

## Partial FCC Test Report

**Report No.:** RFBURR-WTW-P21040075-2

**FCC ID:** S4L4FIC1

**Contains module FCC ID:** QIPELS61-US

**Test Model:** 4FIC1

**Series Model:** 4FIC0 (refer to item 3.1 for more details)

**Received Date:** May 07, 2021

**Test Date:** May 07 ~ Jun. 03, 2021

**Issued Date:** Jun. 16, 2021

**Applicant:** TomTom International B.V.

**Address:** De Ruijterkade 154, 1011 AC Amsterdam The Netherlands

**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. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City  
33383, TAIWAN

**FCC Registration /** 788550 / TW0003  
**Designation Number:**



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### Release Control Record

| Issue No.              | Description      | Date Issued   |
|------------------------|------------------|---------------|
| RFBURR-WTW-P21040075-2 | Original release | Jun. 16, 2021 |

## 1 Certificate of Conformity

**Product:** TomTom BRIDGE Hub

**Brand:** TOMTOM

**Test Model:** 4FIC1

**Series Model:** 4FIC0 (refer to item 3.1 for more details)

**Sample Status:** Pre-MFB build sample

**Applicant:** TomTom International B.V.

**Test Date:** May 07 ~ Jun. 03, 2021

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.10:2013

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.

**Prepared by :** Celine Chou , **Date:** Jun. 16, 2021  
Celine Chou / Senior Specialist

**Approved by :** Bruce Chen , **Date:** Jun. 16, 2021  
Bruce Chen / Senior Project Engineer

## 2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart C (Section 15.247) |                                              |        |                                                                              |
|------------------------------------------------|----------------------------------------------|--------|------------------------------------------------------------------------------|
| FCC Clause                                     | Test Item                                    | Result | Remarks                                                                      |
| 15.207                                         | AC Power Conducted Emission                  | NA     | Refer to Note 1                                                              |
| 15.205 /<br>15.209 /<br>15.247(d)              | Radiated Emissions and Band Edge Measurement | Pass   | Meet the requirement of limit. Minimum passing margin is -0.9dB at 70.77MHz. |
| 15.247(d)                                      | Antenna Port Emission                        | NA     | Refer to Note 1                                                              |
| 15.247(a)(2)                                   | 6dB bandwidth                                | NA     | Refer to Note 1                                                              |
| 15.247(b)                                      | Conducted power                              | Pass   | Meet the requirement of limit.                                               |
| 15.247(e)                                      | Power Spectral Density                       | NA     | Refer to Note 1                                                              |
| 15.203                                         | Antenna Requirement                          | Pass   | No antenna connector is used.                                                |

Note:

1. The Conducted Output Power and Radiated Emission (worst channel) test items are performed for the addendum. Refer to original report for the other test data.
2. 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:

| Measurement                    | Frequency        | Expanded Uncertainty (k=2) (±) |
|--------------------------------|------------------|--------------------------------|
| Radiated Emissions up to 1 GHz | 9kHz ~ 30MHz     | 3.04 dB                        |
|                                | 30MHz ~ 200MHz   | 3.86 dB                        |
|                                | 200MHz ~ 1000MHz | 3.87 dB                        |
| Radiated Emissions above 1 GHz | 1GHz ~ 18GHz     | 2.29 dB                        |
|                                | 18GHz ~ 40GHz    | 2.29 dB                        |

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

|                     |                                |
|---------------------|--------------------------------|
| Product             | TomTom BRIDGE Hub              |
| Brand               | TOMTOM                         |
| Test Model          | 4FIC1                          |
| Series Model        | 4FIC0                          |
| Model Difference    | Refer to note                  |
| Sample Status       | Pre-MFB build sample           |
| Power Supply Rating | 12-24Vdc, 2.0A                 |
| Modulation Type     | GFSK                           |
| Transfer Rate       | 1Mbps                          |
| Operating Frequency | 2402 ~ 2480MHz                 |
| Number of Channel   | 40                             |
| Channel Spacing     | 2MHz                           |
| Output Power        | 1.734mW                        |
| Antenna Type        | Chip antenna with 1.69dBi gain |
| Antenna Connector   | NA                             |
| Accessory Device    | Refer to note                  |
| Cable Supplied      | Refer to note                  |

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV CPS report no.: RF171003C10-3) is updated LTE module from rel1 to rel2 (the part number is not changed). Therefore, only the Conducted Output Power and Radiated Emission (worst channel) have been tested for this addendum. Other testing data please refer to the original test report.
2. All models are listed as below.

| Brand  | Model | GNSS/WLAN/BT | LTE | WOIP/CAN<br>Bus/HDMI/CVBS |
|--------|-------|--------------|-----|---------------------------|
| TOMTOM | 4FIC0 | O            | O   | X                         |
|        | 4FIC1 | O            | O   | O                         |

Note: "O" means support, "X" means no support.

