



**SGS-CSTC Standards Technical Services Co., Ltd.**  
**Shenzhen Branch**

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Report No.: SZEM170600675203  
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## **TEST REPORT**

**Application No.:** SZEM1706006752CR  
**Applicant:** Angee Inc.  
**Address of Applicant:** 1201 N ORANGE ST STE 7419, Wilmington, Delaware, United States, 19801  
**Manufacturer:** SKY LIGHT Electronic (ShenZhen) Limited  
**Address of Manufacturer:** No. 24 Building, JinBi Industrial Area, HuangTian, BaoAn, Shenzhen, China.  
**Factory:** SKY LIGHT Electronic (ShenZhen) Limited  
**Address of Factory:** No. 24 Building, JinBi Industrial Area, HuangTian, BaoAn, Shenzhen, China.  
**Equipment Under Test (EUT):**  
**EUT Name:** ANGEE SECURITY TAG  
**Model No.:** TAG-S13-B-00  
**Trade mark:** Angee  
**FCC ID:** 2ANIUTAG-001  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.231  
**Date of Receipt:** 2017-08-18  
**Date of Test:** 2017-08-22 to 2017-08-28  
**Date of Issue:** 2017-10-09

|                     |       |
|---------------------|-------|
| <b>Test Result:</b> | Pass* |
|---------------------|-------|

\* In the configuration tested, the EUT complied with the standards specified above.



Jack Zhang  
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2017-10-09 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                                                                                     |  |  |
|--------------------------|--|-------------------------------------------------------------------------------------|--|--|
| Authorized for issue by: |  |                                                                                     |  |  |
|                          |  |    |  |  |
|                          |  | Harry Wu /Project Engineer                                                          |  |  |
|                          |  |  |  |  |
|                          |  | Eric Fu /Reviewer                                                                   |  |  |



## 2 Test Summary

| Radio Spectrum Technical Requirement |                                  |        |                                  |        |
|--------------------------------------|----------------------------------|--------|----------------------------------|--------|
| Item                                 | Standard                         | Method | Requirement                      | Result |
| Antenna Requirement                  | 47 CFR Part 15, Subpart C 15.231 | N/A    | 47 CFR Part 15, Subpart C 15.203 | Pass   |

| Radio Spectrum Matter Part               |                                  |                                        |                                     |        |
|------------------------------------------|----------------------------------|----------------------------------------|-------------------------------------|--------|
| Item                                     | Standard                         | Method                                 | Requirement                         | Result |
| 20dB Bandwidth                           | 47 CFR Part 15, Subpart C 15.231 | ANSI C63.10 (2013) Section 6.9         | 47 CFR Part 15, Subpart C 15.231(c) | Pass   |
| Limit of Transmission Time               | 47 CFR Part 15, Subpart C 15.231 | ANSI C63.10 (2013) Section 7.8.4       | 47 CFR Part 15, Subpart C 15.231(a) | Pass   |
| Field Strength of the Fundamental Signal | 47 CFR Part 15, Subpart C 15.231 | ANSI C63.10 (2013) Section 6.5         | 47 CFR Part 15, Subpart C 15.231(b) | Pass   |
| Radiated Emissions                       | 47 CFR Part 15, Subpart C 15.231 | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | 47 CFR Part 15, Subpart C 15.231(b) | Pass   |



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## 4 General Information

### 4.1 Details of E.U.T.

|                      |                                |
|----------------------|--------------------------------|
| Power supply:        | DC 3.0V (2*1.5V AAA batteries) |
| Operating Frequency: | 433.92MHz                      |
| Channel Numbers:     | 1                              |
| Sample Type:         | Portable production            |
| Modulation Type:     | ASK                            |
| Antenna Type:        | Integral                       |
| Antenna Gain:        | 0dBi                           |

### 4.2 Description of Support Units

The EUT has been tested as an independent unit.

### 4.3 Measurement Uncertainty

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Radio Frequency                 | $7.25 \times 10^{-8}$   |
| 2   | Duty cycle                      | 0.37%                   |
| 3   | Occupied Bandwidth              | 3%                      |
| 4   | RF conducted power              | 0.75dB                  |
| 5   | RF power density                | 2.84dB                  |
| 6   | Conducted Spurious emissions    | 0.75dB                  |
| 7   | RF Radiated power               | 4.5dB (below 1GHz)      |
|     |                                 | 4.8dB (above 1GHz)      |
| 8   | Radiated Spurious emission test | 4.5dB (30MHz-1GHz)      |
|     |                                 | 4.8dB (1GHz-18GHz)      |
| 9   | Temperature test                | 1 °C                    |
| 10  | Humidity test                   | 3%                      |
| 11  | Supply voltages                 | 1.5%                    |
| 12  | Time                            | 3%                      |



#### **4.4 Test Location**

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### **4.5 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

#### **4.6 Deviation from Standards**

None

#### **4.7 Abnormalities from Standard Conditions**

None



## 5 Equipment List

| 20dB Bandwidth       |                 |                         |              |            |              |
|----------------------|-----------------|-------------------------|--------------|------------|--------------|
| Equipment            | Manufacturer    | Model No                | Inventory No | Cal Date   | Cal Due Date |
| DC Power Supply      | ZhaoXin         | RXN-305D                | SEM011-02    | 2016-10-09 | 2017-10-09   |
| Spectrum Analyzer    | Rohde & Schwarz | FSU43                   | SEM004-08    | 2017-04-14 | 2018-04-13   |
| Measurement Software | JS Tonscend     | JS1120-2<br>BT/WIFI V2. | N/A          | N/A        | N/A          |
| Signal Generator     | Rohde & Schwarz | SML03                   | SEM006-02    | 2017-04-14 | 2018-04-13   |
| Power Meter          | Rohde & Schwarz | NRVS                    | SEM014-02    | 2016-10-09 | 2017-10-09   |
| Coaxial Cable        | SGS             | N/A                     | SEM031-01    | 2017-07-13 | 2018-07-12   |

| Limit of Transmission Time |                 |                         |              |            |              |
|----------------------------|-----------------|-------------------------|--------------|------------|--------------|
| Equipment                  | Manufacturer    | Model No                | Inventory No | Cal Date   | Cal Due Date |
| DC Power Supply            | ZhaoXin         | RXN-305D                | SEM011-02    | 2016-10-09 | 2017-10-09   |
| Spectrum Analyzer          | Rohde & Schwarz | FSU43                   | SEM004-08    | 2017-04-14 | 2018-04-13   |
| Measurement Software       | JS Tonscend     | JS1120-2<br>BT/WIFI V2. | N/A          | N/A        | N/A          |
| Signal Generator           | Rohde & Schwarz | SML03                   | SEM006-02    | 2017-04-14 | 2018-04-13   |
| Power Meter                | Rohde & Schwarz | NRVS                    | SEM014-02    | 2016-10-09 | 2017-10-09   |
| Coaxial Cable              | SGS             | N/A                     | SEM031-01    | 2017-07-13 | 2018-07-12   |

| Field Strength of the Fundamental Signal |                      |                     |              |            |              |
|------------------------------------------|----------------------|---------------------|--------------|------------|--------------|
| Equipment                                | Manufacturer         | Model No            | Inventory No | Cal Date   | Cal Due Date |
| 3m Semi-Anechoic Chamber                 | ETS-LINDGREN         | N/A                 | SEM001-01    | 2017-05-10 | 2018-05-10   |
| Measurement Software                     | AUDIX                | e3 V8.2014-<br>6-27 | N/A          | N/A        | N/A          |
| EMI Test Receiver                        | Agilent Technologies | N9038A              | SEM004-05    | 2016-10-09 | 2017-10-09   |
| BiConiLog Antenna<br>(26-3000MHz)        | ETS-LINDGREN         | 3142C               | SEM003-01    | 2014-11-01 | 2017-11-01   |
| Double-ridged horn<br>(1-18GHz)          | ETS-LINDGREN         | 3117                | SEM003-11    | 2015-10-17 | 2018-10-17   |
| Horn Antenna<br>(18-26GHz)               | ETS-LINDGREN         | 3160                | SEM003-12    | 2014-11-24 | 2017-11-24   |
| Coaxial Cable                            | SGS                  | N/A                 | SEM024-01    | 2017-07-13 | 2018-07-12   |



