MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

Fiber Optics — FLCS Family
Photo Detector
Darlington Output

MFOD73

FLCS FAMILY
FIBER OPTICS
PHOTO DETECTOR
DARLINGTON OUTPUT

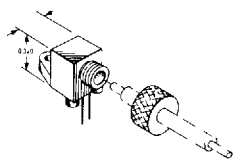
The MFOD73 is designed for low cost, short distance Fiber Optic Systems using 1000 micron core plastic fiber

Features:

- High Sensitivity Photodarlington 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



CASE 363B-01
PLASTIC
STYLE 3

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

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	60	Volts
Total Power Dissipation @ T_A = 25°C Derate above 25°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°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Collector Dark Current (V_{CE} = 10 V)	I_D	—	—	100	nA
Collector-Emitter Breakdown Voltage (I_C = 10 mA)	$V_{(BR)CEO}$	60	—	—	Volts

OPTICAL CHARACTERISTICS

Responsivity (V_{CC} = 5 V, Figure 2)		R	1,000	1,500	—	μA/μW
Saturation Voltage (λ = 850 nm, V_{CC} = 5 V) (P_{in} = 1 μW, I_C = 2 mA)		$V_{CE(sat)}$	—	0.75	1	Volts
Turn-On Time	R_L = 100 Ω, P_{in} = 1 μW, λ = 850 nm, V_{CC} = 5 V	t_{on}	—	125	—	μs
Turn-Off Time		t_{off}	—	150	—	μs

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MFOD73

TYPICAL COUPLED CHARACTERISTICS

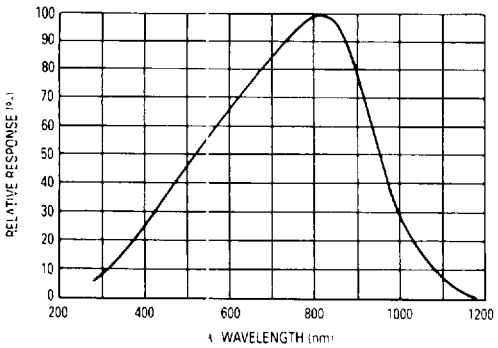

Figure 1. Relative Spectral Response

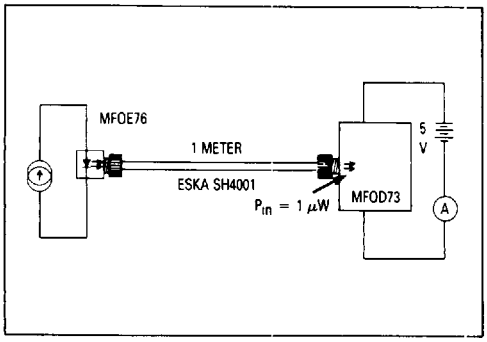

Figure 2. Responsivity Test Configuration

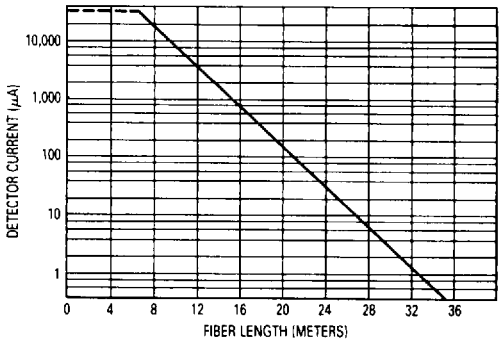

Figure 3. Detector Current versus Fiber Length

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

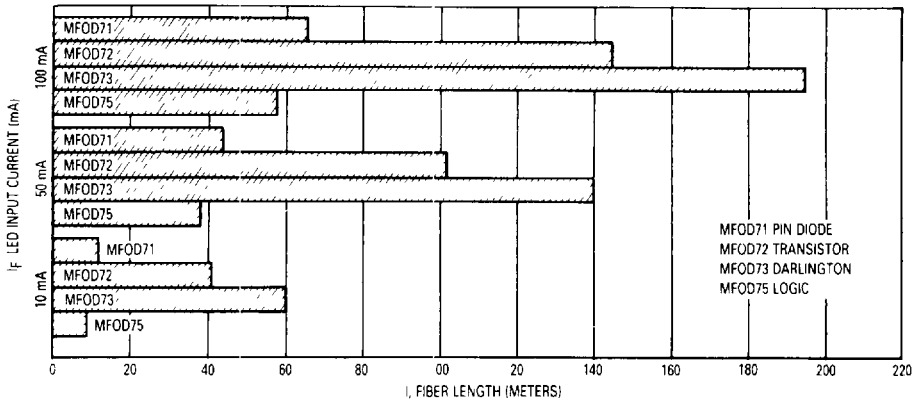

Figure 4. MFOE76 Working Distances

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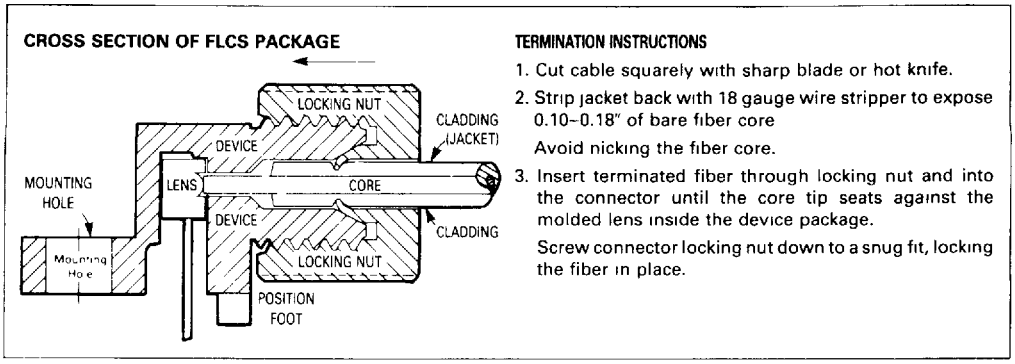
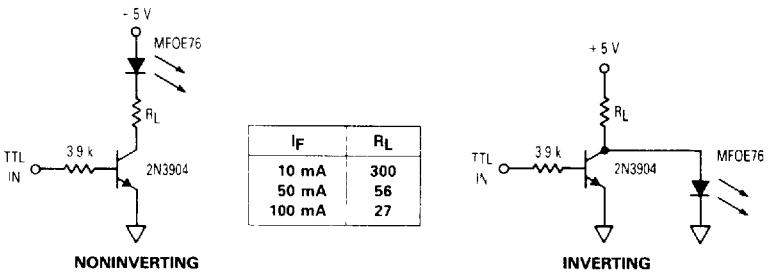


Figure 5. FO Cable Termination and Assembly

INPUT SIGNAL CONDITIONING

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



I_F	R_L
10 mA	300
50 mA	56
100 mA	27

Figure 6. TTL Transmitters

OUTPUT SIGNAL CONDITIONING

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

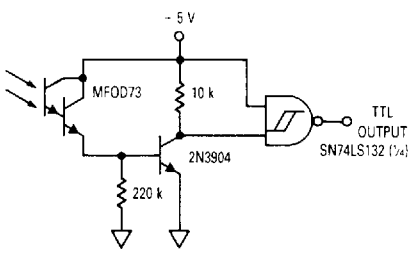


Figure 7. 1 kHz Darlington Receiver