

## TEST REPORT

### Nr. R21247001

### Federal Communication Commission (FCC)

|                                                                                                                                                                                                            |                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Report Reference No.</b> .....                                                                                                                                                                          | R21247001                                                                                            |
| Date of issue: .....                                                                                                                                                                                       | 09.11.2021                                                                                           |
| Total number pages: .....                                                                                                                                                                                  | 59                                                                                                   |
| <b>Applicant's name</b> .....                                                                                                                                                                              | Caen RFID S.r.l.                                                                                     |
| Address .....                                                                                                                                                                                              | Via Vetraria, 11 – 55049 Viareggio (LU) – Italy                                                      |
| <b>Test specification:</b>                                                                                                                                                                                 |                                                                                                      |
| Standards .....                                                                                                                                                                                            | FCC Rules & Regulations, Title 47:2020<br>Part 15 paragraph(s): 203, 204, 205, 207, 209, 215 and 247 |
| Non-standard test method .....                                                                                                                                                                             | N/A                                                                                                  |
| <b>Test Report Form No.</b> .....                                                                                                                                                                          | 15-247_HoppingCMC                                                                                    |
| Test Report Form(s) Originator ..                                                                                                                                                                          | CMC Centro Misure Compatibilità S.r.l.                                                               |
| Master TRF .....                                                                                                                                                                                           | 2021-07                                                                                              |
| <b>General disclaimer:</b>                                                                                                                                                                                 |                                                                                                      |
| The test results presented in this report relate only to the object tested.<br>This report shall not be reproduced, except in full, without the written approval of CMC Centro Misure Compatibilità S.r.l. |                                                                                                      |
| <b>Test item description</b> .....                                                                                                                                                                         | R1210IU – Trid – RAIN RFID Smart Tray Reader – FCC                                                   |
| Trademark .....                                                                                                                                                                                            | Caen RFID                                                                                            |
| Manufacturer .....                                                                                                                                                                                         | Caen RFID S.r.l.                                                                                     |
| Model / Type reference .....                                                                                                                                                                               | WR1210IXUSAA                                                                                         |
| FCC ID .....                                                                                                                                                                                               | UVECAENRFID033                                                                                       |
| Rating(s) .....                                                                                                                                                                                            | 5 Vdc from USB<br>3,7 Vdc from internal battery                                                      |
| <b>Report</b>                                                                                                                                                                                              |                                                                                                      |
| Tested by (name + signature) .....                                                                                                                                                                         | M. Segalla                                                                                           |
| Approved by (name + signature) .....                                                                                                                                                                       | R. Beghetto                                                                                          |

## 1 Summary

|     |                                                                                   |    |
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|                                                                                                                                                    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>2 Reference standard</b>                                                                                                                        |    |
| FCC Rules and Regulation Title 47 part 15:2020                                                                                                     | -- |
| <b>3 List of attachments</b>                                                                                                                       |    |
| Attachment 1: Instruments list, measurement uncertainty, judgement of compliance and quality manual references                                     |    |
| <b>4 Deviation(s) from test specification</b>                                                                                                      |    |
| None                                                                                                                                               |    |
| <b>5 Testing location</b>                                                                                                                          |    |
| CMC Centro Misura Compatibilità S.r.l.<br>Via della Fisica, 20 – 36016 Thiene (VI) – Italy<br>Test site facility's FCC registration number: 182474 |    |

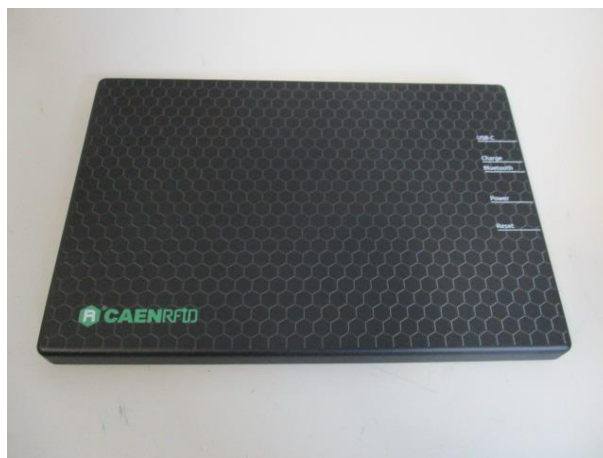
| Revision index | Date       | Change history |
|----------------|------------|----------------|
| 1.0            | 09.11.2021 | --             |

| Testing and sampling:                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date of receipt of test item .....                                                                                                                                                                                                                                                                                                   | 25.10.2021                                                                                                                                                                             |
| Testing start date .....                                                                                                                                                                                                                                                                                                             | 28.10.2021                                                                                                                                                                             |
| Testing end date .....                                                                                                                                                                                                                                                                                                               | 04.11.2021                                                                                                                                                                             |
| Sampling procedure.....                                                                                                                                                                                                                                                                                                              | Equipment used for testing was picked up by the manufacturer, at the end of the production process with random criterion.<br>The results relate to the sample as it has been received. |
| Internal identification .....                                                                                                                                                                                                                                                                                                        | Adhesive label with the product number P211207                                                                                                                                         |
| General remarks:                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                        |
| <p>This report shall not be reproduced, except in full, without the written approval of CMC.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>“(see appended table)”: refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> |                                                                                                                                                                                        |
| Possible test case verdicts:                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                        |
| Test case does not apply to the test object:                                                                                                                                                                                                                                                                                         | N/A (Not Applicable)                                                                                                                                                                   |
| Test object does meet the requirement:                                                                                                                                                                                                                                                                                               | P (Pass)                                                                                                                                                                               |
| Test object does not meet the requirement:                                                                                                                                                                                                                                                                                           | F (Fail)                                                                                                                                                                               |
| Test object does not performed:                                                                                                                                                                                                                                                                                                      | N/E (Not Executed)                                                                                                                                                                     |
| Definition of symbols used in this test report:                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> Indicates that the listed condition, standard or equipment is applicable for this report.<br><input type="checkbox"/> Indicates that the listed condition, standard or equipment is not applicable for this report.                                                                              |                                                                                                                                                                                        |

## 6 General description of tested item and testing condition(s)

|                                                           |                                                    |                                                 |                             |                          |                             |                          |                          |
|-----------------------------------------------------------|----------------------------------------------------|-------------------------------------------------|-----------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|
| Description .....                                         | R1210IU – Trid – RAIN RFID Smart Tray Reader – FCC |                                                 |                             |                          |                             |                          |                          |
| Model Number .....                                        | WR1210IXUSAA                                       |                                                 |                             |                          |                             |                          |                          |
| FCC ID .....                                              | UVECAENRFID033                                     |                                                 |                             |                          |                             |                          |                          |
| Serial Number .....                                       | 0001000121360003                                   |                                                 |                             |                          |                             |                          |                          |
| Brand name .....                                          | Caen RFID                                          |                                                 |                             |                          |                             |                          |                          |
| Frequency band .....                                      | 902 – 928 MHz                                      |                                                 |                             |                          |                             |                          |                          |
| Nominal frequencies .....                                 | F <sub>L</sub> : 902,75 MHz                        |                                                 | F <sub>M</sub> : 914,75 MHz |                          | F <sub>H</sub> : 927,25 MHz |                          |                          |
| Test power supply .....                                   |                                                    | Voltage and Frequency                           | Reference poles             |                          |                             |                          |                          |
|                                                           |                                                    |                                                 | N                           | L1                       | L2                          | L3                       | PE                       |
|                                                           | <input type="checkbox"/>                           | AC:                                             | <input type="checkbox"/>    | <input type="checkbox"/> | <input type="checkbox"/>    | <input type="checkbox"/> | <input type="checkbox"/> |
|                                                           | <input type="checkbox"/>                           | AC:                                             | <input type="checkbox"/>    | <input type="checkbox"/> | <input type="checkbox"/>    | <input type="checkbox"/> | <input type="checkbox"/> |
|                                                           | <input checked="" type="checkbox"/>                | DC: 5 V from USB                                |                             |                          |                             |                          | <input type="checkbox"/> |
| Software version .....                                    | 1.0.0                                              |                                                 |                             |                          |                             |                          |                          |
| Pseudo randomly ordered list of hopping frequencies ..... | See document R1210IU_Operational_Description       |                                                 |                             |                          |                             |                          |                          |
| Test configuration .....                                  | <input checked="" type="checkbox"/>                | Table top equipment                             |                             |                          |                             |                          |                          |
|                                                           | <input type="checkbox"/>                           | Floor standing equipment                        |                             |                          |                             |                          |                          |
|                                                           | <input type="checkbox"/>                           | Hand-held equipment                             |                             |                          |                             |                          |                          |
| Type of equipment .....                                   | <input checked="" type="checkbox"/>                | Transmitter unit                                |                             |                          |                             |                          |                          |
|                                                           | <input type="checkbox"/>                           | Receiver unit                                   |                             |                          |                             |                          |                          |
| Type of station .....                                     | <input type="checkbox"/>                           | Portable station                                |                             |                          |                             |                          |                          |
|                                                           | <input checked="" type="checkbox"/>                | Mobile station                                  |                             |                          |                             |                          |                          |
| Operating modes .....                                     | No.                                                | Operating mode of test item                     |                             |                          |                             |                          |                          |
|                                                           | 1                                                  | EUT in continuous transmission at maximum power |                             |                          |                             |                          |                          |

