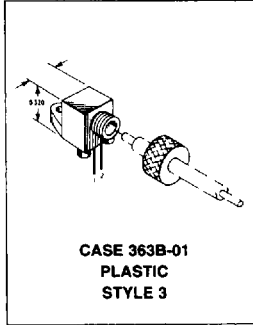


**MOTOROLA**  
**SEMICONDUCTOR**  
 TECHNICAL DATA

**Fiber Optics — FLCS Family**  
**Photo Detector**  
**Transistor Output**

**MFOD72**  
 Motorola Preferred Device

**FLCS FAMILY**  
**FIBER OPTICS**  
**PHOTO DETECTOR**  
**TRANSISTOR OUTPUT**



The MFOD72 is designed for low cost, short distance Fiber Optic Systems using 1000 micron core plastic fiber

**Features:**

- Standard Phototransistor Output
- Ideally Matched to MFOE76 Emitter for Plastic Fiber Systems.
- Annular Passivated Structure for Stability and Reliability
- FLCS Package
  - Includes Connector
  - Simple Fiber Termination and Connection (Figure 4)
  - Easy Board Mounting
  - Molded Lens for Efficient Coupling
  - Mates with 1000 Micron Core Plastic Fiber (Eska SH4001)

**Applications:**

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

**MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CE0}$	30	Volts
Total Power Dissipation ( $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ )	$P_D$	150 2	mW mW/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-40 to +100	°C

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

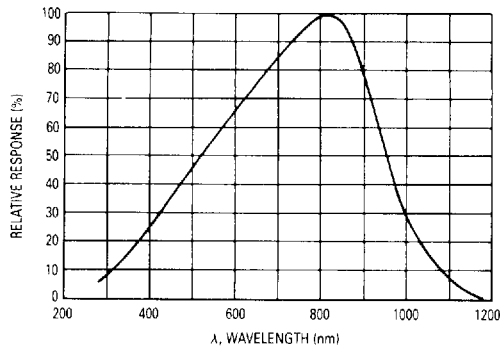
Characteristic	Symbol	Min	Typ	Max	Unit
Collector Dark Current ( $V_{CE} = 10\text{ V}$ )	$I_D$	—	—	100	nA
Collector-Emitter Breakdown Voltage ( $I_C = 10\text{ mA}$ )	$V_{(BR)CEO}$	30	—	—	Volts

**OPTICAL CHARACTERISTICS**

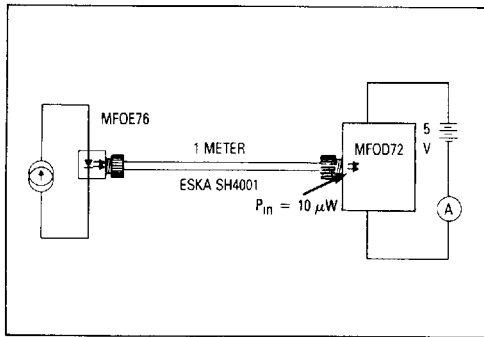
Responsivity ( $V_{CC} = 5\text{ V}$ , Figure 2)	R	80	125	—	$\mu\text{A}/\mu\text{W}$
Saturation Voltage ( $\lambda = 850\text{ nm}$ , $V_{CC} = 5\text{ V}$ ) ( $P_{in} = 10\ \mu\text{W}$ , $I_C = 1\text{ mA}$ )	$V_{CE(sat)}$	—	0.25	0.4	Volts
Turn-On Time	$t_{on}$	—	10	—	$\mu\text{s}$
Turn-Off Time	$t_{off}$	—	60	—	$\mu\text{s}$

Preferred devices are Motorola recommended choices for future use and best overall value

