MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

Fiber Optics — FLCS Family Photo Detector
Logic Output

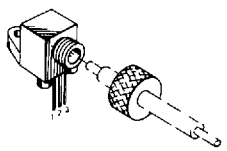
MFOD75

FLCS FAMILY
FIBER OPTICS
PHOTO DETECTOR
LOGIC OUTPUT

The MFOD75 is designed for low cost, short distance (<60 m) fiber optics systems using 1000 micron (1 mm) plastic core fiber.

Features:
- Ideally Matched to MFOE76 Emitter For Plastic Fiber Systems
- Connector Included
- Simple Fiber Termination and Connection (Figure 12)
- Easy Board Mounting
- Molded Lens for Efficient Coupling
- Designed for 1000 Micron Core Plastic Fiber, Such As: Eska SH4001

Applications:
- Medical Electronics
- Industrial Controls
- Security Systems
- Short Haul Communication Systems
- High Isolation Interconnects
- M6800 Microprocessor Systems



CASE 363C-01
PLASTIC
STYLE 1

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

Rating	Symbol	Value	Unit
Supply Voltage Range	V_{CC}	3–16	Volts
Output Current	I_o	50	mA
Power Dissipation* / Derate above 25°C	P_D / ΔP_D	150 / 2	mW / mW/°C
Operating and Junction Temperature Range	T_A, T_J	−40 to +85	°C
Storage Temperature Range	T_{stg}	−40 to +100	°C
Soldering Temperature (5 seconds)	—	260	°C

DEVICE CHARACTERISTICS (T_A = 25°C)

Characteristic		Symbol	Min	Typ	Max	Unit
Supply Current with Output High (I_F = 0, V_{CC} = 5 V)		$I_{CC(off)}$	—	1.3	5	mA
Output Current with Output High (I_F = 0, V_{CC} = 15 V, R_L = 270 Ω)		I_{OH}	—	—	100	nA
Supply Current with Output Low (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}	—	0.14	0.4	Volts
Light Required to Trigger (V_{CC} = 5 V, R_L = 270 Ω, λ = 850 nm)		$H_{(on)}$	—	6	10	μW
Hysteresis Ratio (V_{CC} = 5 V, R_L = 270 Ω)		$\frac{H_{(on)}}{H_{(off)}}$	—	0.75	—	—
Turn-On Time	V_{CC} = 5 V, R_L = 270 Ω, H = 20 μW, Figure 2, @ 850 nm	t_{on}	—	0.4	2	μs
Fall Time		t_f	—	20	—	ns
Turn-Off Time		t_{off}	—	0.8	2	μs
Rise Time		t_r	—	40	—	ns

