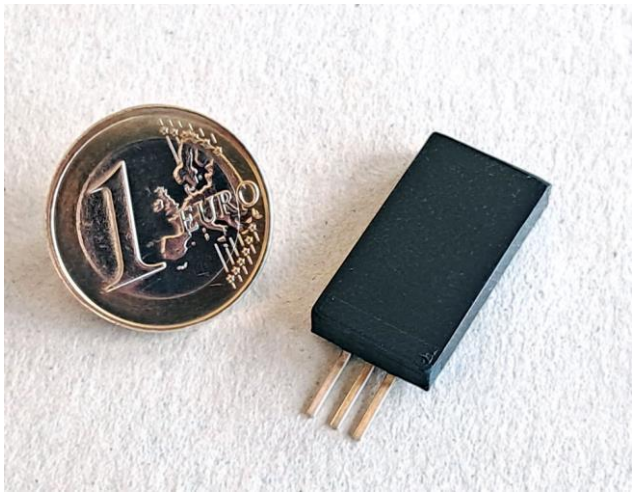


# Radiation Sensor BG51-OEM

## - 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 (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

### 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

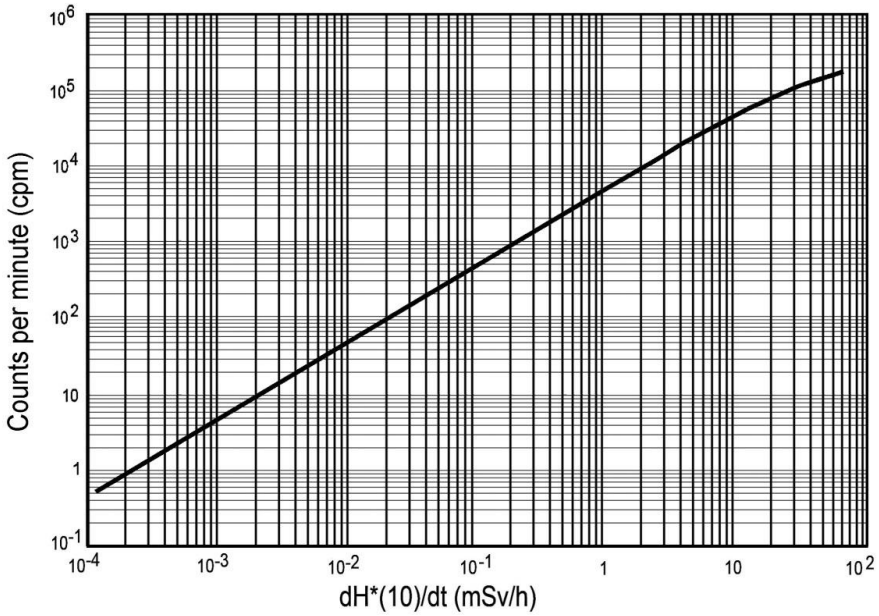
| | |
|---|---|
| Supply voltage, $V_{CC}$ to GND | 18.0V |
| Output short-circuit current | continuous |
| Storage temperature range | -65°C to 100°C |

## Electrical characteristics

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

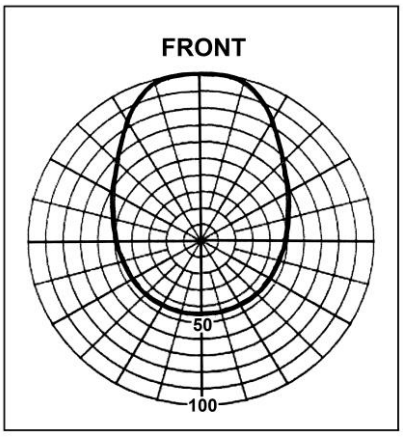
## BG51-OEM Sensor Linearity



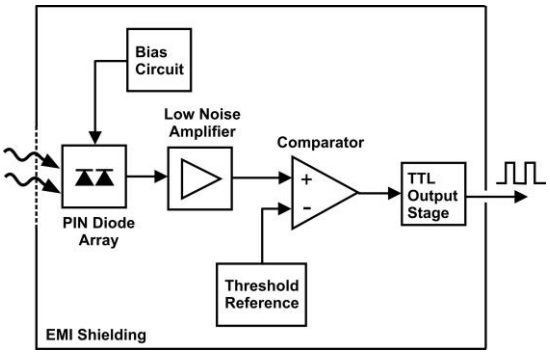

dH*(10) / dt = Radiation dose equivalent rate for Cs-137 and Co-60 (mSv/h)

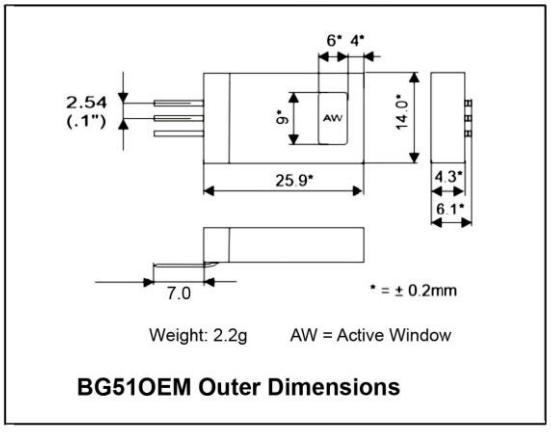
**BG51 Directional Response**
Front: 100%, Back: 45%



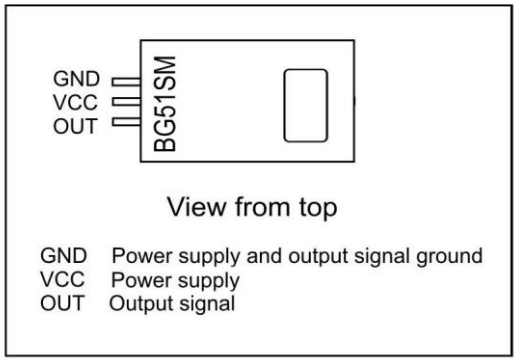

**BG51 Functional Block Diagram**




**BG51 Outline Dimensions**
(in millimeters)




**BG51 Connection Descriptions**
(View from the top side)



### Proper 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.

### Correct attachment to the PCB.

It is recommended to attach the sensor to the PCB with an insulated wire bracket. Caution: Do not obstruct the active window. Never attach with adhesive, as there is a risk of injury to the shielding foil.

## 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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