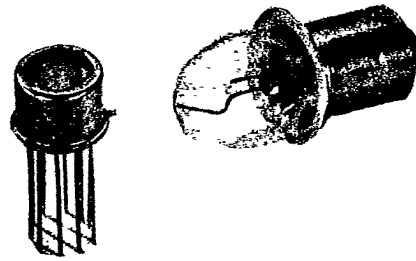
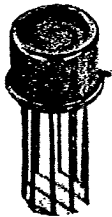


DEVAR

TYPE 509

Photo Diode Optical Detector with Integral Amplifier



A high performance Photo Diode and Microcircuit Amplifier housed in a single TO-5 package.

The integrated photo-detector/amplifier combination offers lowest noise, greatest precision, and smallest size in comparison with conventional optical detectors.

- Sensitivities to 10^{-12} watts
- Silicon Photo Detector offers Spectral Range 0.35 to 1.12 microns
- 7 Decade Linear Dynamic Range
- Bandwidths from DC to 10 MHz
- Output Noise less than 1 millivolt over full bandwidth
- NEP's to 10^{-12} watts/ $\sqrt{\text{Hz}}$
- Large Detector Active Area, 10 mm^2

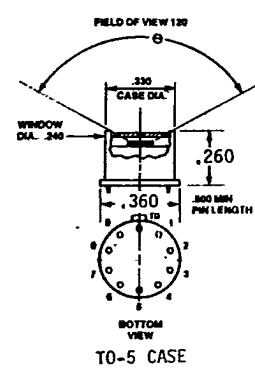
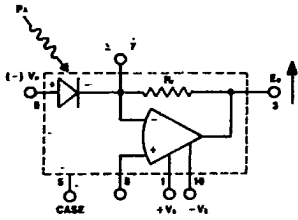
CUSTOM FILTER OPTION AVAILABLE

PHOTO DETECTOR WITH AMPLIFIER

T-41-67

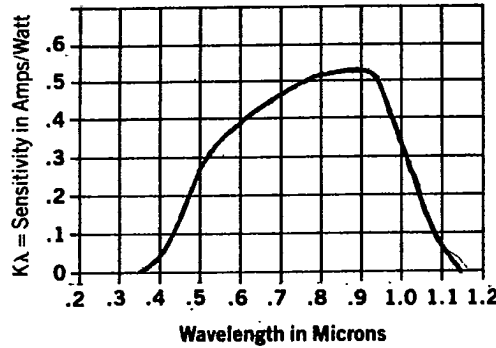
DEVAR

TYPE 509

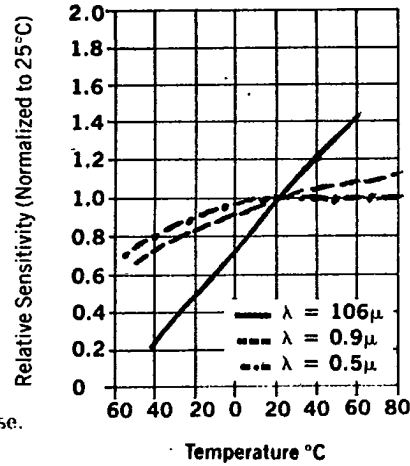


TO-5 CASE
ALL DIMENSIONS ARE IN INCHES

SPECTRAL RESPONSE vs. WAVELENGTH



RELATIVE SENSITIVITY vs. AMBIENT TEMPERATURE



APPLICATION NOTES

- Return Pins 8 and 5 to Supply Common for lowest noise.
- Offset may be zeroed with a Pot or Divider at Pin 8.
- Output at Pin 3 is Positive going with light.
- Return Pin 9 to Common or to a *Minus* Bias Voltage only.
- A small C_f (across R_f) may be required to reduce overshoot on some applications.

CHARACTERISTICS T_A = 25°C V_S = +15V.

PARAMETER	UNITS	509-01	509-1	509-10	509-50	CONDITIONS
Feedback Resistor [#] R _F	Megohms	0.1	1	10	50	
Responsivity R	Volts/Watt	4 x 10 ⁴	4 x 10 ⁵	4 x 10 ⁶	2 x 10 ⁷	λ = 0.8 MICRON V = 0V.
Bandwidth, 3dB BW	Hertz	—	40K	10K	4K	V _D = 0V.
Risetime, 10-90% T _R	Micro-seconds	—	8	30	90	V _D = 0V.
		0.3	3	20	—	V _D = -15V.
Slew Rate dE ₀ /dt	Volts/μsec	35	0.3	0.3	0.3	LARGE SIGNAL, R _L = 2K OHMS
Output Noise e _{n0}	Millivolts, RMS	—	0.6	0.7	0.8	V _D = 0V.
		0.8	0.4	0.6	—	V _D = -15V.
Dark Offset E _{0D}	Millivolts	—	2	10	50	V _D = 0V.
		10	8	100	—	V _D = -15V.
Dark Offset Temp. Coeff. (Avg.)	Millivolts per °C	—	0.06	0.6	3	V _D = 0V.
		0.4	4	40	—	V _D = -15V.
Output Impedance, R ₀	Ohms	<0.1	<0.1	<0.1	<0.1	0 TO 100 Hz
Output Current, I ₀	Milli-amperes	±15	±5	±5	±5	E ₀ ± 10V.
Bias Voltage, V _D	Volts	← 0 TO - 50 VOLTS MAX. →				
Supply Current, I _S	Milli-amperes	≤4	≤0.8	≤0.8	≤0.8	V _S ± 5 TO ± 20V.
Temperature T _A	°C	← 0 to + 70° OPERATING - 25 to + 100°C STORAGE →				



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