FCC TEST REPORT

FCC ID : SJ8LSP-R1000

Applicant : **RDI Technology (Shenzhen) Co., Ltd.**
Building C1 Xingtang Industrial Park,East Baishixia, Fuyong,Baoan, Shenzhen, PRC.

Equipment Under Test (EUT) :

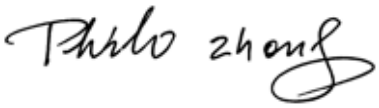
Product description : Home Viewer

Model No. : LSP-R1000

Standards : FCC 15 Paragraph 15.249

Date of Test : September 11, 2006

Test Engineer : **Tiger Su**

Reviewed By : 

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3 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 25GHz)	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	PASS

4 General Information

4.1 Client Information

Applicant:	**RDI Technology (Shenzhen) Co., Ltd.**
Address of Applicant:	Building C1 Xingtang Industrial Park,East Baishixia, Fuyong,Baoan, Shenzhen, PRC.
Manufacturer:	**RDI Technology (Shenzhen) Co., Ltd.**
Address of Manufacturer:	Building C1 Xingtang Industrial Park,East Baishixia, Fuyong,Baoan, Shenzhen, PRC.

4.2 General Description of E.U.T.

Product description:	Home Viewer
Model No.:	LSP-R1000

4.3 Details of E.U.T.

Power Supply:	DC 9V Battery Adapter input: 100~240V/50~60Hz Adapter output: 9.0 VDC

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 Home Viewer. The standards used were FCC 15 Paragraph 15.249, Paragraph 15.207, Paragraph 15.209, Paragraph 15.31, Paragraph 15.33, Paragraph 15.35.

4.6 Test Facility

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

- **FCC – Registration No.: 556682**

  SGS-CSTC Standards Technical Services Co., Ltd ShenZhen Branch EMC Lab, 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 556682, August 04, 2005.

4.7 Test Location

All Emissions tests were performed at:-
No.1 Workshop,M-10,Middle Section, Science &Technology Park, ShenZhen, China 518057.

5 Equipment Used during Test

Equipment	Brand Name	Model	Cal. Int Months	Last Cal. Date
3m Anechoic chamber				
EMC Analyzer	Agilent	E7402A	12	2006-08-30
EMI Test Receiver	R&S	ESS	12	2006-08-30
Pre Amplifier	Anritsu	MH648A	12	2006-08-30
Bilog Antenna	SCHAFFNER	CBL6111C	12	2006-08-30
Horn Antenna	ETS.LINDGREN	CH14-H052	12	2006-08-30
AM/FM Stereo Signal Generator	Panasonic	VP-8122A	12	2006-08-30
Signal Generator	R&S	SMG	12	2006-08-30
RF Selector	TOYO	NS4901A	-	-
Turn Disc	HD	DS4150S	-	-
Antenna Mast	HD	MA2400	-	-
EMI Shielded Room				
Spectrum analyzer	ADVANTEST	R3261C	12	2006-08-30
EMI Test Receiver	R&S	ESS	12	2006-08-30
Pre Amplifier	Anritsu	MH648A	12	2006-08-30
LISN	R&S	ENV216	12	2006-08-30
Absorbing Clamp	R&S	MDS-21	12	2006-08-30
Distortion Meter	MEGURO	MAK-6578A	12	2006-08-30
AM/FM Stereo Signal Generator	Panasonic	VP-8122A	12	2006-08-30
Oscilloscope	LEADER	LS1020	12	2006-08-30
Function Generator	National	VP-7422A	12	2006-08-30
Signal Generator	R&S	SMG	12	2006-08-30
RF Selector	TOYO	NS4000	-	-

6 Conducted Emission Test

Product Name:	Home Viewer
Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	Based on FCC Part15 Paragraph 15.207
Test Date:	September 11, 2006
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

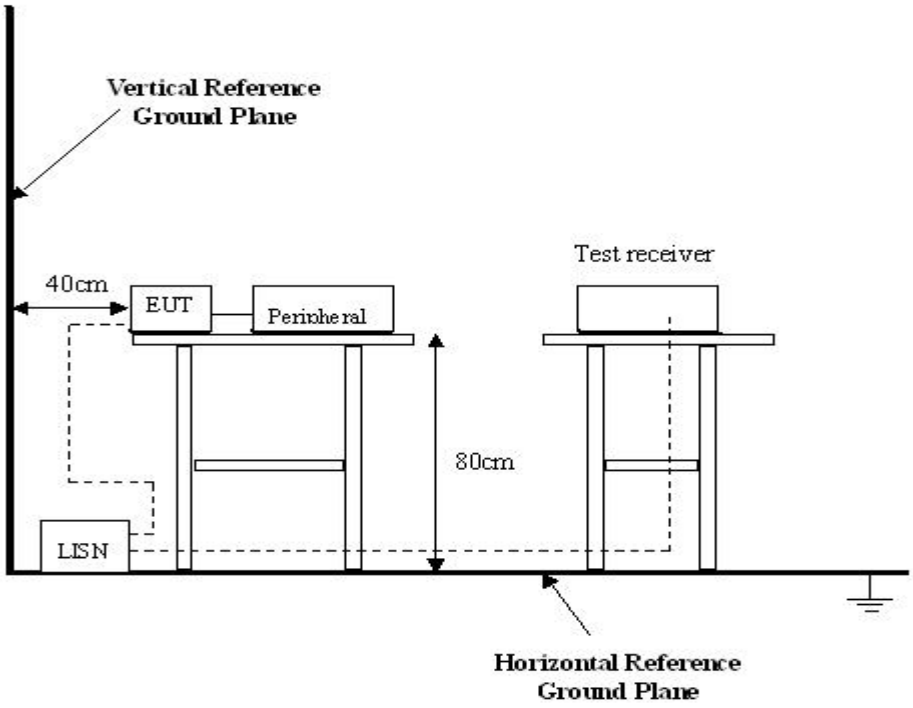
Please refer to Section 5 this report.

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.

6.3 Conducted Test Setup

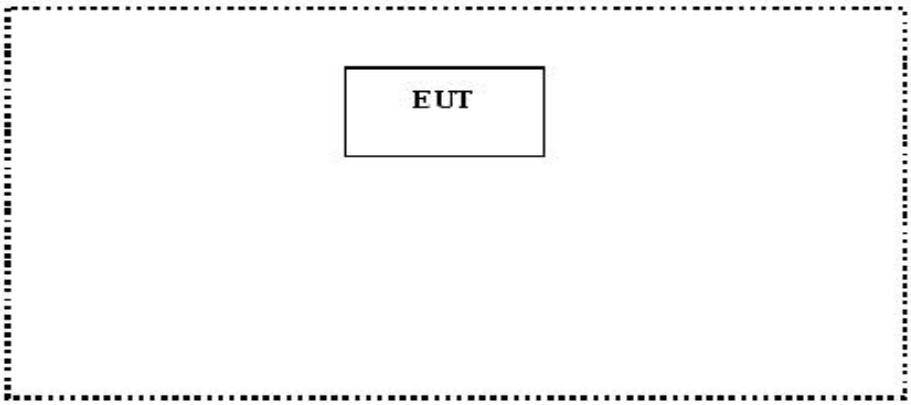
The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15 Paragraph 15.207 limits.



