Report No: CSBG (R) 12012005EB
FCC ID: QISC218-800

FCC TEST REPORT OF 800MHz CDMA Handset

M/N: C218

Apr.20, 2005

Reliability Laboratory of Huawei Technologies Co., Ltd.

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REPORT ON	FCC Test of 800MHz CDMA Handset M/N: C218 Report No: CSBG (R) 12012005EB Mar. 30, 2005
REGULATION	**FCC CFR47 Part 2: Subpart J;** **FCC CFR47 Part 22: Subpart H;** **FCC CFR47 Part 15: Subpart B;**
CONCLUSION	There are 8 items need to be tested, 9 items have been tested. The sample of the model completely meets the requirements

Final Judgement: Pass

General Manager	**2004.12.16**	**Tang Shuanli**	
	Date	Name	signature
Technical Responsibility For Area of Testing	**2004.12.15**	**Zhang Xinghai**	
	Date	Name	signature
Test Lab Engineer	**2004.12.13**	**Deng Jiang**	
	Date	Name	signature

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1 Summary

The table below summarizes the measurements and results for the Huawei CDMA Handset. Detailed results and descriptions are shown in the following pages.

FCC Measurement Specification	FCC Limits Part(s)	Description	Result
2.1046	22.913	Effective radiated power limits	PASS
2.1047	22.901	Modulation Characteristics	PASS
2.1049		Occupied Bandwidth	PASS
2.1051	22.917(e)	Spurious Emission at Antenna Terminals	PASS
2.1053	22.917(e)	Field Strength of Spurious Emissions	PASS
2.1055	22.355	Frequency Stability	PASS
-	15.107	Conducted Emission at Power Port	PASS
-	15.109	Radiated Emission in Idle Mode	PASS

2 Product Description

HUAWEI CDMA Handset C218 is subscriber equipment in the CDMA system. The frequency band is Band Class 0 (cellular band). C218 implements such functions as RF signal receiving / Transmitting, CDMA protocol processing, voice and SMS service etc. C218 uses MSM6000 chipset and Zero-IF technologies.

3 Test Site Description

The test site of:

Huawei Technologies Co. Ltd.
P.O. Box 518129
Huawei base, bantian,
Longgang District, Shenzhen, China

The test site description has been submitted to FCC and registration granted under the registration number **97456** on March 11. 2003. The test site has been accredited by and the accredited number is **2714.01** in Jan of 2004.

3.1 Testing Period

The test have been performed during the period of

Mar. 15, 2005 to Apr. 15, 2005

3.2 General Set up Description

Huawei CDMA handset C218 can only support CDMA mode and Band Class 0(Cellular Band). During this measurement, the handset just works in CDMA mode and band class 0.

4 Product Description

4.1 Technical Characteristics

4.1.1 Frequency Range

Uplink band	824 to 849 MHz
Downlink band	869 to 894 MHz

4.1.2 Channel Spacing / Separation

Channel spacing:	30KHz
Channel separation	1.23MHz

4.1.3 Type of Emission

Emission Designation:	**1M25F9W**

According to CFR 47 (FCC) part 2, subpart C, section 2.201 and 2.202

4.1.4 Environmental Requirements

Minimum temperature:	- 10 °C
Maximum temperature:	+ 55 °C
Relative Humidity:	5％～95％RH

4.1.5 Power Source

DC voltage nominal:	3.7VDC
DC voltage range	3.3V ~ 4.2VDC
DC current maximal:	600mA

4.1.6 Tune-up Procedure

According to CFR (FCC) part 2, subpart 2, section 2.1033 (9)

Please reference the document Tune-up Procedure in TCF

4.1.7 Applied DC Voltages and Currents

According to CFR (FCC) part 2, subpart 2, section 2.1033 (8)

The voltage and current in the final RF stage is:

Voltage: 3.7VDC
Current: 600mA According to CFR (FCC) part 2, subpart 2, section 2.1033 (8)

4.2 EUT Identification List

4.2.1 Board Information

800MHz CDMA Handset
C218

Board and Module		
Equipment Designation / Description	Serial Number	Remarks
-Main board	053G061	
-LCD	0506	
-Battery	HGY532300963	

4.2.2 Adapter Technical Data

Adapter 1:

AC/DCAdapter Model:	MU03-M050040-A1
Manufacturer:	TECH-POWER INTERNATIONAL CO,. LTD
Input Voltage:	100-240V ~50/60Hz
Output Voltage:	⎓ 5.0V
Rated Power:	2W

Adapter 2:

AC/DCAdapter Model:	TPCA-050040E
Manufacturer:	LEADER ELECTRONICS INC.
Input Voltage:	100-240V ~50/60Hz
Output Voltage:	⎓ 5.0V
Rated Power:	2W

4.2.3 Battery Technical Data

Type:	Rechargeable Li-ion Battery
Manufacturer:	Harbin Coslight Power Co.,Ltd.
Battery Model:	HBC218
Rated capacity:	720mAH
Nominal Voltage:	⎓ 3.7V
Charging Voltage:	⎓ 4.2V

4.2.4 FCC Identification

Grantee Code: **QIS**

FCC Identification: **QISC218-800**

5 Transmitter Measurements

5.1 Effective Radiated Power (Maximum Channel Power)

5.1.1 Test Conditions

Preconditioning:	1 hour
Ambient temperature:	24.5℃
Relative humidity:	57%

5.1.2 Test Specifications and Limits

5.1.2.1 Specification

CFR 47 (FCC) part 2.1046 and part 22.913

5.1.2.2 Supporting Standards:

EIA/TIA-603-A: 1992	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
EIA/TIA-102-CAAA:1999	Digital C4FM/CQPSK Transceiver Measurement Methods (ANSI/TIA/EIA-102.CAAA-1999)
3GPP2 C.S0011-A	Recommended Minimum Performance Standards for cdma2000 Spectrum Mobile Standards. Release A

5.1.2.3 Limits

Compliance with 22.913 requires in no any case may the peak power of a Mobile Station transmitter exceed 7 W. And calculate longitude ERP by following formula：ERP(dBm)= 10*log ($ERP_{in\ watts}$).

