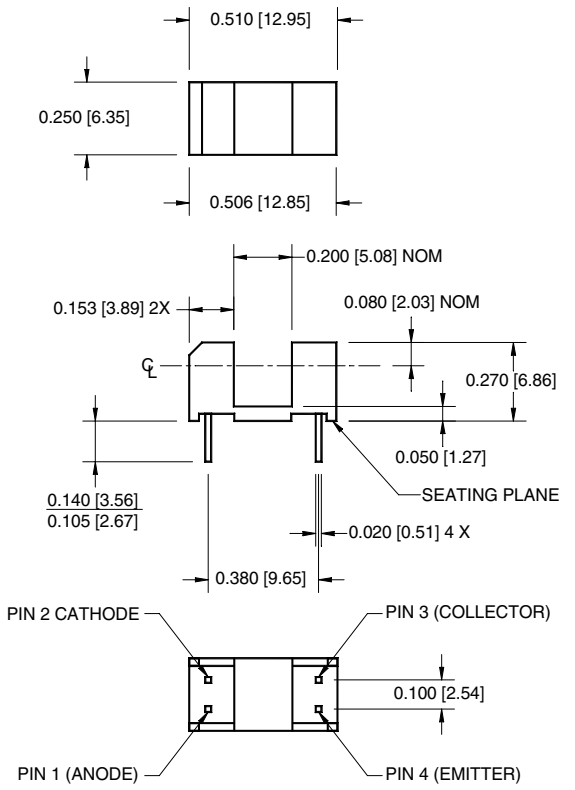
MOC70P1 / MOC70P2 / MOC70P3

PHOTOTRANSISTOR OPTICAL INTERRUPTER SWITCH

FAIRCHILD SEMICONDUCTOR™

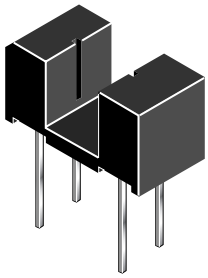
PACKAGE DIMENSIONS



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

DESCRIPTION

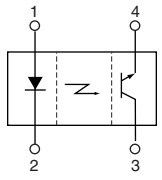
The MOC70PX consists of an infrared light emitting diode coupled to an NPN silicon phototransistor packaged into an injection molded housing. The housing is designed for wide gap, non contact sensing.



FEATURES

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

SCHEMATIC



NOTES

1. Derate power dissipation linearly, on each component, 1.67 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.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

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

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ELECTRICAL / OPTICAL CHARACTERISTICS (T_A = 25°C)

PARAMETER	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
EMITTER						
Forward Voltage	I_F = 50 mA	V_F	—	—	1.8	V
Reverse Leakage Current	V_R = 6 V	I_R	—	—	100	µA
SENSOR						
Collector-Emitter Breakdown Voltage	I_C = 10 mA	BV_{CEO}	30	—	—	V
Emitter-Collector Breakdown Voltage	I_E = 100 µA	BV_{ECO}	4	—	—	V
Collector-Emitter Leakage	V_{CE} = 10 V, I_F = 0	I_{CEO}	—	—	100	nA
COUPLED						
Collector Current (See selection guide below)		$I_{C(ON)}$				
Collector Emitter Saturation Voltage (See selection guide below)		$V_{CE\ (SAT)}$				
Turn-on Time	I_F = 30 mA, V_{CC} = 5 V, R_L = 2.5 kΩ	$t_{(ON)}$	—	20	—	µs
Turn-off Time	I_F = 30 mA, V_{CC} = 5 V, R_L = 2.5 kΩ	$t_{(OFF)}$	—	80	—	µs

