

FCC PART 24E
MEASUREMENT AND TEST REPORT

For

ZTE Corporation

ZTE Plaza, Keji Road South, Hi-tech Park, Nanshan District,

Shenzhen, Guangdong, China 518057

FCC ID: Q78-ZTEX176
Model: ZTEX176

Report Type: Original Report	Product Type: CDMA 1X Digital Mobile Phone
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Report No.:	ZTEB0809307-24E
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1 GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The ZTE Corporation's product, FCC ID: Q78-ZTE X176 or the "EUT" as referred to in this report is a CDMA 1X Digital Mobile Phone, which measures approximately 100mm(L) x43.3mm(W) x 13.4mm(H)

The frequency range is CDMA 1.9 GHz (UL: 1850~1910 MHz, DL: 1930~1990 MHz).

Type of Modulation: OQPSK

Occupied Bandwidth: 1.25 MHz

TX/RX Separation: 20 MHz

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

Antenna Frequency Range: 1850-1990 MHz

Connector Type: Crimp Connection

Maximum Gain: 2dB

Antenna Type/Pattern: Monopole/ Omni directional

1.2 EUT Photo



Additional Photos in Exhibit C

1.3 Objective

This type approval report is prepared on behalf of *ZTE Corporation* in accordance with Part 2, Subpart J, and Part 24 Subpart E 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.

1.4 Related Submittal(s)/Grant(s)

FCC Part15B JBP Submission FCC ID: Q78-ZTE X176.

1.5 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 24 Subpart E -Personal communications services

Applicable Standards: TIA-98-E, TIA603-C, ANSI C63.4-2003.

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

1.6 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

Tel: +86-755-26770345

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.

2 SYSTEM TEST CONFIGURATION

2.1 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.

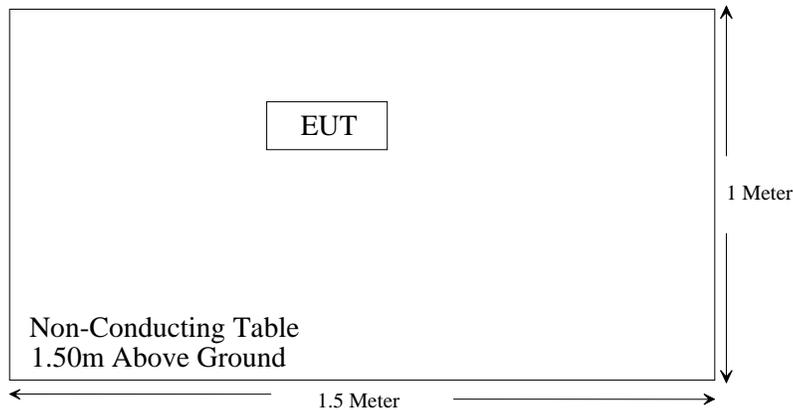
2.2 Equipment Modifications

No modifications were made to the EUT.

2.3 Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Agilent	Wireless communication test set	8960 E5515C	GB43042905
ZTE	Adaptor	STC-A22050F18	100611150324138

2.4 Test Setup Block Diagram



3 SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§ 2.1047	Modulation Characteristics	N/A *
§ 2.1053	Spurious Radiated Emissions	Compliant
§2.1093	RF Exposure	Compliant**
§ 2.1046, § 24.232	RF Output Power	Compliant
§ 2.1049 § 24.238	Out of Band Emission, Occupied Bandwidth	Compliant
§ 2.1051, §24.238(a)	Spurious Emissions at Antenna Terminals	Compliant
§ 2.1055 § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§24.238	Band Edge	Compliant

Note: * There are no modulation requirements for FCC Part 24E therefore it is not applicable

**Please refer to SAR test report provided by Shenzhen Electronic Product Quality Testing Center (Report number: SAR08-085 released on September 26 2008).

4 §2.1047 - MODULATION CHARACTERISTIC

4.1 Applicable Standard

Requirement: FCC § 2.1047(d).

4.2 Result:

As part 24E has not specific requirement for CDMA modulation, therefore modulation characteristic is not presented.

5 §2.1053 - SPURIOUS RADIATED EMISSIONS

5.1 Applicable Standard

CFR 47, § 2.1053.

5.2 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 = $10 \log (\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{Log}_{10} (\text{power out in Watts})$

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

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

5.3 Test Equipment List and Details

Manufacturers	Description	Model	Serial Number	Cal. Dates
R & S	EMI Test Receiver 20Hz~26.5GHz	ESI26	100058	2007-11-1
R&S	Log periodic Antenna 30~3000 MHz	HL562	100022	2008-8-11
R & S	Double-Ridged Waveguide Horn Antenna 1~18 GHz	HF906 RX	100032	2008-8-11
Albatross	Anechoic Chamber 3m site	3m site	A0001735A	2008-7-01
R & S	Software	ES-K1	N/A	N/A
SCHWARZBECK	VHF-UHF Broad band Antenna 30-1000 MHz	VUBA 9117	122	2008-8-11
R & S	Double-Ridged Waveguide Horn Antenna 1~18 GHz	HF906 TX	100446	2008-8-11
R & S	Signal generator 10 MHz~20 GHz	SMR20	100098	2007-11-2
Agilent	Wireless Communication Test Set	8960 E5515C	GB43042905	2008-01-19

