

TEST REPORT

Applicant Name & Address : Scosche Industries
P. O. Box 2901, Oxnard, CA 93034, U.S.A.
Manufacturing Site : PH Marketing Limited
Block B23, 1st Industrial Area, Phoenix Village, Fuyong Town, Shenzhen,
China

Sample Description
Product : FM Transmitter
Model No. : FMTD3
Electrical Rating : 12 V DC
FCC ID : IKQFMTD3

Date Received : 10 March 2007
Date Test Conducted : 20 March – 18 April 2008

Test standards : **FCC Part 15: 2007**

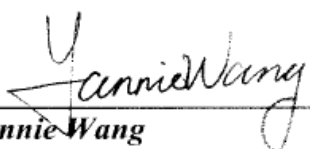
Test Result : Pass

Conclusion : The submitted samples complied with the above rules/standards.

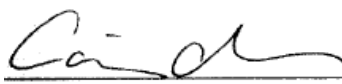
Remark : None.

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Prepared By:


Yannie Wang
Assistant Manager
Intertek Guangzhou

Checked By:

 · **Signature**
Carrie Chen
Project Engineer
Intertek Guangzhou
18 April 2008 **Date**

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Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
1~8th floor, Block E2, 11 Cai Pin Road, Science city, Guangzhou Economic Development Zone, Guangzhou, China
Telephone/Fax: 86-20-8213 9688/86-20-3205 7538

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TEST RESULTS SUMMARY**Classification of EUT: Intentional radiator**

Test Item	Standard	Result
Conducted Emission	15.207, FCC Part 15: 2007	N/A
Radiated Emission	15.239, FCC Part 15: 2007 ANSI C63.4: 2003, section 13	Pass
Emission Bandwidth	15.239(a), FCC Part 15: 2007 ANSI C63.4: 2003, section 13.1.7	Pass

Remark: 1. The symbol "N/A" in above table means Not Applicable.**2. When determining the test results, measurement uncertainty of tests has been considered.**

2

Test Results Conclusion
(with Justification)

RE: EMC Testing Pursuant to FCC Part 15: 2007 Performed On the FM Transmitter, Model: FMTD3.

We tested the FM Transmitter, Model: FMTD3, to determine if it was in compliance with the relevant FCC rules as marked on the Test Results Summary. We found that the unit met the requirement of FCC Part 15, Subpart C: 2007 when tested as received. The worst case's test data was presented in this test report. Radiated Emission and Emission Bandwidth were subcontracted to Shenzhen Academy of Metrology and Quality Inspection, the FCC registration number for semi-anechoic chamber is 274801.

The device has been modified to pass the FCC Part 15. The production units are required to conform to the modified sample when the units are placed on the market.

3 LABORATORY MEASUREMENTS

3.1 General Description of the EUT

Equipment Under Test (EUT):	FM Transmitter
Model:	FMTD3
Serial No.:	N/A
Rated Voltage:	12 VDC
Modulation Type:	FM
Carrier Frequency:	88.1-107.9 MHz
Number of Channels:	100
Separation between two channels:	200 kHz
Antenna Type:	Printed antenna on PCB
Antenna Joint Type:	N/A
Data Cable:	N/A
I/O Ports:	N/A
Associated Devices:	N/A

Note: The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specification or user's manual.

3.2 Brief Functional Description

The EUT is a car FM transmitter, powered by car cigarette lighter, it can transmit signal to car stereo by using the FM channel. It modulates audio signal into FM signal and transmits wirelessly and can be connected to portable devices such as iPod, MP3, PDA or CD players through audio input jack. Built-in FM wireless transmitter, transmitting range is 88.1 MHz ~ 107.9 MHz, total 100 channels.

3.3 Test Modes of the EUT

After Tuning Range Checking, it is found that the tuning controls are manually adjusted and maximum tuning range within 88.1 to 107.9 MHz.

100 channels are provided to the EUT:

Freq.(MHz)	88.1	88.3	88.5	88.7	88.9	89.1	89.3	89.5	89.7	89.9
Freq.(MHz)	90.1	90.3	90.5	90.7	90.9	91.1	91.3	91.5	91.7	91.9
Freq.(MHz)	92.1	92.3	92.5	92.7	92.9	93.1	93.3	93.5	93.7	93.9
Freq.(MHz)	94.1	94.3	94.5	94.7	94.9	95.1	95.3	95.5	95.7	95.9
Freq.(MHz)	96.1	96.3	96.5	96.7	96.9	97.1	97.3	97.5	97.7	97.9

