

ISED CABid: ES1909

Test Report No:  
77037RRF.018

Lab. Company Number: 4621A

## Partial Test Report

USA FCC Part 15.225, 15.209

CANADA RSS-210, RSS-Gen

|   |  |
|---|--|
| (*) Identification of item tested         | XS4 Original+ Electronic Lock Series including all mechanical variants   |
| (*) Trademark                             | SALTO  |
| (*) Model and/or type reference           | W40MH (Type reference: E2131)  |
| (*) Derived model not tested              | XS4 One S Electronic Lock Series including all mechanical variants   |
| Other identification of the product       | FCC ID: UKCW40MH<br>IC: 10088A-W40MH   |
| (*) Features                              | Bluetooth LE<br>HW version: 1.0<br>SW version: 0174 (Control FW) + 0186 (FUS FW) + 0187 (BLE FW) + 0197 (HSE FW) + 0219 (Motor and battery connection FW)  |
| Applicant                                 | SALTO SYSTEMS, S.L.<br>Arkotz 9, Polígono Lanbarren<br>20180 Oiartzun, Gipuzkoa, SPAIN   |
| Test method requested, standard           | USA FCC Part 15.225 (10-1-21 Edition): Operation within the band 13.110 -14.010.<br>USA FCC Part 15.209 (10-1-21 Edition): Radiated emission limits, general requirements.<br>CANADA RSS-210 Issue 10 (December 2019).<br>CANADA RSS-Gen Issue 5 amendment 2 (February 2021).<br>ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices. |
| Approved by (name / position & signature) | José Manuel Gómez Galván<br>EMC Consumer & RF<br>Lab. Manager  |
| Date of issue                             | 2023-11-07   |
| Report template No                        | FDT08_24<br>(*) "Data provided by the client"  |

# Index

|                                    |   |
|------------------------------------|---|
| Competences and guarantees .....   | 3 |
| General conditions .....           | 3 |
| Uncertainty.....                   | 3 |
| Data provided by the client .....  | 4 |
| Usage of samples .....             | 4 |
| Test sample description.....       | 5 |
| Identification of the client ..... | 6 |
| Testing period and place .....     | 6 |
| Document history .....             | 6 |
| Environmental conditions .....     | 6 |
| Remarks and comments.....          | 7 |
| Testing verdicts.....              | 8 |
| Summary .....                      | 8 |
| Appendix A: Test results.....      | 9 |

## Competences and guarantees

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DEKRA Testing and Certification is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory, CABid: ES1909, Company Number: 4621A, with the appropriate scope of accreditation that covers the performed tests in this report.

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The results presented in this Test Report apply only to the particular item under test established in this document.

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## General conditions

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1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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## Uncertainty

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Uncertainty (factor  $k=2$ ) was calculated according to the DEKRA Testing and Certification internal document PODT000.

The total uncertainty of the measurement system for the radiated emissions of EUT from 9 kHz to 30 MHz is:  
Measurement uncertainty  $\leq \pm 3.08$  dB (with factor  $k = 2$ ).

The total uncertainty of the measurement system for the radiated emissions of EUT from 30 MHz to 200 MHz is:  
Measurement uncertainty  $\leq \pm 5.35$  dB (with factor  $k = 2$ ).

## Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample consists of a XS4 Original+ KPP Electronic Lock Series with RFID Mifare (ISO14443A & ISO15693 standard based) and Bluetooth LE technology.
3. The sample undergoing test, XS4 Original+ Electronic Lock, have been selected as a representative sample of XS4 Original+ and XS4 One S Electronic Lock Series.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

## Usage of samples

Samples undergoing test have been selected by: The client.

| Id   | Control Number | Description                         | Model | Serial Nº | Date of Reception | Application           |
|------|----------------|-------------------------------------|-------|-----------|-------------------|-----------------------|
| S/01 | 77037B_52.1    | XS4 Original+<br>Electronic<br>Lock | W40MH | --        | 2023-09-28        | Element<br>Under Test |

Notes referenced to samples during the project:

| Id   | Type                             |
|------|----------------------------------|
| S/01 | Sample used for radiated testing |

