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Optoelectronic Components

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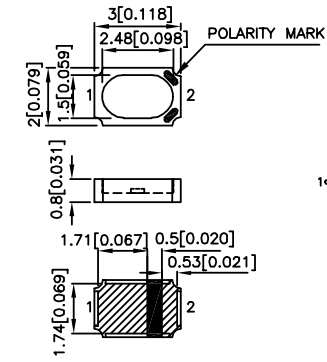
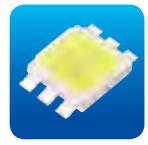
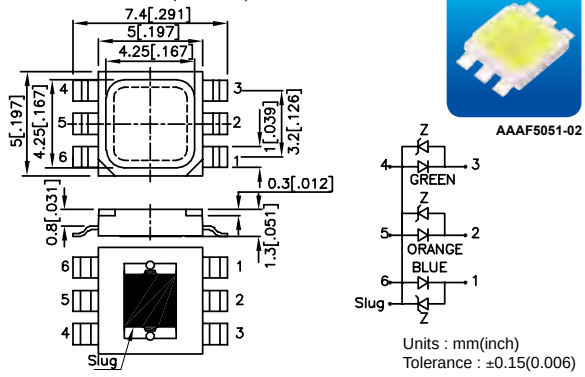
0.5W HIGH BRIGHTNESS LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @120mA * Φv (lm) @150mA MIN.	Iv (mcd) @120mA * Φv (lm) @150mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
AT3020SEL1ZS-RV	AlGaInP	618	water clear	-	*9	120°	3 0mm x 2.0mm x 0.8mm
AT3020SYL1ZS-RV	AlGaInP	590	water clear	-	*7.5	120°	
AT3020ZG24ZS-RV	AlGaInN	525	water clear	-	*18	120°	
AT3020QB24ZS-RV	AlGaInN	457	water clear	-	*4	120°	
AAAF5051-02	AlGaInN	457	water clear	900	1450	120°	5 0mm x 5.0mm x 1.3mm (Full Color)
	AlGaInP	624		2500	4000		
	AlGaInN	525		3800	4900		

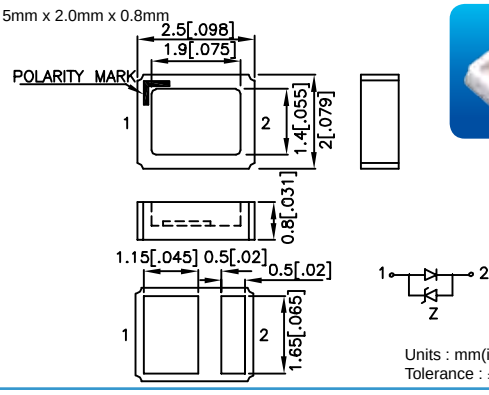


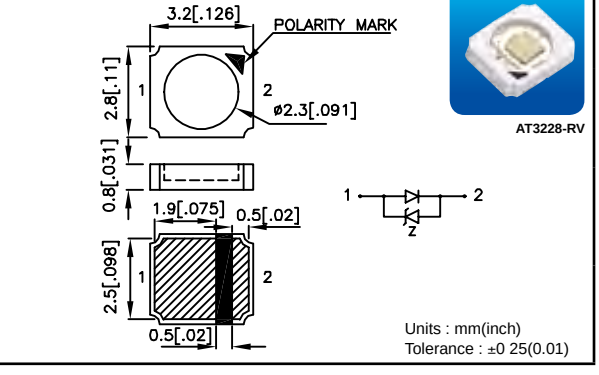




1W HIGH BRIGHTNESS LED

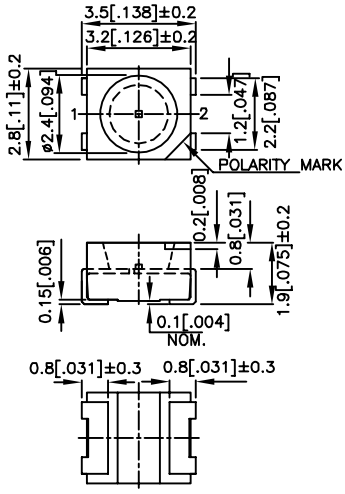
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Φv (lm) @ 350mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
AT2520SE9ZS-350MA	AlGaInP	623	water clear	18	130°	2 5mm x 2.0mm x 0.8mm
AT2520SY9ZS-350MA	AlGaInP	591	water clear	16	130°	
AT2520ZG10ZS-350MA	AlGaInN	530	water clear	45	120°	
AT2520QB10ZS-350MA	AlGaInN	458	water clear	13	120°	
AT3228SE9ZS-RV	AlGaInP	623	water clear	18	120°	3 2mm x 2.8mm x 0.8mm
AT3228SY9ZS-RV	AlGaInP	591	water clear	14	120°	
AT3228ZG10ZS-RV	AlGaInN	530	water clear	50	120°	
AT3228QB10ZS-RV	AlGaInN	458	water clear	13	120°	

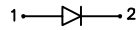




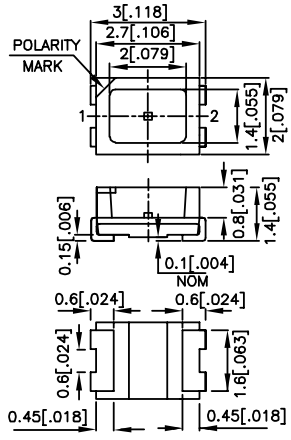
TOP-EMITTING PLCC SMD LED

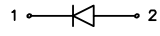
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
AA3528AEC	GaAsP/GaP	625	water clear	7	30	120°	3.5mm x 2.8mm
AA3528ASRC-RV	GaAlAs	640	water clear	50	150	120°	
AA3528ASURCK	AlGaInP	630	water clear	70	250	120°	
AA3528ASECK	AlGaInP	601	water clear	70	300	120°	
AA3528AYC	GaAsP/GaP	588	water clear	4	15	120°	
AA3528ASYCK	AlGaInP	590	water clear	50	180	120°	
AA3528ASGC	GaP	568	water clear	10	25	120°	
AA3528AMGC	AlGaInP	570	water clear	70	150	120°	
AA3528ACGCK	AlGaInP	570	water clear	18	60	120°	
AA3528AZGC	InGaN	525	water clear	380	600	120°	
AA3528AVGC/A	InGaN	525	water clear	110	220	120°	
AA3528AVGC/Z-R	InGaN	535	water clear	480	950	120°	
AA3528AQBC/D	AlGaInN	470	water clear	70	200	120°	
AA3528APBC/A	InGaN	470	water clear	18	60	120°	
AA3528APBS/Z-R	InGaN	465	water clear	180	350	120°	
AA3020AEC	GaAsP/GaP	625	water clear	7	20	90°	3.0mm x 2.0mm (1108)
AA3020ASRC-RV	GaAlAs	640	water clear	36	120	90°	
AA3020ASURCK	AlGaInP	630	water clear	70	200	90°	
AA3020ASECK	AlGaInP	601	water clear	70	250	90°	
AA3020AYC	GaAsP/GaP	588	water clear	4	15	90°	
AA3020ASYCK	AlGaInP	590	water clear	50	180	90°	
AA3020ASGC	GaP	568	water clear	7	30	90°	
AA3020AMGC	AlGaInP	570	water clear	36	80	90°	
AA3020ACGCK	AlGaInP	570	water clear	18	60	90°	
AA3020AZGC	InGaN	525	water clear	180	500	90°	
AA3020AVGC/A	InGaN	525	water clear	70	150	90°	
AA3020AVGC/Z-R	InGaN	535	water clear	650	1000	90°	
AA3020AQBC/D	AlGaInN	470	water clear	70	160	90°	
AA3020APBC/A	InGaN	470	water clear	18	60	90°	
AA3020APBC/Z-R	InGaN	465	water clear	110	280	120°	
AA3022EC-4.5SF	GaAsP/GaP	625	water clear	7	30	90°	3.0mm x 2.2mm
AA3022SRC-4.5SF	GaAlAs	640	water clear	36	150	90°	
AA3022YC-4.5SF	GaAsP/GaP	588	water clear	4	10	90°	
AA3022SGC-4.5SF	GaP	568	water clear	7	20	90°	



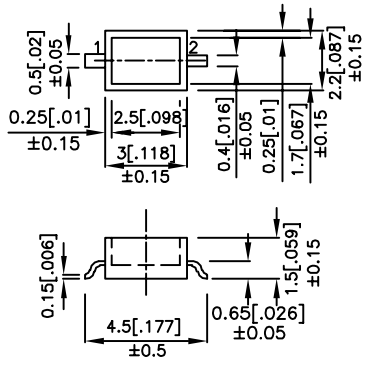


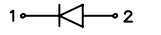
Units : mm(inch)
Tolerance : ±0.25(0.01)

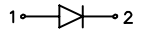




Units : mm(inch)
Tolerance : ±0.25(0.01)





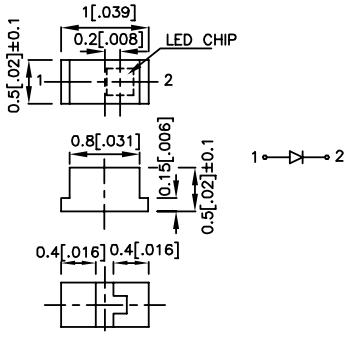


AA3022SRC-4.5SF

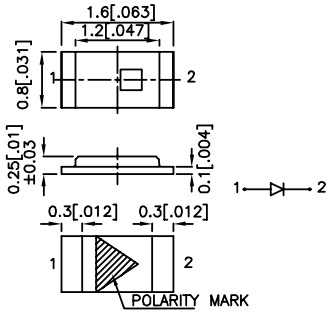
Units : mm(inch)
Tolerance : ±0.25(0.01)

TOP-EMITTING CHIP SMD LED

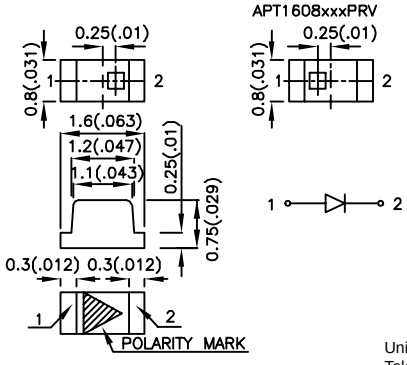
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APHHS1005SURCK	AlGaInP	630	water clear	70	220	120°	1.0mm x 0.5mm x 0.5mm (0402)
APHHS1005SECK	AlGaInP	601	water clear	70	240	120°	
APHHS1005SYCK	AlGaInP	590	water clear	50	150	120°	
APHHS1005CGCK	AlGaInP	570	water clear	10	40	120°	
APHHS1005VGC/A	InGaN	525	water clear	50	180	120°	
APHHS1005PBC/A	InGaN	470	water clear	18	60	120°	
APG1608SURKC/T	AlGaInP	630	water clear	180	320	120°	1.6mm x 0.8mm x 0.25mm (0603 Ultra Thin)
APG1608SEKC/T	AlGaInP	601	water clear	110	200	120°	
APG1608SYKC/T	AlGaInP	590	water clear	70	100	120°	
APG1608CGKC/T	AlGaInP	570	water clear	36	60	120°	
APG1608ZGC	InGaN	525	water clear	280	420	120°	
APG1608VGC/A	InGaN	525	water clear	110	200	120°	
APG1608QBC/D	AlGaInN	470	water clear	50	70	120°	
APG1608PBC/A	InGaN	470	water clear	18	35	120°	
APT1608EC	GaAsP/GaP	625	water clear	4	12	120°	1.6mm x 0.8mm x 0.75mm (0603)
APT1608SRCPRV	GaAlAs	640	water clear	36	100	120°	
APT1608SURCK	AlGaInP	630	water clear	70	220	120°	
APT1608SECK	AlGaInP	601	water clear	70	240	120°	
APT1608YC	GaAsP/GaP	588	water clear	2.6	8	120°	
APT1608SYCK	AlGaInP	590	water clear	50	150	120°	
APT1608SGC	GaP	568	water clear	4	15	120°	
APT1608MGC	AlGaInP	570	water clear	18	70	120°	
APT1608CGCK	AlGaInP	570	water clea	10	40	120°	
APT1608ZGC	InGaN	525	water clear	110	300	120°	
APT1608VGC/A	InGaN	525	water clear	50	180	120°	
APT1608VGC/Z-PRV	InGaN	535	water clear	180	400	120°	
APT1608QBC/D	AlGaInN	470	water clear	50	100	120°	
APT1608PBC/A	InGaN	470	water clear	18	60	120°	
APT1608PBC/Z-PRV-SI	InGaN	465	water clear	70	180	120°	
APT1608MBC	GaN	466	water clear	4	10	120°	
APT2012EC	GaAsP/GaP	625	water clear	4	12	120°	2.0mm x 1.25mm x 0.75mm (0805)
APT2012SRCPRV	GaAlAs	640	water clear	36	100	120°	
APT2012SURCK	AlGaInP	630	water clear	70	220	120°	
APT2012SECK	AlGaInP	601	water clear	70	240	120°	
APT2012YC	GaAsP/GaP	588	water clear	2.6	8	120°	
APT2012SYCK	AlGaInP	590	water clear	50	150	120°	
APT2012SGC	GaP	568	water clear	4	15	120°	
APT2012MGC	AlGaInP	570	water clear	18	70	120°	
APT2012CGCK	AlGaInP	570	water clear	10	40	120°	
APT2012ZGC	InGaN	525	water clear	110	300	120°	
APT2012VGC/A	InGaN	525	water clear	50	180	120°	
APT2012VGC/Z-PRV	InGaN	535	water clear	180	400	120°	
APT2012QBC/D	AlGaInN	470	water clear	50	100	120°	
APT2012PBC/A	InGaN	470	water clear	18	60	120°	
APT2012PBC/Z-PRV-SI	InGaN	465	water clear	70	180	120°	
APT2012MBC	GaN	466	water clear	4	10	120°	



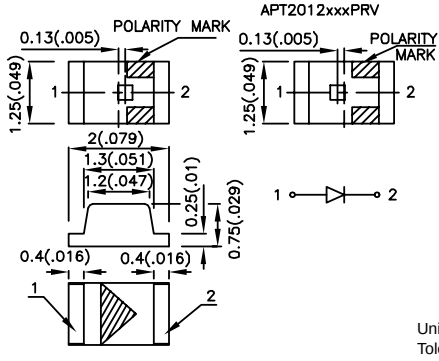
Units : mm(inch)
Tolerance : ±0.1(0.004)



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



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

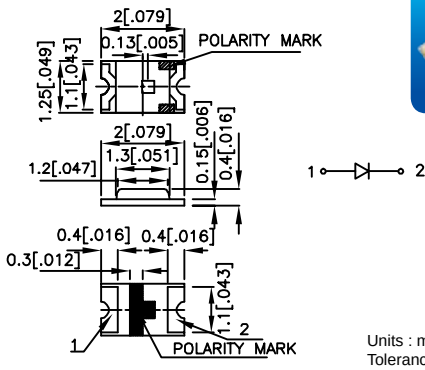


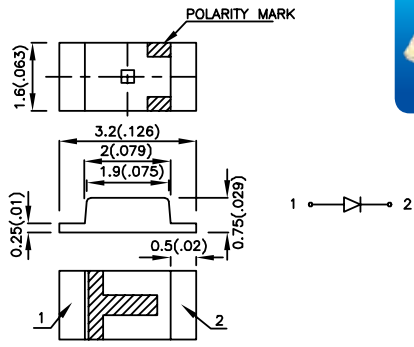
Units : mm(inch)
Tolerance : ±0.1(0.004)

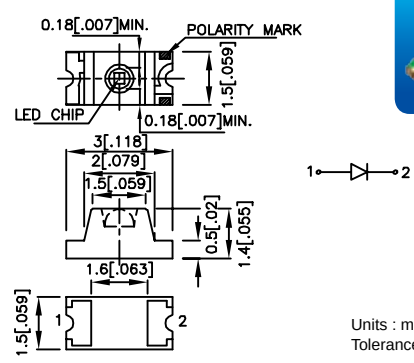
NOTE: 1.AP series custom-made is available upon request.

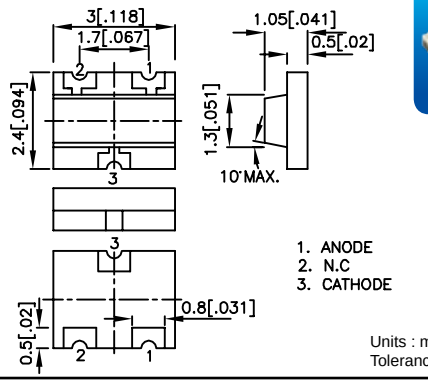
TOP-EMITTING CHIP SMD LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APHCM2012SURCK-F01	AlGaInP	630	water clear	70	220	110°	2.0mm x 1.25mm x 0.4mm (0805 Super Thin)
APHCM2012SECK-F01	AlGaInP	601	water clear	70	240	110°	
APHCM2012SYCK-F01	AlGaInP	590	water clear	50	150	110°	
APHCM2012CGCK-F01	AlGaInP	570	water clear	10	40	110°	
APHCM2012ZGC-F01	InGaN	525	water clear	110	300	110°	
APHCM2012VGC/A-F01	InGaN	525	water clear	50	180	110°	
APHCM2012QBC/D-F01	AlGaInN	470	water clear	50	100	110°	
APHCM2012PBC/A-F01	InGaN	470	water clear	18	60	110°	
APT3216EC	GaAsP/GaP	625	water clear	4	12	120°	3.2mm x 1.6mm x 0.75mm (1206)
APT3216SRCPRV	GaAlAs	640	water clear	36	80	120°	
APT3216SURCK	AlGaInP	630	water clear	70	220	120°	
APT3216SECK	AlGaInP	601	water clear	70	240	120°	
APT3216YC	GaAsP/GaP	588	water clear	2.6	8	120°	
APT3216SYCK	AlGaInP	590	water clear	50	150	120°	
APT3216SGC	GaP	568	water clear	4	15	120°	
APT3216MGC	AlGaInP	570	water clear	18	70	120°	
APT3216CGCK	AlGaInP	570	water clear	10	40	120°	
APT3216ZGC	InGaN	525	water clear	110	300	120°	
APT3216VGC/A	InGaN	525	water clear	50	180	120°	
APT3216VGC/Z-PRV	InGaN	535	water clear	180	400	120°	
APT3216QBC/D	AlGaInN	470	water clear	50	100	120°	
APT3216PBC/A	InGaN	470	water clear	18	60	120°	
APT3216PBC/Z-PRV-SI	InGaN	465	water clear	70	180	120°	
APT3216MBC	GaN	466	water clear	4	10	120°	
APL3015EC-F01	GaAsP/GaP	625	water clear	4	20	70°	3.0mm x 1.5mm x 1.4mm (1106)
APL3015SRCPRV-F01	GaAlAs	640	water clear	50	150	70°	
APL3015SURCK-F01	AlGaInP	630	water clear	280	500	70°	
APL3015SECK-F01	AlGaInP	601	water clear	280	550	70°	
APL3015SYCK-F01	AlGaInP	590	water clear	110	300	70°	
APL3015SGC-F01	GaP	568	water clear	4	20	70°	
APL3015MGC-F01	AlGaInP	570	water clear	70	140	70°	
APL3015CGCK-F01	AlGaInP	570	water clear	36	90	70°	
APL3015ZGC-F01	InGaN	525	water clear	380	850	70°	
APL3015VGC/A-F01	InGaN	525	water clear	110	300	70°	
APL3015VGC/Z-PRV	InGaN	535	water clear	1200	1800	70°	
APL3015QBC/D-F01	AlGaInN	470	water clear	70	180	70°	
APL3015PBC/A-F01	InGaN	470	water clear	50	120	70°	
APL3015PBC/Z-PRV-SI	InGaN	465	water clear	480	850	70°	
AP23SURCK/F-F01	AlGaInP	630	water clear	70	220	120°	3.0mm x 2.4mm x 1.05mm
AP23SECK/F-F01	AlGaInP	601	water clear	70	240	120°	
AP23SYCK/F-F01	AlGaInP	590	water clear	50	150	120°	
AP23SGC/F-F01	GaP	568	water clear	7	20	120°	
AP23CGCK/F-F01	AlGaInP	570	water clear	18	60	120°	
AP23ZGC/F-F01	InGaN	525	water clear	110	380	120°	
AP23VGC/A/F-F01	InGaN	525	water clear	50	180	120°	
AP23PBC/A/F-F01	InGaN	470	water clear	18	50	120°	
AP23QBC/D/F-F01	AlGaInN	470	water clear	50	100	120°	





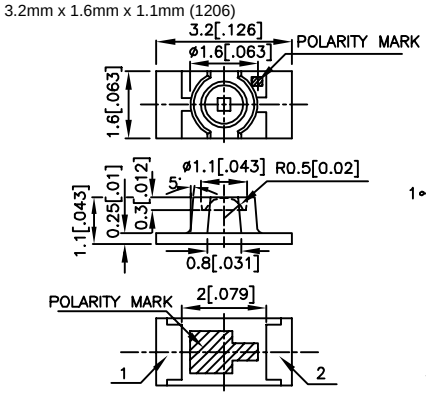




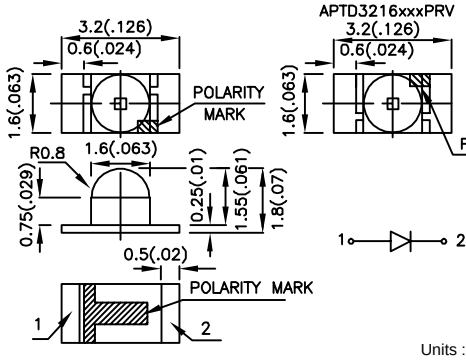
NOTE: 1.AP series custom-made is available upon request.

TOP-EMITTING CHIP SMD LED

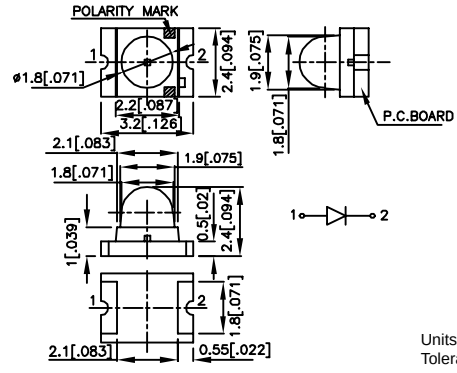
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APTL3216SURCK	AlGaInP	630	water clear	280	550	70°	3.2mm x 1.6mm x 1.1mm (1206)
APTL3216SECK	AlGaInP	601	water clear	380	550	70°	
APTL3216SYCK	AlGaInP	590	water clear	110	350	70°	
APTL3216CGCK	AlGaInP	570	water clear	70	200	70°	
APTL3216ZGC	InGaN	525	water clear	650	1100	70°	
APTL3216VGC/A	InGaN	525	water clear	280	450	70°	
APTL3216QBC/D	AlGaInN	470	water clear	180	340	70°	
APTL3216PBC/A	InGaN	470	water clear	50	200	70°	
APTD3216EC	GaAsP/GaP	625	water clear	10	50	40°	3.2mm x 1.6mm x 1.8mm (1206 Dome Lens)
APTD3216SRCPRV	GaAlAs	640	water clear	180	400	50°	
APTD3216SURCK	AlGaInP	630	water clear	480	1000	50°	
APTD3216SECK	AlGaInP	601	water clear	480	1300	50°	
APTD3216YC	GaAsP/GaP	588	water clear	4	30	40°	
APTD3216SYCK	AlGaInP	590	water clear	280	700	50°	
APTD3216SGC	GaP	568	water clear	10	50	40°	
APTD3216MGC	AlGaInP	570	water clear	180	450	50°	
APTD3216CGCK	AlGaInP	570	water clear	110	300	50°	
APTD3216ZGC	InGaN	525	water clear	380	850	50°	
APTD3216VGC/A	InGaN	525	water clear	280	800	50°	
APTD3216VGC/Z-PRV	InGaN	535	water clear	2200	5000	50°	
APTD3216QBC/D	AlGaInN	470	water clear	280	500	40°	
APTD3216PBC/A	InGaN	470	water clear	110	400	50°	
APTD3216PBC/Z-PRV-SI	InGaN	465	water clear	480	1000	50°	
APD3224EC-F01	GaAsP/GaP	625	water clear	36	70	20°	3.2mm x 2.4mm x 2.4mm (Dome Lens)
APD3224SURCK-F01	AlGaInP	630	water clear	480	1000	20°	
APD3224SECK-F01	AlGaInP	601	water clear	650	1300	20°	
APD3224YC-F01	GaAsP/GaP	588	water clear	10	40	20°	
APD3224SYCK-F01	AlGaInP	590	water clear	380	1000	20°	
APD3224SGC-F01	GaP	568	water clear	18	70	20°	
APD3224CGCK-F01	AlGaInP	570	water clear	180	550	20°	
APD3224ZGC-F01	InGaN	525	water clear	1200	2400	20°	
APD3224VGC/A-F01	InGaN	525	water clear	480	1000	20°	
APD3224QBC/D-F01	AlGaInN	470	water clear	480	900	20°	
APD3224PBC/A-F01	InGaN	470	water clear	110	380	20°	
APED3528SURCK-F01	AlGaInP	630	water clear	380	800	40°	3.5mm x 2.8mm x 3.2mm (Dome Lens)
APED3528SECK-F01	AlGaInP	601	water clear	380	700	40°	
APED3528SYCK-F01	AlGaInP	590	water clear	180	400	40°	
APED3528CGCK-F01	AlGaInP	570	water clear	70	170	40°	
APED3528ZGC-F01	InGaN	525	water clear	480	1400	40°	
APED3528VGC/A-F01	InGaN	525	water clear	110	300	40°	
APED3528QBC/D-F01	AlGaInN	470	water clear	280	500	40°	
APED3528PBC/A-F01	InGaN	470	water clear	50	150	40°	



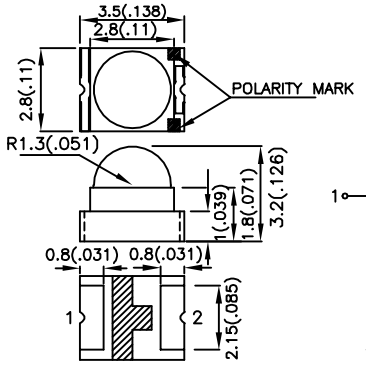
Units : mm(inch)
Tolerance : ±0.1(0.004)



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



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

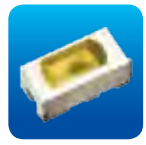


Units : mm(inch)
Tolerance : ±0.2(0.008)

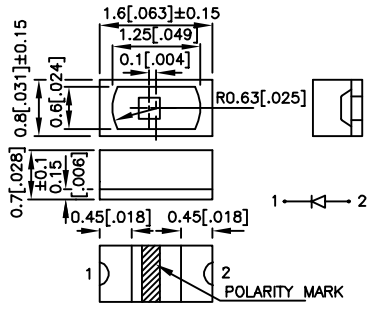
NOTE: 1.AP series custom-made is available upon request.

TOP-EMITTING CHIP SMD LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APHK1608SURCK	AlGaInP	630	water clear	70	200	90°	1.6mm x 0.8mm x 0.7mm (0603)
APHK1608SECK	AlGaInP	601	water clear	70	250	90°	
APHK1608SYCK	AlGaInP	590	water clear	50	180	90°	
APHK1608CGCK	AlGaInP	570	water clear	18	60	90°	
APHK1608ZGC	InGaN	525	water clear	180	500	90°	
APHK1608VGC/A	InGaN	525	water clear	70	200	90°	
APHK1608QBC/D	AlGaInN	470	water clear	50	120	90°	
APHK1608PBC/A	InGaN	470	water clear	36	70	90°	
APTK2012SURCK-F01	AlGaInP	630	water clear	70	200	100°	2.0mm x 1.25mm x 0.75mm (0805)
APTK2012SECK-F01	AlGaInP	601	water clear	70	250	100°	
APTK2012SYCK-F01	AlGaInP	590	water clear	50	180	100°	
APTK2012CGCK-F01	AlGaInP	570	water clear	18	60	100°	
APTK2012ZGC-F01	InGaN	525	water clear	180	500	100°	
APTK2012VGC/A-F01	InGaN	525	water clear	70	200	100°	
APTK2012QBC/D-F01	AlGaInN	470	water clear	50	120	100°	
APTK2012PBC/A-F01	InGaN	470	water clear	36	70	100°	

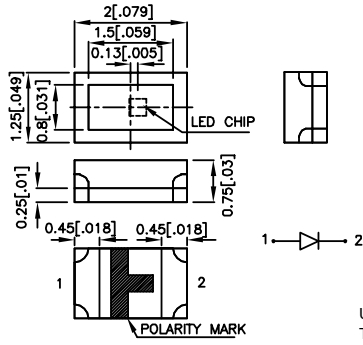


APHK1608



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

APTK2012-F01

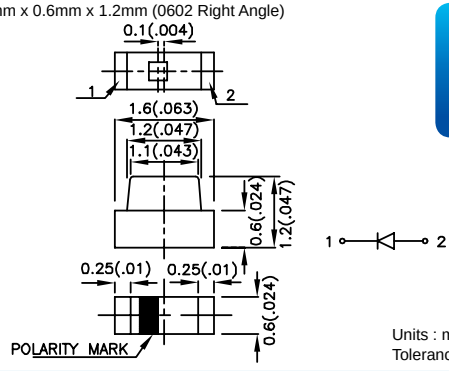


Units : mm(inch)
Tolerance : ±0.1(0.004)

RIGHT ANGLE SMD LED

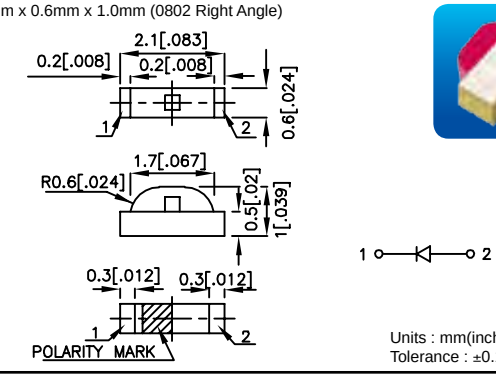
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APA1606SURCK	AlGaInP	630	water clear	110	250	110°	1.6mm x 0.6mm x 1.2mm (0602 Right Angle)
APA1606SECK	AlGaInP	601	water clear	70	250	110°	
APA1606SYCK	AlGaInP	590	water clear	50	150	110°	
APA1606MGC	AlGaInP	570	water clear	36	80	110°	
APA1606CGCK	AlGaInP	570	water clear	18	60	110°	
APA1606ZGC	InGaN	525	water clear	70	250	110°	
APA1606VGC/A	InGaN	525	water clear	70	180	110°	
APA1606QBC/D	AlGaInN	470	water clear	36	90	110°	
APA1606PBC/A	InGaN	470	water clear	18	60	110°	
APA2106SURCK	AlGaInP	630	water clear	110	250	120°	2.1mm x 0.6mm x 1.0mm (0802 Right Angle)
APA2106SECK	AlGaInP	601	water clear	70	250	120°	
APA2106SYCK	AlGaInP	590	water clear	50	150	120°	
APA2106MGC	AlGaInP	570	water clear	36	80	120°	
APA2106CGCK	AlGaInP	570	water clear	18	60	120°	
APA2106ZGC	InGaN	525	water clear	70	250	120°	
APA2106VGC/A	InGaN	525	water clear	70	180	120°	
APA2106VGC/Z-PRV	InGaN	535	water clear	380	800	120°	
APA2106QBC/D	AlGaInN	470	water clear	36	90	120°	
APA2106PBC/A	InGaN	470	water clear	18	60	120°	
APA2106PBC/Z-PRV-SI	InGaN	465	water clear	110	230	120°	

APA1606



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

APA2106

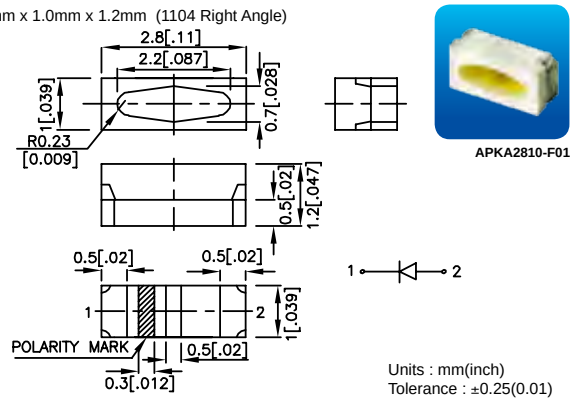


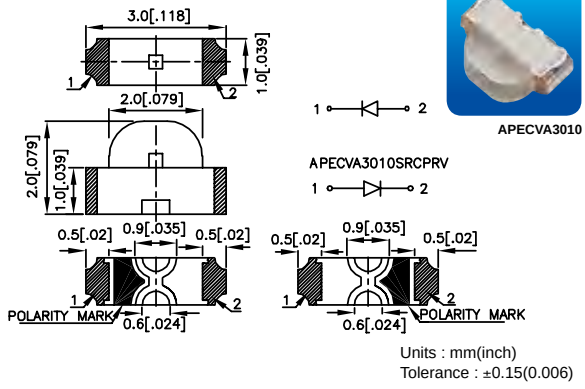
Units : mm(inch)
Tolerance : ±0.1(0.004)

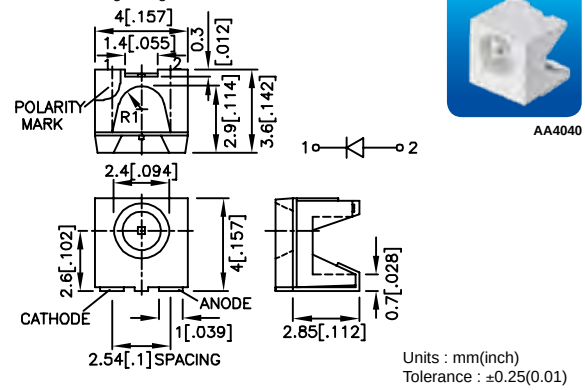
NOTE: 1.AP series custom-made is available upon request.

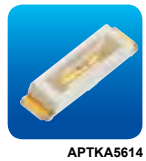
RIGHT ANGLE SMD LED

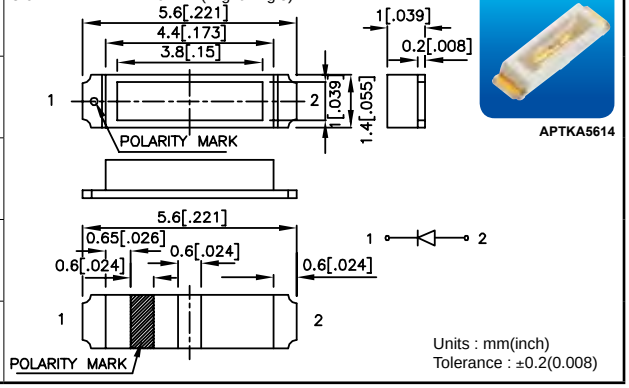
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APKA2810SURCK-F01	AlGaInP	630	water clear	70	250	90°	2.8mm x 1.0mm x 1.2mm (1104 Right Angle)
APKA2810SECK-F01	AlGaInP	601	water clear	70	300	90°	
APKA2810SYCK-F01	AlGaInP	590	water clear	70	180	90°	
APKA2810CGCK-F01	AlGaInP	570	water clear	18	60	90°	
APKA2810ZGC-F01	InGaN	525	water clear	110	300	90°	
APKA2810VGC/A-F01	InGaN	525	water clear	70	200	90°	
APKA2810QBC/D-F01	AlGaInN	470	water clear	50	120	90°	
APKA2810PBC/A-F01	InGaN	470	water clear	36	70	90°	
APECVA3010EC	GaAsP/GaP	625	water clear	4	15	120°	3.0mm x 1.0mm x 2.0mm (1104 Right Angle)
APECVA3010SRCPRV	GaAlAs	640	water clear	50	100	120°	
APECVA3010SURCK	AlGaInP	630	water clear	110	250	120°	
APECVA3010SECK	AlGaInP	601	water clear	70	250	120°	
APECVA3010YC	GaAsP/GaP	588	water clear	2.6	7	120°	
APECVA3010SYCK	AlGaInP	590	water clear	50	150	120°	
APECVA3010SGC	GaP	568	water clear	4	15	120°	
APECVA3010MGC	AlGaInP	570	water clear	36	80	120°	
APECVA3010CGCK	AlGaInP	570	water clear	18	60	120°	
APECVA3010ZGC	InGaN	525	water clear	70	250	120°	
APECVA3010VGC/A	InGaN	525	water clear	70	180	120°	
APECVA3010QBC/D	AlGaInN	470	water clear	36	90	120°	
APECVA3010PBC/A	InGaN	470	water clear	18	60	120°	
AA4040SRC	GaAlAs	640	water clear	70	200	90°	4.0mm x 4.0mm Right Angle
AA4040SURCK	AlGaInP	630	water clear	70	250	90°	
AA4040SECK	AlGaInP	601	water clear	70	300	90°	
AA4040SYCK	AlGaInP	590	water clear	50	180	90°	
AA4040SGC	GaP	568	water clear	10	25	90°	
AA4040MGC	AlGaInP	570	water clear	50	100	90°	
AA4040CGCK	AlGaInP	570	water clear	36	70	90°	
AA4040ZGC	InGaN	525	water clear	380	600	90°	
AA4040VGC/A	InGaN	525	water clear	70	200	90°	
AA4040VGC/Z	InGaN	535	water clear	480	1000	90°	
AA4040QBC/D	AlGaInN	470	water clear	70	150	90°	
AA4040PBC/A	InGaN	470	water clear	36	120	90°	
AA4040PBC/Z	InGaN	465	water clear	110	280	90°	
APTKA5614SURCK	AlGaInP	630	water clear	70	250	90°	5.6mm x 1.4mm x 1.0mm (Right Angle)
APTKA5614SEC	AlGaInP	601	water clear	110	300	90°	
APTKA5614SYCK	AlGaInP	590	water clear	70	180	90°	
APTKA5614VGC/A	InGaN	525	water clear	70	200	90°	
APTKA5614PBC/A	InGaN	470	water clear	36	80	90°	







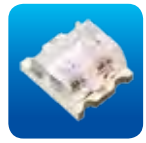




NOTE: 1.AP series custom-made is available upon request.

MULTI-COLOR SMD LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APTB1612ESGC-F01	GaAsP/GaP	625	water clear	4	12	120°	1.6mm x 1.25mm x 0.65mm (0605 Bi-Color)
	GaP	568		4	12		
APTB1612YSGC-F01	GaAsP/GaP	588	water clear	2.6	8	120°	
	GaP	568		4	12		
APTB1612SURKCGKC-F01	AlGaInP	630	water clear	70	220	120°	
	AlGaInP	570		18	50		
APTB1612SURKQBDC-F01	AlGaInP	630	water clear	70	220	120°	
	AlGaInN	470		50	90		
APTB1612SYKCGKC-F01	AlGaInP	590	water clear	50	150	120°	
	AlGaInP	570		18	50		
APTB1615ESGC-F01	GaAsP/GaP	625	water clear	4	12	120°	1.6mm x 1.5mm x 0.7mm (0606 Bi-Color)
	GaP	568		4	12		
APTB1615YSGC-F01	GaAsP/GaP	588	water clear	2.6	8	120°	
	GaP	568		4	12		
APTB1615SURKCGKC-F01	AlGaInP	630	water clear	70	220	120°	
	AlGaInP	570		18	50		
APTB1615SYKCGKC-F01	AlGaInP	590	water clear	50	150	120°	
	AlGaInP	570		18	50		
APTF1616SEEVGAPBAC	AlGaInP	621	water clear	180	400	120°	1.6mm x 1.6mm x 0.7mm (Full Color)
	InGaN	525		70	180		
	InGaN	470		10	40		
APTF1616PBASURKCGKC	InGaN	470	water clear	10	40	120°	
	AlGaInP	630		110	230		
	AlGaInP	570		18	50		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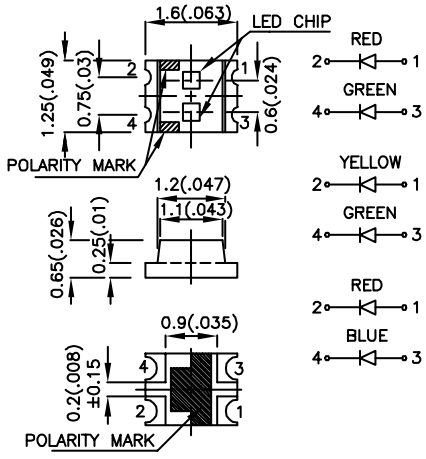
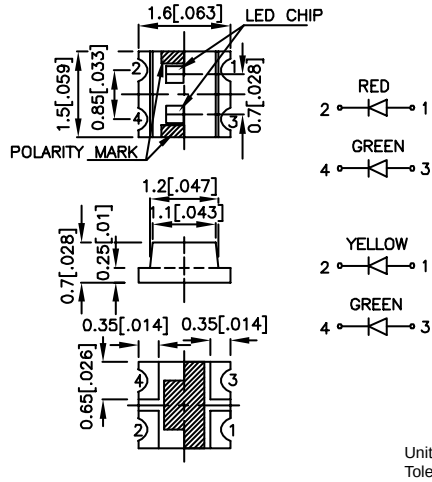


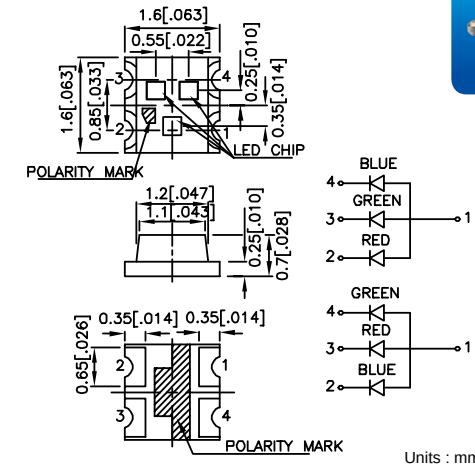
Units : mm(inch)
Tolerance : ±0.2(0.008)


APTB1615-F01



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


APTF1616



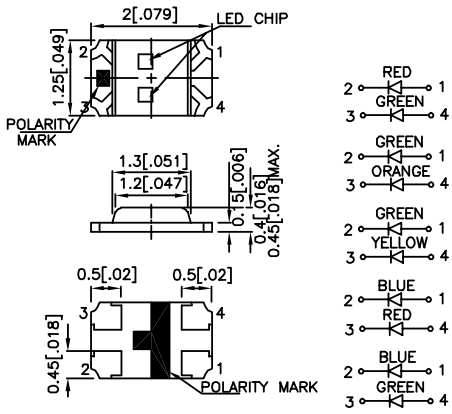
Units : mm(inch)
Tolerance : ±0.2(0.008)

NOTE: 1.AP series custom-made is available upon request.

MULTI-COLOR SMD LED

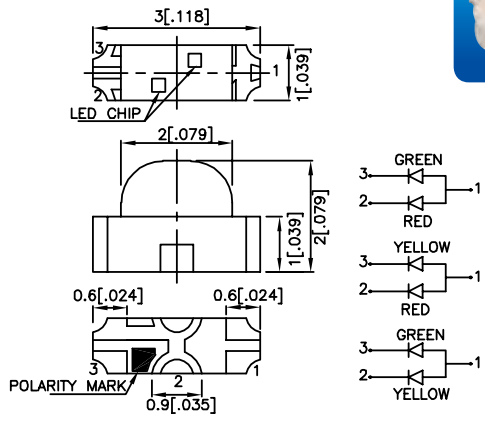
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APHBM2012ETSGTC	GaAsP/GaP	625	water clear	4	17	120°	2.0mm x 1.25mm x 0.45mm (0805 Super Thin, Bi-Color)
	GaP	568		7	20		
APHBM2012SURKCGKC	AlGaInP	630	water clear	70	220	120°	
	AlGaInP	570		36	80		
APHBM2012CGKSEKC	AlGaInP	570	water clear	36	80	120°	
	AlGaInP	601		110	250		
APHBM2012CGKSYKC	AlGaInP	570	water clear	36	80	120°	
	AlGaInP	590		50	150		
APHBM2012PBASURKC	InGaN	470	water clear	18	50	120°	
	AlGaInP	630		70	220		
APHBM2012PBACGKC	InGaN	470	water clear	18	50	120°	
	AlGaInP	570		36	80		
APBVA3010ESGC	GaAsP/GaP	625	water clear	7	15	140°	3.0mm x 1.0mm x 2mm (1104 Right Angle, Bi-Color)
	GaP	568		7	15		
APBVA3010EYC	GaAsP/GaP	625	water clear	7	15	140°	
	GaAsP/GaP	588		2.6	6		
APBVA3010YSGC	GaAsP/GaP	588	water clear	2.6	6	140°	
	GaP	568		7	15		
APBVA3010SURKCGKC	AlGaInP	630	water clear	110	200	140°	
	AlGaInP	570		18	50		
APBVA3010SYKCGKC	AlGaInP	590	water clear	50	150	140°	
	AlGaInP	570		18	50		
APFA3010SURKCGKPBAC	AlGaInP	630	water clear	70	200	120°	3.0mm x 1.0mm x 1.5mm (1104 Right Angle, Full Color)
	AlGaInP	570		18	50		
	InGaN	470		18	60		
APFA3010SEEVGAPBAC	AlGaInP	621	water clear	110	300	120°	
	InGaN	525		50	200		
	InGaN	470		18	60		


APHBM2012



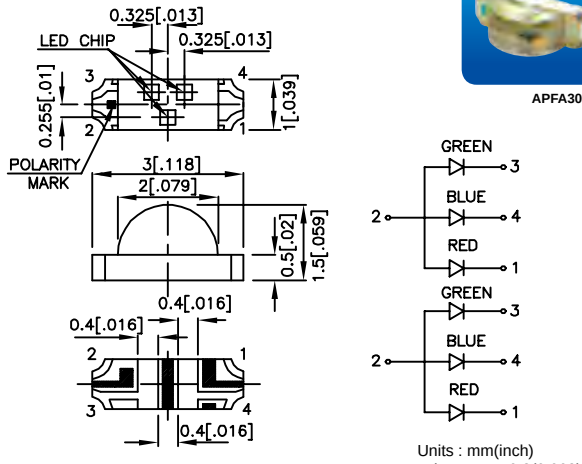
Units : mm(inch)
Tolerance : ±0.1(0.004)


APBVA3010



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


APFA3010



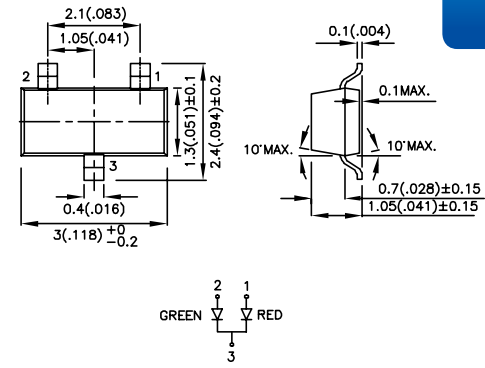
Units : mm(inch)
Tolerance : ±0.2(0.008)

NOTE: 1.AP series custom-made is available upon request.

