

|                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                    |                                                            |                                                                                    |                                                                                    |                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Prüfbericht-Nr.:</b><br>Test report no.:                                                                                                                                                                                                                                                                                                                                                                 | <b>60440644-001</b>                                                                | <b>Auftrags-Nr.:</b><br>Order no.:                         | <b>23870506 030</b>                                                                | Seite 1 von 32<br>Page 1 of 32                                                     |                                                                        |
| <b>Kunden-Referenz-Nr.:</b><br>Client reference no.:                                                                                                                                                                                                                                                                                                                                                        | -                                                                                  | <b>Auftragsdatum:</b><br>Order date:                       | <b>2021.02.10</b>                                                                  |                                                                                    |                                                                        |
| <b>Auftraggeber:</b><br>Client:                                                                                                                                                                                                                                                                                                                                                                             | <b>Brainlit AB</b>                                                                 |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Prüfgegenstand:</b><br>Test item:                                                                                                                                                                                                                                                                                                                                                                        | <b>Alven Global</b>                                                                |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Bezeichnung / Typ-Nr.:</b><br>Identification / Type no.:                                                                                                                                                                                                                                                                                                                                                 | <b>Contains FCC ID:VPYLBEE5HY1MW</b>                                               |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Auftrags-Inhalt:</b><br>Order content:                                                                                                                                                                                                                                                                                                                                                                   | <b>Accredited testing</b>                                                          |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Prüfgrundlage:</b><br>Test specification:                                                                                                                                                                                                                                                                                                                                                                | <b>FCC 47 CFR Part 15.247 with parts 15.207 &amp; 15.209<br/>ANSI C63.10: 2013</b> |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Wareneingangsdatum:</b><br>Date of sample receipt:                                                                                                                                                                                                                                                                                                                                                       | <b>2021.02.10</b>                                                                  |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Prüfmuster-Nr.:</b><br>Test sample no:                                                                                                                                                                                                                                                                                                                                                                   | <b>A003001961-001</b>                                                              |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Prüfzeitraum:</b><br>Testing period:                                                                                                                                                                                                                                                                                                                                                                     | <b>2021.04.08 – 2021.04.14</b>                                                     |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Ort der Prüfung:</b><br>Place of testing:                                                                                                                                                                                                                                                                                                                                                                | <b>Lund, Sweden</b>                                                                |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Prüflaboratorium:</b><br>Testing laboratory:                                                                                                                                                                                                                                                                                                                                                             | <b>TÜV Rheinland Sweden</b>                                                        |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Prüfergebnis*:</b><br>Test result*:                                                                                                                                                                                                                                                                                                                                                                      | <b>Pass</b>                                                                        |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>überprüft von:</b><br>reviewed by:                                                                                                                                                                                                                                                                                                                                                                       | <b>genehmigt von:</b><br>authorized by:                                            |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Datum: 2021.05.25</b><br>Date:                                                                                                                                                                                                                                                                                                                                                                           | <b>Datum: 2021.05.25</b><br>Date:                                                  |                                                            |                                                                                    |                                                                                    |                                                                        |
| <b>Stellung / Position:</b>                                                                                                                                                                                                                                                                                                                                                                                 | <b>Senior Technical Expert</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>3 = satisfactory<br>F(ail) = failed a.m. test specification(s) | 4 = ausreichend<br>N/A = nicht anwendbar<br>4 = sufficient<br>N/A = not applicable | 5 = mangelhaft<br>N/T = nicht getestet<br>5 = poor<br>N/T = not tested |
| * 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 = 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 History60440644-00160440644-001

| REVISION                                                       | DATE       | REMARKS       | AUTHOR          |
|----------------------------------------------------------------|------------|---------------|-----------------|
| 001                                                            | 2021.05.25 | First release | Niall Forrester |
|                                                                |            |               |                 |
|                                                                |            |               |                 |
| Note: Latest revision report will replace all previous reports |            |               |                 |
| This report based on FCC Part 15.247 Template version 1.2      |            |               |                 |

## 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)           | Out of Band Emissions                                     | YES           | 4.3            | N.P.   | See note 1         |
| 15.247 (d)           | Band Edge Compliance (Authorized Band)                    | YES           | 4.4            | N.P.   | See note 1         |
| 15.247 (d)           | Band Edge Compliance (Restricted Band)                    | YES           | 4.5            | PASS   |                    |
| 15.247 (a)(1)        | 20dB Bandwidth                                            | YES           | 4.6            | N.P.   | See note 1         |
| 15.247 (a)(1)        | Carrier (Hopping Channel) Separation                      | NO            | 4.7            | N/A    | Non-hopping device |
| 15.247 (a)(1)        | Number of Hopping Channels                                | NO            | 4.8            | N/A    | Non-hopping device |
| 15.247 (a)(1)        | Time of Occupancy (Dwell Time)                            | NO            | 4.9            | N/A    | Non-hopping device |
| 15.247 (a)(2)        | 6dB Bandwidth                                             | YES           | 4.10           | N.P.   | See note 1         |
| 15.247 (b)           | Peak Conducted Output Power                               | YES           | 4.11           | N.P.   | See note 1         |
| 15.247 (e)           | Power Spectral Density                                    | YES           | 4.12           | N.P.   | See note 1         |

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.                  |

**Note 1:** the device includes pre-certified modules as described in section 2.1 below

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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:              | Brainlit AB                                                                                         |
| Address:                   | Scheelevägen 34                                                                                     |
|                            | 223 63 Lund                                                                                         |
|                            | Sweden                                                                                              |
|                            |                                                                                                     |
| Contact Person:            | Johan Frogner                                                                                       |
| Contact e-Mail / Telephone | <a href="mailto:Johan.Frogner@brainlit.com">Johan.Frogner@brainlit.com</a> /<br>+46 (0) 708 300 439 |

## 2. PRODUCT INFORMATION

### 2.1 General Description

|                                       |                                                           |
|---------------------------------------|-----------------------------------------------------------|
| <b>Model name:</b>                    | Alven Global                                              |
| <b>Manufacturer:</b>                  | Brainlit AB                                               |
| <b>Model number / Marketing name:</b> | Alven Global / 100023                                     |
| <b>FCC ID:</b>                        | N/A (Contains approved module with FCC ID: VPYLBEE5HY1MW) |
| <b>Description:</b>                   | Free Standing LED Luminaire                               |
| <b>Ancillary Equipment:</b>           | See section 2.7                                           |

The device incorporates one pre-certified module:

- Murata LBEE5HY1MW (FCC ID: VPYLBEE5HY1MW) for WLAN 2.4 GHz 802.11 b/g/n, WLAN 5GHz 802.11 a/n/ac and Bluetooth Low Energy

### 2.2 Device Characteristics

|                                          |                                         |
|------------------------------------------|-----------------------------------------|
| <b>Type of Power Supply</b>              | AC                                      |
| <b>Nominal Supply Voltage</b>            | 115 VAC                                 |
| <b>Supply Voltage Range</b>              | 110 – 240 VAC                           |
| <b>Operating Temperature Range</b>       | 0° - 30° C                              |
| <b>Operating Air Humidity Range</b>      | IP 20 Class, Normal Ambient temperature |
| <b>Highest Internal Frequency Source</b> | 2480 MHz                                |

### 2.3 Test Samples

| EUT # | EUT ID         | Description          | Used For:                                 |
|-------|----------------|----------------------|-------------------------------------------|
| 1     | A003001961-001 | Standard test sample | Radiated Emissions<br>Conducted Emissions |

## 2.4 Wireless Technologies and Bands Supported by the EUT

| Technology                    | Band    | Frequency Range (Tx) | Evaluation Performed* |
|-------------------------------|---------|----------------------|-----------------------|
| Bluetooth LE (LBEE5HY1MW)     | 2.4 GHz | 2402 MHz – 2480 MHz  | NO                    |
| WiFi 802.11b/g/n (LBEE5HY1MW) | 2.4 GHz | 2412 MHz – 2462 MHz  | YES                   |

\*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) |
|---------------------------|---------|--------------------|-----------------|------------|
| Bluetooth LE (LBEE5HY1MW) | 2.4 GHz | 1                  | PCB Antenna     | 0.1        |
| WiFi 802.11b (LBEE5HY1MW) | 2.4 GHz | 1                  | PCB Antenna     | 0.1        |

## 2.6 Wireless Technology Details

| Technology                    | Band    | Rated Pwr (dBm) | Modulation Type(s)         | No. of Channels | Channel Spacing | Adaptivity |
|-------------------------------|---------|-----------------|----------------------------|-----------------|-----------------|------------|
| Bluetooth LE (LBEE5HY1MW)     | 2.4 GHz | 5.11            | GFSK                       | 40              | 2 MHz           | N/A        |
| WiFi 802.11b/g/n (LBEE5HY1MW) | 2.4 GHz | 23.83           | CCK / BPSK / QPSK / 64-QAM | 11              | 5.5 MHz         | N/A        |

## 2.7 Ancillary Equipment

No ancillary equipment.

