Radiation Sensor AL53

- Detects Alpha and Beta Particles and Gamma Ray
- Ultra Low Power Requirement

Description

The heart of the AL53 radiation sensor is a customized PIN diode, covered with a thin aluminum foil to make it insensitive to light. An integrated pulse discriminator with a temperature compensated threshold level provides true TTL signal output. The AL53 is capable of detecting alpha and beta particles and gamma ray.

The performance of the AL53 solid state sensor, in combination with ultra low power requirements make it a good choice for new state-of-the-art designs as well as for upgrading existing designs.

Features and Benefits

- Detects alpha (Am-241), beta (C-14) and gamma radiation
- Ultra low power requirement (25 µA)
- Detector sensitivity: 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

- Equipment for detecting radioactivity in medical environment
- Radiation monitors for nuclear safeguards and security
- Detection of illicit substances
- Natural sciences courses and practical lab experiments

Absolute Maximum Ratings

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

Electrical Characteristics

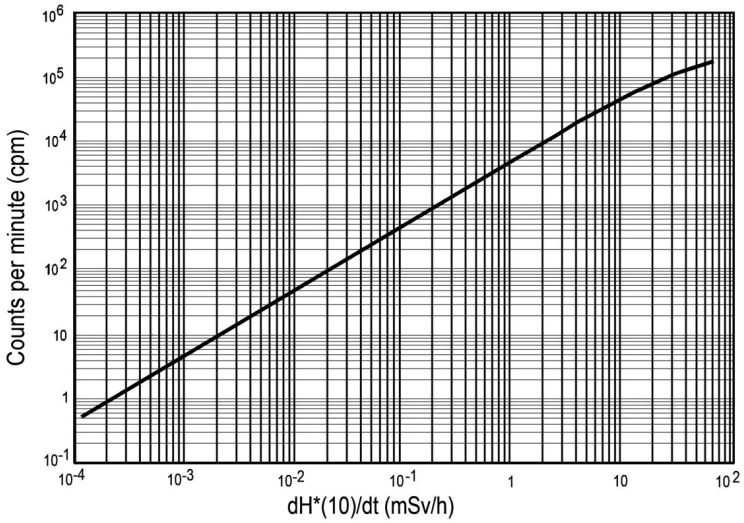
Unless otherwise indicated specified at:
V_{CC} = 4.0 V, T_A = 25 °C

Measurement range of dose rate	0.1 µSv/h to 100 mSv/h
Pulse count rate	5 cpm ± 15% for 1 µSv/h radiation dose rate
Energy response	50 keV to above 10 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}	2.5 V to 15.0 V
Supply current, I_S	25 µA TYP
Operating temperature range	-30 °C to 60 °C

Sensor Characteristics

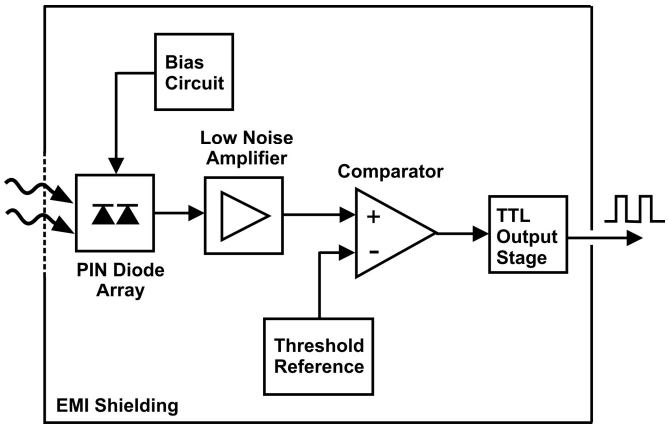
PIN diode active area	13 mm^2
Window	Aluminum 9.5 x 9.5 x 0.01 mm

