

SPSx Family

Battery Free Wireless Sensor

ON Semiconductor's family of Battery Free Wireless Sensors are UHF RFID wireless sensors which use the MagnusS2[®] Sensor IC and can perform either moisture/proximity or temperature/proximity sensing functions in a variety of applications where size and accessibility are at a premium.

Battery Free Wireless Sensors digitize sensed moisture detection/level or temperature information which can then be read by a standard UHF RFID Gen 2 compliant reader. Sensor tags function in either the FCC defined UHF band (part numbers ending in "A") or the ETSI UHF band (part numbers ending in "B").

Features

- Single IC, Battery Free Wireless Sensing
- Small Form Factor Packages
- 64 bit TID and 128 bit EPC + 144 bit User Defined Memory
- EPC Class 1 Gen 2 v.2.0.0 ISO 18 000–6C Compliant
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Max	Unit
Human Body Model (Note 1)	ESD	±1	kV

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Junction and Storage Temperature Range (Note 2)	T _J , T _{stg}	-40 to +85	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Non-repetitive current pulse at T_A = 25°C, per JS-001 waveform.
2. Shelf Life – minimum 2 years from date of manufacturing.



ON Semiconductor[®]

www.onsemi.com

CASE TBD

ORDERING INFORMATION

Device	Package	Shipping
SPS1M001A	Clear Dry PET Inlay (Pb-Free)	TBD
SPS1M001B		TBD
SPS1M002A		500 / Reel
SPS1M002B		500 / Reel
SPS1M003A		TBD
SPS1M003B		TBD
SPS2T001A		TBD
SPS2T001B		TBD

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

This document contains information on some products that are still under development. ON Semiconductor reserves the right to change or discontinue these products without notice.

SPSx Family

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Device	Frequency (MHz)		Read Sensitivity (dBm)	TID (Bits)	EPC (Bits)	ROM (Bits)	Wet/Dry Trip Level (Code)
	Min	Max	Min	Min	Min	Min	Typ
SPS1M001	860	960	-16	64	128	144	15
SPS1M002	860	960	-16	64	128	144	15
SPS1M003	860	960	-16	64	128	144	15
SPS2T001	860	960	TBD	TBD	TBD	TBD	-

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

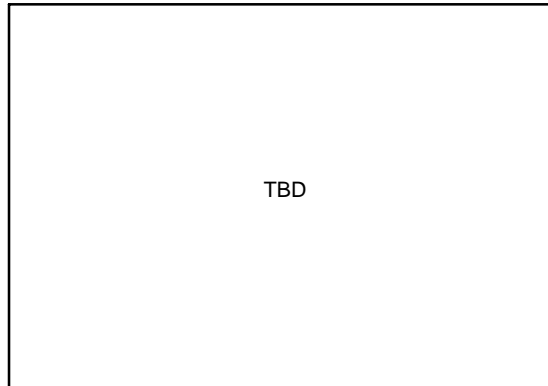


Figure 1. Read Range (m) in Free Air

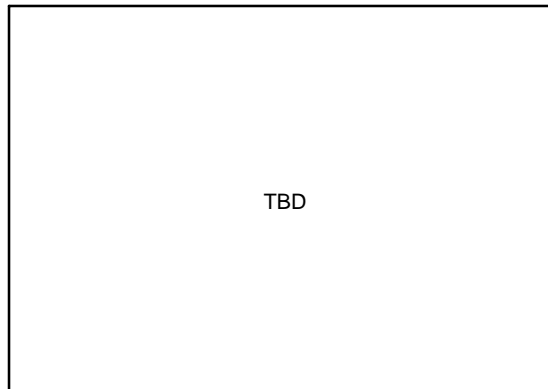


Figure 2. Sensor Code Value

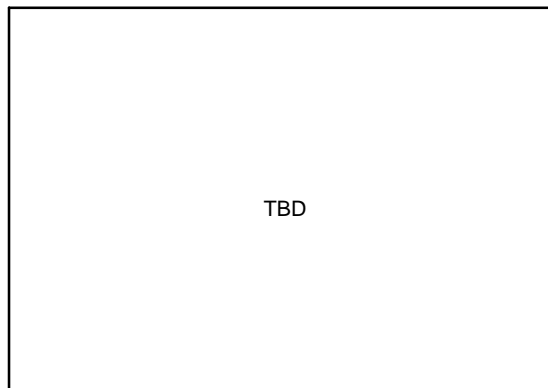


Figure 3. Sensor Code versus Temperature

SPSx Family

SENSOR TAG DESCRIPTIONS

SPS1M001 – Quality Control Water Intrusion Sensor Tag

The quality control water intrusion sensor tag is specifically designed for the passive sensing of moisture in finished goods as a form of leak detection. The sensors can be placed in specific areas of the object and greatly simplifies the quality control test for leaks. This Battery Free Wireless Sensor can reduce the number of missed defects and significantly improve the quality manufacturing lines.

