

## TEST REPORT

**Report No.: 25020692HKG-001**

JTB Products, LLC

Application For Original Grant of 47 CFR Part 15 Certification

Single New of RSS-210 Issue 11 Certification

Groovz Earbuds

**FCC ID: 2B03PGRVZ-PRO**

**IC: 33938-GRVZPRO**

**Prepared and Checked by:**

**Approved by:**

Signed on File  
Leung Chun Ning, Peter  
Engineer

 Digitally signed  
by Jess Tang  
Location:  
Intertek Testing  
Services Hong  
Kong Limited

Tang Kwan Mo, Jess  
Assistant Supervisor  
Date: 02 May 2025

Intertek's standard Terms and Conditions can be obtained at our website <http://www.intertek.com/terms/>.

The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

© 2017 Intertek

## TEST REPORT

### GENERAL INFORMATION

|                                    |                                                                                                                                                          |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Grantee:</b>                    | JTB Products, LLC                                                                                                                                        |
| <b>Grantee Address:</b>            | 827 Lincoln Avenue, Suite B7,<br>West Chester, Pennsylvania 19380,<br>USA.                                                                               |
| <b>FCC Specification Standard:</b> | FCC Part 15, October 1, 2023 Edition                                                                                                                     |
| <b>FCC ID:</b>                     | 2BO3PGRVZ-PRO                                                                                                                                            |
| <b>FCC Model(s):</b>               | GRVZ-PRO                                                                                                                                                 |
| <b>IC Specification Standard:</b>  | RSS-210 Issue 11, June 2024<br>RSS-Gen Issue 5 Amendment 2, February 2021                                                                                |
| <b>IC:</b>                         | 33938-GRVZPRO                                                                                                                                            |
| <b>HVIN:</b>                       | GRVZ-PRO                                                                                                                                                 |
| <b>PMN:</b>                        | GRVZ-PRO                                                                                                                                                 |
| <b>Type of EUT:</b>                | Transceiver                                                                                                                                              |
| <b>Description of EUT:</b>         | Groovz Earbuds                                                                                                                                           |
| <b>Brand Name:</b>                 | Groovz                                                                                                                                                   |
| <b>Sample Receipt Date:</b>        | March 18, 2025                                                                                                                                           |
| <b>Date of Test:</b>               | March 18, 2025 to March 25, 2025                                                                                                                         |
| <b>Report Date:</b>                | May 02, 2025                                                                                                                                             |
| <b>Environmental Conditions:</b>   | Temperature: +10 to 40°C<br>Relative Humidity: 10 to 90%                                                                                                 |
| <b>Conclusion:</b>                 | Test was conducted by client submitted sample.<br>The submitted sample as received complied with the<br>47 CFR Part 15 / RSS-210 Issue 11 Certification. |

## TEST REPORT

### SUMMARY OF TEST RESULT

| Test Items                                 | FCC Part 15 Section | RSS-210 / RSS-Gen <sup>#</sup> | Results        |
|--------------------------------------------|---------------------|--------------------------------|----------------|
| Transmitter Power Line Conducted Emissions | 15.207              | 8.8 <sup>#</sup>               | Not Applicable |
| Radiated Emission                          | 15.249, 15.209      | B.10 / 8.9 <sup>#</sup>        | Complied       |
| Radiated Emission on the Bandedge          |                     |                                | Complied       |
| Radiated Emission in Restricted Bands      | 15.205              | 8.10 <sup>#</sup>              | Complied       |

For all technical data can be referred to Annex B – Report cover sheet.

For electronic filing, the Annex B – Report cover sheet is saved with filename: Annex B.pdf.

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2023 Edition

RSS-210 Issue 11, June 2024

RSS-Gen Issue 5 Amendment 2, February 2021

- Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.
2. Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

## TEST REPORT

### TABLE OF CONTENTS

|             |                                                     |           |
|-------------|-----------------------------------------------------|-----------|
| <b>1.0</b>  | <b>GENERAL DESCRIPTION.....</b>                     | <b>5</b>  |
| 1.1         | Product Description .....                           | 5         |
| 1.2         | Related Submittal(s) Grants.....                    | 5         |
| 1.3         | Test Methodology .....                              | 5         |
| 1.4         | Test Facility.....                                  | 5         |
| <b>2.0</b>  | <b>SYSTEM TEST CONFIGURATION.....</b>               | <b>6</b>  |
| 2.1         | Justification .....                                 | 6         |
| 2.2         | EUT Exercising Software.....                        | 6         |
| 2.3         | Details of EUT and Description of Accessories ..... | 6         |
| 2.4         | Measurement Uncertainty.....                        | 6         |
| <b>3.0</b>  | <b>EMISSION RESULTS.....</b>                        | <b>7</b>  |
| 3.1         | Field Strength Calculation .....                    | 7         |
| 3.2         | Radiated Emission Configuration Photograph.....     | 8         |
| 3.3         | Radiated Emission Data .....                        | 8         |
| <b>4.0</b>  | <b>EQUIPMENT PHOTOGRAPHS.....</b>                   | <b>22</b> |
| <b>5.0</b>  | <b>PRODUCT LABELLING.....</b>                       | <b>22</b> |
| <b>6.0</b>  | <b>TECHNICAL SPECIFICATIONS .....</b>               | <b>22</b> |
| <b>7.0</b>  | <b>INSTRUCTION MANUAL .....</b>                     | <b>22</b> |
| <b>8.0</b>  | <b>MISCELLANEOUS INFORMATION .....</b>              | <b>23</b> |
| 8.1         | Radiated Emission on the Bandedge .....             | 23        |
| 8.2         | Discussion of Pulse Desensitization .....           | 32        |
| 8.3         | Calculation of Average Factor.....                  | 32        |
| 8.4         | Emissions Test Procedures.....                      | 33        |
| 8.5         | Occupied Bandwidth .....                            | 35        |
| <b>9.0</b>  | <b>CONFIDENTIALITY REQUEST.....</b>                 | <b>39</b> |
| <b>10.0</b> | <b>EQUIPMENT LIST .....</b>                         | <b>39</b> |

## TEST REPORT

### 1.0 GENERAL DESCRIPTION

#### 1.1 Product Description

The Equipment Under Test (EUT), is a portable 2.4GHz Bluetooth Classic and Bluetooth BLE Transceiver for a pair of Bluetooth Earbuds. For the Bluetooth Classic mode, the sample supplied operated on 79 channels, normally at 2402 - 2480MHz. The channels are separated with 1MHz spacing. For the Bluetooth BLE mode, the sample supplied operated on 40 channels, normally at 2402 - 2480MHz. The channels are separated with 2MHz spacing.

The EUT is powered by 1 x 3.7V Lithium polymer battery for each side of the earbuds. After switching on EUT, it can be paired up with a smartphone and will be used to play different sound based on the sound received from the paired smartphone. Bluetooth function is disabled during charging.

Antenna Type: Internal, Integral

For electronic filing, the brief circuit description is saved with filename: Descri.pdf.

#### 1.2 Related Submittal(s) Grants

This is a single application for certification of a transceiver.

#### 1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.10-2020 + Cor.1-2023. All radiated measurements were performed in an 3m Chamber. Preliminary scans were performed in the 3m Chamber only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the “**Justification Section**” of this Application.

#### 1.4 Test Facility

The 3m Chamber and conducted measurement facility used to collect the radiated data is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong SAR, China. This test facility and site measurement data have been placed on file with the FCC and IC No. 2042H, CABID is “HKAP01”.

## TEST REPORT

### 2.0 SYSTEM TEST CONFIGURATION

#### 2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.10-2020 + Cor.1-2023.

The device was powered by 3.7VDC (1 x 3.7V Lithium Polymer Battery) for each side of earbuds.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

For simultaneous transmission, both left and right antennas are also switched on when taking radiated emission for determining worst-case spurious emission.

#### 2.2 EUT Exercising Software

The EUT exercise program (FCC Assist 1.0.2.2) used during radiated testing was designed to exercise the various system components in a manner similar to a typical use.

#### 2.3 Details of EUT and Description of Accessories

Not Applicable.

#### 2.4 Measurement Uncertainty

Decision Rule for compliance: For FCC/IC standard, the measured value must be within the limits of applicable standard without accounting for the measurement uncertainty. For EN/IEC/HKTA/HKTC standard, conformity rules will be used as per standard directly excepted EN/IEC 61000-3-2, EN/IEC 61000-3-3, HKTA1004, HKCA1008, HKTA1019, HKTA1020, HKTA1041 and HKTA1044.

## TEST REPORT

### 3.0 EMISSION RESULTS

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

#### 3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG - AV$$

where

|    |   |                                                     |
|----|---|-----------------------------------------------------|
| FS | = | Field Strength in dBμV/m                            |
| RA | = | Receiver Amplitude (including preamplifier) in dBμV |
| AF | = | Antenna Factor in dB                                |
| CF | = | Cable Attenuation Factor in dB                      |
| AG | = | Amplifier Gain in dB                                |
| AV | = | Average Factor in dB                                |

In the following table(s), the reading shown on the data table reflects the preamplifier gain.

