

FCC MEASUREMENT AND TEST REPORT

For

ZTE Corporation

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

FCC ID: Q78-R8860C196CF

Dec 26, 2009

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: CDMA Remote Radio Unit
Test Engineer:	
Report No.:	FCC-2009-039
Test Date:	Nov ,20 – Dec 28, 2009
Reviewed By:	
Prepared By:	ZTE Corporation. ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen, Guangdong, China 518057, P.R.China Tel: +86-755-26770000 Fax: +86-755-26771999

Note: The test report is specially limited to the above company and this particular sample only. It may not be duplicated without prior written consent of ZTE Corporation. This report must not be used by the client to claim product certification 、 approval 、 or endorsement by any agency of the US Government.

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2 GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The ZTE Corporation's product, model number: ZXSDR R8860 C196 or the "EUT" as referred to in this report is a CDMA Remote Radio Unit.

Technical specification:

Size: 500 mm × 320 mm × 172 mm(H x W x D)

Input voltage: -57 ~ -40Vdc

Frequency range: 1970MHz to 1985MHz,

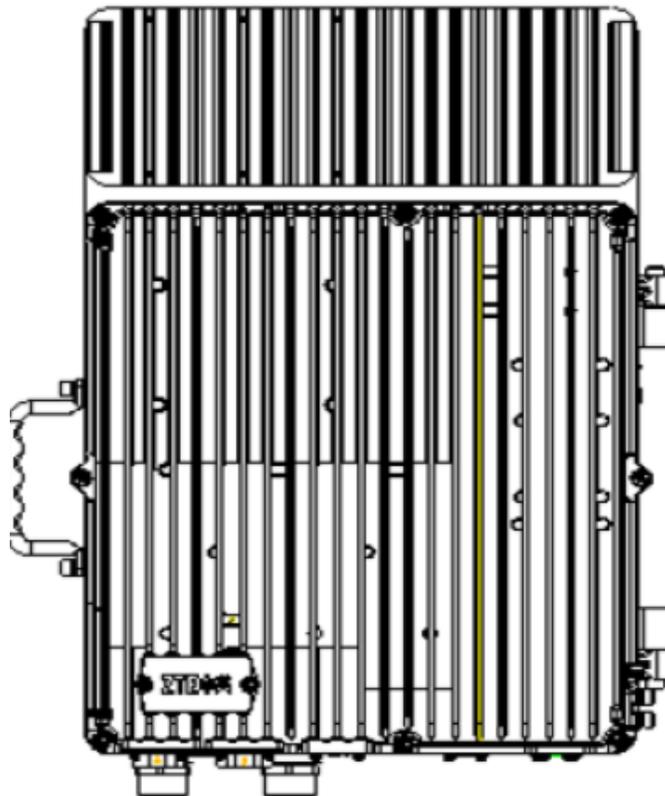
(Bottom frequency is about 1970.65MHz, Middle frequency is about 1977.50MHz, Top frequency is about 1984.35MHz).

Max RF output power: 48dBm

Gain of the antenna: 13dBi

Modulation type of emission: CDMA

Appearance of EUT:



Objective

This Type approval report is prepared on behalf of ZTE Corporation in accordance with Part 2, Part 15, Part 24 of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

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

FCC CFR47 Part 2

FCC CFR47 Part 24

Applicable Standards: TIA EIA 137-A, TIA EIA 97-D, TIA/EIA 603-C, Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

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

Test Facility

The Test site used by ZTE Corporation to collect test data is located in the ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China, Tel: +86-755-26770000, Fax: +86-755-26771999. 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 November 04, 2004. The facility also complies with the radiated and AC line 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 Registration No.: 0007895832. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

3 SYSTEM TEST CONFIGURATION

Description of Test Configuration

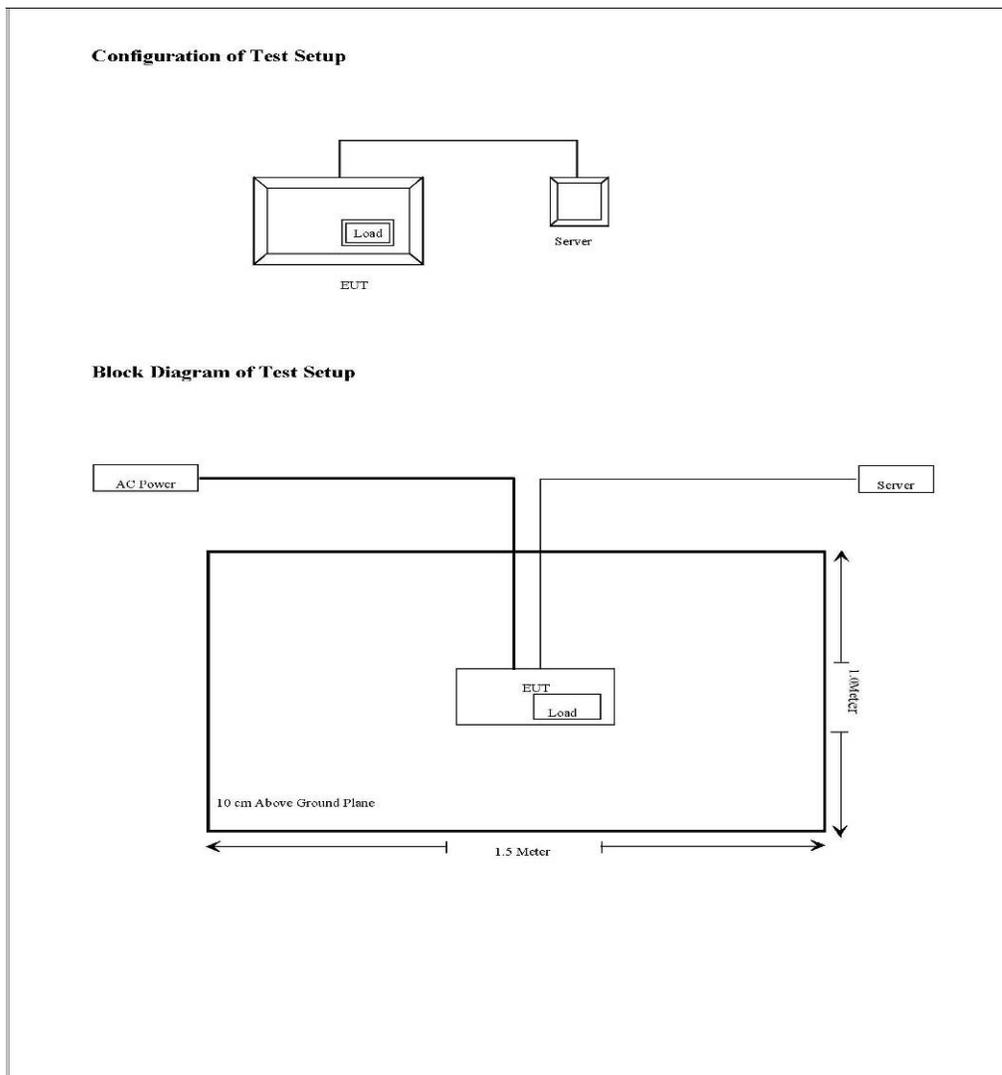
Justification

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

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

Equipment Modifications

ZTE Corporation has not done any modification on the EUT.



4 SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§2.1046 §24.232	Transmitter output Power	Compliant
§2.1091 §1.1037	RF Exposure	Compliant
§2.1053	Spurious Radiated Emissions	Compliant
§2.1051, §24.238	Spurious Emissions AT Antenna Terminals	Compliant
§2.1049 §24.229 §24.238	Occupied Bandwidth	Compliant
§24.238	Band Edge	Compliant
§ 2.1055 § 24.235	Frequency stability	Compliant

5 TRANSMITTER OUTPUT POWER

Applicable Standard: FCC §2.1046 §24.232

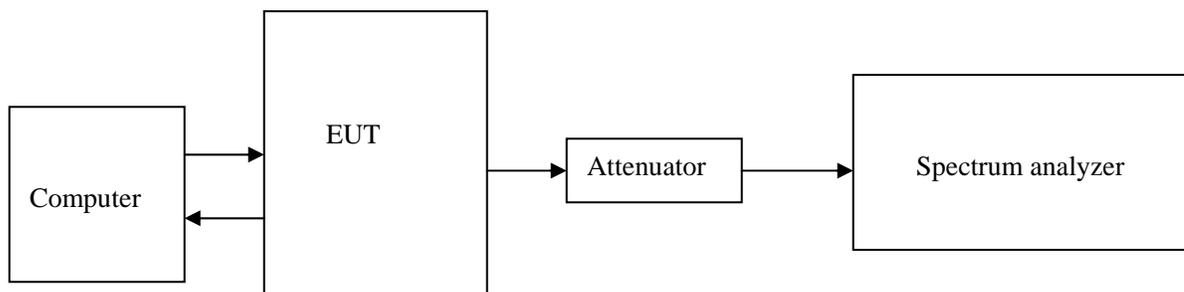
According to FCC §2.1046 & §24.232, the EIRP (equivalent isotropically radiated power) must not exceed 1640 Watts for base station transmitters operating in the band of 1930 MHz to 1995 MHz with the antenna height above average terrain up to 300 meters. If used in urban area, the limit should be 1640 Watts/MHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY48011941	2009-4-10	2010-4-9
DTS	DTS100 40dB Attenuator	DTS100-40dB-N	N/A	N/A	N/A
Hewlett Packard	Hewlett Packard RF Cable	8120-6192	01428251	N/A	N/A

***statement of traceability:** ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure



The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation. External attenuation Loss is 40dB, Cable Loss is about 3dB

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

The testing was performed by Wei bin on Dec 13, 2009

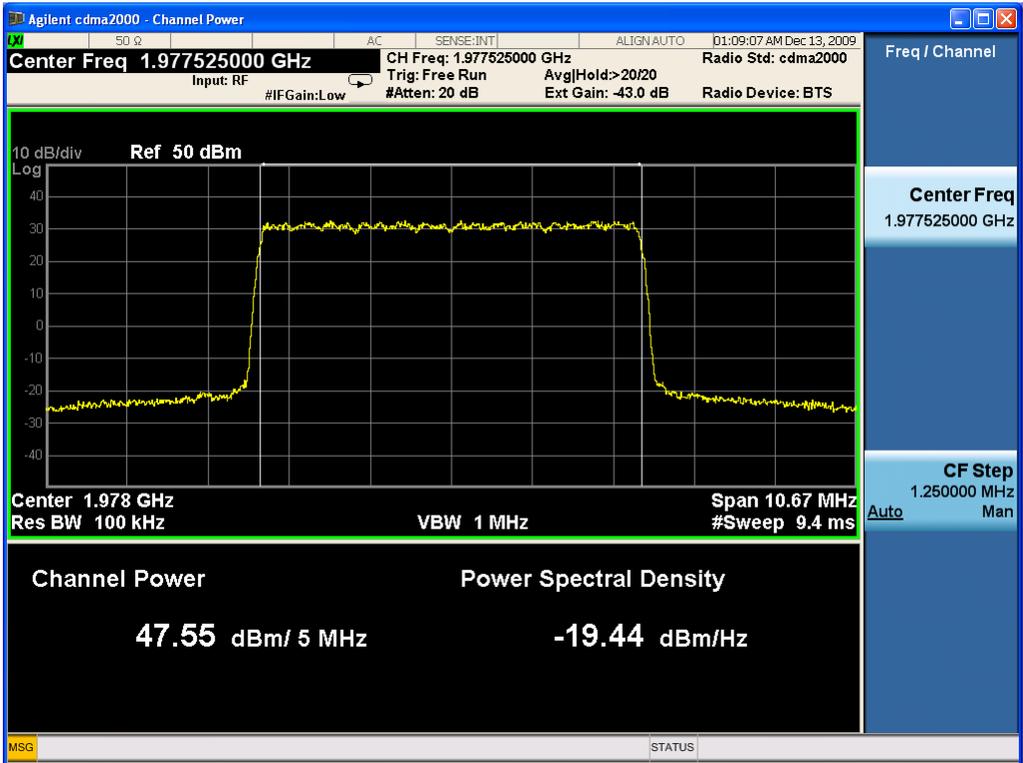
Test Result: Pass

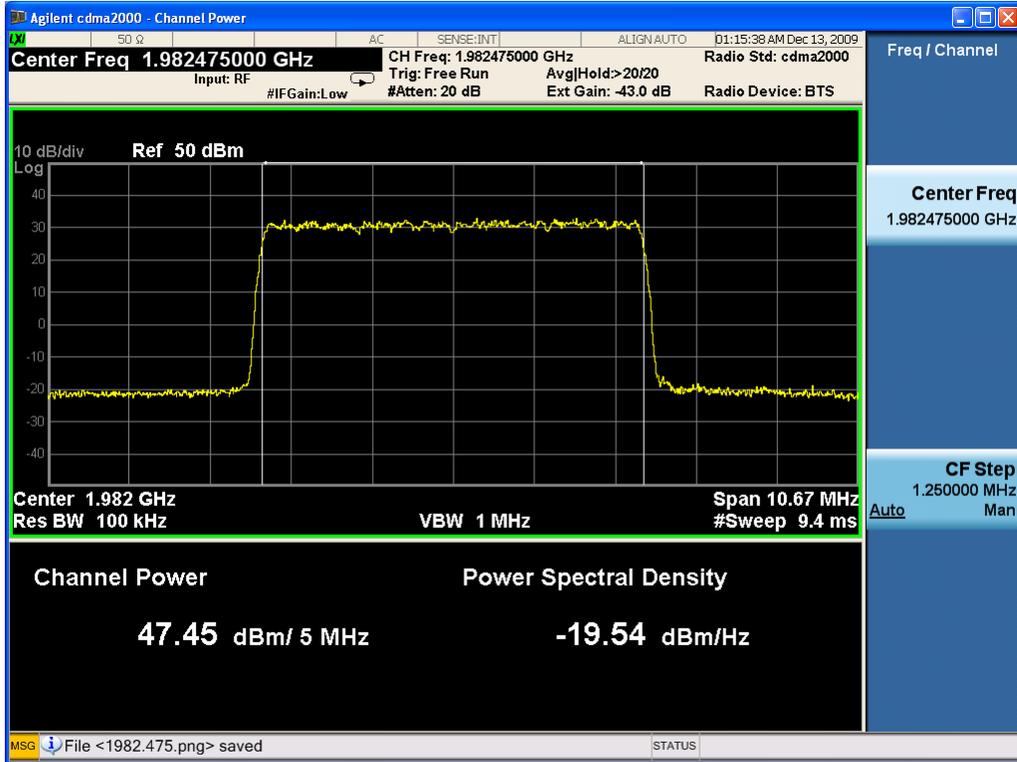
Test Mode: Transmitting CDMA ,QPSK modulation

Test Data:

