(2004)量认(国)字(H2402)号 No.L1659

FCC TEST REPORT

of

PCS Mobile Station

FCC ID:	S5D-KMP6J1AJ1
Brand name:	NEC
Model No.:	N630
Serial No.:	N.A.
Report No.:	FCC05-8001
Date:	March 25, 2005

Prepared for

Wuhan NEC Mobile Communication Co., Ltd.
2/F No.1 Workshop No.2 Industrial District,
GuanDong Science and Technology Industrial Park, Wuhan, P.R.China

Prepared by

ShenZhen Electronic Product Quality Testing Center
Electronic Testing Building, Shahe Road, Xili, Nanshan District, ShenZhen, 518055, P.R.China
Tel: 86 755 26627338 Fax: 86 755 26627238

Table of Contents

1 Test Report Certification

Product:	PCS Mobile Station
FCC ID:	S5D-KMP6J1AJ1
Model No.:	N630
Applicant:	Wuhan NEC Mobile Communication Co., Ltd.
Applicant Address:	2/F No.1 Workshop No.2 Industrial District, GuanDong Science and Technology Industrial Park, Wuhan, P.R.China
Manufacturer:	Wuhan NEC Mobile Communication Co., Ltd.
Manufacturer Address:	2/F No.1 Workshop No.2 Industrial District, GuanDong Science and Technology Industrial Park, Wuhan, P.R.China
Test Standards:	47 CFR Part 2 47 CFR Part 24, Subpart E 47 CFR Part 15, Subpart B & Subpart C
Test Result:	**PASS**

We, Shenzhen Electronic Product Quality Testing Center, hereby certify that the submitted samples of the above item, as detailed in chapter 2.1 of this report, has been tested in our facility. The test record, data evaluation and test configuration represented herein are true and accurate accounts of measurements of the sample's EMC characteristics under the conditions herein specified.

Tested by: Lin Xingsun, Date: March. 25. 2005
Lin Xingsun

Checked by: Smart Li, Date: March. 25. 2005
Smart Li

Approved by: Wang Keqin, Date: Mar. 25, 2005
Wang Keqin

2 General Information

2.1 Description of EUT

EUT1	
Description:	PCS 1900MHz Mobile Station (MS)
Model No.:	N630
Frequency:	Tx: 1850-1910MHz; Rx: 1930MHz-1990MHz
Power:	1W
IMEI No.:	355253000003315
Serial No.:	N.A.
Hardware Version:	ME84001787 _P2
Software Version:	NEC_N630_Ver_2.0
EUT2	
Description:	Lithium-ion Battery
Model No.:	N63004B09303A
Serial No.:	A4KAS0299D
Manufacturer:	Shenzhen XWODA Electronic Co., Ltd.
Capacitance:	700mAh
Rated Voltage:	3.7V
Charge Limit:	4.2V
EUT3	
Description:	AC Adaptor (Charger)
Model No.:	901.0078
Serial No.:	411277346
Manufacturer:	Friwo Electrical (Shenzhen) Co., Ltd.
Rated Input:	a.c. 100-240V, 0.2A, 50/60Hz
Rated Output:	d.c. 5.2V, 550mA
Length DC cable:	180cm

NOTE:

1. The EUT is a model of PCS 1900MHz Mobile Station. It consists of Hand Telephone Set and normal options: Lithium Battery and Charger, as listed above.
2. Please refer to Appendix I for the photographs of the EUT. For a more detailed features description about the EUT, please refer to User's Manual.

2.2 Objective

Perform EMC test according to FCC rules Part 2, Part 15 and Part 24 for FCC ID Certification.

2.3 Test Standards and Results

The EUT has been tested according to 47 CFR

- Part 2 Frequency Allocations and Radio Treaty Matters: General Rules and Regulations
- Part 15 Radio Frequency Devices
- Part 24 Personal Communications Services

Test items and the results are as bellow:

№	FCC Rules	Test Type	Result
1	§15.107 §15.207	Conducted Emission	PASS
2	§15.109	Radiated Emission	PASS
3	§2.1046 §24.232	Equivalent Isotropically Radiated Power (EIRP)	PASS
4	§2.1053 §24.238	Spurious Radiation	PASS
5	§2.1055 §24.235	Frequency Stability	PASS

2.4 List of Equipments Used

Description	Manufacturer	Model No.	Serial No.
Test Receiver	Schwarzbeck	FCKL1528	A0304230
Test Receiver	Rohde & Schwarz	ESIB26	A0304218
LISN	Schwarzbeck	NSLK8127	A0304233
Ultra Broadband Ant	Rohde & Schwarz	HL562	A0304224
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	A0304212
3G Communication Antenna	European Antennas	PSA 75301R/170	A0304213
Temperature Chamber	JAPAN TABAI	PSL-4G	A8708056
Regulated DC Power Supply	Jiangbo	JB-305	A0412374
Shield Room	Nanbo Tech	Site 3	A9901141
Shield Room	Nanbo Tech	Site 1	A0304210
Anechoic Chamber	Albatross	H-249	A0304210

NOTE: Equipments listed above have been calibrated and are in the period of validation.

2.5 Test Facility

Shenzhen Electronic Product Quality Testing Center (SET) is a third party testing organization accredited by China National Accreditation Committee for Laboratories (CNACL) according to ISO/IEC 17025. The EMC chamber site No.1, and the radiated and conducted Emission test equipments of SET are constructed and calibrated to meet the FCC requirements ANSI C63.4:2001 and CISPR 22/EN 55022. The Registration Number is 261302.