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

5.4 Environmental Conditions

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

* The testing was performed by Bob Xiong on 2008-09-16

5.5 Test Result

Test without headphones

30 MHz – 3 GHz: 23.36 dB at 1981.964 MHz

3 – 20 GHz: 36.81dB at 18306.613 MHz

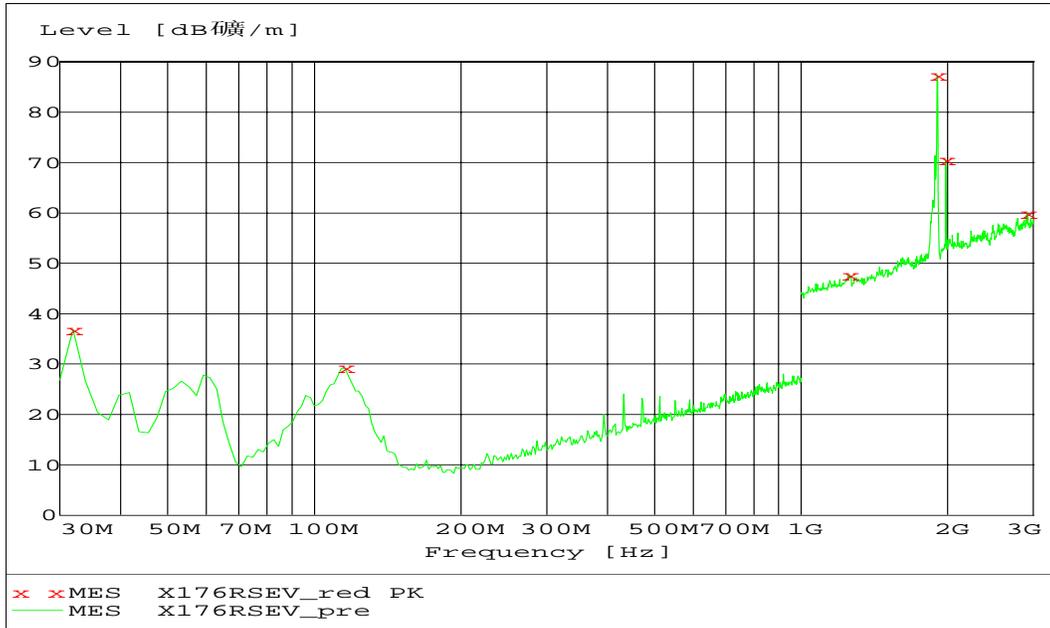
TX Spurious Emission scans 30 MHz – 3 GHz (TX) Middle channel

Indicated		Test Ant. Polar (H/V)	Substituted		Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV/m)		Freq. (MHz)	Level (dBm)					
2899.800	59.29	H	2899.800	-44.82	7.95	4.50	-43.52	-13	30.52
1985.972	64.89	H	1985.972	-41.71	6.55	3.70	-41.01	-13	28.01
1256.513	47.76	V	1256.513	-57.89	4.25	3.00	-58.79	-13	45.79
2911.824	59.91	V	2911.824	-41.83	7.95	4.60	-40.63	-13	27.63
1981.964	70.56	V	1981.964	-36.96	6.55	3.80	-36.36	-13	23.36

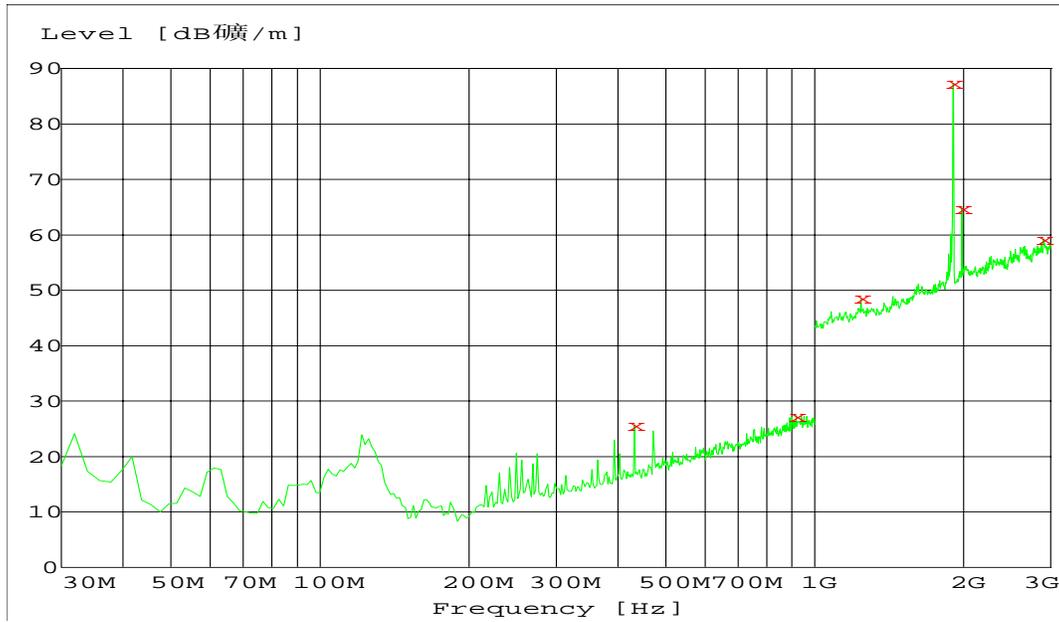
TX Spurious Emission scan 3GHz – 20 GHz (TX) Middle channel

