TEST REPORT

of

FCC Part 15 Subpart C §15.225
FCC ID : ZNFL02D

Equipment Under Test	: PCS GSM/GPRS with Bluetooth, WLAN and NFC (Felica) Phone
Model Name	: L-02D
Serial No.	: N/A
Applicant	: LG Electronics MobileComm U.S.A., Inc.
Manufacturer	: LG Electronics MobileComm U.S.A., Inc.
Date of Test(s)	: 2011.09.08 ~ 2011.10.06
Date of Issue	: 2011.10.28

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

Tested By: **Date** **2011.10.28**

Duke Ko

Approved By: **Date** **2011.10.28**

Feel Jeong

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1. General Information

1.1. Testing laboratory

SGS Korea Co., Ltd.(Gunpo Laboratory)
- 705, Dongchun-Dong Sooji-Gu, Yongin-Shi, Kyungki-Do, South Korea.
- Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

www.kr.sgs.com/ee

Phone No. : +82 +31 428 5700
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1.2. Details of Applicant

Applicant : LG Electronics MobileComm U.S.A., Inc.
Address : 10101 Old Grove Road, San Diego, CA 92131
Contact Person : An, Hee-Ju
Phone No. : +82 +10 2846 2750

1.3. Description of EUT

Kind of Product	PCS GSM/GPRS with Bluetooth, WLAN and NFC (Felica) Phone
Model Name	L-02D
Serial Number	N/A
Power Supply	DC 3.7 V (Li-Ion Battery)
Frequency Range	13.56 ㎒
Modulation Technique	ASK
Number of Channels	1
Antenna Type	Fixed type

1.4. Declaration by the manufacturer

- Worst case is XZ plane.

1.4. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal Due.
Signal Generator	R & S	SMR40	100272	Jul. 15, 2012
Spectrum Analyzer	Agilent	E4440A	MY43362142	May. 18, 2012
Test Receiver	R & S	ESU26	100109	Feb. 21, 2012
Loop Antenna	R & S	HFH2-Z2	100118	Aug. 24, 2013
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	396	Apr. 27, 2013
Preamplifier	H.P.	8447F	2944A03909	Jul. 04, 2012
Two-Line V-Network	R & S	ENV216	100190	Jan. 06, 2012
Test Receiver	R & S	ESHS10	863365/018	Apr. 27, 2012
DC power Supply	Agilent	U8002A	MY49030063	Jan. 05, 2012
Temperature Chamber	Hangil	HGTP-4050	HGTP-4050-04-01	Nov. 08, 2011
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.6 m)	N.C.R.	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (6.5 m×3.5 m×3.5 m)	N.C.R.	N.C.R.

1.5. Summary of Test Results

The EUT has been tested according to the following specifications:

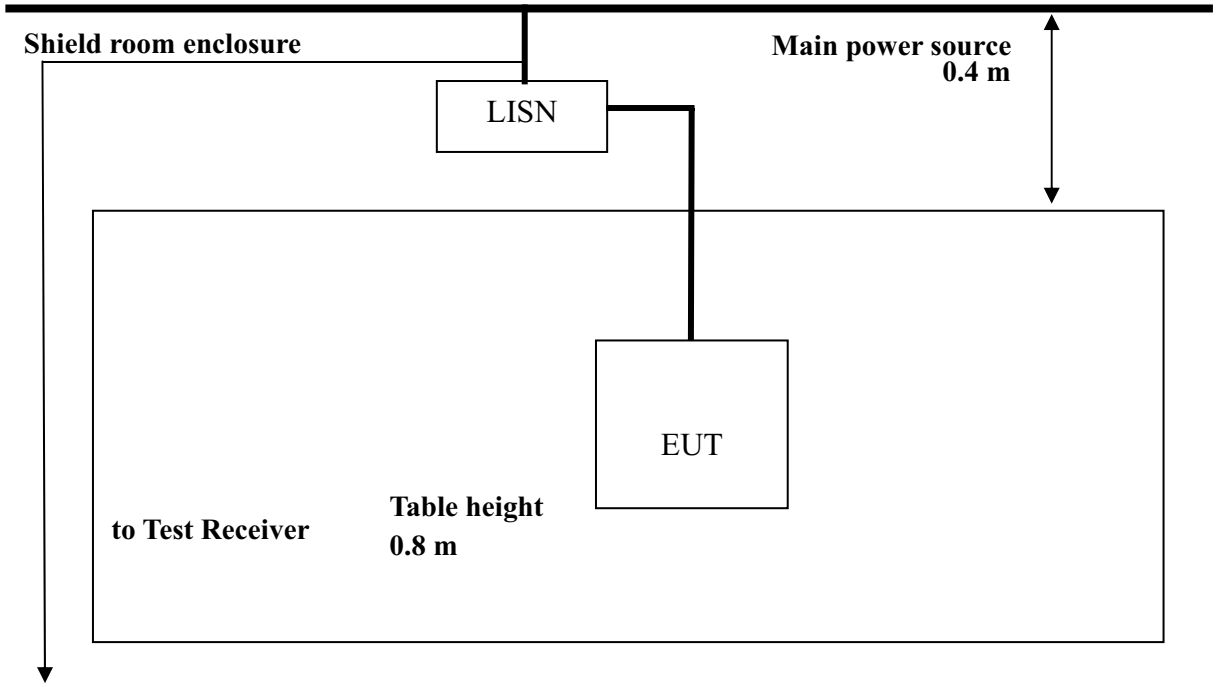
Applied standard : FCC Part15 subpart C		
Standard section	**Test item**	**Result**
15.207	Transmitter AC Power Line Conducted Emission	Complied
15.225(a)(b)(c)(d) 15.209	Radiated emission	Complied
15.225(e)	Frequency Stability	Complied
15.215(c)	20 dB Bandwidth	-