MOC70PX OPTICAL SWITCH SELECTION GUIDE

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

Fig. 1 Forward Current vs. Forward Voltage

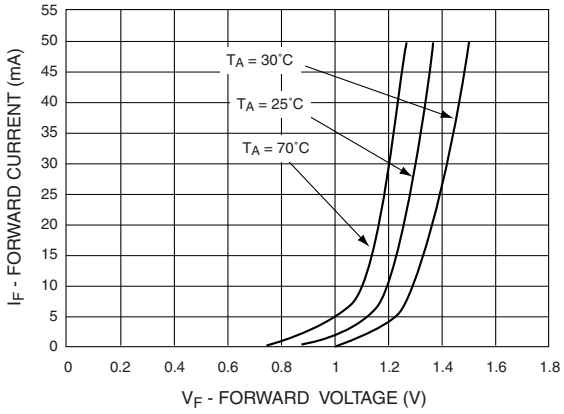


Fig. 2 Forward Voltage vs. Ambient Temperature

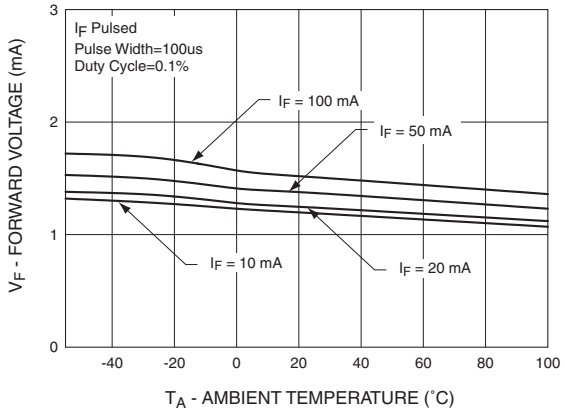


Fig. 3 Collector-Emitter Dark Current (Normalized) vs. Ambient Temperature

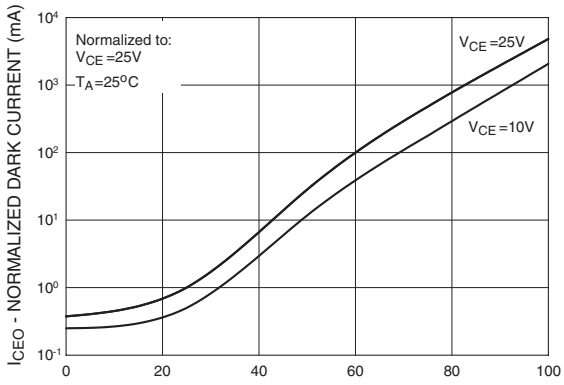


Fig. 4 Collector Current vs. Collector-Emitter Voltage

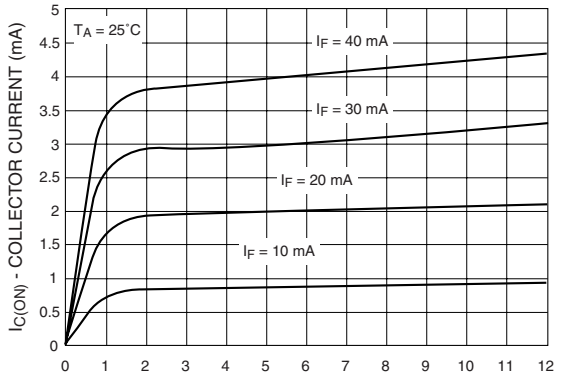


Fig. 5 Collector Current vs. Forward Current

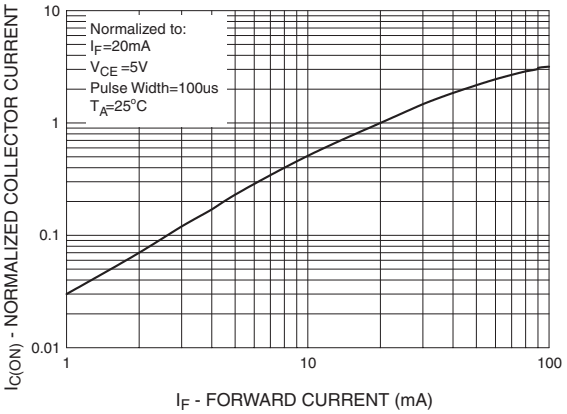


Fig. 6 Collector Current vs. Ambient Temperature

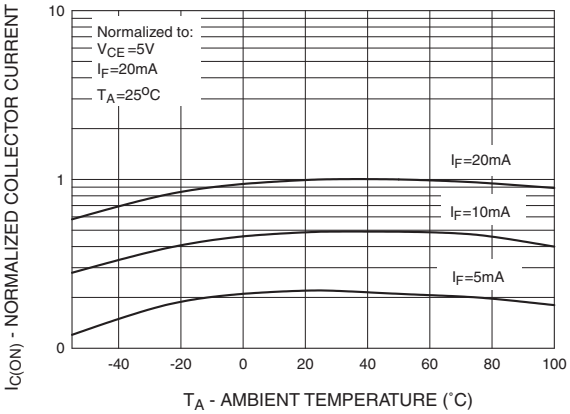


Fig. 7 Switching Time Vs. Load Resistance

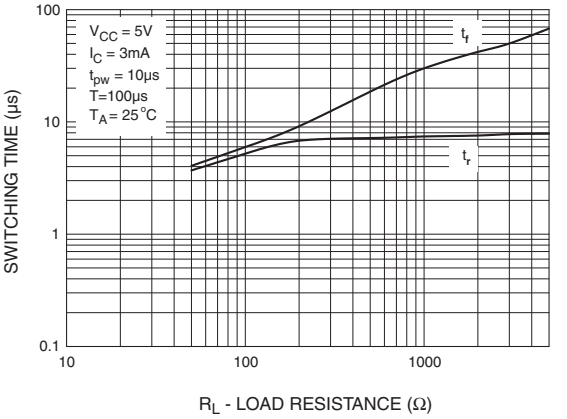
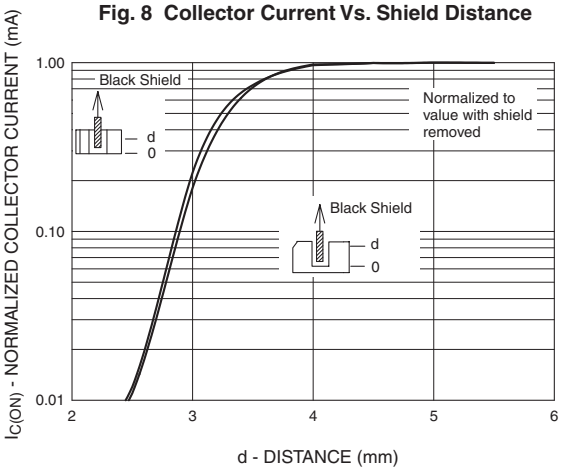


Fig. 8 Collector Current Vs. Shield Distance



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