\* The model of the 4FIC1 was chosen for final test.

3. The EUT contains the following accessories.

| Item                                | Brand  | Model                     | Specification                                                 | Remark    |
|-------------------------------------|--------|---------------------------|---------------------------------------------------------------|-----------|
| Car Charger                         | TomTom | CLA 4FIC0,<br>4FIC.000.02 | Input: 12/24Vdc, 2A<br>Output: 12/24Vdc, 2A<br>FUSE: 125V, 5A | Option    |
| InCube Power Cable                  | TomTom | 4FIC.000.01               | 2m non-shielded power cable without core                      | Accessory |
| InCube CLA Car Charger Cable        | TomTom | 4FIC.000.02               | 2m non-shielded power cable without core                      | Option    |
| InCube Full Power Cable (Harnessed) | TomTom | 4FIC.000.03               | 2m non-shielded power cable without core                      | Option    |

4. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

5. The WWAN module (model no.: ELS61-US, brand name: GEMALTO, FCC ID: QIPELS61-US) is collocated in this EUT.
6. WLAN (2.4GHz or 5GHz), BT (BT EDR or BT LE) and WWAN technology can transmit simultaneously.
7. Spurious emission of the simultaneous operation (WLAN (2.4GHz or 5GHz), BT (BT EDR or BT LE) and WWAN) has been evaluated and no non-compliance was found.

### 3.2 Description of Test Modes

40 channels are provided to this EUT:

| Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 0       | 2402        | 10      | 2422        | 20      | 2442        | 30      | 2462        |
| 1       | 2404        | 11      | 2424        | 21      | 2444        | 31      | 2464        |
| 2       | 2406        | 12      | 2426        | 22      | 2446        | 32      | 2466        |
| 3       | 2408        | 13      | 2428        | 23      | 2448        | 33      | 2468        |
| 4       | 2410        | 14      | 2430        | 24      | 2450        | 34      | 2470        |
| 5       | 2412        | 15      | 2432        | 25      | 2452        | 35      | 2472        |
| 6       | 2414        | 16      | 2434        | 26      | 2454        | 36      | 2474        |
| 7       | 2416        | 17      | 2436        | 27      | 2456        | 37      | 2476        |
| 8       | 2418        | 18      | 2438        | 28      | 2458        | 38      | 2478        |
| 9       | 2420        | 19      | 2440        | 29      | 2460        | 39      | 2480        |

### 3.2.1 Test Mode Applicability and Tested Channel Detail

| EUT Configure Mode | Applicable to |       |       | Description |
|--------------------|---------------|-------|-------|-------------|
|                    | RE $\geq$ 1G  | RE<1G | Power |             |
| -                  | √             | √     | √     | -           |

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement  
 RE<1G: Radiated Emission below 1GHz  
 Power: Conducted Output Power Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

#### **Radiated Emission Test (Above 1GHz):**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 19             | GFSK            | 1                |

#### **Radiated Emission Test (Below 1GHz):**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 19             | GFSK            | 1                |

#### **Conducted Output Power Measurement:**

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 0, 19, 39      | GFSK            | 1                |

#### **Test Condition:**

| Applicable to | Environmental Conditions | Input Power | Tested by  |
|---------------|--------------------------|-------------|------------|
| RE $\geq$ 1G  | 24 deg. C, 66% RH        | 12Vdc       | Edison Lin |
| RE<1G         | 23 deg. C, 67% RH        | 12Vdc       | Edison Lin |
| Power         | 25 deg. C, 60% RH        | 12Vdc       | Ivan Tseng |