Four Carriers

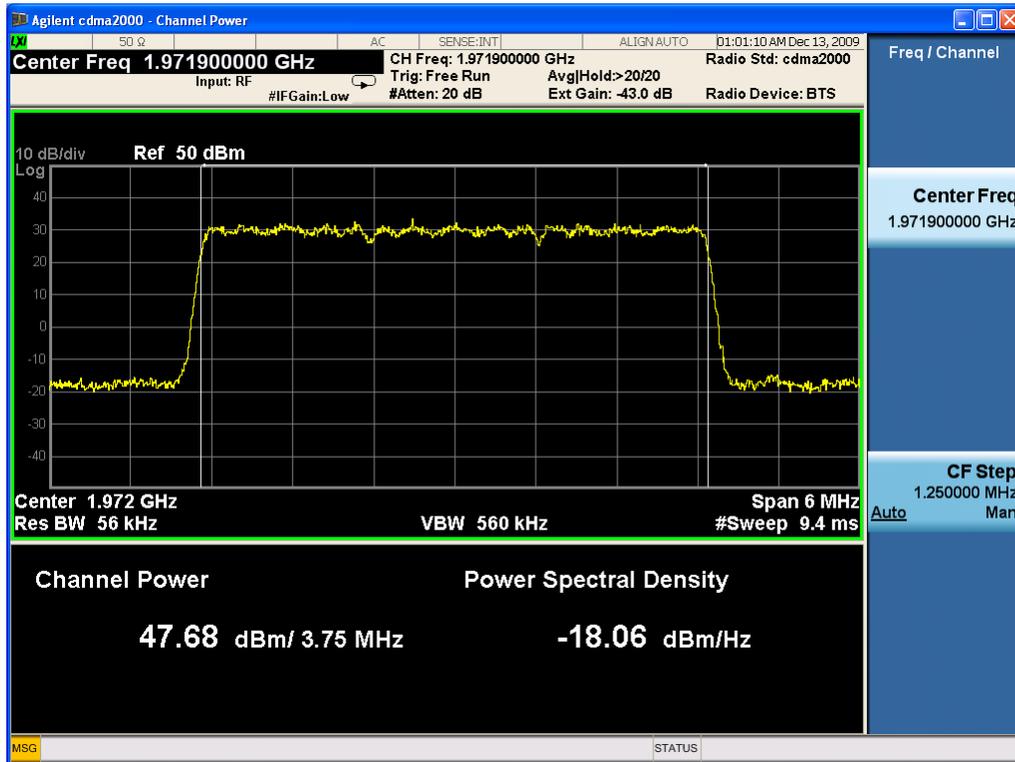
Center Freq. (MHz)	Frequency (MHz)	Max output Power in dBm	Antenna gain dBi	Total Power in W
1972.525	1970.65/1971.90/1973.15/1974.4	47.70	13	1175
1977.525	1975.95/1977.2/1978.45/1979.7	47.55	13	1135
1982.475	1980.6/1981.85/1983.10/1984.35	47.45	13	1109

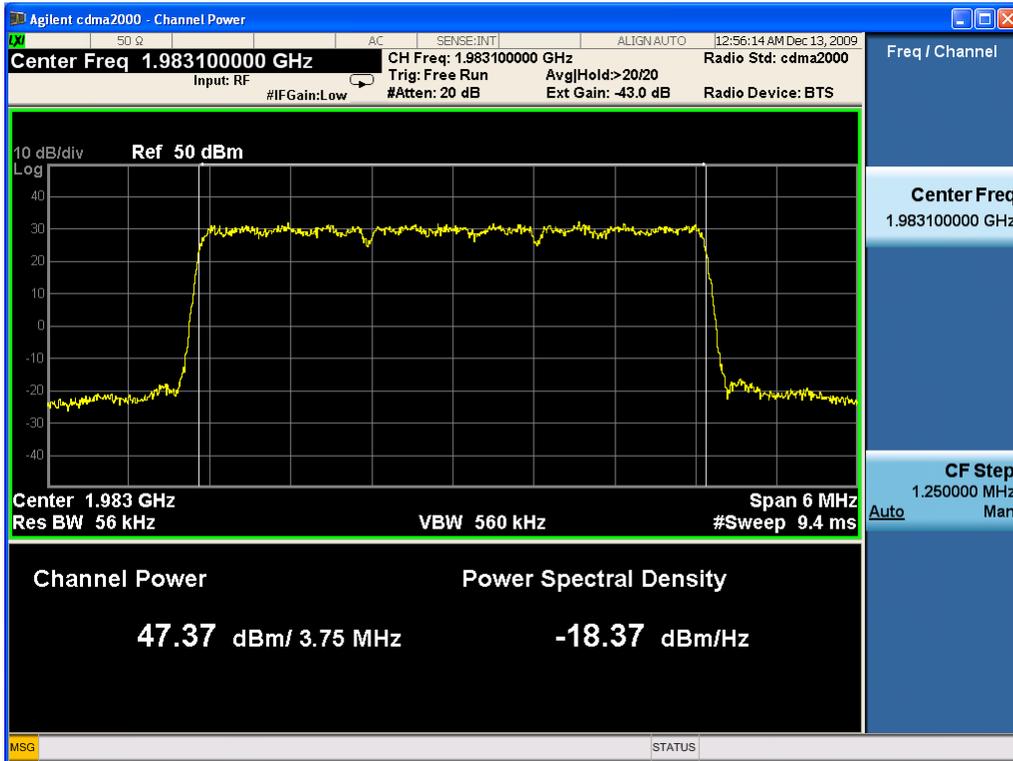
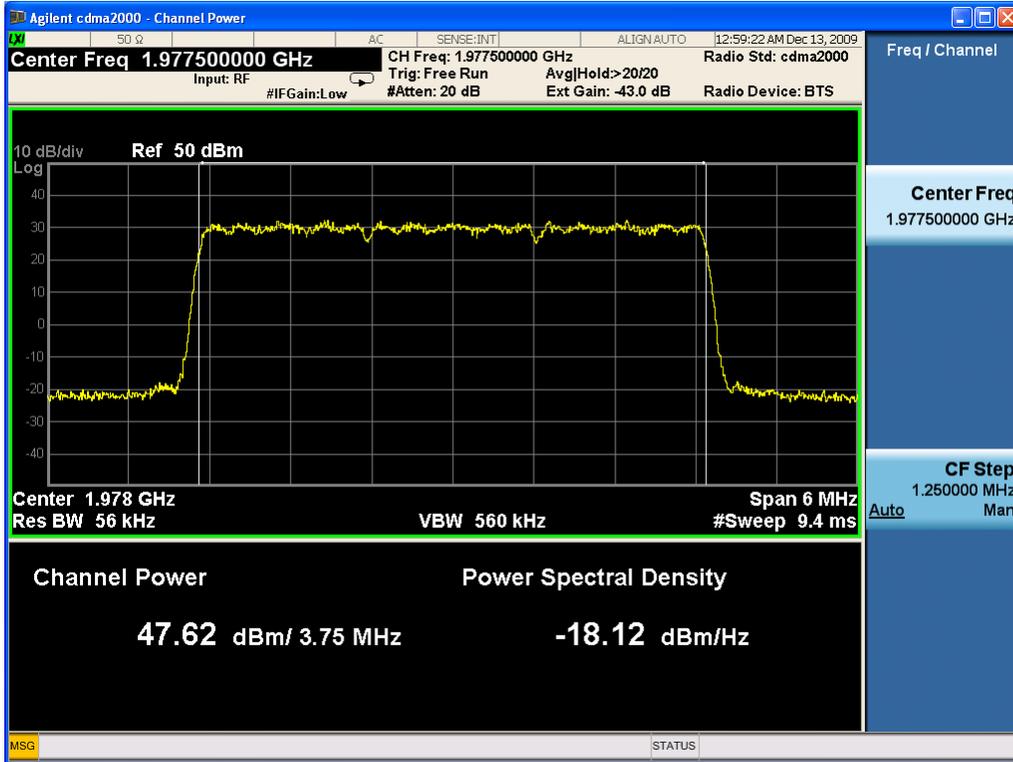




Three carriers

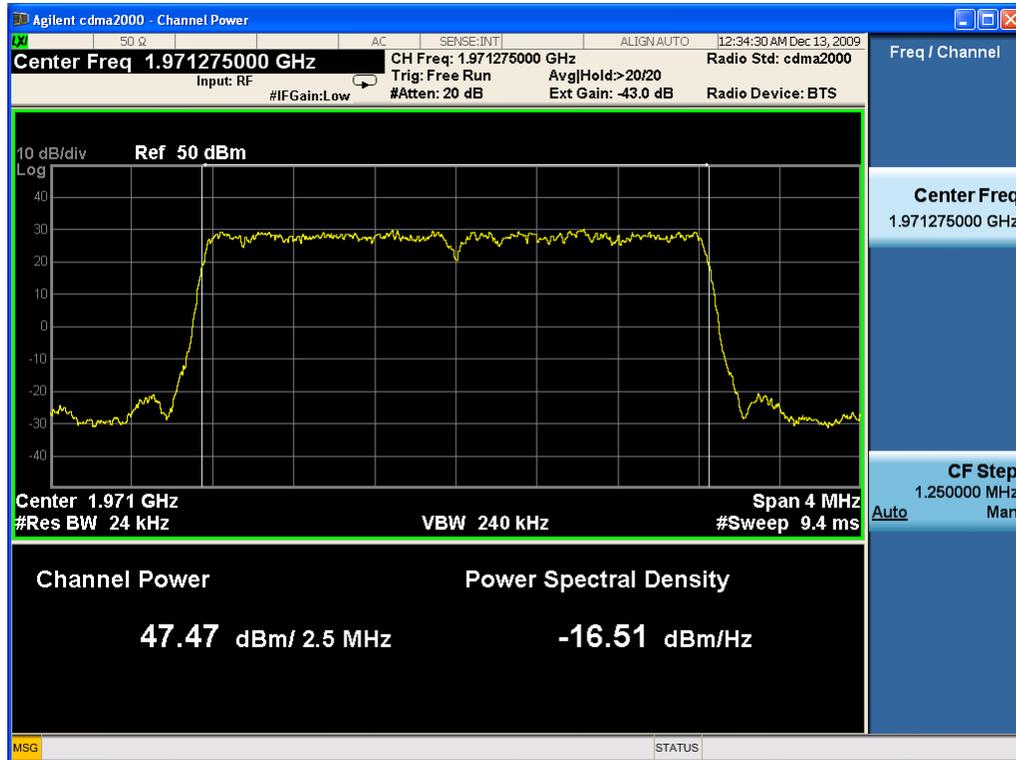
Center Freq. (MHz)	Frequency (MHz)	Max output Power in dBm	Antenna gain dBi	Total Power in W
1971.9	1970.65/1971.9/1973.15	47.68	13	1169
1977.5	1976.25/1977.5/1978.75	47.62	1153	
1983.1	1981.85/1983.1/1984.35	47.37	13	1089

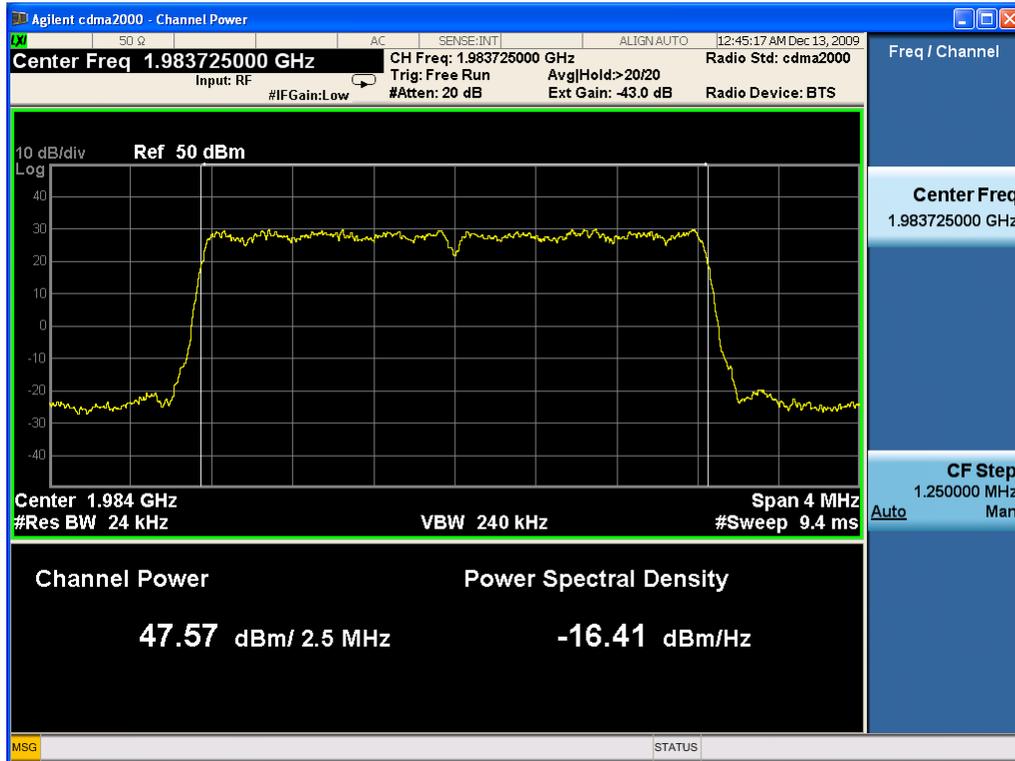
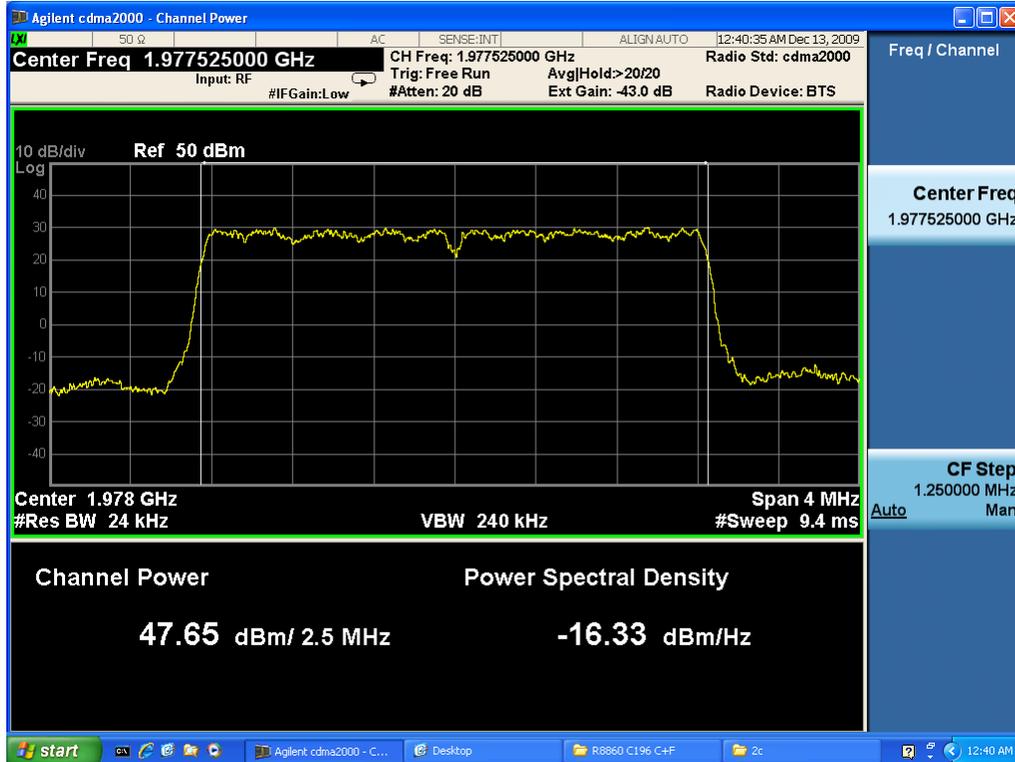




