

|                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                        |                                                                                    |                                                                     |                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------|
| <b>Prüfbericht-Nr.:</b><br>Test report no.:                                                                                                                                                                                                                                                                                                                                                                 | <b>SE24P27W-002</b>                                                    | <b>Auftrags-Nr.:</b><br>Order no.:                                                 | 290100495                                                           | Seite 1 von 53<br>Page 1 of 53           |
| <b>Kunden-Referenz-Nr.:</b><br>Client reference no.:                                                                                                                                                                                                                                                                                                                                                        | 1774198                                                                | <b>Auftragsdatum:</b><br>Order date:                                               | 2023.10.25                                                          |                                          |
| <b>Auftraggeber:</b><br>Client:                                                                                                                                                                                                                                                                                                                                                                             | IKEA of Sweden AB                                                      |                                                                                    |                                                                     |                                          |
| <b>Prüfgegenstand:</b><br>Test item:                                                                                                                                                                                                                                                                                                                                                                        | Hub for smart products                                                 |                                                                                    |                                                                     |                                          |
| <b>Bezeichnung / Typ-Nr.:</b><br>Identification / Type no.:                                                                                                                                                                                                                                                                                                                                                 | DIRIGERA / E2315 / FCC ID: FHO-E2315                                   |                                                                                    |                                                                     |                                          |
| <b>Auftrags-Inhalt:</b><br>Order content:                                                                                                                                                                                                                                                                                                                                                                   | Accredited testing                                                     |                                                                                    |                                                                     |                                          |
| <b>Prüfgrundlage:</b><br>Test specification:                                                                                                                                                                                                                                                                                                                                                                | FCC 47 CFR Part 15.247 with parts 15.207 & 15.209<br>ANSI C63.10: 2013 |                                                                                    |                                                                     |                                          |
| <b>Wareneingangsdatum:</b><br>Date of sample receipt:                                                                                                                                                                                                                                                                                                                                                       | 2023.12.06                                                             |                                                                                    |                                                                     |                                          |
| <b>Prüfmuster-Nr.:</b><br>Test sample no.:                                                                                                                                                                                                                                                                                                                                                                  | See section 2.3                                                        |                                                                                    |                                                                     |                                          |
| <b>Prüfzeitraum:</b><br>Testing period:                                                                                                                                                                                                                                                                                                                                                                     | 2023.12.15 - 2024.04.08                                                |                                                                                    |                                                                     |                                          |
| <b>Ort der Prüfung:</b><br>Place of testing:                                                                                                                                                                                                                                                                                                                                                                | Lund, Sweden                                                           |                                                                                    |                                                                     |                                          |
| <b>Prüflaboratorium:</b><br>Testing laboratory:                                                                                                                                                                                                                                                                                                                                                             | TÜV Rheinland Sweden                                                   |                                                                                    |                                                                     |                                          |
| <b>Prüfergebnis*:</b><br>Test result*:                                                                                                                                                                                                                                                                                                                                                                      | Pass                                                                   |                                                                                    |                                                                     |                                          |
| <b>überprüft von:</b><br>reviewed by:                                                                                                                                                                                                                                                                                                                                                                       | <b>genehmigt von:</b><br>authorized by:                                |                                                                                    |                                                                     |                                          |
| <b>Datum: 2024.05.13</b><br>Date:                                                                                                                                                                                                                                                                                                                                                                           | <b>Datum: 2024.05.13</b><br>Date:                                      |                                                                                    |                                                                     |                                          |
| <b>Stellung / Position:</b>                                                                                                                                                                                                                                                                                                                                                                                 | <b>Test Engineer</b>                                                   | <b>Stellung / Position:</b>                                                        | <b>Lab Manager</b>                                                  |                                          |
| <b>Sonstiges / Other:</b>                                                                                                                                                                                                                                                                                                                                                                                   |                                                                        |                                                                                    |                                                                     |                                          |
| <b>Zustand des Prüfgegenstandes bei Anlieferung:</b><br>Condition of the test item at delivery:                                                                                                                                                                                                                                                                                                             |                                                                        | <b>Prüfmuster vollständig und unbeschädigt</b><br>Test item complete and undamaged |                                                                     |                                          |
| * Legende:                                                                                                                                                                                                                                                                                                                                                                                                  | 1 = sehr gut<br>P(ass) = entspricht o.g. Prüfgrundlage(n)              | 2 = gut<br>F(ail) = entspricht nicht o.g. Prüfgrundlage(n)                         | 3 = befriedigend<br>F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | 4 = ausreichend<br>N/A = nicht anwendbar |
| * Legend:                                                                                                                                                                                                                                                                                                                                                                                                   | 1 = very good<br>P(ass) = passed a.m. test specification(s)            | 2 = good<br>F(ail) = failed a.m. test specification(s)                             | 3 = satisfactory<br>F(ail) = failed a.m. test specification(s)      | 4 = sufficient<br>N/A = not applicable   |
| 5 = mangelhaft<br>N/T = nicht getestet<br>5 = poor<br>N/T = not tested                                                                                                                                                                                                                                                                                                                                      |                                                                        |                                                                                    |                                                                     |                                          |
| <p><b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b></p> <p><i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts.</i></p> |                                                                        |                                                                                    |                                                                     |                                          |

## Revision History

| REVISION                                                       | DATE       | REMARKS        | AUTHOR       |
|----------------------------------------------------------------|------------|----------------|--------------|
| 001                                                            | 2024.04.15 | First release  | Maria Nyltun |
| 002                                                            | 2024.05.13 | Second release | Maria Nyltun |
|                                                                |            |                |              |
| Note: Latest revision report will replace all previous reports |            |                |              |
| This report based on FCC Part 15.247 Template version 1.4      |            |                |              |

## Summary of Test Results

| FCC 47 CFR Rule Part | Test Description                                          | Applicability | Report Section | RESULT | REMARKS                    |
|----------------------|-----------------------------------------------------------|---------------|----------------|--------|----------------------------|
| 15.207               | AC Power Line Conducted Emissions (Intentional Radiators) | YES           | 4.1            | PASS   |                            |
| 15.209               | Radiated Emissions (Intentional Radiators)                | YES           | 4.2            | PASS   |                            |
| 15.247 (d)           | Antenna Conducted Emissions                               | NO            | 4.3            | N/A    | Radiated testing performed |
| 15.247 (d)           | Band Edge Compliance (Authorized Band)                    | YES           | 4.4            | PASS   |                            |
| 15.247 (d)           | Band Edge Compliance (Restricted Band)                    | YES           | 4.5            | PASS   |                            |
| 15.247 (a)(1)        | 20dB Bandwidth                                            | NO            | 4.6            | N/A    | ZigBee is non-hopping      |
| 15.247 (a)(1)        | Carrier (Hopping Channel) Separation                      | NO            | 4.7            | N/A    | ZigBee is non-hopping      |
| 15.247 (a)(1)        | Number of Hopping Channels                                | NO            | 4.8            | N/A    | ZigBee is non-hopping      |
| 15.247 (a)(1)        | Time of Occupancy (Dwell Time)                            | NO            | 4.9            | N/A    | ZigBee is non-hopping      |
| 15.247 (a)(2)        | 6dB Bandwidth & 99% Bandwidth                             | YES           | 4.10           | PASS   |                            |
| 15.247 (b)           | Peak Conducted Output Power                               | YES           | 4.11           | PASS   |                            |
| 15.247 (e)           | Power Spectral Density                                    | YES           | 4.12           | PASS   |                            |

Possible test case verdicts:

- |                                                |                       |
|------------------------------------------------|-----------------------|
| - Test case does not apply to the test object: | N/A                   |
| - Test object complies with the requirement:   | PASS or COMPLIANT     |
| - Test object does not meet the requirement:   | FAIL or NOT COMPLIANT |
| - Test case not performed on the test object:  | N.P.                  |

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## 1. GENERAL INFORMATION

### 1.1 Test Site

|                                     |                         |
|-------------------------------------|-------------------------|
| Test Facility:                      | TÜV Rheinland Sweden AB |
| Address:                            | Mobilvägen 10           |
|                                     | 223 62 Lund             |
|                                     | Sweden                  |
|                                     |                         |
| Swedac Registration Number:         | 10325                   |
| FCC Test Firm Registration Number:  | 517458                  |
| ISED Test Site Registration Number: | 24753                   |

### 1.2 Client Information

|                            |                                                                                                        |
|----------------------------|--------------------------------------------------------------------------------------------------------|
| Company Name:              | IKEA of Sweden AB                                                                                      |
| Address:                   | Tulpanvägen 8                                                                                          |
|                            | 343 34 Älmhult                                                                                         |
|                            | Sweden                                                                                                 |
|                            |                                                                                                        |
| Contact Person:            | Gurudeep Manjulgud Devraj                                                                              |
| Contact e-Mail / Telephone | <a href="mailto:gurudeep.manjulgud.devraj@inter.ikea.com">gurudeep.manjulgud.devraj@inter.ikea.com</a> |

## 2. PRODUCT INFORMATION

### 2.1 General Description

|                                       |                                      |
|---------------------------------------|--------------------------------------|
| <b>Model name:</b>                    | DIRIGERA                             |
| <b>Manufacturer:</b>                  | IKEA of Sweden AB, SE-343 81 Älmhult |
| <b>Model number / Marketing name:</b> | E2315                                |
| <b>FCC ID:</b>                        | FHO-E2315                            |
| <b>Description:</b>                   | Hub for smart products               |
| <b>Ancillary Equipment:</b>           | See section 2.7                      |

The device incorporates two separate pre-certified modules:

- Silicon Labs MGM210L22F “No. 1” (FCC ID: QOQMGM210L) for Zigbee 802.15.4
- Silicon Labs MGM210L22F “No. 2” (FCC ID: QOQMGM210L) for Thread 802.15.4

Each module uses its own built-in antenna

### 2.2 Device Characteristics

|                                          |                                         |
|------------------------------------------|-----------------------------------------|
| <b>Type of Power Supply</b>              | USB Power Supply (via AC/DC Adapter)    |
| <b>Nominal Supply Voltage</b>            | 120V or 230V AC (Adapter) / 5V DC (USB) |
| <b>Supply Voltage Range</b>              | 100-240V AC                             |
| <b>Operating Temperature Range</b>       | 0°C - 40 °C                             |
| <b>Operating Air Humidity Range</b>      | -                                       |
| <b>Highest Internal Frequency Source</b> | 2480 MHz                                |

### 2.3 Test Samples

| EUT # | EUT ID         | Description         | Used For:                                 |
|-------|----------------|---------------------|-------------------------------------------|
| 1     | A003618316-004 | Standard Sample     | Conducted Emissions<br>Radiated Emissions |
| 2     | A003623398-001 | Standard Sample     | Radiated Emissions                        |
| 3     | A003618316-002 | DUT Conducted Radio | Conducted Radio                           |

## 2.4 Wireless Technologies and Bands Supported by the EUT

| Technology                              | Band    | Frequency Range (Tx) | Evaluation Performed* |
|-----------------------------------------|---------|----------------------|-----------------------|
| ZigBee 802.15.4<br>(MGM210L22F22F No.1) | 2.4 GHz | 2405 MHz – 2480 MHz  | YES                   |
| Thread 802.15.4<br>(MGM210L22F22F No.2) | 2.4 GHz | 2405 MHz – 2480 MHz  | NO                    |

\*This statement refers only to this report. Other wireless technologies may be covered by other reports.

## 2.5 Antenna Information

| Technology                           | Band    | Number of Antennas | Antenna Type(s)      | Gain (dBi) |
|--------------------------------------|---------|--------------------|----------------------|------------|
| ZigBee 802.15.4<br>(MGM210L22F No.1) | 2.4 GHz | 1                  | Inverted F PCB Trace | 0.50       |
| Thread 802.15.4<br>(MGM210L22F No.2) | 2.4 GHz | 1                  | Inverted F PCB Trace | 0.50       |

## 2.6 Wireless Technology Details

| Technology                        | Band    | Modulation Type(s) | No. of Channels | Channel Spacing | Adaptivity |
|-----------------------------------|---------|--------------------|-----------------|-----------------|------------|
| ZigBee 802.15.4<br>(MGM210L No.1) | 2.4 GHz | O-QPSK             | 16              | 5 MHz           | -          |
| Thread 802.15.4<br>(MGM210L No.2) | 2.4 GHz | O-QPSK             | 16              | 5 MHz           | -          |

## 2.7 Ancillary Equipment

| ID             | Description           | Manufacturer / Model | Hardware & Software Versions |
|----------------|-----------------------|----------------------|------------------------------|
| A003625200-005 | AC/DC Power supply 5W | -                    | -                            |
| A003618316-005 | USB cable             | -                    | -                            |
| A003618316-013 | Ethernet cable        | -                    | -                            |
| A003625200-001 | AC/DC Power supply 5W | -                    | -                            |
| A003623398-003 | USB cable             | -                    | -                            |
| A003623398-007 | Ethernet cable        | -                    | -                            |
| A003618316-002 | AC/DC Power supply 5W | -                    | -                            |
| A003618316-006 | USB cable             | -                    | -                            |
| A003618316-013 | Ethernet cable        | -                    | -                            |

## 2.8 EUT Diagrams

N/A

## 3. TEST METHODS

### 3.1 Test Standards

Testing was performed according to the following standards / references

| Standard          | Version | Description                                                                 |
|-------------------|---------|-----------------------------------------------------------------------------|
| FCC 47 CFR 15.247 | -       | Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz. |
| FCC 47 CFR 15.207 | -       | Conducted limits                                                            |
| FCC 47 CFR 15.209 | -       | Radiated emission limits; general requirements                              |

### 3.2 Additional references

The following standards / references were also considered for the testing

| Standard    | Version | Description                                                                                    |
|-------------|---------|------------------------------------------------------------------------------------------------|
| ANSI C63.10 | 2013    | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |

### 3.3 Limits

| FCC 47 CFR Rule Part | Test Description                                          | Limit Reference (FCC 47 CFR Reference)                 |
|----------------------|-----------------------------------------------------------|--------------------------------------------------------|
| 15.207               | AC Power Line Conducted Emissions (Intentional Radiators) | 15.207 (a)                                             |
| 15.209               | Radiated Emissions (Intentional Radiators)                | 15.209 (a)<br>*See Note 1                              |
| 15.247 (d)           | Out of Band Emissions                                     | 15.247 (d)                                             |
| 15.247 (d)           | Band Edge Compliance (Authorized Band)                    | 15.247 (d)                                             |
| 15.247 (d)           | Band Edge Compliance (Restricted Band)                    | 15.247 (d)                                             |
| 15.247 (a)(1)        | 20dB Bandwidth                                            | 15.247 (a)(1)                                          |
| 15.247 (a)(1)        | Carrier (Hopping Channel) Separation                      | 15.247 (a)(1)                                          |
| 15.247 (a)(1)        | Number of Hopping Channels                                | 15.247 (a)(1)                                          |
| 15.247 (a)(1)        | Time of Occupancy (Dwell Time)                            | 15.247 (a)(1)                                          |
| 15.247 (a)(2)        | 6dB & 99% Bandwidth                                       | 15.247 (a)(2)                                          |
| 15.247 (b)           | Peak Conducted Output Power                               | 15.247 (b)(1) [Hopping]<br>15.247 (b)(3) [Non-Hopping] |
| 15.247 (e)           | Power Spectral Density                                    | 15.247 (e)                                             |

Interpretation of the measurement results has been performed in accordance with ANSI C63.10 section 1.3

Compliance with the requirements has been based on the results of the measurements compared to the specified limits, not taking into account measurement instrumentation uncertainty.

Measurement Uncertainty figures are stated in section 6

#### Note 1

Radiated Emissions limits in the tables from 47 CFR sections 15.109 & 15.209 are presented in  $\mu\text{V/m}$ . Measurements on the test system are made in  $\text{dB}\mu\text{V/m}$ . To convert between these, the following adjustment is used:

$$\text{New Limit} = 20 \log \left( \frac{\text{Original Limit}}{10^6} \right) + 120$$

Example: from 15.209(a) the limit for 30MHz – 88MHz is  $100\mu\text{V/m}$  at 3m. This gives:

$$\text{New Limit} = 20 \log \left( \frac{100}{10^6} \right) + 120 = 40\text{dB}\mu\text{V/m at 3m}$$

Additionally, in some cases testing has been performed at distances other than those specified in the tables. When this has occurred, the limits have been adjusted in accordance with the requirements in 47 CFR 15.31, using an extrapolation factor of 40dB/decade at frequencies below 30MHz and 20dB/decade at or above 30MHz

Example: from 15.209(a) the limit for 1.705MHz – 30MHz is  $30\mu\text{V/m}$  (=29.54  $\text{dB}\mu\text{V/m}$ ) at 30m

$$\text{Limit@3m} = \text{Limit@30m} + 40 \log \left( \frac{30}{3} \right) = 29.54 + 40.00 = 69.54 \text{ dB}\mu\text{V/m at 3m}$$

Example: from 15.209(a) the limit for 1GHz – 18GHz is  $500\mu\text{V/m}$  (=53.98  $\text{dB}\mu\text{V/m}$ ) at 3m

$$\text{Limit@1m} = \text{Limit@3m} + 20 \log \left( \frac{3}{1} \right) = 53.98 + 9.54 = 63.52 \text{ dB}\mu\text{V/m at 1m}$$

### 3.4 Description of Test Methods and Equipment Setup

#### 3.4.1 General Description

Testing was performed in accordance with the various requirements of ANSI C63.4 and ANSI C63.10. Any deviations from the test methods are described in section 3.7

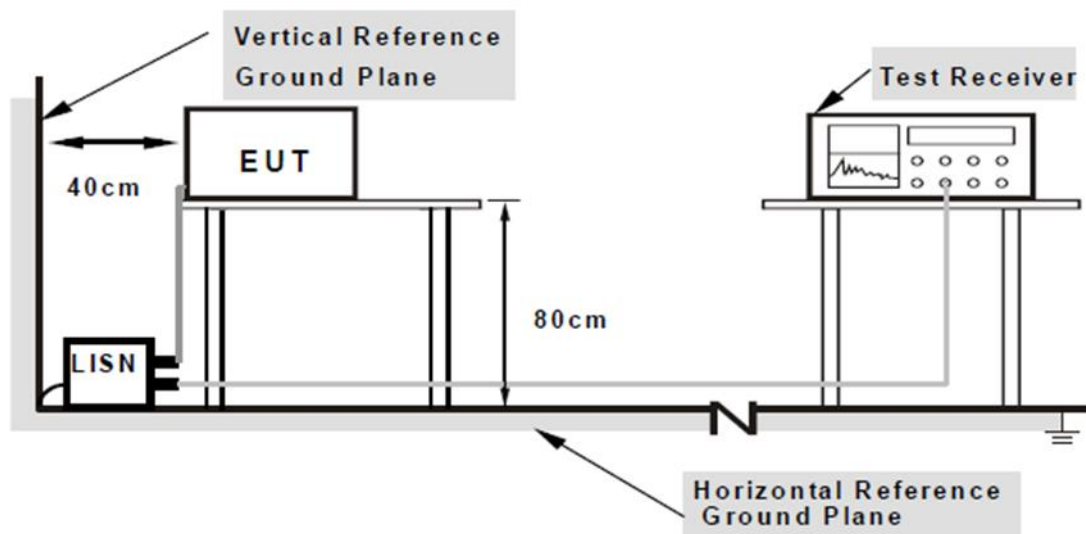
Where different arrangements of equipment were used for different types of measurements, these are tabulated in section 3.4.2 and details of each arrangement are included in subsequent sections

#### 3.4.2 Test Equipment Setup Used by Test Type

| FCC 47 CFR Rule Part | Test Description                                          | Test Equipment Used |
|----------------------|-----------------------------------------------------------|---------------------|
| 15.207               | AC Power Line Conducted Emissions (Intentional Radiators) | Conducted Emissions |
| 15.209               | Radiated Emissions (Intentional Radiators)                | SAC5                |
| 15.247 (d)           | Out of Band Emissions                                     | CTE                 |
| 15.247 (d)           | Band Edge Compliance (Authorized band)                    | CTE                 |
| 15.247 (d)           | Band Edge Compliance (Restricted band)                    | SAC 5               |
| 15.247 (a)(1)        | 20dB Bandwidth                                            | N/A                 |
| 15.247 (a)(1)        | Carrier (Hopping Channel) Separation                      | N/A                 |
| 15.247 (a)(1)        | Number of Hopping Channels                                | N/A                 |
| 15.247 (a)(1)        | Time of Occupancy (Dwell Time)                            | N/A                 |
| 15.247 (a)(2)        | 6dB & 99% Bandwidth                                       | CTE                 |
| 15.247 (b)           | Peak Conducted Output Power                               | CTE                 |
| 15.247 (e)           | Power Spectral Density                                    | CTE                 |

### 3.4.3 Test Equipment Setup – Conducted Emissions

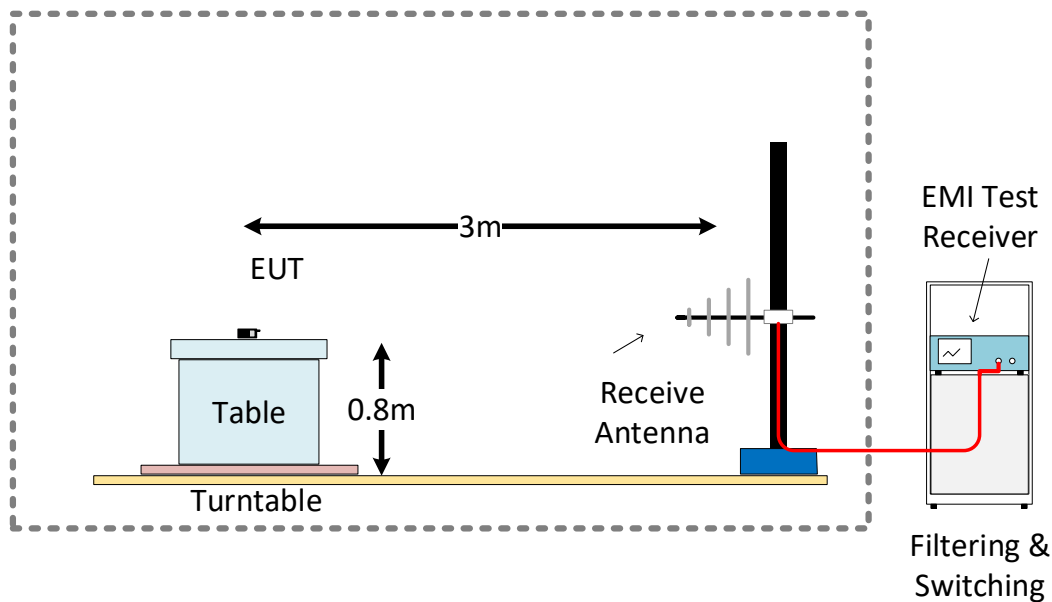
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The LISNs provide  $50\Omega/50\mu\text{H}$  of coupling impedance for the measuring instrument.
- The lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10 dB under the prescribed limits could not be reported.



