

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

*OF*

**Portal of Power for Xbox One**

**Model No.: 87506790**

**FCC ID: XLU87506790**

**Trademark: Activision**

**Report No.:KAD150529169E**

**Issue Date: August 06, 2015**

*Prepared for*

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*Prepared by*

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DONGGUAN EMTEK CO., LTD.**


## VERIFICATION OF COMPLIANCE

Applicant:	Activision Publishing, Inc 3100 Ocean Park Blvd., Santa Monica, CA90405, USA
Manufacturer:	Sunlight Technology Electronic Manufacturing Co., Ltd. New Asia Industrial City, Lin Village, Tangxia Town, Dongguan City, China.
Product Description:	Portal of Power for Xbox One
Model Number:	87506790
Trademark:	Activision


### We hereby certify that:

The above equipment was tested by DONGGUAN EMTEK 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(2014).

Date of Test : May 28, 2015 to July 16, 2015

Prepared by :   
Ivy Huang/Editor

Reviewer :   
Hong Yang/Supervisor

Approved & Authorized Signer :   
Sam Lv/Manager

## Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	KAD150529169E

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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 From Xbox One Input AC 120V/60Hz
- E). Antenna Type: Internal Loop antenna
- F). Antenna Gain: 0 dBi
- G). Product Hardware Version: V0.0
- H). Product Software Version: V2.32

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: XLU87506790 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

: DONGGUAN EMTEK 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**

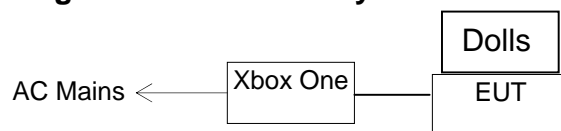
The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

#### **2.3.2 Radiated Emissions**

The EUT is a placed on as 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	87506790	XLU87506790	N/A	<b>EUT</b>
2.	Xbox One	Microsoft	N/A	N/A	N/A	Support Equipment
3.	Hot Streak	Activision	87550888	N/A	N/A	Support Equipment
4.	Stealth Elf	Activision	87541888	N/A	N/A	Support Equipment
5.	Spitfire	Activision	87532888	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

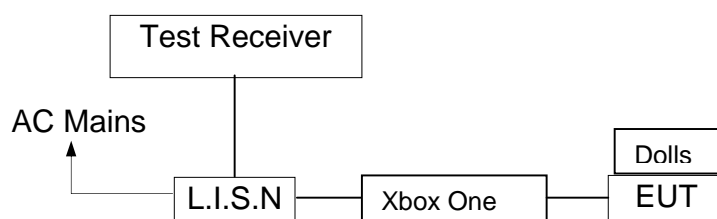
<b>FCC Rules</b>	<b>Description Of Test</b>	<b>Result</b>
§15.207	AC Power Conducted Emission	Complied
§15.225(a)(b)(c), (d), §15.209	Radiated Emission	Complied
§15.225(e)	Frequency Stability	Complied
§15.203	Antenna Application	Complied

## 4 Conducted Emissions Test

### 4.1 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.

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



### 4.3 Measurement Equipment Used

Conducted Emission Test Site						
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	Characteristics	Last Cal.	Due date
Test Receiver	Rohde & Schwarz	ESCS30	100018	9kHz~3GHz	03/15/2015	03/14/2016
L.I.S.N	Rohde & Schwarz	ENV216	100017	9KHz-300MHz	03/15/2015	03/14/2016
RF Switching Unit	CDS	RSU-M2	38401	9KHz-300MHz	03/15/2015	03/14/2016
Coaxial Cable	CDS	79254	46107086	9kHz~3GHz	03/15/2015	03/14/2016

### 4.4 Conducted Emission Limit

#### Conducted Emission Frequency(MHz)

0.15-0.5

0.5-5.0

5.0-30.0

#### Quasi-peak

66-56

56

60

#### Average

56-46

46

50

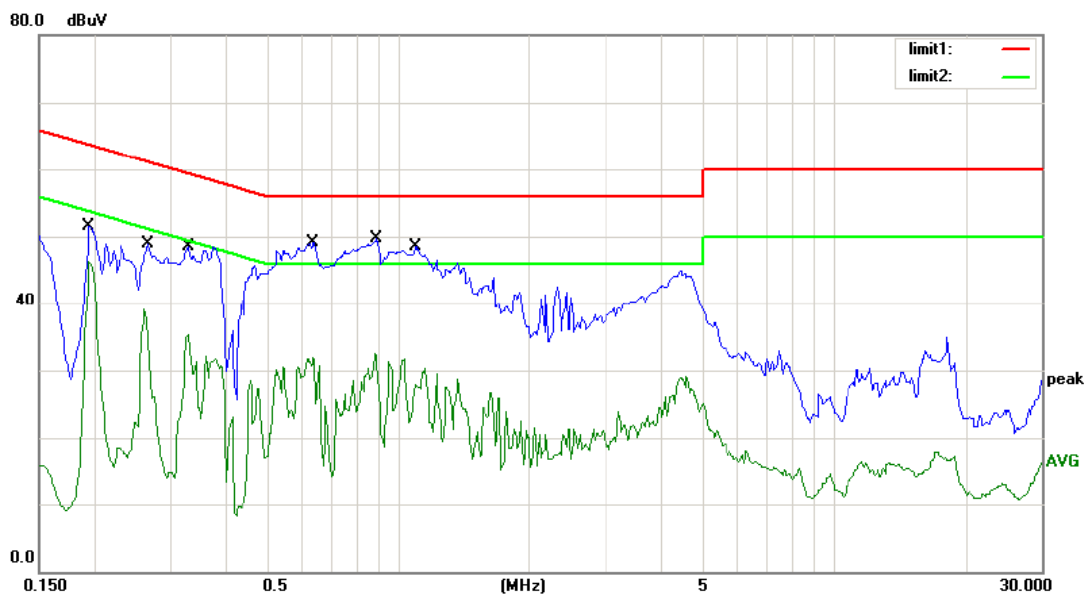
**Note:** 1. The lower limit shall apply at the transition frequencies

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 4.5 Measurement Result

Pass.

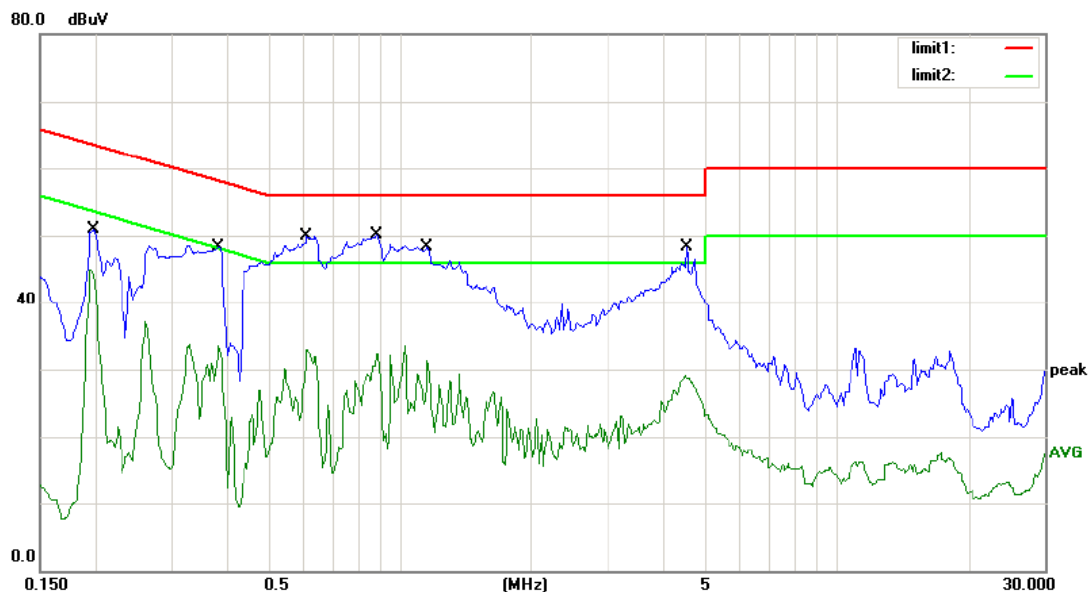
Please refer to the following.