## 6.1 Photos of the test item





## 7 Verdict summary section

| FCC Rules & Regulations, Title 47:2020<br>Part 15 paragraph(s): 203, 204, 205, 207, 209, 215 and 247 |                                                     |                |          |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------|----------------|----------|
| Clause                                                                                               | Requirement – Test case                             | Basic standard | Verdict  |
| Part 15.247 (a) (1)                                                                                  | Pseudo randomly ordered list of hopping frequencies | --             | <b>P</b> |
| Part 15.203                                                                                          | Antenna requirements                                | ANSI C63.10    | <b>P</b> |
| Part 15.207                                                                                          | Conducted emissions                                 | ANSI C63.10    | <b>P</b> |
| Part 15.209                                                                                          | Radiated emissions and spurious emission            | ANSI C63.10    | <b>P</b> |
| Part 15.247                                                                                          | 20 dB Bandwidth                                     | ANSI C63.10    | <b>P</b> |
| Part 15.247                                                                                          | Channel Separation                                  | ANSI C63.10    | <b>P</b> |
| Part 15.247                                                                                          | Number of Hopping Channel                           | ANSI C63.10    | <b>P</b> |
| Part 15.247                                                                                          | Time of occupancy                                   | ANSI C63.10    | <b>P</b> |
| Part 15.247                                                                                          | Band edge                                           | ANSI C63.10    | <b>P</b> |
| Part 15.209 and 15.247                                                                               | Peak Output Power                                   | ANSI C63.10    | <b>P</b> |

| Normative references                           |                                                                                                                                                                                          |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reference no.                                  | Description                                                                                                                                                                              |
| FCC Rules and Regulation Title 47 part 15:2020 | --                                                                                                                                                                                       |
| KDB 558074 D01 15.247 Meas Guidance v05r02     | Guidance for compliance measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under section 15.247 of the FCC rules |
| ANSI C63.4:2014                                | American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz                         |
| ANSI C63.10:2013                               | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                                                                                           |

## 8 Test conditions

### 8.1 General

|                                          |                                                                                                                                                          |                 |                             |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------|
| Environmental reference conditions.....: | The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.        |                 |                             |
|                                          | The climatic conditions during the tests were within the following limits:                                                                               |                 |                             |
|                                          | <b>Temperature</b>                                                                                                                                       | <b>Humidity</b> | <b>Atmospheric pressure</b> |
|                                          | 15 °C – 35 °C                                                                                                                                            | 30 % - 60 %     | 800 hPa – 1060 hPa          |
|                                          | If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report. |                 |                             |
| Measurement uncertainties .....          | Attachment 1                                                                                                                                             |                 |                             |

## 9 Test results

### 9.1 Antenna requirements

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Tested by .....                     | M. Segalla                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  |
| Test date .....                     | 28.10.2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  |
| Reference standards .....           | FCC Rules and Regulation; Titles 47 Part. 15.203 and 15.204                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |
| Test specification .....            | <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded</p> |                  |
| Antenna type.....                   | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Integral antenna |
|                                     | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | External antenna |
| Antenna gain.....                   | -4 dBi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |
| External R.F. power amplifier ..... | Not Present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |

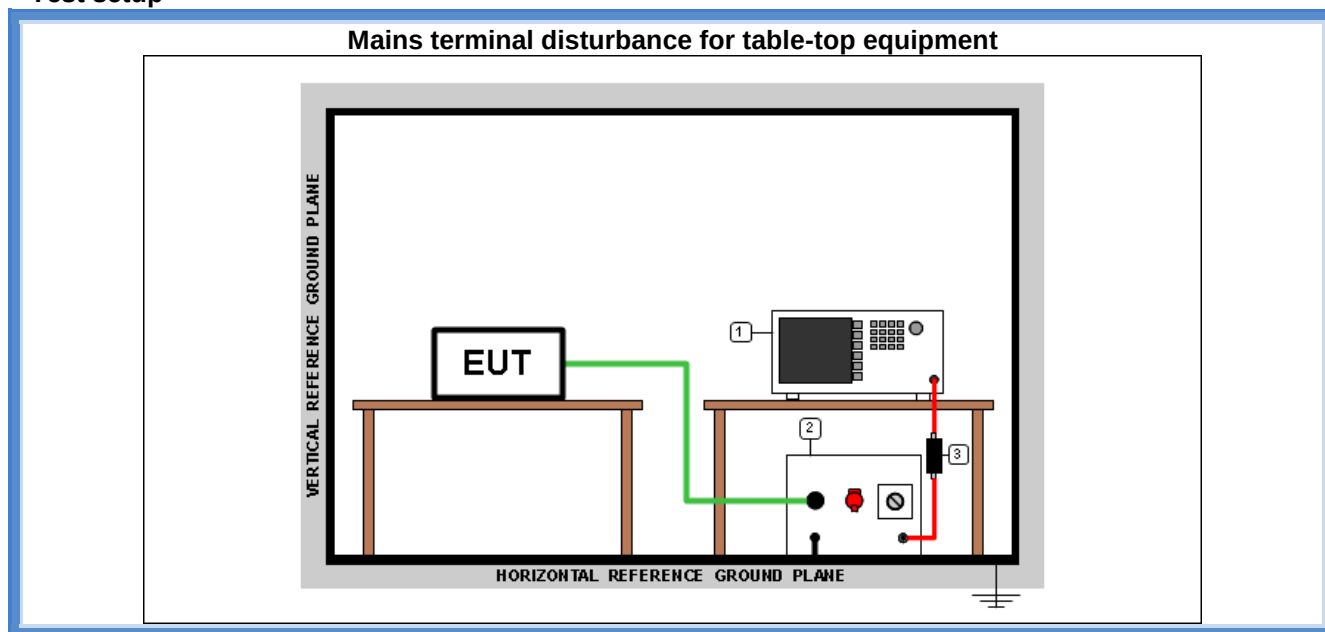
## 9.2 Conducted emission

|                                             |                                                                         |                                                                                                              |
|---------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Tested by .....                             | M. Segalla                                                              |                                                                                                              |
| Test date .....                             | 04.11.2021                                                              |                                                                                                              |
| Test location (stand) .....                 | Shielded chamber (CMC A001)                                             |                                                                                                              |
| Reference standards .....                   | FCC Rules and Regulation; Titles 47 Part. 15.207<br>ANSI C63.10 cl. 6.2 |                                                                                                              |
| Test set-up description .....               | <input checked="" type="checkbox"/>                                     | Table top equipment set-up (80 cm above the reference ground plane)                                          |
|                                             | <input type="checkbox"/>                                                | Floor standing equipment set-up (insulating material up to 12 mm thick)                                      |
|                                             | <input type="checkbox"/>                                                | False floor installation equipment set-up (insulating material up to 34 cm above the reference ground plane) |
| Supplementary Test set-up description ..... | --                                                                      |                                                                                                              |
| Test method applied .....                   | <input checked="" type="checkbox"/>                                     | Artificial mains network, 50 $\mu$ H/50 $\Omega$ LISN                                                        |
|                                             | <input type="checkbox"/>                                                | Other:                                                                                                       |

