

MOC70P1, MOC70P2, MOC70P3 Phototransistor Optical Interrupter Switch

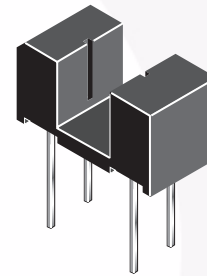
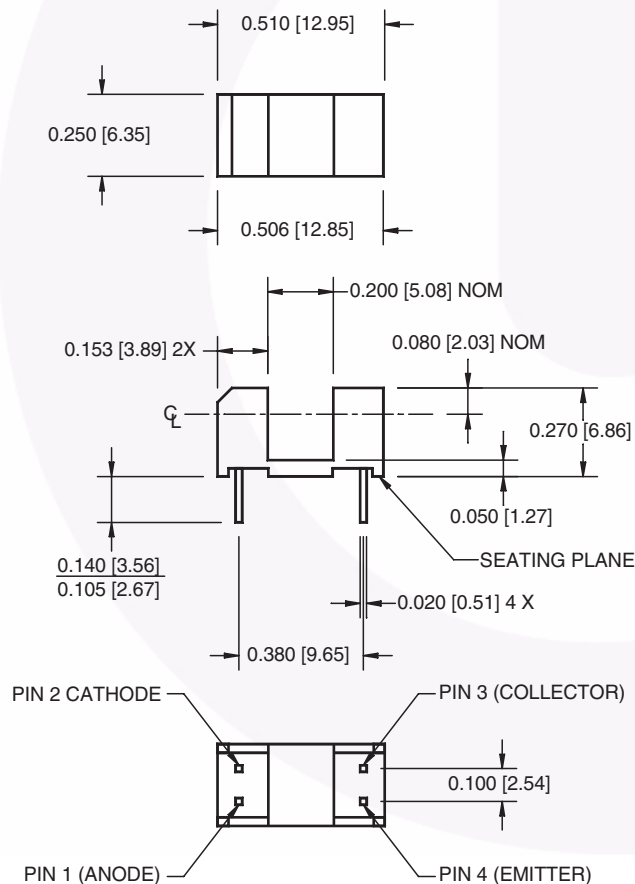
Features

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

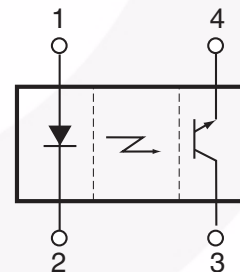
Description

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.

Package Dimensions



Schematic



Notes:

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

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating	Units
T_{OPR}	Operating Temperature	-55 to +100	$^\circ\text{C}$
T_{STG}	Storage Temperature	-55 to +100	$^\circ\text{C}$
T_{SOL-I}	Soldering Temperature (Iron) ^(2,3,4,5)	240 for 5 sec	$^\circ\text{C}$
T_{SOL-F}	Soldering Temperature (Flow) ^(2,3,5)	260 for 10 sec	$^\circ\text{C}$
EMITTER			
I_F	Continuous Forward Current	50	mA
V_R	Reverse Voltage	6	V
P_D	Power Dissipation ⁽¹⁾	100	mW
SENSOR			
V_{CEO}	Collector-Emitter Voltage	30	V
V_{ECO}	Emitter-Collector Voltage	4.5	V
I_C	Collector Current	20	mA
P_D	Power Dissipation ⁽¹⁾	150	mW

Notes:

- Derate power dissipation linearly, on each component, 1.33 mW/ $^\circ\text{C}$ 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.

Electrical/Optical Characteristics ($T_A = 25^\circ\text{C}$)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
EMITTER						
V_F	Forward Voltage	$I_F = 50\text{mA}$			1.8	V
I_R	Reverse Leakage Current	$V_R = 6\text{V}$			100	μA
SENSOR						
BV_{CEO}	Collector-Emitter Breakdown Voltage	$I_C = 10\text{mA}$	30			V
BV_{ECO}	Emitter-Collector Breakdown Voltage	$I_E = 100\mu\text{A}$	4			V
I_{CEO}	Collector-Emitter Leakage	$V_{CE} = 10\text{V}, I_F = 0$			100	nA
COUPLED						
$I_{C(ON)}$	Collector Current (See selection guide on the next page)					
$V_{CE(SAT)}$	Collector Emitter Saturation Voltage (See selection guide on the next page)					
$t_{(ON)}$	Turn-on Time	$I_F = 30\text{mA}, V_{CC} = 5\text{V}, R_L = 2.5\text{k}\Omega$		20		μs
$t_{(OFF)}$	Turn-off Time	$I_F = 30\text{mA}, V_{CC} = 5\text{V}, R_L = 2.5\text{k}\Omega$		80		μs

