

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**Portal of power for Xbox One**

**Model No.: 84709791**

**FCC ID: XLU84709791**

**Trademark: Activision**

**Report No.: ED160617010E**

**Issue Date: June 30, 2016**

*Prepared for*

**Activision Publishing, Inc.  
3100 Ocean Park Blvd., Santa Monica, CA90405, USA**

*Prepared by*

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EMTEK(DONGGUAN) CO., LTD.**

## VERIFICATION OF COMPLIANCE

|                      |                                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Applicant:           | Activision Publishing, Inc<br>3100 Ocean Park Blvd., Santa Monica, CA90405, USA                                                     |
| Manufacturer:        | Fooway Electronics Plastics Metals Factory<br>Bubugao Road, Jiangbei, Wusha, Changan Town, Dongguan City, Guangdong Province, China |
| Product Description: | Portal of power for Xbox One                                                                                                        |
| Model Number:        | 84709791                                                                                                                            |
| Trademark:           | Activision                                                                                                                          |

### We hereby certify that:

The above equipment was tested by EMTEK(DONGGUAN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.225(2016).

Date of Test : June 20, 2016 to June 27, 2016

*Yolanda Liang*

Prepared by : Yolanda Liang/Editor

*Alan He*

Reviewer : Alan He/Supervisor

*Sam Lv*

Approved & Authorized Signer : Sam Lv/Manager

## Modified Information

| Version | Summary         | Revision Date | Report No.   |
|---------|-----------------|---------------|--------------|
| Ver.1.0 | Original Report | /             | ED160617010E |
|         |                 |               |              |
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APPENDIX (Photos of EUT) (5 pages)

## **1 General Information**

### **1.1 Product Description**

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 13.56MHz
- B). Modulation: ASK
- C). Number of Channel: 1 channel
- D). Power Supply: DC 5V (Xbox One Input)
- E). Antenna Type: Internal Loop antenna
- F). Antenna Gain: 0 dBi
- G). Hardware Version: V01
- H). Software Version: V25.08

Note: for a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

### **1.2 Related Submittal(s) / Grant(s)**

This submittal(s) (test report) is intended for FCC ID: XLU84709791 filing to comply with Section 15.225 of the FCC Part 15, Subpart C Rules.

### **1.3 Test Methodology**

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10-2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

### **1.4 Special Accessories**

There is a USB cable with two ferrite cores in this submission.

### **1.5 Equipment Modifications**

Not available for this EUT intended for grant.

### **1.6 Test Facility**

Site Description

EMC Lab. :

Registered on FCC, June 18, 2014  
The Certificate Number is 247565

Registered on Industry Canada, February 19, 2014  
The Certificate Number is 9444A.

Name of Firm :

EMTEK(DONGGUAN) CO., LTD.

Site Location :

No.281, Guantai Road, Nancheng District,  
Dongguan, Guangdong, China

## **2 System Test Configuration**

### **2.1 EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### **2.2 EUT Exercise**

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

### **2.3 Test Procedure**

#### **2.3.1 Conducted Emissions**

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

#### **2.3.2 Radiated Emissions**

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter(EUT) was tested according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013.

## 2.4 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**

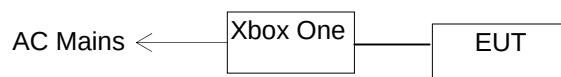


**Table 2-1 Equipment Used in Tested System**

| Item | Equipment                    | Mfr/Brand  | Model/Type No. | FCC ID      | Series No.     | Note              |
|------|------------------------------|------------|----------------|-------------|----------------|-------------------|
| 1    | Portal of power for Xbox One | Activision | 84709791       | XLU84709791 | N/A            | <b>EUT</b>        |
| 2    | Xbox One                     | Microsoft  | N/A            | N/A         | N/A            | Support Equipment |
| 3    | AC adapte for Xbox One       | Microsoft  | PA-2221-02MX   | N/A         | 1D21I002176316 | Support Equipment |
| 4    | Golden Queen                 | Activision | 87798888       | N/A         | N/A            | Support Equipment |

**Note:**

- (1) Unless otherwise denoted as EUT in 『Remark』 column, device(s) used in tested system is a support equipment.

### 3 Summary of Test Results

| FCC Rules                         | Description Of Test         | Result   |
|-----------------------------------|-----------------------------|----------|
| §15.207                           | AC Power Conducted Emission | Complied |
| §15.225(a)(b)(c),<br>(d), §15.209 | Radiated Emission           | Complied |
| §15.225(e)                        | Frequency Stability         | Complied |
| §15.203                           | Antenna Application         | Complied |

#### 4 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Parameter                      | Uncertainty               |
|--------------------------------|---------------------------|
| Radio Frequency                | $\pm 1 \times 10^{-5}$    |
| Maximum Peak Output Power Test | $\pm 1.0\text{dB}$        |
| Conducted Emissions Test       | $\pm 2.0\text{dB}$        |
| Radiated Emission Test         | $\pm 2.0\text{dB}$        |
| Power Density                  | $\pm 2.0\text{dB}$        |
| Occupied Bandwidth Test        | $\pm 1.0\text{dB}$        |
| Band Edge Test                 | $\pm 3\text{dB}$          |
| All emission, radiated         | $\pm 3\text{dB}$          |
| Antenna Port Emission          | $\pm 3\text{dB}$          |
| Temperature                    | $\pm 0.5^{\circ}\text{C}$ |
| Humidity                       | $\pm 3\%$                 |

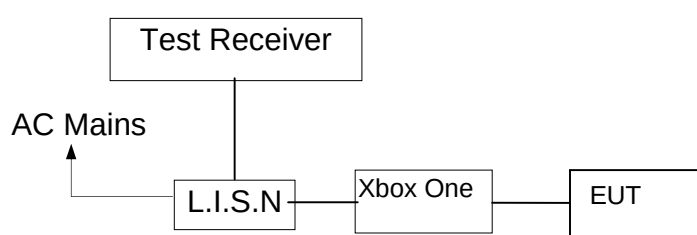
Remark: The coverage Factor ( $k=2$ ), and measurement Uncertainty for a level of Confidence of 95%

## 5 Conducted Emissions Test

### 5.1 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)



### 5.3 Measurement Equipment Used

| Conducted Emission Test Site |                 |              |               |                 |            |            |
|------------------------------|-----------------|--------------|---------------|-----------------|------------|------------|
| EQUIPMENT TYPE               | MFR             | MODEL NUMBER | SERIAL NUMBER | Characteristics | Last Cal.  | Due date   |
| Test Receiver                | Rohde & Schwarz | ESCS30       | 828985/018    | 9kHz~3GHz       | 06/15/2016 | 06/14/2017 |
| Artificial Network           | Schwarzbeck     | 8126D        | 8126D-211     | 9KHz-300MHz     | 06/15/2016 | 06/14/2017 |
| RF Switching Unit            | CDS             | RSU-M2       | 38401         | 9KHz-300MHz     | 06/15/2016 | 06/14/2017 |
| Coaxial Cable                | CDS             | 79254        | 46107086      | 9kHz~3GHz       | 06/15/2016 | 06/14/2017 |

### 5.4 Conducted Emission Limit

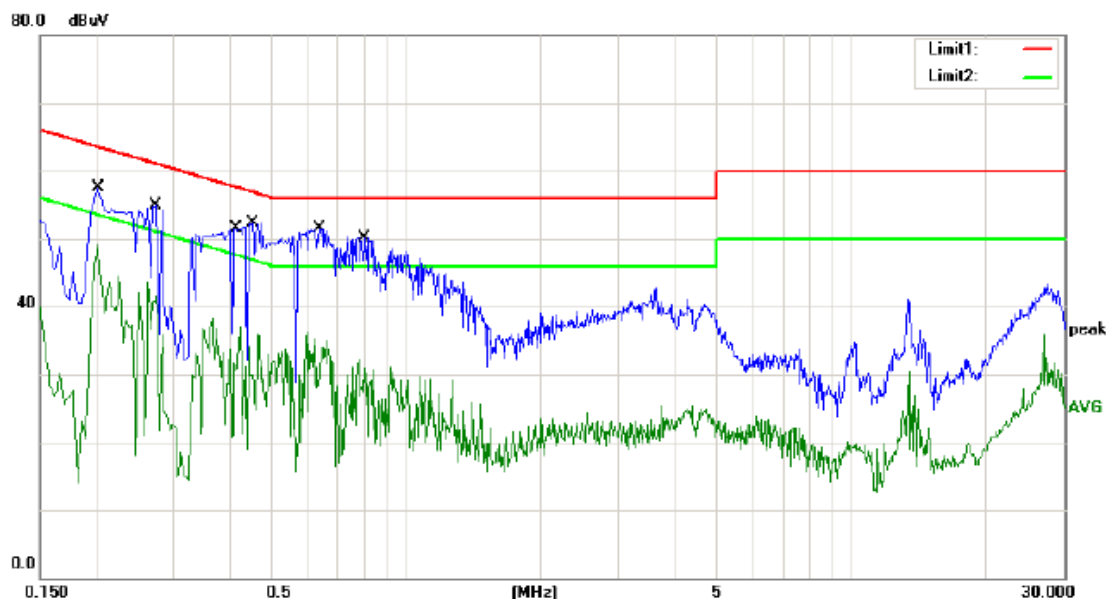
| Conducted Emission Frequency(MHz) | Quasi-peak | Average |
|-----------------------------------|------------|---------|
| 0.15-0.5                          | 66-56      | 56-46   |
| 0.5-5.0                           | 56         | 46      |
| 5.0-30.0                          | 60         | 50      |

- Note:** 1. The lower limit shall apply at the transition frequencies  
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 5.5 Measurement Result

Pass.

Please refer to the following.



