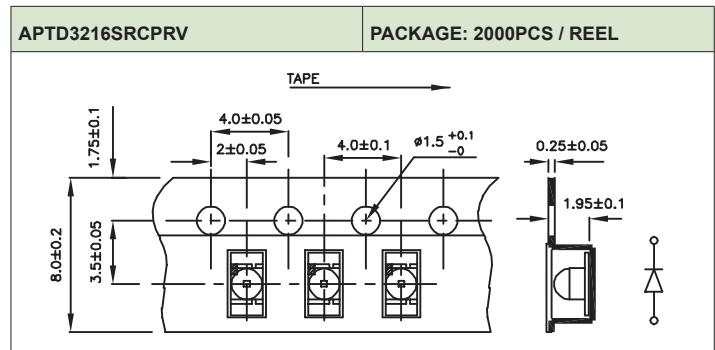
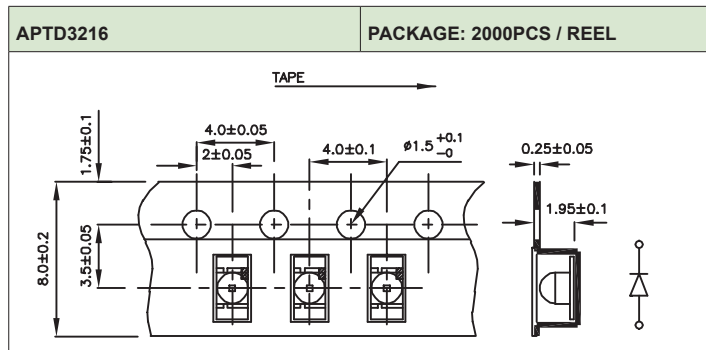
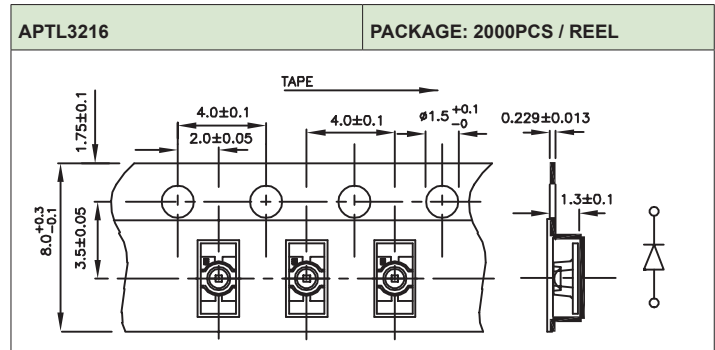
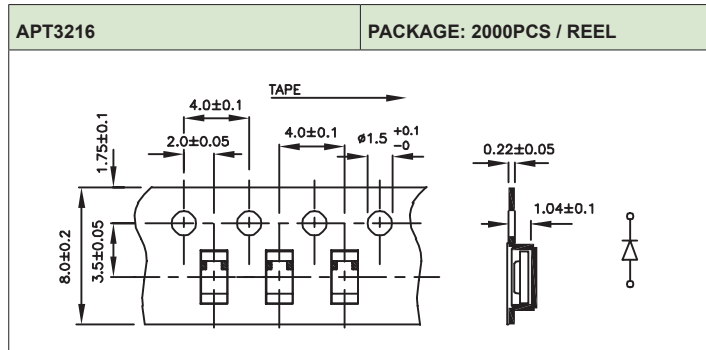
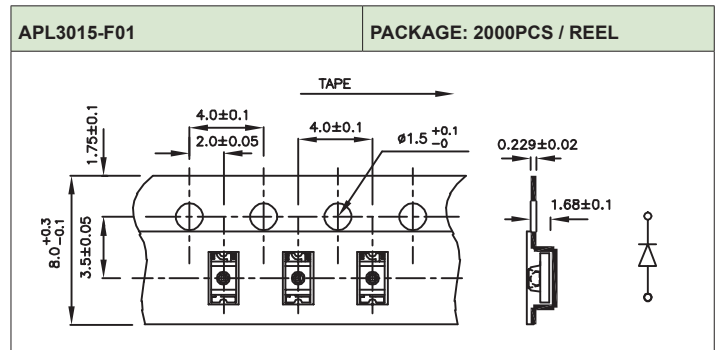
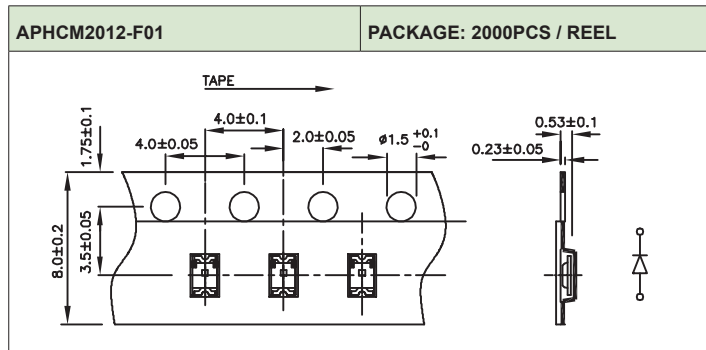
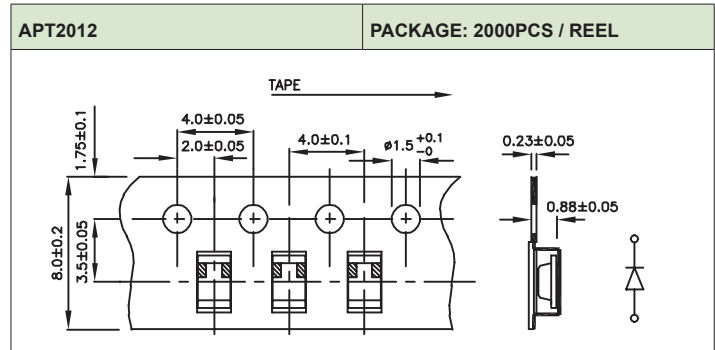
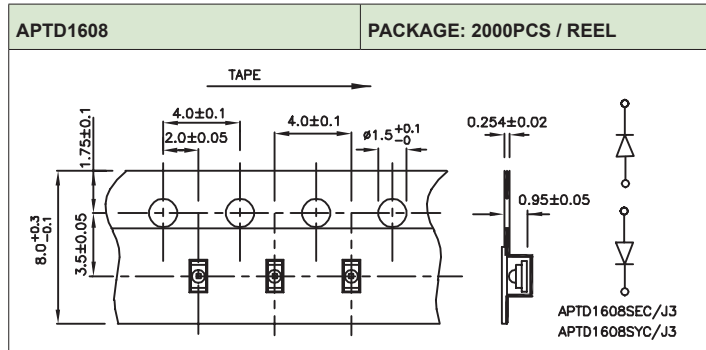


NOTE: 1. All dimensions are in millimeters(inches).

SMD TAPE SPECIFICATIONS

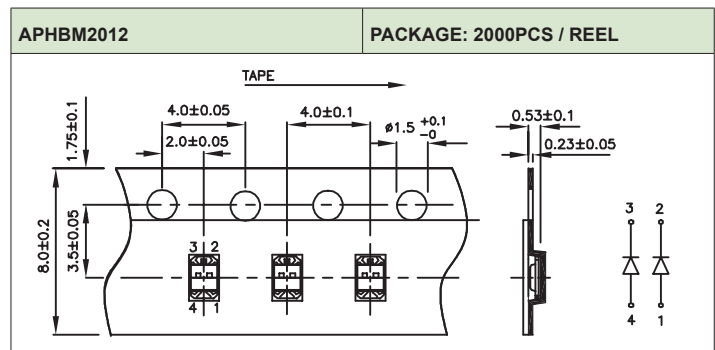
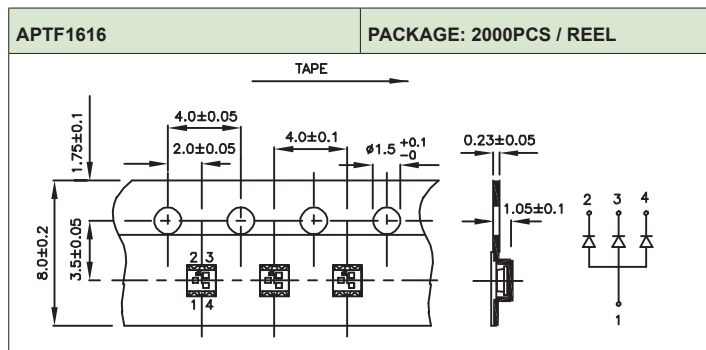
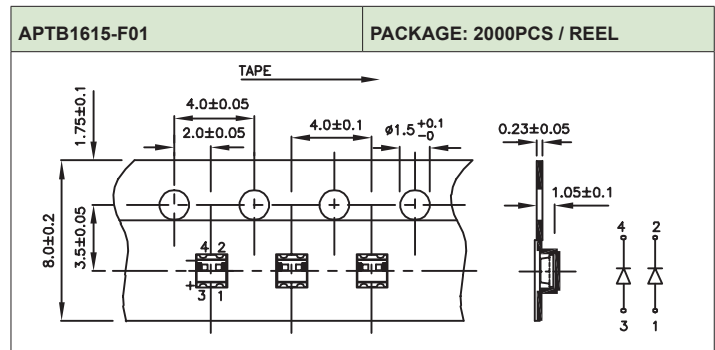
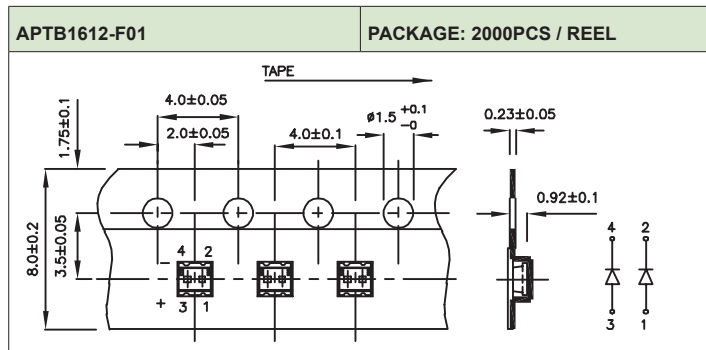
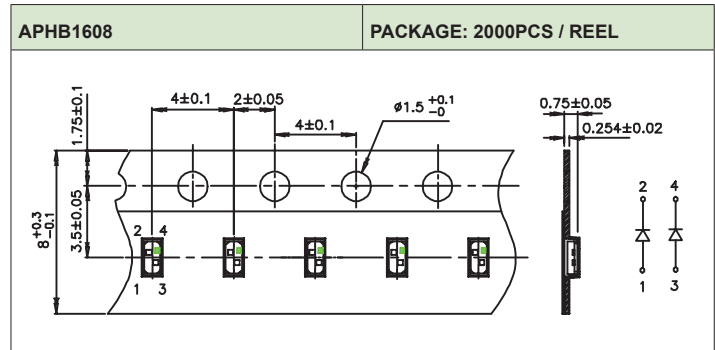
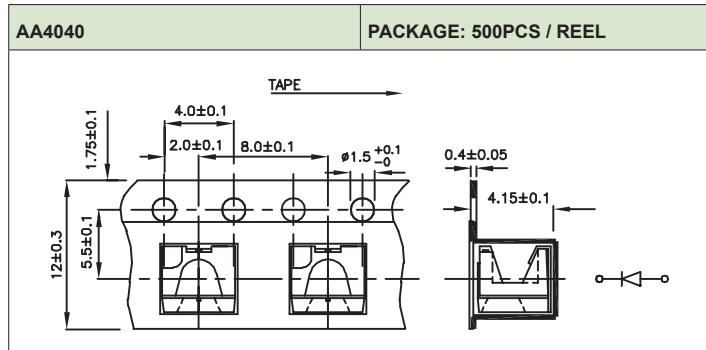
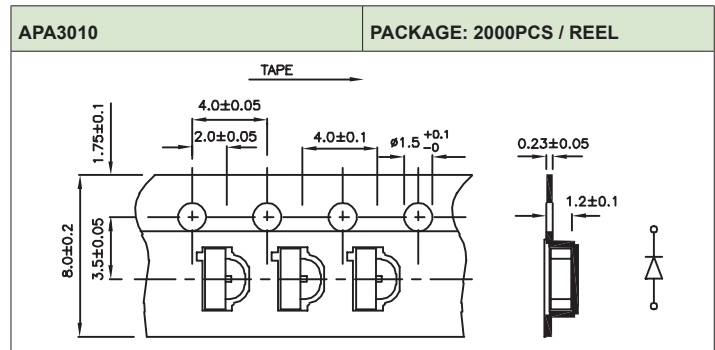
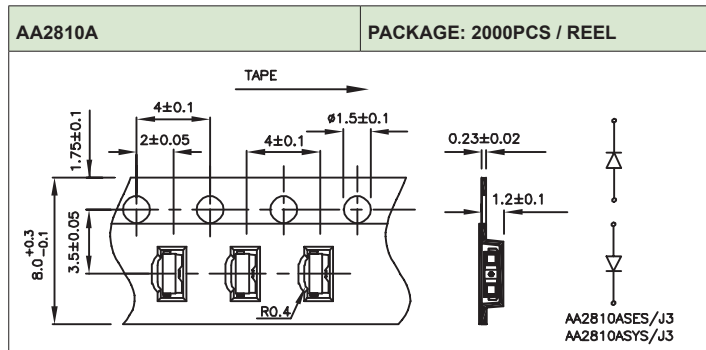
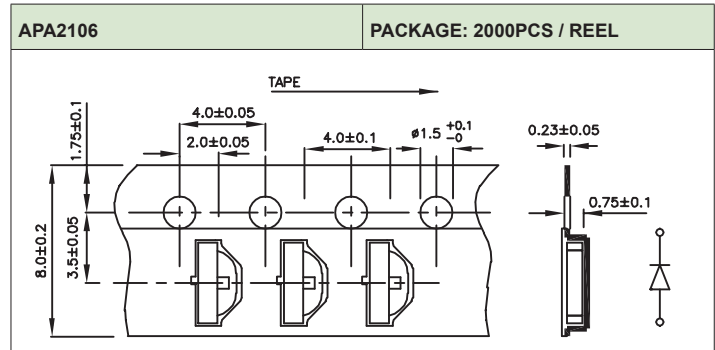
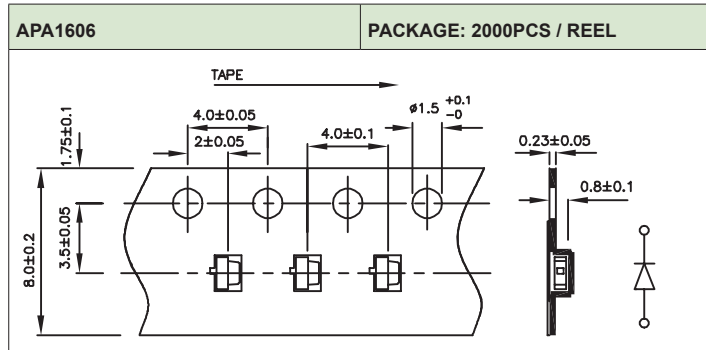


