

## TEST REPORT

**Report No.: 19120335HKG-004**

Application For Original Grant of 47 CFR Part 15 Certification  
New Family of RSS-210 Issue 10 Equipment Certification

DECT 6.0 Cordless Telephone with Bluetooth

**FCC ID: EW780-2018-00**

**IC: 1135B-80201800**

**Prepared and Checked by:**

**Approved by:**

Signed On File  
Leung Chiu Kuen, Stanley  
Engineer

---

Tang Kwan Mo, Jess  
Lead Engineer  
Date: March 03, 2020

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>                    | VTech Telecommunications Ltd.                                                                                                                      |
| <b>Grantee Address:</b>            | 23/F., Tai Ping Industrial Centre, Block 1,<br>57 Ting Kok Road, Tai Po,<br>Hong Kong.                                                             |
| <b>FCC Specification Standard:</b> | FCC Part 15, October 1, 2018 Edition                                                                                                               |
| <b>FCC ID:</b>                     | EW780-2017-00                                                                                                                                      |
| <b>FCC Model(s):</b>               | DLP73540, DLP73210, DLP73410, DLP73440, DLP73XY0, IS7256-3, IS725Z-XY                                                                              |
| <b>IC Specification Standard:</b>  | RSS-210 Issue 10, December 2019<br>RSS-Gen Issue 5, April 2018                                                                                     |
| <b>IC:</b>                         | 1135B-80201700                                                                                                                                     |
| <b>HVIN</b>                        | 35-201292BS                                                                                                                                        |
| <b>PMN</b>                         | DLP73210/DLP73410/DLP73440/DLP73540, IS7256-3                                                                                                      |
| <b>Type of EUT:</b>                | Transceiver                                                                                                                                        |
| <b>Description of EUT:</b>         | DECT 6.0 Cordless Telephone with Bluetooth                                                                                                         |
| <b>Serial Number:</b>              | N/A                                                                                                                                                |
| <b>Sample Receipt Date:</b>        | December 09, 2019                                                                                                                                  |
| <b>Date of Test:</b>               | December 09, 2019 to January 22, 2020                                                                                                              |
| <b>Report Date:</b>                | March 03, 2020                                                                                                                                     |
| <b>Environmental Conditions:</b>   | Temperature: +10 to 40°C<br>Humidity: 10 to 90%                                                                                                    |
| <b>Conclusion:</b>                 | Test was conducted by client submitted sample. The submitted sample as received complied with the 47 CFR Part 15 / RSS-210 Issue 10 Certification. |

## TEST REPORT

### TABLE OF CONTENTS

|            |                                                                 |           |
|------------|-----------------------------------------------------------------|-----------|
| <b>1.0</b> | <b>TEST RESULTS SUMMARY &amp; STATEMENT OF COMPLIANCE .....</b> | <b>4</b>  |
| 1.1        | Summary of Test Results.....                                    | 4         |
| 1.2        | Statement of Compliance.....                                    | 4         |
| <b>2.0</b> | <b>GENERAL DESCRIPTION .....</b>                                | <b>5</b>  |
| 2.1        | Product Description.....                                        | 5         |
| 2.2        | Test Methodology .....                                          | 5         |
| 2.3        | Test Facility .....                                             | 5         |
| <b>3.0</b> | <b>SYSTEM TEST CONFIGURATION.....</b>                           | <b>6</b>  |
| 3.1        | Justification .....                                             | 6         |
| 3.2        | EUT Exercising Software.....                                    | 7         |
| 3.3        | Radiated Emission Test Setup .....                              | 8         |
| 3.4        | Conducted Emission Test Setup .....                             | 9         |
| 3.5        | Details of EUT and Description of Accessories.....              | 10        |
| 3.6        | Measurement Uncertainty .....                                   | 10        |
| <b>4.0</b> | <b>TEST RESULTS.....</b>                                        | <b>11</b> |
| 4.1        | Field Strength Calculation.....                                 | 11        |
| 4.2        | Radiated Emissions.....                                         | 12        |
| 4.2.1      | Radiated Emission Configuration Photograph .....                | 12        |
| 4.2.2      | Radiated Emission Data .....                                    | 12        |
| 4.2.3      | Transmitter Duty Cycle Calculation .....                        | 18        |
| 4.3        | Radiated Emission on the Bandedge .....                         | 19        |
| 4.4        | AC Power Line Conducted Emission .....                          | 22        |
| 4.4.1      | AC Power Line Conducted Emission Configuration Photograph ..... | 22        |
| 4.4.2      | AC Power Line Conducted Emission Data .....                     | 22        |
| <b>5.0</b> | <b>EQUIPMENT LIST .....</b>                                     | <b>27</b> |

## TEST REPORT

### 1.0 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

#### 1.1 Summary of Test Results

| Test Items                            | FCC Part 15 Section      | RSS-210/<br>RSS-Gen#/<br>RSS-310^ Section | Results | Details<br>See<br>Section |
|---------------------------------------|--------------------------|-------------------------------------------|---------|---------------------------|
| Antenna Requirement                   | 15.203                   | 6.8 <sup>#</sup>                          | Pass    | 2.1                       |
| Security Code Information             | 15.214(d)                | 2.4                                       | Pass    | 2.1                       |
| Radiated Emission                     | 15.249(a), 209, &<br>109 | A2.9(a)                                   | Pass    | 4.2                       |
| Radiated Emission on the Bandedge     | 15.249(d)                | A2.9(b)                                   | Pass    | 4.3                       |
| Radiated Emission in Restricted Bands | 15.205                   | 2.2                                       | Pass    | 4.2                       |
| AC Power Line Conducted Emission      | 15.207 & 15.107          | 8.8 <sup>#</sup>                          | Pass    | 4.4                       |

Note: 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.

