

## TEST REPORT

**Report No.: 22120824HKG-001**

VTech Telecommunications Ltd.

Application For Original Grant of 47 CFR Part 15 Certification

Single New of RSS-247 Issue 2 Certification

Video Baby Monitor - Baby Unit

**FCC ID: EW780-3087-00**

**IC: 1135B-80308700**

**Prepared and Checked by:**

**Approved by:**

Signed on File  
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Lead Engineer

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Assistant Supervisor  
Date: February 05, 2023

## 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>Manufacturer Name:</b>          | VTech (Dongguan) Telecommunications Limited                                                                                                             |
| <b>Manufacturer Address:</b>       | VTech Science Park, Xia Ling Bei Management Zone,<br>Liaobu, Dongguan, Guangdong, China.                                                                |
| <b>FCC Specification Standard:</b> | FCC Part 15, October 1, 2021 Edition                                                                                                                    |
| <b>FCC ID:</b>                     | EW780-3087-00                                                                                                                                           |
| <b>FCC Model(s):</b>               | RM5887HD BU                                                                                                                                             |
| <b>IC Specification Standard:</b>  | RSS-247 Issue 2, February 2017<br>RSS-Gen Issue 5 Amendment 2, February 2021                                                                            |
| <b>IC:</b>                         | 1135B-80308700                                                                                                                                          |
| <b>HVIN:</b>                       | 35-400439BU                                                                                                                                             |
| <b>PMN:</b>                        | RM5887HD BU                                                                                                                                             |
| <b>VTech Model(s):</b>             | RM5887HD BU                                                                                                                                             |
| <b>Type of EUT:</b>                | Spread Spectrum Transmitter                                                                                                                             |
| <b>Description of EUT:</b>         | Video Baby Monitor - Baby Unit                                                                                                                          |
| <b>Brand Name:</b>                 | VTech                                                                                                                                                   |
| <b>Sample Receipt Date:</b>        | December 23, 2022                                                                                                                                       |
| <b>Date of Test:</b>               | December 23, 2022 to February 05, 2023                                                                                                                  |
| <b>Report Date:</b>                | February 05, 2023                                                                                                                                       |
| <b>Environmental Conditions:</b>   | Temperature: +10 to 40°C<br>Relative Humidity: 10 to 90%                                                                                                |
| <b>Conclusion:</b>                 | Test was conducted by client submitted sample.<br>The submitted sample as received complied with the 47 CFR Part 15<br>/ RSS-247 Issue 2 Certification. |

## TEST REPORT

### SUMMARY OF TEST RESULT

| Test Items                                                   | FCC Part 15 Section        | RSS-247 / RSS-Gen <sup>#</sup> Section | Results  |
|--------------------------------------------------------------|----------------------------|----------------------------------------|----------|
| Antenna Requirement                                          | 15.203                     | 7.1.2 <sup>#</sup>                     | Complied |
| Max. Conducted Output Power (Peak)                           | 15.247(b)(3)&(4)           | 5.4(4)                                 | Complied |
| Min. 6dB RF Bandwidth                                        | 15.247(a)(2)               | 5.2(1)                                 | Complied |
| Max. Power Density                                           | 15.247(e)                  | 5.2(2)                                 | Complied |
| Out of Band Antenna Conducted Emission                       | 15.247(d)                  | 5.5                                    | Complied |
| Radiated Emission in Restricted Bands and Spurious Emissions | 15.247(d), 15.209 & 15.109 | 5.5                                    | Complied |
| AC Power Line Conducted Emission                             | 15.207 & 15.107            | 7.2.4 <sup>#</sup>                     | Complied |

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.

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

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

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

FCC Part 15, October 1, 2021 Edition

RSS-247 Issue 2, February 2017

RSS-Gen Issue 5 Amendment 2, February 2021

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## TEST REPORT

### EXHIBIT 1 GENERAL DESCRIPTION

#### 1.1 Product Description

The RM5887HD BU (35-400439BU) is a Video Baby Monitor - Baby Unit.

The Equipment Under Test (EUT) operates at frequency range of 2412MHz to 2462MHz with 11 channels.

For IEEE 802.11b mode, it operates at frequency range of 2412.000MHz to 2462.000MHz with 11 channels. It transmits via Direct-sequence spread spectrum (DSSS) modulation. Maximum bit rate can be up to 11Mbps.

For IEEE 802.11g mode, it operates at frequency range of 2412.000MHz to 2462.000MHz with 11 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can be up to 54Mbps.

For IEEE 802.11n (with 20MHz bandwidth) mode, it operates at frequency range of 2412.000MHz to 2462.000MHz with 11 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 65Mbps.

The EUT was powered by AC/DC Adaptor.

(Model: VT07EUS05150; Input: 100-240VAC 50/60Hz 0.5A; Output: 5VDC 1.5A 7.5W)

The antenna(s) used in the EUT: integral, internal Monopole Antenna

Peak antenna gain = 0 dBi

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

#### 1.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in 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.

Antenna port conducted measurements were performed according to ANSI C63.10 (2013) and KDB Publication No. 558074 D01 v05r02 (April 02, 2019) All other measurements were made in accordance with the procedures in 47 CFR Part 2 and RSS-Gen Issue 5 Amendment 2, February 2021.

#### 1.3 Test Facility

The radiated emission test site and antenna port conducted measurement facility used to collect the radiated data and conductive 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 Industry Canada No.: 2042H, CABID is "HKAP01".

#### 1.4 Related Submittal(s) Grants

This is a single application for certification of a transceiver (WiFi Portion).

## TEST REPORT

### EXHIBIT 2 SYSTEM TEST CONFIGURATION

#### 2.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit / receive continuously 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 EUT was powered by 120VAC during test.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable at 0.8m height from the ground plane for emission testing at or below 1GHz and 1.5m for emission measurements above 1GHz. If the parent unit attached to peripherals, they were connected and operational (as typical as possible).

For floor-stand equipment, The unit was operated standalone and placed on insulating material to prevent direct metallic contact of the EUT and reference ground plane.

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.

Radiated emission measurement for transmitter were 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 / RSS-247 2.5. Digital circuitries used to control additional functions other than the operation of the transmitter are subject to FCC Part 15 Section 15.109 / RSS-247 Section 5.5 Limits.

## TEST REPORT

### 2.1 Justification (Cont'd)

Detector function for radiated emissions was in peak mode. Average readings, when required, were 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 4.8.3.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF*. The effective period (Teff) was referred to Exhibit 4.8.3. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

For AC power 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.

Different data rates have been tested. Worst case is reported only.

