



# FCC TEST REPORT

## FCC ID:2A87M-D4

Report Number.....: ZKT-2211238787E-1

Date of Test..... Feb. 02, 2023 to Feb. 08, 2023

Date of issue.....: Feb. 08, 2023

Total number of pages..... 24

Test Result .....: PASS

**Testing Laboratory.....: Shenzhen ZKT Technology Co., Ltd.**

Address .....: 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

**Applicant's name .....: ShenZhen PanWei Electronics Co.,Ltd**

Address .....: Floor 5, fudigang second industrial zone, pingdi street, longgang district, shenzhen

**Manufacturer's name .....: ShenZhen PanWei Electronics Co.,Ltd**

Address .....: Floor 5, fudigang second industrial zone, pingdi street, longgang district, shenzhen

Test specification:

Standard.....: FCC CFR Title 47 Part 15 Subpart C Section 15.225  
ANSI C63.10:2013

Test procedure.....: /

Non-standard test method .....: N/A

**Test Report Form No.....: TRF-EL-112\_V0**

**Test Report Form(s) Originator.....: ZKT Testing**

**Master TRF .....: Dated: 2020-01-06**

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Product name.....: Bluetooth fingerprint lock**

Trademark .....: N/A

Model/Type reference.....: D4  
D1, D2, D3

Ratings.....: Input: Battery 1.5V\*4



**Testing procedure and testing location:**

**Testing Laboratory.....: Shenzhen ZKT Technology Co., Ltd.**

**Address.....: 1/F, No. 101, Building B, No. 6, Tangwei Community  
Industrial Avenue, Fuhai Street, Bao'an District,  
Shenzhen, China**

**Tested by (name + signature).....: Tom Zou**

*Tom Zou*

**Reviewer (name + signature).....: Jackson Fang**

*Jackson Fang*

**Approved (name + signature).....: Lake Xie**





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**1.VERSION**

| Report No.        | Version | Description             | Approved      |
|-------------------|---------|-------------------------|---------------|
| ZKT-2211238787E-1 | Rev.01  | Initial issue of report | Feb. 08, 2023 |
|                   |         |                         |               |
|                   |         |                         |               |



## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.225) , Subpart C |   |          |        |
|---------------------------------|---|----------|--------|
| Standard Section                | Test Item   | Judgment | Remark |
| FCC part 15.203                 | Antenna requirement                                 | PASS     |        |
| FCC part 15.207                 | AC Power Line Conducted Emission                    | N/A      |        |
| FCC part 15.225(a)(b)(c)(d)     | Fundamental &Radiated Spurious Emission Measurement | PASS     |        |
| FCC part 15.215                 | Channel Bandwidth                                   | PASS     |        |
| FCC part 15.225(e)              | Frequency Tolerance                                 | PASS     |        |

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report



## 2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.

Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225

Designation Number: CN1299

IC Registered No.: 27033

## 2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$  , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$  , providing a level of confidence of approximately 95 % .

| No. | Item                         | Uncertainty               |
|-----|------------------------------|---------------------------|
| 1   | Conducted Emission Test      | $\pm 1.38\text{dB}$       |
| 2   | RF power conducted           | $\pm 0.16\text{dB}$       |
| 3   | Spurious emissions conducted | $\pm 0.21\text{dB}$       |
| 4   | All emissions radiated(<1G)  | $\pm 4.68\text{dB}$       |
| 5   | All emissions radiated(>1G)  | $\pm 4.89\text{dB}$       |
| 6   | Temperature                  | $\pm 0.5^{\circ}\text{C}$ |
| 7   | Humidity                     | $\pm 2\%$                 |



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                          |  |
|--------------------------|--|
| Product Name:            | Bluetooth fingerprint lock   |
| Model No.:               | D4   |
| Model Different.:        | The product models D4,D1, D2, D3, are identical in the same PCB layout, interior structure and electrical circuits, Only the key panelkey panel are different. |
| Serial No.:              | D1, D2, D3   |
| Hardware Version:        | H1.0   |
| Software Version:        | S1.0   |
| Sample(s) Status:        | Engineer sample  |
| Operation Frequency:     | 13.56MHz   |
| Channel Numbers:         | 1  |
| Channel Separation:      | N/A  |
| Modulation Type:         | ASK  |
| Antenna Type:            | Loop Antenna   |
| Antenna gain:            | 0dBi   |
| Power supply:            | Input: Battery 1.5V*4  |
| SWITCHING POWER ADAPTER: | N/A  |

#### 3.2 TEST CHANNEL

| Channel List |                |         |                |
|--------------|----------------|---------|----------------|
| Channel      | Frequency(MHz) | Channel | Frequency(MHz) |
| 01           | 13.56          |         |                |



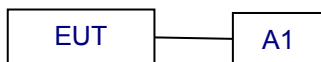


### 3.3 DESCRIPTION OF TEST MODES

|   |  |
|---|--|
| Transmitting mode   | Keep the EUT in continuously transmitting NFC mode |
| Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data. |  |

### 3.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

#### Radiated Emission



#### Conducted Spurious



### 3.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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

| Item | Equipment                  | Mfr/Brand | Model/Type No. | Series No. | Note      |
|------|----------------------------|-----------|----------------|------------|-----------|
| E-1  | Bluetooth fingerprint lock | N/A       | D4             | D1, D2, D3 | EUT       |
| A1   | AAA Battery*4              | NANFU     | N/A            | N/A        | Auxiliary |
|      |                            |           |                |            |           |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |

#### Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) EUT used new batteries during test.



