

TEST REPORT

of

FCC Part 15 Subpart C §15.225

FCC ID : SS4P1770

Equipment Under Test	:	GSM/WCDMA PDA phone with Bluetooth & WLAN
Model Name	:	BIP-6000
Serial No.	:	N/A
Applicant	:	Bluebird Soft, Inc.
Manufacturer	:	Bluebird Soft, Inc.
Date of Test(s)	:	2009-03-18 ~ 2009-05-07
Date of Issue	:	2009-05-13

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

Tested By:



Date

2009-05-13

Feel Jeong

Approved By



Date

2009-05-13

Charles Kim

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1. General Information

Testing Laboratory

SGS Testing Korea Co., Ltd.

Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

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1.2. Details of Applicant

Applicant : Bluebird Soft, Inc.
Address : 558-5, Sinsa-dong, Kangnam-gu, Seoul, Korea
Contact Person : In-Gu Kim
Phone No. : +82 2 541 4002

1.3. Description of EUT

Kind of Product	GSM/WCDMA PDA phone with Bluetooth & WLAN
Model Name	BIP-6000
Serial Number	N/A
Power Supply	DC 3.7 V
Frequency Range	GSM : 824.2 MHz ~ 848.8 MHz and 1850.2 MHz ~ 1909.8 MHz WCDMA : 826.4 MHz ~ 846.6 MHz and 1852.4 MHz ~ 1907.6 MHz 2412 MHz ~ 2462 MHz (11b/g) 2402 MHz ~ 2480 MHz (Bluetooth) 13.56 MHz(RFID)
Modulation Technique	GSM/WCDMA : GMSK, 8DPSK, QPSK 11b : DSSS (CCK, BPSK, QPSK), 11g : OFDM (BPSK, QPSK, 16QAM, 64QAM) Bluetooth : GFKS, π/4DQPSK, 8DPSK RFID:ASK
Number of Channels	GSM 850(125), GSM 1900(300), WCDMA 850(103), WCDMA 1900 (103) 11b(11), 11g(11), Bluetooth(79),RFID(1)
Antenna Type	Integral Type(BT,WLAN)
Antenna Gain	0 dBi(BT), 0 dBi(WLAN)
Operating Conditions	-20 ~ 50

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1.4. Test Equipment List

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	H.P.	8565E	Oct. 01, 2009
Spectrum Analyzer	Rohde & Schwarz	FSP40	Oct. 01, 2009
Test Receiver	Rohde & Schwarz	ESVS10	Jul. 30, 2009
Loop Antenna	Rohde & Schwarz	HFH2-Z2	Sep. 18, 2009
Ultra-Broadband Antenna	Rohde & Schwarz	HL562	Oct. 02, 2009
Two-Line V-Network	Rohde & Schwarz	ENV216	Jan. 01, 2010
Test Receiver	Rohde & Schwarz	ESHS10	Jun. 21, 2009
Temperature Chamber	Hangil	HGTP-4050-04-01	Oct. 02, 2009
DC Power Supply	Agilent	6553A	Oct. 01, 2009
Anechoic Chamber	SY Corporation	L W H (9.6 m 6.4 m 6.6 m)	Jan. 31, 2010
Anechoic Chamber	SY Corporation	L W H (6.5 m 3.5 m 3.5 m)	N.C.R.

1.5. Summary of Test Results

The EUT has been tested according to the following specifications:

Applied standard : FCC Part15 subpart C		
Standard section	Test item	Result
15.207	Transmitter AC Power Line Conducted Emission	Complied
15.225(a)(b)(c)(d) 15.209	Radiated emission	Complied
15.225(e)	Frequency Stability	Complied
15.215(c)	20dB Bandwidth	-

