# TEST REPORT

| | |
|---|---|
| Applicant | PAX Technology Limited |
| Address | Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Hong Kong, China |

| | |
|---|---|
| Manufacturer or Supplier | PAX Computer Technology (Shenzhen) Co., Ltd. |
| Address | 4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C. |
| Product | Smart Mobile Payment Terminal |
| Brand Name | PAX |
| Model | A920Pro |
| Additional Model & Model Difference | N/A |
| Date of tests | Apr. 01, 2020~ May 15, 2020 |
| the tests have been carried out according to the requirements of the following standards: | |
| ☒ **FCC Part 15, Subpart C, Section 15.225** | |
| **CONCLUSION: The submitted sample was found to COMPLY with the test requirement** | |

| Tested by Evans He<br>Project Engineer / EMC Department | Approved by David Huang<br>Supervisor / EMC Department |
|---|---|
| Evans He | David Huang<br>Date: May 18, 2020 |

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# RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|---|---|---|
| RF200327S008 | Original release | May 18, 2020 |

**Bureau Veritas (Shenzhen)**
**Consumer Products Services Co., Ltd.**

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# 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 15, Subpart C | | | |
|---|---|---|---|
| **STANDARD SECTION** | **TEST TYPE AND LIMIT** | **RESULT** | **REMARK** |
| 15.207 | AC Power Conducted Emission | PASS | Meet the requirement of limit. |
| 15.225 (a)&(b)&(c) | The field strength of any emissions within the band | PASS | Meet the requirement of limit. |
| 15.225 (d) | The field strength of any emissions appearing outside of the 13.110-14.010 MHz band | PASS | Meet the requirement of limit. |
| 15.225 (e) | Frequency tolerance | PASS | Meet the requirement of limit. |
| 15.215 (c) | 20dB Bandwidth | PASS | Meet the requirement of limit. |
| 15.203 | Antenna Requirement | PASS | No antenna connector is used. |

# 2 MEASUREMENT UNCERTAINTY

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

| MEASUREMENT | FREQUENCY | UNCERTAINTY |
|---|---|---|
| Conducted emissions | 9kHz~30MHz | 2.70dB |
| Radiated emissions | 9KHz ~ 30MHz | 2.16dB |
| | 30MHz ~ 1GMHz | 3.74dB |
| | 1GHz ~ 18GHz | 4.66dB |
| | 18GHz ~ 40GHz | 4.67dB |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

# 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **PRODUCT** | Smart Mobile Payment Terminal |
| **MODEL NO.** | A920Pro |
| **ADDITIONAL MODELS** | N/A |
| **FCC ID** | V5PA920PRO |
| **POWER SUPPLY** | DC 5V from Adapter |
| **MODULATION TECHNOLOGY** | NFC |
| **MODULATION TYPE** | ASK |
| **OPERATING FREQUENCY** | 13.56MHz |
| **NUMBER OF CHANNEL** | 1 |
| **ANTENNA TYPE** | Loop Antenna |
| **I/O PORTS** | Refer to user's manual |
| **CABLE SUPPLIED** | N/A |

**NOTE:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 200324W001) for detailed product photo.

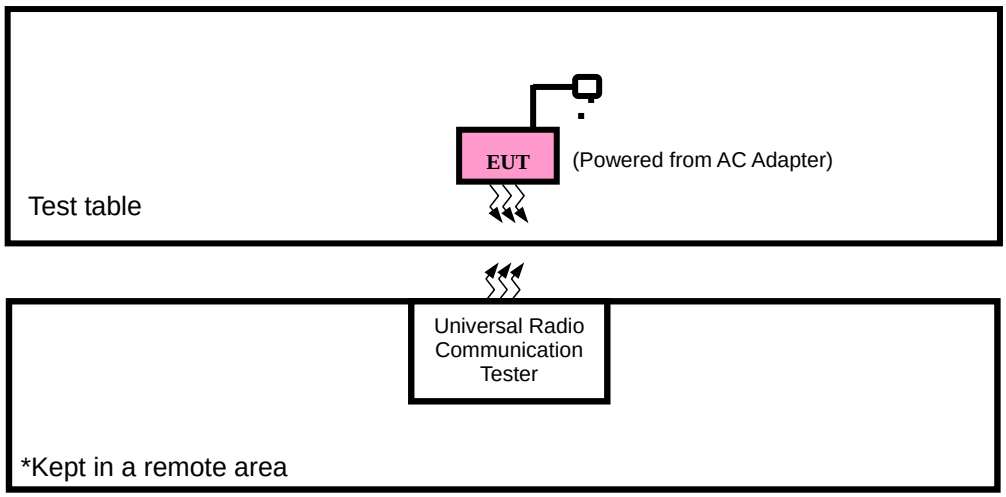
## 3.2 DESCRIPTION OF TEST MODES

The EUT only have one channel.

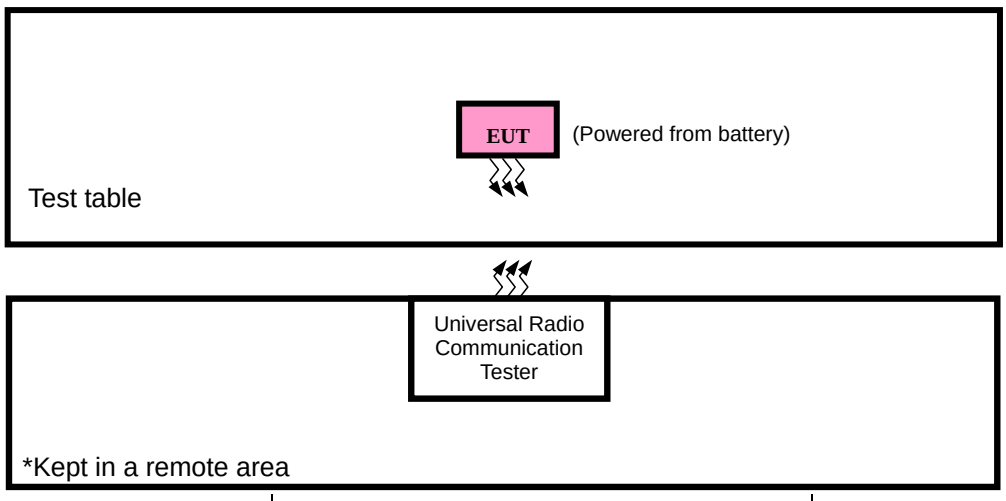
| CHANNEL | FREQUENCY (MHz) |
|---|---|
| 1 | 13.56 |

