TEST REPORT

Reference No.	:	WTS14S0918362E
FCC ID	:	2ACV7MF003F
Applicant	:	Beijing KiChina Co., Ltd.
Address	:	Room 302, Building 4, BeiWu New Technology Park, 23 BeiWuCun Road, HaiDian District, Beijing, China.
Manufacturer	:	The same as above
Address	:	The same as above
Product Name	:	Car Vehicle FM Transmitter
Model No	:	MF 003F
Standards	:	FCC CFR47 Part 15 Section 15.239: 2012
Date of Receipt sample	:	Sep.16, 2014
Date of Test	:	Sep.18~ Sep.20, 2014
Date of Issue	:	Nov.05, 2014
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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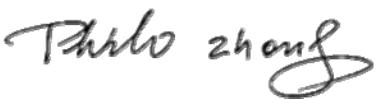
Compiled by:

Zero.zhou / Project Engineer

Approved by:



Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.107	PASS
Radiated Spurious Emissions	15.205(a) 15.209 15.239	PASS
99% Bandwidth	15.239	PASS
Band edge	15.205(a) 15.209 15.239	PASS
Antenna Requirement	15.203	PASS

3 Contents

4 General Information

4.1 General Description of E.U.T.

Product Name	: Car Vehicle FM Transmitter
Model No.	: MF 003F
Model Difference	: N/A
Type of Modulation	: FM
Frequency Range	: 102.9-107.8MHz
The Lowest Oscillator	: 24.0 MHz
Antenna installation	: Integrated Antenna

4.2 Details of E.U.T.

Technical Data	: DC 5V by USB Charging DC 3.6V Power supply by battery

4.3 Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	102.9	2	103.0	3	107.7	4	107.8

4.4 Test Mode

Test mode	Low channel	Middle channel	High channel
Transmitting	102.9MHz	/	107.8MHz

4.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A-1**

  Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A-1, July 12, 2012.

- **FCC – Registration No.: 880581**

  Waltek Services (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.15,2014	Sep.14,2015
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.15,2014	Sep.14,2015
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.15,2014	Sep.14,2015
4.	Cable	LARGE	RF300	-	Sep.15,2014	Sep.14,2015
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2014	Sep.14,2015
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Sep.15,2014	Sep.14,2015
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2014	Sep.14,2015
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Sep.15,2014	Sep.14,2015
6	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Sep.15,2014	Sep.14,2015
7	Coaxial Cable (above 1GHz)	Top	1000MHz-25GHz	EW02014-7	Sep.15,2014	Sep.14,2015
8	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Sep.15,2014	Sep.14,2015
9.	Audio Generator	GW	GAG-809	EH831261	Sep.15,2014	Sep.14,2015

5.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emissions	150kHz~30MHz	±3.64dB	(1)
Radiated Spurious Emissions	30MHz~1000MHz	±5.03dB	(1)
	1000M~5000MHz	± 5.47 dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.107
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

6.1 E.U.T. Operation

Operating Environment **:**

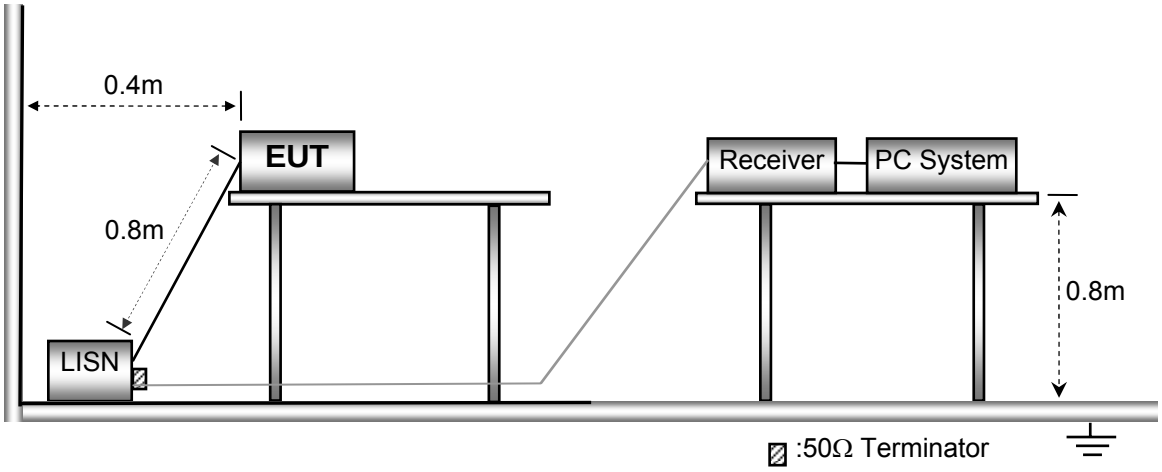
Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation **:**

The test was performed in charging mode(The EUT cannot power on in charging mode)

6.2 EUT Setup

The EUT was placed on the test table in shielding room.

