

# Test Report

## 1-2154-25-01-15\_TR1-R03

Number of pages: 22 Date of Report: 2026-Sep-28

Testing company: cetecom advanced GmbH  
Untertuerkheimer Str. 6-10  
66117 Saarbruecken  
GERMANY

Applicant: Metrohm AG

Product: IONIC Titrator  
Model: IONIC Titrator

FCC ID: 2ACG6-CCIMX8

IC: 12034A-CCIMX8  
HVIN: CC8X  
PMN: CC8X  
HMN: IONIC Titrator

Testing has been carried out in accordance with:

**FCC Regulations**  
**Title 47 CFR, Chapter I, Subchapter A**  
Part 15, Subpart C Intentional Radiators; § 15.209 Radiated emission limits; general requirements  
**Title 47 CFR, Chapter I, Subchapter B**  
Part 27, Subpart C Miscellaneous Wireless Communications Services  
**Title 47 CFR, Chapter I, Subchapter A, Part 15**  
**Subpart C Intentional Radiators**  
§ 15.247 Operation within the bands 2400-2483.5 MHz  
**Subpart E Unlicensed National Information Infrastructure Devices**  
§ 15.407 General technical requirements

**ISED-Regulations, Radio Standards Specification**  
**RSS-Gen, Issue 5**  
General Requirements for Compliance of Radio Apparatus  
**RSS-130, Issue 2**  
Equipment Operating in the Frequency Bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz  
**RSS-199, Issue 4**  
Broadband Radio Service (BRS) Equipment Operating in the Band 2500–2690 MHz  
**RSS-247, Issue 4**  
Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Device

Tested Technology: LTE, BLE, WLAN 2G4, WLAN 5G

Test Results: ☒ The EUT complies with the requirements in respect of selected parameters subject to the test.

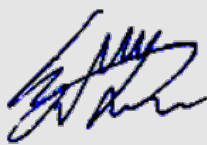
The test results relate only to devices specified in this document

The current version of Test Report 1-2154-25-01-15\_TR1-R03 replaces the test report 1-2154-25-01-15\_TR1-R02 dated 2026-Sep-15. The replaced test report is herewith invalid.

Signatures:



CN = Martin Nunier email =  
Martin.  
Nunier@cetekomadvanced.  
com C = DE O = cetecom  
advanced GmbH OU =  
Radio Labs  
2026.09.28 17:18:31 +02'00'



Martin Nunier  
Coordinator Area  
Authorization of test report

Paul Shin  
Testing Manager  
Responsible of test report

## Table of Contents

|                                                                           |    |
|---------------------------------------------------------------------------|----|
| Table of Annex .....                                                      | 3  |
| 1 General information .....                                               | 4  |
| 1.1 Disclaimer and Notes.....                                             | 4  |
| 1.2 Attestation.....                                                      | 4  |
| 1.3 Summary of Test Results .....                                         | 5  |
| 1.4 Summary of Test Methods .....                                         | 6  |
| 2 Administrative Data .....                                               | 7  |
| 2.1 Identification of the Testing Laboratory .....                        | 7  |
| 2.2 General limits for environmental conditions.....                      | 7  |
| 2.3 Test Laboratories sub-contracted.....                                 | 7  |
| 2.4 Organizational Items .....                                            | 7  |
| 2.5 Applicant's details .....                                             | 7  |
| 2.6 Manufacturer's details .....                                          | 7  |
| 2.7 Equipment under Test (EUT) .....                                      | 8  |
| 2.8 Untested Variant (VAR) .....                                          | 8  |
| 2.9 Auxiliary Equipment (AE).....                                         | 8  |
| 2.10 Connected cables (CAB).....                                          | 8  |
| 2.11 Software (SW).....                                                   | 8  |
| 2.12 EUT set-ups.....                                                     | 8  |
| 2.13 EUT operation modes .....                                            | 9  |
| 3 Equipment under test (EUT) .....                                        | 10 |
| 3.1 General Data of Main EUT as Declared by Applicant.....                | 10 |
| 3.2 Worst case identification.....                                        | 10 |
| 3.3 Modifications on Test sample .....                                    | 10 |
| 4 Measurements.....                                                       | 11 |
| 4.1 Radiated field strength emissions below 30 MHz .....                  | 11 |
| 4.2 Radiated spurious emissions .....                                     | 15 |
| 4.3 Equipment lists.....                                                  | 18 |
| 5 Results from external laboratory.....                                   | 21 |
| 6 Opinions and interpretations .....                                      | 21 |
| 7 List of abbreviations .....                                             | 21 |
| 8 Measurement Uncertainty valid for conducted/radiated measurements ..... | 22 |
| 9 Versions of test reports (change history) .....                         | 22 |

| Table of Annex                                 |                                               |                                     |             |
|------------------------------------------------|-----------------------------------------------|-------------------------------------|-------------|
| Annex No.                                      | Contents                                      | Reference Description               | Total Pages |
| <b>Annex 1</b>                                 | Test result diagrams                          | <b>1-2154-25-01-15_TR1-A201-R03</b> | 13          |
| <b>Annex 2</b>                                 | Internal photographs of EUT                   | <b>1-2154-25-01-15_TR1-A102-R03</b> | 3           |
| <b>Annex 3</b>                                 | External photographs of EUT                   | <b>1-2154-25-01-15_TR1-A101-R03</b> | 4           |
| <b>Annex 4</b>                                 | Test set-up photographs                       | <b>1-2154-25-01-15_TR1-A103-R03</b> | 3           |
| <b>Annex 5</b>                                 | Declaration of applicant of model differences | <b>1-2154-25-01-15_TR1-A301-R03</b> | 2           |
| The listed attachments are separate documents. |                                               |                                     |             |

# 1 General information

## 1.1 Disclaimer and Notes

The test results of this test report relate exclusively to the test item specified in this test report as specified in chapter 2.7. cetecom advanced does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of cetecom advanced.

The testing service provided by cetecom advanced has been rendered under the current "General Terms and Conditions for cetecom advanced".

cetecom advanced will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the customer.

Under no circumstances does the cetecom advanced test report include any endorsement or warranty regarding the functionality, quality or performance of any other product or service provided.

Under no circumstances does the cetecom advanced test report include or imply any product or service warranties from cetecom advanced, including, without limitation, any implied warranties of merchantability, fitness for purpose, or non-infringement, all of which are expressly disclaimed by cetecom advanced.

All rights and remedies regarding vendor's products and services for which cetecom advanced has prepared this test report shall be provided by the party offering such products or services and not by cetecom advanced.

In no case this test report can be considered as a Letter of Approval.

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at cetecom advanced.

Also we refer on special conditions which the applicant should fulfill according §2.927 to §2.948, special focus regarding modification of the equipment and availability of sample equipment for market surveillance tests.

## 1.2 Attestation

I declare that all measurements were performed by me or under my supervision and that all measurements have been performed and are correct to my best knowledge and belief to Industry Canada standards. All of the above requirements are met in accordance with enumerated standards.

