FCC PART 15 C
MEASUREMENT AND TEST REPORT

For

HongKong iBest Digital&Technology Company Limited

Rooms 1318-20, 13/F, Hollywood Plaza, 610 Nathan Road,
Mongkok, Kowloom, H.K.

FCC ID: VPLLJ-6296

September 28, 2007

This Report Concerns:	**Equipment Type:**
☒ Original Report	Wireless FM Transmitter

Test Engineer:	Robert Lee
Report Number:	**SE07I-239R**
Test Date:	September 24-28, 2007
Reviewed By:	
Prepared By:	**S&E Technologies Laboratory Ltd** Room407,Block A Shennan Garden,Hi-Tech Industrial Park, Shenzhen 518057, P.R. China. Tel: 86-755-26636573, 26630631 Fax: 86-755-26630557

TABLE OF CONTENTS

1 – General Information

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	**HongKong iBest Digital&Technology Company Limited**
Address of applicant:	Rooms 1318-20, 13/F, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloom, H.K. Tel: 86-755-27444350 Fax: 86-755-29726840
Manufacturer:	**Jia LiJin (iBest) Digital&Technology Company Limited**
Address of manufacturer:	JiaLiJin Industry Zone, New Town, Jinggangshan City, Jiangxi, China Tel: 86-796-6891379 Fax: 86-796-6891378

General Description of E.U.T

The **HongKong iBest Digital&Technology Company Limited**'s product, model number: **LJ-6296** or the "EUT" as referred to in this report is an audio FM transmitter.

The technical data has been listed following:

Items	Description
EUT Description:	Wireless FM Transmitter
Trade Name:	N/A
Model No.:	LJ-6296
Power Supply:	DC 3V
Frequency range:	88.1MHz-107.9MHz
Antenna Designation:	Non-User Replaceable
Product Class:	Low Power Communication Device Transmitter

** The tuning controls were manually adjusted to verify each rated frequency..*
** The test data gathered are from the production sample provided by the manufacturer.*

1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with

FCC Rules and Regulations Part 15 Subpart C Section15.239

The objective of the manufacturer is to demonstrate compliance with the described above standards.

1.3 Test Summary

For the EUT described above. The standards used is FCC Part 15 Subpart C Section 15.239

Tests Carried Out Under FCC Part 15 Subpart C Section 15.239

Standard	Test Items	Status	Application
Part 15 Subpart C Section 15.239	Disturbance Voltage at The Mains Terminals	X	N/A, without AC power supply
	Radiation Emission	√	
	Occupied Bandwidth	√	

√ Indicates that the test is applicable
× Indicates that the test is not applicable

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

The maximum emission levels emanating from the device are compared to the Part 15 Subpart C Section 15.239 limits for radiation emissions and the measurement results contained in this test report show that EUT is to be technically compliant with FCC requirements.

All measurement required was performed at laboratory of Compliance Certification Services (Shenzhen) Inc. at No.5 Jinao Industrial Park, No.35 Jukeng Rd., Guanlan Town, Baoan District, Shenzhen, Guangdong, China.

1.5 Test Facility

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

FCC – Registration No.: 101879

Compliance Certification Services (Shenzhen) Inc., 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.

1.6 Test Equipment List and Details

Table 1: Test Equipment for Emission Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100038	2006/10	1 year
EMI Test Receiver	ROHDE & SCHWARZ	ESPI	100123	2007/03	1 year
Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2006/10	1 year
Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2006/10	1 year
Ultra-Broadband Antenna	ROHDE & SCHWARZ	HL562	100015	2006/10	1 year
EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100009	2006/10	1 year
RF Test Panel	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	N/A	N/A
Turntable	ETS	2088	2149	N/A	N/A
Antenna Mast	ETS	2075	2346	N/A	N/A

Table 2: General Description of Test Auxiliary

Description:	Manufacturer	Model No.	Serial No.	Certificate
MP3	LENOVO	M3K512	120649T3	FCC

2 – System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being normal operation.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product supplied by **HongKong iBest Digital&Technology Company Limited** and its respective support equipment manufacturers.

2.4 Equipment Modifications

The EUT tested was not modified by S&E Technologies.