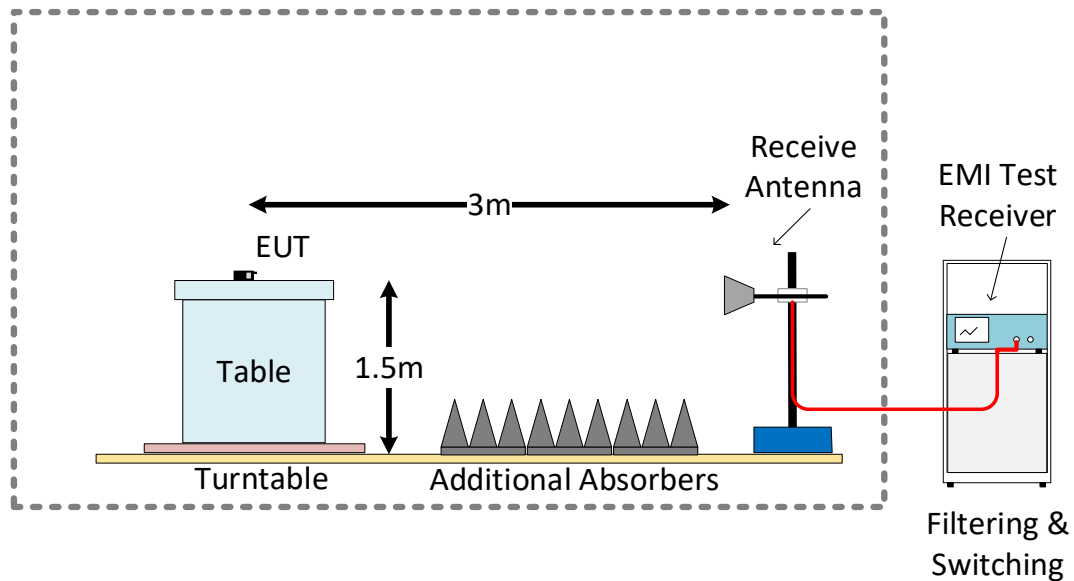
#### 3.4.4 Test Equipment Setup – SAC 5 (Radiated Emissions and Restricted Band Edge)

- For frequency range 30MHz-1GHz Log-Periodic Antenna was used. Antenna elevated from 100 cm from floor to 400 cm from floor, and was placed at 3 m from center of turntable in tilted position. The equipment under test (EUT) was placed at the middle of the turntable at 80 cm height from floor. The antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.
- For frequency range 1GHz-18GHz horn Antenna was used. Antenna elevated from 100 cm from floor to 200 cm from floor, and was placed at 3 m from center of turntable. The equipment under test (EUT) was placed at the middle of the turntable at 150 cm height from floor. The antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.
- For frequency range 18GHz-40GHz double horn Antenna was used. Antenna's height was adjusted to 150 cm from floor, and 1 m distance to center of turntable. The equipment under test (EUT) was placed at the middle of the turntable on at 150 cm height from floor.
- For all frequency ranges the turntable was rotated 360° for obtaining the maximum emission.

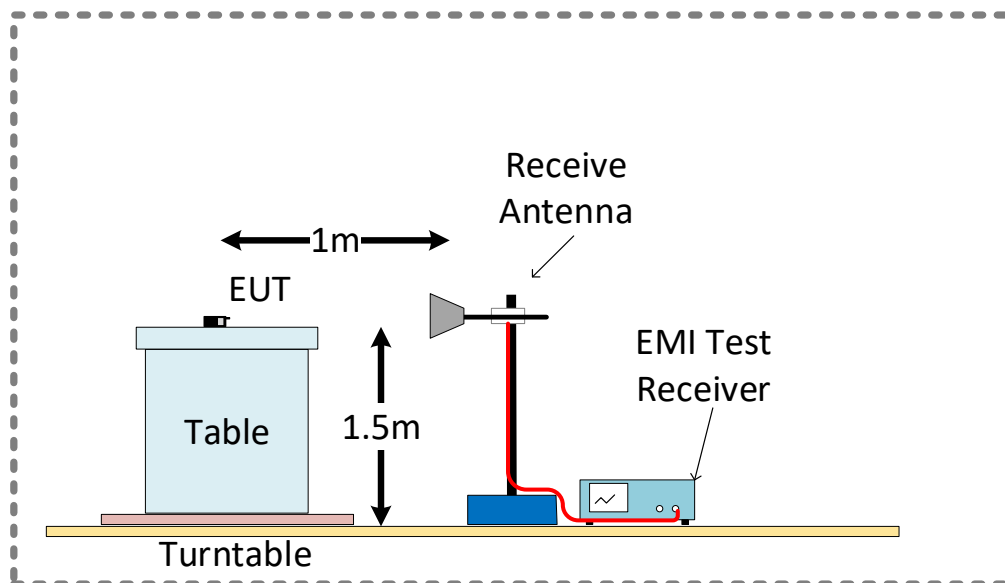
SAC 5 Test Setup Configuration 30MHz – 1GHz



**SAC 5 Test Setup Configuration 1GHz – 18GHz**



**SAC 5 Test Setup Configuration 18GHz – 40GHz**



### 3.5 EUT Configuration During Test

#### AC Power Line Conducted Emissions

For AC power line conducted emissions testing, the device was connected to the USB Charger and set to continuous transmit mode on the mid channel with appropriate modulation. A LAN cable was connected between the device and a laptop PC placed outside of the test area. Conducted emissions tests were run on the Mains AC connection to the charger. See test setup photographs for more detail.

#### Radiated Emissions

For radiated emissions testing, the device was connected to the USB Charger and set to continuous transmit mode on an appropriate channel, with appropriate modulation. A LAN cable was connected between the device and a laptop PC placed outside of the test area.

### 3.6 EUT Operation Modes

| Operation mode | Description                                                                               |
|----------------|-------------------------------------------------------------------------------------------|
| Continuous Tx  | The device was set to transmit continuously with an appropriate frequency and modulation. |

### 3.7 Deviations from the Test Standard

None.

### 3.8 Environmental Conditions

#### 3.8.1 Environmental Conditions – Conducted Emissions System

| Date       | Time  | Temperature (°C) | Relative Humidity (%) |
|------------|-------|------------------|-----------------------|
| 2024.01.17 | 09:16 | 20.6             | 22.7                  |

#### 3.8.2 Environmental Conditions – SAC5 (Radiated Emissions)

| Date       | Time  | Temperature (°C) | Relative Humidity (%) |
|------------|-------|------------------|-----------------------|
| 2023.12.15 | 08:50 | 19.5             | 41.5                  |
| 2023.12.18 | 08:06 | 19.8             | 39.6                  |
| 2023.12.28 | 09:20 | 20.6             | 33.0                  |
| 2023.12.29 | 08:45 | 21.5             | 32.4                  |
| 2024.01.02 | 15:01 | 21.9             | 29.0                  |
| 2024.01.05 | 08:52 | 18.1             | 28.4                  |
| 2024.01.11 | 11:38 | 20.5             | 25.0                  |
| 2024.01.12 | 10:20 | 20.3             | 31.7                  |
| 2024.01.13 | 14:23 | 18.9             | 31.0                  |
| 2024.01.15 | 09:30 | 19.2             | 29.3                  |
| 2024.01.17 | 09:14 | 18.6             | 29.6                  |

#### 3.8.3 Environmental Conditions – Conducted Measurements

| Date       | Time  | Temperature (°C) | Relative Humidity (%) |
|------------|-------|------------------|-----------------------|
| 2024.04.05 | 10:30 | 24.7             | 26.3                  |
| 2024.04.08 | 09:28 | 25.3             | 27.2                  |

## 4. TEST RESULTS

### 4.1 Test Results – AC Power Line Conducted Emissions (Intentional Transmitter)

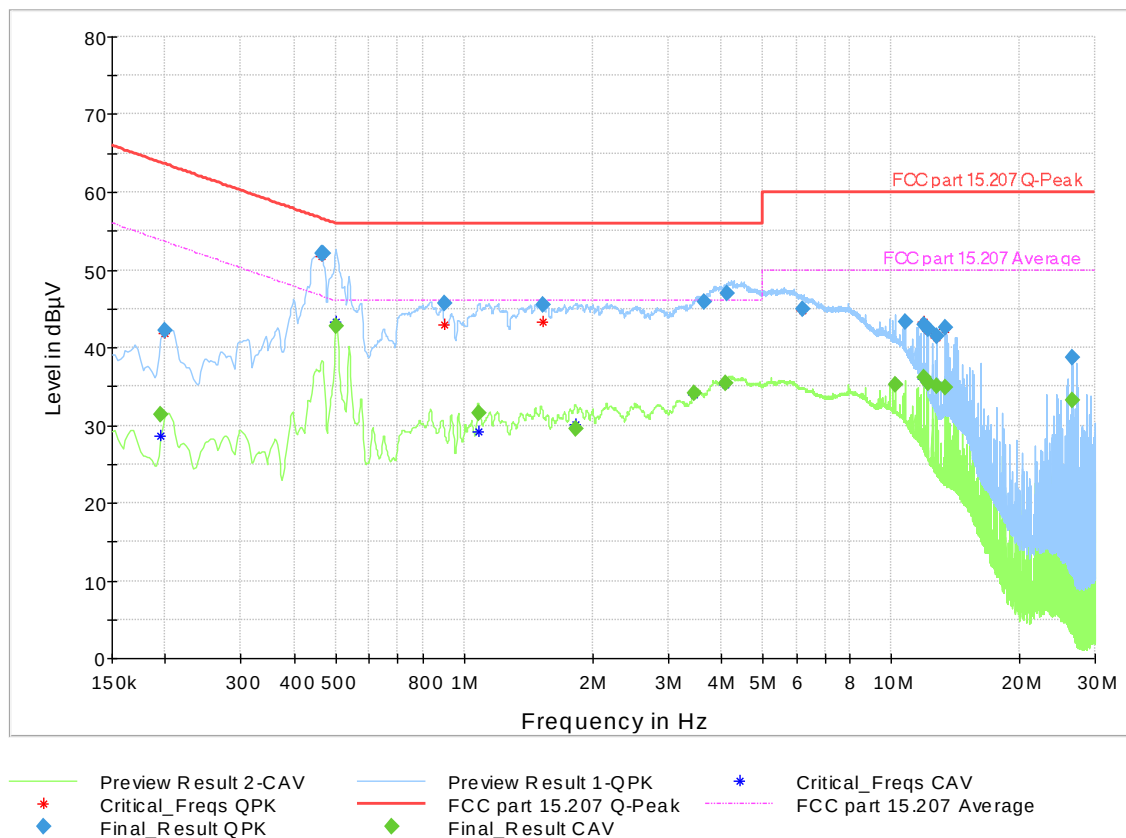
#### 4.1.1 AC Power Line Conducted Emissions (Intentional) – Test Summary

| Test Specification                            | FCC 47 CFR 15.207 (Part 15 Subpart C) |                  |                                  |
|-----------------------------------------------|---------------------------------------|------------------|----------------------------------|
| Test Engineer & Date                          | Fariborz Abasi                        | 2024.01.17       |                                  |
| EUT and Ancillary Equipment IDs               | A003618316-004                        | A003625200-001   | A003623398-003<br>A003623398-007 |
| EUT Operation Mode(s)                         | Continuous Tx                         |                  |                                  |
| EUT Wireless Configuration(s)                 | Zigbee                                |                  |                                  |
| EUT Hardware Configuration(s)                 | N/A                                   |                  |                                  |
| Overall Result                                | PASS                                  |                  |                                  |
| Test Parameter                                | Wireless Configuration                | Frequency Range  | Result*                          |
| AC Conducted Power Line Emissions – “N” Line  | Zigbee Mid Channel (O-QPSK 2445 MHz)  | 150 kHz – 30 MHz | PASS                             |
| AC Conducted Power Line Emissions – “L1” Line | Zigbee Mid Channel (O-QPSK 2445 MHz)  | 150 kHz – 30 MHz | PASS                             |

\* For detailed measurements, see tables and graphs in sections below

#### 4.1.2 AC Power Line Conducted Emissions (Intentional) – Test Details

|                            |                               |                  |
|----------------------------|-------------------------------|------------------|
| <b>Test</b>                | Conducted Emission            |                  |
| <b>Test mode condition</b> | ZigBee Mid Channel (2445 MHz) |                  |
| <b>Standard</b>            | 47 CFR Part 15.247 Class B    |                  |
| <b>EUT</b>                 | A003618316-004                |                  |
| <b>Ancillary Equipment</b> | A003625200-001                |                  |
|                            | A003623398-003                |                  |
|                            | A003623398-007                |                  |
| <b>Test Engineer</b>       | Fariborz Abasi                | Date: 2024.01.17 |



| Frequency<br>(MHz) | QuasiPeak<br>(dBµV) | CAverage<br>(dBµV) | Limit<br>(dBµV) | Margin<br>(dB) | Meas. Time<br>(ms) | Bandwidth<br>(kHz) | Line | Filter | Corr.<br>(dB) |
|--------------------|---------------------|--------------------|-----------------|----------------|--------------------|--------------------|------|--------|---------------|
| 0.195000           | ---                 | 31.36              | 53.82           | 22.46          | 1000.0             | 9.000              | L1   | ON     | 9.6           |
| 0.199500           | 42.13               | ---                | 63.63           | 21.50          | 1000.0             | 9.000              | L1   | ON     | 9.6           |
| 0.465000           | 52.18               | ---                | 56.60           | 4.42           | 1000.0             | 9.000              | L1   | ON     | 9.6           |
| 0.467250           | 52.15               | ---                | 56.56           | 4.41           | 1000.0             | 9.000              | L1   | ON     | 9.6           |
| 0.503250           | ---                 | 42.72              | 46.00           | 3.28           | 1000.0             | 9.000              | L1   | ON     | 9.6           |
| 0.897000           | 45.73               | ---                | 56.00           | 10.27          | 1000.0             | 9.000              | L1   | ON     | 9.6           |
| 1.086000           | ---                 | 31.58              | 46.00           | 14.42          | 1000.0             | 9.000              | L1   | ON     | 9.6           |
| 1.529250           | 45.49               | ---                | 56.00           | 10.51          | 1000.0             | 9.000              | L1   | ON     | 9.7           |
| 1.821750           | ---                 | 29.60              | 46.00           | 16.40          | 1000.0             | 9.000              | L1   | ON     | 9.7           |
| 3.444000           | ---                 | 34.20              | 46.00           | 11.80          | 1000.0             | 9.000              | L1   | ON     | 9.7           |
| 3.648750           | 45.93               | ---                | 56.00           | 10.07          | 1000.0             | 9.000              | L1   | ON     | 9.7           |
| 4.107750           | ---                 | 35.34              | 46.00           | 10.66          | 1000.0             | 9.000              | L1   | ON     | 9.7           |
| 4.114500           | 47.02               | ---                | 56.00           | 8.98           | 1000.0             | 9.000              | N    | ON     | 9.7           |
| 6.180000           | 45.03               | ---                | 60.00           | 14.97          | 1000.0             | 9.000              | L1   | ON     | 9.7           |
| 10.243500          | ---                 | 35.28              | 50.00           | 14.72          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 10.792500          | 43.29               | ---                | 60.00           | 16.71          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 11.892750          | 42.97               | ---                | 60.00           | 17.03          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 11.892750          | ---                 | 36.13              | 50.00           | 13.87          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 12.198750          | 42.44               | ---                | 60.00           | 17.56          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 12.198750          | ---                 | 35.50              | 50.00           | 14.50          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 12.747750          | ---                 | 35.08              | 50.00           | 14.92          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 12.747750          | 41.50               | ---                | 60.00           | 18.50          | 1000.0             | 9.000              | N    | ON     | 9.8           |
| 13.357500          | ---                 | 34.89              | 50.00           | 15.11          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 13.418250          | 42.55               | ---                | 60.00           | 17.45          | 1000.0             | 9.000              | N    | ON     | 9.8           |
| 26.610000          | ---                 | 33.20              | 50.00           | 16.80          | 1000.0             | 9.000              | L1   | ON     | 9.8           |
| 26.610000          | 38.79               | ---                | 60.00           | 21.21          | 1000.0             | 9.000              | L1   | ON     | 9.8           |

## 4.2 Test Results – Radiated Emissions (Intentional Transmitter)

### 4.2.1 Radiated Emissions (Intentional) – Test Summary

|                                        |  |                                       |                                                    |
|----------------------------------------|--|---------------------------------------|----------------------------------------------------|
| <b>Test Specification</b>              |  | FCC 47 CFR 15.209 (Part 15 Subpart C) |                                                    |
| <b>Test Engineer &amp; Date</b>        |  | Fariborz Abasi                        | 2023.12.15 – 2024.01.15                            |
| <b>EUT and Ancillary Equipment IDs</b> |  | A003623398-001<br>A003618316-004      | A003625200-001<br>A003623398-003<br>A003623398-007 |
| <b>EUT Operation Mode(s)</b>           |  | Continuous Tx                         |                                                    |
| <b>EUT Wireless Configuration(s)</b>   |  | Zigbee                                |                                                    |
| <b>EUT Hardware Configuration(s)</b>   |  | N/A                                   |                                                    |
| <b>Overall Result</b>                  |  | PASS                                  |                                                    |

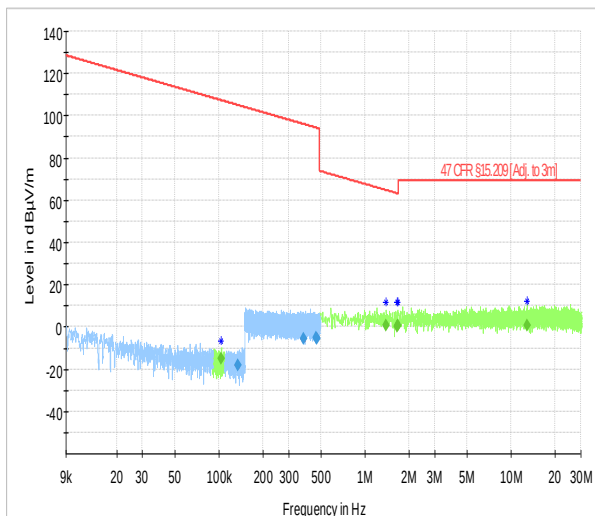
  

| Test Parameter     | Wireless Configuration                | Frequency Range | Result |
|--------------------|---------------------------------------|-----------------|--------|
| Radiated Emissions | Zigbee Low Channel (O-QPSK 2405 MHz)  | 9 kHz – 30 MHz  | PASS   |
| Radiated Emissions | Zigbee Low Channel (O-QPSK 2405 MHz)  | 30 MHz – 1 GHz  | PASS   |
| Radiated Emissions | Zigbee Low Channel (O-QPSK 2405 MHz)  | 1 GHz – 18 GHz  | PASS   |
| Radiated Emissions | Zigbee Low Channel (O-QPSK 2405 MHz)  | 18 GHz – 40 GHz | PASS   |
| Radiated Emissions | Zigbee Mid Channel (O-QPSK 2445 MHz)  | 9 kHz – 30 MHz  | PASS   |
| Radiated Emissions | ZigbeeMid Channel (O-QPSK 2445 MHz)   | 30 MHz – 1 GHz  | PASS   |
| Radiated Emissions | Zigbee Mid Channel (O-QPSK 2445 MHz)  | 1 GHz – 18 GHz  | PASS   |
| Radiated Emissions | Zigbee Mid Channel (O-QPSK 2445 MHz)  | 18 GHz – 40 GHz | PASS   |
| Radiated Emissions | Zigbee High Channel (O-QPSK 2480 MHz) | 9 kHz – 30 MHz  | PASS   |
| Radiated Emissions | Zigbee High Channel (O-QPSK 2480 MHz) | 30 MHz – 1 GHz  | PASS   |
| Radiated Emissions | Zigbee High Channel (O-QPSK 2480 MHz) | 1 GHz – 18 GHz  | PASS   |
| Radiated Emissions | Zigbee High Channel (O-QPSK 2480 MHz) | 18 GHz – 40 GHz | PASS   |

