

EURISYS PSC823C OPERATING MANUAL

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PSC823

OPERATING MANUAL

HISTORIQUE DES MODIFICATIONS / MODIFICATIONS HISTORICAL

| Ind / Rev | Date / Date | Origine des modifications / Modifications origin | Paragraphes concernés / Related sections |
|------------------|--------------------|---|---|
| A | June 2003 | Origin of the document. | All |

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1. PRELIMINARY.

CAUTION

EXAMINE THE PREAMPLIFIER PSC823C YOU HAVE RECEIVED.

***IN CASE OF OBVIOUS SHIPPING DAMAGE NOTIFY THE CARRIER
AND FILE A DAMAGE CLAIM.***

READ CAREFULLY THIS MANUAL BEFORE YOU SET UP THE PREAMPLIFIER.

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2. PREAMPLIFIER PSC823C DESCRIPTION.

The charge preamplifier PSC823C has been developed to be mounted on germanium detectors with warm or cold FET.

This preamplifier is dedicated to work with a resistive feedback loop and can provide negative or positive output signal.

Four version of PSC823C exist :

- The standard PSC823C version B
- The standard PSC823C version C. The difference comes from the location of the strap and from the spacing between feedback, drain, source and test pins.
- The lateral PSC823C version C with the potentiometers in lateral position.
- The PSC823C version D with a substrate potentiometer.

In standard conditions the PSC823C has a warm FET and a feedback network mounted on the board.

Check if an input FET is already mounted in the detector, in this case you should remove the FET and feedback associated mounted on the PSC823C.

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3. ELECTRICAL SPECIFICATIONS.

Output termination : impedance 50 ohms.

Conversion gain (Ge) : 200mV/MeV (unterminated).

Gain tolerance : +/- 5%.

Rise time : 20ns/0pF.

Slope : 0.8ns/pF.

Decay time : 50µs +/- 5%

Output swing : +/- 9.5V (unterminated).

Integral non linearity : $\leq 0.025\%$.

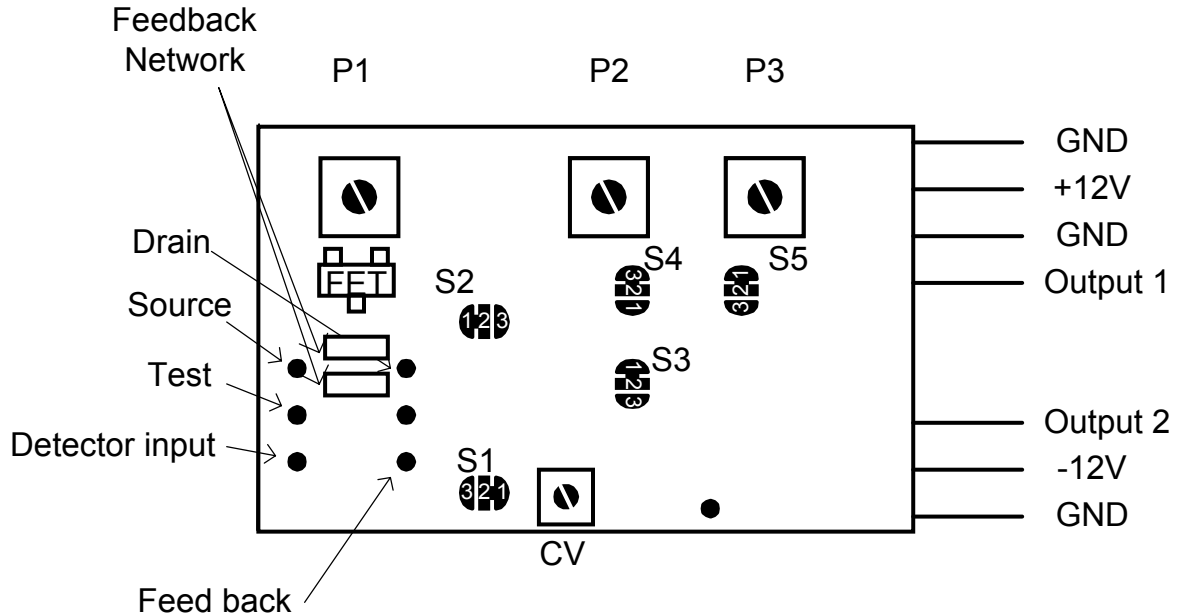
Noise : 0.9keV/0pF, first stage at room temperature, 3µs shaping time.

Power required : +12V / 25mA

-12V / 16mA.