An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

where

|    |   |                          |
|----|---|--------------------------|
| FS | = | Field Strength in dBμV/m |
| RR | = | RA - AG - AV in dBμV     |
| LF | = | CF + AF in dB            |

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29.0 dB and average factor of 5.0 dB are subtracted, giving a field strength of 27.0 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

|    |   |                          |                |
|----|---|--------------------------|----------------|
| RA | = | 52.0 dBμV/m              |                |
| AF | = | 7.4 dB                   | RR = 18.0 dBμV |
| CF | = | 1.6 dB                   | LF = 9.0 dB    |
| AG | = | 29.0 dB                  |                |
| AV | = | 5.0 dB                   |                |
| FS | = | RR + LF                  |                |
| FS | = | 18.0 + 9.0 = 27.0 dBμV/m |                |

Level in μV/m = Common Antilogarithm [(27.0 dBμV/m)/20] = 22.4 μV/m

## TEST REPORT

### 3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 9608 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: Setup Photos.pdf.

### 3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 1.3 dB

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Left Antenna BT Classic)

Table 1

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Lowest Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2402.000        | 83.7           | 33                | 29.4                | 80.1                         | 94.0                         | -13.9       |
| V            | 4804.000        | 38.9           | 33                | 34.9                | 40.8                         | 54.0                         | -13.2       |
| V            | 7206.000        | 42.2           | 33                | 37.9                | 47.1                         | 54.0                         | -6.9        |
| V            | 9608.000        | 42.2           | 33                | 40.4                | 49.6                         | 54.0                         | -4.4        |
| V            | 12010.000       | 38.3           | 33                | 40.5                | 45.8                         | 54.0                         | -8.2        |
| V            | 14412.000       | 39.0           | 33                | 40.0                | 46.0                         | 54.0                         | -8.0        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2402.000        | 94.4           | 33                | 29.4                | 90.8                      | 114.0                     | -23.2       |
| V            | 4804.000        | 50.3           | 33                | 34.9                | 52.2                      | 74.0                      | -21.8       |
| V            | 7206.000        | 53.9           | 33                | 37.9                | 58.8                      | 74.0                      | -15.2       |
| V            | 9608.000        | 54.1           | 33                | 40.4                | 61.5                      | 74.0                      | -12.5       |
| V            | 12010.000       | 51.6           | 33                | 40.5                | 59.1                      | 74.0                      | -14.9       |
| V            | 14412.000       | 52.3           | 33                | 40.0                | 59.3                      | 74.0                      | -14.7       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Left Antenna BT Classic)

Table 2

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Middle Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2440.000        | 81.5           | 33                | 29.4                | 77.9                         | 94.0                         | -16.1       |
| V            | 4880.000        | 37.8           | 33                | 34.9                | 39.7                         | 54.0                         | -14.3       |
| V            | 7320.000        | 44.5           | 33                | 37.9                | 49.4                         | 54.0                         | -4.6        |
| V            | 9760.000        | 40.8           | 33                | 40.4                | 48.2                         | 54.0                         | -5.8        |
| V            | 12200.000       | 40.8           | 33                | 40.5                | 48.3                         | 54.0                         | -5.7        |
| V            | 14640.000       | 39.3           | 33                | 38.4                | 44.7                         | 54.0                         | -9.3        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2440.000        | 92.3           | 33                | 29.4                | 88.7                      | 114.0                     | -25.3       |
| V            | 4880.000        | 48.9           | 33                | 34.9                | 50.8                      | 74.0                      | -23.2       |
| V            | 7320.000        | 56.1           | 33                | 37.9                | 61.0                      | 74.0                      | -13.0       |
| V            | 9760.000        | 53.6           | 33                | 40.4                | 61.0                      | 74.0                      | -13.0       |
| V            | 12200.000       | 53.9           | 33                | 40.5                | 61.4                      | 74.0                      | -12.6       |
| V            | 14640.000       | 52.8           | 33                | 38.4                | 58.2                      | 74.0                      | -15.8       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Left Antenna BT Classic)

Table 3

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Highest Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2480.000        | 78.7           | 33                | 29.4                | 75.1                         | 94.0                         | -18.9       |
| V            | 4960.000        | 35.4           | 33                | 34.9                | 37.3                         | 54.0                         | -16.7       |
| V            | 7440.000        | 40.1           | 33                | 37.9                | 45.0                         | 54.0                         | -9.0        |
| H            | 9920.000        | 42.4           | 33                | 40.4                | 49.8                         | 54.0                         | -4.2        |
| V            | 12400.000       | 41.1           | 33                | 40.5                | 48.6                         | 54.0                         | -5.4        |
| H            | 14880.000       | 39.9           | 33                | 38.4                | 45.3                         | 54.0                         | -8.7        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2480.000        | 89.5           | 33                | 29.4                | 85.9                      | 114.0                     | -28.1       |
| V            | 4960.000        | 48.4           | 33                | 34.9                | 50.3                      | 74.0                      | -23.7       |
| V            | 7440.000        | 52.6           | 33                | 37.9                | 57.5                      | 74.0                      | -16.5       |
| H            | 9920.000        | 54.6           | 33                | 40.4                | 62.0                      | 74.0                      | -12.0       |
| V            | 12400.000       | 54.9           | 33                | 40.5                | 62.4                      | 74.0                      | -11.6       |
| H            | 14880.000       | 54.1           | 33                | 38.4                | 59.5                      | 74.0                      | -14.5       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Left Antenna BLE)

Table 4

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Lowest Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| V            | 2402.000        | 75.2           | 33                | 29.4                | 71.6                         | 94.0                         | -22.4       |
| V            | 4804.000        | 35.8           | 33                | 34.9                | 37.7                         | 54.0                         | -16.3       |
| V            | 7206.000        | 35.6           | 33                | 37.9                | 40.5                         | 54.0                         | -13.5       |
| V            | 9608.000        | 38.9           | 33                | 40.4                | 46.3                         | 54.0                         | -7.7        |
| V            | 12010.000       | 38.3           | 33                | 40.5                | 45.8                         | 54.0                         | -8.2        |
| V            | 14412.000       | 39.4           | 33                | 40.0                | 46.4                         | 54.0                         | -7.6        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| V            | 2402.000        | 92.4           | 33                | 29.4                | 88.8                      | 114.0                     | -25.2       |
| V            | 4804.000        | 49.5           | 33                | 34.9                | 51.4                      | 74.0                      | -22.6       |
| V            | 7206.000        | 51.2           | 33                | 37.9                | 56.1                      | 74.0                      | -17.9       |
| V            | 9608.000        | 53.6           | 33                | 40.4                | 61.0                      | 74.0                      | -13.0       |
| V            | 12010.000       | 51.8           | 33                | 40.5                | 59.3                      | 74.0                      | -14.7       |
| V            | 14412.000       | 52.8           | 33                | 40.0                | 59.8                      | 74.0                      | -14.2       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Left Antenna BLE)

Table 5

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Middle Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2440.000        | 72.6           | 33                | 29.4                | 69.0                         | 94.0                         | -25.0       |
| V            | 4880.000        | 34.4           | 33                | 34.9                | 36.3                         | 54.0                         | -17.7       |
| V            | 7320.000        | 36.4           | 33                | 37.9                | 41.3                         | 54.0                         | -12.7       |
| H            | 9760.000        | 38.7           | 33                | 40.4                | 46.1                         | 54.0                         | -7.9        |
| V            | 12200.000       | 40.0           | 33                | 40.5                | 47.5                         | 54.0                         | -6.5        |
| V            | 14640.000       | 39.6           | 33                | 38.4                | 45.0                         | 54.0                         | -9.0        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2440.000        | 89.8           | 33                | 29.4                | 86.2                      | 114.0                     | -27.8       |
| V            | 4880.000        | 48.2           | 33                | 34.9                | 50.1                      | 74.0                      | -23.9       |
| V            | 7320.000        | 52.6           | 33                | 37.9                | 57.5                      | 74.0                      | -16.5       |
| H            | 9760.000        | 53.1           | 33                | 40.4                | 60.5                      | 74.0                      | -13.5       |
| V            | 12200.000       | 53.4           | 33                | 40.5                | 60.9                      | 74.0                      | -13.1       |
| V            | 14640.000       | 53.1           | 33                | 38.4                | 58.5                      | 74.0                      | -15.5       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Left Antenna BLE)

Table 6

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Highest Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| V            | 2480.000        | 69.2           | 33                | 29.4                | 65.6                         | 94.0                         | -28.4       |
| H            | 4960.000        | 33.0           | 33                | 34.9                | 34.9                         | 54.0                         | -19.1       |
| H            | 7440.000        | 36.8           | 33                | 37.9                | 41.7                         | 54.0                         | -12.3       |
| V            | 9920.000        | 39.8           | 33                | 40.4                | 47.2                         | 54.0                         | -6.8        |
| H            | 12400.000       | 41.2           | 33                | 40.5                | 48.7                         | 54.0                         | -5.3        |
| H            | 14880.000       | 39.1           | 33                | 38.4                | 44.5                         | 54.0                         | -9.5        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| V            | 2480.000        | 86.4           | 33                | 29.4                | 82.8                      | 114.0                     | -31.2       |
| H            | 4960.000        | 47.3           | 33                | 34.9                | 49.2                      | 74.0                      | -24.8       |
| H            | 7440.000        | 51.7           | 33                | 37.9                | 56.6                      | 74.0                      | -17.4       |
| V            | 9920.000        | 54.7           | 33                | 40.4                | 62.1                      | 74.0                      | -11.9       |
| H            | 12400.000       | 55.0           | 33                | 40.5                | 62.5                      | 74.0                      | -11.5       |
| H            | 14880.000       | 53.1           | 33                | 38.4                | 58.5                      | 74.0                      | -15.5       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Right Antenna BT Classic)