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

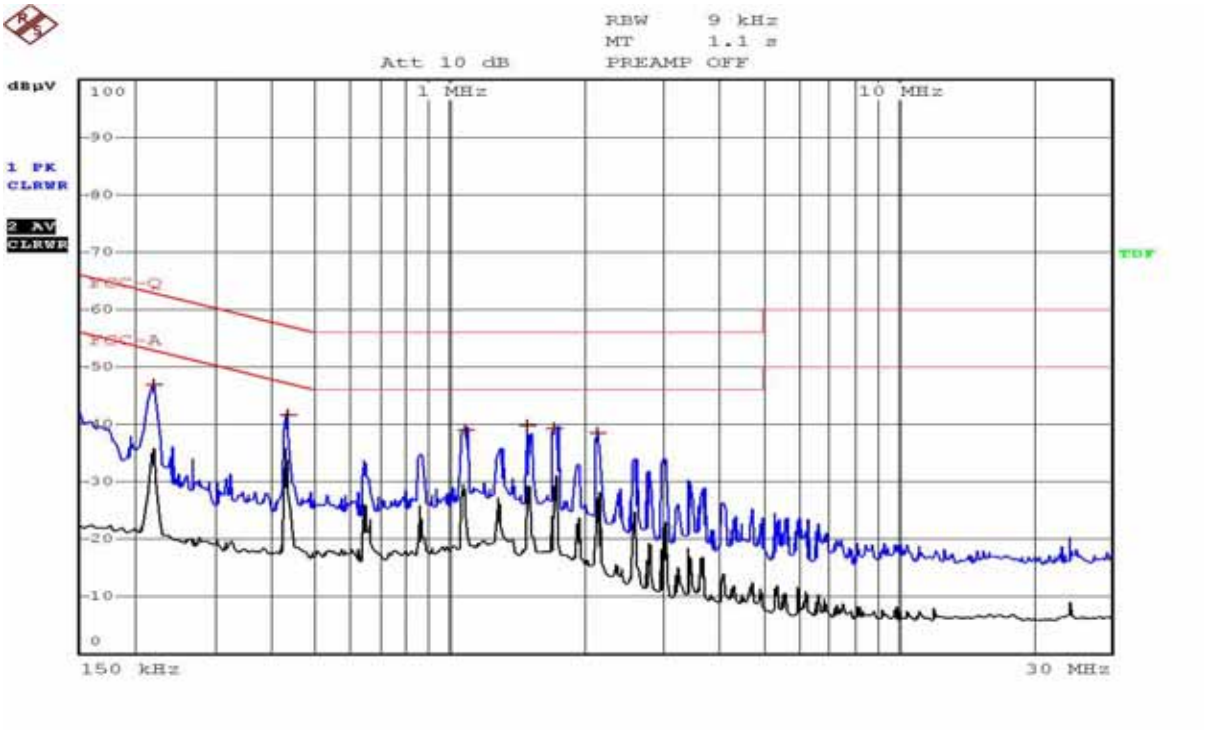
56 dBμV/m between 0.5MHz & 5MHz

60 dBμV/m between 5MHz & 30MHz

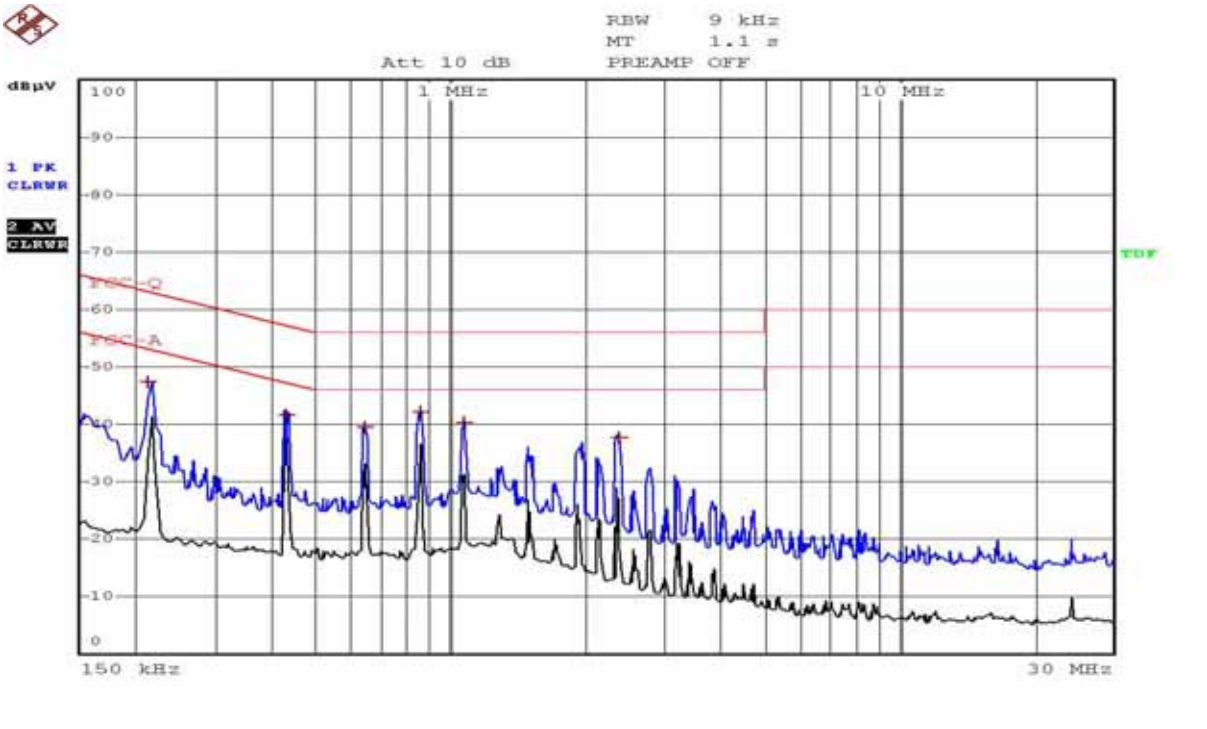
Note: In the above limits, the tighter limit applies at the band edges.

