Report No: SYBH(R)26122006
FCC ID: QISC2008

FCC TEST REPORT OF HUAWEI CDMA 800MHz Mobile Phone

M/N: C2008

Jan. 16, 2007

Reliability Laboratory of Huawei Technologies Co., Ltd.

Notice

1.	The laboratory has obtained the accreditation of China National Accreditation Committee for Laboratories (CNAL), and accreditation number: L0310.
2.	The laboratory has obtained the accreditation of THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION (A2LA), and Accreditation Council Certificate Number: 2174.01.
3.	The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
4.	The laboratory also has been listed by the VCCI to perform EMC measurements. The accreditation number is C1758, R1672, and T153.
5.	The test report is invalid if not marked with "exclusive stamp for the test report".
6.	Any copy of the test report is invalid if not re-marked with the "exclusive stamp for the test report".
7.	The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
8.	The test report is invalid if there is any evidence of erasure and/or falsification.
9.	If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.
10.	Normally, the test report is only responsible for the samples that have undergone the test.
11.	Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.

Huawei Technologies Co Ltd
Huawei Industrial Base,
Bantian Longgang
Shenzhen 518128, P.R China
Tel: +86 755 89651014
Fax: +86 755 89652518

REPORT ON	**FCC Test of HUAWEI CDMA Mobile Phone** M/N: C2008 Report No: SYBH(R)26122006
REGULATION	**FCC CFR47 Part 2: Subpart J;** **FCC CFR47 Part 22: Subpart H;** **FCC CFR47 Part 15: Subpart B;**
CONCLUSION	There are 9 items need to be tested, 9 items have been tested. The sample of the model completely meets the requirements **Final Judgement: Pass**

General Manager	**2007.01.15**	**Tang Shuanli**	
	Date	Name	signature
Technical Responsibility For Area of Testing	**2007.01.15**	**Zhang Xinghai**	
	Date	Name	signature
Test Lab Engineer	**2007.01.15**	**Deng Jiang**	
	Date	Name	signature

Contents

1 Summary

The table below summarizes the measurements and results for the HUAWEI CDMA Mobile Phone C2008. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

FCC Measurement Specification	FCC Limits Part(s)	Description	Result
2.1046	22.913	Effective Radiated Power of Transmitter	PASS
2.1047		Modulation Characteristics	PASS
2.1049		Occupied Bandwidth	PASS
2.1051	22.917	Band Edges compliance	PASS
2.1051	22.917	Spurious Emission at Antenna Terminal	PASS
2.1053	22.917	Radiated Spurious Emission	PASS
2.1055	22.355	Frequency Stability	PASS
-	15.107	Conducted Emission at Power Port	PASS
-	15.109	Radiated Emission of Enclosure in Idle Mode	PASS

2 Product Description

2.1 Production Information

2.1.1 General Description

HUAWEI CDMA Mobile Phone C2008 is subscriber equipment in the CDMA system. The frequency band is US Cellular. The Mobile Phone implements such functions as RF signal receiving / Transmitting, CDMA protocol processing, voice and SMS service etc. The Mobile Phone uses MSM6000 chipset and Zero-IF technologies.

2.1.2 Support function and Service

The Mobile Phone C2008 support the function and service as follows:

Table 2 Service and Test mode List

Service Name	Characteristic	Corresponding Test Mode	Note
Voice and SMS	Modulation: QPSK	TM1*	
Voice and SMS	Modulation: HPSK	TM3*	

Note: * Refer to ANSI/TIA-98-E section 1.3 for the information of TM (Test Mode).

2.2 Modification Information

For original equipment, following table is not application.

Table 3 Modification Information

Model Number	Board/Module	Original Version	New Version	Modify Information

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 A2LA and the accredited number is **2714.01** in Jan of 2004.

3.1 Testing Period

The test have been performed during the period of

Dec. 01, 2006 to Jan. 05, 2007

3.2 General Set up Description

HUAWEI CDMA Mobile Phone C2008 can only support CDMA mode and US Cellular Band. During this measurement, the Mobile Phone just works in CDMA mode and US Cellular Band.

TM1: Forward Traffic Channel Radio Configuration 1, Reverse Traffic Channel Radio Configuration 1
TM3: Forward Traffic Channel Radio Configuration 3, Reverse Traffic Channel Radio Configuration 3

Parameter	Units	Value
$\hat{I}or$	dBm/1.23 MHz	-104
$\frac{\text{Pilot Ec}}{I_{or}}$	dB	-7
$\frac{\text{Traffic Ec}}{I_{or}}$	dB	-7.4

4 Product Description

4.1 Technical Characteristics

4.1.1 Frequency Range

Table 4 Frequency Range

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

4.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / Separation

Channel spacing:	30 KHz
Channel separation:	1.23 MHz

4.1.3 Type of Emission

Table 6 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

Table 7 Environmental Requirements

Minimum temperature:	- 10 °C
Maximum temperature:	+ 55 °C
Nominal temperature	+ 25 °C
Relative Humidity:	5％-95％RH

4.1.5 Power Source

Table 8 Power Source

AC voltage nominal:	~220V
AC voltage range	~100V-240V
AC current maximal:	650mA

4.1.6 Tune-up Procedure

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

The voltage and current in the final RF stage is:

Table 9 Applied DC Voltages and Currents

Voltage:	⎓ +2.85V
Current:	150mA According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)

4.2 EUT Identification List

4.2.1 Board Information

Table 10 Board Information

800MHz CDMA Mobile Phone		
C2008		
Board and Module		
Equipment Designation / Description	Serial Number	Remarks
-Main board	UMT-SZ 2MV 94V-06706	HC1C2008M
-LCD	1512033901021T	W-FC156-1-B-P1-C-D-1
-Battery	HGY660702313	HBC80S

Table 11

4.2.2 Adapter Technical Data

Input Voltage: ~100-240V ;50/60Hz
Output Voltage: ⎓ +5.3V
Rated Power: 3.5W

4.2.3 Battery Technical Data

Battery Model: HBC80S
Rated capacity: 800mAh
Nominal Voltage: ⎓ +3.7V
Charging Voltage: ⎓ +5.0V

