FCC
RF Test Report

Product Name:
CDMA 1X Digital Mobile Phone with Bluetooth

Model Number: M635

Report No: SYBH(Z-RF)006042011-2002
FCC ID: QISC6071

Reliability Laboratory of Huawei Technologies Co., Ltd.

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

Tel: +86 755 28780808 Fax: +86 755 89652518

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.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-1.
4. The test report is invalid if not marked with "exclusive stamp for the test report".
5. 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.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. 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.
8. Normally, the test report is only responsible for the samples that have undergone the test.
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	

REPORT ON	**RF TEST OF CDMA 1X Digital Mobile Phone with Bluetooth**
	M/N: M635
REGULATION	**FCC CFR47 Part 2: Subpart J;**
	FCC CFR47 Part 24 : Subpart E;
START OF TEST	**Mar.23, 2011**
END OF TEST	**Mar.26, 2011**
Final Judgement:	**Pass**

Chen Xiaohong

Approved By **2011-04-08** **Chenxiaohong**
Date **Name** **Signature**

Xuguangyi

Reviewed By **2011-04-08** **Xuguangyi**
Date **Name** **Signature**

Rebecca Wang

Operator **2011-04-08** **Wangyue**
Date **Name** **Signature**

CONTENT

1 Summary

The table below summarizes the measurements and results for the M635. 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	24.232	Effective Isotropic radiated power of Transmitter	PASS
2.1046	24.232	Conducted Power of Transmitter	PASS
2.1047		Modulation Characteristics	PASS
2.1049		Occupied Bandwidth	PASS
2.1051	24.238	Band Edges Compliance	PASS
2.1051	24.238	Spurious Emission at Antenna Terminal	PASS
2.1055	24.235	Frequency Stability	PASS
2.1053	24.238	Radiated Spurious Emissions	See Note

Note: The Radiated Spurious Emissions' test results are shown in the EMC report.

2 Product Description

2.1 Production Information

2.1.1 General Description

HUAWEI CDMA Mobile Phone M635 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 M635 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. 23, 2011 – Mar. 26, 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

Uplink band:	1850 to 1910 MHz
Downlink band:	1930 to 1990 MHz

4.1.2 Channel Spacing / Separation

Table 6 Channel Spacing / Separation

Channel spacing:	50 kHz
Channel raster:	1.25 MHz

4.1.3 Type of Emission

Table 7 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 8 Environmental Requirements

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

4.1.5 Power Source

Table 9 Power Source

DC voltage nominal:	⎓ 5.0 V;
DC voltage range	⎓ 4.75 - 5.25 V
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 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		
M635		
Board and Module		
Software Version	Serial Number	Hardware Version
M635C45B105	Z7H2B11112100213	Ver.B

4.2.2 Adapter Technical Data

Table 12 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

Table 13 Battery Technical Data

Name	Qty.	Manufacture	Serials number	Description
Rechargeable Li-ion	1	Huawei Technologies Co., Ltd.	YAC9921H13913846	Battery Model: HB4A1H Rated capacity: 900mAh Nominal Voltage: ⎓ +3.7V Charging Voltage: ⎓ +4.2V

4.2.4 FCC Identification

Grantee Code: **QIS**
Product Code: **C6071**
FCC Identification: **QISC6071**

5 Main Test Instruments

Table 14 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.27,2011
Wireless Communication Test set	Agilent	N4010A	MY49081592	Dec.14.2011
Universal Radio Communication Tester	R&S	CMU200	105822	Oct.24.2011
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug.04,2011
Spectrum Analyzer	Agilent	E4440A	MY49420179	Apr.24,2011
Signal Analyzer	R&S	FSQ40	100025	Oct.09,2011
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2011
Temperature Chamber	ESPEC	MW3030	611403	May.12,2011
Signal Generator	R&S	SMR40	100325	May.12,2011
Vector Signal Generator	R&S	SMU200A	104162	Sep.07,2011
Spectrum Analyzer	R&S	FSU26	EG26725	Mar.07,2012
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 Isotropic radiated power of Transmitter (EIRP)

6.1.1 Test Conditions

Table 15 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 24 subpart E

6.1.2.2 Supporting Standards

Table 16 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 24.232, mobile/portable stations are limited to 2 watts EIRP peak power.
W(dBm)= 10*log ($W_{In\ mW}$).