Site site #1 Phase: **L1** Temperature: 24  
 Limit: (CE)FCC PART 15B\_QP Power: DC 5V (Xbox One Input AC120V/60Hz) Humidity: 55 %  
 Mode: TX  
 Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1950	48.25	0.00	48.25	63.82	-15.57	QP	
2 *	0.1950	46.23	0.00	46.23	53.82	-7.59	AVG	
3	0.2670	46.32	0.00	46.32	61.21	-14.89	QP	
4	0.2670	39.09	0.00	39.09	51.21	-12.12	AVG	
5	0.3300	46.14	0.00	46.14	59.45	-13.31	QP	
6	0.3300	35.40	0.00	35.40	49.45	-14.05	AVG	
7	0.6405	46.85	0.00	46.85	56.00	-9.15	QP	
8	0.6405	31.87	0.00	31.87	46.00	-14.13	AVG	
9	0.8970	46.57	0.00	46.57	56.00	-9.43	QP	
10	0.8970	32.57	0.00	32.57	46.00	-13.43	AVG	
11	1.0950	46.51	0.00	46.51	56.00	-9.49	QP	
12	1.0950	30.26	0.00	30.26	46.00	-15.74	AVG	

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



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

Phase: **N**  
 Power: DC 5V (Xbox One Input AC120V/60Hz)  
 Temperature: 24  
 Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1995	48.65	0.00	48.65	63.63	-14.98	QP	
2		0.1995	44.97	0.00	44.97	53.63	-8.66	AVG	
3		0.3840	46.71	0.00	46.71	58.19	-11.48	QP	
4		0.3840	33.45	0.00	33.45	48.19	-14.74	AVG	
5		0.6134	47.35	0.00	47.35	56.00	-8.65	QP	
6		0.6134	32.87	0.00	32.87	46.00	-13.13	AVG	
7	*	0.8880	48.25	0.00	48.25	56.00	-7.75	QP	
8		0.8880	32.37	0.00	32.37	46.00	-13.63	AVG	
9		1.1580	46.47	0.00	46.47	56.00	-9.53	QP	
10		1.1580	31.32	0.00	31.32	46.00	-14.68	AVG	
11		4.5300	46.25	0.00	46.25	56.00	-9.75	QP	
12		4.5300	29.17	0.00	29.17	46.00	-16.83	AVG	

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

#### 4.6 Conducted Measurement Photos:



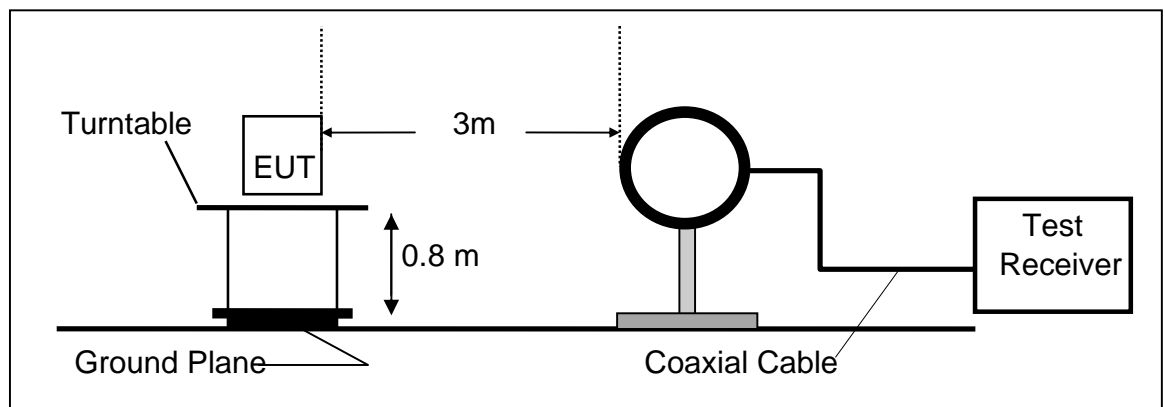
## 5 Radiated Emission Test

### 5.1 Measurement Procedure

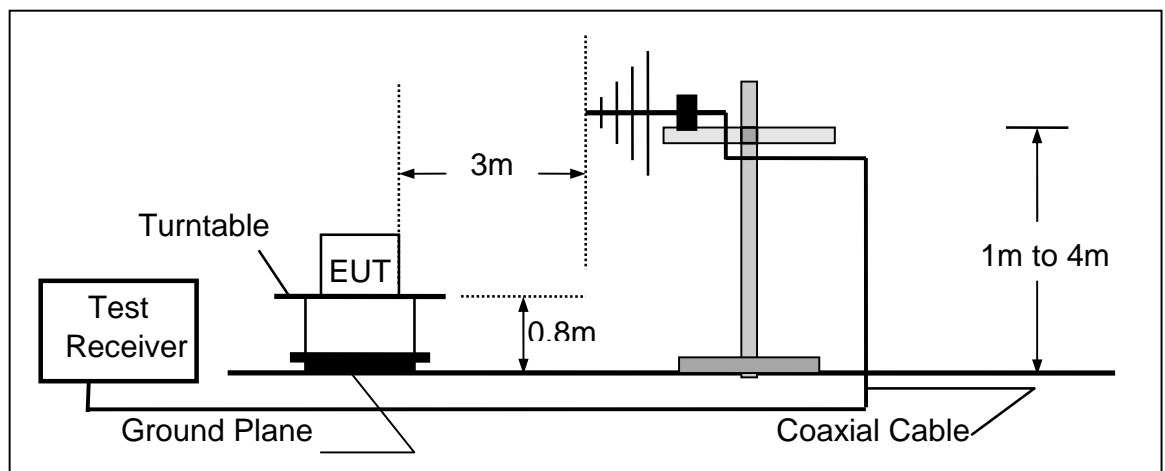
1. The EUT was placed on a turntable which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above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

### 5.2 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



### 5.3 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	3/15/2015	1 Year
2.	Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	12/29/2014	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	000141	25MHz-2GHz	3/15/2015	1 Year
4.	Power Amplifier	CDS	RSU-M352	818	1MHz-1GHz	3/15/2015	1 Year
5.	Power Amplifier	HP	8447F	OPT H64	1GHz-26.5GHz	3/15/2015	1 Year
6.	Color Monitor	SUNPO	SP-140A	N/A	--	3/15/2015	1 Year
7.	Single Line Filter	JIANLI	XL-3	N/A	--	3/15/2015	1 Year
8.	Single Phase Power Line Filter	JIANLI	DL-2X100B	N/A	--	3/15/2015	1 Year
9.	3 Phase Power Line Filter	JIANLI	DL-4X100B	N/A	--	3/15/2015	1 Year
10.	DC Power Filter	JIANLI	DL-2X50B	N/A	--	3/15/2015	1 Year
11.	Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	3/15/2015	1 Year
12.	Cable	Rosenberger	CIL02	A0783566	9KHz-3GHz	3/15/2015	1 Year
13.	Cable	Rosenberger	RG 233/U	525178	9KHz-3GHz	3/15/2015	1 Year

### 5.4 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 at 3m Measurement Distance	
	(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
<sup>1</sup> 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.