Table 7

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Lowest Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2402.000        | 87.1           | 33                | 29.4                | 83.5                         | 94.0                         | -10.5       |
| H            | 4804.000        | 36.7           | 33                | 34.9                | 38.6                         | 54.0                         | -15.4       |
| H            | 7206.000        | 33.5           | 33                | 37.9                | 38.4                         | 54.0                         | -15.6       |
| V            | 9608.000        | 45.3           | 33                | 40.4                | 52.7                         | 54.0                         | -1.3        |
| H            | 12010.000       | 38.4           | 33                | 40.5                | 45.9                         | 54.0                         | -8.1        |
| H            | 14412.000       | 39.2           | 33                | 40.0                | 46.2                         | 54.0                         | -7.8        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2402.000        | 97.9           | 33                | 29.4                | 94.3                      | 114.0                     | -19.7       |
| H            | 4804.000        | 48.4           | 33                | 34.9                | 50.3                      | 74.0                      | -23.7       |
| H            | 7206.000        | 47.2           | 33                | 37.9                | 52.1                      | 74.0                      | -21.9       |
| V            | 9608.000        | 56.9           | 33                | 40.4                | 64.3                      | 74.0                      | -9.7        |
| H            | 12010.000       | 52.4           | 33                | 40.5                | 59.9                      | 74.0                      | -14.1       |
| H            | 14412.000       | 52.5           | 33                | 40.0                | 59.5                      | 74.0                      | -14.5       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Right Antenna BT Classic)

Table 8

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Middle Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2440.000        | 90.7           | 33                | 29.4                | 87.1                         | 94.0                         | -6.9        |
| H            | 4880.000        | 32.2           | 33                | 34.9                | 34.1                         | 54.0                         | -19.9       |
| H            | 7320.000        | 34.3           | 33                | 37.9                | 39.2                         | 54.0                         | -14.8       |
| V            | 9760.000        | 39.3           | 33                | 40.4                | 46.7                         | 54.0                         | -7.3        |
| V            | 12200.000       | 40.0           | 33                | 40.5                | 47.5                         | 54.0                         | -6.5        |
| H            | 14640.000       | 39.8           | 33                | 38.4                | 45.2                         | 54.0                         | -8.8        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2440.000        | 101.4          | 33                | 29.4                | 97.8                      | 114.0                     | -16.2       |
| H            | 4880.000        | 45.4           | 33                | 34.9                | 47.3                      | 74.0                      | -26.7       |
| H            | 7320.000        | 48.0           | 33                | 37.9                | 52.9                      | 74.0                      | -21.1       |
| V            | 9760.000        | 53.9           | 33                | 40.4                | 61.3                      | 74.0                      | -12.7       |
| V            | 12200.000       | 53.1           | 33                | 40.5                | 60.6                      | 74.0                      | -13.4       |
| H            | 14640.000       | 53.0           | 33                | 38.4                | 58.4                      | 74.0                      | -15.6       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Right Antenna BT Classic)

Table 9

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Highest Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2480.000        | 88.4           | 33                | 29.4                | 84.8                         | 94.0                         | -9.2        |
| H            | 4960.000        | 37.8           | 33                | 34.9                | 39.7                         | 54.0                         | -14.3       |
| H            | 7440.000        | 34.7           | 33                | 37.9                | 39.6                         | 54.0                         | -14.4       |
| V            | 9920.000        | 38.6           | 33                | 40.4                | 46.0                         | 54.0                         | -8.0        |
| H            | 12400.000       | 41.2           | 33                | 40.5                | 48.7                         | 54.0                         | -5.3        |
| H            | 14880.000       | 39.0           | 33                | 38.4                | 44.4                         | 54.0                         | -9.6        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2480.000        | 99.1           | 33                | 29.4                | 95.5                      | 114.0                     | -18.5       |
| H            | 4960.000        | 50.7           | 33                | 34.9                | 52.6                      | 74.0                      | -21.4       |
| H            | 7440.000        | 48.4           | 33                | 37.9                | 53.3                      | 74.0                      | -20.7       |
| V            | 9920.000        | 53.4           | 33                | 40.4                | 60.8                      | 74.0                      | -13.2       |
| H            | 12400.000       | 54.7           | 33                | 40.5                | 62.2                      | 74.0                      | -11.8       |
| H            | 14880.000       | 52.6           | 33                | 38.4                | 58.0                      | 74.0                      | -16.0       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Right Antenna BLE)

Table 10

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Lowest Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2402.000        | 78.8           | 33                | 29.4                | 75.2                         | 94.0                         | -18.8       |
| H            | 4804.000        | 32.3           | 33                | 34.9                | 34.2                         | 54.0                         | -19.8       |
| V            | 7206.000        | 33.8           | 33                | 37.9                | 38.7                         | 54.0                         | -15.3       |
| V            | 9608.000        | 41.1           | 33                | 40.4                | 48.5                         | 54.0                         | -5.5        |
| V            | 12010.000       | 38.5           | 33                | 40.5                | 46.0                         | 54.0                         | -8.0        |
| H            | 14412.000       | 39.7           | 33                | 40.0                | 46.7                         | 54.0                         | -7.3        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2402.000        | 95.9           | 33                | 29.4                | 92.3                      | 114.0                     | -21.7       |
| H            | 4804.000        | 46.5           | 33                | 34.9                | 48.4                      | 74.0                      | -25.6       |
| V            | 7206.000        | 47.4           | 33                | 37.9                | 52.3                      | 74.0                      | -21.7       |
| V            | 9608.000        | 55.8           | 33                | 40.4                | 63.2                      | 74.0                      | -10.8       |
| V            | 12010.000       | 51.6           | 33                | 40.5                | 59.1                      | 74.0                      | -14.9       |
| H            | 14412.000       | 53.5           | 33                | 40.0                | 60.5                      | 74.0                      | -13.5       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Right Antenna BLE)

Table 11

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Middle Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2440.000        | 82.3           | 33                | 29.4                | 78.7                         | 94.0                         | -15.3       |
| V            | 4880.000        | 32.1           | 33                | 34.9                | 34.0                         | 54.0                         | -20.0       |
| H            | 7320.000        | 33.6           | 33                | 37.9                | 38.5                         | 54.0                         | -15.5       |
| H            | 9760.000        | 36.4           | 33                | 40.4                | 43.8                         | 54.0                         | -10.2       |
| H            | 12200.000       | 39.8           | 33                | 40.5                | 47.3                         | 54.0                         | -6.7        |
| V            | 14640.000       | 39.3           | 33                | 38.4                | 44.7                         | 54.0                         | -9.3        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2440.000        | 99.5           | 33                | 29.4                | 95.9                      | 114.0                     | -18.1       |
| V            | 4880.000        | 45.4           | 33                | 34.9                | 47.3                      | 74.0                      | -26.7       |
| H            | 7320.000        | 47.3           | 33                | 37.9                | 52.2                      | 74.0                      | -21.8       |
| H            | 9760.000        | 50.6           | 33                | 40.4                | 58.0                      | 74.0                      | -16.0       |
| H            | 12200.000       | 53.2           | 33                | 40.5                | 60.7                      | 74.0                      | -13.3       |
| V            | 14640.000       | 53.0           | 33                | 38.4                | 58.4                      | 74.0                      | -15.6       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Transmitting (Right Antenna BLE)

Table 12

Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Highest Channel

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|------------------------------|------------------------------|-------------|
| H            | 2480.000        | 80.3           | 33                | 29.4                | 76.7                         | 94.0                         | -17.3       |
| H            | 4960.000        | 33.7           | 33                | 34.9                | 35.6                         | 54.0                         | -18.4       |
| V            | 7440.000        | 33.7           | 33                | 37.9                | 38.6                         | 54.0                         | -15.4       |
| H            | 9920.000        | 35.5           | 33                | 40.4                | 42.9                         | 54.0                         | -11.1       |
| V            | 12400.000       | 41.2           | 33                | 40.5                | 48.7                         | 54.0                         | -5.3        |
| V            | 14880.000       | 38.9           | 33                | 38.4                | 44.3                         | 54.0                         | -9.7        |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2480.000        | 97.5           | 33                | 29.4                | 93.9                      | 114.0                     | -20.1       |
| H            | 4960.000        | 48.7           | 33                | 34.9                | 50.6                      | 74.0                      | -23.4       |
| V            | 7440.000        | 47.5           | 33                | 37.9                | 52.4                      | 74.0                      | -21.6       |
| H            | 9920.000        | 49.6           | 33                | 40.4                | 57.0                      | 74.0                      | -17.0       |
| V            | 12400.000       | 54.6           | 33                | 40.5                | 62.1                      | 74.0                      | -11.9       |
| V            | 14880.000       | 52.5           | 33                | 38.4                | 57.9                      | 74.0                      | -16.1       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. Average detector is applied according to ANSI C63.10.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## TEST REPORT