Table 17 Limits

Maximum Output Power (Watts)	< 2 Watts
Maximum Output Power (dBm)	< 33 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

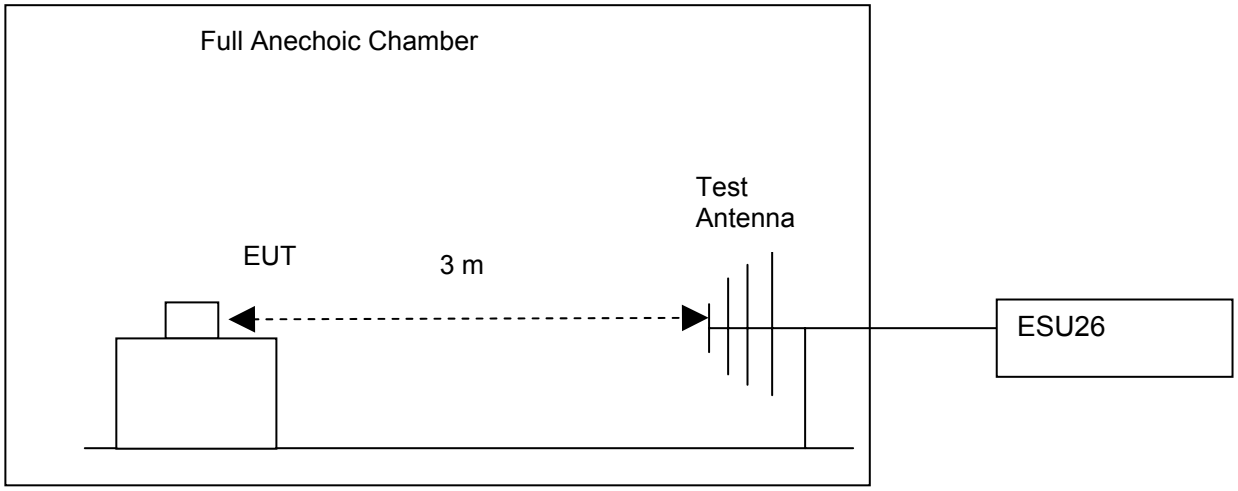
2.1033(c)(8). Connect the EUT to the wireless communication tester CMU200 via the air interface. The band is set as PCS.

(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 horn antenna. The horn 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

