SAW COMPONENTS Dresden GmbH

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<td>55</td>
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<td>58</td>
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<tr>
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</table>
Introduction

SAW Sensor Systems provide a sophisticated sensing technology for challenging requirements. The robust and reliable sensors are fit for harshest environments and high temperatures in industrial applications.

The service and support for all industrial components is guaranteed for at least 5 years. Combining high precision and long lifetime with passive and wireless sensing, SAW Sensor Systems enable continuous process control and efficiency.

Systems

- temperature sensing
  - -180°C - +350°C
  - accuracy +/- 1K
- strain sensing
  - up to 4000 ppm
  - accuracy < 1 ppm
- wireless
  - range up to 10 m
  - passive
- aging: 0.3K / 1000h
  - lifetime: min. 1000h
  - at Tmax
- RFID / identification
  - up to 700°C
  - up to 64 bit code
- wireless
  - up to 3 m
  - passive
- for rotating objects
  - up to 1000 KHz rate
  - lifetime: min. 1000h
  - at Tmax
- passive
- range up to 3 m
- passive

Frequency Band

**ISM 2.4**

ISM Band 2.4 GHz

(2400 – 2483 MHz)

**ISM 433**

ISM Band 433 MHz

(433,05 – 434,79 MHz)

Operating Temperature

Maximum operating temperature of a device is displayed by this symbol in each datasheet.
System Components

Every SAW System contains these basic elements:

Customer IT
- SPS
- Database
- Server
- ...

SAW Systems can be connected to a broad variety of customer systems via the following interfaces:
- LAN
- WIFI
- 0-10 V
- 4-20 mA
- ...

SAW Reader
- SAW INDUSTRY
- SAW ECO
- SAW PREMIUM
- ...

SAW Reader are specialized for different applications, by their performance, interfaces and protection class.

Antenna
- Patch A.
- Flagpole A.
- Slot Antenna
- ...

Reading antennas are available for all environments and requested ranges, i.e.

Sensor / Transponder
- SAW Temperature Sensor
- SAW Strain Sensor
- SAW Transponder

Sensors and Transponders are available at electronic device or with antenna ("Tag"), optimized for specific applications, i.e.:

- 350°C RFID
- 700°C surface RFID
- temperature spits
- strain modules for shafts

Please see the specific section in the catalogue to find the device for your application.

If you do not find a fitting device, feel free to contact us!

www.sawcomponents.de
**Select your Reader**

Below please find a brief overview about the major features of all SAW readers. The detailed datasheets and descriptions are listed on the following pages.

<table>
<thead>
<tr>
<th>SAW IDENT</th>
<th>ECO*</th>
<th>INDUSTRY</th>
<th>ACCESS-POINT</th>
<th>PREMIUM</th>
<th>PREMIUM High Speed</th>
<th>2GAGE industry</th>
<th>A4F</th>
</tr>
</thead>
<tbody>
<tr>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>-</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SAW TEMP</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>SAW STRAIN</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># of Antennas</th>
<th>2</th>
<th>2 - 4</th>
<th>1</th>
<th>4</th>
<th>4</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read Rate (Hz)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>75</td>
<td>1000</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Ethernet</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Analog Output</td>
<td>-</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>-</td>
<td>●</td>
</tr>
<tr>
<td>Protection Class</td>
<td>IP 40</td>
<td>IP 65</td>
<td>IP 65</td>
<td>IP 20</td>
<td>IP 20</td>
<td>IP 54</td>
<td>IP 20</td>
</tr>
</tbody>
</table>

**Legend:**

- ● Feature integrated in reader (stand alone, no PC necessary)
- ○ Feature available on PC software (PC necessary)
- - Feature not available
Legend

Dimensions

All dimensions are given in the following format, unless otherwise stated:

Width x Length x Height
A stand alone reader is fully integrated, no further computer system is required for running the device. The reader is controlled by remote control over Ethernet. The data is send via Ethernet, WIFI or analogue output.
SAW INDUSTRY

The SAW Reader

Order Number: SAWINDUSTRY

Antenna: 2x external (SMA female)
optional: 4x external (N female)
Frequency Band: 2400 – 2483 MHz (ISM)

Interface: LAN
Trigger (in/out)
optional: WIFI (5 GHz)
current interface 4 – 20 mA
voltage interface 0 – 10 V

Sampling Rate: up to 10 HZ
Frequency Accuracy: ± 3 ppm

CPU Speed: Dual Core 1.60 GHz
RAM: 2GB RAM
Hard Disk: 32 GB SSD

Dimensions: 200 mm x 127 mm x 45 mm
Weight: 690g (900g with optional interfaces)

Power: 100-240 V AC power supply
15 V DC, 4.3 A (4.8 W)
Protection Class: IP65
Assembly: stand alone
mounting plate (e.g. cap rail)

Operating Temp.: 0°C – 40°C

SAW Systems: SAW IDENT
SAW TEMP
SAW STRAIN
Options
SAW INDUSTRY

Useful Add-Ons for the industrial application

4 Antenna Ports

Extent the number of antennas for your reader to 4 robust N-connectors.

The 2x SMA connectors get replaced by an additional stack with 4x N connectors.

N connectors provide best robustness for harsh industrial environments.

Analogue Output

Connect your reader via analogue output.

Current Interface 4 – 20 mA

Channels: 8
Resolution: 12 Bit
Connector: M16 16 Pole

Voltage Interface 0 – 10 V

Channels: 8
Resolution: 12 Bit
Connector: M16 16 Pole
**SAW ECO+**

The SAW IDENT Reader

<table>
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<tr>
<th>Parameter</th>
<th>Specification</th>
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<tr>
<td><strong>Order Number:</strong></td>
<td>SAWECO</td>
</tr>
<tr>
<td><strong>Antenna:</strong></td>
<td>2x external (SMA female)</td>
</tr>
<tr>
<td><strong>Frequency Band:</strong></td>
<td>2400 – 2483 MHz (ISM)</td>
</tr>
<tr>
<td><strong>Interface:</strong></td>
<td>LAN</td>
</tr>
<tr>
<td><strong>Sampling Rate:</strong></td>
<td>up to 10 Hz</td>
</tr>
<tr>
<td><strong>Frequency Accuracy:</strong></td>
<td>± 3 ppm</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>200 mm x 127 mm x 45 mm</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>550g</td>
</tr>
<tr>
<td><strong>Power:</strong></td>
<td>7.5V Power Supply</td>
</tr>
<tr>
<td><strong>Protection Class:</strong></td>
<td>IP40</td>
</tr>
<tr>
<td><strong>Assembly:</strong></td>
<td>stand alone, mounting angle (e.g. cap rail)</td>
</tr>
<tr>
<td><strong>Operating Temp.:</strong></td>
<td>0°C – 40°C</td>
</tr>
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<td><strong>SAW Systems:</strong></td>
<td>SAW IDENT</td>
</tr>
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</table>