Indicated		Test Ant. Polar (H/V)	Substituted		Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV/m)		Freq. (MHz)	Level (dBm)					
5597.194	46.31	H	5597.194	-52.3	9.05	6.40	-51.80	-13	38.80
18176.353	63.16	H	18176.353	-43.28	6.45	12.20	-51.18	-13	38.18
10490.982	51.82	V	10490.982	-56.41	11.35	9.10	-56.31	-13	43.31
18306.613	63.61	V	18306.613	-41.91	6.45	12.20	-49.81	-13	36.81

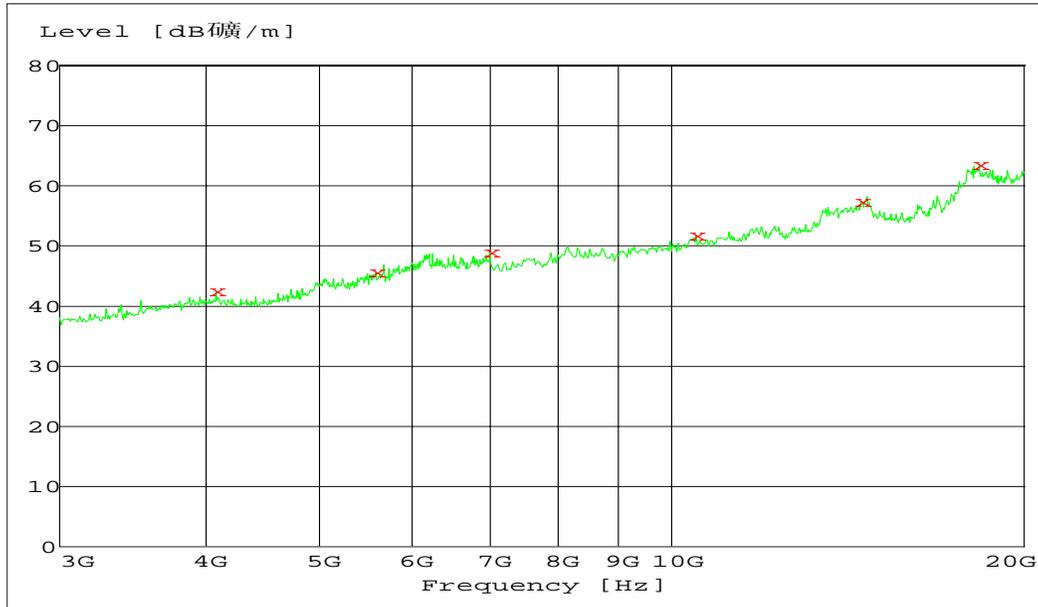
(30 MHz~3 GHz)Vertical



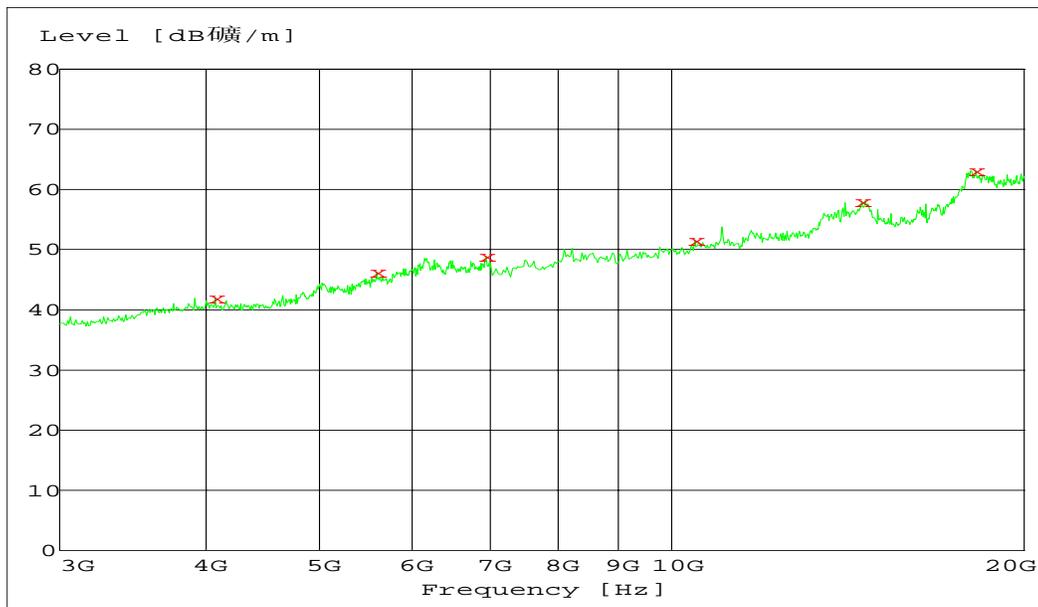
(30 MHz~3 GHz)Horizontal



(3~20 GHz)Vertical



(3 ~20 GHz)Horizontal



6 §2.1046, §24.232 – RF OUTPUT POWER

6.1 Applicable Standard

According to FCC §2.1046 and §24.232 (a), in no case may the peak output power of a base station transmitter exceed 2 watt.