3 Conducted Emission Measurement

3.1 Limits of Conducted Emission

According to FCC §15.107 and §15.207, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV), Class B digital device	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

NOTE:

1. The lower limit shall apply at the band edges.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.2 Test Procedure

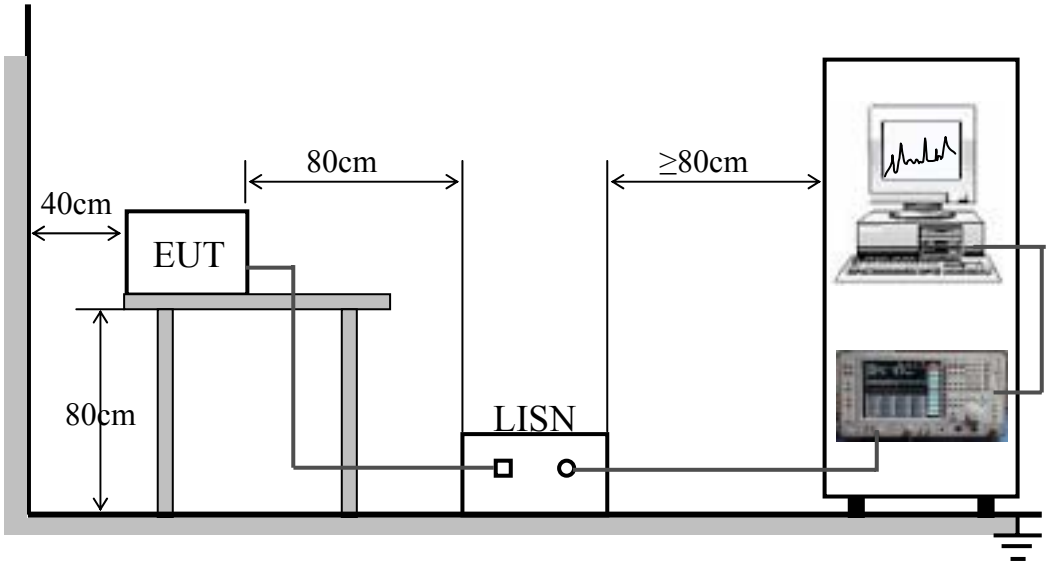
a. The EUT was placed on a 0.8m high insulating table and kept 0.4 meters from the conducting wall of shielded room.

b. The EUT was connected to the power mains through a line impedance stabilization network (LISN). The LISN provide 50Ω/50μH of coupling impedance for the measuring instrument.

c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

d. The frequency range from 150 kHz to 30 MHz was searched using CISPR Quasi-Peak and Average detector.

3.3 Test Setup



For the actual test configuration, please refer to the related item - Photographs of the Test Configuration.

3.4 EUT Setup and Operating Conditions

The EUT configuration of the emission tests was MS + Battery + Charger.

Before the measurement, the lithium battery was completely discharge.

During the measurement, the lithium battery and the charger were installed, and the MS were in charging state. A communication link was established between the MS and a System Simulator (SS). The MS operates at PCS 1900MHz mid ARFCN (661) and maximum output power (level 0).

The charger was powered by 120V 60Hz AC mains supply.

3.5 Test Results

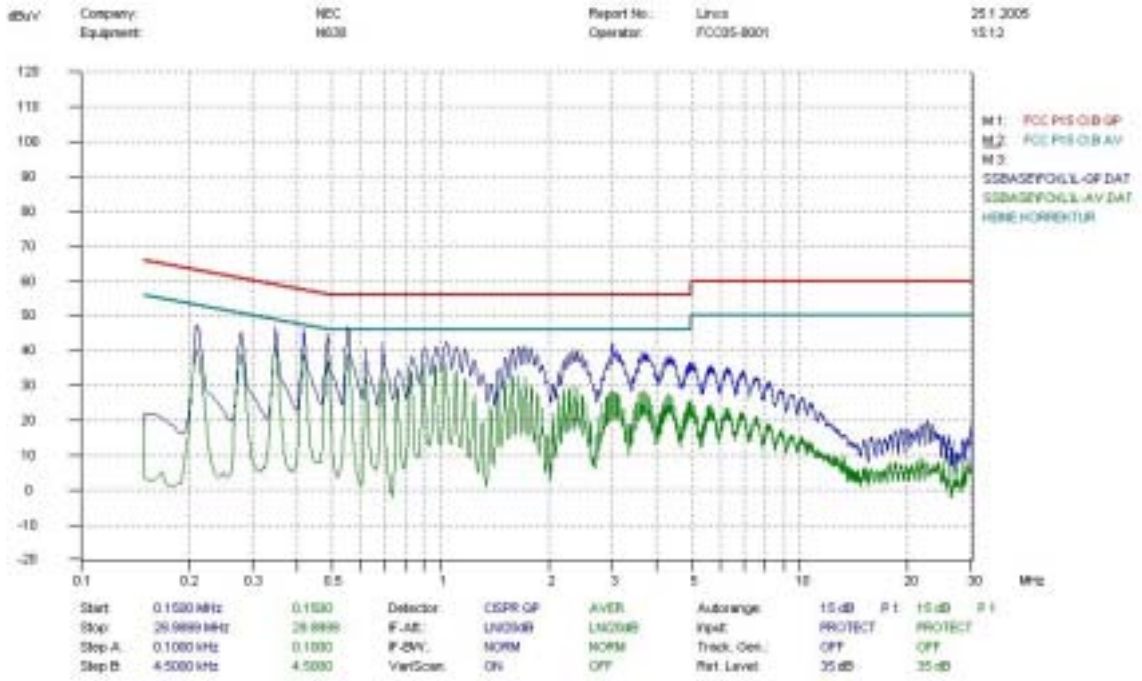
No.	Freq. (MHz)	Limit Value (dBμV)		Emission Level (dBμV)	
		QP	AV	QP	AV
1	0.2130	63.1	53.1	47.3	39.7
2	0.3480	59.0	49.0	46.8	40.8
3	0.4155	57.5	47.5	46.5	39.3
4	0.4830	56.3	46.3	44.9	36.2
5	0.5505	56.0	46.0	46.6	38.7
6	1.0365	56.0	46.0	42.4	35.6
7	1.7205	56.0	46.0	41.5	33.0
8	3.003	56.0	46.0	42.0	28.5

NOTE:

