FCC PART 22H

MEASUREMENT AND TEST REPORT

For

ZTE Corporation

ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen,
Guangdong, China 518057

FCC ID: Q78-AC8710

Model: AC8710

Report Type: ☒ Original Report	**Product Type:** 800 MHz CDMA2000 1X /EVDO Wireless Data Terminal
Test Engineer:	Tina Peng Bob Xiong
Report No.:	B0801098
Testing Date:	2007-12-18/19
Report Date:	2007-12-30
Reviewed By:	Lab Manager David Gong
Prepared By:	ZTE Corporation Reliability Testing Center ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, NanShan District, Shenzhen，Guangdong 518057，P.R. of China Tel: +86-755-26770345 Fax: +86-755-26770347

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ZTE Corporation's product, FCC ID: Q78-AC8710 or the "EUT" as referred to in this report is a 800 MHz CDMA2000 1X /EVDO Wireless Data Terminal, which measures approximately 80mm(L)×36mm(W)×12.8mm(H).

The frequency range is TX 824MHz～849MHz, RX 869MHz～894MHz.

* The test data gathered are from production sample, serial number: 290727810211, provided by the manufacturer.

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
Part 15 Subpart B – Unintentional radiators

Applicable Standards: TIA-98-E, TIA/EIA603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

ZTE Corporation Reliability Testing Center

ZTE Plaza,Keji Road South,Hi-Tech Industrial Park, NanShan District, Shenzhen， Guangdong，518057，P.R. of China

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Fax: +86-755-26770347

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

The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 25, 2005. ZTE Corporation Lab's FCC Registration Number is 373926.

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.

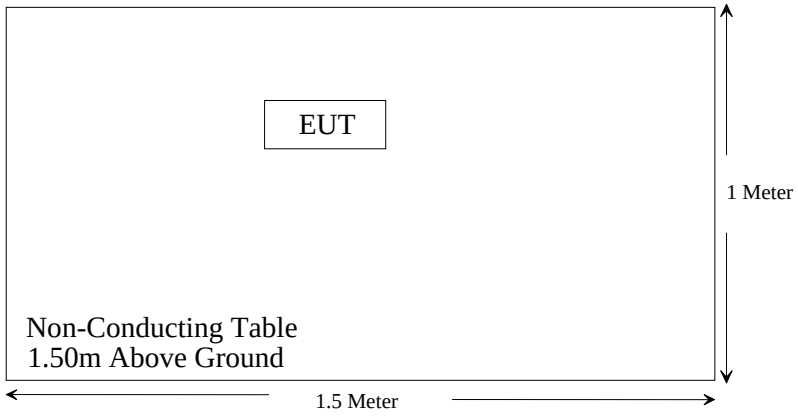
Equipment Modifications

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 Rules	Description of Test	Result
§ 2.1047	Modulation Characteristics	N/A*
§ 2.1053	Spurious Radiated Emissions	Compliant
§2.1093	RF Exposure	Compliant**
§ 2.1046, § 22.912 (d)	RF Output Power	Compliant
§ 2.1049 § 22.917 § 22.905	Out of Band Emissions, Occupied Bandwidth	Compliant
§ 2.1051, § 22.917	Spurious Emissions at Antenna Terminals	Compliant
§ 2.1055 (a) § 2.1055 (d) § 22.355	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§ 22.917	Band Edge	Compliant
§ 15.109	Radiated Emission of Enclosure	Compliant

Note:

* There are no modulation requirements for FCC part 22H therefore it is not applicable

**Please refer to BACL Test Report R0801098-SAR for Complete Test Results.

§2.1047 - MODULATION CHARACTERISTIC

Applicable Standard

Requirement: FCC § 2.1047(d). As part 22H has not specific requirement for CDMA modulation, therefore modulation characteristic is not presented.

§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.

Measurement bandwidth (RBW) for 30MHz to 1000MHz: 100kHz.

Measurement bandwidth (RBW) for 1000 MHz to 12750 MHz: 1MHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
R&S	EMI Test Receiver 20Hz～26.5GHz	ESI26	100058	2007-10-25
R&S	Log periodic Antenna 30～3000MHz	HL562	100022	2007-3-7
R&S	Double-Ridged Waveguide Horn Antenna 1～18GHz	HF906 RX	100032	2007-10-10
R&S	Filters	TS-FILT	N/A	2007-10-25
R&S	Cable Set Up to 18Ghz	RF Cable	N/A	2007-10-25
Albatross	Anechoic Chamber 3m site	3m site	N/A	2007-5-14
R&S	Software	ES-K1	N/A	N/A
SCHWARZBECK	VHF-UHF Broad band Antenna 30-1000MHz	VUBA 9117	173	2007-4-11
R&S	Double-Ridged Waveguide Horn Antenna 1~18GHz	HF906 TX	100446	2007-9-20
R&S	Signal generator 10MHz~20GHz	SMR20	100098	2007-10-16
Agilent	Wireless communication test set	8960 E5515C	GB42431673	2007-01-18

*** Statement of Traceability: ZTE Corporation Reliability Testing Center** 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 2007-12-19*

Test Result

Worst case reading as follows:

Part22H:

33.13 dBc at 8140.80 MHz

TX Spurious Emission scan 30 MHz – 12.75 GHz (TX) Middle (283) channel (836.52MHz)

Indicated		Test Ant. Polarization (H/V)	Substituted		Antenna Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dBc)
Frequency (MHz)	Amp. (dBuV/)		Frequency (MHz)	Level (dBm)					
6182.3647	53.06	H	6182.36	-50.33	9.05	6.9	-50.33	-13	37.33
6983.6253	53.04	H	6983.63	-52.38	9.25	7.3	-52.58	-13	39.58
10284.068	57.38	H	10284.10	-51.56	11.35	8.9	-51.26	-13	38.26
1601.2024	48.98	V	1601.20	-58.89	6.55	3.3	-57.79	-13	44.79
2034.0681	54.26	V	2034.10	-53.26	7.05	3.8	-52.16	-13	39.16
8140.7816	55.49	V	8140.80	-45.43	9.45	8	-46.13	-13	33.13
10503.006	57.29	V	10503.1	-50.94	11.75	9.1	-50.44	-13	37.44