### 3.2.1. CONFIGURATION OF SYSTEM UNDER TEST

**FOR RADIATION EMISSION**




**FOR CONDUCTED & E.R.P. TEST**



## 3.2.2. TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports The worst case was found when positioned on X axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

| EUT CONFIGURE MODE | APPLICABLE TO | | | | DESCRIPTION |
|---|---|---|---|---|---|
| | RE | FT | PLC | BW | |
| A | √ | √ | √ | √ | DC 5V from Adapter |

Where **RE:** Radiated Emission **FT:** Frequency tolerance
**PLC:** Power Line Conducted Emission **BW:** 20dB Bandwidth

**RADIATED EMISSION TEST:**

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

| EUT CONFIGURE MODE | TESTED CHANNEL | TESTED FREQUENCY (MHZ) | MODULATION TYPE | AXIS |
|---|---|---|---|---|
| A | 1 | 13.56 | ASK | X |

## FREQUENCY TOLERANCE:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.

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

| EUT CONFIGURE MODE | TESTED CHANNEL | TESTED FREQUENCY (MHZ) | MODULATION TYPE | AXIS |
|---|---|---|---|---|
| A | 1 | 13.56 | ASK | X |

## POWER LINE CONDUCTED EMISSION TEST:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.

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

| EUT CONFIGURE MODE | TESTED CHANNEL | TESTED FREQUENCY (MHZ) | MODULATION TYPE | AXIS |
|---|---|---|---|---|
| A | 1 | 13.56 | ASK | X |

## 20dB BANDWIDTH:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.

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

| EUT CONFIGURE MODE | TESTED CHANNEL | TESTED FREQUENCY (MHZ) | MODULATION TYPE | AXIS |
|---|---|---|---|---|
| A | 1 | 13.56 | ASK | X |

**TEST CONDITION:**

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | TEST VOLTAGE (SYSTEM) | TESTED BY |
|---|---|---|---|
| RE | 21deg. C, 63%RH | DC 5V from Adapter | Aaron liang |
| FT | 25deg. C, 60%RH | DC 5V from Adapter | Aaron liang |
| PLC | 25deg. C, 55%RH | DC 5V from Adapter | Aaron liang |
| BW | 25deg. C, 60%RH | DC 5V from Adapter | Aaron liang |

## 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC Part 15, Subpart C. Section 15.225**
**ANSI C63.10-2013**

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

**NOTE:** 1. All test items have been performed and recorded as per the above standards.

2. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (sDOC). The test report has been issued separately.

## 3.4 DESCRIPTION OF SUPPORT UNITS

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

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|---|---|---|---|---|---|
| 1 | - | - | - | - | - |
| 2 | - | - | - | - | - |
| 3 | - | - | - | - | - |

| NO. | DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | N/A |

# 4 TEST TYPES AND RESULTS

## 4.1. CONDUCTED EMISSION MEASUREMENT

### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 ~ 0.5 | 66 to 56 | 56 to 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

**NOTE**: 1.The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.1.2 TEST INSTRUMENTS

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde&Schwarz | ESCS30 | 8471241027 | Mar. 24,20 | Mar. 24,21 |
| Artificial Mains Network | SCHWARZBECK | 8127 | 8127713 | Mar. 24,20 | Mar. 24,21 |
| ISN | Com-Power | ISN T800 | 34373 | Mar. 24,20 | Mar. 24,21 |
| Test software | EZ-EMC | ICP-03A1 | N/A | N/A | N/A |

**NOTE:**

1. The test was performed in shielded room 553.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

### 4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

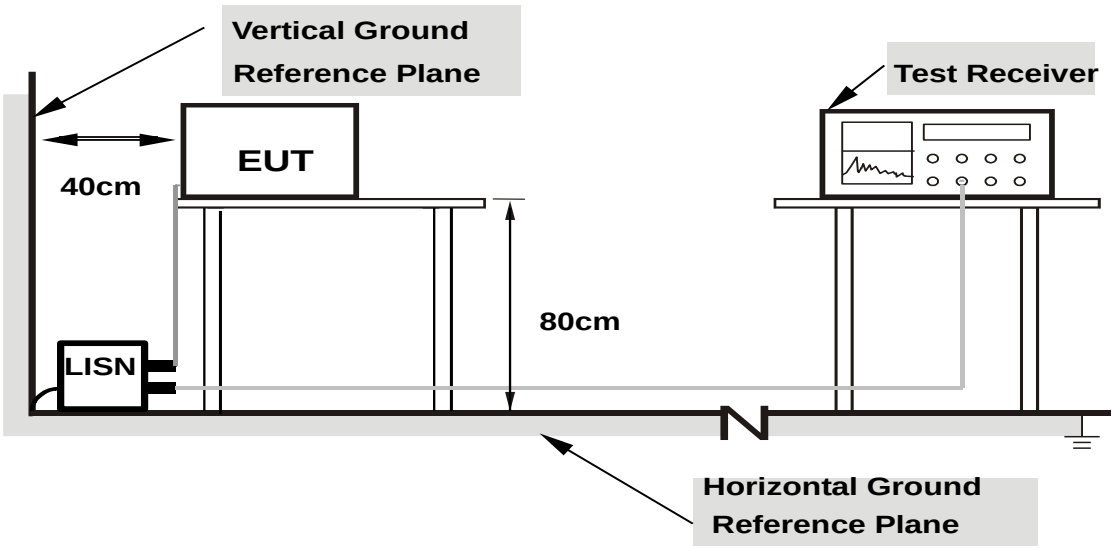
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

## 4.1.5 TEST SETUP




**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

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

## 4.1.6 EUT OPERATING CONDITIONS

a. Turned on the power and connected of all equipment.
b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