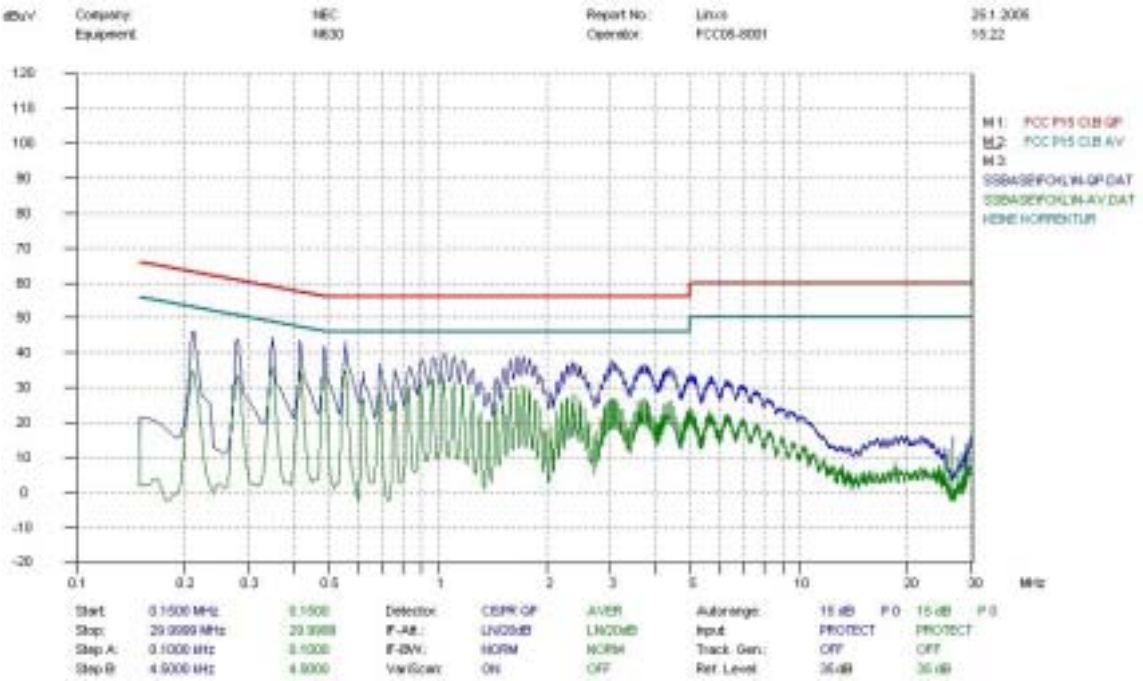
1. QP and AV are abbreviations of the quasi-peak and average individually.

2. If the emission levels measured with QP detector are lower than AV limits, there is unnecessary to measure with AV detector.
3. The emission levels recorded above is the larger ones of both L phase and N phase.

1. Mains terminal disturbance voltage, L phase



2. Mains terminal disturbance voltage, N phase



4 Radiated Emission Test

4.1 Limits of Radiated Emission

According to FCC §15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)
30 - 88	100	40
88 -216	150	43.5
216 - 960	200	46
Above 960	500	54

NOTE:

1. Field Strength (dBμV/m) =20log Field Strength (μV/m).
2. In the emission tables above, the tighter limit applies at the band edges.

4.2 Test Procedure

a. The EUT was placed on the top of a ratable 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

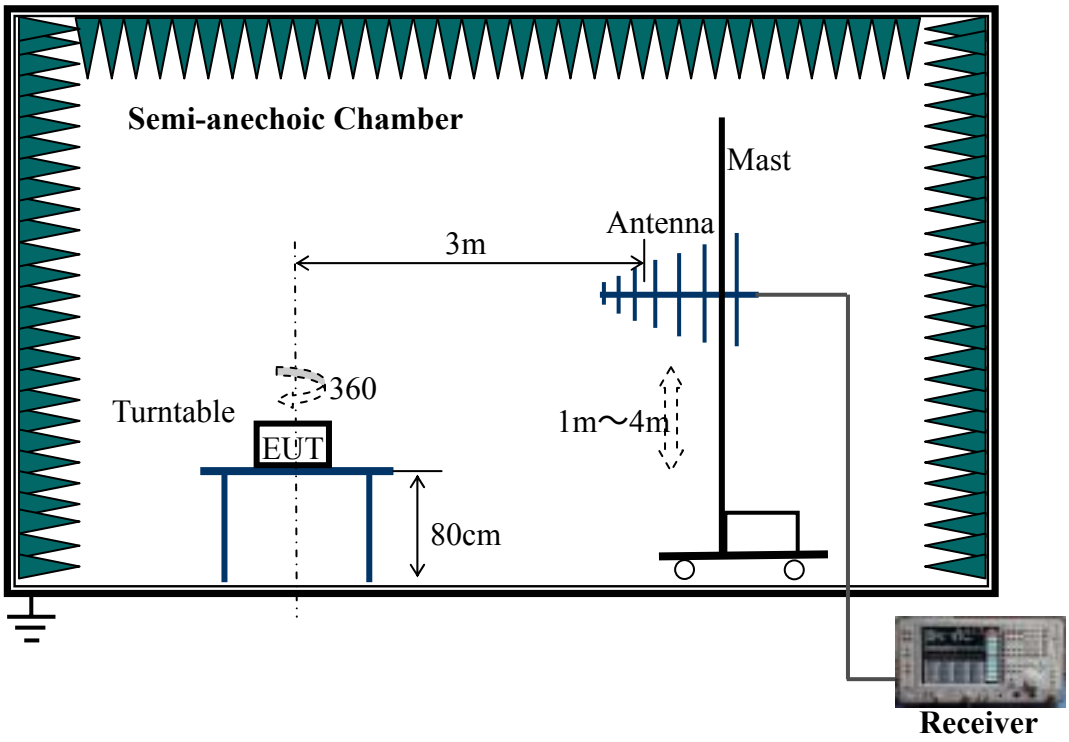
c. The antenna is a broadband antenna, and its height is varied from one meter to four meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the heights from 1 to 4 meters and the ratable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detector Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emission that did not have 10 dB margins would be retested one by one using the quasi-peak method.

4.3 Test Setup



For the actual test configuration, please refer to the related item-Photographs of the Test Configuration.

4.4 EUT Setup and Operating Conditions

The EUT configuration of the emission tests was MS + Battery + Charger.

Before the measurement, the lithium battery was completely discharge.