**Optional Features:**

SAW TEMP and SAW STRAIN available under the following conditions:
- Reader used as PC-connected reader (not stand alone)
- with SAW Wireless Systems software
PC connected Reader
# SAW PREMIUM

SAW PREMIUM (75 Hz)  
SAW PREMIUM High Speed (1000 Hz)

## Order Number:
- Type 75 Hz: SAWPREMIUM  
- Type 1000 Hz: SAWPREMIUMHS

## Antenna:
- 4x external (SMA female)

## Frequency Band:
- 2400 – 2483 MHz (ISM)

## Interface:
- LAN, RS232  
- Trigger (in/out)  
- optional: 4-20 mA

## Sampling Rate:
- SAWPREMIUM: up to 75 Hz  
- SAWPREMIUMHS: up to 1000 Hz

## Frequency Accuracy:
- ± 2.5 ppm

## Dimensions:
- 165 mm x 130 mm x 60 mm

## Weight:
- ca. 440 g

## Power:
- 9-36V Phoenix-Connector

## Protection Class:
- IP20

## Assembly:
- stand alone, mounting plate

## Operating Temp.:
- -40°C – +60°C

## SAW Systems:
- SAW IDENT  
- SAW TEMP  
- SAW STRAIN

The SAW PREMIUM Reader Family uses high-end hybrid reader technology, providing highest reading rates and reading distances with the finest resolution and noise suppression.

These are the readers for the most demanding applications, which require very high sampling rate, e.g. fast rotating application or vibration measurement.
Mobile Reader
SAW 2gage INDUSTRY

Handheld Reader

Order Number: 2GAGEINDUS

Antenna: 1x internal 8.5 dBi
left circular
1x external (SMA female)

Frequency Band: 2400 – 2483 MHz (ISM)

Interface: LAN, USB
optional: WIFI

Sampling Rate: up to 10 Hz
Frequency Accuracy: ± 3 ppm

CPU Speed: Dual Core 1.60 GHz
RAM: 2GB RAM
Hard Disk: 32 GB SSD

Dimensions: 200 mm x 126 mm x 80 mm
Weight: ca. 1600 g
Power: accumulator 26 Wh
optional: power pack (+56 Wh)
100-240 V AC power supply
15 V DC, 4.3 A (4.8 W)

Protection Class: IP40
Assembly: mobile use

Operating Temp.: 0°C – 40°C

SAW Systems: SAW IDENT
SAW TEMP
SAW STRAIN

The SAW 2gage INDUSTRY is the mobile reader for professional users. Covered in a IP 67 metal cover it is capable to be used even in harsh industrial environments. The reader is equipped with the SAW Wireless Systems software package and can transmit data via WIFI.
### SAW A4F

**One-Hand Operation Handheld Reader**

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</tr>
<tr>
<td><strong>Antenna:</strong></td>
<td>1x internal 8.5 dBi</td>
</tr>
<tr>
<td></td>
<td>left circular</td>
</tr>
<tr>
<td></td>
<td>1x external (SMA)</td>
</tr>
<tr>
<td><strong>Frequency Band:</strong></td>
<td>2400 – 2483 MHz (ISM)</td>
</tr>
<tr>
<td><strong>Interface:</strong></td>
<td>2x USB</td>
</tr>
<tr>
<td><strong>Sampling Rate:</strong></td>
<td>up to 10 Hz</td>
</tr>
<tr>
<td><strong>Frequency Accuracy:</strong></td>
<td>± 3 ppm</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>100 mm x 225 mm x 210 mm</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>ca. 900 g</td>
</tr>
<tr>
<td><strong>Power:</strong></td>
<td>accumulator 24Wh</td>
</tr>
<tr>
<td></td>
<td>15V power supply</td>
</tr>
<tr>
<td><strong>Protection Class:</strong></td>
<td>IP20</td>
</tr>
<tr>
<td><strong>Assembly:</strong></td>
<td>mobile use</td>
</tr>
<tr>
<td><strong>Operating Temp.:</strong></td>
<td>0°C – 40°C</td>
</tr>
<tr>
<td></td>
<td>short-time: -20°C – 65°C</td>
</tr>
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<td>SAW IDENT</td>
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<td>SAW TEMP</td>
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<td></td>
<td>SAW STRAIN</td>
</tr>
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The SAW A4F is a small mobile reader for the one-handed operation in logistic and sensor applications.
Software
SAW IDENT

Module for the RFID with SAW

Features

- reader control and setup
- display transponder code
- logging of the identification data
- output to interfaces
- acoustic reading signal

Stand Alone - Reader

- reader setup via SAW IDENT Module
- remote control of reader via Ethernet (TCP/IP protocol) by customer software
- datagramm

PC connected Reader: system requirements

- operating system: min. Windows XP / 7
- CPU: min. Dual-Core 1.60GHz
- RAM: 2 GB
- Hard Disk: 1 GB
SAW TEMP

Module for the Wireless Temperature Measurement

Features

- reader control and setup
- graphic user interface
  - analoge instruments
  - flexible time domain-presentation
- logging of measurement values
- output to interfaces

Für Stand Alone - Reader

- reader setup via SAW TEMP Module
- remote control of reader via Ethernet (TCP/IP protocol) by customer software
- datagramm

PC connected Reader: system requirements

- operating system: Windows XP / 7
- CPU: min. Dual-Core 1.60GHz
- RAM: 2 GB
- Hard Disk: 1 GB
SAW STRAIN

Module for the Wireless Strain Measurement

Features

- reader control and setup
- graphic user interface
  - analogue instruments
  - flexible time domain-presentation
- logging of measurement values
- output to interfaces

For Stand Alone - Reader

- reader setup via SAW STRAIN Module
- remote control of reader via Ethernet (TCP/IP protocol) by customer software
- datagramm

PC connected Reader: system requirements

- operating system: Windows XP / 7
- CPU: min. Dual-Core 1.60GHz
- RAM: 2 GB
- Hard Disk: 1 GB
SAW Transponder
High Temperature Transponder

STHT2450B

Order Number: STHT2450B
Code: SAW Code 16 Bit
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna Gain: 9 dBi
Polarity: linear
Use on Metal: yes
Operating Temp.: -40°C - 200°C
Dimensions: 96 x 65 x 23 mm
Material: Stainless Steel
Protection: IP 67
Weight: 157g
Assembly: screwing (M6) welding

The High Temperature Transponders STHT2450B is a full-passive state-of-the-art transponder for logistic applications in hot environments like the steel industry or painting lines. The robust steel design provides a high reading range and a great resistivity against dust and mechanical influences.