### 1.3 Summary of Test Results

#### LTE FDD7/ BLE / WLAN 2G4

| Test case                                                      | Reference<br>Clause FCC ☒                    | Reference<br>Clause ISSED ☒                                                               | Page | Remark | Result |
|----------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------|------|--------|--------|
| <a href="#">Radiated field strength emissions below 30 MHz</a> | §15.205, §15.209, §15.247(d)                 | RSS-Gen: Issue 5: §8.9 Table 6                                                            | 14   | --     | PASSED |
| <a href="#">Radiated spurious emissions</a>                    | §27.53(m)(4), §2.1053, §2.1057(a) §15.247(d) | RSS-Gen, Issue 5: §6.1 §8.9 Table 5+7<br>RSS-199, Issue 4: §4.5, RSS-247, Issue 4, § 5.53 | 17   | --     | PASSED |

#### LTE FDD13 / BLE / WLAN 5G

| Test case                                                      | Reference<br>Clause FCC ☒                                                                           | Reference<br>Clause ISSED ☒                                                                                  | Page | Remark | Result |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------|--------|--------|
| <a href="#">Radiated field strength emissions below 30 MHz</a> | §15.205, §15.209                                                                                    | RSS-Gen: Issue 5: §8.9 Table 6                                                                               | 14   | --     | PASSED |
| <a href="#">Radiated spurious emissions</a>                    | §27.53(c)(2)(3)(4) §27.53(f) §27.1053(a)(b) §2.1053, §2.1057(a) §15.247(d) §15.407(6)(7) §15.407(b) | RSS-Gen, Issue 5: §6.13 §8.9 Table 5+7<br>RSS-130, Issue 2: §4.7.1, §4.7.2(a)(b),<br>RSS-247, Issue 4, § 5.5 | 17   | --     | PASSED |

PASSED

The EUT complies with the essential requirements in the standard.

FAILED

The EUT does not comply with the essential requirements in the standard.

N/A

Test case does not apply to the test object.

NP

The test was not performed by the cetecom advanced Laboratory.

Decision Rule: cetecom advanced GmbH follows [ILAC G8:2019 chapter 4.2.1 \(Simple Acceptance Rule\)](#).

## 1.4 Summary of Test Methods

| Test case                                      | Test method                                                       |
|------------------------------------------------|-------------------------------------------------------------------|
| AC-Power Lines Conducted Emissions             | ANSI C63.4-2014, §7, ANSI C63.10-2013 §6.2                        |
| Conducted RF output power                      | ANSI C63.26:2015, §5.2, KDB 971168 D01 v03r01                     |
| Radiated RF output power                       | ANSI C63.26:2015, §5.2.7, KDB 971168 D01 v03r01                   |
| Occupied Channel Bandwidth 99%                 | ANSI C63.26:2015, §5.4.4, KDB 971168 D01 v03r01                   |
| 26dB Emission bandwidth                        | ANSI C63.26:2015, §5.4.3, KDB 971168 D01 v03r01                   |
| Modulation characteristics                     | ANSI C63.26:2015, §5.3                                            |
| Radiated Band Edge                             | ANSI C63.26:2015, §5.5, KDB 971168 D01 v03r01                     |
| Conducted RF Band Edge                         | ANSI C63.26:2015, §5.7, KDB 971168 D01 v03r01                     |
| Peak to Average ratio (PAPR)                   | ANSI C63.26:2015, §5.2.6                                          |
| Radiated field strength emissions below 30 MHz | ANSI C63.4-2014 §5.3, §8.2.1, §8.3.1.1+§8.3.2.1                   |
| Spurious emissions at antenna terminals        | ANSI C63.26:2015, §5.7, KDB 971168 D01 v03r01                     |
| Radiated spurious emissions                    | ANSI C63.26:2015, §5.5, KDB 971168 D01 v03r01, ANSI C63.26.1:2018 |

## 2 Administrative Data

### 2.1 Identification of the Testing Laboratory

|                              |                                                             |
|------------------------------|-------------------------------------------------------------|
| Company name:                | cetecom advanced GmbH                                       |
| Address:                     | Untertuerkheimer Str. 6-10<br>66117 Saarbruecken<br>Germany |
| Accreditation scope:         | <b>DAkkS Webpage:</b> <a href="#">FCC ISED</a>              |
| IC Lab company No. / CAB ID: | 3462D / DE0001                                              |
| Test location 1:             | Im Teelbruch 116; 45219 Essen                               |
| Test location 2:             | --                                                          |

### 2.2 General limits for environmental conditions

|                     |           |
|---------------------|-----------|
| Temperature:        | 22±2 °C   |
| Relative. humidity: | 45±15% rH |

### 2.3 Test Laboratories sub-contracted

|               |    |
|---------------|----|
| Company name: | -- |
|---------------|----|

### 2.4 Organizational Items

|                              |                            |
|------------------------------|----------------------------|
| Responsible testing manager: | Paul Shin                  |
| Receipt of EUT:              | 2026-Jun-18                |
| Date(s) of test:             | 2026-Jul-03 to 2026-Jul-09 |
| Version of template:         | 24.0301                    |

### 2.5 Applicant's details

|                         |                                               |
|-------------------------|-----------------------------------------------|
| Applicant's name:       | Metrohm AG                                    |
| Address:                | Ionenstrasse 6<br>9100 Herisau<br>SWITZERLAND |
| Contact Person:         | Jürg Steiner                                  |
| Contact Person's Email: | juerg.steiner@metrohm.com                     |

### 2.6 Manufacturer's details

|                      |                                               |
|----------------------|-----------------------------------------------|
| Manufacturer's name: | Metrohm AG                                    |
| Address:             | Ionenstrasse 6<br>9100 Herisau<br>SWITZERLAND |

## 2.7 Equipment under Test (EUT)

| EUT No. *) | Sample No. | Product        | Model          | Type | SN                                                       | HW                                                                                | SW                                            |
|------------|------------|----------------|----------------|------|----------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------|
| EUT 1      | 72.293     | IONIC Titrator | IONIC Titrator | 1040 | (01)07613337793946<br>(21)001000939351<br>(240)110400220 | Metrohm:<br>3002000400 v05<br>Digi: CC8X, Var.<br>0x02,<br>SoM RevD, SoC<br>RevC0 | IONICTitrator<br>Image:<br>0.3.23-<br>Release |

\*) EUT short description is used to simplify the identification of the EUT in this test report.

## 2.8 Untested Variant (VAR)

| VAR No. *) | Sample No. | Product | Model | Type | SN | HW | SW |
|------------|------------|---------|-------|------|----|----|----|
|------------|------------|---------|-------|------|----|----|----|

\*) The listed additional untested model variant(s) (VAR) is/are not object of evaluation of compliance.

If the table above does not show any other line than the headline, no untested variants are available.

