ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

FM Transmitter

MODEL No.: RF-INV80

FCC ID: V3U-RFINV80

REPORT NO: E0802004F

ISSUE DATE: February 26, 2008

Prepared for

STONE TECHNOLOGY INC

3450W. Central. Suite 116, Toledo, Ohio 43606, USA

Prepared by

SHENZHEN EMTEK CO., LTD

**Bldg 69, Majialong Industry Zone, Nanshan District,
Shenzhen, Guangdong, China
TEL: 86-755-26954280
FAX: 86-755-26954282**

VERIFICATION OF COMPLIANCE

Applicant:	STONE TECHNOLOGY INC 3450W. Central. Suite 116, Toledo, Ohio 43606, USA
Product Description:	FM Transmitter
Brand Name:	N/A
Model Number:	RF-INV80
Serial Number:	100F
File Number:	E0802004F
Date of Test:	February 13, 2008 to February 26, 2008

We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. 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 results of this report relate only to the tested sample identified in this report.

Approved By

David Lee / Q.A. Manager
SHENZHEN EMTEK CO., LTD.

Table of Contents

1. GENERAL INFORMATION

1.1 Product Description

The STONE TECHNOLOGY INC Model: RF-INV80 (referred to as the EUT in this report). The EUT is a car using stereo FM transmitter, with a high quality stereo FM transmitter IC inside, The actual tuning Controls can be manually adjusted to from 88.1 MHz to 107.9MHz with channel spacing of 100KHz.

A major technical descriptions of EUT is described as following:

A). Operation Frequency: 88.1MHz~107.9MHz
B). Antenna Designation: Internal
C). Power Supply: DC12V
D). Channel Spacing: 100KHz

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: V3U-RFINV80 filing to comply with Section 15.239 of the FCC Part 15, Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

1.6 Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2005.11.02
The certificate is valid until 2010.11
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025: 2005)
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Guangzhou, 2005.1
The certificate is valid until 2008.2
The Laboratory has been assessed according to the requirements ISO/IEC 17025:1999

Accredited by FCC, July 07, 2005
The Certificate Registration Number is 709623.

Accredited by Industry Canada, August 30, 2005
The Certificate Registration Number is 46405-4480

Name of Firm : SHENZHEN EMTEK CO., LTD
Site Location : Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The Tx frequency was 88.1MHz~107.9MHz.

2.3 Test Procedure

2.3.1 Conducted Emissions (Not apply in the report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 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**.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. 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 13.1.4.1 of ANSI C63.4-2003.

2.4 Limitation

(1) Radiated Emission

(b) The field strength of any emissions within the permitted 200kHz 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 section 15.35 for limiting peak emissions apply.

(c) 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.

Remark: The limit for average field strength dBuv/m for the fundamental frequency=48.0 dBuv/m.
And the limit for peak field strength dBuv/m for the fundamental frequency=68.0 dBuv/m.

Intentional Radiators general limit).as below.

Frequency (MHz)	Field strength μV/m	Distance(m)	Field strength at 3m dBμV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

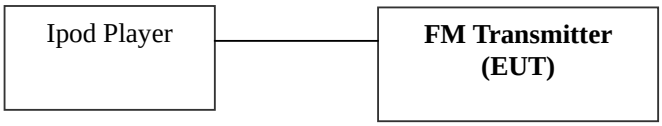
(2) Occupied Bandwidth

(a) Emissions from the intentional radiator shall be confined within a band 200kHz wide centered on the operation frequency; The 200kHz band shall lie wholly within the frequency range of 88.1-107.9MHz.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

Transmitting mode:



Charging/discharging:

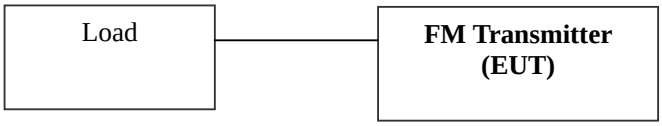


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	FM Transmitter	STONE	RF-INV80	V3U-RFINV80	N/A	***EUT***
2.	Ipod player	Ipod	A1136	N/A	N/A	

Note:

(1) Unless otherwise denoted as EUT in『Remark』column , device(s) used in tested system is a support equipment.

3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§ 15.239	Radiated Emission	Compliant
§ 15.239	Bandwidth Test	Compliant

4. Description of test modes

The EUT (FM Transmitter) has been tested under normal operating condition.
Three channels of EUT (the lowest channel, the middle channel and the highest channel) have been chosen for testing under Normal Operating condition. In this report, all the measured datum of the three channels have been reported. No software used to control the EUT for staying in continuous transmitting mode for testing.

