

FCC PART 22 TYPE APPROVALS EMI MEASUREMENT AND TEST REPORT

For

ZTE Corporation

ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen,
Guangdong 518057, P.R. of China

FCC ID: Q78-MG880
Model: MG880

This Report Concerns: <input checked="" type="checkbox"/> Original Report		Product Type: 800 MHz CDMA2000 1X Wireless Data Terminal
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Report No.:	R200705001	
Report Date:	2007-05-30	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ZTE Corporation's product, FCC ID: Q78-MG880 or the "EUT" as referred to in this report is a 800 MHz CDMA2000 1X Wireless Data Terminal, which measures approximately 80mm(L)×36mm(W)×12.8mm(H).

The frequency range is TX 824MHz~849MHz,

RX 869MHz~894MHz.

EUT Photo



Additional Photos in Exhibit C

Objective

This type approval report is prepared on behalf of ZTE Corporation in accordance with Part 2, Subpart J, Part 22 Subpart H of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristic, occupied bandwidth, spurious emission at antenna terminal, field strength of spurious radiation, frequency stability, band edge, and conducted and radiated margin.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services

Applicable Standards: TIA-98-E, TIA 603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurement was performed at Reliability Test Center of ZTE Corporation. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site used by Reliability Test Center of ZTE Corporation to collect radiated and conducted emission measurement data is located at it's facility in Shenzhen, Guangdong, P.R. China.

Test site at Reliability Test Center of ZTE Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC).

The detail of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 25, 2005. The facility also complies with the radiated and conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC file 373926. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, ZTE Corporation Reliability Test Center is accredited by China National Accreditation Service for conformity Assessment (CNAS), Accredited Program (Lab Code L0611).

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603 C.

The final qualification test was performed with the EUT operating at normal mode.

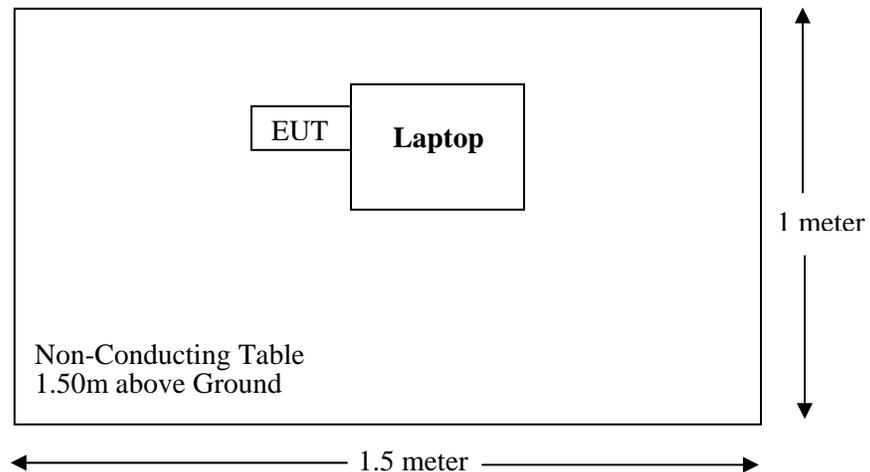
Equipment Modifications

No modifications were made to the EUT.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Agilent	Wireless communication test set	8960 E5515C	GB42431673

Test Setup Block Diagram



SUMMARY OF TEST RESULTS

FCC Rule	Description of Test	Result
CFR47 § 2.1047	Modulation Characteristics	N/R
CFR47 § 2.1053	Spurious Radiated Emissions	Compliant
CFR47 § 2.1093	RF Exposure	Compliant, Please refer to SAR report
CFR47 § 2.1046, CFR47 § 22.912 (d)	RF Output Power	Compliant
CFR47 § 2.1049 CFR47 § 22.917 CFR47 § 22.905	Out of Band Emission, Occupied Bandwidth	Compliant
CFR47 § 2.1051, CFR47 § 22.917	Spurious Emissions at Antenna Terminals	Compliant
CFR47 § 2.1055 (a) CFR47 § 2.1055 (d) CFR47 § 22.355	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
CFR47 § 22.917	Band Edge	Compliant

CFR47 §2.1047 - MODULATION CHARACTERISTIC

Applicable Standard

Requirement: CFR47 § 2.1047(d).

Result: As part 22H has not specific requirement for CDMA modulation, therefore modulation Characteristic is not presented.

