

Radiation Sensor BG51-OEM

- Nuclear Beta and Gamma Radiation Sensor
- For the Original Equipment Manufacturer (OEM)

Description

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

The performance of the BG51-OEM 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

- Low weight (2,2g)
- New: Ultra low power requirement (25 μ A)
- Pulse Rate vs. Radiation Rate: 5 cpm/ μ Sv/h
- High immunity to RF and electrostatic fields
- Linear response over wide temperature range (-30°C to 60°C)
- Swiss made

Application Areas

- CubeSats conducting scientific investigations in space
- Original Equipment Manufacturers (OEM)
- Equipment for detecting radioactivity in medical environment
- Radiation monitors for nuclear safeguards and security
- Gamma detector to detect illicit nuclear material

Absolute Maximum Ratings

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

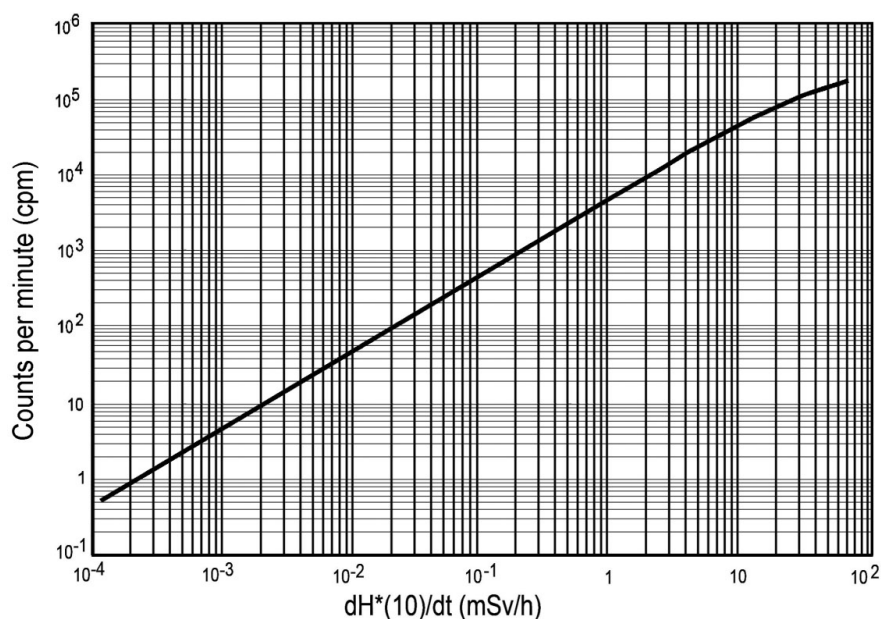
Electrical characteristics

Unless otherwise indicated specified at:

$V_{CC} = 4.0V$, $T_A = 25^\circ C$

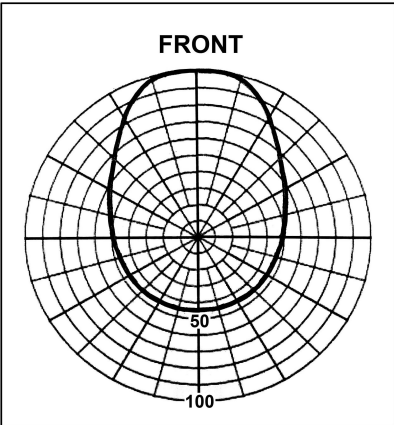
Measurement range of dose rate	0.1 $\mu Sv/h$ to 100 mSv/h
Pulse Rate vs. Radiation Rate	5 cpm \pm 15% for 1 $\mu Sv/h$
Energy response	70 keV to 2 MeV
Output pulse level	Equal to supply voltage (positive going)
Output pulse width	50 μs to 200 μs (LOW \rightarrow HIGH \rightarrow LOW)
Supply voltage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

BG51-OEM Sensor Linearity

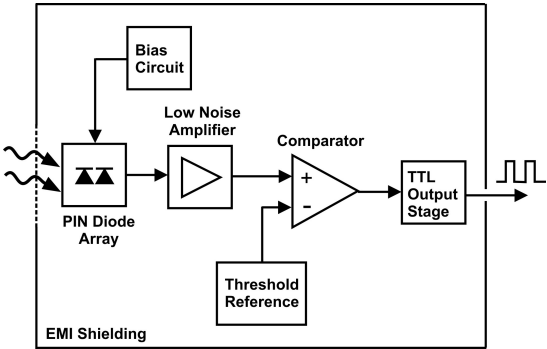


$dH^*(10) / dt$ = Radiation dose equivalent rate for Cs-137 and Co-60 (mSv/h)

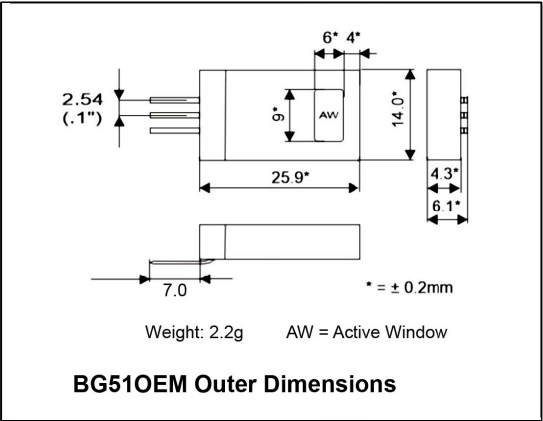
BG51 Directional Response
Front: 100%, Back: 45%



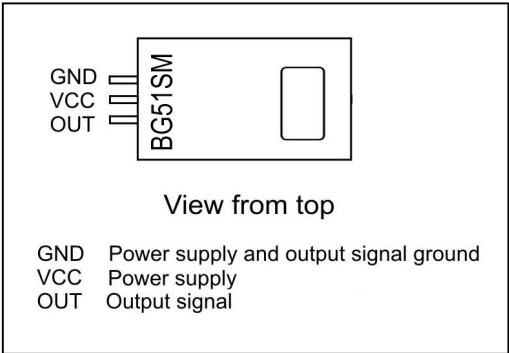
BG51 Functional Block Diagram



BG51 Outline Dimensions
(in millimeters)



BG51 Connection Descriptions
(View from the top side)



Handling

Handle with care. Do not scratch the aluminum shielding! Scratched or damaged foil would reduce the shielding against surrounding light and cause malfunction of the internal PIN diodes.

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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