

FEATURES:

- Operates from one to three alkaline or NiMH cells
- Ultra-low power consumption
- Low-cost design
- Selectable 400 V or 500 V high-voltage output
- Integrated pulse shaping
- Auxiliary +5 V DC output for external circuitry
- Easy to use
- Compatible with most Geiger-Mueller tubes
- Compatible with Arduino boards using 5 V logic
- Reverse-polarity input protection
- Available in fast and slow versions

TYPICAL APPLICATIONS:

- Evaluation of Geiger-Mueller tubes
- Development of portable dosimeters
- Demonstration of the Geiger-Mueller tube operating principle
- School and college electronics laboratories

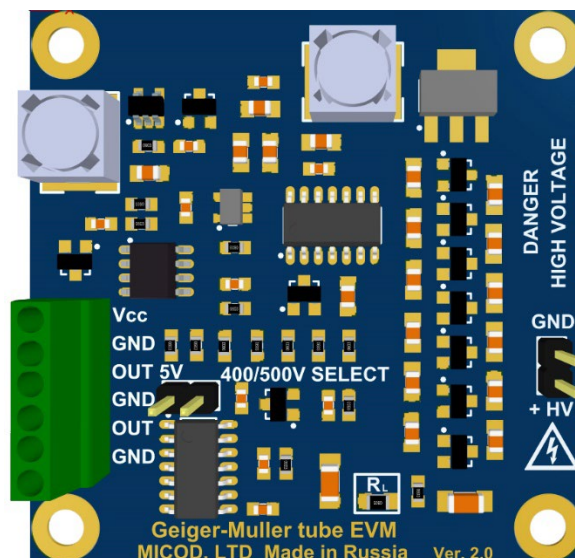


Table 1 - ABSOLUTE MAXIMUM RATINGS

Parameter	Maximum rating
Supply voltage, VCC	5.5 V
+5 V output current without the optional snubber circuit, $V_{CC} > 2.0 \text{ V}^{(1)}$	150 mA
+5 V output current with the optional snubber circuit, $V_{CC} > 2.5 \text{ V}^{(1,2)}$	400 mA

Table 2 - SPECIFICATIONS

Parameter	Min.	Nominal / Typical	Max.
Supply voltage, VCC	1.5 V		5 V
High-voltage output		400/500 V $\pm 7\%$	
Auxiliary DC output voltage		5 V	
Quiescent current, no load, no GM tube, $V_{CC} = 5 \text{ V}^{(3)}$		$\sim 100/100 \mu\text{A}$	
Quiescent current, no load, no GM tube, $V_{CC} = 1.5 \text{ V}^{(3)}$		$\sim 370/445 \mu\text{A}$	
Signal output pulse width, fast/slow version $^{(4)}$		$\sim 1 \mu\text{s} / \sim 10 \mu\text{s}$	
Signal output high level		5 V	
GM-tube current-limiting resistor, $R_L^{(5)}$		10 M Ω	
Weight		15 g	

- The maximum available output current depends on the supply voltage and increases as V_{CC} increases.
- The maximum output current of 400 mA is available only when the optional snubber circuit is installed. The snubber circuit consists of resistor R, capacitor C, and Schottky diode D. The ZHCS1000TA diode is recommended. Typical component values are $R = 5 \Omega$ and $C = 120 \text{ pF}$. The snubber circuit increases the total current consumption.
- Values are specified without and with the snubber circuit, respectively.
- The pulse width is approximate and depends on the Geiger-Mueller tube used.
- Other resistor values are available on request.

QUIESCENT CURRENT

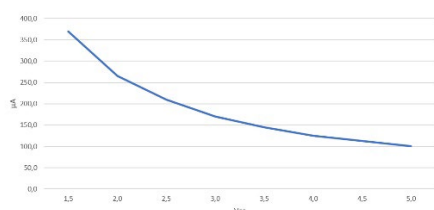


Fig. 1. Quiescent current without the snubber circuit.