1.6. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL005026	Initial
1	F690501/RF-RTL005026-1	- Change Applicant and Manufacturer - Update AC power line Emission
2	F690501/RF-RTL005026-2	-Change EUT description

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 ㎑ to 30 ㎒, 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 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 (㎒)	Conducted limit (㏈ μV)	
	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.

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 m × 3.6 m× 3.6 m (L×W×H) shielded room. The EUT along with its peripherals were placed on a 1.0 m(W)× 1.5 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.

2.4. Test Results

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

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

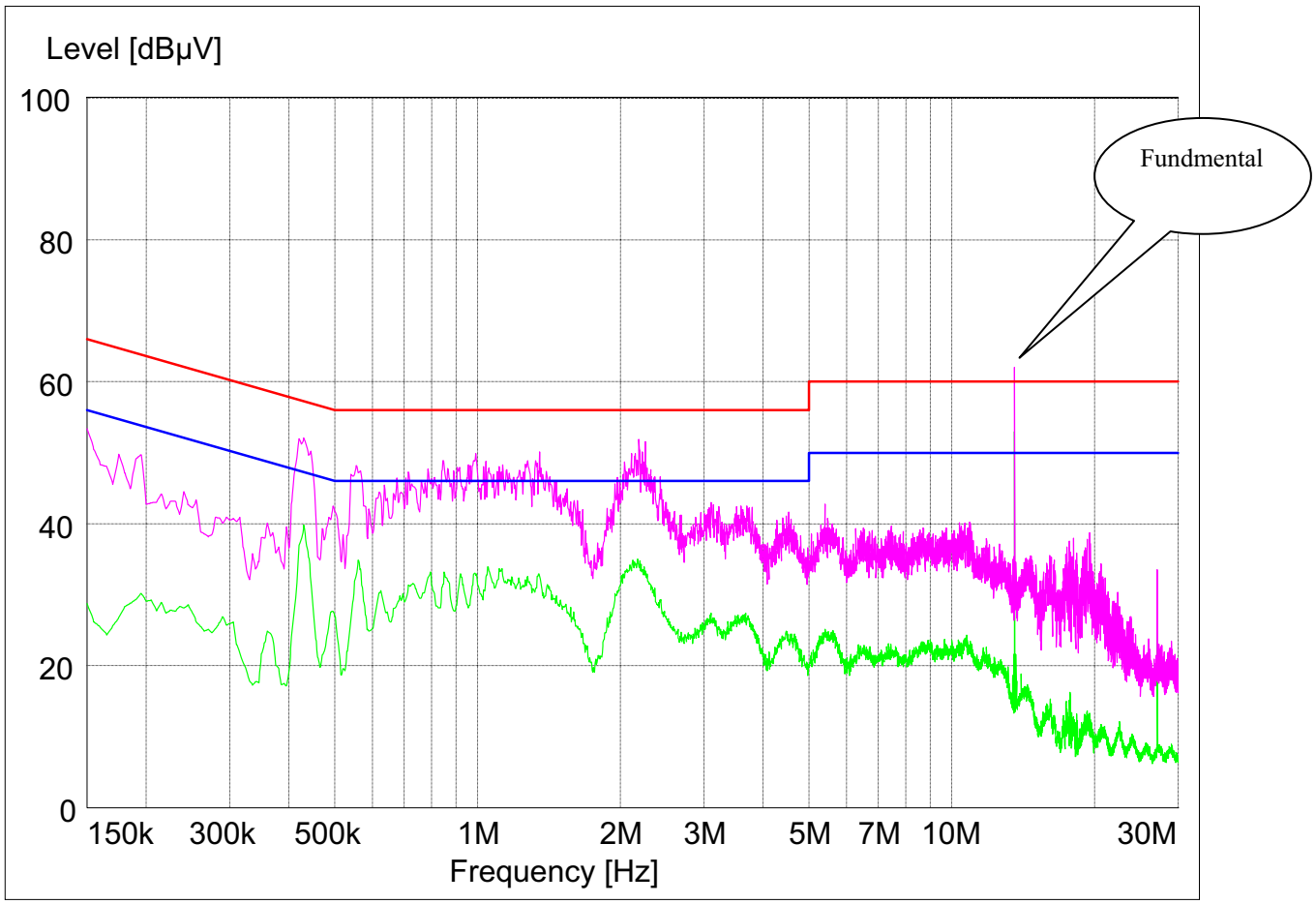
Frequency range : 0.15 ㎒ – 30 ㎒
Measured Bandwidth : 9 ㎑