SMD TAPE SPECIFICATIONS



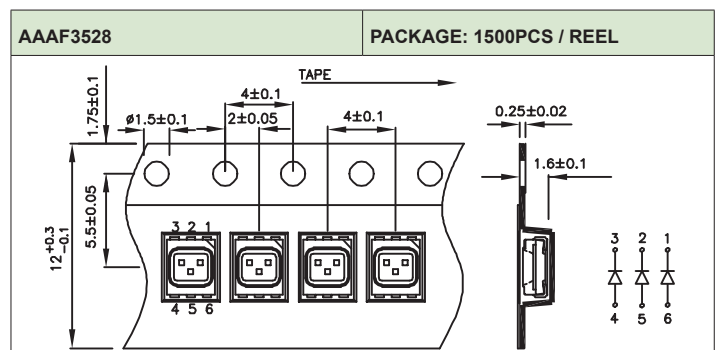
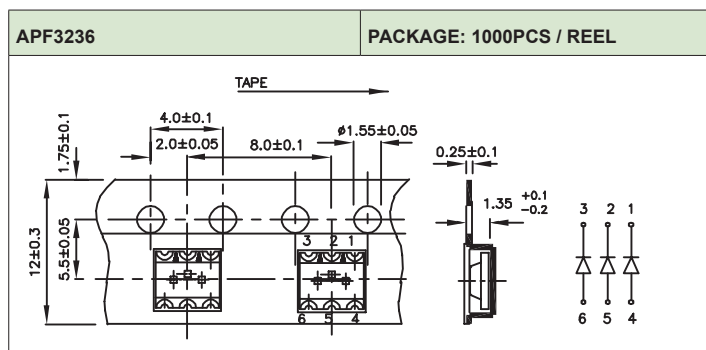
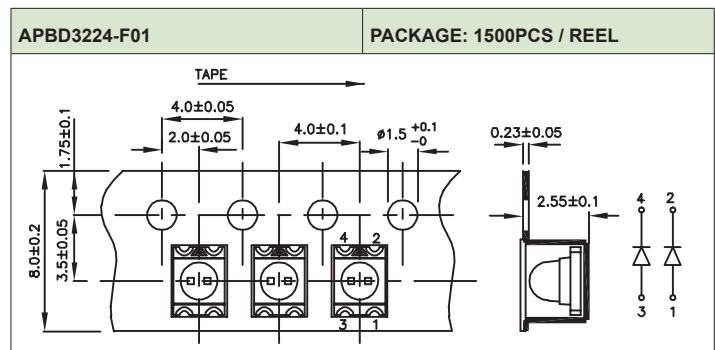
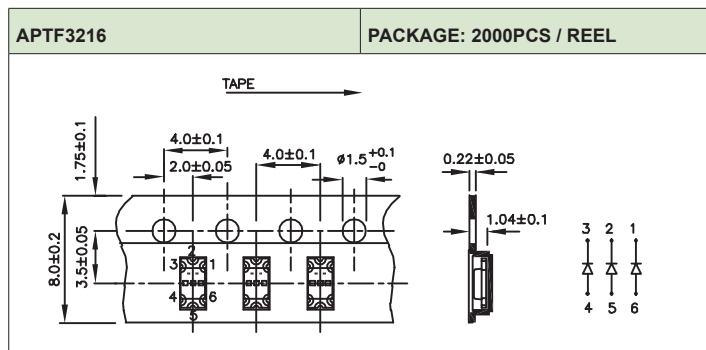
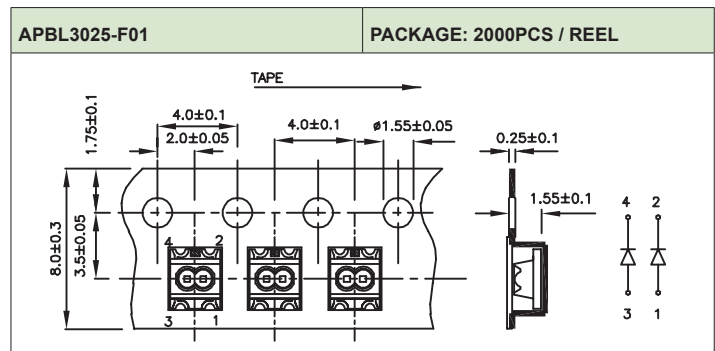
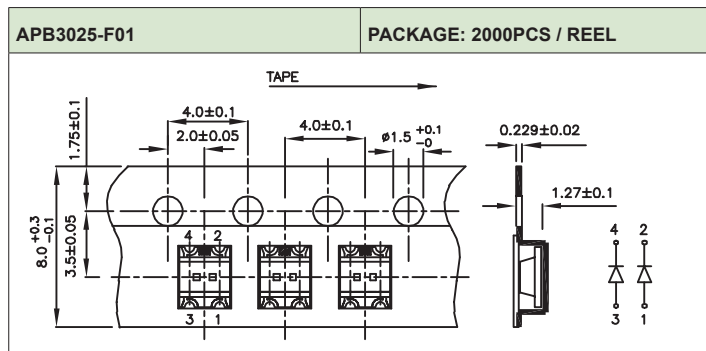
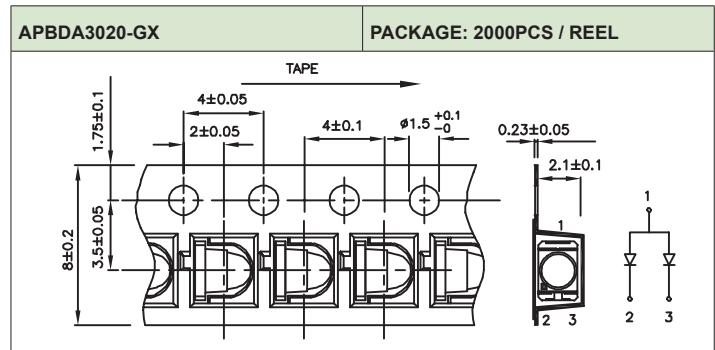
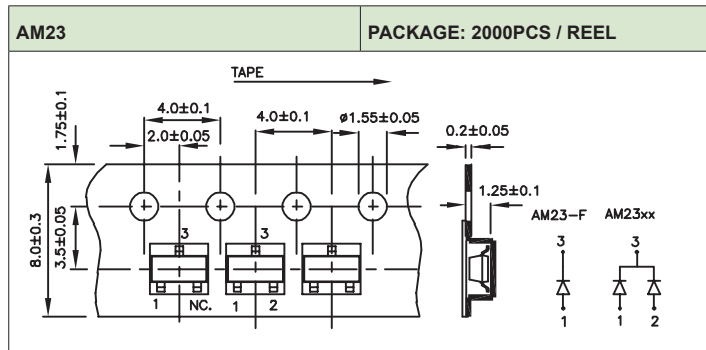
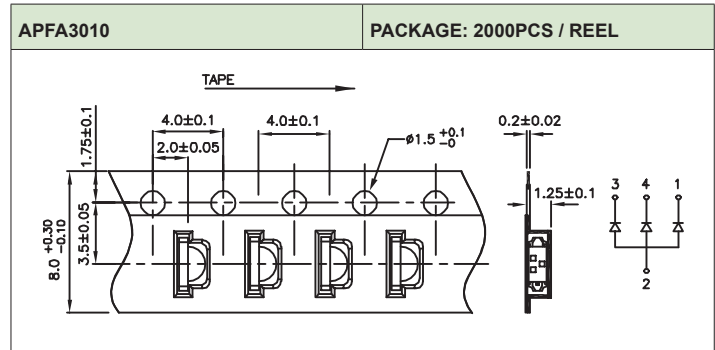
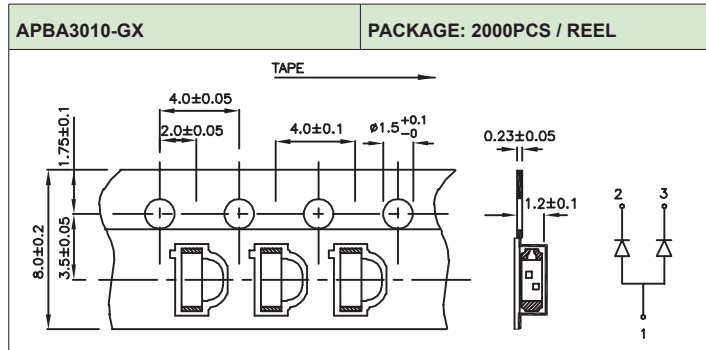
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS



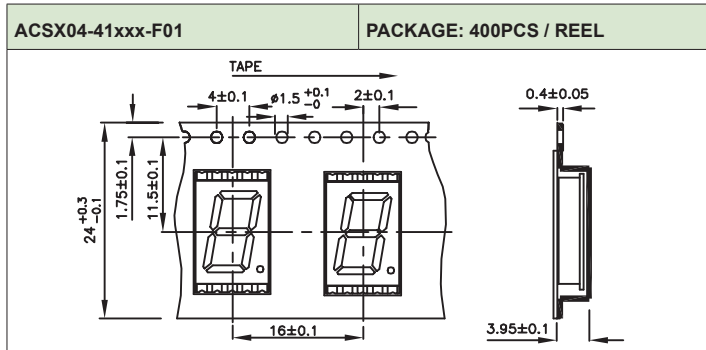
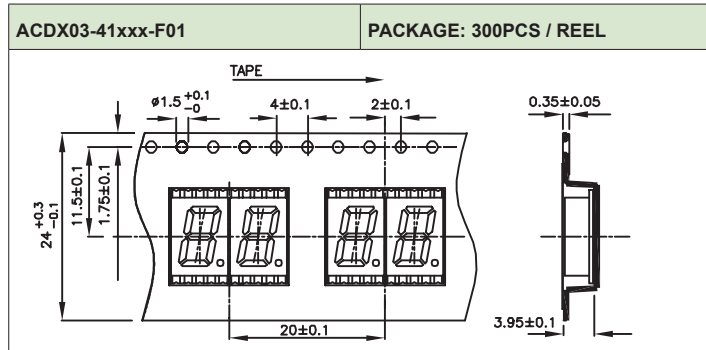
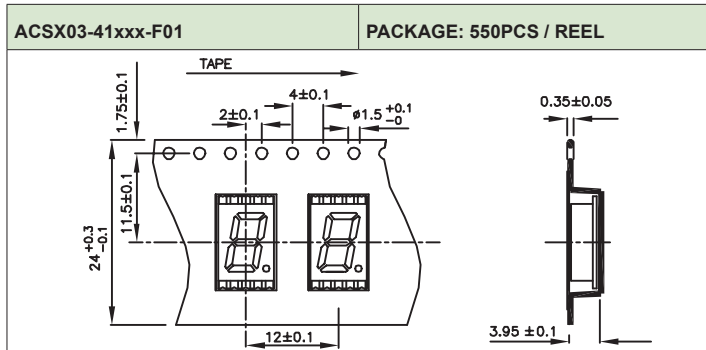
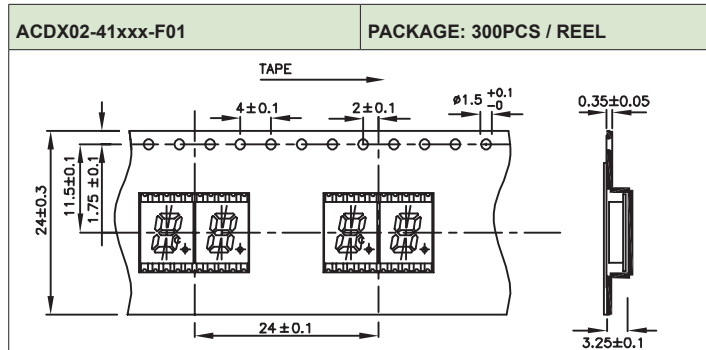
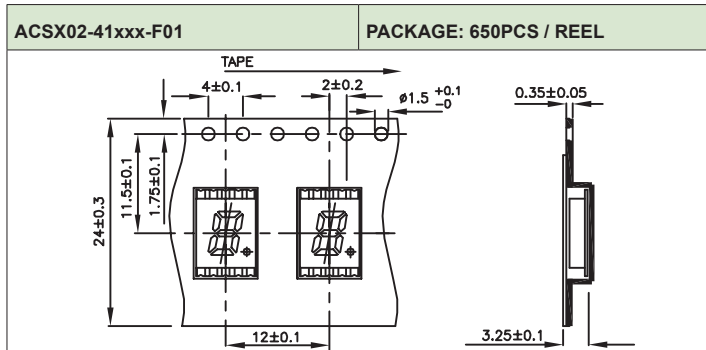
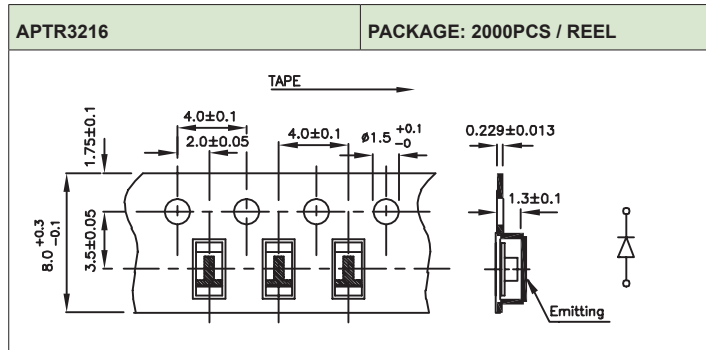
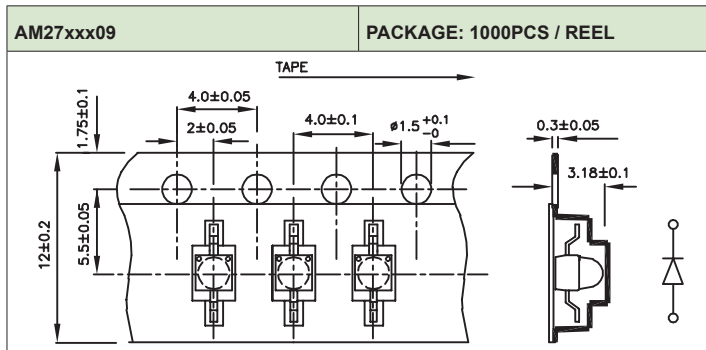
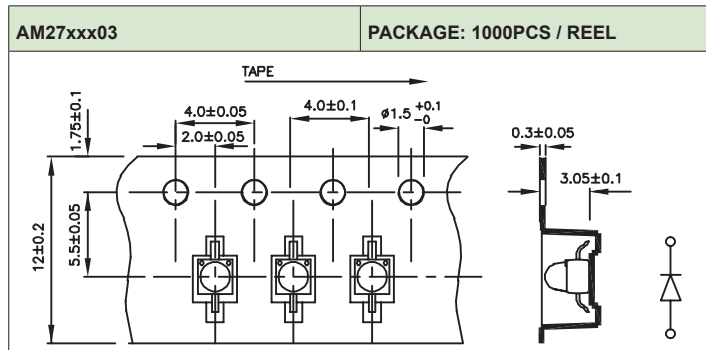
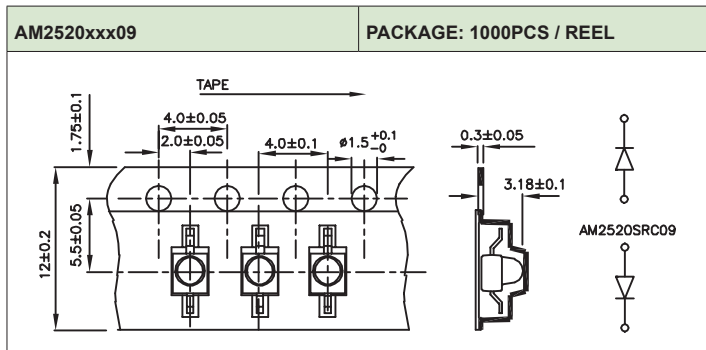
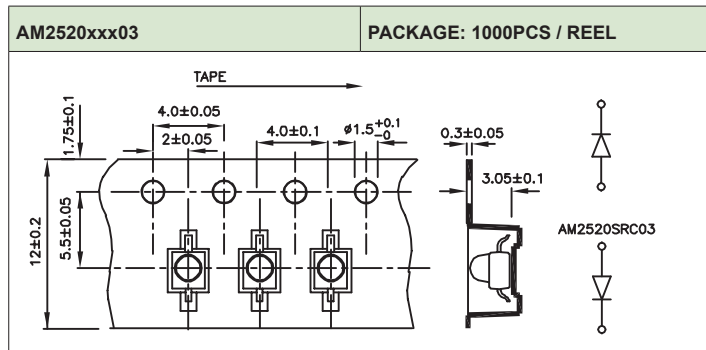
TECHNICAL NOTES ■ SMD TAPE SPECIFICATIONS