2.5 Basic Test Setup Block Diagram

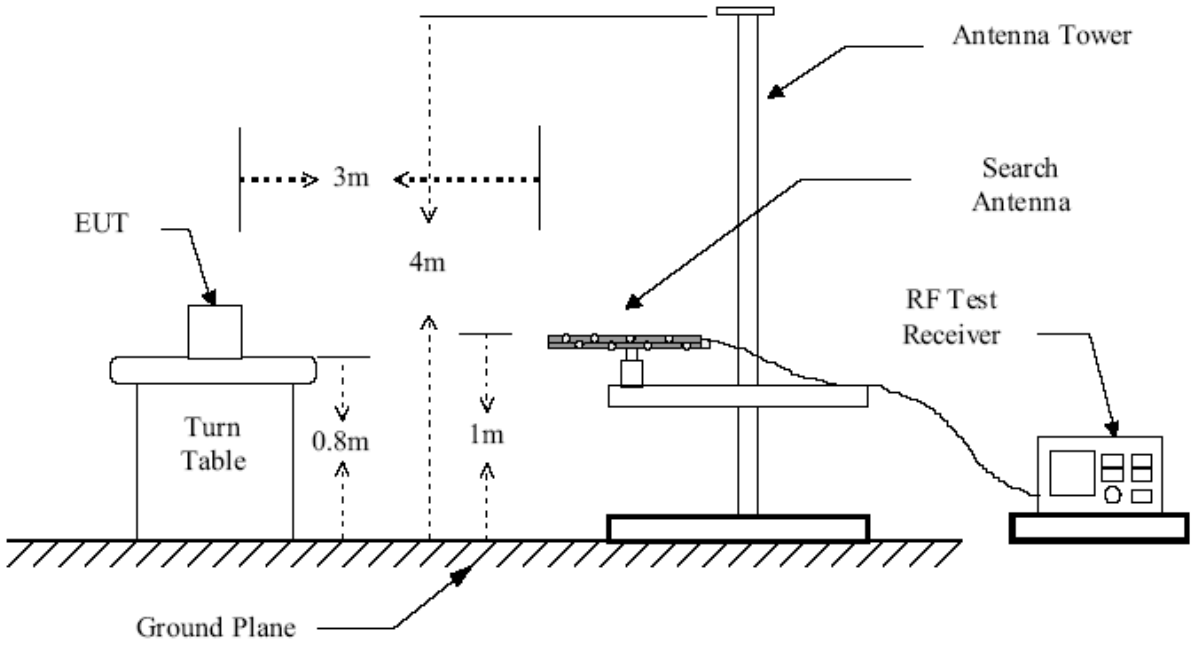


Figure 1 : Frequencies measured below 1 GHz configuration

3 – Disturbance Voltage At The Mains Terminals

3.1 Measurement Uncertainty

All test results complied with Section 15.207 requirements. Measurement Uncertainty is 2.4 dB.

3.2 Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

3.3 Test Description

The EUT is excused from investigation of Disturbance Voltage at The Mains Terminals, for it is powered by a iPod player (3.3Vd.c.). According to the Section 15.207(d), measurement to demonstrate compliance with the limits of Disturbance Voltage at The Mains Terminals are not required to the devices which only employed bettary power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

4- Radiated Disturbances

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in 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.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ±4.0 dB.

4.2 Limit of Radiated Disturbances

Frequency (MHz)	Distance (meters)	Field Strengths Limits (dBμV/m)
30 ~ 88	3	40
88~216	3	43.5
216 ~ 960	3	46
960 and above	3	54

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.3 EUT Setup

The radiated emission tests were performed in the 3-meter anechoic chamber, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15 Subpart B limits.

The EUT was placed on the center of the test table. In the frequency range below 1 GHz, Ultra-Broadband Antenna horn-antenna is used. Test setup refer to **Section 2.5 Basic Test Setup Block Diagram** of this report.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

4.4 Test Receiver Setup

According to FCC Part 15 rule, the frequency was investigated from 30 to 1000 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting for frequency range below 1000MHz:

Detector……..Peak & Quasi-Peak
IF Band Width……..100KHz
Frequency Range……30MHz to 1000MHz
Turntable Rotated……0 to 360 degrees

Antenna Position:

Height……1m to 4m
Polarity……...Horizontal and Vertical

4.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

1). Configure the EUT according to ANSI C63.4-2003.

2). The EUT was placed on the top of the turntable 0.8 meter above ground.

3). The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.

4). Power on the EUT and all the supporting units.

5). The turntable was rotated by 360 degrees to determine the position of the highest radiation.

6). For each suspected emission, the antenna tower was scanned (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading of both horizontal and vertical polarization.

7). Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode. Then all data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dBμV of specification limits), and are distinguished with a "**QP**" in the data plots.

8). The tuning controls were manually adjusted to verify each rated frequency.