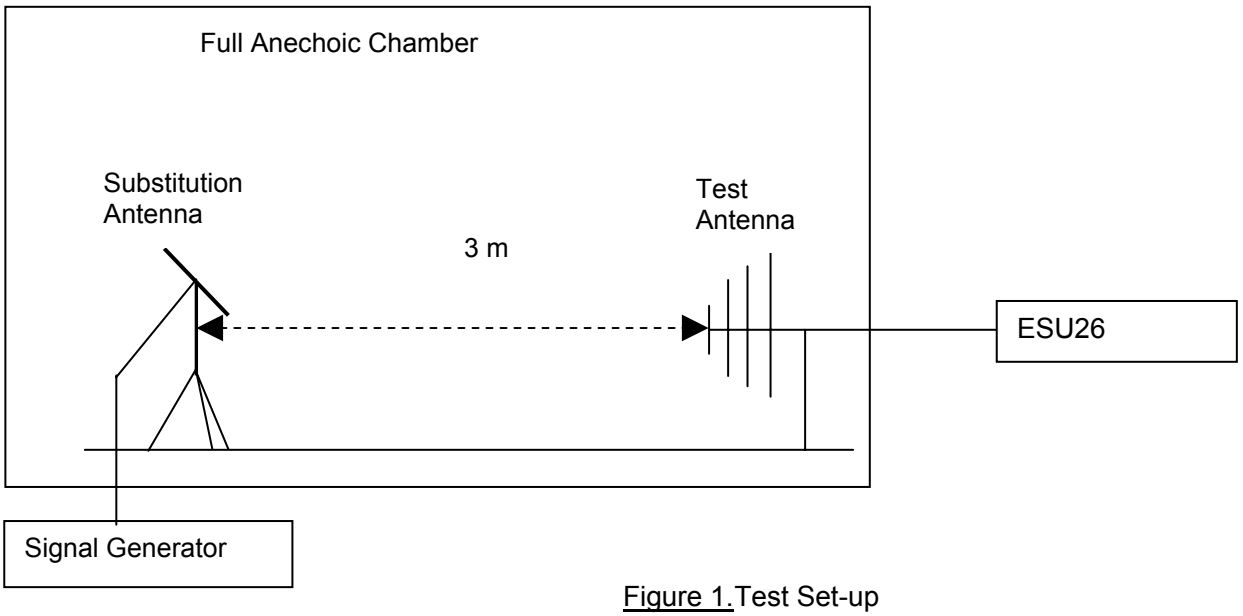


Figure 1.Test Set-up

NOTE: Effective Isotropic radiated power (EIRP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave horn antennas.
There is a constant difference of 2.15 dB between EIRP and ERP.
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 18 Measurement Results

TEST CONDITIONS		RF Output Power					
		Channel25(B) 1851.25MHz		Channel600(M) 1880MHz		Channel 1175(T) 1908.75MHz	
		dBm		dBm		dBm	
		Measured	Limit	Measured	Limit	Measured	Limit
TM1	T_{nom} (25 °C) V_{nom} (3.7V)	24.89	33	24.92	33	24.90	33
TM3	T_{nom} (25 °C) V_{nom} (3.7V)	24.91	33	24.88	33	24.93	33

1`

6.1.4.2 Substitution Results

Table 19 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
TM1	11851.25	24.89	Horn Ant.	21.28	4.5	1.0	24.78	33	Pass
TM1	1880.0	24.92	Horn Ant.	21.55	4.5	1.0	25.05	33	Pass
TM1	1908.75	24.90	Horn Ant.	21.28	4.8	1.0	25.08	33	Pass
TM3	11851.25	24.91	Horn Ant.	21.52	4.5	1.0	25.02	33	Pass
TM3	1880.0	24.88	Horn Ant.	21.50	4.5	1.0	25. 00	33	Pass
TM3	1908.75	24.93	Horn Ant.	21.08	4.8	1.0	24.88	33	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 20 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 24 subpart E

6.2.2.2 Supporting Standards

Table 21 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 24.232, 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 ($EIRP_{in\ mW}$).

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 22 Limits

Maximum Output Power (Watts)	< 2 Watts (33 dBm)
Antenna Gain(dBi):	0.66
Maximum Conducted Output Power (dBm)	< 32

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 M635 to the wireless communication tester CMU200 via the antenna connector. The band class is set as PCS.
(b)Test the Conducted maximum output power by the CMU200.

Test setup

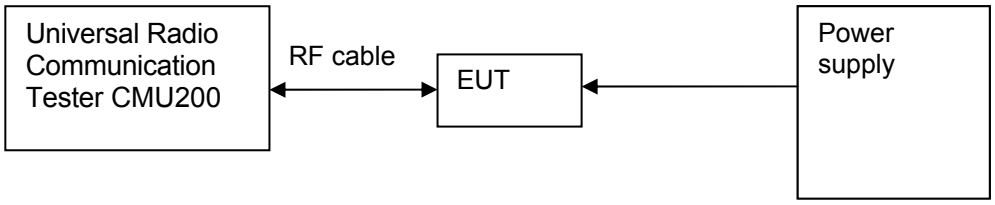


Figure 2. Test Set-up

6.2.4 Measurement Results

Table 23 Measurement Results

PCS band TEST CONDITIONS		RF Output Power					
		Channel 25(B) 1851.25MHz		Channel600(M) 1880MHz		Channel 1175(T) 1908.75MHz	
		dBm		dBm		dBm	
		Measured	Limit	Measured	Limit	Measured	Limit
TM1	T_{nom} (25 °C) V_{nom} (3.7V)	24.23	34.27	24.26	34.27	24.24	34.27
TM3	T_{nom} (25 °C) V_{nom} (3.7V)	24.25	34.27	24.22	34.27	24.27	34.27