### Acceptance limits

| Frequency range (MHz) | <i>dB(<math>\mu</math>V) Quasi-peak</i> | <i>dB(<math>\mu</math>V) Average</i> |
|-----------------------|-----------------------------------------|--------------------------------------|
| 0,15 to 0,50          | 66 to 56                                | 56 to 46                             |
| 0,5 to 5              | 56                                      | 46                                   |
| 5 to 30               | 60                                      | 50                                   |

## Test setup



*Test setup PE001\_01*

| Nr. | Id. Number | Manufacturer    | Model     | Description            |
|-----|------------|-----------------|-----------|------------------------|
| 3   | CMC S010   | Rohde & Schwarz | ESH3-Z2   | Pulse limiter          |
| 2   | CMC S200   | Schwarzbeck     | NSLK 8128 | V-LISN                 |
| 1   | CMC S206   | Rohde & Schwarz | ESCI 7    | EMC Receiver 9KHz-7GHz |

## Result

| Line | Frequency Range (MHz) | Graphs    | Remarks | Result |
|------|-----------------------|-----------|---------|--------|
| N    | 0,15 – 30             | G21247035 | --      | P      |
| L1   | 0,15 – 30             | G21247036 | --      | P      |

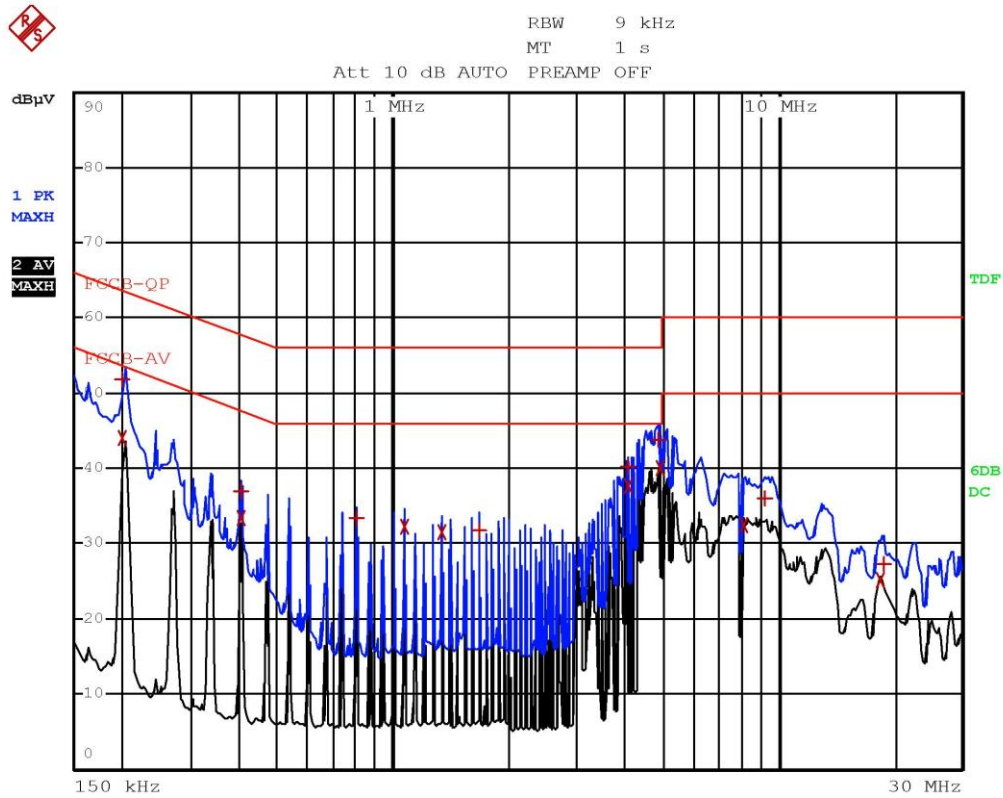
**Remarks:** test performed on 120 Vac side of auxiliary PC power unit

### Graphs Legend

PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +

AV: Average; AV [1s] (average at 1 second) values are marked with a X

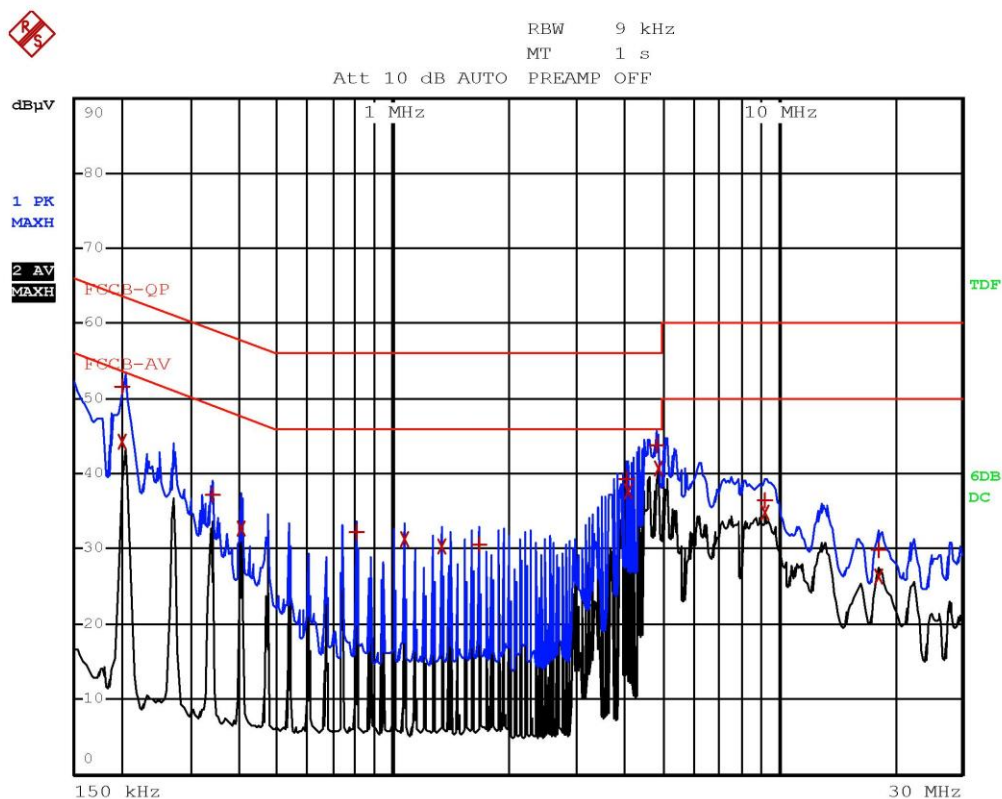
## Graphs



Segalla 21247035

| EDIT PEAK LIST (Final Measurement Results) |           |            |                |  |
|--------------------------------------------|-----------|------------|----------------|--|
| Trace1:                                    | FCCB-QP   |            |                |  |
| Trace2:                                    | FCCB-AV   |            |                |  |
| Trace3:                                    | ---       |            |                |  |
| TRACE                                      | FREQUENCY | LEVEL dBμV | DELTA LIMIT dB |  |
| 1 Quasi Peak                               | 202 kHz   | 51.88      | -11.64         |  |
| 2 Average                                  | 202 kHz   | 44.00      | -9.51          |  |
| 1 Quasi Peak                               | 402 kHz   | 36.89      | -20.91         |  |
| 2 Average                                  | 402 kHz   | 33.32      | -14.48         |  |
| 1 Quasi Peak                               | 806 kHz   | 33.35      | -22.64         |  |
| 2 Average                                  | 1.074 MHz | 32.22      | -13.77         |  |
| 2 Average                                  | 1.342 MHz | 31.56      | -14.43         |  |
| 1 Quasi Peak                               | 1.678 MHz | 31.84      | -24.15         |  |
| 1 Quasi Peak                               | 4.098 MHz | 40.35      | -15.64         |  |
| 2 Average                                  | 4.098 MHz | 37.59      | -8.41          |  |
| 1 Quasi Peak                               | 4.902 MHz | 43.79      | -12.20         |  |
| 2 Average                                  | 4.97 MHz  | 40.10      | -5.89          |  |
| 2 Average                                  | 8.126 MHz | 32.50      | -17.49         |  |
| 1 Quasi Peak                               | 9.202 MHz | 35.99      | -24.00         |  |
| 2 Average                                  | 18.41 MHz | 25.08      | -24.91         |  |
| 1 Quasi Peak                               | 18.74 MHz | 27.22      | -32.77         |  |