## 2.9 Auxiliary Equipment (AE)

| AE No. *) | Sample No. | Auxiliary Equipment          | Model              | SN  | HW  | SW  |
|-----------|------------|------------------------------|--------------------|-----|-----|-----|
| AE 1      | 57.843     | Power supply for measurement | 6A-601DB24         | N/A | N/A | N/A |
| AE 2      | N/A        | Power supply for production  | GTM961200P12024-T3 | N/A | N/A | N/A |

\*) AE short description is used to simplify the identification of the auxiliary equipment in this test report. If the table above does not show any other line than the headline, no AE was used during testing nor was taken into account for evaluation

\*) The power supply AE2 is the model intended for production, whereas the AE1 was used for radio measurement only. For further information, please refer to the declaration in Annex 5

## 2.10 Connected cables (CAB)

| CAB No. *) | Sample No. | Cable Type | Connectors / Details | Length |
|------------|------------|------------|----------------------|--------|
|------------|------------|------------|----------------------|--------|

\*) CAB short description is used to simplify the identification of the connected cables in this test report. If the table above does not show any other line than the headline, no cable was used during testing nor was taken into account for evaluation

## 2.11 Software (SW)

| SW No. *) | Sample No. | SW Name | Description | SW Status |
|-----------|------------|---------|-------------|-----------|
|-----------|------------|---------|-------------|-----------|

\*) SW short description is used to simplify the identification of the used software in this test report. If the table above does not show any other line than the headline, no SW was used during testing nor was taken into account for evaluation.

## 2.12 EUT set-ups

| set-up no. *) | Combination of EUT and AE | Description                    |
|---------------|---------------------------|--------------------------------|
| Set 1         | EUT 1 + AE 1              | Used for radiated measurements |

\*) EUT set-up no. is used to simplify the identification of the EUT set-up in this test report.

## 2.13 EUT operation modes

| EUT operating mode no. *) | Operating modes           | Additional information                                                                                            |
|---------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------|
| Op. 1                     | LTE FDD7 / BLE / WLAN 2G4 | LTE Cat.1 FDD 7<br>BLE Channel 19 1Mbps<br>WLAN 2G4 802.11b Ch.Low(2412MHz) 1Mbps<br>WLAN power setting 13.5dBm   |
| Op. 2                     | LTE FDD13 / BLE / WLAN 5G | LTE Cat.1 FDD 13<br>BLE Channel 19 1Mbps<br>WLAN 5G 802.11n HT20 Ch.116(5580MHz) MCS8<br>WLAN power setting 12dBm |

\*) EUT operating mode no. is used to simplify the test report.

### 3 Equipment under test (EUT)

#### 3.1 General Data of Main EUT as Declared by Applicant

|                                                                                          |                                                                                                                                    |                                                                        |                        |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------|
| Firmware                                                                                 | <input type="checkbox"/> for normal use                                                                                            | <input checked="" type="checkbox"/> Special version for test execution |                        |
| Power supply                                                                             | <input checked="" type="checkbox"/> AC Mains                                                                                       | 120 V AC                                                               |                        |
|                                                                                          | <input type="checkbox"/> DC Mains                                                                                                  | --                                                                     |                        |
|                                                                                          | <input type="checkbox"/> Battery                                                                                                   | --                                                                     |                        |
| Operational conditions                                                                   | T <sub>nom</sub> = 21 °C                                                                                                           | T <sub>min</sub> = N/A                                                 | T <sub>max</sub> = N/A |
| EUT sample type                                                                          | Pre-Production                                                                                                                     |                                                                        |                        |
| Weight                                                                                   | Approx. 4.6 kg                                                                                                                     |                                                                        |                        |
| Size [LxWxH]                                                                             | 26.5 cm x 32.2 cm x 14.2 cm                                                                                                        |                                                                        |                        |
| Interfaces/Ports                                                                         | ETH, USB                                                                                                                           |                                                                        |                        |
| Antenna Type                                                                             | Integrated antenna                                                                                                                 |                                                                        |                        |
| Antenna Gain                                                                             | Cellular: Peak 1.34 dBi @698-960MHz and 5.07 dBi @1710-2700MHz<br>BLE/WLAN: Peak 2.03 dBi @2400-2485MHz and 4.45 dBi @4900-5825MHz |                                                                        |                        |
| For further details refer Applicants Declaration & following technical documents         |                                                                                                                                    |                                                                        |                        |
| - IONIC_Titrator_Radio_Equipment_Approval_Tech_Spec_V1_2.pdf                             |                                                                                                                                    |                                                                        |                        |
| - ENG_DS_2367286-X_A.pdf                                                                 |                                                                                                                                    |                                                                        |                        |
| - AVX-E_1001932PT.pdf                                                                    |                                                                                                                                    |                                                                        |                        |
| - 810408101EN.pdf (Manual 8.1040.8101EN / v3 / 2026-08-05)                               |                                                                                                                                    |                                                                        |                        |
| For further details regarding radio parameters, please refer to document ETSI TS 136 508 |                                                                                                                                    |                                                                        |                        |

#### 3.2 Worst case identification

The worst case operation modes are defined based on analysis of the measurements and module test reports.  
For more details, Please refer to the section 2.13; EUT operation modes.

#### 3.3 Modifications on Test sample

|                                    |    |
|------------------------------------|----|
| Additions/deviations or exclusions | -- |
|------------------------------------|----|

## 4 Measurements

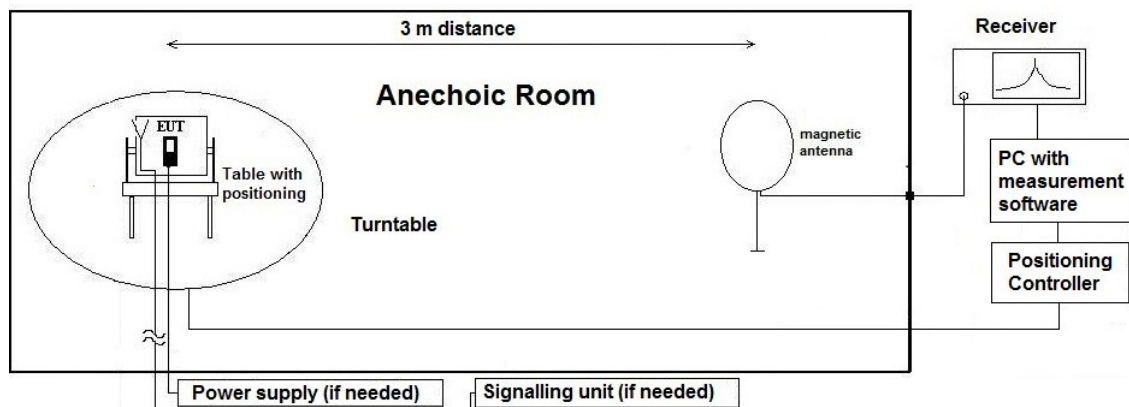
### 4.1 Radiated field strength emissions below 30 MHz

#### 4.1.1 Description of the general test setup and methodology, see below example:

Evaluating the radiated field emissions are done first by an exploratory emission measurement and a final measurement for most critical frequencies determined.

The loop antenna was placed at 1 m height above ground plane and 3 m measurement distance from set-up for investigations. Because of reduced measurement distance, correction data were applied, as stated in chapter "General Limit - Radiated field strength emissions below 30 MHz". The tests are performed in the semi anechoic room recognized by the regulatory commission.

#### Schematic:



#### Testing method:

The measurement is made according to relevant reference clauses:  
(See Tables *Summary of Test Results* and *Summary of Test Methods* on page 5)

#### Exploratory, preliminary measurements

The EUT and its associated accessories are placed on a non-conductive position manipulator (tipping device) of 0.8 m height which is placed on the turntable. By rotating the turntable (step 90°, range 0° to 360°) and the EUT itself either on 3-orthogonal axis (portable equipment) or 2-orthogonal axis (defined operational position of EUT), the emission spectrum was recorded.