Freq.(MHz)	98.1	98.3	98.5	98.7	98.9	99.1	99.3	99.5	99.7	99.9
Freq.(MHz)	100.1	100.3	100.5	100.7	100.9	101.1	101.3	101.5	101.7	101.9
Freq.(MHz)	102.1	102.3	102.5	102.7	102.9	103.1	103.3	103.5	103.7	103.9
Freq.(MHz)	104.1	104.3	104.5	104.7	104.9	105.1	105.3	105.5	105.7	105.9
Freq.(MHz)	106.1	106.3	106.5	106.7	106.9	107.1	107.3	107.5	107.7	107.9

The Lowest (88.1 MHz), Middle (98.1 MHz) and Highest (107.9 MHz) channels were selected to test individually. The EUT was powered by a 12 V battery during test.

3.4 Description of Support Units

The EUT has been tested together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Name of Support Units or Accessories	Number	Brand	Model
1	MP3 Player	--	IPOD	Video 3G
2	12 V Battery	--	Power Kingdom	PS4-12

No.	Cable Description of the above support units
1	1.5 m non-shielded DC power cable

4 TEST RESULTS

4.1 Conducted Emission Test

Test Result: Not Applicable

Remark:

Since the EUT neither has AC port nor intends to be connected to the AC power source and is powered by the vehicle battery, so the test item is not applicable.

4.2 Radiated Emission

Test Result: Pass

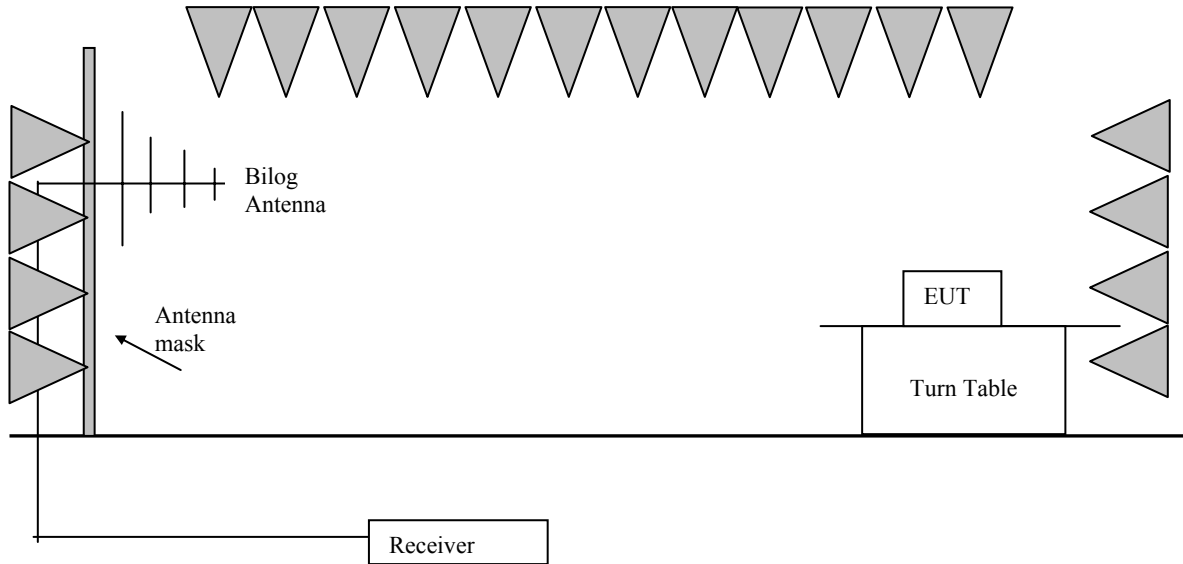
4.2.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer	Mature Date of Calibration
SB3436	EMI receiver	ESIB 26	R&S	24 Jan., 2009
SB3345	Loop Antenna	FMZB1516	Schwarzbeck	24 Jan., 2009
SB3440	Broadband Antenna	CBL6112B	Chase	24 Jan., 2009
SB3450	3 m SAC	9*6*6m	Albatross Project	24 Jan., 2009

Note:

1. The calibration interval of the above test equipment is 12 months.
2. The Broadband Antenna whose test frequency range is from 30 MHz to 2 GHz is used.

4.2.2 Block Diagram of Test Setup



For the actual test configuration, please refer to 4.2.3 Test Setup and Procedure in this test report.

4.2.3 Test Setup and Procedure

The measurement was applied in a 3 m semi-anechoic chamber. The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The EUT azimuth and the turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mask. The Loop Antenna and Broadband antenna were used.