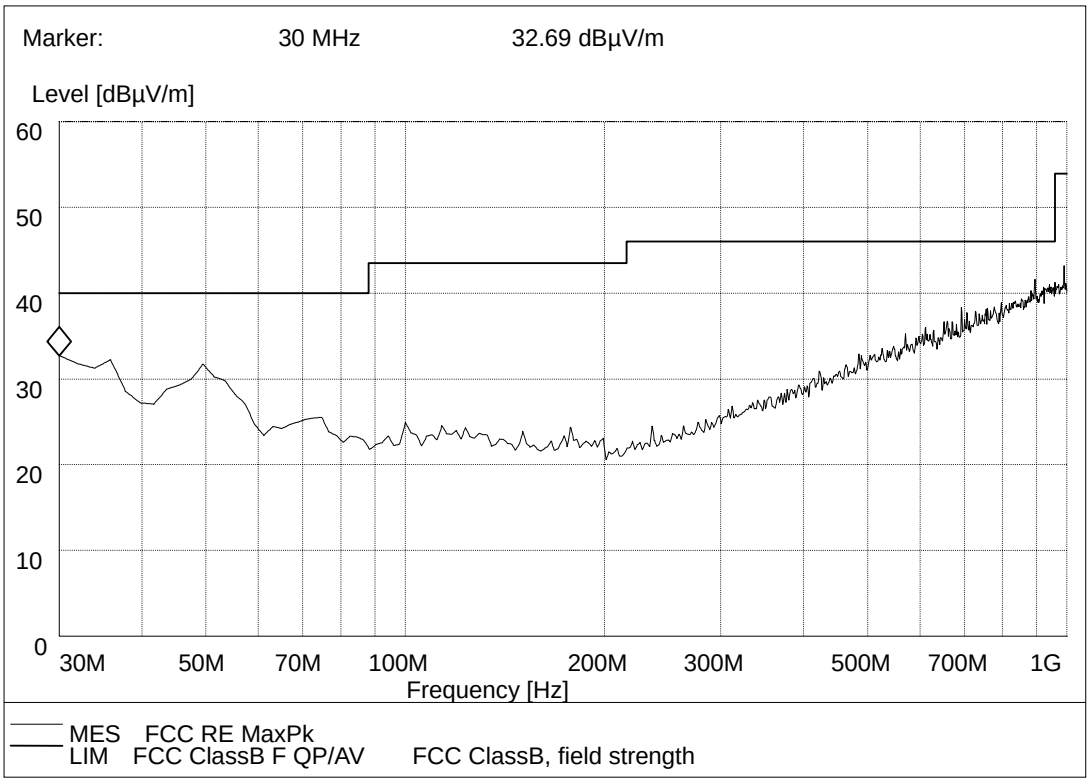
During the measurement, the lithium battery and the charger were installed, and the MS were in charging state. A communication link was established between the MS and a System Simulator (SS). The MS operates at PCS 1900MHz mid ARFCN (661) and maximum output power (level 0).

The charger was powered by 120V 60Hz AC mains supply.

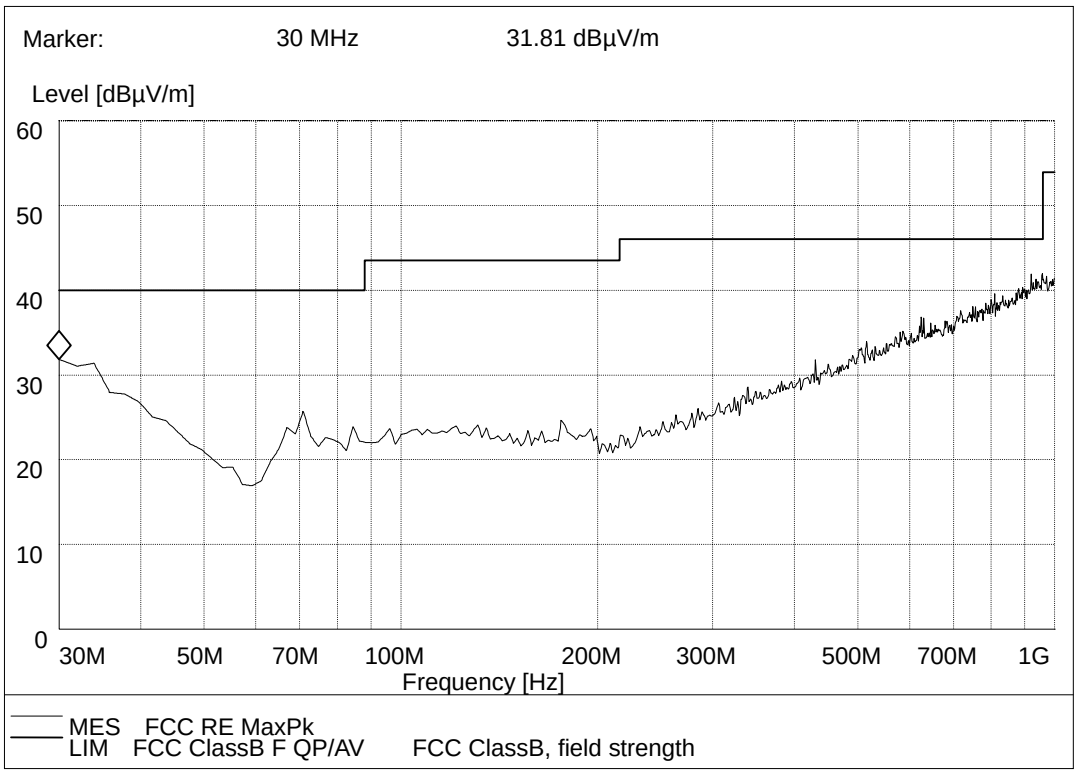
4.5 Test Results

No.	Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	QP Limits (dBμV)	Emission Level (dBμV)
1	31.00	Vertical	100	200	40	27.03
2	36.28	Vertical	100	210	40	26.90
3	48.60	Vertical	100	200	40	28.50
4	52.08	Vertical	100	60	40	27.39
5	66.92	Horizontal	260	0	40	23.57
6	69.20	Horizontal	270	10	40	23.05

1. Radiation disturbances, maxpeak detector, antenna polarization: Vertical



2. Radiation disturbances, maxpeak detector, antenna polarization: Horizontal



5 Equivalent Isotropically Radiated Power (EIRP) Test

5.1 Limits of EIRP

According to FCC §24.232, the broadband PCS mobile stations are limited to 2 watts EIRP peak power.

