

MODEL 711 ULTRA LOW NOISE PHOTODETECTOR-AMPLIFIER MODULES

ULTRA LOW NOISE PHOTODECTOR-AMPLIFIER MODULE

- ULTRA LOW NOISE DOWN TO 10fW/√Hz
- BANDWIDTH FROM DC TO 140kHz
- HIGH GAIN UP TO 7.7V/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.) AC (add -AC to part number) DC (add -DC to part number) AC cut-on frequency of ≤120Hz	Polarity	Non-Inverting Positive output with flux applied. ±15VDC at 30mA typical Internal ±12V regulators	
Coupling		Power		
		Temperature	0° to 70°C	
Output Load Swing	50Ω 2.5V pk (-1 and -2) 6V pk (-3)	Connections Input Output Power Bias	Photodetector BNC Filter feed-thru pins and ground lug Pin decoupled with 0.01μF, 1kV 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 Weight	3.49" x 1.93" x 0.92" 3.2 ounces	

Specifications subject to change without notice.

APPLICATIONS:

Photodetection of Ultra Low Signal Levels

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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 = 1.0mm Peak λ = 900mn Optimum bias = +45V (1)	Optical Gain		0.06V/nW	0.006-0.06V/nW
		Noise (5)		0.7pW/√Hz	1.2pW/√Hz
		3dB Frequency (6)		8.75kHz	140kHz
-2A	FFD-100 Si PIN Diameter = 2.5mm Peak λ = 900nm Optimum bias = +15V (1)	Optical Gain		0.06V/nW	0.006-0.06V/nW
		Noise (5)		0.1pW/√Hz	1.0pW/√Hz
		3dB Frequency (6)		6.5kHz	115kHz
-3A	C30902E Si APD Diameter = 0.5mm Peak λ = 830nm Optimum bias = +180-250V (2) (4)	Optical Gain		7.7V/nW	0.77-7.7V/nW
		Noise (5)		10fW/√Hz	10fW/√Hz
		3dB Frequency (6)		9kHz	140kHz
-4A	GAP326 InGaAs PIN Diameter = $300\mu m$ Peak λ = $1.55\mu m$ Optimum bias = +12V internal (4)	Optical Gain	0.9V/nW	0.09V/nW	0.009-0.09V/nW
		Noise (5)	50fW√Hz	0.5pW/√Hz	0.9pW/√Hz
		3dB Frequency (6)	1.5kHz	9kHz	140kHz
Max light induced DC current			1.0nA	10nA	100nA at min gain 10nA at max gain

(1) Internal bias provided at +12V. 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.

(5) Actual noise may vary by $\pm 20\%$ (6) Bandwidth tolerance is $\pm 20\%$.

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

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

