FCC Measurement/Technical Report on

Rational WA112

FCC ID: contains XMR2023EG916QGL (cellular) and contains XO2-SPB611 (WLAN/BT)

IC: contains 8713A-SPB611

Report Reference: MDE_AVNET_2403_FCC_02

Test Laboratory:
7layers GmbH
Borsigstrasse 11
40880 Ratingen
Germany

DAkkS Deutsche Akkreditierungsstelle D-PL-12140-01-00

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1 APPLIED STANDARDS AND TEST SUMMARY

1.1 APPLIED STANDARDS

Type of Authorization
Certification for a cellular mobile device.

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 2, 22, 24, 27 and 90 (10-1-24 Edition). The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

Part 22, Subpart H – Cellular Radiotelephone Service

§ 22.905 – Channels for cellular service
§ 22.913 – Effective radiated power limits
§ 22.917 – Emission limitations for cellular equipment

Part 24, Subpart E – Broadband PCS

§ 24.232 – Power and antenna height limits
§ 24.235 – Frequency stability
§ 24.238 – Emission limitations for Broadband PCS equipment

Part 27; Miscellaneous Wireless Communications Services
Subpart C – Technical standards

§ 27.50 – Power and duty cycle limits
§ 27.53 – Emission limits
§ 27.54 – Frequency stability

Part 90; Private Land Mobile Radio Services
Subpart S—REGULATIONS GOVERNING LICENSING AND USE OF FREQUENCIES IN THE 806-824, 851-869, 896-901, AND 935-940 MHZ BANDS

§ 90.635 – Limitations on power and antenna height
§ 90.669 – Emission limitations
§ 90.539 – Frequency stability

The tests were selected and performed with reference to:

- ANSI C63.26: 2015
- FCC OET KDB 971168 D01 Power Meas License Digital Systems v03r01, 2018-04-09
- FCC OET KDB 996369 D01 Module Certification Guide v04, 2024-04-16
  and
  FCC OET KDB 996369 D04 Module Integration Guide v02, 2020-10-13

In general tests are performed according to the ANSI standard. If the KDB is used for testing in addition to the ANSI, the result of the affected test is marked with KDB).

1.2 MEASUREMENT SUMMARY

47 CFR CHAPTER I FCC PART 22 Subpart H	**§ 2.1053 § 22.917**		
Field strength of spurious radiation			
The measurement was performed according to ANSI C63.26; 5.5.2.3.1			**Final Result**
OP-Mode	**Setup**	**Date**	**FCC**
ST_05	S01_AF02	2025-05-21	Passed

47 CFR CHAPTER I FCC PART 24 Subpart E	**§ 2.1053 § 24.236**		
Field strength of spurious radiation			
The measurement was performed according to ANSI C63.26; 5.5.2.3.1			**Final Result**
OP-Mode	**Setup**	**Date**	**FCC**
ST_02	S01_AF02	2025-05-22	Passed

47 CFR CHAPTER I FCC PART 27 Subpart C	**§ 2.1053 § 27.53**		
Field strength of spurious radiation			
The measurement was performed according to ANSI C63.26; 5.5.2.3.1			**Final Result**
OP-Mode	**Setup**	**Date**	**FCC**
ST_07	S01_AF02	2025-05-21	Passed

47 CFR CHAPTER I FCC PART 90 Subpart S	**§ 2.1053 § 90.669**		
Field strength of spurious radiation			
The measurement was performed according to ANSI C63.26; 5.5.2.3.1			**Final Result**
OP-Mode	**Setup**	**Date**	**FCC**
ST_26	S01_AF02	2025-05-21	Passed

2 REVISION HISTORY / SIGNATURES

Report version control			
Version	**Release date**	**Change Description**	**Version validity**
initial	2025-09-02	--	valid
--	--	--	--

COMMENT:
The device contains pre-certified modules, therefore radiated spurious emissions tests were performed within a limited frequency range of 1 GHz to 26 GHz.

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40880 Ratingen, Germany
Phone +49 (0)2102 749 0

(responsible for accreditation scope)
Dipl.-Ing. Daniel Gall

(responsible for testing and report)
Dipl.-Ing. Andreas Petz

3 ADMINISTRATIVE DATA

3.1 TESTING LABORATORY

Company Name:	7layers GmbH
Address:	Borsigstr. 11 40880 Ratingen Germany

The test facility is accredited by the following accreditation organisation:

Laboratory accreditation no:	DAkkS D-PL-12140-01-00
FCC Designation Number:	DE0015
FCC Test Firm Registration:	929146
ISED CAB Identifier	DE0007; ISED#: 3699A
Responsible for accreditation scope:	Dipl.-Ing. Daniel Gall
Report Template Version:	2023-09-29

3.2 PROJECT DATA

Responsible for testing and report:	Dipl.-Ing. Andreas Petz
Employees who performed the tests:	documented internally at 7Layers
Date of Report:	2025-09-02
Testing Period:	2025-05-21 to 2025-05-22

3.3 APPLICANT DATA

Company Name:	Tria Technologies GmbH
Address:	Industriestr. 16 76297 Stutensee Germany
Contact Person:	Martin Schneider

3.4 MANUFACTURER DATA

Company Name:	please see Applicant Data

4 TEST OBJECT DATA

4.1 GENERAL EUT DESCRIPTION

<table>
<tr><td>Kind of Device
product description</td><td colspan="3">Device with WLAN / Bluetooth and cellular transceivers for controlling professional kitchen devices</td></tr>
<tr><td>Product name</td><td colspan="3">Rational WA112</td></tr>
<tr><td>Type</td><td colspan="3">–</td></tr>
<tr><td colspan="4">Declared EUT data by the supplier</td></tr>
<tr><td>Power Supply Type</td><td colspan="3">DC</td></tr>
<tr><td>Nominal Voltage /
Frequency</td><td colspan="3">AC (primary voltage of auxiliary power supply): 120 V / 60 Hz
DC_1: 12.0 V; DC_2: 5.0 V</td></tr>
<tr><td>Test Voltage /
Frequency</td><td colspan="3">AC: 120 V / 60 Hz
DC_1: 12.0 V; DC_2: 5.0 V</td></tr>
<tr><td>Highest internal
frequency</td><td colspan="3">5.7 GHz</td></tr>
<tr><td>General Description</td><td colspan="3">The device is designed for use in professional kitchen devices. Exchange of data is possible by using a cellular network link or WLAN / Bluetooth / LAN / RS485 connections to other devices.</td></tr>
<tr><td>Ports</td><td colspan="3">
<table>
<tr><td>Name:</td><td>Cable:</td><td>Length:</td></tr>
<tr><td>DC input</td><td>AWG 22, 2-wire, unshielded</td><td>1.2 m</td></tr>
<tr><td>AC input (AUX, 6005D)</td><td>AWG 16, 3-wire, unshielded</td><td>2.4 m, effective/ bundled 1.0m</td></tr>
<tr><td>AC input (AUX, PS 303)</td><td>AWG 16, 3-wire, unshielded</td><td>1.0 m</td></tr>
<tr><td>AC input (AUX, PS 2403)</td><td>AWG 16, 3-wire, unshielded</td><td>1.0 m</td></tr>
<tr><td>USB 1</td><td>4-wire, USB 3.0, shielded (keyboard + extension)</td><td>1.8 m</td></tr>
<tr><td>LAN 1</td><td>8-wire, CAT5e, shielded</td><td>2.0 m</td></tr>
<tr><td>Audio</td><td>2-wire, AWG 24, unshielded</td><td>1.0 m</td></tr>
<tr><td>RS485</td><td>9-wire, DB9, shielded</td><td>2.0 m</td></tr>
</table>
Notes:
Above, the length of the connected cable under test is given, not the specified (max.) length (defined by the applicant).</td></tr>
<tr><td>Special software used for testing</td><td colspan="3">Labtool: Scripts to control WLAN</td></tr>
<tr><td rowspan="2">Used power setting in EUT's test software</td><td colspan="3">Applicant's table “Rational WA112, WIFI PowerTable”</td></tr>
<tr><td colspan="2">2.4 GHz</td><td>5 GHz</td></tr>
<tr><td>11b 14 dBm
11g 12 dBm
HT20 12 dBm</td><td>HT40 11 dBm
HE20 11 dBm
HE40 10 dBm</td><td>11a 12 dBm
HT20 12 dBm
HT40 9 dBm
VHT20 11 dBm
VHT40 9 dBm</td><td>VHT80 7 dBm
HE20 9 dBm
HE40 8 dBm
HE80 7 dBm</td></tr>
</table>

4.2 EUT MAIN COMPONENTS

Sample Name	**Sample Code**	**Description**
af02	DE1183057af02	Sample for testing
Sample Parameter	**Value**	
Serial No.	F251901575	
HW Version	DV3	
SW Version	please refer to the annex for the SW version	
Comment	–	

NOTE: The short description is used to simplify the identification of the EUT in this test report.