Broadband antenna was moved up and down from 1 meter to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interface cables were manipulated during radiated test. The bandwidth setting on R&S Test Receiver was 120 kHz. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

The frequency range checked is from 9 kHz to the tenth harmonic of highest fundamental frequency or to 40 GHz, whichever is lower.

4.2.4 Limits of Radiated Emission

According to clause 15.239 the field strength of emission from intentional radiators within the permitted 200 kHz band shall not exceed the following limits at 3 meters:

Fundamental Frequency (MHz)	Field Strength of Fundamental at 3 meters			
	Peak (μ V/m)	Peak (dB μ V/m)	Average (μ V/m)	Average (dB μ V/m)
88-108	2500	68	250	48

Emission radiated outside of the specified 200 kHz band shall not exceed the general radiated limits in clause 15.209 as follows:

Frequency (MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	/	300
0.490-1.705	24000/F(kHz)	/	30
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

Note: 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.

On any frequency below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified.

Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

4.2.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor to Net value. The basic equation is as follows:

- Emission level($\text{dB } \mu\text{V/m}$)= Net value($\text{dB } \mu\text{V}$)+Correction Factor(dBm^{-1})
- Correction Factor(dBm^{-1})= Antenna Factor(dBm^{-1})+Cable Loss (dB)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

- Margin value = Emission level – Limit value

4.2.6 Test Data

Operating Mode: Transmitting

Channel: Lowest (Fundamental frequency is 88.10 MHz)

Frequency (MHz)	Antenna Polarity	Detector	Net ($\text{dB } \mu\text{V}$)	Antenna Factor (dB m^{-1})	Cable Loss (dB)	Emission ($\text{dB } \mu\text{V/m}$)	Limit at 3 m ($\text{dB } \mu\text{V/m}$)	Margin (dB)
88.1	H	PK	32.6	10.3	0.6	43.5	68	-24.5
88.1	H	AV	31.0	10.3	0.6	41.9	48	-6.1
176.2	H	QP	28.4	10.3	1.0	39.7	43.5	-3.8
352.4	H	QP	15.6	15.4	1.3	32.3	46.0	-13.7
88.1	V	PK	23.7	10.3	0.6	34.6	68	-33.4
88.1	V	AV	19.1	10.3	0.6	30.0	48	-18.0
176.2	V	QP	17.0	10.3	1.0	28.3	43.5	-15.2
492.0	V	QP	14.9	17.6	1.6	34.1	46.0	-11.9

Operating Mode: Transmitting

Channel: Middle (Fundamental frequency is 98.10 MHz)

Frequency (MHz)	Antenna Polarity	Detector	Net ($\text{dB } \mu\text{V}$)	Antenna Factor (dB m^{-1})	Cable Loss (dB)	Emission ($\text{dB } \mu\text{V/m}$)	Limit at 3 m ($\text{dB } \mu\text{V/m}$)	Margin (dB)
98.1	H	PK	35.2	11.7	0.7	47.6	68	-20.4
98.1	H	AV	28.2	11.7	0.7	40.6	48	-7.4
196.4	H	QP	29.8	9.9	1.0	40.7	43.5	-2.8
98.1	V	PK	25.1	11.7	0.7	37.5	68	-30.5
98.1	V	AV	15.7	11.7	0.7	28.1	48	-19.9
196.4	V	QP	25.4	9.9	1.0	36.3	43.5	-7.2

Operating Mode: Transmitting
Channel: Highest (Fundamental frequency is 107.90 MHz)

Frequency (MHz)	Antenna Polarity	Detector	Net (dB μ V)	Antenna Factor (dB m^{-1})	Cable Loss (dB)	Emission (dB μ V/m)	Limit at 3 m (dB μ V/m)	Margin (dB)
107.9	H	PK	27.0	12.5	0.8	40.3	68	-27.7
107.9	H	AV	25.9	12.5	0.8	39.2	48	-8.8
215.8	H	QP	27.0	10.0	1.0	38.0	43.5	-5.5
323.8	H	QP	22.7	14.0	1.3	38.0	46.0	-8.0
107.9	V	PK	28.1	12.5	0.8	41.4	68	-26.6
107.9	V	AV	24.6	12.5	0.8	37.9	48	-10.1
215.8	V	QP	27.0	10.0	1.0	38.0	43.5	-5.5
323.8	V	QP	22.7	14.0	1.3	38.0	46.0	-8.0

Remarks:

- All other emission levels were 20 dB below the limits.
- Emission level(dB μ V/m)= Net value(dB μ V)+Correction Factor(dB m^{-1})
- Correction Factor(dB m^{-1})= Antenna Factor(dB m^{-1})+Cable Loss (dB)
- Margin value = Emission level – Limit value

4.2.7 Measurement uncertainty

Uncertainty: 4.5 dB in the frequency range of 30-1000 MHz at a level of confidence of 95% as specified in CISPR 16-4-2: 2003. Measurement uncertainty is under consideration above 1000 MHz according to CISPR 16-4-2: 2003.