Note: No Pre-amplifier

§2.1046, §22.913(a) – RF OUTPUT POWER

Applicable Standard

According to FCC §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: ZTE Corporation Reliability Testing Center** 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 Tina Peng on 2007-12-18*

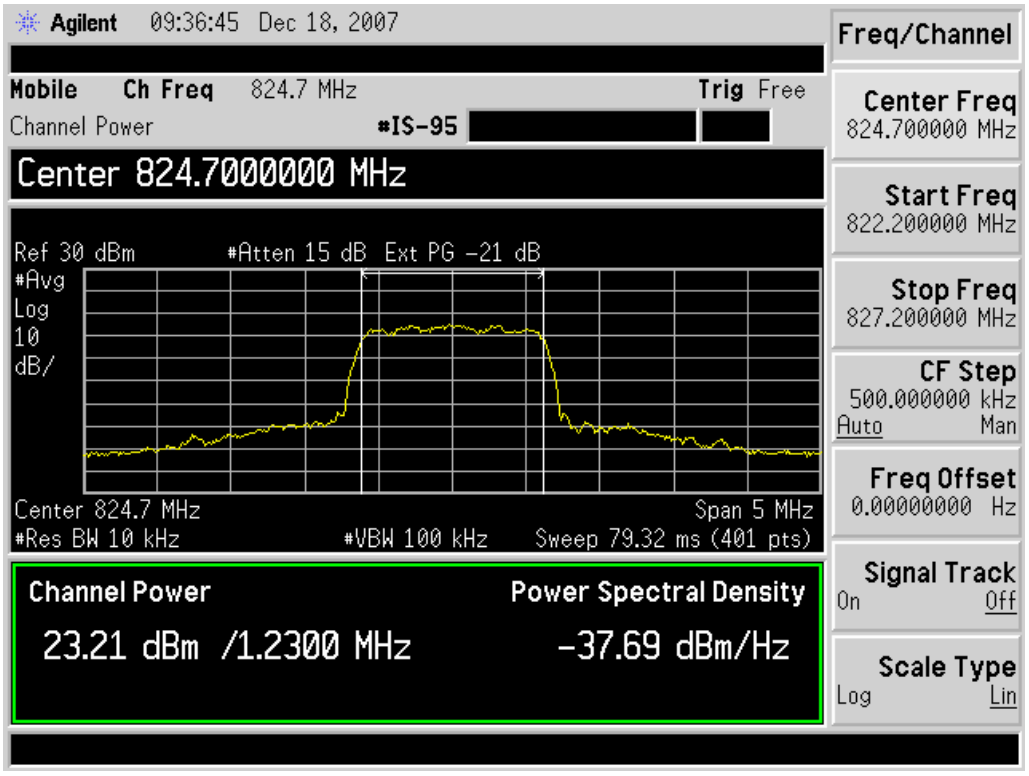
Test Results

Channel	Radio Configuration and Conducted Power (dBm)				
	RC1	RC2	RC3	RC4	RC5
Low	23.75	23.89	23.21	23.96	23.86
Mid	23.87	23.82	23.14	23.69	23.64
High	23.79	23.81	23.15	23.87	23.59
SO	SO2	SO9	SO55	SO55	SO55

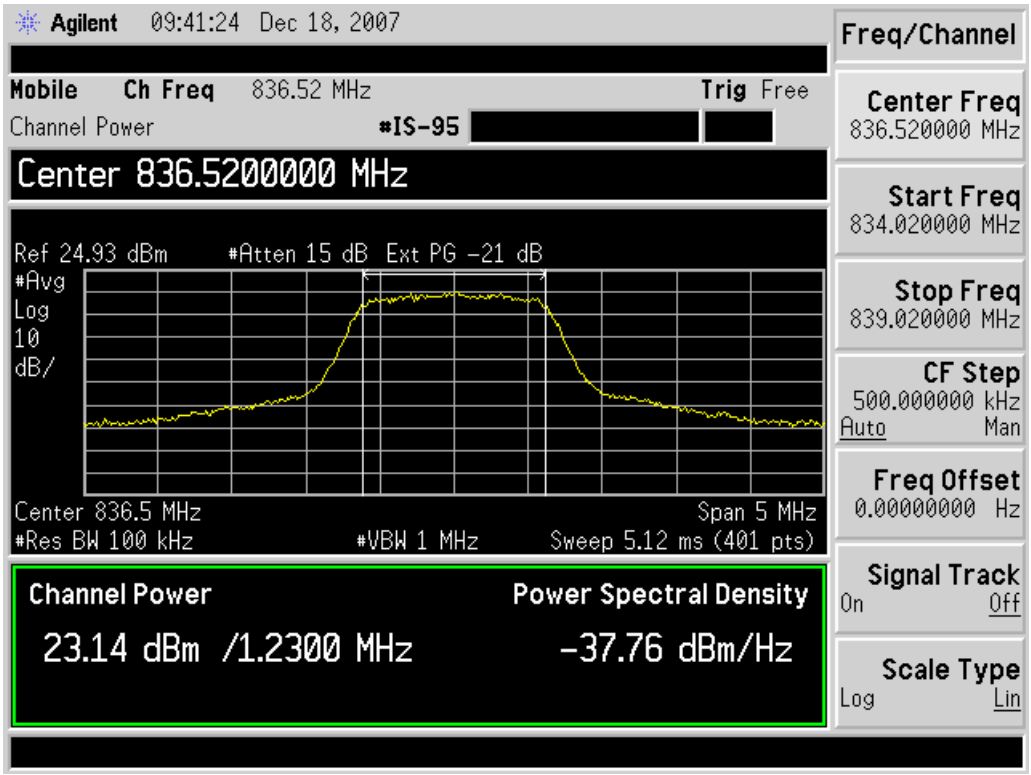
The EUT antenna is non-retractable antenna with 0dBi gain, VSWR<2.0 and vertical polarization.