## 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 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  $\mu\text{V}/\text{m}$ . Measurements on the test system are made in  $\text{dB}\mu\text{V}/\text{m}$ . 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  $100\mu\text{V}/\text{m}$  at 3m. This gives:

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

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  $30\mu\text{V}/\text{m}$  (=29.54  $\text{dB}\mu\text{V}/\text{m}$ ) 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 $\mu$ V/m (=53.98 dB $\mu$ 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                                     | N.P.                |
| 15.247 (d)           | Band Edge Compliance (Authorized band)                    | N.P.                |
| 15.247 (d)           | Band Edge Compliance (Restricted band)                    | SAC 5               |
| 15.247 (a)(1)        | 20dB Bandwidth                                            | N.P.                |
| 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 Bandwidth                                             | N.P.                |
| 15.247 (b)           | Peak Conducted Output Power                               | N.P.                |
| 15.247 (e)           | Power Spectral Density                                    | N.P.                |

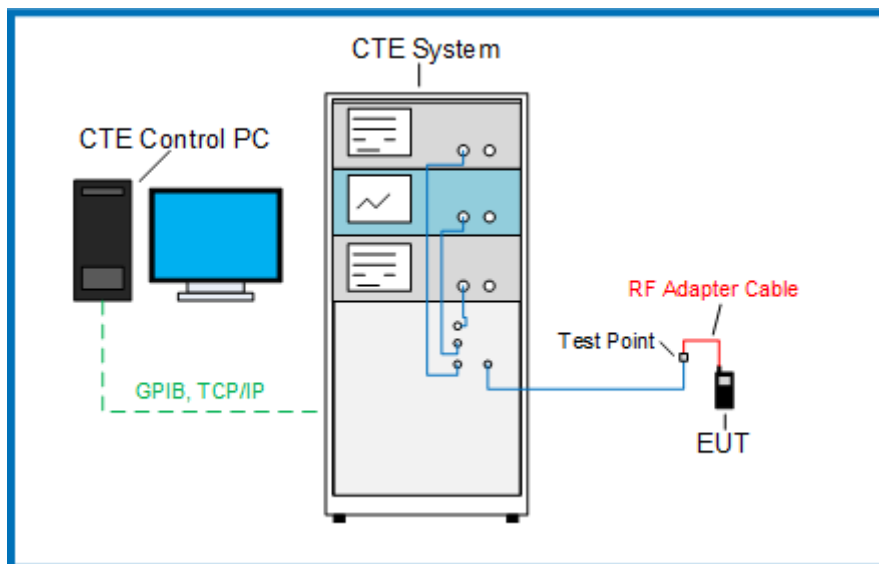
### 3.4.3 Test Equipment Setup – CTE System

The Comprehensive Test Environment (CTE) system consists of a number of instruments (see section ) mounted in a rack together with automated relays and interconnecting hardware. The instruments and other equipment are controlled from a standard PC running software provided by the manufacturer. The RF output of the EUT is connected to the test system via a coaxial cable.

Tests are in the form of pre-defined scripts that can be loaded on the PC. The scripts, as well as the hardware setup, have been verified for conformance with the relevant test specifications.

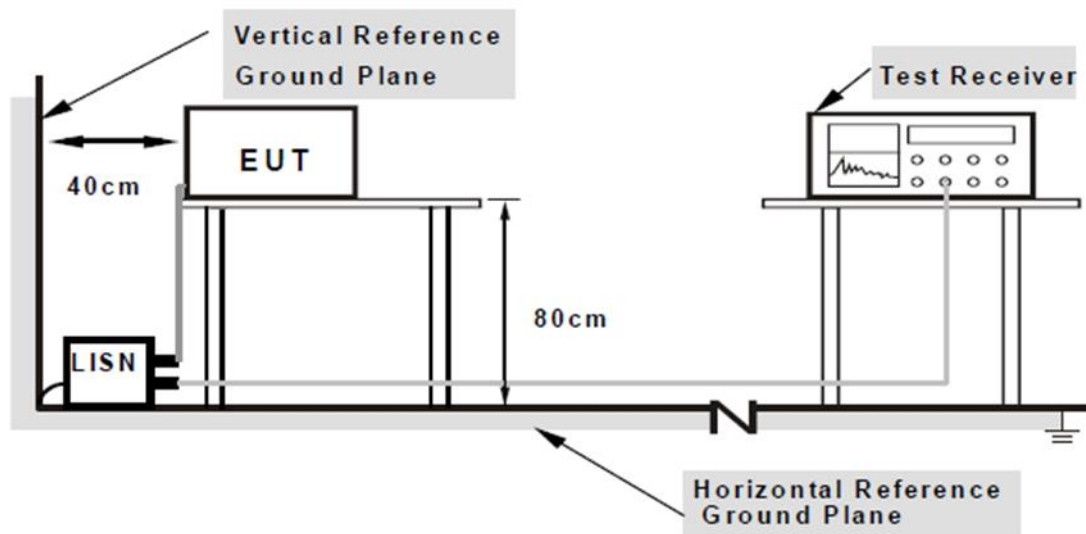
Losses in the cables and interconnects have been measured using the system's own automated routines and are compensated for automatically. Any additional loss in RF adapter cables supplied together with the EUT can be compensated for using the known characteristics of that adapter.

CTE Block Diagram



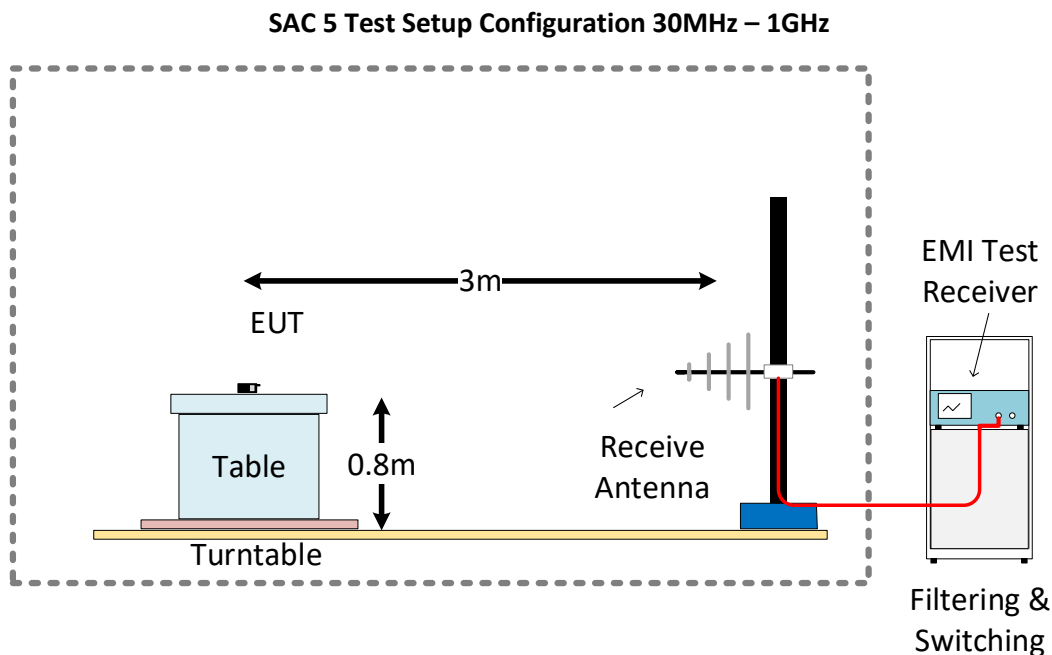
#### 3.4.4 Test Equipment Setup – Conducted Emissions

- 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.