4.6 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. –Limit

4.7 Radiated Emissions Test Result

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	Wireless FM Transmitter
M/N	LJ-6296
Operating Mode	Continuous Transmitting

Fundamental Emission Test Data

Peak Measurement					
Test Frequency (MHz)	Measuring Level (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
88.10	43.0	46.3	68.0	25.0	21.7
Average Measurement					
88.10	39.7	42.3	48.0	8.3	5.7

Peak Measurement					
Test Frequency (MHz)	Measuring Level (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
98.10	42.9	46.5	68.0	25.1	21.5
Average Measurement					
98.10	38.8	42.7	48.0	9.2	5.3

Peak Measurement					
Test Frequency (MHz)	Measuring Level (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
107.90	42.1	45.5	68.0	25.9	22.5
Average Measurement					
107.90	37.9	41.0	48.0	10.1	7.0

Harmonics & Spurious Emission

88.10MHz Spurious Emission							
Maximum Frequency (MHz)	**Position and Level**					**Limit**	**Margin**
	Polarity	**Ant. Hei. m**	**Value dBμV/m**	**Transd**	**Result dBμV/m**	**dBμV/m**	**dBμV/m**
176.08	H	1.7	24.3	10.8	35.1	43.5	8.4
264.26	H	2.1	27.3	11.2	38.5	46.0	7.5
352.49	H	1.7	22.1	15.6	37.7	46.0	8.3
440.61	H	2.0	15.2	18.1	33.3	46.0	12.7
528.38	H	2.3	11.2	18.7	29.9	46.0	16.1
Others					-		
176.08	V	1.6	18.2	10.8	29.0	43.5	14.5
264.26	V	2.0	22.9	11.2	34.1	46.0	11.9
352.49	V	1.7	15.8	15.6	31.4	46.0	14.6
440.61	V	2.0	9.0	18.1	27.1	46.0	18.9
528.38	V	2.2	8.2	18.7	26.9	46.0	19.1
Others					-		

Remark: Datum of measurement within this frequency range shown “-”in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

98.10MHz Spurious Emission							
Maximum Frequency (MHz)	**Position and Level**					**Limit**	**Margin**
	Polarity	**Ant. Hei. m**	**Value dBμV/m**	**Transd**	**Result dBμV/m**	**dBμV/m**	**dBμV/m**
196.17	H	1.5	25.9	9.1	35.0	43.5	8.5
294.37	H	1.3	26.7	12.1	38.8	46	7.2
392.22	H	2.3	20.4	17.6	38.0	46	8.0
490.35	H	1.5	15.4	17.8	33.2	46	12.8
586.61	H	2.4	10.2	20.0	30.2	46	15.8
Others					-		
196.17	V	1.5	20.2	9.1	29.3	43.5	14.2
294.37	V	2.4	22.3	12.1	34.4	46	11.6
392.22	V	1.9	13.7	17.6	31.3	46	14.7
490.35	V	1.5	10.9	17.8	28.7	46	17.3
586.61	V	2.4	8.1	20.0	28.1	46	17.9
Others					-		

Remark: Datum of measurement within this frequency range shown “-”in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

107.90MHz Spurious Emission							
Maximum Frequency (MHz)	**Position and Level**					**Limit**	**Margin**
	Polarity	**Ant. Hei. m**	**Value dBμV/m**	**Transd**	**Result dBμV/m**	**dBμV/m**	**dBμV/m**
215.73	H	2.0	24.8	9.7	34.5	43.5	9.0
323.89	H	2.7	24.7	13.6	38.3	46.0	7.7
431.64	H	1.8	20.1	18.1	38.2	46.0	7.8
539.65	H	1.8	14.0	18.9	32.9	46.0	13.1
647.59	H	2.0	9.6	20.2	29.8	46.0	16.2
Others					-		
215.73	V	2.0	19.3	9.7	29.0	43.5	14.5
323.89	V	2.7	20.5	13.6	34.1	46.0	11.9
431.64	V	1.5	12.8	18.1	30.9	46.0	15.1
539.65	V	2.2	10.2	18.9	29.1	46.0	16.9
647.59	V	2.0	5.8	20.2	26.0	46.0	20.0
Others					-		

Remark: Datum of measurement within this frequency range shown “-”in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5- Occupied Bandwidth

5.1 Requirement of Occupied Bandwidth

Emission 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 88~108MHz.

5.2 Test Procedure

1). The EUT was placed on the top of the turntable 0.8 meter above ground.

2). The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.