1. For lowest channel : 88.1MHz
2. For middle channel : 98.0MHz
3. For highest channel: 107.9MHz

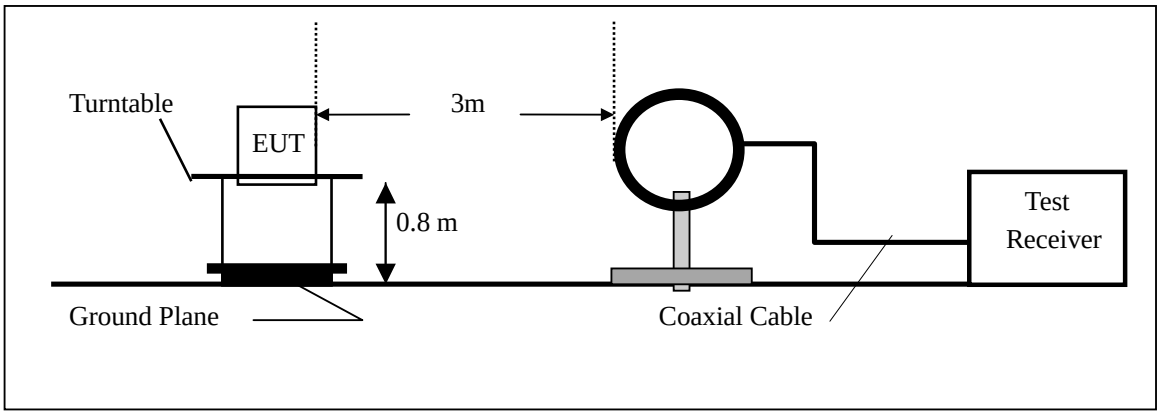
5. Radiated Emission Test

5.1 Measurement Procedure

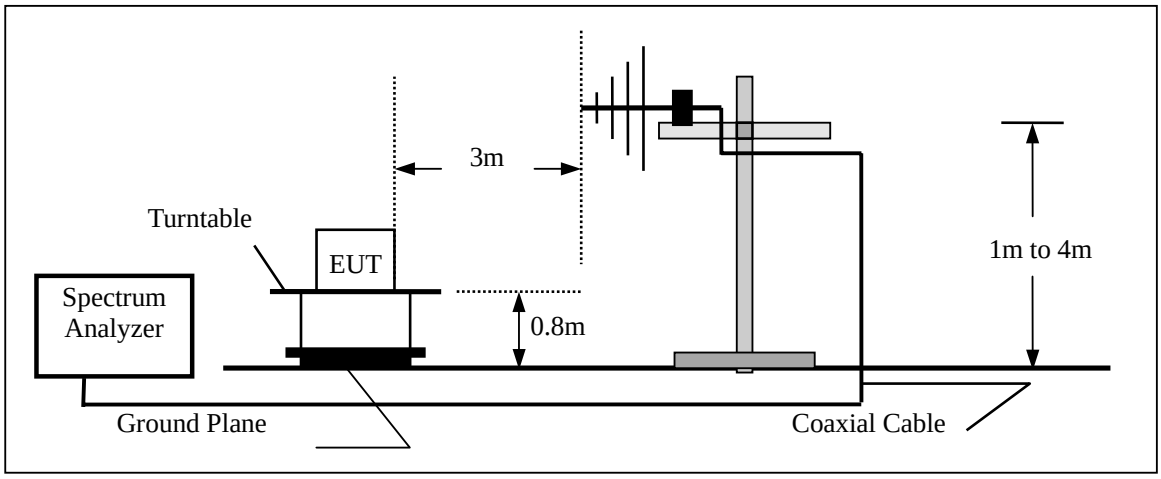
1 The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



5.3 Measurement Equipment Used:

Open Area Test Site # 3					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	ANRITSU	MS2661C	6200140915	05/29/2007	05/29/2008
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2007	05/29/2008
Pre-Amplifier	HP	8447D	2944A07999	05/29/2007	05/29/2008
Bilog Antenna	Schwarzbeck	VULB9163	142	05/29/2007	05/29/2008
Loop Antenna	ARA	PLA-1030/B	1029	05/29/2007	05/29/2008

