FCC
RF Test Report

Product Name: CDMA 1X Digital Mobile Phone with Bluetooth

Model Number: M615

Report No: SYBH(Z-RF)022032011-2003
FCC ID: QISC6070

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice

1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.
2. 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.
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9. 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.

Notice 2

Modification Information:

Table 1 Modification Information

Modification Information	1	
	2	
	3	Not Applicable!
	4	
	5	
	6	
	7	

REGULATION	FCC CFR47 Part 2: Subpart J;
	FCC CFR47 Part 27 : Subpart C&L;
START OF TEST	Mar.15, 2011
END OF TEST	Mar.18, 2011
Final Judgement:	Pass

Approved By	2011-03-24	Chen Xiaohong	Chen Xiaohong
	Date	Name	Signature
Reviewed By	2011-03-24	Xu Guangyi	Xuguangyi
	Date	Name	Signature
Operator	2011-03-24	Wangyue	Rebecca Wang
	Date	Name	Signature

Contents

1 Summary

The table below summarizes the measurements and results for the M615. Detailed results and descriptions are shown in the following pages.

Table 2 Summary of results

FCC Measurement Specification	FCC Limits Part(s)	Description	Result
2.1046	27.50(d)(2)	Effective Radiated Power of Transmitter	PASS
2.1046	27.50(d)(2)	Conducted Power of Transmitter	PASS
2.1047	/	Modulation Characteristics	PASS
2.1049	/	Occupied Bandwidth	PASS
2.1051	27.53(g)	Band Edges Compliance	PASS
2.1051	27.53(g)	Spurious Emission at Antenna Terminal	PASS
2.1055	27.54	Frequency Stability	PASS

2 Product Description

2.1 Production Information

2.1.1 General Description

HUAWEI CDMA Mobile Phone M615 is subscriber equipment in the CDMA system. The frequency band is US Cellular, PCS, AWS. The Mobile Phone implements such functions as RF signal receiving / Transmitting, CDMA protocol processing, voice and SMS service etc. It also provides Bluetooth module to synchronize data between a PC and the phone, or to exchange data with other Bluetooth devices.

2.1.2 Support function and Service

The M580 support the function and service as follows:

Table 3 Service and Test mode List

Service Name	Characteristic	Corresponding Test Mode	Note
voice and data	Modulation: QPSK	TM1*	
voice and data	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 4 Modification Information

Model Number	Board/Module	Original Version	New Version	Modify Information

Not applicable

3 Test Site Description

The test site of:

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

3.1 Testing Period

The test have been performed during the period of

Mar. 15, 2011 – Mar. 18, 2011

3.2 General Set up Description

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 5 Frequency Range

1700M Band	
Uplink band:	1710 to 1755 MHz
Downlink band:	2110 to 2155 MHz

4.1.2 Channel Spacing / Separation

Table 6 Channel Spacing / Separation

Channel spacing:	1.23 MHz
Channel raster:	30 KHz

4.1.3 Type of Emission

Table 7 Type of Emission

Emission Designation:	1M23F9W

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

4.1.4 Environmental Requirements

Table 8 Environmental Requirements

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

4.1.5 Power Source

Table 9 Table 8 Power Source

DC voltage nominal:	⎓ 5.0V;
DC voltage range	⎓ 4.75-5.25V
DC current maximal:	400mA

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 10 Applied RF Module DC Voltages and Currents

Voltage:	⎓ 2.85V (for the RF IC)
Current:	150mA According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)
Voltage:	⎓ 3.6V (for the PA module)
Current:	350mA According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)

4.2 EUT Identification List

4.2.1 Board Information

Table 11 Board Information

CDMA 1X Digital Mobile Phone with Bluetooth		
M615		
Board and Module		
Model Name	Serial Number	Description
M615	S9X2B11111400288	Main board of Mobile Phone

4.2.2 Adapter Technical Data

AC/DC Adapter Model:	HS-050040U5	HS-050040U5
Manufacturer:	SHENZHEN HUNTKEY POWER TECHNOLOGY CO., LTD	TECH-POWER ELECTRONICS (SHENZHEN) CO.,LTD
Rated Voltage	~ 120V, 60Hz	~ 120V, 60Hz
Input Voltage:	~ 100-240V 50/60Hz	~ 100-240V 50/60Hz
Output Voltage;	⎓ 5.0 V	⎓ 5.0 V
Rated Power:	2W	2W
S/N:	HKAAA2315490	TPAA42132510