## 5.5 Measurement Result

Operation Mode: TX Mode      Test Date : June 24, 2015  
Frequency Range: 9KHz~30MHz      Temperature : 28℃  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: KYO

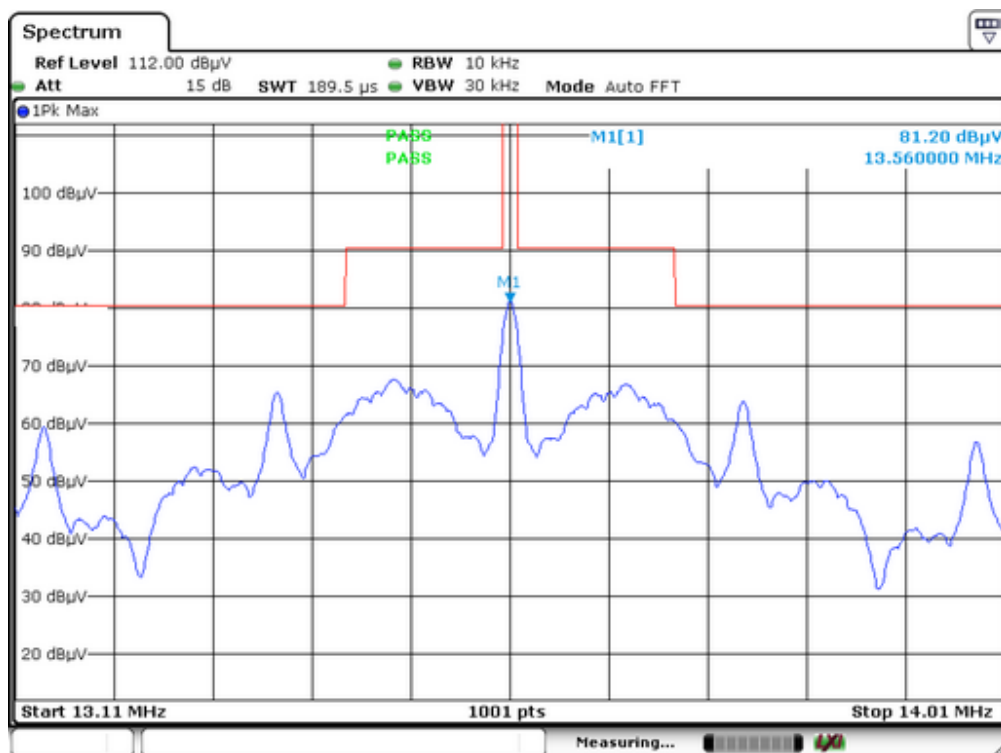
Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)	Note
10.24	V	36.01	69.54	-33.53	QP
12.11	V	31.57	69.54	-37.97	QP
14.68	V	39.24	69.54	-30.30	QP
18.13	V	38.66	69.54	-30.88	QP
20.14	V	37.24	69.54	-32.30	QP
26.54	V	35.77	69.54	-33.77	QP
6.13	H	36.36	69.54	-33.18	QP
11.57	H	33.79	69.54	-35.75	QP
15.37	H	36.23	69.54	-33.31	QP
20.88	H	35.79	69.54	-33.75	QP
24.13	H	35.38	69.54	-34.16	QP
27.26	H	34.74	69.54	-34.80	QP

Operation Mode: TX Mode      Test Date : June 24, 2015  
Frequency Range: 30~1000MHz      Temperature : 28℃  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: KYO

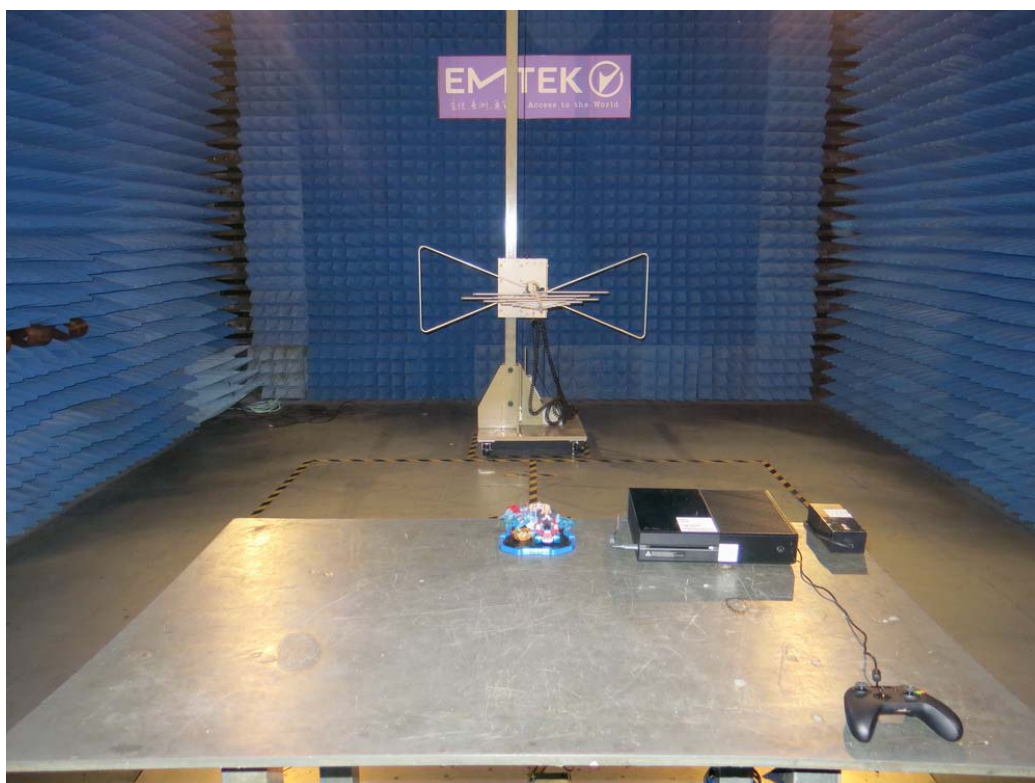
Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)	Note
35.8200	V	29.17	40.00	-10.83	QP
41.6400	V	31.88	40.00	-8.12	QP
124.0900	V	33.00	43.50	-10.50	QP
131.8500	V	30.20	43.50	-13.30	QP
143.4900	V	28.05	43.50	-15.45	QP
178.4100	V	20.52	43.50	-22.98	QP
41.6400	H	18.48	40.00	-21.52	QP
56.1900	H	15.18	40.00	-24.82	QP
123.1200	H	16.80	43.50	-26.70	QP
144.4600	H	16.58	43.50	-26.92	QP
200.7200	H	27.96	43.50	-15.54	QP
455.8300	H	19.17	46.00	-26.83	QP

Operation Mode: TX Mode  
Frequency Range: 13.110MHz~14.010 MHz  
Test Result: PASS  
Measured Distance: 3m

Test Date : June 24, 2015  
Temperature : 28°C  
Humidity : 65 %  
Test By: KYO



## 5.6 Radiated Measurement Photos:



## 6 FREQUENCY STABILITY MEASUREMENT

### 6.1 FREQUENCY STABILITY LIMITS

FCC Part 15.225(e)

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

### 6.2 MEASUREMENT INSTRUMENTS LIST

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	Characteristics	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	FSV30	1321.3008K	10Hz-30GHz	03/15/2015	03/14/2016
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	03/15/2015	03/14/2016
Antenna Connector	ARTHUR-YANG	2244-N1TG1	N/A	10Hz-30GHz	03/15/2015	03/14/2016

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.

