

# TEST REPORT

## CERTIFICATE OF CONFORMITY

**Standard:** 47 CFR FCC Part 15, Subpart C (Section 15.249)  
47 CFR FCC Part 15, Subpart C (Section 15.247)

**Report No.:** REBUUY-WTW-P25080468-3

**FCC ID:** XGB-HWBB0013

**Product:** Wireless Headset

**Brand:** TURTLE BEACH

**Model No.:** HWBB0013

**Received Date:** 2025/8/22

**Test Date:** 2025/9/6 ~ 2025/9/16

**Issued Date:** 2025/9/30

**Applicant:** Voyetra Turtle Beach, Inc.

**Address:** 15822 BERNARDO CENTER DRIVE, SUITE 105, SAN DIEGO, CA 92127

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**Test Location:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**FCC Registration /** 198487 / TW2021

**Designation Number:**

**Approved by:**

*Jeremy Lin*

Jeremy Lin / Project Engineer

**, Date:**

2025/9/30

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Prepared by : Jessica Cheng / Senior Specialist

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## Release Control Record

| Issue No.              | Description       | Date Issued |
|------------------------|-------------------|-------------|
| REBUUY-WTW-P25080468-3 | Original release. | 2025/9/30   |

## 1 Certificate

**Product:** Wireless Headset

**Brand:** TURTLE BEACH

**Test Model:** HWBB0013

**Sample Status:** Engineering sample

**Applicant:** Voyetra Turtle Beach, Inc.

**Test Date:** 2025/9/6 ~ 2025/9/16

**Standard:** 47 CFR FCC Part 15, Subpart C (Section 15.249)  
47 CFR FCC Part 15, Subpart C (Section 15.247)

**Measurement procedure:** ANSI C63.10-2020

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

## 2 Summary of Test Results

| Standard / Clause                                                | Test Item                      | Result | Remark                         |
|------------------------------------------------------------------|--------------------------------|--------|--------------------------------|
| 15.205 /15.209 /15.247(d)/<br>15.249(d)                          | Unwanted Emissions below 1 GHz | Pass   | Meet the requirement of limit. |
| 15.205 /15.209 /15.247(d)/<br>15.249(a) /15.249(d)<br>/15.249(e) | Unwanted Emissions above 1 GHz | Pass   | Meet the requirement of limit. |

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Parameter                              | Specification   | Uncertainty<br>(±) |
|----------------------------------------|-----------------|--------------------|
| Radiated Spurious Emissions below 1GHz | 9 kHz ~ 30 MHz  | 2.55 dB            |
|                                        | 30 MHz ~ 1 GHz  | 5.77 dB            |
| Radiated Spurious Emissions above 1GHz | 1 GHz ~ 6 GHz   | 4.71 dB            |
|                                        | 6 GHz ~ 18 GHz  | 5.3 dB             |
|                                        | 18 GHz ~ 40 GHz | 4.98 dB            |

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

### 2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

|                       |                  |                 |
|-----------------------|------------------|-----------------|
| Product               | Wireless Headset |                 |
| Brand                 | TURTLE BEACH     |                 |
| Test Model            | HWBB0013         |                 |
| Modulation Technology | BT-EDR           | FHSS            |
|                       | BT-LE            | DTS             |
| Operating Frequency   | BT-EDR           | 2402 ~ 2480 MHz |
|                       | BT-LE            | 2402 ~ 2480 MHz |
|                       | SRD              | 2402 ~ 2480 MHz |

Note:

1. Simultaneously transmission combination.

| Combination | Technology |     |
|-------------|------------|-----|
| 1           | Bluetooth  | SRD |

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

2. The EUT uses following accessories.

| Item                 | Spec.                     |
|----------------------|---------------------------|
| USB-A to USB-C cable | Shielded without core, 2m |

3. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

#### 3.2 Antenna Description of EUT

The antenna information is listed as below.

| Technology | Gain(dBi) | Antenna Type | Connector Type |
|------------|-----------|--------------|----------------|
| Bluetooth  | 3.14      | PIFA         | none           |
| SRD        | 2.59      | PIFA         | none           |

\* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.  
es description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

