

# TEST REPORT

**Report No. :** 15050811-4

**Product description:** Wireless Microphone

**Model/Type :** U-1800, U-2800R, U-3800, U-4800,  
U-5800, U-6800R, U-7800, U-8800,  
U-9800, U-101, U-103, U-105, U-  
902, U-988, U-22, U-605

**Applicant's name:** KTV Equipment LLC.

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<b>TEST REPORT</b> <b>FCC Part 15.249: 2014</b> <b>FCC ID: 2AEPBU-1800</b>	
<b>Report Reference No. ....:</b> 15050811-4	
<b>Tested by (+ signature) .....</b>	<i>Jumy qiu</i> Jumy Qiu
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<b>Applicant's name .....</b> KTV Equipment LLC. <b>Address .....</b> 365 N. Berry St. BREA, CA 92821 <b>Manufacturer's name .....</b> KTV Equipment LLC. <b>Address .....</b> 365 N. Berry St. BREA, CA 92821	
<b>Test specification .....</b> Entrusted testing <b>Standard .....</b> FCC Part 15.249: 2014 <b>Non-standard test method .....</b> N/A	
<b>Test Report Form No. ....:</b> N/A <b>Test Report Form(s) Originator ..:</b> N/A	
<b>Test item description .....</b> Wireless Microphone <b>Trade Mark .....</b> Martin Ranger <b>Model/Type reference .....</b> U-1800 <b>Ratings .....</b> 3.0Vdc 2*AA Batteries	

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## 1 TEST SUMMARY

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (9kHz to 25GHz)	FCC PART 15.249	ANSI C63.10:2013	In FCC PART 15.249	PASS
Occupied Bandwidth	FCC PART 15.215	ANSI C63.10:2013	In FCC PART 15.215	PASS
Conducted Emissions at Mains Terminals	FCC PART 15.207	ANSI C63.10: 2013: Clause 6.2	In FCC PART 15.207	N/A*
Frequency Stability	FCC PART 15.249	FCC CFR 47 Part 2.1055	In FCC PART 15.249.b)2)	PASS

Remark:

Model: **U-1800, U-2800R, U-3800, U-4800, U-5800, U-6800R, U-7800, U-8800, U-9800, U-101,**

**U-103, U-105, U-902, U-988, U-22, U-605**

Only tested **U-1800**, since the other models listed above are electric identical with only difference being the model name and appearance ( button's shape and location setting ).

♣

Channel	Frequency/ MHz
Lowest	902.3
Middle	914.5
Highest	927.7

The tests were carried out on the 3 samples with the typical frequency of lowest/ middle/ highest channels listed above.

## 2 GENERAL INFORMATION

### 2.1 Client Information

Applicant: KTV Equipment LLC.  
Address of Applicant: 365 N. Berry St. BREA, CA 92821

### 2.2 General Description of E.U.T.

EUT Name: Wireless Microphone  
Item No.: U-1800, U-2800R, U-3800, U-4800, U-5800, U-6800R, U-7800, U-8800, U-9800, U-101, U-103, U-105, U-902, U-988, U-22, U-605  
Serial No.: Not supplied by client

### 2.3 Details of E.U.T.

Power Supply: 3.0Vdc 2\*AA Batteries  
Main Function: Wireless microphone system with an associated receiver for transmitting voice.  
Oscillating Frequency: Y1: 24MHz  
Port: USB port only for power supplied by batteries  
Frequency Range: 902.3 MHz to 927.7 MHz for all the models listed in the cover. 16 channels for each microphone.  
Modulation: F3E; Emission designator: 228KF3E  
Occupied bandwidth (99 % BW): 228kHz  
Antenna Number & Type: One & Fixed on PCB; Gained: 0 dBi; Impedance: 50-Ohm;  
Antenna length: 15mm; Antenna min distance to the shell: 20 mm

### 2.4 Description of Support Units

/

### 2.5 Standards Applicable for Testing

The standard used was 47 CFR Part 15.249: 2014

The EUT belongs to low power communication device transmitter, and it's an unlicensed low power auxiliary device.

**2.6 Test Location**

I-Test Laboratory

Address: 1-2 floor, South Block, Building A2 No3 Keyan Lu, Science City, Guangzhou, Guangdong, China

Accredited by CNAS, Accredited Number: L4957

FCC- Registration No: 935596 Renewal on April. 19, 2012

**2.7 Deviation from Standards**

None.

**2.8 Abnormalities from Standard Conditions**

None.

### 3 TEST RESULTS

#### 3.1 Radiation Interference

Test Requirement: FCC Part15.249, a) & FCC Part15.209  
Test Method: ANSI C63.10:2013  
Detector: Peak for pre-scan (The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz up to 1.0GHz and 1.0 MHz with a video BW of 3.0 MHz above 1.0GHz.)  
Average detector if maximised peak within 6dB of limit  
Test Date: Apr. 10, 2015

##### 3.1.1 E.U.T. Operation

Operating Environment:

Temperature: 20°C

Humidity:50% RH

Atmospheric Pressure: 103 kPa

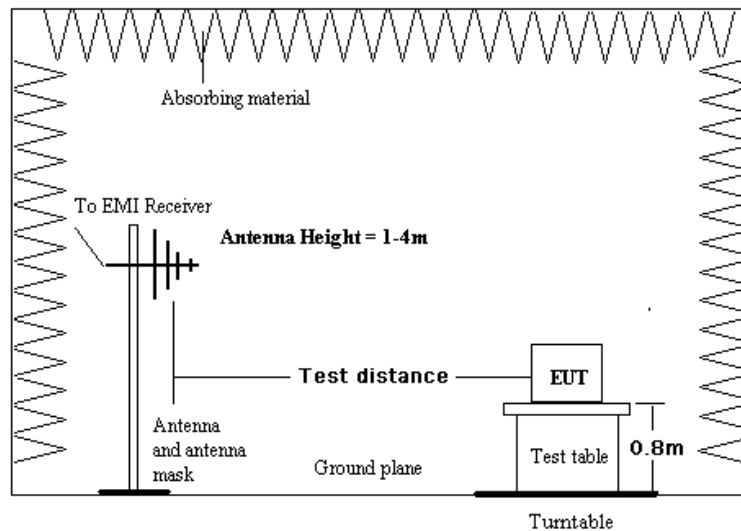
EUT Operation:

In the fundamental test, connecting the EUT to peripheral devices.

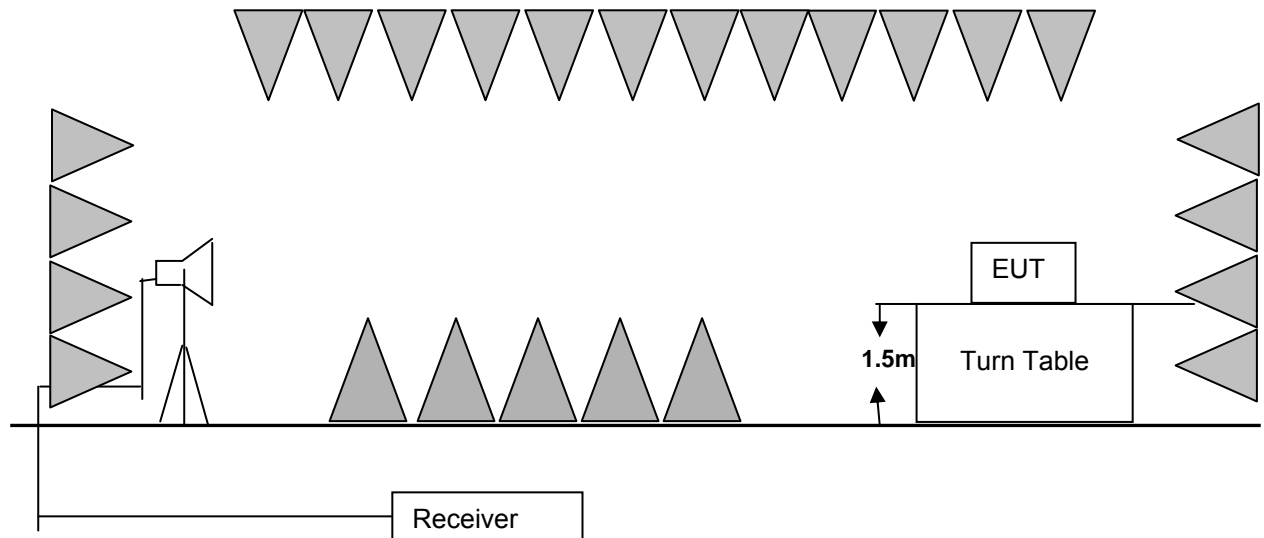
Test the EUT work normally in on mode during the whole test.

##### 3.1.2 Test Setup

30MHz-1GHz emissions:



1 GHz to 40 GHz emissions:



### 3.1.3 Test Procedure

#### **ANSI STANDARD C63.10-2013 6.5 Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz**

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical polarities. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes and choose the worst case of X/ Y/ Z orthogonal planes for the final measurement.