### 3.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

#### Radiation Test equipment

| Item | Equipment                         | Manufacturer   | Type No.        | Serial No.        | Last calibration | Calibrated until |
|------|-----------------------------------|----------------|-----------------|-------------------|------------------|------------------|
| 1    | Spectrum Analyzer (9kHz-26.5GHz)  | KEYSIGHT       | 9020A           | MY55370835        | Oct. 28, 2022    | Oct. 27, 2023    |
| 2    | Spectrum Analyzer (10kHz-39.9GHz) | R&S            | FSQ             | 100363            | Oct. 28, 2022    | Oct. 27, 2023    |
| 3    | EMI Test Receiver (9kHz-7GHz)     | R&S            | ESCI7           | 101169            | Oct. 28, 2022    | Oct. 27, 2023    |
| 4    | Bilog Antenna (30MHz-1500MHz)     | Schwarzbeck    | VULB9168        | N/A               | Nov. 02, 2022    | Nov. 01, 2023    |
| 5    | Horn Antenna (1GHz-18GHz)         | Agilent        | AH-118          | 071145            | Nov. 01, 2022    | Oct. 31, 2023    |
| 6    | Horn Antenna (15GHz-40GHz)        | A.H.System     | SAS-574         | 588               | Oct. 28, 2022    | Oct. 27, 2023    |
| 7    | Loop Antenna                      | TESEQ          | HLA6121         | 58357             | Nov. 01, 2022    | Oct. 31, 2023    |
| 8    | Amplifier (30-1000MHz)            | EM Electronics | EM330 Amplifier | 060747            | Nov. 15, 2022    | Nov. 14, 2023    |
| 9    | Amplifier (1GHz-26.5GHz)          | Agilent        | 8449B           | 3008A00315        | Oct. 28, 2022    | Oct. 27, 2023    |
| 10   | Amplifier (500MHz-40GHz)          | 全聚达            | DLE-161         | 097               | Oct. 28, 2022    | Oct. 27, 2023    |
| 11   | Test Cable                        | N/A            | R-01            | N/A               | Oct. 28, 2022    | Oct. 27, 2023    |
| 12   | Test Cable                        | N/A            | R-02            | N/A               | Oct. 28, 2022    | Oct. 27, 2023    |
| 13   | Test Cable                        | N/A            | R-03            | N/A               | Oct. 28, 2022    | Oct. 27, 2023    |
| 14   | Test Cable                        | N/A            | RF-01           | N/A               | Oct. 28, 2022    | Oct. 27, 2023    |
| 15   | Test Cable                        | N/A            | RF-02           | N/A               | Oct. 28, 2022    | Oct. 27, 2023    |
| 16   | Test Cable                        | N/A            | RF-03           | N/A               | Oct. 28, 2022    | Oct. 27, 2023    |
| 17   | ESG Signal Generator              | Agilent        | E4421B          | N/A               | Oct. 21, 2022    | Oct. 20, 2023    |
| 18   | Signal Generator                  | Agilent        | N5182A          | N/A               | Oct. 21, 2022    | Oct. 20, 2023    |
| 19   | Magnetic Field Probe Tester       | Narda          | ELT-400         | 0-0344            | Nov. 15, 2022    | Nov. 14, 2023    |
| 20   | Wideband Radio Communication Test | R&S            | CMW500          | 106504            | Oct. 28, 2022    | Oct. 27, 2023    |
| 21   | MWRF Power Meter Test system      | MW             | MW100-RPCB      | N/A               | Oct. 21, 2022    | Oct. 20, 2023    |
| 22   | D.C. Power Supply                 | LongWei        | TPR-6405D       | N/A               | \                | \                |
| 23   | EMC Software                      | Frad           | EZ-EMC          | Ver.EMC-CON 3A1.1 | \                | \                |
| 24   | RF Software                       | MW             | MTS8310         | V2.0.0.0          | \                | \                |
| 25   | Turntable                         | MF             | MF-7802BS       | N/A               | \                | \                |
| 26   | Antenna tower                     | MF             | MF-7802BS       | N/A               | \                | \                |



