

## PARTIAL TEST REPORT

Test report no.: 1-8514-24-01-08\_TR1-R02



### Testing laboratory

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**Accredited Testing Laboratory:**

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS).

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number:

D-PL-12047-01-00.

ISED Testing Laboratory Recognized Listing Number: DE0001

FCC designation number: DE0002

### Applicant

**Emerson Rosemount Tank Radar AB**

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435 33 Mölnlycke / SWEDEN

Phone: +46 3 13 37 01 77

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### Manufacturer

**Emerson Rosemount Tank Radar AB**

Layoutvägen 1

435 33 Mölnlycke / SWEDEN

### Test standard/s

FCC – Title 47 CFR Part 15      FCC – Title 47 of the Code of Federal Regulations, Chapter I, Part 15 – Radio frequency devices

RSS - 211      Level Probing Radar Equipment

For further applied test standards please refer to section 3 of this test report.

### Test Item

**Kind of test item:**      77 – 81 GHz Tank Level Probing Radar

**Model name:**      Rosemount 3408 Wireless Level Transmitter

**FCC ID:**      K8C3408W

**IC:**      2827A-3408W

**Frequency:**      77 GHz – 81 GHz

**Technology tested:**      FMCW Radar

**Antenna:**      Process Seal Antenna with PTFE Plate

**Power supply:**      7.2 V DC from 701PBKKF Black Power module

**Temperature range:**      -40°C to +85°C

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.

### Test report authorized:



Thomas Vogler  
Lab Manager  
Radio Labs

### Test performed:



Meheza Walla  
Lab Manager  
Radio Labs

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## 2 General information

### 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. cetecom advanced GmbH 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.

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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.

### 2.2 Application details

|                                    |            |
|------------------------------------|------------|
| Date of receipt of order:          | 2024-10-31 |
| Date of receipt of test item:      | 2025-01-13 |
| Start of test:*                    | 2025-01-20 |
| End of test:*                      | 2025-08-11 |
| Person(s) present during the test: | -/-        |

\*Date of each measurement, if not shown in the plot, can be requested. Dates are stored in the measurement software.

## 2.3 Involved test locations

☒ **Saarbruecken lab**  
Untertuerkheimer Str. 6-10  
66117 Saarbruecken  
Germany

☐ **Essen lab**  
Im Teelbruch 116  
45219 Essen  
Germany

## 2.4 Test laboratories sub-contracted

None

## 2.5 Laboratory listings and recognitions

|      | Saarbruecken | Essen        |
|------|--------------|--------------|
| FCC  | DE0002       | DE0003       |
| ISED | DE0001 3462C | DE0001 3462D |

### 3 Test standard/s, references and accreditations

| Test standard              | Date    | Description                                                                                     |
|----------------------------|---------|-------------------------------------------------------------------------------------------------|
| FCC - Title 47 CFR Part 15 |         | FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices |
| RSS - 211                  | 2015-03 | Level Probing Radar Equipment                                                                   |

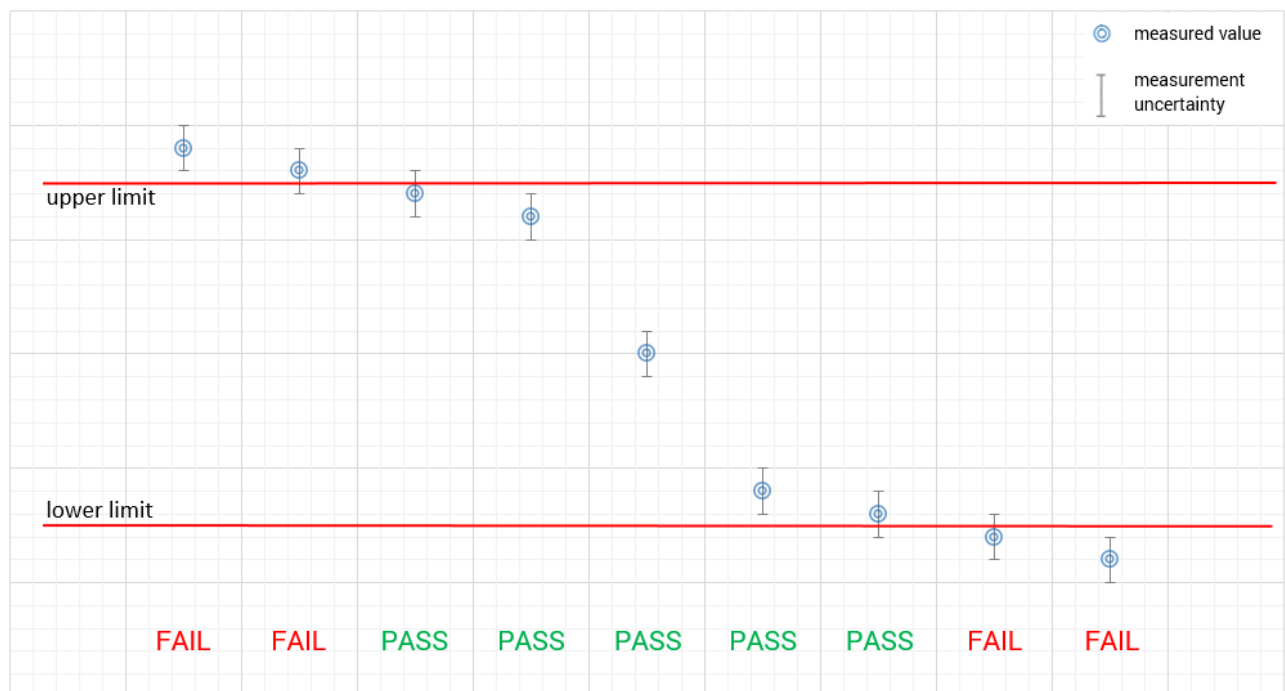
| Guidance         | Version | Description                                                                                                                                                         |
|------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANSI C63.4a-2017 | -/-     | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| ANSI C63.10-2020 | -/-     | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                                                                      |