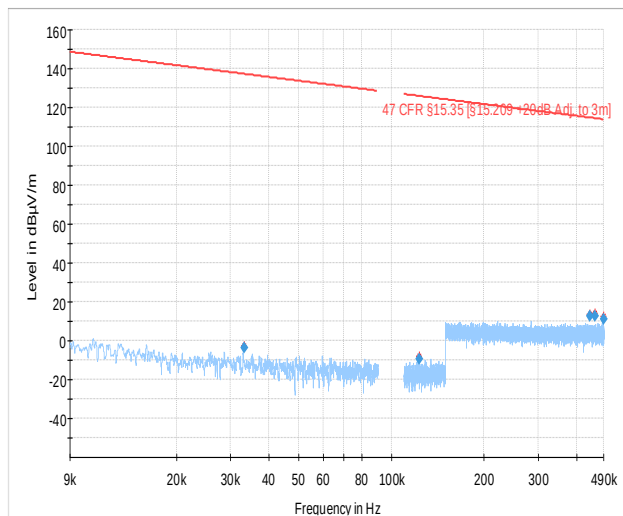
## 4.2.2 Radiated Emissions (Intentional) – Test Details

### Low Channel

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Low channel (2405 MHz) |                  |
| Antenna orientation | Loop Antenna Parallel to Axis  |                  |
| Sweep frequency     | 9kHz - 30 MHz                  |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003623398-001                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2024.01.05 |
| Chamber details     | Chamber: SAC 5                 |                  |



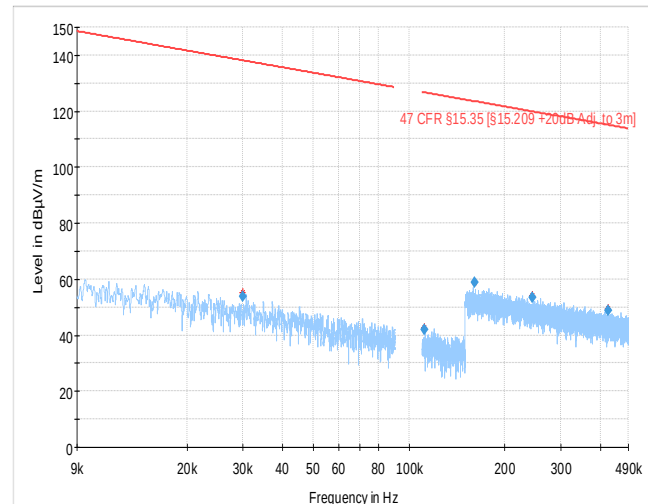
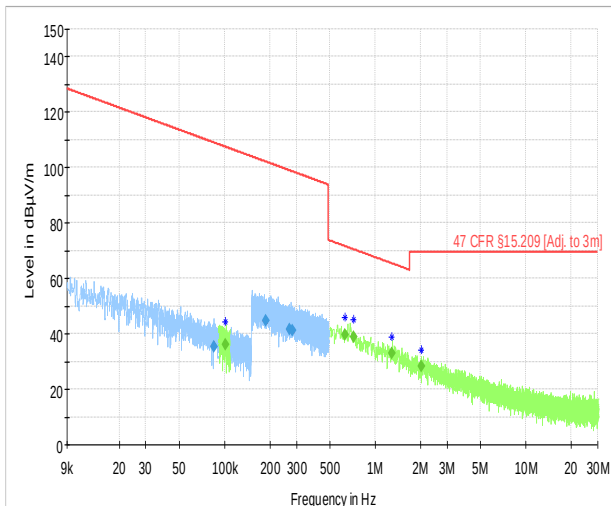
— Preview Result 2-PK+  
+ Critical\_Freqs PK+  
— 47 CFR §15.209 [Adj. to 3m]  
♦ Final\_Result QPK  
— Preview Result 1-AVG  
+ Critical\_Freqs AVG  
♦ Final\_Result AVG



— Preview Result 1-PK+  
— 47 CFR §15.35 [§15.209 +20dB Adj. to 3m]  
+ Critical\_Freqs PK+  
♦ Final\_Result PK+

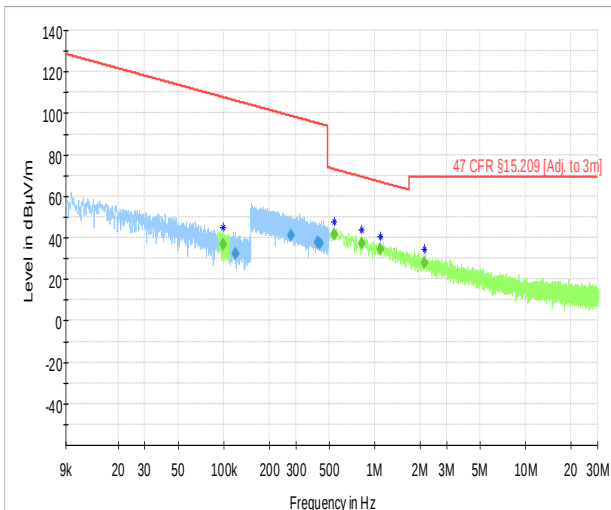
| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 0.103366        | ---              | -14.73             | 107.32         | 122.04      | 1000.0          | 0.200           | 100.0       | H   | 0.0           | 10.5         |
| 0.134300        | -18.23           | ---                | 105.04         | 123.27      | 1000.0          | 0.200           | 100.0       | H   | 205.0         | 10.5         |
| 0.380462        | -5.61            | ---                | 96.00          | 101.60      | 1000.0          | 9.000           | 100.0       | H   | 206.0         | 10.2         |
| 0.463471        | -5.15            | ---                | 94.28          | 99.44       | 1000.0          | 9.000           | 100.0       | H   | 0.0           | 10.3         |
| 0.468026        | -5.36            | ---                | 94.20          | 99.56       | 1000.0          | 9.000           | 100.0       | H   | -41.0         | 10.3         |
| 1.398963        | ---              | 0.56               | 64.69          | 64.12       | 1000.0          | 9.000           | 100.0       | H   | 135.0         | 10.8         |
| 1.659488        | ---              | 0.33               | 63.21          | 62.87       | 1000.0          | 9.000           | 100.0       | H   | 49.0          | 10.8         |
| 1.674330        | ---              | 0.49               | 63.13          | 62.64       | 1000.0          | 9.000           | 100.0       | H   | 25.0          | 10.8         |
| 12.841684       | ---              | 0.62               | 69.54          | 68.92       | 1000.0          | 9.000           | 100.0       | H   | 256.0         | 11.4         |

|                     |                                    |                  |
|---------------------|------------------------------------|------------------|
| Test mode condition | Zigbee, Low channel (2405 MHz)     |                  |
| Antenna orientation | Loop Antenna Perpendicular to Axis |                  |
| Sweep frequency     | 9kHz - 30 MHz                      |                  |
| Standard            | 47 CFR FCC Part 15 subpart C       |                  |
| EUT                 | A003623398-001                     |                  |
| Ancillary Equipment | A003625200-001                     |                  |
|                     | A003623398-003                     |                  |
|                     | A003623398-007                     |                  |
| Test Engineer       | Fariborz Abasi                     | Date: 2024.01.12 |
| Chamber details     | Chamber: SAC 5                     |                  |



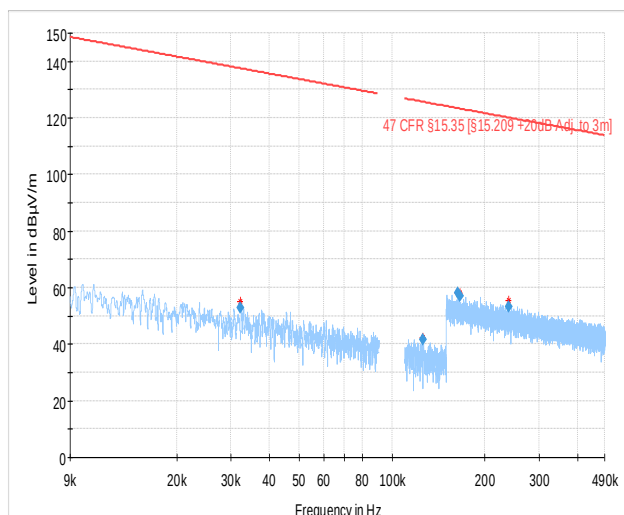
| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 0.084671        | 35.27            | ---                | 109.05         | 73.78       | 1000.0          | 0.200           | 100.0       | H   | 225.0         | 10.9       |
| 0.101094        | ---              | 36.08              | 107.51         | 71.43       | 1000.0          | 0.200           | 100.0       | H   | 257.0         | 10.5       |
| 0.188730        | 44.82            | ---                | 102.09         | 57.27       | 1000.0          | 9.000           | 100.0       | H   | 270.0         | 10.4       |
| 0.269679        | 41.59            | ---                | 98.99          | 57.40       | 1000.0          | 9.000           | 100.0       | H   | 245.0         | 10.3       |
| 0.283070        | 41.15            | ---                | 98.57          | 57.42       | 1000.0          | 9.000           | 100.0       | H   | 225.0         | 10.3       |
| 0.628597        | ---              | 39.77              | 71.64          | 31.87       | 1000.0          | 9.000           | 100.0       | H   | 135.0         | 10.5       |
| 0.718580        | ---              | 38.69              | 70.48          | 31.79       | 1000.0          | 9.000           | 100.0       | H   | 77.0          | 10.5       |
| 1.285631        | ---              | 32.79              | 65.42          | 32.63       | 1000.0          | 9.000           | 100.0       | H   | 49.0          | 10.8       |
| 2.019586        | ---              | 28.20              | 69.54          | 41.35       | 1000.0          | 9.000           | 100.0       | H   | 49.0          | 10.8       |

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Low channel (2405 MHz) |                  |
| Antenna orientation | Loop Antenna Parallel to floor |                  |
| Sweep frequency     | 9kHz - 30 MHz                  |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003623398-001                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2024.01.13 |
| Chamber details     | Chamber: SAC 5                 |                  |



Preview Result 2-PK+  
 Critical\_Freqs PK+  
 47 CFR §15.209 (Adj. to 3m)  
 Final\_Result QPK  
 QuasiPeak-QPK (Single)

Preview Result 1-AVG  
 Critical\_Freqs AVG  
 Final\_Result AVG  
 MaxPeak-PK+ (Single)  
 Average-AVG (Single)

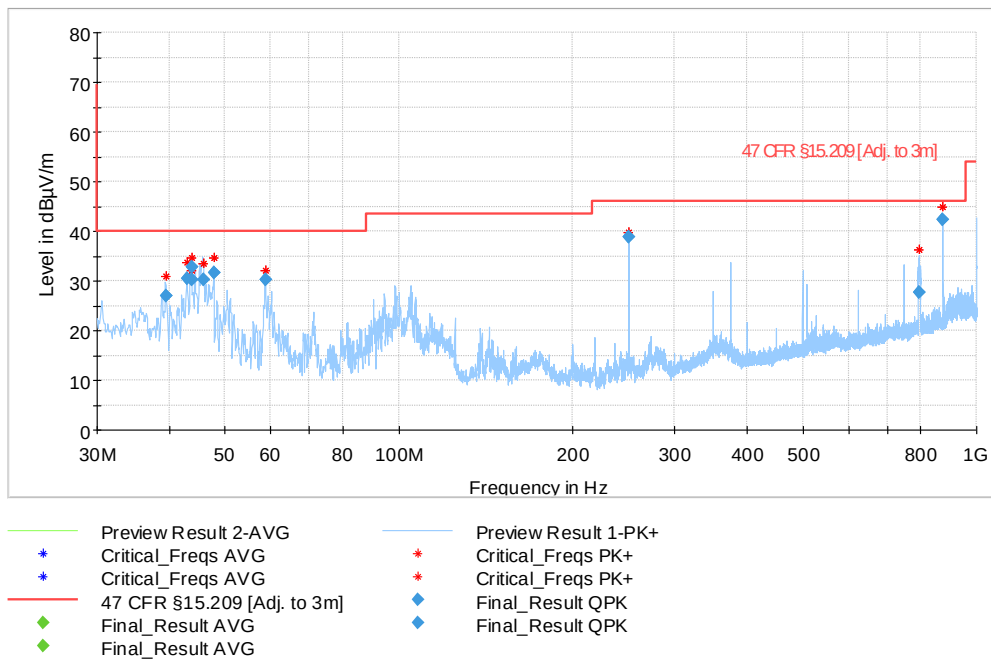


Preview Result 1-PK+  
 47 CFR §15.35 (S15.209 +20dB Adj. to 3m)  
 MaxPeak-PK+ (Single)

Critical\_Freqs PK+  
 Final\_Result PK+

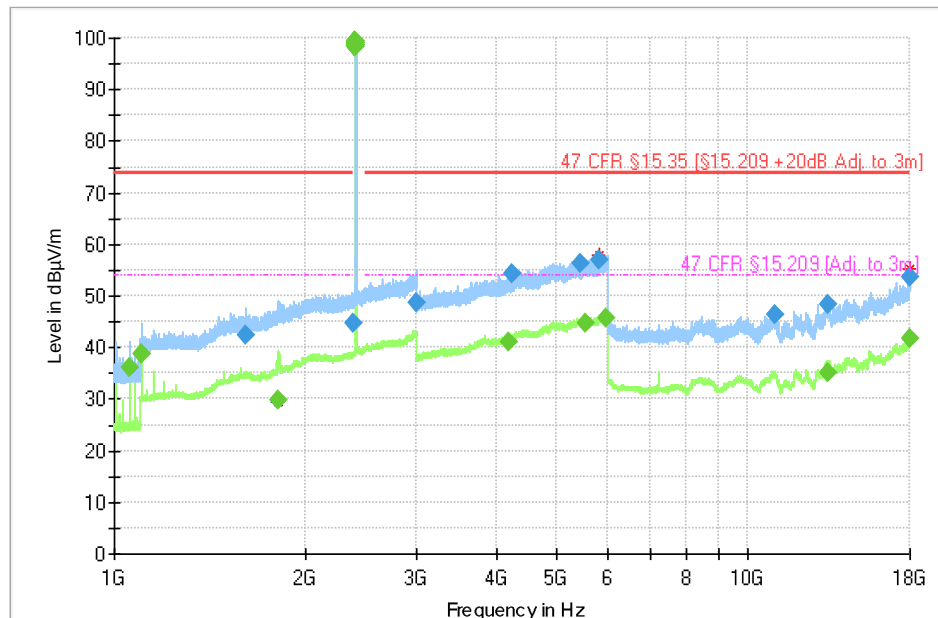
| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 0.099473        | ---              | 36.92              | 107.65         | 70.73       | 1000.0          | 0.200           | 100.0       | H   | 0.0           | 10.5         |
| 0.120181        | 32.07            | ---                | 106.01         | 73.94       | 1000.0          | 0.200           | 100.0       | H   | 229.0         | 10.5         |
| 0.279491        | 41.24            | ---                | 98.68          | 57.44       | 1000.0          | 9.000           | 100.0       | H   | 49.0          | 10.3         |
| 0.420320        | 37.70            | ---                | 95.13          | 57.43       | 1000.0          | 9.000           | 100.0       | H   | -38.0         | 10.2         |
| 0.433322        | 37.44            | ---                | 94.87          | 57.43       | 1000.0          | 9.000           | 100.0       | H   | 139.0         | 10.3         |
| 0.537659        | ---              | 41.57              | 72.99          | 31.42       | 1000.0          | 9.000           | 100.0       | H   | 218.0         | 10.4         |
| 0.817908        | ---              | 37.30              | 69.35          | 32.05       | 1000.0          | 9.000           | 100.0       | H   | 45.0          | 10.5         |
| 1.097801        | ---              | 34.69              | 66.79          | 32.10       | 1000.0          | 9.000           | 100.0       | H   | 154.0         | 10.8         |
| 2.147127        | ---              | 27.68              | 69.54          | 41.86       | 1000.0          | 9.000           | 100.0       | H   | 225.0         | 10.8         |

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Low channel (2405 MHz) |                  |
| Antenna orientation | Horizontal and Vertical        |                  |
| Sweep frequency     | 30 MHz – 1 GHz                 |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003623398-001                 |                  |
| Ancillary Equipment | A003618316-001                 |                  |
|                     | A003618316-003                 |                  |
|                     | A003618316-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2023.12.15 |
| Chamber details     | Chamber: SAC 5                 |                  |



| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 39.460840       | 27.00              | 40.00          | 13.00       | 1000.0          | 120.000         | 100.0       | V   | 202.0         | -35.0        |
| 42.935920       | 30.57              | 40.00          | 9.43        | 1000.0          | 120.000         | 100.0       | V   | 202.0         | -37.7        |
| 43.786480       | 30.32              | 40.00          | 9.68        | 1000.0          | 120.000         | 129.0       | V   | 112.0         | -38.3        |
| 43.789480       | 32.73              | 40.00          | 7.27        | 1000.0          | 120.000         | 100.0       | V   | 206.0         | -38.3        |
| 45.782760       | 30.27              | 40.00          | 9.73        | 1000.0          | 120.000         | 129.0       | V   | 200.0         | -39.8        |
| 47.803200       | 31.54              | 40.00          | 8.46        | 1000.0          | 120.000         | 100.0       | V   | 158.0         | -41.1        |
| 58.721840       | 30.33              | 40.00          | 9.67        | 1000.0          | 120.000         | 279.0       | V   | 338.0         | -44.7        |
| 249.998520      | 38.83              | 46.02          | 7.19        | 1000.0          | 120.000         | 125.0       | H   | 87.0          | -40.8        |
| 796.455920      | 27.65              | 46.02          | 18.37       | 1000.0          | 120.000         | 179.0       | V   | 248.0         | -28.5        |
| 874.999440      | 42.41              | 46.02          | 3.61        | 1000.0          | 120.000         | 100.0       | H   | 26.0          | -27.5        |

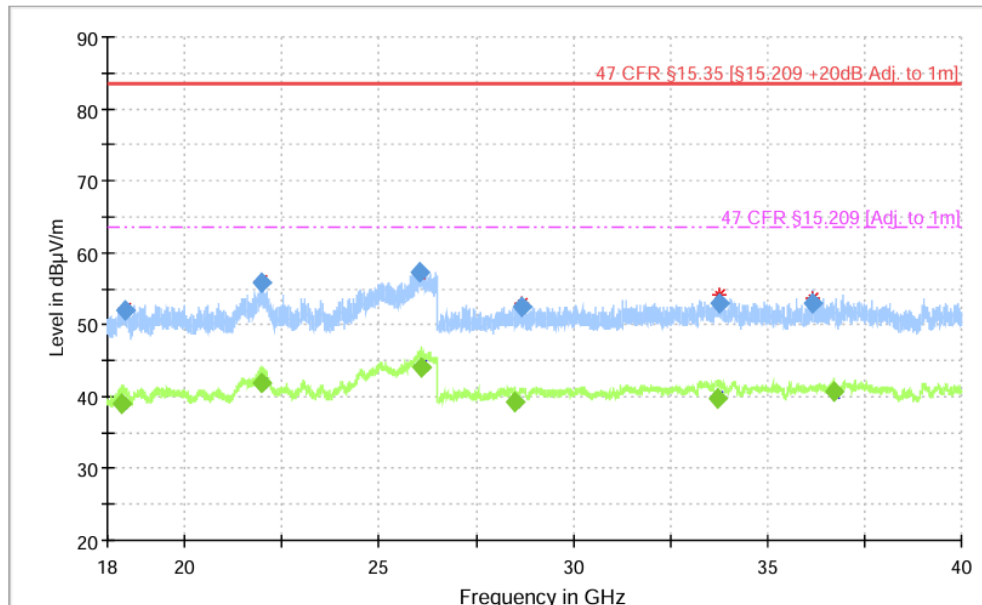
|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Low channel (2405 MHz) |                  |
| Antenna orientation | Horizontal and Vertical        |                  |
| Sweep frequency     | 1 GHz – 18 GHz                 |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003618316-004                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2023.12.28 |
| Chamber details     | Chamber: SAC 5                 |                  |