AL53 Sensor Linearity

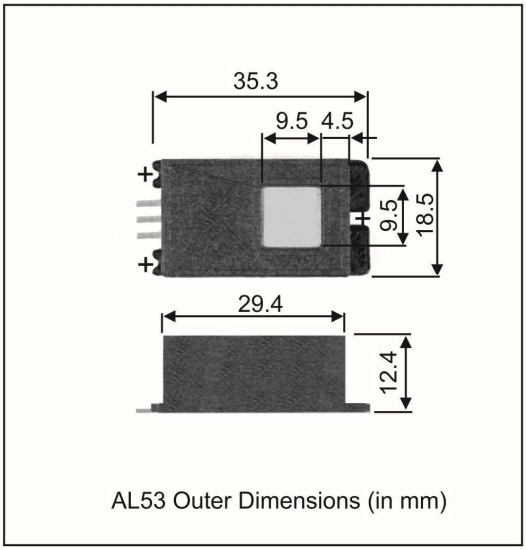


dH*(10) / dt = Radiation dose equivalent rate for Cs-137 and Co-60 (mSv/h)

AL53 Functional Block Diagram

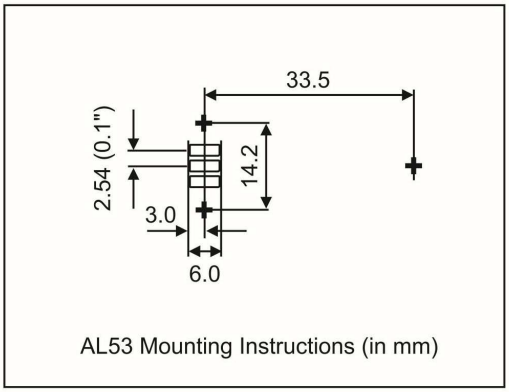


AL53 Outer Dimensions



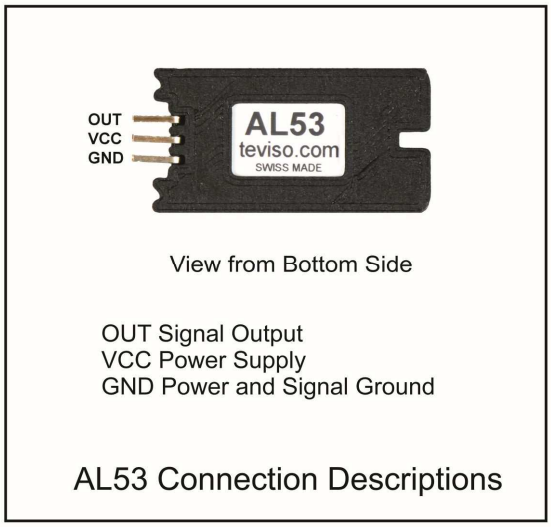
AL53 Outer Dimensions (in mm)

AL53 Mounting Instructions



AL53 Mounting Instructions (in mm)

AL53 Connection Descriptions



AL53 Soldering Recommendations

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

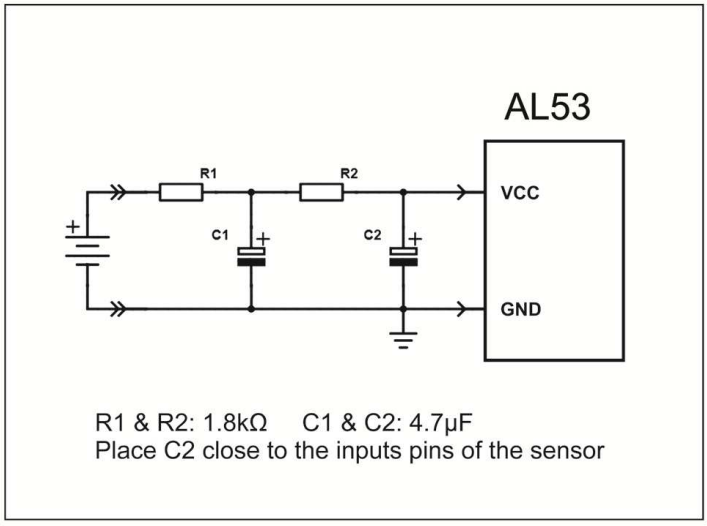
Application Information

Window

Do not touch or clean the window! A scratched or bruised window impairs the function of the PIN diode or could even destroy it.

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.



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