6.6 Conducted Emission Test Result

Live Line:



Neutral Line:



6.7 Conducted Emissions Test Data

Freq. MHz	Line	QP Reading dBuV	FCC 15 Limit dBuV	Margin dB	AV Reading dBuV	FCC 15 Limit dBuV	Margin dB
0.214	Live	44.47	63.07	18.60	34.31	53.07	18.76
0.434	Live	38.75	57.23	18.48	33.04	47.23	14.19
1.082	Live	36.94	56.00	19.06	28.10	46.00	17.90
1.498	Live	36.47	56.00	19.53	28.45	46.00	17.55
1.741	Live	37.32	56.00	18.68	29.27	46.00	16.73
2.150	Live	33.97	56.00	22.03	25.92	46.00	20.08
0.214	Neutral	45.61	63.07	17.46	40.17	53.07	12.90
0.430	Neutral	40.45	57.30	16.85	37.73	47.30	9.57
0.446	Neutral	37.15	57.00	19.85	32.95	47.00	14.05
0.862	Neutral	40.36	56.00	45.64	33.36	46.00	12.64
1.070	Neutral	37.44	56.00	18.56	31.56	46.00	14.44
2.374	Neutral	34.56	56.00	21.44	23.00	46.00	23.00

7 Radiation Emission Test

Product Name:	Home Viewer
Test Requirement:	FCC Part15 Paragraph 15.249
Test Method:	Based on FCC Part15 Paragraph 15.31 and Paragraph 15.33
Test Date:	September 11, 2006
Frequency Range:	30MHz to 25GHz
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 centre variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

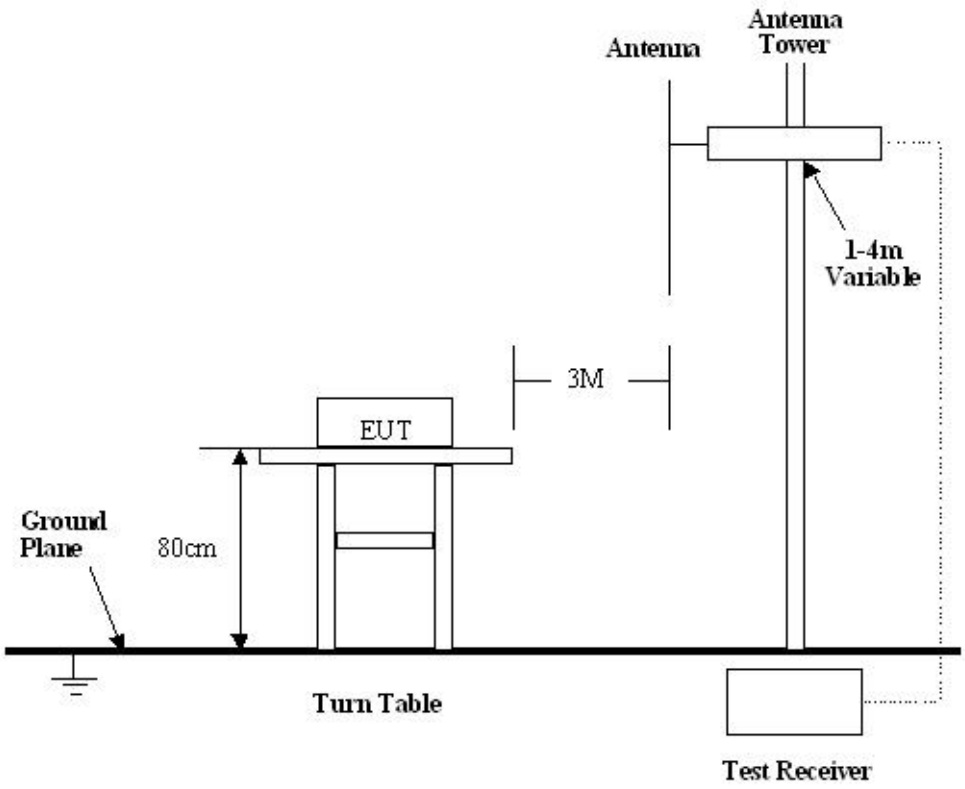
Based on ANSI C63.4: 2003, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at SGS EMC Lab is +4.0 dB.

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.

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 15.249 and Paragraph 15.209 limits.



7.5 Spectrum Analyzer Setup

According to FCC Part15 Paragraph 15.249 Rules, the system was tested to 25000 MHz.

Start Frequency..... 30 MHz
Stop Frequency..... 25000 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 15.249 standards.

7.8 EUT Operating Condition

Same as section 6.4 of this report.

7.9 Radiated Emissions Limit

A. FCC Part 15 subpart C Paragraph 15.249 Limit

Fundamental Frequency	Field Strength of Fundamental		Field Strength of Harmonics	
	mV/m	dBuV/m	uV/m	dBuV/m
902-928MHz	50	94	500	54
2400-2483.5 MHz	50	94	500	54
5725-5875 MHz	50	94	500	54
24.0-24.25GHz	250	108	2500	68

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.

(4) Above 1GHz,do a Peak and average measurements for all emissions,Limit for peak is 74dBuvV/m,According to Part15.35(b) and average is 54BuvV/m.

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.

7.10 Radiated Emissions Test Result

Formula of conversion factors: the field strength at 3m was established by adding
The meter reading of the spectrum analyzer (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

Test Voltage:	120V AC/60Hz
Test Mode:	TX On
Temperature:	24 °C
Humidity:	52%RH
Test Result:	PASS

Remarks: 30-1000MHz radiation test no significant emissions above the equipment noise floor were detected.

1GHZ-25GHZ Radiated Emission Data

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)	FCC 15 Subpart C Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
Low frequency						
2410.00	Vertical	81.20	94.0	12.80	1.5	120
4820.00	Vertical	41.20	54.0	12.80	1.5	45
7230.00	Vertical	40.36	54.0	13.64	1.5	90
9640.00	Vertical	40.51	54.0	13.49	1.5	45
2410.00	Horizontal	72.74	94.0	21.26	1.5	90
4820.00	Horizontal	40.10	54.0	13.90	1.5	180
7230.00	Horizontal	42.79	54.0	11.21	1.5	45
9640.00	Horizontal	43.17	54.0	10.83	1.5	90
Middle frequency						
2440.00	Vertical	85.70	94.0	8.30	1.5	60
4880.00	Vertical	36.50	54.0	17.50	1.5	45
7320.00	Vertical	40.30	54.0	13.70	1.5	90
9760.00	Vertical	44.28	54.0	9.72	1.5	270
2440.00	Horizontal	74.29	94.0	19.71	1.5	90
4880.00	Horizontal	40.40	54.0	13.60	1.5	90
7320.00	Horizontal	43.40	54.0	10.60	1.5	180
9760.00	Horizontal	41.20	54.0	12.80	1.5	45
High frequency						
2470.00	Vertical	79.35	94.00	14.65	1.5	45
4940.00	Vertical	35.20	54.00	18.80	1.5	60
7410.00	Vertical	39.27	54.00	14.73	1.5	180
9880.00	Vertical	44.75	54.00	9.25	1.5	90
2470.00	Horizontal	71.88	94.00	22.12	1.5	180
4940.00	Horizontal	36.25	54.00	17.75	1.5	90
7410.00	Horizontal	40.19	54.00	13.81	1.5	90
9880.00	Horizontal	43.70	54.00	10.30	1.5	45

Note: Above 1GHz,do a Peak and average measurements for all emissions,Limit for peak is 94dBuvV/m,According to Part15.35(b) and average is 54BuvV/m.