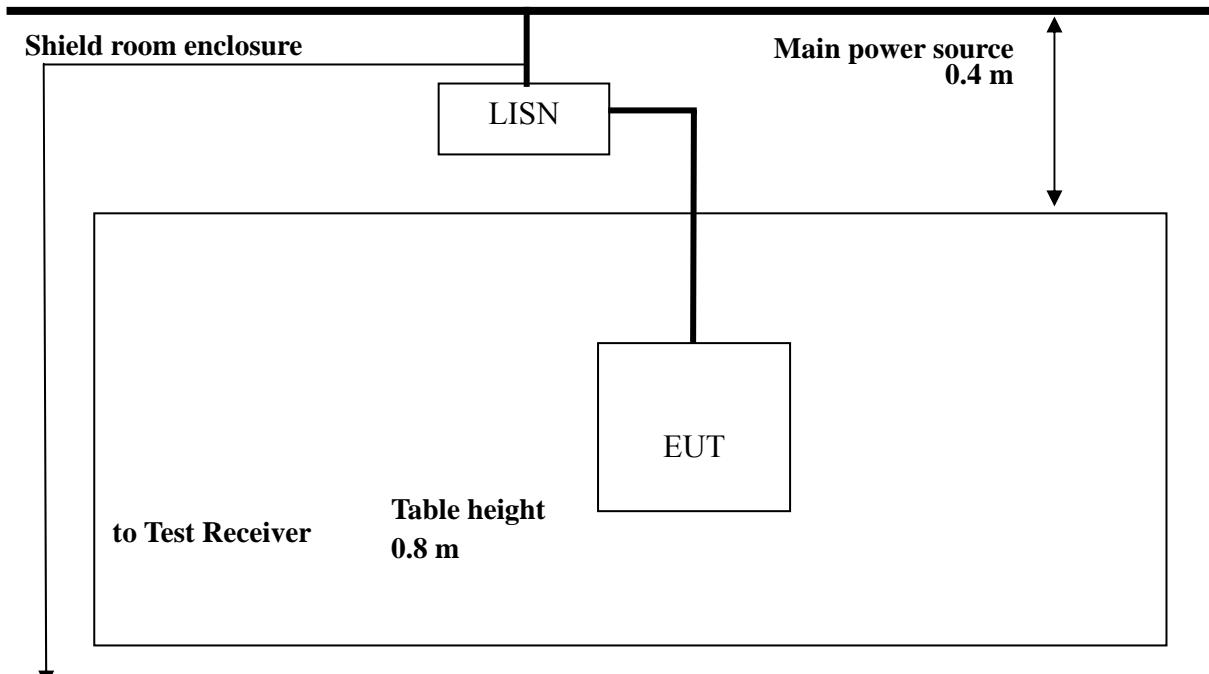
1.6. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL003051	Initial
1	F690501/RF-RTL003051-1	Add the frequency stability and 20 dB bandwidth

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2. Transmitter AC power line conducted emission

2.1. Test Setup



2.2. Limit

According to §15.207(a) for an intentional radiator that is designed to be connected to the public utility (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 the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network (LISN).

Compliance with the provision of this paragraph shall be on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15 – 0.50	66-56*	56-46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

* Decreases with the logarithm of the frequency.

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2.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The test procedure is performed in a $6.5\text{ m} \times 3.6\text{ m} \times 3.6\text{ m}$ (L×W×H) shielded room. The EUT along with its peripherals were placed on a $1.0\text{ m(W)} \times 1.5\text{ m(L)}$ and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

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2.4. Test Results

Ambient temperature : 22

Relative humidity : 46 % R.H.

