

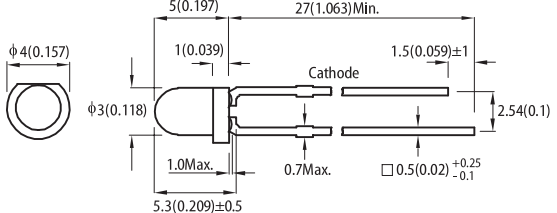
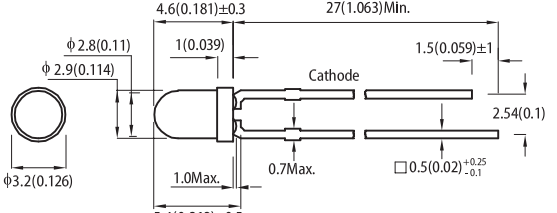
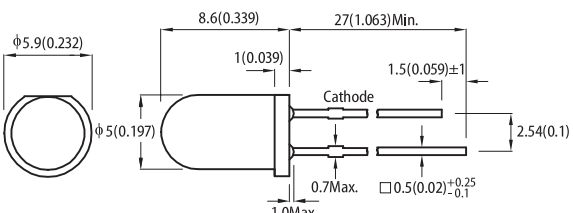
INFRARED EMITTING DIODE

Part Number	Material	λ_P (nm)	Lens Type	Po (mW/sr) @20mA *50mA		Viewing Angle	Dimensions
				Min.	Typ.		
KP-1608F3C	GaAs	940	water clear	0.8	2	150°	1.6mm x 0.8mm x 1.1mm (0603) KP-1608 F3 1 2 SF4 1 2 Units : mm(inch) Tolerance : ±0.1(0.004)
KP-1608SF4C	GaAlAs	880	water clear	0.8	1.5	150°	
KP-2012F3C	GaAs	940	water clear	0.8	2	160°	2.0mm x 1.25mm x 1.1mm (0805) KP-2012 F3 1 2 SF4 1 2 Units : mm(inch) Tolerance : ±0.1(0.004)
KP-2012SF4C	GaAlAs	880	water clear	0.8	1.5	160°	
KPA-3010F3C	GaAs	940	water clear	0.8	2	160°	3.0mm x 2.0mm x 1.0mm (1104 Right Angle) KPA-3010 1 2 Units : mm(inch) Tolerance : ±0.15(0.006)
KM2520F3C03	GaAs	940	water clear	3	8	20°	2mm Subminiature IR Emitter KM2520F3C03 1 2 Units : mm(inch) Tolerance : ±0.25(0.01)
				*8	*16		

NOTE:

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

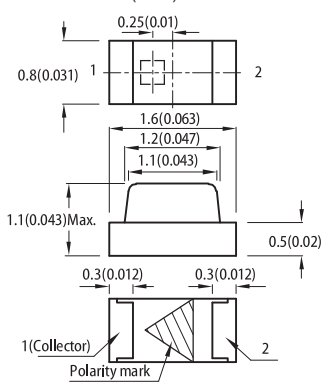
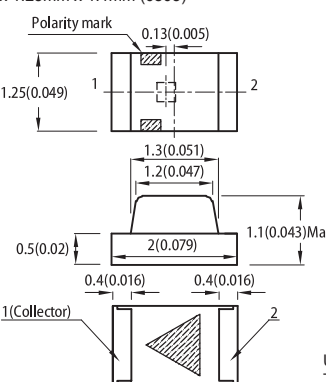
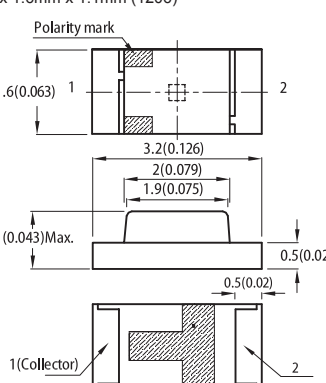
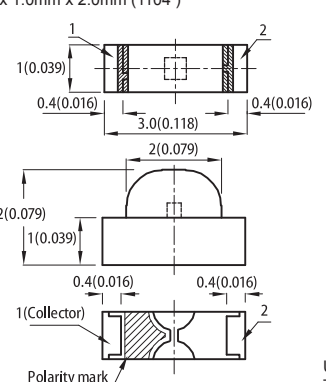
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Part Number	Material	λ_P (nm)	Lens Type	Po (mW/sr) @20mA *50mA		Viewing Angle 2 θ 1/2	Dimensions
				Min.	Typ.		
L-34F3C	GaAs	940	water clear	3	8	50°	T-1 (3mm) Round  
				*8	*15	50°	
L-34SF4C	GaAlAs	880	water clear	3	16	50°	Units : mm(inch) Tolerance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

NOTE:

