



# Test Report

**Applicant:** Enping Sange Electronic Co., Ltd.  
**Address of Applicant:** No. 12, F District, Individual & Foreign Capital Industry Zone, Enping City, Guangdong Province, P. R. China  
**Equipment Under Test (EUT):**  
EUT Name: Transmitter  
Model No.: BM-8  
Trade Mark: NA  
Serial No.: Not supplied by client  
**Standards:** FCC PART15 SUBPART C: 2008  
**Date of Receipt:** Aug. 30, 2012  
**Date of Test:** Aug. 30 to Sep. 7, 2012  
**Date of Issue:** Sep. 10, 2012  
**Test Result :** **PASS\***

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Henly Xie / Manager

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

All test results in this report can be traceable to National or International Standards.

The test report prepare by:

Guangzhou Huesent Testing Service Co.,Ltd.

Self-ordained 68# courtyard, No.91, Dongguanzhuang Road,Guangzhou,China.

Tel: 86-20-28263298 Fax: 86-20-28263237

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## 1 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	FCC PART 15.249	ANSI C63.4:2003	Class B	PASS
Occupied Bandwidth	FCC PART 15.215	ANSI C63.4:2003	Class B	PASS

Remark:



Channel	Frequency/ MHz
Lowest	902.2
Mid	912.0
Highest	927.8

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### 3 General Information

#### 4.1. Client Information

Applicant: Enping Sange Electronic Co., Ltd.  
Address of Applicant: No. 12, F District, Individual & Foreign Capital Industry Zone,  
Enping City, Guangdong Province, P. R. China

#### 4.2. General Description of E.U.T.

EUT Name: Transmitter  
Item No.: BM-8  
Serial No.: Not supplied by client

#### 4.3. Details of E.U.T.

Power Supply: 3.7Vdc, chargeable battery  
Main Function: Wireless microphone system with an associated receiver for transmitting voice.  
Frequency Range: 902.200 MHz to 927.800 MHz for all the models listed in the cover. 16 channels for each microphone.  
Modulation: F3E.  
Antenna Type: Fixed; Gained: 0 dBi

#### 4.4. Description of Support Units

Test the EUT with signal generator.

#### 4.5. Standards Applicable for Testing

The standard used was FCC PART 15, SUBPART C, PART 15.249.  
The EUT belongs to unlicensed low power auxiliary devices.

#### **4.6. Test Location**

GuangZhou Huesent Testing Service Co., Ltd.

No.91, Dongguanzhuang Road, Guangzhou, China.

Tel: 86-20-87221905, Fax: 86-20-87223892

CNAS- Accreditation No.: L2885.

CMA- Authorisation Certificate No.: 2008191614Z

ERP & Spurious Emission tests were subcontracted to the laboratory following-

CEPREI (headquarters) lab.

No.110, Dongguanzhuang Road, Tianhe District, Guangzhou city, Guangdong Province,  
P.R. China

Tel: 86-20-87237178      Fax: 86-20-87236171      Email: emc@ceprei.biz

FCC- Registration No: 258518 on Mar 25, 2005

CNAS- Accreditation No: L0462.

#### **4.7. Deviation from Standards**

None.

#### **4.8. Abnormalities from Standard Conditions**

None.

## 5. Equipments Used during Test

Test Equipment	Manufactory	Model No,	Serial o.	Cal Date
Antenna	R & S	HF906	/	2011-5-10
3m Semi-anechoic Chamber	ABLATROSS	SAC-3	/	2011-5-10
EMI Receiver	R & S	ESCI-3	/	2012-5-10
RF Generator	Rohde & Schwarz	SMT06	61-318	2012-6-8
Anechoic Chamber	ETS•Lindgren	RFSD-F-100	2693	2012-6-8
Double Ridged Guide Antenna	EMCO	3115	640201028-08	2012-6-8
Spectrum Analyzer	R&S	CMU 200	/	2012-6-8
EMI Test Receiver	Rohde & Schwarz	ESU	/	2012-6-8
Power Meter	Rohde & Schwarz	URV35	EMC1506	2012-6-8
Signal generator	R&S	SMT06	/	2012-6-8
RF Power Amplifier	AR	50SIG4A 0.8-4.2GHz	/	2012-6-8
RF Power Amplifier	AR	150W1000 80M-1000MHz	/	2012-6-8
18G RF Pre-amplifier	MITEQ	AFS44	1381096	2012-6-8
Power Meter	Rohde & Schwarz	URV35	EMC1506	2012-6-8
Audio Analyzer	Rohde & Schwarz	UPL	EMC1508	2012-6-8
Power Sensor	Rohde & Schwarz	URV5-Z7	EMC1507	2012-6-8
Temperature Chamber	Gongwen	GDS-250	1150	2012-6-8
D.C. Power Supply	WELLSTAR	PS-205A	SEL0045	2012-6-8
Humidity/ Temperature Meter	Shanghai	ZJ1-2B	SEL0101 to SEL0103	2012-6-8
Barometer	ChangChun	DYM3	SEL0088	2012-6-8
Multimeter	Victor	VC9805A+	3000125	2012-6-8
DC Power Supply	DG HuaYang	PS-3030	9862036	2012-6-8
Low Loss Coaxial Cable	HST	2 m	EMC1008	2012-6-8
Monopole Antenna	HST	N/A	N/A	2012-6-8
Noise Generaror	Ningbo Zhongce	DF1681	EMC0009	2012-6-8
Spectrum Analyzer	R&S	FSP30	EMC0001	2012-1-18
Multifunction Counter	Electonix	HC-F1000L	EMC0013	2011-11-14