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Frequency range : 0.15 MHz – 30 MHz

Measured Bandwidth : 9 kHz

FREQ. (MHz)	LEVEL(dBuV)		LINE	LIMIT(dBuV)		MARGIN(dB)	
	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.17	50.40	36.70	N	64.96	54.96	14.56	18.26
0.22	38.10	21.30	N	62.82	52.82	24.72	31.52
1.62	30.50	21.40	N	56.00	46.00	25.50	24.60
3.30	30.10	22.60	N	56.00	46.00	25.90	23.40
10.08	27.10	19.30	N	60.00	50.00	32.90	30.70
22.44	28.20	22.80	N	60.00	50.00	31.80	27.20
0.15	48.50	36.90	H	66.00	56.00	17.50	19.10
0.19	43.00	24.90	H	64.04	54.04	21.04	29.14
0.94	28.70	17.80	H	56.00	46.00	27.30	28.20
2.97	29.70	19.00	H	56.00	46.00	26.30	27.00
10.32	27.70	21.20	H	60.00	50.00	32.30	28.80
23.62	24.20	18.60	H	60.00	50.00	35.80	31.40

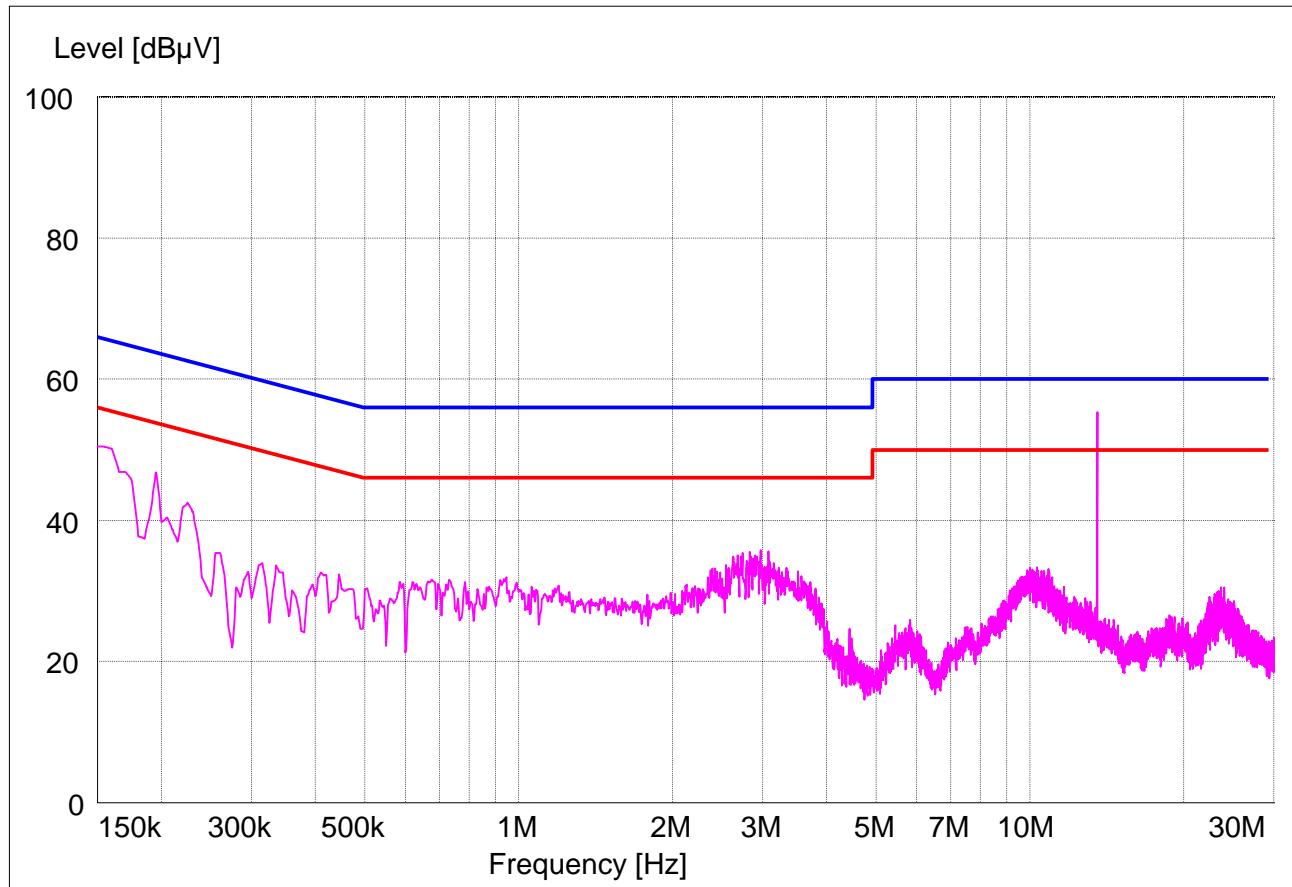
Note ;