SPS1M002 – Moisture Level Detection Sensor Tag

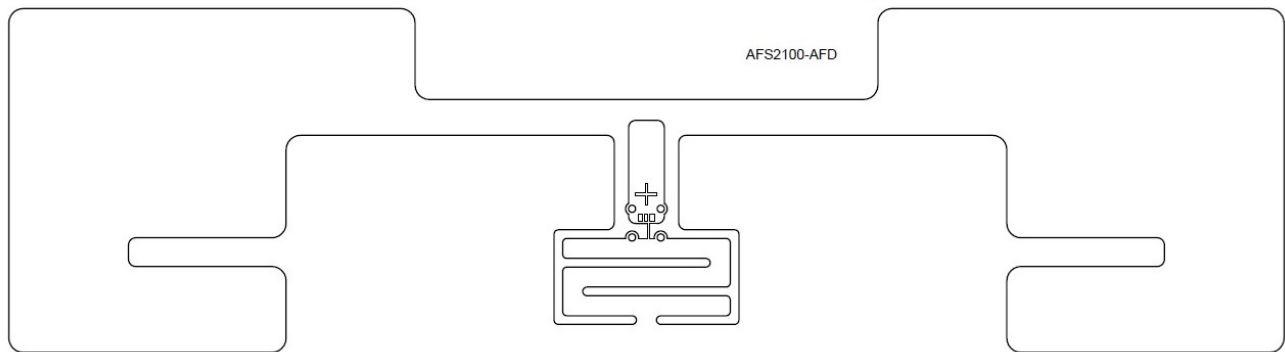
The moisture level detection sensor tag is specifically designed for the passive sensing of moisture on various surfaces and finished goods such as plastics, wood, and plaster. The tag digitizes sensed moisture detection/level information which can be read by a standard UHF RFID Gen 2 compliant reader. This Battery Free Wireless Sensor can greatly enhance the reliability of the end product and offer many benefits for deployment in industrial settings.

SPS1M003 – High Sensitivity Moisture Level Detection Sensor Tag

The high sensitivity moisture level detection sensor tag is specifically designed for the passive sensing of moisture that does not touch the tag. This high sensitivity allows the tag to detect moisture through layers of material making it ideal for applications where the tag cannot be placed directly in the area of interest. The tag digitizes sensed moisture detection/level information which can be read by a standard UHF RFID Gen 2 compliant reader. This Battery Free Wireless Sensor can offer many benefits for deployment in a variety of settings.

SPS2T001 – Temperature Sensor Tag

The temperature sensor tag is specifically designed for the passive sensing of temperature experienced by the tag. The tag digitizes the sensed temperature which can be read by a standard UHF RFID Gen 2 compliant reader. This Battery Free Wireless Sensor can offer many benefits for deployment in industrial as well as agricultural settings.