Conducted emissions Test

| Item | Kind of Equipment   | Manufacturer | Type No. | Serial No.           | Last calibration | Calibrated until |
|------|---------------------|--------------|----------|----------------------|------------------|------------------|
| 1    | LISN                | R&S          | ENV216   | 101471               | Oct. 21, 2022    | Oct. 20, 2023    |
| 2    | LISN                | CYBERTEK     | EM5040A  | E1850400149          | Oct. 21, 2022    | Oct. 20, 2023    |
| 3    | Test Cable          | N/A          | C-01     | N/A                  | Oct. 21, 2022    | Oct. 20, 2023    |
| 4    | Test Cable          | N/A          | C-02     | N/A                  | Oct. 21, 2022    | Oct. 20, 2023    |
| 5    | Test Cable          | N/A          | C-03     | N/A                  | Oct. 21, 2022    | Oct. 20, 2023    |
| 6    | EMI Test Receiver   | R&S          | ESCI3    | 101393               | Oct. 28, 2022    | Oct. 27, 2023    |
| 7    | Triple-Loop Antenna | N/A          | RF300    | N/A                  | Oct. 28, 2022    | Oct. 27, 2023    |
| 8    | Absorbing Clamp     | DZ           | ZN23201  | 15034                | Oct. 31, 2022    | Oct. 30, 2023    |
| 9    | EMC Software        | Frad         | EZ-EMC   | Ver.EMC-CON<br>3A1.1 | \                | \                |



#### 4. EMC EMISSION TEST

##### 4.1 CONDUCTED EMISSION MEASUREMENT

|                       |                                      |
|-----------------------|--------------------------------------|
| Test Requirement:     | FCC Part15 C Section 15.207          |
| Test Method:          | ANSI C63.10:2013                     |
| Test Frequency Range: | 150KHz to 30MHz                      |
| Receiver setup:       | RBW=9KHz, VBW=30KHz, Sweep time=auto |

##### 4.1.1 POWER LINE CONDUCTED EMISSION Limits

| FREQUENCY (MHz) | Limit (dBuV) |           | Standard |
|-----------------|--------------|-----------|----------|
|                 | Quas-peak    | Average   |          |
| 0.15 -0.5       | 66 - 56 *    | 56 - 46 * | FCC      |
| 0.50 -5.0       | 56.00        | 46.00     | FCC      |
| 5.0 -30.0       | 60.00        | 50.00     | FCC      |

Note:

(1) \*Decreases with the logarithm of the frequency.

##### 4.1.2 TEST PROCEDURE

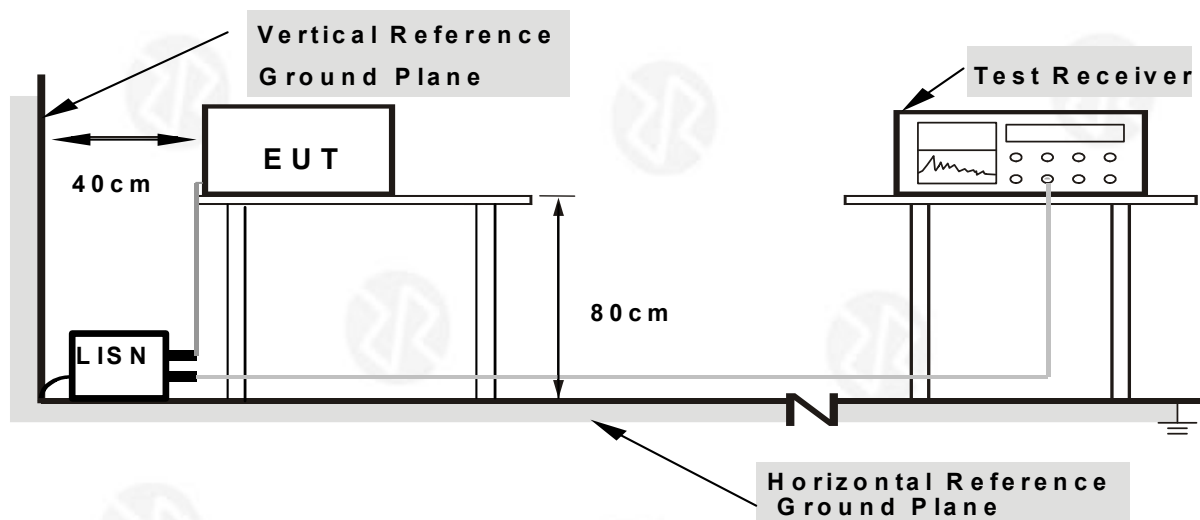
- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

##### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation



#### 4.1.4 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 cm from other units and other metal planes

#### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

#### 4.1.6 Test Result

N/A

The EUT is powered by DC only. The test items is not applicable.



