MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

Slotted Optical Switches
Logic Output

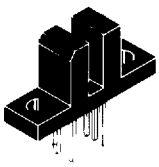
MOC75 Series
*MOC75T1 and MOC75U1 are Motorola Preferred Devices

SLOTTED OPTICAL SWITCHES LOGIC OUTPUT

These devices consist of a GaAs LED facing a silicon, high-speed integrated circuit detector in a molded plastic housing. A slot in the housing between the emitter and the detector provides a means of mechanically interrupting the signal and switching the output from an on-state to an off-state. The detector incorporates a schmitt trigger which provides hysteresis for noise immunity and pulse shaping. The detector circuit is optimized for simplicity of operation and has an open-collector output for application flexibility

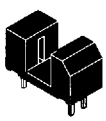
Features:
- Single Unit for Easy PCB Mounting
- Non-Contact Logic Level Switching
- Long-Life Liquid Phase EPI Emitter
- 1 mm Detector Aperture Width
- Suitable for use in 3 V Applications

Applications:
Shaft encoders, non-contact switches, position sensing, paper handlers, coin handlers, and interruptive sensor application requiring logic level outputs.



T
CASE 354C-03
STYLE 1

U
CASE 354B-02
STYLE 1



P
CASE 354K-01
STYLE 1

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

Rating	Symbol	Value	Unit
INPUT LED			
Power Dissipation	P_D	100	mW
Forward Current (Continuous)	I_F	60	mA
Forward Current (Peak) (Pulse Width ≤ 1 μs, PRR < 300 PPS)	I_F	1.5	A
Reverse Voltage	V_R	6	V
OUTPUT DETECTOR			
Output Voltage Range	V_O	0–16	V
Supply Voltage Range	V_{CC}	3–16	V
Output Current	I_O	50	mA
Power Dissipation	P_D	150*	mW
TOTAL DEVICE			
Storage Temperature	T_{stg}	−40°C to 100°C	°C
Operating Temperature	T_J	−40°C to 100°C	°C
Lead Soldering Temperature (5 seconds maximum)	T_L	260	°C

*Derate 2 mW/°C above 25°C ambient

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MOC75 Series

INDIVIDUAL ELECTRICAL CHARACTERISTICS (0–70°C) (See Note 1)

Characteristic		Symbol	Min	Typ	Max	Unit
INPUT LED						
Forward Voltage (I_F = 20 mA)		V_F	—	1.1	1.6	V
Reverse Current (V_R = 3 V)		I_R	—	—	10	μA
Reverse Breakdown Voltage (I_R = 100 μA)		$V_{(BR)R}$	6	—	—	V
Capacitance (V = 0 V, f = 1 MHz)		C	—	24	50	pF
OUTPUT DETECTOR						
Operating Voltage		V_{CC}	3	—	15	V
Supply Current (I_F = 0, V_{CC} = 5 V)		$I_{CC(off)}$	—	1.3	5	mA
Output Current, High (I_F = 0, V_{CC} = V_O = 15 V)		I_{OH}	—	—	100	μA
COUPLED (0–70°C) (See Note 1)						
Threshold Current, ON (R_L = 270 Ω, V_{CC} = 5 V)	MOC75(T,U,P)1 MOC75(T,U,P)2	$I_{F(on)}$	— —	20 10	30 15	mA
Threshold Current, OFF (R_L = 270 Ω, V_{CC} = 5 V)	MOC75(T,U,P)1 MOC75(T,U,P)2	$I_{F(off)}$	0.5 0.5	15 8	— —	mA
Hysteresis Ratio (R_L = 270 Ω, V_{CC} = 5 V)		$\frac{I_{F(off)}}{I_{F(on)}}$	—	0.75	—	—
Supply Current (I_F = $I_{F(on)}$, V_{CC} = 5 V)		$I_{CC(on)}$	—	3	5	mA
Output Voltage, Low (I_F = $I_{F(on)}$ V_{CC} = 5 V, R_L = 270 Ω)		V_{OL}	—	0.2	0.4	V
Turn-On Time	R_L = 270 Ω, V_{CC} = 5 V, I_F = $I_{F(on)}$ T_A = 25°C	t_{on}	—	1.2	—	μs
Fall Time		t_f	—	0.1	—	
Turn-Off Time		t_{off}	—	1.2	—	
Rise Time		t_r	—	0.1	—	

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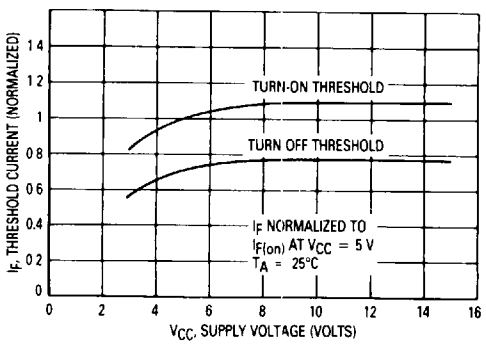