4.3 ANCILLARY EQUIPMENT

For the purposes of this test report, ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Ancillary Equipment can influence the test results.

Device	**Details (Manufacturer, Type Model, HW, SW, S/N)**	**Description**
Cellular Antenna	2J Antennas, 2JF1224P, –, –, –	external antenna for LTE
2.4/5 GHz Antenna	2J Antennas, 2JF0102P, –, –, –	external antenna for WLAN / Bluetooth

4.4 AUXILIARY EQUIPMENT

For the purposes of this test report, auxiliary equipment is defined as equipment which is used temporarily to enable operational and control features especially used for the tests of the EUT which is not used during normal operation or equipment that is used during the tests in combination with the EUT but is not subject of this test report. It is necessary to configure the system in a typical fashion, as a customer would normally use it.
But nevertheless Auxiliary Equipment can influence the test results.

Device	Details (Manufacturer, Type Model, HW, SW, S/N)	Description
Companion Device	Rational GmbH, CPU_112_01, DV3, –, F244473200	LAN / RS485 testing (providing LAN iperf3 server)
Gigabit Switch	Netgear, GS308v2, –, –, 4P017C5J00B2D	Ethernet distribution
AC-DC-Adapter	Netgear, AD2015023, –, –, 3115473221070417PF	Power Supply for for Gigabit Switch
Laboratory Power Supply (4 outputs)	R&S, NGP814, 05.04, 2.22, 100900	Laboratory Power Supply 120 V 60 Hz, generation of DC
Speaker	VISATON, SL 64 FR Art. No. 2364 (8 ohm), –, –, –	output of audio signals
USB Stick	Innodisk, USB Drive 3SE, –, –, –	USB 2.0 OTG, USB 3.0 storage device
Display/Touch/Housing AF	Rational, iCombi Blende (provided by Rational), –, –, 30262517	Enclosure for the EUT af02 and its antennas; housing made of plastic (Polyflam RPP 374 ND CS1)

4.5 EUT SETUPS

This chapter describes the combination of EUTs and equipment used for testing. The rationale for selecting the EUTs, ancillary and auxiliary equipment and interconnecting cables, is to test a representative configuration meeting the requirements of the referenced standards.

Setup	Combination of EUTs	Description and Rationale
S01_AF02	af02, Cellular Antenna, 2.4/5 GHz Antenna, Companion Device, Gigabit Switch, AC-DC Adapter, Laboratory Power Supply, Speaker, USB Stick, Display/Touch/Housing AF	Representative setup for testing

4.6 OPERATING MODES / TEST CHANNELS

This chapter describes the operating modes of the EUTs used for testing.

Mode	Description Mode 1	Description Mode 2
ST_05	eFDD5, 1 RB mid, BW 5 MHz, QPSK, TX CH20525 (836.5 MHz)	WLAN b-mode, 1 Mbps, DSSS, BW 20 MHz, local TX CH6 (2437 MHz)
ST_02	eFDD2, 1 RB mid, BW 5 MHz, QPSK, TX CH18900 (1880.0 MHz)	WLAN a-mode, 54 Mbps, DSSS, BW 20 MHz, local TX CH116 (5580 MHz)
ST_07	eFDD7, 1 RB mid, BW 5 MHz, QPSK, TX CH21100 (2535.0 MHz)	WLAN a-mode, 54 Mbps, DSSS BW 20 MHz, local TX CH40 (5200 MHz)
ST_26	eFDD26, 1 RB mid, BW 5 MHz, QPSK, TX CH26740 (819.0 MHz)	WLAN b-mode, 1 Mbps, DSSS, BW 20 MHz, local TX CH6 (2437 MHz)

Abbreviations:

Mode	Combination of simultaneous transmissions in modes 1 and 2
CH	Channel (uplink to base station simulator, TX frequency)
RB	No. of Resource Blocks, middle position
BW	Nominal bandwidth
Mbps	Nominal Data Rate in Megabit per second
eFDD2	E-UTRA Frequency Division Duplex data link band 2 (e.g. for band 2)
local TX	Synthetic transmission in test mode, controlled by special software

4.7 PRODUCT LABELLING

Please refer to the documentation of the applicant.

5 TEST RESULTS

5.1 FIELD STRENGTH OF SPURIOUS RADIATION (PART 22)

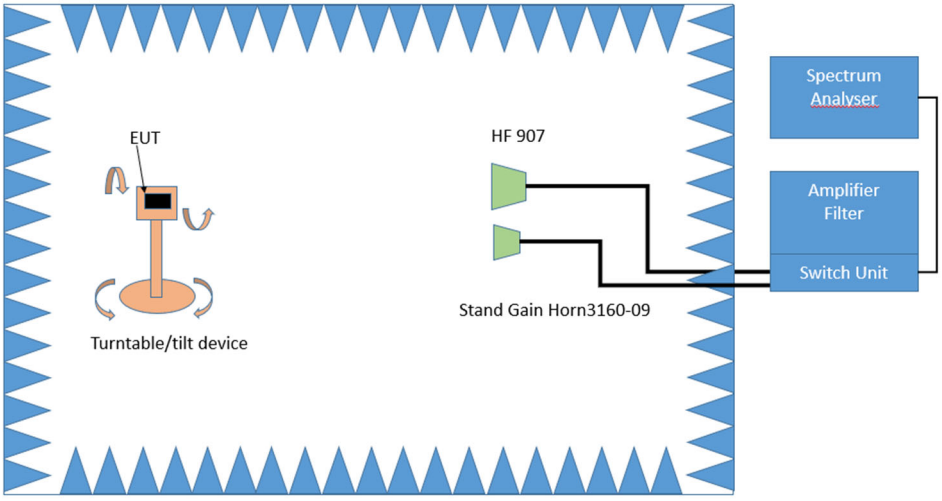
Standard **FCC PART 22 Subpart H**

The test was performed according to:
ANSI C63.26; 5.5.2.3.1

5.1.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable radiated spurious emission measurements per § 2.1053 and RSS-GEN 6.13. The limit and requirements come from the applicable rule part and ISED RSS-Standard for the operating band of the cellular device. The EUT was connected to the test setup according to the following diagram:

Frequency Range: 1 GHz – 26.5 GHz



Test Setup; Spurious Emission Radiated (FAC), 1 GHz-26.5 GHz

The test set-up was made in accordance to the general provisions of ANSI C63.26 in a typical installation configuration. The Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m² in the semi-anechoic chamber. The influence of the EUT support table that is used between 30–1000 MHz was evaluated.
The measurement procedure is implemented into the EMI test software EMC32 from R&S. Exploratory tests are performed at 3 orthogonal axes to determine the worst-case orientation of a body-worn or handheld EUT. The final test on all kind of EUTs is also performed at 3 axes. A pre-check is performed while the EUT is powered from a DC power source.