SMD TAPE SPECIFICATIONS



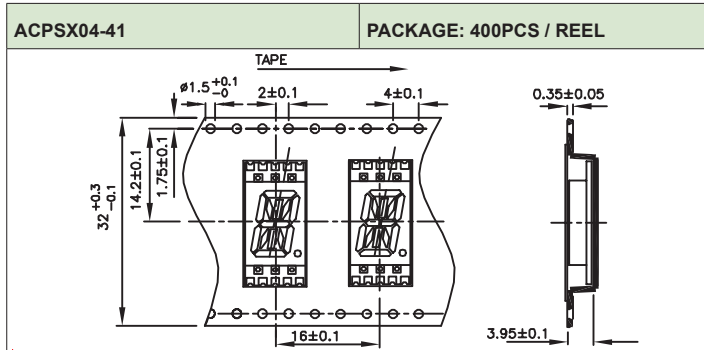
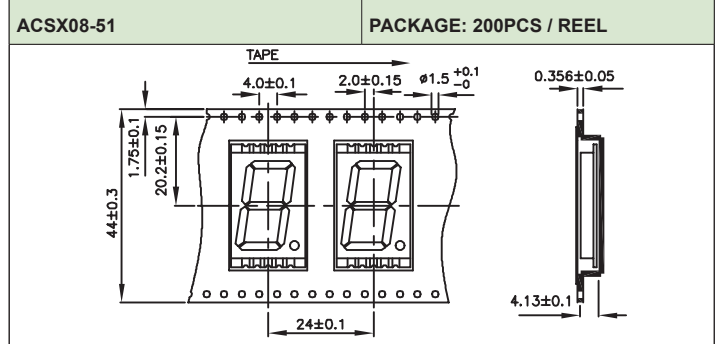
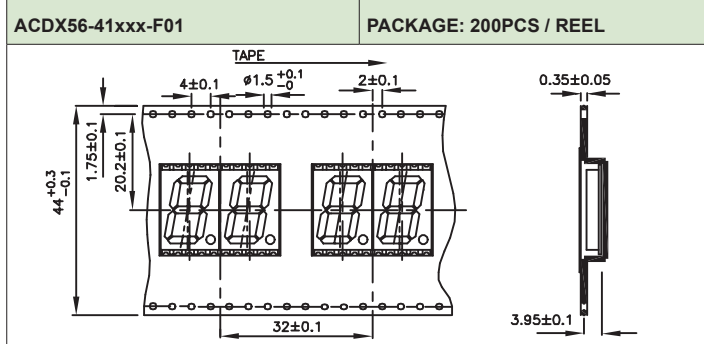
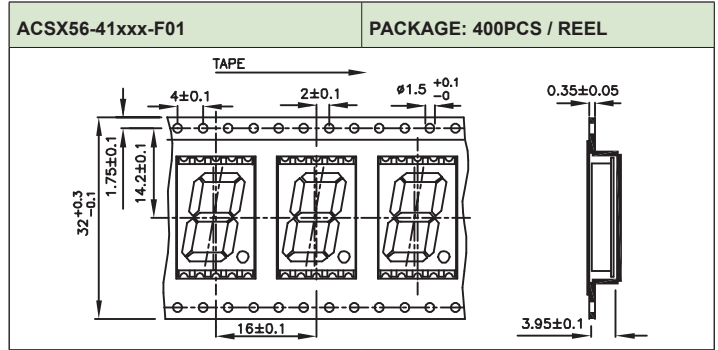
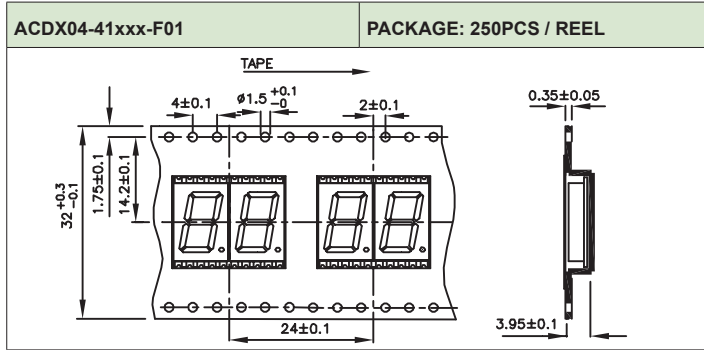
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

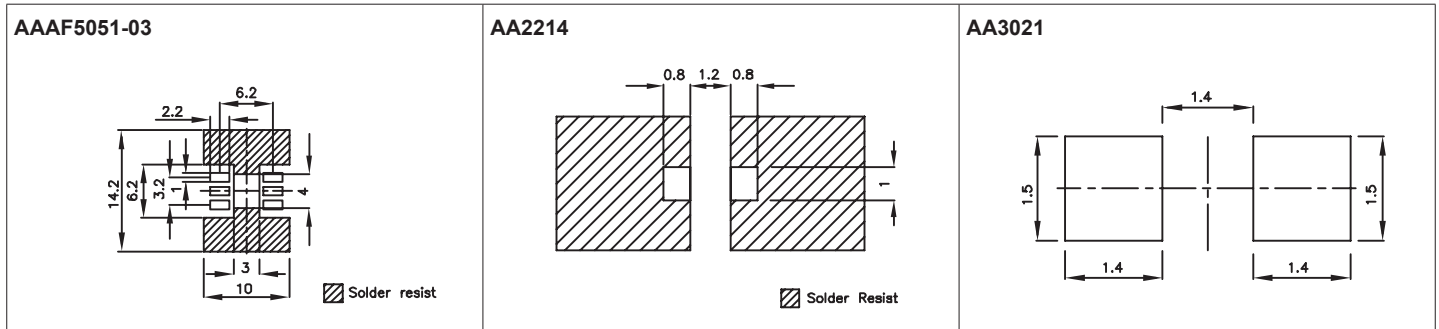
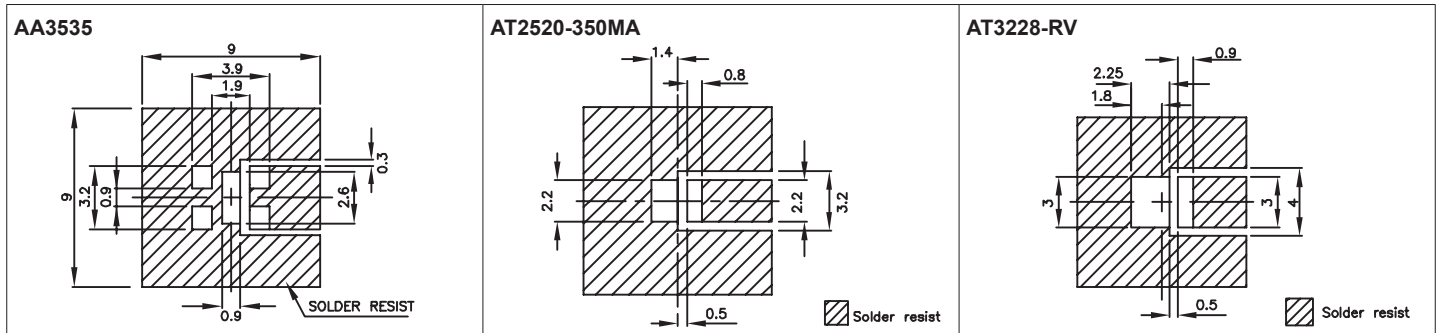


TECHNICAL NOTES ■ SMD TAPE SPECIFICATIONS

SMD TAPE SPECIFICATIONS



RECOMMENDED SOLDERING PATTERN



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

RECOMMENDED SOLDERING PATTERN

<p>AA3528</p>	<p>APHHS1005</p>	<p>APG1608, APT1608, APTD1608</p>
<p>APT2012</p>	<p>APHCM2012-F01</p>	<p>APL3015-F01</p>
<p>APT3216, APTD3216</p>	<p>APTL3216</p>	<p>APD3224-F01</p>
<p>APETD3528</p> <p>☒ Solder resist</p>	<p>APA1606</p>	<p>APA2106</p>
<p>AA2810A</p>	<p>APA3010-GX, APBA3010-GX</p>	<p>AA4040</p>

RECOMMENDED SOLDERING PATTERN

<p>APHB1608</p>	<p>APTB1612-F01</p>	<p>APTB1615-F01, APTF1616</p>
<p>APHBM2012</p>	<p>APFA3010</p>	<p>AM23-F, AM23xx</p>
<p>APBDA3020-GX</p>	<p>APB3025-F01, APBL3025-F01</p>	<p>APTF3216</p>
<p>APBD3224-F01</p>	<p>APF3236</p>	<p>AAAF3528</p>
<p>AM2520xxx03, AM27xxx03</p>	<p>AM2520xxx09, AM27xxx09</p>	<p>APTR3216</p>

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

RECOMMENDED SOLDERING PATTERN

<p>ACSX02-41xxx-F01</p>	<p>ACDX02-41xxx-F01</p>	<p>ACSX03-41xxx-F01</p>
<p>ACDX03-41xxx-F01</p>	<p>ACSX04-41xxx-F01</p>	<p>ACDX04-41xxx-F01</p>
<p>ACSX56-41xxx-F01</p>	<p>ACDX56-41xxx-F01</p>	<p>ACSX08-51</p>
<p>ACPSX04-41</p>		

TECHNICAL NOTES ■ RECOMMENDED SOLDERING PATTERN

TECHNICAL DATA

Absolute maximum ratings (T _A =25°C)		E,I Hi.Eff.Red Orange (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	SURK Hyper Red (AlGaInP)	SURK/T Hyper Red (AlGaInP)	SUR Hyper Red (AlGaInP)	SUR/E Hyper Red (AlGaInP)	Unit
Reverse voltage	V _R	● 5	● 5	● 5	● 5	● 5	● 5	● 5	V
Forward current	I _F	30	25	30	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	I _{FS}	160	130	155	185	150	185	200	mA
Power dissipation	P _D	75	62.5	75	75	75	75	75	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		E,I Hi.Eff.Red Orange (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	SURK Hyper Red (AlGaInP)	SURK/T Hyper Red (AlGaInP)	SUR Hyper Red (AlGaInP)	SUR/E Hyper Red (AlGaInP)	Unit
Forward voltage (typ.) I _F =20mA	V _F	● 2.0	● 2.25	● 1.85	● 1.95	● 2.0	● 1.9	● 1.9	V
I _F =10mA		1.9	2.05	1.8	1.85	1.85	1.85	1.8	
I _F =2mA		1.7	1.85	1.65	1.75	1.75	1.7	1.7	
Forward voltage (max.) I _F =20mA, 10mA, 2mA	V _F	2.5	2.5	2.5	2.5	2.5	2.5	2.5	V
Reverse current V _R =5V	I _R	10	10	10	10	10	10	10	μA
Peak Emission Wavelength I _F =20mA, 10mA, 2mA	λ _P	627	700	660	650	650	650	640	nm
Dominant Wavelength I _F =20mA, 10mA, 2mA	λ _D	625	660	640	630	630	630	630	nm
Spectral line half-width I _F =20mA, 10mA, 2mA	Δλ _{1/2}	45	45	20	28	20	27	25	nm
Capacitance V _F =0V, f=1MHZ	C	15	40	45	35	35	45	45	pF

TECHNICAL DATA

Absolute maximum ratings (T _A =25°C)		N Pure Orange (GaAsP/GaP)	SEK Super Bright Orange (AlGaInP)	SEK/T Super Bright Orange (AlGaInP)	SE Super Bright Orange (AlGaInP)	SE/E Hyper Red (AlGaInP)	SE/J3 Hyper Red (AlGaInP)	G,SG Green, Super Bright Green (GaP)	Unit
Reverse voltage	V _R	●	●	●	●	●	●	●	V
Forward current	I _F	5	5	5	5	5	5	5	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i _{FS}	25	30	30	30	30	30	25	mA
Power dissipation	P _D	145	195	150	195	195	150	140	mW
LED LAMPS:									
Operating temperature	T _A	62.5	75	75	75	75	84	62.5	°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		N Pure Orange (GaAsP/GaP)	SEK Super Bright Orange (AlGaInP)	SEK/T Super Bright Orange (AlGaInP)	SE Super Bright Orange (AlGaInP)	SE/E Hyper Red (AlGaInP)	SE/J3 Hyper Red (AlGaInP)	G,SG Green, Super Bright Green (GaP)	Unit
Forward voltage (typ.) I _F =20mA	V _F	●	●	●	●	●	●	●	V
I _F =10mA		2.05	2.1	2.05	2.0	2.0	2.2	2.2	
I _F =2mA		1.95	2.0	1.95	1.9	1.9	2.0	2.0	
Forward voltage (max.) I _F =20mA, 10mA, 2mA	V _F	1.85	1.85	1.8	1.8	1.8	1.8	1.9	V
Reverse current V _R =5V	I _R	2.5	2.5	2.5	2.5	2.5	2.8	2.5	V
Peak Emission Wavelength I _F =20mA, 10mA, 2mA	λ _p	10	10	10	10	10	10	10	μA
Dominant Wavelength I _F =20mA, 10mA, 2mA	λ _D	607	610	610	610	630	640	565	nm
Spectral line half-width I _F =20mA, 10mA, 2mA	Δλ _{1/2}	610	601	601	601	621	625	568	nm
Capacitance V _F =0V, f=1MHZ	C	35	29	17	29	20	25	30	nm
		15	15	15	30	25	27	15	pF

TECHNICAL DATA

Absolute maximum ratings (T _A =25°C)		PG Pure Green	CGK Green	CGK/T Green	MG Mega Green	ZG Green	ZG/G Green	Y Yellow	Unit
		(GaP)	(AlGaInP)	(AlGaInP)	(AlGaInP)	(InGaN)	(InGaN)	(GaAsP/GaP)	
Reverse voltage	V _R	● 5	● 5	● 5	● 5	● 5	● 5	● 5	V
Forward current	I _F	25	30	30	30	25	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	I _{FS}	135	150	150	150	150	100	140	mA
Power dissipation	P _D	62.5	75	78	75	102.5	120	75	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		PG Pure Green	CGK Green	CGK/T Green	MG Mega Green	ZG Green	ZG/G Green	Y Yellow	Unit
		(GaP)	(AlGaInP)	(AlGaInP)	(AlGaInP)	(InGaN)	(InGaN)	(GaAsP/GaP)	
Forward voltage (typ.) I _F =20mA	V _F	● 2.25	● 2.1	● 2.1	● 2.1	● 3.3	● 3.2	● 2.1	V
I _F =10mA		2.1	2.0	1.95	2.0	3.0	3.05	1.95	
I _F =2mA		1.9	1.9	1.8	1.9	2.65	2.8	1.85	
Forward voltage (max.) I _F =20mA, 10mA, 2mA	V _F	2.5	2.5	2.6	2.5	4.1	4.0	2.5	V
Reverse current V _R =5V	I _R	10	10	10	10	50	50	10	μA
Peak Emission Wavelength I _F =20mA, 10mA, 2mA	λ _p	555	574	574	574	515	520	590	nm
Dominant Wavelength I _F =20mA, 10mA, 2mA	λ _D	555	570	570	570	525	525	588	nm
Spectral line half-width I _F =20mA, 10mA, 2mA	Δλ _{1/2}	30	20	15	26	30	35	35	nm
Capacitance V _F =0V, f=1MHZ	C	45	15	15	20	45	100	20	pF

TECHNICAL DATA

Absolute maximum ratings (T _A =25°C)		SYK Super Bright Yellow	SYK/T Super Bright Yellow	SY Super Bright Yellow	SY/J3 Super Bright Yellow	QB/D Blue	QB/F Blue	VB/D Blue	Unit
		(AlGaInP)	(AlGaInP)	(AlGaInP)	(AlGaInP)	(InGaN)	(InGaN)	(InGaN)	
Reverse voltage	V _R	5	5	5	5	5	5	5	V
Forward current	I _F	30	30	30	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	I _{FS}	175	150	150	140	150	150	100	mA
Power dissipation	P _D	75	75	75	75	120	120	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		SYK Super Bright Yellow	SYK/T Super Bright Yellow	SY Super Bright Yellow	SY/J3 Super Bright Yellow	QB/D Blue	QB/F Blue	VB/D Blue	Unit
		(AlGaInP)	(AlGaInP)	(AlGaInP)	(AlGaInP)	(InGaN)	(InGaN)	(InGaN)	
Forward voltage (typ.) I _F =20mA	V _F	2.0	2.05	2.0	2.0	3.3	3.3	3.3	V
I _F =10mA		1.95	1.95	1.95	1.95	3.0	3.0	3.0	
I _F =2mA		1.85	1.8	1.8	1.85	2.65	2.65	2.65	
Forward voltage (max.) I _F =20mA, 10mA, 2mA	V _F	2.5	2.5	2.5	2.5	4.0	4.0	4.0	V
Reverse current V _R =5V	I _R	10	10	10	10	50	50	50	μA
Peak Emission Wavelength I _F =20mA, 10mA, 2mA	λ _p	590	590	590	590	468	461	445	nm
Dominant Wavelength I _F =20mA, 10mA, 2mA	λ _D	590	590	590	589	470	465	450	nm
Spectral line half-width I _F =20mA, 10mA, 2mA	Δλ _{1/2}	20	15	28	20	25	25	22	nm
Capacitance V _F =0V, f=1MHZ	C	20	25	25	45	100	100	100	pF