4.2.3 Battery Technical Data

Battery Model:	HB5D1H
Rated capacity:	900 mAh
Nominal Voltage:	⎓ 3.7 V
Charging Voltage:	⎓ 4.2 V

4.2.4 FCC Identification

Grantee Code: **QIS**
Product Code: **C6070**
FCC Identification: **QISC6070**

5 Main Test Instruments

Table 12 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.27,2011
Universal Radio Communication Tester	R&S	CMU200	105822	Oct.24.2011
Wireless Communication Test set	Agilent	N4010A	MY49081592	Dec.14.2011
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug.04,2011
Spectrum Analyzer	Agilent	E4440A	MY49420179	Apr.24,2011
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2011
Temperature Chamber	WEISS	WKL64	24600294	Jan.03,2012
Signal generator	Agilent	E8257D	MY49281095	Jul.9.2011
Vector Signal Generator	R&S	SMU200A	104162	Sep.07,2011
Test receiver	R&S	ESIB26	100318	May.04.2011
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	919/1009	Dec.13.2011
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Dec.13.2011
Horn Antenna	R & S	HF906	359287/005	May.07, 2011
Horn Antenna	R & S	HF906	359287/006	April.27, 2011
Broadband Antenna	SCHAFFNER	CBL 6112B	2536	Sep.21, 2011
Broadband Antenna	SCHAFFNER	CBL 6112B	2941	Jun.11, 2011
Horn Antenna	ETS-LINDGREN	3160	60008	Sep.20.2011
Horn Antenna	ETS-LINDGREN	3160	60006	Oct.27.2011

6 Transmitter Measurements

6.1 Effective Radiated Power of Transmitter (EIRP)

6.1.1 Test Conditions

Table 13 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	25℃
Relative humidity:	55%
Test Configurations:	CDMA 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 27.50(d)2

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 Stations

6.1.2.3 Limits

Compliance with Part 27.232, mobile/portable stations are limited to 1 watts EIRP peak power.
W(dBm)= 10*log ($W_{In\ mW}$).

Table 15 Limits

Maximum Output Power (Watts)	< 1 Watts
Maximum Output Power (dBm)	< 30 dBm

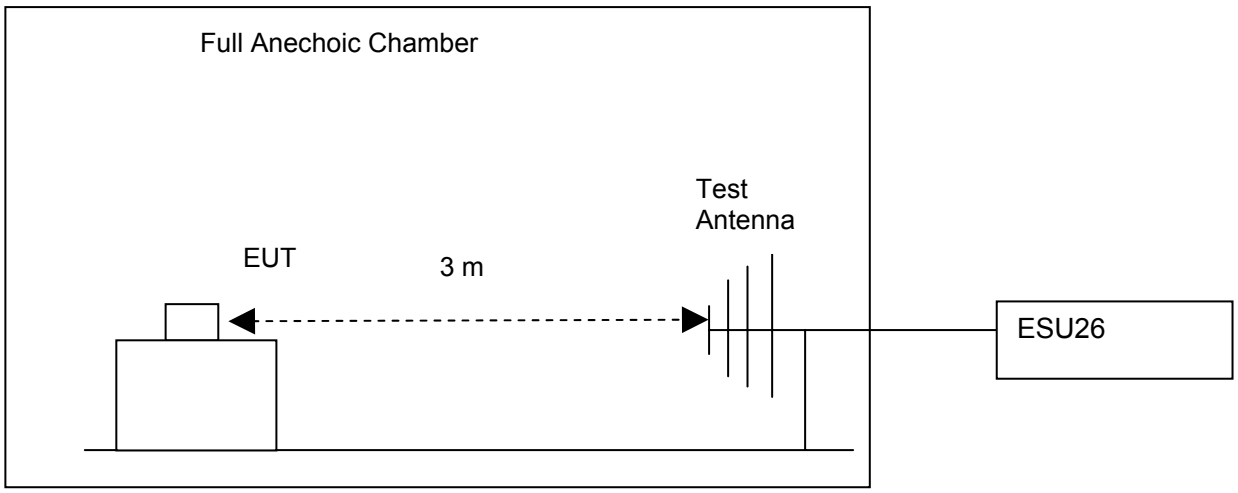
6.1.3 Test Method and Setup

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, EIRP 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 EUT to the wireless communication tester CMU200 via the air interface. The band is set as AWS.

