

# EMC TEST REPORT

For

Tunecast Auto for iPod

Model Number: F8V3080

FCC ID: K7SF8V3080A

Report Number : WT068002022

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Quality Inspection EMC Laboratory  
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**TEST REPORT DECLARATION**

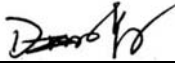
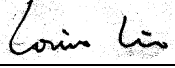
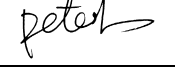
Applicant : Belkin Corporation  
 Address : 501 West Walnut Street, Compton, CA90220, U.S.A.  
 Manufacturer : Belkin Corporation  
 Address : 501 West Walnut Street, Compton, CA90220, U.S.A.  
 EUT Description : Tunecast Auto for iPod  
 Model Number : F8V3080  
**FCC ID Number** : K7SF8V3080A

Test Standards:

**FCC Part 15 15.239 :2006**

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.239.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested by:	 _____ (Dewelly Yang)	Date:	Sep. 13,2006 _____
Checked by:	 _____ (Louis Lin)	Date:	Sep. 13,2006 _____
Approved by:	 _____ (Peter Lin)	Date:	Sep. 13, 2006 _____

## 1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Conducted Disturbance	15.207	N/A
Radiated disturbance	15.239	Pass
Occupied Bandwidth	15.239	Pass
Band Edges	15.239	Pass
Antenna Requirement	15.203	Pass

## 2. GENERAL INFORMATION

### 2.1. Report information

- 2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.
- 2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.
- 2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

### 2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Committee for Laboratories (**CNAL**) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (**FCC**), and the registration number are **97379**(open area test site) and **274801**(semi anechoic chamber).

The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (**VCCI**), and the registration number are **R-1974**(open area test site) , **R-1966**(semi anechoic chamber), **C-2117**(mains ports conducted interference measurement) and **T-180**(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (**IC**), and the registration number is **IC4174**.

**TUV Rhineland** accredits the Laboratory for conformance to IEC and EN standards, the registration number is **E2024086Z02**.

Measurement Uncertainty

### 2.3. Measurement Uncertainty

Conducted Disturbance : 9kHz~30MHz 3.5dB

Radiated Disturbance: 30MHz~1000MHz 4.5dB  
1GHz~18GHz 4.6dB

## 3. PRODUCT DESCRIPTION

### 3.1. EUT Description

Description	: Tunecast Auto for iPod
Manufacturer	: Belkin Corporation
Model Number	: F8V3080
Input Power	: DC 12V(dc input port) 2 X AA battery
DC power adaptor	: Input :DC12V Output: DC12V Output power cord: 1.2m unshielding one core two turns
Operate Frequency	: 88.1 ~107.9MHz
Channel Spacing	: 100kHz
Modulation	: Frequency Modulation
Antenna Designation	: integrate

The transmission system consists of a FM transmitter; two power supplies, a MCU controller, a LCD display, an EEPROM programmer, a low battery detector as well as an audio detector, In addition to three-control press keys.

The FM transmitter is a FM stereo transmitting configuration, which radiates FM wave on the air by modulating the any required signal to the carrier signal. The transmission frequency is set from 88.1 to 107.9MHz.

This product has two power supplies, one is the 2x1.5V alkaline battery, and the other is external DC/DC 12vDC/200mA cable. You can choose either one. The DC regulator 78L05 is a step-down three terminal regulator, which transforms 12VDC into 5VDC as the whole system's power. The DC-DC converter XC6371 is a PWM controlled step-up DC/DC

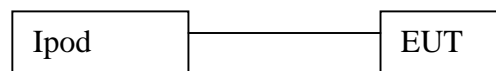
converter by which the whole system in a position to obtain 5V supply easily.

There are three function press buttons. One is up button, another is down button, and the other is memory button. Users employ those keys to manipulate this is easier than the former version. In addition to the above function, we can press and hold both up and down buttons simultaneously for about two seconds turn on the unit. To turn off the unit, press and hold both buttons simultaneously again for two seconds or so. At operation mode, press M button will toggle among the 4 memory slots to retrieve the memorized frequency. Moreover, when there is no key press after ten seconds the unit will return from memory mode back to operation mode.

### 3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: K7SF8V3080A filing to comply with Section 15.239 of the FCC Part 15, Subpart C Rules.

### 3.3. Block Diagram of EUT Configuration



### 3.4. Operating Condition of EUT

Mode 1: FM88.1MHz (play mp3.)  
 Mode 2: FM98.1MHz (play mp3)  
 Mode 3: FM107.9MHz (play mp3)

For radiation test, the EUT was powered by battery, AC power adaptor and DC power adaptor.

### 3.5. Special Accessories

Not available for this EUT intended for grant.

### 3.6. Equipment Modifications

The original problem is add a ferrite blocker to the cable of CLA section . This method can't be accepted by user .If not using the ferrite blocker , it can't get requirement of FCC standard .

Improving method:

- 1>. According to the testing and setup requirement of FCC , the cable wiring of CLA need be bound down a hank in order to prevent interfering of RF eradiating from cable wire .
- 2>. Increasing the value of C50 from 15pF to 16pF in order to reduce RF output power .So its RF eradiating power will accord with FCC standard by testing lab . The location of C50 ,please reference the schematic diagram and PCB layout section .

### 3.7. Support Equipment List

Ipod  
 M/N: A1137  
 S/N: YM60207GTJT  
 Input:DC5-30V 1A  
 Manufacturer: Apple

AC Power Adaptor:  
 M/N: JOD-41U-42  
 S/N: ---  
 Input:AC 120V 118mA  
 Output: DC 12V 600mA  
 Manufacturer: Click  
 Output power cord: 1.6m unshielding one core two turns

### 3.8. Test Conditions

Date of test: Oct 12-16,2006  
 Date of EUT Receive: Oct 12,2006  
 Temperature: 25 °C  
 Relative Humidity: 68-69%

## 4. TEST EQUIPMENT USED

### 4.1. Test Equipment Used to Measure Conducted Disturbance

Table 2 Conducted Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB2603	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.28, 2006	1 Year
SB3321	AMN	Rohde & Schwarz	ESH2-Z5	Jan.28, 2006	1 Year
SB2585	AM/FM generator	Jung Jin	JSG-1101B	Jun.20, 2006	1 Year
SB3612	Audio generator	KENWOOD	AD-203D	Jun.20, 2006	1 Year

### 4.2. Test Equipment Used to Measure Radiated Disturbance and bandwidth

Table 3 Radiated Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3436	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.28, 2006	1 Year
SB3440	Bilog Antenna	Chase	CBL6112B	Jan.28, 2006	1 Year
SB2585	AM/FM generator	Jung Jin	JSG-1101B	Jun.20, 2006	1 Year
SB3612	Audio generator	KENWOOD	AD-203D	Jun.20, 2006	1 Year



## 5. CONDUCTED DISTURBANCE TEST

### 5.1. Test Standard and Limit

#### 5.1.1. Test Standard

FCC Part 15:2006

#### 5.1.2. Test Limit

Table 4 Conducted Disturbance Test Limit (Class B)

Frequency	Maximum RF Line Voltage (dB $\mu$ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

- Decreasing linearly with logarithm of the frequency
- The lower limit shall apply at the transition frequency.

### 5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

### 5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

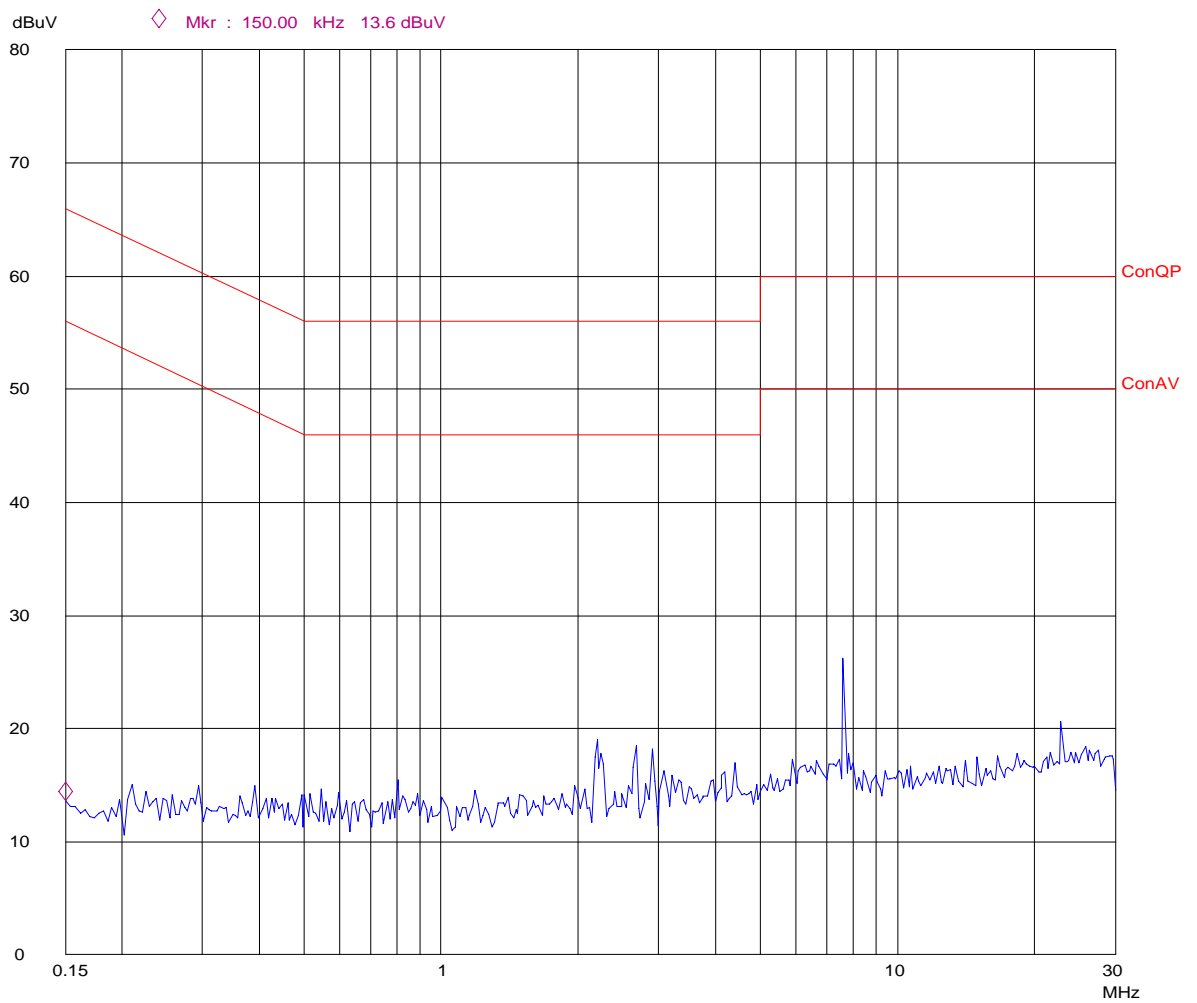
#### **5.4. Test Data**

This EUT was tested with ac power adaptor.

The emissions don't show in below are too low against the limits. Refer to the test curves .  
The data shown below is the worst case.