#### 4 Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3.

The measurement uncertainty is mentioned in this test report, see chapter 9, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

measured value, measurement uncertainty, verdict



## 5 Test environment

|                           |   |                                     |                                                                                                                     |
|---------------------------|---|-------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Temperature               | : | $T_{nom}$<br>$T_{max}$<br>$T_{min}$ | +22 °C during room temperature tests<br>+50 °C during high temperature tests<br>-30 °C during low temperature tests |
| Relative humidity content | : |                                     | 49 %                                                                                                                |
| Barometric pressure       | : |                                     | 990 hPa to 1010 hPa                                                                                                 |
| Power supply              | : | $V_{nom}$                           | 7.2 V DC from 701PBKKF Black Power module                                                                           |

## 6 Test item

### 6.1 General description

|                     |   |                                                               |
|---------------------|---|---------------------------------------------------------------|
| Kind of test item   | : | 77 – 81 GHz Tank Level Probing Radar                          |
| Model name          | : | Rosemount 3408 Wireless Level Transmitter                     |
| HMN                 | : | -/-                                                           |
| PMN                 | : | Rosemount 3408 Wireless Level Transmitter                     |
| HVIN                | : | 3408TW1                                                       |
| FVIN                | : | -/-                                                           |
| S/N serial number   | : | Prototype                                                     |
| Hardware status     | : | Electronics Box: DP4;<br>Radio Module RM5801 Rev AB           |
| Software status     | : | Electronics Box: 1.A0 MAR1825;<br>Radio Module 5801 SW Rev 11 |
| Frequency band      | : | 77 GHz – 81 GHz                                               |
| Type of modulation  | : | FMCW                                                          |
| Number of channels: |   | 1                                                             |
| Antenna             | : | Process Seal Antenna with PTFE Plate                          |
| Power supply        | : | 7.2 V DC from 701PBKKF Black Power module                     |
| Temperature range   | : | -40°C to +85°C                                                |

### 6.2 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup and EUT photos are included in test report:

- 1-8514-24-01-01\_TR1-A101-R02 (External photographs of EUT)
- 1-8514-24-01-01\_TR1-A102-R02 (Internal photographs of EUT)
- 1-8514-24-01-01\_TR1-A103-R01 (Test set-up photographs)
- Note: The referenced photos show EUT delivered by the customer in this project, not necessarily the exact one used for the specific tests. EUT identification shown in the photos may differ.

Additional declarations (manufacturer's declarations, declarations of conformity, etc.):

- Blackbird-DE-0114\_Iss 3 (test instructions Lemur).pdf
- Blackbird-DE-0111\_Iss3.pdf

## 7 Description of the test setup

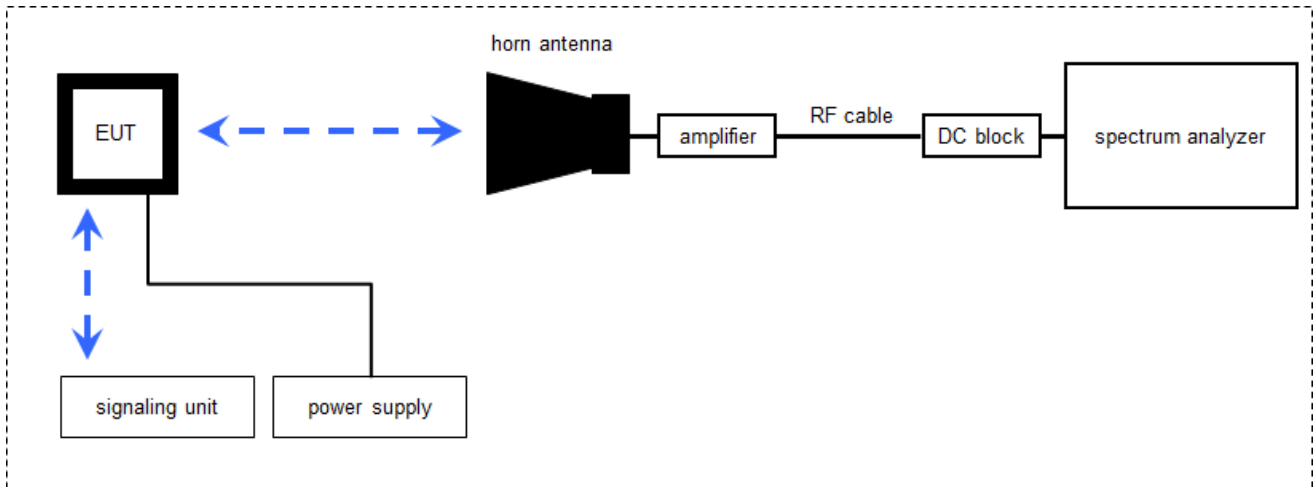
Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

