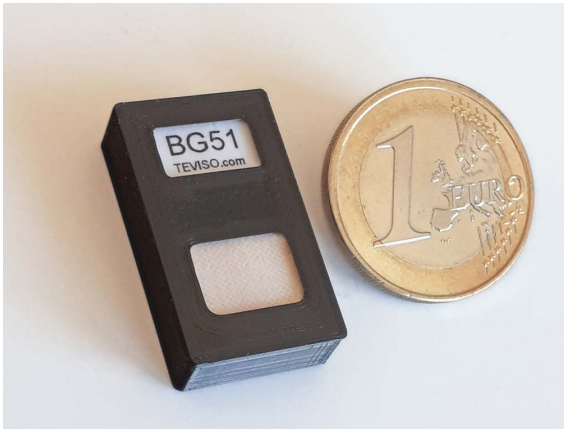


Radiation Sensor BG51

- Nuclear Beta and Gamma Radiation Sensor
- Ultra Low Power Requirement

Description

The function of the BG51 radiation sensor is based on an array of customized PIN diodes. The integrated pulse discriminator with a temperature compensated threshold level provides true TTL signal output. The BG51 is capable of detecting beta radiation (electrons), gamma radiation (photons) and X-rays.

The performance of the BG51 solid state sensor, in combination with high immunity to electrostatic fields make it a good choice for new state-of-the-art designs as well as for upgrading existing designs.

Features and Benefits

- Detects beta and gamma radiation and X-rays
- Ultra low power requirement (25µA)
- Pulse Rate vs. Radiation Rate: 5 cpm/µSv/h
- High immunity to RF and electrostatic fields
- Linear response over wide temperature range (-30°C to 60°C)
- Swiss made

Applications

- Equipment for detecting radioactivity in medical environment
- Radiation monitors for nuclear safeguards and security
- Gamma detector to detect illicit nuclear material
- Education on nuclear physics
- CubeSats conducting scientific investigations in space

Absolute Maximum Ratings

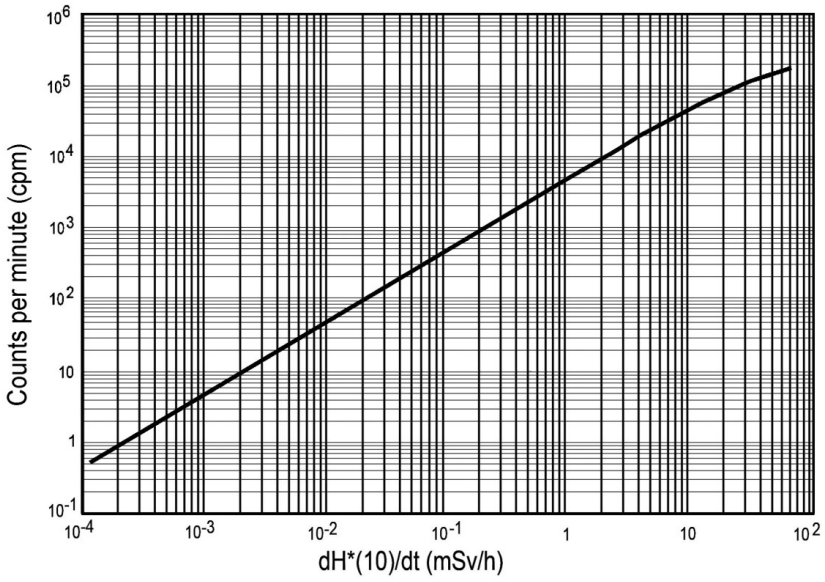
Supply voltage, V_{CC} to GND	18.0V
Output short-circuit current	continuous
Storage temperature range	-65°C to 100°C

Electrical characteristics

Unless otherwise indicated specified at:
V_{CC} = 4.0V, T_A = 25°C

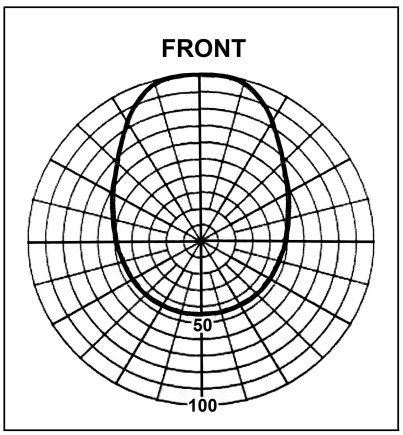
Measurement range of dose rate	0.1 µSv/h to 100 mSv/h
Pulse Rate vs. Radiation Rate	5 cpm ± 15% for 1 µSv/h
Energy response	70 keV to 2 MeV
Output pulse level	Equal to supply voltage (positive going)
Output pulse width	50 µs to 200 µs (LOW→HIGH→LOW)
Supply voltage range, V_{CC}	2.5V to 10.0V
Supply current, I_S	25µA TYP
Operating temperature range	-30°C to 60°C

BG51 Sensor Linearity

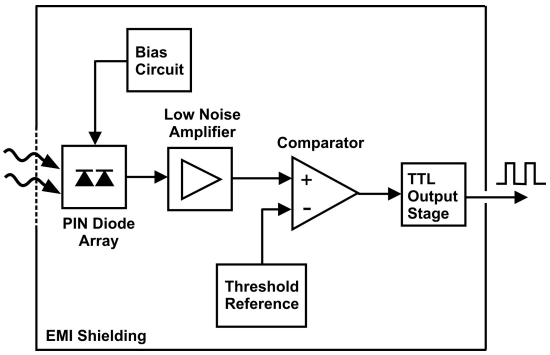


dH*(10) / dt = Radiation dose equivalent rate for Cs-137 and Co-60 (mSv/h)

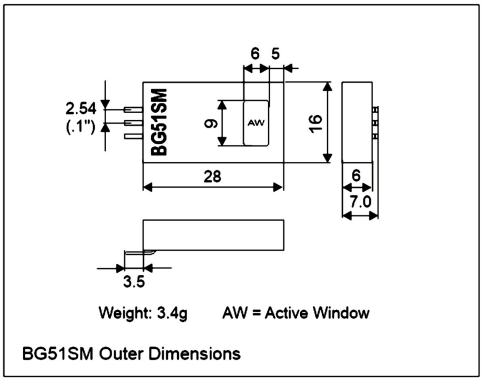
BG51 Directional Response
Front: 100%, Back: 45%



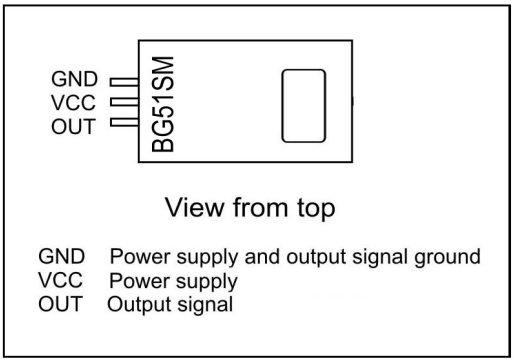
BG51 Functional Block Diagram



BG51 Outline Dimensions
(in millimeters)



BG51 Connection Descriptions
(View from the top side)



Soldering Recommendations

Hand soldering is recommended. 360°C max., 5 seconds max.

Application Information

Preventing undesired pulses

https://www.teviso.com/file/pdf/bg51-preventing-undesired-pulses.pdf

Measuring the BG51 pulse rate performance

https://www.teviso.com/file/pdf/measuring-the-pulse-rate-performance.pdf

Facts about radioactivity

https://www.teviso.com/file/pdf/facts-about-radioactivity.pdf

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