#### 1.2 Statement of Compliance

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

FCC Part 15, October 1, 2018 Edition  
RSS-210 Issue 10, December 2019  
RSS-Gen Issue 5, April 2018

## TEST REPORT

### 2.0 GENERAL DESCRIPTION

#### 2.1 Product Description

The DLP73540 (35-201292BS) is a DECT 6.0 Cordless Telephone with Bluetooth. It operates at frequency range of 2402MHz to 2480MHz. The Base Unit is powered by an AC adaptor 100-120VAC 60Hz 200mA or 100-240VAC 50/60Hz 0.15A.

The Bluetooth antenna used in base unit is integral, and the test sample is a prototype.

For FCC, the Model(s): DLP73210, DLP73410, DLP73440, DLP73XY0, IS7256-3, IS725Z-XY is the same as the Model: DLP73540 in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure as declared by client. The only differences between these models are model number, color, trade name, package type and number of handsets and chargers to be sold for marketing purpose as declared by client. Suffix (X, Y, Z in DLP73XY0, DLP70XY0 and IS725Z-XY) indicates different number of handset and extra charger, package type or color of enclosure and package type (material) as declared by client.

The circuit description is saved with filename: descri.pdf.

Connection between the device and the telephone network is accomplished through the use of USOC RJ11C in the 2-wire loop calling central office line.

#### 2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2014) and ANSI C63.10 (2013). Preliminary radiated scans and all radiated measurements were performed in Radiated Emission Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

#### 2.3 Test Facility

The radiated emission test sites and conducted measurement facility used to collect the radiated data and conducted data are 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 fully placed on file with the FCC and IC No. 2042H.

## TEST REPORT

### 3.0 SYSTEM TEST CONFIGURATION

#### 3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit continuously mode to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The Base Unit was powered by a 100-120VAC 60Hz 200mA to 6.0VDC 600mA or 100-240VAC 50/60Hz 0.15A to 6.0VDC 600mA 0.36W adaptor.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the 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. If the base unit attached to peripherals, they were connected and operational to simulate typical use. The handset was remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base was wired to transmit full power.

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. Radiated emissions were taken at three meters unless the signal level was too low for measurement at that distance. If necessary, a pre-amplifier was used and/or the test was conducted at a closer distance.

For any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

For transmitter radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz. The resolution bandwidth was 1 MHz for frequencies above 1000 MHz.

Radiated emission measurement for transmitter was performed 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 to 40 GHz, whichever is lower.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.209. Digital circuitry used to control additional functions other than the operation of the transmitter are subject to FCC Part 15 Section 15.109 Limits.

The DECT module was put into transmission mode when taking radiated emission data for determining worst-case spurious emission.

## TEST REPORT

### 3.1 Justification - Cont'd

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 section 4.2.3.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF*. The effective period ( $T_{eff}$ ) was 625 $\mu$ s. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

All relevant operation modes and different type of adaptors have been tested, and the worst case data is included in this report.