### 6.3 TEST PROCEDURE

- 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 ( $25\pm 5^{\circ}\text{C}$ )
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 6.4 EUT OPERATING CONDITIONS

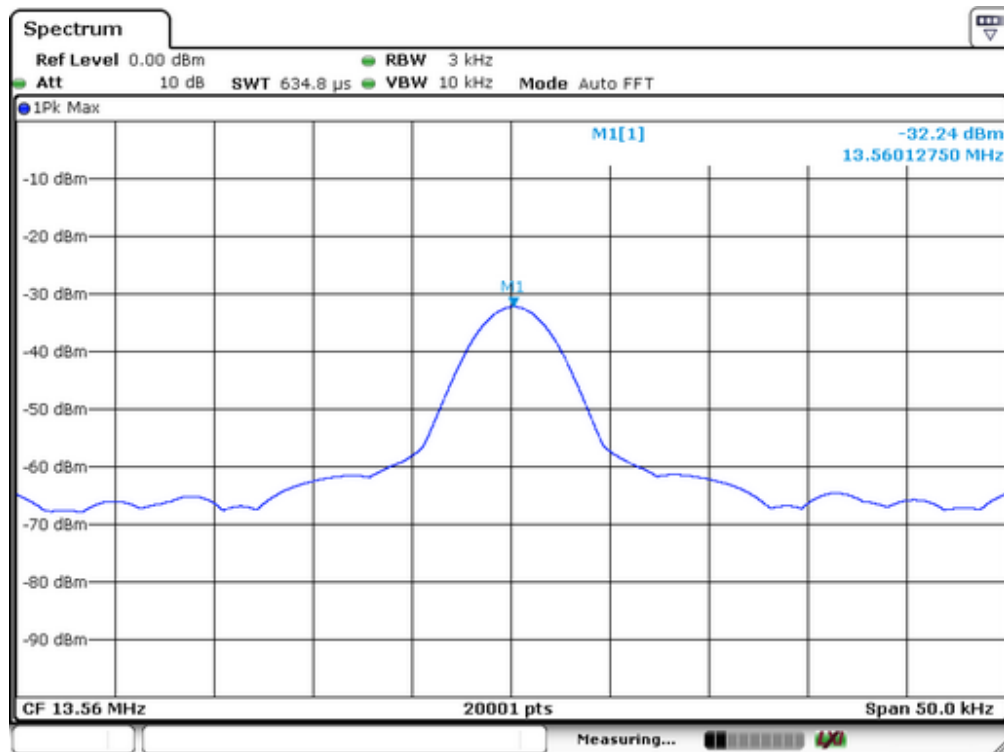
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

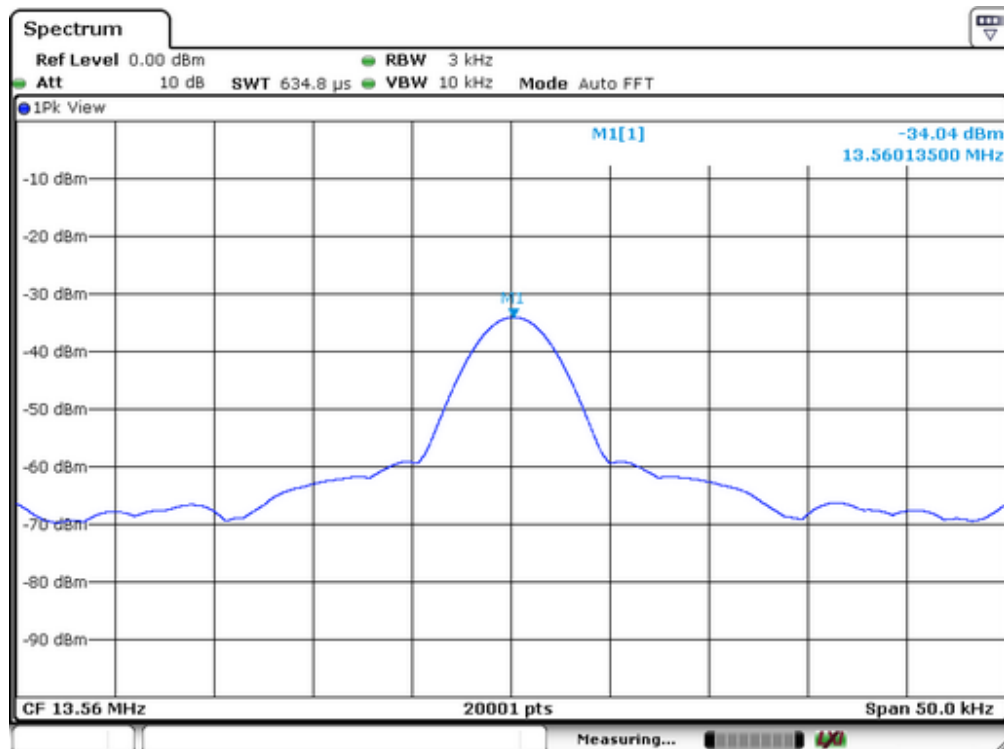
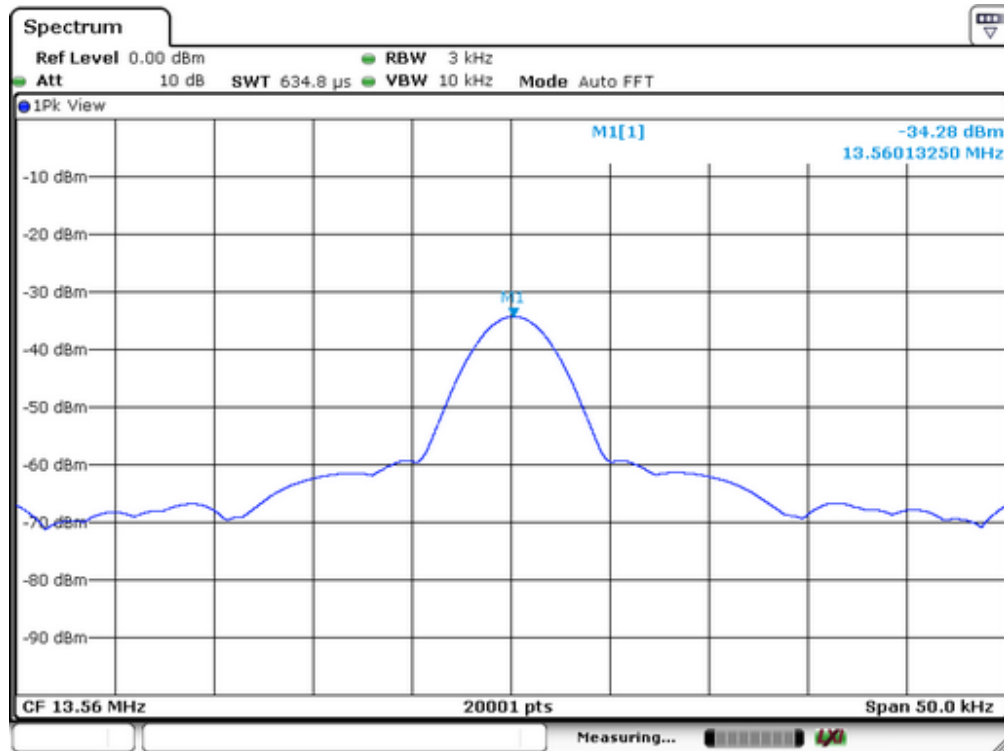
## 6.5 TEST RESULTS

