

FEATURES:

- Low cost
- Unipolar power supply
- Ultra low consumption
- Hermetically sealed housing
- Small size
- Metal case

APPLICATIONS:

- Medical equipment
- Personal dose monitor
- Portable devices
- Nuclear monitoring
- Nuclear electronics
- Gamma-ray spectrometer



PRODUCT DESCRIPTION

The shaper amplifier (SA) is designed to amplify and reshape a quasi-Gauss shaped output signals of a charge sensitive amplifier (CSA). The shaper amplifier enhances essentially the signal to noise ratio and enables to direct the signal to a counting device or to a spectrometric analog-to-digital converter. The amplifier is mounted into hermetically sealed metal-glass casing. The amplifier will be used in pair with CSA or a scintillator-photodiode detector with integrated CSA.



ATTENTION! The device may be damaged by electrostatic discharge (ESD).

Electrostatic damage may range from partial derating to complete device failure.

Table 1— ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

Name	Value
Vcc Supply voltage	+ 6 V

Table 2 — SPECIFICATIONS

Name	Min.	TYP	Max.
Vcc Supply voltage	+ 4 V	+ 5 V	+ 5.5 V
Icc Current consumption ⁽²⁾		1 mA	2.5 mA
Storage temperature	- 65 °C		+ 70 °C
Operational temperature	- 50 °C		+ 60°C
Weight, grams	5.5		7

- (1) Voltages beyond the limits specified in absolute maximum values may cause permanent damage to the device. Exposure to maximum voltages for extended periods of time may affect reliability of the device or its failure.
- (2) Current draw values are given for SA receiving pulses from CSA within 50 pulses per minute at Vcc = 5V, T = 20°C.

PINOUT CONFIGURATION

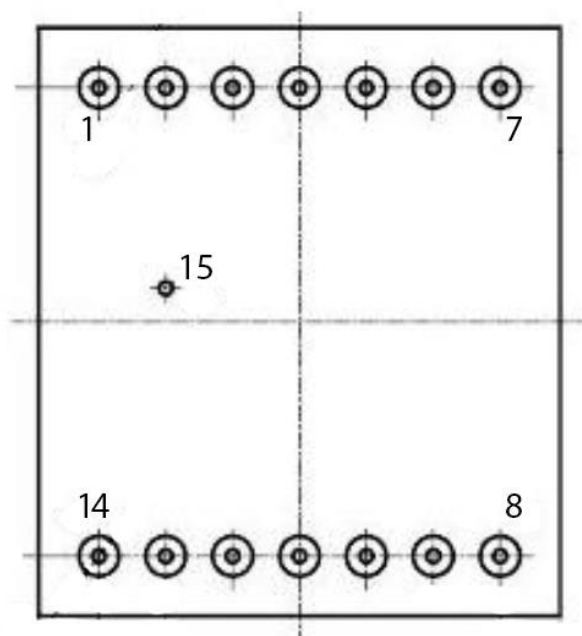


Fig. 1. Pinout, bottom view.

Table 3 - PIN FUNCTIONAL DESCRIPTIONS

Pin #	Identification	Assignment
1	GND	Analog ground
2	IN	Input
3	GND	Analog ground
4	GND	Analog ground
5	GND	Analog ground
6	GND	Analog ground
7	GND	Analog ground
8	GND	Analog ground
9	Vcc	Power supply
10	GND	Analog ground
11	OUT	Output
12	GND	Analog ground
13	GND	Analog ground
14	GND	Analog ground
15	GND	Analog ground

PIN IDENTIFICATION

IN

Input from the charge sensitive amplifier. In the case the signal line wiring from CSA is long, you should use a shielded cable.

Vcc

Positive voltage supply. Each amplifier has its filter, however, a stable and low-noise voltage source is required to power the detector. Installation of the SMAJ5.0CA, SMAJ6.0CA or equivalent protective TVS diode between the VCC pin and GND is recommended.