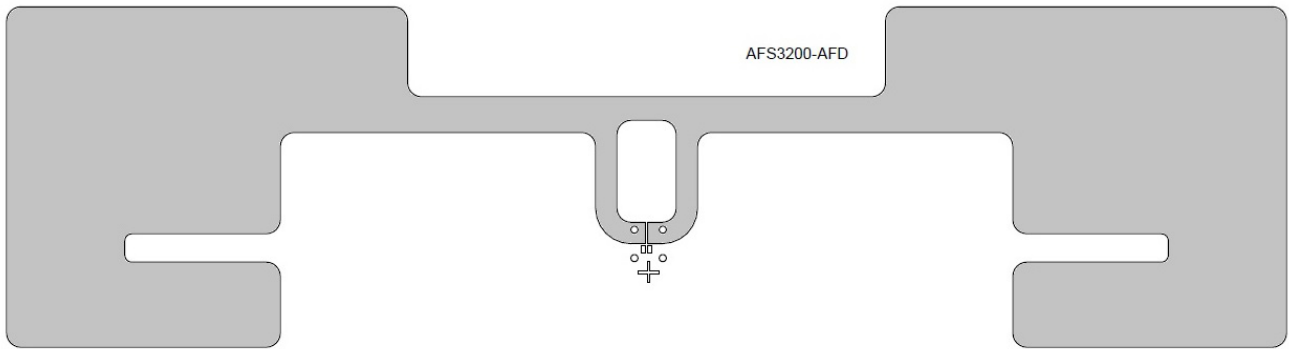


Antenna View

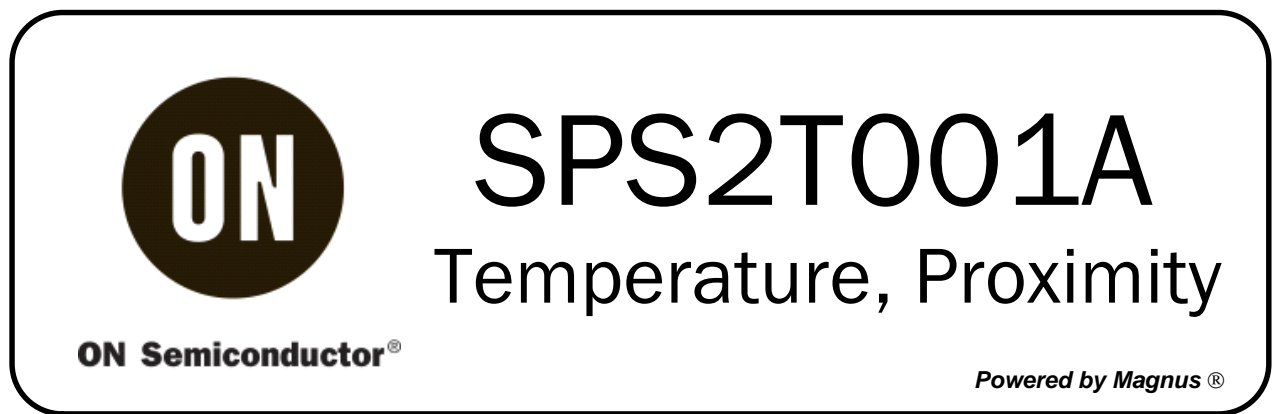


Product Marking View

SPSx Family

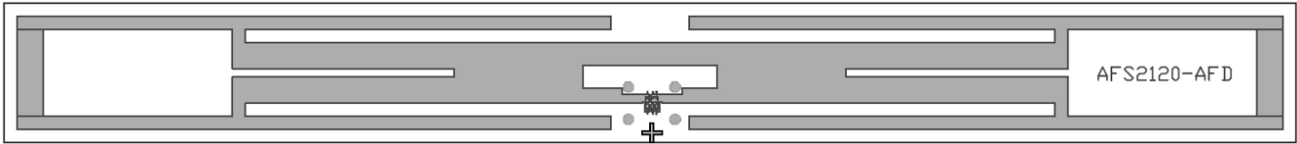


Antenna View



Product Marking View

SPSx Family

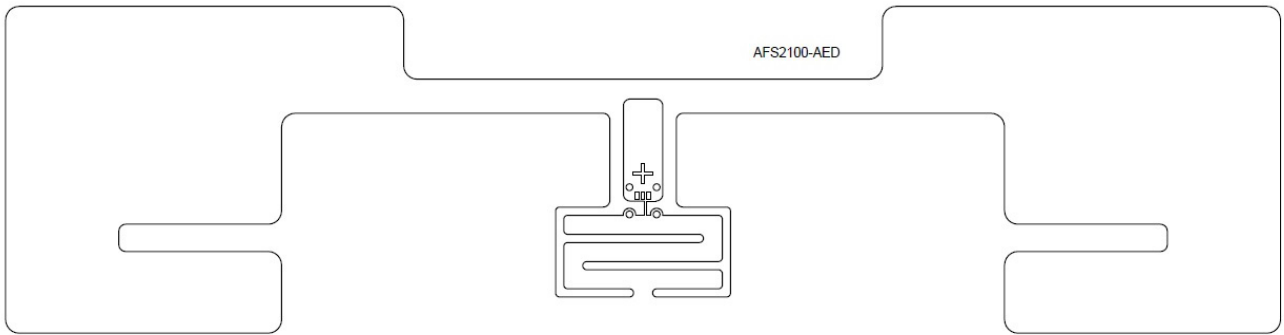


Antenna View



Product Marking View

SPSx Family



Antenna View



ON Semiconductor[®]