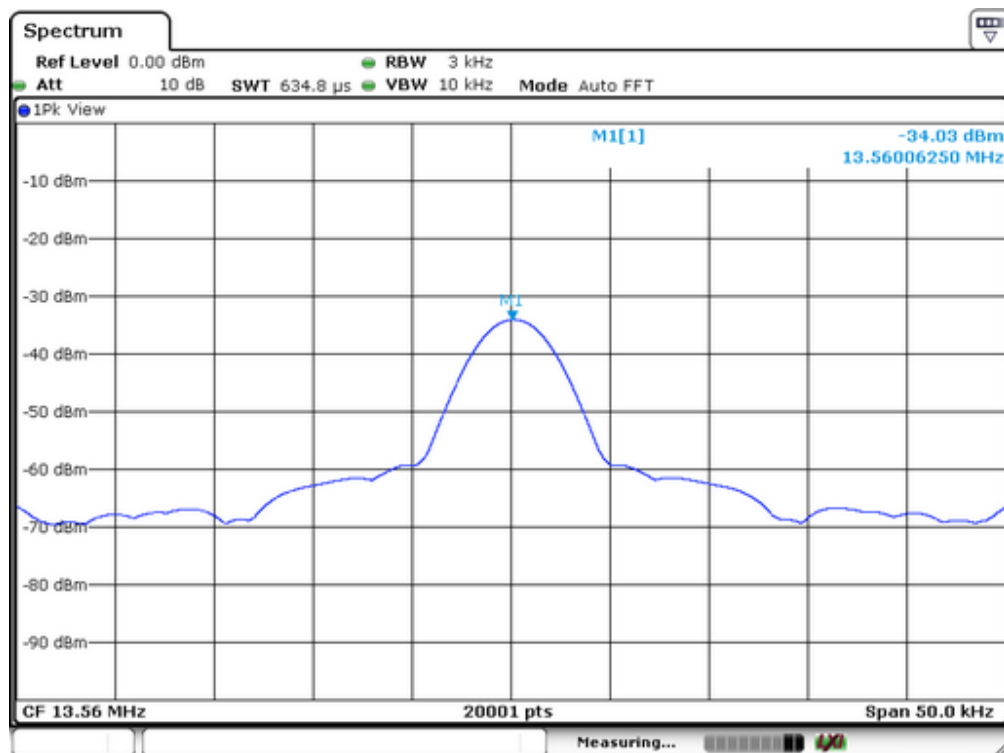
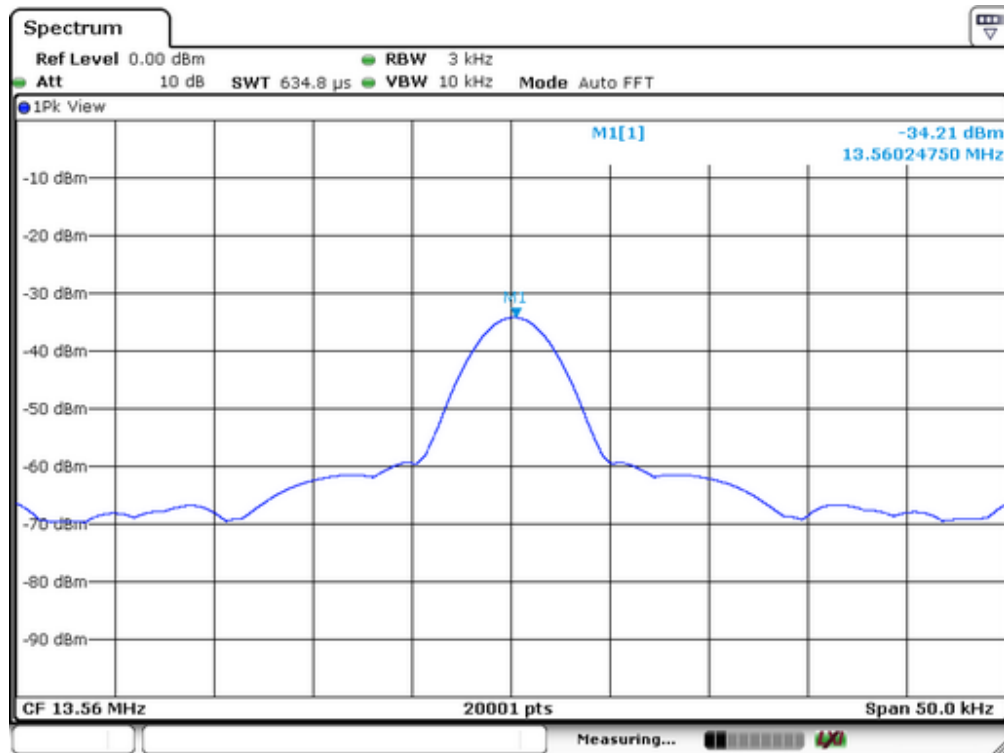
E.U.T :	Portal of Power for Xbox One	Test Mode :	TX Mode
Test Voltage :	DC 5V		

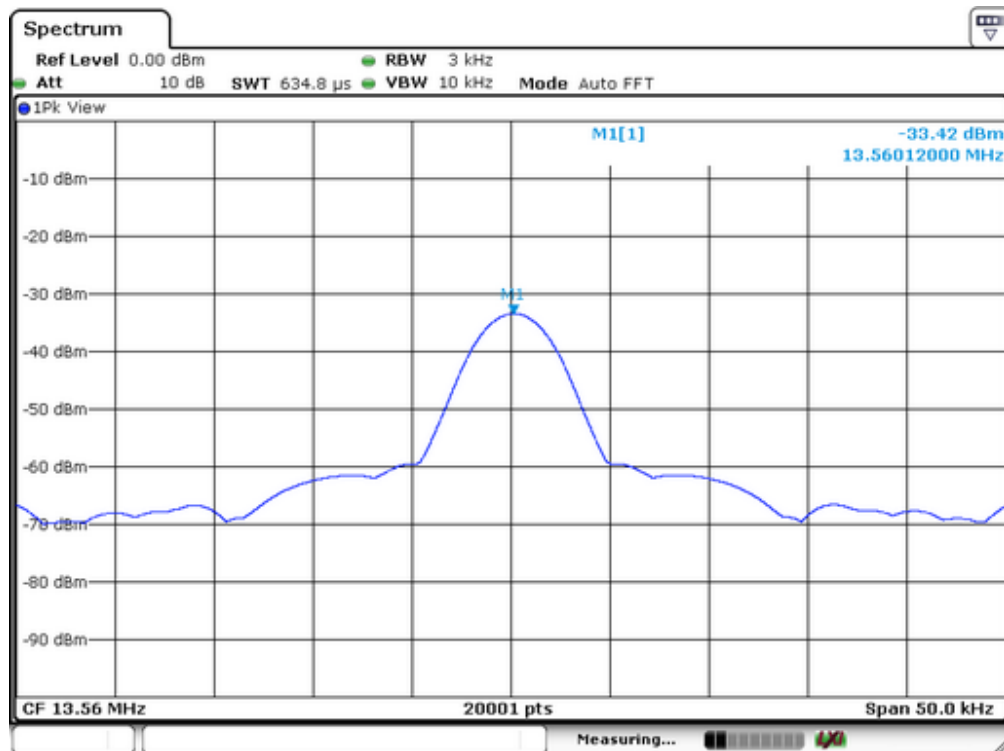
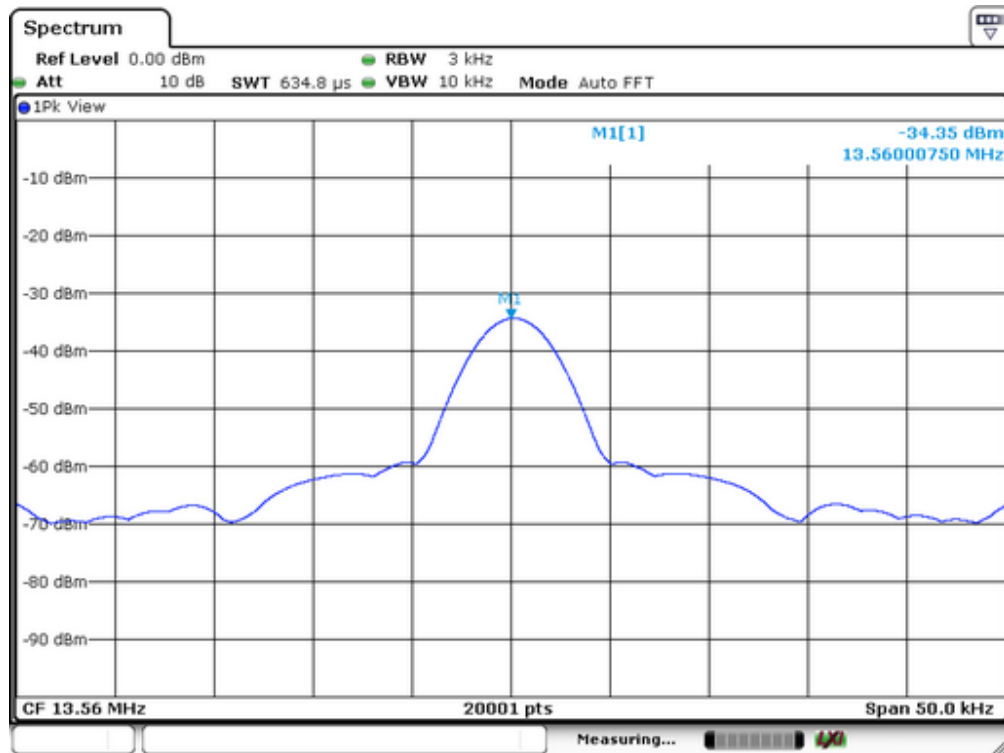
Frequency Stability Versus Environmental Temperature					
Temperature (°C)	Voltage (Vdc)	Frequency (MHz)	Freq Error (ppm)	Limit (ppm)	Results
-20	5V	13.5601275	9.40	100	PASS
-10	5V	13.5601325	9.77	100	PASS
0	5V	13.5601350	9.96	100	PASS
10	5V	13.5602475	18.25	100	PASS
20	5V	13.5600625	4.61	100	PASS
30	5V	13.5600075	0.55	100	PASS
40	5V	13.5601200	8.85	100	PASS
50	5V	13.5601025	7.56	100	PASS