4.3 Emission Band Width

Test Result: Pass

4.3.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer	Mature Date of Calibration
SB3436	EMI receiver	ESIB 26	R&S	24 Jan., 2009
SB3440	Bilog Antenna	CBL6112B	Chase	24 Jan., 2009
SB3450	3 m SAC	9*6*6m	Albatross Project	24 Jan., 2009

4.3.2 Block Diagram of Test Setup

Same as 4.2.2.

4.3.3 Test Setup and Procedure

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 10 kHz RBW and 30 kHz VBW.

Plot the curve of unmodulated carrier, the peak point of this unmodulated carrier is the reference level. Modulated the FM transmitter as follows: properly tested with maximum audio input (user controls or audio input adjusted to maximize emission for test, use a typical audio file from iPod. Plot the curve of modulated carrier in the same plot of unmodulated carrier. Measured the 26 dB bandwidth and plotted the graph.

4.3.4 Limits of Emission Band Width

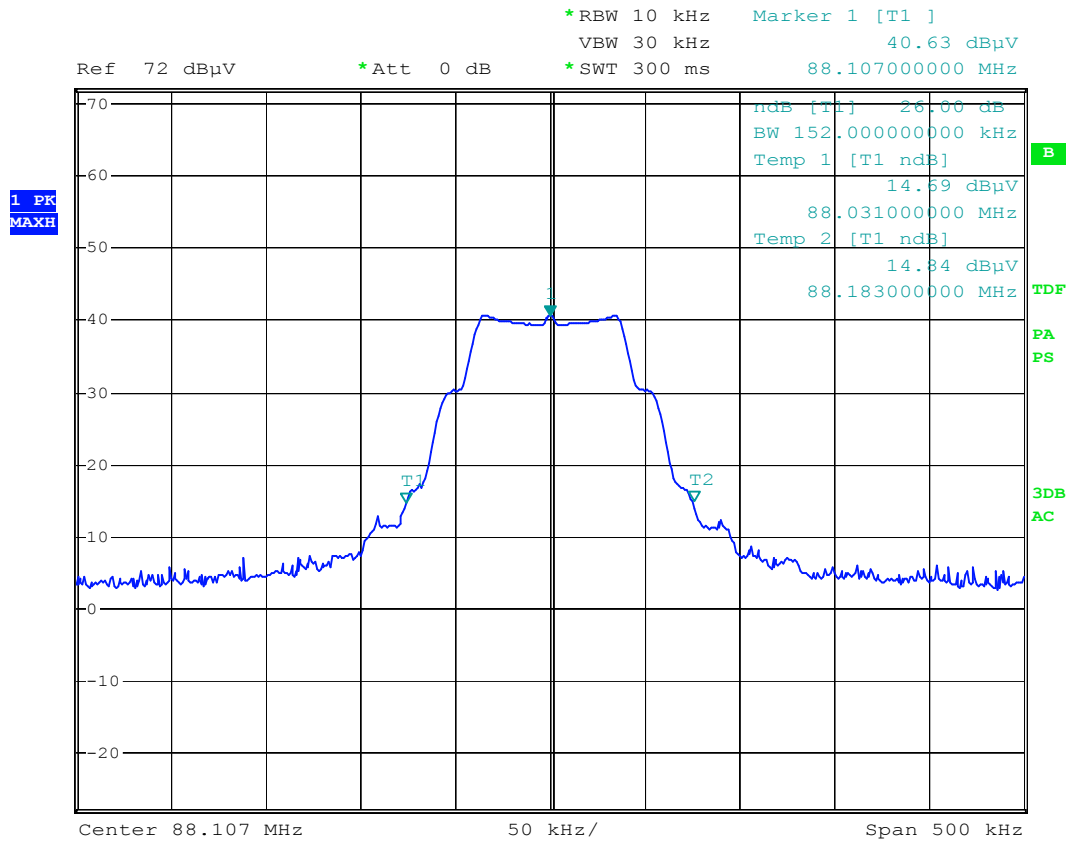
Maximum limit of emission band width is 200 kHz.