MULTI-COLOR SMD LED

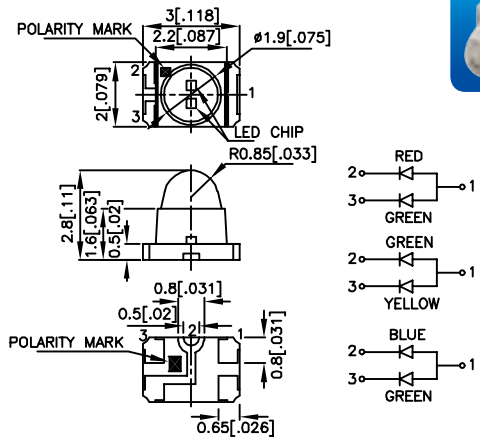
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA MIN.	Iv (mcd) @20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
AM23ESGW	GaAsP/GaP	625	white diffused	4	15	140°	SOT-23 Surface Mount LED Lamp (3mm x 1.3mm)
	GaP	568		4	15		
AM23ESGC	GaAsP/GaP	625	water clear	4	15	140°	
	GaP	568		4	15		
APBVDA3020SURKCGKC	AlGaInP	630	water clear	480	900	15°	3.0mm x 2.0mm x 2.8mm (Dome Lens)
	AlGaInP	570		110	300		
APBVDA3020CGKSYKC	AlGaInP	570	water clear	50	200	15°	
	AlGaInP	590		480	750		
APBVDA3020PBACGKC	InGaN	470	water clear	110	220	15°	
	AlGaInP	570		110	300		
AP23ESGC-F01	GaAsP/GaP	625	water clear	7	20	120°	3.0mm x 2.4mm x 1.05mm
	GaP	568		7	20		
AP23YSGC-F01	GaAsP/GaP	588	water clear	2.6	8	120°	
	GaP	568		7	20		


AM23



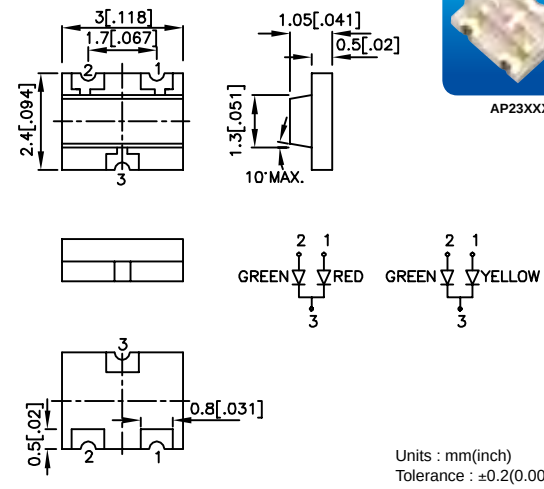
Units : mm(inch)
Tolerance : ±0.25(0.01)


APBVDA3020



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


AP23XXX-F01

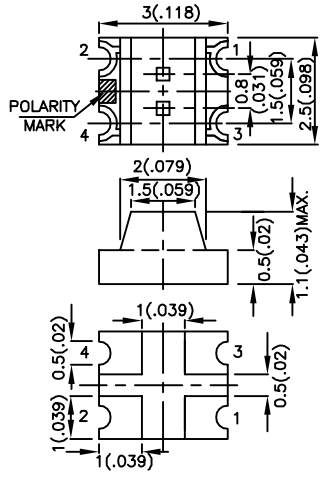


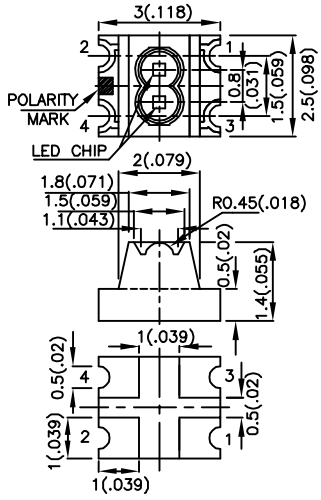
Units : mm(inch)
Tolerance : ±0.2(0.008)

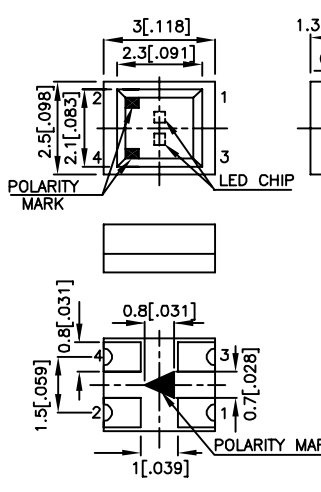
NOTE: 1.AP series custom-made is available upon request.

MULTI-COLOR SMD LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA MIN.	Iv (mcd) @20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
APB3025ESGC-F01	GaAsP/GaP	625	water clear	4	12	120°	3.0mm x 2.5mm x 1.1mm (1109 Bi-Color)
	GaP	568		4	12		
APB3025EYC-F01	GaAsP/GaP	625	water clear	4	12	120°	
	GaAsP/GaP	588		2.6	8		
APB3025YSGC-F01	GaAsP/GaP	588	water clear	2.6	8	120°	
	GaP	568		4	12		
APB3025SURKCGKC-F01	AlGaInP	630	water clear	70	220	120°	
	AlGaInP	570		18	50		
APBL3025ESGC-F01	GaAsP/GaP	625	water clear	7	20	100°	3.0mm x 2.5mm x 1.4mm (1109 Bi-Color)
	GaP	568		7	20		
APBL3025EYC-F01	GaAsP/GaP	625	water clear	7	20	100°	
	GaAsP/GaP	588		4	15		
APBL3025YSGC-F01	GaAsP/GaP	588	water clear	4	15	100°	
	GaP	568		7	20		
APBL3025SURKCGK-F01	AlGaInP	630	water clear	180	500	100°	
	AlGaInP	570		36	120		
APKB3025ESGC-F01	GaAsP/GaP	625	water clear	10	20	120°	3.0mm x 2.5mm x 1.3mm (1109 Bi-Color)
	GaP	568		10	20		
APKB3025YSGC-F01	GaAsP/GaP	588	water clear	2.6	8	120°	
	GaP	568		10	20		

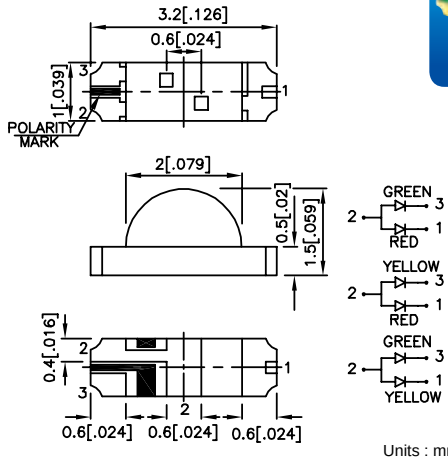
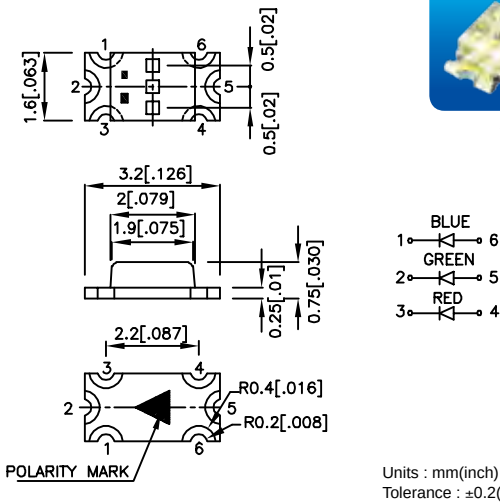
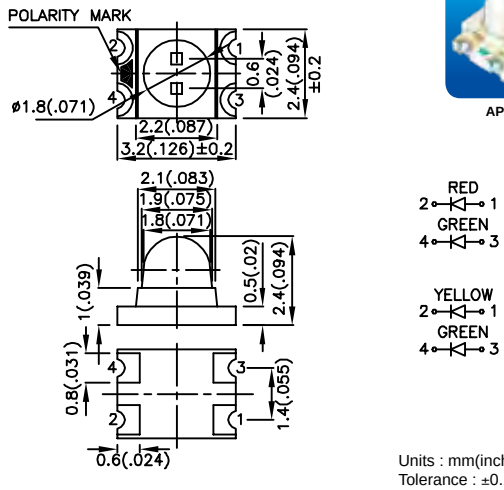






NOTE: 1.AP series custom-made is available upon request.

MULTI-COLOR SMD LED

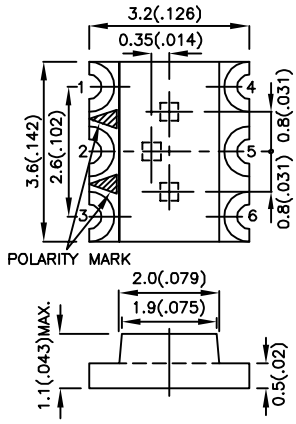
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA MIN.	Iv (mcd) @20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
APBA3210ESGC-F01	GaAsP/GaP	625	water clear	4	12	120°	3.2mm x 1.0mm x 1.5mm (1304 Right Angle, Bi-Color)  APBA3210-F01  Units : mm(inch) Tolerance : ±0.1(0.004)
	GaP	568		4	12		
APBA3210EYC-F01	GaAsP/GaP	625	water clear	4	12	120°	
	GaAsP/GaP	588		2.6	8		
APBA3210YSGC-F01	GaAsP/GaP	588	water clear	2.6	8	120°	
	GaP	568		4	12		
APBA3210SURKCGKC-F01	AlGaInP	630	water clear	110	200	120°	
	AlGaInP	570		18	50		
APBA3210SYKCGKC-F01	AlGaInP	590	water clear	50	150	120°	
	AlGaInP	570		18	50		
APTF3216PBAVGASUK	InGaN	470	water clear	18	60	120°	3.2mm x 1.6mm x 1.75mm (Full Color)  APTF3216  Units : mm(inch) Tolerance : ±0.2(0.008)
	InGaN	525		50	150		
	AlGaInP	630		70	220		
APBD3224ESGC-F01	GaAsP/GaP	625	water clear	18	60	20°	3.2mm x 2.4mm x 2.4mm (Dome Lens)  APBD3224-F01  Units : mm(inch) Tolerance : ±0.1(0.004)
	GaP	568		10	40		
APBD3224SURKCGKC-F01	AlGaInP	630	water clear	380	800	20°	
	AlGaInP	570		110	300		
APBD3224SYKCGKC-F01	AlGaInP	590	water clear	110	500	20°	
	AlGaInP	570		110	300		

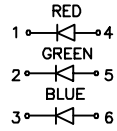
NOTE: 1.AP series custom-made is available upon request.

MULTI-COLOR SMD LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA MIN.	Iv (mcd) @20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
APF3236SURKVGAPBA	AlGaInP	630	water clear	70	220	120°	3.2mm x 3.6mm x 1.1mm (Full Color)
	InGaN	525		50	150		
	InGaN	470		18	60		
AAAF3528PBGSEJ3VGAW	InGaN	470	white diffused	50	100	120°	3.5mm x 2.8mm x 1.4mm (Full Color)
	AlGaInP	625		900	1700		
	InGaN	525		110	330		
AAAF3528QBFSEJ3ZGW	AlGaInN	465	white diffused	110	200	120°	
	AlGaInP	625		900	1700		
	InGaN	525		480	900		

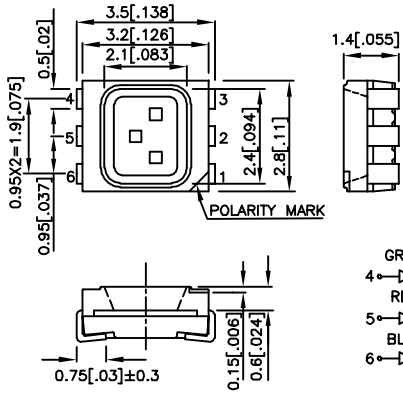

APF3236

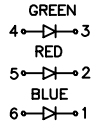




Units : mm(inch)
Tolerance : ±0.2(0.008)


AAAF3528





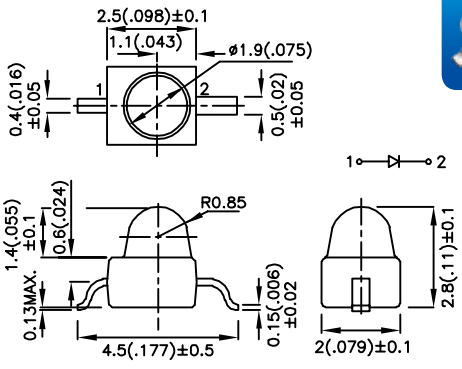
Units : mm(inch)
Tolerance : ±0.2(0.008)

NOTE: 1.AP series custom-made is available upon request.

SUBMINIATURE SMD LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA MIN.	Iv (mcd) @20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
AM2520EC03	GaAsP/GaP	625	water clear	10	70	20°	Subminiature Solid State Lamps Gull Wing Lead
AM2520SRC03-RV	GaAlAs	640	water clear	110	600	20°	
AM2520SURCK03	AlGaInP	630	water clear	900	1800	20°	
AM2520SECK03	AlGaInP	601	water clear	900	1800	20°	
AM2520YC03	GaAsP/GaP	588	water clear	10	50	20°	
AM2520SYCK03	AlGaInP	590	water clear	900	1800	20°	
AM2520SGC03	GaP	568	water clear	36	80	20°	
AM2520MGC03	AlGaInP	570	water clear	280	600	20°	
AM2520CGCK03	AlGaInP	570	water clear	110	400	20°	
AM2520ZGC03	InGaN	525	water clear	1200	2500	20°	
AM2520VGC/A03	InGaN	525	water clear	380	800	20°	
AM2520QBC/D03	AlGaInN	470	water clear	180	500	20°	
AM2520PBC/A03	InGaN	470	water clear	180	500	20°	


AM2520xxx03

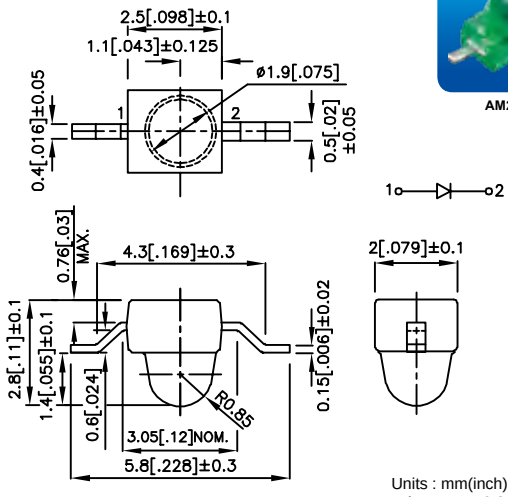


Units : mm(inch)
Tolerance : ±0.25(0.01)

SUBMINIATURE SMD LED

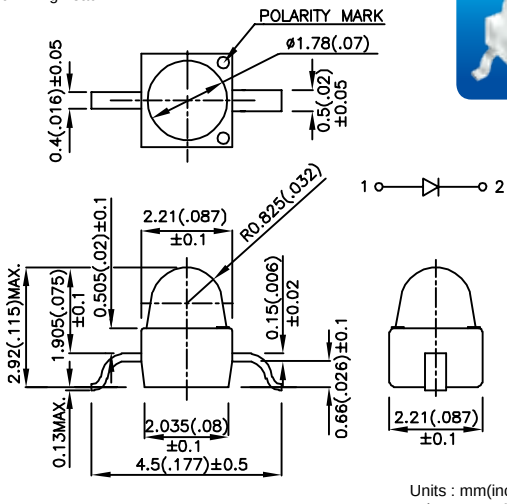
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
AM2520EC09	GaAsP/GaP	625	water clear	10	70	20°	Subminiature Solid State Lamps Z-Bend Lead
AM2520SRC09-RV	GaAlAs	640	water clear	110	600	20°	
AM2520SURCK09	AlGaInP	630	water clear	900	1800	20°	
AM2520SECK09	AlGaInP	601	water clear	900	1800	20°	
AM2520YC09	GaAsP/GaP	588	water clear	10	50	20°	
AM2520SYCK09	AlGaInP	590	water clear	900	1800	20°	
AM2520SGC09	GaP	568	water clear	36	80	20°	
AM2520MGC09	AlGaInP	570	water clear	280	600	20°	
AM2520CGCK09	AlGaInP	570	water clear	110	400	20°	
AM2520ZGC09	InGaN	525	water clear	1200	2500	20°	
AM2520VGC/A09	InGaN	525	water clear	380	800	20°	
AM2520QBC/D09	AlGaInN	470	water clear	180	500	20°	
AM2520PBC/A09	InGaN	470	water clear	180	500	20°	
AM27EC03	GaAsP/GaP	625	water clear	10	70	20°	Subminiature Solid State Lamps Gull Wing Lead
AM27SRC03-RV	GaAlAs	640	water clear	110	600	20°	
AM27SURCK03	AlGaInP	630	water clear	900	1800	20°	
AM27SECK03	AlGaInP	601	water clear	900	1800	20°	
AM27YC03	GaAsP/GaP	588	water clear	10	50	20°	
AM27SYCK03	AlGaInP	590	water clear	900	1800	20°	
AM27SGC03	GaP	568	water clear	36	80	20°	
AM27MGC03	AlGaInP	570	water clear	280	600	20°	
AM27CGCK03	AlGaInP	570	water clear	110	400	20°	
AM27ZGC03	InGaN	525	water clear	1200	2500	20°	
AM27VGC/A03	InGaN	525	water clear	380	800	20°	
AM27QBC/D03	AlGaInN	470	water clear	180	500	20°	
AM27PBC/A03	InGaN	470	water clear	180	500	20°	
AM27EC09	GaAsP/GaP	625	water clear	10	70	20°	Subminiature Solid State Lamps Z-Bend Lead
AM27SRC09-RV	GaAlAs	640	water clear	110	600	20°	
AM27SURCK09	AlGaInP	630	water clear	900	1800	20°	
AM27SECK09	AlGaInP	601	water clear	900	1800	20°	
AM27YC09	GaAsP/GaP	588	water clear	10	50	20°	
AM27SYCK09	AlGaInP	590	water clear	900	1800	20°	
AM27SGC09	GaP	568	water clear	36	80	20°	
AM27MGC09	AlGaInP	570	water clear	280	600	20°	
AM27CGCK09	AlGaInP	570	water clear	110	400	20°	
AM27ZGC09	InGaN	525	water clear	1200	2500	20°	
AM27VGC/A09	InGaN	525	water clear	380	800	20°	
AM27QBC/D09	AlGaInN	470	water clear	180	500	20°	
AM27PBC/A09	InGaN	470	water clear	180	500	20°	

AM2520xxx09



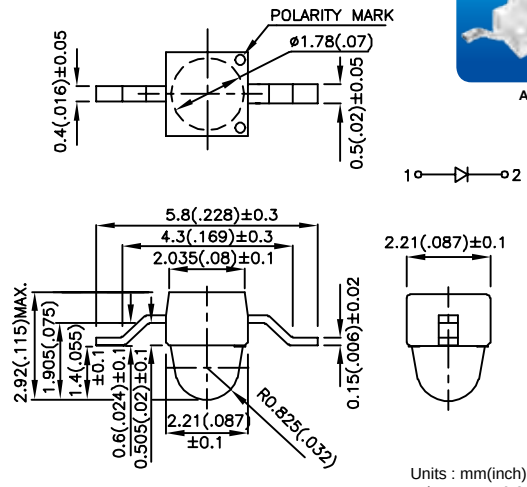
Units : mm(inch)
Tolerance : ±0.25(0.01)

AM27xxx03



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

AM27xxx09

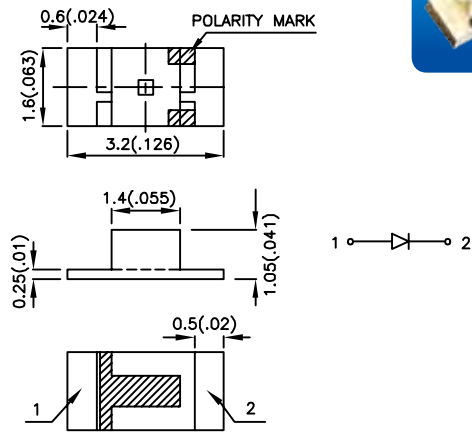


Units : mm(inch)
Tolerance : ±0.25(0.01)

REVERSE MOUNT SMD LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APTR3216EC	GaAsP/GaP	625	water clear	4	12	120°	3.2mm x 1.6mm x 1.05mm (1206 Reverse Mount)
APTR3216SRCPRV	GaAlAs	640	water clear	36	80	120°	
APTR3216SURCK	AlGaInP	630	water clear	70	220	120°	
APTR3216SECK	AlGaInP	601	water clear	70	240	120°	
APTR3216YC	GaAsP/GaP	588	water clear	2.6	8	120°	
APTR3216SYCK	AlGaInP	590	water clear	50	150	120°	
APTR3216SGC	GaP	568	water clear	4	15	120°	
APTR3216MGC	AlGaInP	570	water clear	18	70	120°	
APTR3216CGCK	AlGaInP	570	water clear	10	40	120°	
APTR3216ZGC	InGaN	525	water clear	110	300	120°	
APTR3216VGC/A	InGaN	525	water clear	50	180	120°	
APTR3216VGC/Z-PRV	InGaN	535	water clear	180	400	120°	
APTR3216QBC/D	AlGaInN	470	water clear	50	100	120°	
APTR3216PBC/A	InGaN	470	water clear	18	60	120°	
APTR3216PBC/Z-PRV-SI	InGaN	465	water clear	70	180	120°	

APTR3216



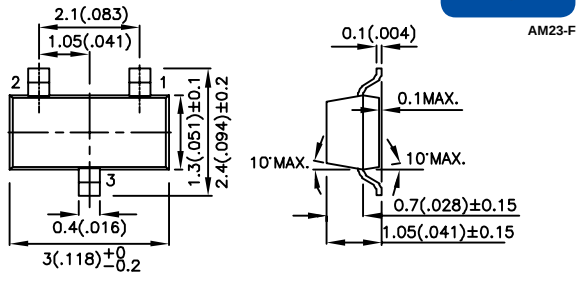
Units : mm(inch)
Tolerance : ±0.2(0.008)

NOTE: 1.AP series custom-made is available upon request.

SOT-23 SMD LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
AM23ID-F	GaAsP/GaP	625	red diffused	4	12	140°	SOT-23 Surface Mount LED Lamp (3mm x 1.3mm)
AM23EC-F	GaAsP/GaP	625	water clear	4	15	140°	
AM23SRD-F-RV	GaAlAs	640	red diffused	36	70	140°	
AM23SRC-F-RV	GaAlAs	640	water clear	36	90	140°	
AM23YD-F	GaAsP/GaP	588	yellow diffused	2.6	8.5	140°	
AM23YC-F	GaAsP/GaP	588	water clear	2.6	10	140°	
AM23SYD-F	AlGaInP	590	yellow diffused	50	100	140°	
AM23SYC-F	AlGaInP	590	water clear	50	150	140°	
AM23SGD-F	GaP	568	green diffused	2.6	8	140°	
AM23SGC-F	GaP	568	water clear	4	15	140°	

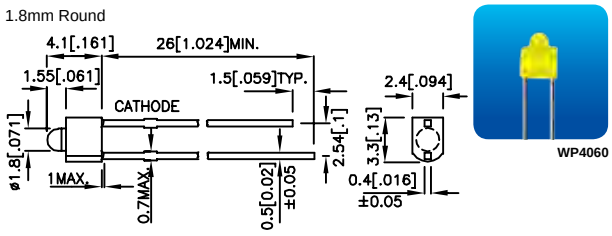
AM23-F

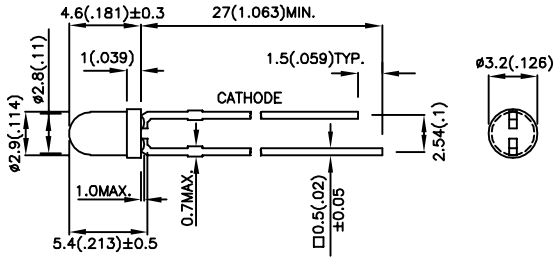


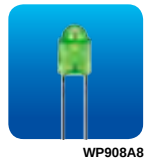
Units : mm(inch)
Tolerance : ±0.25(0.01)

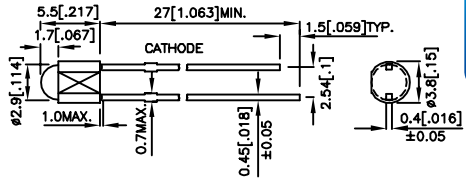
ROUND LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP4060ID	GaAsP/GaP	625	red diffused	8	15	70°	1.8mm Round
WP4060SRD	GaAlAs	640	red diffused	*70	*200	70°	
WP4060ED	GaAsP/GaP	625	orange diffused	8	20	70°	
WP4060YD	GaAsP/GaP	588	yellow diffused	1.8	5	70°	
WP4060GD	GaP	568	green diffused	5	10	70°	
WP7104ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Round
WP7104IT	GaAsP/GaP	625	red transparent	18	60	34°	
WP7104EC	GaAsP/GaP	625	water clear	18	60	34°	
WP7104ED	GaAsP/GaP	625	orange diffused	8	20	40°	
WP7104ND	GaAsP/GaP	610	orange diffused	8	30	40°	
WP7104NT	GaAsP/GaP	610	orange transparent	18	50	34°	
WP7104NC	GaAsP/GaP	610	water clear	18	50	34°	
WP7104YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP7104YT	GaAsP/GaP	588	yellow transparent	8	30	34°	
WP7104YC	GaAsP/GaP	588	water clear	8	30	34°	
WP7104GD	GaP	568	green diffused	8	20	40°	
WP7104GT	GaP	568	green transparent	18	60	34°	
WP7104GC	GaP	568	water clear	18	60	34°	
WP7104PGD	GaP	555	green diffused	1.8	5	40°	
WP7104PGT	GaP	555	green transparent	3	15	34°	
WP7104PGC	GaP	555	water clear	3	15	34°	
WP7104SRC/D	GaAlAs	640	water clear	*480	*600	34°	
WP7104SRC/E	GaAlAs	640	water clear	*650	*800	34°	
WP7104SRD/D	GaAlAs	640	red diffused	*110	*150	40°	
WP7104SRD/E	GaAlAs	640	red diffused	*180	*250	40°	
WP7104SRD/F	GaAlAs	640	red diffused	*280	*350	40°	
WP7104SRD/J	GaAlAs	640	red diffused	*900	*1200	40°	
WP7104SURC/E	AlGaInP	630	water clear	*900	*1300	34°	
WP7104SEC	AlGaInP	601	water clear	*480	*1300	34°	
WP7104SET	AlGaInP	601	orange transparent	*480	*1300	34°	
WP7104SED	AlGaInP	601	orange diffused	*280	*800	40°	
WP7104SEC/E	AlGaInP	621	water clear	*900	*2000	34°	
WP7104SEC/J3	AlGaInP	625	water clear	*3300	*7000	34°	
WP7104SYC	AlGaInP	590	water clear	*280	*700	34°	
WP7104SYT	AlGaInP	590	yellow transparent	*280	*700	34°	
WP7104SYD	AlGaInP	590	yellow diffused	*110	*250	40°	
WP7104SYC/J3	AlGaInP	589	water clear	*1200	*2200	34°	
WP7104SGC	GaP	568	water clear	*70	*150	34°	
WP7104SGD	GaP	568	green diffused	*18	*40	40°	
WP7104CGCK	AlGaInP	570	water clear	*110	*350	34°	
WP7104TGC/Z	InGaN	507	water clear	*2800	*6000	34°	
WP7104VGC/A	InGaN	525	water clear	*1200	*3000	34°	
WP7104VGC/Z	InGaN	535	water clear	*3300	*9000	34°	
WP7104QBC/D	AlGaInN	470	water clear	*900	*1500	20°	
WP7104PBC/A	InGaN	470	water clear	*380	*1200	20°	
WP7104PBC/Z	InGaN	465	water clear	*1500	*3000	20°	
WP908A8ID	GaAsP/GaP	625	red diffused	5	20	80°	T-1 (3mm) Round
WP908A8SRD	GaAlAs	640	red diffused	*70	*250	80°	
WP908A8ND	GaAsP/GaP	610	orange diffused	8	26	80°	
WP908A8YD	GaAsP/GaP	588	yellow diffused	5	20	80°	
WP908A8GD	GaP	568	green diffused	5	25	80°	





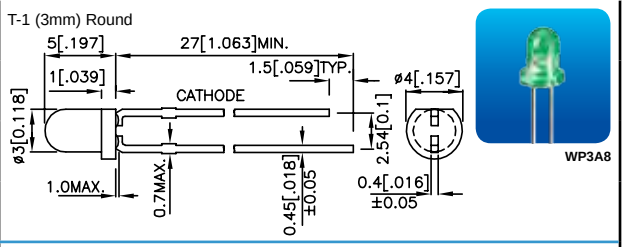




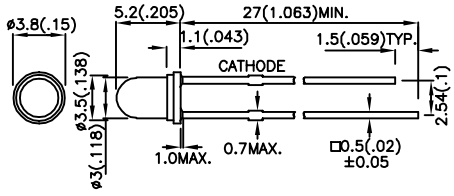
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

ROUND LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP3A8HD	GaP	660	red diffused	1	2.5	50°	T-1 (3mm) Round
WP3A8ID	GaAsP/GaP	625	red diffused	8	25	50°	
WP3A8YD	GaAsP/GaP	588	yellow diffused	5	15	50°	
WP3A8GD	GaP	568	green diffused	8	20	50°	
WP132XID	GaAsP/GaP	625	red diffused	8	25	60°	T-1 (3mm) Round
WP132XIT	GaAsP/GaP	625	red transparent	18	60	50°	
WP132XND	GaAsP/GaP	610	orange diffused	8	30	60°	
WP132XNT	GaAsP/GaP	610	orange transparent	18	50	50°	
WP132XNC	GaAsP/GaP	610	water clear	18	50	50°	
WP132XYD	GaAsP/GaP	588	yellow diffused	5	15	60°	
WP132XYT	GaAsP/GaP	588	yellow transparent	8	20	50°	
WP132XYC	GaAsP/GaP	588	water clear	8	20	50°	
WP132XGD	GaP	568	green diffused	8	15	60°	
WP132XGT	GaP	568	green transparent	12	40	50°	
WP132XGC	GaP	568	water clear	12	40	50°	
WP132XPGD	GaP	555	green diffused	1.8	5	60°	
WP132XPGT	GaP	555	green transparent	3	10	50°	
WP132XPGC	GaP	555	water clear	3	10	50°	
WP7113ID	GaAsP/GaP	625	red diffused	8	45	30°	T-1 3/4 (5mm) Round
WP7113IT	GaAsP/GaP	625	red transparent	28	80	20°	
WP7113ED	GaAsP/GaP	625	orange diffused	8	25	30°	
WP7113EC	GaAsP/GaP	625	water clear	28	80	20°	
WP7113ND	GaAsP/GaP	610	orange diffused	12	30	30°	
WP7113NT	GaAsP/GaP	610	orange transparent	40	80	20°	
WP7113NC	GaAsP/GaP	610	water clear	40	80	20°	
WP7113YD	GaAsP/GaP	588	yellow diffused	5	20	30°	
WP7113YT	GaAsP/GaP	588	yellow transparent	18	40	20°	
WP7113YC	GaAsP/GaP	588	water clear	18	40	20°	
WP7113GD	GaP	568	green diffused	5	20	30°	
WP7113GT	GaP	568	green transparent	18	60	20°	
WP7113GC	GaP	568	water clear	18	60	20°	
WP7113PGD	GaP	555	green diffused	1.8	5	30°	
WP7113PGT	GaP	555	green transparent	5	10	20°	
WP7113PGC	GaP	555	water clear	5	10	20°	
WP7113SRC/DU	GaAlAs	640	water clear	*900	*1100	20°	
WP7113SRC/DV	GaAlAs	640	water clear	*1200	*1400	20°	
WP7113SRC/DW	GaAlAs	640	water clear	*1500	*1700	20°	
WP7113SRD/D	GaAlAs	640	red diffused	*180	*250	30°	
WP7113SRD/E	GaAlAs	640	red diffused	*280	*400	30°	
WP7113SRD/F	GaAlAs	640	red diffused	*480	*600	30°	
WP7113SURC	AlGaInP	630	water clear	*1200	*1400	20°	
WP7113SURC/E	AlGaInP	630	water clear	*1500	*2200	20°	
WP7113SEC	AlGaInP	601	water clear	*650	*2500	20°	
WP7113SET	AlGaInP	601	orange transparent	*650	*2500	20°	
WP7113SED	AlGaInP	601	orange diffused	*380	*800	30°	
WP7113SEC/E	AlGaInP	621	water clear	*1500	*5000	20°	
WP7113SEC/J3	AlGaInP	625	water clear	*6700	*12000	20°	
WP7113SYC	AlGaInP	590	water clear	*650	*2000	20°	
WP7113SYT	AlGaInP	590	yellow transparent	*650	*2000	20°	
WP7113SYD	AlGaInP	590	yellow diffused	*180	*600	30°	
WP7113SYC/J3	AlGaInP	589	water clear	*2200	*3800	20°	
WP7113SGC	GaP	568	water clear	*70	*200	20°	
WP7113SGD	GaP	568	green diffused	*18	*40	30°	
WP7113CGCK	AlGaInP	570	water clear	*380	*900	20°	
WP7113TGC/Z	InGaN	507	water clear	*7500	*17000	20°	
WP7113ZGC	InGaN	525	water clear	*3800	*6500	20°	
WP7113VGC/A	InGaN	525	water clear	*1800	*5500	20°	
WP7113VGC/Z	InGaN	535	water clear	*5700	*10000	20°	
WP7113QBC/D	AlGaInN	470	water clear	*900	*2200	16°	
WP7113PBC/A	InGaN	470	water clear	*480	*1600	16°	
WP7113PBC/Z	InGaN	465	water clear	*2500	*5500	20°	

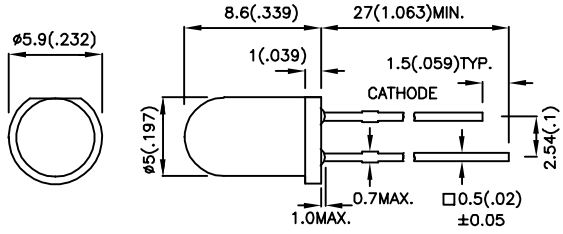


WP3A8



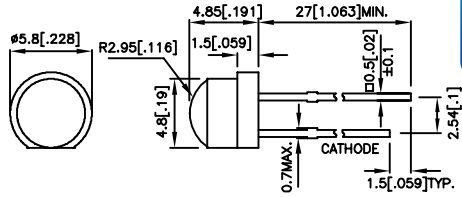
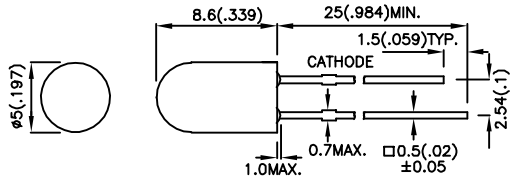
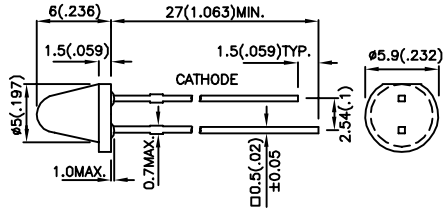
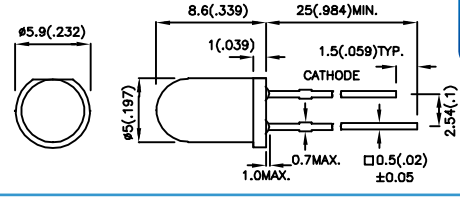
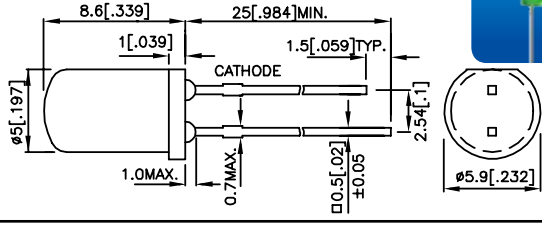
WP132X

WP7113



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

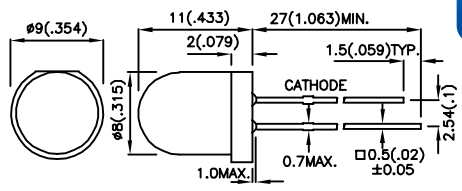
ROUND LED

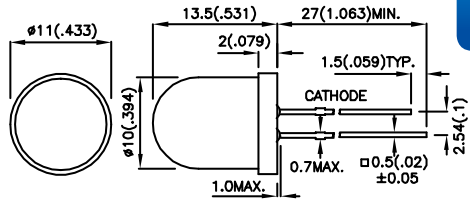
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP9294SEC/J3	AlGaInP	625	water clear	*650	*1600	130°	5mm Round   WP9294
WP9294SYC/J3	AlGaInP	589	water clear	*280	*530	130°	
WP9294VGC/Z	InGaN	535	water clear	*480	*1300	130°	
WP9294PBC/Z	InGaN	465	water clear	*180	*650	130°	
WP1503ID	GaAsP/GaP	625	red diffused	8	30	60°	T-1 3/4 (5mm) Round   WP1503
WP1503IT	GaAsP/GaP	625	red transparent	28	80	30°	
WP1503EC	GaAsP/GaP	625	water clear	28	80	30°	
WP1503SRD	GaAlAs	640	red diffused	*380	*700	60°	
WP1503SRC/D	GaAlAs	640	water clear	*900	*1500	30°	
WP1503SRC/E	GaAlAs	640	water clear	*1800	*2800	30°	
WP1503SRC/F	GaAlAs	640	water clear	*3300	*4000	30°	
WP1503YD	GaAsP/GaP	588	yellow diffused	5	20	60°	
WP1503YT	GaAsP/GaP	588	yellow transparent	18	40	30°	
WP1503YC	GaAsP/GaP	588	water clear	18	40	30°	
WP1503GD	GaP	568	green diffused	5	20	60°	
WP1503GT	GaP	568	green transparent	18	60	30°	
WP1503GC	GaP	568	water clear	18	60	30°	
WP1503SGT	GaP	568	green transparent	*70	*150	30°	
WP1503SGC	GaP	568	water clear	*70	*200	30°	
WP63ID	GaAsP/GaP	625	red diffused	12	20	60°	T-1 3/4 (5mm) Round   WP63
WP63IT	GaAsP/GaP	625	red transparent	28	50	30°	
WP63SRD	GaAlAs	640	red diffused	*110	*300	60°	
WP63SRT	GaAlAs	640	red transparent	*280	*600	30°	
WP63SRC	GaAlAs	640	water clear	*180	*700	30°	
WP63YD	GaAsP/GaP	588	yellow diffused	1.8	6	60°	
WP63YT	GaAsP/GaP	588	yellow transparent	18	35	30°	
WP63GD	GaP	568	green diffused	5	12	60°	
WP63GT	GaP	568	green transparent	18	40	30°	
WP7143SRC/D	GaAlAs	640	water clear	*650	*900	30°	T-1 3/4 (5mm) Round   WP7143
WP7143SURC/E	AlGaInP	630	water clear	*650	*1300	30°	
WP7143SGC	GaP	568	water clear	*70	*150	30°	
WP7083SED/J3	AlGaInP	625	orange diffused	*2200	*3700	60°	T-1 3/4 (5mm) Round   WP7083
WP7083SYD/J3	AlGaInP	589	yellow diffused	*280	*800	60°	
WP7083VGD/Z	InGaN	535	green diffused	*1500	*2300	60°	
WP7083PBD/Z	InGaN	465	blue diffused	*280	*600	60°	

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

ROUND LED

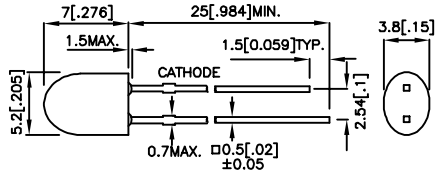
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP793ID	GaAsP/GaP	625	red diffused	36	100	30°	8mm Round
WP793SRC/D	GaAlAs	640	water clear	1500	1700	15°	
WP793SRC/E	GaAlAs	640	water clear	1800	2700	15°	
WP793SRC/F	GaAlAs	640	water clear	2800	3800	15°	
WP793SRD/D	GaAlAs	640	red diffused	280	350	30°	
WP793SRD/E	GaAlAs	640	red diffused	380	450	30°	
WP793SRD/F	GaAlAs	640	red diffused	480	600	30°	
WP793SRD/G	GaAlAs	640	red diffused	650	700	30°	
WP793SRD/H	GaAlAs	640	red diffused	900	1200	30°	
WP793ED	GaAsP/GaP	625	orange diffused	36	100	30°	
WP793YD	GaAsP/GaP	588	yellow diffused	18	50	30°	
WP793GD	GaP	568	green diffused	18	60	30°	
WP813ID	GaAsP/GaP	625	red diffused	36	100	30°	10mm Round
WP813SRC/D	GaAlAs	640	water clear	1500	1700	15°	
WP813SRC/E	GaAlAs	640	water clear	1800	2700	15°	
WP813SRC/F	GaAlAs	640	water clear	2800	3800	15°	
WP813SRD/D	GaAlAs	640	red diffused	280	350	30°	
WP813SRD/E	GaAlAs	640	red diffused	380	450	30°	
WP813SRD/F	GaAlAs	640	red diffused	480	600	30°	
WP813SRD/G	GaAlAs	640	red diffused	650	700	30°	
WP813SRD/H	GaAlAs	640	red diffused	900	1200	30°	
WP813ED	GaAsP/GaP	625	orange diffused	36	100	30°	
WP813YD	GaAsP/GaP	588	yellow diffused	10	50	30°	
WP813GD	GaP	568	green diffused	18	60	30°	





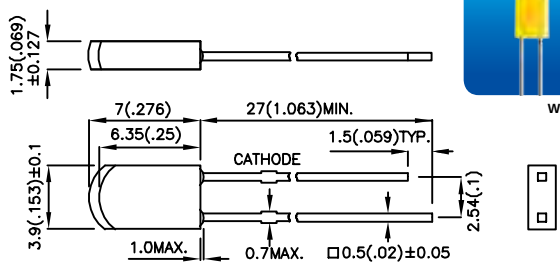
OVAL LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP5603SIDL/SD/J3	AlGaInP	630	red semi diffused	1800	3600	100°(H) 50°(V)	5.2mm Oval
WP5603SYDL/SD/J3	AlGaInP	589	yellow semi diffused	380	1200	100°(H) 50°(V)	
WP5603VGDL/SD/Z	InGaN	535	green semi diffused	2200	5000	100°(H) 50°(V)	
WP5603PBDL/SD/Z	InGaN	465	blue semi diffused	480	1100	90°(H) 30°(V)	



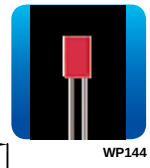
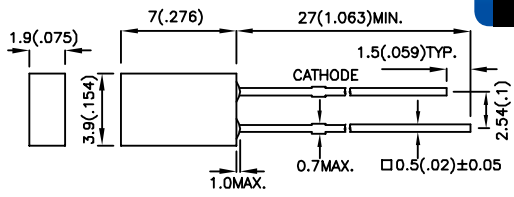
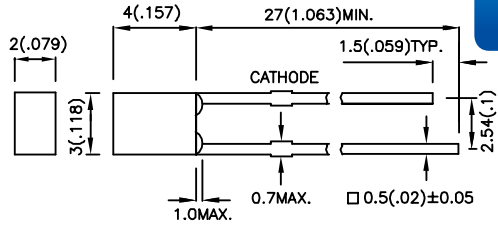
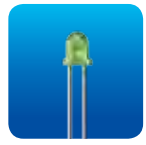
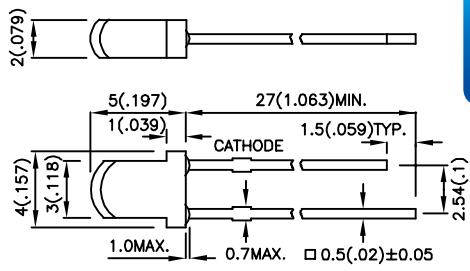
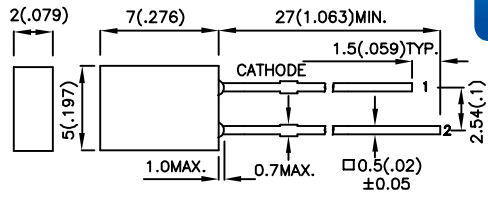
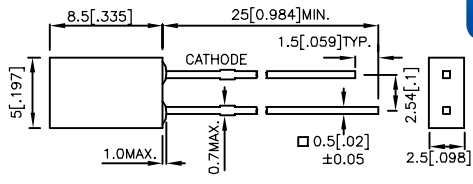
RECTANGULAR LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP2773HD	GaP	660	red diffused	0.7	2	100°	1.75mm x 3.9mm Rectangular
WP2773ID	GaAsP/GaP	625	red diffused	5	10	100°	
WP2773ED	GaAsP/GaP	625	orange diffused	5	10	100°	
WP2773ND	GaAsP/GaP	610	orange diffused	5	8	100°	
WP2773YD	GaAsP/GaP	588	yellow diffused	3	8	100°	
WP2773GD	GaP	568	green diffused	3	10	100°	



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

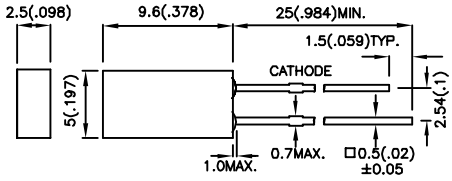
RECTANGULAR LED

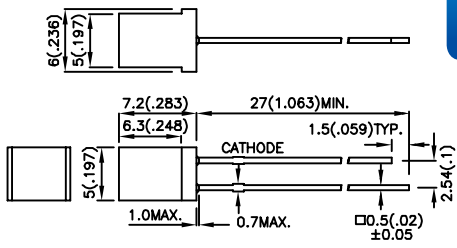
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP144HDT	GaP	660	red diffused	0.4	1	110°	1.9mm x 3.9mm Rectangular  WP144 
WP144IDT	GaAsP/GaP	625	red diffused	3	6	110°	
WP144SRDT	GaAlAs	640	red diffused	*36	*70	110°	
WP144EDT	GaAsP/GaP	625	orange diffused	3	6	110°	
WP144YDT	GaAsP/GaP	588	yellow diffused	1	3	110°	
WP144GDT	GaP	568	green diffused	1	4	110°	
WP914HDT	GaP	660	red diffused	0.2	1	100°	2mm x 3mm Rectangular  WP914 
WP914HT	GaP	660	red transparent	0.4	1	90°	
WP914IDT	GaAsP/GaP	625	red diffused	1.8	8	100°	
WP914IT	GaAsP/GaP	625	red transparent	3	8	90°	
WP914EDT	GaAsP/GaP	625	orange diffused	1.8	8	100°	
WP914ET	GaAsP/GaP	625	orange transparent	3	8	90°	
WP914GDT	GaP	568	green diffused	1.8	6	100°	
WP914GT	GaP	568	green transparent	3	8	90°	
WP914PGT	GaP	555	green transparent	0.4	1	90°	
WP169XID	GaAsP/GaP	625	red diffused	8	15	60°	2mm x 3mm Rectangular  WP169X 
WP169XYD	GaAsP/GaP	588	yellow diffused	5	10	60°	
WP169XGD	GaP	568	green diffused	5	15	60°	
WP113HDT	GaP	660	red diffused	0.4	1	110°	2mm x 5mm Rectangular  WP113 
WP113IDT	GaAsP/GaP	625	red diffused	3	5	110°	
WP113SRDT	GaAlAs	640	red diffused	*36	*80	110°	
WP113EDT	GaAsP/GaP	625	orange diffused	3	5	110°	
WP113YDT	GaAsP/GaP	588	yellow diffused	1	4	110°	
WP113GDT	GaP	568	green diffused	1.8	5	110°	
WP513HDT	GaP	660	red diffused	0.4	1	110°	2.5mm x 5mm Rectangular  WP513 
WP513IDT	GaAsP/GaP	625	red diffused	1.8	5	110°	
WP513EDT	GaAsP/GaP	625	orange diffused	1.8	5	110°	
WP513YDT	GaAsP/GaP	588	yellow diffused	1	3	110°	
WP513GDT	GaP	568	green diffused	1	3	110°	
WP513SGDT	GaP	568	green diffused	*7	*10	110°	

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

RECTANGULAR LED

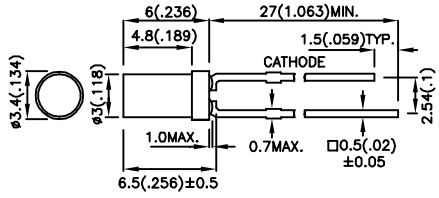
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP383HDT	GaP	660	red diffused	0.4	1	110°	2.5mm x 5mm Rectangular
WP383IDT	GaAsP/GaP	625	red diffused	3	5	110°	
WP383SRDT	GaAlAs	640	red diffused	*36	*70	110°	
WP383EDT	GaAsP/GaP	625	orange diffused	3	5	110°	
WP383YDT	GaAsP/GaP	588	yellow diffused	1	4	110°	
WP383GDT	GaP	568	green diffused	1	4	110°	
WP503HDT	GaP	660	red diffused	0.4	1	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	3	110°	

