

# FCC PART 22 TYPE APPROVAL

## EMI MEASUREMENT AND TEST REPORT

For

### ZTE Corporation

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

**FCC ID: Q78-CBTSI28A**

May 30, 2006

<p><b>This Report Concerns:</b></p> <p><input checked="" type="checkbox"/> Original Report</p>	<p><b>Equipment Type:</b></p> <p>CDMA2000 Compact Base Transceiver Station-I2</p>
<p><b>Test Engineer:</b> <u>JX HE</u> </p>	
<p><b>Report No.:</b> <u>RSZ06053001</u></p>	
<p><b>Test Date:</b> <u>May 01-28, 2006</u></p>	
<p><b>Reviewed By:</b> <u>ZH XIE</u> </p>	
<p><b>Prepared By:</b> ZTE Corporation. ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen, Guangdong, China 518057, P.R.China Tel: +86-755-26770000 Fax: +86-755-26771999</p>	

**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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## **GENERAL INFORMATION**

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### **Product Description for Equipment Under Test (EUT)**

The ZTE Corporation's product, model number: ZXC10 CBTS I28A or the "EUT" as referred to in this report is a CDMA2000 Compact Base Transceiver Station-I2. The EUT is measured approximately 85.0 cm L x 60.0cmW x 60.0cmH, rated input voltage: DC -48 V.

*\* The test data gathered are from production sample, serial number: 0504170.*

### **Objective**

This Type approval report is prepared on behalf of ZTE Corporation in accordance with Part 2, Subpart J and Part 22 Subpart H 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,Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services

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

### **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.: 373926. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

**External I/O Cable**

<b>Cable Description</b>	<b>Length (M)</b>	<b>From/Port</b>	<b>To</b>
Unshielded Detachable DC Power Cable	3.0	EUT	DC Power Supply

## SYSTEM TEST CONFIGURATION

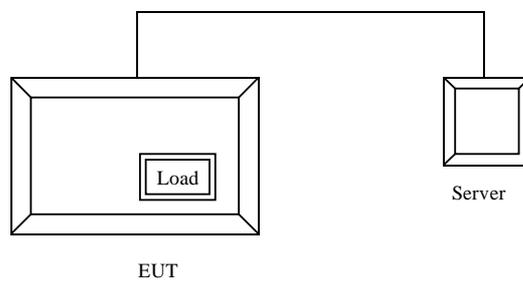
### Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

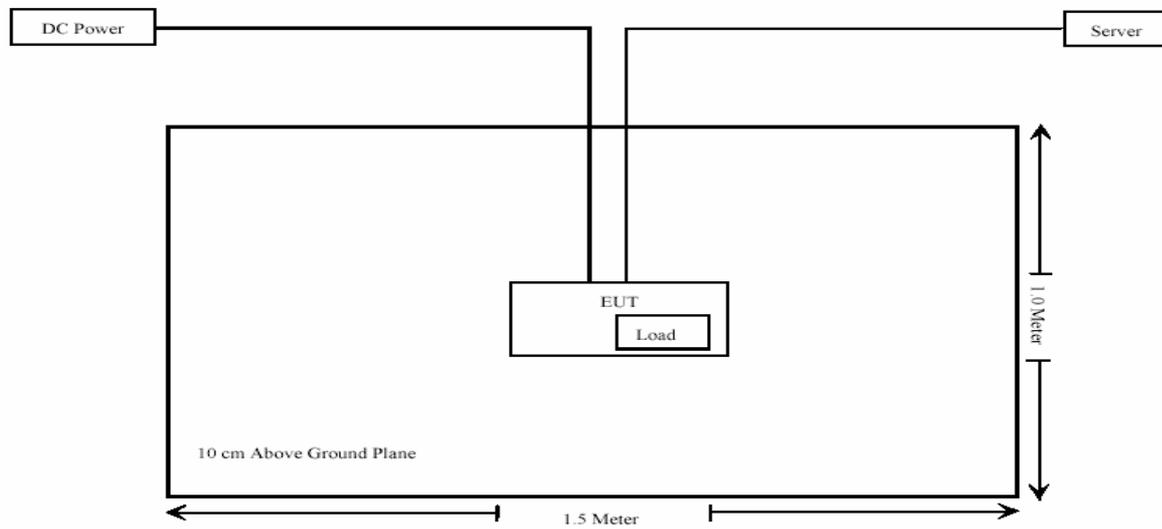
### Equipment Modifications

ZTE Corporation has not done any modification on the EUT.

### Configuration of Test Setup



### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§2.1046, §22.913(a)	Effective radiated power	Compliant
§ 2.1091	RF Exposure	Compliant
§2.1047	Modulation characteristic	Compliant
§15.109(a)	Radiation Emission	Compliant
§2.1053	Spurious Radiated Emissions	Compliant
§2.1051, §22.917	Spurious Emissions AT Antenna Terminals	Compliant
§22.1049 §22.917 §22.905	Occupied Bandwidth	Compliant
§22.917	Band Edge	Compliant
§ 2.1055 (a) § 2.1055 (d) § 22.355	Frequency stability	Compliant

## §2.1091 - RF EXPOSURE

### 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 §2.1093 RF exposure is calculated.

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300.	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6

f = frequency in MHz

\* = Plane-wave equivalent power density

### 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: 46.51 (dBm)

Maximum peak output power at antenna input terminal: 44.77 (W)

Prediction distance: 300 (cm)

Predication frequency: 874.80 (MHz)

Antenna Gain (typical): 17 (dBi)

Power density at predication frequency at 300 cm: 0.673 (mW/cm<sup>2</sup>)

MPE limit for uncontrolled exposure at prediction frequency: 2.899 (mW/cm<sup>2</sup>)

Test Result: Pass

## §2.1046, §22.913(a) - EFFECTIVE RADIATED POWER

### Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of transmitters and cellular repeaters must not exceed 500 Watts.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PSA Spectrum Analyzer	E4445A	MY44300451	2006-3-2	2007-3-2

### Test Procedure

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

### Test Data

#### Environmental Conditions

Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

The testing was performed by JX HE on May 01-28, 2006.

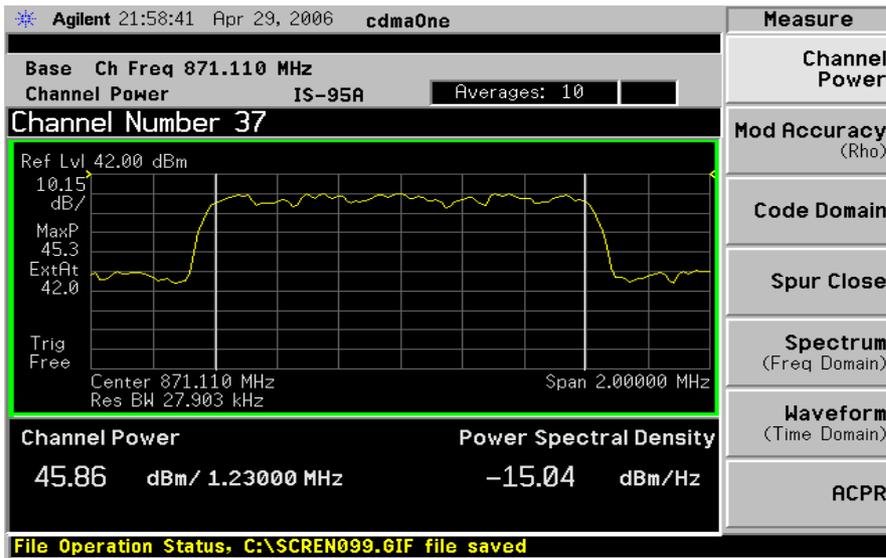
Test Result: Pass

Test Mode: Transmitting/CDMA2000 1X EV

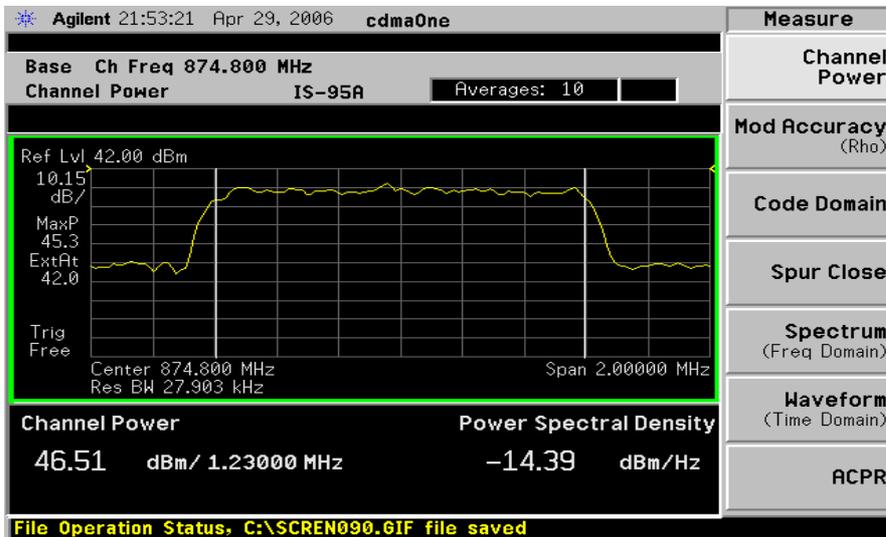
#### 1 Carrier

Channel	Frequency (MHz)	Total Power in dBm	Total Power in W	Limit in W
Channel 37	871.11	45.86	38.55	500
Channel 160	874.80	46.51	44.77	500
Channel 310	879.30	45.98	39.63	500

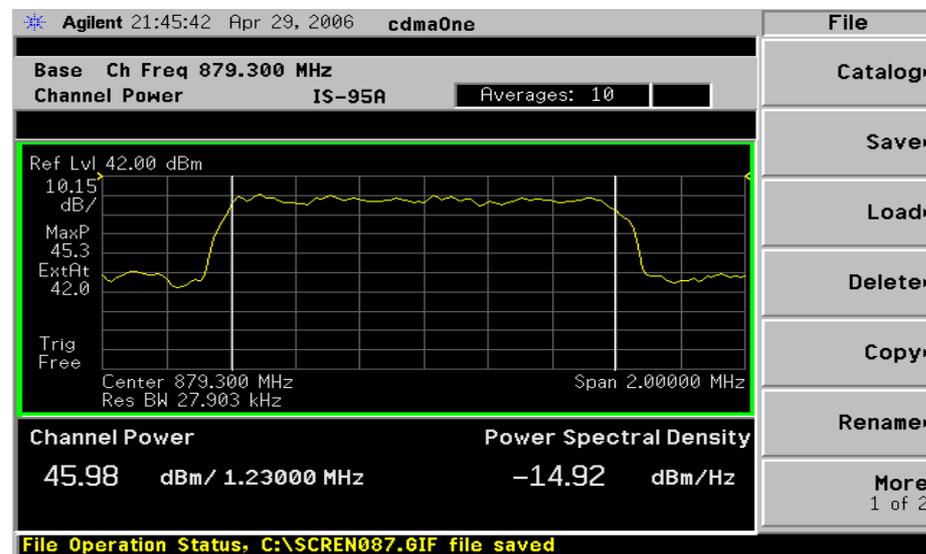
Channel 37



Channel 160



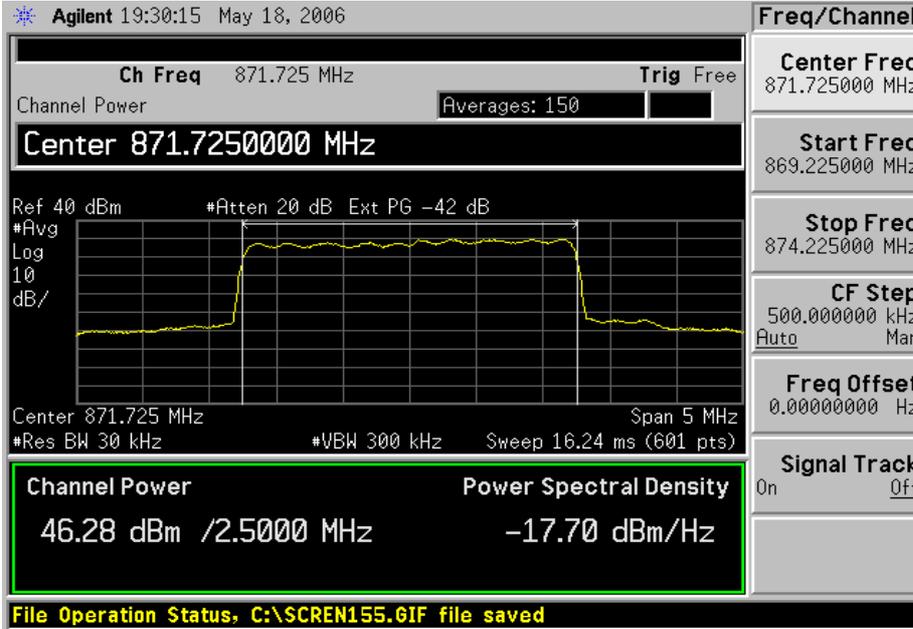
Channel 310



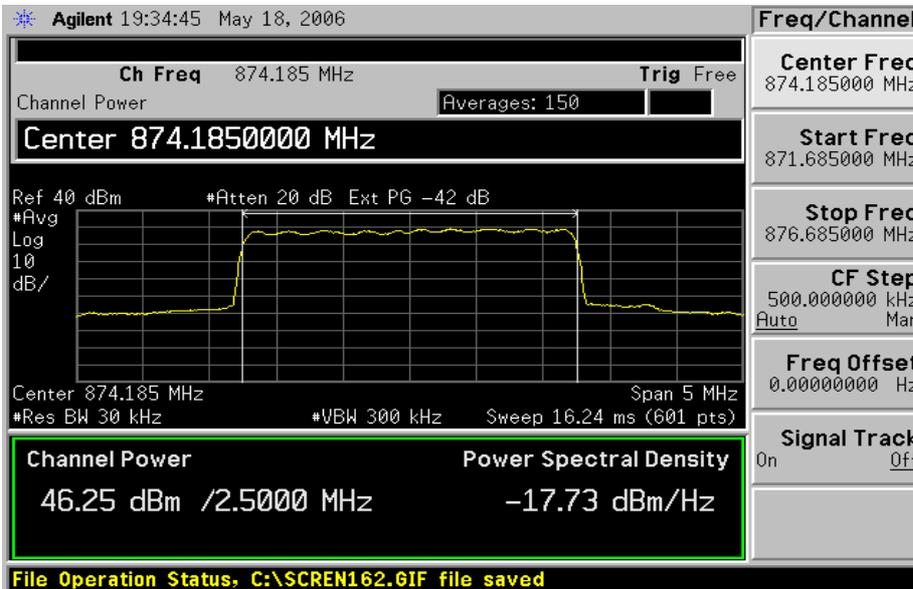
2 Carrier

Channel	Frequency (MHz)	Total Power in dBm	Total Power in W	Limit in W
Channel 37、78	871.725	46.28	42.5	500
Channel 119、160	874.185	46.25	42.2	500
Channel 269、310	878.685	46.27	42.4	500

