Custom Spectral Response

Advanced Detector Corporation offers devices with optimized spectral response in the UV, blue, or red spectral regions.

Custom spectral response is achieved using glass or interference filters which provide the optics engineer with control of device responsivity characteristics.

Military/Aerospace Products

Advanced Detector Corporation has provided high reliability products to the military and aerospace industry for decades. Our quality assurance program has been developed to meet the requirements of Mil-Q-9858A. ADC's quality assurance program, described in document ADC 91-6064, outlines the quality assurance policies implemented on all products and is available upon request.

In addition to our standard quality program, additional Mil-spec tests include reverse or forward bias, burn-in, gross and fine leak tests, acceleration, vibration, shock, humidity, thermal cycle and thermal shock.

Like all other ADC products, custom capability is readily available including application and design assistance.

Calibration Services

Advanced Detector Corporation offers calibration services for ADC and other photodiodes, sunsensors and solar cells in the near-ultraviolet, visible and near-infrared wavelength regions. A general description of the different calibration services is listed below.

Absolute Responsivity

Absolute responsivity is defined as the short-circuit current for a given light input power at a specific wavelength.

This parameter is often a critical specification for a photodiodes in electro-optic systems, but standards are not readily available. For this reason ADC offers an NBS-traceable calibration service for photodiodes.

This service consists of measuring the absolute response of photodiodes using a 23-wavelength filter wheel with a mercury-xenon light source covering a wavelength range of 200 nm to 1100 nm. The light source is continuously monitored using computerized instrumentation operated on an IEEE-488 computer bus. The system has a reproducibility of responsivity measurement typically ± 0.1%. The absolute responsivity accuracy is limited by the absolute accuracy of the NBS responsivity transfer standards, typically ± maximum error. Data curves and a tabular presentation of the results are provided, along with a summary of standard performance parameters including capacitance, dark current, shunt resistance, and breakdown voltage.

A second method, which is based on NBS-traceable electrical substitution radiometry, is also available at discrete wavelengths. This calibration can have an absolute accuracy within ± 0.2% maximum error depending on the test wavelength. Limited wavelengths are available since this calibration technique requires the stable, collimated light source typical of HeNe lasers.

100% Quantum Efficiency Device

A unique photodiode assembly designed by ADC offers 100% *external* (+0%, −2%) quantum efficiency from 550nm to 950 nm. The fact that it is 100% efficient in converting optical power to electrical current makes its calibration independent of any other standards. The responsivity (R) is simply:

$$R = L/1.24$$

where R is measured in amperes per watt and the wavelength L is between 0.550 and 0.950 microns. For more information, refer to the section on custom spectral response photodiodes.

CUSTOM SPECTRAL RESPONSE

TYPE NUMBER	PACKAGE OUTLINE	ELEMENT DIMENSIONS (mm^2)	PHOTO-SENSITIVE AREA (mm)	RESPONSE CURVE TYPE	RESPONSE RANGE (nm)	PEAK WAVE-LENGTH (nm)	RESPONSIVITY[1] PEAK (A/W)
33PSF105M	C16	2.3 x 2.3	5.2	F1	380-480	440	0.13
33PSF205M	C16	2.3 x 2.3	5.2	F2	690-1050	730	0.55
33PSF305M	C16	2.3 x 2.3	5.2	F3	810-1060	970	0.52
33PSF405M	C16	2.3 x 2.3	5.2	"CIE"	480-660	540	0.23
100QE	C4	6.3 DIAM	31	100QE	190-1100	975	0.74

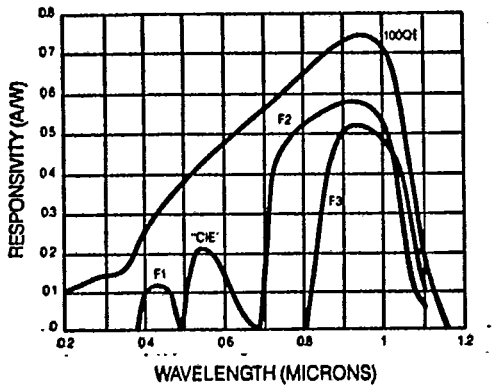
1) MINIMUM RESPONSIVITY IS 90% OF TYPICAL RESPONSIVITY.

