FCC TEST REPORT

FCC ID : **VCKMSF-9**

Applicant : **Shenzhen Linfeng Technology Electronics Co., Ltd.**
Address : Building C, GuangHaoFeng Science and Technology Park, Gu Shu Road, Xi Xiang Town, Bao'an District, Shen Zhen, China

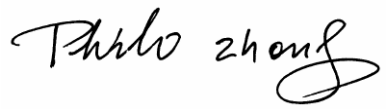
Equipment Under Test (EUT) :

Product : Car mp3 transmitter
Model No. : MSF-9/F1/F5/F9/F13/F13-1/F15/F17/F19/F21/F25/F27/F29/F31/F35
Modulation : FM
Operation Frequency :Low frequency 88.1~88.9MHz, High frequency 106.7~107.9MHz

Standards : FCC 15 Subpart C Paragraph 15.239

Date of Test : June 11, 2007

Test Engineer : **Tiger Su**

Reviewed By : 

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2 Contents

3 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	FCC PART 15: 2003	ANSI C63.4: 2003	Class B	PASS
Conducted Emission (150KHz to 30MHz)	FCC PART 15: 2003	ANSI C63.4: 2003	Class B	N/A

4 General Information

4.1 Client Information

Applicant:	**Shenzhen Linfeng Technology Electronics Co., Ltd.**
Address:	Building C, GuangHaoFeng Science and Technology Park, Gu Shu Road, Xi Xiang Town, Bao'an District, Shen Zhen, China
Manufacturer:	**Shenzhen Linfeng Technology Electronics Co., Ltd.**
Address:	Building C, GuangHaoFeng Science and Technology Park, Gu Shu Road, Xi Xiang Town, Bao'an District, Shen Zhen, China

4.2 General Description of E.U.T.

Product description:	Car mp3 transmitter
Model No.:	MSF-9/F1/F5/F9/F13/ F13-1/F15/F17/F19/F21/F25/F27/F29/F31/F35

4.3 Details of E.U.T.

Power Supply:	DC 12 V

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a Car mp3 transmitter. The standards used were FCC 15 Paragraph 15.209 and Paragraph 15.239.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC – Registration No.: 101879**

  Compliance Engineering Service (China) 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 101879, September 28, 2004.

4.7 Test Location

All Emissions testswere performed at:-

No. 6 Bldg. 35 Jin Ao Industry Technolog Yuan, Jukeng Rd., Da-Dhui-Keng Cun, Guan Lan Zhen, Bao An Qu, ShenZhen City, China 518110

5 Equipment Used during Test

DESCRIPTION	MFR	MODEL#	SERIAL #	LAST CAL.	CAL.DUE	Firmware	Software
AMPLIFIER	MITEQ	AW-1604-3000	1093584	2007/06/10	2008/06/09	N/A	N/A
ANTENNA	EMCO	3142B	9910-1436	2007/06/10	2008/06/09	N/A	N/A
BILOG ANTENNA	SCHAFFNER	CBL6143	5082	2007/06/10	2008/06/09	N/A	N/A
Horn Antenna	ASA	NA	NA	2007/06/10	2008/06/09	N/A	N/A
CABLE	TIME MICRO WAVE	LMR-400	N-TYPE04	2007/06/10	2008/06/09	N/A	N/A
Spectrum Analyzer	Agilent	E7402A	MY42000139	2007/06/10	2008/06/09	N/A	N/A
EMI test Receiver	ROHDE&SCHWARZ	ESCI	1166.595K03	2007/02/09	2008/02/08	N/A	N/A
Signal Generator	Agilent	8648C	3847M01114	2007/02/09	2008/02/08	N/A	N/A
DESCRIPTION	MFR	MODEL#	SERIAL#	LAST CAL.	CAL. DUE	Firmware	Software
Receiver	R&S	ESPI3		2007/02/09	2008/02/08	Ver 3.32 SP2	Labview 5.0
LISN (EUT)	R&S	ENV216		2007/02/09	2008/02/08	N/A	N/A
LISN	EMCO	3825/2	8901-1459	2007/02/09	2008/02/08	N/A	N/A
SPECTRUM ANALYZER	ADVANTENT	R3132	N02563	2007/06/10	2008/06/09	Ver F04	N/A

6 Conducted Emission Test

Product Name:	Car mp3 transmitter
Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	Based on FCC Part15 Paragraph 15.207
Test Date:	…….
Frequency Range:	150kHz to 30MHz
Class:	Class B
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 Test Equipment

