Wireless Batteryless and Chipless Harmonic Platform for DC Resistive Sensors

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Abstract

This past year I have been working on a versatile harmonic platform for direct current resistive sensors that operate without the need for a battery or microcontroller. In contrast to the chipless sensing harmonic transponders documented in scientific literature, which have been designed for single-purpose applications such as temperature or humidity sensing, The platform is capable of monitoring any physical parameter that can be translated into a resistive variation. Such phenomena include temperature, light intensity, gas concentration, weight and other measurable variables. The system exploits the second harmonic generated by nonlinear devices to transmit sensor data wirelessly. The sensor's resistance must fall within the range of 0.2 to 10 kΩ. With a sensitivity radio of -100 dBm and a fundamental frequency of 2.45 GHz, the system achieves a coverage of 1.5 m with an output signal power amplitude of approximately 10 dBm.

Keywords: Harmonic Tag, Harmonic Transponder, Second Harmonic, Wireless Platform, Resistive Sensors, Temperature, Light, Weight, Baterryless, RFID, IOT, Chipless, Direct Current.

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