### 3.1.4 Measurement Data

Copy from FCC Part 15.249.a)

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental	Field Strength	
Frequency	Fundamental	Harmonics
MHz	millivolts/meter(mV/m)	microvolts/meter(uV/m)
902 - 928	50	500
2400 - 2483.5	50	500
5725 - 5875	50	500
24000 - 24250	250	2500

**Quasi-Peak measurement of carrier**

Frequency	Level		Transducer	Limit	Margin	
MHz	dBuV/m		dB	dBuV/m	dB	
	V	H			V	H
902.3 (L)	87.1	89.0	27.6	94	6.9	5.0
914.5 (M)	88.6	90.3	27.8	94	5.4	3.7
927.7 (H)	84.6	91.0	27.9	94	9.4	3.0

**Note:**

50mV/m (94dBuV/m) for QP limit in band (902MHz to 928MHz).  
The transducer factor = antenna factor + cable loss - preamplifier.  
The Level = Read level + transducer factor.

H: Antenna polarization horizontal direction. V: Antenna polarization vertical direction.

**Peak measurement of harmonics and spurious emission at lowest channel 902.3 MHz**

Frequency	Level		Transducer	Limit	Min. Margin	
MHz	dBuV/m		dB	dBuV/m	dB	
	V	H			V	H
2 <sup>nd</sup> 1804.6	40.1	40.2	27.4	74dB	33.9	33.8
3 <sup>rd</sup> 2706.9	43.5	43.1	27.9		30.5	30.9
4 <sup>th</sup> 3609.2	43.2	44.2	30.3		30.8	29.8
5 <sup>th</sup> 4511.5	43.6	44.4	34.1		30.4	29.6
6 <sup>th</sup> 5413.8	44.1	44.1	31.0		29.9	29.9
7 <sup>th</sup> 6316.1	44.5	44.4	35.1		29.5	29.6
8 <sup>th</sup> 7218.4	44.3	44.2	35.0		29.7	29.8
9 <sup>th</sup> 8120.7	44.6	45.2	36.0		29.4	28.8
10 <sup>th</sup> 9023.0	44.7	45.4	37.3		29.3	28.6

**Average measurement of harmonics and spurious emission at lowest channel 902.3 MHz**

Frequency	Level		Transducer	Limit	Min. Margin	
MHz	dBuV/m		dB	dBuV/m	dB	
	V	H			V	H
2 <sup>nd</sup> 1804.6	32.2	33.4	27.4	54dB	21.8	20.6
3 <sup>rd</sup> 2706.9	31.8	33.2	27.9		22.2	20.8
4 <sup>th</sup> 3609.2	32.4	34.4	30.3		21.6	19.6
5 <sup>th</sup> 4511.5	33.2	34.3	34.1		20.8	19.7
6 <sup>th</sup> 5413.8	33.1	34.7	31.0		20.9	19.3
7 <sup>th</sup> 6316.1	34.0	34.4	35.1		20.0	19.6
8 <sup>th</sup> 7218.4	34.2	34.8	35.0		19.8	19.2
9 <sup>th</sup> 8120.7	34.5	35.2	36.0		19.5	18.8
10 <sup>th</sup> 9023.0	34.7	35.8	37.3		19.3	18.2

**Peak measurement of harmonics and spurious emission at middle channel 914.5 MHz**

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2 <sup>nd</sup>	1829.0	40.5	40.4	27.4	74dB	33.5	33.6
3 <sup>rd</sup>	2743.5	42.8	43.3	27.9		31.2	30.7
4 <sup>th</sup>	3658.0	43.2	44.4	30.3		30.8	29.6
5 <sup>th</sup>	4572.5	43.1	43.7	34.1		30.9	30.3
6 <sup>th</sup>	5487.0	44.0	44.4	31.0		30.0	29.6
7 <sup>th</sup>	6401.5	44.7	44.5	35.1		29.3	29.5
8 <sup>th</sup>	7316.0	44.2	44.9	35.0		29.8	29.1
9 <sup>th</sup>	8230.5	44.5	45.6	36.0		29.5	28.4
10 <sup>th</sup>	9145.0	44.1	45.8	37.3		29.9	28.2

**Average measurement of harmonics and spurious emission at middle channel 914.5 MHz**

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2 <sup>nd</sup>	1829.0	32.5	33.4	27.4	54dB	21.5	20.6
3 <sup>rd</sup>	2743.5	31.6	33.2	27.9		22.4	20.8
4 <sup>th</sup>	3658.0	32.1	34.5	30.3		21.9	19.5
5 <sup>th</sup>	4572.5	33.4	34.6	34.1		20.6	19.4
6 <sup>th</sup>	5487.0	33.3	34.8	31.0		20.7	19.2
7 <sup>th</sup>	6401.5	34.3	34.5	35.1		19.7	19.5
8 <sup>th</sup>	7316.0	34.3	34.5	35.0		19.7	19.5
9 <sup>th</sup>	8230.5	34.4	35.7	36.0		19.6	18.3
10 <sup>th</sup>	9145.0	34.3	35.5	37.3		19.7	18.5

## Peak measurement of harmonics and spurious emission at highest channel 927.7MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2 <sup>nd</sup>	1855.4	40.3	40.3	27.4	74dB	33.7	33.7
3 <sup>rd</sup>	2783.1	43.2	43.2	27.9		30.8	30.8
4 <sup>th</sup>	3710.8	43.6	44.3	30.3		30.4	29.7
5 <sup>th</sup>	4638.5	43.5	44.1	34.1		30.5	29.9
6 <sup>th</sup>	5566.2	44.1	44.3	31.0		29.9	29.7
7 <sup>th</sup>	6493.9	44.3	44.5	35.1		29.7	29.5
8 <sup>th</sup>	7421.6	44.3	44.6	35.0		29.7	29.4
9 <sup>th</sup>	8349.3	44.6	45.1	36.0		29.4	28.9
10 <sup>th</sup>	9277.0	44.4	45.6	37.3		29.6	28.4

## Average measurement of harmonics and spurious emission at highest channel 927.7MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2 <sup>nd</sup>	1855.4	32.4	33.7	27.4	54dB	21.6	20.3
3 <sup>rd</sup>	2783.1	31.7	33.2	27.9		22.3	20.8
4 <sup>th</sup>	3710.8	32.8	34.5	30.3		21.2	19.5
5 <sup>th</sup>	4638.5	33.4	34.5	34.1		20.6	19.5
6 <sup>th</sup>	5566.2	33.2	34.8	31.0		20.8	19.2
7 <sup>th</sup>	6493.9	34.2	34.1	35.1		19.8	19.9
8 <sup>th</sup>	7421.6	34.3	34.7	35.0		19.7	19.3
9 <sup>th</sup>	8349.3	34.5	35.5	36.0		19.5	18.5
10 <sup>th</sup>	9277.0	34.5	35.7	37.3		19.5	18.3

### Note:

500 $\mu$ V/m (54dBuV/m) for AVG limit, and Peak limit= AVG limit + 20dB.

The transducer factor = antenna factor + cable loss - preamplifier.

The Level = Read level + transducer factor.

H: Antenna polarization horizontal direction. V: Antenna polarization vertical direction.

### Note:

The EUT's transmitting frequency range belonged to 902MHz to 928 MHz, and it is complied with the requirements of FCC Part 15.249.a).

The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes and choose the worst case of X orthogonal plane for the final measurement.

### 3.1.5 Radiated outside of the specified frequency bands

Copy from FCC Part 15.249.d)

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Copy from FCC Part 15.209: Radiated emission limits, general requirements

(a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency MHz	Field Strength microvolts/meter(uV/m)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Note:

Since the fundamental emissions peak and average values are shown on section 6.1.4 of this report, the general radiated emission limits in Section 15.209 is the lesser attenuation.

## Limits for the frequency bands of 902 M - 928 MHz

Frequency	FCC Part 15.209 Radiated limits	
MHz	dBuV/m@3m	
	QP	AVG
30 - 88	40	/
88 - 216	43.5	/
216 - 960	46	/
960 - 1000	54	/
Above 1000	74(PK)	54

Frequency	15.249.d) limits	
MHz	dBuV/m@3m	
	QP	AVG
30 - 88	40	/
88 - 216	43.5	/
216 - 902	46	/
928-960	46	/
960 - 1000	54	/
1000-9280	74(PK)	54

### Remark:

1. RF line voltage (dBuV)= 20 log RF line voltage (uV)
2. In the above table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

### 3.1.6 Measurement Data for 15.249.d

Test the EUT work normally in transmitting mode in mains.