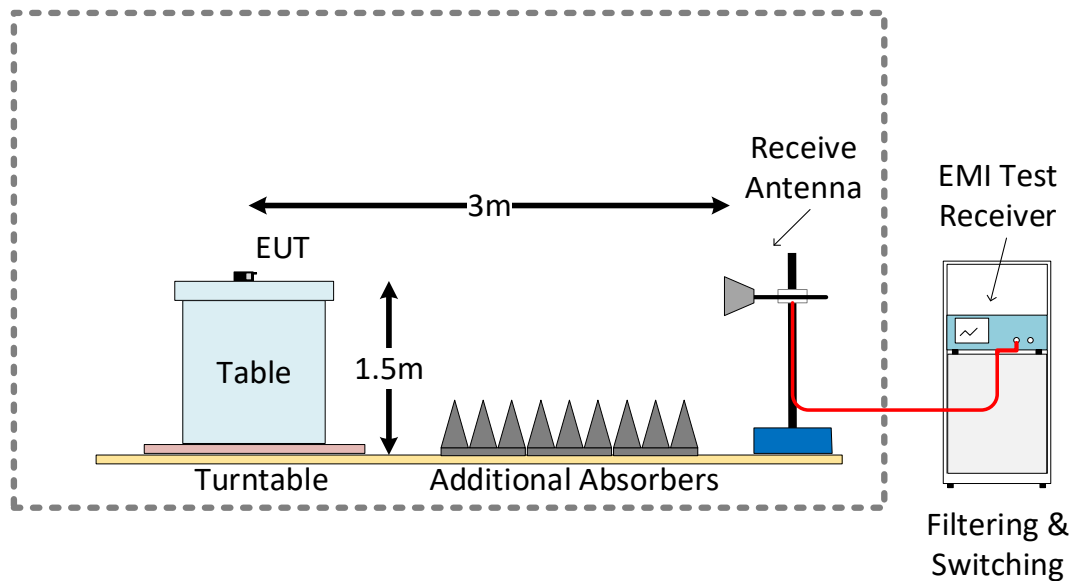


### 3.4.5 Test Equipment Setup – SAC 5 (Radiated Emissions and Restricted Band Edge)

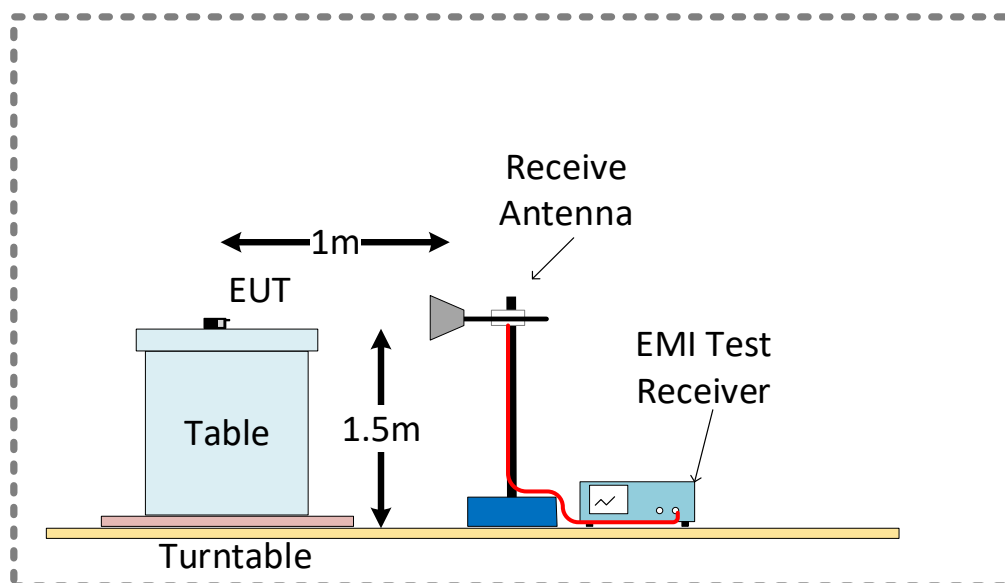
- For frequency range 30MHz-1GHz Log-Periodic Antenna was used. Antenna elevated from 100 cm from floor to 400 cm from floor, and was placed at 3 m from center of turntable in tilted position. The equipment under test (EUT) was placed at the middle of the turntable at 150 cm height from floor. The antenna 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 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 1GHz – 18GHz**



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



### 3.5 EUT Configuration During Test

N/A

### 3.6 EUT Operation Modes

| Operation mode      | Description                                                   |
|---------------------|---------------------------------------------------------------|
| Maximum Light Level | The device was set with the light output at its maximum level |

### 3.7 Deviations from the Test Standard

This product is based on a pre-certified module as described in section 2.1, hence a limited test scope has been verified.

Measurement data from certification reports for the module was used in determining which tests to include or exclude from the test scope.

### 3.8 Environmental Conditions

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

##### Environmental Conditions Log – SAC5

| Date       | Time  | Temperature (°C) | Relative Humidity (%) |
|------------|-------|------------------|-----------------------|
| 2021.04.12 | 09:00 | 19.5             | 30                    |
| 2021.04.13 | 10:10 | 19.2             | 31                    |

## 4. TEST RESULTS

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

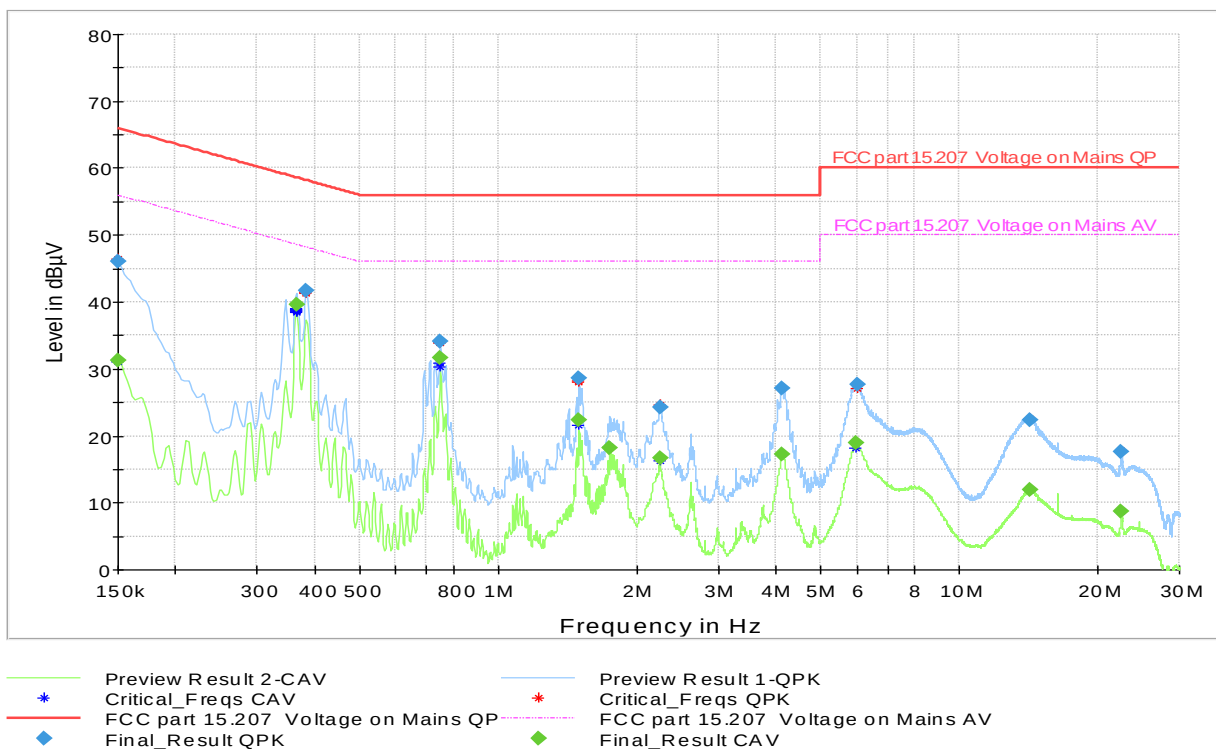
#### 4.1.1 AC Power Line Conducted Emissions (Intentional) – Test Summary

|                                                          |                                              |                 |         |
|----------------------------------------------------------|----------------------------------------------|-----------------|---------|
| Test Specification                                       | FCC 47 CFR 15.207 (Part 15 Subpart C)        |                 |         |
| Test Engineer & Date                                     | Sam Ebadeh                                   | 2021.04.14      |         |
| EUT and Ancillary Equipment IDs                          | A003001961-001                               | None            |         |
| EUT Operation Mode(s)                                    | Maximum Light Level                          |                 |         |
| EUT Wireless Configuration(s)                            | WLAN 802.11g 6Mbps                           |                 |         |
| EUT Hardware Configuration(s)                            | Default                                      |                 |         |
| Overall Result                                           | PASS                                         |                 |         |
| Test Parameter                                           | Wireless Configuration                       | Frequency Range | Result* |
| AC Conducted Power Line Emissions – “N” Line & “L1” Line | WLAN 802.11g 6Mbps Channel 6 (BPSK 2437 MHz) | 0.15 – 30 MHz   | PASS    |

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

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

|                     |                     |                  |
|---------------------|---------------------|------------------|
| Test mode condition | Conducted Emissions |                  |
| Sweep frequency     | 150 kHz – 30 MHz    |                  |
| Standard            | FCC 47 Part 15.207  |                  |
| EUT                 | A002965790-001      |                  |
| Ancillary Equipment | None                |                  |
| Test Engineer       | Sam Ebadeh          | Date: 2021.04.14 |



| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Filter | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|--------|------------|
| 0.150000        | ---              | 31.23           | 56.00        | 24.77       | 1000.0          | 9.000           | L1   | ON     | 9.7        |
| 0.150000        | 46.08            | ---             | 66.00        | 19.92       | 1000.0          | 9.000           | L1   | ON     | 9.7        |
| 0.366000        | ---              | 39.65           | 48.59        | 8.94        | 1000.0          | 9.000           | N    | ON     | 9.6        |
| 0.384000        | 41.66            | ---             | 58.19        | 16.53       | 1000.0          | 9.000           | N    | ON     | 9.6        |
| 0.750750        | 34.04            | ---             | 56.00        | 21.96       | 1000.0          | 9.000           | N    | ON     | 9.6        |
| 0.750750        | ---              | 31.70           | 46.00        | 14.30       | 1000.0          | 9.000           | N    | ON     | 9.6        |
| 1.500000        | ---              | 22.33           | 46.00        | 23.67       | 1000.0          | 9.000           | N    | ON     | 9.7        |
| 1.500000        | 28.57            | ---             | 56.00        | 27.43       | 1000.0          | 9.000           | N    | ON     | 9.7        |
| 1.749750        | ---              | 18.14           | 46.00        | 27.86       | 1000.0          | 9.000           | N    | ON     | 9.7        |
| 2.249250        | ---              | 16.64           | 46.00        | 29.36       | 1000.0          | 9.000           | N    | ON     | 9.7        |
| 2.249250        | 24.33            | ---             | 56.00        | 31.67       | 1000.0          | 9.000           | N    | ON     | 9.7        |
| 4.116750        | ---              | 17.20           | 46.00        | 28.80       | 1000.0          | 9.000           | L1   | ON     | 9.8        |
| 4.123500        | 27.09            | ---             | 56.00        | 28.91       | 1000.0          | 9.000           | L1   | ON     | 9.8        |
| 5.979750        | ---              | 18.99           | 50.00        | 31.01       | 1000.0          | 9.000           | N    | ON     | 9.8        |
| 5.991000        | 27.63            | ---             | 60.00        | 32.37       | 1000.0          | 9.000           | N    | ON     | 9.8        |
| 14.259750       | 22.33            | ---             | 60.00        | 37.67       | 1000.0          | 9.000           | L1   | ON     | 9.9        |
| 14.273250       | ---              | 12.03           | 50.00        | 37.97       | 1000.0          | 9.000           | L1   | ON     | 9.9        |
| 22.463250       | ---              | 8.68            | 50.00        | 41.32       | 1000.0          | 9.000           | L1   | ON     | 10.0       |
| 22.483500       | 17.67            | ---             | 60.00        | 42.33       | 1000.0          | 9.000           | L1   | ON     | 10.0       |