Measurement above 1 GHz
The following modifications apply to the measurement procedure for the frequency range above 1 GHz:
Step 1:
The Equipment Under Test (EUT) was set up on a non-conductive support (tilt device) at 1.5 m height in the fully-anechoic chamber.
All steps were performed with one height (1.5 m) of the receiving antenna only.
The EUT is turned during the preliminary measurement across the elevation axis, with a step size of 90 °.
The turn table step size (azimuth angle) for the preliminary measurement is 45 °.
- Antenna distance: 3 m
- Detector: Peak
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep time: coupled
- Turntable angle range: –180° to 90°
- Turntable step size: 90°
- Polarisation: Horizontal + Vertical

Step 2:
Due to the fact, that in this frequency range the test is performed in a fully anechoic room, the height scan of the receiving antenna instep 2 is omitted. Instead of this, a maximum search with a step size ± 45° for the elevation axis is performed.
The turn table azimuth will slowly vary by ± 22.5°.
The elevation angle will slowly vary by ± 45°
EMI receiver settings (for all steps):
- Detector: Peak,
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep time: coupled

Step 3:
Spectrum analyser settings for step 3:
- Detector: RMS
- Measured frequencies: in step 1 determined frequencies
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep Time: 1 s

5.1.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1053; Measurement required: Field strength of spurious radiation:

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate.

Part 22, Subpart H – Cellular Radiotelephone Service

§ 22 917 – Emission limitations for cellular equipment

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

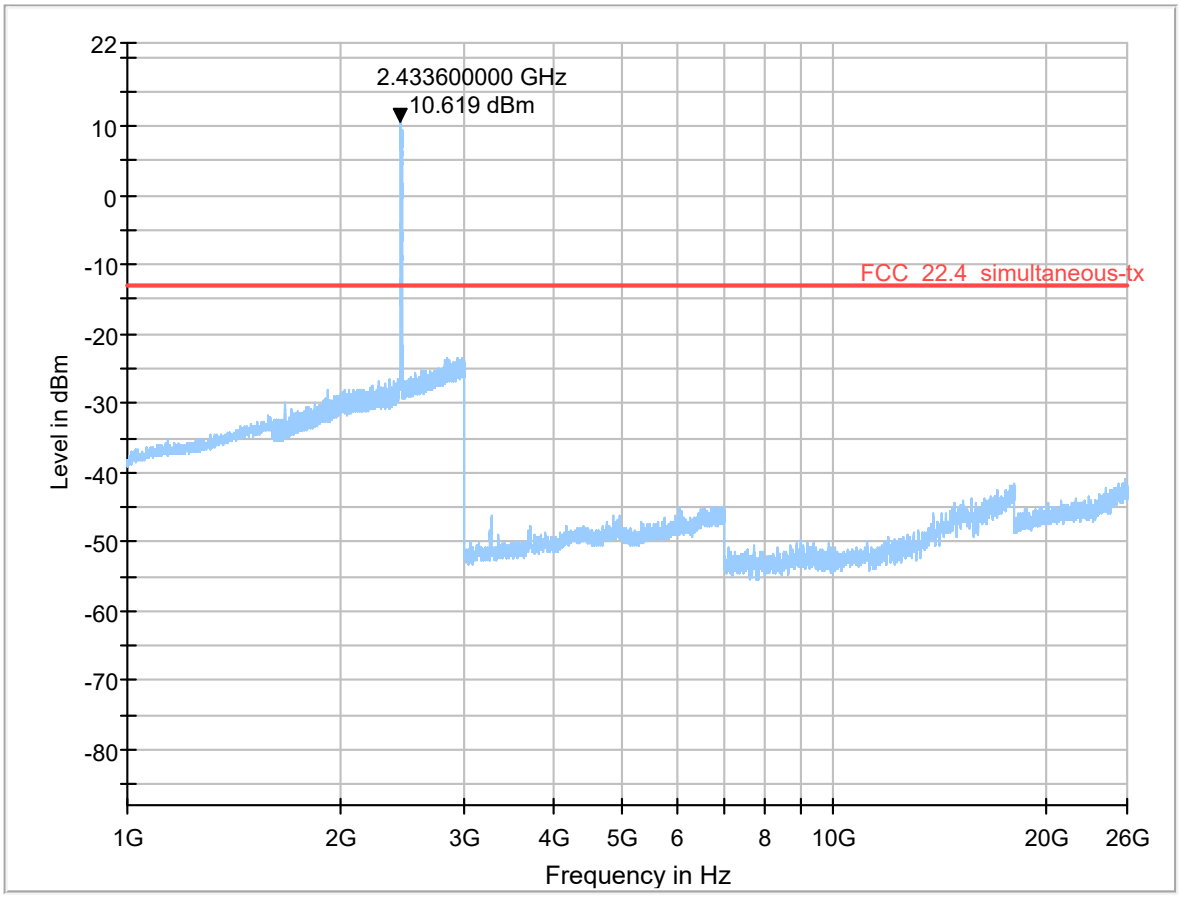
5.1.3 TEST PROTOCOL

Ambient temperature: 24 °C
Air Pressure: 1008 hPa
Relative Humidity: 38 %

Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin Limit [dB]
-	-	-	-	-	-

Remark: Please see next sub-clause for the measurement plot.

5.1.4 MEASUREMENT PLOT FCC PART 22, ST_05, S01_AF02



Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Elevation	Corr. (dB)
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Note:
▼ Marker set to intentional radiator WLAN

5.1.5 TEST EQUIPMENT USED

- Radiated Emissions FAR Cellular

5.2 FIELD STRENGTH OF SPURIOUS RADIATION (PART 24)

Standard **FCC PART 24 Subpart E**

The test was performed according to:
ANSI C63.26; 5.5.2.3.1

5.2.1 TEST DESCRIPTION

Please see sub-clause 5.1.1.

5.2.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1053; Measurement required: Field strength of spurious radiation:

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate.