CFR47 §2.1053 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

Requirements: CFR 47 § 2.1053.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a 50 ohms load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 log (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log₁₀ (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Wireless communication test set	8960 E5515C	GB42431673	2007-01-18
Agilent	Spectrum Analysis	E4405B	MY41440292	2007-01-18
Agilent	CW Signal Generator	8664A	3744A02962	2007-01-18
Agilent	Signal Generator	E4438C	MY42082381	2007-01-18
Jiesai	Directional coupler	OHQ400	N/A	N/A
Mini	Power Division or Combine	ZB3PD	N/A	N/A
RF Cable	1 meter N-SMA Type	KENAITE	N/A	Calibration before test
Albatross	Anechoic Chamber	3m Site	N/A	2004-10-10
R&S	Ultra Broadband Antenna	HL562	100022	2003-03-07
R&S	Double-Ridged Waveguide Horn Antenna	HF906 TX	100446	2006-09-20
R&S	EMI Test receiver	ESI26	2173-12-11	2006-12-4

* **Statement of Traceability: BA CL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

* The testing was performed by Bob Xiong on 2007-05-30

Test Result

Worst case reading as follows:

-22.4 dB at 1673.04 MHz

TX Spurious Emission scan 30 MHz - 9GHz (TX) Middle channel (836.52MHz)

Indicated		Table Angle Degree	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain (dB)	Cable Loss (dB)	Absolute Level (dBm)		
1673.04	32.30	80	1.4	v	1673.04	-43.20	9.3	1.5	-35.4	-13	-22.4
3346.08	27.60	180	1.3	v	3346.08	-43.60	10.0	2.2	-35.8	-13	-22.8
3346.08	27.30	0	1.4	h	3346.08	-44.30	10.0	2.2	-36.5	-13	-23.5
2509.56	27.80	180	1.7	v	2509.56	-44.20	9.3	1.9	-36.8	-13	-23.8
2509.56	27.20	200	1.5	h	2509.56	-44.40	9.3	1.9	-37.0	-13	-24.0
1673.04	28.50	70	1.2	h	1673.04	-46.30	9.3	1.5	-38.5	-13	-25.5

Note: No Pre-amplifier.

CFR47 §2.1046, §22.913(a) – RF OUTPUT POWER

Applicable Standard

According to CFR47 §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

Test Procedure

Conducted:

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Wireless communication test set	8960 E5515C	GB42431673	2007-01-18
Agilent	Spectrum Analysis	E4405B	MY41440292	2007-01-18

* **Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

* *The testing was performed by Jeff Zhang on 2007-05-30*

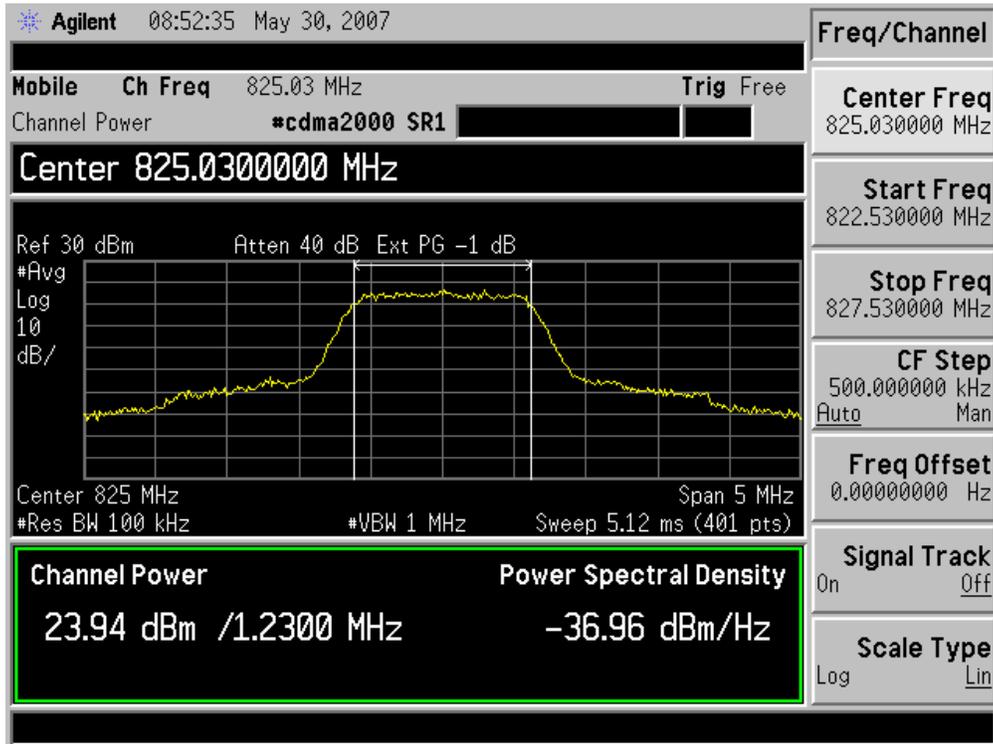
Test Results

Channel	Radio Configuration and Conducted Power (dBm)			
	<i>RC1</i>	<i>RC2</i>	<i>RC3</i>	<i>RC4</i>
Low	23.61	23.87	23.94	23.79
Mid	23.73	23.91	23.78	24.08
High	23.79	24.03	24.52	24.17