The loop antenna was moved at least to 2-perpendicular axes (antenna vector in direction of EUT and parallel to EUT) in order to maximize the emissions. The results are documented in a diagram. Critical frequencies (low margin to limit) are saved within a data reduction table for further investigations. If various operating modes are supported, further investigations are made to find the worst-case. Also the interconnection cables and equipment position were varied in order to maximize the emissions.

#### Final measurement on critical frequencies

Based on the exploratory measurements, the most critical frequencies are re-measured by maintaining the EUT's worst-case operation mode, cable position, etc.

First a frequency zoom around the critical frequency is done to locate the frequency more precisely. After this step, for all identified critical frequencies, the maximum peak was determined.

Following parameters were varied: the turntable angle continuously in the range 0 to 360 degree, the EUT itself either over 3-orthogonal axis (not defined usage position) or 2-orthogonal axis (defined usage position).

On the determined worst-case position, a final measurement with necessary bandwidth and detector according standard has been carried out.

#### Formula:

$$E_C = E_R + AF + C_L + D_F - G_A$$

$$M = L_T - E_C$$

AF = Antenna factor

C<sub>L</sub> = Cable loss

D<sub>F</sub> = Distance correction factor (if used)

E<sub>C</sub> = Electrical field – corrected value

E<sub>R</sub> = Receiver reading

G<sub>A</sub> = Gain of pre-amplifier (if used)

L<sub>T</sub> = Limit

M = Margin

All units are dB-units, positive margin means value is below limit.

#### 4.1.2 Sample calculation

| Raw-Value<br>[dBuV/m] | Antenna<br>factor | Distance<br>Correction<br>[dB] | Cable<br>Loss | Preamplifier | Resulting<br>correction value<br>[dB] | Final result<br>[dBuV/m] | Remarks                                                       |
|-----------------------|-------------------|--------------------------------|---------------|--------------|---------------------------------------|--------------------------|---------------------------------------------------------------|
| 19.83                 | 18.9              | -70.75                         | 0.18          | --           | -51.67                                | -31.83                   | 30 to 3 m<br>correction used<br>according<br>ANSI C63.10-2013 |

Remark: This calculation is based on an example value at 458 kHz

#### 4.1.3 Correction factors due to reduced meas. distance ( $f < 30$ MHz):

The used correction factors when the measurement distance is reduced compared to regulatory measurement distance, are calculated according to Extrapolation formulas valid for EUT's with maximum dimension of  $0.625 \times \lambda$ . Formula 2+3+4 as presented in ANSI C63.10, Chapter 6.4.4 are used for the calculations of proper extrapolation factors

| Frequency Range | f [kHz/MHz] | Lambda [m] | Far-Field Point [m] | Distance Limit accord. 15.209 [m] | 1st Condition (dmeas < Dnear-field) | 2nd Condition (Limit distance bigger dnear-field) | Distance Correction accord. Formula |
|-----------------|-------------|------------|---------------------|-----------------------------------|-------------------------------------|---------------------------------------------------|-------------------------------------|
| kHz             | 9           | 33333.33   | 5305.17             | 300                               | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 10          | 30000.00   | 4774.65             |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 20          | 15000.00   | 2387.33             |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 30          | 10000.00   | 1591.55             |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 40          | 7500.00    | 1193.66             |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 50          | 6000.00    | 954.93              |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 60          | 5000.00    | 795.78              |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 70          | 4285.71    | 682.09              |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 80          | 3750.00    | 596.83              |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 90          | 3333.33    | 530.52              |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 100         | 3000.00    | 477.47              |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 125         | 2400.00    | 381.97              |                                   | fulfilled                           | not fulfilled                                     | -80.00                              |
|                 | 200         | 1500.00    | 238.73              |                                   | fulfilled                           | fulfilled                                         | -78.02                              |
|                 | 300         | 1000.00    | 159.16              |                                   | fulfilled                           | fulfilled                                         | -74.49                              |
|                 | 400         | 750.00     | 119.37              |                                   | fulfilled                           | fulfilled                                         | -72.00                              |
|                 | 490         | 612.24     | 97.44               |                                   | fulfilled                           | fulfilled                                         | -70.23                              |
|                 | 500         | 600.00     | 95.49               | 30                                | fulfilled                           | not fulfilled                                     | -40.00                              |
|                 | 600         | 500.00     | 79.58               |                                   | fulfilled                           | not fulfilled                                     | -40.00                              |
|                 | 700         | 428.57     | 68.21               |                                   | fulfilled                           | not fulfilled                                     | -40.00                              |
|                 | 800         | 375.00     | 59.68               |                                   | fulfilled                           | not fulfilled                                     | -40.00                              |
|                 | 900         | 333.33     | 53.05               |                                   | fulfilled                           | not fulfilled                                     | -40.00                              |
| MHz             | 1.00        | 300.00     | 47.75               |                                   | fulfilled                           | not fulfilled                                     | -40.00                              |
|                 | 1.59        | 188.50     | 30.00               |                                   | fulfilled                           | not fulfilled                                     | -40.00                              |
|                 | 2.00        | 150.00     | 23.87               |                                   | fulfilled                           | fulfilled                                         | -38.02                              |
|                 | 3.00        | 100.00     | 15.92               |                                   | fulfilled                           | fulfilled                                         | -34.49                              |
|                 | 4.00        | 75.00      | 11.94               |                                   | fulfilled                           | fulfilled                                         | -32.00                              |
|                 | 5.00        | 60.00      | 9.55                |                                   | fulfilled                           | fulfilled                                         | -30.06                              |
|                 | 6.00        | 50.00      | 7.96                |                                   | fulfilled                           | fulfilled                                         | -28.47                              |
|                 | 7.00        | 42.86      | 6.82                |                                   | fulfilled                           | fulfilled                                         | -27.13                              |
|                 | 8.00        | 37.50      | 5.97                |                                   | fulfilled                           | fulfilled                                         | -25.97                              |
|                 | 9.00        | 33.33      | 5.31                |                                   | fulfilled                           | fulfilled                                         | -24.95                              |
|                 | 10.00       | 30.00      | 4.77                |                                   | fulfilled                           | fulfilled                                         | -24.04                              |
|                 | 10.60       | 28.30      | 4.50                |                                   | fulfilled                           | fulfilled                                         | -23.53                              |
|                 | 11.00       | 27.27      | 4.34                |                                   | fulfilled                           | fulfilled                                         | -23.21                              |
|                 | 12.00       | 25.00      | 3.98                |                                   | fulfilled                           | fulfilled                                         | -22.45                              |
|                 | 13.56       | 22.12      | 3.52                |                                   | fulfilled                           | fulfilled                                         | -21.39                              |
|                 | 15.00       | 20.00      | 3.18                |                                   | fulfilled                           | fulfilled                                         | -20.51                              |
|                 | 15.92       | 18.85      | 3.00                |                                   | fulfilled                           | fulfilled                                         | -20.00                              |
|                 | 17.00       | 17.65      | 2.81                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |
|                 | 18.00       | 16.67      | 2.65                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |
|                 | 20.00       | 15.00      | 2.39                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |
|                 | 21.00       | 14.29      | 2.27                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |
|                 | 23.00       | 13.04      | 2.08                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |
|                 | 25.00       | 12.00      | 1.91                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |
|                 | 27.00       | 11.11      | 1.77                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |
|                 | 29.00       | 10.34      | 1.65                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |
|                 | 30.00       | 10.00      | 1.59                |                                   | not fulfilled                       | fulfilled                                         | -20.00                              |