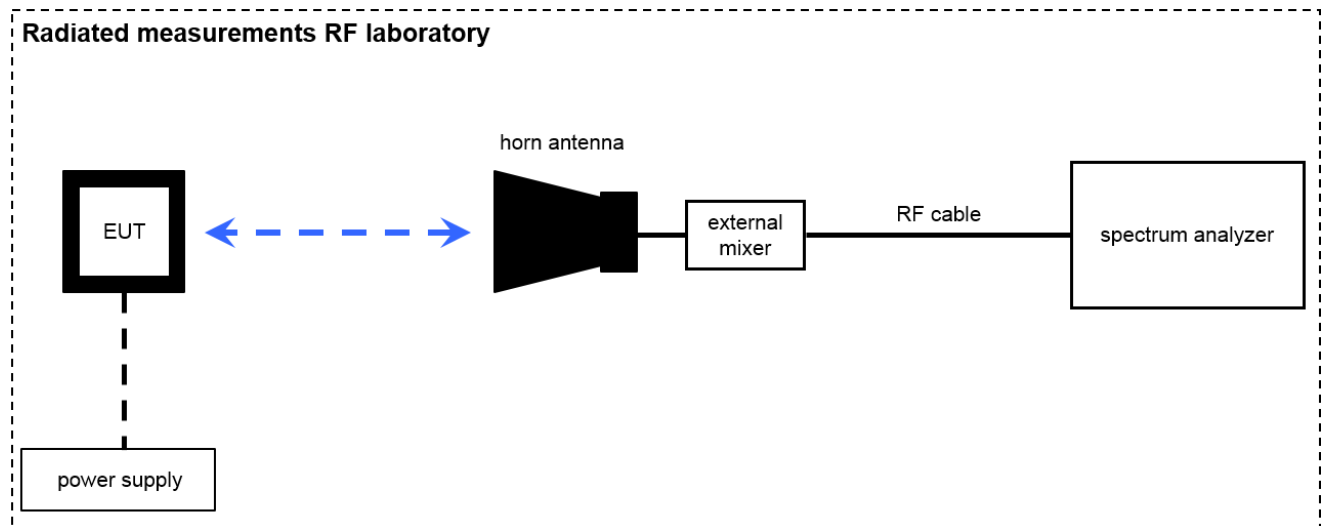
### **Agenda:** Kind of Calibration

|        |                                            |     |                                                      |
|--------|--------------------------------------------|-----|------------------------------------------------------|
| k/cal  | calibration / calibrated                   | EK  | limited calibration                                  |
| Ne/cnn | not required (k, ev, izw, zw not required) | zw  | cyclical maintenance (external cyclical maintenance) |
| Ev/chk | periodic self verification                 | izw | internal cyclical maintenance                        |
| Ve     | long-term stability recognized             | g   | blocked for accredited testing                       |
| vkl!   | Attention: extended calibration interval   |     |                                                      |
| NK!    | Attention: not calibrated                  | *)  | next calibration ordered / currently in progress     |
| cpu    | check prior usage                          |     |                                                      |

## 7.1 Radiated measurements > 18 GHz



## 7.2 Radiated measurements > 50/85 GHz



Measurement distance: horn antenna e.g. 75 cm

$$FS = UR + CA + AF$$

(FS-field strength; UR-voltage at the receiver; CA-loss signal path & distance correction; AF-antenna factor)

Example calculation:

$$FS \text{ [dB}\mu\text{V/m]} = 40.0 \text{ [dB}\mu\text{V/m]} + (-60.1) \text{ [dB]} + 36.74 \text{ [dB/m]} = 16.64 \text{ [dB}\mu\text{V/m]} \text{ (6.79 } \mu\text{V/m)}$$

$$OP = AV + D - G + CA$$

(OP-radiated output power; AV-analyzer value; D-free field attenuation of measurement distance;

G-antenna gain+amplifier gain; CA-loss signal path)

Example calculation:

$$OP \text{ [dBm]} = -59.0 \text{ [dBm]} + 44.0 \text{ [dB]} - 20.0 \text{ [dBi]} + 5.0 \text{ [dB]} = -30 \text{ [dBm]} \text{ (1 } \mu\text{W)}$$

Note: conversion loss of mixer is already included in analyzer value.

**Equipment table:**

| No. | Equipment                                      | Type                                                 | Manufacturer                                         | Serial No. | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------------------------------------------|------------------------------------------------------|------------------------------------------------------|------------|-----------|---------------------|------------------|------------------|
| 1   | Temperature Test Chamber                       | Temperature Test Chamber T-40/50                     | CTS Clima<br>Temperatur Systeme<br>GmbH / Hechingen  | 064023     | 300003540 | calchk              | 11.07.2024       | 11.07.2026       |
| 2   | Signal- and Spectrum Analyzer<br>2 Hz - 85 GHz | Signal- and Spectrum Analyzer<br>2 Hz - 85 GHz FSW85 | Rohde & Schwarz<br>Messgerätebau<br>GmbH / Memmingen | 101333     | 300005568 | cal                 | 27.09.2024       | 27.09.2025       |
| 3   | Signal- and Spectrum Analyzer<br>2 Hz - 50 GHz | Signal- and Spectrum Analyzer<br>2 Hz - 50 GHz FSW50 | Rohde & Schwarz<br>Messgerätebau<br>GmbH / Memmingen | 101560     | 300006179 | cal                 | 27.12.2024       | 31.12.2025       |
| 4   | Broadband LNA<br>18-50 GHz                     | Broadband LNA 18-50<br>GHz CBL18503070PN             | CERNEX                                               | 25240      | 300004948 | chk                 | 22.04.2024       | 22.04.2026       |
| 5   | Std. Gain Horn Antenna<br>49.9-75.8 GHz        | Std. Gain Horn Antenna 2524-20<br>49.9-75.8 GHz      | Flann                                                | *          | 300001983 | cnn                 | -/-              | -/-              |
| 6   | Std. Gain Horn Antenna<br>33.0-50.1 GHz        | Std. Gain Horn Antenna 2324-20<br>33.0-50.1 GHz      | Flann                                                | 57         | 400000683 | cnn                 | -/-              | -/-              |
| 7   | Harmonic Mixer 3-Port, 50-75 GHz               | Harmonic Mixer FS-Z75<br>3-Port, 50-75 GHz           | Rohde & Schwarz<br>Messgerätebau<br>GmbH / Memmingen | 101578     | 300005788 | cal                 | 11.05.2025       | 31.03.2026       |

## 8 Sequence of testing

### 8.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

#### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, it is placed on a table with 0.8 m height.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

#### Premeasurement\*

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1 m.
- At each turntable position the analyzer sweeps with positive-peak detector to find the maximum of all emissions.

