

FCC PART 24 TYPE APPROVAL
EMI MEASUREMENT AND TEST REPORT
For
ZTE Corporation

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

FCC ID: Q78-CBTSI219

May 30, 2006

This Report Concerns: ☒ Original Report	Equipment Type: CDMA2000 Compact Base Transceiver Station-I2
Test Engineer: JX HE 	
Report No.: RSZ06053002	
Test Date: May 01-28, 2006	
Reviewed By: ZH XIE 	
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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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The ZTE Corporation's product, model number: ZXC10 CBTS I219 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: 0504171.*

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.

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 24 Subpart E - PCS

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: +86-755-26790000, Fax: +86-755-26791999.

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.: 0009043175. 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

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

SYSTEM TEST CONFIGURATION

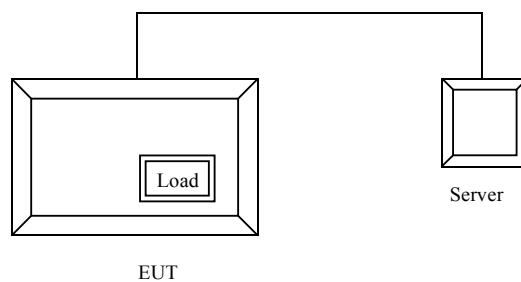
Description of Test Configuration

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

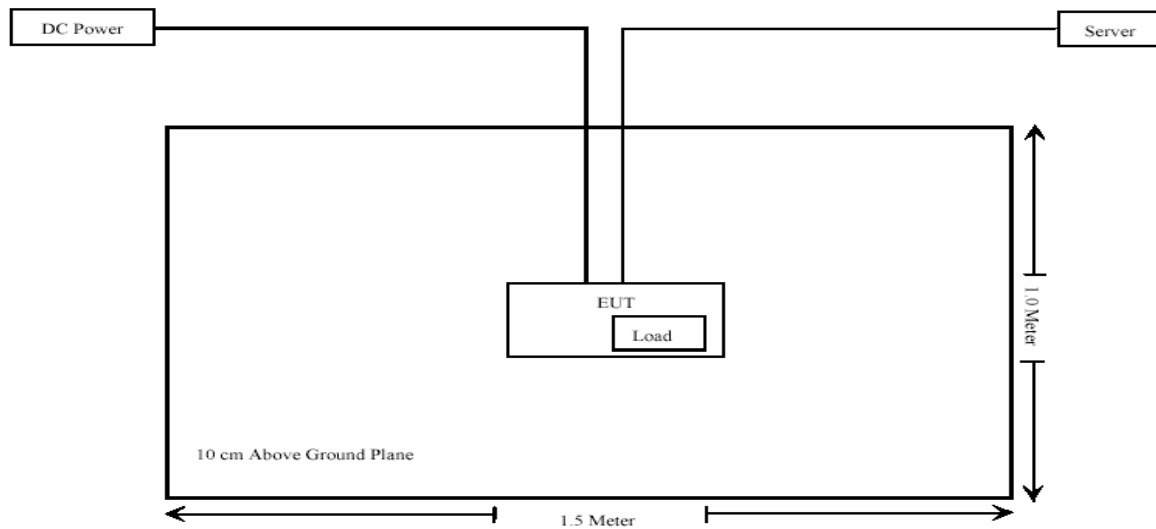
Equipment Modifications

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, §24.232	Conducted Output 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, §24.238(a)	Spurious Emissions AT Antenna Terminals	Compliant
§2.1049, §24.238	Occupied Bandwidth	Compliant
§24.238	Band Edge	Compliant
§ 2.1055 (a) § 2.1055 (d) § 24.235	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 ²)	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 ²)	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: 44.84 (dBm)

Maximum peak output power at antenna input terminal: 30.48 (W)

Prediction distance: 300 (cm)

Predication frequency: 1959.375 (MHz)

Antenna Gain (typical): 17 (dBi)

Power density at predication frequency at 300 cm: 0.458 (mW/cm²)

MPE limit for uncontrolled exposure at prediction frequency: 5 (mW/cm²)

Test Result: Pass

§2.1046, §24.232- CONDUCTED OUTPUT POWER

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 100 watt.

