



# FCC Test Report

Report No: FCS202104022W01

Issued for

|                                                                                                                                                                                                                                                                             |                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Applicant:                                                                                                                                                                                                                                                                  | Shenzhen Aotule Electronics & Technology Co.,LTD                                |
| Address:                                                                                                                                                                                                                                                                    | 3B-1204,Tiananyungu, Bantian St, Longgang District,<br>Shenzhen, China 518000   |
| Product Name:                                                                                                                                                                                                                                                               | ATOTO Wireless Phone Charger & Holder                                           |
| Brand Name:                                                                                                                                                                                                                                                                 | ATOTO                                                                           |
| Model Name:                                                                                                                                                                                                                                                                 | FreeHolder 01                                                                   |
| Series Model:                                                                                                                                                                                                                                                               | FreeHolder 01A, FreeHolder 02, FreeHolder 02A,<br>FreeHolder 03, FreeHolder 03A |
| FCC ID:                                                                                                                                                                                                                                                                     | 2AYLO-FH01                                                                      |
| Issued By: Flux Compliance Service Laboratory<br>Add: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech<br>Industrial, Song shan lake Dongguan<br>Tel: 769-27280901 Fax:769-27280901 <a href="http://www.fcs-lab.com">http://www.fcs-lab.com</a> |                                                                                 |

## TEST RESULT CERTIFICATION

Applicant's Name.....: Shenzhen Aotule Electronics & Technology Co.,LTD  
Address.....: 3B-1204,Tiananyungu, Bantian St, Longgang District, Shenzhen, China 518000  
Manufacture's Name.....: Shenzhen Aotule Electronics & Technology Co.,LTD  
Address.....: 3B-1204,Tiananyungu, Bantian St, Longgang District, Shenzhen, China 518000

### Product Description

Product Name.....: ATOTO Wireless Phone Charger & Holder  
Brand Name .....: ATOTO  
Model Name.....: FreeHolder 01  
Series Model.....: FreeHolder 01A, FreeHolder 02, FreeHolder 02A, FreeHolder 03, FreeHolder 03A  
Test Standards.....: FCC Rules and Regulations Part 15 Subpart C, Section 209  
Test Procedure.....: ANSI C63.10:2013

This device described above has been tested FCS, 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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### Date of Test.....:

Date (s) of performance of tests.: 01 Apr. 2021 ~ 09 Apr. 2021

Date of Issue.....: 09 Apr. 2021

Test Result.....: Pass

Tested by : Scott Shen  
(Scott Shen)  
Reviewed by : Duke Qian  
(Duke Qian)  
Approved by : Kait Chen  
(Kait Chen)

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**Revision History**

| Rev. | Issue Date   | Effect Page | Contents      |
|------|--------------|-------------|---------------|
| 00   | 09 Apr. 2021 | All         | Initial Issue |
|      |              |             |               |

## 1. SUMMARY OF TEST RESULTS

| FCC Rules and Regulations Part 15 Subpart C, Section 209 |                            |          |        |
|----------------------------------------------------------|----------------------------|----------|--------|
| Standard Section                                         | Test Item                  | Judgment | Remark |
| 15.207                                                   | Conducted Emission         | N/A      | --     |
| 15.209(a) (f)                                            | Radiated Spurious Emission | PASS     | --     |
| 15.215(c)                                                | 20dB Bandwidth             | PASS     | --     |
| 15.203                                                   | Antenna Requirement        | PASS     | --     |

### NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) All tests are according to ANSI C63.10-2013

## 1.1 TEST FACTORY

|                                                                                                               |                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Company Name:                                                                                                 | Flux Compliance Service Laboratory                                                                               |
| Address:                                                                                                      | Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan |
| Telephone:                                                                                                    | +86-769-27280901                                                                                                 |
| Fax:                                                                                                          | +86-769-27280901                                                                                                 |
| FCC Test Firm Registration Number: 514908<br>Designation number: CN0127<br>A2LA accreditation number: 5545.01 |                                                                                                                  |