### RADIATED EMISSIONS

Model: GRVZ-PRO  
Date of Test: March 21, 2025  
Worst-Case Operating Mode: Operating

Table 13

Pursuant to FCC Part 15 Section 15.209 / RSS-GEN 8.9 Requirement

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-amp (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|--------------|---------------------|--------------------|----------------------|-------------|
| V            | 54.856          | 20.2           | 16           | 11.0                | 15.2               | 40.0                 | -24.8       |
| V            | 213.209         | 21.3           | 16           | 17.0                | 22.3               | 43.5                 | -21.2       |
| H            | 346.705         | 20.9           | 16           | 24.0                | 28.9               | 46.0                 | -17.1       |
| V            | 407.209         | 22.5           | 16           | 24.0                | 30.5               | 46.0                 | -15.5       |
| V            | 703.786         | 19.0           | 16           | 30.0                | 33.0               | 46.0                 | -13.0       |
| V            | 957.563         | 17.7           | 16           | 33.0                | 34.7               | 46.0                 | -11.3       |

- Notes:
1. Peak Detector Data unless otherwise stated.
  2. All measurements were made at 3 meters.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna is used for the emission over 1000MHz.
  5. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  6. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## **TEST REPORT**

### **4.0 EQUIPMENT PHOTOGRAPHS**

For electronic filing, the photographs are saved with filename: External Photos.pdf and Internal Photos.pdf.

### **5.0 PRODUCT LABELLING**

For electronics filing, the FCC ID label artwork and the label location are saved with filename: Label.pdf.

### **6.0 TECHNICAL SPECIFICATIONS**

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: Block.pdf and Circuit.pdf respectively.

### **7.0 INSTRUCTION MANUAL**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: Manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States and Canada.

## TEST REPORT

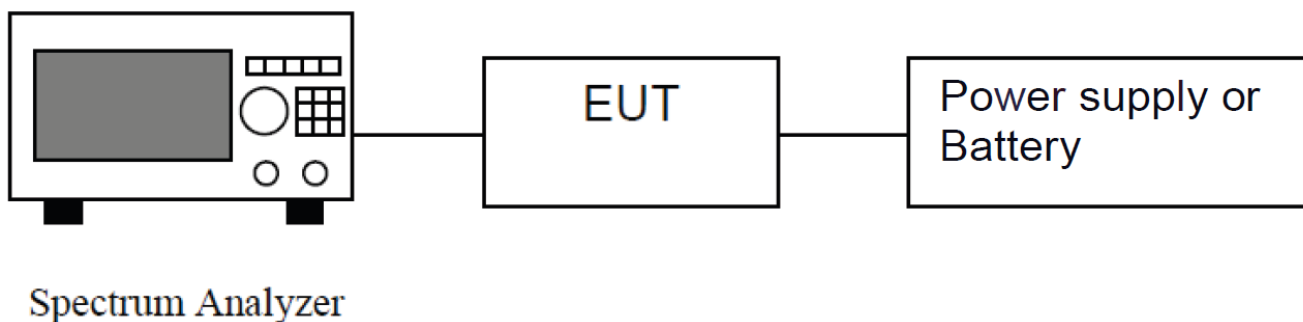
### 8.0 MISCELLANEOUS INFORMATION

The miscellaneous information includes details of the test procedure and measured bandwidth / calculation of factor such as pulse desensitization and averaging factor (calculation and timing diagram).

#### 8.1 Radiated Emission on the Bandedge

From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz to 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.10-2020 + Cor.1-2023 for frequency being measured.

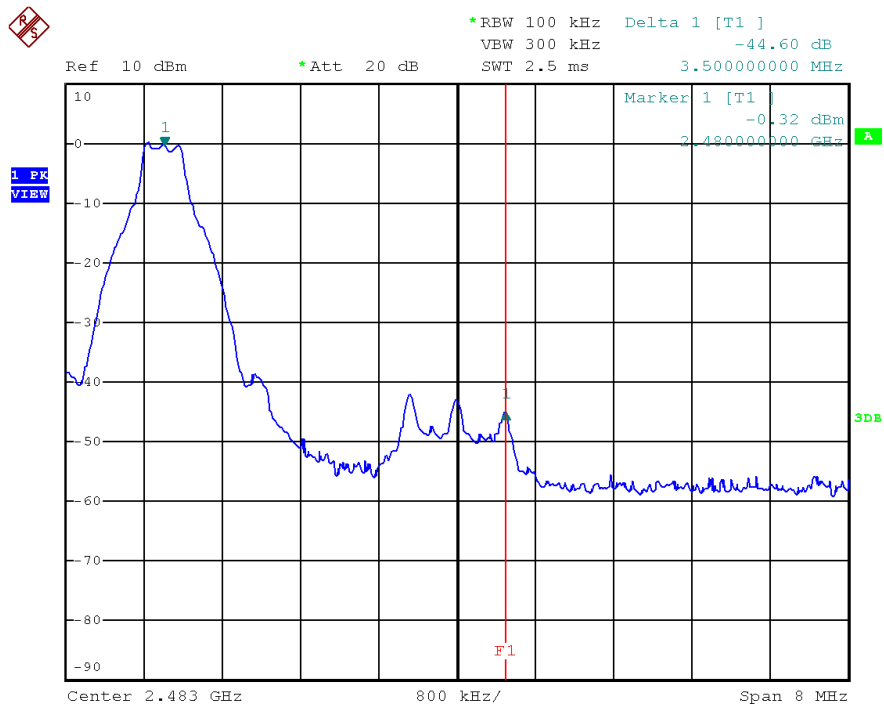
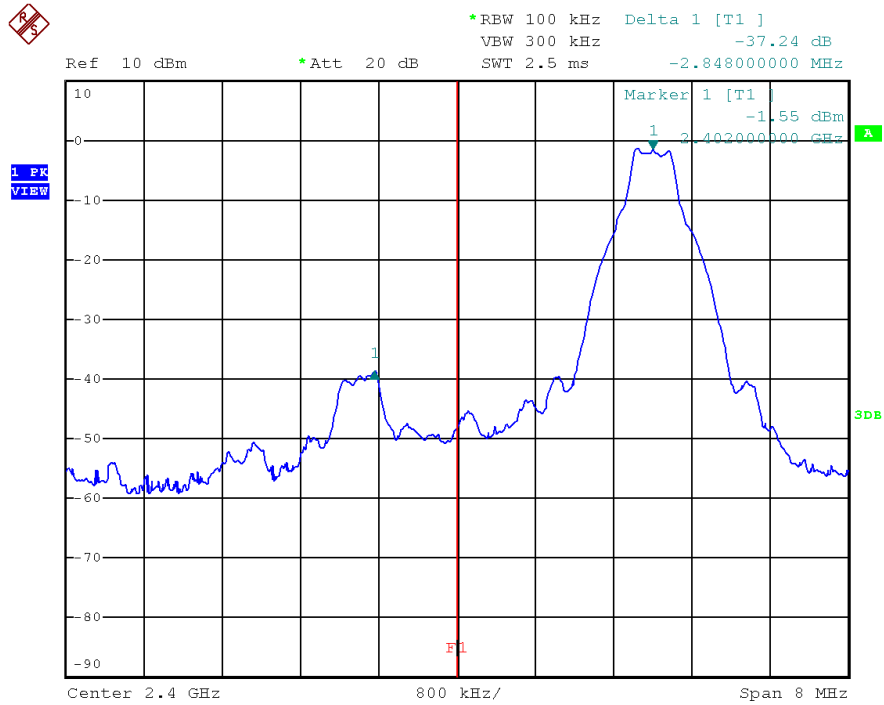
Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50dB below the level of the fundamental or to the general radiated emissions limits in Section 15.209 / RSS-Gen 8.9, whichever is the lesser attenuation, which meet the requirement of Part 15.249(d) / RSS-210 B.10.