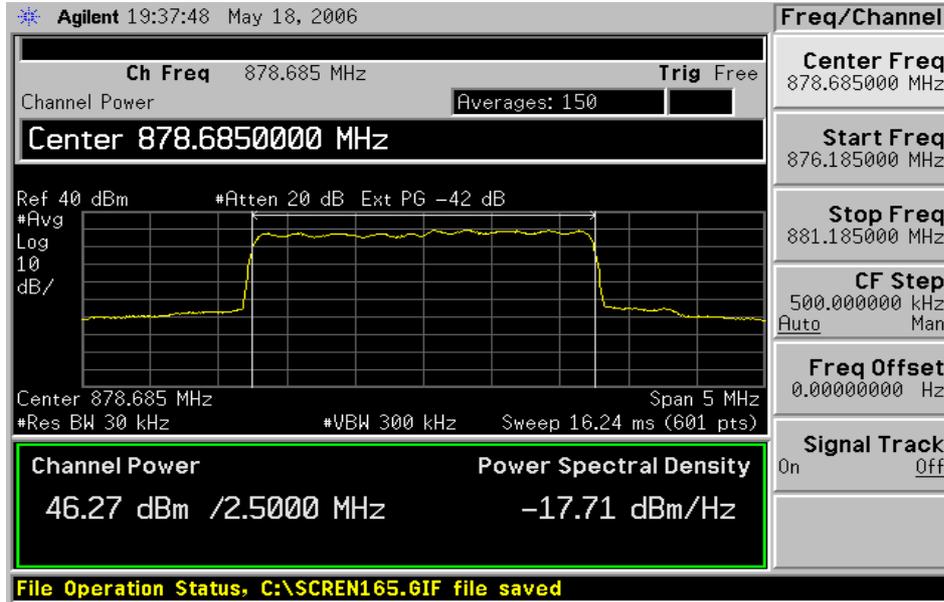
Channel 37、78



Channel 119、160



Channel 269、310

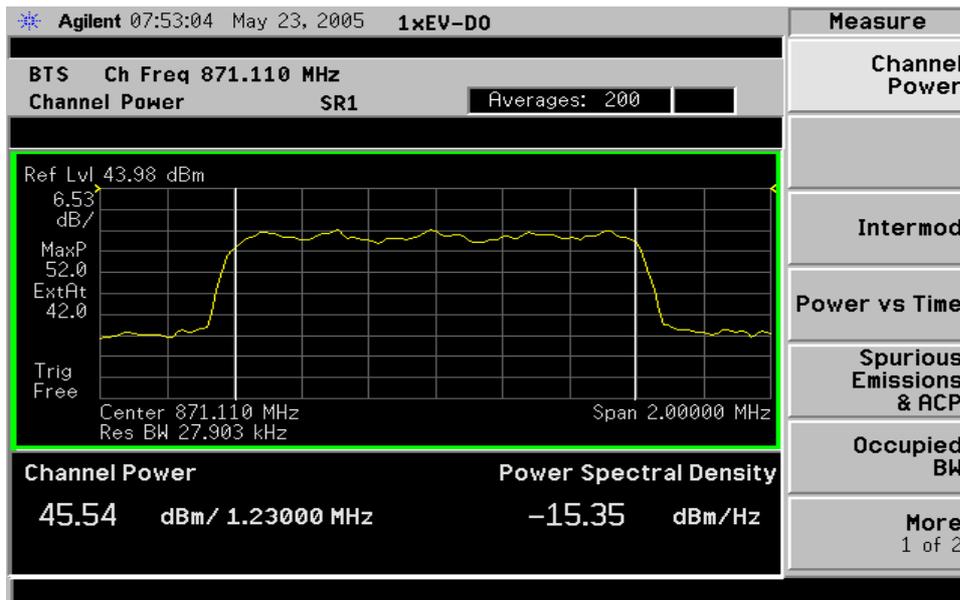


Test Mode: Transmitting/CDMA2000 1X EV DO

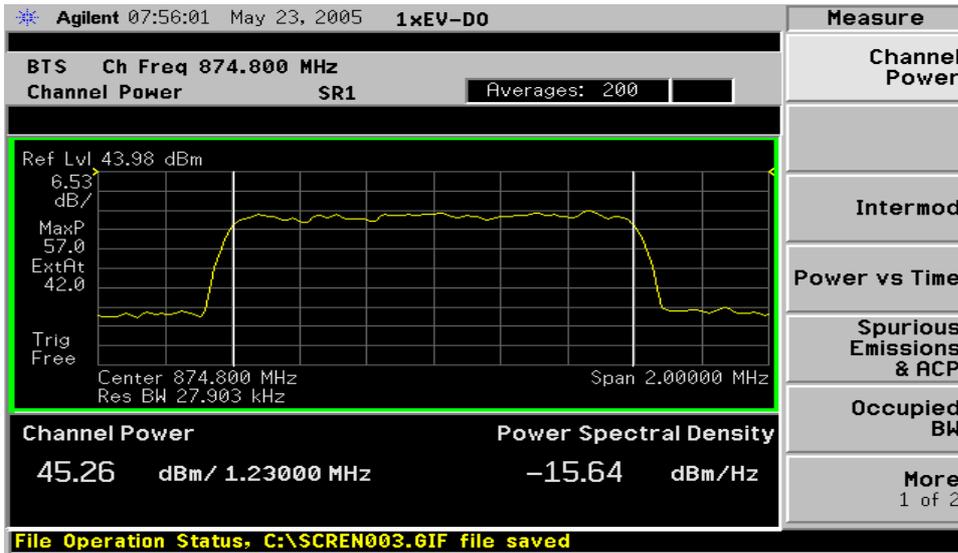
1 Carrier

Channel	Frequency (MHz)	Total Power in dBm	Total Power in W	Limit in W
Channel 37	871.11	45.54	35.81	500
Channel 160	874.80	45.26	33.57	500
Channel 310	879.30	45.53	35.73	500

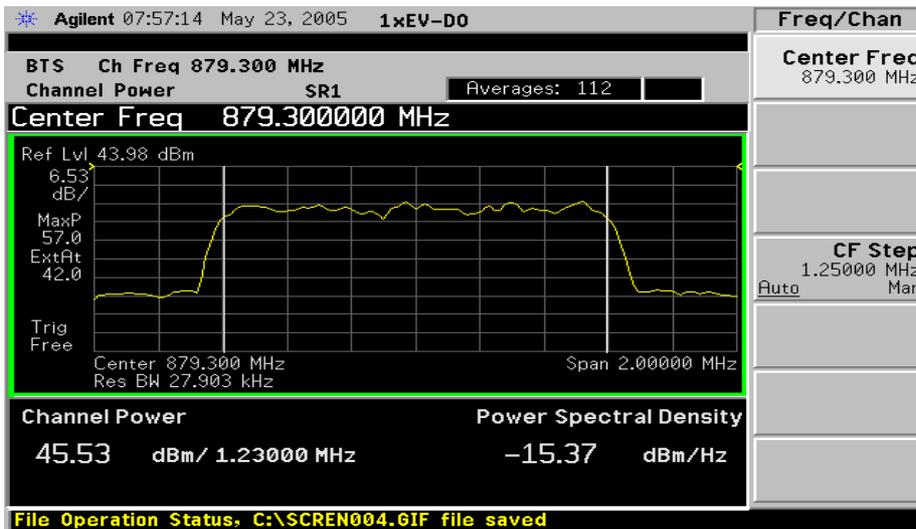
Channel 37



Channel 160



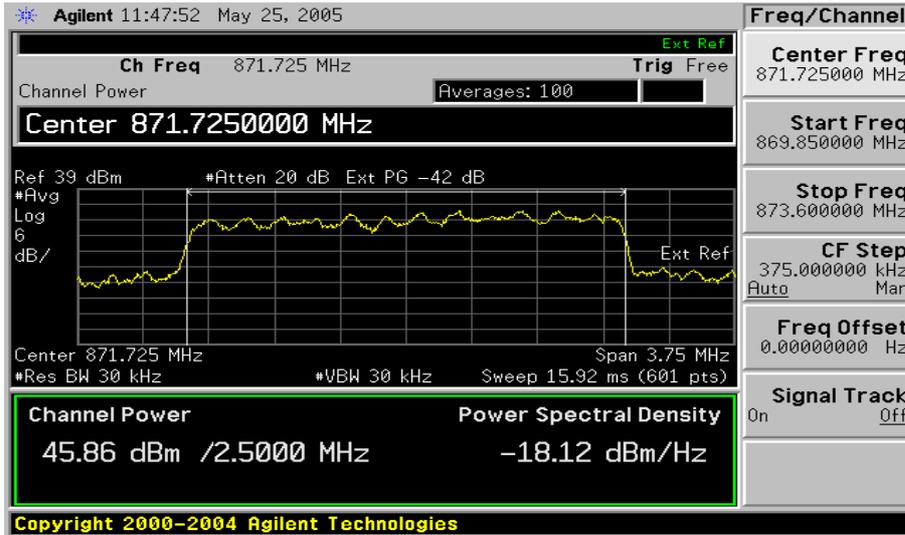
Channel 310



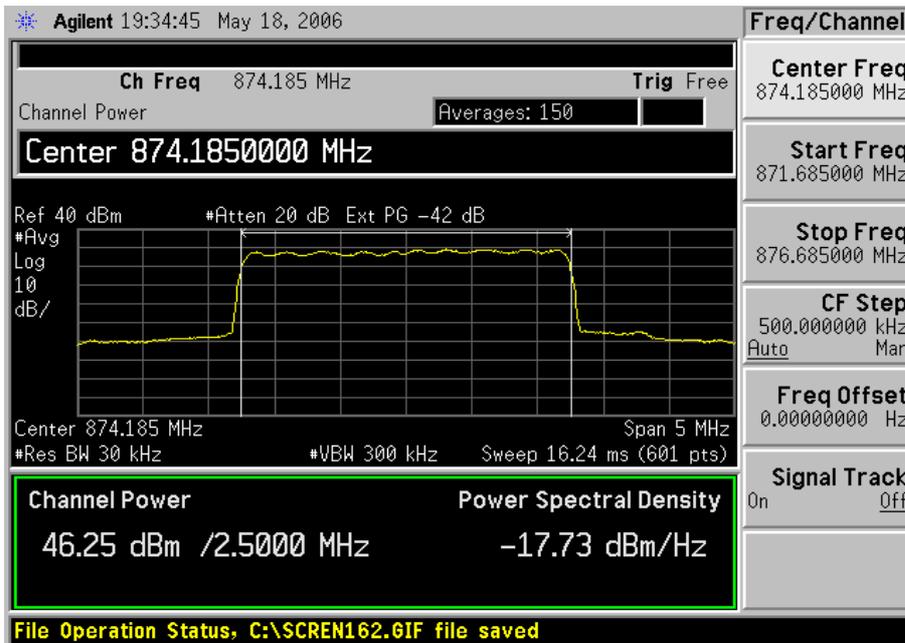
2 Carrier

Channel	Frequency (MHz)	Total Power in dBm	Total Power in W	Limit in W
Channel 37、78	871.725	45.86	38.55	500
Channel 119、160	874.185	46.25	42.17	500
Channel 269、310	878.685	46.38	43.45	500

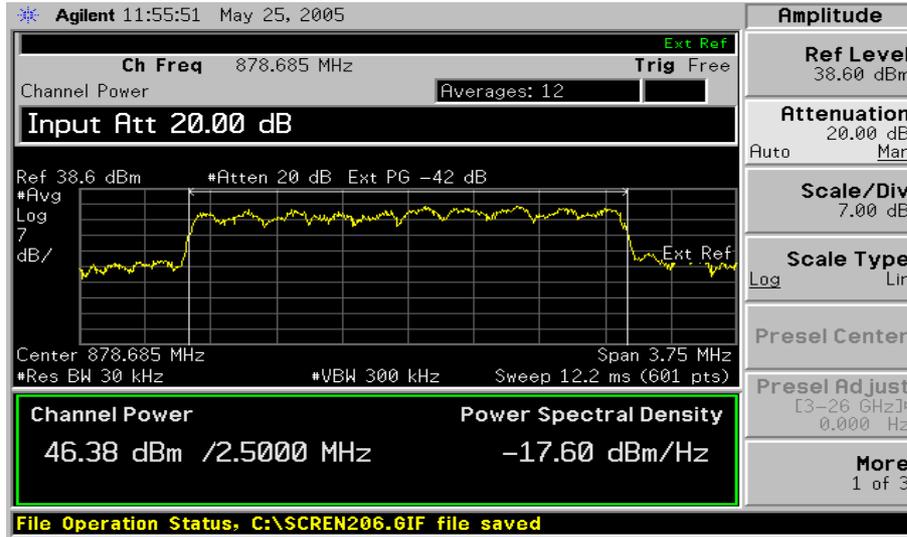
Channel 37、78



Channel 119、160



Channel 269、310



## §2.1047- MODULATION CHARACTERISTIC

### Applicable Standard

Requirement: §2.1047.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PSA Spectrum Analyzer	E4445A	MY44300451	2006-3-2	2007-3-2

### Test Procedure

CDMA digital mode is used by EUT.