#### 4.2 RADIATED EMISSION MEASUREMENT

|                       |                             |            |        |        |            |
|-----------------------|-----------------------------|------------|--------|--------|------------|
| Test Requirement:     | FCC Part15 C Section 15.209 |            |        |        |            |
| Test Method:          | ANSI C63.10:2013            |            |        |        |            |
| Test Frequency Range: | 9kHz to 1GHz                |            |        |        |            |
| Test site:            | Measurement Distance: 3m    |            |        |        |            |
| Receiver setup:       | Frequency                   | Detector   | RBW    | VBW    | Value      |
|                       | 9KHz-150KHz                 | Quasi-peak | 200Hz  | 600Hz  | Quasi-peak |
|                       | 150KHz-30MHz                | Quasi-peak | 9KHz   | 30KHz  | Quasi-peak |
|                       | 30MHz-1GHz                  | Quasi-peak | 100KHz | 300KHz | Quasi-peak |
|                       | Above 1GHz                  | Peak       | 1MHz   | 3MHz   | Peak       |
|                       |                             | Peak       | 1MHz   | 10Hz   | Average    |

##### 4.2.1 RADIATED EMISSION LIMITS

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/meter) | Measurement Distance<br>(meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009~0.490          | 2400/F(KHz)                          | 300                              |
| 0.490~1.705          | 24000/F(KHz)                         | 30                               |
| 1.705~30.0           | 30                                   | 30                               |
| 30~88                | 100                                  | 3                                |
| 88~216               | 150                                  | 3                                |
| 216~960              | 200                                  | 3                                |
| Above 960            | 500                                  | 3                                |

Field Strength of Fundamental Limit:

- The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters. 15,848 microvolts/meter at 3 meters=124 dBuV/m.
- Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters. 334 microvolts/meter at 3 meters=90.47 dBuV/m.

##### 4.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.





f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

g. For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

Note:

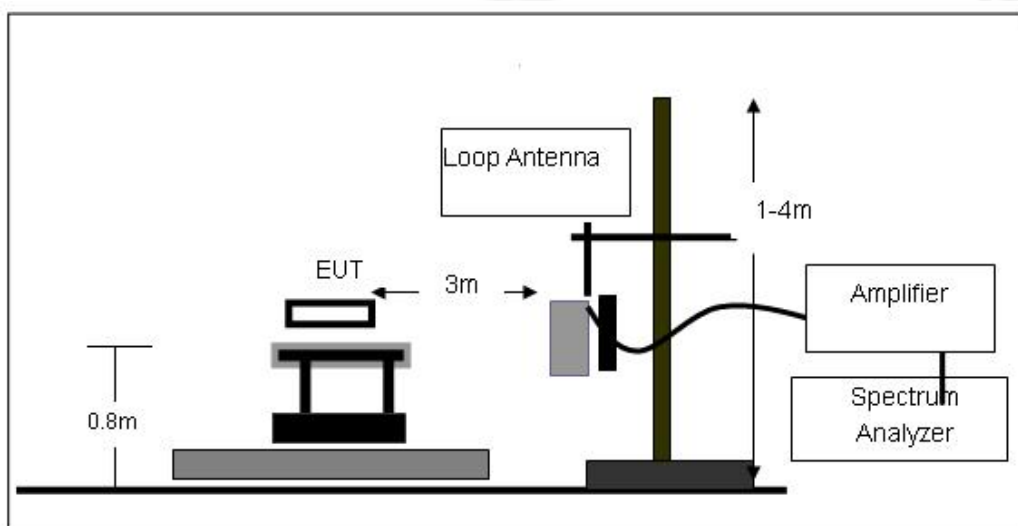
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