5.4 Measurement Result

A. Fundamental Radiated Emission Data

Operation Mode:	Transmitting Mode	Test Date :	February 15, 2008
Test Item:	Fundamental Radiated Emission Data	Temperature :	28 ℃
Fundamental Frequency:	Lowest channel	Humidity :	65 %
Test Result:	PASS	Test By:	Andy

Peak Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
88.10	V	46.35	68.00	-21.65	Peak
88.10	H	47.12	68.00	-20.88	Peak

Average Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
88.10	V	41.35	48.00	-6.65	AV
88.10	H	43.38	48.00	-4.62	AV

Note: (1) All Readings are Peak Value.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	Transmitting Mode	Test Date :	February 15, 2008
Test Item:	Fundamental Radiated Emission Data	Temperature :	28 ℃
Fundamental Frequency:	Middle channel	Humidity :	65 %
Test Result:	PASS	Test By:	Andy

Peak Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
98.0	V	46.56	68	-21.44	Peak
98.0	H	47.32	68	-20.68	Peak

Average Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
98.0	V	42.17	48.00	-5.83	AV
98.0	H	43.56	48.00	-4.44	AV

Note: (1) All Readings are Peak Value.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	Transmitting Mode	Test Date :	February 15, 2008
Test Item:	Fundamental Radiated Emission Data	Temperature :	28 ℃
Fundamental Frequency:	Highest channel	Humidity :	65 %
Test Result:	PASS	Test By:	Andy

Peak Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
107.90	V	45.24	68.00	-22.76	Peak
107.90	H	48.85	68.00	-19.15	Peak

Average Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
107.90	V	41.61	48.00	-6.39	AV
107.90	H	44.56	48.00	-3.44	AV

Note: (1) All Readings are Peak Value.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

B. General Radiated Emission Data

Operation Mode:	Transmitting Mode	Test Date :	February 15, 2008
Test Item:	General Radiated Emission Data	Temperature :	28 ℃
Fundamental Frequency:	Lowest channel	Humidity :	65 %
Test Result:	PASS	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
176.1756	V	39.61	43.50	-3.89	Peak
264.300	V	38.26	46.00	-7.74	Peak
352.400	V	37.93	46.00	-8.07	Peak
440.400	V	36.49	46.00	-9.51	Peak
528.500	V	33.93	46.00	-12.07	Peak
616.690	V	32.93	46.00	-13.07	Peak
176.200	H	37.29	43.50	-6.21	Peak
264.300	H	38.41	46.00	-7.59	Peak
352.400	H	38.51	46.00	-7.49	Peak
440.400	H	37.98	46.00	-8.02	Peak
528.500	H	35.96	46.00	-10.04	Peak
616.60	H	33.68	46.00	-12.32	Peak

Note: Emission Level= Reading Level+ Probe Factor +Cable Loss

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.209.

Operation Mode:	Transmitting Mode	Test Date :	February 15, 2008
Test Item:	General Radiated Emission Data	Temperature :	28 ℃
Fundamental Frequency:	Middle channel	Humidity :	65 %
Test Result:	PASS	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
196.20	V	36.56	43.50	-6.94	Peak
294.30	V	39.50	46.00	-6.50	Peak
392.40	V	38.61	46.00	-7.39	Peak
490.50	V	35.27	46.00	-10.73	Peak
588.60	V	34.50	46.00	-11.50	Peak
686.70	V	33.68	46.00	-12.32	Peak
196.20	H	36.63	43.50	-6.87	Peak
294.30	H	39.75	46.00	-6.25	Peak
392.40	H	39.51	46.00	-6.49	Peak
490.50	H	36.97	46.00	-9.03	Peak
588.60	H	33.91	46.00	-12.09	Peak
686.70	H	32.58	46.00	-13.42	Peak

Note: Emission Level= Reading Level+ Probe Factor +Cable Loss

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.209.

Operation Mode:	Transmitting Mode	Test Date :	February 15, 2008
Test Item:	General Radiated Emission Data	Temperature :	28 ℃
Fundamental Frequency:	Highest channel	Humidity :	65 %
Test Result:	PASS	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
215.80	V	38.56	43.50	-4.94	Peak
323.70	V	39.69	46.00	-6.31	Peak
431.60	V	38.93	46.00	-7.07	Peak
539.50	V	36.94	46.00	-9.06	Peak
647.40	V	34.97	46.00	-11.03	Peak
755.30	V	32.94	46.00	-13.06	Peak
215.80	H	38.57	43.50	-4.93	Peak
323.70	H	39.52	46.00	-6.48	Peak
431.60	H	36.51	46.00	-9.49	Peak
539.50	H	35.61	46.00	-10.39	Peak
647.40	H	33.56	46.00	-12.44	Peak
755.30	H	32.36	46.00	-13.64	Peak

Note: Emission Level= Reading Level+ Probe Factor +Cable Loss

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.209.

