

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 ($T_A = 25^\circ\text{C}$ 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	$^\circ\text{C}$

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 $T_A = 25^\circ\text{C}$, 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.

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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.

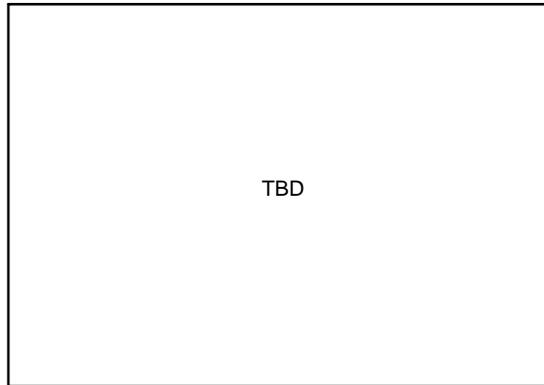


Figure 1. Read Range (m) in Free Air

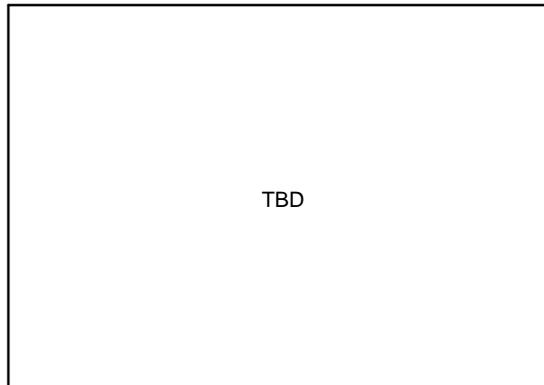


Figure 2. Sensor Code Value

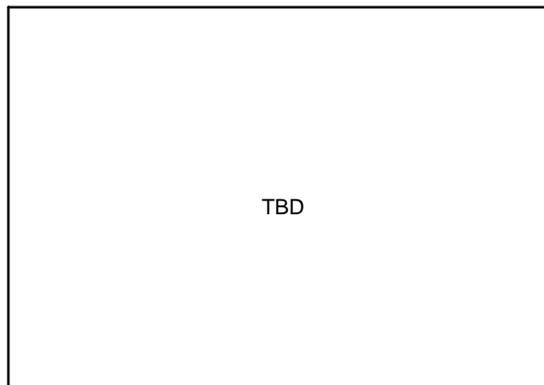


Figure 3. Sensor Code versus Temperature

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

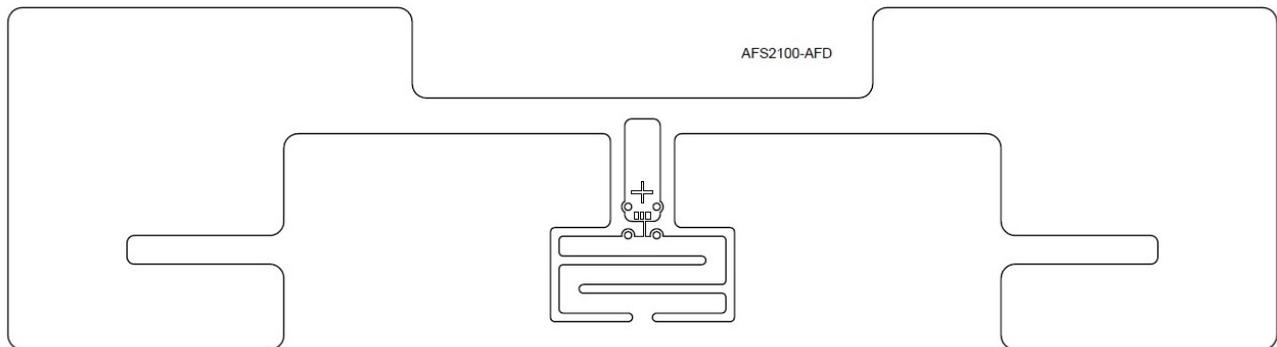
The moisture level detection sensor tag is specifically designed for the passive sensing of moisture on various surfaces and finished goods such as plastics, wood, and plaster. The tag digitizes sensed moisture detection/level information which can be read by a standard UHF RFID Gen 2 compliant reader. 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.