Plots of Conducted Output RF Power for RC3:

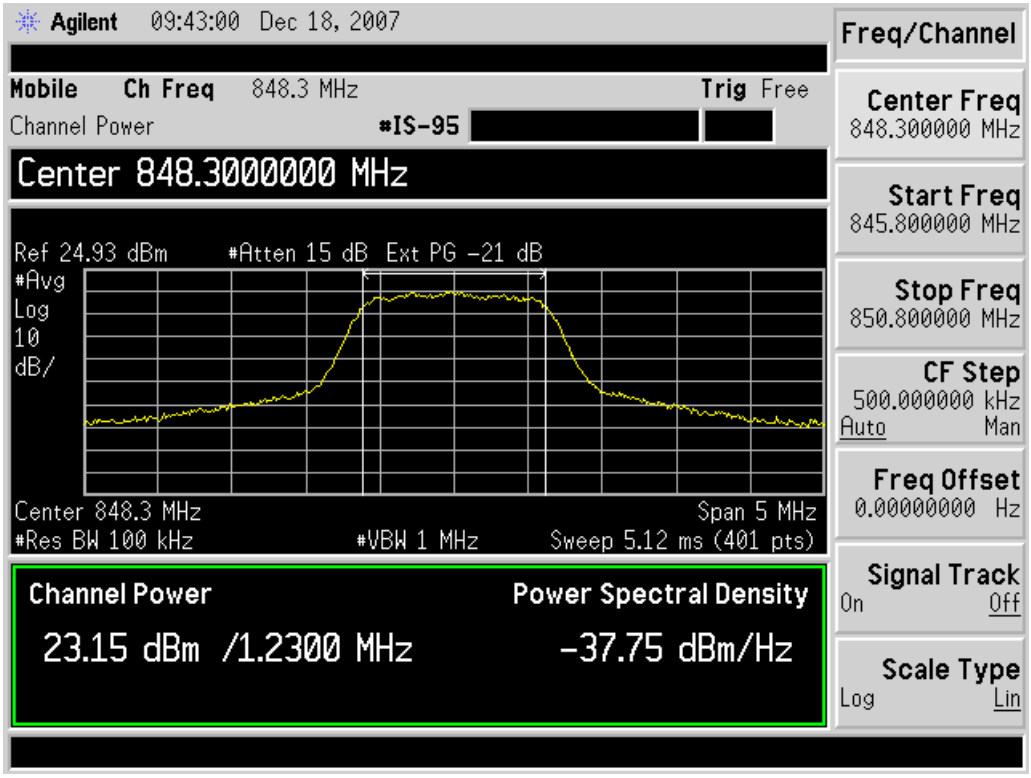
Low Channel



Middle Channel



High Channel



§2.1049, §22.917, §22.905 - OCCUPIED BANDWIDTH

Applicable Standard

Requirements: CFR 47, Section 2.1049, Section 22.901, Section 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 30 kHz 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: ZTE Corporation Reliability Testing Center** 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

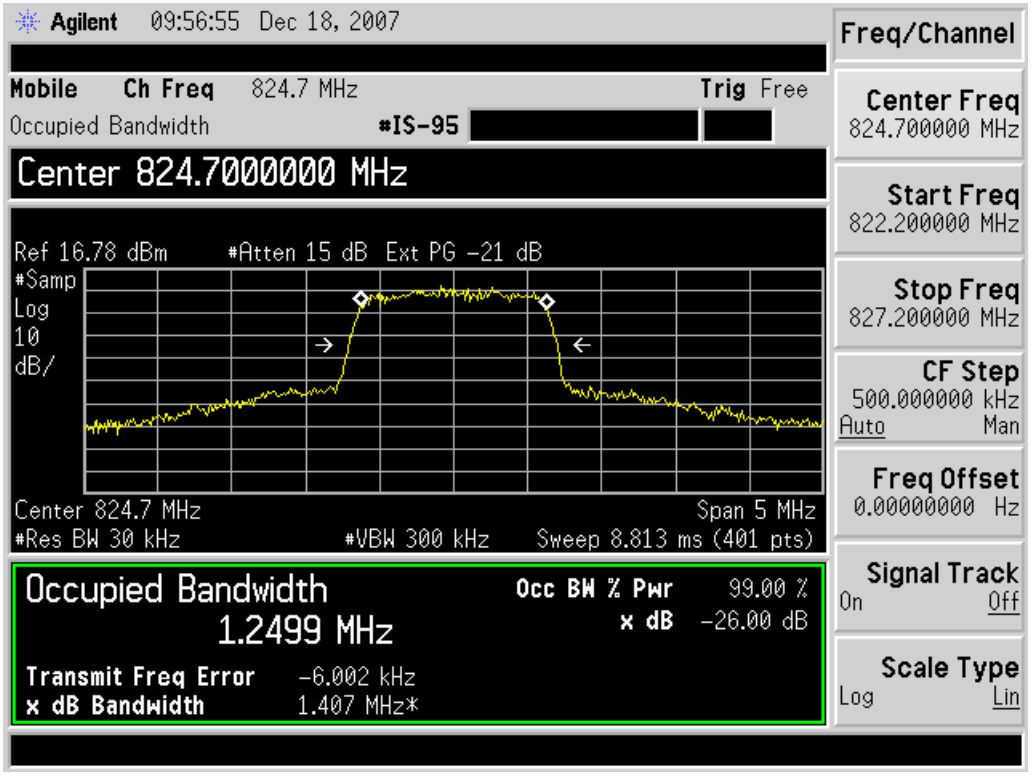
* The testing was performed by *Tina Peng on 2007-12-18*