### Test Data

#### Environmental Conditions

Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

*The testing was performed by JX HE on May 01-28, 2006.*

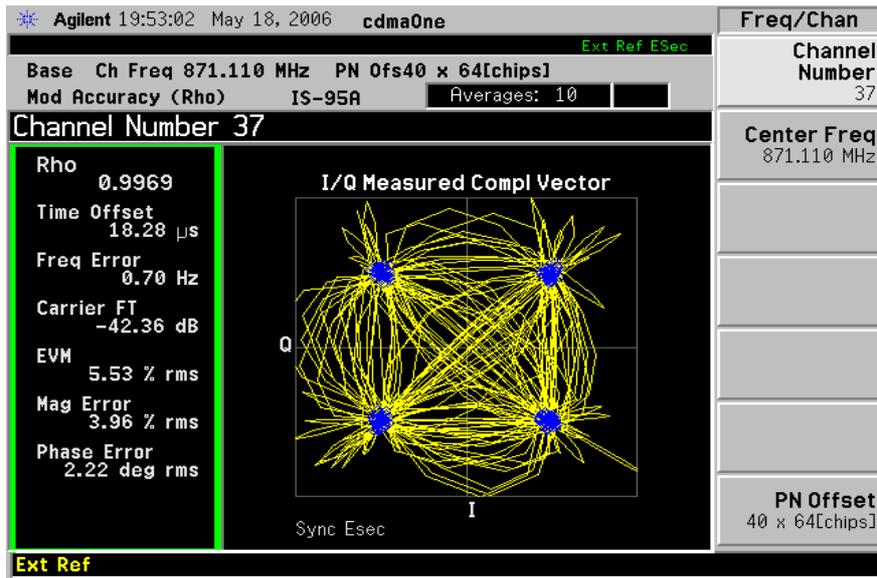
Test Result: Pass

*Test Mode: Transmitting/CDMA2000 1X EV*

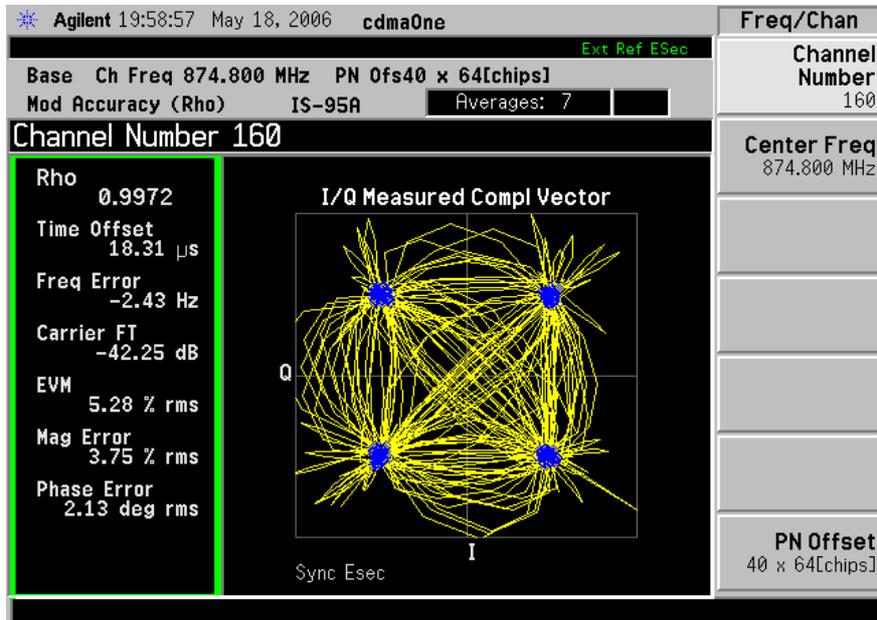
#### *1 Carrier*

Channel	Frequency (MHz)	Rho
Channel 37	871.11	0.9969
Channel 160	874.80	0.9972
Channel 310	879.30	0.9972

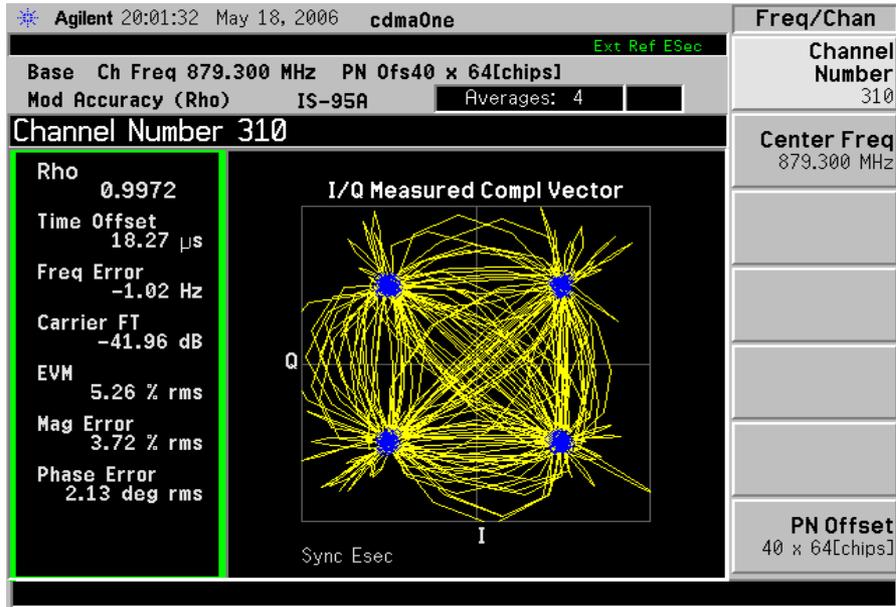
Channel 37



Channel 160



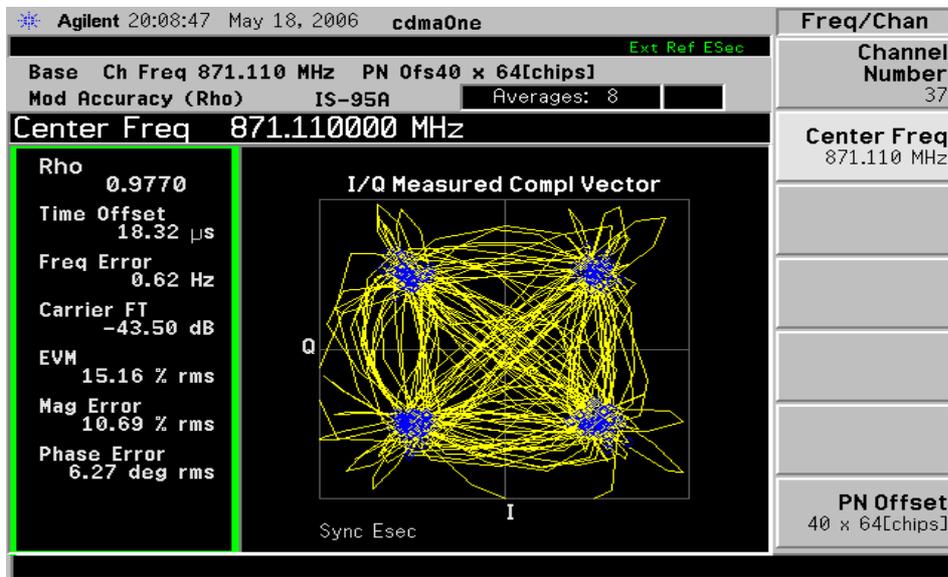
Channel 310



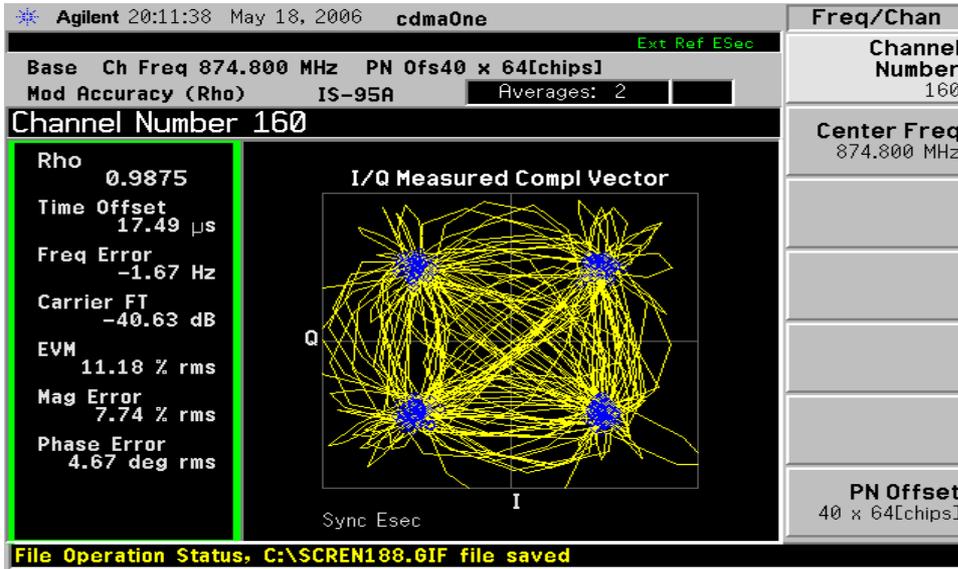
2 Carrier

Channel	Frequency (MHz)	Rho
Channel 37、78	871.11	0.9770
Channel 119、160	874.80	0.9875
Channel 269、310	879.30	0.9875

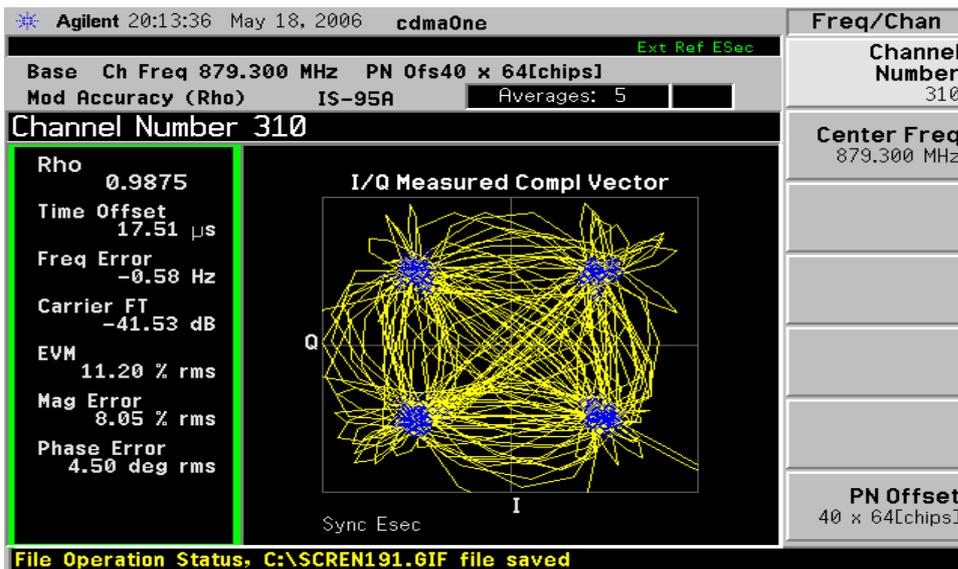
Channel 37、78



Channel 119、160



Channel 269、310

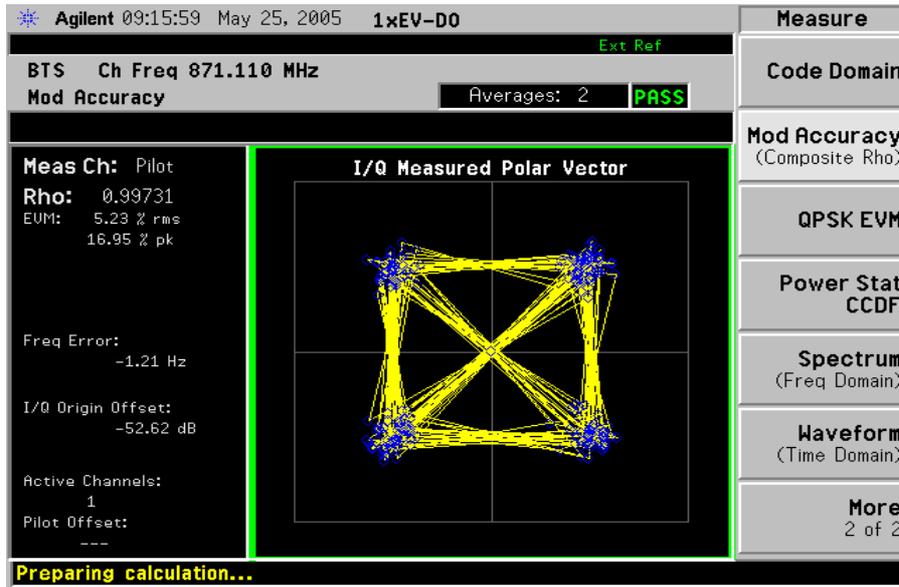


Test Mode: Transmitting/ CDMA2000 1X EV DO

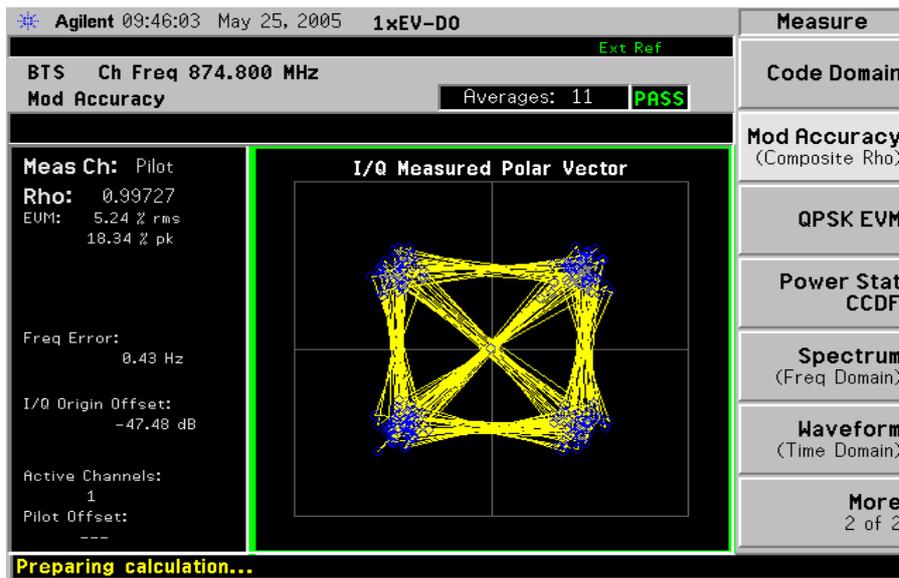
1 Carrier

Channel	Frequency (MHz)	Rho
Channel 37	871.11	0.99731
Channel 160	874.80	0.99727
Channel 310	879.30	0.99674