5.2 Test Procedure

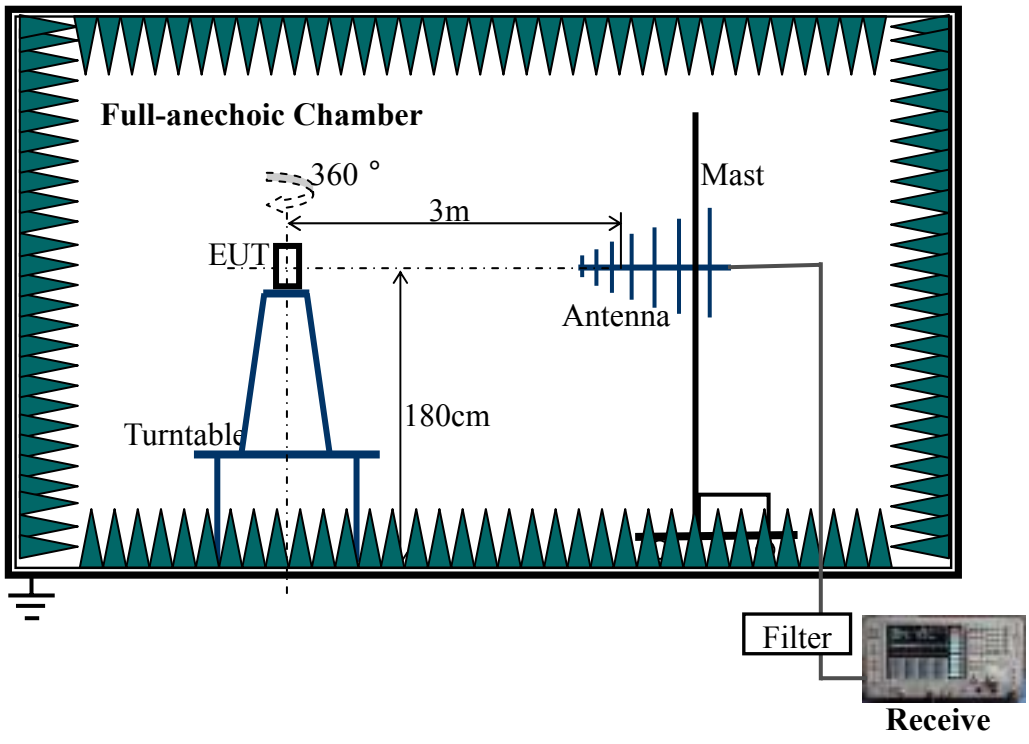
a. The radiated power measurement was performed in a full anechoic chamber. The air lost of the site and the factors of the test system is pre-calibrated using substitution method.

b. The EUT was placed on the vertical axis of a turntable 1.8 meters above the ground. The table was turned from 0 degrees to 360 degrees to find the maximum reading.

c. In the frequency range 30 MHz to 3 GHz, ultra-broadband bi-log antenna was used. In the frequency range above 3 GHz, horn antenna was used. The antenna was at the same height as the EUT. Since the there was no reflection from the chamber floor and the site was pre-calibrated, the antenna height need not to be changed as the open site method. The measurement was performed with the antenna at horizontal and vertical polarization respectively.

d. The test receiver was set to Maxpeak Detector function and Maximum Hold mode. The IF bandwidth and video bandwidth was both set to 1MHz.

5.3 Test Setup



For the actual test configuration, please refer to the related item-Photographs of the Test Configuration.

5.4 EUT Setup and Operating Conditions

The EUT configuration of the emission tests was MS + Battery.

The EUT was in stand-up position.

A communication link was established between the MS and a System Simulator (SS). The MS operates at the maximum output power (level 0). The PCS 1900 channel No.512 (low), 661 (mid), and 810 (high) was measured respectively.

5.5 Test Results

No.	PCS 1900 Channel No.	Frequency (MHz)	Antenna Polarization	EIRP (dBm)	Limit (dBm)
1	512	1850.20	Vertical	24.82	33
2			Horizontal	18.48	33
3	661	1880.00	Vertical	25.88	33
4			Horizontal	19.25	33
5	810	1909.80	Vertical	25.28	33
6			Horizontal	17.74	33

6 Spurious Radiation Test

6.1 Limits of Spurious Radiation

According to FCC §24.238, on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. For a mobile station with a rated transmitter power of 1W, the limit is -13 dBm.

6.2 Test Procedure

a. The radiated power measurement was performed in a full anechoic chamber. The air lost of the site and the factors of the test system is pre-calibrated using substitution method.

b. The EUT was placed on the vertical axis of a turntable 1.8 meters above the ground. The table was turned from 0 degrees to 360 degrees to find the maximum reading.

c. In the frequency range 30 MHz to 3 GHz, ultra-broadband bi-log antenna was used. In the frequency range above 3 GHz, horn antenna was used. The antenna was at the same height as the EUT. Since the there was no reflection from the chamber floor and the site was pre-calibrated, the antenna height need not to be changed as the open site method. The measurement was performed with the antenna at horizontal and vertical polarization respectively.

d. The test receiver was set to Maxpeak Detector function and Maximum Hold mode. Measuring frequencies are from 30 MHz to 10th harmonic of the fundamental frequency.

6.3 Test Setup

Same as 5.3

6.4 EUT Setup and Operating Conditions

The EUT configuration of the emission tests was MS + Battery.

The EUT was tested in stand-up and lie-on position respectively.

A communication link was established between the MS and a System Simulator (SS). The MS operates at the maximum output power (level 0). The PCS 1900 channel No.512 (low), 661 (mid), and 810 (high) was measured respectively.

