

# Kingbright

## Optoelectronic Components



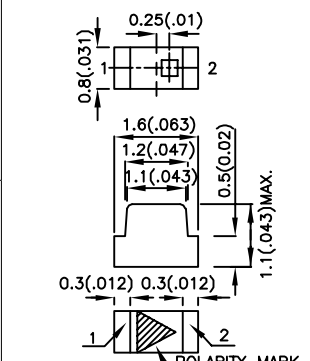
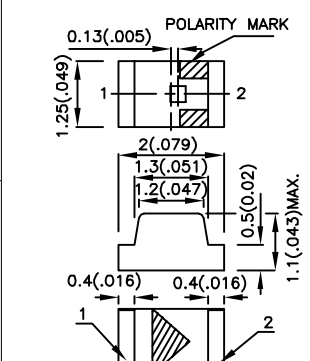
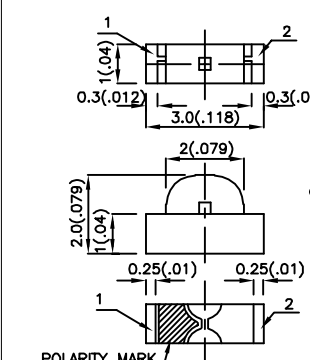
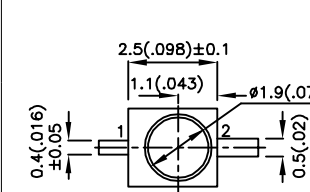
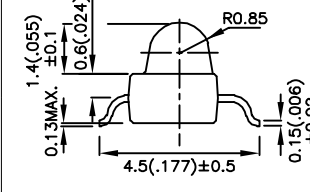
### **Infrared & Phototransistor** **88**

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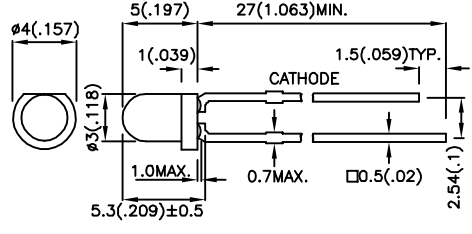

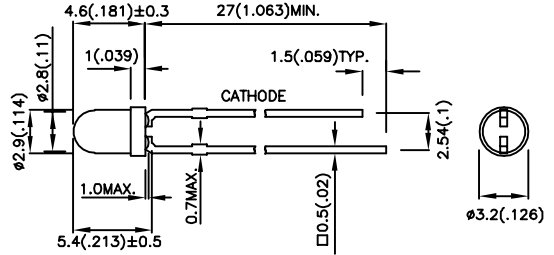


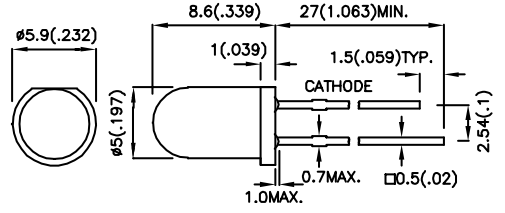
Infrared Emitting Diode 88

Phototransistor 90

## INFRARED EMITTING DIODE

| PART NUMBER  | MATERIAL | $\lambda_P$<br>(nm) | LENS TYPE   | Po (mW/sr)<br>@20mA *50mA |      | VIEWING<br>ANGLE | DIMENSION  |
|--------------|----------|---------------------|-------------|---------------------------|------|------------------|--|
|              |          |                     |             | MIN.                      | TYP. |                  |  |
| KP-1608F3C   | GaAs     | 940                 | water clear | 0.7                       | 3    | 120°             | 1.6mm x 0.8mm x 1.1mm (0603)<br><br>Units : mm(inch)<br>Tolerance : ±0.1(0.004)                |
| KP-1608SF4C  | GaAlAs   | 880                 | water clear | 0.4                       | 1.5  | 120°             |  |
| KP-2012F3C   | GaAs     | 940                 | water clear | 0.7                       | 3    | 120°             | 2.0mm x 1.25mm x 1.1mm (0805)<br><br>Units : mm(inch)<br>Tolerance : ±0.1(0.004)              |
| KP-2012SF4C  | GaAlAs   | 880                 | water clear | 0.4                       | 1.5  | 120°             |  |
| KPA-3010F3C  | GaAs     | 940                 | water clear | 0.7                       | 2    | 120°             | 3.0mm x 1.0mm x 2.0mm (1104 Right Angle)<br><br>Units : mm(inch)<br>Tolerance : ±0.15(0.006) |
| KM2520F3C03  | GaAs     | 940                 | water clear | 1.6                       | 8    | 20°              | 2mm Subminiature IR Emitter<br><br>Units : mm(inch)<br>Tolerance : ±0.25(0.01)               |
|              |          |                     |             | *10                       | *15  |                  |  |
| KM2520SF4C03 | GaAlAs   | 880                 | water clear | 1.6                       | 4    | 20°              | <br>Units : mm(inch)<br>Tolerance : ±0.25(0.01)  |
|              |          |                     |             | *2.6                      | *8   |                  |  |

