TEST REPORT

Report No. :	**HST201512-4764-FCC**
Product description:	**UHF Wireless Transmitter**
Model/Type :	**EM-100, DV-100, EM-110, EM-200, DV-200, ALT-9000, ALB-9000, WB-9000, EX-100, EX-200, EX-220, EX-300, EX-500, EX-520, ENG CM1T/R, GT-1, GT-2, ST-1, VT-1, BP, MINI-BP, STAGE IN EAR, QUANTUM7, EM-500, EM-550, EM-600, EM-650, EM-2100, EM-3100, EM-4100**
Applicant's name:	**HONBO AUDIO CHINA LIMITED**

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TEST REPORT

FCC Part 15.249: 2014

FCC ID: 2AG6QEM-100

Report Reference No. .....:	HST201512-4764-FCC	
Tested by (+ signature) .....:	Lemon Fu	Lemon Fu
Review by (+ signature) .....:	Sandy Yu	Sandy Yu
Approved by (+ signature)		Robin Peng
Date of issue .....:	Jan. 7, 2016	
Total number of pages .....:	52 Pages	
Testing Laboratory……..:	I-Test Laboratory (Accredited by CNAS, Accredited Number: L4957) FCC- Registration No: 935596 Renewal on April. 19, 2012	
Address .....:	1-2 floor, South Block, Building A2 No3 Keyan Lu, Science City, Guangzhou, Guangdong, China	
Applicant's name .....:	HONBO AUDIO CHINA LIMITED	
Address .....:	Beijiao Suburb Industrial Zone, Enping City, Guangdong, China	
Manufacturer's name .....:	HONBO AUDIO CHINA LIMITED	
Address .....:	Beijiao Suburb Industrial Zone, Enping City, Guangdong, China	
Test specification……:	Entrusted testing	
Standard.....:	FCC Part 15.249: 2014	
Non-standard test method……...:	N/A	
Date of Sample Receive ..... …...:	Dec. 15, 2015	
Date of Test.....:	Dec. 18, 2015 to Jan. 6, 2016	
Test item description.....:	UHF Wireless Transmitter	
Trade Mark.....:	N/A	
Model/Type reference .....:	EM-100	
Ratings .....:	DC12-18V/500mA by AC/DC switching adapter	

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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	PASS
Frequency Stability	FCC Part 15.249b)	FCC CFR 47 Part 2.1055	±0.001% for "fixed, point-to-point operation is permitted in the 24.05-24.25 GHz band subject"	N/A

Remark:

Model: **EM-100, DV-100, EM-110, EM-200, DV-200, ALT-9000, ALB-9000, WB-9000, EX-100, EX-200, EX-220, EX-300, EX-500, EX-520, ENG CM1T/R, GT-1, GT-2, ST-1, VT-1, BP, MINI-BP, STAGE IN EAR, QUANTUM7, EM-500, EM-550, EM-600, EM-650, EM-2100, EM-3100, EM-4100**

Only tested **EM-100**, since the other models listed above are electric identical with only difference being the model name and appearance.

♣

Channel	Frequency/ MHz
Lowest	902.25
Middle	915.00
Highest	926.75

2 GENERAL INFORMATION

2.1 Client Information

Applicant:	HONBO AUDIO CHINA LIMITED
Address of Applicant:	Beijiao Suburb Industrial Zone, Enping City, Guangdong, China

2.2 General Description of E.U.T.

EUT Name:	UHF Wireless Transmitter
Item No.:	EM-100
Serial No.:	Not supplied by client

2.3 Details of E.U.T.

Power Supply:	DC12-18V/500mA by AC/DC switching adapter Manufacture: Shenzhen Pengshengye Electronic Co., Ltd. Model: FYB12006US, Input: 100-240V~50/60Hz, 0.6Amax; Output: 12Vdc500mA
Main Function:	Wireless transmitter system with an associated receiver for transmitting voice.
Oscillating Frequency:	X1: 12 MHz
Port:	DC input; Audio input: AF input1, AF input 2; headphone output
Cable:	Microphone cable: 780mm.

Frequency Range: 902.25 MHz to 926.75 MHz for all the models listed in the cover. 99 channels for each microphone. Frequency spacing: 250k Hz.

Modulation: FM; Emission designator: 32KF3E

Occupied bandwidth (99 % BW): 24 kHz

Antenna Number & Type: One & external dipole TNC antenna; Gained: 1.5 dBi; Impedance: 50-Ohm; Antenna length: 215mm; Antenna min distance to the shell: 3 mm

Product SW/HW version: EX-100TX-PIC699/ EX-100-M1
Radio SW/HW version: N/A
Test SW Version: N/A
RF power setting in TEST SW: 1 mW

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

3.1.1 **E.U.T. Operation**

Operating Environment:

Temperature: 15°C Humidity:45% RH Atmospheric Pressure: 103 kPa

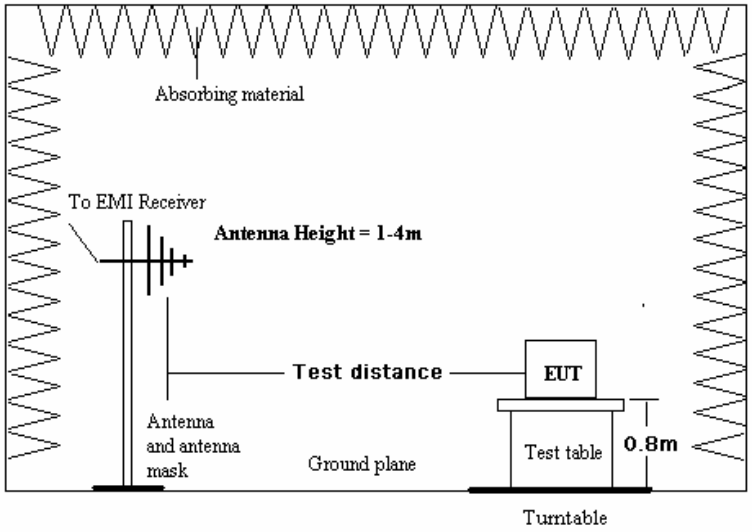
EUT Operation:

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

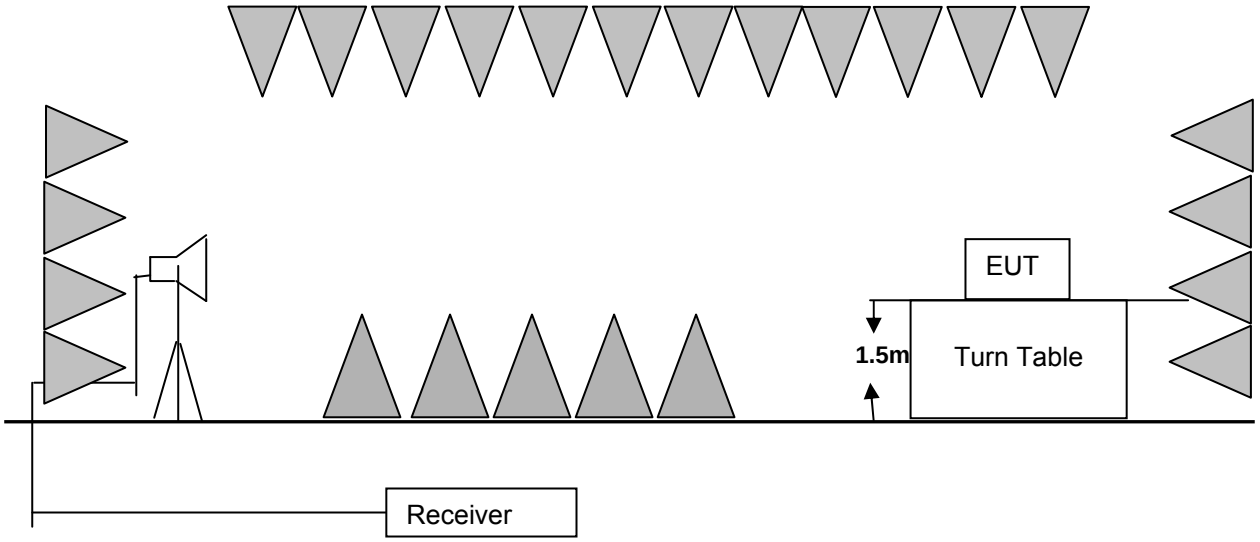
Test the EUT work normally in on mode during the whole test.

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
902.25 (L)	89.2	90.4	27.6	94	4.8	3.6
915.0 (M)	89.9	90.2	27.8	94	4.1	3.8
926.75 (H)	89.1	89.7	27.9	94	4.9	4.3

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.

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.

Peak measurement of harmonics and spurious emission at lowest channel 902.25 MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	1804.50	70.5	58.6	32.8		3.5	15.4
3rd	2706.75	70.8	55.9	34.8		3.2	18.1
4th	3609.00	61.5	60.1	39.3		12.5	13.9
5th	4511.25	59.4	56.4	43.3		14.6	17.6
6th	5413.50	54.1	54.1	44.2	74dB	19.9	19.9
7th	6315.75	54.5	54.4	45.1		19.5	19.6
8th	7218.00	54.3	54.2	46.0		19.7	19.8
9th	8120.25	54.6	55.2	46.6		19.4	18.8
10th	9022.50	54.7	55.4	47.3		19.3	18.6

Average measurement of harmonics and spurious emission at lowest channel 902.25 MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	1804.50	32.2	33.4	32.8		21.8	20.6
3rd	2706.75	31.8	33.2	34.8		22.2	20.8
4th	3609.00	32.4	34.4	39.3		21.6	19.6
5th	4511.25	33.2	34.3	43.3		20.8	19.7
6th	5413.50	33.1	34.7	44.2	54dB	20.9	19.3
7th	6315.75	34.0	34.4	45.1		20.0	19.6
8th	7218.00	34.2	34.8	46.0		19.8	19.2
9th	8120.25	34.5	35.2	46.6		19.5	18.8
10th	9022.50	34.7	35.8	47.3		19.3	18.2

Peak measurement of harmonics and spurious emission at middle channel 915.0 MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	1830.00	69.2	57.1	32.8	74dB	4.8	16.9
3rd	2745.00	67.8	53.1	34.8		6.2	20.9
4th	3660.00	55.0	56.7	39.3		19.0	17.3
5th	4575.00	58.5	57.5	43.3		15.5	16.5
6th	5490.00	54.0	54.4	44.2		20.0	19.6
7th	6405.00	54.7	54.5	45.1		19.3	19.5
8th	7320.00	54.2	54.9	46.0		19.8	19.1
9th	8235.00	54.5	55.6	46.6		19.5	18.4
10th	9150.00	54.1	55.8	47.3		19.9	18.2

Average measurement of harmonics and spurious emission at middle channel 915.0 MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	1830.00	32.5	33.4	32.8	54dB	21.5	20.6
3rd	2745.00	31.6	33.2	34.8		22.4	20.8
4th	3660.00	32.1	34.5	39.3		21.9	19.5
5th	4575.00	33.4	34.6	43.3		20.6	19.4
6th	5490.00	33.3	34.8	44.2		20.7	19.2
7th	6405.00	34.3	34.5	45.1		19.7	19.5
8th	7320.00	34.3	34.5	46.0		19.7	19.5
9th	8235.00	34.4	35.7	46.6		19.6	18.3
10th	9150.00	34.3	35.5	47.3		19.7	18.5

Peak measurement of harmonics and spurious emission at highest channel 926.75MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	1853.50	69.1	54.4	32.8	74dB	4.9	19.6
3rd	2780.25	67.7	49.6	34.8		6.3	24.4
4th	3707.00	54.8	55.7	39.3		19.2	18.3
5th	4633.75	59.3	58.1	43.3		14.7	15.9
6th	5560.50	54.1	54.3	44.2		19.9	19.7
7th	6487.25	54.3	54.5	45.1		19.7	19.5
8th	7414.00	54.3	54.6	46.0		19.7	19.4
9th	8340.75	54.6	55.1	46.6		19.4	18.9
10th	9267.50	54.4	55.6	47.3		19.6	18.4

Average measurement of harmonics and spurious emission at highest channel 926.75MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	1853.50	32.4	33.7	32.8	54dB	21.6	20.3
3rd	2780.25	31.7	33.2	34.8		22.3	20.8
4th	3707.00	32.8	34.5	39.3		21.2	19.5
5th	4633.75	33.4	34.5	43.3		20.6	19.5
6th	5560.50	33.2	34.8	44.2		20.8	19.2
7th	6487.25	34.2	34.1	45.1		19.8	19.9
8th	7414.00	34.3	34.7	46.0		19.7	19.3
9th	8340.75	34.5	35.5	46.6		19.5	18.5
10th	9267.50	34.5	35.7	47.3		19.5	18.3

Note:

500μV/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.