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

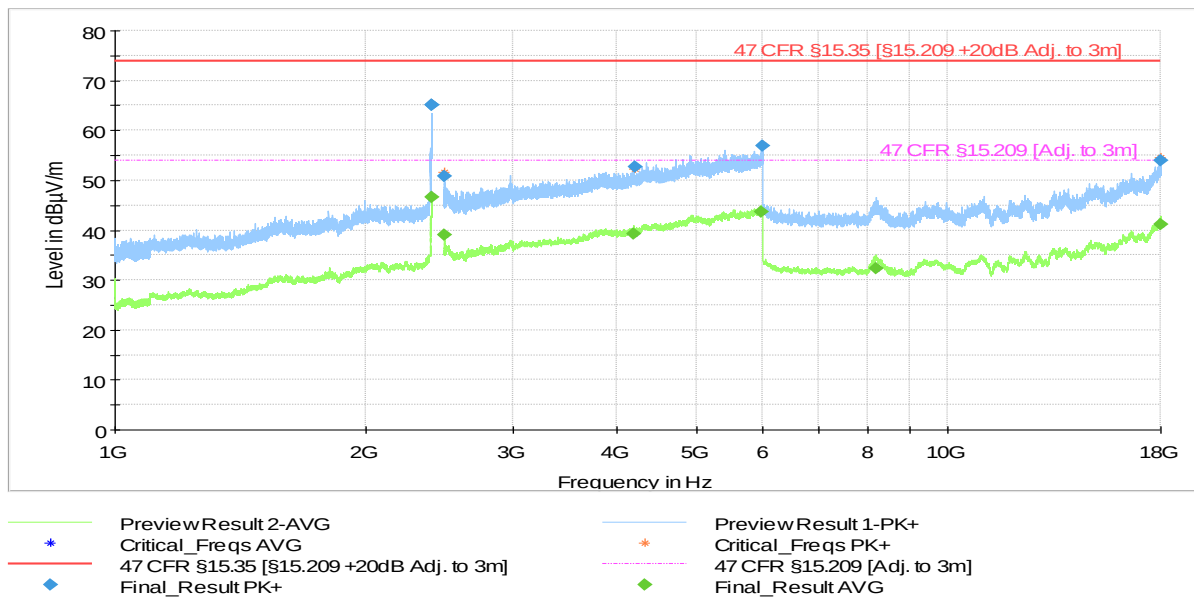
### 4.2.1 Radiated Emissions (Intentional) – Test Summary

| <b>Test Specification</b>              |                                                 | FCC 47 CFR 15.209 (Part 15 Subpart C) |                         |
|----------------------------------------|-------------------------------------------------|---------------------------------------|-------------------------|
| <b>Test Engineer &amp; Date</b>        |                                                 | Joel Efraimsson<br>Niall Forrester    | 2021.04.12 – 2021.04.13 |
| <b>EUT and Ancillary Equipment IDs</b> |                                                 | A003001961-001                        | -                       |
| <b>EUT Operation Mode(s)</b>           |                                                 | Maximum Light Level                   |                         |
| <b>EUT Wireless Configuration(s)</b>   |                                                 | WLAN 802.11g 6Mbps                    |                         |
| <b>EUT Hardware Configuration(s)</b>   |                                                 | Default                               |                         |
| <b>Overall Result</b>                  |                                                 | PASS                                  |                         |
| Test Parameter                         | Wireless Configuration                          | Frequency Range                       | Result                  |
| Radiated Emissions                     | WLAN 802.11g 6Mbps<br>Channel 1 (BPSK 2412 MHz) | 1 GHz – 18 GHz                        | PASS                    |
| Radiated Emissions                     | WLAN 802.11g 6Mbps<br>Channel 6 (BPSK 2437 MHz) | 9 kHz – 30 MHz                        | PASS                    |
| Radiated Emissions                     | WLAN 802.11g 6Mbps<br>Channel 6 (BPSK 2437 MHz) | 30 MHz – 1 GHz                        | PASS                    |
| Radiated Emissions                     | WLAN 802.11g 6Mbps<br>Channel 6 (BPSK 2437 MHz) | 1 GHz – 18 GHz                        | PASS                    |
| Radiated Emissions                     | WLAN 802.11g 6Mbps<br>Channel 11(BPSK 2462 MHz) | 1 GHz – 18 GHz                        | PASS                    |

#### 4.2.2 Radiated Emissions (Intentional) – Test Details

##### Low Channel

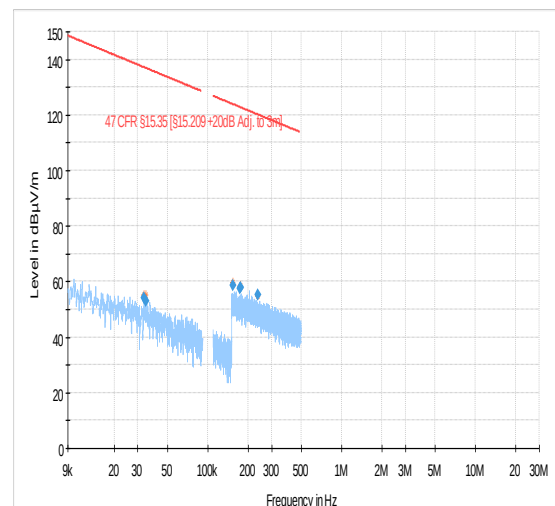
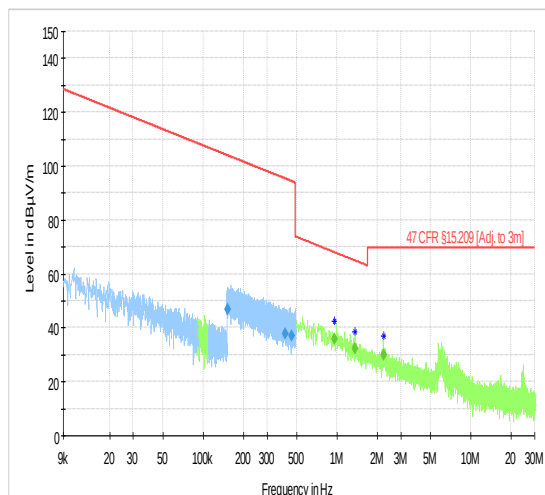
|                     |                                         |                  |
|---------------------|-----------------------------------------|------------------|
| Test mode condition | WLAN 802.11g 6Mbps Channel 1 (2412 MHz) |                  |
| Antenna orientation | Horizontal and Vertical                 |                  |
| Sweep frequency     | 1 GHz – 18 GHz                          |                  |
| Standard            | 47 CFR FCC Part 15 subpart C            |                  |
| EUT                 | A003001961-001                          |                  |
| Ancillary Equipment | -                                       |                  |
| Test Engineer       | Niall Forrester                         | Date: 2021-04-12 |
| Chamber details     | Chamber: SAC 5                          |                  |



| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 2397.479444     | 65.08            | ---              | 73.98          | 8.90        | 1000.0          | 1000.000        | 170.0       | H   | 314.0         |
| 2397.626076     | 65.15            | ---              | 73.98          | 8.83        | 1000.0          | 1000.000        | 121.0       | H   | 296.0         |
| 2399.986500     | ---              | 46.58            | 53.98          | 7.39        | 1000.0          | 1000.000        | 170.0       | H   | 312.0         |
| 2483.528000     | ---              | 39.07            | 53.98          | 14.91       | 1000.0          | 1000.000        | 125.0       | V   | 68.0          |
| 2483.970014     | 50.90            | ---              | 73.98          | 23.08       | 1000.0          | 1000.000        | 120.0       | H   | 202.0         |
| 4188.697000     | ---              | 39.35            | 53.98          | 14.63       | 1000.0          | 1000.000        | 125.0       | V   | 112.0         |
| 4204.393000     | 52.63            | ---              | 73.98          | 21.35       | 1000.0          | 1000.000        | 175.0       | H   | -22.0         |
| 5977.395000     | ---              | 43.64            | 53.98          | 10.34       | 1000.0          | 1000.000        | 102.0       | H   | 252.0         |
| 5978.656000     | 56.95            | ---              | 73.98          | 17.03       | 1000.0          | 1000.000        | 175.0       | H   | 200.0         |
| 8206.876000     | ---              | 32.39            | 53.98          | 21.59       | 1000.0          | 1000.000        | 125.0       | V   | 22.0          |
| 17984.290000    | 53.99            | ---              | 73.98          | 19.99       | 1000.0          | 1000.000        | 170.0       | V   | 129.0         |
| 17987.628000    | ---              | 41.23            | 53.98          | 12.75       | 1000.0          | 1000.000        | 100.0       | V   | 154.0         |