Test Results

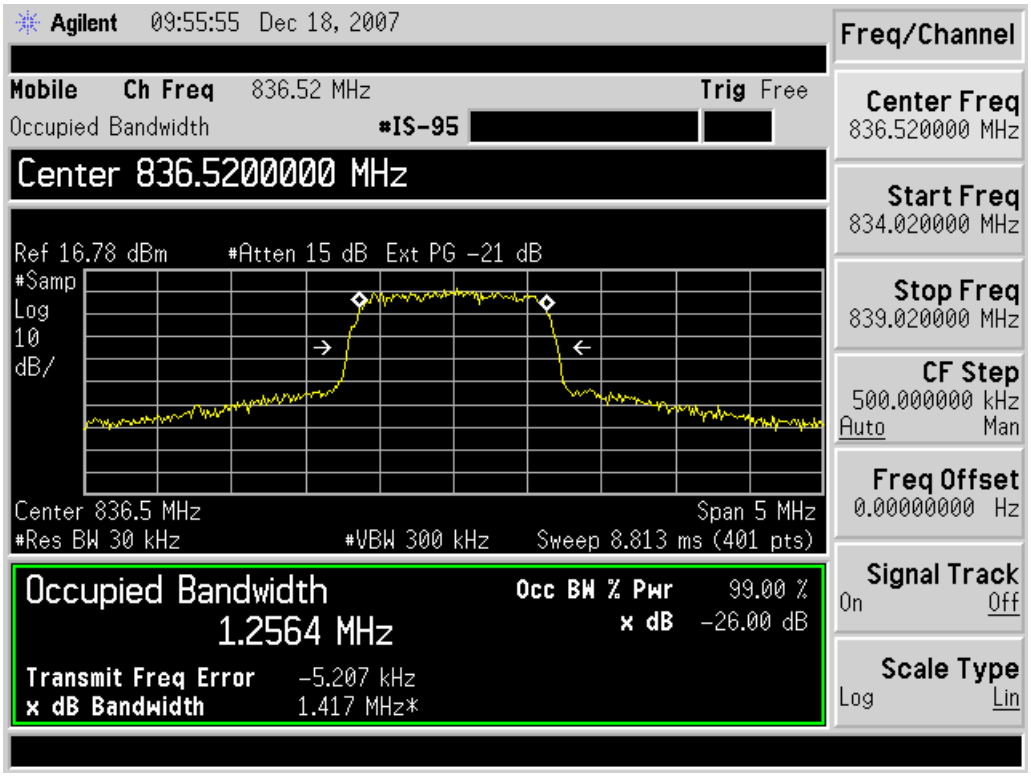
Channel	Frequency (MHz)	Measured Bandwidth (MHz)
Low	824.7	1.2499
Mid	836.52	1.2564
High	848.31	1.2605

Please refer to the following plots.

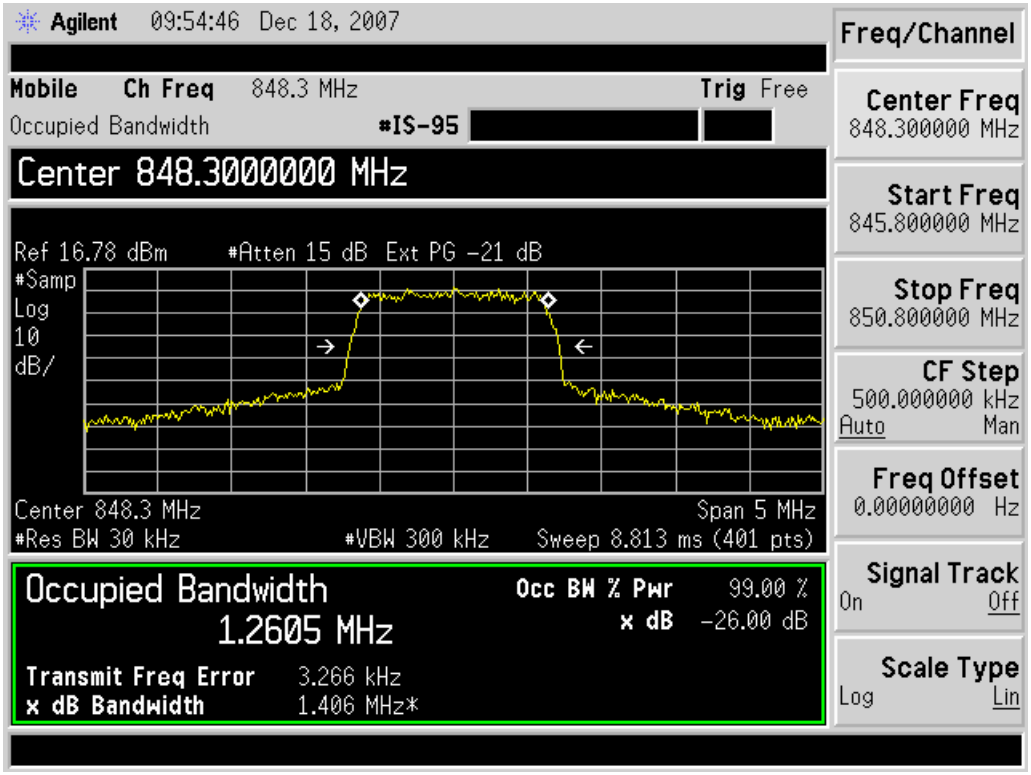
Low Channel



Mid Channel



High Channel



§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 10^{th} 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: ZTE Corporation Reliability Testing Center** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