Line (H) : Hot

Line (N) : Neutral

Plot of Conducted Power line

Test mode : (Hot)



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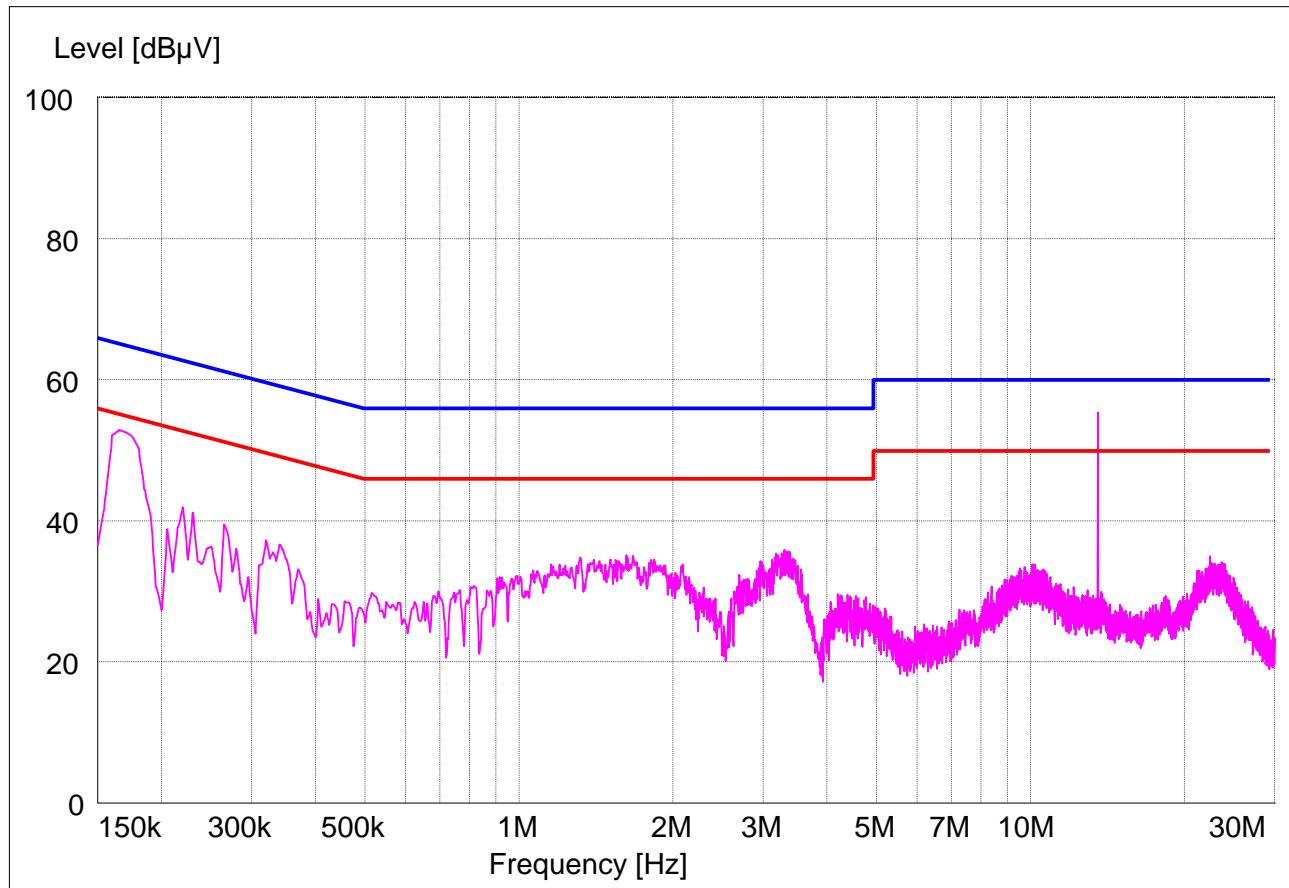
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Test mode : (Neutral)