—◆ Preview Result 2-AVG  
—◆ Preview Result 1-PK+  
—◆ Critical\_Freqs AVG  
—◆ Critical\_Freqs PK+  
— 47 CFR §15.35 [§15.209 + 20dB Adj. to 3m]  
— 47 CFR §15.209 [Adj. to 3m]  
◆ Final\_Result PK+  
◆ Final\_Result AVG

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 1615.547000     | 42.26            | ---              | 73.98          | 31.72       | 1000.0          | 1000.000        | 100.0       | H   | 252.0         | -17.5        |
| 2378.091000     | 44.57            | ---              | 73.98          | 29.41       | 1000.0          | 1000.000        | 104.0       | V   | 112.0         | -14.3        |
| 11013.324000    | 46.28            | ---              | 73.98          | 27.70       | 1000.0          | 1000.000        | 175.0       | H   | 26.0          | 8.5          |
| 13326.108000    | 48.36            | ---              | 73.98          | 25.62       | 1000.0          | 1000.000        | 129.0       | V   | 248.0         | 11.2         |
| 2994.269153     | 48.78            | ---              | 73.98          | 25.20       | 1000.0          | 1000.000        | 179.0       | V   | 11.0          | -11.0        |
| 1818.030000     | ---              | 29.70            | 53.98          | 24.28       | 1000.0          | 1000.000        | 100.0       | H   | 162.0         | -17.2        |
| 17971.478000    | 53.70            | ---              | 73.98          | 20.28       | 1000.0          | 1000.000        | 175.0       | H   | 116.0         | 22.0         |
| 4237.745000     | 54.41            | ---              | 73.98          | 19.57       | 1000.0          | 1000.000        | 217.0       | H   | 281.0         | -5.2         |
| 13340.105000    | ---              | 34.97            | 53.98          | 19.01       | 1000.0          | 1000.000        | 175.0       | V   | -18.0         | 11.2         |
| 1056.026000     | ---              | 36.06            | 53.98          | 17.92       | 1000.0          | 1000.000        | 179.0       | V   | 68.0          | -23.3        |
| ...             | ...              | ...              | ...            | ...         | ...             | ...             | ...         | ... | ...           | ...          |

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Low channel (2405 MHz) |                  |
| Antenna orientation | Horizontal and Vertical        |                  |
| Sweep frequency     | 18 GHz – 40 GHz                |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003618316-004                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2024.01.02 |
| Chamber details     | Chamber: SAC 5                 |                  |

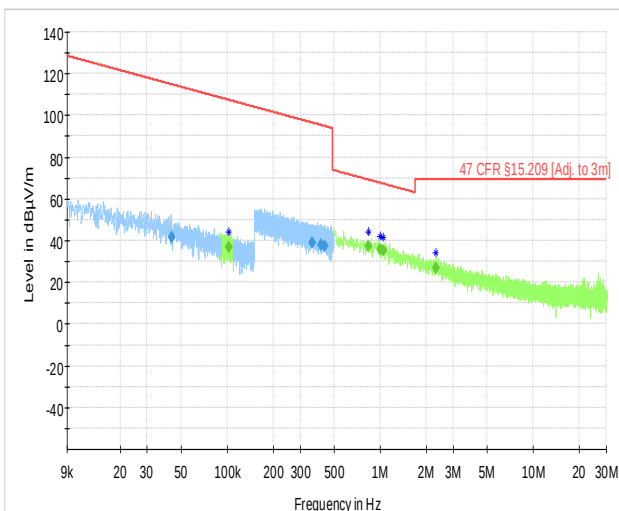


— Preview Result 2-AVG  
— Preview Result 1-PK+  
— 47 CFR §15.35 [§15.209 +20dB Adj. to 1m]  
— 47 CFR §15.209 [Adj. to 1m]  
♦ Final\_Result PK+  
♦ Final\_Result AVG  
✕ MaxPeak-PK+ (Single)  
✕ Critical\_Freqs PK+  
✕ Critical\_Freqs AVG  
+ Average-AVG (Single)

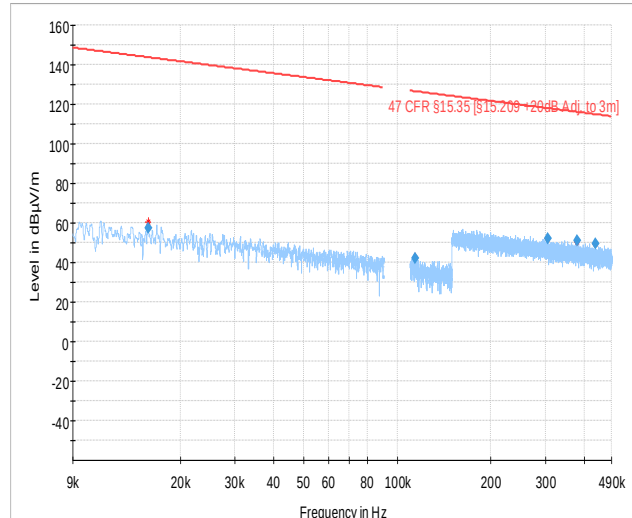
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|
| 18377.852000    | ---              | 39.10            | 63.52          | 24.43       | 1000.0          | 1000.000        | 155.0       | V   |
| 18477.101000    | 51.98            | ---              | 83.52          | 31.54       | 1000.0          | 1000.000        | 155.0       | H   |
| 21994.650000    | ---              | 41.97            | 63.52          | 21.55       | 1000.0          | 1000.000        | 155.0       | V   |
| 21995.038000    | 55.79            | ---              | 83.52          | 27.74       | 1000.0          | 1000.000        | 155.0       | H   |
| 26032.523000    | 57.22            | ---              | 83.52          | 26.30       | 1000.0          | 1000.000        | 155.0       | V   |
| 26092.011000    | ---              | 44.17            | 63.52          | 19.35       | 1000.0          | 1000.000        | 155.0       | V   |
| 28482.649000    | ---              | 39.27            | 63.52          | 24.25       | 1000.0          | 1000.000        | 155.0       | H   |
| 28671.253000    | 52.56            | ---              | 83.52          | 30.96       | 1000.0          | 1000.000        | 155.0       | H   |
| 33714.699000    | ---              | 39.73            | 63.52          | 23.79       | 1000.0          | 1000.000        | 155.0       | H   |
| 33762.365000    | 53.04            | ---              | 83.52          | 30.48       | 1000.0          | 1000.000        | 155.0       | H   |
| 36143.645000    | 52.92            | ---              | 83.52          | 30.60       | 1000.0          | 1000.000        | 155.0       | V   |
| 36707.324000    | ---              | 40.58            | 63.52          | 22.94       | 1000.0          | 1000.000        | 155.0       | V   |

### Mid Channel

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Mid channel (2445 MHz) |                  |
| Antenna orientation | Loop Antenna Parallel to Axis  |                  |
| Sweep frequency     | 9kHz - 30 MHz                  |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003623398-001                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2024.01.05 |
| Chamber details     | Chamber: SAC 5                 |                  |



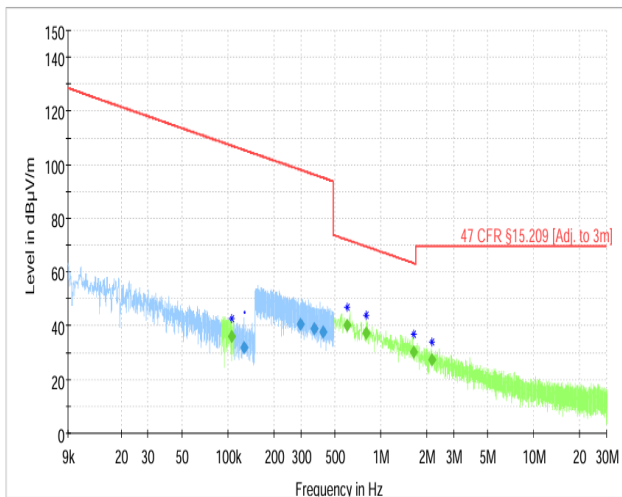
— Preview Result 2-PK+  
— Preview Result 1-AVG  
\* Critical\_Freqs PK+  
— 47 CFR §15.209 [Adj. to 3m]  
♦ Final\_Result QPK



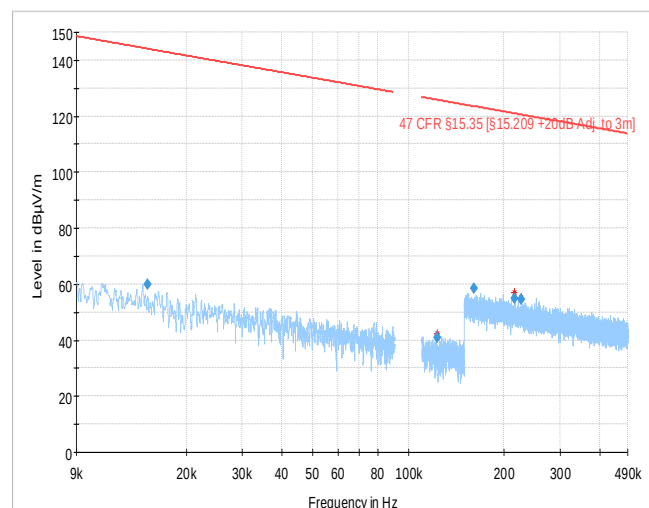
— Preview Result 1-PK+  
— 47 CFR §15.35 [§15.209 +20dB Adj. to 3m]  
\* Critical\_Freqs PK+  
♦ Final\_Result PK+

| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 0.043294        | 41.34            | ---                | 114.88         | 73.54       | 1000.0          | 0.200           | 100.0       | H   | 225.0         | 12.2         |
| 0.102668        | ---              | 36.95              | 107.38         | 70.43       | 1000.0          | 0.200           | 100.0       | H   | -26.0         | 10.5         |
| 0.360671        | 39.04            | ---                | 96.46          | 57.43       | 1000.0          | 9.000           | 100.0       | H   | 126.0         | 10.2         |
| 0.408733        | 37.98            | ---                | 95.38          | 57.39       | 1000.0          | 9.000           | 100.0       | H   | 307.0         | 10.2         |
| 0.431803        | 37.41            | ---                | 94.90          | 57.49       | 1000.0          | 9.000           | 100.0       | H   | -1.0          | 10.3         |
| 0.836125        | ---              | 37.28              | 69.16          | 31.88       | 1000.0          | 9.000           | 100.0       | H   | -1.0          | 10.5         |
| 0.995527        | ---              | 35.76              | 67.64          | 31.88       | 1000.0          | 9.000           | 100.0       | H   | 38.0          | 10.8         |
| 1.042104        | ---              | 35.38              | 67.25          | 31.86       | 1000.0          | 9.000           | 100.0       | H   | 167.0         | 10.8         |
| 2.307237        | ---              | 26.88              | 69.54          | 42.66       | 1000.0          | 9.000           | 100.0       | H   | 13.0          | 10.8         |

|                     |                                    |                  |
|---------------------|------------------------------------|------------------|
| Test mode condition | Zigbee, Mid channel (2445 MHz)     |                  |
| Antenna orientation | Loop Antenna Perpendicular to Axis |                  |
| Sweep frequency     | 9kHz - 30 MHz                      |                  |
| Standard            | 47 CFR FCC Part 15 subpart C       |                  |
| EUT                 | A003623398-001                     |                  |
| Ancillary Equipment | A003625200-001                     |                  |
|                     | A003623398-003                     |                  |
|                     | A003623398-007                     |                  |
| Test Engineer       | Fariborz Abasi                     | Date: 2024.01.12 |
| Chamber details     | Chamber: SAC 5                     |                  |



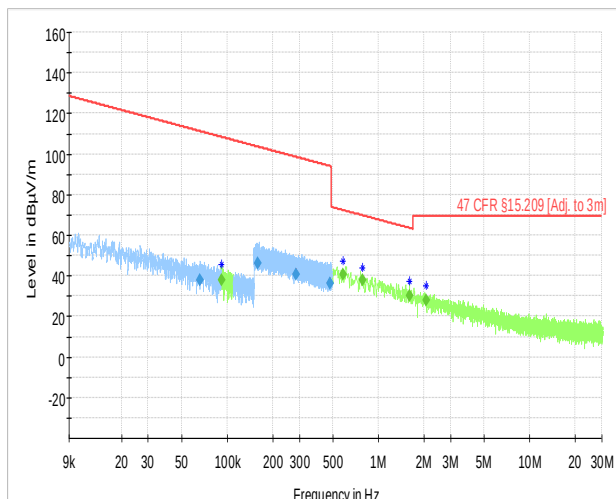
Preview Result 2-PK+  
 Critical\_Freqs PK+  
 47 CFR §15.209 [Adj. to 3m]  
 Final\_Result QPK  
 QuasiPeak-QPK (Single)  
 Preview Result 1-AVG  
 Critical\_Freqs AVG  
 Final\_Result AVG  
 MaxPeak-PK+ (Single)  
 Average-AVG (Single)



Preview Result 1-PK+  
 47 CFR §15.35 [§15.209 +20dB Adj. to 3m]  
 Critical\_Freqs PK+  
 Final\_Result PK+

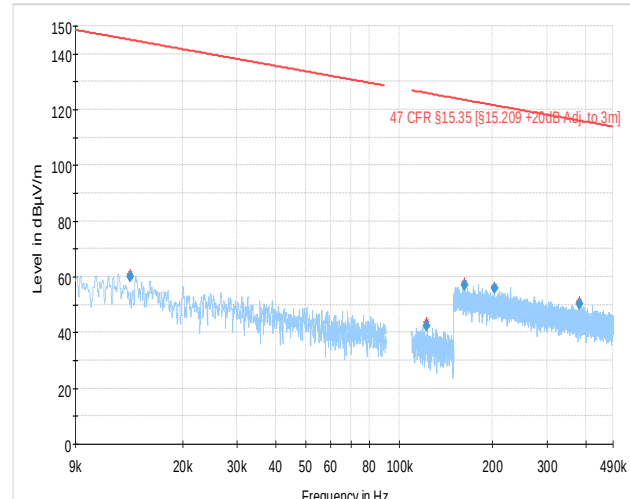
| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 0.105886        | ---              | 36.04              | 107.11         | 71.07       | 1000.0          | 0.200           | 100.0       | H   | 45.0          | 10.5       |
| 0.128379        | 31.90            | ---                | 105.43         | 73.54       | 1000.0          | 0.200           | 100.0       | H   | 225.0         | 10.5       |
| 0.296435        | 40.64            | ---                | 98.17          | 57.53       | 1000.0          | 9.000           | 100.0       | H   | 89.0          | 10.3       |
| 0.365874        | 38.83            | ---                | 96.34          | 57.50       | 1000.0          | 9.000           | 100.0       | H   | 38.0          | 10.2       |
| 0.419976        | 37.59            | ---                | 95.14          | 57.55       | 1000.0          | 9.000           | 100.0       | H   | 225.0         | 10.2       |
| 0.605558        | ---              | 40.23              | 71.96          | 31.74       | 1000.0          | 9.000           | 100.0       | H   | 77.0          | 10.5       |
| 0.806904        | ---              | 37.48              | 69.47          | 31.98       | 1000.0          | 9.000           | 100.0       | H   | 135.0         | 10.5       |
| 1.635805        | ---              | 30.22              | 63.33          | 33.11       | 1000.0          | 9.000           | 100.0       | H   | 229.0         | 10.8       |
| 2.164642        | ---              | 27.45              | 69.54          | 42.09       | 1000.0          | 9.000           | 100.0       | H   | 25.0          | 10.8       |

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Mid channel (2445 MHz) |                  |
| Antenna orientation | Loop Antenna Parallel to floor |                  |
| Sweep frequency     | 9kHz - 30 MHz                  |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003623398-001                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2024.01.13 |
| Chamber details     | Chamber: SAC 5                 |                  |



Preview Result 2-PK+  
 Critical\_Freqs PK+  
 47 CFR §15.209 (Adj. to 3m)  
 Final\_Result QPK  
 QuasiPeak-QPK (Single)

Preview Result 1-AVG  
 Critical\_Freqs AVG  
 Final\_Result AVG  
 MaxPeak-PK+ (Single)  
 Average-AVG (Single)

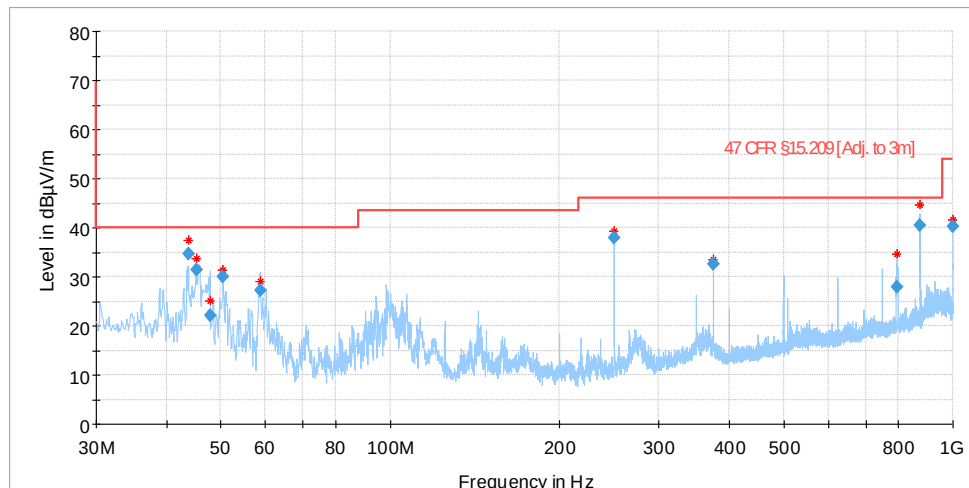


Preview Result 1-PK+  
 47 CFR §15.35 (Adj. to 3m)  
 MaxPeak-PK+ (Single)

Critical\_Freqs PK+  
 Final\_Result PK+

| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 0.065926        | 37.74            | ---                | 111.22         | 73.48       | 1000.0          | 0.200           | 100.0       | H   | -45.0         | 11.2         |
| 0.091422        | ---              | 37.75              | 108.38         | 70.63       | 1000.0          | 0.200           | 100.0       | H   | 139.0         | 10.9         |
| 0.159507        | 46.30            | ---                | 103.55         | 57.25       | 1000.0          | 9.000           | 100.0       | H   | -1.0          | 10.4         |
| 0.286139        | 40.92            | ---                | 98.47          | 57.55       | 1000.0          | 9.000           | 100.0       | H   | 225.0         | 10.3         |
| 0.479568        | 36.49            | ---                | 93.99          | 57.50       | 1000.0          | 9.000           | 100.0       | H   | 282.0         | 10.4         |
| 0.582046        | ---              | 40.82              | 72.31          | 31.48       | 1000.0          | 9.000           | 100.0       | H   | 229.0         | 10.5         |
| 0.784083        | ---              | 37.87              | 69.72          | 31.84       | 1000.0          | 9.000           | 100.0       | H   | 49.0          | 10.5         |
| 1.601186        | ---              | 30.42              | 63.52          | 33.09       | 1000.0          | 9.000           | 100.0       | H   | 76.0          | 10.8         |
| 2.062869        | ---              | 28.03              | 69.54          | 41.51       | 1000.0          | 9.000           | 100.0       | H   | -45.0         | 10.8         |

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Mid channel (2445 MHz) |                  |
| Antenna orientation | Horizontal and Vertical        |                  |
| Sweep frequency     | 30 MHz – 1 GHz                 |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003623398-001                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2023.12.18 |
| Chamber details     | Chamber: SAC 5                 |                  |

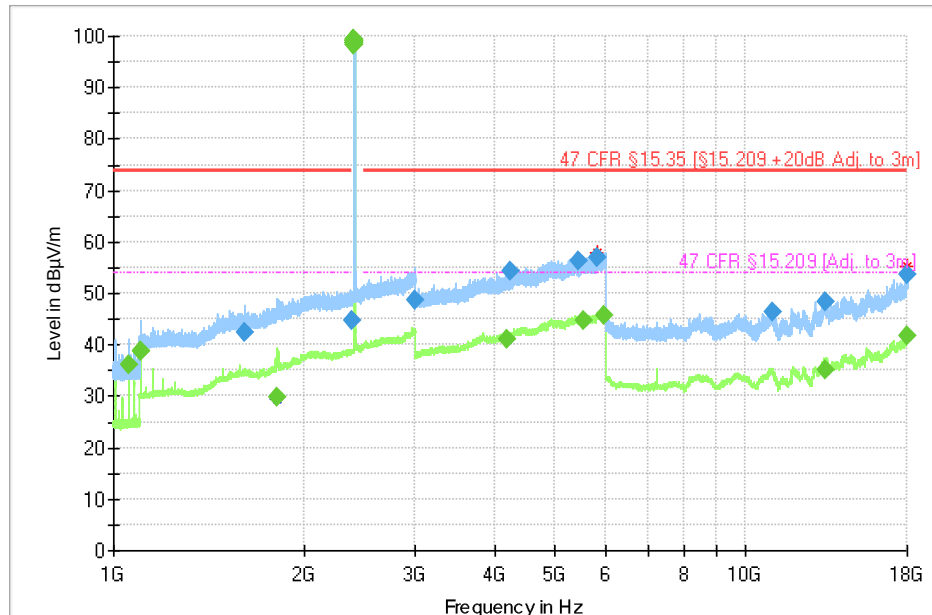


Preview Result 2-AVG  
 Critical\_Freqs AVG  
 Critical\_Freqs AVG  
 47 CFR §15.209 [Adj. to 3m]  
 Final\_Result AVG  
 Final\_Result AVG

