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October 2009

MOC70P1, MOC70P2, MOC70P3
Phototransistor Optical Interrupter Switch

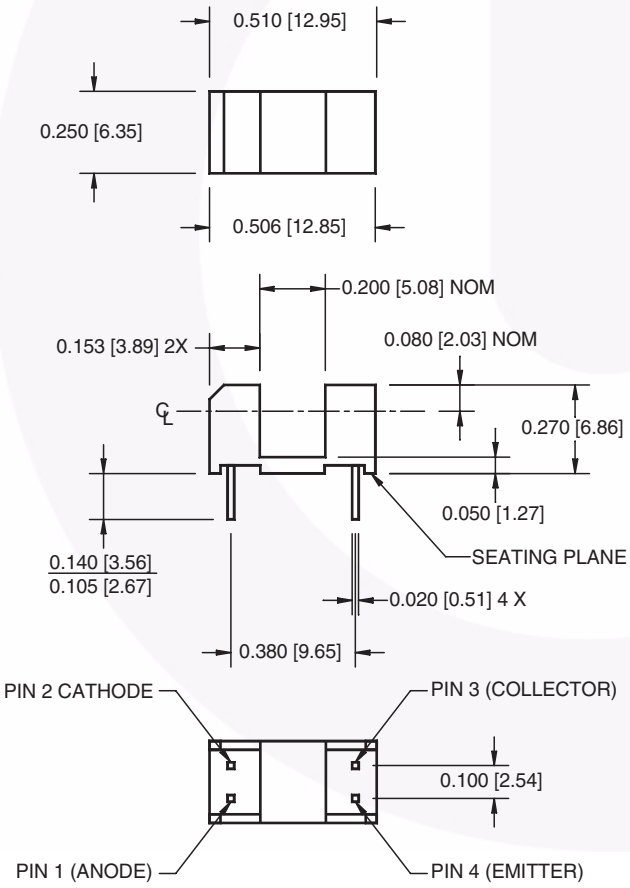
Features

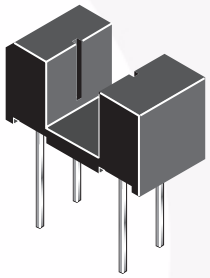
- No contact sensing
- 5mm gap
- .040” aperture
- Low profile
- PCB mount
- Transistor output

Description

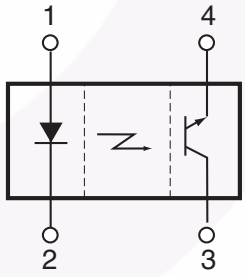
The MOC70PX consists of an infrared light emitting diode coupled to an NPN silicon phototransistor packaged into an injection molded housing. The housing is designed for wide gap, non contact sensing.

Package Dimensions





Schematic



Notes:

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

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Absolute Maximum Ratings (T_A = 25°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	°C
T_{STG}	Storage Temperature	-55 to +100	°C
T_{SOL-I}	Soldering Temperature (Iron)[2,3,4,5]	240 for 5 sec	°C
T_{SOL-F}	Soldering Temperature (Flow)[2,3,5]	260 for 10 sec	°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:

1. Derate power dissipation linearly, on each component, 1.33 mW/°C above 25°C.
2. RMA flux is recommended.
3. Methanol or isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron tip 1/16” (1.6mm) from housing.
5. As long as leads are not under any stress or spring tension.

Electrical/Optical Characteristics (T_A = 25°C)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
EMITTER						
V_F	Forward Voltage	I_F = 50mA			1.8	V
I_R	Reverse Leakage Current	V_R = 6V			100	µA
SENSOR						
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C = 10mA	30			V
BV_{ECO}	Emitter-Collector Breakdown Voltage	I_E = 100µA	4			V
I_{CEO}	Collector-Emitter Leakage	V_{CE} = 10V, 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 = 30mA, V_{CC} = 5V, R_L = 2.5kΩ		20		µs
$t_{(OFF)}$	Turn-off Time	I_F = 30mA, V_{CC} = 5V, R_L = 2.5kΩ		80		µs

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MOC70PX Optical Switch Selection Guide

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

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Typical Performance Characteristics