INFRARED EMITTING DIODE

| PART NUMBER | MATERIAL | $\lambda_P$ (nm) | LENS TYPE        | Po (mW/sr)<br>@20mA *50mA |      | VIEWING<br>ANGLE<br>2 $\theta$ 1/2 | DIMENSION   |
|-------------|----------|------------------|------------------|---------------------------|------|------------------------------------|---|
|             |          |                  |                  | MIN.                      | TYP. |                                    |   |
| L-34F3C     | GaAs     | ● 940            | water clear      | 7                         | 40   | 50°                                | T-1 (3mm) Round<br><br>L-34F3C<br>           |
| L-34F3BT    | GaAs     | ● 940            | blue transparent | 4                         | 40   | 50°                                |   |
| L-34SF4C    | GaAlAs   | ● 880            | water clear      | 7                         | 40   | 50°                                |   |
| L-34SF4BT   | GaAlAs   | ● 880            | blue transparent | 4                         | 40   | 50°                                |   |
| L-34SF6C    | GaAlAs   | ● 860            | water clear      | 7                         | 15   | 50°                                |   |
| L-34SF6BT   | GaAlAs   | ● 860            | blue transparent | 7                         | 15   | 50°                                |   |
| L-34SF7C    | GaAlAs   | ● 850            | water clear      | 7                         | 18   | 50°                                |   |
| L-34SF7BT   | GaAlAs   | ● 850            | blue transparent | 7                         | 18   | 50°                                |   |
|             |          |                  |                  | *18                       | *45  | 50°                                |   |
|             |          |                  |                  | *10                       | *45  | 50°                                |   |
|             |          |                  |                  |                           |      |                                    | Units : mm(inch)<br>Tolerance : ±0.25(0.01)   |
| L-7104F3C   | GaAs     | ● 940            | water clear      | 7                         | 30   | 34°                                | T-1 (3mm) Round<br><br>L-7104F3C<br>       |
|             |          |                  |                  | *18                       | *80  | 34°                                |   |
| L-7104F3BT  | GaAs     | ● 940            | blue transparent | 7                         | 28   | 34°                                | <br>Units : mm(inch)<br>Tolerance : ±0.25(0.01)  |
|             |          |                  |                  | *18                       | *70  | 34°                                |   |
| L-7113F3C   | GaAs     | ● 940            | water clear      | 7                         | 30   | 20°                                | T-1 3/4 (5mm) Round<br><br>L-7113F3C<br> |
| L-7113F3BT  | GaAs     | ● 940            | blue transparent | 4                         | 20   | 20°                                |   |
| L-7113SF4C  | GaAlAs   | ● 880            | water clear      | 7                         | 20   | 20°                                |   |
| L-7113SF4BT | GaAlAs   | ● 880            | blue transparent | 4                         | 20   | 20°                                |   |
| L-7113SF6C  | GaAlAs   | ● 860            | water clear      | 10                        | 40   | 20°                                |   |
| L-7113SF6BT | GaAlAs   | ● 860            | blue transparent | 10                        | 40   | 20°                                |   |
| L-7113SF7C  | GaAlAs   | ● 850            | water clear      | 10                        | 40   | 20°                                |   |
| L-7113SF7BT | GaAlAs   | ● 850            | blue transparent | 10                        | 40   | 20°                                |   |
|             |          |                  |                  | *50                       | *100 | 20°                                |   |
|             |          |                  |                  | *50                       | *100 | 20°                                |   |
|             |          |                  |                  |                           |      |                                    | Units : mm(inch)<br>Tolerance : ±0.25(0.01)   |