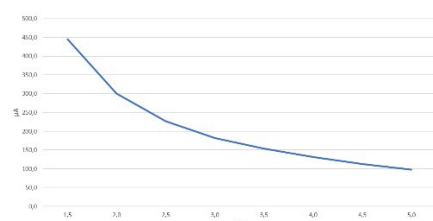


Fig. 2. Quiescent current with the snubber circuit.



WARNING

This device generates hazardous high voltage.

Persons with pacemakers or other implanted electronic medical devices must not operate or adjust this device. Hazardous voltage may remain at the high-voltage output for some time after input power has been removed. Ensure that the output is fully discharged before touching the board or any connected equipment. The manufacturer assumes no liability for equipment damage, fire, personal injury, disability, or death resulting from improper use of the device. Insufficient electrical clearance may cause arcing, which can result in fire, equipment damage, or power-supply failure.

BOARD LAYOUT AND DIMENSIONS

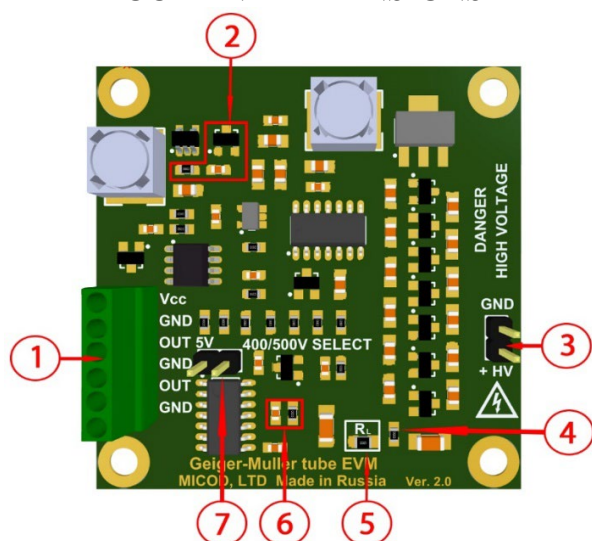


Fig. 3. EVM board ⁽¹⁾.

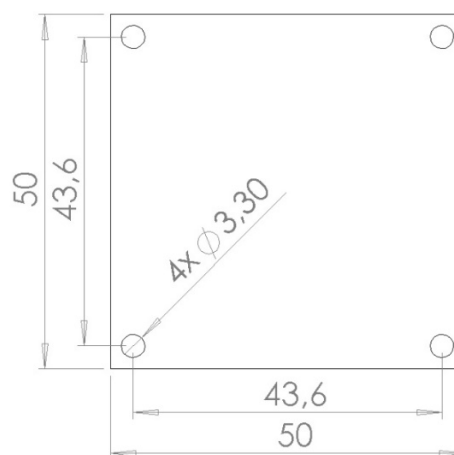


Fig. 4. EVM board dimensions.
All dimensions are in mm.

- 1 Main connector: VCC, GND, +5 V OUT, GND, SIGNAL OUT, GND;
- 2 Optional snubber circuit;
- 3 Geiger-Mueller tube connector: HIGH-VOLTAGE OUTPUT;
- 4 High-voltage test point;
- 5 Current-limiting resistor, typically 10 M Ω ;
- 6 RC network that sets the output pulse width;
- 7 High-voltage output selector: jumper open = 400 V; jumper shorted = 500 V.

(1) The solder-mask color and PCB surface finish are selected at the manufacturer's discretion. Typical configuration: white solder mask and ENIG surface finish.

SIGNAL OUTPUT WAVEFORM

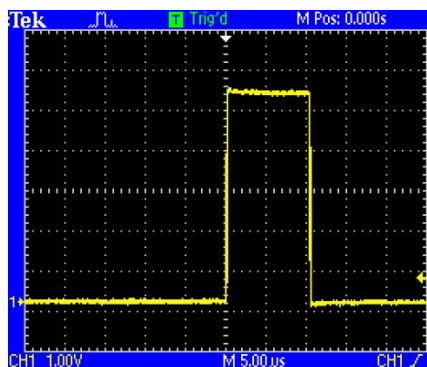


Fig. 5. Output signal waveform for the slow version.