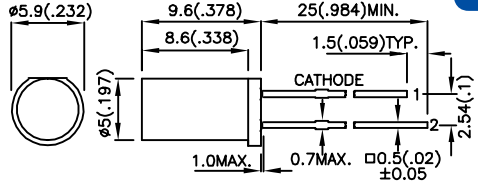




CYLINDRICAL LED

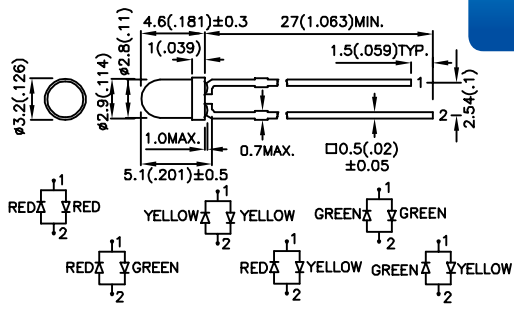
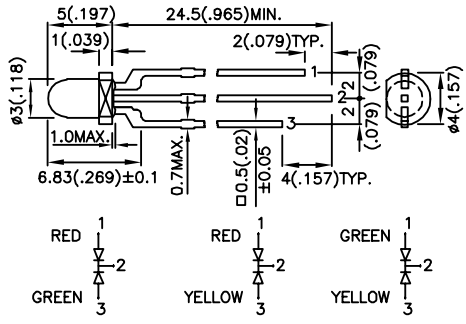
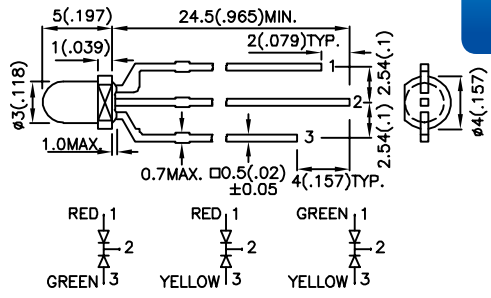
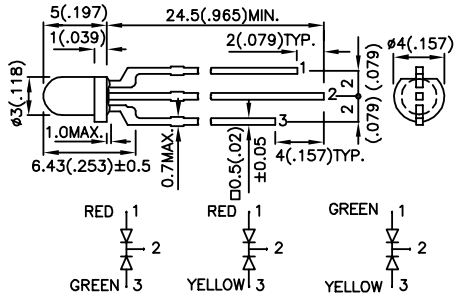
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP424HDT	GaP	660	red diffused	0.4	1	100°	T-1 (3mm) Cylindrical
WP424IDT	GaAsP/GaP	625	red diffused	3	5	100°	
WP424SRDT	GaAlAs	640	red diffused	*36	*100	100°	
WP424EDT	GaAsP/GaP	625	orange diffused	3	5	100°	
WP424YDT	GaAsP/GaP	588	yellow diffused	1	4	100°	
WP424GDT	GaP	568	green diffused	1	4	100°	
WP483HDT	GaP	660	red diffused	0.4	1	100°	T-1 3/4 (5mm) Cylindrical
WP483IDT	GaAsP/GaP	625	red diffused	1.8	5	100°	
WP483EDT	GaAsP/GaP	625	orange diffused	3	7	100°	
WP483YDT	GaAsP/GaP	588	yellow diffused	0.7	3	100°	
WP483GDT	GaP	568	green diffused	1	4	100°	





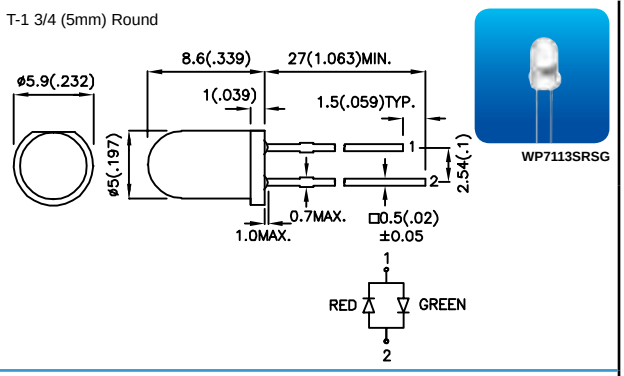
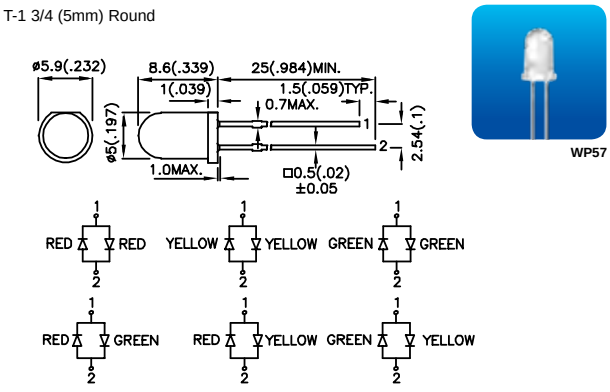
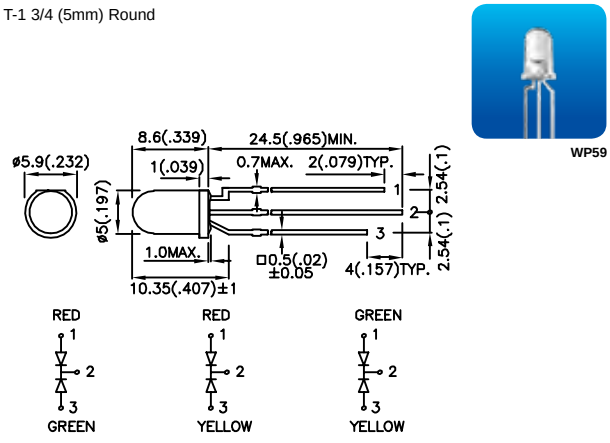
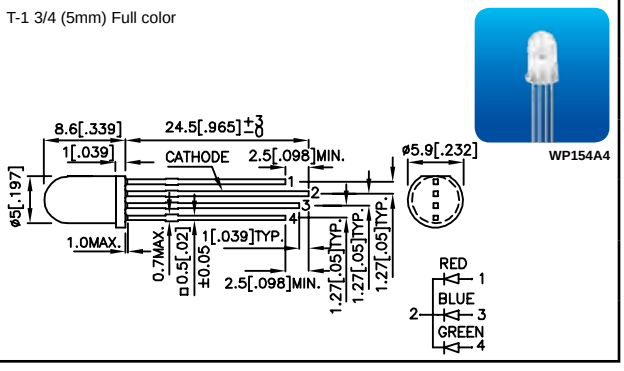
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

MULTI-COLOR LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP937IID	GaAsP/GaP	625	red diffused	7	20	60°	T-1 (3mm) Round  WP937 
	GaAsP/GaP	625		7	20		
WP937YYD	GaAsP/GaP	588	yellow diffused	4	10	60°	
	GaAsP/GaP	588		4	10		
WP937GGD	GaP	568	green diffused	4	15	60°	
	GaP	568		4	15		
WP937EGW	GaAsP/GaP	625	white diffused	7	20	60°	
	GaP	568		7	16		
WP937EYW	GaAsP/GaP	625	white diffused	7	20	60°	
	GaAsP/GaP	588		1.6	7		
WP937GYW	GaP	568	white diffused	7	16	60°	
	GaAsP/GaP	588		1.6	7		
WP115VEGW	GaAsP/GaP	625	white diffused	10	50	60°	T-1 (3mm) Round  WP115V 
	GaP	568		10	30		
WP115VEYW	GaAsP/GaP	625	white diffused	10	50	60°	
	GaAsP/GaP	588		7	15		
WP115VGYW	GaP	568	white diffused	10	30	60°	
	GaAsP/GaP	588		7	15		
WP115WEGW	GaAsP/GaP	625	white diffused	10	40	60°	T-1 (3mm) Round  WP115W 
	GaP	568		10	35		
WP115WEYW	GaAsP/GaP	625	white diffused	10	40	60°	
	GaAsP/GaP	588		7	20		
WP115WGYW	GaP	568	white diffused	10	35	60°	
	GaAsP/GaP	588		7	20		
WP3VEGW	GaAsP/GaP	625	white diffused	10	40	60°	T-1 (3mm) Round  WP3V 
	GaP	568		10	35		
WP3VEYW	GaAsP/GaP	625	white diffused	10	40	60°	
	GaAsP/GaP	588		7	15		
WP3VGYW	GaP	568	white diffused	10	35	60°	
	GaAsP/GaP	588		7	15		

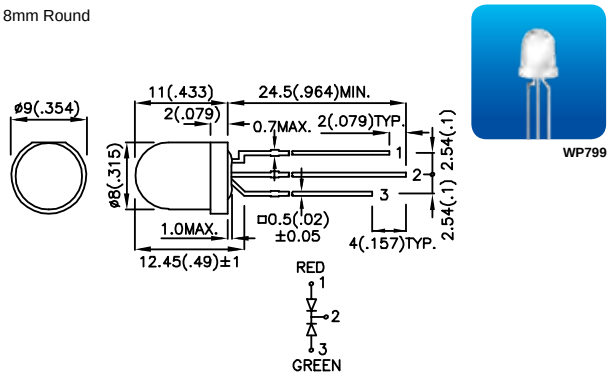
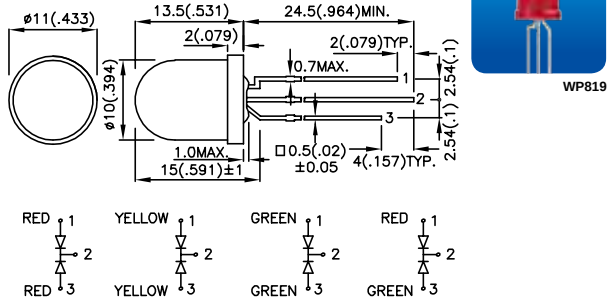
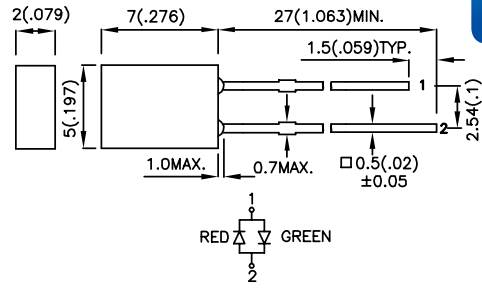
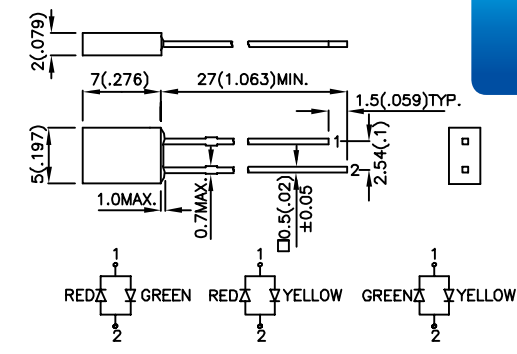
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

MULTI-COLOR LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA MIN.	Iv (mcd) @20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP7113SRSGW	GaAlAs	640	white diffused	110	200	35°	T-1 3/4 (5mm) Round 
	GaP	568		18	60		
WP57IID	GaAsP/GaP	625	red diffused	7	20	60°	T-1 3/4 (5mm) Round 
	GaAsP/GaP	625		7	20		
WP57YYD	GaAsP/GaP	588	yellow diffused	4	10	60°	
	GaAsP/GaP	588		4	10		
WP57GGD	GaP	568	green diffused	4	10	60°	
	GaP	568		4	10		
WP57SRSRD	GaAlAs	640	red diffused	70	150	60°	
	GaAlAs	640		70	150		
WP57EGW	GaAsP/GaP	625	white diffused	10	30	60°	
	GaP	568		10	20		
WP57EYW	GaAsP/GaP	625	white diffused	10	30	60°	
	GaAsP/GaP	588		4	10		
WP57GYW	GaP	568	white diffused	10	20	60°	
	GaAsP/GaP	588		4	10		
WP59EGW	GaAsP/GaP	625	white diffused	18	60	60°	T-1 3/4 (5mm) Round 
	GaP	568		18	50		
WP59EYW	GaAsP/GaP	625	white diffused	18	60	60°	
	GaAsP/GaP	588		18	40		
WP59GYW	GaP	568	white diffused	18	50	60°	
	GaAsP/GaP	588		18	40		
WP59SRSGW/CC	GaAlAs	640	white diffused	110	220	60°	
	GaP	568		18	50		
WP59SURKCGKW	AlGaInP	630	white diffused	280	700	60°	
	AlGaInP	570		50	200		
WP59EGC	GaAsP/GaP	625	water clear	70	150	24°	
	GaP	568		70	150		
WP59EYC	GaAsP/GaP	625	water clear	70	150	24°	
	GaAsP/GaP	588		18	60		
WP59GYC	GaP	568	water clear	70	150	24°	
	GaAsP/GaP	588		18	60		
WP154A4SUREPBGVGAC	AlGaInP	630	water clear	650	1300	50°	T-1 3/4 (5mm) Full color 
	InGaN	470		280	800		
	InGaN	525		480	1200		
WP154A4SUREPBGVGAW	AlGaInP	630	white diffused	380	750	60°	
	InGaN	470		180	450		
	InGaN	525		180	500		

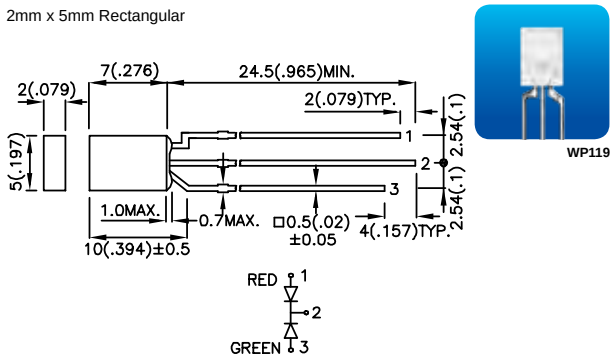
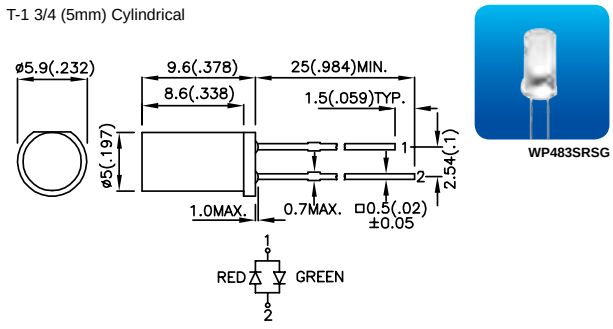
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

MULTI-COLOR LED

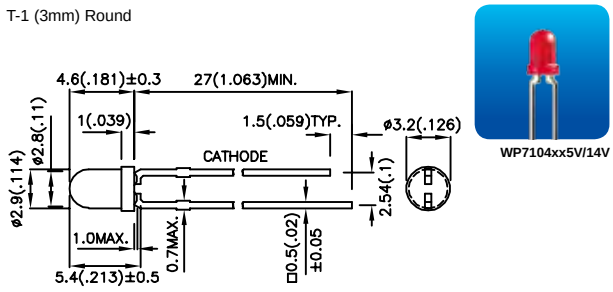
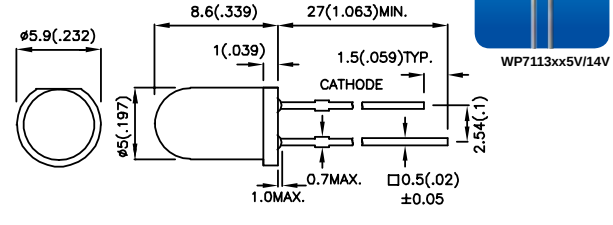
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP799EGW	GaAsP/GaP	625	white diffused	36	80	50°	8mm Round  WP799
	GaP	568		18	50		
WP799SRSGW/CC	GaAlAs	640	white diffused	110	200	50°	
	GaP	568		18	50		
WP799SURKMGKW	AlGaInP	630	white diffused	380	600	50°	
	AlGaInP	570		50	130		
WP819IID	GaAsP/GaP	625	red diffused	36	80	50°	10mm Round   WP819
	GaAsP/GaP	625		36	80		
WP819YYD	GaAsP/GaP	588	yellow diffused	10	30	50°	
	GaAsP/GaP	588		10	30		
WP819GGD	GaP	568	green diffused	10	40	50°	
	GaP	568		10	40		
WP819EGW	GaAsP/GaP	625	white diffused	36	80	50°	
	GaP	568		18	50		
WP819SRSGW/CC	GaAlAs	640	white diffused	110	300	50°	
	GaP	568		36	50		
WP819SURKMGKW	AlGaInP	630	white diffused	380	750	50°	
	AlGaInP	570		50	130		
WP113SRSGWT	GaAlAs	640	white diffused	36	70	110°	2mm x 5mm Rectangular   WP113SRSG
	GaP	568		7	10		
WP117EGWT	GaAsP/GaP	625	white diffused	4	10	110°	2mm x 5mm Rectangular   WP117
	GaP	568		4	8		
WP117EYWT	GaAsP/GaP	625	white diffused	4	10	110°	
	GaAsP/GaP	588		2.6	6		
WP117GYWT	GaP	568	white diffused	4	8	110°	
	GaAsP/GaP	588		2.6	6		

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

MULTI-COLOR LED

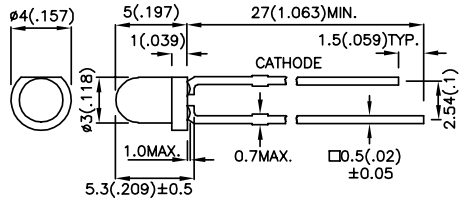
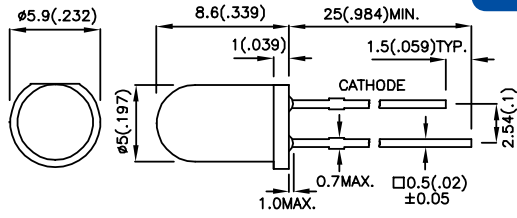
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA MIN.	Iv (mcd) @20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP119EGWT	GaAsP/GaP	625	white diffused	7	20	110°	2mm x 5mm Rectangular  WP119
	GaP	568		4	12		
WP119SRSGWT/CC	GaAlAs	640	white diffused	18	60	110°	
	GaP	568		4	12		
WP119SURKMGKWT	AlGaInP	630	white diffused	70	170	110°	
	AlGaInP	570		10	30		
WP483SRSGW	GaAlAs	640	white diffused	18	50	80°	T-1 3/4 (5mm) Cylindrical  WP483SRSG
	GaP	568		4	10		

RESISTOR LED

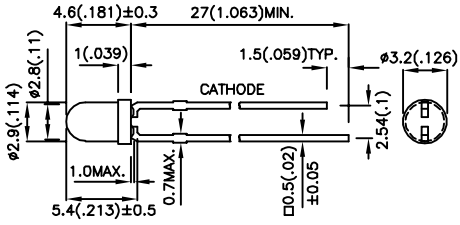
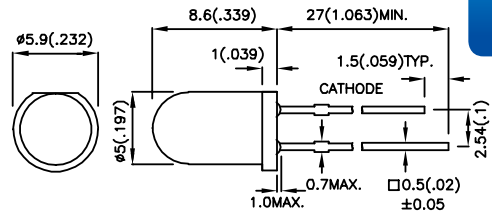
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) V=5V *V=14V MIN.	Iv (mcd) V=5V *V=14V TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP7104ID5V	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Round  WP7104xx5V/14V
WP7104ID14V	GaAsP/GaP	625	red diffused	*8	*20	40°	
WP7104SRD5V	GaAlAs	640	red diffused	70	150	40°	
WP7104SRD14V	GaAlAs	640	red diffused	*28	*90	40°	
WP7104YD5V	GaAsP/GaP	588	yellow diffused	8	15	40°	
WP7104YD14V	GaAsP/GaP	588	yellow diffused	*3	*11	40°	
WP7104GD5V	GaP	568	green diffused	8	20	40°	
WP7104GD14V	GaP	568	green diffused	*8	*20	40°	
WP7104SGD5V	GaP	568	green diffused	8	20	40°	
WP7104SGD14V	GaP	568	green diffused	*8	*20	40°	
WP7113ID5V	GaAsP/GaP	625	red diffused	12	30	30°	T-1 3/4 (5mm) Round   WP7113xx5V/14V
WP7113ID14V	GaAsP/GaP	625	red diffused	*12	*30	30°	
WP7113SRD5V	GaAlAs	640	red diffused	110	180	30°	
WP7113SRD14V	GaAlAs	640	red diffused	*70	*160	30°	
WP7113YD5V	GaAsP/GaP	588	yellow diffused	5	20	30°	
WP7113YD14V	GaAsP/GaP	588	yellow diffused	*5	*16	30°	
WP7113SGD5V	GaP	568	green diffused	8	20	30°	
WP7113SGD14V	GaP	568	green diffused	*5	*18	30°	

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

BLINKING LED

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) V=9V		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP36BHD	GaP	660	red diffused	1	2	60°	T-1 (3mm) Round  WP36B 
WP36BID	GaAsP/GaP	625	red diffused	12	20	60°	
WP36BSRD/B	GaAlAs	640	red diffused	110	200	60°	
WP36BYD	GaAsP/GaP	588	yellow diffused	5	10	60°	
WP36BGD	GaP	568	green diffused	5	15	60°	
WP56BHD	GaP	660	red diffused	0.7	4	60°	T-1 3/4 (5mm) Round  WP56B 
WP56BID	GaAsP/GaP	625	red diffused	18	40	60°	
WP56BSRD/B	GaAlAs	640	red diffused	110	200	60°	
WP56BYD	GaAsP/GaP	588	yellow diffused	5	20	60°	
WP56BGD	GaP	568	green diffused	5	20	60°	

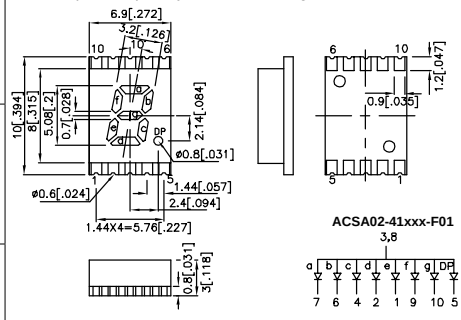
LOW CURRENT LED

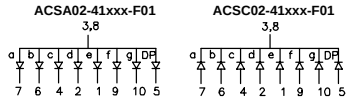
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @2mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP7104LID	GaAsP/GaP	625	red diffused	0.7	3	40°	T-1 (3mm) Round  WP7104L 
WP7104LSRD	GaAlAs	640	red diffused	8	20	40°	
WP7104LYD	GaAsP/GaP	588	yellow diffused	0.7	1.5	40°	
WP7104LGD	GaP	568	green diffused	0.7	2	40°	
WP7113LID	GaAsP/GaP	625	red diffused	0.7	5	30°	T-1 3/4 (5mm) Round  WP7113L 
WP7113LSRD	GaAlAs	640	red diffused	8	20	30°	
WP7113LYD	GaAsP/GaP	588	yellow diffused	0.7	2	30°	
WP7113LGD	GaP	568	green diffused	0.7	2	30°	

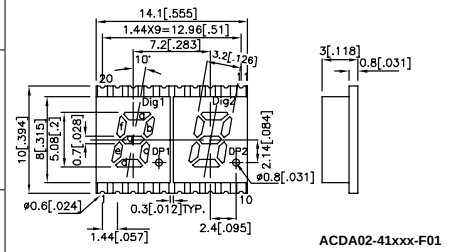
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

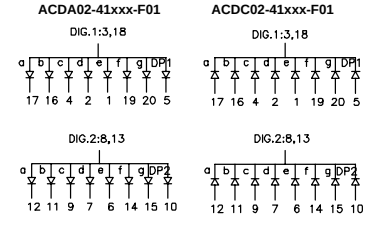
7-SEGMENT SMD DISPLAY

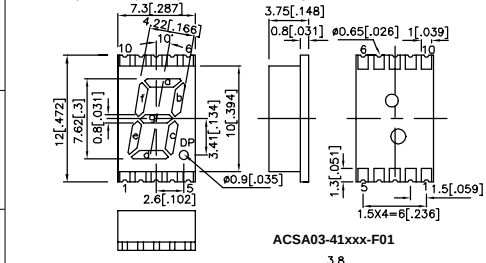
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
ACSA02-41SURKWA-F01 ACDA02-41SURKWA-F01	ACSC02-41SURKWA-F01 ACDC02-41SURKWA-F01	AlGaInP	630	8000	30400	0.2 inch (5.08mm), Gray Face, White Segment
ACSA02-41SEKWA-F01 ACDA02-41SEKWA-F01	ACSC02-41SEKWA-F01 ACDC02-41SEKWA-F01	AlGaInP	601	8000	37200	
ACSA02-41SYKWA-F01 ACDA02-41SYKWA-F01	ACSC02-41SYKWA-F01 ACDC02-41SYKWA-F01	AlGaInP	590	8000	34000	
ACSA02-41SGWA-F01 ACDA02-41SGWA-F01	ACSC02-41SGWA-F01 ACDC02-41SGWA-F01	GaP	568	1900	10000	
ACSA02-41CGKWA-F01 ACDA02-41CGKWA-F01	ACSC02-41CGKWA-F01 ACDC02-41CGKWA-F01	AlGaInP	570	4700	26000	
ACSA02-41PBWA/A-F01 ACDA02-41PBWA/A-F01	ACSC02-41PBWA/A-F01 ACDC02-41PBWA/A-F01	InGaN	470	1200	5000	
ACSA03-41SRWA-F01 ACDA03-41SRWA-F01	ACSC03-41SRWA-F01 ACDC03-41SRWA-F01	GaAlAs	640	4700	19000	0.3 inch (7.62mm), Gray Face, White Segment
ACSA03-41SURKWA-F01 ACDA03-41SURKWA-F01	ACSC03-41SURKWA-F01 ACDC03-41SURKWA-F01	AlGaInP	630	8000	27000	
ACSA03-41SEKWA-F01 ACDA03-41SEKWA-F01	ACSC03-41SEKWA-F01 ACDC03-41SEKWA-F01	AlGaInP	601	12000	46000	
ACSA03-41SYKWA-F01 ACDA03-41SYKWA-F01	ACSC03-41SYKWA-F01 ACDC03-41SYKWA-F01	AlGaInP	590	18000	36000	
ACSA03-41SGWA-F01 ACDA03-41SGWA-F01	ACSC03-41SGWA-F01 ACDC03-41SGWA-F01	GaP	568	1200	5600	
ACSA03-41CGKWA-F01 ACDA03-41CGKWA-F01	ACSC03-41CGKWA-F01 ACDC03-41CGKWA-F01	AlGaInP	570	4700	16000	
ACSA03-41PBWA/A-F01 ACDA03-41PBWA/A-F01	ACSC03-41PBWA/A-F01 ACDC03-41PBWA/A-F01	InGaN	470	1200	6000	

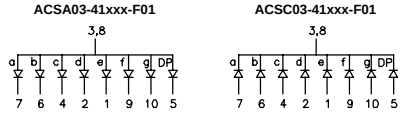


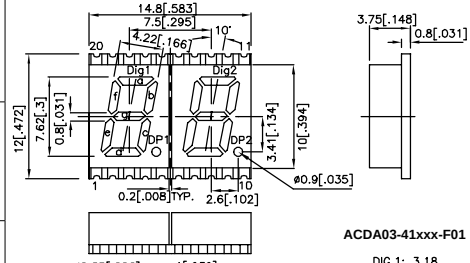


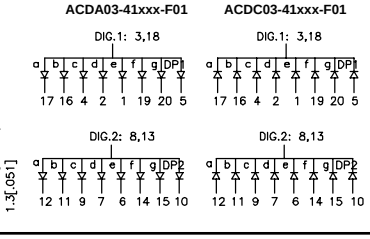








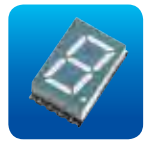


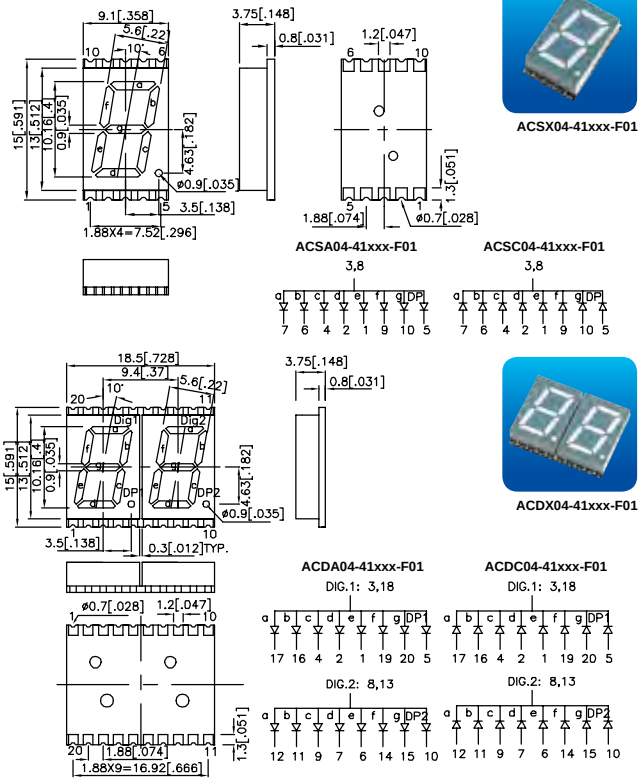


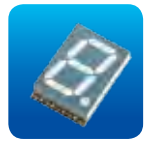
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

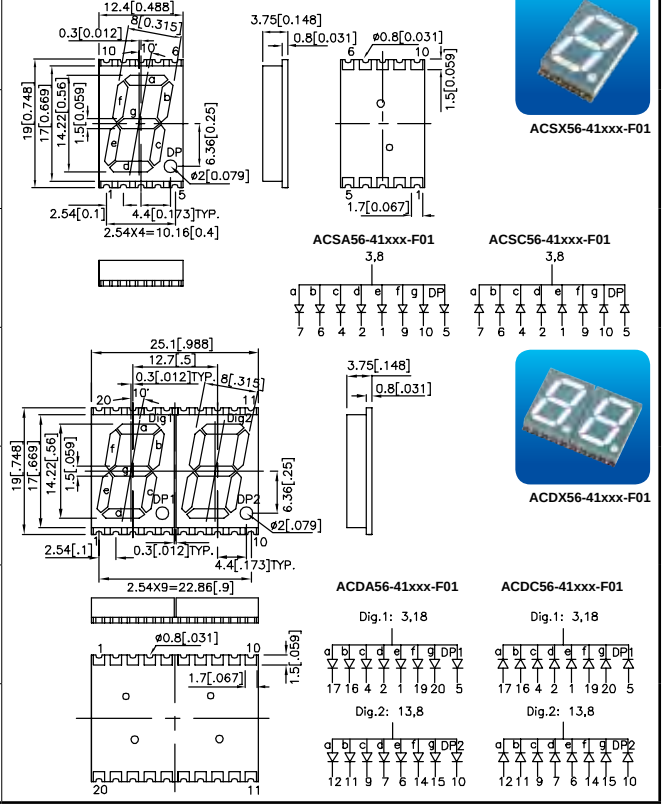
7-SEGMENT SMD DISPLAY

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	4700	18000	0.4 inch (10.16mm), Gray Face, White Segment
ACSA04-41SURKWA-F01 ACDA04-41SURKWA-F01	ACSC04-41SURKWA-F01 ACDC04-41SURKWA-F01	AlGaInP	630	8000	26000	
ACSA04-41SEKWA-F01 ACDA04-41SEKWA-F01	ACSC04-41SEKWA-F01 ACDC04-41SEKWA-F01	AlGaInP	601	12000	50000	
ACSA04-41SYKWA-F01 ACDA04-41SYKWA-F01	ACSC04-41SYKWA-F01 ACDC04-41SYKWA-F01	AlGaInP	590	12000	49000	
ACSA04-41SGWA-F01 ACDA04-41SGWA-F01	ACSC04-41SGWA-F01 ACDC04-41SGWA-F01	GaP	568	1900	7000	
ACSA04-41CGKWA-F01 ACDA04-41CGKWA-F01	ACSC04-41CGKWA-F01 ACDC04-41CGKWA-F01	AlGaInP	570	4700	17400	
ACSA04-41PBWA/A-F01 ACDA04-41PBWA/A-F01	ACSC04-41PBWA/A-F01 ACDC04-41PBWA/A-F01	InGaN	470	1200	4700	
ACSA56-41SRWA-F01 ACDA56-41SRWA-F01	ACSC56-41SRWA-F01 ACDC56-41SRWA-F01	GaAlAs	640	8000	26000	0.56 inch (14.22mm), Gray Face, White Segment
ACSA56-41SURKWA-F01 ACDA56-41SURKWA-F01	ACSC56-41SURKWA-F01 ACDC56-41SURKWA-F01	AlGaInP	630	18000	44000	
ACSA56-41SEKWA-F01 ACDA56-41SEKWA-F01	ACSC56-41SEKWA-F01 ACDC56-41SEKWA-F01	AlGaInP	601	12000	50000	
ACSA56-41SYKWA-F01 ACDA56-41SYKWA-F01	ACSC56-41SYKWA-F01 ACDC56-41SYKWA-F01	AlGaInP	590	18000	76000	
ACSA56-41SGWA-F01 ACDA56-41SGWA-F01	ACSC56-41SGWA-F01 ACDC56-41SGWA-F01	GaP	568	3000	13200	
ACSA56-41CGKWA-F01 ACDA56-41CGKWA-F01	ACSC56-41CGKWA-F01 ACDC56-41CGKWA-F01	AlGaInP	570	8000	35500	
ACSA56-41PBWA/A-F01 ACDA56-41PBWA/A-F01	ACSC56-41PBWA/A-F01 ACDC56-41PBWA/A-F01	InGaN	470	1900	9000	





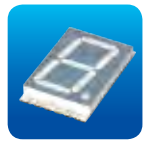




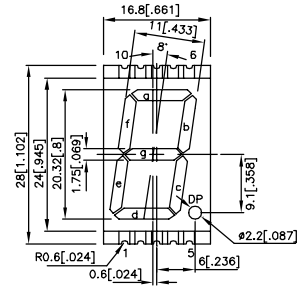
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

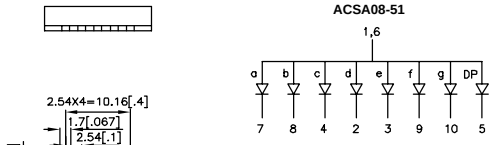
7-SEGMENT SMD DISPLAY

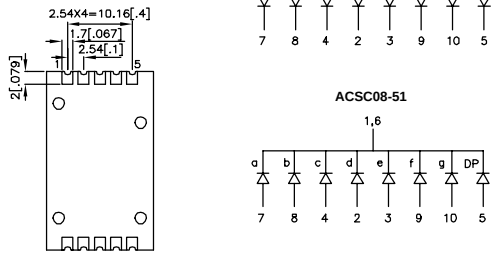
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
ACSA08-51SURKWA	ACSC08-51SURKWA	AlGaInP	630	18000	61000	0.8 inch (20.32mm), Gray Face, White Segment
ACSA08-51SEKWA	ACSC08-51SEKWA	AlGaInP	601	18000	80000	
ACSA08-51SYKWA	ACSC08-51SYKWA	AlGaInP	590	12000	65000	
ACSA08-51SGWA	ACSC08-51SGWA	GaP	568	1900	7500	
ACSA08-51CGKWA	ACSC08-51CGKWA	AlGaInP	570	8000	30000	
ACSA08-51PBWA/A	ACSC08-51PBWA/A	InGaN	470	3000	12000	



ACSX08-51

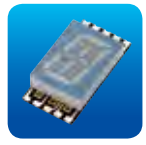




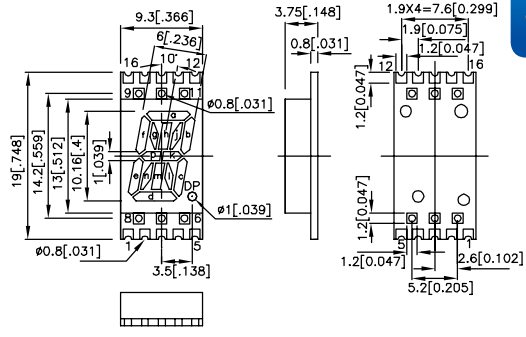


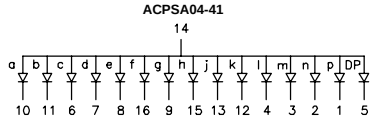
ALPHANUMERIC SMD DISPLAY

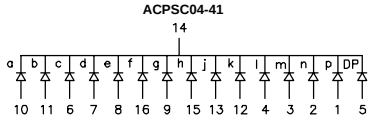
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
ACPSA04-41SRWA	ACPSC04-41SRWA	GaAlAs	640	4700	16200	0.4 inch (10.16mm), Gray Face, White Segment
ACPSA04-41SURKWA	ACPSC04-41SURKWA	AlGaInP	630	8000	36000	
ACPSA04-41SEKWA	ACPSC04-41SEKWA	AlGaInP	601	12000	44000	
ACPSA04-41SYKWA	ACPSC04-41SYKWA	AlGaInP	590	12000	45500	
ACPSA04-41SGWA	ACPSC04-41SGWA	GaP	568	1900	7500	
ACPSA04-41CGKWA	ACPSC04-41CGKWA	AlGaInP	570	4700	18500	
ACPSA04-41PBWA/A	ACPSC04-41PBWA/A	InGaN	470	1900	6400	



ACPSX04-41





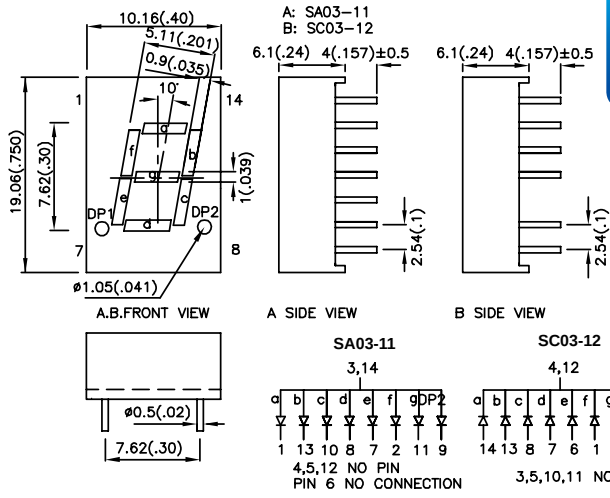


NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

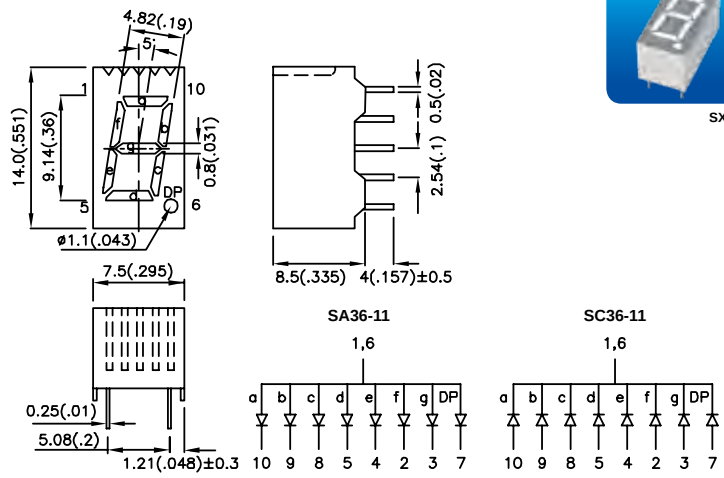
SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
SA03-11EWA	SC03-12EWA	GaAsP/ GaP	625	1900	8500	0.3 inch (7.62mm), Gray Face, White Segment
SA03-11SRWA	SC03-12SRWA	GaAlAs	640	8000	26000	
SA03-11YWA	SC03-12YWA	GaAsP/ GaP	588	1200	4700	
SA03-11GWA	SC03-12GWA	GaP	568	1900	8000	
SA36-11EWA	SC36-11EWA	GaAsP/ GaP	625	480	1900	0.36 inch (9.14mm), Gray Face, White Segment
SA36-11SRWA	SC36-11SRWA	GaAlAs	640	1900	8200	
SA36-11YWA	SC36-11YWA	GaAsP/ GaP	588	800	3200	
SA36-11GWA	SC36-11GWA	GaP	568	800	3500	
SA39-11EWA SA39-12EWA	SC39-11EWA SC39-12EWA	GaAsP/ GaP	625	800	4100	0.39 inch (9.9mm), Gray Face, White Segment
SA39-11SRWA SA39-12SRWA	SC39-11SRWA SC39-12SRWA	GaAlAs	640	4700	20000	
SA39-11YWA SA39-12YWA	SC39-11YWA SC39-12YWA	GaAsP/ GaP	588	800	3000	
SA39-11GWA SA39-12GWA	SC39-11GWA SC39-12GWA	GaP	568	1200	6400	

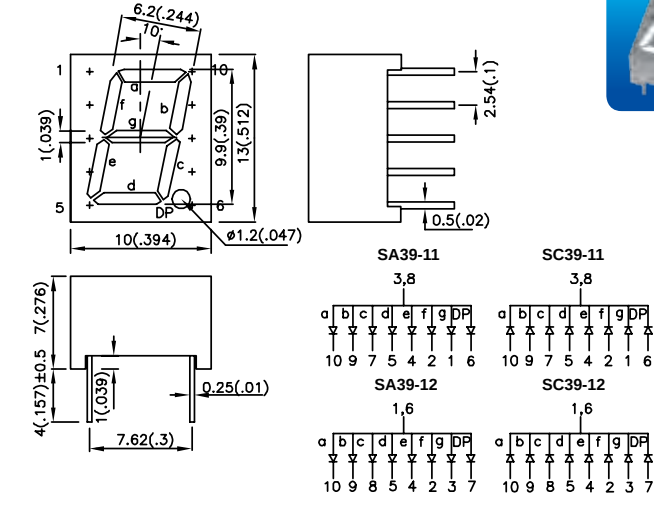

SX03




SX36



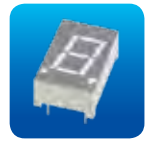

SX39



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

SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
SA04-11EWA SA04-12EWA	SC04-11EWA SC04-12EWA	GaAsP/ GaP	625	1900	8000	0.4 inch (10.16mm), Gray Face, White Segment
SA04-11SRWA SA04-12SRWA	SC04-11SRWA SC04-12SRWA	GaAlAs	640	12000	36000	
SA04-11YWA SA04-12YWA	SC04-11YWA SC04-12YWA	GaAsP/ GaP	588	1200	4700	
SA04-11GWA SA04-12GWA	SC04-11GWA SC04-12GWA	GaP	568	3000	12000	
SA43-11EWA SA43-13EWA	SC43-11EWA SC43-13EWA	GaAsP/ GaP	625	1200	4700	0.43 inch (10.92mm), Gray Face, White Segment
SA43-11SRWA SA43-13SRWA	SC43-11SRWA SC43-13SRWA	GaAlAs	640	8000	26000	
SA43-11YWA SA43-13YWA	SC43-11YWA SC43-13YWA	GaAsP/ GaP	588	1200	4700	
SA43-11GWA SA43-13GWA	SC43-11GWA SC43-13GWA	GaP	568	1900	10500	
SA05-11EWA	SC05-11EWA	GaAsP/ GaP	625	1900	8000	0.5 inch (12.7mm), Gray Face, White Segment
SA05-11SRWA	SC05-11SRWA	GaAlAs	640	8000	29500	
SA05-11YWA	SC05-11YWA	GaAsP/ GaP	588	1200	4700	
SA05-11GWA	SC05-11GWA	GaP	568	1900	10500	

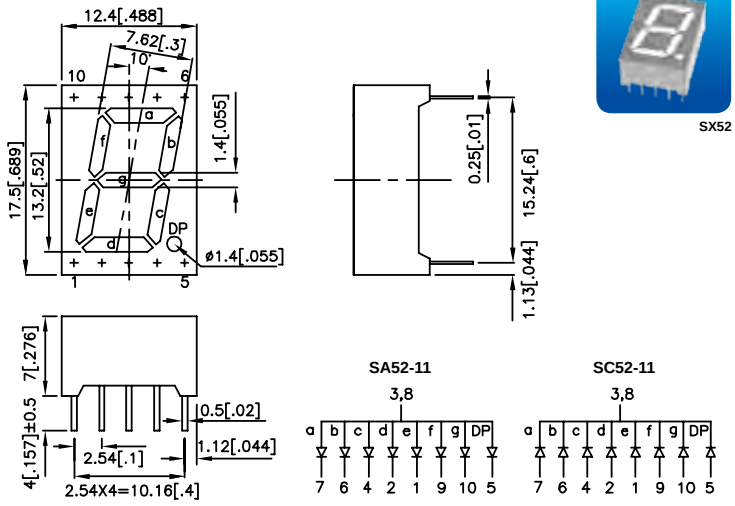


NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

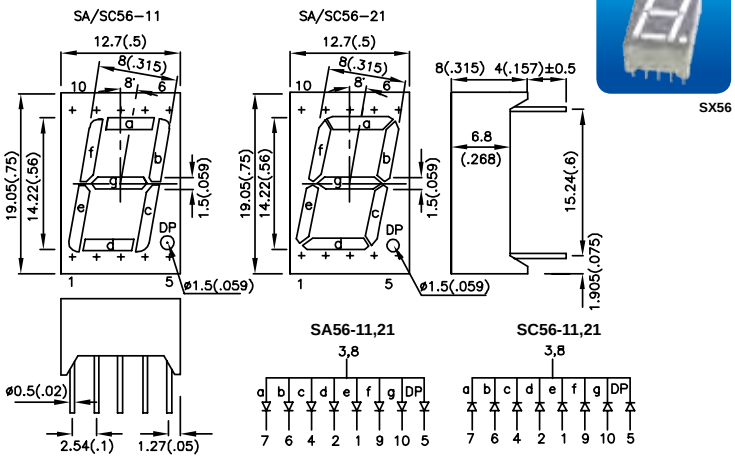
SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

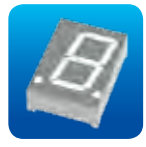
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
SA52-11EWA	SC52-11EWA	GaAsP/ GaP	625	1200	6400	0.52 inch (13.2mm), Gray Face, White Segment
SA52-11SRWA	SC52-11SRWA	GaAlAs	640	8000	29000	
SA52-11GWA	SC52-11GWA	GaP	568	1900	10500	
SA56-11EWA SA56-21EWA	SC56-11EWA SC56-21EWA	GaAsP/ GaP	625	1200	6400	0.56 inch (14.2mm), Gray Face, White Segment
SA56-11SRWA SA56-21SRWA	SC56-11SRWA SC56-21SRWA	GaAlAs	640	12000	36000	
SA56-11YWA SA56-21YWA	SC56-11YWA SC56-21YWA	GaAsP/ GaP	588	1200	4700	
SA56-11GWA SA56-21GWA	SC56-11GWA SC56-21GWA	GaP	568	1900	10500	
SA08-11EWA SA08-12EWA	SC08-11EWA SC08-12EWA	GaAsP/ GaP	625	1900	8000	0.8 inch (20.32mm), Gray Face, White Segment
SA08-11SRWA SA08-12SRWA	SC08-11SRWA SC08-12SRWA	GaAlAs	640	8000	36000	
SA08-11YWA SA08-12YWA	SC08-11YWA SC08-12YWA	GaAsP/ GaP	588	1200	4700	
SA08-11GWA SA08-12GWA	SC08-11GWA SC08-12GWA	GaP	568	3000	16000	