### 3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

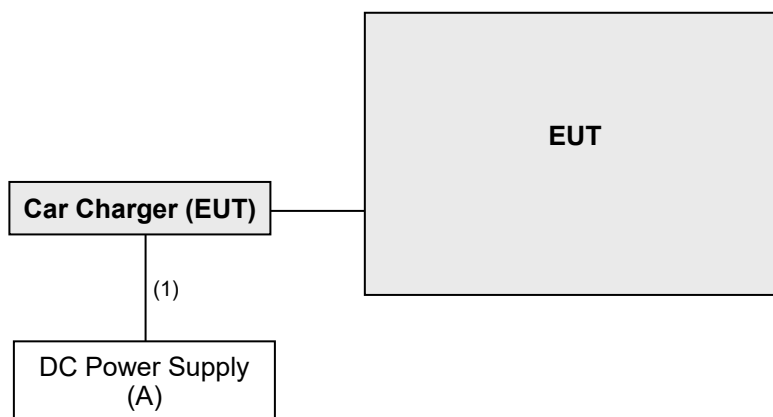
| ID | Product         | Brand   | Model No. | Serial No. | FCC ID | Remarks |
|----|-----------------|---------|-----------|------------|--------|---------|
| A. | DC Power Supply | Topward | 33010D    | 807748     | NA     | -       |

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A was placed under the test table.

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|----|--------------|------|------------|--------------------|--------------|---------|
| 1. | DC           | 1    | 0.5        | N                  | 0            | -       |

#### 3.3.1 Configuration of System under Test



### 3.4 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

**Test standard:**

**FCC Part 15, Subpart C (15.247)**

ANSI C63.10:2013

All test items have been performed and recorded as per the above standards.

**References Test Guidance:**

**KDB 558074 D01 15.247 Meas Guidance v05r02**

All test items have been performed as a reference to the above KDB test guidance.

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

#### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

| Frequencies<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(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                                |

Note:

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 1000MHz, 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 20dB under any condition of modulation.

#### 4.1.2 Test Instruments

| Description & Manufacturer                | Model No.                             | Serial No.                                          | Cal. Date     | Cal. Due      |
|-------------------------------------------|---------------------------------------|-----------------------------------------------------|---------------|---------------|
| Spectrum Analyzer<br>ROHDE & SCHWARZ      | FSP40                                 | 100269                                              | Jun. 09, 2020 | Jun. 08, 2021 |
| Test Receiver<br>ROHDE & SCHWARZ          | ESR3                                  | 102579                                              | Jul. 07, 2020 | Jul. 06, 2021 |
| BILOG Antenna<br>SCHWARZBECK              | VULB9168                              | 9168-171                                            | Nov. 04, 2020 | Nov. 03, 2021 |
| HORN Antenna<br>SCHWARZBECK               | 9120D                                 | 209                                                 | Nov. 22, 2020 | Nov. 21, 2021 |
| HORN Antenna<br>SCHWARZBECK               | BBHA 9170                             | BBHA9170241                                         | Nov. 22, 2020 | Nov. 21, 2021 |
| Loop Antenna<br>TESEQ                     | HLA 6121                              | 45745                                               | Jul. 06, 2020 | Jul. 05, 2021 |
| Preamplifier<br>Agilent<br>(Below 1GHz)   | 8447D                                 | 2944A10738                                          | Aug. 16, 2020 | Aug. 15, 2021 |
| Preamplifier<br>Agilent<br>(Above 1GHz)   | 8449B                                 | 3008A02465                                          | Mar. 22, 2021 | Mar. 21, 2022 |
| RF Coaxial Cable<br>WOKEN<br>With 5dB PAD | 8D-FB                                 | Cable-CH3-01                                        | Aug. 16, 2020 | Aug. 15, 2021 |
| RF signal cable<br>HUBER+SUHNER           | SUCOFLEX 104                          | Cable-CH3-03<br>(223653/4)                          | Aug. 16, 2020 | Aug. 15, 2021 |
| RF signal cable<br>HUBER+SUHNER&<br>EMCI  | SUCOFLEX<br>104&EMC104-SM-S<br>M-8000 | Cable-CH3-03<br>(309224+170907)                     | Aug. 16, 2020 | Aug. 15, 2021 |
| Software<br>BV ADT                        | ADT_Radiated_<br>V7.6.15.9.5          | NA                                                  | NA            | NA            |
| Antenna Tower<br>inn-co GmbH              | MA 4000                               | 013303                                              | NA            | NA            |
| Antenna Tower Controller<br>BV ADT        | AT100                                 | AT93021702                                          | NA            | NA            |
| Turn Table<br>BV ADT                      | TT100                                 | TT93021702                                          | NA            | NA            |
| Turn Table Controller<br>BV ADT           | SC100                                 | SC93021702                                          | NA            | NA            |
| Boresight Antenna Fixture                 | FBA-01                                | FBA-SIP01                                           | NA            | NA            |
| USB Wideband Power Sensor<br>KEYSIGHT     | U2021XA                               | MY55050005/MY5519<br>0004/MY55190007/MY<br>55210005 | Jul. 13, 2020 | Jul. 12, 2021 |

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 3.