#### 4.1.4 Measurement Location

|           |                                         |
|-----------|-----------------------------------------|
| Test site | 120901 - SAC3 - Radiated Emission <1GHz |
|-----------|-----------------------------------------|

#### 4.1.5 Limit

| Radiated emissions limits (3 meters) |                                  |                                           |              |            |           |
|--------------------------------------|----------------------------------|-------------------------------------------|--------------|------------|-----------|
| Frequency Range [MHz]                | Limit [ $\mu\text{V}/\text{m}$ ] | Limit [ $\text{dB}\mu\text{V}/\text{m}$ ] | Distance [m] | Detector   | RBW [kHz] |
| 0.009 – 0.09                         | 2400 / f [kHz]                   | 67.6 – 20Log(f) (kHz)                     | 300          | Pk & Avg   | 0.2       |
| 0.09 – 0.11                          | 2400 / f [kHz]                   | 67.6 – 20Log(f) (kHz)                     | 300          | Quasi peak | 0.2       |
| 0.11 – 0.15                          | 2400 / f [kHz]                   | 67.6 – 20Log(f) (kHz)                     | 300          | Pk & Avg   | 0.2       |
| 0.15 – 0.49                          | 2400 / f [kHz]                   | 67.6 – 20Log(f) (kHz)                     | 300          | Pk & Avg   | 9         |
| 0.49 – 1.705                         | 24000 / f [kHz]                  | 87.6 – 20Log(f) (kHz)                     | 30           | Quasi peak | 9         |
| 1.705 - 30                           | 30                               | 29.5                                      | 30           | Quasi peak | 9         |

\*Remark: In Canada same limits apply, just unit reference is different

#### 4.1.6 Result

| Diagram | Mode                           | Maximum Level [ $\text{dB}\mu\text{V}/\text{m}$ ]<br>Frequency Range 0.009 – 30 MHz | Result |
|---------|--------------------------------|-------------------------------------------------------------------------------------|--------|
| 2.11    | Op. 1(LTE B7 / BLE / WLAN 2G4) | No peaks < 6 dB margin found                                                        | Passed |
| 2.21    | Op. 2(LTEB13 / BLE / WLAN 5G)  | No peaks < 6 dB margin found                                                        | Passed |

Remark 1: for more information and graphical plot see annex 1 **1-2154-25-01-15\_TR1-A201-R03**

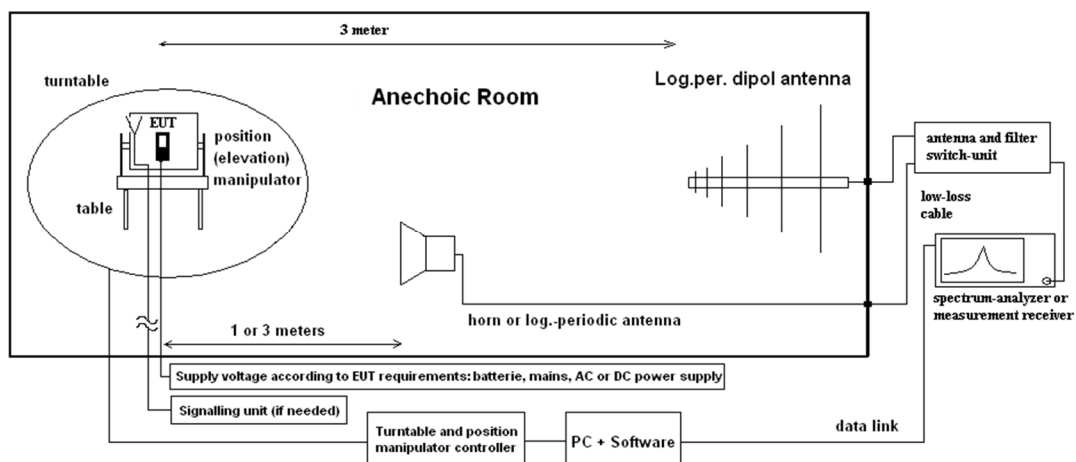
Remark 2: The EUT is intended to be used only in the lying position

## 4.2 Radiated spurious emissions

### 4.2.1 Description of the general test setup and methodology, see below example:

Evaluating the emissions have to be done first by an exploratory emissions measurement and a final measurement for most critical frequencies. The tests are performed in a CISPR 16-1-4:2010 compliant fully anechoic room (FAR) recognized by the regulatory commission. The measurement distance was set to 3 meter for frequencies up to 18 GHz and 2 meter above 18 GHz. A logarithmic periodic antenna is used for the frequency range 30 MHz to 1 GHz. Horn antennas are used for frequency range 1 GHz to 40 GHz. The EUT is aligned within 3 dB beam width of the measurement antenna with three orthogonal axis measurements on the EUT.

#### Schematic:



#### Testing method:

The measurement is made according to relevant reference clauses:

(See Tables *Summary of Test Results* and *Summary of Test Methods* on page 5)

#### Exploratory, preliminary measurements

The EUT and its associated accessories are placed on a non-conductive position manipulator (tipping device) of 1.50 m height which is placed on the turntable. By rotating the turntable (range 0° to 360°, step 45°) and the EUT itself on 3-orthogonal axis (the emission spectrum and it's characteristics was recorded with an EMI-receiver, broadband antenna and software.

The measurements are performed in horizontal and vertical polarization of the measurement antennas. The results are documented in a diagram. Critical frequencies (low margin to limit) are saved within a table for further investigations. If various operating modes are supported, further investigations are made to find the worst-case of them. Also the interconnection cables and equipment position were varied in order to maximize the emissions.

#### Final measurement on critical frequencies

Based on the exploratory measurements, the most critical frequencies are re-measured by main-taining the EUT's worst-case operation mode, cable position, etc.

First a frequency zoom around the critical frequency is done to locate the frequency more precisely. After this step, for all identified critical frequencies, the maximum peak was determined.

Following parameters were varied: the turntable angle continuously in the range 0 to 360 degree, the EUT itself over 3-orthogonal axis and the height for EUT with large dimensions.

On the determined worst-case position, a final measurement with necessary bandwidth and detector according standard has been carried out.

The readings on the spectrum analyzer are corrected with conversion value between field strength and E(I)RP, so the readings shown are equivalent to ERP/EIRP values. Critical measurements near the limit are re-measured with a substitution method accord. ANSI/TIA/EIA 603 C/D

### Formula:

$$P_{EIRP} = P_{MEAS} + C_L + FSL - G_{PreA} - G_{ANT} \quad (1)$$

$P_{MEAS}$  = measured power at instrument

$M$  = Margin

$L_T$  = Limit

$FSL$  = Free Space loss = Function(frequency, measurement distance)

$$M = L_T - P_{EIRP}$$

$C_L$  = cable loss

$G_{PreA}$  = Gain of pre-amplifier (if used)

$G_{ANT}$  = Gain of antenna in [dBi]

All units are dB-units, positive margin means value is below limit.