### 3.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

## TEST REPORT

### 3.3 Radiated Emission Test Setup

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

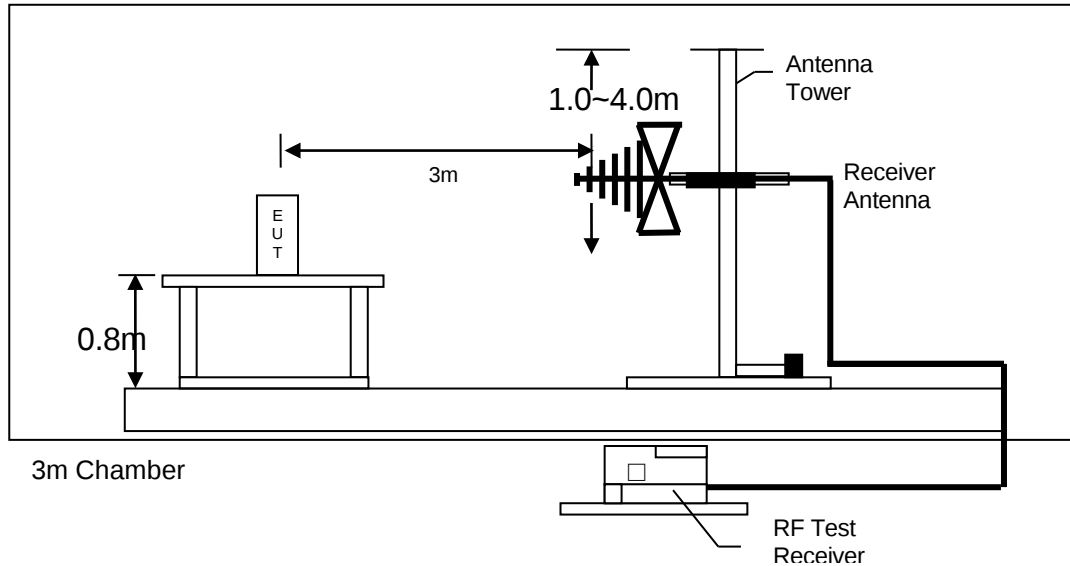


Figure 3.3.1 Test setup of radiated emissions up to 1GHz

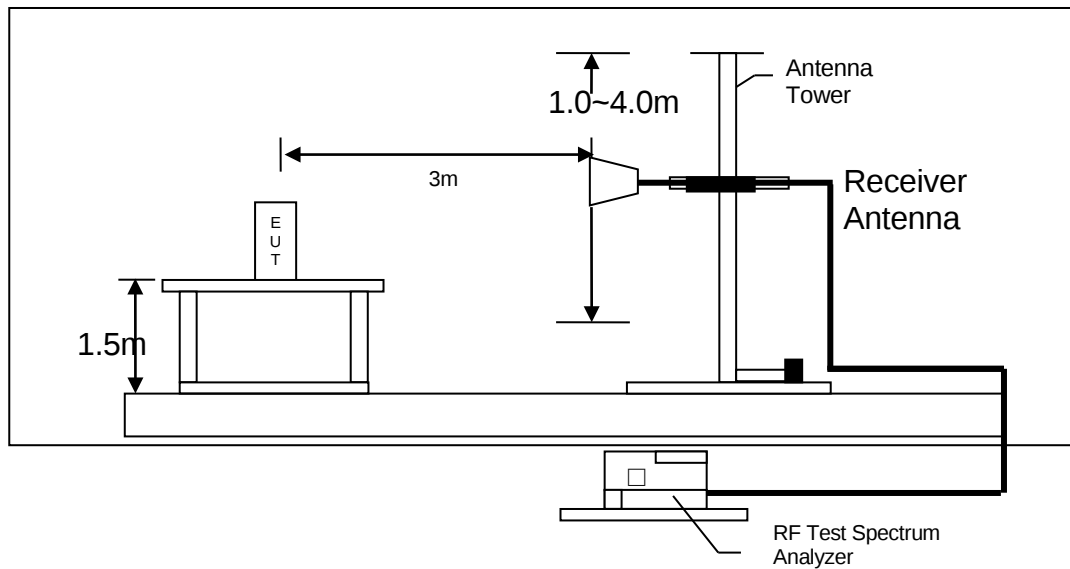


Figure 3.3.2 Test setup of radiated emissions above 1GHz

## TEST REPORT

### 3.4 Conducted Emission Test Setup

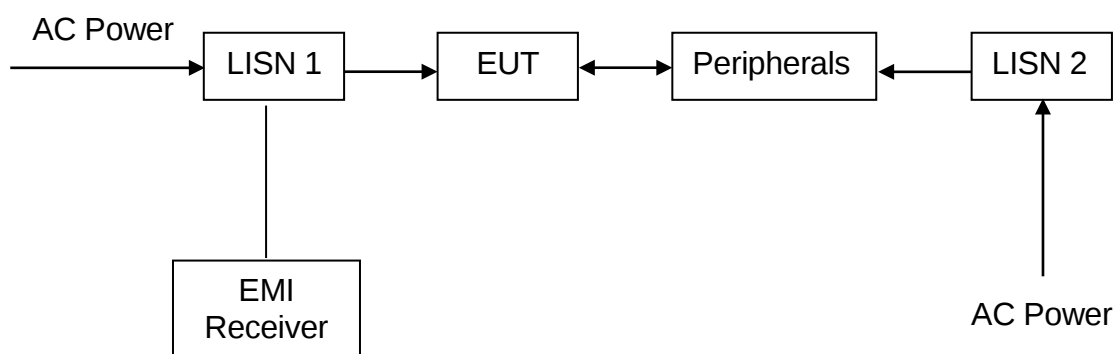


Figure 3.4.1

## TEST REPORT

### 3.5 Details of EUT and Description of Accessories

#### Details of EUT:

An AC adaptor (provided with the unit) was used to power the device. Their description are listed below.

- (1) An AC adaptor (100-120VAC 60Hz 200mA to 6.0VDC 600mA, Model: S006AKU0600060, Brand: Ten Pao) (Supplied by Client)
- (2) An AC adaptor (100-240VAC 50/60Hz 0.15A to 6.0VDC 600mA 0.36W, Model: VT05EUS06060, Brand: VTPL) (Supplied by Client)

#### Description of Accessories:

- (1) Telecommunication cable with RJ11C connectors (1m, unshielded), terminated (Supplied by Intertek)
- (2) Handset (Model: DL73540, FCC ID: EW780-2017-00) (Supplied by Client)

### 3.6 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered. The values of the Measurement uncertainty for radiated emission test, AC line conducted emission test and RF conducted test, frequency stability and timing jitter are  $\pm 5.3\text{dB}$ ,  $\pm 4.2\text{dB}$ ,  $\pm 1\text{dB}$ ,  $\pm 23\text{Hz}$ ,  $0.1\mu\text{s}$  respectively.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

## TEST REPORT

### 4.0 TEST 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.

#### 4.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

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

where

- FS = Field Strength in dB $\mu$ V/m
- RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB
- PD = Pulse Desensitization in dB
- AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

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

#### Example

Assume a receiver reading of 62.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$\begin{aligned} RA &= 62.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29 \text{ dB} \\ PD &= 0 \text{ dB} \\ AV &= -10 \text{ dB} \\ FS &= 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

## TEST REPORT

### 4.2 Radiated Emissions

#### 4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission  
at

960.756 MHz

The worst case radiated emission configuration photographs are saved with filename: config photos.pdf

#### 4.2.2 Radiated Emission Data

The data in tables 1-5 list the significant emission frequencies, the limit and the margin of compliance. Test setup is shown in section 3.3 Figure 3.3.1 and 3.3.2.

