FCC Test Report

Report No.: AGC087120201F2

FCC ID	:	**N4YF30**
PRODUCT DESIGNATION	:	FM transmitter
BRAND NAME	:	N/A
TEST MODEL	:	F30
CLIENT	:	Shen zhen Onuoda Electronics Technology Co.,Ltd
DATE OF ISSUE	:	Mar.14, 2012
STANDARD(S)	:	FCC Part 15 Rules

Attestation of ***G***lobal ***C***ompliance Co., Ltd.

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1. VERIFICATION OF COMPLIANCE

Applicant:	Shen zhen Onuoda Electronics Technology Co.,Ltd
Applicant Address:	3F, D Building, jingfu industry zone, Airway(west), Gushu village, xixiang town, Bao'an district, Shenzhen city, Guangdong, China
Manufacturer:	Shen zhen Onuoda Electronics Technology Co.,Ltd
Manufacturer Address:	3F, D Building, jingfu industry zone, Airway(west), Gushu village, xixiang town, Bao'an district, Shenzhen city, Guangdong, China
Product Description:	FM transmitter
Brand Name:	N/A
Model Name:	F30
FCC ID:	**N4YF30**
Report Number:	AGC087120201F2
Date of Test:	Mar.02 ~ Mar.09, 2012

WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2003. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested By: Curoky Chen Mar.14, 2012

Reviewed By: Forrest Lei Mar.14, 2012

Approved By: Solger Zhang Mar.14, 2012

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)

EUT- FM Transmitter	
Description:	FM Transmitter
Brand Name:	N/A
Model Name:	F30
Rated Voltage:	DC 12V~24V by Vehicle Charger
Frequency Range:	88.1-107.9MHz
Channel Separation:	0.1MHz
Modulation Type:	FM
Operation Function	The device will stop transmitting after remove the input audio signal
Type of Antenna:	Integrated Antenna
Accessories 1- Battery	
Description:	Li-Ion Battery
Brand Name:	N/A
Model No.:	042030P
Manufacturer:	Shenzhen Red Sunshine Energy Technology Co., Ltd.
Address:	1-4fF, Red Sunshine Building, 29# Bao Yuan Road, Xixiang Town, Baoan district, Shenzhen
Capacitance:	180mAh
Rated Voltage:	DC3.7V
Accessories 2- Vehicle Charger	
Description:	Vehicle Charger
Brand Name:	N/A
Model No.:	C6 car charge
Manufacturer:	Shen zhen Onuoda Electronics Technology Co., Ltd
Address:	3F, D Building, jingfu industry zone, Airway(west), Gushu village, xixiang town, Bao'an district, Shenzhen city, Guangdong, China
Rated Input:	DC12V
Rated Output:	DC5V

2.2. TEST STANDARDS

The following report of is prepared on behalf of the Attestation of Global Compliance Co., Ltd. in accordance with FCC Part 15, Subpart C, and section 15.239, 15.203 and 15.209 of the Federal Communication Commission rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.239, 15.203 and 15.209 of the Federal Communication Commission rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

2.3. RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for FCC ID: **N4YF30** filing to comply with Section 15.239 of the FCC Part 15, Subpart C Rules.

2.4. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions. The EUT was tested in all three orthogonal planes and the worse case was showed.

2.5. TEST FACILITY

All measurement facilities used to collect the measurement data are located at
Attestation of Global Compliance Co., Ltd.
(2F, No.2 Building, Huafeng No.1 Technical, Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen, China)
The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.
FCC register No.: 259865

2.6. EUT EXERCISE SOFTWARE

The EUT exercise program used during the testing was designed to exercise the system components. The test software is started while the EUT system is on.

2.7. ACCESSORIES EQUIPMENT LIST AND DETAILS

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
MP4	TONGFANG	N/A	N/A	N/A	N/A

2.8. EUT PORT&CABLE LIST AND DETAILS

I/O Port Type	Q'TY	Cable	Tested with
AUX IN	1	N/A	1
USB Port	1	N/A	1

3. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.203 Antenna Requirement	Compliant
§15.209 & §15.239 (b) Radiated Emission	Compliant
§15.239 (a) Emission Bandwidth	Compliant
§15.239 (c) Out of band emission	Compliant

4. TEST MODES

No.	Test modes
1	Low Channel-TX
2	Middle Channel-TX
3	High Channel-TX
Note: *All test modes are tested. For some test items, only the result of the worst case was recorded in the report.*	

5. § 15.203 - ANTENNA REQUIREMENT

5.1. TEST LIMIT

According to FCC 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 or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.2. TEST RESULT

This product has a Integrated antenna, fulfill the requirement of this section.

6. §15.209, §15.239 (b)(c)- RADIATED EMISSION

6.1. MEASUREMENT UNCERTAINTY

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is +/-3.2 dB.

6.2. TEST LIMITS

According to §15.239(b), 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 §15.35 for limiting peak emissions apply.

According to §15.239(c), 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.

RADIATED EMISSION LIMITS:			
Frequency (MHz)	**Field Strength**		**Measurement Distance (meters)**
	uV/m	**dB uV/m**	
0.009 - 0.490	2400/F(kHz)	*	300
0.490 - 1.705	24000/F(kHz)	*	300
1.705 - 30.0	30	29.5	30
30 - 88	100**	40	3
88 - 216	150**	43.5	3
216 - 960	200**	46	3
Above 960	500	54	3
Carrier frequency	250	48(AVG)	3
Carrier frequency		68(Peak)	3

Notes:

**Emission Level(dB uV/m)=20log Emission Level(uV/m);*

***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, operatio within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

6.3. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	06/27/2011	06/26/2012
BICONICAL ANTENNA	A.H.	SAS-521-4	128	06/27/2011	06/26/2012
LOOP ANTENNA	R&S	HM525	N/A	06/27/2011	06/26/2012
HORN ANTENNA	EM	EM-AH-10180	N/A	06/27/2011	06/26/2012
AMPLIFIER	EM	EM30180	0607030	06/27/2011	06/26/2012
COAXIAL CABLE	SCHWARZBECK	AK9513	9513-10	06/27/2011	06/26/2012
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	06/27/2011	06/26/2012

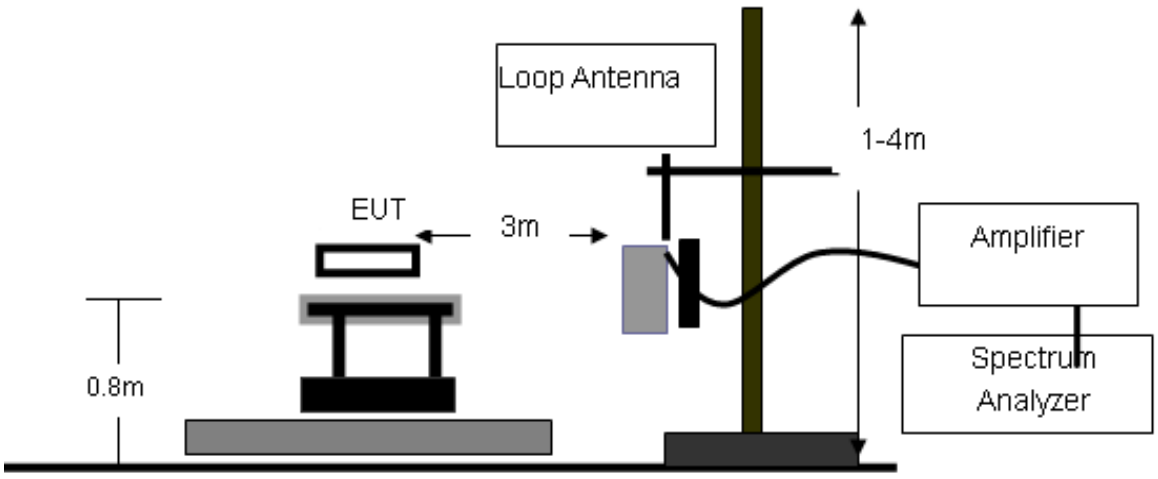
6.4. TEST PROCEDURE

The EUT was modulated by 1.0 KHz audio signal from the MP4 which the volume is adjusted to maximum.

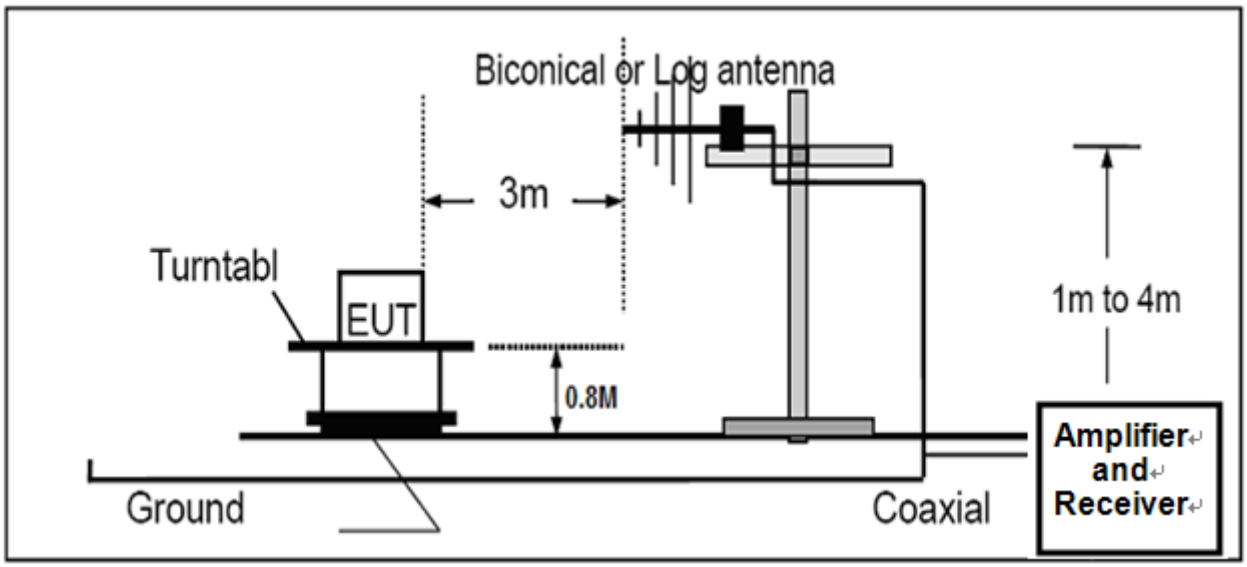
The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.239(b) and FCC Part 15.209 Limit.