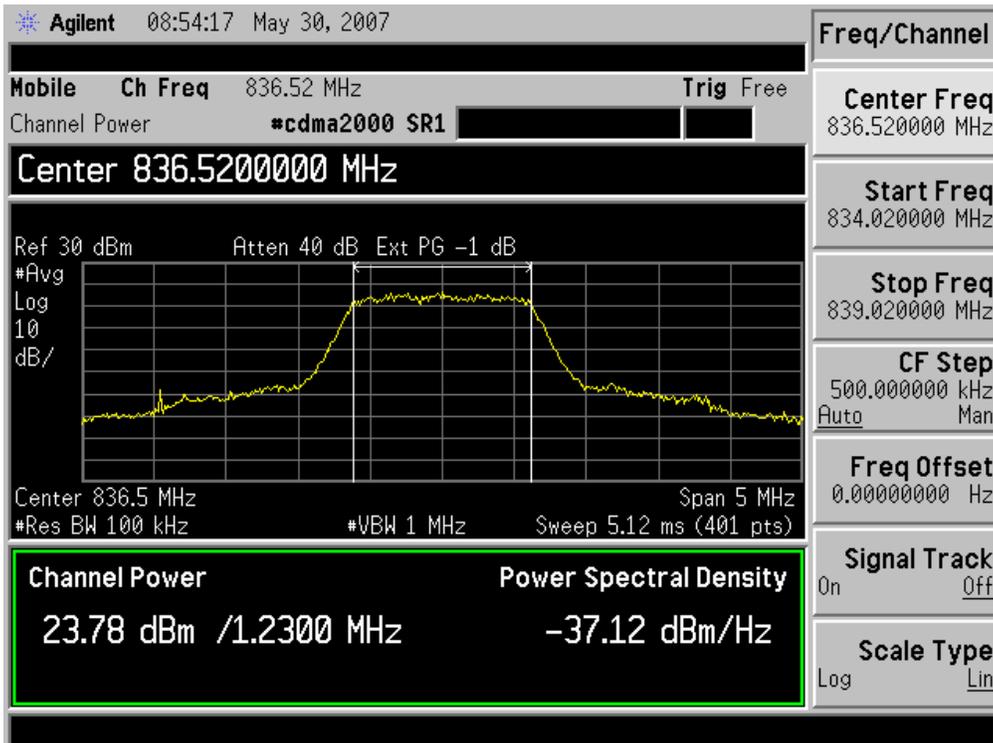
Note: The EUT antenna is non-retractable antenna with 0dBi gain, VSWR<2.0 and vertical polarization.

Please refer to the following plots (Conducted output RF power for RC3):