(b) Test the Radiated maximum output power by the CMU200 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 CMU200, 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 EIRP

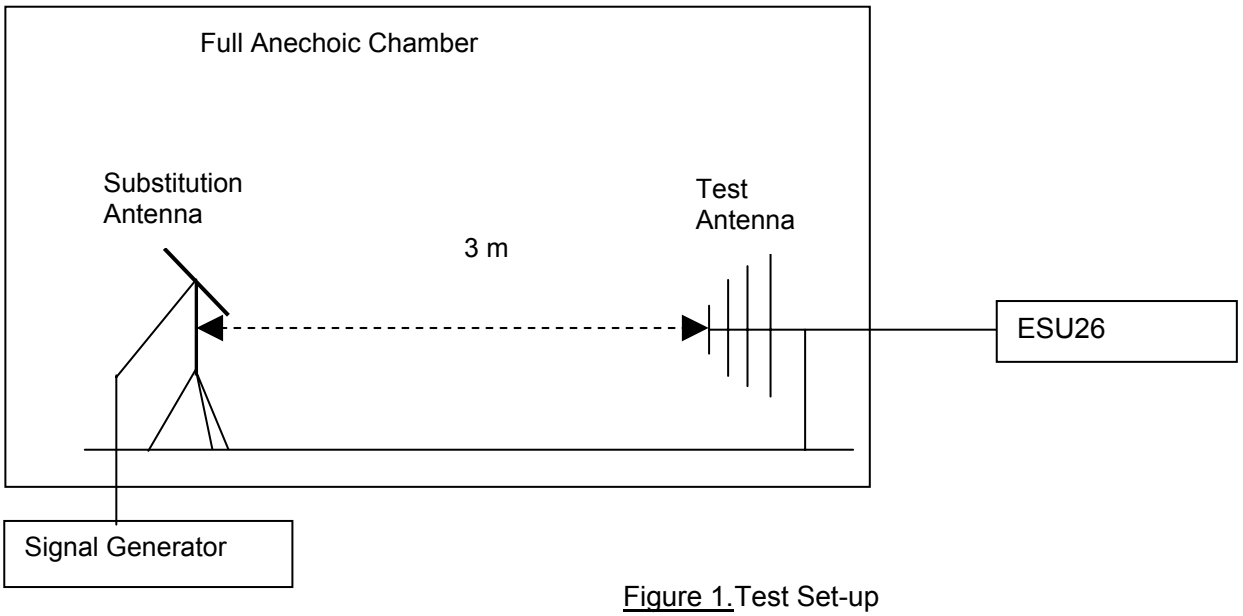


Figure 1.Test Set-up

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.
There is a constant difference of 2.15 dB between ERP and EIRP.
EIRP (dBm)= ERP (dBm) + 2.15 (ITU-R Recommendation SM.329-10).
EIRP was measured using 1 host.

6.1.4 Measurement Results

6.1.4.1 Pre-test Results

Table 16 Pre-test Measurement Results

TEST CONDITIONS		RF Output Power(ERP)					
		Channel25(B) 1711.25MHz		Channel 425(M) 1731.25MHz		Channel 875(T) 1753.75MHz	
		dBm		dBm		dBm	
		Measured	Limit	Measured	Limit	Measured	Limit
TM1	T_{nom} (25 °C) V_{nom} (3.7V)	23.74	33	23.82	33	23.76	33
TM3	T_{nom} (25 °C) V_{nom} (3.7V)	23.67	33	23.78	33	23.77	33

6.1.4.2 Substitution Results

Table 17 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	Result
TM1	1711.25	23.74	Dipole Ant..	27.03	-2.18	1	23.85	Pass
TM1	1731.25	23.82	Dipole Ant..	27.37	-2.46	1	23.91	Pass
TM1	1753.75	23.76	Dipole Ant..	27.62	-2.77	1	23.85	Pass
TM3	1711.25	23.67	Dipole Ant..	27.02	-2.18	1	23.84	Pass
TM3	1731.25	23.78	Dipole Ant..	27.04	-2.46	1	23.58	Pass
TM3	1753.75	23.77	Dipole Ant..	27.46	-2.77	1	23.69	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]

NOTE: SGP- Signal Generator Level

b, A CDMA EVDO signal with bandwidth of 1.23MHz is 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 Conducted Power of Transmitter

6.2.1 Test Conditions

Table 18 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	52 %
Test Configurations:	CDMA TM1 and TM3 at frequency B,M ,T

6.2.2 Test Specifications and Limits

6.2.2.1 Specification

CFR 47 (FCC) part 2.1047 and Part 27.50(d)(2)

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 Stations

6.2.2.3 Limits

Compliance with Part 27.232, in no any case may the peak power of a mobile station transmitter exceed 2 W. The calculated longitude EIRP by following formula:

EIRP(dBm)= 10*log (EIRP $_{mW}$).