Two carriers

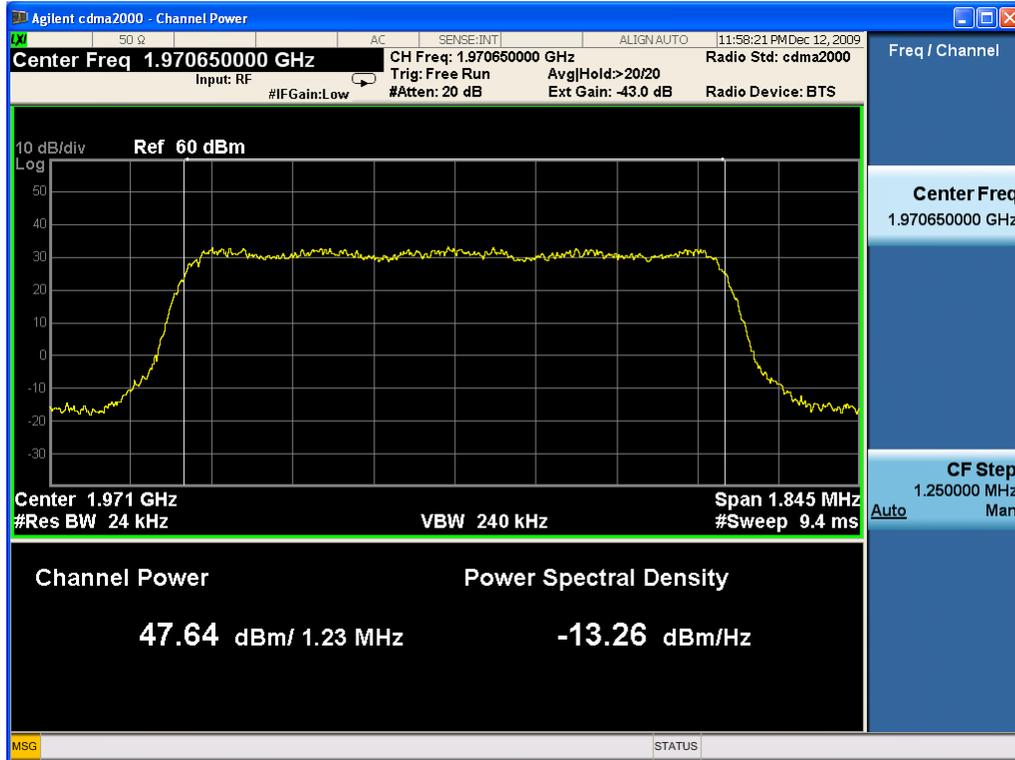
Center Freq. (MHz)	Frequency (MHz)	Max output Power in dBm	Antenna gain dBi	Total Power in W
1971.275	1970.65/1971.90	47.47	13	1114
1977.525	1976.90/1978.15	47.65	1161	
1983.725	1983.10/1984.35	47.57	13	1140

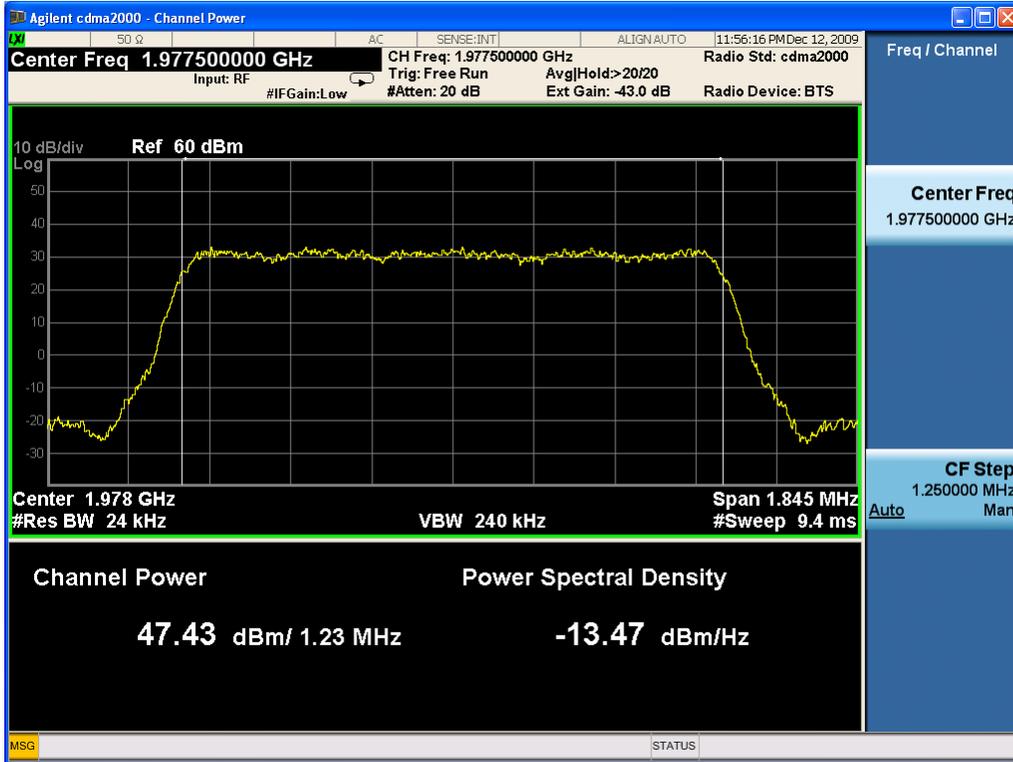




One carrier

Center Freq. (MHz)	Frequency (MHz)	Max output Power in dBm	Antenna gain dBi	Total Power in W
1970.65	1970.65	47.64	13	1158
1977.50	1977.50	47.43	13	1104
1984.35	1984.35	48.04	13	1270





6 RF EXPOSURE

Applicable standard: FCC §2.1091 §1.1037

Limit

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated. Limits for Maximum Permissible Exposure (MPE)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

Test Data

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
 $S = PG / 4\pi R^2$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal: 48.04(dBm) Maximum peak output power at antenna input terminals: 63.7 (W)

Prediction distance: 400 (cm)

Predication frequency: 1984.35 (MHz)

Antenna Gain (typical): 13 (dBi)

Power density at predication frequency at 400 cm: 0.00632 (mW/cm²)

MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm²)

Test Result: pass

7 MODULATION CHARACTERISTIC

Applicable Standard: FCC §2.1047

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY48011941	2009-4-10	2010-4-9
DTS	DTS100 40dB Attenuator	DTS100-40dB-N	N/A	N/A	N/A
Hewlett Packard	Hewlett Packard RF Cable	8120-6192	01428251	N/A	N/A

***statement of traceability:** ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

Test Procedure

CDMA digital mode is used by EUT.

Test Data Environmental Conditions

Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

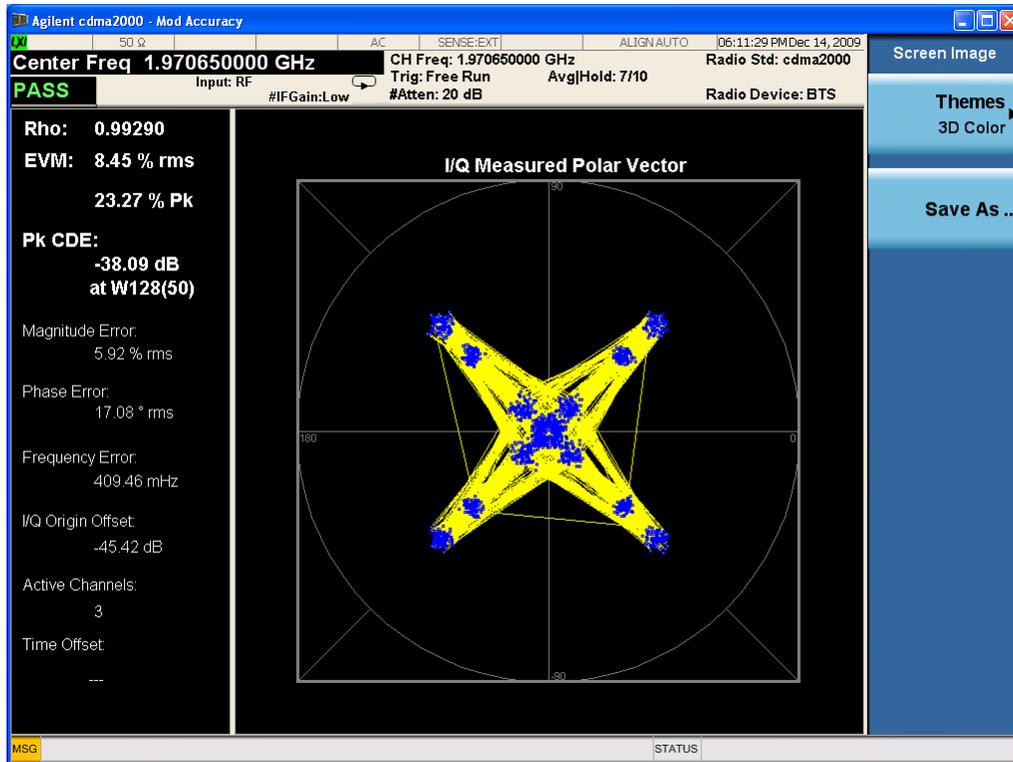
The testing was performed by Wei bin on Dec 14, 2009

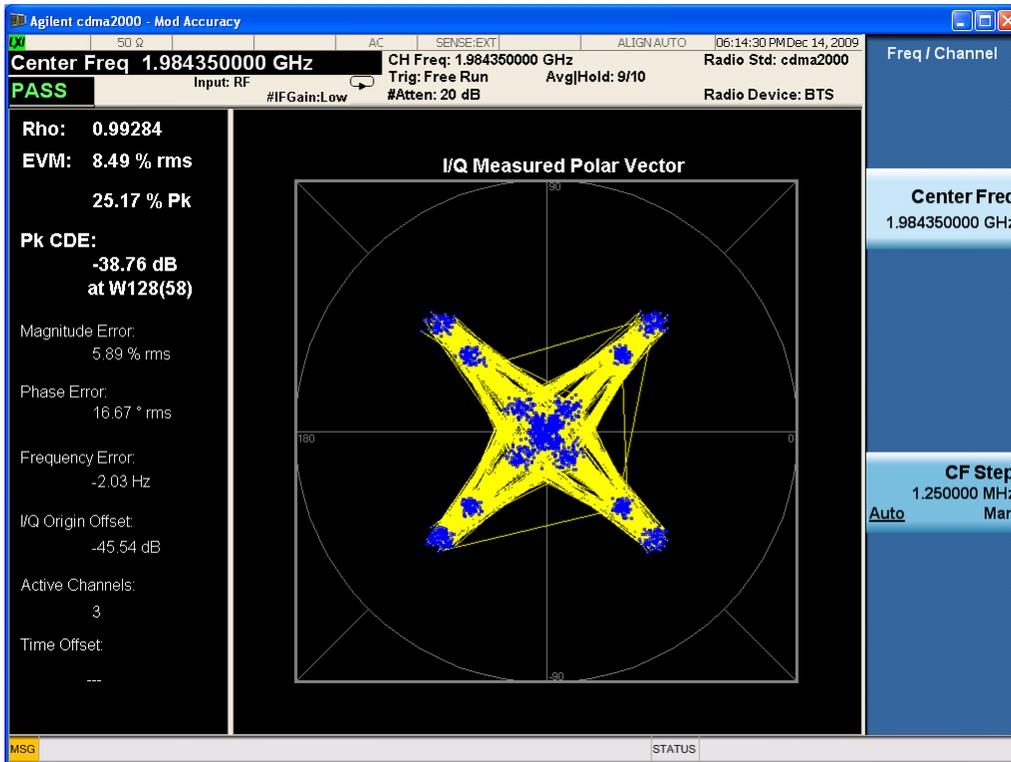
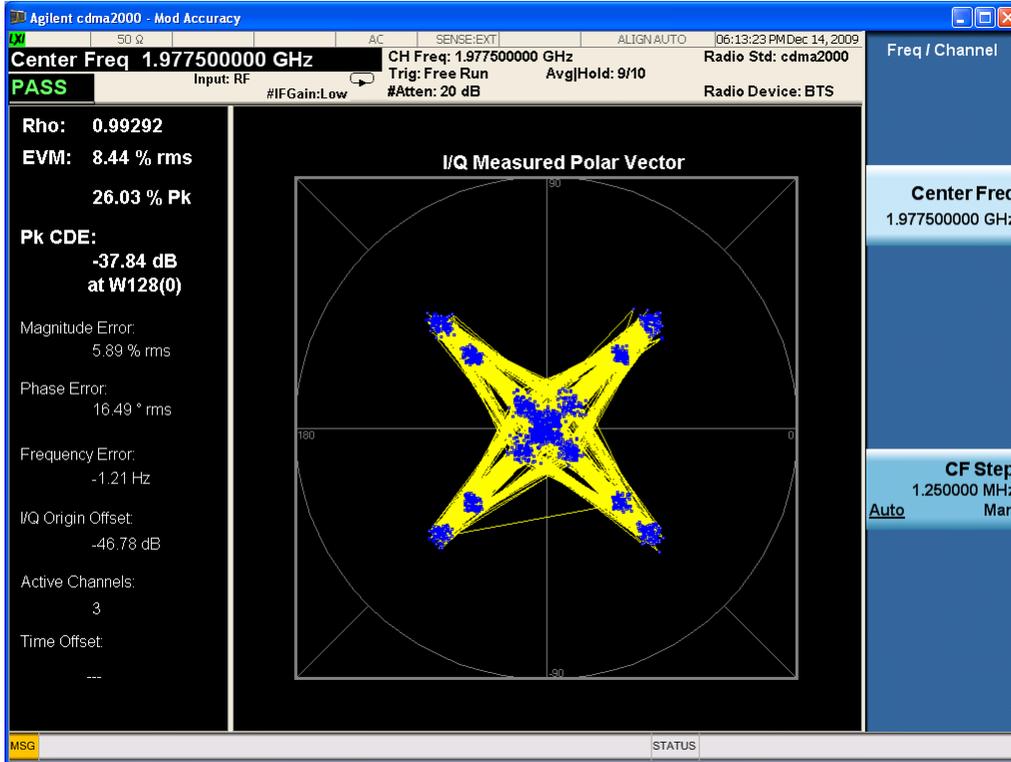
Test Result: Pass

Test Mode: Transmitting CDMA

Test Data:

Frequency (MHz)	Rho
1984.35	0.99284
1977.50	0.99292
1970.65	0.99290





8 SPURIOUS RADIATED EMISSIONS

Applicable Standard: FCC CFR 47, §2.1053

Test Equipment List and Details

Manufacturer	Equipment	Model	Serial Number	Last Cal.	Cal. Interval
Sunol Sciences	Horn Antenna	DRH-118	A052604	2009-09-25	1 Year
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	1 Year
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-08-28	1 Year
HP	Preamplifier	8449B	3008A00277	2009-09-12	1 Year
HP	Signal Generator	HP8657A	2849U00982	2009-10-16	1 Year
HP	Amplifier	HP8447D	2944A09795	2009-08-02	1 Year
HP	Synthesized Sweeper	8341B	2624A00116	2009-11-07	1 Year
COM POWER	Dipole Antenna	AD-100	041000	2009-09-25	1 Year
A.H. System	Horn Antenna	SAS-200/57 1	135	2009-05-17	1 Year
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	1100.0008.02	2009-09-26	1 Year

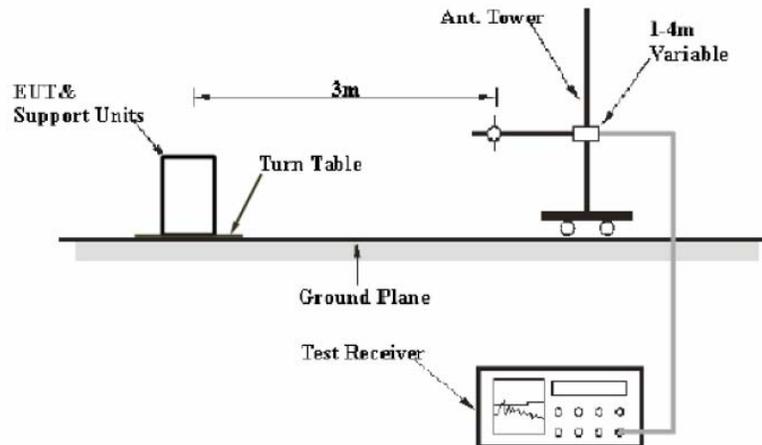
***statement of traceability:** BACL Corporation Testing lab attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiated emissions measurement at the EMC lab of BACL Corp. is 3.6dB.