#### 1) 9kHz~30MHz Test result

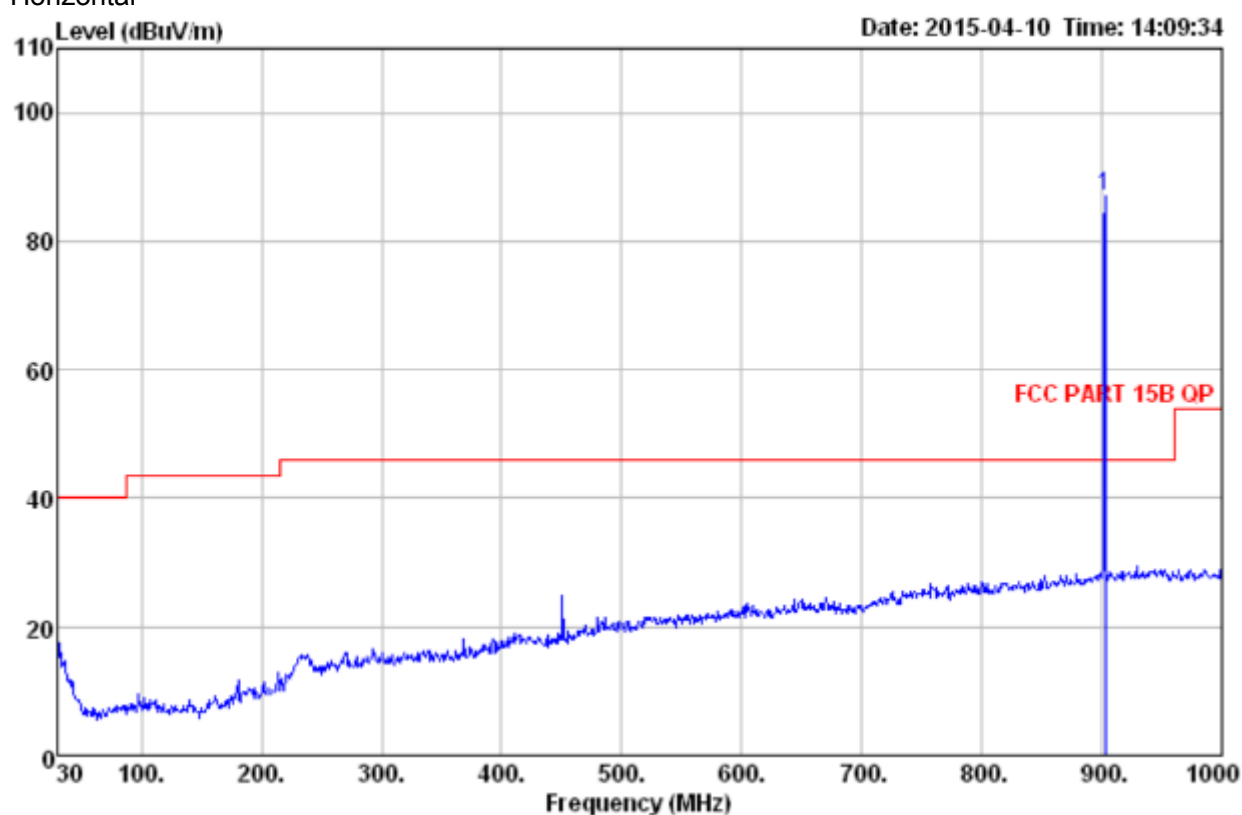
The Low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report.

#### 2) 30 MHz~1 GHz Spurious Emissions. Quasi-Peak Measurement

Test curves ( with the Quasi-peak measurement and QP limit), 30M-1GHz, Horizontal & Vertical:

lowest channel 902.3MHz

Horizontal



Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
30.0	17.3	17.9	40	22.7
184.2	16.6	8.9	43.5	26.9
447.4	24.4	16.6	46	21.6
860.1*	29.4	23.0	46	16.6
936.2*	29.8	24.2	46	16.2
972.6	29.0	23.9	54	25.0

Note:

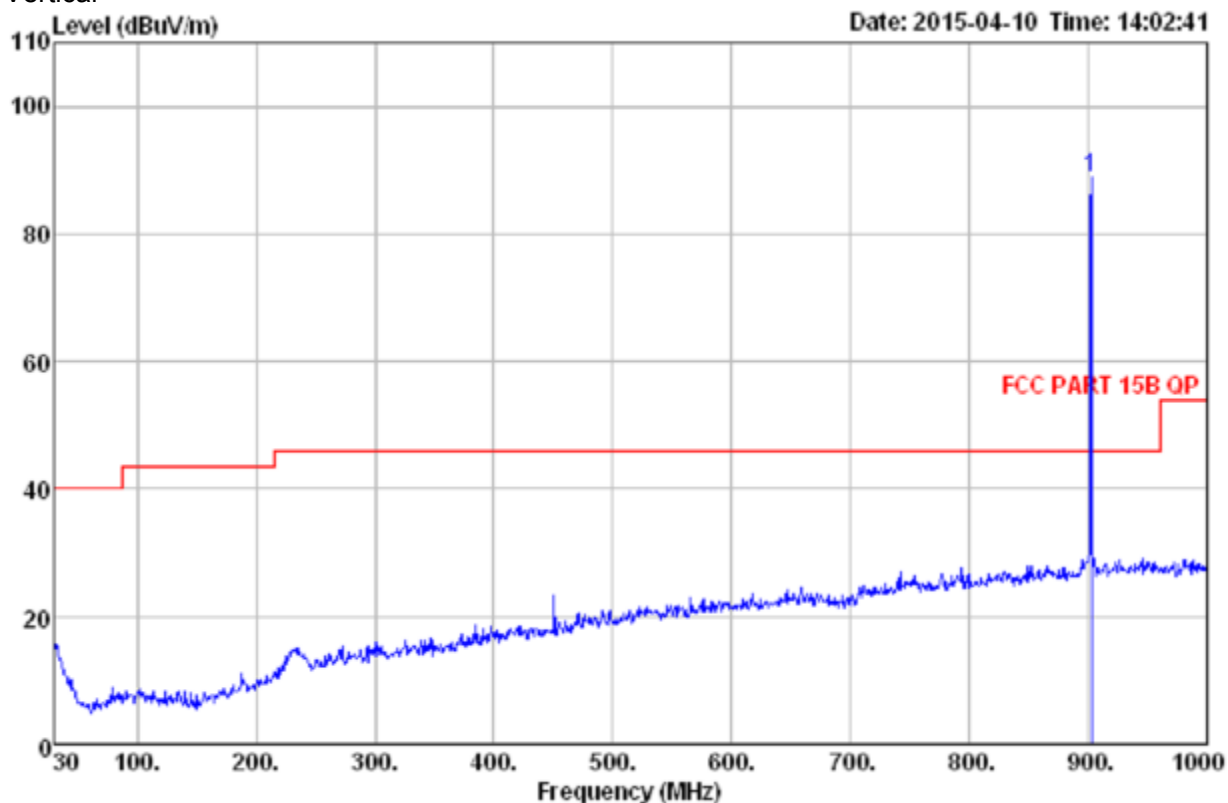
The transducer factor includes antenna factor and cable loss.

\* means the max Quasi peak value for band-edge (frequency range of 802 MHz to 902MHz, except for harmonics) is the plot measurement at 860.1 MHz.

\* means the max Quasi peak value for band-edge (frequency range of 928 MHz to 1000 MHz, except for harmonics) is the plot measurement at 936.2 MHz.

lowest channel 902.3MHz

Vertical



## Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
30.0	16.5	17.9	40	23.5
184.1	13.4	8.9	43.5	30.1
444.2	22.4	18.8	46	23.6
900.4*	30.5	23.9	46	15.5
935.2*	30.5	24.2	46	15.5
981.7	30.3	23.7	54	23.7

## Note:

The transducer factor includes antenna factor and cable loss.

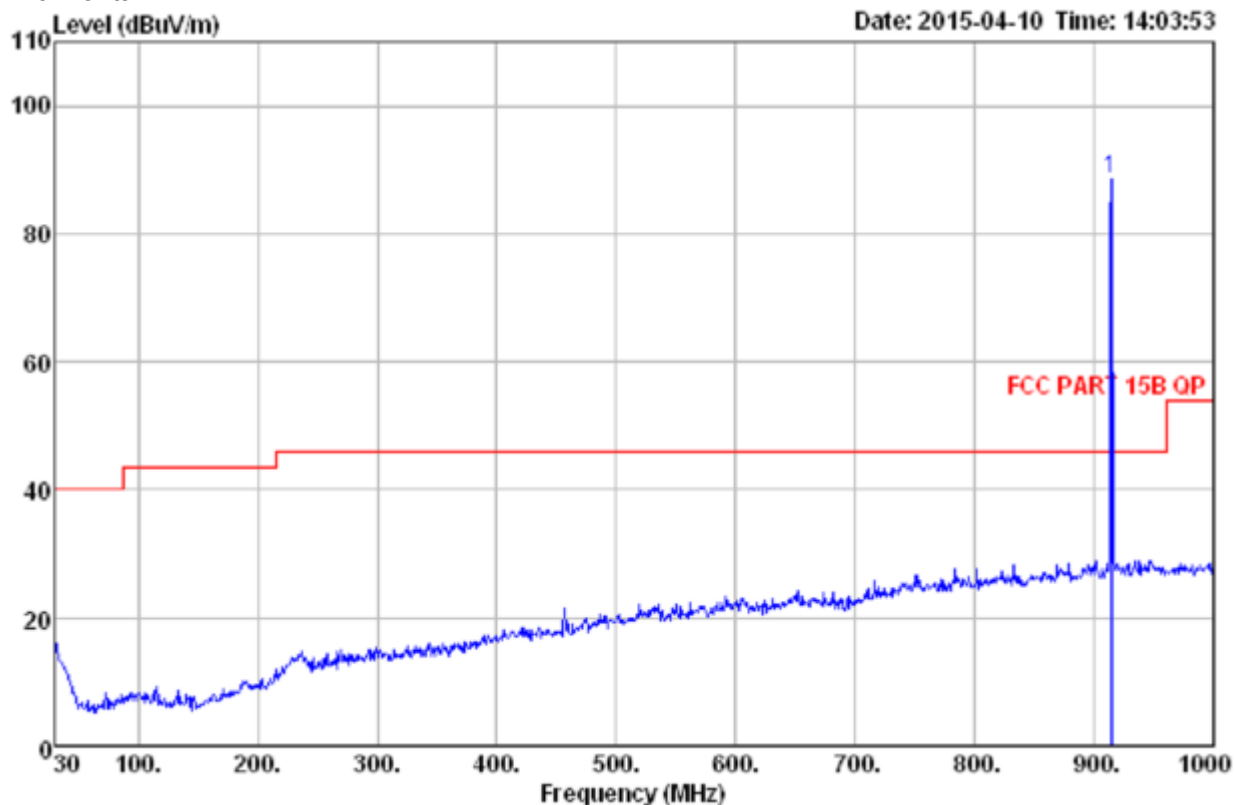
\* means the max Quasi peak value for band-edge (frequency range of 802 MHz to 902MHz, except for harmonics) is the plot measurement at 900.4 MHz.