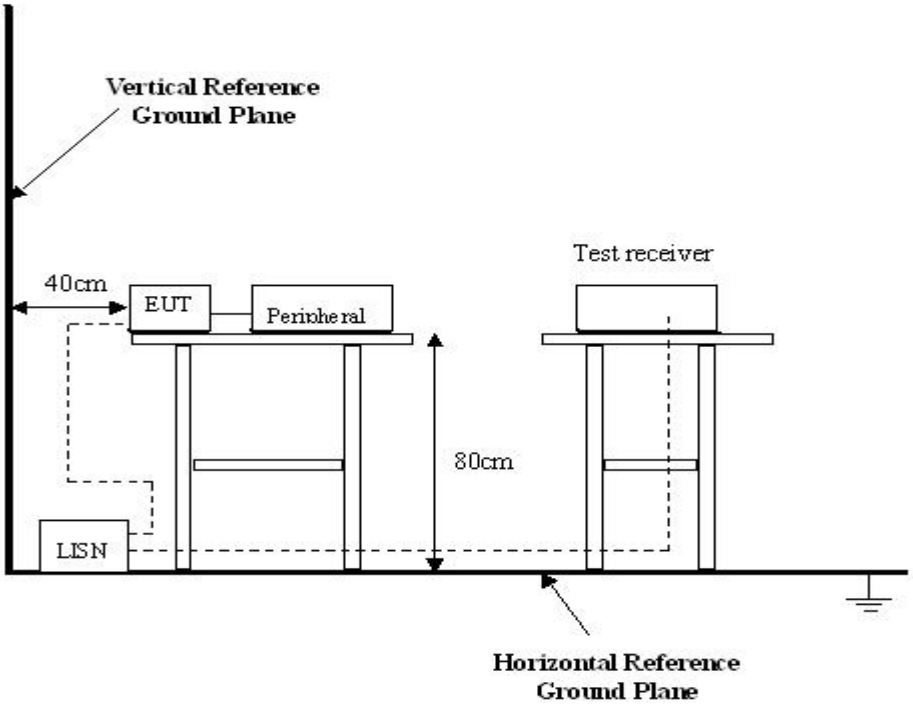
Please refer to Section 5 this report.

6.2 Test Procedure

1. The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.
2. 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.
3. Compliance test was performed test in the EUT was connect the adaptor output.

6.3 Conducted Test Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15 Paragraph 15.207 limits.



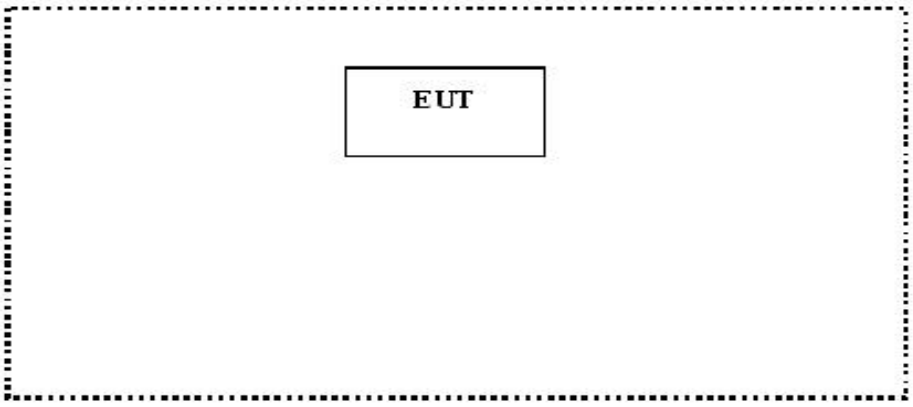
6.4 EUT Operating Condition

Operating condition is according to ANSI C63.4:2003.

A. Setup the EUT and simulators as shown on follow.

B. Enable RF signal and confirm EUT active.

C. Modulate output capacity of EUT up to specification.



6.5 Conducted Emission Limits

66-56 dBμV/m between 0.15MHz & 0.5MHz
56 dBμV/m between 0.5MHz & 5MHz
60 dBμV/m between 5MHz & 30MHz

Note: In the above limits, the tighter limit applies at the band edges.
Owing to the DC operation of EUT, this test is not performed.

7 Radiation Emission Test

Product Name:	Car mp3 transmitter
Test Requirement:	FCC Part15 Paragraph 15.239
Test Method:	Based on ANSI C63.4:2003
Test Date:	June 11, 2007
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Detector:	Peak for pre-scan (120kHz resolution bandwidth)
	Quasi-Peak if maximised peak within 6dB of limit

7.1 Test Equipment

Please refer to Section 5 this report.

