

# Photo Detector

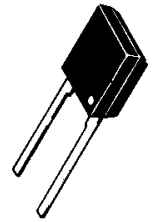
## Diode Output

This device is designed for infrared remote control and other sensing applications, and can be used in conjunction with the MLED81 infrared emitting diode.

- Low Cost
- Designed for Automated Handling and Accurate Positioning
- Sensitive Throughout the Near Infrared Spectral Range
- Infrared Filter for Rejection of Visible Light
- High Speed

**MRD821**

**PHOTO DETECTOR  
 DIODE OUTPUT**



**CASE 381-01**

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	35	Volts
Forward Current — Continuous	$I_F$	100	mA
Total Power Dissipation ( $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ )	$P_D$	150 3.3	mW mW/ $^\circ\text{C}$
Ambient Operating Temperature Range	$T_A$	-30 to +70	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 to +80	$^\circ\text{C}$
Lead Soldering Temperature, 5 seconds max, 1/16 inch from case	—	260	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
Dark Current ( $V_R = 10\text{ V}$ )	$I_D$	—	3	30	nA
Capacitance ( $f = 1\text{ MHz}$ , $V = 0$ )	$C_J$	—	175	—	pF

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

Characteristic	Symbol	Min	Typ	Max	Unit
Wavelength of Maximum Sensitivity	$\lambda_{max}$	—	940	—	nm
Spectral Range	$\Delta\lambda$	—	170	—	nm
Sensitivity ( $\lambda = 940\text{ nm}$ , $V_R = 20\text{ V}$ )	$S$	—	50	—	$\mu\text{A}/\text{mW}/\text{cm}^2$
Temperature Coefficient of Sensitivity	$\Delta S$	—	0.18	—	%/K
Acceptance Half-Angle	$\varphi$	—	$\pm 70$	—	$^\circ$
Short Circuit Current ( $E_v = 1000\text{ lux}^1$ )	$I_S$	—	50	—	$\mu\text{A}$
Open Circuit Voltage ( $E_v = 1000\text{ lux}^1$ )	$V_L$	—	0.3	—	V

NOTE 1.  $E_v$  is the illumination from an unfiltered tungsten filament source, having a color temperature of 2856K (standard light A, in accordance with DIN5030 and IEC publication 306-1).