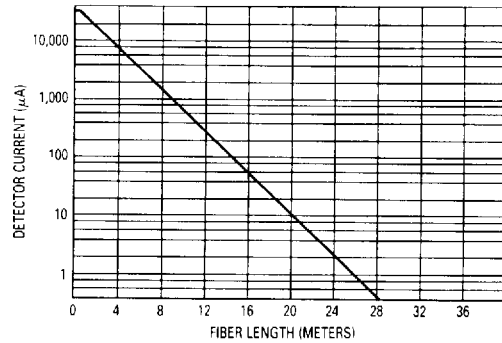
**TYPICAL COUPLED CHARACTERISTICS**



**Figure 1. Relative Spectral Response**



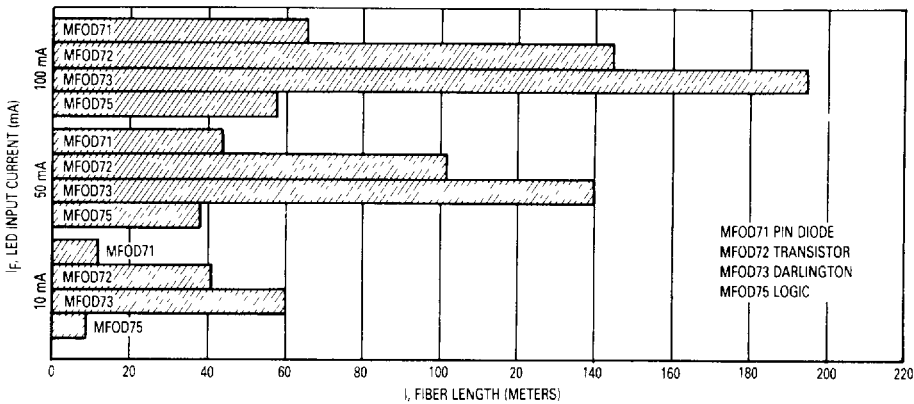
**Figure 2. Responsivity Test Configuration**



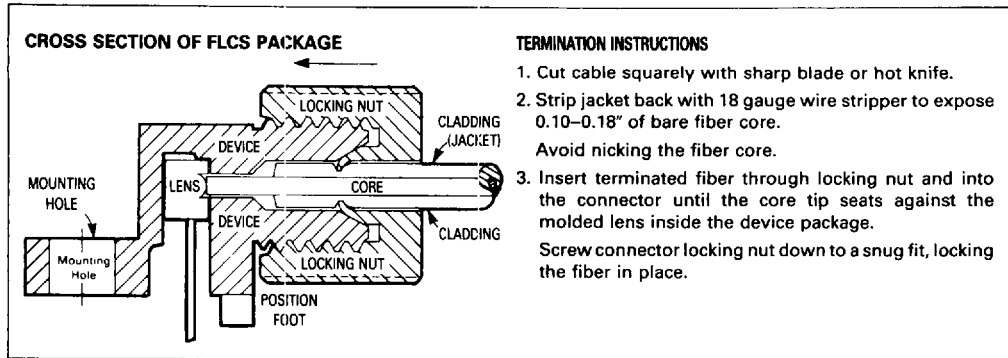
**Figure 3. Detector Current versus Fiber Length**

The system length achieved with a MFOE76 emitter and various detectors, using 1000 micron core plastic fiber (Eska SH4001 or equivalent), depends on the LED forward

current ( $I_f$ ) and the responsivity of the detector chosen. Each detector will perform with the MFOE76 up to the distances shown below



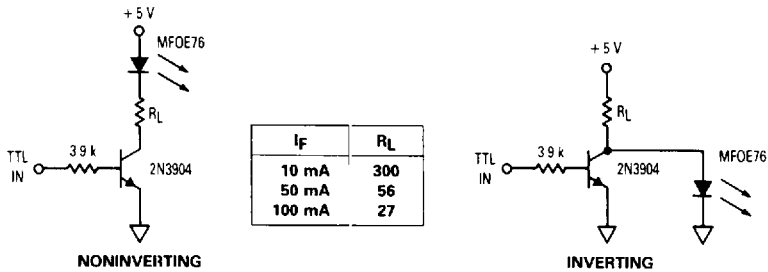
**Figure 4. MFOE76 Working Distances**



**Figure 5. FO Cable Termination and Assembly**

**INPUT SIGNAL CONDITIONING**

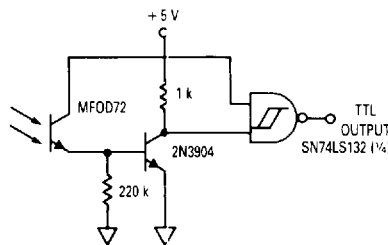
The following circuits are suggested to provide the desired forward current through the emitter.



**Figure 6. TTL Transmitters**

**OUTPUT SIGNAL CONDITIONING**

The following circuit is suggested to take the MFOD72 detector output and condition it to drive TTL with an acceptable bit error rate.



**Figure 7. 5 kHz Transistor Receiver**