



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

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Report No.: SZEM170600607703  
Page: 1 of 27

## **TEST REPORT**

**Application No.:** SZEM1706006077CR(SGS SZ No.:T51710230086EM)  
**Applicant:** MGA ENTERTAINMENT (H.K.) LTD.  
**Address of Applicant:** 6/F, YHC TOWER, 1 SHEUNG YUET ROAD, KOWLOON BAY, KOWLOON,  
Hong Kong

**Equipment Under Test (EUT):**  
**EUT Name:** Construct'n Learn Smart Workbench  
**Item No.:** 643651, 643651C, 643651E4, 643651E4C ♣  
♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

**P.O. No.:** HKPO17001675  
**Labeled Age Grading:** 3+ Years  
**Country of Origin:** China  
**Country of Destination:** US  
**FCC ID:** LU9643651C  
**Standards:** 47 CFR Part 15, Subpart C 15.225  
**Date of Receipt:** 2017-06-15  
**Date of Test:** 2017-06-19 to 2017-06-20  
**Date of Issue:** 2017-06-22

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

\* 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              |         | 2017-06-22 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                             |  |            |
|--------------------------|--|-----------------------------|--|------------|
| Authorized for issue by: |  |                             |  |            |
|                          |  | Gebin Sun                   |  | 2017-06-20 |
|                          |  | Gebin Sun /Project Engineer |  | Date       |
|                          |  | Eric Fu                     |  | 2017-06-22 |
|                          |  | Eric Fu /Reviewer           |  | Date       |



## 2 Test Summary

| Radio Spectrum Technical Requirement |                                  |        |                                  |        |
|--------------------------------------|----------------------------------|--------|----------------------------------|--------|
| Item                                 | Standard                         | Method | Requirement                      | Result |
| Antenna Requirement                  | 47 CFR Part 15, Subpart C 15.225 | 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 15.225 | ANSI C63.10 (2013) Section 6.9     | 47 CFR Part 15, Subpart C 15.215             | Pass   |
| Emission Mask                  | 47 CFR Part 15, Subpart C 15.225 | ANSI C63.10 (2013) Section 6.4     | 47 CFR Part 15, Subpart C 15.225(a)&(b)&(C)  | Pass   |
| Frequency tolerance            | 47 CFR Part 15, Subpart C 15.225 | ANSI C63.10 (2013) Section 6.8     | 47 CFR Part 15, Subpart C 15.225(e)          | Pass   |
| Radiated Emissions(9kHz-30MHz) | 47 CFR Part 15, Subpart C 15.225 | ANSI C63.10 (2013) Section 6.4&6.5 | 47 CFR Part 15, Subpart C 15.225(d) & 15.209 | Pass   |
| Radiated Emissions(30MHz-1GHz) | 47 CFR Part 15, Subpart C 15.225 | ANSI C63.10 (2013) Section 6.4&6.5 | 47 CFR Part 15, Subpart C 15.225(d) & 15.209 | Pass   |

### Remark:

Item No.: 643651, 643651C, 643651E4, 643651E4C

Only the item 643651 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above items, only different on item No..



### 3 Contents

|                                                     | Page |
|-----------------------------------------------------|------|
| 1 COVER PAGE .....                                  | 1    |
| 2 TEST SUMMARY .....                                | 3    |
| 3 CONTENTS .....                                    | 4    |
| 4 GENERAL INFORMATION .....                         | 5    |
| 4.1 DETAILS OF E.U.T. ....                          | 5    |
| 4.2 DESCRIPTION OF SUPPORT UNITS .....              | 5    |
| 4.3 MEASUREMENT UNCERTAINTY .....                   | 5    |
| 4.4 TEST LOCATION .....                             | 6    |
| 4.5 TEST FACILITY .....                             | 6    |
| 4.6 DEVIATION FROM STANDARDS .....                  | 6    |
| 4.7 ABNORMALITIES FROM STANDARD CONDITIONS .....    | 6    |
| 5 EQUIPMENT LIST .....                              | 7    |
| 6 RADIO SPECTRUM TECHNICAL REQUIREMENT .....        | 9    |
| 6.1 ANTENNA REQUIREMENT .....                       | 9    |
| 6.1.1 Test Requirement: .....                       | 9    |
| 6.1.2 Conclusion .....                              | 9    |
| 7 RADIO SPECTRUM MATTER TEST RESULTS .....          | 10   |
| 7.1 20dB BANDWIDTH .....                            | 10   |
| 7.1.1 E.U.T. Operation .....                        | 10   |
| 7.1.2 Test Setup Diagram .....                      | 10   |
| 7.1.3 Measurement Procedure and Data .....          | 10   |
| 7.2 EMISSION MASK .....                             | 12   |
| 7.2.1 E.U.T. Operation .....                        | 13   |
| 7.2.2 Test Setup Diagram .....                      | 13   |
| 7.2.3 Measurement Procedure and Data .....          | 13   |
| 7.3 FREQUENCY TOLERANCE .....                       | 16   |
| 7.3.1 E.U.T. Operation .....                        | 16   |
| 7.3.2 Test Setup Diagram .....                      | 16   |
| 7.3.3 Measurement Procedure and Data .....          | 16   |
| 7.4 RADIATED EMISSIONS(9KHZ-30MHZ) .....            | 18   |
| 7.4.1 E.U.T. Operation .....                        | 19   |
| 7.4.2 Test Setup Diagram .....                      | 19   |
| 7.4.3 Measurement Procedure and Data .....          | 19   |
| 7.5 RADIATED EMISSIONS(30MHZ-1GHZ) .....            | 22   |
| 7.5.1 E.U.T. Operation .....                        | 23   |
| 7.5.2 Test Setup Diagram .....                      | 23   |
| 7.5.3 Measurement Procedure and Data .....          | 24   |
| 8 PHOTOGRAPHS .....                                 | 27   |
| 8.1 RADIATED EMISSIONS(9KHZ-30MHZ) TEST SETUP ..... | 27   |
| 8.2 RADIATED EMISSIONS(30MHZ-1GHZ) TEST SETUP ..... | 27   |
| 8.3 EUT CONSTRUCTIONAL DETAILS .....                | 27   |



## 4 General Information

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

Power supply: 6V DC(1.5V x 4 "AA" Size Batteries)  
4.5V DC(1.5V x 3 "AAA" Size Batteries)

Operation Frequency: 13.56MHz  
Antenna type: Loop antenna

### 4.2 Description of Support Units

The EUT has been tested independently.