All relevant operation modes have been tested, and the worst-case data is included in this report.

### 2.2 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

### 2.3 Details of EUT and Description of Accessories

#### Details of EUT:

An AC/DC Adaptor (provided with the unit) was used to power the device.  
Their descriptions are listed below.

(Model: VT07EUS05150; Input: 100-240VAC 50/60Hz 0.5A; Output: 5VDC 1.5A 7.5W)

#### Description of Accessories:

There are no accessories for compliance of this product.

### 2.4 Measurement Uncertainty

Decision Rule for compliance: For FCC/IC standard, the measured value must be within the limits of applicable standard without accounting for the measurement uncertainty. For EN/IEC/HKTA/HKTC standard, conformity rules will be used as per standard directly excepted EN/IEC 61000-3-2, EN/IEC 61000-3-3, HKTA1004, HKCA1008, HKTA1019, HKTA1020, HKTA1041 and HKTA1044. For these excepted or not mentioned standards, Cl 4.2.2 of ILAC-G8:09/2019 decision rules will be reference and guard band will be equal to our measurement uncertainty with 95% confidence level ( $k=2$ ). In case, the measured value is within guard band region, undetermined decision will be used.

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.

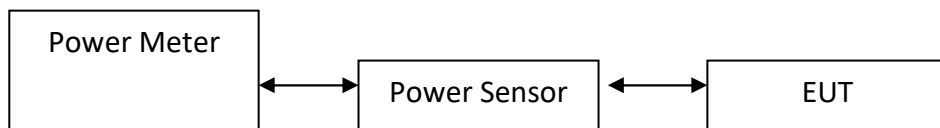
## TEST REPORT

### EXHIBIT 3 TEST RESULTS

#### 3.1 Maximum Conducted (Peak) Output Power at Antenna Terminals

##### RF Conduct Measurement Test Setup

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



The antenna port of the EUT was connected to the input of a spectrum analyzer.

- ☒ The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals. The measurement procedure 9.1.2 was used.
- ☐ The EUT should be configured to transmit continuously (at a minimum duty cycle of 98%) at full power over the measurement duration. The measurement procedure AVG1 was used.

#### IEEE 802.11b (DSSS, 1 Mbps) Peak Antenna Gain = 0 dBi

| Frequency (MHz)      | Output in dBm | Output in mWatt |
|----------------------|---------------|-----------------|
| Low Channel: 2412    | 15.2          | 33.1            |
| Middle Channel: 2437 | 13.7          | 23.4            |
| High Channel: 2462   | 14.7          | 29.5            |

#### IEEE 802.11g (OFDM, 9 Mbps) Peak Antenna Gain = 0 dBi

| Frequency (MHz)      | Output in dBm | Output in mWatt |
|----------------------|---------------|-----------------|
| Low Channel: 2412    | 11.8          | 15.1            |
| Middle Channel: 2437 | 11.0          | 12.6            |
| High Channel: 2462   | 12.0          | 15.8            |

#### IEEE 802.11n (20MHz) (OFDM, MCS0) Peak Antenna Gain = 0 dBi

| Frequency (MHz)      | Output in dBm | Output in mWatt |
|----------------------|---------------|-----------------|
| Low Channel: 2412    | 10.9          | 12.3            |
| Middle Channel: 2437 | 10.5          | 11.2            |
| High Channel: 2462   | 11.6          | 14.5            |

## TEST REPORT

### 3.1 Maximum Conducted (Peak) Output Power at Antenna Terminals (Cont'd)

Cable loss: 0.5dB External Attenuation: 0dB

Cable loss, external attenuation: ☒ included in OFFSET function  
☐ added to SA raw reading

IEEE 802.11b (DSSS, 1 Mbps)

Max. Conducted (Peak) Output Level = 15.2dBm

IEEE 802.11g (OFDM, 9 Mbps)

Max. Conducted (Peak) Output Level = 12.0dBm

IEEE 802.11n (20MHz) (OFDM, MCS0)

Max. Conducted (Peak) Output Level = 11.6dBm

Limits:

1W (30dBm) for antennas with gains of 6dBi or less.

The plots of Conducted (Peak) Output Power at Antenna Terminals are saved with filename:  
test data.pdf

## TEST REPORT

### 3.2 Minimum 6dB RF Bandwidth

The antenna port of the EUT was connected to the input of a spectrum analyzer. The EBW measurement procedure was used. A PEAK output reading was taken, a DISPLAY line was drawn 6dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

#### IEEE 802.11b (DSSS, 1 Mbps)

| Frequency (MHz)      | 6dB Bandwidth (MHz) |
|----------------------|---------------------|
| Low Channel: 2412    | 9.3                 |
| Middle Channel: 2437 | 7.3                 |
| High Channel: 2462   | 7.3                 |

#### IEEE 802.11g (OFDM, 6 Mbps)

| Frequency (MHz)      | 6dB Bandwidth (MHz) |
|----------------------|---------------------|
| Low Channel: 2412    | 16.7                |
| Middle Channel: 2437 | 16.5                |
| High Channel: 2462   | 16.5                |

#### IEEE 802.11n (20MHz) (OFDM, MCS0)

| Frequency (MHz)      | 6dB Bandwidth (MHz) |
|----------------------|---------------------|
| Low Channel: 2412    | 17.7                |
| Middle Channel: 2437 | 17.8                |
| High Channel: 2462   | 17.5                |

Limits:

6dB bandwidth shall be at least 500kHz.

The plots of 6dB RF Bandwidth are saved with filename: test data.pdf

## TEST REPORT

### 3.3 Minimum Power Spectral Density

Antenna output of the EUT was coupled directly to spectrum analyzer. The measurement procedure 10.2 PKPSD was used. If an external attenuator and/or cable was used, these losses are compensated for using the OFFSET function of the analyser.

#### IEEE 802.11b (DSSS, 1 Mbps)

| Frequency (MHz)      | PSD in 100kHz (dBm) |
|----------------------|---------------------|
| Low Channel: 2412    | 5.619               |
| Middle Channel: 2437 | 4.152               |
| High Channel: 2462   | 5.308               |

#### IEEE 802.11g (OFDM, 6 Mbps)

| Frequency (MHz)      | PSD in 100kHz (dBm) |
|----------------------|---------------------|
| Low Channel: 2412    | -0.668              |
| Middle Channel: 2437 | -1.552              |
| High Channel: 2462   | -0.313              |

#### IEEE 802.11n (20MHz) (OFDM, MCS0)

| Frequency (MHz)      | PSD in 100kHz (dBm) |
|----------------------|---------------------|
| Low Channel: 2412    | -1.998              |
| Middle Channel: 2437 | -1.683              |
| High Channel: 2462   | -0.640              |

Cable Loss: 0.5dB

Limit: 8dBm in 3kHz

The plots of Power Spectral Density are saved with filename: test data.pdf

## TEST REPORT

### 3.4 Out of Band Conducted Emissions

For IEEE 802.11b/g/n20MHz, the maximum conducted (peak) output power was used to demonstrate compliance as described in 9.1. Then the display line (in red) shown in the following plots denotes the limit at 20dB below maximum measured in-band peak PSD level in 100 KHz bandwidth for IEEE 802.11b/g/n20MHz.