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.

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	Field Strength	Measurement Distance
MHz	microvolts/meter(uV/m)	(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

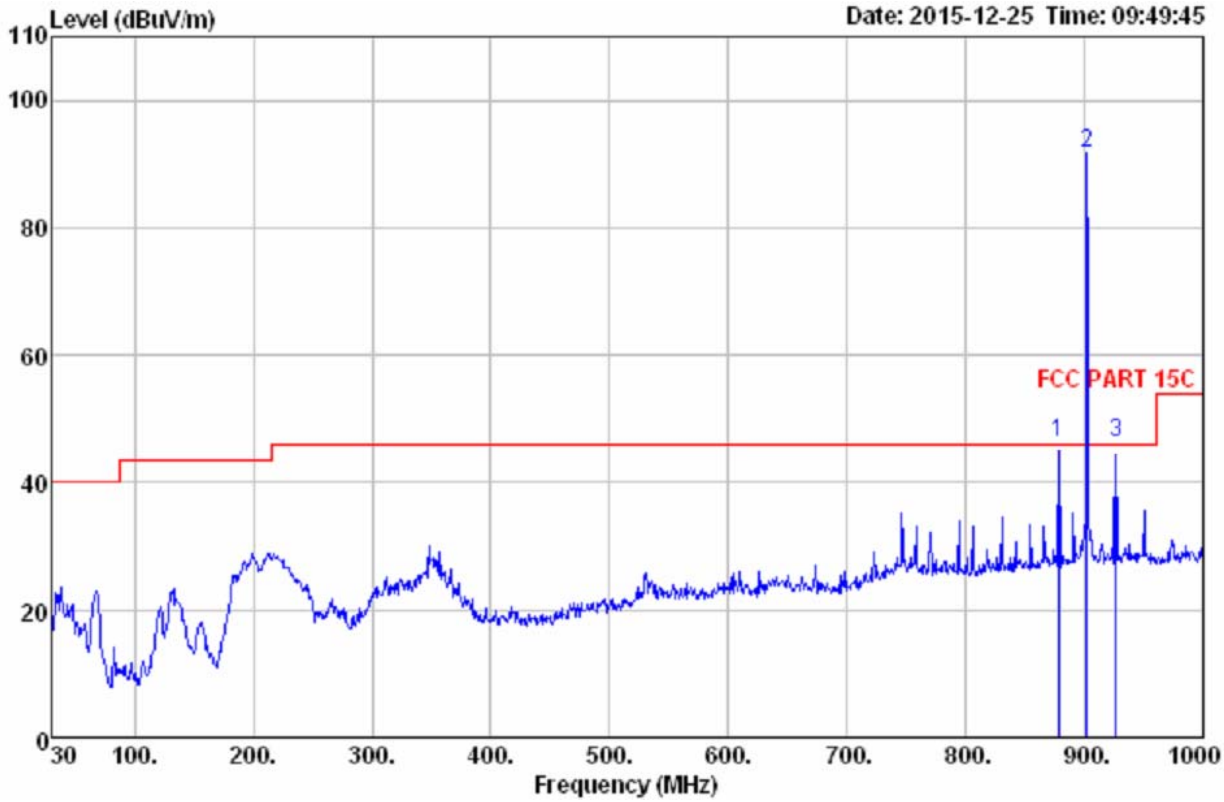
The Low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report.

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 902.25MHz

Horizontal

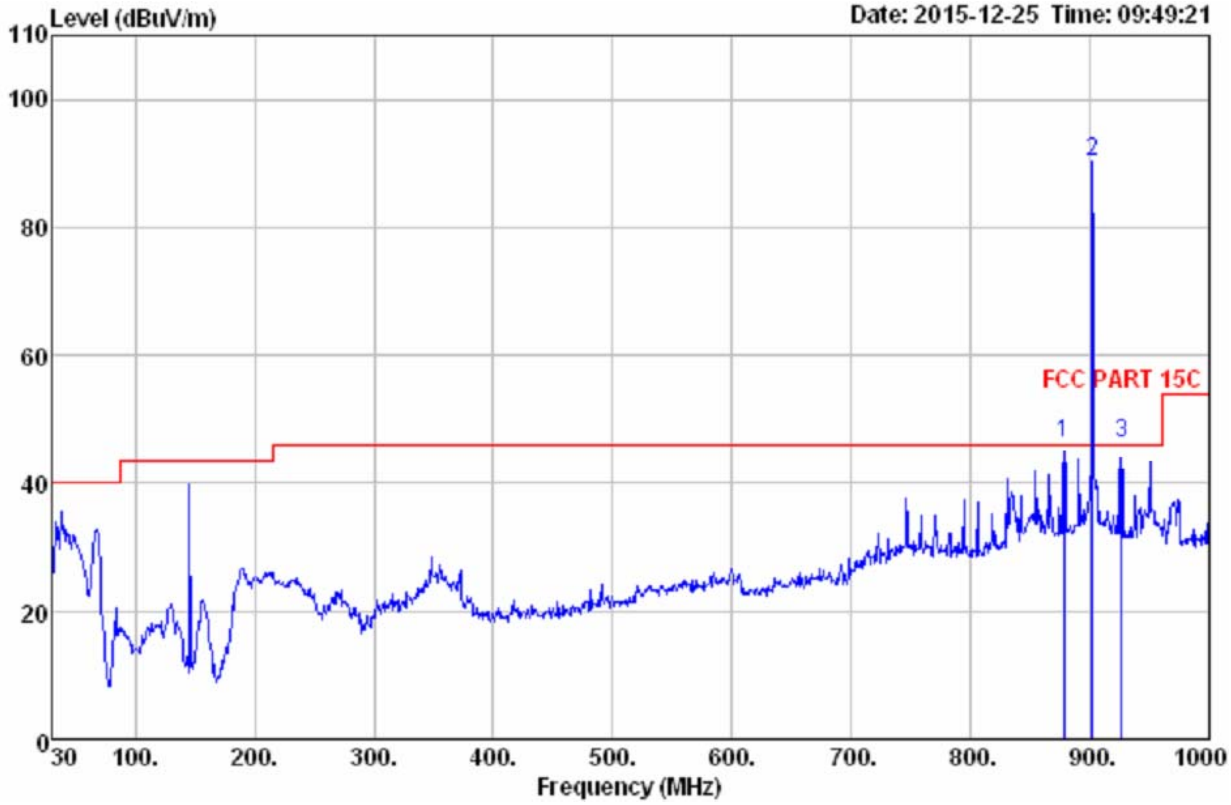


Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
36.0	23.3	17.9	40	16.7
128.2	23.6	9.2	43.5	19.9
199.5	29.3	11.5	43.5	14.2
347.4	29.4	15.6	46	16.6
891.4*	43.2	27.0	46	2.8
938.9*	42.7	28.0	46	3.3

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 891.4 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 938.9 MHz.

lowest channel 902.25MHz
Vertical



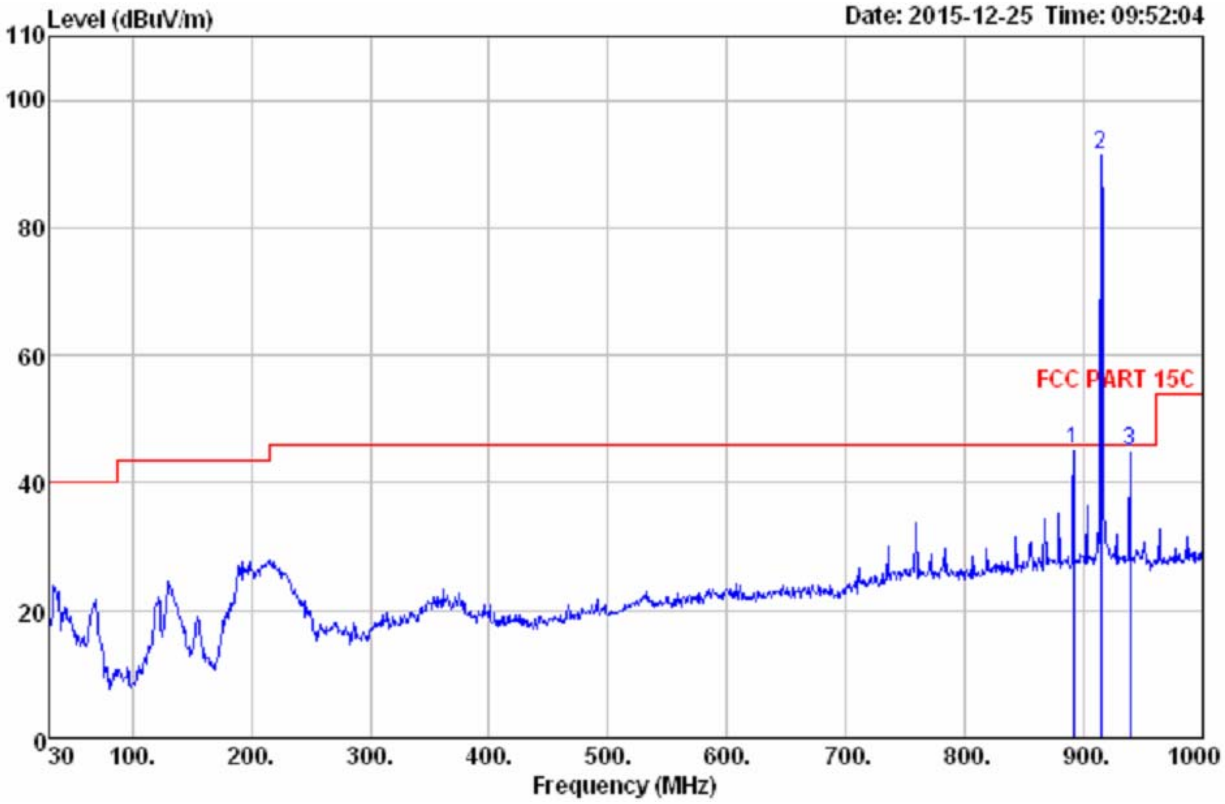
Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
36.0	36.5	17.9	40	3.5
66.2	32.7	15.3	40	7.3
144.1	38.7	10.3	43.5	4.8
344.2	28.4	18.2	46	17.6
891.4*	42.9	27.0	46	3.1
938.9*	42.3	28.0	46	3.7

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 891.4 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 938.9 MHz.

middle channel 915.0MHz

Horizontal



Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
34.0	24.1	17.9	40	15.9
126.2	25.6	11.7	43.5	17.9
188.1	28.6	8.9	43.5	14.9
758.2	33.5	21.6	46	12.5
891.4*	43.5	27.0	46	2.5
938.9*	43.2	28.0	46	2.8