TECHNICAL DATA 5V/14V WITH INTERNAL RESISTANCE

Absolute maximum ratings (T _A =25°C)		E,I Hi.Eff.Red (GaAsP/GaP)	SR Super Bright Red (GaAlAs)	G,SG Green, Super Bright Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
Reverse voltage	V _R	5	5	5	5	V
Forward voltage (Max.) for 5V	V _F	6	6	6	6	V
Forward voltage (Max.) for 14V	V _F	16	16	16	16	V
Power dissipation for 5V	P _D	85	85	85	85	mW
Power dissipation for 14V	P _D	160	160	160	160	mW
LED LAMPS:						
Operating temperature	T _A	- 40~+70	- 40~+70	- 40~+70	- 40~+70	°C
Storage temperature	T _{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:						
Operating temperature	T _A	- 40~+70	- 40~+70	- 40~+70	- 40~+70	°C
Storage temperature	T _{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		E,I Hi.Eff.Red (GaAsP/GaP)	SR Super Bright Red (GaAlAs)	G,SG Green, Super Bright Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
Forward current (typ.) V _F =5V	I _F	13	13	11.5	13	mA
Forward current (typ.) V _F =14V	I _F	10.5	10.5	10.5	10.5	mA
Forward current (max.) V _F =5V	I _F	17.5	17.5	17.5	17.5	mA
Forward current (max.) V _F =14V	I _F	13.5	13.5	13.5	13.5	mA
Reverse current V _R =5V	I _R	10	10	10	10	uA
Peak Emission Wavelength V _F =5V,14V	λ _p	627	660	565	590	nm
Dominant Wavelength V _F =5V,14V	λ _D	625	640	568	588	nm
Spectral line half-width V _F =5V,14V	Δλ _{1/2}	45	20	30	35	nm

TECHNICAL DATA FOR BLINKING LED LAMPS

Absolute maximum ratings (T _A =25°C)		E,I Hi.Eff.Red (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	G,SG Green, Super Bright Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
Reverse voltage	V _R	0.5	0.5	0.5	0.5	0.5	V
Forward voltage (max.)	V _F	14	14	14	14	14	V
Total Power dissipation	P _D	310	310	310	310	310	mW
Operating temperature	T _A	- 40~+70	- 40~+70	- 40~+70	- 40~+70	- 40~+70	°C
Storage temperature	T _{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		E,I Hi.Eff.Red (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	G,SG Green, Super Bright Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
Forward current (min.) V _F =3.5V	I _F	8	8	8	8	8	mA
Forward current (typ.) V _F =5V	I _F	22	22	22	22	22	mA
Supply current V _F =3.5V ~ 14V	I _{SON}	8 ~ 44	8 ~ 44	8 ~ 44	8 ~ 44	8 ~ 44	mA
Blink frequency V _F =3.5V ~ 14V	f	3 ~ 1.5	3 ~ 1.5	3 ~ 1.5	3 ~ 1.5	3 ~ 1.5	Hz
Peak Emission Wavelength	λ _p	627	700	660	565	590	nm
Dominant Wavelength	λ _D	625	660	640	568	588	nm
Spectral line half-width	Δλ _{1/2}	45	45	20	30	35	nm

TECHNICAL DATA FOR INFRARED

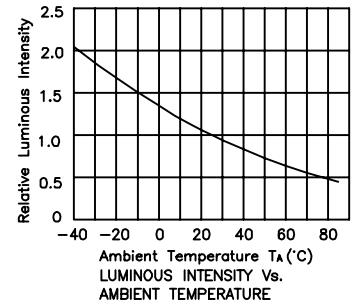
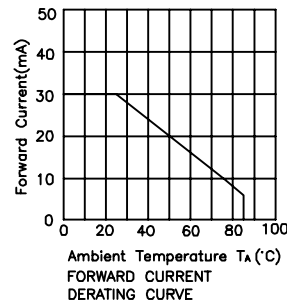
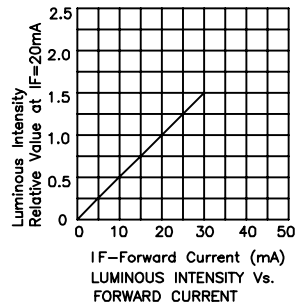
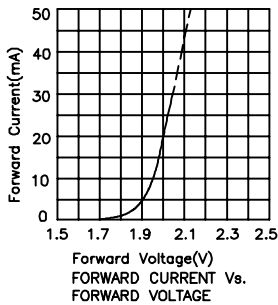
Absolute maximum ratings (T _A =25°C)		F3	SF4	Unit
		(GaAs)	(GaAlAs)	
Reverse voltage	V _R	5	5	V
Forward current	I _F	50	50	mA
Forward current (Peak) 1/100 Duty Cycle, 10µs Pulse Width	i _{FS}	1.2	1.2	A
Power dissipation	P _D	80	80	mW
LED LAMPS:				
Operating temperature	T _A	-40~+85	-40~+85	°C
Storage temperature	T _{STG}	-40~+85	-40~+85	°C
LED DISPLAYS:				
Operating temperature	T _A	-40~+85	-40~+85	°C
Storage temperature	T _{STG}	-40~+85	-40~+85	°C

Operating Characteristics		F3	SF4	Unit
		(GaAs)	(GaAlAs)	
Forward voltage (typ.) I _F =20mA	V _F	1.2	1.3	V
Forward voltage (max.) I _F =20mA	V _F	1.6	1.6	V
Reverse current V _R =5V	I _R	10	10	µA
Peak Emission Wavelength I _F =20mA	λ _p	940	880	nm
Spectral line half-width I _F =20mA	Δλ _{1/2}	50	50	nm
Capacitance V _F =0V, f=1MHZ	C	90	90	pF

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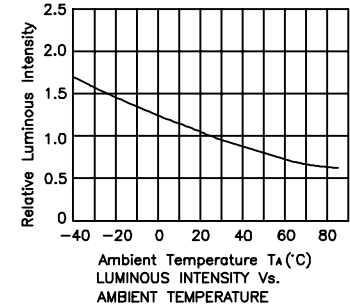
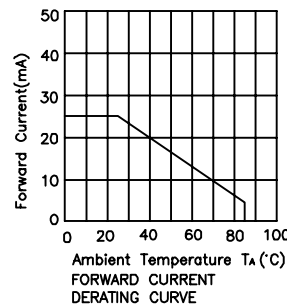
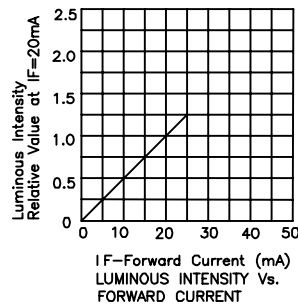
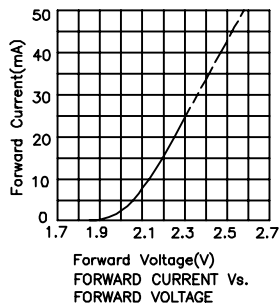
High Efficiency Red, Orange

E,I : GaAsP/GaP



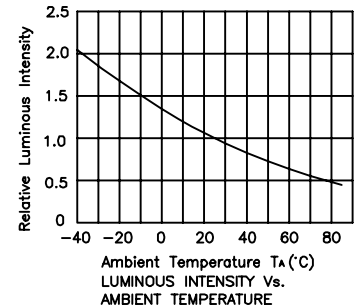
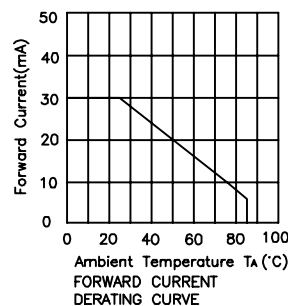
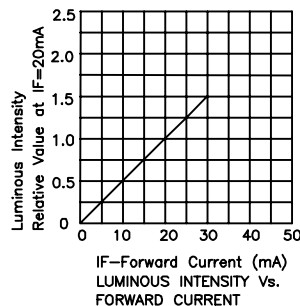
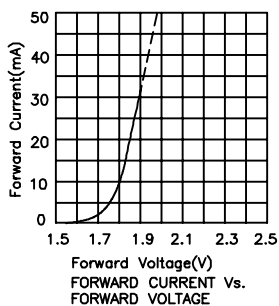
Bright Red

H : GaP



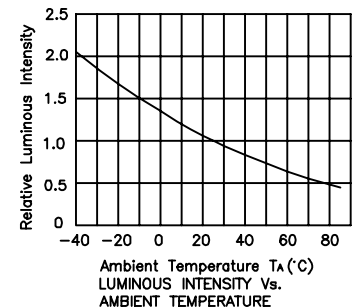
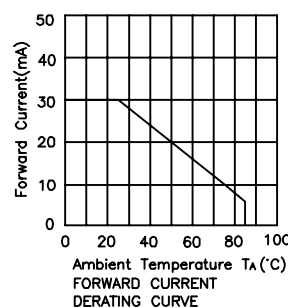
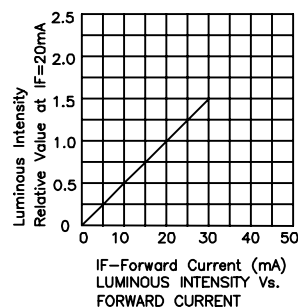
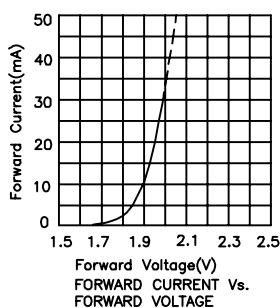
Super Bright Red

SR : GaAlAs



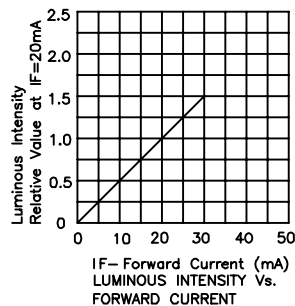
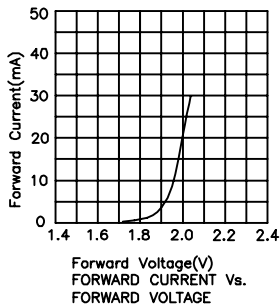
Hyper Red

SURK : AlGaInP

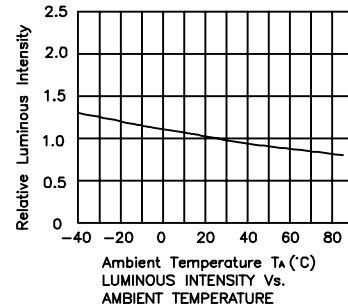
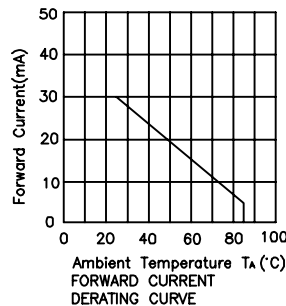


TECHNICAL DATA

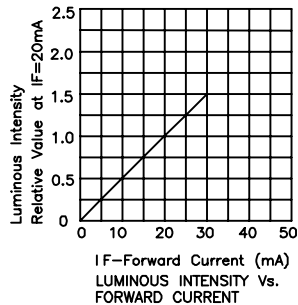
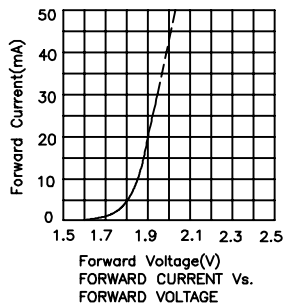
Hyper Red



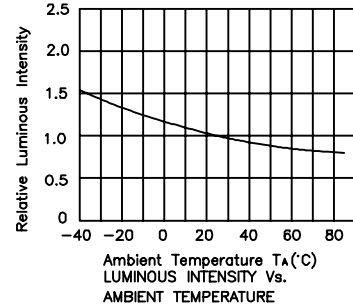
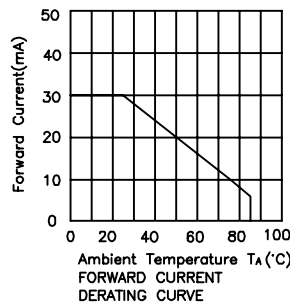
SURK/T : AlGaInP



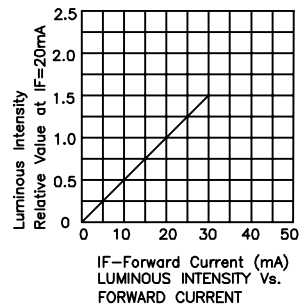
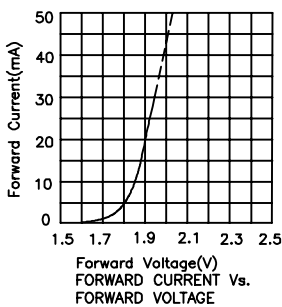
Hyper Red



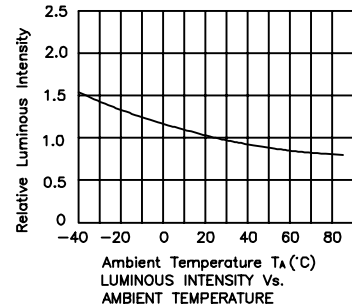
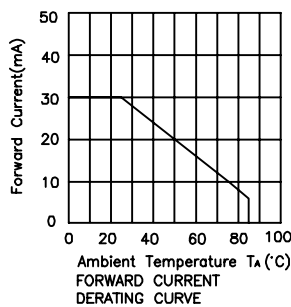
SUR : AlGaInP



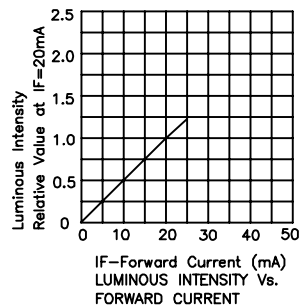
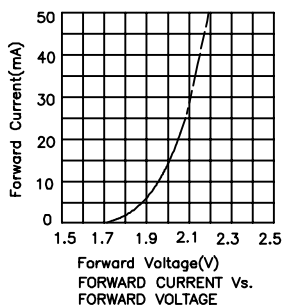
Hyper Red



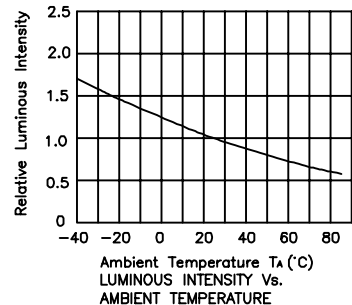
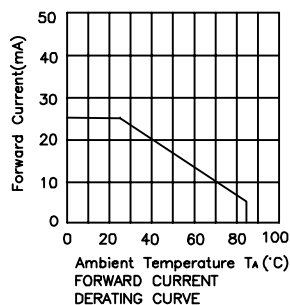
SUR/E : AlGaInP



Pure Orange



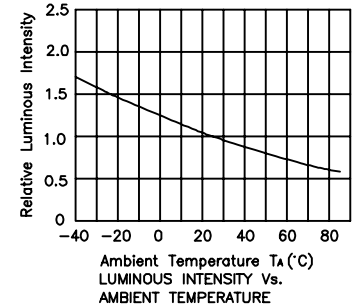
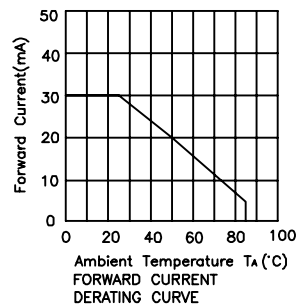
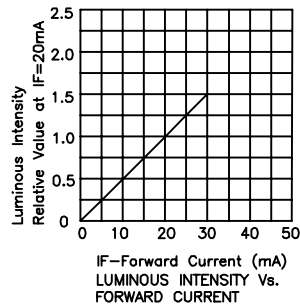
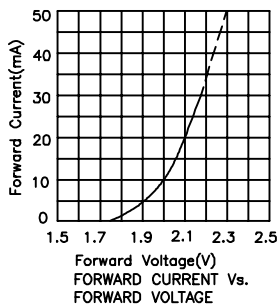
N : GaAsP/GaP