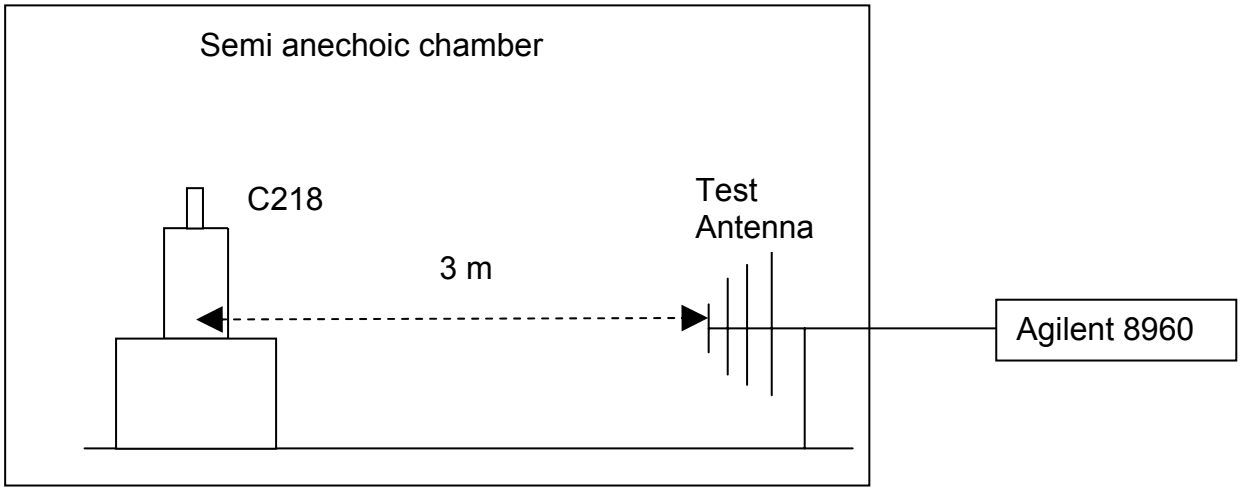
Max. Effective Radiated Power(Watts)	< 7 Watts
Max. Effective Radiated Power(dBm)	< 38.5 dBm

5.1.3 Test Method and Setup

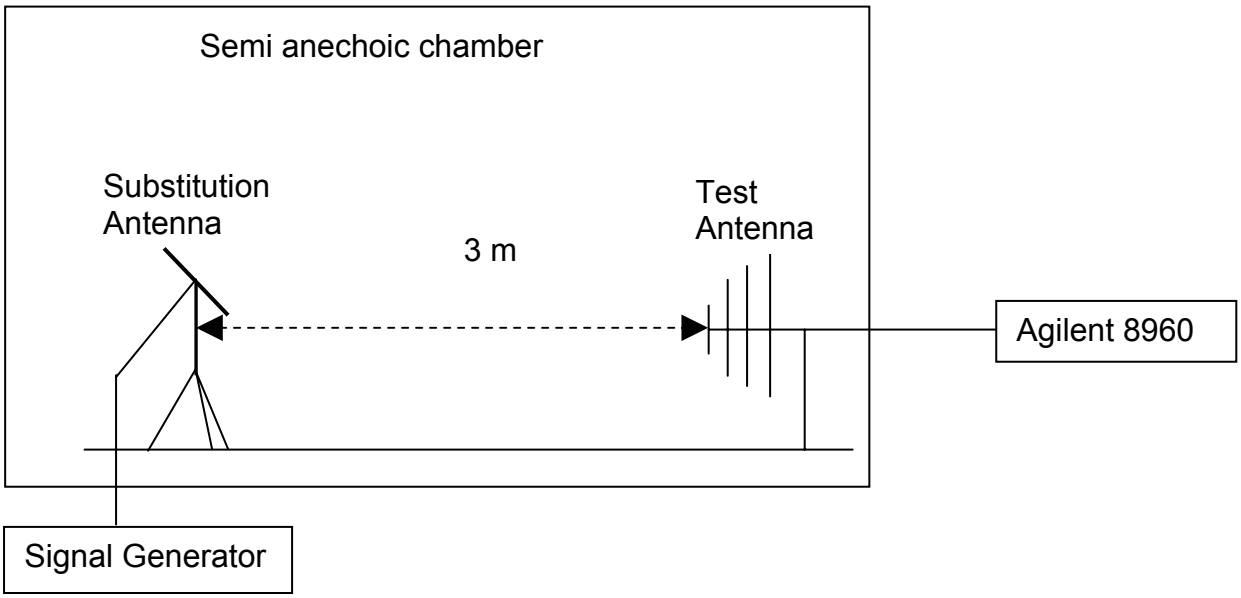
(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, E.R.P. shall be measured when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in 2.1033(c)(9). Connect the handset to the wireless communication tester Agilent 8960 via the air interface. The band class is set as US Cellular.
(b) Test the Radiated maximum output power by the Agilent 8960 received from test antenna.
(c) Use substitution method to verify the Maximum output power. The EUT is substituted by a dipole antenna. The dipole is connected to a signal generator. And then adjust the output level of the signal generator to get the same received power recorded in step (b) on Agilent 8960, and record the power level of Signal Generator. Of course, the cable loss at the test frequency should be compensated.

Test setup

Step 1: find the maximum E.R.P.



Step 2: substitution method



5.1.4 Measurement Results

TEST CONDITIONS		Effective Radiated Power					
		Channel1023 825MHz		Channel283 833.49Mhz		Channel777 848.31MHz	
		dBm		dBm		dBm	
		Measured	**Limit**	**Measured**	**Limit**	**Measured**	**Limit**
T_{nom} (25 °C)	V_{nom} (3.7 V)	**25.16**	**< 38.5**	**25.46**	**< 38.5**	**23.66**	**< 38.5**
Substitution Result		**24.69**	**---**	**25.01**	**---**	**23.12**	**---**
Measurement uncertainty (dB)		Equipment			Requirement		
		5 dB			N/A		

5.1.4.1 Conclusion

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix A with 4 pages.