Features and Applications:
- container and material tracking in high temperature environments
- ladle tracking
- painting lines
# Ultra High Temperature Transponder

**STUHT2450A**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>Order Number</td>
<td>STUHT2450A</td>
</tr>
<tr>
<td>Code</td>
<td>SAW Code 16 Bit</td>
</tr>
<tr>
<td>Frequency Band</td>
<td>2400 – 2483 MHz (ISM)</td>
</tr>
<tr>
<td>Antenna Gain</td>
<td>9 dBi</td>
</tr>
<tr>
<td>Polarity</td>
<td>linear</td>
</tr>
<tr>
<td>Use on Metal</td>
<td>yes</td>
</tr>
<tr>
<td>Operating Temp.:</td>
<td>-40°C - +350°C</td>
</tr>
<tr>
<td>Dimensions</td>
<td>96 x 65 x 23 mm</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Protection</td>
<td>IP 67</td>
</tr>
<tr>
<td>Weight</td>
<td>157g</td>
</tr>
<tr>
<td>Assembly</td>
<td>screwing (M6) welding</td>
</tr>
</tbody>
</table>

The High Temperature Transponders STUHT2450A is a full-passive state-of-the-art transponders for logistic applications in very hot environments like the steel industry or painting lines. The robust steel design provides a high reading range and a great resistivity against dust and mechanical influences.

**Features and Applications:**

- container and material tracking in high temperature environments
- ladle tracking
- painting lines
# Hot Surface Transponder

**STUHT2450-S**

<table>
<thead>
<tr>
<th><strong>Order Number:</strong></th>
<th>STUHT2450-S</th>
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</thead>
<tbody>
<tr>
<td><strong>Code:</strong></td>
<td>SAW Code 16 Bit</td>
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<tr>
<td><strong>Frequency Band:</strong></td>
<td>2400 – 2483 MHz (ISM)</td>
</tr>
<tr>
<td><strong>Antenna Gain:</strong></td>
<td>9 dBi</td>
</tr>
<tr>
<td><strong>Polarity:</strong></td>
<td>linear</td>
</tr>
<tr>
<td><strong>Use on Metal:</strong></td>
<td>yes</td>
</tr>
<tr>
<td><strong>Operating Temp.:</strong></td>
<td></td>
</tr>
<tr>
<td>at Transponder</td>
<td>-40°C - +350°C</td>
</tr>
<tr>
<td>at Surface</td>
<td>-40°C - +700°C</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>110 x 72 x 36 mm</td>
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<tr>
<td><strong>Material:</strong></td>
<td>Stainless Steel</td>
</tr>
<tr>
<td></td>
<td>Calcium Silicate</td>
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<tr>
<td><strong>Protection:</strong></td>
<td>IP 67</td>
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<tr>
<td><strong>Weight:</strong></td>
<td>215g</td>
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<tr>
<td><strong>Assembly:</strong></td>
<td>welding</td>
</tr>
</tbody>
</table>

**Features and Applications:**
- tracking of containers and material with particularly hot surfaces
- tracking of Beam Blanks, Billets or Castings
Universal Transponder

STUT2450

Order Number: STUT2450

Code: SAW Code 16 Bit
      SAW Code 20 Bit

Frequency Band: 2400 – 2483 MHz (ISM)
Antenna Gain: 4 dBi
Polarity: linear
Use on Metal: yes

Operating Temp.: Type STUT2450 -40°C - +120°C

Dimensions: 49.5 mm x 36.5 mm x 13 mm

Material: PX 223HT
Protection: IP 67
Weight: 30g

Assembly: gluing,
optional: magnetic assembling
          mounting plate

Features and Applications:
  • logistics
  • asset tracking

The STUT2450 is the standard SAW Transponder for logistic application with a robust plastic packaging.
Neckband Transponder
STCNT2450 (agriculture)

Order Number: STCNT2450

Code:
- SAW Code 16 Bit
- SAW Code 20 Bit

Frequency Band: 2400 – 2483 MHz (ISM)

Antenna Gain: 5 dBi

Polarity: linear

Use on Metal: yes

Operating Temp.: -40°C - +85°C

Dimensions: 59 mm x 52 mm x 27 mm

Material: PX 223HT

Protection: IP 67

Weight: 49g

Assembly: on animal neckband

Features and Applications:
- compatible with standard animal neckbands
- animal identification and location in the agriculture

The STCNT2450 is the special version of the STUT2450 for use on neckbands in the agriculture.
The STCET2450 is a special SAW Transponder for the use in agriculture. It uses a standard earmark packaging and can be applied with all typical earmark applicators. The Transponder provides the great reading range (ca. 2-3 m) of the passive SAW IDENT technology for the agriculture, improving reading distance and reliability on gates, stations and during manual selection.

Features and Applications:

- 10x reading distance compared to standard LF/HF transponders
- fully passive (no battery)
- fully compatible to usual earmark applicators
- for animal identification according to international animal identification laws
SAW Access Transponders

STT2450 (Token)
STC2450 (Card)

Order Number:
Token  STT2450
Card  STC2450

Code:  SAW Code 16 Bit
SAW Code 20 Bit

Frequency Band:  2400 – 2483 MHz (ISM)
Antenna Gain:  0 dBi
Polarity:  circular
Use on Metal:  no

Operating Temp.:  -40°C - +85°C

Dimensions:
STT2450  32 mm x 57 mm x 4 mm
STC2450  86 mm x 54 mm x 2.5 mm

Material:
STT2450  ABS top, polyamide casing
STC2450  Protection:  IP 54
Weight:
STT2450  8.5 g
STC2450

The SAW Access Transponders allow contact-free access control using passive SAW IDENT technology. The reading distance is significantly larger than with LF/HF transponders, combining the range of infrared door openers with the access control function of RFID.

Features and Applications:
- 10x reading distance compared to standard LF/HF transponders
- fully passive (no battery)
- for hands-free access
Sensor Modules
Overview: Temperature Sensors

SAW COMPONENTS provides a broad range of SAW Sensor Elements. Choose the element which meets the needs of your application.