TECHNICAL DATA

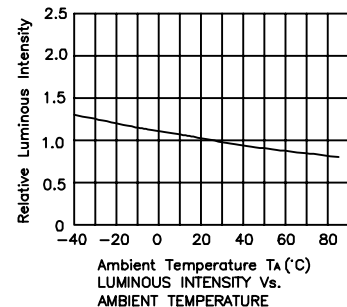
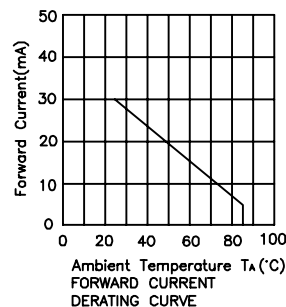
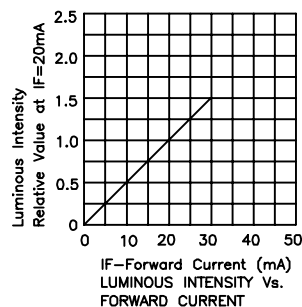
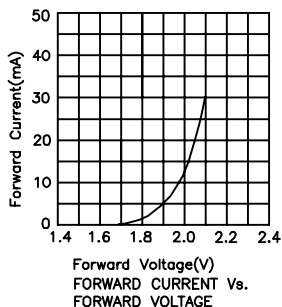
Super Bright Orange

SEK : AlGaInP



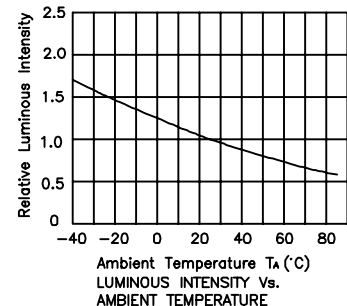
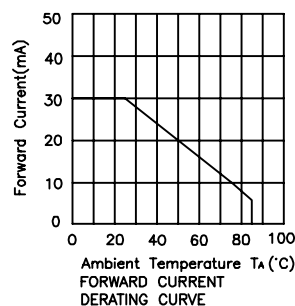
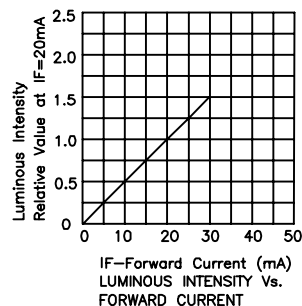
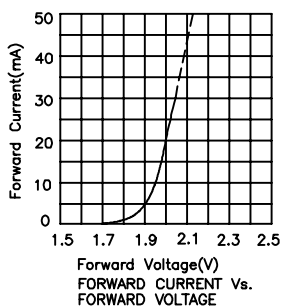
Super Bright Orange

SEK/T : AlGaInP



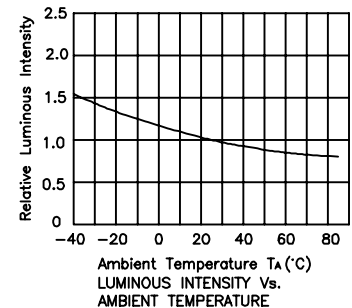
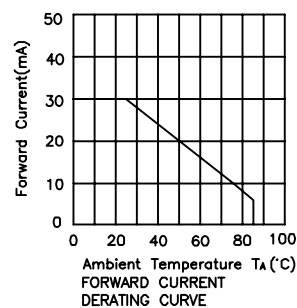
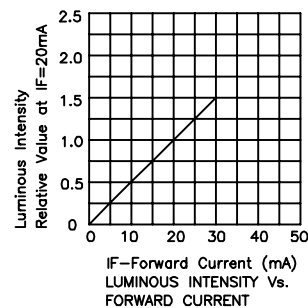
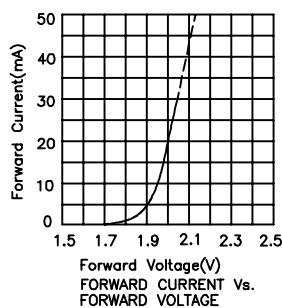
Super Bright Orange

SE : AlGaInP



Hyper Red

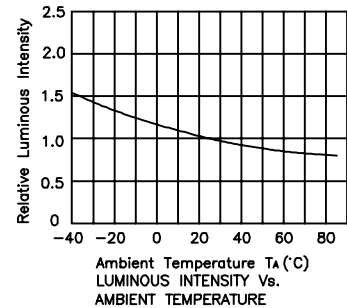
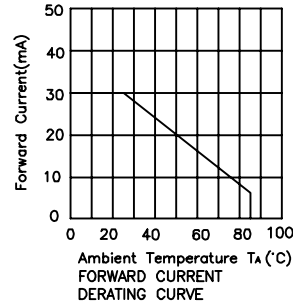
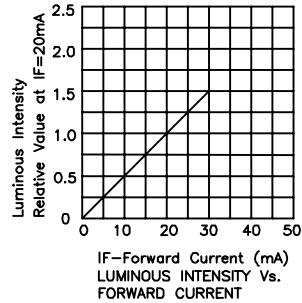
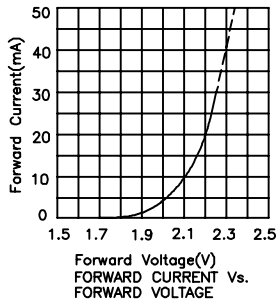
SE/E : AlGaInP



TECHNICAL DATA

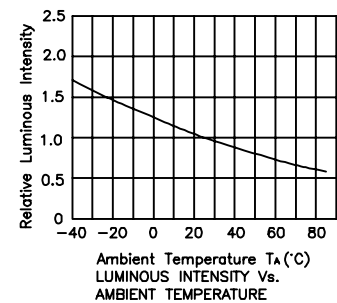
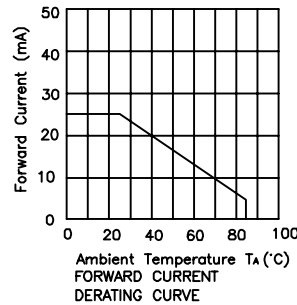
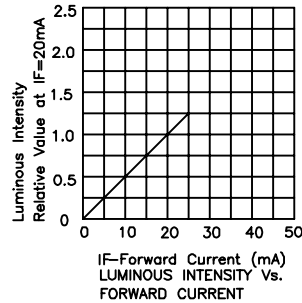
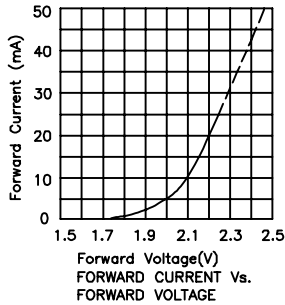
Hyper Red

SE/J3 : AlGaInP



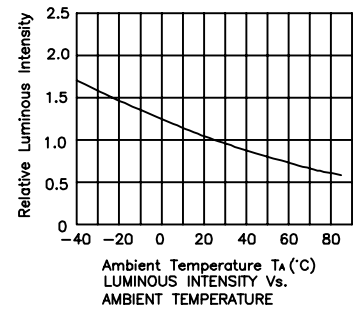
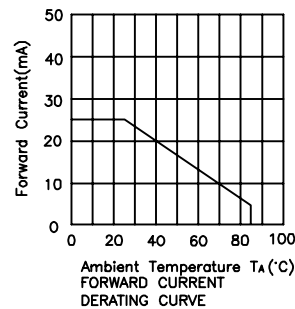
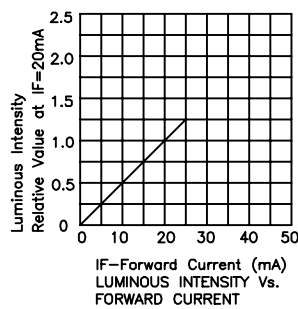
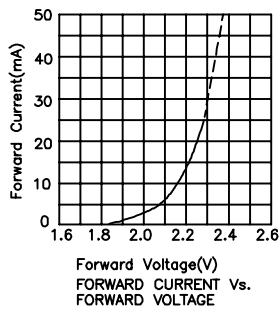
Green/Super Bright Green

G,SG : GaP



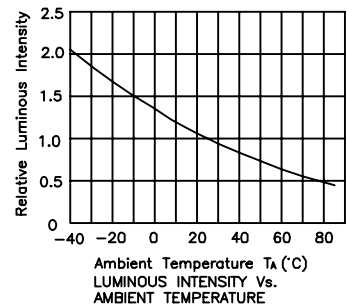
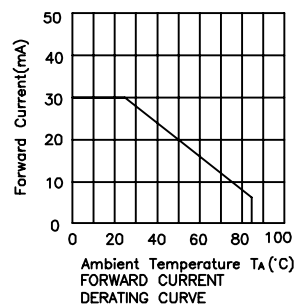
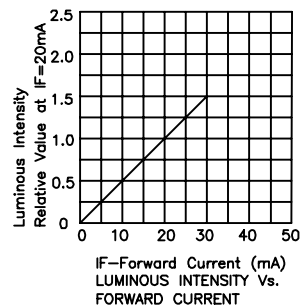
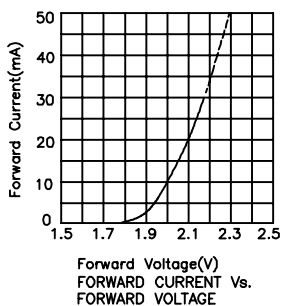
Pure Green

PG : GaP



Green

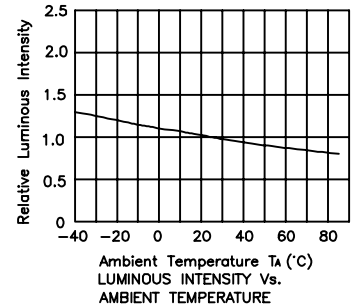
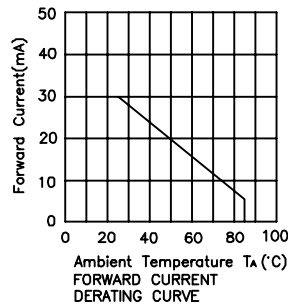
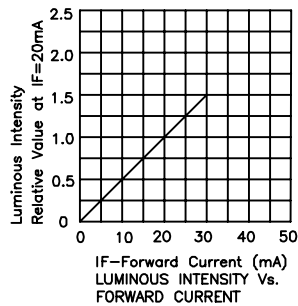
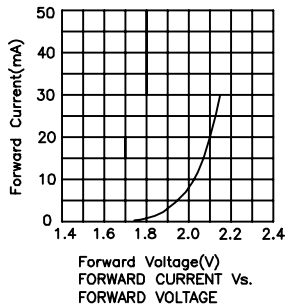
CGK : AlGaInP



TECHNICAL DATA

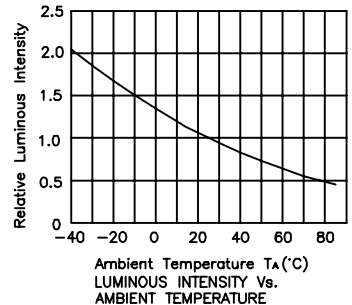
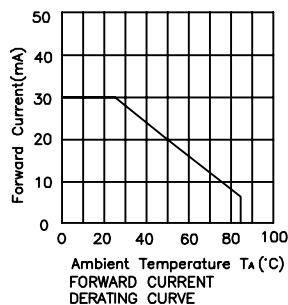
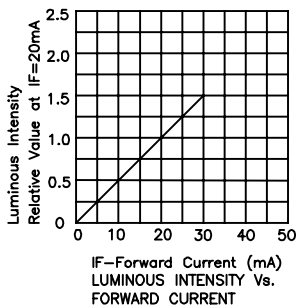
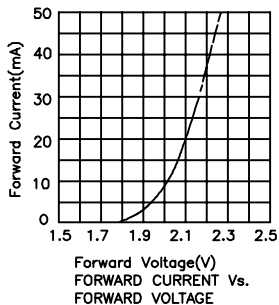
Green

CGK/T : AlGaInP



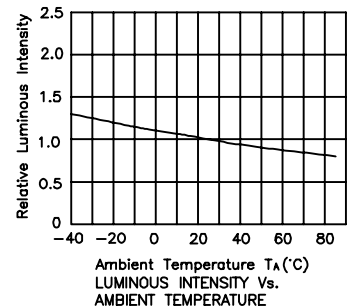
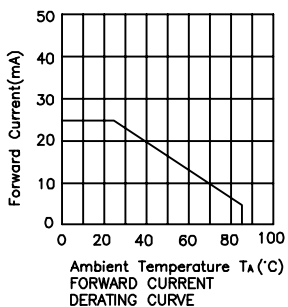
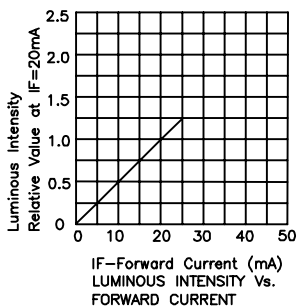
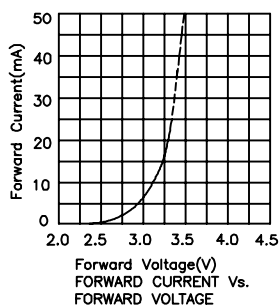
Mega Green

MG : AlGaInP



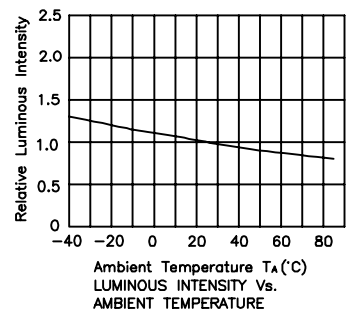
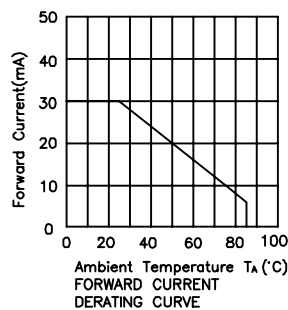
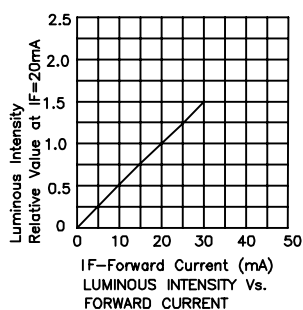
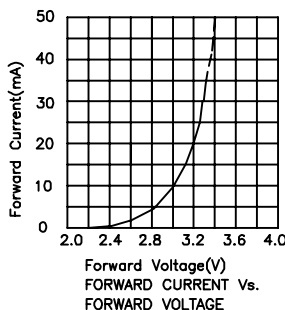
Green

ZG : InGaN



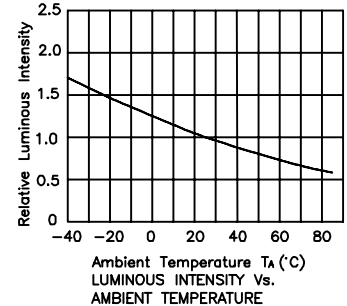
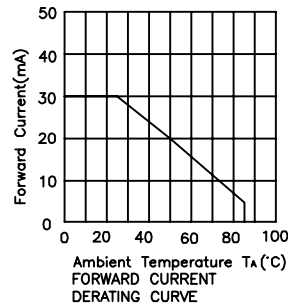
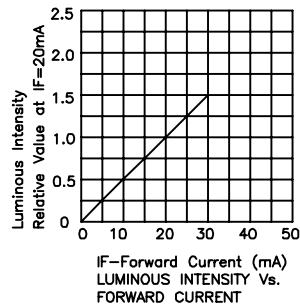
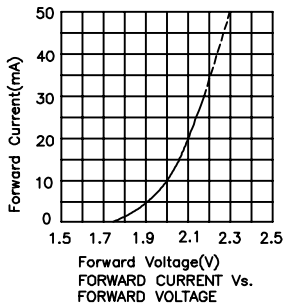
Green

ZG/G : InGaN

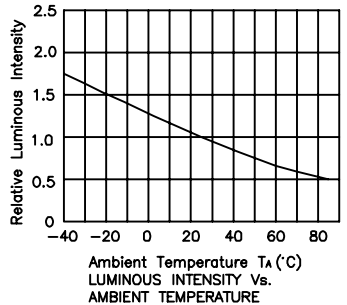
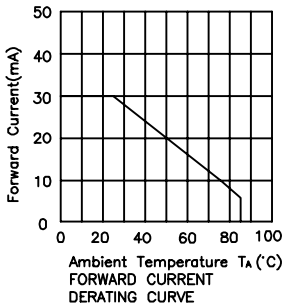
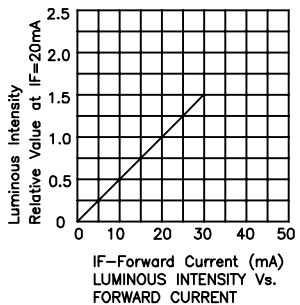
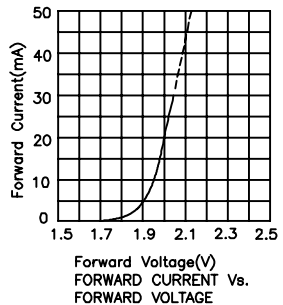