### 4.3 Measurement Uncertainty

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Radio Frequency                 | 7.25 x 10 <sup>-8</sup> |
| 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 – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **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 |
| Signal Generator | Rohde & Schwarz | SML03    | SEM006-02    | 2017-04-14 | 2018-04-13   |

| Frequency tolerance |                 |          |              |            |              |
|---------------------|-----------------|----------|--------------|------------|--------------|
| Equipment           | Manufacturer    | Model No | Inventory No | Cal Date   | Cal Due Date |
| Signal Generator    | Rohde & Schwarz | SML03    | SEM006-02    | 2017-04-14 | 2018-04-13   |

| Radiated Emissions(9kHz-30MHz)     |                      |          |              |            |              |
|------------------------------------|----------------------|----------|--------------|------------|--------------|
| Equipment                          | Manufacturer         | Model No | Inventory No | Cal Date   | Cal Due Date |
| 10m Semi-Anechoic Chamber          | SAEMC                | FSAC1018 | SEM001-03    | 2017-05-10 | 2018-05-10   |
| EMI Test Receiver (9k-3GHz)        | Rohde & Schwarz      | ESCI     | SEM004-01    | 2017-04-14 | 2018-04-13   |
| Trilog-Broadband Antenna(30M-1GHz) | Schwarzbeck          | VULB9168 | SEM003-17    | 2016-01-26 | 2019-01-26   |
| Pre-amplifier                      | Sonoma Instrument Co | 310N     | SEM005-03    | 2017-06-05 | 2018-06-04   |
| Active Loop Antenna                | ETS-Lindgren         | 6502     | SEM003-08    | 2015-08-14 | 2018-08-14   |

| Radiated Emissions(30MHz-1GHz)    |                      |           |               |                           |                               |
|-----------------------------------|----------------------|-----------|---------------|---------------------------|-------------------------------|
| Test Equipment                    | Manufacturer         | Model No. | Inventory No. | Cal. Date<br>(yyyy-mm-dd) | Cal. Due date<br>(yyyy-mm-dd) |
| 3m Semi-Anechoic Chamber          | ETS-LINDGREN         | N/A       | SEM001-01     | 2017-05-10                | 2018-05-10                    |
| 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                    |
| Pre-amplifier<br>(0.1-1300MHz)    | Agilent Technologies | 8447D     | SEM005-01     | 2017-04-14                | 2018-04-13                    |
| Band filter                       | Amindeon             | Asi 3314  | SEM023-01     | N/A                       | N/A                           |
| DC Power Supply                   | Zhao Xin             | RXN-305D  | SEM011-02     | 2016-10-09                | 2017-10-09                    |
| Loop Antenna                      | Beijing Daze         | ZN30401   | SEM003-09     | 2015-05-13                | 2018-05-13                    |



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**Shenzhen Branch**

Report No.: SZEM170600607703

Page: 8 of 27

| 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

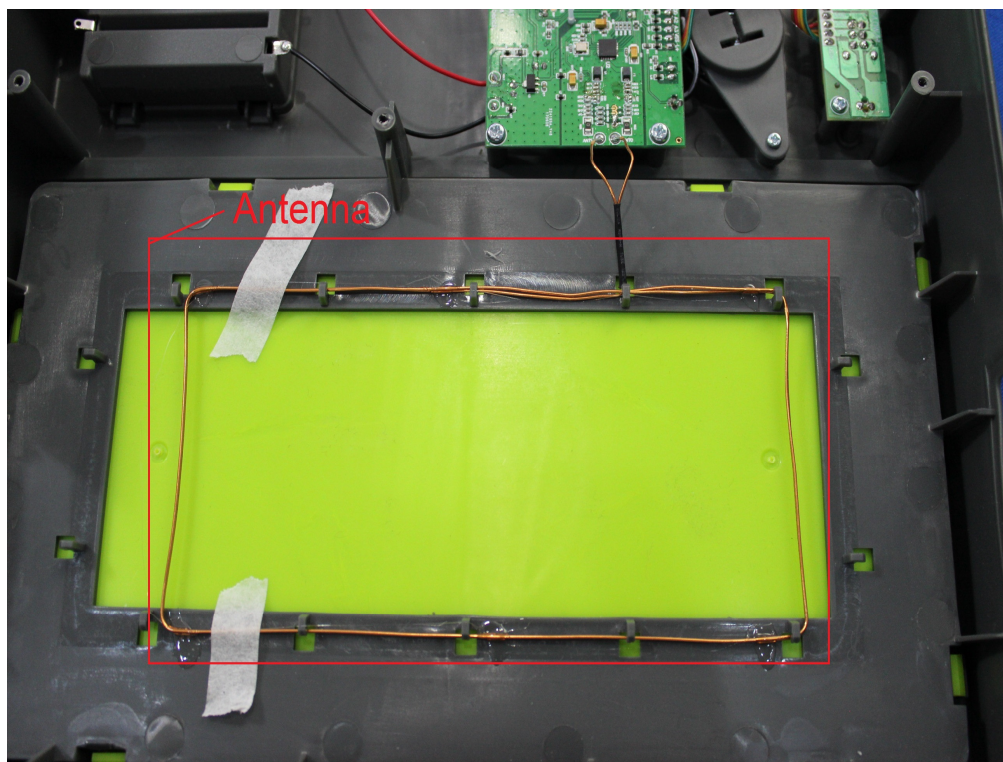
#### 6.1.2 Conclusion

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 a 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

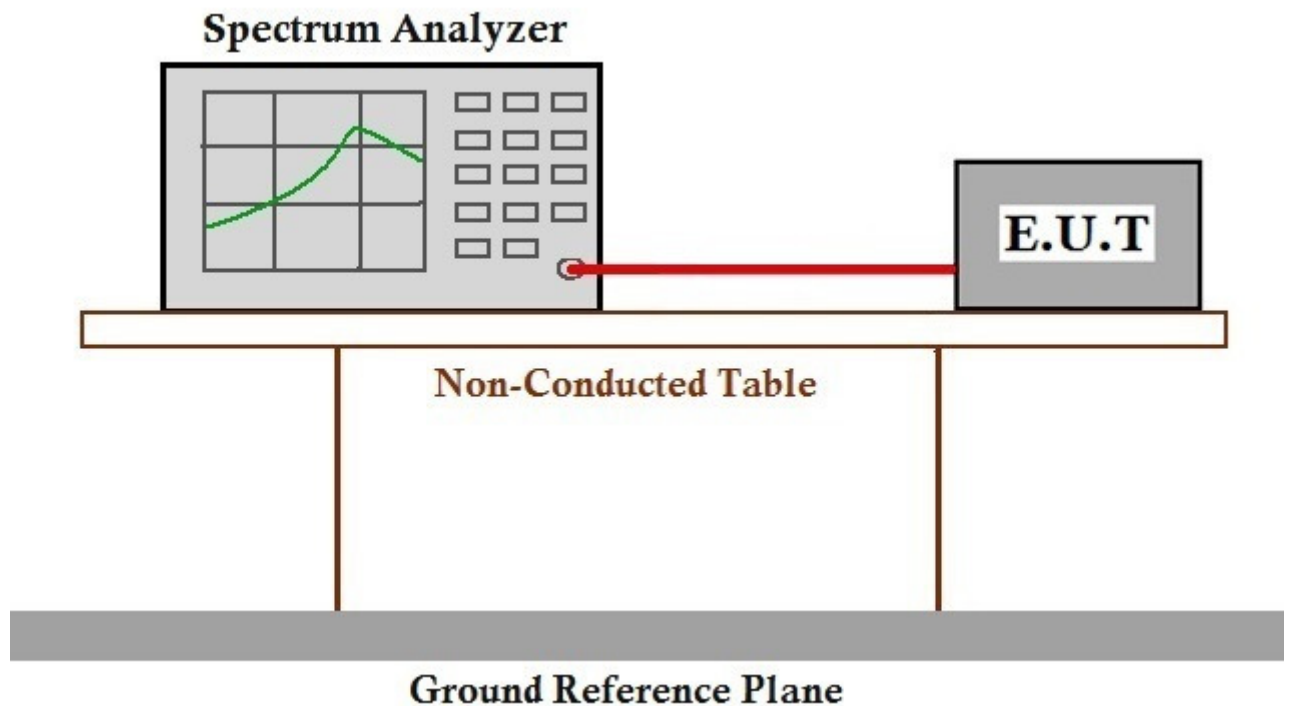
|                       |                                  |
|-----------------------|----------------------------------|
| Test Requirement      | 47 CFR Part 15, Subpart C 15.215 |
| Test Method:          | ANSI C63.10 (2013) Section 6.9   |
| Measurement Distance: | 10m                              |
| Limit:                | N/A                              |