Block diagram of Test setup

## TEST REPORT

### PEAK MEASUREMENT (Left Antenna BT Classic)



## TEST REPORT

### PEAK MEASUREMENT (Left Antenna BT Classic)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower Bandedge

Peak Resultant Field Strength = Fundamental Emissions (Peak Value) – delta from the plot

$$= 90.8 \text{ dB}\mu\text{V/m} - 37.2 \text{ dB}$$

$$= 53.6 \text{ dB}\mu\text{V/m}$$

Average Resultant Field Strength = Fundamental Emissions (Average Value) – delta from the plot

$$= 80.1 \text{ dB}\mu\text{V/m} - 37.2 \text{ dB}$$

$$= 42.9 \text{ dB}\mu\text{V/m}$$

Upper Bandedge

Peak Resultant Field Strength = Fundamental Emissions (Peak Value) – delta from the plot

$$= 85.9 \text{ dB}\mu\text{V/m} - 44.6 \text{ dB}$$

$$= 41.3 \text{ dB}\mu\text{V/m}$$

Average Resultant Field Strength = Fundamental Emissions (Average Value) – delta from the plot

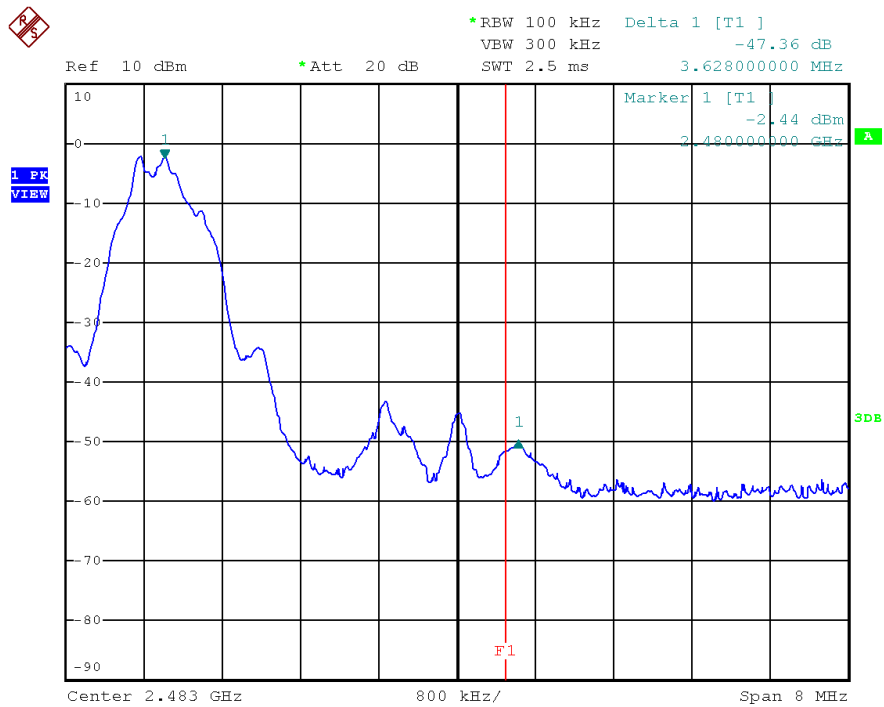
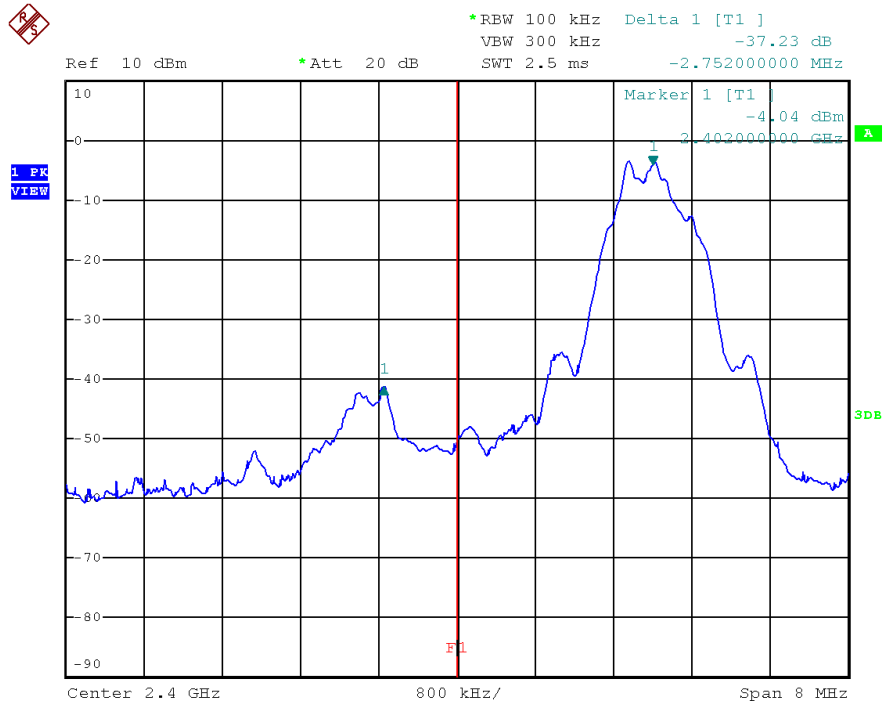
$$= 75.1 \text{ dB}\mu\text{V/m} - 44.6 \text{ dB}$$

$$= 30.5 \text{ dB}\mu\text{V/m}$$

The resultant field strength meets the general radiated emission limit in Section 15.209, which does not exceed 74 dBμV/m (Peak Limit) and 54 dBμV/m (Average Limit).

## TEST REPORT

### PEAK MEASUREMENT (Left Antenna BLE)



## TEST REPORT

### PEAK MEASUREMENT (Left Antenna BLE)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower Bandedge

Peak Resultant Field Strength = Fundamental Emissions (Peak Value) – delta from the plot

$$= 88.8 \text{ dB}\mu\text{V/m} - 37.2 \text{ dB}$$

$$= 51.6 \text{ dB}\mu\text{V/m}$$

Average Resultant Field Strength = Fundamental Emissions (Average Value) – delta from the plot

$$= 71.6 \text{ dB}\mu\text{V/m} - 37.2 \text{ dB}$$

$$= 34.4 \text{ dB}\mu\text{V/m}$$

Upper Bandedge

Peak Resultant Field Strength = Fundamental Emissions (Peak Value) – delta from the plot

$$= 82.8 \text{ dB}\mu\text{V/m} - 47.4 \text{ dB}$$

$$= 35.4 \text{ dB}\mu\text{V/m}$$

Average Resultant Field Strength = Fundamental Emissions (Average Value) – delta from the plot

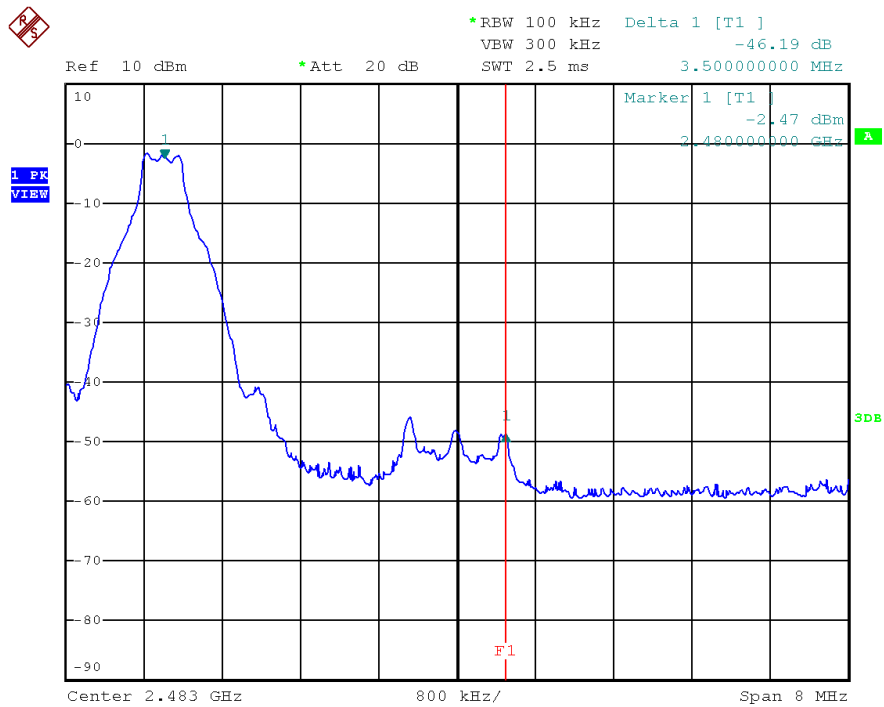
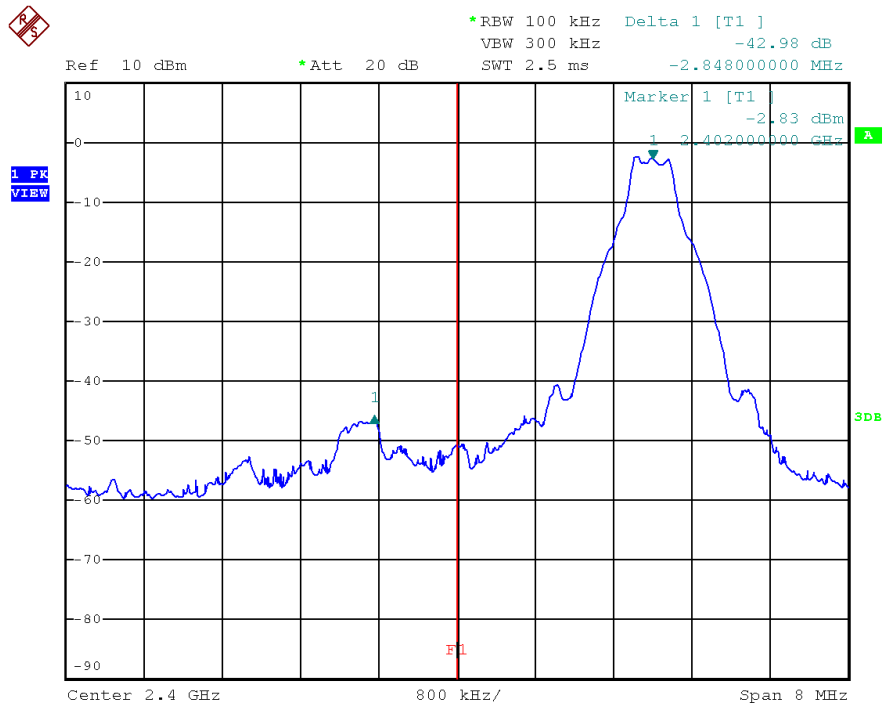
$$= 65.6 \text{ dB}\mu\text{V/m} - 47.4 \text{ dB}$$

$$= 18.2 \text{ dB}\mu\text{V/m}$$

The resultant field strength meets the general radiated emission limit in Section 15.209, which does not exceed 74 dBμV/m (Peak Limit) and 54 dBμV/m (Average Limit).

