MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

Infrared LED

MLED930

. . . designed for applications requiring high power output, low drive power and very fast response time. This device is used in industrial processing and control, light modulators, shaft or position encoders, punched card readers, optical switching, and logic circuits. It is spectrally matched for use with silicon detectors.

- High-Power Output — 4 mW (Typ) @ I_F = 100 mA, Pulsed
- Infrared-Emission — 940 nm (Typ)
- Low Drive Current — 10 mA for 450 μW (Typ)
- Popular TO-18 Type Package for Easy Handling and Mounting
- Hermetic Metal Package for Stability and Reliability

INFRARED
LED
940 nm

CONVEX
LENS

CASE 209-01
METAL

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Reverse Voltage	V_R	6	Volts
Forward Current — Continuous	I_F	60	mA
Forward Current — Peak Pulse (PW = 100 μs, d.c. = 2%)	I_F	1	A
Total Device Dissipation @ T_A = 25°C Derate above 25°C (Note 1)	P_D	250 2.27	mW mW/°C
Operating Temperature Range	T_A	−55 to +125	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

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

Characteristic	Fig. No.	Symbol	Min	Typ	Max	Unit
Reverse Leakage Current (V_R = 3 V)	—	I_R	—	2	—	nA
Reverse Breakdown Voltage (I_R = 100 μA)	—	$V_{(BR)R}$	6	20	—	Volts
Forward Voltage (I_F = 50 mA)	2	V_F	—	1.32	1.5	Volts
Total Capacitance (V_R = 0 V, f = 1 MHz)	—	C_T	—	18	—	pF

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

Total Power Output (Note 2) (I_F = 60 mA, dc) (I_F = 100 mA, PW = 100 μs, duty cycle = 2%)	3, 4	P_O	— 1	2.5 4	— —	mW
Radiant Intensity (Note 3) (I_F = 100 mA, PW = 100 μs, duty cycle = 2%)	—	I_O	—	1.5	—	mW/ steradian
Peak Emission Wavelength	1	λP	—	940	—	nm
Spectral Line Half Width	1	$\Delta\lambda$	—	40	—	nm

Notes: 1. Printed Circuit Board Mounting
2. Power Output, P_O, is the total power radiated by the device into a solid angle of 2π steradians. It is measured by directing all radiation leaving the device, within this solid angle, onto a calibrated silicon solar cell.
3. Irradiance from a Light Emitting Diode (LED) can be calculated by:

$$H = \frac{I_e}{d^2}$$

where H is irradiance in mW/cm^2; I_e is radiant intensity in mW/steradian; d^2 is distance from LED to the detector in cm.