Judgement -

Passed by 1.0 dB margin

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 00 with VTPL Adaptor

Table 1, Base Unit

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (dB) | Calculated at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------|---------------------------|------------------------------|-------------|
| V            | 2402.000        | 93.8           | 33                | 29.4                | 90.2                      | 24                  | 66.2                      | 94.0                         | -27.8       |
| V            | 4804.000        | 36.8           | 33                | 34.9                | 38.7                      | 24                  | 14.7                      | 54.0                         | -39.3       |
| V            | 7206.000        | 33.5           | 33                | 37.9                | 38.4                      | 24                  | 14.4                      | 54.0                         | -39.6       |
| V            | 9608.000        | 31.2           | 33                | 40.4                | 38.6                      | 24                  | 14.6                      | 54.0                         | -39.4       |
| V            | 12010.000       | 31.0           | 33                | 40.5                | 38.5                      | 24                  | 14.5                      | 54.0                         | -39.5       |
| V            | 14412.000       | 31.2           | 33                | 40.0                | 38.2                      | 24                  | 14.2                      | 54.0                         | -39.8       |

| 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) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| V            | 2402.000        | 93.8           | 33                | 29.4                | 90.2                      | 114.0                     | -23.8       |
| V            | 4804.000        | 36.8           | 33                | 34.9                | 38.7                      | 74.0                      | -35.3       |
| V            | 7206.000        | 33.5           | 33                | 37.9                | 38.4                      | 74.0                      | -35.6       |
| V            | 9608.000        | 31.2           | 33                | 40.4                | 38.6                      | 74.0                      | -35.4       |
| V            | 12010.000       | 31.0           | 33                | 40.5                | 38.5                      | 74.0                      | -35.5       |
| V            | 14412.000       | 31.2           | 33                | 40.0                | 38.2                      | 74.0                      | -35.8       |

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna is used for the emission over 1000MHz.
  5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

## TEST REPORT

Mode: TX-Channel 39 with VTPL Adaptor

Table 2, Base Unit

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (dB) | Calculated at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------|---------------------------|------------------------------|-------------|
| V            | 2442.000        | 93.5           | 33                | 29.4                | 89.9                      | 24                  | 65.9                      | 94.0                         | -28.1       |
| V            | 4884.000        | 36.2           | 33                | 34.9                | 38.1                      | 24                  | 14.1                      | 54.0                         | -39.9       |
| V            | 7326.000        | 33.7           | 33                | 37.9                | 38.6                      | 24                  | 14.6                      | 54.0                         | -39.4       |
| V            | 9768.000        | 30.8           | 33                | 40.4                | 38.2                      | 24                  | 14.2                      | 54.0                         | -39.8       |
| V            | 12210.000       | 31.3           | 33                | 40.5                | 38.8                      | 24                  | 14.8                      | 54.0                         | -39.2       |
| V            | 14652.000       | 33.8           | 33                | 38.4                | 39.2                      | 24                  | 15.2                      | 54.0                         | -38.8       |

| 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) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| V            | 2442.000        | 93.5           | 33                | 29.4                | 89.9                      | 114.0                     | -24.1       |
| V            | 4884.000        | 36.2           | 33                | 34.9                | 38.1                      | 74.0                      | -35.9       |
| V            | 7326.000        | 33.7           | 33                | 37.9                | 38.6                      | 74.0                      | -35.4       |
| V            | 9768.000        | 30.8           | 33                | 40.4                | 38.2                      | 74.0                      | -35.8       |
| V            | 12210.000       | 31.3           | 33                | 40.5                | 38.8                      | 74.0                      | -35.2       |
| V            | 14652.000       | 33.8           | 33                | 38.4                | 39.2                      | 74.0                      | -34.8       |

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna is used for the emission over 1000MHz.
  5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

## TEST REPORT

Mode: TX-Channel 78 with VTPL Adaptor

Table 3, Base Unit

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (dB) | Calculated at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------|---------------------------|------------------------------|-------------|
| V            | 2480.000        | 91.2           | 33                | 29.4                | 87.6                      | 24                  | 63.6                      | 94.0                         | -30.5       |
| V            | 4960.000        | 36.4           | 33                | 34.9                | 38.3                      | 24                  | 14.3                      | 54.0                         | -39.7       |
| V            | 7440.000        | 34.0           | 33                | 37.9                | 38.9                      | 24                  | 14.9                      | 54.0                         | -39.1       |
| V            | 9920.000        | 31.3           | 33                | 40.4                | 38.7                      | 24                  | 14.7                      | 54.0                         | -39.3       |
| V            | 12400.000       | 31.1           | 33                | 40.5                | 38.6                      | 24                  | 14.6                      | 54.0                         | -39.4       |
| V            | 14880.000       | 33.7           | 33                | 38.4                | 39.1                      | 24                  | 15.1                      | 54.0                         | -38.9       |

| 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        | 91.2           | 33                | 29.4                | 87.6                      | 114.0                     | -26.5       |
| V            | 4960.000        | 36.4           | 33                | 34.9                | 38.3                      | 74.0                      | -35.7       |
| V            | 7440.000        | 34.0           | 33                | 37.9                | 38.9                      | 74.0                      | -35.1       |
| V            | 9920.000        | 31.3           | 33                | 40.4                | 38.7                      | 74.0                      | -35.3       |
| V            | 12400.000       | 31.1           | 33                | 40.5                | 38.6                      | 74.0                      | -35.4       |
| V            | 14880.000       | 33.7           | 33                | 38.4                | 39.1                      | 74.0                      | -34.9       |