EUT Setup



The radiated emission tests were performed in the 3-meter Chamber, using the setup accordance with the TIA/EIA 603-C. The specification used were the FCC Part 24.238 limits.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating 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 lg (TX pwr in Watts/0.001)-the absolute level

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

The resolution bandwidth of the spectrum analyzer was set at 100KHz for 30MHz to 1GHz scanning, set at 1MHz or 3MHz for 1GHz to 20GHz scanning.

Test Results Summary: PASS

Environmental Conditions

Temperature: 26°C

Relative Humidity:	60 %
ATM Pressure:	1009 mbar
The testing was performed by Guan bin on Dec 12 ,2009	

Test data

Frequency MHz	Field strength dBmV/m	Output power of the signal generator (dBm)	Cable loss (dB)	Isotropic gain of the substitution antenna (dBi)	Measurement result (dBm)	Limit (dBm)	Margin (dB)
156.352705	27.27	-64.77	1	-4.87	-72.79	-13	59.79
638.436874	28.26	-72.63	2.1	-1.09	-77.97	-13	64.97
945.571142	34.41	-63.05	2.6	-2.2	-70	-13	57
1388.77756	47.59	-58.51	3.1	4.25	-59.51	-13	46.51
1977.95591	91.86	-14.74	3.8	6.55	-14.14	-13	1.14
2595.19038	63.76	-41.46	4.3	7.95	-39.96	-13	26.96

Radiation emission spurious 30MHz to 3GHz in middle frequency (horizontal)

Frequency MHz	Field strength dBmV/m	Output power of the signal generator (dBm)	Cable loss (dB)	Isotropic gain of the substitution antenna (dBi)	Measurement result (dBm)	Limit (dBm)	Margin (dB)
59.158317	29.28	-37.92	0.5	-29.52	-70.09	-13	57.09
226.332665	29.66	-68.41	1.2	1.6	-70.16	-13	57.16
996.112224	33.94	-62.17	2.7	-2.59	-69.61	-13	56.61
1336.67335	47.7	-56.09	3.1	4.25	-57.09	-13	44.09
1977.95591	91.86	-15.66	3.8	6.55	-15.06	-13	2.06
2599.1984	63.42	-44.11	4.3	7.95	-42.61	-13	29.61

Radiation emission spurious 30MHz to 3GHz in middle frequency (vertical)

Frequency MHz	Field strength dBmV/m	Output power of the signal generator (dBm)	Cable loss (dB)	Isotropic gain of the substitution antenna (dBi)	Measurement result (dBm)	Limit (dBm)	Margin (dB)
4050.1002	46.92	-57.73	5.3	7.95	-57.23	-13	44.23
5621.24249	47.26	-51.35	6.5	9.05	-50.95	-13	37.95
5933.86774	52.39	-46.22	6.6	9.05	-45.92	-13	32.92
10412.8257	52.13	-56.81	9.1	11.35	-56.71	-13	43.71
14216.4329	56.23	-49.09	10.7	9.65	-52.29	-13	39.29
20000	67.29	-39.31	12.2	6.45	-47.21	-13	34.21

Radiation emission spurious 3GHz to 20GHz in middle frequency(horizontal)

Frequency MHz	Field strength dBmV/m	Output power of the signal generator (dBm)	Cable loss (dB)	Isotropic gain of the substitution antenna (dBi)	Measurement result (dBm)	Limit (dBm)	Margin (dB)
4010.02004	44.89	-61.2	5.3	7.95	-60.7	-13	47.7
5589.17836	47.82	-58.81	6.4	9.05	-58.31	-13	45.31
5933.86774	58.58	-44.9	6.6	9.05	-44.6	-13	31.6
10464.9299	52.23	-56	9.1	11.35	-55.9	-13	42.9
14086.1723	56.46	-53.06	10.8	9.65	-56.36	-13	43.36
19921.8437	66.81	-40.72	12.2	6.45	-48.62	-13	35.62

Radiation emission spurious 3GHz to 20GHz in middle frequency (vertical)

9 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard: FCC§2.1051, §24.238

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

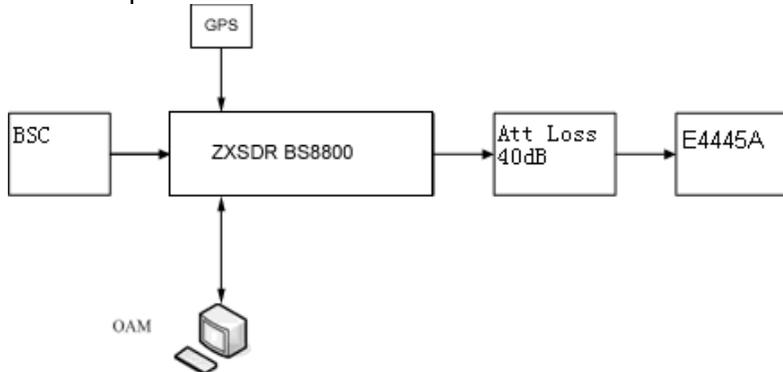
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY48011941	2009-4-10	2010-4-9
DST	DST100 40dB Attenuator	DTS100-40dB-N	N/A	N/A	N/A
Hewlett Packard	Hewlett Packard RF Cable	8120-6192	01428251	N/A	N/A

***statement of traceability:** ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

Test Procedure

EUT Setup:



REMARKS: Attenuator loss (dB)=40dB, Cable Loss (dB)=3dB.

The RF output of the transceiver was connected to a spectrum analyzer through appropriate

attenuation. The resolution bandwidth of the spectrum analyzer was set at 1 kHz for 9KHz to 150KHZ scanning, set at 10KHz for 150KHz to 30MHz scanning ,set at 100KHz for 30MHz to 1GHz scanning, set at 1MHz or 3MHz for 1GHz to 22GHz scanning. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Data Environmental Conditions

Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

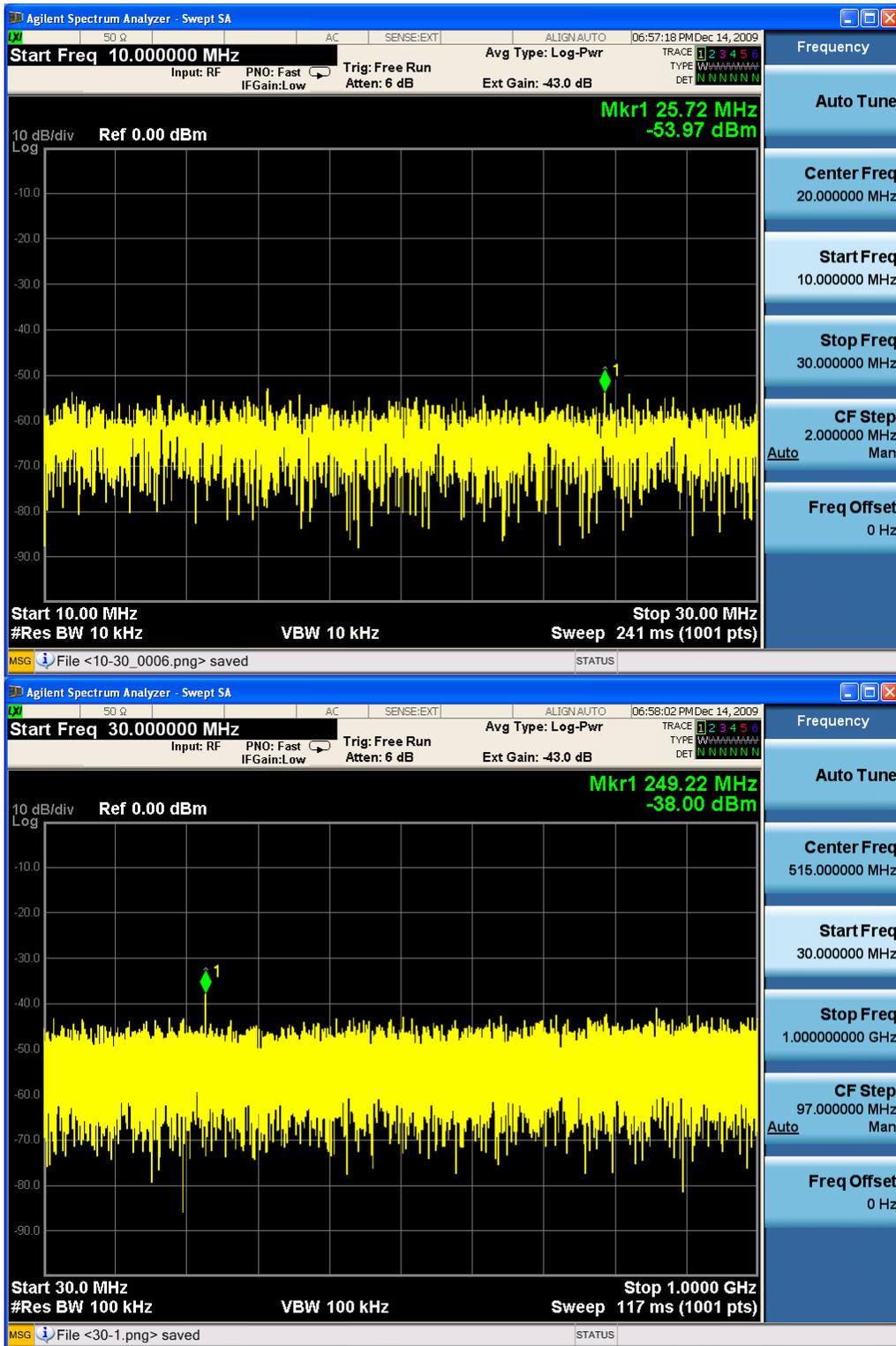
The testing was performed by Wei bin on Dec 14, 2009

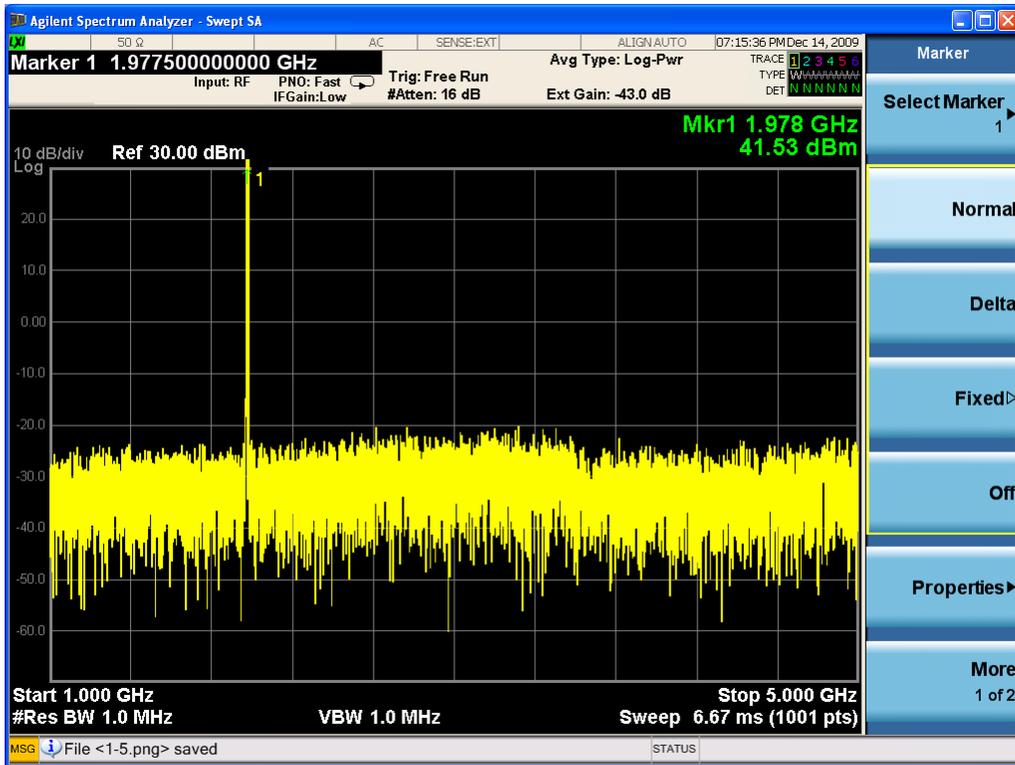
Test Result: Pass

Test Mode: Transmitting CDMA with QPSK Modulation

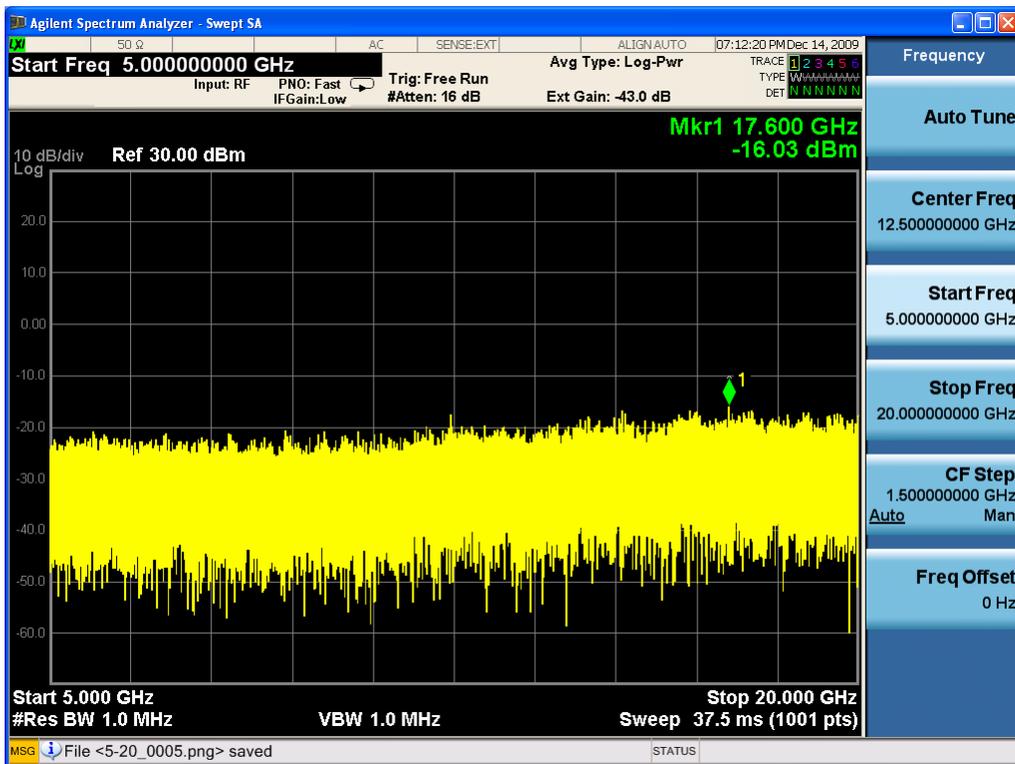
Test Data:

Channel	Frequency(Hz)	RBW(Hz)	Measured value	Limit(dBm)	Carriers
M	9k~150k	1k	-42.06	-13	4
	150k~10M	10K	-46.43		
	10M~30M	10k	-53.97		
	30M~1G	100k	-38.00		
	1G~20G	1M	-16.00		
M	9k~150k	1k	-42.83	-13	1
	150k~10M	10K	-46.69		
	10M~30M	10k	-52.23		
	30M~1G	100k	-38.00		
	1G~20G	1M	-26.73		

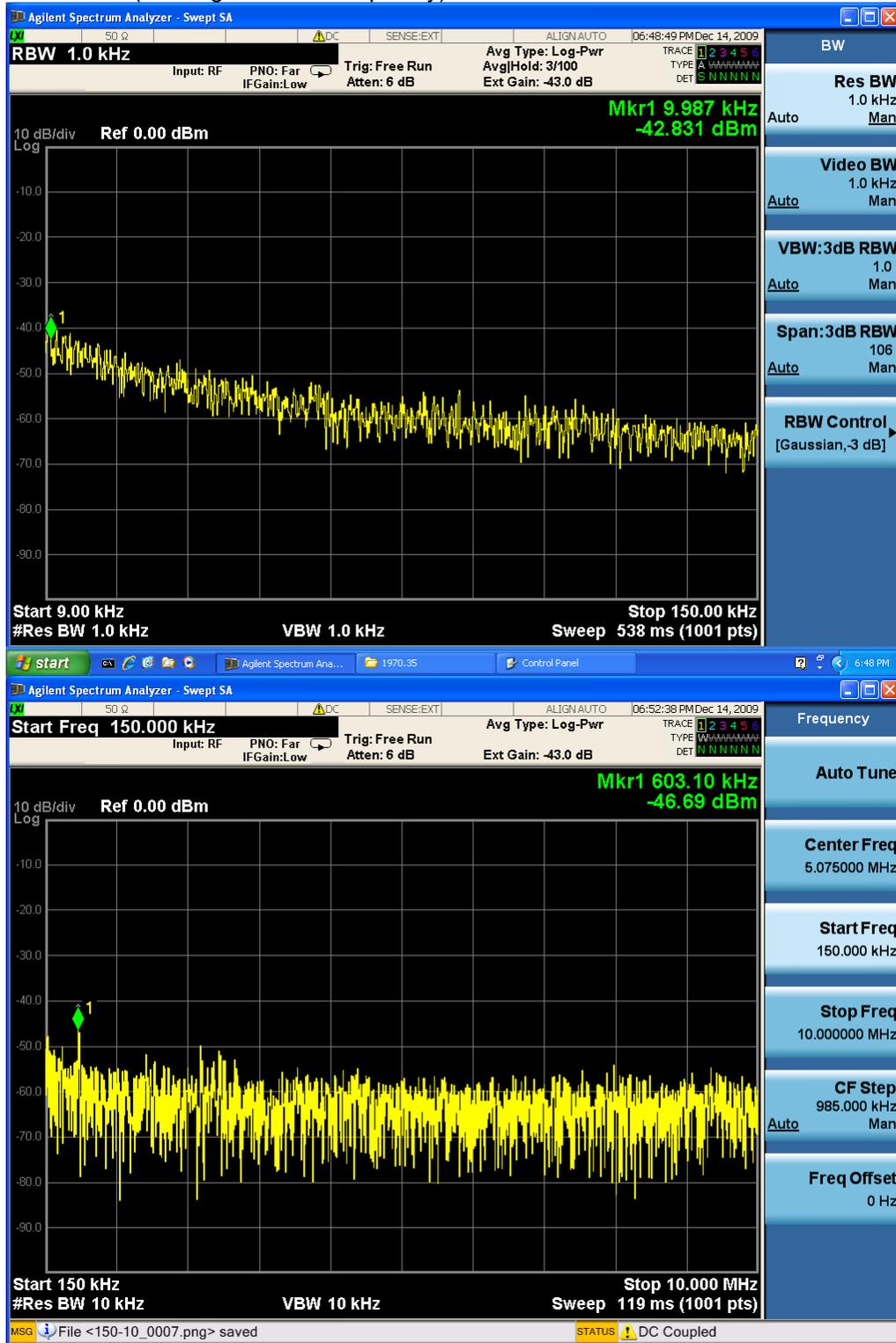


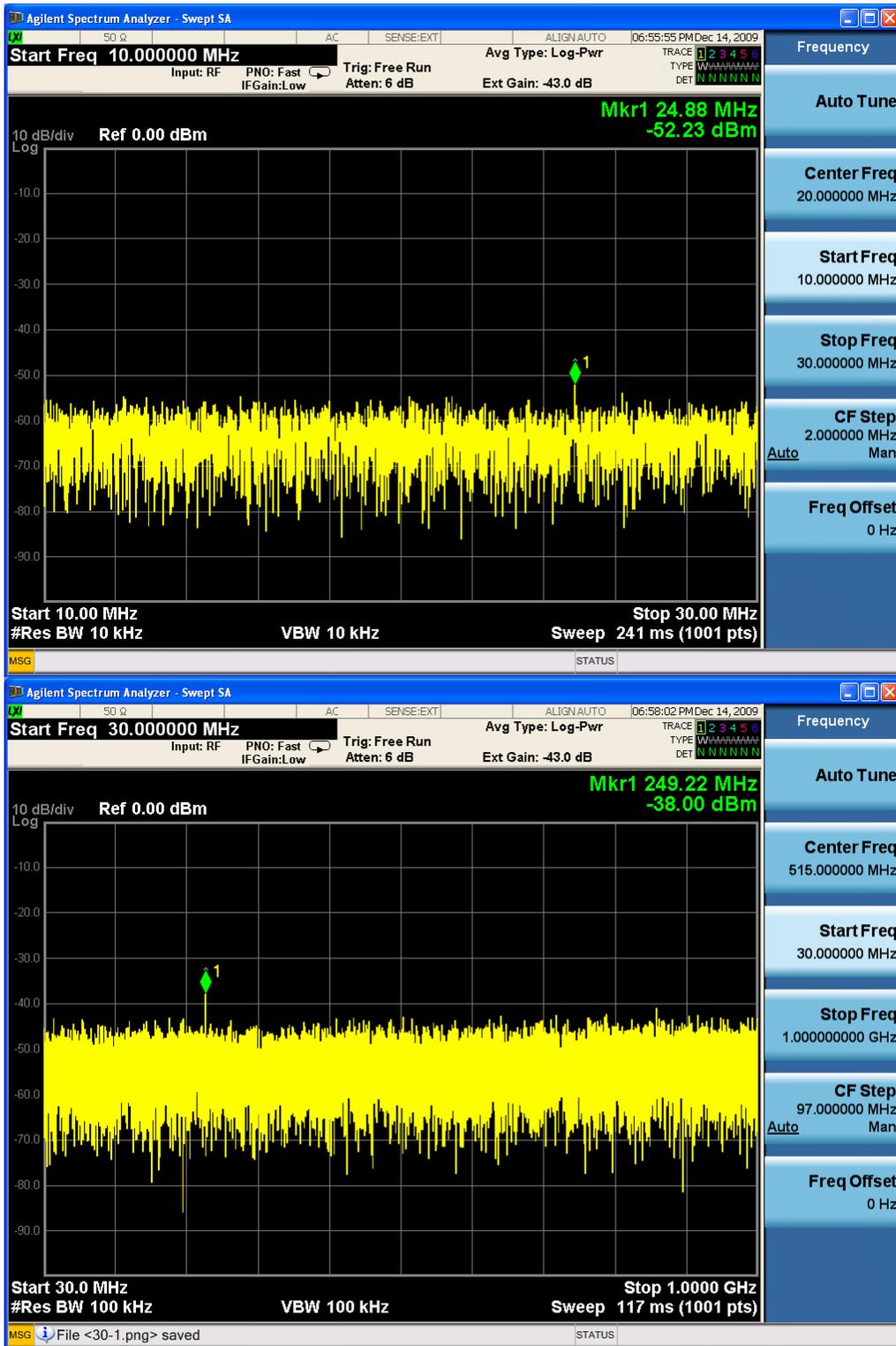


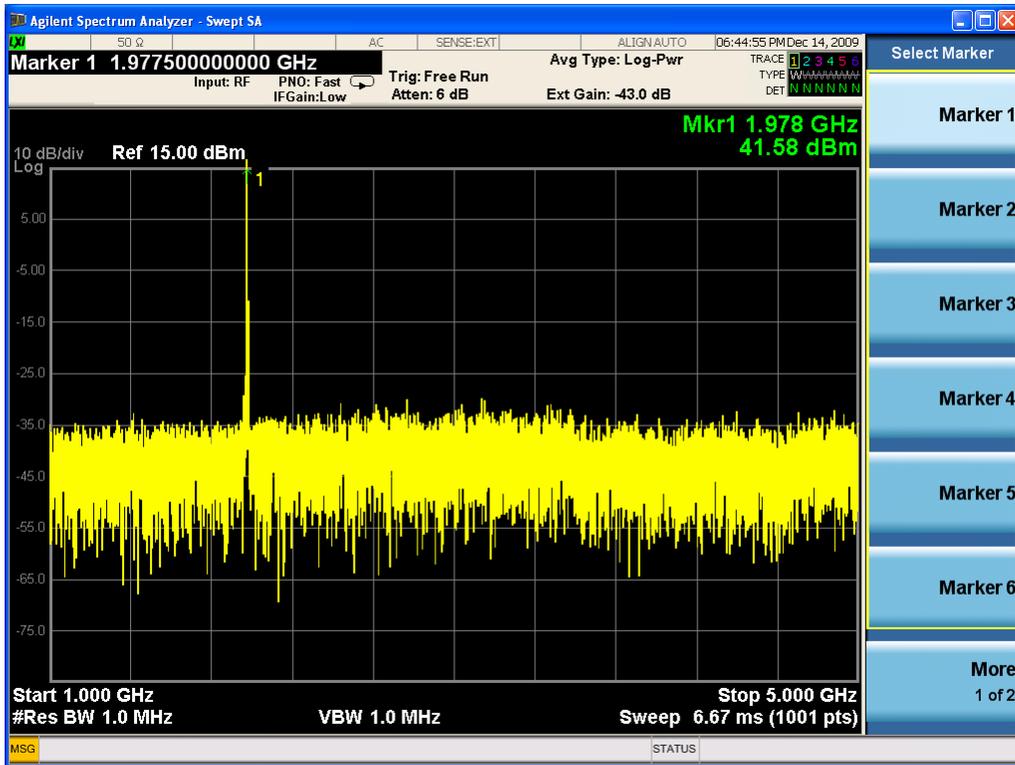
* The highest point is in working frequency block



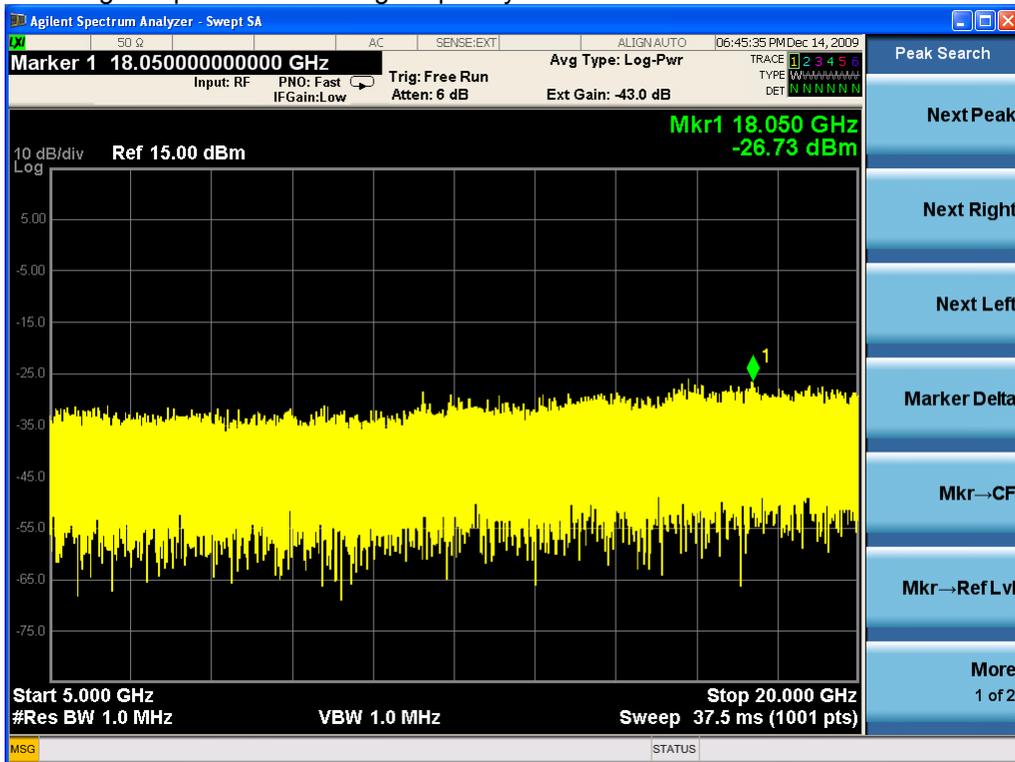
One carrier (working in middle frequency)







* The highest point is in working frequency block



10 OCCUPIED BANDWIDTH

Applicable Standard: FCC §2.1049 §24.229 §24.238

Test Equipment List and Details :

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY48011941	2009-4-10	2010-4-9
DST	DST100 40dB Attenuator	DTS100-40dB-N	N/A	N/A	N/A
Hewlett Packard	Hewlett Packard RF Cable	8120-6192	01428251	N/A	N/A

***statement of traceability:** ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

Test Procedure

The RF out of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation. The resolution bandwidth of the spectrum analyzer was set at 1% of the span or higher and 99%Power bandwidth was recorded.

Environmental Conditions

Temperature:	20 ° C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Wei bin on Dec 13 2009.