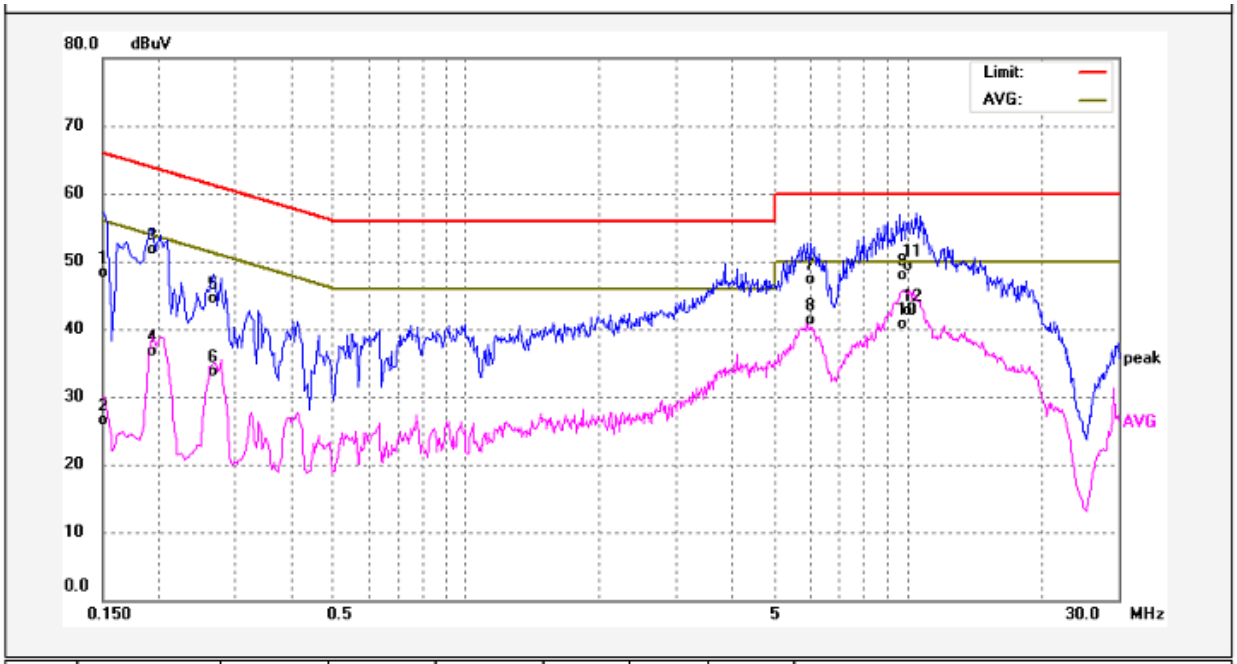


6.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

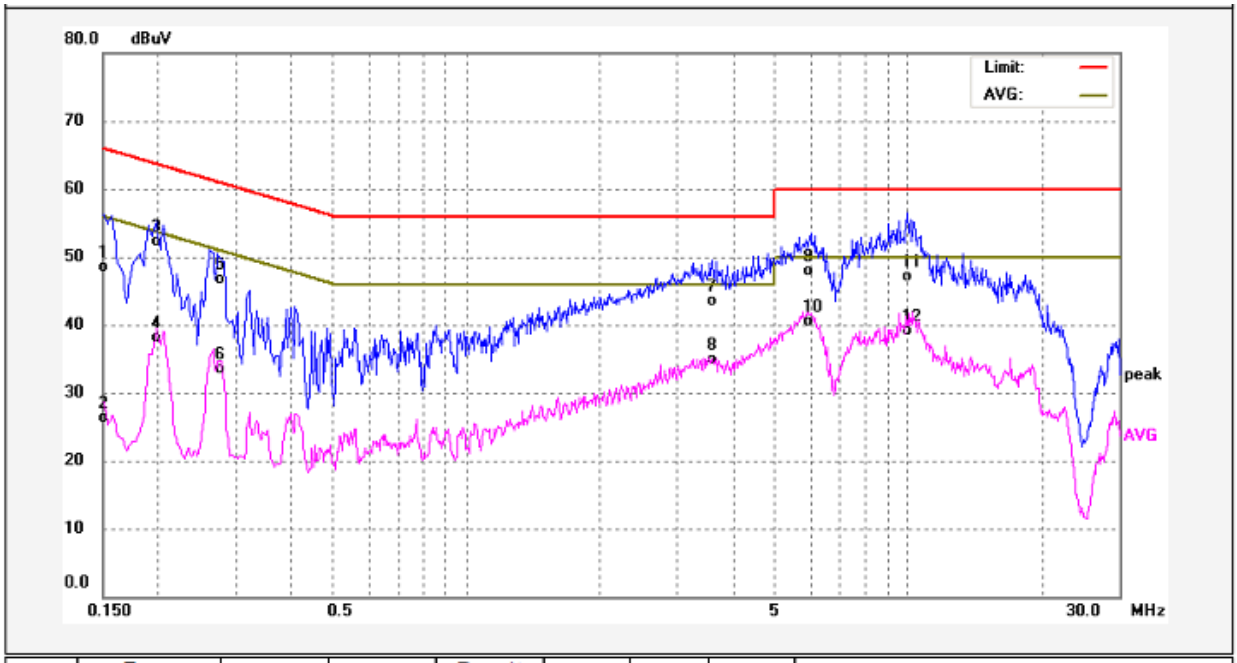
6.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	37.75	10.57	48.32	65.99	-17.67	QP	
2	0.1500	15.89	10.57	26.46	55.99	-29.53	AVG	
3	0.1940	41.20	10.57	51.77	63.86	-12.09	QP	
4	0.1940	26.15	10.57	36.72	53.86	-17.14	AVG	
5	0.2672	33.90	10.57	44.47	61.20	-16.73	QP	
6	0.2672	23.06	10.57	33.63	51.20	-17.57	AVG	
7	6.0300	36.46	10.75	47.21	60.00	-12.79	QP	
8	6.0300	30.46	10.75	41.21	50.00	-8.79	AVG	
9	9.6059	37.06	10.80	47.86	60.00	-12.14	QP	
10	9.6059	29.83	10.80	40.63	50.00	-9.37	AVG	
11	10.0060	38.48	10.81	49.29	60.00	-10.71	QP	
12	10.0060	31.82	10.81	42.63	50.00	-7.37	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	37.90	10.57	48.47	65.99	-17.52	QP	
2	0.1500	15.76	10.57	26.33	55.99	-29.66	AVG	
3	0.1980	41.82	10.57	52.39	63.69	-11.30	QP	
4	0.1980	27.45	10.57	38.02	53.69	-15.67	AVG	
5	0.2740	36.12	10.57	46.69	60.99	-14.30	QP	
6	0.2740	22.91	10.57	33.48	50.99	-17.51	AVG	
7	3.5900	32.37	11.04	43.41	56.00	-12.59	QP	
8	3.5900	23.87	11.04	34.91	46.00	-11.09	AVG	
9	6.0020	37.13	10.74	47.87	60.00	-12.13	QP	
10	6.0020	29.77	10.74	40.51	50.00	-9.49	AVG	
11	9.9260	36.24	10.81	47.05	60.00	-12.95	QP	
12	9.9260	28.27	10.81	39.08	50.00	-10.92	AVG	