6.2.5 Conclusion

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

6.3 Modulation Characteristics

6.3.1 Test Conditions

Table 24 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 M

6.3.2 Test Specifications and Limits

6.3.2.1 Specification

CFR 47 (FCC) part 2.1047 and part 24 subpart E

6.3.2.2 Supporting Standards

Table 25 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 26 Limits

Limits	Not applicable

6.3.3 Test Method and Setup

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

Test setup

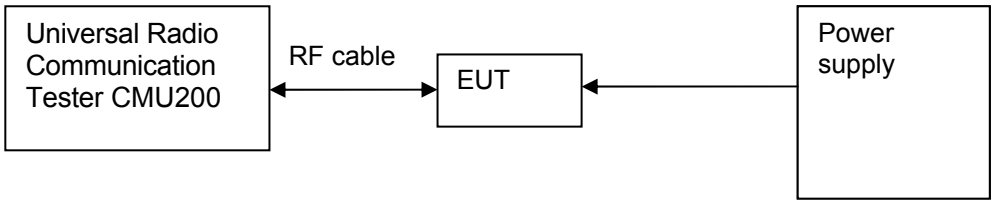


Figure 3.Test Set-up

6.3.4 Measurement Results

Table 27Measurement Results

TEST CONDITIONS		Modulation Characteristic	
		Channel600(M) 1880MHz	
		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 28 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 24 subpart E

6.4.2.2 Supporting Standards

Table 29 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 24 subpart E, 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 30 Limits

Upper /lower frequency limits	0.5% of the mean power

6.4.3 Test Method and Setup

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

For TM1/TM2 following RBW and VBW are employed:
Measurement bandwidth (RBW): 3 kHz (Resolution bandwidth)
Video bandwidth (VBW): 10 kHz
For TM3 following RBW and VBW are employed:
Measurement bandwidth (RBW): 50 kHz (Resolution bandwidth)
Video bandwidth (VBW): 500 kHz

Test Set-up

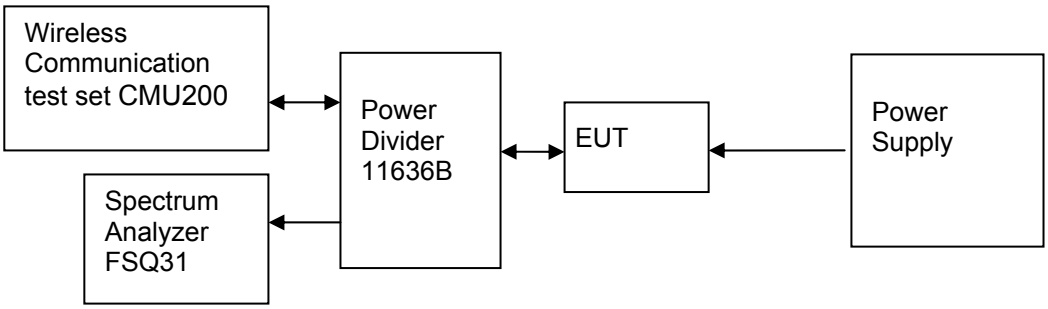


Figure 4.Test Set-up

6.4.4 Measurement Results

Table 31 Measurement Results

TEST CONDITIONS		Occupied Bandwidth					
		Channel25(B) 1851.25MHz		Channel600 (M) 1880MHz		Channel1175(T) 1908.75MHz	
		Measured (MHz)		Measured (MHz)		Measured (MHz)	
		CDMA		CDMA		CDMA	
		TM1	TM3	TM1	TM3	TM1	TM3
Tnom (25 °C)	Vnom (3.7V)	1.28	1.28	1.33	1.30	1.32	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 32 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 Part24 Subpart E

6.5.2.2 Supporting Standards

Table 33 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 24.238, 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 34 Limits for GPRS