#### 4.2.3 DEVIATION FROM TEST STANDARD

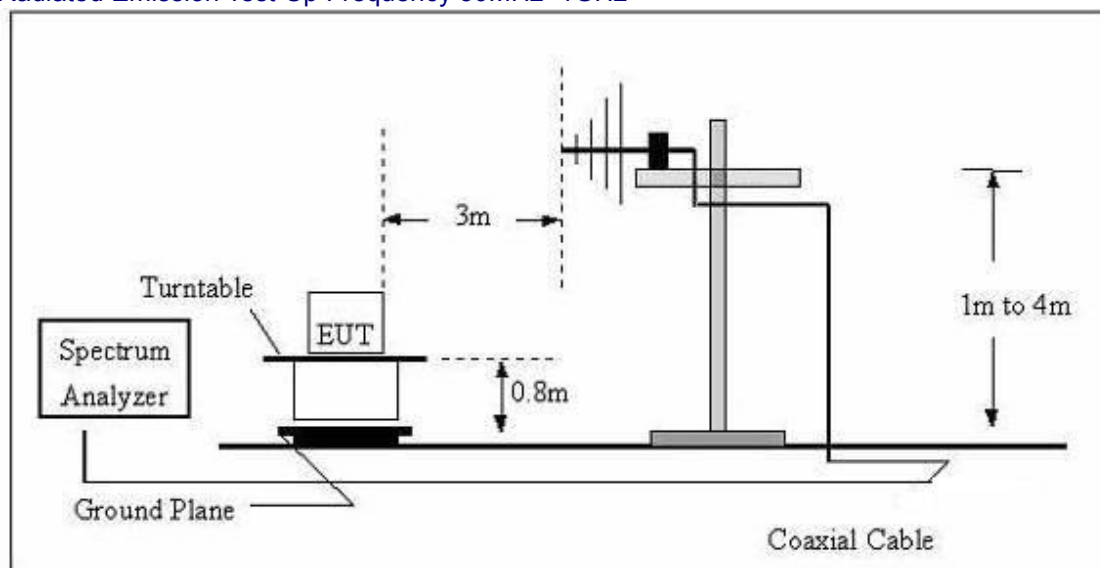
No deviation

#### 4.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz

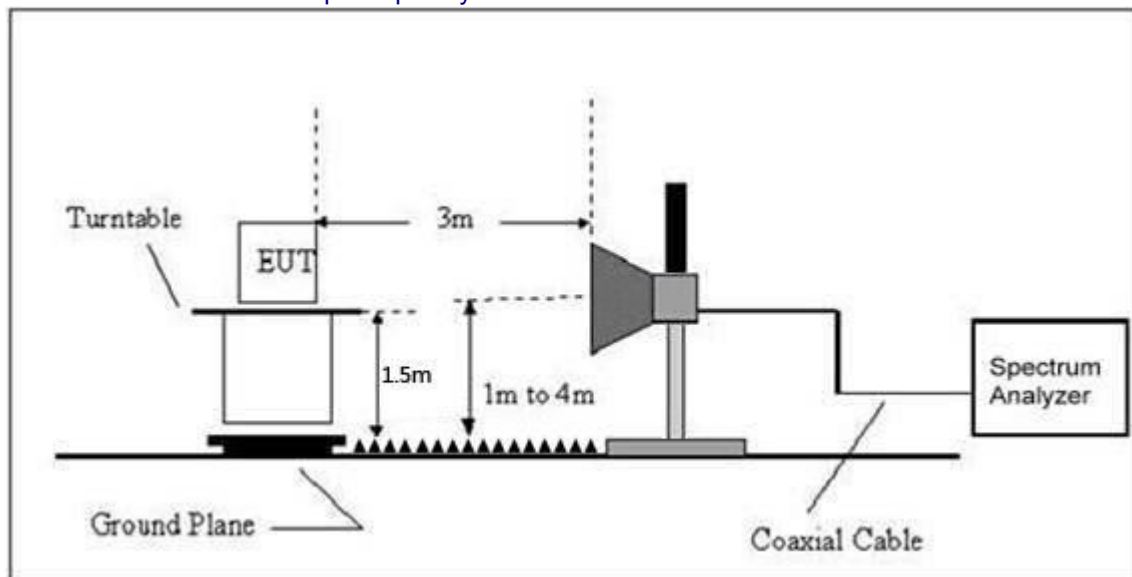


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(C) Radiated Emission Test-Up Frequency Above 1GHz



4.2.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

4.2.6 TEST RESULTS

Field Strength of Fundamental

| Frequency (MHz) | Reading (dBuV/m) | Correction Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar (H/V) | Detector |
|-----------------|------------------|-------------------------|-----------------|----------------|-------------|-------------|----------|
| 13.440          | 52.63            | 15.82                   | 68.45           | 90.47          | -22.02      | H           | QP       |
| 13.440          | 51.57            | 15.82                   | 67.39           | 90.47          | -23.08      | V           | QP       |
| 13.550          | 57.96            | 15.61                   | 73.57           | 90.47          | -16.90      | H           | QP       |
| 13.550          | 56.41            | 15.61                   | 72.02           | 90.47          | -18.45      | V           | QP       |
| 13.560          | 87.74            | 12.33                   | 100.07          | 124.00         | -23.93      | H           | Peak     |
| 13.560          | 82.39            | 12.33                   | 94.72           | 124.00         | -29.28      | V           | Peak     |
| 13.569          | 56.85            | 12.33                   | 69.18           | 90.47          | -21.29      | H           | QP       |
| 13.569          | 54.91            | 12.33                   | 67.24           | 90.47          | -23.23      | V           | QP       |
| 13.650          | 50.64            | 15.82                   | 66.46           | 90.47          | -24.01      | H           | QP       |
| 13.650          | 49.43            | 15.82                   | 65.25           | 90.47          | -25.22      | V           | QP       |





Between 9KHz – 30 MHz

Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80  
Limit dBuV/m @3m = Limit dBuV/m @30m + 40

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (kHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 23.85     | 37.52         | 15.35  | 52.87          | 120.05   | -67.18 | AV            |
| 59.33     | 38.64         | 15.26  | 53.90          | 112.14   | -58.24 | AV            |
| 161.54    | 39.25         | 16.12  | 55.37          | 103.44   | -48.07 | AV            |
| 1237.15   | 38.45         | 15.87  | 54.32          | 65.76    | -11.44 | QP            |
| 2136.25   | 36.36         | 17.48  | 53.84          | 69.54    | -15.70 | QP            |
| 3217.92   | 34.59         | 18.72  | 53.31          | 69.54    | -16.23 | QP            |
| 6845.63   | 32.38         | 16.34  | 48.72          | 69.54    | -20.82 | QP            |
| 9272.28   | 30.74         | 12.85  | 43.59          | 69.54    | -25.95 | QP            |
| 11136.58  | 31.85         | 11.36  | 43.21          | 69.54    | -26.33 | QP            |

Note:

Pre-scan in the all of mode, the worst case in of was recorded.