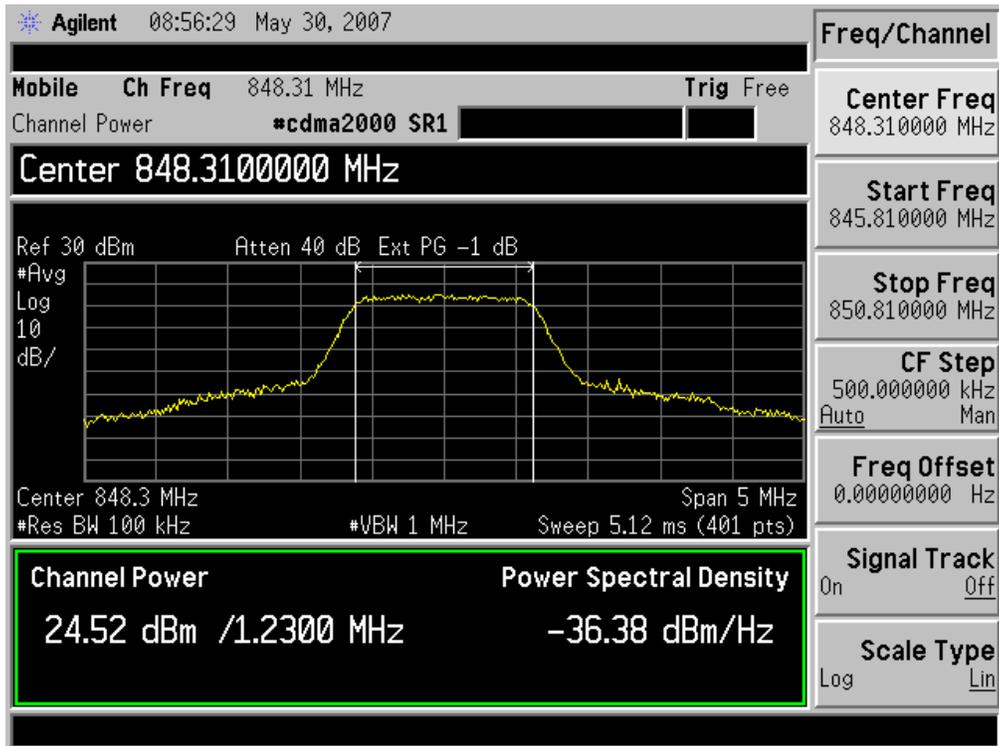
Low Channel



Middle Channel



High Channel



CFR47 §2.1049, §22.917, §22.905 - OCCUPIED BANDWIDTH

Applicable Standard

Requirements: CFR 47 §2.1049, §22.901, § 22.917.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30kHz and the 26 dB & 99% bandwidth was recorded.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Wireless communication test set	8960 E5515C	GB42431673	2007-01-18
Agilent	Spectrum Analysis	E4405B	MY41440292	2007-01-18

* **Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

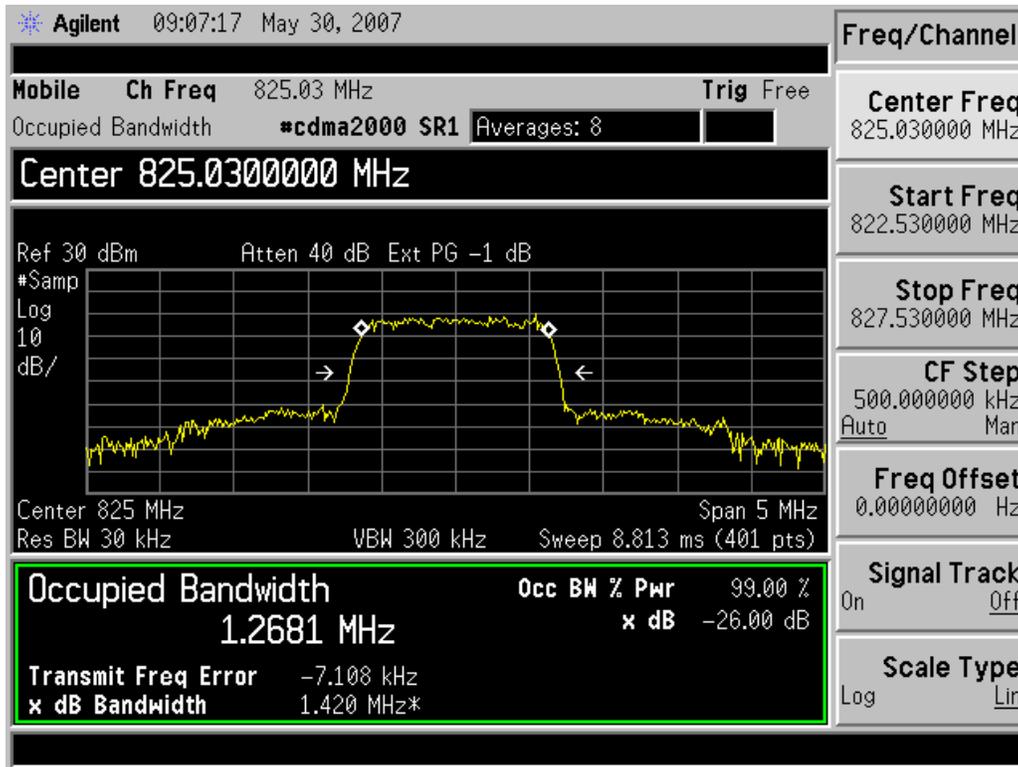
* The testing was performed by Jeff Zhang on 2007-05-30