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna is used for the emission over 1000MHz.
  5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

## TEST REPORT

Mode: Bluetooth Talk with Ten Pao Adaptor

Table 4, Base Unit

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-amp (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|--------------|---------------------|--------------------|----------------------|-------------|
| V            | 62.416          | 25.4           | 16           | 10.0                | 19.4               | 40.0                 | -20.6       |
| V            | 110.800         | 31.7           | 16           | 14.0                | 29.7               | 43.5                 | -13.8       |
| V            | 144.559         | 28.0           | 16           | 14.0                | 26.0               | 43.5                 | -17.5       |
| V            | 192.456         | 28.2           | 16           | 16.0                | 28.2               | 43.5                 | -15.3       |
| V            | 385.019         | 24.9           | 16           | 24.0                | 32.9               | 46.0                 | -13.1       |
| V            | 414.513         | 34.5           | 16           | 25.0                | 43.5               | 46.0                 | -2.6        |
| H            | 960.756         | 35.6           | 16           | 33.0                | 52.6               | 54.0                 | -1.4        |

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna is used for the emission over 1000MHz.
  5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

## TEST REPORT

Mode: Bluetooth Talk with VTPL Adaptor

Table 5, Base Unit

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-amp (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|--------------|---------------------|--------------------|----------------------|-------------|
| V            | 60.466          | 35.0           | 16           | 10.0                | 29.0               | 40.0                 | -11.0       |
| V            | 103.731         | 29.9           | 16           | 13.0                | 26.9               | 43.5                 | -16.6       |
| V            | 168.081         | 27.2           | 16           | 18.0                | 29.2               | 43.5                 | -14.3       |
| V            | 192.213         | 27.0           | 16           | 16.0                | 27.0               | 43.5                 | -16.5       |
| V            | 414.756         | 31.8           | 16           | 25.0                | 40.8               | 46.0                 | -5.2        |
| V            | 960.756         | 36.0           | 16           | 33.0                | 53.0               | 54.0                 | -1.0        |

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna is used for the emission over 1000MHz.
  5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

## TEST REPORT

### 4.2.3 Transmitter Duty Cycle Calculation

Based on the Bluetooth Specification Version 2.0 / 2.1 + EDR, the transmitter ON time for each timeslot of Bluetooth is 625µs. DH5 has the maximum duty cycle, which consists of 5 continuous Tx slots and 1 Rx slot. Therefore one hopset take  $(5+1) \times 625\mu s = 3.75ms$ . For one period for a pseudo-random hopping through at least 20 RF channels in adaptive mode (worst case), it take:  $20 \times 3.75ms = 75ms$ .

The dwell time for DH5 is  $5 \times 625\mu s = 3.125ms$

For the worst case calculation, there are two transmissions might occur in 100ms.

Therefore,

$$\begin{aligned}\text{Duty Cycle (DC)} &= \text{Maximum On time in } 100ms / 100ms \\ &= 3.125ms \times 2 / 100ms \\ &= 0.0625\end{aligned}$$

$$\begin{aligned}\text{Average Factor (AF) of Bluetooth in dB} &= 20 \log_{10} (0.0625) \\ &= -24.0dB\end{aligned}$$

## TEST REPORT

### 4.3 Radiated Emission on the Bandedge

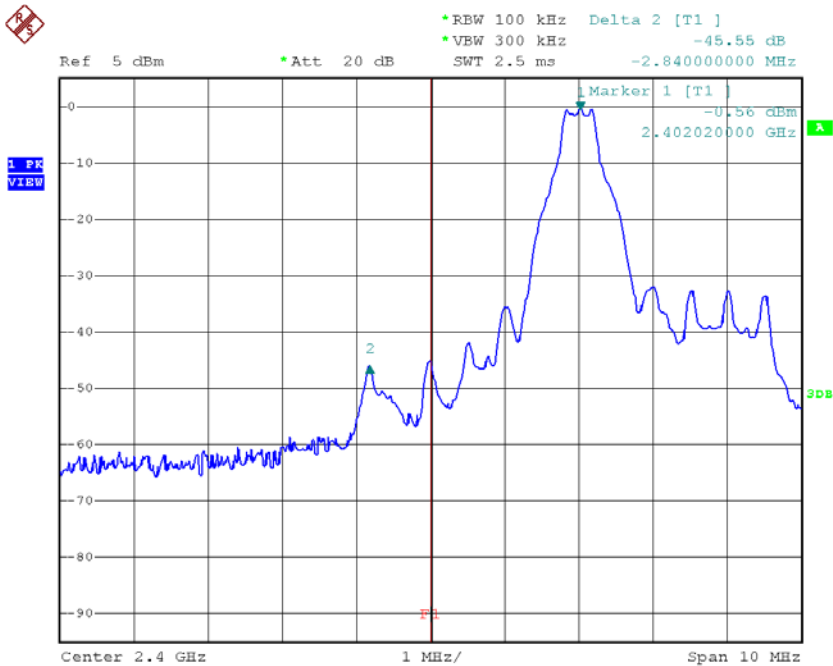
From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz and 2483.5MHz). In case of emissions up to two standard bandwidths away from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2014) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in FCC Part 15 Section 15.209 / Table 4 of RSS-Gen, whichever is the lesser attenuation, which meet the requirement of FCC Part 15 Section 15.249(d) / RSS-210 A2.9(b).