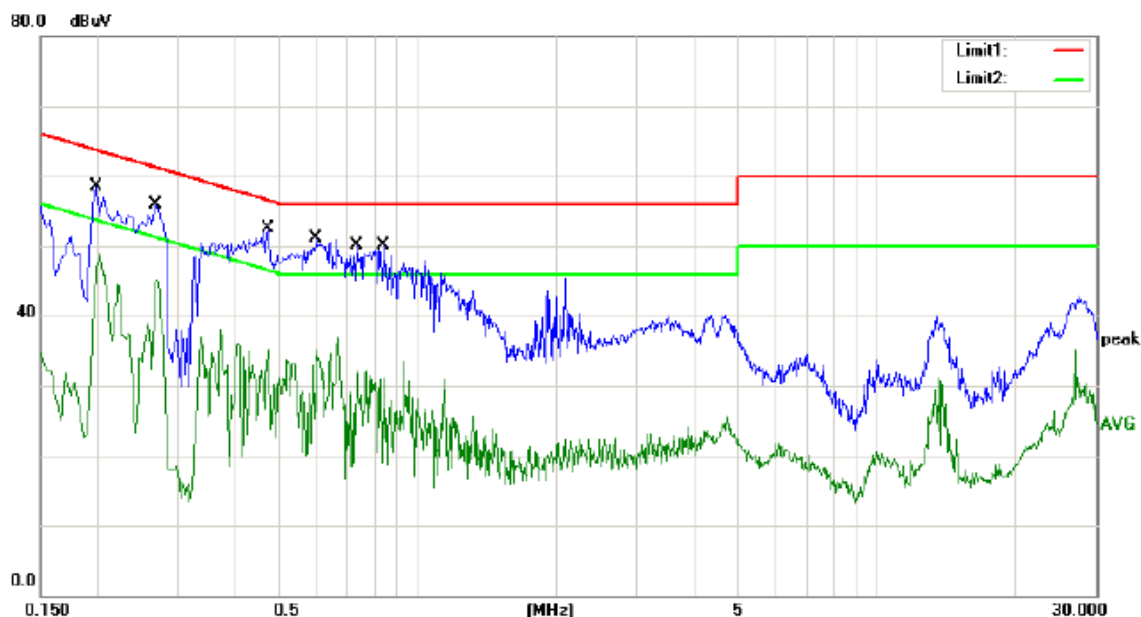
Site: site #1  
 Limit: (CE)FCC Part 15 B\_QP  
 Mode: TX  
 Note:

Phase: **L1**  
 Power: DC 5V from Xbox One  
 Input(AC120V/60Hz)

Temperature: 24  
 Humidity: 55 %

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.2020       | 37.49                    | 10.01                   | 47.50                    | 63.53         | -16.03     | QP       |         |
| 2   | *   | 0.2020       | 39.00                    | 10.01                   | 49.01                    | 53.53         | -4.52      | AVG      |         |
| 3   |     | 0.2740       | 34.89                    | 10.01                   | 44.90                    | 61.00         | -16.10     | QP       |         |
| 4   |     | 0.2740       | 33.57                    | 10.01                   | 43.58                    | 51.00         | -7.42      | AVG      |         |
| 5   |     | 0.4140       | 31.39                    | 10.01                   | 41.40                    | 57.57         | -16.17     | QP       |         |
| 6   |     | 0.4140       | 28.26                    | 10.01                   | 38.27                    | 47.57         | -9.30      | AVG      |         |
| 7   |     | 0.4500       | 32.19                    | 10.01                   | 42.20                    | 56.88         | -14.68     | QP       |         |
| 8   |     | 0.4500       | 27.10                    | 10.01                   | 37.11                    | 46.88         | -9.77      | AVG      |         |
| 9   |     | 0.6340       | 31.49                    | 10.01                   | 41.50                    | 56.00         | -14.50     | QP       |         |
| 10  |     | 0.6340       | 26.30                    | 10.01                   | 36.31                    | 46.00         | -9.69      | AVG      |         |
| 11  |     | 0.8060       | 31.09                    | 10.01                   | 41.10                    | 56.00         | -14.90     | QP       |         |
| 12  |     | 0.8060       | 22.29                    | 10.01                   | 32.30                    | 46.00         | -13.70     | AVG      |         |

\*:Maximum data    x:Over limit    !:over margin    Comment: Factor build in receiver.    Operator:



Site site #1

Phase: **N**

Temperature: 24

Limit: (CE)FCC Part 15 B\_QP

Power: DC 5V from Xbox One  
Input(AC120V/60Hz)

Humidity: 55 %

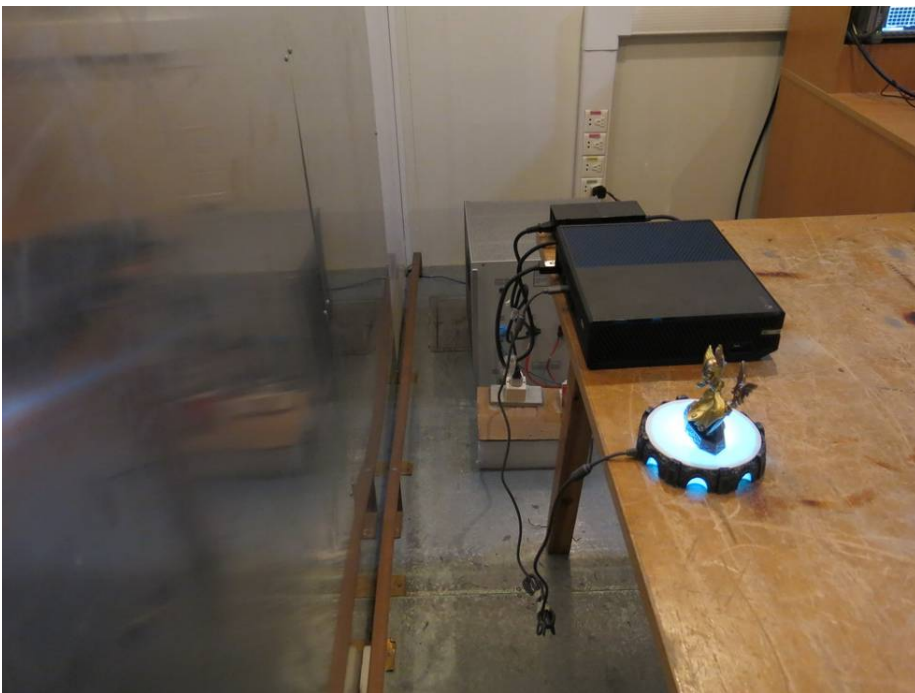
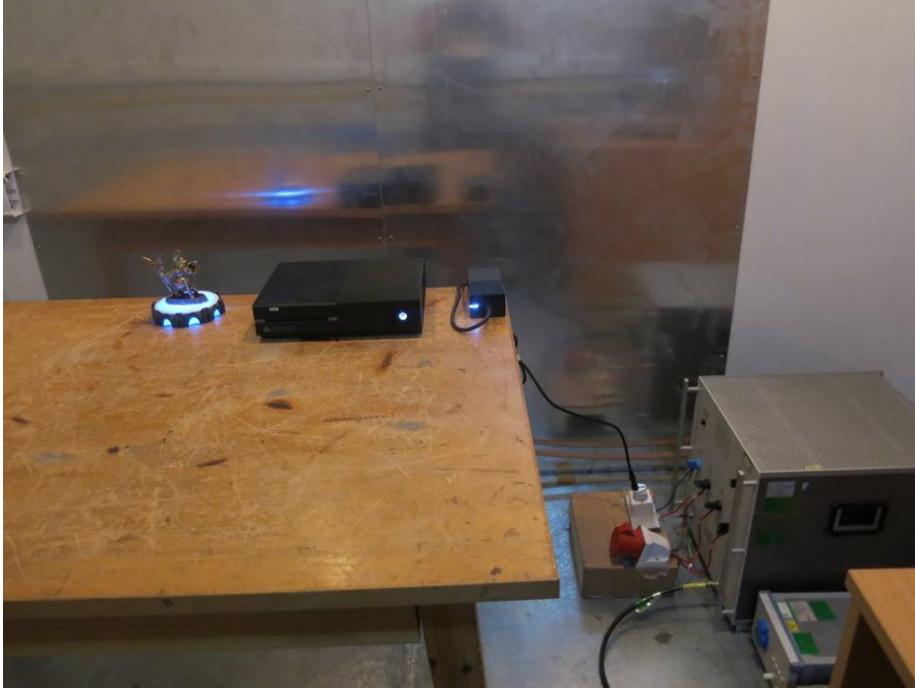
Mode: TX

Note:

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit | Over   |          |         |
|-----|-----|--------|---------------|----------------|-------------|-------|--------|----------|---------|
|     |     | MHz    | dBuV          | dB             | dBuV        | dBuV  | dB     | Detector | Comment |
| 1   |     | 0.1980 | 38.49         | 10.01          | 48.50       | 63.69 | -15.19 | QP       |         |
| 2   | *   | 0.1980 | 38.95         | 10.01          | 48.96       | 53.69 | -4.73  | AVG      |         |
| 3   |     | 0.2660 | 36.09         | 10.01          | 46.10       | 61.24 | -15.14 | QP       |         |
| 4   |     | 0.2660 | 35.05         | 10.01          | 45.06       | 51.24 | -6.18  | AVG      |         |
| 5   |     | 0.4700 | 32.49         | 10.01          | 42.50       | 56.51 | -14.01 | QP       |         |
| 6   |     | 0.4700 | 25.23         | 10.01          | 35.24       | 46.51 | -11.27 | AVG      |         |
| 7   |     | 0.5980 | 31.09         | 10.01          | 41.10       | 56.00 | -14.90 | QP       |         |
| 8   |     | 0.5980 | 25.00         | 10.01          | 35.01       | 46.00 | -10.99 | AVG      |         |
| 9   |     | 0.7340 | 32.59         | 10.01          | 42.60       | 56.00 | -13.40 | QP       |         |
| 10  |     | 0.7340 | 26.99         | 10.01          | 37.00       | 46.00 | -9.00  | AVG      |         |
| 11  |     | 0.8420 | 31.49         | 10.01          | 41.50       | 56.00 | -14.50 | QP       |         |
| 12  |     | 0.8420 | 23.43         | 10.01          | 33.44       | 46.00 | -12.56 | AVG      |         |

\*:Maximum data    x:Over limit    !:over margin    Comment: Factor build in receiver.    Operator:

## 5.6 Conducted Measurement Photos:



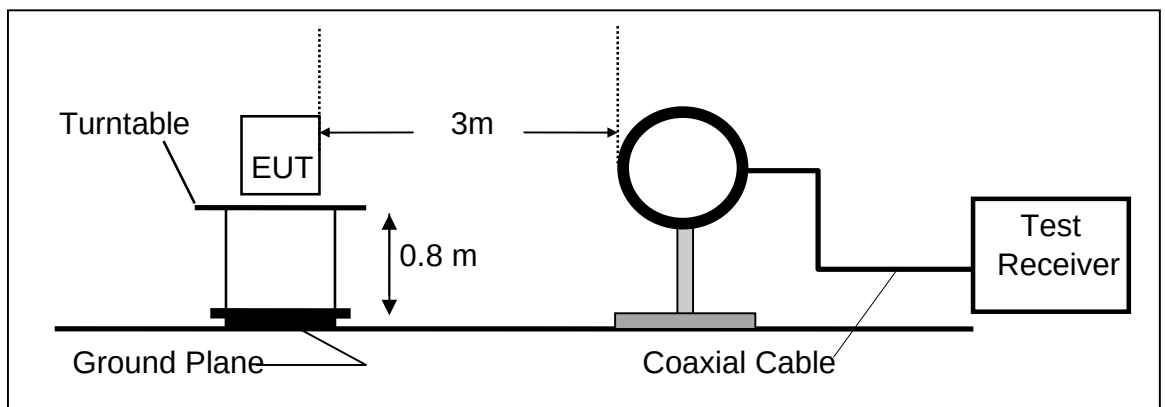
## 6 Radiated Emission Test

### 6.1 Measurement Procedure

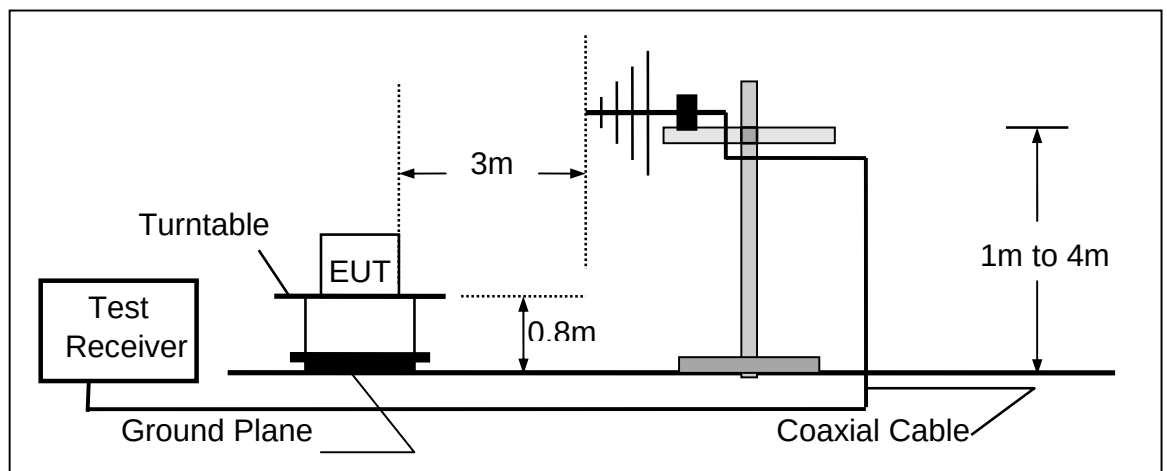
1. The EUT was placed on a turntable which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 6.2 Test SET-UP (Block Diagram of Configuration)

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



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



### 6.3 Measurement Equipment Used

| Item | Equipment                      | Manufacturer    | Model No. | Serial No.   | Characteristics | Last Cal.  | Cal. Interval |
|------|--------------------------------|-----------------|-----------|--------------|-----------------|------------|---------------|
| 1.   | Test Receiver                  | Rohde & Schwarz | ESCI      | 1166.5950.03 | 9KHz-3GHz       | 06/15/2016 | 1 Year        |
| 2.   | Loop Antenna                   | Schwarzbeck     | FMZB 1519 | 012          | 9 KHz -30MHz    | 12/29/2015 | 1 Year        |
| 3.   | Bilog Antenna                  | Schwarzbeck     | VULB9163  | 000141       | 25MHz-2GHz      | 06/15/2016 | 1 Year        |
| 4.   | Power Amplifier                | HP              | 8447F     | OPT H64      | 9 KHz -1300MHz  | 06/15/2016 | 1 Year        |
| 5.   | Color Monitor                  | SUNSPO          | SP-140A   | N/A          | --              | 06/15/2016 | 1 Year        |
| 6.   | Single Line Filter             | JIANLI          | XL-3      | N/A          | --              | 06/15/2016 | 1 Year        |
| 7.   | Single Phase Power Line Filter | JIANLI          | DL-2X100B | N/A          | --              | 06/15/2016 | 1 Year        |
| 8.   | 3 Phase Power Line Filter      | JIANLI          | DL-4X100B | N/A          | --              | 06/15/2016 | 1 Year        |
| 9.   | DC Power Filter                | JIANLI          | DL-2X50B  | N/A          | --              | 06/15/2016 | 1 Year        |
| 10.  | Cable                          | Schwarzbeck     | PLF-100   | 549489       | 9KHz-3GHz       | 06/15/2016 | 1 Year        |
| 11.  | Cable                          | Rosenberger     | CIL02     | A0783566     | 9KHz-3GHz       | 06/15/2016 | 1 Year        |
| 12.  | Cable                          | Rosenberger     | RG 233/U  | 525178       | 9KHz-3GHz       | 06/15/2016 | 1 Year        |

### 6.4 Radiated Emission Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

| FCC Part 15.209 |                           |      |                                                                |                         |
|-----------------|---------------------------|------|----------------------------------------------------------------|-------------------------|
| Frequency (MHz) | Field Strength Limitation |      | Field Strength Limitation Frequency at 3m Measurement Distance |                         |
|                 | (uV/m)                    | Dist | (uV/m)                                                         | (dBuV/m)                |
| 0.009 – 0.490   | 2400 / F(KHz)             | 300m | 10000 * 2400/F(KHz)                                            | 20log 2400/F(KHz) + 80  |
| 0.490 – 1.705   | 24000 / F(KHz)            | 30m  | 100 * 24000/F(KHz)                                             | 20log 24000/F(KHz) + 40 |
| 1.705 – 30.00   | 30                        | 30m  | 100* 30                                                        | 20log 30 + 40           |
| 30.0 – 88.0     | 100                       | 3m   | 100                                                            | 20log 100               |
| 88.0 – 216.0    | 150                       | 3m   | 150                                                            | 20log 150               |
| 216.0 – 960.0   | 200                       | 3m   | 200                                                            | 20log 200               |
| Above 960.0     | 500                       | 3m   | 500                                                            | 20log 500               |

| FCC Part 15.225(a)/(b)/(c) |                           |      |                                                                 |          |
|----------------------------|---------------------------|------|-----------------------------------------------------------------|----------|
| Frequency (MHz)            | Field Strength Limitation |      | Field Strength Limitation Frequency tion at 3m Measurement Dist |          |
|                            | (uV/m)                    | Dist | (uV/m)                                                          | (dBuV/m) |
| 13.110 – 13.410            | 106                       | 30 m | 106*100                                                         | 80.5     |
| 13.410 – 13.553            | 334                       | 30 m | 334*100                                                         | 90.5     |
| 13.553 – 13.567            | 15,848                    | 30 m | 15,848*100                                                      | 124      |
| 13.567 – 13.710            | 334                       | 30 m | 334*100                                                         | 90.5     |
| 13.710 – 14.010            | 106                       | 30 m | 106*100                                                         | 80.5     |

#### 15.205 Restricted bands of operation

| MHz                 | MHz                   | MHz             | GHz              |
|---------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110       | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15       |
| 0.495 - 0.505       | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905     | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128       | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775   | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775   | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218       | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825   | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225   | 123 - 138             | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294       | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366       | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675   | 156.7 - 156.9         | 2690 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475   | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293      | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025 | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725 | 322 - 335.4           | 3600 - 4400     | ( <sup>2</sup> ) |

Remark 1. Emission level in dBuV/m=20 log (uV/m)

- :
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
  3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

## 6.5 Measurement Result

Operation Mode: TX Mode      Test Date : June 25, 2016  
Frequency Range: 9kHz~30MHz      Temperature : 28℃  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: KYO

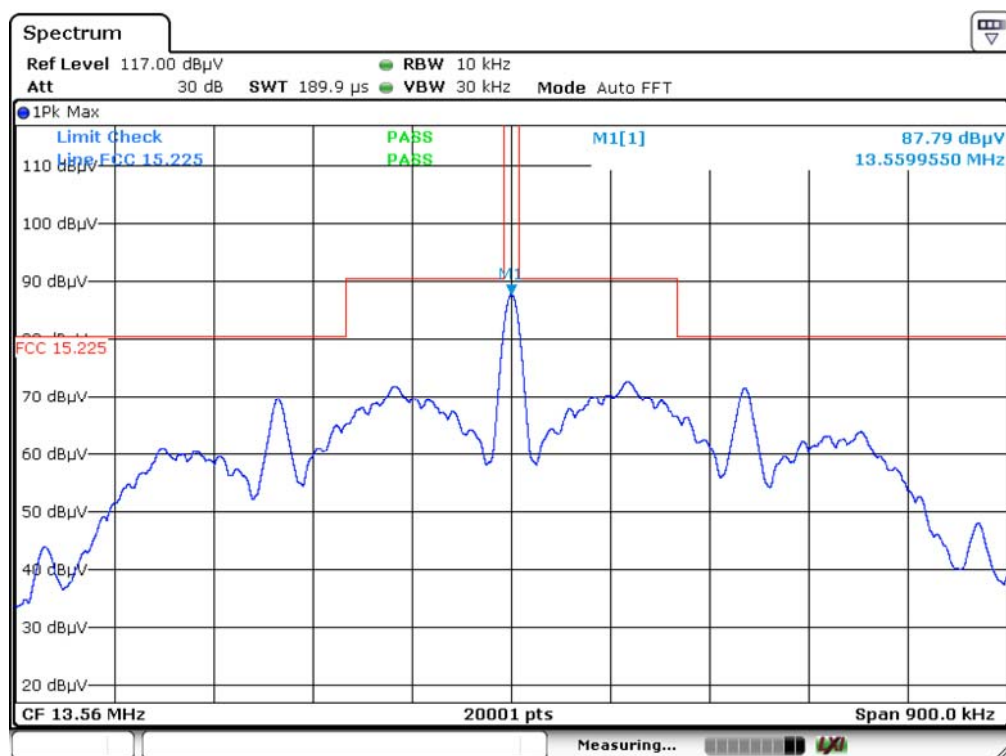
| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV/m) | Limit 3m<br>(dBuV/m) | Over<br>(dB) | Note |
|----------------|-----------------|----------------------------|----------------------|--------------|------|
| 8.52           | V               | 33.06                      | 69.54                | -36.48       | QP   |
| 12.32          | V               | 31.20                      | 69.54                | -38.34       | QP   |
| 14.55          | V               | 35.47                      | 69.54                | -34.07       | QP   |
| 17.12          | V               | 34.16                      | 69.54                | -35.38       | QP   |
| 21.76          | V               | 36.91                      | 69.54                | -32.63       | QP   |
| 28.47          | V               | 37.42                      | 69.54                | -32.12       | QP   |
|                |                 |                            |                      |              |      |
| 6.17           | H               | 31.46                      | 69.54                | -38.08       | QP   |
| 11.78          | H               | 32.58                      | 69.54                | -36.96       | QP   |
| 15.22          | H               | 36.69                      | 69.54                | -32.85       | QP   |
| 20.66          | H               | 37.82                      | 69.54                | -31.72       | QP   |
| 25.34          | H               | 34.05                      | 69.54                | -35.49       | QP   |
| 27.21          | H               | 36.18                      | 69.54                | -33.36       | QP   |

Operation Mode: TX Mode      Test Date : June 25, 2016  
Frequency Range: 30~1000MHz      Temperature : 28℃  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: KYO

