MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

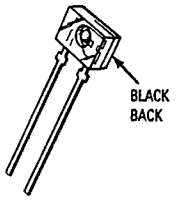
Photo Detector
Transistor Output

MRD701

**PHOTO DETECTOR
TRANSISTOR OUTPUT
NPN SILICON
30 VOLTS**

. . . designed for industrial processing and control applications such as light modulators, shaft or position encoders, end of tape detectors. The MRD701 is designed to be used with the MLED71 infrared emitter in optical slotted coupler/interrupter applications.

- Economical, Miniature Plastic Package
- Package Designed for Accurate Positioning
- Lens Molded into Package



CASE 349-01
PLASTIC

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Volts
Total Device Dissipation @ T_A = 25°C Derate above 25°C (Note 1)	P_D	150 2	mW mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−40 to +100	°C
Lead Soldering Temperature (5 sec max, 1/16" from case) (Note 2)	—	260	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Collector Dark Current (V_{CE} = 10 V, H ≈ 0)	I_D	—	—	100	nA
Collector-Emitter Breakdown Voltage (I_C = 10 mA, H ≈ 0)	$V_{(BR)CEO}$	30	—	—	Volts

OPTICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Collector Light Current (V_{CE} = 5 V, H = 500 μW/cm²)		I_L	100	500	—	μA
Turn-On Time	H = 5 mW/cm², V_{CC} = 5 V R_L = 2400 Ω	t_{on}	—	10	—	μs
Turn-Off Time		t_{off}	—	60	—	μs
Saturation Voltage (H = 10 mW/cm², I_C = 2 mA, V_{CC} = 5 V)		$V_{CE(sat)}$	—	0.25	0.4	Volts
Wavelength of Maximum Sensitivity		λ_s	—	0.8	—	μm

Notes: 1. Measured with device soldered into a typical PC board.
2. Heat sink should be applied to leads during soldering to prevent case temperature from exceeding 100°C.

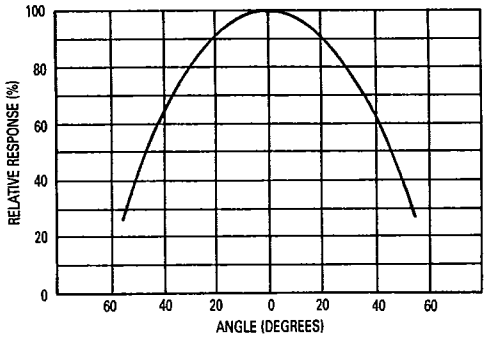


Figure 1. Angular Response

TYPICAL COUPLED CHARACTERISTICS USING MLED71 EMITTER AND MRD701 PHOTOTRANSISTOR DETECTOR

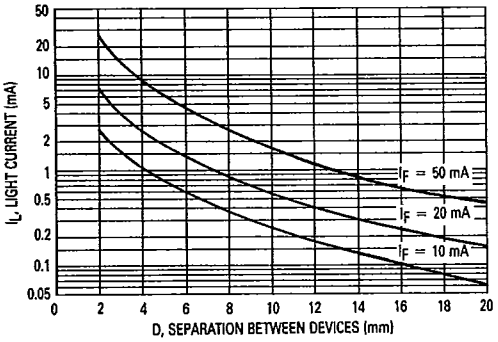


Figure 2. Continuous MRD701 Collector Light Current versus Distance from MLED71

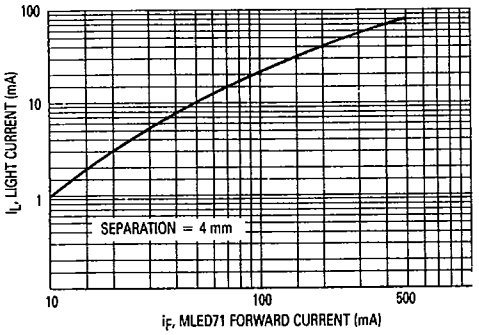
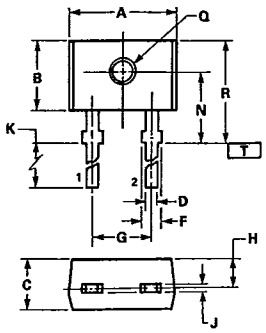


Figure 3. Instantaneous MRD701 Collector Light Current versus MLED71 Forward Current

OUTLINE DIMENSIONS



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NOTES:
1. DIMENSIONS A, B AND C ARE DATUMS
2. POSITIONAL TOLERANCE FOR Q DIMENSION: ⌖ | 0.25 (0.010) Ⓜ | -T- | A Ⓜ | C Ⓜ
3. POSITIONAL TOLERANCE FOR Q DIAMETER: ⌖ | 0.25 (0.010) Ⓜ | A Ⓜ | B Ⓜ
4. -T- IS SEATING PLANE.
5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.

STYLE 2:
PIN 1. EMITTER
2. COLLECTOR

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	3.43	4.60	0.135	0.185
B	2.79	3.30	0.110	0.130
C	2.03	3.18	0.080	0.125
D	0.43	0.60	0.017	0.024
F	1.14	1.40	0.045	0.055
G	2.54 BSC		0.100 BSC	
H	1.52 BSC		0.060 BSC	
J	0.23	0.56	0.009	0.022
K	12.83	19.05	0.505	0.750
N	3.05	3.30	0.120	0.130
Q	0.76	1.52	0.030	0.060
R	3.81	4.60	0.150	0.185