



# FCC TEST REPORT



Issued to

**VSN Technologies Inc.**

For

**Mobile phone**

Model Name: V3001  
Trade Name: Revel Mobile  
Brand Name: Revel  
FCC ID: 2AA9WW3001  
Standard: 47 CFR Part 15 Subpart B  
Test date: April 17, 2014 – April 29, 2014  
Issue date: April 29, 2014

By

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| Change History |                |                   |
|----------------|----------------|-------------------|
| Issue          | Date           | Reason for change |
| 1.0            | April 29, 2014 | First edition     |
|                |                |                   |
|                |                |                   |

## 1. GENERAL INFORMATION

### 1.1 EUT Description

|                          |                                                                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT Type:</b>         | Mobile Phone                                                                                                                                                             |
| <b>Serial No:</b>        | (n.a., marked #1 by test site)                                                                                                                                           |
| <b>Hardware Version:</b> | TBW9758B1_mainboard_p2                                                                                                                                                   |
| <b>Software Version:</b> | 975813_9373_V006015                                                                                                                                                      |
| <b>Applicant:</b>        | VSN Technologies Inc.<br>1975 E Sunrise Blvd, Suite 400, Fort Lauderdale, Fl. 33304                                                                                      |
| <b>Manufacturer:</b>     | Beijing Benywave technology Co., Ltd.<br>No 55, Jiachuang second road, Zhongguancun Science Park<br>OPTO-Mechatronics Industrial Park, Tongzhou District, Beijing, China |

|                             |                                         |                               |
|-----------------------------|-----------------------------------------|-------------------------------|
| <b>Power supply:</b>        | <b>Battery</b>                          |                               |
|                             | Brand Name:                             | N/A                           |
|                             | Model No.:                              | TBT9703                       |
|                             | Serial No.:                             | (n.a. marked #1 by test site) |
|                             | Capacity:                               | 2600mAh                       |
|                             | Rated Voltage:                          | 3.7V                          |
|                             | Charge Limit:                           | 4.2V                          |
| <b>Ancillary Equipment:</b> | <b>AC Adapter (Charger for Battery)</b> |                               |
|                             | Brand Name:                             | REVEL                         |
|                             | Model No.:                              | N/A                           |
|                             | Serial No.:                             | (n.a. marked #1 by test site) |
|                             | Rated Input:                            | ~ 100-240V, 200mA, 50/60Hz    |
|                             | Rated Output:                           | = 5V, 800mA                   |

#### NOTE:

1. The EUT is a Mobile Phone, It supports GSM850MHz, 1900MHz, GPRS, EDGE, WCDMA Band II, Band V, HSDPA, HSUPA, HSPA+, GPS, ISM 2.4GHz Bluetooth and WIFI(802.11b/g/n20) band.
2. it is equipped with a T-Flash card slot, a Micro-USB port which can be connected to the ancillary equipments e.g. the PC. It supports FM function.
3. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

## 1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

| No. | Identity                        | Document Title          |
|-----|---------------------------------|-------------------------|
| 1   | 47 CFR Part 15(10-1-13 Edition) | Radio Frequency Devices |

Test detailed items/section required by FCC rules and results are as below:

| No. | Section | Description        | Result |
|-----|---------|--------------------|--------|
| 1   | 15.107  | Conducted Emission | PASS   |
| 2   | 15.109  | Radiated Emission  | PASS   |

NOTE: The tests were performed according to the method of measurements prescribed in ANSI C63.4-2009.

## 1.3 Facilities and Accreditations

### 1.3.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China 518101. The test site is constructed in conformance with the requirements of ANSI C63.4-2009 and CISPR Publication 22:2008; the FCC registration number is 695796.