### 3.3 Test Mode Applicability and Tested Channel Detail

|             |                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pre-Scan:   | 1. EUT can be used in the following ways: XYZ 3-axis. Pre-scan in these ways and find the worst case as a representative test condition.<br>2. For Unwanted Emission below/ above 1 GHz has Battery/ EUT with USB cable(Adapter)/ EUT with USB cable(Laptop) mode of power supply. Pre-scan these modes and find the worst case as a representative test condition. |
| Worst Case: | 1. X/ Y/ Z Worst Condition: Z Axis for Unwanted Emission above 1GHz and Unwanted Emission below 1GHz.<br>2. For Unwanted Emission below/above 1 GHz EUT with USB cable(Laptop) mode is the worst case of power supply.                                                                                                                                              |

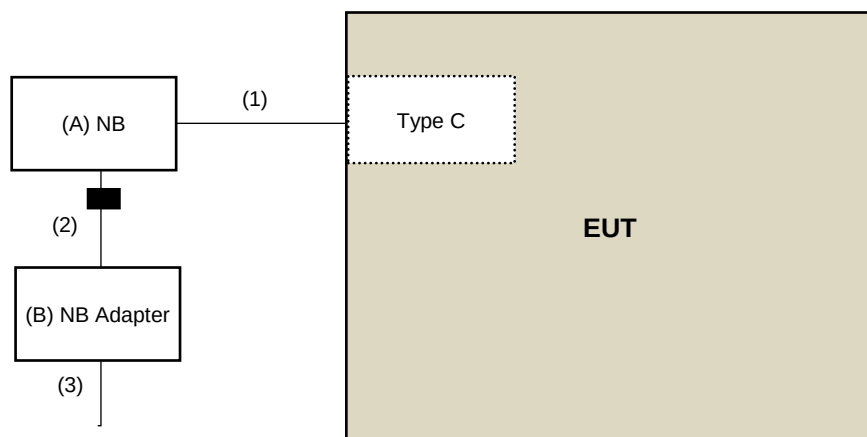
Following channel(s) was (were) selected for the final test as listed below:

| Test Item                      | Combination | Mode           | Tested Channel |
|--------------------------------|-------------|----------------|----------------|
| Unwanted Emissions below 1 GHz | 1           | GFSK<br>SRD 2M | 39<br>0        |
| Unwanted Emissions above 1 GHz | 1           | GFSK<br>SRD 2M | 39<br>0        |

### 3.4 Test Program Used and Operation Descriptions

Controlling software (AB157x\_Airoha\_Tool\_Kit(ATK)\_v5.5.0.2) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

### 3.5 Connection Diagram of EUT and Peripheral Devices



### 3.6 Configuration of Peripheral Devices and Cable Connections

| ID | Product    | Brand  | Model No.  | Serial No. | FCC ID | Remarks         |
|----|------------|--------|------------|------------|--------|-----------------|
| A  | NB         | Dell   | P90F       | N/A        | N/A    | Provided by Lab |
| B  | NB Adapter | Dell   | LA65NS2-01 | N/A        | N/A    | Provided by Lab |
| C  | Adapter    | Belkin | WCB007dq   | N/A        | N/A    | Provided by Lab |

| ID | Cable Descriptions   | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks               |
|----|----------------------|------|------------|--------------------|--------------|-----------------------|
| 1  | USB-A to USB-C cable | 1    | 2          | Y                  | 0            | Supplied by applicant |
| 2  | NB Adapter DC cable  | 1    | 1.9        | N                  | 1            | Provided by Lab       |
| 3  | NB Adapter AC cable  | 1    | 0.8        | N                  | 0            | Provided by Lab       |

## 4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.1 Unwanted Emissions below 1 GHz

| Description<br>Manufacturer                  | Model No.        | Serial No.   | Calibrated Date | Calibrated Until |
|----------------------------------------------|------------------|--------------|-----------------|------------------|
| Bi_Log Antenna<br>Schwarzbeck                | VULB 9168        | 137          | 2024/10/9       | 2025/10/8        |
| Coupling / Decoupling Network<br>Schwarzbeck | CDNE-M2          | 00097        | 2025/5/28       | 2026/5/27        |
|                                              | CDNE-M3          | 00091        | 2025/3/20       | 2026/3/19        |
| Loop Antenna<br>TESEQ                        | HLA 6121         | 64095        | 2024/10/17      | 2025/10/16       |
| MXE EMI Receiver<br>Agilent                  | N9038A           | MY50010158   | 2024/10/11      | 2025/10/10       |
| Preamplifier<br>Agilent                      | 8447D            | 2944A11064   | 2025/2/14       | 2026/2/13        |
| RF Coaxial Cable<br>Pacific                  | 8D-FB            | Cable-CH6-02 | 2025/6/24       | 2026/6/23        |
| Signal Analyzer<br>R&S                       | FSV40            | 101544       | 2025/7/1        | 2026/6/30        |
| Software<br>BVADT                            | Radiated_V8.7.08 | N/A          | N/A             | N/A              |
| Tower<br>ADT                                 | AT100            | 0306         | N/A             | N/A              |
| Turn Table<br>ADT                            | TT100            | 0306         | N/A             | N/A              |