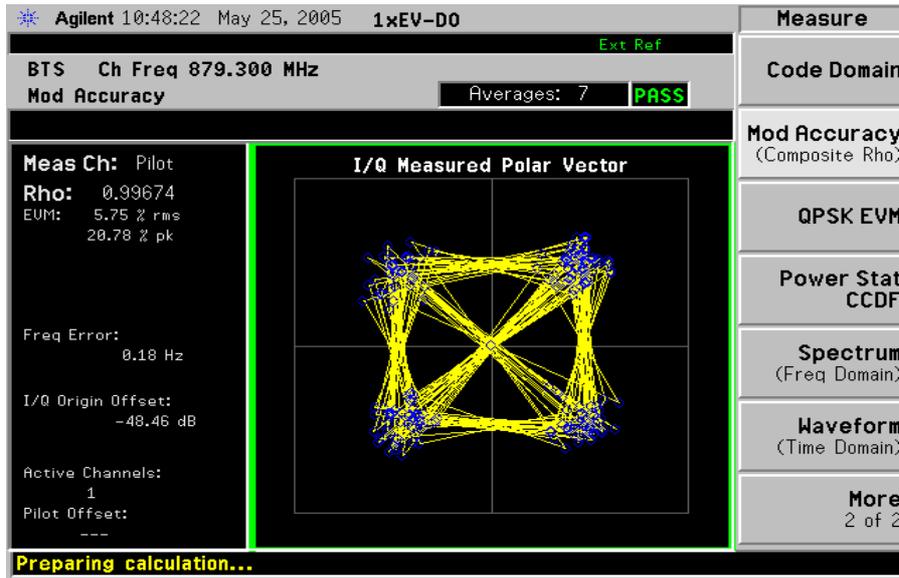
Channel 37



Channel 160



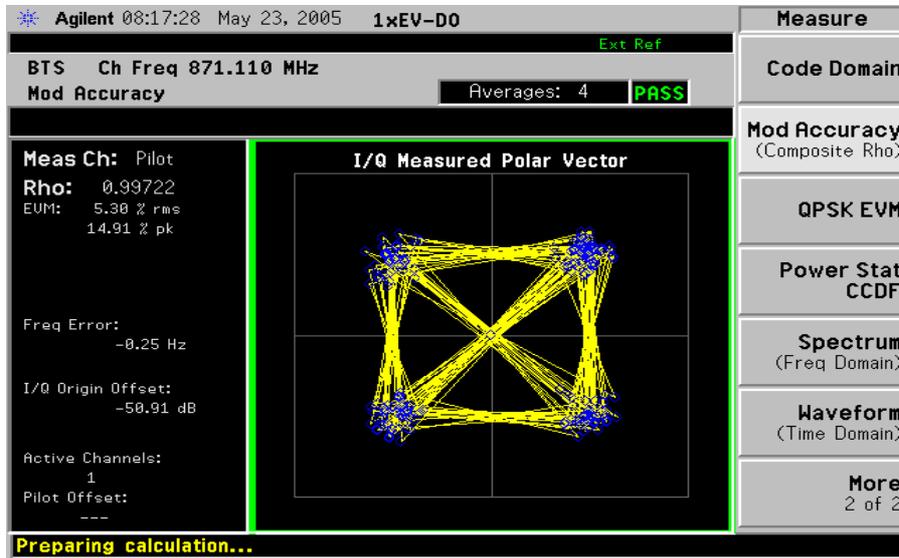
Channel 310



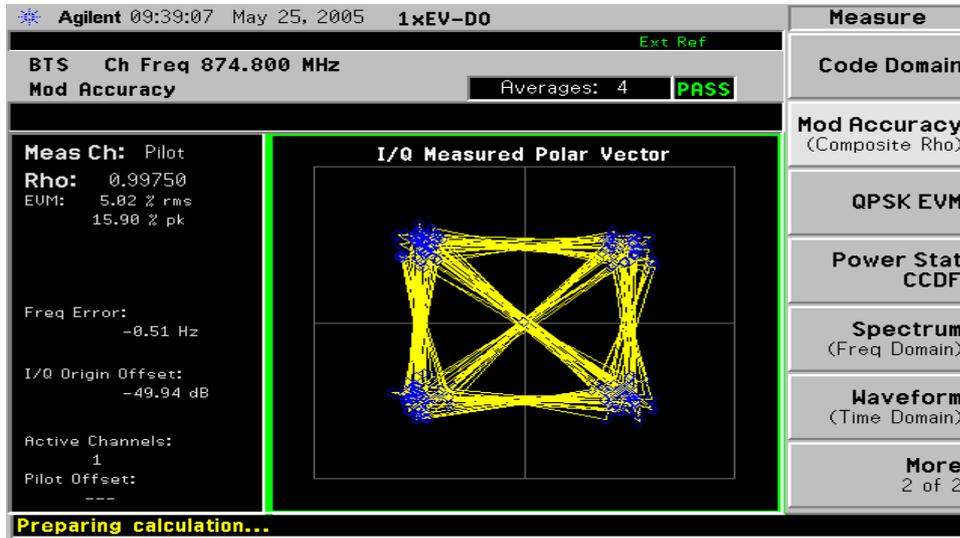
2 Carrier

Channel	Frequency (MHz)	Rho
Channel 37、78	871.11	0.99722
Channel 119、160	874.80	0.99750
Channel 269、310	879.30	0.99696

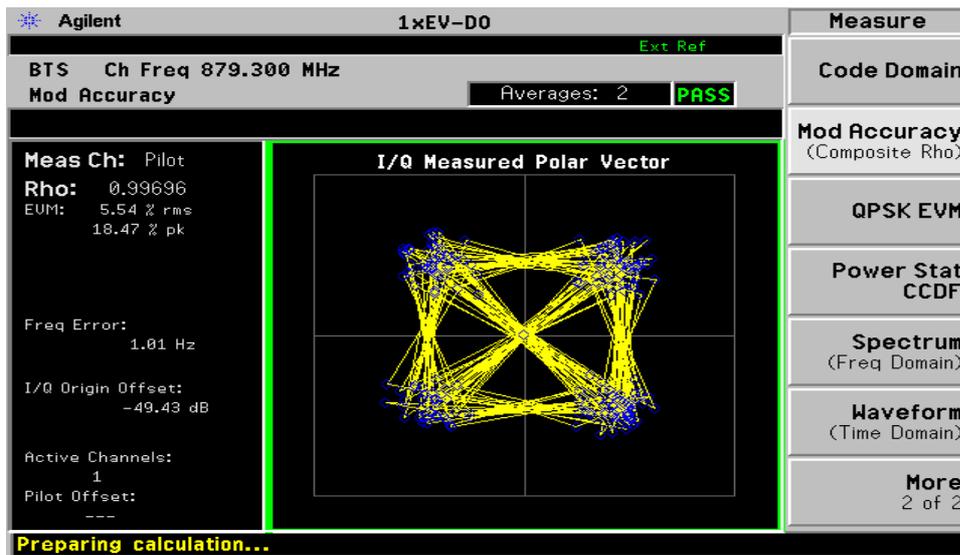
Channel 37、78



Channel 119、160



Channel 269、310



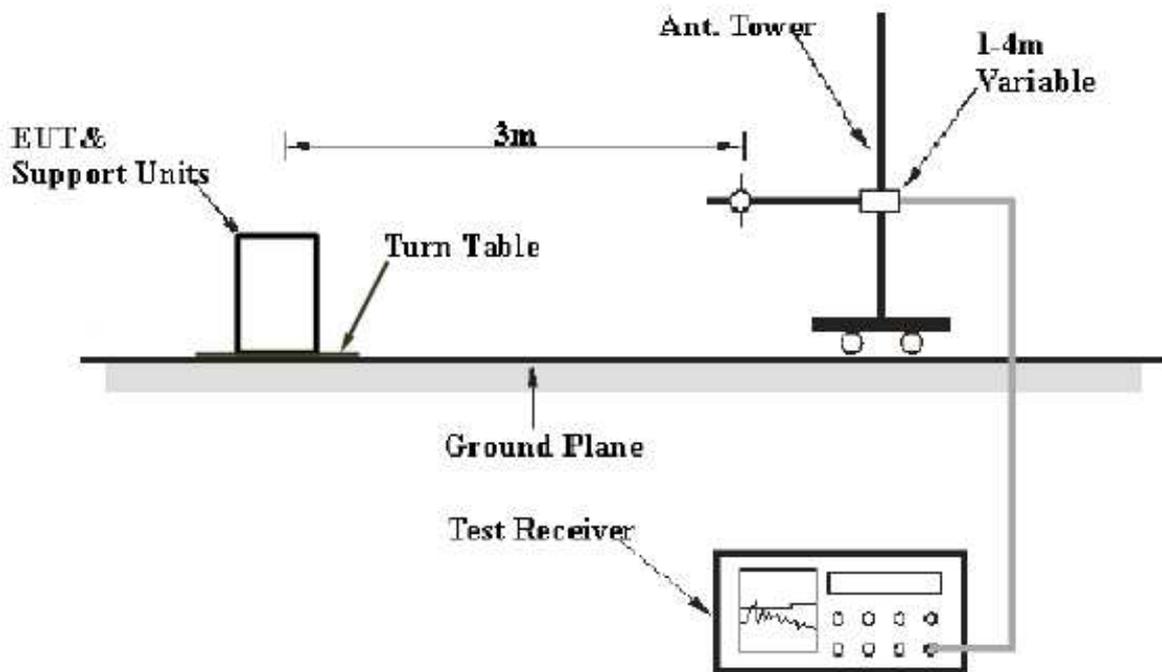
## §15.109(a)- RADIATED EMISSION

### 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 ZTE Corp. is  $\pm 3.6\text{dB}$ .

### EUT Setup



The radiated emission tests were performed in the 3-meter Chamber using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.109(a) limits.

### EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

During the radiated emission test, the EMI Test Receiver was set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>IF B/W</i>
30 – 1000 MHz	100 kHz	300kHz	120kHz

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESI26	100058	2005-10-17	2006-10-16
R&S	Ultra roadband Antenna	HL562	100022	2003-3-7	2008-3-6
R&S	Double-Ridged Waveguide Horn Antenna	HF906	100032	2004-10-10	2009-10-9
Albatross	Anechoic Chamber	3m Site	N/A	2005-7-15	2008-7-14
R&S	Cable Set	RE Cable	N/A	2005-10-17	2006-10-16
R&S	Software	ES-K1	N/A	N/A	N/A

### Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the PK detection mode.

### Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit for Class B.

The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

### Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.109(a), with the worst margin reading of:

**9.5 dB at 830.88 MHz in the Vertical polarization.**

**Test Data****Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	47 %
ATM Pressure:	1000 mbar

*The testing was performed by Guan Bin on 2006-5-24, and the data were only for unintentional radiator and be subjected to verification*

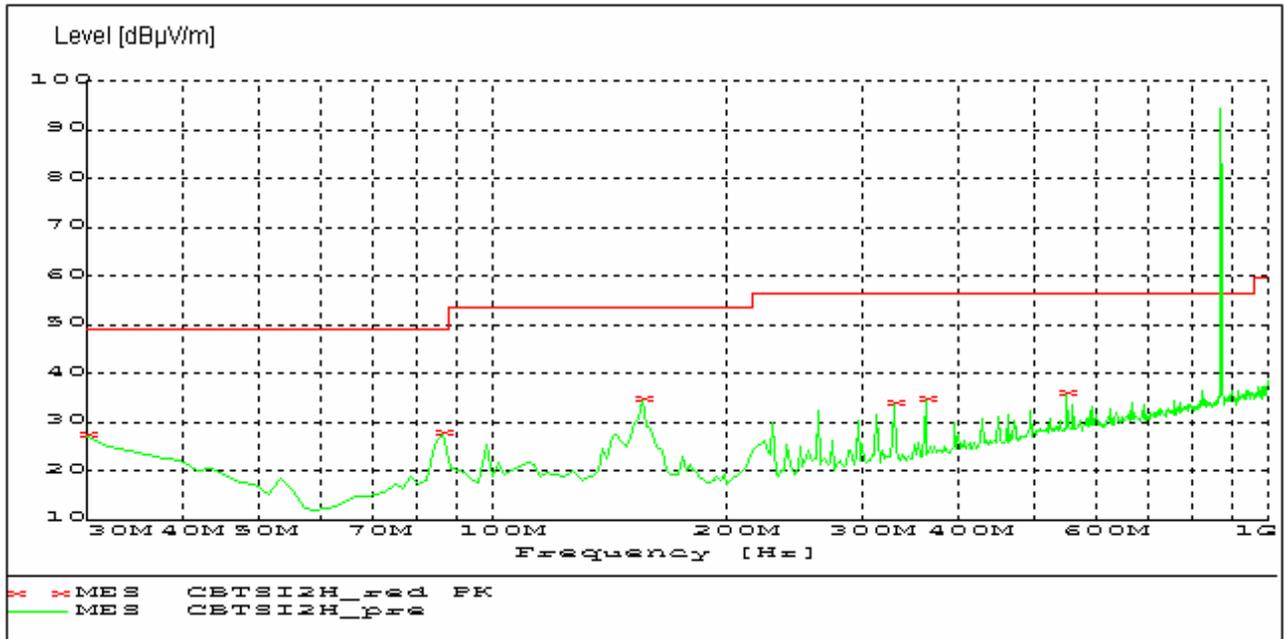
*Test Mode: Transmitting*

**Plot(s) of Test Data**

Plot(s) of Test Data is presented hereinafter as reference.

Channel 37

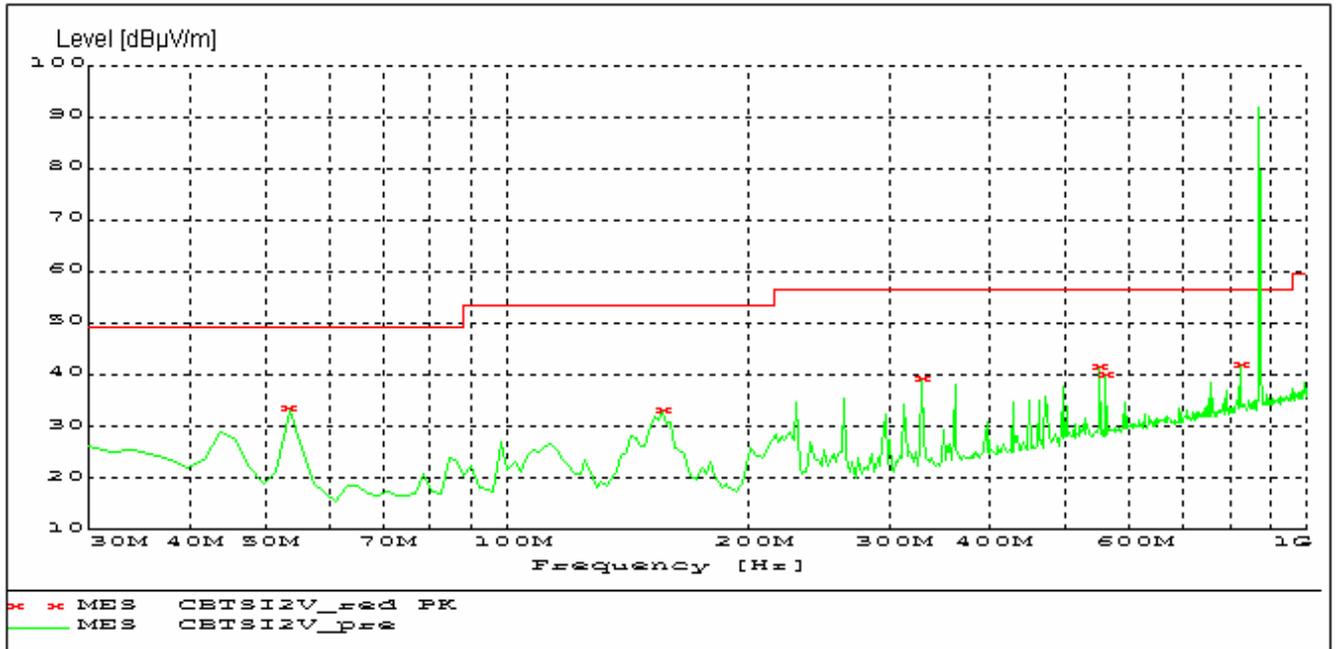
EUT: ZXC10 CBTS I28A  
 Manufacturer: ZTE  
 Operating Condition: Running  
 Test Site: Anechoic Chamber  
 Operator:  
 Test Specification: FCC Part15 Class A  
 Comment: Horizontal, channel 37  
 Start of Test: 2006-5-24 / 10:40:26



**MEASUREMENT RESULT: "CBTSI2H\_red PK"**

Frequency MHz	Level dBµV/m	Azimuth deg	Height cm	Polarisation	Transd dB	Limit dBµV/m	Margin dB
30.000000	27.13	83.00	200.0	HOR	-5.4	49.1	22.0
86.372745	27.73	281.00	200.0	HOR	-15.5	49.1	21.3
156.352705	34.79	97.00	200.0	HOR	-15.8	53.5	18.7
329.358717	33.74	131.00	100.0	HOR	-10.4	56.4	22.7
362.404810	34.57	131.00	100.0	HOR	-9.4	56.4	21.9
550.961924	36.00	310.00	200.0	HOR	-4.7	56.4	20.4