7 Radiated Spurious Emissions

Test Requirement: FCC Part15 Paragraph 15.239

Test Method: ANSI C63.4:2003

Test Result: PASS

Measurement Distance: 3m

Limit:

The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in Section 15.209.

7.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

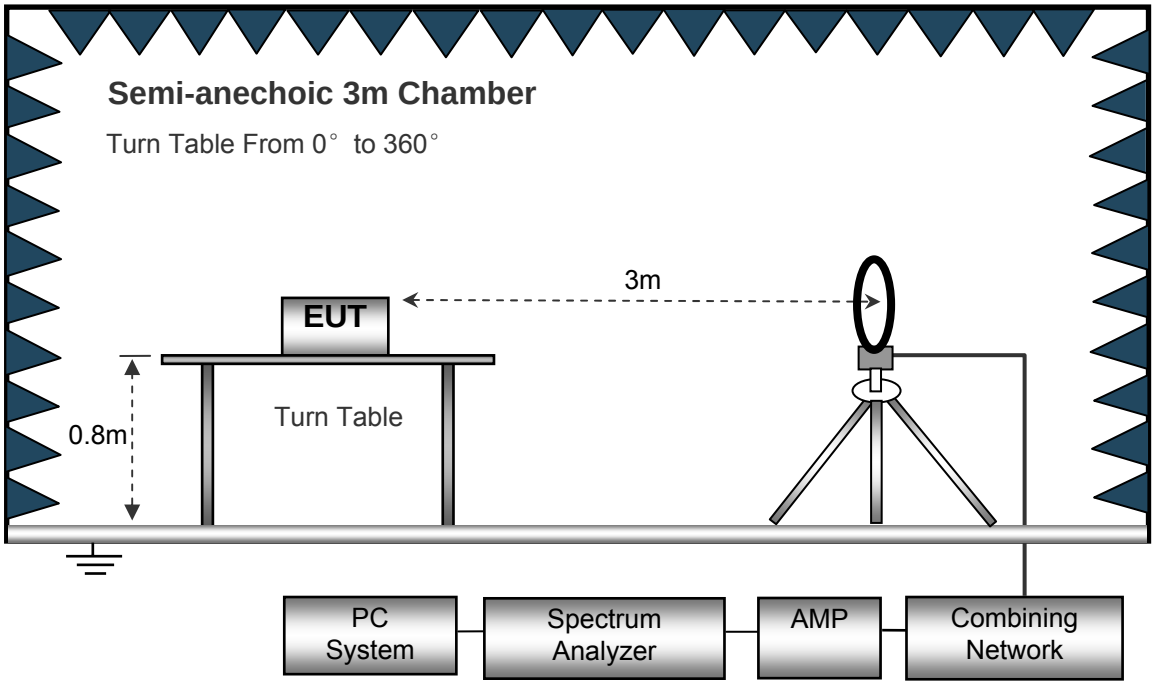
EUT Operation **:**

The test was performed in transmitting mode, the test data were shown in the report.