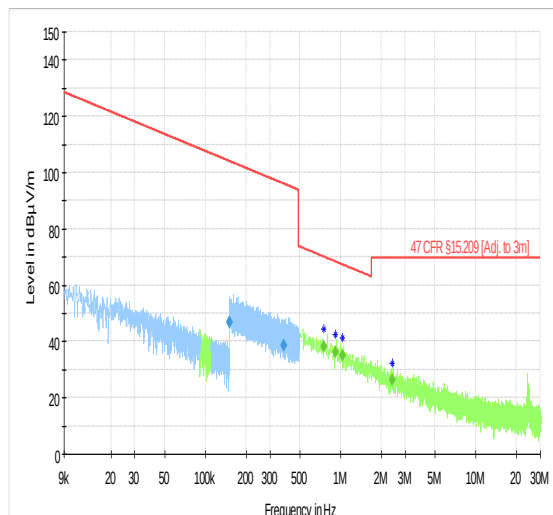
## Mid Channel

|                     |                                         |            |
|---------------------|-----------------------------------------|------------|
| Test mode condition | WLAN 802.11g 6Mbps Channel 6 (2437 MHz) |            |
| Antenna orientation | Loop Antenna Parallel to Axis           |            |
| Sweep frequency     | 9 KHz – 30 MHz                          |            |
| Standard            | 47 CFR FCC Part 15 subpart C            |            |
| EUT                 | A003001961-001                          |            |
| Ancillary Equipment | -                                       |            |
| Test Engineer       | Joel Efraimsson                         | 2021-04-13 |
| Chamber details     | Chamber: SAC 5                          |            |

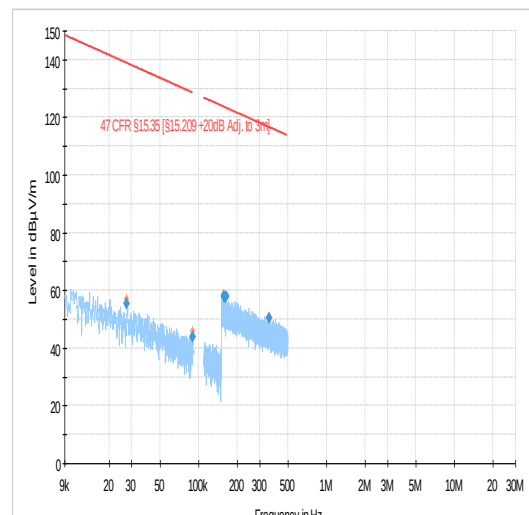


| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|--------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 0.151825        | 46.74            | ---                | ---              | 103.98         | 57.24       | 1000.0          | 9.000           | 100.0       | H   | 225.0         |
| 0.410007        | 37.94            | ---                | ---              | 95.35          | 57.41       | 1000.0          | 9.000           | 100.0       | H   | 135.0         |
| 0.455612        | 37.05            | ---                | ---              | 94.43          | 57.38       | 1000.0          | 9.000           | 100.0       | H   | 139.0         |
| 0.960169        | ---              | 35.70              | ---              | 67.96          | 32.25       | 1000.0          | 9.000           | 100.0       | H   | 139.0         |
| 1.363073        | ---              | 32.12              | ---              | 64.91          | 32.80       | 1000.0          | 9.000           | 100.0       | H   | 315.0         |
| 2.228964        | ---              | 29.79              | ---              | 69.54          | 39.75       | 1000.0          | 9.000           | 100.0       | H   | 192.0         |
| 0.033375        | ---              | ---                | 54.14            | 137.14         | 82.99       | 1000.0          | 0.200           | 100.0       | H   | 202.0         |
| 0.034329        | ---              | ---                | 52.83            | 136.89         | 84.06       | 1000.0          | 0.200           | 100.0       | H   | 165.0         |
| 0.154395        | ---              | ---                | 58.62            | 123.83         | 65.22       | 1000.0          | 9.000           | 100.0       | H   | -2.0          |
| 0.174549        | ---              | ---                | 57.67            | 122.77         | 65.10       | 1000.0          | 9.000           | 100.0       | H   | 75.0          |
| 0.175684        | ---              | ---                | 57.73            | 122.71         | 64.98       | 1000.0          | 9.000           | 100.0       | H   | 113.0         |
| 0.235755        | ---              | ---                | 55.10            | 120.16         | 65.06       | 1000.0          | 9.000           | 100.0       | H   | 280.0         |

|                            |                                         |            |
|----------------------------|-----------------------------------------|------------|
| <b>Test mode condition</b> | WLAN 802.11g 6Mbps Channel 6 (2437 MHz) |            |
| <b>Antenna orientation</b> | Loop Antenna Perpendicular to Axis      |            |
| <b>Sweep frequency</b>     | 9 KHz – 30 MHz                          |            |
| <b>Standard</b>            | 47 CFR FCC Part 15 subpart C            |            |
| <b>EUT</b>                 | A003001961-001                          |            |
| <b>Ancillary Equipment</b> | -                                       |            |
| <b>Test Engineer</b>       | Joel Efraimsson                         | 2021-04-13 |
| <b>Chamber details</b>     | Chamber: SAC 5                          |            |



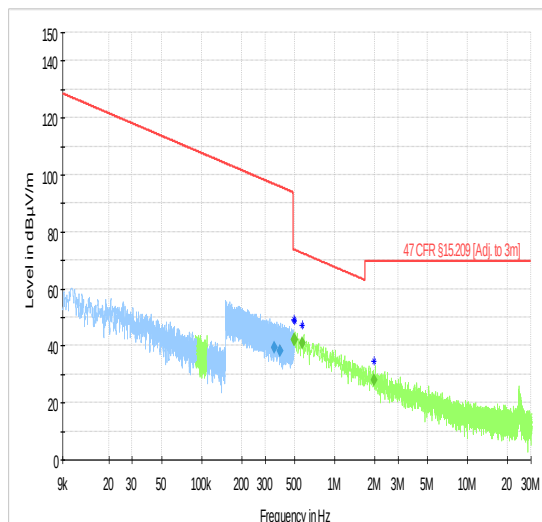
PreviewResult 2-PK+  
 Critical\_Freqs PK+  
 47 CFR §15.209 (Adj. to 3m)  
 Final\_Result QPK  
 PreviewResult 1-AVG  
 Critical\_Freqs AVG  
 Final\_Result AVG



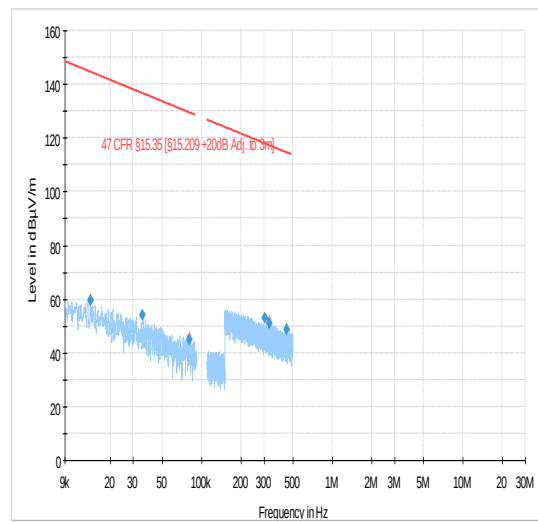
PreviewResult 1-PK+  
 47 CFR §15.35 (S15.209+20dB Adj. to 3m)  
 Critical\_Freqs PK+  
 Final\_Result PK+

| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|--------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 0.150350        | 46.80            | ---                | ---              | 104.06         | 57.26       | 1000.0          | 9.000           | 100.0       | H   | 89.0          |
| 0.380615        | 38.50            | ---                | ---              | 96.00          | 57.50       | 1000.0          | 9.000           | 100.0       | H   | 192.0         |
| 0.754981        | ---              | 38.03              | ---              | 70.05          | 32.01       | 1000.0          | 9.000           | 100.0       | H   | 45.0          |
| 0.920329        | ---              | 36.13              | ---              | 68.33          | 32.20       | 1000.0          | 9.000           | 100.0       | H   | 135.0         |
| 1.038971        | ---              | 35.10              | ---              | 67.27          | 32.17       | 1000.0          | 9.000           | 100.0       | H   | 139.0         |
| 2.417173        | ---              | 26.24              | ---              | 69.54          | 43.31       | 1000.0          | 9.000           | 100.0       | H   | 281.0         |
| 0.027345        | ---              | ---                | 55.32            | 138.87         | 83.55       | 1000.0          | 0.200           | 100.0       | H   | 135.0         |
| 0.089879        | ---              | ---                | 43.89            | 128.53         | 84.64       | 1000.0          | 0.200           | 100.0       | H   | 256.0         |
| 0.156724        | ---              | ---                | 57.89            | 123.70         | 65.81       | 1000.0          | 9.000           | 100.0       | H   | 88.0          |
| 0.161319        | ---              | ---                | 57.46            | 123.45         | 65.99       | 1000.0          | 9.000           | 100.0       | H   | 267.0         |
| 0.164117        | ---              | ---                | 57.90            | 123.30         | 65.40       | 1000.0          | 9.000           | 100.0       | H   | -27.0         |
| 0.353750        | ---              | ---                | 50.51            | 116.63         | 66.12       | 1000.0          | 9.000           | 100.0       | H   | -45.0         |

|                            |                                         |            |
|----------------------------|-----------------------------------------|------------|
| <b>Test mode condition</b> | WLAN 802.11g 6Mbps Channel 6 (2437 MHz) |            |
| <b>Antenna orientation</b> | Loop Antenna Parallel to Floor          |            |
| <b>Sweep frequency</b>     | 9 KHz – 30 MHz                          |            |
| <b>Standard</b>            | 47 CFR FCC Part 15 subpart C            |            |
| <b>EUT</b>                 | A003001961-001                          |            |
| <b>Ancillary Equipment</b> | -                                       |            |
| <b>Test Engineer</b>       | Joel Efraimsson                         | 2021-04-13 |
| <b>Chamber details</b>     | Chamber: SAC 5                          |            |