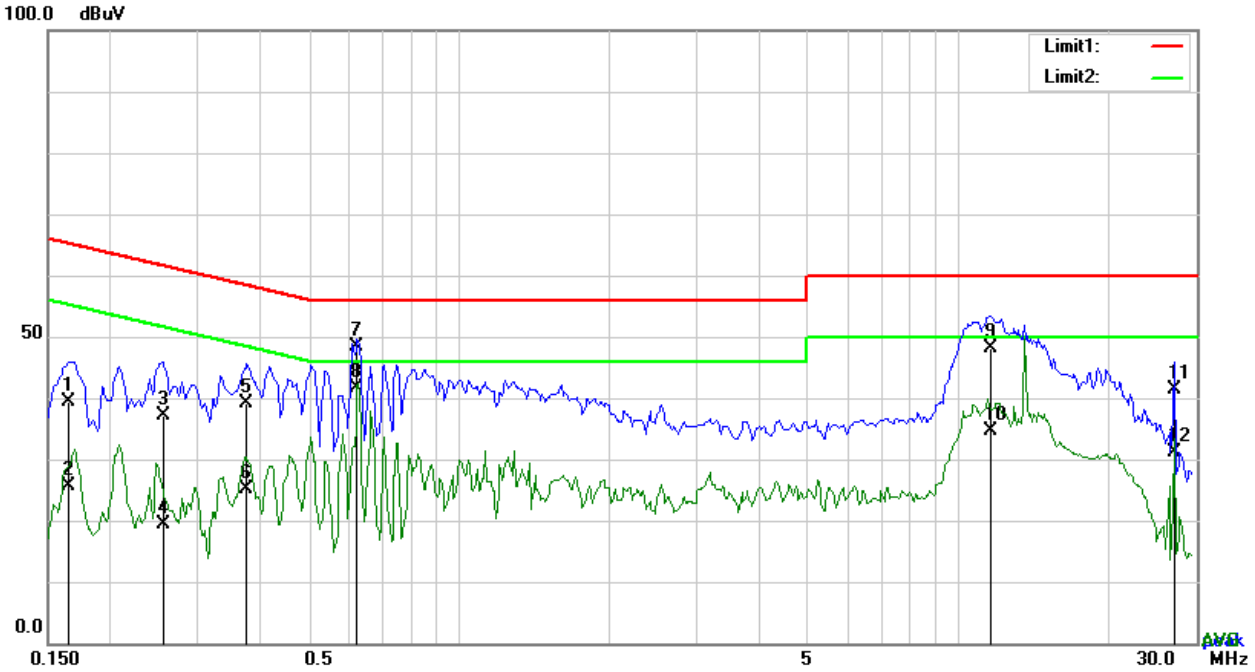
## 4.1.7 TEST RESULTS

### CONDUCTED WORST-CASE DATA:

| PHASE | Line | 6dB BANDWIDTH | 9kHz |
|---|---|---|---|

| No. | P/L | Frequency (MHz) | Reading (dBuV) | Detector | Corrected (dB} | Result (dBuV) | Limit (dBuV) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | L1 | 0.1656 | 29.29 | QP | 10.12 | 39.41 | 65.18 | -25.77 |
| 2 | L1 | 0.1656 | 15.49 | AVG | 10.12 | 25.61 | 55.18 | -29.57 |
| 3 | L1 | 0.2553 | 27.08 | QP | 10.11 | 37.19 | 61.58 | -24.39 |
| 4 | L1 | 0.2553 | 9.39 | AVG | 10.11 | 19.50 | 51.58 | -32.08 |
| 5 | L1 | 0.3762 | 29.00 | QP | 10.11 | 39.11 | 58.36 | -19.25 |
| 6 | L1 | 0.3762 | 14.94 | AVG | 10.11 | 25.05 | 48.36 | -23.31 |
| 7 | L1 | 0.6258 | 38.39 | QP | 10.11 | 48.50 | 56.00 | -7.50 |
| 8 | L1 | 0.6258 | 31.50 | AVG | 10.11 | 41.61 | 46.00 | -4.39 |
| 9 | L1 | 11.5605 | 37.74 | QP | 10.28 | 48.02 | 60.00 | -11.98 |
| 10 | L1 | 11.5605 | 24.42 | AVG | 10.28 | 34.70 | 50.00 | -15.30 |
| 11 | L1 | 27.1215 | 30.82 | QP | 10.59 | 41.41 | 60.00 | -18.59 |
| 12 | L1 | 27.1215 | 20.61 | AVG | 10.59 | 31.20 | 50.00 | -18.80 |

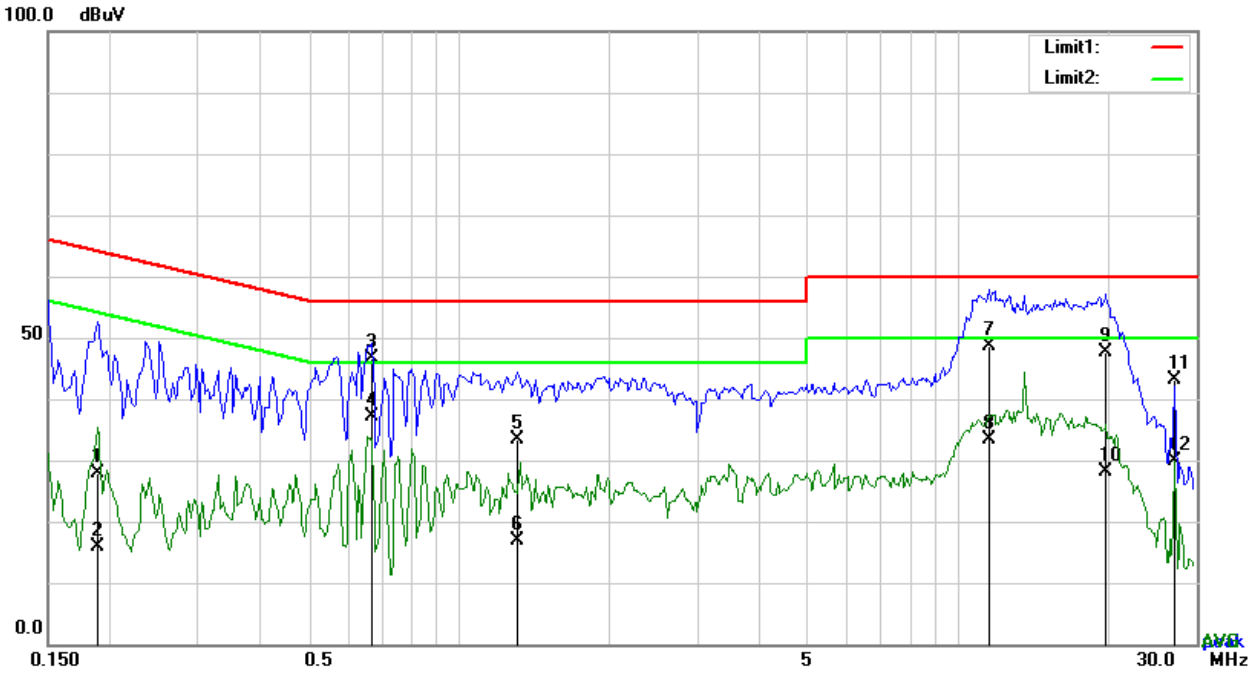
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