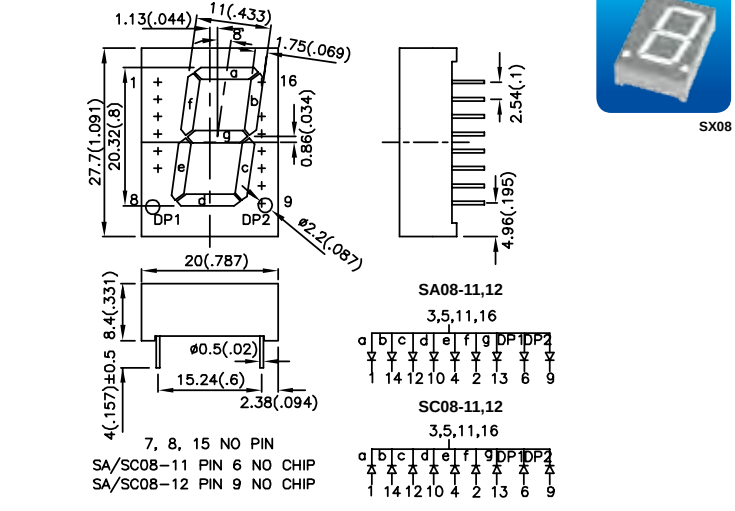

SX52




SX56



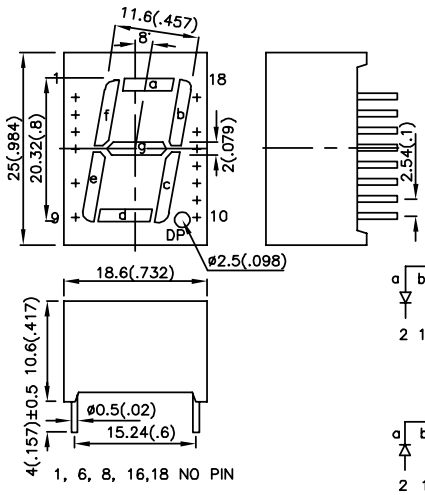

SX08

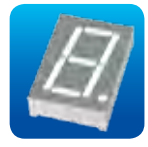


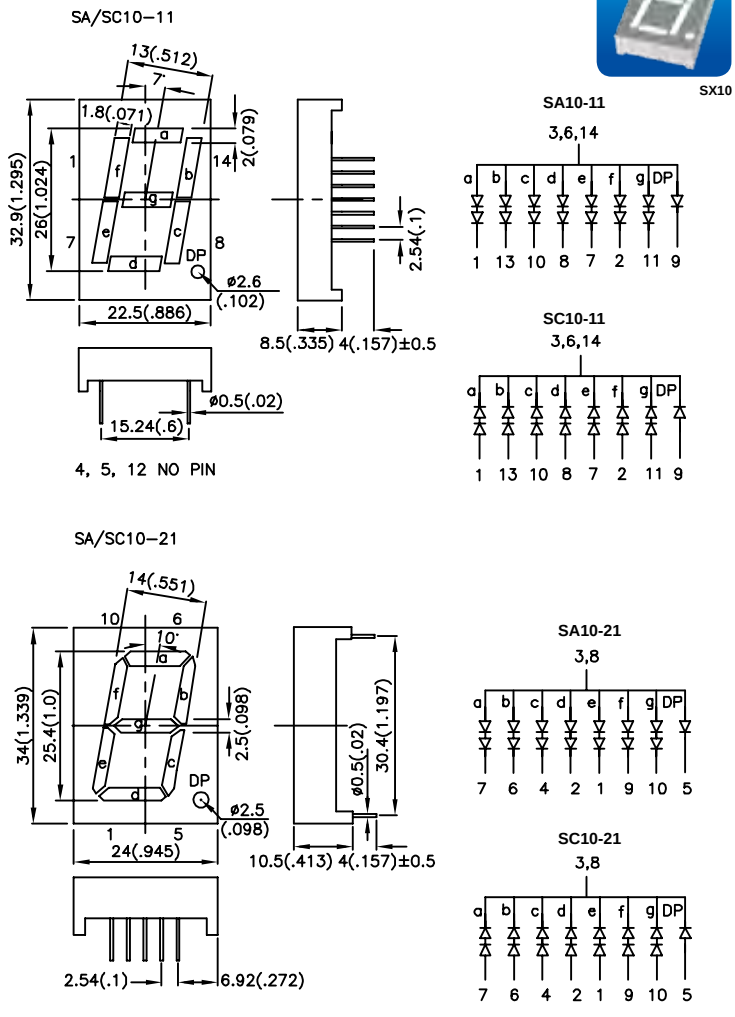
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
SA08-21EWA	SC08-21EWA	GaAsP/ GaP	625	1900	8000	0.8 inch (20.32mm), Gray Face, White Segment
SA08-21SRWA	SC08-21SRWA	GaAlAs	640	8000	36000	
SA08-21YWA	SC08-21YWA	GaAsP/ GaP	588	1200	4700	
SA08-21GWA	SC08-21GWA	GaP	568	3000	16000	
SA10-11EWA SA10-21EWA	SC10-11EWA SC10-21EWA	GaAsP/ GaP	625	8000	24000	1.0 inch (25.4mm), Gray Face, White Segment
SA10-11SRWA SA10-21SRWA	SC10-11SRWA SC10-21SRWA	GaAlAs	640	26000	101000	
SA10-11YWA SA10-21YWA	SC10-11YWA SC10-21YWA	GaAsP/ GaP	588	8000	24000	
SA10-11GWA SA10-21GWA	SC10-11GWA SC10-21GWA	GaP	568	8000	24000	



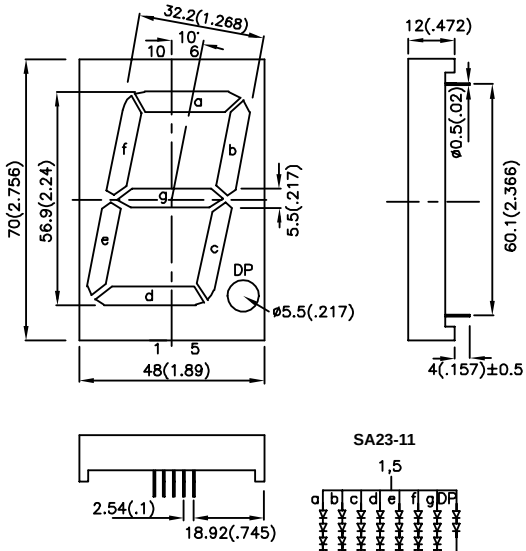


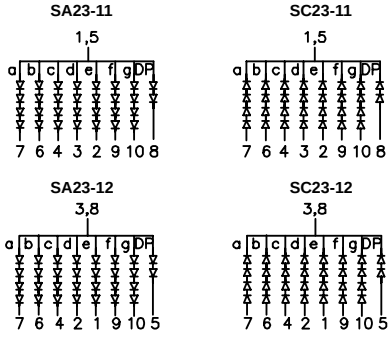


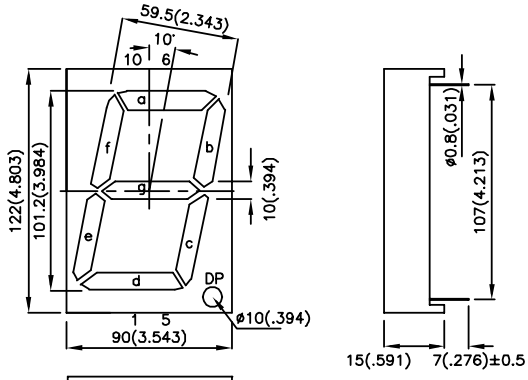
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

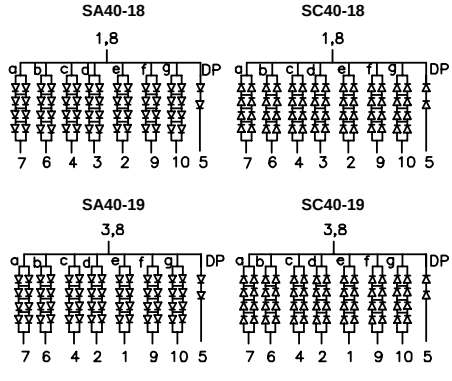
SINGLE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
SA23-11EWA SA23-12EWA	SC23-11EWA SC23-12EWA	GaAsP/ GaP	625	12000	55500	2.24 inch (56.9mm), Gray Face, White Segment
SA23-11SRWA SA23-12SRWA	SC23-11SRWA SC23-12SRWA	GaAlAs	640	75000	173000	
SA23-11YWA SA23-12YWA	SC23-11YWA SC23-12YWA	GaAsP/ GaP	588	8000	26500	
SA23-11GWA SA23-12GWA	SC23-11GWA SC23-12GWA	GaP	568	12000	53000	
SA40-18EWA SA40-19EWA	SC40-18EWA SC40-19EWA	GaAsP/ GaP	625	12000	44000	3.984 inch (101.2mm), Gray Face, White Segment
SA40-18SRWA SA40-19SRWA	SC40-18SRWA SC40-19SRWA	GaAlAs	640	26000	105000	
SA40-18YWA SA40-19YWA	SC40-18YWA SC40-19YWA	GaAsP/ GaP	588	8000	26000	
SA40-18GWA SA40-19GWA	SC40-18GWA SC40-19GWA	GaP	568	12000	60000	





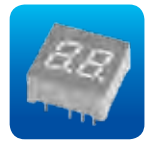


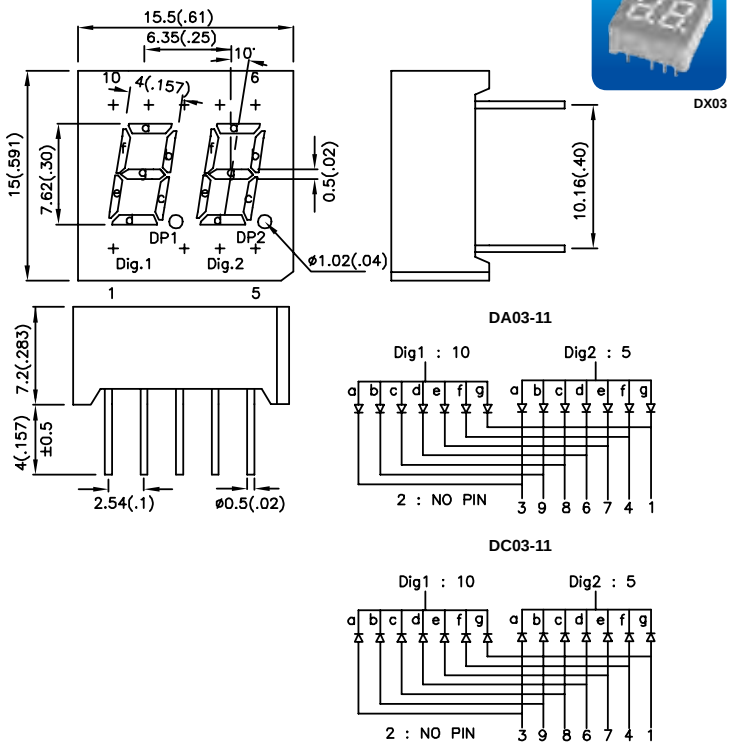


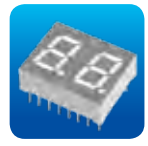
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

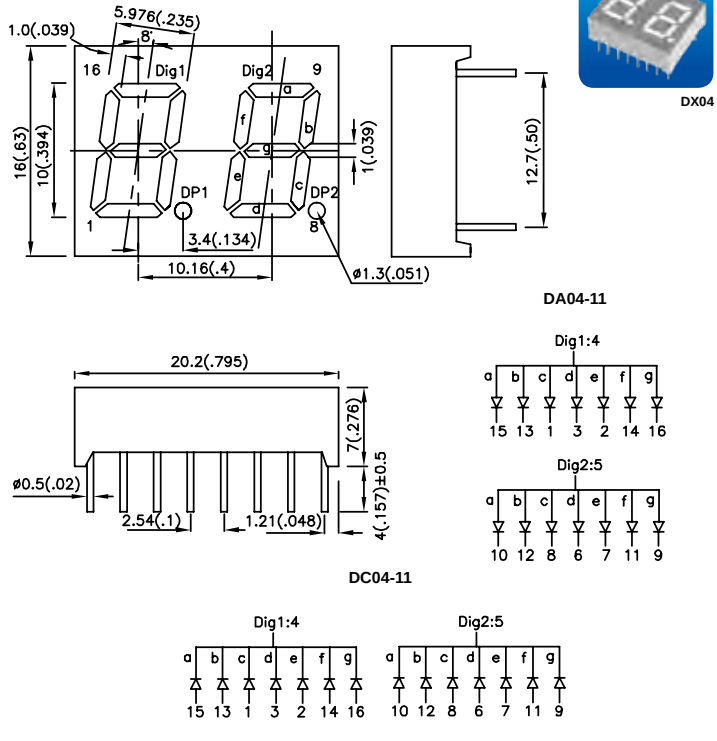
DUAL DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
DA03-11EWA	DC03-11EWA	GaAsP/ GaP	625	800	3100	0.3 inch (7.62mm), Gray Face, White Segment
DA03-11SRWA	DC03-11SRWA	GaAlAs	640	3000	13600	
DA03-11YWA	DC03-11YWA	GaAsP/ GaP	588	480	1900	
DA03-11GWA	DC03-11GWA	GaP	568	1200	4300	
DA04-11EWA	DC04-11EWA	GaAsP/ GaP	625	1200	4700	0.394 inch (10mm), Gray Face, White Segment
DA04-11SRWA	DC04-11SRWA	GaAlAs	640	4700	18000	
DA04-11YWA	DC04-11YWA	GaAsP/ GaP	588	1200	4700	
DA04-11GWA	DC04-11GWA	GaP	568	1900	8000	


DX03



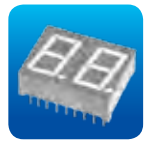

DX04

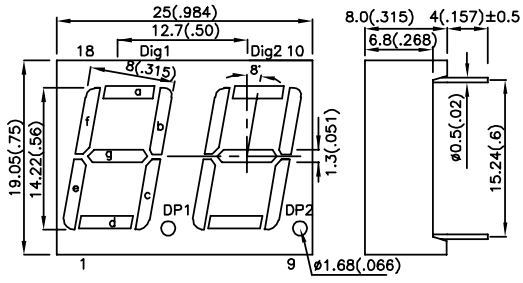


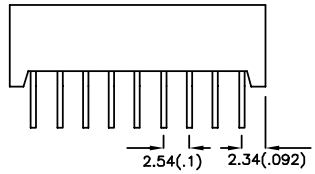
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

DUAL DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

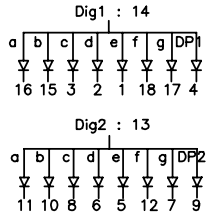
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
DA56-11EWA	DC56-11EWA	GaAsP/ GaP	625	1900	8000	0.56 inch (14.22mm), Gray Face, White Segment
DA56-11SRWA	DC56-11SRWA	GaAlAs	640	8000	27500	
DA56-11YWA	DC56-11YWA	GaAsP/ GaP	588	1200	4700	
DA56-11GWA	DC56-11GWA	GaP	568	1900	10500	
DA56-51EWA	DC56-51EWA	GaAsP/ GaP	625	3000	12000	0.56 inch, (14.22mm), Gray Face, White Segment
DA56-51YWA	DC56-51YWA	GaAsP/ GaP	588	1200	5300	
DA56-51GWA	DC56-51GWA	GaP	568	3000	14400	


DX56-11

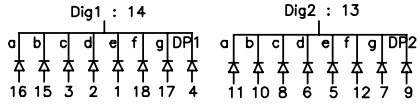




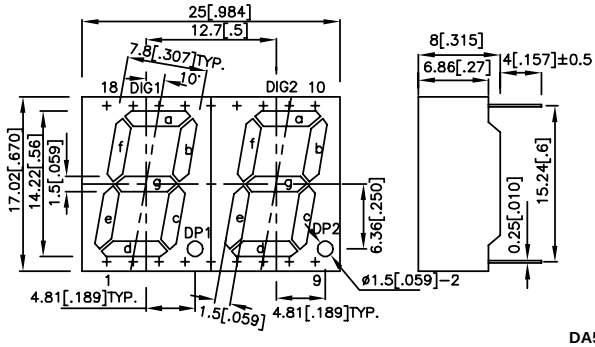
DA56-11

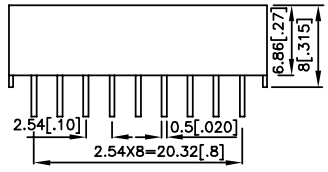


DC56-11

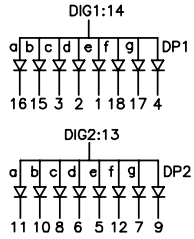



DX56-51

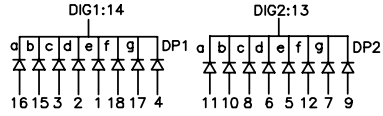




DA56-51



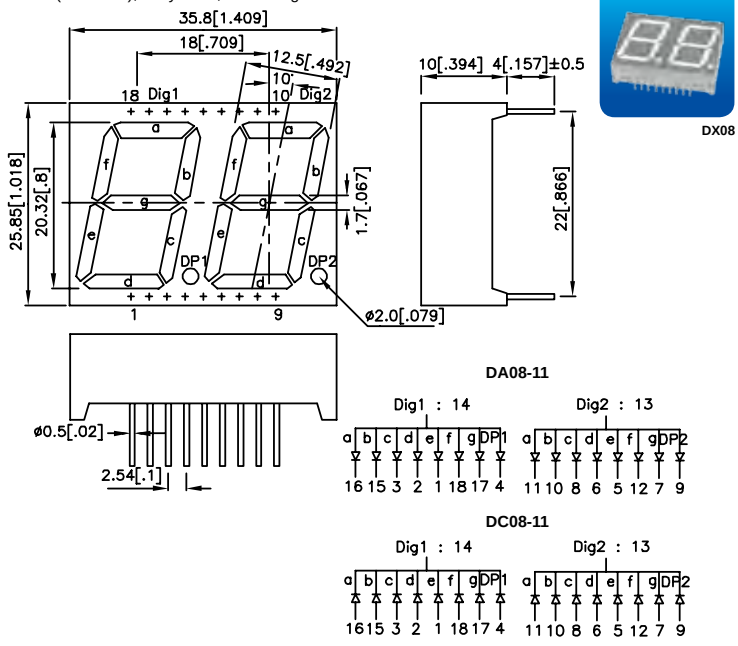
DC56-51



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

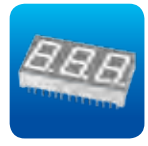
DUAL DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

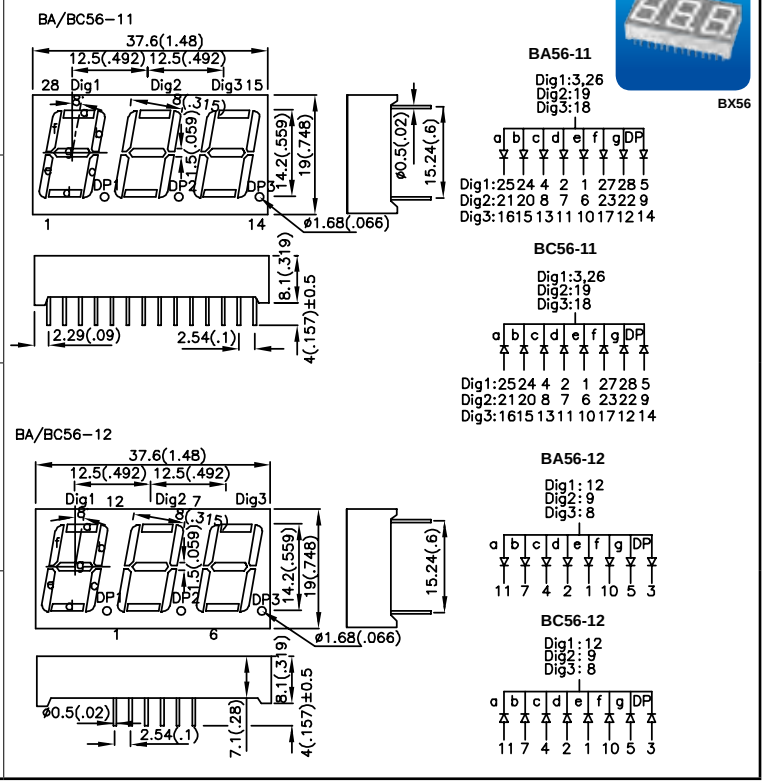
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
DA08-11EWA	DC08-11EWA	GaAsP/ GaP	625	1900	8000	0.8 inch (20.32mm), Gray Face, White Segment
DA08-11SRWA	DC08-11SRWA	GaAlAs	640	8000	29000	
DA08-11YWA	DC08-11YWA	GaAsP/ GaP	588	1200	4700	
DA08-11GWA	DC08-11GWA	GaP	568	3000	13000	



THREE DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
BA56-11EWA BA56-12EWA	BC56-11EWA BC56-12EWA	GaAsP/ GaP	625	3000	16000	0.56 inch (14.22mm), Gray Face, White Segment
BA56-11SRWA BA56-12SRWA	BC56-11SRWA BC56-12SRWA	GaAlAs	640	12000	45000	
BA56-11YWA BA56-12YWA	BC56-11YWA BC56-12YWA	GaAsP/ GaP	588	1900	8000	
BA56-11GWA BA56-12GWA	BC56-11GWA BC56-12GWA	GaP	568	3000	16000	



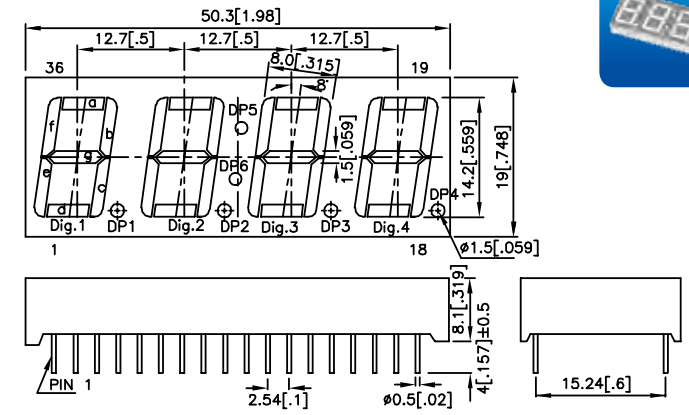


NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

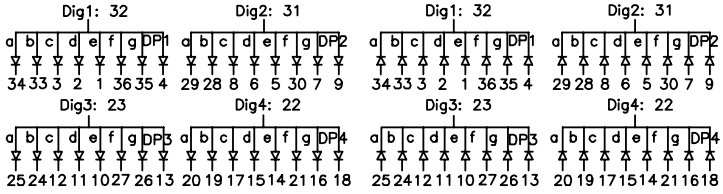
FOUR DIGIT 7-SEGMENT THROUGH-HOLE DISPLAY

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
CA56-11EWA	CC56-11EWA	GaAsP/ GaP	625	1900	8000	0.56 inch (14.22mm), Gray Face, White Segment
CA56-11SRWA	CC56-11SRWA	GaAlAs	640	12000	45000	
CA56-11YWA	CC56-11YWA	GaAsP/ GaP	588	1900	8000	
CA56-11GWA	CC56-11GWA	GaP	568	3000	13000	


CX56



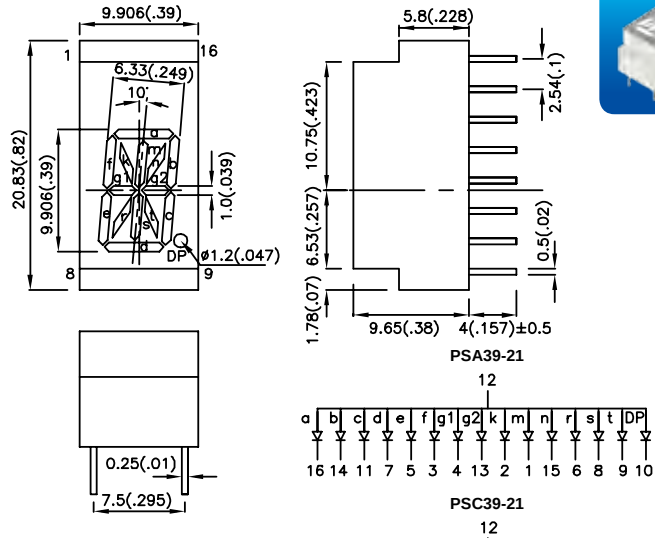
CA56-11 CC56-11



ALPHANUMERIC THROUGH-HOLE DISPLAY

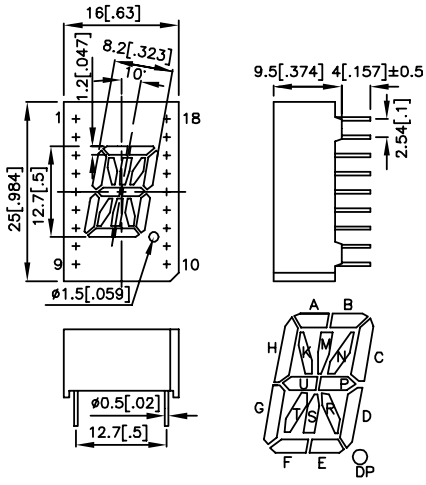
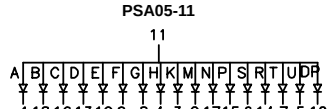
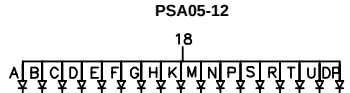
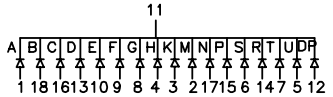
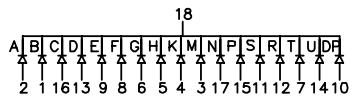
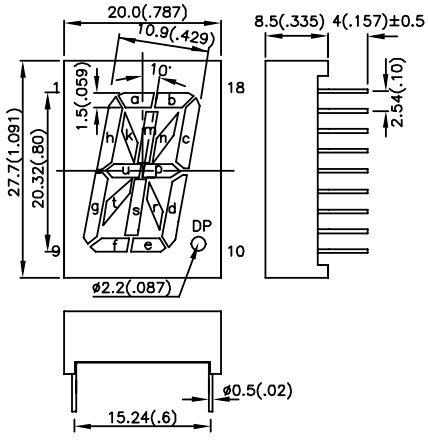
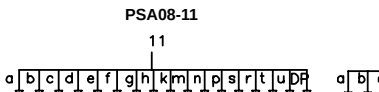
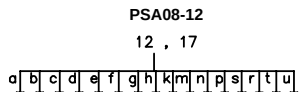
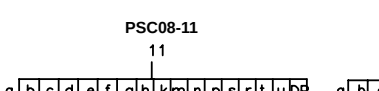
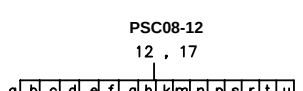
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
PSA39-21EWA	PSC39-21EWA	GaAsP/ GaP	625	1200	3188	0.39 inch (9.9mm), Gray Face, White Segment
PSA39-21SRWA	PSC39-21SRWA	GaAlAs	640	3000	13250	
PSA39-21YWA	PSC39-21YWA	GaAsP/ GaP	588	800	4100	
PSA39-21GWA	PSC39-21GWA	GaP	568	1200	6400	


PSX39



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

ALPHANUMERIC THROUGH-HOLE DISPLAY

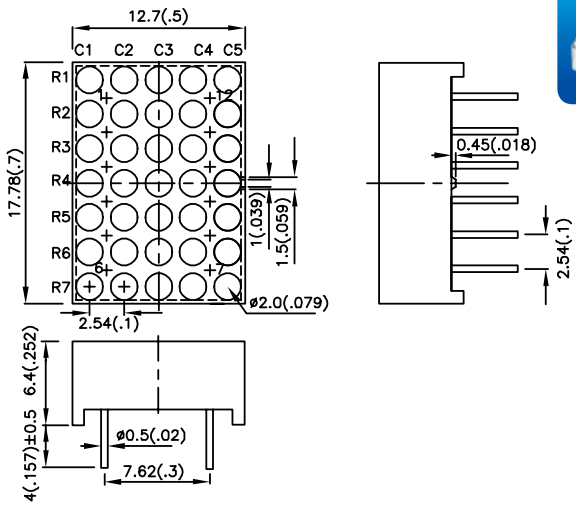
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COMMON ANODE	COMMON CATHODE			MIN.	TYP.	
PSA05-11EWA PSA05-12EWA	PSC05-11EWA PSC05-12EWA	GaAsP/ GaP	625	1900	6400	0.5 inch (12.7mm), Gray Face, White Segment  PSX05   PSA05-11 PSA05-12  PSC05-11  PSC05-12 
PSA05-11SRWA PSA05-12SRWA	PSC05-11SRWA PSC05-12SRWA	GaAlAs	640	8000	36000	
PSA05-11YWA PSA05-12YWA	PSC05-11YWA PSC05-12YWA	GaAsP/ GaP	588	800	3000	
PSA05-11GWA PSA05-12GWA	PSC05-11GWA PSC05-12GWA	GaP	568	1200	4700	
PSA08-11EWA PSA08-12EWA	PSC08-11EWA PSC08-12EWA	GaAsP/ GaP	625	1200	4700	0.8 inch (20.32mm), Gray Face, White Segment  PSX08   PSA08-11 PSA08-12  PSC08-11  PSC08-12 
PSA08-11SRWA PSA08-12SRWA	PSC08-11SRWA PSC08-12SRWA	GaAlAs	640	4700	18000	
PSA08-11YWA PSA08-12YWA	PSC08-11YWA PSC08-12YWA	GaAsP/ GaP	588	1200	4700	
PSA08-11GWA PSA08-12GWA	PSC08-11GWA PSC08-12GWA	GaP	568	1900	8200	

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

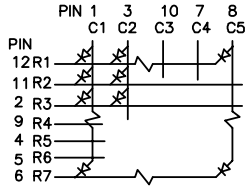
DOT MATRIX

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COLUMN ANODE	COLUMN CATHODE			MIN.	TYP.	
TA07-11EWA	TC07-11EWA	GaAsP/ GaP	625	1900	8000	0.7 inch (18mm), 5x7, Gray Face, White Dot
TA07-11SRWA	TC07-11SRWA	GaAlAs	640	8000	30000	
TA07-11YWA	TC07-11YWA	GaAsP/ GaP	588	1900	8100	
TA07-11GWA	TC07-11GWA	GaP	568	4700	18000	
TA15-11EWA	TC15-11EWA	GaAsP/ GaP	625	3000	12500	1.5 inch (38mm), 8x8, Gray Face, White Dot
TA15-11SRWA	TC15-11SRWA	GaAlAs	640	12000	45500	
TA15-11YWA	TC15-11YWA	GaAsP/ GaP	588	1900	8000	
TA15-11GWA	TC15-11GWA	GaP	568	4700	19500	

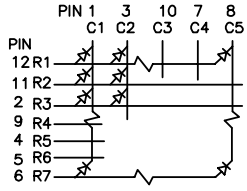

TX07



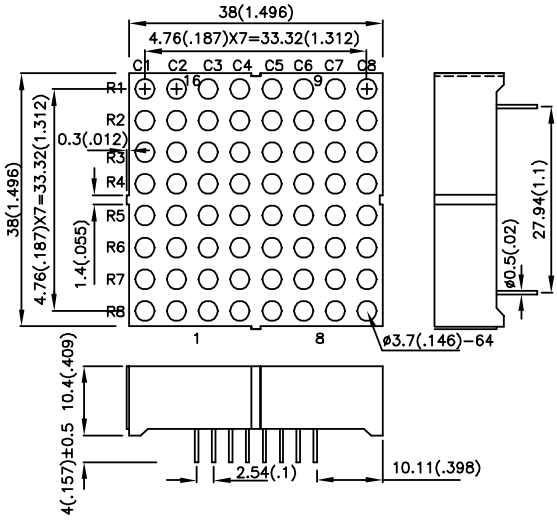
TA07-11



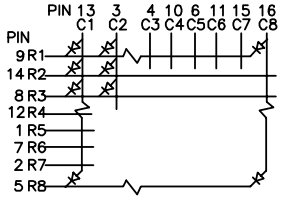
TC07-11



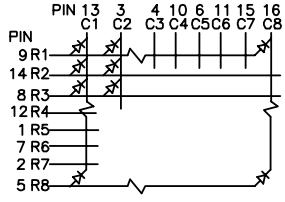

TX15



TA15-11



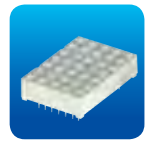
TC15-11

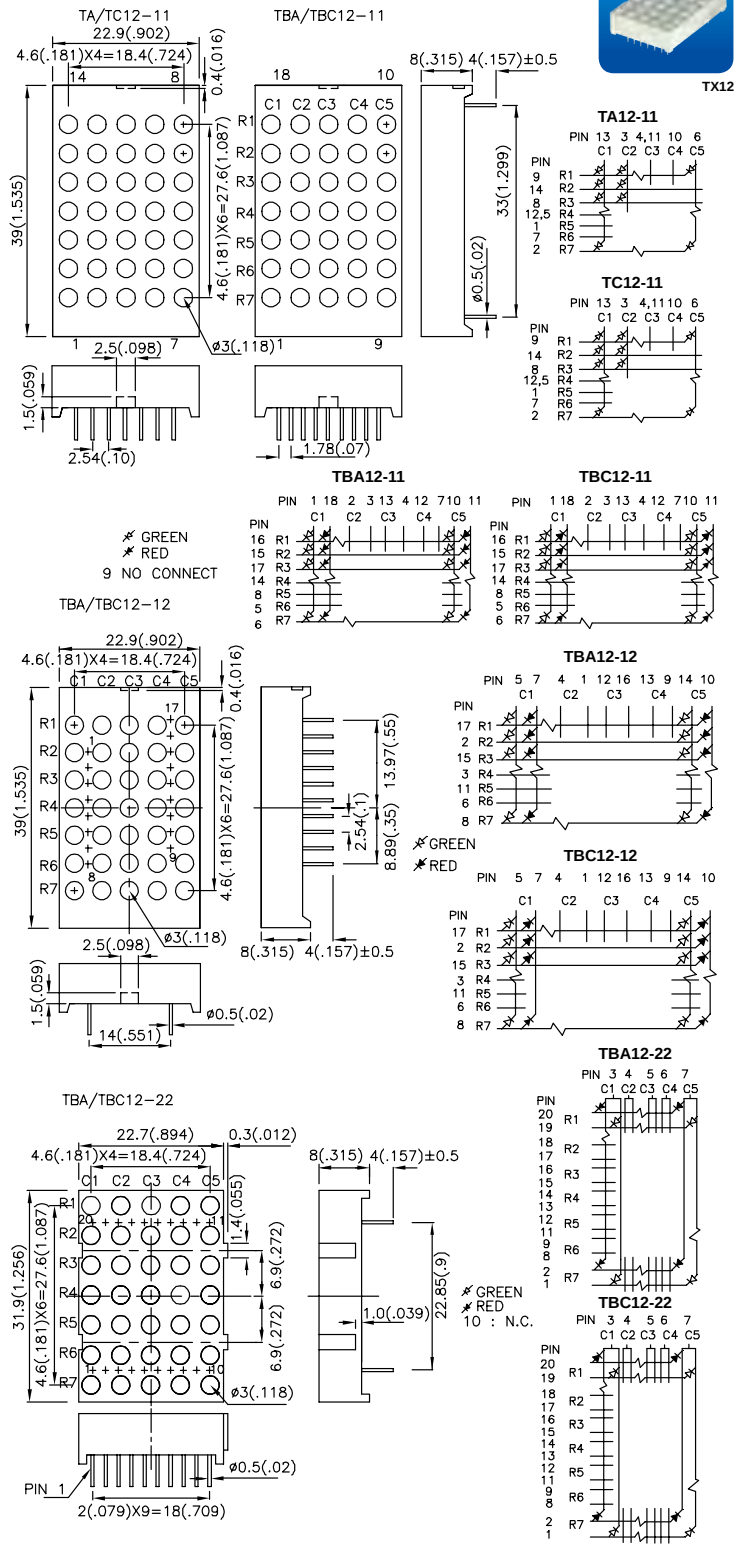


NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

DOT MATRIX

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COLUMN ANODE	COLUMN CATHODE			MIN.	TYP.	
TA12-11EWA	TC12-11EWA	GaAsP/ GaP	625	3000	12000	1.2 inch (30mm), 5x7, Gray Face, White Dot
TA12-11SRWA	TC12-11SRWA	GaAlAs	640	8000	36000	
TA12-11YWA	TC12-11YWA	GaAsP/ GaP	588	3000	12500	
TA12-11GWA	TC12-11GWA	GaP	568	4700	19000	
TBA12-11EGWA	TBC12-11EGWA	GaAsP/ GaP	625	3000	12000	
		GaP	568	4700	19000	
TBA12-12EGWA	TBC12-12EGWA	GaAsP/ GaP	625	3000	12000	
		GaP	568	4700	19000	
TBA12-22EGWA	TBC12-22EGWA	GaAsP/ GaP	625	3000	12000	
		GaP	568	4700	19000	



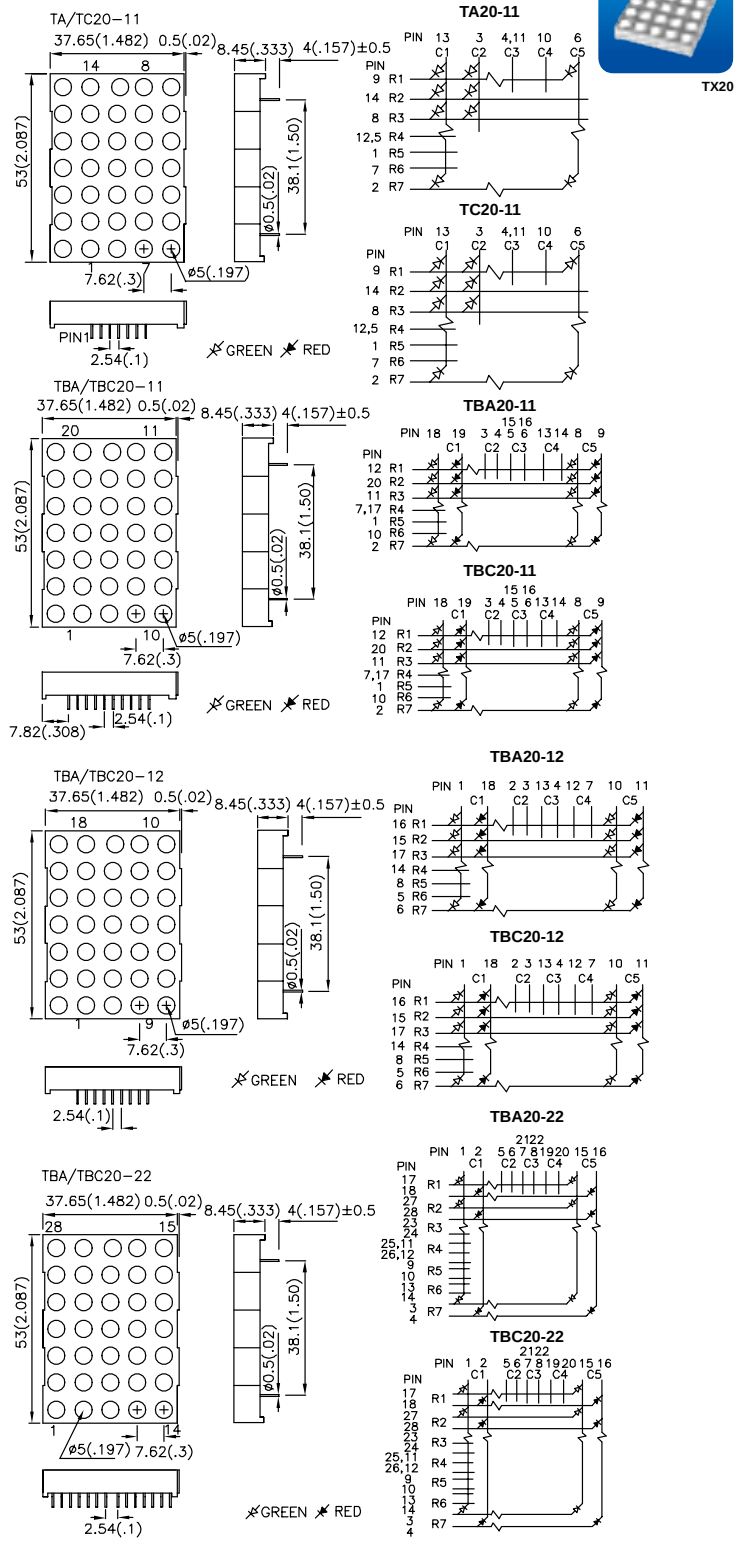


NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

DOT MATRIX

PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COLUMN ANODE	COLUMN CATHODE			MIN.	TYP.	
TA20-11EWA	TC20-11EWA	GaAsP/GaP	625	3000	12000	2.0 inch (50mm), 5x7, Gray Face, White Dot
TA20-11SRWA	TC20-11SRWA	GaAlAs	640	8000	26000	
TA20-11YWA	TC20-11YWA	GaAsP/GaP	588	1900	8000	
TA20-11GWA	TC20-11GWA	GaP	568	3000	16000	
TBA20-11EGWA	TBC20-11EGWA	GaAsP/GaP	625	3000	12000	
		GaP	568	3000	16000	
TBA20-12EGWA	TBC20-12EGWA	GaAsP/GaP	625	3000	12000	
		GaP	568	3000	16000	
TBA20-22EGWA	TBC20-22EGWA	GaAsP/GaP	625	3000	12000	
		GaP	568	3000	16000	


TX20



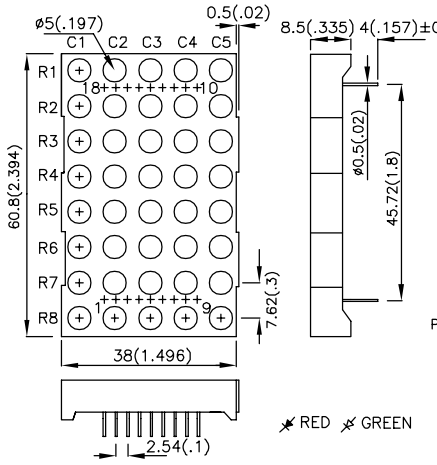
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

DOT MATRIX

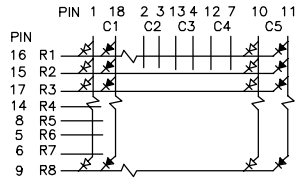
PART NUMBER		MATERIAL	λ D (nm)	Iv (ucd) @10mA		DIMENSION
COLUMN ANODE	COLUMN CATHODE			MIN.	TYP.	
TBA24-11EGWA	TBC24-11EGWA	GaAsP/ GaP	625	3000	13500	2.4 inch (60.8mm), 5x8, Gray Face, White Dot
		GaP	568	4700	20000	
TBA24-22EGWA	TBC24-22EGWA	GaAsP/ GaP	625	3000	13500	
		GaP	568	4700	20000	

TX24

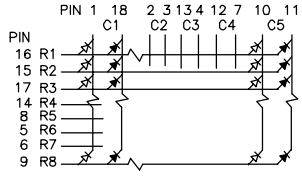
TBA/TBC24−11



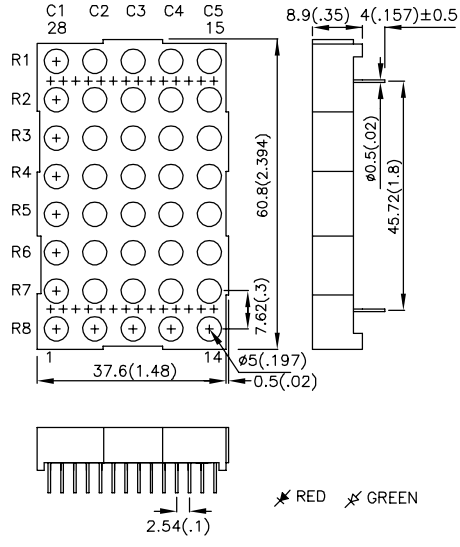
TBA24-11



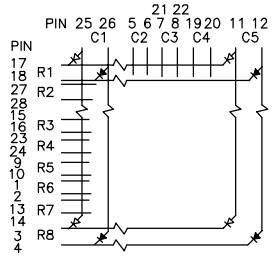
TBC24-11



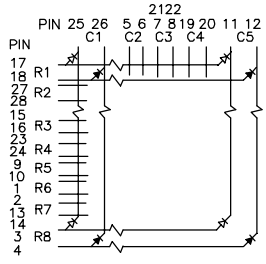
TBA/TBC24−22



TBA24-22

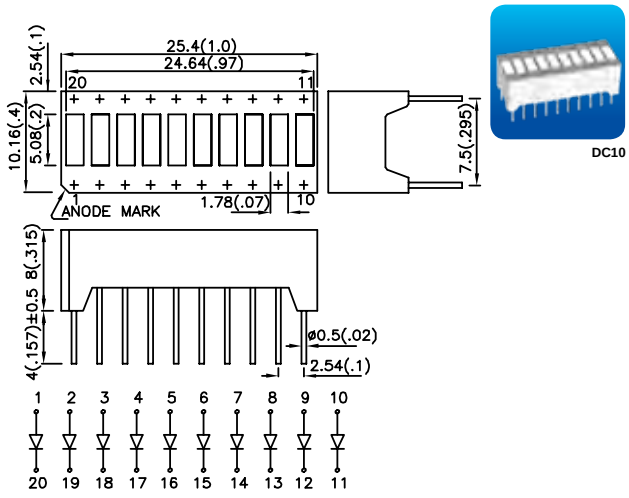


TBC24-22

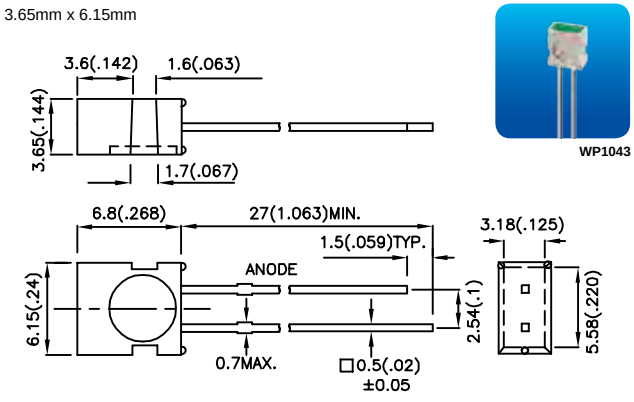
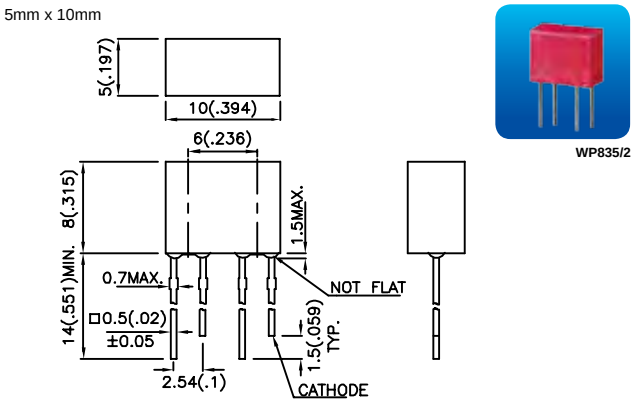


NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

BAR GRAPH ARRAY

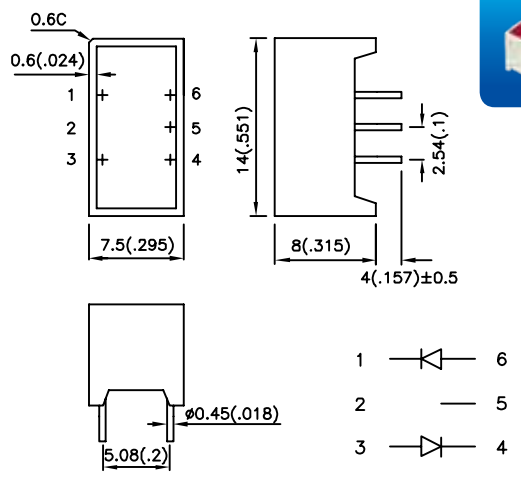
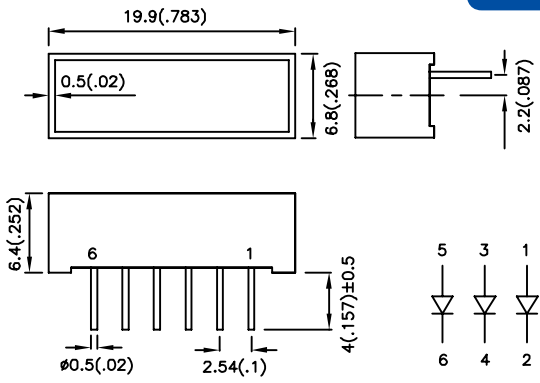
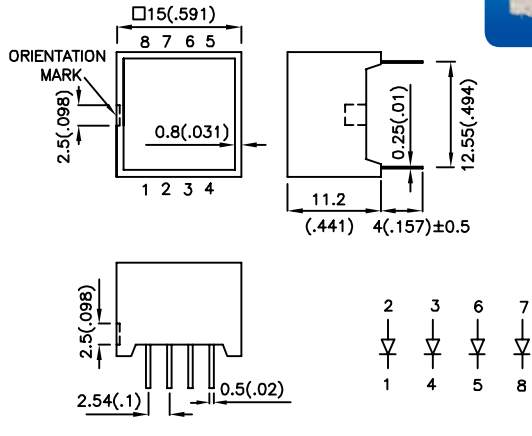
PART NUMBER	EMITTING COLOR + λ D (nm) + MATERIAL	Iv (ucd) @10mA MIN.	Iv (ucd) @10mA TYP.	DESCRIPTION	DIMENSION
DC10EWA	Hi.Eff. Red 625 GaAsP/GaP	1900	9000	10 Segments Bar graph-Display Gray Face White Segment	
DC10SRWA	Super Bright Red 640 GaAlAs	8000	31000		
DC10YWA	Yellow 588 GaAsP/GaP	1900	9000		
DC10GWA	Green 568 GaP	3000	16000		
DC7G3HWA	Green 568 GaP	3000	16000	10 Segments Bar graph-Display 7 x Green, 3 x Red Gray Face White Segment	
	Bright Red 660 GaP	800	4000		