7.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

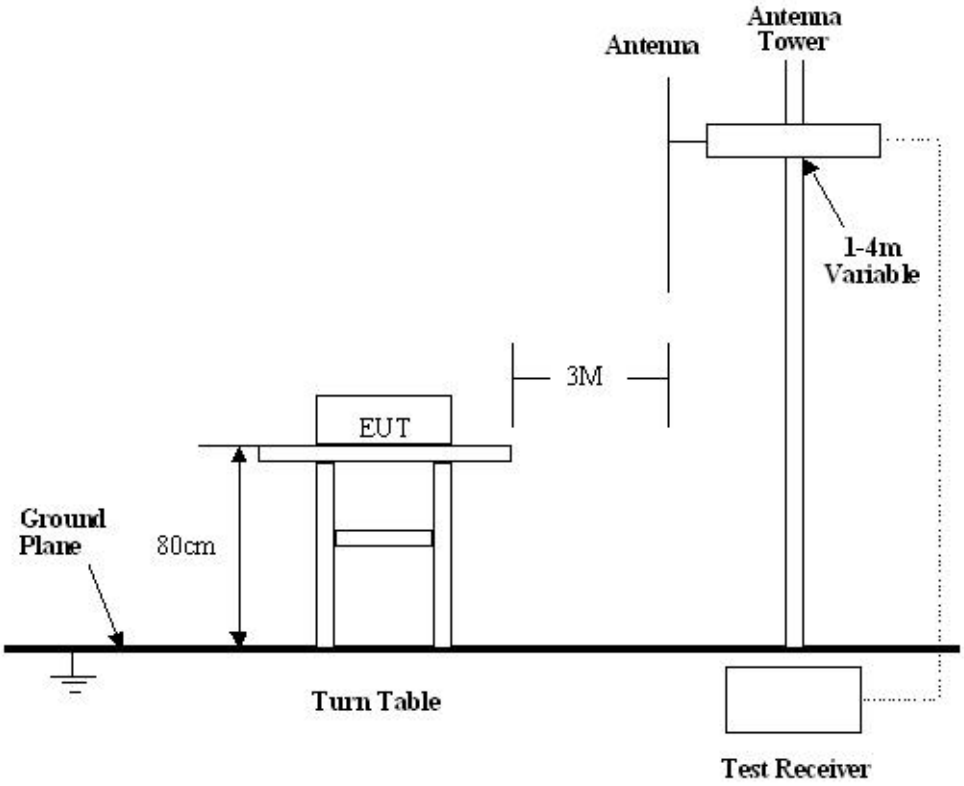
Based on ANSI C63.4:2003, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at CCS EMC Laboratory is +4.0 dB.

7.3 Test Procedure

1. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.
2. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "Qp" in the data table.
3. The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.
4. The market sample is tested for low frequency testing at 88.1 MHz and high frequency testing at 106.7 and 107.9 MHz.

7.4 Radiated 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 specification used in this report was the FCC Part15 Paragraph 15.209 and Paragraph 15.239 limits.



7.5 Spectrum Analyzer Setup

According to FCC Part15 Paragraph 15.239 Rules, the system was tested to 1000 MHz.

Start Frequency.....30 MHz
Stop Frequency.....1000 MHz
Sweep Speed Auto
IF Bandwidth.....100 kHz
Video Bandwidth.....1 MHz
Quasi-Peak Adapter Bandwidth .....120 kHz
Quasi-Peak Adapter Mode.....Normal
Resolution Bandwidth 1MHz

7.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

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

Margin = Corr. Ampl. – Class B Limit

7.7 Summary of Test Results

According to the data in section 7.10, the EUT complied with the FCC Part15 Paragraph 15.239 standards.

7.8 EUT Operating Condition

Same as section 6.4 of this report. Compliance test was performed test in the transmitter operation Mode.

7.9 Radiated Emissions Limit

A. FCC Part 15 subpart C Paragraph 15.239 Limit

Fundamental Frequency(MHZ)	Field Strength of Fundamental	
	uV/m	dBuV/m
88-108	250	48

Note: (1) RF Voltage(dBuV)=20 log RF Voltage(uV)

(2) 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) The emission limit in this paragraph is based on measurement instrumentaion employing an average detector.Measurement using instrumentation with a peak detector function,corresponding to 20dB above the maximum permitted average limit.

B. Frequencies in restricted band are complied to limit on Paragraph 15.209

Frequency(MHZ)	Distance(m)	Field strength(dBuV/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: (1) RF Voltage(dBuV)=20 log RF 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.

As shown in 15.35(b),for frequencies above 1000MHz,the field strength limits are based on average detector,however,the peak field strength of any emission shall not exceed the maximum permitted average limits,specified above by more than 20dB under any condition of modulation.