| PHASE | Neutral | 6dB BANDWIDTH | 9kHz |
|---|---|---|---|

| No. | P/L | Frequency (MHz) | Reading (dBuV) | Detector | Corrected (dB} | Result (dBuV) | Limit (dBuV) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | N | 0.1890 | 17.62 | QP | 10.14 | 27.76 | 64.08 | -36.32 |
| 2 | N | 0.1890 | 5.85 | AVG | 10.14 | 15.99 | 54.08 | -38.09 |
| 3 | N | 0.6687 | 36.56 | QP | 10.13 | 46.69 | 56.00 | -9.31 |
| 4 | N | 0.6687 | 26.91 | AVG | 10.13 | 37.04 | 46.00 | -8.96 |
| 5 | N | 1.3083 | 23.16 | QP | 10.15 | 33.31 | 56.00 | -22.69 |
| 6 | N | 1.3083 | 6.85 | AVG | 10.15 | 17.00 | 46.00 | -29.00 |
| 7 | N | 11.5488 | 38.42 | QP | 10.28 | 48.70 | 60.00 | -11.30 |
| 8 | N | 11.5488 | 23.14 | AVG | 10.28 | 33.42 | 50.00 | -16.58 |
| 9 | N | 19.8207 | 37.14 | QP | 10.37 | 47.51 | 60.00 | -12.49 |
| 10 | N | 19.8207 | 17.80 | AVG | 10.37 | 28.17 | 50.00 | -21.83 |
| 11 | N | 27.1215 | 32.61 | QP | 10.51 | 43.12 | 60.00 | -16.88 |
| 12 | N | 27.1215 | 19.29 | AVG | 10.51 | 29.80 | 50.00 | -20.20 |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



## 4.2. RADIATED EMISSION AND BANDEDGE MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

The field strength of any emissions shall not exceed the following limits:

(a)15.848mV/m(84dBuV/m) at 30m, within the band 13.553-13.567 MHz;

(b)334uV/m(50.5dBuV/m) at 30m, within the band 13.410-13.553 MHz and 13.567-13.710MHz;

(c)106uV/m(40.5dBuV/m) at 30m, within the band 13.110-13.410 MHz and 13.710-14.010MHz;

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

| FREQUENCIES (MHz) | FIELD STRENGTH (microvolts/meter) | MEASUREMENT DISTANCE (meters) |
|---|---|---|
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 |
| 1.705 ~ 30.0 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

**NOTE**:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

Example:

13.56MHz = 15848uV/m 30m
= 84dBuV/m 30m
= $84+20\log(30/3)^2$ 3m
= 124dBuV/m

## 4.2.2 TEST INSTRUMENTS

**FREQUENCY RANGE BELOW 1GHz**

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde&Schwarz | ESL6 | 1300.5001K06-100262-eQ | Mar. 24,20 | Mar. 24,21 |
| Bilog Antenna | Sunol Sciences | JB6 | A110712 | Apr. 08, 20 | Apr. 07, 21 |
| Active Antenna | CMO-POWER | AL-130 | 121031 | Mar. 27, 20 | Mar. 26, 21 |
| Signal Amplifier | HP | 8447E | 443008 | Mar. 24, 20 | Mar. 24, 21 |
| 3m Semi-anechoic Chamber | SAEMC | 9m*6m*6m | N/A | Oct. 18,18 | Oct. 17,21 |
| Test Software | EZ-EMC | ICP-03A1 | N/A | N/A | N/A |

**NOTE:**

1. The test was performed in 966 Chamber (a 3m Semi-anechoic chamber).
2. The calibration interval of the above test instruments are 12 months (Except 3m Semi-anechoic Chamber). And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above1GHz if tested.
4. The FCC Site Registration No. is 535293.

## 4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3&10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

g. For below 30MHz, a loop antenna with its plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

**NOTE:**

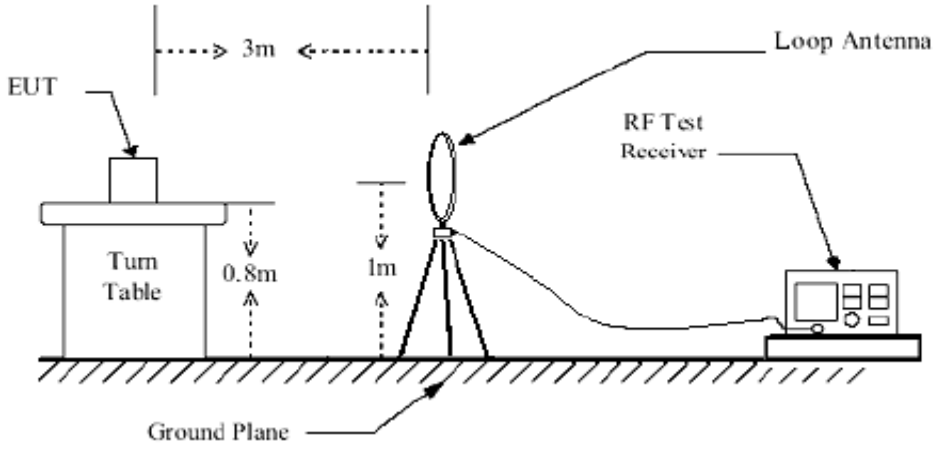
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