The measurement procedures under sections 11 of KDB558074 D01 v05r02 (April 2, 2019) were used.

Furthermore, delta measurement technique for measuring bandedge emissions was incorporated in the test of the edge at 2483.5MHz.

#### Limits:

All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20dB below the maximum measured in-band peak PSD level for IEEE 802.11b/g/n20MHz.

The plots of Out of Band Conducted Emissions are saved with filename: test data.pdf

## TEST REPORT

### 3.5 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 dBμV/m                            |
|       | RA | = | Receiver Amplitude (including preamplifier) in dBμV |
|       | 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 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29.0 dB is subtracted. The pulse desensitization factor of the spectrum analyzer is 0.0 dB, and the resultant average factor is -10.0 dB. The net field strength for comparison to the appropriate emission limit is 32.0 dBμV/m. This value in dBμV/m is converted to its corresponding level in μV/m.

$$\begin{aligned}
 RA &= 62.0 \text{ dB}\mu\text{V} \\
 AF &= 7.4 \text{ dB} \\
 CF &= 1.6 \text{ dB} \\
 AG &= 29.0 \text{ dB} \\
 PD &= 0.0 \text{ dB} \\
 AV &= -10.0 \text{ dB} \\
 FS &= 62.0 + 7.4 + 1.6 - 29.0 + 0.0 + (-10.0) = 32.0 \text{ dB}\mu\text{V/m}
 \end{aligned}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32.0 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

## TEST REPORT

### 3.6 Transmitter Radiated Emissions in Restricted Bands and Spurious Emissions

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.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

#### 3.6.1 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission at 399.934 MHz.

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

#### 3.6.2 Radiated Emission Data

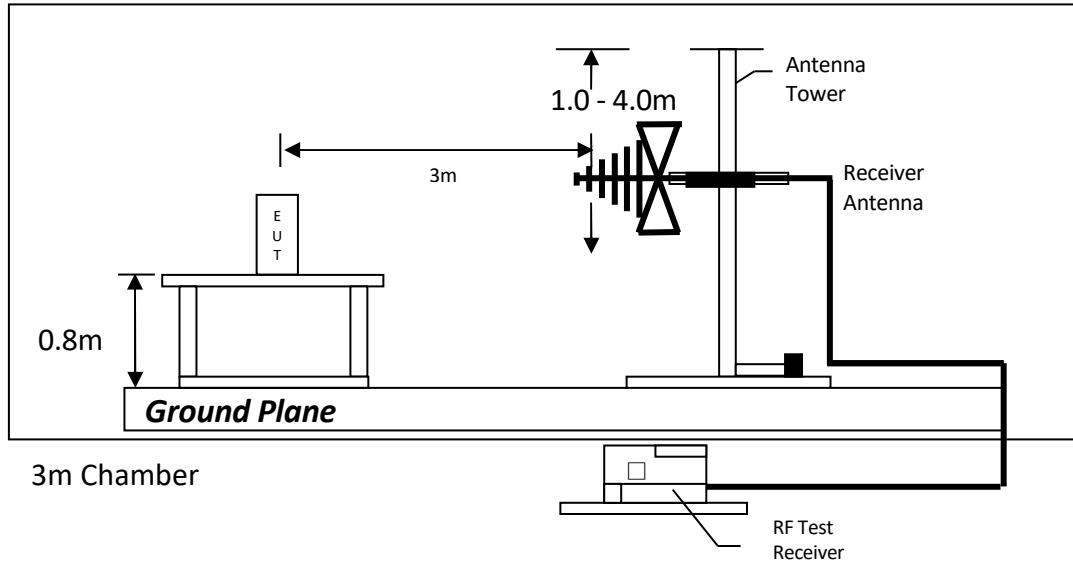
The data in tables 1-10 list the significant emission frequencies, the limit and the margin of compliance.