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

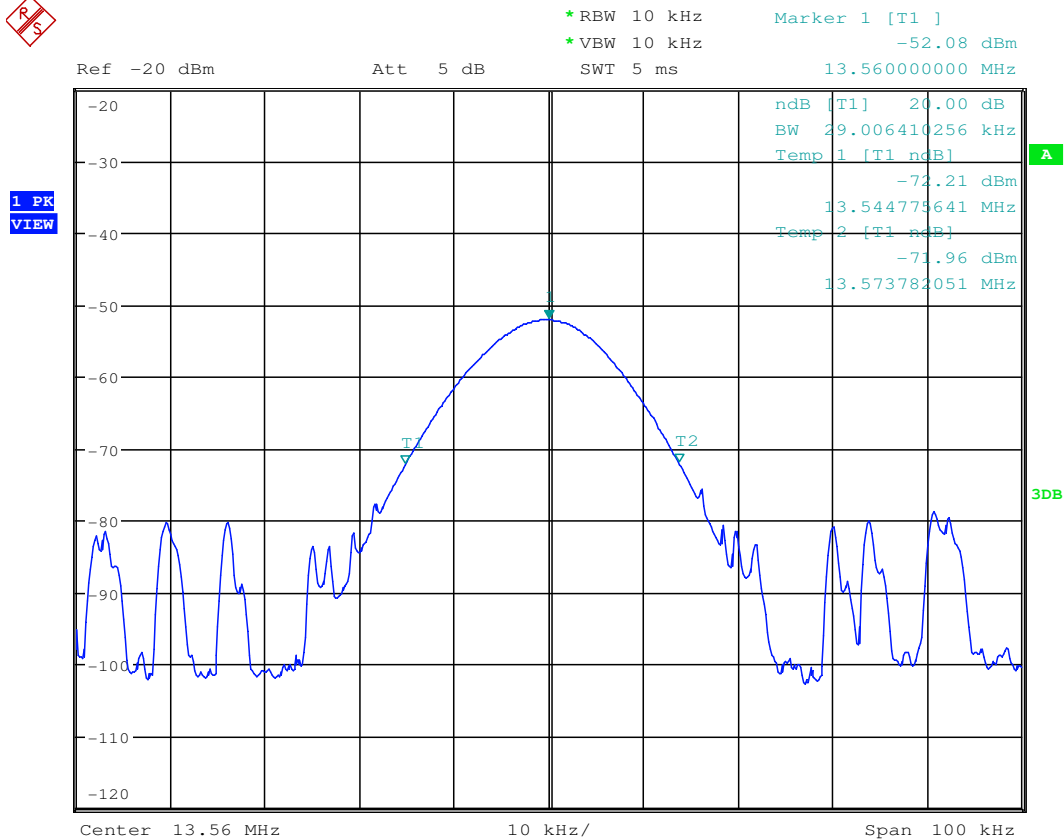
Operating Environment:

|              |                                              |           |         |                       |           |
|--------------|----------------------------------------------|-----------|---------|-----------------------|-----------|
| Temperature: | 24 °C                                        | Humidity: | 54 % RH | Atmospheric Pressure: | 1005 mbar |
| Test mode    | c:TX mode_Keep the EUT in transmitting mode. |           |         |                       |           |

#### 7.1.2 Test Setup Diagram



#### 7.1.3 Measurement Procedure and Data





## **7.2 Emission Mask**

Test Requirement 47 CFR Part 15, Subpart C 15.225(a)&(b)&(C )

Test Method: ANSI C63.10 (2013) Section 6.4

Measurement Distance: 3m

Limit:

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15.848 microvolts/meter at 30 meters.
- (b) 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.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

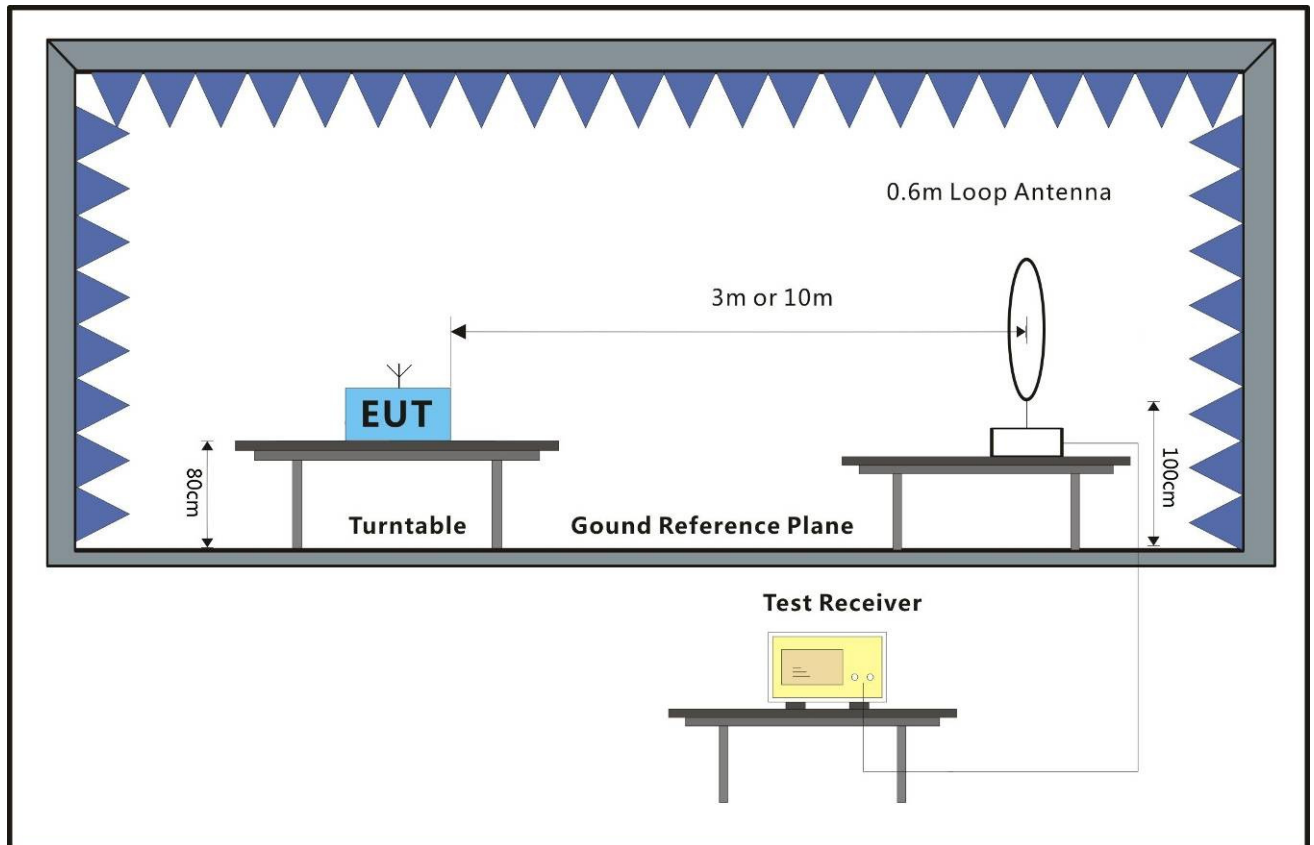
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

Test mode c:TX mode\_Keep the EUT in transmitting mode.