#### Final measurement

- Identified emissions during the pre-measurement are maximized by the software by rotating the turntable from 0° to 360°.
- Loop antenna is rotated about its vertical axis for maximum response at each azimuth about the EUT. (For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT)
- The final measurement is done in the position (turntable and elevation) causing the highest emissions with quasi-peak (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. A plot with the graph of the premeasurement and the limit is stored.

\*)Note: The sequence will be repeated three times with different EUT orientations.

## 8.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 10 m or 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 3 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

### Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position  $\pm 45^\circ$  and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

### 8.3 Sequence of testing radiated spurious 1 GHz to 18 GHz

#### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

#### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector to find the maximum of all emissions.

#### Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

## 8.4 Sequence of testing radiated spurious above 18 GHz

### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet.
- The measurement distance is as appropriate (e.g. 0.5 m).
- The EUT is set into operation.

### Premeasurement

- The test antenna is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.

### Final measurement

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.

## 8.5 Sequence of testing radiated spurious above 50 GHz with external mixers

### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet.
- The measurement distance is as appropriate for far field (e.g. 0.25 m).
- The EUT is set into operation.

### Premeasurement

- The test antenna with external mixer is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.
- Caution is taken to reduce the possible overloading of the external mixer.

### Final measurement

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- As external mixers may generate false images care is taken to ensure that any emission measured by the spectrum analyzer does indeed originate in the EUT. Signal identification feature of spectrum analyzer is used to eliminate false mixer images (i.e., it is not the fundamental emission or a harmonic falling precisely at the measured frequency).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.

## 9 Measurement uncertainty

| Test case                                                          | Uncertainty                                               |
|--------------------------------------------------------------------|-----------------------------------------------------------|
| Equivalent isotropically radiated power (e.i.r.p.)                 | Conducted value $\pm 1$ dB<br>Radiated value $\pm 3.5$ dB |
| Permitted range of operating frequencies                           | $\pm 100$ kHz                                             |
| Conducted unwanted emissions in the spurious domain (up to 18 GHz) | $\pm 1$ dB                                                |
| Radiated unwanted emissions in the spurious domain (up to 18 GHz)  | $\pm 3.5$ dB                                              |
| Conducted unwanted emissions in the spurious domain (18 to 40 GHz) | $\pm 4$ dB                                                |
| Radiated unwanted emissions in the spurious domain (18 to 40 GHz)  | $\pm 4$ dB                                                |
| Conducted unwanted emissions in the spurious domain (40 to 50 GHz) | $\pm 4.5$ dB                                              |
| Radiated unwanted emissions in the spurious domain (40 to 50 GHz)  | $\pm 4.5$ dB                                              |
| Conducted unwanted emissions in the spurious domain (above 50 GHz) | $\pm 5$ dB                                                |
| Radiated unwanted emissions in the spurious domain (above 50 GHz)  | $\pm 5$ dB                                                |
| DC and low frequency voltages                                      | $\pm 3$ %                                                 |
| Temperature                                                        | $\pm 1$ °C                                                |
| Humidity                                                           | $\pm 3$ %                                                 |

## 10 Far field consideration for measurements above 18 GHz

### Far field distance calculation:

$$D_{ff} = 2 \times D^2 / \lambda$$

with

$D_{ff}$  Far field distance  
 $D$  Antenna dimension  
 $\lambda$  wavelength

### Spurious emission measurements:

| Antenna frequency range in GHz | Highest measured frequency in GHz | D in cm | $\lambda$ in cm | $D_{ff}$ in cm |
|--------------------------------|-----------------------------------|---------|-----------------|----------------|
| 18 - 26.5                      | 26.5                              | 3.4     | 1.13            | 20.44          |
| 26.5 - 40                      | 40                                | 2.2     | 0.75            | 12.91          |
| 40 - 50                        | 50                                | 2.77    | 0.60            | 25.58          |
| 50 - 75                        | 75                                | 1.85    | 0.40            | 17.11          |
| 75 - 110                       | 110                               | 1.24    | 0.27            | 11.28          |
| 90 - 140                       | 140                               | 1.02    | 0.22            | 9.72           |
| 110 - 170                      | 170                               | 0.85    | 0.18            | 8.19           |
| 140 - 220                      | 220                               | 0.68    | 0.14            | 6.78           |
| 220 - 325                      | 325                               | 0.43    | 0.09            | 4.01           |
| 325 - 500                      | 500                               | 0.26    | 0.06            | 2.25           |