Part 24, Subpart E – Broadband PCS

§ 24 238 – Emission limitations for Broadband PCS equipment

a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

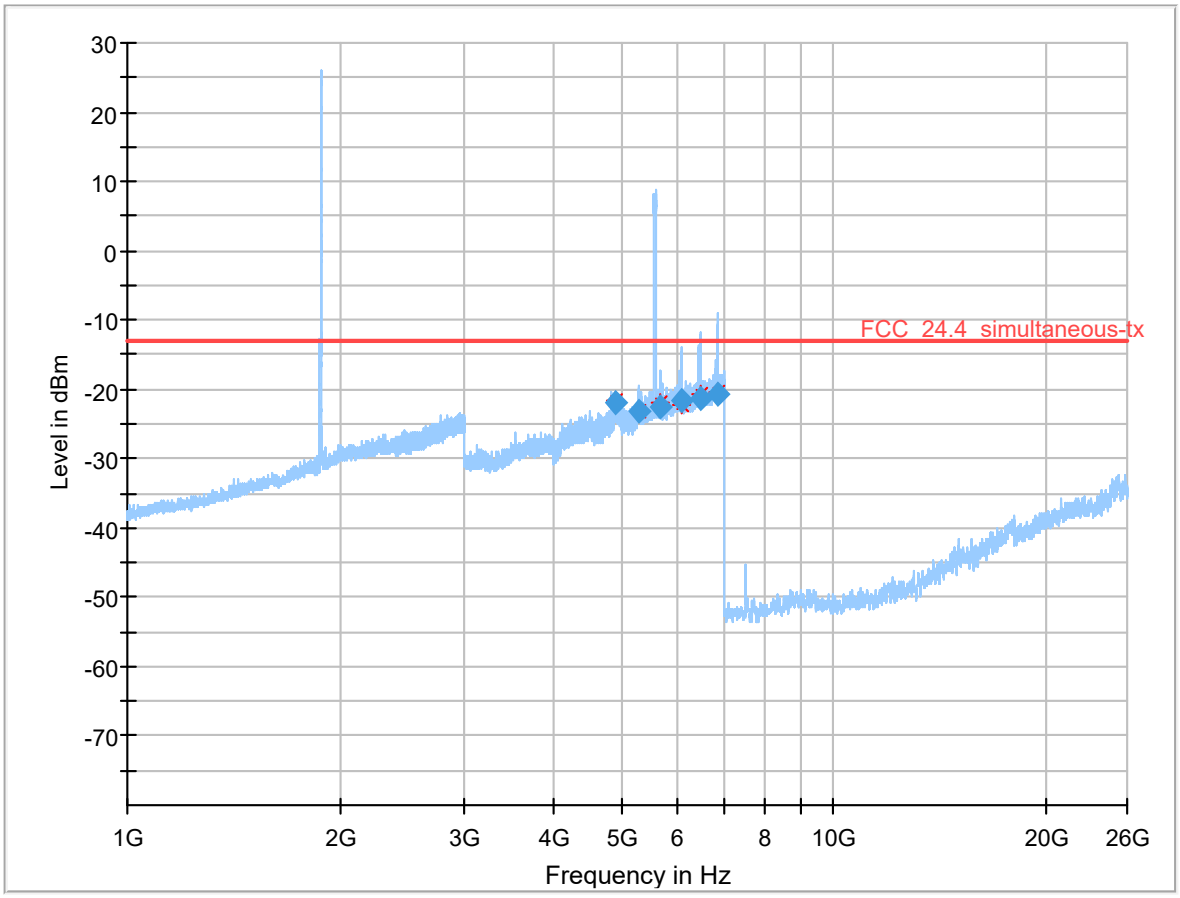
5.2.3 TEST PROTOCOL

Ambient temperature: 24 °C
Air Pressure: 1007 hPa
Humidity: 33 %

Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin Limit [dB]
-	-	-	-	-	-

Remark: Please see next sub-clause for the measurement plot.

5.2.4 MEASUREMENT PLOT FCC PART 24, ST_02, S01_AF02

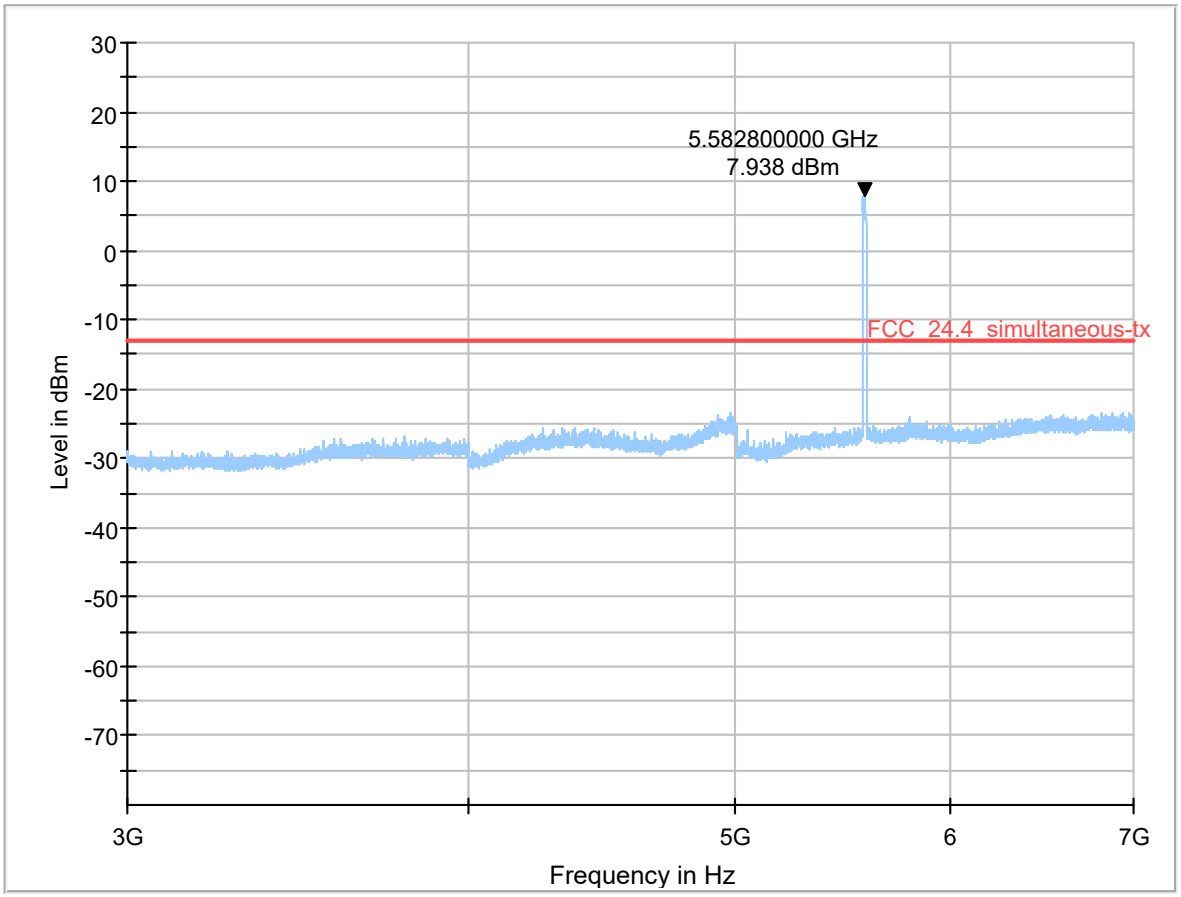


Final_Result

Frequency (MHz)	MaxPeak (dBm)	DET 2 (dBm)	Limit (dBm	Margin	Meas. Time	Bandwidth	Height	Pol	Azimuth	Elevation	Corr. (dB)
4913.600	-21.8	---	-13.00	8.81	1000.0	1000.000	150.0	H	59.0	90.0	-55.0
5298.000	-23.1	---	-13.00	10.13	1000.0	1000.000	150.0	H	66.0	98.0	-55.0
5686.400	-22.5	---	-13.00	9.51	1000.0	1000.000	150.0	H	63.0	54.0	-54.2
6074.000	-21.7	---	-13.00	8.69	1000.0	1000.000	150.0	H	26.0	60.0	-53.1
6463.600	-21.4	---	-13.00	8.39	1000.0	1000.000	150.0	H	22.0	79.0	-52.3
6851.200	-20.6	---	-13.00	7.59	1000.0	1000.000	150.0	H	40.0	101.0	-52.0

Notes:
Emissions from intentional radiators are visible above a level of 0 dBm.
Emissions between 3 GHz and 7 GHz can be ignored, please refer to the next plot.

Test repeated in the frequency range 3 GHz to 7 GHz, including the high pass 2.7 GHz to avoid ghost signals at spectrum analyser caused by oversteering related to the cellular signal



Final_Result

Frequency (MHz)	MaxPeak (dBm)	DET 2 (dBm)	Limit (dBm	Margi n	Meas. Time	Bandwidt h	Heigh t	Pol	Azimut h	Elevatio n	Corr. (dB)
---	---	---	---	---	---	---	---		---	---	---

Note:
▼ Marker set to intentional radiator WLAN

5.2.5 TEST EQUIPMENT USED

- Radiated Emissions FAR Cellular

5.3 FIELD STRENGTH OF SPURIOUS RADIATION (PART 27)

Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26; 5.5.2.3.1

5.3.1 TEST DESCRIPTION

Please see sub-clause 5.1.1.

5.3.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1053; Measurement required: Field strength of spurious radiation:

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate.