MILITARY/AEROSPACE (MIL-STD.)

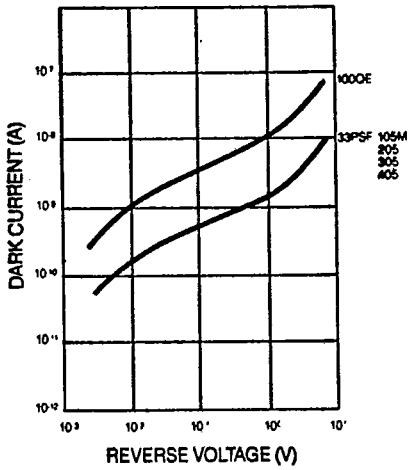
TYPE NUMBER	PACKAGE OUTLINE	ELEMENT DIMENSIONS (mm^2)	PHOTO-SENSITIVE AREA (mm)	RESPONSE CURVE TYPE	RESPONSE RANGE (nm)	PEAK WAVE-LENGTH (nm)	RESPONSIVITY[1] 550 nm (A/W)	RESPONSIVITY[1] PEAK (A/W)	Isc[2] (mA)
33PH05MIL	T05	2.3 X 2.3	5.2	R70G	320-1100	9500	0.31	0.57	160
25PDU05MIL	T05/3	2.3 x 1.3	3.2	R70G	320-1100	950	0.31	0.57	96
11PS18MIL	T018/3	1.0 x 1.0	1.0	R70G	320-1100	950	0.31	0.57	30

1) MINIMUM RESPONSIVITY IS 90% OF TYPICAL RESPONSIVITY. 2) SHORT CIRCUIT CURRENT (Isc) IS MEASURED WITH 10 mW/cm² OF OPTICAL POW FROM A TUNGSTEN LIGHT SOURCE OPERATED AT 2800 degK TEMPERATURE.

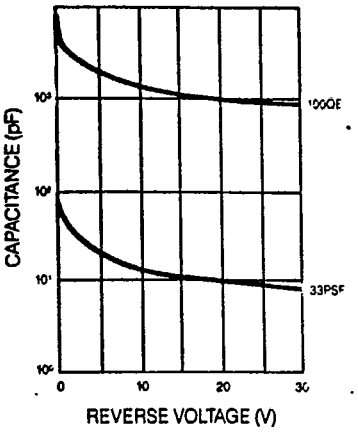
RESPONSIVITY CURVES (TYPICAL)



DARK CURRENT vs. VOLTAGE



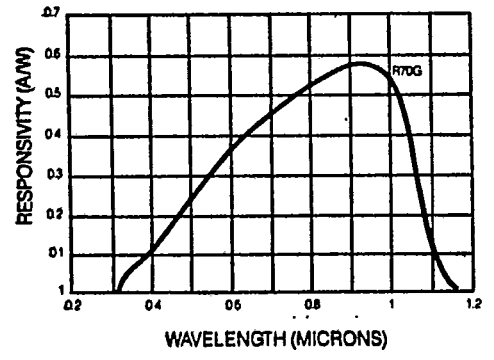
CAPACITANCE vs. VOLTAGE



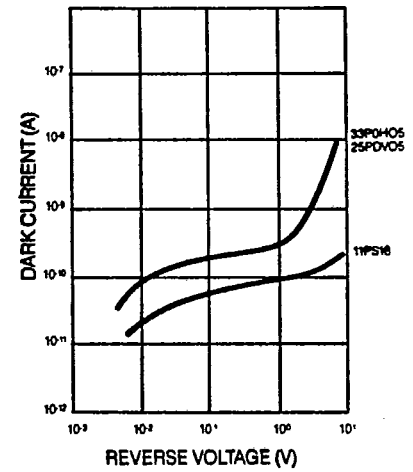
V_R= -0.01V MAX. (nA)	DARK CURRENT V_R= -1.0V MAX. (nA)	V_R= -10V MAX. (nA)	BREAKDOWN VOLT. I_{DR}=10μA MIN. (V)	SHUNT RESISTANCE TYP. (Mohm)	TYPICAL CAPACITANCE V_R= 0V (pF)	V_R= -1V (pF)	V_R= -10V (pF)	RISETIME[2] V_R= 0, (ns)	V_R= -10 V (ns)	NEP TYP. (W$\sqrt{Hz}$)	D* TYP. (cm$\sqrt{Hz}$/W)
0.33	6.0	14	50	60	114	55	19	450	3	1.6E-14	1.4E+13
0.33	6.0	14	50	60	114	55	19	450	3	1.6E-14	1.4E+13
0.33	6.0	14	50	60	114	55	19	450	3	1.6E-14	1.4E+13
0.33	6.0	14	50	60	114	55	19	450	3	1.6E-14	1.4E+13
20	100	5000	15	10	8800	4200	1500	2000	200	4.0E-14	1.4E+13