6.5. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

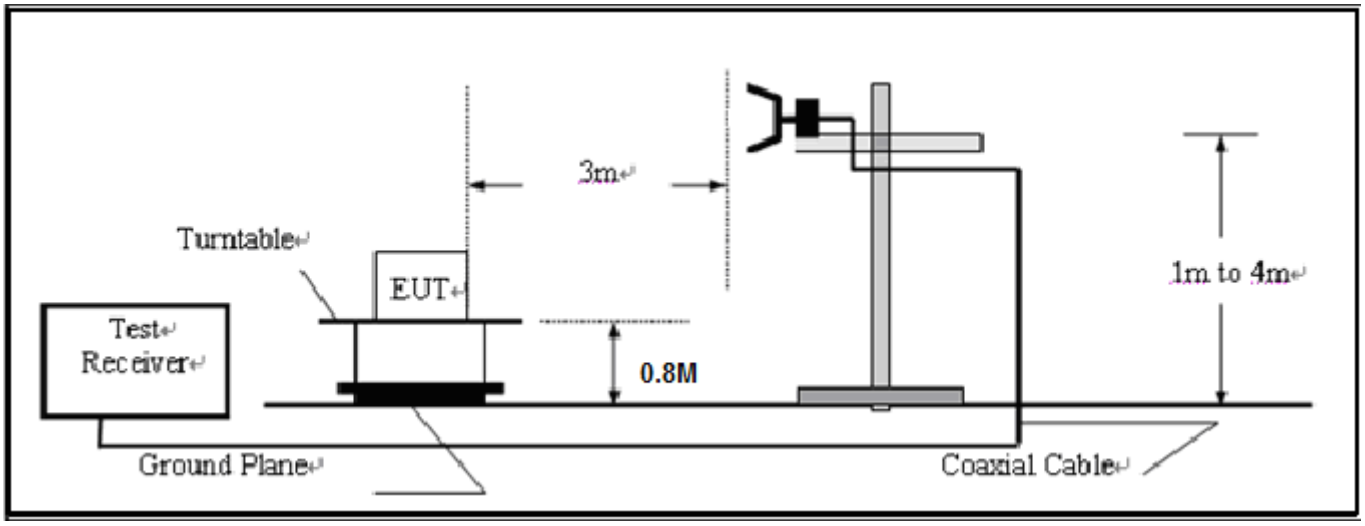
BELOW 30MHz:



30MHz-1000MHz:



ABOVE 1000MHz:



6.6. TEST RESULTS

TEST RESULT OF RADIATED EMISSION TEST (9KHZ-30MHZ)

Freq. (MHz)	Level (dB uV)	Over Limit (dB)	Limit Line (dB uV)	Remark
--	--	--	--	Seen to Note

***Note:*

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be report.

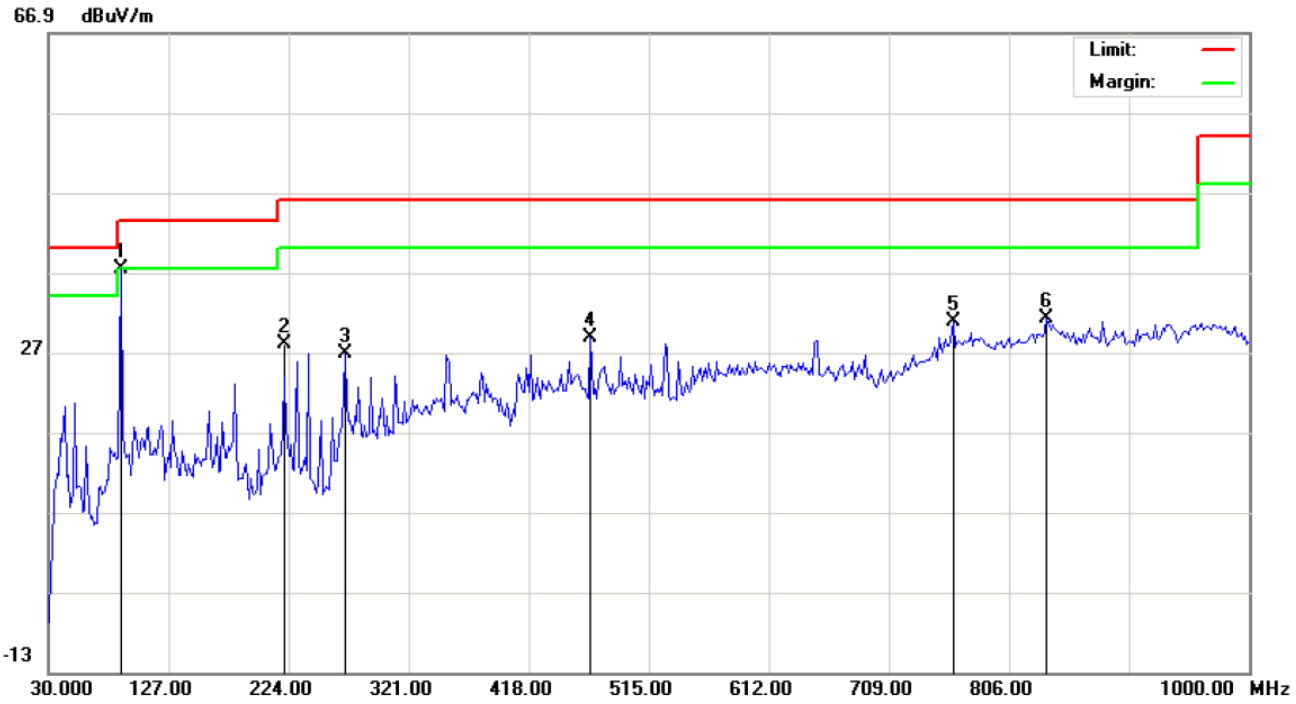
Distance extrapolation factor=40 log(specific distance/test distance)(dB);

Limit line=specific limits(dBuV)+distance extrapolation factor.

TEST RESULT OF RADIATED EMISSION TEST (30MHZ-1GHZ)

The worst test mode is Low Channel-TX.

Horizontal:



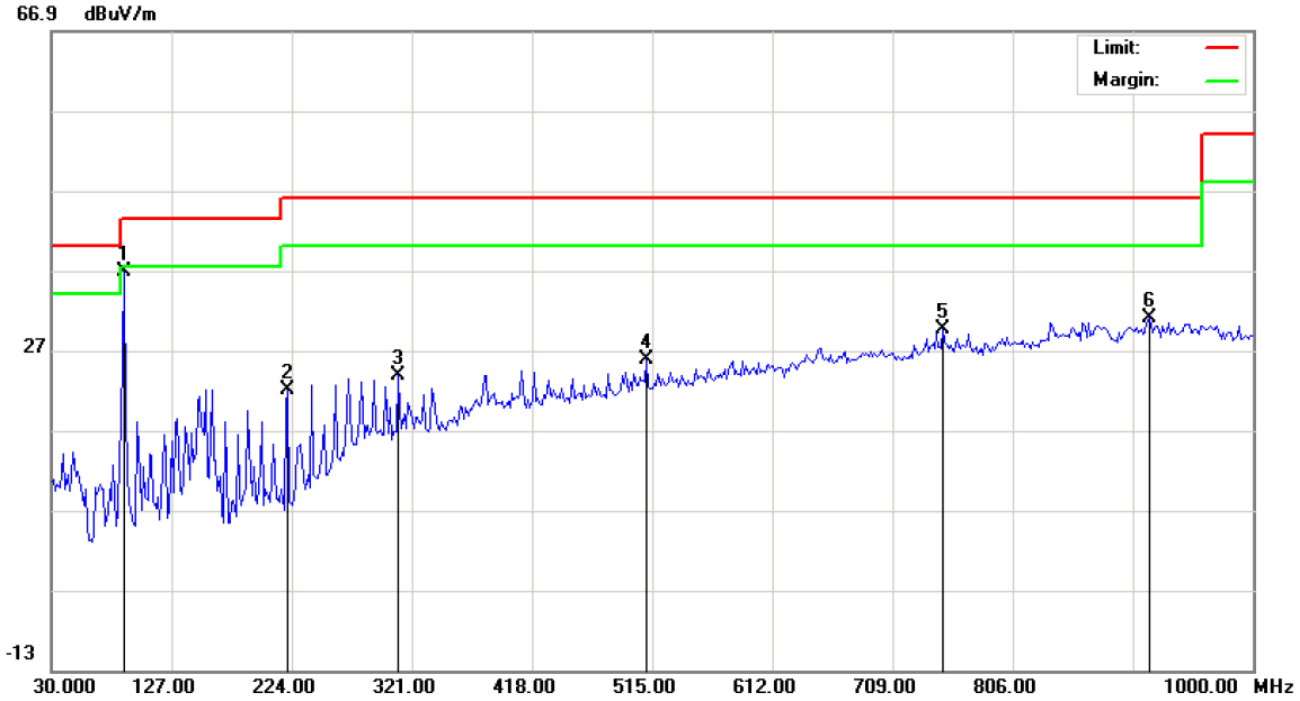
Site: site #1
Limit: FCC Class B 3M Radiation
EUT: FM Transmitter
M/N: F30
Mode: Low channel-TX
Note:

Polarization: ***Horizontal***
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	88.2000	21.37	16.03	37.40	43.50	-6.10	peak			
2		220.7667	15.56	12.47	28.03	46.00	-17.97	peak			
3		269.2667	9.95	16.89	26.84	46.00	-19.16	peak			
4		468.1167	7.22	21.58	28.80	46.00	-17.20	peak			
5		760.7333	3.31	27.57	30.88	46.00	-15.12	peak			
6		836.7166	0.45	30.81	31.26	46.00	-14.74	peak			

Vertical:



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: FM Transmitter
M/N: F30
Mode: Low channel-TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	88.2000	29.85	6.91	36.76	43.50	-6.74	peak			
2		220.7667	14.50	7.56	22.06	46.00	-23.94	peak			
3		309.6832	6.23	17.63	23.86	46.00	-22.14	peak			
4		510.1500	2.74	23.13	25.87	46.00	-20.13	peak			
5		749.4167	2.09	27.51	29.60	46.00	-16.40	peak			
6		915.9333	4.23	26.68	30.91	46.00	-15.09	peak			

TEST RESULT OF RADIATED EMISSION TEST (ABOVE 1000MHZ)

Freq. (MHz)	Level (dB uV)	Over Limit (dB)	Limit Line (dB uV)	Remark
--	--	--	--	Seen to Note

***Note:*

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be report.

7. §15.239(a) EMISSION BANDWIDTH TESTING

7.1. TEST LIMIT

According to FCC 15.239(a), 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.

7.2. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	06/27/2011	06/26/2012
RECEIVER ANTENNA	ETS	2175	57337	06/27/2011	06/26/2012
COAXIAL CABLE	ETS	SUCOFLEX 104	25498514	06/27/2011	06/26/2012

7.3. TEST PROCEDURE

The EUT was modulated by 1.0 KHz audio signal from the MP4 can achieve the maximum audio input.

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna, which was connected to the spectrum analyzer with the START, and STOP frequencies set to the EUT's operation band.

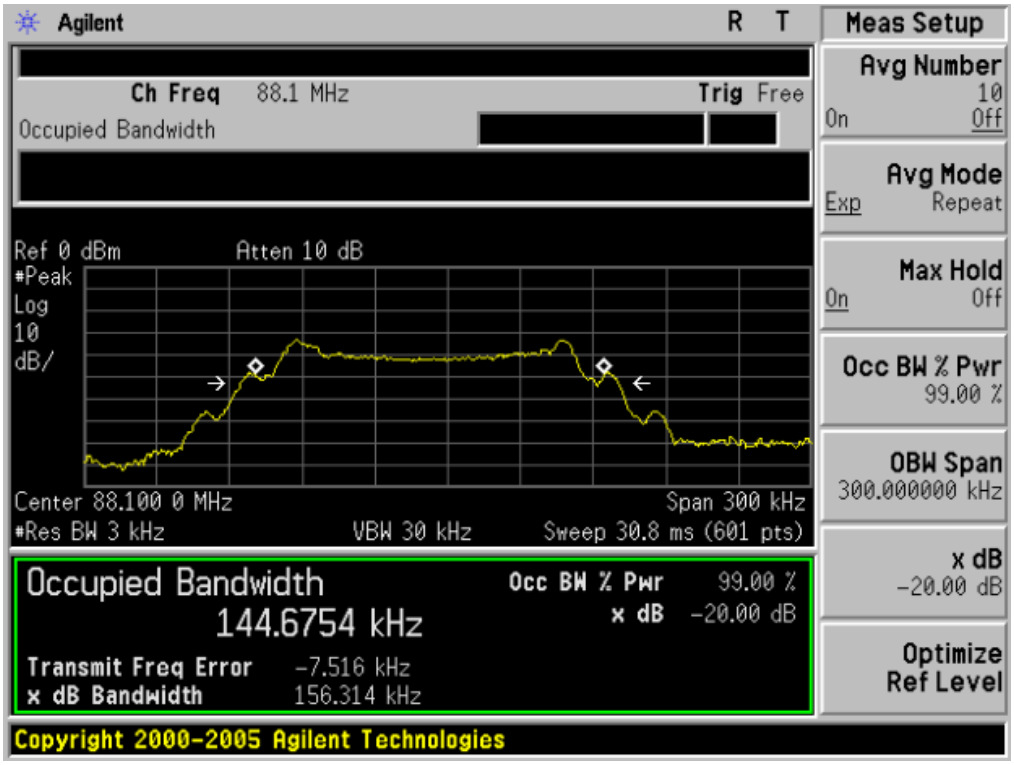
7.4. TEST RESULTS

Operation Mode:	FM Transmitter	Test Date:	Mar.03, 2011
Temperature:	25°C	Tested by:	Leo
Humidity:	55 % RH		

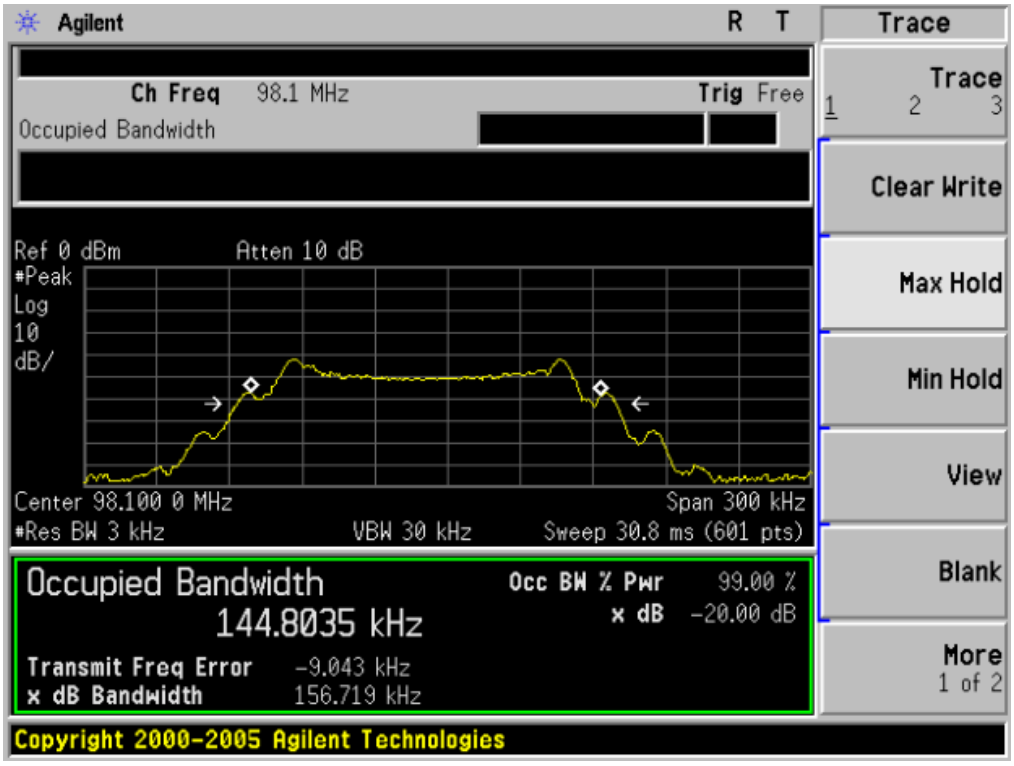
Frequency (MHz)	Emission Bandwidth (KHz)	Limit (KHz)
88.1	156.31	≦200KHz
98.1	156.72	≦200KHz
107.9	156.95	≦200KHz