6.2 Test Procedure

Conducted Method:

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

Radiated Method:

TIA/EIA 603-C Section 2.2.17

6.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Dates
Agilent	Wireless communication test set	8960 E5515C	GB43042905	2008-01-19
Agilent	Spectrum Analysis	E4405B	MY41440292	2008-01-19

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

6.4 Environmental Conditions

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

* *The testing was performed by Bob Xiong on 2008-09-16*

6.5 Test Results

Antenna Port Conducted Power:

Channel	Radio Configuration and Conducted Power (dBm)				
	RC1	RC2	RC3	RC4	RC5
Low	20.32	20.35	20.22	20.86	20.72
Mid	20.47	20.45	20.66	20.21	20.35
High	20.54	20.42	20.13	20.28	20.38
SO	SO2	SO9	SO55	SO55	SO55

EIRP:

Frequency (MHz)	Substitution Reading (dBm)	Substitution Antenna Gain dBi)	Substitution Cable Loss (dB)	EIRP (dBm)	EIRP (Watt)	Part 24E Limit (Watt)
1851.25	20.22	0.0	1.5	21.72	0.149	2
1880.00	20.66	0.0	1.5	22.16	0.164	2
1908.75	20.13	0.0	1.5	21.63	0.146	2

Sample calculation:

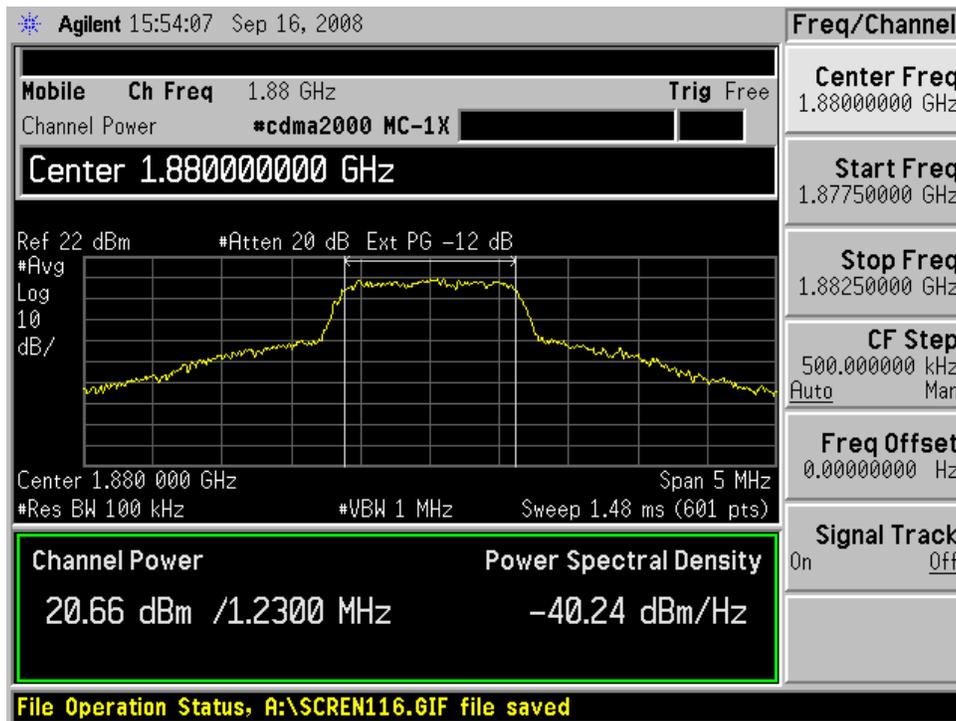
Absolute level=substitution reading+ antenna gain + cable loss

Plots of Conducted Output RF Power for RC3

Low Channel



Middle Channel



High Channel



7 §2.1049, §24.238- OCCUPIED BANDWIDTH

7.1 Applicable Standard

Requirements: CFR 47, Section 2.1049, Section 24.238

7.2 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.

7.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Dates
Agilent	Wireless communication test set	8960 E5515C	GB43042905	2008-01-19
Agilent	Spectrum Analysis	E4405B	MY41440292	2008-01-19