2) 50 OHM LOAD λ = 800 nm

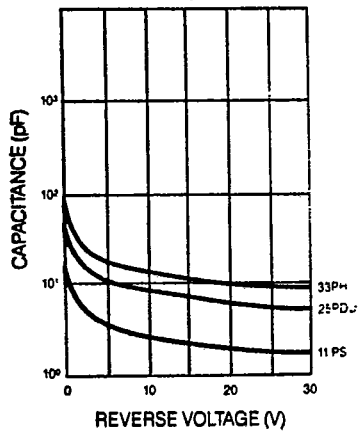
RESPONSIVITY CURVES (TYPICAL)



DARK CURRENT vs. VOLTAGE

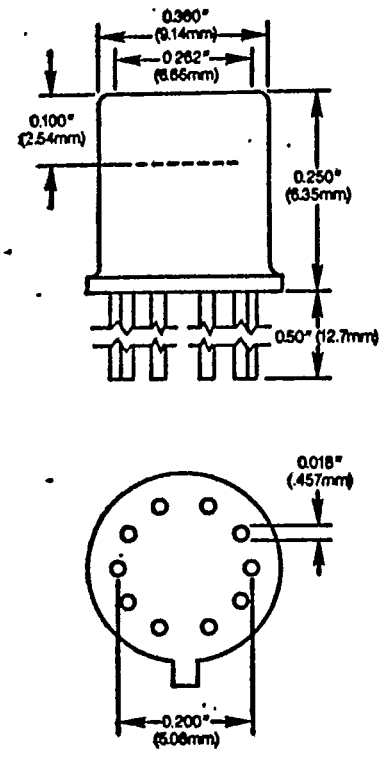


CAPACITANCE vs. VOLTAGE

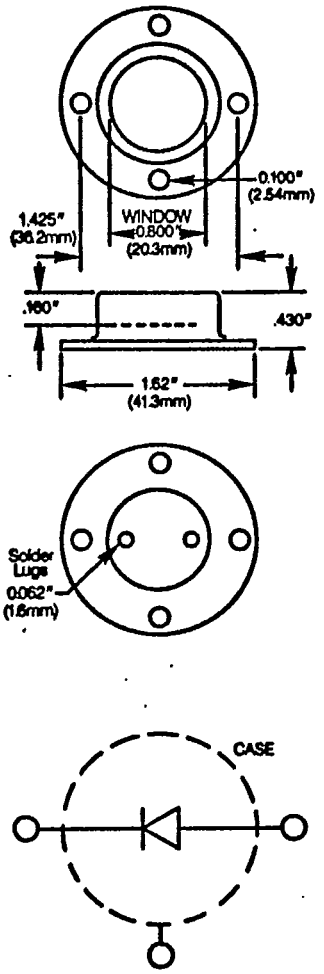


V_R= -0.01V MAX. (nA)	DARK CURRENT V_R= -1.0V MAX. (nA)	V_R= -10V MAX. (nA)	BREAKDOWN VOLT. I_{DR}=10μA MIN. (V)	SHUNT RESISTANCE TYP. (Mohm)	TYPICAL CAPACITANCE V_R= 0V (pF)	V_R= -1V (pF)	V_R= -10V (pF)	RISETIME[3] V_R= 0, (ns)	V_R= -10 V (ns)	NEP TYP. (W$\sqrt{Hz}$)	D* TYP. (cm$\sqrt{Hz}$/W)
0.20	0.50	25 (V_R= -5V)	50	100	125	56	19	450	3	1.3E-14	1.8E+13
0.20	0.50	50.00	50	100	77	34	12	450	3	1.3E-14	1.4E+13
0.05	0.20	0.40	100	400	24	11	4	450	2	6.3E-15	1.6E+13

