

## Slotted Optical Switches Darlington Output

Each device consists of a gallium arsenide infrared emitting diode facing a silicon NPN photodarlington in a molded plastic housing. A slot in the housing between the emitter and the detector provides the means for mechanically interrupting the infrared beam. These devices are widely used as position sensors in a variety of applications.

- Single Unit for Easy PCB Mounting
- Non-Contact Electrical Switching
- Long-Life Liquid Phase Epi Emitter
- Several Convenient Package Styles

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
<b>INPUT LED</b>			
Reverse Voltage	$V_R$	6	Volts
Forward Current — Continuous	$I_F$	60	mA
Input LED Power Dissipation ( $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ )	$P_D$	150 2	mW mW/ $^\circ\text{C}$

### OUTPUT DARLINGTON

Collector-Emitter Voltage	$V_{CEO}$	30	Volts
Output Current — Continuous	$I_C$	100	mA
Output Darlington Power Dissipation ( $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ )	$P_D$	150 2	mW mW/ $^\circ\text{C}$

### TOTAL DEVICE

Ambient Operating Temperature Range	$T_A$	-40 to +100	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 to +100	$^\circ\text{C}$
Lead Soldering Temperature (5 seconds max)	—	260	$^\circ\text{C}$
Total Device Power Dissipation ( $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ )	$P_D$	300 4	mW mW/ $^\circ\text{C}$

## MOC71 Series

### SLOTTED OPTICAL SWITCHES DARLINGTON OUTPUT



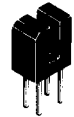
CASE 374-01  
**H**



CASE 354A-01  
**T**



CASE 354E-01  
**P**

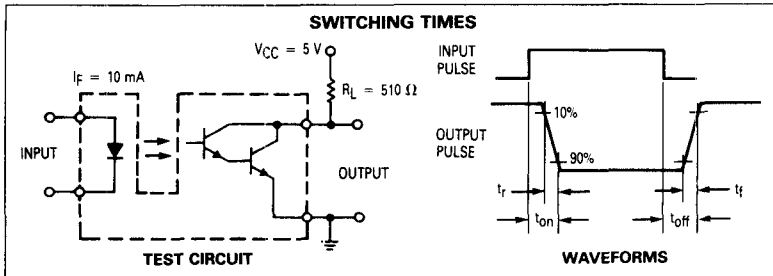


CASE 354-02  
**U**

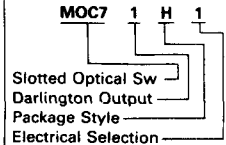


CASE 354G-01  
**V**

7



### PART NUMBER DERIVATION



# MOC71 Series

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted. Note 1.)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>INPUT LED</b>					
Forward Voltage ( $I_F = 50\text{ mA}$ )	$V_F$	0.9	1.3	1.8	Volts
Reverse Leakage ( $V_R = 6\text{ V}$ )	$I_R$	—	0.05	100	$\mu\text{A}$
Capacitance ( $V = 0\text{ V}$ , $f = 1\text{ MHz}$ )	$C_J$	—	18	—	pF

## OUTPUT DARLINGTON

Dark Current ( $V_{CE} = 10\text{ V}$ )	$I_{CEO}$	—	10	100	nA
Collector-Emitter Breakdown Voltage ( $I_C = 1\text{ mA}$ )	$V_{(BR)CEO}$	30	90	—	Volts
Emitter-Collector Breakdown Voltage ( $I_E = 100\ \mu\text{A}$ )	$V_{(BR)ECO}$	7	—	—	Volts
Capacitance ( $V = 0\text{ V}$ , $f = 1\text{ MHz}$ )	$C_{CE}$	—	5.5	—	pF
DC Current Gain ( $V_{CE} = 10\text{ V}$ , $I_C = 2\text{ mA}$ )	$h_{FE}$	—	10,000	—	—

## COUPLED (Note 2)

Output Collector Current ( $I_F = 5\text{ mA}$ , $V_{CE} = 5\text{ V}$ )	MOC71__1	$I_C$	2.5	5	—	mA
	MOC71__3		8	14	—	
Output Collector Current ( $I_F = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$ )	MOC71__1	$I_C$	7.5	15	—	mA
	MOC71__3		20	35	—	
Collector-Emitter Saturation Voltage ( $I_C = 1.8\text{ mA}$ , $I_F = 10\text{ mA}$ )		$V_{CE(sat)}$	—	—	1	Volts
Turn-On Time ( $I_F = 10\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 510\ \Omega$ )		$t_{on}$	—	120	—	$\mu\text{s}$
Turn-Off Time ( $I_F = 10\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 510\ \Omega$ )		$t_{off}$	—	500	—	$\mu\text{s}$

Notes: 1. Stray radiation can alter values of characteristics. Adequate light shielding should be provided.  
2. No actuator in sensing gap.