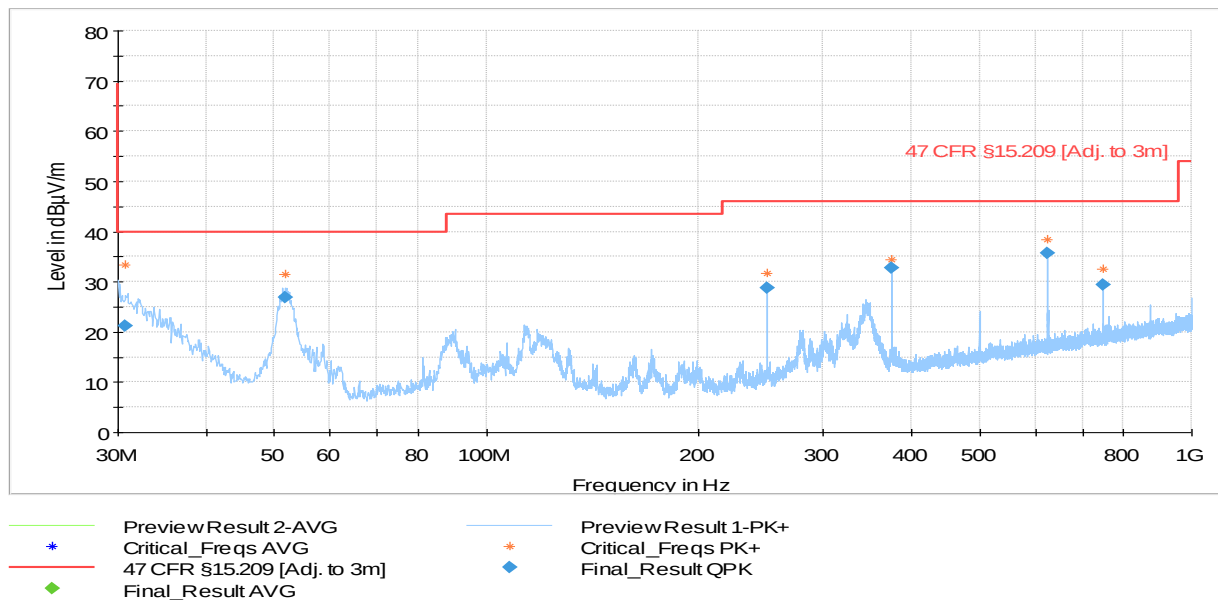
PreviewResult2-PK+  
 Critical\_Freqs PK+  
 47 CFR §15.209 (Adj. to 3m)  
 Final\_Result QPK  
 PreviewResult1-AVG  
 Critical\_Freqs AVG  
 Final\_Result AVG



PreviewResult1-PK+  
 47 CFR §15.35 (S15.209+20dB Adj. to 3m)  
 Critical\_Freqs PK+  
 Final\_Result PK+

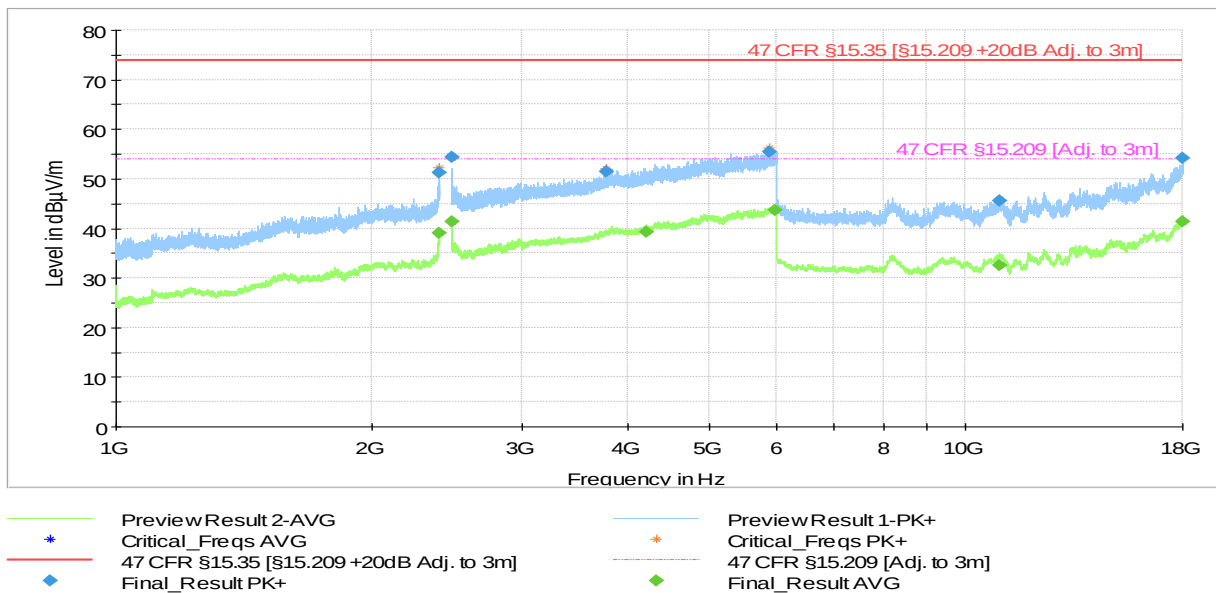
| Frequency (MHz) | Average (dBµV/m) | QuasiPeak (dBµV/m) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|--------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 0.350268        | 39.25            | ---                | ---              | 96.72          | 57.46       | 1000.0          | 9.000           | 100.0       | H   | 205.0         |
| 0.387478        | 38.35            | ---                | ---              | 95.84          | 57.49       | 1000.0          | 9.000           | 100.0       | H   | -13.0         |
| 0.493377        | ---              | 42.20              | ---              | 73.74          | 31.54       | 1000.0          | 9.000           | 100.0       | H   | 135.0         |
| 0.500152        | ---              | 42.13              | ---              | 73.62          | 31.49       | 1000.0          | 9.000           | 100.0       | H   | 229.0         |
| 0.568789        | ---              | 40.82              | ---              | 72.51          | 31.68       | 1000.0          | 9.000           | 100.0       | H   | 128.0         |
| 1.976328        | ---              | 28.08              | ---              | 69.54          | 41.46       | 1000.0          | 9.000           | 100.0       | H   | 225.0         |
| 0.014066        | ---              | ---                | 59.44            | 144.64         | 85.20       | 1000.0          | 0.200           | 100.0       | H   | 101.0         |
| 0.035380        | ---              | ---                | 53.93            | 136.63         | 82.70       | 1000.0          | 0.200           | 100.0       | H   | 113.0         |
| 0.080636        | ---              | ---                | 44.73            | 129.47         | 84.74       | 1000.0          | 0.200           | 100.0       | H   | 191.0         |
| 0.305245        | ---              | ---                | 52.85            | 117.91         | 65.06       | 1000.0          | 9.000           | 100.0       | H   | 23.0          |
| 0.328464        | ---              | ---                | 51.15            | 117.27         | 66.12       | 1000.0          | 9.000           | 100.0       | H   | 315.0         |
| 0.448166        | ---              | ---                | 48.70            | 114.58         | 65.88       | 1000.0          | 9.000           | 100.0       | H   | 139.0         |

|                     |                                         |            |
|---------------------|-----------------------------------------|------------|
| Test mode condition | WLAN 802.11g 6Mbps Channel 6 (2437 MHz) |            |
| Antenna orientation | Horizontal and Vertical                 |            |
| Sweep frequency     | 30 MHz – 1 GHz                          |            |
| Standard            | 47 CFR FCC Part 15 subpart C            |            |
| EUT                 | A003001961-001                          |            |
| Ancillary Equipment | -                                       |            |
| Test Engineer       | Joel Efraimsson                         | 2021-04-12 |
| Chamber details     | Chamber: SAC 5                          |            |



| Frequency (MHz) | QuasiPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|--------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 30.645125       | 21.25              | ---              | 40.00          | 18.75       | 1000.0          | 120.000         | 133.0       | H   | 0.0           |
| 51.782000       | 26.96              | ---              | 40.00          | 13.04       | 1000.0          | 120.000         | 100.0       | V   | 144.0         |
| 250.006440      | 28.87              | ---              | 46.02          | 17.15       | 1000.0          | 120.000         | 220.0       | H   | 68.0          |
| 375.002840      | 32.81              | ---              | 46.02          | 13.21       | 1000.0          | 120.000         | 100.0       | V   | 338.0         |
| 625.003400      | 35.79              | ---              | 46.02          | 10.23       | 1000.0          | 120.000         | 275.0       | V   | 310.0         |
| 750.028120      | 29.38              | ---              | 46.02          | 16.64       | 1000.0          | 120.000         | 108.0       | V   | 220.0         |