OUT

Positive Quasi-Gauss signal output.

GND

The GND pin should connect to analog ground. Never use common ground with high current, high power and other devices (UHF, GSM transmitters, etc.). It is recommended to use a multilayer board; top layer and bottom layer should connect to the ground, and the conductors from pins: Vcc, BIAS, OUT will pass through the inner layers shielded against interference.

INSTALLATION

Only manual soldering with “POS-60” (Sn 60%, Pb 40%) or similar solder is allowed. The maximum heating temperature of the terminals should never be over 250 degrees for 4 seconds. Never use an oven for soldering! Flux residue removal is mandatory.

OUTPUT SIGNAL EXAMPLES

Figure 2 shows an examples of input (blue) signal received from a scintillator-photodiode detector with integrated CSA and output (yellow) signal of the amplifier-shaper.

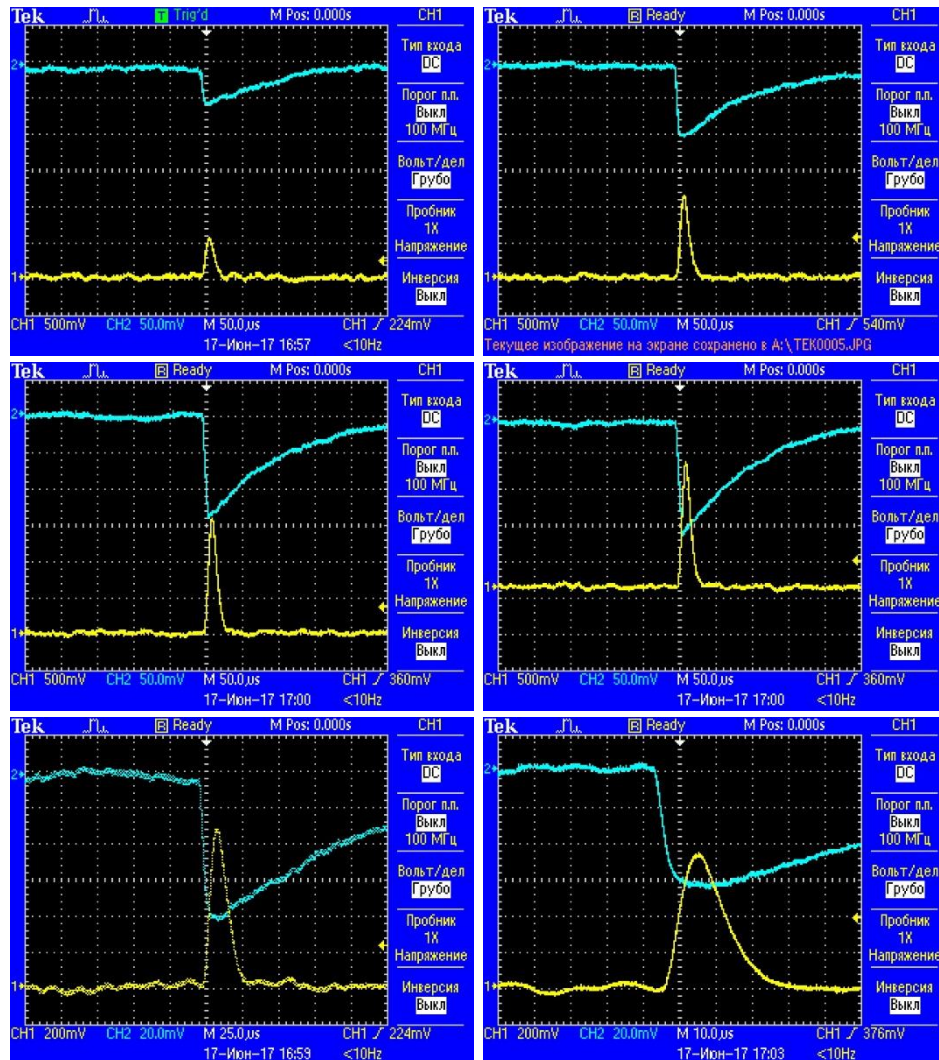


Fig. 2. An example of signal processing by the amplifier-shaper. Input (blue) and output (yellow) signals.