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| RE in Chamber |                                   |                      |                 |               |                           |                               |
|---------------|-----------------------------------|----------------------|-----------------|---------------|---------------------------|-------------------------------|
| Item          | Test Equipment                    | Manufacturer         | Model No.       | Inventory No. | Cal. Date<br>(yyyy-mm-dd) | Cal. Due date<br>(yyyy-mm-dd) |
| 1             | 3m Semi-Anechoic Chamber          | ETS-LINDGREN         | N/A             | SEM001-01     | 2017-05-10                | 2018-05-10                    |
| 2             | MXE EMI Receiver<br>(20Hz-8.4GHz) | Agilent Technologies | N9038A          | SEM004-05     | 2016-10-09                | 2017-10-09                    |
| 3             | BiConiLog Antenna<br>(26-3000MHz) | ETS-LINDGREN         | 3142C           | SEM003-02     | 2017-03-05                | 2020-03-05                    |
| 4             | Pre-amplifier<br>(0.1-1300MHz)    | Agilent Technologies | 8447D           | SEM005-01     | 2017-04-14                | 2018-04-13                    |
| 5             | Measurement Software              | AUDIX                | e3 V8.2014-6-27 | N/A           | N/A                       | N/A                           |
| 6             | Coaxial Cable                     | SGS                  | N/A             | SEM024-01     | 2017-07-13                | 2018-07-12                    |

| RE in Chamber |                                       |                          |                   |               |                           |                               |
|---------------|---------------------------------------|--------------------------|-------------------|---------------|---------------------------|-------------------------------|
| Item          | Test Equipment                        | Manufacturer             | Model No.         | Inventory No. | Cal. Date<br>(yyyy-mm-dd) | Cal. Due date<br>(yyyy-mm-dd) |
| 1             | 3m Semi-Anechoic Chamber              | AUDIX                    | N/A               | SEM001-02     | 2017-05-10                | 2018-05-10                    |
| 2             | EXA Signal Analyzer<br>(10Hz-26.5GHz) | Agilent Technologies Inc | N9010A            | SEM004-09     | 2017-06-05                | 2018-06-04                    |
| 3             | BiConiLog Antenna<br>(26-3000MHz)     | ETS-Lindgren             | 3142C             | SEM003-01     | 2014-11-01                | 2017-11-01                    |
| 4             | Horn Antenna<br>(1-18GHz)             | Rohde & Schwarz          | HF907             | SEM003-07     | 2015-06-14                | 2018-06-13                    |
| 5             | Amplifier<br>(0.1-1300MHz)            | HP                       | 8447D             | SEM005-02     | 2016-10-09                | 2017-10-09                    |
| 6             | Low Noise Amplifier<br>(100MHz-18GHz) | Black Diamond Series     | BDLNA-0118-352810 | SEM005-05     | 2016-10-09                | 2017-10-09                    |
| 7             | Band filter                           | N/A                      | N/A               | N/A           | N/A                       | N/A                           |
| 8             | Measurement Software                  | AUDIX                    | e3 V8.2014-6-27   | N/A           | N/A                       | N/A                           |
| 9             | Coaxial Cable                         | SGS                      | N/A               | SEM024-01     | 2017-07-13                | 2018-07-12                    |



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| General used equipment          |                                           |          |              |            |              |
|---------------------------------|-------------------------------------------|----------|--------------|------------|--------------|
| Equipment                       | Manufacturer                              | Model No | Inventory No | Cal Date   | Cal Due Date |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory  | ZJ1-2B   | SEM002-03    | 2016-10-12 | 2017-10-12   |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory  | ZJ1-2B   | SEM002-04    | 2016-10-12 | 2017-10-12   |
| Humidity/ Temperature Indicator | Mingle                                    | N/A      | SEM002-08    | 2016-10-12 | 2017-10-12   |
| Barometer                       | Changchun Meteorological Industry Factory | DYM3     | SEM002-01    | 2017-04-18 | 2018-04-18   |

## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

#### 6.1.2 Conclusion

Standard Requirement:

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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an 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 antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

## 7 Radio Spectrum Matter Test Results

### 7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.231(c)

Test Method: ANSI C63.10 (2013) Section 6.9

Limit:

| Frequency range(MHz) | Limit                                       |
|----------------------|---------------------------------------------|
| 70-900               | No wider than 0.25% of the center frequency |
| Above 900            | No wider than 0.5% of the center frequency  |

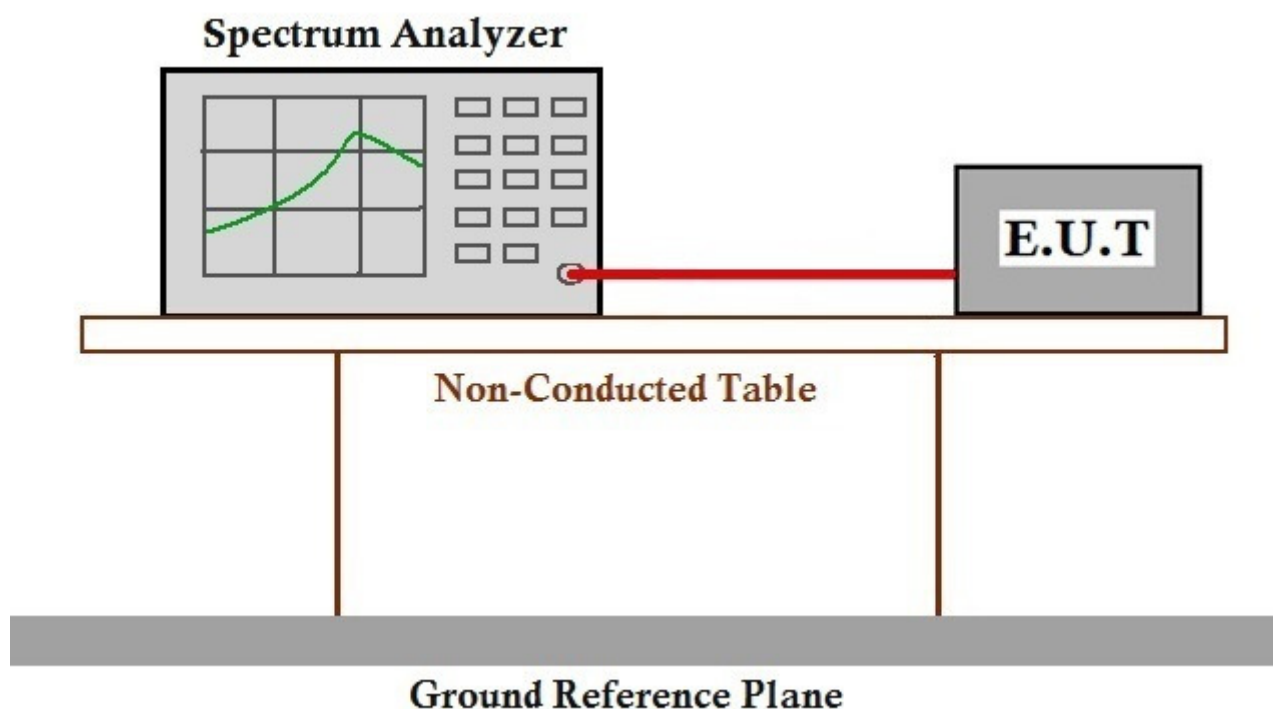
#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar

Test mode d:TX mode\_Keep the EUT in transmitting with modulation mode.