TECHNICAL DATA

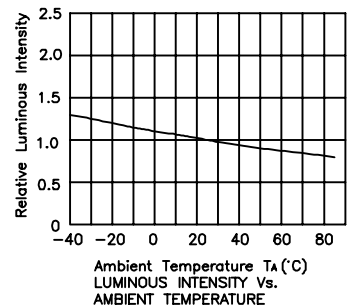
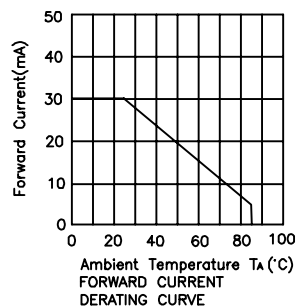
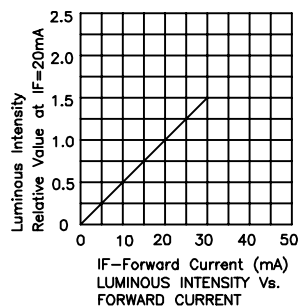
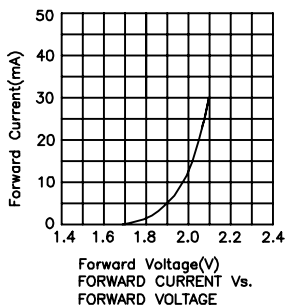
Yellow Y : GaAsP/GaP



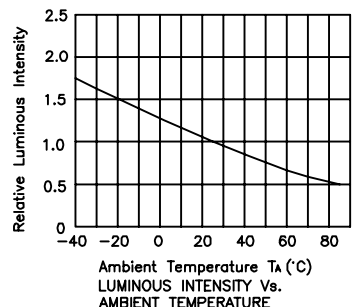
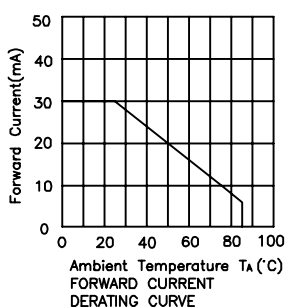
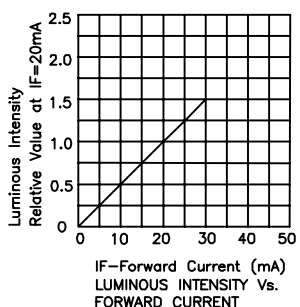
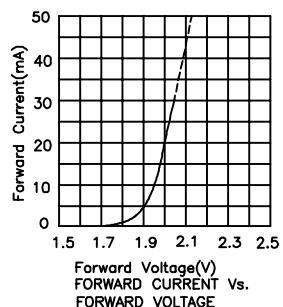
Super Bright Yellow SYK : AlGaInP



Super Bright Yellow SYK/T : AlGaInP



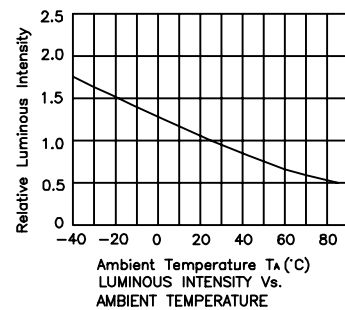
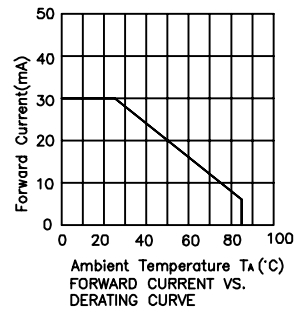
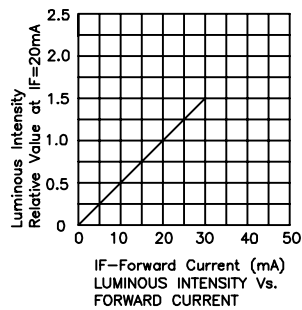
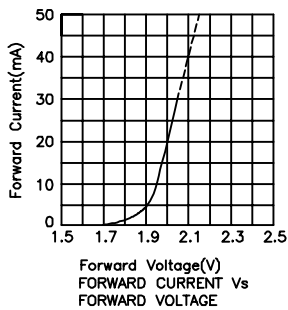
Super Bright Yellow SY : AlGaInP



TECHNICAL DATA

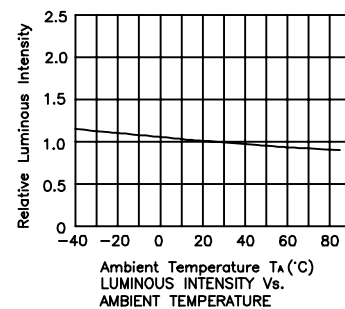
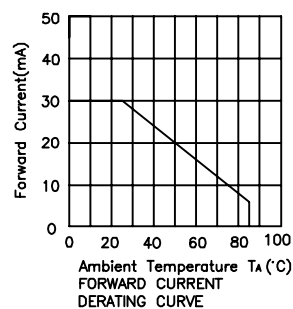
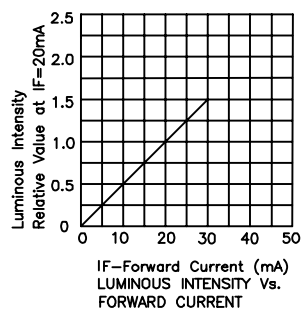
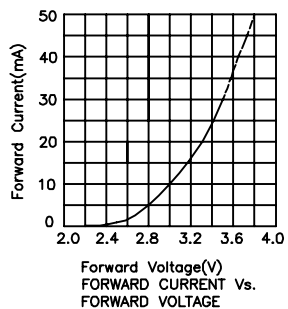
Super Bright Yellow

SY/J3 : AlGaInP



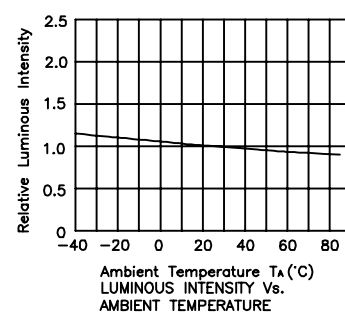
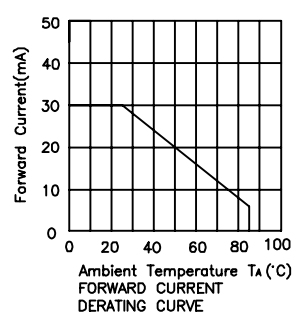
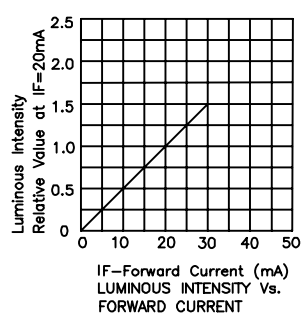
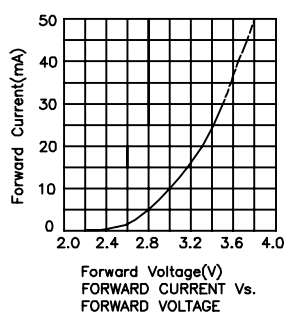
Blue

QB/D: InGaN



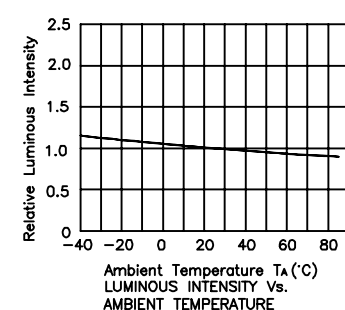
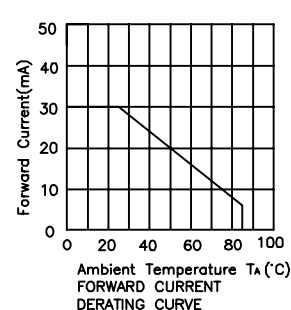
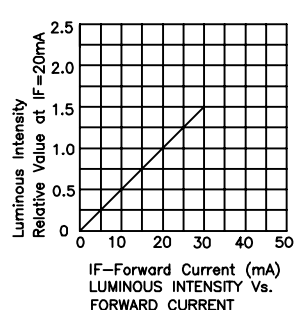
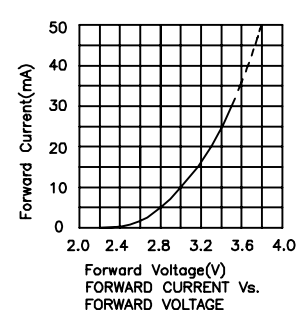
Blue

QB/F: InGaN



Blue

VB/D : InGaN



BIN CODE SYSTEMS

SELECTION CODE FOR STANDARD LEDs (T _A =25°C)					
Group	Light intensity in mcd(10mA)		Group	Light intensity in mcd(10mA)	
	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)					
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)					
Group	Radiant intensity in mW/sr(20mA)		Group	Radiant intensity in mW/sr(20mA)	
	Min.	Max.		Min.	Max.
AK	0.8	1.2	D	8	12
AL	1.2	2	E	12	20
A	2	3	F	20	40
B	3	5	G	40	55
C	5	8	H	55	80

SELECTION CODE FOR SUPER BRIGHT LEDs (T _A =25°C)					
Group	Light intensity in mcd(20mA)		Group	Light intensity in mcd(20mA)	
	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)					
Group	Light intensity in ucd(10mA)		Group	Light intensity in ucd(10mA)	
	Min.	Max.		Min.	Max.
C	70	140	P	14000	21000
D	140	240	Q	21000	31000
E	240	360	R	31000	52000
F	360	560	S	52000	88000
G	560	900	T	88000	150000
H	900	1400	U	150000	255000
I	1400	2200	V	255000	433000
K	2200	3600	W	433000	736000
L	3600	5600	X	736000	1251000
M	5600	9000	Y	1251000	2126000
N	9000	14000	Z	2126000	3614000

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	510	515
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
PHOTOCOUPLER	<=260°C	3s	>2mm	<=310°C	3s	-
	-	-	-	<=260°C	10s	-

