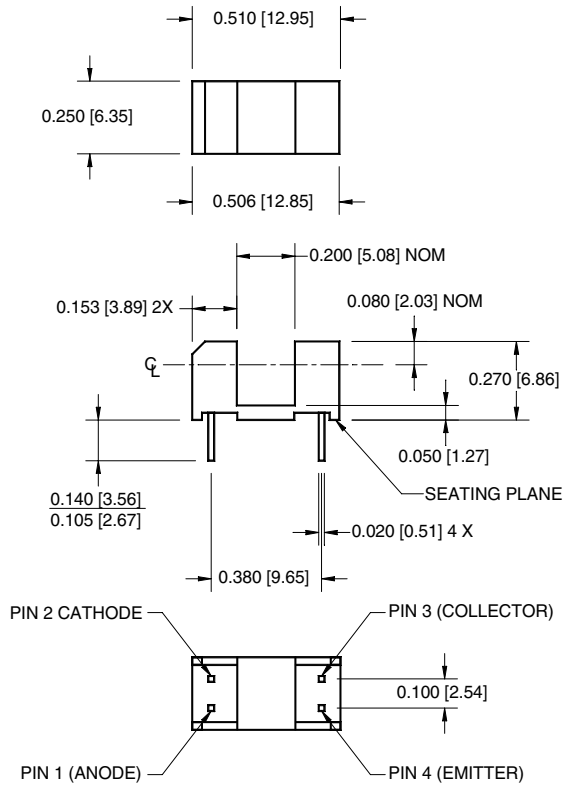


# MOC70P1 / MOC70P2 / MOC70P3

## PHOTOTRANSISTOR OPTICAL INTERRUPTER SWITCH

### PACKAGE DIMENSIONS

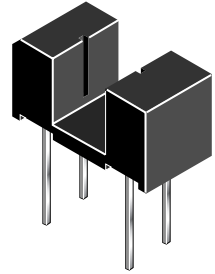


**NOTES:**

- Dimensions for all drawings are in inches (millimeters).
- Tolerance of  $\pm .010$  (.25) on all non-nominal dimensions unless otherwise specified.

### DESCRIPTION

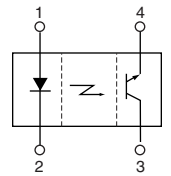
The MOC70PX consists of an infrared light emitting diode coupled to an NPN silicon phototransistor packaged into an injection molded housing. The housing is designed for wide gap, non contact sensing.



### FEATURES

- No contact sensing
- 5 mm gap
- .040" aperture
- Low profile
- PCB mount
- Transistor output

### SCHEMATIC



### NOTES

- Derate power dissipation linearly, on each component, 1.67 mW/°C above 25°C.
- RMA flux is recommended.
- Methanol or isopropyl alcohols are recommended as cleaning agents.
- Soldering iron tip 1/16" (1.6mm) from housing.
- As long as leads are not under any stress or spring tension.

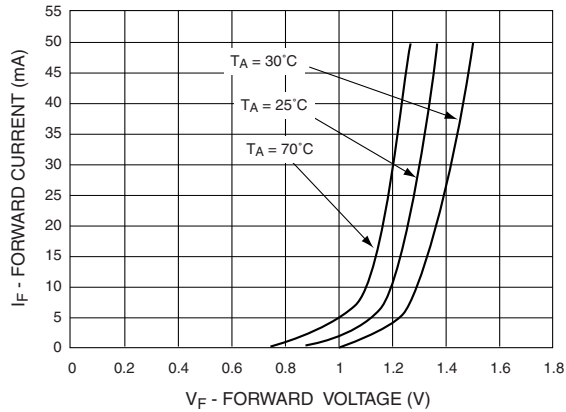
### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise specified)