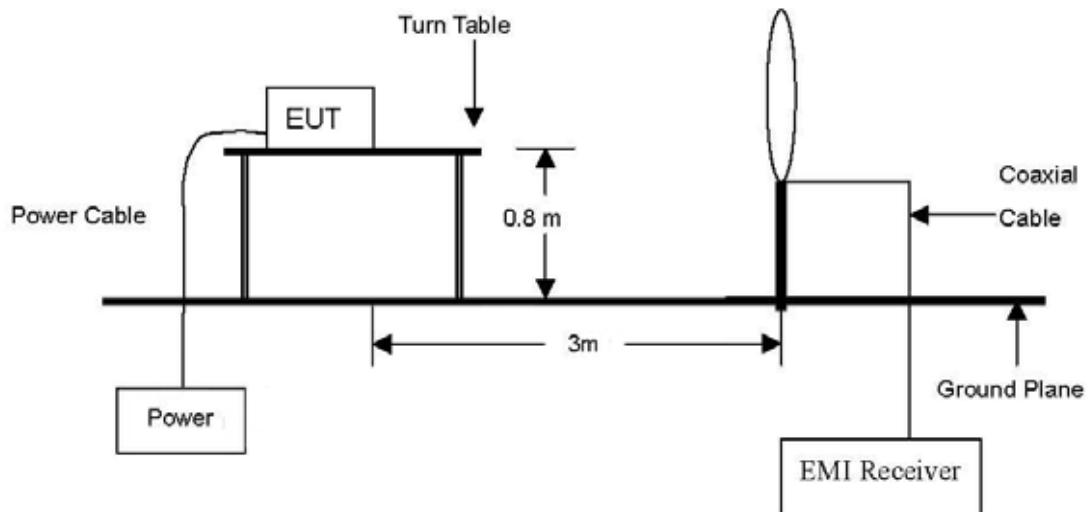


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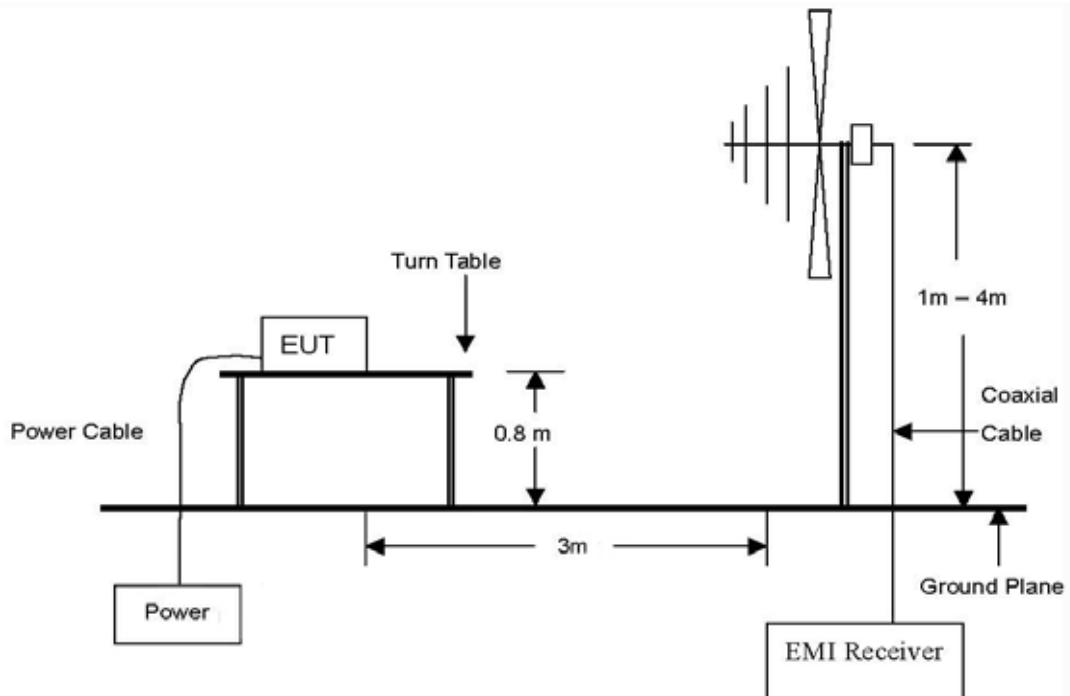
3. Radiated Emissions