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| EDIT PEAK LIST (Final Measurement Results) |           |            |                |  |
|--------------------------------------------|-----------|------------|----------------|--|
| Trace1:                                    | FCCB-QP   |            |                |  |
| Trace2:                                    | FCCB-AV   |            |                |  |
| Trace3:                                    | ---       |            |                |  |
| TRACE                                      | FREQUENCY | LEVEL dBpV | DELTA LIMIT dB |  |
| 1 Quasi Peak                               | 202 kHz   | 51.65      | -11.87         |  |
| 2 Average                                  | 202 kHz   | 44.24      | -9.28          |  |
| 1 Quasi Peak                               | 338 kHz   | 37.24      | -22.00         |  |
| 2 Average                                  | 402 kHz   | 32.71      | -15.09         |  |
| 1 Quasi Peak                               | 806 kHz   | 32.13      | -23.87         |  |
| 2 Average                                  | 1.074 MHz | 31.31      | -14.68         |  |
| 2 Average                                  | 1.346 MHz | 30.28      | -15.71         |  |
| 1 Quasi Peak                               | 1.678 MHz | 30.70      | -25.29         |  |
| 1 Quasi Peak                               | 4.03 MHz  | 39.23      | -16.76         |  |
| 2 Average                                  | 4.098 MHz | 37.64      | -8.35          |  |
| 1 Quasi Peak                               | 4.838 MHz | 43.92      | -12.07         |  |
| 2 Average                                  | 4.906 MHz | 40.76      | -5.23          |  |
| 1 Quasi Peak                               | 9.206 MHz | 36.50      | -23.49         |  |
| 2 Average                                  | 9.274 MHz | 34.85      | -15.14         |  |
| 2 Average                                  | 18.21 MHz | 26.28      | -23.71         |  |
| 1 Quasi Peak                               | 18.28 MHz | 29.93      | -30.06         |  |

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### 9.3 Emissions in restricted frequency bands and in unrestricted frequency bands

|                                             |                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tested by .....                             | M. Segalla                                                                                                                                                                                                                                                                                                                                           |
| Test date .....                             | 29.10.2021                                                                                                                                                                                                                                                                                                                                           |
| Test location (stand) .....                 | Semi-anechoic chamber (CMC A070)                                                                                                                                                                                                                                                                                                                     |
| Reference standards .....                   | FCC Rules and Regulation; Titles 47 Part. 15.209<br>ANSI C63.10 cl. 6.3, 6.4, 6.5 and 6.6                                                                                                                                                                                                                                                            |
| Test set-up description .....               | <input checked="" type="checkbox"/> Table top equipment set-up (80 cm above the reference ground plane)<br><input type="checkbox"/> Floor standing equipment set-up (insulating material up to 12 mm thick)<br><input type="checkbox"/> False floor installation equipment set-up (insulating material up to 34 cm above the reference ground plane) |
| Supplementary test set-up description ..... | --                                                                                                                                                                                                                                                                                                                                                   |
| Test method applied .....                   | SAC with measurement distance [m]: 10                                                                                                                                                                                                                                                                                                                |
| Supplementary information.....              | --                                                                                                                                                                                                                                                                                                                                                   |

#### Acceptance limits

| <b>Acceptance limits for emissions in restricted frequency bands (<math>f &lt; 1000</math> MHz)</b> |                   |                         |
|-----------------------------------------------------------------------------------------------------|-------------------|-------------------------|
| Frequency range (MHz)                                                                               | Test distance (m) | Limits [dB( $\mu$ V/m)] |
| 0,009 to 0,490                                                                                      | 300               | 48,5 to 13,8            |
| 0,490 to 1,705                                                                                      | 30                | 33,8 to 22,9            |
| 1,705 to 30                                                                                         | 30                | 29,5                    |
| 30 to 88                                                                                            | 3                 | 40                      |
| 88 to 216                                                                                           | 3                 | 43,5                    |
| 216 to 960                                                                                          | 3                 | 46,0                    |
| 960 to 1000                                                                                         | 3                 | 54                      |

**Remarks:** The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz and 110–490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector. The results have been extrapolated to the specified distance using an extrapolation factor

| <b>Acceptance limits for emissions in restricted frequency bands (<math>f \geq 1000</math> MHz)</b> |                   |                            |                              |
|-----------------------------------------------------------------------------------------------------|-------------------|----------------------------|------------------------------|
| Frequency (MHz)                                                                                     | Test distance (m) | AV limits [dB( $\mu$ V/m)] | Peak limits [dB( $\mu$ V/m)] |
| > 1000                                                                                              | 3                 | 54                         | 74                           |

The restricted frequency bands are listed in the following table

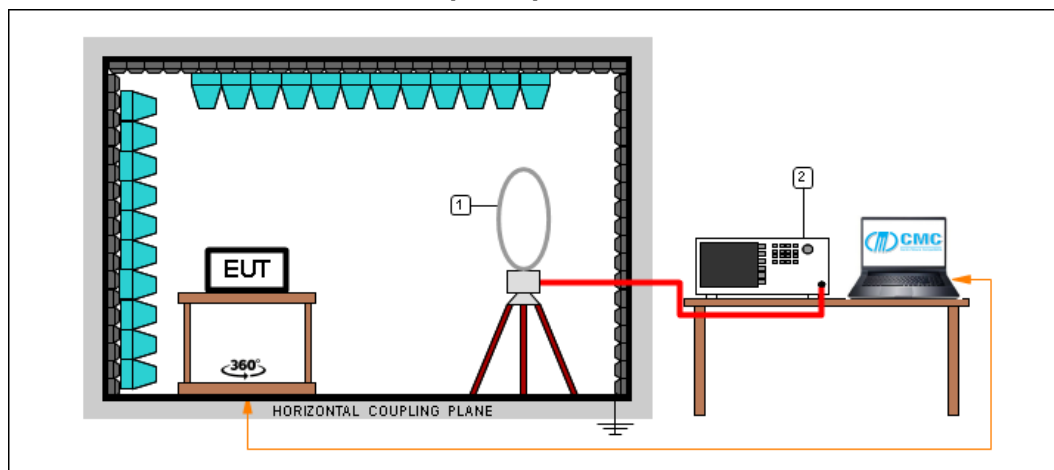
| MHz                 | MHz                   | MHz             | GHz           |
|---------------------|-----------------------|-----------------|---------------|
| 0,090 – 0,110       | 16,42 – 16,423        | 399,9 – 410     | 4,5 – 5,15    |
| 0,495 – 0,505       | 16,69475 – 16,69525   | 608 – 614       | 5,35 – 5,46   |
| 2,1735 – 2,1905     | 16,80425 – 16,80475   | 960 – 1240      | 7,25 – 7,75   |
| 4,125 – 4,128       | 25,5 – 25,67          | 1300 – 1427     | 8,025 – 8,5   |
| 4,17725 – 4,17775   | 37,5 – 38,25          | 1435 – 1626,5   | 9,0 – 9,2     |
| 4,20725 – 4,20775   | 73 – 74,6             | 1645,5 – 1646,5 | 9,3 – 9,5     |
| 6,215 – 6,218       | 74,8 – 75,2           | 1660 – 1710     | 10,6 – 12,7   |
| 6,26775 – 6,26825   | 108 – 121,94          | 1718,8 – 1722,2 | 13,25 – 13,4  |
| 6,31175 – 6,31225   | 123 – 138             | 2200 – 2300     | 14,47 – 14,5  |
| 8,291 – 8,294       | 149,9 – 150,05        | 2310 – 2390     | 15,35 – 16,2  |
| 8,362 – 8,366       | 156,52475 – 156,52525 | 2483,5 – 2500   | 17,7 – 21,4   |
| 8,37625 – 8,38675   | 156,7 – 156,9         | 2690 – 2900     | 22,01 – 23,12 |
| 8,41425 – 8,41475   | 162,0125 – 167,17     | 3260 – 3267     | 23,6 – 24,0   |
| 12,29 – 12,293      | 167,72 – 173,2        | 3332 – 3339     | 31,2 – 31,8   |
| 12,51975 – 12,52025 | 240 – 285             | 3345,8 – 3358   | 36,43 – 36,5  |
| 12,57675 – 12,57725 | 322 – 335,4           | 3600 – 4400     | Above 38,6    |
| 13,36 – 13,41       |                       |                 |               |

#### **Acceptance limits for emissions in non-restricted frequency bands**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