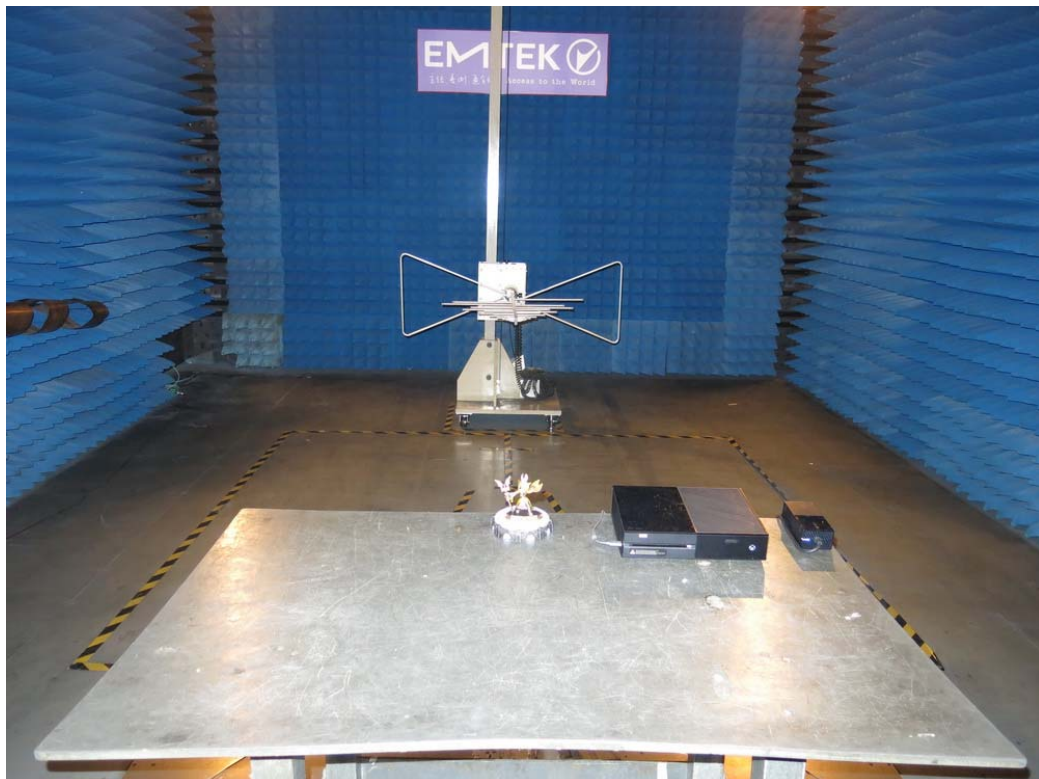
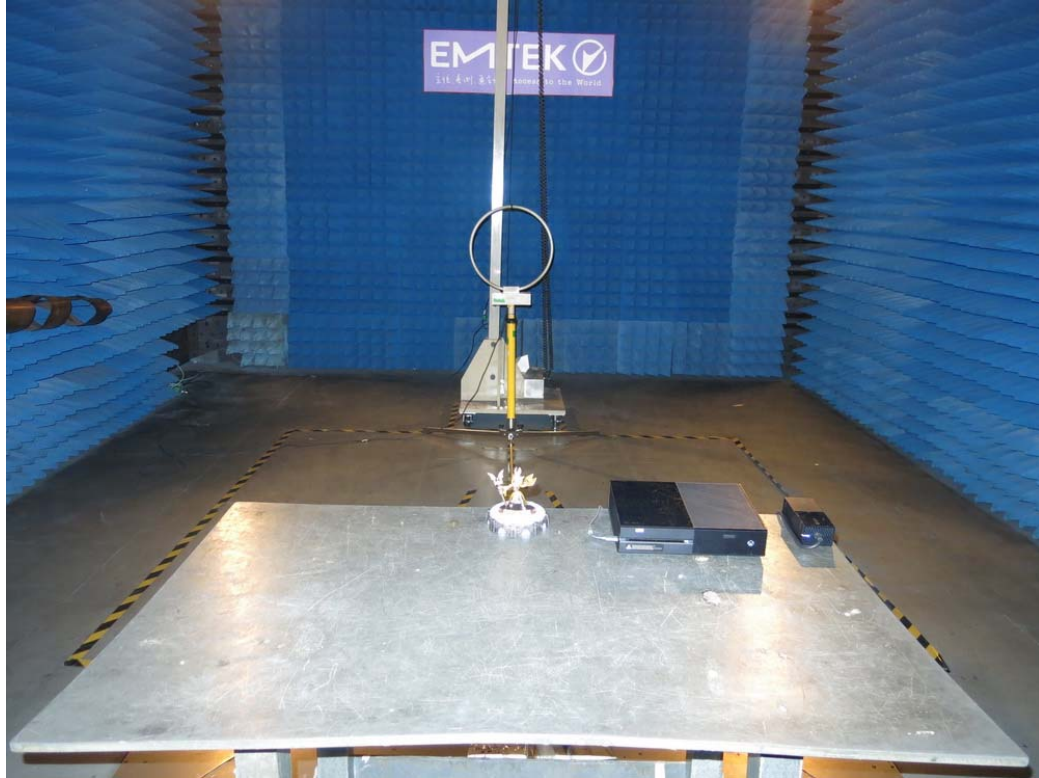
| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV/m) | Limit 3m<br>(dBuV/m) | Over<br>(dB) | Note |
|----------------|-----------------|----------------------------|----------------------|--------------|------|
| 40.67          | V               | 31.94                      | 40.00                | -8.06        | QP   |
| 123.12         | V               | 35.70                      | 43.50                | -7.80        | QP   |
| 127.00         | V               | 36.24                      | 43.50                | -7.26        | QP   |
| 134.76         | V               | 35.72                      | 43.50                | -7.78        | QP   |
| 161.92         | V               | 36.41                      | 43.50                | -7.09        | QP   |
| 190.05         | V               | 31.85                      | 43.50                | -11.65       | QP   |
|                |                 |                            |                      |              |      |
| 40.67          | H               | 33.78                      | 40.00                | -6.22        | QP   |
| 53.28          | H               | 26.03                      | 40.00                | -13.97       | QP   |
| 125.06         | H               | 29.17                      | 43.50                | -14.33       | QP   |
| 143.49         | H               | 35.60                      | 43.50                | -7.90        | QP   |
| 159.01         | H               | 34.80                      | 43.50                | -8.70        | QP   |
| 270.56         | H               | 31.24                      | 46.00                | -14.76       | QP   |

Operation Mode: TX Mode  
Frequency Range: 13.560 MHz  
Test Result: PASS  
Measured Distance: 3m

Test Date : June 25, 2016  
Temperature : 28°C  
Humidity : 65 %  
Test By: KYO



**6.6 Radiated Measurement Photos:**



## 7 FREQUENCY STABILITY MEASUREMENT

### 7.1 FREQUENCY STABILITY LIMITS

FCC Part 15.225(e)

the frequency tolerance of the carrier signal shall be maintained within +/-0.01% of the operating frequency over a temperature variation of -20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

### 7.2 MEASUREMENT INSTRUMENTS LIST

| EQUIPMENT TYPE    | MFR             | MODEL NUMBER | SERIAL NUMBER | Characteristics | LAST CAL.  | CAL DUE.   |
|-------------------|-----------------|--------------|---------------|-----------------|------------|------------|
| Spectrum Analyzer | Rohde & Schwarz | FSV30        | 1321.3008K    | 10Hz-30GHz      | 06/15/2016 | 06/14/2017 |
| Coaxial Cable     | CDS             | 79254        | 46107086      | 10Hz-30GHz      | 06/15/2016 | 06/14/2017 |
| Antenna Connector | ARTHUR-YANG     | 2244-N1TG1   | N/A           | 10Hz-30GHz      | 06/15/2016 | 06/14/2017 |

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

### 7.3 TEST PROCEDURE

- The equipment under test was connected to an external AC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber. After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.
- At room temperature (25±5°C), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 7.4 EUT OPERATING CONDITIONS

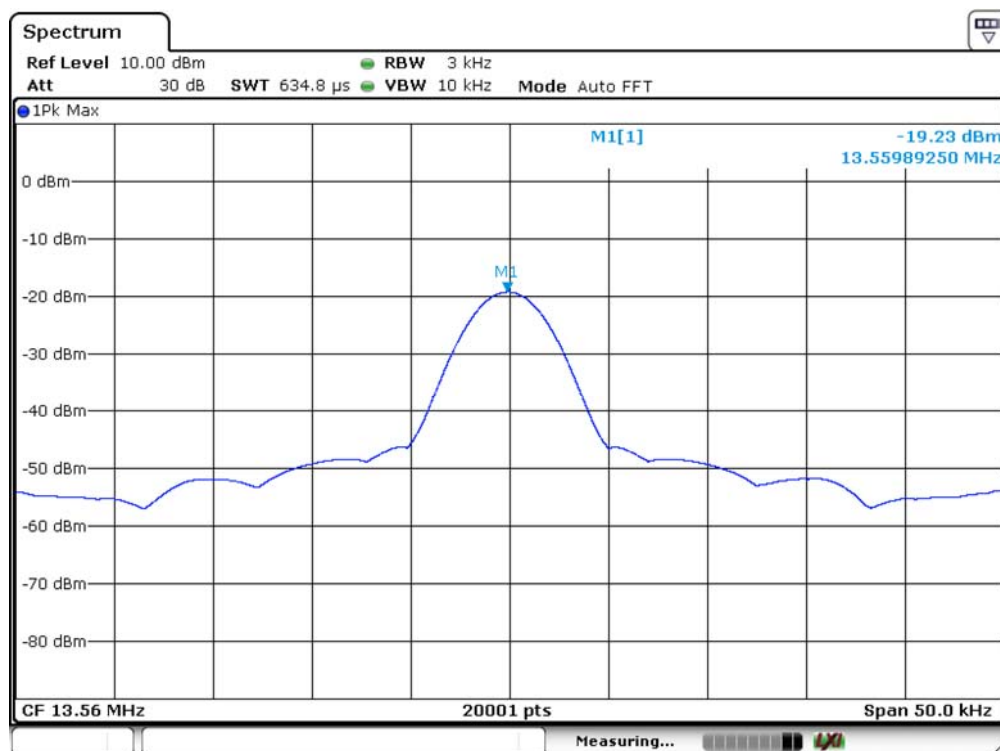
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

