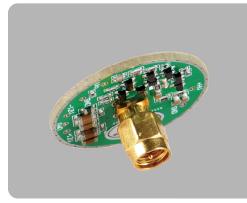


EP-AP5104 Low Noise PIPS

Specialized Charge Sensitive Preamplifier

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	±12V Dual power input
Output signal dynamic range	±10V Max
Output resistance	50Ω
Output signal polarity	Opposite to the input signal
Signal Gain	200mV/MeV
Rising time	<60ns
Signal output	Exponential pulse signal
Coupling method	AC coupling
High voltage input	0~+500V input, adjusted according to the detector
Integral nonlinearity	0.01% when the output signal is between -2V~+2V
Signal-to-noise ratio	$\cdot\cdot$ A signal-to-noise ratio greater than 100 can be realized at room temperature
Operating temperature	-20°C~+60°C, relative humidity 5%~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	es can be customized)



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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.

TB: 5µs	T: 0 s	Auto	CH1:136 mV √AC		2001	MSa/s Re	al Time Cor	mplete
O CH1: 20	0 mV≈ ^B u	= CH2: 5 mV =						
				¥				
	Vp+: 1.00	1						
								**
			tr: 3	4.06 ns ⊧ – – •				
								_
					⊲ tf: 2.86 μs			
							MnCy: ?	
	Vp-: -16.00	OmV 🔺						
								1
		_		4	RMSC	w 2	T: ?	_
通道 1					Vpp: 1	.02 V	f: ?	
耦合	r C	端接	带宽	偏置	反向	垂直刻度		
AC					ını uur∔	200 mV	更多 112	Þ
AC		<u>50Ω</u> _1MΩ	ZUMHZ			200 m V		

Figure 2 ²⁴¹Am energy spectrum

Figure 1 ²⁴¹Am raw waveform graphs

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		基本信息 开始时间:2019-08-27 20:05:24
2400		測量时间(秒):1200.00秒 总计载(个):147629
3230 -		谱计数(个):146776 活时间(960):994.22
5000 -	•	总计数率(cps):122.31
2000 -		光标信息
2508 -		光标:8630=5500.27 KeV 光标计数: 2943
2408		峰信息: 8628.25 = 5499.16 KeV 分辨率:0.32 分辨率(1/5):0.49
2200		FWHM:17.59 FWH(1/5)M:26.80 核素: 元
2000 -		总峰计数: 90777 净峰计数: 73681 ± 539
1800	→ FWHM=18keV@5499keV	总/净峰计数率: 75.65 / 61.40cps
1500 -		ROI信息 ROI名称:
1400		左册坦: 左疏量(kev):
1200 -		右道址: 右影量(kev):
1000 -		息计数(个): 计数率(cps):
600		上一个
600		
400 -	a 123 3264	
200		
0		
-200		1.0
7403 1818/510	250 7468 7758 7468 7556 8668 8518 8258 8258 8558 8458 8558 8558 8558 855	5+.04