## 1.2 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   | RF output power, conducted                | $\pm 0.71$ dB |
| 2   | Unwanted Emissions, conducted             | $\pm 2.98$ dB |
| 3   | Conducted Emission (9KHz-150KHz)          | $\pm 4.13$ dB |
| 4   | Conducted Emission (150KHz-30MHz)         | $\pm 4.74$ dB |
| 5   | All emissions,radiated(<1G) 30MHz-1000MHz | $\pm 3.2$ dB  |
| 6   | All emissions,radiated (1GHz -18GHz)      | $\pm 3.66$ dB |
| 7   | All emissions,radiated (18GHz -40GHz)     | $\pm 4.31$ dB |

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF THE EUT

|                         |                                                                                                                                                                                              |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name            | ATOTO Wireless Phone Charger & Holder                                                                                                                                                        |
| Trade Name              | ATOTO                                                                                                                                                                                        |
| Model Name              | FreeHolder 01                                                                                                                                                                                |
| Series Model            | FreeHolder 01A, FreeHolder 02, FreeHolder 02A, FreeHolder 03, FreeHolder 03A                                                                                                                 |
| Model Difference        | The above product with same circuit, PCB layout, electrical parts, materials and wiring structures, Appearance shape, the materials of decorative accessories is same, only different color. |
| Channel List            | Please refer to the Note 2.                                                                                                                                                                  |
| Operation frequency     | 110-205KHz                                                                                                                                                                                   |
| Modulation Type         | MSK                                                                                                                                                                                          |
| Antenna Type            | Inductive Loop Antenna with 1.0dBi                                                                                                                                                           |
| Power Supply            | Input:5V/2A;9V/2A;12V/1.8A<br>Output:5W,5V/1A;7.5W,7.5V/1A;<br>10W,9V/1.12A;15W,9V/1.67A                                                                                                     |
| Hardware version number | V1.0                                                                                                                                                                                         |
| Software version number | V1.0                                                                                                                                                                                         |
| Connecting I/O Port(s)  | Please refer to the User's Manual                                                                                                                                                            |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

## 2. Channel List

| Channel | Frequency (MHz) |
|---------|-----------------|
| Low     | 0.115           |
| Middle  | 0.125           |
| High    | 0.205           |

## 3. Table for Filed Antenna

| Ant. | Brand | Model Name | Antenna Type           | Connector | Gain (dBi) | NOTE    |
|------|-------|------------|------------------------|-----------|------------|---------|
| 1    | N/A   | RHDS       | Inductive Loop Antenna | N/A       | 1.0dBi     | Antenna |



## 2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test software: KCC

The test software was used to control EUT work in continuous TX mode, and select test channel, Wireless mode as below table

| Tested mode, channel , information |         |                 |
|------------------------------------|---------|-----------------|
| Mode                               | Channel | Frequency (MHz) |
| Full load                          | Middle  | 0.125           |
|                                    |         |                 |

### 2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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.

#### Necessary accessories

| Item | Equipment | Mfr/Brand | Model/Type No. | Serial No. | Note                                        |
|------|-----------|-----------|----------------|------------|---------------------------------------------|
| 1    | Adapter   | HW        | 0789SK         | N/A        | This adapter is for testing only in report. |
|      |           |           |                |            |                                             |
|      |           |           |                |            |                                             |
|      |           |           |                |            |                                             |

#### Support units

| Item | Equipment | Mfr/Brand | Model/Type No. | Serial No. | 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) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

## 2.4 EQUIPMENTS LIST

### Radiation Test equipment

| Kind of Equipment                | Manufacturer | Type No.     | Company No. | Last calibration | Calibrated until |
|----------------------------------|--------------|--------------|-------------|------------------|------------------|
| EMI Test Receiver                | R&S          | ESRP 3       | FCS-E001    | 2020. 06.26      | 2021. 06.25      |
| Signal Analyzer                  | R&S          | FSV40-N      | FCS-E012    | 2020.06.05       | 2021.06.04       |
| Active loop Antenna              | ZHINAN       | ZN30900C     | FCS-E013    | 2020.08.09       | 2021.08.10       |
| Bilog Antenna                    | SCHWARZBECK  | VULB 9168    | FCS-E002    | 2020.08.26       | 2021.08.25       |
| Horn Antenna                     | SCHWARZBECK  | BBHA 9120D   | FCS-E003    | 2020.08.26       | 2021.08.25       |
| SHF-EHF Horn Antenna (18G-40GHz) | A-INFO       | LB-180400-KF | FCS-E018    | 2020.06.26       | 2021.06.25       |
| Pre-Amplifier(0.1M-3G Hz)        | EMCI         | EM330N       | FCS-E004    | 2020.06.26       | 2021.06.25       |
| Pre-Amplifier (1G-18GHz)         | N/A          | TSAMP-0518SE | FCS-E014    | 2020.06.03       | 2021.06.02       |
| Pre-Amplifier (18G-40GHz)        | TERA-MW      | TRLA-0400    | FCS-E019    | 2020.08.08       | 2021.08.07       |
| Temperature & Humidity           | HTC-1        | victor       | FCS-E005    | 2020.08.26       | 2021.08.25       |