And for conducted power, we can use Antenna Gain to calculate the limit. So the conducted power:

$P_{cod.}$(dBm)=EIRP(dBm)- Gain(dBi).
and Gain (dBi)= Gain(dBd)+ 2.15dB

Table 20 Limits

Maximum Output Power (Watts)	< 1 Watts (30 dBm)
Antenna Gain(dBi):	-0.41
Maximum Conducted Output Power (dBm)	< 29

6.2.3 Test Method and Setup

(a)For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, Conducted maximum power 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 EUT to the wireless communication tester CMU200 via the antenna connector. The band class is set as AWS.
(b)Test the Conducted maximum output power by the CMU200.

Test setup

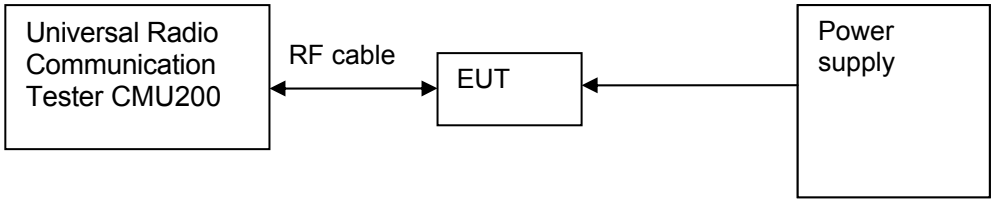


Figure 2. Test Set-up

6.2.4 Measurement Results

Table 21Measurement Results

TEST CONDITIONS		RF Output Power(ERP)					
		Channel 25(B) 1711.25MHz		Channel 425(M) 1731.25MHz		Channel 875(T) 1753.75MHz	
		dBm		dBm		dBm	
		Measured	Limit	Measured	Limit	Measured	Limit
TM1	Tnom (25 °C) Vnom (3.7V)	24.15	32.4	24.23	32.4	24.17	32.4
TM3	Tnom (25 °C) Vnom (3.7V)	24.08	32.4	24.19	32.4	24.18	32.4

6.2.5 Conclusion

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

6.3 Modulation Characteristics

6.3.1 Test Conditions

Table 22 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	52 %
Test Configurations:	CDMA mode TM1 and TM3 at frequency M

6.3.2 Test Specifications and Limits

6.3.2.1 Specification

CFR 47 (FCC) part 2.1047 and Part 27 Subpart C&L

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 Stations.

6.3.2.3 Limits

No specific modulation characteristics requirement limits in part 2.1047 and part 24 subpart E.

Table 24 Limits

Limits	Not applicable

6.3.3 Test Method and Setup

Connect the Mobile Phone to the Universal Radio Communication Tester CMU200 via the antenna connector. The band class is set as AWS band; the Mobile Phone's output is matched with 50 Ω loads. Test method was according to ANSI/TIA-98-E. The waveform quality of the Mobile Phone was tested.

Test setup

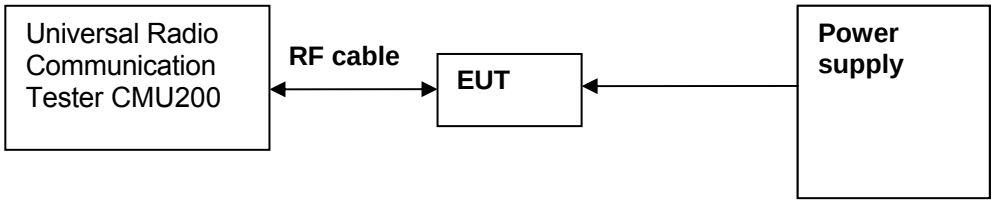


Figure 3.Test Set-up

6.3.4 Measurement Results

Table 25Measurement Results

TEST CONDITIONS		Modulation Characteristic	
		Channel 425(M) 1731.25MHz	
		Measured	
		CDMA Mode TM1	CDMA Mode TM3
T_{nom} (25 °C)	V_{nom} (3.7V)	Refer to Appendix A	Refer to Appendix A

6.3.5 Conclusion

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

For the measurement results refer to appendix A.