8 Band Edge

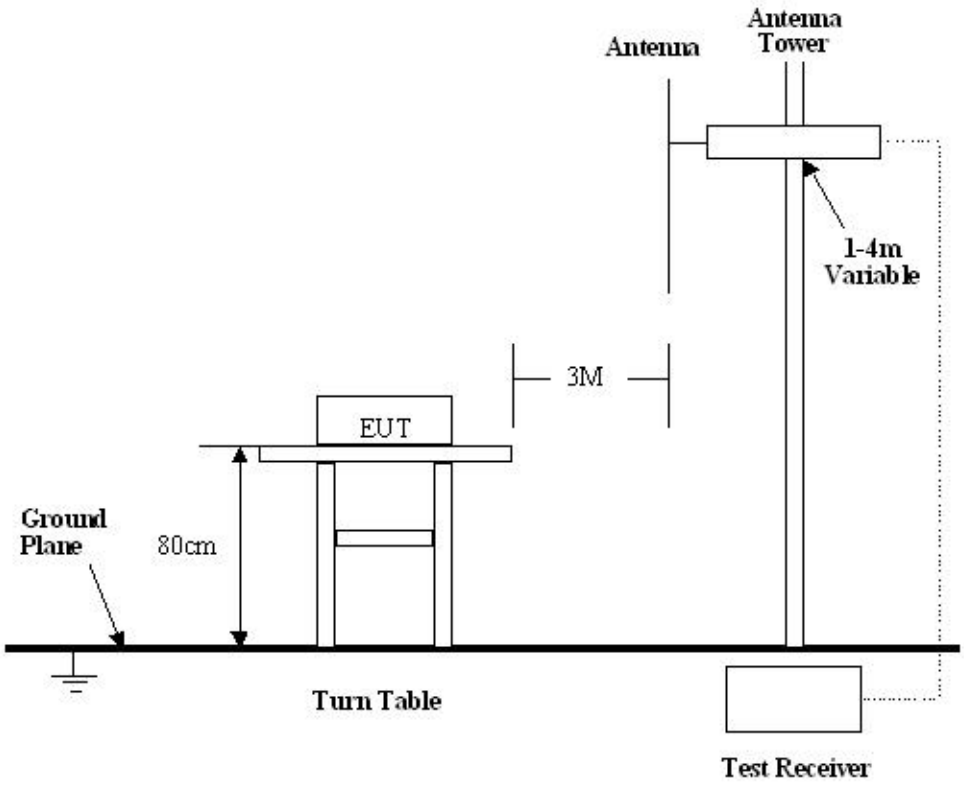
8.1 Test Equipment

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. With the EUT's antenna attached, The EUT's radiated emission power was received by the test antenna which was connected to the spectrum analyser with the START and STOP frequencies set to the EUT's operation band. Measurements were made at 3 meters.
3. The antenna high were varied from 1m to 4m high to find the maximum emission for each frequency.
4. Maximizing procedure was performed on the highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak reading 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.
5. The antenna polarization: Vertical polarization and horizontal polarization.

8.3 Radiated Test Setup



8.4 EUT Operation

Same as section 6.4 of this report.

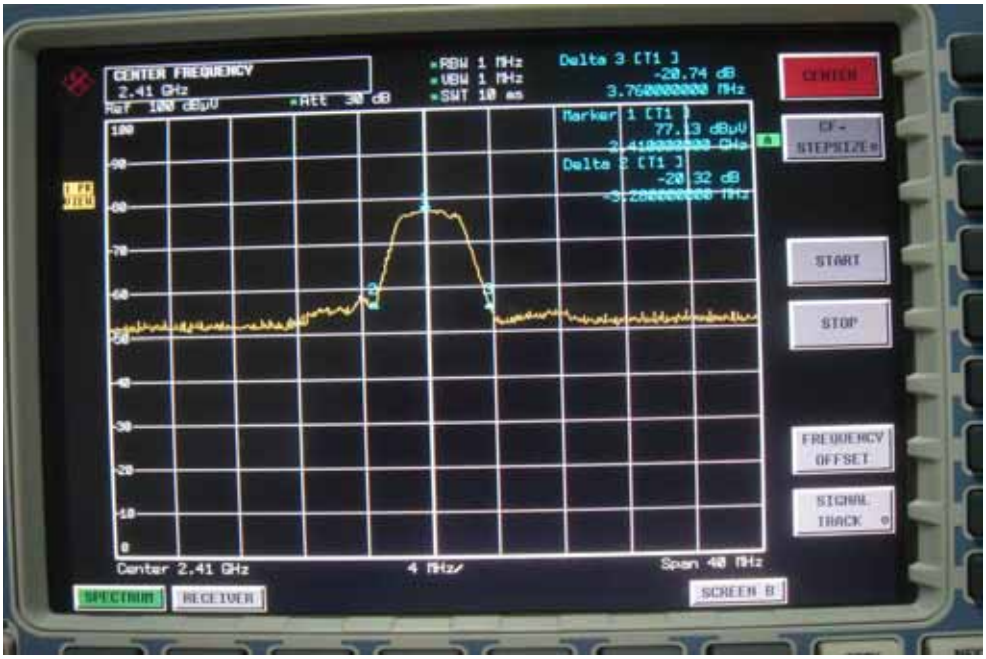
8.5 Band Edge

Requirements: FCC 15.249(d), The emission power at the START and STOP frequencies shall be at least 50dB below the level of the fundamental or to the general radiated emission limits in FCC 15.209.