3). Power on the EUT and all the supporting units. The input signal of EUT is controlled by MP3 player. So the volume control of MP3 player was set to maximum level during the test. It means that the test was performed with the maximum audio input. The audio file used is mp3 format music.

4). The turntable was rotated by 360 degrees to determine the position of the highest radiation.

5). For each suspected emission, the antenna tower was scanned (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading of both horizontal and vertical polarization.

6). Set EMI test receiver with Max hold. Mark peak, -20dB.

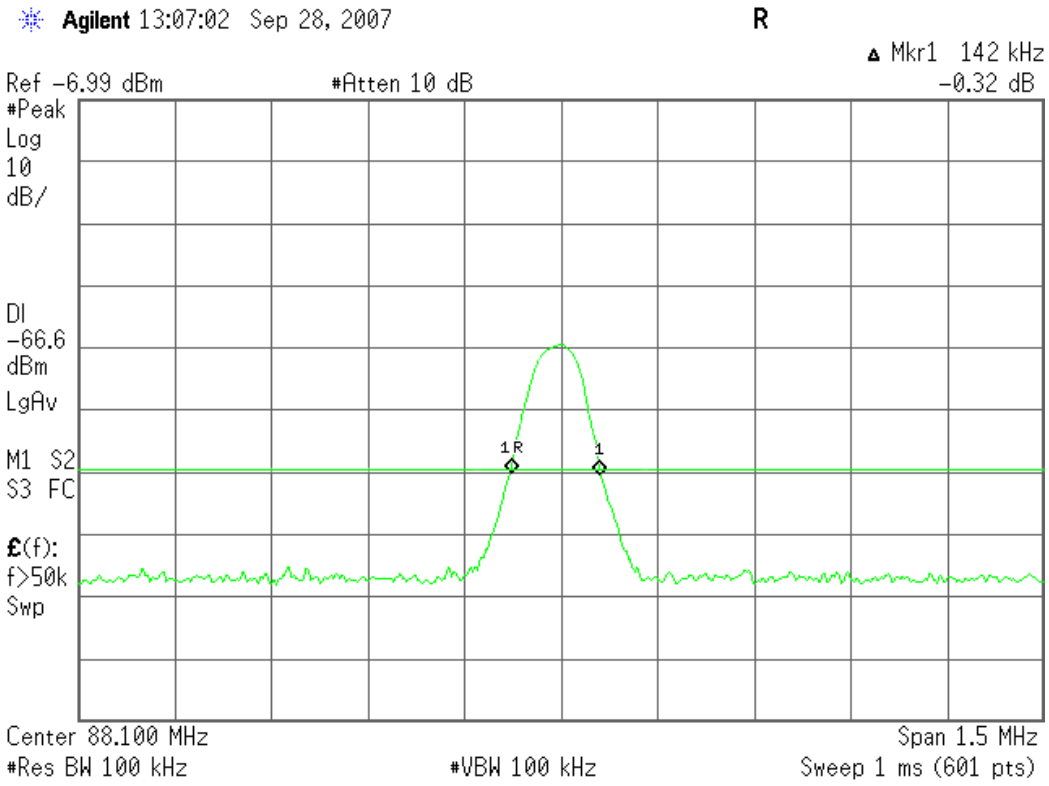
5.3 Occupied Bandwidth Test Result

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	Wireless FM Transmitter
M/N	LJ-6296
Operating Mode	Continuous Transmitting