Test Result: Pass

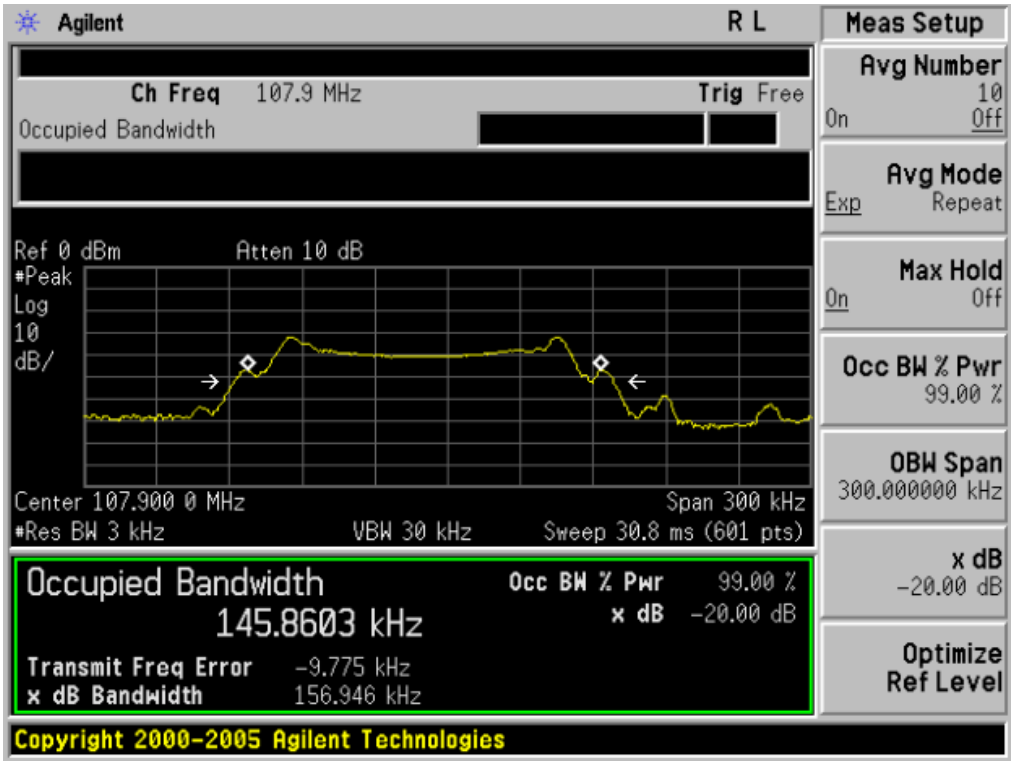
Low Channel :



Middle Channel :



High Channel :



8. § 15.239(c) OUT OF BAND EMISSIONS

8.1. TEST LIMIT

According to §15.239(c), 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.

8.2. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	06/27/2011	06/26/2012
BICONICAL ANTENNA	A.H.	SAS-521-4	128	06/27/2011	06/26/2012
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	06/27/2011	06/26/2012

8.3. TEST PROCEDURE

The EUT was modulated by 1.0 KHz audio signal from the MP4 which the volume is adjusted to maximum.

As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 88MHz to 108MHz, than mark the higher-level emission for comparing with the FCC rules.the worst data record in the Test report.

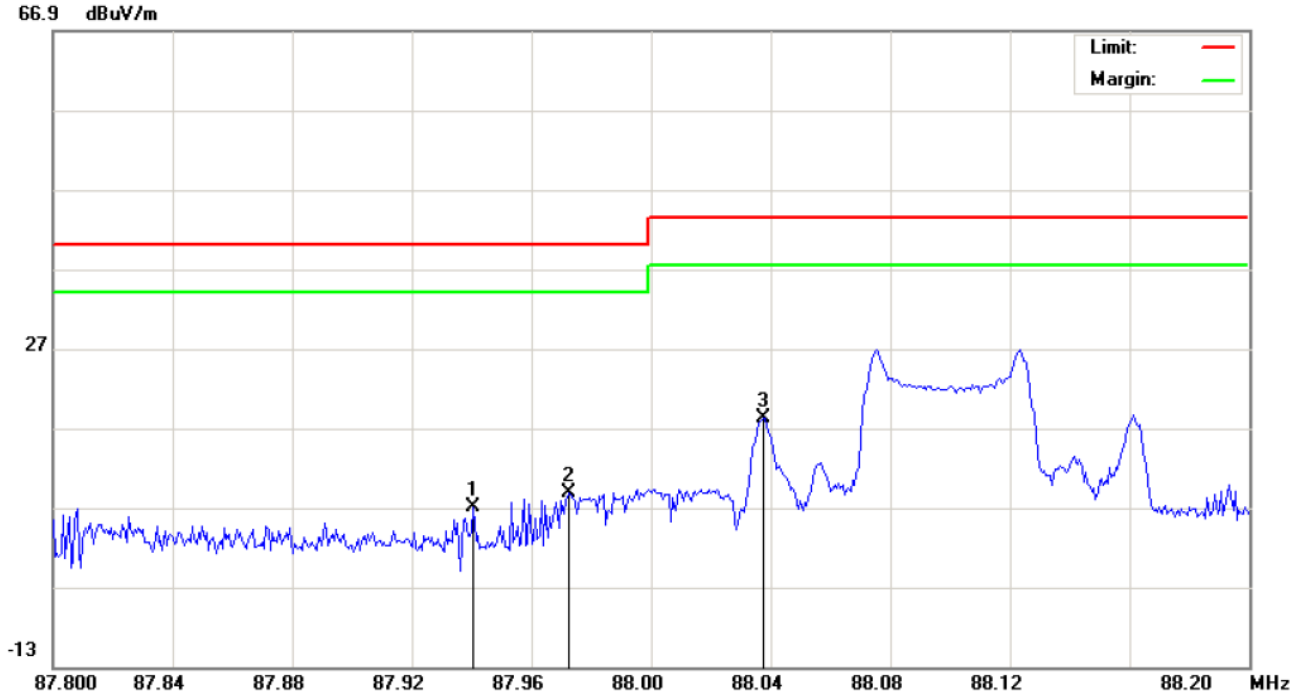
8.4. TEST RESULTS

Operation Mode:	FM Transmitter	Test Date:	Mar.03, 2012
Temperature:	25°C	Tested by:	Leo
Humidity:	55 % RH		

Test Result: Pass

Refer to the attached plots.

Low Channel-TX:

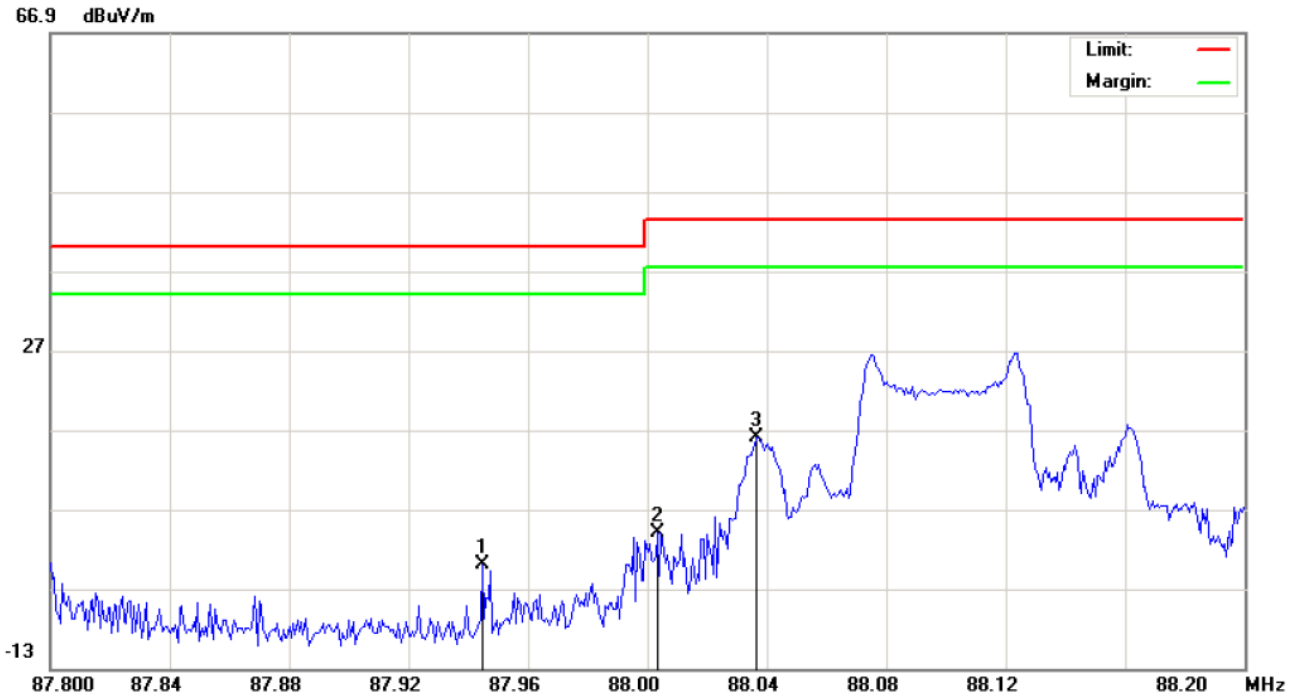


Site: site #1
Limit: FCC Class B 3M Radiation
EUT: FM Transmitter
M/N: F30
Mode: Low channel-TX
Note:

Polarization: ***Horizontal***
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		87.9407	-8.80	15.86	7.06	40.00	-32.94	peak			
2		87.9727	-7.08	15.88	8.80	40.00	-31.20	peak			
3	*	88.0373	2.30	15.92	18.22	43.50	-25.28	peak			