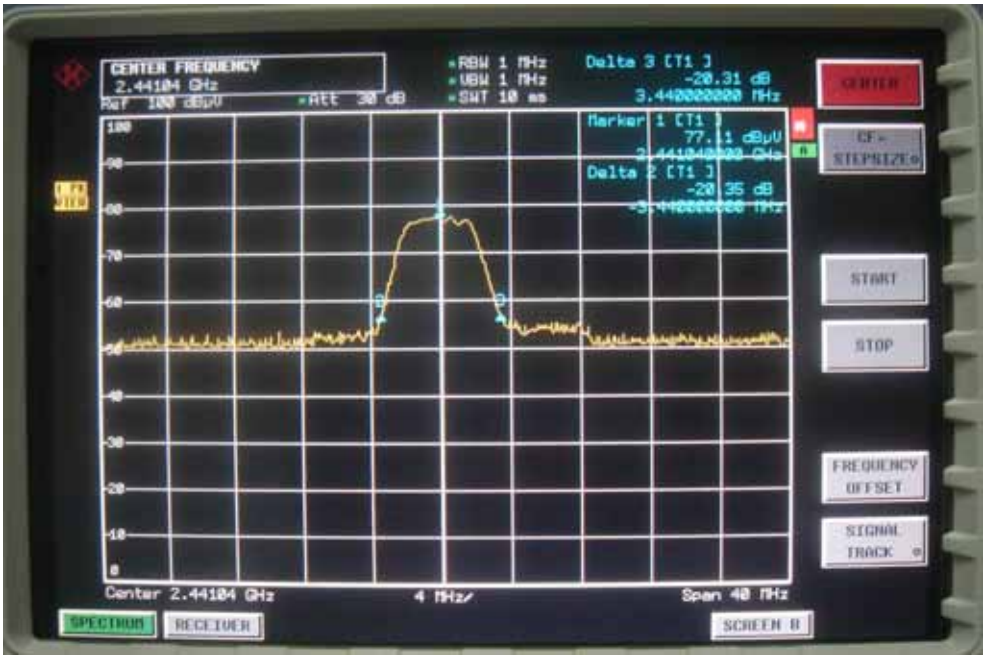
8.6 Band Edge Test Result

Product Name:	Home Viewer
Test Item:	Band Edge Test
Test Voltage:	120V AC/60Hz
Test Mode:	TX On
Temperature:	24 °C
Humidity:	52%RH

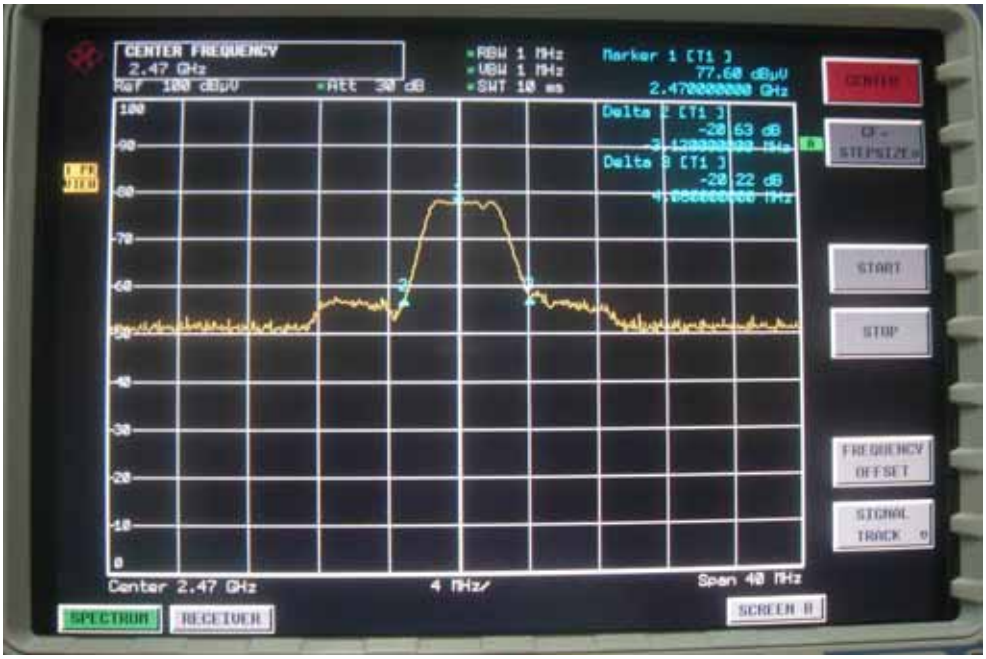
2410MHz TX



2440MHz TX



2470MHz TX



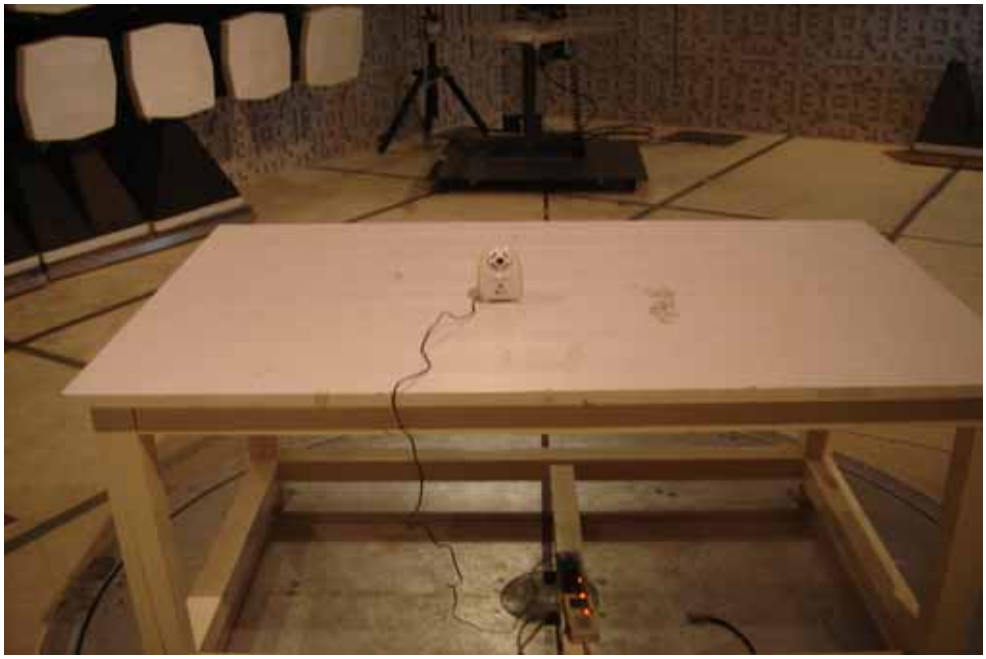
Note: (1) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.249.

(2) This device does meet the FCC requirement.