#### 4.1.3 Test Procedures

##### For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

##### For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) 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 detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect 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.

Note:

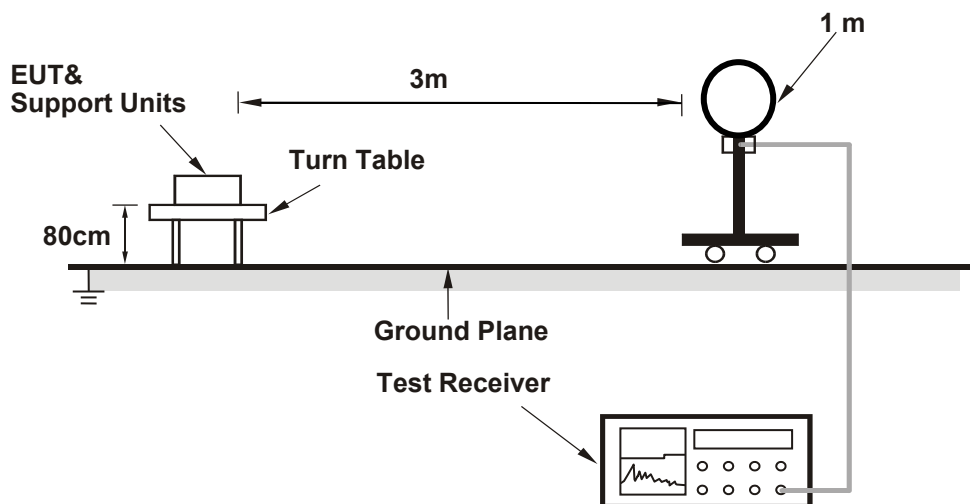
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98%) or 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz. (The duty cycle value refers to the original report, RBW = 1MHz, VBW = 3kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

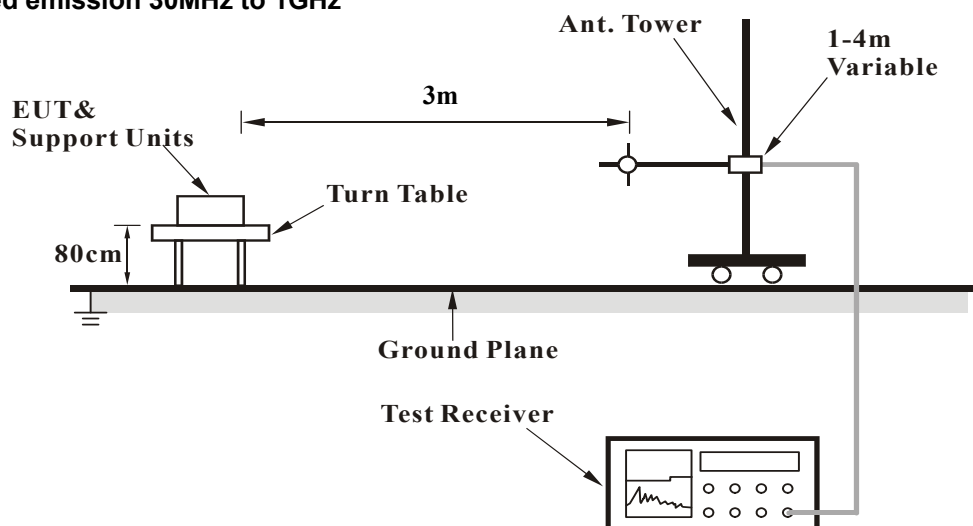
No deviation.