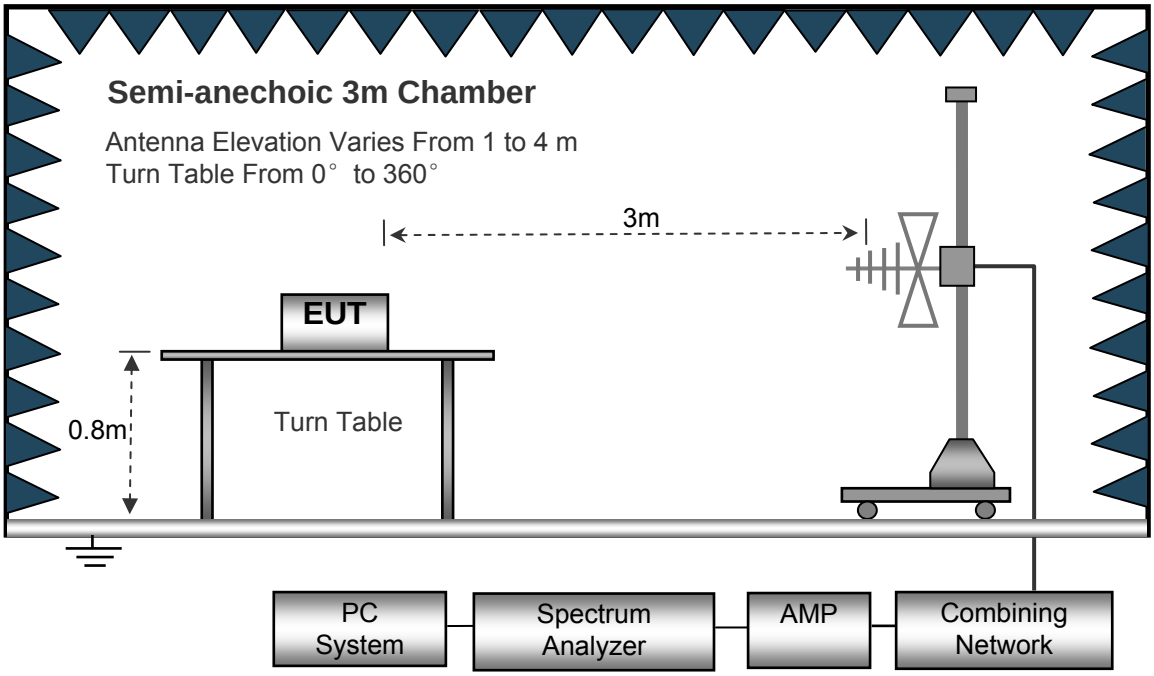
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.

The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz

Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X, Y, Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand). After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

7.5 Summary of Test Results

Test Frequency: 24MHz-30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 1GHz

Freq.	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.239/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/Ave)	Degree	(m)	(H/V)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
Low channel 102.9MHz									
102.90	28.89	PK	311	1.7	H	14.15	43.04	68.00	-24.96
102.90	27.23	Ave	311	1.7	V	14.24	41.47	48.00	-6.53
205.22	27.45	PK	345	1.2	H	12.41	39.86	43.50	-3.64
205.22	26.48	PK	345	1.2	V	11.54	38.02	43.50	-5.48
258.74	24.60	PK	12	1.9	H	15.33	39.93	46.00	-6.07
258.74	21.89	PK	12	1.9	V	15.56	37.45	46.00	-8.55
308.70	26.68	PK	294	1.9	H	15.52	42.20	46.00	-3.80
308.70	25.84	PK	294	1.9	V	15.56	41.40	46.00	-4.60
411.60	20.72	PK	15	1.2	H	18.15	38.87	46.00	-7.13
411.60	23.01	PK	15	1.2	V	15.16	38.17	46.00	-7.83
514.50	19.68	PK	225	1.4	H	20.42	40.10	46.00	-5.90
514.50	21.76	PK	225	1.4	V	20.47	42.23	46.00	-3.77
High channel 107.8MHz									
107.80	28.14	PK	118	1.8	V	14.41	42.55	68.00	-25.45
107.80	26.54	Ave	118	1.8	V	14.49	41.03	48.00	-6.97
202.39	25.01	PK	6	1.7	H	12.36	37.37	43.50	-6.13
202.39	24.35	PK	6	1.7	V	12.25	36.60	43.50	-6.90
215.60	24.56	PK	86	1.2	H	12.50	37.06	43.50	-6.44
215.60	20.34	PK	86	1.2	V	12.58	32.92	43.50	-10.58
323.40	23.09	PK	114	1.1	H	17.08	40.17	46.00	-5.83
323.40	20.05	PK	114	1.1	V	17.12	37.17	46.00	-8.83
431.20	21.54	PK	353	1.6	H	20.55	42.09	46.00	-3.91
431.20	19.45	PK	353	1.6	V	20.58	40.03	46.00	-5.97
539.00	18.35	PK	97	1.4	H	22.78	41.13	46.00	-4.87
539.00	19.66	PK	97	1.4	V	22.81	42.47	46.00	-3.53