## 4.2.4 DEVIATION FROM TEST STANDARD

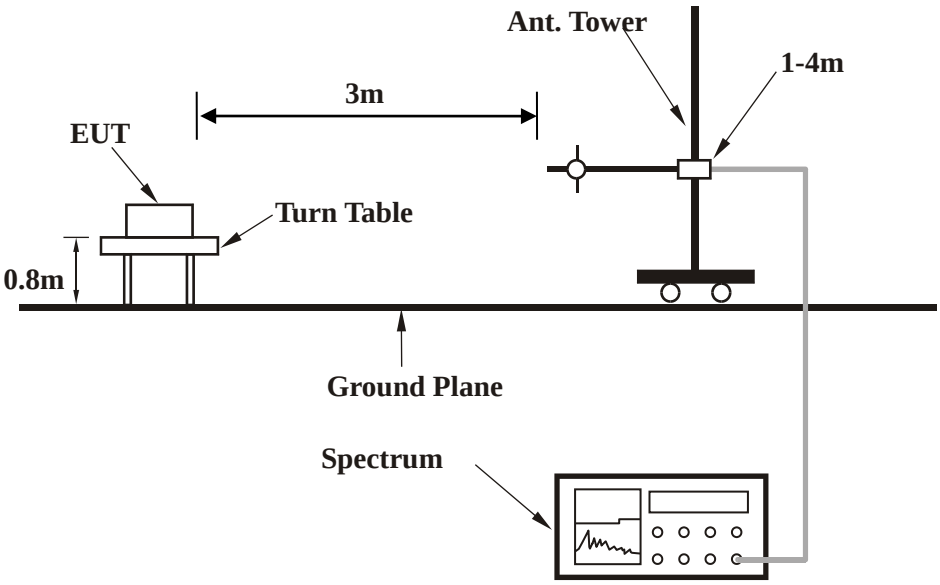
No deviation.

## 4.2.5 TEST SETUP

### Below 30MHz test setup




### Below 1GHz test setup




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

## 4.2.6 EUT OPERATING CONDITIONS

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

## 4.2.7 TEST RESULTS

### FIELD STRENGTH (BELOW 30MHZ AT 3M)

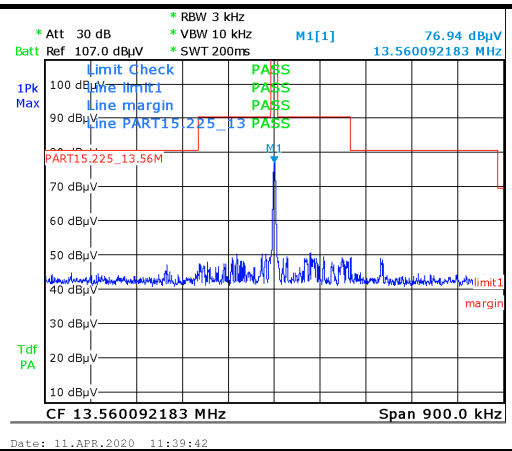
| No. | Freq. (MHz) | Correction Factor (dB/m) | Raw Value (dBuV) | Emission Level (dBuV/m) | Polarity (0° / 90°) | Limit (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 1 | *13.56(QP) | 20.87 | 56.07 | 76.94 | 0° | 124 | -47.06 |
| 2 | 27.12(QP) | 19.71 | 18.67 | 38.38 | 0° | 69.5 | -31.12 |
| 3 | *13.56(QP) | 20.87 | 47.66 | 68.53 | 90° | 124 | -55.47 |
| 4 | 27.12(QP) | 19.71 | 15.56 | 35.27 | 90° | 69.5 | -34.23 |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

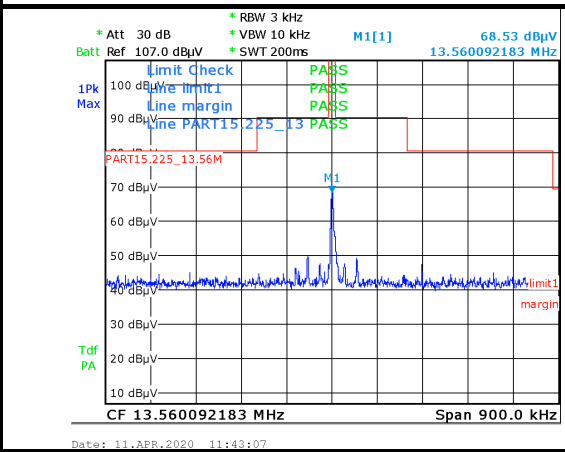
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. For the test results, both 0° and 360° ( Parallel, perpendicular, parallel to the ground ) of the antenna are set to make the measurement, All emissions are greater than 20dB below the limit.

**TEST PLOT**

0°




90°



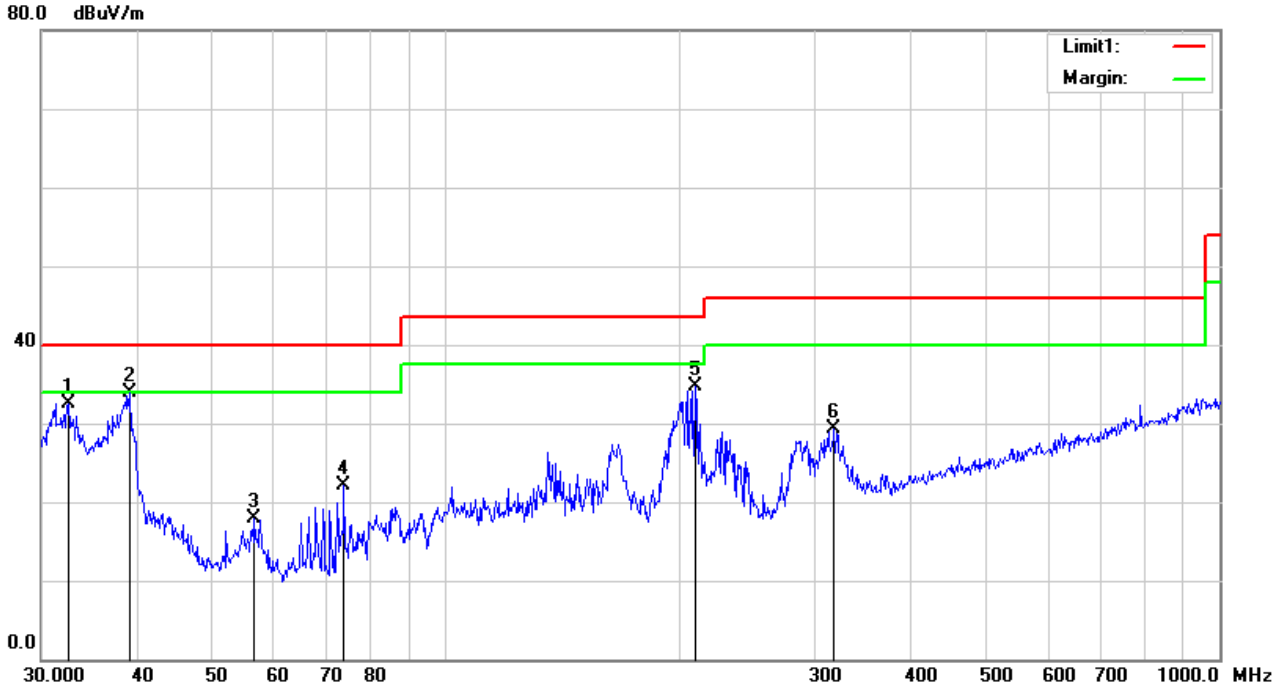
## BELOW 1GHz WORST-CASE DATA:

| CHANNEL | 13.56MHz | DETECTOR FUNCTION | Quasi-Peak (QP) |
|---|---|---|---|
| FREQUENCY RANGE | 9KHz ~ 1GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency | Reading | Ant_F | PA_G | Cab_L | Result | Limit | Margin | Height | Degree |
| | (MHz) | (dBuV/m) | (dB/m) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (°) |
| 1 | 32.5198 | 35.24 | 19.46 | 22.26 | 0.14 | 32.58 | 40.00 | -7.42 | 100 | 0 |
| 2 | 39.0245 | 41.46 | 14.61 | 22.27 | 0.18 | 33.98 | 40.00 | -6.02 | 100 | 0 |
| 3 | 56.5929 | 32.43 | 7.67 | 22.40 | 0.25 | 17.95 | 40.00 | -22.05 | 300 | 210 |
| 4 | 73.8756 | 36.33 | 7.72 | 22.40 | 0.42 | 22.07 | 40.00 | -17.93 | 100 | 176 |
| 5 | 210.0482 | 43.45 | 11.96 | 22.36 | 1.56 | 34.61 | 43.50 | -8.89 | 100 | 249 |
| 6 | 317.7011 | 35.81 | 13.97 | 22.24 | 1.77 | 29.31 | 46.00 | -16.69 | 100 | 292 |

**REMARK:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.

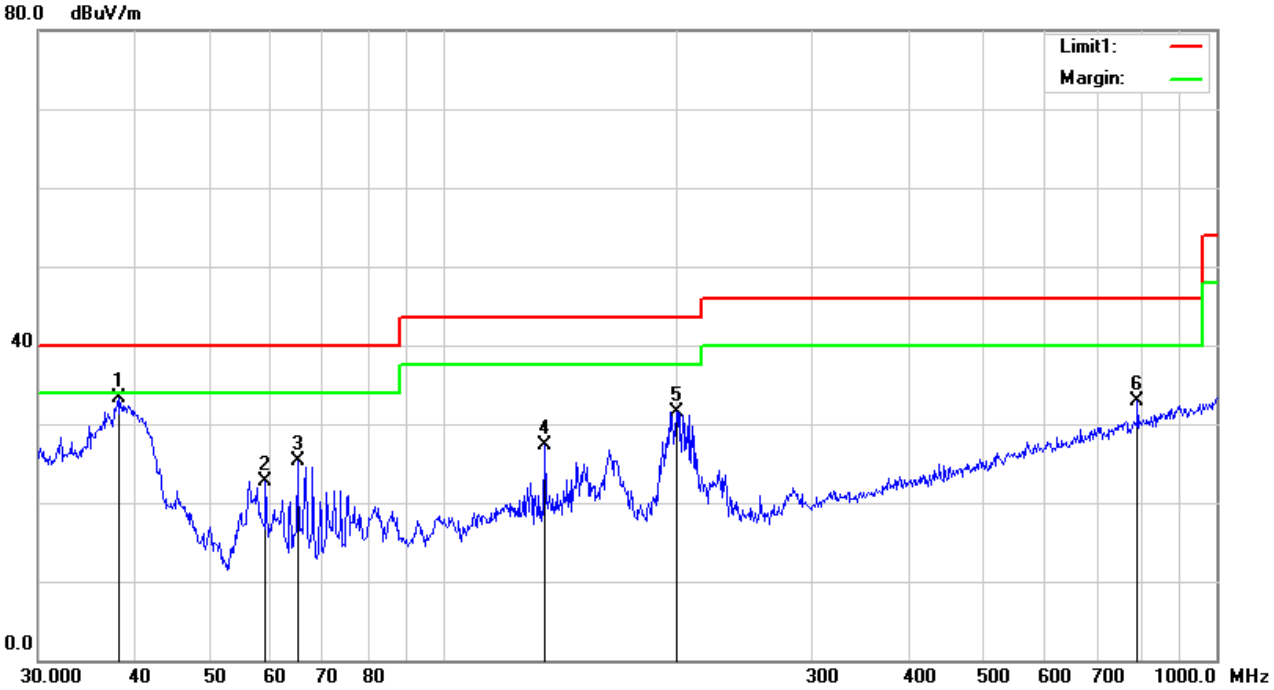


| CHANNEL | 13.56MHz | DETECTOR FUNCTION | Quasi-Peak (QP) |
|---|---|---|---|
| FREQUENCY RANGE | 9KHz ~ 1GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency | Reading | Ant_F | PA_G | Cab_L | Result | Limit | Margin | Height | Degree |
| | (MHz) | (dBuV/m) | (dB/m) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (°) |
| 1 | 38.0783 | 40.06 | 15.30 | 22.27 | 0.17 | 33.26 | 40.00 | -6.74 | 100 | 73 |
| 2 | 59.0251 | 37.36 | 7.41 | 22.41 | 0.26 | 22.62 | 40.00 | -17.38 | 100 | 107 |
| 3 | 64.8865 | 39.91 | 7.54 | 22.40 | 0.30 | 25.35 | 40.00 | -14.65 | 100 | 107 |
| 4 | 135.5062 | 35.59 | 12.89 | 22.40 | 1.15 | 27.23 | 43.50 | -16.27 | 200 | 224 |
| 5 | 200.6881 | 40.25 | 12.09 | 22.38 | 1.55 | 31.51 | 43.50 | -11.99 | 100 | 0 |
| 6 | 790.6188 | 30.32 | 21.29 | 21.17 | 2.54 | 32.98 | 46.00 | -13.02 | 100 | 0 |