FREQ.	LEVEL(dB uV)		LINE	LIMIT(dB uV)		MARGIN(dB)	
(㎒)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.43	43.8	33.7	H	57.3	47.3	13.5	13.6
2.19	43.0	33.3	H	56.0	46.0	13.0	12.7
27.12	32.0	28.5	H	60.0	50.0	28.0	21.5
0.43	44.5	33.9	N	57.3	47.3	12.8	13.4
1.12	37.5	31.1	N	56.0	46.0	18.5	14.9
2.11	38.0	30.6	N	56.0	46.0	18.0	15.4
27.13	24.9	22.4	N	60.0	50.0	35.1	27.6

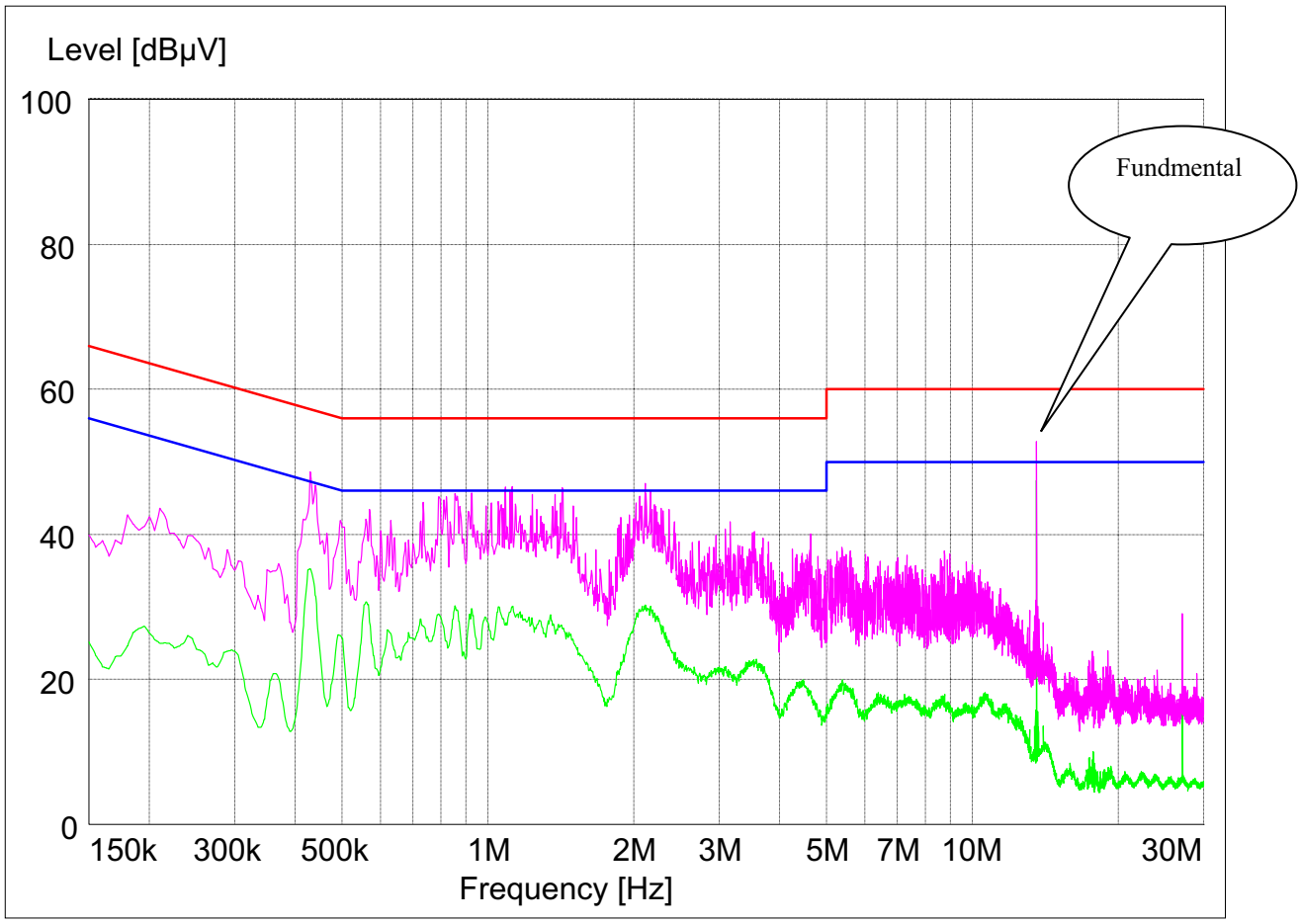
Note ;
Line (H) : Hot
Line (N) : Neutral

Plot of Conducted Power line

Test mode : (Hot)



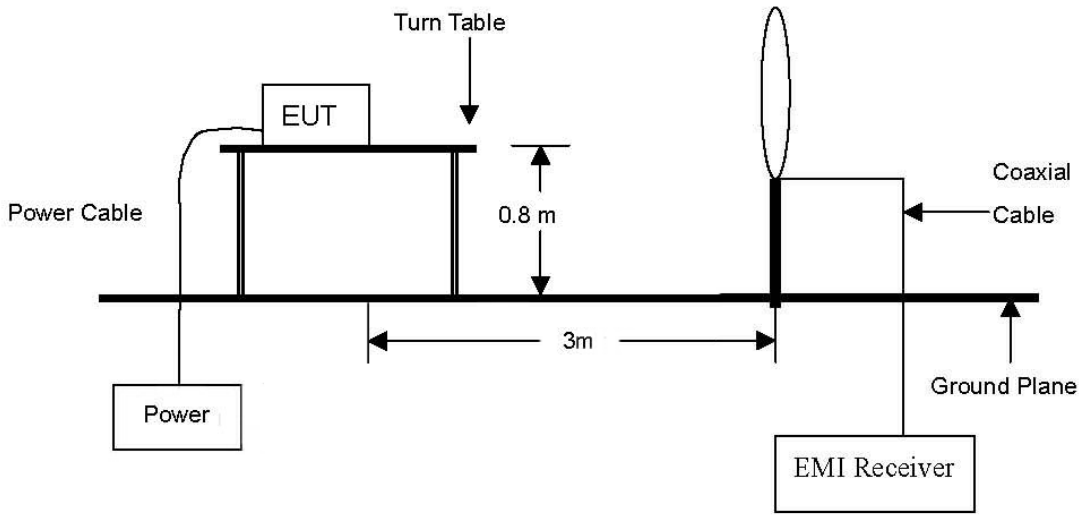
Test mode : (Neutral)