Frequency Stability Versus Environmental Temperature

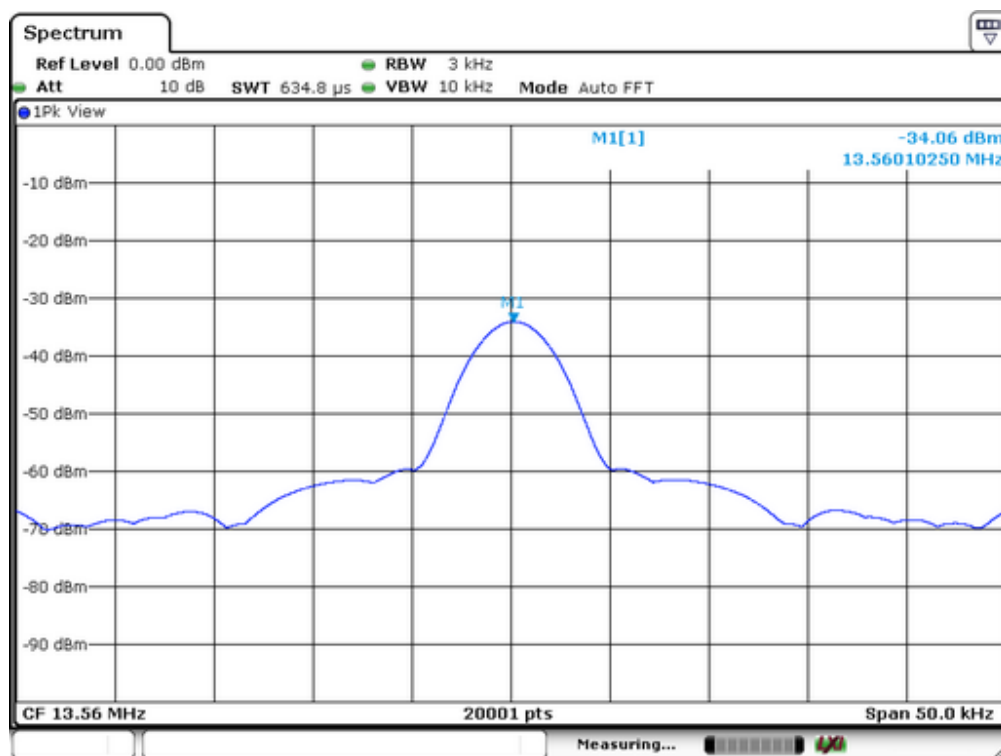






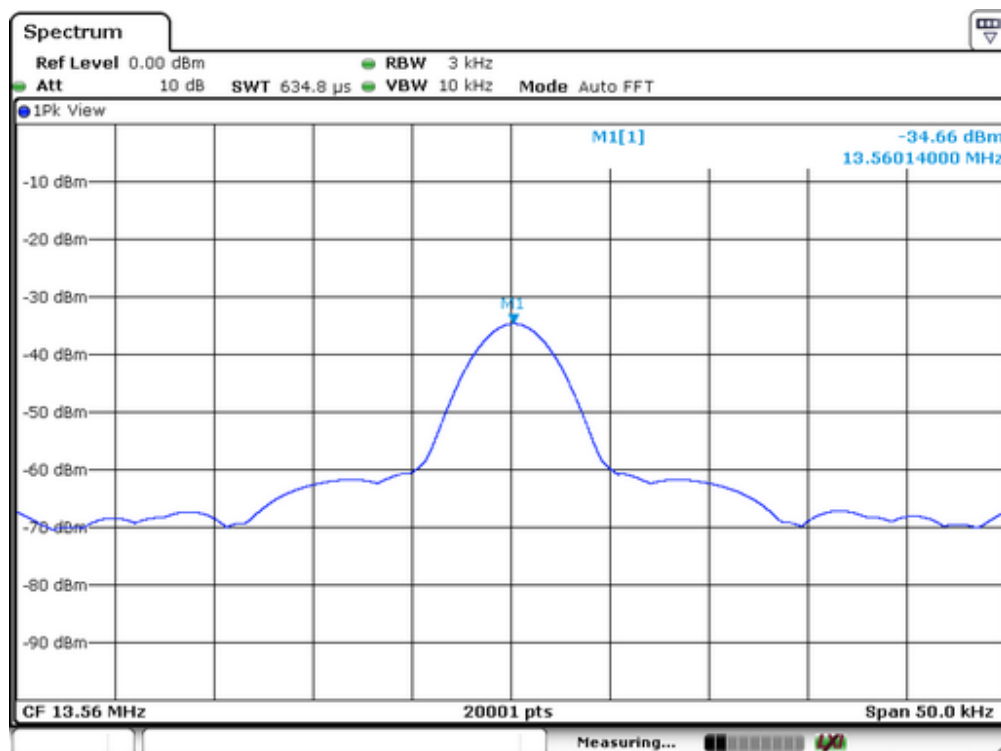
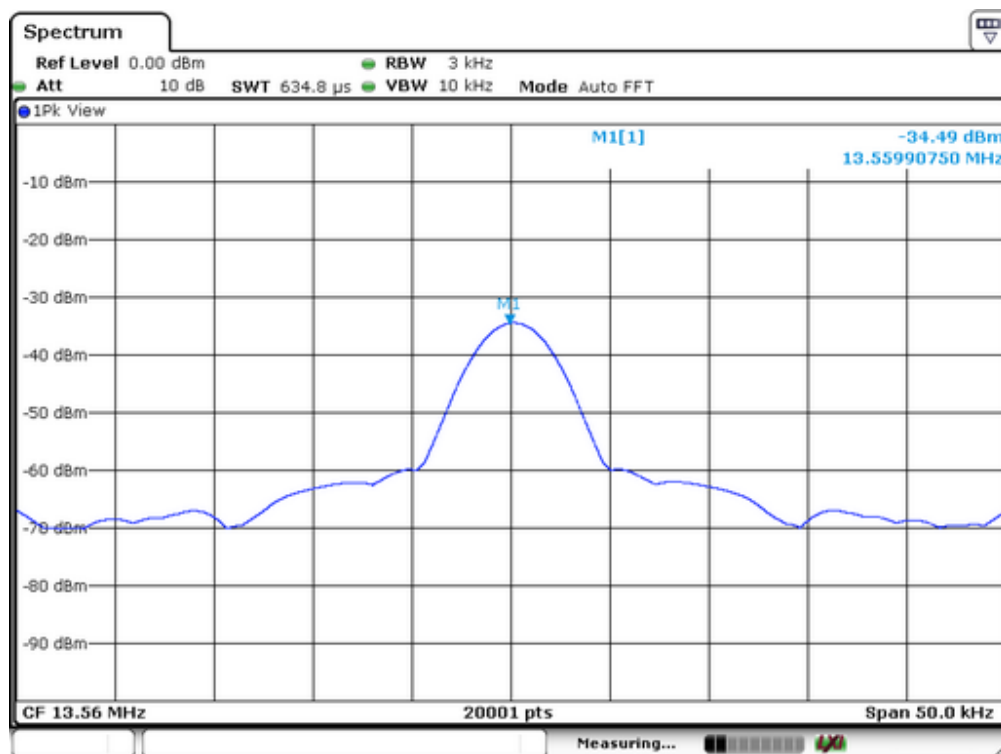