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

7.4 Environmental Conditions

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

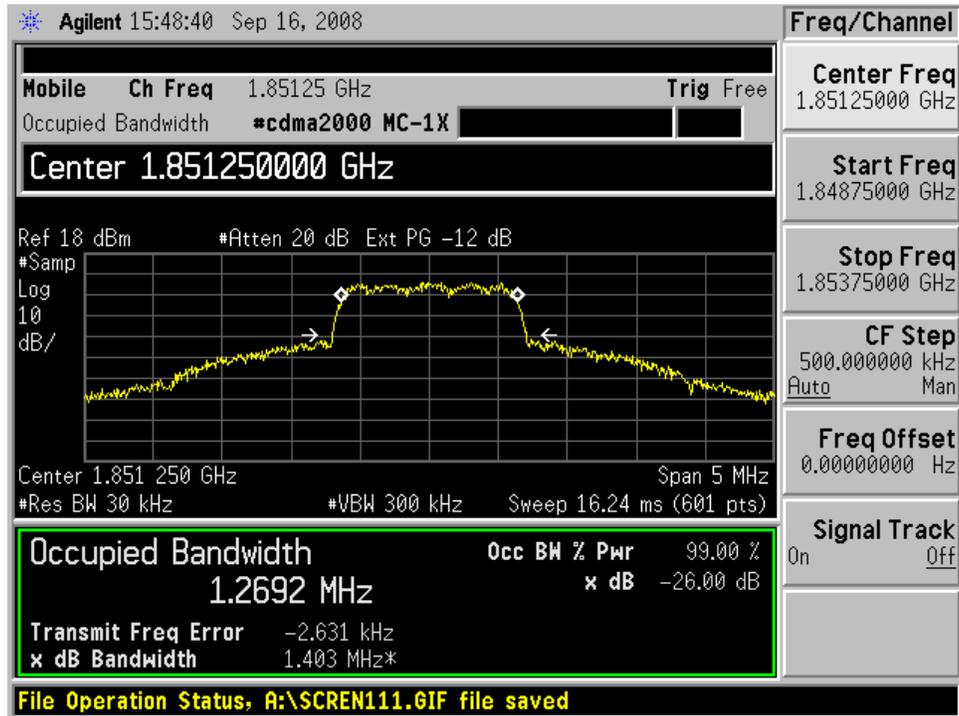
* The testing was performed by Tina Bob Xiong 2008-09-16

7.5 Test Results

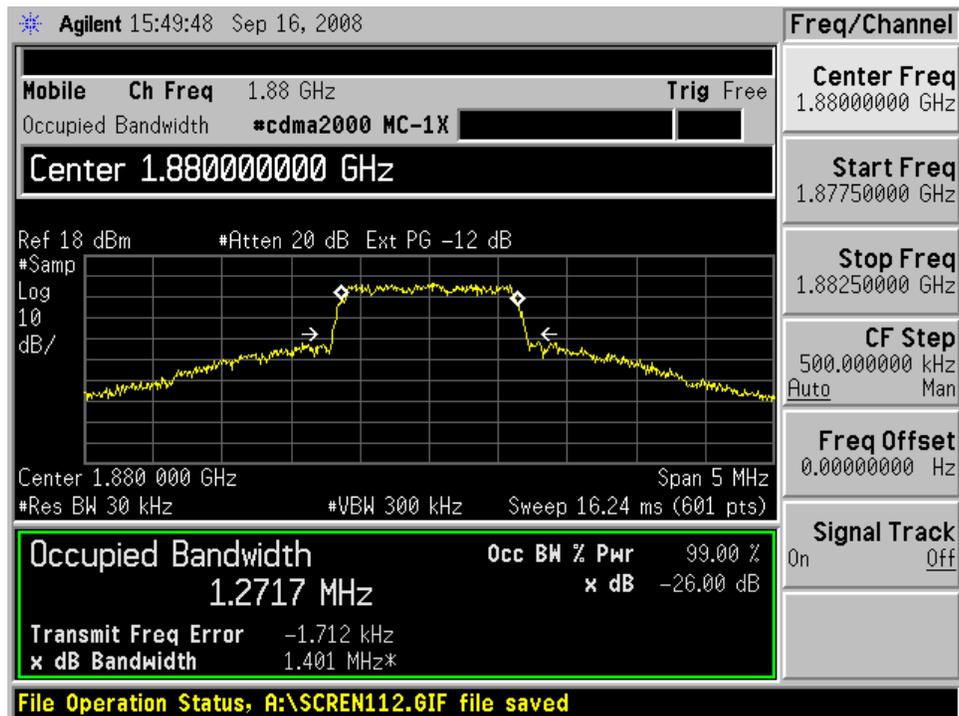
Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26 dB Bandwidth (MHz)
Low	1851.25	1.2692	1.403
Mid	1880.00	1.2717	1.401
High	1908.75	1.2742	1.412

Please refer to the following plots.