Temperature Range

The temperature range of a sensor or sensor module is indicated by the number in the product name:

<table>
<thead>
<tr>
<th>Type:</th>
<th>Tmax:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB2</td>
<td>200°C</td>
</tr>
<tr>
<td>FB3</td>
<td>275°C</td>
</tr>
<tr>
<td>FB4</td>
<td>350°C</td>
</tr>
</tbody>
</table>

Package

The package of the sensor is indicated by the last letter in the product name:

- FB2: SMD 3x3 mm²
- FO2: TO25 2.5 mm
- FM4: TO39 10 mm

Available Sensor Types: Temperature Sensors

<table>
<thead>
<tr>
<th>Type</th>
<th>Band</th>
<th>Measurement R.</th>
<th>Package</th>
<th>Number of FQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS43xFB2</td>
<td>ISM 433 MHz</td>
<td>-40°C – 200°C</td>
<td>SMD 3x3 mm²</td>
<td>4</td>
</tr>
<tr>
<td>SS43xFB3</td>
<td>ISM 433 MHz</td>
<td>-40°C – 275°C</td>
<td>SMD 3x3 mm²</td>
<td>4</td>
</tr>
<tr>
<td>SS43xFB4</td>
<td>ISM 433 MHz</td>
<td>-40°C – 350°C</td>
<td>SMD 3x3 mm²</td>
<td>4</td>
</tr>
<tr>
<td>SS43xFO2</td>
<td>ISM 433 MHz</td>
<td>-40°C – 200°C</td>
<td>TO25 2.5mm</td>
<td>3</td>
</tr>
<tr>
<td>SS43xFO4</td>
<td>ISM 433 MHz</td>
<td>-40°C – 350°C</td>
<td>TO25 2.5mm</td>
<td>3</td>
</tr>
<tr>
<td>SS24xxBB2</td>
<td>ISM 2.4 GHz</td>
<td>-40°C – 200°C</td>
<td>SMD 3x3 mm²</td>
<td>18</td>
</tr>
<tr>
<td>SS24xxBB3</td>
<td>ISM 2.4 GHz</td>
<td>-40°C – 275°C</td>
<td>SMD 3x3 mm²</td>
<td>18</td>
</tr>
<tr>
<td>SS2xxxAB3</td>
<td>ISM 2.4 GHz</td>
<td>0°C – 275°C</td>
<td>SMD 3x3 mm²</td>
<td>20</td>
</tr>
<tr>
<td>SS24xxAO2</td>
<td>ISM 2.4 GHz</td>
<td>0°C – 275°C</td>
<td>TO25 2.5mm</td>
<td>20</td>
</tr>
<tr>
<td>SS24xxBO2</td>
<td>ISM 2.4 GHz</td>
<td>-40°C – 200°C</td>
<td>TO25 2.5mm</td>
<td>19</td>
</tr>
<tr>
<td>SS24xxAO3</td>
<td>ISM 2.4 GHz</td>
<td>0°C – 275°C</td>
<td>TO25 2.5mm</td>
<td>20</td>
</tr>
<tr>
<td>SS24xxBO3</td>
<td>ISM 2.4 GHz</td>
<td>-40°C – 275°C</td>
<td>TO25 2.5mm</td>
<td>19</td>
</tr>
</tbody>
</table>
Number of Sensors

SAW Sensors based on the **resonator principle** shift their centre frequency (fc) over the temperature. The frequency is measured by the reader and the resulting temperature is calculated from this frequency.

It is possible to use several sensors simultaneously in the ISM band. The sensors are distinguished and identified by the nominal frequency [see “nominal frequencies” in the sensor section]. To avoid an overlap of sensors, which would result in the loss of assignability of the sensor data, there is a frequency gap between each sensor:

The number of sensors that can be used simultaneously without leaving the restrictions of the ISM bands depend two factors: **Measuring Range (MR)** and **Temperature Difference between the Measuring Points (ΔT)**. See the following table for typical values in the ISM Band 2.4 GHz (2400 MHz – 2483 MHz):

<table>
<thead>
<tr>
<th>ΔT</th>
<th>0 – 50°C</th>
<th>0 – 100°C</th>
<th>0 – 200°C</th>
<th>-40 – 200°C</th>
<th>-40 – 275°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 K</td>
<td>20</td>
<td>18</td>
<td>12</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>50 K</td>
<td>12</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>100 K</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>200 K</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Note:** Above description only applies for SAW sensors using resonator principle. For delay line sensors, the information does not apply.
SAW Cable Sensor

SCS24xxBB2 (200°C)
SCS24xxBB3 (275°C)

Order Number:
Type 200°C SCS24xxBB20SM
Type 275°C SCS24xxBB30SM

Sensor Type: Resonator
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna: SMA-, N-connector or antenna (on request)

Operating Temp.:
Type SCS24XXBB2
at Sensor: -40°C – 200°C
at Connector: -40°C – 160°C

Type SCS24XXBB3
at Sensor: -40°C – 275°C
at Connector: -40°C – 160°C

Dimensions: sensing head: Ø 4.00 mm x L 15.00 mm
cable length: on request
Material: Stainless Steel, Ceramic, Kapton
Protection Class: IP 64
Assembly: on request

The SAW Cable Sensor is a small SAW sensor with a separated antenna. This allows the temperature measurement in conditions, where the sensor and the antenna have to be separated.

Features and Applications:
- applications with separated measurement point and antenna mount
- use in vacuum
Wireless Tube Spit

WTB24xxBB2 (200°C)
WTB24xxBB3 (275°C)

Order Number: WTB24xxBB2RSF
Sensor Type: Resonator
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna: R-SMA connector

Operating Temp.: Type WTB24XXBB2
at Sensor: -40°C – 200°C
at Connector: -40°C – 160°C

Type WTB24XXBB3
at Sensor: -40°C – 275°C
at Connector: -40°C – 160°C

Dimensions: sensing head: 165 mm x 15 mm / Ø 4.00 mm (tip)
sensor length: on request
Material: V2A: AISI 304 / 1.4301
Protection Class: IP 67
Assembly: Use WTS-E1 and WTS-AM1

Customization Options:
- spit length on request
- 1-axis pliable
- fixed antenna APTSW01 5 dBi

The Wireless Tube Spit is screwed into the M10 connection flange (WTS-E1) and can be removed from the tube without pressure shutdown. The Wireless Tube Spit can be customized to different applications.
Features and Applications:
- temperature measurement in tubes with fitting
- wireless sensing head
- use miscellaneous antennas

Accessories:

WTS-AM1

Function: solder fitting, access to tube, screw in WTS-E1

Dimensions: Ø 17 mm x H 18 mm

Material: brass

Weight: 20 g

Assembly: hard-soldering on tube flat

WTS-E1

Function: metering point, screw in WTS-AM1 holds Wireless Tube Spit

Dimensions: W 19 mm x H 52 mm

Material: stainless steel 1.4571

Weight: 52 g

Pressure: 40 bar

Buckling load: max. 5kg

Assembly: screw in WTS-AM1

wrench size: 19
High Temperature Wireless Tube Spit

WTSC24xxBB3

Order Number: WTSC24xxBB3ASTSW05

Sensor Type: Resonator
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna Gain: 8 dBi

Operating Temp.:  
at Sensor: -40°C – 275°C  
at Antenna: -40°C – 350°C

Dimensions: 95.00 mm (diameter antenna)  
80.00 mm (height antenna)  
100.00 mm x 4.00 mm (tip)

Material: V2A: ALSI 304 / 1.4301
Weight: ca. 150 g
Protection Class: IP 67

Assembly: Threat G¼ 20.30mm (length)

The High Temperature Wireless Tube Spit is a special temperature sensor for air heated manufacturing machines. The antenna is suitable to work in high temperature air flow and to provide high reading distances.