6.5 Test Results

No.	Frequency (MHz)	EIRP (dBm) V – E1	EIRP (dBm) V – E2	EIRP (dBm) H – E1	EIRP (dBm) H – E2	Limit (dBm)
PCS 1900 Channel No. 512 (1850.20 MHz)						
1	3700.40	-43.47	-46.71	-42.93	-47.68	-13
2	5550.60	-43.21	-45.72	-45.51	--	-13
3	7400.80	--	--	--	--	-13
4	9251.00	--	--	--	--	-13
5	11101.20	--	--	--	--	-13
6	12951.40	--	--	--	--	-13
7	14801.60	--	--	--	--	-13
8	16651.80	--	--	--	--	-13
9	18502.00	--	--	--	--	-13
PCS 1900 Channel No. 661 (1880.00 MHz)						
10	3760.00	-41.70	-45.38	-35.31	-47.83	-13
11	5640.00	-45.73	-46.20	-47.21	--	-13
12	7520.00	--	--	--	--	-13
13	9400.00	--	--	--	--	-13
14	11280.00	--	--	--	--	-13
15	13160.00	--	--	--	--	-13
16	15040.00	--	--	--	--	-13
17	16920.00	--	--	--	--	-13
18	18800.00	--	--	--	--	-13
PCS 1900 Channel No. 810 (1909.80 MHz)						
19	3819.60	-38.11	-40.78	-33.34	-42.05	-13
20	5729.40	-43.07	-43.29	-44.91	-45.37	-13
21	7639.20	--	--	--	--	-13
22	9549.00	--	--	--	--	-13
23	11458.80	--	--	--	--	-13
24	13368.60	--	--	--	--	-13
25	15278.40	--	--	--	--	-13
26	17188.20	--	--	--	--	-13
27	19098.00	--	--	--	--	-13

NOTE:

1. V and H are the antenna polarizations: Vertical and Horizontal. E1 and E2 mean the EUT positions: stand-up and lie-on.
2. The spurious radiations from 30 MHz to 10th harmonic of the fundamental frequency are researched. Only the harmonics are record in the table above because the spurious radiations from other frequencies are even lower and are at least 20 dB below the limit.
3. "--" in the table above means that the emissions are too small to be measured and are at least 20 dB below the limit.

7 Frequency Stability Test

7.1 Requirement of Frequency Stability

According to FCC §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

The frequency stability of the transmitter shall be maintained within±0.1ppm.

According to FCC §2.1055, the test conditions are:

- **Temperature**: The temperature is varied from -30ºC to +50ºC at intervals of not more than 10ºC.
- **Primary Supply Voltage**: For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

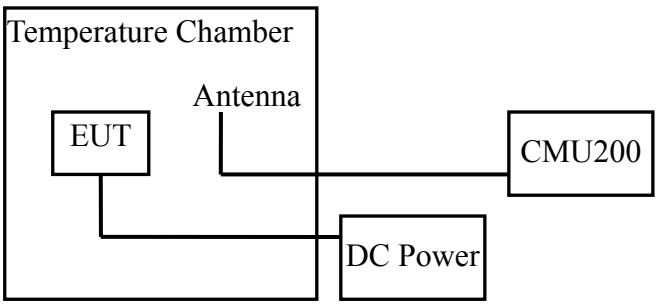
7.2 Test Procedure

a. The temperature was varied from -30ºC to +50ºC at intervals of 10ºC. At each temperature level, the EUT was powered off and put in the temperature chamber for 2 hour.

b. After sufficient stabilization, the EUT was turned on and a communication link was established. The frequency was measured within three minutes.

c. For extreme supply voltage measurement, the EUT was tested at room temperature.

7.3 Test Setup



7.4 EUT Setup and Operating Conditions

The EUT configuration of the emission tests was MS + DC power supply.

A communication link was established between the MS and a System Simulator (SS). The MS operates at the maximum output power (level 0). The PCS 1900 channel No.512 (low), 661 (mid), and 810 (high) was measured respectively.