4.3.5 Test Data

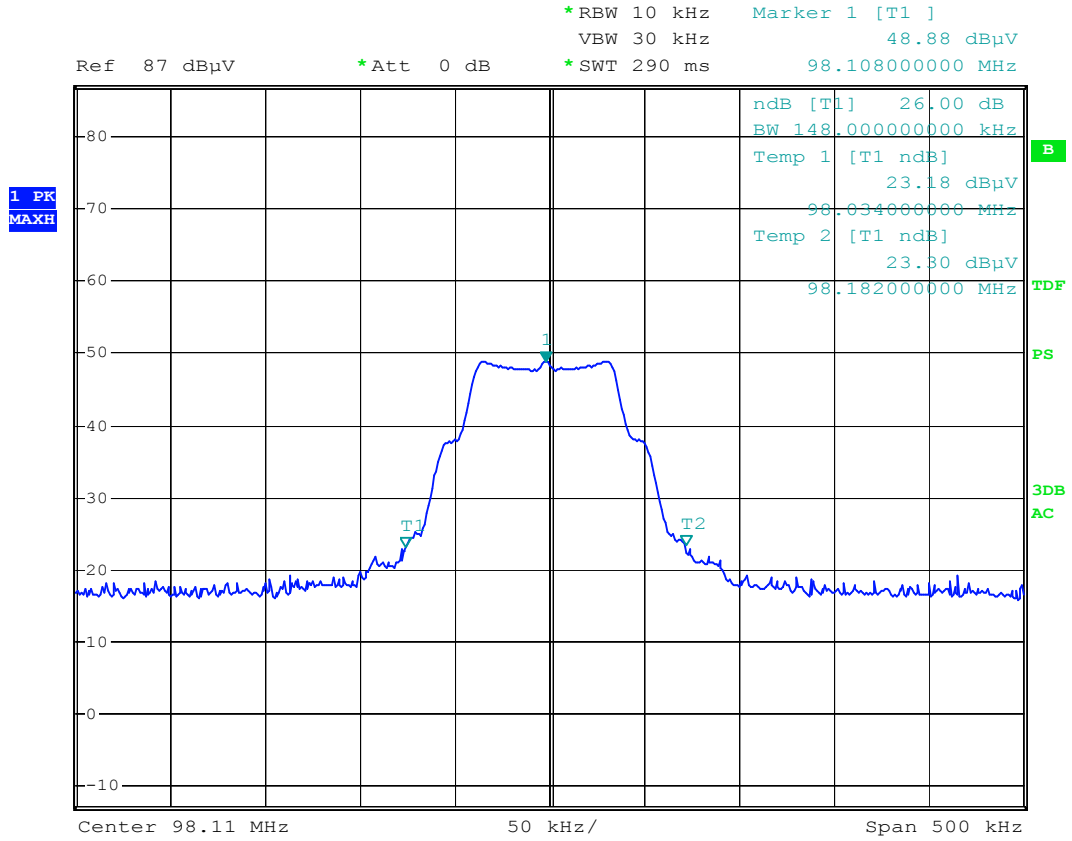
Channel	Channel Frequency (MHz)	26dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/Fail
Lowest	88.1	152	200	Pass
Middle	98.1	148	200	Pass
Highest	107.9	175	200	Pass