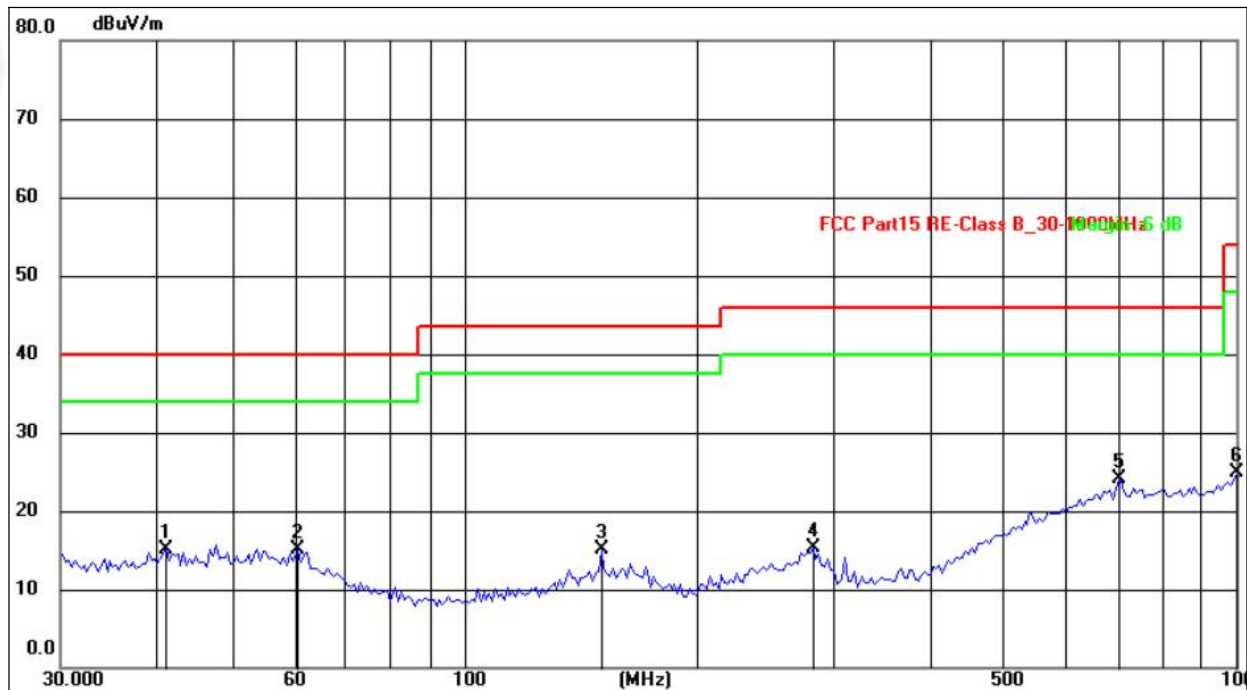
Factor = antenna factor + cable loss – pre-amplifier.

Margin = Emission Level- Limit.