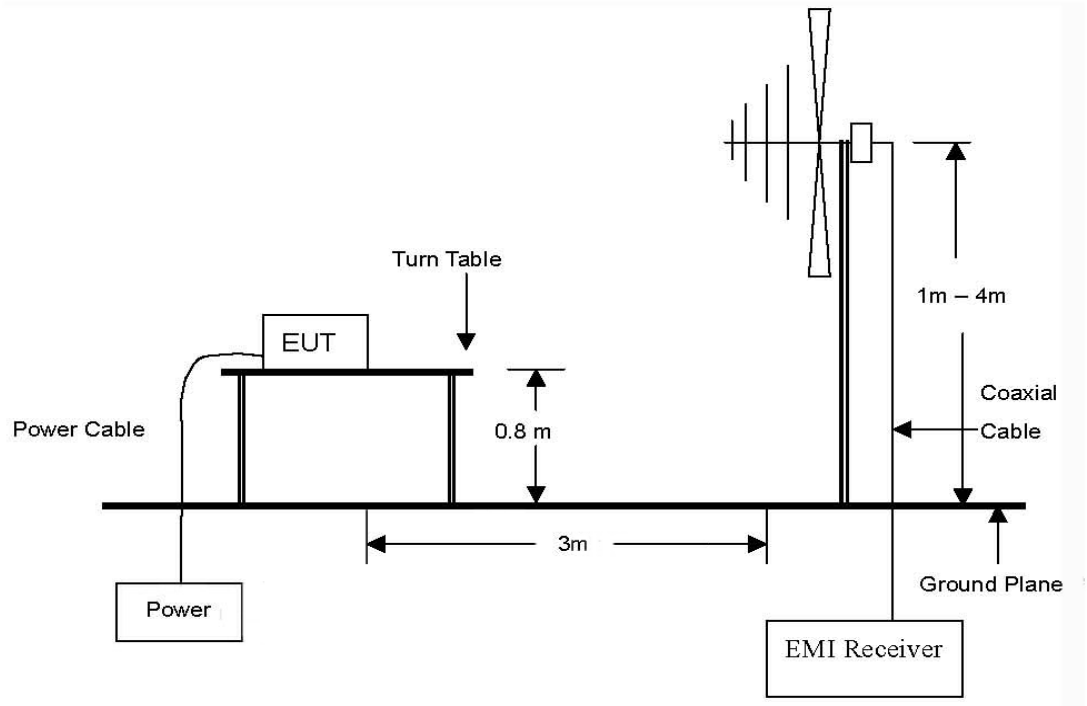
3. Radiated Emissions

3.1. Test Setup

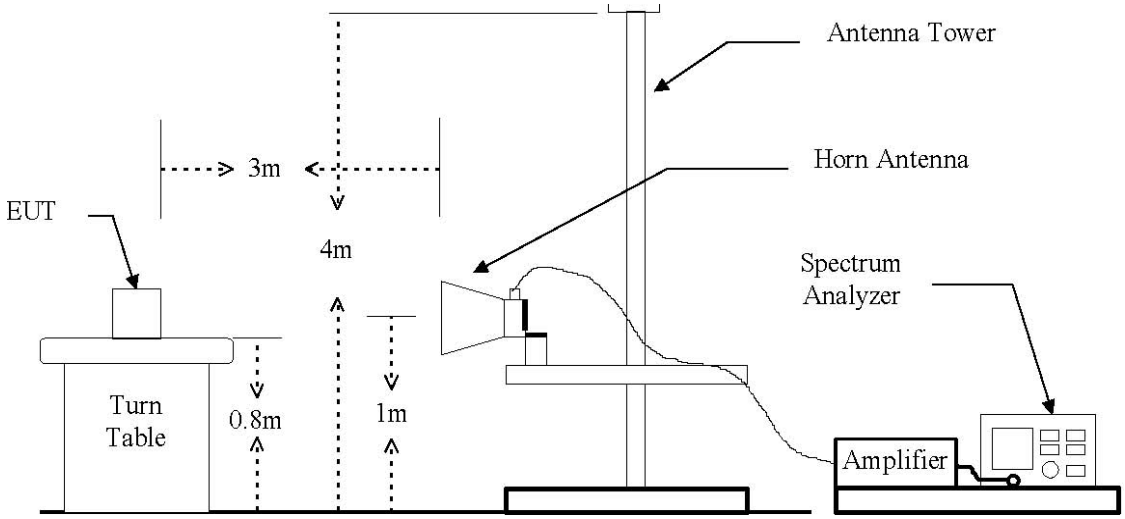
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions.



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



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



3.2. Limit

According to §15.225,

(a) The field strength of any emissions within the band 13.553 – 13.567 ㎒ shall not exceed 15,848 microvolts / meter at 30 meters.