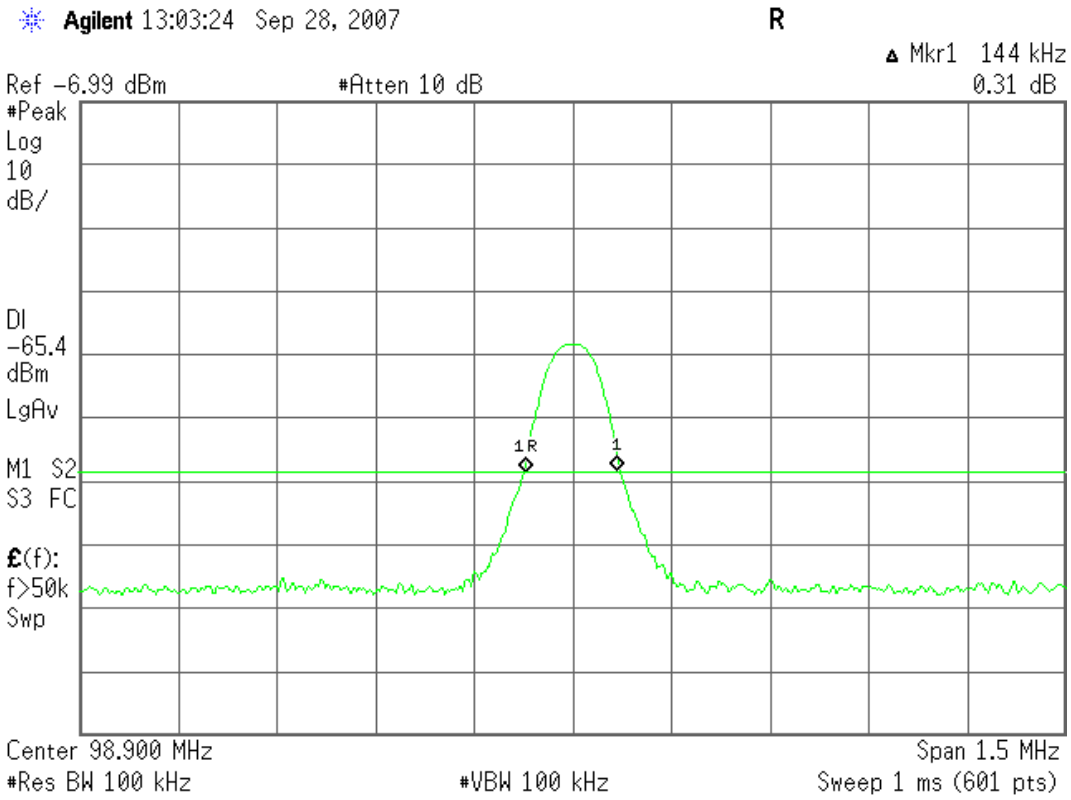
Test Result: pass

Test plots see following pages

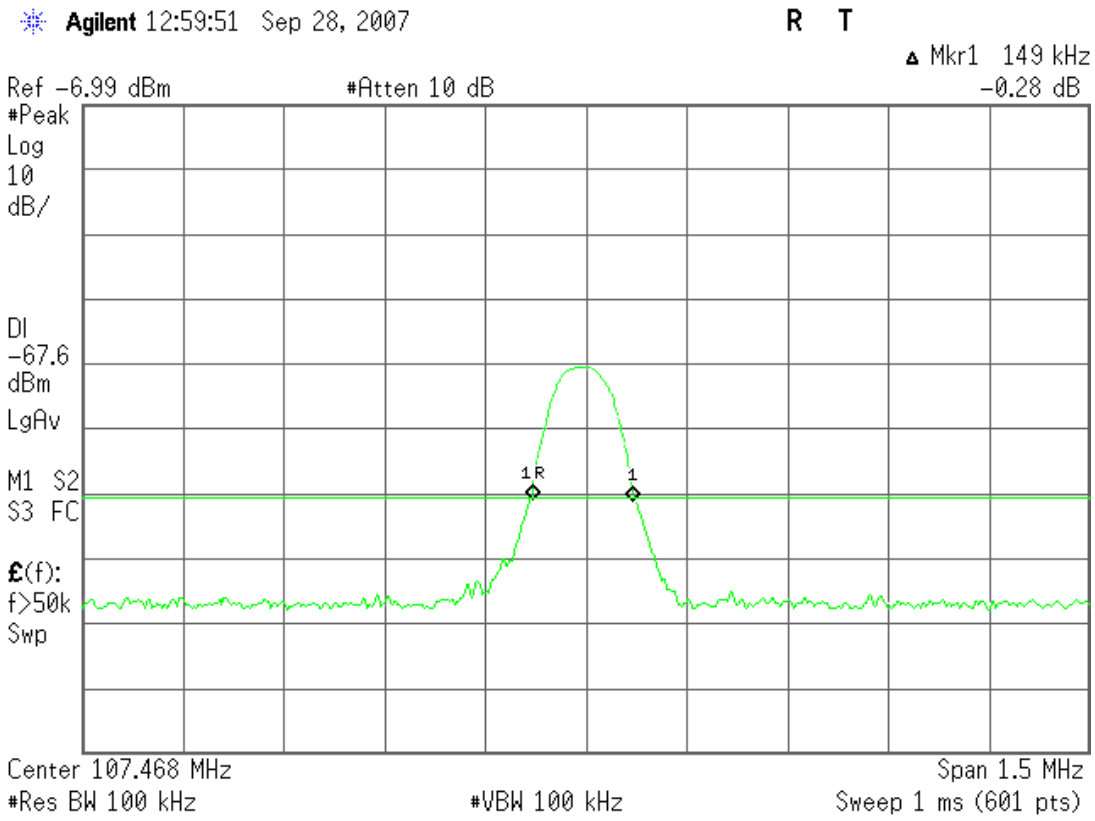
106.70MHz


Agilent 13:07:02 Sep 28, 2007
R
Mkr1 142 kHz
-0.32 dB
Ref -6.99 dBm
#Atten 10 dB
#Peak
Log
10
dB/
Dl
-66.6
dBm
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
1R
1
Center 88.100 MHz
#Res BW 100 kHz
#VBW 100 kHz
Span 1.5 MHz
Sweep 1 ms (601 pts)

98.10MHz


Agilent 13:03:24 Sep 28, 2007
R
Mkr1 144 kHz
0.31 dB
Ref -6.99 dBm
#Atten 10 dB
#Peak
Log
10
dB/
Dl
-65.4
dBm
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
1R
1
Center 98.900 MHz
Span 1.5 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 1 ms (601 pts)

107.90MHz


Agilent 12:59:51 Sep 28, 2007
R T
Mkr1 149 kHz
-0.28 dB
Ref -6.99 dBm
#Atten 10 dB