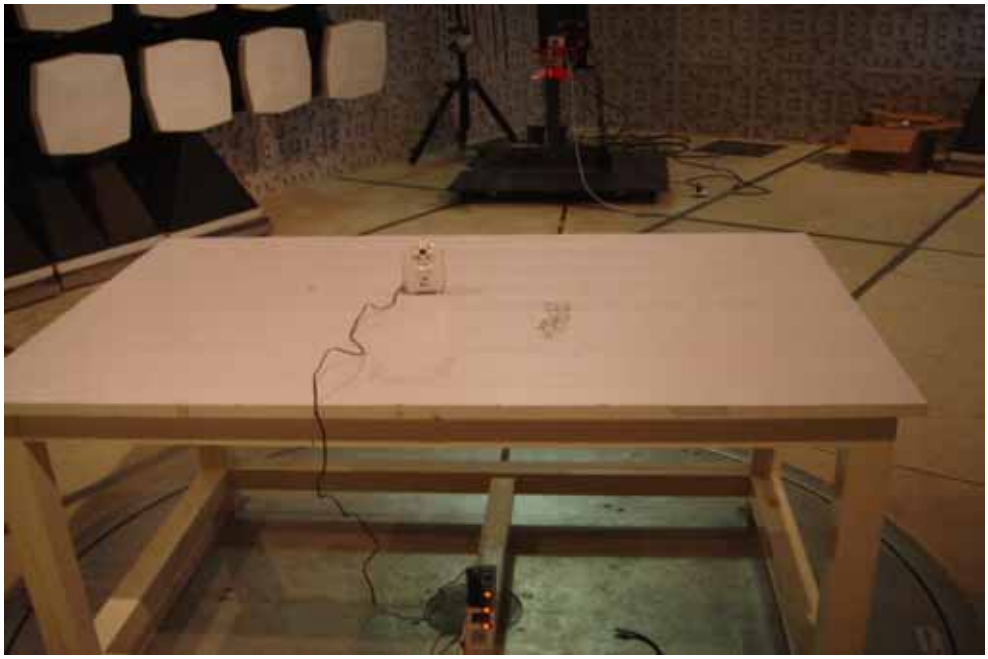
9 Photographs of Testing

9.1 Conduction Emission Test Setup

9.2 Radiation Emission Test View For 30MHz-1000MHz



9.3 Radiation Emission Test View For 1GHz-25GHz



10 Photographs - Constructional Details

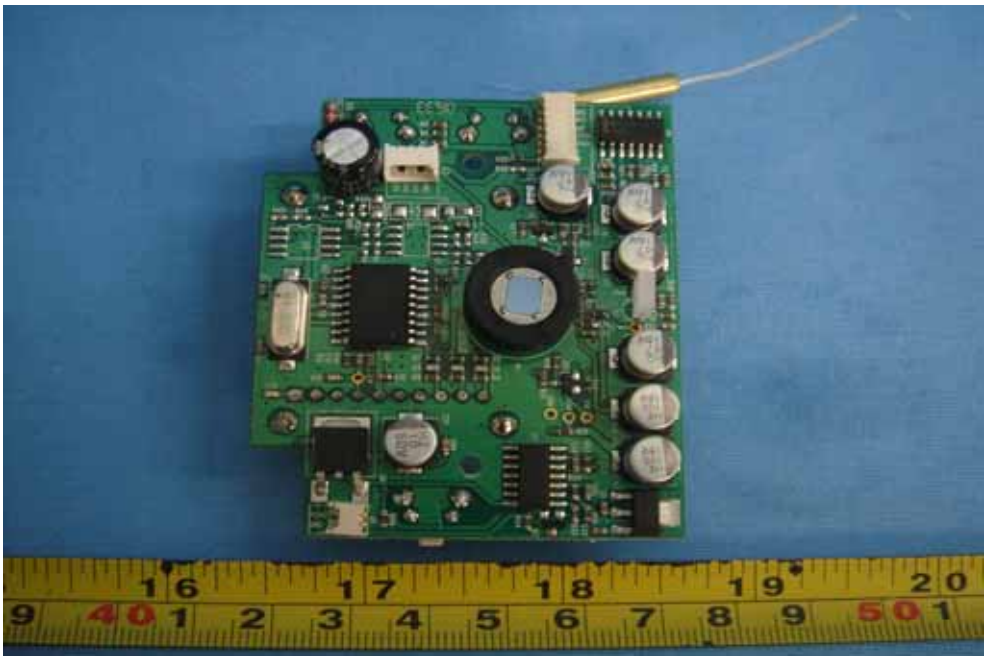
10.1 EUT - Front View