\* means the max Quasi peak value for band-edge (frequency range of 928 MHz to 1000 MHz, except for harmonics) is the plot measurement at 935.2 MHz.



middle channel 914.5MHz

Horizontal



## Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
30.0	17.1	17.9	40	22.9
188.1	13.6	8.9	43.5	29.9
447.2	21.5	16.6	46	24.5
854.1*	29.1	23.0	46	16.9
935.3*	29.7	24.2	46	16.3
972.8	29.1	23.9	54	24.9

## Note:

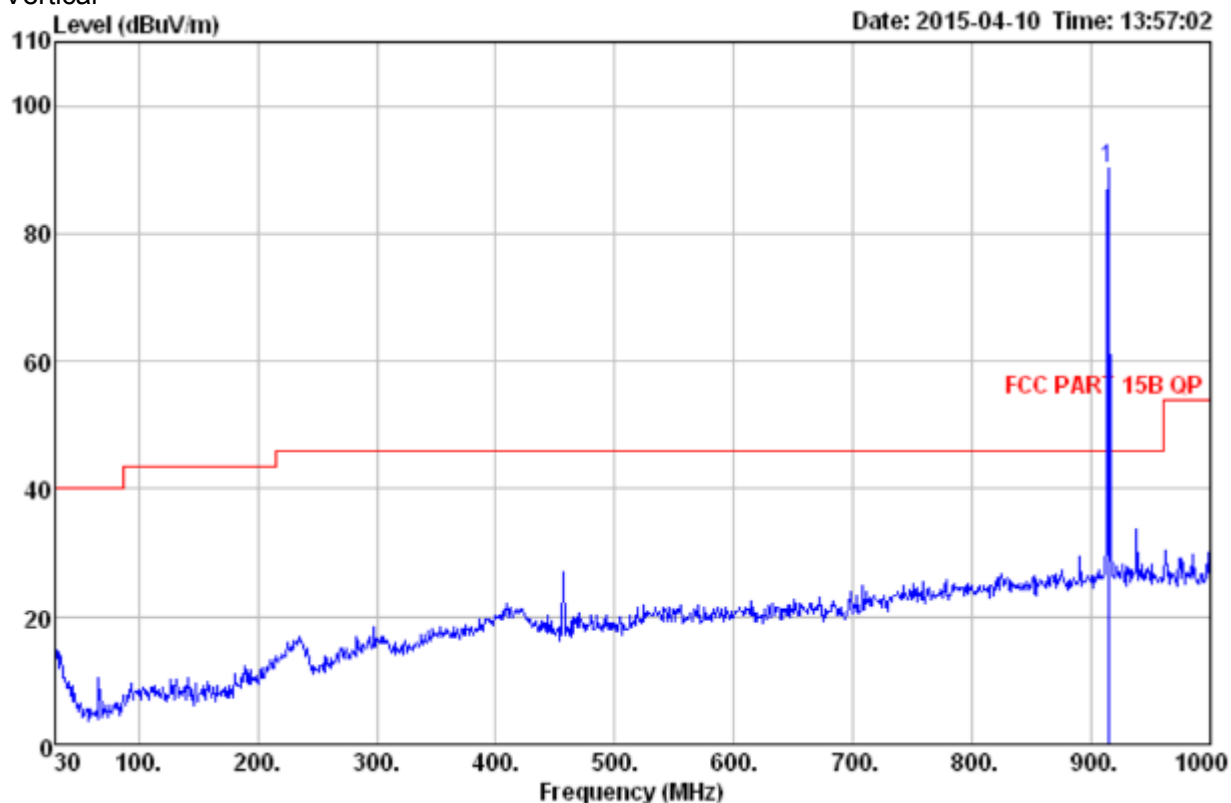
The transducer factor includes antenna factor and cable loss.

\* means the max Quasi peak value for band-edge (frequency range of 802 MHz to 902MHz, except for harmonics) is the plot measurement at 854.1 MHz.

\* means the max Quasi peak value for band-edge (frequency range of 928 MHz to 1000 MHz, except for harmonics) is the plot measurement at 972.8 MHz.

middle channel 914.5MHz

Vertical



## Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
30.0	16.8	17.9	40	23.2
184.3	13.8	8.9	43.5	29.7
448.3	26.5	18.8	46	19.5
880.4*	30.3	23.9	46	15.7
937.2*	34.5	24.2	46	11.5
967.7	31.7	23.7	54	22.3

## Note:

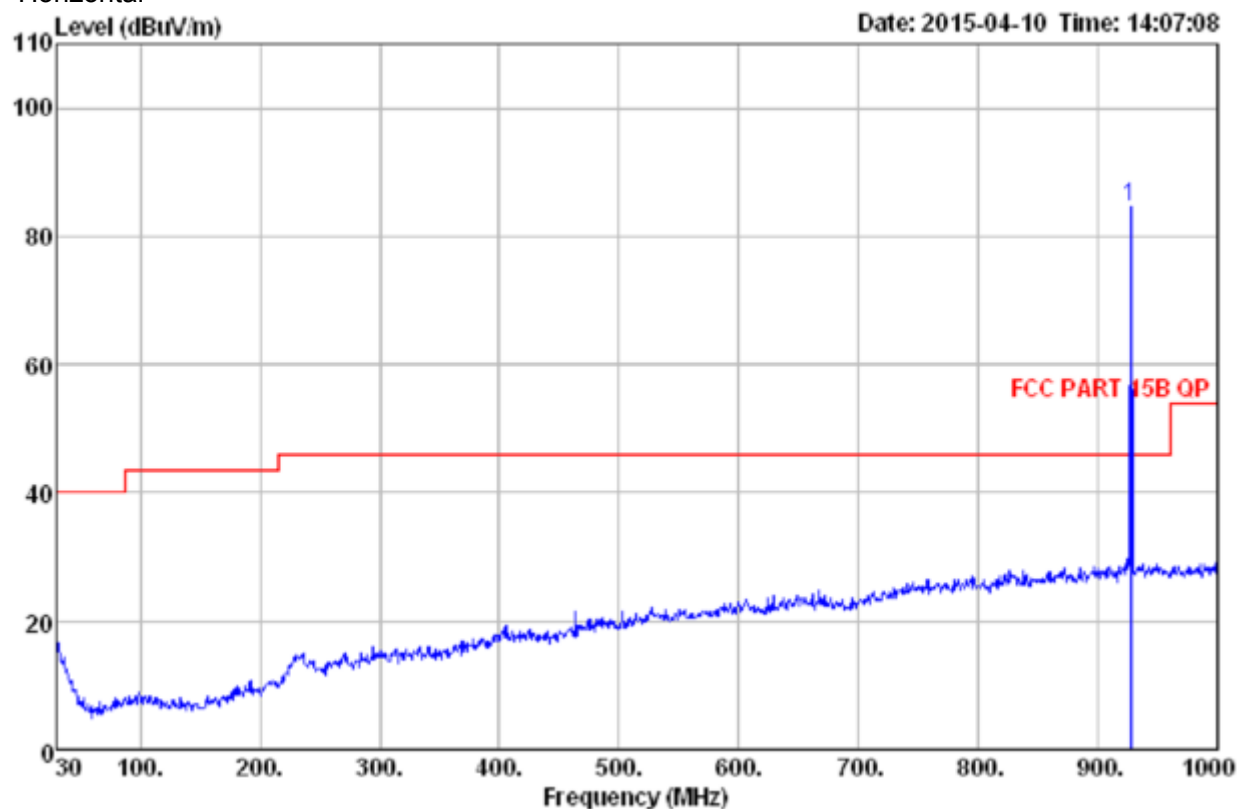
The transducer factor includes antenna factor and cable loss.

\* means the max Quasi peak value for band-edge (frequency range of 802 MHz to 902MHz, except for harmonics) is the plot measurement at 880.4 MHz.