## TEST REPORT

### PEAK MEASUREMENT (Right Antenna BT Classic)



## TEST REPORT

### PEAK MEASUREMENT (Right Antenna BT Classic)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower Bandedge

Peak Resultant Field Strength = Fundamental Emissions (Peak Value) – delta from the plot

$$= 94.3 \text{ dB}\mu\text{V/m} - 43.0 \text{ dB}$$

$$= 51.3 \text{ dB}\mu\text{V/m}$$

Average Resultant Field Strength = Fundamental Emissions (Average Value) – delta from the plot

$$= 83.5 \text{ dB}\mu\text{V/m} - 43.0 \text{ dB}$$

$$= 40.5 \text{ dB}\mu\text{V/m}$$

Upper Bandedge

Peak Resultant Field Strength = Fundamental Emissions (Peak Value) – delta from the plot

$$= 95.5 \text{ dB}\mu\text{V/m} - 46.2 \text{ dB}$$

$$= 49.3 \text{ dB}\mu\text{V/m}$$

Average Resultant Field Strength = Fundamental Emissions (Average Value) – delta from the plot

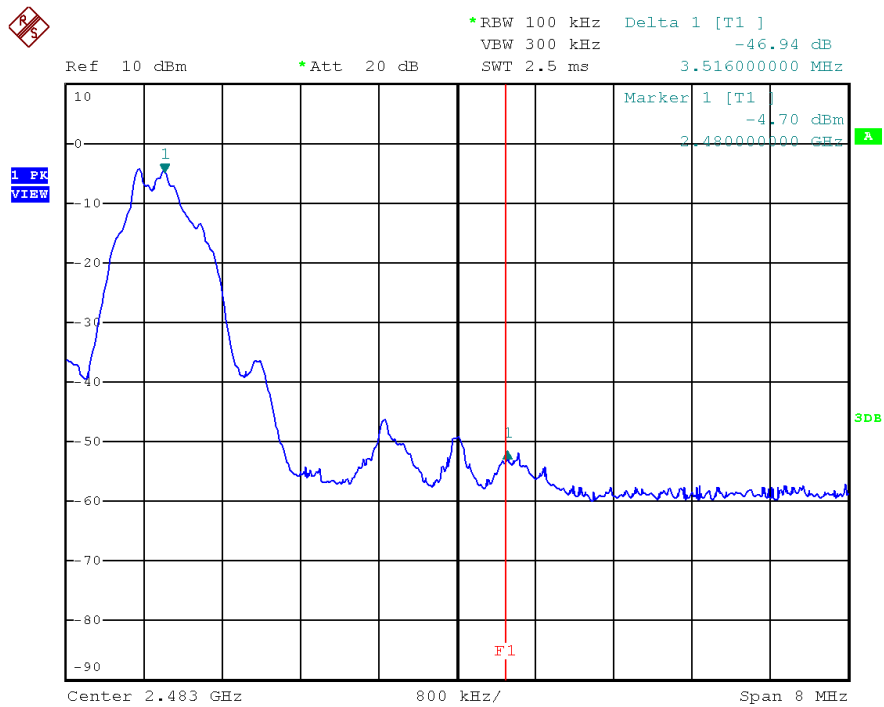
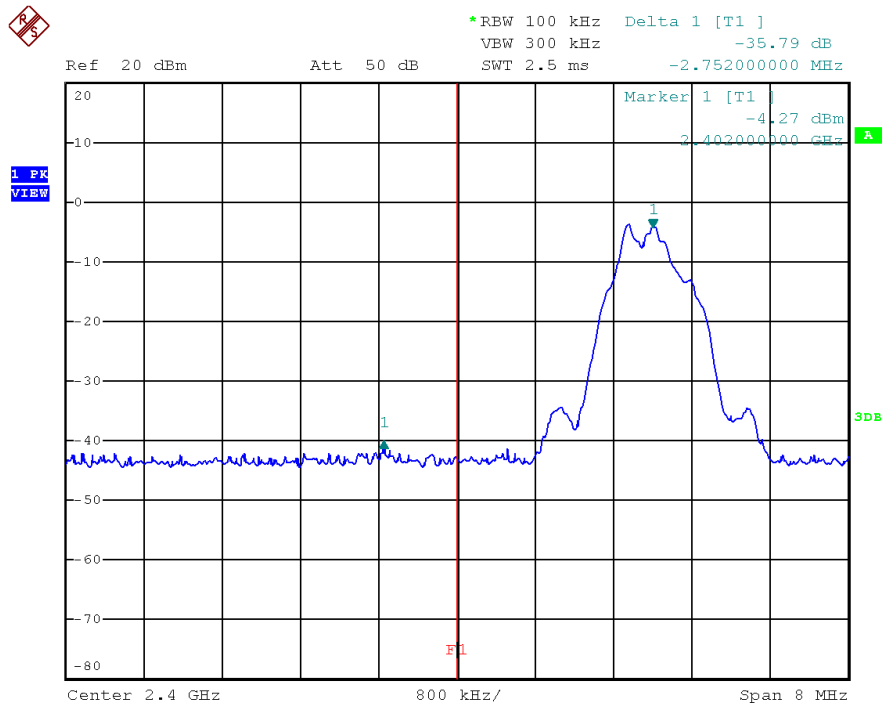
$$= 84.8 \text{ dB}\mu\text{V/m} - 46.2 \text{ dB}$$

$$= 38.6 \text{ dB}\mu\text{V/m}$$

The resultant field strength meets the general radiated emission limit in Section 15.209, which does not exceed 74 dB $\mu$ V/m (Peak Limit) and 54 dB $\mu$ V/m (Average Limit).

## TEST REPORT

### PEAK MEASUREMENT (Right Antenna BLE)



## TEST REPORT

### PEAK MEASUREMENT (Right Antenna BLE)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower Bandedge

Peak Resultant Field Strength = Fundamental Emissions (Peak Value) – delta from the plot

$$= 92.3 \text{ dB}\mu\text{V/m} - 35.8 \text{ dB}$$

$$= 56.5 \text{ dB}\mu\text{V/m}$$

Average Resultant Field Strength = Fundamental Emissions (Average Value) – delta from the plot

$$= 75.2 \text{ dB}\mu\text{V/m} - 35.8 \text{ dB}$$

$$= 39.4 \text{ dB}\mu\text{V/m}$$

Upper Bandedge

Peak Resultant Field Strength = Fundamental Emissions (Peak Value) – delta from the plot

$$= 93.9 \text{ dB}\mu\text{V/m} - 46.9 \text{ dB}$$

$$= 47.0 \text{ dB}\mu\text{V/m}$$

Average Resultant Field Strength = Fundamental Emissions (Average Value) – delta from the plot

$$= 76.7 \text{ dB}\mu\text{V/m} - 46.9 \text{ dB}$$

$$= 29.8 \text{ dB}\mu\text{V/m}$$

The resultant field strength meets the general radiated emission limit in Section 15.209, which does not exceed 74 dBμV/m (Peak Limit) and 54 dBμV/m (Average Limit).

## TEST REPORT

### 8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period ( $T_{eff}$ ) is approximately  $625\mu s$  for a digital "1" bit which illustrated on technical specification, with a resolution bandwidth (3dB) of 3MHz, so the pulse desensitivity factor is 0dB.

### 8.3 Calculation of Average Factor

Not Applicable

## TEST REPORT

### 8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitter operating under the Part 15, Subpart C rules.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately 0.8m in height above the ground plane for emission measurement at or below 1GHz and 1.5m in height above the ground plane for emission measurement above 1GHz. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements were made as described in ANSI C63.10-2020 + Cor.1-2023.