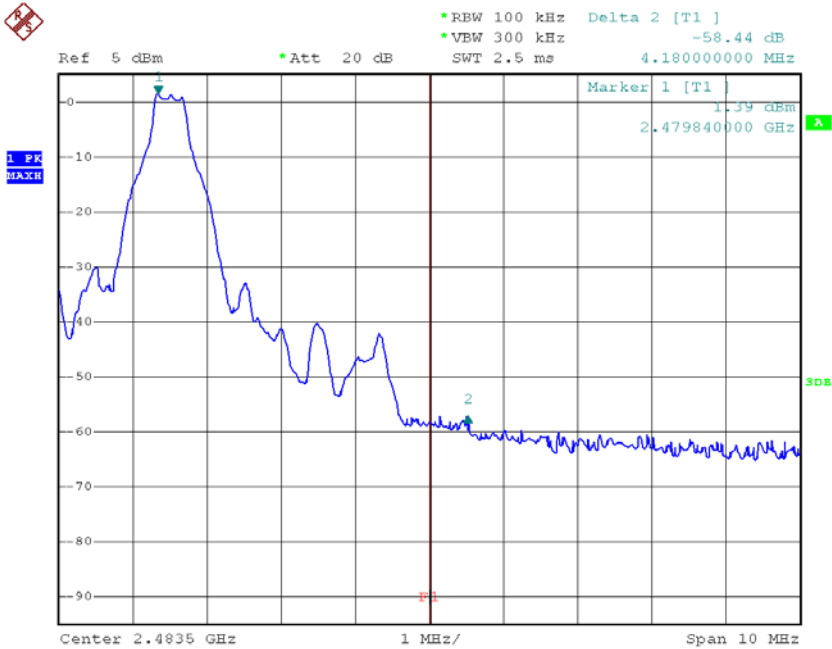
The plots of radiated emission on the bandedge are saved as below.

TEST REPORT

BASE UNIT WITH BLUETOOTH PORTION, LOWEST CHANNEL



BASE UNIT WITH BLUETOOTH PORTION, HIGHEST CHANNEL



## TEST REPORT

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

Resultant Field Strength = Fundamental Emissions - Delta from the plot

Resultant field strength for the lowest and/or highest channel(s), with corresponding average values are calculated as follows:

| Channel | Fundamental Emission (dBμV/m) | Delta from the Plot (dB) | Resultant Field Strength (dBμV/m) | Average Limit (dBμV/m) | Margin (dB) |
|---------|-------------------------------|--------------------------|-----------------------------------|------------------------|-------------|
| Lowest  | 66.2                          | 48.55                    | 17.65                             | 54                     | -36.35      |
| Highest | 63.6                          | 58.44                    | 5.16                              | 54                     | -48.84      |

| Channel | Fundamental Emission (dBμV/m) | Delta from the Plot (dB) | Resultant Field Strength (dBμV/m) | Peak Limit (dBμV/m) | Margin (dB) |
|---------|-------------------------------|--------------------------|-----------------------------------|---------------------|-------------|
| Lowest  | 90.2                          | 48.55                    | 41.65                             | 74                  | -32.35      |
| Highest | 87.6                          | 58.44                    | 29.16                             | 74                  | -44.84      |

The resultant field strength meets the general radiated emission limit in Table 4 of RSS-Gen, which does not exceed 74dBμV/m for peak limit and also 54dBμV/m for average limit.

## TEST REPORT

### 4.4 AC Power Line Conducted Emission

- [ ] Not applicable – EUT is only powered by battery for operation.
- [x] EUT connects to AC power line. Emission Data is listed in following pages.
- [ ] Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

Test setup is shown in section 3.4 Figure 3.4.1.

#### 4.4.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration  
at

0.321 MHz

The worst case line conducted configuration photographs are saved with filename: config photos.pdf.