### Conduction Test equipment

| Kind of Equipment      | Manufacturer | Type No. | Company No. | Last calibration | Calibrated until |
|------------------------|--------------|----------|-------------|------------------|------------------|
| EMI Test Receiver      | R&S          | ESPI     | FCS-E020    | 2020.06.03       | 2021.06.02       |
| LISN                   | R&S          | ENV216   | FCS-E007    | 2020.08.08       | 2021.08.07       |
| LISN                   | ETS          | 3810/2NM | FCS-E009    | 2020.06.03       | 2021.06.02       |
| Temperature & Humidity | HTC-1        | victor   | FCS-E008    | 2020.08.08       | 2021.08.07       |

### RF Connected Test

| Kind of Equipment | Manufacturer | Type No. | Company No. | Last calibration | Calibrated until |
|-------------------|--------------|----------|-------------|------------------|------------------|
| Spectrum Analyzer | Keysight     | N9020A   | FCS-E015    | 2020.06.03       | 2021.06.02       |
| Spectrum Analyzer | Agilent      | E4447A   | MY50180039  | 2020.08.08       | 2021.08.07       |
| Spectrum Analyzer | R&S          | FSV-40   | 101499      | 2020.08.26       | 2021.08.25       |

### 3. RADIATED EMISSION MEASUREMENT

#### 3.1 LIMIT

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009mhz - 1000mhz)

| 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                                |

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- (5) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

### 3.2 TEST PROCEDURE

| Spectrum Parameter                    | Setting                         |
|---------------------------------------|---------------------------------|
| Attenuation                           | Auto                            |
| Detector                              | Peak/AV                         |
| Start Frequency                       | 1000 MHz(Peak/AV)               |
| Stop Frequency                        | 10th carrier hamonic(Peak/AV)   |
| RB / VB (emission in restricted band) | PK=1MHz / 1MHz, AV=1 MHz /10 Hz |

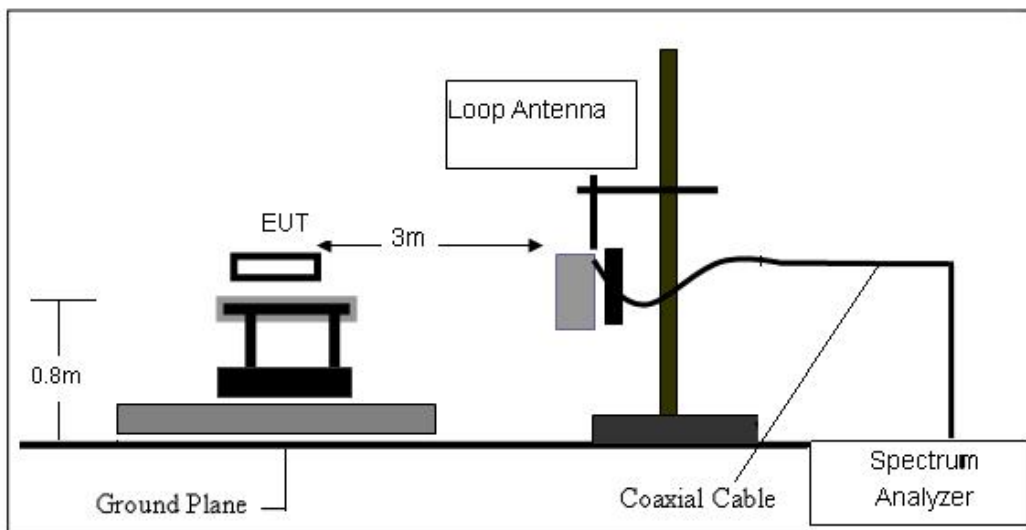
- The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. 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 QuasiPeak 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