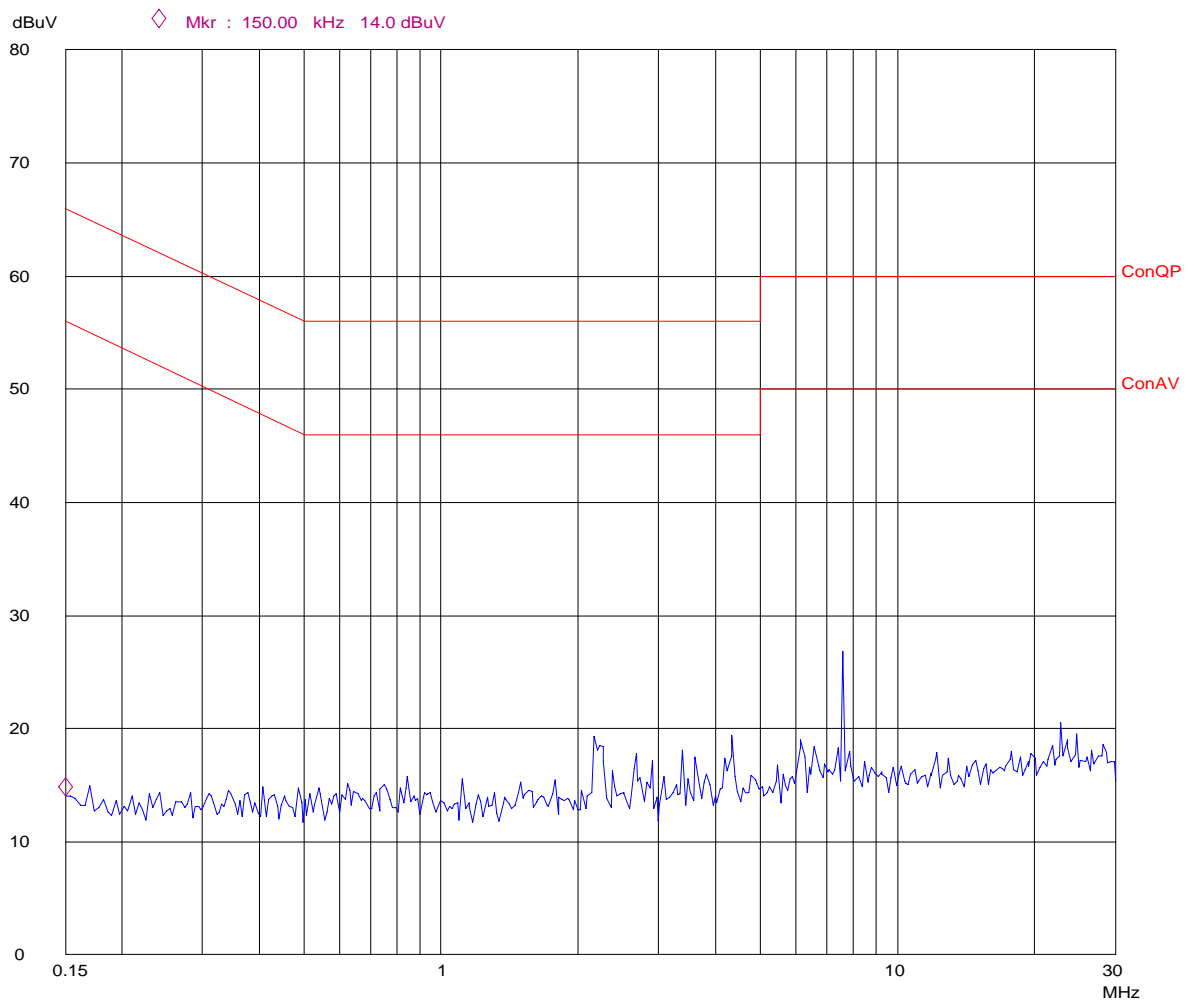
## Conducted Disturbance

EUT: M/N:F8V3080  
Op Cond: FM98.1MHz  
Test Spec: L  
Comment: AC 120V/60Hz



## Conducted Disturbance

EUT: M/N:F8V3080  
Op Cond: FM98.1MHz  
Test Spec: N  
Comment: AC 120V/60Hz



## 6. RADIATED DISTURBANCE TEST

### 6.1. Test Standard and Limit

#### 6.1.1. Test Standard

FCC Part 15:2006

#### 6.1.2. Test Limit

Table 5 Radiated Disturbance Test Limit (Class B)

FREQUENCY MHz	FIELD STRENGTHS LIMITS ( $\mu$ V/m)	FIELD STRENGTHS LIMITS dB ( $\mu$ V/m)
30 ~ 88	100	40.0
88 ~ 216	150	43.5
216 ~ 960	200	46.0
960 ~	500	54.0

\* The lower limit shall apply at the transition frequency.

\* The test distance is 3m.

### 6.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

### 6.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

### 6.4. Test Data

Emissions don't show below are too low against the limits, the test curves are shown in the APPENDIX I

Table 6 Radiated Disturbance Test Data (AC adaptor)

Model No.: F8V3080								
Test Mode: 1								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
88.105	H	35.4	0.7	0.9	10.69	47.7	68.0	PK
88.105	H	34.5	0.7	0.9	10.69	46.8	48.0	AV
137.134	H	15.1	0.9	1.2	12.06	29.3	43.5	QP
172.846	H	19.2	0.9	1.3	10.34	31.7	43.5	QP
31.648	V	4.4	0.4	0.5	18.8	24.1	40	QP
88.105	V	28.5	0.7	0.9	10.69	40.8	68.0	PK
88.105	V	27.2	0.7	0.9	10.69	39.5	48.0	AV
172.846	V	14.6	0.9	1.3	10.34	27.1	43.5	QP

Table 7 Radiated Disturbance Test Data (AC adaptor)

Model No.: F8V3080								
Test Mode: 2								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
98.125	H	26.2	0.7	0.9	11.92	39.7	68.0	PK
98.125	H	24.8	0.7	0.9	11.92	38.3	48.0	AV
137.134	H	13.6	0.9	1.2	12.06	27.8	43.5	QP
172.846	H	15.7	0.9	1.3	10.34	28.2	43.5	QP
31.454	V	3.7	0.4	0.5	18.8	23.4	40.0	QP
98.125	V	17.1	0.7	0.9	11.92	30.6	68.0	PK
98.125	V	15.2	0.7	0.9	11.92	28.7	48.0	AV
137.134	V	10.4	0.9	1.2	12.06	24.6	43.5	QP

Table 8 Radiated Disturbance Test Data (AC adaptor)

Model No.: F8V3080								
Test Mode: 3								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
107.907	H	25.0	0.7	0.9	12.71	39.3	68.0	PK
107.907	H	22.6	0.7	0.9	12.71	36.9	48.0	AV
137.134	H	9.0	0.9	1.2	12.06	23.2	43.5	QP
154.990	H	8.7	0.9	1.2	11.11	21.9	43.5	QP
31.454	V	2.7	0.4	0.5	18.8	22.4	40.0	QP
47.856	V	11.0	0.5	0.7	9.41	21.6	40.0	QP
107.907	V	15.8	0.7	0.9	12.71	30.1	68.0	PK
107.907	V	12.4	0.7	0.9	12.71	26.7	48.0	AV

Table 9 Radiated Disturbance Test Data (DC adaptor)

Model No.: F8V3080								
Test Mode: 1								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
88.095	H	35.4	0.7	0.9	10.69	47.7	68.0	PK
88.095	H	34.9	0.7	0.9	10.69	47.2	48.0	AV
137.134	H	13.9	0.9	1.2	12.06	28.1	43.5	QP
172.726	H	17.6	0.9	1.3	10.34	30.1	43.5	QP
41.900	V	14.6	0.5	0.7	12.8	28.6	40.0	QP
88.111	V	29.6	0.7	0.9	10.69	41.9	68.0	PK
88.111	V	26.4	0.7	0.9	10.69	38.7	48.0	AV
172.846	V	13.5	0.9	1.3	10.34	26.0	43.5	QP

Table 10 Radiated Disturbance Test Data (DC adaptor)

Model No.: F8V3080								
Test Mode: 2								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
98.125	H	25.6	0.7	0.9	11.92	39.1	68.0	PK
98.125	H	24.4	0.7	0.9	11.92	37.9	48.0	AV
154.990	H	16.9	0.9	1.2	11.11	30.1	43.5	QP
196.653	H	15.1	1.0	1.4	10.26	27.8	43.5	QP
98.125	V	19.9	0.7	0.9	11.92	33.4	68.0	PK
98.125	V	18.4	0.7	0.9	11.92	31.9	48.0	AV
154.990	V	8.7	0.9	1.2	11.11	21.9	43.5	QP
196.653	V	8.1	1.0	1.4	10.26	20.8	43.5	QP

Table 11 Radiated Disturbance Test Data (DC adaptor)

Model No.: F8V3080								
Test Mode: 3								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
107.915	H	26.2	0.7	0.9	12.71	40.5	68.0	PK
107.915	H	22.9	0.7	0.9	12.71	37.2	48.0	AV
155.758	H	14.2	0.9	1.2	10.98	27.3	43.5	QP
214.509	H	12.5	1.1	1.5	10.04	25.1	43.5	QP
30.000	V	4.0	0.4	0.5	18.8	23.7	40.0	QP
107.915	V	14.6	0.7	0.9	12.71	28.9	68.0	PK
107.915	V	13.0	0.7	0.9	12.71	27.3	48.0	AV
154.990	V	8.3	0.9	1.2	11.11	21.5	43.5	QP



Table 12 Radiated Disturbance Test Data (BATTERY)

Model No.: F8V3080								
Test Mode: 1								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
88.103	H	33.5	0.7	0.9	10.69	45.8	68.0	PK
88.103	H	32.8	0.7	0.9	10.69	45.1	48.0	AV
176.058	H	20.9	0.9	1.3	10.07	33.2	43.5	QP
262.124	H	8.2	1.1	1.7	13.74	24.7	46.0	QP
88.115	V	23.3	0.7	0.9	10.69	35.6	68.0	PK
88.115	V	22.5	0.7	0.9	10.69	34.8	48.0	AV
30.000	V	1.9	0.4	0.5	18.8	21.6	40.0	QP
172.845	V	14.9	0.9	1.3	10.34	27.4	43.5	QP

Table 13 Radiated Disturbance Test Data (BATTERY)

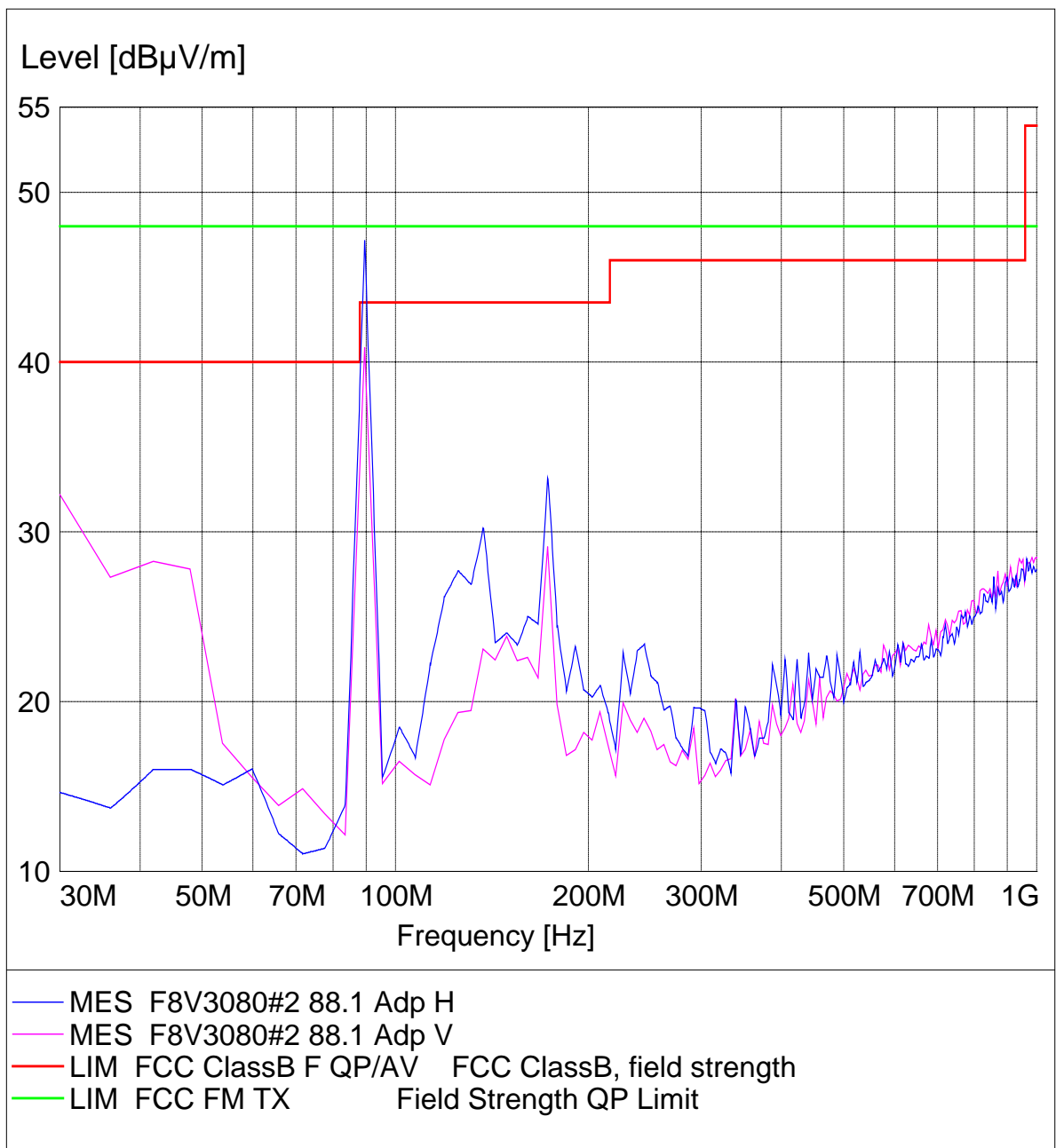
Model No.: F8V3080								
Test Mode: 2								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
98.105	H	29.9	0.7	0.9	11.92	43.4	68.0	PK
98.105	H	28.0	0.7	0.9	11.92	41.5	48.0	AV
196.653	H	18.5	1	1.4	10.26	31.2	43.5	QP
256.172	H	14.3	1.1	1.6	13.79	30.8	46.0	QP
30.000	V	5.8	0.4	0.5	18.8	25.5	40.0	QP
98.105	V	18.5	0.7	0.9	11.92	32.0	68.0	PK
98.105	V	17.3	0.7	0.9	11.92	30.8	48.0	AV
196.653	V	11.9	1	1.4	10.26	24.6	43.5	QP

Table 14 Radiated Disturbance Test Data (BATTERY)

Model No.: F8V3080								
Test Mode: 3								
Frequency(MHz)	Polarization	Reading (dB $\mu$ V)	Cable Loss R1 (dB)	Cable Loss R2 (dB)	Antenna Factor (dB/m)	Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
107.897	H	26.2	0.7	0.9	12.71	40.5	68.0	PK
107.897	H	24.5	0.7	0.9	12.71	38.8	48.0	AV
172.846	H	13.3	0.9	1.3	10.34	25.8	43.5	QP
208.557	H	12.4	1	1.4	10.09	24.9	43.5	QP
107.897	V	14.5	0.7	0.9	12.71	28.8	68.0	PK
107.897	V	11.9	0.7	0.9	12.71	26.2	48.0	AV
30.000	V	0.4	0.4	0.5	18.8	20.1	40.0	QP
41.904	V	7.5	0.5	0.7	12.8	21.5	40.0	QP
178.979	V	9.4	0.9	1.3	10.07	21.7	43.5	QP

