

PHOTODETECTOR/PREAMPLIFIER MODULES

Detector/preamplifier modules using Silicon, Germanium, Indium Gallium Arsenide, and Indium Arsenide photovoltaic detectors are available in convenient, plug-in packages (TO-5 & TO-8). All PD/AMP modules are available with up to 5mm diameter or square photodiodes or photoconductors, and with TE cooling options. These modules contain low-noise transconductance amplifiers with selectable gain resistors.

Typical Specifications @ 22 °C

Model No	Active Area (Dia mm)	Wavelength Range (μm)	Output Responsivity (V/W)	NEP (W/Hz ^{1/2})
SE-XXX	0.3-10	0.25-1.1	10^3 - 10^9	to 1×10^{-15}
GE-XXX	0.3-10	0.8-1.8	10^3 - 10^7	to 5×10^{-13}
IGAE-XXX	0.3-3.0	0.9-1.7	10^3 - 10^9	to 1×10^{-15}
IAE-XXX	1	1-3.6	10^3 - 10^5	to 1×10^{-12}

NOTE: Custom gain bandwidth products can be supplied. For bandwidth limiting and/or gain peaking prevention, a capacitor shunting the feedback resistor maybe required. The exact value will depend on the specific detector, but as a guide the 3 dB roll off frequency is determined from:

$$f_{3dB} = 1/2\pi R_F C_F$$

where R_F and C_F are the gain resistor and selected capacitor.

These modules are designed for maximum flexibility from the user's standpoint and can be operated in the following formats:

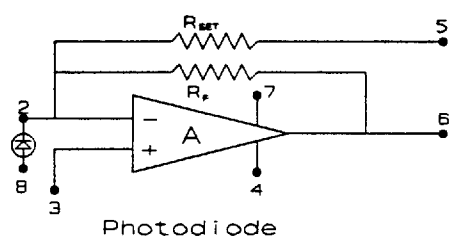
- A. Current Mode- zero bias, photovoltaic operation (ultra low noise),
- B. Variable Offset Mode- apply bias to amplifier to reduce DC offset, and
- C. Bias Mode- apply bias (photoconductive) to the photodiode to increase frequency response, linearity, and maximum power.

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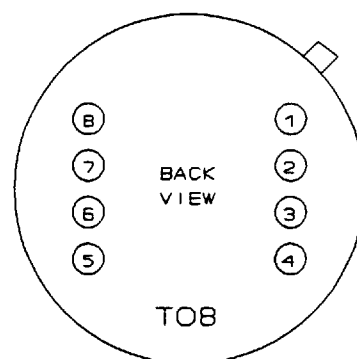
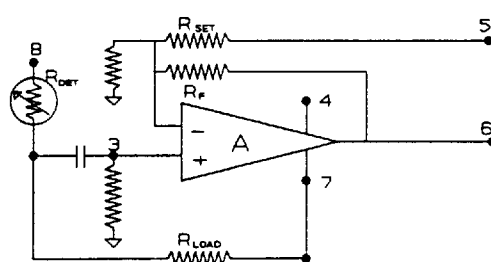
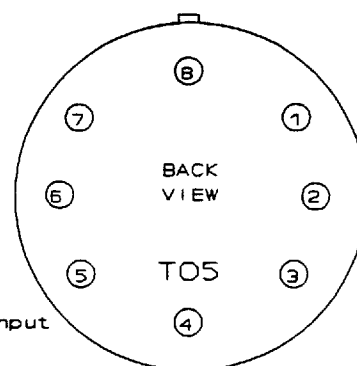
T-91-20

ELECTRONICS



PIN CONNECTIONS

- 1= No Connection
- 2= Inverting Input
PV Cathode
- 3= Non Inverting Input
PC Electrode
- 4= $-V_{IN}$
- 5= Gain Set
- 6= Output
- 7= $+V_{IN}$
- 8= PV Anode
PC Electrode



Integrated Photodetector/Amplifier

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TO PACKAGES

EOS discrete element and multielement photodetectors are housed in coaxial packages allowing integration of preamplifier, optical filtering, immersion lens, and/or Peltier cooling options.