## 6. Test Results

### 6.1. RADIATION INTERFERENCE

Test Requirement: FCC Part15.249, a) & FCC Part15.209

Test Method: ANSI C63.4

Detector: Peak for pre-scan (The resolution bandwidth was 100KHz and the video bandwidth was 300KHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz.)

Average detector if maximised peak within 6dB of limit

Test Date: Sep. 11, 2012

#### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25°C

Humidity: 45% RH

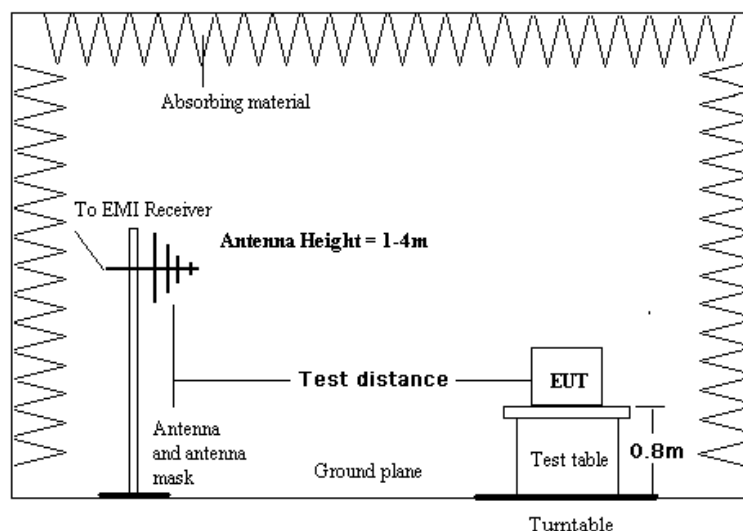
Atmospheric Pressure: 1020mBar

EUT Operation:

In the fundamental test, an Apple's Ipad supplied a sinusoidal signal at 1 kHz as input in worst case ( within 1kHz to 20kHz input for pre-testing ), connecting with the EUT to peripheral devices.

Test the EUT work normally in on mode during the whole test.

#### 6.1.2 Test Setup



#### 6.1.3 Test Procedure

##### ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES:

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical polarities.

### 6.1.4 Measurement Data

#### Quasi-Peak measurement of carrier

Frequency	Level		Transducer	Limit	Min. Margin
MHz	dBuV/m		dB		dB
	V	H			
902.2 (L)	77.3	81.9	30.4	94 dBuV/m (50mV/m)	12.1
912.0 (M)	78.0	81.9	30.6		12.1
927.8 (H)	78.2	83.4	30.8		10.6

#### Average & Peak measurement of harmonics and spurious emission at

lowest channel 902.2MHz

Frequency		Level				Transducer	Limit	Min. Margin
MHz		dBuV/m				dB	dBuV/m	dB AVG
		V		H				
		Peak	Avg.	Peak	Avg.		500μV/m	
2 <sup>nd</sup>	1804.4	<50	<44	65.6	<44	-11.8		-8.4
3 <sup>rd</sup>	2706.6	<50	<44	72.8	47.3	-7.9		-1.2
4 <sup>th</sup>	3608.8	<50	<44	57.1	<44	-4.6		-16.9
5 <sup>th</sup>	4511.0	<50	<44	63.2	<44	-3.6		-10.8
6 <sup>th</sup>	5413.2	<50	<44	55.4	<44	-2.0		-18.6
7 <sup>th</sup>	6315.4	<50	<44	<50	<44	-0.7		>10
Above to 9.3G		<50	<44	<50	<44			NA