| Parameter   | Symbol             | Rating         | Units |
|---|--------------------|----------------|-------|
| Operating Temperature                             | T <sub>OPR</sub>   | -55 to +100    | °C    |
| Storage Temperature                               | T <sub>STG</sub>   | -55 to +100    | °C    |
| Soldering Temperature (Iron) <sup>(2,3,4,5)</sup> | T <sub>SOL-I</sub> | 240 for 5 sec  | °C    |
| Soldering Temperature (Flow) <sup>(2,3,5)</sup>   | T <sub>SOL-F</sub> | 260 for 10 sec | °C    |
| <b>EMITTER</b>                                    |                    |                |       |
| Continuous Forward Current                        | I <sub>F</sub>     | 50             | mA    |
| Reverse Voltage                                   | V <sub>R</sub>     | 6              | V     |
| Power Dissipation <sup>(1)</sup>                  | P <sub>D</sub>     | 100            | mW    |
| <b>SENSOR</b>                                     |                    |                |       |
| Collector-Emitter Voltage                         | V <sub>CEO</sub>   | 30             | V     |
| Emitter-Collector Voltage                         | V <sub>ECO</sub>   | 4.5            | V     |
| Collector Current                                 | I <sub>C</sub>     | 20             | mA    |
| Power Dissipation <sup>(1)</sup>                  | P <sub>D</sub>     | 150            | mW    |

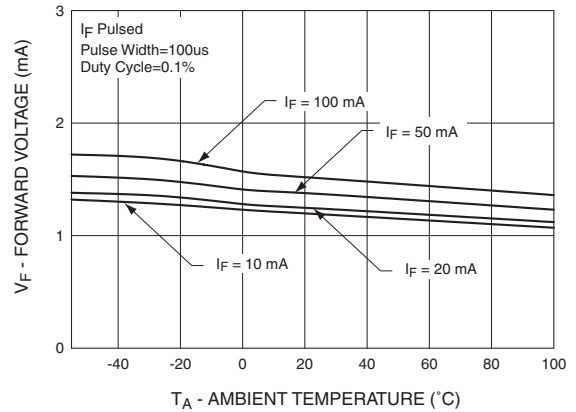
| <b>ELECTRICAL / OPTICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ ) |   |               |     |     |     |               |
|--|---|---------------|-----|-----|-----|---------------|
| PARAMETER  | TEST CONDITIONS   | SYMBOL        | MIN | TYP | MAX | UNITS         |
| <b>EMITTER</b>   |   |               |     |     |     |               |
| Forward Voltage  | $I_F = 50\text{ mA}$  | $V_F$         | —   | —   | 1.8 | V             |
| Reverse Leakage Current  | $V_R = 6\text{ V}$  | $I_R$         | —   | —   | 100 | $\mu\text{A}$ |
| <b>SENSOR</b>  |   |               |     |     |     |               |
| Collector-Emitter Breakdown Voltage                                      | $I_C = 10\text{ mA}$  | $BV_{CEO}$    | 30  | —   | —   | V             |
| Emitter-Collector Breakdown Voltage                                      | $I_E = 100\text{ }\mu\text{A}$                                      | $BV_{ECO}$    | 4   | —   | —   | V             |
| Collector-Emitter Leakage  | $V_{CE} = 10\text{ V}, I_F = 0$                                     | $I_{CEO}$     | —   | —   | 100 | nA            |
| <b>COUPLED</b>   |   |               |     |     |     |               |
| Collector Current (See selection guide below)                            |   | $I_{C(ON)}$   |     |     |     |               |
| Collector Emitter  |   | $V_{CE(SAT)}$ |     |     |     |               |
| Saturation Voltage ( See selection guide below)                          |   |               |     |     |     |               |
| Turn-on Time   | $I_F = 30\text{ mA}, V_{CC} = 5\text{ V}, R_L = 2.5\text{ k}\Omega$ | $t_{(ON)}$    | —   | 20  | —   | $\mu\text{s}$ |
| Turn-off Time  | $I_F = 30\text{ mA}, V_{CC} = 5\text{ V}, R_L = 2.5\text{ k}\Omega$ | $t_{(OFF)}$   | —   | 80  | —   | $\mu\text{s}$ |

