

FEATURES:

- Low cost**
- Single-supply operation**
- Ultra-low power consumption**
- Hermetically sealed package**
- Compact size**
- Metal package**

Revision: July 2026



APPLICATIONS:

- Medical equipment**
- Personal dosimeters**
- Portable devices**
- Nuclear monitoring**
- Nuclear electronics**
- Gamma-ray spectrometers**

PRODUCT DESCRIPTION

The SA-25 (MS-25) shaping amplifier is designed to amplify and shape quasi-Gaussian output pulses from a charge-sensitive amplifier (CSA). The shaping amplifier significantly improves the signal-to-noise ratio and provides an output signal suitable for a spectrometric analog-to-digital converter. The amplifier is assembled in a hermetically sealed glass-to-metal package. It is intended for operation with a CSA or with a scintillator-photodiode detector with an integrated CSA.



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

Electrostatic damage may range from parametric degradation 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
Operating temperature	-50 °C		+60 °C
Weight, g	5.5		7

- (1) Stresses beyond the absolute maximum ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability or cause failure.
- (2) Current consumption is specified with the SA receiving pulses from a CSA at a rate of up to 50 pulses per minute, VCC = 5 V, T = 20 °C.

PINOUT CONFIGURATION

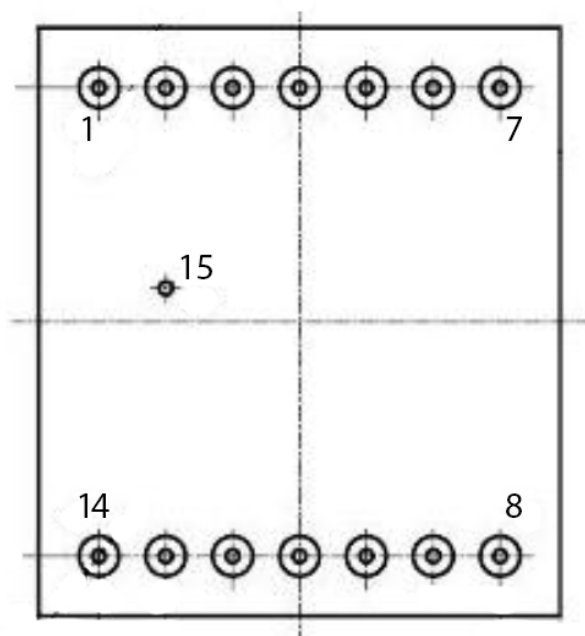


Fig. 1. Pinout, bottom view.

Table 3 - PIN FUNCTION DESCRIPTIONS

Pin No.	Signal	Function
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	Positive supply voltage
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. If the CSA signal line is long, use a shielded cable.

VCC

Positive supply voltage. Each amplifier includes an internal filter; however, a stable, low-noise voltage source is required for detector operation. Installing an SMAJ5.0CA or equivalent TVS diode between VCC and GND is recommended.

OUT

Positive quasi-Gaussian signal output.

GND

Connect the GND pins to analog ground. Do not share this ground with high-current, high-power, or RF transmitting circuits (UHF/GSM transmitters, etc.). A multilayer PCB is recommended: connect the top and bottom layers to ground and route the VCC, IN, and OUT traces in inner layers shielded from interference.

INSTALLATION

Manual soldering only, using Sn60Pb40 or equivalent solder. The terminal temperature must not exceed 250 °C; maximum heating time is 4 seconds. Do not use reflow or oven soldering. Flux residues must be removed.