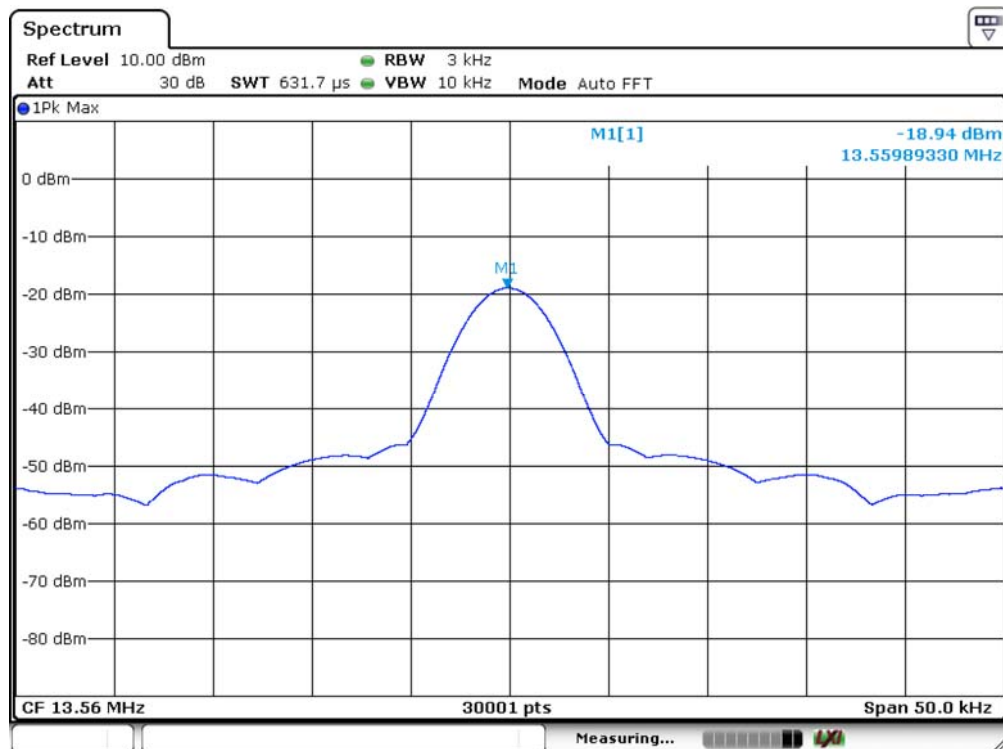
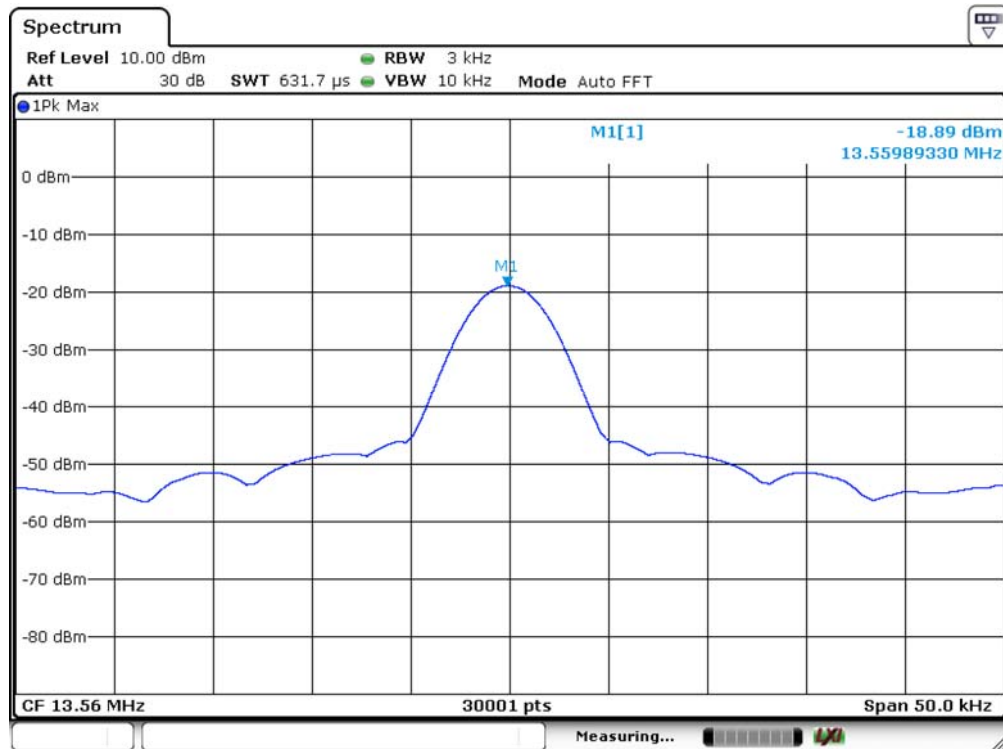
## 7.5 TEST RESULTS

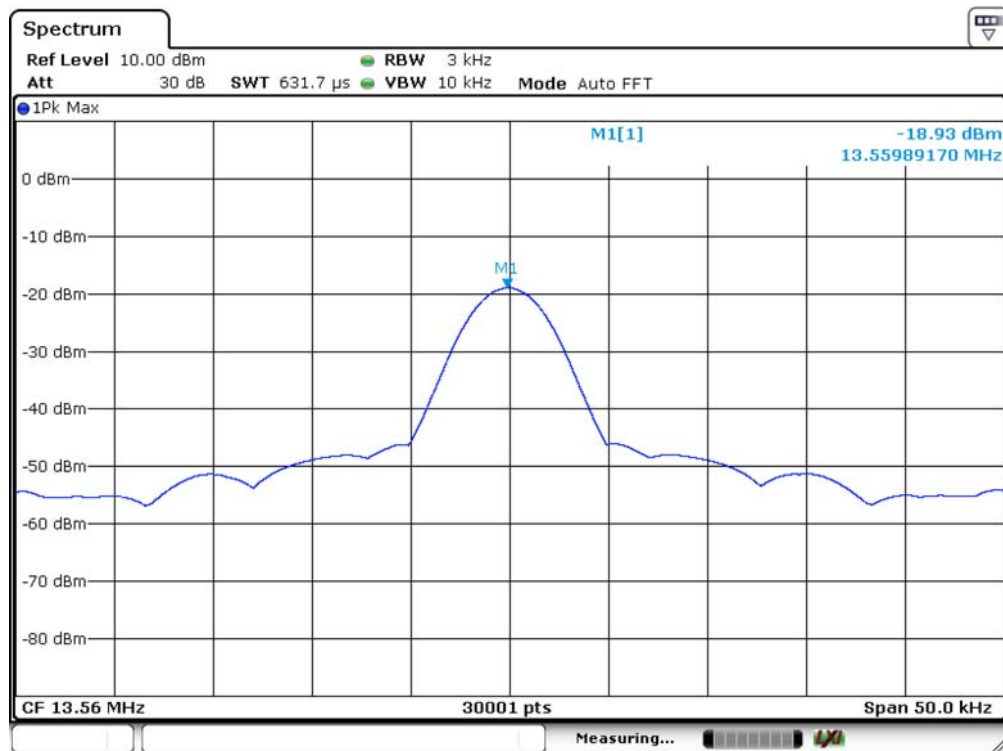
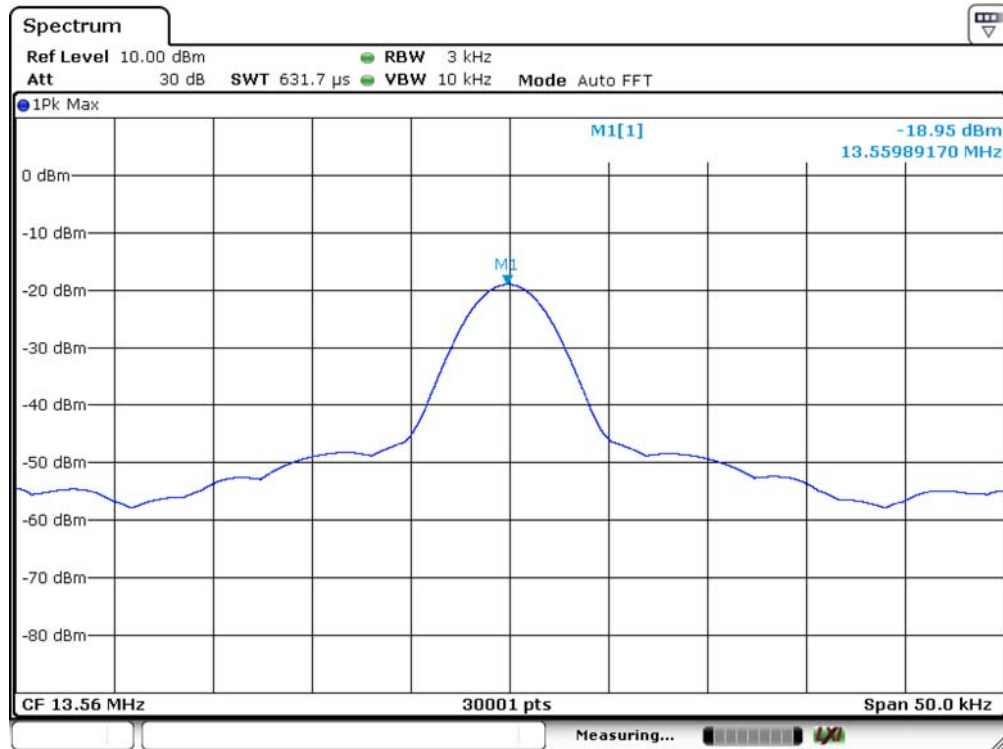
|                |                 |             |         |
|----------------|-----------------|-------------|---------|
| E.U.T :        | Portal of Power | Test Mode : | TX Mode |
| Test Voltage : | DC 5V           |             |         |