## Test sample description

| Ports.....                                    | Port name and description  | Cable                            |                      |           |                                   |     |
|---|--|----------------------------------|----------------------|-----------|-----------------------------------|-----|
|   |  | Specified max length [m]         | Attached during test | Shielded  | Coupled to patient <sup>(3)</sup> |     |
|   | .....  | .....                            | [ ]                  | [ ]       | [ ]                               | [ ] |
| Supplementary information to the ports.....   | .....  |                                  |                      |           |                                   |     |
| Rated power supply .....                      | Voltage and Frequency  |                                  | Reference poles      |           |                                   |     |
|   |  |                                  | L1                   | L2        | L3                                | N   |
|   | [ ]  | AC: .....                        | [ ]                  | [ ]       | [ ]                               | [ ] |
|   | [X]  | DC: 4.5 Vdc (3 x LR03 batteries) |                      |           |                                   |     |
| Rated Power .....                             | N/A  |                                  |                      |           |                                   |     |
| Clock frequencies .....                       | 27.12 MHz, 32 MHz, 32.768 KHz  |                                  |                      |           |                                   |     |
| Other parameters.....                         | N/A  |                                  |                      |           |                                   |     |
| Software version .....                        | 0174 (Control FW) + 0186 (FUS FW) + 0187 (BLE FW) + 0197 (HSE FW) + 0219 (Motor and battery connection FW) |                                  |                      |           |                                   |     |
| Hardware version.....                         | 1.0  |                                  |                      |           |                                   |     |
| Dimensions in cm (W x H x D)....              | External part: 4.0 x 28.2 x 2.0 cm Internal part: 4.0 x 13.7 x 2.0 cm                                      |                                  |                      |           |                                   |     |
| Mounting position.....                        | [ ]  | Table top equipment              |                      |           |                                   |     |
|   | [ ]  | Wall/Ceiling mounted equipment   |                      |           |                                   |     |
|   | [ ]  | Floor standing equipment         |                      |           |                                   |     |
|   | [ ]  | Hand-held equipment              |                      |           |                                   |     |
|   | [X]  | Other: Door mounting             |                      |           |                                   |     |
| Modules/parts .....                           | Module/parts of test item  |                                  |                      | Type      | Manufacturer                      |     |
|   | SoC + Antenna  |                                  |                      | BLE       | ST + JOHANSON                     |     |
|   | .....  |                                  |                      | .....     | .....                             |     |
| Accessories (not part of the test item) ..... | Description  |                                  |                      | Type      | Manufacturer                      |     |
|   | .....  |                                  |                      | .....     | .....                             |     |
| Documents as provided by the applicant.....   | Description  |                                  |                      | File name | Issue date                        |     |
|   | User manual  |                                  |                      | .....     | .....                             |     |
|   | FW Explanation   |                                  |                      | .....     | .....                             |     |
|   | .....  |                                  |                      | .....     | .....                             |     |
|   | .....  |                                  |                      | .....     | .....                             |     |

<sup>(3)</sup> Only for Medical Equipment

## Identification of the client

SALTO SYSTEMS, S.L.  
Arkotz 9, Polígono Lanbarren  
20180, Oiartzun, Gipuzkoa, SPAIN

## Testing period and place

|               |  |
|---------------|--|
| Test Location | DEKRA Testing and Certification S.A.U. |
| Date (start)  | 2023-10-17                             |
| Date (finish) | 2023-10-19                             |

## Document history

| Report number | Date       | Description    |
|---------------|------------|----------------|
| 77037RRF.018  | 2023-11-07 | First release. |

## Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

|                   |                              |
|-------------------|------------------------------|
| Temperature       | Min. = 15 °C<br>Max. = 35 °C |
| Relative humidity | Min. = 20 %<br>Max. = 75 %   |

In the semianechoic chamber, the following limits were not exceeded during the test.

|                   |                              |
|-------------------|------------------------------|
| Temperature       | Min. = 15 °C<br>Max. = 35 °C |
| Relative humidity | Min. = 20 %<br>Max. = 75 %   |

## Remarks and comments

The tests have been performed by the technical personnel: Jose Manuel Jimenez.

Used instrumentation:

| Control No. | Equipment                           | Model          | Manufacturer      | Next Calibration |
|-------------|-------------------------------------|----------------|-------------------|------------------|
| 6791        | SEMIANECHOIC ABSORBER LINED CHAMBER | FACT 3 200 STP | ETS LINDGREN      | N/A              |
| 6792        | SHIELDED ROOM                       | S101           | ETS LINDGREN      | N/A              |
| 0242        | ACTIVE LOOP ANTENNA 9 KHZ-30 MHz    | 11966A         | HEWLETT PACKARD   | 2024-08-18       |
| 6143        | HYBRID BILOG ANTENNA 30MHz-6GHz     | 3142E          | ETS LINDGREN      | 2023-10-29       |
| 6144        | PRE-AMPLIFIER G>40dB 10MHz-6GHz     | BLNA 0160-01N  | BONN ELEKTRONIK   | 2024-07-25       |
| 7817        | EMI TEST RECEIVER 2Hz-44GHz         | ESW44          | ROHDE AND SCHWARZ | 2023-12-30       |
| 4848        | SOFTWARE FOR EMC/RF TESTING         | EMC32          | ROHDE AND SCHWARZ | N/A              |