3.1. Test Setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.

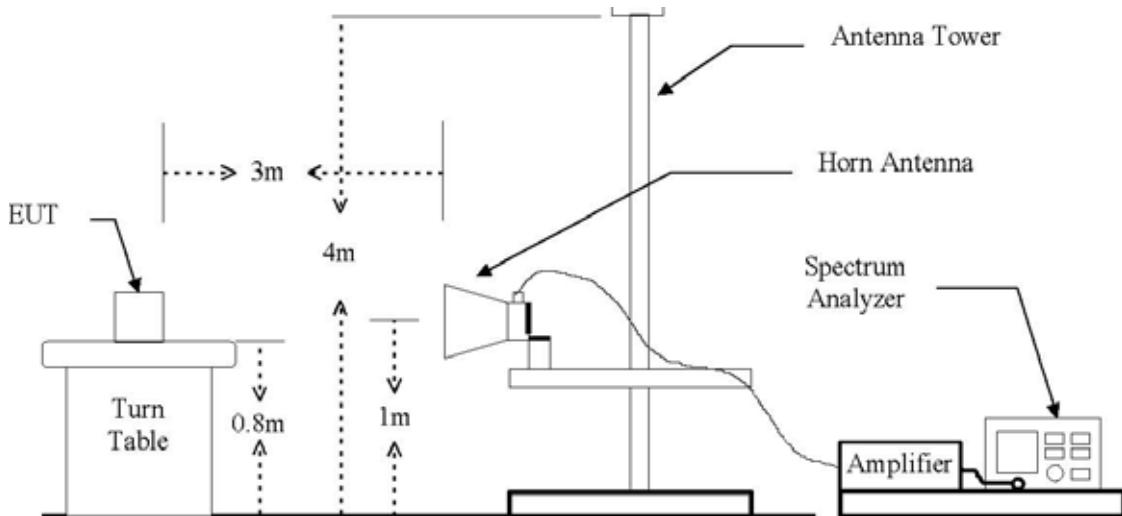


The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



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The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 18 GHz Emissions.



3.2. Limit

According to §15.225,

- The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 15,848 microvolts / meter at 30 meters.
- Within the bands 13.410 – 13.553 MHz and 13.567 -13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts / meter at 30 meters.
- Within the bands 13.110 – 13.410 MHz and 13.710 – 14.010 MHz the field strength of any emissions shall not exceed 106 microvolts / meter at 30 meters.
- The field strength of any emissions appearing outside of the 13.110 – 14.010 MHz and shall not exceed the general radiated emission limits in §15.209.

3.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Average Detect Function and Specified Bandwidth with Maximum Hold Mode.

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3.4. Test Result

Ambient temperature : 22

Relative humidity : 46 % R.H.

The following table shows the highest levels of radiated emissions.