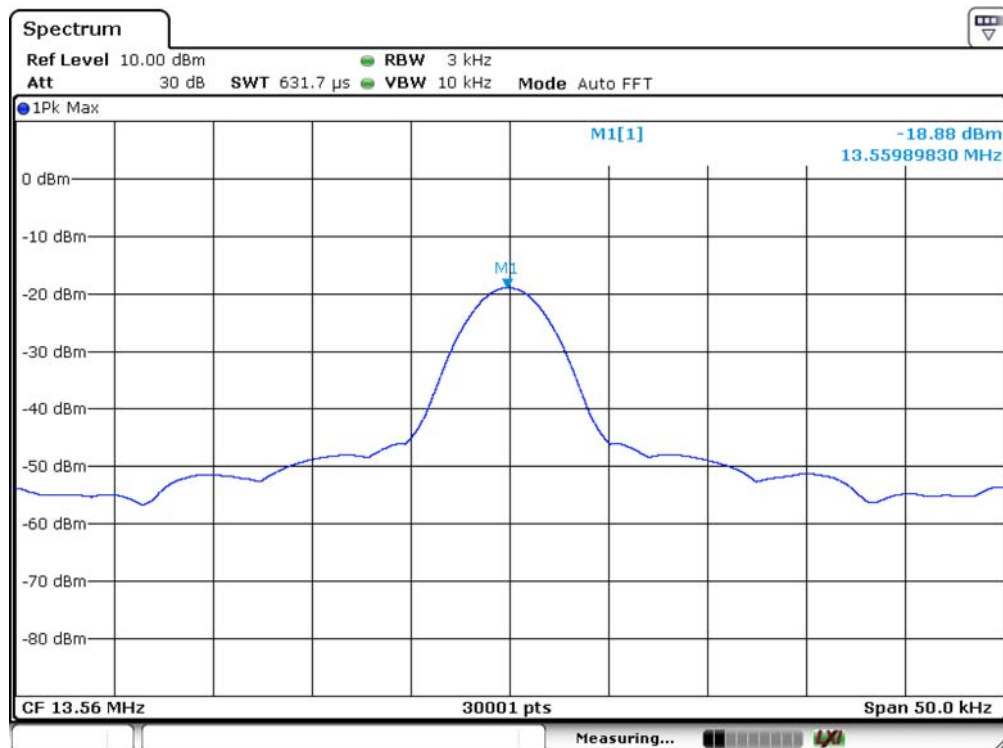
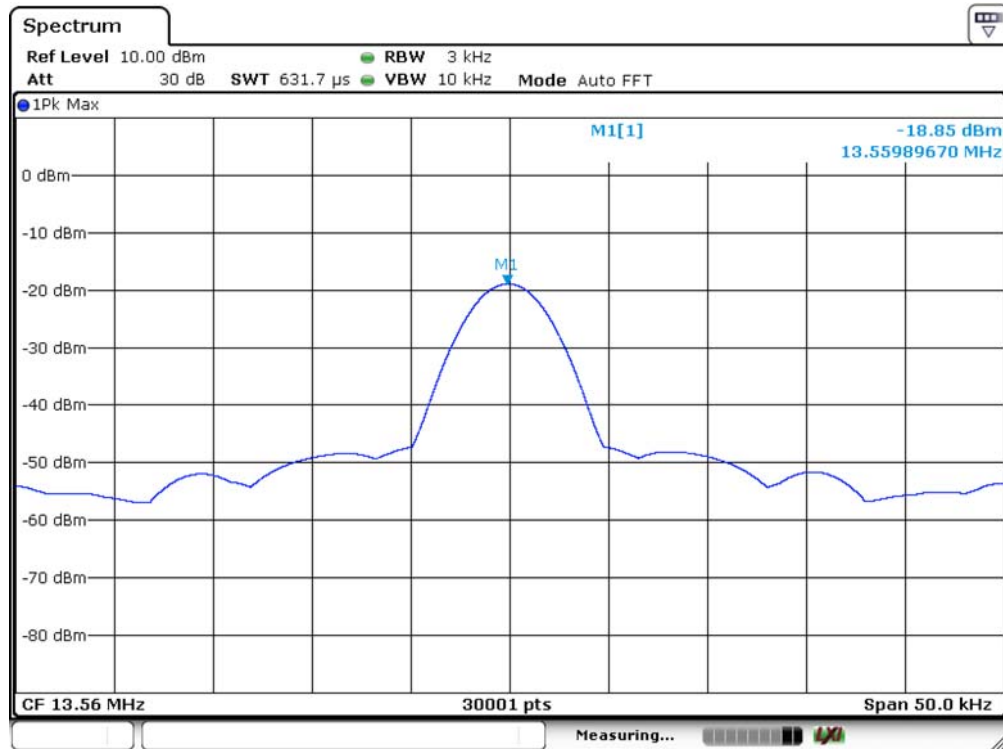
| Frequency Stability Versus Environmental Temperature |               |                 |                  |             |         |
|------------------------------------------------------|---------------|-----------------|------------------|-------------|---------|
| Temperature (°C)                                     | Voltage (Vdc) | Frequency (MHz) | Freq Error (ppm) | Limit (ppm) | Results |
| -20                                                  | DC 5V         | 13.5598925      | -7.98            | 100         | PASS    |
| -10                                                  | DC 5V         | 13.5598933      | -7.87            | 100         | PASS    |
| 0                                                    | DC 5V         | 13.5598933      | -7.87            | 100         | PASS    |
| 10                                                   | DC 5V         | 13.5598917      | -7.99            | 100         | PASS    |
| 20                                                   | DC 5V         | 13.5598917      | -7.99            | 100         | PASS    |
| 30                                                   | DC 5V         | 13.5598967      | -7.62            | 100         | PASS    |
| 40                                                   | DC 5V         | 13.5598983      | -7.50            | 100         | PASS    |
| 50                                                   | DC 5V         | 13.5598914      | -8.01            | 100         | PASS    |

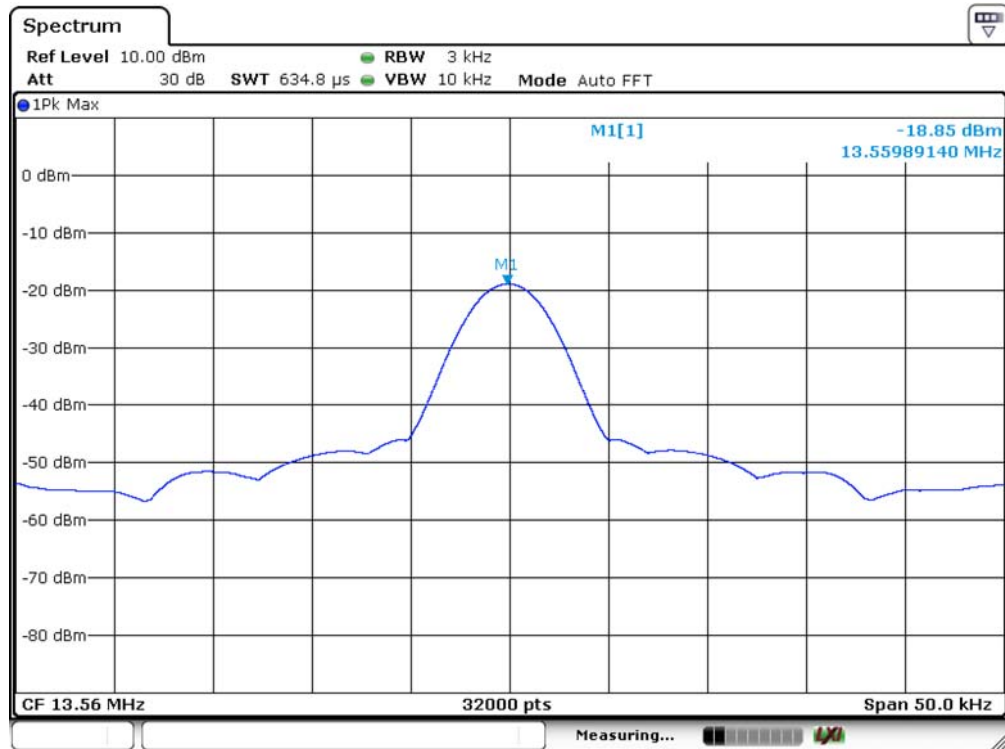
### Frequency Stability Versus Environmental Temperature