MLED930

TYPICAL CHARACTERISTICS

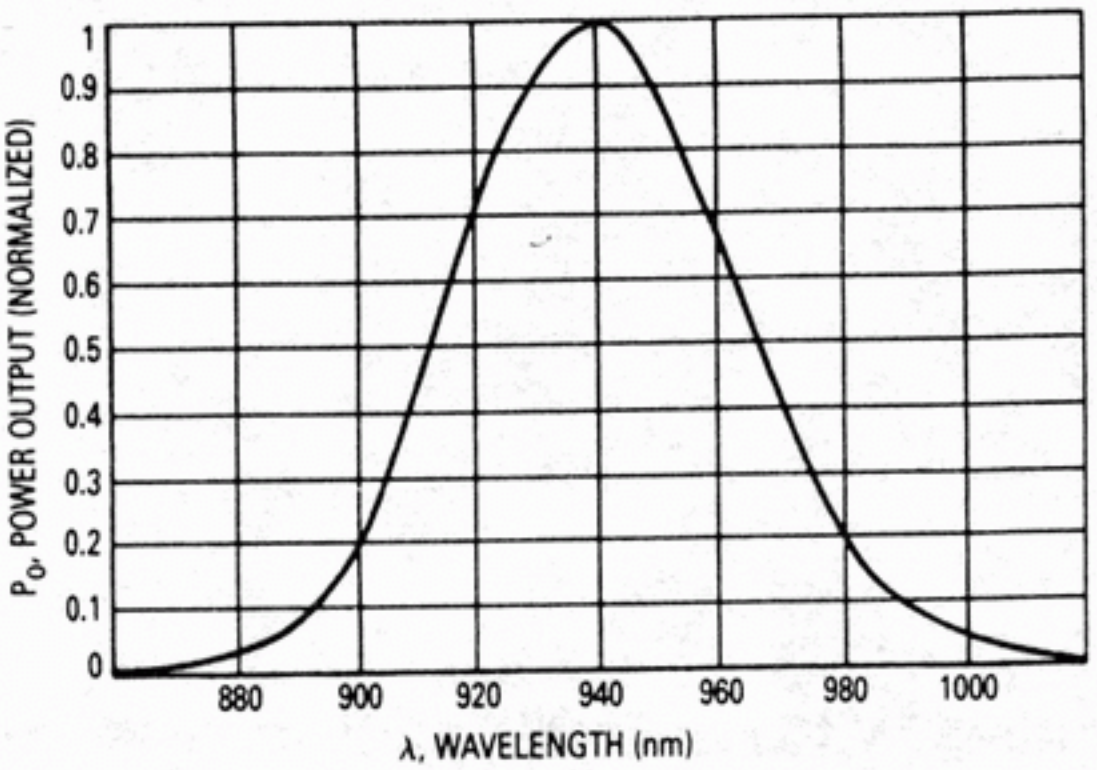


Figure 1. Relative Spectral Output

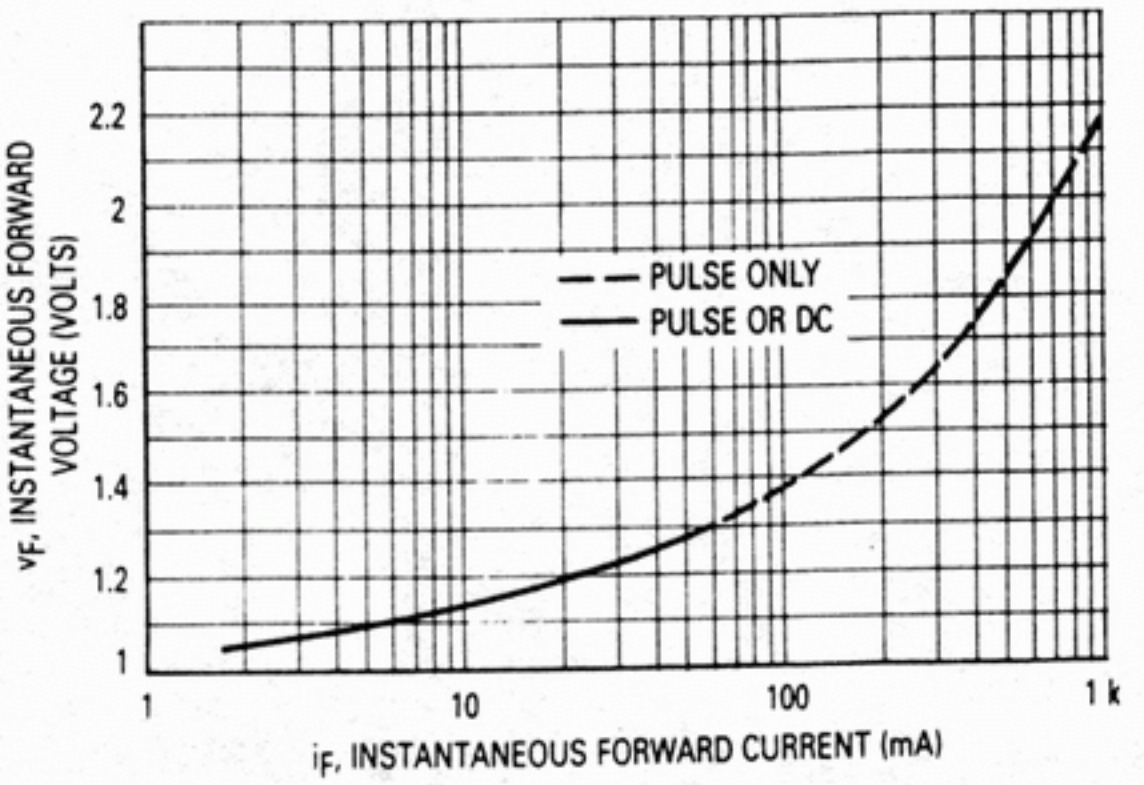


Figure 2. Forward Characteristics

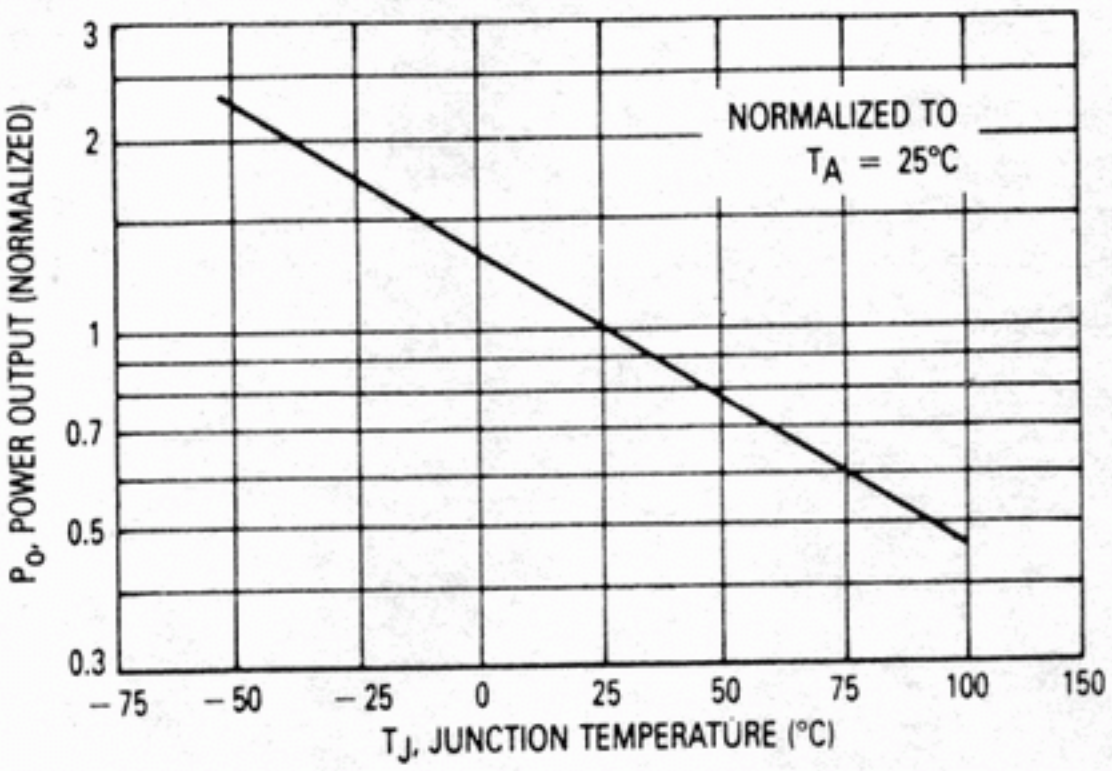


Figure 3. Power Output versus Junction Temperature