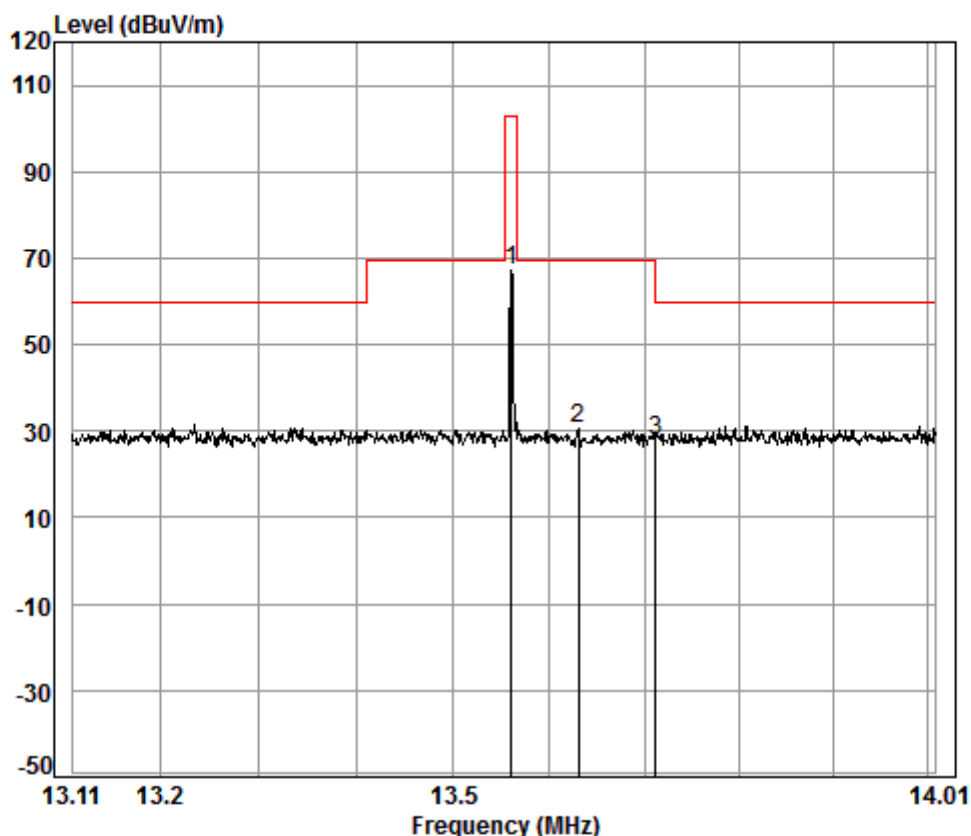
### 7.2.2 Test Setup Diagram



### 7.2.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

Mode:c



Condition: 10m

Job No. : 06077CR

Test Mode: TX

|      | Freq  | Cable Loss | Ant Factor | Preamplifier Factor | Read Level | Level  | Limit Line | Over Limit |
|------|-------|------------|------------|---------------------|------------|--------|------------|------------|
|      | MHz   | dB         | dB/m       | dB                  | dBuV       | dBuV/m | dBuV/m     | dB         |
| 1    | 13.56 | 0.57       | 10.47      | 32.50               | 88.62      | 67.16  | 103.08     | -35.92     |
| 2    | 13.63 | 0.57       | 10.47      | 32.50               | 52.02      | 30.56  | 69.56      | -39.00     |
| 3 pp | 13.71 | 0.57       | 10.47      | 32.50               | 49.39      | 27.93  | 59.59      | -31.66     |



**Below 30MHz**

The test was performed at a 10m test site. According to below formulate and the test data at 10m test distance,

$$L_{30} / L_{10} = D_{10} / D_{30}$$

Note:

L<sub>30</sub>: Level @ 30m distance. Unit: uV/m;

L<sub>10</sub>: Level @ 10m distance. Unit: uV/m;

D<sub>30</sub>: 30m distance. Unit: m

D<sub>10</sub>: 10m distance. Unit: m

The level at 30m test distance is below:

| Frequency (MHz) | Level @ 10m (dBuV/m) | Level @ 10m (uV/m) | Level @ 30m (uV/m) | Level @ 30m (dBuV/m) | Limit @ 30m (dBuV/m) | Margin (dB) |
|-----------------|----------------------|--------------------|--------------------|----------------------|----------------------|-------------|
| 13.56           | 67.16                | 2280.34            | 760.11             | 57.62                | 84.000               | -26.38      |
| 13.63           | 30.56                | 33.73              | 11.24              | 21.02                | 50.470               | -29.45      |
| 13.71           | 27.93                | 24.92              | 8.31               | 18.39                | 40.510               | -22.12      |

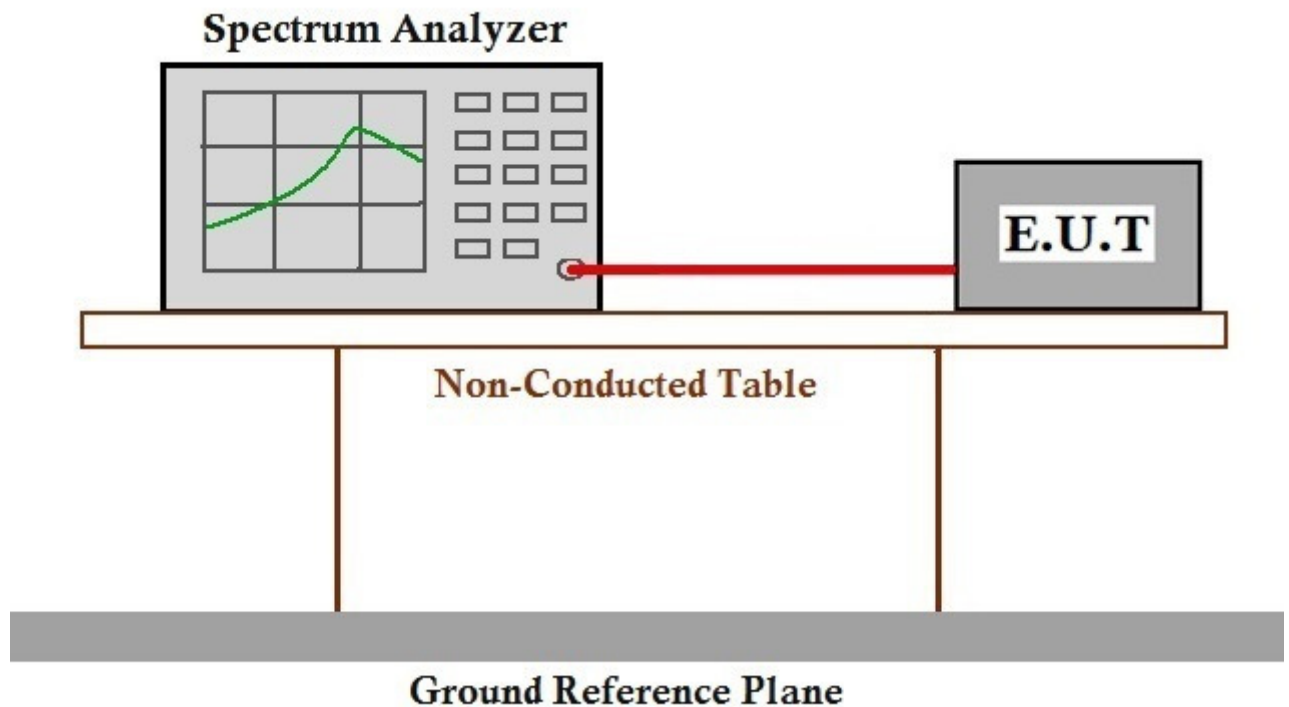
### 7.3 Frequency tolerance

Test Requirement 47 CFR Part 15, Subpart C 15.225(e)  
Test Method: ANSI C63.10 (2013) Section 6.8  
Measurement Distance: 10m  
Limit: 1.356kHz

#### 7.3.1 E.U.T. Operation

Operating Environment:  
Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar  
Test mode c:TX mode\_Keep the EUT in transmitting mode.