Judgement – Passed by 5.8 dB margin

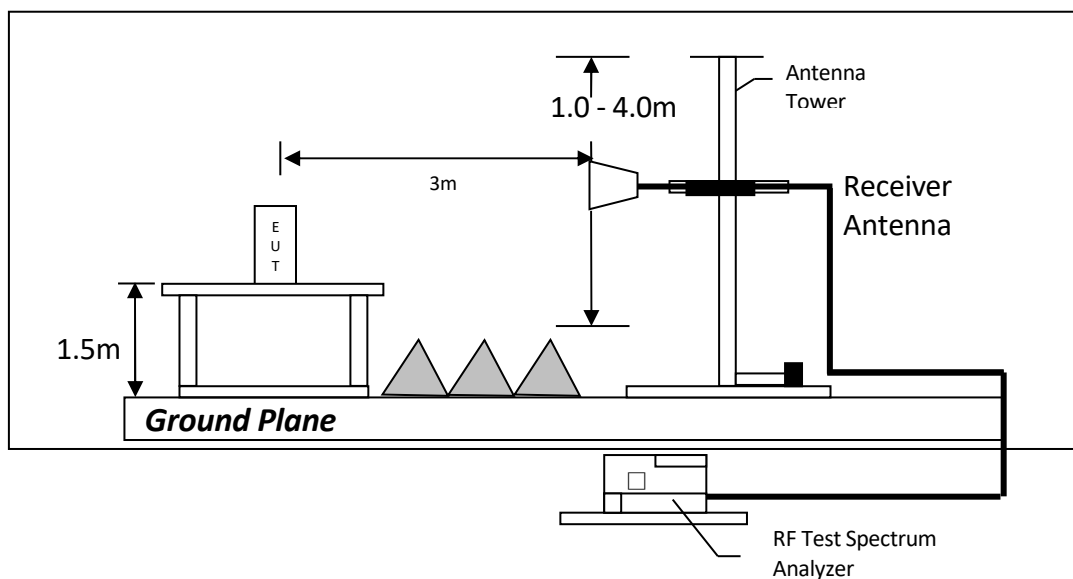
## TEST REPORT

### 3.6.3 Radiated Emission Test Setup

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



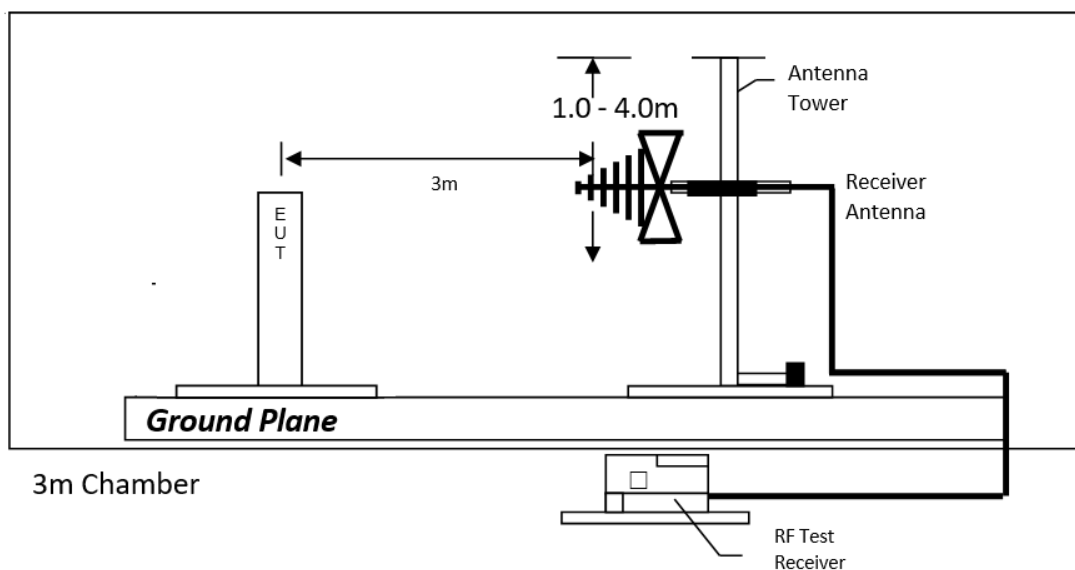
Test setup of radiated emissions up to 1GHz



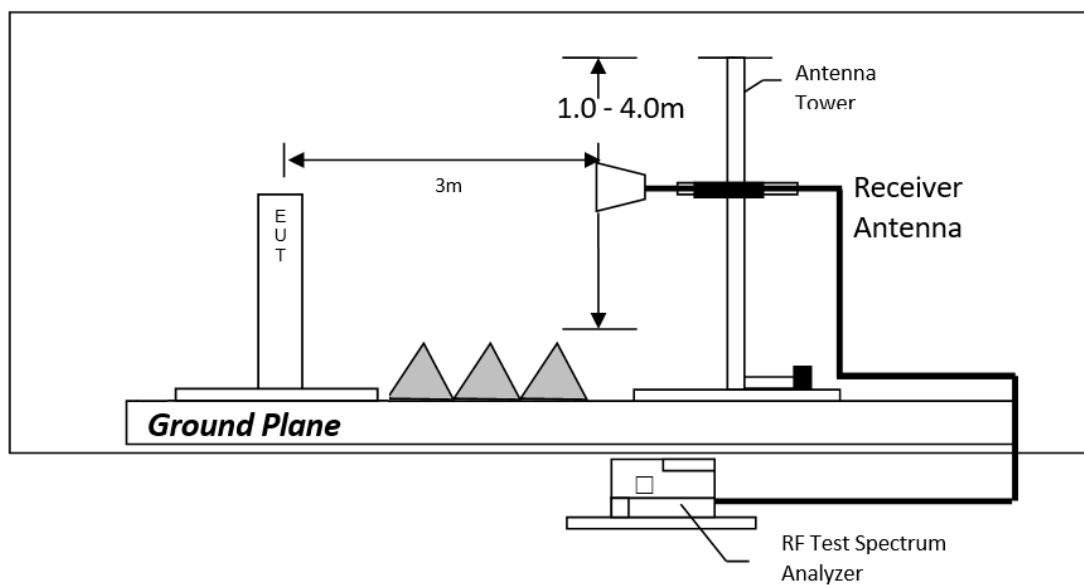
Test setup of radiated emissions above 1GHz

## TEST REPORT

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



Test setup of radiated emissions up to 1GHz



Test setup of radiated emissions above 1GHz

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 00

Table 1, IEEE 802.11b DSSS 1Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 2390.000        | 46.0           | 33                | 29.4                | 42.4                       | 54.0                         | -11.6       |
| H            | 4824.000        | 40.6           | 33                | 34.9                | 42.5                       | 54.0                         | -11.5       |
| V            | 12060.000       | 31.1           | 33                | 40.5                | 38.6                       | 54.0                         | -15.4       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2390.000        | 59.1           | 33                | 29.4                | 55.5                      | 74.0                      | -18.5       |
| H            | 4824.000        | 47.3           | 33                | 34.9                | 49.2                      | 74.0                      | -24.8       |
| V            | 12060.000       | 48.7           | 33                | 40.5                | 56.2                      | 74.0                      | -17.8       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
    8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
    9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 06

Table 2, IEEE 802.11b DSSS 1Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 4874.000        | 44.5           | 33                | 34.9                | 46.4                       | 54.0                         | -7.6        |
| H            | 7311.000        | 37.9           | 33                | 37.9                | 42.8                       | 54.0                         | -11.2       |
| V            | 12185.000       | 31.1           | 33                | 40.5                | 38.6                       | 54.0                         | -15.4       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 4874.000        | 48.9           | 33                | 34.9                | 50.8                      | 74.0                      | -23.2       |
| H            | 7311.000        | 48.5           | 33                | 37.9                | 53.4                      | 74.0                      | -20.6       |
| V            | 12185.000       | 48.3           | 33                | 40.5                | 55.8                      | 74.0                      | -18.2       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
  8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
  9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 11

Table 3, IEEE 802.11b DSSS 1Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 2483.500        | 45.1           | 33                | 29.4                | 41.5                       | 54.0                         | -12.5       |
| H            | 4924.000        | 44.9           | 33                | 34.9                | 46.8                       | 54.0                         | -7.2        |
| H            | 7386.000        | 39.9           | 33                | 37.9                | 44.8                       | 54.0                         | -9.2        |
| V            | 12310.000       | 30.7           | 33                | 40.5                | 38.2                       | 54.0                         | -15.8       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2483.500        | 58.8           | 33                | 29.4                | 55.2                      | 74.0                      | -18.8       |
| H            | 4924.000        | 49.7           | 33                | 34.9                | 51.6                      | 74.0                      | -22.4       |
| H            | 7386.000        | 47.6           | 33                | 37.9                | 52.5                      | 74.0                      | -21.5       |
| V            | 12310.000       | 48.1           | 33                | 40.5                | 55.6                      | 74.0                      | -18.4       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
  8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
  9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 00