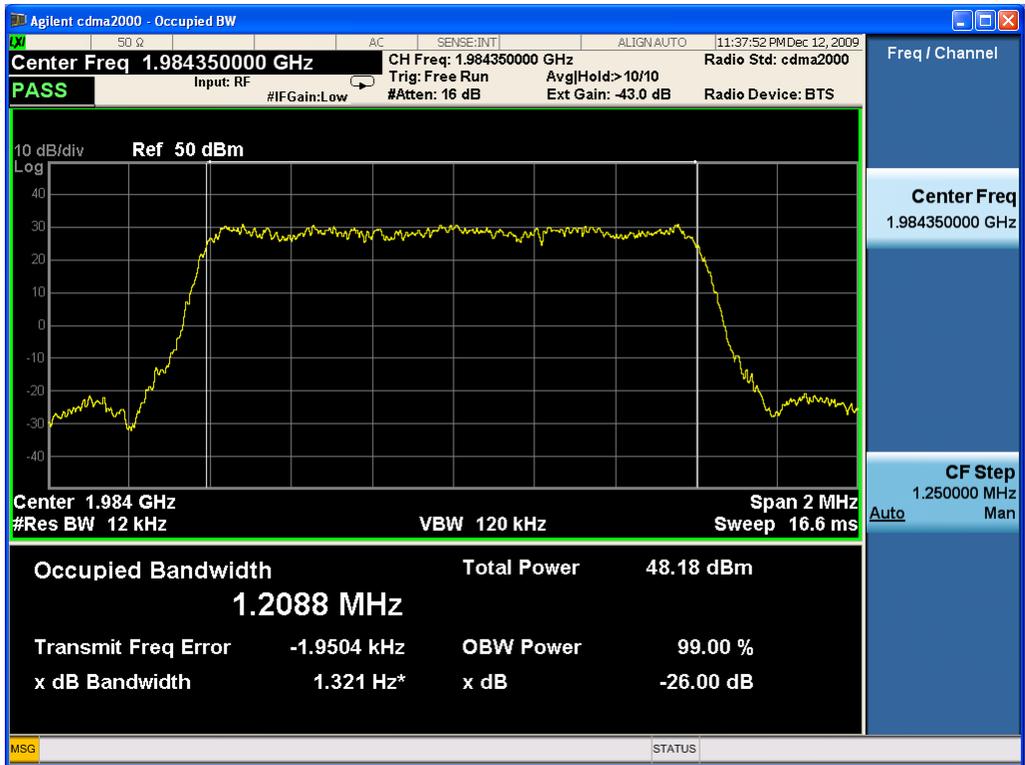
Test Result: Pass

Test Mode: Transmitting CDMA

Test Data

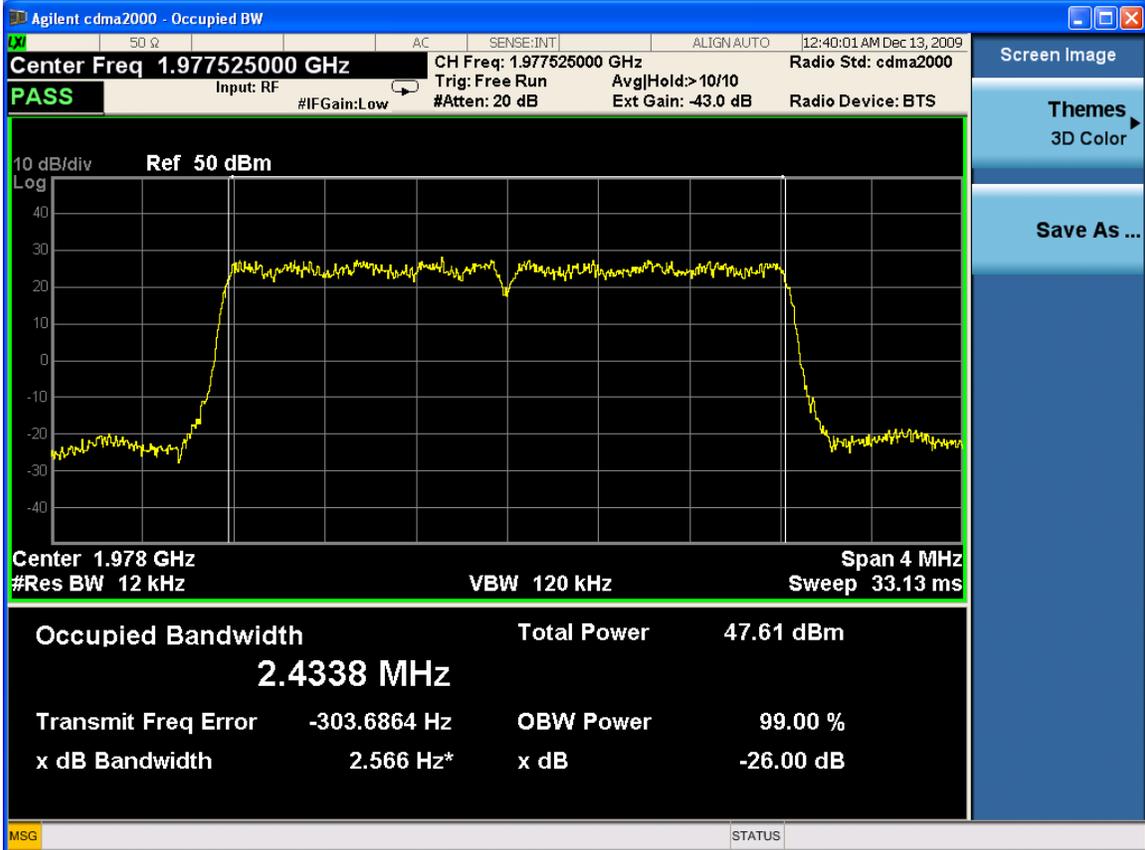
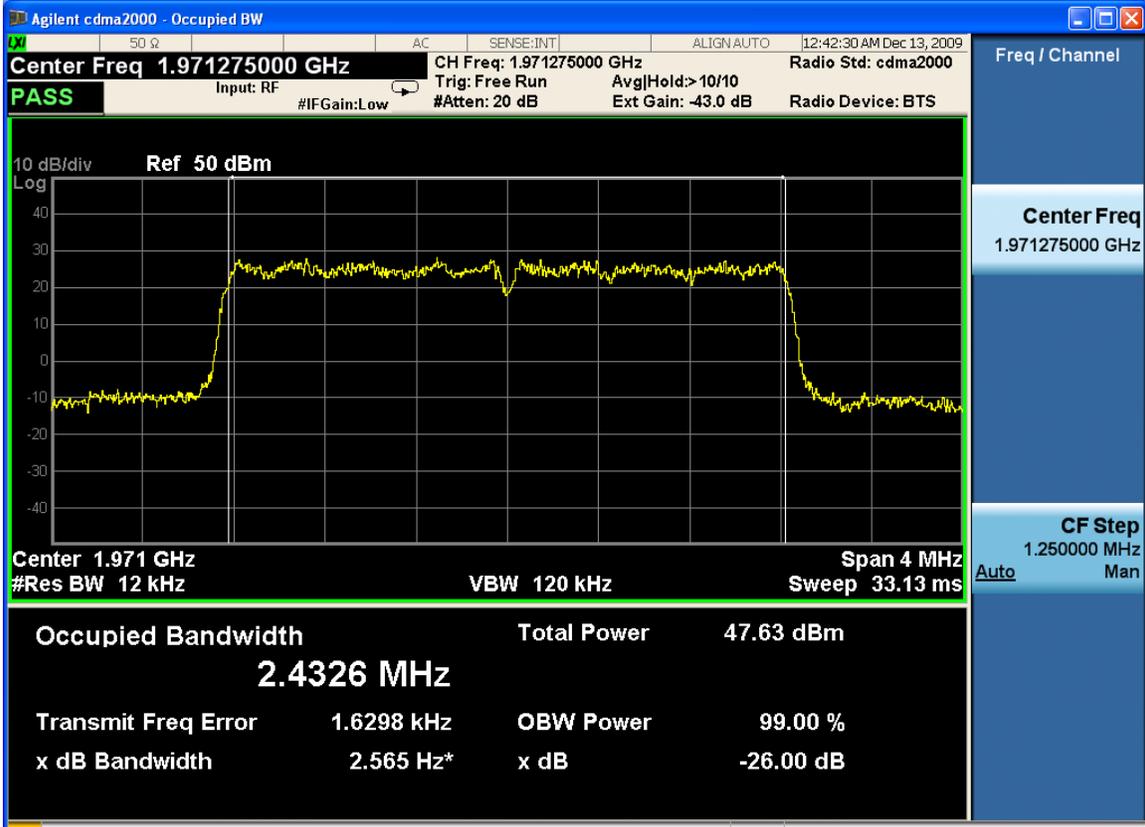
Frequency (MHz)	Channel	99% Power Bandwidth (MHz)	Limit (MHz)
1970.65/1977.5/1984.35	813/950/1087	1.2079/1.2102/1.2088	<1.25

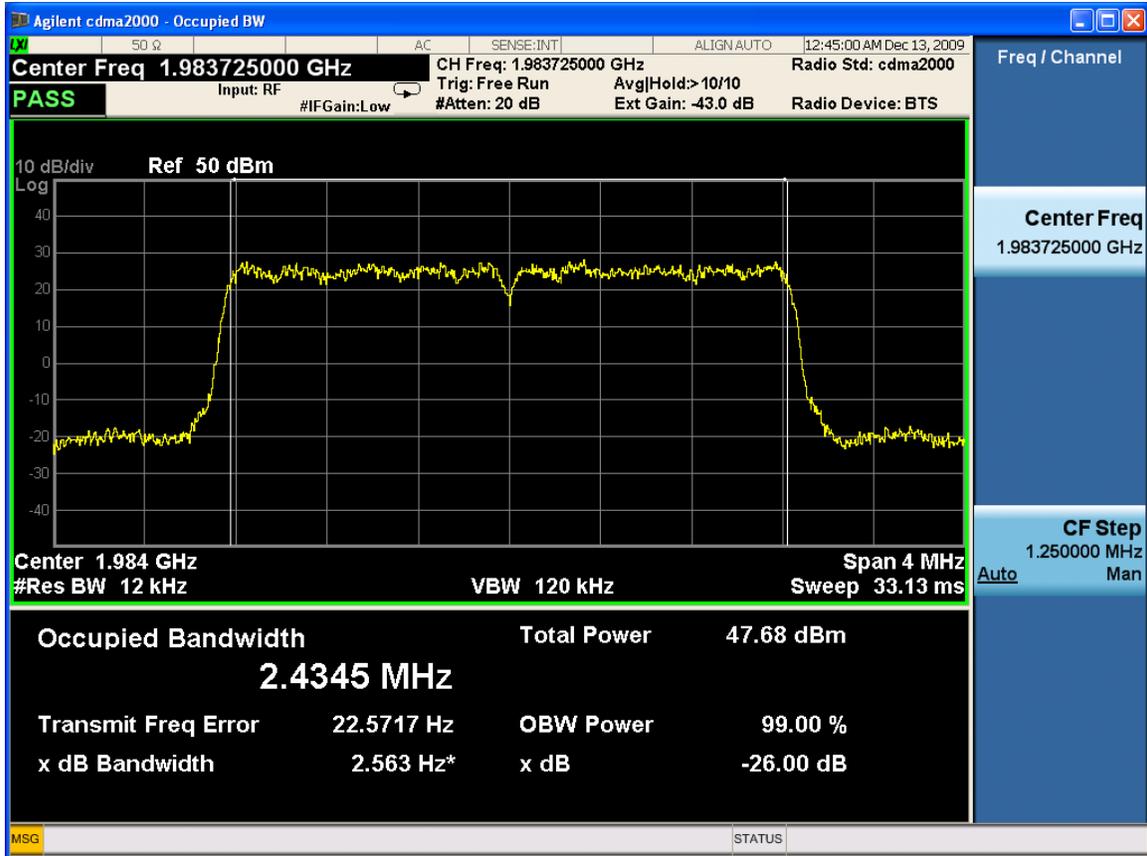




Two carriers

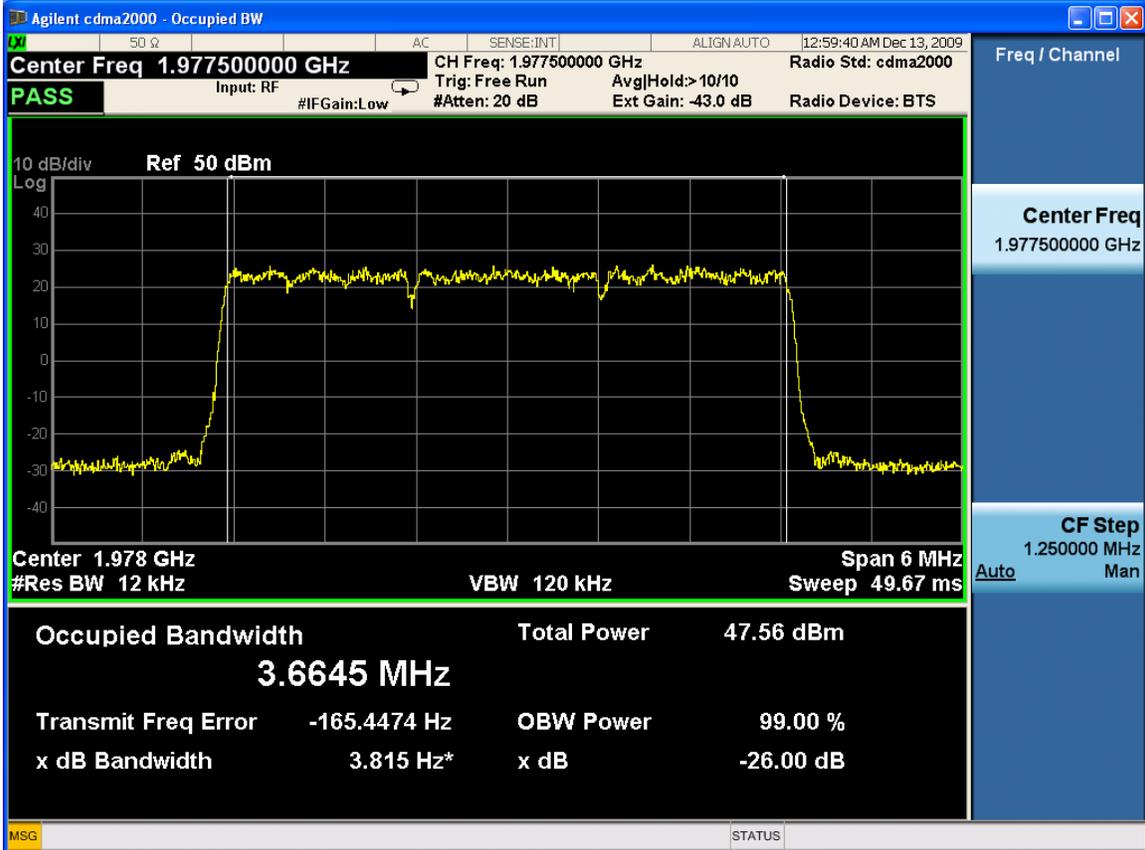
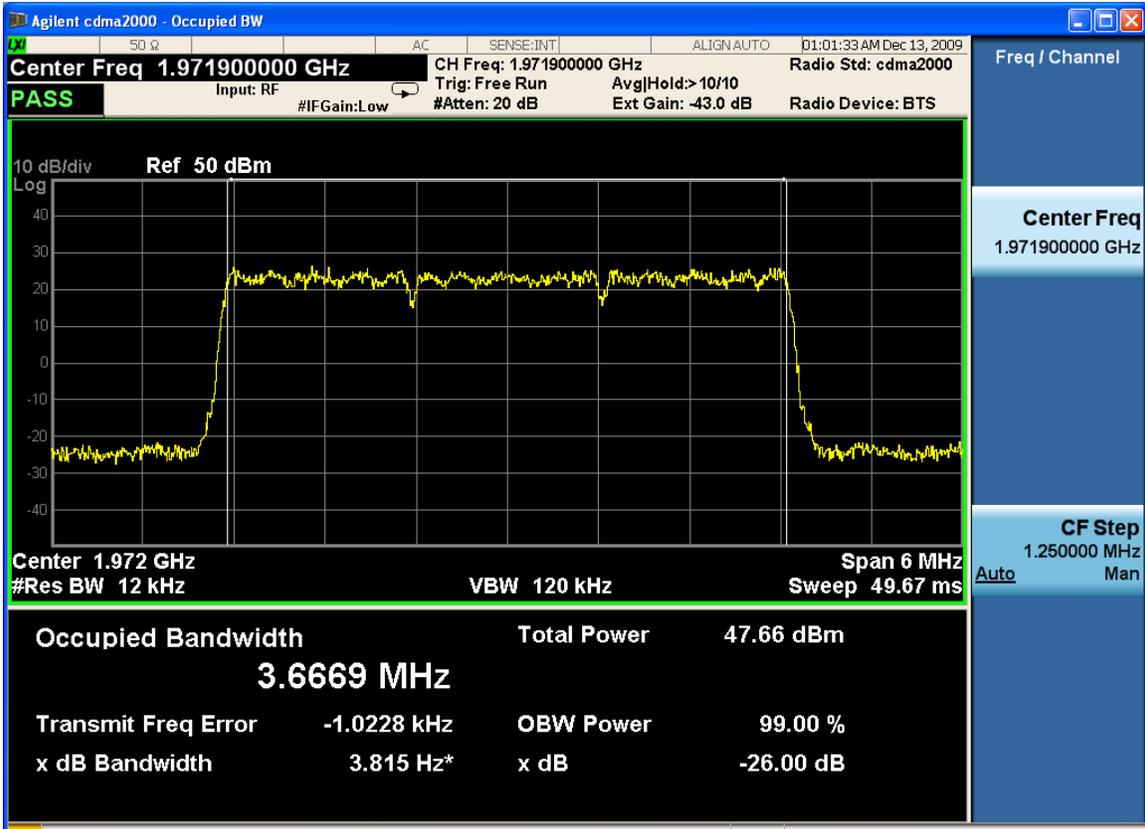
Frequency (MHz)	Channel	99% Power Bandwidth (MHz)	Limit (MHz)
1971.275/1977.525/1983.725	/	2.4326/2.4338/2.4345	<2.50