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 result has been complied with the §2.1046, §24.232, see the following plot:

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

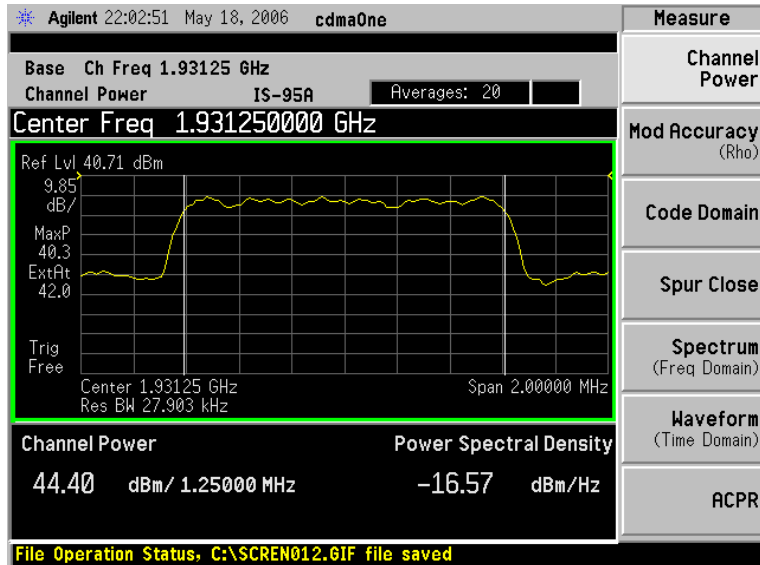
Test Result: Pass

Test Mode: Transmitting/CDMA2000 1X EV

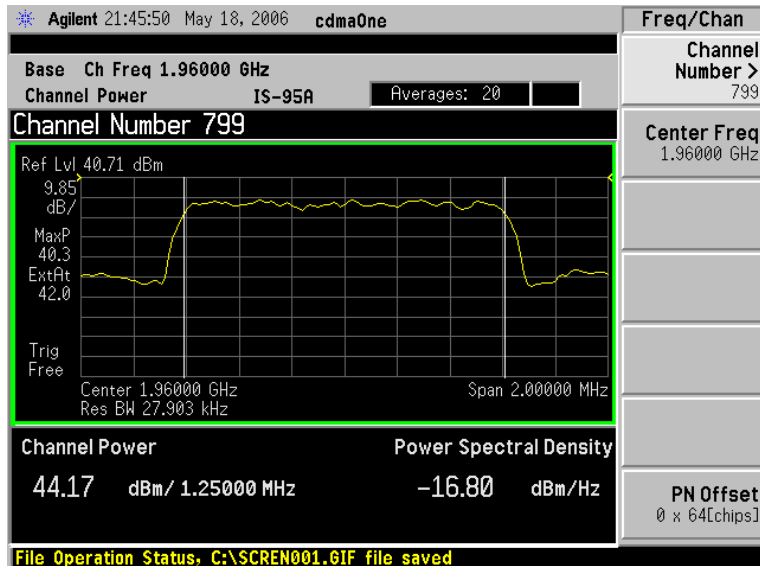
1 Carrier

Channel	Frequency (MHz)	Total Power in dBm	Total Power in W	Limit in W
Channel 25	1931.25	44.40	27.54	100
Channel 600	1960	44.17	26.12	100
Channel 1175	1988.75	44.50	28.18	100