10.2 EUT - Back View

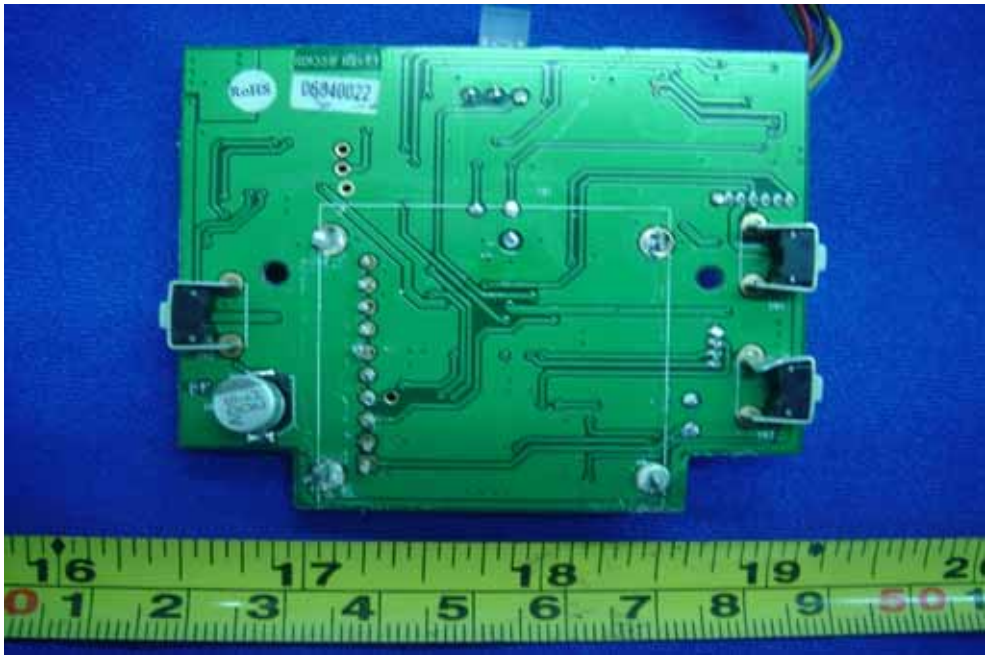
10.3 Adapter - Front View

10.4 Adapter - Back View

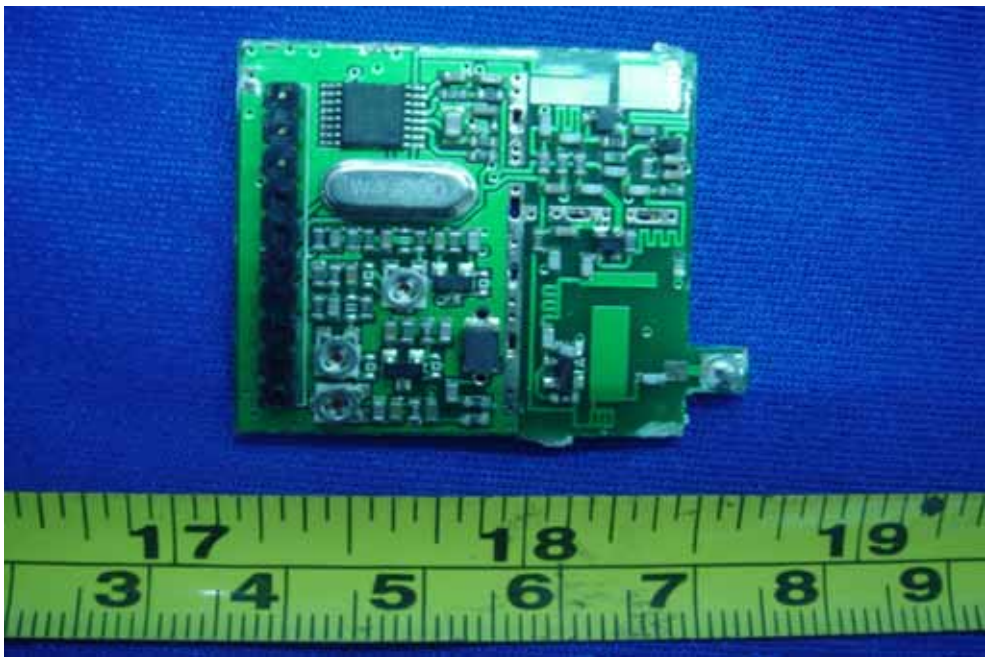
10.5 PCB1 - Front View



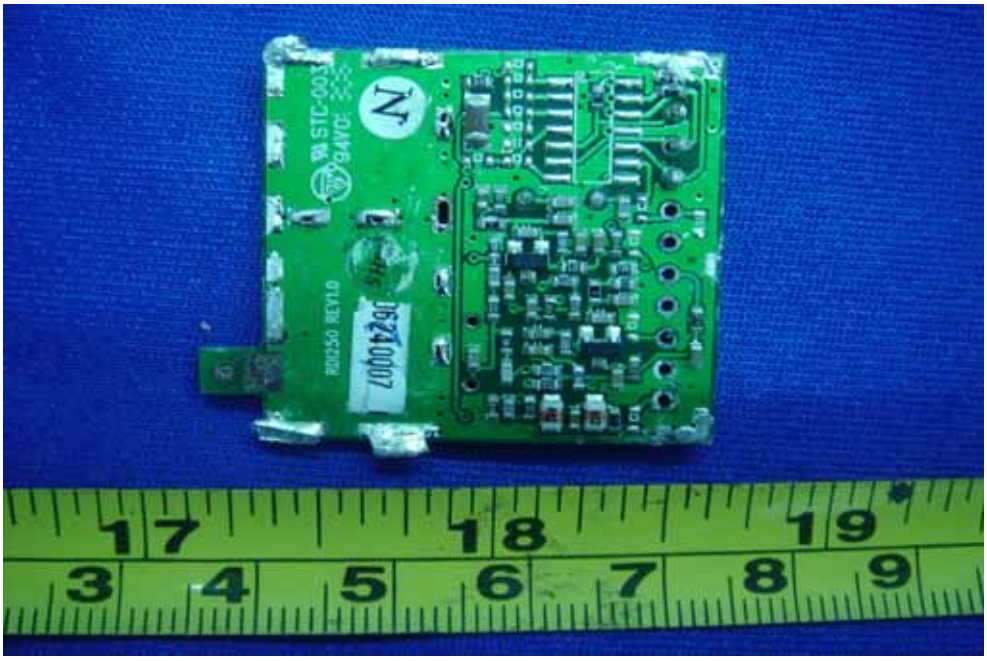
10.6 PCB1 - Back View



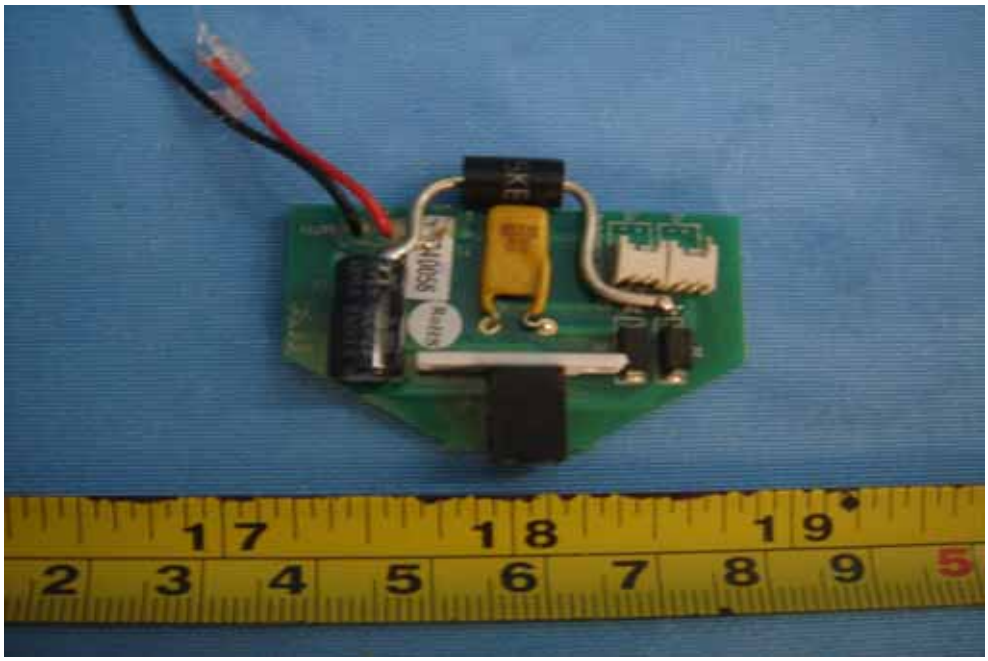