#### 4.1.5 Test Setup

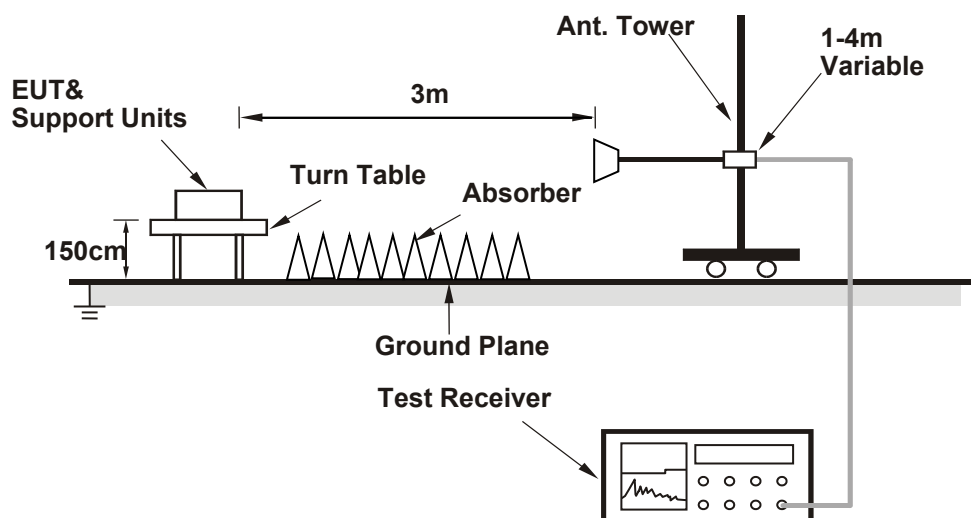
##### For Radiated emission below 30MHz



##### For Radiated emission 30MHz to 1GHz



### For Radiated emission above 1GHz



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

#### 4.1.6 EUT Operating Conditions

- a. Set the EUT under transmission condition continuously at specific channel frequency.

#### 4.1.7 Test Results

Above 1 GHz Data:

|                 |              |                   |                           |
|-----------------|--------------|-------------------|---------------------------|
| RF Mode         | TX BT LE     | Channel           | CH 19 : 2440 MHz          |
| Frequency Range | 1GHz ~ 25GHz | Detector Function | Peak (PK)<br>Average (AV) |

| 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                                                    | *2440.00        | 99.3 PK                 |                |             | 1.39 H             | 247                  | 65.0             | 34.3                     |
| 2                                                    | *2440.00        | 98.0 AV                 |                |             | 1.39 H             | 247                  | 63.7             | 34.3                     |
| 3                                                    | 4880.00         | 46.0 PK                 | 74.0           | -28.0       | 2.13 H             | 162                  | 40.3             | 5.7                      |
| 4                                                    | 4880.00         | 33.5 AV                 | 54.0           | -20.5       | 2.13 H             | 162                  | 27.8             | 5.7                      |
| 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                                                    | *2440.00        | 88.4 PK                 |                |             | 2.87 V             | 316                  | 54.1             | 34.3                     |
| 2                                                    | *2440.00        | 87.3 AV                 |                |             | 2.87 V             | 316                  | 53.0             | 34.3                     |
| 3                                                    | 4880.00         | 46.8 PK                 | 74.0           | -27.2       | 1.89 V             | 155                  | 41.1             | 5.7                      |
| 4                                                    | 4880.00         | 34.0 AV                 | 54.0           | -20.0       | 1.89 V             | 155                  | 28.3             | 5.7                      |

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. " \* " : Fundamental frequency.

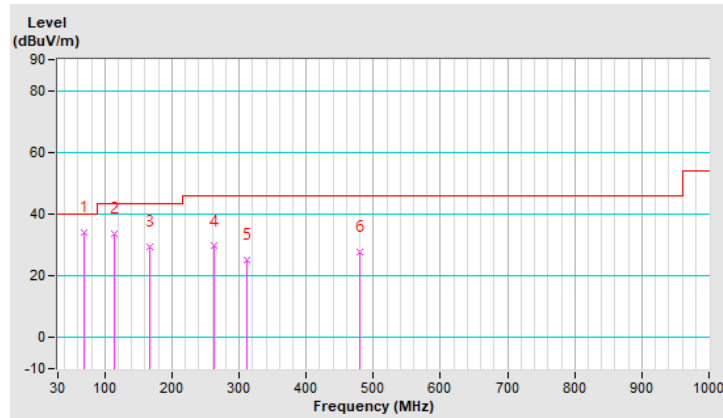
Below 1GHz worst-case data:

|                 |              |                   |                  |
|-----------------|--------------|-------------------|------------------|
| RF Mode         | TX BT LE     | Channel           | CH 19 : 2440 MHz |
| Frequency Range | 30MHz ~ 1GHz | Detector Function | Quasi-Peak (QP)  |

| 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                                                    | 69.36           | 34.0 QP                 | 40.0           | -6.0        | 1.50 H             | 191                  | 45.0             | -11.0                    |
| 2                                                    | 114.35          | 33.7 QP                 | 43.5           | -9.8        | 1.00 H             | 239                  | 45.3             | -11.6                    |
| 3                                                    | 166.36          | 29.4 QP                 | 43.5           | -14.1       | 1.00 H             | 139                  | 38.0             | -8.6                     |
| 4                                                    | 263.36          | 29.6 QP                 | 46.0           | -16.4       | 1.00 H             | 9                    | 37.4             | -7.8                     |
| 5                                                    | 311.16          | 25.2 QP                 | 46.0           | -20.8       | 2.00 H             | 13                   | 31.5             | -6.3                     |
| 6                                                    | 479.86          | 27.8 QP                 | 46.0           | -18.2       | 1.00 H             | 244                  | 30.4             | -2.6                     |