Features and Applications:  
- high temperature sensor antenna  
- for molds, plastic casting machines
Universal Sensor Module

SM24xxBB2

Order Number: SM24xxBB20SF

Sensor Type: Resonator
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna: SMA

Operating Temp.:
at Sensor: -40°C – 200°C
at Connector: -40°C – 160°C

Dimensions: Ø 25 mm x H 19.50 mm
Material: Stainless Steel
Protection Class: IP 67

Assembly: Screwing (M3) hole distance: 16mm
Welding, Gluing
Mounting on Clamp

The Universal Sensor Module is a small SAW sensor for the use in all kind of application, including switch gears, tubes (with additional clamp ring) or tools. Equipped with a robust SMA connector it can be equipped with different types of 2.4 GHz antennas, to provide optimal reading signals for each application.

Features and Applications:
- use miscellaneous antenna
- for switch gears
# M10 Sensor Screw

SSS1024xxBB2 (200°C)  
SSS1024xxBB3 (275°C)

<table>
<thead>
<tr>
<th>Order Number:</th>
<th>Type 200°C</th>
<th>SSS1024xxBB2ASLSW01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 275°C</td>
<td></td>
<td>SSS1024xxBB3ASLSW01</td>
</tr>
</tbody>
</table>

**Sensor Type:** Resonator  
**Frequency Band:** 2400 – 2483 MHz (ISM)  
**Antenna Gain:** -3 dBi  

**Operating Temp.:**  
Type SCS24XXBB2: -40°C – 200°C  
Type SCS24XXBB3: -40°C – 275°C

**Dimensions:**  
Ø 17mm x H 15 mm (M10 screw)  
wrench size: 16 mm

**Material:** Stainless Steel, Rogers  
**Protection Class:** IP 67

**Assembly:** Screwing (M10x1)

The M10 Sensor Screw is a small but robust SAW sensor module to be screwed into a metric M10 thread. The short range antenna on top of the sensor has less than 2mm height, allowing the use in application with restricted space.

**Features and Applications:**
- short range temperature monitoring  
- on rotating objects (engines, rotors)
M4 Miniature Sensor Screw

SSS24xxBO2

Order Number: SSS0424xxBO2AMPSW01

Sensor Type: Resonator

Frequency Band: 2400 – 2483 MHz (ISM)

Antenna Gain: 0 dBi

Operating Temp.: -40°C – 200°C

Dimensions: sensing head: M4 screw x H 10 mm
antenna: 36mm (dep. on range)
wrench size: 7 mm

Material: Stainless Steel, Brass

Protection Class: IP 67

Assembly: Screwing (M4), wrench size: 7 mm

The M4 Miniature Sensor Screw is the smallest SAW temperature sensor ever created. Its special low weight construction is especially suitable for applications on vibrating parts, e.g. fuel pumps.

Features and Applications:
- short range temperature monitoring
- vibrating objects (engines, ...)

-200°C - 200°C

ISM 2.4
High G-Force Sensor Module

SES2xxxAB3 (275°C)
SES2xxxBB3 (275°C)

Order Number:
Type AB3* SES2xxxAB3ASLSW02
Type BB3 SES2xxxBB3ASLSW02

Sensor Type: Resonator
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna Gain: -3 dBi

Operating Temp.:
Type SES2XXXAB3* 0°C – 275°C
Type SES2XXXBB3 -40°C – 275°C

Dimensions: Ø 25mm
Material: Stainless Steel, Rogers
Protection: IP 67
Assembly: Screwing (M2), Cavity

*) different temperature coefficient of frequency (TCF)

The High G-Force Sensor Module is a special temperature sensor for applications which require a flush construction, with no supernatant. The sensor can be let-in flush into any surface, even in metal surfaces. The construction allows operation under extreme G-forces up to 16’000 g.

Features and Applications:
- maximum centrifugal force: 16’000 g
- short range temperature monitoring
- zero construction height
- use on rotating objects
- engines, turbines, sealings
## SALOS High Vacuum Sensor

**SALOS24xxBB3**

<table>
<thead>
<tr>
<th><strong>Order Number:</strong></th>
<th>SALOS24xxBB3ADPSW01</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensor Type:</strong></td>
<td>Resonator</td>
</tr>
<tr>
<td><strong>Frequency Band:</strong></td>
<td>2400 – 2483 MHz (ISM)</td>
</tr>
<tr>
<td><strong>Antenna Gain:</strong></td>
<td>0 dBi</td>
</tr>
<tr>
<td><strong>Operating Temp.:</strong></td>
<td>-40°C – 275°C</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>L 45mm x W 6 mm x H 3 mm</td>
</tr>
<tr>
<td><strong>Material:</strong></td>
<td>Ceramic (Al2O3)</td>
</tr>
<tr>
<td><strong>Protection:</strong></td>
<td>IP 67</td>
</tr>
<tr>
<td><strong>Assembly:</strong></td>
<td>Gluing</td>
</tr>
</tbody>
</table>

The SALOS Temperature Sensor is fully covered by aluminium oxide and allows the use in high temperature and high vacuum environments. Its especially suitable for use in clean environments of the processing chambers in the semiconductor industry.

### Features and Applications:
- leak proof ceramic packaging
- use in processing chambers of semiconductor manufacturing
- temperature measurement
  - chamber surfaces
  - chucks
  - wafers
Antennas
**Universal Antenna 8 dBi**

**AFPHS 8 dBi**

<table>
<thead>
<tr>
<th><strong>Order Number:</strong></th>
<th>AFPHS01LCP080850SM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antenna Type:</strong></td>
<td>Sencity Antenna</td>
</tr>
<tr>
<td><strong>Frequency Band:</strong></td>
<td>2400 – 2483 MHz (ISM)</td>
</tr>
<tr>
<td><strong>Antenna Gain:</strong></td>
<td>8.5 dBi</td>
</tr>
<tr>
<td><strong>3dB Beam Angle:</strong></td>
<td>70°</td>
</tr>
<tr>
<td><strong>Polarity:</strong></td>
<td>left circular</td>
</tr>
<tr>
<td><strong>Operating Temp.:</strong></td>
<td>-40°C - +85°C</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>95 mm x 101 mm x 32 mm</td>
</tr>
<tr>
<td><strong>Material:</strong></td>
<td>ASA</td>
</tr>
<tr>
<td><strong>Protection:</strong></td>
<td>IP 54</td>
</tr>
<tr>
<td><strong>Connector:</strong></td>
<td>SMA</td>
</tr>
<tr>
<td><strong>Assembly:</strong></td>
<td>screwing, mounting plate</td>
</tr>
</tbody>
</table>

The universal 8 dBi antenna is the standard 2.4 GHz reading antenna for many applications that have no increased requirements in environmental conditions or reading distance, e.g. production logistics or assembly lines. The 8 dBi gain provides a reading distance of 1-3 meters with many types of SAW IDENT transponders and SAW Sensors (depending on transponder/sensor antenna).