## Test setup

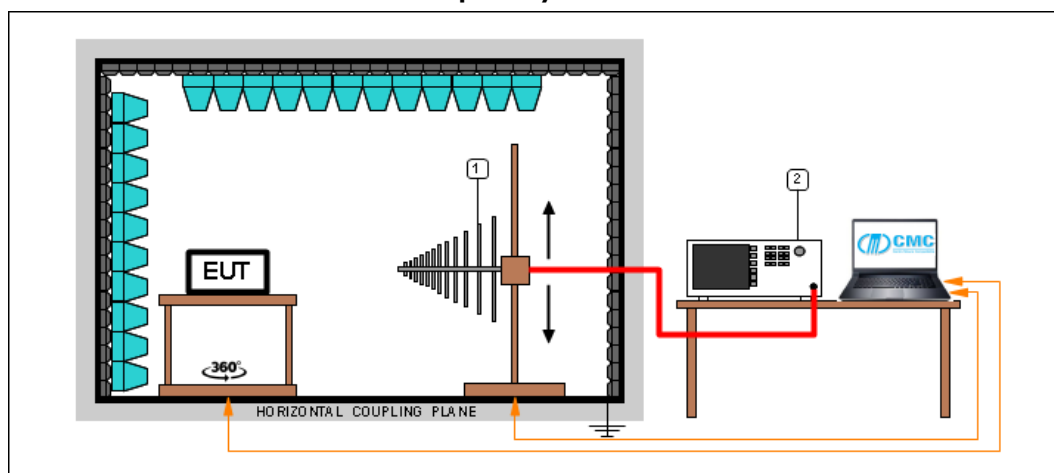
### Frequency $\leq 30$ MHz



Test setup PE004\_01

| Nr. | Id. Number | Manufacturer    | Model   | Description                       |
|-----|------------|-----------------|---------|-----------------------------------|
| 2   | CMC S353   | Rohde & Schwarz | ESW26   | EMI Test Receiver 1 Hz - 26.5 GHz |
| 1   | CMC S127   | Schaffner       | HLA6120 | Loop Antenna 9kHz - 30MHz         |

### Frequency $\leq 1$ GHz



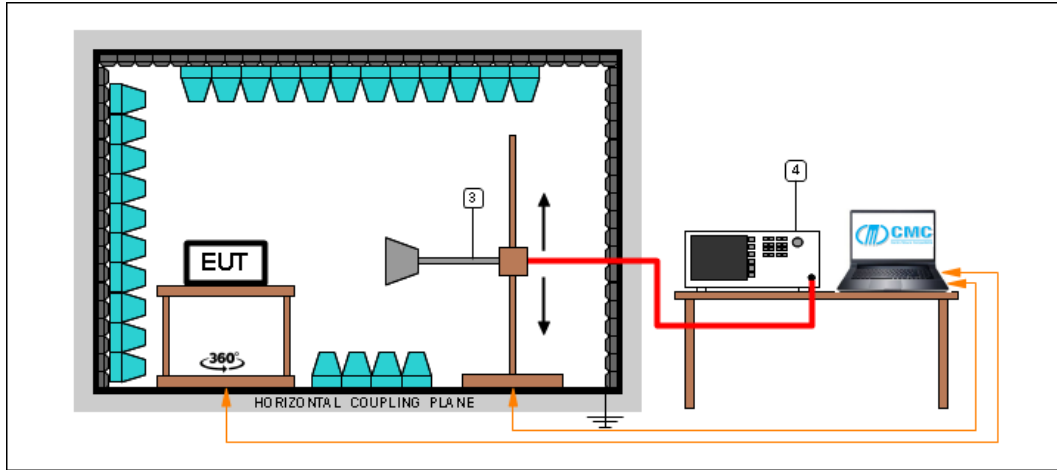
Test setup PE004\_02

| Nr. | Id. Number | Manufacturer    | Model                | Description                       |
|-----|------------|-----------------|----------------------|-----------------------------------|
| 2   | CMC S353   | Rohde & Schwarz | ESW26                | EMI Test Receiver 1 Hz - 26.5 GHz |
| 1   | CMC S271   | Schwarzbeck     | BBA 9106 + VHBB 9124 | Broadband Antenna                 |

Test setup PE004\_03

| Nr. | Id. Number | Manufacturer    | Model       | Description                       |
|-----|------------|-----------------|-------------|-----------------------------------|
| 2   | CMC S353   | Rohde & Schwarz | ESW26       | EMI Test Receiver 1 Hz - 26.5 GHz |
| 1   | CMC S287   | Schwarzbeck     | VUSLP 9111B | Broadband Antenna                 |

### Frequency > 1 GHz



#### Test setup PE004\_04

| Nr. | Id. Number | Manufacturer    | Model | Description                       |
|-----|------------|-----------------|-------|-----------------------------------|
| 4   | CMC S353   | Rohde & Schwarz | ESW26 | EMI Test Receiver 1 Hz - 26.5 GHz |
| 3   | CMC S108   | Emco            | 3115  | Waveguide antenna                 |

#### Test setup PE004\_05

| Nr. | Id. Number | Manufacturer    | Model     | Description                       |
|-----|------------|-----------------|-----------|-----------------------------------|
| 4   | CMC S353   | Rohde & Schwarz | ESW26     | EMI Test Receiver 1 Hz - 26.5 GHz |
| 3   | CMC S290   | Schwarzbeck     | BBHA 9170 | Horn Antenna (15-40 GHz)          |

## Result

| Channel (MHz) | Polarization | Frequency Range (MHz) | Graphs    | Result |
|---------------|--------------|-----------------------|-----------|--------|
| 902,75        | H            | 300 – 1000            | G21247020 | P      |
| 902,75        | V            | 300 – 1000            | G21247021 | P      |
| 914,75        | V            | 300 – 1000            | G21247022 | P      |
| 914,75        | H            | 300 – 1000            | G21247023 | P      |
| 927,25        | H            | 300 – 1000            | G21247024 | P      |
| 927,25        | V            | 300 – 1000            | G21247025 | P      |
| Worst case    | V            | 30 – 300              | G21247026 | P      |
| Worst case    | H            | 30 – 300              | G21247027 | P      |
| Worst case    | Loop         | 0,009 – 30            | G21247028 | P      |
| 902,75        | V            | 1000 – 10000          | G21247029 | P      |
| 902,75        | H            | 1000 – 10000          | G21247030 | P      |
| 914,75        | H            | 1000 – 10000          | G21247031 | P      |
| 914,75        | V            | 1000 – 10000          | G21247032 | P      |
| 927,25        | V            | 1000 – 10000          | G21247033 | P      |
| 927,25        | H            | 1000 – 10000          | G21247034 | P      |