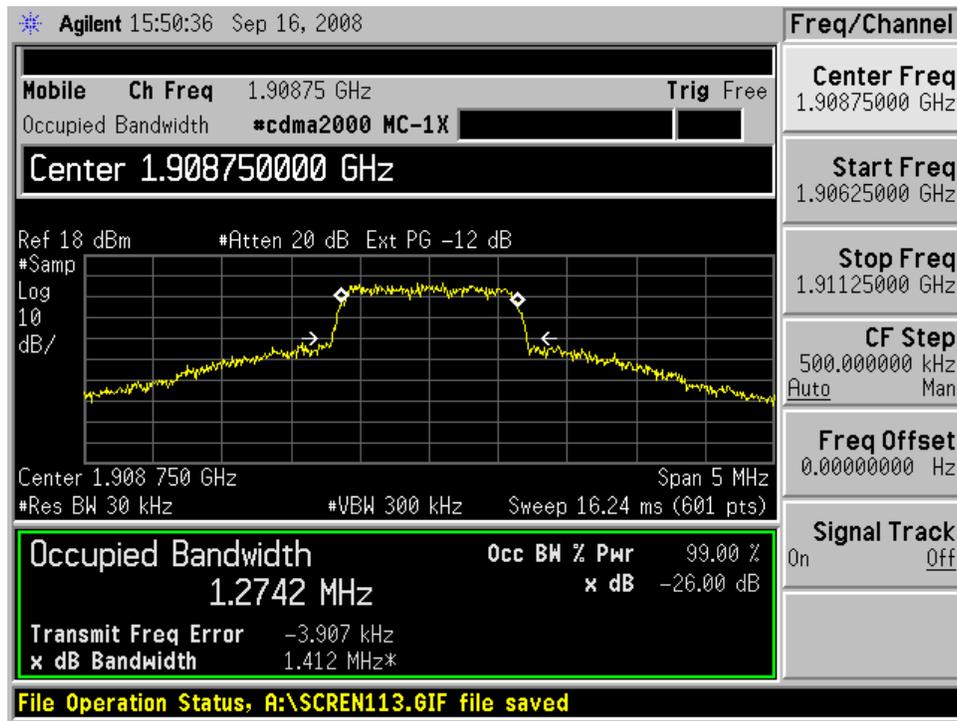
Low Channel



Mid Channel



High Channel



8 §2.1051, §24.238(a)-SPURIOUS EMISSIONS AT ANTENNA TERMINALS

8.1 Applicable Standard

Requirements: CFR 47, § 2.1051. §24.238(a).

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

8.2 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.

8.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Dates
Agilent	Wireless communication test set	8960 E5515C	GB43042905	2008-01-19
Agilent	Spectrum Analysis	E4405B	MY41440292	2008-01-19

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

8.4 Environmental Conditions

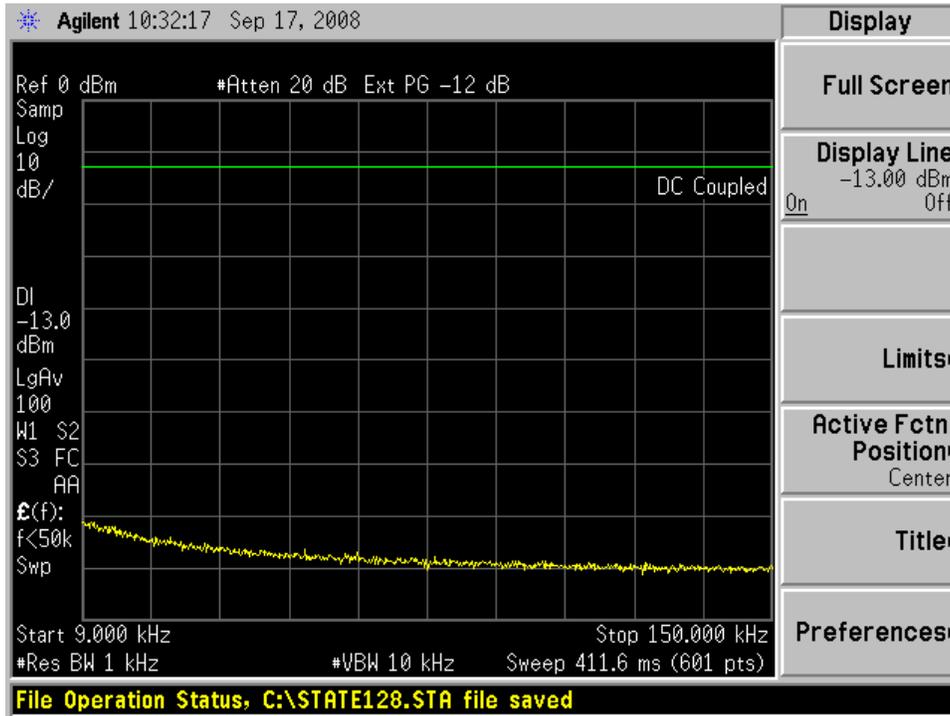
Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	1018mbar

* The testing was performed by Tina Bob Xiong 2008-09-16

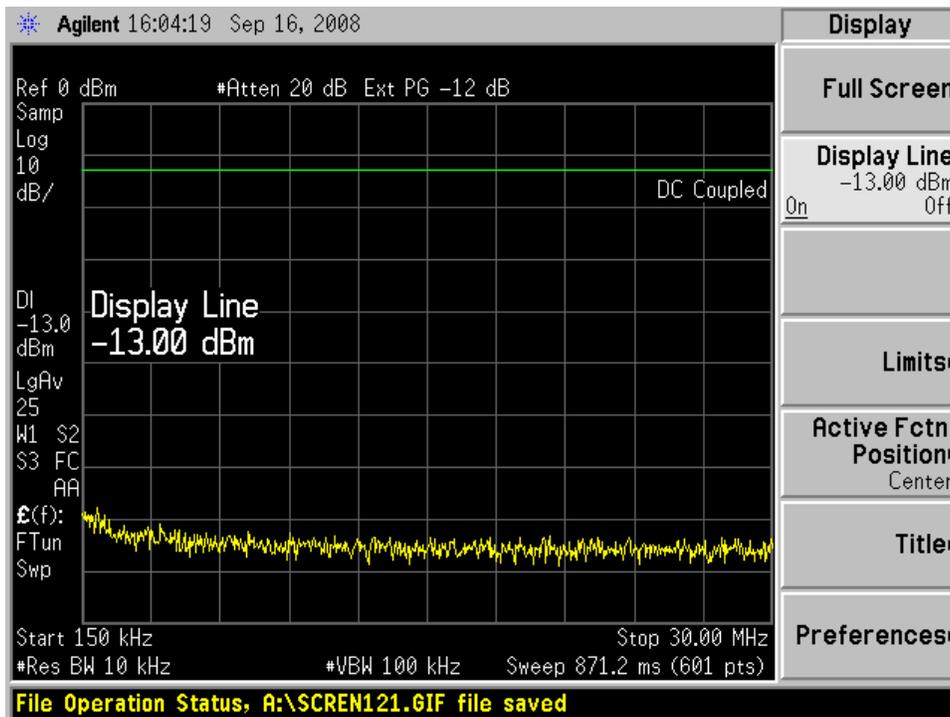
8.5 Test Results

Please refer to the hereinafter plots.

