

Self -Powered Radio Frequency Signal Generator And Method Of Generating Thereof

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ABSTRACT

A self-powered radio frequency (RF) signal generator (102) and a method (700) of generating thereof is disclosed. The self-powered RF signal generator (102) includes a voltage-controlled oscillator (VCO) circuit (106) configured to generate oscillating RF signals and provide excitation to a sensor (108). A power supply circuit (104) electrically coupled to the VCO circuit (106) and configured to provide a regulated electrical supply to the VCO circuit (106). A power detection circuit (112) electrically coupled to an output of the sensor (108) and configured to measure a power level of the RF signals received from the sensor (108). A frequency pre-scaler circuit (110) electrically coupled to the output of the sensor (108) and the power detection circuit (112). A counter circuit (114) electrically coupled to the frequency pre-scaler circuit (110). A microcontroller (116) electrically coupled to the power detection circuit (112) and the counter circuit (114).

KEY APPLICATION AREAS

1. Biomedical Sensing & Diagnostics.
2. Wearable Healthcare Devices.
3. Material Characterization & Testing.
4. Portable RF Measurement Systems.
5. Remote Monitoring & Field Testing.
6. Wireless Sensor Networks.

POTENTIAL USE

1. Non-invasive tissue analysis using RF sensing.
2. Early-stage cancer detection, hydration monitoring, and glucose analysis.
3. Material property testing (permittivity and conductivity measurement).
4. Portable RF signal generation and analysis for field applications.
5. Real-time remote diagnostics with wireless data transmission.
6. Wearable biomedical monitoring systems.