



## Radon Detector RN53

- For Continuous Radon Monitoring (CRM) Systems
- Ultra Low Power Requirement

### Description

The RN53 Radon Detector operates on the method of electrostatic collecting of the radon  $^{222}\text{Rn}$  progeny  $^{218}\text{Po}$  and  $^{214}\text{Po}$ . Both  $^{218}\text{Po}$  and  $^{214}\text{Po}$  decay via alpha emission. A PIN diode, which is part of the RN53 detector, continuously detects the alpha particles being emitted during the decay of  $^{218}\text{Po}$  and  $^{214}\text{Po}$ . An integrated energy spectrum analyzer separates the signal of undesired decay products. The rate of the output pulses of the RN53 is a direct measure for the radon gas concentration in the sampled air.

Electrostatic collecting of the decay products of the radon gas is a precise and reliable method to get a representative measure for the concentration of radon in the environment being monitored.

### Features and Benefits

- Continuous monitoring of radon concentration
- Ultra low power requirement for battery powered applications
- Integrated energy spectrum analyzer
- TTL/CMOS compatible pulse output
- Swiss made

### Application Areas

- Environmental monitoring in IoT
- Integration in commercial CRM systems
- Natural sciences courses and practical lab experiments

## Absolute Maximum Ratings

Supply voltage, $V_{CC}$ to GND	18.0V
Collecting voltage	1000V
Output short-circuit duration	continuous
Storage temperature range	-65°C to 100°C

## Electrical Characteristics

Unless otherwise indicated specified at:

$V_{CC} = 4.5V$ ;  $T_A = 23^\circ C$ ; relative humidity RH = 20%;

Measuring chamber volume: 170cm<sup>3</sup>; collecting voltage: +400V

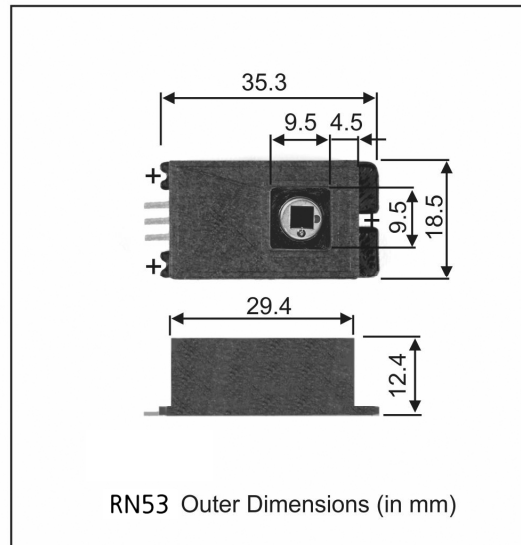
Output pulse level	Equal to supply voltage (positive going)
Output pulse width	200µs (LOW→HIGH→LOW)
Supply voltage range, $V_{CC}$	2.5V to 15.0V
Supply current, $I_S$	20µA TYP
Operating temperature range	-20°C to 60°C
Sensitivity	150 cph/1000Bq/m <sup>3</sup>
Accuracy	±10% typical at 1000Bq/m <sup>3</sup>

### Note:

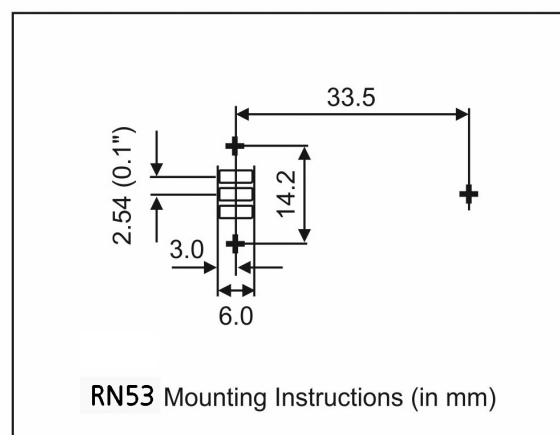
The pulse count rate highly depends on factors such as

- volume and construction of the measuring chamber
- collecting voltage
- humidity and temperature of the environment

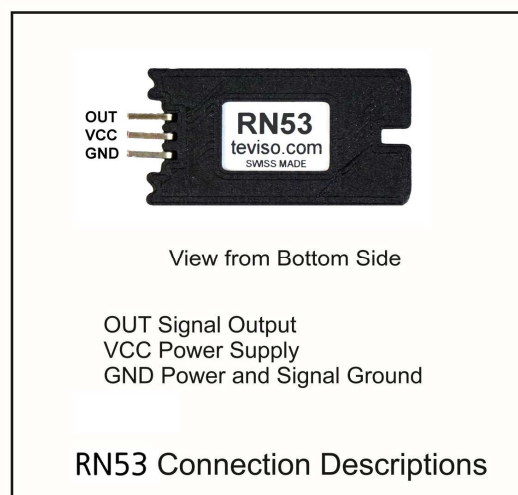
## RN53 Outline Dimensions



## RN53 Mounting Instructions



## RN53 Connection Descriptions



## Soldering Recommendations

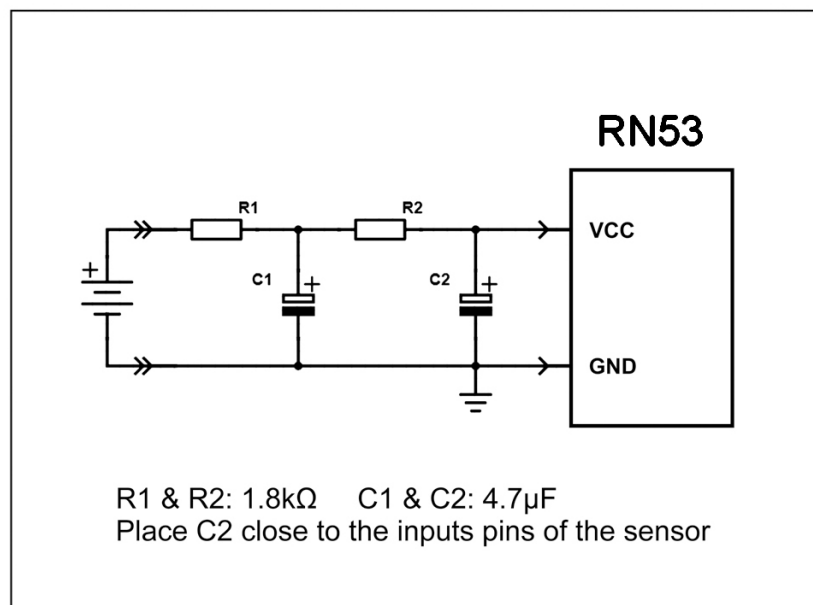
Hand soldering is recommended. 360°C max., 5 seconds max.

## Precaution

- **Never touch or cleanse the sensor chip.**
- The PIN diode is sensitive to light. During operation the RN53 Radon Detector and the measuring chamber should be kept in a dark environment for maximum accuracy.

## 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.



## RN53 Application Notes

For first-time users of the RN-53 Radon Detector the RN53-STK Starter Kit is strongly recommended. The kit includes one RN53 Radon Detector, pre-installed in a measuring chamber, ready for a successful start. Part of the kit is also a radon source which is essential for functional tests. Further information can be found on

<https://www.teviso.com/file/pdf/rn53-stk-starter-kit-data-spec.pdf>

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