Rated Power:	21.0dBm
Required attenuation:	43+10log (0.125) = 34.0, 21.0dBm – 34.0dB
Absolute level	- 13 dBm

6.5.3 Test Method and Setup

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

Measurement bandwidth (RBW): 13 kHz (Resolution bandwidth)
Video bandwidth (VBW): 130 kHz
For TM3 following RBW and VBW are employed:
Measurement bandwidth (RBW): 50 kHz (Resolution bandwidth)

Video bandwidth (VBW): 200 kHz

Test Set-up

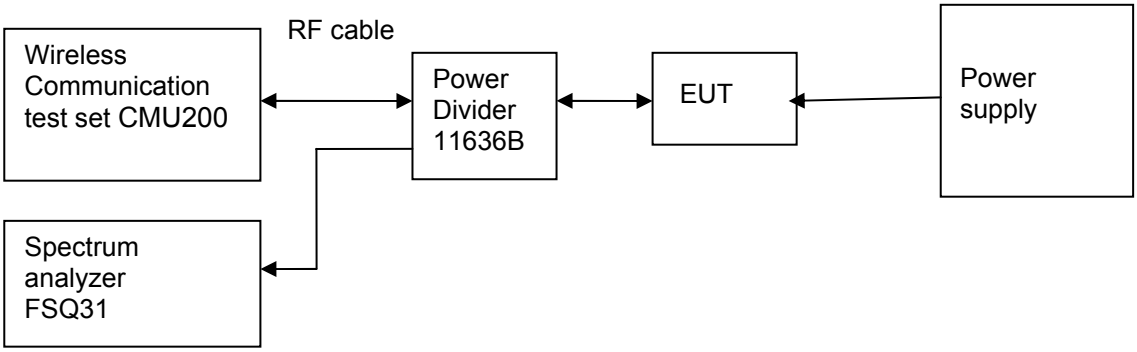


Figure 5. Test Set-up

6.5.4 Measurement Results

Table 35 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
PCS Band	T_{nom} (25 °C), V_{nom} (3.7V)						
	1851.25	25 (B)	TM1 & TM3	24	<-13(See appendix C)	- 13 dBm	Pass
	1908.75	1175 (T)	TM1 & TM3	24	<-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 36 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,T

6.6.2 Test Specifications and Limits

6.6.2.1 Specification

CFR 47 (FCC) part 2.1051 and Part24 Subpart E

6.6.2.2 Supporting Standards

Table 37 Supporting Standards:

Rated Power:	21.0dBm
Required attenuation:	43+10log (0.125) = 34.0, 21.0dBm – 34.0dB
Absolute level	- 13 dBm

6.6.2.3 Limits

Compliance with part 24.238, 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 38 Limits for GPRS Mode

Rated Power:	21.0dBm
Required attenuation:	43+10log (0.125) = 34.0, 21.0dBm – 34.0dB
Absolute level	- 13 dBm

6.6.3 Test Method and Setup

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

According to part 24.238, 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 1000 kHz or greater.

Measurement bandwidth (RBW) for 9 kHz up to 150kHz: 1kHz;
Measurement bandwidth (RBW) for 150kHz up to 30MHz: 10kHz;
Measurement bandwidth (RBW) for 30MHz up to 20GHz: 1MHz;