Preview Result 1-PK+  
 Critical\_Freqs PK+  
 Critical\_Freqs PK+  
 Final\_Result QPK  
 Final\_Result QPK

| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 43.785160       | 34.66              | 40.00          | 5.34        | 1000.0          | 120.000         | 100.0       | V   | 279.0         | -38.3        |
| 45.256560       | 31.43              | 40.00          | 8.57        | 1000.0          | 120.000         | 100.0       | V   | 162.0         | -39.4        |
| 47.797440       | 22.00              | 40.00          | 18.00       | 1000.0          | 120.000         | 100.0       | V   | 87.0          | -41.1        |
| 50.441400       | 29.97              | 40.00          | 10.03       | 1000.0          | 120.000         | 100.0       | V   | 267.0         | -42.8        |
| 58.716920       | 27.25              | 40.00          | 12.75       | 1000.0          | 120.000         | 257.0       | V   | 338.0         | -44.7        |
| 249.993600      | 37.82              | 46.02          | 8.20        | 1000.0          | 120.000         | 129.0       | H   | 72.0          | -40.8        |
| 374.989280      | 32.60              | 46.02          | 13.42       | 1000.0          | 120.000         | 179.0       | V   | 338.0         | -36.8        |
| 795.118000      | 27.92              | 46.02          | 18.10       | 1000.0          | 120.000         | 207.0       | V   | 9.0           | -28.5        |
| 875.001120      | 40.58              | 46.02          | 5.44        | 1000.0          | 120.000         | 100.0       | H   | 26.0          | -27.5        |
| 999.997900      | 40.23              | 53.98          | 13.75       | 1000.0          | 120.000         | 100.0       | V   | -3.0          | -25.6        |

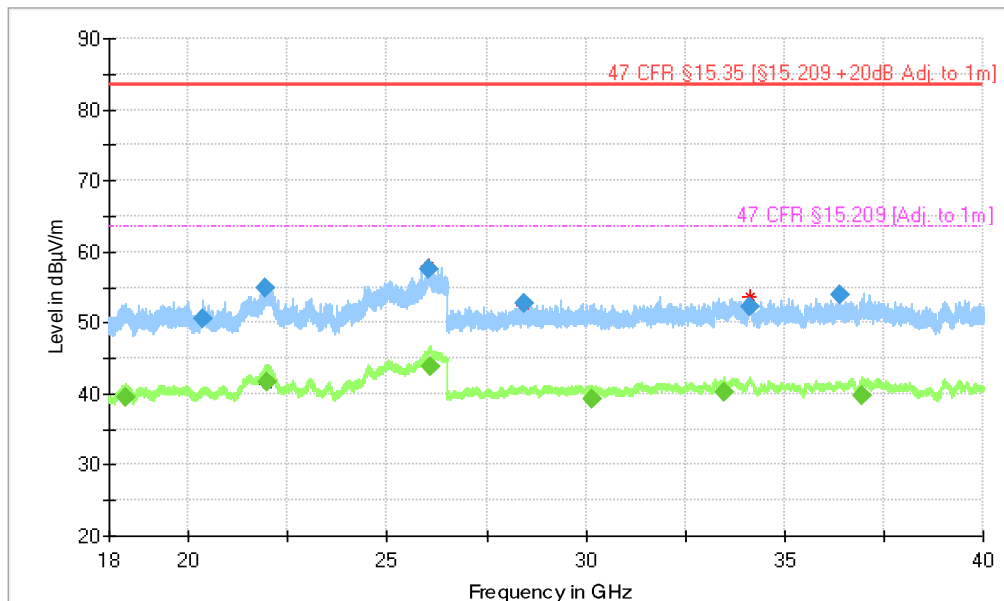
|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Mid channel (2445 MHz) |                  |
| Antenna orientation | Horizontal and Vertical        |                  |
| Sweep frequency     | 1 GHz – 18 GHz                 |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003618316-004                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2023.12.28 |
| Chamber details     | Chamber: SAC 5                 |                  |



—◆— Preview Result 2-AVG  
—◆— Preview Result 1-PK+  
\* Critical\_Freqs AVG  
\* Critical\_Freqs PK+  
— 47 CFR §15.35 [§15.209 + 20dB Adj. to 3m]  
— 47 CFR §15.209 [Adj. to 3m]  
◆ Final\_Result PK+  
◆ Final\_Result AVG

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 1615.547000     | 42.26            | ---              | 73.98          | 31.72       | 1000.0          | 1000.000        | 100.0       | H   | 252.0         | -17.5        |
| 2378.091000     | 44.57            | ---              | 73.98          | 29.41       | 1000.0          | 1000.000        | 104.0       | V   | 112.0         | -14.3        |
| 11013.324000    | 46.28            | ---              | 73.98          | 27.70       | 1000.0          | 1000.000        | 175.0       | H   | 26.0          | 8.5          |
| 13326.108000    | 48.36            | ---              | 73.98          | 25.62       | 1000.0          | 1000.000        | 129.0       | V   | 248.0         | 11.2         |
| 2994.269153     | 48.78            | ---              | 73.98          | 25.20       | 1000.0          | 1000.000        | 179.0       | V   | 11.0          | -11.0        |
| 1818.030000     | ---              | 29.70            | 53.98          | 24.28       | 1000.0          | 1000.000        | 100.0       | H   | 162.0         | -17.2        |
| 17971.478000    | 53.70            | ---              | 73.98          | 20.28       | 1000.0          | 1000.000        | 175.0       | H   | 116.0         | 22.0         |
| 4237.745000     | 54.41            | ---              | 73.98          | 19.57       | 1000.0          | 1000.000        | 217.0       | H   | 281.0         | -5.2         |
| 13340.105000    | ---              | 34.97            | 53.98          | 19.01       | 1000.0          | 1000.000        | 175.0       | V   | -18.0         | 11.2         |
| 1056.026000     | ---              | 36.06            | 53.98          | 17.92       | 1000.0          | 1000.000        | 179.0       | V   | 68.0          | -23.3        |
| ...             | ...              | ...              | ...            | ...         | ...             | ...             | ...         | ... | ...           | ...          |

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Mid channel (2445 MHz) |                  |
| Antenna orientation | Horizontal and Vertical        |                  |
| Sweep frequency     | 18 GHz – 40 GHz                |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003618316-004                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Fariborz Abasi                 | Date: 2024.01.02 |
| Chamber details     | Chamber: SAC 5                 |                  |

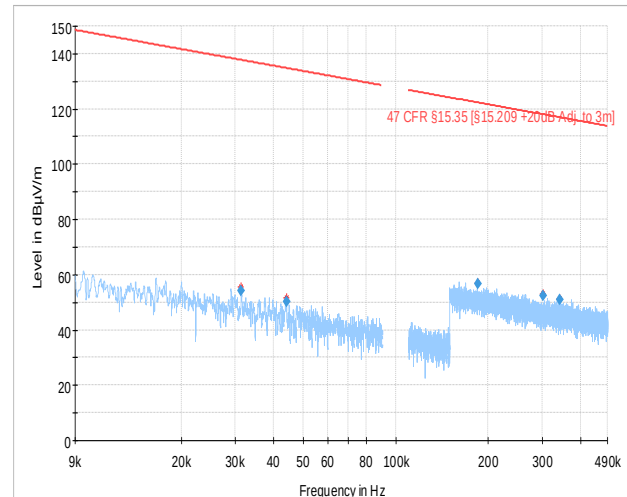
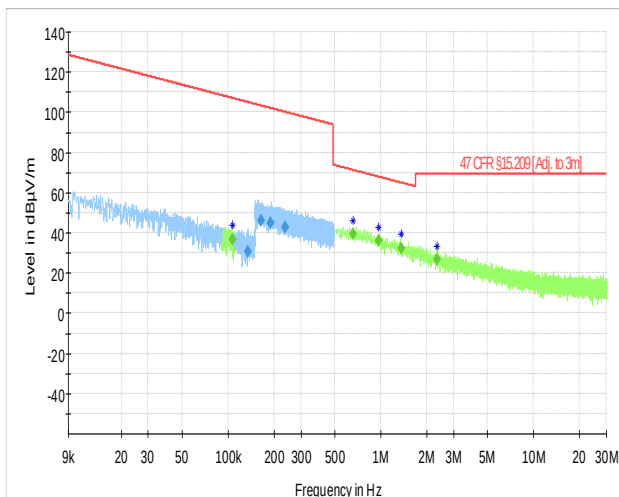


—◆— Preview Result 2-AVG  
—◆— Preview Result 1-PK+  
\* Critical\_Freqs AVG  
--- 47 CFR §15.35 [§15.209 +20dB Adj. to 1m]  
◆ Final\_Result PK+  
x MaxPeak-PK+ (Single)  
--- 47 CFR §15.209 [Adj. to 1m]  
◆ Final\_Result AVG  
+ Average-AVG (Single)

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|------------|-----------------|-------------|-----|---------------|--------------|
| 18413.963000    | ---              | 39.56            | 63.52          | 23.96       | 1000.0     | 1000.000        | 155.0       | H   | 262.0         | -5.6         |
| 20349.342000    | 50.63            | ---              | 83.52          | 32.90       | 1000.0     | 1000.000        | 155.0       | V   | 52.0          | -4.3         |
| 21917.976000    | 54.79            | ---              | 83.52          | 28.73       | 1000.0     | 1000.000        | 155.0       | H   | 248.0         | -0.2         |
| 21960.787000    | ---              | 41.55            | 63.52          | 21.97       | 1000.0     | 1000.000        | 155.0       | H   | 225.0         | 0.1          |
| 26059.376000    | 57.63            | ---              | 83.52          | 25.89       | 1000.0     | 1000.000        | 155.0       | H   | 98.0          | 0.8          |
| 26079.377000    | ---              | 43.88            | 63.52          | 19.64       | 1000.0     | 1000.000        | 155.0       | V   | 132.0         | 0.7          |
| 28460.081000    | 52.67            | ---              | 83.52          | 30.85       | 1000.0     | 1000.000        | 155.0       | H   | 338.0         | -4.9         |
| 30161.813000    | ---              | 39.35            | 63.52          | 24.17       | 1000.0     | 1000.000        | 155.0       | H   | 308.0         | -4.9         |
| 33461.341000    | ---              | 40.30            | 63.52          | 23.23       | 1000.0     | 1000.000        | 155.0       | V   | 86.0          | -4.7         |
| 34132.885000    | 52.27            | ---              | 83.52          | 31.26       | 1000.0     | 1000.000        | 155.0       | H   | 352.0         | -4.8         |
| 36394.275000    | 53.85            | ---              | 83.52          | 29.67       | 1000.0     | 1000.000        | 155.0       | V   | 102.0         | -6.7         |
| 36966.493000    | ---              | 39.77            | 63.52          | 23.76       | 1000.0     | 1000.000        | 155.0       | H   | 52.0          | -6.3         |

## High Channel

|                     |                                 |                  |
|---------------------|---------------------------------|------------------|
| Test mode condition | Zigbee, High channel (2480 MHz) |                  |
| Antenna orientation | Loop Antenna Parallel to Axis   |                  |
| Sweep frequency     | 9kHz - 30 MHz                   |                  |
| Standard            | 47 CFR FCC Part 15 subpart C    |                  |
| EUT                 | A003623398-001                  |                  |
| Ancillary Equipment | A003625200-001                  |                  |
|                     | A003623398-003                  |                  |
|                     | A003623398-007                  |                  |
| Test Engineer       | Fariborz Abasi                  | Date: 2024.01.11 |
| Chamber details     | Chamber: SAC 5                  |                  |



Preview Result 2-PK+  
 Critical\_Freqs PK+  
 47 CFR §15.209 [Adj. to 3m]  
 Final\_Result QPK  
 QuasiPeak-QPK (Single)

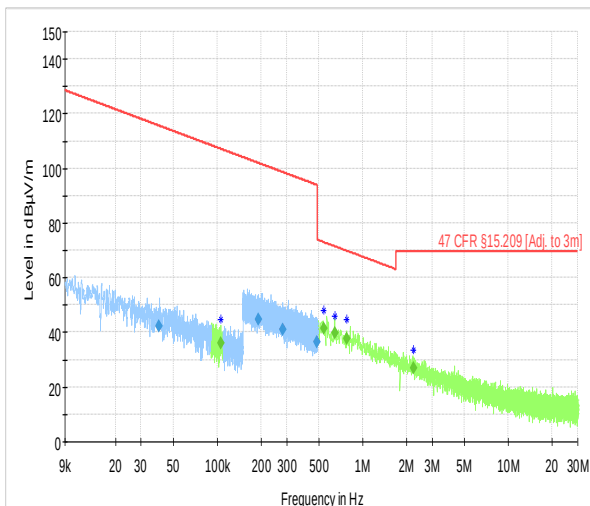
Preview Result 1-AVG  
 Critical\_Freqs AVG  
 Final\_Result AVG  
 MaxPeak-PK+ (Single)  
 Average-AVG (Single)

Preview Result 1-PK+  
 47 CFR §15.35 [§15.209 +20dB Adj. to 3m]

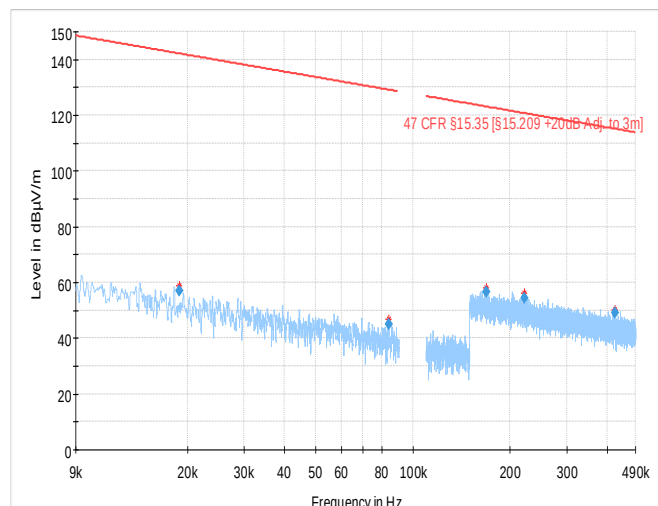
Critical\_Freqs PK+  
 Final\_Result PK+

| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 0.106800        | ---              | 36.57              | 107.03         | 70.46       | 1000.0          | 0.200           | 100.0       | H   | 101.0         | 10.5         |
| 0.134196        | 30.83            | ---                | 105.05         | 74.22       | 1000.0          | 0.200           | 100.0       | H   | 178.0         | 10.5         |
| 0.163933        | 46.07            | ---                | 103.31         | 57.24       | 1000.0          | 9.000           | 100.0       | H   | 225.0         | 10.4         |
| 0.189197        | 44.93            | ---                | 102.07         | 57.14       | 1000.0          | 9.000           | 100.0       | H   | 76.0          | 10.4         |
| 0.236793        | 42.77            | ---                | 100.12         | 57.34       | 1000.0          | 9.000           | 100.0       | H   | 101.0         | 10.4         |
| 0.654757        | ---              | 39.64              | 71.28          | 31.64       | 1000.0          | 9.000           | 100.0       | H   | 244.0         | 10.5         |
| 0.964573        | ---              | 35.95              | 67.92          | 31.97       | 1000.0          | 9.000           | 100.0       | H   | -45.0         | 10.7         |
| 1.362567        | ---              | 32.34              | 64.92          | 32.58       | 1000.0          | 9.000           | 100.0       | H   | -41.0         | 10.8         |
| 2.334161        | ---              | 26.68              | 69.54          | 42.86       | 1000.0          | 9.000           | 100.0       | H   | 45.0          | 10.8         |

|                     |                                    |                  |
|---------------------|------------------------------------|------------------|
| Test mode condition | Zigbee, High channel (2480 MHz)    |                  |
| Antenna orientation | Loop Antenna Perpendicular to Axis |                  |
| Sweep frequency     | 9kHz - 30 MHz                      |                  |
| Standard            | 47 CFR FCC Part 15 subpart C       |                  |
| EUT                 | A003623398-001                     |                  |
| Ancillary Equipment | A003625200-001                     |                  |
|                     | A003623398-003                     |                  |
|                     | A003623398-007                     |                  |
| Test Engineer       | Fariborz Abasi                     | Date: 2024.01.12 |
| Chamber details     | Chamber: SAC 5                     |                  |



Preview Result 2-PK+  
 Critical\_Freqs PK+  
 47 CFR §15.209 (Adj. to 3m)  
 Final\_Result QPK  
 QuasiPeak-QPK (Single)

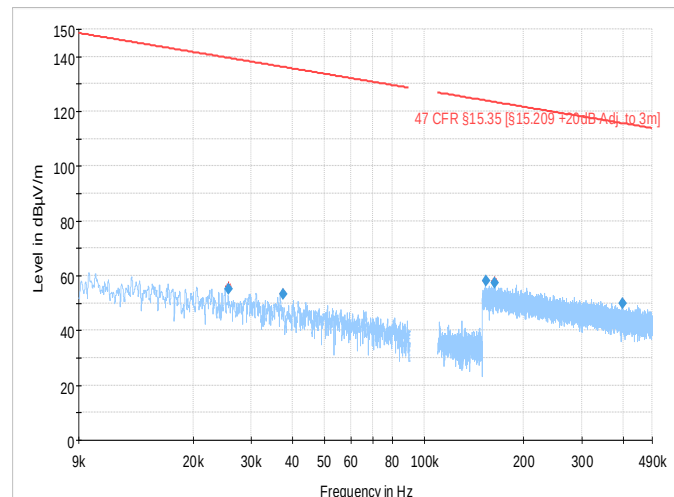
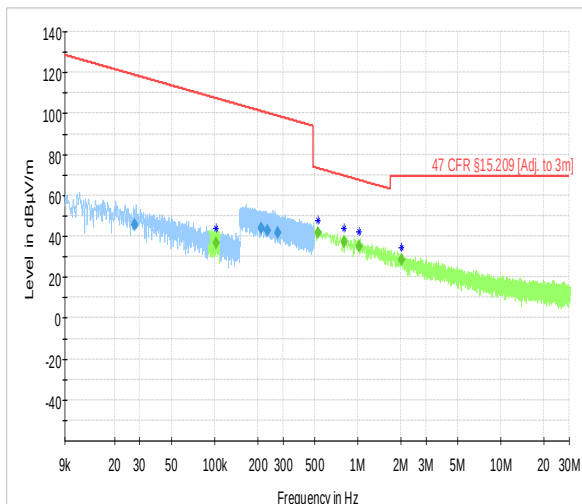


Preview Result 1-PK+  
 47 CFR §15.35 (S15.209 +20dB Adj. to 3m)  
 MaxPeak-PK+ (Single)

Critical\_Freqs PK+  
 Final\_Result PK+

| Frequency (MHz) | Average (dBμV/m) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 0.039941        | 42.18            | ---                | 115.58         | 73.40       | 1000.0          | 0.200           | 100.0       | H   | 14.0          | 12.4       |
| 0.106488        | ---              | 36.22              | 107.06         | 70.84       | 1000.0          | 0.200           | 100.0       | H   | 225.0         | 10.5       |
| 0.191682        | 44.78            | ---                | 101.95         | 57.17       | 1000.0          | 9.000           | 100.0       | H   | 270.0         | 10.4       |
| 0.281162        | 41.16            | ---                | 98.63          | 57.47       | 1000.0          | 9.000           | 100.0       | H   | 282.0         | 10.3       |
| 0.483911        | 36.66            | ---                | 93.91          | 57.25       | 1000.0          | 9.000           | 100.0       | H   | 245.0         | 10.4       |
| 0.539096        | ---              | 41.39              | 72.97          | 31.58       | 1000.0          | 9.000           | 100.0       | H   | 315.0         | 10.4       |
| 0.641654        | ---              | 39.79              | 71.46          | 31.67       | 1000.0          | 9.000           | 100.0       | H   | 135.0         | 10.5       |
| 0.777403        | ---              | 37.87              | 69.79          | 31.92       | 1000.0          | 9.000           | 100.0       | H   | -41.0         | 10.5       |
| 2.227839        | ---              | 27.07              | 69.54          | 42.47       | 1000.0          | 9.000           | 100.0       | H   | 135.0         | 10.8       |

|                     |                                 |                  |
|---------------------|---------------------------------|------------------|
| Test mode condition | Zigbee, High channel (2480 MHz) |                  |
| Antenna orientation | Loop Antenna Parallel to floor  |                  |
| Sweep frequency     | 9kHz - 30 MHz                   |                  |
| Standard            | 47 CFR FCC Part 15 subpart C    |                  |
| EUT                 | A003623398-001                  |                  |
| Ancillary Equipment | A003625200-001                  |                  |
|                     | A003623398-003                  |                  |
|                     | A003623398-007                  |                  |
| Test Engineer       | Fariborz Abasi                  | Date: 2024.01.13 |
| Chamber details     | Chamber: SAC 5                  |                  |