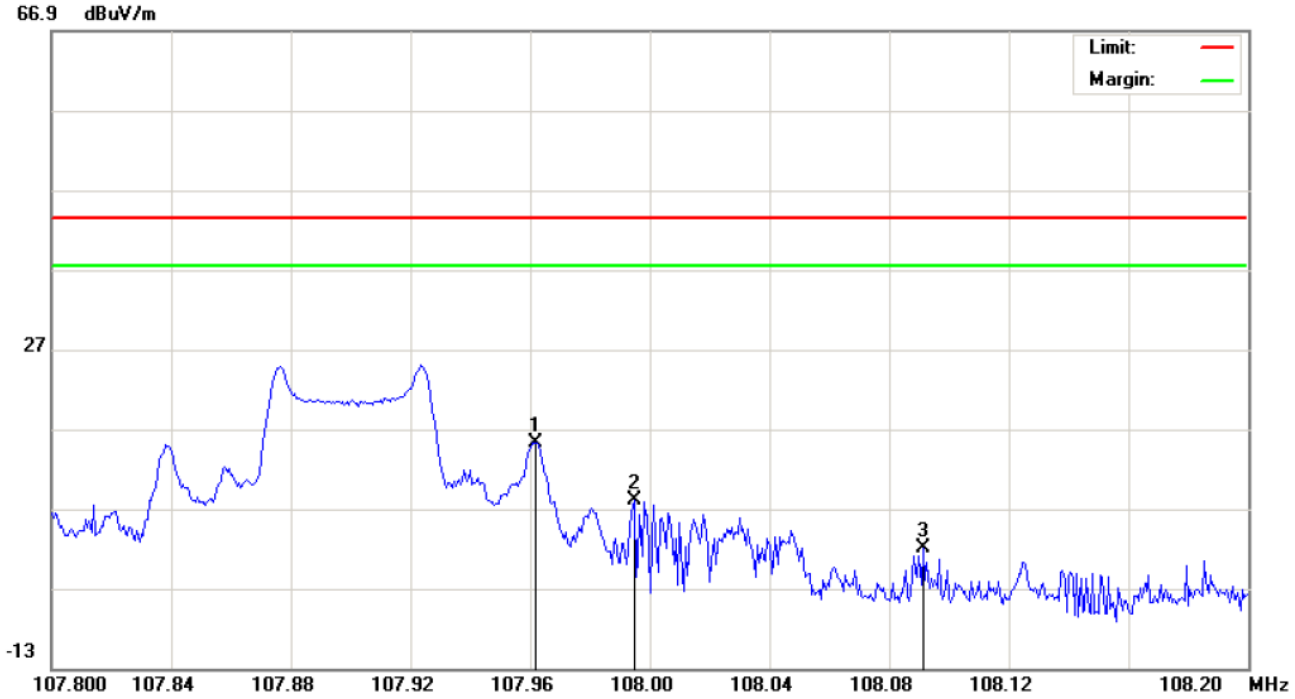
Site: site #1
Limit: FCC Class B 3M Radiation
EUT: FM Transmitter
M/N: F30
Mode: Low channel-TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		87.9446	-6.77	6.68	-0.09	40.00	-40.09	peak			
2		88.0032	-2.64	6.74	4.10	43.50	-39.40	peak			
3	*	88.0366	9.26	6.77	16.03	43.50	-27.47	peak			

High Channel-TX:

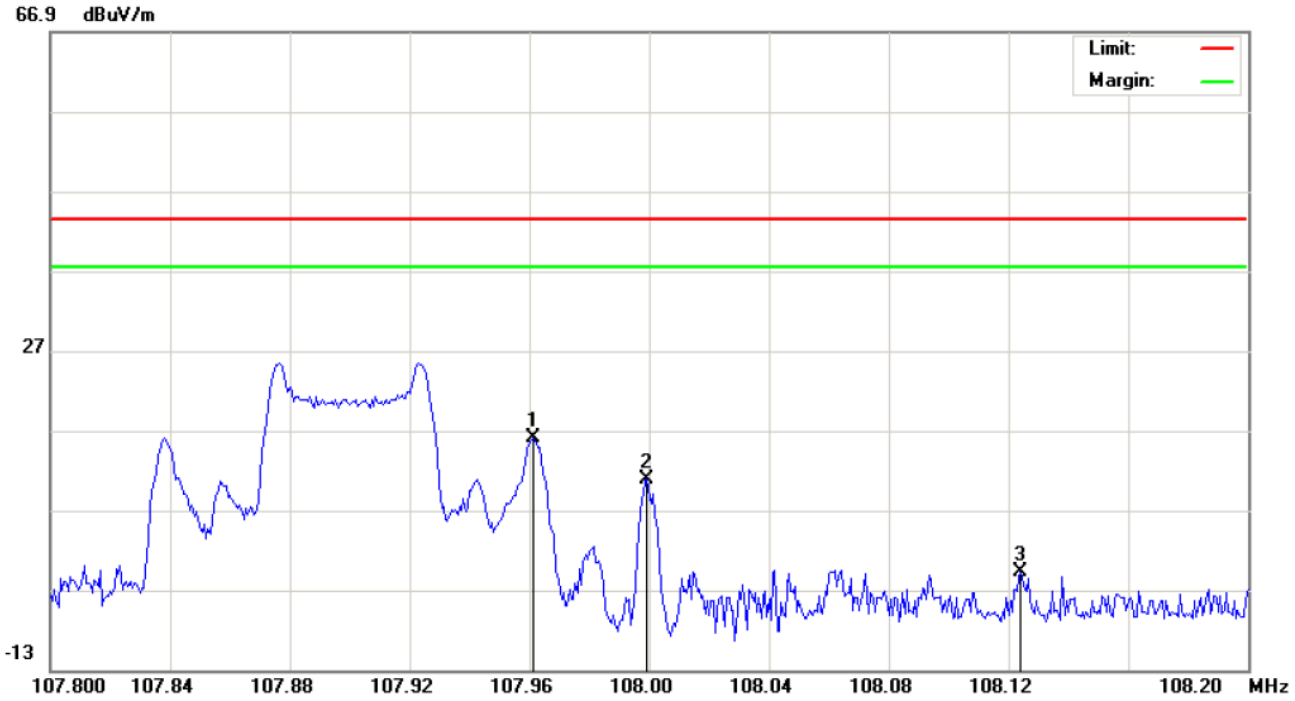


Site: site #1
Limit: FCC Class B 3M Radiation
EUT: FM Transmitter
M/N: F30
Mode: High channel-TX
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	107.9620	2.28	12.99	15.27	43.50	-28.23	peak			
2		107.9947	-5.04	12.99	7.95	43.50	-35.55	peak			
3		108.0913	-11.07	13.00	1.93	43.50	-41.57	peak			



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: FM Transmitter
M/N: F30
Mode: High channel-TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
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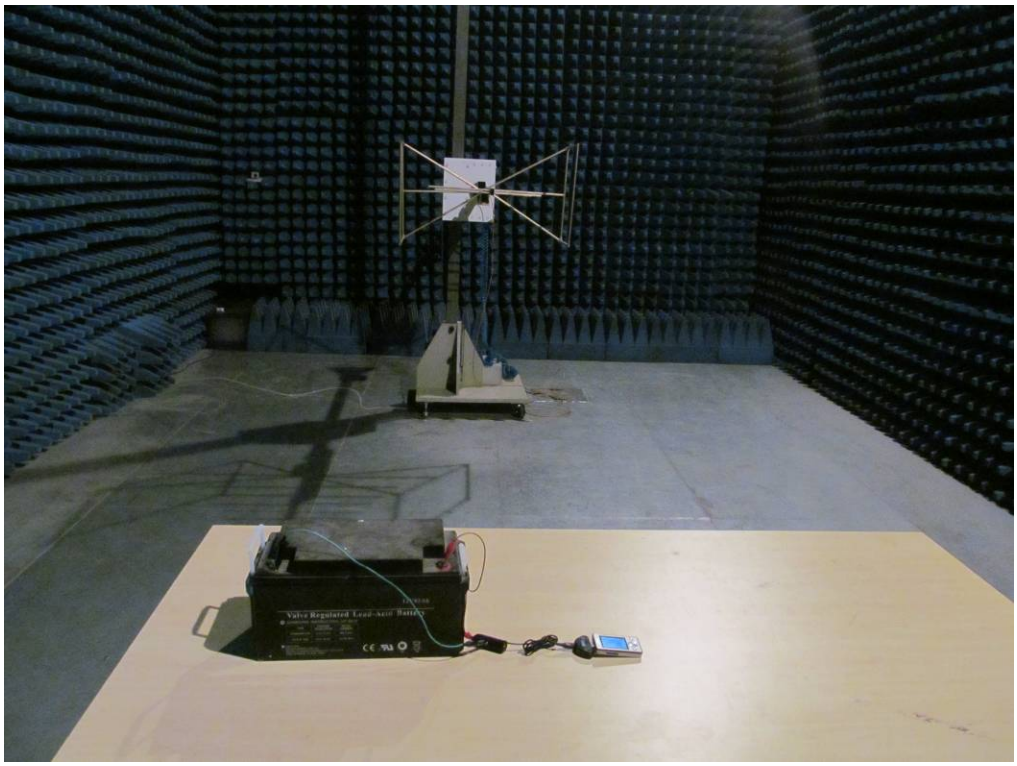
No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	107.9612	6.09	9.88	15.97	43.50	-27.53	peak			
2		107.9993	0.98	9.89	10.87	43.50	-32.63	peak			
3		108.1239	-10.77	9.92	-0.85	43.50	-44.35	peak			