(b) Within the bands 13.410 – 13.553 ㎒ and 13.567 -13.710 ㎒, the field strength of any emissions shall not exceed 334 microvolts / meter at 30 meters.

(c) Within the bands 13.110 – 13.410 ㎒ and 13.710 – 14.010 ㎒ the field strength of any emissions shall not exceed 106 microvolts / meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110 – 14.010 ㎒ 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

a. 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.

b. 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.

c. 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.

d. The test-receiver system was set to Average Detect Function and Specified Bandwidth with Maximum Hold Mode.

3.4. Test Result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

The following table shows the highest levels of radiated emissions.

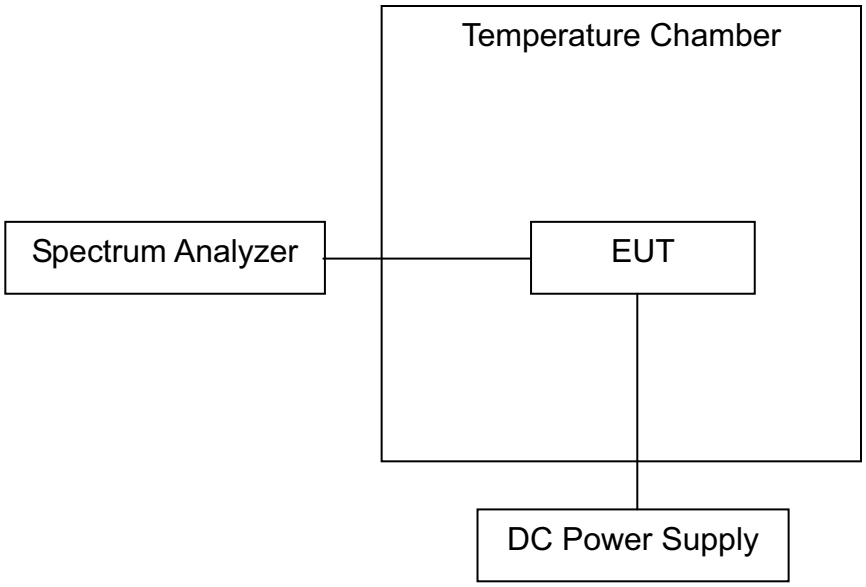
Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	Ant. (dB/m)	Cable (dB)	Actual (dB uV/m)	Limit 3m (dB uV/m)	Margin (dB)
13.56	30.2	Average	H	17.3	0.2	47.7	124.0	76.3
176.30	45.0	Peak	H	9.9	-25.0	29.9	43.5	13.6
Above 200.000	Not Detected	-	-	-	-	-	-	-

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 = 84+40log(30/3)
   Limit(dB uV/m)
   = 124
3. Other Spurious Emission Frequencies were not detected up to 1 000 ㎒.
4. The worst case is XZ.

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 ㎐, VBW = RBW, Span = 10 ㎑, Sweep = auto.
e. Mark the peak frequency and measure the frequency tolerance using frequency counter function.
f. Repeat until all the results are investigated.

4.4. Test Result

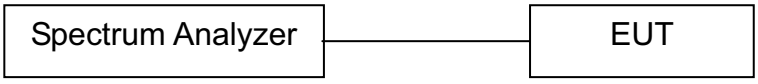
Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

Operating Frequency: 13.56 ㎒
Reference Voltage: 3.7 V_{DC}

Voltage (%)	Power (VDC)	Temperature (℃)	Frequency (㎐)	Deviation (%)
100	3.7	50	13.560 664	0.004 9
		40	13.560 724	0.005 3
		30	13.560 812	0.006 0
		20	13.560 803	0.005 9
		10	13.560 896	0.006 6
		0	13.560 897	0.006 6
		-10	13.560 858	0.006 3
		-20	13.560 842	0.006 2
115	4.26	20	13.560 890	0.006 6
batt. End point	3.4	20	13.560 759	0.005 6

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 ㎑, VBW = RBW, Span = 20 ㎑, Sweep = auto.
d. Mark the peak frequency and 20 dB (upper and lower) frequency.
e. Repeat until all the rest channels are investigated.

5.4. Test Result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

Frequency (㎒)	20dB Bandwidth (㎑)
13.56	2.77