### 1.3.2 Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

|                             |         |
|-----------------------------|---------|
| Temperature (°C):           | 15 - 35 |
| Relative Humidity (%):      | 30 - 60 |
| Atmospheric Pressure (kPa): | 86 -106 |

### 1.3.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

|                                    |        |
|------------------------------------|--------|
| Uncertainty of Conducted Emission: | ±1.8dB |
| Uncertainty of Radiated Emission:  | ±3.1dB |

## 2. TEST CONDITIONS SETTING

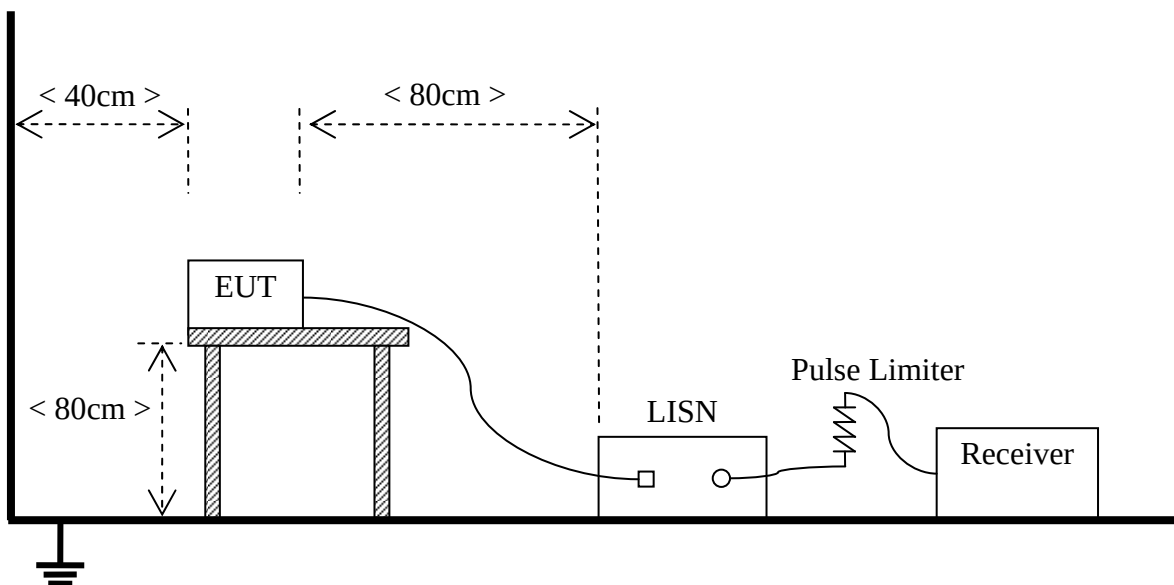
### 2.1 Test Mode

|                                                                                                        |                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                                                      | <b>The first test mode (Data Transmission)</b><br>The EUT configuration of the emission tests is EUT + Battery + T-Flash Card + PC.<br>In this test mode, the EUT with a T-Flash Card embedded was connected to a PC via the Micro-B USB port. During the measurement, the data is transmitting between the PC and the T-Flash Card of the EUT. |
| 2                                                                                                      | <b>The second test mode (Standby)</b><br>The EUT configuration of the emission tests is EUT + Battery + Charger.<br>During the measurement, the EUT was charged by its adapter and turned on.                                                                                                                                                   |
| Note: All test modes are performed, only the worst case(Data Transmission) is recorded in this report. |                                                                                                                                                                                                                                                                                                                                                 |