#### 4.4.2 AC Power Line Conducted Emission Data

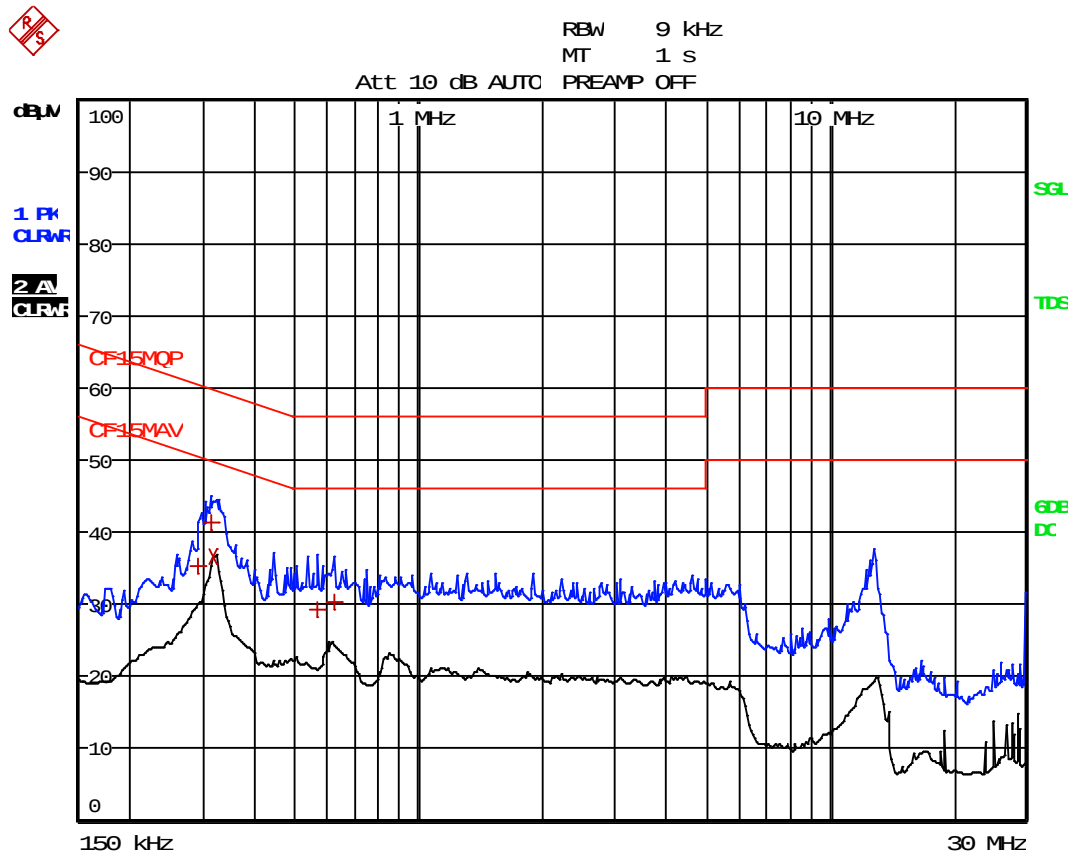
The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance.