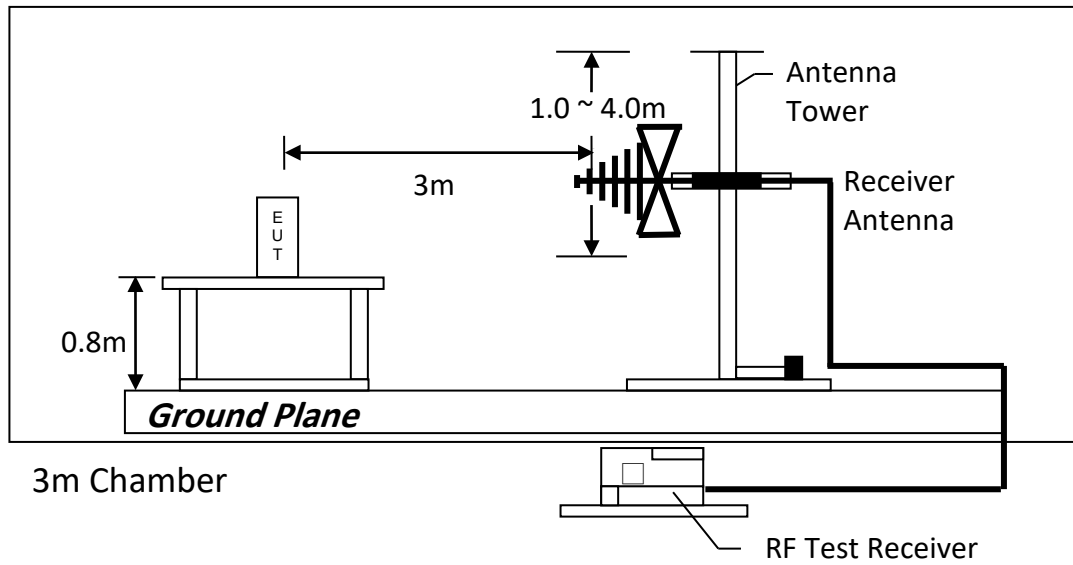
The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 3 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

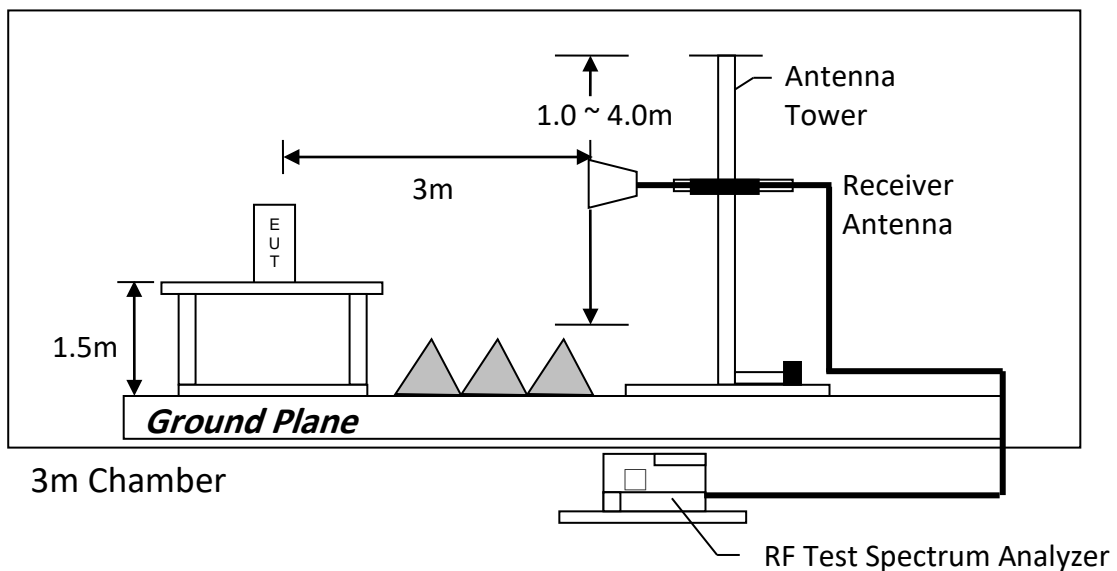
## TEST REPORT

### 8.4.1 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



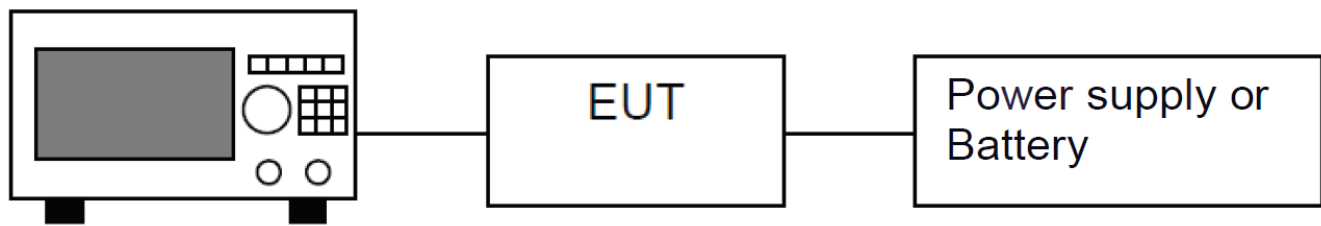
Test setup of radiated emissions up to 1GHz



Test setup of radiated emissions above 1GHz

TEST REPORT

8.5 Occupied Bandwidth



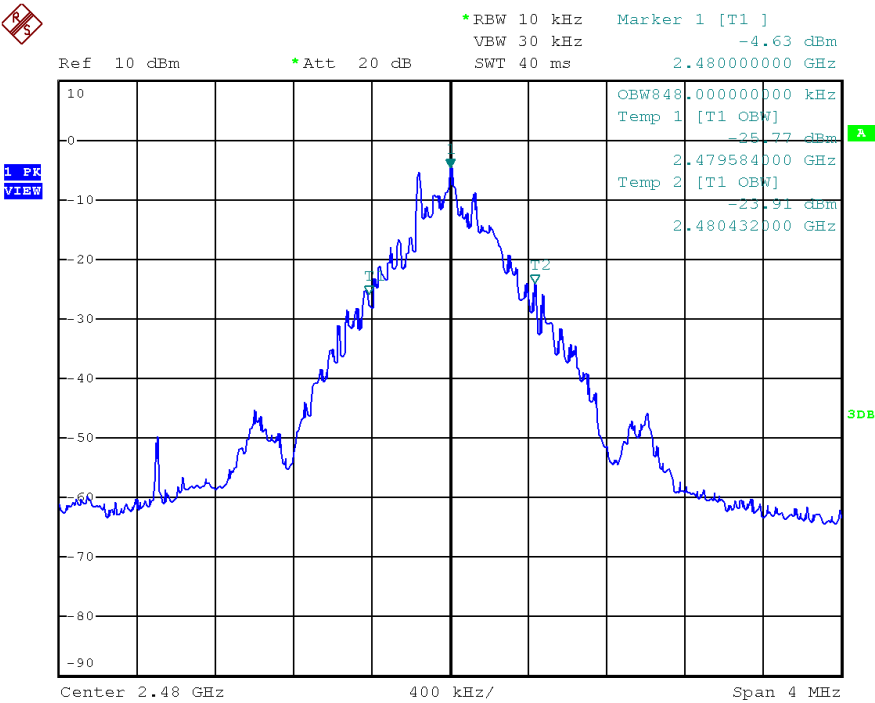
Spectrum Analyzer

Block diagram of Test setup

Occupied Bandwidth Results: (Left Antenna BT Classic)

| Bluetooth (MHz)      | Occupied Bandwidth (kHz) |
|----------------------|--------------------------|
| Low Channel: 2402    | 840                      |
| Middle Channel: 2440 | 848                      |
| High Channel: 2480   | 848                      |

The worst case is shown as below:

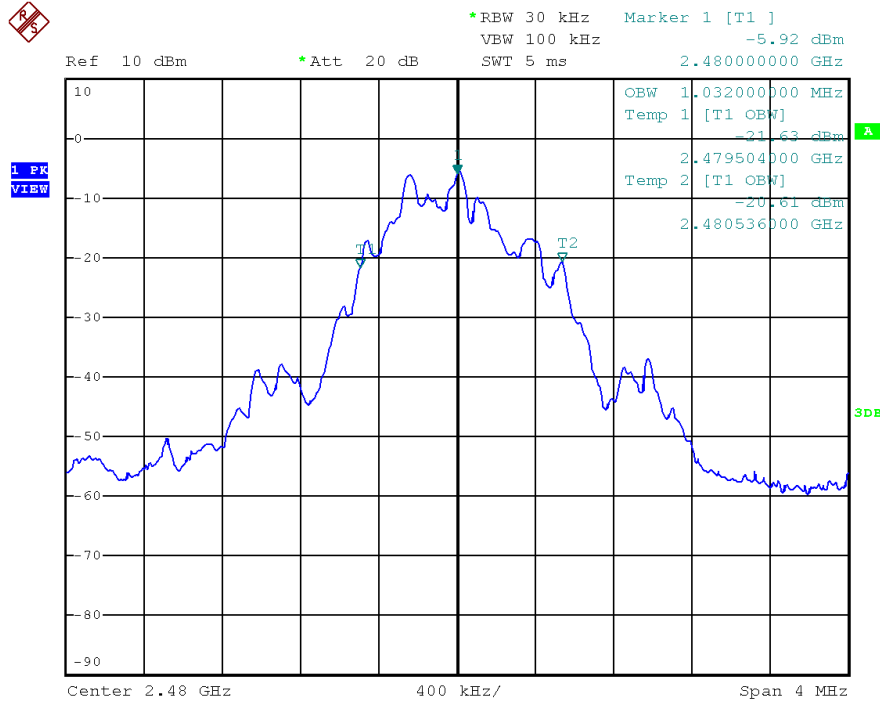


## TEST REPORT

Occupied Bandwidth Results: (Left Antenna BLE)

| Bluetooth (MHz)      | Occupied Bandwidth (kHz) |
|----------------------|--------------------------|
| Low Channel: 2402    | 1024                     |
| Middle Channel: 2440 | 1024                     |
| High Channel: 2480   | 1032                     |