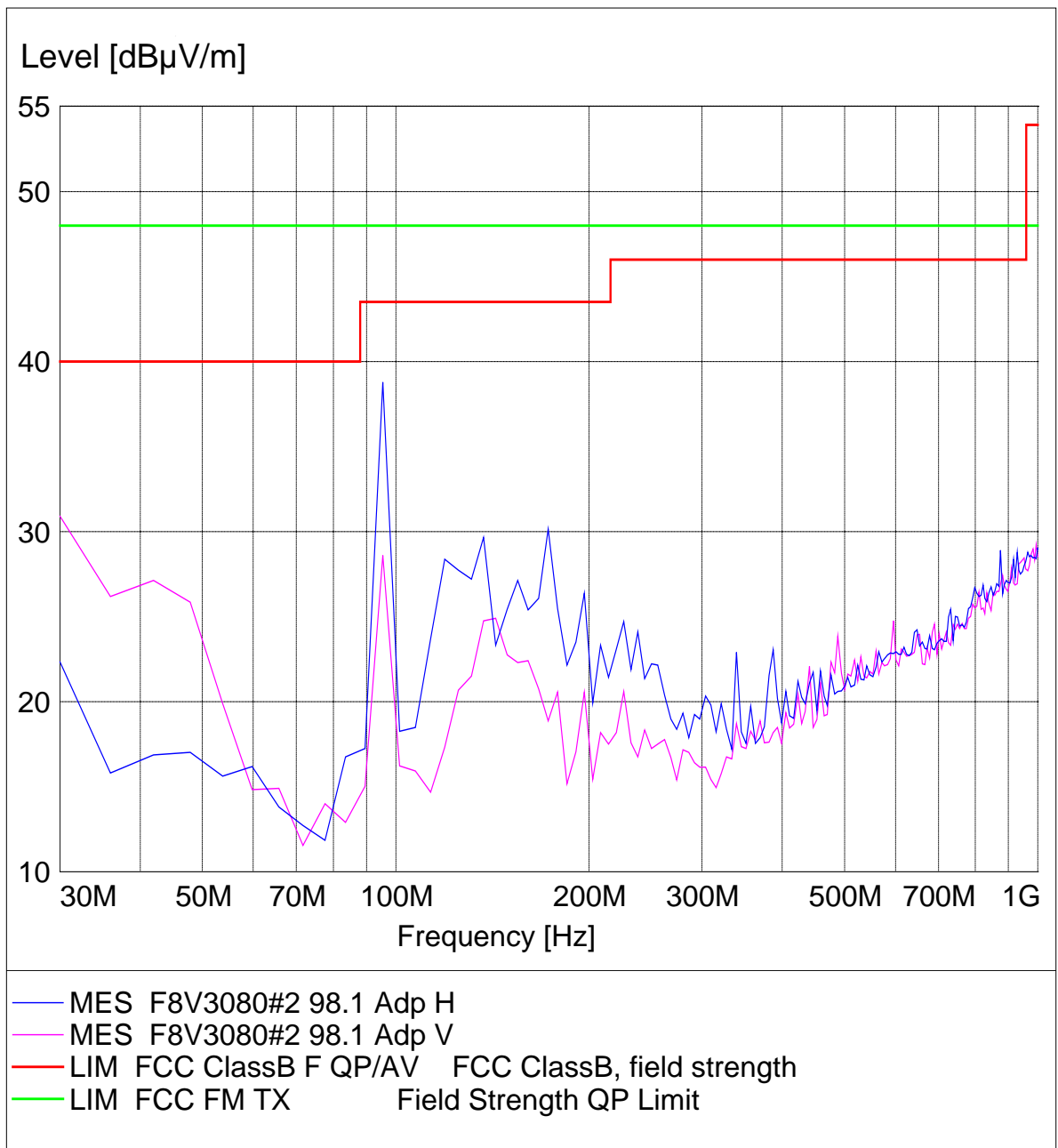
**Radiated Emission**

EUT: M/N:F8V3080  
 Manufacturer:  
 Operating Condition: 88.1M  
 Test Site: SMQ EMC Lab.  
 Test Specification: Horizontal & Vertical  
 comment: AC120V/DC12V Adaptor



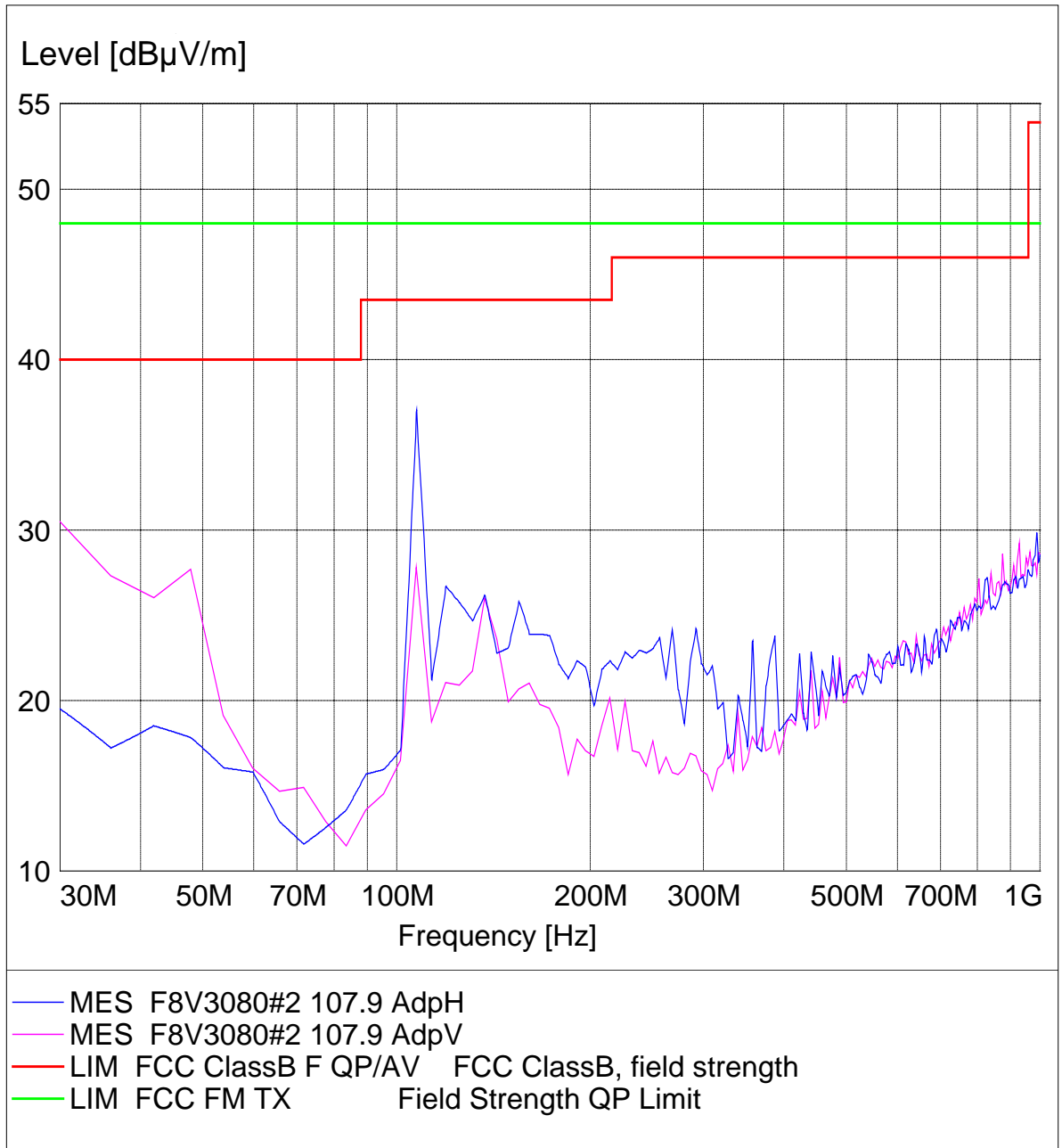
**Radiated Emission**

EUT: M/N:F8V3080  
 Manufacturer:  
 Operating Condition: 98.1M  
 Test Site: SMQ EMC Lab.  
 Test Specification: Horizontal & Vertical  
 comment: AC120V/DC12V Adaptor



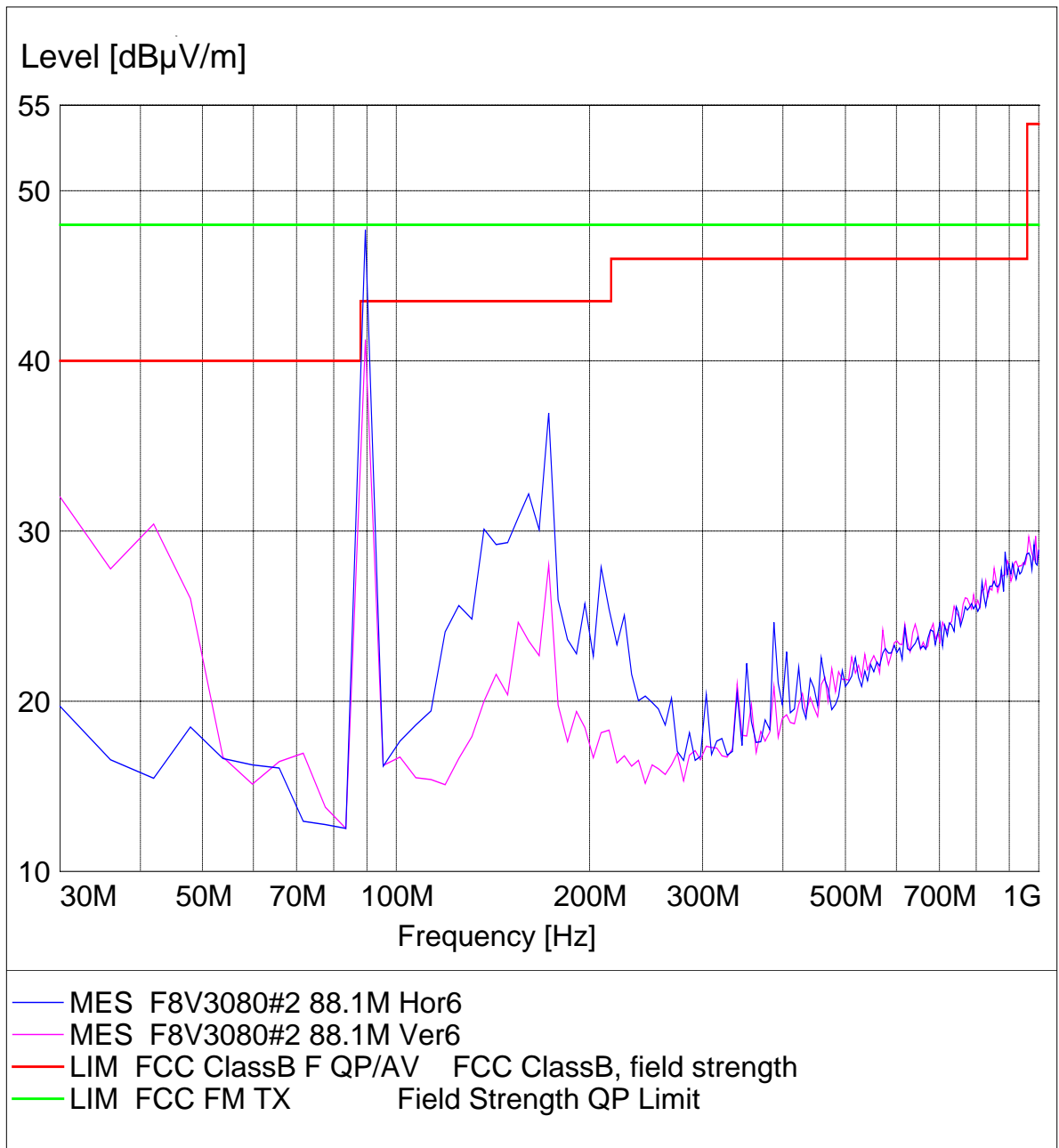
**Radiated Emission**

EUT: M/N:F8V3080  
 Manufacturer:  
 Operating Condition: 107.9M  
 Test Site: SMQ EMC Lab.  
 Test Specification: Horizontal & Vertical  
 comment: AC120V/DC12V Adaptor