4.2.4 FCC Identification

Grantee Code: QIS
Product Code: C2008
FCC Identification: QISC2008

5 Main Test Instruments

Table 12 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until (MM.DD.YYYY)
3m Semi Anechoic Chamber	S+M	N/A	N/A	12.24.2007
3m Full Anechoic Chamber	S+M	N/A	N/A	12.05.2007
Signal Analyzer	R&S	FSU 26	200002	09.23.2007
EMI Test Receiver	R&S	ESMI 1032.5640.53	829550/008	05.29.2007
Receiver	R&S	ESIB 26	100318	05.21.2007
Receiver	R&S	ESCS30	830245/018	05.29.2007
Pre-Amplifier	Agilent	8447D	2944A10146	05.21.2007
Pre-Amplifier	Agilent	83017A	3950M00246	02.08.2007
Loop Antenna	Schwarzbeck	FMZB1516	1516115	01.08.2007
BiLog Antenna	Schaffner	CBL 6112B	2536	05.03.2007
BiLog Antenna	Schaffner	CBL 6112B	2536	05.04.2007
Horn Antenna	R&S	HF906 4044.4507.02	359287/005	02.26.2007
Horn Antenna	R&S	HF906	359287/005	02.26.2007
Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	05.21.2007
Signal Generator	R&S	SMT06	830264/009	05.21.2007
Signal Generator	R&S	SMR 40	100325	06.26.2007
Artificial Mains Network	Schwarzbeck	NNLK8121	8121416	04.24.2007
Power Supply	Keithley	2306	1045337	04.20.2007
Universal Radio Communication Tester	R&S	CMU200	105822	04.22.2007
Universal Radio Communication Tester	Agilent	8960	GB43042699	04.28.2007

6 Transmitter Measurements

6.1 Effective Radiated Power of Transmitter (ERP)

6.1.1 Test Conditions

Table 13 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	+25℃
Relative humidity:	55%
Test Configurations:	TM1 and TM3 at frequency B、M、T

6.1.2 Test Specifications and Limits

6.1.2.1 Specification

CFR 47 (FCC) part 2.1046 and part 22.913

6.1.2.2 Supporting Standards

Table 14 Supporting Standards:

ANSI/TIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI/TIA-98-E: 2003	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Phones

6.1.2.3 Limits

Compliance with part 22.913, in no any case may the peak power of a mobile phone transmitter exceed 7 W. The calculated longitude ERP by following formula：ERP(dBm)= 10*log ($ERP_{in\ watts}$).

Table 15 Limits

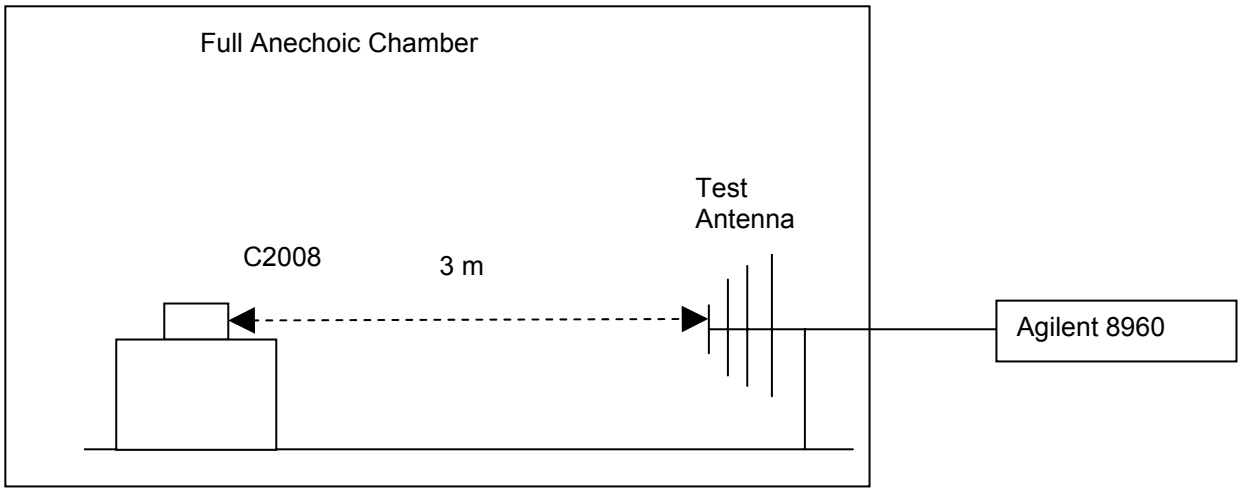
Maximum Output Power (Watts)	< 7 Watts
Maximum Output Power (dBm)	< 38.5 dBm

6.1.3 Test Method and Setup

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, ERP 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)(8). Connect the Mobile Phone 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: Pre-test