## Testing verdicts

|                |     |
|----------------|-----|
| Fail           | F   |
| Inconclusive   | I   |
| Not applicable | N/A |
| Not measured   | N/M |
| Pass           | P   |

## Summary

| FCC PART 15 PARAGRAPH / RSS-210   |         |        |  |
|---|---------|--------|--|
| Requirement – Test case   | Verdict | Remark |  |
| FCC 15.225 (a) / RSS-210 B.6 (a)(i) Field strength of emissions within the band 13.553 MHz -13.567 MHz                        | P       | --     |  |
| FCC 15.225 (b) / RSS-210 B.6 (a)(ii) Field strength of emissions within the band 13.410 - 13.553 MHz and 13.567 – 13.710 MHz  | P       | --     |  |
| FCC 15.225 (c) / RSS-210 B.6 (a)(iii) Field strength of emissions within the band 13.110 - 13.410 MHz and 13.710 – 14.010 MHz | P       | --     |  |
| FCC 15.225 (d) / RSS-210 B.6 (a)(iv) Field strength of emissions outside of the band 13.110 MHz -14.010 MHz                   | P       | --     |  |
| FCC 15.225 (e) / RSS-210 B.6 (b) Frequency tolerance of the carrier signal  | N/M     | (1)    |  |
| <u>Supplementary information and remarks:</u>   |         |        |  |
| 1. Test not requested by the client   |         |        |  |

## Appendix A: Test results

## INDEX

|  |    |
|--|----|
| TEST CONDITIONS .....  | 11 |
| FCC 15.225 (a) (b) (c) / RSS-210 B.6 (a) (b) (c). Field strength of emissions within the band 13.553 -13.567 MHz, 13.410 - 13.553 MHz and 13.567 - 13.710 MHz, 13.110 - 13.410 MHz and 13.710 - 14.010 MHz ..... | 13 |
| FCC 15.225 (d) / RSS-210 B.6 (a)(iv) Field Strength of Emissions outside of the band 13.110 MHz - 14.010 MHz .....   | 17 |

## TEST CONDITIONS

(\*) Data provided by the Applicant.

### POWER SUPPLY (\*):

Vnominal: 4.5Vdc  
Type of Power Supply: External power supply (3 x LR03 batteries)

### ANTENNA (\*):

Type of Antenna: Integral (PCB)

### TEST FREQUENCY (\*):

Nominal Operating Frequency: 13.56 MHz

### MODULATION:

RFID mode ISO 14443A  
RFID mode ISO 15693

### RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Loop antenna for the range between 9 kHz to 30 MHz and Bilog antenna for the range between 30 MHz to 200 MHz) is situated at a distance of 3 m.

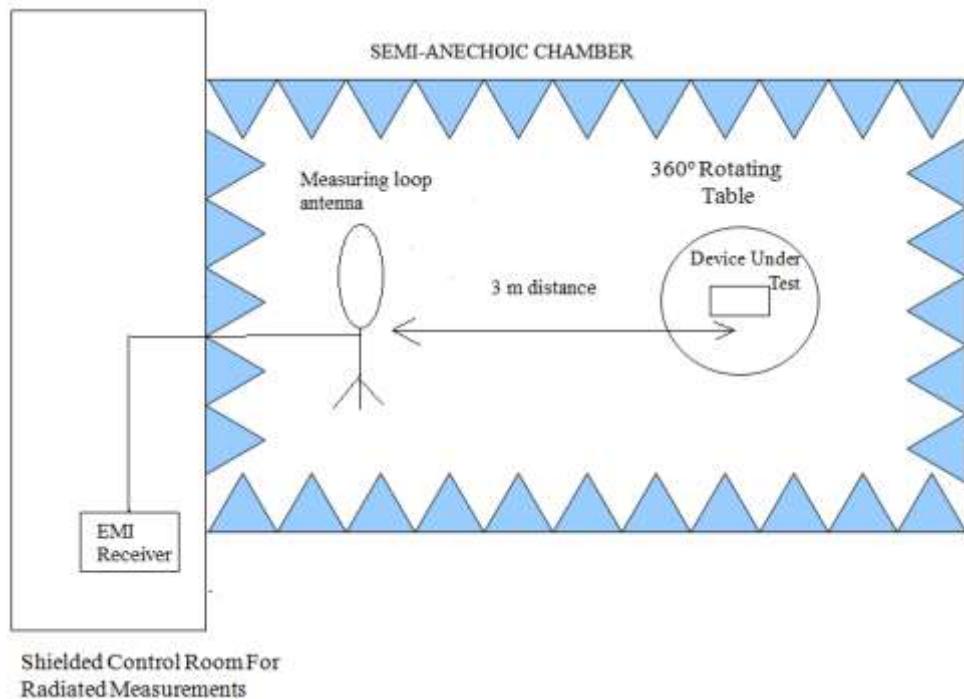
For radiated emissions in the range 9 kHz to 30 MHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 40 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and in the range between 30 MHz and 200 MHz the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