**REMARK:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.



## 4.3. FREQUENCY TOLERANCE

### 4.3.1. LIMIT OF FREQUENCY TOLERANCE

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

### 4.3.2. TEST INSTRUMENTS

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| Wireless Connectivity Tester | R&S | CMW270 | 1201.0002K75 | Dec. 18, 19 | Dec. 17, 20 |
| MXA VEXTOR SIGNAL | Agilent | n5182a | MY50140530 | Mar. 24,20 | Mar. 24,21 |
| MXA signal analyzer | Agilent | n9020a | MY49100060 | Mar. 24,20 | Mar. 24,21 |
| RF Control Unit | Tonscend | JS0806-2 | 188060112 | Mar. 24,20 | Mar. 24,21 |
| Signal Generation | Agilent | E4421B | US40051152 | Dec. 18, 19 | Dec. 17, 20 |
| DC Power Supply | Agilent | E3640A | MY40004013 | Mar. 28,20 | Mar. 27,21 |
| Programmable Temperature & Humidity Chamber | Hongjin | HYC-TH-225 DH | DG-180746 | Mar. 24,20 | Mar. 24,21 |
| Test System | Tonscend | JS 1120-3 | N/A | N/A | N/A |
| Power Splitter | Weinschel | 1580-1 | TL177 | Mar. 20,20 | Mar. 19,21 |
| Universal Radio Communication | ROHDE&SCHWARZ | CMU200 | 112012 | Mar. 24,20 | Mar. 24,21 |
| Universal Radio Communication | ROHDE&SCHWARZ | CMU200 | 121393 | Mar. 28,20 | Mar. 27,21 |
| Wireless Communication Test Set | ROHDE&SCHWARZ | CMW500 | 1201.0002K500-155842-Gd | Nov. 01, 19 | Oct. 31, 20 |

**NOTE:**

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

### 4.3.3. TEST PROCEDURES

a) The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.

b) Turn the EUT on and couple its output to a spectrum analyzer.

c) Turn the EUT off and set the chamber to the highest temperature specified.

d) Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.

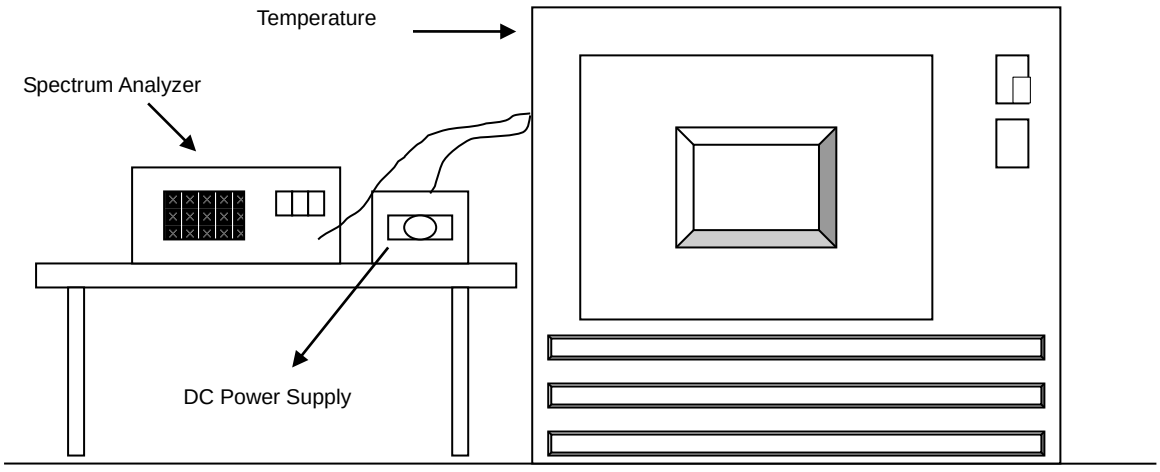
e) Repeat step c) and d) with the temperature chamber set to the lowest temperature.

f) The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

### 4.3.4. DEVIATION FROM TEST STANDARD

No deviation.

### 4.3.5. TEST SETUP



## 4.3.6. EUT OPERATING CONDITIONS

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

## 4.3.7. TEST RESULTS

| FREQUEMCY STABILITY VERSUS TEMP. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TEMP. (℃) | POWER SUPPLY (V) | 0 MINUTE | | 2 MINUTE | | 5 MINUTE | | 10 MINUTE | |
| | | Measured Frequency | Frequency Drift | Measured Frequency | Frequency Drift | Measured Frequency | Frequency Drift | Measured Frequency | Frequency Drift |
| | | (MHz) | % | (MHz) | % | (MHz) | % | (MHz) | % |
| 50 | 5V | 13.56027 | 0.00199 | 13.56015 | 0.00111 | 13.56057 | 0.00420 | 13.56013 | 0.00096 |
| 40 | 5V | 13.56010 | 0.00074 | 13.56023 | 0.00170 | 13.56041 | 0.00302 | 13.56020 | 0.00147 |
| 30 | 5V | 13.56019 | 0.00140 | 13.56059 | 0.00435 | 13.56044 | 0.00324 | 13.56055 | 0.00406 |
| 20 | 5V | 13.56043 | 0.00317 | 13.56033 | 0.00243 | 13.56060 | 0.00442 | 13.56051 | 0.00376 |
| 10 | 5V | 13.56032 | 0.00236 | 13.56054 | 0.00398 | 13.56018 | 0.00133 | 13.56052 | 0.00383 |
| 0 | 5V | 13.56028 | 0.00206 | 13.56045 | 0.00332 | 13.56059 | 0.00435 | 13.56022 | 0.00162 |
| -10 | 5V | 13.56034 | 0.00251 | 13.56041 | 0.00302 | 13.56010 | 0.00074 | 13.56019 | 0.00140 |
| -20 | 5V | 13.56050 | 0.00369 | 13.56040 | 0.00295 | 13.56020 | 0.00147 | 13.56011 | 0.00081 |

| FREQUEMCY STABILITY VERSUS VOLTAGE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TEMP. (℃) | POWER SUPPLY (V) | 0 MINUTE | | 2 MINUTE | | 5 MINUTE | | 10 MINUTE | |
| | | Measured Frequency | Frequency Drift | Measured Frequency | Frequency Drift | Measured Frequency | Frequency Drift | Measured Frequency | Frequency Drift |
| | | (MHz) | % | (MHz) | % | (MHz) | % | (MHz) | % |
| 20 | 4.5V | 13.56012 | 0.00088 | 13.56037 | 0.00273 | 13.56026 | 0.00192 | 13.56051 | 0.00376 |
| | 5V | 13.56042 | 0.00310 | 13.56026 | 0.00192 | 13.56022 | 0.00162 | 13.56049 | 0.00361 |
| | 5.5V | 13.56025 | 0.00184 | 13.56037 | 0.00273 | 13.56016 | 0.00118 | 13.56018 | 0.00133 |