## 2.2 Test Setup and Equipments List

### 2.2.1 Conducted Emission

#### A. Test Setup:



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

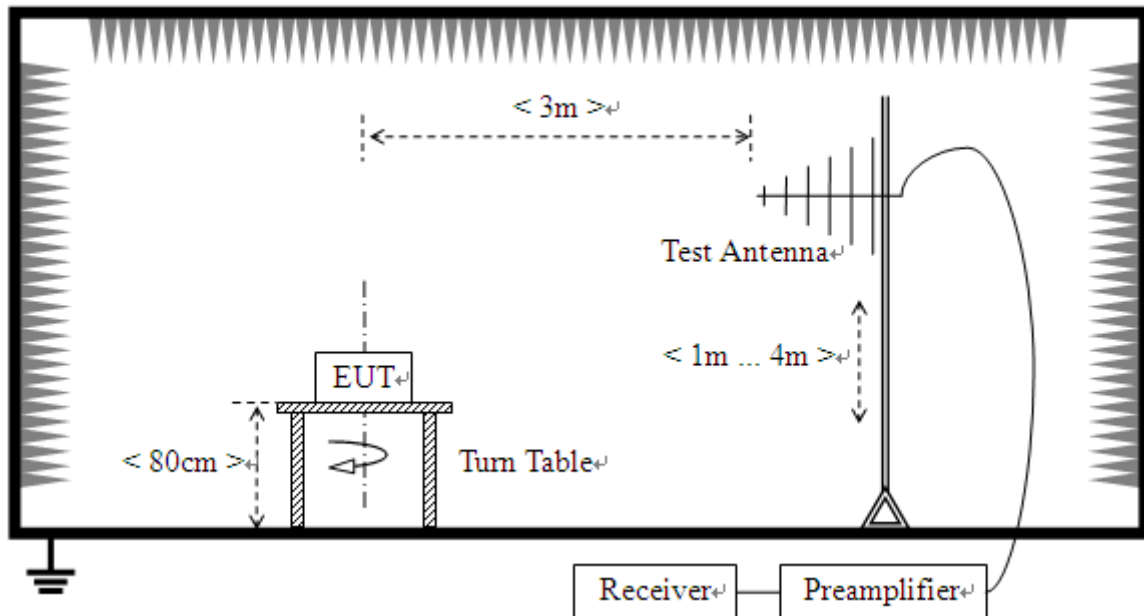
#### B. Equipments List:

| Description          | Manufacturer | Model       | Serial No. | Cal. Date | Due. Date |
|----------------------|--------------|-------------|------------|-----------|-----------|
| Receiver             | Narda        | PMM 9010    | 595WX11007 | 2014.2.21 | 2015.2.20 |
| EMC Analyzer         | Agilent      | E7405A      | US44210471 | 2014.2.21 | 2015.2.20 |
| LISN                 | Schwarzbeck  | NSLK 8127   | 812744     | 2014.2.24 | 2015.2.23 |
| Pulse Limiter (20dB) | Schwarzbeck  | VTSD 9561-D | 9391       | (n.a.)    | (n.a.)    |
| System Simulator     | Agilent      | E5515C      | GB43130131 | 2014.2.21 | 2015.2.20 |
| PC                   | Lenovo       | ThinkPadT61 | ZZF3077    | (n.a.)    | (n.a.)    |