5.1.4.2 Equipment List

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until (MM.DD.YYYY)
Wireless communications test set	Agilent	8960	GB43042699	03.10.2006
BiLog Antenna	Schaffner	CBL 6112B	2747	10.15.2005
Cable	Huber&Suhner	RG58U	N/A	Before test
Dipole	Schwarzbeck	D69250-VHAD	979	08.10.2005
Signal Generator	R&S	SMR 40	100325	12.09.2005

5.2 Modulation Characteristics

5.2.1 Test Conditions

Preconditioning:	1 hour
Maximum Specified Transmitter Power:	26dBm
Measured at:	Antenna connector
Ambient temperature:	24 °C
Relative humidity:	57 %

5.2.2 Test Specifications and Limits

5.2.2.1 Specification

CFR 47 (FCC) part 2.1047 and part 22.917

5.2.2.2 Supporting Standards:

EIA/TIA-603-A: 1992	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
EIA/TIA-102-CAAA:1999	Digital C4FM/CQPSK Transceiver Measurement Methods (ANSI/TIA/EIA-102.CAAA-1999)
3GPP2 C.S0011-A	Recommended Minimum Performance Standards for cdma2000 Spectrum Mobile Standards. Release A

5.2.2.3 Limits

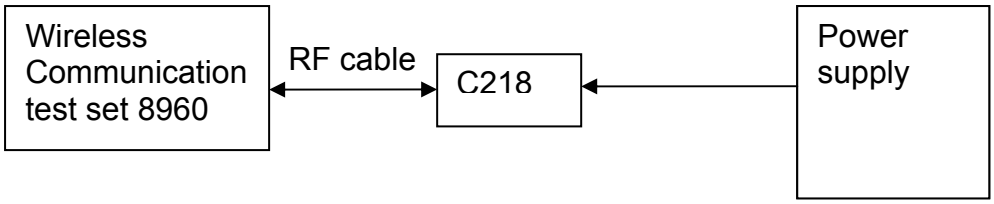
Compliance with 22.915 requires not a specific modulation characteristic since the EUT is applied for 22.901(d)

Limits	Not applicable

5.2.3 Test Method and Setup

Connect the Handset to the wireless communication test set Agilent 8960 via the RF connector. The band class is set as US Cellular. Test the Waveform Quality ρ of the handset by the Agilent 8960.

Test setup



5.2.4 Measurement Results

TEST CONDITIONS		Rho(RC1/1)					
		Channel1023 825MHz		Channel283 833.49Mhz		Channel777 848.31MHz	
		N/A		N/A		N/A	
		Measured	**Limit**	**Measured**	**Limit**	**Measured**	**Limit**
T_{nom} (25 °C)	V_{nom}(3.7)	**0.9930**	**0.9440**	**0.9916**	**0.9440**	**0.9909**	**0.9440**
Measurement uncertainty		Equipment			Requirement		
		0.001			N/A		

TEST CONDITIONS		Rho(RC3/3)					
		Channel1023 825MHz		Channel283 833.49Mhz		Channel777 848.31MHz	
		N/A		N/A		N/A	
		Measured	**Limit**	**Measured**	**Limit**	**Measured**	**Limit**
T_{nom} (25 °C)	V_{nom}(3.7)	**0.9926**	**0.9440**	**0.9944**	**0.9440**	**0.9925**	**0.9440**
Measurement uncertainty		Equipment			Requirement		
		0.001			N/A		

5.2.4.1 Conclusion

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix B with 9 pages.

5.2.4.2 Equipment List

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Wireless communications test set	Agilent	8960	GB43042699	03.10.2006
Cable	Huber&Suhner	RG58U	N/A	Before test

5.3 Occupied Bandwidth

5.3.1 Test Conditions

Preconditioning:	1 hour
Measured at:	RF connector
Ambient temperature:	25 °C
Relative humidity:	55 %

5.3.2 Test Specifications and Limits

5.3.2.1 Specification

CFR 47 (FCC) part 2.1049 and part 22.917

5.3.2.2 Supporting Standards:

EIA/TIA-603-A: 1992	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
EIA/TIA-102-CAAA: 1999	Digital C4FM/CQPSK Transceiver Measurement Methods (ANSI/TIA/EIA-102.CAAA-1999)
3GPP2 C.S0011-A:	Recommended Minimum Performance Standards for cdma2000 Spectrum Mobile Standards. Release A

5.3.2.3 Limits

Compliance with 2.1049 requires not a specific occupied bandwidth since the EUT is applied for part 22 subpart H and possesses a digital modulation there is no specific requirement formulated in before mentioned rules the 99% rules applies.

Upper /lower frequency limits	0.5% of the mean power

5.3.3 Test Method and Setup

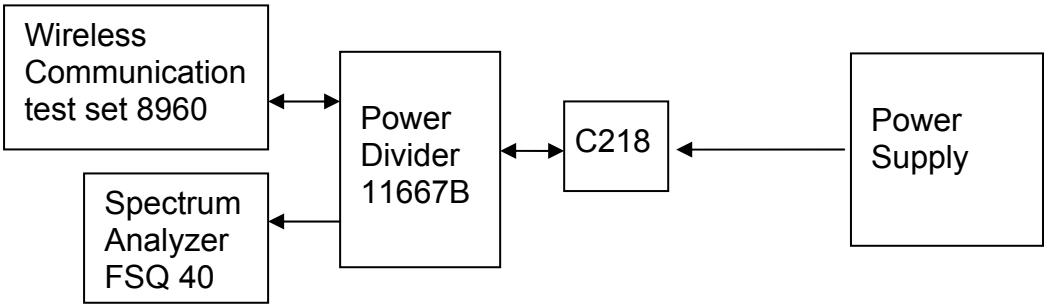
The OBW, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(g) Transmitter in which the modulating base band comprises not more than three independent channels - when modulated by the full complement of signals for which the transmitter is rated. The level of modulation for each channel should be set to that prescribed in rule parts applicable to the services for which the transmitter is intended. If specific modulation levels are not set forth in the rules, the tests should provide the manufacturer's maximum rated condition.
(h) Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudorandom generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at discretion of the user.

Measurement bandwidth (RBW): 30 kHz (Resolution bandwidth)
Video bandwidth (VBW): 300 kHz

Test Set-up

Connect the handset to the wireless communication test set Agilent 8960 and the Spectrum Analyzer FSQ 40 via the divider.



5.3.4 Measurement Results

TEST CONDITIONS		Occupied Bandwidth					
		Channel1023		Channel283		Channel777	
		825MHz		833.49MHz		848.31MHz	
		Measured (MHz)	Limit (MHz)	Measured (MHz)	Limit (MHz)	Measured (MHz)	Limit (MHz)
T_{nom} (25 °C)	V_{nom} (3.7 V)	1.2725	1.48	1.2620	1.48	1.2625	1.48

Measurement uncertainty (dB)	Equipment	Requirement
	0.2%	N/A

5.3.4.1 Conclusion

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix C with 4 pages.