Notes:

1. The test was performed in Linkou 966 Chamber 6 (CH 6).
2. Tested Date: 2025/9/16

## 4.2 Unwanted Emissions above 1 GHz

| Description<br>Manufacturer           | Model No.           | Serial No.   | Calibrated Date | Calibrated Until |
|---------------------------------------|---------------------|--------------|-----------------|------------------|
| Boresight antenna tower fixture<br>BV | BAF-02              | 6            | N/A             | N/A              |
| High Pass Filter<br>Wainwright        | WHK 3.1/18G-10SS    | SN 8         | 2025/5/22       | 2026/5/21        |
| Horn Antenna<br>EMCO                  | 3115                | 00028257     | 2024/11/10      | 2025/11/9        |
| Horn Antenna<br>ETS-Lindgren          | 3117-PA             | 00215857     | 2024/11/10      | 2025/11/9        |
| Horn Antenna<br>Schwarzbeck           | BBHA 9170           | 212          | 2024/10/18      | 2025/10/17       |
|                                       |                     | BBHA9170190  | 2024/11/10      | 2025/11/9        |
| MXE EMI Receiver<br>Agilent           | N9038A              | MY50010158   | 2024/10/11      | 2025/10/10       |
| Notch Filter<br>Micro-Tronics         | BRC50703-01         | 010          | 2025/5/22       | 2026/5/21        |
|                                       | BRM17690            | 005          | 2025/5/22       | 2026/5/21        |
| Preamplifier<br>EMCI                  | EMC0126545          | 980076       | 2025/2/14       | 2026/2/13        |
|                                       |                     | 980175       | 2025/8/23       | 2026/8/22        |
|                                       |                     | 980235       | 2025/2/14       | 2026/2/13        |
| Preamplifier<br>HP                    | 8449B               | 3008A01201   | 2025/2/14       | 2026/2/13        |
| RF Coaxial Cable<br>EMCI              | EMC104              | 190801       | 2025/7/4        | 2026/7/3         |
|                                       |                     | 190804       | 2025/7/4        | 2026/7/3         |
| RF Coaxial Cable<br>EMEC              | EM102-KMKM-100      | 02           | 2025/7/4        | 2026/7/3         |
| RF Coaxial Cable<br>HUBER+SUHNER      | SF-104              | Cable-CH6-01 | 2025/7/4        | 2026/7/3         |
| Signal Analyzer<br>R&S                | FSV40               | 101544       | 2025/7/1        | 2026/6/30        |
| Software<br>BVADT                     | Radiated_V7.7.1.1.1 | N/A          | N/A             | N/A              |
| Tower<br>ADT                          | AT100               | 0306         | N/A             | N/A              |
| Turn Table<br>ADT                     | TT100               | 0306         | N/A             | N/A              |

### Notes:

1. The test was performed in Linkou 966 Chamber 6 (CH 6).
2. Tested Date: 2025/9/6 ~ 2025/9/16

## 5 Limits of Test Items

### 5.1 Unwanted Emissions below 1 GHz

For FCC 15.249:

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009 ~ 0.490     | 2400/F(kHz)                       | 300                           |
| 0.490 ~ 1.705     | 24000/F(kHz)                      | 30                            |
| 1.705 ~ 30.0      | 30                                | 30                            |
| 30 ~ 88           | 100                               | 3                             |
| 88 ~ 216          | 150                               | 3                             |
| 216 ~ 960         | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

For FCC 15.247:

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009 ~ 0.490     | 2400/F(kHz)                       | 300                           |
| 0.490 ~ 1.705     | 24000/F(kHz)                      | 30                            |
| 1.705 ~ 30.0      | 30                                | 30                            |
| 30 ~ 88           | 100                               | 3                             |
| 88 ~ 216          | 150                               | 3                             |
| 216 ~ 960         | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

## 5.2 Unwanted Emissions above 1 GHz

For FCC 15.249:

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

| Fundamental Frequency | Field Strength of Fundamental (millivolts/meter) | Field Strength of Harmonics (microvolts/meter) |
|-----------------------|--------------------------------------------------|------------------------------------------------|
| 2400 ~ 2483.5 MHz     | 50                                               | 500                                            |

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation.