#Peak
Log
10
dB/
Dl
-67.6
dBm
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
1R
1
Center 107.468 MHz
Span 1.5 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 1 ms (601 pts)

Appendix A – Product Labeling

FCC ID Label Specification

Specification: Text is Black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT or silk-screened onto the EUT.

FCC ID: VPLLJ-6296

Proposed Label Location on EUT

EUT Proposed FCC ID Label Location

Appendix B - EUT Photographs

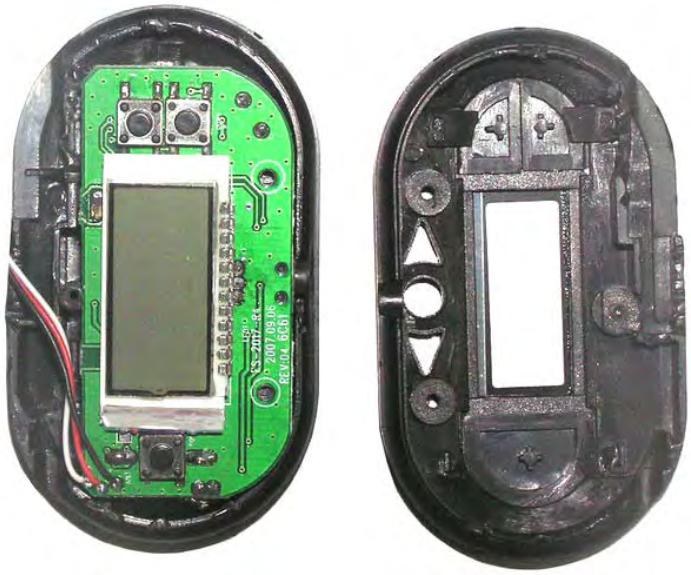
EUT - External View

EUT - Top View

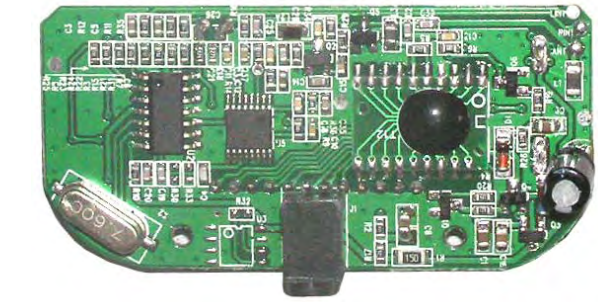
EUT - Bottom View

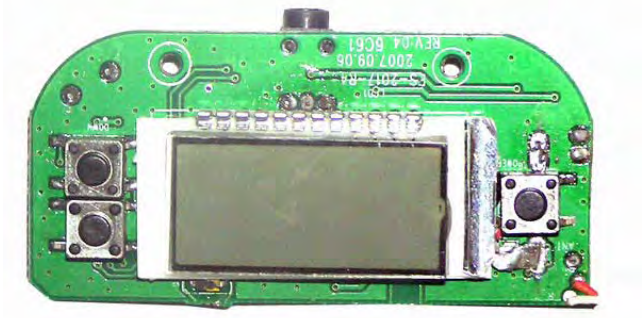
EUT - Side View

EUT - Inside View



EUT – PCB View





Appendix C – Test Setup Photographs

Radiated Emission