#### Average and Peak measurement at middle channel 912.0MHz

2 <sup>nd</sup> 1824.0	<50	<44	65.9	<44	-11.8	AVG: 54dB 500μV/m	-8.1
3 <sup>rd</sup> 2736.0	<50	<44	73.1	47.8	-7.9		-0.9
4 <sup>th</sup> 3648.0	<50	<44	57.2	<44	-4.6		-16.8
5 <sup>th</sup> 4560.0	<50	<44	63.4	<44	-3.6		-10.6
6 <sup>th</sup> 5472.0	<50	<44	55.9	<44	-2.0		-18.1
7 <sup>th</sup> 6384.0	<50	<44	<50	<44	-0.7	Peak: 74dB	>10
Above to 9.3G	<50	<44	<50	<44			NA

#### Average and Peak measurement at highest channel 927.8MHz

2 <sup>nd</sup> 1855.6	<50	<44	66.2	<44	-11.8	AVG: 54dB 500μV/m	-7.8
3 <sup>rd</sup> 2783.4	<50	<44	73.0	47.7	-7.9		-1.0
4 <sup>th</sup> 3711.2	<50	<44	57.5	<44	-4.6		-16.5
5 <sup>th</sup> 4639.0	<50	<44	63.8	<44	-3.6		-10.2
6 <sup>th</sup> 5566.8	<50	<44	55.7	<44	-2.0		-18.3
7 <sup>th</sup> 6494.6	<50	<44	<50	<44	-0.7	Peak: 74dB	>10
Above to 9.3G	<50	<44	<50	<50			NA

Note: The transducer factor = antenna factor + cable loss - preamplifier.

The Level = Read level + transducer factor.



## 6.2. Occupied Bandwidth

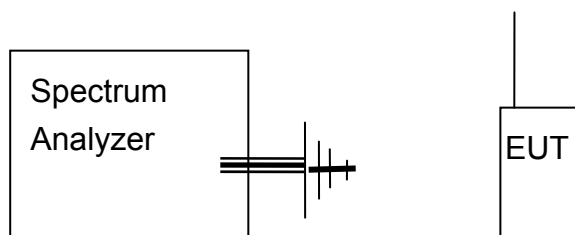
Test Requirement: FCC Part15.215  
Test Method: ANSI C63.4  
Detector: Peak for scan (The resolution bandwidth was 1kHz and the video bandwidth was 1kHz, span was 2M/600k Hz)  
maximised peak hold  
Test Date: Sep. 11, 2012

### 6.2.1 E.U.T. Operation

Operating Environment:  
Temperature: 25°C Humidity:45% RH Atmospheric Pressure: 1020mBar  
EUT Operation:

Test the EUT work normally in on mode during the whole test.

### 6.2.2 Test Setup



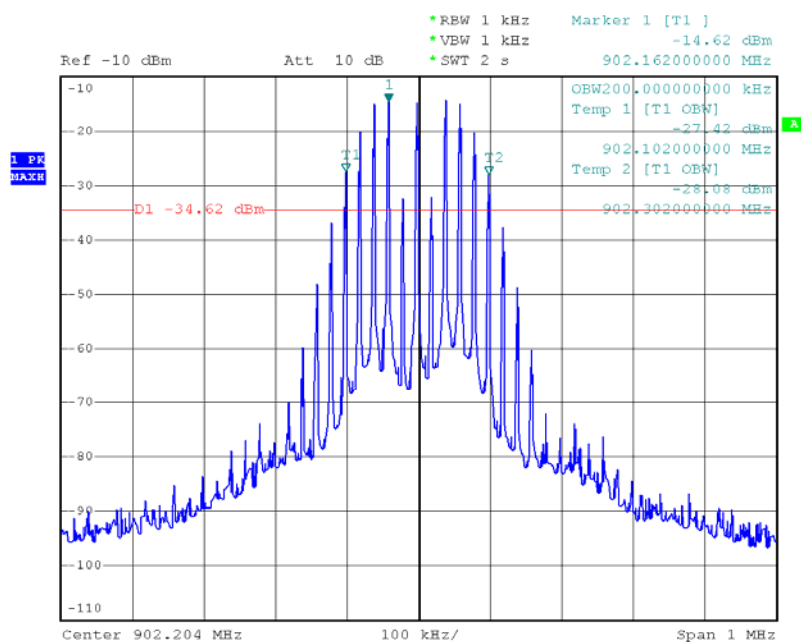
### 6.2.3 Test Procedure

#### **ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES:**

An initial pre-scan was performed in the 3m chamber using the spectrum analyzer in peak detection mode. Average measurements were conducted based on the peak sweep graph. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical polarities.