Step 2: Substitution method to verify the maximum ERP

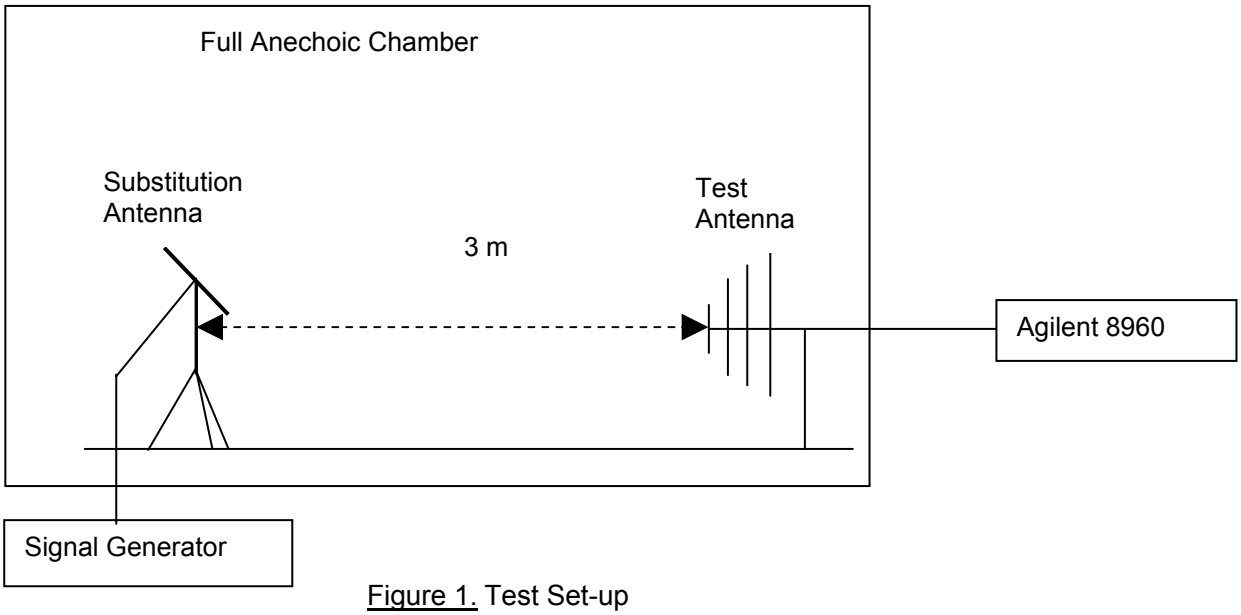


Figure 1. Test Set-up

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

6.1.4 Measurement Results

6.1.4.1 Pre-measurement Results

Table 16 Measurement Results

TEST CONDITIONS	RF Output Power		
	Channel1013(B) 824.7MHz	Channel283(M) 833.49Mhz	Channel777(T) 848.31MHz
	dBm	dBm	dBm

		Measured	Limit	Measured	Limit	Measured	Limit
TM1	T_{nom} (+25 °C) V_{nom} (3.7 V)	22.22	38.5	21.97	38.5	22.04	38.5
TM3	T_{nom} (+25 °C) V_{nom} (3.7 V)	22.23	38.5	22.11	38.5	22.01	38.5

6.1.4.2 Substitution Results

Table 17 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	Substitution Gain [dBd]	Cable Loss [dB]	Signal Generator Level [dBm]	Substitution Level [dBm]	FCC limit [dBm]	Result
TM1	824.7	22.35	Dipole Ant.	-3.11	0.6	26.81	23.05	38.5	Pass
TM1	843.49	22.01	Dipole Ant.	-3.11	0.6	26.02	22.26	38.5	Pass
TM1	848.31	22.48	Dipole Ant.	-3.11	0.6	26.11	22.35	38.5	Pass
TM3	824.7	22.21	Dipole Ant.	-3.11	0.6	26.10	22.34	38.5	Pass
TM3	843.49	22.09	Dipole Ant.	-3.11	0.6	26.29	22.54	38.5	Pass
TM3	848.31	22.15	Dipole Ant.	-3.11	0.6	26.43	22.67	38.5	Pass

Note: a, For get the ERP (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

ERP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBd]

SGP: Signal Generator Level

b, A cdma signal with bandwidth of 1.23MHz are created by the vector generator R&S SMU200A.
c, RBW=10kHz, VBW=300kHz, and integrated by the instrument to 1.23MHz.

6.1.5 Conclusion

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

6.2 Modulation Characteristics

6.2.1 Test Conditions

Table 18 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	+25 °C
Relative humidity:	47 %
Test Configurations:	TM1 and TM3 at frequency M

6.2.2 Test Specifications and Limits

6.2.2.1 Specification

CFR 47 (FCC) part 2.1047 and part 22 subpart H.

6.2.2.2 Supporting Standards

Table 19 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI/TIA-98-E: 2003	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Phones.

6.2.2.3 Limits

No specific modulation characteristics requirement limits in part 2.1047 and part 22 subpart H.

Table 20 Limits

Limits	Not applicable

6.2.3 Test Method and Setup

Connect the Mobile Phone to Universal Radio Communication Tester CMU200 via the antenna connector. The band class is set as US Cellular; the Mobile Phone's output is matched with 50 Ω load, test method was according to ANSI/TIA-98-E. The waveform quality and constellation of the Mobile Phone were tested.

Test setup

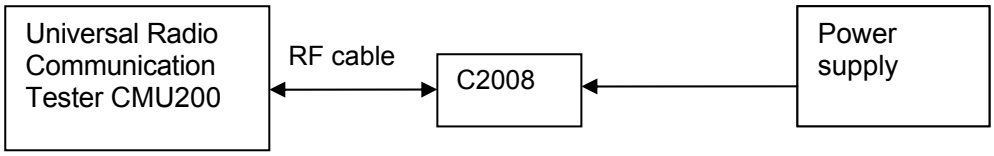


Figure 2. Test Set-up

6.2.4 Measurement Results

Table 21 Measurement Results

TEST CONDITIONS		Modulation Characteristic	
		Channel283(M) 833.49Mhz	
		Measured	
		TM1	TM3
T_{nom} (+25 °C)	V_{nom} (3.7V)	Refer to Appendix A	Refer to Appendix A

6.2.5 Conclusion

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

For the measurement results refer to appendix A with 3 pages.

6.3 Occupied Bandwidth

6.3.1 Test Conditions

Table 22 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	+25 °C
Relative humidity:	55 %
Test Configurations:	TM1 and TM3 at frequency B、M、T

6.3.2 Test Specifications and Limits

6.3.2.1 Specification

CFR 47 (FCC) part 2.1049 and part 22 subpart H.

6.3.2.2 Supporting Standards

Table 23 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI/TIA-98-E: 2003	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Phones.

6.3.2.3 Limits

No specific occupied bandwidth requirement in part 22 subpart H, but the occupied bandwidth was defined in part 2.1049: 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.

Table 24 Limits

Upper /lower frequency limits	0.5% of the mean power

6.3.3 Test Method and Setup

Mobile Phone was connected to the wireless signal analyzer R&S FSU26 via the one RF connector. The band class is set as US Cellular; Mobile Phone was controlled to transmit maximum power. Measure and record the occupied bandwidth of the Mobile Phone by the R&S FSU26.