Fig. 1 Forward Current vs. Forward Voltage

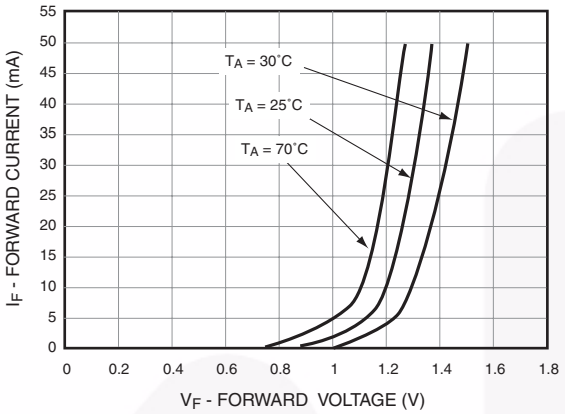


Fig. 2 Forward Voltage vs. Ambient Temperature

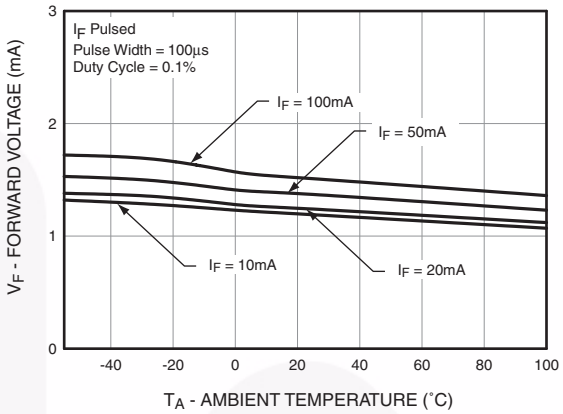


Fig. 3 Collector-Emitter Dark Current (Normalized) vs. Ambient Temperature

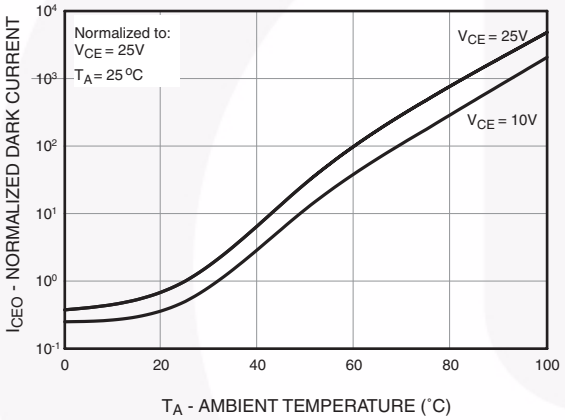


Fig. 4 Collector Current vs. Collector-Emitter Voltage

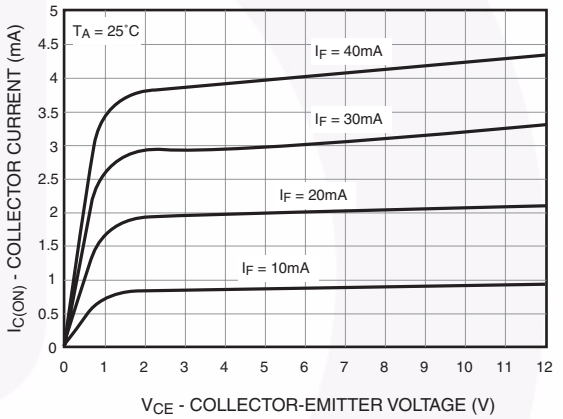


Fig. 5 Collector Current vs. Forward Current

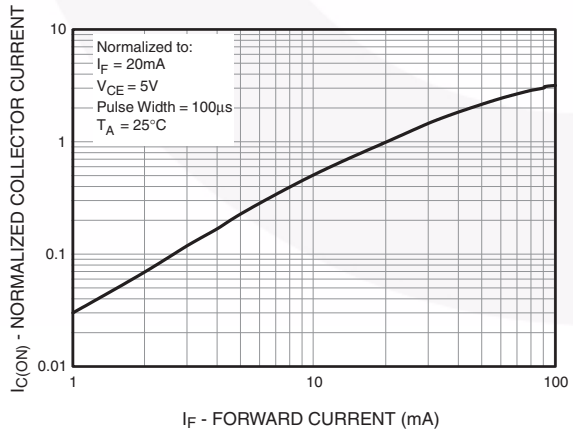
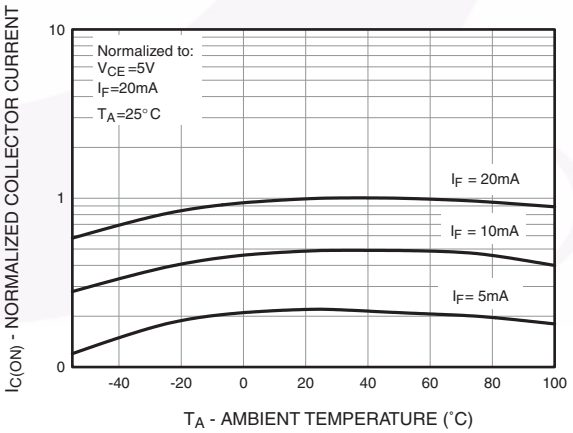


Fig. 6 Collector Current vs. Ambient Temperature



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Typical Performance Characteristics (Continued)

Fig. 7 Switching Time Vs. Load Resistance

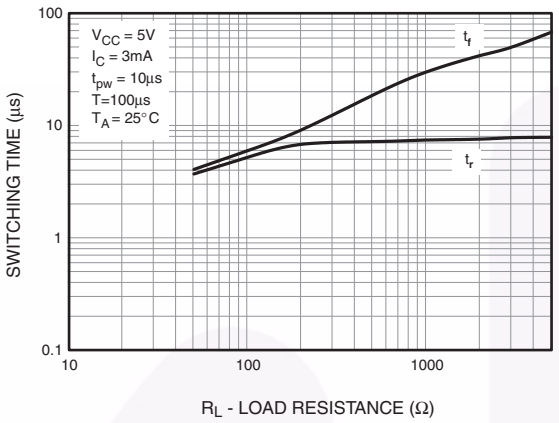
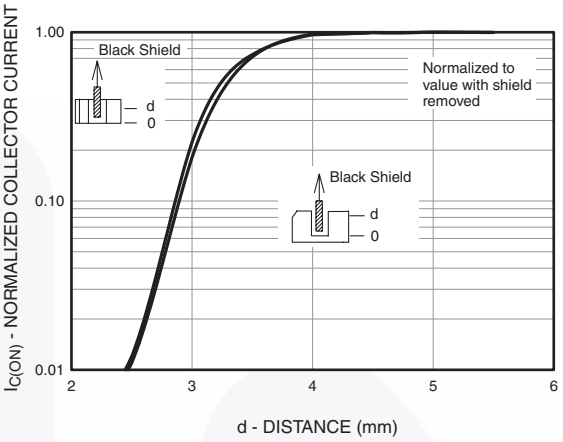


Fig. 8 Collector Current Vs. Shield Distance



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