Between 30MHz – 1GHz

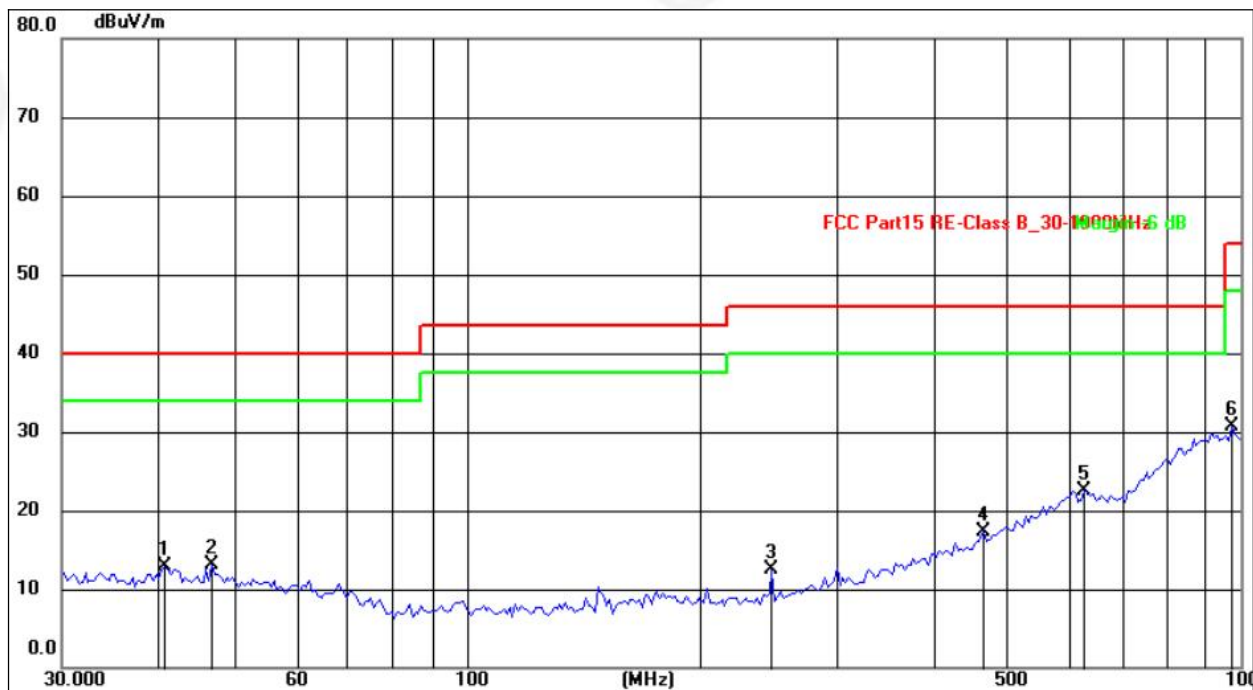
|               |         |                    |            |
|---------------|---------|--------------------|------------|
| Temperature:  | 26°C    | Relative Humidity: | 54%        |
| Pressure:     | 101 kPa | Polarization:      | Horizontal |
| Test Voltage: | DC 6V   |                    |            |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 41.1320         | 29.32          | -14.12        | 15.20          | 40.00          | -24.80      | QP       |
| 2   | 61.0244         | 29.58          | -14.51        | 15.07          | 40.00          | -24.93      | QP       |
| 3   | 150.5377        | 31.58          | -16.54        | 15.04          | 43.50          | -28.46      | QP       |
| 4   | 282.9851        | 29.94          | -14.73        | 15.21          | 46.00          | -30.79      | QP       |
| 5   | 704.2261        | 30.78          | -6.72         | 24.06          | 46.00          | -21.94      | QP       |
| 6   | 1000.0000       | 29.84          | -4.87         | 24.97          | 54.00          | -29.03      | QP       |



|               |        |                    |          |
|---------------|--------|--------------------|----------|
| Temperature:  | 26°C   | Relative Humidity: | 54%      |
| Pressure:     | 101kPa | Polarization:      | Vertical |
| Test Voltage: | DC 6V  |                    |          |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 40.7730         | 29.89          | -16.90        | 12.99          | 40.00          | -27.01      | QP       |
| 2   | 46.9124         | 30.24          | -17.17        | 13.07          | 40.00          | -26.93      | QP       |
| 3   | 248.1165        | 32.44          | -20.02        | 12.42          | 46.00          | -33.58      | QP       |
| 4   | 466.4164        | 30.08          | -12.75        | 17.33          | 46.00          | -28.67      | QP       |
| 5   | 628.3745        | 30.31          | -7.74         | 22.57          | 46.00          | -23.43      | QP       |
| 6   | 974.0436        | 30.97          | -0.35         | 30.62          | 54.00          | -23.38      | QP       |

Remarks:

- 1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2.The emission levels of other frequencies are very lower than the limit and not show in test report.



## 5. FREQUENCY TOLERANCE

|                   |                                |
|-------------------|--------------------------------|
| Test Requirement: | FCC Part15 C Section 15.225(e) |
| Test Method:      | ANSI C63.10:2013               |

### 5.1 LIMIT

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  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. For battery operated equipment, the equipment tests shall be performed using a new battery.

Limit:  $\pm 0.01\%$  of 13.56MHz= $\pm 1356$ Hz

### 5.2 TEST PROCEDURE

1. Set RBW = 10 kHz.
2. Set the video bandwidth (VBW)  $\geq$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. The transmitter output (antenna port) was connected to the spectrum analyzer.

### 5.3 DEVIATION FROM TEST STANDARD

No deviation

### 5.4 TEST SETUP



### 5.5 TEST RESULT

| Test Conditions |              |                  | Frequency Deviation  |               | Limit        |
|-----------------|--------------|------------------|----------------------|---------------|--------------|
| Frequency MHz   | Power(Vdc)   | Temperature (°C) | Measured Freq. (MHz) | Deviation (%) |              |
| 13.56           | Normal       | -20              | 13.5601              | 0.0001        | $\pm 0.01\%$ |
|                 | Normal       | -10              | 13.5602              | 0.0002        |              |
|                 | Normal       | 0                | 13.5602              | 0.0002        |              |
|                 | Normal       | 10               | 13.5600              | 0             |              |
|                 | Normal       | 20               | 13.5602              | 0.0002        |              |
|                 | Normal       | 30               | 13.5601              | 0.0001        |              |
|                 | Normal       | 40               | 13.5603              | 0.0003        |              |
|                 | Normal       | 50               | 13.5601              | 0.0001        |              |
|                 | Normal*85%   | 20               | 13.5602              | 0.0002        |              |
|                 | Normal *115% | 20               | 13.5604              | 0.0004        |              |



