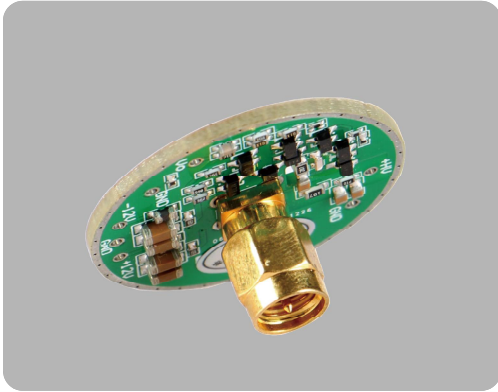


1. Overview



The EP-AP5104 low noise charge sensitive preamplifier is a preamplifier for semiconductor detectors designed and manufactured using discrete components. The charge sensitive preamplifier works on the basis of RC discharge and resistive-capacitive coupling, and can be matched with small-area and large-area semiconductor detectors such as PIPS and gold-silicon surface barriers, etc. It is compact and easy to be embedded in different applications, and can be widely used in on-line radioactivity aerosol monitors, fluorine meters, fission debris meters and other occasions.

2. Performance parameter

- ▶ Power supply $\pm 12\text{V}$ Dual power input
- ▶ Output signal dynamic range $\pm 10\text{V}$ Max
- ▶ Output resistance 50Ω
- ▶ Output signal polarity Opposite to the input signal
- ▶ Signal Gain 200mV/MeV
- ▶ Rising time $< 60\text{ns}$
- ▶ Signal output Exponential pulse signal
- ▶ Coupling method AC coupling
- ▶ High voltage input $0\sim +500\text{V}$ input, adjusted according to the detector
- ▶ Integral nonlinearity 0.01% when the output signal is between $-2\text{V}\sim +2\text{V}$
- ▶ Signal-to-noise ratio A signal-to-noise ratio greater than 100 can be realized at room temperature
- ▶ Operating temperature $-20^{\circ}\text{C}\sim +60^{\circ}\text{C}$, relative humidity $5\%\sim 60\%$
- ▶ Dimensions Diameter 50mm , height 18mm with SMA connector

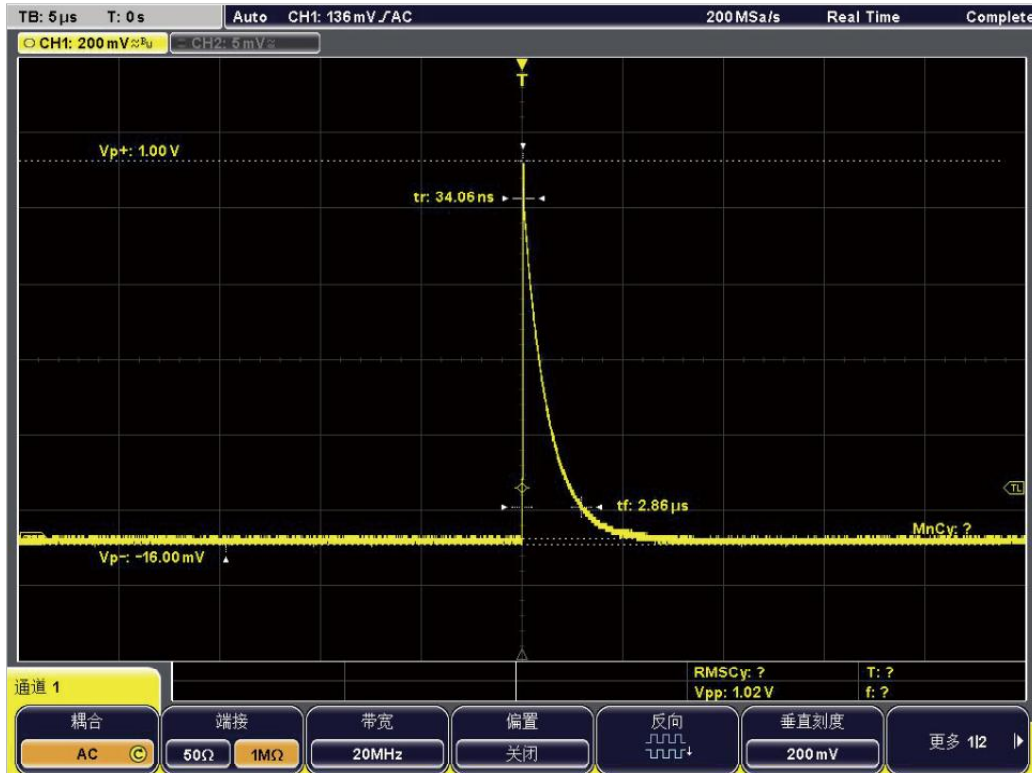
3. Electromechanical interface

- ▶ Power supply interface Pad soldering on PCB
- ▶ High voltage power supply Pad soldering on PCB
- ▶ Detector interface Standard SMA male chassis (other interfaces can be customized)

4. Performance testing

The following figure shows the raw signal and energy spectrum of ²⁴¹Am α particles measured by EP-AP5104 with PIPS detector under vacuum. The amplitude of the raw pulse signal is 1V, and the noise is less than 10mV, and the signal-to-noise ratio is more than 100. The following spectrum is the spectrum measured with Canberra PD450, the resolution is up to 18keV. EP-AP5104 is very suitable for α spectrum measurement, such as α spectrometer, aerosol monitor, radon meter and other equipments.

● Figure 1 ²⁴¹Am raw waveform graphs



● Figure 2 ²⁴¹Am energy spectrum