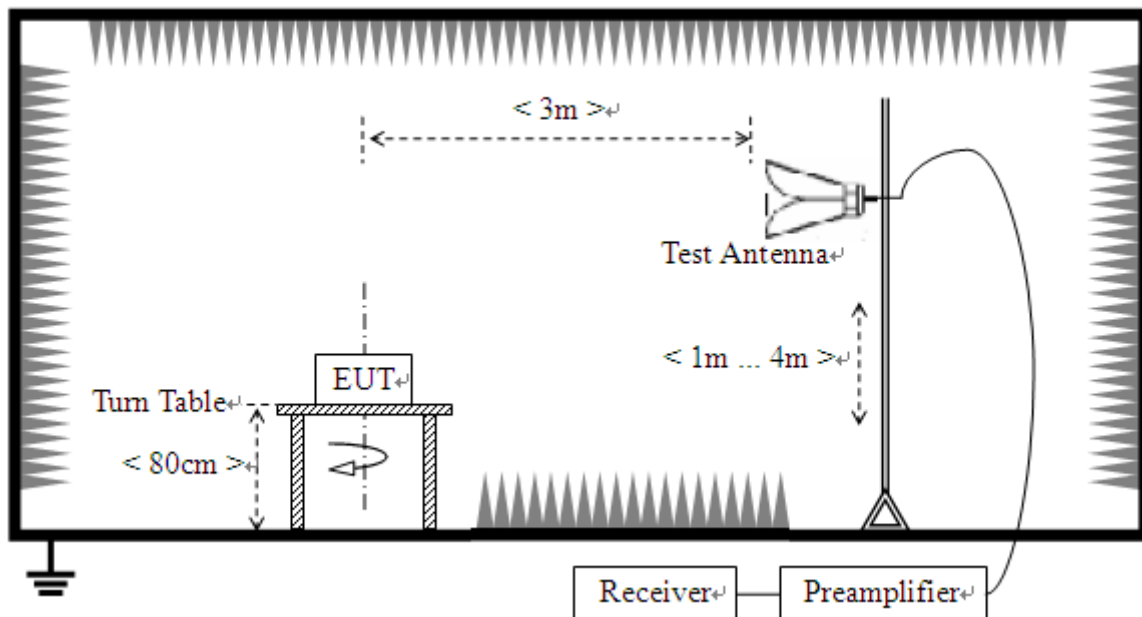
## 2.2.2 Radiated Emission

### A. Test Setup:

- 1) For radiated emissions from 30MHz to 1GHz



- 2) For radiated emissions above 1GHz



The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table,

and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

#### B. Equipments List:

| Description           | Manufacturer | Model       | Serial No. | Cal. Date | Due. Date |
|-----------------------|--------------|-------------|------------|-----------|-----------|
| EMC Analyzer          | Agilent      | E7405A      | US44210471 | 2014.2.21 | 2015.2.20 |
| Semi-Anechoic Chamber | Albatross    | 9m*6m*6m    | (n.a.)     | 2014.2.21 | 2015.2.20 |
| Test Antenna - Bi-Log | Schwarzbeck  | VULB 9163   | 9163-274   | 2014.2.25 | 2015.2.24 |
| Test Antenna - Horn   | Schwarzbeck  | BBHA 9120D  | 9120D-963  | 2014.2.25 | 2015.2.24 |
| PC                    | Lenovo       | ThinkPadT61 | ZZF3077    | (n.a.)    | (n.a.)    |

### 3. 47 CFR PART 15B REQUIREMENTS

#### 3.1 Conducted Emission

##### 3.1.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

| Frequency range (MHz) | Conducted Limit (dB $\mu$ V) |          |
|-----------------------|------------------------------|----------|
|                       | Quasi-peak                   | Average  |
| 0.15 - 0.50           | 66 to 56                     | 56 to 46 |
| 0.50 - 5              | 56                           | 46       |
| 5 - 30                | 60                           | 50       |

NOTE:

- a) The limit subjects to the Class B digital device.
- b) The lower limit shall apply at the band edges.
- c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