## 11 Measurement results

### 11.1 Summary

|                                     |                                                                                                                                  |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | No deviations from the technical specifications were ascertained                                                                 |
| <input type="checkbox"/>            | There were deviations from the technical specifications ascertained                                                              |
| <input checked="" type="checkbox"/> | <b>This test report is only a partial test report.<br/>The content and verdict of the performed test cases are listed below.</b> |

| TC identifier | Description             | verdict   | date       | Remark |
|---------------|-------------------------|-----------|------------|--------|
| RF-Testing    | 47 CFR Part 15 / RS-211 | see below | 2025-09-09 | -/-    |

| Test Specification Clause        | Test Case                                          | Temperature Conditions | Power Source Voltages | C                                   | NC                       | NA                       | NP                       | Results  |
|----------------------------------|----------------------------------------------------|------------------------|-----------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|----------|
| §15.209<br>RSS-Gen<br>6.13 / 8.9 | Radiated emissions limits,<br>general requirements | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | complies |
| §15.109<br>RSS-Gen<br>6.13 / 8.9 | Radiated emissions limits                          | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | complies |

As the FCC has approved EMERSON's suggestion mentioned in the document "Blackbird-DE-0111\_Iss3.pdf", only delta measurements were performed to show compliance with the report 1-3693/21-01-04.pdf.

**Note:** C = Compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

## 11.2 Additional comments

### Reference documents:

- Blackbird-DE-0114\_Iss 3 (test instructions Lemur).pdf
- Blackbird-DE-0111\_Iss3.pdf

### Special test descriptions:

- Blackbird-DE-0114\_Iss 3 (test instructions Lemur).pdf

### Configuration descriptions:

- Blackbird-DE-0114\_Iss 3 (test instructions Lemur).pdf
- For information, the delivered devices have a cycle time of approx. 650 ms.

### Stop-Modes:

In addition to the normal operation mode (NM), Stop-Modes (SM) are used in accordance with CFR 47 Part §15.31 (c) & (m), in which the frequency sweep is stopped at the following positions in the range of operation:

- Stop-Mode, low frequency: 77.28 GHz
- Stop-Mode, middle frequency: 79.00 GHz
- Stop-Mode, high frequency: 80.92 GHz
- Refer to customer documentation: "Blackbird-DE-0114\_Iss 3 (test instructions Lemur).pdf"

### 1.2 Setting "semi" CW (Stop mode)

To configure the transmitter to a very small bandwidth (to emulate CW/Stop mode, the following settings may be used.

For center frequency: (Fc=79.0 GHz):

|                                  |                                    |    |   |
|----------------------------------|------------------------------------|----|---|
| <b>PM_Sweep</b>                  |                                    |    |   |
| PM_Sweep-SweepMode               | <input type="text" value="1"/>     | na | < |
| PM_Sweep-SweepMode1_StartFreqGHz | <input type="text" value="78.97"/> | na | < |
| PM_Sweep-SweepMode1_StopFreqGHz  | <input type="text" value="79.03"/> | na | < |

For low frequency (Fc=77.28 GHz):

|                                  |                                    |    |   |
|----------------------------------|------------------------------------|----|---|
| PM_Sweep-SweepMode1_StartFreqGHz | <input type="text" value="77.25"/> | na | < |
| PM_Sweep-SweepMode1_StopFreqGHz  | <input type="text" value="77.31"/> | na | < |

For high frequency (Fc=80.92 GHz):

|                                  |                                    |    |   |
|----------------------------------|------------------------------------|----|---|
| PM_Sweep-SweepMode1_StartFreqGHz | <input type="text" value="80.89"/> | na | < |
| PM_Sweep-SweepMode1_StopFreqGHz  | <input type="text" value="80.95"/> | na | < |

### Associated equipment (AE):

- AE1: USB Dongle (Used to set the EUT stopped mode)
- AE2: PC

### 11.3 Unwanted emissions limit (transmitter)

#### Description:

§15.209

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table below.

#### Measurement parameters:

Resolution bandwidth: 100 kHz / 1 MHz  
 Video bandwidth:  $\geq$  resolution bandwidth  
 Detector: Quasi Peak / Average (RMS)  
 Trace: Max hold

#### Limits:

| FCC §15.209 / RSS-Gen chapter 6.13 - 8.9      |                                    |                          |
|-----------------------------------------------|------------------------------------|--------------------------|
| Field strength of the harmonics and spurious. |                                    |                          |
| Frequency (MHz)                               | Field strength ( $\mu\text{V/m}$ ) | Measurement distance (m) |
| 0.009 – 0.490                                 | 2400/F(kHz)                        | 300                      |
| 0.490 – 1.705                                 | 24000/F(kHz)                       | 30                       |
| 1.705 – 30                                    | 30 (29.5 dB $\mu\text{V/m}$ )      | 30                       |
| 30 – 88                                       | 100 (40 dB $\mu\text{V/m}$ )       | 3                        |
| 88 – 216                                      | 150 (43.5 dB $\mu\text{V/m}$ )     | 3                        |
| 216 – 960                                     | 200 (46 dB $\mu\text{V/m}$ )       | 3                        |
| >960                                          | 500 (54 dB $\mu\text{V/m}$ )       | 3                        |