7.10 Radiated Emissions Test Result

Formula of conversion factors:the field strength at 3m was egtablished by adding The meter reading of the spectrum analyer (which is set to read in units of dBuV) To the antenna correction factor supplied by the antenna manufacturer. The antenna Correction factors are stared in terms of dB.The gain of the pressletor was accounted For in the spectrum analyser meter reading.

Example:

Freq(MHz) Meter Reading +ACF=FS

33 20dBuV+10.36dB=30.36dBuV/m @3m

Radiated Emission Test Data

A. Test Item: Radiated Emission Test Data

Test Voltage: DC 12V

Test Mode: ON TX

Temperature: 24 °C

Humidity: 52%RH

Test Result: PASS

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°C)
Low Frequency						
88.10	Horizontal	43.3	48.0	4.7	1.0	120
176.2	Horizontal	38.9	43.5	4.6	1.8	45
264.3	Horizontal	38.7	46.0	7.3	1.8	180
352.4	Horizontal	37.2	46.0	8.8	1.5	90
88.10	Vertical	41.8	48.0	6.2	1.0	90
176.2	Vertical	38.1	43.5	5.4	1.8	180
264.3	Vertical	35.6	46.0	10.4	2.0	120
352.4	Vertical	33.4	46.0	12.6	1.0	45
High Frequency						
106.7	Horizontal	44.3	48.0	3.7	1.8	180
213.4	Horizontal	39.4	43.5	4.1	1.8	90
320.1	Horizontal	38.5	46.0	7.5	2.0	45
106.7	Vertical	42.1	48.0	5.9	2.0	90
213.4	Vertical	37.2	43.5	6.3	1.5	90
320.1	Vertical	35.6	46.0	10.4	1.0	180

High Frequency						
107.9	Horizontal	42.6	48.0	5.4	1.0	90
215.8	Horizontal	38.4	43.5	5.1	1.8	45
232.7	Horizontal	37.6	46.0	8.4	1.5	60
107.9	Vertical	41.8	48.0	6.2	2.0	120
215.8	Vertical	36.9	43.5	6.6	1.8	180
232.7	Vertical	35.7	46.0	10.3	1.0	180

Note: (1) All Reading Levels below 1GHz are Quasi-Peak, above are peak and average value.

(2) Emission Level = Reading Level + Probe Factor + Cable Loss.

8 Band Edge

8.1 Test Equipment

Please refer to Section 5 this report.

8.2 Test Procedure

1.The EUT, peripherals were put on the turntable which table size is 1mX1.5m, table high 0.8m. All set up is according to ANSI C63.4:2003.

2. The antenna high were varied from 1m to 4m high to find the maximum emission for each frequency.

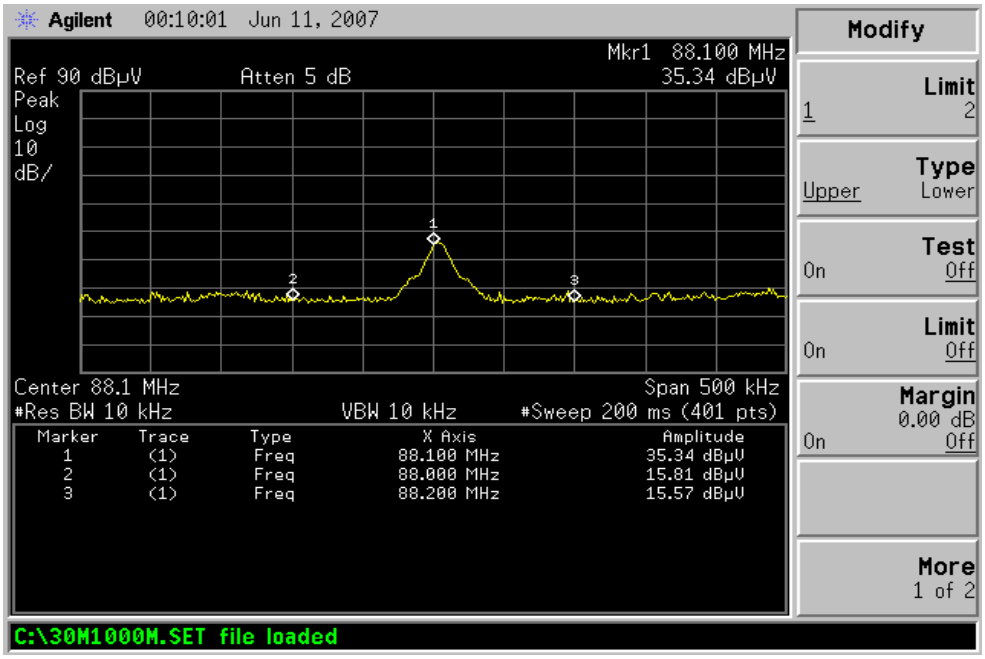
3. The field strength of any emissions radiated on any frequency outside of the specified 200KHz band shall not exceed the general radiated emission limits in Section 15.209.