Preview Result 2-PK+  
 Critical\_Freqs PK+  
 47 CFR §15.209 [Adj. to 3m]  
 Final\_Result QPK  
 QuasiPeak-QPK (Single)

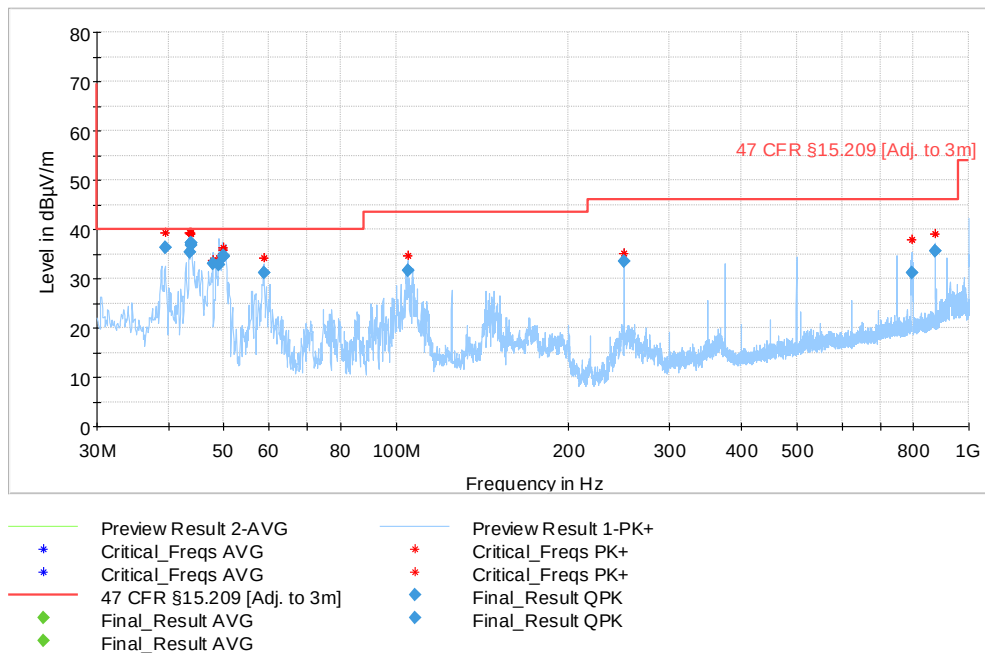
Preview Result 1-AVG  
 Critical\_Freqs AVG  
 Final\_Result AVG  
 MaxPeak-PK+ (Single)  
 Average-AVG (Single)

Preview Result 1-PK+  
 47 CFR §15.35 [S15.209 +20dB Adj. to 3m]  
 MaxPeak-PK+ (Single)

Critical\_Freqs PK+  
 Final\_Result PK+

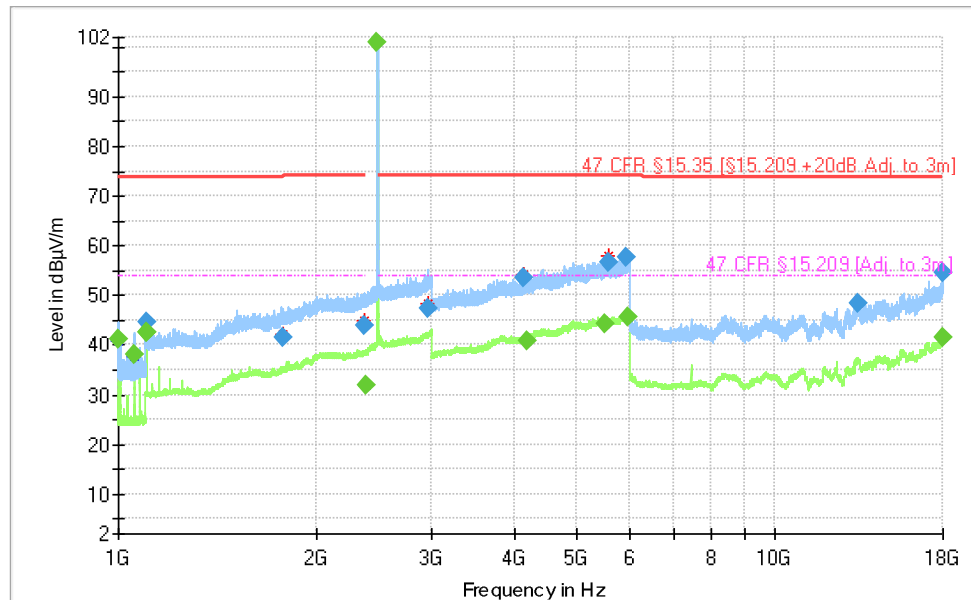
| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 0.027742        | 45.71            | ---                | 118.74         | 73.03       | 1000.0          | 0.200           | 100.0       | H   | 45.0          | 14.0         |
| 0.102802        | ---              | 36.81              | 107.36         | 70.55       | 1000.0          | 0.200           | 100.0       | H   | 65.0          | 10.5         |
| 0.212036        | 43.83            | ---                | 101.08         | 57.25       | 1000.0          | 9.000           | 100.0       | H   | 135.0         | 10.4         |
| 0.234916        | 42.93            | ---                | 100.19         | 57.26       | 1000.0          | 9.000           | 100.0       | H   | 0.0           | 10.4         |
| 0.275324        | 41.41            | ---                | 98.81          | 57.40       | 1000.0          | 9.000           | 100.0       | H   | -41.0         | 10.3         |
| 0.531156        | ---              | 41.44              | 73.10          | 31.66       | 1000.0          | 9.000           | 100.0       | H   | 45.0          | 10.4         |
| 0.798767        | ---              | 37.51              | 69.56          | 32.05       | 1000.0          | 9.000           | 100.0       | H   | 128.0         | 10.5         |
| 1.018607        | ---              | 35.27              | 67.44          | 32.17       | 1000.0          | 9.000           | 100.0       | H   | 169.0         | 10.8         |
| 2.013839        | ---              | 28.13              | 69.54          | 41.41       | 1000.0          | 9.000           | 100.0       | H   | 205.0         | 10.8         |

|                     |                                 |                  |
|---------------------|---------------------------------|------------------|
| Test mode condition | Zigbee, High channel (2480 MHz) |                  |
| Antenna orientation | Horizontal and Vertical         |                  |
| Sweep frequency     | 30 MHz – 1 GHz                  |                  |
| Standard            | 47 CFR FCC Part 15 subpart C    |                  |
| EUT                 | A003623398-001                  |                  |
| Ancillary Equipment | A003625200-001                  |                  |
|                     | A003623398-003                  |                  |
|                     | A003623398-007                  |                  |
| Test Engineer       | Fariborz Abasi                  | Date: 2024.01.15 |
| Chamber details     | Chamber: SAC 5                  |                  |



| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 39.489200       | 36.38              | 40.00          | 3.62        | 1000.0          | 120.000         | 100.0       | V   | 26.0          | -35.0        |
| 43.501000       | 35.40              | 40.00          | 4.60        | 1000.0          | 120.000         | 100.0       | V   | -18.0         | -38.1        |
| 43.789960       | 37.12              | 40.00          | 2.88        | 1000.0          | 120.000         | 100.0       | V   | -18.0         | -38.3        |
| 43.797360       | 36.83              | 40.00          | 3.17        | 1000.0          | 120.000         | 100.0       | V   | -18.0         | -38.3        |
| 43.798600       | 37.24              | 40.00          | 2.76        | 1000.0          | 120.000         | 100.0       | V   | -18.0         | -38.3        |
| 47.804880       | 32.92              | 40.00          | 7.08        | 1000.0          | 120.000         | 100.0       | V   | -22.0         | -41.1        |
| 49.067560       | 32.81              | 40.00          | 7.19        | 1000.0          | 120.000         | 100.0       | V   | -22.0         | -42.0        |
| 49.845960       | 34.60              | 40.00          | 5.40        | 1000.0          | 120.000         | 100.0       | V   | -22.0         | -42.4        |
| 49.850920       | 34.45              | 40.00          | 5.55        | 1000.0          | 120.000         | 100.0       | V   | -22.0         | -42.4        |
| 58.725680       | 31.06              | 40.00          | 8.94        | 1000.0          | 120.000         | 175.0       | V   | 252.0         | -44.7        |
| 104.750480      | 31.60              | 43.52          | 11.92       | 1000.0          | 120.000         | 125.0       | V   | 335.0         | -41.1        |
| 249.995880      | 33.47              | 46.02          | 12.56       | 1000.0          | 120.000         | 129.0       | H   | 148.0         | -40.8        |
| 795.947360      | 31.14              | 46.02          | 14.88       | 1000.0          | 120.000         | 225.0       | V   | 68.0          | -28.5        |
| 875.002080      | 35.51              | 46.02          | 10.51       | 1000.0          | 120.000         | 125.0       | V   | 87.0          | -27.5        |

|                     |                                 |                  |
|---------------------|---------------------------------|------------------|
| Test mode condition | Zigbee, High channel (2480 MHz) |                  |
| Antenna orientation | Horizontal and Vertical         |                  |
| Sweep frequency     | 1 GHz – 18 GHz                  |                  |
| Standard            | 47 CFR FCC Part 15 subpart C    |                  |
| EUT                 | A003618316-004                  |                  |
| Ancillary Equipment | A003625200-001                  |                  |
|                     | A003623398-003                  |                  |
|                     | A003623398-007                  |                  |
| Test Engineer       | Fariborz Abasi                  | Date: 2023.12.15 |
| Chamber details     | Chamber: SAC 5                  |                  |

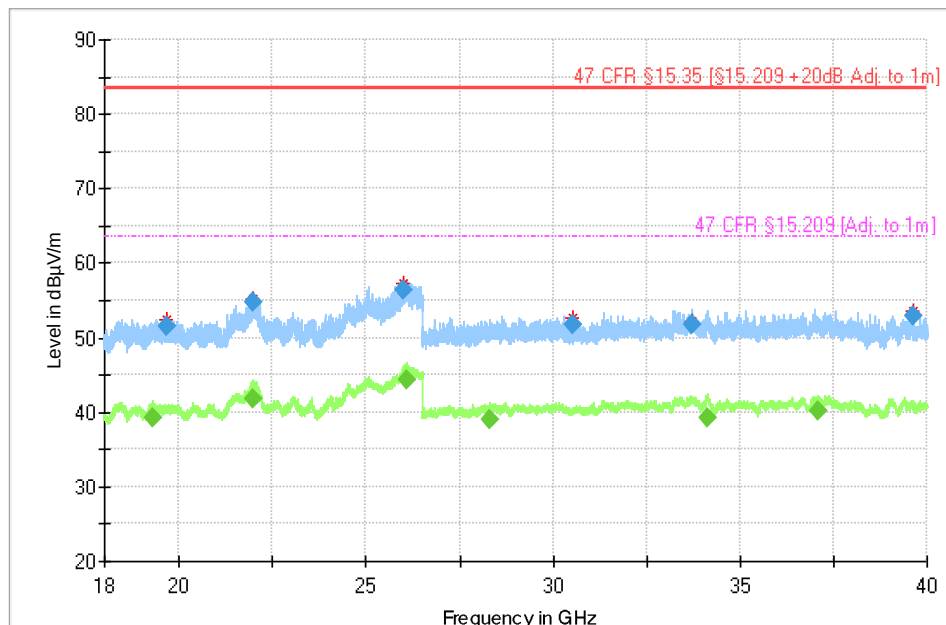


— Preview Result 2-AVG  
\* Critical\_Freqs AVG  
— 47 CFR §15.35 [\$15.209 + 20dB Adj. to 3m]  
◆ Final\_Result PK+  
× MaxPeak-PK+ (Single)

— Preview Result 1-PK+  
\* Critical\_Freqs PK+  
— 47 CFR §15.209 [Adj. to 3m]  
◆ Final\_Result AVG  
+ Average-AVG (Single)

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 1000.032256     | ---              | 41.01            | 53.98          | 12.97       | 1000.0          | 1000.000        | 159.0       | V   | 72.0          | -23.2        |
| 1056.006000     | ---              | 37.93            | 53.98          | 16.05       | 1000.0          | 1000.000        | 179.0       | V   | 72.0          | -23.3        |
| 1103.963691     | ---              | 42.54            | 53.98          | 11.44       | 1000.0          | 1000.000        | 225.0       | V   | 312.0         | -21.6        |
| 1104.012237     | ---              | 42.50            | 53.98          | 11.48       | 1000.0          | 1000.000        | 214.0       | V   | 313.0         | -21.6        |
| 1104.062581     | 44.64            | ---              | 73.98          | 29.35       | 1000.0          | 1000.000        | 175.0       | H   | -18.0         | -21.6        |
| 1776.993000     | 41.58            | ---              | 73.99          | 32.42       | 1000.0          | 1000.000        | 175.0       | H   | 292.0         | -16.9        |
| 2370.595000     | 43.91            | ---              | 74.00          | 30.09       | 1000.0          | 1000.000        | 125.0       | H   | 22.0          | -14.4        |
| 2380.162000     | ---              | 32.02            | 54.00          | 21.98       | 1000.0          | 1000.000        | 129.0       | H   | 100.0         | -14.3        |
| 2479.446000     | 104.74           | ---              | ---            | ---         | 1000.0          | 1000.000        | 175.0       | V   | 234.0         | -13.3        |
| 2480.050000     | ---              | 100.81           | ---            | ---         | 1000.0          | 1000.000        | 175.0       | V   | 202.0         | -13.3        |
| ...             | ...              | ...              | ...            | ...         | ...             | ...             | ...         | ... | ...           | ...          |

|                     |                                 |                  |
|---------------------|---------------------------------|------------------|
| Test mode condition | Zigbee, High channel (2480 MHz) |                  |
| Antenna orientation | Horizontal and Vertical         |                  |
| Sweep frequency     | 18 GHz – 40 GHz                 |                  |
| Standard            | 47 CFR FCC Part 15 subpart C    |                  |
| EUT                 | A003618316-004                  |                  |
| Ancillary Equipment | A003625200-001                  |                  |
|                     | A003623398-003                  |                  |
|                     | A003623398-007                  |                  |
| Test Engineer       | Fariborz Abasi                  | Date: 2024.01.02 |
| Chamber details     | Chamber: SAC 5                  |                  |



— Preview Result 2-AVG  
— Preview Result 1-PK+  
\* Critical\_Freqs AVG  
\* Critical\_Freqs PK+  
◆ Final\_Result PK+  
◆ Final\_Result AVG

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|------------|-----------------|-------------|-----|---------------|--------------|
| 19308.470000    | ---              | 39.23            | 63.52          | 24.29       | 1000.0     | 1000.000        | 155.0       | V   | 218.0         | -4.7         |
| 19663.093000    | 51.44            | ---              | 83.52          | 32.08       | 1000.0     | 1000.000        | 155.0       | H   | 22.0          | -5.3         |
| 21972.732000    | 54.82            | ---              | 83.52          | 28.70       | 1000.0     | 1000.000        | 155.0       | H   | 292.0         | 0.0          |
| 21992.578000    | ---              | 41.83            | 63.52          | 21.69       | 1000.0     | 1000.000        | 155.0       | H   | 38.0          | 0.2          |
| 26014.202000    | 56.46            | ---              | 83.52          | 27.07       | 1000.0     | 1000.000        | 155.0       | H   | 306.0         | 0.7          |
| 26077.299000    | ---              | 44.23            | 63.52          | 19.29       | 1000.0     | 1000.000        | 155.0       | H   | 248.0         | 0.7          |
| 28315.008000    | ---              | 38.93            | 63.52          | 24.59       | 1000.0     | 1000.000        | 155.0       | H   | 22.0          | -5.0         |
| 30503.944000    | 51.71            | ---              | 83.52          | 31.81       | 1000.0     | 1000.000        | 155.0       | H   | 116.0         | -4.9         |
| 33691.906000    | 51.74            | ---              | 83.52          | 31.78       | 1000.0     | 1000.000        | 155.0       | V   | 322.0         | -5.1         |
| 34117.630000    | ---              | 39.35            | 63.52          | 24.17       | 1000.0     | 1000.000        | 155.0       | H   | 22.0          | -4.8         |
| 37105.322000    | ---              | 40.26            | 63.52          | 23.27       | 1000.0     | 1000.000        | 155.0       | V   | 248.0         | -6.8         |
| 39618.450000    | 52.97            | ---              | 83.52          | 30.55       | 1000.0     | 1000.000        | 155.0       | V   | 86.0          | -3.1         |

## 4.3 Test Results – Antenna Conducted Emissions

### 4.3.1 Antenna Conducted Emissions – Test Summary

Emissions measurements have been performed as radiated test (see section 4.2)

## 4.4 Test Results – Band Edge Compliance (Authorized Band)

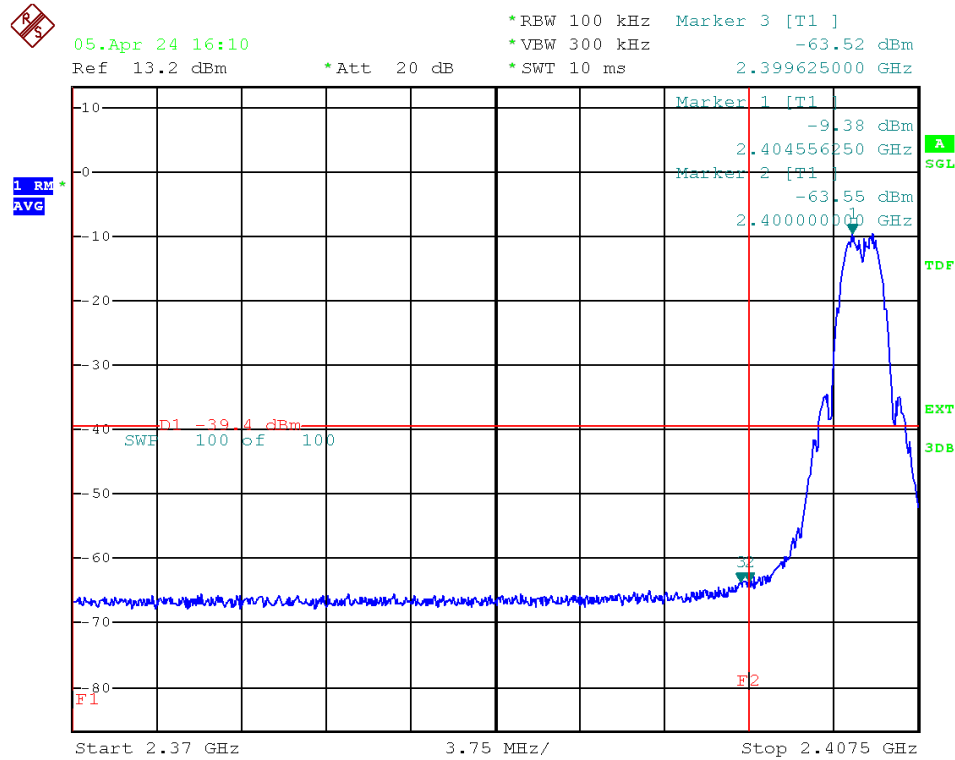
### 4.4.1 Band Edge Compliance (Authorized Band) – Test Summary

|                                 |                   |                                                    |  |  |
|---------------------------------|-------------------|----------------------------------------------------|--|--|
| Test Specification              | 47 CFR 15.247 (d) |                                                    |  |  |
| Test Engineer & Date            | Maria Nyltun      | 2024.04.05 – 2024.04.08                            |  |  |
| EUT and Ancillary Equipment IDs | A003618316-002    | A003625200-005<br>A003618316-005<br>A003618316-013 |  |  |
| EUT Operation Mode(s)           | Continuous Tx     |                                                    |  |  |
| EUT Wireless Configuration(s)   | Zigbee            |                                                    |  |  |
| EUT Hardware Configuration(s)   | N/A               |                                                    |  |  |
| Overall Result                  | PASS              |                                                    |  |  |