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	Ant. (dB/m)	Cable (dB)	Actual (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)
13.560	41.6	Average	H	18.93	0.01	60.54	124.00	63.46
367.075	46.0	Peak	V	12.70	-25.37	33.34	46.00	12.66
391.325	44.9	Peak	V	13.16	-25.52	32.54	46.00	13.46
444.675	49.1	Peak	V	15.11	-25.70	38.51	46.00	7.49
468.925	52.8	Peak	V	15.23	-25.78	42.26	46.00	3.74
495.600	52.5	Peak	V	16.11	-25.87	42.74	46.00	3.26
519.850	47.9	Peak	V	15.69	-25.87	37.72	46.00	8.28
546.525	44.9	Peak	V	16.19	-25.84	35.25	46.00	10.75
570.775	46.0	Peak	V	16.56	-25.79	36.77	46.00	9.23
Above 580	Not detected							

Remark:

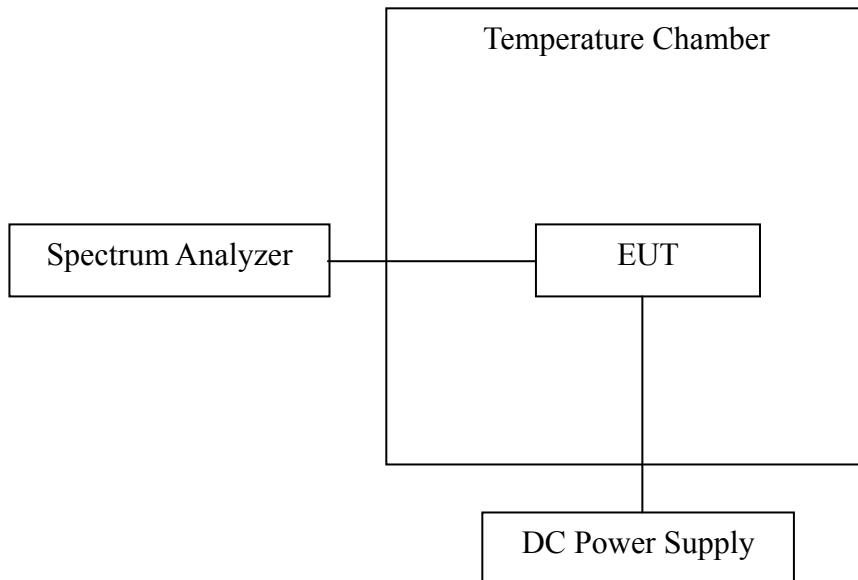
To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes.

Note:

1. A Peak limit is 20 dB above the average limit.
2. 3m Limit(dBuV/m) = $84+40\log(30/3)$
= 124
3. Other Spurious Emission Frequencies were not detected up to 1000 MHz.

4. Frequency Stability

4.1. Test Setup



4.2. Limit

According to §15.207(e), the frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

4.3. Test Procedures

- a. Place the EUT on the table and set it in the transmitting mode.
- b. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- c. Set the environment into appropriate environment.
- d. Set the spectrum analyzer as RBW=100 Hz, VBW = RBW, Span = 10 kHz, Sweep = auto.
- e. Mark the peak frequency and measure the frequency tolerance using frequency counter function.
- f. Repeat until all the results are investigated.

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4.4. Test Result

Ambient temperature : 20

Relative humidity : 46 % R.H.

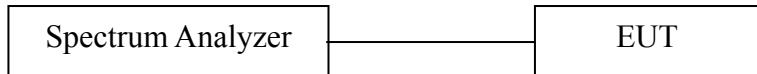
Operating Frequency: 13.560 MHz**Reference Voltage: 3.7 V_{DC}**

Voltage (%)	Power (VDC)	Temperature (°)	Frequency (Hz)	Deviation (%)
100	3.70	-20	13,560,385	0.0028
		-10	13,560,353	0.0026
		0	13,560,363	0.0027
		10	13,560,389	0.0029
		20(Ref)	13,560,375	0.0028
		30	13,560,332	0.0024
		40	13,560,307	0.0023
		50	13,560,284	0.0021
85	3.15	20	13,560,384	0.0028
115	4.26	20	13,560,364	0.0027

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5. 20 dB Bandwidth

5.1. Test Setup



5.2. Limit

None; for reporting purposes only.