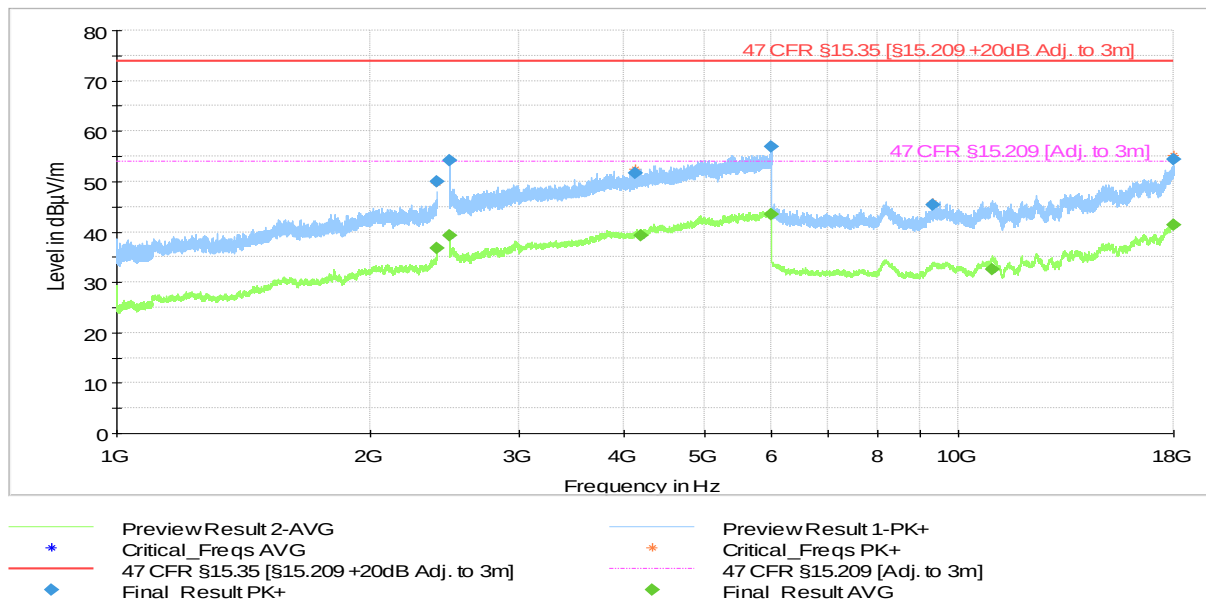
|                     |                                         |                  |
|---------------------|-----------------------------------------|------------------|
| Test mode condition | WLAN 802.11g 6Mbps Channel 6 (2437 MHz) |                  |
| Antenna orientation | Horizontal and Vertical                 |                  |
| Sweep frequency     | 1 GHz – 18 GHz                          |                  |
| Standard            | 47 CFR FCC Part 15 subpart C            |                  |
| EUT                 | A003001961-001                          |                  |
| Ancillary Equipment | -                                       |                  |
| Test Engineer       | Joel Efraimsson                         | Date: 2021-04-12 |
| Chamber details     | Chamber: SAC 5                          |                  |



| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 2399.473936     | 51.26            | ---              | 73.98          | 22.72       | 1000.0          | 1000.000        | 175.0       | H   | 296.0         |
| 2399.973500     | ---              | 39.14            | 53.98          | 14.84       | 1000.0          | 1000.000        | 197.0       | H   | -22.0         |
| 2483.544960     | ---              | 41.42            | 53.98          | 12.56       | 1000.0          | 1000.000        | 112.0       | H   | 311.0         |
| 2483.660363     | 54.38            | ---              | 73.98          | 19.60       | 1000.0          | 1000.000        | 148.0       | H   | 267.0         |
| 3774.662000     | 51.49            | ---              | 73.98          | 22.49       | 1000.0          | 1000.000        | 100.0       | V   | 22.0          |
| 4207.228000     | ---              | 39.20            | 53.98          | 14.78       | 1000.0          | 1000.000        | 177.0       | V   | 54.0          |
| 5867.597000     | 55.48            | ---              | 73.98          | 18.50       | 1000.0          | 1000.000        | 125.0       | H   | 87.0          |
| 5977.340000     | ---              | 43.63            | 53.98          | 10.35       | 1000.0          | 1000.000        | 177.0       | H   | -3.0          |
| 10945.722000    | ---              | 32.58            | 53.98          | 21.40       | 1000.0          | 1000.000        | 175.0       | V   | 202.0         |
| 10958.895000    | 45.47            | ---              | 73.98          | 28.51       | 1000.0          | 1000.000        | 176.0       | H   | 322.0         |
| 17974.458000    | 54.15            | ---              | 73.98          | 19.83       | 1000.0          | 1000.000        | 125.0       | V   | 176.0         |
| 17991.040000    | ---              | 41.29            | 53.98          | 12.69       | 1000.0          | 1000.000        | 100.0       | V   | 248.0         |

## High Channel

|                     |                                          |                  |
|---------------------|------------------------------------------|------------------|
| Test mode condition | WLAN 802.11g 6Mbps Channel 11 (2462 MHz) |                  |
| Antenna orientation | Horizontal and Vertical                  |                  |
| Sweep frequency     | 1 GHz – 18 GHz                           |                  |
| Standard            | 47 CFR FCC Part 15 subpart C             |                  |
| EUT                 | A003001961-001                           |                  |
| Ancillary Equipment | -                                        |                  |
| Test Engineer       | Joel Efraimsson                          | Date: 2021-04-12 |
| Chamber details     | Chamber: SAC 5                           |                  |



| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 2399.919000     | 50.02            | ---              | 73.98          | 23.96       | 1000.0          | 1000.000        | 197.0       | H   | 202.0         |
| 2399.987000     | ---              | 36.73            | 53.98          | 17.25       | 1000.0          | 1000.000        | 112.0       | H   | 290.0         |
| 2483.567530     | ---              | 39.27            | 53.98          | 14.70       | 1000.0          | 1000.000        | 102.0       | H   | 252.0         |
| 2483.623962     | 54.12            | ---              | 73.98          | 19.86       | 1000.0          | 1000.000        | 148.0       | H   | 280.0         |
| 4130.304000     | 51.69            | ---              | 73.98          | 22.29       | 1000.0          | 1000.000        | 121.0       | H   | 87.0          |
| 4187.211000     | ---              | 39.37            | 53.98          | 14.61       | 1000.0          | 1000.000        | 125.0       | V   | 162.0         |
| 5985.077000     | 57.00            | ---              | 73.98          | 16.98       | 1000.0          | 1000.000        | 175.0       | V   | -3.0          |
| 5986.865000     | ---              | 43.57            | 53.98          | 10.41       | 1000.0          | 1000.000        | 177.0       | H   | 22.0          |
| 9325.428000     | 45.30            | ---              | 73.98          | 28.68       | 1000.0          | 1000.000        | 126.0       | H   | 322.0         |
| 10980.386000    | ---              | 32.63            | 53.98          | 21.34       | 1000.0          | 1000.000        | 175.0       | V   | 312.0         |
| 17987.734000    | ---              | 41.32            | 53.98          | 12.66       | 1000.0          | 1000.000        | 206.0       | V   | 142.0         |
| 17995.549500    | 54.45            | ---              | 73.98          | 19.53       | 1000.0          | 1000.000        | 175.0       | V   | 68.0          |



## 4.3 Test Results – Out of Band Emissions

### 4.3.1 Out of Band Emissions – Test Summary

Test has not been performed. Product is based on certified module VPYLBEE5HY1MW.

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

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

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

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

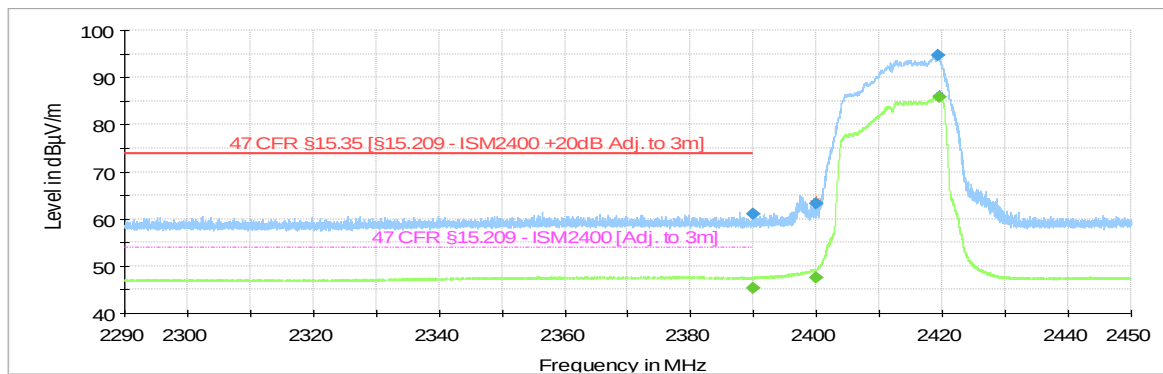
| Test Specification                                 | 47 CFR 15.209 & 15.247 (d)                      |            |
|----------------------------------------------------|-------------------------------------------------|------------|
| Test Engineer & Date                               | Joel Efraimsson                                 | 2021.04.12 |
| EUT and Ancillary Equipment IDs                    | A003001961-001                                  | -          |
| EUT Operation Mode(s)                              | Maximum Light Level                             |            |
| EUT Wireless Configuration(s)                      | WLAN 802.11g 6Mbps                              |            |
| EUT Hardware Configuration(s)                      | Default                                         |            |
| Overall Result                                     | PASS                                            |            |
| Test Parameter                                     | Wireless Configuration                          | Result*    |
| Emissions at Band Edge<br>(Rest. Band – Low Edge)  | WLAN 802.11g 6Mbps<br>Channel 1 (BPSK 2412 MHz) | PASS       |
| Emissions at Band Edge<br>(Rest. Band – High Edge) | WLAN 802.11g 6Mbps<br>Channel 11(BPSK 2462 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 | WLAN 802.11g 6Mbps Channel 1 (2412 MHz) |                  |
| Antenna orientation | Horizontal and Vertical                 |                  |
| Sweep frequency     | ISM 2400 Lower Band Edge                |                  |
| Standard            | 47 CFR FCC Part 15 subpart C            |                  |
| EUT                 | A003001961-001                          |                  |
| Ancillary Equipment | -                                       |                  |
| Test Engineer       | Joel Efraimsson                         | Date: 2021-04-12 |
| Chamber details     | Chamber: SAC 5                          |                  |