#### 7.1.2 Test Setup Diagram



#### 7.1.3 Measurement Procedure and Data

##### Measurement Data

| 20dB bandwidth (MHz) | Limit (MHz) | Results |
|----------------------|-------------|---------|
| 0.059                | 1.085       | Pass    |

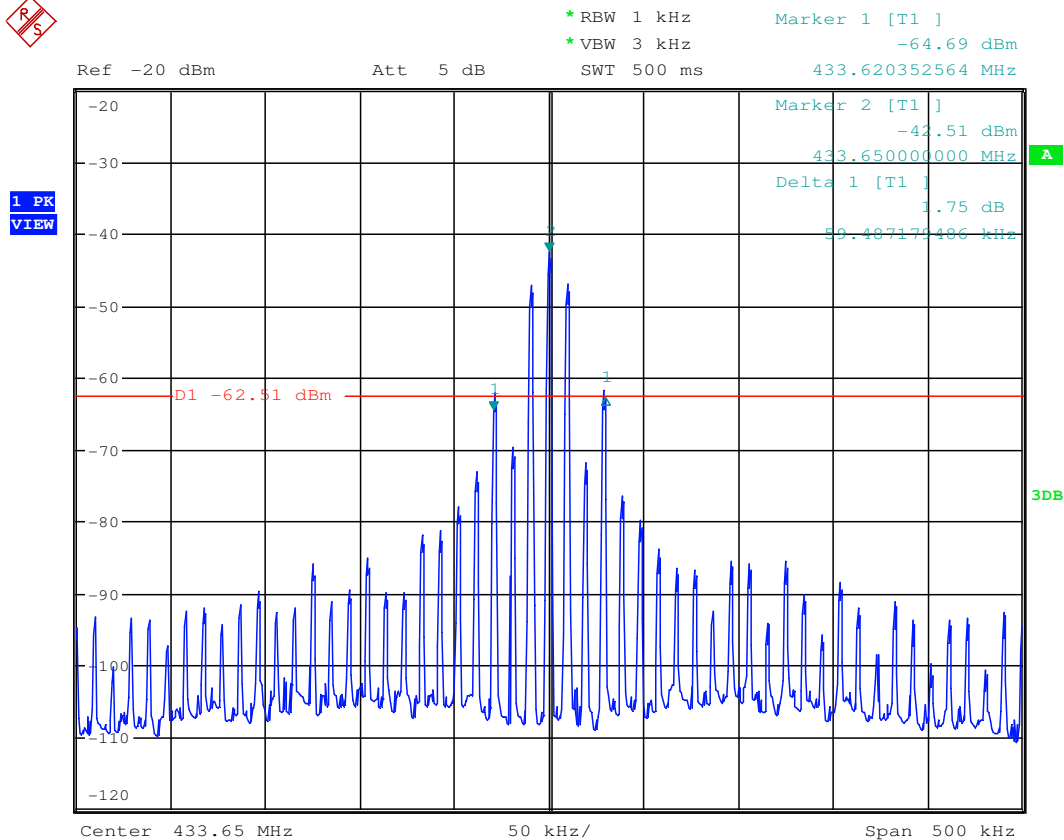


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Mode d:



## 7.2 Limit of Transmission Time

Test Requirement 47 CFR Part 15, Subpart C 15.231(a)

Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

| Device type                                                                                                  | Limit                                                                                                |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Manually operated transmitter                                                                                | The switch automatically deactivate the transmitter within not more than 5 seconds of being released |
| Automatically actived transmitter                                                                            | Cease transmission within 5 seconds after activation                                                 |
| Periodic transmissions to determine system integrity of transmitters used in security or safety applications | The total transmission time does not exceed 2 seconds per hour                                       |

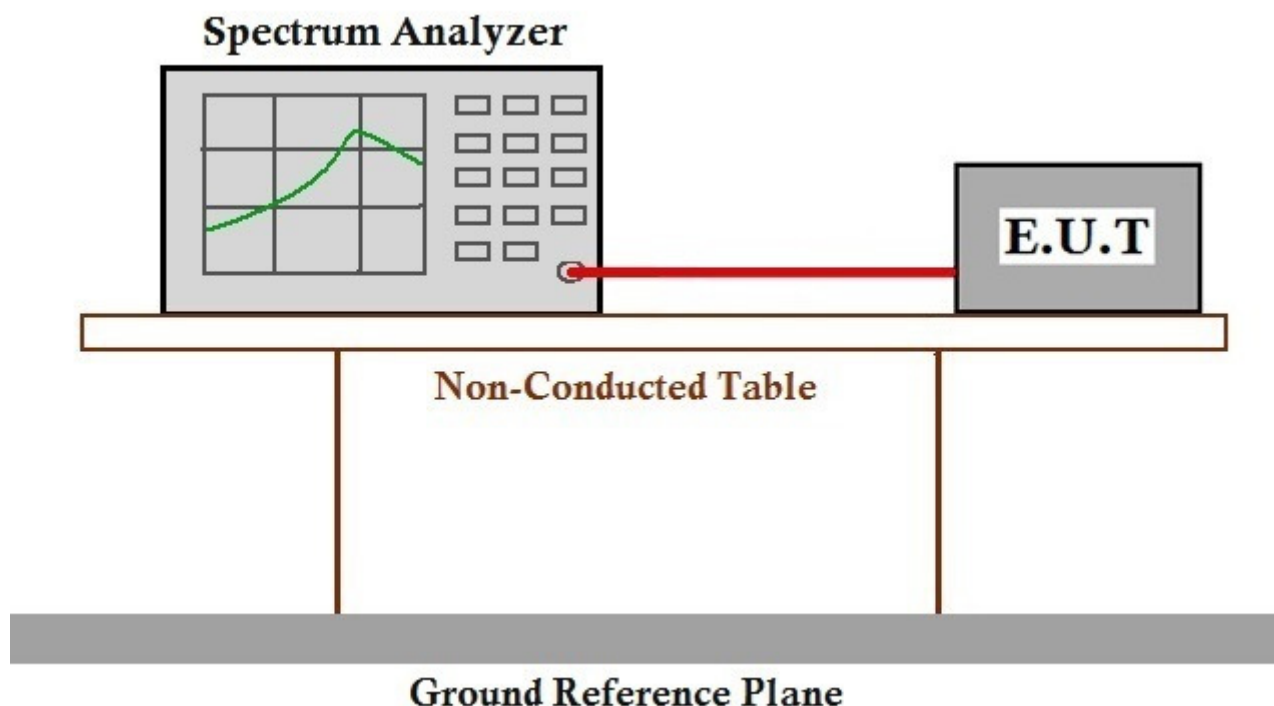
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar

Test mode d:TX mode\_Keep the EUT in transmitting with modulation mode.