OUTPUT SIGNAL EXAMPLES

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

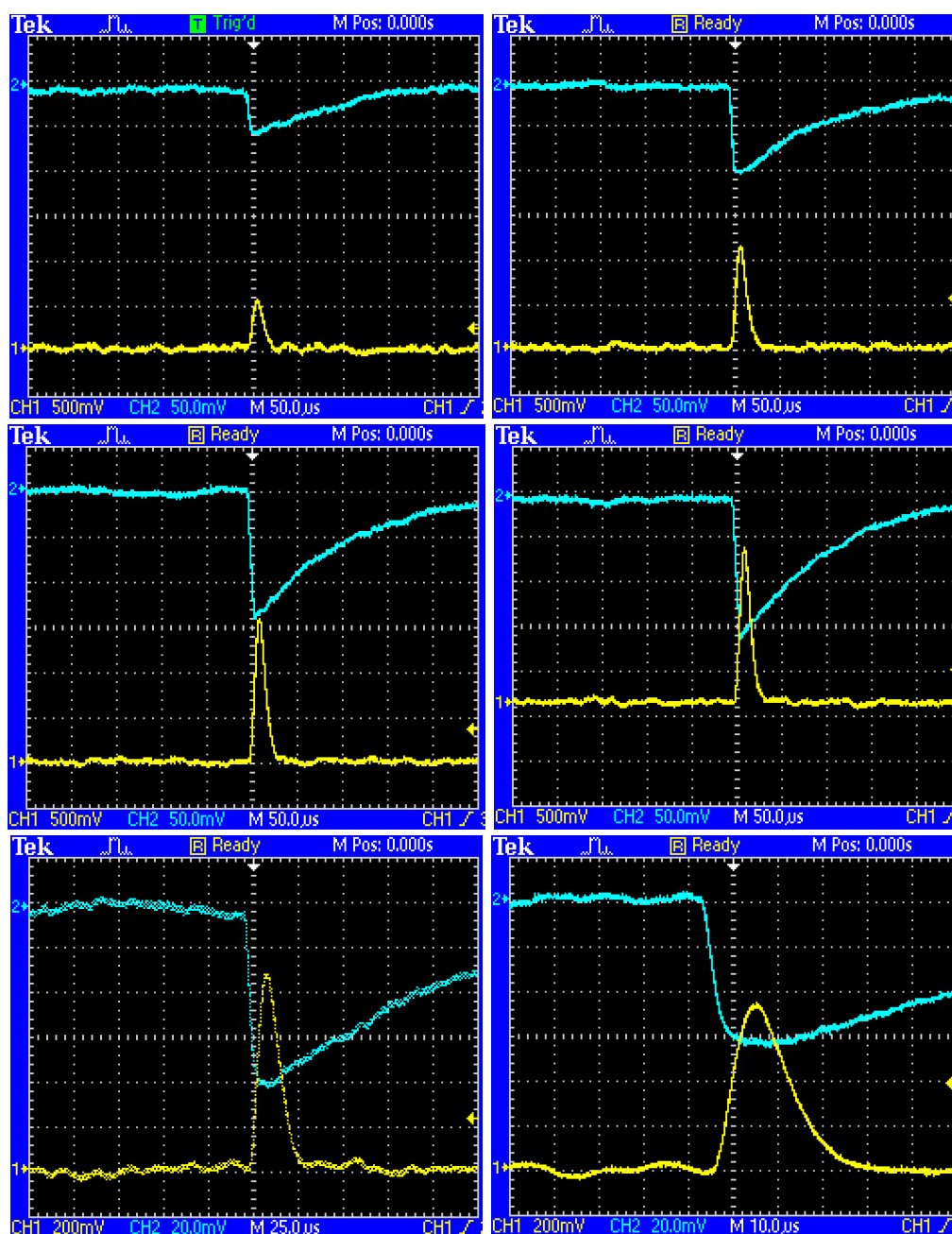


Fig. 2. Example of signal processing by the shaping amplifier: input signals (blue) and output signals (yellow).

SAMPLE SPECTRUM

Figure 3 shows a gamma spectrum obtained using a CSA, a scintillator-photodiode detector, and the SA-25 shaping amplifier.