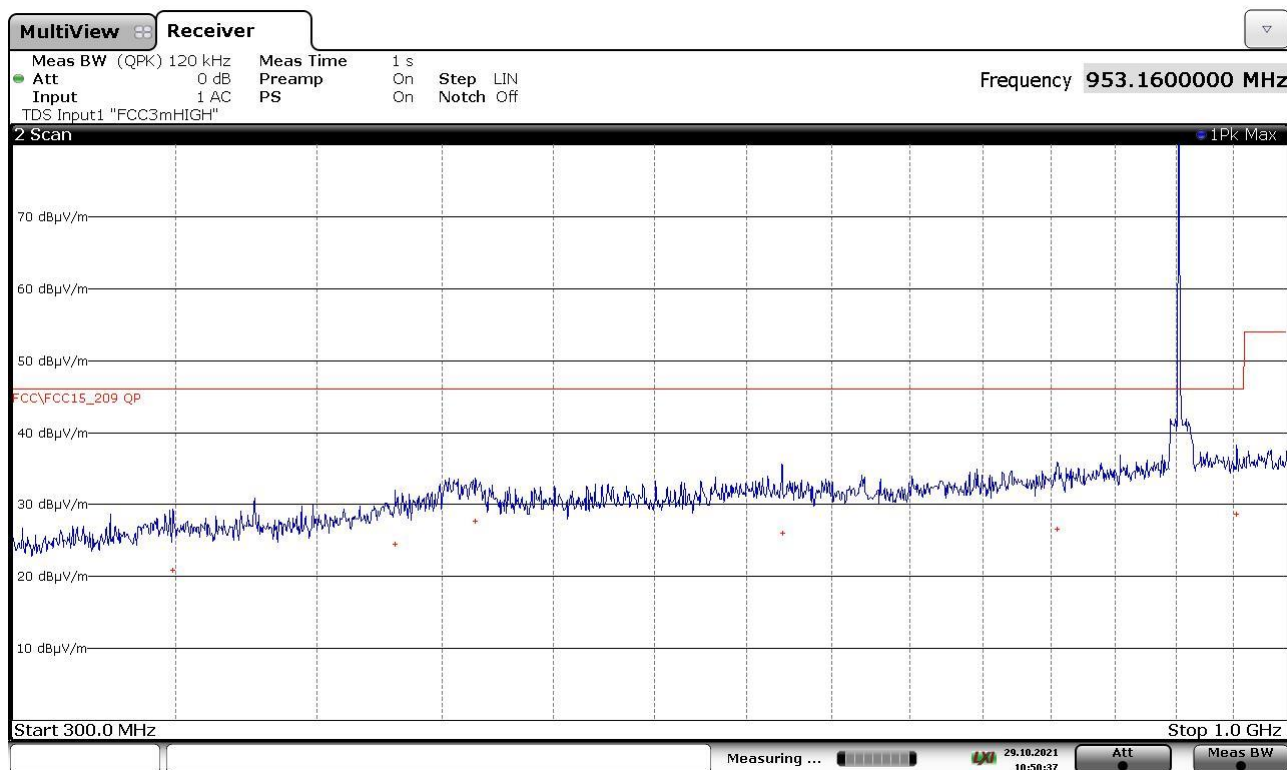
**Remarks:** EUT was tested in 3 orthogonal planes, graphs are related to the highest detected levels. Measurements at frequencies lower than 30 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor  $40\log(\text{test distance}/10)$  based on the measuring distance provided by the standard. Measurements at frequencies higher than 30 MHz and lower than 1000 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor  $20\log(\text{test distance}/10)$  based on the measuring distance provided by the standard. Peaks above the limits are caused by the nominal transmitting frequencies

### Graphs Legend

PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +  
 AV: Average; AV [1s] (average at 1 second) values are marked with a X

## Graphs

Segalla 21247020



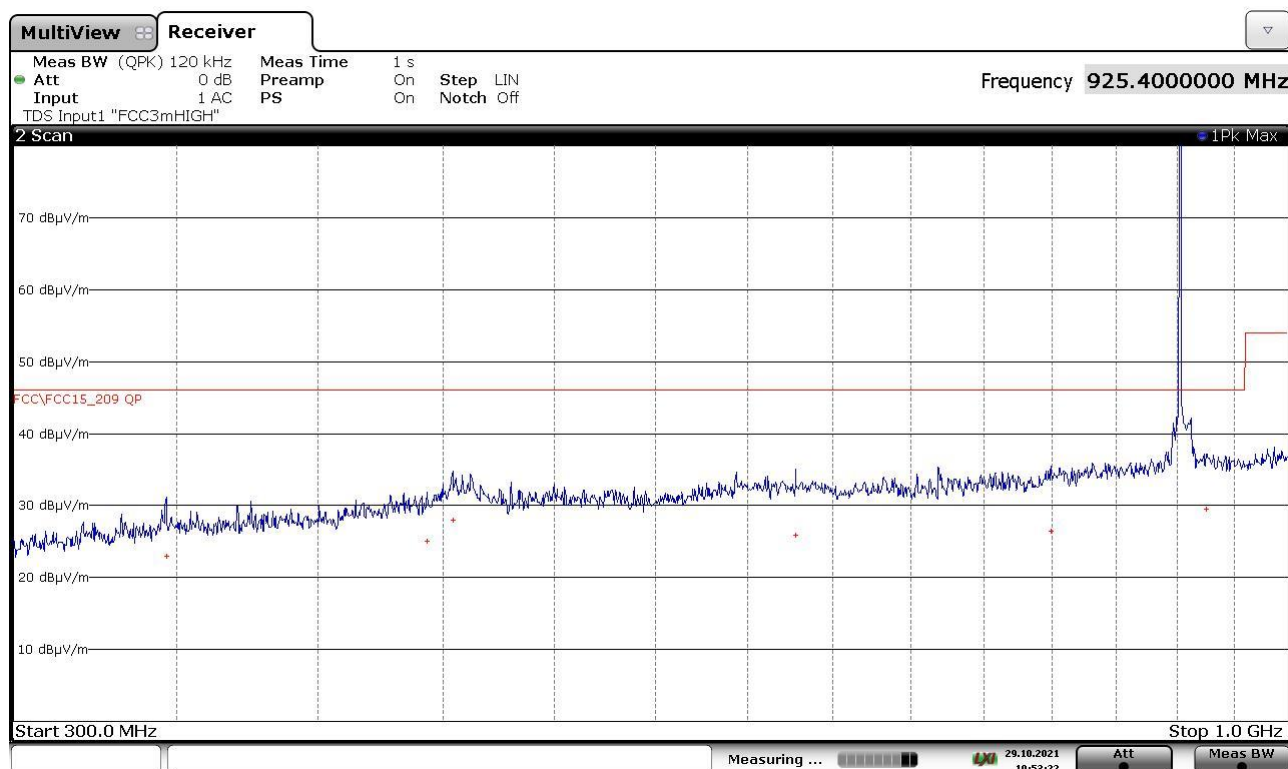
### FINAL RESULT TABLE

#### QUASI PEAK

| Freq Hz   | Lev dBuV/m | Margin dB |
|-----------|------------|-----------|
| 349160000 | +20,92     | -25,10    |
| 430440000 | +24,51     | -21,51    |
| 464520000 | +27,63     | -18,39    |
| 620560000 | +26,06     | -19,96    |
| 804720000 | +26,63     | -19,39    |
| 953160000 | +28,70     | -17,32    |

21247020\_2

Segalla 21247021



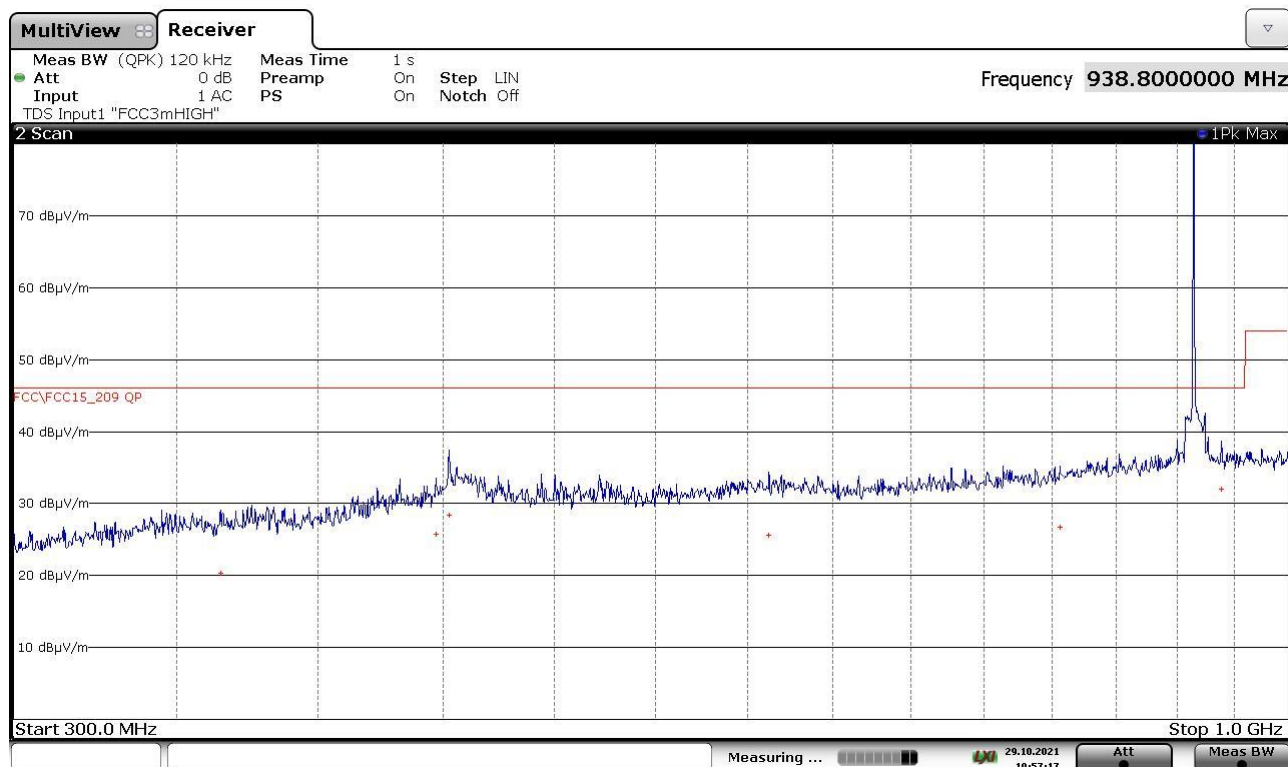
### FINAL RESULT TABLE

#### QUASI PEAK

| Freq Hz   | Lev dBuV/m | Margin dB |
|-----------|------------|-----------|
| 346600000 | +22,93     | -23,09    |
| 443280000 | +25,05     | -20,97    |
| 454240000 | +28,03     | -17,99    |
| 628040000 | +25,88     | -20,14    |
| 798960000 | +26,50     | -19,52    |
| 925400000 | +29,43     | -16,59    |