**Note:**

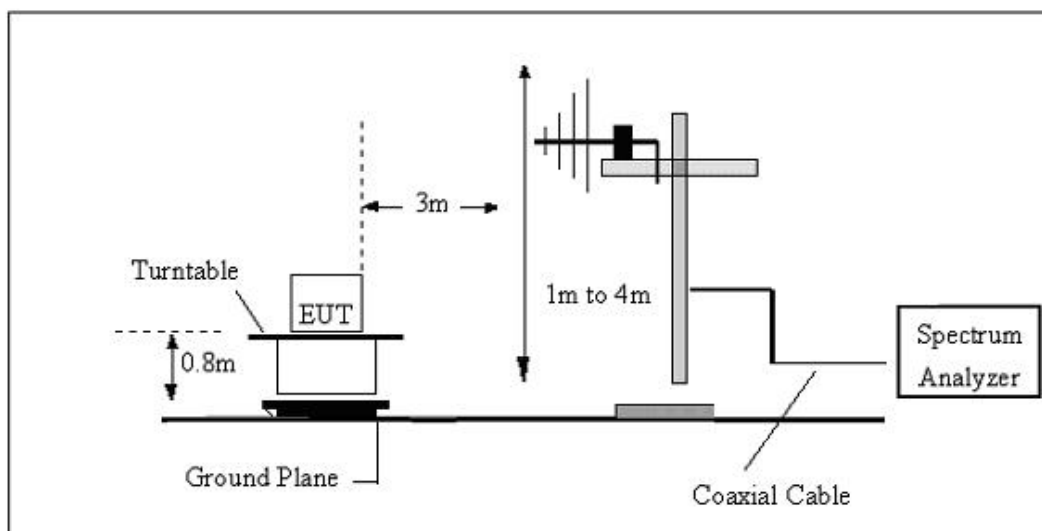
Both horizontal and vertical antenna polarities were tested. The worst case emissions were reported

### 3.3 TEST SETUP

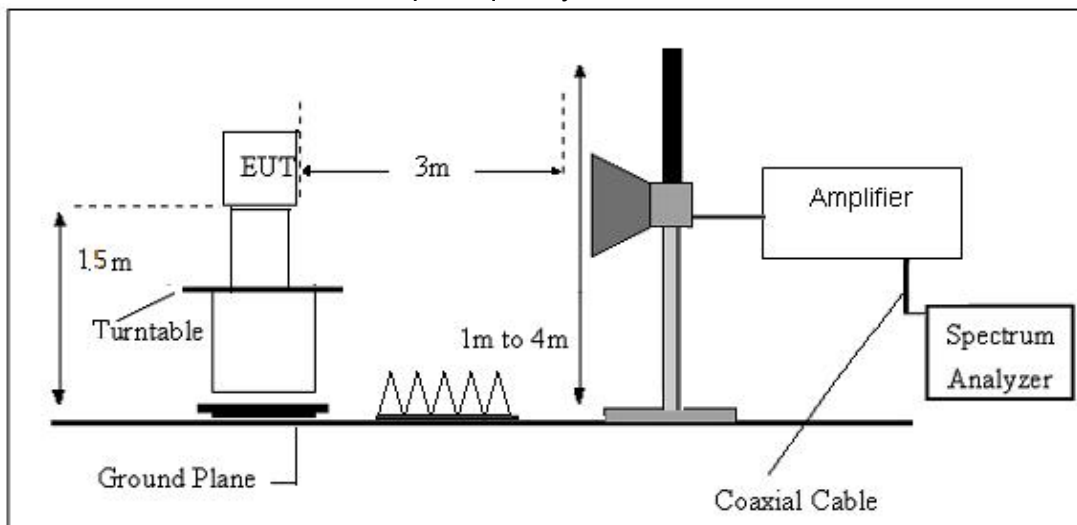
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