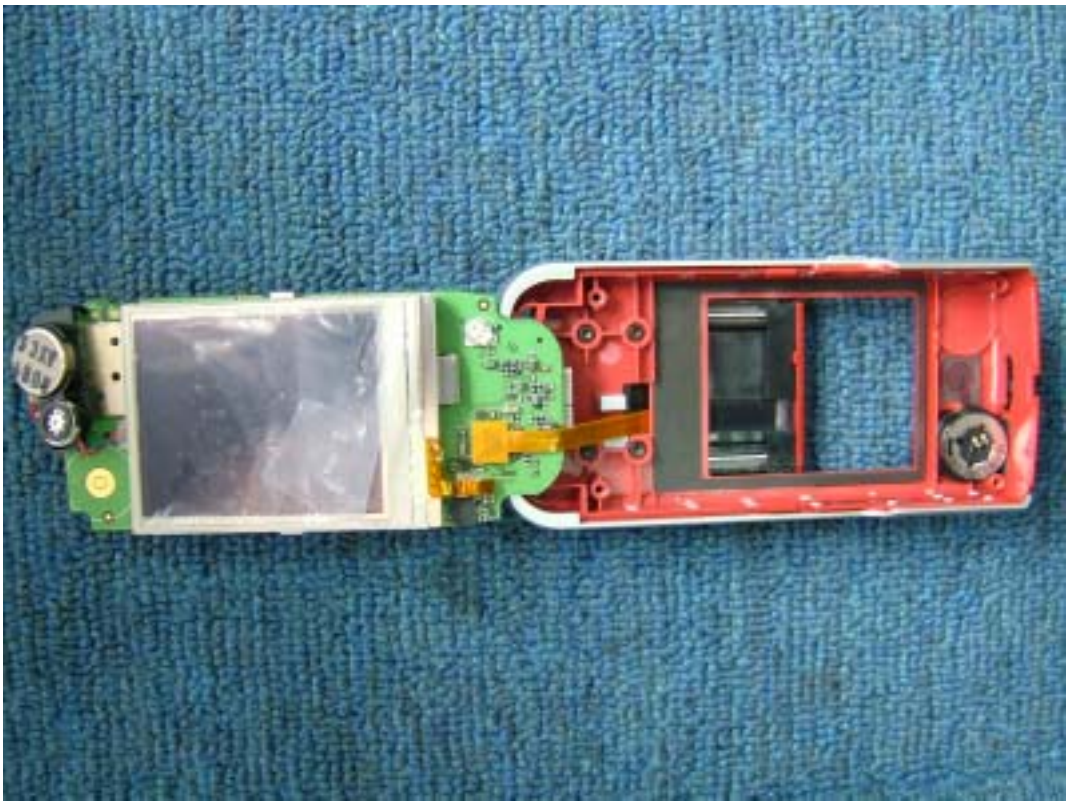
7.5 Test Results

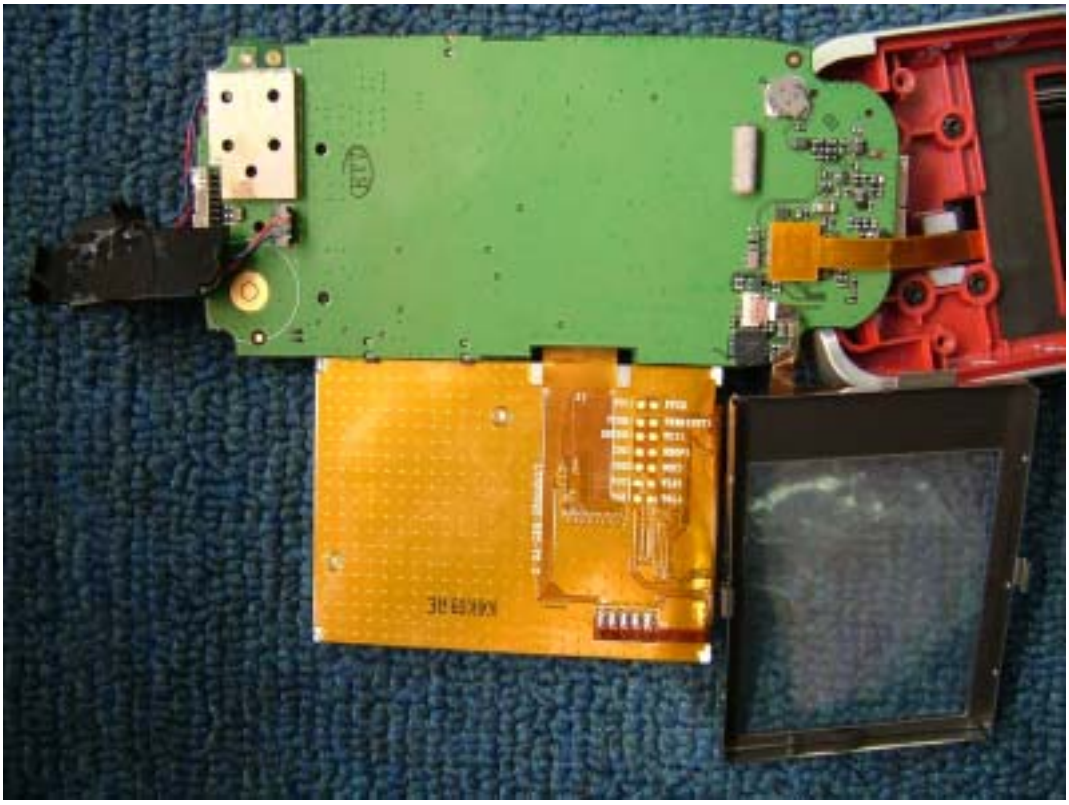
No.	Test Conditions		Frequency Deviation (Hz)			
	Volatage	Temperature (ºC)	512CH	661CH	810CH	Limit (±0.1ppm)
1	3.7V (V_{nom})	-30	65	42	-20	512CH, ±185Hz 661CH, ±188Hz 810CH, ±191Hz
2		-20	68	27	26	
3		-10	36	38	35	
4		0	-28	10	33	
5		+10	34	19	24	
6		+20	-52	21	36	
7		+30	-45	-12	17	
8		+40	-13	16	41	
9		+50	-20	-41	37	
10	4.2V (V_{max})	+22	-40	32	30	
11	3.6V (V_{min})	+22	-22	37	32	