21247021\_2

Segalla 21247022



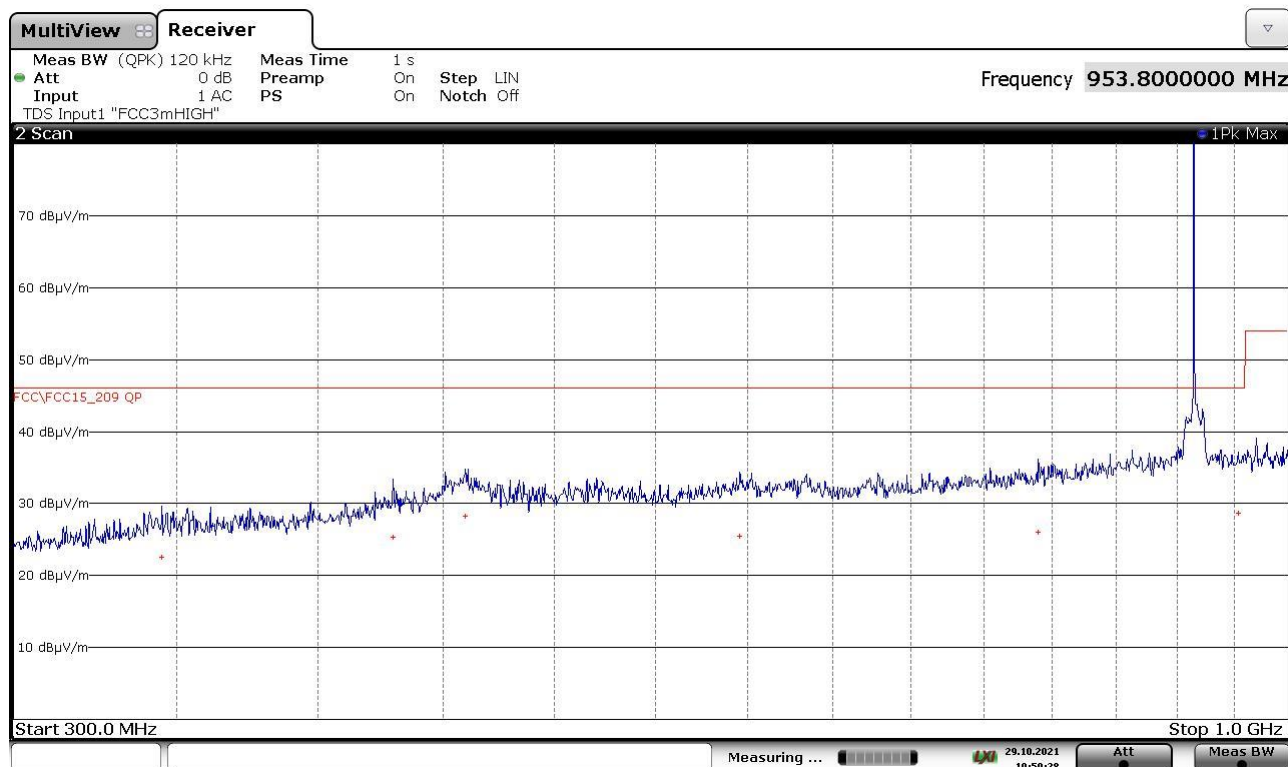
### FINAL RESULT TABLE

#### QUASI PEAK

| Freq Hz   | Lev dBuV/m | Margin dB |
|-----------|------------|-----------|
| 364720000 | +20,25     | -25,77    |
| 447080000 | +25,69     | -20,33    |
| 452600000 | +28,32     | -17,70    |
| 612320000 | +25,64     | -20,38    |
| 806080000 | +26,72     | -19,30    |
| 938800000 | +32,02     | -14,00    |

21247022\_2

Segalla 21247023



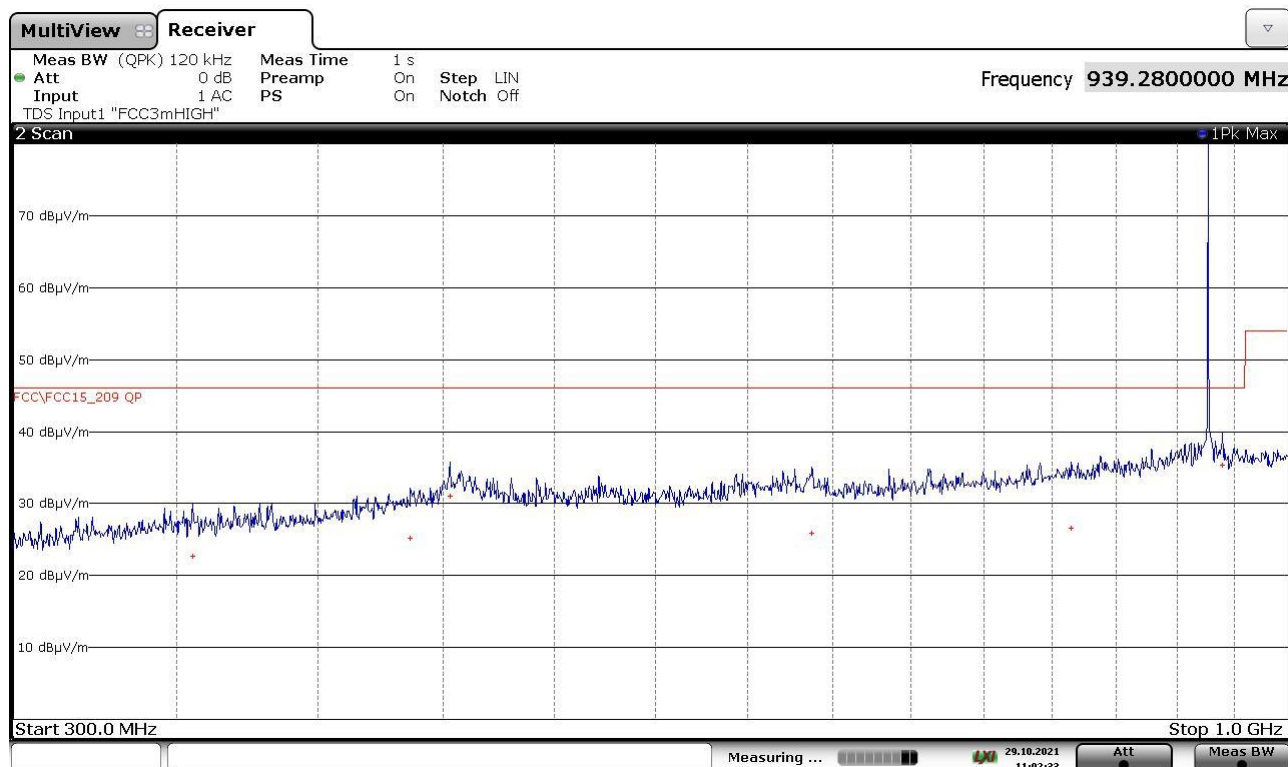
### FINAL RESULT TABLE

#### QUASI PEAK

| Freq Hz   | Lev dBuV/m | Margin dB |
|-----------|------------|-----------|
| 345160000 | +22,49     | -23,53    |
| 429320000 | +25,32     | -20,70    |
| 459680000 | +28,25     | -17,77    |
| 595680000 | +25,49     | -20,53    |
| 789600000 | +25,98     | -20,04    |
| 953800000 | +28,64     | -17,38    |