FCC Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§27.53 – Emission limits

Band 7:
(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.
(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

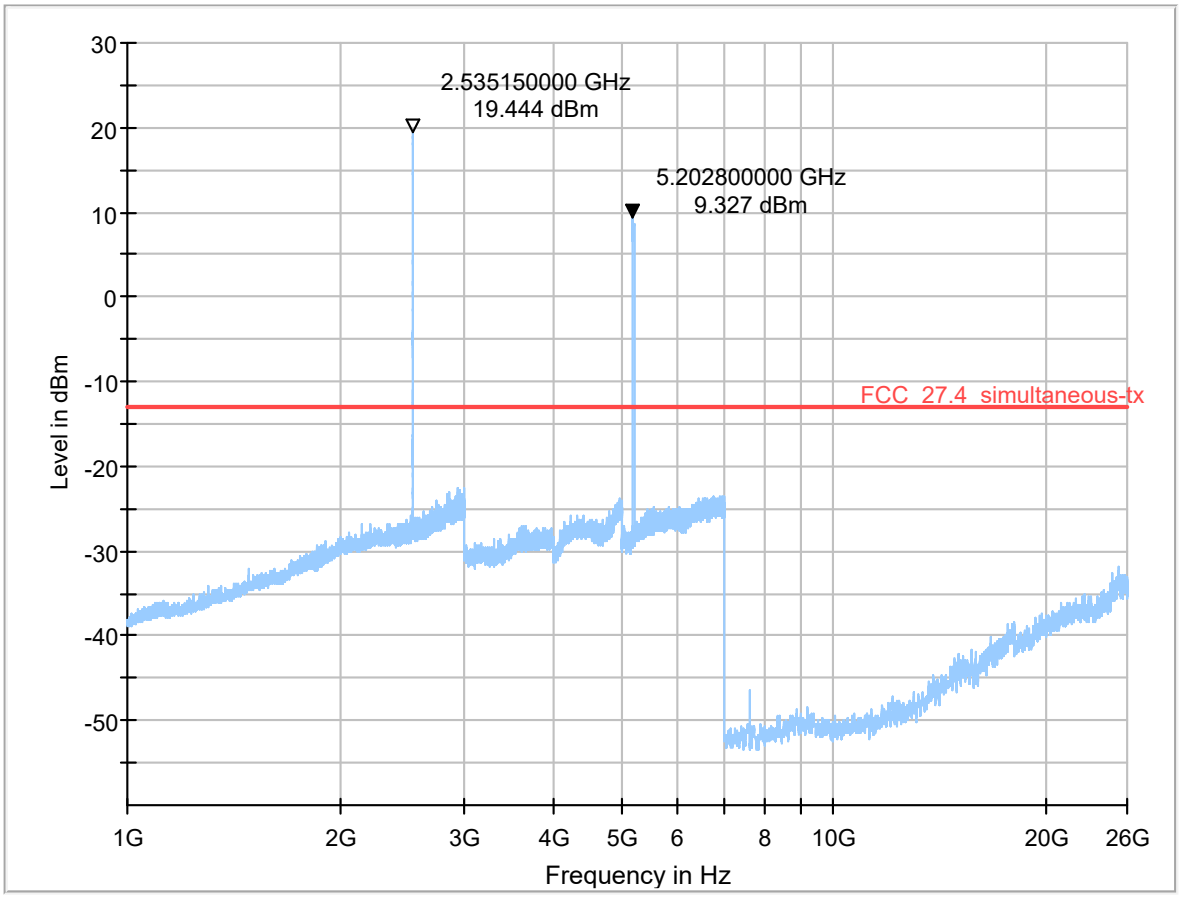
5.3.3 TEST PROTOCOL

Ambient temperature:	24 °C
Air Pressure:	1008 hPa
Relative Humidity:	38 %

Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin Limit [dB]
-	-	-	-	-	-

Remark: Please see next sub-clause for the measurement plot.

5.3.4 MEASUREMENT PLOT FCC PART 27, ST_07, S01_AF02



Final_Result

Frequency (MHz)	RMS (dBm	Limit (dBm	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Elevation	Corr. (dB)
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Note:
▼ Markers set to intentional radiators cellular and WLAN

5.3.5 TEST EQUIPMENT USED

- Radiated Emissions FAR Cellular

5.4 FIELD STRENGTH OF SPURIOUS RADIATION (PART 90)

Standard **FCC PART 90 Subpart S**

The test was performed according to:
ANSI C63.26; 5.5.2.3.1

5.4.1 TEST DESCRIPTION

Please see sub-clause 5.1.1.

5.4.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1053; Measurement required: Field strength of spurious radiation:

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate.

Part 90; PRIVATE LAND MOBILE RADIO SERVICES

Subpart S—Regulations Governing Licensing and Use of Frequencies in the 806–824, 851–869, 896–901, and 935–940 MHz Bands

§ 90.669 – Emission limitations

(a) On any frequency in an MTA licensee's spectrum block that is adjacent to a non-MTA frequency, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 plus 10 log10(P) decibels or 80 decibels, whichever is the lesser attenuation.

NOTE: The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

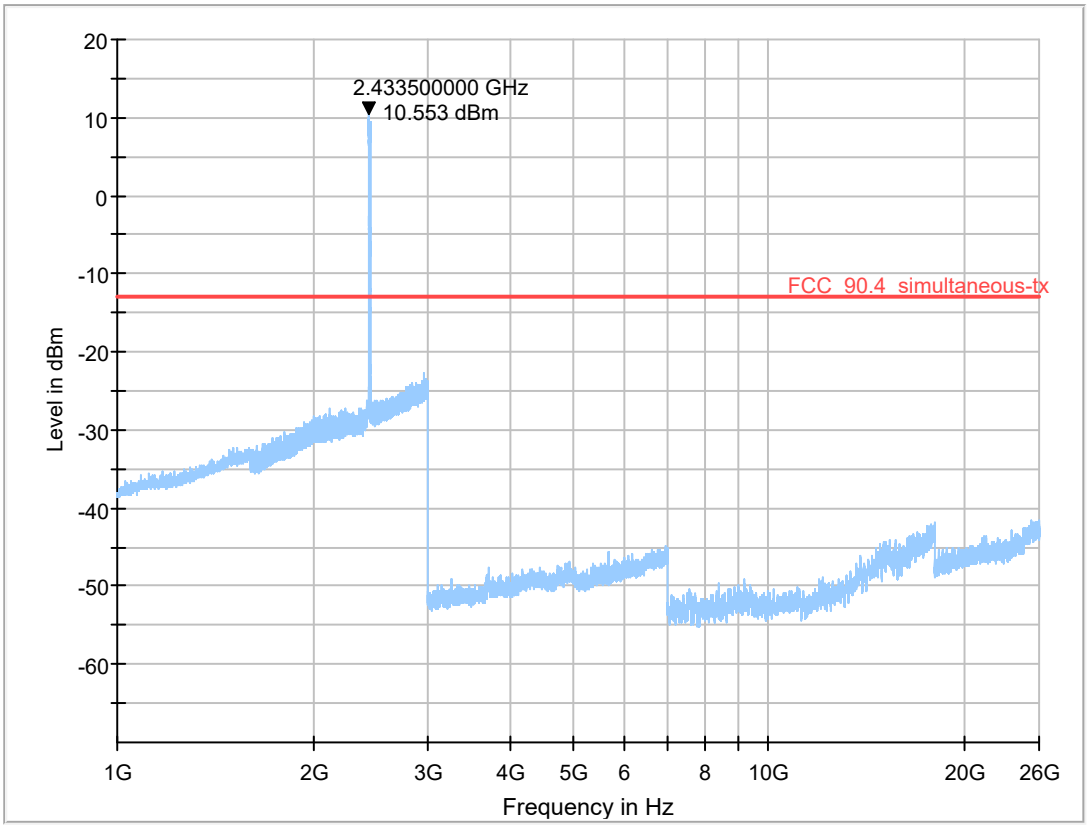
5.4.3 TEST PROTOCOL

Ambient temperature: 24 °C
Air Pressure: 1008 hPa
Relative Humidity: 38 %

Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin Limit [dB]
-	-	-	-	-	-

Remark: Please see next sub-clause for the measurement plot.