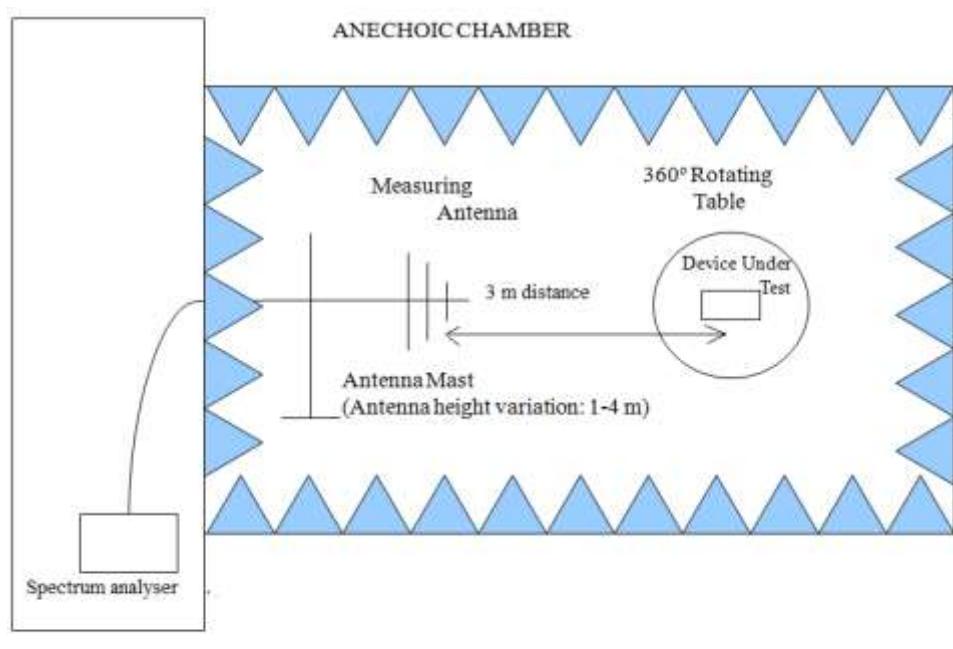
In the range between 9 kHz and 30 MHz the measurements were made in the three different orientation planes of the loop antenna to determine the maximum received field.

In the range between 30 MHz and 200 MHz the measurements were made in both horizontal and vertical planes of polarization.

Radiated measurements setup 9 kHz to 30 MHz:



Radiated measurements setup 30 MHz to 200 MHz:



**FCC 15.225 (a) (b) (c) / RSS-210 B.6 (a) (b) (c). Field strength of emissions within the band 13.553 -13.567 MHz, 13.410 - 13.553 MHz and 13.567 - 13.710 MHz, 13.110 - 13.410 MHz and 13.710 - 14.010 MHz**

**SPECIFICATION:**

- FCC 15.225 (a) / RSS-210 B.6 (a). Field strength of emissions within the band 13.553 -13.567 MHz**

The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 15,848 microvolts/meter (84 dB $\mu$ V/m) at 30 meters.

- FCC 15.225 (b) / RSS-210 B.6 (b). Field strength of emissions within the band 13.410 - 13.553 MHz and 13.567 - 13.710 MHz**

Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (50.47 dB $\mu$ V/m) at 30 meters.

- FCC 15.225 (c) / RSS-210 B.6 (c). Field strength of emissions within the band 13.110 - 13.410 MHz and 13.710 - 14.010 MHz**

Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz, the field strength of any emissions shall not exceed 106 microvolts/meter (40.51 dB $\mu$ V/m) at 30 meters.

**RESULTS:**

Measurement distance: 3 meters.

- RFID mode ISO 14443A**

**- Band 13.553 -13.567 MHz**

| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m) measured at 3 m (quasi-peak detector) | Maximum field strength (dB $\mu$ V/m) extrapolated to 30 m (40 dB/decade) |
|-----------------|---|---|
| 13.560          | 12.77   | -27.23  |

**- Band 13.410 - 13.553 MHz**

| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m) measured at 3 m (quasi-peak detector) | Maximum field strength (dB $\mu$ V/m) extrapolated to 30 m (40 dB/decade) |
|-----------------|---|---|
| 13.453          | -6.03   | -46.03  |