5.3.4.2 Equipment List

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Wireless communications test set	Agilent	8960	GB43042699	03.10.2006
Spectrum Analyzer	R&S	FSQ 40	100025	01.02.2006
Cable	Huber&Suhner	RG58U	N/A	Before test
Power Divider	HP	11667B	11674	Before test

5.4 Spurious Emission at Antenna Terminal

5.4.1 Test Conditions

Preconditioning:	1 hour
Measured at:	Antenna connector
Ambient temperature:	23.5°C
Relative humidity:	55 %

5.4.2 Test Specifications and Limits

5.4.2.1 Specification

CFR 47 (FCC) part 2.1051 and part 22.917(e)

5.4.2.2 Supporting Standards:

EIA/TIA-603-A: 1992	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
EIA/TIA-102-CAAA:1999	Digital C4FM/CQPSK Transceiver Measurement Methods (ANSI/TIA/EIA-102.CAAA-1999)
3GPP2 C.S0011-A	Recommended Minimum Performance Standards for cdma2000 Spectrum Mobile Standards. Release A

5.4.2.3 Limits

Compliance with 22.917 requires that all spurious emission must be attenuated below the transmitter power by at least 43 +10 $\log_{10}$ P. (Whereas P is the rated power of the EUT).

Rated Power:	26 dBm
Required attenuation:	43+10log (0.4) = 39 , 26 dBm – 39 dB
Absolute level	- 13 dBm

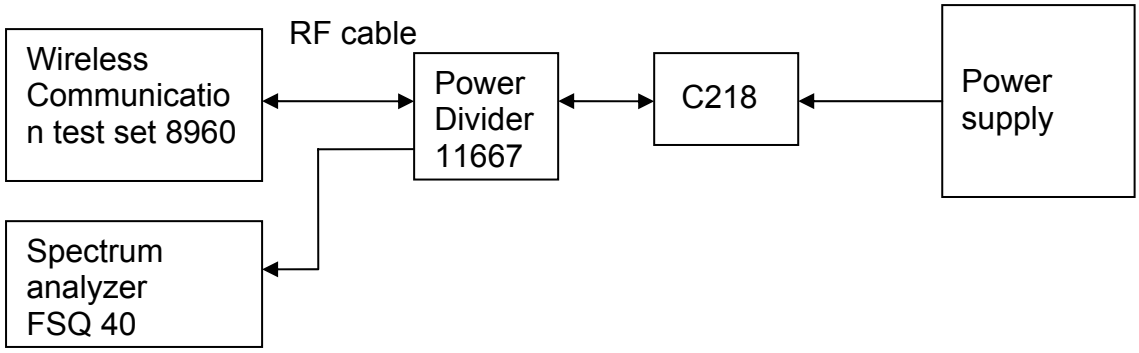
5.4.3 Test Method and Setup

The wireless communication tester Agilent 8960 controls the HUAWEI CDMA handset C218. Every antenna port is connected to an artificial 50-Ohm load. The Handset operates two channels at a time.

Measurement bandwidth (RBW) for up to 150kz adjacent to carrier: 1 kHz;
Measurement bandwidth (RBW) for 150kz up to 30 MHz: 10 kHz;
Measurement bandwidth (RBW) for 30MHz up to 1 GHz: 100 kHz;
Measurement bandwidth (RBW) for all others frequencies above 1GHz: 1MHz

Test Set-up

Connect the handset to the wireless communication test set Agilent 8960 and the Spectrum Analyzer FSQ 40 via a power divider. The C218's output is matched with 50 Ω load.



5.4.4 Measurement Results at Block Edges

Channel Number	Frequency of Band edge [MHz]	Power [dBm]	Spurious Level measured [dBm]	FCC limit	Result
1023	825.0	26	<-13(See appendix D)	- 13 dBm	Pass
777	848.31	26	<-13(See appendix D)	- 13 dBm	Pass

5.4.5 Measurement Results outside Band Edges

Channel Number	Test Range (Frequency)	Power [dBm]	Spurious Level measured [dBm]	FCC limit	Result
1023	9 kHz ~12.75GHz	26	<- 13 dBm (See appendix D)	- 13 dBm	Pass
283	9 kHz	26	<- 13 dBm	- 13 dBm	Pass

	~12.75GHz		(See appendix D)		
777	9 kHz ~12.75GHz	26	<- 13 dBm (See appendix D)	- 13 dBm	Pass

5.4.5.1 Conclusion

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix D with 15 pages.

5.4.5.2 Equipment List

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Spectrum analyzer	R&S	FSQ 40	100025	01.02.2006
Wireless communication test set	Agilent	8960	GB43042699	2005.03.10
Power Divider	Agilent	11667B	N/A	Before test
Cable	Huber&Suhner	RG58U	N/A	Before test
Power Divider	HP	11667B	11674	Before test

5.5 Field Strength of Spurious Radiation

5.5.1 Test Conditions

Preconditioning:	0.5 hour
Nominal Output Power:	26 dBm
Ambient temperature:	23 °C
Relative humidity:	51 %

5.5.2 Test Specifications and Limits

5.5.2.1 Specification

CFR 47 (FCC) part 2.1053 and part 22.917(e)

5.5.2.2 Supporting Standards:

EIA/TIA-603-A: 1992	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
EIA/TIA-102-CAAA:1999	Digital C4FM/CQPSK Transceiver Measurement Methods (ANSI/TIA/EIA-102.CAAA-1999)
EIA/TIA -95B-1999	Mobile Station-Base Station Compatibility Standard for Wideband Spread Spectrum Cellular Systems (ANSI/TIA/EIA-95-B-99)
EIA/TIA-98D-2001	Recommended Minimum Performance Standard for Mobile Stations Supporting Dual-Mode Spread Spectrum Cellular Mobile Stations

5.5.2.3 Limits

Compliance with 22.917 requires that all spurious emission must be attenuated below the transmitter power by at least 43 +10 $\log_{10}$ P. (Whereas P is the rated power of the EUT).