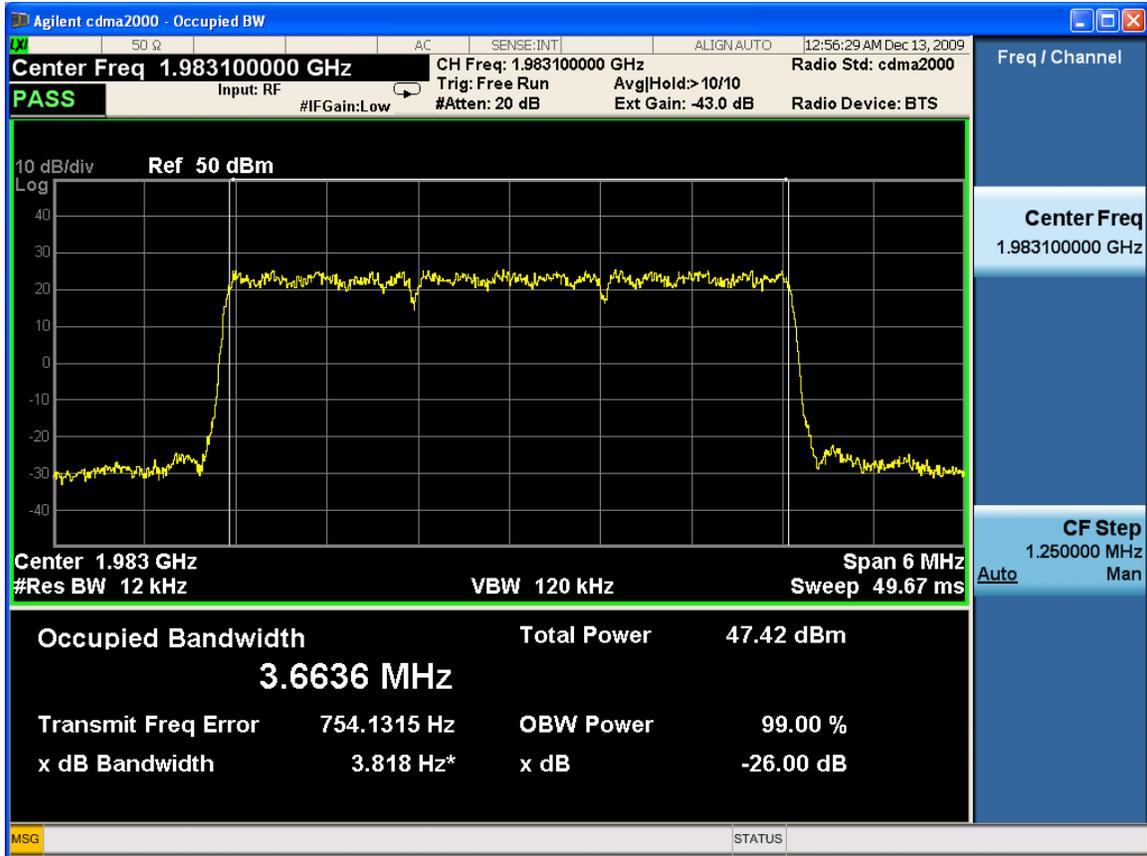




Three carriers

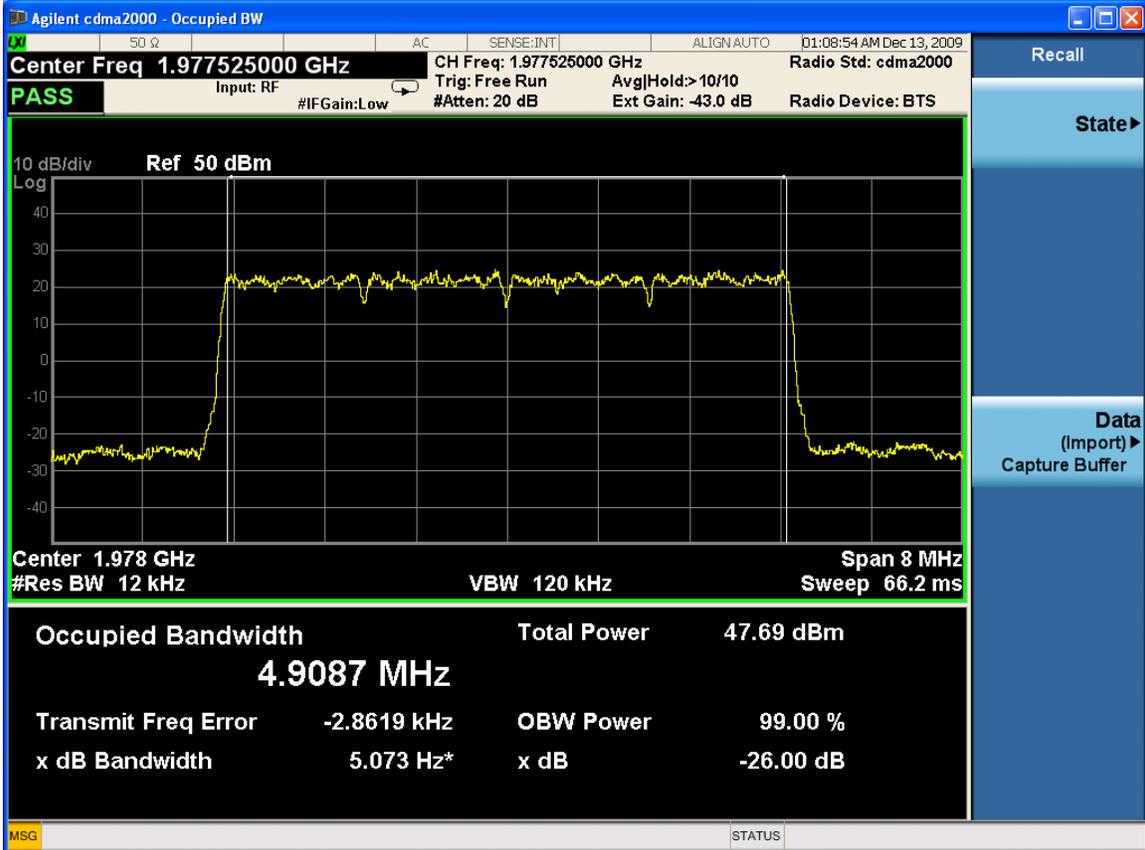
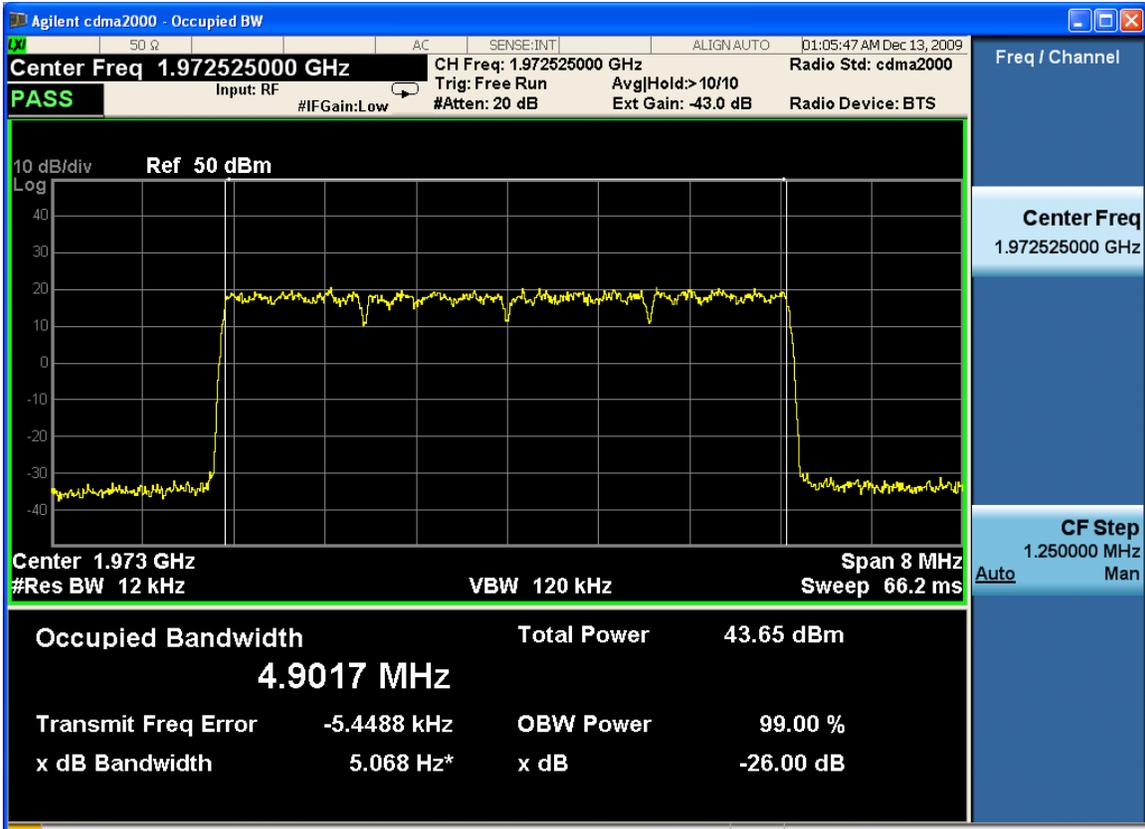
Frequency (MHz)	Channel	99% Power Bandwidth (MHz)	Limit (MHz)
1971.900/1977.500/1983.100	/	3.6669/3.6645/3.6636	<3.75

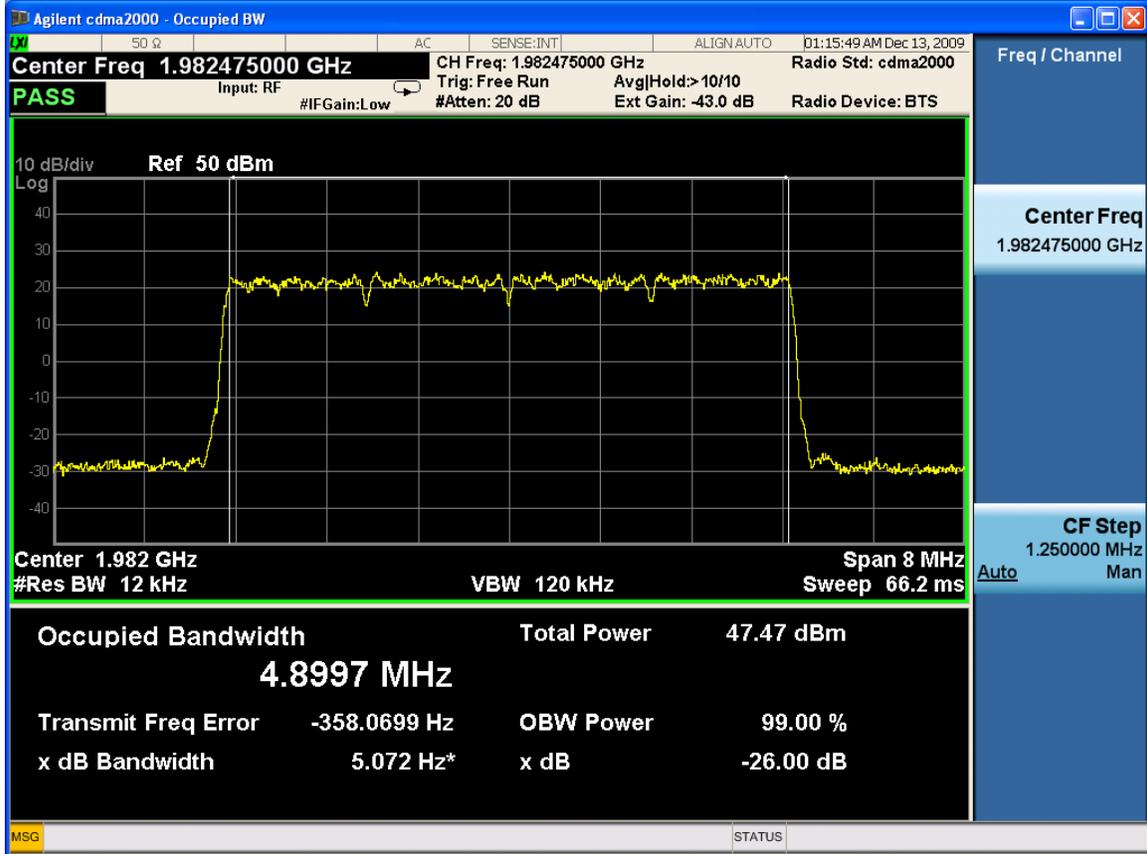




Four carriers

Frequency (MHz)	Channel	99% Power Bandwidth (MHz)	Limit (MHz)
1972.525/1977.525/1982.475	/	4.9017/4.9087/4.8997	<5.00





11 BAND EDGES

Applicable Standard: FCC §24.238

According to §2.1051 and §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. The limit (dBm) should $< P - (43 + 10 \log(P)) = -13 \text{dBm}$.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY48011941	2009-4-10	2010-4-9
DST	DST100 40dB Attenuator	DTS100-40dB-N	N/A	N/A	N/A
Hewlett Packard	Hewlett Packard RF Cable	8120-6192	01428251	N/A	N/A

***statement of traceability:** ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

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.