**- Band 13.567-13.710 MHz**

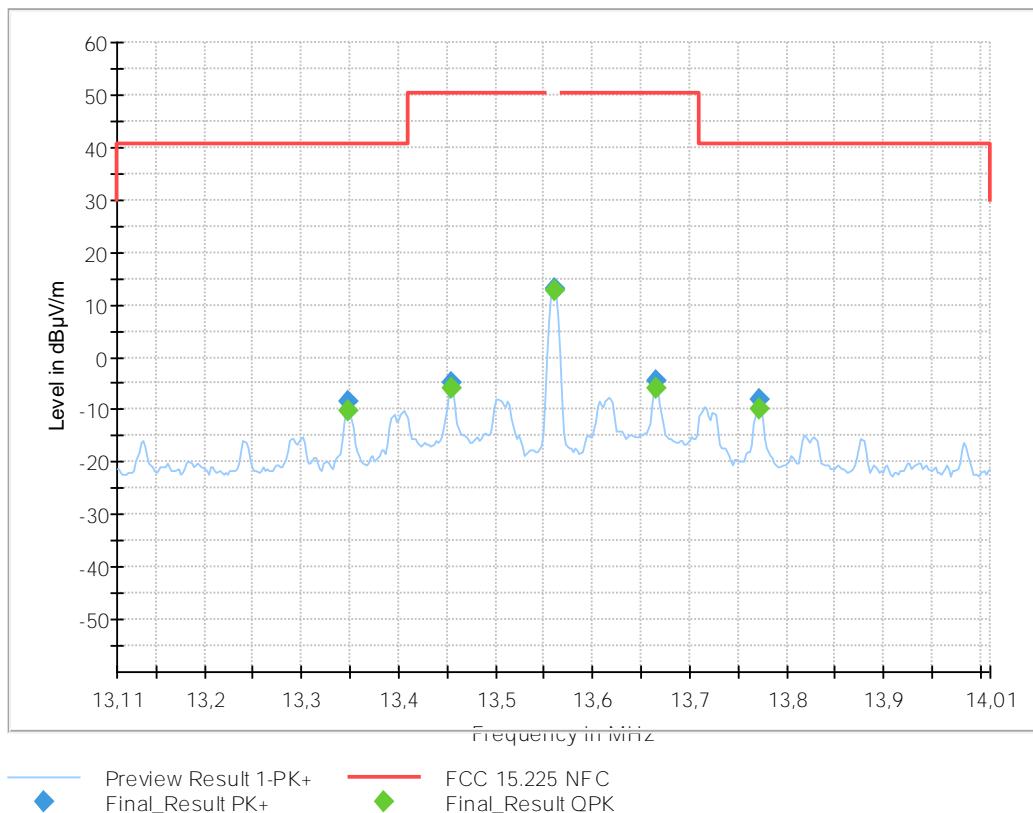
| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m) measured at 3 m (quasi-peak detector) | Maximum field strength (dB $\mu$ V/m) extrapolated to 30 m (40 dB/decade) |
|-----------------|---|---|
| 13.666          | -5.77   | -45.77  |

- Band 13.110-13.410 MHz

| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m)<br>measured at 3 m (quasi-peak<br>detector) | Maximum field strength (dB $\mu$ V/m)<br>extrapolated to 30 m (40 dB/decade) |
|-----------------|---|--|
| 13.349          | -10.33  | -50.33   |

- Band 13.710-14.010 MHz

| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m)<br>measured at 3 m (quasi-peak<br>detector) | Maximum field strength (dB $\mu$ V/m)<br>extrapolated to 30 m (40 dB/decade) |
|-----------------|---|--|
| 13.772          | -9.91   | -49.91   |



Spectrum analyzer parameters:

| Subrange                              | Step Size | Detectors | IF BW  | Meas. Time | Preamplifier |
|---------------------------------------|-----------|-----------|--------|------------|--------------|
| Receiver: [ESW 44]<br>9 kHz - 150 kHz | 50 Hz     | PK+       | 200 Hz | 0,1 s      | 0 dB         |
| 150 kHz - 30 MHz                      | 2,25 kHz  | PK+       | 9 kHz  | 0,1 s      | 0 dB         |

- **RFID mode ISO 15693**

- **Band 13.553 -13.567 MHz**

| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m)<br>measured at 3 m (quasi-peak<br>detector) | Maximum field strength (dB $\mu$ V/m)<br>extrapolated to 30 m (40<br>dB/decade) |
|-----------------|---|---|
| 13.560          | 11.69   | -28.31  |

- **Band 13.410 - 13.553 MHz**

| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m)<br>measured at 3 m (quasi-peak<br>detector) | Maximum field strength (dB $\mu$ V/m)<br>extrapolated to 30 m (40<br>dB/decade) |
|-----------------|---|---|
| 13.454          | -6.83   | -46.83  |