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

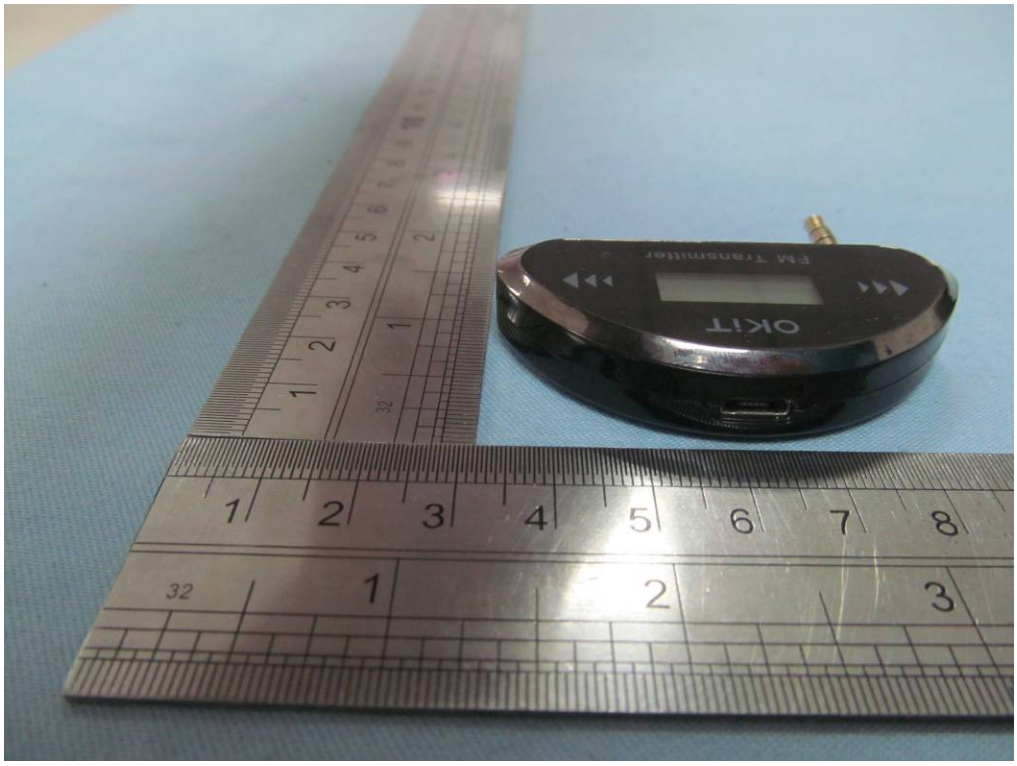
Radiated Emission Test Setup



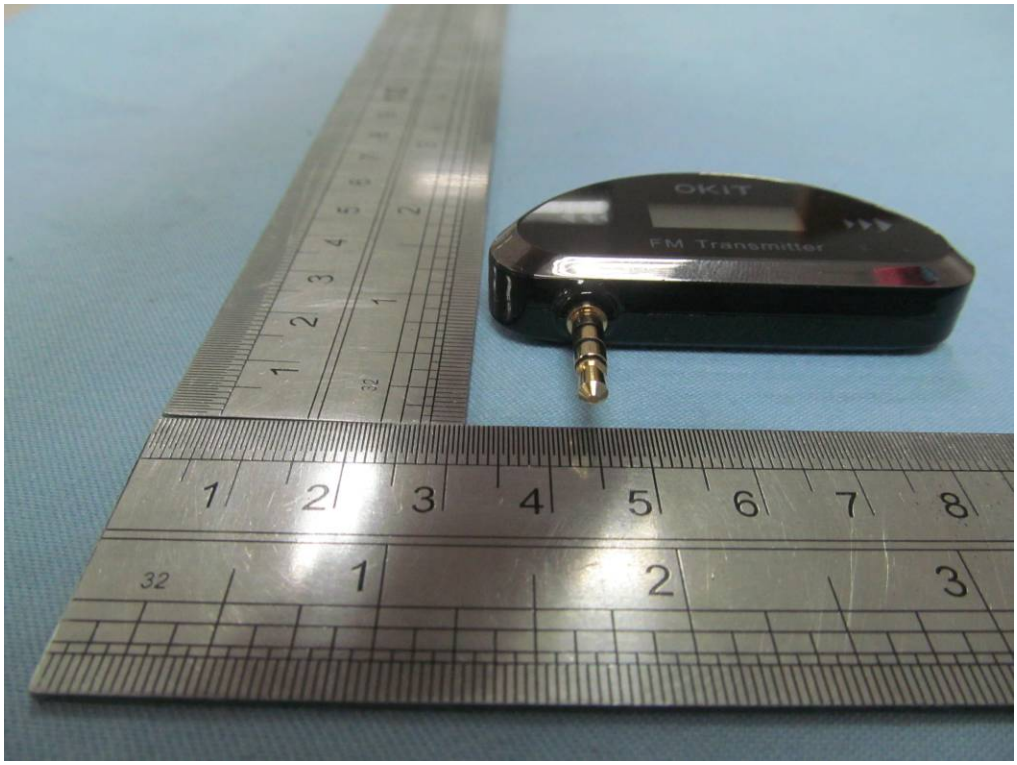
APPENDIX 2
PHOTOGRAPHS OF EUT

WHOLE VIEW OF EUT

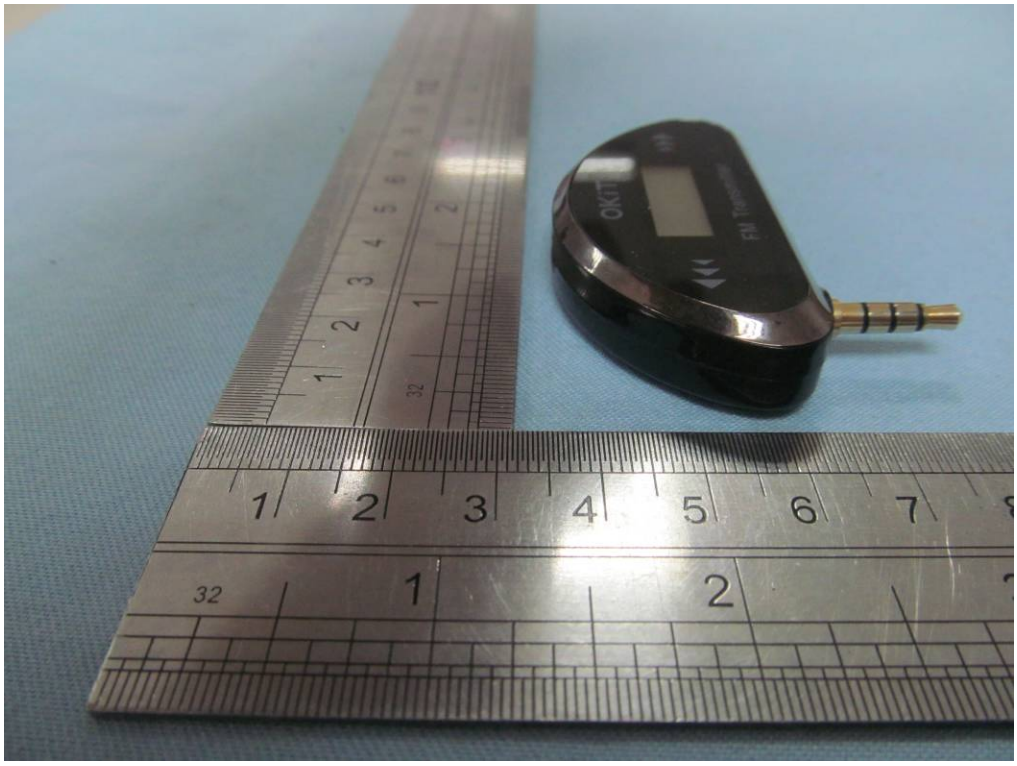
TOP VIEW OF EUT



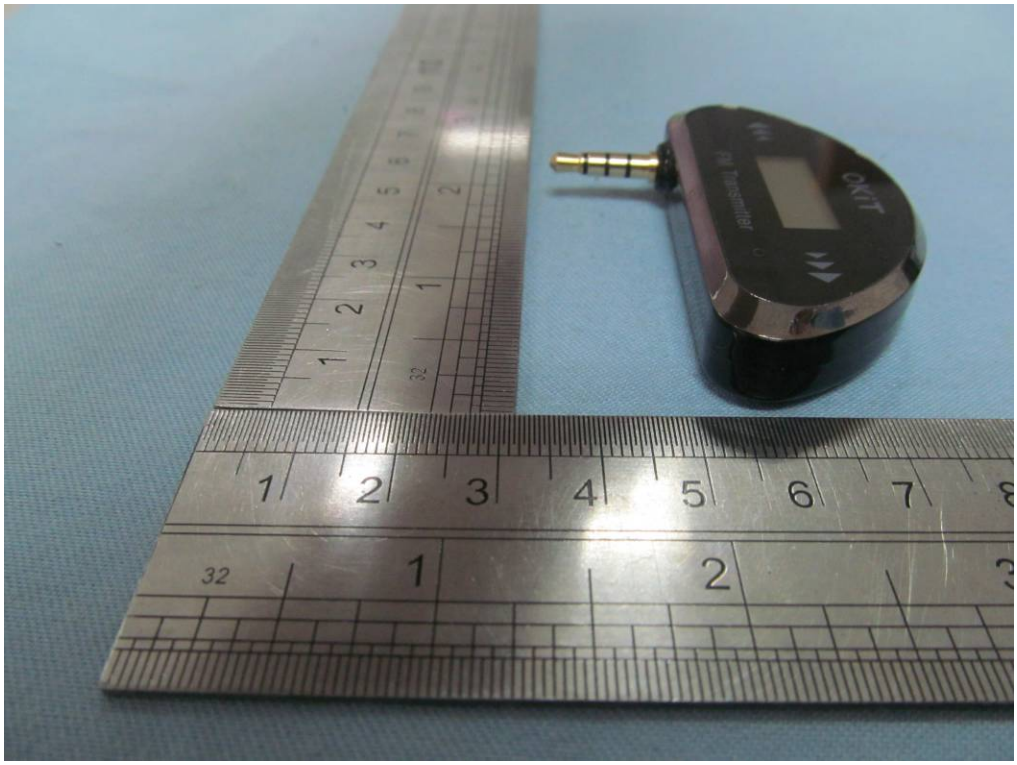