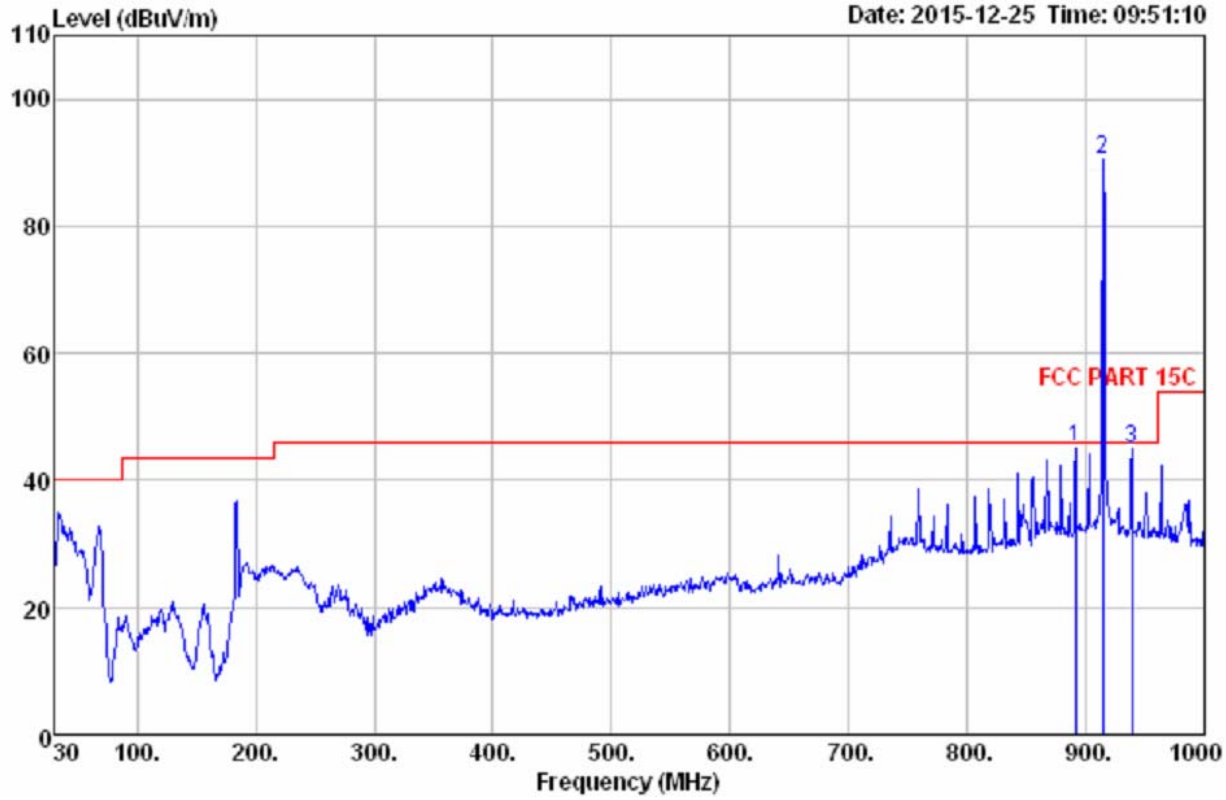
Note:

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 891.4 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 938.9 MHz.

middle channel 915.0MHz
Vertical



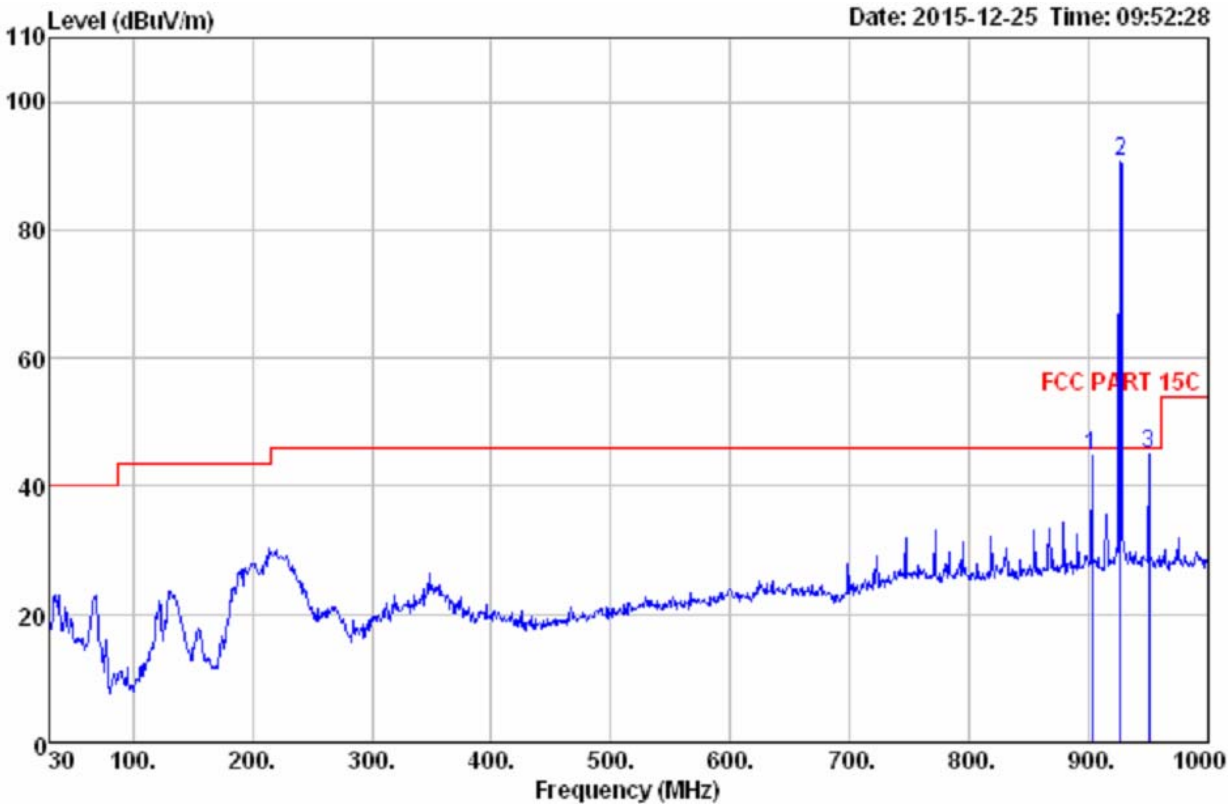
Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
33.0	34.8	17.9	40	5.2
66.2	33.7	15.3	40	6.3
184.3	36.8	8.9	43.5	6.7
758.2	38.5	21.6	46	7.5
891.4*	43.2	27.0	46	2.8
938.9*	43.0	28.0	46	3.0

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 891.4 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 938.9 MHz.

highest channel 926.75MHz

Horizontal



Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
31.7	23.4	17.9	40	16.6
66.8	23.7	15.3	40	16.3
200.01	27.9	9.2	43.5	15.6
779.2	34.3	21.8	46	11.7
891.4*	42.5	27.0	46	3.5
938.9*	42.4	28.0	46	3.6

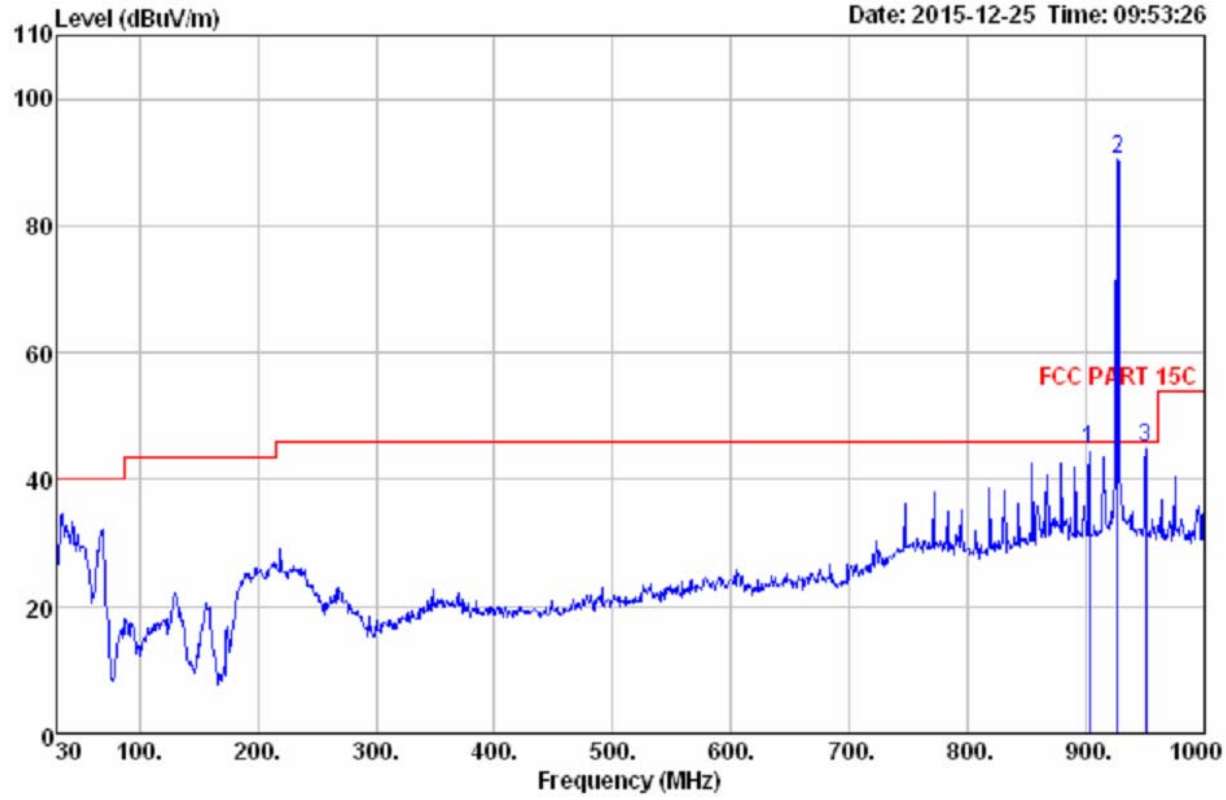
Note:

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 891.4 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 938.9 MHz.

highest channel 926.75MHz
Vertical



Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
33.0	34.1	17.9	40	5.9
66.9	31.8	15.3	40	8.2
132.1	22.4	9.2	43.5	21.1
779.5	38.3	21.8	46	7.7
891.4*	42.4	27.0	46	3.6
938.9*	42.6	28.0	46	3.4

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 891.4 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 938.9 MHz.

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

Horizontal & Vertical:

Average measurement at lowest channel: 902.25 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: 902.25 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: 915.0 MHz

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: 915.0 MHz

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: 926.75 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: 926.75 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.						

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.d).

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.

3.2 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

3.2.1 E.U.T. Operation

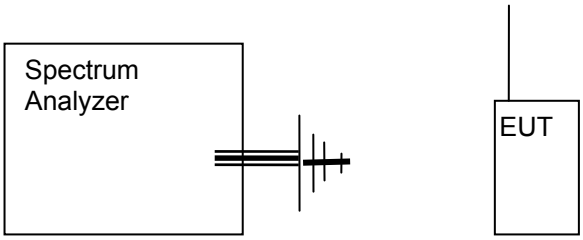
Operating Environment:

Temperature: 15°C Humidity:45% RH Atmospheric Pressure: 103.0 kPa

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

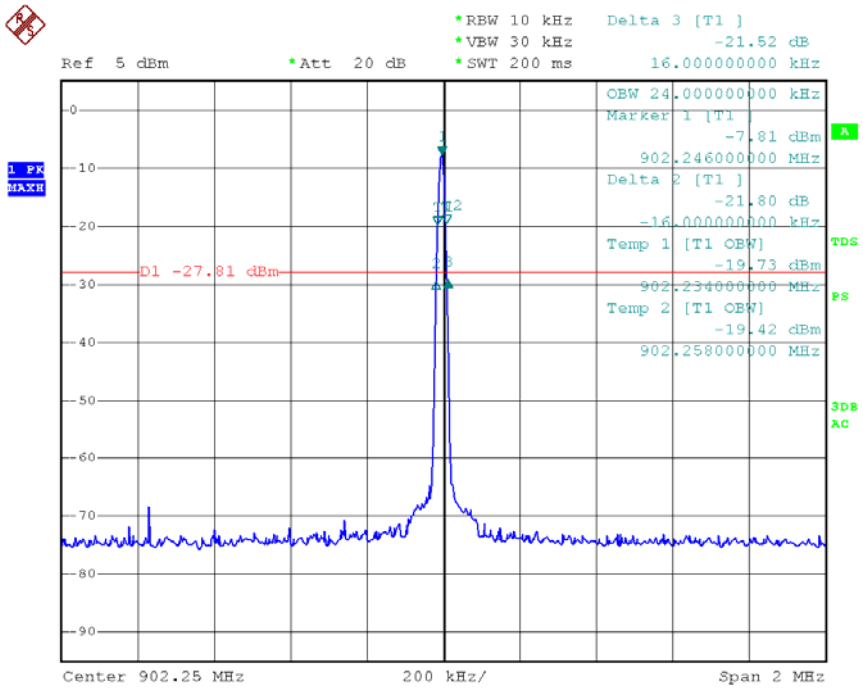
ANSI STANDARD C63.10-2013 6.9 Occupied bandwidth tests:

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.