Rated Power:	26 dBm (0.4W)
Required attenuation:	43 +10 $\log_{10}$ (0.4W) = 39 dB
Absolute level	26 dBm – 39 dB= - 13 dBm

5.5.3 Test Method and Setup

(a) Measurements were made to detect spurious emissions radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data were supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph 2.1049(c) as appropriate. For equipment operating on frequencies below 890 MHz, an Open Field Test is normally required with the measuring instrument antenna located in the far field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurement will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections, which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with the reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.
(b) Measurements specified in paragraph (a) of this section shall be made for the following equipment:
(1) Those in which the spurious emission are required to be 60 dB or more below the mean power of the transmitter.
(2) All equipment operating on frequencies higher than 25 MHz
(3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.
(4) Other types of equipment as required, when deemed necessary by the Commission.

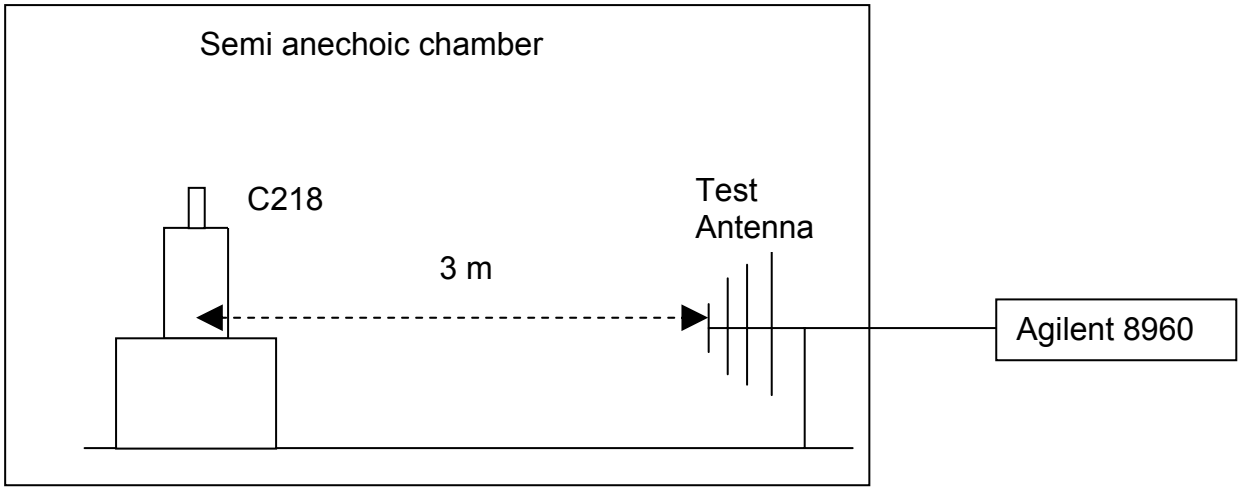
HUAWEI CDMA Handset C218 is equipment with integral antenna. And it should test according to part (b) of above section.
BTS simulator is connected to a communication antenna. The BTS simulator controls the CDMA Handset to transmitter the maximum power which defined in specification of product. The Handset operates on a typical channel.

The test procedure is the same as in 5.1.3

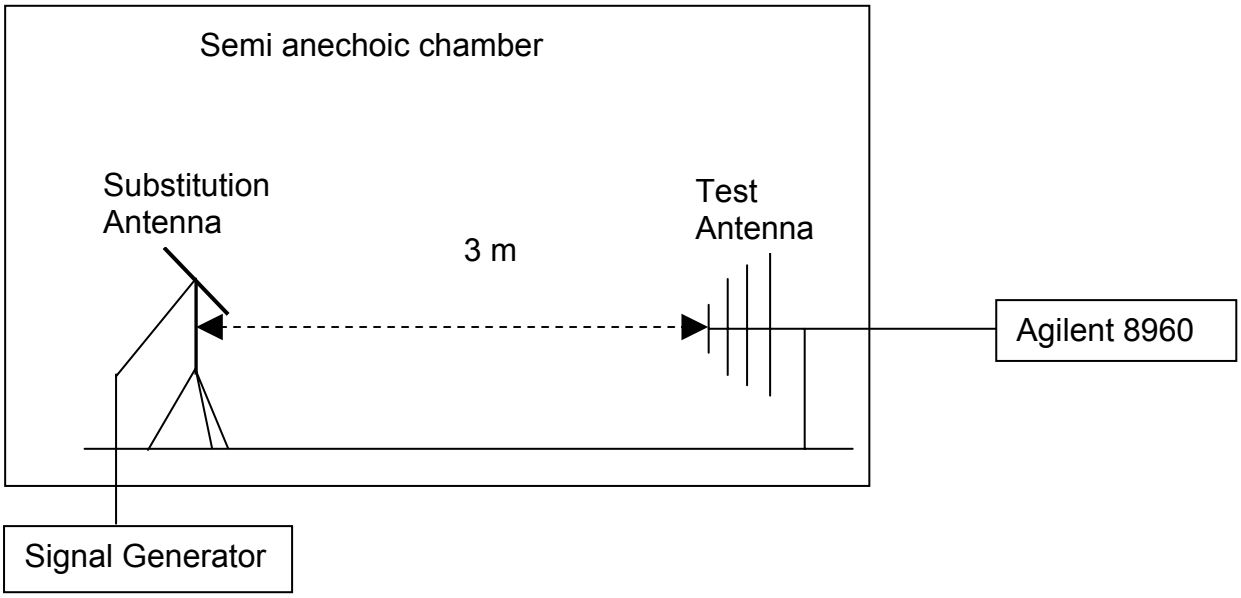
Measurement bandwidth: 9 kHz – 150 kHz: 1 kHz
Measurement bandwidth: 150 kHz – 30 MHz: 9 kHz
Measurement bandwidth: 30 MHz – 1000 MHz: 120 kHz
Measurement bandwidth: 1 GHz – 12.75 GHz: 1 MHz

Test setup

Step 1: find the maximum E.R.P.