\* means the max Quasi peak value for band-edge (frequency range of 928 MHz to 1000 MHz, except for harmonics) is the plot measurement at 937.2 MHz.

highest channel 927.7MHz

Horizontal



## Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
30.0	17.4	17.9	40	22.6
187.3	13.6	8.9	43.5	29.9
449.2	21.3	16.6	46	24.7
873.1*	29.0	23.0	46	17.0
936.3*	29.3	24.2	46	16.7
975.2	29.1	23.9	54	24.9

## Note:

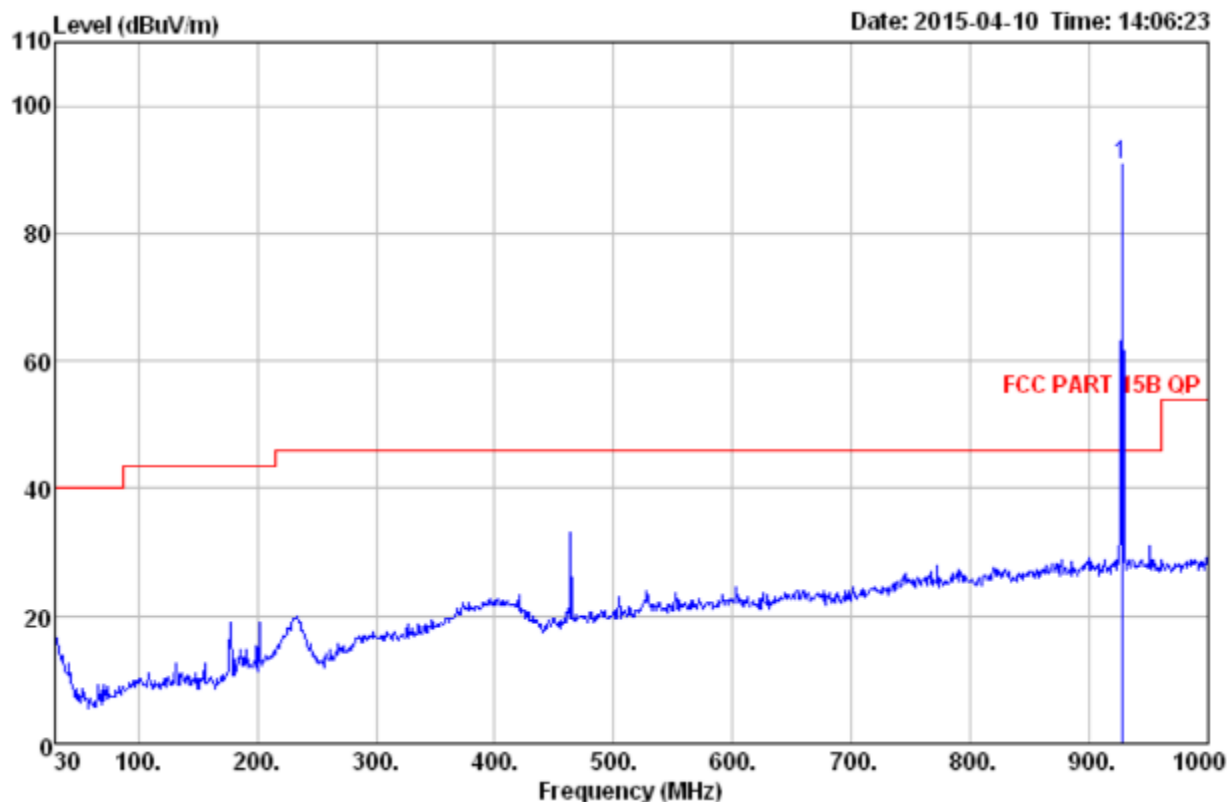
The transducer factor includes antenna factor and cable loss.

\* means the max Quasi peak value for band-edge (frequency range of 802 MHz to 902MHz, except for harmonics) is the plot measurement at 873.1 MHz.

\* means the max Quasi peak value for band-edge (frequency range of 928 MHz to 1000 MHz, except for harmonics) is the plot measurement at 936.3 MHz.

highest channel 927.7MHz

Vertical



## Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
30.0	17.1	17.9	40	22.9
182.1	18.4	8.9	43.5	25.1
453.5	31.2	18.8	46	14.8
900.2*	30.2	23.9	46	15.8
947.2*	30.8	24.2	46	15.2
978.7	29.3	23.7	54	24.7

## Note:

The transducer factor includes antenna factor and cable loss.

\* means the max Quasi peak value for band-edge (frequency range of 802 MHz to 902MHz, except for harmonics) is the plot measurement at 900.2 MHz.

\* means the max Quasi peak value for band-edge (frequency range of 928 MHz to 1000 MHz, except for harmonics) is the plot measurement at 947.2 MHz.

**3) 1 GHz~9.30 GHz Spurious Emissions .Average & PK Measurement**

Horizontal &amp; Vertical:

Average measurement at lowest channel: 902.3 MHz

Average measurement at lowest channel: 562.5 MHz						
Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.218	32.3	33.6	24.8	54	21.7	20.4
2.393	31.1	33.6	26.6		22.9	20.4
2.562	32.3	34.2	26.8		21.7	19.8
5.243	33.3	34.6	33.1		20.7	19.4
7.458	33.2	34.9	35.9		20.8	19.1
9.217	34.1	34.6	37.5		19.9	19.4
Note: The transducer factor includes antenna factor and cable loss.						

Peak measurement at lowest channel: 902.3 MHz

Peak measurement at lowest channel: 662.5 MHz						
Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.218	40.6	40.5	24.8	74	33.4	33.5
2.393	43.1	43.7	26.6		30.9	30.3
2.562	43.4	44.8	26.8		30.6	29.2
5.243	43.2	44.8	33.1		30.8	29.2
7.458	44.3	44.7	35.9		29.7	29.3
9.217	44.4	44.7	37.5		29.6	29.3
Note: The transducer factor includes antenna factor and cable loss.						

Average measurement at middle channel: 914.5 MHz

Average measurement at middle channel: 0.1 Hz BW						
Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.222	32.4	33.5	24.8	54	21.6	20.5
2.391	31.2	33.4	26.6		22.8	20.6
2.614	32.5	34.4	26.8		21.5	19.6
5.158	33.1	34.5	33.1		20.9	19.5
7.462	33.3	34.8	35.9		20.7	19.2
9.168	32.4	33.5	37.5		19.9	19.4
Note: The transducer factor includes antenna factor and cable loss.						

Peak measurement at middle channel: 914.5 MHz

Peak Measurement at Middle Channel: 0.1 Hz BW						
Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.222	40.3	40.4	24.8	74	33.7	33.6
2.391	43.2	43.5	26.6		30.8	30.5
2.614	43.1	44.8	26.8		30.9	29.2
5.158	43.2	44.7	33.1		30.8	29.3
7.462	44.2	44.6	35.9		29.8	29.4
9.168	44.3	44.6	37.5		29.7	29.4
Note: The transducer factor includes antenna factor and cable loss.						

## Average measurement at highest channel: 927.7 MHz

Average measurement at highest channel: 527.7 MHz						
Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.242	32.4	33.2	24.8	54	21.6	20.8
2.391	31.5	33.3	26.6		22.5	20.7
2.612	32.5	34.1	26.8		21.5	19.9
5.324	33.6	34.4	33.1		20.4	19.6
7.462	33.4	34.5	35.9		20.6	19.5
9.266	34.2	34.5	37.5		19.8	19.5
Note: The transducer factor includes antenna factor and cable loss.						

## Peak measurement at highest channel: 927.7 MHz

Peak measurement at highest channel: 527.7 MHz						
Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.242	40.6	40.9	24.8	74	33.4	33.1
2.391	43.2	43.7	26.6		30.8	30.3
2.612	43.1	44.9	26.8		30.9	29.1
5.324	43.3	44.8	33.1		30.7	29.2
7.462	44.5	44.8	35.9		29.5	29.2
9.266	44.4	44.8	37.5		29.6	29.2
Note: The transducer factor includes antenna factor and cable loss.						

## 3.2 Occupied Bandwidth

Test Requirement: FCC Part15.215  
Test Method: ANSI C63.10: 2013  
Detector: Peak for scan (The resolution bandwidth was 30kHz and the video bandwidth was 10kHz, span was 2MHz)  
maximised peak hold  
Test Date: Apr. 10, 2015

### 3.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25°C

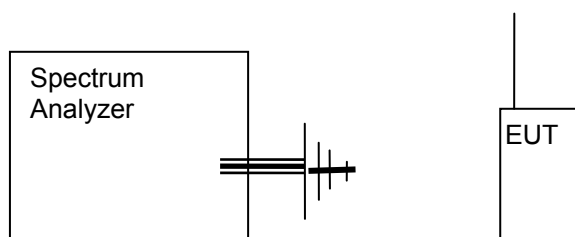
Humidity:45% RH

Atmospheric Pressure: 1020mBar

EUT Operation:

Pre-test the EUT with 1k to 20kHz sine wave signal input(level: 0.3 Vp-p). And the max 99%BW was measured as the EUT with 20 kHz sine wave signal input.