*Measured with device soldered into typical printed circuit board

9

MFOD75

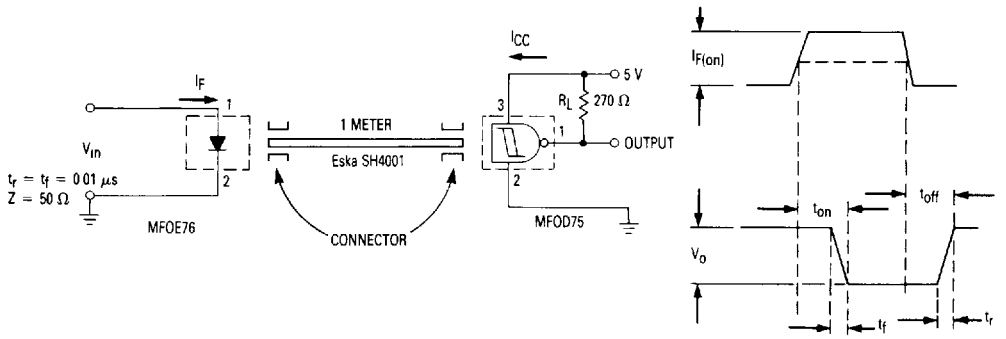


Figure 1. Switching Test Circuit

TYPICAL CHARACTERISTICS

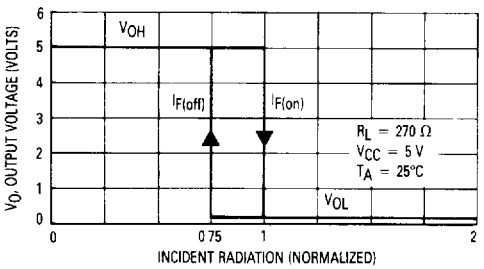


Figure 2. Transfer Characteristics

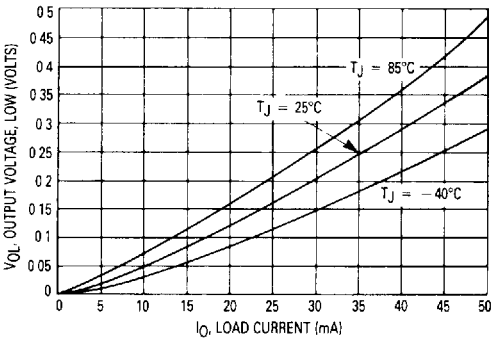


Figure 3. Output Voltage, Low versus Load Current

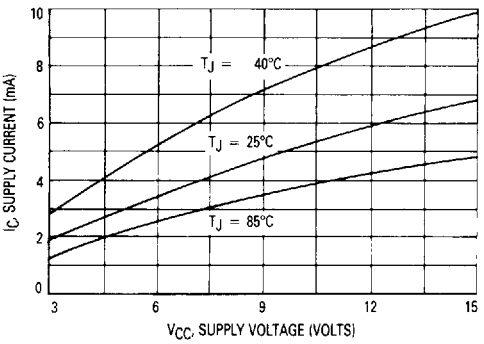


Figure 4. Supply Current versus Supply Voltage — Output Low

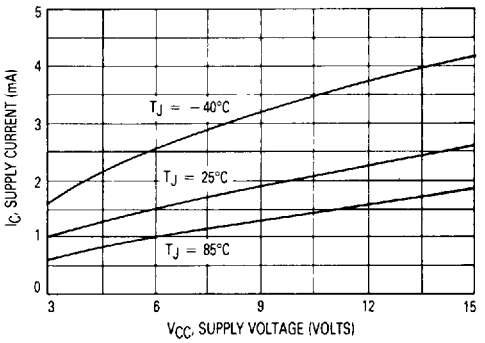


Figure 5. Supply Current versus Supply Voltage — Output High

TYPICAL CHARACTERISTICS

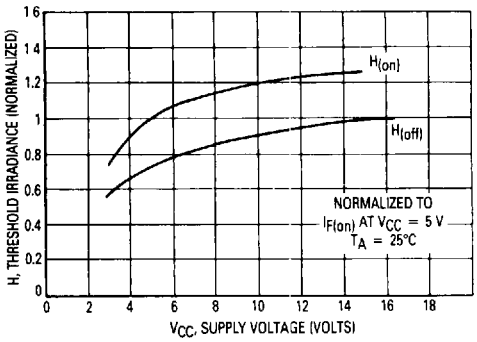


Figure 6. Threshold Irradiance versus Supply Voltage

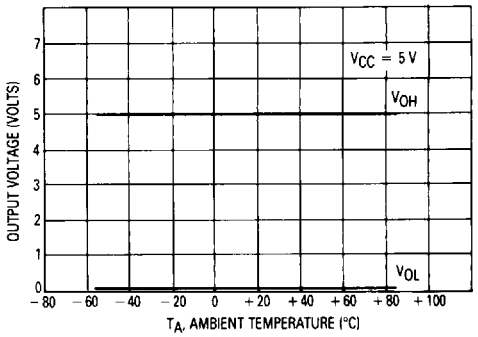


Figure 7. Output Voltage versus Ambient Temperature

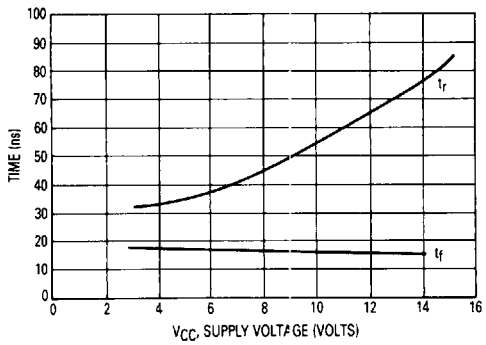


Figure 8. Pulse Response Time versus Supply Voltage

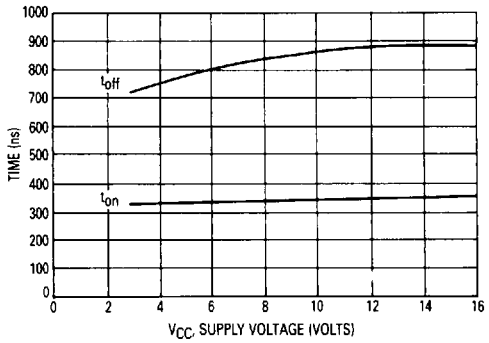