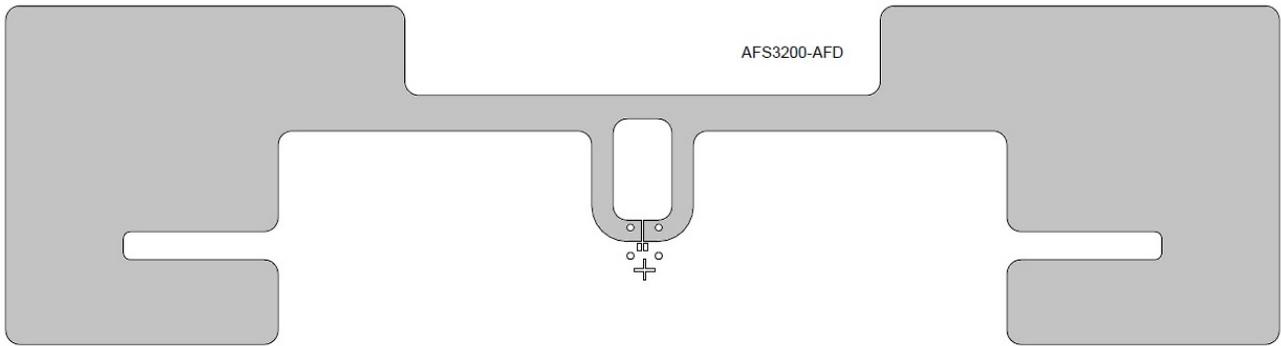


Antenna View



Product Marking View

SPSx Family



Antenna View



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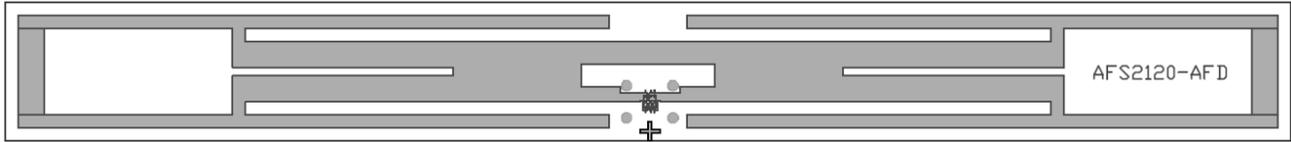
SPS2T001A

Temperature, Proximity

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Product Marking View

SPSx Family



Antenna View



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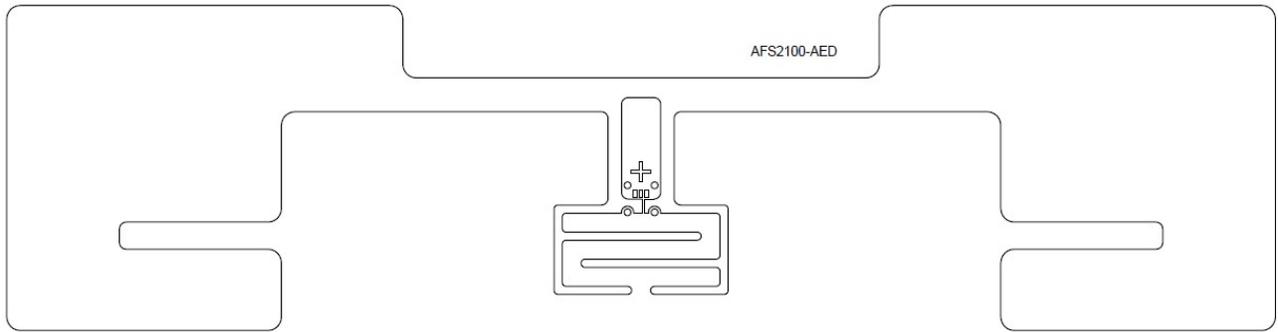
SPS1M003A