8 99% Bandwidth

Test Requirement: FCC Part15.239

Test Method: FCC Part15.239

Limit Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

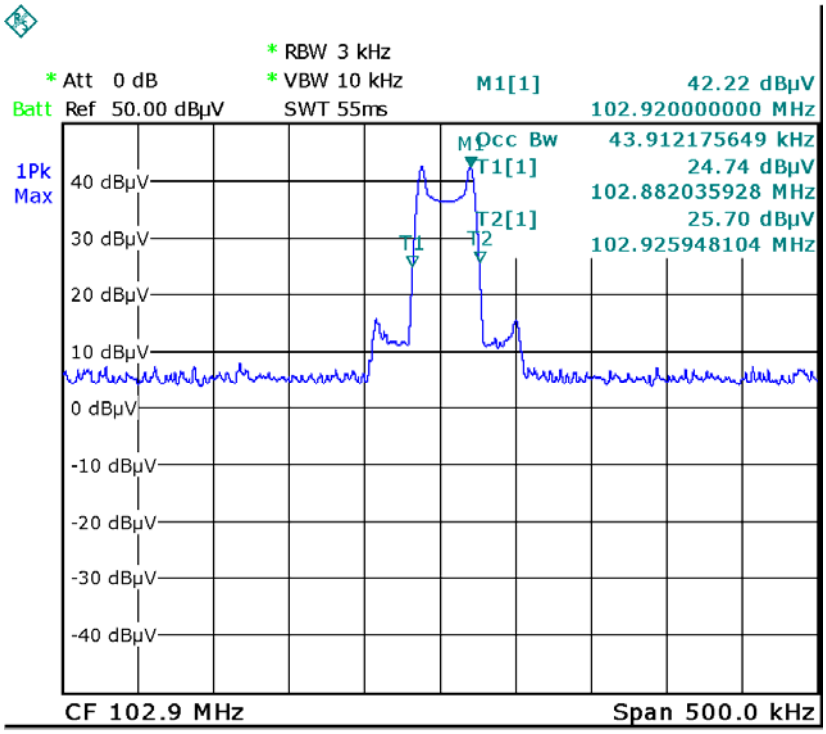
8.1 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.EUT and its simulators are placed on a table, let EUT working in test mode, then test it.
2. The bandwidth of the fundamental frequency was measure by spectrum analyser with 3kHz RBW and 10kHz VBW.

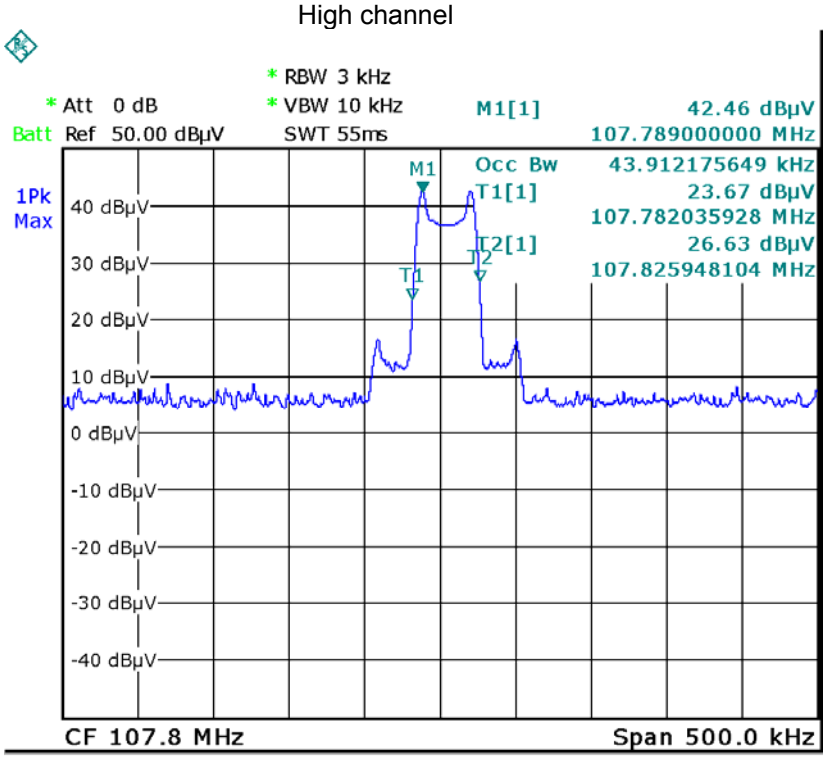
8.2 Test Result

Test Plots

Low channel



High channel



9 Band edge

Test Requirement: FCC Part15.239/15.209/15.205

Test Method: ANSI C63.4:2003

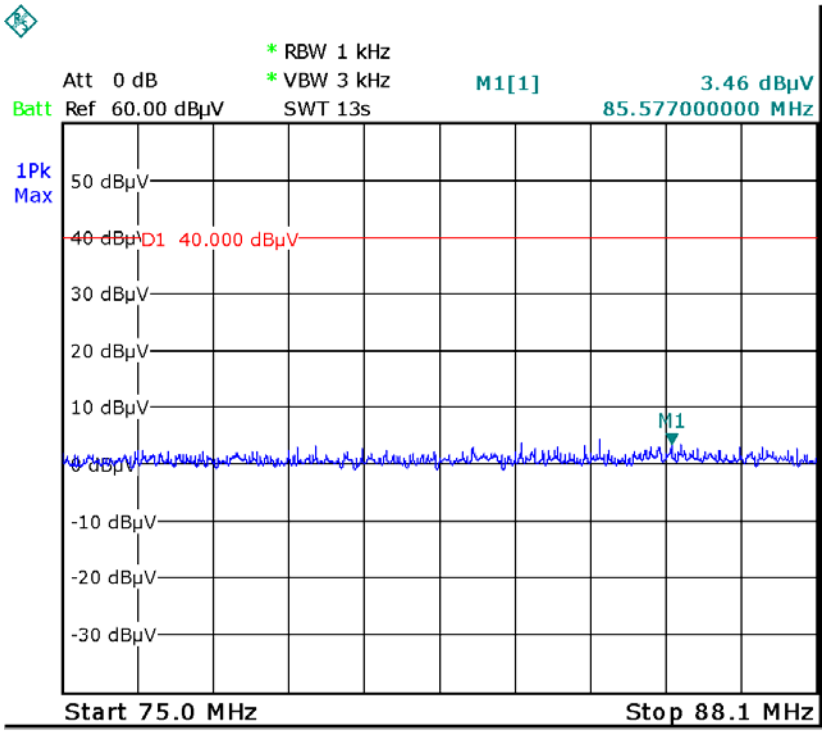
Limit: The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in §15.209.