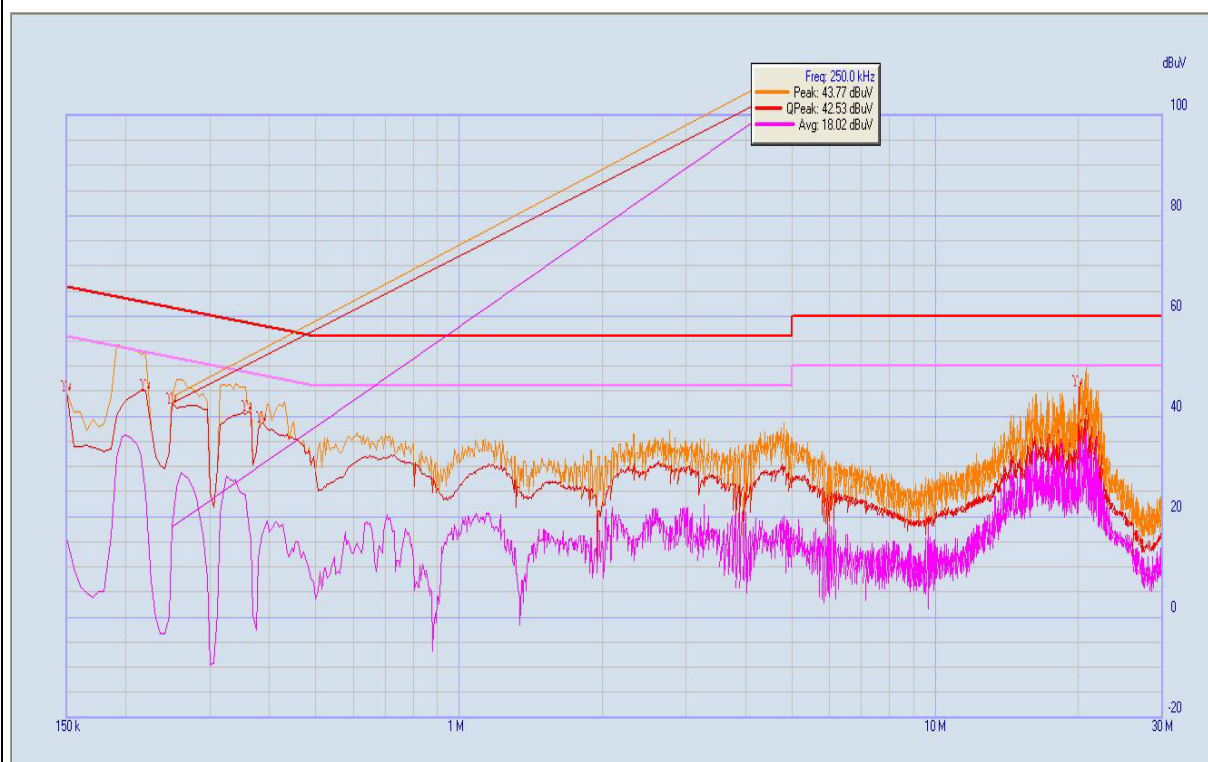
##### 3.1.2 Test Description

See section 2.2.1 of this report.

##### 3.1.3 Test Result

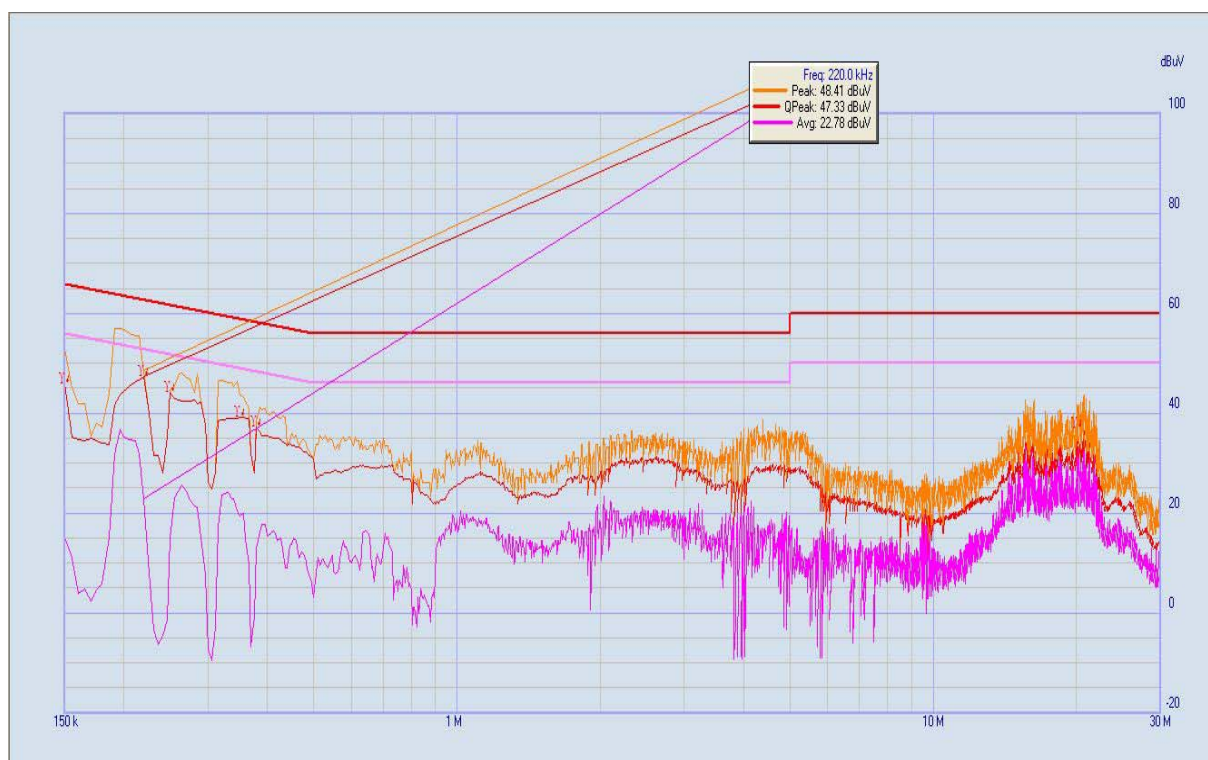
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