10.7 PCB2 - Front View



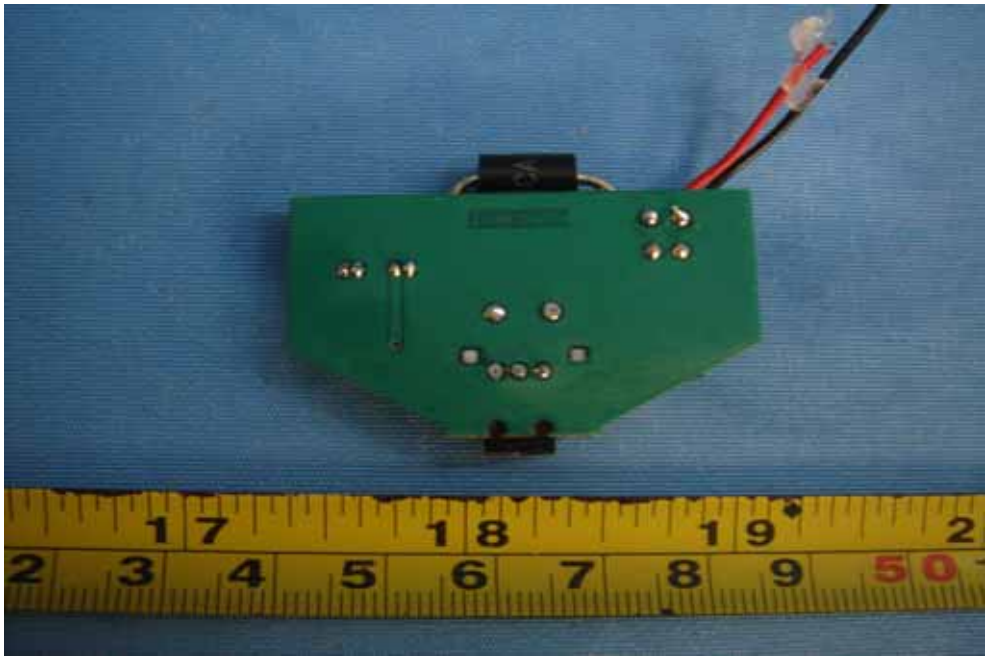
10.8 PCB2 - Back View



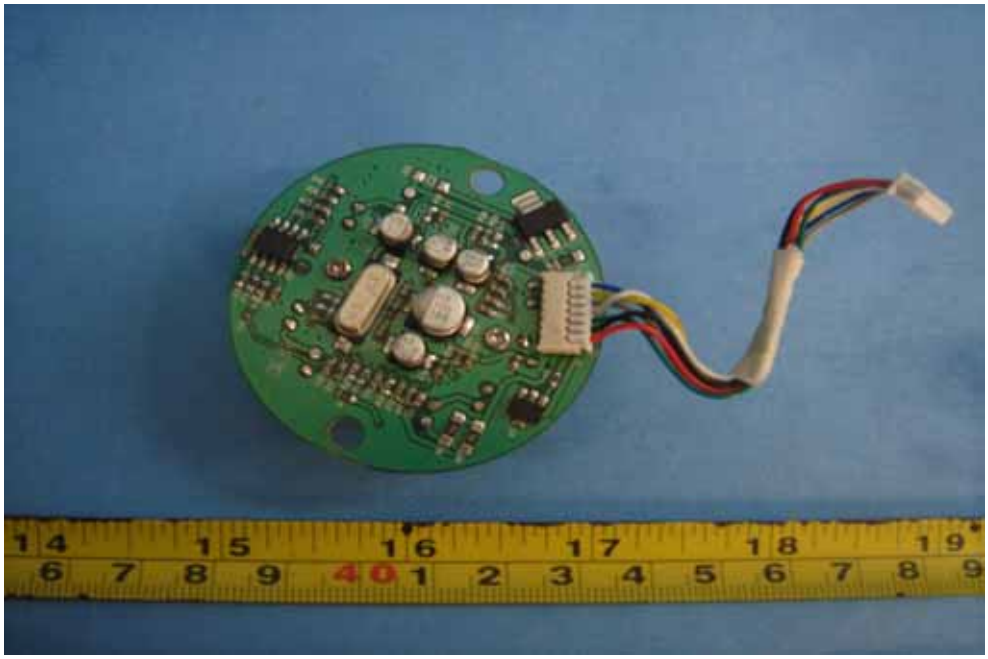
10.9 PCB3 - Front View



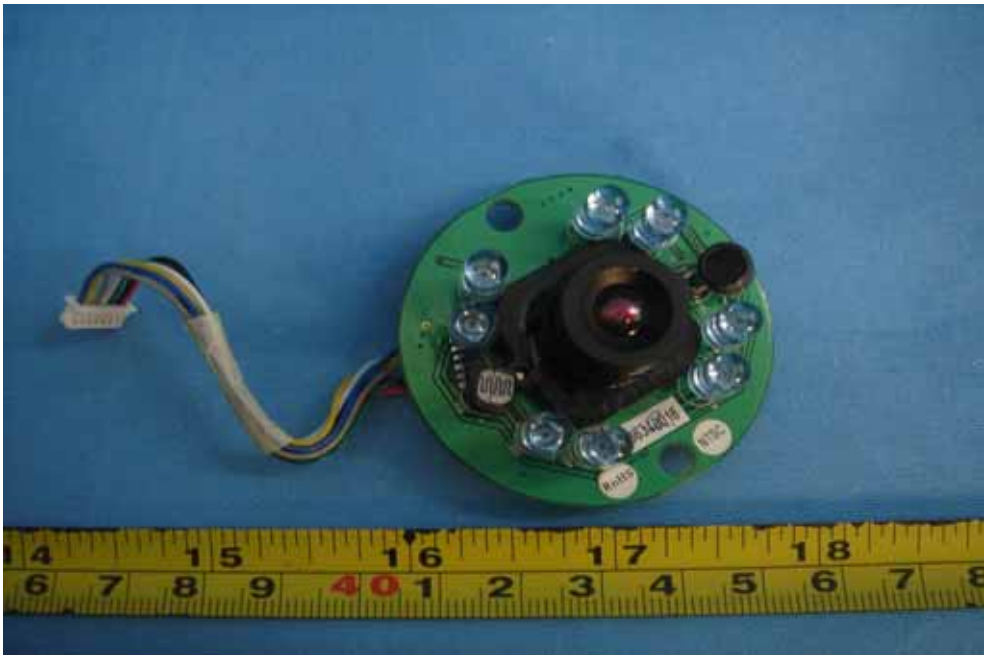
10.10 PCB3 - Back View



10.11 PCB4 - Front View



10.12 PCB4 - 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