EUT: ZXC10 CBTS I28A  
 Manufacturer: ZTE  
 Operating Condition: Running  
 Test Site: Anechoic Chamber  
 Operator:  
 Test Specification: FCC Part15 Class A  
 Comment: Vertical, channel 37  
 Start of Test: 2006-5-24 / 10:35:20



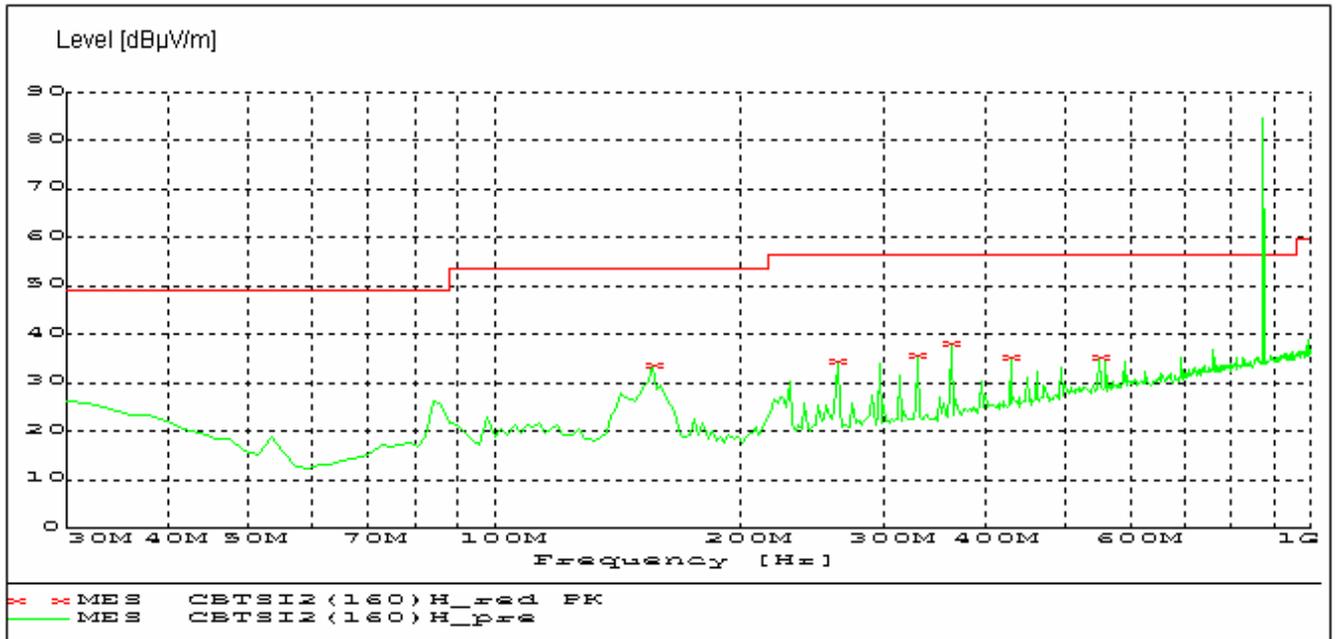
**MEASUREMENT RESULT: "CBTSI2V\_red PK"**

Frequency MHz	Level dBµV/m	Azimuth deg	Height deg	Polarisation cm	Transd dB	Limit dBµV/m	Margin dB
53.326653	33.17	346.00	100.0	VER	-19.0	49.1	15.9
156.352705	32.81	155.00	100.0	VER	0.5	53.5	20.7
329.358717	39.09	155.00	100.0	VER	-10.4	56.4	17.3
550.961924	41.18	69.00	100.0	VER	-4.7	56.4	15.3
560.681363	39.80	83.00	100.0	VER	-4.5	56.4	16.6
825.050100	41.57	69.00	100.0	VER	0.2	56.4	14.9

A

Channel 160

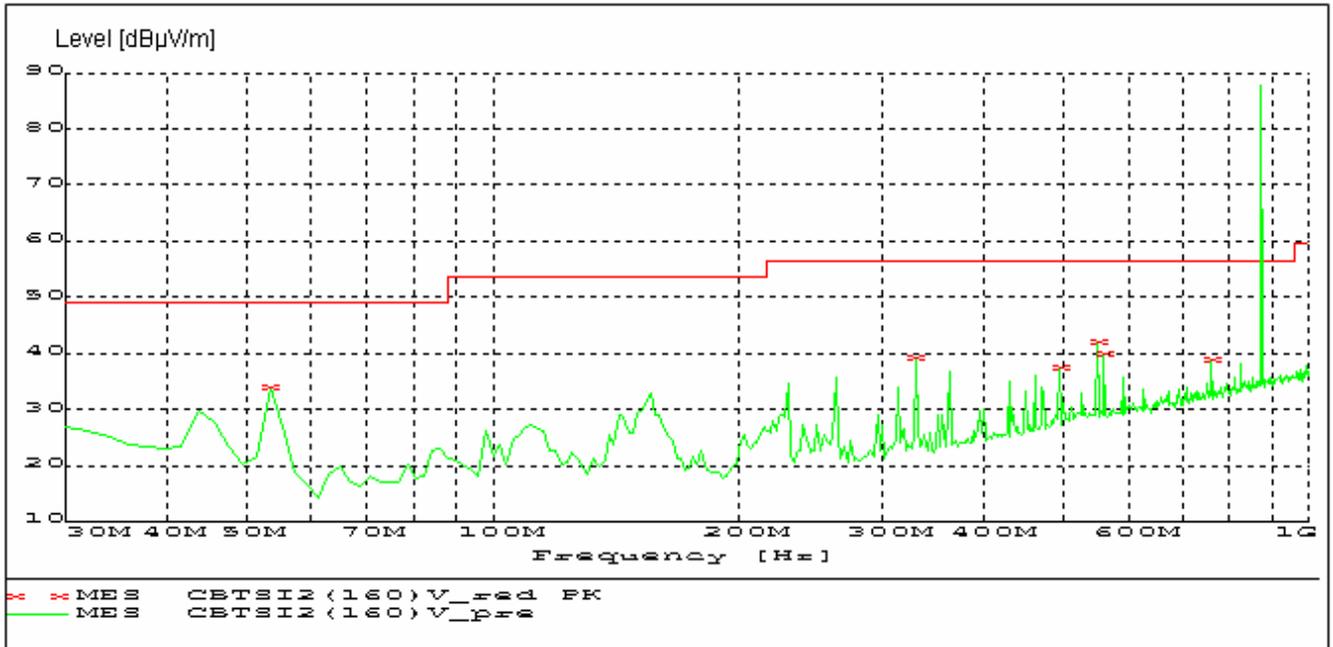
EUT: ZXC10 CBTS I28A  
 Manufacturer: ZTE  
 Operating Condition: Running  
 Test Site: Anechoic Chamber  
 Operator:  
 Test Specification: FCC Part15 Class A  
 Comment: Horizontal, channel 160  
 Start of Test: 2006-5-24 / 10:52:45



**MEASUREMENT RESULT: "CBTSI2(160)H\_red PK"**

Frequency MHz	Level dBµV/m	Azimuth deg	Height cm	Polarisation	Transd dB	Limit dBµV/m	Margin dB
156.352705	33.41	73.00	200.0	HOR	-15.8	53.5	20.1
263.266533	34.43	109.00	100.0	HOR	-12.8	56.4	22.0
329.358717	35.23	66.00	100.0	HOR	-10.4	56.4	21.2
362.404810	37.73	38.00	100.0	HOR	-9.4	56.4	18.7
428.496994	35.11	325.00	200.0	HOR	-7.5	56.4	21.3
550.961924	35.11	310.00	200.0	HOR	-4.7	56.4	21.3

EUT: ZXC10 CBTS I28A  
 Manufacturer: ZTE  
 Operating Condition: Running  
 Test Site: Anechoic Chamber  
 Operator:  
 Test Specification: FCC Part15 Class A  
 Comment: Vertical, channel 160  
 Start of Test: 2006-5-24 / 10:57:59

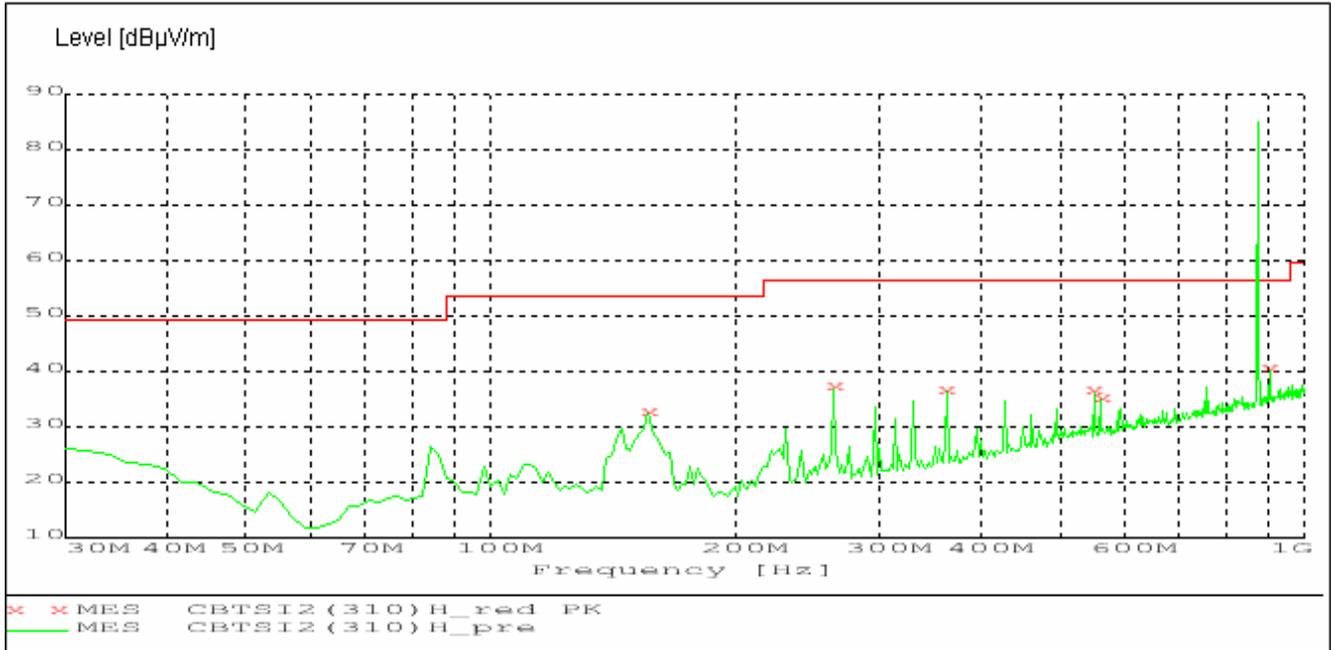


**MEASUREMENT RESULT: "CBTSI2(160)V\_red PK"**

Frequency MHz	Level dBµV/m	Azimuth deg	Height cm	Polarisation cm	Transd dB	Limit dBµV/m	Margin dB
53.326653	33.71	298.00	100.0	VER	-19.0	49.1	15.4
329.358717	38.93	8.00	100.0	VER	-10.4	56.4	17.5
494.589178	37.38	87.00	100.0	VER	-5.8	56.4	19.1
550.961924	41.76	74.00	100.0	VER	-4.7	56.4	14.7
560.681363	39.77	87.00	100.0	VER	-4.5	56.4	16.7
758.957916	38.62	74.00	100.0	VER	-1.1	56.4	17.8

Channel 310

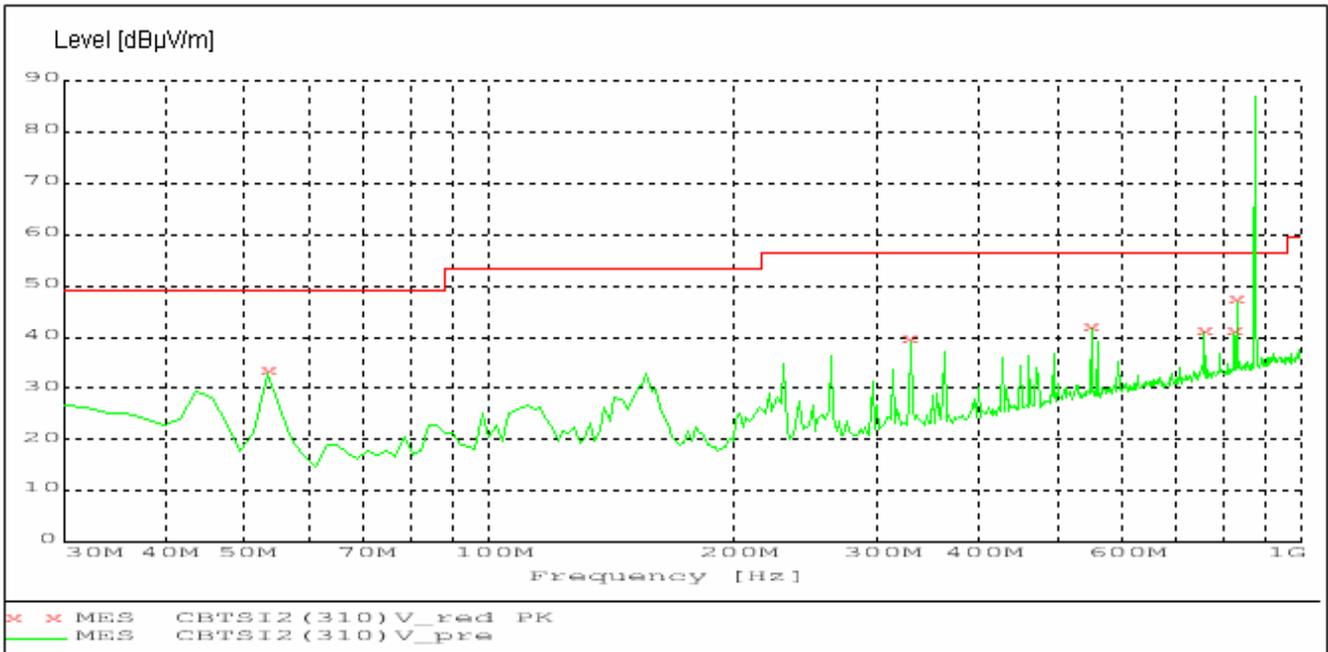
EUT: ZXC10 CBTS I28A  
 Manufacturer: ZTE  
 Operating Condition: Running  
 Test Site: Anechoic Chamber  
 Operator:  
 Test Specification: FCC Part15 Class A  
 Comment: Horizontal, channel 310  
 Start of Test: 2006-5-24 / 11:12:04



**MEASUREMENT RESULT: "CBTSI2(310)H\_red PK"**

Frequency MHz	Level dBµV/m	Azimuth deg	Height deg	Polarisation cm	Transd dB	Limit dBµV/m	Margin dB
156.352705	32.42	97.00	200.0	HOR	-15.8	53.5	21.1
263.266533	36.77	95.00	100.0	HOR	-12.8	56.4	19.7
362.404810	36.25	38.00	100.0	HOR	-9.4	56.4	20.2
550.961924	36.17	310.00	200.0	HOR	-4.7	56.4	20.3
560.681363	34.84	337.00	100.0	HOR	-4.5	56.4	21.6
904.749499	39.95	252.00	100.0	HOR	1.2	56.4	16.5