SAMPLE SPECTRUM

A gamma spectrum obtained when CSA working together with the scintillator—
photodiode detector and amplifier-shaper.

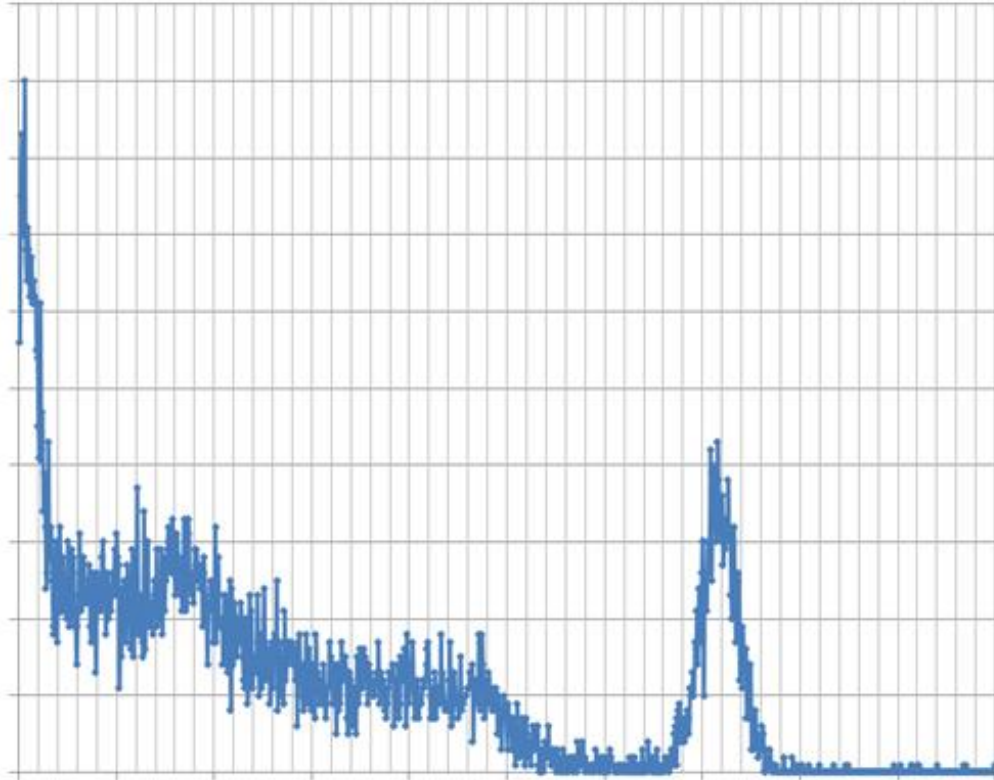


Fig. 3. Cs137 isotope spectrum.

CONNECTION DIAGRAM

Figures 4, 5 shows the circuitry of the amplification channel engagement with a detector of a scintillator-photodiode type or a silicon detector. The amplification channel consists of the charge sensitive preamplifier (CSA-250) and the amplifier-shaper (SA-25). Fig.4. shows a typical connection diagram. Fig.5 depicts an optional circuitry for special settings of the bias voltage circuit.