4. ADJUSTMENT.

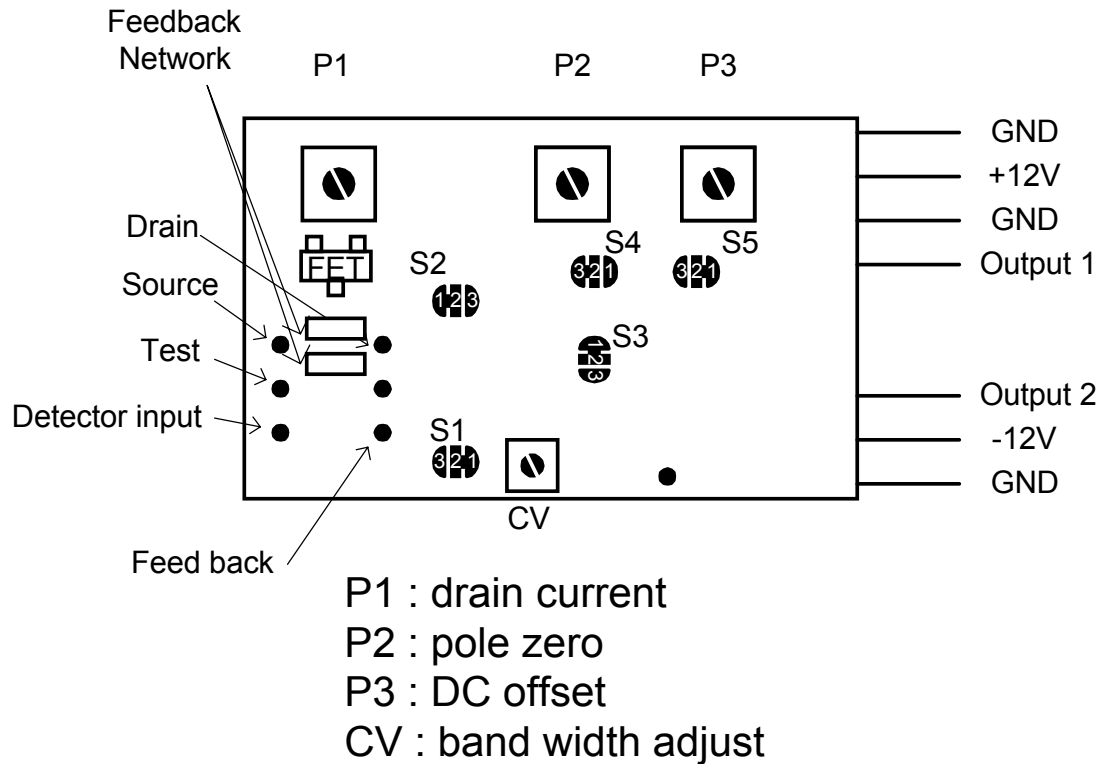
4.1. PSC823C VER B LINK.



P1 : drain current
 P2 : pole zero
 P3 : DC offset
 CV : band width adjust

| Link | Function | Standard Status | | Other Status | |
|------|-------------------------------|-----------------|-------------------|--------------|-----------------|
| S1 | Polarity of the output signal | 1-2 | Non-inverting | 2-3 | Inverting |
| S2 | | 1-2 | | 2-3 | |
| S3 | P/Z cancellation | 1-2 | Standard | 2-3 | Fine |
| S4 | | 2-3 | | 1-2 | |
| S5 | Count rate | 1-2 | Normal count rate | 2-3 | High count rate |

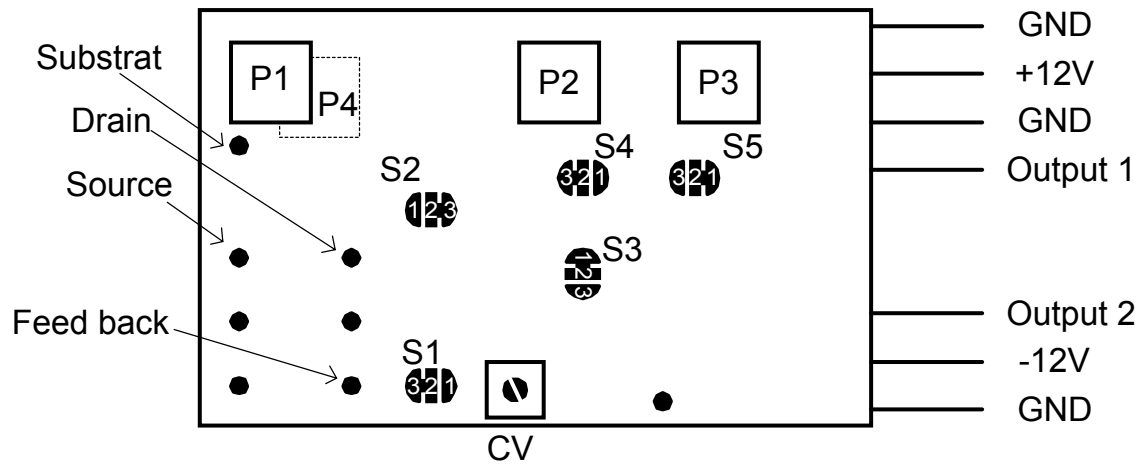
4.2. PSC823C VER C LINK.



| Link | Function | Standard Status | | Other Status | |
|------|-------------------------------|-----------------|-------------------|--------------|-----------------|
| S1 | Polarity of the output signal | 1-2 | Non-inverting | 2-3 | Inverting |
| S2 | | 1-2 | | 2-3 | |
| S3 | P/Z cancellation | 1-2 | Standard | 2-3 | Fine |
| S4 | | 2-3 | | 1-2 | |
| S5 | Count rate | 1-2 | Normal count rate | 2-3 | High count rate |

For the lateral PSC823C version the links are the same than in PSC823C ver C.