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:

Refer to 47CFR part2.1049 section (g)&(h).
(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

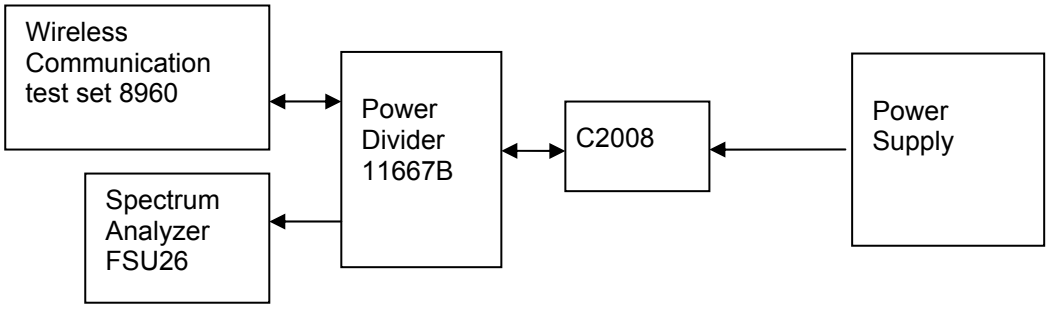


Figure 3. Test Set-up

6.3.4 Measurement Results

Table 25 Measurement Results

TEST CONDITIONS		Occupied Bandwidth					
		Channel1013 (B) 824.70MHz		Channel283 (M) 833.49Mhz		Channel777(T) 848.31MHz	
		Measured (MHz)		Measured (MHz)		Measured (MHz)	
		TM1	TM3	TM1	TM3	TM1	TM3
T_{nom} (+25 °C)	V_{nom} (3.7V)	1.2734	1.2734	1.2768	1.2734	1.2768	1.2734

Table 26

6.3.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix B with 7 pages.

6.4 Band Edges Compliance

6.4.1 Test Conditions

Table 27 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	+25°C
Relative humidity:	55 %
Test Configurations:	TM1 and TM3 at frequency B、T

6.4.2 Test Specifications and Limits

6.4.2.1 Specification

CFR 47 (FCC) part 2.1051 and part 22.917

6.4.2.2 Supporting Standards

Table 28 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI/TIA-98-E: 2003	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Phones.

6.4.2.3 Limits

Compliance with 22.917, 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).

Table 29 Limits

Rated Power:	24 dBm
Required attenuation:	43+10log (0.251) = 37.0 , 24.0 dBm – 37.0 dB
Absolute level	- 13 dBm

6.4.3 Test Method and Setup

Mobile Phone was connected to the wireless signal analyzer R&S FSU26 via the one RF connector, the band class is set as US Cellular. Mobile Phone was controlled to transmit maximum power. Measure and record Band edge compliance of the Mobile Phone by the R&S FSU26.

RBW of 20 kHz (1% of 2MHz) was used up to 5MHz away from the band edge. So the FCC rules specify that RBW of 100kHz for measurements of emissions >1MHz away from the band edges ,the limit was adjusted with -13dBm to -20dBm to compensate for the reduced measurement bandwidth.

Test Set-up

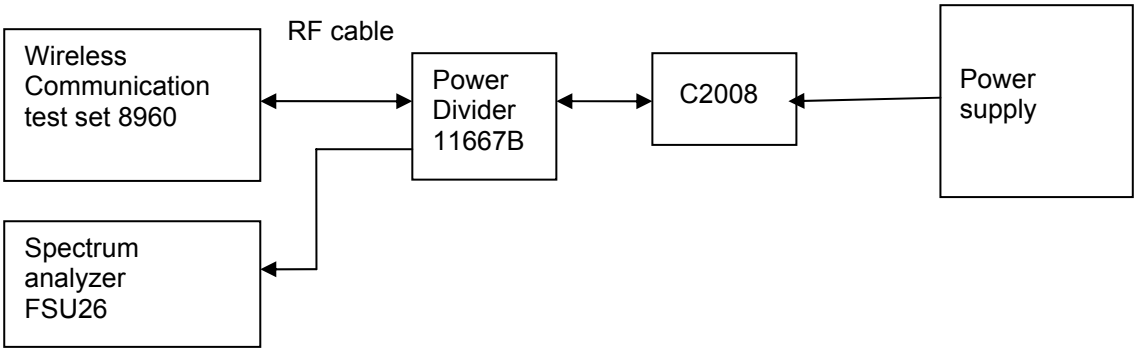


Figure 4. Test Set-up

6.4.4 Measurement Results

Table 30 Measurement Results outside Band Edges-- Single Carrier

Band	Frequency of Band edges [MHz]	Channel Number	Test Mode	Power [dBm]	Spurious Level measured [dBm]	FCC limit	Result
US Cellular	T_{nom} (+25 °C), V_{nom} (3.7V)						
	824	1013 (B)	TM1 & TM3	24.2	<-13(See appendix D)	- 13 dBm	Pass
	869	777 (T)	TM1 & TM3	24.2	<-13(See appendix D)	- 13 dBm	Pass

6.4.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix C with 5 pages.

6.5 Spurious Emission at Antenna Terminal

6.5.1 Test Conditions

Table 31 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	+25°C
Relative humidity:	50 %
Test Configurations:	TM1 and TM3 at frequency B、M、T

6.5.2 Test Specifications and Limits

6.5.2.1 Specification

CFR 47 (FCC) part 2.1051 and part 22.917

6.5.2.2 Supporting Standards

Table 32 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI/TIA-98-E: 2003	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Phones.

6.5.2.3 Limits

Compliance with part 22.917, 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).

Table 33 Limits

Rated Power:	24 dBm
Required attenuation:	43+10log (0.251) = 37.0 , 24 dBm – 37.0 dB = -13 dBm
Absolute level	- 13 dBm

6.5.3 Test Method and Setup

Mobile Phone was connected to the wireless signal analyzer R&S FSU26 via the one RF connector, the band class is set as US Cellular. Mobile Phone was controlled to transmit maximum power.
Measure and record the Conducted Spurious Emission of the Mobile Phone by the R&S FSU26.