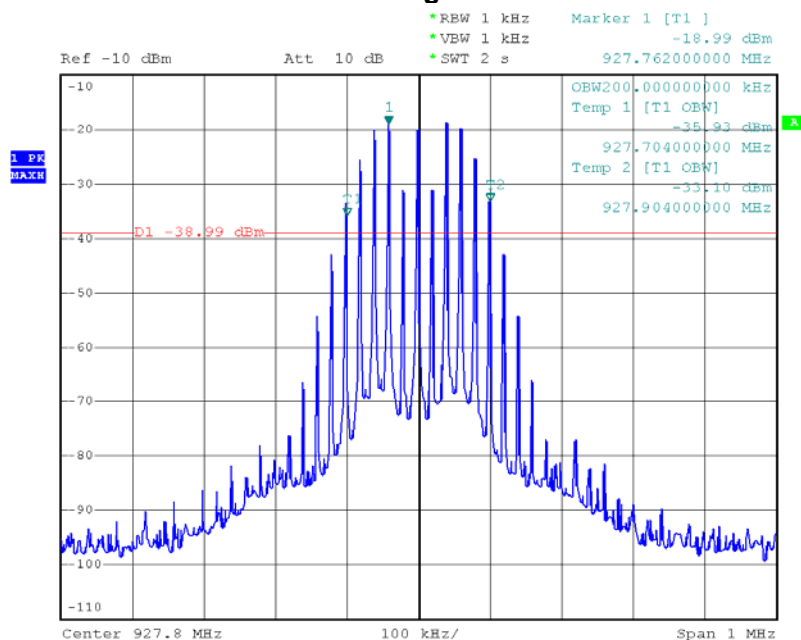
## 6.2.4 Measurement Data

### Maximum Peak hold measurement for lowest channel 902.2M



Date: 7.SEP.2012 12:58:57

### Maximum Peak hold measurement for highest channel 927.8M



Date: 8.SEP.2012 07:55:51

**The 20 Bandwidth is 200 kHz:** An Apple's Ipod supplied a sinusoidal signal at 20 kHz as input in worst case ( within 1kHz to 20kHz input for pre-testing ).



Test curves:

30MHz-1GHz, RBW: 120kHz, VBW: 300kHz, test in 3m semi-anechoic chamber

Test Channel: MHz	Frequency: MHz	Peak Value: dBuV/m	
		Vertical	Horizontal
902.2	902.0	17.5*	17.4*
927.8	928.0	18.0*	17.8*

Note:

Data \* mean they were tested with a 30dB pre-amplifier.

Frequencies of 902.2 MHz and 927.8 MHz were the emissions radiated outside of the specified frequency bands, and they complied with the FCC Part15.249d).

### 6.3. Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

**Test Requirement:** FCC Part 15 C section 15.207

**Test Method:** ANSI C63.10: Clause 6.2 & DA 00-705

**Frequency Range:** 150 kHz to 30 MHz

**Detector:** Peak for pre-scan (9 kHz Resolution Bandwidth)

#### Test Limit

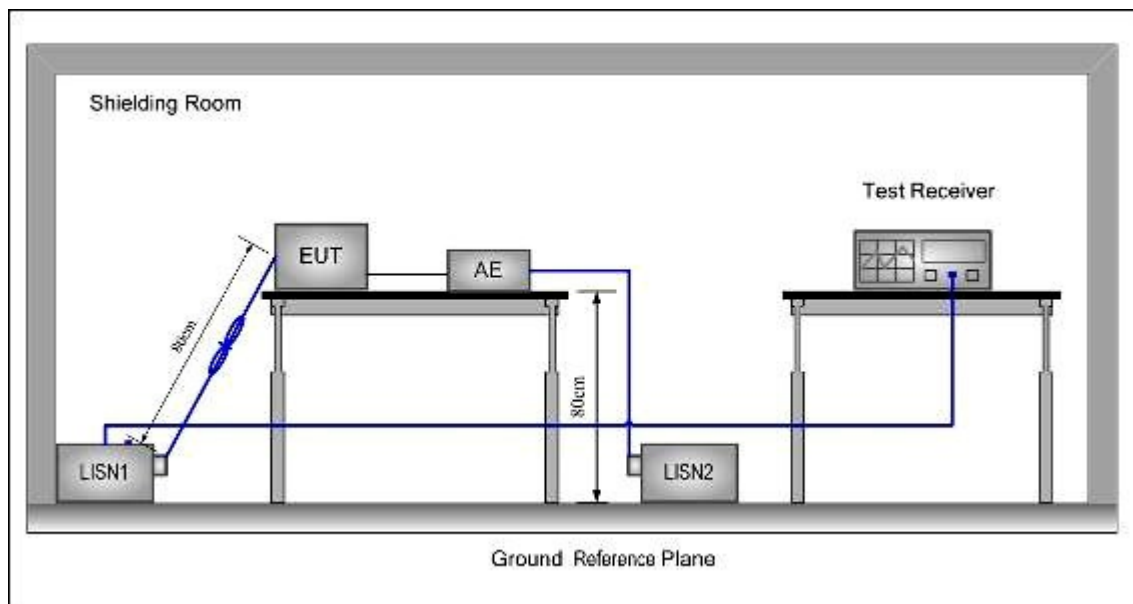
**Limits for conducted disturbance at the mains ports of class B**