4.3. PSC823C VER D LINK.



- P1 : drain current
- P2 : pole zero
- P3 : DC offset
- P4 : substrat voltage
- CV : band width adjust

P4 is set to have a correct EurifET substrate voltage. This potentiometer is located on the soldering side of preamplifier board.

| Link | Function | Standard Status | | Other Status | |
|------|-------------------------------|-----------------|-------------------|--------------|-----------------|
| S1 | Polarity of the output signal | 1-2 | Non-inverting | 2-3 | Inverting |
| S2 | | 1-2 | | 2-3 | |
| S3 | P/Z cancellation | 1-2 | Standard | 2-3 | Fine |
| S4 | | 2-3 | | 1-2 | |
| S5 | Count rate | 1-2 | Normal count rate | 2-3 | High count rate |

4.4. PSC823C SETTING.

4.4.1. Potentiometers adjusting:

All the potentiometers have the same function on all preamplifier version.

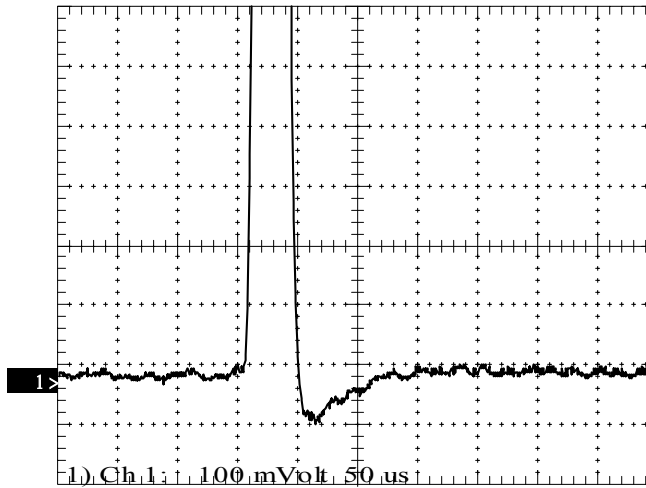
- P1 allows to adjust FET polarisation current.
- P2 allows to adjust PZ.
- P3 Allows to adjust offset.
- P4 Allows to adjust the substrate voltage.
- CV allows to adjust bandwidth

Drain current and substrate voltage have to be adjusted to get the best noise/signal ratio. The way to determine the good setting is to make different measurements with different values of drain current and substrate voltage. The best setting is when you have the best resolution with your detector.

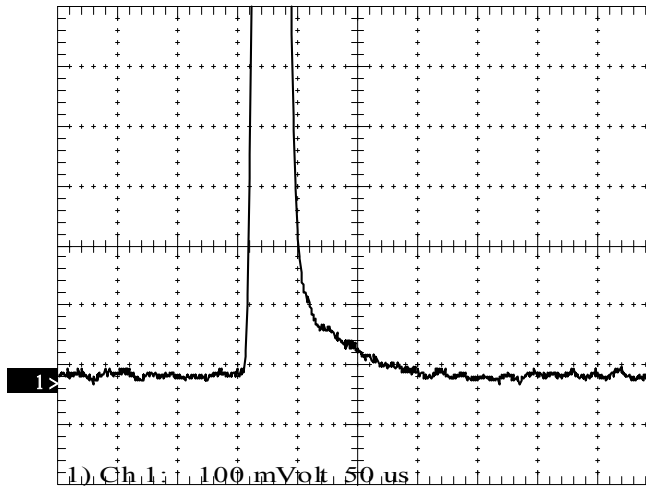
4.4.2. Adjusting pole zero.

To obtain the specified resolutions you must set the PZ as shown in the scope diagram.

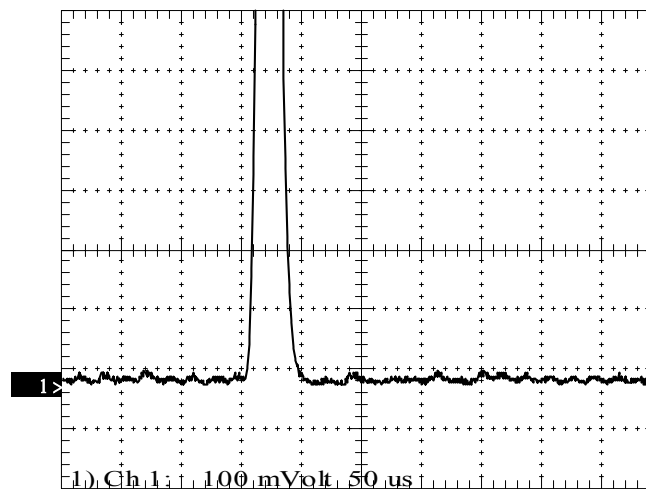
SHAPING AMPLIFIER OUTPUT



Signal with « undershoot ».



Signal with « overshoot ».



Correct setting.