Table 4, IEEE 802.11g OFDM, 6 Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 2390.000        | 45.4           | 33                | 29.4                | 41.8                       | 54.0                         | -12.2       |
| H            | 4824.000        | 28.5           | 33                | 34.9                | 30.4                       | 54.0                         | -23.6       |
| V            | 12060.000       | 30.7           | 33                | 40.5                | 38.2                       | 54.0                         | -15.8       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2390.000        | 66.0           | 33                | 29.4                | 62.4                      | 74.0                      | -11.6       |
| H            | 4824.000        | 41.7           | 33                | 34.9                | 43.6                      | 74.0                      | -30.4       |
| V            | 12060.000       | 48.3           | 33                | 40.5                | 55.8                      | 74.0                      | -18.2       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
  8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
  9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 06

Table 5, IEEE 802.11g OFDM, 6 Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 4874.000        | 28.9           | 33                | 34.9                | 30.8                       | 54.0                         | -23.2       |
| H            | 7311.000        | 30.5           | 33                | 37.9                | 35.4                       | 54.0                         | -18.6       |
| V            | 12185.000       | 31.0           | 33                | 40.5                | 38.5                       | 54.0                         | -15.5       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 4874.000        | 42.3           | 33                | 34.9                | 44.2                      | 74.0                      | -29.8       |
| H            | 7311.000        | 44.5           | 33                | 37.9                | 49.4                      | 74.0                      | -24.6       |
| V            | 12185.000       | 47.9           | 33                | 40.5                | 55.4                      | 74.0                      | -18.6       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
  8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
  9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 11

Table 6, IEEE 802.11g OFDM, 6 Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 2483.500        | 45.1           | 33                | 29.4                | 41.5                       | 54.0                         | -12.5       |
| H            | 4924.000        | 29.7           | 33                | 34.9                | 31.6                       | 54.0                         | -22.4       |
| H            | 7386.000        | 31.6           | 33                | 37.9                | 36.5                       | 54.0                         | -17.5       |
| V            | 12310.000       | 30.9           | 33                | 40.5                | 38.4                       | 54.0                         | -15.6       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2483.500        | 59.4           | 33                | 29.4                | 55.8                      | 74.0                      | -18.2       |
| H            | 4924.000        | 43.6           | 33                | 34.9                | 45.5                      | 74.0                      | -28.5       |
| H            | 7386.000        | 45.9           | 33                | 37.9                | 50.8                      | 74.0                      | -23.2       |
| V            | 12310.000       | 48.3           | 33                | 40.5                | 55.8                      | 74.0                      | -18.2       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
  8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
  9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 00

Table 7, IEEE 802.11n (20MHz) OFDM, MCS0

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 2390.000        | 44.4           | 33                | 29.4                | 40.8                       | 54.0                         | -13.2       |
| H            | 4824.000        | 28.6           | 33                | 34.9                | 30.5                       | 54.0                         | -23.5       |
| V            | 12060.000       | 30.7           | 33                | 40.5                | 38.2                       | 54.0                         | -15.8       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2390.000        | 59.2           | 33                | 29.4                | 55.6                      | 74.0                      | -18.4       |
| H            | 4824.000        | 41.7           | 33                | 34.9                | 43.6                      | 74.0                      | -30.4       |
| V            | 12060.000       | 48.9           | 33                | 40.5                | 56.4                      | 74.0                      | -17.6       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
  8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
  9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 06

Table 8, IEEE 802.11n (20MHz) OFDM, MCS0

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 4874.000        | 29.9           | 33                | 34.9                | 31.8                       | 54.0                         | -22.2       |
| H            | 7311.000        | 30.6           | 33                | 37.9                | 35.5                       | 54.0                         | -18.5       |
| V            | 12185.000       | 31.3           | 33                | 40.5                | 38.8                       | 54.0                         | -15.2       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 4874.000        | 43.5           | 33                | 34.9                | 45.4                      | 74.0                      | -28.6       |
| H            | 7311.000        | 44.7           | 33                | 37.9                | 49.6                      | 74.0                      | -24.4       |
| V            | 12185.000       | 49.3           | 33                | 40.5                | 56.8                      | 74.0                      | -17.2       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
  8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
  9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: TX-Channel 11

Table 9, IEEE 802.11n (20MHz) OFDM, MCS0

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m Average (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|----------------------------|------------------------------|-------------|
| H            | 2483.500        | 46.8           | 33                | 29.4                | 43.2                       | 54.0                         | -10.8       |
| H            | 4924.000        | 28.3           | 33                | 34.9                | 30.2                       | 54.0                         | -23.8       |
| H            | 7386.000        | 32.3           | 33                | 37.9                | 37.2                       | 54.0                         | -16.8       |
| V            | 12310.000       | 30.7           | 33                | 40.5                | 38.2                       | 54.0                         | -15.8       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|---------------------------|-------------|
| H            | 2483.500        | 64.1           | 33                | 29.4                | 60.5                      | 74.0                      | -13.5       |
| H            | 4924.000        | 41.9           | 33                | 34.9                | 43.8                      | 74.0                      | -30.2       |
| H            | 7386.000        | 47.3           | 33                | 37.9                | 52.2                      | 74.0                      | -21.8       |
| V            | 12310.000       | 49.3           | 33                | 40.5                | 56.8                      | 74.0                      | -17.2       |

- Notes:
1. Peak detector is used for the emission measurement.
  2. Average detector is used for the average data of emission measurement.
  3. All measurements were made at 3 meters.
  4. Negative value in the margin column shows emission below limit.
  5. Horn antenna is used for the emission over 1000MHz.
  6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
  7. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.
  8. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth
  9. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

## TEST REPORT

### RADIATED EMISSION DATA

Mode: Live Mode

Table 10

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-amp (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|--------------|---------------------|--------------------|----------------------|-------------|
| V            | 30.122          | 30.8           | 16           | 10.0                | 24.8               | 40.0                 | -15.2       |
| V            | 67.345          | 25.2           | 16           | 8.0                 | 17.2               | 40.0                 | -22.8       |
| H            | 112.814         | 23.4           | 16           | 14.0                | 21.4               | 43.5                 | -22.1       |
| H            | 123.848         | 25.5           | 16           | 14.0                | 23.5               | 43.5                 | -20.0       |
| H            | 182.532         | 17.8           | 16           | 20.0                | 21.8               | 43.5                 | -21.7       |
| H            | 399.934         | 31.2           | 16           | 25.0                | 40.2               | 46.0                 | -5.8        |

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

## TEST REPORT

### 3.7 Transmitter Duty Cycle Calculation

Not Applicable – No average factor is required

### 3.8 AC Power Line Conducted Emission

- ☐ Not Applicable – EUT is only powered by battery for operation.
- ☒ 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.