## 4.4. 20dB BANDWIDTH

### 4.4.1 LIMITS OF 20dB BANDWIDTH

The 20dB bandwidth shall be specified in operating frequency band.(13.11MHz – 14.01MHz)

### 4.4.2 TEST INSTRUMENTS

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| Wireless Connectivity Tester | R&S | CMW270 | 1201.0002K75 | Dec. 18, 19 | Dec. 17, 20 |
| MXA VEXTOR SIGNAL | Agilent | n5182a | MY50140530 | Mar. 24,20 | Mar. 24,21 |
| MXA signal analyzer | Agilent | n9020a | MY49100060 | Mar. 24,20 | Mar. 24,21 |
| RF Control Unit | Tonscend | JS0806-2 | 188060112 | Mar. 24,20 | Mar. 24,21 |
| Signal Generation | Agilent | E4421B | US40051152 | Dec. 18, 19 | Dec. 17, 20 |
| DC Power Supply | Agilent | E3640A | MY40004013 | Mar. 28,20 | Mar. 27,21 |
| Programmable Temperature & Humidity Chamber | Hongjin | HYC-TH-225 DH | DG-180746 | Mar. 24,20 | Mar. 24,21 |
| Test System | Tonscend | JS 1120-3 | N/A | N/A | N/A |
| Power Splitter | Weinschel | 1580-1 | TL177 | Mar. 20,20 | Mar. 19,21 |
| Universal Radio Communication | ROHDE&SCHWARZ | CMU200 | 112012 | Mar. 24,20 | Mar. 24,21 |
| Universal Radio Communication | ROHDE&SCHWARZ | CMU200 | 121393 | Mar. 28,20 | Mar. 27,21 |
| Wireless Communication Test Set | ROHDE&SCHWARZ | CMW500 | 1201.0002K50 0-155842-Gd | Nov. 01, 19 | Oct. 31, 20 |

**NOTE:**

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

### 4.4.3 TEST PROCEDURE

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

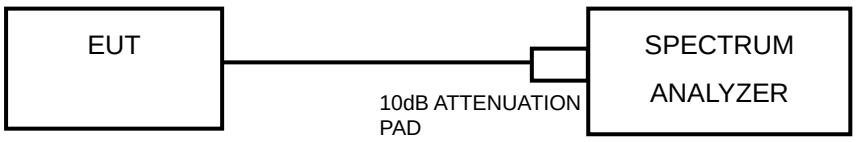
c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.

d. Repeat above procedures until all frequencies measured were complete.

### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.4.5 TEST SETUP



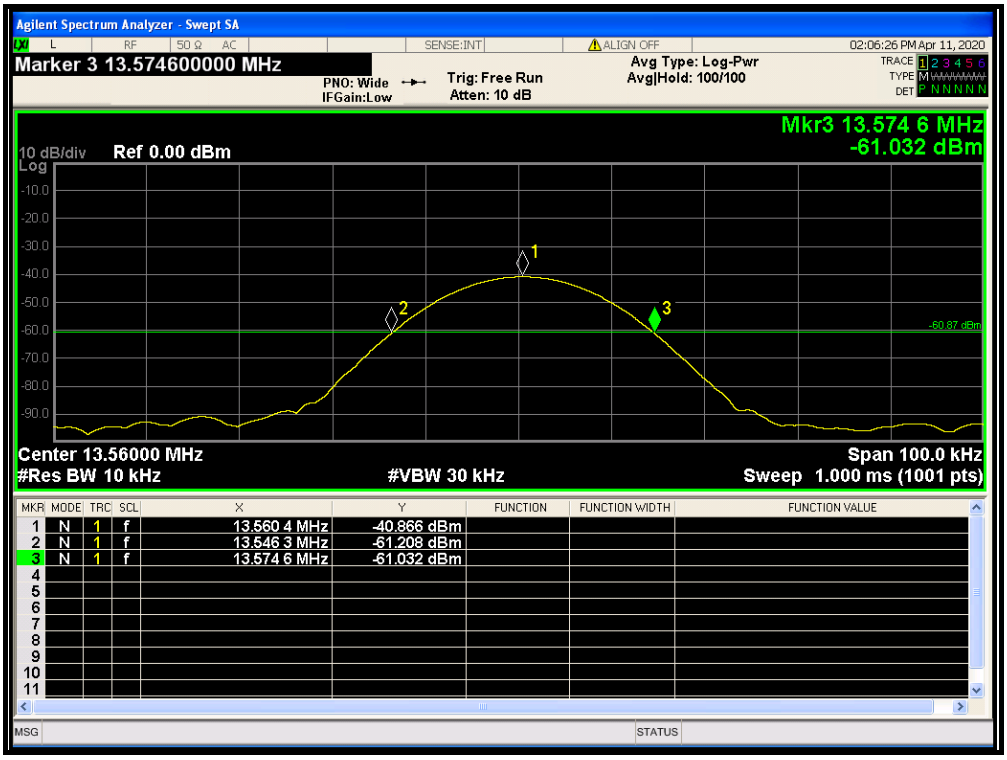
### 4.4.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously.

### 4.4.7 TEST RESULTS

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (KHz) |
|---|---|---|
| 1 | 13.56 | 28.3 |

| Lower & Upper Test Frequency Point (MHz) | Test Frequency (MHz) | P/F |
|---|---|---|
| Lower | 13.5463 | PASS |
| Upper | 13.5746 | PASS |



# 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

# 6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

**---END---**