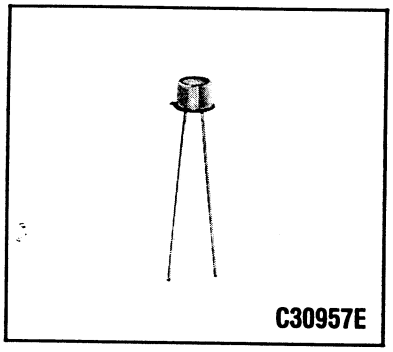
EG&G CANADA LTD.
Optoelectronics Division
Formerly RCA
Effective January 1, 1991

Photodiode C30957E

DATA SHEET



n-Type Silicon p-i-n Photodetector

- Detector Chip Close to Window
- Low Operating Voltage — V_R = 45 V
- Anti-Reflection Coated to Enhance Responsivity at 900 nm
- Hermetically-Sealed Package
- Spectral Response Range — (10% points) 400 to 1100 nm

RCA Type C30957E is an n-type Silicon p-i-n Photodiode designed for use in a wide variety of broad band low light level applications covering the spectral range from below 400 to over 1100 nanometers.

These characteristics make this device highly useful in HeNe and GaAs laser detection systems and in optical demodulation, data transmission, ranging, and high-speed switching applications.

Absolute Maximum Ratings

Limiting Values

DC Reverse Operating Voltage, V_R . . . . . 100 max. V

Photocurrent Density, j_p, at 22°C:
- Average value, continuous operation 5 mA/mm²
- Peak value . . . . . 20 mA/mm²

Forward Current, I_F:
- Average value, continuous operation 10 max. mA
- Peak value . . . . . 100 max. mA

Ambient Temperature:
- Storage, T_{stg} . . . . . −60 to +100°C
- Operating, T_A . . . . . −40 to + 80°C
- Soldering:
  - For 5 seconds . . . . . 200°C

Mechanical Characteristics

Photosensitive Surface:
- Shape . . . . . Circular
- Useful area . . . . . 0.8 mm²
- Useful diameter . . . . . 1.0 mm

Optical Characteristics

Field of View:[1]
- Full angle (∝) for totally illuminated photosensitive surface . . . . . 100 deg
- Full angle (∝) for partially illuminated photosensitive surface . . . . . 114 deg

Electrical Characteristics[2]

	Min.	Typ.	Max.	Units
Breakdown Voltage, V_{BR}	100	—	—	V
Responsivity:				
At 900 nm	0.5	0.6	—	A/W
At 1060 nm	0.1	0.15	—	A/W
Luminous Respons. (2856 K)	—	8.5	—	mA/lm
Quantum Efficiency:				
At 900 nm	70	83	—	%
At 1060 nm	12	17	—	%
Dark Current, I_d:				
At V_R = 10V	—	2×10^{-9}	1×10^{-8}	A
At V_R = 45V	—	1×10^{-8}	5×10^{-8}	A
See Figure 2				
Noise Current, i_n: f = 10 kHz, Δf = 1.0 Hz . . . . See Figure 3	—	6×10^{-14}	4×10^{-13}	A/Hz$^{1/2}$
Capacitance, C_d . . See Figure 4	—	2.5	3.0	pF
Rise Time, t_r: R_L = 50Ω, λ = 900 nm, 10% to 90% pts	—	3	7	ns
Fall Time: R_L = 50Ω, λ = 900 nm, 90% to 10% pts	—	6	10	ns

[1] The values specified for field of view are approximate and are critically dependent on the dimensional tolerances of the package component parts.

[2] At T_A = 22°C and V_R = 45 V, unless otherwise specified. The recommended range of reverse operating voltage V_R at 22°C is 0 to 50 V. However, when the device is operated in the photovoltaic mode, i.e., at V_R = 0 V, some of the electrical characteristics will differ from those shown.