### 7.2.2 Test Setup Diagram

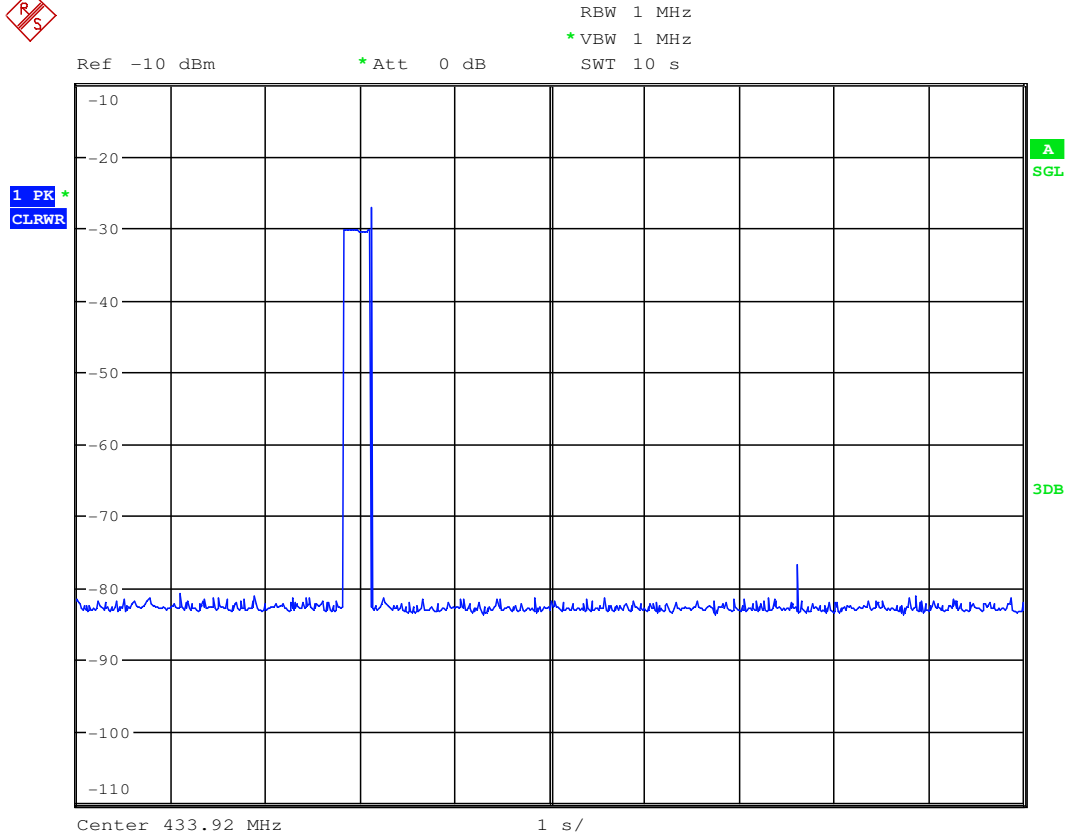


### 7.2.3 Measurement Procedure and Data

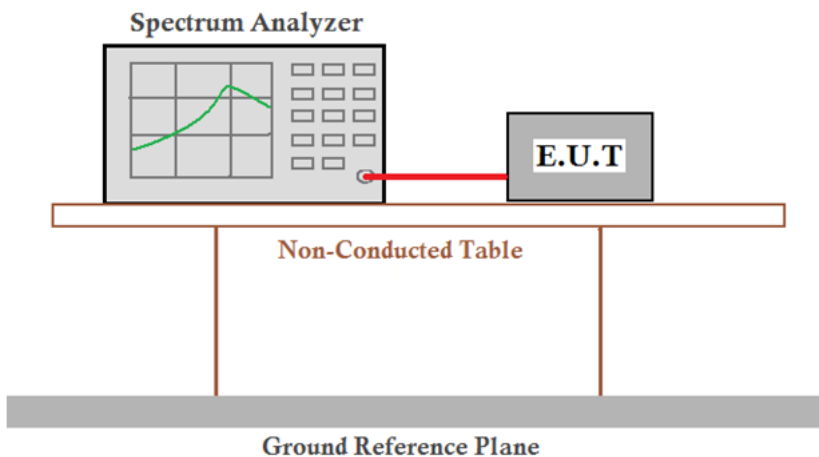
| Test item         | Limit | Results |
|-------------------|-------|---------|
| Transmitting time | ≤5S   | Pass    |



Mode d:



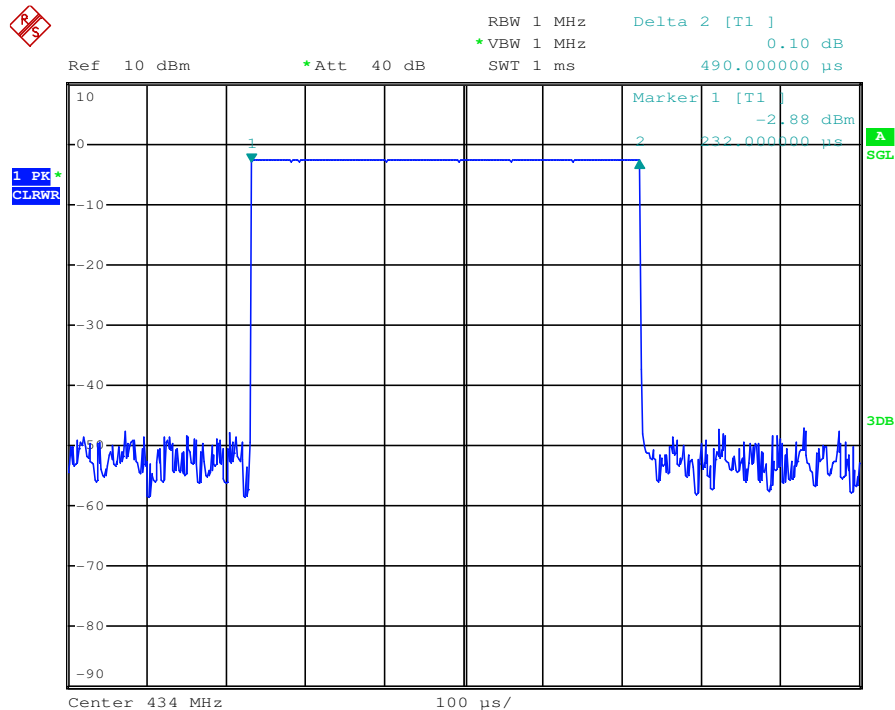
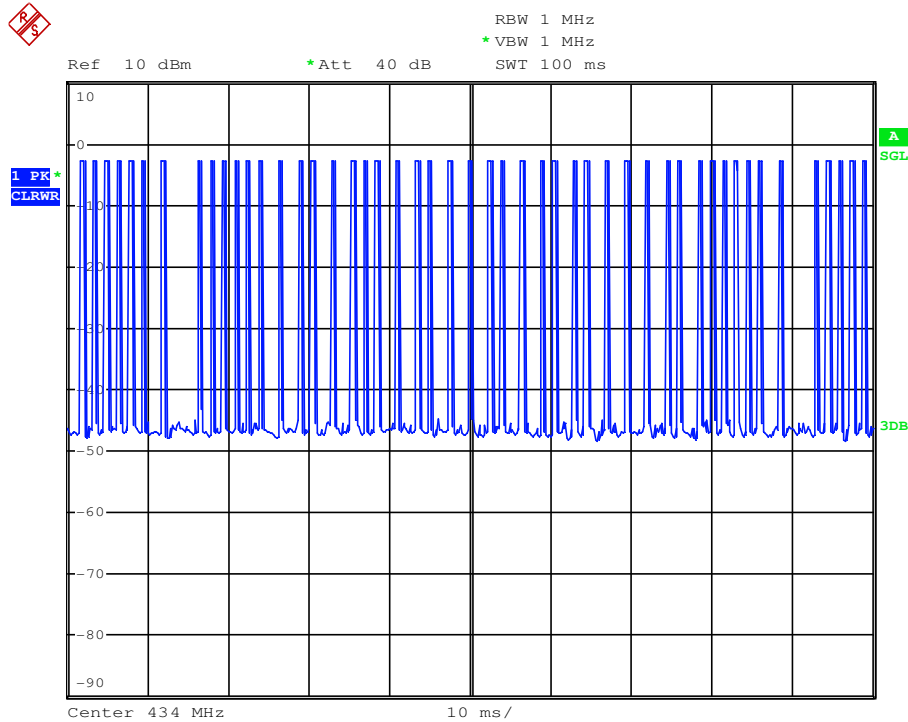
### 7.3 Duty Cycle