##### A. Test Plot and Suspicious Points:



(Plot A: L Phase)

| NO. | Fre.<br>(MHz) | Emission Level (dBμV) |         | Limit (dBμV) |         | Power-line | Verdict |
|-----|---------------|-----------------------|---------|--------------|---------|------------|---------|
|     |               | Quai-peak             | Average | Quai-peak    | Average |            |         |
| 1   | 0.15          | 44.93                 | 15.80   | 66.00        | 56.00   | Line       | PASS    |
| 2   | 0.22          | 45.17                 | 24.26   | 64.00        | 54.00   |            | PASS    |
| 3   | 0.25          | 42.53                 | 18.02   | 63.14        | 53.14   |            | PASS    |
| 4   | 0.36          | 40.94                 | 20.52   | 60.00        | 50.00   |            | PASS    |
| 5   | 0.385         | 38.72                 | 16.49   | 59.29        | 49.29   |            | PASS    |
| 6   | 20.0          | 45.92                 | 36.61   | 60.00        | 50.00   |            | PASS    |



(Plot B: N Phase)

| NO. | Fre.<br>(MHz) | Emission Level (dBμV) |         | Limit (dBμV) |         | Power-line | Verdict |
|-----|---------------|-----------------------|---------|--------------|---------|------------|---------|
|     |               | Quai-peak             | Average | Quai-peak    | Average |            |         |
| 1   | 0.15          | 45.97                 | 15.17   | 66.00        | 56.00   | Neutral    | PASS    |
| 2   | 0.22          | 47.33                 | 22.78   | 64.00        | 54.00   |            | PASS    |
| 3   | 0.25          | 44.12                 | 15.07   | 63.14        | 53.14   |            | PASS    |
| 4   | 0.35          | 39.19                 | 19.46   | 60.29        | 50.29   |            | PASS    |
| 5   | 0.38          | 37.19                 | 13.04   | 59.43        | 49.43   |            | PASS    |
| 6   | 20.0          | 36.47                 | 31.83   | 60.00        | 50.00   |            | PASS    |

**Test Result: PASS**

## 3.2 Radiated Emission

### 3.2.1 Requirement

According to FCC section 15.109(a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency range (MHz) | Field Strength  |      | Field Strength Limitation at 3m Measurement Dist |                            |
|-----------------------|-----------------|------|--------------------------------------------------|----------------------------|
|                       | $\mu\text{V/m}$ | Dist | $(\mu\text{V/m})$                                | $(\text{dB}\mu\text{V/m})$ |
| 30.0 - 88.0           | 100             | 3m   | 100                                              | $20\log 100$               |
| 88.0 - 216.0          | 150             | 3m   | 150                                              | $20\log 150$               |
| 216.0 - 960.0         | 200             | 3m   | 200                                              | $20\log 200$               |
| Above 960.0           | 500             | 3m   | 500                                              | $20\log 500$               |

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in  $\text{dB}\mu\text{V/m}$  is calculated by  $20\log \text{Emission Level}(\mu\text{V/m})$ .
- 3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of  $Ld1 = Ld2 * (d2/d1)^2$ .

Example:

F.S Limit at 30m distance is  $30\mu\text{V/m}$ , then F.S Limitation at 3m distance is adjusted as

$$Ld1 = L1 = 30\mu\text{V/m} * (10)^2 = 100 * 30\mu\text{V/m}$$

### 3.2.2 Test Description

See section 2.2.2 of this report.

### 3.2.3 Frequency range of measurement

Highest frequency generated or used in the device is the highest speed of the processor, lowest frequency generated or used in the device is the lowest frequency of the oscillator. According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

| Frequency | Frequency generated or used in the device | Frequency range of radiated measurement in the report |
|-----------|-------------------------------------------|-------------------------------------------------------|
| Highest   | 1.4GHz                                    | 7GHz                                                  |