**Features and Applications:**
- best price-performance ratio
- easy to handle
- for medium range reading
- RFID stations
Universal Antenna 16 / 20 dBi

AFPSC 16 dBi
AFPSC 20 dBi

Order Number:
Type 16 dBi: AFPSC010LP160850NF
Type 20 dBi: AFPSC010LP200850NF

Antenna Type: Flat Panel Antenna
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna Gain: 16 dBi / 20 dBi
3 dB Beam Angle: 28° / ??
Polarity: linear

Operating Temp.: -40°C - +85°C

Dimensions:
Type 16 dBi: 205 mm x 205 mm x 45 mm
Type 20 dBi: 350 mm x 350 mm x 30 mm

Material: PVC, Aluminium
Protection: IP 54

Connector: N, female
Assembly: screwing, mounting plate

The universal 16 dBi antenna is a standard 2.4 GHz reading antenna for applications that have no increased requirements in environmental conditions but require a high reading distance. The 16 dBi gain provides a reading distance of 5-8 meters with many types of SAW IDENT transponders and SAW Sensors.

Features and Applications:
- cost efficient
- for high range reading
Small Size Patch Antenna

APTSW01 5 dBi

Order Number: APTSW010LP051000SF

Antenna Type: Patch Antenna
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna Gain: 5 dBi
Polarity: linear

Operating Temp.: -40°C - +100°C

Dimensions:
Type 8 dBi 65 mm x 65 mm x 17 mm

Material: PVC
Protection: IP 54
Connector: N, female
Assembly: screwing on mounting plate, gluing

The Small Size Patch Antenna is a small reading antenna for all applications that require a small reading antenna which has still a high gain. It provides good reading distance for many applications in normal environmental conditions, e.g. logistics.

Features and Applications:
- for applications with limited space
- logistics
- can also be used as sensor antenna, e.g. for Wireless Tube Spit
The High Temperature Slot Antenna is the standard reading antenna for all applications that have harsh environmental conditions, like temperatures up to 260°C or even 350°C. It provides enhanced reading distance for many applications, e.g. production ovens and heaters. The 350°C-version can be used in high vacuum conditions.

**Features and Applications:**
- for high temperature environments
- steel industry, production ovens, heaters, vacuum chambers.
High Temperature Horn Antenna

AHOSW01 17 dBi

Order Number: AHOSW010LP172750NF

Antenna Type: Horn Antenna
Frequency Band: 2400 – 2483 MHz (ISM)
Antenna Gain: 17 dBi
Polarity: linear

Operating Temp.: -40°C - +275°C (optional 350°C)

Dimensions: 305 mm x 305 mm x 320 mm
Material: stainless steel (V2A)
Protection: IP 67
Connector: N, female
Assembly: screwing (M5)

The High Temperature Horn Antenna is a special high-range antenna for very harsh environments. It is especially built to work in conditions with a high level of dust or dirt and temperature. It combines a robust design with a very high antenna gain of 17 dBi for high reading distances up to 10 meters with many types of SAW sensors and SAW transponders.

Features and Applications:
- for high temperature environments
- for harsh conditions like dirt, spray water
- steel industry, production ovens, heaters; also vacuum chambers
## Strip Line Antenna

### Ring / Ring Segment Strip Line Antenna

<table>
<thead>
<tr>
<th>Order Number:</th>
<th>on request</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antenna Type:</strong></td>
<td>Strip Line Antenna</td>
</tr>
<tr>
<td><strong>Frequency Band:</strong></td>
<td>2400 – 2483 MHz (ISM)</td>
</tr>
<tr>
<td><strong>Antenna Gain:</strong></td>
<td>0 dBi</td>
</tr>
<tr>
<td><strong>Polarity:</strong></td>
<td>linear</td>
</tr>
<tr>
<td><strong>Operating Temp.:</strong></td>
<td>depending on application</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>depending on application</td>
</tr>
<tr>
<td><strong>Material:</strong></td>
<td>Rigidiso RI 40205</td>
</tr>
<tr>
<td><strong>Protection:</strong></td>
<td>IP 40</td>
</tr>
<tr>
<td><strong>Connector:</strong></td>
<td>SMA, female</td>
</tr>
<tr>
<td><strong>Assembly:</strong></td>
<td>screwing, mounting plate</td>
</tr>
</tbody>
</table>

The Strip Line Antenna is available for rotating applications like shafts and axles run at high rotating speeds that cannot be read with standard antennas. The antenna can be customized to the requirements of the application like diameter and number of stripes (separate antennas integrated in one casing).

### Features and Applications:
- diameter customized for application
- one or more stripes in one antenna casing available
- different temperature ranges available
- for rotating objects like shafts, axles, ...
- can be run at all rotation speeds (> 0 rpm)
Antenna Accessories

Antenna Cables and Connectors

All antennas can be equipped with different types of cables. Cables will be made up with the connectors in the desired length.

<table>
<thead>
<tr>
<th>Cable</th>
<th>Tmax [°C]</th>
<th>Cover Material</th>
<th>Ø [mm]</th>
<th>Bending-Rad. [mm]</th>
<th>Flexible</th>
<th>Connector</th>
<th>Attenuation [dB / m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCL7</td>
<td>85</td>
<td>PVC</td>
<td>7.30</td>
<td>25.00</td>
<td>SMA</td>
<td>•</td>
<td>0.3</td>
</tr>
<tr>
<td>RG142</td>
<td>165</td>
<td>FEP</td>
<td>4.95</td>
<td>30.00 (static)</td>
<td>N</td>
<td>•</td>
<td>0.8</td>
</tr>
<tr>
<td>KPTN1</td>
<td>260</td>
<td>Kapton</td>
<td>2.40</td>
<td>18.00</td>
<td>•</td>
<td>•</td>
<td>4.0</td>
</tr>
<tr>
<td>TCX01</td>
<td>600</td>
<td>Stainless Steel</td>
<td>3.00</td>
<td>9.00</td>
<td>•</td>
<td>•</td>
<td>2.6</td>
</tr>
</tbody>
</table>

ARCL7  KPTN1  RG142  TXC01
Sensor Elements
Overview: Sensor Elements

SAW COMPONENTS provides a broad range of SAW Sensor Elements. Choose the element which meets the needs of your application.