#### 7.3.2 Test Setup Diagram



#### 7.3.3 Measurement Procedure and Data



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

Report No.: SZEM170600607703

Page: 17 of 27

| Test Frequency: 13.56MHz |                      |                    | Temperature:20℃ |        |
|--------------------------|----------------------|--------------------|-----------------|--------|
| Supply Voltage<br>(V) AC | Test Result<br>(MHz) | Deviation<br>(kHz) | Limit<br>(kHz)  | Result |
| 120                      | 13.5596780           | 0.322              | 1.3560          | Pass   |

| Test Frequency: 13.56MHz |                      |                    | Voltage:120V   |        |
|--------------------------|----------------------|--------------------|----------------|--------|
| Temperature<br>(℃)       | Test Result<br>(MHz) | Deviation<br>(kHz) | Limit<br>(kHz) | Result |
| -20                      | 13.5596730           | 0.327              | 1.3560         | Pass   |
| -10                      | 13.5596770           | 0.323              | 1.3560         |        |
| 0                        | 13.5596730           | 0.327              | 1.3560         |        |
| 10                       | 13.5596788           | 0.3212             | 1.3560         |        |
| 20                       | 13.5596745           | 0.3255             | 1.3560         |        |
| 30                       | 13.5596768           | 0.3232             | 1.3560         |        |
| 40                       | 13.5596758           | 0.3242             | 1.3560         |        |
| 50                       | 13.5596742           | 0.3258             | 1.3560         |        |



#### **7.4 Radiated Emissions(9kHz-30MHz)**

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Measurement Distance: 10m

Limit:

| Frequency(MHz) | Field strength<br>(microvolts/meter) | Limit<br>(dBuV/m) | Detector | Measurement Distance<br>(meters) |
|----------------|--------------------------------------|-------------------|----------|----------------------------------|
| 0.009-0.490    | 2400/F(kHz)                          | -                 | -        | 300                              |
| 0.490-1.705    | 24000/F(kHz)                         | -                 | -        | 30                               |
| 1.705-30       | 30                                   | -                 | -        | 30                               |
| 30-88          | 100                                  | 40.0              | QP       | 3                                |
| 88-216         | 150                                  | 43.5              | QP       | 3                                |
| 216-960        | 200                                  | 46.0              | QP       | 3                                |
| 960-1000       | 500                                  | 54.0              | QP       | 3                                |
| Above 1000     | 500                                  | 54.0              | AV       | 3                                |

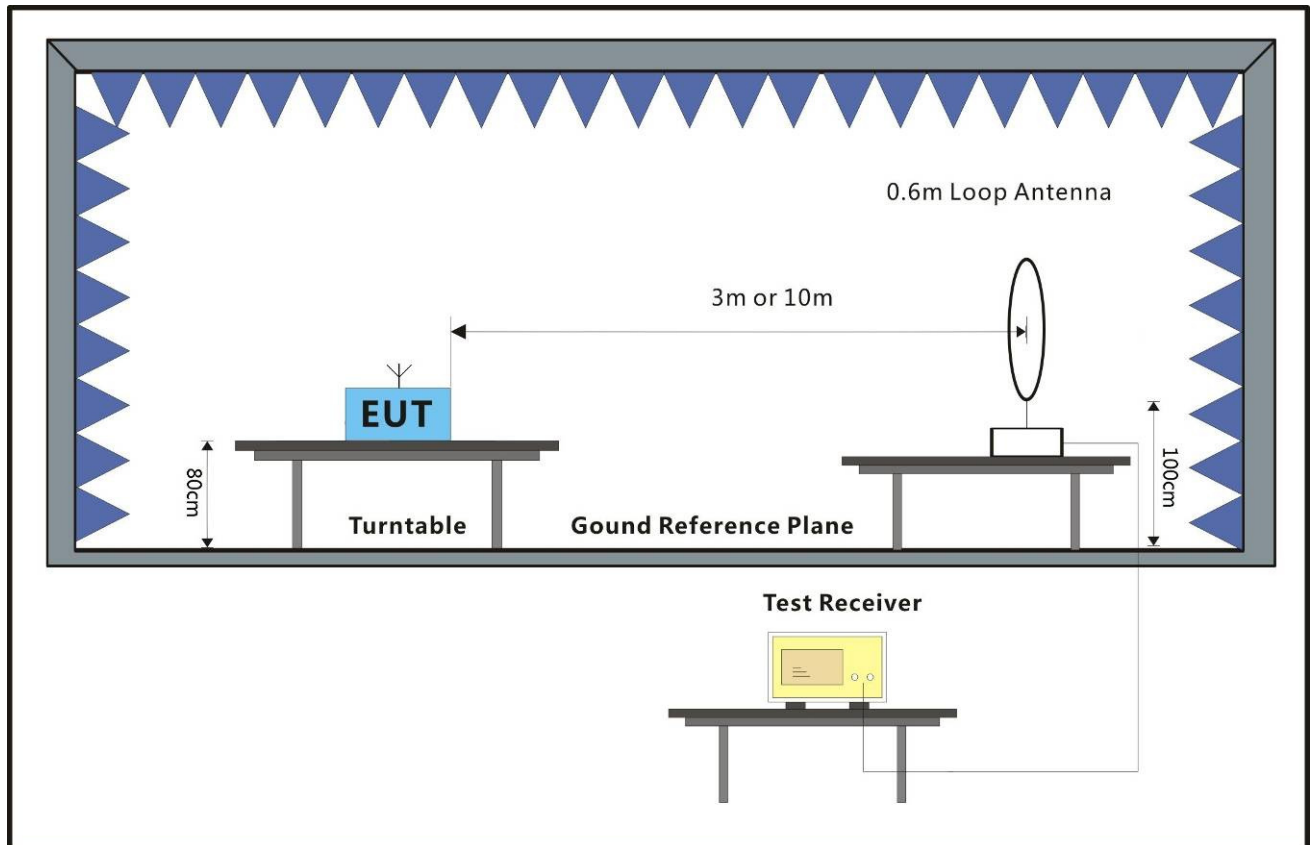
#### 7.4.1 E.U.T. Operation

Operating Environment:

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

Test mode c:TX mode\_Keep the EUT in transmitting mode.