According to part 22.917, the defined measurement bandwidth as following:

22.917(b) Measurement procedure: Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

Measurement bandwidth (RBW) for 9 kHz up to 1 GHz: 100 kHz;
Measurement bandwidth (RBW) for 1GHz up to 12.75GHz: 1 MHz;

Test Set-up

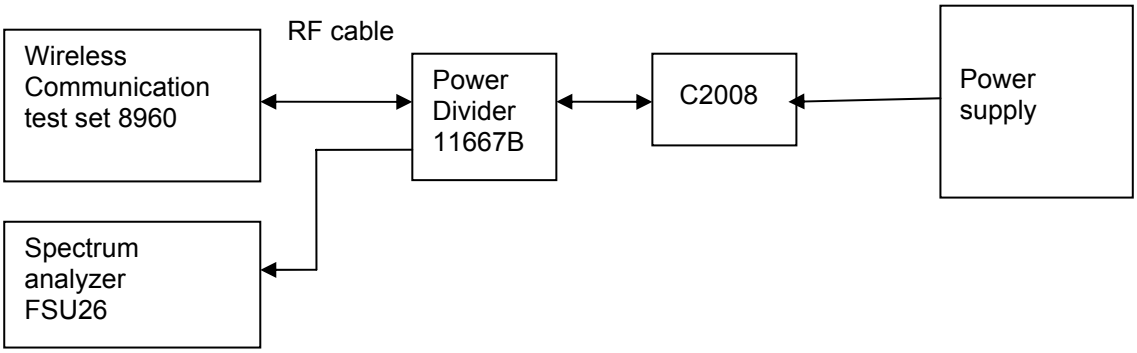


Figure 5. Test Set-up

6.5.4 Measurement Results

Table 34 Measurement Results

Channel Number	Test Mode	Test Range (Frequency)	Conducted Power [dBm]	Spurious Level measured [dBm]	FCC limit	Result
Channel 1013(B)	TM1	9 kHz ~12.75GHz	24.2	<- 13 dBm (See appendix E)	- 13 dBm	Pass
	TM3	9 kHz ~12.75GHz	24.2	<- 13 dBm (See appendix E)	- 13 dBm	Pass
Channel 283(M)	TM1	9 kHz ~12.75GHz	24.3	<- 13 dBm (See appendix E)	- 13 dBm	Pass
	TM3	9 kHz ~12.75GHz	24.2	<- 13 dBm (See appendix E)	- 13 dBm	Pass
Channel 777(T)	TM1	9 kHz ~12.75GHz	24.3	<- 13 dBm (See appendix E)	- 13 dBm	Pass
	TM3	9 kHz ~12.75GHz	24.2	<- 13 dBm (See appendix E)	- 13 dBm	Pass

6.5.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix D with 19 pages.

6.6 Radiated Spurious Emission

6.6.1 Test Conditions

Table 35 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	+25 °C
Relative humidity:	53 %
Test Configurations:	TM1 at frequency M

6.6.2 Test Specifications and Limits

6.6.2.1 Specification

CFR 47 (FCC) part 2.1053 and part 22.917

6.6.2.2 Supporting Standards

Table 36 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI/TIA-98-E: 2003	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Phones.

6.6.2.3 Limits

Compliance with 22.917, 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).

Table 37 Limits

Rated Power:	24 dBm (0.251W)
Required attenuation:	43 +10 $\log_{10}$ (0.251W) = 37.0 dB
Absolute level	24 dBm – 37.0 dB= - 13 dBm

6.6.3 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 Mobile Phone C2008 is equipment with non-integral antenna. And it should test according to part (b) of above section.

BTS simulator is connected to a communication antenna, by which communicate with the Mobile Phone C2008 inside the test site. The BTS simulator controls the Mobile Phone to transmit at maximum power which defined in specification of product when in traffic mode, field strength of spurious emission in idle mode were also tested. The Mobile Phone C2008 operates on a typical channel.

The test procedure:

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, ERP 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)(8). Connect the Mobile Phone to the BTS simulator via the air interface. The band class is set as US Cellular.
(b) Test the Radiated maximum output power by the Rohde and Schwarz ESMI Test Receiver 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 ESMI Test Receiver, and record the power level of Signal Generator. Of course, the cable loss at the test frequency should be compensated.

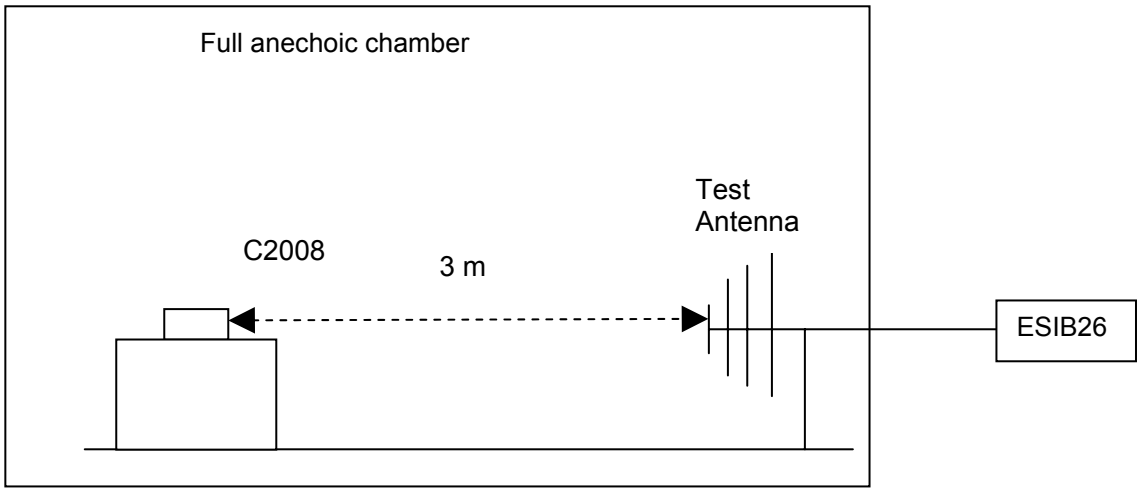
According to part 22.917, the defined measurement bandwidth as following:

22.917(b) Measurement procedure: Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

Measurement bandwidth (RBW) for 9 kHz up to 1 GHz: 100 kHz;
Measurement bandwidth (RBW) for 1GHz up to 12.75 GHz: 100 kHz;