6.4 Occupied Bandwidth

6.4.1 Test Conditions

Table 26 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector

Ambient temperature:	25 °C
Relative humidity:	55 %
Test Configurations:	CDMA TM1 and TM3 at frequency B,M ,T

6.4.2 Test Specifications and Limits

6.4.2.1 Specification

CFR 47 (FCC) part 2.1049 and Part 27

6.4.2.2 Supporting Standards

Table 27 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 Stations

6.4.2.3 Limits

No specific occupied bandwidth requirement in Part 27 Subpart C&L, 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 28 Limits

Upper /lower frequency limits	0.5% of the mean power

6.4.3 Test Method and Setup

Mobile Phone was connected to the wireless communication test set CMU200 and the Spectrum Analyzer FSQ31 via the divider. The band class is set as AWS band; Mobile Phone was controlled to transmit Maximum power. Measure and record the Occupied Bandwidth of the Mobile Phone by the Spectrum Analyzer FSQ31

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

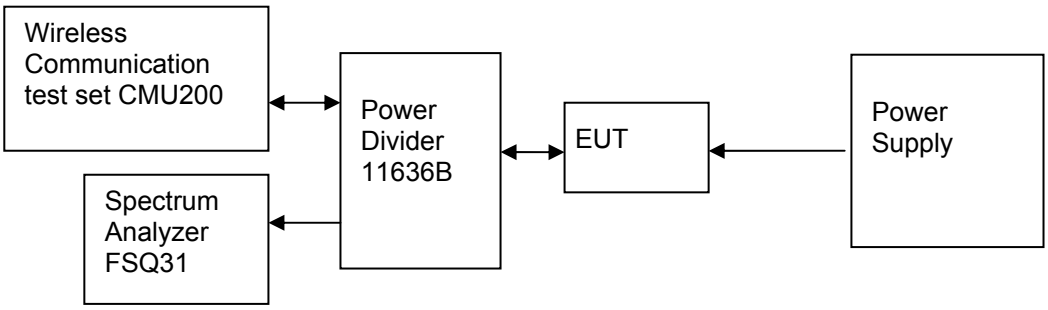


Figure 4.Test Set-up

6.4.4 Measurement Results

Table 29 Measurement Results

TEST CONDITIONS		Occupied Bandwidth					
		Channel 25 (B) 1711.25MHz		Channel 425 (B) 1731.25MHz		Channel 875(T) 1753.75MHz	
		Measured (MHz)		Measured (MHz)		Measured (MHz)	
		CDMA		CDMA		CDMA	
		TM1	TM3	TM1	TM1	TM1	TM1
Tnom (25 °C)	Vnom (3.7V)	1.29	1.29	1.28	1.28	1.30	1.28

6.4.5 Conclusion

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

6.5 Band Edges Compliance

6.5.1 Test Conditions

Table 30 Test Conditions

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

6.5.2 Test Specifications and Limits

6.5.2.1 Specification

CFR 47 (FCC) part 2.1051 and Part 27.53

6.5.2.2 Supporting Standards

Table 31 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 Stations

6.5.2.3 Limits

Compliance with Part 27.50(d) (2), all spurious emission must be attenuated below the transmitter power by at least 43 +10 $\log_{10}$ P (W). (Whereas P is the rated power of the EUT).

Table 32 Limits

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

6.5.3 Test Method and Setup

Mobile Phone was connected to the wireless communication test set CMU200 and the Spectrum Analyzer FSQ31 via the divider, the band class is set as AWS band. Mobile Phone was controlled to transmit Maximum power. Measure and record Band edge compliance of the Mobile Phone by the FSQ31.