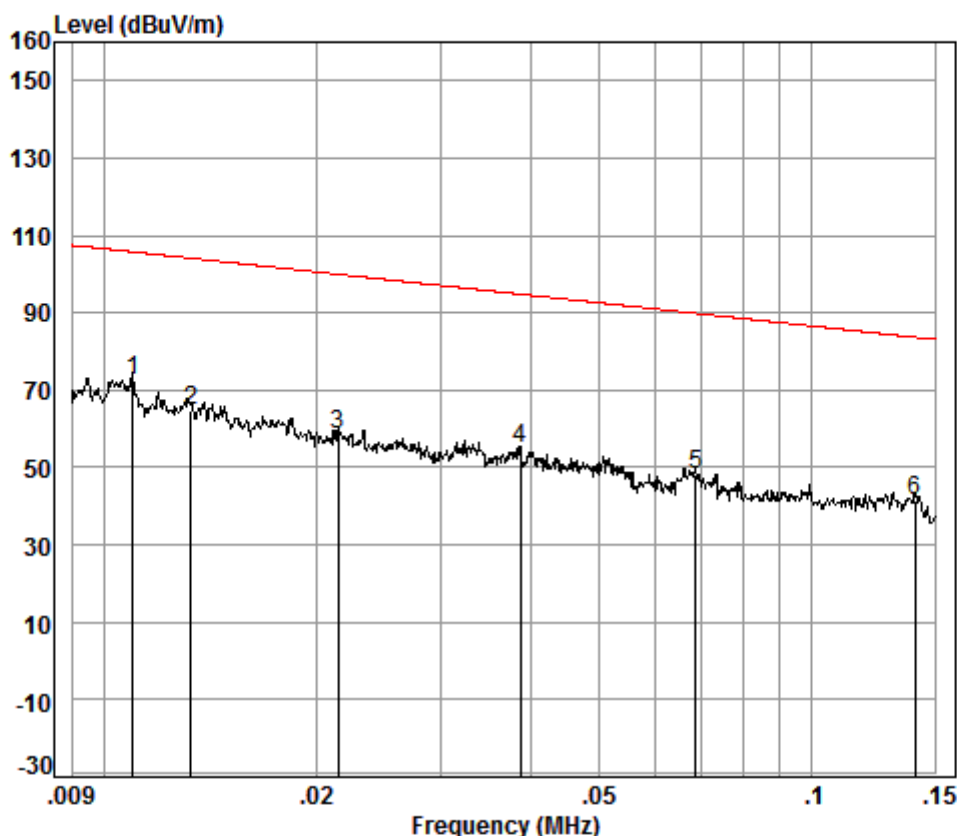
#### 7.4.2 Test Setup Diagram



#### 7.4.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

Mode:c;



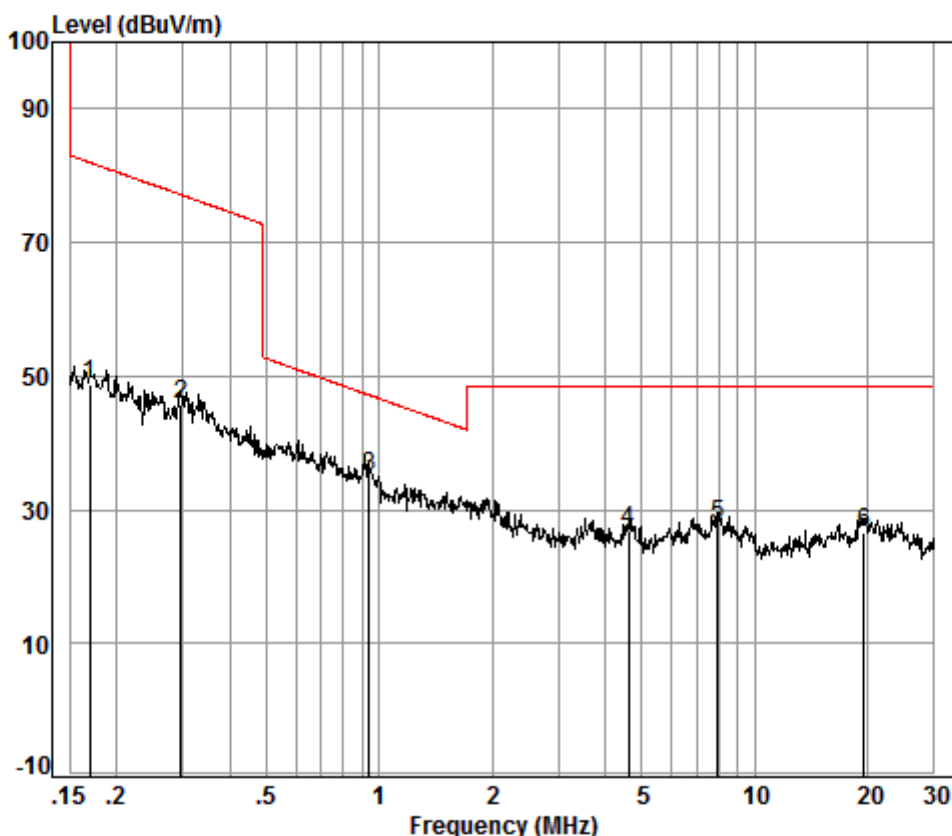
Condition: 10m

Job No. : 06077CR

Test Mode: TX

|      |      | Cable | Ant    | Preamp | Read  |        | Limit  | Over   |
|------|------|-------|--------|--------|-------|--------|--------|--------|
|      | Freq | Loss  | Factor | Factor | Level | Level  | Line   | Limit  |
|      | MHz  | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
| 1 pp | 0.01 | 0.28  | 18.71  | 32.48  | 85.85 | 72.36  | 105.77 | -33.41 |
| 2    | 0.01 | 0.26  | 17.55  | 32.48  | 79.43 | 64.76  | 104.13 | -39.37 |
| 3    | 0.02 | 0.21  | 14.81  | 32.49  | 75.83 | 58.36  | 99.98  | -41.62 |
| 4    | 0.04 | 0.15  | 13.12  | 32.50  | 73.90 | 54.67  | 94.82  | -40.15 |
| 5    | 0.07 | 0.09  | 12.17  | 32.51  | 68.43 | 48.18  | 89.87  | -41.69 |
| 6    | 0.14 | 0.06  | 11.75  | 32.50  | 62.35 | 41.66  | 83.69  | -42.03 |

Mode:c;



Condition: 10m

Job No. : 06077CR

Test Mode: TX

|      | Freq  | Cable Loss | Ant Factor | Preamplifier Factor | Read Level | Level  | Limit Line | Over Limit |
|------|-------|------------|------------|---------------------|------------|--------|------------|------------|
|      | MHz   | dB         | dB/m       | dB                  | dBuV       | dBuV/m | dBuV/m     | dB         |
| 1    | 0.17  | 0.07       | 12.80      | 32.50               | 68.47      | 48.84  | 81.97      | -33.13     |
| 2    | 0.30  | 0.09       | 12.73      | 32.52               | 65.47      | 45.77  | 77.14      | -31.37     |
| 3 pp | 0.94  | 0.22       | 12.76      | 32.45               | 54.41      | 34.94  | 47.13      | -12.19     |
| 4    | 4.60  | 0.42       | 11.38      | 32.48               | 47.43      | 26.75  | 48.50      | -21.75     |
| 5    | 7.98  | 0.47       | 10.73      | 32.49               | 48.97      | 27.68  | 48.50      | -20.82     |
| 6    | 19.53 | 0.67       | 10.76      | 32.52               | 47.67      | 26.58  | 48.50      | -21.92     |