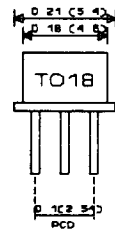


FIG 1a

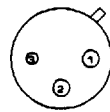


FIG 1b

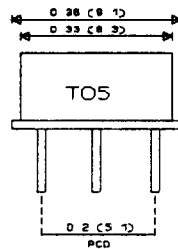


FIG 2a

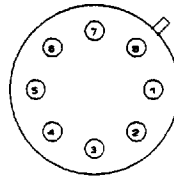


FIG 2b

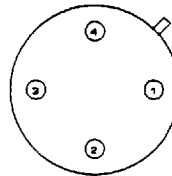


FIG 2c

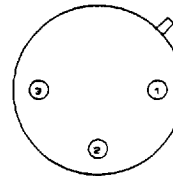


FIG 2d

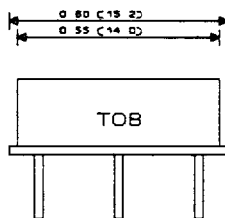


FIG 3a

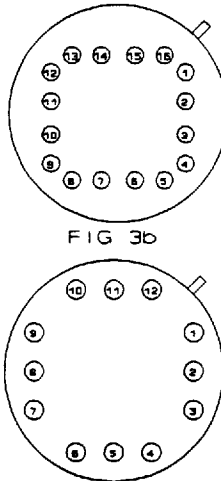


FIG 3b

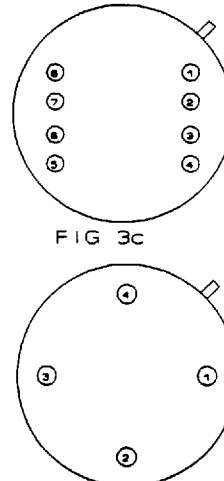


FIG 3c

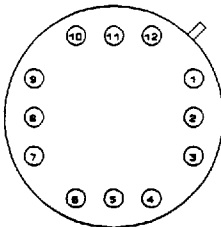


FIG 3d

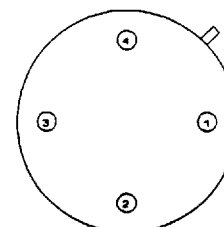


FIG 3e

Figure 1a & 1b illustrate the TO18 package used for small area photodiodes (less than ϕ 1 mm).

Figure 2a-2d illustrate the TO5 package used for discrete photodetector elements less than ϕ 5 mm, two color sandwich detector, and detector/preamplifier hybrid.

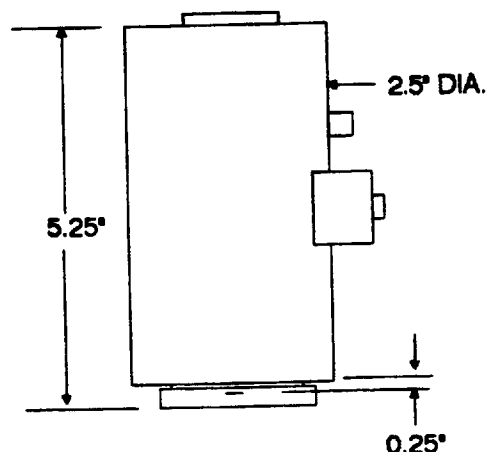
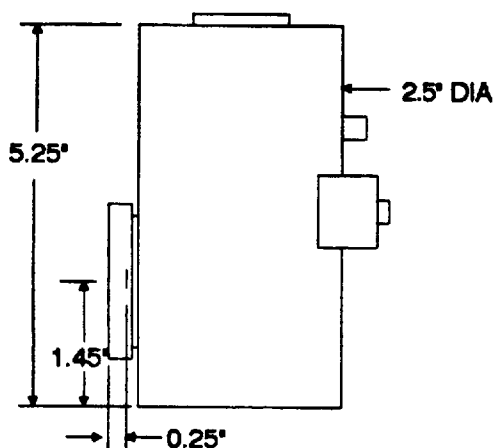
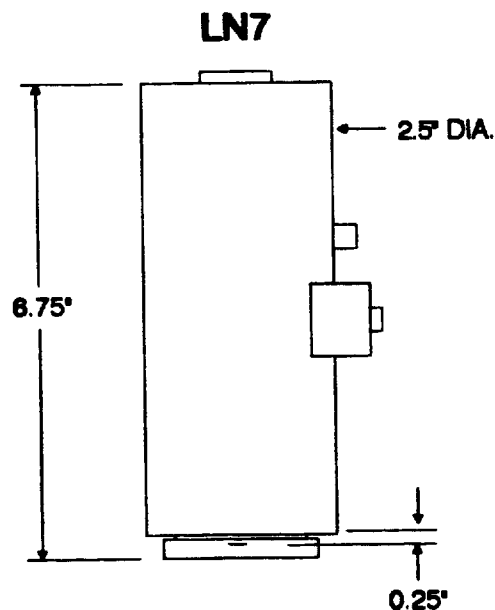
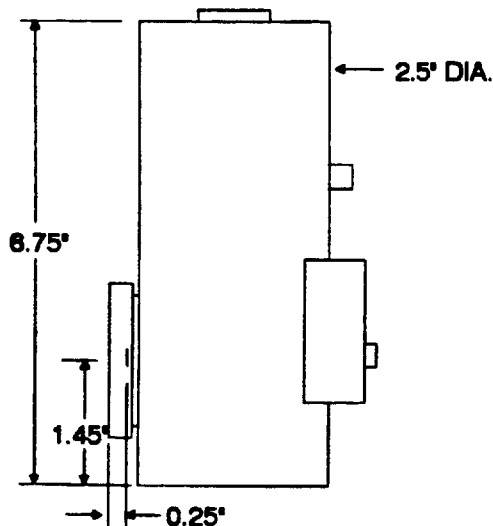
Figure 3a-3e illustrate the TO8 package used for large area detector elements ($\leq \phi$ 8 mm), large area two color sandwich detector, two color sandwich with dual preamplifiers, single element TE cooled detectors, two color sandwich with TE cooling, and two color sandwich with TE cooling and dual preamplifiers.

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DEWAR PACKAGES

The LN series cryostats are available in either side view or end view geometry. These dewars have a typical coolant hold time exceeding 10 hours. Photodetectors are mounted on the cold finger with optional cold filter, and/or FOV restrictor. Preamplifiers are integrated into the dewar achieving optimum sensitivity, with minimum microphonics. Custom dewar geometries are available, please contact the factory.

LN4**LN5****LN6****ELECTRO-OPTICAL SYSTEMS, INC.**

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