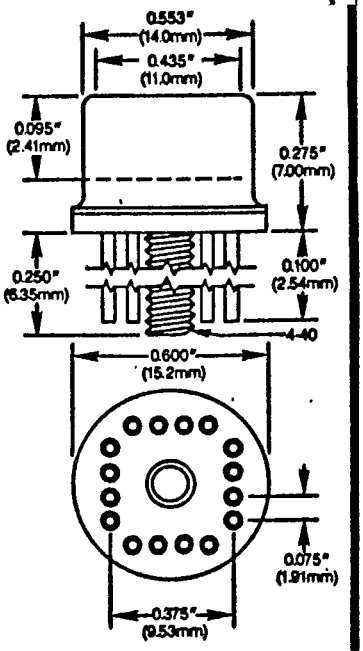
3) 50 OHM LOAD λ = 800 nm



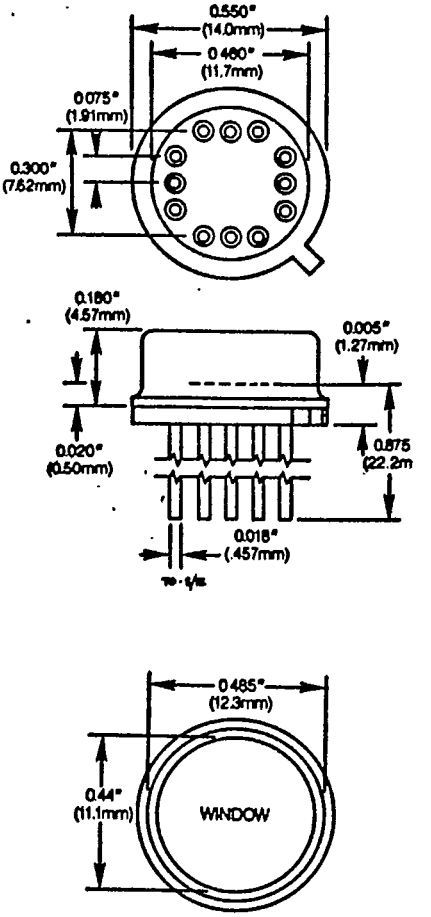
TO-74



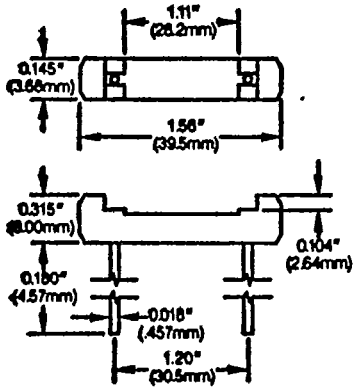
TO-3/3



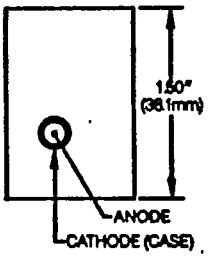
TO-8/16

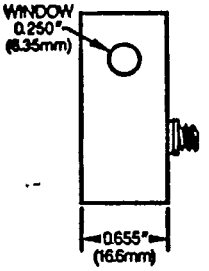


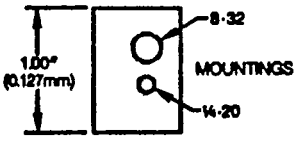
TO-8/12