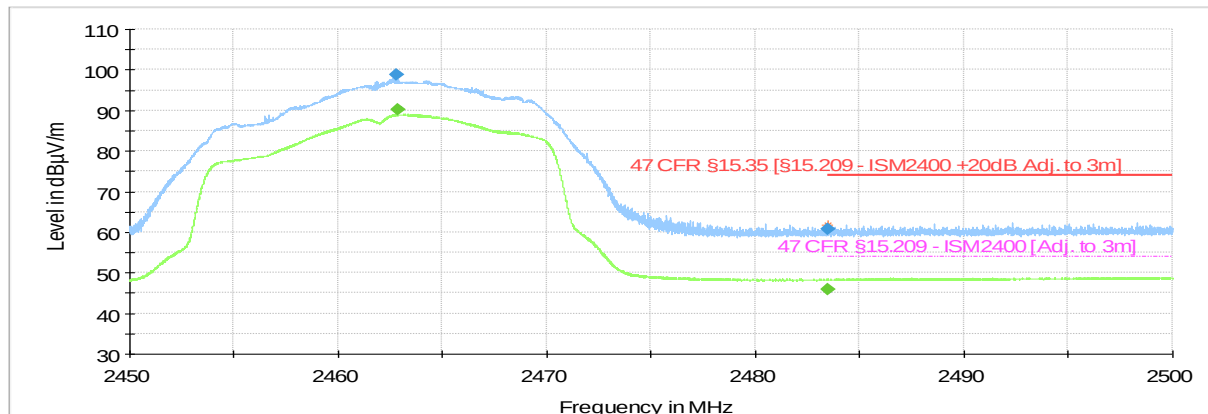


PreviewResult 2-AVG  
 PreviewResult 1-PK+  
 \* Critical\_Freqs AVG  
 \* Critical\_Freqs PK+  
 47 CFR §15.35 [§15.209 - ISM2400 +20dB Adj. to 3m]  
 47 CFR §15.209 - ISM2400 [Adj. to 3m]  
 ◆ Final\_Result PK+  
 ◆ Final\_Result AVG  
 × MaxPeak-PK+ (Single)  
 + Average-AVG (Single)

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 2390.000000     | 61.00            | ---              | 73.98          | 12.98       | 1000.0          | 1000.000        | 111.0       | H   | 79.0          |
| 2390.000000     | ---              | 45.25            | 53.98          | 8.73        | 1000.0          | 1000.000        | 133.0       | H   | 292.0         |
| 2400.000000     | 63.21            | ---              | ---            | ---         | 1000.0          | 1000.000        | 112.0       | H   | 338.0         |
| 2400.000000     | ---              | 47.52            | ---            | ---         | 1000.0          | 1000.000        | 112.0       | H   | 316.0         |
| 2419.312000     | 94.62            | ---              | ---            | ---         | 1000.0          | 1000.000        | 112.0       | H   | 328.0         |
| 2419.568000     | ---              | 85.83            | ---            | ---         | 1000.0          | 1000.000        | 111.0       | H   | 325.0         |

### Restricted Band – High Edge

|                     |                                          |                  |
|---------------------|------------------------------------------|------------------|
| Test mode condition | WLAN 802.11g 6Mbps Channel 11 (2462 MHz) |                  |
| Antenna orientation | Horizontal and Vertical                  |                  |
| Sweep frequency     | ISM 2400 Upper Band Edge                 |                  |
| Standard            | 47 CFR FCC Part 15 subpart C             |                  |
| EUT                 | A003001961-001                           |                  |
| Ancillary Equipment | -                                        |                  |
| Test Engineer       | Joel Efraimsson                          | Date: 2021-04-12 |
| 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) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 2462.805000     | 98.68            | ---              | ---            | ---         | 1000.0          | 1000.000        | 133.0       | H   | 297.0         |
| 2462.840000     | ---              | 90.27            | ---            | ---         | 1000.0          | 1000.000        | 111.0       | H   | 301.0         |
| 2483.500000     | ---              | 45.95            | 53.98          | 8.03        | 1000.0          | 1000.000        | 111.0       | H   | 303.0         |
| 2483.500000     | 60.64            | ---              | 73.98          | 13.34       | 1000.0          | 1000.000        | 210.0       | H   | 31.0          |

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

### **4.6.1 20dB Bandwidth – Test Summary**

Test has not been performed. Product is based on certified module VPYLBEE5HY1MW.

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

### **4.7.1 Carrier (Hopping Channel) Separation – Test Summary**

Test not performed as the WLAN is a non-hopping technology.

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

### **4.8.1 Number of Hopping Channels – Test Summary**

Test not performed as the WLAN is a non-hopping technology.

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

### **4.9.1 Time of Occupancy (Dwell Time) – Test Summary**

Test not performed as the WLAN is a non-hopping technology.

## **4.10 Test Results – 6dB Bandwidth**

### **4.10.1 6dB Bandwidth – Test Summary**

Test has not been performed. Product is based on certified module VPYLBEE5HY1MW.

## **4.11 Test Results – Peak Conducted Output Power**

### **4.11.1 Peak Conducted Output Power – Test Summary**

Test has not been performed. Product is based on certified module VPYLBEE5HY1MW.

## **4.12 Test Results – Power Spectral Density**

### **4.12.1 Power Spectral Density – Test Summary**

Test has not been performed. Product is based on certified module VPYLBEE5HY1MW.

## 5. TEST EQUIPMENT STATUS

### 5.1 List of Hardware with Calibration Dates

#### 5.1.1 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            | 2020.07.16       | 2021.07.16      |
| Test Receiver 9KHz to 3.5 GHz | Rohde & Schwarz              | ESR3    | 101674<br>2704016            | 2020.07.17       | 2021.07.17      |
| RF PROBE                      | Fischer Custom Communication | F-52    | 22<br>2902256                | 2019.04.09       | 2021.04.09      |
| Humidity Temperature Probe    | Lufft                        | OPUS 20 | 113.0118.0802.033<br>2771025 | 2020.07.31       | 2022.07.31      |

#### 5.1.2 Hardware List – SAC5 System

| Type                                 | Manufacturer    | Model             | Serial Number / ID           | Calibration Date | Calibration Due |
|--------------------------------------|-----------------|-------------------|------------------------------|------------------|-----------------|
| EMI Test Receiver                    | Rohde & Schwarz | ESW44             | 101760<br>2881044            | 2020.07.17       | 2021.07.17      |
| Ultra Broadband Antenna              | Rohde & Schwarz | HL562E            | 100988<br>2823181            | 2019.07.23       | 2021.07.23      |
| Double Ridged Waveguide Horn Antenna | Rohde & Schwarz | HF907             | 102678<br>2823164            | 2019.07.15       | 2021.07.15      |
| Control Device                       | Maturo          | NCD               | NCD/393/2372.01              | N/A              | N/A             |
| Open Switch & Control Unit           | Rohde & Schwarz | OSP150            | 100081<br>2884198            | 2020.08.04       | 2021.08.04      |
| Open Switch & Control Unit           | Rohde & Schwarz | OSP120            | 100084<br>2761253            | 2020.08.04       | 2021.08.04      |
| Shielded Filter Unit                 | Rohde & Schwarz | OSP-F Extension 1 | 101333<br>2761265            | 2020.08.04       | 2021.08.04      |
| Shielded Filter Unit                 | Rohde & Schwarz | OSP-F Extension 2 | 101335<br>2761266            | 2020.08.04       | 2021.08.04      |
| Shielded Filter Unit                 | Rohde & Schwarz | OSP-F Base Unit   | 101330<br>2761262            | 2020.08.04       | 2021.08.04      |
| Humidity Temperature Probe           | Lufft           | OPUS 20           | 126.0118.0802.033<br>2771042 | 2020.07.31       | 2022.07.31      |

## 5.2 Software / Firmware Versions

| Equipment                  | Software / Firmware Name | Version   |
|----------------------------|--------------------------|-----------|
| Conducted Emissions System | EMC 32                   | V10.60.10 |
| 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**

### **7.1 Photographs of the EUT**

For photographs see appendix.