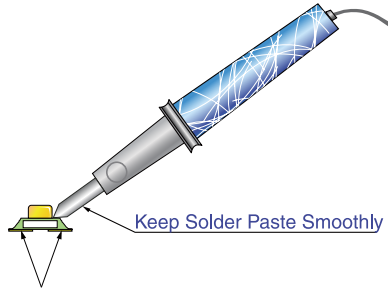
INDEX

AA2214 SERIES.....	P-5	CC56-11 SERIES.....	P-42	SA39-12 SERIES.....	P-35	WP1533AA/ SERIES.....	P-61
AA2810A SERIES.....	P-10	DA03-11 SERIES.....	P-39	SA40-18 SERIES.....	P-39	WP1533AA/xx14V SERIES.....	P-61
AA3021 SERIES.....	P-5	DA04-11 SERIES.....	P-40	SA40-19 SERIES.....	P-39	WP1533BQ/ SERIES.....	P-55
AA3528 SERIES.....	P-5	DA08-11 SERIES.....	P-41	SA43-11 SERIES.....	P-36	WP154A4 SERIES.....	P-27
AA3528F3S.....	P-63	DA56-11 SERIES.....	P-40	SA43-13 SERIES.....	P-36	WP169X SERIES.....	P-23
AA3528P3S.....	P-65	DA56-51 SERIES.....	P-41	SA52-11 SERIES.....	P-37	WP36B SERIES.....	P-29
AA3528SF4S-R.....	P-63	DC03-11 SERIES.....	P-39	SA56-11 SERIES.....	P-37	WP383 SERIES.....	P-24
AA3535 SERIES.....	P-3	DC04-11 SERIES.....	P-40	SA56-21 SERIES.....	P-37	WP3A10 SERIES.....	P-20
AA4040 SERIES.....	P-10	DC08-11 SERIES.....	P-41	SC03-12 SERIES.....	P-35	WP3DP3BT.....	P-65
AAAF3528QBFSEJ3ZGW.....	P-14	DC10 SERIES.....	P-48	SC04-11 SERIES.....	P-36	WP3V SERIES.....	P-26
AAAF5051-03.....	P-3	DC56-11 SERIES.....	P-40	SC04-12 SERIES.....	P-36	WP4060 SERIES.....	P-19
ACDX02-41xxx-F01 SERIES.....	P-31	DC56-51 SERIES.....	P-41	SC05-11 SERIES.....	P-36	WP4060VH/2 SERIES.....	P-56
ACDX03-41xxx-F01 SERIES.....	P-31	DE2 SERIES.....	P-49	SC08-11 SERIES.....	P-37	WP4060XH/3 SERIES.....	P-59
ACDX04-41xxx-F01 SERIES.....	P-32	DE4 SERIES.....	P-49	SC08-12 SERIES.....	P-37	WP424 SERIES.....	P-25
ACDX56-41xxx-F01 SERIES.....	P-32	DF3 SERIES.....	P-49	SC08-21 SERIES.....	P-38	WP42WUM/ SERIES.....	P-54
ACPSX04-41 SERIES.....	P-33	KB2300EW.....	P-50	SC10-11 SERIES.....	P-38	WP483 SERIES.....	P-25
ACPSX04-41 SERIES.....	P-33	KB2350EW.....	P-50	SC10-21 SERIES.....	P-38	WP503 SERIES.....	P-24
ACPSX04-41 SERIES.....	P-33	KB2400YW.....	P-50	SC23-11 SERIES.....	P-38	WP513 SERIES.....	P-24
ACPSX04-41xxx-F01 SERIES.....	P-32	KB2450YW.....	P-50	SC23-12 SERIES.....	P-38	WP5603 SERIES.....	P-23
ACPSX08-51 SERIES.....	P-33	KB2500SGD.....	P-50	SC36-11 SERIES.....	P-35	WP56B SERIES.....	P-29
ACPSX56-41xxx-F01 SERIES.....	P-32	KB2550SGD.....	P-50	SC39-11 SERIES.....	P-35	WP57 SERIES.....	P-26
AM23ESGx SERIES.....	P-13	KB2600EW.....	P-50	SC39-12 SERIES.....	P-35	WP59 SERIES.....	P-27
AM23xxx-F SERIES.....	P-17	KB2620EW.....	P-51	SC40-18 SERIES.....	P-39	WP59BL/ SERIES.....	P-56
AM2520xxx03 SERIES.....	P-15	KB2635EW.....	P-51	SC40-19 SERIES.....	P-39	WP59CB/ SERIES.....	P-56
AM2520xxx09 SERIES.....	P-15	KB2655EW.....	P-50	SC43-11 SERIES.....	P-36	WP63 SERIES.....	P-22
AM27xxx03 SERIES.....	P-16	KB2670EW.....	P-51	SC43-13 SERIES.....	P-36	WP7083 SERIES.....	P-22
AM27xxx09 SERIES.....	P-16	KB2685EW.....	P-51	SC52-11 SERIES.....	P-37	WP7104ALUP/2 SERIES.....	P-60
APA1606 SERIES.....	P-9	KB2700YW.....	P-50	SC56-11 SERIES.....	P-37	WP710A10 SERIES.....	P-19
APA2106 SERIES.....	P-9	KB2720YW.....	P-51	SC56-21 SERIES.....	P-37	WP710A10F3C.....	P-64
APA3010-GX SERIES.....	P-10	KB2735YW.....	P-51	TA07-11 SERIES.....	P-44	WP710A10L SERIES.....	P-29
APA3010F3C-GX.....	P-63	KB2755YW.....	P-50	TA12-11 SERIES.....	P-45	WP710A10SF4C.....	P-64
APA3010P3BT-GX.....	P-65	KB2770YW.....	P-51	TA15-11 SERIES.....	P-47	WP710A10xxx14V SERIES.....	P-28
APB3025-F01 SERIES.....	P-13	KB2785YW.....	P-51	TA20-11 SERIES.....	P-46	WP710A10xxx5V SERIES.....	P-28
APBA3010-GX SERIES.....	P-12	KB2800SGD.....	P-50	TBA12-11 SERIES.....	P-45	WP7113 SERIES.....	P-20
APBD3224-F01 SERIES.....	P-14	KB2820SGD.....	P-51	TBA12-12 SERIES.....	P-45	WP7113 SERIES.....	P-21
APBDA3020-GX SERIES.....	P-13	KB2835SGD.....	P-51	TBA12-22 SERIES.....	P-45	WP7113F3C.....	P-64
APBL3025-F01 SERIES.....	P-13	KB2855SGD.....	P-50	TBA20-11 SERIES.....	P-46	WP7113L SERIES.....	P-29
APD3224-F01 SERIES.....	P-9	KB2870SGD.....	P-51	TBA20-12 SERIES.....	P-46	WP7113P3BT.....	P-65
APETD3528 SERIES.....	P-9	KB2885SGD.....	P-51	TBA20-22 SERIES.....	P-46	WP7113SF4C.....	P-64
APF3236 SERIES.....	P-14	KB-A100SRW.....	P-50	TBA24-11 SERIES.....	P-47	WP7113SRSGW.....	P-26
APFA3010 SERIES.....	P-12	KB-B100SRW.....	P-50	TBA24-22 SERIES.....	P-47	WP7113xxx14V SERIES.....	P-28
APG1608 SERIES.....	P-6	KB-C100SRW.....	P-50	TBC12-11 SERIES.....	P-45	WP7113xxx5V SERIES.....	P-28
APHB1608 SERIES.....	P-11	KB-D100SRW.....	P-50	TBC12-12 SERIES.....	P-45	WP7143 SERIES.....	P-22
APHBM2012 SERIES.....	P-12	KB-E100SRW.....	P-51	TBC12-22 SERIES.....	P-45	WP73EB/2 SERIES.....	P-58
APHCM2012-F01 SERIES.....	P-7	KB-F100SRW.....	P-51	TBC20-11 SERIES.....	P-46	WP73JB/ SERIES.....	P-55
APHHS1005 SERIES.....	P-6	KB-G100SRW.....	P-51	TBC20-12 SERIES.....	P-46	WP793 SERIES.....	P-22
APL3015-F01 SERIES.....	P-7	KB-H100SRW.....	P-51	TBC20-22 SERIES.....	P-46	WP799EGW.....	P-27
APT1608 SERIES.....	P-6	PSA05-11 SERIES.....	P-43	TBC24-11 SERIES.....	P-47	WP813 SERIES.....	P-22
APT1608F3C.....	P-63	PSA05-12 SERIES.....	P-43	TBC24-22 SERIES.....	P-47	WP819EGW.....	P-27
APT1608SF4C-PRV.....	P-63	PSA08-11 SERIES.....	P-44	TC07-11 SERIES.....	P-44	WP835/2 SERIES.....	P-48
APT2012 SERIES.....	P-7	PSA08-12 SERIES.....	P-44	TC12-11 SERIES.....	P-45	WP914 SERIES.....	P-23
APT2012F3C.....	P-63	PSA39-21 SERIES.....	P-43	TC15-11 SERIES.....	P-47	WP914CK/4 SERIES.....	P-60
APT2012P3BT.....	P-65	PSC05-11 SERIES.....	P-43	TC20-11 SERIES.....	P-46	WP9294 SERIES.....	P-21
APT2012SF4C-PRV.....	P-63	PSC05-12 SERIES.....	P-43	WP1043 SERIES.....	P-48	WP934CA/2-90 SERIES.....	P-56
APT3216 SERIES.....	P-8	PSC08-11 SERIES.....	P-44	WP113 SERIES.....	P-24	WP934CB/ SERIES.....	P-53
APTB1612-F01 SERIES.....	P-11	PSC08-12 SERIES.....	P-44	WP115V SERIES.....	P-25	WP934EB/2 SERIES.....	P-57
APTB1615-F01 SERIES.....	P-11	PSC39-21 SERIES.....	P-43	WP115W SERIES.....	P-26	WP934EW/ SERIES.....	P-53
APTD1608 SERIES.....	P-6	SA03-11 SERIES.....	P-35	WP117 SERIES.....	P-28	WP934FG/2 SERIES.....	P-57
APTD3216 SERIES.....	P-8	SA04-11 SERIES.....	P-36	WP119EGWT.....	P-28	WP934GE/2 SERIES.....	P-57
APTF1616 SERIES.....	P-12	SA04-12 SERIES.....	P-36	WP130WCP/2 SERIES.....	P-58	WP934GO/2 SERIES.....	P-57
APTF3216 SERIES.....	P-14	SA05-11 SERIES.....	P-36	WP130WDT/ SERIES.....	P-54	WP934MD/2 SERIES.....	P-58
APTL3216 SERIES.....	P-8	SA08-11 SERIES.....	P-37	WP132X SERIES.....	P-20	WP934PJ/3 SERIES.....	P-59
APTR3216 SERIES.....	P-17	SA08-12 SERIES.....	P-37	WP1384AD/ SERIES.....	P-54	WP934RS/ SERIES.....	P-53
AT2520-350MA SERIES.....	P-3	SA08-21 SERIES.....	P-38	WP1384AL/ SERIES.....	P-54	WP934RZ/3 SERIES.....	P-59
AT3228-RV SERIES.....	P-3	SA10-11 SERIES.....	P-38	WP138A8QMP/1 SERIES.....	P-61	WP934SA/3 SERIES.....	P-59
BA56-11 SERIES.....	P-42	SA10-21 SERIES.....	P-38	WP144 SERIES.....	P-23	WP934SB/4 SERIES.....	P-60
BA56-12 SERIES.....	P-42	SA23-11 SERIES.....	P-38	WP1503 SERIES.....	P-21	WP934ZH/ SERIES.....	P-53
BC56-11 SERIES.....	P-42	SA23-12 SERIES.....	P-38	WP1503CB/ SERIES.....	P-55	WP937 SERIES.....	P-25
BC56-12 SERIES.....	P-42	SA36-11 SERIES.....	P-35	WP1503EB/2 SERIES.....	P-58		
CA56-11 SERIES.....	P-42	SA39-11 SERIES.....	P-35	WP150A9VS/ SERIES.....	P-55		

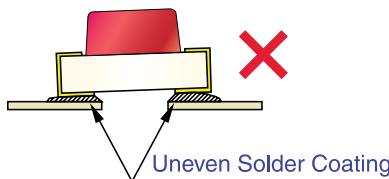
APPLICATION NOTES

General Notes

1. We recommend manual soldering operations only for repair and rework purposes. The soldering iron should not exceed 30W in power. 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 (425nm), blue-green (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.



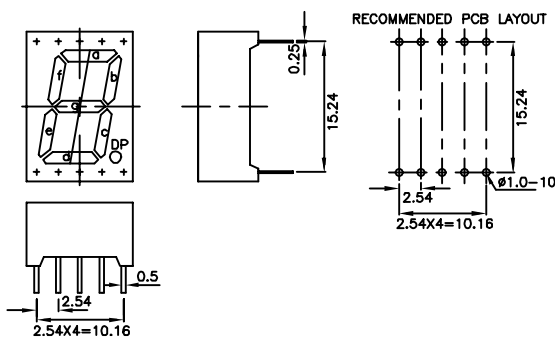
2. The tip of the soldering iron should never touch the lens epoxy.
3. Do not apply stress to the leads when the component is heated above 85°C, otherwise internal wire bonds may be damaged.
4. Through-hole LEDs are incompatible with reflow soldering.
5. If the LED will undergo multiple soldering passes 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 :

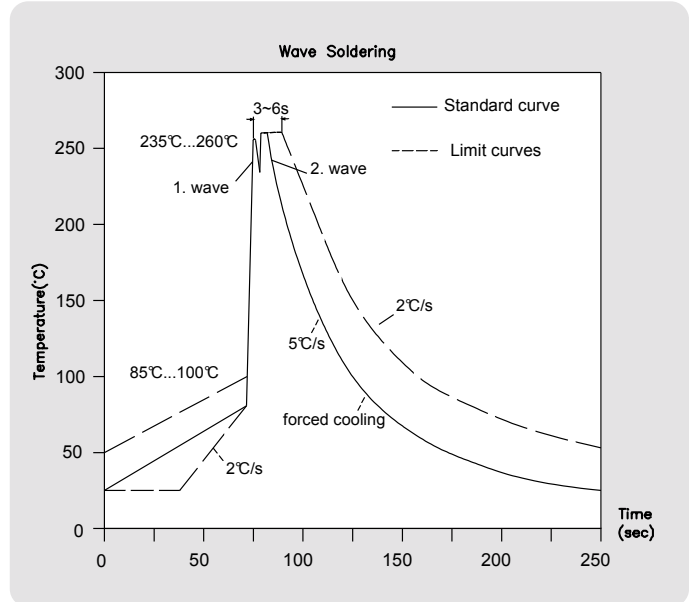
Round pin type : 2 x pin diameters

Square pin type :

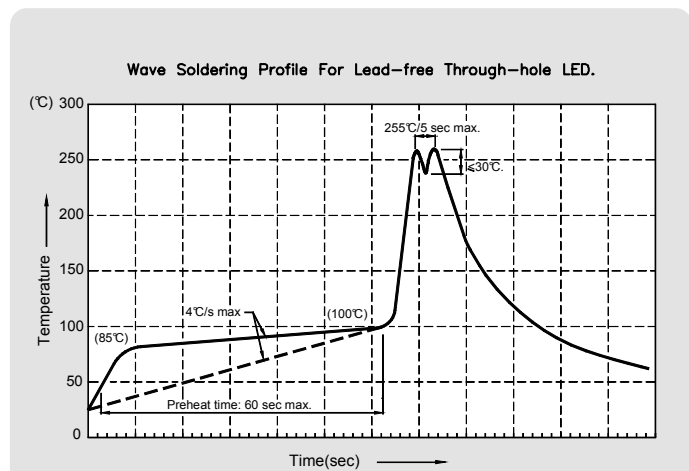


Recommended Wave Soldering Profiles For Kingbright Through-Hole Products

1. Wave Soldering Profile With Pb-Sn Solder



2. Lead-Free Wave Soldering Profile



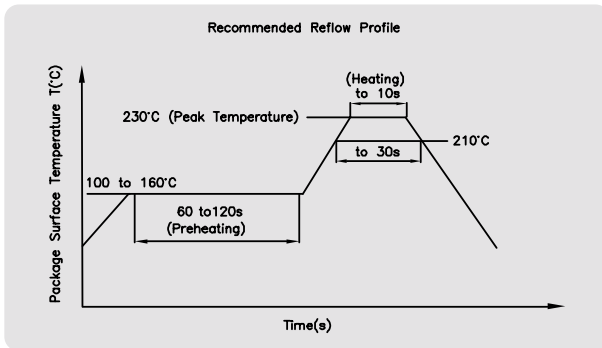
Notes:

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

Recommended Reflow Soldering Profiles For Kingbright SMD Products

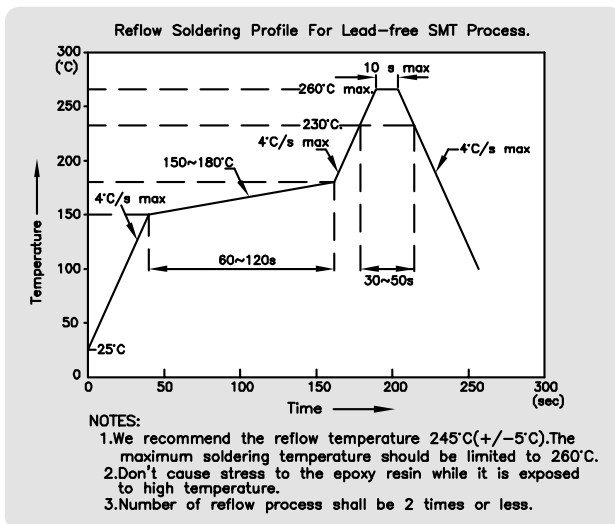
1. Reflow Soldering Profiles With Pb-Sn Solder

No more than two soldering passes with the recommended profile.



2. Lead-Free Reflow Soldering Profile

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.

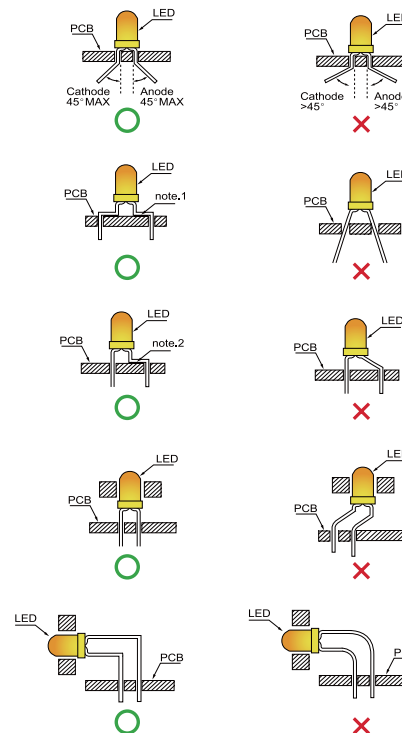
ESD Protection During Production

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 production machinery and test instruments must be electrically grounded.
3. Operators must wear anti-static bracelets.
4. Wear anti-static suit when entering work areas with conductive machinery.
5. Set up ESD protection areas using grounded metal plating for component handling.
6. All workstations that handle IC and ESD-sensitive components must maintain an electrostatic potential of 150V or less.
7. Maintain a humidity level of 50% or higher in production areas.
8. Use anti-static packaging for transport and storage.
9. 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.



"O" Correct mounting method
 "X" Incorrect mounting method
 Note 1-2 : Do not route PCB trace in the contact area between the leadframe and the PCB to prevent short-circuits.

- When soldering wire to the LED, use individual heat-shrink tubing to insulate the exposed leads to prevent accidental contact short-circuit. (Fig.2)

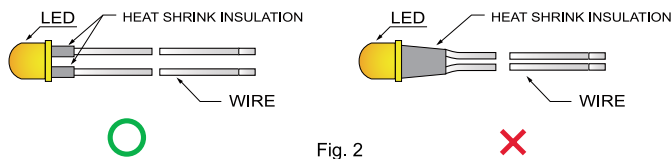


Fig. 2

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

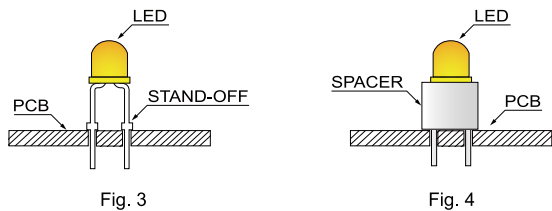


Fig. 3

Fig. 4

Lead Forming Procedures

- Maintain a minimum of 2mm clearance between the base of the LED lens and the first lead bend. (Fig. 5 and 6)

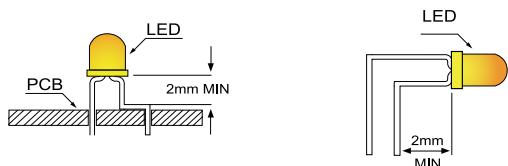


Fig. 5

Fig. 6

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

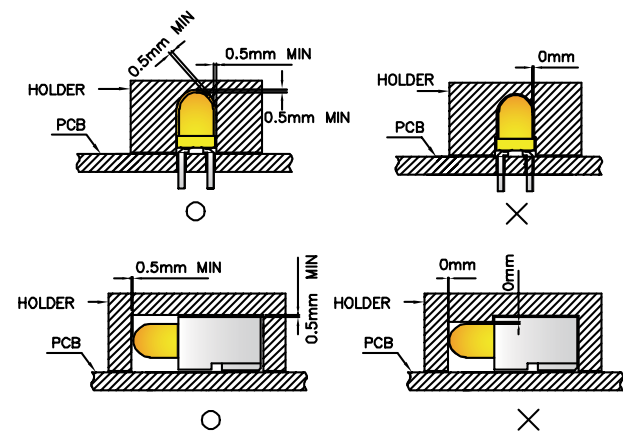


Fig. 7

- 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)

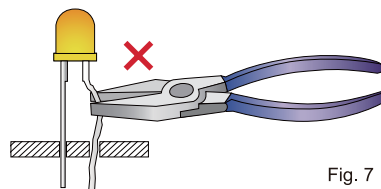


Fig. 7

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

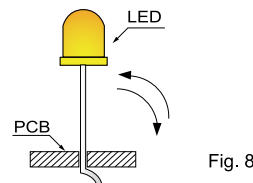


Fig. 8

- 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.