1. Choose from 3 temperature ranges:

<table>
<thead>
<tr>
<th>Type</th>
<th>Tmax</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB2</td>
<td>200°C</td>
</tr>
<tr>
<td>FB3</td>
<td>275°C</td>
</tr>
<tr>
<td>FB4</td>
<td>350°C</td>
</tr>
</tbody>
</table>

2. Choose from 2 licence free ISM bands:

- ISM Band 433 MHz
  433.05 MHz – 434.79 MHz

- ISM Band 2.4 GHz
  2400 MHz – 2483 MHz

3. Choose package:

<table>
<thead>
<tr>
<th>Type</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB</td>
<td>SMD 3x3mm² ceramic</td>
</tr>
<tr>
<td>FO</td>
<td>TO25 2.5mm metal</td>
</tr>
<tr>
<td>FM</td>
<td>TO39 10mm metal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Band</th>
<th>Temperature R.</th>
<th>Package</th>
<th>Number of FQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS43xFB2</td>
<td>ISM 433 MHz</td>
<td>-40°C – 200°C</td>
<td>SMD 3x3 mm²</td>
<td>4</td>
</tr>
<tr>
<td>SS43xFB3</td>
<td>ISM 433 MHz</td>
<td>-40°C – 275°C</td>
<td>SMD 3x3 mm²</td>
<td>4</td>
</tr>
<tr>
<td>SS43xFB4</td>
<td>ISM 433 MHz</td>
<td>-40°C – 350°C</td>
<td>SMD 3x3 mm²</td>
<td>4</td>
</tr>
<tr>
<td>SS43xFO2</td>
<td>ISM 433 MHz</td>
<td>-40°C – 200°C</td>
<td>TO25 2.5mm</td>
<td>3</td>
</tr>
<tr>
<td>SS43xFO4</td>
<td>ISM 433 MHz</td>
<td>-40°C – 350°C</td>
<td>TO25 2.5mm</td>
<td>3</td>
</tr>
<tr>
<td>SS24xxBB2</td>
<td>ISM 2.4 GHz</td>
<td>-40°C – 200°C</td>
<td>SMD 3x3 mm²</td>
<td>18</td>
</tr>
<tr>
<td>SS24xxBB3</td>
<td>ISM 2.4 GHz</td>
<td>-40°C – 275°C</td>
<td>SMD 3x3 mm²</td>
<td>18</td>
</tr>
<tr>
<td>SS2xxxAB3</td>
<td>ISM 2.4 GHz</td>
<td>0°C – 275°C</td>
<td>SMD 3x3 mm²</td>
<td>20</td>
</tr>
<tr>
<td>SS24xxAO2</td>
<td>ISM 2.4 GHz</td>
<td>0°C – 275°C</td>
<td>TO25 2.5mm</td>
<td>20</td>
</tr>
<tr>
<td>SS24xxBO2</td>
<td>ISM 2.4 GHz</td>
<td>-40°C – 200°C</td>
<td>TO25 2.5mm</td>
<td>19</td>
</tr>
<tr>
<td>SS24xxBO3</td>
<td>ISM 2.4 GHz</td>
<td>-40°C – 275°C</td>
<td>TO25 2.5mm</td>
<td>19</td>
</tr>
</tbody>
</table>
**SS43XFB2**

433 MHz - SAW Sensor for 200°C

Sensor Type: Resonator  
Operating Temp.: -40°C – 200°C

<table>
<thead>
<tr>
<th>Order Number</th>
<th>nominal Frequency</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS433FB2</td>
<td>433.560 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS434FB2</td>
<td>434.350 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS435FB2</td>
<td>435.740 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS436FB2</td>
<td>437.030 MHz</td>
<td>± 15 kHz</td>
</tr>
</tbody>
</table>

Sensitivity: 15 kHz / K  
Aging (Tmax): 0.3 K / 1000 h @ 200°C  
Package SMD 3x3mm²

All dimensions in mm

Features and Applications:
- temperature measurement probes
- food industry
- environments without line-of-sight between antennas

**Important Note:** SAW Sensor for the ISM 433 MHz-Band do **NOT** operate with the ISM 2.4 GHz-Band system components in this catalogue.
SS43XFB3

433 MHz - SAW Sensor for 275°C

Sensor Type: Resonator
Operating Temp.: -40°C – 275°C

<table>
<thead>
<tr>
<th>Order Number</th>
<th>nominal Frequency</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS433FB3</td>
<td>433.560 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS434FB3</td>
<td>434.350 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS435FB3</td>
<td>435.740 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS436FB3</td>
<td>437.030 MHz</td>
<td>± 15 kHz</td>
</tr>
</tbody>
</table>

Sensitivity: 15 kHz / K
Aging (Tmax): -0.3 K / 1000 h @ 275°C
Package: SMD 3x3mm²

Features and Applications:
• temperature measurement probes
• food industry
• environments without line-of-sight between antennas

Important Note: SAW Sensor for the ISM 433 MHz-Band do NOT operate with the ISM 2.4 GHz-Band system components in this catalogue.
**SS43XFB4**

433 MHz - SAW Sensor for 350°C

**Sensor Type:** Resonator  
**Operating Temp.:** -40°C – 350°C

<table>
<thead>
<tr>
<th>Order Number</th>
<th>nominal Frequency</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS433FB4</td>
<td>433.560 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS434FB4</td>
<td>434.350 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS435FB4</td>
<td>435.740 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS436FB4</td>
<td>437.030 MHz</td>
<td>± 15 kHz</td>
</tr>
</tbody>
</table>

**Sensitivity:** 15 kHz / K  
**Aging (Tmax):** -0.3 K / 1000 h @ 350°C  
**Package** SMD 3x3mm²

**Features and Applications:**
- temperature measurement probes
- process monitoring
- environments without line-of-sight between antennas

**Important Note:** SAW Sensor for the ISM 433 MHz-Band do **NOT** operate with the ISM 2.4 GHz-Band system components in this catalogue.
### SS43XFO2

The smallest 433 MHz - SAW Sensor for 200°C

| Sensor Type: | Resonator |
| Operating Temp.: | -40°C – 200°C |

<table>
<thead>
<tr>
<th>Order Number</th>
<th>nominal Frequency</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS434FO2</td>
<td>434.290 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS435FO2</td>
<td>435.265 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS436FO2</td>
<td>436.580 MHz</td>
<td>± 15 kHz</td>
</tr>
</tbody>
</table>

| Sensitivity: | 15 kHz / K |
| Aging (Tmax): | -0.8 K / 1000 h @ 200°C |
| Package | TO25 2.5mm metal package |

*All dimensions in mm*

**Features and Applications:**
- temperature measurement probes
- food probes
- PT100 replacement
- environments without line-of-sight between antennas

**Important Note:** SAW Sensor for the ISM 433 MHz-Band do **NOT** operate with the ISM 2.4 GHz-Band system components in this catalogue.
SS43XFO4
The smallest 433 MHz - SAW Sensor for 350°C