Appendix I：Photographs of the EUT

1. Appearance of the MS

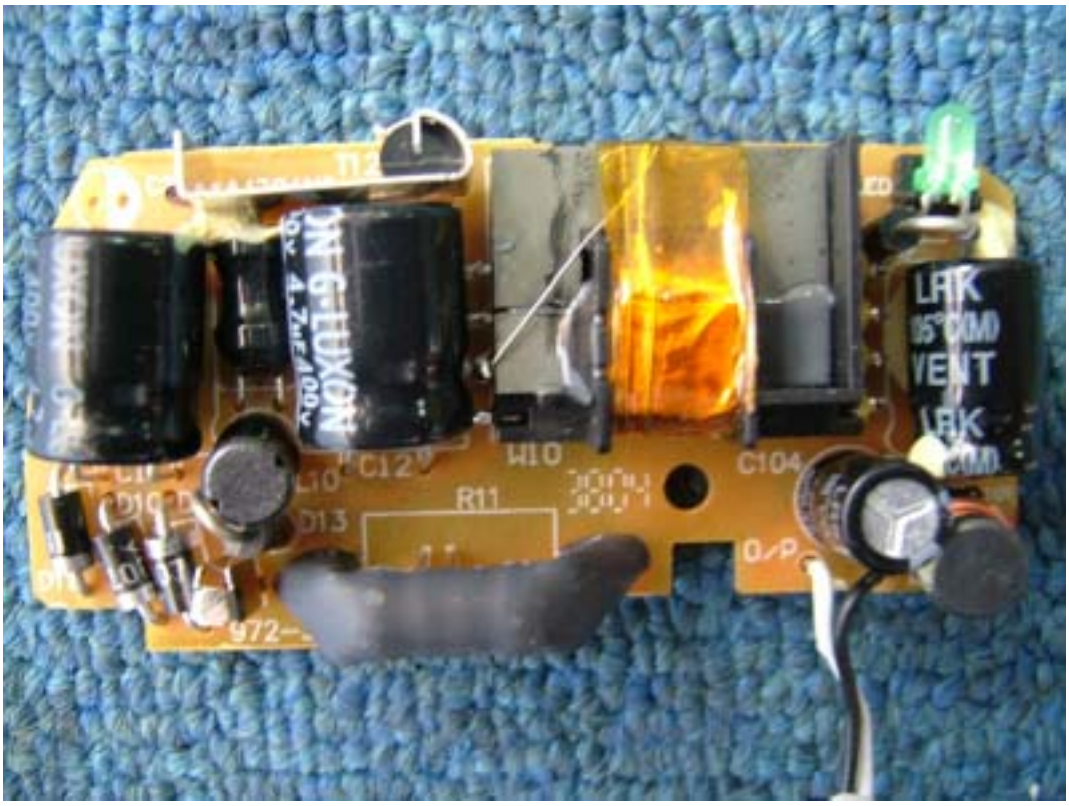
2. Inside of the MS

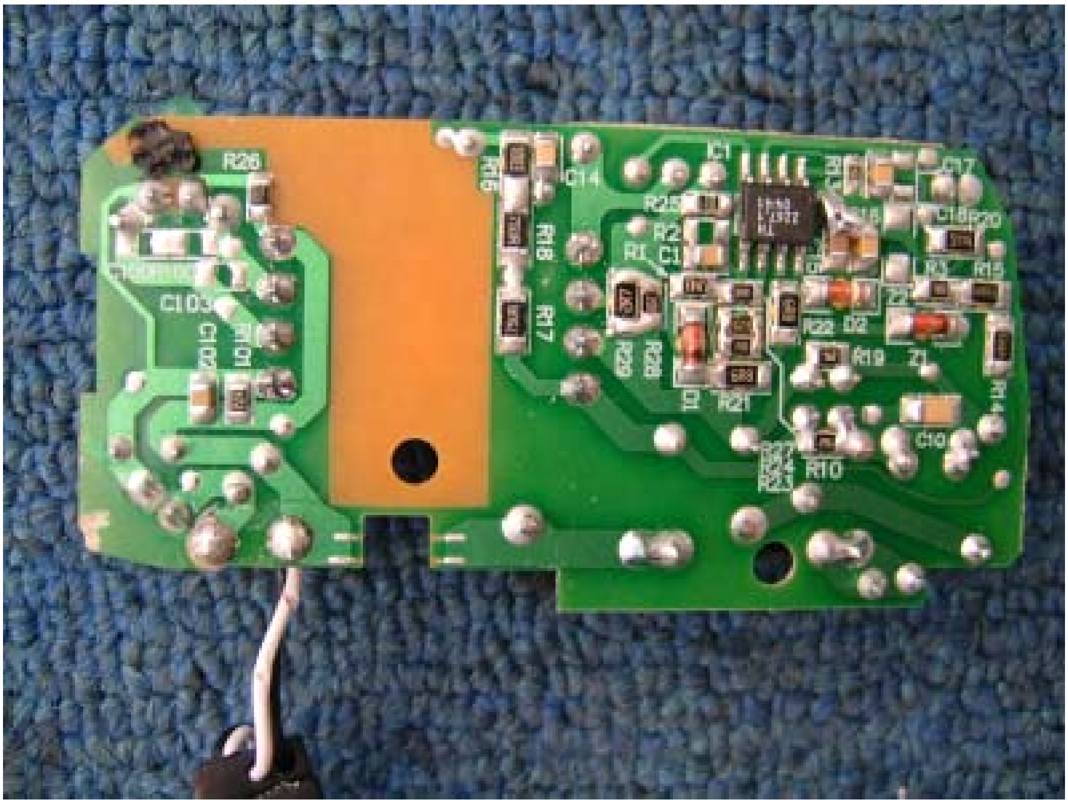




3. Appearance of the Charger

4. Inside of the Charger

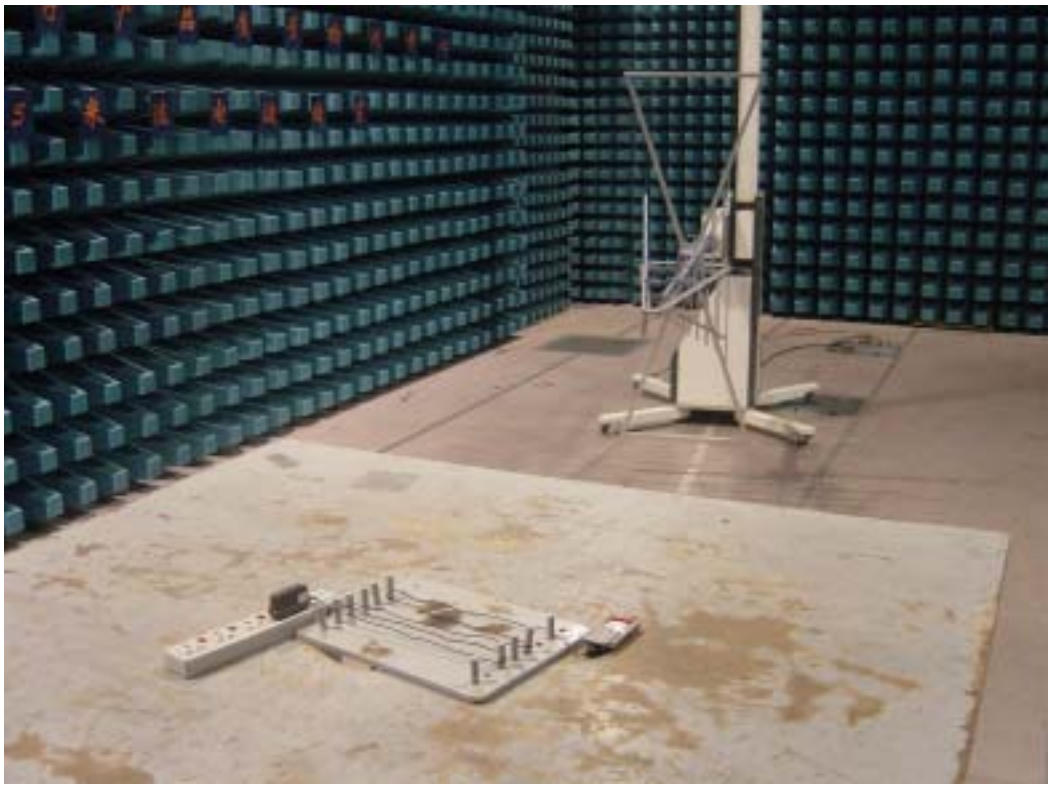



R26
C103
C14
R18
R17
IC1
R25
R2
R1
C1
C17
R3
R15
R22
D2
R19
Z1
R21
D1
R10
C10

Appendix II：Photographs of the Test Configuration

1. Conducted Emission Measurement

2. Radiated Emission Measurement



3. EIRP and Spurious Radiation Measurement