**Radiated Emission**

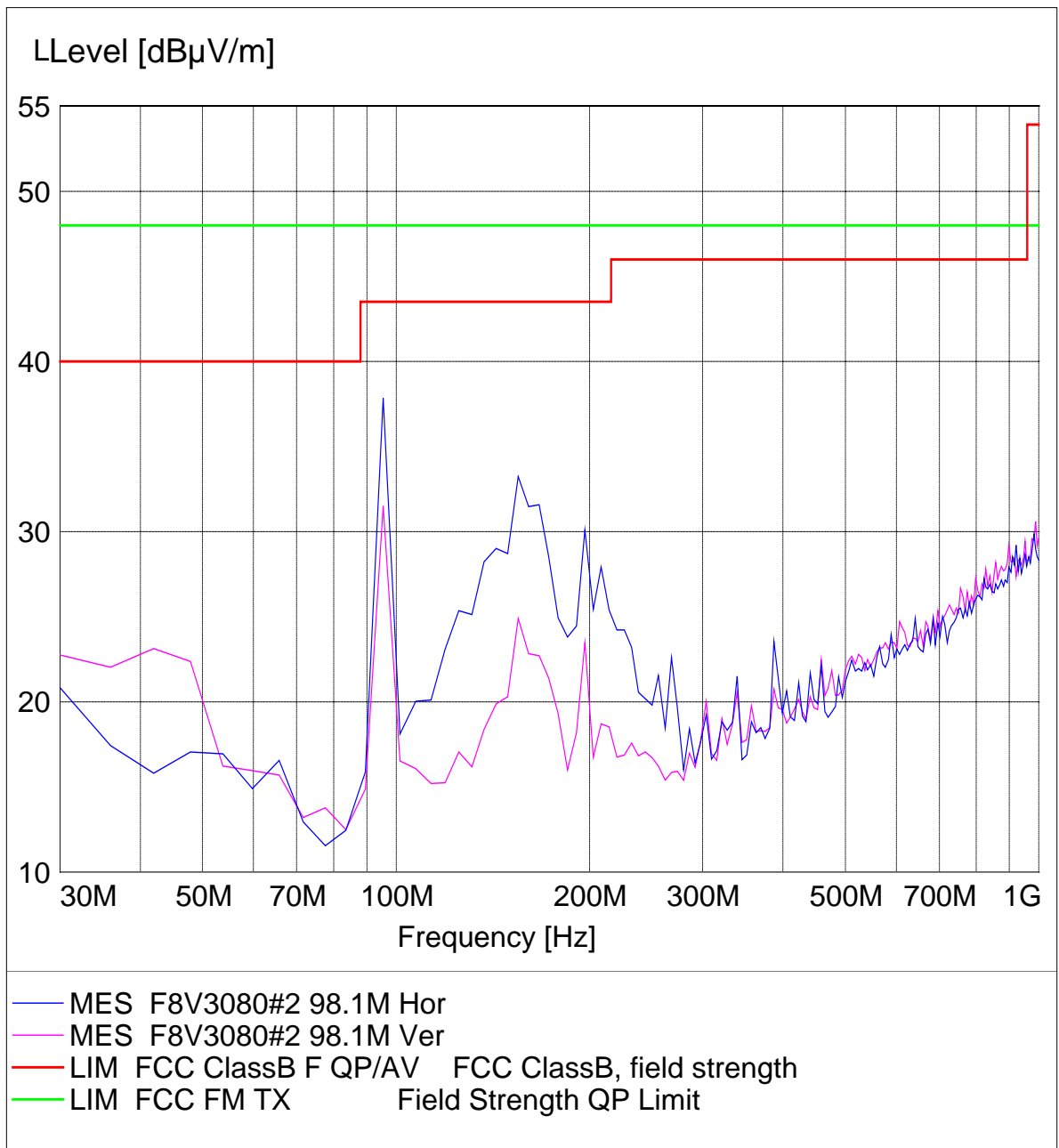
EUT: M/N:F8V3080  
 Manufacturer:  
 Operating Condition: 88.1M  
 Test Site: SMQ EMC Lab.  
 Test Specification: Horizontal & Vertical  
 comment: DC 12V



**Radiated Emission**

EUT: M/N:F8V3080

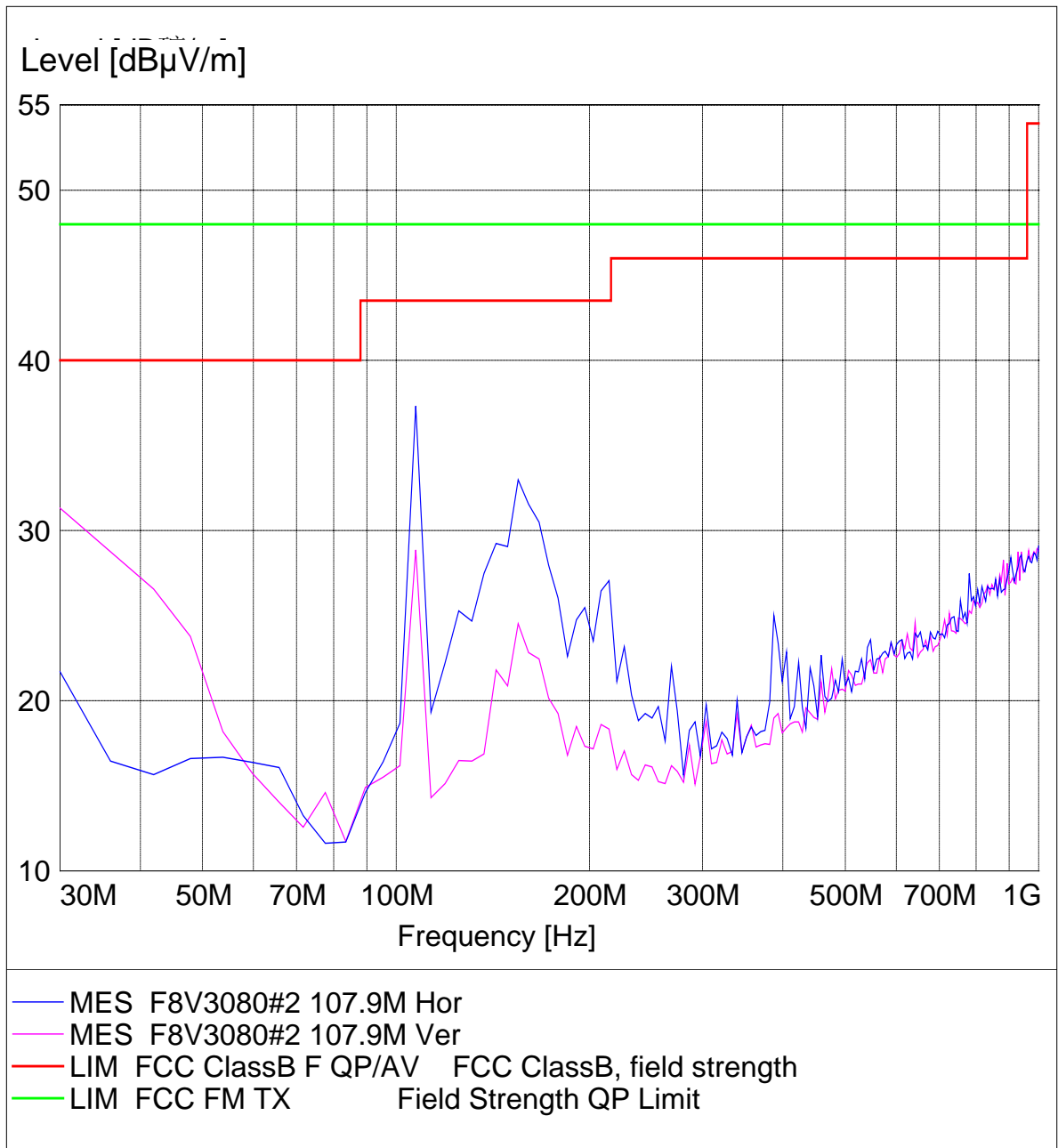
Manufacturer:  
 Operating Condition: 98.1M  
 Test Site: SMQ EMC Lab.  
 Test Specification: Horizontal & Vertical  
 comment: DC 12V



**Radiated Emission**

EUT: M/N:F8V3080

Manufacturer:  
 Operating Condition: 107.9M  
 Test Site: SMQ EMC Lab.  
 Test Specification: Horizontal & Vertical  
 comment: DC 12V

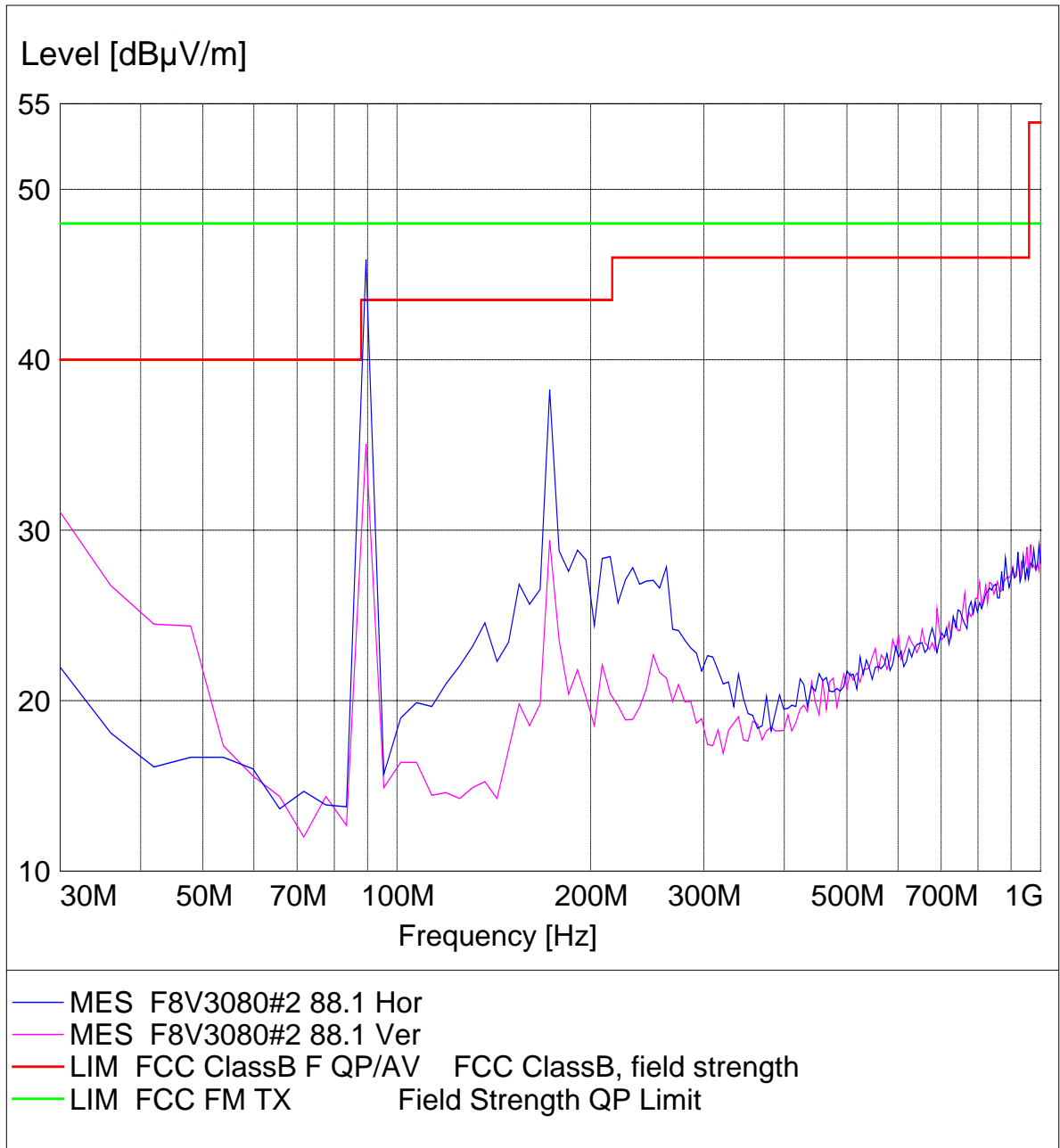


***Radiated Emission***

EUT: M/N:F8V3080  
 Manufacturer:



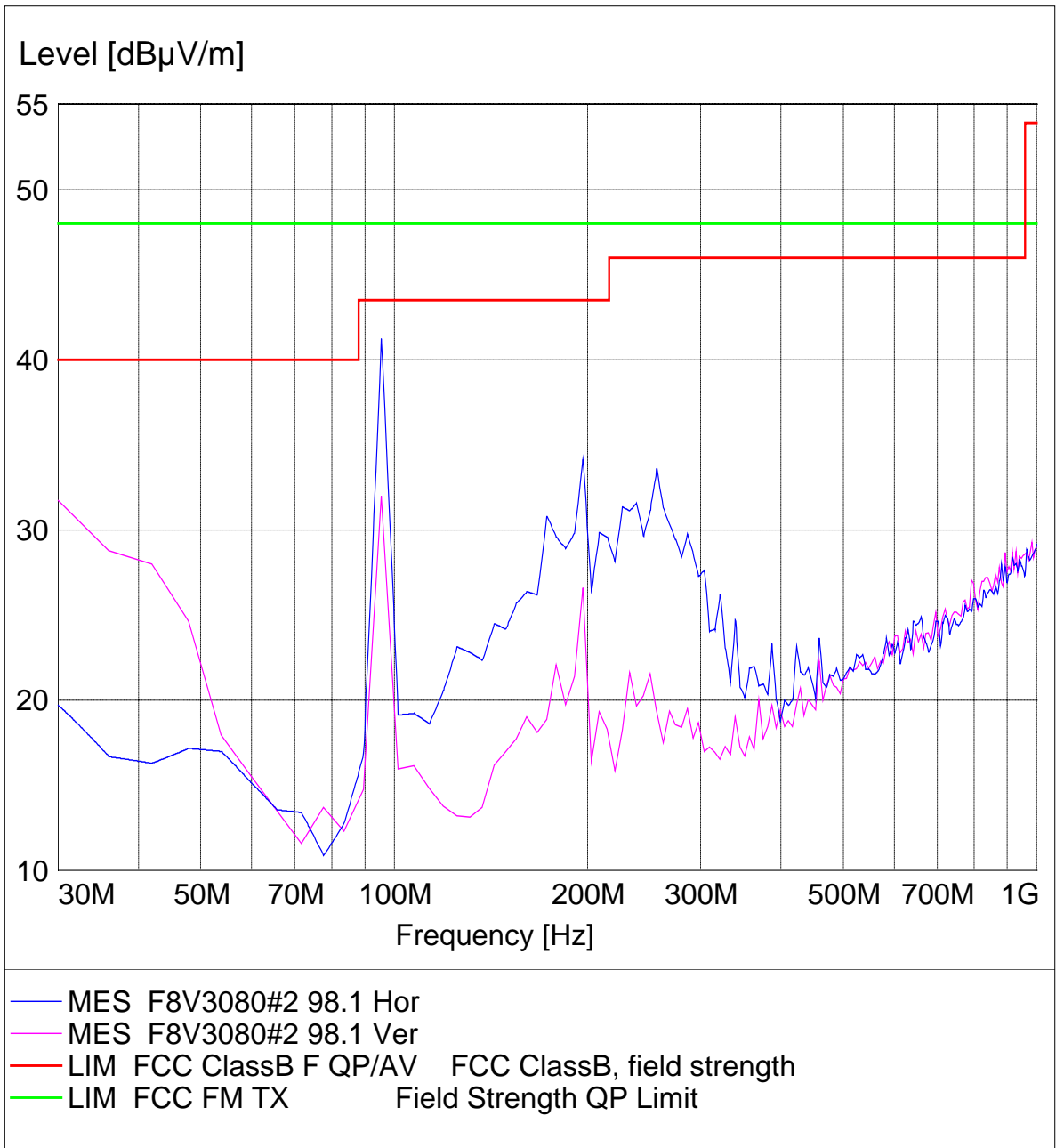
Operating Condition: 88.1M  
 Test Site: SMQ EMC Lab.  
 Test Specification: Horizontal & Vertical  
 comment: DC 3V



**Radiated Emission**

EUT: M/N:F8V3080  
 Manufacturer:  
 Operating Condition: 98.1M

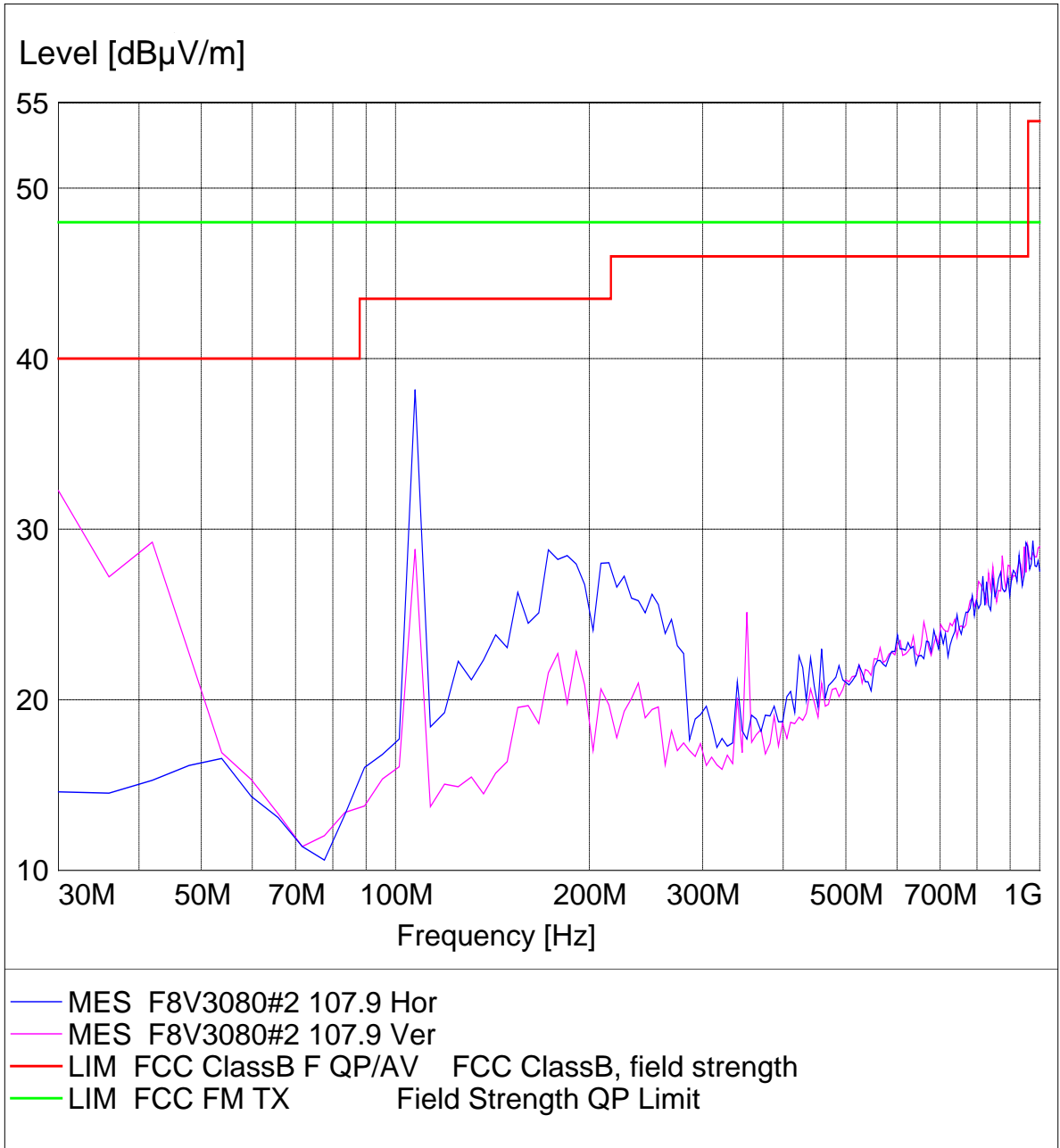
Test Site: SMQ EMC Lab.  
 Test Specification: Horizontal & Vertical  
 comment: DC 3V



**Radiated Emission**

EUT: M/N:F8V3080  
 Manufacturer:  
 Operating Condition: 107.9M  
 Test Site: SMQ EMC Lab.

Test Specification: Horizontal & Vertical  
 comment: DC 3V



## 7. OCCUPIED BANDWIDTH

### 7.1. Test Standard and Limit

#### 7.1.1. Test Standard

FCC Part 15:2006

#### 7.1.2. Test Limit

Table 9 Bandwidth Limit

	Limit (kHz)
Bandwidth	200

### 7.2. Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation (the volume control of ipod was set to maximum.)
3. Set EMI test receiver (ESIB26) Center Frequency = fundamental frequency, RBW, VBW = 5KHz, Span = 300KHz.
4. Set EMI test receiver (ESIB26) Max hold. Mark peak, -26dB.

### 7.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

### 7.4. Test Data

Input signal : play MP3  
FM 88.1MHz  
26dB bandwidth = 146.4kHz

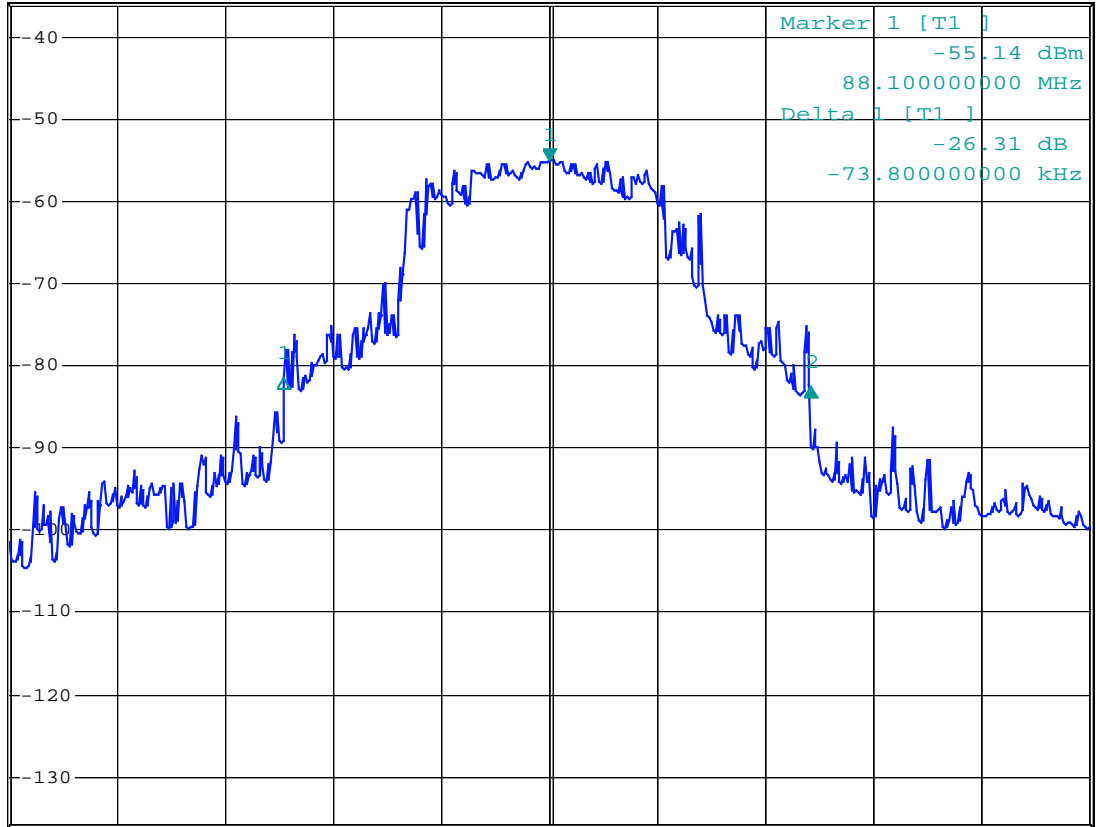
FM 98.1MHz  
26dB bandwidth = 183.0kHz

FM 107.9MHz  
26dB bandwidth = 160.8kHz



\*RBW 3 kHz      Delta 2 [T1 ]  
 \*VBW 3 kHz      -27.57 dB  
 Ref -36 dBm      \*Att 0 dB      SWT 70 ms      72.60000000 kHz

1 PK  
 VIEW



A

PRN

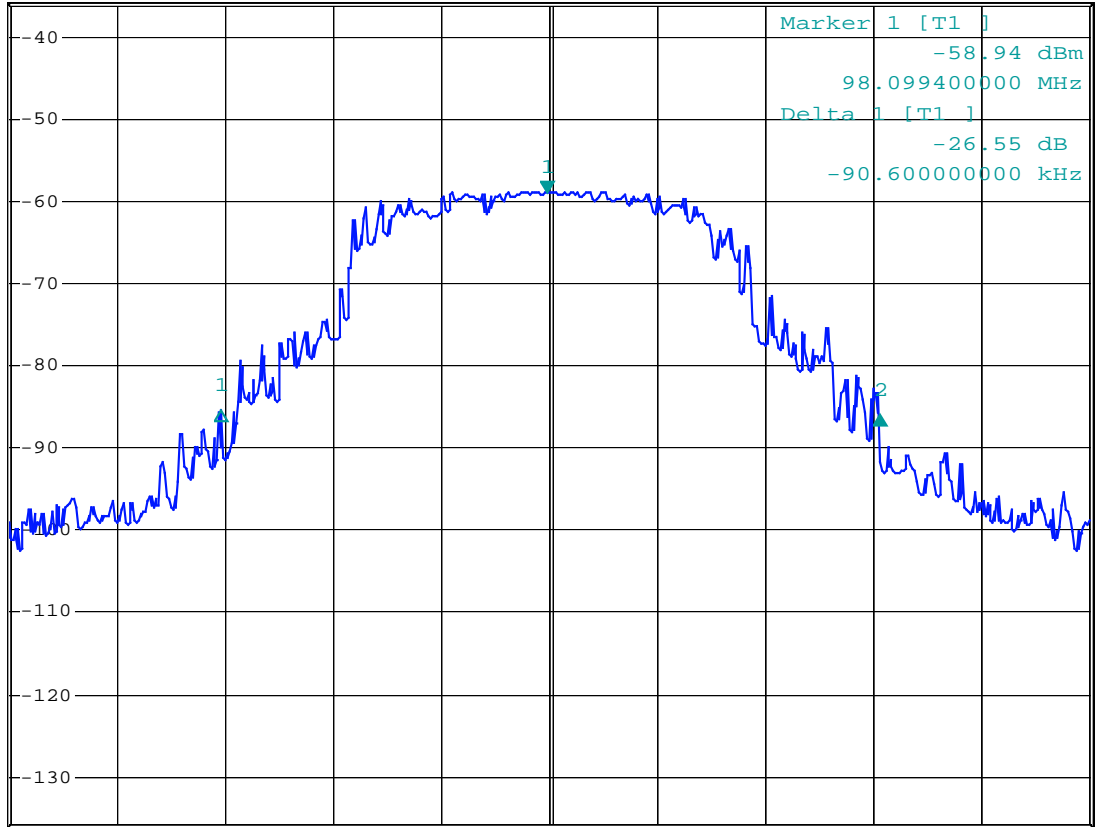
Center 88.1 MHz      30 kHz/      Span 300 kHz