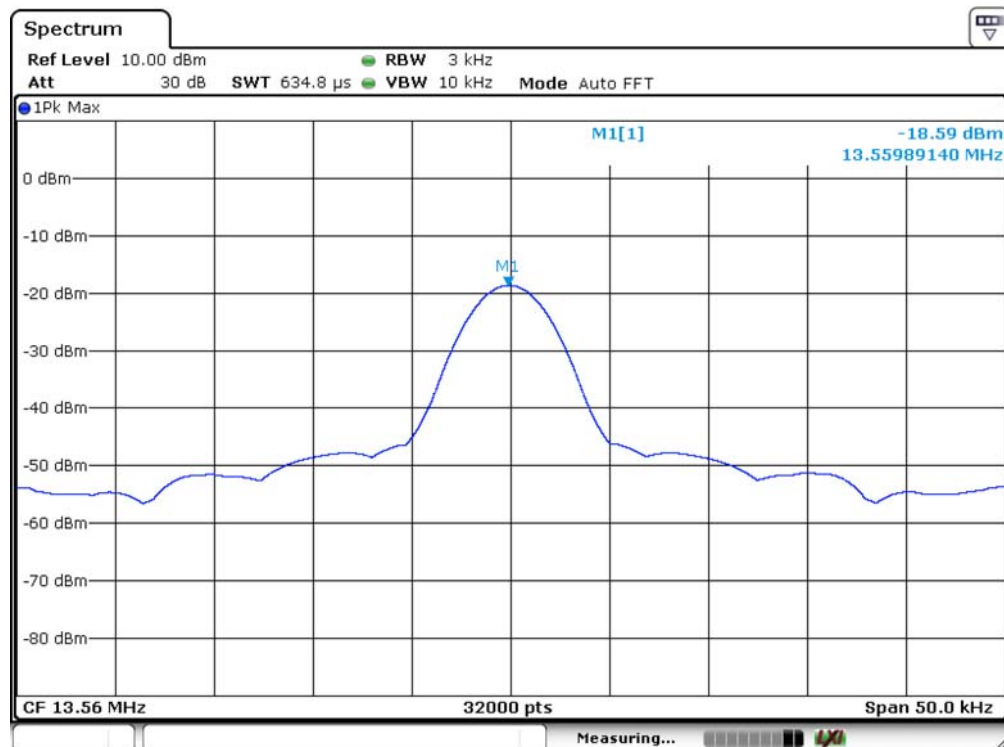


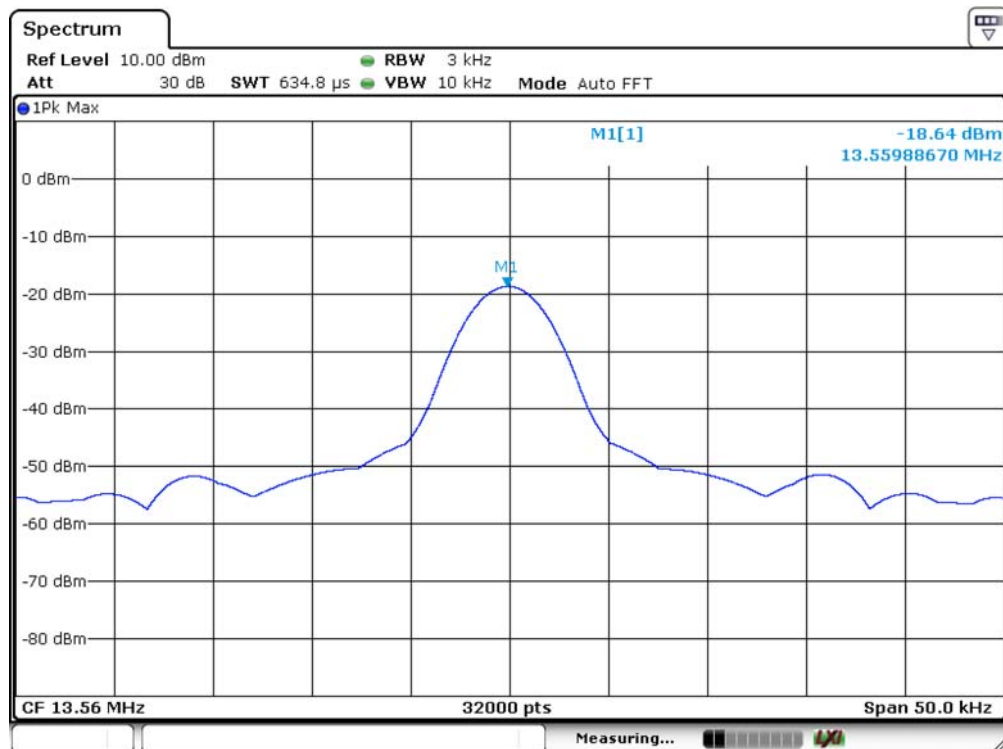
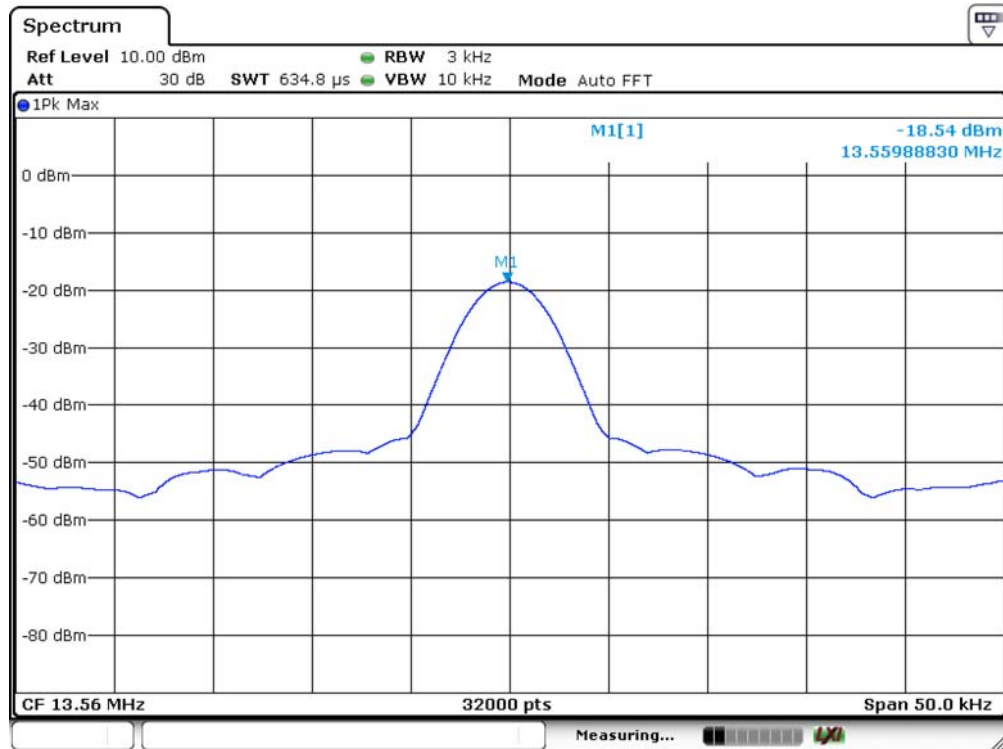


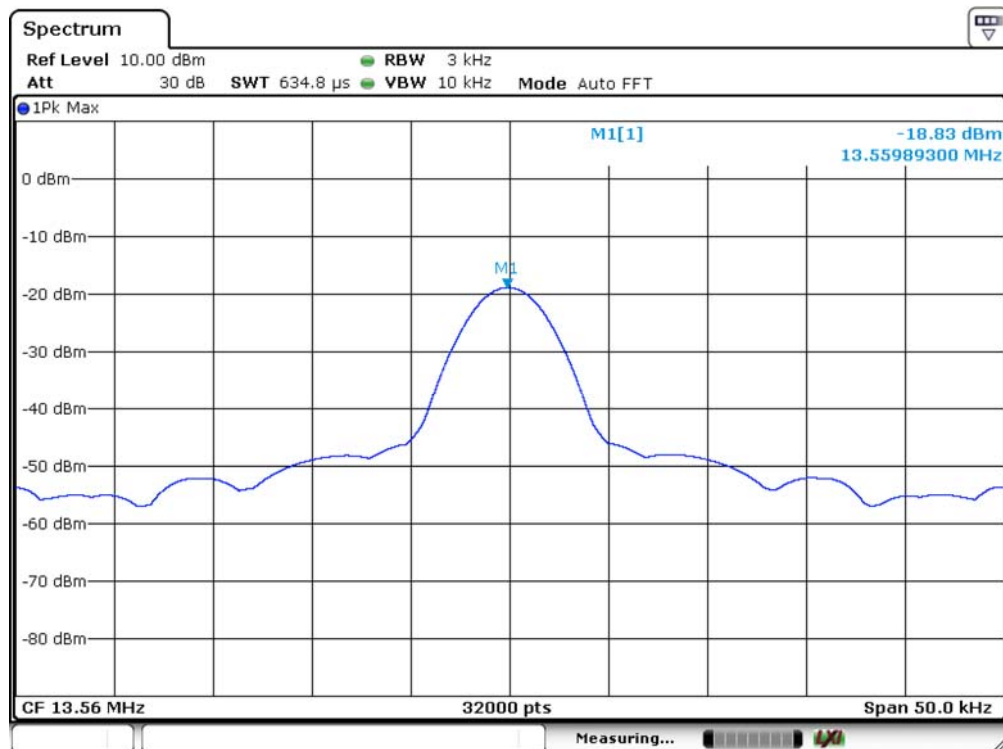
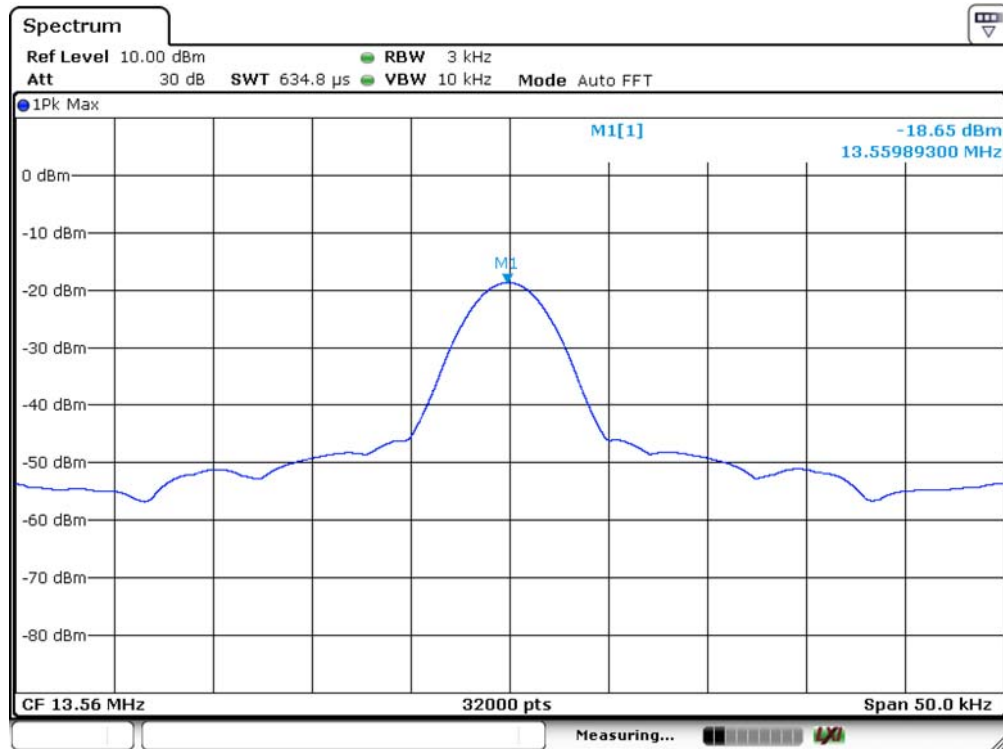


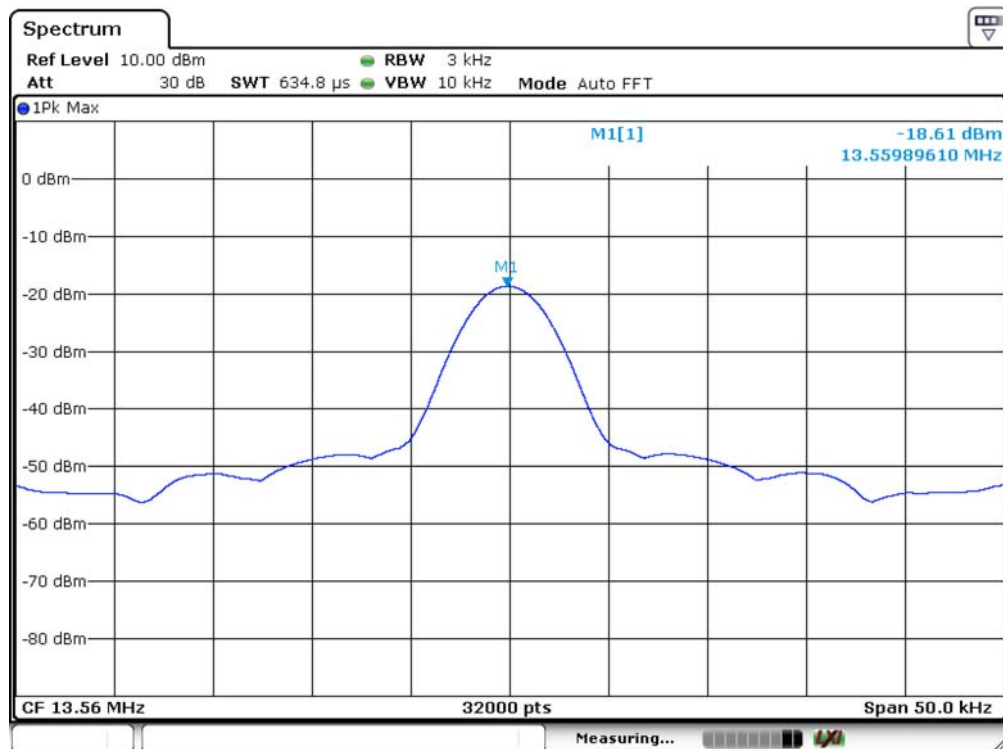
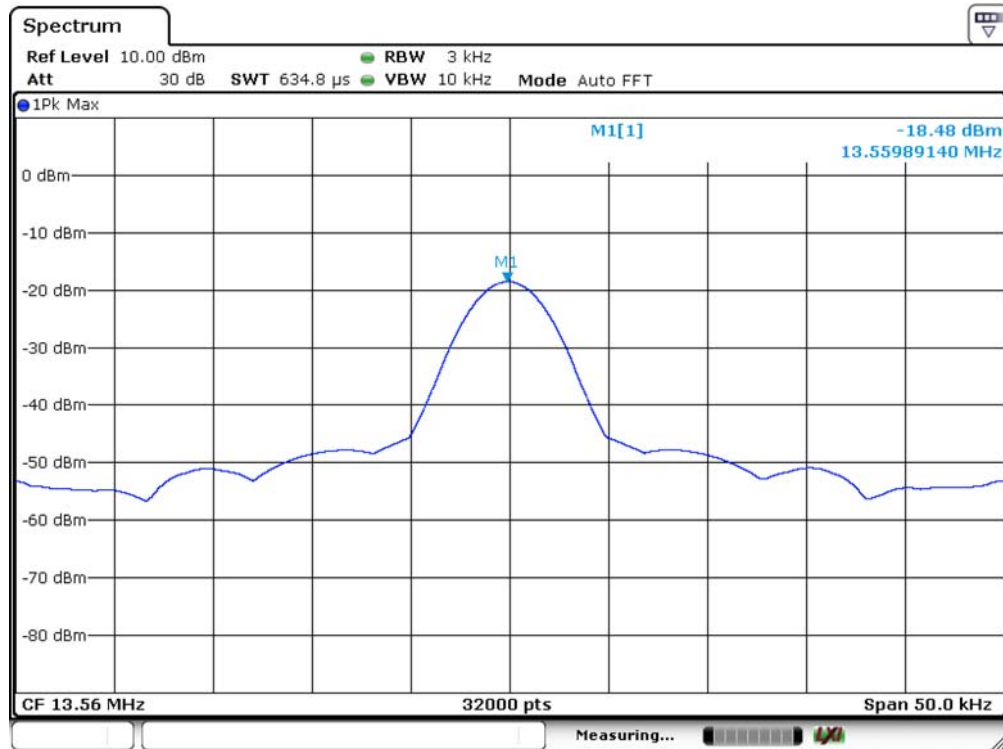
| Frequency Stability Versus Input Voltage |               |                 |                  |             |         |
|------------------------------------------|---------------|-----------------|------------------|-------------|---------|
| Temperature (°C)                         | Voltage (Vdc) | Frequency (MHz) | Freq Error (ppm) | Limit (ppm) | Results |
| 20                                       | 2.75          | 13.5598914      | -8.84            | 100         | PASS    |
| 20                                       | 3.5           | 13.5598883      | -8.24            | 100         | PASS    |
| 20                                       | 4.25          | 13.5598867      | -8.36            | 100         | PASS    |
| 20                                       | 5             | 13.5598930      | -7.89            | 100         | PASS    |
| 20                                       | 5.75          | 13.5598930      | -7.89            | 100         | PASS    |
| 20                                       | 6.5           | 13.5598914      | -8.01            | 100         | PASS    |
| 20                                       | 7.25          | 13.5598961      | -7.66            | 100         | PASS    |