Operation Mode:	Charging	Test Date :	February 20, 2008
Test Item:	30MHz-1000MHz	Temperature :	28 ℃
Test Result:	PASS	Humidity :	65 %
		Test By:	Andy

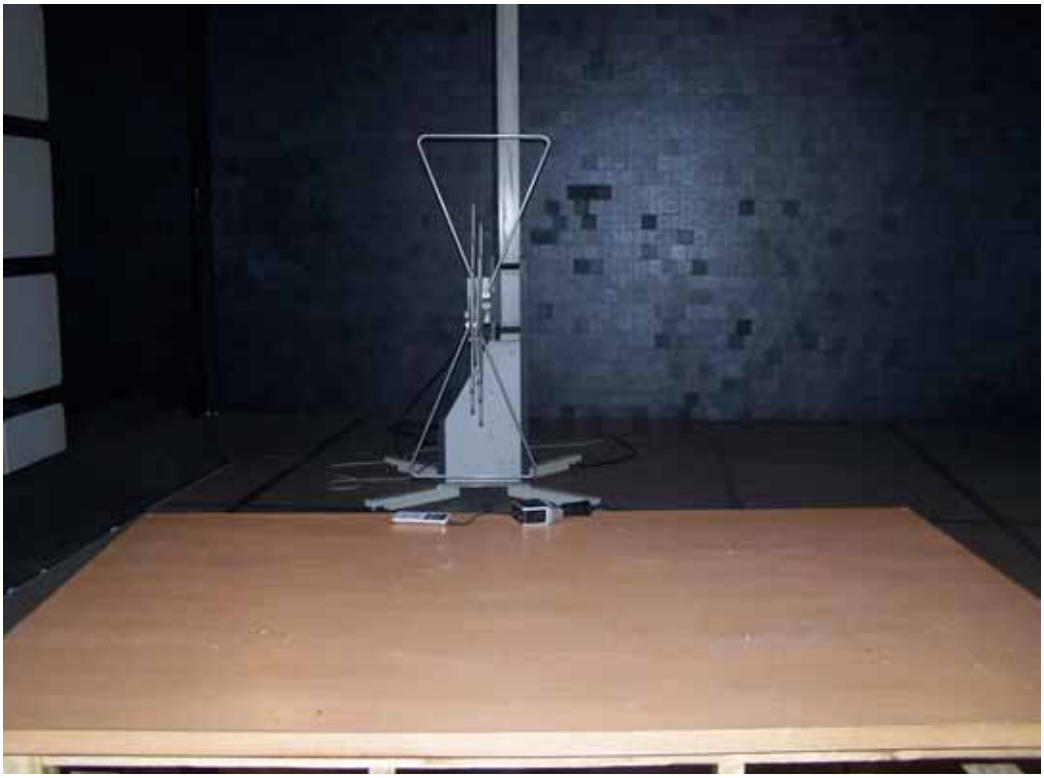
Polarization	Frequency MHz	Emission Level dBμV/m	Limits dBμV/m	Margin dBμV/m
Horizontal	36.280	36.100	40.000	-3.90
	41.640	30.690	40.000	-9.31
	112.650	38.960	43.500	-4.64
	441.280	39.100	46.000	-6.90
	450.980	38.776	46.000	-7.22
	718.700	40.200	46.000	-5.80
Vertical	35.820	37.300	40.000	-2.70
	48.560	36.520	40.000	-3.48
	122.560	39.600	43.500	3.90
	438.690	38.850	46.000	-7.15
	450.980	38.160	46.000	-8.84
	841.800	41.889	46.000	-4.11

Operation Mode:	Discharging	Test Date :	February 20, 2008
Test Item:	30MHz-1000MHz	Temperature :	28 ℃
Test Result:	PASS	Humidity :	65 %
		Test By:	Andy