4.3.6 Test Curve

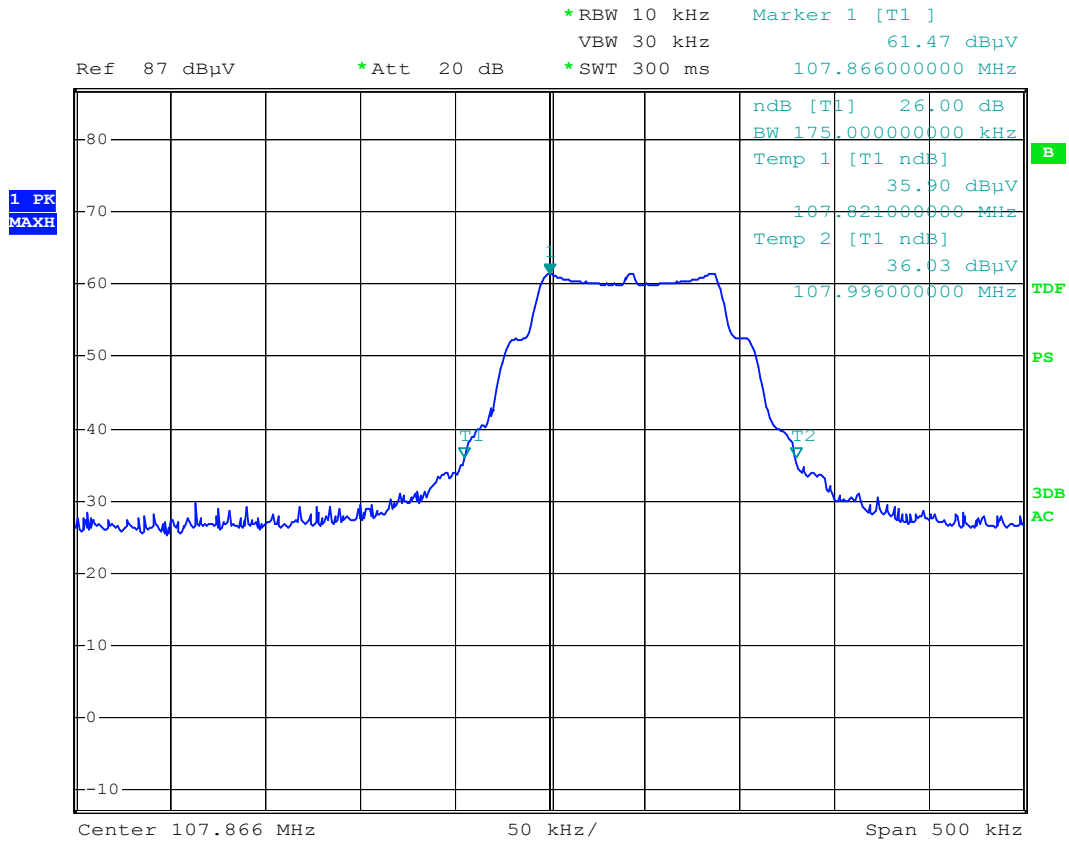
Operating Mode: Transmitting
Channel: Lowest (Fundamental frequency is 88.10 MHz)



Operating Mode: Transmitting