LIGHT BAR

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA MIN.	Iv (mcd) @10mA *20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP1043ID	GaAsP/GaP	625	red diffused	1.8	10	100°	3.65mm x 6.15mm 
WP1043SRD	GaAlAs	640	red diffused	*36	*90	100°	
WP1043YD	GaAsP/GaP	588	yellow diffused	1	4	100°	
WP1043GD	GaP	568	green diffused	1	4	100°	
WP1043SGD	GaP	568	green diffused	*4	*10	100°	
WP835/2IDT	GaAsP/GaP	625	red diffused	5	10	120°	5mm x 10mm 
WP835/2SRDT	GaAlAs	640	red diffused	*18	*60	120°	
WP835/2YDT	GaAsP/GaP	588	yellow diffused	1.8	4	120°	
WP835/2GDT	GaP	568	green diffused	1.8	5	120°	

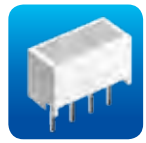
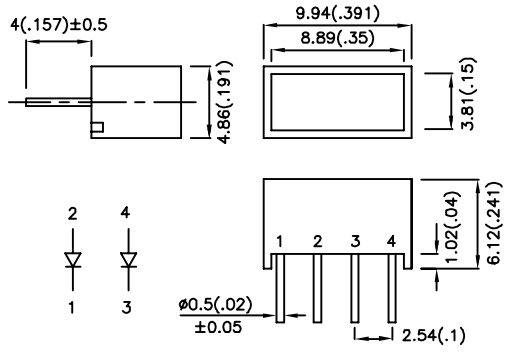
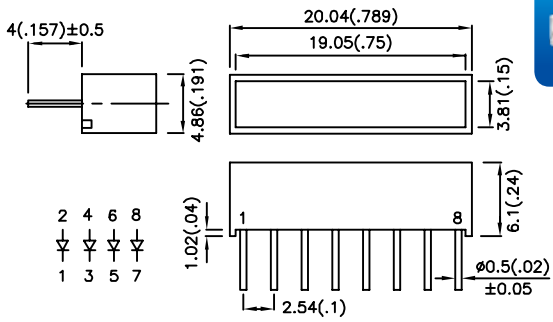
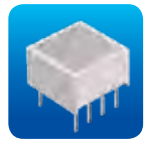
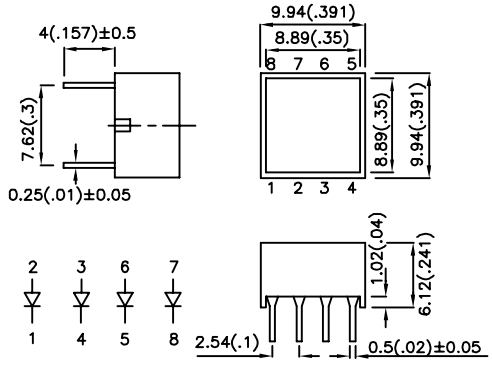
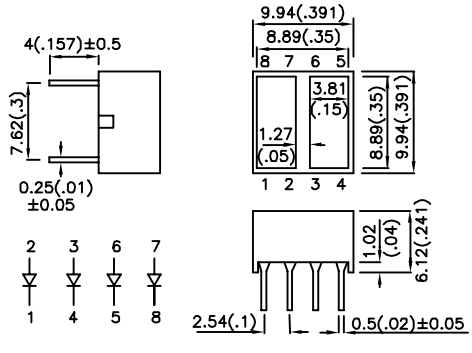
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

LIGHT BAR

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		DIMENSION
				MIN.	TYP.	
DE2ID	GaAsP/GaP	625	red diffused	8	31	7.5mm x 14mm  DE2 
DE2SRD	GaAlAs	640	red diffused	*70	*300	
DE2YD	GaAsP/GaP	588	yellow diffused	8	31	
DE2GD	GaP	568	green diffused	12	52	
DE2SGD	GaP	568	green diffused	*18	*80	
DF3ID	GaAsP/GaP	625	red diffused	8	31	6.8mm x 19.9mm  DF3 
DF3SRD	GaAlAs	640	red diffused	*70	*300	
DF3YD	GaAsP/GaP	588	yellow diffused	8	31	
DF3GD	GaP	568	green diffused	12	52	
DF3SGD	GaP	568	green diffused	*36	*100	
DE4ID	GaAsP/GaP	625	red diffused	8	31	15mm x 15mm  DE4 
DE4SRD	GaAlAs	640	red diffused	*70	*300	
DE4YD	GaAsP/GaP	588	yellow diffused	8	31	
DE4GD	GaP	568	green diffused	12	52	
DE4SGD	GaP	568	green diffused	*18	*80	

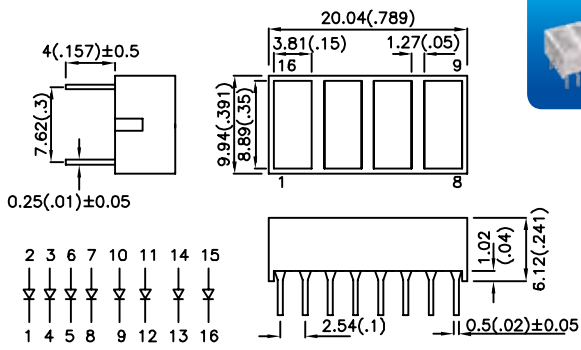
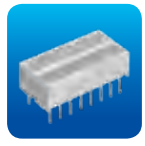
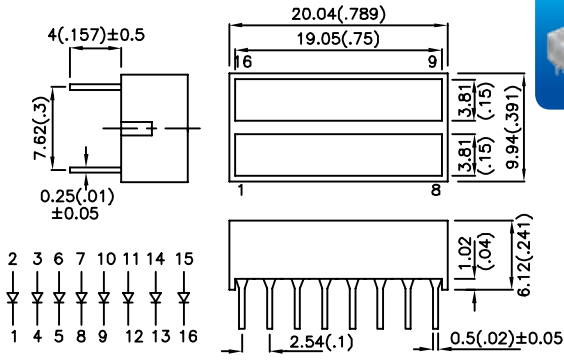
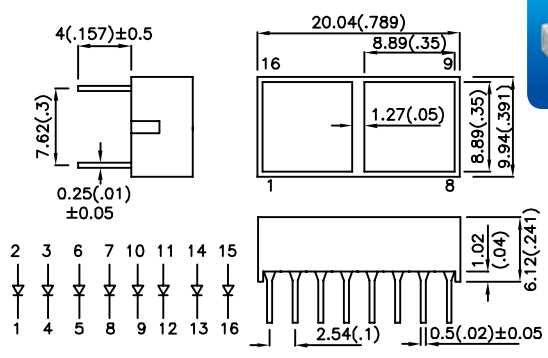
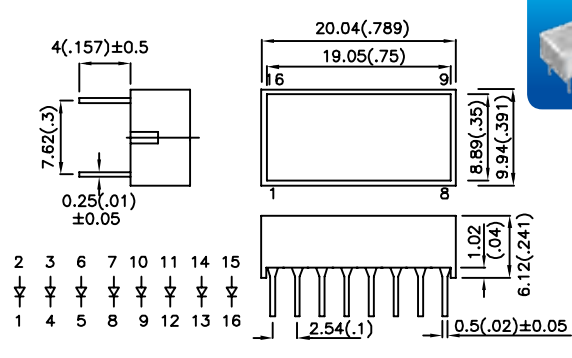
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

LIGHT BAR

PART NUMBER	EMITTING COLOR + MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		DIMENSION
				MIN.	TYP.	
KB2300EW	Hi.Eff.Red GaAsP/GaP	625	white diffused	7	40	8.89mm x 3.81mm Size of Light Emitting Areas  KB2300EW 
KB-A100SRW	Super Bright Red GaAlAs	640	white diffused	50	90	
KB2400YW	Yellow GaAsP/GaP	588	white diffused	7	40	
KB2500SGD	Super Bright Green GaP	568	green diffused	7	40	
KB2350EW	Hi.Eff.Red GaAsP/GaP	625	white diffused	10	50	19.05mm x 3.81mm Size of Light Emitting Areas  KB2350EW 
KB-B100SRW	Super Bright Red GaAlAs	640	white diffused	50	200	
KB2450YW	Yellow GaAsP/GaP	588	white diffused	10	50	
KB2550SGD	Super Bright Green GaP	568	green diffused	18	70	
KB2655EW	Hi.Eff.Red GaAsP/GaP	625	white diffused	10	60	8.89mm x 8.89mm Size of Light Emitting Areas  KB2655EW 
KB-C100SRW	Super Bright Red GaAlAs	640	white diffused	50	200	
KB2755YW	Yellow GaAsP/GaP	588	white diffused	10	50	
KB2855SGD	Super Bright Green GaP	568	green diffused	18	80	
KB2600EW	Hi.Eff.Red GaAsP/GaP	625	white diffused	10	50	8.89mm x 3.81mm Size of Light Emitting Areas  KB2600EW 
KB-D100SRW	Super Bright Red GaAlAs	640	white diffused	36	100	
KB2700YW	Yellow GaAsP/GaP	588	white diffused	7	40	
KB2800SGD	Super Bright Green GaP	568	green diffused	10	50	

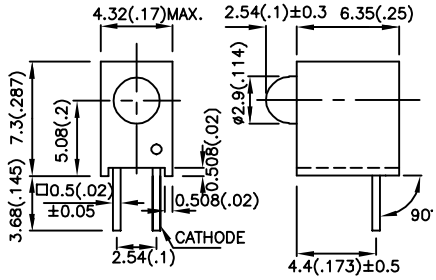
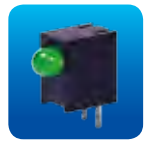
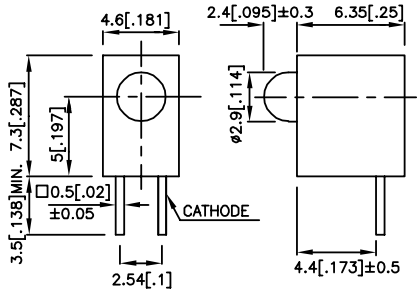
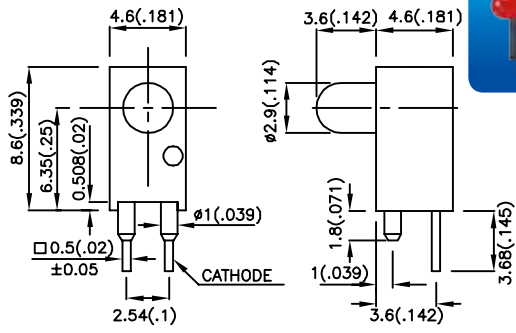
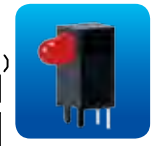
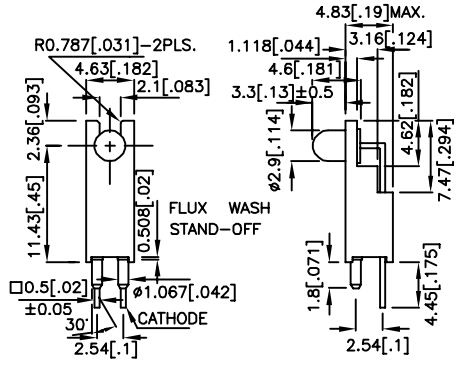
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

LIGHT BAR

PART NUMBER	EMITTING COLOR + MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA		DIMENSION
				MIN.	TYP.	
KB2620EW	Hi.Eff.Red GaAsP/GaP	625	white diffused	10	50	8.89mm x 3.81mm Size of Light Emitting Areas  KB2620EW 
KB-E100SRW	Super Bright Red GaAlAs	640	white diffused	18	90	
KB2720YW	Yellow GaAsP/GaP	588	white diffused	7	40	
KB2820SGD	Super Bright Green GaP	568	green diffused	7	40	
KB2635EW	Hi.Eff.Red GaAsP/GaP	625	white diffused	10	60	3.81mm x 19.05mm Size of Light Emitting Areas  KB2635EW 
KB-F100SRW	Super Bright Red GaAlAs	640	white diffused	50	200	
KB2735YW	Yellow GaAsP/GaP	588	white diffused	7	40	
KB2835SGD	Super Bright Green GaP	568	green diffused	36	100	
KB2670EW	Hi.Eff.Red GaAsP/GaP	625	white diffused	10	50	8.89mm x 8.89mm Size of Light Emitting Areas  KB2670EW 
KB-G100SRW	Super Bright Red GaAlAs	640	white diffused	50	200	
KB2770YW	Yellow GaAsP/GaP	588	white diffused	10	50	
KB2870SGD	Super Bright Green GaP	568	green diffused	18	70	
KB2685EW	Hi.Eff.Red GaAsP/GaP	625	white diffused	10	60	8.89mm x 19.05mm Size of Light Emitting Areas  KB2685EW 
KB-H100SRW	Super Bright Red GaAlAs	640	white diffused	50	200	
KB2785YW	Yellow GaAsP/GaP	588	white diffused	10	50	
KB2885SGD	Super Bright Green GaP	568	green diffused	50	200	

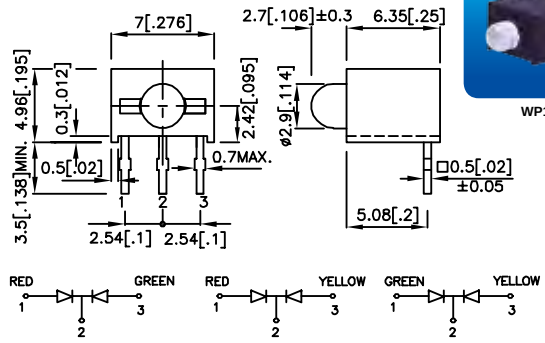
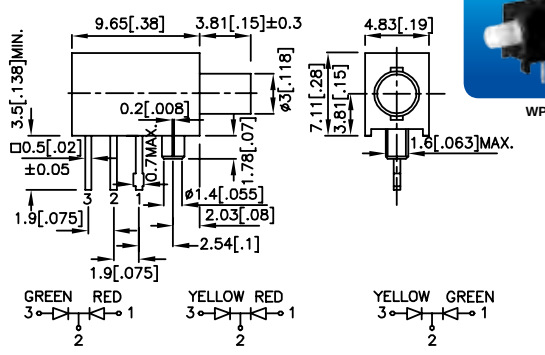
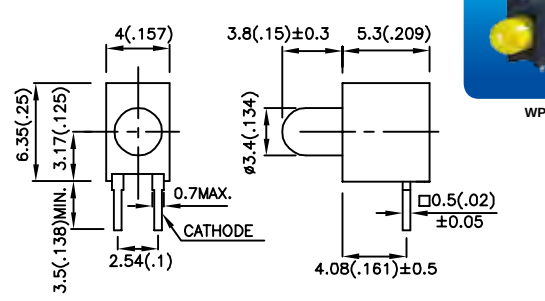
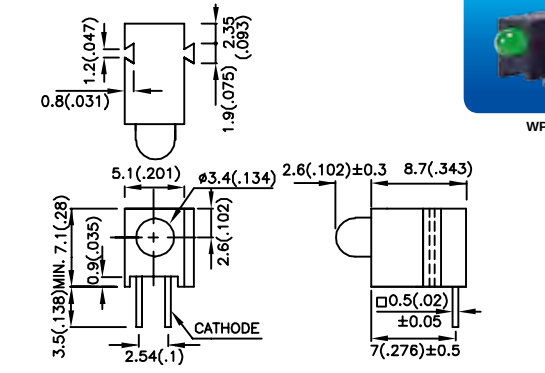
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

SINGLE-LEVEL CBI

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP934EW/ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Right Angle   WP934EW/
WP934EW/SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934EW/YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934EW/GD	GaP	568	green diffused	8	20	40°	
WP934CB/ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Right Angle   WP934CB/
WP934CB/SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934CB/YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934CB/GD	GaP	568	green diffused	8	20	40°	
WP934RS/ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Right Angle   WP934RS/
WP934RS/SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934RS/YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934RS/GD	GaP	568	green diffused	8	20	40°	
WP934ZH/ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Right Angle   WP934ZH/
WP934ZH/SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934ZH/YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934ZH/GD	GaP	568	green diffused	8	20	40°	

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

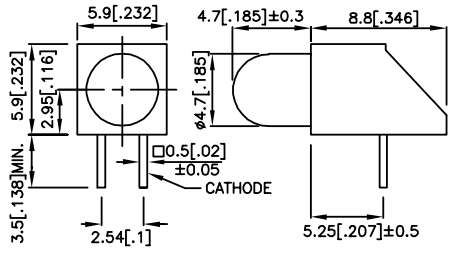
SINGLE-LEVEL CBI

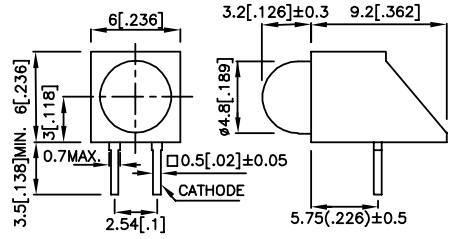
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP130WDT/EGW	GaAsP/GaP	625	white diffused	*7	*30	60°	T-1 (3mm) Right Angle  WP130WDT/ 
	GaP	568		*7	*25		
WP130WDT/EYW	GaAsP/GaP	625	white diffused	*7	*30	60°	
	GaAsP/GaP	588		*7	*20		
WP130WDT/GYW	GaP	568	white diffused	*7	*25	60°	
	GaAsP/GaP	588		*7	*20		
WP42WUM/EGW	GaAsP/GaP	625	white diffused	*4	*13	100°	T-1 (3mm) Right Angle  WP42WUM/ 
	GaP	568		*4	*13		
WP42WUM/EYW	GaAsP/GaP	625	white diffused	*4	*13	100°	
	GaAsP/GaP	588		*2.6	*6		
WP42WUM/GYW	GaP	568	white diffused	*4	*13	100°	
	GaAsP/GaP	588		*2.6	*6		
WP1384AD/ID	GaAsP/GaP	625	red diffused	12	20	60°	3.4mm Right Angle  WP1384AD/ 
WP1384AD/SRD	GaAlAs	640	red diffused	*70	*200	60°	
WP1384AD/YD	GaAsP/GaP	588	yellow diffused	8	15	60°	
WP1384AD/GD	GaP	568	green diffused	8	15	60°	
WP1384AL/ID	GaAsP/GaP	625	red diffused	12	20	60°	3.4mm Right Angle  WP1384AL/ 
WP1384AL/SRD	GaAlAs	640	red diffused	*70	*200	60°	
WP1384AL/YD	GaAsP/GaP	588	yellow diffused	8	15	60°	
WP1384AL/GD	GaP	568	green diffused	8	15	60°	

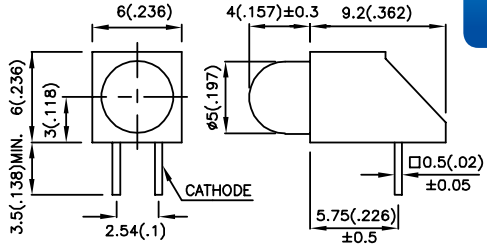
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

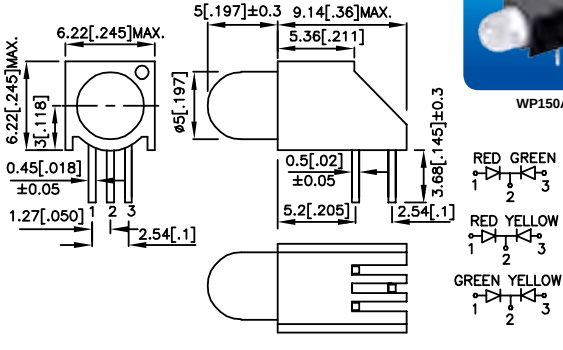
SINGLE-LEVEL CBI

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA MIN.	Iv (mcd) @10mA *20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP1533BQ/ID	GaAsP/GaP	625	red diffused	8	30	60°	4.7mm Right Angle  WP1533BQ/
WP1533BQ/SRD	GaAlAs	640	red diffused	*110	*400	60°	
WP1533BQ/YD	GaAsP/GaP	588	yellow diffused	5	18	60°	
WP1533BQ/GD	GaP	568	green diffused	5	20	60°	
WP73JB/IDA	GaAsP/GaP	625	red diffused	8	30	60°	4.8mm Right Angle  WP73JB/
WP73JB/SRDA	GaAlAs	640	red diffused	*110	*300	60°	
WP73JB/YDA	GaAsP/GaP	588	yellow diffused	5	20	60°	
WP73JB/GDA	GaP	568	green diffused	8	20	60°	
WP1503CB/ID	GaAsP/GaP	625	red diffused	8	30	60°	T-1 3/4 (5mm) Right Angle  WP1503CB/
WP1503CB/SRD	GaAlAs	640	red diffused	*380	*700	60°	
WP1503CB/YD	GaAsP/GaP	588	yellow diffused	5	20	60°	
WP1503CB/GD	GaP	568	green diffused	5	20	60°	
WP150A9VS/EGW	GaAsP/GaP	625	white diffused	*18	*50	30°	T-1 3/4 (5mm) Right Angle  WP150A9VS/
	GaP	568		*10	*45		
WP150A9VS/EYW	GaAsP/GaP	625	white diffused	*18	*50	30°	
	GaAsP/GaP	588		*7	*30		
WP150A9VS/GYW	GaP	568	white diffused	*10	*45	30°	
	GaAsP/GaP	588		*7	*30		





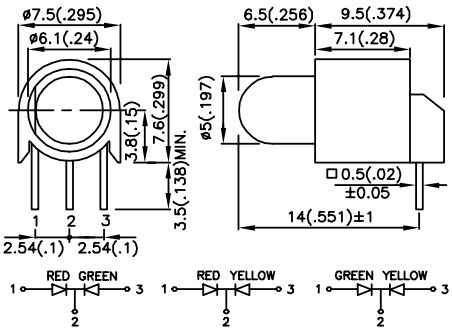


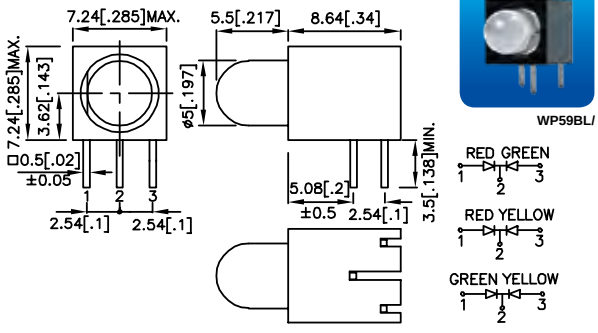


NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

SINGLE-LEVEL CBI

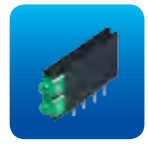
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @20mA MIN.	Iv (mcd) @20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP59CB/EGW	GaAsP/GaP	625	white diffused	18	60	60°	T-1 3/4 (5mm) Right Angle
	GaP	568		18	50		
WP59CB/EYW	GaAsP/GaP	625	white diffused	18	60	60°	
	GaAsP/GaP	588		18	40		
WP59CB/GYW	GaP	568	white diffused	18	50	60°	
	GaAsP/GaP	588		18	40		
WP59BL/EGW	GaAsP/GaP	625	white diffused	18	60	60°	T-1 3/4 (5mm) Right Angle
	GaP	568		18	50		
WP59BL/EYW	GaAsP/GaP	625	white diffused	18	60	60°	
	GaAsP/GaP	588		18	40		
WP59BL/GYW	GaP	568	white diffused	18	50	60°	
	GaAsP/GaP	588		18	40		

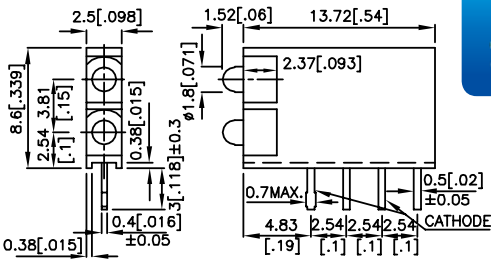


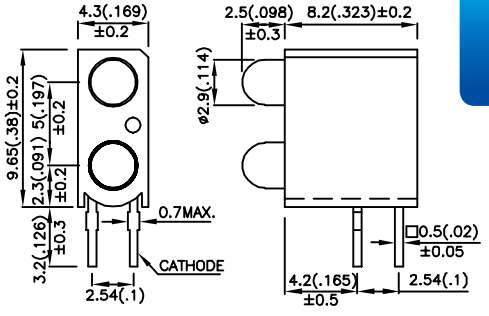


BI-LEVEL CBI

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA MIN.	Iv (mcd) @10mA *20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP4060VH/2ID	GaAsP/GaP	625	red diffused	8	15	70°	1.8mm Bi-Level
WP4060VH/2SRD	GaAlAs	640	red diffused	*70	*200	70°	
WP4060VH/2YD	GaAsP/GaP	588	yellow diffused	1.8	5	70°	
WP4060VH/2GD	GaP	568	green diffused	5	10	70°	
WP934FG/2ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Bi-Level
WP934FG/2SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934FG/2YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934FG/2GD	GaP	568	green diffused	8	20	40°	

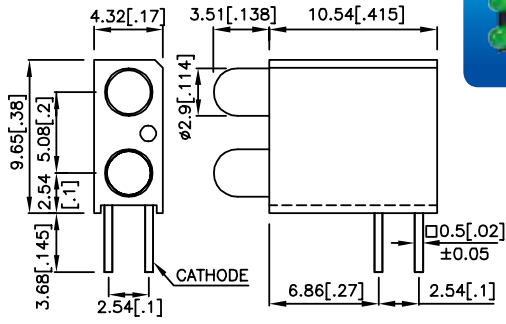
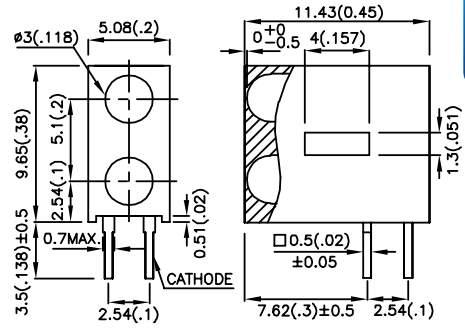
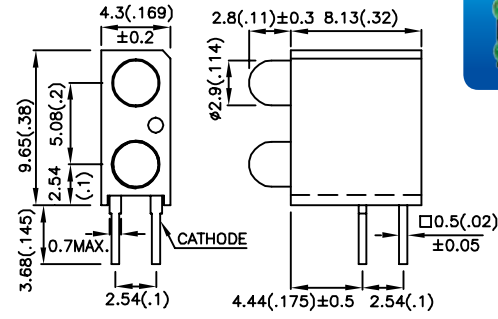
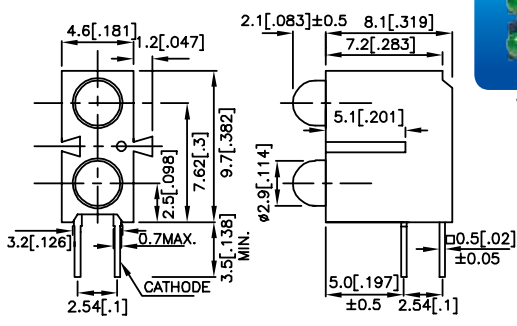






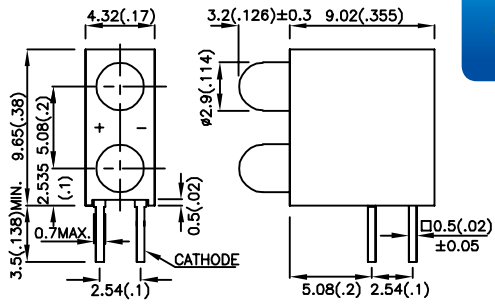
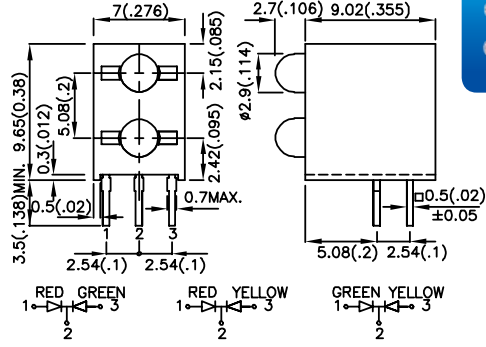
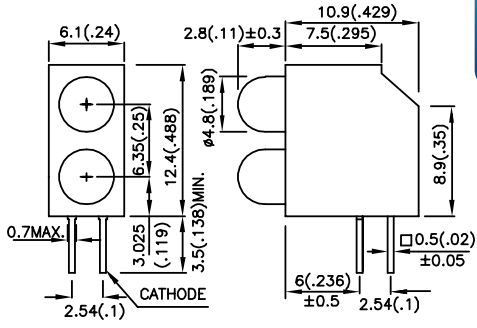
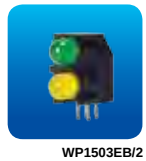
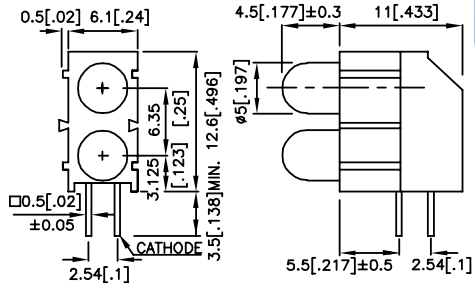
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

BI-LEVEL CBI

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP934GE/2ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Bi-Level  WP934GE/2 
WP934GE/2SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934GE/2YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934GE/2GD	GaP	568	green diffused	8	20	40°	
WP934GO/2ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Bi-Level  WP934GO/2 
WP934GO/2SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934GO/2YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934GO/2GD	GaP	568	green diffused	8	20	40°	
WP934MD/2ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Bi-Level  WP934MD/2 
WP934MD/2SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934MD/2YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934MD/2GD	GaP	568	green diffused	8	20	40°	
WP934CA/2ID-90	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Bi-Level  WP934CA/2-90 
WP934CA/2SRD-90	GaAlAs	640	red diffused	*110	*300	40°	
WP934CA/2YD-90	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934CA/2GD-90	GaP	568	green diffused	8	20	40°	

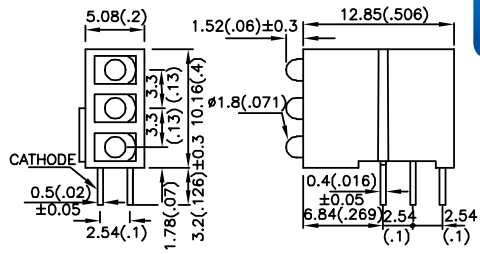
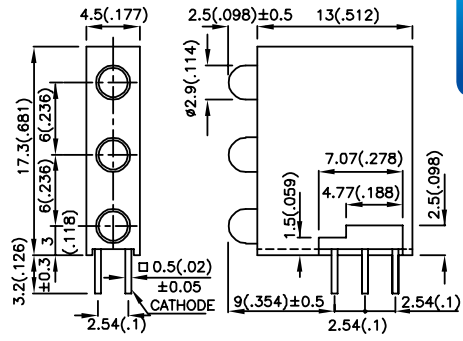
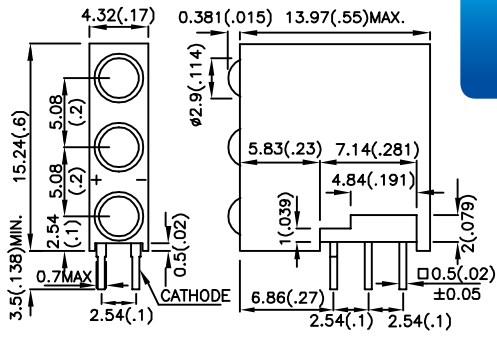
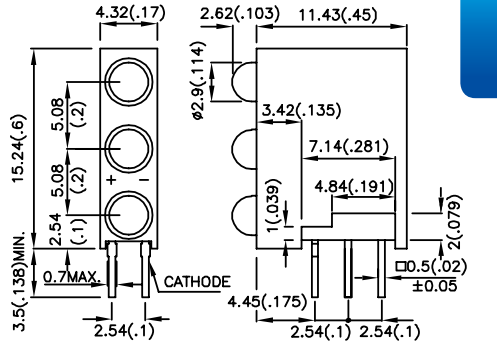
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

BI-LEVEL CBI

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA MIN.	Iv (mcd) @10mA *20mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP934EB/2ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Bi-Level  WP934EB/2 
WP934EB/2SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934EB/2YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934EB/2GD	GaP	568	green diffused	8	20	40°	
WP130WCP/2EGW	GaAsP/GaP	625	white diffused	*7	*30	60°	T-1(3mm) Bi-Level  WP130WCP/2 
	GaP	568		*7	*25		
WP130WCP/2EYW	GaAsP/GaP	625	white diffused	*7	*30	60°	
	GaAsP/GaP	588		*7	*20		
WP130WCP/2GYW	GaP	568	white diffused	*7	*25	60°	
	GaAsP/GaP	588		*7	*20		
WP73EB/2IDA	GaAsP/GaP	625	red diffused	8	30	60°	4.8mm Bi-Level  WP73EB/2 
WP73EB/2SRDA	GaAlAs	640	red diffused	*110	*300	60°	
WP73EB/2YDA	GaAsP/GaP	588	yellow diffused	5	20	60°	
WP73EB/2GDA	GaP	568	green diffused	8	20	60°	
WP1503EB/2ID	GaAsP/GaP	625	red diffused	8	30	60°	T-1 3/4 (5mm) Bi-Level  WP1503EB/2 
WP1503EB/2SRD	GaAlAs	640	red diffused	*380	*700	60°	
WP1503EB/2YD	GaAsP/GaP	588	yellow diffused	5	20	60°	
WP1503EB/2GD	GaP	568	green diffused	5	20	60°	

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

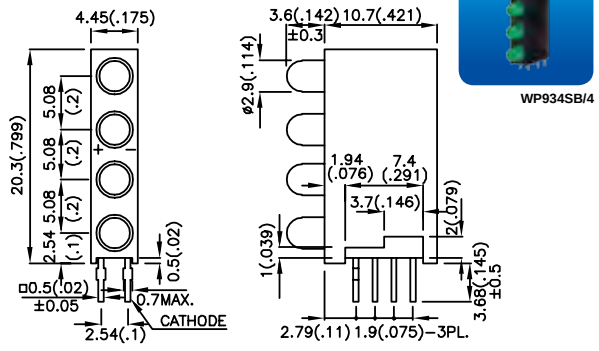
TRI-LEVEL CBI

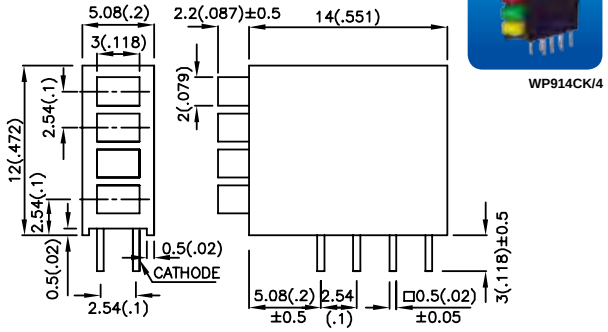
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP4060XH/3ID	GaAsP/GaP	625	red diffused	8	15	70°	1.8mm Tri-Level  WP4060XH/3 
WP4060XH/3SRD	GaAlAs	640	red diffused	*70	*200	70°	
WP4060XH/3YD	GaAsP/GaP	588	yellow diffused	1.8	5	70°	
WP4060XH/3GD	GaP	568	green diffused	5	10	70°	
WP934PJ/3ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Tri-Level  WP934PJ/3 
WP934PJ/3SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934PJ/3YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934PJ/3GD	GaP	568	green diffused	8	20	40°	
WP934RZ/3ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Tri-Level  WP934RZ/3 
WP934RZ/3SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934RZ/3YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934RZ/3GD	GaP	568	green diffused	8	20	40°	
WP934SA/3ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Tri-Level  WP934SA/3 
WP934SA/3SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934SA/3YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934SA/3GD	GaP	568	green diffused	8	20	40°	

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

QUAD-LEVEL CBI

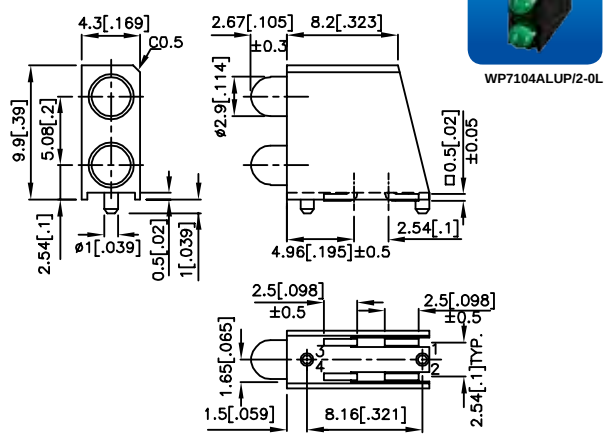
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP934SB/4ID	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Quad-Level
WP934SB/4SRD	GaAlAs	640	red diffused	*110	*300	40°	
WP934SB/4YD	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP934SB/4GD	GaP	568	green diffused	8	20	40°	
WP914CK/4IDT	GaAsP/GaP	625	red diffused	1.8	8	100°	2mm x 3mm Quad-Level
WP914CK/4YDT	GaAsP/GaP	588	yellow diffused	1	4	100°	
WP914CK/4GDT	GaP	568	green diffused	1.8	6	100°	





SMD CBI

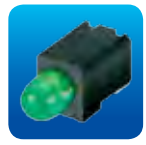
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP7104ALUP/2ID-0L	GaAsP/GaP	625	red diffused	8	20	40°	T-1 (3mm) Bi-level
WP7104ALUP/2SRD-0L	GaAlAs	640	red diffused	*110	*300	40°	
WP7104ALUP/2YD-0L	GaAsP/GaP	588	yellow diffused	5	15	40°	
WP7104ALUP/2GD-0L	GaP	568	green diffused	8	20	40°	



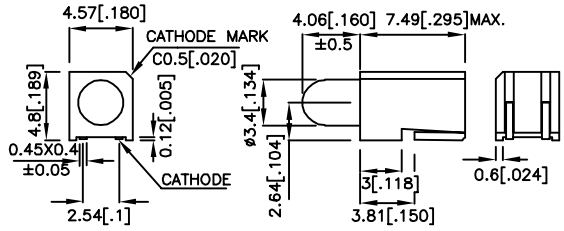
NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

SMD CBI

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP138A8QMP/ID/TG	GaAsP/GaP	625	red diffused	12	20	60°	3.4mm Right Angle
WP138A8QMP/SRD/TG	GaAlAs	640	red diffused	*110	*250	60°	
WP138A8QMP/YD/TG	GaAsP/GaP	588	yellow diffused	8	15	60°	
WP138A8QMP/GD/TG	GaP	568	green diffused	8	15	60°	

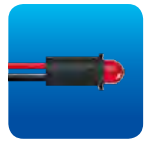


WP138A8QMP/



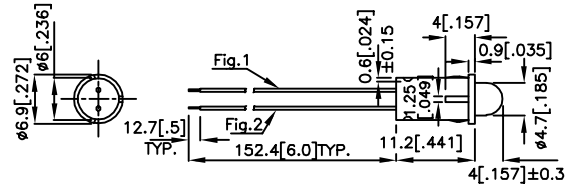
PANEL MOUNT CBI

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Iv (mcd) @10mA *20mA **V=14V		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
WP1533AA/ID-W152	GaAsP/GaP	625	red diffused	8	30	60°	4.7mm
WP1533AA/ID14V-W152	GaAsP/GaP	625	red diffused	**18	**55	60°	
WP1533AA/SRD-W152	GaAlAs	640	red diffused	*110	*400	60°	
WP1533AA/SRD14V-W152	GaAlAs	640	red diffused	**70	**200	60°	
WP1533AA/YD-W152	GaAsP/GaP	588	yellow diffused	5	18	60°	
WP1533AA/YD14V-W152	GaAsP/GaP	588	yellow diffused	**5	**20	60°	
WP1533AA/GD-W152	GaP	568	green diffused	5	20	60°	
WP1533AA/GD14V-W152	GaP	568	green diffused	**8	**25	60°	



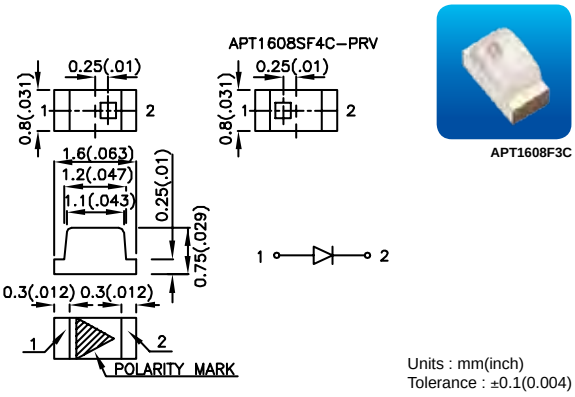
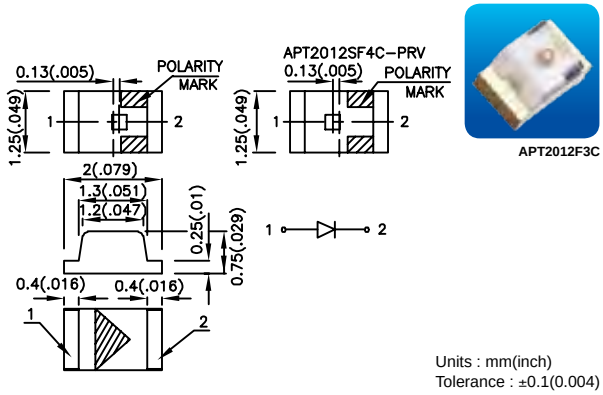
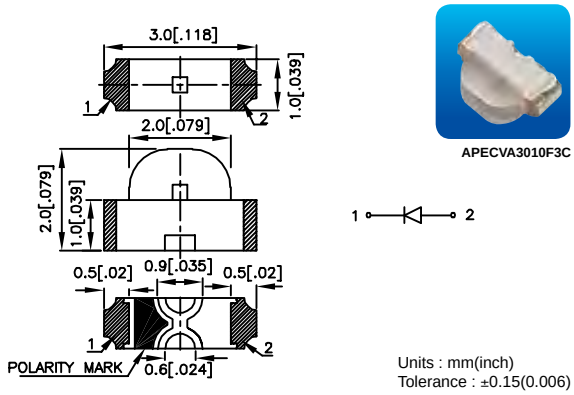
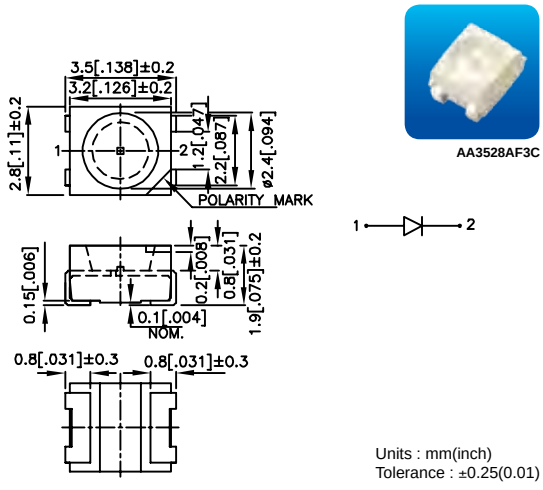
WP1533AA/

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 .