Comment: Conducted Disturbance  
 Date: 16.OCT.2006 22:28:02



\*RBW 3 kHz Delta 2 [T1 ]  
 \*VBW 3 kHz -27.17 dB  
 Ref -36 dBm \*Att 0 dB SWT 70 ms 92.40000000 kHz

1 PK  
 VIEW



Center 98.1 MHz 30 kHz/ Span 300 kHz

Comment: Conducted Disturbance  
 Date: 16.OCT.2006 21:59:33

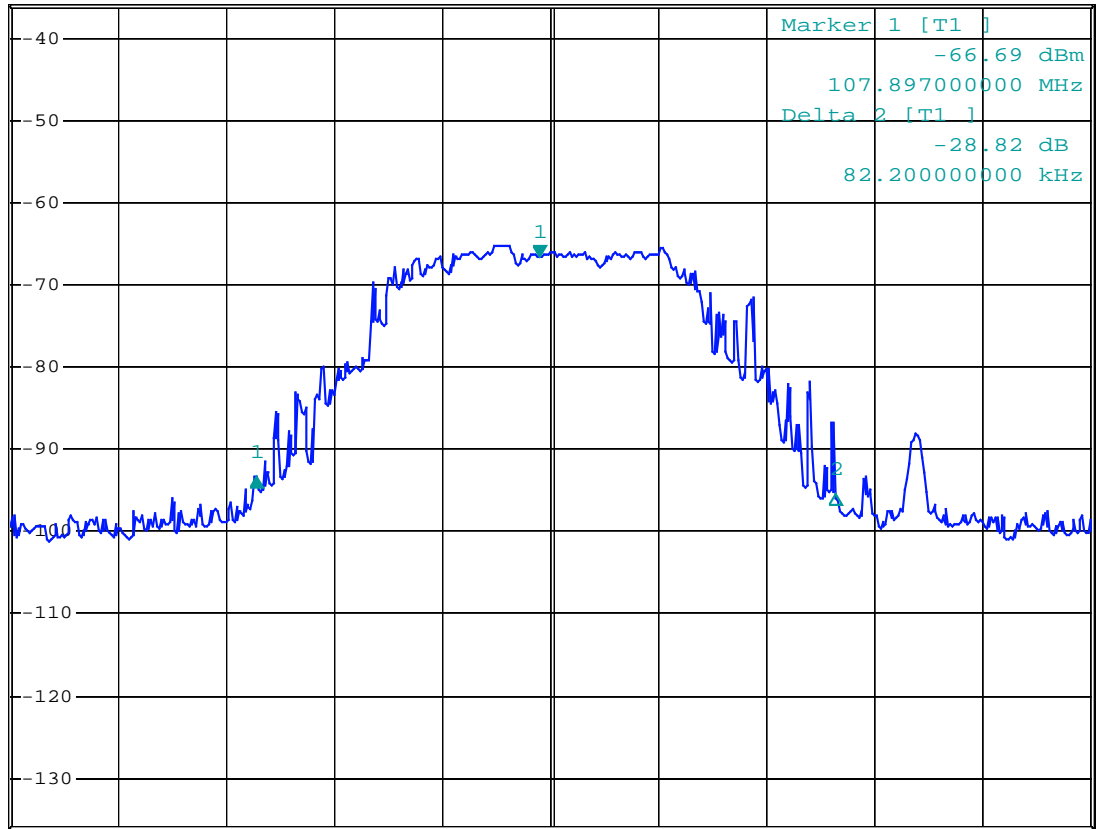


\*RBW 3 kHz      Delta 1 [T1 ]  
 \*VBW 3 kHz      -26.64 dB  
 SWT 70 ms      -78.600000000 kHz

Ref -36 dBm

\*Att 0 dB

1 PK  
 VIEW



A

PRN

Center 107.9 MHz

30 kHz/

Span 300 kHz

Comment: Conducted Disturbance  
 Date: 16.OCT.2006 22:04:52

## **8. BAND EDGE**

### **8.1. Test Standard and Limit**

#### 8.1.1. Test Standard

FCC Part 15 15.239 :2006

### **8.2. Band Edge FCC 15.239(d) 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 Section 15.209.

### **8.3. Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instruments. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Measure the highest amplitude appearing on spectral display and set it as reference level. Plot the graph with marking the highest point and edge frequency.
4. Repeat above procedures until all measured frequencies were complete.

### **8.4. Test Arrangement**

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

### **8.5. Test Data**





\*RBW 3 kHz      Delta 1 [T1 ]  
\*VBW 3 kHz      -38.72 dB  
SWT 190 ms      -100.000000000 kHz

Ref -36 dBm

\*Att 0 dB

1 PK  
VIEW



Center 87.932 MHz

100 kHz/

Span 1 MHz

Comment: Conducted Disturbance  
Date: 16.OCT.2006 22:16:49

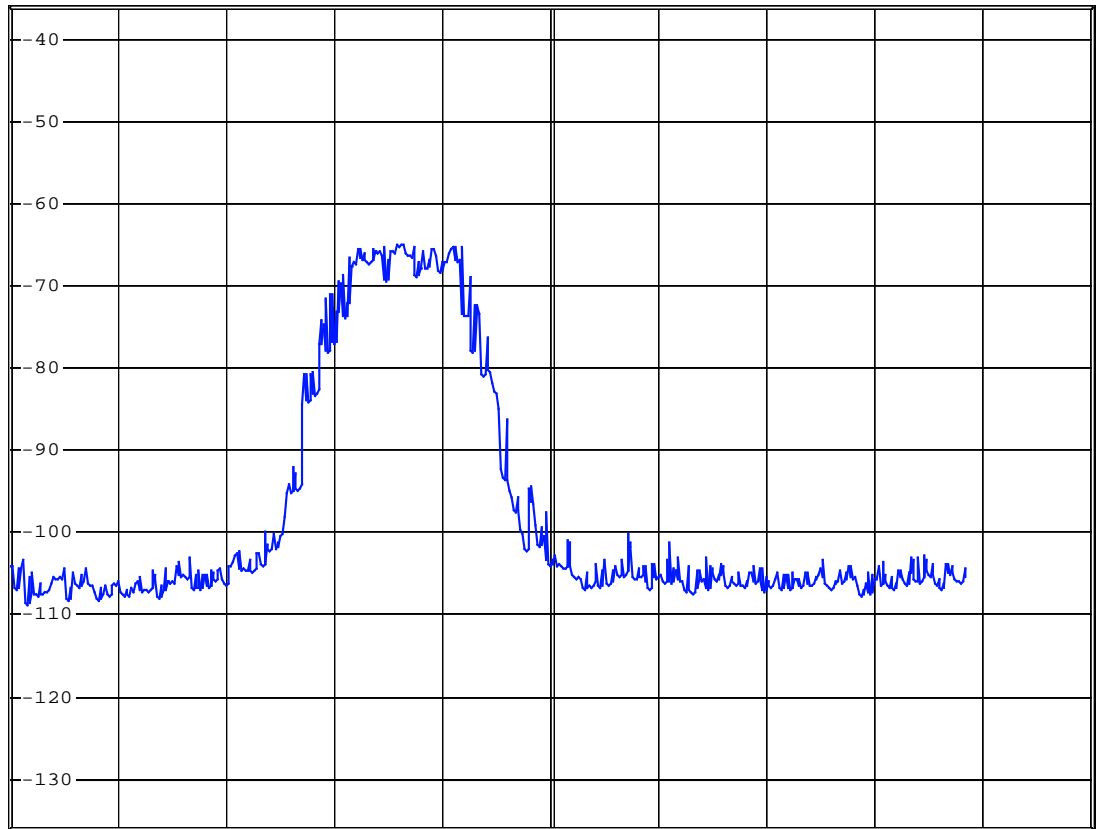


\*RBW 3 kHz  
\*VBW 3 kHz  
SWT 190 ms

Ref -36 dBm

\*Att 0 dB

1 PK  
VIEW



Center 108.034 MHz

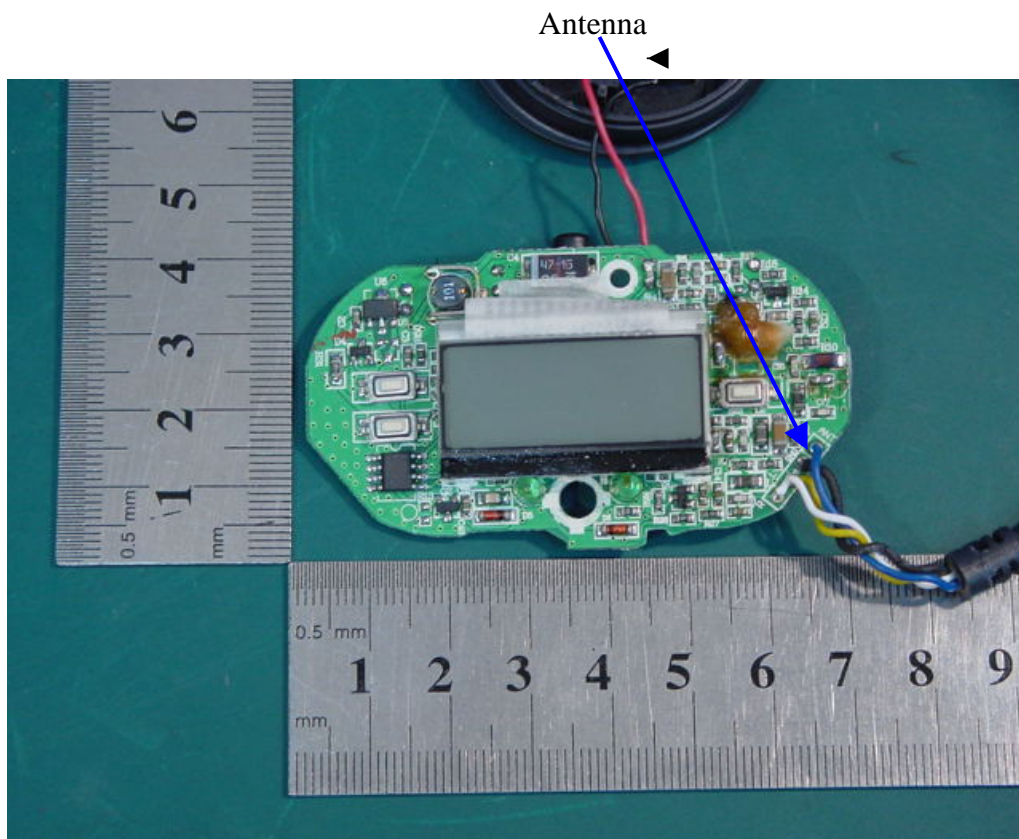
100 kHz/

Span 1 MHz

## 9. ANTENNA REQUIREMENT

According to Section 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 EUT has a built in antenna which is wire soldered on the PCB, this is permanently attached antenna and meets the requirements of this section.



## **10. TURNING RANG**

### **10.1. Test Standard and Limit**

#### 10.1.1. Test Standard

FCC Part 15 15.239 :2006

### **10.2. Band Edge FCC 15.239(d) Limit**

88-108MHz

### **10.3. Test Procedure**

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set the EUT working on the lowest frequency.
3. Set EMI test receiver(ESIB26) Center Frequency = working frequency, RBW, VBW= 1KHz, Span=300KHz.
4. Measuring the working frequency. And check the measuring result with the frequency display on Ipod .
5. Set the EUT working on the mid frequency. Repeat step 3 and 4.
6. Set the EUT working on the high frequency. Repeat step 3 and 4.
7. Press the ↑ or ↓ button on the TuneCast Auto to select the transmission frequency, from the low to high frequency. And check the working frequency display on the EUT screen. The working frequency should be inside 88-108MHz.

### **10.4. Test Data**

Low Frequency= 88.100MHz	display 88.1MHz
Mid Frequency= 98.102MHz	display 98.1MHz
High Frequency=107.902MHz	display 107.9MHz

The working frequency rang is from 88.1 to 107.9MHz.