EUT: ZXC10 CBTS I28A  
 Manufacturer: ZTE  
 Operating Condition: Running  
 Test Site: Anechoic Chamber  
 Operator:  
 Test Specification: FCC Part15 Class A  
 Comment: Vertical, channel 310  
 Start of Test: 2006-5-24 / 11:07:12



**MEASUREMENT RESULT: "CBTSI2(310)V\_red PK"**

Frequency MHz	Level dBµV/m	Azimuth deg	Height deg	Polarisation cm	Transd dB	Limit dBµV/m	Margin dB
53.326653	32.79	352.00	100.0	VER	-19.0	49.1	16.3
329.358717	39.19	168.00	100.0	VER	-10.4	56.4	17.3
550.961924	41.62	66.00	100.0	VER	-4.7	56.4	14.8
758.957916	40.91	81.00	100.0	VER	-1.1	56.4	15.5
825.050100	40.60	66.00	100.0	VER	0.2	56.4	15.8
830.881764	46.94	53.00	200.0	VER	0.4	56.4	9.5

## §2.1053- SPURIOUS RADIATED EMISSIONS

### Applicable Standard

Requirements: CFR 47, §2.1053

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Dat	Calibration Due Date
R&S	EMI Test Receiver	ESI26	100058	2005-10-17	2006-10-16
R&S	Ultra roadband Antenna	HL562	100022	2003-3-7	2008-3-6
R&S	Double-Ridged Waveguide Horn Antenna	HF906	100032	2004-10-10	2009-10-9
Albatross	Anechoic Chamber	3m Site	N/A	2005-7-15	2008-7-14
R&S	Cable Set	RE Cable	N/A	2005-10-17	2006-10-16
R&S	Software	ES-K1	N/A	N/A	N/A

### Test Procedure

The transmitter was placed on the 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 teeth 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 (TXpwr in Watts/0.001)-the absolute level

Spurious attenuation limit in dB =43+10 Log<sub>10</sub> (power out in Watts)

### Test Results Summary

Channel 37: -37.1 dB at 1733.47 MHz  
 Channel 160: -40.2 dB at 6170.34 MHz  
 Channel 310: -40.2 dB at 6146.29 MHz

**Test Data****Environmental Conditions**

Temperature:	26°C
Relative Humidity:	60 %
ATM Pressure:	1009 mbar

The testing was performed by Guan Bin on 2006-5-24

Test Mode: Transmitting

Indicated Frequency MHz	Meter Reading dBuV/m	Table	Test Antenna		Substituted			Antenna Gain Correction dBi	Cable Loss dB	Absolute Level dBm	Limit dBm	Margin dB
		Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V					
Channel 37 f= 871.11MHz												
1733.47	45.76	141	100	V	1733.47	-51	V	3.5	6.55	-50.1	-13	-37.1
2611.22	51.87	102	100	H	2611.22	-53.4	H	4.4	7.95	-52	-13	-39
6146.29	50.56	0	200	H	6146.29	-53.2	H	6.8	9.05	-53.1	-13	-40.1
8655.31	53.94	265	100	H	8655.31	-54.2	H	8.3	9.65	-55	-13	-42
6158.32	50.59	304	100	V	6158.32	-57.5	V	6.9	9.05	-57.5	-13	-44.5
3272.55	44.6	18	100	H	3272.55	-58.4	H	4.8	7.75	-57.6	-13	-44.6
8675.35	53.55	141	100	V	8675.35	-57.5	V	8.3	9.65	-58.3	-13	-45.3
4210.42	44.38	177	200	V	4210.42	-63	V	5.5	7.95	-62.7	-13	-49.7
2070.14	39.48	347	100	H	2070.14	-65.7	H	3.9	7.05	-64.7	-13	-51.7
2743.49	40.78	54	200	V	2743.49	-66.8	V	4.4	7.95	-65.4	-13	-52.4
1000	38.26	13	200	V	1000	-70.1	V	2.7	4.25	-70.7	-13	-57.7
1408.82	35.02	91	200	H	1408.82	-71.1	H	3.1	4.25	-72.1	-13	-59.1
Channel 160 f=874.8MHz												
6170.34	50.49	347	100	H	6170.34	-53.2	H	6.9	9.05	-53.2	-13	-40.2
8879.76	53.99	265	100	H	8879.76	-54.1	H	8.4	9.65	-55	-13	-42
1000	35.67	299	200	H	1000	-56	H	2.7	4.25	-56.6	-13	-43.6
6170.34	50.57	102	100	V	6170.34	-56.7	V	6.9	9.05	-56.7	-13	-43.7
2623.25	46.64	18	100	H	2623.25	-58.6	H	4.4	7.95	-57.2	-13	-44.2
2623.25	48.52	60	100	V	2623.25	-58.8	V	4.4	7.95	-57.4	-13	-44.4
3272.55	44.38	360	100	H	3272.55	-58.3	H	4.8	7.75	-57.5	-13	-44.5
8659.32	53.72	266	100	V	8659.32	-57.3	V	8.3	9.65	-58.1	-13	-45.1
4246.49	44.28	18	100	V	4246.49	-63.4	V	5.5	7.95	-63.1	-13	-50.1
1745.49	42.18	102	100	V	1745.49	-65.9	V	3.5	6.55	-65	-13	-52
1745.49	38.88	142	100	H	1745.49	-66.9	H	3.5	6.55	-66	-13	-53
1000	40.35	12	200	V	1000	-67.1	V	2.7	4.25	-67.7	-13	-54.7

Indicated Frequency MHz	Meter Reading dBuV/m	Table	Test Antenna			Substituted			Antenna Gain Correction dBi	Cable Loss dB	Absolute Level dBm	Limit dBm	Margin dB
		Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V						
Channel 310 f=879.3MHz													
6146.29	49.99	52	200	H	6146.29	-53.3	H	6.8	9.05	-53.2	-13	-40.2	
2623.25	51.85	189	100	V	2623.25	-55.5	V	4.4	7.95	-54.1	-13	-41.1	
6927.86	50.65	134	200	H	6927.86	-54.8	H	7.3	9.25	-55	-13	-42	
8723.45	53.53	257	200	H	8723.45	-54.4	H	8.3	9.65	-55.2	-13	-42.2	
6170.34	50.73	148	100	V	6170.34	-56.7	V	6.9	9.05	-56.7	-13	-43.7	
8667.33	53.84	355	100	V	8667.33	-57.4	V	8.3	9.65	-58.2	-13	-45.2	
3272.55	45.12	360	100	H	3272.55	-59.3	H	4.8	7.75	-58.5	-13	-45.5	
4090.18	44.07	7	200	V	4090.18	-61.6	V	5.4	7.95	-61.2	-13	-48.2	
2635.27	41.2	93	200	H	2635.27	-64.2	H	4.3	7.95	-62.7	-13	-49.7	
1745.49	41.45	143	100	H	1745.49	-64.3	H	3.5	6.55	-63.4	-13	-50.4	
2046.09	39	90	200	V	2046.09	-65.1	V	3.8	7.05	-64	-13	-51	
1000	40.36	7	200	V	1000	-67.1	V	2.7	4.25	-67.7	-13	-54.7	

## **§2.1051, §22.917(a)- SPURIOUS EMISSIONS AT ANTENNA TERMINALS**

### **Applicable Standard**

Requirements: CFR 47§ 2.1051. §22.917(a)

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

### **Test Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10

### **Test Procedure**

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 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10<sup>th</sup> harmonic.

### **Test Data**

#### **Environmental Conditions**

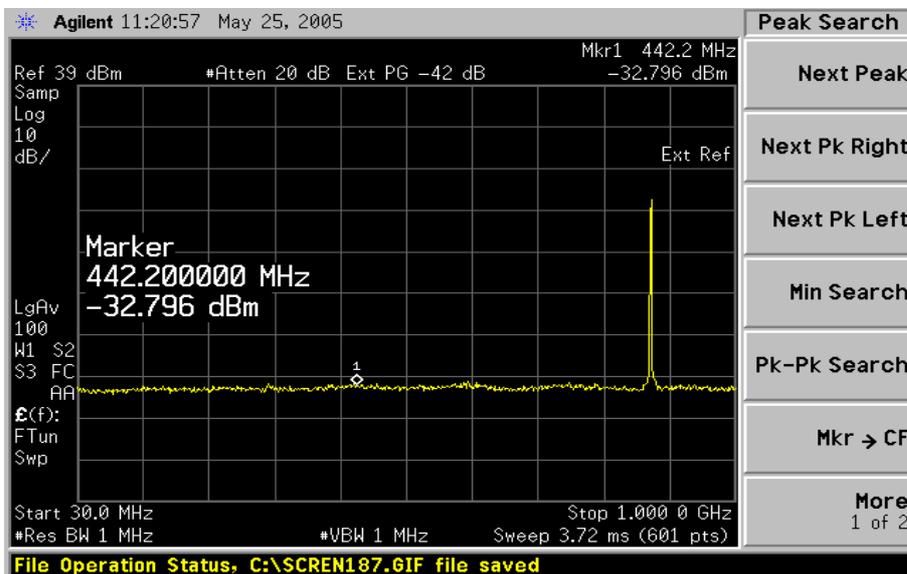
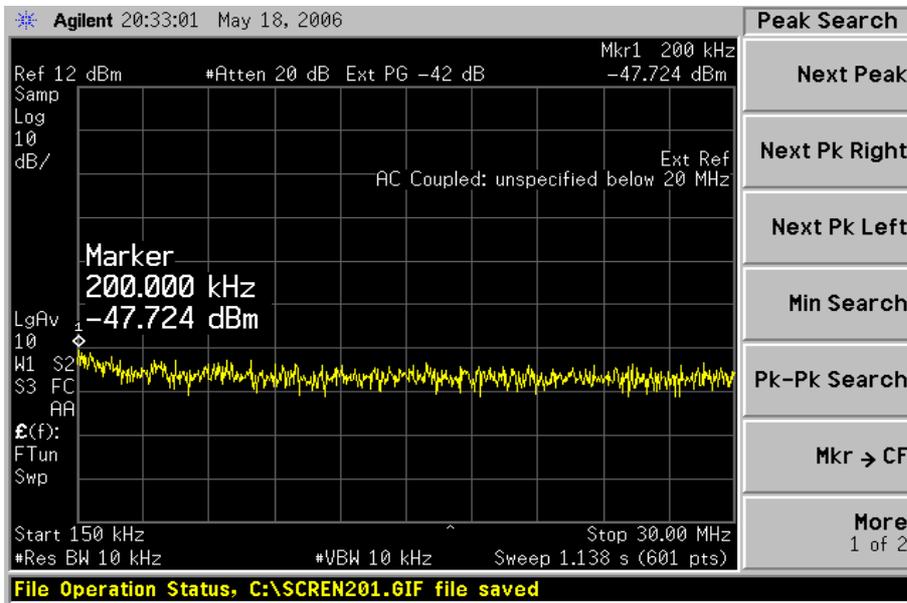
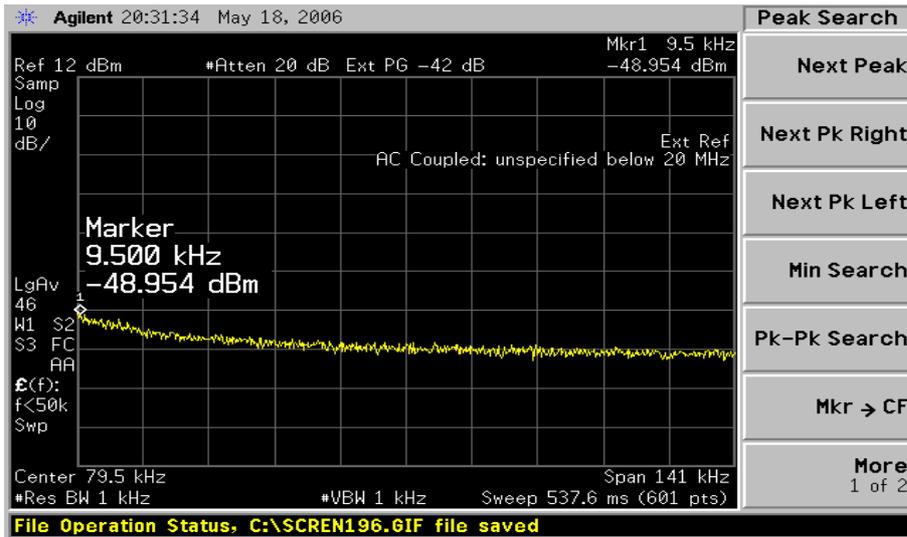
Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

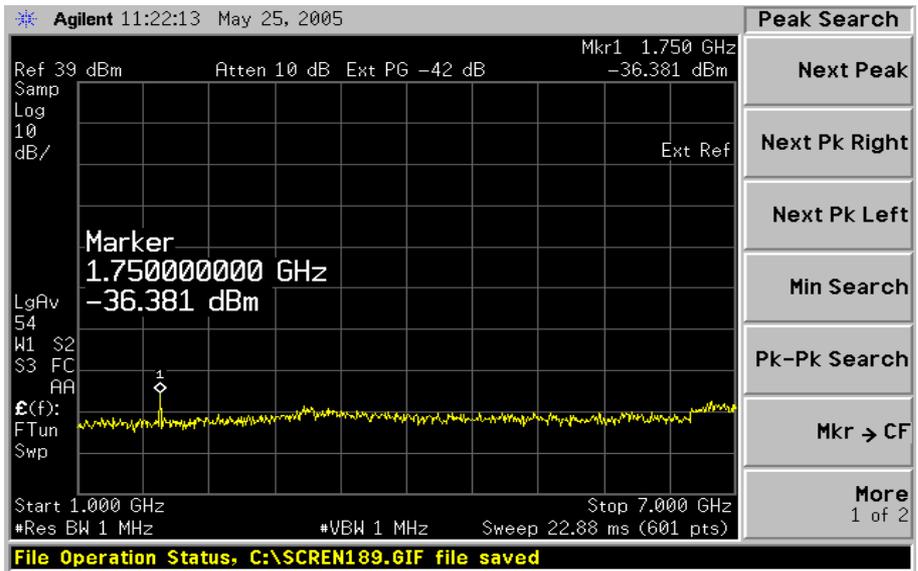
*The testing was performed by JX HE on May 01-28, 2006.*