- **Band 13.567-13.710 MHz**

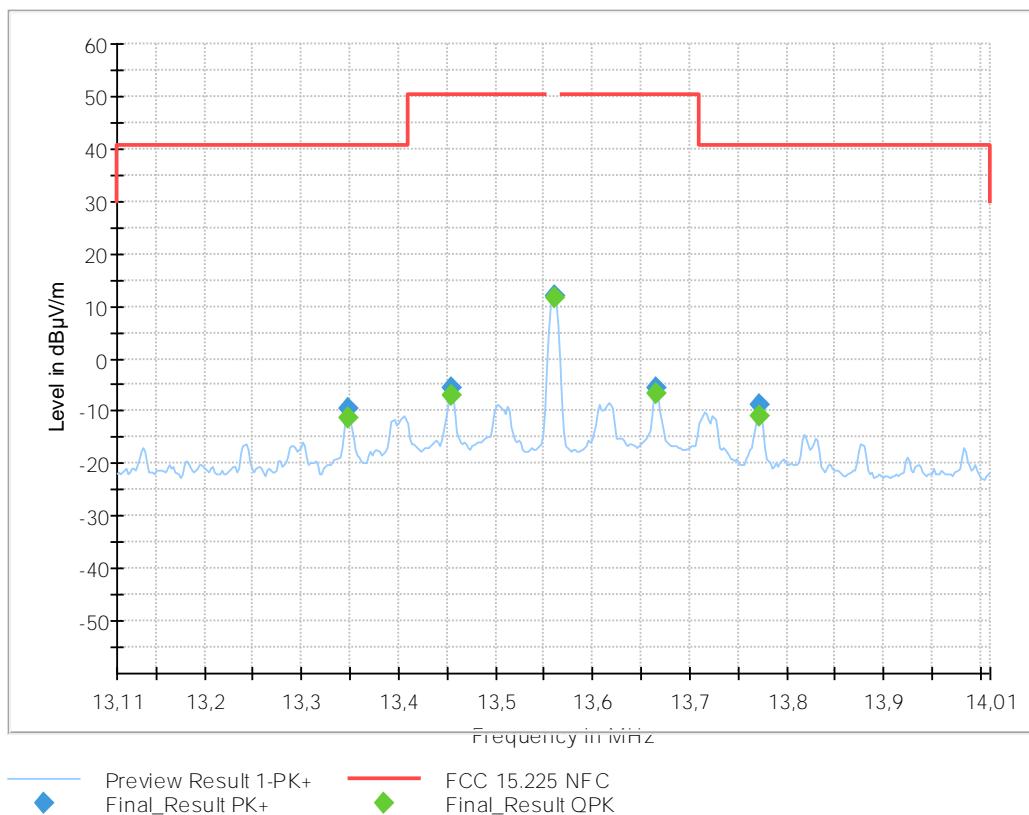
| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m)<br>measured at 3 m (quasi-peak<br>detector) | Maximum field strength (dB $\mu$ V/m)<br>extrapolated to 30 m (40 dB/decade) |
|-----------------|---|--|
| 13.666          | -6.58   | -46.58   |

- **Band 13.110-13.410 MHz**

| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m)<br>measured at 3 m (quasi-peak<br>detector) | Maximum field strength (dB $\mu$ V/m)<br>extrapolated to 30 m (40 dB/decade) |
|-----------------|---|--|
| 13.349          | -11.25  | -51.25   |

- **Band 13.710-14.010 MHz**

| Frequency (MHz) | Maximum field strength (dB $\mu$ V/m)<br>measured at 3 m (quasi-peak<br>detector) | Maximum field strength (dB $\mu$ V/m)<br>extrapolated to 30 m (40 dB/decade) |
|-----------------|---|--|
| 13.772          | -10.80  | -50.80   |



Spectrum analyzer parameters:

| Subrange           | Step Size | Detectors | IF BW  | Meas. Time | Preamp |
|--------------------|-----------|-----------|--------|------------|--------|
| Receiver: [ESW 44] |           |           |        |            |        |
| 9 kHz - 150 kHz    | 50 Hz     | PK+       | 200 Hz | 0,1 s      | 0 dB   |
| 150 kHz - 30 MHz   | 2,25 kHz  | PK+       | 9 kHz  | 0,1 s      | 0dB    |

Verdict: PASS

## FCC 15.225 (d) / RSS-210 B.6 (a)(iv) Field Strength of Emissions outside of the band 13.110 MHz - 14.010 MHz

### SPECIFICATION:

Field strength of any emissions appearing outside of the band 13.110 MHz - 14.010 MHz band shall not exceed the general radiated emission limits in 15.209/RSS-Gen:

| Frequency Range (MHz) | Field strength ( $\mu$ V/m) | Field strength (dB $\mu$ V/m) | Measurement distance (m) |
|-----------------------|-----------------------------|-------------------------------|--------------------------|
| 0.009-0.490           | 2400/F(kHz)                 | -                             | 300                      |
| 0.490-1.705           | 24000/F(kHz)                | -                             | 30                       |
| 1.705 - 30.0          | 30                          | 29.54                         | 30                       |
| 30 - 88               | 100                         | 40                            | 3                        |
| 88 - 216              | 150                         | 43.5                          | 3                        |
| 216 - 960             | 200                         | 46                            | 3                        |
| Above 960             | 500                         | 54                            | 3                        |

### RESULTS:

All tests were performed in a semi-anechoic chamber at a distance of 3 m.