BOTTOM VIEW OF EUT



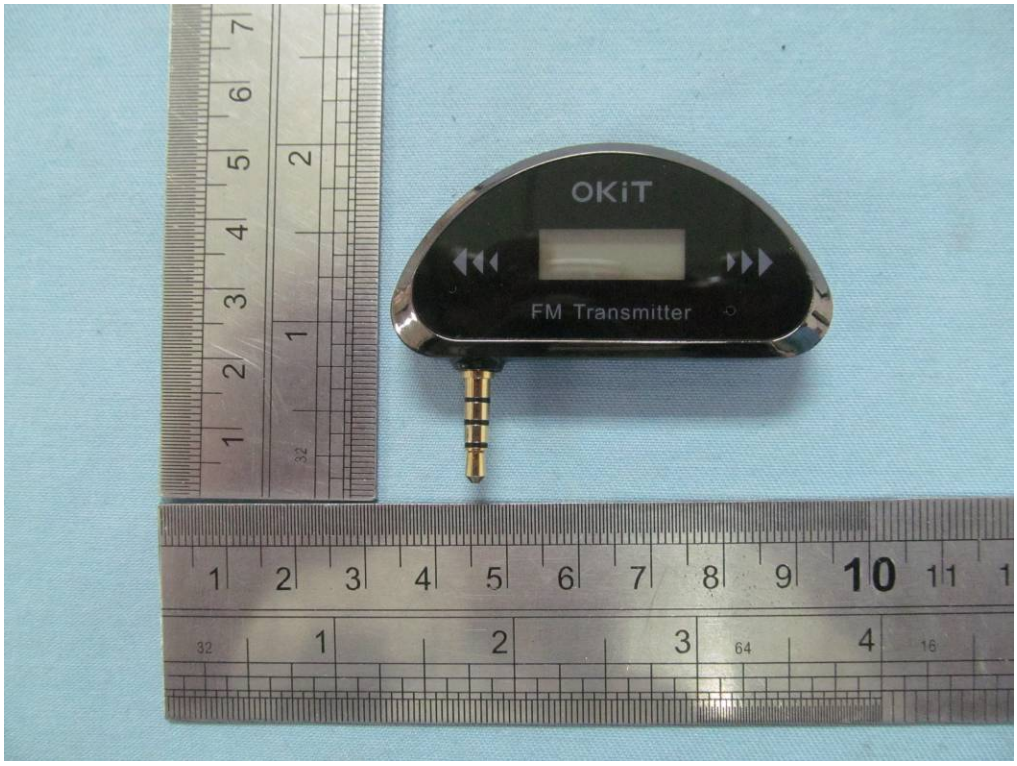
LEFT VIEW OF EUT



RIGHT VIEW OF EUT

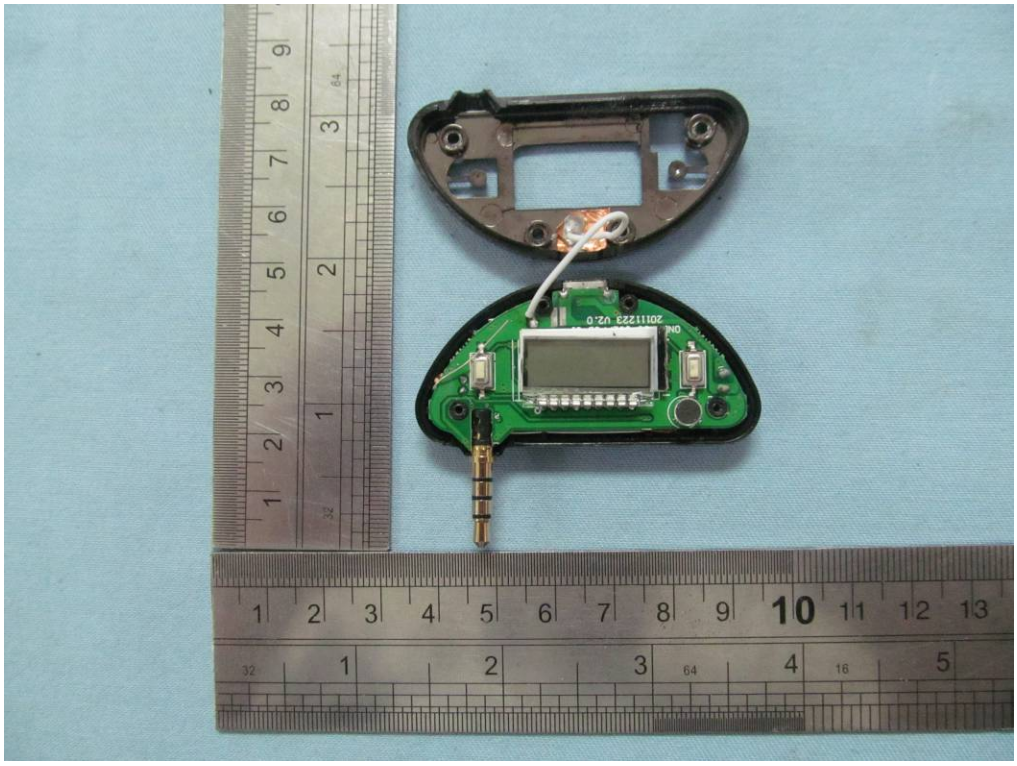


FRONT VIEW OF EUT

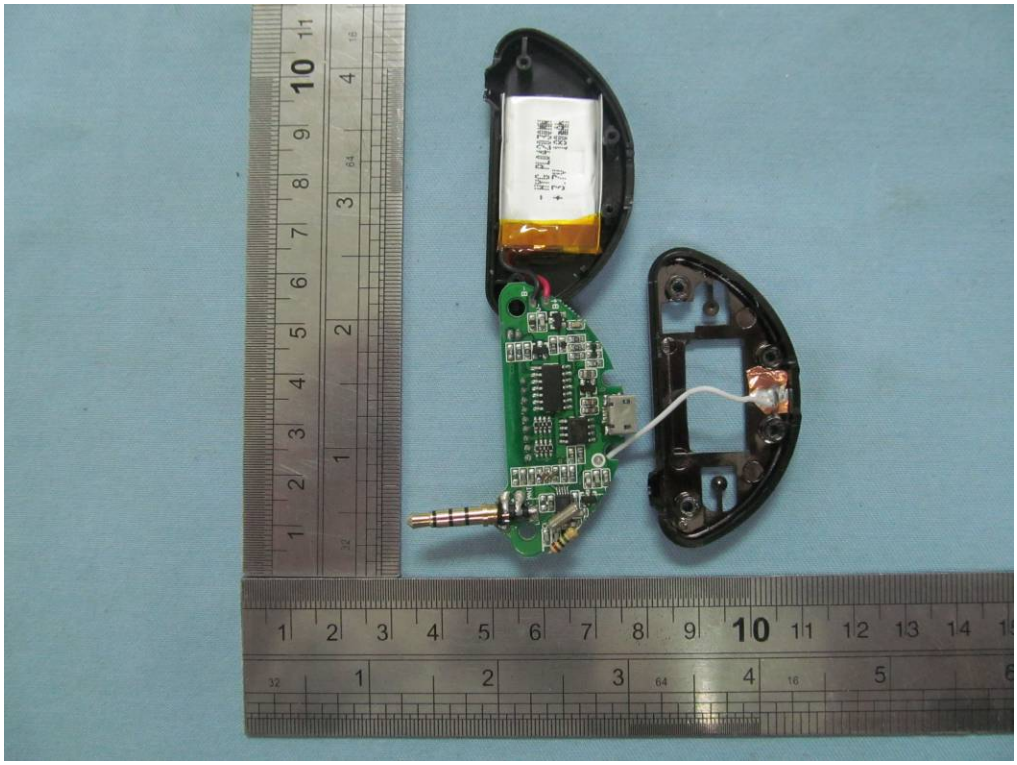


BACK VIEW OF EUT

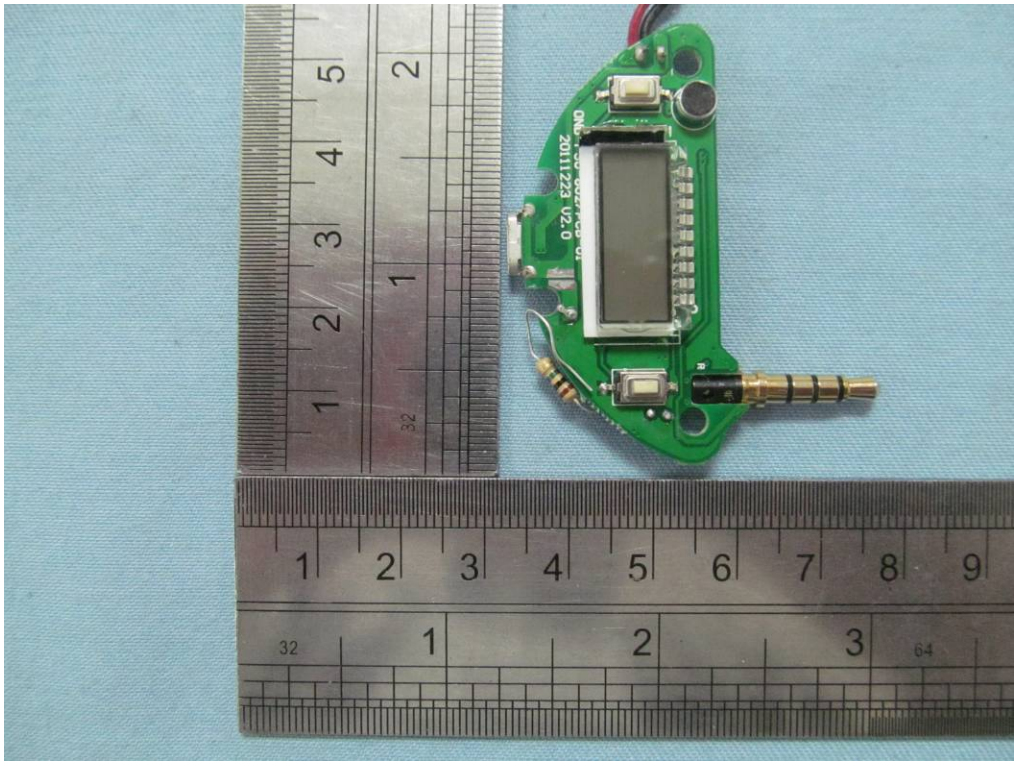
OPEN VIEW OF EUT