Passed by 13.19 dB margin compared with CISPR average limit

## TEST REPORT

### CONDUCTED EMISSION DATA

Worst Case: Bluetooth Talk with Ten Pao Adaptor



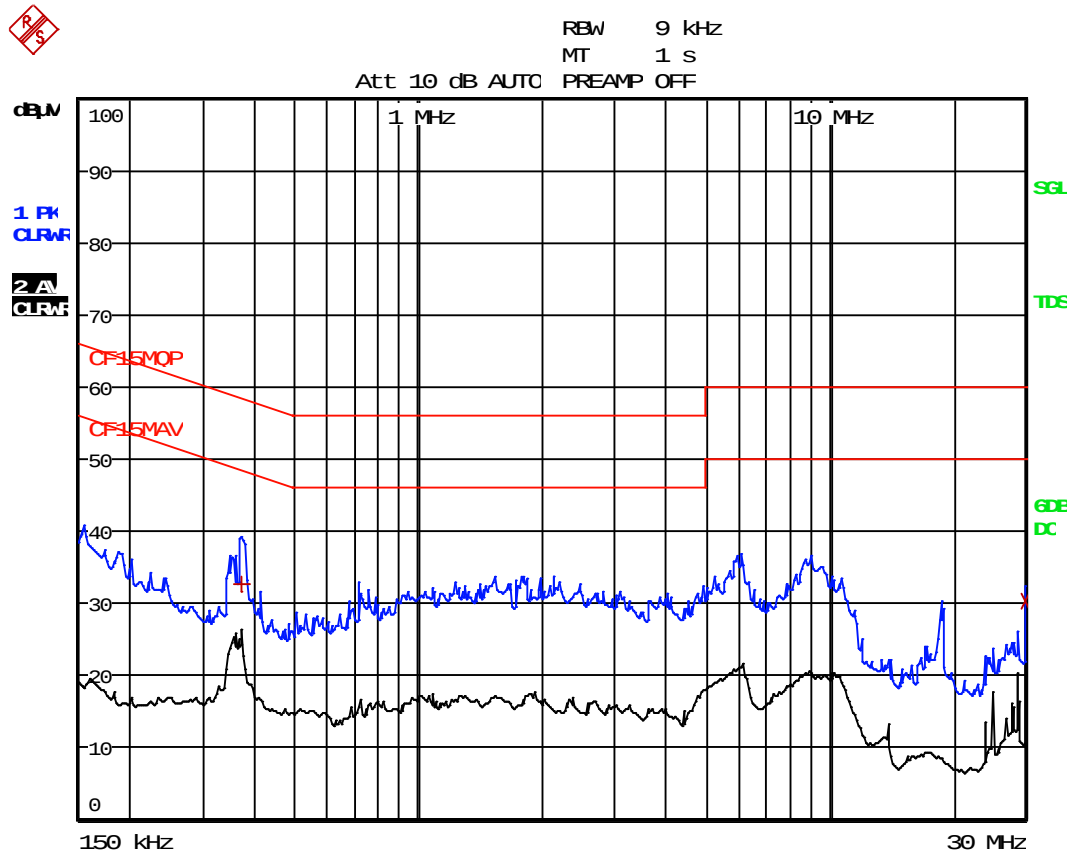
TEST REPORT

Worst Case: Bluetooth Talk with Ten Pao Adaptor

| EDIT PEAK LIST (Final Measurement Results) |           |            |    |                |
|--------------------------------------------|-----------|------------|----|----------------|
| Trace1:                                    |           | CF15MQP    |    |                |
| Trace2:                                    |           | CF15MAV    |    |                |
| Trace3:                                    |           | ---        |    |                |
| TRACE                                      | FREQUENCY | LEVEL dBµV |    | DELTA LIMIT dB |
| 1 Quasi Peak                               | 289.5 kHz | 35.24      | N  | -25.29         |
| 1 Quasi Peak                               | 312 kHz   | 41.22      | L1 | -18.68         |
| 2 CISPR Average                            | 321 kHz   | 36.48      | L1 | -13.19         |
| 1 Quasi Peak                               | 564 kHz   | 29.26      | L1 | -26.74         |
| 1 Quasi Peak                               | 622.5 kHz | 30.21      | L1 | -25.78         |

## TEST REPORT

Worst Case: Bluetooth Talk with VTPL Adaptor



TEST REPORT

Worst Case: Bluetooth Talk with VTPL Adaptor

| EDIT PEAK LIST (Final Measurement Results) |             |            |    |                |
|--------------------------------------------|-------------|------------|----|----------------|
| Trace1:                                    |             | CF15MQP    |    |                |
| Trace2:                                    |             | CF15MAV    |    |                |
| Trace3:                                    |             | ---        |    |                |
| TRACE                                      | FREQUENCY   | LEVEL dBµV |    | DELTA LIMIT dB |
| 1 Quasi Peak                               | 370.5 kHz   | 32.80      | L1 | -25.68         |
| 2 CISPR Average                            | 29.9985 MHz | 30.42      | N  | -19.57         |

## TEST REPORT

### 5.0 EQUIPMENT LIST

#### 1) Radiated Emissions Test

| Equipment            | EMI Test Receiver | Spectrum Analyzer | Biconical Antenna |
|----------------------|-------------------|-------------------|-------------------|
| Registration No.     | EW-3156           | EW-2253           | EW-0571           |
| Manufacturer         | R&S               | R&S               | EMCO              |
| Model No.            | ESR26             | FSP40             | 3104C             |
| Calibration Date     | August 01, 2019   | November 18, 2019 | July 23, 2019     |
| Calibration Due Date | August 01, 2020   | November 18, 2020 | January 23, 2021  |

| Equipment            | Log Periodic Antenna | Notch Filter (cutoff frequency 2.4GHz to 2.5GHz) 2 pieces | Double Ridged Guide Antenna |
|----------------------|----------------------|-----------------------------------------------------------|-----------------------------|
| Registration No.     | EW-0447              | EW-2213                                                   | EW-1133                     |
| Manufacturer         | EMCO                 | EMCO                                                      | EMCO                        |
| Model No.            | 3146                 | BRM50701-02                                               | 3115                        |
| Calibration Date     | September 25, 2019   | July 12, 2019                                             | November 29, 2018           |
| Calibration Due Date | May 25, 2021         | May 13, 2020                                              | May 29, 2020                |

| Equipment            | Pyramidal Horn Antenna (18.0 - 26.5)GHz | 12m Double Shield RF Cable (20MHz to 6GHz) | High Frequency Coaxial Cable Assembly (4 pcs) |
|----------------------|-----------------------------------------|--------------------------------------------|-----------------------------------------------|
| Registration No.     | EW-0905                                 | EW-1852                                    | EW-3126                                       |
| Manufacturer         | EMCO                                    | RADIALL                                    | GREATBILLION                                  |
| Model No.            | 3160-09                                 | N(m)-RG142 - N(m)                          | SMA m st - SMA m ra 0.6m 18GHz                |
| Calibration Date     | July 23, 2019                           | March 04, 2019                             | June 17, 2019                                 |
| Calibration Due Date | January 23, 2021                        | March 04, 2020                             | June 17, 2020                                 |

#### 2) Conducted Emissions Test

| Equipment            | EMI Test Receiver | LISN         | RF Cable 9kHz to 1000MHz |
|----------------------|-------------------|--------------|--------------------------|
| Registration No.     | EW-2251           | EW-2501      | EW-3170                  |
| Manufacturer         | R&S               | R&S          | N/A                      |
| Model No.            | ESCI              | ENV-216      | 9kHz to 1000MHz          |
| Calibration Date     | June 21, 2019     | May 10, 2019 | May 28, 2019             |
| Calibration Due Date | June 21, 2020     | May 10, 2020 | May 28, 2020             |

#### 3) Bandedge Measurement Test

| Equipment            | Spectrum Analyzer |
|----------------------|-------------------|
| Registration No.     | EW-3281           |
| Manufacturer         | R&S               |
| Model No.            | FSP30             |
| Calibration Date     | February 19, 2019 |
| Calibration Due Date | February 19, 2020 |

**END OF TEST REPORT**