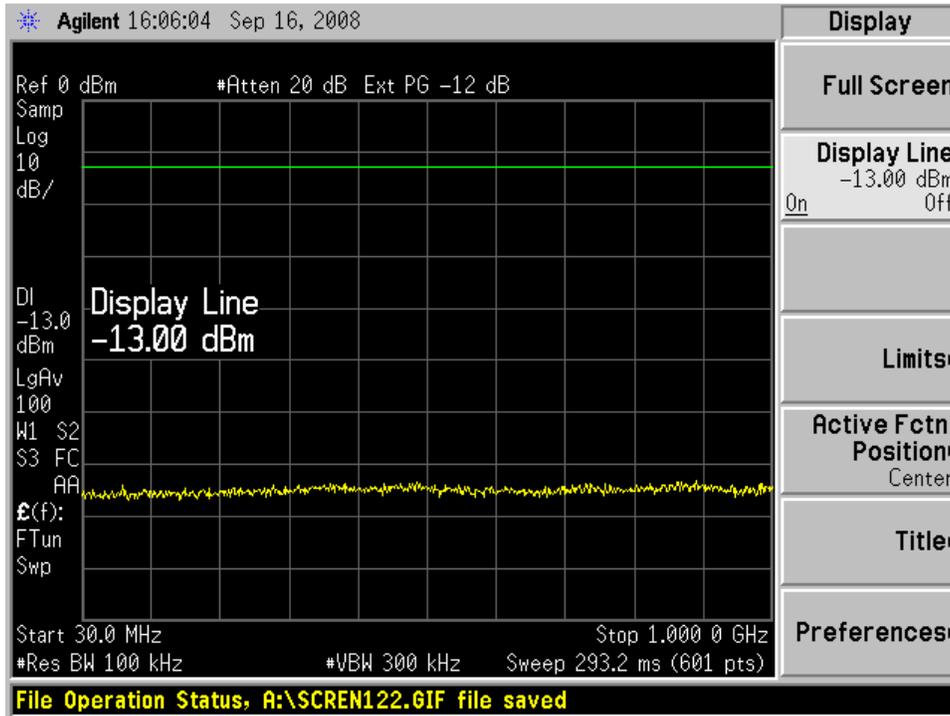
Channel 600



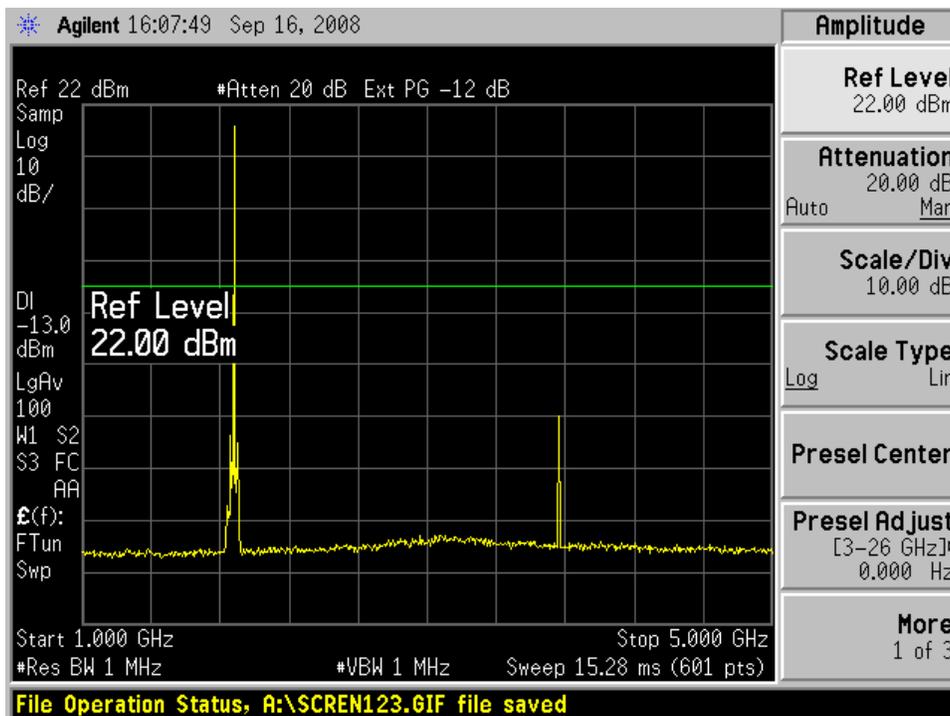
Conducted Spurious Emission Plot-1



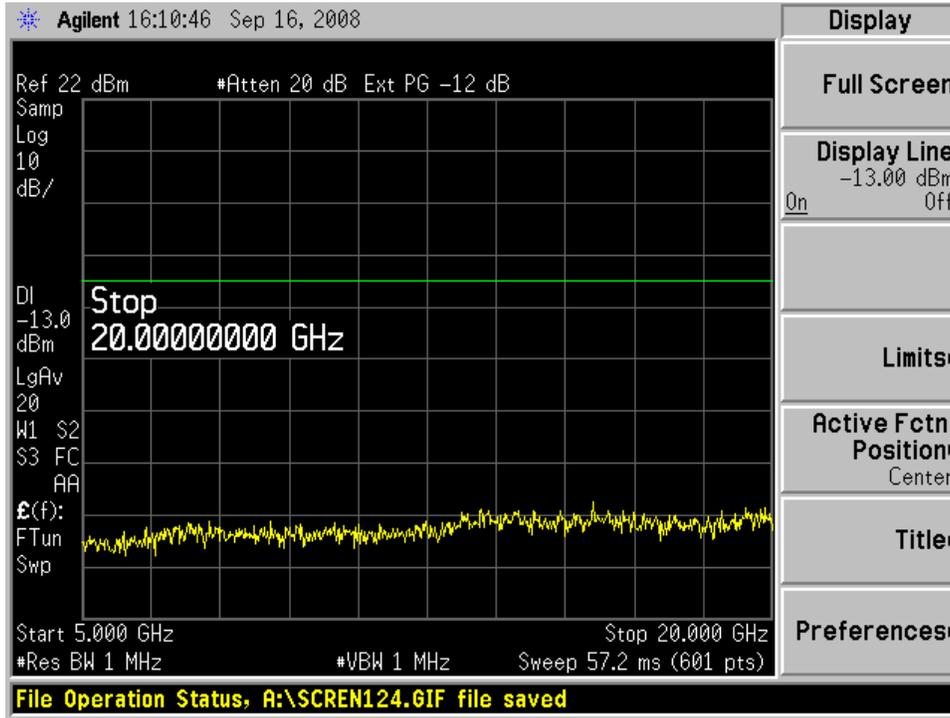
Conducted Spurious Emission Plot-2



Conducted Spurious Emission Plot-3



Conducted Spurious Emission Plot-4



Conducted Spurious Emission Plot-5

9 §2.1055 (a), §2.1055 (d), §24.235 - FREQUENCY STABILITY

9.1 Applicable Standard

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

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

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.

9.2 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.

9.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Dates
Agilent	Wireless Communication Test Set	8960 E5515C	GB43042905	2008-01-19
Agilent	Spectrum Analysis	E4405B	MY41440292	2008-01-19
Wuxi	Temperature Oven	GDW-0100	G30064	2008-01-19

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

9.4 Environmental Conditions

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

* The testing was performed by Tina Bob Xiong 2008-09-16

9.5 Test Results

Reference Frequency: 1880 MHz				
Test Environment		Frequency Error (Hz)	Measurement Results	
Temperature (°C)	Power Supplied (Vdc)		Error (ppm)	Limit (ppm)
50	3.4	4.6	0.0024468	2.5
40	3.4	4.2	0.0022340	2.5
30	3.4	2.5	0.0013298	2.5
20	3.4	0.5	0.0002659	2.5
10	3.4	1.6	0.0008511	2.5
0	3.4	3.8	0.0020213	2.5
-10	3.4	2.8	0.0014894	2.5
-20	3.4	3.8	0.0020213	2.5