Channel: Middle (Fundamental frequency is 98.10 MHz)



Operating Mode: Transmitting
Channel: Highest (Fundamental frequency is 107.90 MHz)

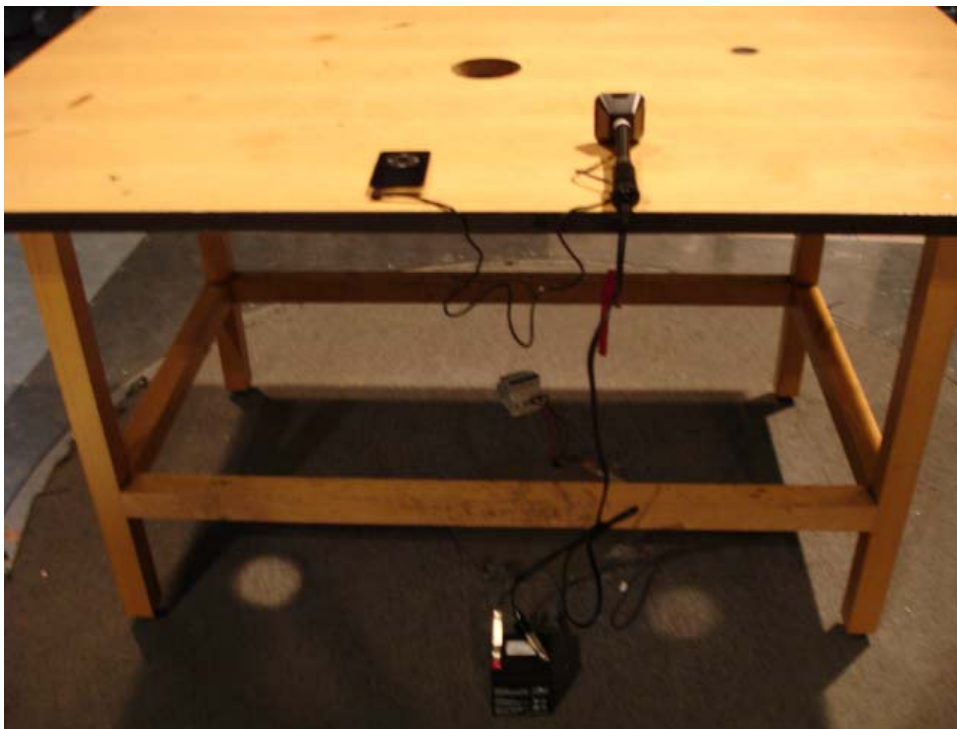
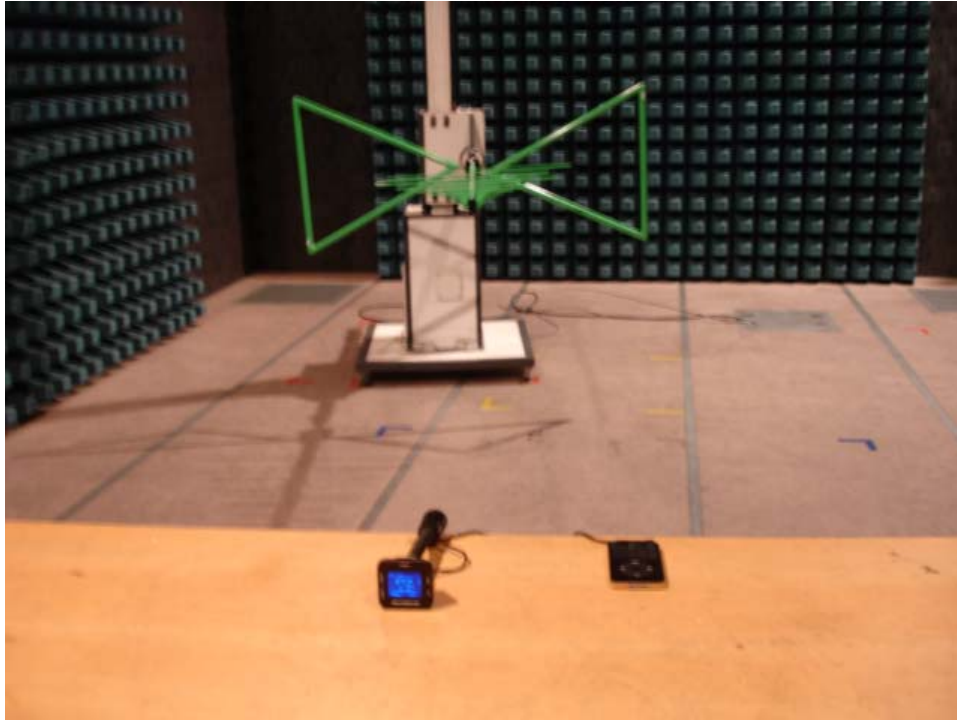