Frequency Range	Class B Limit dB(μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

#### EUT Operation:

Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

**Test Configuration:****Test procedure:**

1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a  $50\Omega/50\mu\text{H} + 5\Omega$  linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

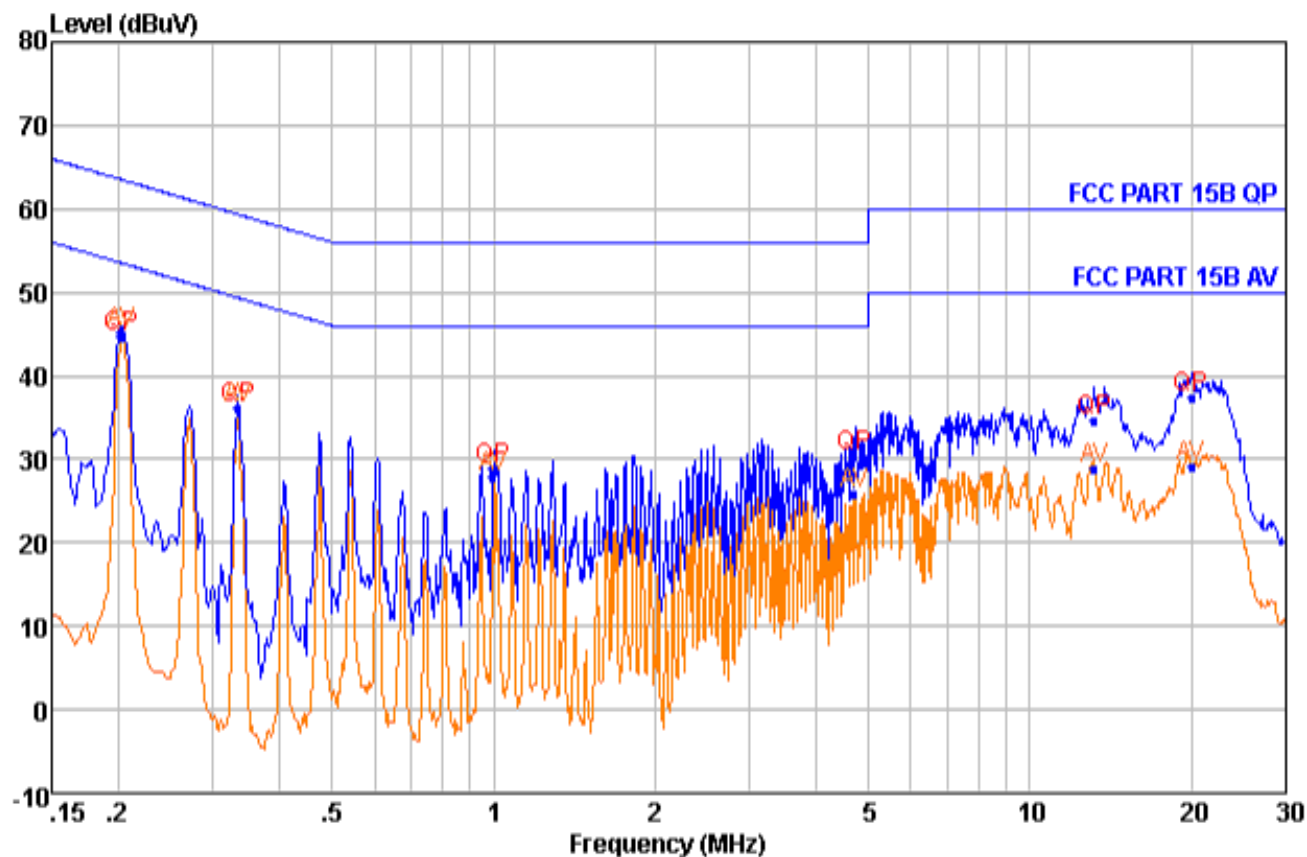
### **6.3.1 Measurement Data**

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT the communicating was worst case mode.