Test setup

Step 1: Pre-test



Step 2: Substitution method to verify the maximum ERP

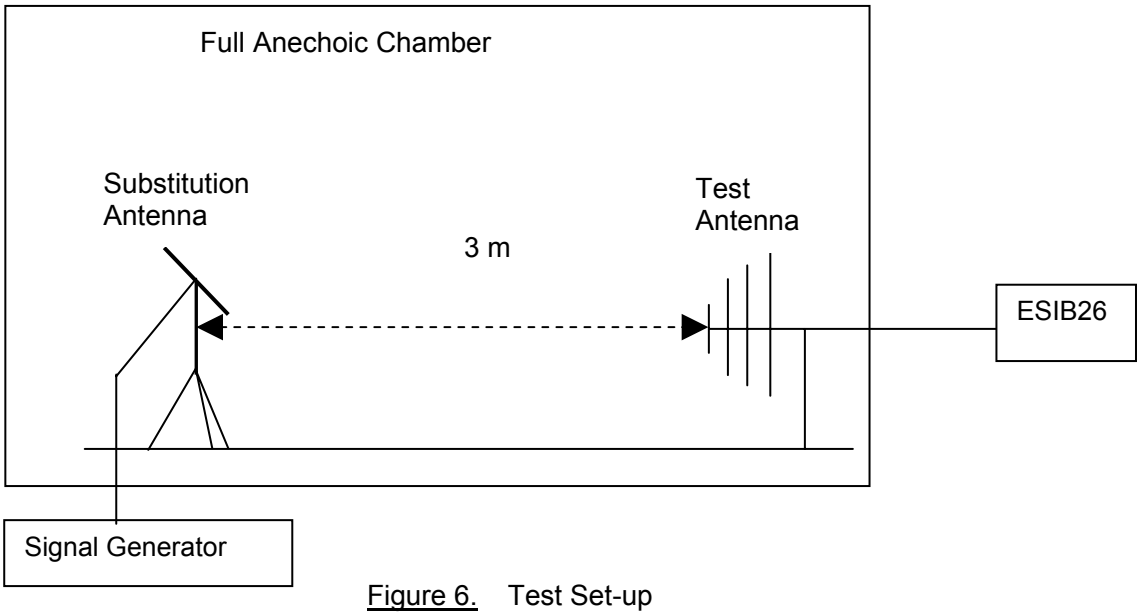


Figure 6. Test Set-up

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

6.6.4 Measurement Results

6.6.4.1 Pre-test Measurement Results

Table 38 Measurement Results

Channel Number	Test Range (Frequency)	Rated Power [dBm]	Spurious Level measured [dBm]	FCC limit	Result
283	9 kHz ~12.75GHz	24.2	<- 13 dBm (See appendix F)	- 13 dBm	Pass

6.6.4.2 Substitution Results

No peak found in pre- test. All test results of spurious emissions were attenuated more than 20 dB below the permissible value.

Calculation Sample:

Table 39 Substitution Results

Freq. [MHz]	Measurement Value [dBm]	Substitution Antenna Type	Gain [dBd]	Cable Loss [dB]	Signal Generator Level [dBm]	Substitution Level [dBm]	FCC limit [dBm]	Result
3923.33	-35.27	Horn Ant.	7.85	2.20	-41.24	-35.59	-13	Pass

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

ERP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBd]

NOTE: SGP- Signal Generator Level

6.6.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix E with 7 pages.

6.7 Frequency Stability

6.7.1 Test Conditions

Table 40 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	See below
Relative humidity:	55 % at 25 °C
Test Configurations:	TM1 and TM3 at frequency M

6.7.2 Test Specifications and Limits

6.7.2.1 Specification

CFR 47 (FCC) part 2.1055 and part 22.355

6.7.2.2 Supporting Standards

Table 41 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI/TIA-98E: 2003	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Phones.

6.7.2.3 Limits

According to part 22.355, from 821MHz to 896MHz, for mobile device, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances 2.5ppm.

6.7.3 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 10^{o} 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

Connect the Mobile Phone to the Wireless Communication test set 8960 via the connector. Then measure the frequency error by the Wireless Communication test set 8960. The Mobile Phone's output is matched with a 50 Ω load.

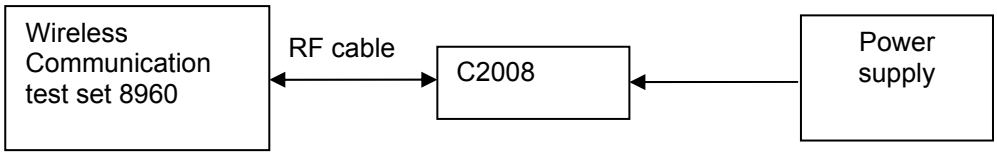


Figure 7. Test Set up

6.7.4 Measurement Results

6.7.4.1 Measurement Results vs. Variation of Temperature

- TM1, 3.7V DC Channel No.**283(833.49MHz)**

Table 42 Measurement Results vs. Variation of Temperature—TM1

Temperature	Conducted Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	24.3	833.49	2.3	Pass
-20 °C	24.2	833.49	1.8	Pass
-10 °C	24.2	833.49	3.1	Pass
0 °C	24.3	833.49	-2	Pass
+10 °C	24.3	833.49	2.6	Pass
+20 °C	24.2	833.49	3.1	Pass
+30 °C	24.2	833.49	-2.5	Pass
+40 °C	24.3	833.49	-2	Pass
+50 °C	24.4	833.49	3.4	Pass