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR Part 15C Section 15.35 (c)                                                                                                                                                                                                                                                                                                                                                                                    |
| Test Method:      | ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                                                                                     |
| Test Setup:       |  <p>The diagram illustrates the test setup. A Spectrum Analyzer, showing a frequency spectrum on its screen, is connected to an E.U.T (Equipment Under Test) by a red cable. Both the Spectrum Analyzer and the E.U.T are positioned on a table labeled 'Non-Conducted Table'. Below this table is a 'Ground Reference Plane'.</p> |
| Limit:            | N/A                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Test Mode:        | Transmitting mode                                                                                                                                                                                                                                                                                                                                                                                                    |
| Instruments Used: | Refer to section 5 for details                                                                                                                                                                                                                                                                                                                                                                                       |
| Test Results:     | N/A                                                                                                                                                                                                                                                                                                                                                                                                                  |



Test plot as follows:

Duty cycle numbers





#### 7.4 Field Strength of the Fundamental Signal

Test Requirement 47 CFR Part 15, Subpart C 15.231(b)

Test Method: ANSI C63.10 (2013) Section 6.5

Measurement Distance: 3m

Limit:

| Fundamental frequency(MHz) | Field strength of fundamental(microvolts/meter) | Field strength of spurious emissions(microvolts/meter) |
|----------------------------|-------------------------------------------------|--------------------------------------------------------|
| 40.66-40.70                | 2250                                            | 225                                                    |
| 70-130                     | 1250                                            | 125                                                    |
| 130-174                    | 1250 to 3750                                    | 125 to 375                                             |
| 174-260                    | 3750                                            | 375                                                    |
| 260-470                    | 3750 to 12500                                   | 375 to 1250                                            |
| Above 470                  | 12500                                           | 1250                                                   |

Remark: the emission limit is based on measurement instrumentation employing an average detector at a distance of 3 meters. The frequencies above 1000MHz are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

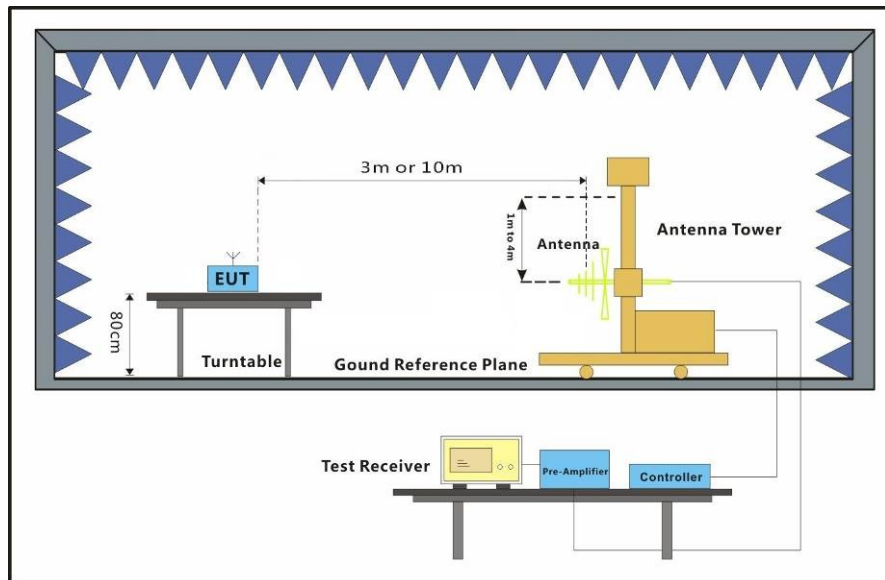
#### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar

Test mode d:TX mode\_Keep the EUT in transmitting with modulation mode.

#### 7.4.2 Test Setup Diagram



#### 7.4.3 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna 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.
- 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



## Measurement Data

| Average value:     |                                  |
|--------------------|----------------------------------|
| Calculate Formula: | Average value=Peak value + PDCF  |
|                    | PDCF=20 log(Duty cycle)          |
|                    | Duty cycle= T on time / T period |
| Test data:         | Ton time =24.01ms                |
|                    | T period =100ms                  |
|                    | Average value= -12.39dB          |

| Peak value:     |                 |                       |                    |                   |                |                     |                 |              |
|-----------------|-----------------|-----------------------|--------------------|-------------------|----------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamp Factor (dB) | Read Level (dBuV) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 433.92          | 2.35            | 12.10                 | 27.33              | 102.26            | 89.38          | 100.82              | -11.44          | Horizontal   |
| 433.92          | 2.35            | 12.10                 | 27.33              | 99.51             | 86.63          | 100.82              | -14.19          | Vertical     |

## Average value:

| Frequency (MHz) | PDCF   | Peak Level (dBuV/m) | Average Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|-----------------|--------|---------------------|------------------------|---------------------|-----------------|--------------|
| 433.92          | -12.39 | 89.38               | 76.99                  | 80.82               | -3.83           | Horizontal   |
| 433.92          |        | 86.63               | 74.24                  | 80.82               | -6.58           | Vertical     |



## 7.5 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.231(e)  
Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6  
Measurement Distance: 3m  
Limit:

| Frequency(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                            |