### 3.2.2 Test Setup



### 3.2.3 Test Procedure

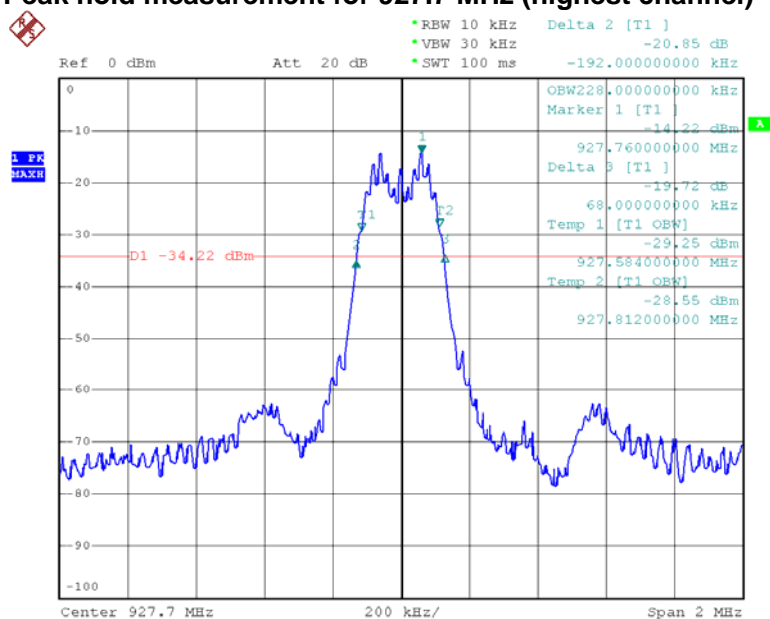
#### ANSI STANDARD C63.10-2013 6.9 Occupied bandwidth tests:

An initial pre-scan was performed in the 3m chamber using the spectrum analyzer in peak detection mode. Average measurements were conducted based on the peak sweep graph. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical polarities.





### Maximum Peak hold measurement for 927.7 MHz (highest channel)



Date: 9.MAY.2015 08:11:14

Frequency/ MHz	$\Delta FL^-$ / kHz	$\Delta FL^+$ / kHz	-20dB Bandwidth/ kHz	Occupied Bandwidth ( 99% of total power)/ kHz
902.3 (lowest)	-192	68	260	228
914.5 (middle)	-188	68	256	228
927.7 (highest)	-192	68	260	228

### 3.3 Frequency Stability

Test Requirement: FCC CFR 47 Part 15.249 b) 2)

Test Method: FCC CFR 47 Part 2.1055

Test Date: Apr. 10, 2015

Requirements: +/-10 ppm

(e) For low power auxiliary stations operating in the bands allocated for TV broadcasting, the following technical requirements apply:

(4) The frequency tolerance of the transmitter shall be 0.001 percent.

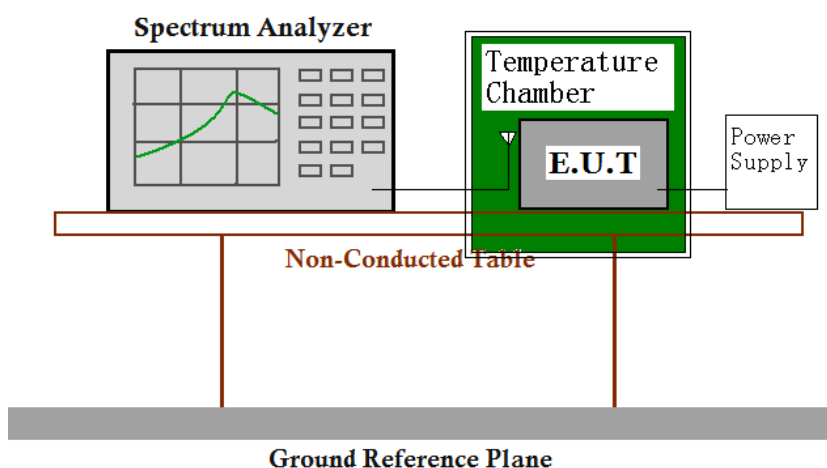
### 3.3.1 Test Procedure:

#### Frequency stability versus Environmental Temperature

The equipment under test was connected to an external DC 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.

#### Frequency Stability versus Input Voltage

At room temperature ( $25 \pm 5^{\circ}\text{C}$ ), 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 hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



#### Copied from FCC CFR 47 Part 15.249 b) 2)

(2) The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.001\%$  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.

**Test Result:**

Assigned Frequency: 902.3/ 914.5/ 927.7 MHz, battery rated voltage: 3.0Vdc					
Environment Temperature (°C)	Power Supplied (Vdc)		Frequency Measure with Time Elapsed Total emission within +/-		
			Low Ch.:	Mid. Ch.:	High Ch.:
			902.3MHz	914.5 MHz	927.7 MHz
			+/-9.023 kHz	+/-9.145 kHz	+/-9.277 kHz
50	3.0		-5.1	-5.4	-4.9
40	3.0		-4.7	-4.6	-4.8
30	3.0		-5.3	-5.1	-5.6
20	3.0		+3.1	+3.3	+3.4
10	3.0		+4.2	+4.4	+4.8
0	3.0		+7.4	+7.1	+7.4
-10	3.0		+7.6	+8.2	+8.3
-20	3.0		+7.7	+8.0	+8.1
Environment Temperature (°C)	Power Supplied		Frequency Measure with Time Elapsed Total emission within Max +/-		
			Low Ch.:	Mid. Ch.:	High Ch.:
			902.3MHz	914.5 MHz	927.7 MHz
			+/-9.023 kHz	+/-9.145 kHz	+/-9.277 kHz
20	85	2.55	-6.2	-6.3	-6.3
20	100	3.0	+3.1	-3.3	+3.4
20	115	3.45	-4.8	-5.1	-5.0