#### Results:

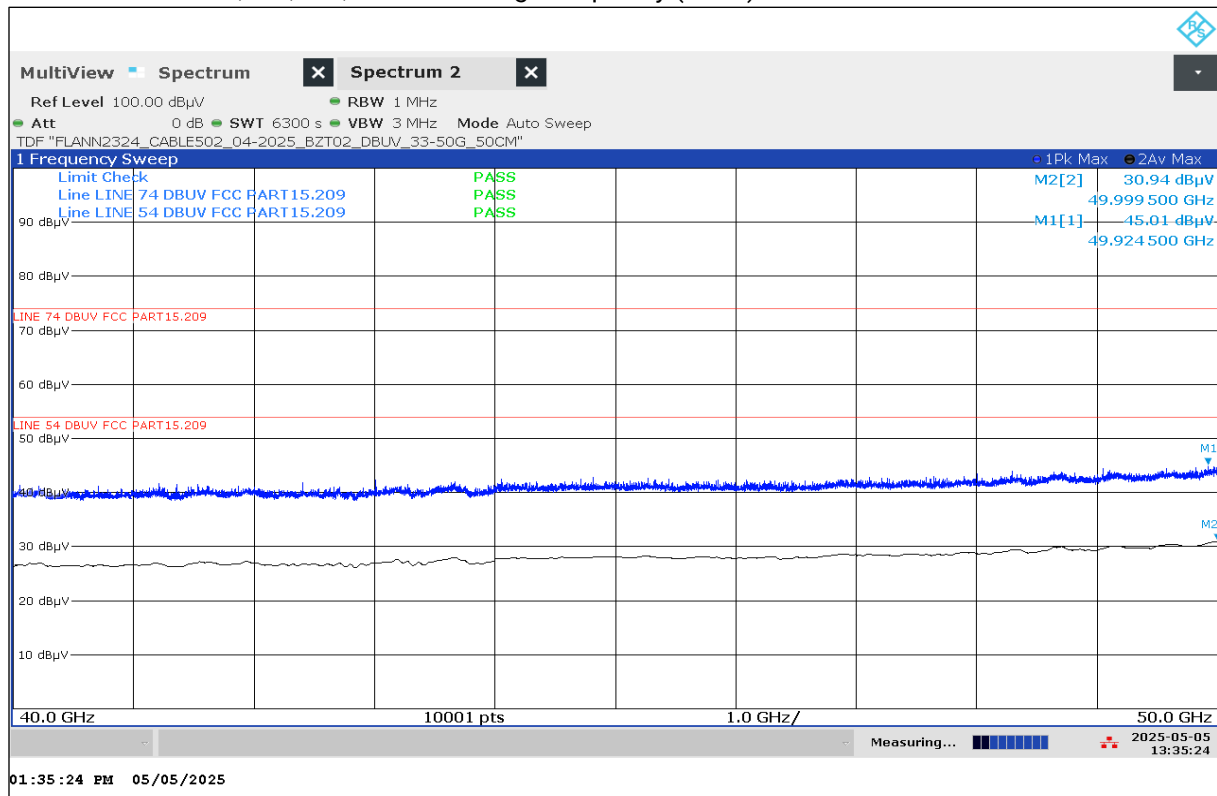
##### SM:

| Frequency [GHz]                                                                             | Detector       | Bandwidth [MHz] | Level [dB $\mu\text{V/m}$ ] | Limit [dB $\mu\text{V/m}$ ] | Margin [dB] |
|---------------------------------------------------------------------------------------------|----------------|-----------------|-----------------------------|-----------------------------|-------------|
| 73.40                                                                                       | Peak           | 1.0             | 56.69                       | 74.0                        | 17.31       |
| 73.13                                                                                       | Linear Average | 1.0             | 43.15                       | 54.0                        | 10.85       |
| Please refer to the following plots for more information on the level of spurious emissions |                |                 |                             |                             |             |

##### NM:

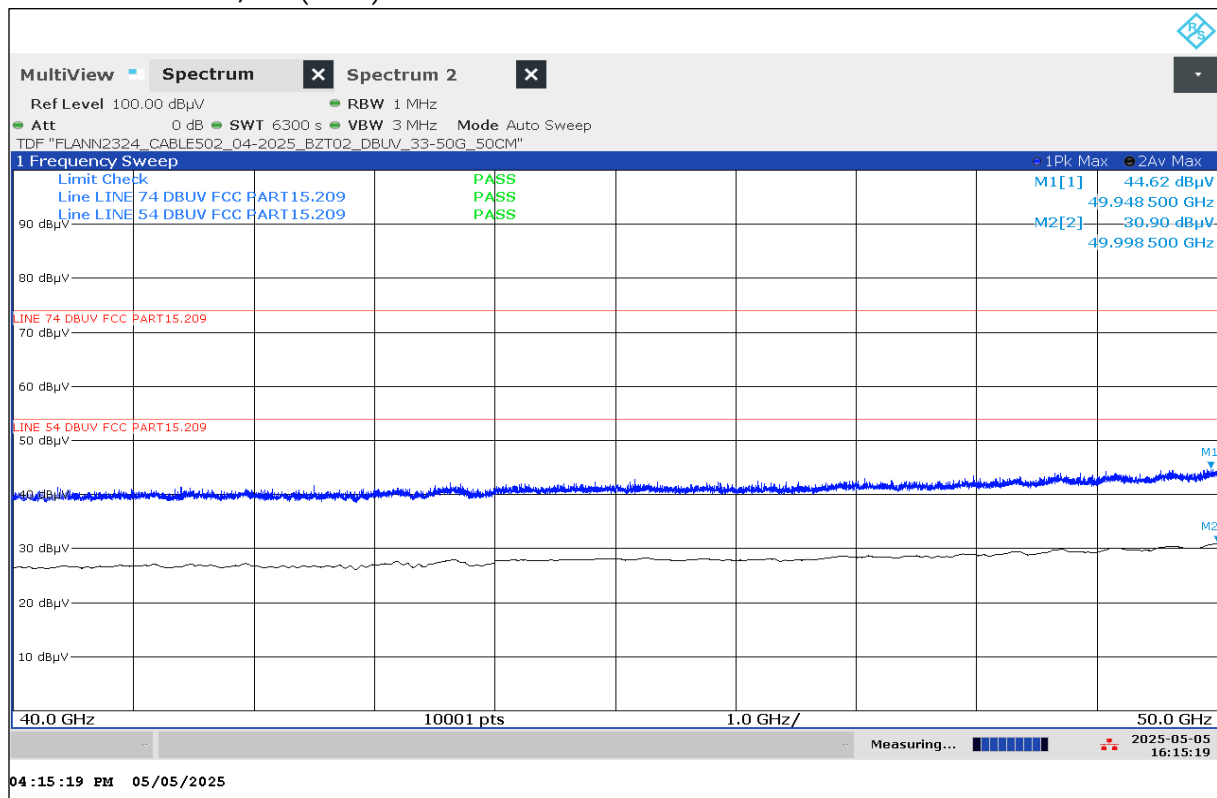
| Frequency [GHz]                                                                             | Detector       | Bandwidth [MHz] | Level [dB $\mu\text{V/m}$ ] | Limit [dB $\mu\text{V/m}$ ] | Margin [dB] |
|---------------------------------------------------------------------------------------------|----------------|-----------------|-----------------------------|-----------------------------|-------------|
| 73.00                                                                                       | Peak           | 1.0             | 57.24                       | 74.0                        | 16.76       |
| 73.04                                                                                       | Linear Average | 1.0             | 43.52                       | 54.0                        | 10.48       |
| Please refer to the following plots for more information on the level of spurious emissions |                |                 |                             |                             |             |