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

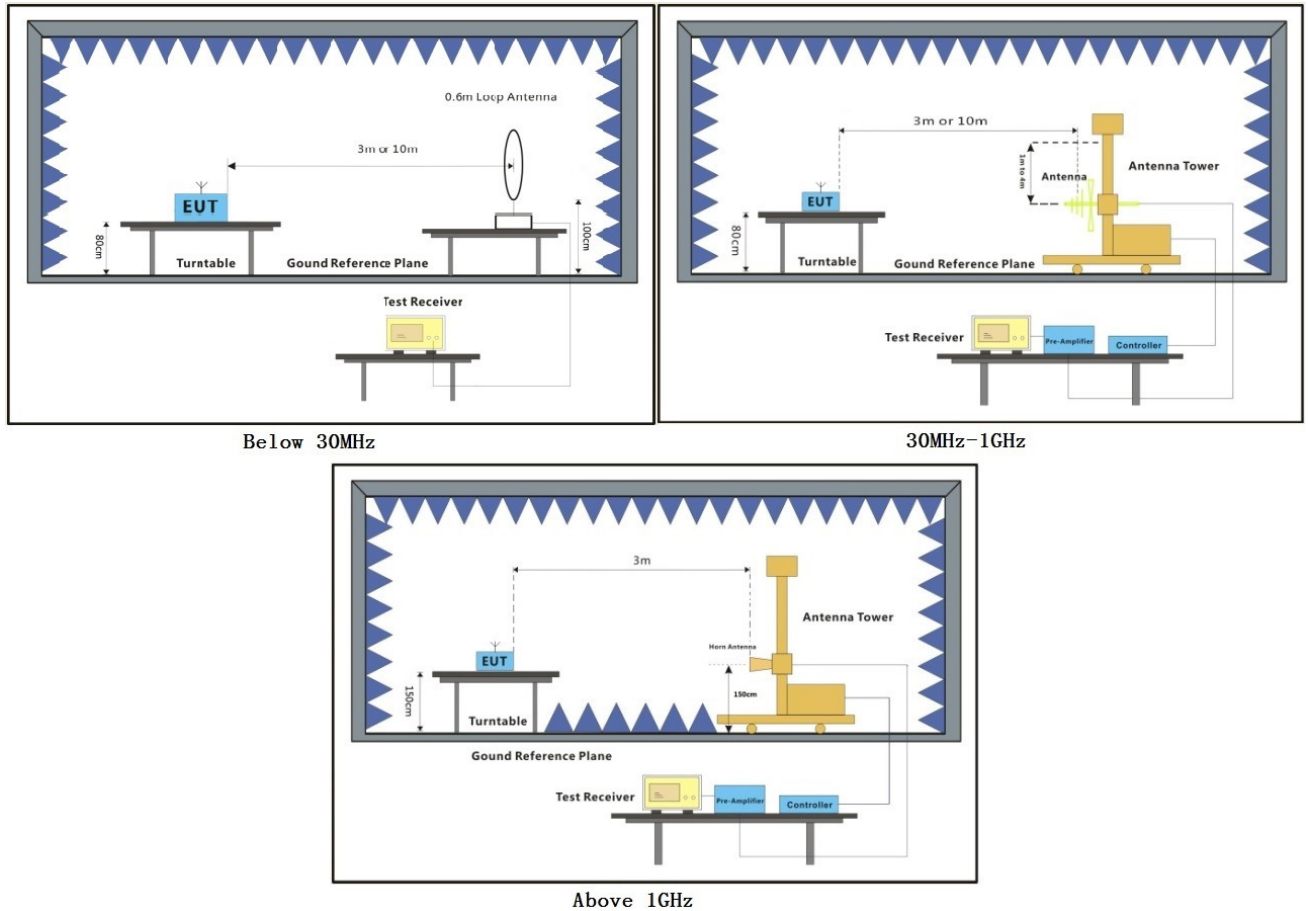
### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

Test mode d:TX mode\_Keep the EUT in transmitting with modulation mode.

### 7.5.2 Test Setup Diagram



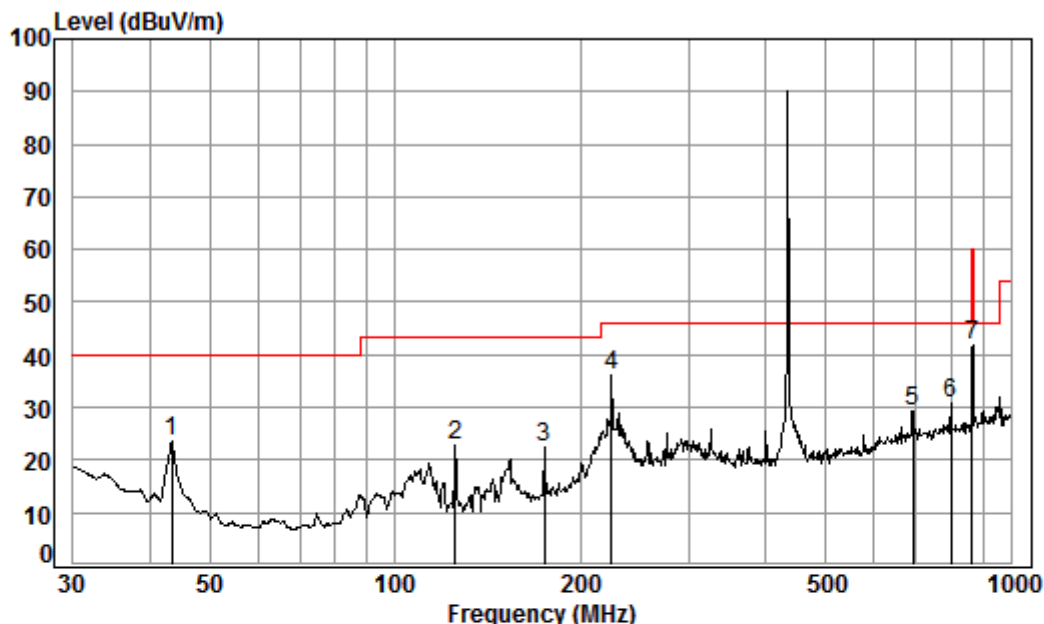


### **7.5.3 Measurement Procedure and Data**

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Mode:d; Polarization:Horizontal