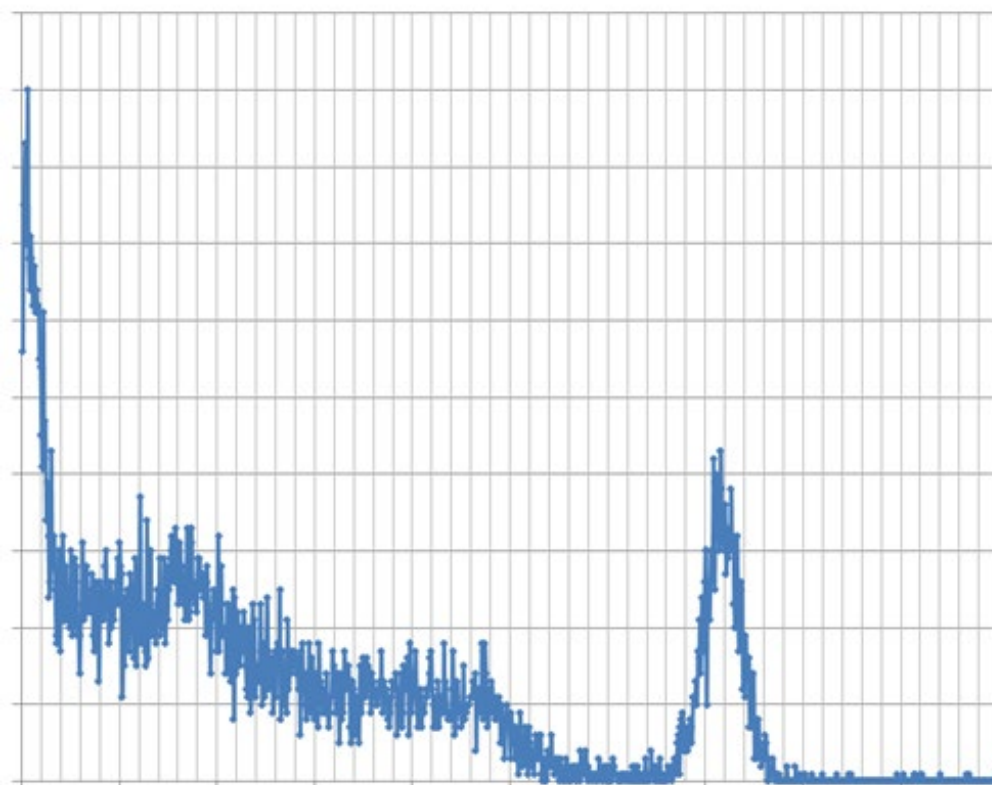


Fig. 3. Cs-137 gamma spectrum.

CONNECTION DIAGRAM

Figures 4 and 5 show connection diagrams for an amplification channel used with a scintillator-photodiode detector or a silicon detector. The amplification channel consists of a charge-sensitive preamplifier (CSA-250) and a shaping amplifier (SA-25). Figure 4 shows a typical connection diagram. Figure 5 shows an optional circuit for alternative bias-voltage configurations.

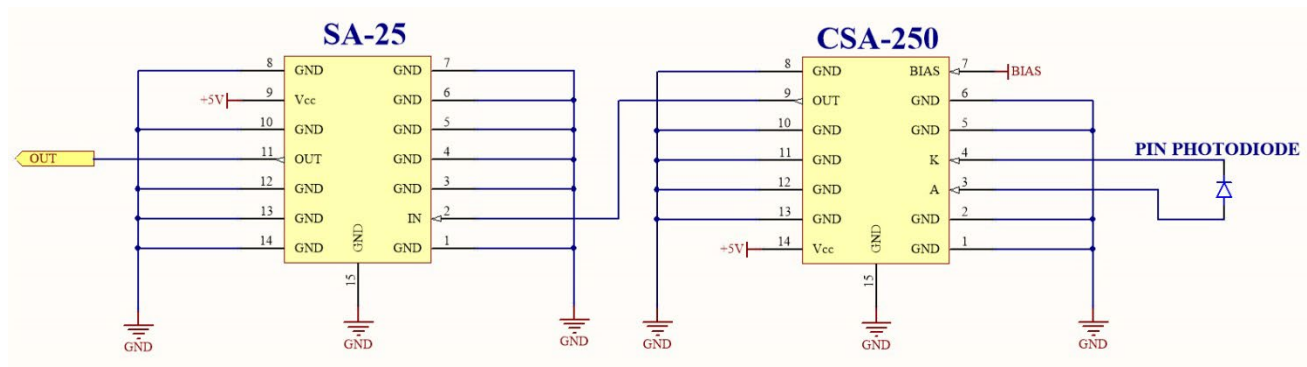


Fig. 4. Typical connection diagram.