## TYPICAL CHARACTERISTICS

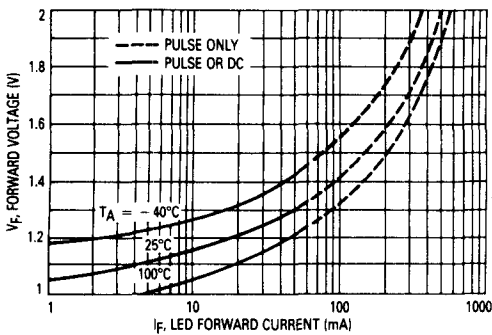


Figure 1. LED Forward Voltage versus Forward Current

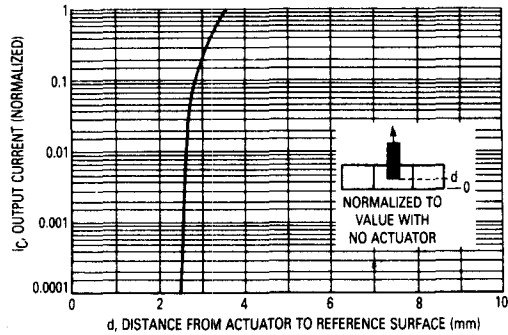


Figure 2. Output Current versus Actuator Position

# MOC71 Series

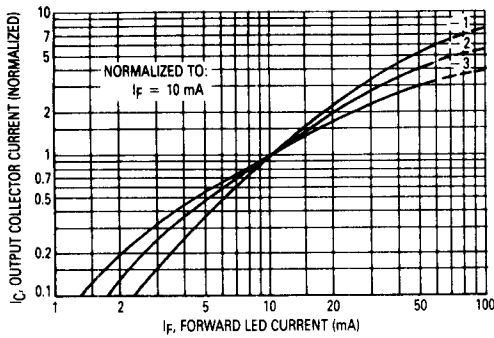


Figure 3. Output Current versus Input Current

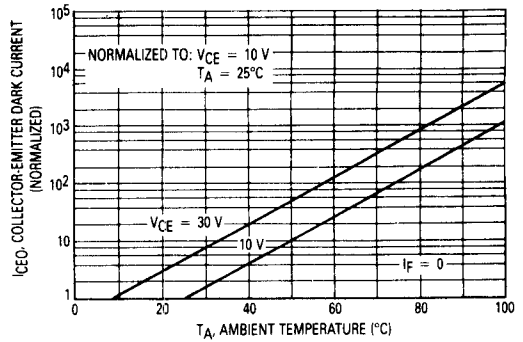


Figure 4. Collector-Emitter Dark Current versus Ambient Temperature

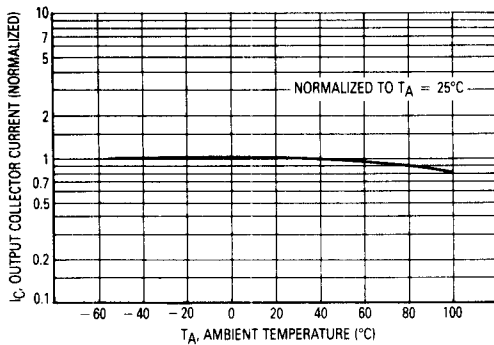


Figure 5. Output Current versus Ambient Temperature



Figure 6. Reduction in Output Current Heating versus Forward Current

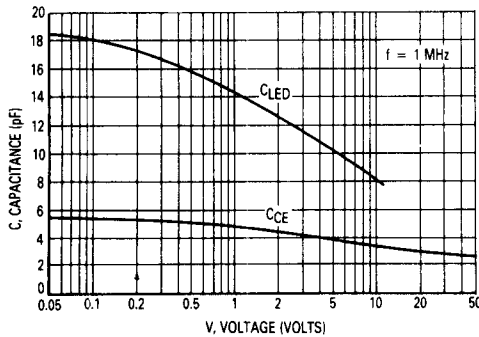


Figure 7. Capacitances versus Voltage

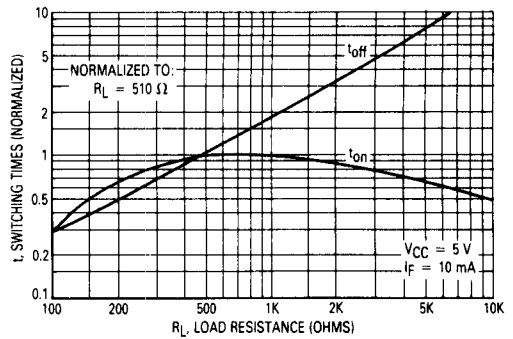


Figure 8. Switching Times versus Load Resistance

OUTLINE DIMENSIONS