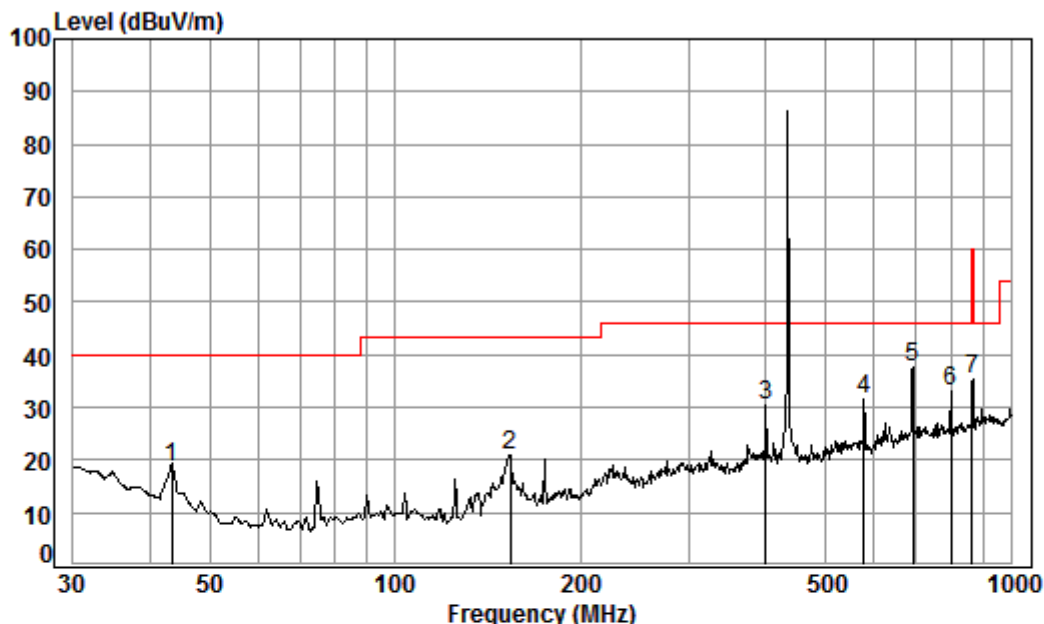
Condition: 3m HORIZONTAL

Job No. : 06752CR/06750CR

Test mode: d

|      | Freq   | Cable | Ant    | Preamp | Read  | Limit  | Over   |
|------|--------|-------|--------|--------|-------|--------|--------|
|      | MHz    | Loss  | Factor | Factor | Level | Line   | Limit  |
|      | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dB     |
| 1    | 43.50  | 0.68  | 11.56  | 27.31  | 38.57 | 23.50  | -16.50 |
| 2    | 125.35 | 1.27  | 7.79   | 27.03  | 40.69 | 22.72  | -20.78 |
| 3    | 174.73 | 1.36  | 9.69   | 26.79  | 38.33 | 22.59  | -20.91 |
| 4 pp | 224.76 | 1.54  | 11.49  | 26.61  | 49.82 | 36.24  | -9.76  |
| 5    | 694.22 | 2.89  | 21.55  | 27.42  | 32.22 | 29.24  | -16.76 |
| 6    | 800.41 | 3.21  | 22.10  | 27.30  | 32.87 | 30.88  | -15.12 |
| 7    | 866.00 | 3.48  | 22.78  | 26.96  | 42.55 | 41.85  | -18.15 |

Mode:d; Polarization:Vertical



Condition: 3m VERTICAL

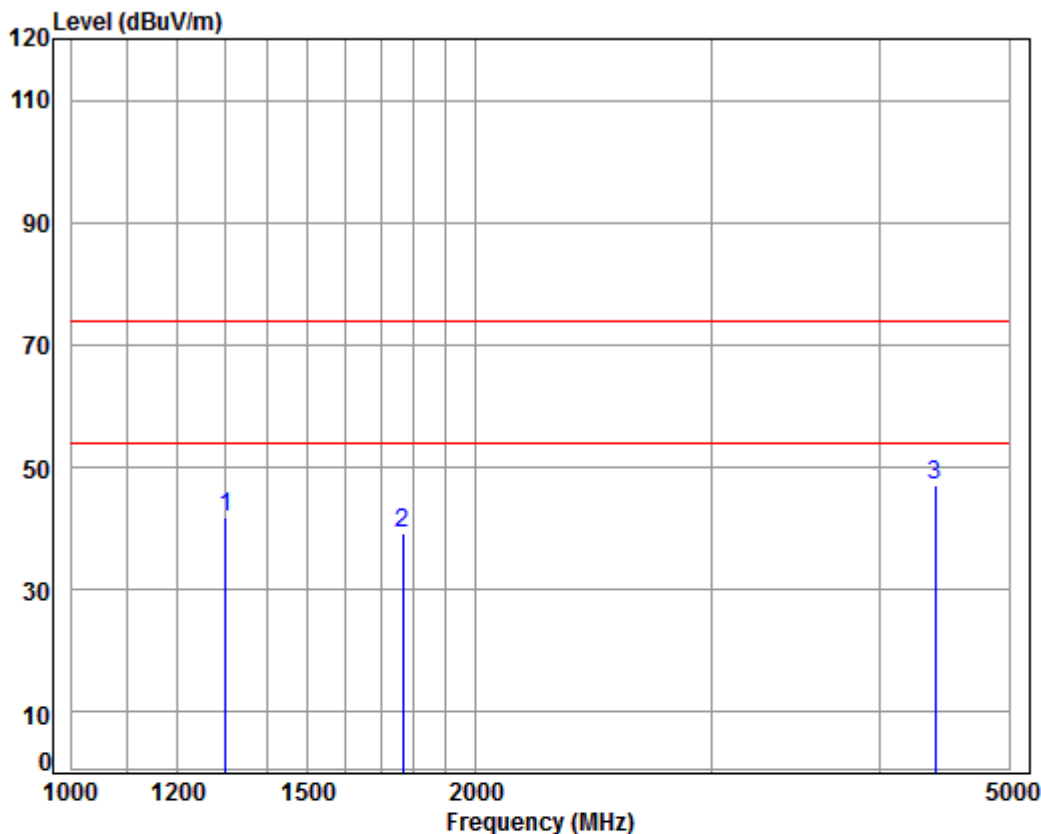
Job No. : 06752CR/06750CR

Test mode: d

|      | Freq   | Cable | Ant    | Preamp | Read  | Limit  | Over   |
|------|--------|-------|--------|--------|-------|--------|--------|
|      | MHz    | Loss  | Factor | Factor | Level | Line   | Limit  |
|      | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m |
| 1    | 43.50  | 0.68  | 11.56  | 27.31  | 33.55 | 18.48  | 40.00  |
| 2    | 153.77 | 1.33  | 9.23   | 26.89  | 37.42 | 21.09  | 43.50  |
| 3    | 400.09 | 2.20  | 16.30  | 27.13  | 38.89 | 30.26  | 46.00  |
| 4    | 576.32 | 2.68  | 19.14  | 27.57  | 37.14 | 31.39  | 46.00  |
| 5 pp | 694.22 | 2.89  | 21.55  | 27.42  | 40.58 | 37.60  | 46.00  |
| 6    | 800.41 | 3.21  | 22.10  | 27.30  | 35.04 | 33.05  | 46.00  |
| 7    | 866.00 | 3.48  | 22.78  | 26.96  | 36.05 | 35.35  | 60.00  |