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| Above 960         | 500                               | 3                             |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

For FCC 15.247:

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| Above 960         | 500                               | 3                             |

Notes:

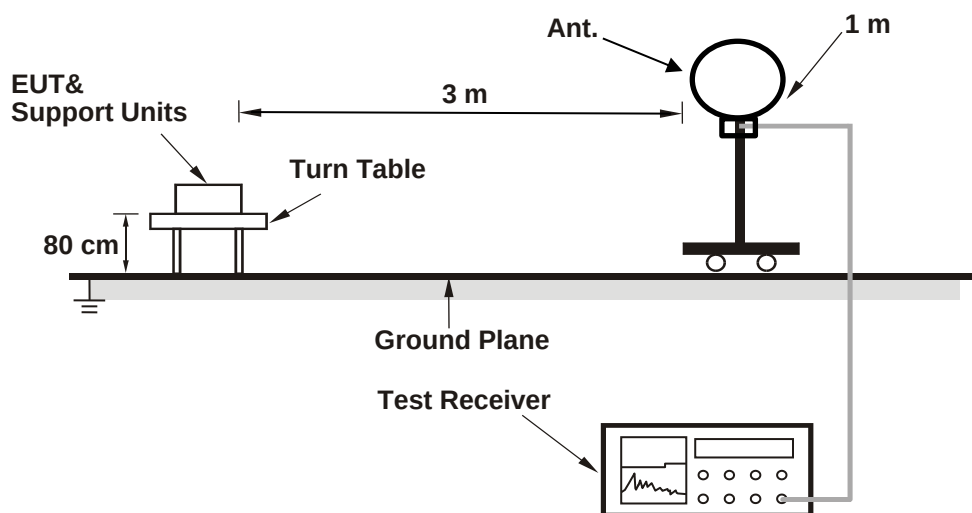
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

## 6 Test Arrangements

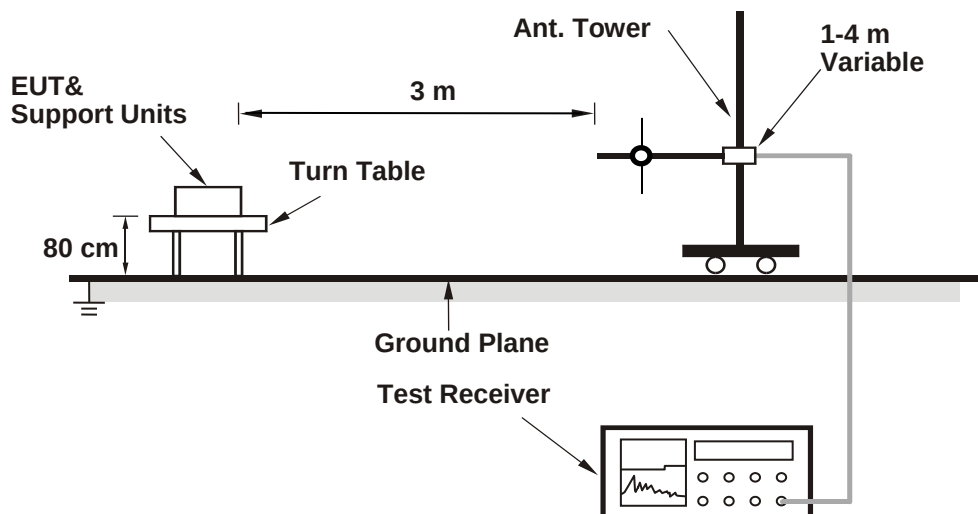
### 6.1 Unwanted Emissions below 1 GHz

#### 6.1.1 Test Setup

##### For Radiated emission below 30 MHz



##### For Radiated emission above 30 MHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 6.1.2 Test Procedure

#### For Radiated emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

#### Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.