9.1 Test Procedure

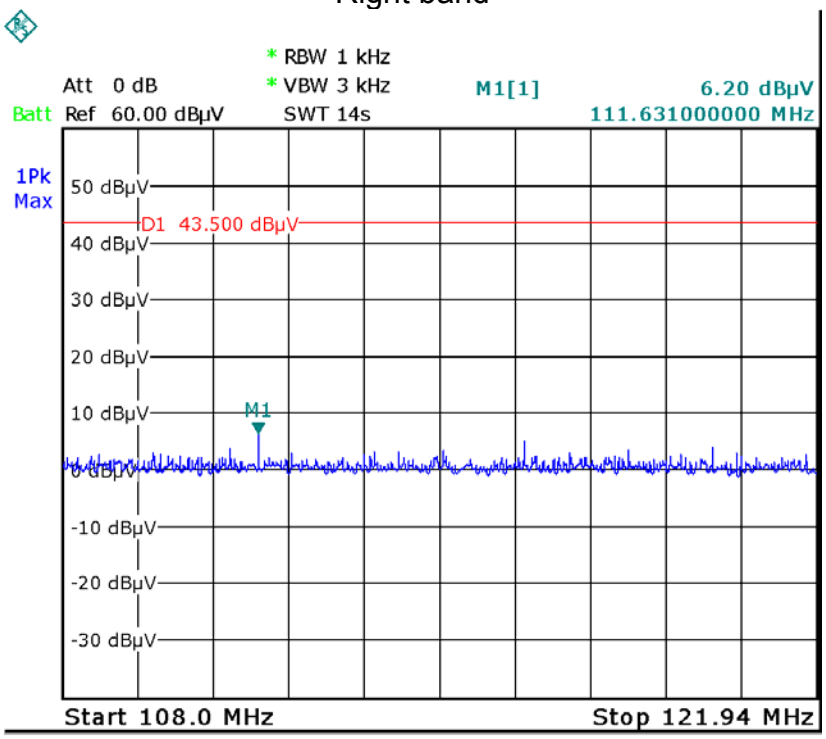
The bandwidth of the fundamental frequency was measure by spectrum analyser with 1kHz RBW and 3kHz VBW.

9.2 Test Plots

Left band



Right band


RBW 1 kHz
Att 0 dB
VBW 3 kHz
M1[1]
6.20 dBµV
Batt
Ref 60.00 dBµV
SWT 14s
111.631000000 MHz
1Pk
Max
50 dBµV
D1 43.500 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
M1
0 dBµV
-10 dBµV
-20 dBµV
-30 dBµV
Start 108.0 MHz
Stop 121.94 MHz

10 Antenna Requirement

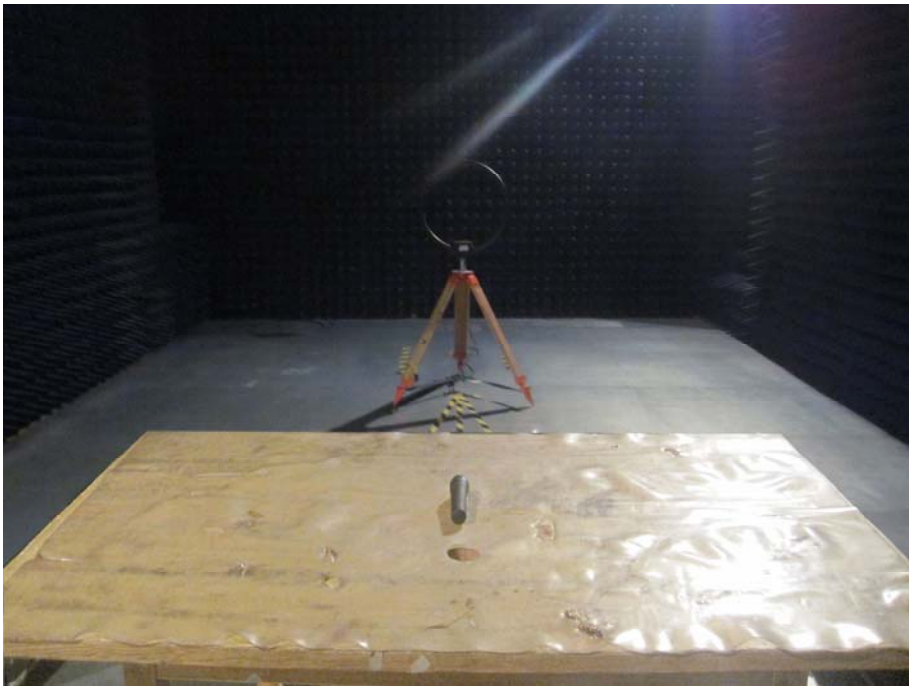
According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product use a permanent integrated antenna, fulfill the requirement of this section