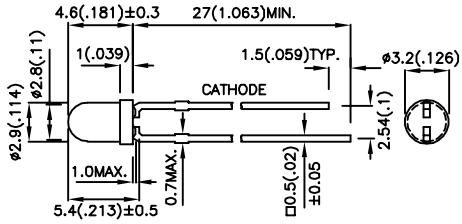
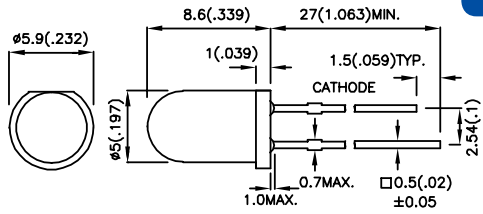


NOTES: 1. All dimensions are in millimeters(inches). 2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

INFRARED EMITTING DIODE

PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Po (mW/sr) @20mA *50mA		VIEWING ANGLE	DIMENSION
				MIN.	TYP.	2θ1/2	
APT1608F3C	GaAs	940	water clear	0.4	1.2	120°	
APT1608SF4C-PRV	GaAlAs	880	water clear	0.4	1	120°	
APT2012F3C	GaAs	940	water clear	0.4	1.2	120°	
APT2012SF4C-PRV	GaAlAs	880	water clear	0.4	1	120°	
APECVA3010F3C	GaAs	940	water clear	0.7	2	120°	
AA3528AF3C	GaAs	940	water clear	1.6	3	120°	
				*2.6	*8	120°	
AA3528ASF4C-R	GaAlAs	880	water clear	0.4	2	120°	
				*4	*8	120°	

INFRARED EMITTING DIODE

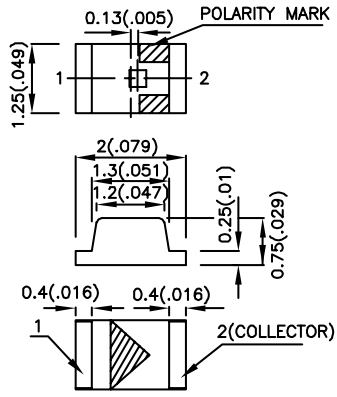
PART NUMBER	MATERIAL	λD (nm)	LENS TYPE	Po (mW/sr) @20mA *50mA MIN.	Po (mW/sr) @20mA *50mA TYP.	VIEWING ANGLE 2θ1/2	DIMENSION
WP7104F3C	GaAs	940	water clear	7	30	34°	T-1 (3mm) Round  WP7104F3C 
				*18	*80	34°	
WP7104SF4C	GaAlAs	880	water clear	4	11	34°	
				*7	*15	34°	
WP7113F3C	GaAs	940	water clear	7	30	20°	T-1 3/4 (5mm) Round  WP7113F3C 
				*18	*85	20°	
WP7113SF4C	GaAlAs	880	water clear	7	20	20°	
				*10	*30	20°	

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

PHOTOTRANSISTOR

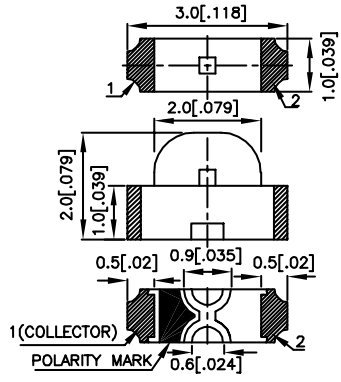
PART NUMBER	LENS TYPE	DIMENSION
APT2012P3BT	BLUE TRANSPARENT LENS	2.0mm x 1.25mm x 0.75mm (0805)
APECVA3010P3BT	BLUE TRANSPARENT LENS	3.0mm x 1.0mm x 2.0mm (1104)
AA3528AP3C	WATER CLEAR	3.5mm x 2.8mm


APT2012P3BT



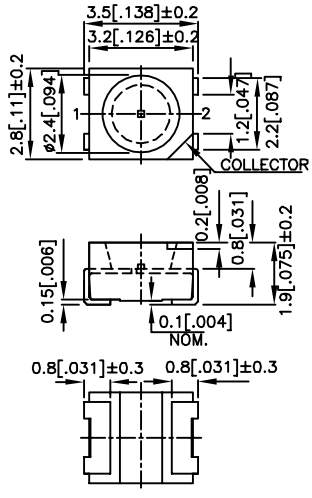
Units : mm(inch)
Tolerance : ±0.1(0.004)


APECVA3010P3BT



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


AA3528AP3C



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

ELECTRICAL AND RADIANT CHARACTERISTICS T_A =25°C

PARAMETER	SYMBOL	PART NUMBER	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Collector-to-Emitter Breakdown Voltage	$V_{BR\ CEO}$	-	30	-	-	V	I_C=100μA Ee=0mW/cm²
Emitter-to-Collector Breakdown Voltage	$V_{BR\ ECO}$	-	5	-	-	V	I_E=100μA Ee=0mW/cm²
Collector-to-Emitter Saturation Voltage	$V_{CE\ (SAT)}$	-	-	-	0.8	V	I_C=2mA Ee=20mW/cm²
Collector Dark Current	I_{CEO}	-	-	-	100	nA	V_{CE}=10V Ee=0mW/cm²
Rise Time (10% to 90%)	T_R	-	-	15	-	μs	V_{CE}=5V I_C=1mA R_L=1KΩ
Fall Time (90% to 10%)	T_F	-	-	15	-	μs	
On State Collector Current	$I_{(ON)}$	APT2012P3BT	0.1	1.0	-	mA	V_{CE}=5V, Ee=1mW/cm² λ=940nm
		APECVA3010P3BT	0.2	0.8			
		AA3528AP3C	0.1	0.2			

ABSOLUTE MAXIMUM RATING T_A =25°C

PARAMETER	MAXIMUM RATINGS
Collector-to-Emitter Voltage	30V
Emitter-to-Collector Voltage	5V
Power Dissipation at (or below) 25°C Free Air Temperature	100mW
Operating Temperature Range	-40°C~ +85°C
Storage Temperature Range	-40°C~ +85°C

PHOTOTRANSISTOR

PART NUMBER	LENS TYPE
WP3DP3BT	BLUE TRANSPARENT LENS
WP7113P3BT	BLUE TRANSPARENT LENS

ELECTRICAL AND RADIANT CHARACTERISTICS T_A =25°C

PARAMETER	SYMBOL	PART NUMBER	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Collector-to-Emitter Breakdown Voltage	$V_{BR\ CEO}$	-	30	-	-	V	I_C=100μA Ee=0mW/cm²
Emitter-to-Collector Breakdown Voltage	$V_{BR\ ECO}$	-	5	-	-	V	I_E=100μA Ee=0mW/cm²
Collector-to-Emitter Saturation Voltage	$V_{CE\ (SAT)}$	-	-	-	0.8	V	I_C=2mA Ee=20mW/cm²
Collector Dark Current	I_{CEO}	-	-	-	100	nA	V_{CE}=10V Ee=0mW/cm²
Rise Time (10% to 90%)	T_R	-	-	15	-	μs	V_{CE}=5V I_C=1mA R_L=1KΩ
Fall Time (90% to 10%)	T_F	-	-	15	-	μs	
On State Collector Current	$I_{(ON)}$	WP3DP3BT	0.2	0.5	-	mA	V_{CE}=5V, Ee=1mW/cm² λ=940nm
		WP7113P3BT	0.7	3.0			

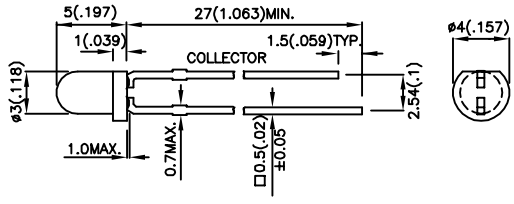
ABSOLUTE MAXIMUM RATING T_A =25°C

PARAMETER		MAXIMUM RATINGS
Collector-to-Emitter Voltage		30V
Emitter-to-Collector Voltage		5V
Power Dissipation at (or below) 25°C	Free Air Temperature	100mW
Operating Temperature Range		-40°C ~ +85°C
Storage Temperature Range		-40°C ~ +85°C
Lead Soldering Temperature	(>5mm For 5sec)	260°C

DIMENSION

T-1 (3mm) PHOTOTRANSISTOR

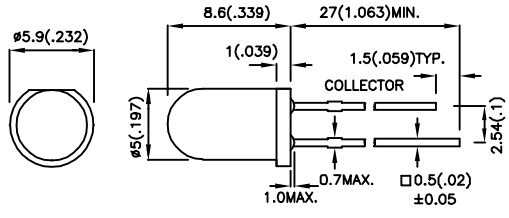
WP3DP3BT



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

T-1 3/4 (5mm) PHOTOTRANSISTOR

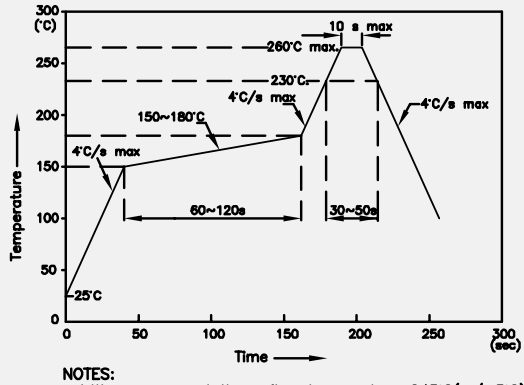
WP7113P3BT



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

SMT Reflow Soldering Instructions

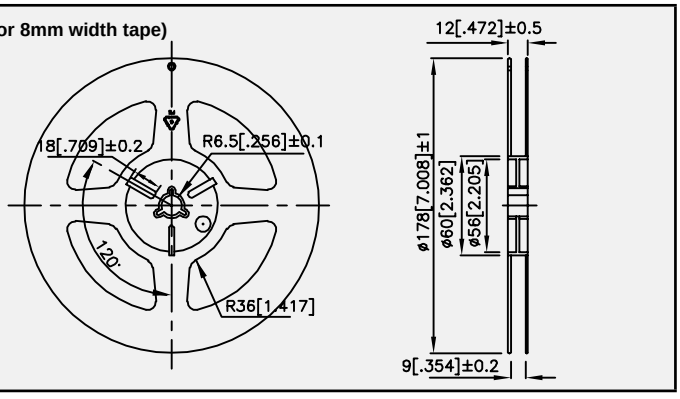
Reflow Soldering Profile For Lead-free SMT Process.



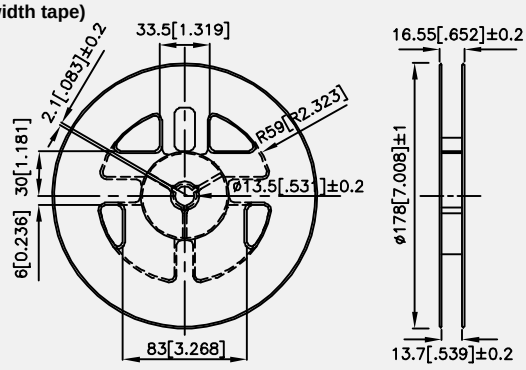
NOTES:
1. We recommend the reflow temperature 245°C(+/-5°C).The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

PART NUMBER	REEL DIMENSIONS
AT3020-RV,AT2520-350MA, AT3228-RV,APHHS1005,APG1608,APT1608, APT2012,APHCM2012-F01, AP23/F-F01,APT3216,APTR3216, APA1606, APA2106,APECVA3010,APL3015-F01,APTL3216, APTD3216,APD3224-F01, APTB1612-F01,APTB1615-F01, APHBM2012,APBVA3010,APBA3210-F01, APB3025-F01,APBL3025-F01,APBD3224-F01, APBVDA3020,APTF1616,APFA3010,APTF3216,APHK1608, APTK2012-F01,APKA2810-F01, APKB3025-F01,AA3020A,AM23-F	7"(for 8mm width tape)
APED3528-F01,APF3236, APTKA5614, AA3022-4.5SF,AA3528A,AAAF3528,AA4040, AM2520xxx03,AM2520xxx09,AM27xxx03, AM27xxx09	7"(for 12mm width tape)
ACSX02-41xxx-F01,ACDX02-41xxx-F01,ACSX03-41xxx-F01, ACDX03-41xxx-F01,ACSX04-41xxx-F01	13"(for 24mm width tape)
ACDX04-41xxx-F01,ACPSX04-41,ACSX56-41xxx-F01	13"(for 32mm width tape)
ACDX56-41xxx-F01,ACSX08-51	13"(for 44mm width tape)
AAAF5051-02	15"(for 16mm width tape)

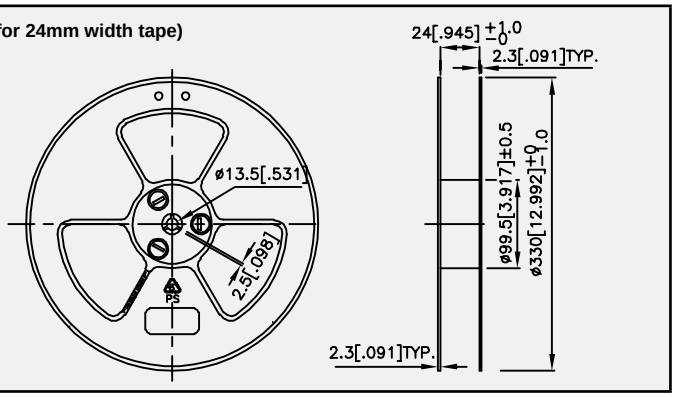
7"(for 8mm width tape)



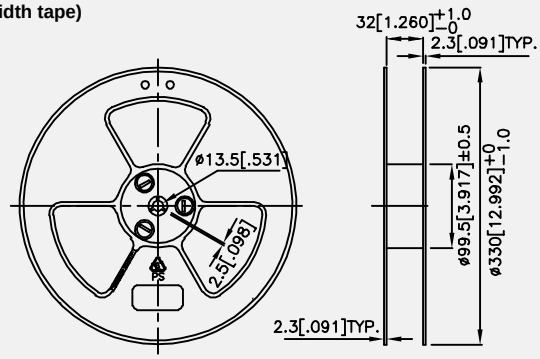
7"(for 12mm width tape)



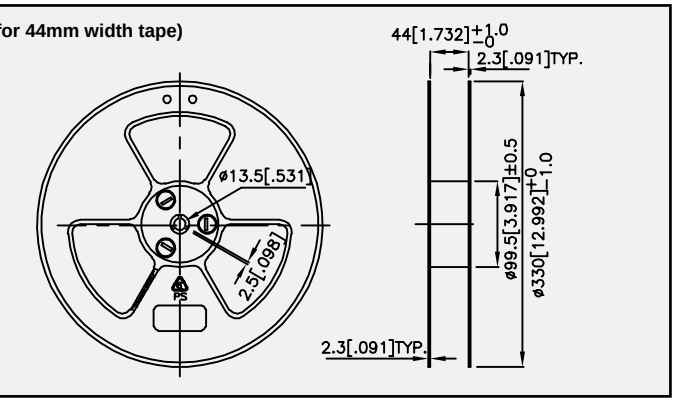
13"(for 24mm width tape)



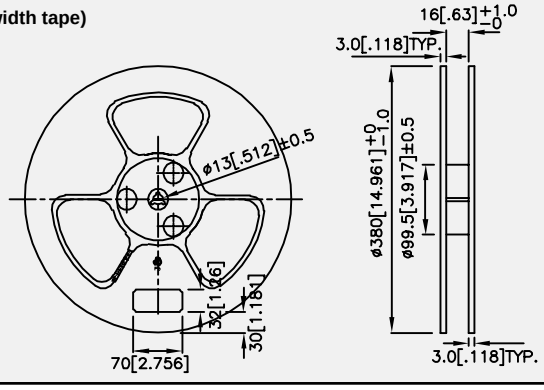
13"(for 32mm width tape)



13"(for 44mm width tape)

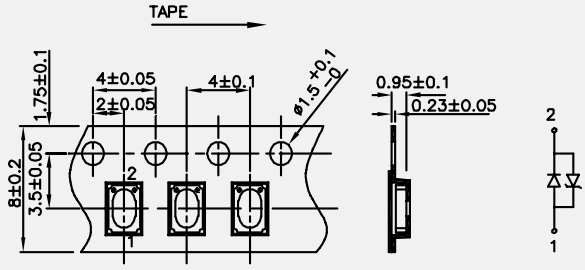


15"(for 16mm width tape)

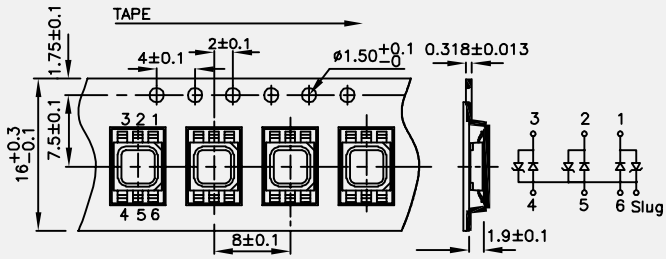


NOTE: 1. All dimensions are in millimeters(inches).

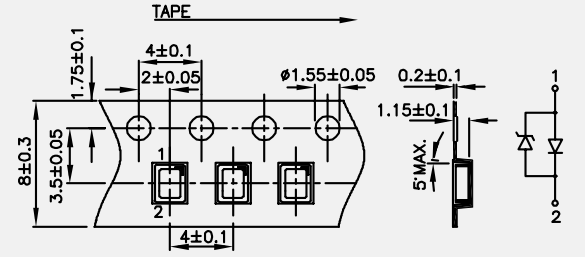
AT3020-RV PACKAGE: 2000PCS / REEL



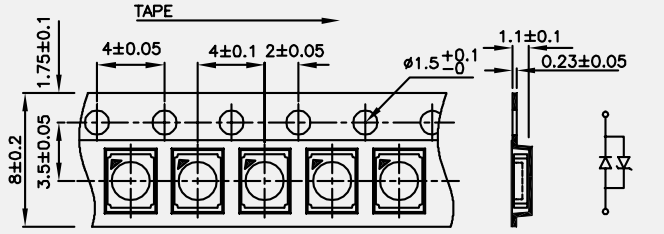
AAAF5051-02 PACKAGE: 500PCS / REEL



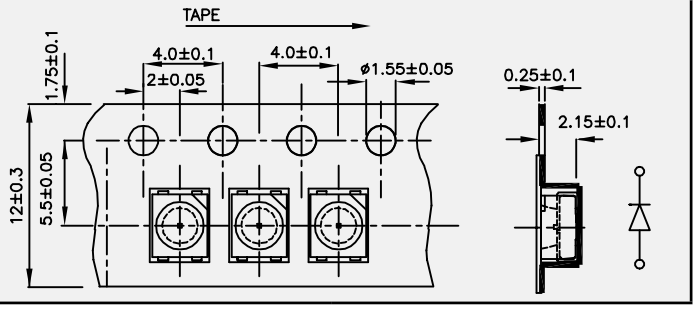
AT2520-350MA PACKAGE: 2000PCS / REEL



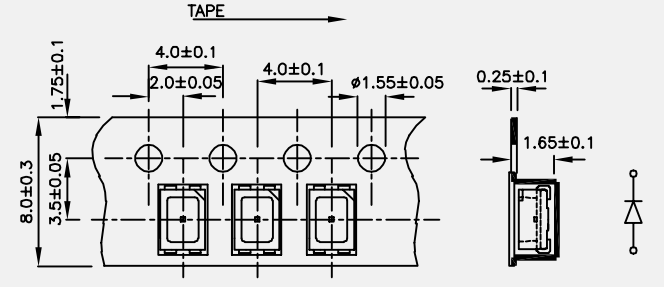
AT3228-RV PACKAGE: 2000PCS / REEL



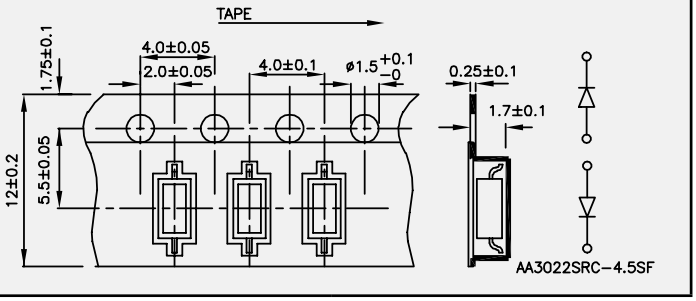
AA3528A PACKAGE: 1500PCS / REEL



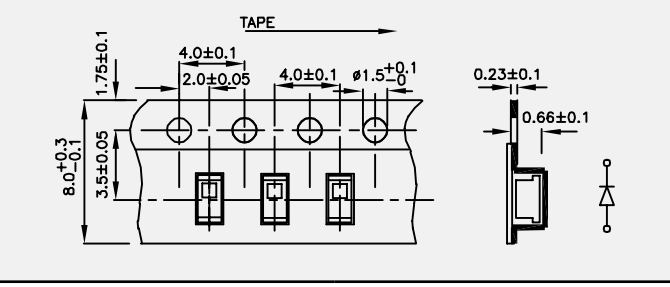
AA3020A PACKAGE: 2000PCS / REEL



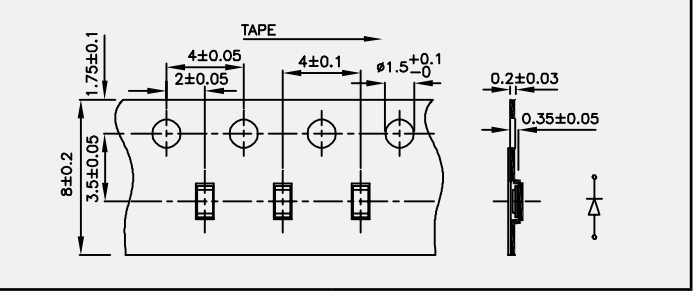
AA3022-4.5SF PACKAGE: 1500PCS / REEL



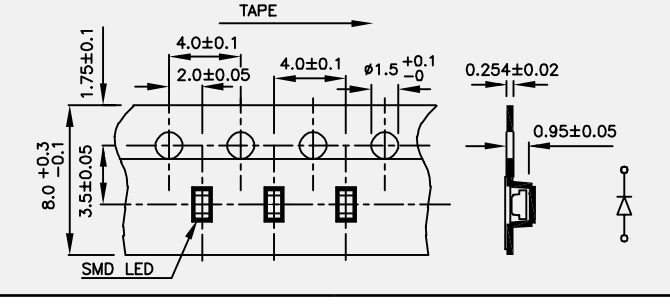
APHHS1005 PACKAGE: 2000PCS / REEL



APG1608 PACKAGE: 2000PCS / REEL

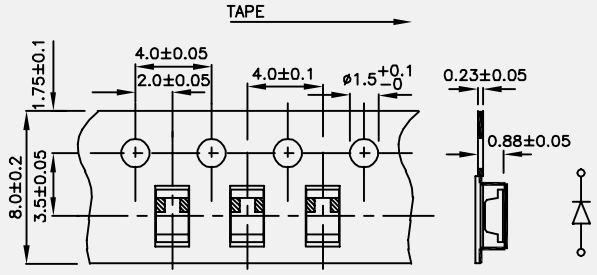


APT1608 PACKAGE: 2000PCS / REEL

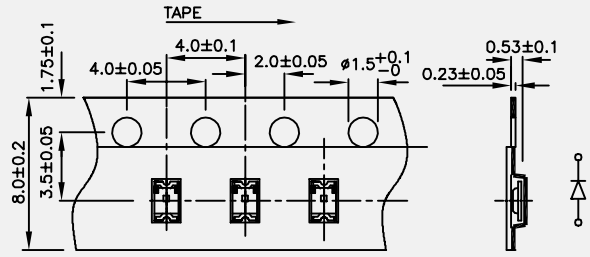


NOTE: 1. All dimensions are in millimeters.

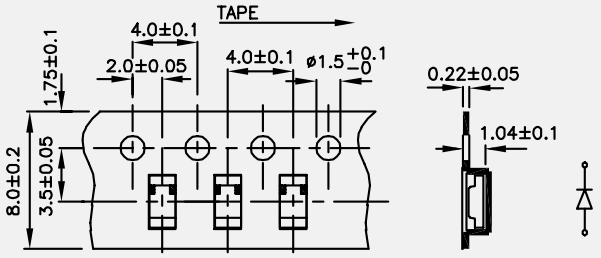
APT2012 PACKAGE: 2000PCS / REEL



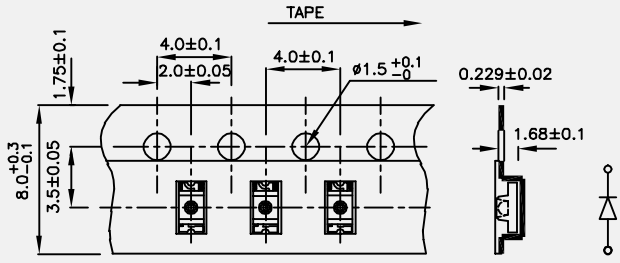
APHCM2012-F01 PACKAGE: 2000PCS / REEL



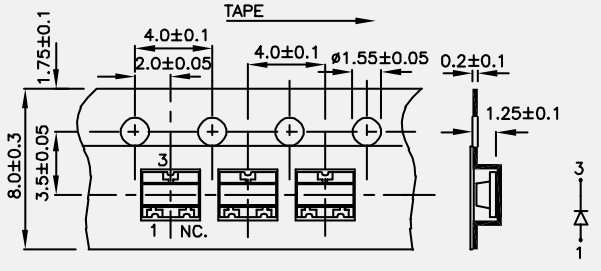
APT3216 PACKAGE: 2000PCS / REEL



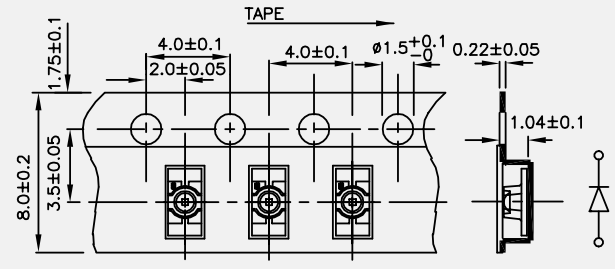
APL3015-F01 PACKAGE: 2000PCS / REEL



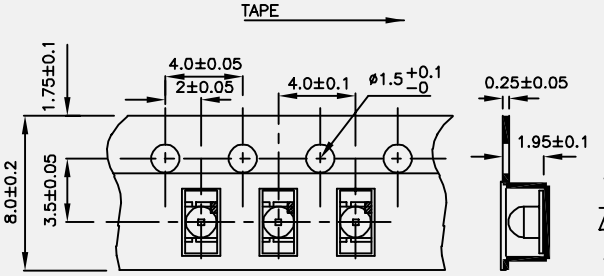
AP23/F-F01 PACKAGE: 2000PCS / REEL



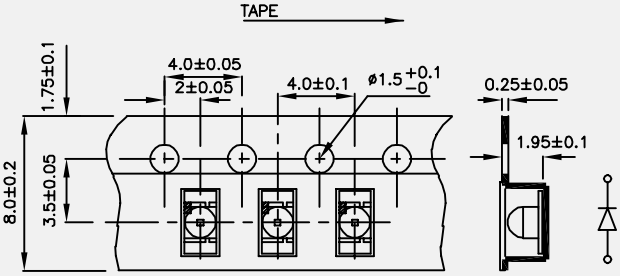
APTL3216 PACKAGE: 2000PCS / REEL



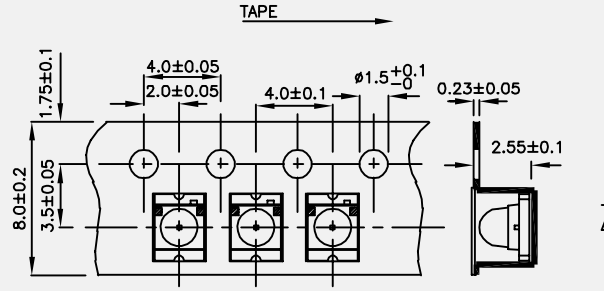
APTD3216 PACKAGE: 2000PCS / REEL



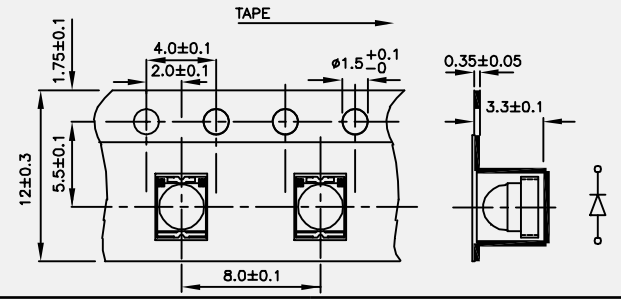
APTD3216SRCPRV PACKAGE: 2000PCS / REEL



APD3224-F01 PACKAGE: 1500PCS / REEL

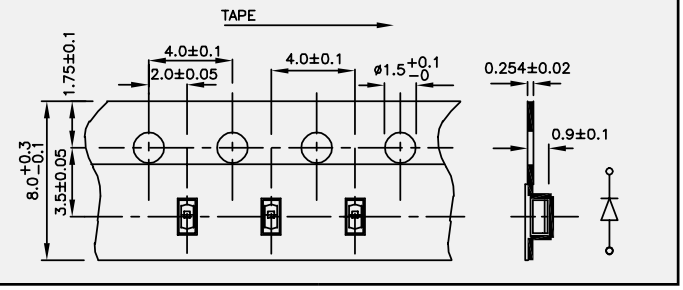


APED3528-F01 PACKAGE: 500PCS / REEL

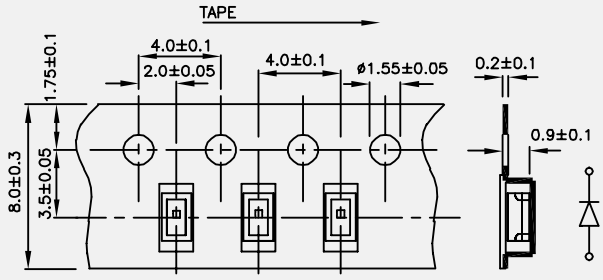


NOTE: 1. All dimensions are in millimeters.

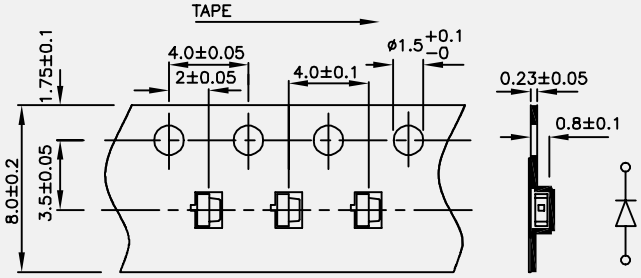
APHK1608 PACKAGE: 2000PCS / REEL



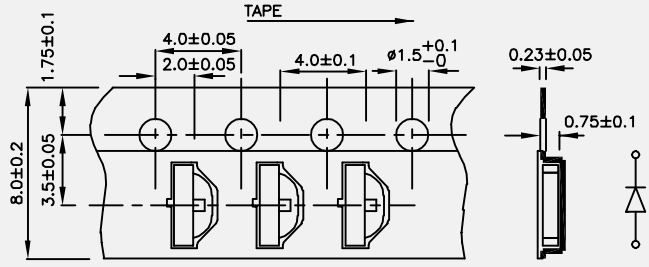
APTK2012-F01 PACKAGE: 2000PCS / REEL



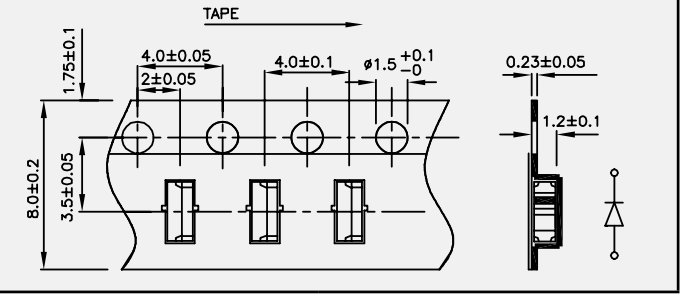
APA1606 PACKAGE: 2000PCS / REEL



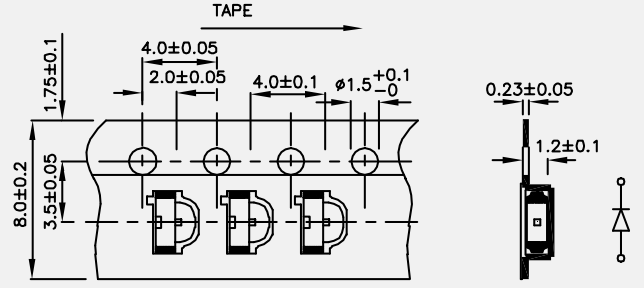
APA2106 PACKAGE: 2000PCS / REEL



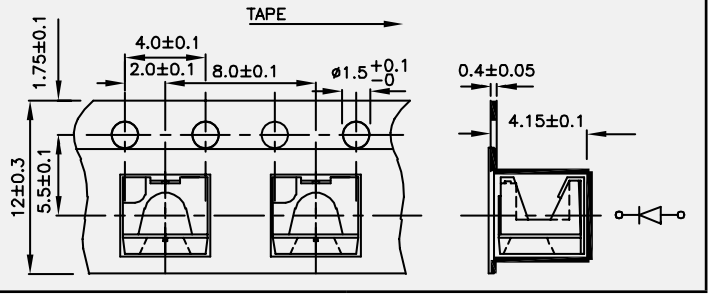
APKA2810-F01 PACKAGE: 2000PCS / REEL



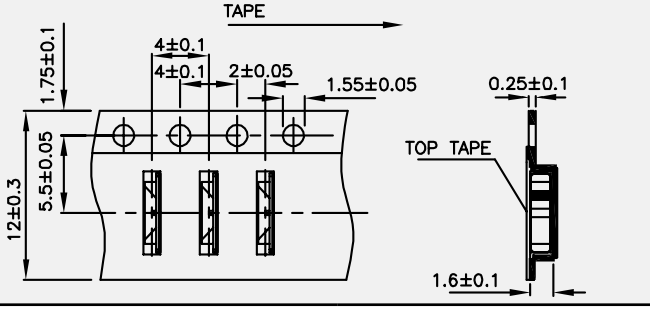
APECVA3010 PACKAGE: 2000PCS / REEL



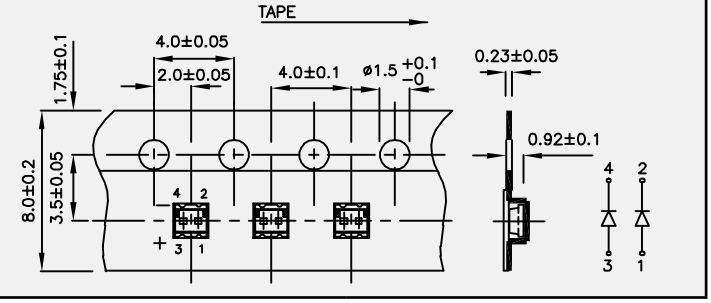
AA4040 PACKAGE:500PCS / REEL



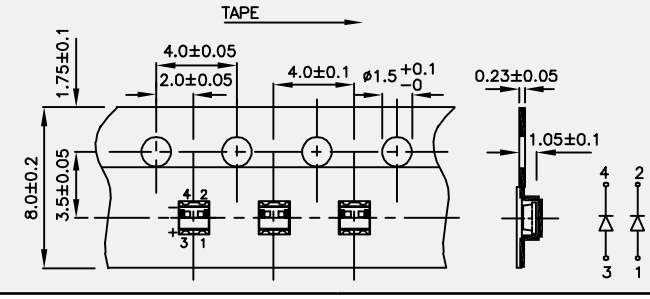
APTKA5614 PACKAGE: 2000PCS / REEL



APTB1612-F01 PACKAGE: 2000PCS / REEL

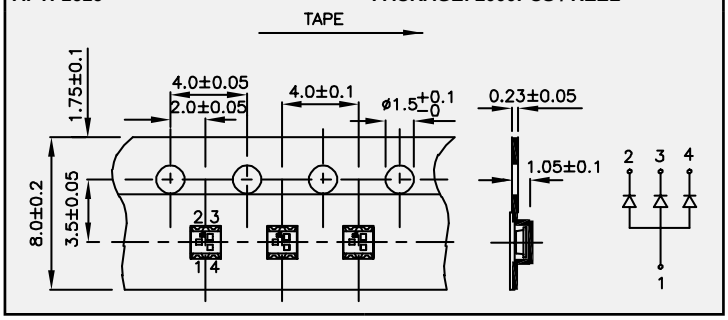


APTB1615-F01 PACKAGE: 2000PCS / REEL

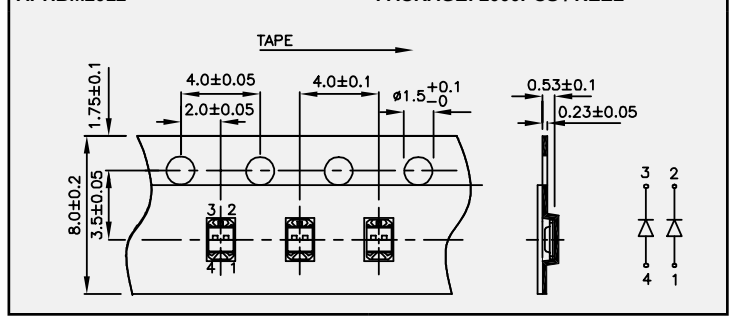


NOTE: 1. All dimensions are in millimeters.

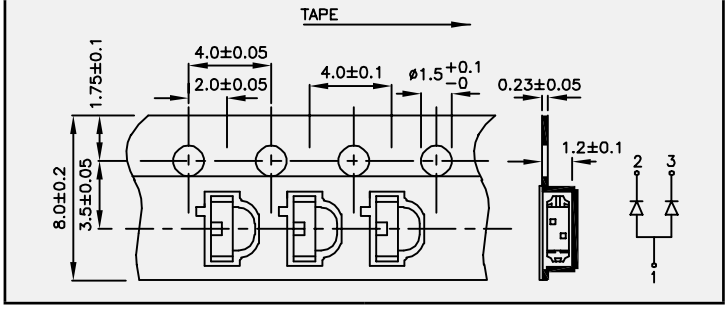
APTF1616 PACKAGE: 2000PCS / REEL



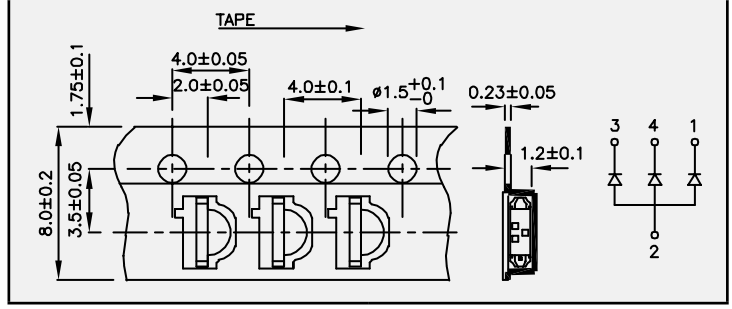
APHBM2012 PACKAGE: 2000PCS / REEL



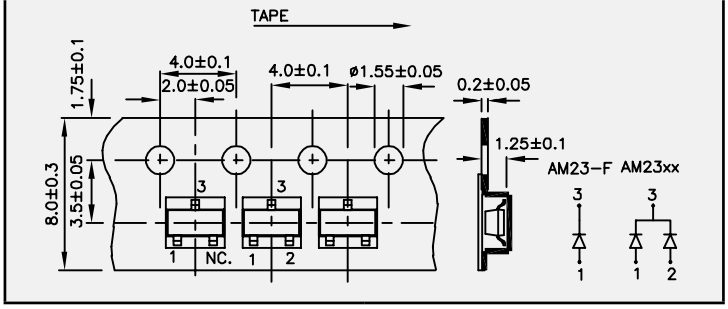
APBVA3010 PACKAGE: 2000PCS / REEL



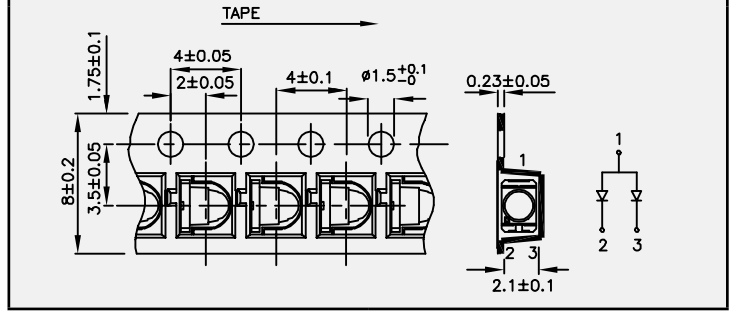
APFA3010 PACKAGE: 2000PCS / REEL



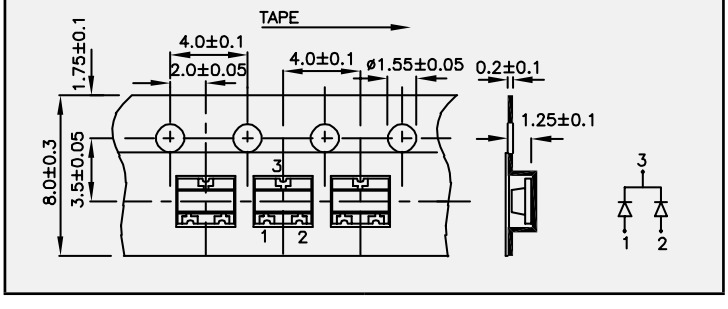
AM23-F,AM23xx PACKAGE: 2000PCS / REEL



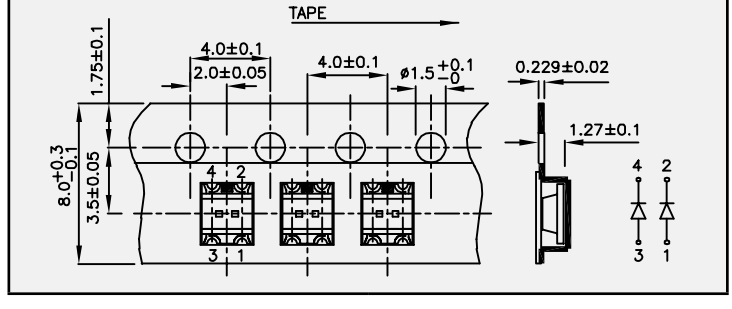
APBVDA3020 PACKAGE: 2000PCS / REEL



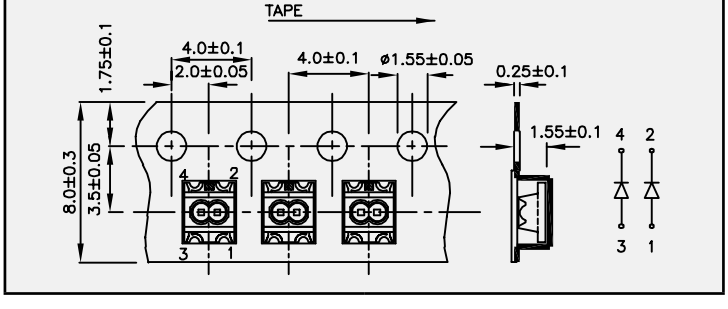
AP23xxx-F01 PACKAGE: 2000PCS / REEL



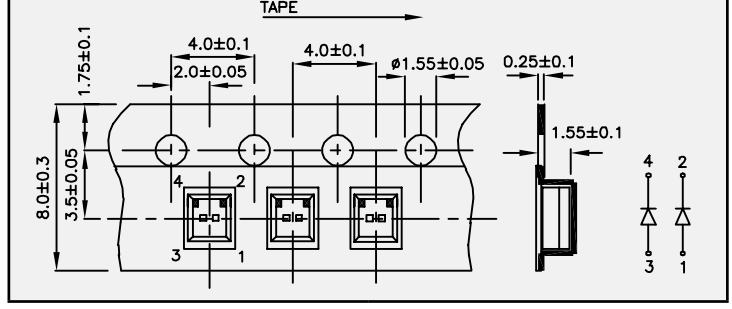
APB3025-F01 PACKAGE: 2000PCS / REEL



APBL3025-F01 PACKAGE: 2000PCS / REEL

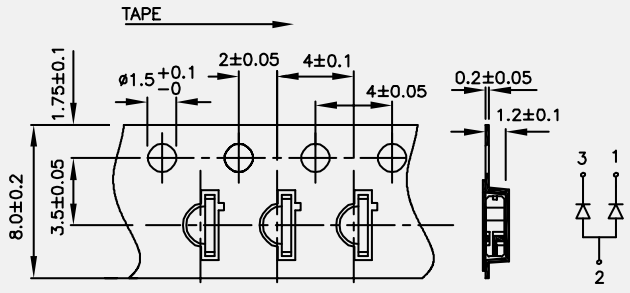


APKB3025-F01 PACKAGE: 2000PCS / REEL

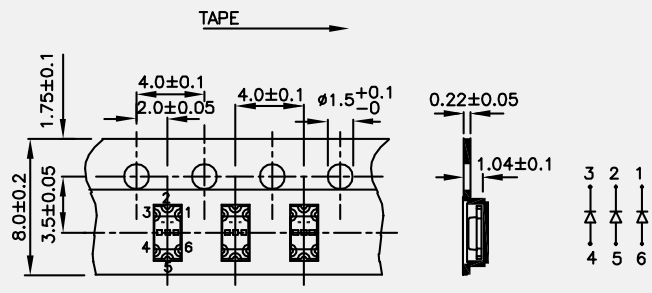


NOTE: 1. All dimensions are in millimeters.

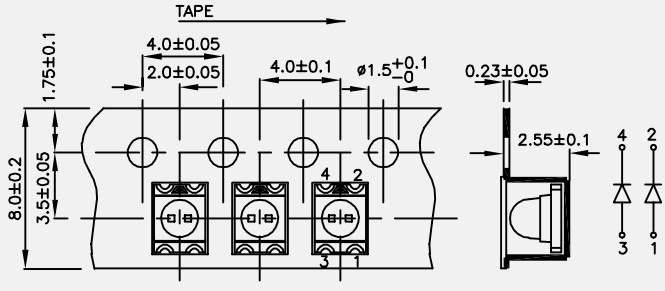
APBA3210-F01 PACKAGE: 2000PCS / REEL



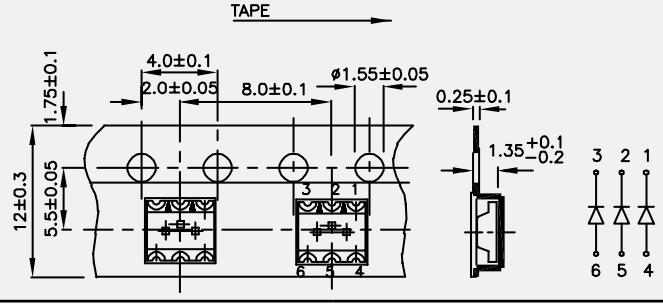
APTF3216 PACKAGE: 2000PCS / REEL



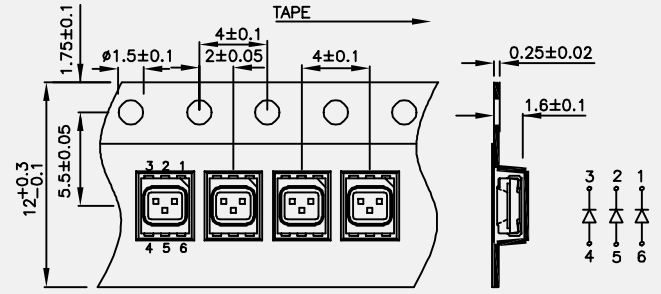
APBD3224-F01 PACKAGE: 1500PCS / REEL



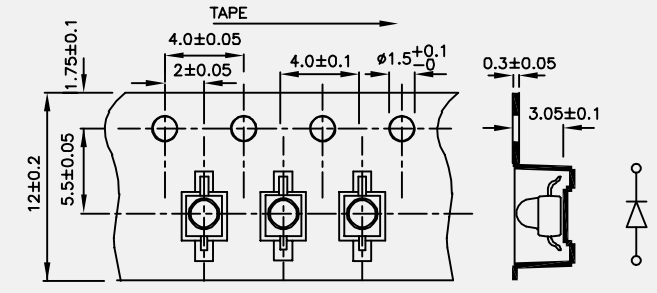
APF3236 PACKAGE: 1000PCS / REEL



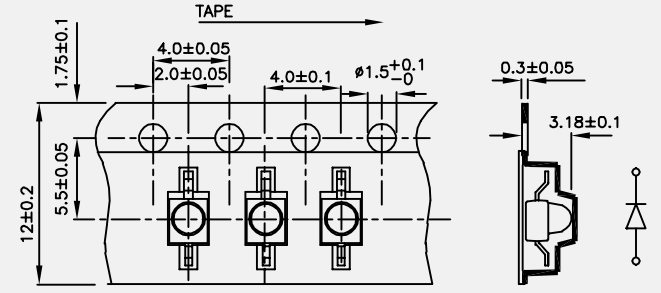
AAAF3528 PACKAGE: 1500PCS / REEL



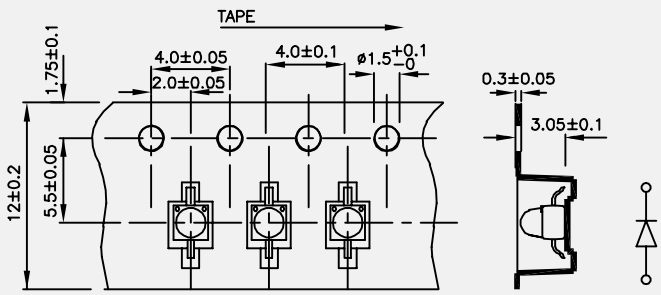
AM2520xxx03 PACKAGE: 1000PCS / REEL



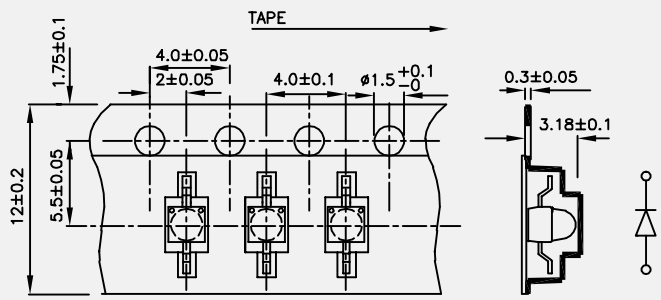
AM2520xxx09 PACKAGE: 1000PCS / REEL



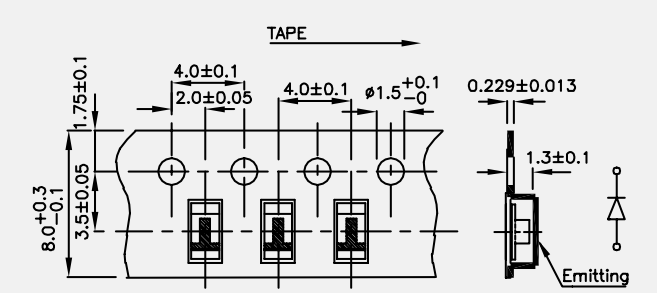
AM27xxx03 PACKAGE: 1000PCS / REEL



AM27xxx09 PACKAGE: 1000PCS / REEL

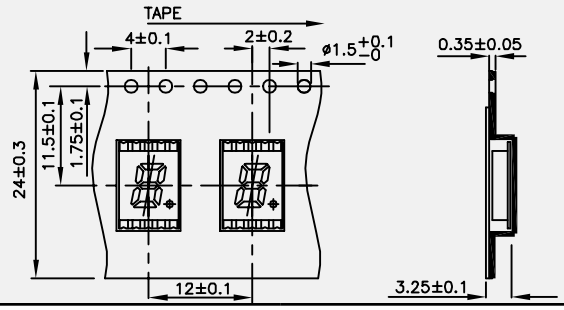


APTR3216 PACKAGE: 2000PCS / REEL

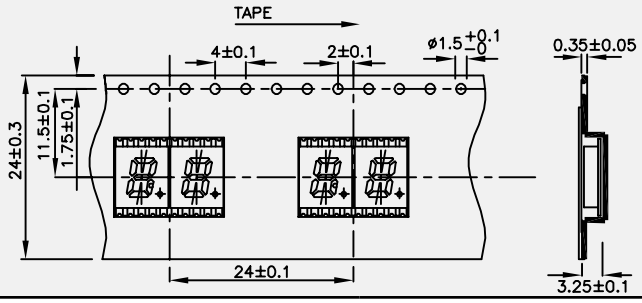


NOTE: 1. All dimensions are in millimeters.