#### For Radiated emission above 30 MHz

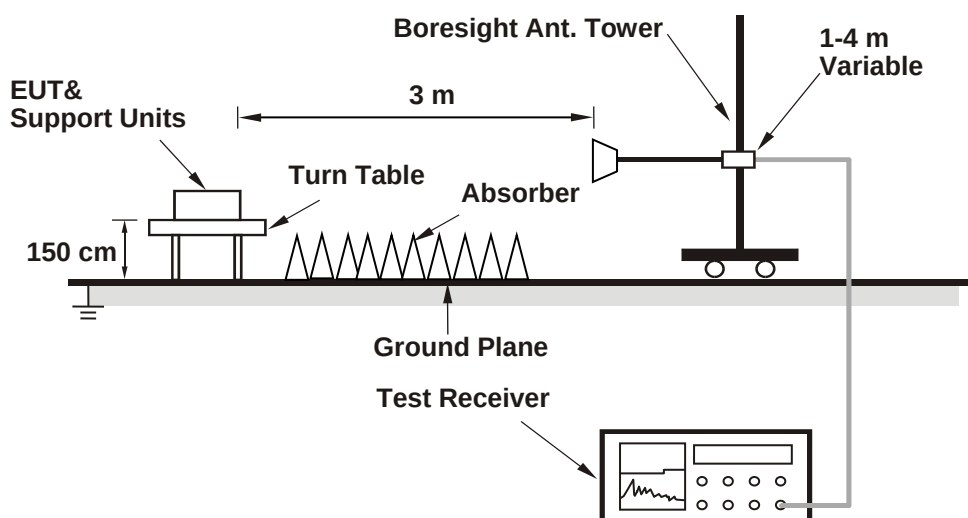
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-peak(QP) detect function, Average(AV) detect function, Peak(PK) detect function and specified bandwidth with maximum hold mode when the test frequencies less than or equal to 1 GHz.

#### Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

## 6.2 Unwanted Emissions above 1 GHz

### 6.2.1 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 6.2.2 Test Procedure

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

#### Notes:

- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.
- The maximum dwell time per 1 MHz is determined as follows:  
Maximum dwell time per 1 MHz = dwell time per 100 ms per channel × (channel separation correction + overlapping channel correction) where:
  - Channel separation correction =  $[1 / \text{channel separation (MHz)}]$  for channel separation < 1 MHz, and = 1 for channel separation ≥ 1 MHz, as determined using the procedures of 7.8.2. If the average measurements are performed on the Nth harmonic, the channel separation value is N times the separation at the fundamental frequency.
  - Overlapping channel correction = 0 when the 20 dB channel bandwidth < channel separation and = 1 for when the 20 dB channel bandwidth > channel separation.

The average value may be determined as follows:

From the peak value of the emission: The measured peak value in dBuV/m is corrected by  $20\log(\text{maximum dwell time in 100 ms} / 100)$  (for BT GFSK)

- According to ANSI C63.10 section 6.6.4 and 4.1.5.2.2. For fundamental and harmonic signal measurement, according to ANSI C63.10 section 7.5, the average value = peak value + duty cycle correction factor. For duty cycle correction factor values, see the Test Signal Duty Cycle section in this report. (for SRD)