### Frequency Stability Versus Input Voltage









## 8 EMISSION BANDWIDTH

### 8.1 Emission Bandwidth Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 – 13.567 MHz).

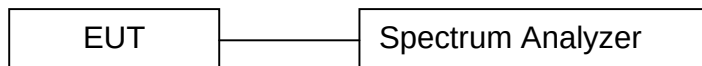
### 8.2 TEST INSTRUMENTS

Refer a test equipment and calibration data table in this test report.

### 8.3 TEST PROCEDURE

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 3kHz RBW and 10kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

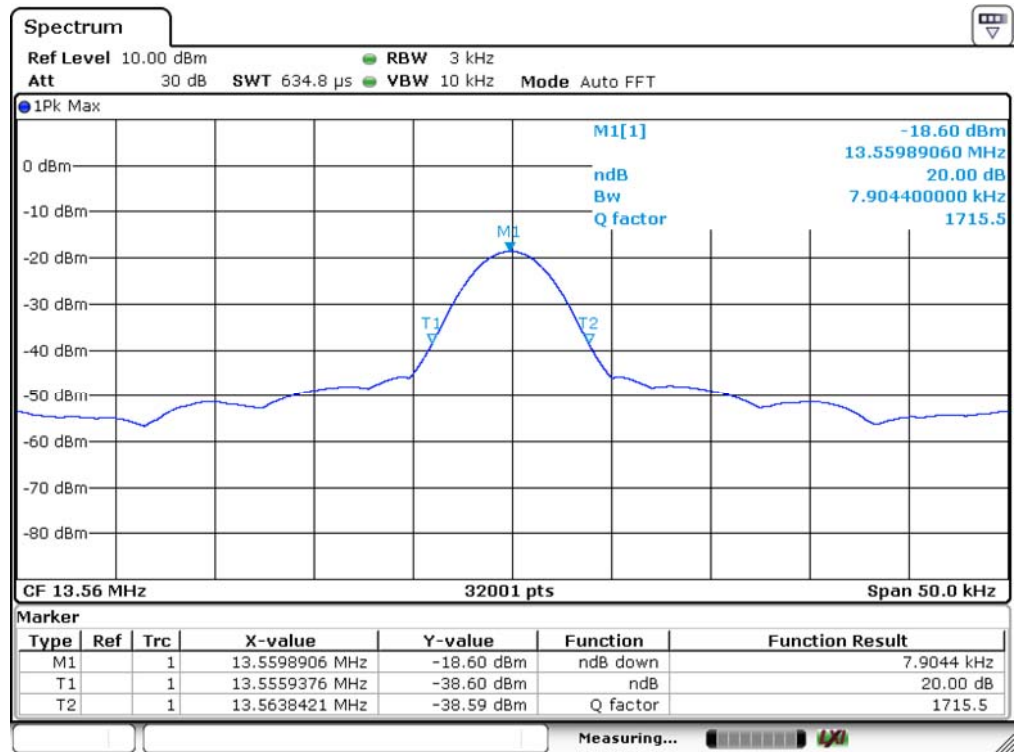
### 8.4 Test Setup



### 8.5 Test Result

| Frequency (MHz) | 20dB Bandwidth (kHz) | Results |
|-----------------|----------------------|---------|
| 13.56           | 7.9044               | PASS    |

## BANDWIDTH TEST PLOT



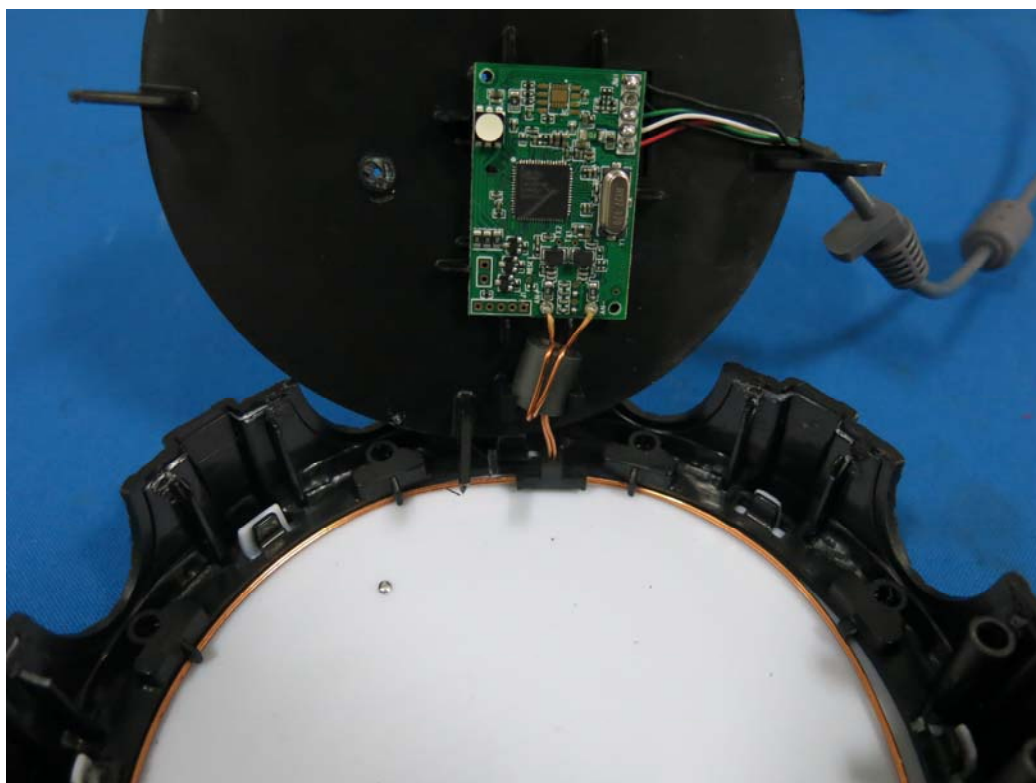
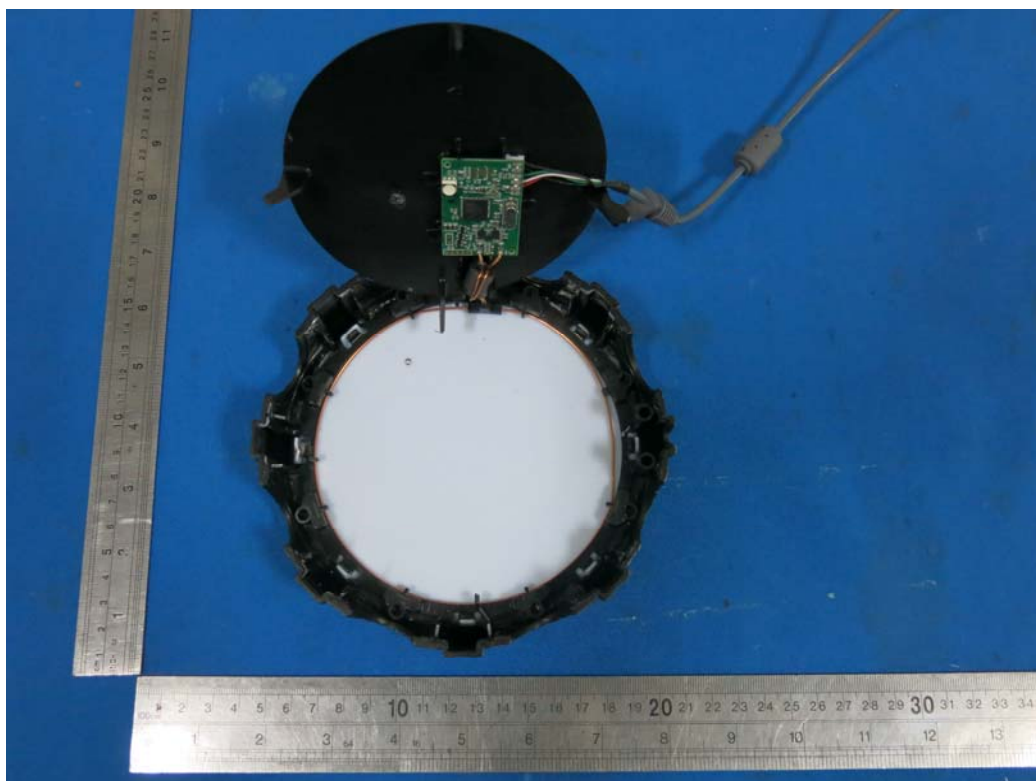
## 9 ANTENNA REQUIREMENT

The EUT'S antenna is met the requirement of FCC part 15C section 15.203.

### 9.1 Result

The EUT's antenna used an inter Loop Antenna and integral on the PCB.





## APPENDIX I (Photos of EUT)