Measurement bandwidth (RBW): 13 kHz (Resolution bandwidth)
Video bandwidth (VBW): 130 kHz

Test Set-up

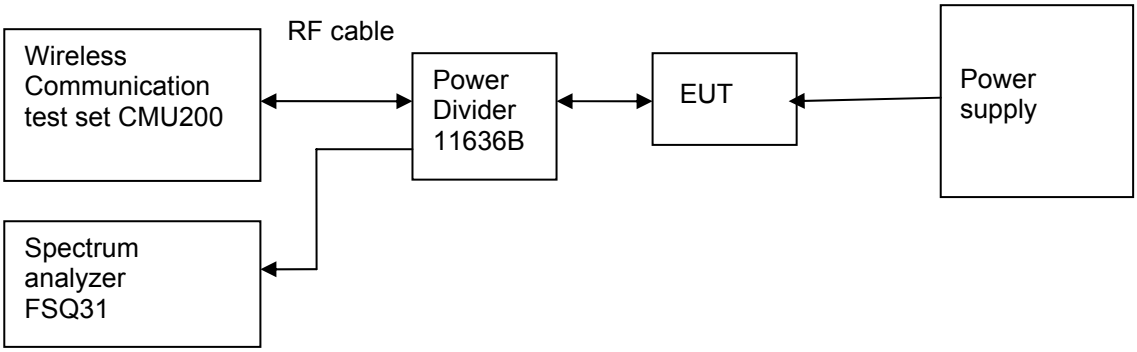


Figure 5. Test Set-up

6.5.4 Measurement Results

Table 33 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
AWS Band	Tnom (25 °C), Vnom (3.7V)						
	1710	25 (B)	TM1 & TM3	24.0	<-13(See appendix C)	- 13 dBm	Pass
	1755	875(T)	TM1 & TM3	24.0	<-13(See appendix C)	- 13 dBm	Pass

6.5.5 Conclusion

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

6.6 Spurious Emission at Antenna Terminal

6.6.1 Test Conditions

Table 34 Test Conditions

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

6.6.2 Test Specifications and Limits

6.6.2.1 Specification

CFR 47 (FCC) part 2.1051 and Part 27.53

6.6.2.2 Supporting Standards

Table 35 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 Stations. Release C

6.6.2.3 Limits

Compliance with Part 27.50(d)(2), 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 36 Limits

Conducted Rated Power:	24 dBm
Required attenuation:	43+10log (0.251) = 37 , 24 dBm – 37 dB
Absolute level	- 13 dBm

6.6.3 Test Method and Setup

Mobile Phone was connected to the wireless communication test set CMU200 and the Spectrum Analyzer FSQ31 via the divider, the band class is set as AWS band. Mobile Phone was controlled to transmit Maximum power. Measure and record the Conducted Spurious Emission of the Mobile Phone by the Spectrum Analyzer FSQ31.

According to part 27.53, the defined measurement bandwidth as following:

24.238(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 150 kHz: 1 kHz;
Measurement bandwidth (RBW) for 150 kHz up to 30 MHz: 10 kHz;
Measurement bandwidth (RBW) for 30 MHz up to 20 GHz: 1 MHz;