4.3.7 Measurement uncertainty

Uncertainty: 4.5 dB in the frequency range of 30-1000 MHz at a level of confidence of 95% as specified in CISPR 16-4-2: 2003.

5 Appendix I - Photos of test setup

Radiated Emission



6 Appendix II - Photos of EUT

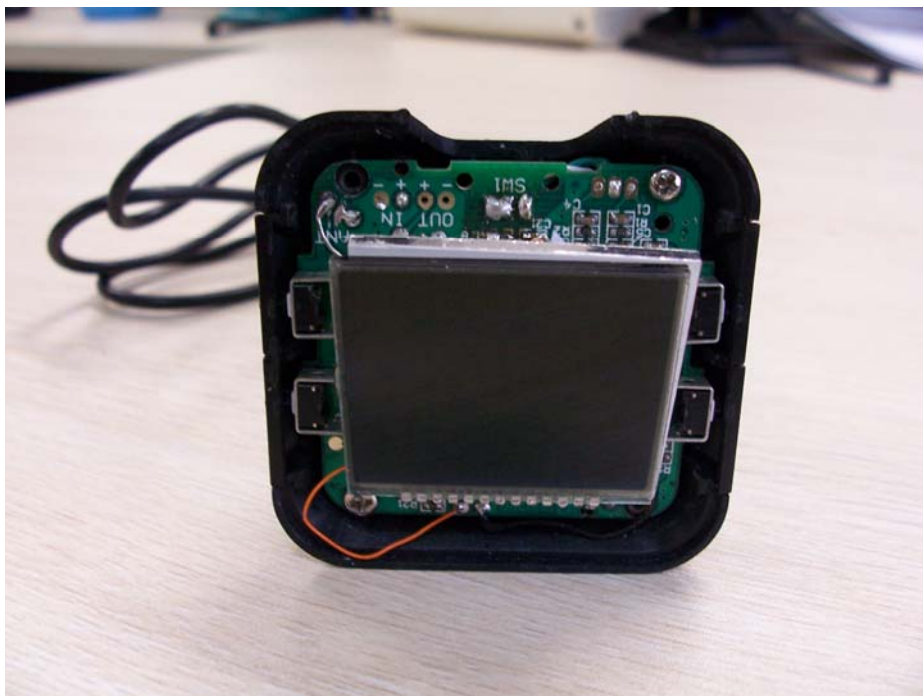
Outside



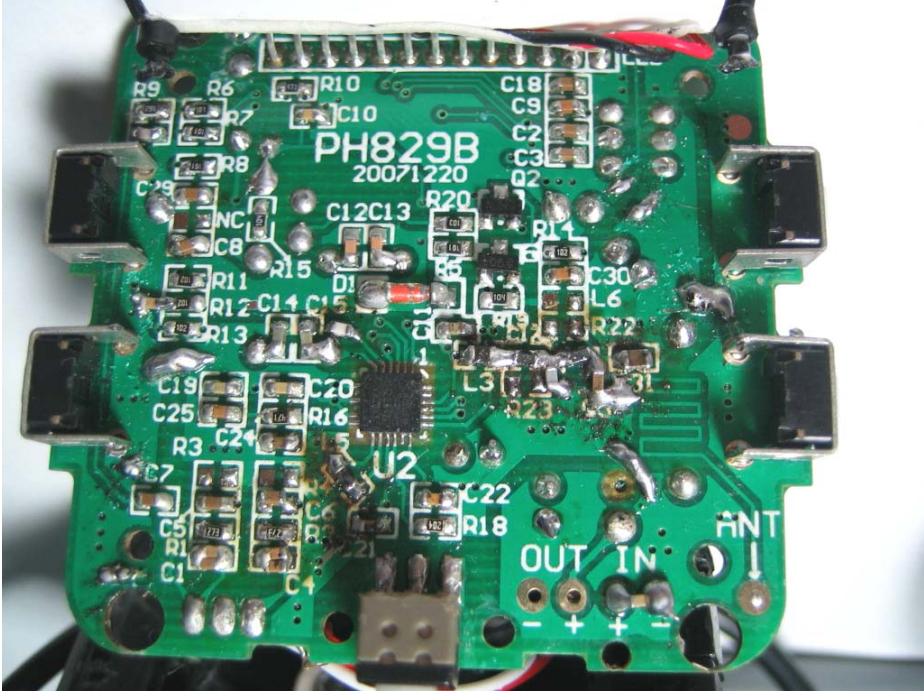
Outside



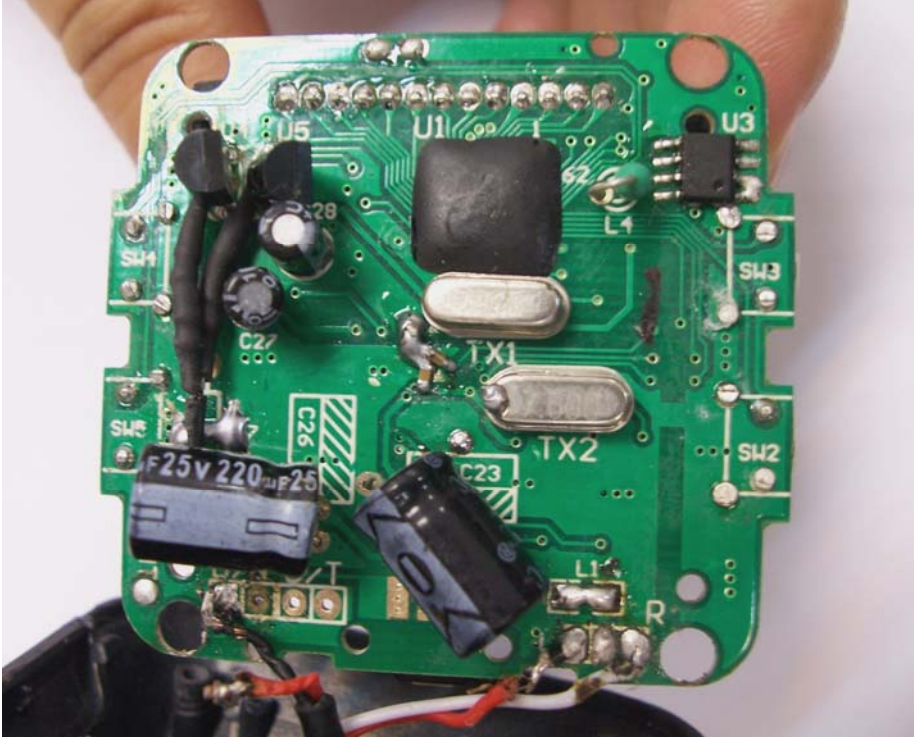
Inside



PCB Front view



PCB Back view



7 Appendix III – Label and Location

Label Location and Dimension



Devices subject to FCC Part 15, Subpart C: 2007 certification must be labeled with the following statement. The label can be affixed at any space external to the product except the battery door or detachable parts.

The label is too small to hold the statement, this statement is written into instruction manual.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