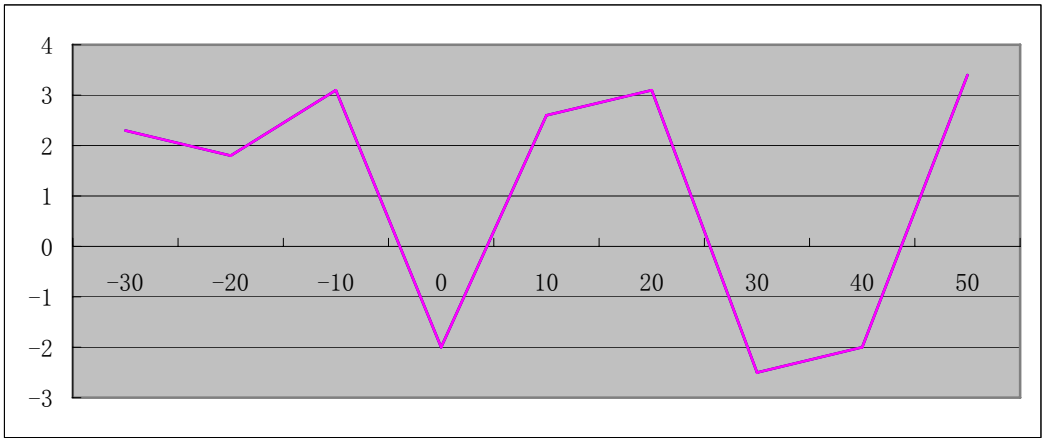


Figure 8. TM1 Test Graph

- TM3, 3.7V DC Channel No.**283(833.49MHz)**

Table 43 Measurement Results vs. Variation of Temperature—TM3

Temperature	Conducted Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	24.2	833.49	2.1	Pass
-20 °C	24.3	833.49	1.5	Pass
-10 °C	24.3	833.49	3	Pass
0 °C	24.4	833.49	-2.4	Pass
+10 °C	24.3	833.49	-3	Pass
+20 °C	24.3	833.49	1.2	Pass
+30 °C	24.2	833.49	1.9	Pass
+40 °C	24.2	833.49	2.6	Pass
+50 °C	24.3	833.49	2.8	Pass

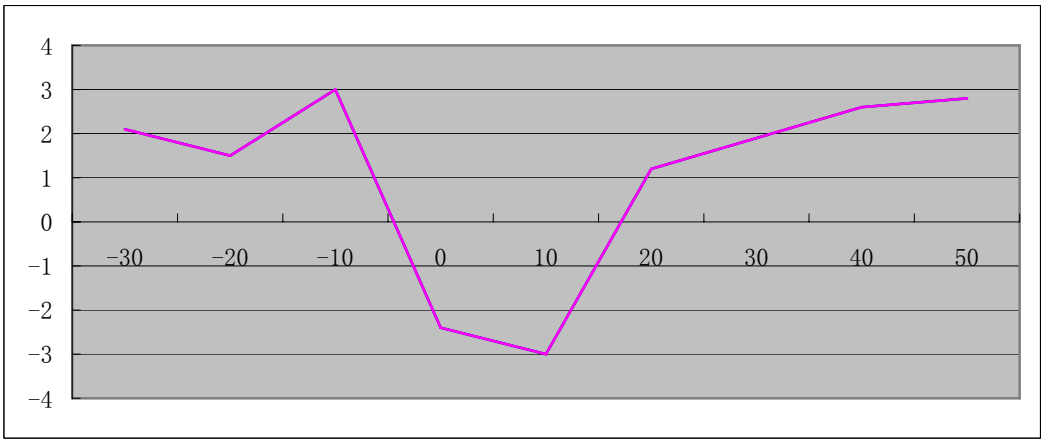


Figure 9. TM3 Test Graph

6.7.4.2 Measurement Results vs. Variation of Voltage

- TM1, 25 °C ,Channel No. **283(833.49MHz)**

Table 44 Measurement Results vs. Variation of Voltage—TM1

Voltage	Conducted Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.4	24.3	833.49	2.3	Pass
3.7	24.3	833.49	2.1	Pass
4.2	24.3	833.49	-1.3	Pass

- TM3, 25 °C ,Channel No. **283(833.49MHz)**

Table 45 Measurement Results vs. Variation of Voltage—TM3

Voltage	Conducted Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.4	24.3	833.49	2.2	Pass
3.7	24.3	833.49	2.5	Pass
4.2	24.3	833.49	1.2	Pass

6.7.5 Conclusion

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

7 EMC Test

7.1 Conducted Emission at Power Port

7.1.1 Test Conditions

Table 46 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	+25°C
Relative humidity:	52 %
Test Configurations:	TM1 at frequency M

7.1.2 Test Specifications and Limits

7.1.2.1 Specification

CFR 47 (FCC) part 15.107

7.1.2.2 Supporting Standards

Table 47 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

7.1.2.3 Limits

Compliance with part 15.107, conducted emission must meet the requirement of following table.

Table 48 Limits

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	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.

7.1.3 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 Mobile Phone C2008 was communicated with the BTS simulator through Air interface, the BTS simulator controls the C2008 to transmitter the maximum power which defined in specification of product. The Mobile Phone operated on the typical channel.

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

Test Set-up

The Mobile Phone was setup in the screened chamber and operated under nominal conditions.

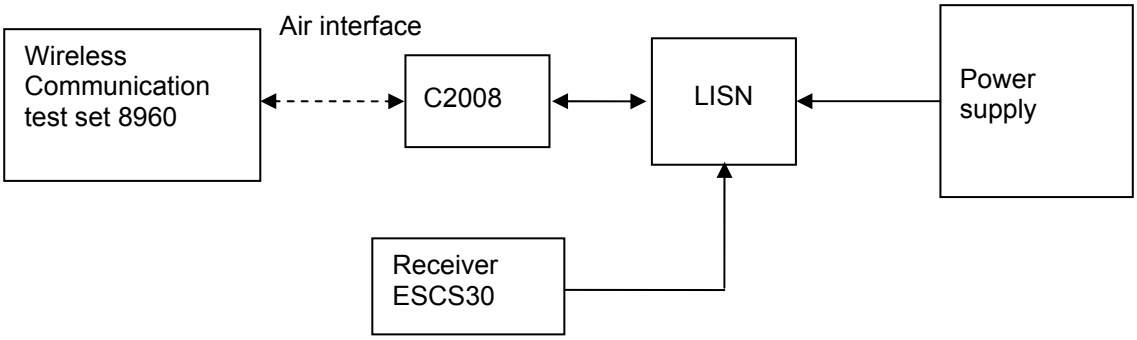


Figure 10. Test Set-up

7.1.4 Measurement Results

Table 49 MEASUREMENT RESULT:QP DECTER

Frequency (MHz)	Level (dBμV)	Transd (dB)	Limit (dBμV)	Margin (dB)	Line	PE
0.150000	37.20	11.0	66	28.8	N	FLO
0.721500	44.50	9.9	56	11.5	L3	FLO
2.049000	47.10	10.1	56	8.9	L3	FLO
2.103000	42.90	10.1	56	13.1	L3	FLO
5.779500	25.20	10.2	60	34.8	L3	FLO
22.888500	21.20	15.5	60	38.8	N	FLO