Test Results

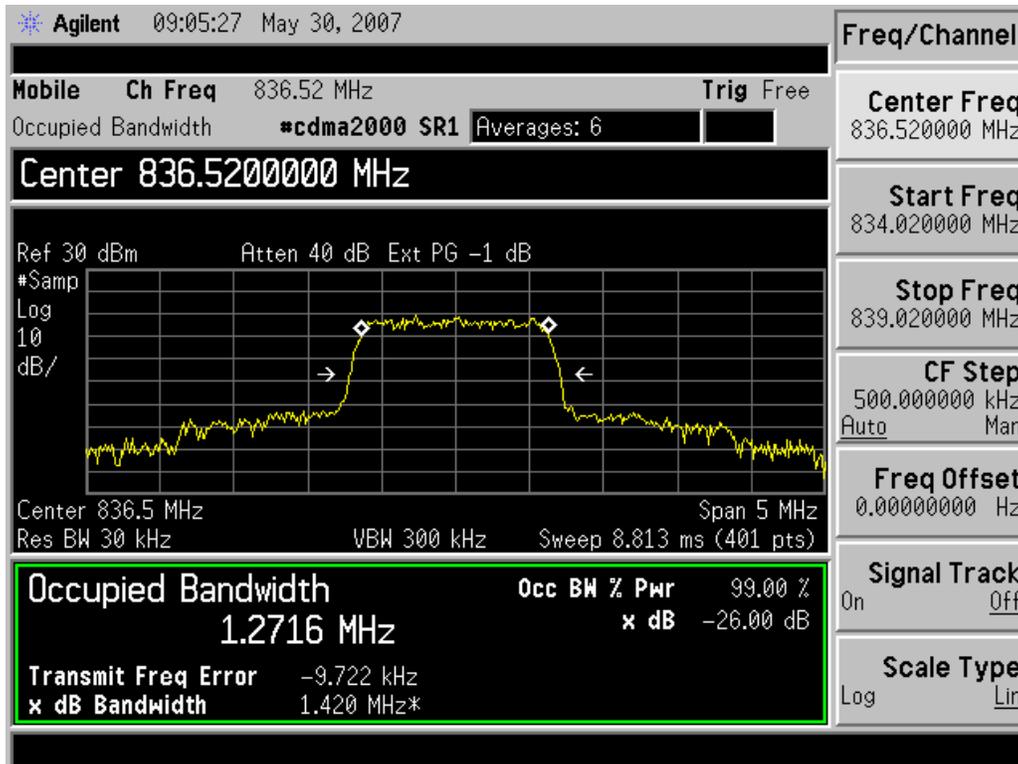
Channel	Frequency (MHz)	Measured Bandwidth (MHz)
Low	825.03	1.2681
Mid	836.52	1.2716
High	848.31	1.2630

Please refer to the following plots.