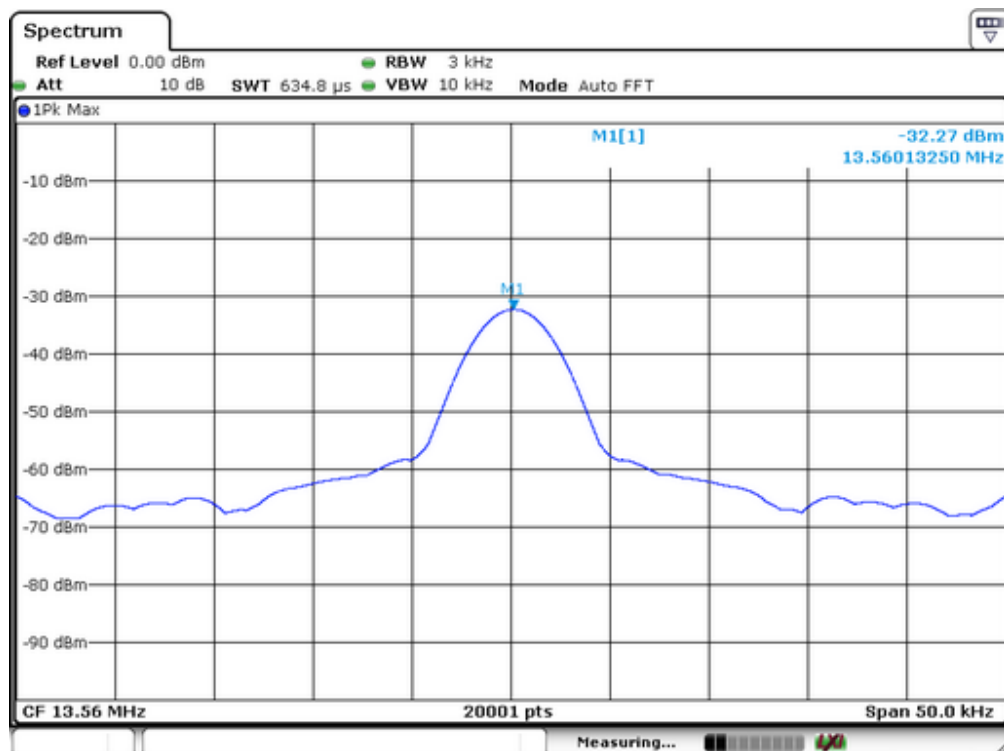
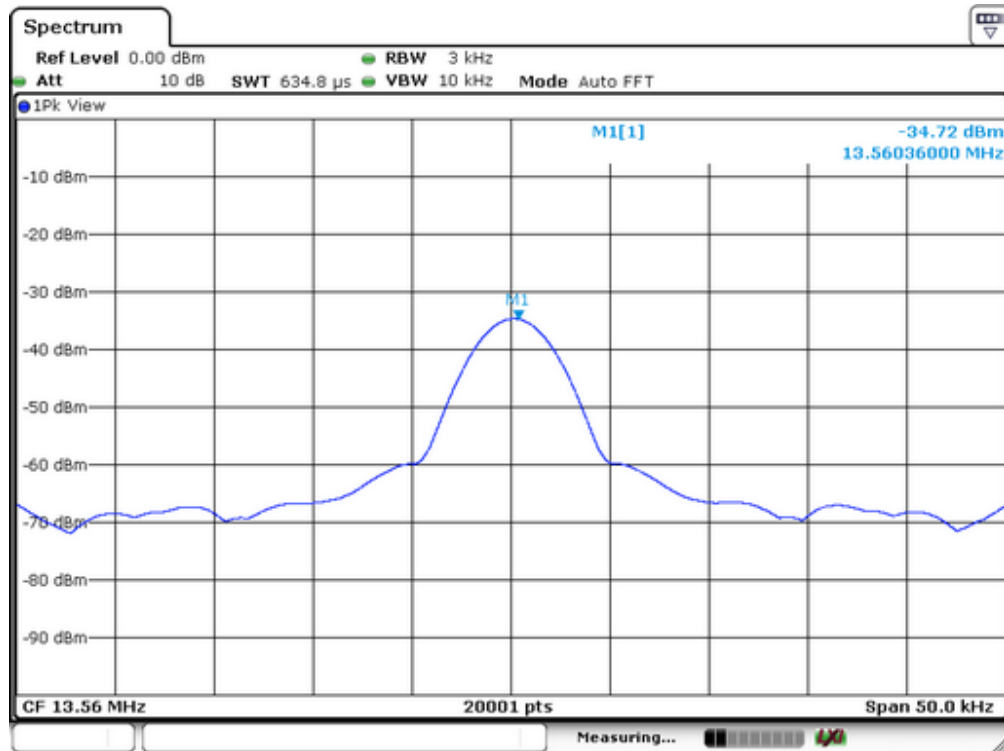


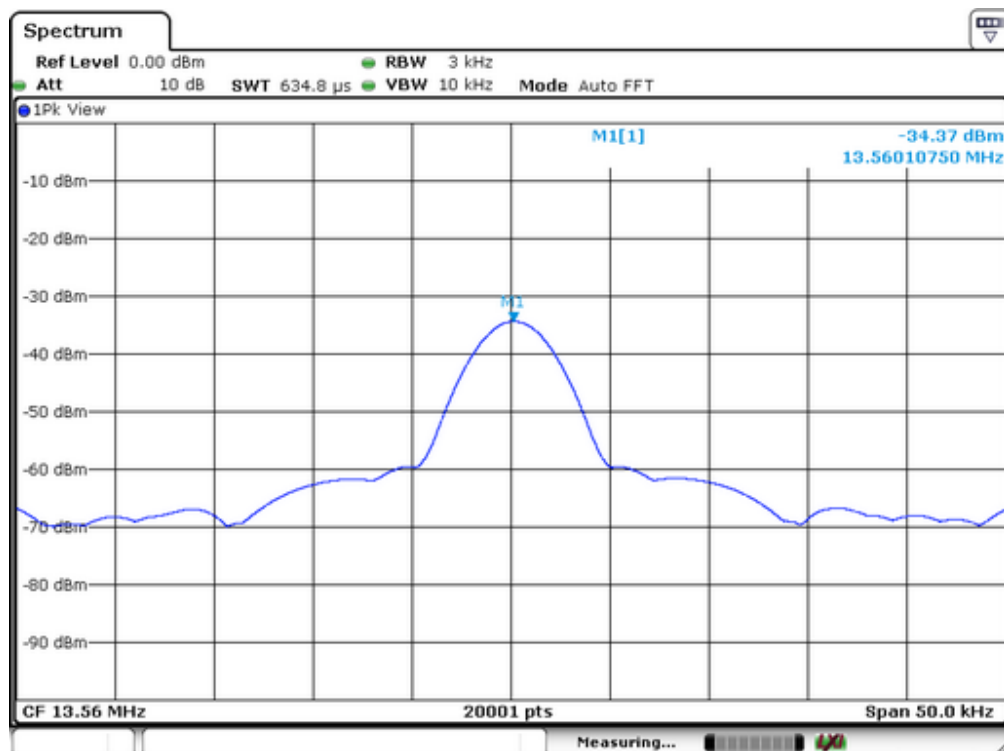
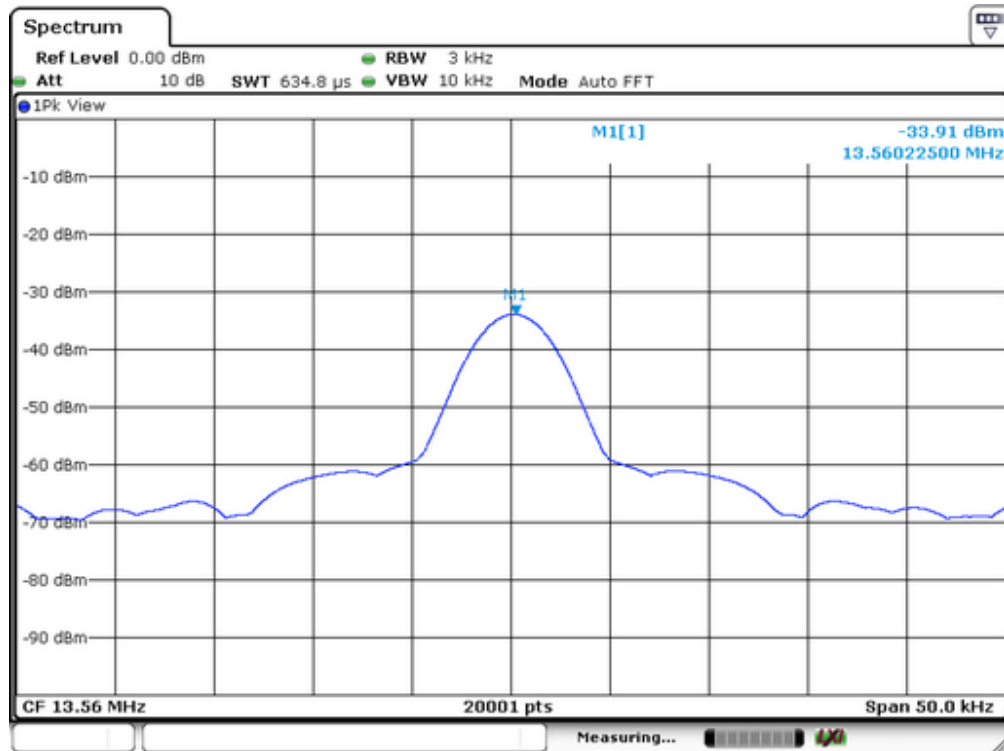