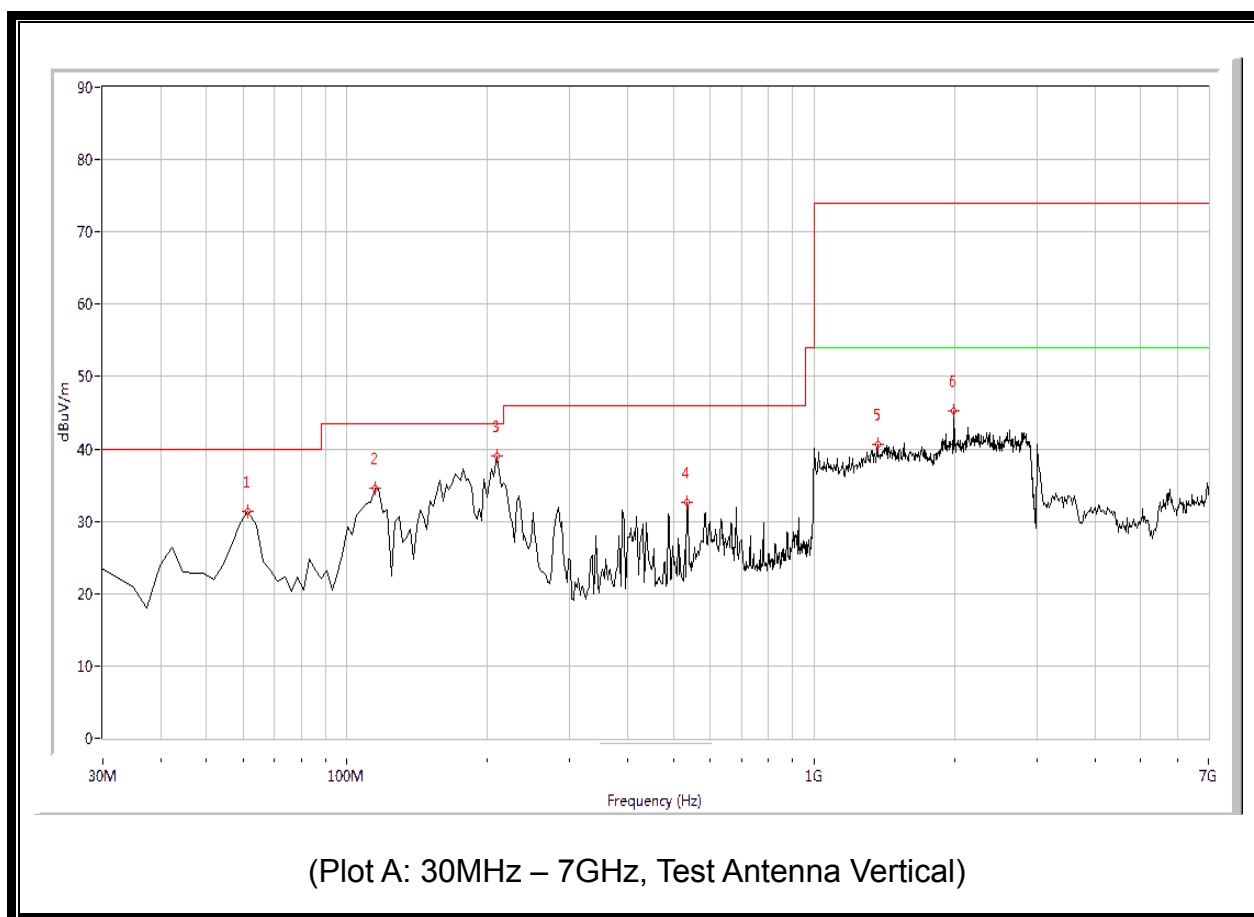
### 3.2.4 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