11 Model MF 003F Photographs of Testing

11.1 Conduction Emission Test Setup

11.2 Radiation Emission Test Setup

24MHz ~30MHz



30MHz to 1GHz

12 Photographs - Constructional Details

12.1 Model MF 003F - Appearance View

Black

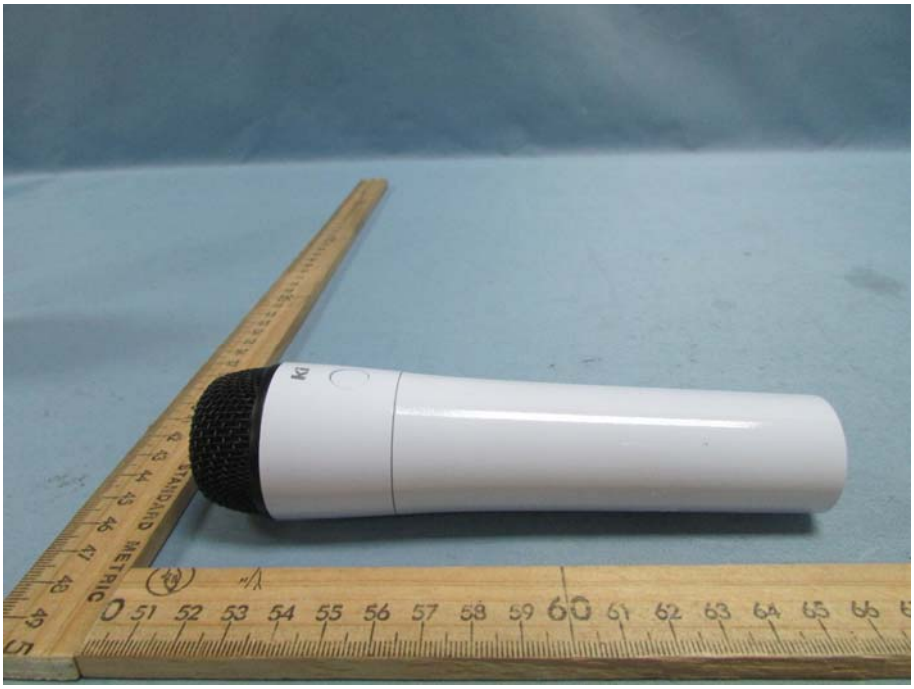

STANDARD METRIC
0 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65


STANDARD METRIC
0 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65

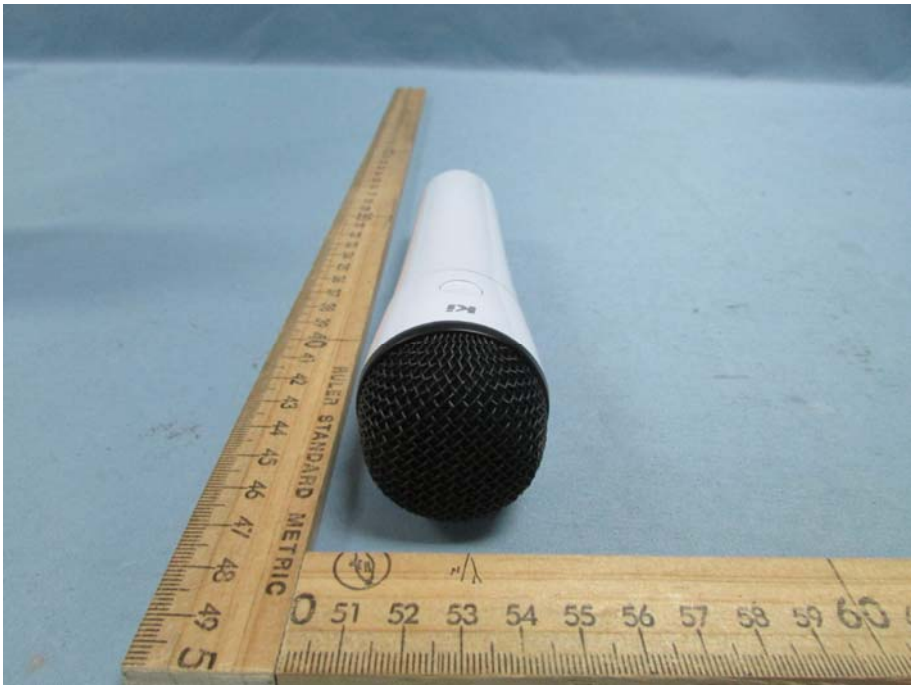

RULER STANDARD METRIC