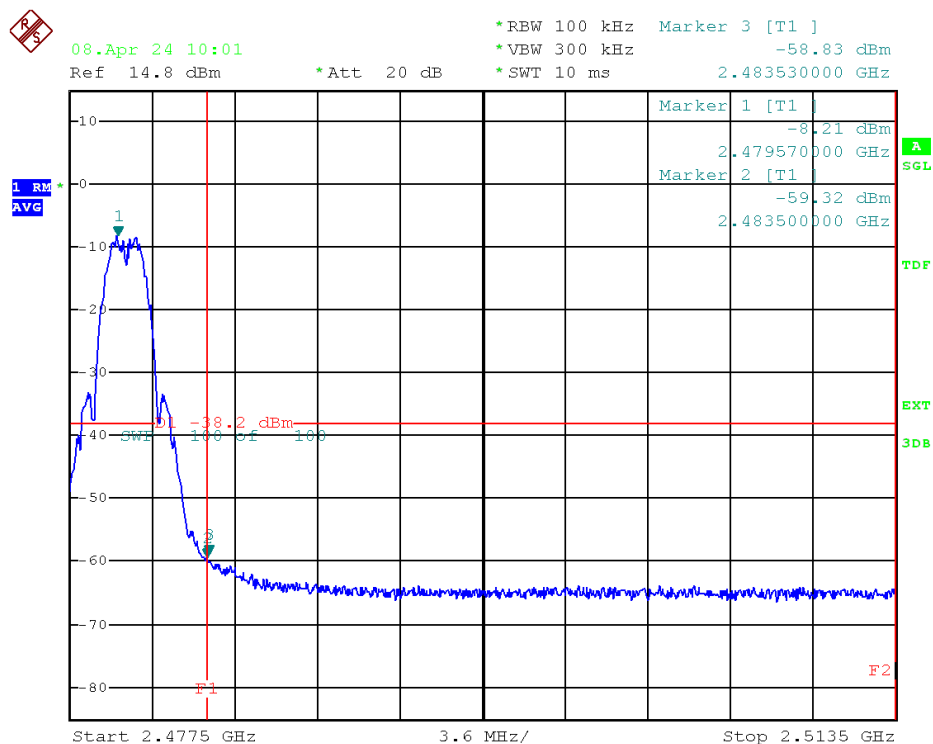
| Test Parameter                                       | Wireless Configuration                   | Measured Level (dBm) | Limit (dBm) | Result |
|------------------------------------------------------|------------------------------------------|----------------------|-------------|--------|
| Peak Emissions at Band Edge (Auth. Band – Low Edge)  | Zigbee<br>Low Channel (O-QPSK 2405 MHz)  | -56.50               | -23.3       | PASS   |
| Avg. Emissions at Band Edge (Auth. Band – Low Edge)  | Zigbee<br>Low Channel (O-QPSK 2405 MHz)  | -63.52               | -39.4       | PASS   |
| Peak Emissions at Band Edge (Auth. Band – High Edge) | Zigbee<br>High Channel (O-QPSK 2480 MHz) | -51.57               | -22.11      | PASS   |
| Avg. Emissions at Band Edge (Auth. Band – High Edge) | Zigbee<br>High Channel (O-QPSK 2480 MHz) | -58.83               | -38.21      | PASS   |

#### 4.4.2 Band Edge Compliance (Authorized Band) – Test Details (Worst Case Plots)

##### Low Channel, Average



##### High Channel, Average



## 4.5 Test Results – Band Edge Compliance (Restricted Band)

### 4.5.1 Band Edge Compliance (Restricted Band) – Test Summary

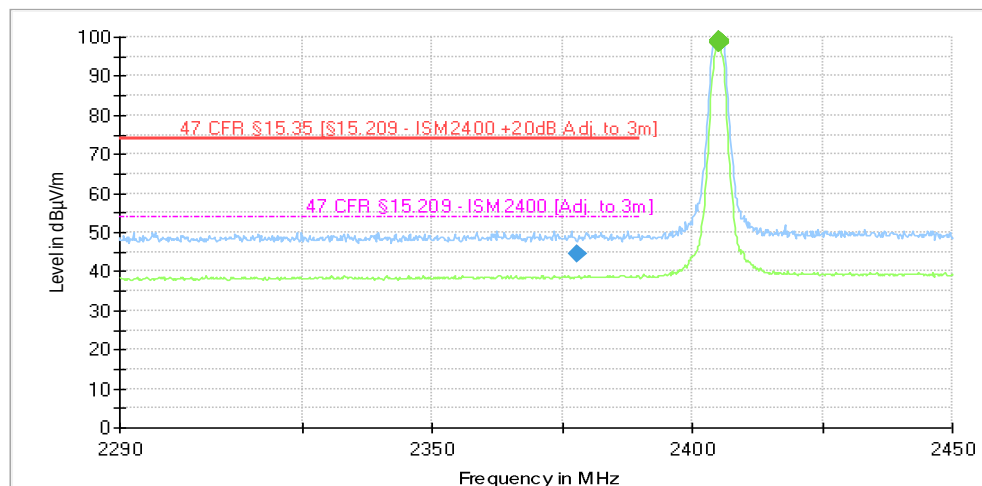
| Test Specification                              | 47 CFR 15.209 & 15.247 (d)            |                                                    |
|-------------------------------------------------|---------------------------------------|----------------------------------------------------|
| Test Engineer & Date                            | Per Isaksson                          | 2023.12.28 – 2023.12.29                            |
| EUT and Ancillary Equipment IDs                 | A003618316-004                        | A003625200-001<br>A003623398-003<br>A003623398-007 |
| EUT Operation Mode(s)                           | Continuous Tx                         |                                                    |
| EUT Wireless Configuration(s)                   | Zigbee                                |                                                    |
| EUT Hardware Configuration(s)                   | N/A                                   |                                                    |
| Overall Result                                  | PASS                                  |                                                    |
| Test Parameter                                  | Wireless Configuration                | Result*                                            |
| Emissions at Band Edge (Rest. Band – Low Edge)  | Zigbee Low Channel (O-QPSK 2405 MHz)  | PASS                                               |
| Emissions at Band Edge (Rest. Band – High Edge) | Zigbee High Channel (O-QPSK 2480 MHz) | PASS                                               |

\* For detailed measurements, see tables and graphs in sections below

#### 4.5.2 Band Edge Compliance (Restricted Band) – Test Details

##### Restricted Band – Low Edge

|                     |                                |                  |
|---------------------|--------------------------------|------------------|
| Test mode condition | Zigbee, Low channel (2405 MHz) |                  |
| Antenna orientation | Horizontal and Vertical        |                  |
| Sweep frequency     | 1 GHz – 18 GHz Lower Band Edge |                  |
| Standard            | 47 CFR FCC Part 15 subpart C   |                  |
| EUT                 | A003618316-004                 |                  |
| Ancillary Equipment | A003625200-001                 |                  |
|                     | A003623398-003                 |                  |
|                     | A003623398-007                 |                  |
| Test Engineer       | Per Isaksson                   | Date: 2023.12.28 |
| Chamber details     | Chamber: SAC 5                 |                  |

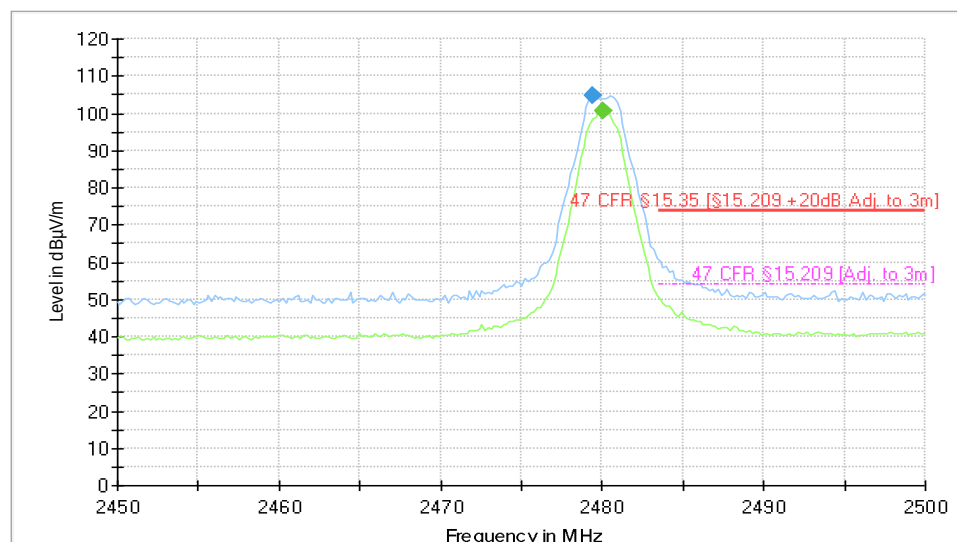


— Preview Result 2-AVG  
— Preview Result 1-PK+  
\* Critical\_Freqs AVG  
\* Critical\_Freqs PK+  
— 47 CFR §15.35 [§15.209 - ISM2400 +20dB Adj. to 3m]  
— 47 CFR §15.209 - ISM2400 [Adj. to 3m]  
◆ Final\_Result PK+  
◆ Final\_Result AVG

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 1615.547000     | 42.26            | ---              | 73.98          | 31.72       | 1000.0          | 1000.000        | 100.0       | H   | 252.0         | -17.5        |
| 2378.091000     | 44.57            | ---              | 73.98          | 29.41       | 1000.0          | 1000.000        | 104.0       | V   | 112.0         | -14.3        |
| 11013.324000    | 46.28            | ---              | 73.98          | 27.70       | 1000.0          | 1000.000        | 175.0       | H   | 26.0          | 8.5          |
| 13326.108000    | 48.36            | ---              | 73.98          | 25.62       | 1000.0          | 1000.000        | 129.0       | V   | 248.0         | 11.2         |
| 2994.269153     | 48.78            | ---              | 73.98          | 25.20       | 1000.0          | 1000.000        | 179.0       | V   | 11.0          | -11.0        |
| 1818.030000     | ---              | 29.70            | 53.98          | 24.28       | 1000.0          | 1000.000        | 100.0       | H   | 162.0         | -17.2        |
| 17971.478000    | 53.70            | ---              | 73.98          | 20.28       | 1000.0          | 1000.000        | 175.0       | H   | 116.0         | 22.0         |
| 4237.745000     | 54.41            | ---              | 73.98          | 19.57       | 1000.0          | 1000.000        | 217.0       | H   | 281.0         | -5.2         |
| 13340.105000    | ---              | 34.97            | 53.98          | 19.01       | 1000.0          | 1000.000        | 175.0       | V   | -18.0         | 11.2         |
| 1056.026000     | ---              | 36.06            | 53.98          | 17.92       | 1000.0          | 1000.000        | 179.0       | V   | 68.0          | -23.3        |
| ...             | ...              | ...              | ...            | ...         | ...             | ...             | ...         | ... | ...           | ...          |

### Restricted Band – High Edge

|                     |                                 |                  |
|---------------------|---------------------------------|------------------|
| Test mode condition | Zigbee, High channel (2480 MHz) |                  |
| Antenna orientation | Horizontal and Vertical         |                  |
| Sweep frequency     | 1 GHz – 18 GHz Upper Band Edge  |                  |
| Standard            | 47 CFR FCC Part 15 subpart C    |                  |
| EUT                 | A003618316-004                  |                  |
| Ancillary Equipment | A003625200-001                  |                  |
|                     | A003623398-003                  |                  |
|                     | A003623398-007                  |                  |
| Test Engineer       | Per Isaksson                    | Date: 2023.12.29 |
| Chamber details     | Chamber: SAC 5                  |                  |



|   |                                           |   |                             |
|---|-------------------------------------------|---|-----------------------------|
| — | Preview Result 2-AVG                      | — | Preview Result 1-PK+        |
| * | Critical_Freqs AVG                        | * | Critical_Freqs PK+          |
| — | 47 CFR §15.35 [§15.209 + 20dB Adj. to 3m] | — | 47 CFR §15.209 [Adj. to 3m] |
| ◆ | Final_Result PK+                          | ◆ | Final_Result AVG            |
| × | MaxPeak-PK+ (Single)                      | + | Average-AVG (Single)        |

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 5976.138000     | ---              | 45.55            | 53.99          | 8.45        | 1000.0          | 1000.000        | 125.0       | V   | 152.0         | -1.5         |
| 5516.304000     | ---              | 44.19            | 53.99          | 9.80        | 1000.0          | 1000.000        | 104.0       | V   | 100.0         | -2.3         |
| 1103.963691     | ---              | 42.54            | 53.98          | 11.44       | 1000.0          | 1000.000        | 225.0       | V   | 312.0         | -21.6        |
| 1104.012237     | ---              | 42.50            | 53.98          | 11.48       | 1000.0          | 1000.000        | 214.0       | V   | 313.0         | -21.6        |
| 17992.167840    | ---              | 41.54            | 53.99          | 12.45       | 1000.0          | 1000.000        | 179.0       | H   | 40.0          | 22.3         |
| 1000.032256     | ---              | 41.01            | 53.98          | 12.97       | 1000.0          | 1000.000        | 159.0       | V   | 72.0          | -23.2        |
| 4181.672000     | ---              | 40.77            | 54.00          | 13.23       | 1000.0          | 1000.000        | 175.0       | H   | 26.0          | -5.6         |
| 1056.006000     | ---              | 37.93            | 53.98          | 16.05       | 1000.0          | 1000.000        | 179.0       | V   | 72.0          | -23.3        |
| 5917.548000     | 57.71            | ---              | 73.99          | 16.28       | 1000.0          | 1000.000        | 175.0       | H   | 280.0         | -1.7         |
| 5589.592000     | 56.68            | ---              | 73.99          | 17.32       | 1000.0          | 1000.000        | 209.0       | H   | 248.0         | -2.3         |
| ...             | ...              | ...              | ...            | ...         | ...             | ...             | ...         | ... | ...           | ...          |

#### **4.6 Test Results – 20dB Bandwidth**

This requirement is not applicable as the radio technology is non-hopping

#### **4.7 Test Results – Carrier (Hopping Channel) Separation**

This requirement is not applicable as the radio technology is non-hopping

#### **4.8 Test Results – Number of Hopping Channels**

This requirement is not applicable as the radio technology is non-hopping

#### **4.9 Test Results – Time of Occupancy (Dwell Time)**

This requirement is not applicable as the radio technology is non-hopping

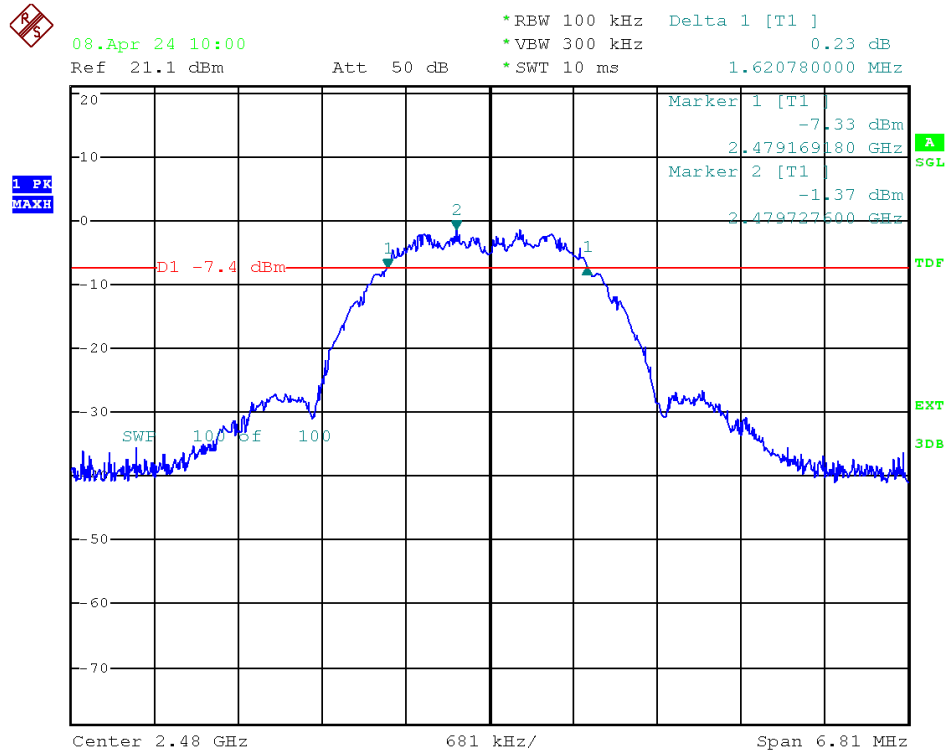
## 4.10 Test Results – 6dB Bandwidth & 99% Bandwidth

### 4.10.1 6dB & 99% Bandwidth – Test Summary

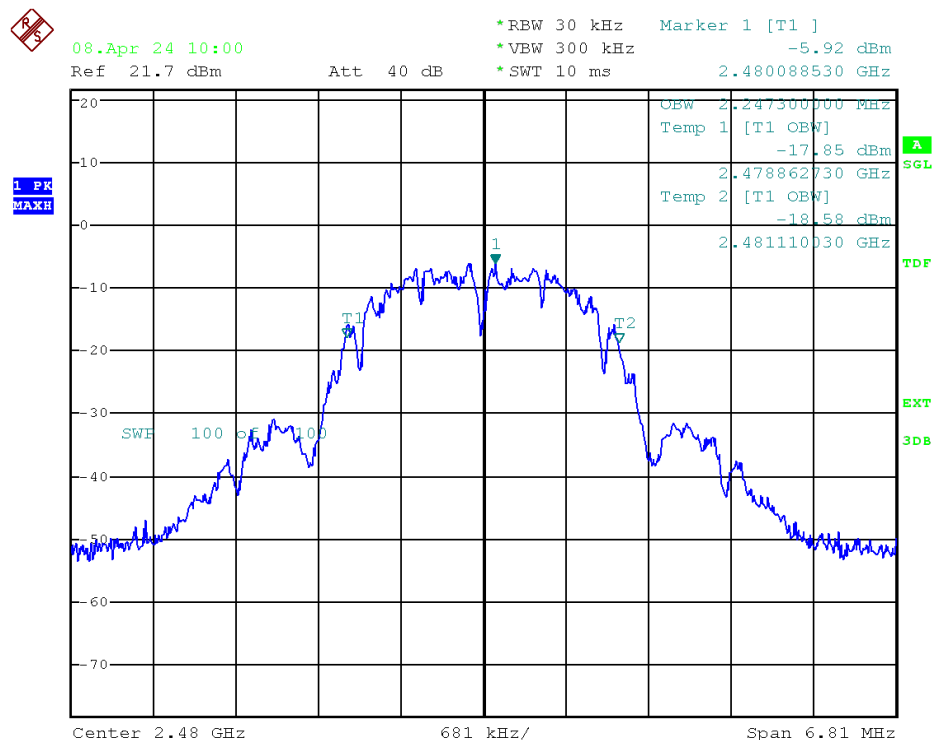
|                                 |                                          |                      |                                                    |           |
|---------------------------------|------------------------------------------|----------------------|----------------------------------------------------|-----------|
| Test Specification              |                                          | 15.247 (a)(2)        |                                                    |           |
| Test Engineer & Date            |                                          | Maria Nyiltun        | 2024.04.05 – 2024.04.08                            |           |
| EUT and Ancillary Equipment IDs |                                          | A003618316-002       | A003625200-005<br>A003618316-005<br>A003618316-013 |           |
| EUT Operation Mode(s)           |                                          | Continuous Tx        |                                                    |           |
| EUT Wireless Configuration(s)   |                                          | Zigbee               |                                                    |           |
| EUT Hardware Configuration(s)   |                                          | N/A                  |                                                    |           |
| Overall Result                  |                                          | PASS                 |                                                    |           |
|                                 |                                          |                      |                                                    |           |
| Test Parameter                  | Wireless Configuration                   | Measured Level (kHz) | Limit (kHz)                                        | Result    |
| 6dB Bandwidth                   | Zigbee<br>Low Channel (O-QPSK 2405 MHz)  | 1637.60              | >500                                               | PASS      |
| 99% Bandwidth                   | Zigbee<br>Low Channel (O-QPSK 2405 MHz)  | 2242.35              | -                                                  | Info Only |
| 6dB Bandwidth                   | Zigbee<br>Mid Channel (O-QPSK 2445 MHz)  | 1624.01              | >500                                               | PASS      |
| 99% Bandwidth                   | Zigbee<br>Mid Channel (O-QPSK 2445 MHz)  | 2255.94              | -                                                  | Info Only |
| 6dB Bandwidth                   | Zigbee<br>High Channel (O-QPSK 2480 MHz) | 1620.78              | >500                                               | PASS      |
| 99% Bandwidth                   | Zigbee<br>High Channel (O-QPSK 2480 MHz) | 2247.30              | -                                                  | Info Only |