5.3. Test Procedures

- a. Place the EUT on the table and set it in the transmitting mode.
- b. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- c. Set the spectrum analyzer as RBW=1 kHz, VBW = RBW, Span = 20 kHz, Sweep = auto.
- d. Mark the peak frequency and 20dB (upper and lower) frequency.
- e. Repeat until all the rest channels are investigated.

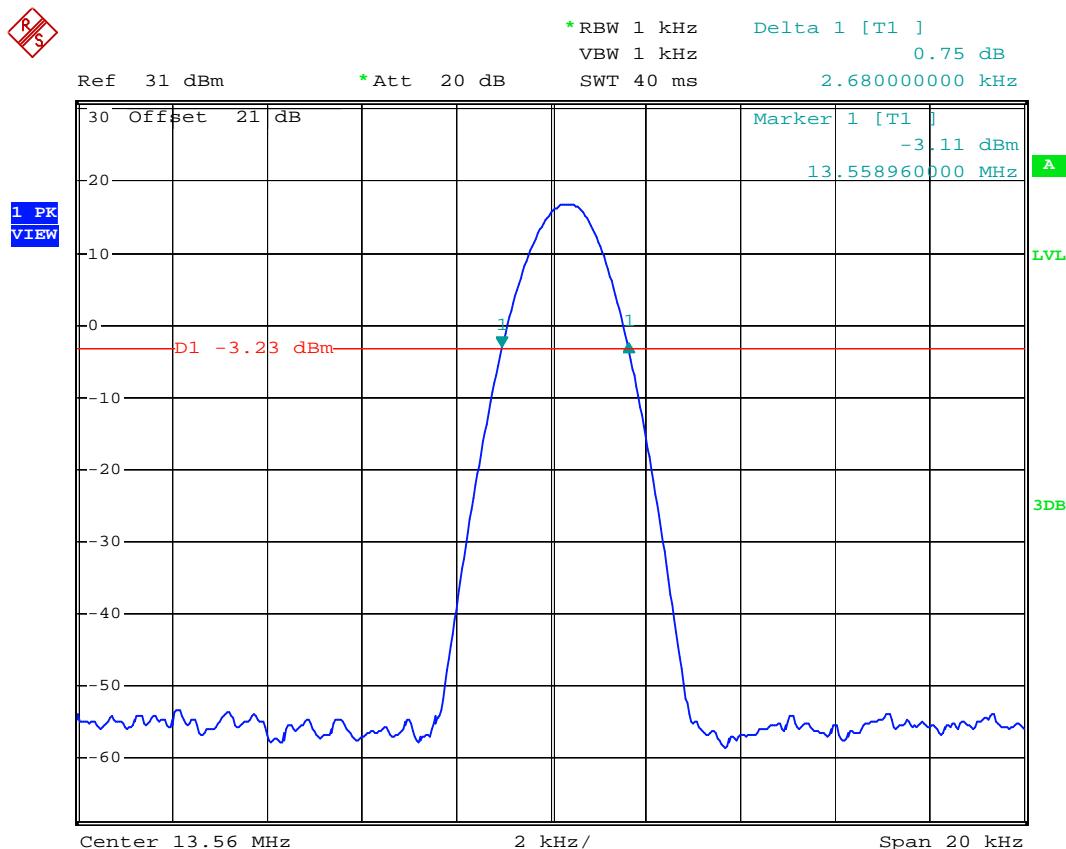
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5.4. Test Result

Ambient temperature : 20

Relative humidity : 46 % R.H.

Frequency (MHz)	20dB Bandwidth (kHz)
13.560	2.68



Date: 4.MAY.2009 10:22:38

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