



ULTRA LOW NOISE PHOTODETECTOR-AMPLIFIER MODULE

- Ultra Low Noise – down to 10 fW/ $\sqrt{\text{Hz}}$
- Bandwidth - from DC to 140 kHz
- High Gain – up to 7.7 V/nW
- Silicon or InGaAs PINs, or Avalanche Photodiodes



DESCRIPTION:

The **711 Series** Ultra Low Noise Photodetector-Amplifier Modules offer a choice of variable or fixed gain amplifiers and the flexibility of incorporating various silicon or InGaAs detectors for low signal level sensing applications. The amplifier is based on the **311 and 341 Series** transimpedance amplifiers. Much lower noise can be achieved with smaller area PIN detectors on the Models **711-1 and 711-2** since the performance is detector limited. Consult factory for different detectors.

SPECIFICATIONS:

Input	Silicon or InGaAs photodetectors (See table on reverse for characteristics.)	Polarity	Non-Inverting Positive output with flux applied.
Coupling	AC (add -AC to part number) DC (add -DC to part number) AC cut-on frequency of ≤ 120 Hz	Power	± 15 VDC at 30 mA typical Internal ± 12 V regulators
Output		Temperature	0° to 70°C
Load	50 Ω	Connections	
Swing	2.5 V pk (-1 and -2) 6 V pk (-3)	Input	Photodetector
		Output	BNC
		Power	Filter feed-thru pins and ground lug
		Bias	Pin decoupled with 0.01 μF , 1 kV capacitor. (See table on reverse.)
Gain	Multiply transimpedance gain by detector responsivity at peak wavelength to get V/W in table. Trimpot adjustable (-3 only)	Size	3.49" x 1.93" x 0.92"
		Weight	3.2 ounces

Specifications subject to change without notice.

APPLICATIONS:

Photodetection of Ultra Low Signal Levels

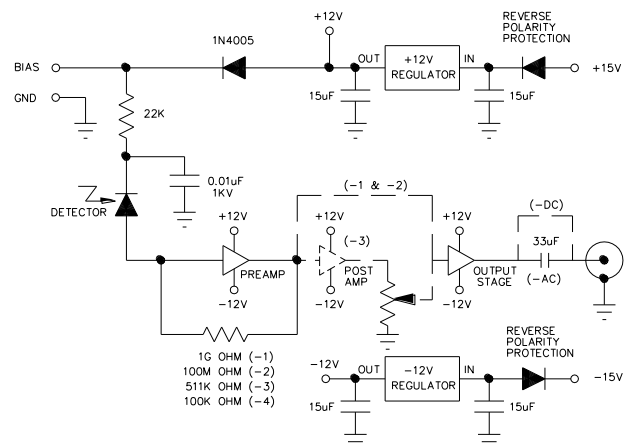
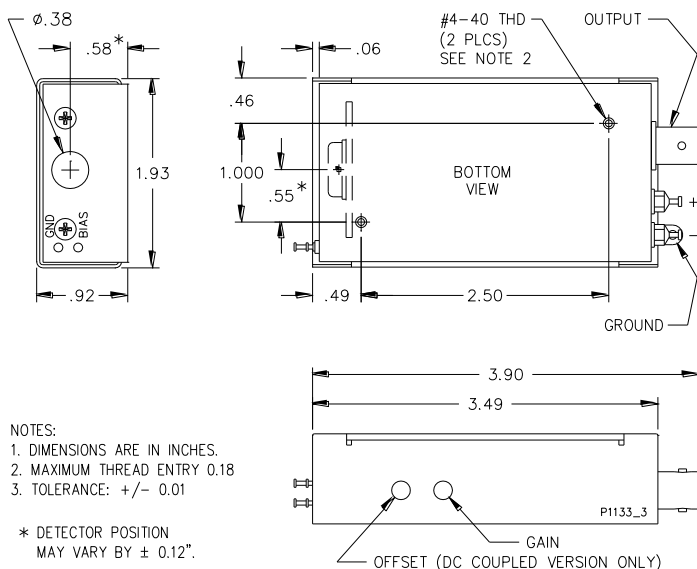
MODEL NUMBER

			711-1	711-2	711-3
Add to part number to specify detector	Detector	Performance	1GV/A Transimpedance Gain	100MV/A Transimpedance Gain	10-100MV/A Transimpedance Gain
-1A	C30807E Si PIN Diameter = 1.0 mm Peak λ = 900 nm Optimum bias = +45 V (1)	Optical Gain		0.06 V/nW	0.006-0.06 V/nW
		Noise (5)		0.7 pW/ $\sqrt{\text{Hz}}$	1.2 pW/ $\sqrt{\text{Hz}}$
		3dB Frequency (6)		8.75 kHz	140 kHz
-2A	FFD-100 Si PIN Diameter = 2.5 mm Peak λ = 900 nm Optimum bias = +15 V (1)	Optical Gain		0.06 V/nW	0.006-0.06 V/nW
		Noise (5)		0.1 pW/ $\sqrt{\text{Hz}}$	1.0 pW/ $\sqrt{\text{Hz}}$
		3dB Frequency (6)		6.5 kHz	115 kHz
-3A	C30902E Si APD Diameter = 0.5 mm Peak λ = 830 nm Optimum bias = +180-250 V (2) (4)	Optical Gain		7.7 V/nW	0.77-7.7 V/nW
		Noise (5)		10 fW/ $\sqrt{\text{Hz}}$	10 fW/ $\sqrt{\text{Hz}}$
		3dB Frequency (6)		9 kHz	140 kHz
-4A	GAP326 InGaAs PIN Diameter = 300 μm Peak λ = 1.55 μm Optimum bias = +12 V internal (4)	Optical Gain	0.9 V/nW	0.09 V/nW	0.009-0.09 V/nW
		Noise (5)	50 fW/ $\sqrt{\text{Hz}}$	0.5 pW/ $\sqrt{\text{Hz}}$	0.9 pW/ $\sqrt{\text{Hz}}$
		3dB Frequency (6)	1.5 kHz	9 kHz	140 kHz
Max light induced DC current			1.0 nA	10 nA	100 nA at min gain 10 nA at max gain

- (1) Internal bias provided at +12 V. For best bandwidth, use *Model 521A* detector power supply to apply optimum reverse bias. Internal bias is protected by diode when external supply is used.
- (2) Adjustable HV supply required. Optional *Model 521A* or *522* available (consult factory).
- (4) Available in ST or FC receptacle (consult factory).
- (5) Actual noise may vary by $\pm 20\%$ due to detector tolerance. Noise is greater with higher capacitance detectors.
- (6) Bandwidth tolerance is $\pm 20\%$.

Typical Part Number: 711-2-2A-AC =

Transimpedance Gain:	100 MV/A
Detector:	FFD-100 Si PIN
Optical Gain:	0.06 V/nW
Noise:	0.1 pW/√Hz
3dB frequency:	6.5 kHz
Cut-on frequency:	AC Coupled, ≤120 Hz
Polarity:	Non-Inverting



NOTE: MODEL 711-X-4A-X HAS NO EXTERNAL BIAS