## 7 Test Results of Test Item

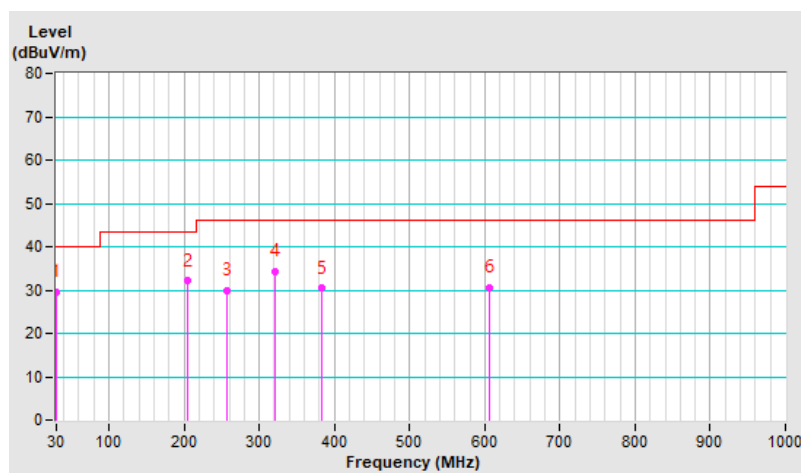
### 7.1 Unwanted Emissions below 1 GHz

|                                 |                   |                                          |                                     |
|---------------------------------|-------------------|------------------------------------------|-------------------------------------|
| <b>RF Mode</b>                  | SRD-2M<br>BT GFSK | <b>Channel</b>                           | CH 0 : 2402 MHz<br>CH 39 : 2441 MHz |
| <b>Frequency Range</b>          | 30 MHz ~ 1 GHz    | <b>Detector Function &amp; Bandwidth</b> | QP: RB=120kHz, DET=Quasi-Peak       |
| <b>Environmental Conditions</b> | 25 °C, 75% RH     | <b>Tested By</b>                         | Jed Wu                              |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|------------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                    | 30.58           | 29.6 QP                 | 40.0           | -10.4       | 1.28 H             | 198                  | 40.2             | -10.6                    |
| 2                                                    | 204.75          | 32.1 QP                 | 43.5           | -11.4       | 1.46 H             | 253                  | 42.5             | -10.4                    |
| 3                                                    | 256.79          | 29.8 QP                 | 46.0           | -16.2       | 1.38 H             | 220                  | 37.3             | -7.5                     |
| 4                                                    | 321.73          | 34.2 QP                 | 46.0           | -11.8       | 1.79 H             | 178                  | 39.2             | -5.0                     |
| 5                                                    | 383.47          | 30.4 QP                 | 46.0           | -15.6       | 1.83 H             | 346                  | 34.2             | -3.8                     |
| 6                                                    | 606.18          | 30.6 QP                 | 46.0           | -15.4       | 1.14 H             | 31                   | 29.2             | 1.4                      |

#### Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

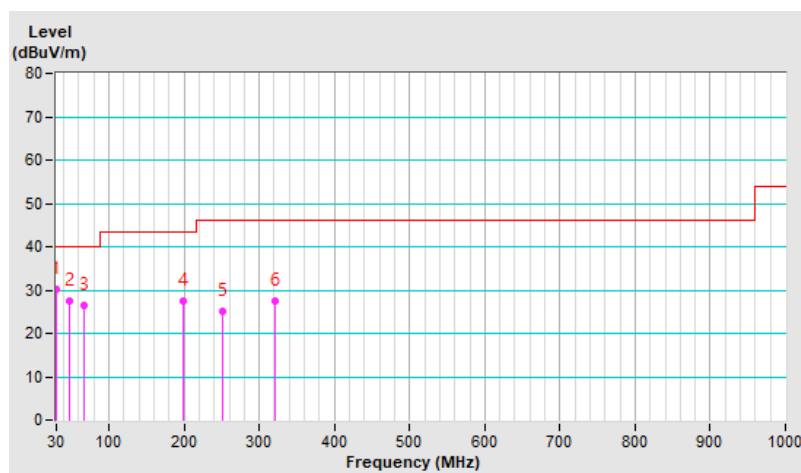


|                                 |                   |                                          |                                     |
|---------------------------------|-------------------|------------------------------------------|-------------------------------------|
| <b>RF Mode</b>                  | SRD-2M<br>BT GFSK | <b>Channel</b>                           | CH 0 : 2402 MHz<br>CH 39 : 2441 MHz |
| <b>Frequency Range</b>          | 30 MHz ~ 1 GHz    | <b>Detector Function &amp; Bandwidth</b> | QP: RB=120kHz, DET=Quasi-Peak       |
| <b>Environmental Conditions</b> | 25 °C, 75% RH     | <b>Tested By</b>                         | Jed Wu                              |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                 | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                  | 30.58           | 30.3 QP                 | 40.0           | -9.7        | 1.24 V             | 149                  | 40.9             | -10.6                    |
| 2                                                  | 46.54           | 27.5 QP                 | 40.0           | -12.5       | 1.13 V             | 304                  | 36.4             | -8.9                     |
| 3                                                  | 66.47           | 26.6 QP                 | 40.0           | -13.4       | 1.08 V             | 206                  | 36.4             | -9.8                     |
| 4                                                  | 198.25          | 27.6 QP                 | 43.5           | -15.9       | 1.63 V             | 319                  | 37.9             | -10.3                    |
| 5                                                  | 250.24          | 25.1 QP                 | 46.0           | -20.9       | 1.59 V             | 56                   | 32.8             | -7.7                     |
| 6                                                  | 321.78          | 27.4 QP                 | 46.0           | -18.6       | 1.97 V             | 136                  | 32.4             | -5.0                     |

#### Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



## 7.2 Unwanted Emissions above 1 GHz

|                                 |                   |                                          |                                                                     |
|---------------------------------|-------------------|------------------------------------------|---------------------------------------------------------------------|
| <b>RF Mode</b>                  | SRD-2M<br>BT GFSK | <b>Channel</b>                           | CH 0 : 2402 MHz<br>CH 39 : 2441 MHz                                 |
| <b>Frequency Range</b>          | 1 GHz ~ 25 GHz    | <b>Detector Function &amp; Bandwidth</b> | PK: RB=1 MHz, VB=3 MHz, DET=Peak<br>AV: RB=1 MHz, VB=3 MHz, DET=RMS |
| <b>Environmental Conditions</b> | 25.2 °C, 74.3% RH | <b>Tested By</b>                         | Jed Wu                                                              |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|------------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                    | 2390.00         | 52.8 PK                 | 74.0           | -21.2       | 1.70 H             | 95                   | 53.5             | -0.7                     |
| 2                                                    | 2390.00         | 40.8 AV                 | 54.0           | -13.2       | 1.70 H             | 95                   | 41.5             | -0.7                     |
| 3                                                    | 2400.00         | 56.4 PK                 | 74.0           | -17.6       | 1.70 H             | 95                   | 57.0             | -0.6                     |
| 4                                                    | 2400.00         | 21.2 AV                 | 54.0           | -32.8       | 1.70 H             | 95                   | 21.8             | -0.6                     |
| 5                                                    | 4804.00         | 46.5 PK                 | 74.0           | -27.5       | 1.12 H             | 333                  | 39.4             | 7.1                      |
| 6                                                    | 4804.00         | 11.3 AV                 | 54.0           | -42.7       | 1.12 H             | 333                  | 4.2              | 7.1                      |
| 7                                                    | 4882.00         | 45.6 PK                 | 74.0           | -28.4       | 2.19 H             | 139                  | 38.1             | 7.5                      |
| 8                                                    | 4882.00         | 14.8 AV                 | 54.0           | -39.2       | 2.19 H             | 139                  | 7.3              | 7.5                      |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                 | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                  | 2390.00         | 52.8 PK                 | 74.0           | -21.2       | 1.09 V             | 292                  | 53.5             | -0.7                     |
| 2                                                  | 2390.00         | 40.8 AV                 | 54.0           | -13.2       | 1.09 V             | 292                  | 41.5             | -0.7                     |
| 3                                                  | 2400.00         | 52.6 PK                 | 74.0           | -21.4       | 1.09 V             | 292                  | 53.2             | -0.6                     |
| 4                                                  | 2400.00         | 17.4 AV                 | 54.0           | -36.6       | 1.09 V             | 292                  | 18.0             | -0.6                     |
| 5                                                  | 4804.00         | 46.1 PK                 | 74.0           | -27.9       | 1.62 V             | 196                  | 39.0             | 7.1                      |
| 6                                                  | 4804.00         | 10.9 AV                 | 54.0           | -43.1       | 1.62 V             | 196                  | 3.8              | 7.1                      |
| 7                                                  | 4882.00         | 45.2 PK                 | 74.0           | -28.8       | 2.69 V             | 30                   | 37.7             | 7.5                      |
| 8                                                  | 4882.00         | 14.4 AV                 | 54.0           | -39.6       | 2.69 V             | 30                   | 6.9              | 7.5                      |

### Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty cycle correction factor is calculated from following formula:  
 $20 \log(\text{Duty cycle}) = 20 \log(1.739 \text{ ms} / 100 \text{ ms}) = -35.2 \text{ dB}$  (for SRD)  
 The average value of harmonic frequency is: Average = Peak value + 20 log(dwelling time per 100 ms per channel \* (channel separation correction + overlapping channel correction)) Where the duty cycle correction factor is calculated from following formula:  
 $20 \log(\text{dwelling time per 100 ms per channel} \times (\text{channel separation correction} + \text{overlapping channel correction}))$   
 $= 20 \log(2.9\text{ms} \times (1+0) / 100 \text{ ms}) = -30.8 \text{ dB}$  (for BT GFSK)

## 8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

## 9 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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The address and road map of all our labs can be found in our web site also.

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