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

Worst Case Line-Conducted Configuration at 433.5 MHz.

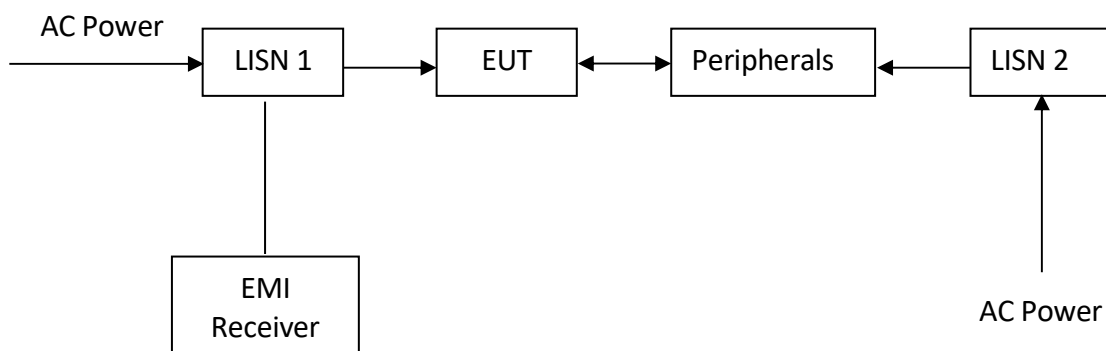
The worst-case line conducted configuration photographs are attached in the Appendix and saved with filename: config photos.pdf.

#### 3.8.2 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 11.3 dB margin

#### 3.8.3 Conducted Emission Test Setup



The EUT along with its peripherals were placed on a 1.0m(W)×1.5m(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 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

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

## TEST REPORT

### AC POWER LINE CONDUCTED EMISSION

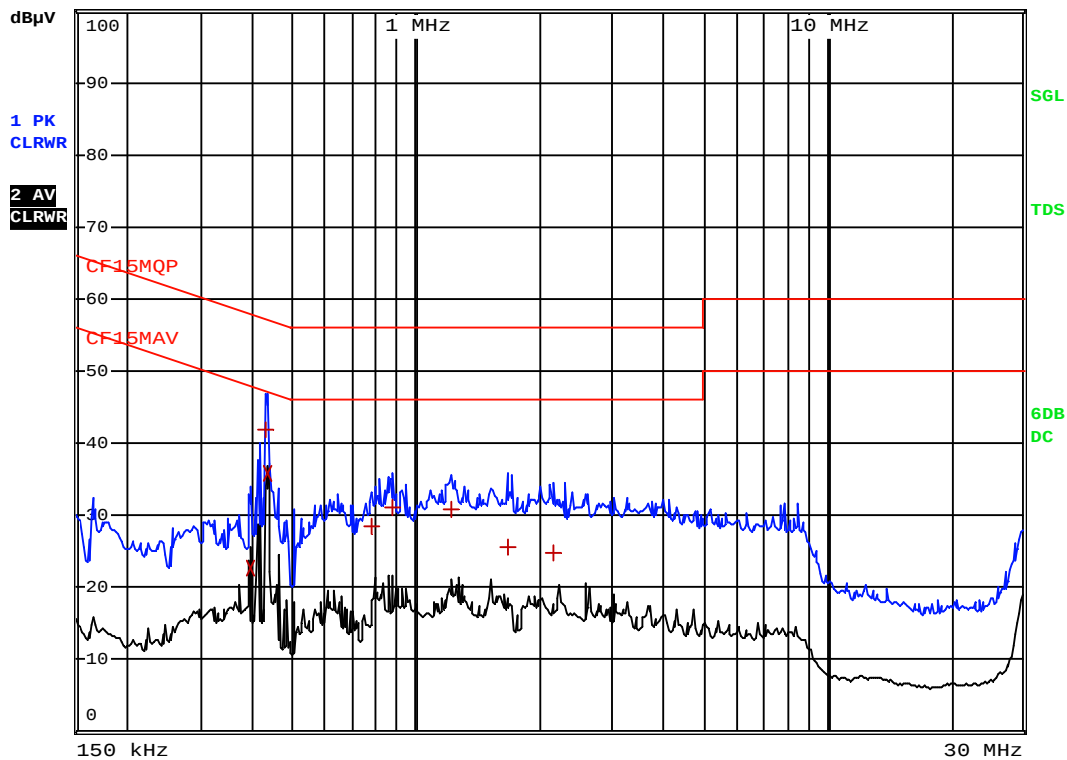
Worst Case: Live Mode



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Date: 9.JAN.2023 11:59:48

# TEST REPORT

## AC POWER LINE CONDUCTED EMISSION

### Worst Case: Live Mode

| EDIT PEAK LIST (Final Measurement Results) |           |         |            |       |       |        |
|--------------------------------------------|-----------|---------|------------|-------|-------|--------|
| Trace1:                                    |           | CF15MQP |            |       |       |        |
| Trace2:                                    |           | CF15MAV |            |       |       |        |
| Trace3:                                    |           | ---     |            |       |       |        |
| TRACE                                      | FREQUENCY | LEVEL   | dB $\mu$ V | DELTA | LIMIT | dB     |
| 2 CISPR Average                            | 393 kHz   | 22.76   | L1         |       |       | -25.24 |
| 1 Quasi Peak                               | 429 kHz   | 41.80   | N          |       |       | -15.46 |
| 2 CISPR Average                            | 433.5 kHz | 35.91   | L1         |       |       | -11.26 |
| 1 Quasi Peak                               | 775.5 kHz | 28.57   | L1         |       |       | -27.42 |
| 1 Quasi Peak                               | 879 kHz   | 31.10   | L1         |       |       | -24.89 |
| 1 Quasi Peak                               | 1.212 MHz | 30.76   | L1         |       |       | -25.23 |
| 1 Quasi Peak                               | 1.68 MHz  | 25.62   | L1         |       |       | -30.38 |
| 1 Quasi Peak                               | 2.157 MHz | 24.77   | L1         |       |       | -31.22 |