### 4.2.2 Measurement Location

|             |                                         |
|-------------|-----------------------------------------|
| Test site 1 | 120904 - FAC1 - Radiated Emissions      |
| Test site 2 | 120901 - SAC3 - Radiated Emission <1GHz |

### 4.2.3 Limit

| Operation band | Frequency Range [MHz] | Limit [dBm]               | Detector [MaxHold] | RBW / VBW [MHz] |
|----------------|-----------------------|---------------------------|--------------------|-----------------|
| LTE7           | 30 - 25700            | -13                       | Peak               | 3 / 3           |
| LTE13          | 30 - 8000             | -13                       | Peak               | 3 / 3           |
|                | 763-775 and 793-805   | -35 (RBW = 6.25 kHz, ERP) |                    |                 |
|                | 1559 – 1610           | -40 (RBW = 1 MHz)         |                    |                 |
|                | 1559 – 1610           | -50 (RBW = 700 Hz)        |                    |                 |

#### 4.2.4 Result

| Diagram | Mode                           | 30 MHz to 1000 MHz           | 1 GHz to 2.8 GHz             | 2.8 to 10 <sup>th</sup> Harmonics | Stop Freq [MHz] | Result |
|---------|--------------------------------|------------------------------|------------------------------|-----------------------------------|-----------------|--------|
| 3.11    | Op. 1(LTE B7 / BLE / WLAN 2G4) | 39.34 dBμV/m @133.330MHz     | --                           | --                                | 1000            | Passed |
| 4.11    | Op. 1(LTE B7 / BLE / WLAN 2G4) | --                           | -34.87 dBm @2473.292MHz      | --                                | 2800            | Passed |
| 4.12    | Op. 1(LTE B7 / BLE / WLAN 2G4) | --                           | --                           | No peaks < 6 dB margin found      | 6800            | Passed |
| 4.13    | Op. 1(LTE B7 / BLE / WLAN 2G4) | --                           | --                           | No peaks < 6 dB margin found      | 18000           | Passed |
| 4.14    | Op. 1(LTE B7 / BLE / WLAN 2G4) | --                           | --                           | No peaks < 6 dB margin found      | 26500           | Passed |
| 3.21    | Op. 2(LTEB13 / BLE / WLAN 5G)  | No peaks < 6 dB margin found | --                           | --                                | 1000            | Passed |
| 4.21    | Op. 2(LTEB13 / BLE / WLAN 5G)  | --                           | No peaks < 6 dB margin found | No peaks < 6 dB margin found      | 6800            | Passed |
| 4.22    | Op. 2(LTEB13 / BLE / WLAN 5G)  | --                           | --                           | No peaks < 6 dB margin found      | 18000           | Passed |
| 4.23    | Op. 2(LTEB13 / BLE / WLAN 5G)  | --                           | --                           | No peaks < 6 dB margin found      | 40000           | Passed |

Remark 1: for more information and graphical plot see annex A1 **1-2154-25-01-15\_TR1-A201-R03**