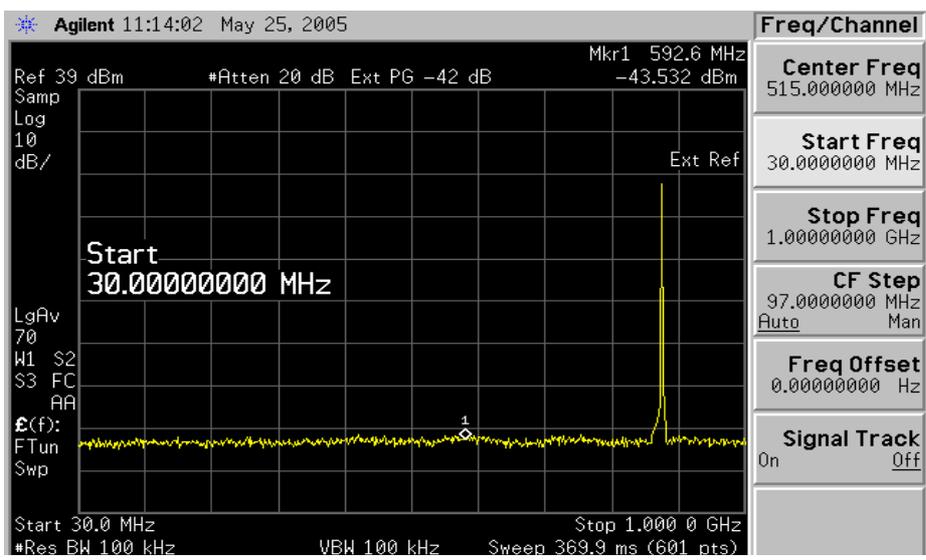
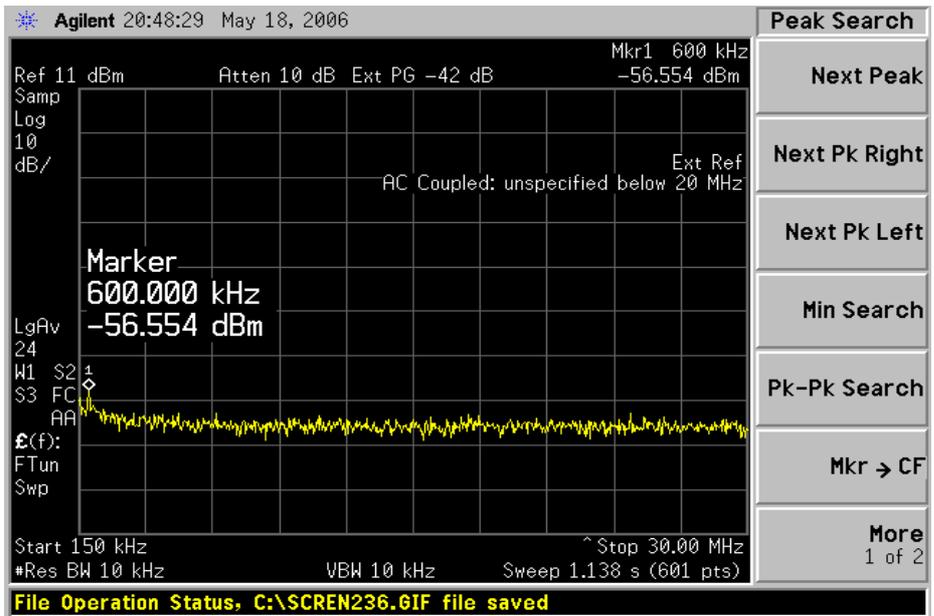
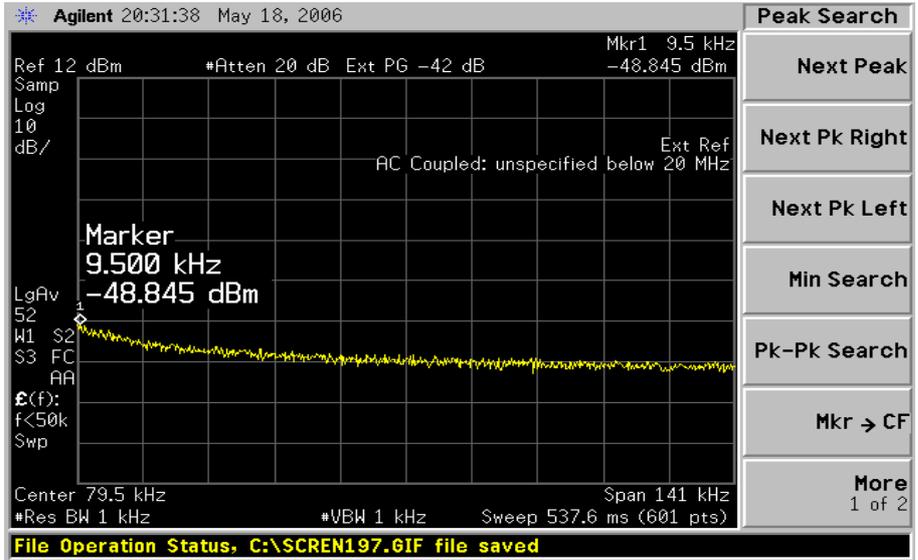
Test Result: Pass

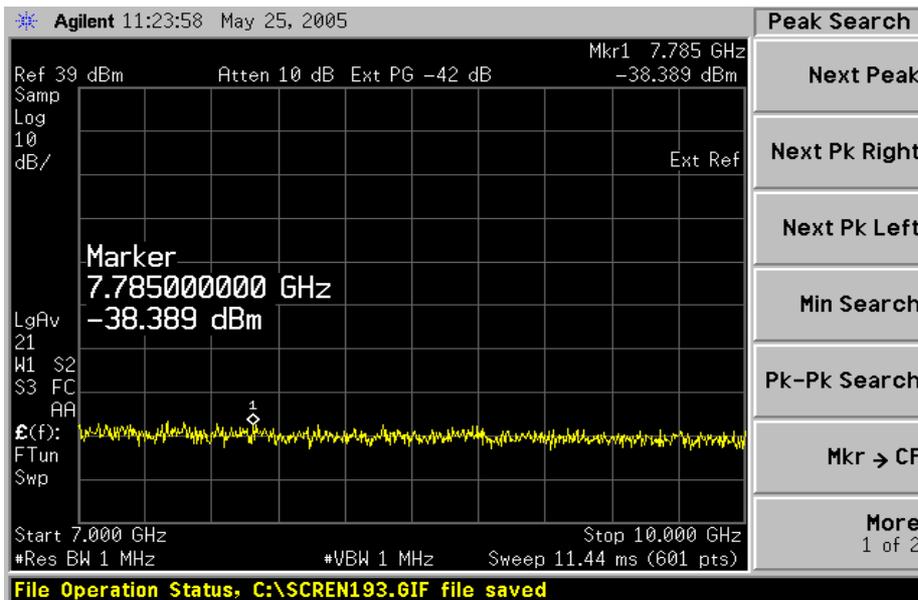
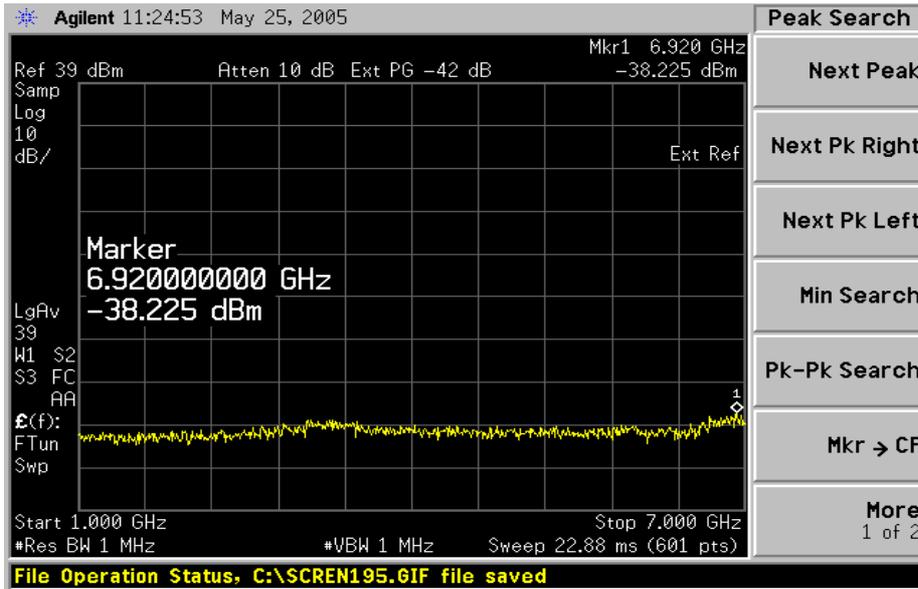
*Test Mode: Transmitting*

Channel 37

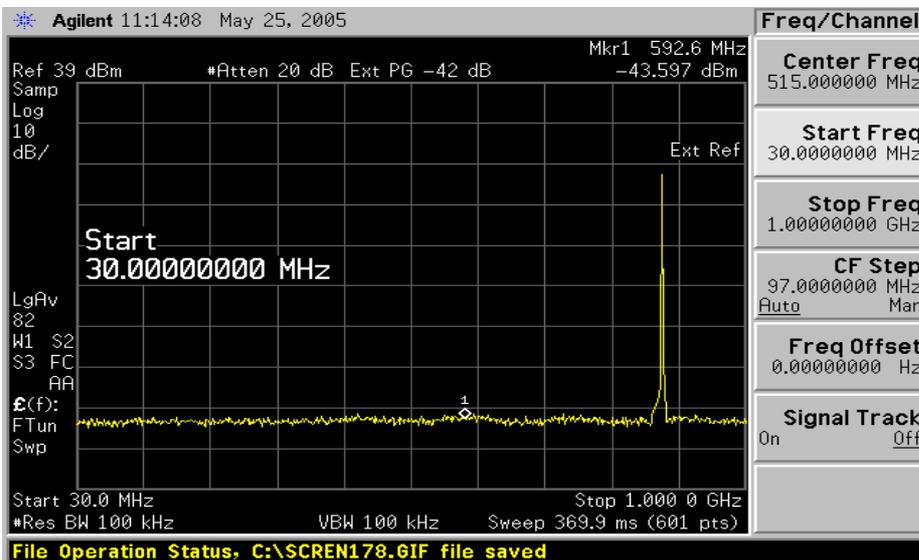
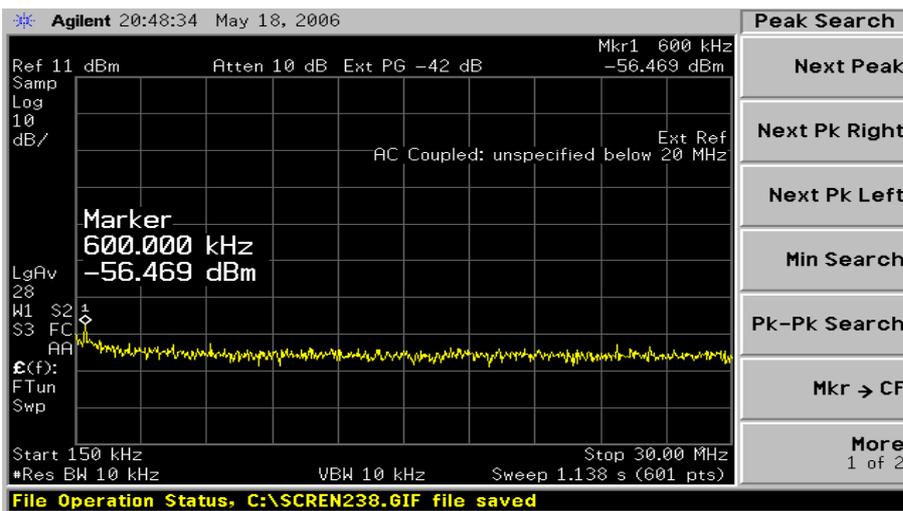
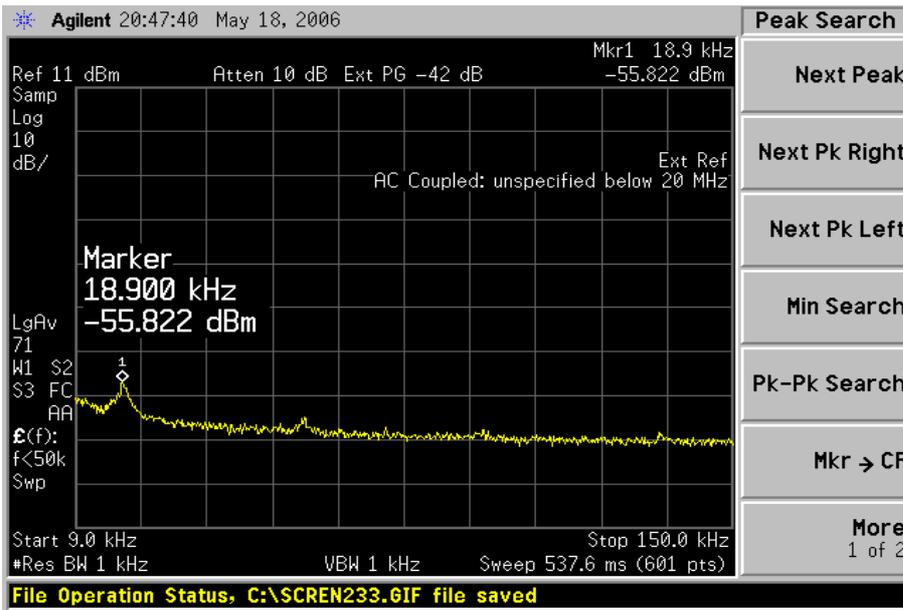


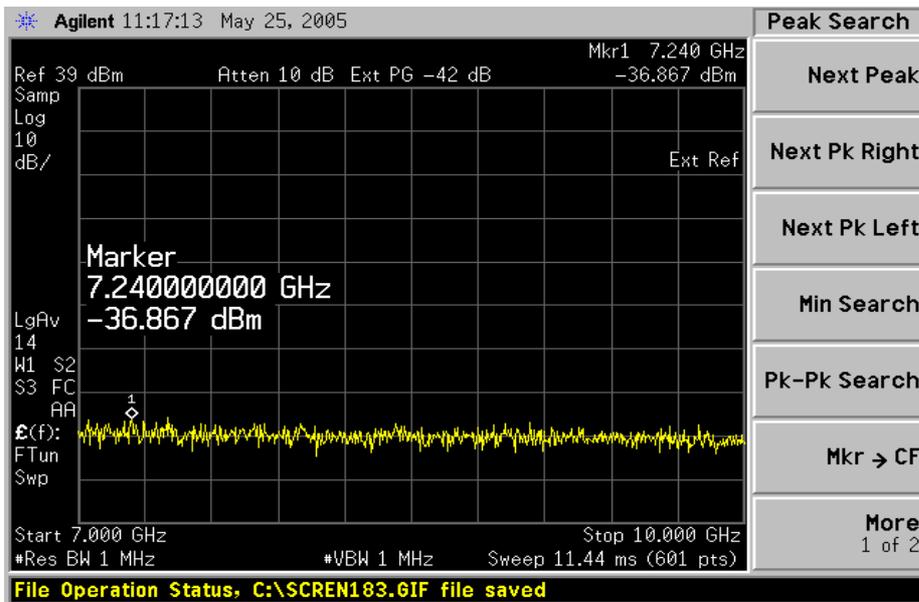
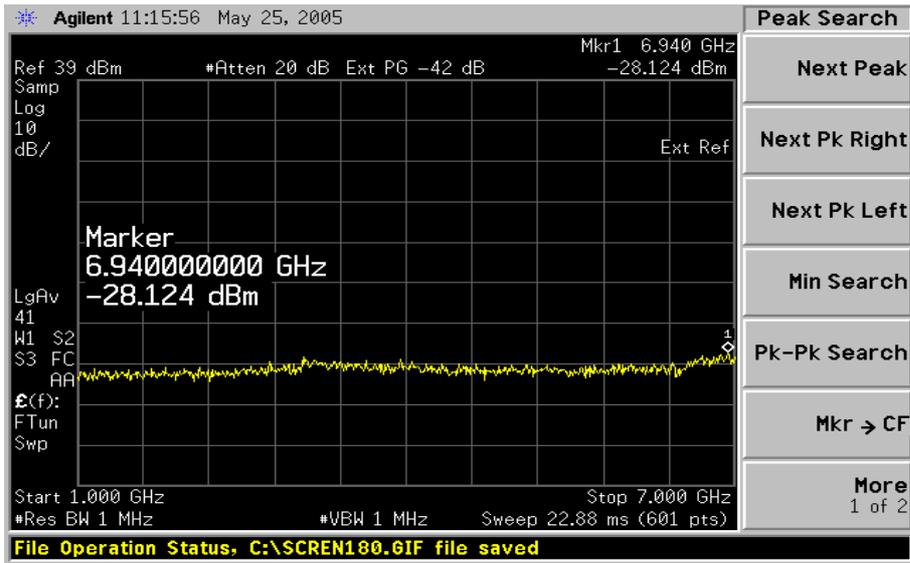






Channel 310





## **§2.1049, §22.917, §22.905 -OCCUPIED BANDWIDTH**

### **Applicable Standard**

Requirements: CFR 47, Section 2.1049, Section 22.901 and Section 22.917.