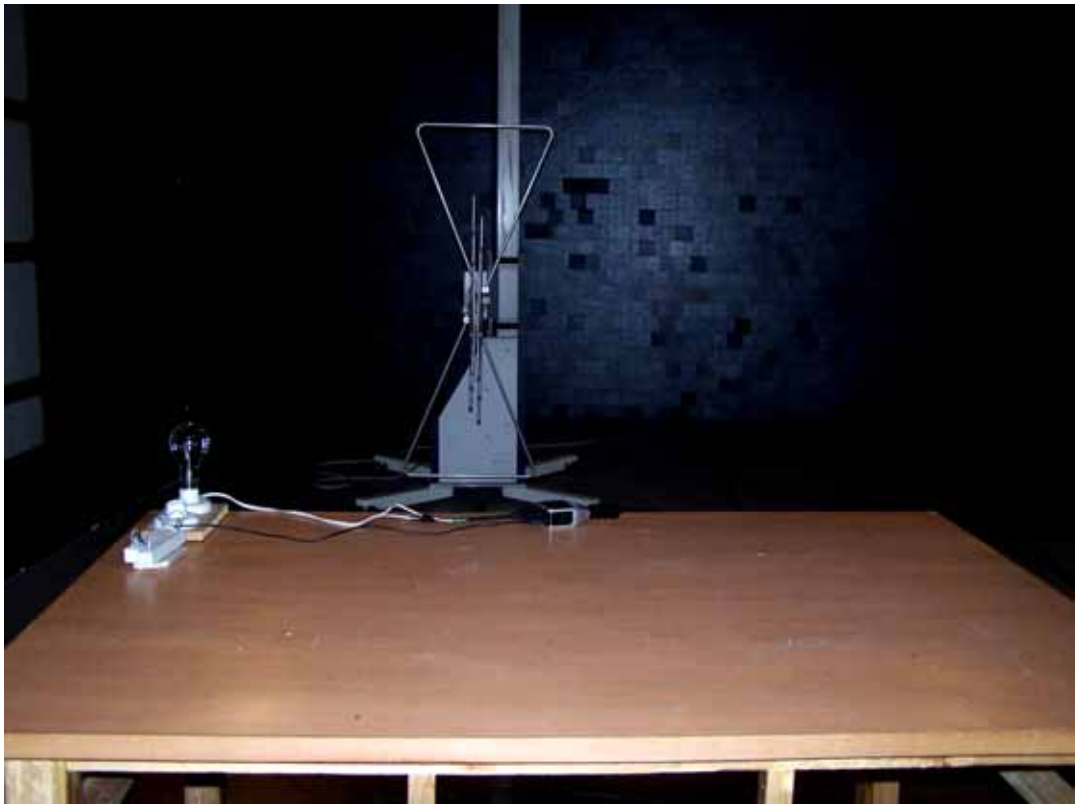
Polarization	Frequency MHz	Emission Level dBμV/m	Limits dBμV/m	Margin dBμV/m
Horizontal	38.640	37.120	40.000	-2.88
	107.310	39.620	43.500	-3.88
	224.120	39.630	46.000	-6.37
	478.140	37.420	46.000	-8.58
	819.580	40.670	46.000	-5.33
	955.380	40.776	46.000	-5.22
Vertical	41.640	36.690	40.000	-3.31
	108.650	40.230	43.500	-3.27
	230.480	38.320	46.000	-7.68
	405.600	37.600	46.000	-8.40
	478.140	39.610	46.000	-6.39
	821.520	40.290	46.000	-5.71

5.5 Radiation Measurement Photos

Transmitting mode:



Charging/discharging mode:



6. Occupied Bandwidth

6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency , RBW = 10KHz, ,VBW= 30KHz
4. Set SPA Max hold. Mark peak.

Note: The EUT can be connected to Ipod Player. The input signal of EUT is controlled by Ipod Player. So the volume control of Ipod Player was set to maximum during the test. It means that the test was performed with the maximum audio input.

6.2 Test SET-UP (Block Diagram of Configuration)

Same as 4.2 Radiated Emission Measurement.

6.3 Measurement Equipment Used:

Same as 4.2 Radiated Emission Measurement.

6.4 Measurement Results:

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209.
Refer to attached data chart.

6.5 Radiated Emission Setup Photos

Band Width Test Data


10:14:36 FEB 18, 2008
MKR Δ 65.0 kHz
-.47 dB
REF 100.0 dBµV
AT 10 dB
PEAK
LOG
10
dB/
MARKER
NORMAL
MARKER
AMPTD
SELECT
MARKER 1
ON OFF
CENTER 107.5000 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 500.0 kHz
SWP 30.0 msec

7. Antenna Application

7.1 Antenna requirement

The EUT's antenna used a dipole antenna and integrated on PCB, The EUT'S antenna is met the requirement of FCC part 15C section 15.203