#### 4.10.2 6dB & 99% Bandwidth – Test Details (Worst case plots)

##### High Channel, 6dB Bandwidth



##### High Channel, 99% Bandwidth



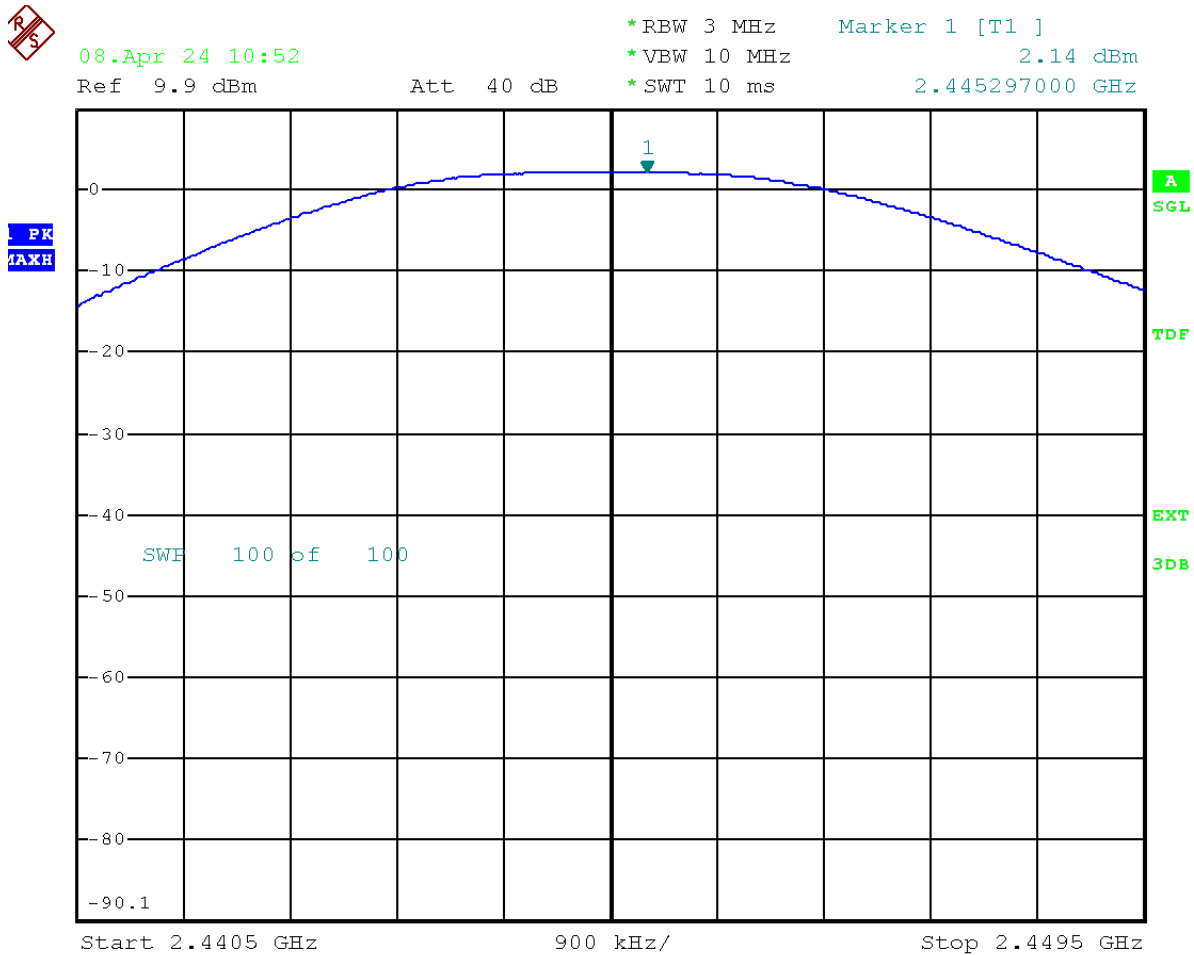
## 4.11 Test Results – Peak Conducted Output Power

### 4.11.1 Peak Conducted Output Power – Test Summary

| Test Specification              |                                             | 15.247 (b)           |          |                                                    |               |        |
|---------------------------------|---------------------------------------------|----------------------|----------|----------------------------------------------------|---------------|--------|
| Test Engineer & Date            |                                             | Maria Nyiltun        |          | 2024.04.05 – 2024.04.08                            |               |        |
| EUT and Ancillary Equipment IDs |                                             | A003618316-002       |          | A003625200-005<br>A003618316-005<br>A003618316-013 |               |        |
| EUT Operation Mode(s)           |                                             | Continuous Tx        |          |                                                    |               |        |
| EUT Wireless Configuration(s)   |                                             | Zigbee               |          |                                                    |               |        |
| EUT Hardware Configuration(s)   |                                             | N/A                  |          |                                                    |               |        |
| Overall Result                  |                                             | PASS                 |          |                                                    |               |        |
| Test Parameter                  | Wireless Configuration                      | Measured Level (dBm) |          |                                                    | Limit (dBm)   | Result |
|                                 |                                             | Low 0°C              | Nom 25°C | High 40°C                                          |               |        |
| Peak Conducted Output Power     | Zigbee<br>Low Channel<br>(O-QPSK 2405 MHz)  | -2.33                | 0.73     | -1.17                                              | > -20<br>< 30 | PASS   |
| Peak Conducted Output Power     | Zigbee<br>Mid Channel<br>(O-QPSK 2445 MHz)  | -2.02                | 2.14     | -0.72                                              | > -20<br>< 30 | PASS   |
| Peak Conducted Output Power     | Zigbee<br>High Channel<br>(O-QPSK 2480 MHz) | 0.11                 | 2.08     | 0.18                                               | > -20<br>< 30 | PASS   |

#### 4.11.2 Peak Conducted Output Power – Test Details (Worst case plot)

##### Mid Channel, Normal Temperature



## 4.12 Test Results – Power Spectral Density

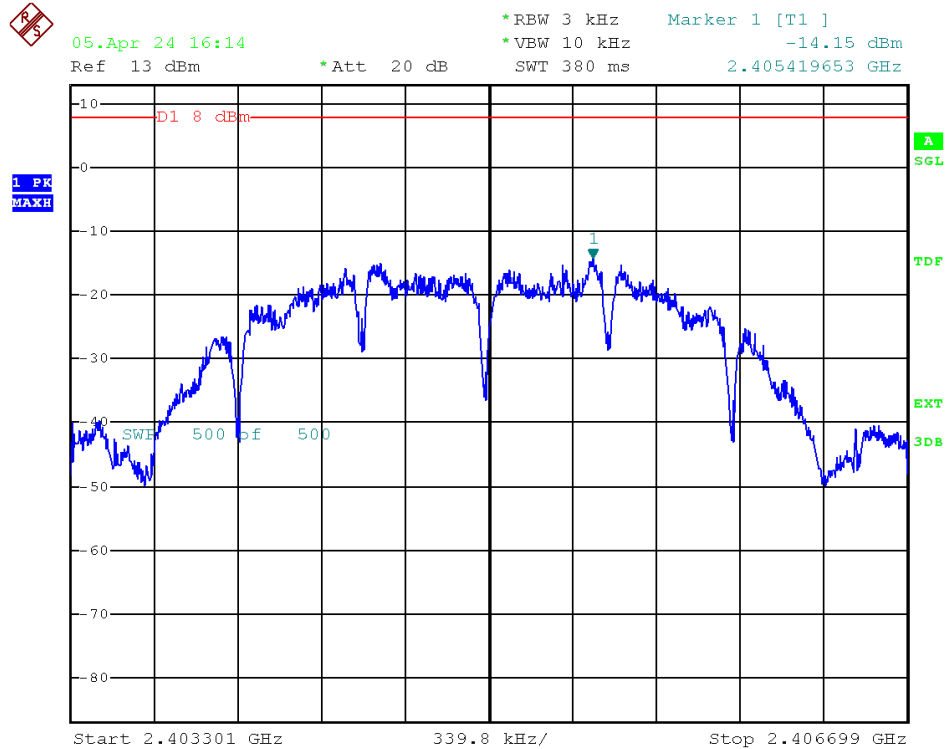
### 4.12.1 Power Spectral Density – Test Summary

|                                 |                |  |                                                    |  |  |
|---------------------------------|----------------|--|----------------------------------------------------|--|--|
| Test Specification              | 15.247 (e)     |  |                                                    |  |  |
| Test Engineer & Date            | Maria Nyiltun  |  | 2024.04.05 – 2024.04.08                            |  |  |
| EUT and Ancillary Equipment IDs | A003618316-002 |  | A003625200-005<br>A003618316-005<br>A003618316-013 |  |  |
| EUT Operation Mode(s)           | Continuous Tx  |  |                                                    |  |  |
| EUT Wireless Configuration(s)   | Zigbee         |  |                                                    |  |  |
| EUT Hardware Configuration(s)   | N/A            |  |                                                    |  |  |
| Overall Result                  | PASS           |  |                                                    |  |  |

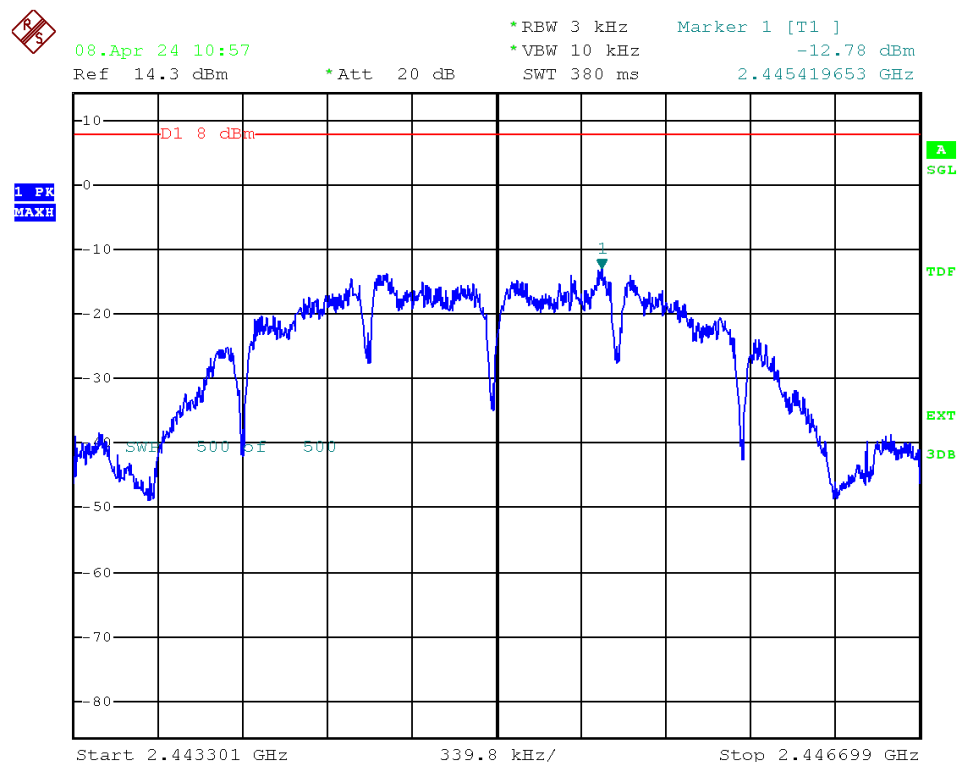
| Test Parameter | Wireless Configuration                      | Measured (dBm/3kHz) | Low Limit (dBm/3kHz) | High Limit (dBm/3kHz) | Result |
|----------------|---------------------------------------------|---------------------|----------------------|-----------------------|--------|
| Power Density  | Zigbee<br>Low Channel<br>(O-QPSK 2405 MHz)  | -14.15              | -30                  | 8                     | PASS   |
| Power Density  | Zigbee<br>Mid Channel<br>(O-QPSK 2445 MHz)  | -12.78              | -30                  | 8                     | PASS   |
| Power Density  | Zigbee<br>High Channel<br>(O-QPSK 2480 MHz) | -12.85              | -30                  | 8                     | PASS   |

#### 4.12.2 Power Spectral Density – Test Details

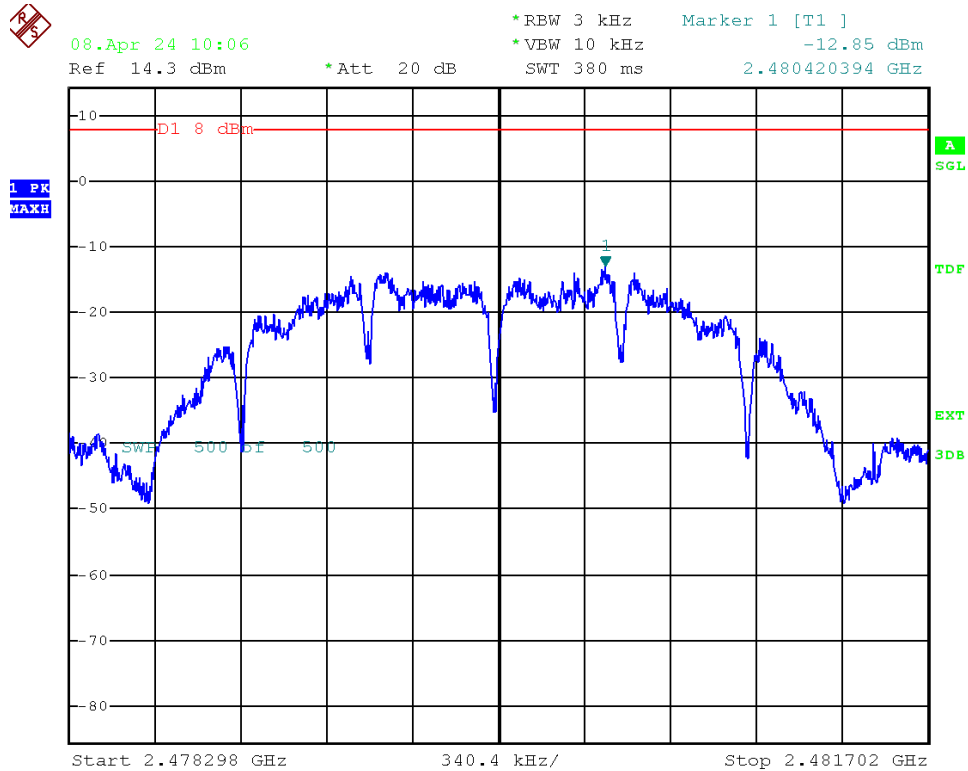
##### Low Channel



##### Mid Channel



### High Channel



## 5. TEST EQUIPMENT STATUS

### 5.1 List of Hardware with Calibration Dates

#### 5.1.1 Hardware List – CTE System

| Type                              | Manufacturer    | Model    | Serial Number / ID           | Calibration Date | Calibration Due |
|-----------------------------------|-----------------|----------|------------------------------|------------------|-----------------|
| Comprehensive Testing Environment | TÜV Rheinland   | HWE 6000 | 00139                        | N/A              | N/A             |
| Bluetooth Signaling Unit          | Rohde & Schwarz | CMW500   | 163750<br>2711468            | 2023-07-17       | 2024-07-17      |
| Spectrum Analyzer                 | Rohde & Schwarz | FSP30    | 100308<br>2704108            | 2023-08-16       | 2024-08-16      |
| Vector Signal Generator           | Rohde & Schwarz | SMU200A  | 101584<br>2704111            | 2023-07-13       | 2024-07-13      |
| Power Supply                      | Keithley        | 2700     | 995343<br>2704115            | 2023-07-21       | 2024-07-21      |
| Multimeter                        | Fluke           | 87       | 61320241<br>2744110          | 2023-06-12       | 2024-06-12      |
| Average Power Sensor              | Rohde & Schwarz | NRP-Z31  | 102145<br>2704104            | 2023-07-12       | 2024-07-12      |
| Temperature Chamber               | Vötsch          | VT4002   | 58566032870010<br>2709706    | N/A              | N/A             |
| Temp. & Humidity Logger           | Lufft           | Opus 20  | 146.0216.0802.030<br>2703980 | 2022-07-27       | 2024-07-27      |

#### 5.1.2 Hardware List – Conducted Emissions System

| Type                          | Manufacturer    | Model   | Serial Number / ID           | Calibration Date | Calibration Due |
|-------------------------------|-----------------|---------|------------------------------|------------------|-----------------|
| Two-Line V-network            | Rohde & Schwarz | ENV216  | 101090<br>2704076            | 2023.07.03       | 2024.07.03      |
| Test Receiver 9KHz to 3.5 GHz | Rohde & Schwarz | ESR3    | 101674<br>2704016            | 2023.06.29       | 2024.06.29      |
| Humidity Temperature Probe    | Lufft           | OPUS 20 | 146.0216.0802.030<br>2703980 | 2022.07.27       | 2024.07.27      |
| Multimeter                    | FLUKE           | 325     | 40860701WS<br>2877011        | 2023.06.08       | 2024.06.08      |

### 5.1.3 Hardware List – SAC5 System

| Type                                 | Manufacturer    | Model             | Serial Number / ID           | Calibration Date | Calibration Due |
|--------------------------------------|-----------------|-------------------|------------------------------|------------------|-----------------|
| EMI Test Receiver                    | Rohde & Schwarz | ESW44             | 101760<br>2881044            | 2023.08.04       | 2024.08.04      |
| Ultra Broadband Antenna              | Rohde & Schwarz | HL562E            | 100988<br>2823181            | 2023.07.18       | 2024.07.18      |
| Double Ridged Waveguide Horn Antenna | Rohde & Schwarz | HF907             | 102678<br>2823164            | 2023.07.27       | 2025.07.27      |
| Horn Antenna – 18 GHz – 26 GHz       | ETS Lindgren    | UG-596A/U         | 20898<br>2814839             | 2022.07.26       | 2024.07.26      |
| Horn Antenna – 26 GHz - 40 GHz       | ETS Lindgren    | UG-600A/U         | 20623<br>2814834             | 2022.07.26       | 2024.07.26      |
| Frequency Multiplier                 | Rohde & Schwarz | SMZ-90            | 101350<br>2886126            | 2021.03.08       | 2024.03.08      |
| Control device                       | Maturo          | NCD               | NCD/393/2372.01<br>2884216   | N/A              | N/A             |
| Open Switch & Control Unit           | Rohde & Schwarz | OSP150            | 100081<br>2884198            | 2023.08.29       | 2024.08.29      |
| Open Switch & Control Unit           | Rohde & Schwarz | OSP120            | 100084<br>2761253            | 2023.08.29       | 2024.08.29      |
| Shielded Filter Unit                 | Rohde & Schwarz | OSP-F Extension 1 | 101333<br>2761265            | 2023.08.29       | 2024.08.29      |
| Shielded Filter Unit                 | Rohde & Schwarz | OSP-F Extension 2 | 101335<br>2761266            | 2023.08.29       | 2024.08.29      |
| Shielded Filter Unit                 | Rohde & Schwarz | OSP-F Base Unit   | 101330<br>2761262            | 2023.08.29       | 2024.08.29      |
| Humidity Temperature Probe           | Lufft           | OPUS 20           | 146.0216.0802.030<br>2703980 | 2022.07.27       | 2024.07.27      |

## 5.2 Software / Firmware Versions

| Equipment                               | Software / Firmware Name | Version        |
|-----------------------------------------|--------------------------|----------------|
| Comprehensive Testing Environment (CTE) | CTE – TMF<br>CTE – BT    | V52.0<br>V44.0 |
| Conducted Emissions System              | EMC 32                   | V10.60.20      |
| SAC 5                                   | EMC 32                   | V10.60.10      |

## 6. MEASUREMENT UNCERTAINTY

### 6.1 Measurement Uncertainty for CTE

| Parameter                                                       | Uncertainty (Coverage Factor k=2) |
|-----------------------------------------------------------------|-----------------------------------|
| Maximum Output Power (15.247b)                                  | ±0.51 dB                          |
| 6dB / 20dB Channel Bandwidth & 99% Occupied bandwidth (15.247a) | <5%                               |
| Carrier Frequency Separation (15.247a)                          | N/A                               |
| Number of Hopping Channels (15.247a)                            | N/A                               |
| Time of Occupancy – Dwell Time (15.247a)                        | N/A                               |
| Band Edge Compliance of Conducted Emissions (15.247a)           | ±1.04 dB                          |
| Conducted Spurious Emissions (15.247d)                          | ±2.98 dB                          |
| Power Spectral Density (15.247e)                                | ±0.51 dB                          |

### 6.2 Measurement Uncertainty for Conducted Emissions

| Parameter                                      | Uncertainty (Coverage Factor k=2) |
|------------------------------------------------|-----------------------------------|
| Conducted emissions with LISN 150KHz to 30 MHz | 2.98 dB                           |

### 6.3 Measurement Uncertainty for SAC 5 (Radiated Emissions & Band Edge)

| Parameter                       | Uncertainty (Coverage Factor k=2) |
|---------------------------------|-----------------------------------|
| Field Strength 10 Hz -9 kHz     | 3.38 dB                           |
| Field Strength 9 kHz -30 MHz    | 3.38 dB                           |
| Field Strength 30 MHz -1000 MHz | 3.38 dB                           |
| Field Strength 1 GHz -18 GHz    | 4.88 dB                           |
| Field Strength 18 GHz - 40 GHz  | 5.14 dB                           |

## **7. PHOTOGRAPHS**

See Appendix 1 for photographs