-30	3.4	5	0.0026596	2.5

Reference Frequency: 1880 MHz				
Test Environment		Frequency Error (Hz)	Measurement Results	
Temperature (°C)	Power Supplied (Vdc)		Error (ppm)	Limit (ppm)
50	3.7	4.6	0.0024468	2.5
40	3.7	4.1	0.0021808	2.5
30	3.7	2.5	0.0013298	2.5
20	3.7	0.6	0.0003191	2.5
10	3.7	1.5	0.0007978	2.5
0	3.7	3.8	0.0020213	2.5
-10	3.7	2.7	0.0014362	2.5
-20	3.7	3.5	0.0018617	2.5
-30	3.7	4.8	0.0025532	2.5

Reference Frequency: 1880 MHz				
Test Environment		Frequency Error (Hz)	Measurement Results	
Temperature (°C)	Power Supplied (Vdc)		Error (ppm)	Limit (ppm)
50	4.1	4.5	0.0023936	2.5
40	4.1	4.1	0.0021808	2.5
30	4.1	2.4	0.0012765	2.5
20	4.1	0.5	0.0002659	2.5
10	4.1	1.5	0.0007978	2.5
0	4.1	3.5	0.0018617	2.5
-10	4.1	2.8	0.0014894	2.5
-20	4.1	3.5	0.0018617	2.5
-30	4.1	5	0.0026596	2.5

10 §24.238 – BAND EDGE

10.1 Applicable Standard

According to §24.238, 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.

10.2 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.

10.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Dates
Agilent	Wireless Communication Test Set	8960 E5515C	GB43042905	2008-01-19
Agilent	Spectrum Analysis	E4405B	MY41440292	2008-01-19

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

10.4 Environmental Conditions

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

The testing was performed by Tina Bob Xiong 2008-09-16

10.5 Test Results

Please refer to the following plots.

Lowest Channel



Highest Channel