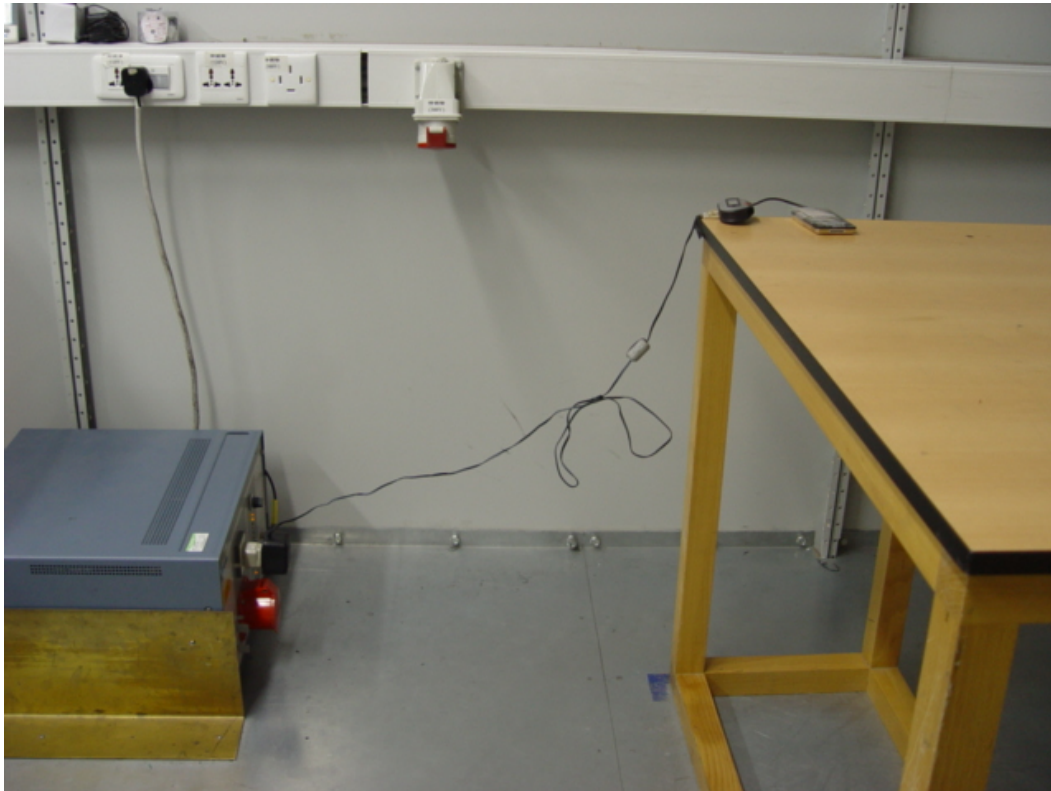




**APPENDIX I TEST PHOTO**



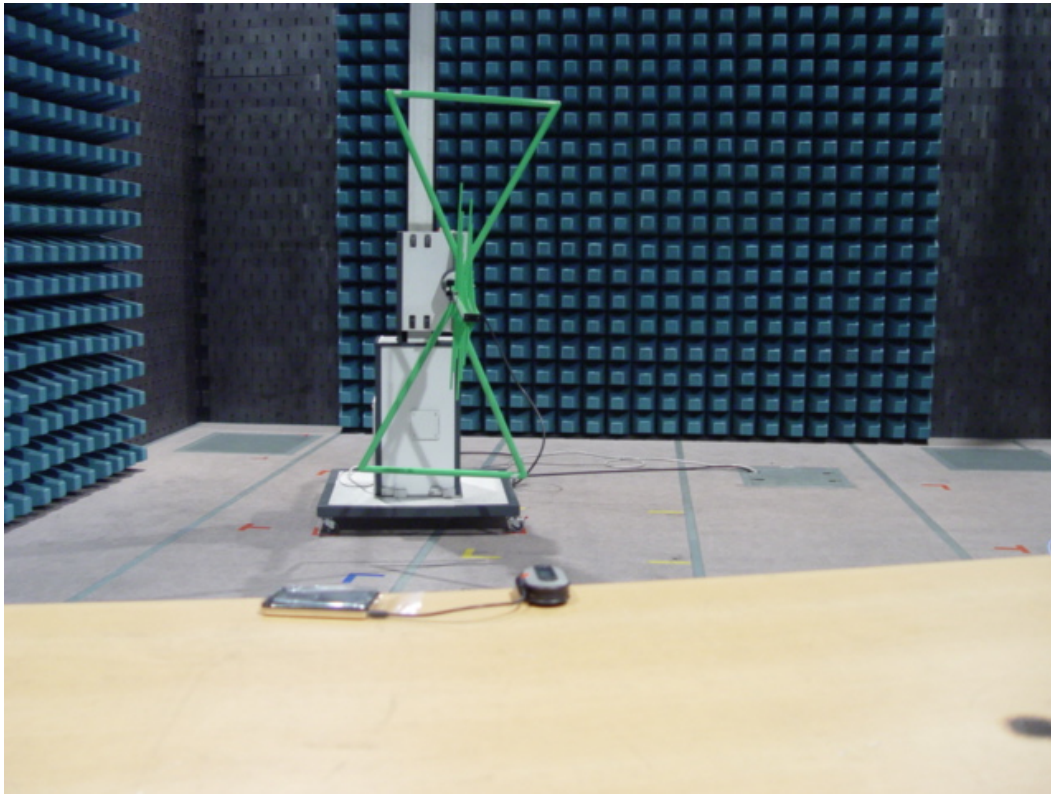
**Photo 1 Conducted Emission Test**



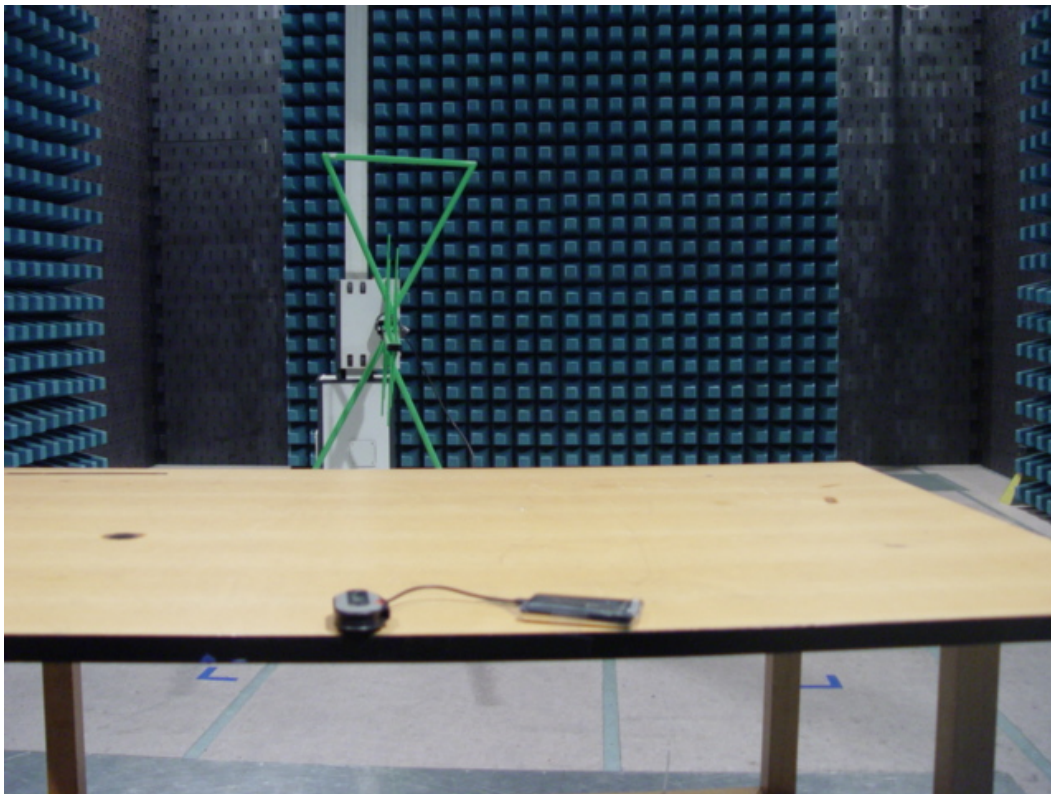
**Photo 2 Conducted Emission Test**



**Photo 3 Radiated Emission Test (power by Battery)**

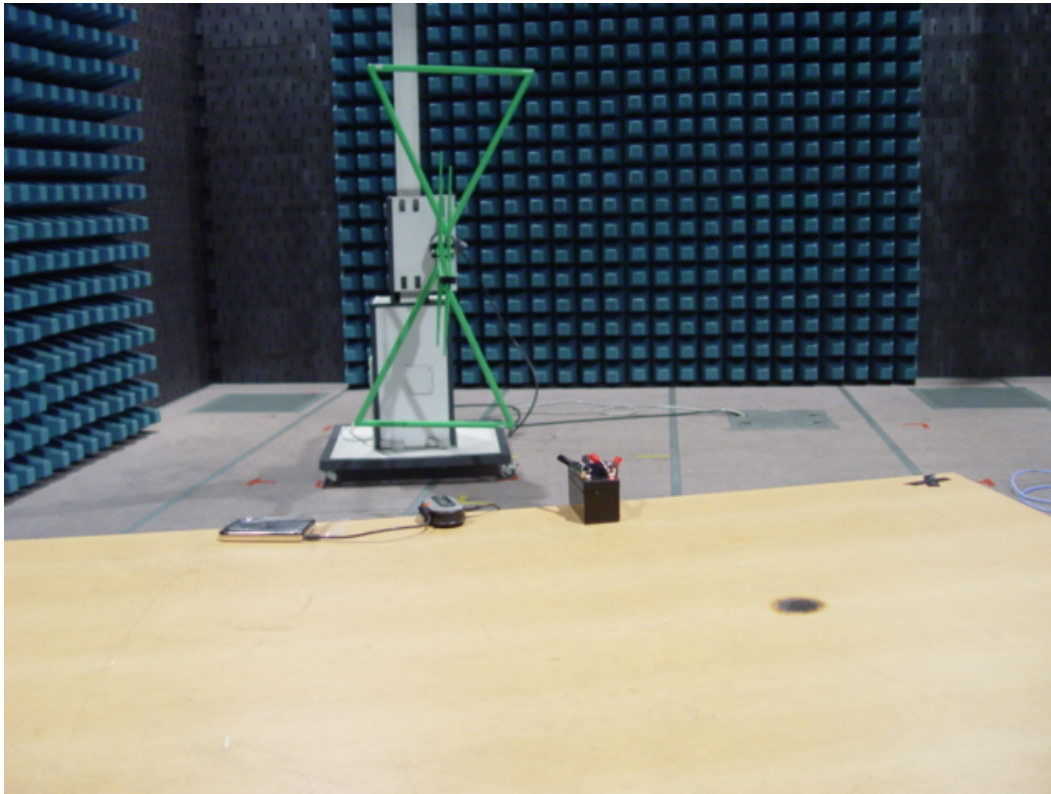


**Photo 4 Radiated Emission Test (power by Battery)**

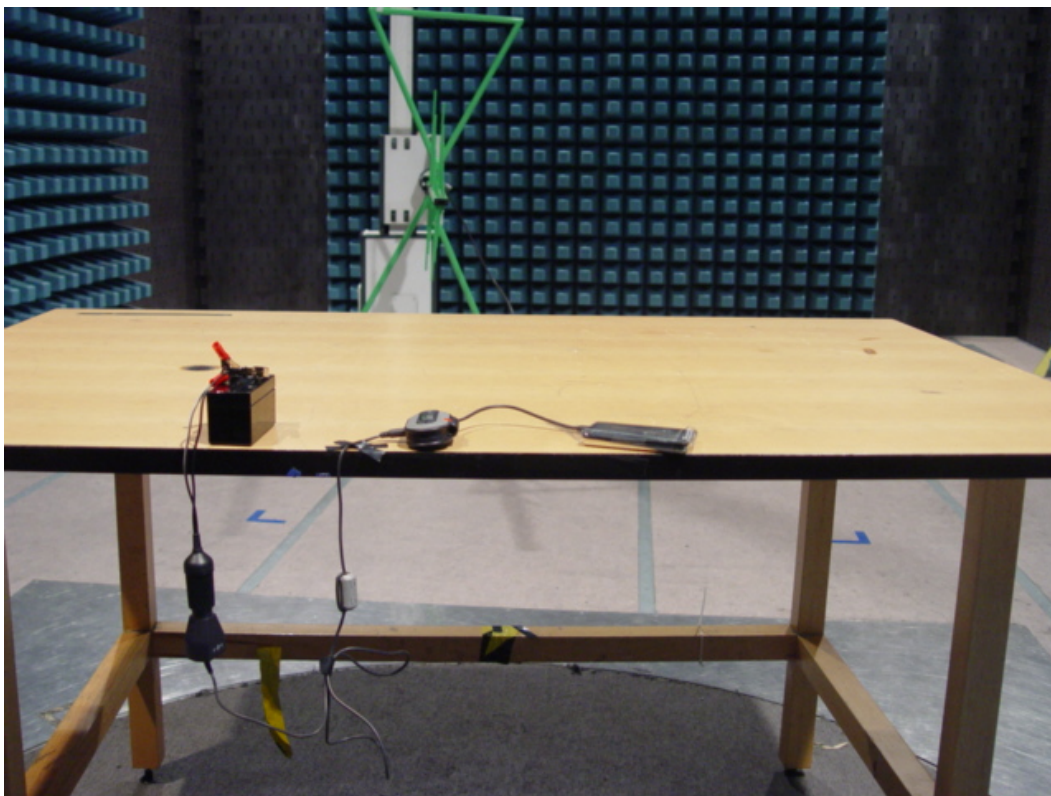




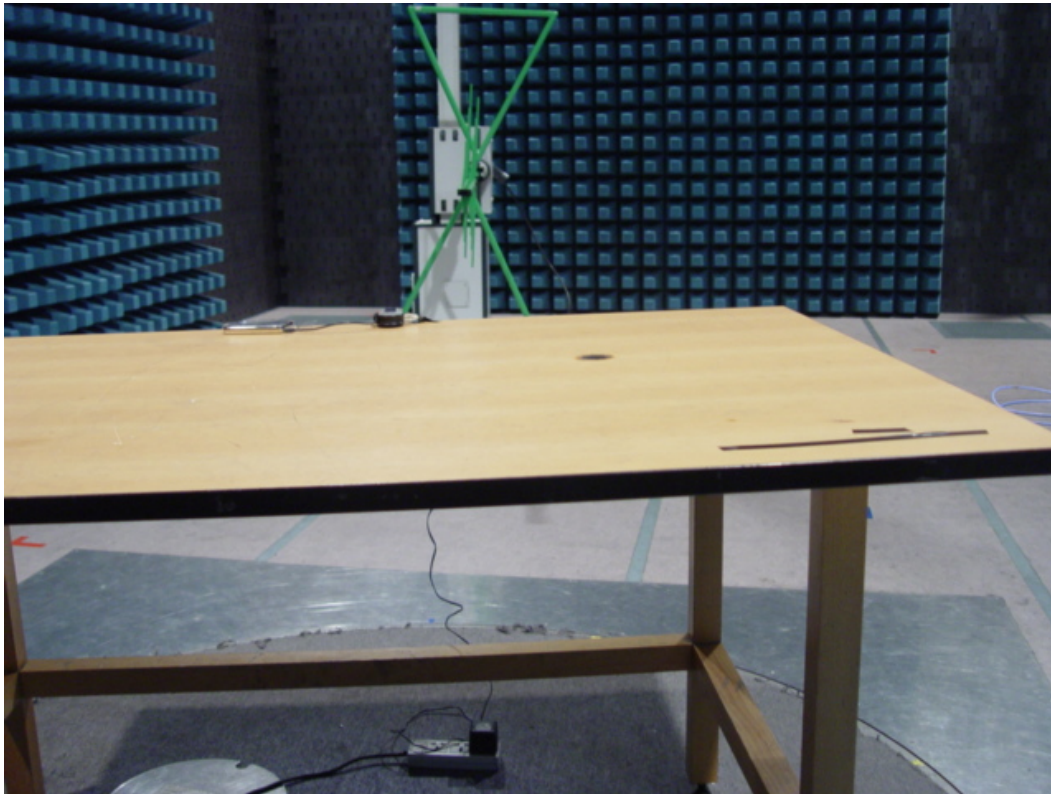
**Photo 5 Radiated Emission Test (power by dc adaptor)**