MOC70PX Optical Switch Selection Guide

Symbol	Device	Test Conditions	Min	Typ	Max	Units
ON-STATE COLLECTOR CURRENT						
$I_{C(ON)}$	MOC70P1	$I_F = 5\text{mA}, V_{CE} = 10\text{V}$	0.15			mA
	MOC70P2		0.30			mA
	MOC70P3		0.60			mA
	MOC70P1	$I_F = 20\text{mA}, V_{CE} = 10\text{V}$	1.0			mA
	MOC70P2		2.0			mA
	MOC70P3		4.0			mA
	MOC70P1	$I_F = 30\text{mA}, V_{CE} = 10\text{V}$	1.9			mA
	MOC70P2		3.0			mA
	MOC70P3		5.5			mA
COLLECTOR-EMITTER SATURATION VOLTAGE						
$V_{CE(SAT)}$	MOC70P1	$I_C = 1.8\text{mA}, I_F = 30\text{mA}$			0.40	V
	MOC70P2	$I_C = 1.8\text{mA}, I_F = 20\text{mA}$			0.40	V
	MOC70P3				0.40	V

Typical Performance Characteristics

Fig. 1 Forward Current vs. Forward Voltage

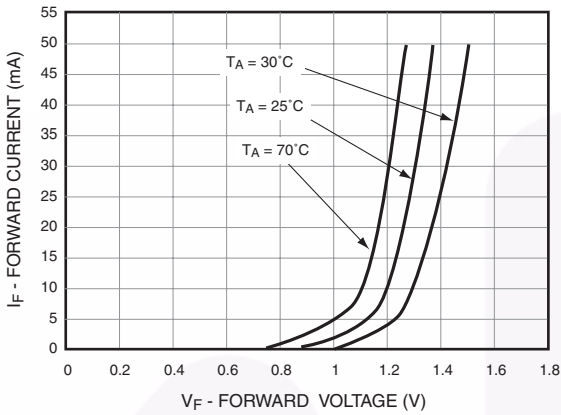


Fig. 2 Forward Voltage vs. Ambient Temperature