## 7.5 Radiated Emissions(30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Measurement Distance: 3m

Limit:

| Frequency     | Field strength<br>(microvolt/meter) | Limit<br>(dBuV/m) | Remark     | Measurement<br>distance (m) |
|---------------|-------------------------------------|-------------------|------------|-----------------------------|
| 30MHz-88MHz   | 100                                 | 40.0              | Quasi-peak | 3                           |
| 88MHz-216MHz  | 150                                 | 43.5              | Quasi-peak | 3                           |
| 216MHz-960MHz | 200                                 | 46.0              | Quasi-peak | 3                           |
| 960MHz-1GHz   | 500                                 | 54.0              | Quasi-peak | 3                           |

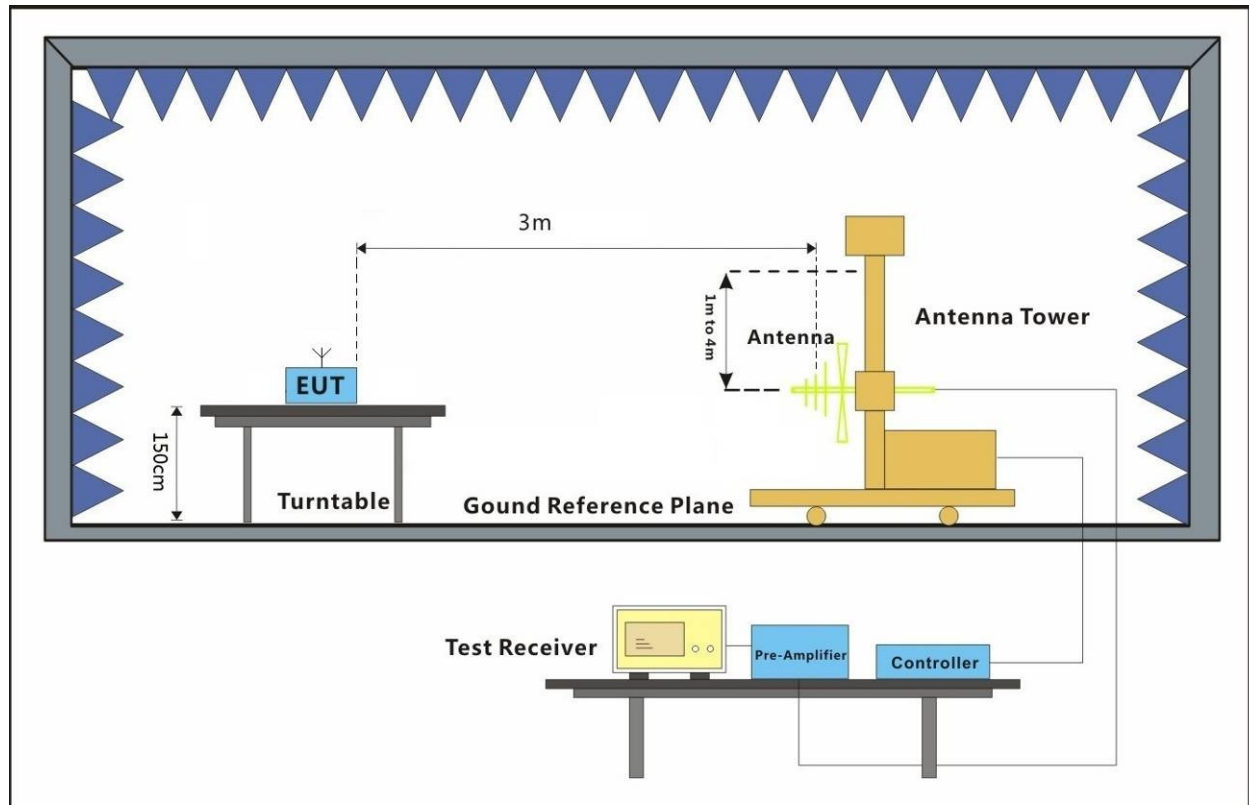
### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

Test mode c:TX mode\_Keep the EUT in transmitting mode.

### 7.5.2 Test Setup Diagram

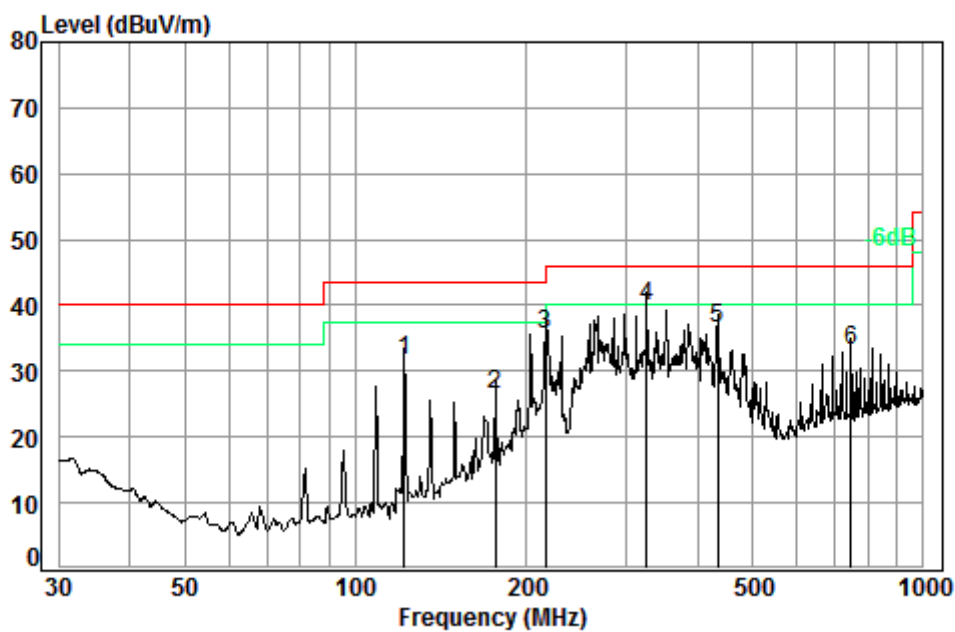




### **7.5.3 Measurement Procedure and Data**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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.
- g. 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.