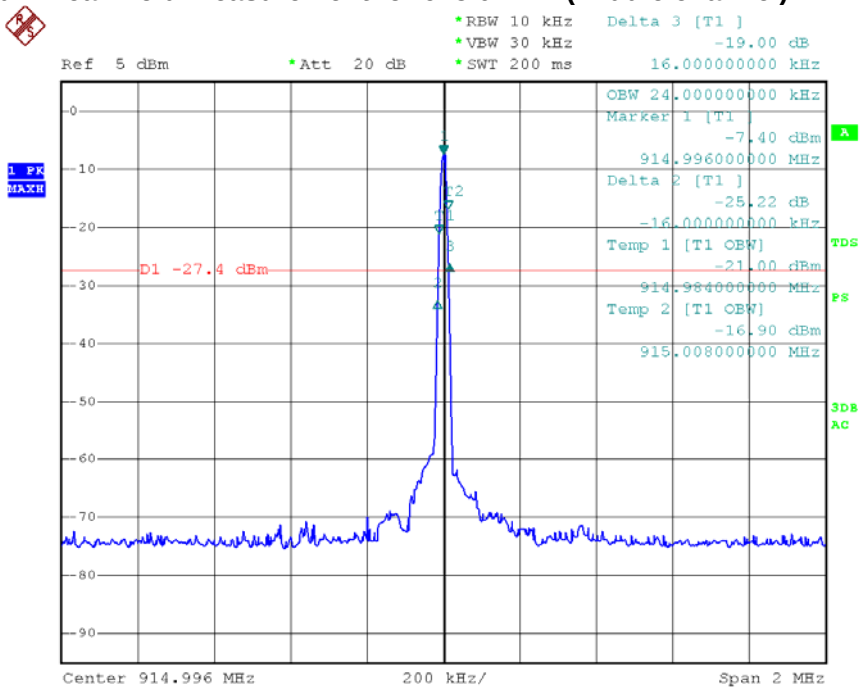
3.2.4 Measurement Data

Test for the EUT with switch ON. Input with 20 kHz AF, 50% modulation + 16dB.

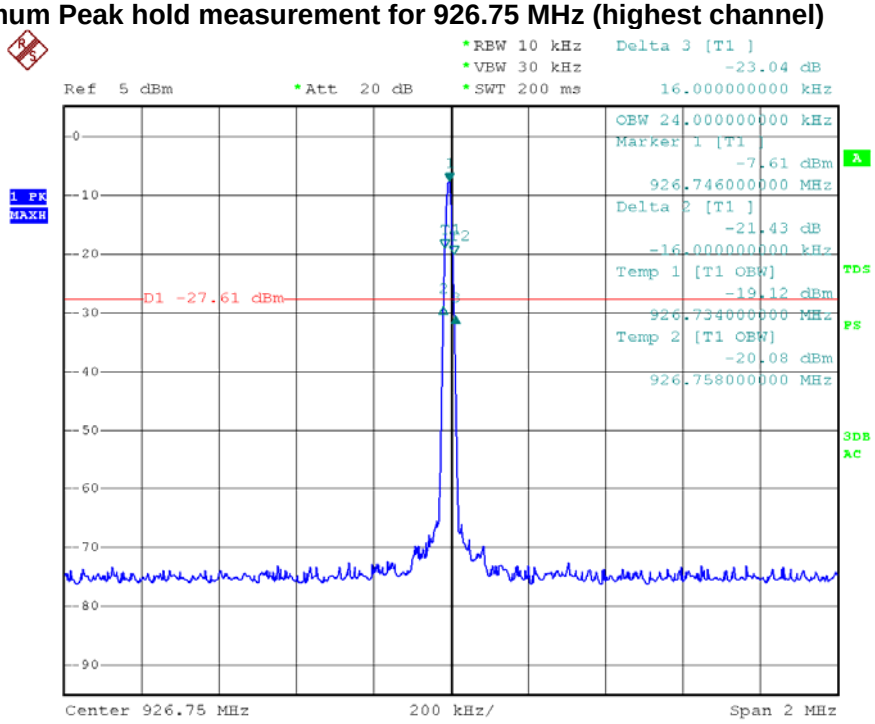
Maximum Peak hold measurement for 902.25 MHz (lowest channel)



Maximum Peak hold measurement for 915.0 MHz (middle channel)



Maximum Peak hold measurement for 926.75 MHz (highest channel)



Date: 6.JAN.2016 09:49:13

Frequency/ MHz	ΔFL- / kHz	ΔFL+ / kHz	-20dB Bandwidth/ kHz	Occupied Bandwidth (99% of total power)/ kHz
902.25 (lowest)	-16	16	32	24
915.0 (middle)	-16	16	32	24
926.75 (highest)	-16	16	32	24

3.3 Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

Test Requirement: FCC Part 15 C section 15.207

Test Method: ANSI C63.10: 2013

Frequency Range: 150 kHz to 30 MHz

Detector: Peak for pre-scan (9 kHz Resolution Bandwidth)

Test Limit

Limits for conducted disturbance at the mains ports of class B

Frequency Range	Class B Limit dB(μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

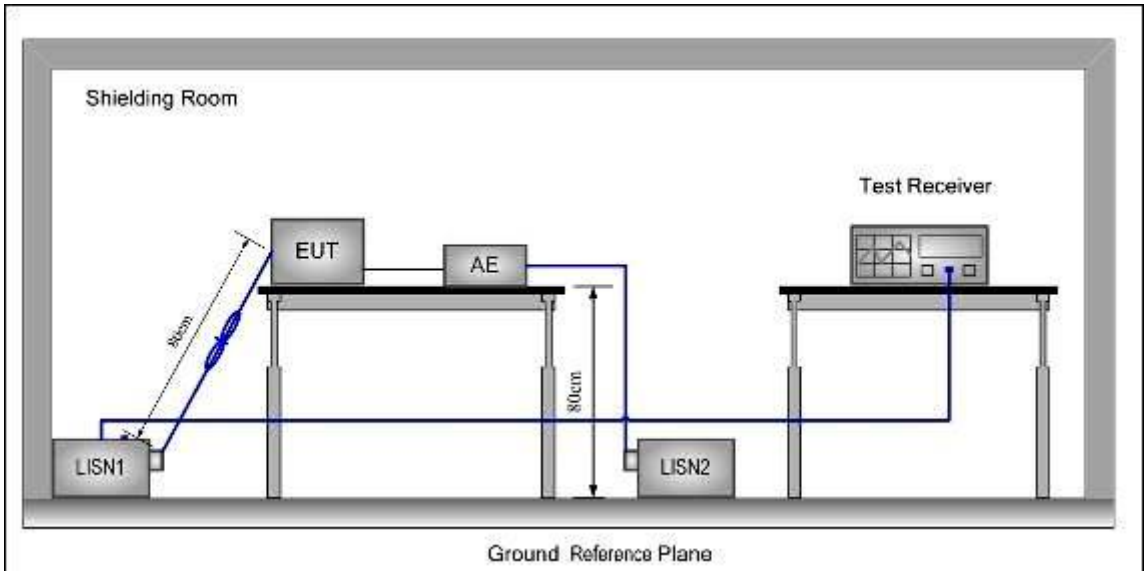
3.3.1 EUT Operation

Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test the EUT work normally in transmitting mode in mains.

3.3.2 Test Configuration



3.3.3 Test Procedure

1. The mains terminal disturbance voltage test was conducted in a shielded room.

2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

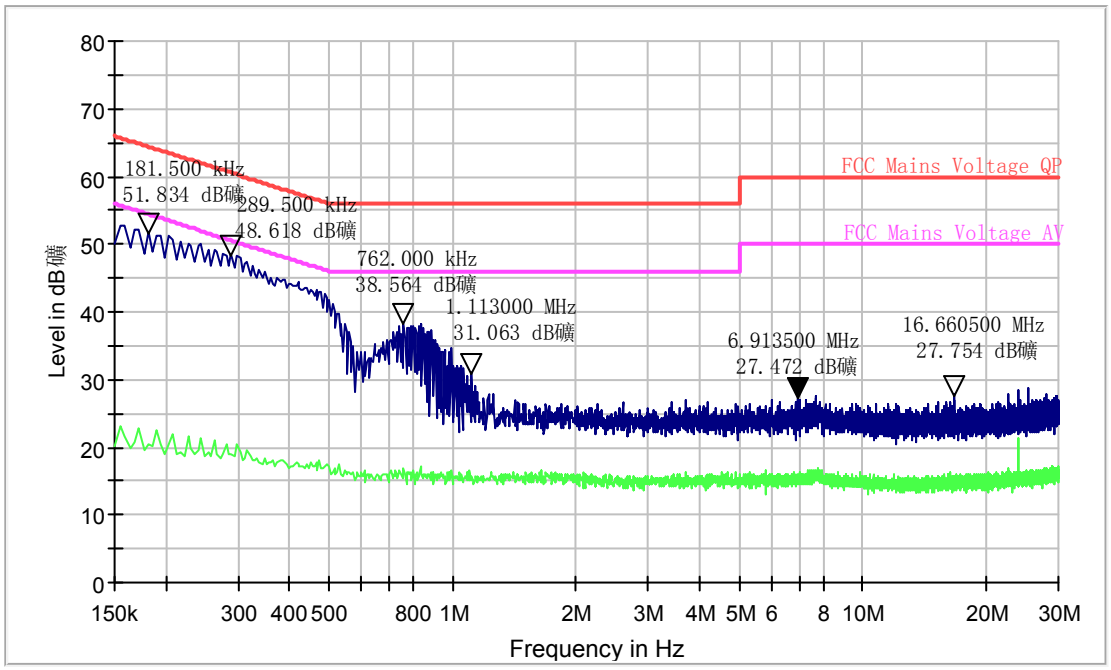
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.

3.3.4 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT the communicating was worst case mode.

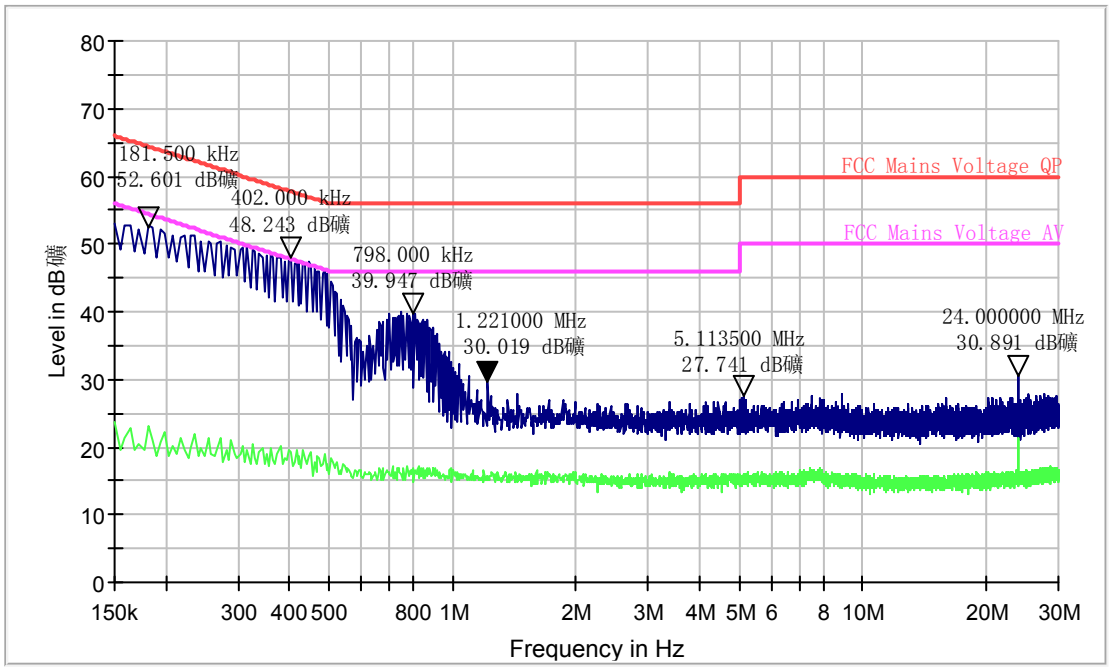
The following Quasi-Peak and Average measurements were performed on the EUT:

Voltage ENV216 PRE



Fruency (MHz)	QP (dBuV)	AV (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	QP Margin (dB)	AV Margin (dB)	QP Limit (dBuV)	AV Limit (dBuV)
0.182	51.8	23.2	1000	9	L1	19.9	12.6	31.2	64.4	54.4
0.290	48.6	21.0				19.9	11.9	29.5	60.5	50.5
0.762	38.6	16.2				20.0	17.4	29.8	56	46
1.113	31.0	16.3				20.0	25.0	29.7	56	46
6.914	27.5	15.8				20.1	32.5	34.2	60	50
16.66	27.8	15.9				20.3	32.2	34.1	60	50
Note: **Filter: Off.**										

Voltage ENV216 PRE

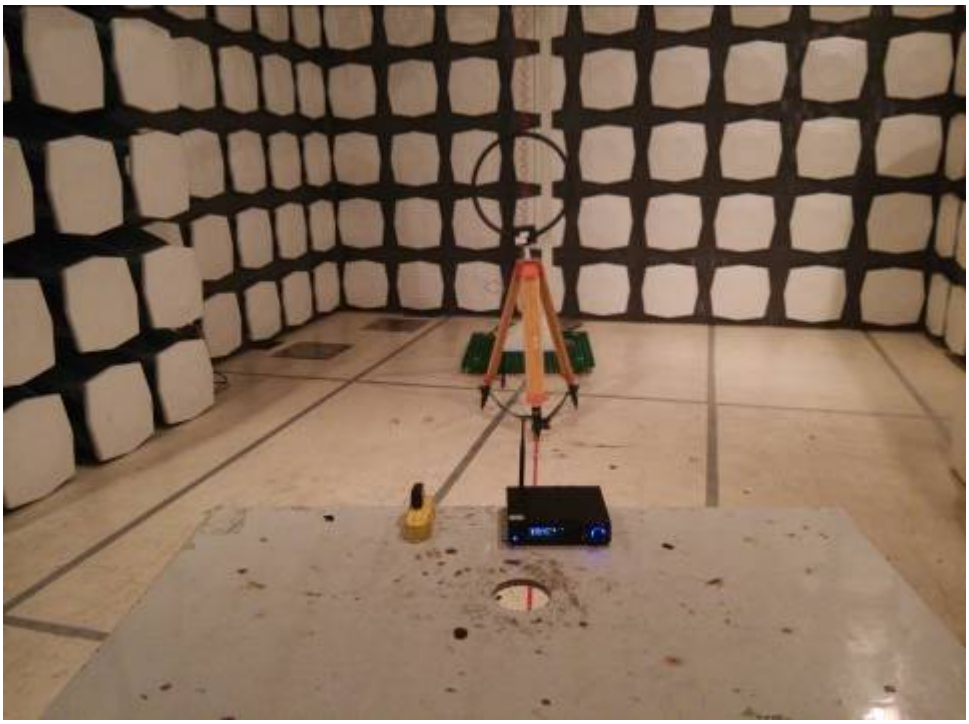


Fruency (MHz)	QP (dBuV)	AV (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	QP Margin (dB)	AV Margin (dB)	QP Limit (dBuV)	AV Limit (dBuV)
0.182	52.6	23.1	1000	9	N	19.9	11.8	31.3	64.4	54.4
0.402	48.2	20.5				19.9	9.6	27.3	57.8	47.8
0.798	39.9	16.5				20.0	16.1	29.5	56	46
1.221	30.0	16.3				20.0	26.0	29.7	56	46
5.114	27.7	16.3				20.1	32.3	33.7	60	50
24.00	30.9	21.9				20.3	29.1	28.1	60	50
Note: Filter: Off.										