**The following Quasi-Peak and Average measurements were performed on the EUT:**

**Test the EUT work normally in charging mode via an AC-DC adapter to the mains of 120VAC60Hz.**

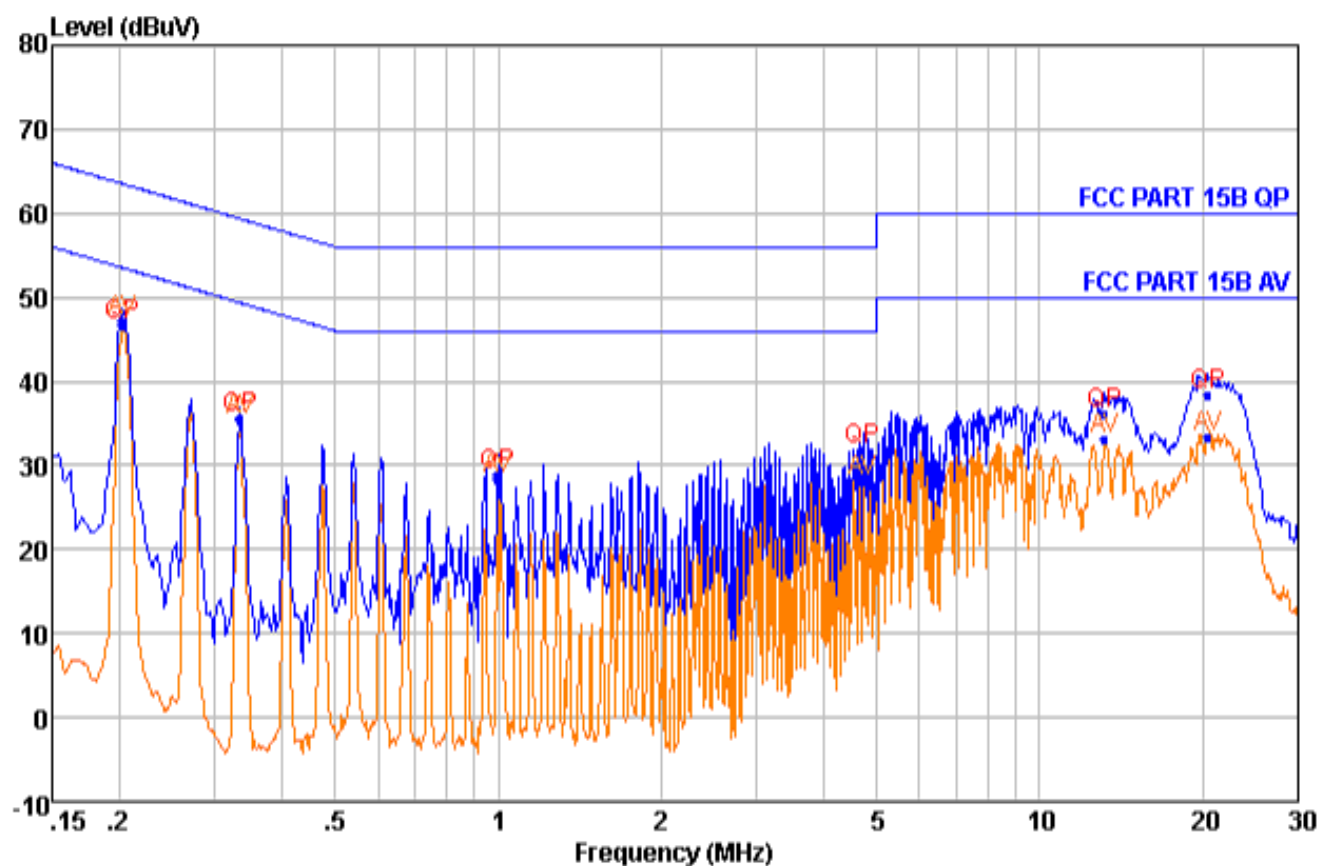
## Live line



NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Margin dB
1	0.202	44.77	QP	9.68	0.22	63.54	-18.77
2	0.202	45.25	Average	9.68	0.22	53.54	-8.29
3	0.333	36.18	QP	9.66	0.25	59.37	-23.19
4	0.333	36.09	Average	9.66	0.25	49.37	-13.28
5	0.998	28.76	QP	9.67	0.31	56.00	-27.24
6	0.998	27.97	Average	9.67	0.31	46.00	-18.03
7	4.711	30.25	QP	9.60	0.40	56.00	-25.75
8	4.711	25.78	Average	9.60	0.40	46.00	-20.22
9	13.162	34.68	QP	9.69	0.45	60.00	-25.32
10	13.162	28.84	Average	9.69	0.45	50.00	-21.16
11	20.013	37.48	QP	9.68	0.48	60.00	-22.52
12	20.013	29.16	Average	9.68	0.48	50.00	-20.84