The worst case is shown as below:

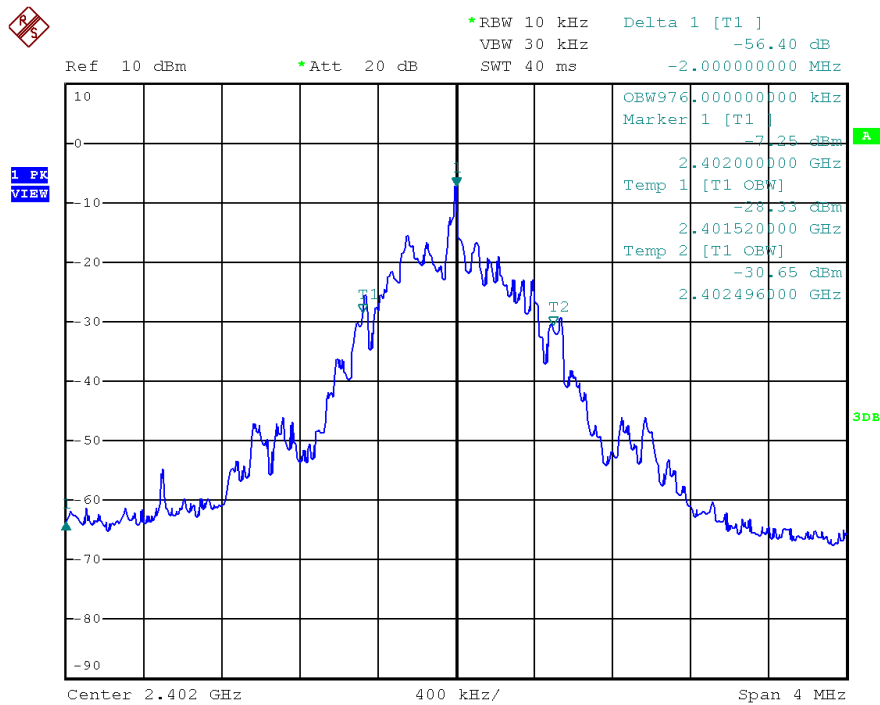


## TEST REPORT

Occupied Bandwidth Results: (Right Antenna BT Classic)

| Bluetooth (MHz)      | Occupied Bandwidth (kHz) |
|----------------------|--------------------------|
| Low Channel: 2402    | 976                      |
| Middle Channel: 2440 | 824                      |
| High Channel: 2480   | 816                      |

The worst case is shown as below:

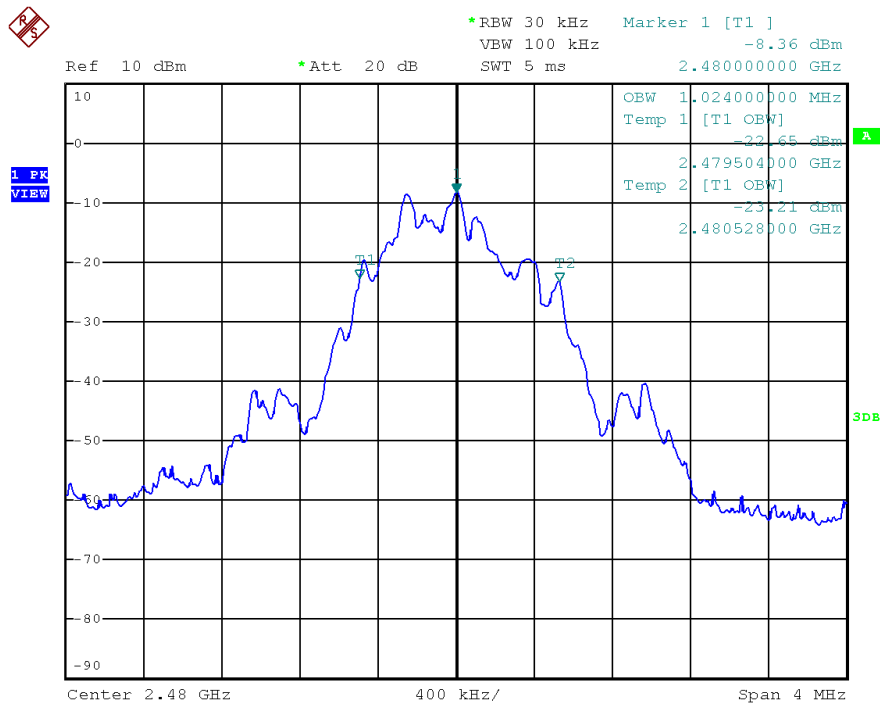


## TEST REPORT

Occupied Bandwidth Results: (Right Antenna BLE)

| Bluetooth (MHz)      | Occupied Bandwidth (kHz) |
|----------------------|--------------------------|
| Low Channel: 2402    | 1024                     |
| Middle Channel: 2440 | 1016                     |
| High Channel: 2480   | 1024                     |

The worst case is shown as below:



## TEST REPORT

### 9.0 CONFIDENTIALITY REQUEST

For electronic filing, a preliminary copy of the confidentiality request is saved with filename: Request.pdf.

### 10.0 EQUIPMENT LIST

#### 1) Radiated Emissions Test

| Equipment            | EMI Test Receiver (9kHz to 26.5GHz) | Biconical Antenna (30MHz to 300MHz) | Log Periodic Antenna |
|----------------------|-------------------------------------|-------------------------------------|----------------------|
| Registration No.     | EW-3156                             | EW-3242                             | EW-3243              |
| Manufacturer         | ROHDESCHWARZ                        | EMCO                                | EMCO                 |
| Model No.            | ESR26                               | 3110C                               | 3148B                |
| Calibration Date     | January 31, 2024                    | July 30, 2024                       | July 30, 2024        |
| Calibration Due Date | May 01, 2025                        | July 30, 2026                       | July 30, 2026        |

| Equipment            | Double Ridged Guide Antenna (1GHz - 18GHz) | Active Loop Antenna (H-field) (9kHz to 30MHz) | RF Preamplifier (9kHz to 6000MHz) |
|----------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------|
| Registration No.     | EW-0194                                    | EW-3326                                       | EW-3006b                          |
| Manufacturer         | EMCO                                       | EMCO                                          | SCHWARZBECK                       |
| Model No.            | 3115                                       | 6502                                          | BBV9718                           |
| Calibration Date     | May 10, 2023                               | January 05, 2024                              | October 20, 2023                  |
| Calibration Due Date | May 10, 2025                               | July 05, 2025                                 | April 20, 2025                    |

| Equipment            | 2.4GHz Notch Filter | 14m Double Shield RF Cable (9kHz - 6GHz) | RF Cable 14m (1GHz to 26.5GHz) |
|----------------------|---------------------|------------------------------------------|--------------------------------|
| Registration No.     | EW-3435             | EW-2376                                  | EW-2781                        |
| Manufacturer         | MICROWAVE           | RADIALL                                  | GREATBILLION                   |
| Model No.            | N0324413            | n m/br56/bnc m 14m                       | SMA m/SHF5MPU /SMA m ra14m,26G |
| Calibration Date     | October 09, 2024    | October 09, 2024                         | January 16, 2024               |
| Calibration Due Date | October 09, 2025    | October 09, 2025                         | April 16, 2025                 |

| Equipment            | 12 metre RF Cable (1-40)GHz | Pyramidal Horn Antenna |
|----------------------|-----------------------------|------------------------|
| Registration No.     | EW-2774                     | EW-0905                |
| Manufacturer         | GREATBILLION                | EMCO                   |
| Model No.            | SMA m-m ra 12m 40G outdoor  | 3160-09                |
| Calibration Date     | January 16, 2024            | December 15, 2023      |
| Calibration Due Date | April 16, 2025              | June 15, 2025          |

## TEST REPORT

### 2) Conducted Emissions Test

| Equipment            | RF Cable 240cm (RG142)<br>(9kHz to 30MHz) | Artificial Mains<br>Network | EMI Test Receiver<br>(9kHz to 3GHz) |
|----------------------|-------------------------------------------|-----------------------------|-------------------------------------|
| Registration No.     | EW-2454                                   | EW-3360                     | EW-3095                             |
| Manufacturer         | RADIALL                                   | ROHDESCHWARZ                | ROHDESCHWARZ                        |
| Model No.            | Bnc m st / 142 / bnc mra<br>240cm         | ENV-216                     | ESCI                                |
| Calibration Date     | June 20, 2024                             | April 07, 2024              | January 18, 2024                    |
| Calibration Due Date | June 20, 2025                             | April 07, 2025              | April 18, 2025                      |

### 3) Bandedge & Bandwidth Measurement

| Equipment            | EMI Test Receiver (9kHz<br>to 3GHz) |
|----------------------|-------------------------------------|
| Registration No.     | EW-3095                             |
| Manufacturer         | ROHDESCHWARZ                        |
| Model No.            | ESCI                                |
| Calibration Date     | January 18, 2024                    |
| Calibration Due Date | April 18, 2025                      |

### 4) Control Software for Radiated Emission

| Software Information |              |
|----------------------|--------------|
| Software Name        | EMC32        |
| Manufacturer         | ROHDESCHWARZ |
| Software version     | 10.50.40     |

**END OF TEST REPORT**