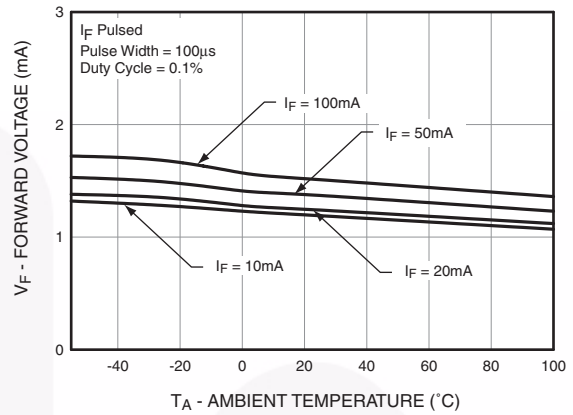


Fig. 3 Collector-Emitter Dark Current (Normalized) vs. Ambient Temperature

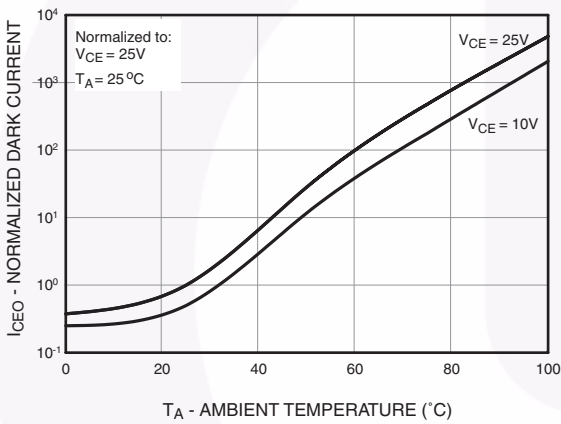


Fig. 4 Collector Current vs. Collector-Emitter Voltage

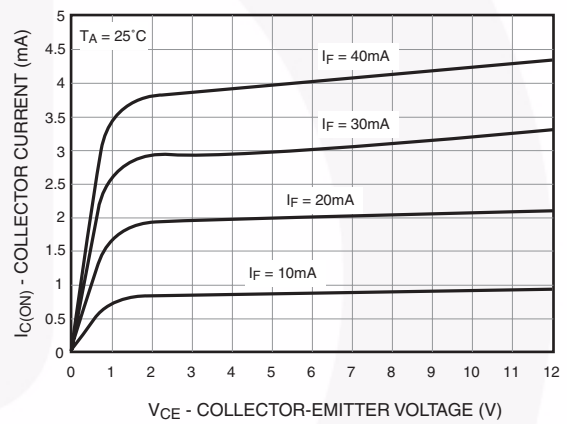


Fig. 5 Collector Current vs. Forward Current

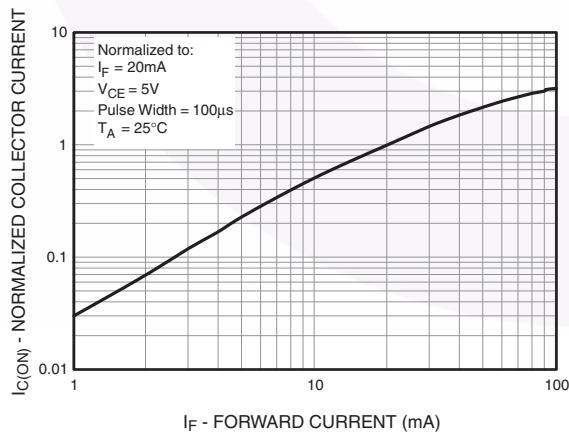
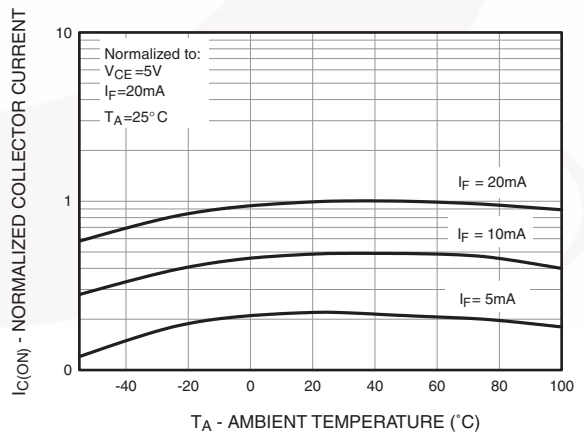


Fig. 6 Collector Current vs. Ambient Temperature



Typical Performance Characteristics (Continued)

Fig. 7 Switching Time Vs. Load Resistance

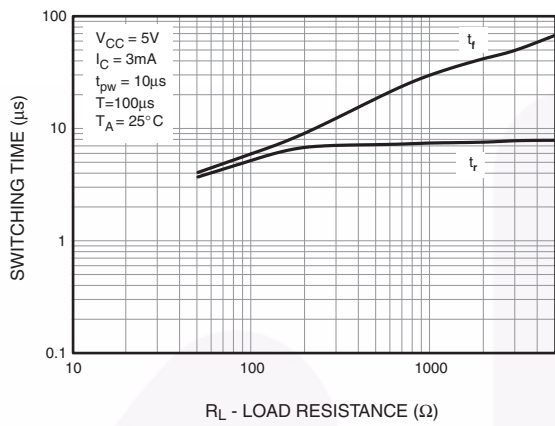
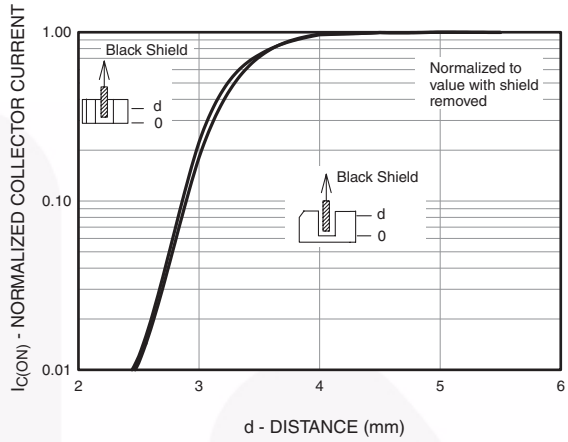






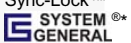
Fig. 8 Collector Current Vs. Shield Distance





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