

# A1427

## A1427 - Low noise fast current neutron flux preamplifier



## Features



- Fast non inverting preamplifier, negative output (EOUT)
- Input impedance: 50  $\Omega$  AC coupled
- Output high impedance (EOUT)
- Bipolar output high impedance (FOUT)
- Test input (TEST IN) impedance: 50  $\Omega$ , negative polarity
- FOUT/DET IN gain (FOUT negative lobe):
  - FC version: 700÷2500
  - PR version: 500÷1500
- FOUT/TEST IN gain: 1/100 of DET IN gain
- Output noise (peak to peak) < 40 mV
- Up to 3 kV detector bias voltage (HV IN)
- Rbias: 200 k $\Omega$

## Description

The CAEN **Mod.A1427** is a fast and low noise current preamplifier with AC coupled input. It hosts two outputs: EOUT (unipolar) that can be integrated to calculate the energy associated to the input signal and FOUT (bipolar) that can be used to calculate the rate of the input signal, discriminating the negative pole using the **A1428** discriminator that is specifically designed to fit with A1427. The discriminator thresholds is settable from -1 to -100 mV via a 10 turn rotary handle with lock.

**A1427 Kit** configuration is also available, it includes the A1427 and the A1428 assembled together, both for fission chambers and for proton recoil detectors.

## Technical Specifications

### Packaging

Shielded box, Dimensions:

WxHxL: 91 x 139 x 39 mm; 91 x 119 x 39 mm (without connectors)

WxHxL A1427CA models: 61 x 112 x 55 mm; 61 x 112 x 31 (without connectors)

### No. of Channels

1

### Detector Input

- SHV connector; accepts negative charge pulses, AC coupled, 50 Ohm input impedance.
- A1427CA models: ATI INTERCO HN Connector 22323

### HV Input

- SHV connector, up to 3 KV for the detector bias, RBIAS 200 kOhm.
- A1427CA models: Itt Cannon 011-2049-040FB9 Terminal

### Test Input

- LEMO connector, negative input, 50 Ohm input impedance;
- GAIN = 1/100 of Detector IN

### Fast Out

- LEMO connector, bipolar output, high impedance (must be externally terminated with 50 Ohm impedance);
- Dynamic range -2 V ÷ +1.3 V max;
- Total duration (negative and positive lobe) A1427FC 120 ns, A1427PR 160 ns;
- Width Out negative lobe: A1427FC 27.5 ns FWHM, A1427PR 40 ns FWHM;
- Risetime negative lobe  $\leq 12$  ns;
- Measured with TEST IN negative pulse, -13 mVpp vs. GND, across 50 Ohm, 10ns rise/fall time, 50ns FWHM, 100kHz frequency

### Energy Out

- LEMO connector, non-inverting unipolar negative output, high impedance (must be externally terminated with 50 Ohm impedance);
- Dynamic range 0 ÷ -350 mV max;
- Width Out 50 ns FWHM;
- Risetime  $\leq 19$  ns;
- Measured with TEST IN negative pulse, -13 mVpp vs. GND, across 50 Ohm, 10ns rise/fall time, 50ns FWHM, 100kHz frequency

## GAIN Voltage

Trimmer adjustable:

- 700÷2500 on A1427FC;
- 500÷1500 on A1427PR

(referred to amplitude of FOUT negative lobe, with DET IN signal; with TEST IN input, GAIN = 1/100 of nominal value)

FOUT/EOUT amplitude ratio:

- A1427FC = 4
- A1427PR = 5.6

## Output noise

- $\leq 40$  mV p.p. (measured with gain =1000 on FOUT A1427FC)
- $\leq 30$  mV p.p. (measured with gain =700 on FOUT A1427PR)
- $\leq 7$  mV p.p. (measured with gain =1000 on EOUT A1427FC)
- $\leq 4$  mV p.p. (measured with gain =700 on EOUT A1427PR)

## Power requirements

- External power supply Switchbox FRA045-S12-4 (12 VDC, 3.75 A, 45 W); Universal Input C14 receptacle;
- INPUT Voltage range 100- 240VAC 1.2A 50-60Hz. Inrush current 40A at 115VAC / 80A at 230VAC max. Dielectric withstand Input/output 3,000VDC.
- OUTPUT Output voltage +12V. Ripple and noise 2% p-p max. Load regulation  $\pm 5\%$  max. No load stand by power  $< 0.5W@ 230VAC$ . Efficiency  $\geq 85\%$  for CEC requirement. Hold up time 10ms at nominal line. Protections OCP, OVP, over power & short circuit.
- GENERAL Std output connector Dc barrel jack. Std output cable/length UL1185, #18AWG / 5 ft.
- ENVIRONMENTAL Operating temperature  $0^{\circ}C$  to  $+40^{\circ}C$ . Storage temperature  $-20^{\circ}C$  to  $+85^{\circ}C$ .
- STANDARDS Safety standards IEC/UL/EN60950-1, CE, CB. EMC EN55022 (CISPR 22) class B, FCC class B.
- A1427CA models: TE 282834-5; 1 GND, 2 +12V

## Ordering Options

Code	Description	
WA1427ALIXAA	A1427/28 ALIMENTATORE LOW NOISE	RoHS
WA1427CABFCA	A1427 Cabri Low Noise Fast Current Preamplifier for Fission Chamber	RoHS
WA1427CABPRA	A1427 Cabri Low Noise Fast Current Preamplifier for Proton Recoil	RoHS
WA1427FCAAAA	A1427 Low Noise Fast Current Preamplifier for Fission Chamber	RoHS
WA1427PRAAAA	A1427 Low Noise Fast Current Preamplifier for Proton Recoil	RoHS

## Related Products

### A1428



A1428 - Discriminator for Low noise fast current neutron flux preamplifier

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### A1427 KIT



Low noise fast current preamplifier and discriminator

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## Gallery



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