Plot 1: 40 GHz – 50 GHz, SM, low, middle and high frequency (TLPR)

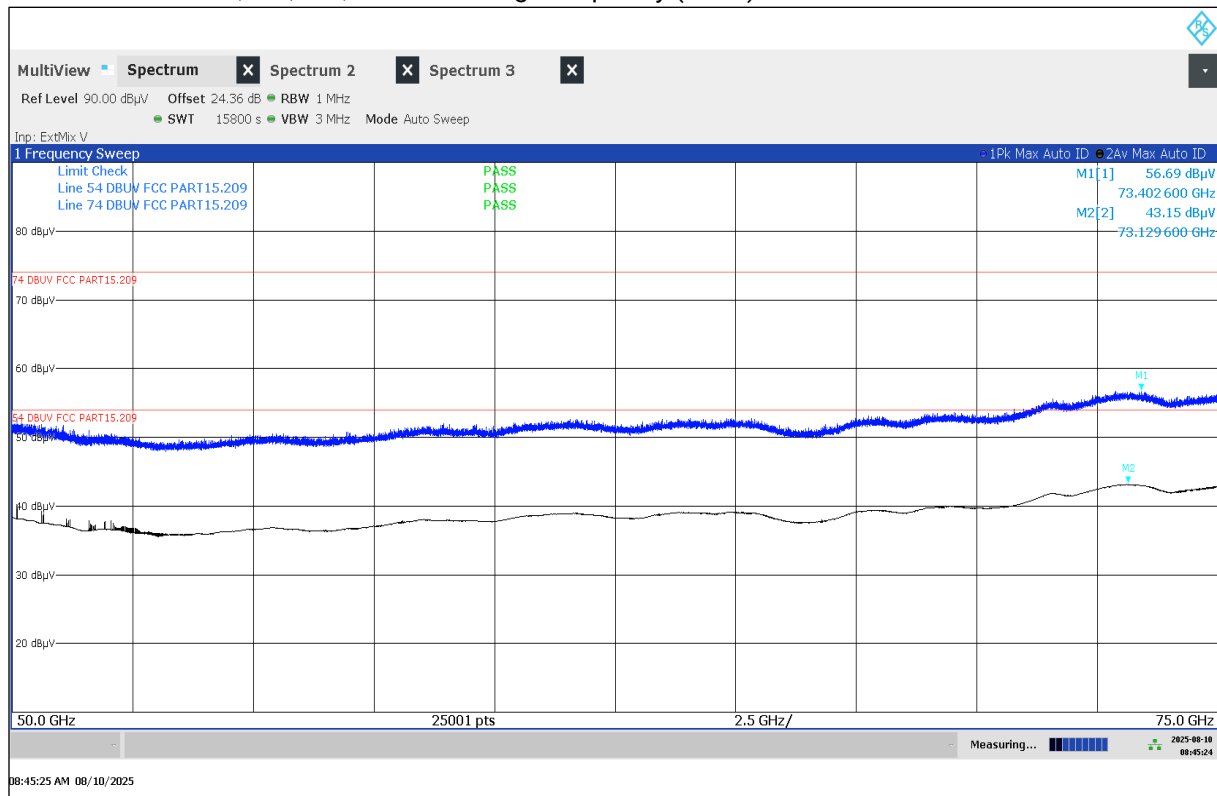


Note: The 3 SM frequencies were tested and the max hold was recorded.