## PHOTOTRANSISTOR

| PART NUMBER | LENS TYPE   | DIMENSION                     |
|-------------|-------------|-------------------------------|
| KP-1608P1C  | WATER CLEAR | 1.6mm x 0.8mm x 1.1mm (0603)  |
| KP-2012P3C  | WATER CLEAR | 2.0mm x 1.25mm x 1.1mm (0805) |
| KP-3216P3C  | WATER CLEAR | 3.2mm x 1.6mm x 1.1mm (1206)  |
| KPA-3010P3C | WATER CLEAR | 3.0mm x 1.0mm x 2.0mm (1104)  |

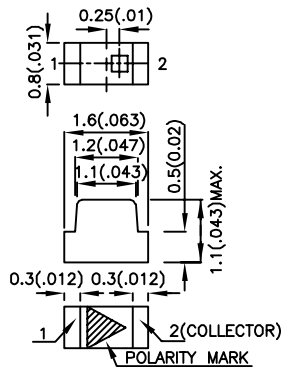
### ELECTRICAL AND RADIANT CHARACTERISTICS $T_A = 25^\circ\text{C}$

| PARAMETER                               | SYMBOL          | PART NUMBER | MIN. | TYP. | MAX. | UNIT          | TEST CONDITION  |
|---|-----------------|-------------|------|------|------|---------------|---|
| Collector-to-Emitter Breakdown Voltage  | $V_{BR\ CE0}$   | -           | 30   | -    | -    | V             | $I_C = 100\mu\text{A}$<br>$E_e = 0\text{mW/cm}^2$                           |
| Emitter-to-Collector Breakdown Voltage  | $V_{BR\ ECO}$   | -           | 5    | -    | -    | V             | $I_E = 100\mu\text{A}$<br>$E_e = 0\text{mW/cm}^2$                           |
| Collector-to-Emitter Saturation Voltage | $V_{CE\ (SAT)}$ | -           | -    | -    | 0.8  | V             | $I_C = 2\text{mA}$<br>$E_e = 20\text{mW/cm}^2$                              |
| Collector Dark Current                  | $I_{CEO}$       | -           | -    | -    | 100  | nA            | $V_{CE} = 10\text{V}$<br>$E_e = 0\text{mW/cm}^2$                            |
| Rise Time (10% to 90%)                  | $T_R$           | -           | -    | 15   | -    | $\mu\text{s}$ | $V_{CE} = 5\text{V}$<br>$I_C = 1\text{mA}$<br>$R_L = 1\text{K}\Omega$       |
| Fall Time (90% to 10%)                  | $T_F$           | -           | -    | 15   | -    | $\mu\text{s}$ |   |
| On State Collector Current              | $I_{(ON)}$      | KP-1608P1C  | 0.1  | 0.3  | -    | mA            | $V_{CE} = 5\text{V}$<br>$E_e = 1\text{mW/cm}^2$<br>$\lambda = 940\text{nm}$ |
|   |                 | KP-2012P3C  | 0.1  | 0.3  |      |               |   |
|   |                 | KP-3216P3C  | 0.1  | 0.3  |      |               |   |
|   |                 | KPA-3010P3C | 0.1  | 0.3  |      |               |   |

### ABSOLUTE MAXIMUM RATING $T_A = 25^\circ\text{C}$

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

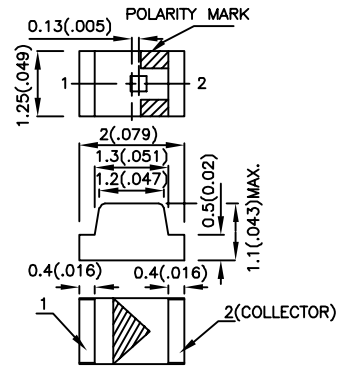
1.6mm x 0.8mm x 1.1mm (0603)



KP-1608P1C

Units : mm(inch)  
Tolerance :  $\pm 0.1(0.004)$

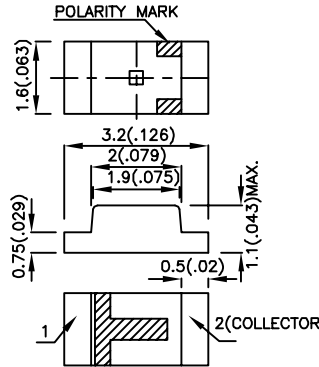
2.0mm x 1.25mm x 1.1mm (0805)