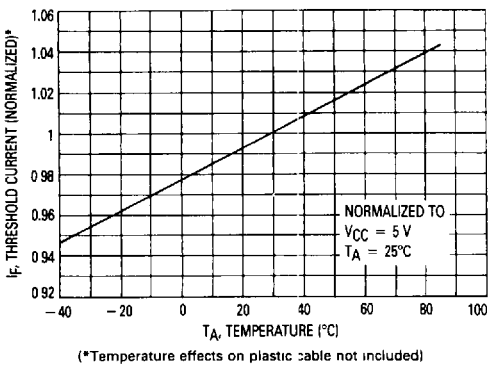


Figure 9. Total Switching Time versus Supply Voltage

9

Typical Coupled Characteristics Using MFOE71 and 1 Meter 1000 μm Plastic Cable



(*Temperature effects on plastic cable not included)

Figure 10. Threshold Current versus Temperature

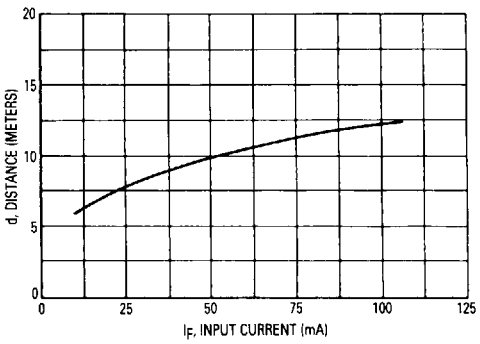
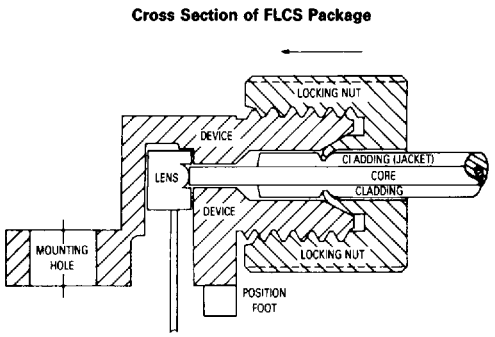


Figure 11. Working Distance versus Input Current



Termination Instructions

1. Cut cable squarely with sharp blade or hot knife.
2. Strip jacket back with 18 gauge wire stripper to expose 0.10–0.18″ of bare fiber core.
   Avoid nicking the fiber core.
3. Insert terminated fiber through locking nut and into the connector until the core tip seats against the molded lens inside the device package.
   Screw connector locking nut down to a snug fit, locking the fiber in place.

Figure 12. FO Cable Termination and Assembly

9