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TYPICAL CHARACTERISTICS

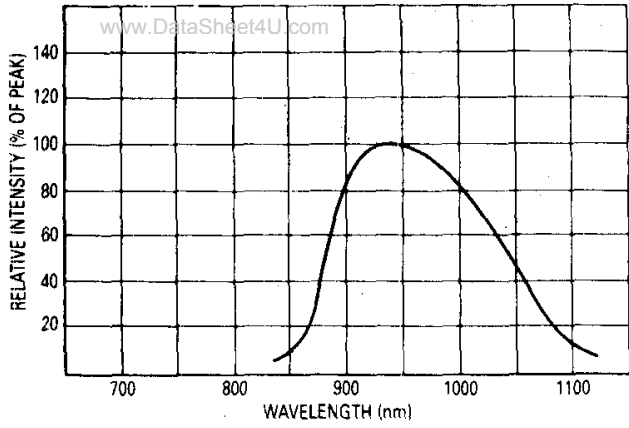


Figure 1. Relative Spectral Sensitivity

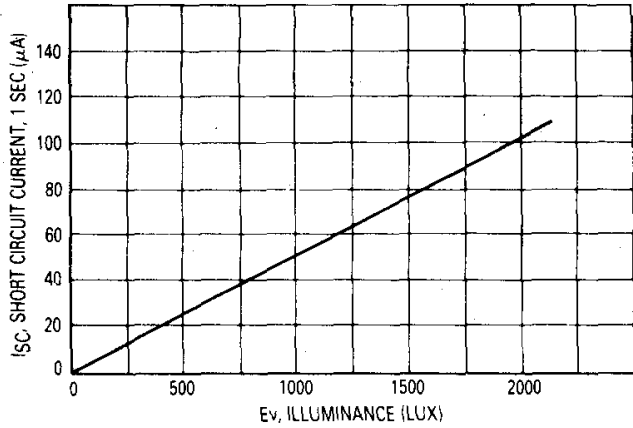


Figure 2. Short Circuit Current versus Illuminance

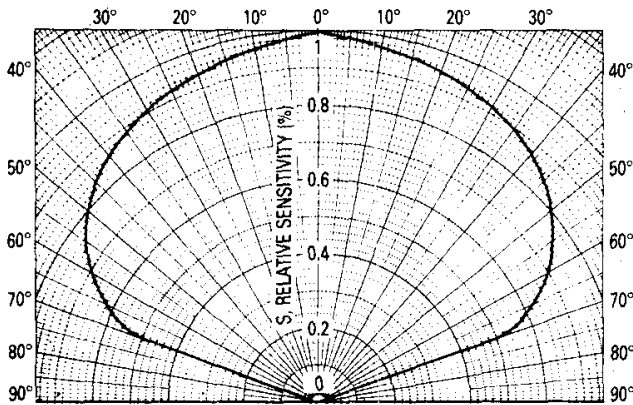


Figure 3. Angular Response

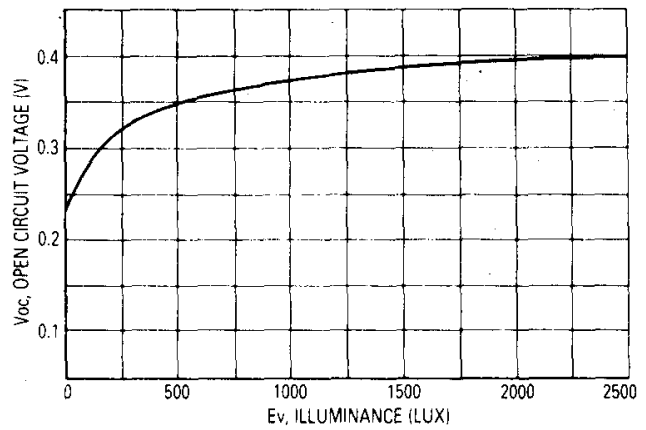


Figure 4. Open Circuit Voltage versus Illuminance

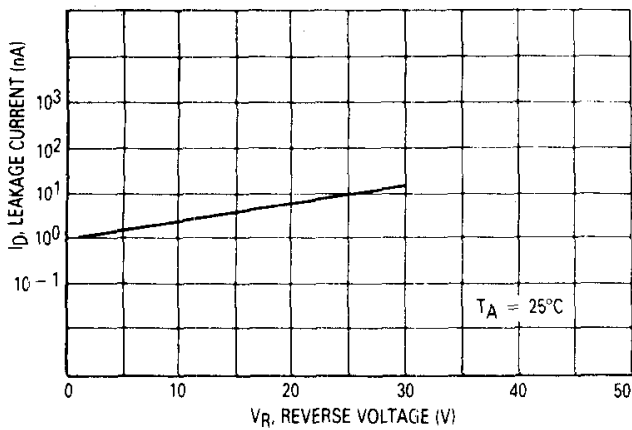


Figure 5. Dark Current versus Reverse Voltage

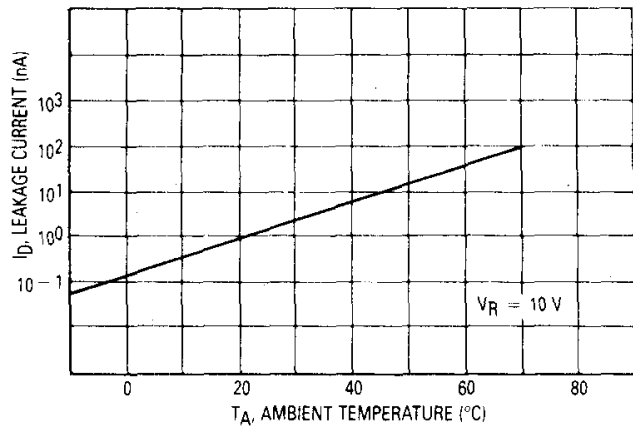


Figure 6. Dark Current versus Temperature

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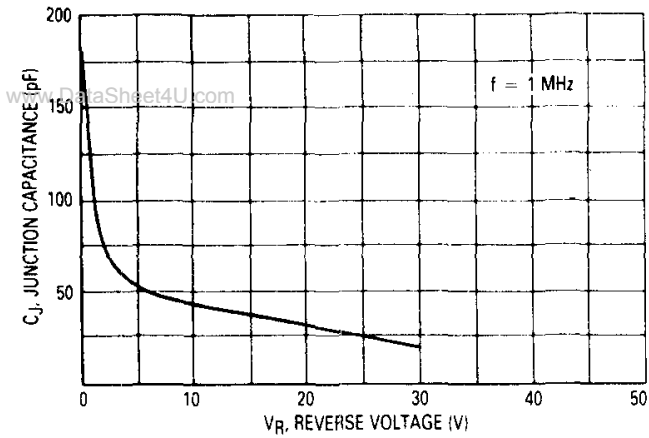


Figure 7. Capacitance versus Reverse Voltage

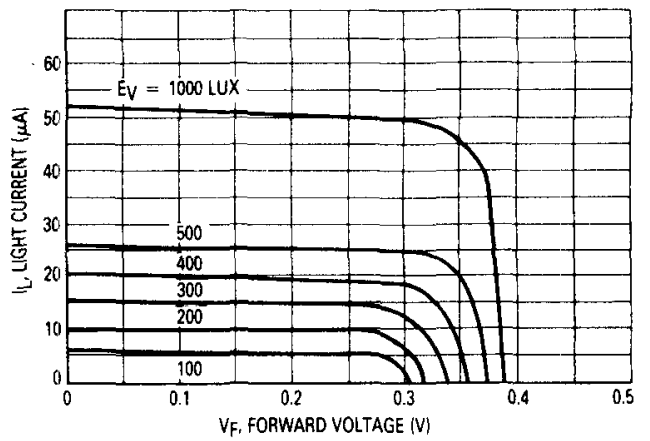


Figure 8. Light Current versus Forward Voltage

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OUTLINE DIMENSIONS

**CASE 381-01**

NOTES

- 1 DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 2 POSITIONAL TOLERANCE FOR LEAD DIMENSION D:  
 $\pm 0.25 (0.010) \text{ M T A M}$
- 3 CONTROLLING DIMENSION: INCH.

STYLE 1:  
 PIN 1, ANODE  
 2, CATHODE

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.81	7.21	0.268	0.284
B	7.80	8.20	0.307	0.323
C	2.59	2.99	0.102	0.118
D	0.51	0.76	0.020	0.030
G	5.28 BSC		0.208 BSC	
H	2.79	2.43	0.086	0.096
J	0.036	0.045	0.014	0.018
K	11.99	13.99	0.472	0.551
L	0.64	0.88	0.025	0.035
C1	1.30	1.49	0.051	0.059