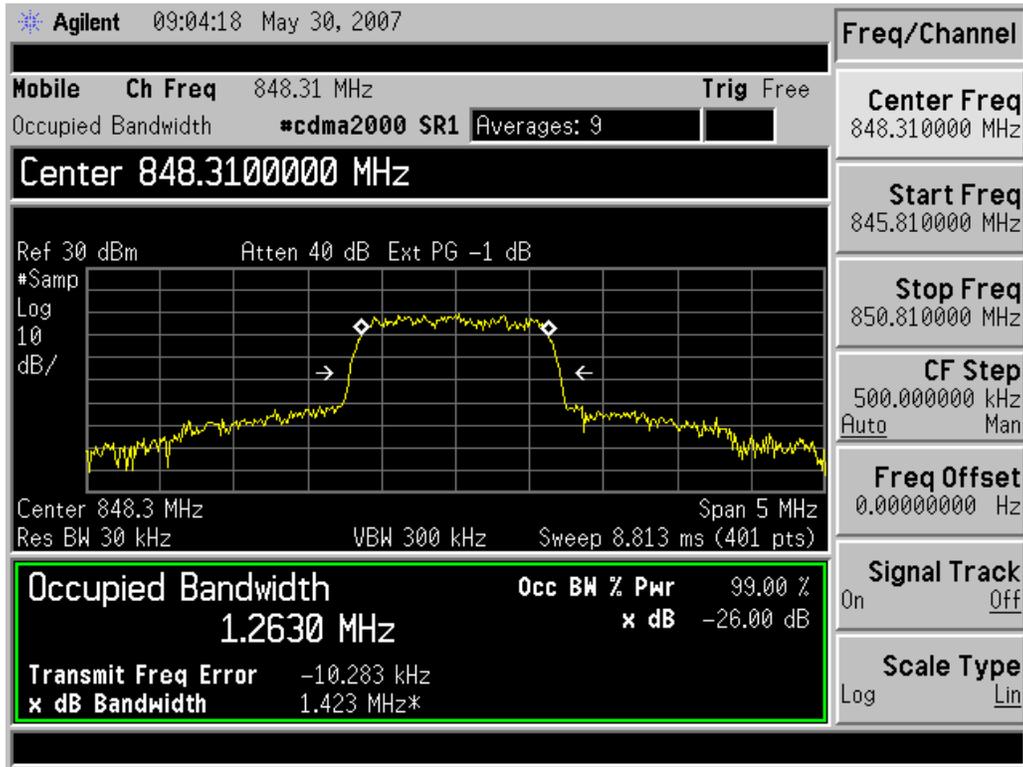
Low Channel



Mid Channel



High Channel



CFR47 §2.1051, §22.917 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Requirements: CFR 47 § 2.1051, § 22.917.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Wireless communication test set	8960 E5515C	GB42431673	2007-01-18
Agilent	Spectrum Analysis	E4405B	MY41440292	2007-01-18

* **Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

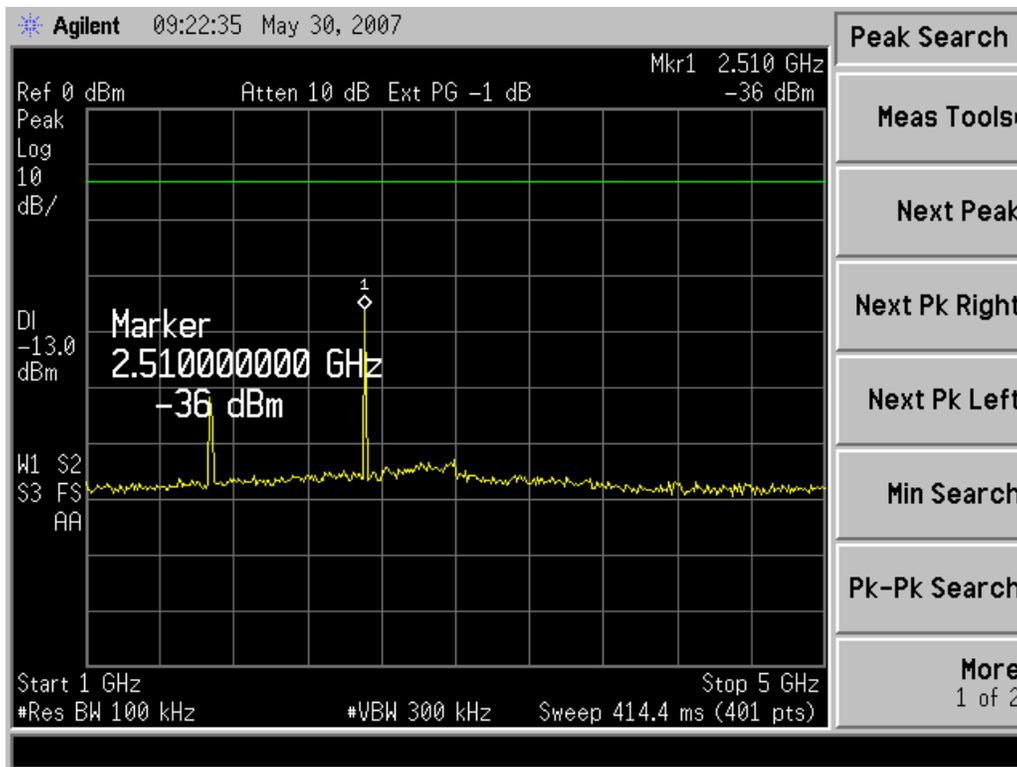
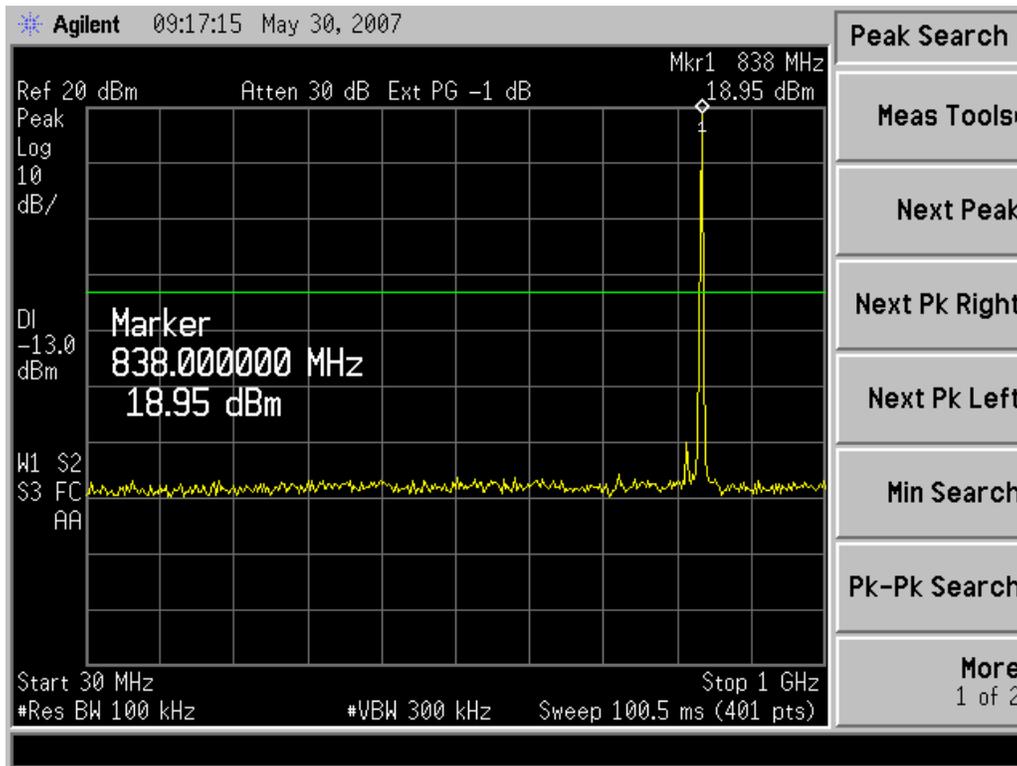
Environmental Conditions

