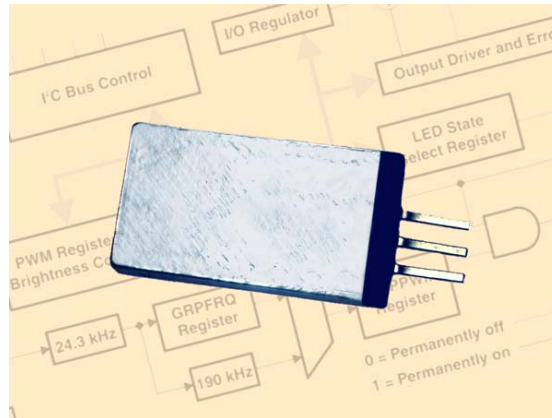


# BG51-OEM



Teviso Sensor Technologies



## 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 $\mu$ A)
- Pulse Rate vs. Radiation Rate: 5 cpm/ $\mu$ 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



# BG51-OEM

## Absolute Maximum Ratings

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

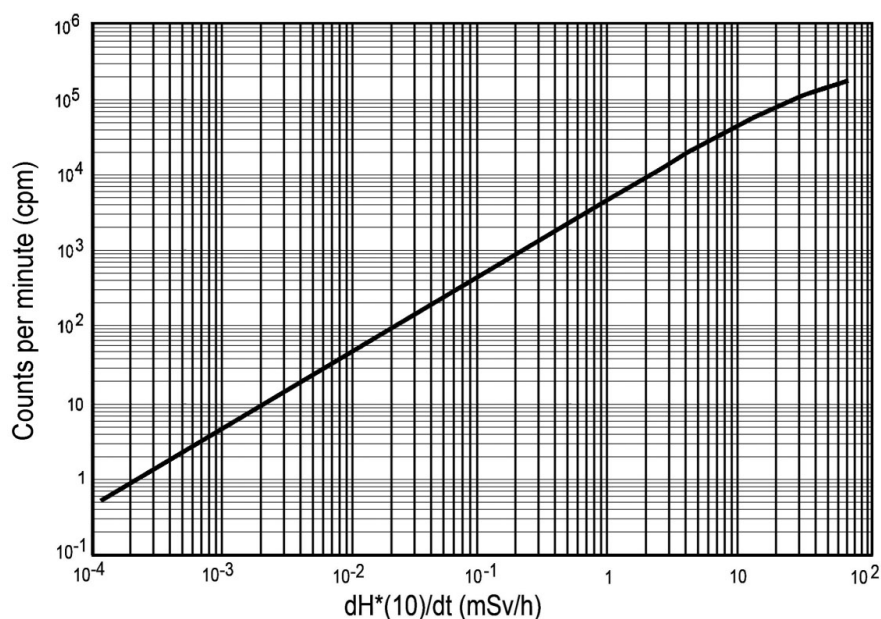
## Electrical characteristics

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 $\mu s$ to 200 $\mu s$ (LOW→HIGH→LOW)
Supply voltage range, $V_{CC}$	2.5V to 10.0V
Supply current, $I_s$	25 $\mu A$ TYP
Operating temperature range	-30°C to 60°C

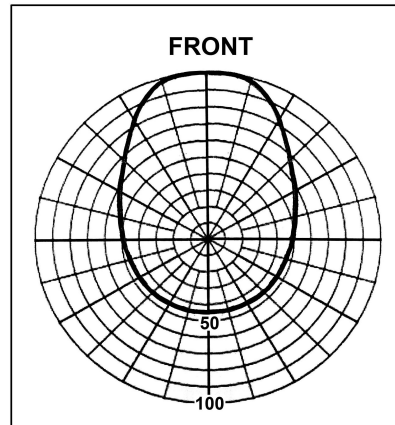
## BG51-OEM Sensor Linearity



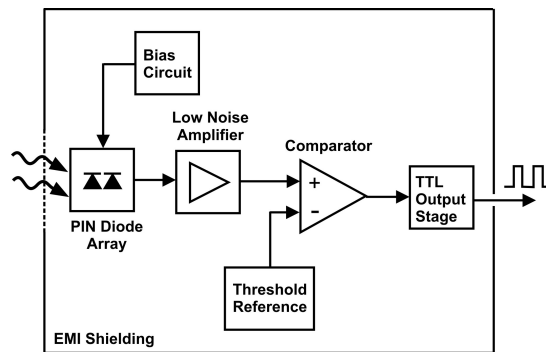
$dH^*(10) / dt$  = Radiation dose equivalent rate for Cs-137 and Co-60 (mSv/h)

# BG51-OEM

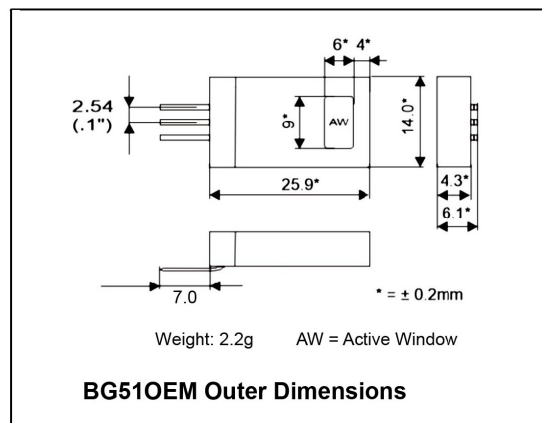
**BG51 Directional Response**  
Front: 100%, Back: 45%



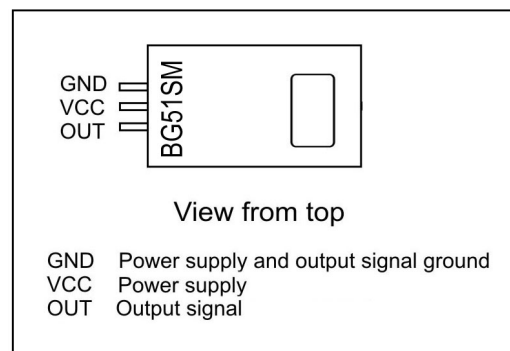
**BG51 Functional Block Diagram**



**BG51 Outline Dimensions**  
(in millimeters)



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



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## 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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