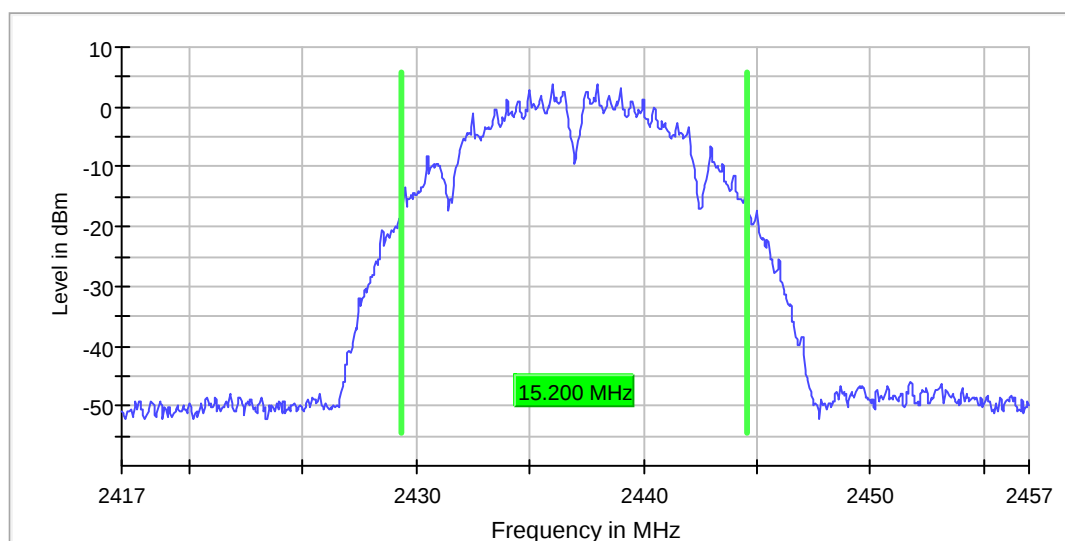
Date: 9.JAN.2023 11:59:33

## TEST REPORT

Occupied Bandwidth Results: (802.11b)

| (802.11b) Occupied Bandwidth (MHz) |        |
|------------------------------------|--------|
| Low Channel: 2412                  | 15.150 |
| Middle Channel: 2437               | 15.200 |
| High Channel: 2462                 | 15.150 |

The worst case is shown as below



## Measurement

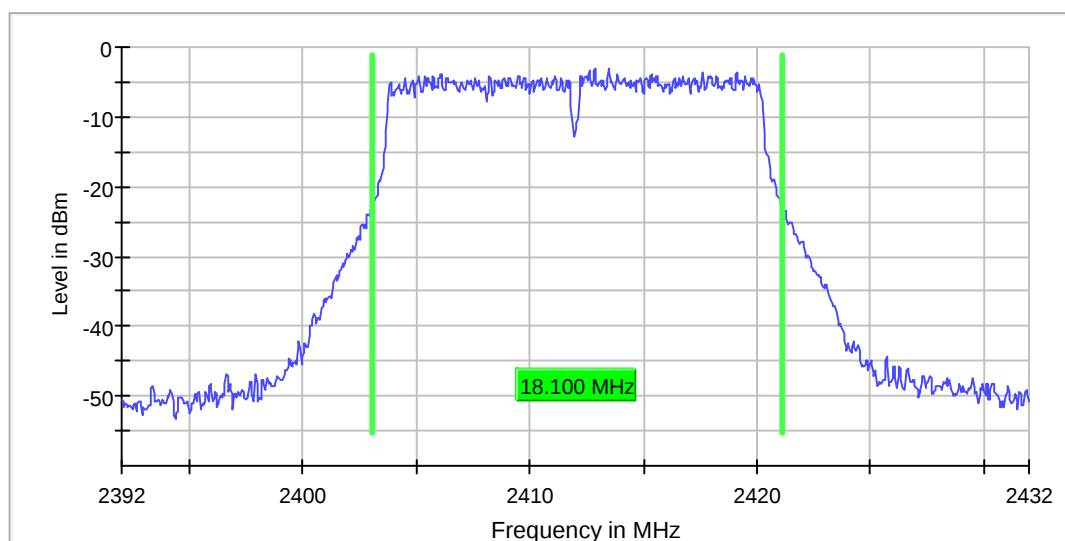
| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.41700 GHz      | 2.41700 GHz    |
| Stop Frequency        | 2.45700 GHz      | 2.45700 GHz    |
| Span                  | 40.000 MHz       | 40.000 MHz     |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz  |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 800              | ~ 800          |
| Sweeptime             | 94.922 $\mu$ s   | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

## TEST REPORT

Occupied Bandwidth Results: (802.11g)

| (802.11g) Occupied Bandwidth (MHz) |        |
|------------------------------------|--------|
| Low Channel: 2412                  | 18.100 |
| Middle Channel: 2437               | 17.750 |
| High Channel: 2462                 | 17.700 |

The worst case is shown as below



## Measurement

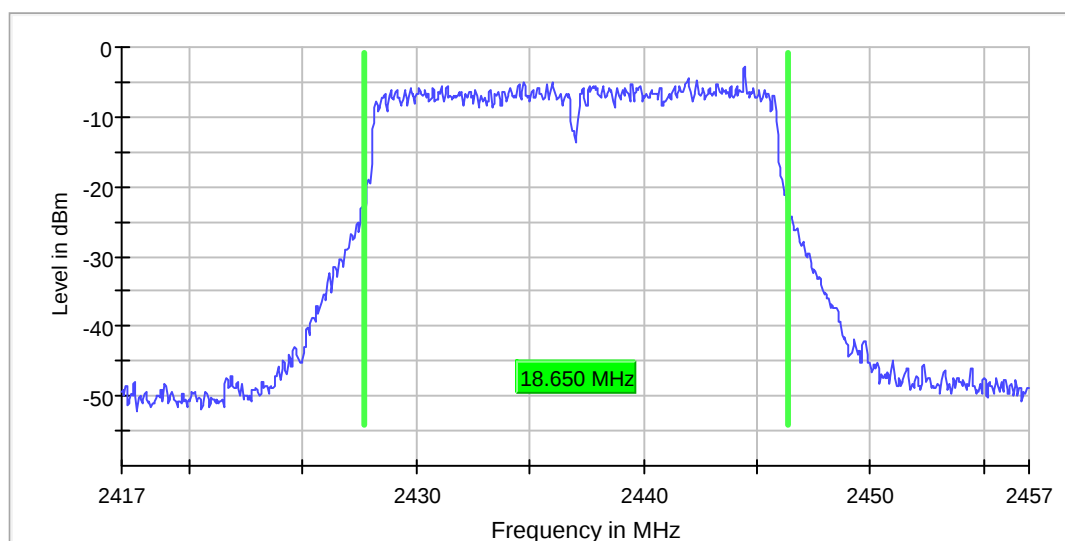
| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.39200 GHz      | 2.39200 GHz    |
| Stop Frequency        | 2.43200 GHz      | 2.43200 GHz    |
| Span                  | 40.000 MHz       | 40.000 MHz     |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz  |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 800              | ~ 800          |
| Sweeptime             | 94.922 $\mu$ s   | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