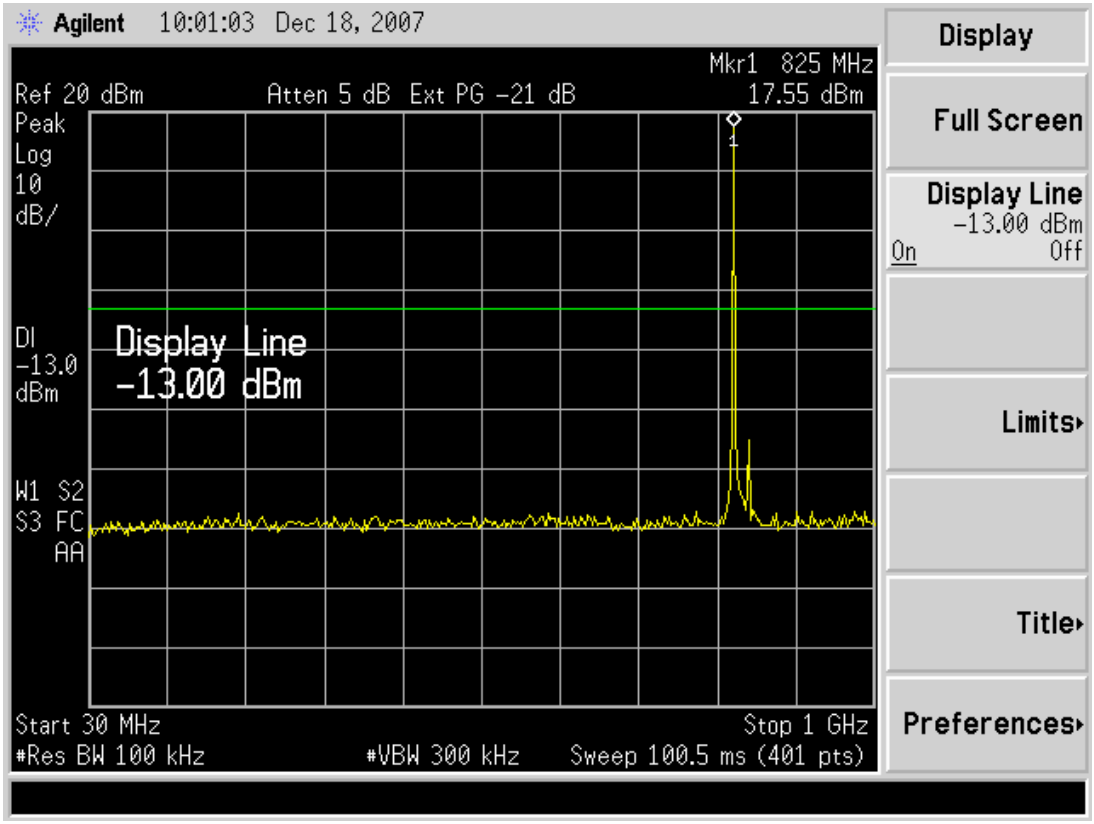
Environmental Conditions

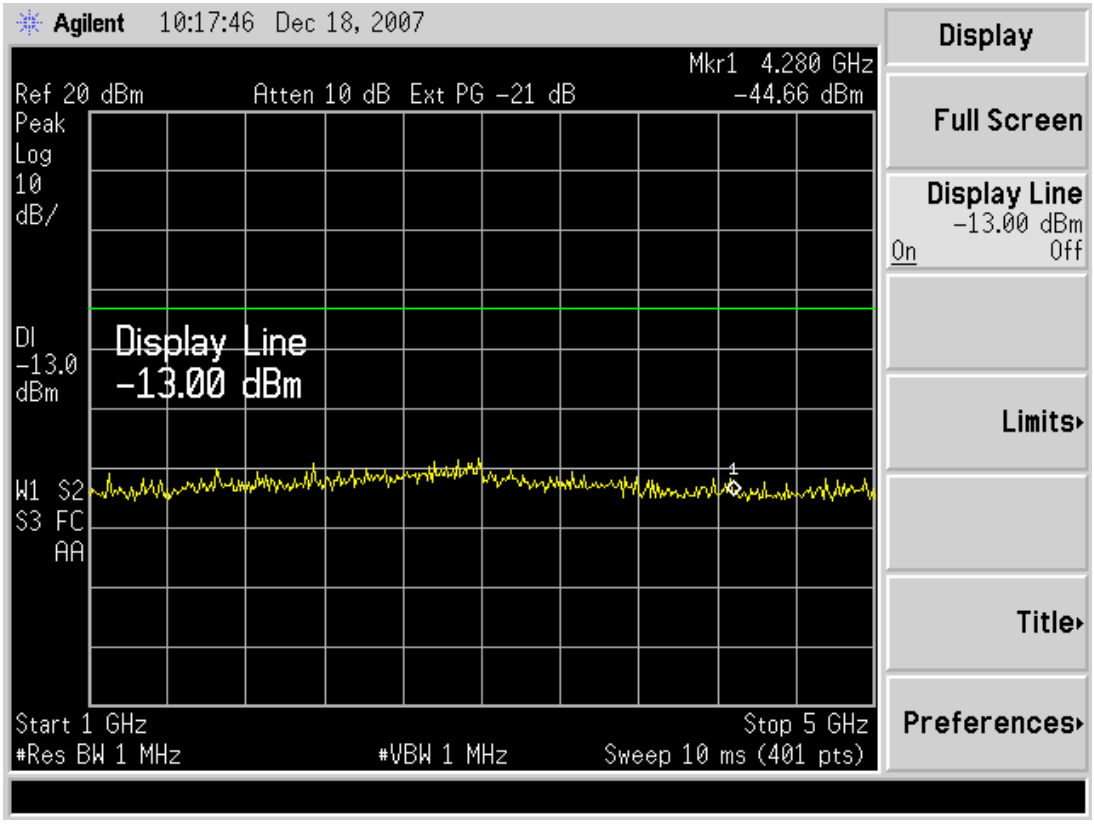
Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