4.The market sample is tested for low frequency testing at 88.1 MHz and high frequency testing at 106.7 and 107.9 MHz..

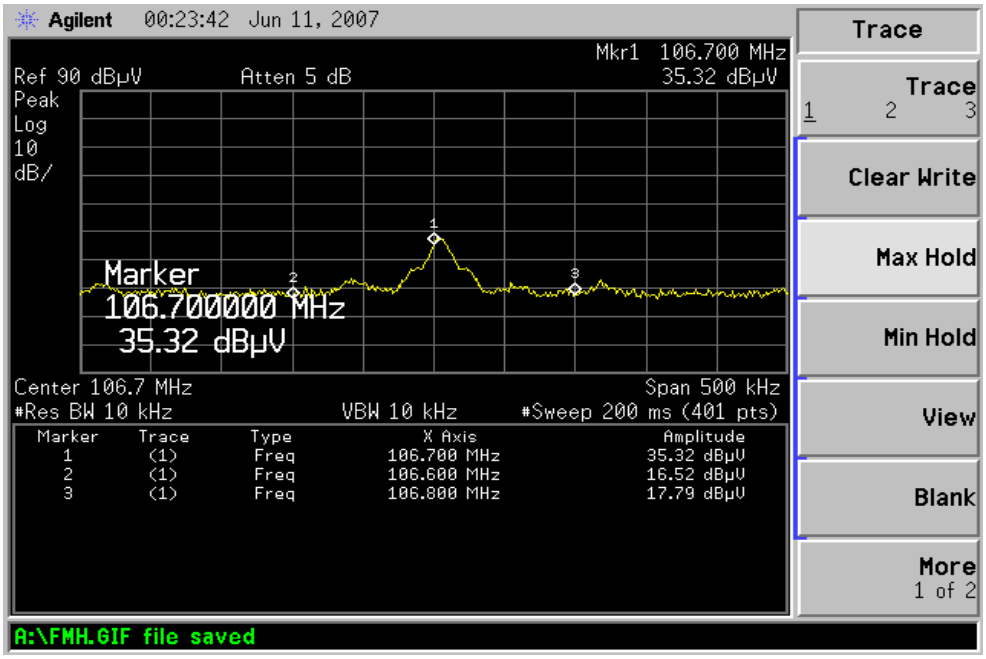
8.3 Band Edge Test Result

Product Name:	Car mp3 transmitter
Test Item:	Band Edge Test
Test Voltage:	DC 12V
Test Mode:	TX ON
Temperature:	24 °C
Humidity:	52%RH

88.1 MHz



106.7 MHz



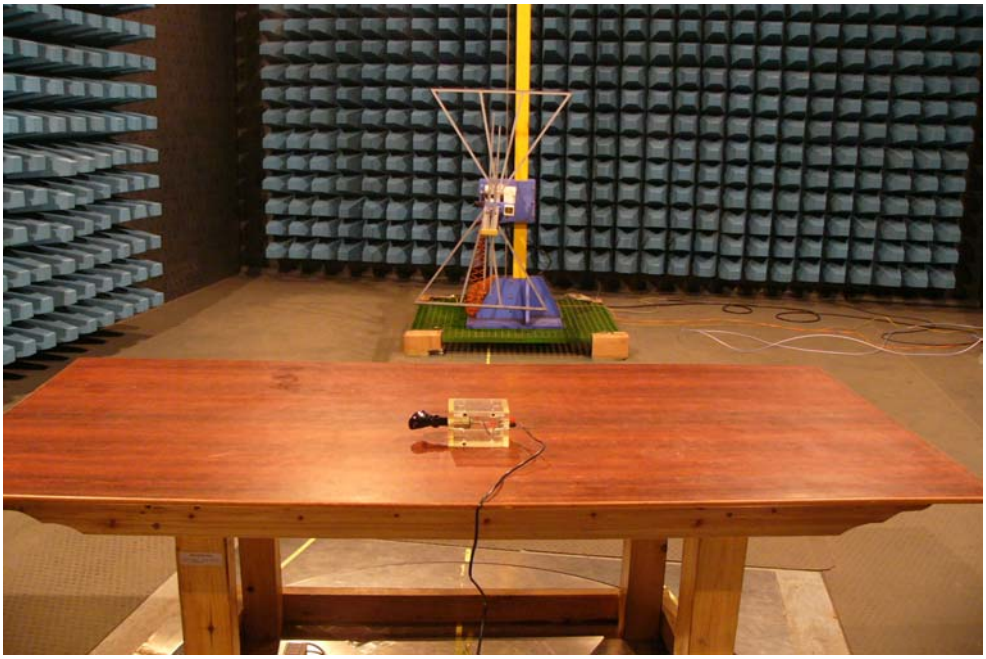
107.9 MHz

Note: (1) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

(2) The average measurement was not performed when the peak measured data under the limit of average detection.

