

## 1. Product introduction



EPIC-APD8428 is a PIPS semiconductor detector Alpha spectrometer, supporting four Alpha spectra measurement simultaneously. It consists of vacuum measurement chamber, PIPS detector, preamplifier circuit board, high and low voltage power supply and single channel control board, high performance digital multi-channelboard, vacuum sensor and vacuum solenoid valve. With spectrometer hardware control, spectrometer status information acquisition and display, spectrometer data readout and management functions.

## 2. Functional indicators

- ▶ Plug-in combination design for quick removal and installation;
- ▶ The system design consists of a high-resolution energy spectrometer and a mechanical vacuum control section;
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- ▶ With spectrometer hardware control, spectrometer status information acquisition and display, spectrometer data readout and management functions;
- ▶ Preamplifier type ..... Charge sensitive preamplifier
- ▶ Communication interface ..... USB2.0 or RJ45
- ▶ Power supply ..... AC220V 50Hz

## 3. Performance parameter

Detector indicators	
Detector	PIPS detector
Energy rang	3-10 MeV
Energy resolution	≤24keV (450mm <sup>2</sup> , detector-to-source distance equals detector diameter)
Detector efficiency	≥25% (450mm <sup>2</sup> )

### Multi-channel technical indicators

Energy channel address	256, 512, 1024, 2048, 4096, 8192 channel selectable
ADC parameter	16bit, 80MSPS
Linearity	Integral non-linearity $\leq 0.05\%$ , differential non-linearity $\leq 1\%$
Multi-channel gain	0.01-10 times adjustable
Bias adjustment	0-200V digital adjustable, maximum output current 1mA
Leakage current measurement range	0-5000nA

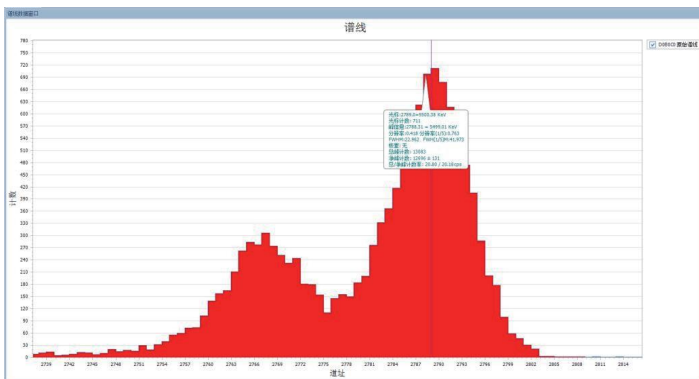
### Vacuum chamber index

Vacuum chamber design	low background integrated design
Maximum detector size	1200mm <sup>2</sup> and 3000mm <sup>2</sup> are available
Maximum diameter of sample	51mm
Sample to detector distance	1-45mm in 4mm steps
Vacuum degree	0-26.7kPa, software can display
Background count rate	above 3 MeV, average count rate per hour $\leq 1$

### Whole machine index

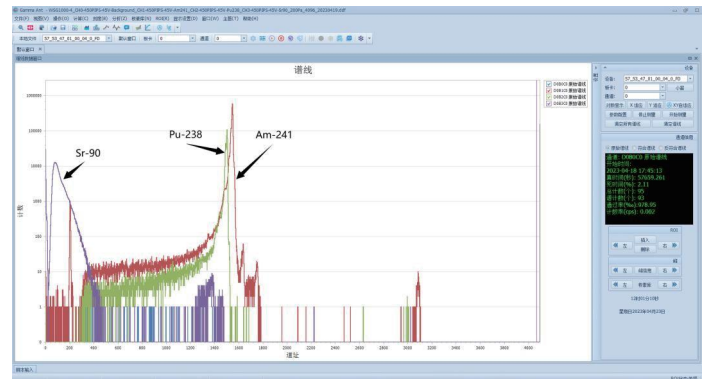
Operating voltage	DC24V
Communication interface	TTL or USB2.0 or Ethernet interface
Working temperature	-10°C ~ 50°C
Relative humidity	30%~80%, non-condensing

## 4. Performance testing



Pu238 Resolution Test

The results of the Pu238 resolution test by EPIC-APD8127 Alpha spectrometer are shown in Fig.2, Energy resolution up to 22.962keV@5499keV.



Multi-channel measurement

The multi-channel test results of EPIC-APD8428 Alpha Energy Spectrometer are shown in the figure, which can realize the energy spectrum measurement function of multi-channel Alpha and Beta radioactive sources.