Moisture, Proximity

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Product Marking View

SPSx Family



Antenna View



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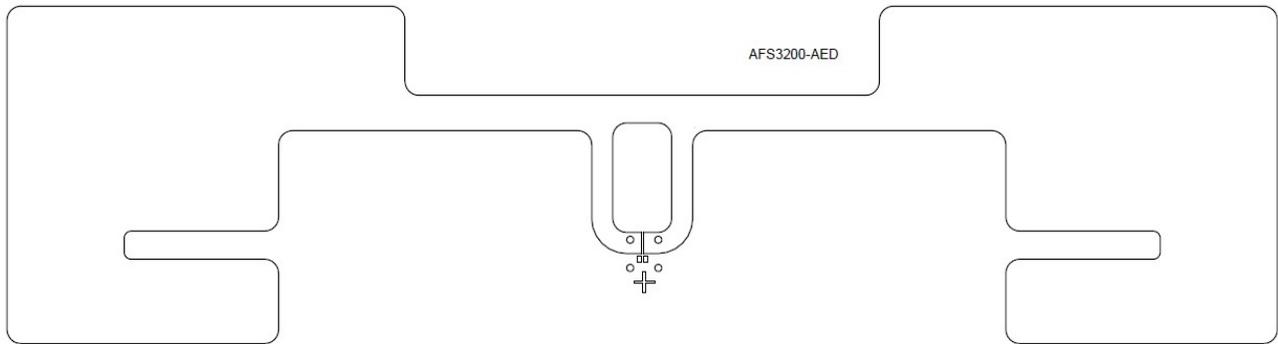
SPS1M002B

Moisture, Proximity

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Product Marking View

SPSx Family



Antenna View



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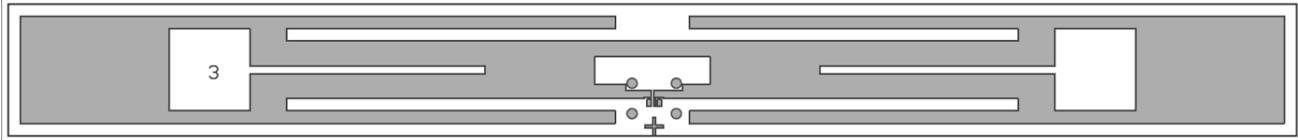
SPS2T001B

Temperature, Proximity

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Product Marking View

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Antenna View



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SPS1M003B

Moisture, Proximity

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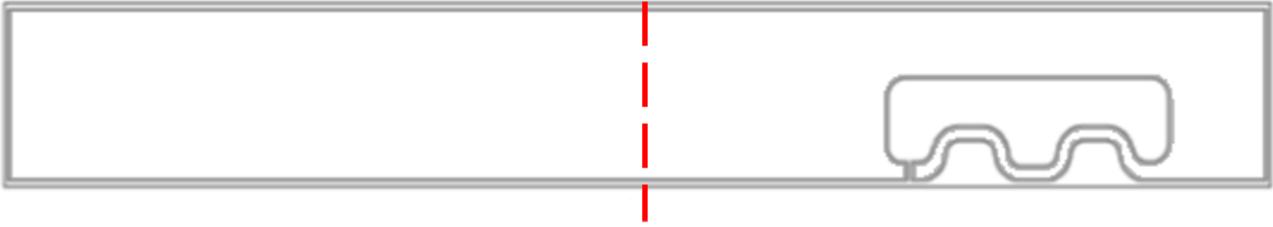
Product Marking View

SPSx Family

Fold line

Back View (no print – adhesive back)

Front View (printed on cover lay)



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SPS1M001B
Moisture, Proximity

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Product Marking View

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PACKAGE DIMENSIONS

TBD
CASE TBD
ISSUE TBD

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