| <b>MOC70PX OPTICAL SWITCH SELECTION GUIDE</b> |  |               |      |     |      |       |
|---|--|---------------|------|-----|------|-------|
| PARAMETER                                     | TEST CONDITIONS                            | SYMBOL        | MIN  | TYP | MAX  | UNITS |
| <b>ON-STATE COLLECTOR CURRENT</b>             |  |               |      |     |      |       |
| MOC70P1                                       | $I_F = 5\text{ mA}, V_{CE} = 10\text{ V}$  | $I_{C(ON)}$   | 0.15 | —   | —    | mA    |
| MOC70P2                                       | $I_F = 5\text{ mA}, V_{CE} = 10\text{ V}$  | $I_{C(ON)}$   | 0.30 | —   | —    | mA    |
| MOC70P3                                       | $I_F = 5\text{ mA}, V_{CE} = 10\text{ V}$  | $I_{C(ON)}$   | 0.60 | —   | —    | mA    |
| MOC70P1                                       | $I_F = 20\text{ mA}, V_{CE} = 10\text{ V}$ | $I_{C(ON)}$   | 1.0  | —   | —    | mA    |
| MOC70P2                                       | $I_F = 20\text{ mA}, V_{CE} = 10\text{ V}$ | $I_{C(ON)}$   | 2.0  | —   | —    | mA    |
| MOC70P3                                       | $I_F = 20\text{ mA}, V_{CE} = 10\text{ V}$ | $I_{C(ON)}$   | 4.0  | —   | —    | mA    |
| MOC70P1                                       | $I_F = 30\text{ mA}, V_{CE} = 10\text{ V}$ | $I_{C(ON)}$   | 1.9  | —   | —    | mA    |
| MOC70P2                                       | $I_F = 30\text{ mA}, V_{CE} = 10\text{ V}$ | $I_{C(ON)}$   | 3.0  | —   | —    | mA    |
| MOC70P3                                       | $I_F = 30\text{ mA}, V_{CE} = 10\text{ V}$ | $I_{C(ON)}$   | 5.5  | —   | —    | mA    |
| <b>COLLECTOR-EMITTER SATURATION VOLTAGE</b>   |  |               |      |     |      |       |
| MOC70P1                                       | $I_F = 1.8\text{ mA}, I_F = 30\text{ mA}$  | $V_{CE(SAT)}$ | —    | —   | 0.40 | V     |
| MOC70P2                                       | $I_F = 1.8\text{ mA}, I_F = 20\text{ mA}$  | $V_{CE(SAT)}$ | —    | —   | 0.40 | V     |
| MOC70P3                                       | $I_F = 1.8\text{ mA}, I_F = 20\text{ mA}$  | $V_{CE(SAT)}$ | —    | —   | 0.40 | V     |

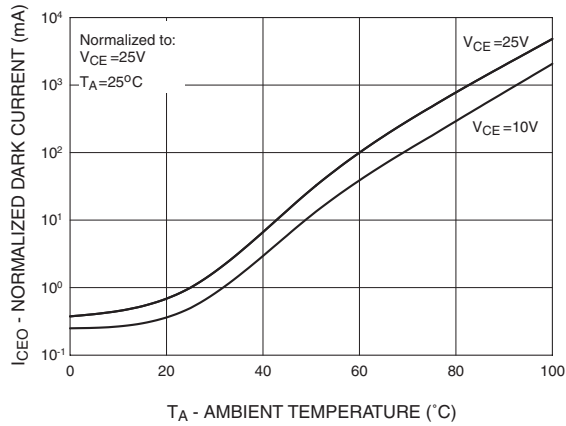
**Fig. 1 Forward Current vs. Forward Voltage**



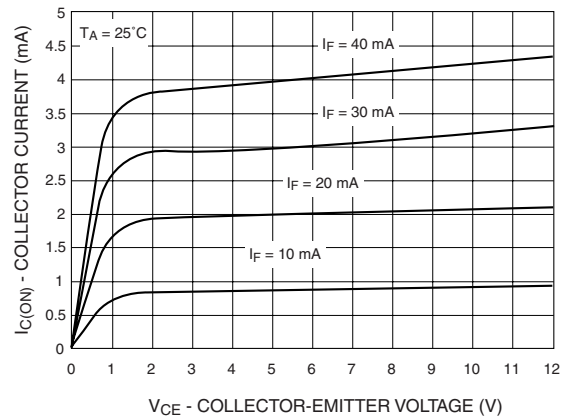
**Fig. 2 Forward Voltage vs. Ambient Temperature**

