



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
- New: Ultra low power requirement (25 μ A)
- Detector sensitivity: 5 cpm/ μ Sv/h
- High immunity to RF and electrostatic fields
- Linear response over wide temperature range (-30°C to 50°C)
- Swiss made

Application Areas

- Equipment for detecting radioactivity in medical environment
- Radiation monitors for nuclear safeguards and security
- Gamma detector to detect illicit nuclear material
- Natural sciences courses and practical lab experiments

BG51

Absolute Maximum Ratings

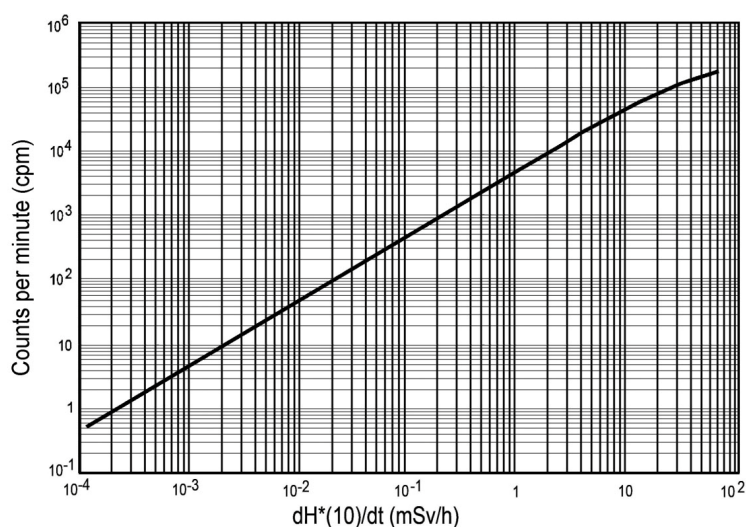
Supply voltage, V_{CC} to GND	18.0V
Output short-circuit current	continuous
Storage temperature range	-65°C to 100°C

Electrical characteristics

Unless otherwise indicated specified at:
 $V_{CC} = 4.0V$, $T_A = 25^\circ C$

Measurement range of dose rate	0.1 $\mu Sv/h$ to 100 mSv/h
Pulse count rate	5 cpm $\pm 15\%$ for 1 $\mu Sv/h$ radiation dose rate
Energy response	50 KeV to above 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 15.0V
Supply current, I_S	25 μA TYP
Operating temperature range	-20°C to 60°C

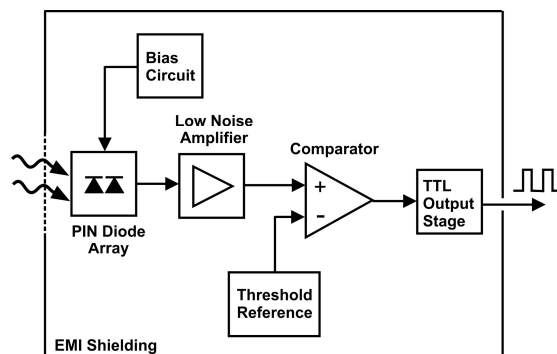
BG51 Sensor Linearity



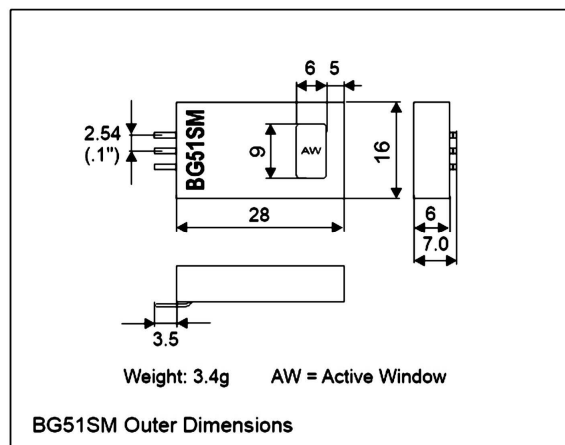
$dH^*(10) / dt$ = Radiation dose equivalent rate for Cs-137 and Co-60 (mSv/h)

BG51

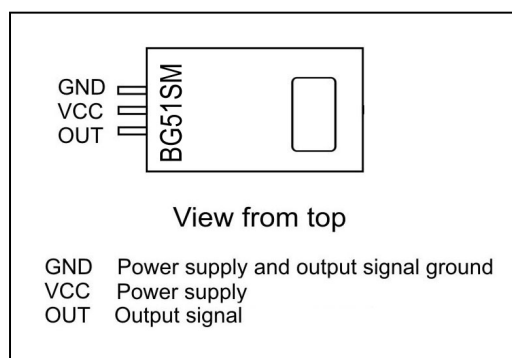
BG51 Functional Block Diagram



BG51-SM Outline Dimensions (in millimeters)



BG51-SM Connection Descriptions (View from the top side)



Soldering Recommendations

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

BG51

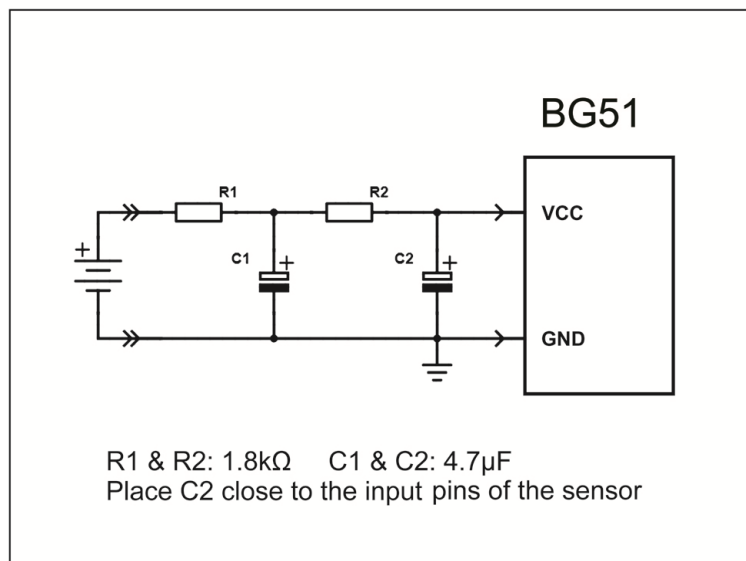
Application Information

Susceptibility to Strong Microwave Signals

In order to prevent generation of false output pulses by strong microwave signals connect a $0.01\mu\text{F}$ capacitor as close as possible to the sensor between the pins GND and VCC.

Susceptibility to Noise on Power Source

In situations where a high noise level on the power source could create undesired output pulses, an RC filter as shown below is recommended.



Disclaimer

Neither the whole nor any part of the information contained in, or the product described in this datasheet, may be adapted or reproduced in any material or electronic form without the prior written consent of the copyright holder.

This product and its documentation are supplied on an as is basis and no warranty as to their suitability for any particular purpose is either made or implied. Teviso Sensor Technologies will not accept any claim for damages howsoever arising as a result of use or failure of this product. Your statutory rights are not affected.

This product or any variant of it is not intended for use in any medical appliance, device or system in which the failure of the product might reasonably be expected to result in personal injury.

This document provides preliminary information that may be subject to change without notice.