Remark 2: The EUT is intended to be used only in the lying position

### 4.3 Equipment lists

| ID    | Description                                           | Manufacturer                                      | SerNo             | CheckType | Last Check                           | Interval             | Next Check                           |
|-------|-------------------------------------------------------|---------------------------------------------------|-------------------|-----------|--------------------------------------|----------------------|--------------------------------------|
|       | 120901 - ESS SAC3 - Radiated Emission <1GHz           |                                                   |                   | chk       | chk: 2025-Mar-29                     | chk: 18M             | chk: 2026-Sep-29                     |
| 20442 | Semi Anechoic Chamber SAC3                            | ETS-Lindgren GmbH / Taufkirchen                   | without           | chk       | chk: 2025-Sep-05                     | chk: 12M             | chk: 2026-Sep-05                     |
| 20482 | Filter Matrix SAC3                                    | cetecom advanced GmbH / Essen                     | without           | cnn       | cal: -<br>chk: -                     | cal: -<br>chk: -     | cal: -<br>chk: -                     |
| 20574 | Biconilog Hybrid Antenna BTA-L                        | Frankonia GmbH / Heideck                          | 980026L           | cal       | cal: 2025-Jun-06                     | cal: 36M             | cal: 2028-Jun-06                     |
| 20620 | EMI Test Receiver ESU26                               | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 100362            | cal       | cal: 2026-May-06                     | cal: 12M             | cal: 2027-May-06                     |
| 20885 | Power Supply EA3632A                                  | Agilent Technologies Deutschland GmbH / Böblingen | 75305850          | cnn       | cal: -<br>chk: -                     | cal: -<br>chk: -     | cal: -<br>chk: -                     |
| 20979 | Loop Antenna HFH2-Z2                                  | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 872096/61         | cal       | cal: 2024-Sep-16                     | cal: 36M             | cal: 2027-Sep-16                     |
| 25549 | Cable Path SAC3 RE < 6 GHz                            | cetecom advanced GmbH / Essen                     | without           | cnn       | cal: -<br>chk: -                     | cal: -<br>chk: -     | cal: -<br>chk: -                     |
| 25555 | Measurement Software EMC32 (SAC3)                     | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | v.10.60.20        | cnn       | cal: -<br>chk: -                     | cal: -<br>chk: -     | cal: -<br>chk: -                     |
|       | 120904 - FAC1 - Radiated Emissions                    |                                                   |                   | chk       | chk: 2025-Mar-25                     | chk: 18M             | chk: 2026-Sep-25                     |
| 20020 | Double-Ridged Waveguide Horn Antenna 3115 (Subst 1)   | EMCO Elektronik GmbH / Gilching                   | 9107-3699         | calchk    | cal: 2024-Sep-11<br>chk: 2025-Oct-20 | cal: 36M<br>chk: 12M | cal: 2027-Sep-11<br>chk: 2026-Oct-20 |
| 20066 | Notch Filter WRCT 1900/2200-5/40-10EEK                | Wainwright Instruments GmbH / Andechs             | 5                 | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20121 | Notch Filter WRCB 1879,5/1880,5EE                     | Wainwright Instruments GmbH / Andechs             | 15                | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20122 | Notch Filter WRCB 1747/1748                           | Wainwright Instruments GmbH / Andechs             | 12                | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20254 | High Pass Filter SHC 2600/12750-1.5KK                 | Trilithic                                         | 23042             | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20287 | Pre-Amplifier 25MHz - 4GHz AMF-2D-100M4G-35-10P       | Miteq Inc.                                        | 379418            | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20290 | Notch Filter WRCA 901,9/903,1SS                       | Wainwright Instruments GmbH / Andechs             | 3RR               | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20291 | High Pass Filter WHJ 2200-4EE                         | Wainwright Instruments GmbH / Andechs             | 14                | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20338 | Pre-Amplifier JS4-00102600-38-5P                      | Miteq Inc.                                        | 838697            | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20341 | Digital Multimeter Fluke 112                          | Fluke Deutschland GmbH / Glottertal               | 81650455          | cal       | cal: 2026-May-07                     | cal: 36M             | cal: 2029-May-07                     |
| 20448 | Notch Filter WRCT 1850.0/2170.0-5/40-10SSK            | Wainwright Instruments GmbH / Andechs             | 5                 | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20449 | Notch Filter WRCT 824.0/894.0-5/40-8SSK               | Wainwright Instruments GmbH / Andechs             | 1                 | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20484 | Pre-Amplifier 2,5GHz - 18GHz AMF-5D-02501800-25-10P   | Miteq Inc.                                        | 1244554           | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20489 | EMI Test Receiver ESU40                               | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 100030            | cal       | cal: 2026-May-08                     | cal: 12M             | cal: 2027-May-08                     |
| 20512 | Notch Filter WRCA 800/960-02/40-6EEK (GSM 850)        | Wainwright Instruments GmbH / Andechs             | 24                | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20549 | Log. Per. Antenna HL025                               | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 1000060           | calchk    | cal: 2024-Oct-08                     | cal: 36M<br>chk: 12M | cal: 2027-Oct-08                     |
| 20558 | Fully Anechoic Chamber 1                              | ETS-Lindgren GmbH / Taufkirchen                   | without           | chk       | chk: 2025-Mar-28                     | chk: 24M             | chk: 2027-Mar-28                     |
| 20608 | Ultrabroadband-Antenna HL562                          | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 830547/009        | cal       | cal: 2023-Jul-04                     | cal: 36M             | cal: 2026-Jul-04                     |
| 20611 | Power Supply E3632A                                   | Agilent Technologies Deutschland GmbH             | KR 75305854       | cpu       |                                      |                      |                                      |
| 20690 | Spectrum Analyzer FSU26                               | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 100302/026        | cal       | cal: 2025-May-07                     | cal: 24M             | cal: 2027-May-07                     |
| 20720 | Measurement Software EMC32 [FAC]                      | Rohde & Schwarz Messgerätebau GmbH                | V10.xx            | cnn       | cal: -<br>chk: -                     | cal: -<br>chk: -     | cal: -<br>chk: -                     |
| 20868 | High Pass Filter AFH-07000                            | AtlanTecRF / Braintree, Essex                     | 16071300004       | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20883 | Open Switch and control Platform OSP-B20052 Satellite | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 101432            | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
| 20884 | Open Switch and control Platform OSP320               | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 101391            | chk       | chk: 2025-Mar-21                     | chk: 18M             | chk: 2026-Sep-21                     |
|       | 120907 - FAC2 - Radiated Emissions                    |                                                   |                   | chk       | chk: 2024-Mar-18                     | chk: 36M             | chk: 2027-Mar-18                     |
| 20302 | Horn Antenna BBHA9170 (Meas 1)                        | Schwarzbeck Mess-Elektronik OHG / Schönaun        | 155               | cpu       | chk: 2020-Apr-15                     | chk: 12M             |                                      |
| 20412 | Fully Anechoic Chamber 2                              | ETS-Lindgren GmbH / Taufkirchen                   | without           | chk       | chk: 2025-Jul-04                     | chk: 12M             | chk: 2026-Jul-04                     |
| 20811 | Horn Antenna ASY-SGH-124-SMA                          | Antenna Systems Solutions S.L / Santander         | 29F14182337       | calchk    | cal: 2024-Oct-08<br>chk: 2025-Oct-16 | cal: 36M<br>chk: 12M | cal: 2027-Oct-08<br>chk: 2026-Oct-16 |
| 20816 | SGH Antenna SGH-26-WR10                               | Anteral S.L. / Pamplona, Navarra                  | 1144              | cpu       | chk: 2024-Mar-22                     |                      |                                      |
| 20817 | Waveguide Rectangular Horn Antenna SAR-2309-22-S2     | ERAVANT / Torrance                                | 13254-01          | chk       | chk: 2025-Oct-17                     | chk: 12M             | chk: 2026-Oct-17                     |
| 20832 | Horn Antenna WR90, 90-HA20                            | TACTRON ELEKTRONIK GmbH & Co. KG / Martinsried    | J202064946        | chk       | chk: 2025-Oct-16                     | chk: 12M             | chk: 2026-Oct-16                     |
| 20836 | 1-18 GHz Amplifier                                    | Wright Technologies, Inc., / Roseville            | 0001              | chk       | chk: 2024-Oct-18                     | chk: 24M             | chk: 2026-Oct-18                     |
| 20877 | JS42-08001800-16-8P Verstärker                        | Miteq Inc.                                        | 2079991 / 2079992 | chk       | chk: 2024-Oct-18                     | chk: 24M             | chk: 2026-Oct-18                     |
| 20879 | JS44-18004000-40-8P Verstärker                        | Miteq Inc.                                        | 1750117           | chk       | chk: 2024-Oct-18                     | chk: 24M             | chk: 2026-Oct-18                     |
| 20907 | Waveguide WR-15 attenuator STA-30-15-M2               | ERAVANT / Torrance                                | 13256-01          | cpu       | chk: 2024-Mar-19                     |                      |                                      |

| ID    | Description                                    | Manufacturer                                            | SerNo       | CheckType | Last Check       | Interval         | Next Check       |
|-------|------------------------------------------------|---------------------------------------------------------|-------------|-----------|------------------|------------------|------------------|
| 20908 | Waveguide WR 10 attenuator STA-30-10-M2        | ERAVANT / Torrance                                      | 13256-01    | cpu       | chk: 2024-Mar-22 |                  |                  |
| 20909 | Waveguide Horn Antenna PE9881-24               | Pasternack Enterprises, Inc. / Irvine                   | 37/2016     | cpu       | chk: 2024-Mar-19 |                  |                  |
| 20910 | Frequency Multiplier 936VF-10/385              | MI-Wave, Millimeter Wave Products Inc. / St. Petersburg | 142         | cpu       | chk: 2024-Mar-19 |                  |                  |
| 20911 | Frequency Multiplier 938WF-10/387              | MI-Wave, Millimeter Wave Products Inc. / St. Petersburg | 141         | cpu       | chk: 2024-Mar-19 |                  |                  |
| 20912 | Low noise Amplifier Module 0.5-4GHz            | RF-Lambda Europe GmbH / Rüsselsheim                     | 19041200083 | chik      | chk: 2024-Oct-18 | chk: 12M         | chk: 2026-Jun-30 |
| 20913 | Phase Amplitude Stable Cable Assembly DC-40GHz | RF-Lambda Europe GmbH                                   | AC19040001  | cnn       | cal: -<br>chk: - | cal: -<br>chk: - | cal: -<br>chk: - |
| 25458 | DRG Horn Antenna 19 dB                         | A.H. Systems, Inc. / Chatsworth                         | 183         | cal       | cal: 2025-Jun-03 | cal: 36M         | cal: 2028-Jun-03 |

Tools used in 'P1M1'