## TEST REPORT

Occupied Bandwidth Results: (802.11n HT20)

| (802.11n HT20)       | Occupied Bandwidth (MHz) |
|----------------------|--------------------------|
| Low Channel: 2412    | 18.400                   |
| Middle Channel: 2437 | 18.650                   |
| High Channel: 2462   | 18.550                   |

The worst case is shown as below



## Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.41700 GHz      | 2.41700 GHz    |
| Stop Frequency        | 2.45700 GHz      | 2.45700 GHz    |
| Span                  | 40.000 MHz       | 40.000 MHz     |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz  |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 800              | ~ 800          |
| Sweeptime             | 94.922 $\mu$ s   | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

## TEST REPORT

### EXHIBIT 4 EQUIPMENT LIST

#### 1) Radiated Emissions Test

| Equipment            | Signal and Spectrum Analyzer (10Hz to 40GHz) | Biconical Antenna (30MHz to 300MHz) | EMI Test Receiver 7GHz |
|----------------------|----------------------------------------------|-------------------------------------|------------------------|
| Registration No.     | EW-3016                                      | EW-3242                             | EW-3481                |
| Manufacturer         | ROHDESCHWARZ                                 | EMCO                                | ROHDESCHWARZ           |
| Model No.            | FSV40                                        | 3110C                               | ESR7                   |
| Calibration Date     | January 29, 2022                             | May 26, 2021                        | December 21, 2021      |
| Calibration Due Date | April 29, 2023                               | May 26, 2023                        | March 21, 2023         |

| Equipment            | Log Periodic Antenna | Double Ridged Guide Antenna | Active Loop H-field (9kHz to 30MHz) |
|----------------------|----------------------|-----------------------------|-------------------------------------|
| Registration No.     | EW-3243              | EW-1133                     | EW-3302                             |
| Manufacturer         | EMCO                 | EMCO                        | EMCO                                |
| Model No.            | 3148B                | 3115                        | 6502                                |
| Calibration Date     | June 03, 2021        | May 26, 2021                | September 08, 2022                  |
| Calibration Due Date | March 30, 2023       | February 26, 2023           | September 08, 2023                  |

| Equipment            | RF Preamplifier (9kHz to 6000MHz) | 2.4GHz Notch Filter | 14m Double Shield RF Cable (9kHz - 6GHz) |
|----------------------|-----------------------------------|---------------------|------------------------------------------|
| Registration No.     | EW-3006b                          | EW-3435             | EW-2376                                  |
| Manufacturer         | SCHWARZBECK                       | MICROWAVE           | RADIAL                                   |
| Model No.            | BBV9718                           | N0324413            | n m/br56/bnc m 14m                       |
| Calibration Date     | February 15, 2022                 | June 16, 2022       | January 26, 2022                         |
| Calibration Due Date | February 15, 2023                 | June 16, 2023       | April 26, 2023                           |

| Equipment            | RF Cable 14m (1GHz to 26.5GHz) | 14m Double Shield RF Cable (20MHz to 6GHz) | Pyramidal Horn Antenna |
|----------------------|--------------------------------|--------------------------------------------|------------------------|
| Registration No.     | EW-2781                        | EW-2074                                    | EW-0905                |
| Manufacturer         | GREATBILLION                   | RADIAL                                     | EMCO                   |
| Model No.            | SMA m/SHF5MPU /SMA m ra14m,26G | N(m)-RG142-BNC(m) L=14M                    | 3160-09                |
| Calibration Date     | November 24, 2021              | December 10, 2021                          | July 20, 2021          |
| Calibration Due Date | April 24, 2023                 | March 10, 2023                             | February 20, 2023      |

## TEST REPORT

### 4.0 EQUIPMENT LIST (CONT'D)

#### 2) Conducted Emissions Test

| Equipment            | RF Cable 240cm<br>(RG142)<br>(9kHz to 30MHz) | Artificial Mains<br>Network | EMI Test Receiver<br>7GHz |
|----------------------|----------------------------------------------|-----------------------------|---------------------------|
| Registration No.     | EW-2454                                      | EW-2501                     | EW-3481                   |
| Manufacturer         | RADIAL                                       | ROHDESCHWARZ                | ROHDESCHWARZ              |
| Model No.            | Bnc m st / 142 / bnc<br>mra 240cm            | ENV-216                     | ESR7                      |
| Calibration Date     | January 26, 2022                             | September 11, 2021          | December 21, 2021         |
| Calibration Due Date | April 26, 2023                               | March 11, 2023              | March 21, 2023            |

#### 3) Conductive Measurement Test

| Equipment            | 5m RF Cable<br>(40GHz) | RF Power Meter with<br>Power Sensor (N1921A) | EMI Test Receiver 7GHz |
|----------------------|------------------------|----------------------------------------------|------------------------|
| Registration No.     | EW-2701                | EW-3309                                      | EW-3481                |
| Manufacturer         | RADIAL                 | ROHDESCHWARZ                                 | ROHDESCHWARZ           |
| Model No.            | Sma m-m 5m 40G         | NRP-Z81                                      | ESR7                   |
| Calibration Date     | November 24, 2020      | December 01, 2021                            | December 21, 2021      |
| Calibration Due Date | February 24, 2023      | March 01, 2023                               | March 21, 2023         |

#### 4) Bandedge & Bandwidth Measurement

| Equipment            | EMI Test Receiver<br>7GHz | 5m RF Cable<br>(40GHz) |
|----------------------|---------------------------|------------------------|
| Registration No.     | EW-3481                   | EW-2701                |
| Manufacturer         | ROHDESCHWARZ              | RADIAL                 |
| Model No.            | ESR7                      | Sma m-m 5m 40G         |
| Calibration Date     | December 21, 2021         | November 24, 2020      |
| Calibration Due Date | March 21, 2023            | February 24, 2023      |

#### 5) Control Software for Radiated Emission

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

END OF TEST REPORT