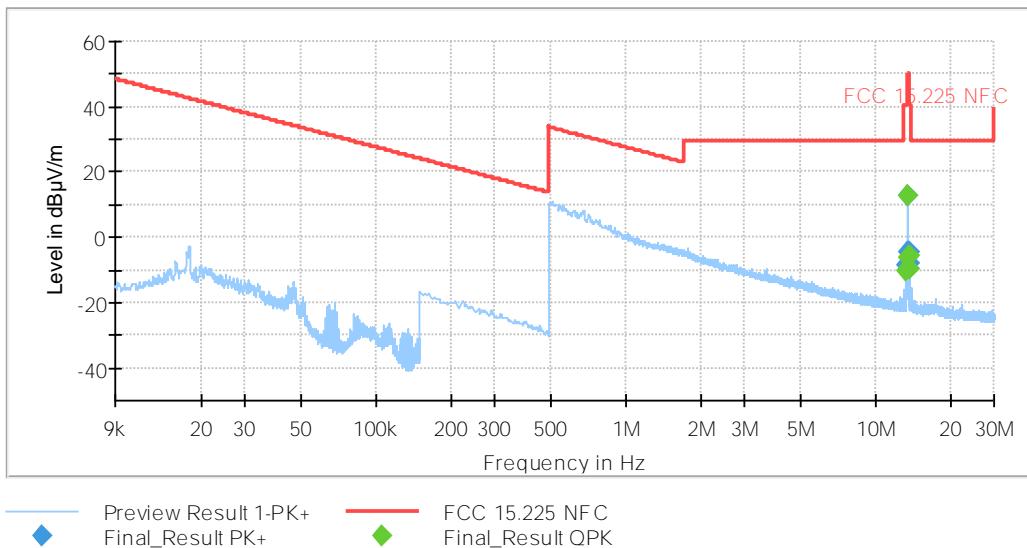
The spectrum was inspected from 9 kHz to 200 MHz searching for spurious signals.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifier gain.

- Frequency range 9 kHz - 30 MHz:

- RFID mode ISO 14443A:

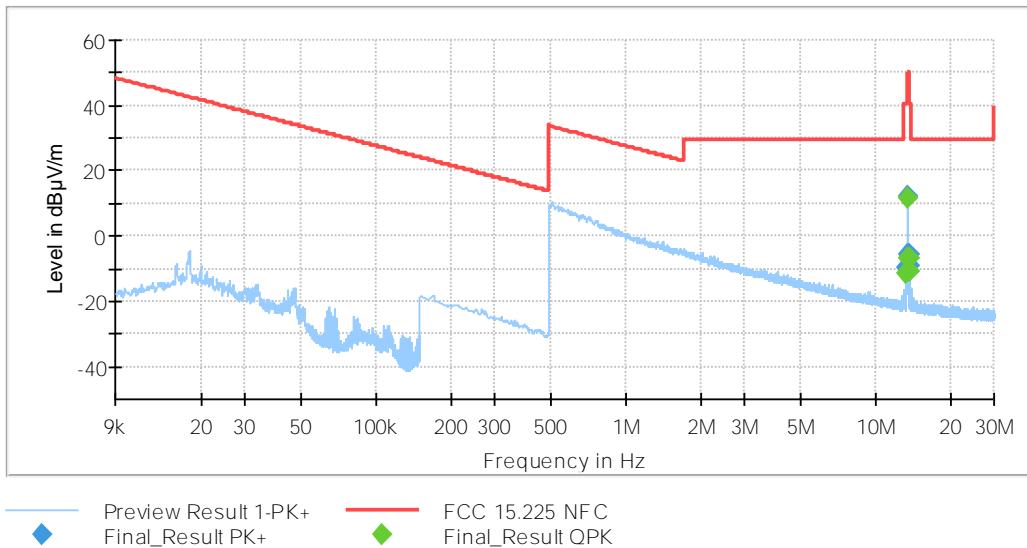
No spurious frequencies were found at less than 20 dB of the limit.



The limits shown in the above plot are extrapolated to 3 meters. The highest peak corresponds to the carrier level.

- RFID mode ISO 15693:

No spurious frequencies were found at less than 20 dB of the limit.



The limits shown in the above plot are extrapolated to 3 meters. The highest peak corresponds to the carrier level.