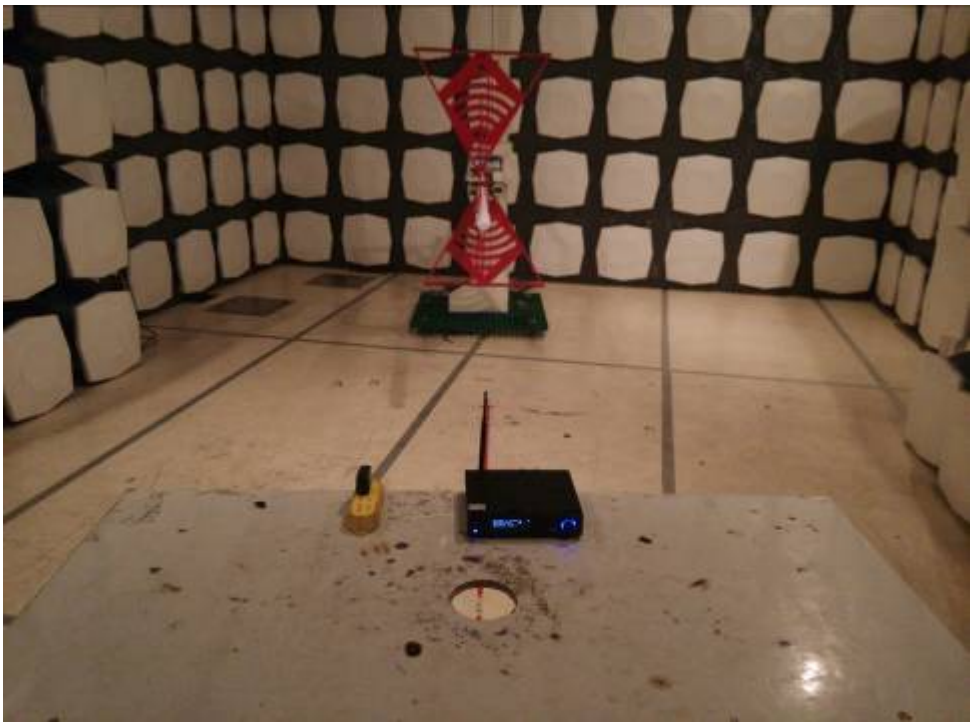
4 PHOTOGRAPHS

4.1 **Radiated Emission Test Setup**

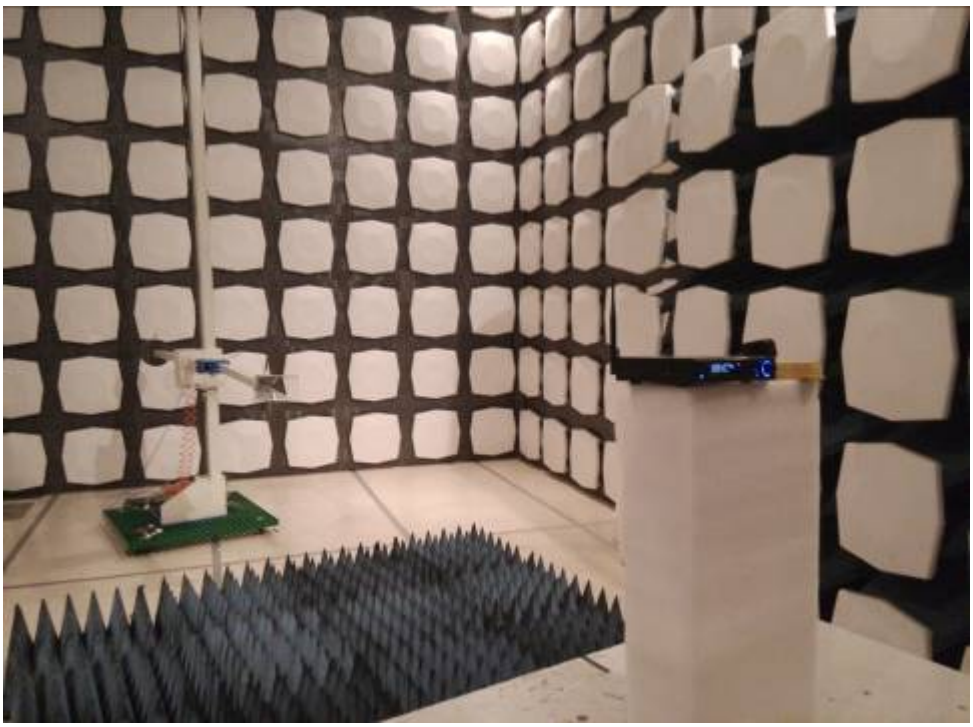
9kHz - 30MHz



30MHz – 1GHz



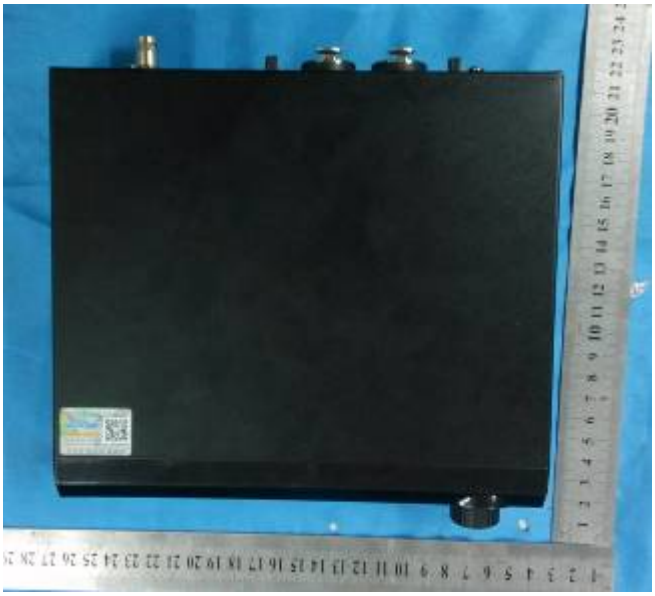
1GHz – 9.3GHz

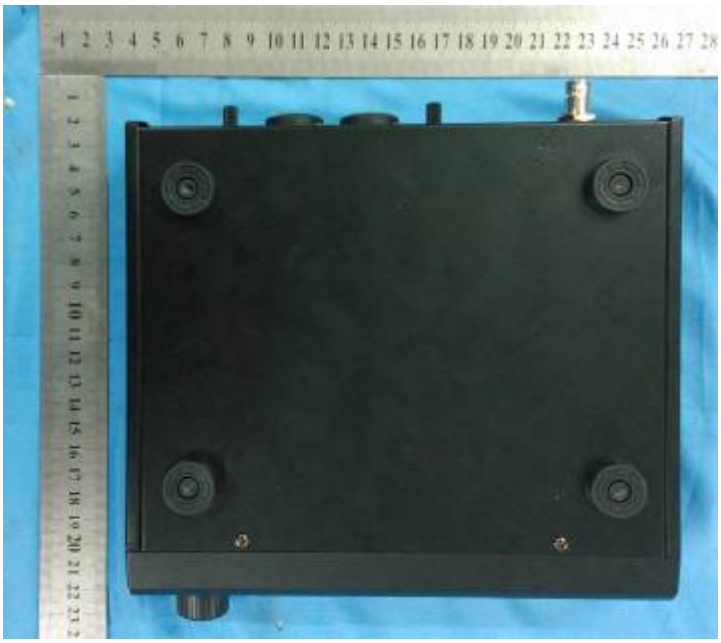


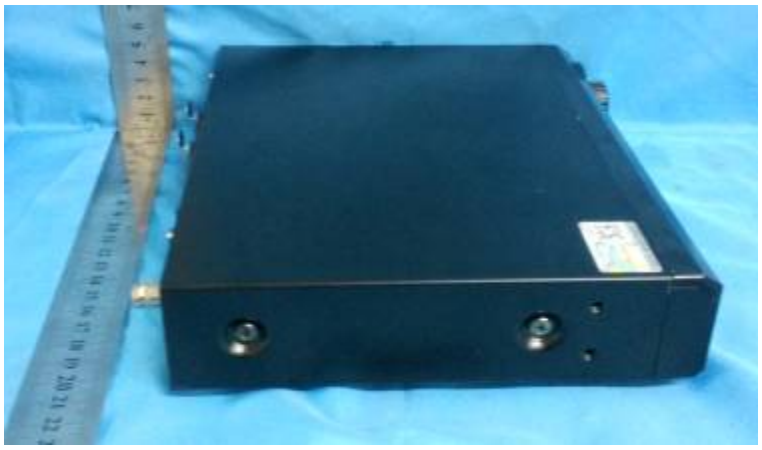
4.2 Conducted Emission Test Setup

4.3 **EUT Constructional Details**

EM-100

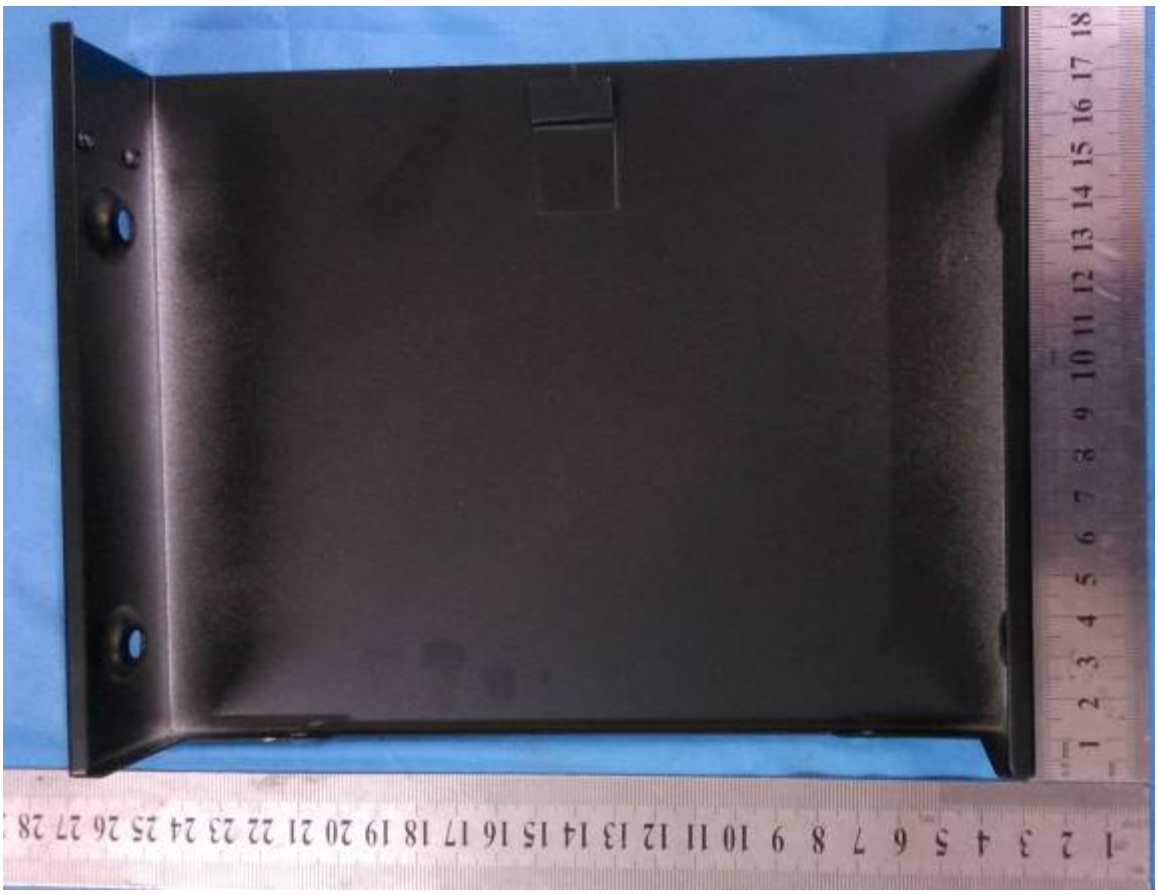


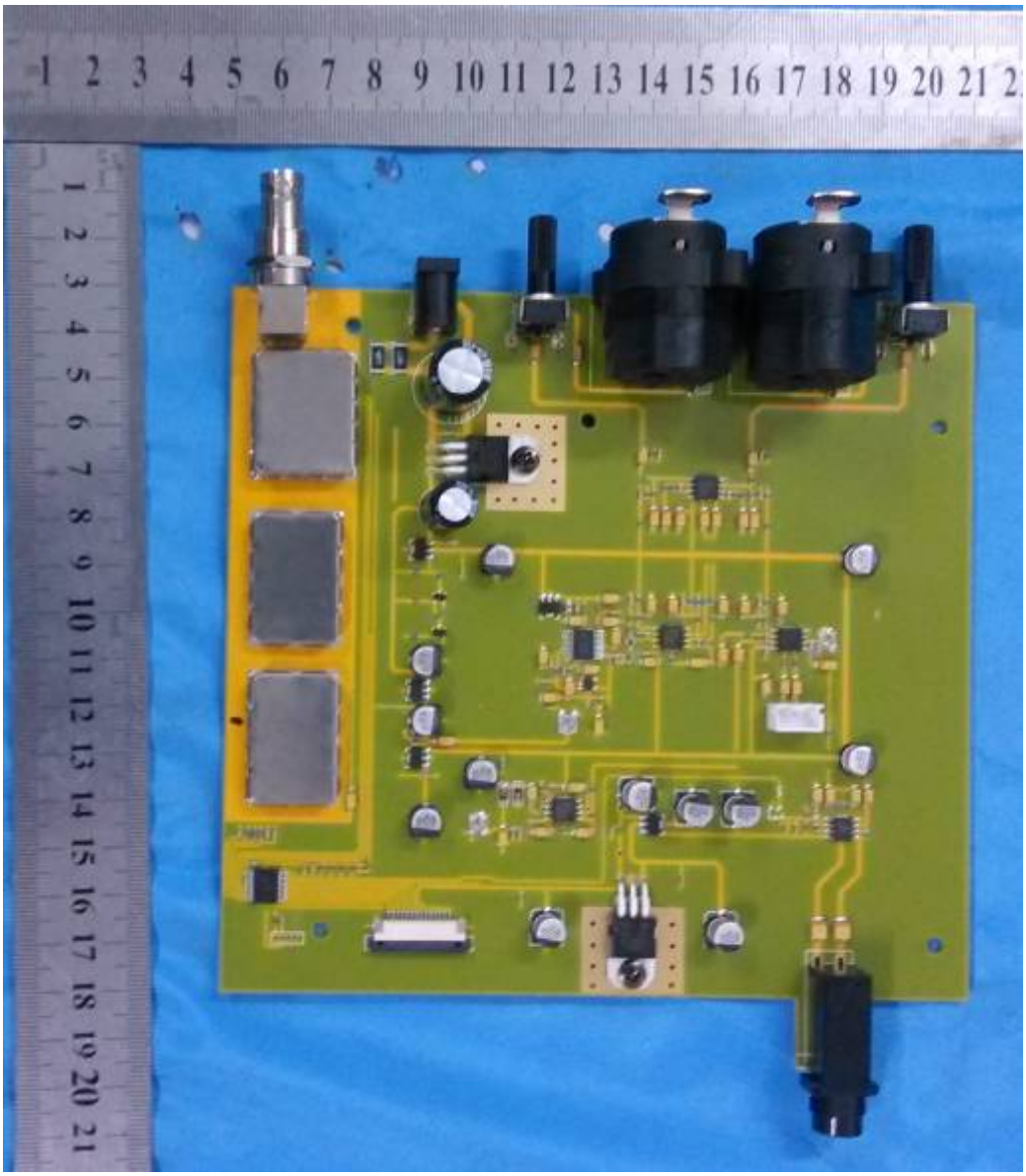


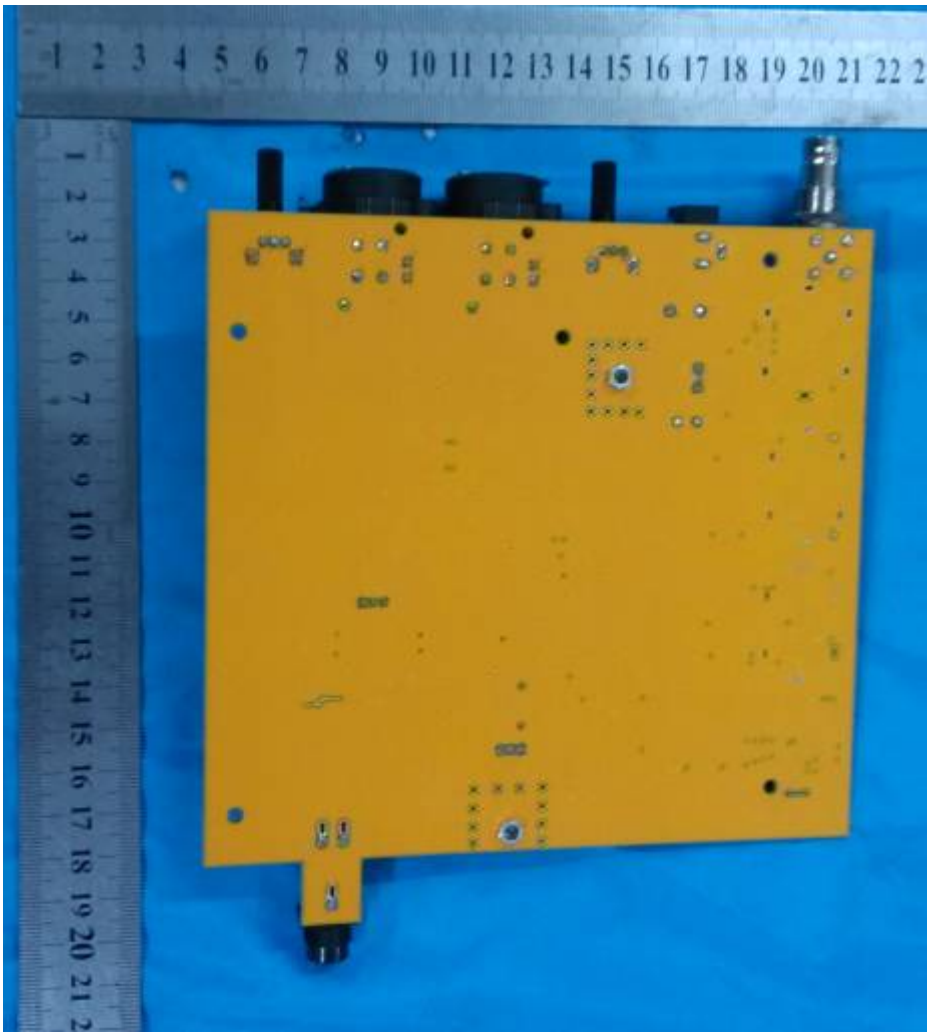


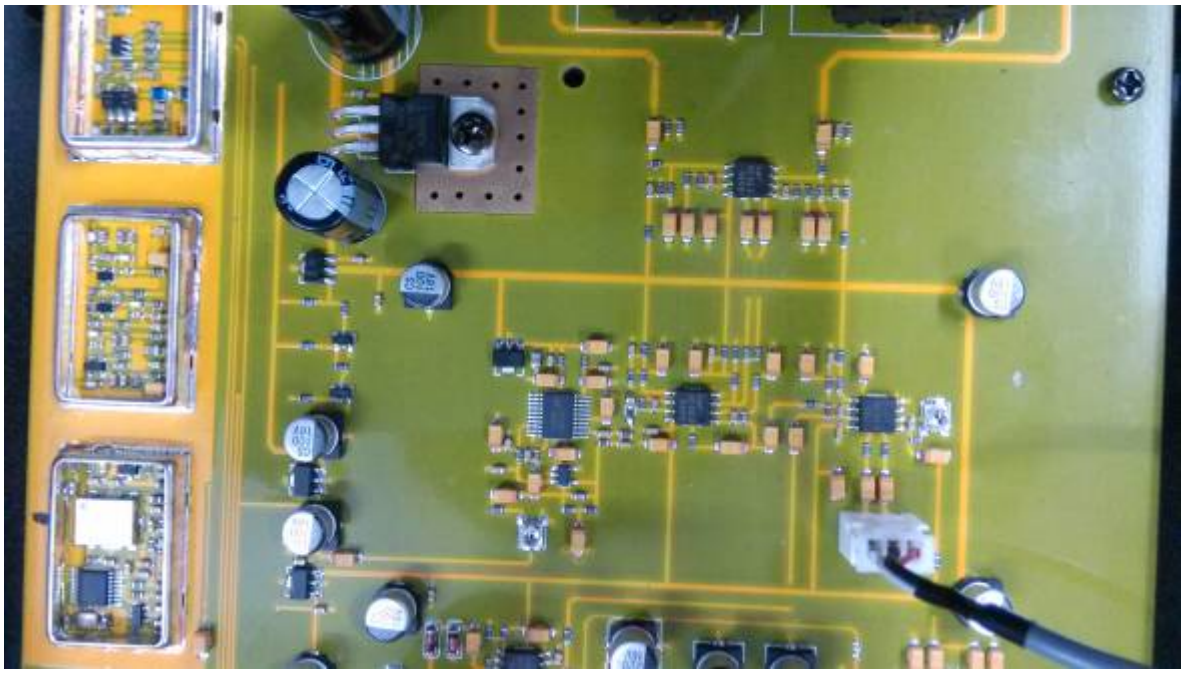

MADE IN CHINA
AF 1
AF INPUT 1
AF INPUT 2
AF 2
DC INPUT
12-18V/500mA
ANTENNA
902-928MHz
CAUTION
RoHS

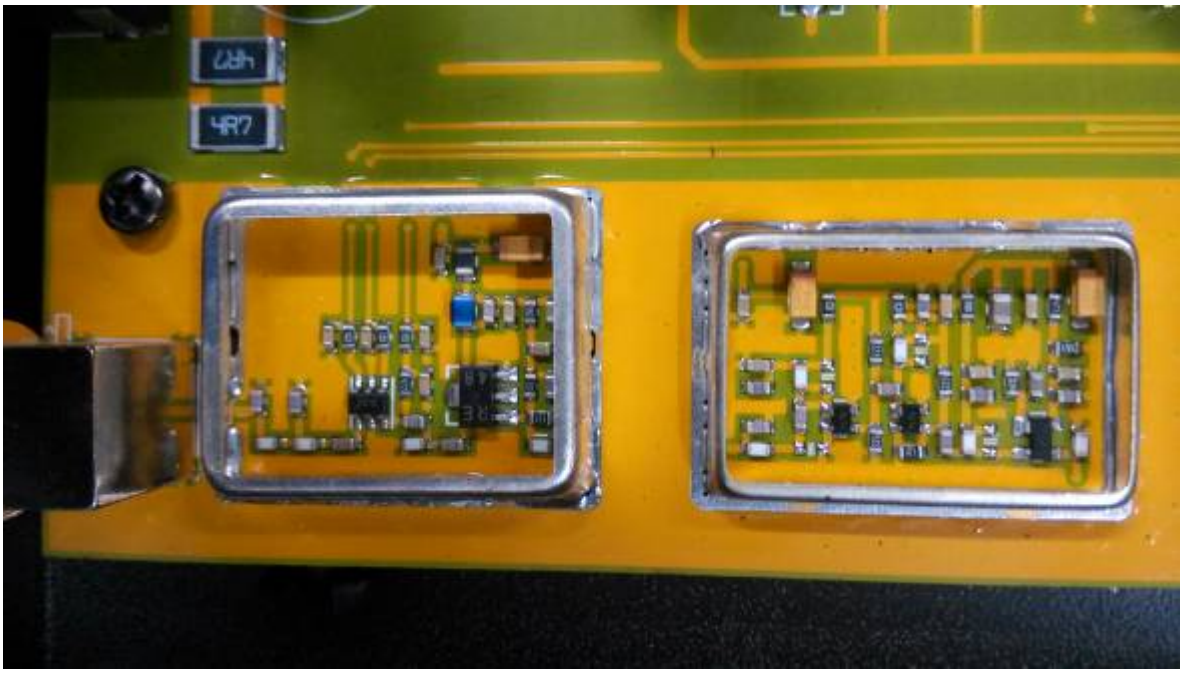

POWER
IR
ACEMIC EM-100 MONO TRANSMITTER
MIN VOLUME MAX

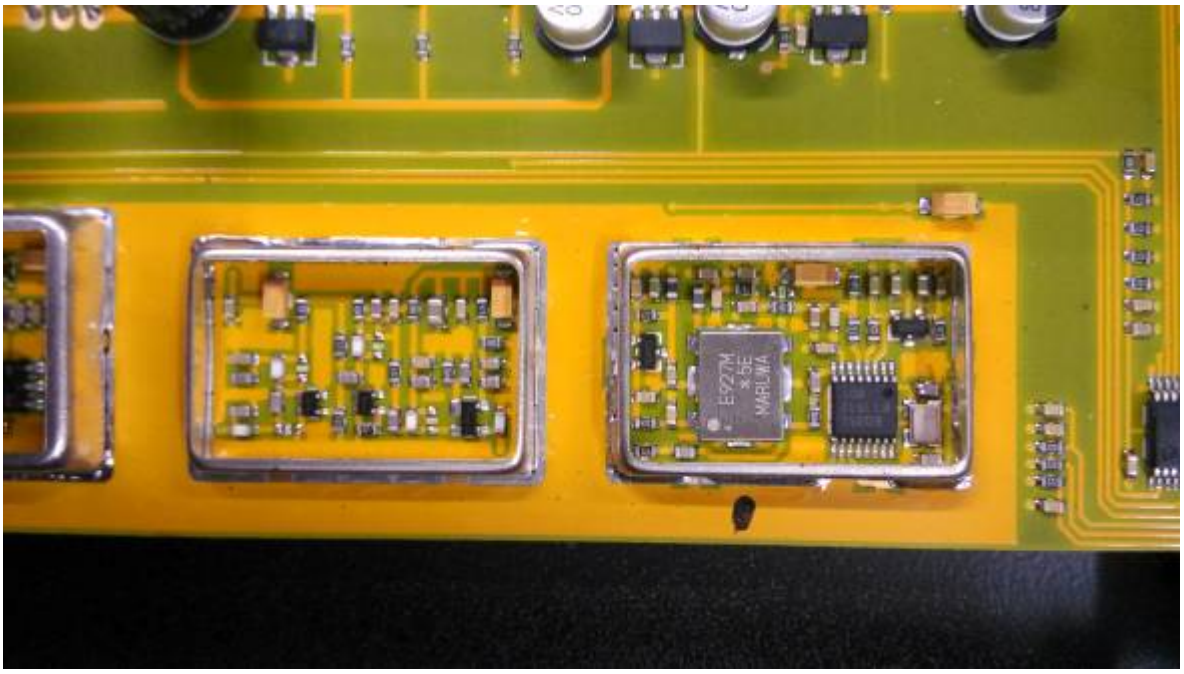


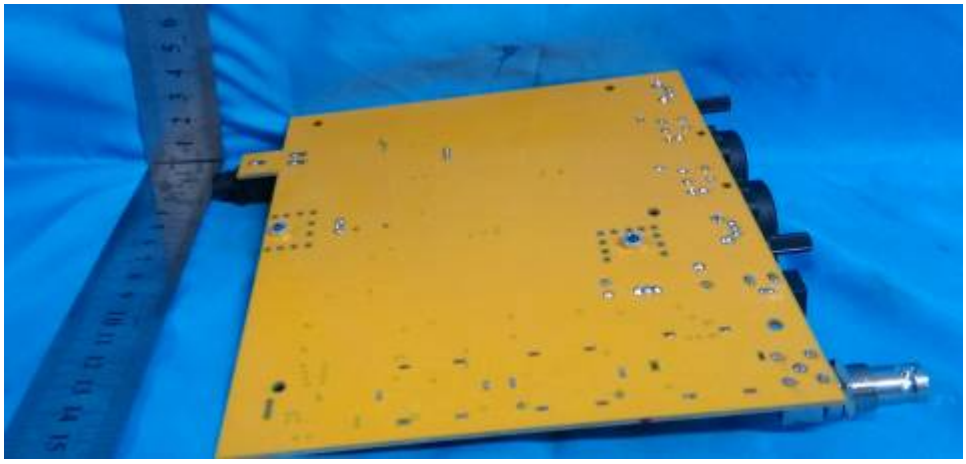