Step 2: substitution method



5.5.4 Measurement Results

Channel Number	Test Range (Frequency)	Power [dBm]	Spurious Level measured [dBm]	FCC limit	Result
1023	9 kHz ~Hz	26	<- 13 dBm (See appendix E)	- 13 dBm	Pass

1023	30MHz ~1GHz	26	<- 13 dBm (See appendix E)	- 13 dBm	Pass
1023	1GHz ~12.75Hz	26	<- 13 dBm (See appendix E)	- 13 dBm	Pass

Measurement Uncertainty: 5 dB

5.5.5 Substitution Results

Freq. [MHz]	Substitution Antenna Type	Gain [dBd]	Cable Loss [dB]	Signal Generator Level [dBm]	Substitution Level [dBm]	FCC limit [dBm]	Result
207.0	Dipole	0	0.34	-63.89	-64.23	-13	Pass
3362.0	Horn Ant.	7.85	2.16	-55.05	-49.36	-13	Pass

Note: For get the E.R.P. (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

E.R.P. [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBd]

NOTE: SGP- Signal Generator Level

5.5.5.1 Conclusion

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix E with 7 pages.

5.5.5.2 Equipment List

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Test Receiver Display Unit	R&S	ESMI 804.8932.52	829214/011	05.30.2005
Test Receiver RF Unit	R&S	ESMI 1032.5640.53	829550/008	05.30.2005
BiLog Antenna	Schaffner	CBL 6112B	2747	10.15.2005
Pre-Amplifier	Agilent	83017A	3950M00246	01.03.2006

Horn Antenna	R&S	HF906 4044.4507.02	359287/005	12.05.2005
Horn Antenna	R&S	HF906 4044.4507.02	359287/006	12.05.2005
Dipole	Schwarzbeck	D69250-VHAD	979	08.10.2005
Chamber_NSA	S+M	N/A	N/A	12.24.2005
Power amplifier	Agilent	8447D	2944A10146	05.30.2005
Signal Generator	R&S	SMR 40	100325	12.09.2005

5.6 Frequency Stability

5.6.1 Test Conditions

Preconditioning:	1 hour
Nominal Output Power:	26dBm
Measured at:	Antenna connector
Ambient temperature:	See below
Relative humidity:	55 % at 20 °C

5.6.2 Test Specifications and Limits

CFR 47 (FCC) part 2.1055 and part 24.235

5.6.2.1 Supporting Standards:

ANSI C63.4-1992	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
EIA/TIA-603-A: 1992	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
EIA/TIA-98D-2001	Recommended Minimum Performance Standard for Mobile Stations Supporting Dual-Mode Spread Spectrum Cellular Mobile Stations

5.6.3 Test Method and Setup

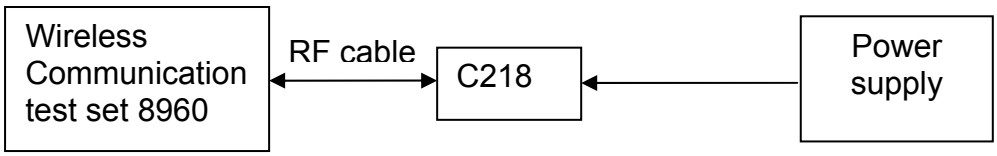
The frequency stability shall be measured with variation of ambient temperature as follows:
(1) From –30 ° to +50 ° centigrade for all equipment except that specified in subparagraphs
(2) and (3) of paragraph 2.1055

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10o centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short-term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:
(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point, which shall be specified by the manufacturer.
(3) 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. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.
(e) When deemed necessary, the Commission may require tests of frequency stability under conditions in addition to those specifically set out in paragraphs (a), (b), (c) and (d) of this section. (For example, measurements showing the effect of proximity to large metal objects, or of various types of antennas, may be required for portable equipment.)

Test Set up

Measurement Bandwidth: 30 kHz
Connect the handset to the wireless communication test set Agilent 8960 via the antenna connector. Test the frequency error by the Agilent 8960. The C218's output is matched with 50 Ω load.



5.6.4 Measurement Results vs. Variation of Temperature

- TRX1: Channel No.**1023(825MHz)**

Temperature	Power (dBm)	Nominal Frequency (MHz)	**RC1/1** Measured Frequency Error(Hz)	**RC3/3** Measured Frequency Error(Hz)	Result
-30 °C	26	825	10.3	8.0	Pass
-20 °C	26	825	-8.3	-6.4	Pass
-10 °C	26	825	21.	8.3	Pass
0 °C	26	825	-4.9	5.9	Pass
+10 °C	26	825	6.8	6.8	Pass
+20 °C	26	825	2.7	7.1	Pass
+30 °C	26	825	3.8	0.0	Pass
+40 °C	26	825	-5.6	3.4	Pass
+50 °C	26	825	5.4	1.2	Pass

- TRX2: Channel No.**283(833.49MHz)**

Temperature	Power (dBm)	Nominal Frequency (MHz)	**RC1/1** Measured Frequency Error(Hz)	**RC3/3** Measured Frequency Error(Hz)	Result
-30 °C	26	833.49	7.4	7.8	Pass
-20 °C	26	833.49	-1.1	10.0	Pass
-10 °C	26	833.49	7.2	6.0	Pass
0 °C	26	833.49	4.6	4.0	Pass
+10 °C	26	833.49	-3.2	10.5	Pass

+20 °C	26	833.49	4.6	7.1	Pass
+30 °C	26	833.49	6.0	-4.0	Pass
+40 °C	26	833.49	0.4	3.6	Pass
+50 °C	26	833.49	2.7	-0.2	Pass

- TRX3: Channel No.**777(848.31MHz)**

Temperature	Power (dBm)	Nominal Frequency (MHz)	**RC1/1** Measured Frequency Error(Hz)	**RC3/3** Measured Frequency Error(Hz)	Result
-30 °C	26	848.31	-10.7	-1.7	Pass
-20 °C	26	848.31	10.8	-8.2	Pass
-10 °C	26	848.31	-6.8	2.2	Pass
0 °C	26	848.31	5.5	0.3	Pass
+10 °C	26	848.31	-6.8	3.6	Pass
+20 °C	26	848.31	2.8	-1.7	Pass
+30 °C	26	848.31	-0.9	4.7	Pass
+40 °C	26	848.31	-2.4	3.1	Pass
+50 °C	26	848.31	3.0	4.1	Pass