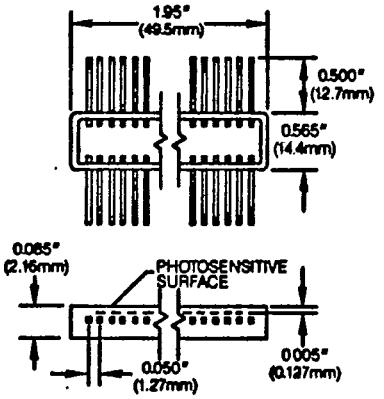
C1



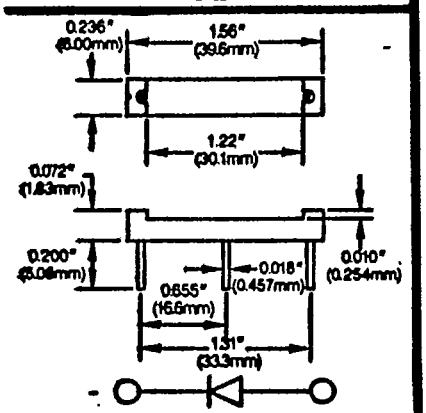




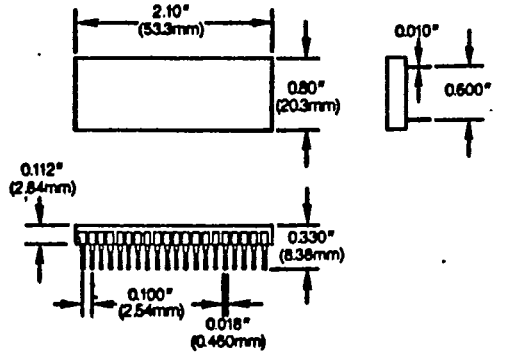
C4



C5



C2



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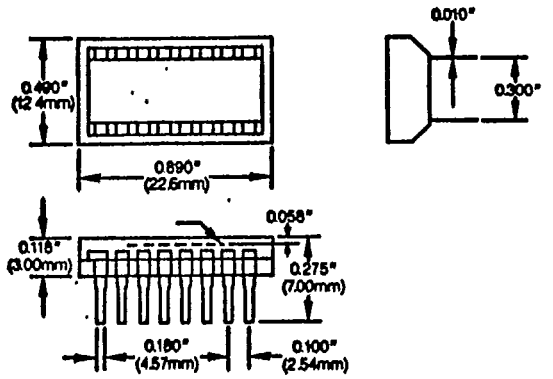
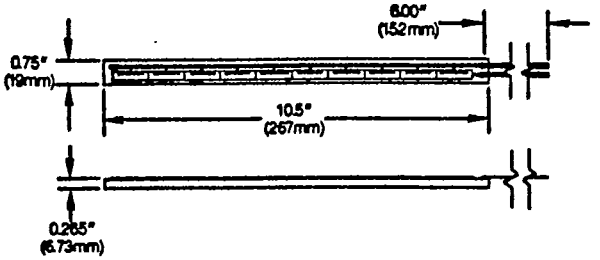
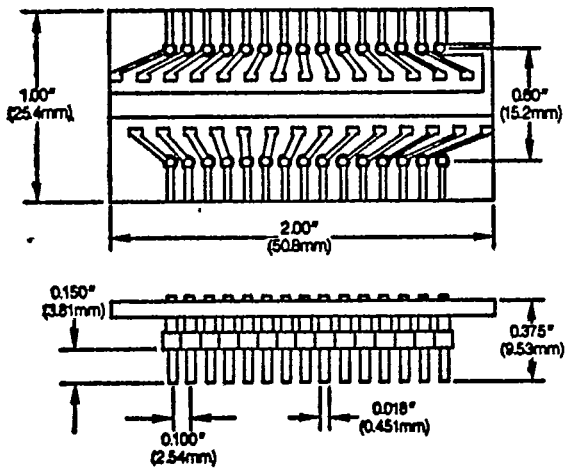