5.4.4 MEASUREMENT PLOT FCC PART 90, ST_26, S01_AF02



Final_Result

Frequency (MHz)	RMS (dBm	Limit (dBm	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Elevation	Corr. (dB)
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Note:
▼ Marker set to intentional radiator WLAN

5.4.5 TEST EQUIPMENT USED

- Radiated Emissions FAR Cellular

6 TEST EQUIPMENT

6.1 TEST EQUIPMENT HARDWARE

1 Radiated Emissions FAR Cellular
Radiated Emissions in a fully anechoic room for Cellular

Ref. No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
1.1	Opus10 TPR (8253.00)	T/P Logger 13	Lufft Mess- und Regeltechnik GmbH	13936	2023-12	2025-12
1.2	Innco Systems CO3000	Controller for bore sight mast FAC	innco systems GmbH	CO3000/1460/5 4740522/P	N/A	N/A
1.3	AMF-7D00101800-30-10P-R	Broadband Amplifier 100 MHz - 18 GHz	Miteq		N/A	N/A
1.4	5HC2700/12750 -1.5-KK	High Pass Filter	Trilithic	9942012	N/A	N/A
1.5	ASP 1.2/1.8-10 kg	Antenna Mast	Maturo GmbH	-	N/A	N/A
1.6	Anechoic Chamber 03	FAR, 8.80m x 4.60m x 4.05m (l x w x h)	Albatross Projects	P26971-647-001-PRB	N/A	N/A
1.7	MCU	Controller Maturo	Maturo GmbH	4390315	N/A	N/A
1.8	Fluke 177	Digital Multimeter 03 (Multimeter)	Fluke Europe B.V.	86670383	2023-08	2025-08
1.9	PONTIS Con4101	PONTIS Camera Controller		6061510370	N/A	N/A
1.10	JS4-18002600-32-5P	Broadband Amplifier 18 GHz - 26 GHz	Miteq	849785	N/A	N/A
1.11	FSW43	Spectrum Analyzer	Rohde & Schwarz GmbH & Co. KG	103779	2024-12	2026-12
1.12	3160-09	Standard Gain / Pyramidal Horn Antenna 26.5 GHz	EMCO Elektronic GmbH	00083069	N/A	N/A
1.13	4HC1600/12750 -1.5-KK	High Pass Filter	Trilithic	9942011	N/A	N/A
1.14	MA3000/0800-XP-ET-compact	Bore Sight Antenna Mast	innco systems GmbH	9210522	N/A	N/A
1.15	TT 1.5 WI	Turn Table	Maturo GmbH	-	N/A	N/A
1.16	HL 562 ULTRALOG	Biconical-log-per Antenna (30 MHz - 3 GHz)	Rohde & Schwarz GmbH & Co. KG	100609	2022-06	2025-06
1.17	3160-10	Standard Gain / Pyramidal Horn Antenna 40 GHz	EMCO Elektronic GmbH	00086675	N/A	N/A
1.18	VLFX-650+	Low Pass Filter DC650 MHz	Mini-Circuits	15542	N/A	N/A
1.19	JUN-AIR Mod. 6-15	Air Compressor	JUN-AIR Deutschland GmbH	612582	N/A	N/A
1.20	5HC3500/18000 -1.2-KK	High Pass Filter	Trilithic	200035008	N/A	N/A
1.21	Opus 20 THI (8120.00)	ThermoHygro Datalogger	Lufft Mess- und Regeltechnik GmbH	115.0318.0802.033	2023-08	2025-08

Ref. No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
1.22	CMW500	Callbox OIL-RE, SUA-160 MHz	Rohde & Schwarz GmbH & Co. KG	167766-By	2022-05	2025-05
1.23	TD1.5-10kg	EUT Tilt Device (Rohacell)	Maturo GmbH	TD1.5-10kg/024/3790709	N/A	N/A
1.24	AFS42-00101800-25-S-42	Broadband Amplifier 25 MHz - 18 GHz	Miteq	2035324	N/A	N/A
1.25	HF 907	Double-ridged horn	Rohde & Schwarz	102444	2024-10	2027-10
1.26	5HC2700/12750-1.5-KK	High Pass Filter	Trilithic	9942012	N/A	N/A
1.27	WHKX 7.0/18G-8SS	High Pass Filter	Wainwright Instruments GmbH	09	N/A	N/A

The calibration interval is the time interval between “Last Calibration” and “Calibration Due”

6.2 TEST EQUIPMENT SOFTWARE

Semi-Anechoic Chamber:	
Software	Version
EMC32 Measurement Software	10.60.10
INNCO Mast Controller	1.02.62
INNCO Mast Height	34.10
INNCO Mast Elevation	36.11
MATURO Controller	1.24
MATURO Mast	12.19
MATURO Turn-Table	30.10
Fully-Anechoic Chamber:	
Software	Version
EMC32 Measurement Software	10.60.10
MATURO Controller	1.30
MATURO Turn-Unit	11.10
MATURO Mast	12.10
MATURO Turntable	12.11
INNCO Controller	1.03.02
INNCO Mast Height	34.10
INNCO Mast Elevation	36.11
TS 8997	
WMS32 Measurement Software	11.60.00 (till 2024-03-19), 11.70.00 + Hotfix 01
Conducted AC Emissions:	
Software	Version
EMC32 Measurement Software	10.60.20

7 ANTENNA FACTORS, CABLE LOSS AND SAMPLE CALCULATIONS

This chapter contains the antenna factors with their corresponding path loss of the used measurement path for all antennas as well as the insertion loss of the LISN.

7.1 LISN R&S ESH3-Z5 (150 KHZ – 30 MHZ)

Frequency		Corr.	LISN insertion loss ESH3-Z5	cable loss (incl. 10 dB atten-uator)
MHz		dB	dB	dB
0.15		10.1	0.1	10.0
5		10.3	0.1	10.2
7		10.5	0.2	10.3
10		10.5	0.2	10.3
12		10.7	0.3	10.4
14		10.7	0.3	10.4
16		10.8	0.4	10.4
18		10.9	0.4	10.5
20		10.9	0.4	10.5
22		11.1	0.5	10.6
24		11.1	0.5	10.6
26		11.2	0.5	10.7
28		11.2	0.5	10.7
30		11.3	0.5	10.8

Sample calculation

U_{LISN} (dB µV) = U (dB µV) + Corr. (dB)
U = Receiver reading
LISN Insertion loss = Voltage Division Factor of LISN
Corr. = sum of single correction factors of used LISN, cables, switch units (if used)
Linear interpolation will be used for frequencies in between the values in the table.

7.2 ANTENNA R&S HFH2-Z2 (9 KHZ – 30 MHZ)

Frequency	AF HFH-Z2)	Corr.	cable loss 1 (inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit)	cable loss 4 (to receiver)	distance corr. (-40 dB/ decade)	d_{Limit} (meas. distance (limit)	d_{used} (meas. distance (used)
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB	m	m
0.009	20.50	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.01	20.45	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.015	20.37	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.02	20.36	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.025	20.38	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.03	20.32	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.05	20.35	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.08	20.30	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.1	20.20	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.2	20.17	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.3	20.14	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.49	20.12	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.490001	20.12	-39.6	0.1	0.1	0.1	0.1	-40	30	3
0.5	20.11	-39.6	0.1	0.1	0.1	0.1	-40	30	3
0.8	20.10	-39.6	0.1	0.1	0.1	0.1	-40	30	3
1	20.09	-39.6	0.1	0.1	0.1	0.1	-40	30	3
2	20.08	-39.6	0.1	0.1	0.1	0.1	-40	30	3
3	20.06	-39.6	0.1	0.1	0.1	0.1	-40	30	3
4	20.05	-39.5	0.2	0.1	0.1	0.1	-40	30	3
5	20.05	-39.5	0.2	0.1	0.1	0.1	-40	30	3
6	20.02	-39.5	0.2	0.1	0.1	0.1	-40	30	3
8	19.95	-39.5	0.2	0.1	0.1	0.1	-40	30	3
10	19.83	-39.4	0.2	0.1	0.2	0.1	-40	30	3
12	19.71	-39.4	0.2	0.1	0.2	0.1	-40	30	3
14	19.54	-39.4	0.2	0.1	0.2	0.1	-40	30	3
16	19.53	-39.3	0.3	0.1	0.2	0.1	-40	30	3
18	19.50	-39.3	0.3	0.1	0.2	0.1	-40	30	3
20	19.57	-39.3	0.3	0.1	0.2	0.1	-40	30	3
22	19.61	-39.3	0.3	0.1	0.2	0.1	-40	30	3
24	19.61	-39.3	0.3	0.1	0.2	0.1	-40	30	3
26	19.54	-39.3	0.3	0.1	0.2	0.1	-40	30	3
28	19.46	-39.2	0.3	0.1	0.3	0.1	-40	30	3
30	19.73	-39.1	0.4	0.1	0.3	0.1	-40	30	3

Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
distance correction = -40 * LOG (d_{Limit}/ d_{used})
Linear interpolation will be used for frequencies in between the values in the table.
Table shows an extract of values

7.3 ANTENNA R&S HL562 (30 MHZ – 1 GHZ)

(d_{Limit} = 3 m)

Frequency	AF R&S HL562	Corr.	cable loss 1 (inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit)	cable loss 4 (to receiver)	distance corr. (-20 dB/ decade)	d_{Limit} (meas. distance (limit)	d_{used} (meas. distance (used)
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB	m	m
30	18.6	0.6	0.29	0.04	0.23	0.02	0.0	3	3
50	6.0	0.9	0.39	0.09	0.32	0.08	0.0	3	3
100	9.7	1.2	0.56	0.14	0.47	0.08	0.0	3	3
150	7.9	1.6	0.73	0.20	0.59	0.12	0.0	3	3
200	7.6	1.9	0.84	0.21	0.70	0.11	0.0	3	3
250	9.5	2.1	0.98	0.24	0.80	0.13	0.0	3	3
300	11.0	2.3	1.04	0.26	0.89	0.15	0.0	3	3
350	12.4	2.6	1.18	0.31	0.96	0.13	0.0	3	3
400	13.6	2.9	1.28	0.35	1.03	0.19	0.0	3	3
450	14.7	3.1	1.39	0.38	1.11	0.22	0.0	3	3
500	15.6	3.2	1.44	0.39	1.20	0.19	0.0	3	3
550	16.3	3.5	1.55	0.46	1.24	0.23	0.0	3	3
600	17.2	3.5	1.59	0.43	1.29	0.23	0.0	3	3
650	18.1	3.6	1.67	0.34	1.35	0.22	0.0	3	3
700	18.5	3.6	1.67	0.42	1.41	0.15	0.0	3	3
750	19.1	4.1	1.87	0.54	1.46	0.25	0.0	3	3
800	19.6	4.1	1.90	0.46	1.51	0.25	0.0	3	3
850	20.1	4.4	1.99	0.60	1.56	0.27	0.0	3	3
900	20.8	4.7	2.14	0.60	1.63	0.29	0.0	3	3
950	21.1	4.8	2.22	0.60	1.66	0.33	0.0	3	3
1000	21.6	4.9	2.23	0.61	1.71	0.30	0.0	3	3

(d_{Limit} = 10 m)

30	18.6	-9.9	0.29	0.04	0.23	0.02	-10.5	10	3
50	6.0	-9.6	0.39	0.09	0.32	0.08	-10.5	10	3
100	9.7	-9.2	0.56	0.14	0.47	0.08	-10.5	10	3
150	7.9	-8.8	0.73	0.20	0.59	0.12	-10.5	10	3
200	7.6	-8.6	0.84	0.21	0.70	0.11	-10.5	10	3
250	9.5	-8.3	0.98	0.24	0.80	0.13	-10.5	10	3
300	11.0	-8.1	1.04	0.26	0.89	0.15	-10.5	10	3
350	12.4	-7.9	1.18	0.31	0.96	0.13	-10.5	10	3
400	13.6	-7.6	1.28	0.35	1.03	0.19	-10.5	10	3
450	14.7	-7.4	1.39	0.38	1.11	0.22	-10.5	10	3
500	15.6	-7.2	1.44	0.39	1.20	0.19	-10.5	10	3
550	16.3	-7.0	1.55	0.46	1.24	0.23	-10.5	10	3
600	17.2	-6.9	1.59	0.43	1.29	0.23	-10.5	10	3
650	18.1	-6.9	1.67	0.34	1.35	0.22	-10.5	10	3
700	18.5	-6.8	1.67	0.42	1.41	0.15	-10.5	10	3
750	19.1	-6.3	1.87	0.54	1.46	0.25	-10.5	10	3
800	19.6	-6.3	1.90	0.46	1.51	0.25	-10.5	10	3
850	20.1	-6.0	1.99	0.60	1.56	0.27	-10.5	10	3
900	20.8	-5.8	2.14	0.60	1.63	0.29	-10.5	10	3
950	21.1	-5.6	2.22	0.60	1.66	0.33	-10.5	10	3
1000	21.6	-5.6	2.23	0.61	1.71	0.30	-10.5	10	3

Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
distance correction = -20 * LOG (d_{Limit}/ d_{used})
Linear interpolation will be used for frequencies in between the values in the table.
Tables show an extract of values.

7.4 ANTENNA R&S HF907 (1 GHZ – 18 GHZ)

Frequency	AF R&S HF907	Corr.	cable loss 1 (relay + cable inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit, atten-uator & pre-amp)	cable loss 4 (to receiver)		
MHz	dB (1/m)	dB	dB	dB	dB	dB		
1000	24.4	-19.4	0.99	0.31	-21.51	0.79		
2000	28.5	-17.4	1.44	0.44	-20.63	1.38		
3000	31.0	-16.1	1.87	0.53	-19.85	1.33		
4000	33.1	-14.7	2.41	0.67	-19.13	1.31		
5000	34.4	-13.7	2.78	0.86	-18.71	1.40		
6000	34.7	-12.7	2.74	0.90	-17.83	1.47		
7000	35.6	-11.0	2.82	0.86	-16.19	1.46		

Frequency	AF R&S HF907	Corr.	cable loss 1 (relay inside chamber)	cable loss 2 (inside chamber)	cable loss 3 (outside chamber)	cable loss 4 (switch unit, atten-uator & pre-amp)	cable loss 5 (to receiver)	used for FCC 15.247
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB	
3000	31.0	-23.4	0.47	1.87	0.53	-27.58	1.33	
4000	33.1	-23.3	0.56	2.41	0.67	-28.23	1.31	
5000	34.4	-21.7	0.61	2.78	0.86	-27.35	1.40	
6000	34.7	-21.2	0.58	2.74	0.90	-26.89	1.47	
7000	35.6	-19.8	0.66	2.82	0.86	-25.58	1.46	

Frequency	AF R&S HF907	Corr.	cable loss 1 (relay inside chamber)	cable loss 2 (High Pass)	cable loss 3 (pre-amp)	cable loss 4 (inside chamber)	cable loss 5 (outside chamber)	cable loss 6 (to receiver)
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB	dB
7000	35.6	-57.3	0.56	1.28	-62.72	2.66	0.94	1.46
8000	36.3	-56.3	0.69	0.71	-61.49	2.84	1.00	1.53
9000	37.1	-55.3	0.68	0.65	-60.80	3.06	1.09	1.60
10000	37.5	-56.2	0.70	0.54	-61.91	3.28	1.20	1.67
11000	37.5	-55.3	0.80	0.61	-61.40	3.43	1.27	1.70
12000	37.6	-53.7	0.84	0.42	-59.70	3.53	1.26	1.73
13000	38.2	-53.5	0.83	0.44	-59.81	3.75	1.32	1.83
14000	39.9	-56.3	0.91	0.53	-63.03	3.91	1.40	1.77
15000	40.9	-54.1	0.98	0.54	-61.05	4.02	1.44	1.83
16000	41.3	-54.1	1.23	0.49	-61.51	4.17	1.51	1.85
17000	42.8	-54.4	1.36	0.76	-62.36	4.34	1.53	2.00
18000	44.2	-54.7	1.70	0.53	-62.88	4.41	1.55	1.91

Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
Linear interpolation will be used for frequencies in between the values in the table.
Tables show an extract of values.