5.6.5 Measurement Results vs. Variation of Voltage

- TRX1: Channel No. **1023(825MHz)**

Voltage	Power (dBm)	Nominal Frequency (MHz)	**RC1/1** Measured Frequency Error(Hz)	**RC3/3** Measured Frequency Error(Hz)	Result
3.3v	26	825	6.1	4.9	Pass
3.7v	26	825	-0.7	-3.1	Pass
4.2v	26	825	7.0	6.0	Pass

- TRX2: Channel No. **283(833.49MHz)**

Voltage	Power (dBm)	Nominal Frequency (MHz)	**RC1/1** Measured Frequency Error(Hz)	**RC3/3** Measured Frequency Error(Hz)	Result
3.3v	26	833.49	5.5	5.3	Pass
3.7v	26	833.49	-3.0	2.5	Pass
4.2v	26	833.49	8.1	-1.9	Pass

- TRX3: Channel No.**777(848.31MHz)**

Voltage	Power (dBm)	Nominal Frequency (MHz)	**RC1/1** Measured Frequency Error(Hz)	**RC3/3** Measured Frequency Error(Hz)	Result
3.3v	26	833.49	6.6	-0.9	Pass
3.7v	26	833.49	8.1	-5.8	Pass
4.2v	26	833.49	-4.9	2.1	Pass

5.6.5.1 Conclusion

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix F with 31 pages.

5.6.5.2 Equipment List

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Wireless communication test set	Agilent	8960	GB43042699	2005.03.10
Cable	Diverse	RG58-U	n.a.	Before test
Climatic Chamber	Weiss	WT11 340	588226027740030	Jan 18.2006

6 EMC Test

6.1 Conducted Emission at Power Port

6.1.1 Test Conditions

Preconditioning:	1 hour
Nominal Output Power:	26dBm
Measured at:	Antenna connector
Ambient temperature:	23.5°C
Relative humidity:	55 %

6.1.2 Test Specifications and Limits

6.1.2.1 Specification

CFR 47 (FCC) part 15.107

6.1.2.2 Supporting Standards:

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

6.1.2.3 Limits

Compliance with CFR 47 part15.107 requires that conducted emission must meet the requirement of following table.

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note * Decreases with the logarithm of the frequency.

6.1.3 Test Method and Setup

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4: 2003.

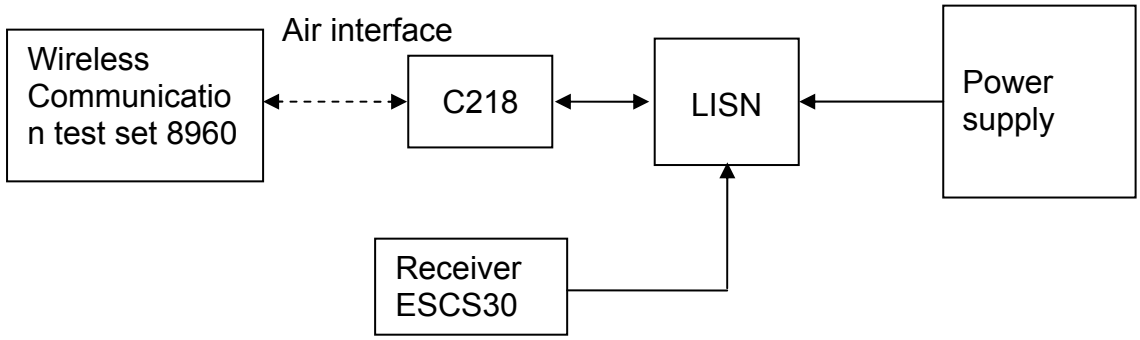
Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

HUAWEI CDMA Handset C218 was communicated with the BTS simulator through Air interface. The Handset operated on the typical channel.

Measurement bandwidth (RBW) for 150kz to 30 MHz: 9 kHz;

Test Set-up

The CDMA Handset was setup in the screened chamber and operated under nominal conditions.



6.1.4 Measurement Results

a、 Adapt 1
MEASUREMENT RESULT: " C2005020410_fin QP”

Frequenc y （MHz）	Level （dBμV）	Trans d （dB ）	Limit （dBμV）	Margin （dB ）	Line	PE
0.501000	51.20	0.6	56	4.8	L2	GND
0.645000	49.90	0.6	56	6.1	L2	GND

0.753000	48.40	0.5	56	7.6	N	GND
1.410000	48.60	0.4	56	7.4	N	GND
1.527000	49.50	0.4	56	6.5	N	GND
2.472000	47.70	0.5	56	8.3	N	GND

MEASUREMENT RESULT: " C2005020410_fin AV "

Frequency（MHz）	Level（dBμV）	Transd（dB）	Limit（dBμV）	Margin（dB）	Line	PE
0.375000	36.00	0.7	48	12.4	N	GND
0.496500	37.40	0.6	46	8.7	L2	GND
0.631500	35.60	0.6	46	10.4	L2	GND
0.757500	32.30	0.5	46	13.7	L2	GND
1.504500	30.10	0.4	46	15.9	L2	GND
2.445000	31.00	0.5	46	15.0	N	GND

b、 Adapt 2

MEASUREMENT RESULT: " C2005032505_fin QP”

Frequency（MHz）	Level（dBμV）	Transd（dB）	Limit（dBμV）	Margin（dB）	Line	PE
0.402000	49.60	0.7	58	8.2	L2	GND
0.874500	44.30	0.5	56	11.7	L2	GND
0.937500	45.00	0.4	56	11.0	L2	GND
1.545000	41.90	0.4	56	14.1	L2	GND
2.080500	44.00	0.5	56	12.0	L2	GND
2.148000	42.90	0.5	56	13.1	L2	GND

MEASUREMENT RESULT: " C2005032505_fin AV "

Frequency（MHz）	Level（dBμV）	Transd（dB）	Limit（dBμV）	Margin（dB）	Line	PE

0.402000	43.50	0.7	48	4.3	L2	GND
0.807000	36.70	0.5	46	9.3	L2	GND
0.870000	38.20	0.5	46	7.8	L2	GND
0.937500	38.10	0.4	46	7.9	L2	GND
2.080500	37.10	0.5	46	8.9	L2	GND
2.148000	35.80	0.5	46	10.2	L2	GND

Measurement Uncertainty: 4 dB

6.1.4.1 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix G with 4 pages.