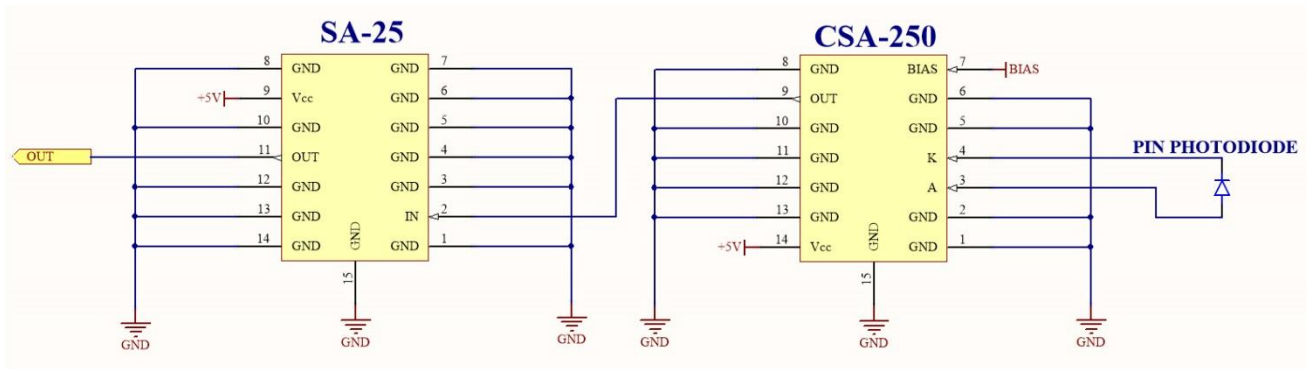


Fig. 4. Main connection diagram.

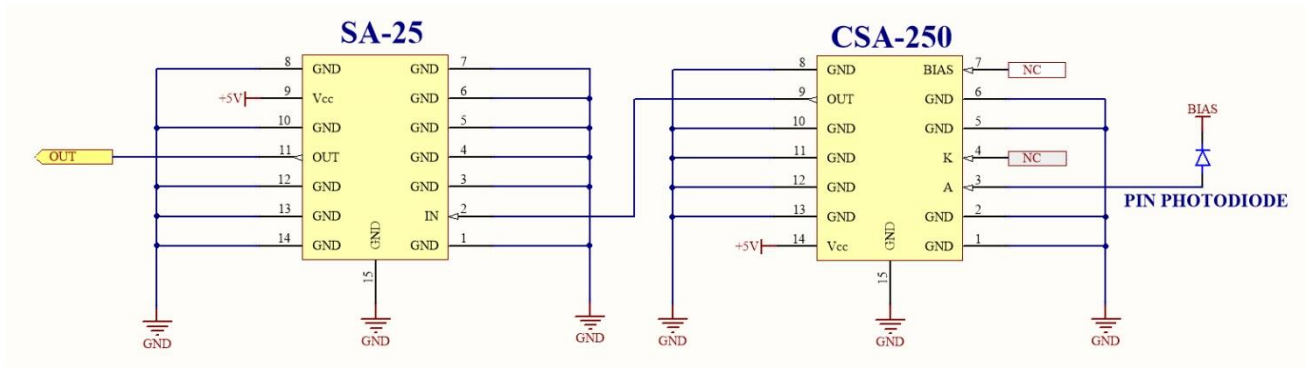


Fig. 5. Optional connection diagram.

DIMENSIONS AND DESIGNATIONS

Figure 6 shows the case of the amplifier, measurements are in mm. The Altium Designer CAD library available for free download on the manufacturer's website contains mounting sites for the board and circuitry symbols for all products of the company. Case glass and metal 153.15-2. Case materials: Fe-53%, Ni-29%, Co-17%, nickel plating; pins: Fe-53%, Ni-29%, Co-17%, nickel plating; insulator: glass.