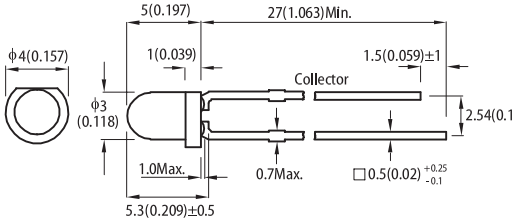
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PHOTOTRANSISTOR

Part Number		Lens Type		Dimensions																																																																									
KP-1608P1C		water clear		1.6mm x 0.8mm x 1.1mm (0603)  KP-1608																																																																									
KP-2012P3C		water clear																																																																											
KP-3216P3C		water clear																																																																											
KPA-3010P3C		water clear																																																																											
Electrical And Radiant Characteristics $T_A = 25^{\circ}C$ <table><tr><th>Parameter</th><th>Symbol</th><th>Part Number</th><th>Min.</th><th>Typ.</th><th>Max.</th><th>Unit</th><th>Test Condition</th></tr><tr><td>Collector-to-Emitter Breakdown Voltage</td><td>$V_{BR\ CEO}$</td><td>-</td><td>30</td><td>-</td><td>-</td><td>V</td><td>$I_C=100\mu A$ $E_e=0mW/cm^2$</td></tr><tr><td>Emitter-to-Collector Breakdown Voltage</td><td>$V_{BR\ ECO}$</td><td>-</td><td>5</td><td>-</td><td>-</td><td>V</td><td>$I_E=100\mu A$ $E_e=0mW/cm^2$</td></tr><tr><td>Collector-to-Emitter Saturation Voltage</td><td>$V_{CE\ (SAT)}$</td><td>-</td><td>-</td><td>-</td><td>0.8</td><td>V</td><td>$I_C=2mA$ $E_e=20mW/cm^2$</td></tr><tr><td>Collector Dark Current</td><td>I_{CEO}</td><td>-</td><td>-</td><td>-</td><td>100</td><td>nA</td><td>$V_{CE}=10V$ $E_e=0mW/cm^2$</td></tr><tr><td>Rise Time (10% to 90%)</td><td>T_R</td><td>-</td><td>-</td><td>15</td><td>-</td><td>μs</td><td rowspan="2">$V_{CE}=5V$ $I_C=1mA$ $R_L=1K\Omega$</td></tr><tr><td>Fall Time (90% to 10%)</td><td>T_F</td><td>-</td><td>-</td><td>15</td><td>-</td><td>μs</td></tr><tr><td rowspan="4">On State Collector Current</td><td rowspan="4">$I_{(ON)}$</td><td>KP-1608P1C</td><td>0.1</td><td>0.3</td><td rowspan="4">-</td><td rowspan="4">mA</td><td rowspan="4">$V_{CE}=5V$, $E_e=1mW/cm^2$ $\lambda=940nm$</td></tr><tr><td>KP-2012P3C</td><td>0.2</td><td>0.4</td></tr><tr><td>KP-3216P3C</td><td>0.2</td><td>0.4</td></tr><tr><td>KPA-3010P3C</td><td>0.2</td><td>0.4</td></tr></table>						Parameter	Symbol	Part Number	Min.	Typ.	Max.	Unit	Test Condition	Collector-to-Emitter Breakdown Voltage	$V_{BR\ CEO}$	-	30	-	-	V	$I_C=100\mu A$ $E_e=0mW/cm^2$	Emitter-to-Collector Breakdown Voltage	$V_{BR\ ECO}$	-	5	-	-	V	$I_E=100\mu A$ $E_e=0mW/cm^2$	Collector-to-Emitter Saturation Voltage	$V_{CE\ (SAT)}$	-	-	-	0.8	V	$I_C=2mA$ $E_e=20mW/cm^2$	Collector Dark Current	I_{CEO}	-	-	-	100	nA	$V_{CE}=10V$ $E_e=0mW/cm^2$	Rise Time (10% to 90%)	T_R	-	-	15	-	μs	$V_{CE}=5V$ $I_C=1mA$ $R_L=1K\Omega$	Fall Time (90% to 10%)	T_F	-	-	15	-	μs	On State Collector Current	$I_{(ON)}$	KP-1608P1C	0.1	0.3	-	mA	$V_{CE}=5V$, $E_e=1mW/cm^2$ $\lambda=940nm$	KP-2012P3C	0.2	0.4	KP-3216P3C	0.2	0.4	KPA-3010P3C	0.2	0.4
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PHOTOTRANSISTOR

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L-3DP3BT	blue transparent							T-1 (3mm) Phototransistor  L-3D																																																																		
L-7113P3C	water clear																																																																									
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T-1 3/4 (5mm) Phototransistor  L-7113	
 Units : mm(inch) Tolerance : ±0.25(0.01)	