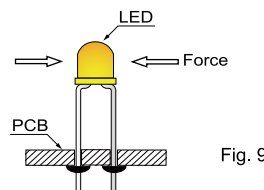


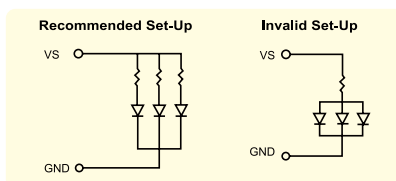
Fig. 9

Cleaning

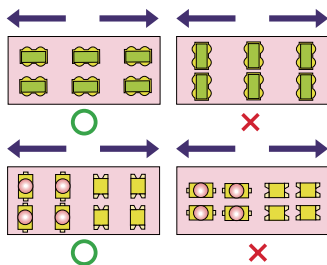
- Do not use harsh organic solvents such as trichloroethylene, acetone, Chlorosen, and Diflon S3MC for cleaning because they may cloud or damage the LED lens.
- Isopropyl alcohol or deionized water are recommended solvents for cleaning.
- Special attention should be taken if other chemicals are used for cleaning because other solvents may damage the epoxy in the lens or housing.
- The cleaning process should take place at room temperature and the devices should not be washed for more than one minute.
- When water is used for cleaning, immediately use forced-air drying to remove excess moisture from the LED.

Miscellaneous Design Notes

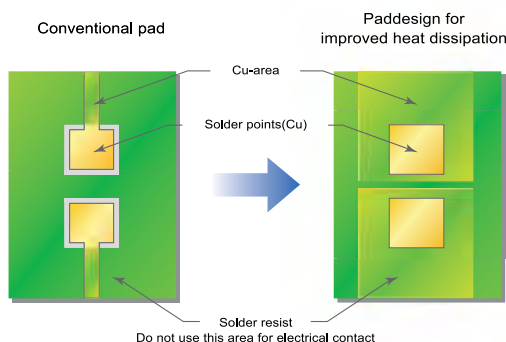
- Protective current-limiting resistors may be necessary to operate the LEDs within the specified range.
- LEDs mounted in parallel should each be placed in series with its own current-limiting resistor.



- The driving circuit should be designed to avoid reverse voltages and transient voltage spikes when the circuit is powered up or shut down.
- During soldering, SMD components should be mounted such that the leads are placed perpendicular to the direction of PCB travel to insure the solder on each lead melts simultaneously during reflow.



- 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.

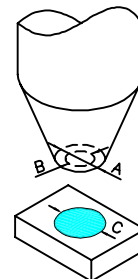


- High temperatures can reduce device performance and reliability. Keep LED devices away from heat source for best performance.

Restrictions on Product Use

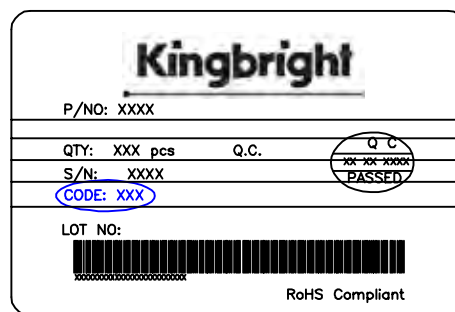
- The information contained within this document is subject to change without notice. Before referencing this document, please confirm it is the most current version available.
- Not all devices and product families are available in every country.
- The light output from UV, blue, white, and other high-power LEDs may cause injury to the human eye when viewed directly.
- 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.
- 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.

- The outer diameter of the SMD pick-up nozzle should not exceed the size of the LED to prevent air leaks. The inner diameter of the nozzle should be as large as possible.



A is the outer diameter of the nozzle
 B is the inner diameter of the nozzle
 C is the window size of the LED

- The size of the nozzle should be as large as possible if the tape is not involved.
- It is not recommended to assemble LEDs with different color bins 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 shown below.



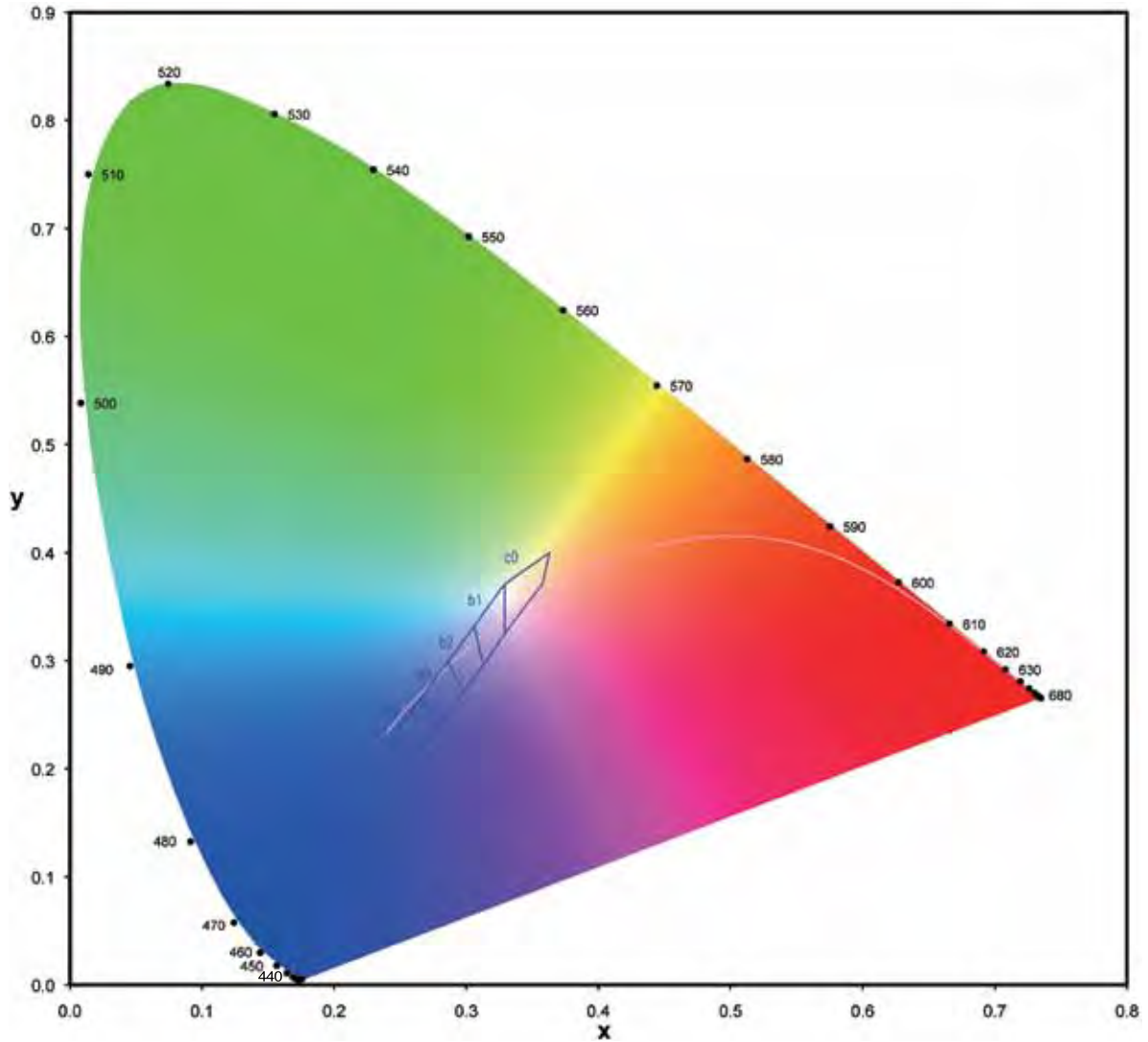
Storage Control

- 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.
- Once MBB is opened, all contained LEDs shall complete soldering process within the specified time frame according to the conditions labeled on Kingbright MBB.
- When the 10% spot of a humidity indicator card (HIC) from MBB indicates wet, the contained LEDs shall be baked according to the baking conditions labeled on Kingbright MBB before mounting.

Soldering

If LEDs will undergo multiple soldering passes or special processes where LEDs may be subjected to intense heat, please check with Kingbright for compatibility before proceeding.

White Bin Code



Bin	x	y
a2	0.263	0.213
	0.282	0.245
	0.265	0.265
	0.242	0.226
CCT: 15000K~		

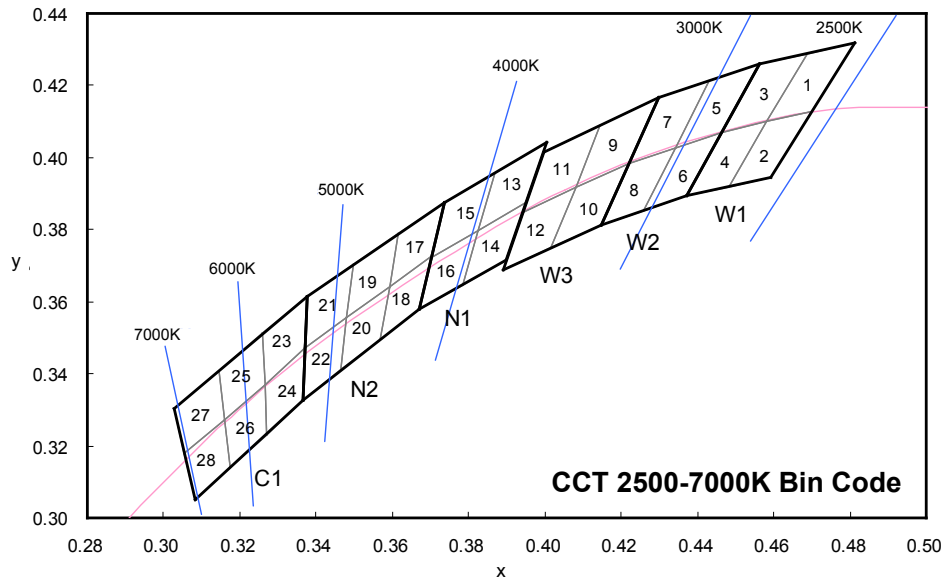
Bin	x	y
b2	0.298	0.271
	0.313	0.296
	0.306	0.332
	0.286	0.299
CCT: 6800~9000K		

Bin	x	y
c0	0.329	0.325
	0.358	0.372
	0.363	0.400
	0.329	0.371
CCT: 4600~5600K		

Bin	x	y
a0	0.282	0.245
	0.298	0.271
	0.286	0.299
	0.265	0.265
CCT: 9000~15000K		

Bin	x	y
b1	0.313	0.296
	0.329	0.325
	0.329	0.371
	0.306	0.332
CCT: 5600~6800K		

CIE CHROMATICITY DIAGRAM



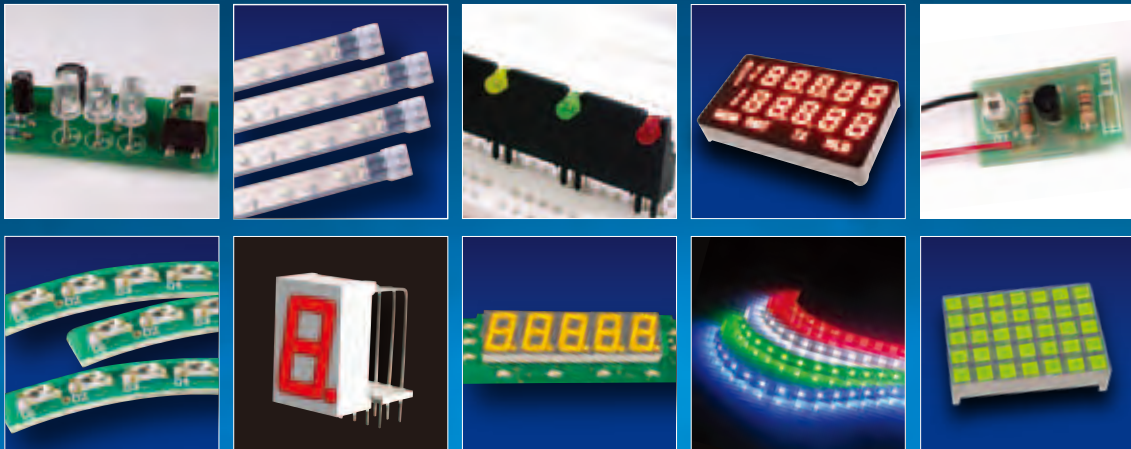
Group	Chromaticity Regions	CCT (K)		
		Min.	Typ.	Max.
W1	1, 2, 3, 4	2580	2700	2870
W2	5, 6, 7, 8	2870	3000	3220
W3	9, 10, 11, 12	3220	3500	3710

Group	Chromaticity Regions	CCT (K)		
		Min.	Typ.	Max.
N1	13, 14, 15, 16	3710	4000	4260
N2	17, 18, 19, 20, 21, 22	4260	4700	5310
C1	23, 24, 25, 26, 27, 28	5310	6000	7040

	x	y		x	y		x	y		x	y
1	0.4582	0.4099	8	0.4147	0.3814	15	0.3702	0.3722	22	0.3481	0.3557
	0.4687	0.4289		0.4221	0.3984		0.3736	0.3874		0.3370	0.3472
	0.4813	0.4319		0.4342	0.4028		0.3869	0.3958		0.3364	0.3328
	0.4700	0.4126		0.4259	0.3853		0.3825	0.3798		0.3466	0.3411
2	0.4483	0.3919	9	0.4080	0.3916	16	0.3670	0.3578	23	0.3376	0.3616
	0.4582	0.4099		0.4146	0.4089		0.3702	0.3722		0.3260	0.3512
	0.4700	0.4126		0.4299	0.4165		0.3825	0.3798		0.3265	0.3371
	0.4593	0.3944		0.4221	0.3984		0.3783	0.3646		0.3370	0.3472
3	0.4465	0.4071	10	0.4017	0.3751	17	0.3736	0.3874	24	0.3370	0.3472
	0.4562	0.4260		0.4080	0.3916		0.3616	0.3788		0.3265	0.3371
	0.4687	0.4289		0.4221	0.3984		0.3592	0.3641		0.3270	0.3230
	0.4582	0.4099		0.4147	0.3814		0.3703	0.3726		0.3364	0.3328
4	0.4373	0.3893	11	0.3941	0.3848	18	0.3703	0.3726	25	0.3260	0.3512
	0.4465	0.4071		0.3996	0.4015		0.3592	0.3641		0.3144	0.3408
	0.4582	0.4099		0.4146	0.4089		0.3568	0.3495		0.3160	0.3274
	0.4483	0.3919		0.4080	0.3916		0.3670	0.3578		0.3265	0.3371
5	0.4342	0.4028	12	0.3889	0.3690	19	0.3616	0.3788	26	0.3265	0.3371
	0.4430	0.4212		0.3941	0.3848		0.3496	0.3702		0.3160	0.3274
	0.4562	0.4260		0.4080	0.3916		0.3481	0.3557		0.3175	0.3139
	0.4465	0.4071		0.4017	0.3751		0.3592	0.3641		0.3270	0.3230
6	0.4259	0.3853	13	0.3825	0.3798	20	0.3592	0.3641	27	0.3144	0.3408
	0.4342	0.4028		0.3869	0.3958		0.3481	0.3557		0.3028	0.3304
	0.4465	0.4071		0.4006	0.4044		0.3466	0.3411		0.3055	0.3177
	0.4373	0.3893		0.3950	0.3875		0.3568	0.3495		0.3160	0.3274
7	0.4221	0.3984	14	0.3783	0.3646	21	0.3496	0.3702	28	0.3160	0.3274
	0.4299	0.4165		0.3825	0.3798		0.3376	0.3616		0.3055	0.3177
	0.4430	0.4212		0.3950	0.3875		0.3370	0.3472		0.3081	0.3049
	0.4342	0.4028		0.3898	0.3716		0.3481	0.3557		0.3175	0.3139

Kingbright

Custom Assembly LEDs



Kingbright offers full custom LED options in package with your desired shape, form, color that will further enhance your design solutions. If you have further LED design objectives or specialized requirement to meet, please contact us at 909-468-0500 or email to sales@KingbrightUSA.com

For comprehensive product selections, please visit our online store at www.KingbrightUSA.com, a streamlined process operating 24/7 online.



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 **QUALITY**  **EFFICIENCY**  **SERVICE**  **INNOVATION**



Kingbright KINGBRIGHT CORPORATION



www.KingbrightUSA.com

sales@KingbrightUSA.com

909.468.0500 tel 909.468.0505 fax

225 Brea Canyon Road, City of Industry, CA 91789-3077, U.S.A.