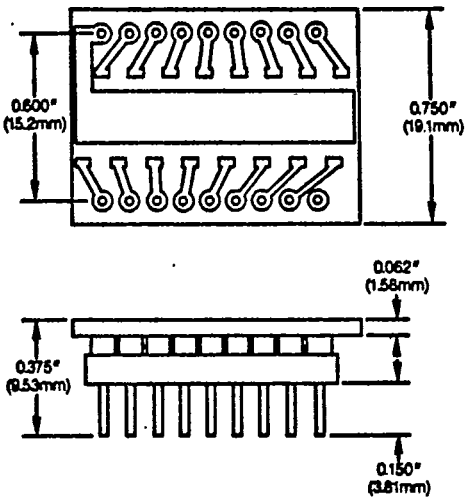
C7



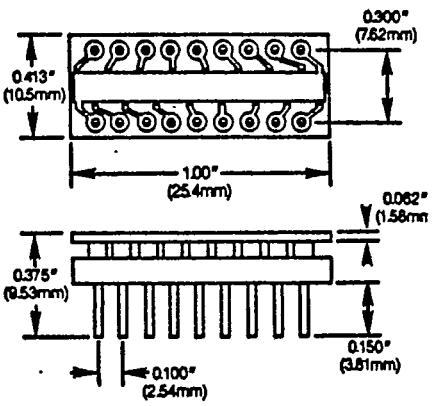
C8



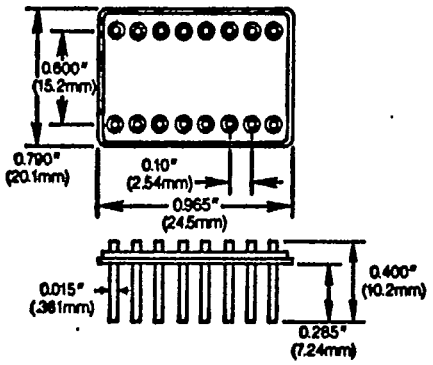
C9



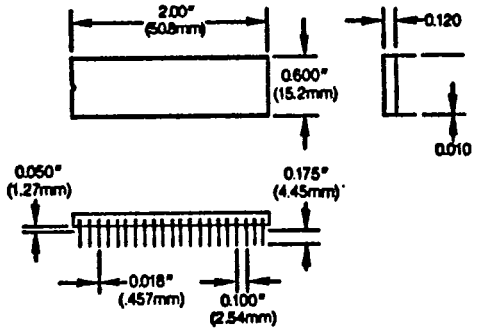
C10



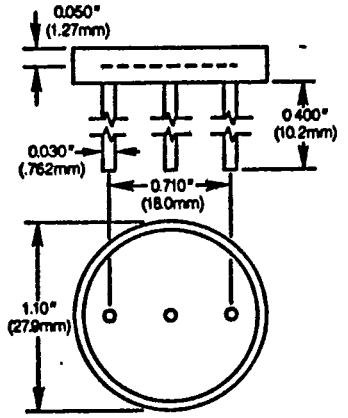
C11



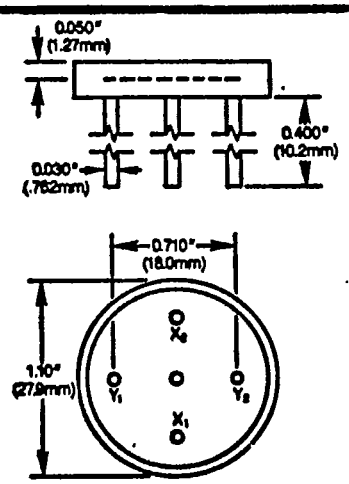
C12