7.5 ANTENNA EMCO 3160-09 (18 GHZ – 26.5 GHZ)

Frequency	AF EMCO 3160-09	Corr.	cable loss 1 (inside chamber)	cable loss 2 (pre-amp)	cable loss 3 (inside chamber)	cable loss 4 (switch unit)	cable loss 5 (to receiver)
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB
18000	40.2	-23.5	0.72	-35.85	6.20	2.81	2.65
18500	40.2	-23.2	0.69	-35.71	6.46	2.76	2.59
19000	40.2	-22.0	0.76	-35.44	6.69	3.15	2.79
19500	40.3	-21.3	0.74	-35.07	7.04	3.11	2.91
20000	40.3	-20.3	0.72	-34.49	7.30	3.07	3.05
20500	40.3	-19.9	0.78	-34.46	7.48	3.12	3.15
21000	40.3	-19.1	0.87	-34.07	7.61	3.20	3.33
21500	40.3	-19.1	0.90	-33.96	7.47	3.28	3.19
22000	40.3	-18.7	0.89	-33.57	7.34	3.35	3.28
22500	40.4	-19.0	0.87	-33.66	7.06	3.75	2.94
23000	40.4	-19.5	0.88	-33.75	6.92	3.77	2.70
23500	40.4	-19.3	0.90	-33.35	6.99	3.52	2.66
24000	40.4	-19.8	0.88	-33.99	6.88	3.88	2.58
24500	40.4	-19.5	0.91	-33.89	7.01	3.93	2.51
25000	40.4	-19.3	0.88	-33.00	6.72	3.96	2.14
25500	40.5	-20.4	0.89	-34.07	6.90	3.66	2.22
26000	40.5	-21.3	0.86	-35.11	7.02	3.69	2.28
26500	40.5	-21.1	0.90	-35.20	7.15	3.91	2.36

Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
Linear interpolation will be used for frequencies in between the values in the table.
Table shows an extract of values.

7.6 ANTENNA EMCO 3160-10 (26.5 GHZ – 40 GHZ)

Frequency	AF EMCO 3160-10	Corr.	cable loss 1 (inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit)	cable loss 4 (to receiver)	distance corr. (-20 dB/ decade)	d_{Limit} (meas. distance (limit)	d_{used} (meas. distance (used)
GHz	dB (1/m)	dB	dB	dB	dB	dB	dB	m	m
26.5	43.4	-11.2	4.4				-9.5	3	1.0
27.0	43.4	-11.2	4.4				-9.5	3	1.0
28.0	43.4	-11.1	4.5				-9.5	3	1.0
29.0	43.5	-11.0	4.6				-9.5	3	1.0
30.0	43.5	-10.9	4.7				-9.5	3	1.0
31.0	43.5	-10.8	4.7				-9.5	3	1.0
32.0	43.5	-10.7	4.8				-9.5	3	1.0
33.0	43.6	-10.7	4.9				-9.5	3	1.0
34.0	43.6	-10.6	5.0				-9.5	3	1.0
35.0	43.6	-10.5	5.1				-9.5	3	1.0
36.0	43.6	-10.4	5.1				-9.5	3	1.0
37.0	43.7	-10.3	5.2				-9.5	3	1.0
38.0	43.7	-10.2	5.3				-9.5	3	1.0
39.0	43.7	-10.2	5.4				-9.5	3	1.0
40.0	43.8	-10.1	5.5				-9.5	3	1.0

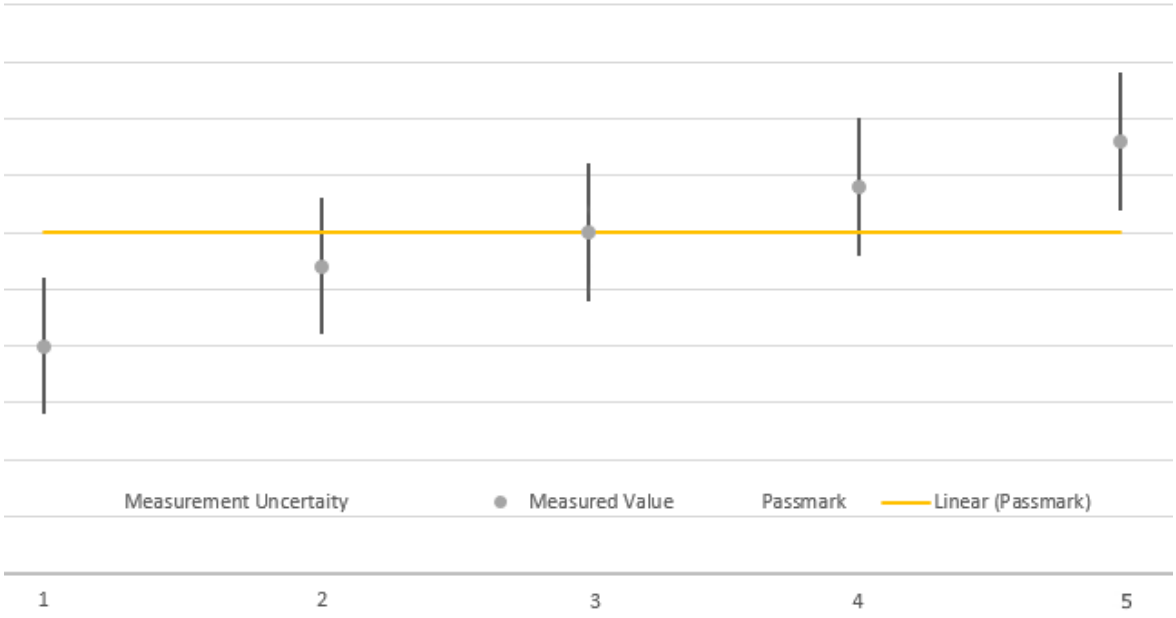
Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
Linear interpolation will be used for frequencies in between the values in the table.
distance correction = -20 * LOG (d_{Limit}/ d_{used})
Linear interpolation will be used for frequencies in between the values in the table.
Table shows an extract of values.

8 MEASUREMENT UNCERTAINTIES

Test Case(s)	Parameter	Uncertainty
- Field strength of spurious radiation	Field Strength	± 5.5 dB

The measurement uncertainties for all parameters are calculated with an expansion factor (coverage factor) k = 1.96. This means, that the true value is in the corresponding interval with a probability of 95 %.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	on pass mark	within pass mark	Passed
4	above pass mark	within pass mark	Failed
5	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.

9 PHOTO REPORT

Please see separate photo report.

10 ANNEX: SOFTWARE VERSION SAMPLE AF02

```
MSC-LDK LOL99_20240805_V1_14_0-7-gf066e6a built on Wed May 14 01:16:17 PM UTC 2025 by @docker
NXP i.MX Release Distro 6.6-scarthgap \n \l

LAYER meta-arm=mickledore-6.1.36-2.1.0-LOL99_20240731_V1_13_0-367-g58268ddc
LAYER meta-freescale-distro=mickledore-6.1.36-2.1.0-LOL99_20240731_V1_13_0-10-gb9d6a5d
LAYER meta-freescale=mickledore-6.1.36-2.1.0-LOL99_20240731_V1_13_0-383-gc4ef717d
LAYER meta-imx=e06f8574e9
LAYER meta-marvell-labtool=ed9c966-dirty
LAYER meta-msc-arm-extensions=LOL99_20240731_V1_13_0-20-g285d820
LAYER meta-msc-ldk-core=LOL99_20240805_V1_14_0-19-gd141a04
LAYER meta-msc-ldk-core-recipes=LOL99_20240805_V1_14_0-33-gc0a49ba
LAYER meta-msc-ldk-distro=68801c2
LAYER meta-msc-ldk-hwtests=LOL99_20240805_V1_14_0-8-gff226e5
LAYER meta-msc-ldk-hwtests-recipes=LOL99_20240805_V1_14_0-41-ge5d31f9
LAYER meta-msc-ldk-mscio=LOL99_20240805_V1_14_0-8-gaec2227
LAYER meta-openembedded=initial-29996-g4a7bb77f7
LAYER meta-qt5=mickledore-LOL99_20240731_V1_13_0-46-geb82841
LAYER meta-rat-wa112=4c81972
LAYER meta-secure-core-windriver=adbc1d9
LAYER meta-spb611-sdio-uart=c09a44a
LAYER msc-ldk-bsp-recipes=2038944-dirty
LAYER yocto=4.3_M1-3727-g59c3a90cf4
```

**********END OF TEST REPORT**********