Mode:c; Polarization:Horizontal



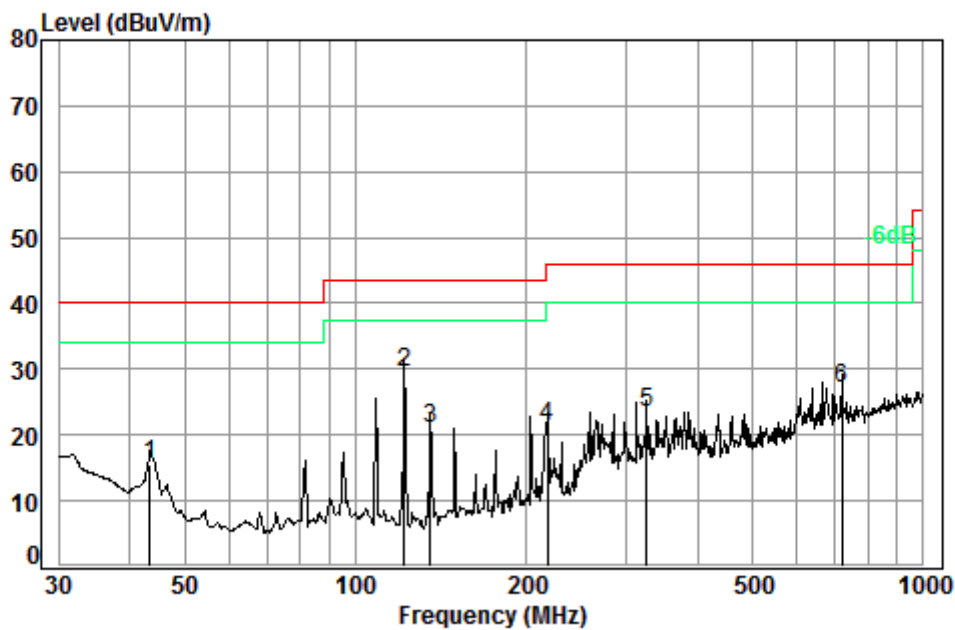
Condition: 3m HORIZONTAL

Job No. : 06077CR

Test mode: c

|      | Freq   | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit Line | Over Limit |
|------|--------|------------|------------|---------------|------------|--------|------------|------------|
|      | MHz    | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m     | dB         |
| 1    | 121.98 | 1.26       | 7.86       | 27.06         | 49.49      | 31.55  | 43.50      | -11.95     |
| 2    | 176.27 | 1.36       | 9.75       | 26.79         | 42.17      | 26.49  | 43.50      | -17.01     |
| 3    | 216.02 | 1.49       | 11.03      | 26.64         | 49.71      | 35.59  | 46.00      | -10.41     |
| 4 pp | 325.60 | 1.98       | 14.78      | 26.60         | 49.77      | 39.93  | 46.00      | -6.07      |
| 5    | 434.07 | 2.35       | 16.58      | 27.35         | 45.06      | 36.64  | 46.00      | -9.36      |
| 6    | 744.87 | 3.04       | 21.68      | 27.36         | 35.66      | 33.02  | 46.00      | -12.98     |

Mode:c; Polarization:Vertical



Condition: 3m VERTICAL

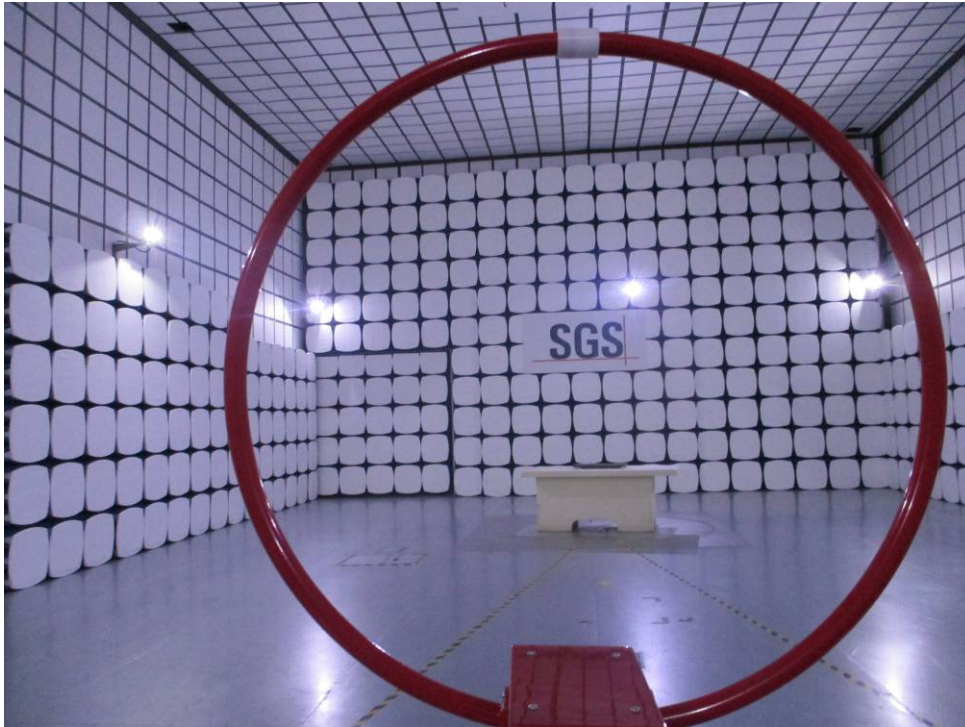
Job No. : 06077CR

Test mode: c

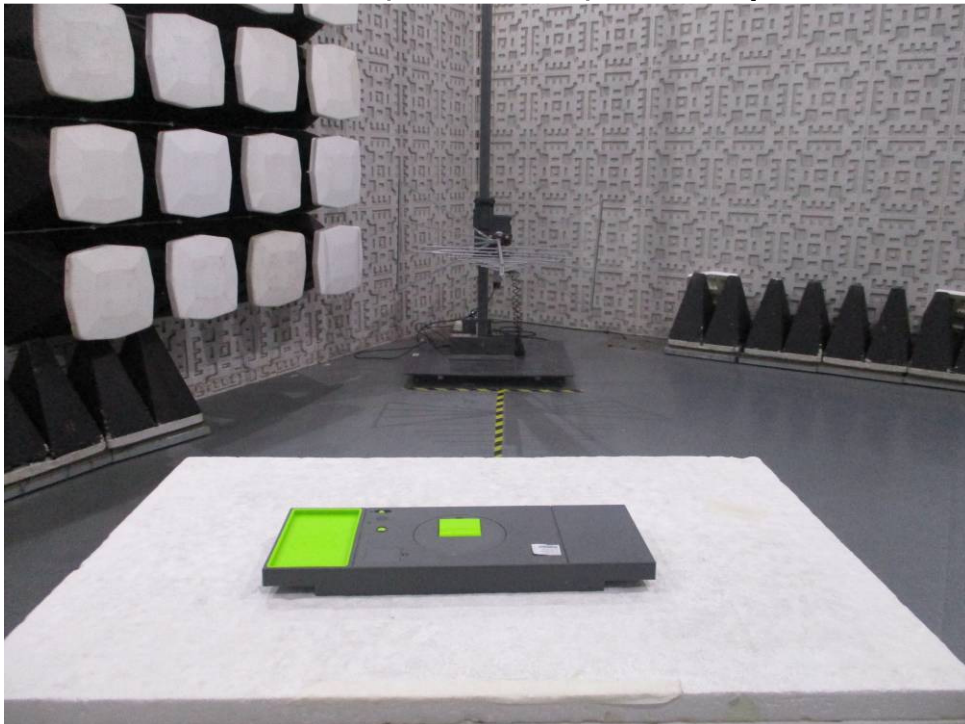
|   |        | Cable | Ant    | Preamp | Read  |        | Limit  | Over   |
|---|--------|-------|--------|--------|-------|--------|--------|--------|
|   | Freq   | Loss  | Factor | Factor | Level | Level  | Line   | Limit  |
|   | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
| 1 | 43.51  | 0.68  | 11.56  | 27.31  | 30.73 | 15.66  | 40.00  | -24.34 |
| 2 | 121.98 | 1.26  | 7.86   | 27.06  | 47.37 | 29.43  | 43.50  | -14.07 |
| 3 | 135.51 | 1.29  | 7.92   | 26.98  | 38.83 | 21.06  | 43.50  | -22.44 |
| 4 | 218.31 | 1.51  | 11.15  | 26.63  | 35.29 | 21.32  | 46.00  | -24.68 |
| 5 | 325.60 | 1.98  | 14.78  | 26.60  | 33.13 | 23.29  | 46.00  | -22.71 |
| 6 | 719.20 | 2.96  | 21.60  | 27.39  | 29.92 | 27.09  | 46.00  | -18.91 |

## 8 Photographs

### 8.1 Radiated Emissions(9kHz-30MHz) Test Setup



### 8.2 Radiated Emissions(30MHz-1GHz) Test Setup



### 8.3 EUT Constructional Details

Refer to External photos & Internal photos