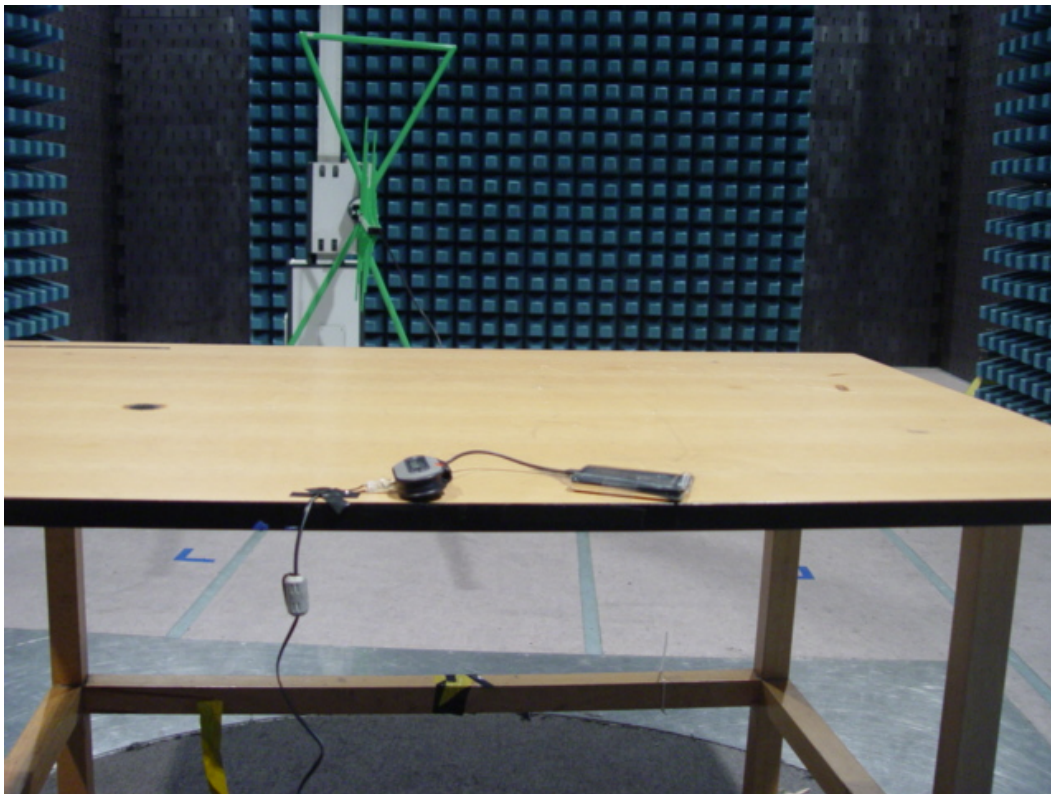
**Photo 6 Radiated Emission Test (power by DC adaptor)**



**Photo 7 Radiated Emission Test (power by AC adaptor)**



**Photo 8 Radiated Emission Test (power by AC adaptor)**



**APPENDIX II EUT PHOTO**



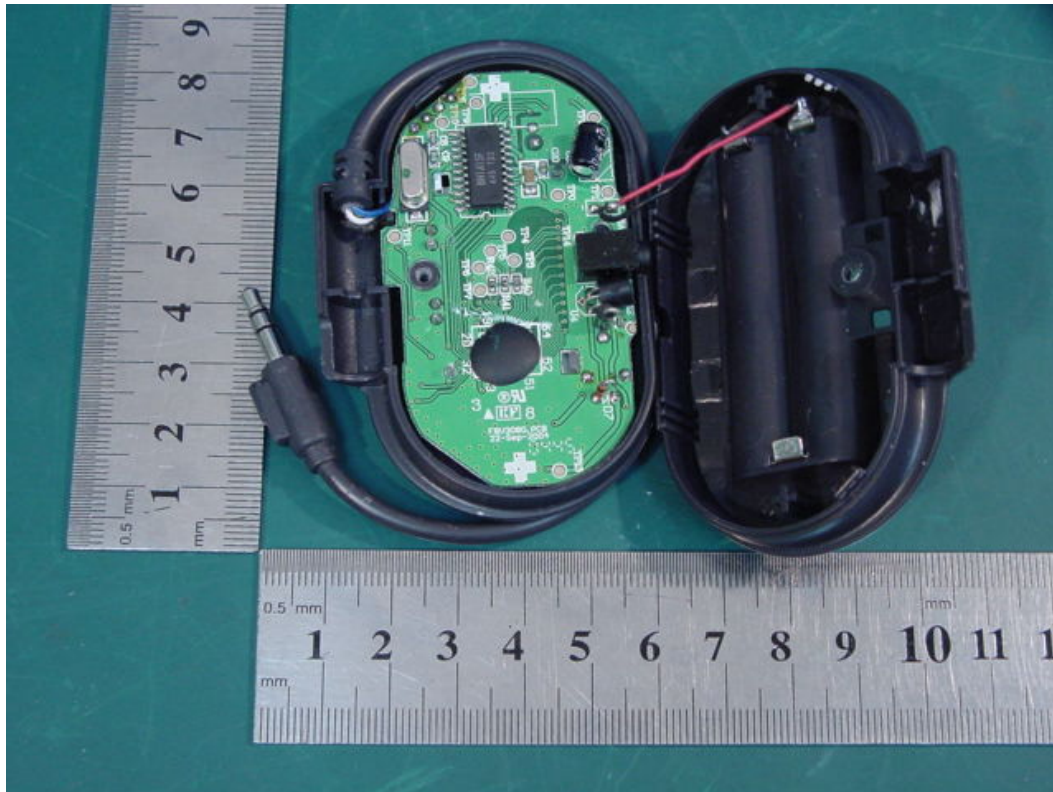
**Photo 1 Appearance of EUT**



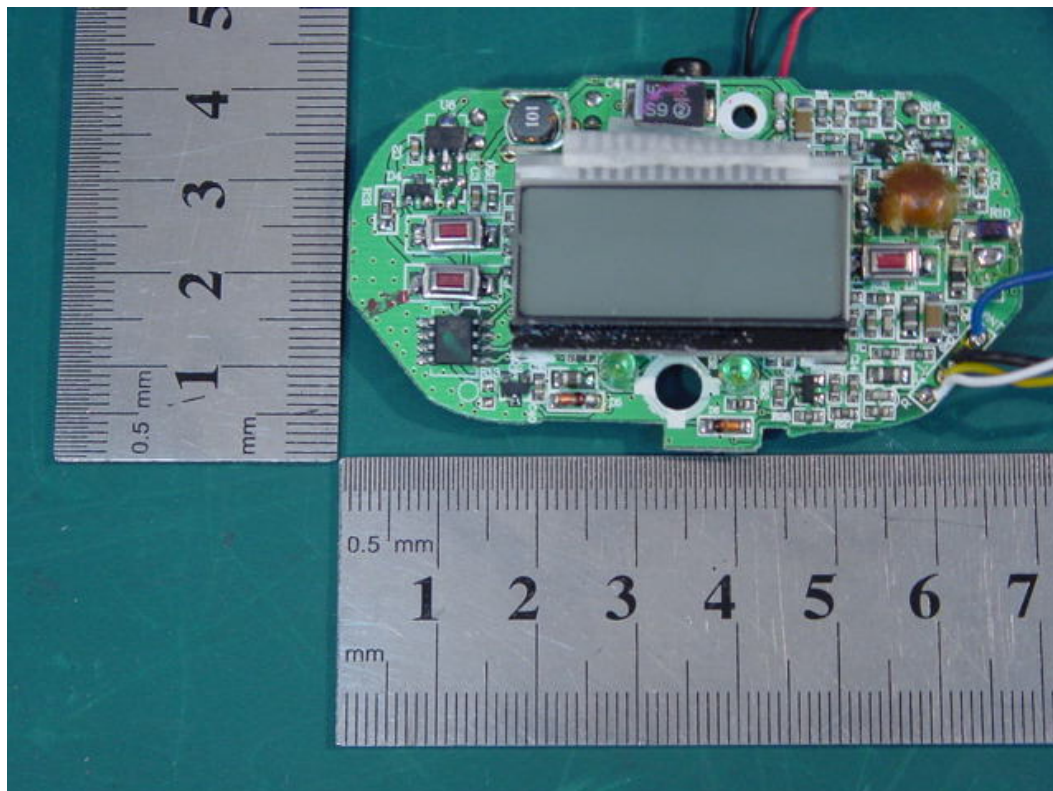
**Photo 2 Appearance of EUT**



**Photo 3 Inside of EUT**

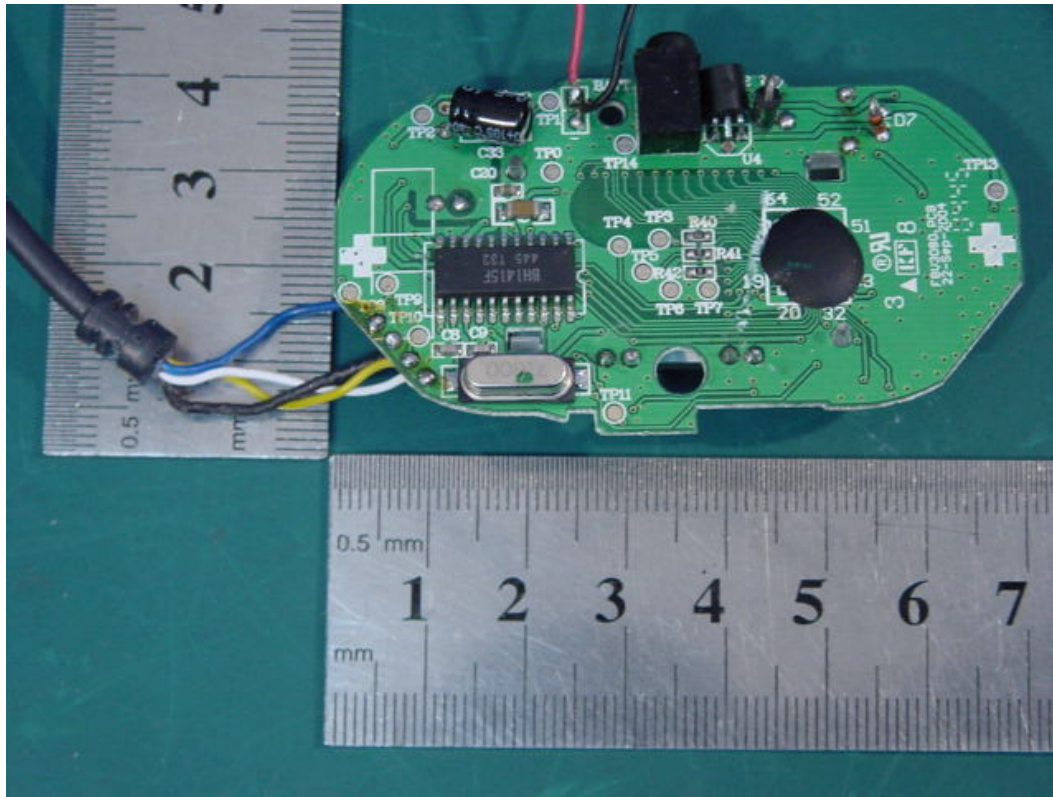


**Photo 4 Inside of EUT**





**Photo 5 Inside of EUT**



**Photo 6 Appearance of DC Adaptor**





**Photo 7 Inside of DC adaptor**