Test Data Environmental Conditions

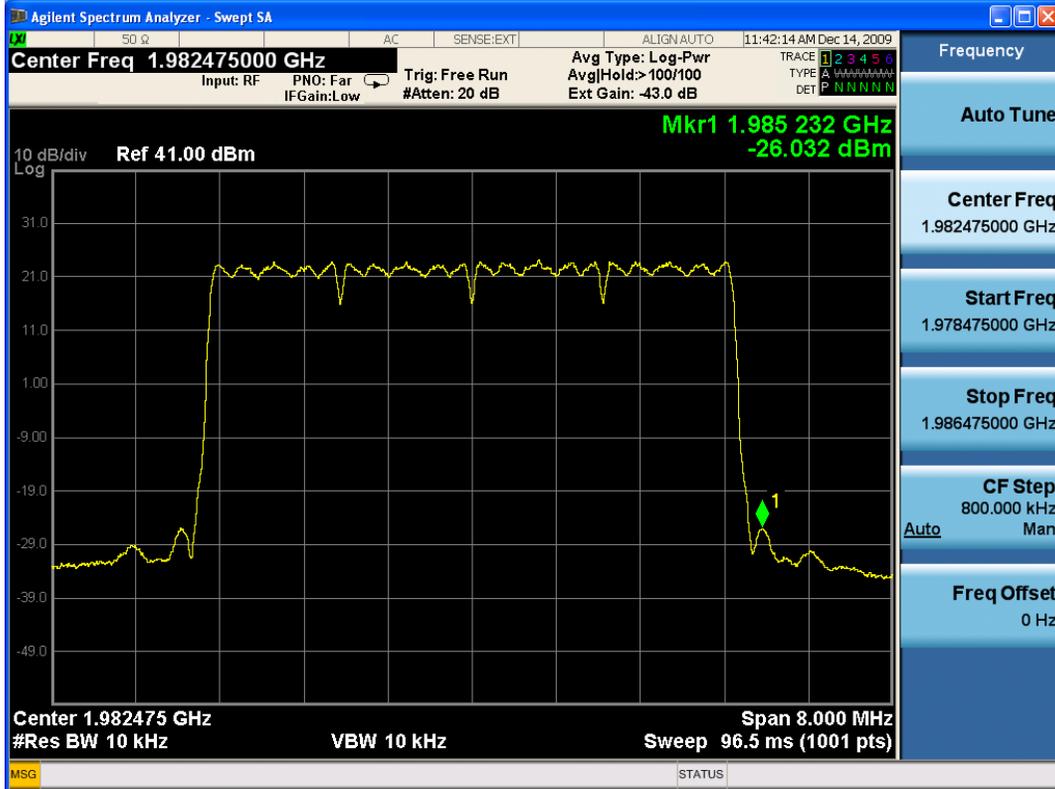
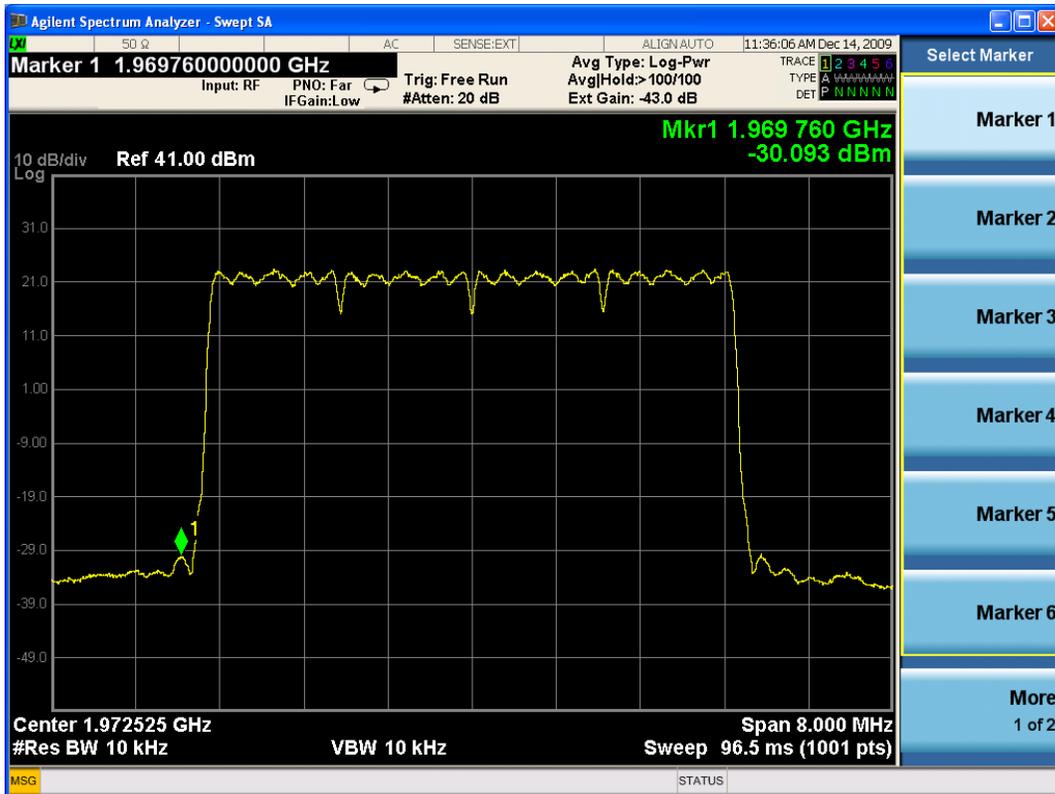
Temperature:	20 °C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Wei bin on Dec 14, 2009

Test Result: Pass**Test Mode:** Transmitting CDMA**Test Data**

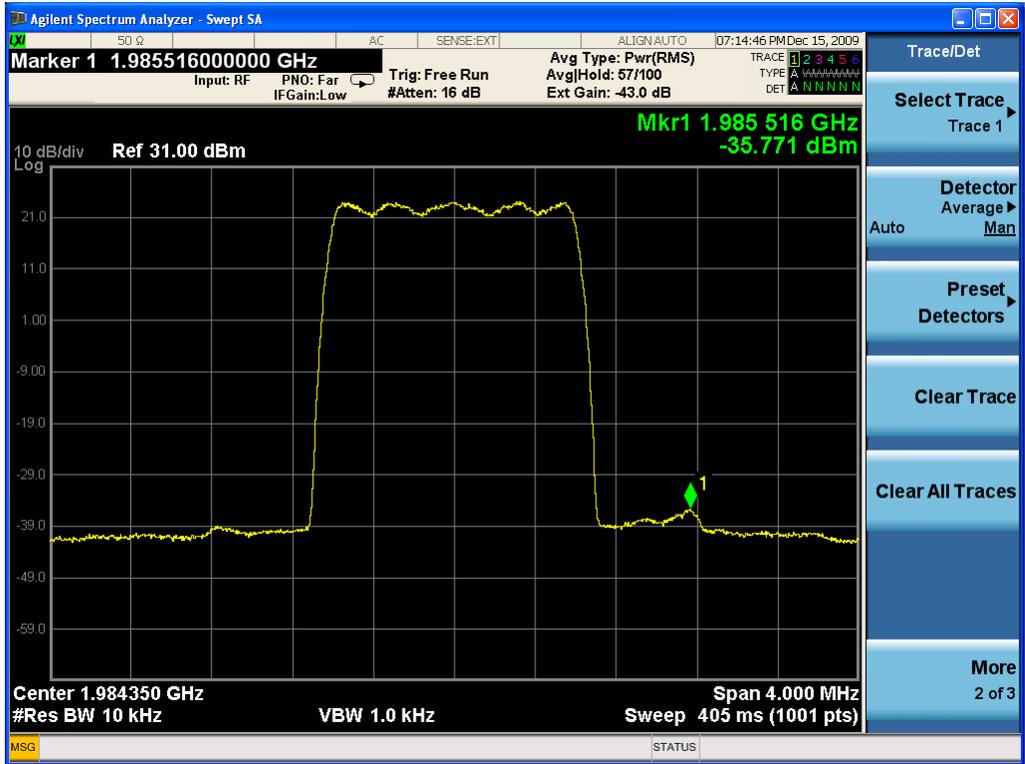
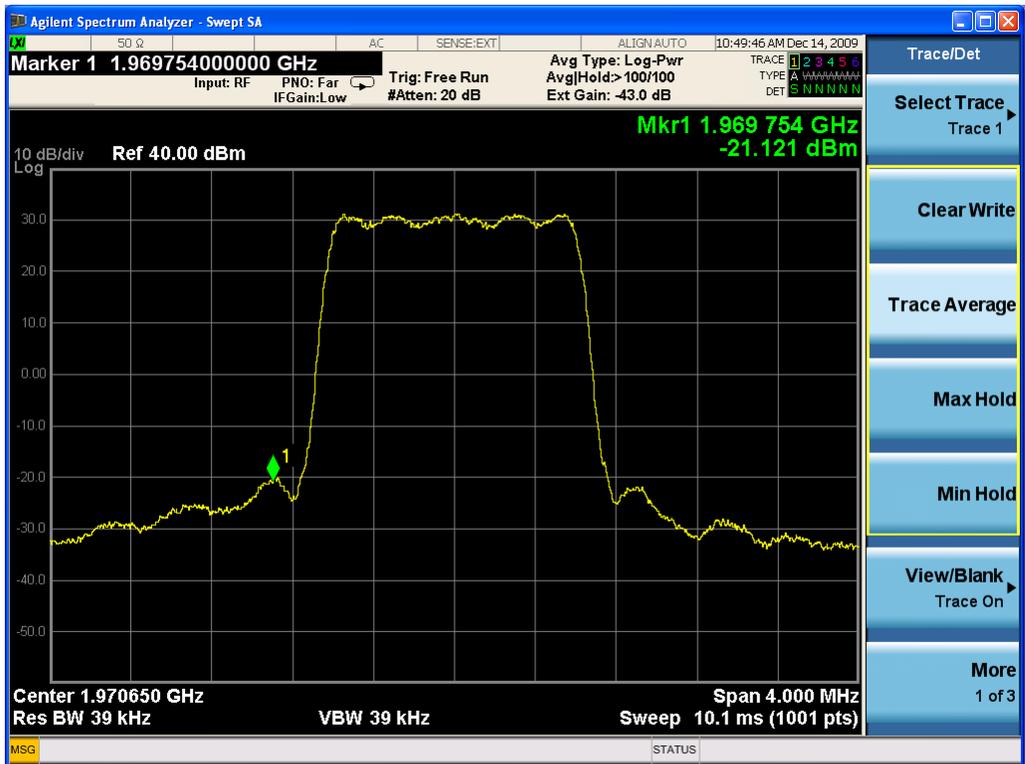
four carriers

Frequency channel	Max bandedge Emission (dBm)	Limit (dBm)
1970.65/1971.90/1973.15/1974.4	-30.093	-13.00
1980.6/1981.85/1983.10/1984.35	-26.032	-13.00



one carriers

Frequency channel	Channel	Max bandedge Emission (dBm)	Limit (dBm)
1970.65	913	-21.121	-13.00
1984.35	1087	-35.771	-13.00



12 FREQUENCY STABILITY

Applicable Standard: FCC § 2.1055 § 24.235

Requirements: FCC § 2.1055 (a)(d), Part24.235

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
GZ-ESPEC	Temperature Chamber	GRW-120	00020268	2009-3-8	2010-3-7
Agilent	MXA Series Spectrum Analyzer	N9020A	MY48011941	2009-4-10	2010-4-9
DST	DST100 40dB Attenuator	DTS100-40dB-N	N/A	N/A	N/A
Hewlett Packard	Hewlett Packard RF Cable	8120-6192	01428251	N/A	N/A

***statement of traceability:** ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

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 a Spectrum Analyzer 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 150 minutes, the frequency output was recorded from the counter.

Frequency Stability vs. Voltage: An external variable DC power supply Source. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the end point. The output frequency was recorded for each voltage.

Environmental Conditions

Normal condition:	25° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

The testing was performed by Wei bin on Dec 14, 2009.

Test Result: Pass

Test Mode: Transmitting CDMA

Test Data**Frequency Stability Versus Temperature**

Frequency Stability vs. Temperature				
Temperature °C	Power Supplied Vdc	Frequency Measure Error Hz	Error ppm	Limit 0.02ppm
f=1970.65 MHz				
-40	-48	-1.77	-0.001	PASS
-30	-48	3.69	0.002	PASS
-20	-48	4.14	0.002	PASS
-10	-48	4.2	0.002	PASS
0	-48	-3.57	-0.002	PASS
10	-48	-3.66	-0.002	PASS
20	-48	1.57	0.001	PASS
30	-48	1.81	0.001	PASS
40	-48	4.57	0.002	PASS
50	-48	5.92	0.003	PASS
55	-48	5.35	0.003	PASS
f=1977.50 MHz				
-40	-48	2.63	0.001	PASS

-30	-48	-1.27	-0.001	PASS
-20	-48	3.48	0.002	PASS
-10	-48	-1.63	-0.001	PASS
0	-48	-1.04	-0.001	PASS
10	-48	1.73	0.001	PASS
20	-48	3.87	0.002	PASS
30	-48	-3.86	-0.002	PASS
40	-48	6.92	0.003	PASS
50	-48	6.21	0.003	PASS
55	-48	1.38	0.001	PASS
f=1984.35 MHz				
-40	-48	6.23	0.003	PASS
-30	-48	-2.67	-0.001	PASS
-20	-48	4.27	0.002	PASS
-10	-48	1.33	0.001	PASS
0	-48	4.9	0.002	PASS
10	-48	4.71	0.002	PASS
20	-48	-4.14	-0.002	PASS
30	-48	-2.96	-0.001	PASS
40	-48	3.48	0.002	PASS
50	-48	5.9	0.003	PASS
55	-48	2.88	0.001	PASS

Frequency Stability Versus Voltage

Frequency Stability vs. Voltage				
VoltageVdc	Temperature °C	Frequency Measure Error Hz	Error ppm	Limit 0.02ppm
f=1970.65 MHz				
-40	20	2.52	0.001	PASS
-44	20	-1.6	-0.001	PASS
-47	20	-6.4	-0.003	PASS
-50	20	3.11	0.002	PASS
-53	20	-3.08	-0.002	PASS
-56	20	-1.96	-0.001	PASS
-57	20	2.52	0.001	PASS
f=1977.50 MHz				
-40	20	1.51	0.001	PASS
-44	20	1.25	0.001	PASS
-47	20	5.63	0.003	PASS
-50	20	1.3	0.001	PASS
-53	20	2.67	0.001	PASS
-56	20	1.31	0.001	PASS
-57	20	1.51	0.001	PASS
f=1984.35 MHz				
-40	20	3.02	0.002	PASS
-44	20	-2.34	-0.001	PASS
-47	20	-1.68	-0.001	PASS
-50	20	-2.37	-0.001	PASS
-53	20	-2.99	-0.002	PASS
-56	20	4.4	0.002	PASS
-57	20	3.02	0.002	PASS