6.1.4.2 Equipment List

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Receiver	R&S	ESCS30	830245/ 018	05.30.2005
Wireless communication test set	Agilent	8960	GB4304 2699	03.10.2006
Artificial Mains Network	NNLK8121	8960	8121416	05.30.2005
Power Divider	Agilent	11667B	N/A	Before test
Cable	Huber&Suhner	RG58U	N/A	Before test

6.2 Radiated Emission of Enclosure in ideal mode

6.2.1 Test Conditions

Preconditioning:	0.5 hour
Nominal Output Power:	26 dBm
Measured at:	Channel 1000, Frequency 1980MHz
Ambient temperature:	23 °C
Relative humidity:	51 %

6.2.2 Test Specifications and Limits

6.2.2.1 Specification

CFR 47 (FCC) part 15.109

6.2.2.2 Supporting Standards:

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

6.2.2.3 Limits

The Radiated Emission of Enclosure of EUT should compliance with the requirement of CFR 15.109. The limit showed in following table.

Frequency of Emission (MHz)	Radiated Limit	
	Unit(μ v/m)	Unit(dB μ V/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
690-1000	500	54

6.2.3 Test Method and Setup

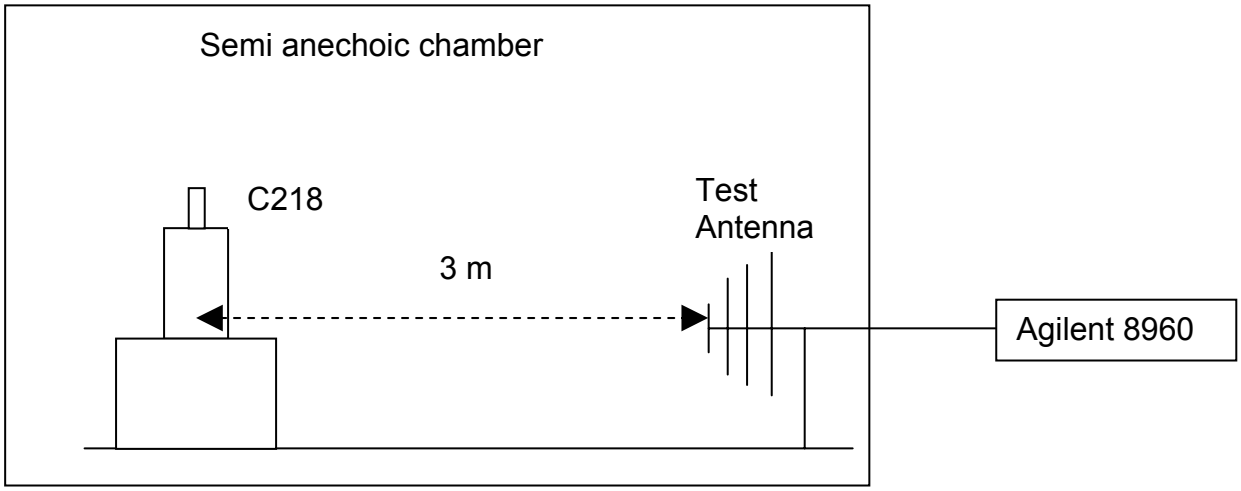
The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2003). The test distance was 3m.The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to EN 55022/CISPR 22
The Radiated Disturbance measurements were made using a Rohde and Schwarz ESMI Test Receiver and control software ES-K1.
A preliminary scan and a final scan of the emissions were made from 30 MHz to 1GHz by using test script of software; the emissions were measured using a Quasi-Peak Detector. The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0°to 360°, The receive antenna has two polarizations V and H.

The test was performed in differential power supply mode: AC power supply, and the test performed at worst emission state.

HUAWEI CDMA Handset C218 was communicated with the BTS simulator through Air interface. The Handset operated on the typical channel. And the handset worked in idle mode. Transmitter was not work in this test.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 kHz
Measurement bandwidth: 1GHz – 10 GHz: 1 MHz

Test set up



6.2.4 Measurement Results

a、 Adapt 1

MEASUREMENT RESULT: “R2005020317_fin QP”

Frequency（MHz）	Level（dBμV/m）	Transd（dB）	Limit（dBμV/m）	Margin（dB）	Height（cm）	Azimuth（deg）	Polarisation
31.020000	17.00	-4.8	40.0	23.0	104.0	329.00	VERTICAL
878.460000	40.00	2.6	47.0	7.0	206.0	250.00	VERTICAL

b、 Adapt 2
MEASUREMENT RESULT: “R2005032510_fin QP”

Frequency（MHz）	Level（dBμV/m）	Transd（dB）	Limit（dBμV/m）	Margin（dB）	Height（cm）	Azimuth（deg）	Polarisation
35.220000	24.00	-7.1	40.0	16.0	112.0	95.00	VERTICAL
55.860000	23.80	-15.8	40.0	16.2	105.0	0.00	VERTICAL
143.820000	35.20	-10.4	40.0	4.8	172.0	82.00	HORIZONTAL
211.440000	28.50	-11.1	40.0	11.5	117.0	99.00	HORIZONTAL

Measurement Uncertainty: 5 dB

6.2.4.1 Conclusion

The equipment PASSED the requirement of this clause.
For the measurement results refer to appendix H with 3 pages.

6.2.4.2 Equipment List

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Test Receiver Display Unit	R&S	ESMI 804.8932.52	829214/011	05.30.2005
Test Receiver RF Unit	R&S	ESMI 1032.5640.53	829550/008	05.30.2005
BiLog Antenna	Schaffner	CBL 6112B	2747	10.15.2005

Chamber_NSA	S+M	N/A	N/A	12.24.2005
Power amplifier	Agilent	8447D	2944A10146	05.30.2005

7 Appendixes

Appendix A	Measurement Results Effective radiated power limits	4 pages
Appendix B	Measurement Results Modulation Characteristics	7 pages
Appendix C	Measurement Results Occupied Bandwidth	4 pages
Appendix D	Measurement Results Spurious Emission at Antenna Terminal	15 pages
Appendix E	Measurement Results Field Strength of Spurious Radiation	7 pages
Appendix F	Measurement Results Frequency Stability versus Temperature and Voltage	73 pages
Appendix G	Measurement Results Conducted Emission at Power Port	4 pages
Appendix H	Measurement Results Radiated Emission of Enclosure at ideal mode	3 pages
Appendix I	Photos of Test Setup	5 pages