9 Photographs of Testing

9.1 Radiation Emission Test View

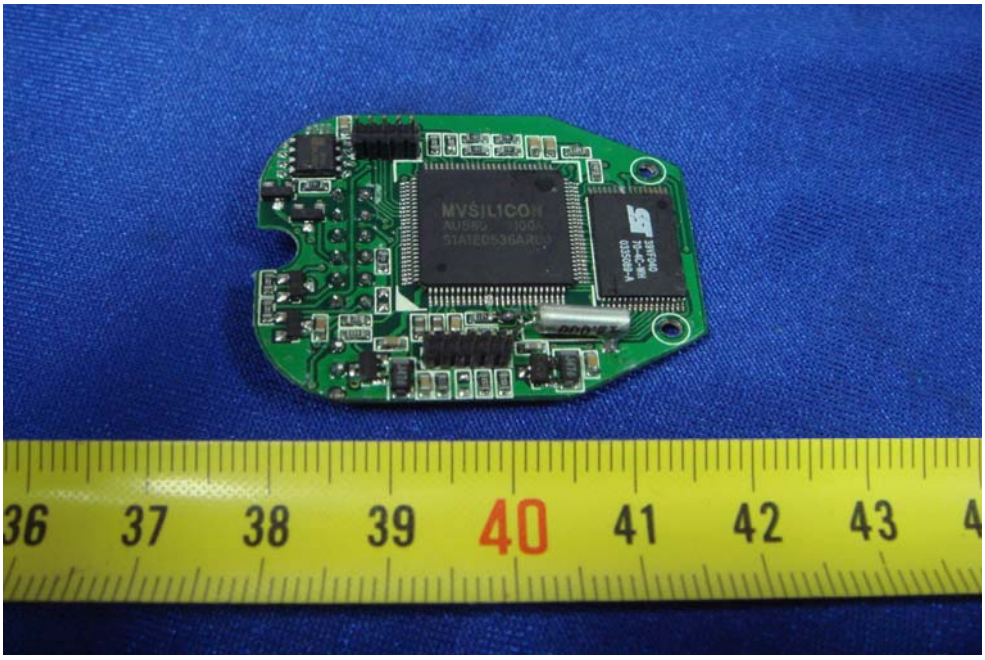


10 Photographs - Constructional Details

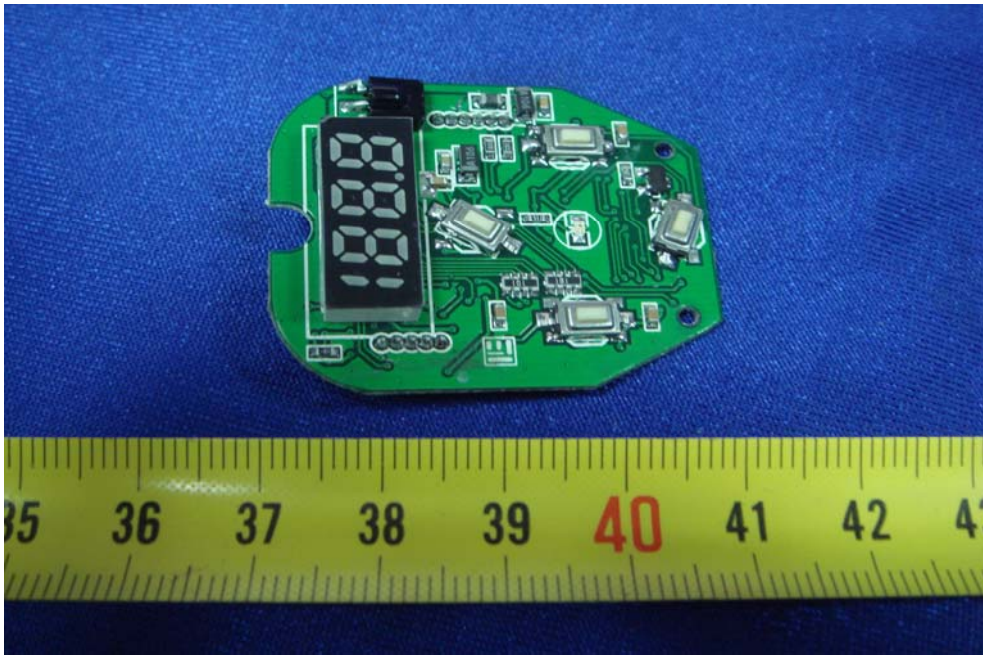
10.1 EUT - Front View

10.2 EUT - Back View