KP-2012P3C

Units : mm(inch)  
Tolerance :  $\pm 0.1(0.004)$

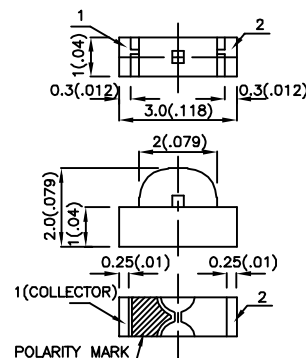
3.2mm x 1.6mm x 1.1mm (1206)



KP-3216P3C

Units : mm(inch)  
Tolerance :  $\pm 0.1(0.004)$


3.0mm x 1.0mm x 2.0mm (1104)



KPA-3010P3C

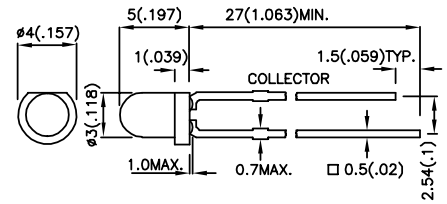
Units : mm(inch)  
Tolerance :  $\pm 0.15(0.006)$

PHOTOTRANSISTOR

| PART NUMBER | LENS TYPE        | DIMENSION  |
|-------------|------------------|--|
| L-3DP3BT    | BLUE TRANSPARENT | T-1 (3mm) PHOTOTRANSISTOR<br><br>L-3DP3BT |
| L-7113P3C   | WATER CLEAR      |  |

ELECTRICAL AND RADIANT CHARACTERISTICS  $T_A = 25^\circ\text{C}$

| PARAMETER                               | SYMBOL        | PART NUMBER | MIN. | TYP. | MAX. | UNIT          | TEST CONDITION   |
|---|---------------|-------------|------|------|------|---------------|--|
| Collector-to-Emitter Breakdown Voltage  | $V_{BR\ CE0}$ | -           | 30   | -    | -    | V             | $I_C=100\mu\text{A}$<br>$E_e=0\text{mW}/\text{cm}^2$                           |
| Emitter-to-Collector Breakdown Voltage  | $V_{BR\ ECO}$ | -           | 5    | -    | -    | V             | $I_E=100\mu\text{A}$<br>$E_e=0\text{mW}/\text{cm}^2$                           |
| Collector-to-Emitter Saturation Voltage | $V_{CE(SAT)}$ | -           | -    | -    | 0.8  | V             | $I_C=2\text{mA}$<br>$E_e=20\text{mW}/\text{cm}^2$                              |
| Collector Dark Current                  | $I_{CEO}$     | -           | -    | -    | 100  | nA            | $V_{CE}=10\text{V}$<br>$E_e=0\text{mW}/\text{cm}^2$                            |
| Rise Time (10% to 90%)                  | $T_R$         | -           | -    | 15   | -    | $\mu\text{s}$ | $V_{CE}=5\text{V}$<br>$I_C=1\text{mA}$<br>$R_L=1\text{K}\Omega$                |
| Fall Time (90% to 10%)                  | $T_F$         | -           | -    | 15   | -    | $\mu\text{s}$ |  |
| On State Collector Current              | $I_{(ON)}$    | L-3DP3BT    | 0.2  | 0.5  | -    | mA            | $V_{CE}=5\text{V}$ ,<br>$E_e=1\text{mW}/\text{cm}^2$<br>$\lambda=940\text{nm}$ |
|   |               | L-7113P3C   | 0.1  | 0.5  | -    |               |  |



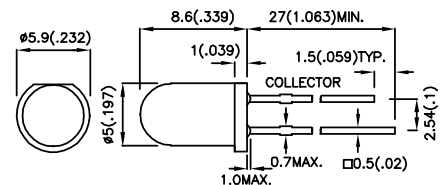
Units : mm(inch)  
Tolerance :  $\pm 0.25(0.01)$

T-1 3/4 (5mm) PHOTOTRANSISTOR



ABSOLUTE MAXIMUM RATING  $T_A = 25^\circ\text{C}$

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



Units : mm(inch)  
Tolerance :  $\pm 0.25(0.01)$