#### 4.3.1 Legend

| Note / remarks | Interval of calibration & Verification |
|----------------|----------------------------------------|
| 12M            | 12 months                              |
| 24M            | 24 months                              |
| 36M            | 36 months                              |
| 10Y            | 10 Years                               |

| Abbreviation Check Type | Description                                |
|-------------------------|--------------------------------------------|
| cnn                     | Calibration and verification not necessary |
| cal                     | Calibration                                |
| calchk                  | Calibration plus intermediate Verification |
| chk                     | Verification                               |
| cpu                     | Verification before usage                  |

## 5 Results from external laboratory

None

-

## 6 Opinions and interpretations

None

-

## 7 List of abbreviations

None

-

## 8 Measurement Uncertainty valid for conducted/radiated measurements

The reported uncertainties are calculated based on the standard uncertainty multiplied with the appropriate coverage factor **k**, such that a confidence level of approximately 95% is achieved. For uncertainty determination, each component used in the concrete measurement set-up was taken in account and its contribution to the overall uncertainty according its statistical distribution calculated.

| Issue No. | Measurement type                                         | Reference         | Frequency range of measurement |            | Calculated Uncertainty based on confidence level of 95.54% | Remarks                                                                         |
|-----------|----------------------------------------------------------|-------------------|--------------------------------|------------|------------------------------------------------------------|---------------------------------------------------------------------------------|
|           |                                                          |                   | Start [MHz]                    | Stop [MHz] |                                                            |                                                                                 |
| 1         | Magnetic Field Strength                                  | EN ,FCC, JP, IC   | 0.009                          | 30         | 4.86                                                       | Magnetic loop antenna, Pre-Amp on                                               |
| 2         | RF-Output Power (EIRP)<br>Unwanted emissions (EIRP) [dB] | EN, FCC, JP, IC   | 30                             | 100        | 4.57                                                       | without Pre-Amp                                                                 |
|           |                                                          |                   | 30                             | 100        | 4.91                                                       | with Pre-Amp                                                                    |
|           |                                                          |                   | 100                            | 1000       | 4.02                                                       | without Pre-Amp                                                                 |
|           |                                                          |                   | 100                            | 1000       | 4.26                                                       | with Pre-Amp                                                                    |
|           |                                                          |                   | 1000                           | 18000      | 4.36                                                       | without Pre-Amp                                                                 |
|           |                                                          |                   | 1000                           | 18000      | 5.23                                                       | with Pre-Amp                                                                    |
|           |                                                          |                   | 18000                          | 33000      | 4.92                                                       | Schwarzbeck BBHA9170 (#20302) Antenna set-up non-waveguide antenna)             |
|           |                                                          |                   | 33000                          | 50000      | 4.17                                                       | Set-up for Q-Band (WR-22), non-wave guide antenna                               |
|           |                                                          |                   | 40000                          | 60000      | 4.69                                                       | Set-up U-Band (WR-19), non-waveguide antenna                                    |
|           |                                                          |                   | 50000                          | 75000      | 4.06                                                       | External Mixer set-up V-Band (WR-15)                                            |
|           |                                                          |                   | 75000                          | 110000     | 4.17                                                       | External Mixer set-up W-Band (WR-6)                                             |
|           |                                                          |                   | 90000                          | 140000     | 5.49                                                       | External Mixer set-up F-Band (WR-8)                                             |
|           |                                                          |                   | 140000                         | 225000     | 6.22                                                       | External Mixer set-up G-Band (WR-5)                                             |
|           |                                                          |                   | 225000                         | 325000     | 7.04                                                       | External Mixer set-up (WR-3)                                                    |
|           |                                                          |                   | 325000                         | 500000     | 8.84                                                       | External Mixer set-up (WR-2.2)                                                  |
| 3         | Radiated Blocking [dB]                                   | EN                | 1000                           | 18000      | 2.85                                                       | Typical set-up with microwave generator and antenna, value for 7 GHz calculated |
|           |                                                          |                   | 18000                          | 33000      | 4.66                                                       | Typical set-up with microwave generator and antenna                             |
|           |                                                          |                   | 33000                          | 50000      | 3.48                                                       | WR-22 set-up                                                                    |
|           |                                                          |                   | 50000                          | 75000      | 3.73                                                       | WR-15 set-up                                                                    |
|           |                                                          |                   | 75000                          | 110000     | 4.26                                                       | WR-6 set-up                                                                     |
| 4         | Frequency Error / UWB+FMCW [kHz]                         | EN, FCC, JP, ISED | 40000                          | 77000      | 276.19                                                     | calculated for 77 GHz (FMCW) carrier                                            |
|           | Frequency Error / NFC [Hz]                               | EN, FCC, JP, ISED | 6000                           | 7000       | 33.92                                                      | calculated for 6.5 GHz UWB Ch.5                                                 |
|           |                                                          |                   | 11.00                          | 14.00      | 20.76                                                      | calculated for 13.56 MHz NFC carrier                                            |
| 5         | TS 8997<br>Conducted Parameters                          | FCC15/18 / ISED   | 30                             | 6000       | 1.11                                                       | 1. Power measurement with Fast-sampling-detector                                |
|           |                                                          |                   | 30                             | 6000       | 1.20                                                       | 2. Power measurement with Spectrum-Analyzer                                     |
|           |                                                          |                   | 30                             | 6000       | 1.20                                                       | 3. Power Spectrum-Density measurement                                           |
|           |                                                          |                   | 30                             | 7500       | 1.20                                                       | 4. Conducted Spurious emissions                                                 |
|           |                                                          |                   | 0.009                          | 30         | 2.56                                                       | 5. Conducted Spurious emissions                                                 |
|           |                                                          |                   | 2.4                            | 2.48       | 1.95 ppm                                                   | 6a. Bandwidth / 2-Marker Method for 2.4 GHz ISM                                 |
|           |                                                          |                   | 5.18                           | 5.825      | 7.180 ppm                                                  | 6b. Bandwidth / 2-Marker Method for 5 GHz WLAN                                  |
|           |                                                          |                   | 5.18                           | 5.825      | 1.099 ppm                                                  | 7. Frequency (Marker method) for 5 GHz WLAN                                     |
|           |                                                          |                   | 30                             | 6000       | 0.11561 µs                                                 | 8. Medium-Utilization factor / Timing                                           |
|           |                                                          |                   | 30                             | 6000       | 1.85                                                       | 9a. Blocking-Level of companion device                                          |
|           |                                                          |                   | 30                             | 6000       | 1.62                                                       | 9b. Blocking Generator level                                                    |
|           |                                                          |                   |                                |            |                                                            |                                                                                 |
|           |                                                          |                   |                                |            |                                                            |                                                                                 |
|           |                                                          |                   |                                |            |                                                            |                                                                                 |
| 6         | Conducted Emissions                                      | EN, FCC           | 0.009                          | 30         | 3.57                                                       | general EMI-measurements on AC/DC ports                                         |

## 9 Versions of test reports (change history)

| Version | Applied changes            | Date of release |
|---------|----------------------------|-----------------|
| R01     | Initial release            | 2026-Aug-21     |
| R02     | RSS-247 version correction | 2026-Sep-15     |
| R03     | FCC/IC ID corrections      | 2026-Sep-28     |

End Of Test Report