### Plot 2: 40 GHz – 50 GHz, NM (TLPR)

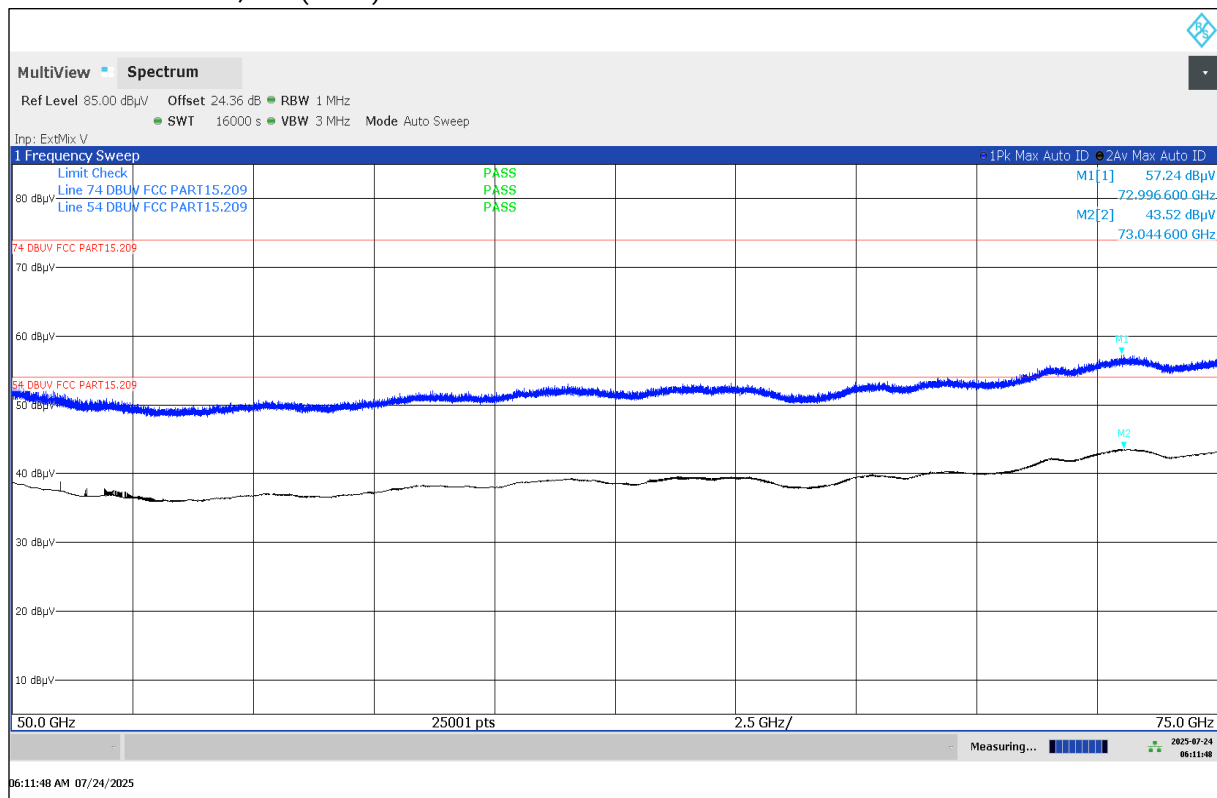


Plot 3: 50 GHz – 75 GHz, SM, low, middle and high frequency (TLPR)



Note: The 3 SM frequencies were tested and the max hold was recorded.

Plot 4: 50 GHz – 75 GHz, NM (TLPR)



## 12 Glossary

|                        |                                                    |
|------------------------|----------------------------------------------------|
| <b>EUT</b>             | Equipment under test                               |
| <b>DUT</b>             | Device under test                                  |
| <b>UUT</b>             | Unit under test                                    |
| <b>GUE</b>             | GNSS User Equipment                                |
| <b>ETSI</b>            | European Telecommunications Standards Institute    |
| <b>EN</b>              | European Standard                                  |
| <b>FCC</b>             | Federal Communications Commission                  |
| <b>FCC ID</b>          | Company Identifier at FCC                          |
| <b>IC</b>              | Industry Canada                                    |
| <b>PMN</b>             | Product marketing name                             |
| <b>HMN</b>             | Host marketing name                                |
| <b>HVIN</b>            | Hardware version identification number             |
| <b>FVIN</b>            | Firmware version identification number             |
| <b>EMC</b>             | Electromagnetic Compatibility                      |
| <b>HW</b>              | Hardware                                           |
| <b>SW</b>              | Software                                           |
| <b>Inv. No.</b>        | Inventory number                                   |
| <b>S/N or SN</b>       | Serial number                                      |
| <b>C</b>               | Compliant                                          |
| <b>NC</b>              | Not compliant                                      |
| <b>NA</b>              | Not applicable                                     |
| <b>NP</b>              | Not performed                                      |
| <b>PP</b>              | Positive peak                                      |
| <b>QP</b>              | Quasi peak                                         |
| <b>AVG</b>             | Average                                            |
| <b>OC</b>              | Operating channel                                  |
| <b>OCW</b>             | Operating channel bandwidth                        |
| <b>OBW</b>             | Occupied bandwidth                                 |
| <b>OOB</b>             | Out of band                                        |
| <b>DFS</b>             | Dynamic frequency selection                        |
| <b>CAC</b>             | Channel availability check                         |
| <b>OP</b>              | Occupancy period                                   |
| <b>NOP</b>             | Non occupancy period                               |
| <b>DC</b>              | Duty cycle                                         |
| <b>PER</b>             | Packet error rate                                  |
| <b>CW</b>              | Clean wave                                         |
| <b>MC</b>              | Modulated carrier                                  |
| <b>WLAN</b>            | Wireless local area network                        |
| <b>RLAN</b>            | Radio local area network                           |
| <b>DSSS</b>            | Dynamic sequence spread spectrum                   |
| <b>OFDM</b>            | Orthogonal frequency division multiplexing         |
| <b>FHSS</b>            | Frequency hopping spread spectrum                  |
| <b>GNSS</b>            | Global Navigation Satellite System                 |
| <b>C/N<sub>0</sub></b> | Carrier to noise-density ratio, expressed in dB-Hz |

13 Document history

| Version | Applied changes                      | Date of release |
|---------|--------------------------------------|-----------------|
| R01     | Initial release                      | 2025-08-25      |
| R02     | 6.2 Additional information (Updated) | 2025-09-09      |

##### END OF TEST REPORT #####