51 52 53 54 55 56 57 58 59 60


RULER STANDARD METRIC
51 52 53 54 55 56 57 58 59 60

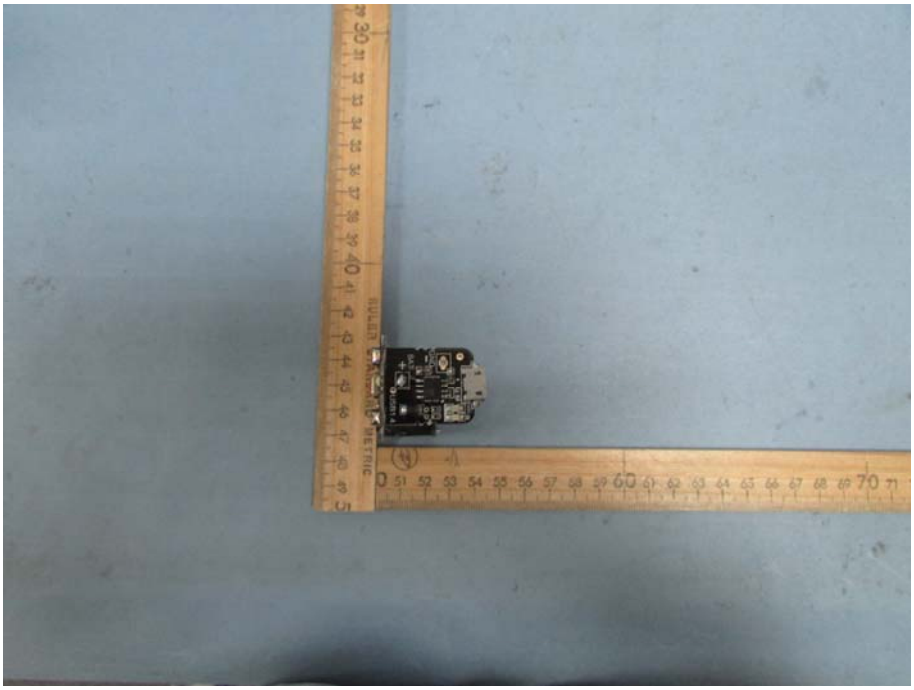
White


STANDARD METRIC
0 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65

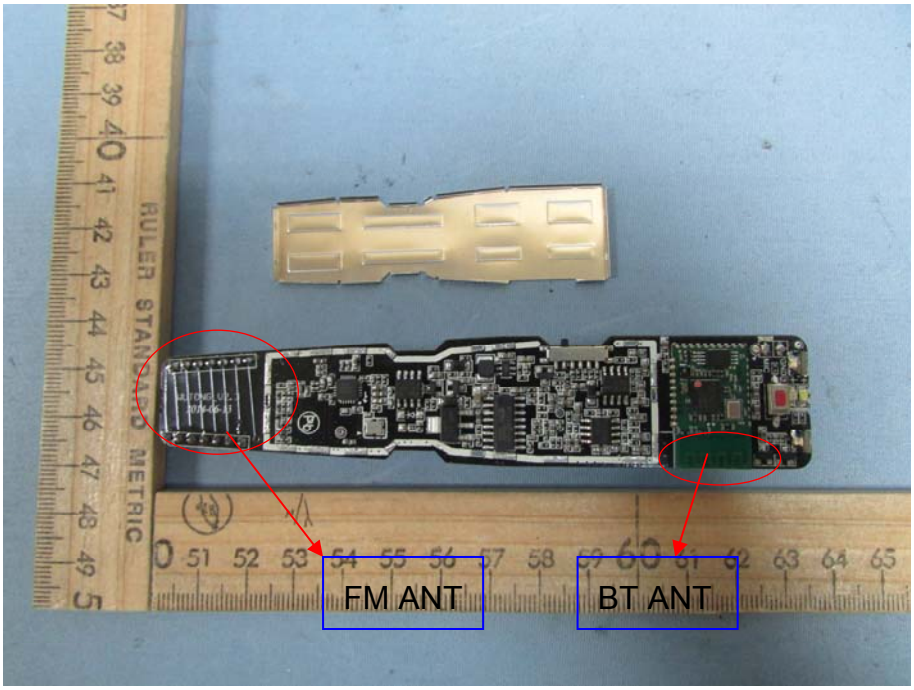

STANDARD METRIC
0 51 52 53 54 55 56 57 58 59 60

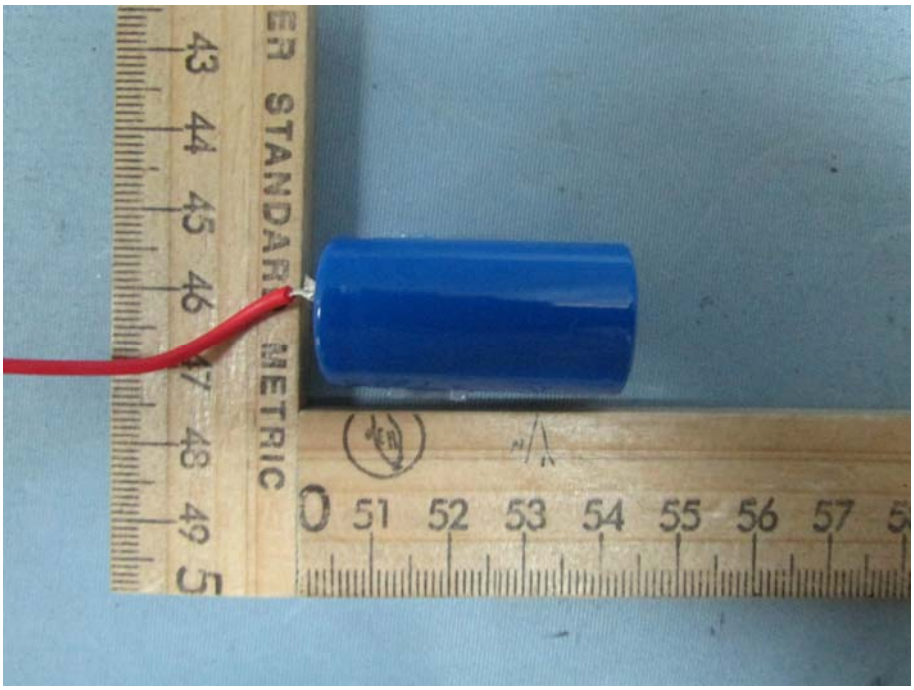

RULER STANDARD METRIC
0 51 52 53 54 55 56 57 58 59 60

12.2 Model MF 003F- Internal View




RULER STANDARD METRIC
FM


FM ANT
BT ANT



======End of Report======