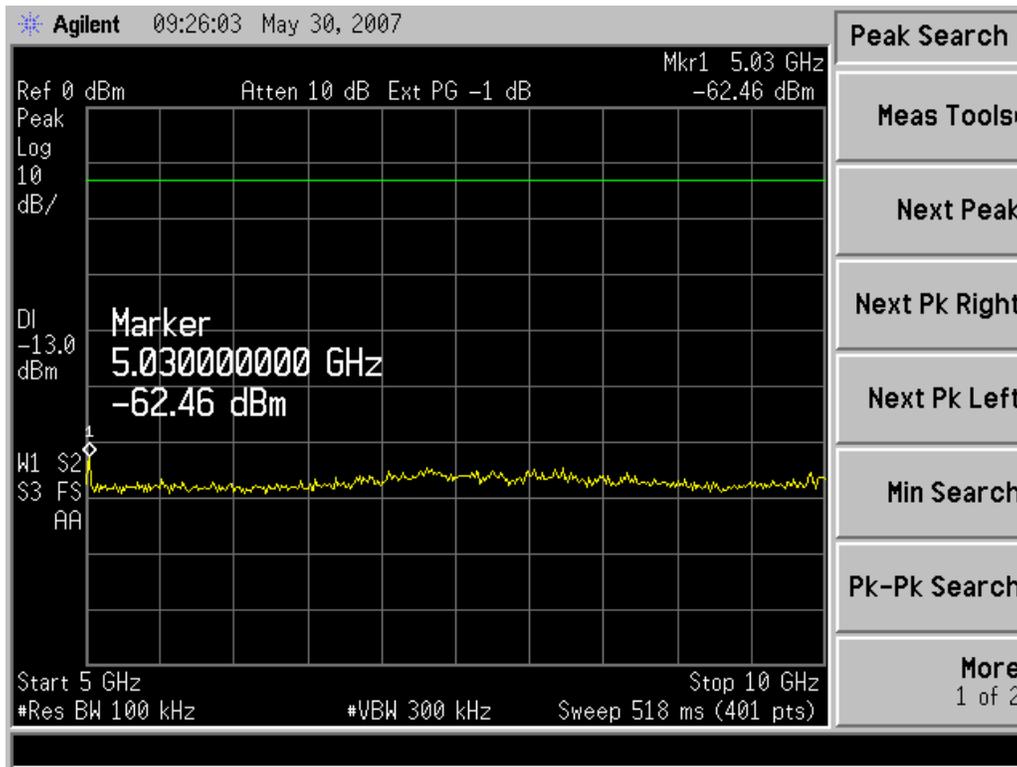
Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

* *The testing was performed by Jeff Zhang on 2007-05-30*

Test Results

Please refer to the hereinafter plots.