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. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

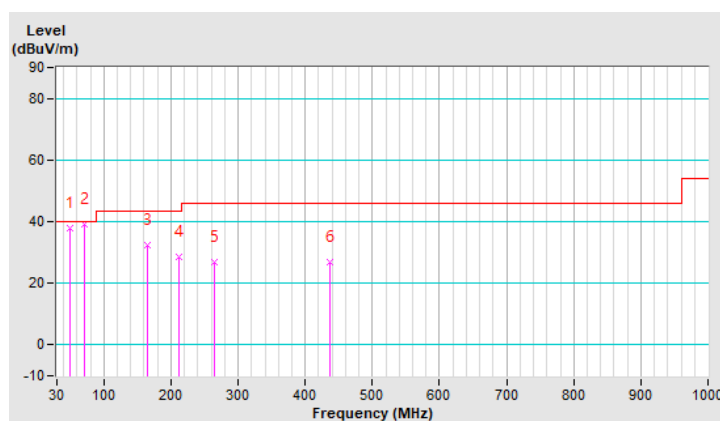


|                 |              |                   |                  |
|-----------------|--------------|-------------------|------------------|
| RF Mode         | TX BT LE     | Channel           | CH 19 : 2440 MHz |
| Frequency Range | 30MHz ~ 1GHz | Detector Function | Quasi-Peak (QP)  |

| 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                                                  | 49.68           | 38.0 QP                 | 40.0           | -2.0        | 1.00 V             | 221                  | 47.1             | -9.1                     |
| <b>2</b>                                           | <b>70.77</b>    | <b>39.1 QP</b>          | <b>40.0</b>    | <b>-0.9</b> | <b>1.00 V</b>      | <b>334</b>           | <b>50.2</b>      | <b>-11.1</b>             |
| 3                                                  | 164.96          | 32.2 QP                 | 43.5           | -11.3       | 1.00 V             | 107                  | 40.8             | -8.6                     |
| 4                                                  | 212.75          | 28.4 QP                 | 43.5           | -15.1       | 1.00 V             | 236                  | 39.2             | -10.8                    |
| 5                                                  | 264.77          | 26.8 QP                 | 46.0           | -19.2       | 1.00 V             | 107                  | 34.6             | -7.8                     |
| 6                                                  | 437.68          | 27.0 QP                 | 46.0           | -19.0       | 1.00 V             | 60                   | 30.5             | -3.5                     |

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. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

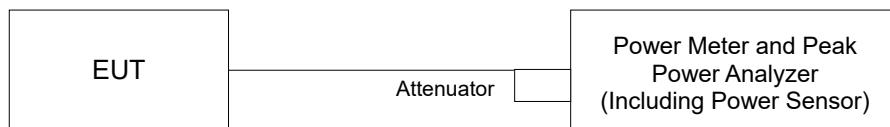


## 4.2 Conducted Output Power Measurement

### 4.2.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

### 4.2.2 Test Setup



### 4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.2.4 Test Procedures

For Peak Power

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

For Average Power

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

### 4.2.5 Deviation from Test Standard

No deviation.

### 4.2.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 4.2.7 Test Results

For Peak Power

| Channel | Frequency (MHz) | Peak Power (mW) | Peak Power (dBm) | Limit (dBm) | Pass/Fail |
|---------|-----------------|-----------------|------------------|-------------|-----------|
| 0       | 2402            | 1.393           | 1.44             | 30.00       | Pass      |
| 19      | 2440            | 1.734           | 2.39             | 30.00       | Pass      |
| 39      | 2480            | 1.262           | 1.01             | 30.00       | Pass      |

For Average Power

| Channel | Frequency (MHz) | Average Power (mW) | Average Power (dBm) |
|---------|-----------------|--------------------|---------------------|
| 0       | 2402            | 0.804              | -0.95               |
| 19      | 2440            | 1.033              | 0.14                |
| 39      | 2480            | 0.635              | -1.97               |

## **5 Pictures of Test Arrangements**

Please refer to the attached file (Test Setup Photo).

## Appendix – 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 and approved 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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