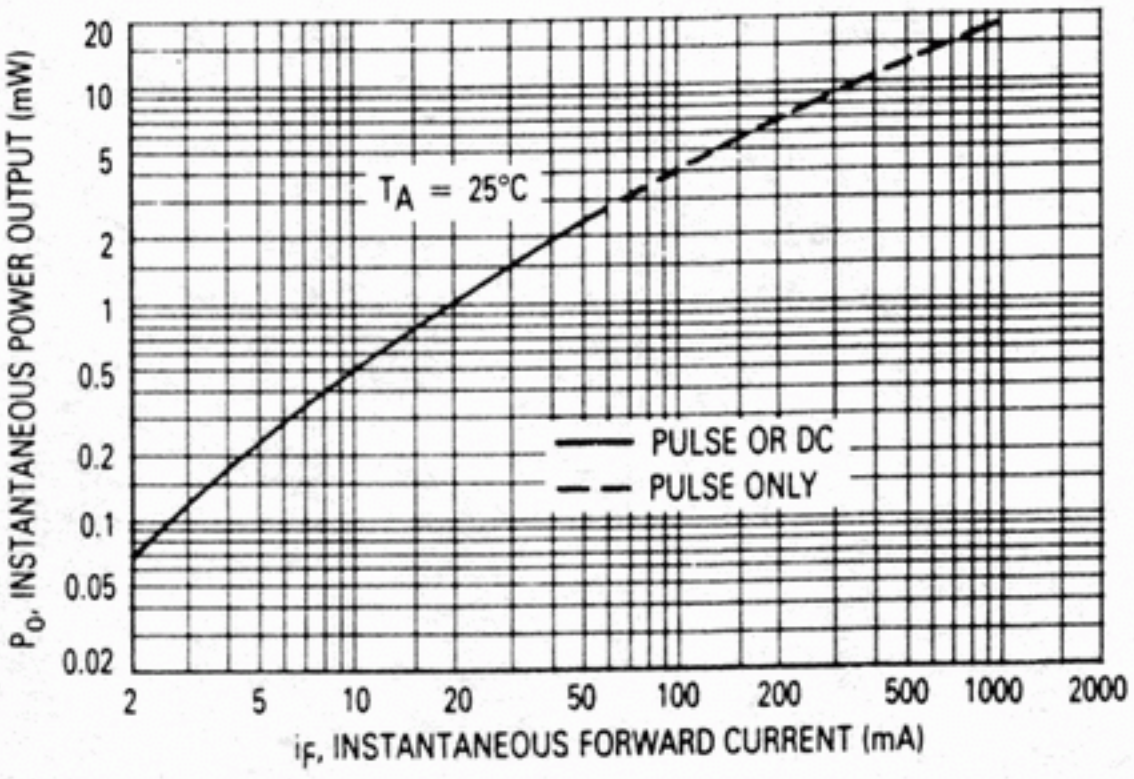


Figure 4. Instantaneous Power Output versus Forward Current

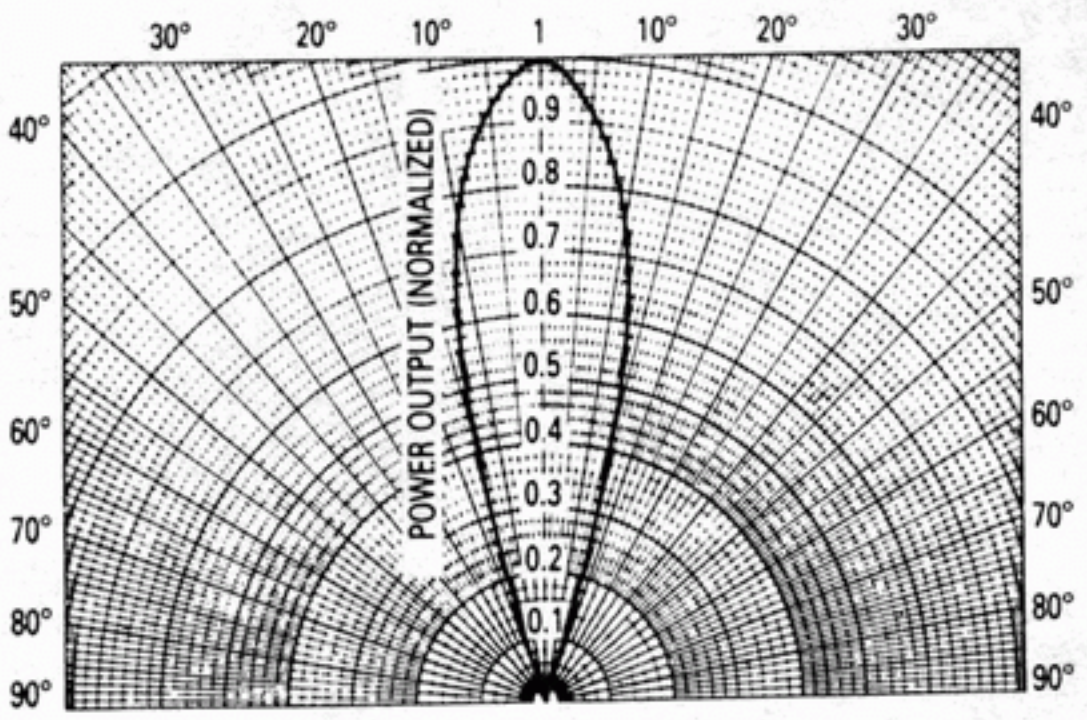
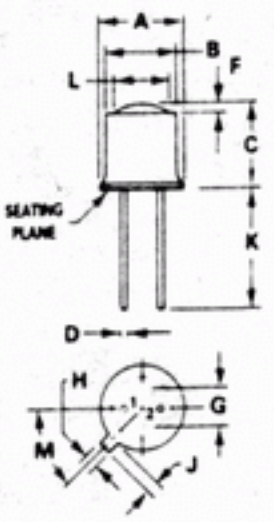


Figure 5. Spatial Radiation Pattern

OUTLINE DIMENSIONS

NOTES:
1. PIN 2 INTERNALLY CONNECTED TO CASE
2. LEADS WITHIN 0.13 mm (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	5.08	6.35	0.200	0.250
D	0.41	0.48	0.016	0.019
F	0.51	1.02	0.020	0.040
G	2.54 BSC		0.100 BSC	
H	0.99	1.17	0.039	0.046
J	0.84	1.22	0.033	0.048
K	12.70	—	0.500	—
L	3.35	4.01	0.132	0.158
M	45° BSC		45° BSC	



STYLE 1:
PIN 1. ANODE
2. CATHODE

CASE 209-01
METAL