CFR47 §2.1055 (a), §2.1055 (d), §22.355 - FREQUENCY STABILITY

Applicable Standard

Requirements: CFR47 § 2.1055 (a), § 2.1055 (d) & following:

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1_Frequency Tolerance for Transmitters in the Public Mobile Services

Table C-1_Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile [le]3 watts (ppm)	Mobile [le]3 watts (ppm)
25 to 50.....	20.0	20.0	50.0
50 to 450.....	5.0	5.0	50.0
450 to 512.....	2.5	5.0	5.0
821 to 896.....	1.5	2.5	2.5
928 to 929.....	5.0	n/a	n/a
929 to 960.....	1.5	n/a	n/a
2110 to 2220.....	10.0	n/a	n/a

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

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Wireless communication test set	8960 E5515C	GB42431673	2007-01-18
Agilent	Spectrum Analysis	E4405B	MY41440292	2007-01-18
Wuxi	Temperature Oven	GDW-0100	G30064	2007-01-18

* **Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

* The testing was performed by Jeff Zhang on 2007-05-30

Test Results

Frequency Stability versus Temperature:

Reference Frequency: 836.52 MHz, Limit: 2.5ppm				
Environment Temperature (°C)	Power Supply (VDC)	Frequency error (Hz)	Measurement Results	
			Error (ppm)	Limit (ppm)
50	5.0	-1.01	-0.001207	2.5
40	5.0	-1.20	-0.001435	2.5
30	5.0	-1.37	-0.001638	2.5
20	5.0	-1.37	-0.001638	2.5
10	5.0	-1.41	-0.001686	2.5
0	5.0	-2.32	-0.002773	2.5
-10	5.0	-2.37	-0.002833	2.5
-20	5.0	-3.00	-0.003586	2.5
-30	5.0	-3.05	-0.003646	2.5

CFR47 §22.917 – BAND EDGE

Applicable Standard

According to CFR47 § 22.917, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Wireless communication test set	8960 E5515C	GB42431673	2007-01-18
Agilent	Spectrum Analysis	E4405B	MY41440292	2007-01-18

* **Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

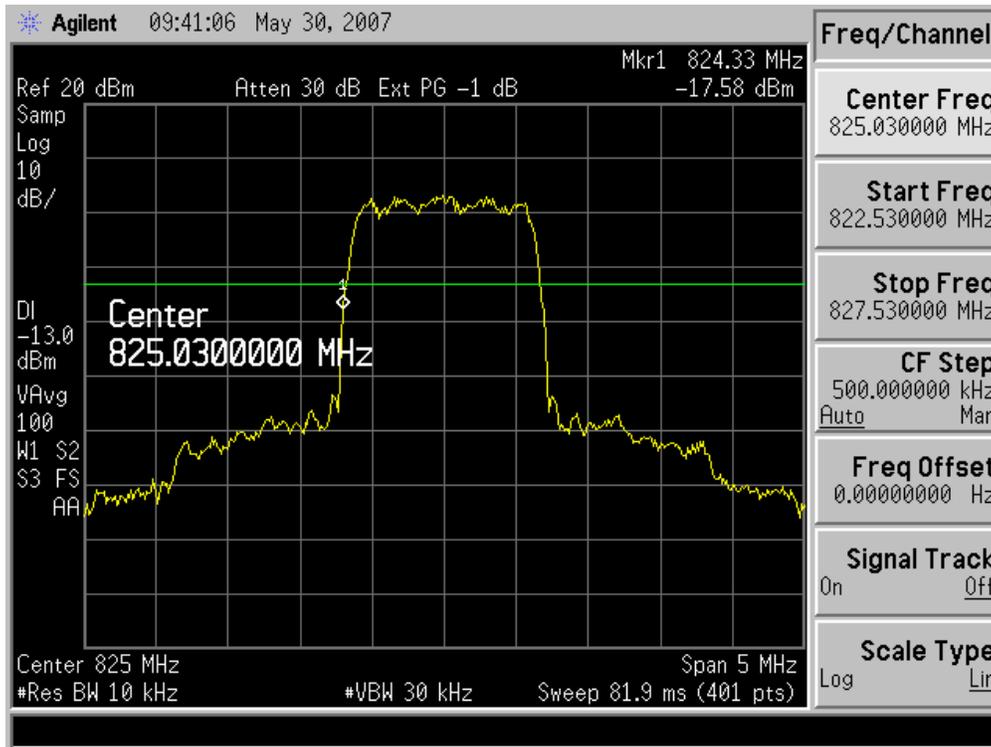
Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

* *The testing was performed by Jeff Zhang on 2007-05-30*

Test Results

Please refer to the following plots.

Lowest Channel



Highest Channel