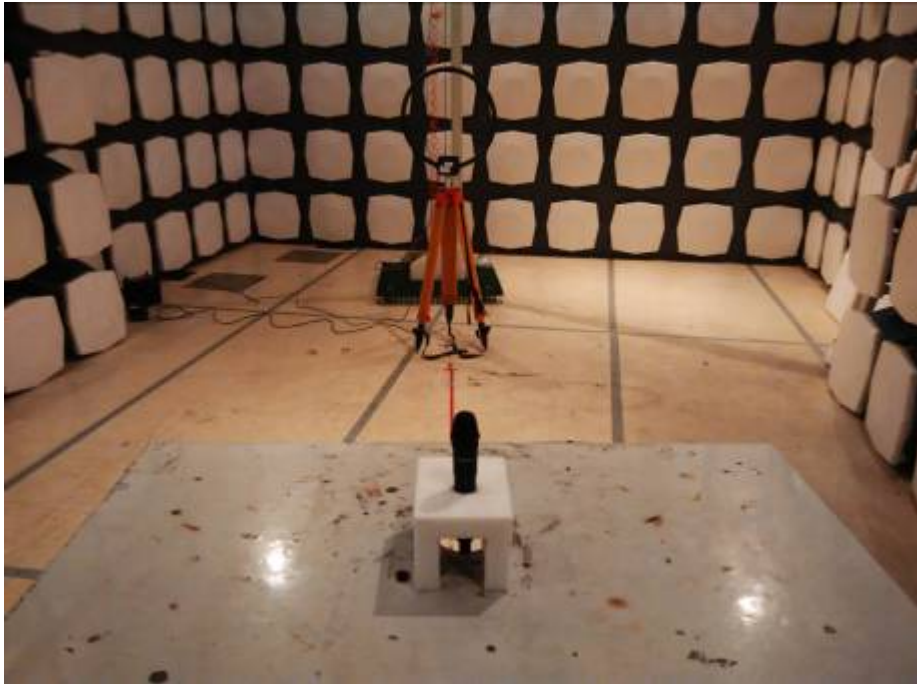
The EUT end point: 2.4Vdc

**The results: The unit does meet the FCC requirements.**

## 4 PHOTOGRAPHS

### 4.1 Radiated Emission Test Setup

9kHz - 30MHz



30MHz – 1GHz



1GHz – 9.3GHz



## 4.2 EUT Constructional Details

U-6800R









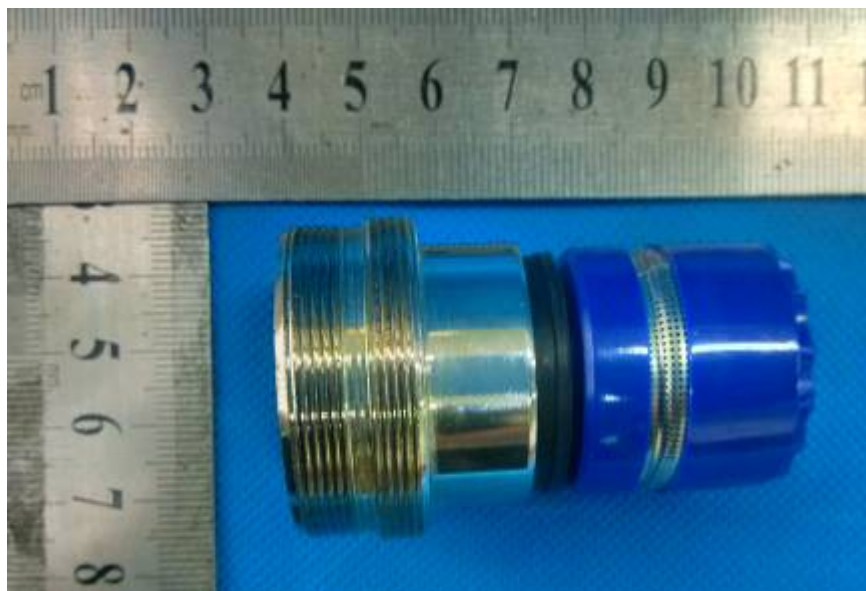
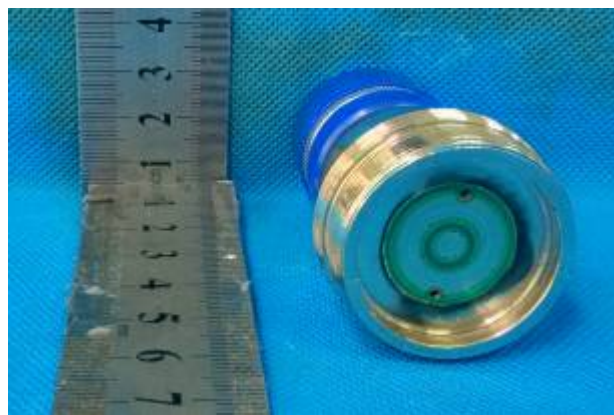
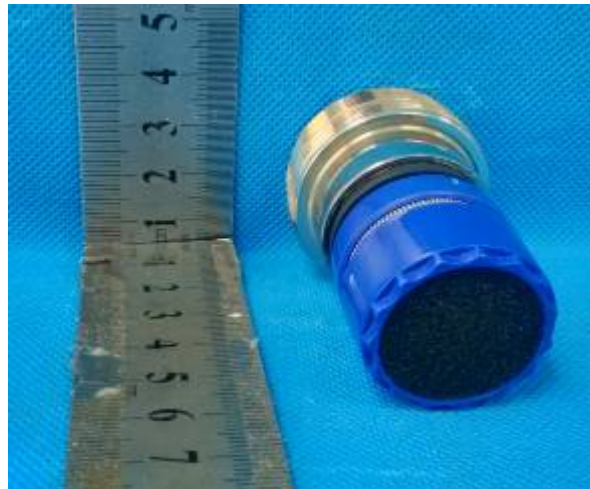


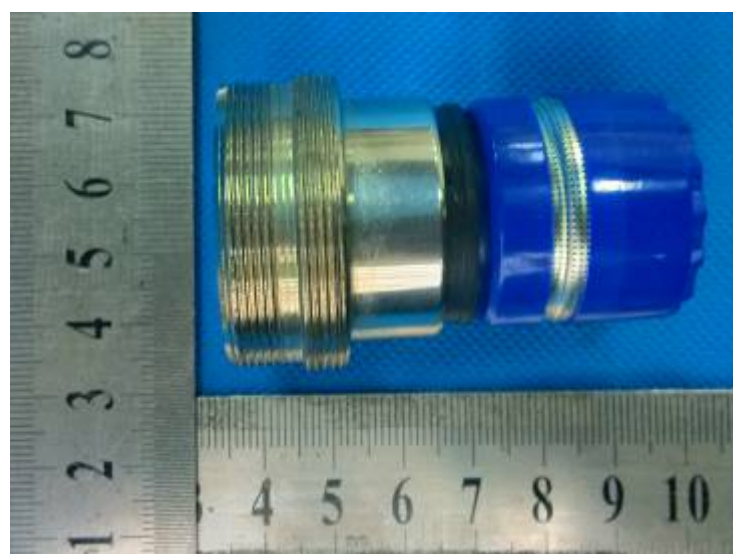






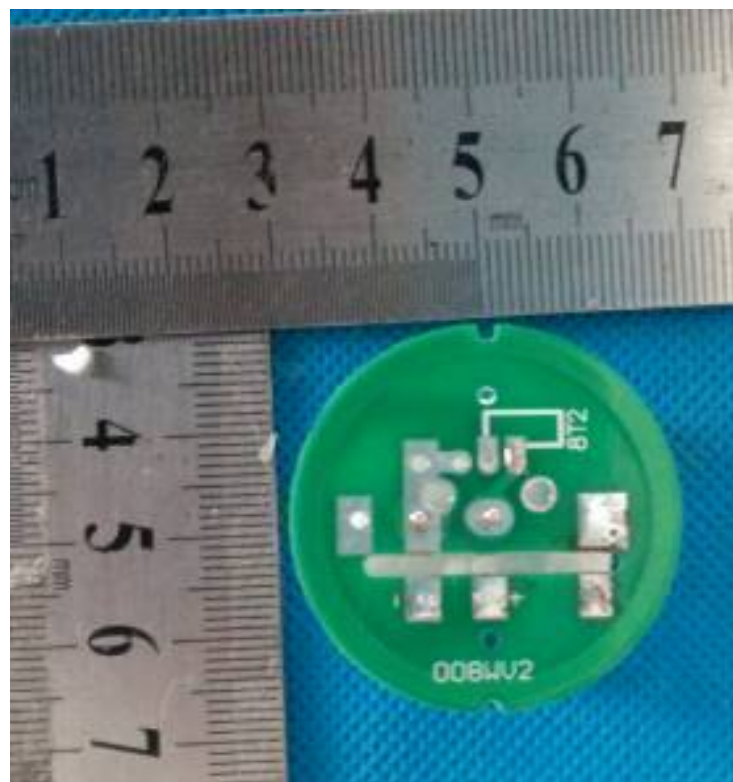
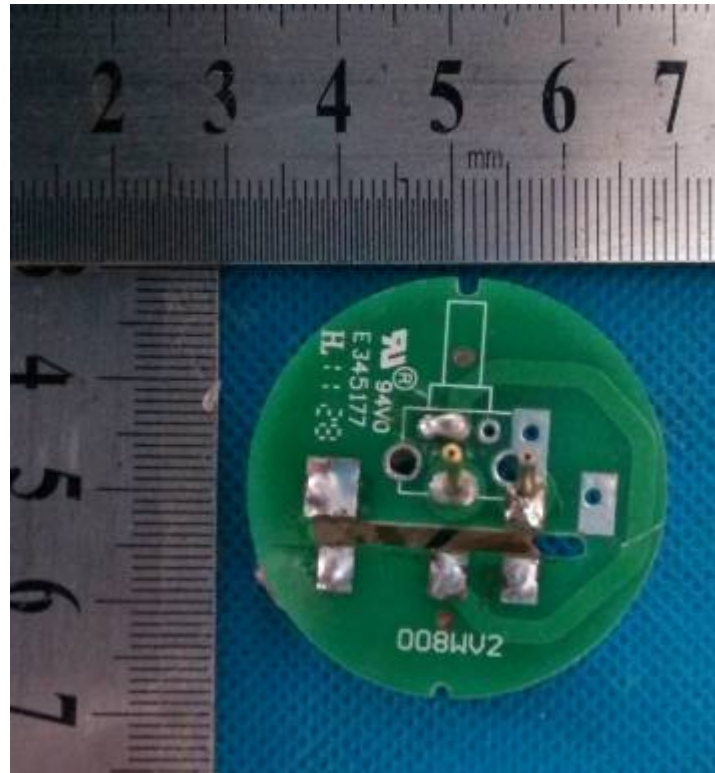