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



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

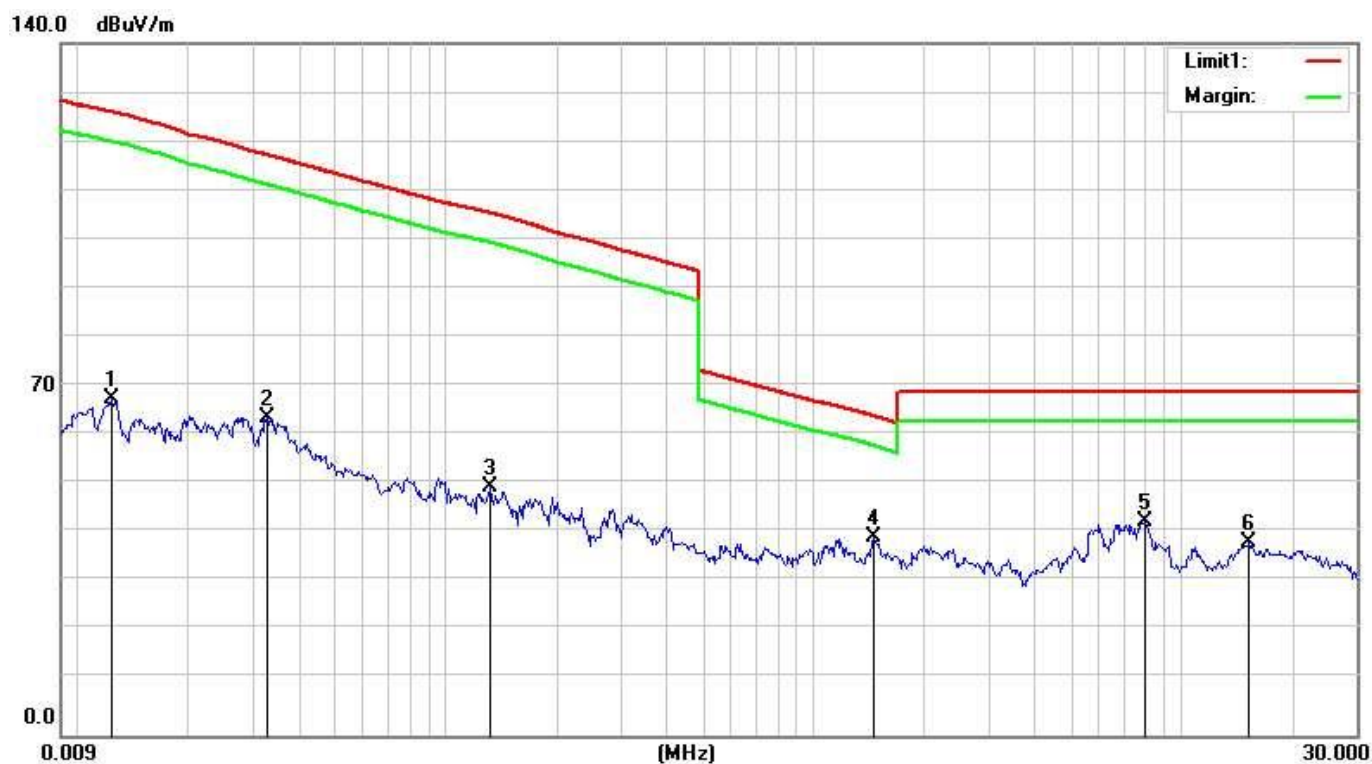


### 3.4 TEST RESULTS

|              |           |                    |        |
|--------------|-----------|--------------------|--------|
| Temperature: | 25°C      | Relative Humidity: | 60%    |
| Test Mode:   | Full load | Test Voltage:      | DC 12V |