### **Test Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Agilent	PSA Spectrum Analyzer	E4445A	MY44300451	2006-3-2	2007-3-2

### **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 30 kHz and the 26 dB and 99% Power bandwidth was recorded.

### **Test Data**

#### **Environmental Conditions**

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1009mbar

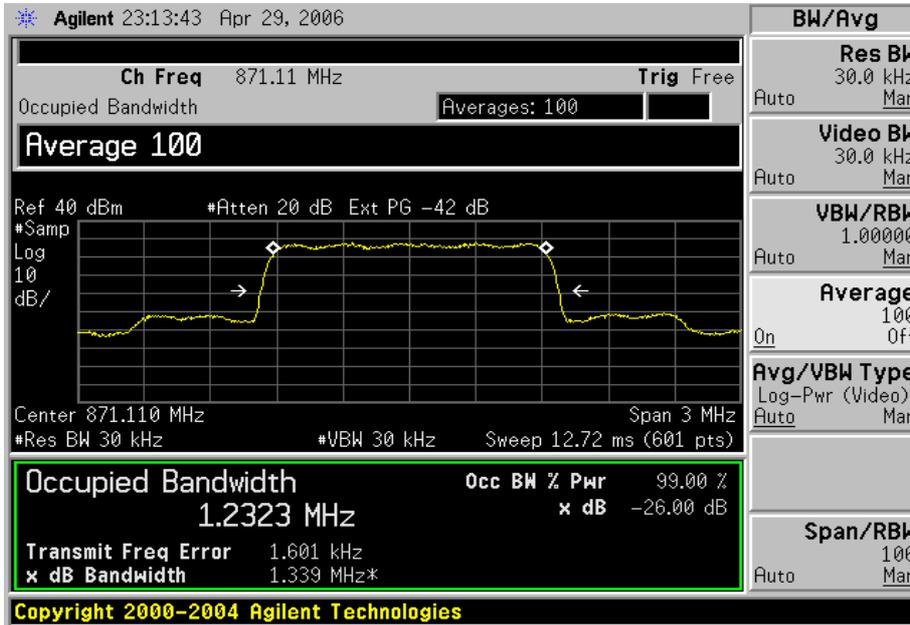
*The testing was performed by JX HE on May 01-28, 2006.*

Test Result: Pass

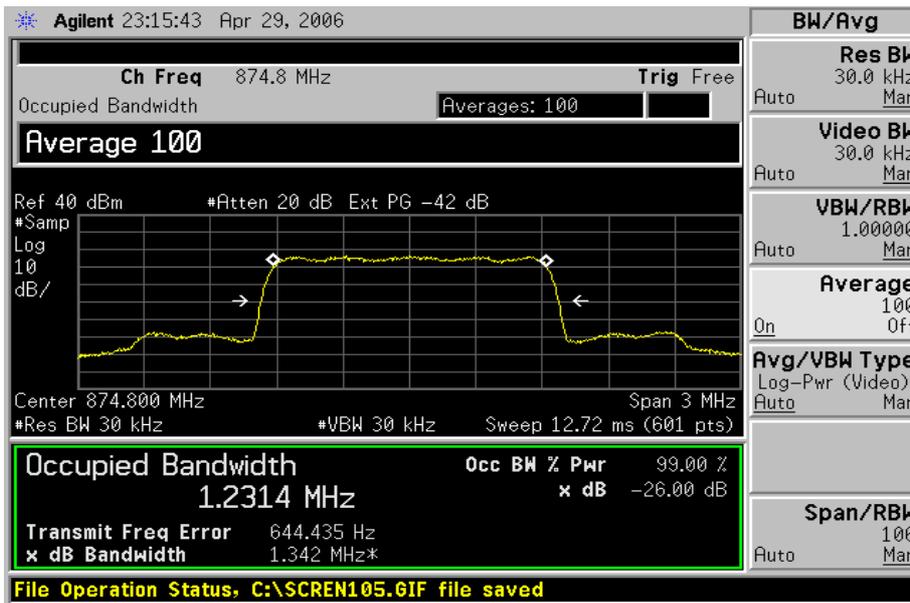
*Test Mode: Transmitting*

<b>Channel</b>	<b>Channel frequency (MHz)</b>	<b>99% Power Bandwidth (MHz)</b>
Channel 37	871.11	1.2323
Channel 160	874.80	1.2314
Channel 310	879.30	1.2336

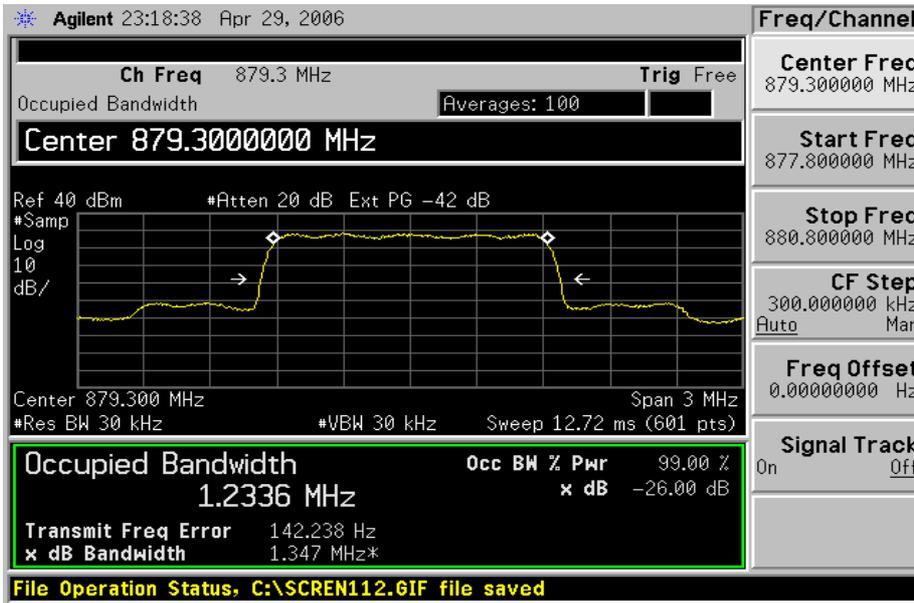
Channel 37



Channel 160



Channel 310



## §22.917- BAND EDGES

### 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PSA Spectrum Analyzer	E4445A	MY44300451	2005-6-3	2006-6-3

### 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 30 kHz.

### Test Data

#### Environmental Conditions

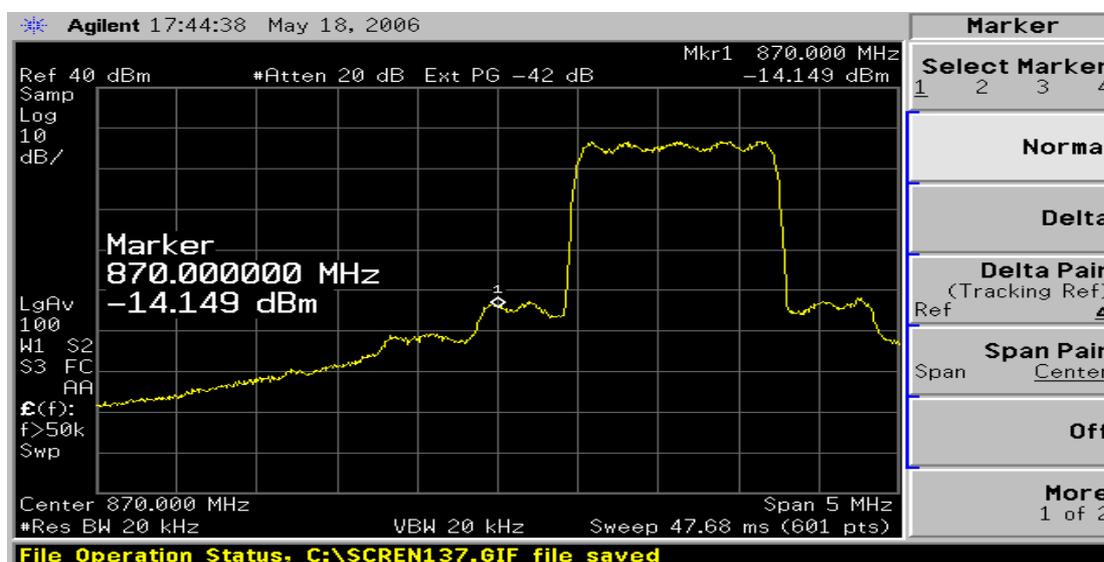
Temperature:	24 °C
Relative Humidity:	59%
ATM Pressure:	1009mbar

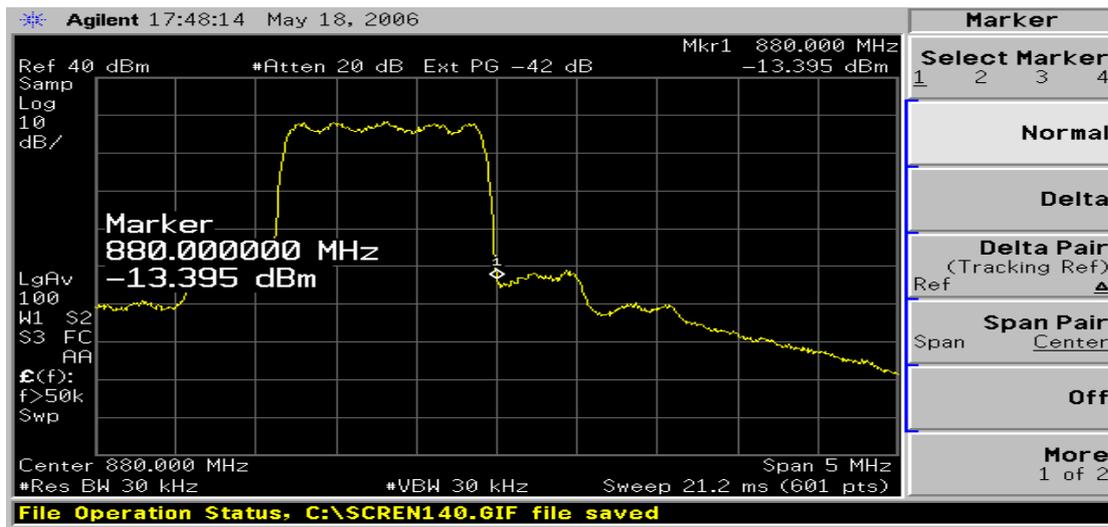
The testing was performed by JX HE on May 01-28, 2006.

Test Result: Pass

Test Mode: Transmitting

Frequency MHz	Emission dBm	Limit dBm
870.00	-14.149	-13.00
880.00	-13.395	-13.00





## **§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	Mobile	Mobile
	(ppm)	(ppm)	(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

### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PSA Spectrum Analyzer	E4445A	MY44300451	2006-3-2	2007-3-2
GZ-ESPEC	Temperature Chamber	GRW-120	00020268	2006-3-8	2007-3-8
Chroma	DC Power	6230K-80	N/A	2005-8-11	2006-8-11

### **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 f 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 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

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.

**Test Data****Environmental Conditions**

Temperature:	20° C
Relative Humidity:	49%
ATM Pressure:	1009 mbar

*The testing was performed by JX HE on May 01-28, 2006.*

Test Result: Pass

*Test Mode: Transmitting*

**Frequency Stability Versus Temperature**

Frequency Stability vs. Temperature				
Temperature °C	Power Supplied Vdc	Frequency Measure Error Hz	Error ppm	Limit 1.5ppm
CH37 f=871.11MHz				
-5	-48	-0.10	0.000115	1.5
5	-48	-0.15	0.000173	1.5
15	-48	-0.76	0.000872	1.5
25	-48	-0.36	0.000413	1.5
35	-48	-0.98	0.001125	1.5
45	-48	0.30	0.000344	1.5
CH160 f=874.80MHz				
-5	-48	-0.20	0.000332	1.5
5	-48	-2.09	0.002583	1.5
15	-48	-1.13	0.001292	1.5
25	-48	-0.71	0.000114	1.5
35	-48	0.86	0.000983	1.5
45	-48	0.54	0.000617	1.5
CH310 f=879.30MHz				
-5	-48	-1.66	0.001888	1.5
5	-48	-1.87	0.002127	1.5
15	-48	0.27	0.000307	1.5
25	-48	0.48	0.000546	1.5
35	-48	-0.36	0.000409	1.5
45	-48	1.61	0.001831	1.5

## Frequency Stability Versus Voltage

Frequency Stability vs. Voltage				
Voltage Vdc	Temperature °C	Frequency Measure Error Hz	Error ppm	Limit 1.5ppm
CH37 f=871.11MHz				
-42	20	1.22	0.001401	1.5
-46	20	-0.59	0.000677	1.5
-48	20	-1.28	0.001469	1.5
-50	20	-2.99	0.003432	1.5
-54	20	0.98	0.001125	1.5
-58	20	0.05	0.000057	1.5
CH160 f=874.80MHz				
-42	20	-0.26	0.000297	1.5
-46	20	1.09	0.001246	1.5
-48	20	0.58	0.000666	1.5
-50	20	0.24	0.000274	1.5
-54	20	0.43	0.000492	1.5
-58	20	0.59	0.000674	1.5
CH310 f=879.30MHz				
-42	20	-0.60	0.000682	1.5
-46	20	-0.91	0.001035	1.5
-48	20	-1.00	0.001137	1.5
-50	20	-2.14	0.002434	1.5
-54	20	-1.77	0.002013	1.5
-58	20	-0.68	0.000773	1.5