## 6. CHANNEL BANDWIDTH

|                   |                             |
|-------------------|-----------------------------|
| Test Requirement: | FCC Part15 C Section 15.215 |
| Test Method:      | ANSI C63.10: 2013           |

### 6.1 APPLIED PROCEDURES / LIMIT

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be demonstrated by measuring the radiated emissions.

### 6.2 TEST PROCEDURE

1. Set RBW = 1 kHz.
2. Set the video bandwidth (VBW)  $\geq$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

### 6.3 DEVIATION FROM STANDARD

No deviation.

### 6.4 TEST SETUP



### 6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

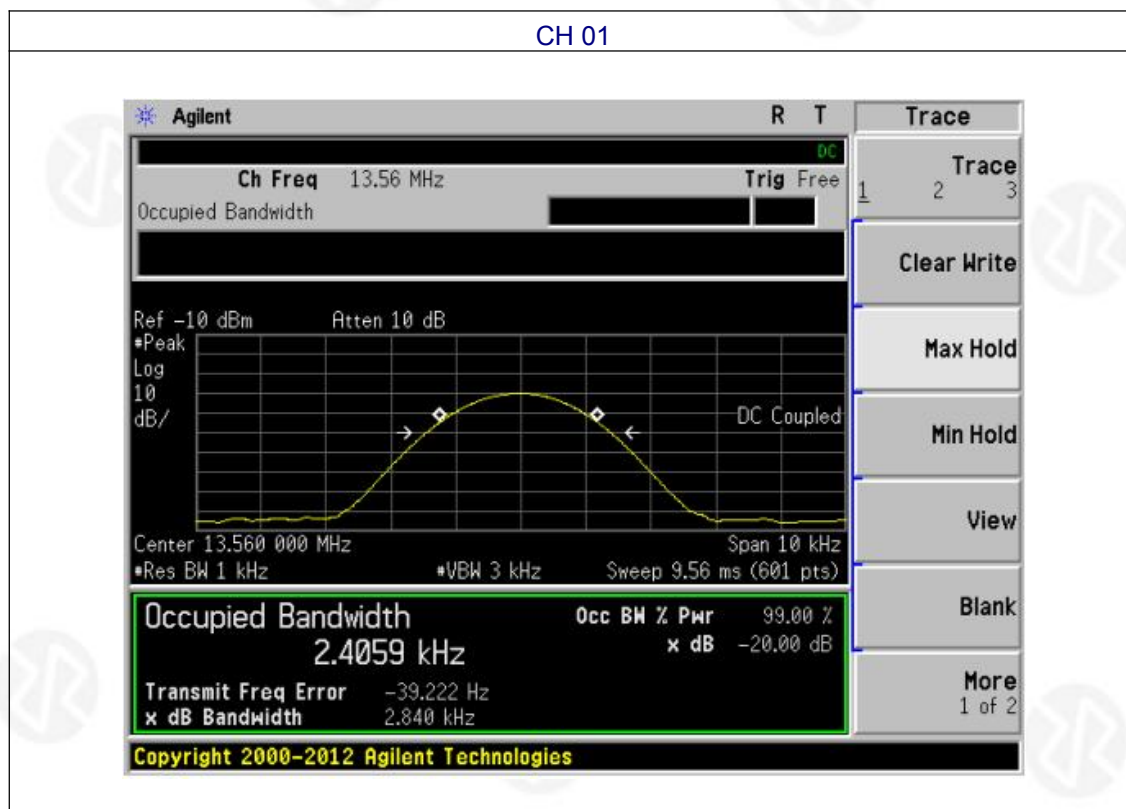




## 6.6 TEST RESULT

|               |      |                     |       |
|---------------|------|---------------------|-------|
| Temperature : | 26°C | Relative Humidity : | 54%   |
| Test Mode :   | ASK  | Test Voltage :      | DC 6V |

| Test channel | 20dB Channel Bandwidth (KHz) | Result |
|--------------|------------------------------|--------|
| 1            | 2.840                        | Pass   |





## 7.ANTENNA REQUIREMENT

|   |                             |
|---|-----------------------------|
| Standard requirement:   | FCC Part15 C Section 15.203 |
| 15.203 requirement:<br>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. |                             |
| EUT Antenna:  |                             |
| The antennas is Loop Antenna, the best case gain of the antennas is 0dBi, reference to the appendix II for details  |                             |



## 8. TEST SETUP PHOTO

Reference to the appendix I for details.

## 9. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

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