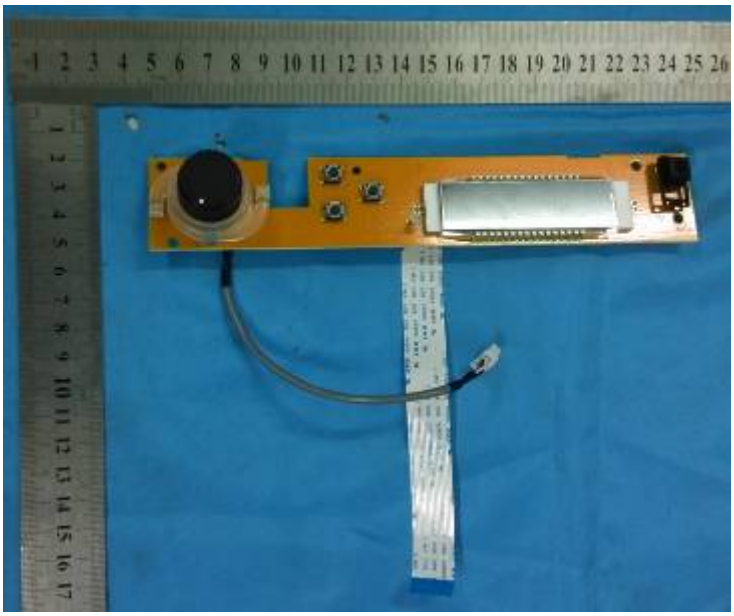


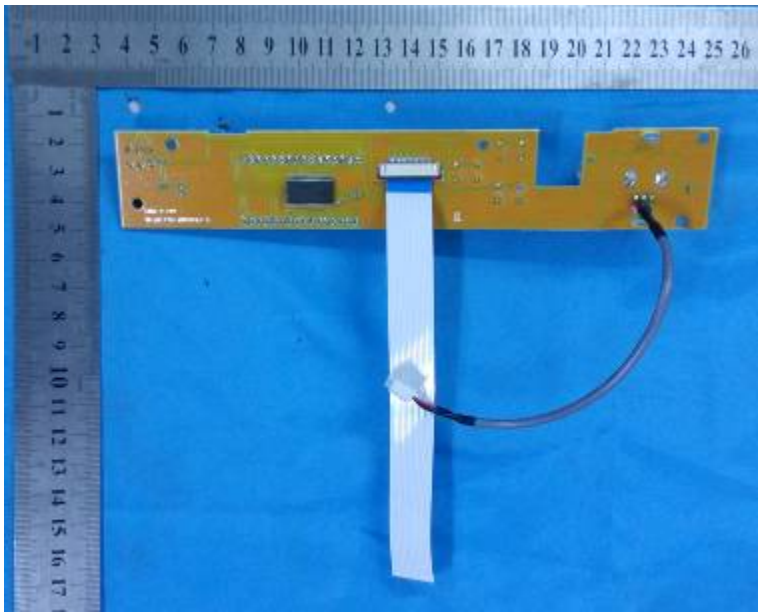


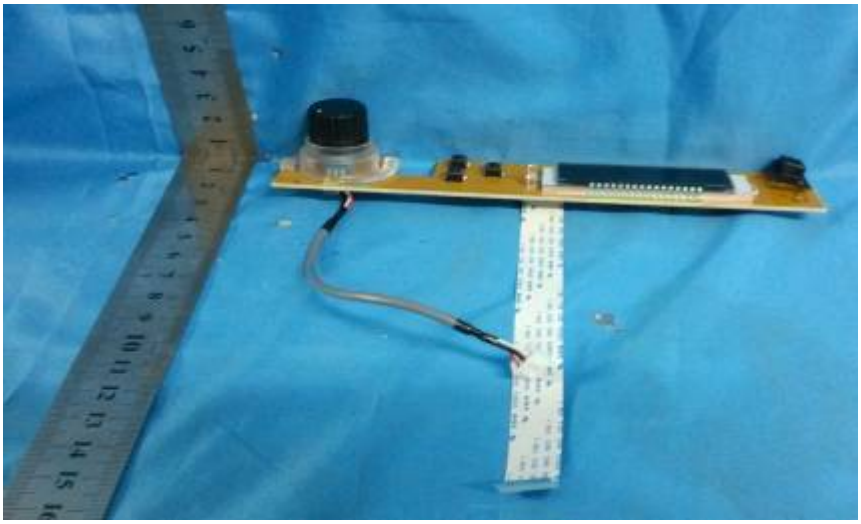

4R7

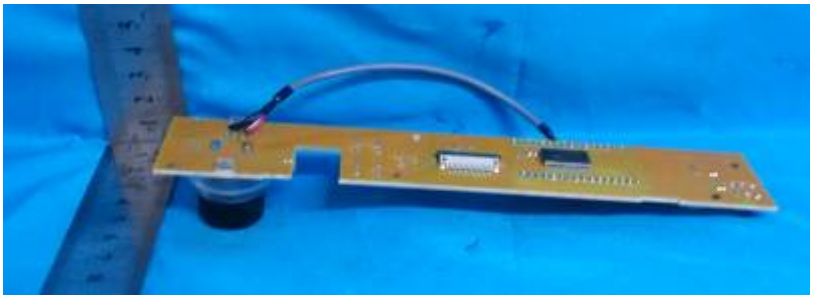




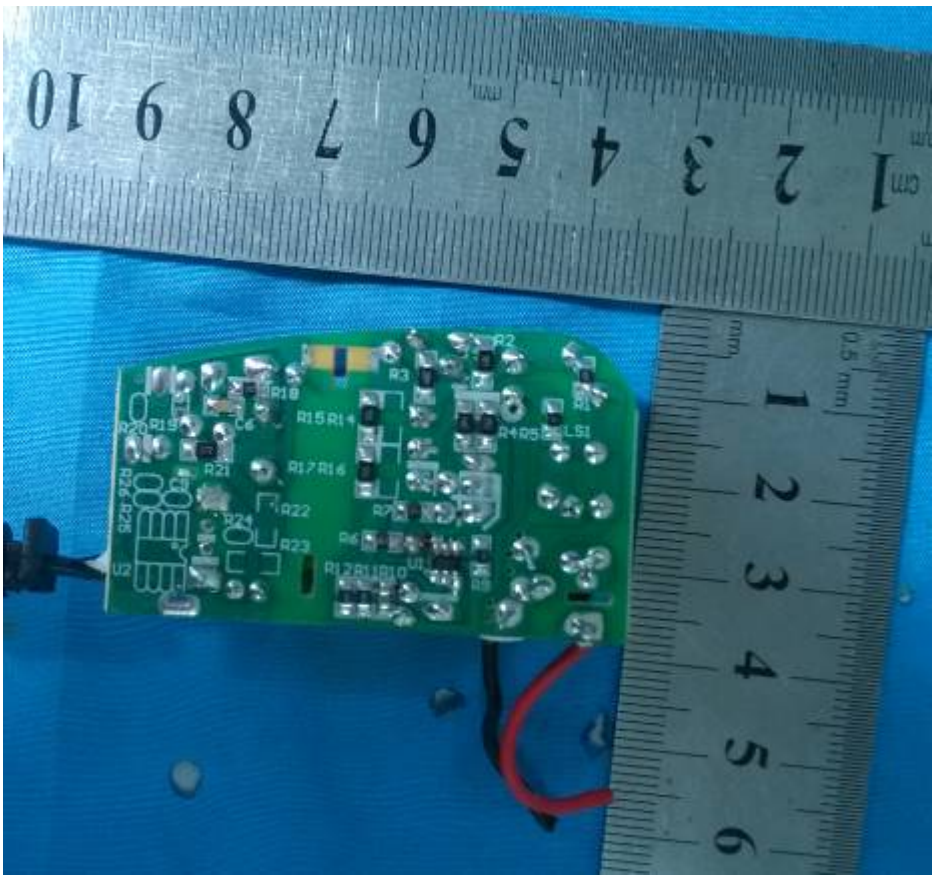


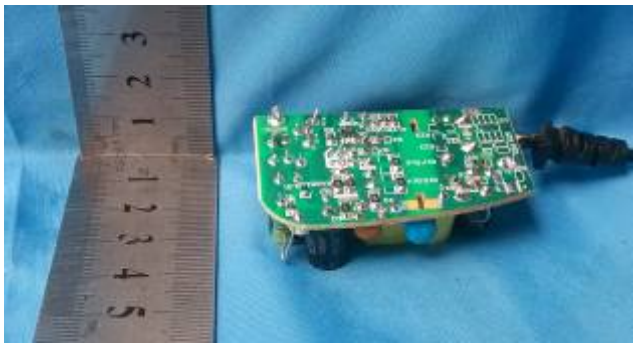


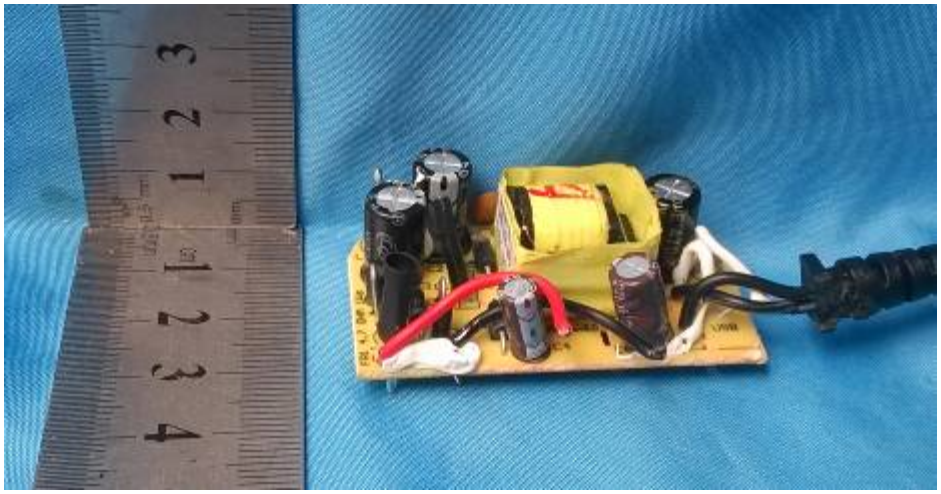





SWITCHING ADAPTER
MODEL:FYB12006US
INPUT: 100-240V~50/60Hz
0.6A Max
OUTPUT: 12V ⎓ 500mA
I.T.E POWER SUPPLY
L.P.S
LISTED
E361870
MADE IN CHINA



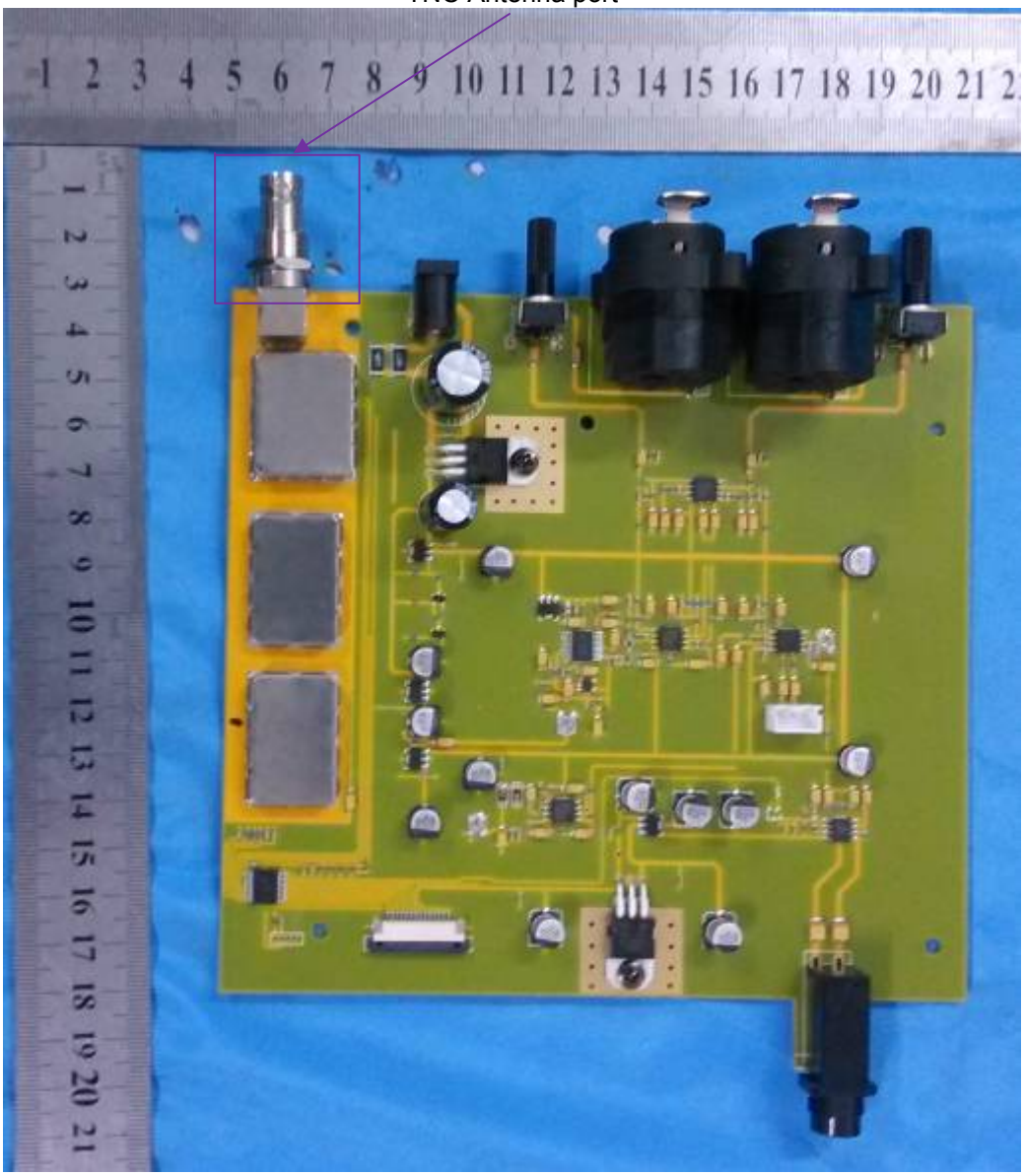




4.4 **Antenna Photo**

Antenna

TNC Antenna port



Note:

The transmitter was used a unique coupling with the 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	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	2015-5-10	2016-5-10
5	Audio Analyzer	Hewlett Packard	8903B	EMC0011	2015-11-5	2016-11-5