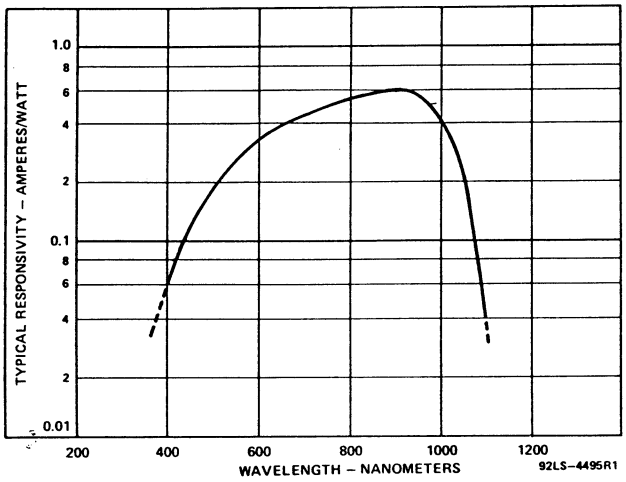


Figure 1 - Typical Spectral Responsivity Characteristic

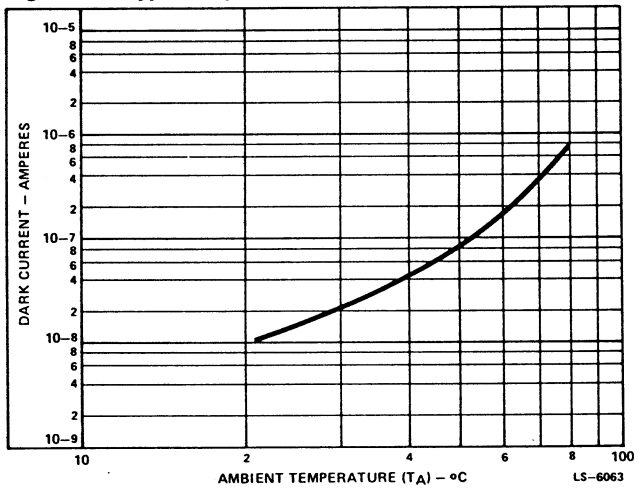


Figure 2 - Typical Dark Current vs Ambient Temperature

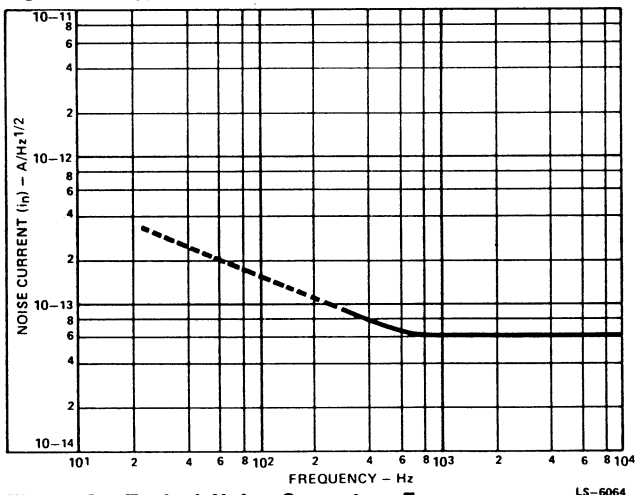


Figure 3 - Typical Noise Current vs Frequency

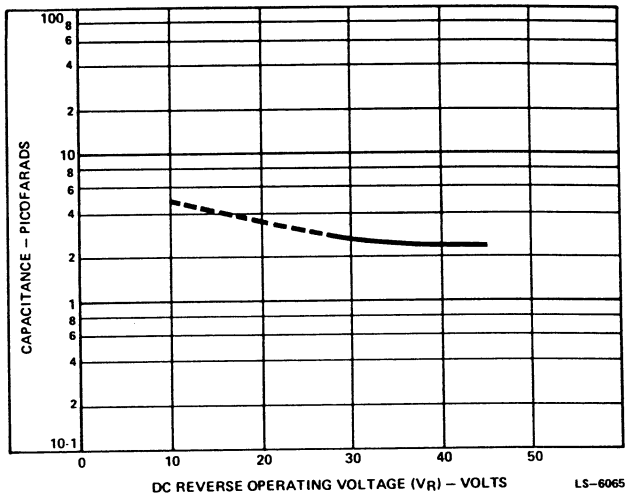
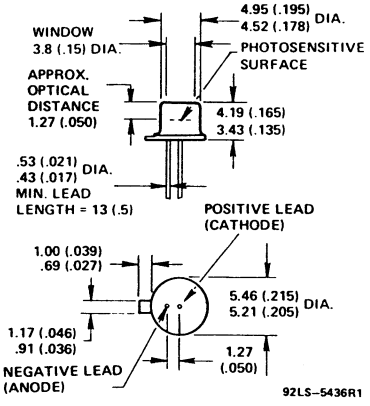


Figure 4 - Typical Photodiode Capacitance vs Operating Voltage



Modified TO-18 Package

Note: Optical distance is defined as the distance from the surface of the silicon chip to the front surface of the window.

Figure 5 - Dimensional Outline

Warning — Personal Safety Hazards

Electrical Shock — Operating voltages applied to this device present a shock hazard.

Dimensions in millimeters. Dimensions in parentheses are in inches.

For further information, please contact your local RCA Electro Optics representative or
ınada J7V 7X3

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