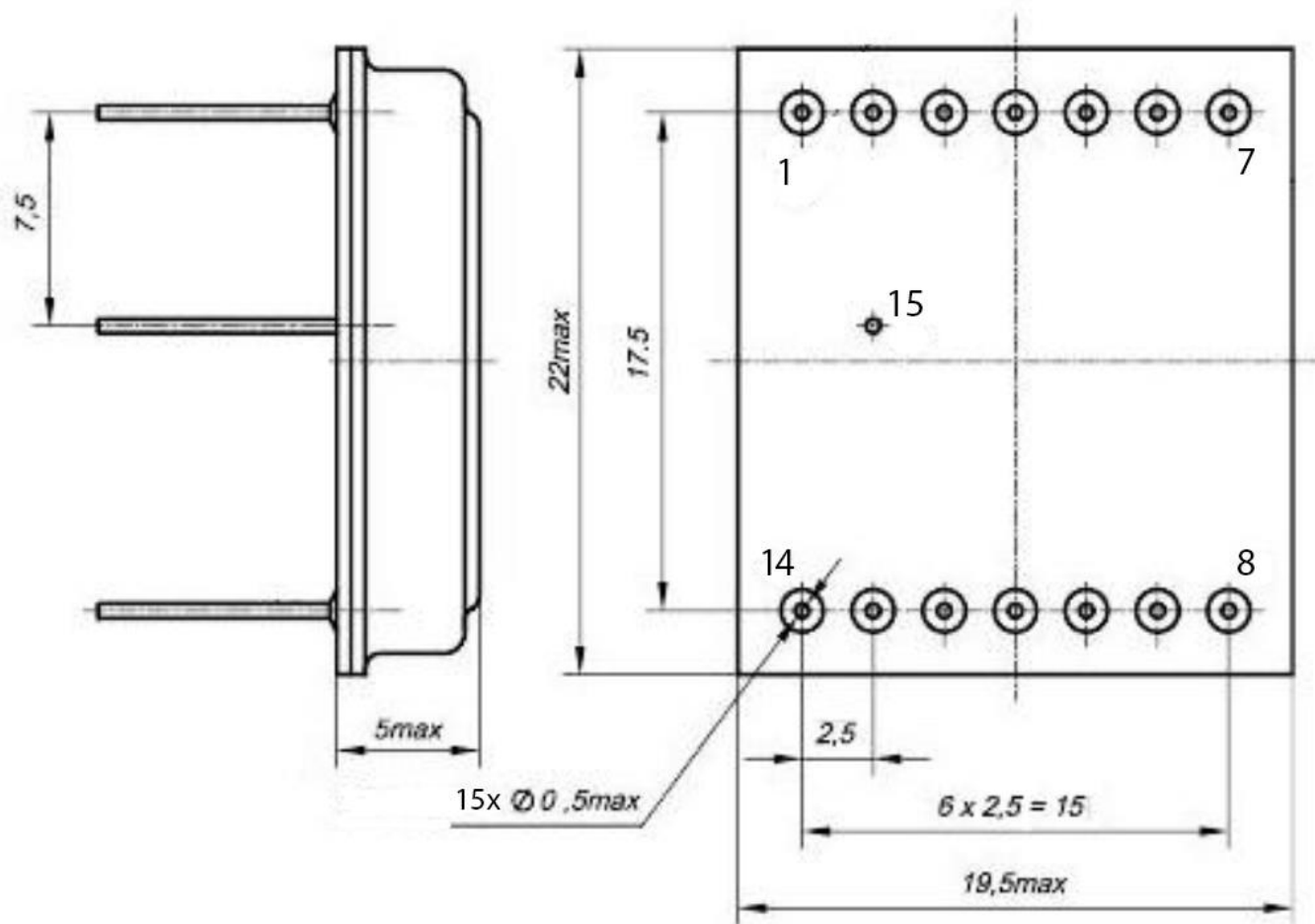


Fig. 6. Case drawing.

Information on the product: Name, Country of production, Manufacturer company.

OEM PRODUCTS PURCHASE AND USE CONDITIONS

Products of the OEM category are not intended for the end user. Products of this category are designed exclusively for developers and manufacturers of electronic equipment. Manufacturer of this product can not check the conditions of use and storage, compliance with the requirements of "absolute electrical values" and "parameters" sections, other requirements listed in product documentation, or customer technical expertise. By purchasing this product, you agree that this product is not subjected to return or replacement. The manufacturer ensures the QC of the entire batch of products before shipment to the customer.