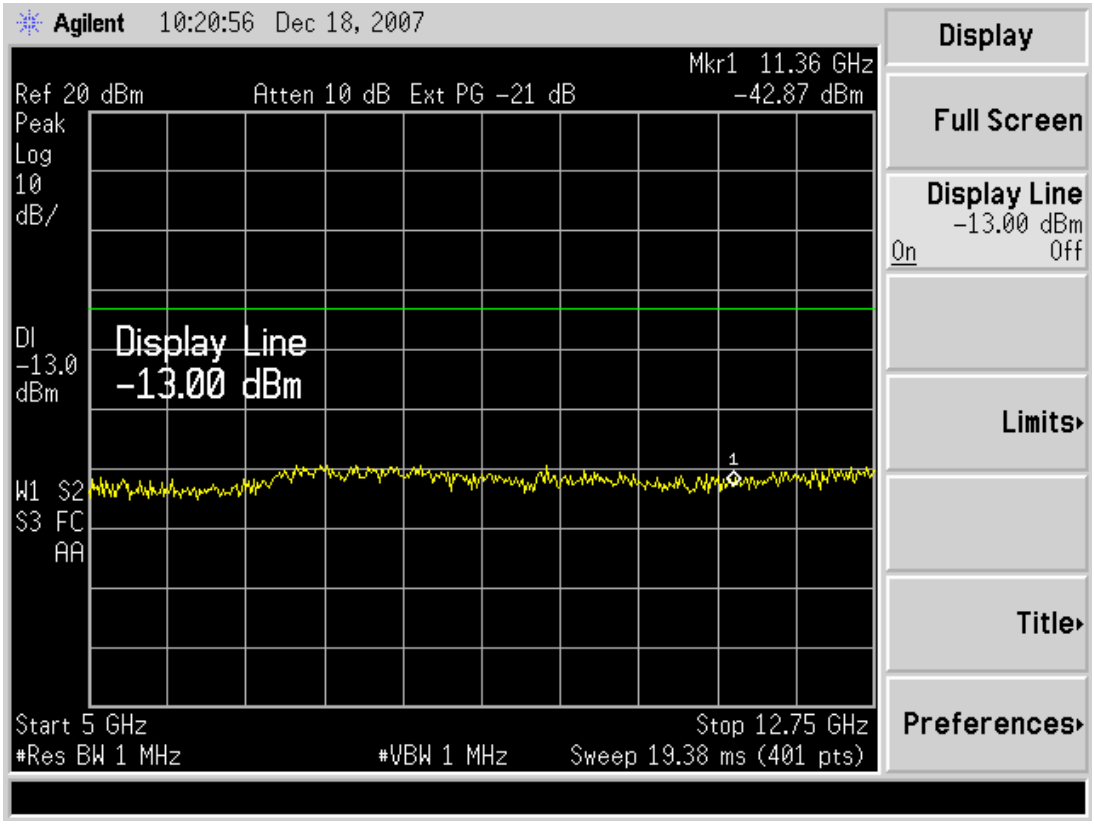
** The testing was performed by Tina Peng on 2007-12-18*

Test Results

Please refer to the hereinafter plots. Channel 1013


Agilent 10:01:03 Dec 18, 2007
Mkr1 825 MHz
Ref 20 dBm
Atten 5 dB Ext PG -21 dB
17.55 dBm
Peak
Log
10
dB/
Display Line
-13.00 dBm
Dl
-13.0
dBm
W1 S2
S3 FC
AA
Start 30 MHz
Stop 1 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 100.5 ms (401 pts)
Display
Full Screen
Display Line
-13.00 dBm
On
Off
Limits
Title
Preferences


Agilent 10:17:46 Dec 18, 2007
Mkr1 4.280 GHz
Ref 20 dBm
Atten 10 dB Ext PG -21 dB
-44.66 dBm
Peak
Log
10
dB/
Display Line
-13.00 dBm
Dl
-13.0
dBm
W1 S2
S3 FC
AA
Start 1 GHz
Stop 5 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 10 ms (401 pts)
Display
Full Screen
Display Line
-13.00 dBm
On
Off
Limits
Title
Preferences


Agilent 10:20:56 Dec 18, 2007
Mkr1 11.36 GHz
Ref 20 dBm
Atten 10 dB Ext PG -21 dB
-42.87 dBm
Peak
Log
10
dB/
Display Line
-13.00 dBm
Dl
-13.0
dBm
W1 S2
S3 FC
AA
Start 5 GHz
Stop 12.75 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 19.38 ms (401 pts)
Display
Full Screen
Display Line
-13.00 dBm
On
Off
Limits
Title
Preferences

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

Applicable Standard

Requirements: FCC § 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

Frequency range (MHz)	Base, fixed (ppm)	Mobile ≤3 watts (ppm)	Mobile ≤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: ZTE Corporation Reliability Testing Center** 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 Tina Peng on 2007-12-18*

Test Results

Frequency Stability versus Temperature:

Reference Frequency: 836.52 MHz, Limit: 2.5ppm				
Test Environment		**Frequency Error (Hz)**	**Measurement Results**	
Temperature (°C)	**Power Supplied (Vdc)**		**Error (ppm)**	**Limit (ppm)**
50	3.7	4.9	0.005858	2.5
40	3.7	-1.3	-0.001554	2.5
30	3.7	3.2	0.003825	2.5
20	3.7	0.1	0.0001195	2.5
10	3.7	3.8	0.004543	2.5
0	3.7	2.2	0.002630	2.5
-10	3.7	3.5	0.004184	2.5
-20	3.7	2.4	0.002869	2.5
-30	3.7	4.9	0.005858	2.5

Frequency Stability versus Voltage:

Reference Frequency: 836.52 MHz, Limit: 2.5ppm				
Test Environment		**Frequency Error (Hz)**	**Measurement Results**	
Temperature (°C)	**Power Supplied (Vdc)**		**Error (ppm)**	**Limit (ppm)**
50	3.4	5.5	0.006574	2.5
40	3.4	-2.2	-0.002630	2.5
30	3.4	3.6	0.004303	2.5
20	3.4	0.6	0.0007173	2.5
10	3.4	4.5	0.005379	2.5
0	3.4	3.3	0.003945	2.5
-10	3.4	4.1	0.004901	2.5
-20	3.4	2.9	0.003467	2.5
-30	3.4	2.4	0.002869	2.5

§22.917 – BAND EDGE

Applicable Standard

According to § 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: ZTE Corporation Reliability Testing Center** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