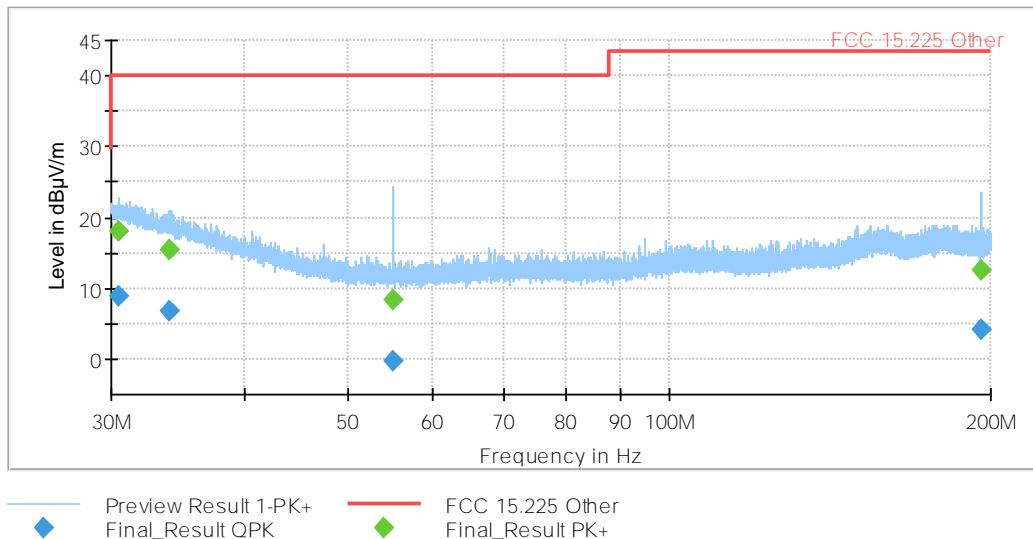
Spectrum analyzer parameters:

| Subrange           | Step Size | Detectors | IF BW  | Meas. Time | Preamp |
|--------------------|-----------|-----------|--------|------------|--------|
| Receiver: [ESW 44] |           |           |        |            |        |
| 9 kHz - 150 kHz    | 50 Hz     | PK+       | 200 Hz | 0,1 s      | 0 dB   |
| 150 kHz - 30 MHz   | 2,25 kHz  | PK+       | 9 kHz  | 0,1 s      | 0dB    |

- Frequency range 30 - 200 MHz:

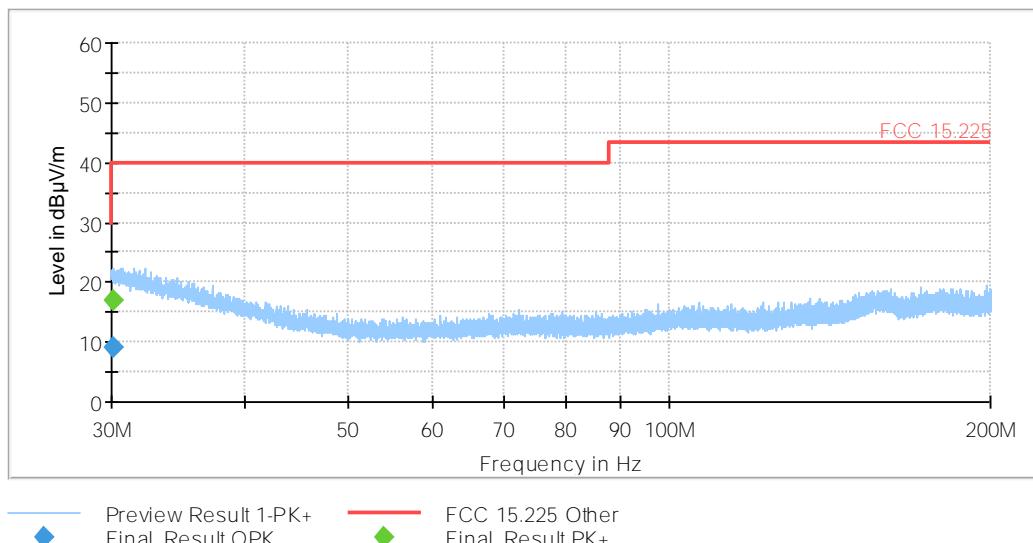
- RFID mode ISO 14443A:

No spurious frequencies were found at less than 20 dB of the limit.



- RFID mode ISO 15693:

No spurious frequencies were found at less than 20 dB of the limit.



Spectrum analyzer parameters:

| Subrange                               | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|--|-----------|-----------|-----------|------------|--------|
| Receiver: [ESW 44]<br>30 MHz - 200 MHz | 8,5 kHz   | PK+       | 100 kHz   | 1 s        | 30 dB  |

Verdict: PASS