Test Set-up

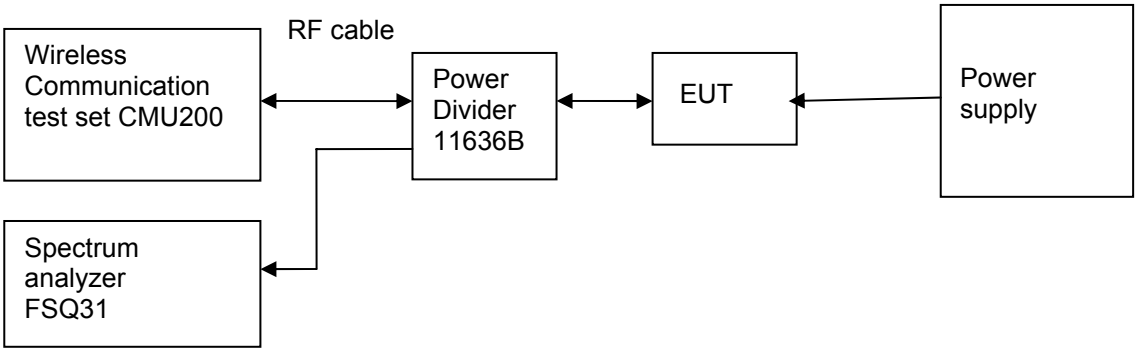


Figure 6. Test Set-up

6.6.4 Measurement Results

Table 37 Measurement Results

Channel Number	Test Mode	Test Range (Frequency)	Conducted Rated Power [dBm]	Spurious Level measured [dBm]	FCC limit	Result
Channel 25(B)	TM1	9 kHz ~20GHz	24.00	<- 13 dBm (See appendix D)	- 13 dBm	Pass
	TM3	9 kHz ~20GHz	24.00	<- 13 dBm (See appendix D)	- 13 dBm	Pass
Channel 425(M)	TM1	9 kHz ~20GHz	24.00	<- 13 dBm (See appendix D)	- 13 dBm	Pass
	TM3	9 kHz ~20GHz	24.00	<- 13 dBm (See appendix D)	- 13 dBm	Pass
Channel 875(T)	TM1	9 kHz ~20GHz	24.00	<- 13 dBm (See appendix D)	- 13 dBm	Pass
	TM3	9 kHz ~20GHz	24.00	<- 13 dBm (See appendix D)	- 13 dBm	Pass

6.6.5 Conclusion

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

6.7 Frequency Stability

6.7.1 Test Conditions

Table 38 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	See below
Relative humidity:	55 % at 25 °C
Test Configurations:	CDMA 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 27.54

6.7.2.2 Supporting Standards

Table 39 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
EIA/TIA-98E: 2003	Recommended Minimum Performance Standards for CDMA2000 Spread Spectrum Mobile Stations.

6.7.2.3 Limits

No specific frequency stability requirement in part 2.1055 and Part 27.50(d)(2).

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

(a) 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.

(b) The frequency stability shall be measured with variation of primary supply voltage as follows:
(1) Vary primary supply voltage from 95 to 105 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.
(c) 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) 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.)

The EUT can only work in such extreme voltage 3.6V and 4.2V，so here the EUT is tested in the 3.6V and 4.2V.

Test Set up

Connect the EUT to the Wireless Communication test set CMU200 via the connector. Then measure the frequency error by the Wireless Communication test set CMU200. The EUT's output is matched with a 50 Ω load.

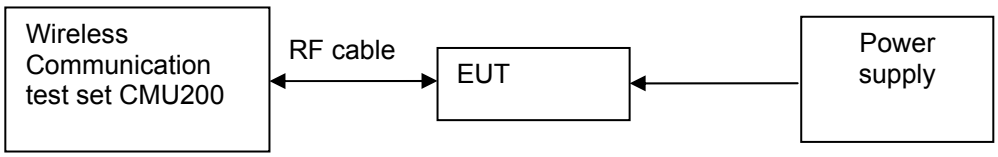


Figure 7. Test Set up

6.7.4 Measurement Results

Measurement Results vs. Variation of Temperature

- AWS,TM1, 3.7V DC Channel No.425**(1731.25MHz)**

Table 40 Measurement Results vs. Variation of Temperature—TM1

Temperature	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	24	1731.25	8	Pass
-20 °C	24	1731.25	-2	Pass
-10 °C	24	1731.25	-9	Pass
0 °C	24	1731.25	-11	Pass
+10 °C	24	1731.25	4	Pass
+20 °C	24	1731.25	12	Pass
+30 °C	24	1731.25	11	Pass
+40 °C	24	1731.25	-5	Pass
+50 °C	24	1731.25	6	Pass

- AWS,TM3, 3.7V DC Channel No.425**(1731.25MHz)**

Table 41 Measurement Results vs. Variation of Temperature—TM3

Temperature	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	24	1731.25	7	Pass
-20 °C	24	1731.25	12	Pass
-10 °C	24	1731.25	-5	Pass
0 °C	24	1731.25	-13	Pass
+10 °C	24	1731.25	7	Pass
+20 °C	24	1731.25	8	Pass
+30 °C	24	1731.25	-2	Pass
+40 °C	24	1731.25	7	Pass
+50 °C	24	1731.25	2	Pass

Measurement Results vs. Variation of Voltage

- TM1, 25 °C ,Channel No. 425**(1731.25MHz)**

Table 42 Measurement Results vs. Variation of Voltage－TM1

Voltage	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.6	24	1731.25	6	Pass
3.7	24	1731.25	-11	Pass
4.2	24	1731.25	8	Pass

- TM3, 25 °C ,Channel No. 425**(1731.25MHz)**

Table 43 Measurement Results vs. Variation of Voltage－TM3

Voltage	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.6	24	1731.25	-7	Pass
3.7	24	1731.25	5	Pass
4.2	24	1731.25	-13	Pass

6.7.5 Conclusion

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

7 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 44 System Measurement Uncertainty

Items		Extended Uncertainty
Effective Radiated Power of Transmitter	EIRP (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

8 Appendices

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