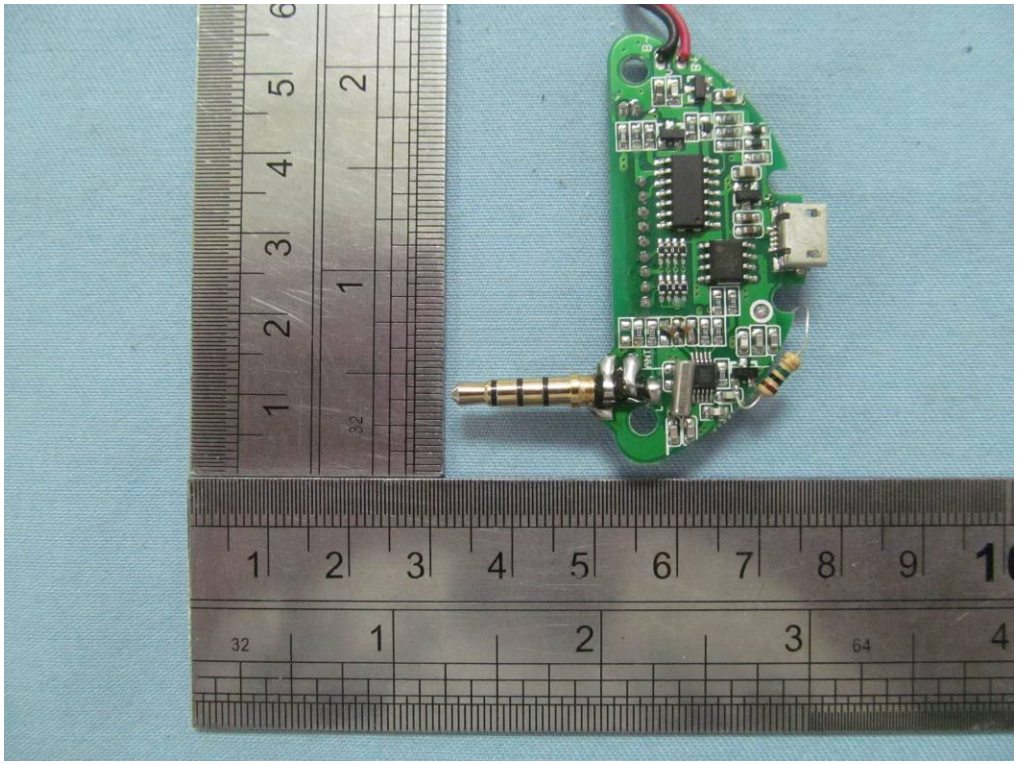
INTERNAL VIEW OF EUT



FRONT VIEW OF PCB

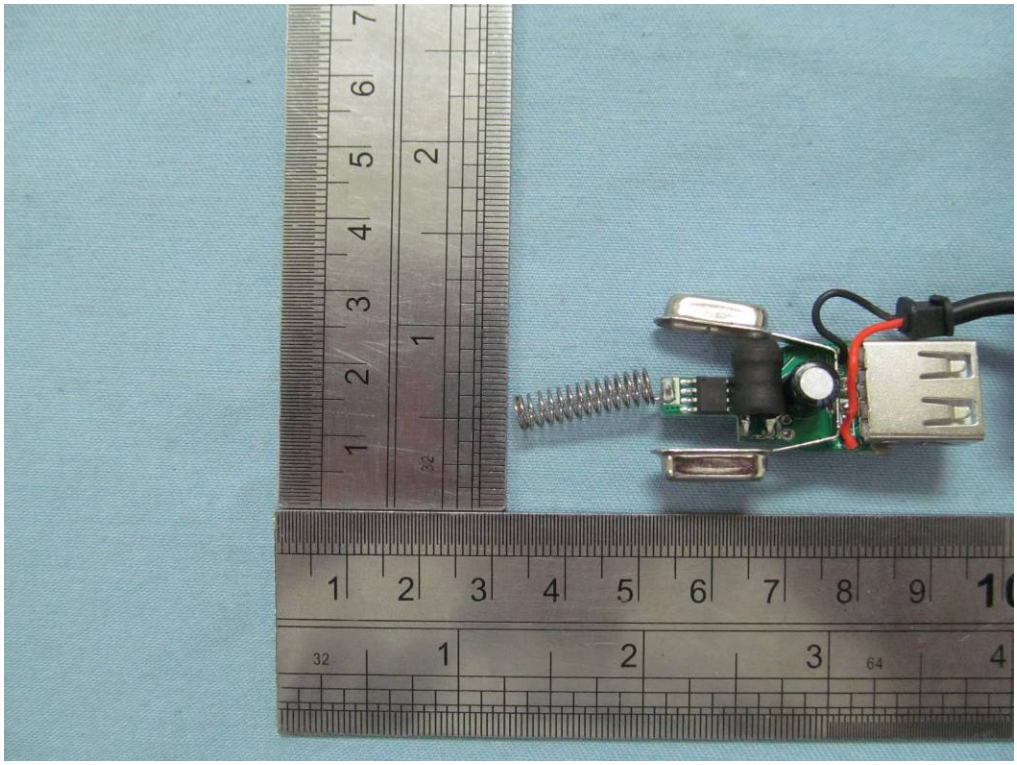


BACK VIEW OF PCB

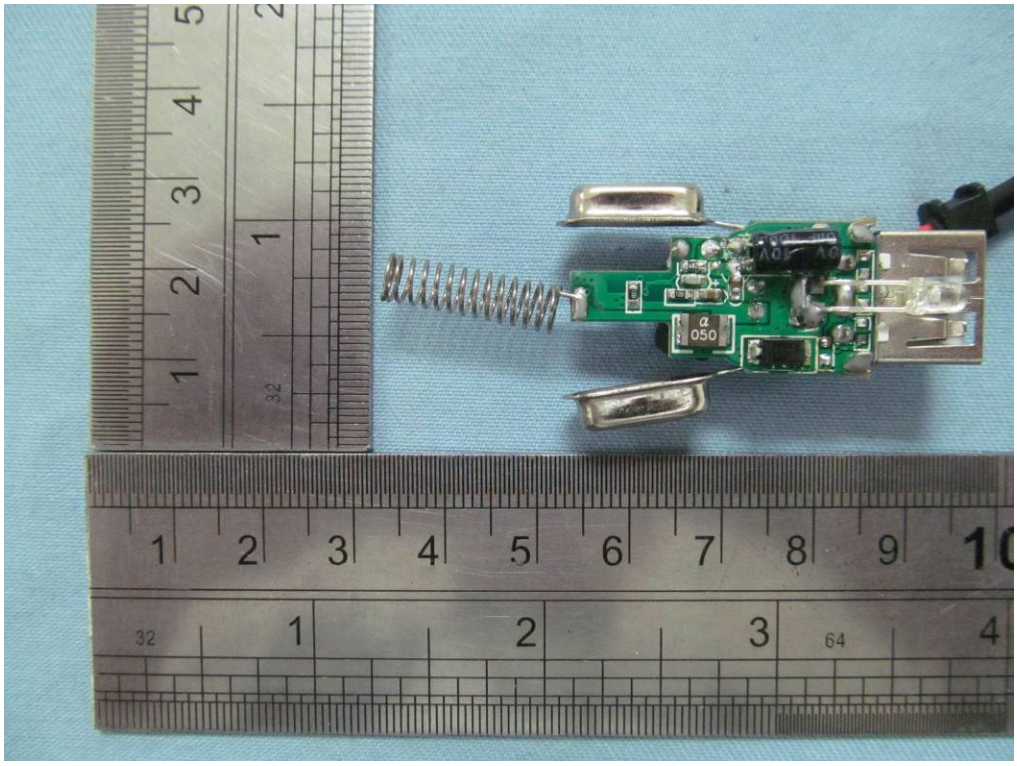


OPEN VIEW OF VEHICLE CHARGER

FRONT VIEW OF PCB-1



BACK VIEW OF PCB-1



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