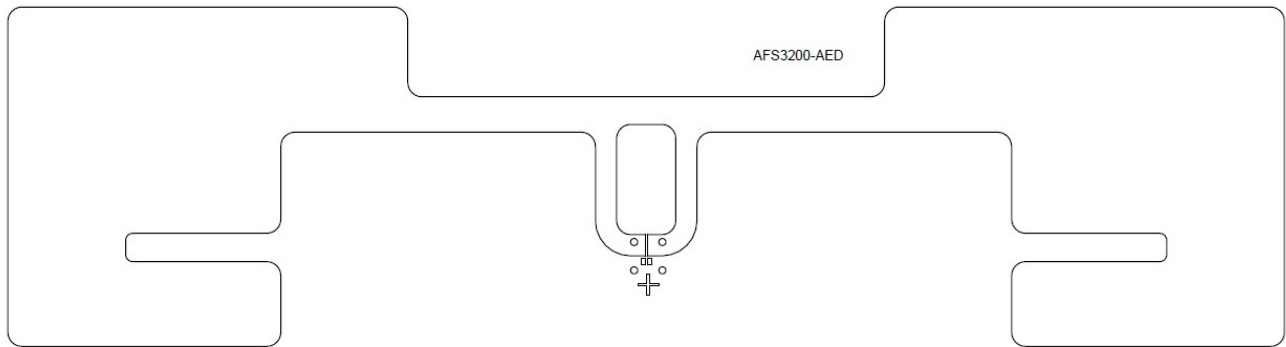
SPS1M002B

Moisture, Proximity


Powered by Magnus[®]

Product Marking View

SPSx Family



Antenna View



ON Semiconductor[®]

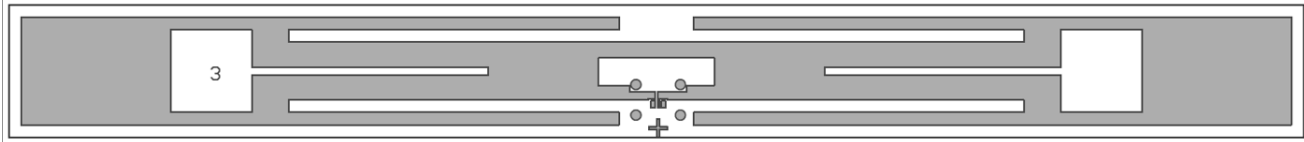
SPS2T001B

Temperature, Proximity

Powered by Magnus[®]

Product Marking View

SPSx Family



Antenna View



ON Semiconductor®

SPS1M003B

Moisture, Proximity

Powered by Magnus®

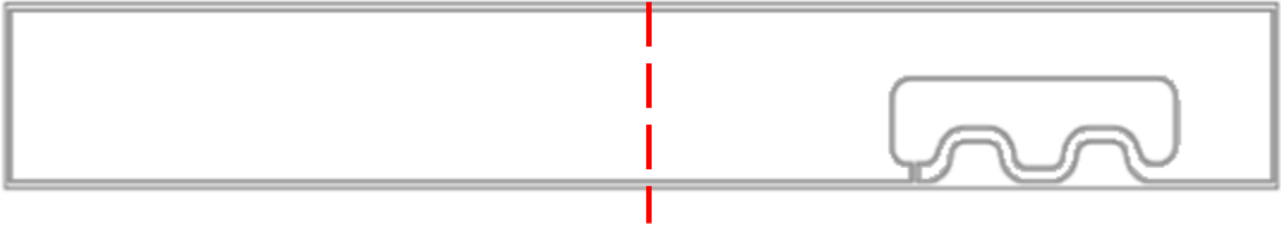
Product Marking View

SPSx Family

Fold line

Back View (no print – adhesive back)

Front View (printed on cover lay)



ON Semiconductor®

SPS1M001B
Moisture, Proximity

Powered by Magnus®


Product Marking View

SPSx Family

PACKAGE DIMENSIONS

TBD
CASE TBD
ISSUE TBD

MagnusS2 is a registered trademark of RfMicron, Inc.

ON Semiconductor and the  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC) or its subsidiaries in the United States and/or other countries. SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local
Sales Representative

SPS1M002/D