Level=Read Level + Lisn Factor + Cable Loss

# Neutral Line



NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Margin dB
1	0.202	46.56	QP	9.63	0.22	63.54	-16.98
2	0.202	47.14	Average	9.63	0.22	53.54	-6.40
3	0.333	35.59	QP	9.65	0.25	59.37	-23.78
4	0.333	35.38	Average	9.65	0.25	49.37	-13.99
5	0.998	28.75	QP	9.63	0.31	56.00	-27.25
6	0.998	28.39	Average	9.63	0.31	46.00	-17.61
7	4.711	31.84	QP	9.62	0.40	56.00	-24.16
8	4.711	28.13	Average	9.62	0.40	46.00	-17.87
9	13.162	36.22	QP	9.63	0.45	60.00	-23.78
10	13.162	33.04	Average	9.63	0.45	50.00	-16.96
11	20.434	38.42	QP	9.62	0.48	60.00	-21.58
12	20.434	33.27	Average	9.62	0.48	50.00	-16.73

Level=Read Level + Lisen Factor + Cable Loss



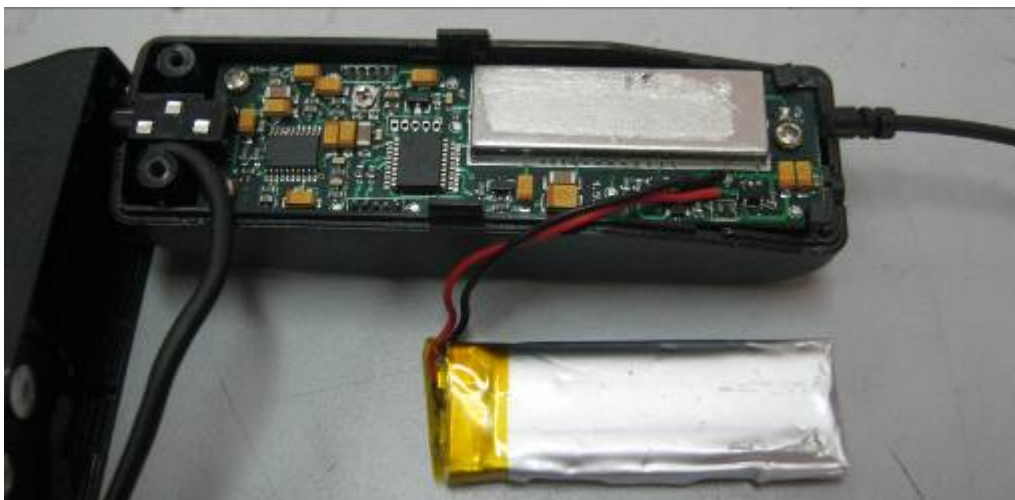
## 7. Photographs

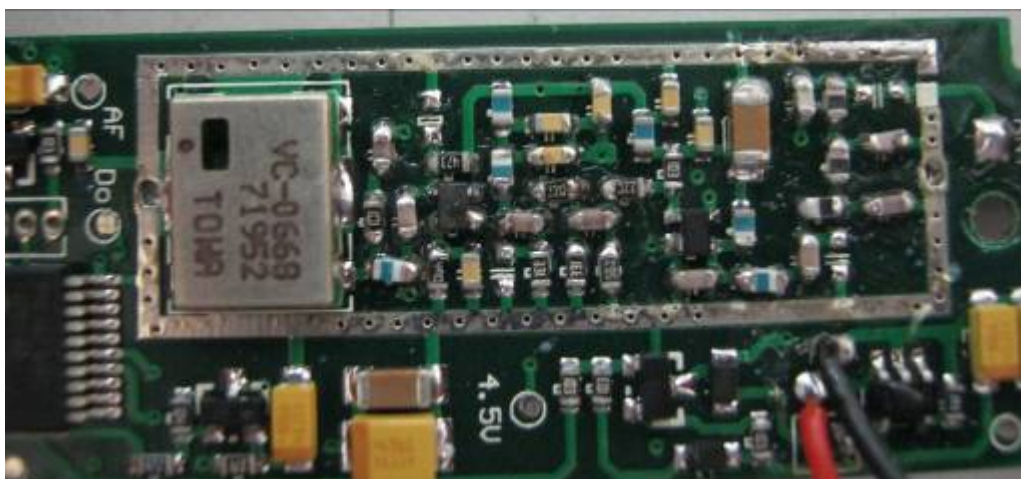
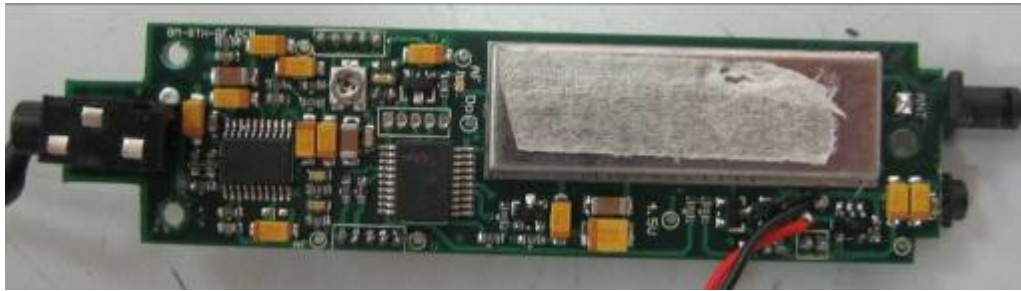
### 7.1. Radiated Emission Test Setup