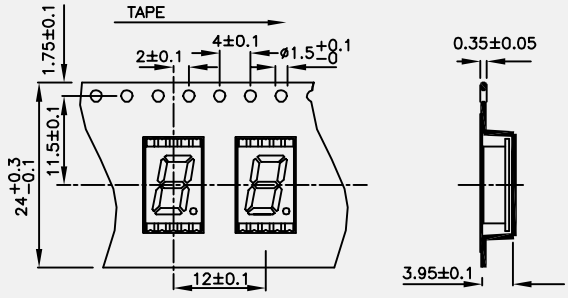
ACSX02-41xxx-F01 **PACKAGE: 650PCS / REEL**



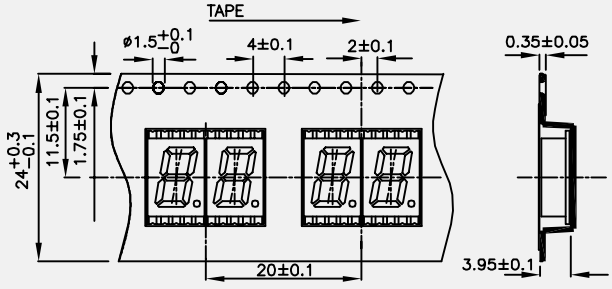
ACDX02-41xxx-F01 **PACKAGE: 300PCS / REEL**



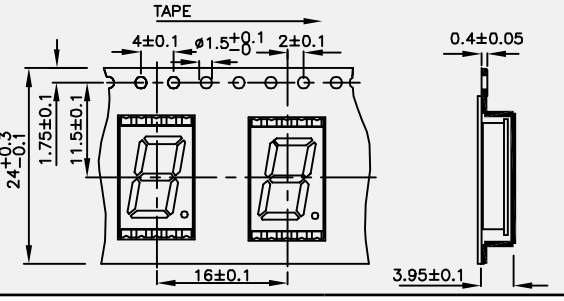
ACSX03-41xxx-F01 **PACKAGE: 550PCS / REEL**



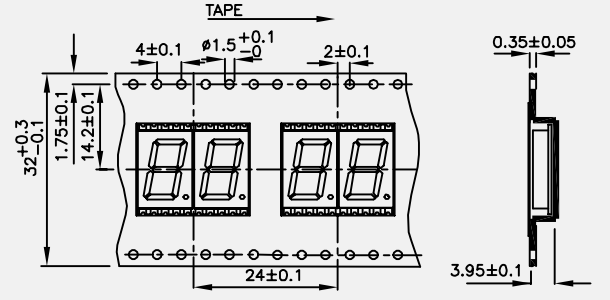
ACDX03-41xxx-F01 **PACKAGE: 300PCS / REEL**



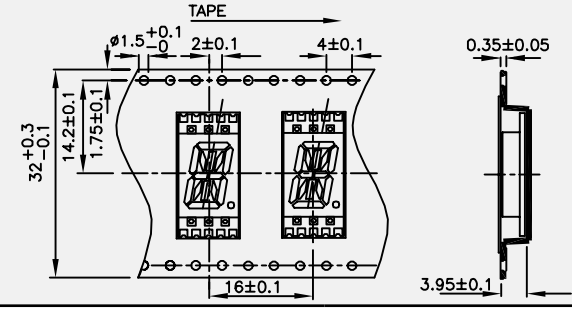
ACSX04-41xxx-F01 **PACKAGE: 400PCS / REEL**



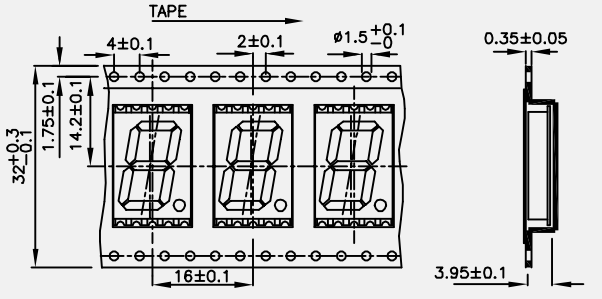
ACDX04-41xxx-F01 **PACKAGE: 250PCS / REEL**



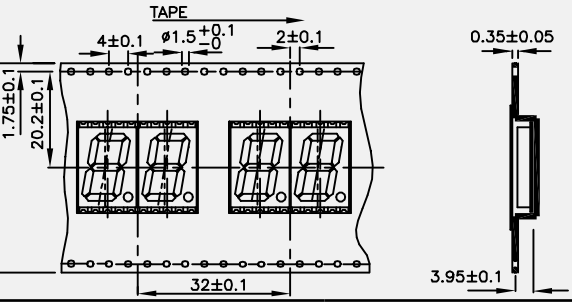
ACPSX04-41 **PACKAGE: 400PCS / REEL**



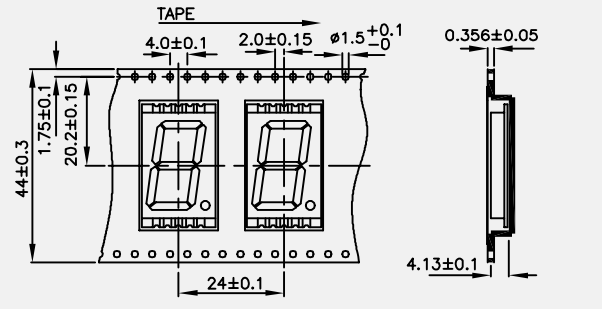
ACSX56-41xxx-F01 **PACKAGE: 400PCS / REEL**



ACDX56-41xxx-F01 **PACKAGE: 200PCS / REEL**

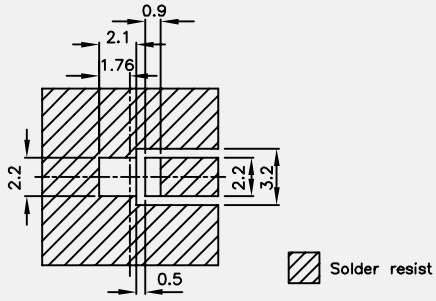


ACSX08-51 **PACKAGE: 200PCS / REEL**

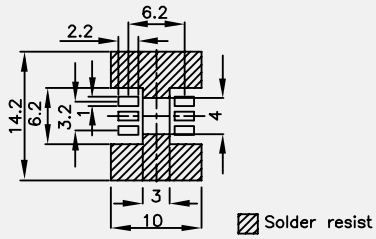


NOTE: 1. All dimensions are in millimeters.

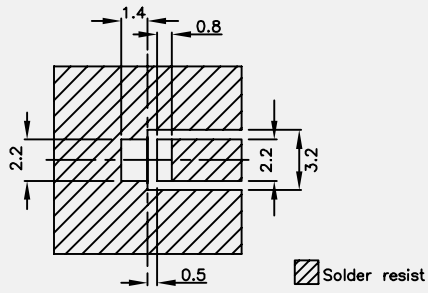
AT3020-RV



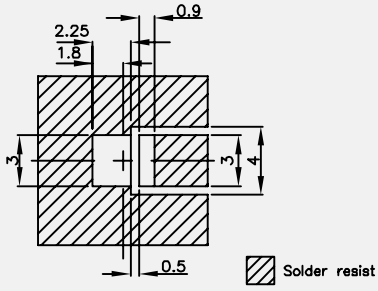
AAAF5051-02



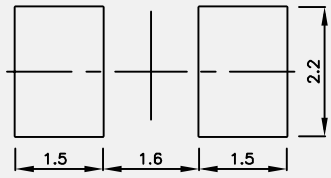
AT2520-350MA



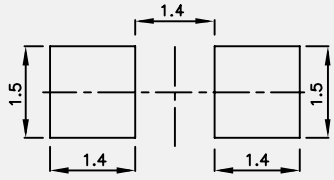
AT3228-RV



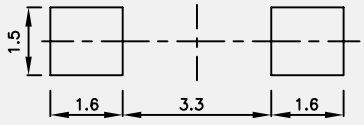
AA3528A , APED3528-F01



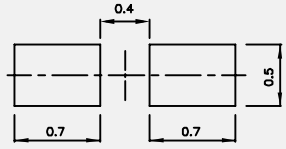
AA3020A



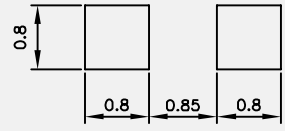
AA3022-4.5SF



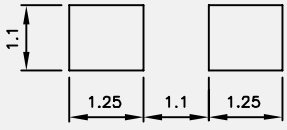
APHHS1005



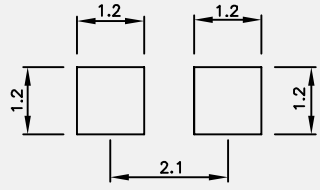
APG1608, APT1608



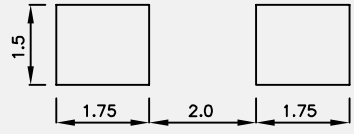
APT2012, APTK2012-F01



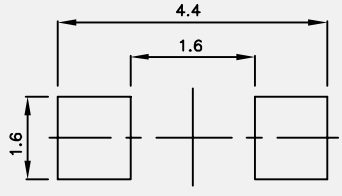
APHCM2012-F01



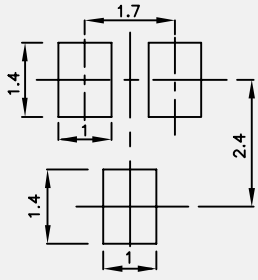
APT3216, APTD3216



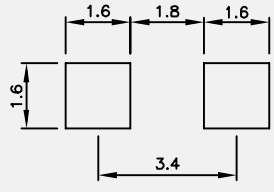
APL3015-F01



AP23/F-F01, AP23xxx-F01

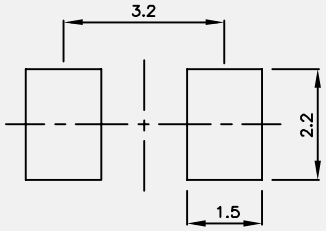


APTL3216

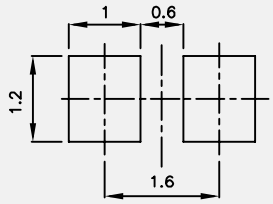


NOTES: 1. All dimensions are in millimeters. 2. Tolerance is ±0.1mm unless otherwise noted.

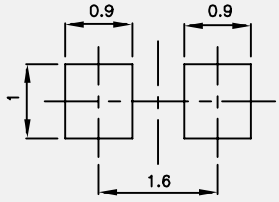
APD3224-F01



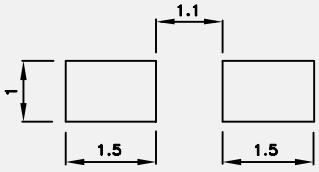
APHK1608



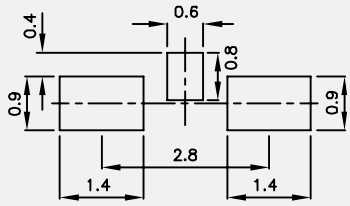
APA1606



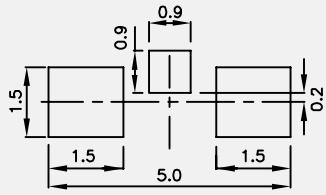
APA2106



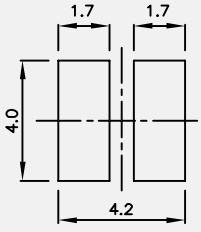
APKA2810-F01



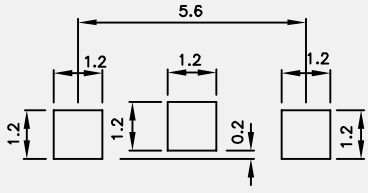
APECVA3010, APBVA3010



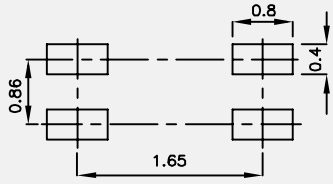
AA4040



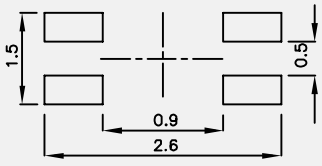
APTKA5614



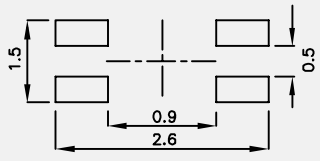
APTB1612-F01



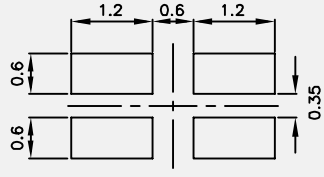
APTB1615-F01



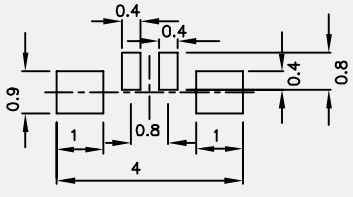
APTF1616



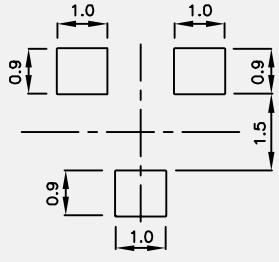
APHBM2012



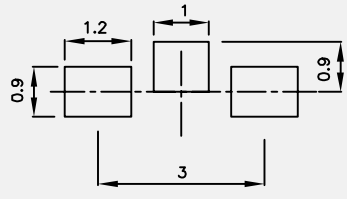
APFA3010



AM23-F,AM23xx

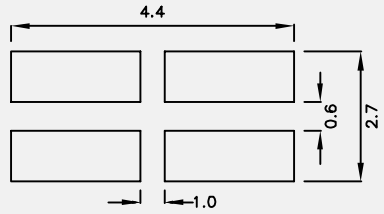


APBVDA3020

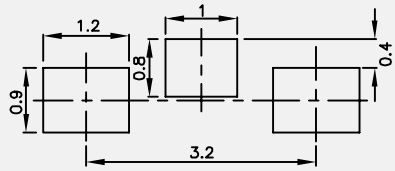


NOTES: 1. All dimensions are in millimeters. 2. Tolerance is ±0.1mm unless otherwise noted.

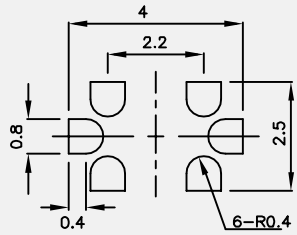
APB3025-F01, APBL3025-F01, APKB3025-F01



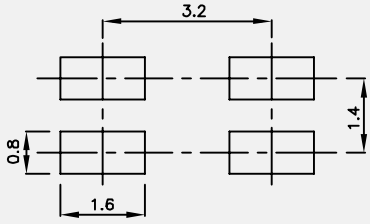
APBA3210-F01



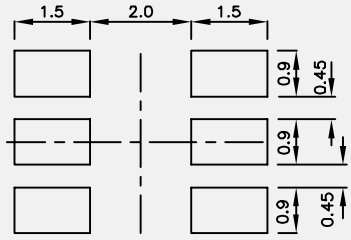
APTF3216



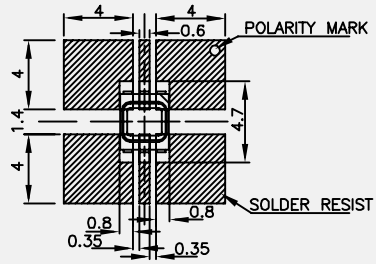
APBD3224-F01



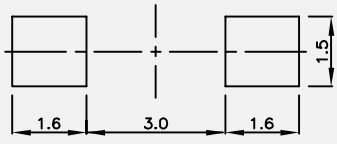
APF3236



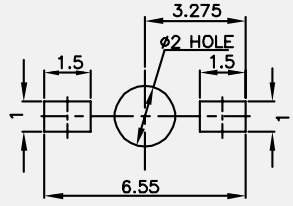
AAAF3528



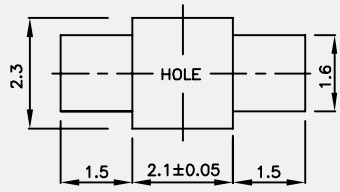
AM2520xxx03,AM27xxx03



AM2520xxx09,AM27xxx09

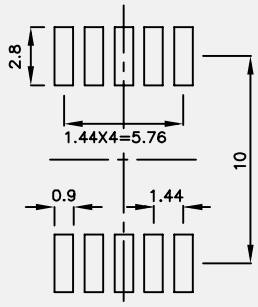


APTR3216

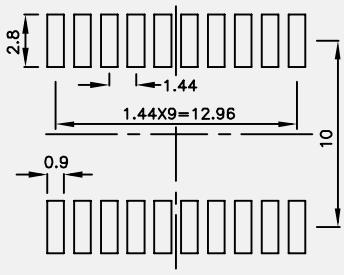


NOTES: 1. All dimensions are in millimeters. 2. Tolerance is ±0.1mm unless otherwise noted.

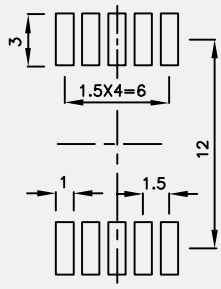
ACSX02-41xxx-F01



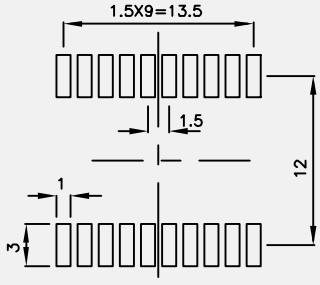
ACDX02-41xxx-F01



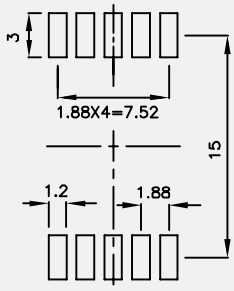
ACSX03-41xxx-F01



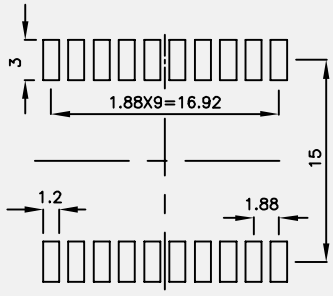
ACDX03-41xxx-F01



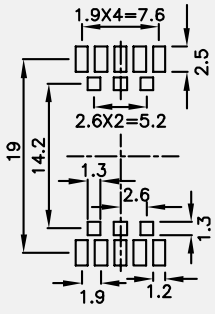
ACSX04-41xxx-F01



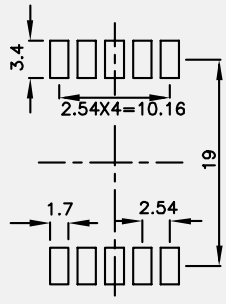
ACDX04-41xxx-F01



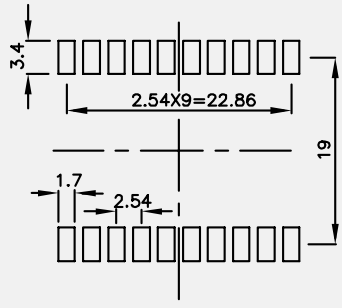
ACPSX04-41



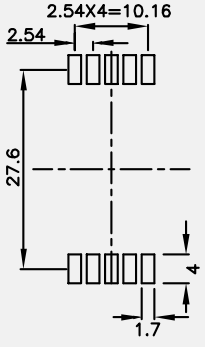
ACSX56-41xxx-F01



ACDX56-41xxx-F01



ACSX08-51



NOTES: 1. All dimensions are in millimeters. 2. Tolerance is ±0.15mm unless otherwise noted.

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_T	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		2.0	2.25	1.85	1.95	2.0	1.9	1.9	
I_F=10mA	V_F	1.9	2.05	1.8	1.85	1.85	1.85	1.8	V
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	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	627	700	660	650	650	650	640	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	625	660	640	630	630	630	630	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	45	45	20	28	20	27	25	nm
Capacitance V_F=0V,f=1MHZ	C	15	40	45	35	35	45	45	pF

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	5	5	5	5	5	5	5	V
Forward current	I_F	25	30	30	30	30	30	25	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	145	195	150	195	195	150	140	mA
Power dissipation	P_T	62.5	75	75	75	75	84	62.5	mW
LED LAMPS:									
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:									
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		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		2.05	2.1	2.05	2.0	2.0	2.2	2.2	
I_F=10mA	V_F	1.95	2.0	1.95	1.9	1.9	2.0	2.0	V
I_F=2mA		1.85	1.85	1.8	1.8	1.8	1.8	1.9	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	2.5	2.5	2.5	2.5	2.5	2.8	2.5	V
Reverse current V_R=5V	I_R	10	10	10	10	10	10	10	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	607	610	610	610	630	640	565	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	610	601	601	601	621	625	568	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	35	29	17	29	20	25	30	nm
Capacitance V_F=0V,f=1MHZ	C	15	15	15	30	25	27	15	pF

Absolute maximum ratings (T_A=25°C)		PG Pure Green (GaP)	CGK Green (AlGaInP)	CGK/T Green (AlGaInP)	MGK Mega Green (AlGaInP)	MG Mega Green (AlGaInP)	VG/A Green (InGaN)	VG/Z Green (InGaN)	Unit
		●	●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	5	V
Forward current	I_F	25	30	30	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	135	150	150	150	150	100	100	mA
Power dissipation	P_T	62.5	75	78	75	75	120	111	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 (GaP)	CGK Green (AlGaInP)	CGK/T Green (AlGaInP)	MGK Mega Green (AlGaInP)	MG Mega Green (AlGaInP)	VG/A Green (InGaN)	VG/Z Green (InGaN)	Unit
		●	●	●	●	●	●	●	
Forward voltage (typ.)									
I_F=20mA		2.25	2.1	2.1	2.1	2.1	3.2	3.2	
I_F=10mA	V_F	2.1	2.0	1.95	2.0	2.0	3.05	3.05	V
I_F=2mA		1.9	1.9	1.8	1.9	1.9	2.8	2.85	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	2.5	2.5	2.6	2.5	2.5	4.0	3.7	V
Reverse current V_R=5V	I_R	10	10	10	10	10	10	10	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	555	574	574	574	574	520	525	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	555	570	570	570	570	525	535	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	30	20	15	20	26	35	39	nm
Capacitance V_F=0V,f=1MHZ	C	45	15	15	15	20	100	65	pF

Absolute maximum ratings (T_A=25°C)		TG/Z Green (InGaN)	ZG Green (InGaN)	Y Yellow (GaAsP/GaP)	SYK Super Bright Yellow (AlGaInP)	SYK/T Super Bright Yellow (AlGaInP)	SY Super Bright Yellow (AlGaInP)	SY/J3 Super Bright Yellow (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}	100	150	140	175	150	150	140	mA
Power dissipation	P_T	114	102.5	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		TG/Z Green (InGaN)	ZG Green (InGaN)	Y Yellow (GaAsP/GaP)	SYK Super Bright Yellow (AlGaInP)	SYK/T Super Bright Yellow (AlGaInP)	SY Super Bright Yellow (AlGaInP)	SY/J3 Super Bright Yellow (AlGaInP)	Unit
		●	●	●	●	●	●	●	
Forward voltage (typ.)									
I_F=20mA		3.2	3.3	2.1	2.0	2.05	2.0	2.0	
I_F=10mA	V_F	3.05	3.0	1.95	1.95	1.95	1.95	1.95	V
I_F=2mA		2.85	2.65	1.85	1.85	1.8	1.8	1.85	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	3.8	4.1	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	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	505	515	590	590	590	590	590	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	507	525	588	590	590	590	589	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	32	30	35	20	15	28	20	nm
Capacitance V_F=0V,f=1MHZ	C	54	45	20	20	25	25	45	pF

Absolute maximum ratings (T_A=25°C)		MB Blue (GaN)	PB/A Blue (InGaN)	PB/G Blue (InGaN)	PB/Z Blue (InGaN)	QB/D Blue (AlGaInN)	QB/F Blue (AlGaInN)	Unit
		●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	V
Forward current	I_F	30	30	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	150	100	100	100	150	150	mA
Power dissipation	P_T	135	120	120	111	120	120	mW
LED LAMPS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		MB Blue (GaN)	PB/A Blue (InGaN)	PB/G Blue (InGaN)	PB/Z Blue (InGaN)	QB/D Blue (AlGaInN)	QB/F Blue (AlGaInN)	Unit
		●	●	●	●	●	●	
Forward voltage (typ.)								
I_F=20mA		3.8	3.2	3.2	3.2	3.3	3.3	
I_F=10mA	V_F	3.6	3.05	3.05	3.05	3.0	3.0	V
I_F=2mA		3.4	2.8	2.8	2.85	2.65	2.65	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	4.5	4.0	4.0	3.7	4.0	4.0	V
Reverse current V_R=5V	I_R	10	10	10	10	10	10	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	430	468	468	458	468	461	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	466	470	470	465	470	465	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	60	21	21	22	25	25	nm
Capacitance V_F=0V,f=1MHZ	C	100	100	100	110	100	100	pF

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 12V	V_F	14	14	14	14	V
Forward voltage (Max.) for 14V	V_F	16	16	16	16	V
Power dissipation for 5V	P_T	85	85	85	85	mW
Power dissipation for 12V	P_T	120	120	120	120	mW
Power dissipation for 14V	P_T	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=12V	I_F	8.5	8.5	8.5	8.5	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=12V	I_F	11.5	11.5	11.5	11.5	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,12V,14V	λp	627	660	565	590	nm
Dominant Wavelength V_F=5V,12V,14V	λD	625	640	568	588	nm
Spectral line half-width V_F=5V,12V,14V	Δλ1/2	45	20	30	35	nm

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_T	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

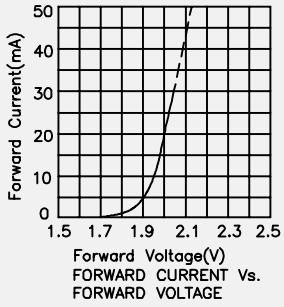
Operating Characteristics		E,I Hi.Eff.Red (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	G,SG Green, Super Bright Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
		●	●	●	●	●	
Forward current (min.) V_F=3.5V	I_F	8	8	8	8	8	mA
Forward current (typ.) V_F=5V	I_F	22	22	22	22	22	mA
Supply current V_F=3.5V ~ 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	λp	627	700	660	565	590	nm
Dominant Wavelength	λD	625	660	640	568	588	nm
Spectral line half-width	Δλ1/2	45	45	20	30	35	nm

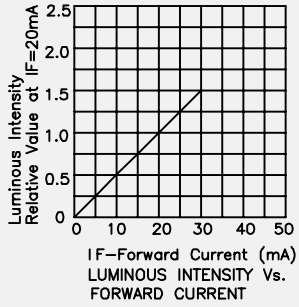
Absolute maximum ratings (T_A=25°C)		F3 (GaAs)	SF4 (GaAlAs)	Unit
Reverse voltage	V_R	5	5	V
Forward current	I_F	50	50	mA
Forward current (Peak) 1/100 Duty Cycle, 10μs Pulse Width	i_{FS}	1.2	1.2	A
Power dissipation	P_T	80	80	mW
LED LAMPS:				
Operating temperature	T_A	- 40~+85	- 40~+85	°C
Storage temperature	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

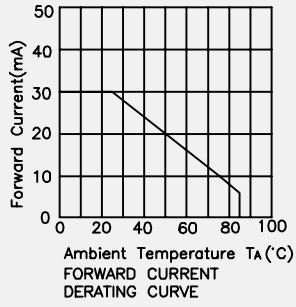
Operating Characteristics		F3 (GaAs)	SF4 (GaAlAs)	Unit
Forward voltage (typ.) I_F=20mA	V_F	1.2	1.3	V
Forward voltage (max.) I_F=20mA	V_F	1.6	1.6	V
Reverse current V_R=5V	I_R	10	10	uA
Peak Emission Wavelength I_F=20mA	λp	940	880	nm
Spectral line half-width I_F=20mA	Δλ1/2	50	50	nm
Capacitance VF=0V,f=1MHZ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