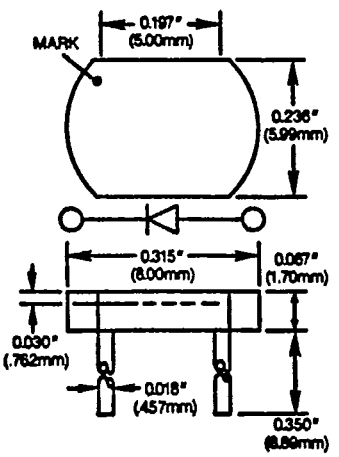
C13



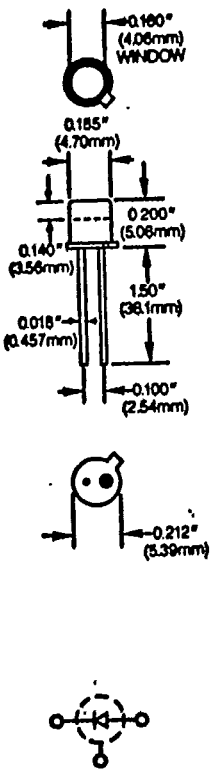
C14



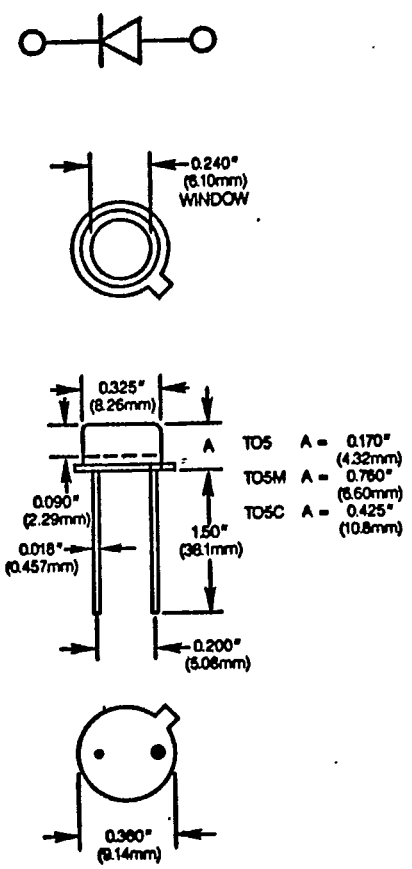
C15



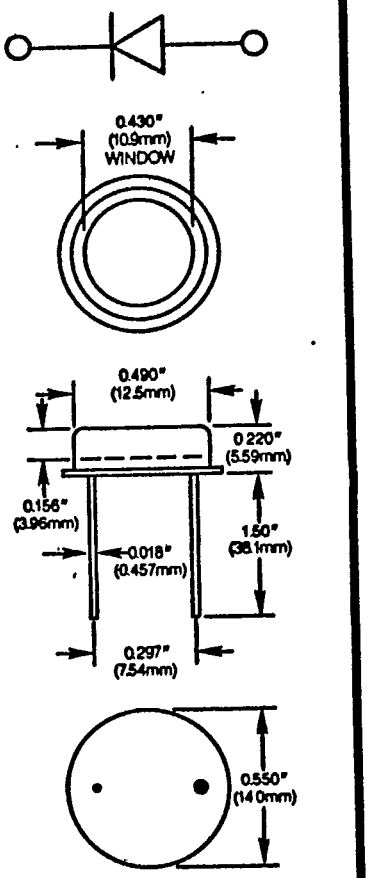
C16



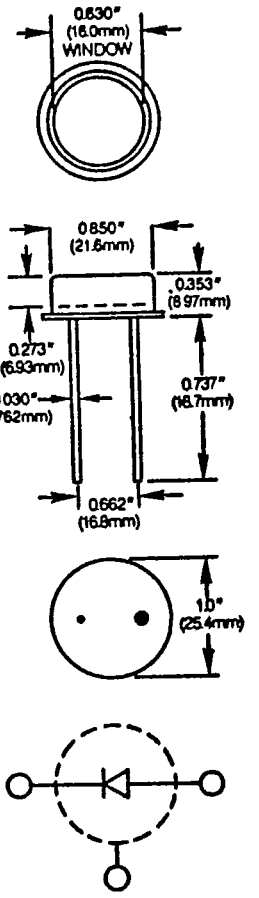
TO-18



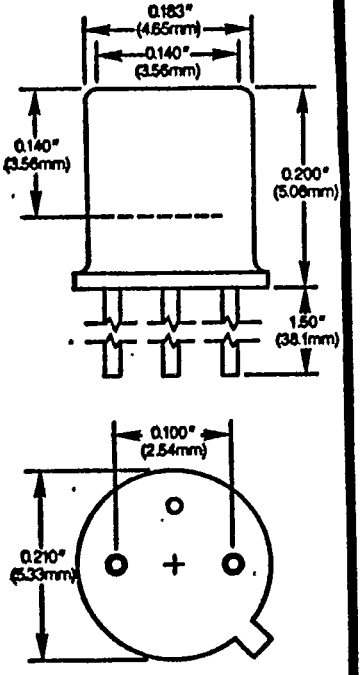