For spurious emission

(9KHz-30MHz)



| No. | Frequency (MHz) | Reading (dBuV) | Correction (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------|-----------------|----------------|-------------|--------|
| 1   | 0.0123          | 88.41          | -20.22            | 68.19           | 126.22         | -58.03      | QP     |
| 2   | 0.0325          | 84.65          | -20.34            | 64.31           | 117.47         | -53.16      | QP     |
| 3   | 0.1318          | 70.40          | -20.14            | 50.26           | 105.69         | -55.43      | QP     |
| 4   | 1.4556          | 60.39          | -20.27            | 40.12           | 64.63          | -24.51      | QP     |
| 5   | 7.9964          | 63.72          | -20.37            | 43.35           | 69.50          | -26.15      | QP     |
| 6   | 15.3010         | 58.43          | -19.47            | 38.96           | 69.50          | -30.54      | QP     |

Remarks:

1. Final Level =Receiver Read level + Factor

(30MHZ-1000MHZ)

|               |           |                    |            |
|---------------|-----------|--------------------|------------|
| Temperature:  | 23.7°C    | Relative Humidity: | 61%        |
| Test Voltage: | DC 12V    | Phase:             | Horizontal |
| Test Mode:    | Full Load |                    |            |



| No. | Frequency (MHz) | Reading (dBuV) | Correction (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------|-----------------|----------------|-------------|--------|
| 1   | 69.1141         | 43.86          | -18.38            | 25.48           | 40.00          | -14.52      | QP     |
| 2   | 111.3468        | 46.42          | -18.62            | 27.80           | 43.50          | -15.70      | QP     |
| 3   | 212.2695        | 51.49          | -16.84            | 34.65           | 43.50          | -8.85       | QP     |
| 4   | 258.3264        | 52.34          | -16.98            | 35.36           | 46.00          | -10.64      | QP     |
| 5   | 303.5437        | 48.93          | -17.04            | 31.89           | 46.00          | -14.11      | QP     |
| 6   | 361.7140        | 46.24          | -17.08            | 29.16           | 46.00          | -16.84      | QP     |

Remarks:

1. Final Level =Receiver Read level + Factor



|               |           |                    |          |
|---------------|-----------|--------------------|----------|
| Temperature:  | 22.7°C    | Relative Humidity: | 61%      |
| Test Voltage: | DC 12V    | Phase:             | Vertical |
| Test Mode:    | Full Load |                    |          |



| No. | Frequency (MHz) | Reading (dBuV) | Correction (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------|-----------------|----------------|-------------|--------|
| 1   | 69.3568         | 51.12          | -18.31            | 32.81           | 40.00          | -7.19       | QP     |
| 2   | 92.7871         | 53.16          | -19.67            | 33.49           | 43.50          | -10.01      | QP     |
| 3   | 107.8877        | 47.26          | -18.39            | 28.87           | 43.50          | -14.63      | QP     |
| 4   | 139.3613        | 42.12          | -15.66            | 26.46           | 43.50          | -17.04      | QP     |
| 5   | 184.4898        | 43.30          | -17.64            | 25.66           | 43.50          | -17.84      | QP     |
| 6   | 247.6820        | 46.55          | -17.01            | 29.54           | 46.00          | -16.46      | QP     |

Remarks:

1. Final Level =Receiver Read level + Factor

## 4. 20 DB BANDWIDTH TEST

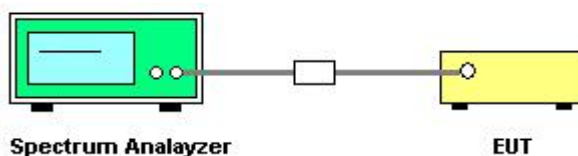
### 4.1 LIMIT

According to 15.215 (c) 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 the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation

### 4.2 TEST PROCEDURE

- Check the calibration of the measuring instrument using either an internal calibrator or a
- known signal from an external generator
  - Position the EUT without connection to measurement instrument. 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.
  - Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

### 4.3 TEST SETUP



#### 4.4 TEST RESULTS

|              |           |                    |        |
|--------------|-----------|--------------------|--------|
| Temperature: | 25°C      | Relative Humidity: | 50%    |
| Test Mode:   | Full load | Test Voltage:      | DC 12V |

| Frequency (KHz) | 20dB Bandwidth (Hz) | Result |
|-----------------|---------------------|--------|
| 125             | 8170                | PASS   |



## 5. ANTENNA REQUIREMENT

### 5.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: 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.

### 5.2 EUT ANTENNA

The antennas used for this product is Inductive Loop Antenna and other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 1.0dBi.

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