RFMicron Magnus® S Temperature Sensor Tag Product Brief - Preliminary

Product Overview

RFMicron continues to drive revolutionary change in the RFID market by providing passive single-chip **temperature** sensing capability via affordable sensor tags. The RFMicron Temperature Sensor tag is a passive UHF tag armed with the RFMicron Magnus®S3 IC with accurate temperature-sensing circuit. This innovation enables maintenance-free and battery-free, temperature sensing solutions to business problems for improved product and quality control.

The Magnus® S Temperature Sensor tag is a cost effective solution that is easy to implement, and works on different low- and high-dielectric materials like cardboard, plastics, stone, wood and construction materials. Intended to serve new and existing markets, such as industrial, perishables, healthcare, and Internet of Things (IoT), it provides great performance and accurately measures temperature in the surrounding environment.

The Magnus® S temperature sensor tag is fully passive and does not require a microcontroller. The sensed temperature is digitized into a 12-bit number, called the TEMPERATURE CODE, and is wirelessly communicated to off-the-shelf readers using a standard UHF Gen 2 protocol READ command. By retrieving the TEMPERATURE CODE and applying a simple formula determined at calibration time, the TEMPERATURE CODE can be converted into to a precise temperature measurement. Typical accuracies of ±0.3°C from 0°C to +50°C and ±1°C over the −40°C to +85°C temperature range can be achieved depending on the calibration technique.

RFMicron's temperature sensing solution enables a new class of fully-functional wireless, passive, temperature sensors consisting of nothing more than the Magnus® S3 chip and an antenna – the same components needed for a conventional RFID tag. It is deployable where active or semi-active sensors are not practical, and involves no battery maintenance, costs or problems with product lifetime or recycling.

Features

- General purpose "dipole-tag"
- Die-cut Size of 148 mm x 15.875 mm
- Antenna Size 145.84 mm x 7.62 mm
- Magnus®S3 IC with accurate temperature-sensing circuit
- 12-bit Temperature Sensor accuracy +/- 0.3 C from 0 to +50C; +/- 1.0 C from -40 to +85 C
- Meets EPCglobal™ Gen2 (v. 2.0.0) and ISO/IEC 18000-6C requirements
- Worldwide operation in the RFID UHF band from 860 to 960 MHz
- User-accessible read-only and read/write memory
  - 64-bit factory programmed unique Tag ID (read-only; unalterable)
  - 176-bit user memory
  - 128-bit EPC™ code
  - 32-bit Access and Kill passwords

Applications: Automotive, Process Controls, Materials, Healthcare, Perishables

Operating Conditions and Electrical Characteristics

Parameter	Min	Typ	Max	Units	Notes
Operating Frequency	860		960	MHz	
Operating Temperature	-40		+85	ºC	
Tag Read Sensitivity		-17.1		dBm	1
Tag Write Sensitivity (EPC compliant)		-11.4		dBm	1
Data Retention	10			Years	2
Write and Erase Endurance		10,000		Cycles	2
Received RF Power			+10	dBm	800-1000 MHz
ESD Immunity			1750	V	Human Body Model (HBM)
Storage Temperature	-40		100	ºC	

1. DSB-ASK modulation with 90% modulation depth and 25 µs Tari used for reader-to-tag communication. Miller M=4 encoding with 256 kbps BLF used for tag-to-reader communication. Ambient temperature: 25 ºC.
2. -40 to +85 ºC

Ordering Information

Part #	Description
RFM-5300AT-ESR2	Temperature Sensor Tag Engineering Sample

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