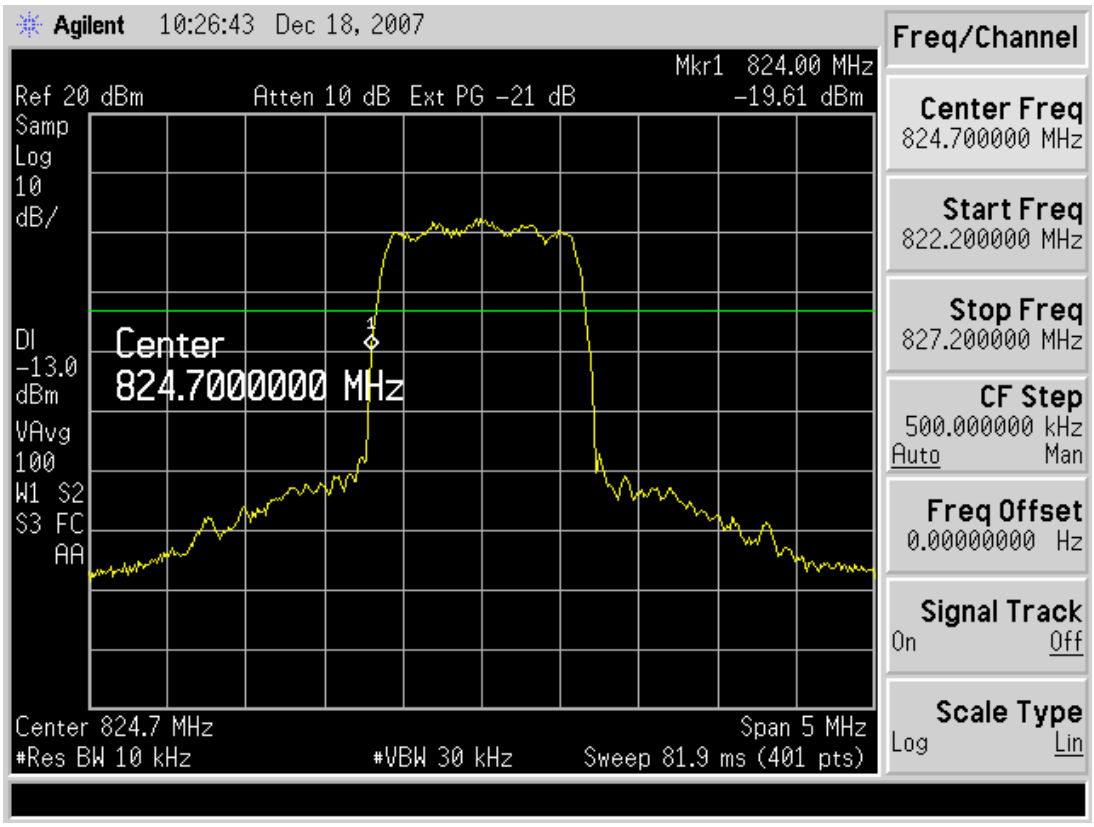
Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

** The testing was performed by Tina Peng on 2007-12-18*

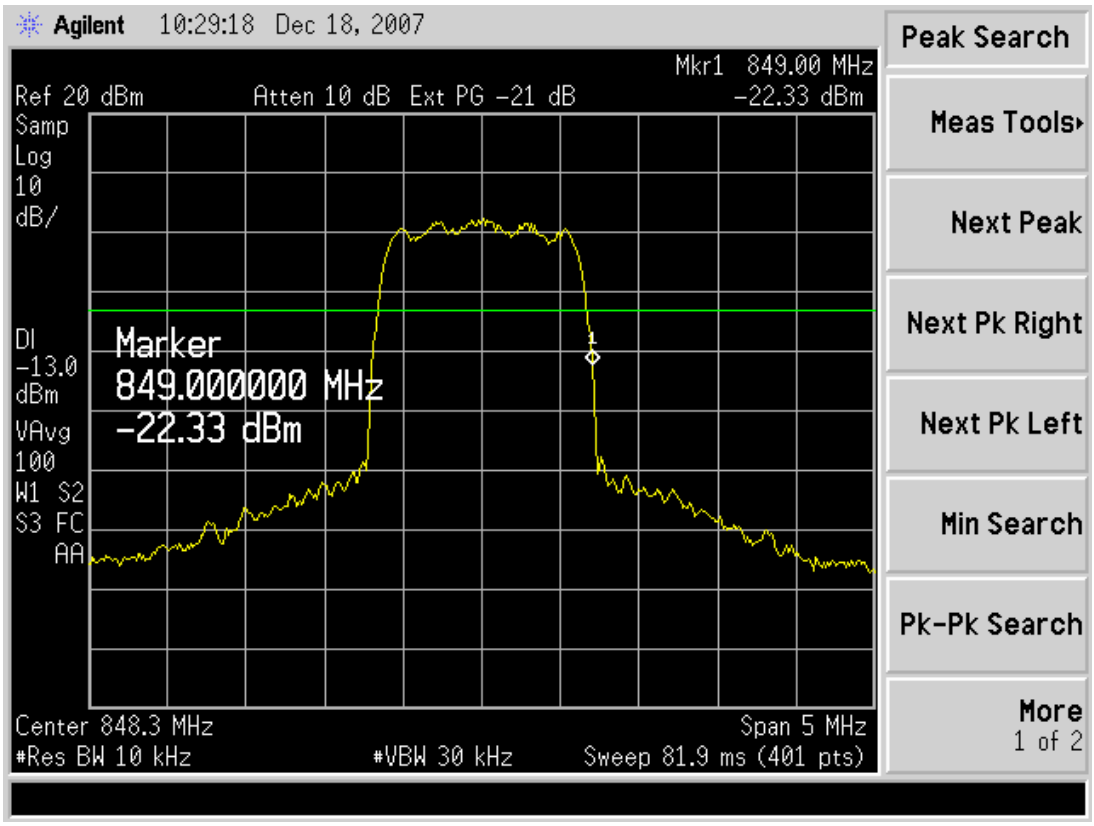
Test Results

Please refer to the following plots.