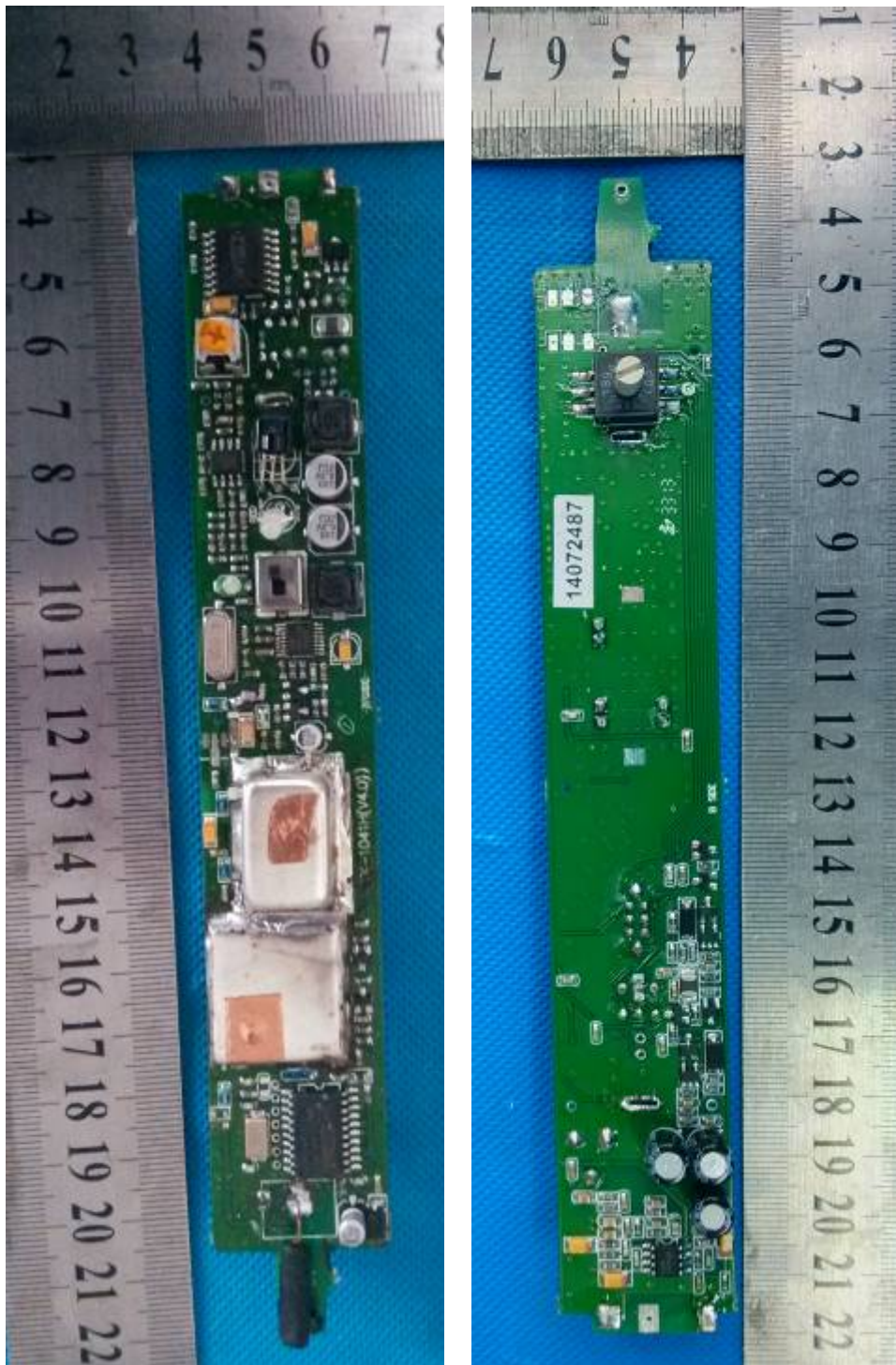




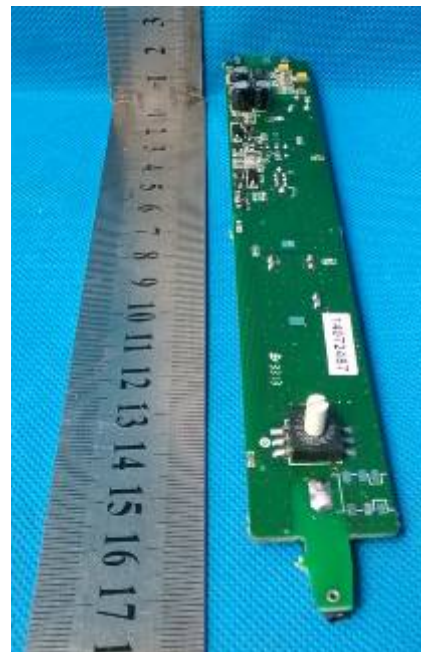
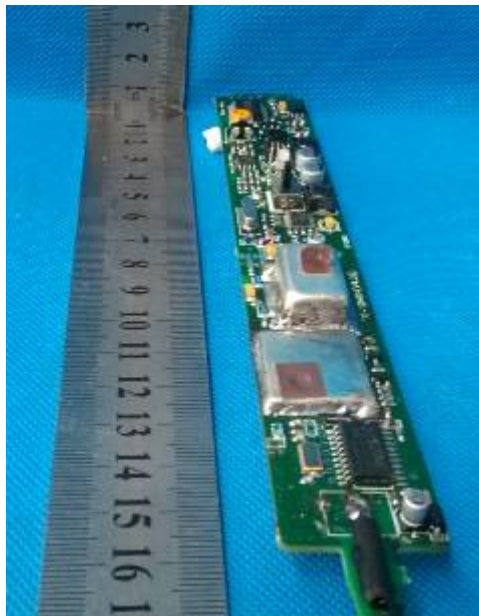


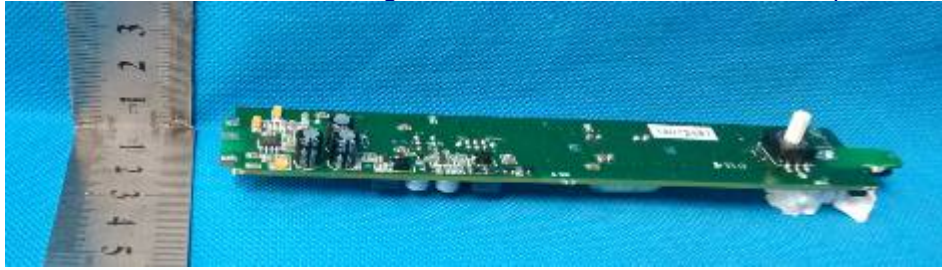








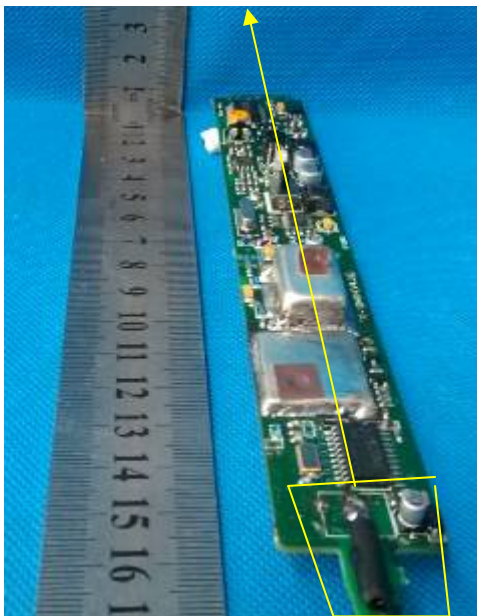




### 4.3 Antenna Photo

SIGNOLUXDTX-A

Antenna



Note:

The EUT was used permanently attached antenna, and it's complied with the requirements of section 15.203: antenna requirement.

## 5 EQUIPMENTS USED DURING TEST

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
1	RF Generator	Rohde & Schwarz	SMB100A-B106	1.031	2014-5-10	2015-5-10
					2015-5-10	2016-5-10
2	Spectrum Analyzer	Rohde & Schwarz	FSP30	EMC0001	2015-3-24	2016-3-24
3	EMI Test Receiver	Rohde & Schwarz	ESCI	EMC1002	2015-3-24	2016-3-24
4	2-Channel Power Meter	Rohde & Schwarz	NRP2	1.033	2014-5-10	2015-5-10
					2015-5-10	2016-5-10
5	Audio Analyzer	Hewlett Packard	8903B	EMC0011	2014-11-5	2015-11-5
6	Power Sensor	Rohde & Schwarz	NRP-Z91	1.034	2014-5-10	2015-5-10
					2015-5-10	2016-5-10
7	Power Sensor	Rohde & Schwarz	NRP-Z91	1.035	2014-5-10	2015-5-10
					2015-5-10	2016-5-10
8	Temperature Chamber	Gongwen	GDS-250	SFT0009	2014-11-5	2015-11-5
9	D.C. Power Supply	KIKUSUI	PAN35-10A	SFT0319	2014-11-5	2015-11-5
10	Temperature Chamber	Gongwen	GDS-250	SFT0009	2014-11-5	2015-11-5
11	D.C. Power Supply	KIKUSUI	PAN35-10A	SFT0319	2014-11-5	2015-11-5
12	Humidity/ Temperature Meter	Anymetre	TH101B	SFT0063	2014-11-5	2015-11-5
13	Barometer	ChangChun	DYM3	SEL0088	2014-6-8	2015-6-8
14	Multimeter	UNI-T	UT70A	EMC0017	2014-11-5	2015-11-5
15	Monopole Antenna	HST	N/A	EMC0089	2014-11-5	2015-11-5
16	Low loss coaxial cable	HST	2 m	EMC1008	2014-11-5	2015-11-5
17	Monopole Antenna	HST	N/A	N/A	2014-11-5	2015-11-5
18	Noise Generator	Ningbo Zhongce	DF1681	EMC0009	2014-11-5	2015-11-5
19	Semi-Anechoic chamber	ETS•Lindgren	FACT3 2.0	ITL-100	2013-6-17	2016-6-17
20	EMI Test receiver	R&S	ESVS10	ITL-111	2015-1-19	2016-1-19
21	EXA Spectrum Analyzer	Agilent Technologies	N9010A	ITL-114	2015-1-19	2016-1-19
22	Biconilog Antenna	ETS•Lindgren	3142D	ITL-105	2015-1-24	2018-1-24
23	Pre Amplifier	HP	8447F	ITL-116	2015-1-19	2016-1-19
24	Wideband Amplifier Super Ultra	Mini-circuits	ZVA-183-S+	ITL-117	2015-1-19	2016-1-19
25	Horn Antenna	A-INFOMW	JXTXLB-10180-N	ITL-110	2015-1-24	2018-1-24
26	Software	Audix	E3	ITL-109	/	/
27	Loop Antenna	BJ 2nd Factory	ZN30900A	EMC6001	2013-7-29	2016-7-29

\*\*\*End of report\*\*\*