Sensor Type: Resonator
Operating Temp.: -40°C – 350°C

<table>
<thead>
<tr>
<th>Order Number</th>
<th>nominal Frequency</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS434FO4</td>
<td>434.280 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS435FO4</td>
<td>435.285 MHz</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>SS436FO4</td>
<td>436.610 MHz</td>
<td>± 15 kHz</td>
</tr>
</tbody>
</table>

Sensitivity: 15 kHz / K
Aging (Tmax): +2.0 K / 1000 h @ 350°C
Package: TO25 2.5mm metal package

Features and Applications:
- temperature measurement probes
- food probes
- process monitoring
- PT100 replacement
- environments without line-of-sight between antennas

Important Note: SAW Sensor for the ISM 433 MHz-Band do NOT operate with the ISM 2.4 GHz-Band system components in this catalogue.
SS24xxBB2

2.45 GHz - SAW Sensor for 200°C

Sensor Type: Resonator
Operating Temp.: -40°C – 200°C

Order Number | nominal Frequency | Tolerance |
-------------|------------------|----------|
SS2414BB2    | 2416.350 MHz     | +/- 500 KHz |
SS2417BB2    | 2423.700 MHz     | +/- 500 KHz |
SS2422BB2    | 2430.950 MHz     | +/- 500 KHz |
SS2429BB2    | 2438.200 MHz     | +/- 500 KHz |
SS2432BB2    | 2445.450 MHz     | +/- 500 KHz |
SS2437BB2    | 2452.700 MHz     | +/- 500 KHz |
SS2444BB2    | 2459.950 MHz     | +/- 500 KHz |
SS2452BB2    | 2467.200 MHz     | +/- 500 KHz |
SS2457BB2    | 2474.550 MHz     | +/- 500 KHz |
SS2459BB2    | 2481.900 MHz     | +/- 500 KHz |
SS2467BB2    | 2481.900 MHz     | +/- 500 KHz |
SS2472BB2    | 2481.900 MHz     | +/- 500 KHz |
SS2474BB2    | 2481.900 MHz     | +/- 500 KHz |
SS2477BB2    | 2481.900 MHz     | +/- 500 KHz |
SS2482BB2    | 2481.900 MHz     | +/- 500 KHz |

Q-Factor: 8750
Sensitivity: 66 kHz / K
Aging (Tmax): -0.5 K / 1000 h @ 200°C
Package: SMD 3x3mm²

Features and Applications:
- temperature measurement probes
- process monitoring
- metallic environments (chambers)

Pin 1: Case ground
Pin 2: Antenna (Input / Output)
Pin 3: to be grounded
Pin 6: to be grounded
Pin 5: to be grounded
Pin 4: Case ground

All dimensions in mm
SS24XXBB3

2.45 GHz - SAW Sensor for 275°C

Sensor Type: Resonator
Operating Temp.: -40°C – 275°C

Order Number | nominal Frequency | Tolerance
--- | --- | ---
SS2414BB3 | 2416.350 MHz on request | +/- 700 KHz
SS2417BB3 | 2423.700 MHz on request | +/- 700 KHz
SS2422BB3 | 2430.950 MHz on request | +/- 700 KHz
SS2427BB3 | 2435.600 MHz on request | +/- 700 KHz
SS2429BB3 | 2445.450 MHz on request | +/- 700 KHz
SS2432BB3 | 2450.100 MHz on request | +/- 700 KHz
SS2437BB3 | 2459.950 MHz on request | +/- 700 KHz
SS2441BB3 | 2464.400 MHz on request | +/- 700 KHz
SS2444BB3 | 2474.550 MHz on request | +/- 700 KHz
SS2448BB3 | 2479.000 MHz on request | +/- 700 KHz

Q-Factor: 6800
Sensitivity: 66 kHz / K @ 23°C (non-linear)
Aging (Tmax): +1.2 K / 1000 h @ 275°C
Package: SMD 3x3mm²

Features and Applications:
- temperature measurement probes
- process monitoring
- metallic environments (chambers)

Pin 1 Case ground
Pin 2 Antenna (Input / Output)
Pin 3 to be grounded
Pin 4 to be grounded
Pin 5 to be grounded
**SS2XXXAB3**

Low Sensitivity 2.45 GHz - SAW Sensor for 275°C

**Sensor Type:** Resonator

**Operating Temp.:** 0°C – 275°C

<table>
<thead>
<tr>
<th>Order Number</th>
<th>nominal Frequency</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS2398AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2412AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2417AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2422AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2426AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2429AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2432AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2437AB3</td>
<td>on request</td>
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<tr>
<td>SS2441AB3</td>
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<td>SS2444AB3</td>
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<td>SS2447AB3</td>
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<td>SS2453AB3</td>
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</tr>
<tr>
<td>SS2472AB3</td>
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</tr>
<tr>
<td>SS2474AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2477AB3</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2481AB3</td>
<td>on request</td>
<td></td>
</tr>
</tbody>
</table>

**Q-Factor:**

**Sensitivity:** 25 kHz / K @ 23°C (non-linear)

**Aging (Tmax):** +1.2 K / 1000 h @ 275°C

**Package:** SMD 3x3mm²

---

**Features and Applications:**

- temperature measurement probes
- process monitoring
- metallic environments (chambers)

**Important Note:** This sensor element may leave 2.4 GHz ISM Band Specification during operation at high temperatures.

---

**Pin Configuration:**

- Pin 1: Case ground
- Pin 2: Antenna (Input / Output)
- Pin 3: to be grounded
- Pin 6: to be grounded
- Pin 5: to be grounded
- Pin 4: Case ground

---

*All dimensions in mm*
SS24XXBO2
Low Sensitivity 2.45 GHz - SAW Sensor for 200°C

Sensor Type: Resonator
Operating Temp.: -40°C – 200°C

<table>
<thead>
<tr>
<th>Order Number</th>
<th>nominal Frequency</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS2412BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2417BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2422BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2427BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2432BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2437BO2</td>
<td>on request</td>
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</tr>
<tr>
<td>SS2441BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2444BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2447BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2452BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2457BO2</td>
<td>on request</td>
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</tr>
<tr>
<td>SS2459BO2</td>
<td>on request</td>
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</tr>
<tr>
<td>SS2462BO2</td>
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</tr>
<tr>
<td>SS2467BO2</td>
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<td></td>
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<tr>
<td>SS2472BO2</td>
<td>on request</td>
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</tr>
<tr>
<td>SS2474BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2477BO2</td>
<td>on request</td>
<td></td>
</tr>
<tr>
<td>SS2482BO2</td>
<td>on request</td>
<td></td>
</tr>
</tbody>
</table>

Q-Factor: Sensitivity: 66 kHz / K @ 23°C
Aging (Tmax): TO25 2.5mm metal package

Features and Applications:
- temperature measurement probes
- very thin probes (3 mm spits possible)

Pin 1: Antenna (Input / Output)
Cap: to be grounded

All dimensions in mm