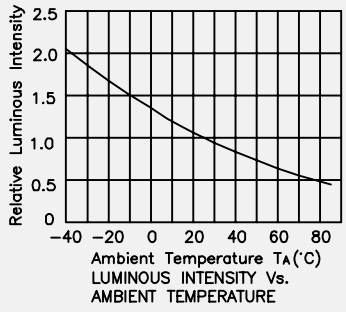
High Efficiency Red,Orange

E,I : GaAsP/GaP



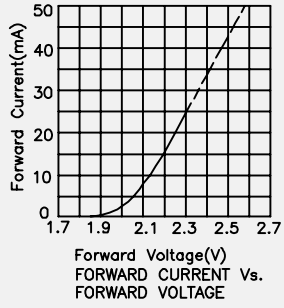


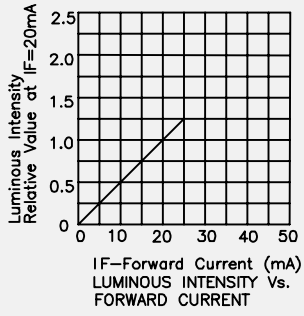


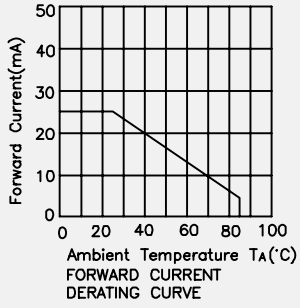


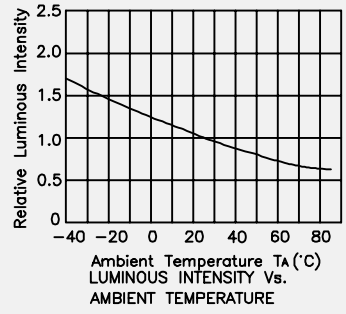
Bright Red

H : GaP



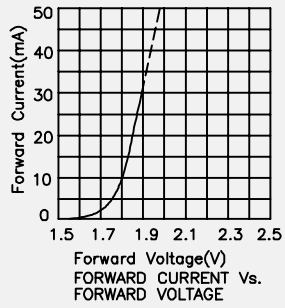


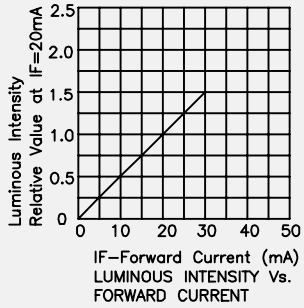


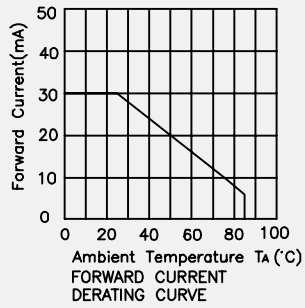


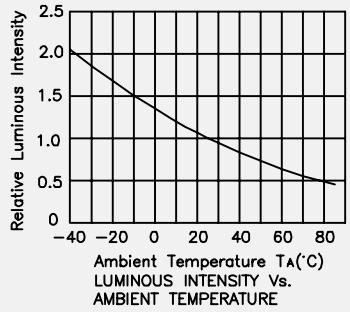
Super Bright Red

SR : GaAlAs



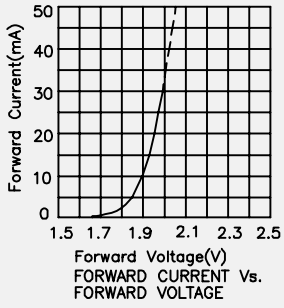


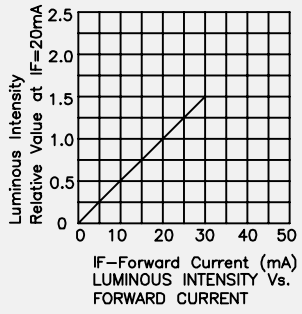


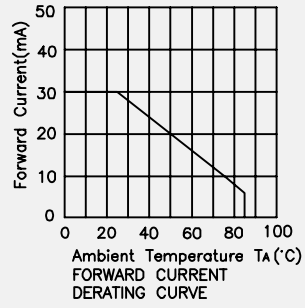


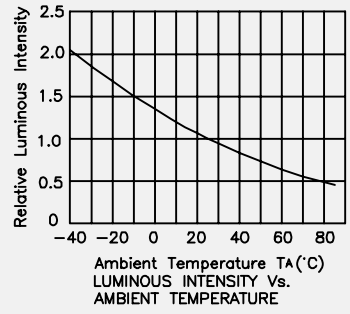
Hyper Red

SURK : AlGaInP

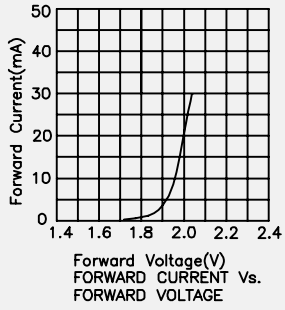


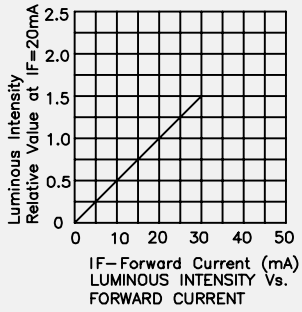




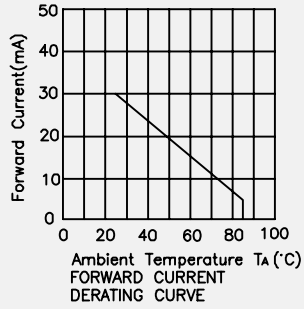


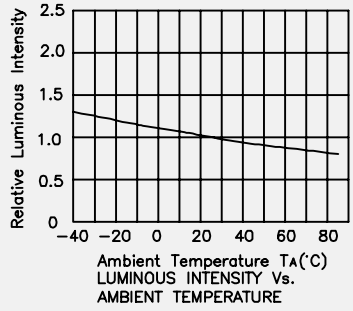
Hyper Red



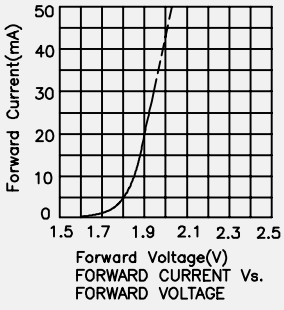


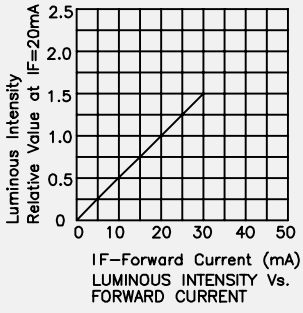
SURK/T : AlGaInP



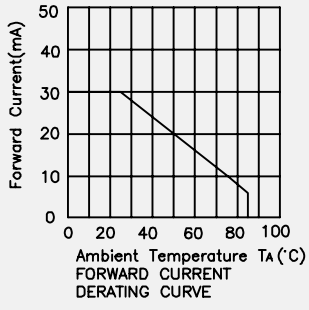


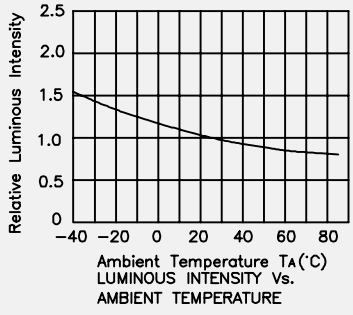
Hyper Red



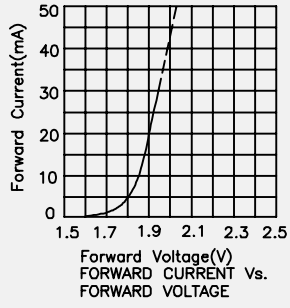


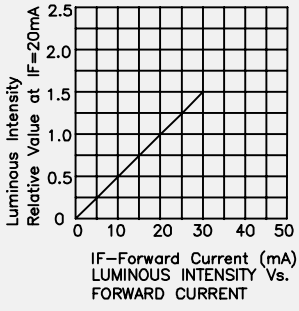
SUR : AlGaInP



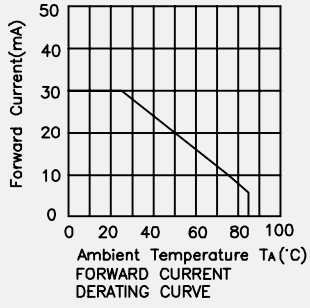


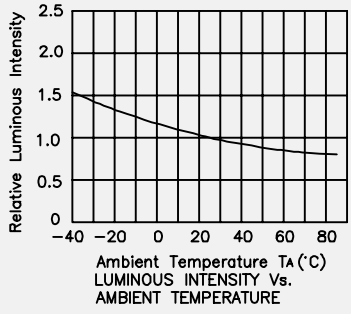
Hyper Red



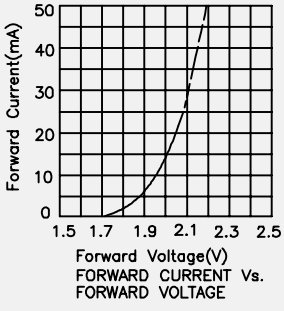


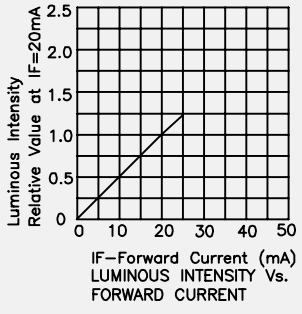
SUR/E : AlGaInP



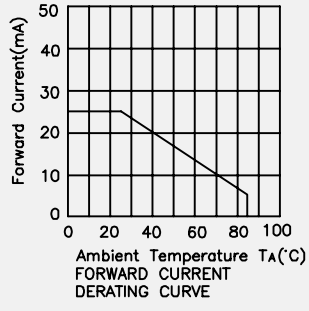


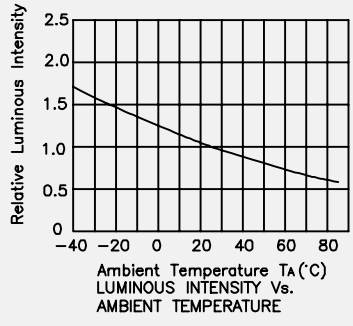
Pure Orange



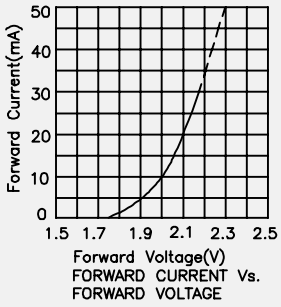


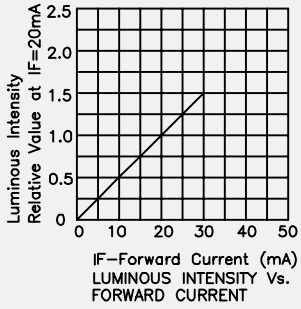
N : GaAsP/GaP

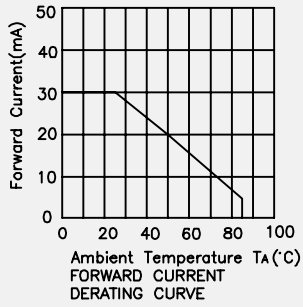


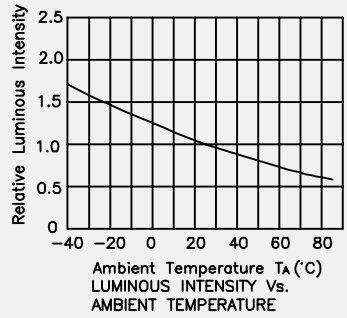


Super Bright Orange — SEK : AlGaInP

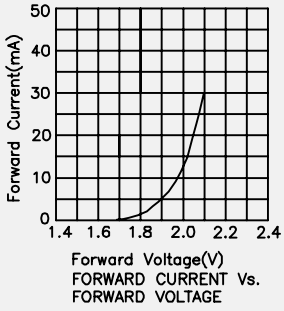


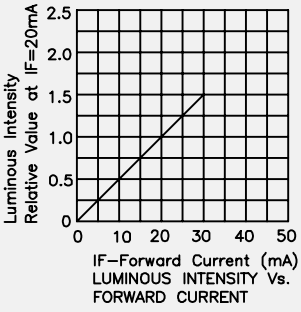


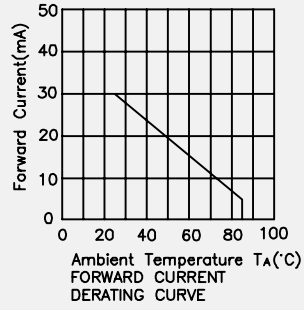


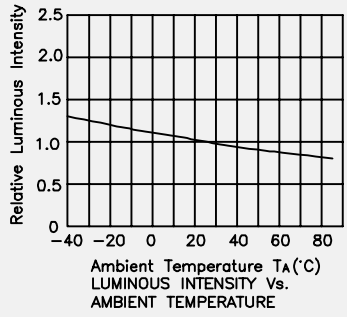


Super Bright Orange — SEK/T : AlGaInP

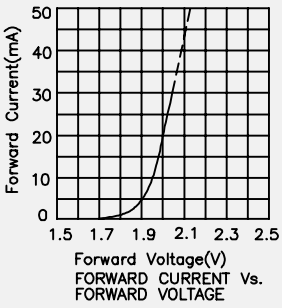


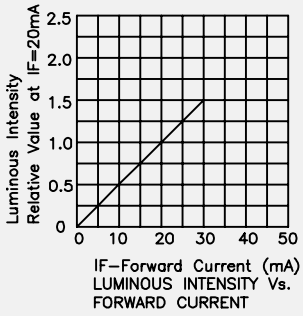


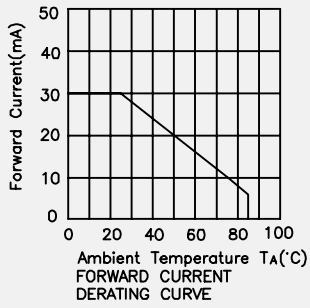


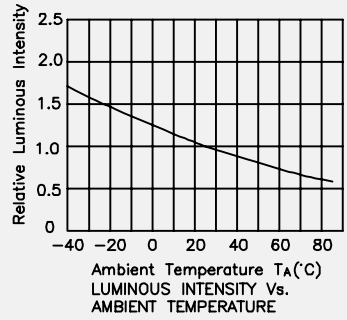


Super Bright Orange — SE : AlGaInP

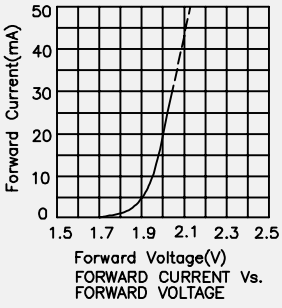


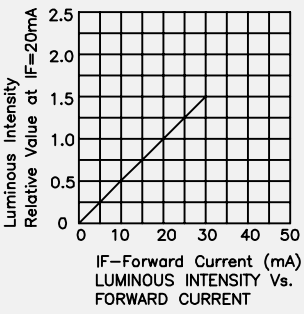


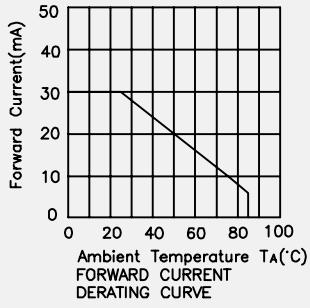


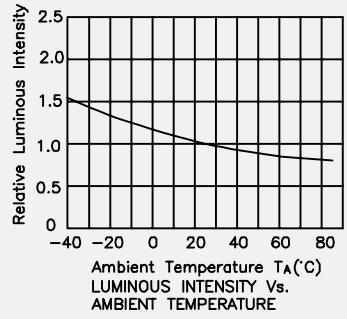


Hyper Red — SE/E : AlGaInP

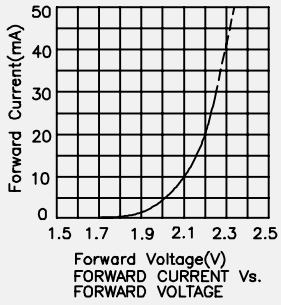


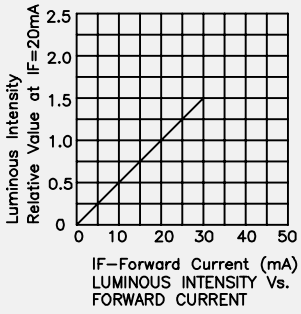


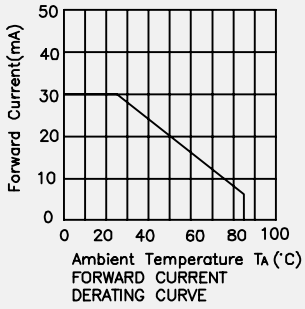


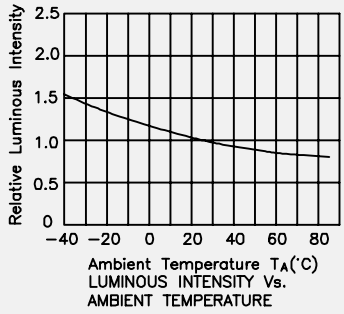


Hyper Red — SE/J3 : AlGaInP

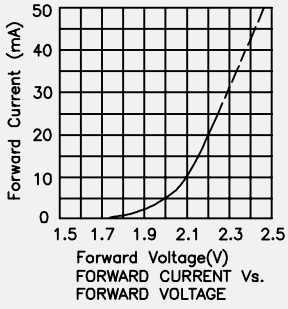


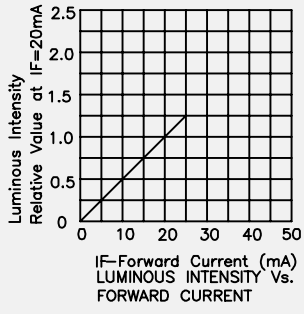


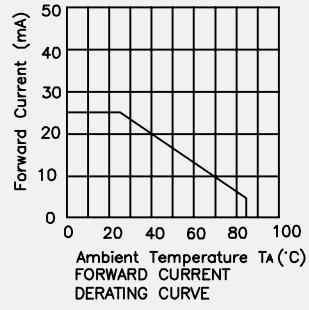


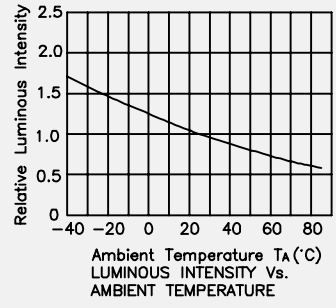


Green/Super Bright Green — G,SG : GaP

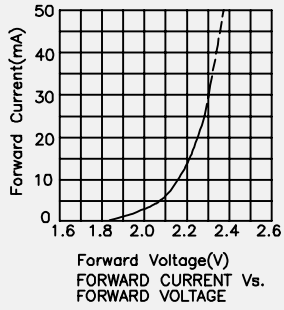


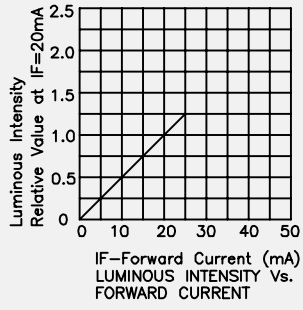


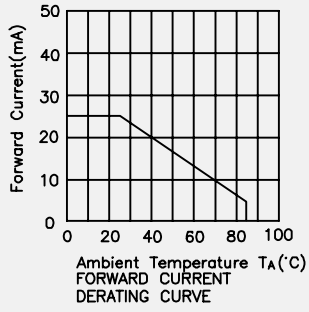


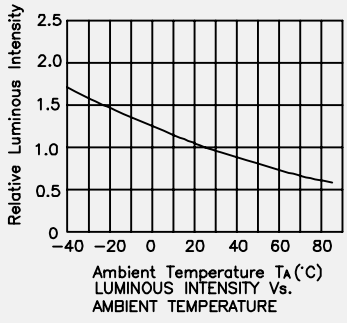


Pure Green — PG : GaP

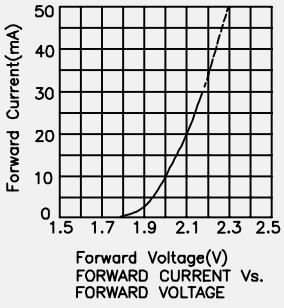


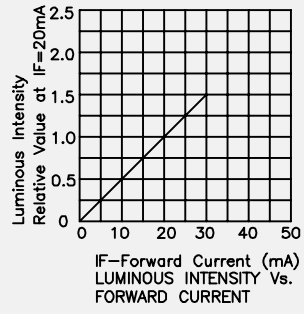


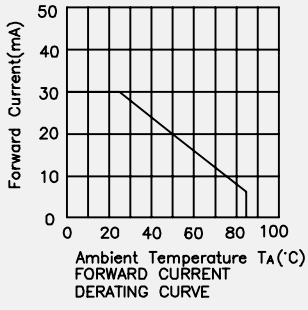


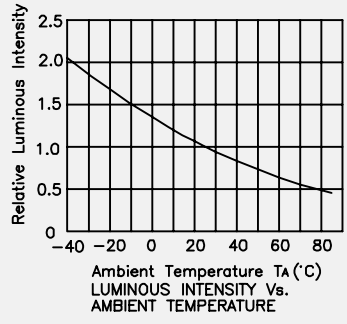


Green — CGK : AlGaInP

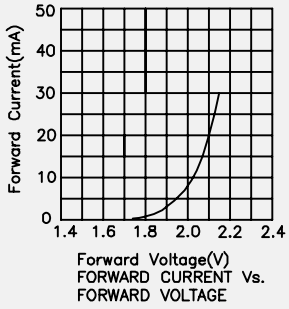


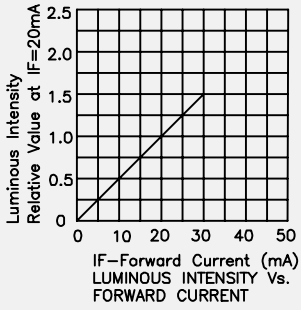


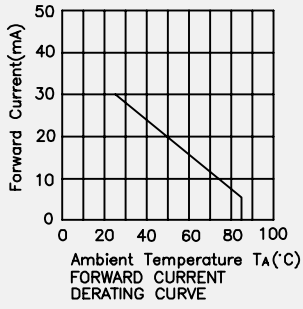


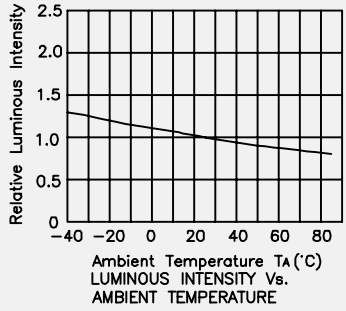


Green — CGK/T : AlGaInP

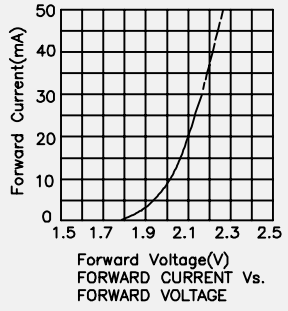


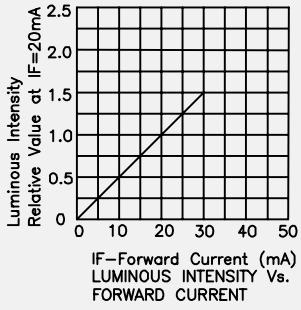


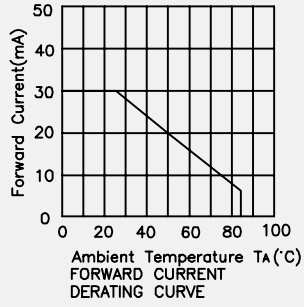


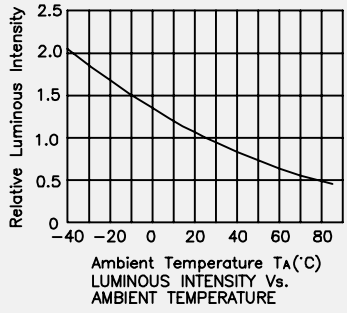


Mega Green — MGK : AlGaInP

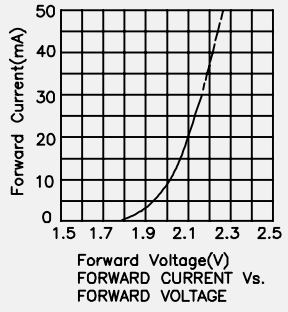


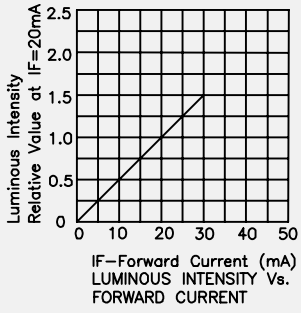


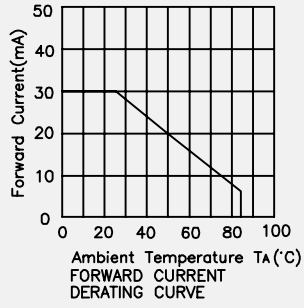


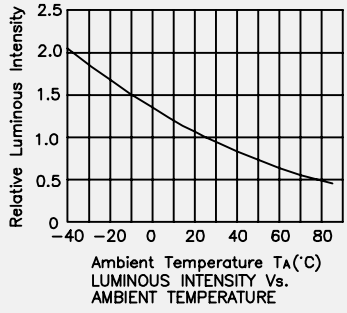


Mega Green — MG : AlGaInP

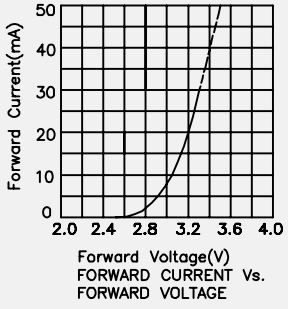


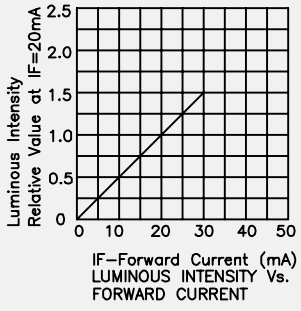


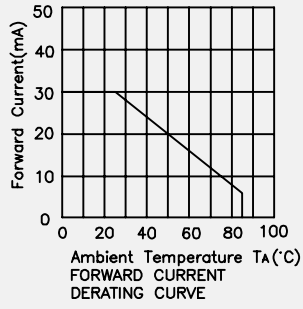


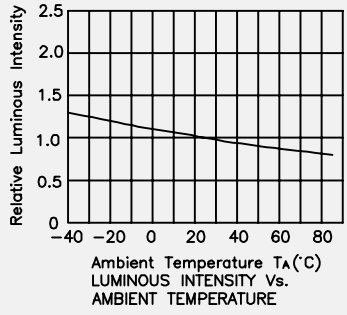


Green — VG/A : InGaN

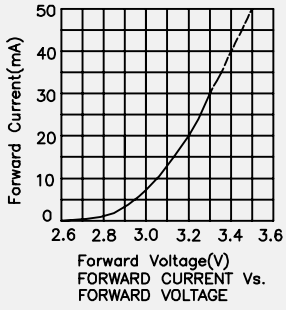


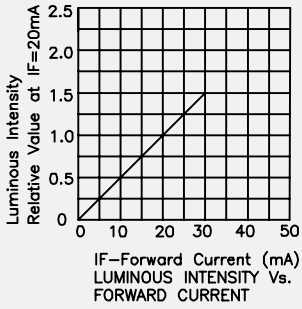


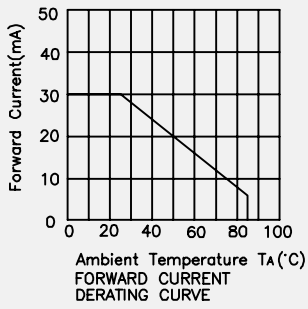


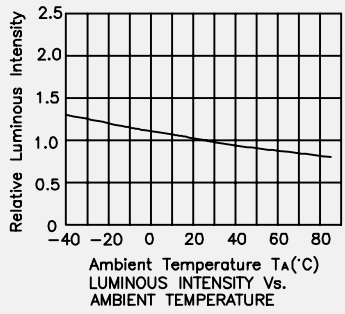


Green — VG/Z : InGaN

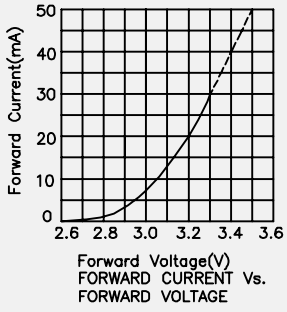


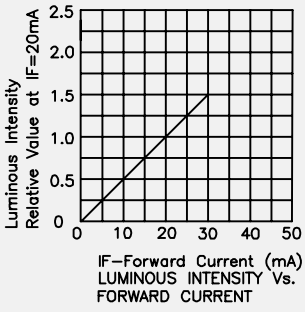


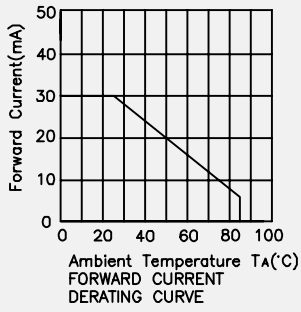


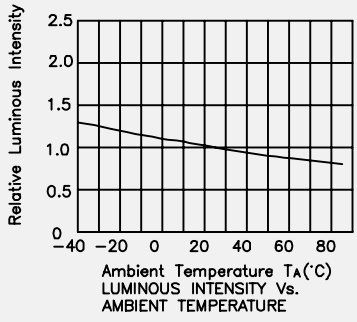


Green — TG/Z : InGaN

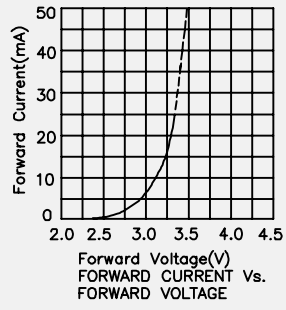


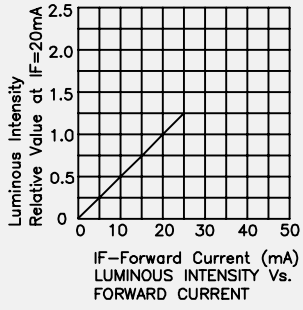


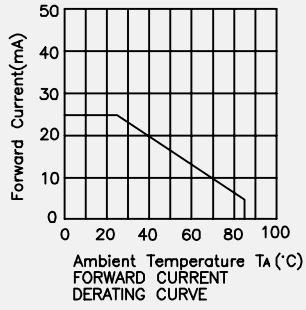


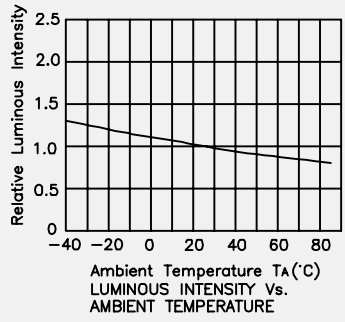


Green — ZG : InGaN

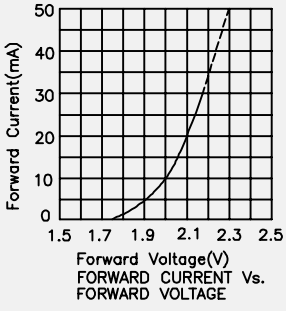


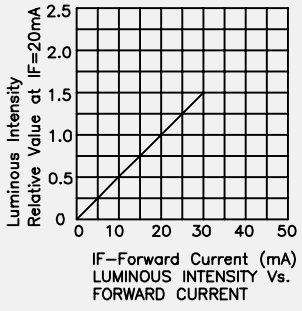


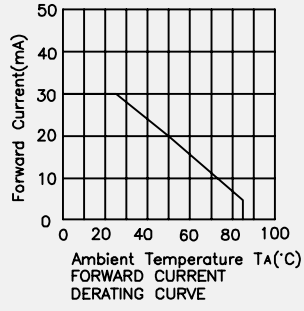


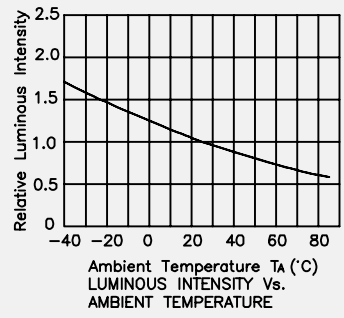


Yellow — Y : GaAsP/GaP

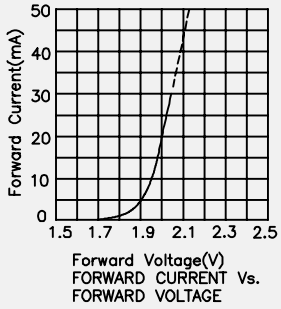


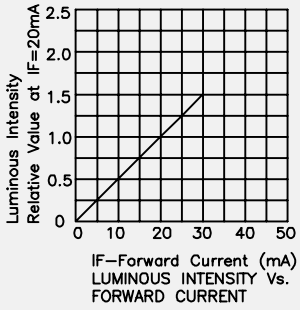


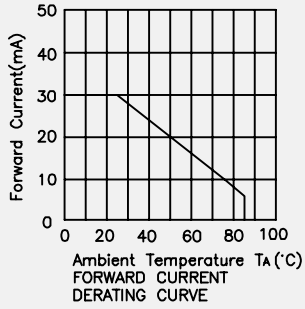


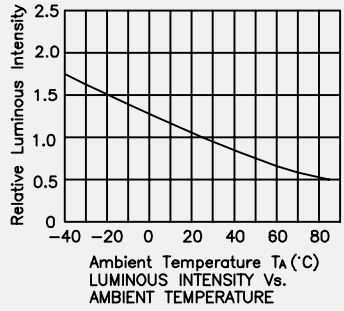


Super Bright Yellow — SYK : AlGaInP

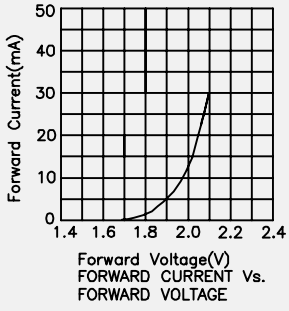


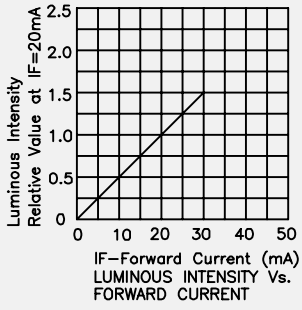


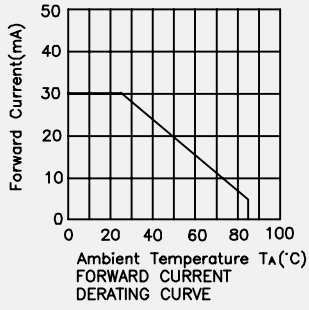


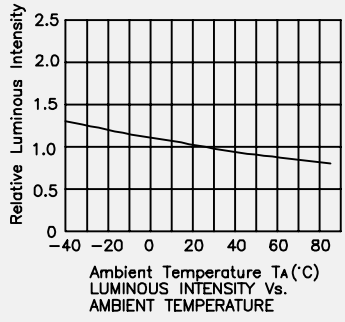


Super Bright Yellow — SYK/T : AlGaInP

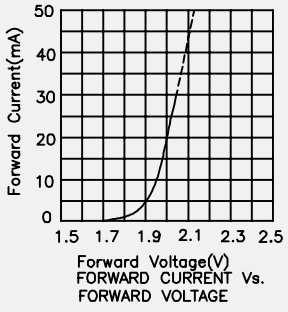


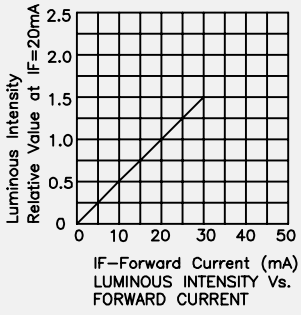


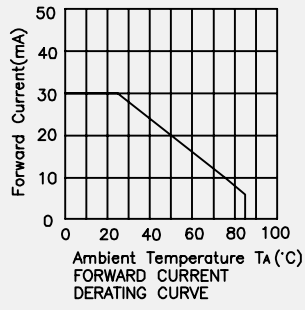


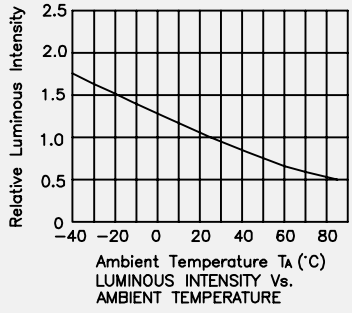


Super Bright Yellow — SY : AlGaInP

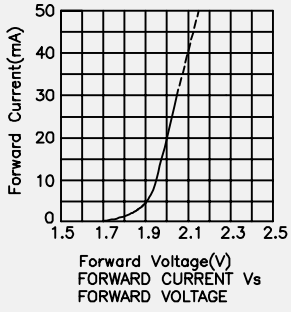


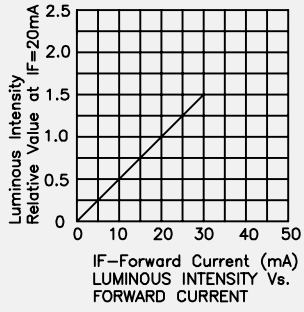


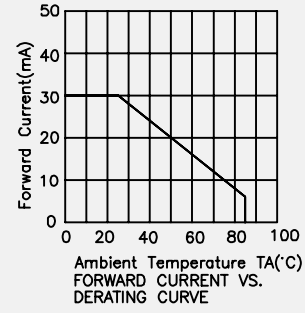


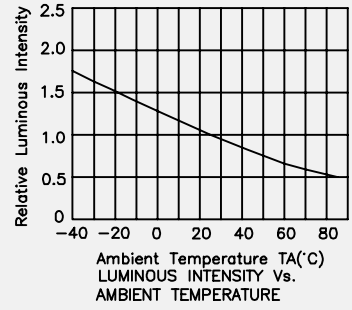


Super Bright Yellow — SY/J3 : AlGaInP

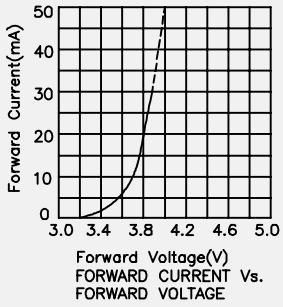


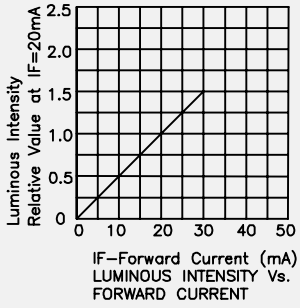


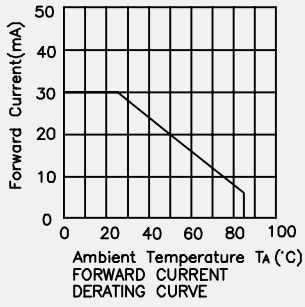


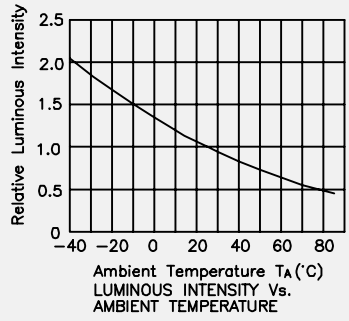


Blue — MB : GaN

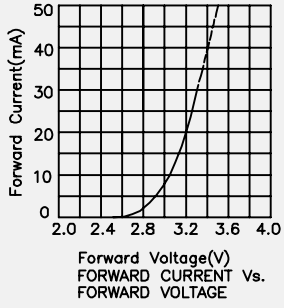


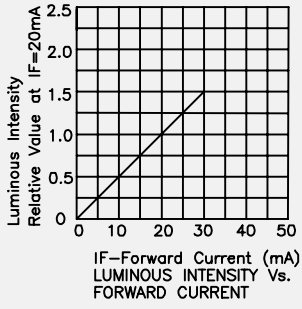


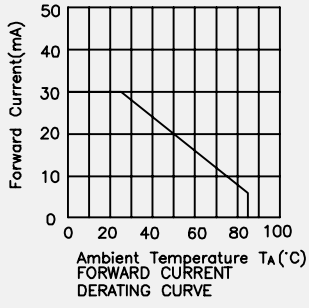


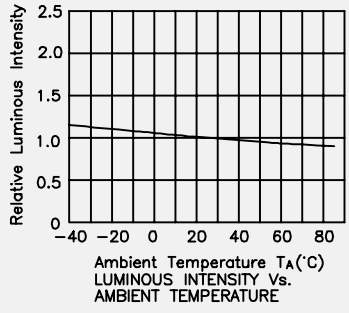


Blue — PB/A : InGaN

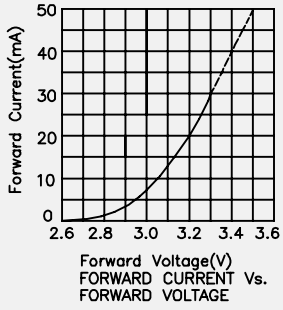


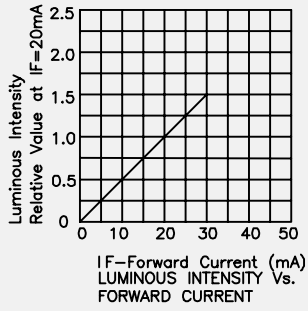


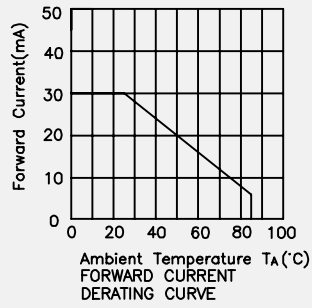


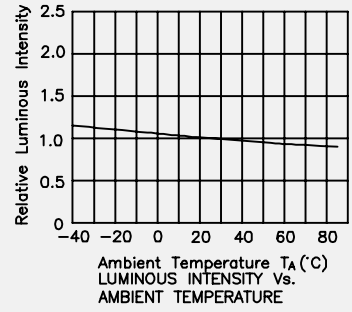


Blue — PB/G : InGaN

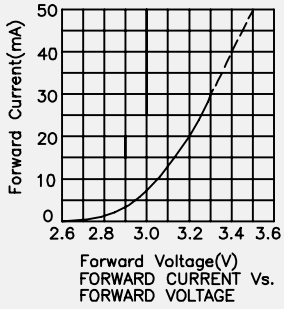


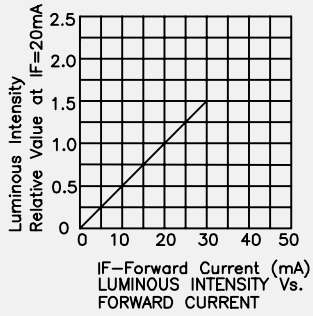


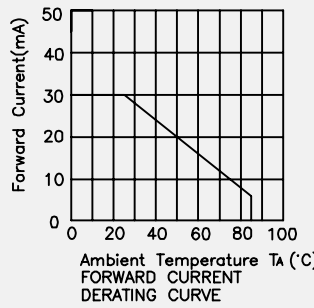


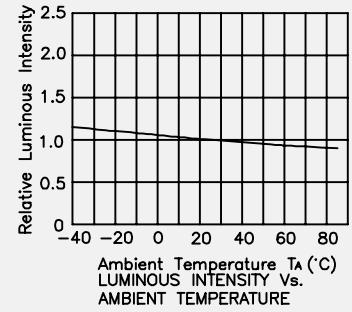


Blue — PB/Z : InGaN

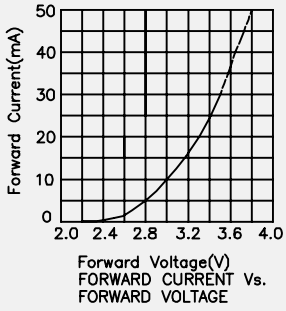


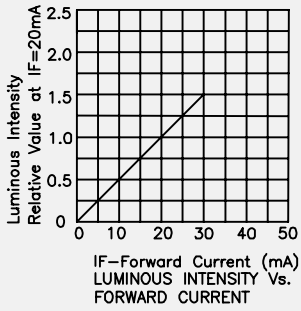


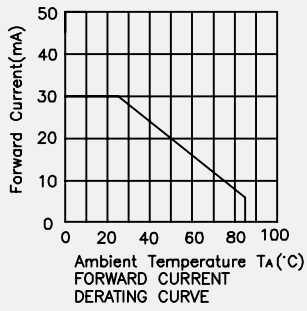


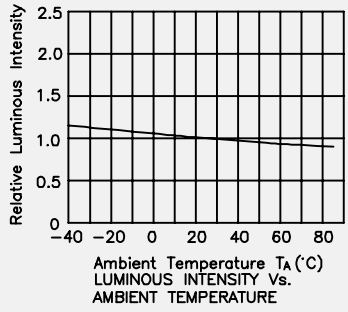


Blue — QB/D: AlGaInN

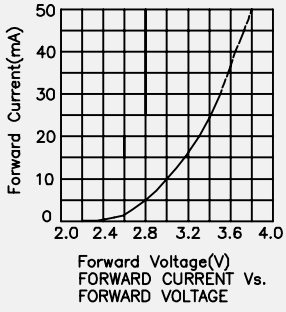


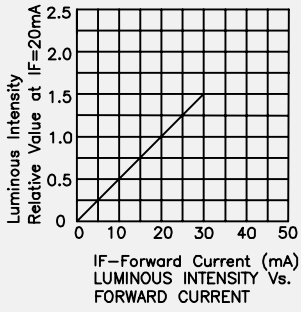


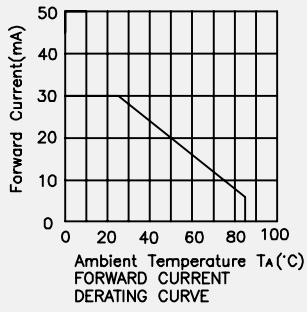


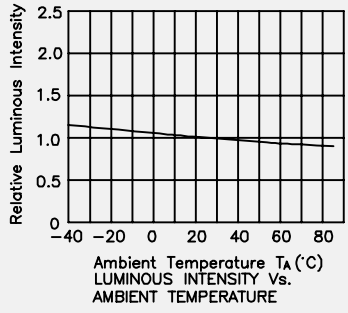


Blue — QB/F: AlGaInN









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	0.25	T	28	55
G	0.2	0.4	U	40	90
H	0.3	0.6	V	70	130
I	0.4	1	W	110	200
K	0.7	1.5	X	170	280
L	1	3	Y	230	350
M	1.8	5	Z	300	500
N	3	7	ZA	400	620
P	5	12	ZB	520	750
Q	8	17	ZC	650	1200
R	12	23	ZD	900	1800
S	18	35	ZE	1400	2400

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	60	160	P	12000	24000
D	120	280	Q	18000	36000
E	200	410	R	26000	60000
F	300	640	S	44000	101000
G	480	1040	T	75000	173000
H	800	1600	U	128000	293000
I	1200	2500	V	217000	498000
K	1900	4100	W	368000	846000
L	3000	6400	X	626000	1438000
M	4700	10500	Y	1063000	2445000
N	8000	16000	Z	1807000	4156000

SELECTION CODE FOR NPN PHOTOTRANSISTORS

(T_A=25°C)

Group	Photocurrent(mA)		Group	Photocurrent(mA)	
	min.	max.		min.	max.
F	0.1	0.25	L	1	3
G	0.2	0.4	M	1.8	5
H	0.3	0.6	N	3	7
I	0.4	1	P	5	12
K	0.7	1.5			

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	1.6	3.5	ZA	2800	3800
B	2.6	5.5	ZB	3300	4500
C	4	10	ZC	3800	5500
D	7	15	ZD	4700	6500
E	10	24	ZE	5700	7500
F	18	44	ZF	6700	8500
G	36	60	ZG	7500	10000
H	50	90	ZH	8000	12000
M	70	130	ZM	10000	16000
N	110	220	ZN	12000	20000
P	180	320	ZP	16000	24000
Q	280	420	ZQ	20000	32000
R	380	550	ZR	24000	40000
S	480	750	ZS	32000	50000
T	650	1100	ZT	40000	60000
U	900	1500	ZU	50000	80000
V	1200	1800	ZV	70000	150000
W	1500	2100	ZW	110000	220000
X	1800	2500	ZX	180000	360000
Y	2200	3000	ZY	280000	560000
Z	2500	3300	ZZ	420000	900000

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	0.5	2	D	7	15
AL	0.8	3.2	E	10	24
A	1.6	3.5	F	18	44
B	2.6	5.5	G	36	60
C	4	10	H	50	90

SELECTION CODE FOR LUMINOUS FLUX

(T_A=25°C;Tolerance: +/-15%)

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

COLOR CODE FOR GREEN LEDS + DISPLAYS

(T_A=25°C)

Group	Dom. Wavelength (nm)			
	TG		VG	
	min.	max.	min.	max.
1	495	503	513	522
2	499	506	518	527
3	502	508	523	532
4	504	510	528	537
5	506	512		
6	508	514		
7	510	517		

COLOR CODE FOR BLUE LEDS + DISPLAYS

(T_A=25°C)

Group	Dom. Wavelength (nm)		Group	Dom. Wavelength (nm)	
	min.	max.		min.	max.
1	443	452	3A	469	475
2	448	457	3B	471	477
3	453	462	4A	473	479
1A	458	465	4B	475	481
1B	461	468	5A	477	483
2A	464	471	5B	479	485
2B	467	473	5C	481	488

COLOR CODE FOR LEDS + DISPLAYS

(T_A=25°C, Tolerance: +/-1nm)

Group	Dom. Wavelength (nm)			
	Green		Yellow	
	min.	max.	min.	max.
0	556	559		
1	559	561	581	584
2	561	563	584	586
3	563	565	586	588
4	565	567	588	590
5	567	569	590	592
6	569	571	592	594
7	571	573	594	597
8	573	575	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 [1]	/	/	/	<=350°C	3s	/
DISPLAYS	* <=260°C	* 3s	* >2mm	<=350°C	3s	>2mm
PHOTOCOUPLER	<=260°C	3s	>2mm	<=310°C	3s	/
	/	/	/	<=260°C	10s	/

NOTE: 1. one time only

Soldering

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),and blue-green (525nm) 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 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.

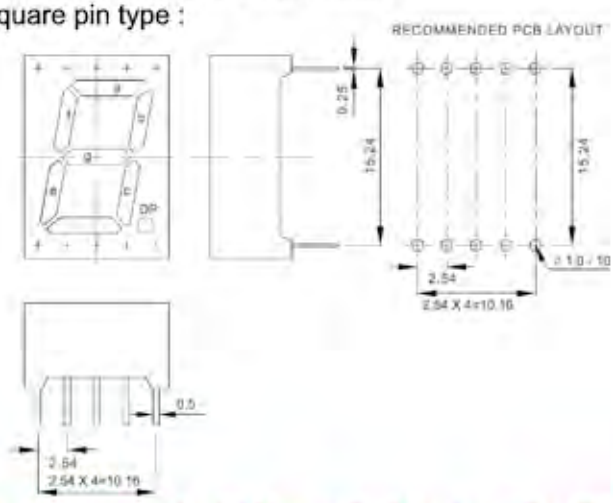
4. SMD products must be mounted according to specified soldering pad patterns. Refer to the product datasheet for details. Solder paste must be evenly applied to each soldering pad to insure proper bonding and positioning of the component.

5.After soldering, allow at least three minutes for the component to cool to room temperature before further operations.

Recommended PCB pin hole diameters for display products are list below :

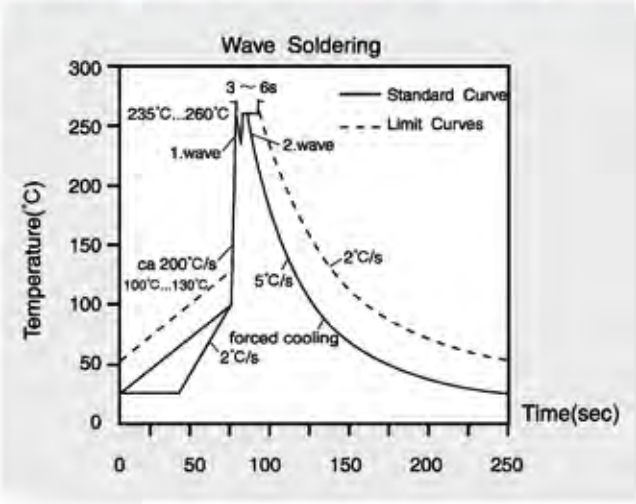
Round pin type : 2 x pin diameters

Square pin type :

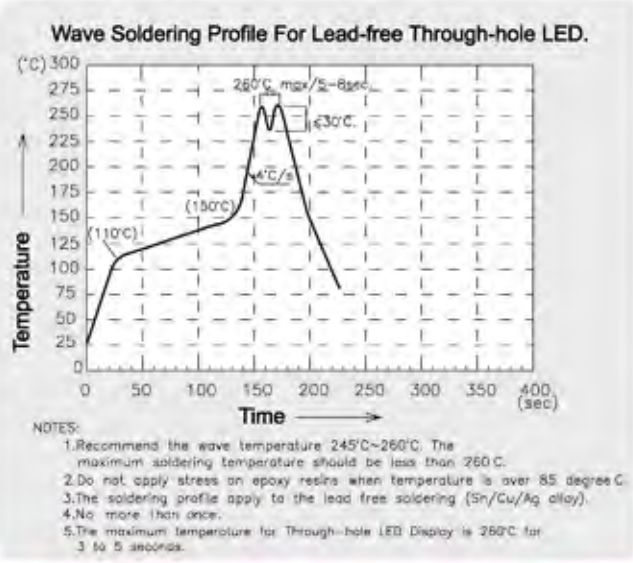


Recommended Wave Soldering Profiles For Kingbright Through-Hole Products

1. Wave Soldering Profile With Pb-Sn Solder



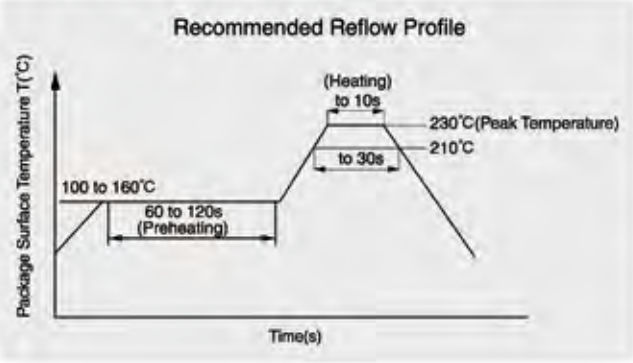
2. Lead-Free Wave Soldering Profile



Recommended Reflow Soldering Profiles For Kingbright SMD Products

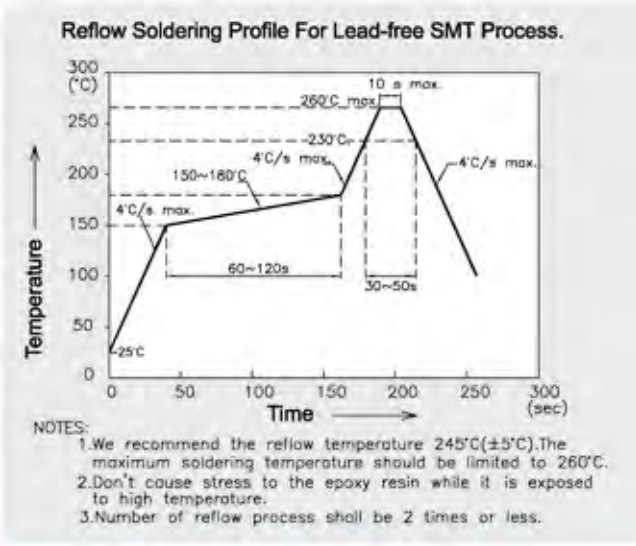
1. Reflow Soldering Profile With Pb-Sn Solder

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 the figure below for proper lead forming procedures. (Fig. 1)

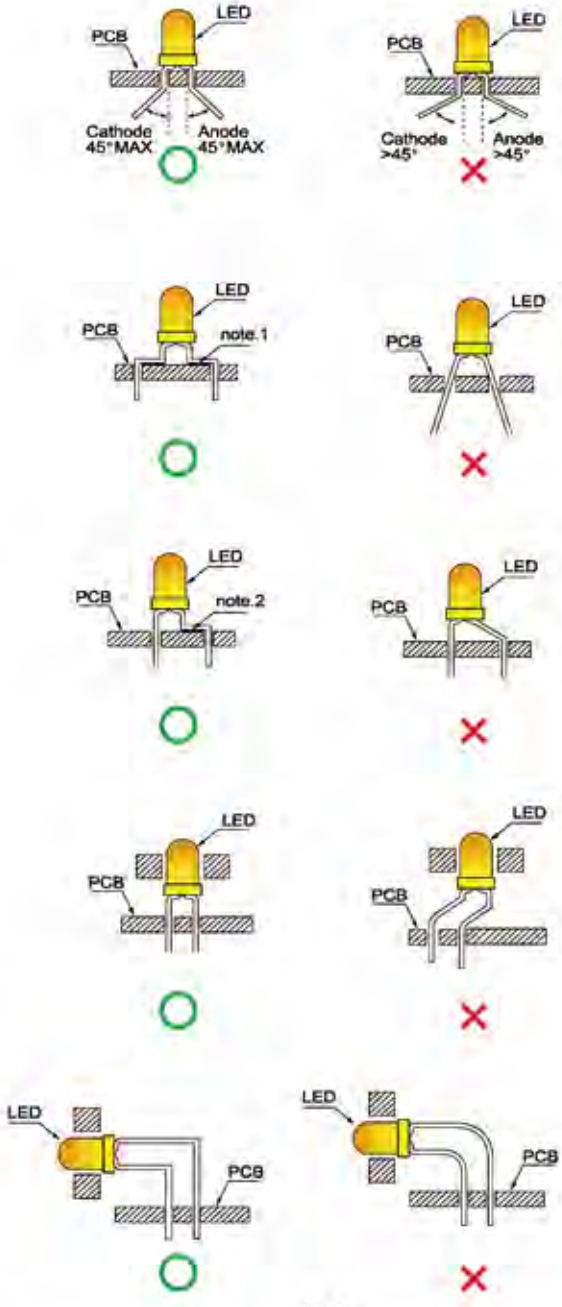


Fig. 1

"○" Correct mounting method
"×" 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.

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

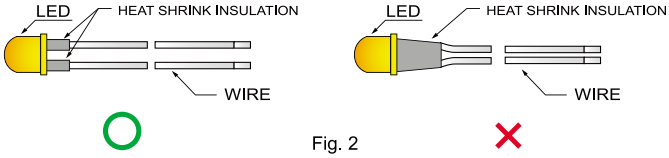


Fig. 2

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

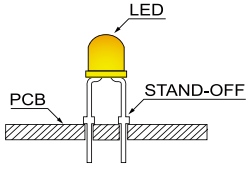


Fig. 3

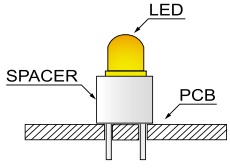


Fig. 4

Lead Forming Procedures

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

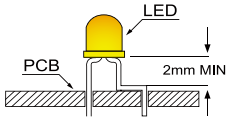


Fig. 5

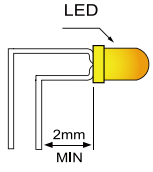


Fig. 6

2. Lead forming or bending must be performed before soldering, never during or after soldering.

3. Do not stress the LED lens during lead-forming in order to prevent fractures in the lens epoxy and damage the internal structures.

4. 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. 7)

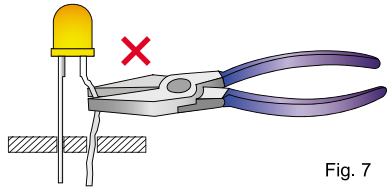


Fig. 7

5. Do not bend the leads more than twice. (Fig. 8)

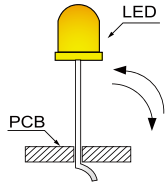


Fig. 8

6. After soldering or other high-temperature assembly, allow the LED to cool down to 50° C before applying outside force (Fig. 9). In general, avoid placing excess force on the LED to avoid damage. For any questions please consult with Kingbright representative for proper handling procedures.

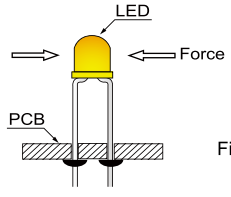


Fig. 9

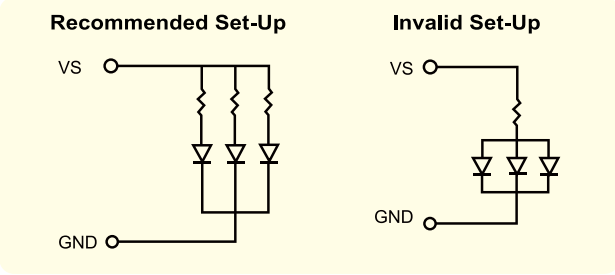
Cleaning

1. 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.
2. Isopropyl alcohol or deionized water are recommended solvents for cleaning.
3. Special attention should be taken if other chemicals are used for cleaning because other solvents may damage the epoxy in the lens or housing.
4. The cleaning process should take place at room temperature and the devices should not be washed for more than one minute.
5. When water is used in the cleaning process, immediately remove excess moisture from the LED via forced-air drying afterwards.

Miscellaneous Design Notes

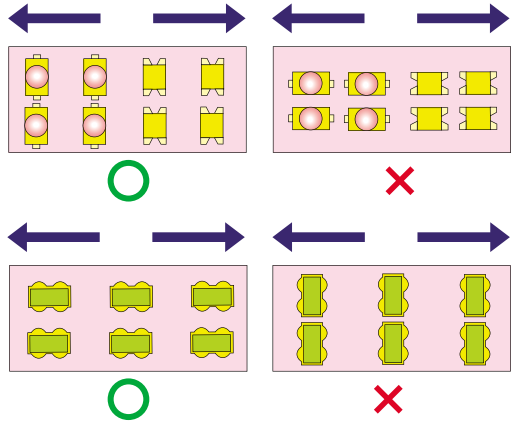
1. Protective current-limiting resistors may be necessary to operate the LEDs within the specified range.

2. LEDs mounted in parallel should each be placed in series with its own current-limiting resistor.

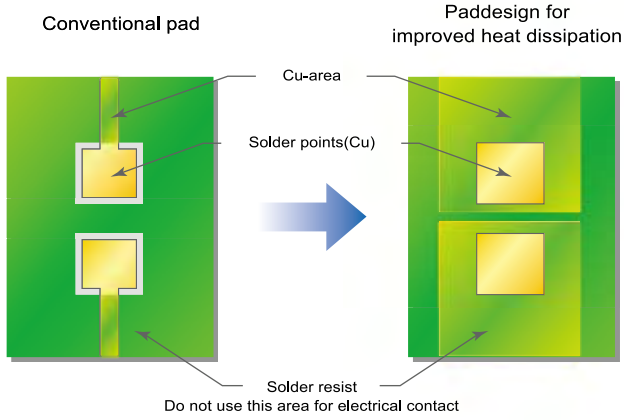


3. The driving circuit should be designed to avoid reverse voltages and transient voltage spikes when the circuit is powered up or shut down.

4. 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.



5. 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.

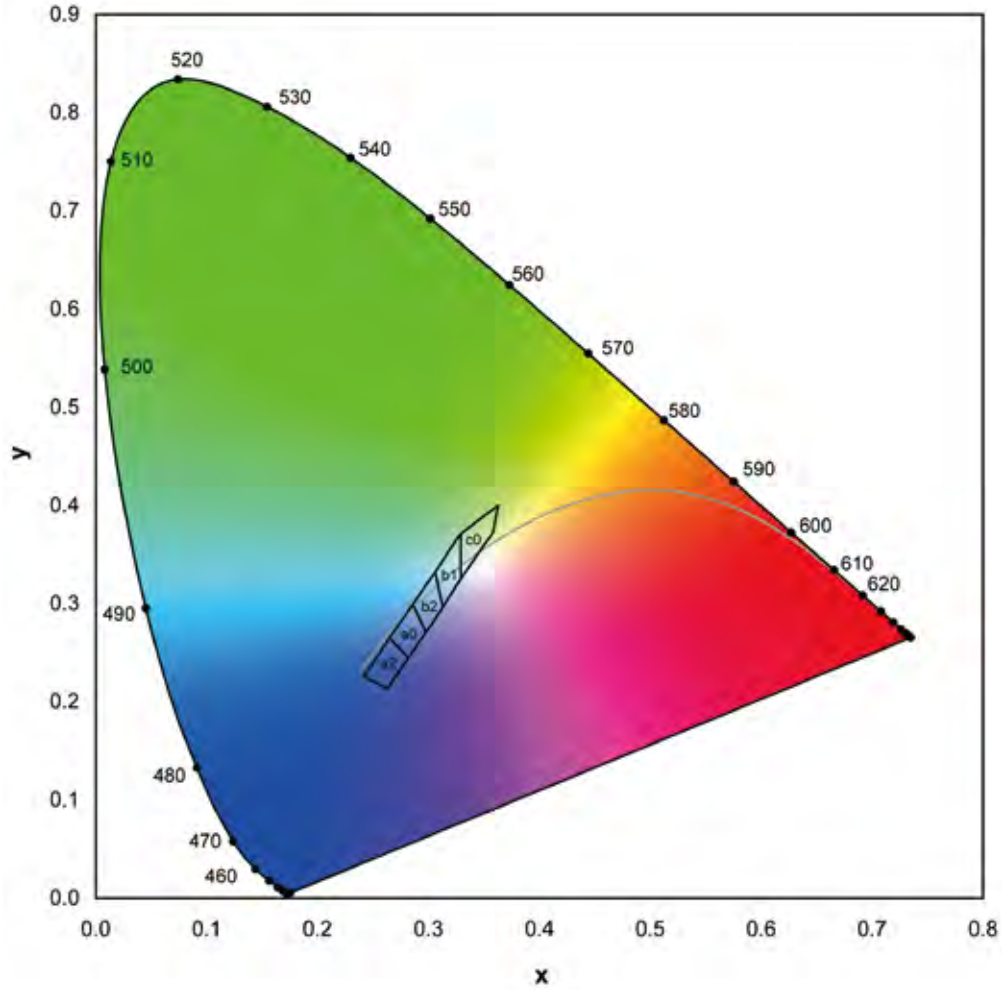


6. High temperatures can reduce device performance and reliability. Keep LED devices away from heat sources for best performance.

Restrictions on Product Use

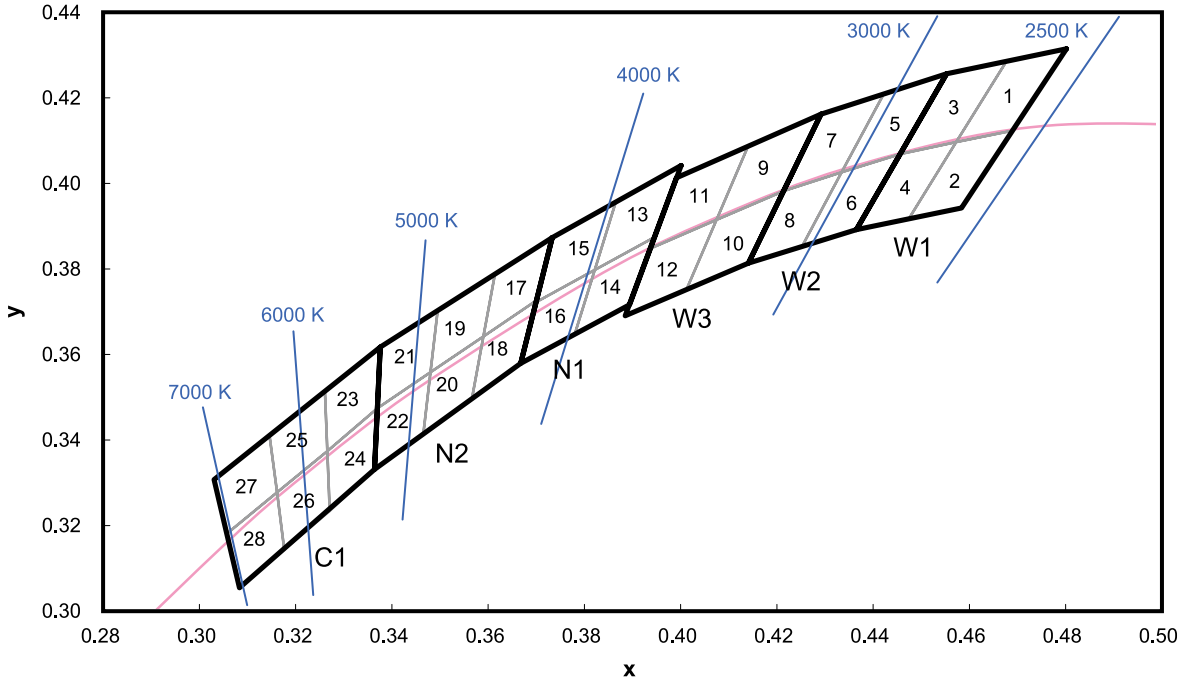
1. The information contained within this document is subject to change without notice. Before referencing this document, please confirm that it is the most current version available.
2. Not all devices and product families are available in every country.
3. The light output from UV, blue, white, and other high-power LEDs may cause injury to the human eye when viewed directly.
4. 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.
5. 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.

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~		
a0	0.282	0.245
	0.298	0.271
	0.286	0.299
	0.265	0.265
CCT: 9000~15000K		
b2	0.298	0.271
	0.313	0.296
	0.306	0.332
	0.286	0.299
CCT: 6800~9000K		
b1	0.313	0.296
	0.329	0.325
	0.329	0.371
	0.306	0.332
CCT: 5600~6800K		
c0	0.329	0.325
	0.358	0.372
	0.363	0.400
	0.329	0.371
CCT: 4600~5600K		

CCT2500 ~ 7000 K Bin Code



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
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		0.3361	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