TO-5



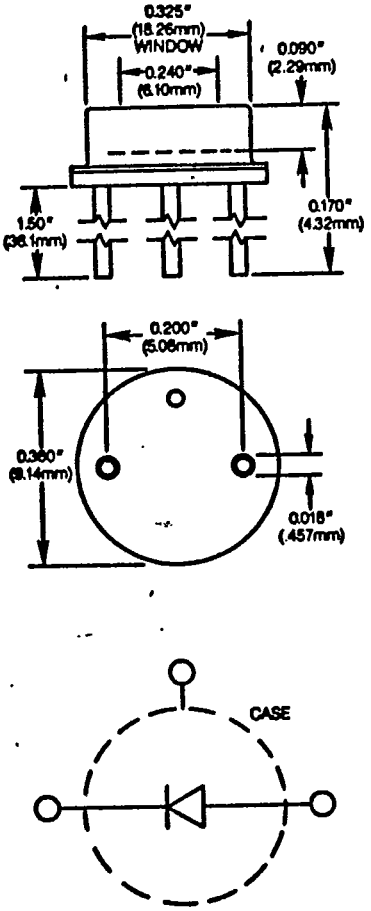
TO-8



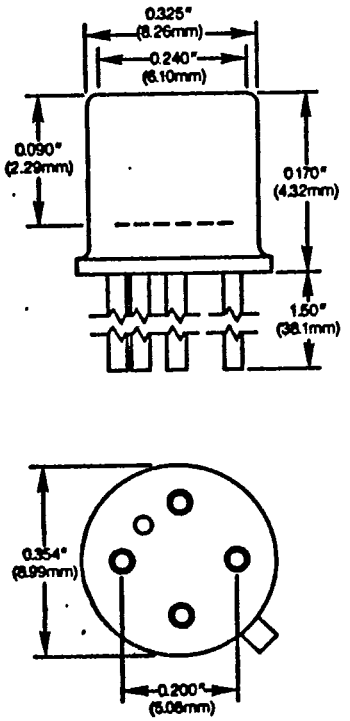
TO-3



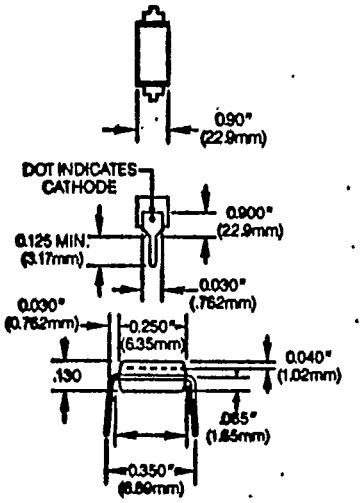
TO-18/3



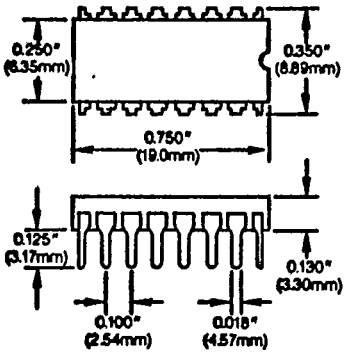
TO-5/3



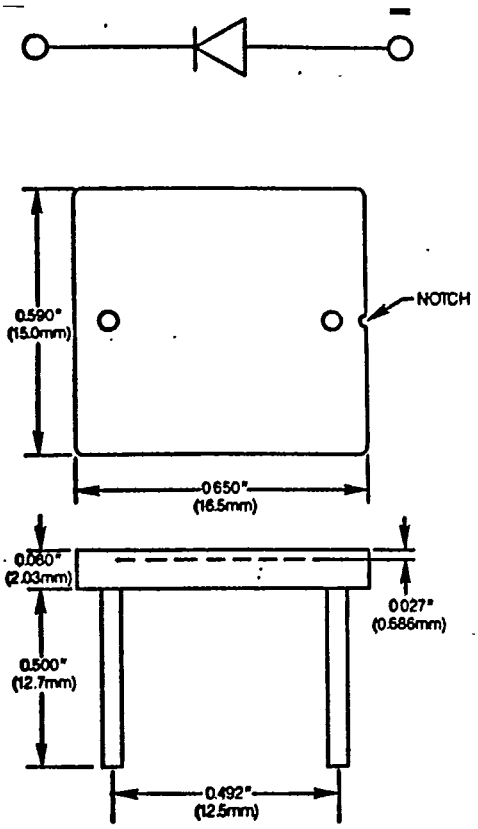
TO-5/5



PDIP1



PDIP2



PII