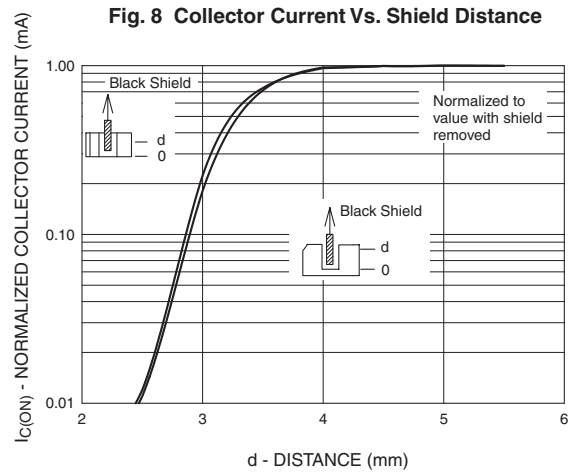
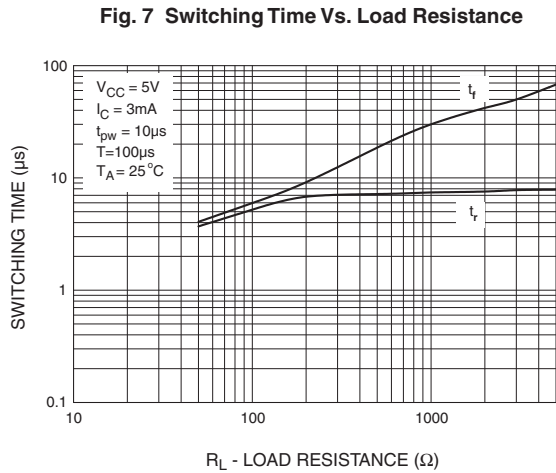
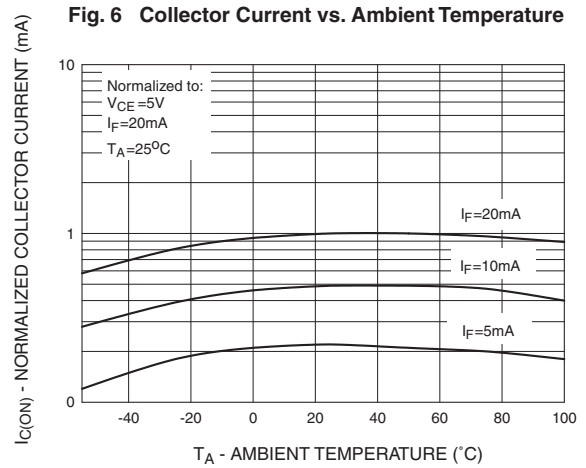
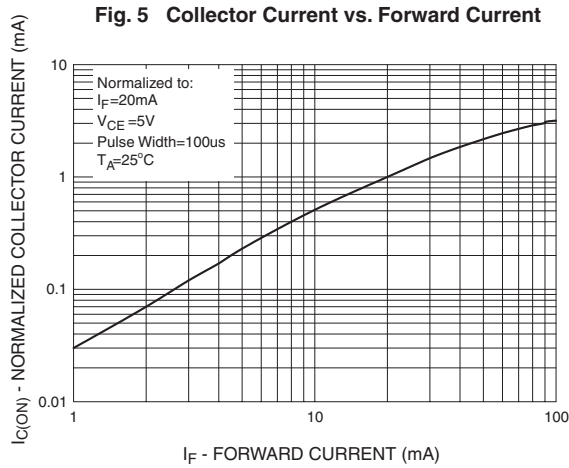


**Fig. 3 Collector-Emitter Dark Current (Normalized) vs. Ambient Temperature**



**Fig. 4 Collector Current vs. Collector-Emitter Voltage**





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