Table 50 MEASUREMENT RESULT:AV DECTER

Frequency (MHz)	Level (dBμV)	Transd (dB)	Limit (dBμV)	Margin (dB)	Line	PE
0.204000	30.00	10.5	53	23.4	N	FLO
0.681000	29.30	10.0	46	16.7	L3	FLO
2.053500	30.80	10.1	46	15.2	L3	FLO
2.382000	30.30	10.1	46	15.7	L3	FLO
5.622000	23.10	10.2	50	26.9	L3	FLO
22.213500	13.60	14.9	50	36.4	L3	FLO

7.1.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix F with 2 pages.

7.2 Radiated Emission of Enclosure in Ideal Mode

7.2.1 Test Conditions

Table 51 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	+25 °C
Relative humidity:	51 %
Test Configurations:	TM1 at frequency M

7.2.2 Test Specifications and Limits

7.2.2.1 Specification

CFR 47 (FCC) part 15.109

7.2.2.2 Supporting Standards

Table 52 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

7.2.2.3 Limits

The Radiated Emission of enclosure of EUT should compliance with the requirement of part15.109. The limit showed in following table.

Table 53 Limits

Frequency of Emission (MHz)	Radiated Limit	
	Unit(μv/m)	Unit(dBμV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
960-1000	500	54

7.2.3 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 ANSI C63.4.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.

HUAWEI Mobile Phone C2008 was communicated with the BTS simulator through Air interface. The C2008 operated on the typical channel and the Mobile Phone worked in idle mode, transmitter was not work in this test.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 k Hz

Test set up

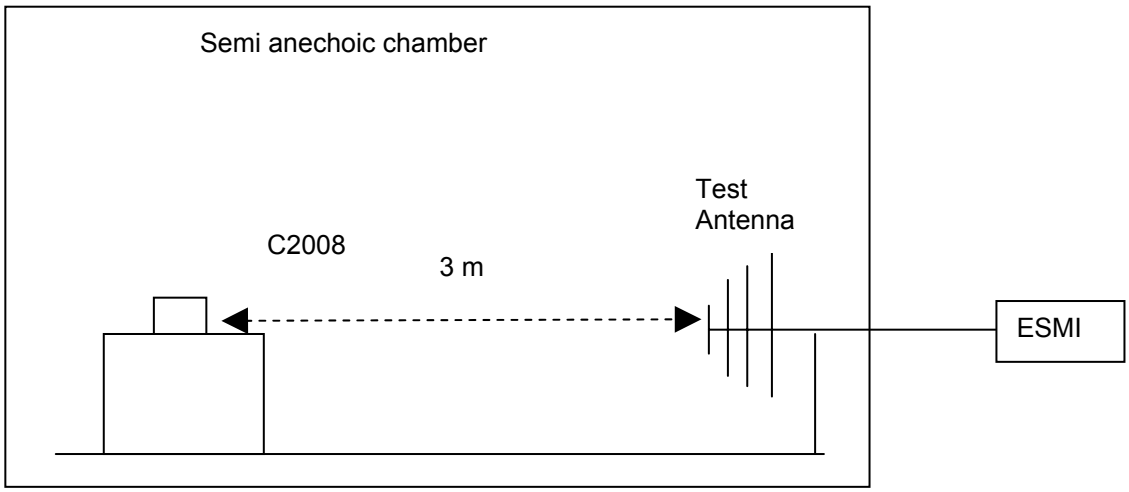


Figure 11. Test set up

7.2.4 Measurement Results

Table 54 MEASUREMENT RESULT: QP DECTER

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
48.780000	31.70	-13.5	40.0	8.3	100.0	48.00	VERTICAL
57.960000	23.50	-16.2	40.0	16.5	100.0	42.00	VERTICAL
119.10000	17.20	-9.8	43.5	26.3	200.0	137.00	HORIZONTAL
198.12000	19.40	-11.8	43.5	24.1	117.0	162.00	HORIZONTAL
282.60000	21.70	-7.3	46.0	24.3	100.0	243.00	HORIZONTAL
558.73000	25.80	-2.0	46.0	20.2	152.0	211.00	HORIZONTAL

7.2.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix G with 2 pages.

8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Table 55 System Measurement Uncertainty

Items		Extended Uncertainty
Effective Radiated Power of Transmitter	ERP(dBm)	U=3dB; k=2
Band Width	Magnitude (%)	U＝0.2%; k=2
Band Edge Compliance	Disturbance Power （dBm）	U＝2.0dB; k=2
Conducted Spurious Emission at Antenna Terminal	Disturbance Power （dBm）	U＝2.0dB; k=2
Frequency Stability	Frequency Accuracy(ppm)	U＝0.21ppm; k=2
Field Strength of Spurious Radiation	ERP(dBm)	U=3dB; k=2
Conducted Output Power	Power(dBm)	U=0.39dB; k=2
Conducted Emission at Power Port	Disturbance Voltage （dBμV）	U=4dB; k=2
Radiated Emission of enclosure at ideal mode	Field strength （dBμV/m）	U=5dB; k=2

9 Appendixes

Appendix A	Measurement Results Modulation Characteristics	3 pages
Appendix B	Measurement Results Occupied Bandwidth	7 pages
Appendix C	Measurement Results Band Edges	5 pages
Appendix D	Measurement Results Spurious Emission at Antenna Terminal	19 pages
Appendix E	Measurement Results Radiated Spurious Emission	7 pages
Appendix F	Measurement Results Conducted Emission at Power Port	2 pages
Appendix G	Measurement Results Radiated Emission of Enclosure at Ideal Mode	2 pages
Appendix H	Photos of Test Setup	4 pages