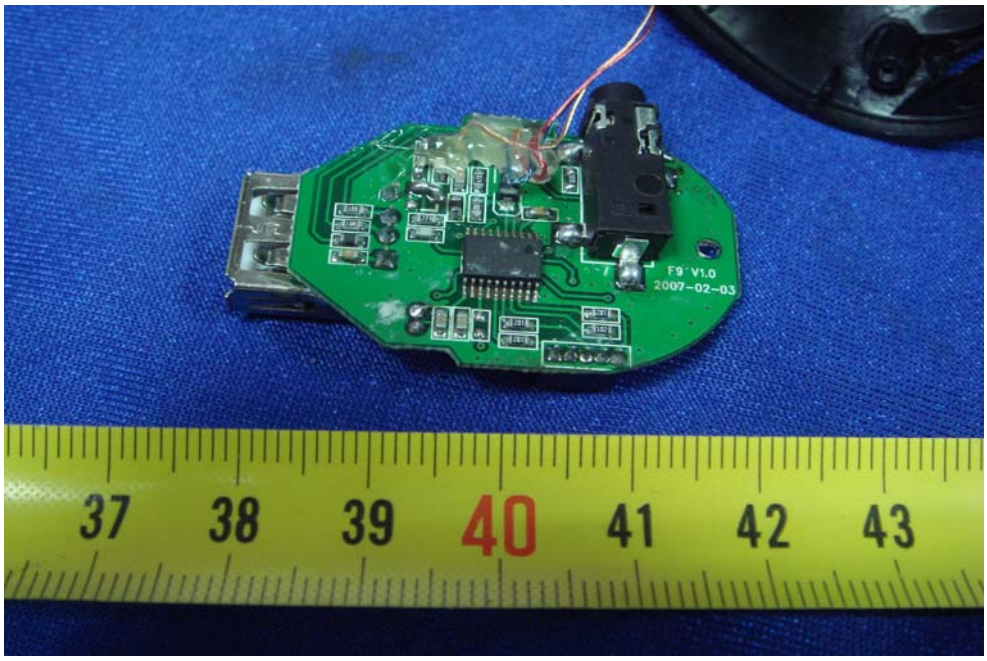
10.3 PCB1-Front View



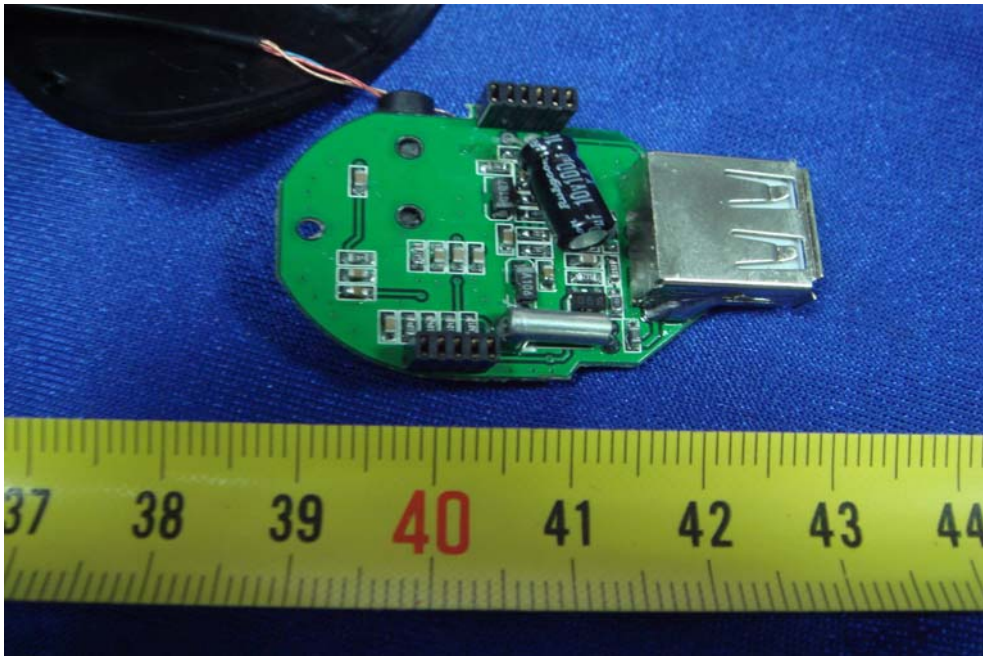
10.4 PCB1-Back View



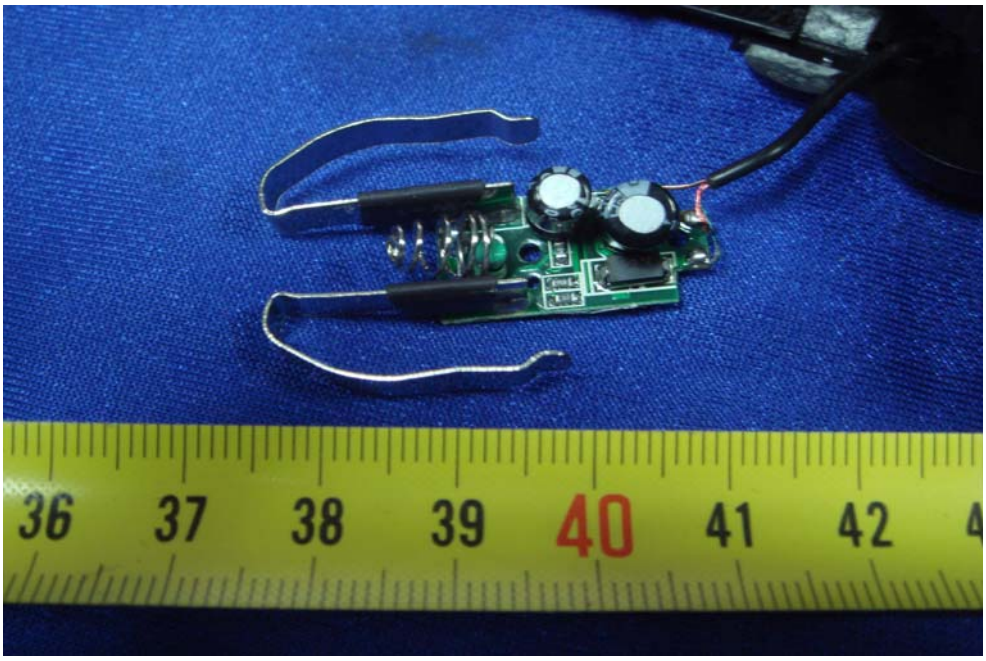
10.5 PCB2-Front View



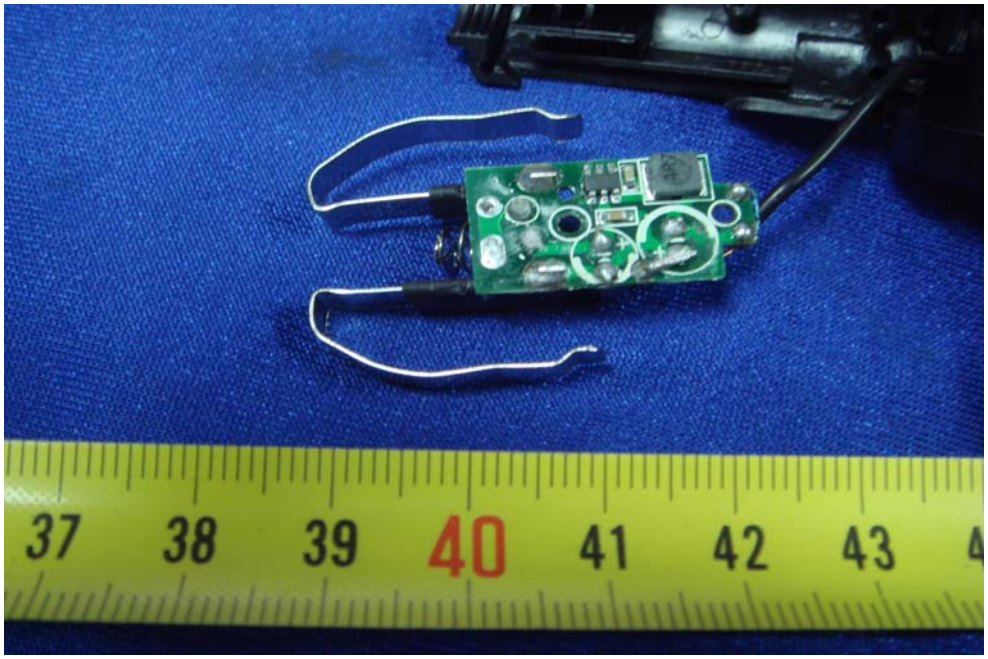
10.6 PCB2-Back View



10.7 PCB3-Front View



10.8 PCB3-Back View



11 FCC ID Label

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.

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT

EUT Bottom View/proposed FCC Mark Location