Lowest Channel



Highest Channel



§15.109 – Radiated Emission of Enclosure

Applicable Standard

CFR47, Part 15.109

Limits

The Radiated Emission of enclosure EUT should compliance with requirement of Part15.109. The limits showed in the following table.

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

Test Procedure

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 0.8m above the Metallic Turntable

The radiated disturbance measurements were made using a Rohde and Schwarz ESI Test Receiver and control software ES-K1.

A preliminary scan and a final scan of the emissions were made form 30MHz to 1GHz by using test script of software; the emissions were measurement using a Quasi-Peak detector. The maximal emission value was acquired by adjusting the antenna height, polarization and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0°to 360°.The receive antenna has two polarizations V and H.

The ZTE Mobile Phone AC8710 was communicated with the Universal radio communication tester through Air interface, the Universal radio communication tester controls the AC8710 to transmitter the maximum power which defined in specification of product. The Mobile Phone operated on the typical channel.

Measurement bandwidth (RBW) for 30MHz to 1000 MHz:120 kHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
R&S	EMI Test Receiver 20Hz～26.5GHz	ESI26	100058	2007-10-25
R&S	Log periodic Antenna 30～3000MHz	HL562	100022	2007-3-7
R&S	Cable Set Up to 18Ghz	RF Cable	N/A	2007-10-25
Albatross	Anechoic Chamber 3m site	3m site	N/A	2007-5-14
R&S	Software	ES-K1	N/A	N/A
Agilent	Universal radio communication tester	8960	GB42431673	2007-01-18

Environmental Conditions

Temperature:	22.5° C
Relative Humidity:	57%
ATM Pressure:	1016mbar

** The testing was performed by Bob Xiong on 2007-12-19*

Measurement Results

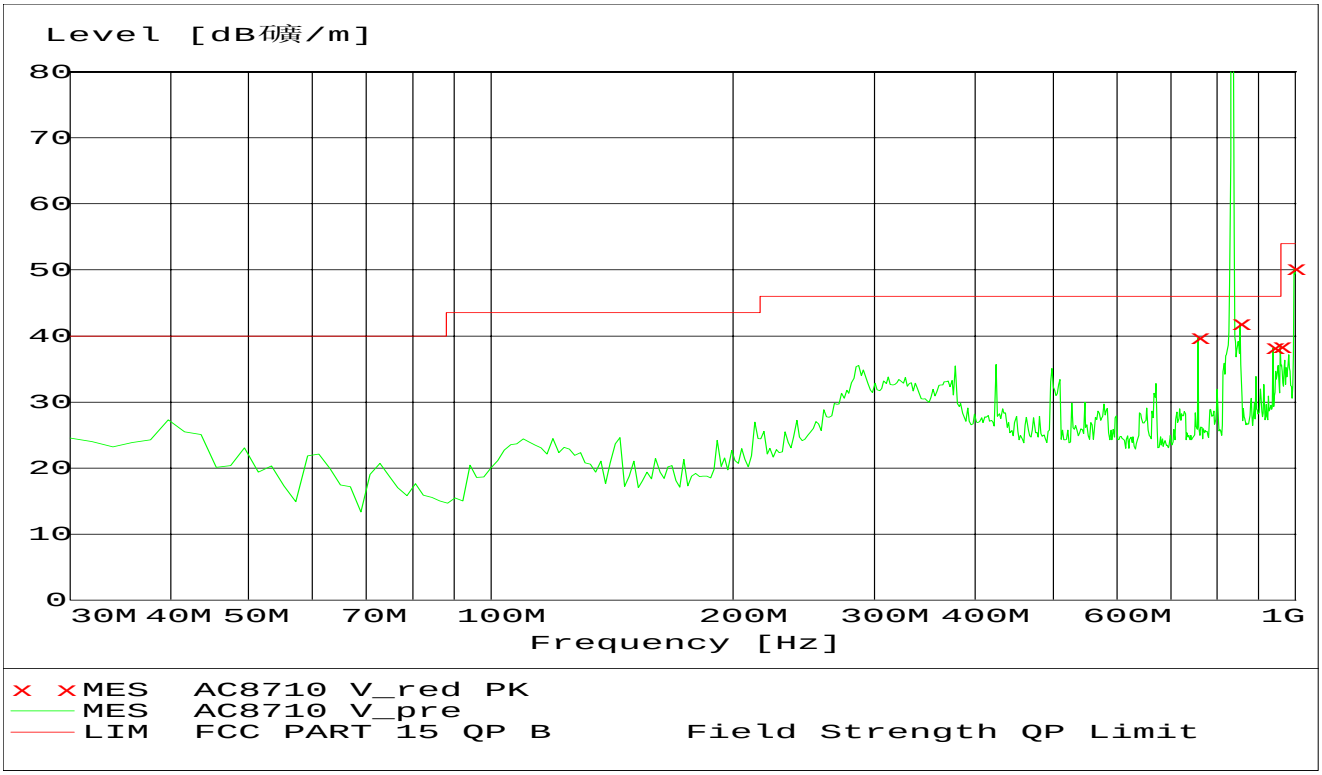
Worst case reading as follows:

3.9 *dB at996.112224 MHz*

Frequency (MHz)	Level (dBμV/m)	Azimuth deg	Ant. Height (cm)	Ant. Polarization (H/V)	Transd. (dB)	Limit (dBμV/m)	Margin (dB)
996.112224	50.08	0	200	VER	2.2	54	3.9
922.244489	41.68	32	100	HOR	1.6	46	4.3
757.014028	39.68	0	200	VER	-1.0	46	6.3
885.310621	39.62	5	100.0	HOR	0.9	46	6.4
795.891784	38.92	6	200	HOR	-0.4	46	7.1
937.795591	38.13	354	200	VER	1.6	46	7.9

For measurement results refer to follows:

The polarizations of receive antenna polarizations is Vertical



The polarizations of receive antenna polarizations is Horizontal