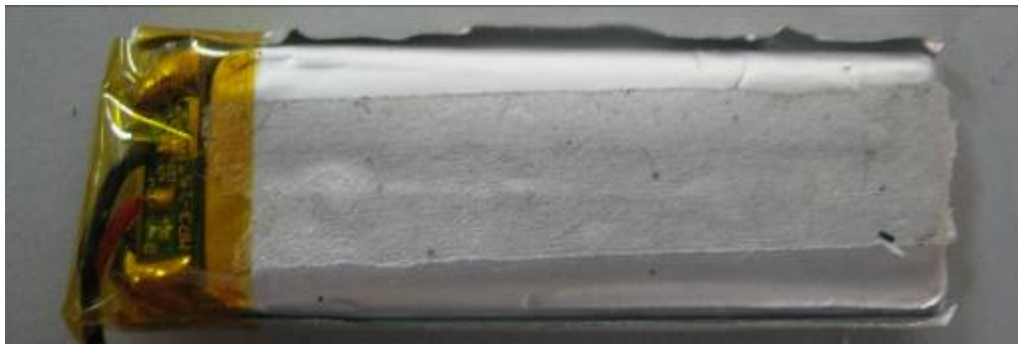
## 7.2. EUT Constructional Details

BM-8

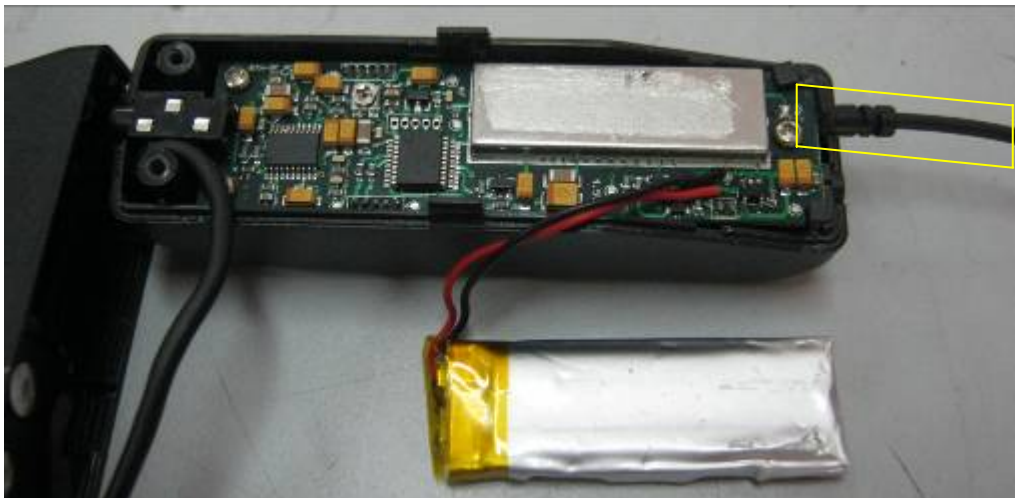
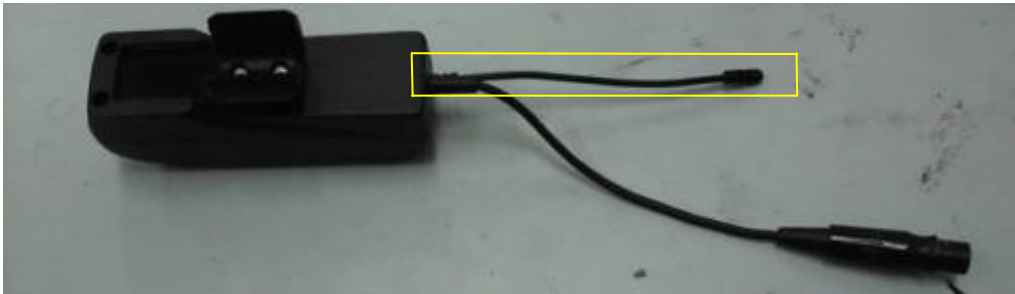








### 7.3. Antenna Photo



\*\*\*End of Report\*\*\*