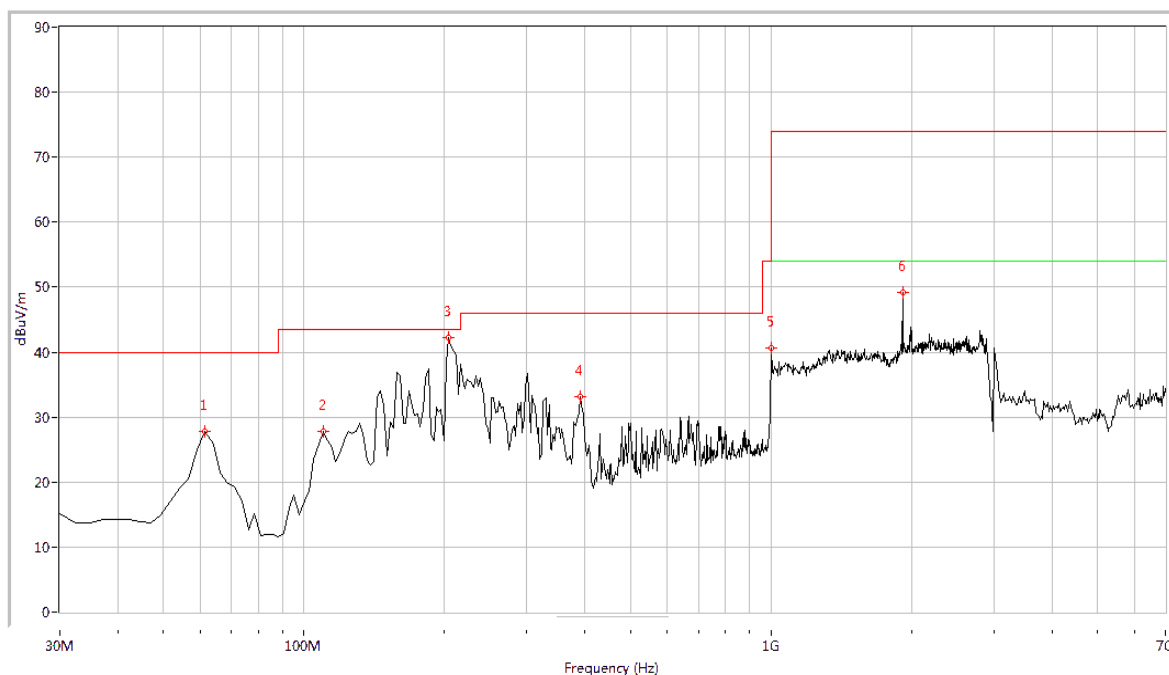
The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

#### A. Test Plots and Suspicious Points:



| NO. | Fre.<br>(MHz) | Pk    | QP    | AV    | Limit-<br>PK | Limit-<br>QP | Limit-<br>AV | Antenna  | Verdict |
|-----|---------------|-------|-------|-------|--------------|--------------|--------------|----------|---------|
| 1   | 61.446        | N.A   | 31.45 | N.A   | N.A          | 40.0         | N.A          | Vertical | Pass    |
| 2   | 114.663       | N.A   | 34.50 | N.A   | N.A          | 43.5         | N.A          | Vertical | Pass    |
| 3   | 209.002       | N.A   | 39.09 | N.A   | N.A          | 43.5         | N.A          | Vertical | Pass    |
| 4   | 535.561       | N.A   | 32.64 | N.A   | N.A          | 46.0         | N.A          | Vertical | Pass    |
| 5   | 1369.077      | 40.62 | N.A   | 34.28 | 74.0         | N.A          | 54.0         | Vertical | Pass    |
| 6   | 1997.506      | 45.31 | N.A   | 38.61 | 74.0         | N.A          | 54.0         | Vertical | Pass    |



(Plot B: 30MHz – 7GHz, Test Antenna Horizontal)

| NO. | Fre.<br>(MHz) | Pk    | QP    | AV    | Limit-<br>PK | Limit-<br>QP | Limit-<br>AV | Antenna    | Verdict |
|-----|---------------|-------|-------|-------|--------------|--------------|--------------|------------|---------|
| 1   | 61.446        | N.A   | 27.72 | N.A   | N.A          | 40.0         | N.A          | Horizontal | Pass    |
| 2   | 109.825       | N.A   | 27.78 | N.A   | N.A          | 43.5         | N.A          | Horizontal | Pass    |
| 3   | 204.165       | N.A   | 41.48 | N.A   | N.A          | 43.5         | N.A          | Horizontal | Pass    |
| 4   | 390.424       | N.A   | 33.12 | N.A   | N.A          | 46.0         | N.A          | Horizontal | Pass    |
| 5   | 1000.000      | N.A   | 40.64 | N.A   | N.A          | 54.0         | N.A          | Horizontal | Pass    |
| 6   | 1917.706      | 49.26 | N.A   | 43.22 | 74.0         | N.A          | 54.0         | Horizontal | Pass    |

**Test Result: PASS**

**\*\*END OF REPORT \*\***