Mode:d; Polarization:Horizontal



Condition: 3m HORIZONTAL

Job No : 06750CR/06752CR

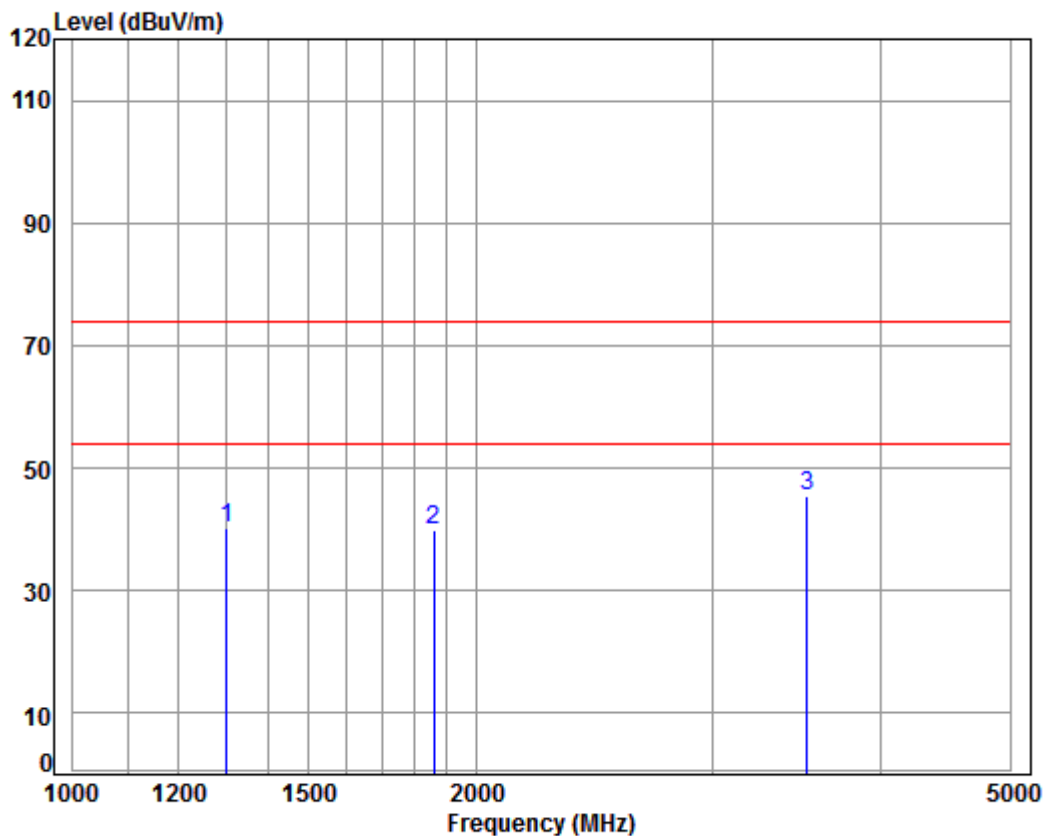
Mode : 433 TX SE

Note : Remote

|      | Freq     | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit  | Over Limit | Remark |
|------|----------|------------|------------|---------------|------------|--------|--------|------------|--------|
|      | MHz      | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m | dB         |        |
| 1    | 1302.060 | 4.22       | 24.96      | 38.06         | 50.61      | 41.73  | 74.00  | -32.27     | Peak   |
| 2    | 1764.966 | 5.15       | 26.93      | 38.02         | 45.10      | 39.16  | 74.00  | -34.84     | Peak   |
| 3 pp | 4403.027 | 7.45       | 33.60      | 38.22         | 44.38      | 47.21  | 74.00  | -26.79     | Peak   |



Mode:d; Polarization:Vertical



Condition: 3m VERTICAL

Job No : 06750CR/06752CR

Mode : 433 TX SE

Note : Remote

|      | Freq     | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|----------|------------|------------|---------------|------------|--------|------------|------------|--------|
|      | MHz      | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 1302.060 | 4.22       | 24.96      | 38.06         | 49.26      | 40.38  | 74.00      | -33.62     | Peak   |
| 2    | 1858.247 | 5.05       | 27.29      | 38.01         | 45.42      | 39.75  | 74.00      | -34.25     | Peak   |
| 3 pp | 3526.091 | 6.49       | 32.28      | 37.96         | 44.64      | 45.45  | 74.00      | -28.55     | Peak   |



Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

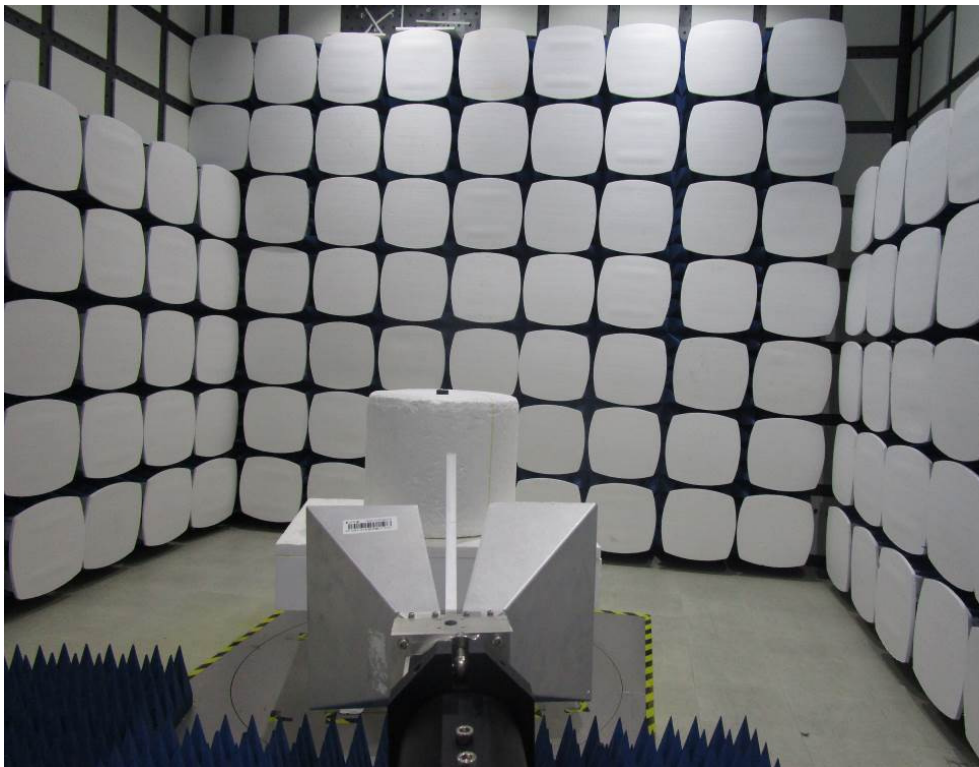
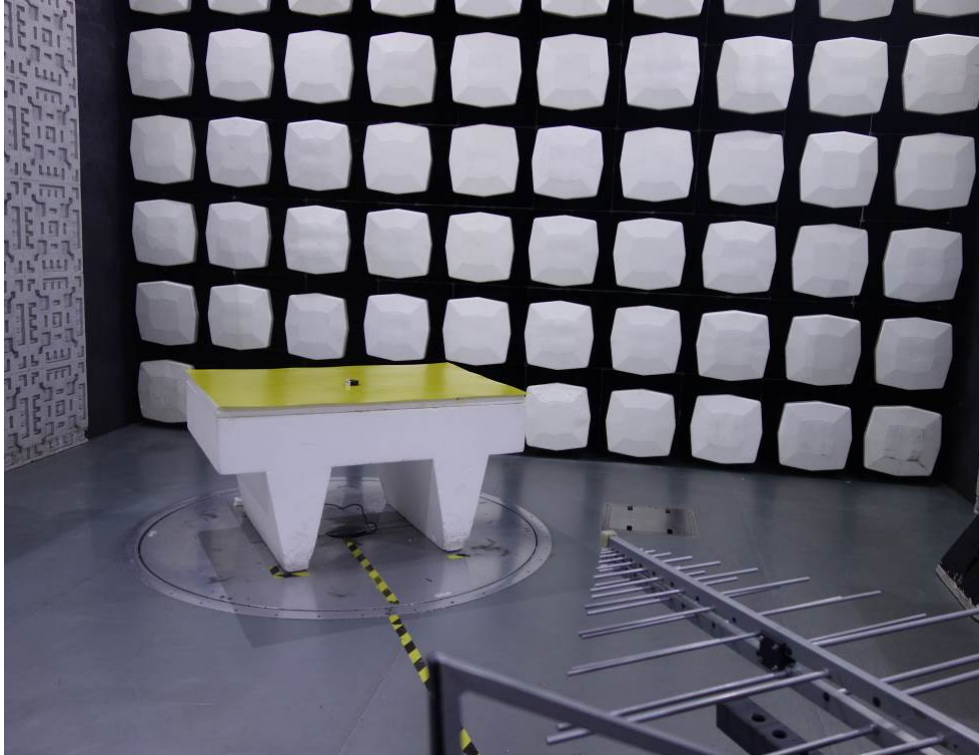
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 5GHz, the disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

## 8 Photographs

### 8.1 Field Strength of the Fundamental Signal Test Setup





## **8.2 EUT Constructional Details**

Refer to EUT external and internal photos.