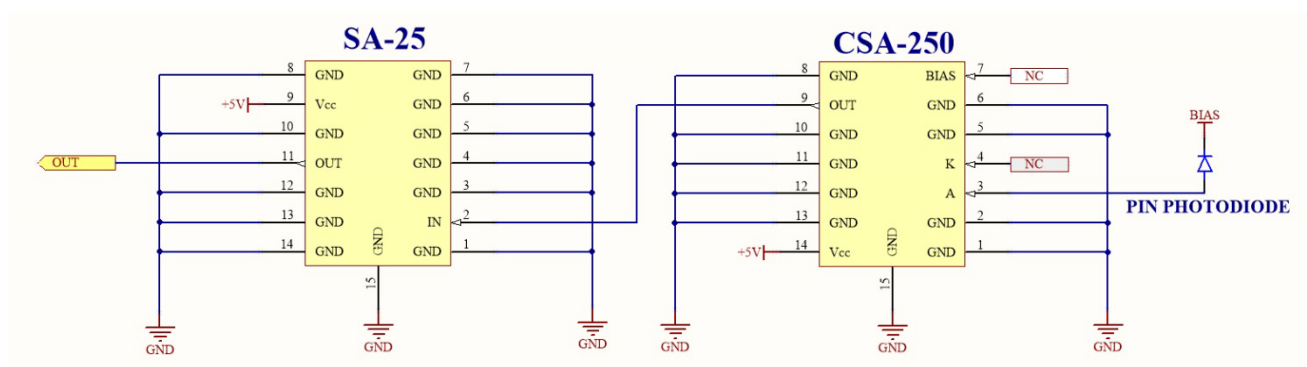


Fig. 5. Optional connection diagram.

PACKAGE DIMENSIONS AND MARKING

Figure 6 shows the amplifier package dimensions in millimeters. The package is a glass-to-metal type 153.15-2. Case material: Fe 53%, Ni 29%, Co 17%, nickel-plated; pins: Fe 53%, Ni 29%, Co 17%, nickel-plated; insulator: glass.

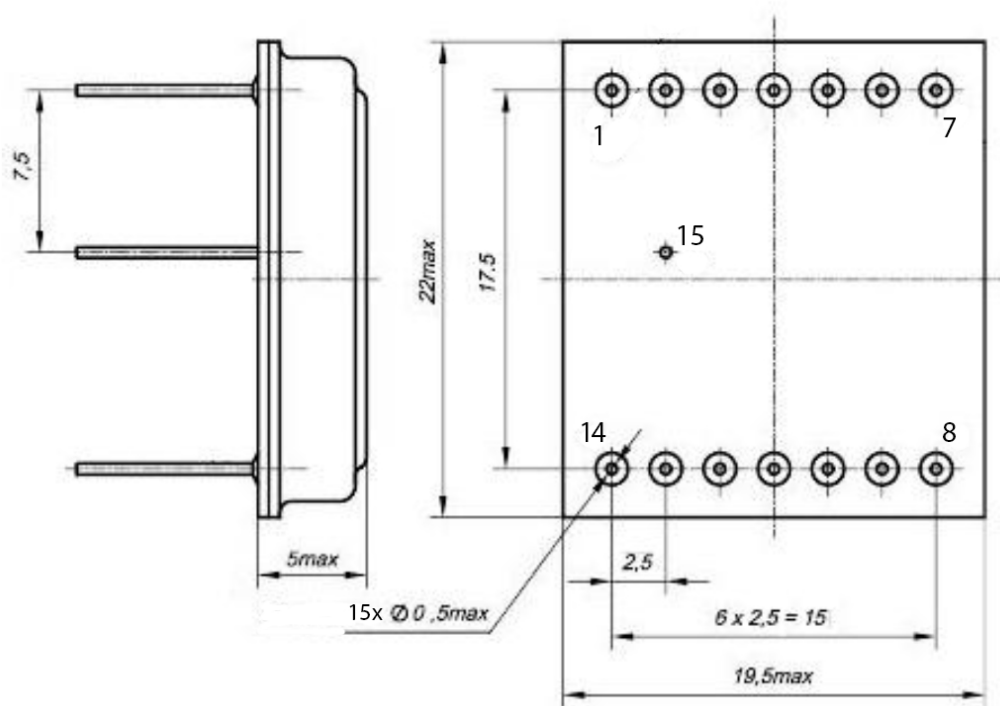


Fig. 6. Case drawing.

Product marking includes the product name, country of origin, and manufacturer.

PURCHASE AND USE CONDITIONS FOR OEM PRODUCTS

Products in the OEM category are not intended for end users. They are intended exclusively for developers and manufacturers of electronic equipment. The manufacturer cannot verify the conditions of use and storage, compliance with the requirements specified in the Absolute Maximum Ratings and Specifications sections, compliance with other requirements stated in the product documentation, or the customer's technical competence. By purchasing this product, the customer acknowledges that the product is not subject to return or replacement. The manufacturer performs quality control of the entire batch before shipment to the customer.