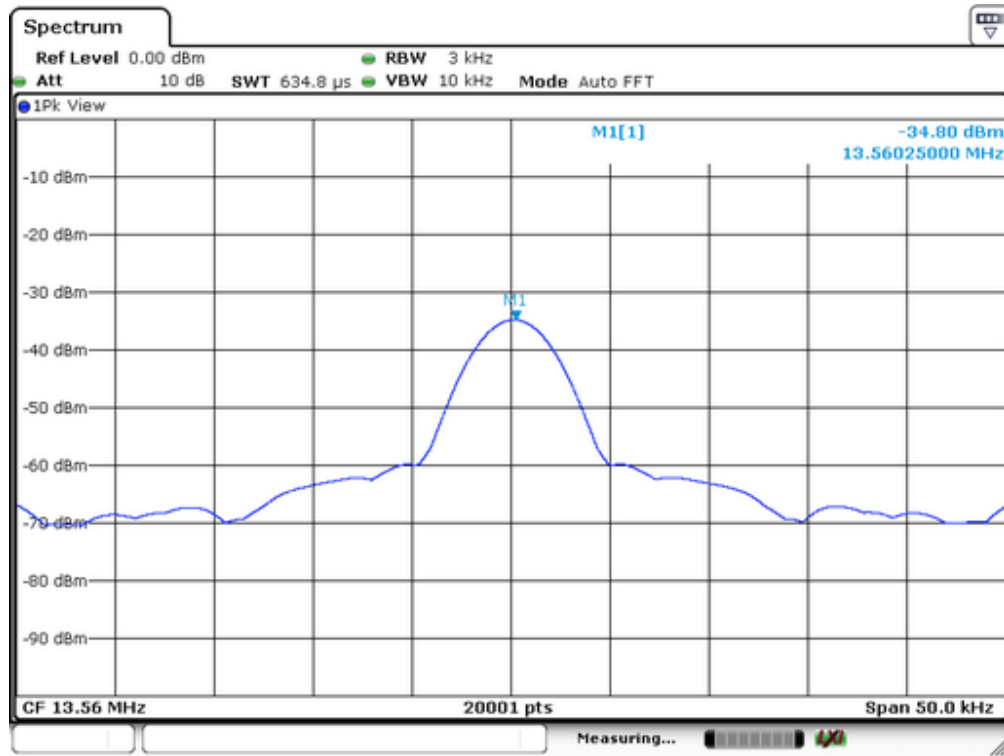
Frequency Stability Versus Input Voltage					
Temperature (°C)	Voltage (Vdc)	Frequency (MHz)	Freq Error (ppm)	Limit (ppm)	Results
20	4.25	13.5599075	-6.82	100	PASS
20	4.50	13.5601400	10.32	100	PASS
20	4.75	13.5603600	26.55	100	PASS
20	5.00	13.5601325	9.77	100	PASS
20	5.25	13.5602250	16.59	100	PASS
20	5.50	13.5601075	7.93	100	PASS
20	5.75	13.5602500	18.44	100	PASS

## Frequency Stability Versus Input Voltage









## 7 EMISSION BANDWIDTH

### 7.1 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).

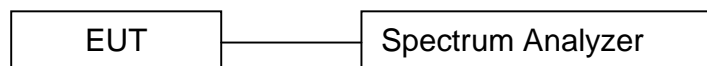
### 7.2 TEST INSTRUMENTS

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

### 7.3 TEST PROCEDURE

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 10kHz RBW and 30kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

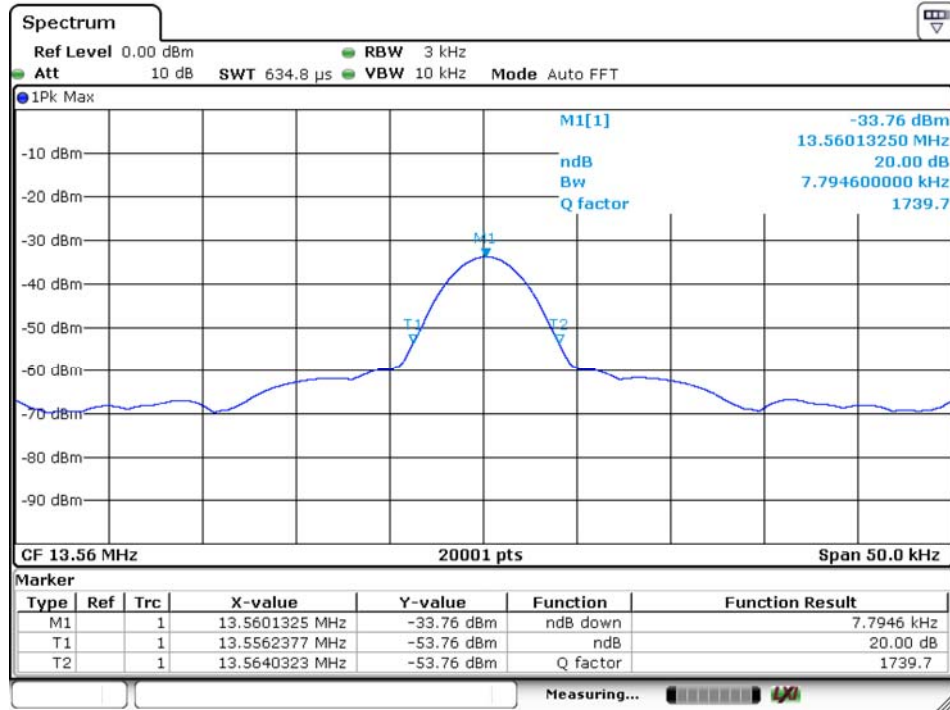
### 7.4 Test Setup



### 7.5 Test Result

Frequency (MHz)	20dB Bandwidth (kHz)	Results
13.56	7.795	PASS

## BANDWIDTH TEST PLOT



## **8 ANTENNA REQUIREMENT**

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

Systems operating in the 2402-2480MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

### **8.1 Result**

The EUT's antenna used an inter Loop Antenna, and the Antenna Gain is 0dBi.



## APPENDIX I (Photos of EUT)