Figure 1. Normalized Threshold Current versus Supply Voltage

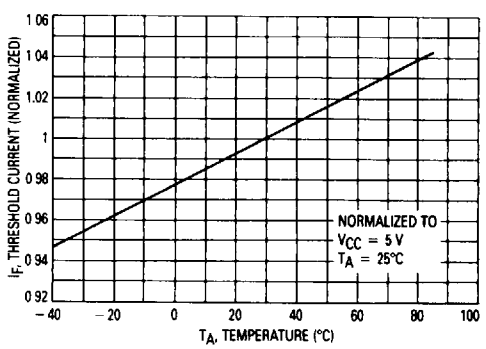

Figure 2. Threshold Current versus Temperature

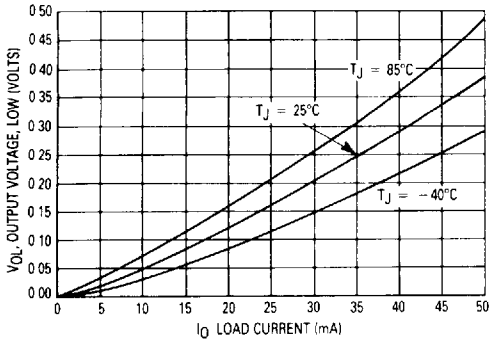

Figure 3. Output Voltage versus Load Current

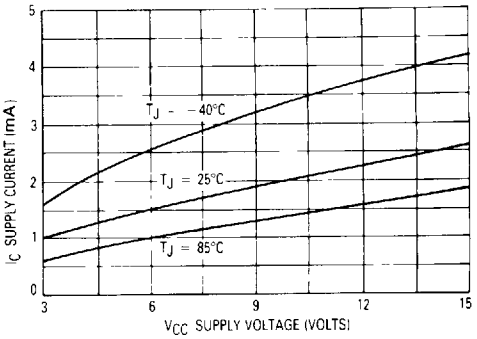

Figure 4. Supply Current versus Supply Voltage — Output High

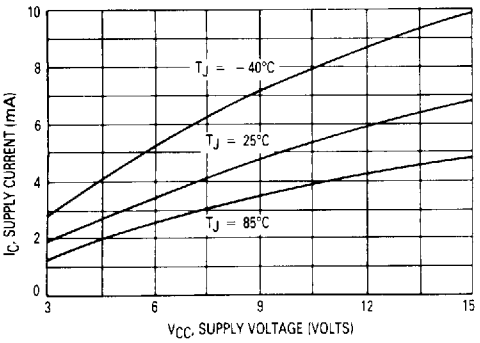

Figure 5. Supply Current versus Supply Voltage — Output Low

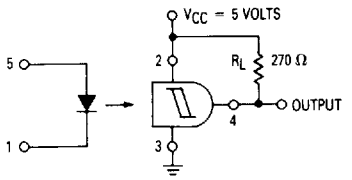

Figure 6. Test Circuit for Threshold Current Measurements

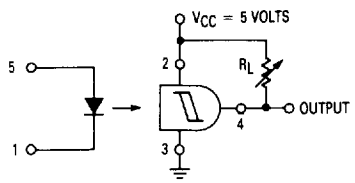

Figure 7. Test Circuit for Output Voltage versus Load Current Measurements

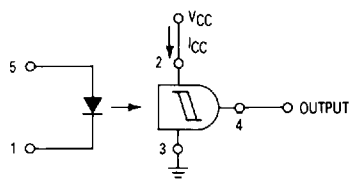

Figure 8. Test Circuit for Supply Current versus Supply Voltage Measurements

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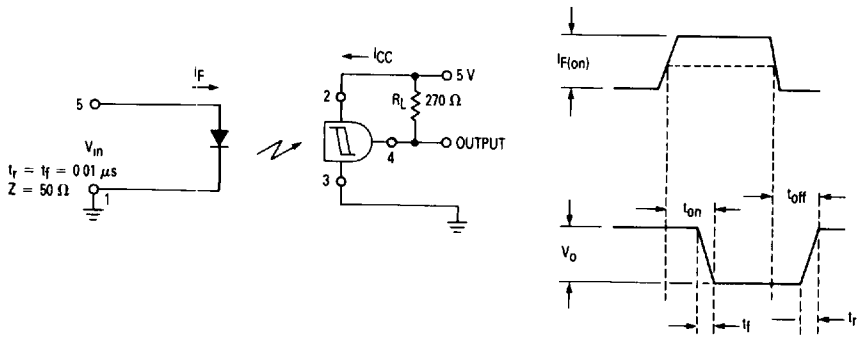

Figure 9. Switching Test Circuit

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