Test Set-up

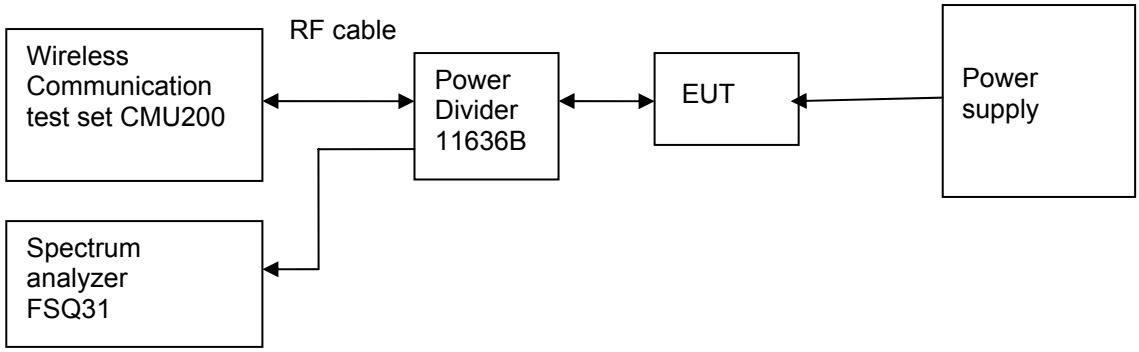


Figure 6. Test Set-up

6.6.4 Measurement Results

Table 39 Measurement Results

Channel Number	Test Mode	Test Range (Frequency)	Output Power [dBm]	Spurious Level measured [dBm]	FCC limit	Result
Channel 25(B)	TM1	9 kHz ~20GHz	24	<- 13 dBm (See appendix_D)	- 13 dBm	Pass
	TM3	9 kHz ~20GHz	24	<- 13 dBm (See appendix_D)	- 13 dBm	Pass
Channel 600(M)	TM1	9 kHz ~20GHz	24	<- 13 dBm (See appendix_D)	- 13 dBm	Pass
	TM3	9 kHz ~20GHz	24	<- 13 dBm (See appendix_D)	- 13 dBm	Pass
Channel 1175(T)	TM1	9 kHz ~20GHz	24	<- 13 dBm (See appendix_D)	- 13 dBm	Pass
	TM3	9 kHz ~20GHz	24	<- 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 40 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 Part24 Subpart E

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
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 24.235.

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.

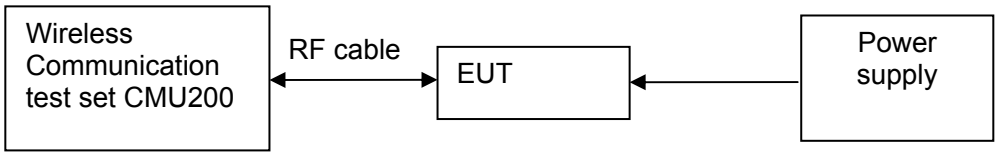


Figure 7. Test Set up

6.7.4 Measurement Results

6.7.4.1 Measurement Results vs. Variation of Temperature

- PCS,TM1, 3.7V DC Channel No.600**(1880MHz)**

Table 42 Measurement Results vs. Variation of Temperature—TM1

Temperature	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	24	1880	11	Pass
-20 °C	24	1880	-9	Pass
-10 °C	24	1880	-11	Pass
0 °C	24	1880	7	Pass
+10 °C	24	1880	11	Pass
+20 °C	24	1880	5	Pass
+30 °C	24	1880	-6	Pass
+40 °C	24	1880	-11	Pass
+50 °C	24	1880	-7	Pass

- PCS,TM3, 3.7V DC Channel No.600**(1880MHz)**

Table 43 Measurement Results vs. Variation of Temperature—TM3

Temperature	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	24	1880	8	Pass
-20 °C	24	1880	-10	Pass
-10 °C	24	1880	8	Pass
0 °C	24	1880	11	Pass
+10 °C	24	1880	9	Pass
+20 °C	24	1880	-11	Pass
+30 °C	24	1880	10	Pass
+40 °C	24	1880	8	Pass
+50 °C	24	1880	7	Pass

6.7.4.2 Measurement Results vs. Variation of Voltage

- TM1, 25 °C ,Channel No. 600**(1880MHz)**

Table 44 Measurement Results vs. Variation of Voltage—TM1

Voltage	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.6	24	1880	-11	Pass
3.7	24	1880	-11	Pass
4.2	24	1880	15	Pass

- TM3, 25 °C ,Channel No. 600**(1880MHz)**

Table 45 Measurement Results vs. Variation of Voltage—TM3

Voltage	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.6	24	1880	11	Pass
3.7	24	1880	6	Pass
4.2	24	1880	-12	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 46 System Measurement Uncertainty

Items		Extended Uncertainty
Effective Isotropic 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