21247023\_2

Segalla 21247024



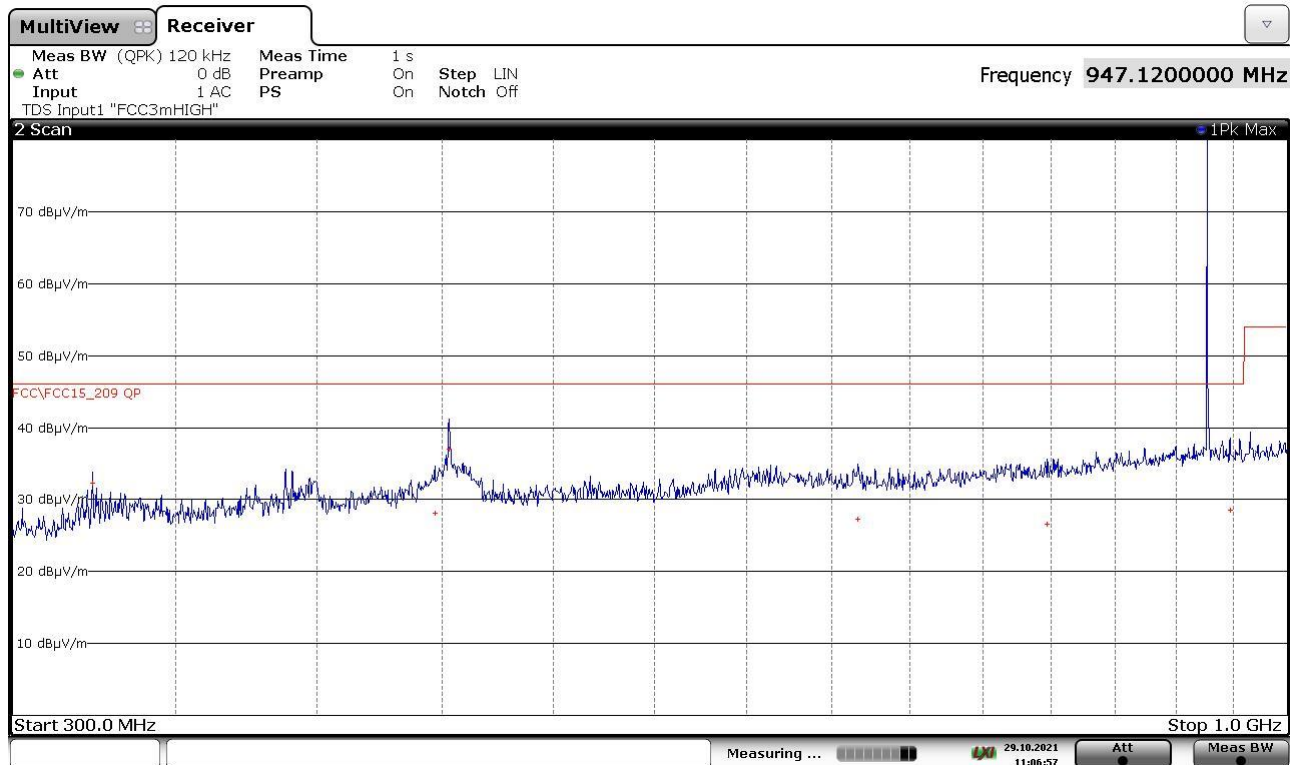
### FINAL RESULT TABLE

#### QUASI PEAK

| Freq Hz   | Lev dBuV/m | Margin dB |
|-----------|------------|-----------|
| 355280000 | +22,68     | -23,34    |
| 436400000 | +25,25     | -20,77    |
| 453000000 | +30,99     | -15,03    |
| 637680000 | +25,81     | -20,21    |
| 814600000 | +26,62     | -19,40    |
| 939280000 | +35,32     | -10,70    |

21247024\_2

Segalla 21247025



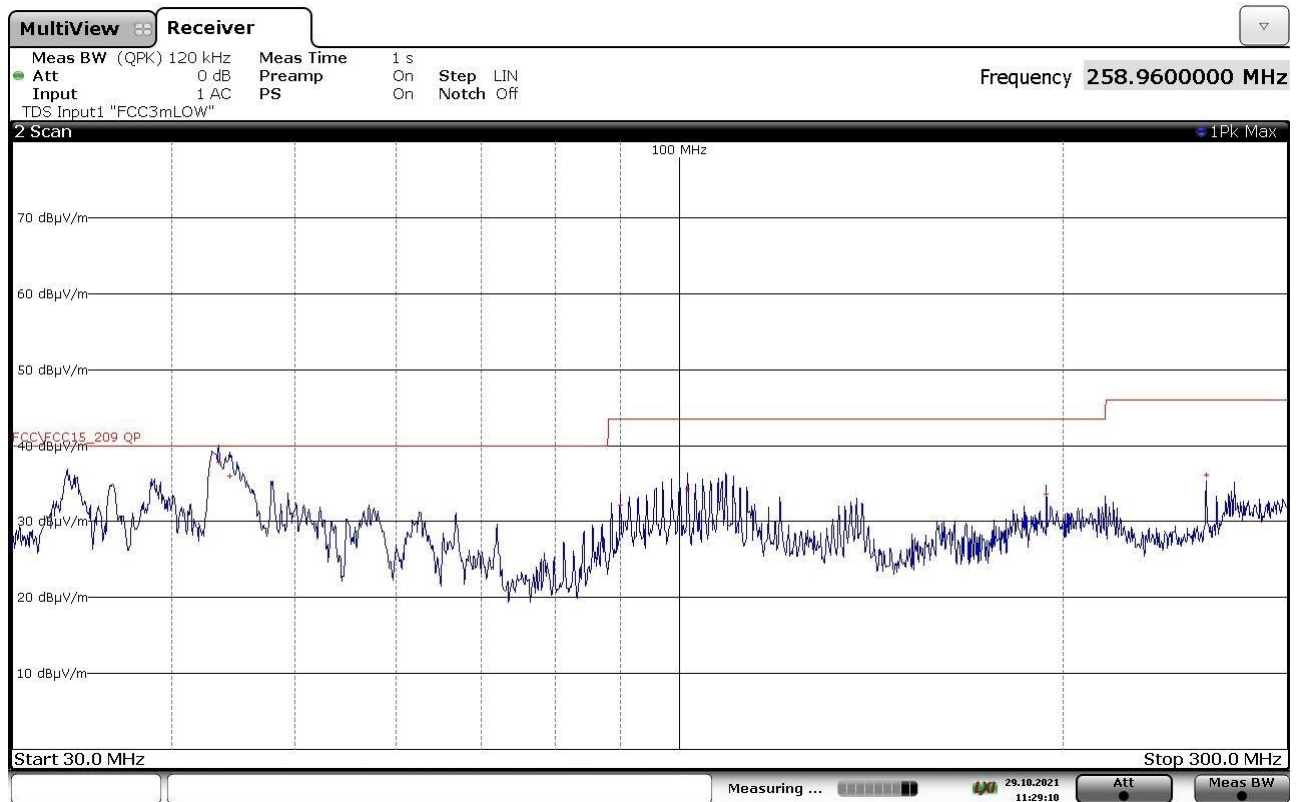
### FINAL RESULT TABLE

#### QUASI PEAK

| Freq Hz   | Lev dBuV/m | Margin dB |
|-----------|------------|-----------|
| 323560000 | +32,22     | -13,80    |
| 447080000 | +28,06     | -17,96    |
| 452920000 | +37,05     | -8,97     |
| 666600000 | +27,29     | -18,73    |
| 797080000 | +26,59     | -19,43    |
| 947120000 | +28,51     | -17,51    |

21247025\_2

Segalla 21247026



### FINAL RESULT TABLE

#### QUASI PEAK

| Freq Hz   | Lev dBuV/m | Margin dB |
|-----------|------------|-----------|
| 43520000  | +37,78     | -2,22     |
| 44400000  | +35,94     | -4,06     |
| 89920000  | +32,15     | -11,37    |
| 101560000 | +34,28     | -9,24     |
| 194080000 | +33,63     | -9,89     |
| 258960000 | +36,16     | -9,86     |

21247026\_2