6	Power Sensor	Rohde & Schwarz	NRP-Z91	1.034	2015-5-10	2016-5-10
7	Power Sensor	Rohde & Schwarz	NRP-Z91	1.035	2015-5-10	2016-5-10
8	Temperature Chamber	Gongwen	GDS-250	SFT0009	2015-11-5	2016-11-5
9	D.C. Power Supply	KIKUSUI	PAN35-10A	SFT0319	2015-11-5	2016-11-5
10	Temperature Chamber	Gongwen	GDS-250	SFT0009	2015-11-5	2016-11-5
11	D.C. Power Supply	KIKUSUI	PAN35-10A	SFT0319	2015-11-5	2016-11-5
12	Humidity/ Temperature Meter	Anymetre	TH101B	SFT0063	2015-11-5	2016-11-5
13	Barometer	ChangChun	DYM3	SEL0088	2015-6-8	2016-6-8
14	Multimeter	UNI-T	UT70A	EMC0017	2015-11-5	2016-11-5
15	Monopole Antenna	HST	N/A	EMC0089	2015-11-5	2016-11-5
16	Low loss coaxial cable	HST	2 m	EMC1008	2015-11-5	2016-11-5
17	Monopole Antenna	HST	N/A	N/A	2015-11-5	2016-11-5
18	Noise Generaror	Ningbo Zhongce	DF1681	EMC0009	2015-11-5	2016-11-5
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