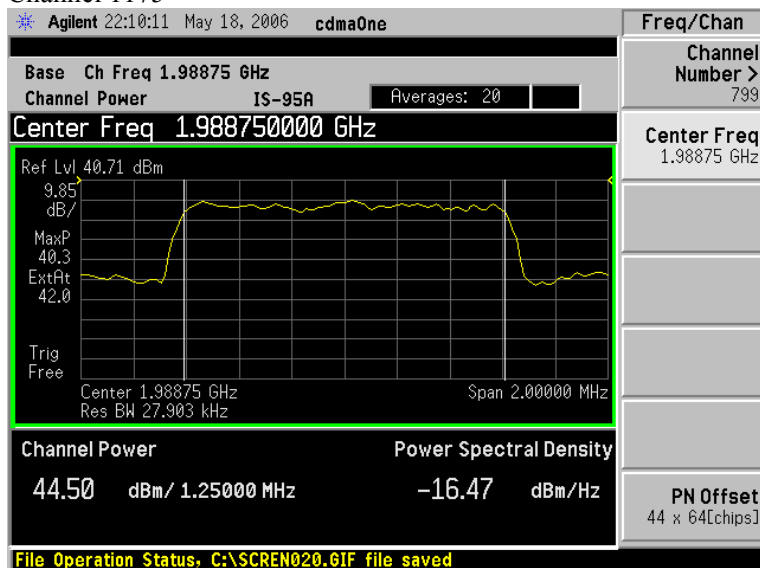
Channel 25



Channel 600



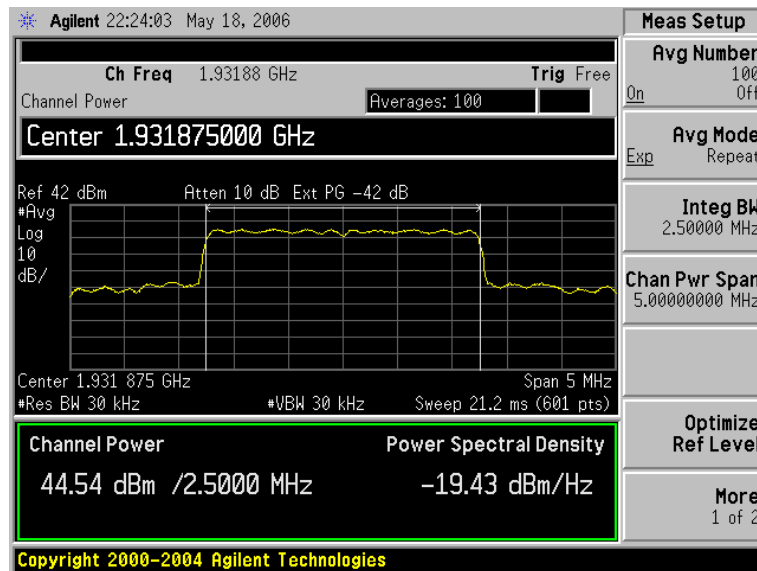
Channel 1175



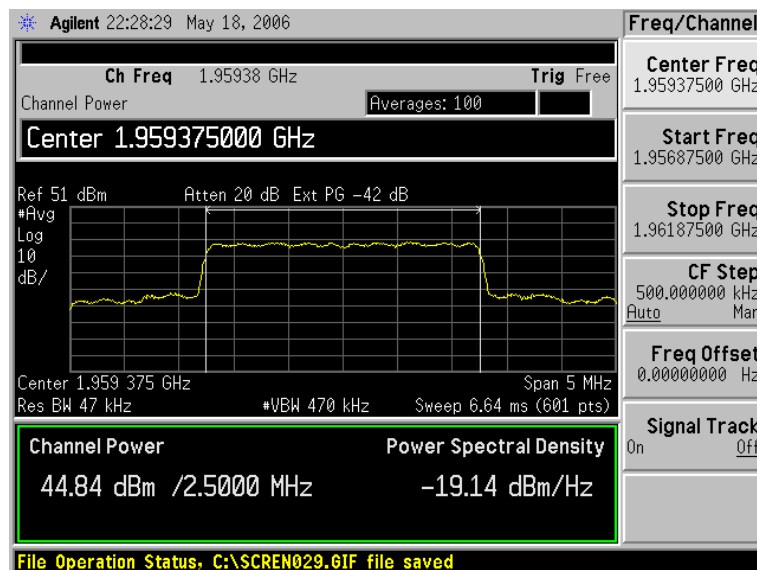
2 Carrier

Channel	Frequency (MHz)	Total Power in dBm	Total Power in W	Limit in W
Channel 25、50	1931.875	44.54	28.44	100
Channel 575、600	1959.375	44.84	30.48	100
Channel 1150、1175	1988.125	44.55	28.51	100

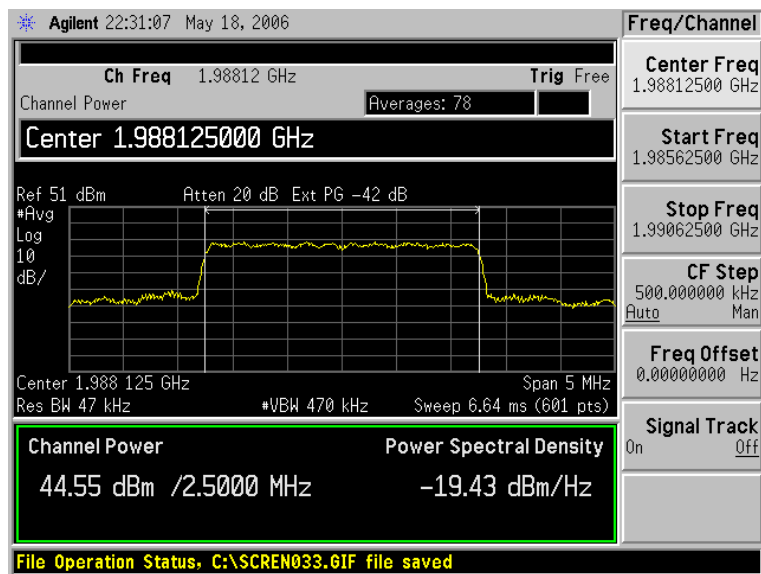
Channel 25、50



Channel 575、600



Channel 1150、1175

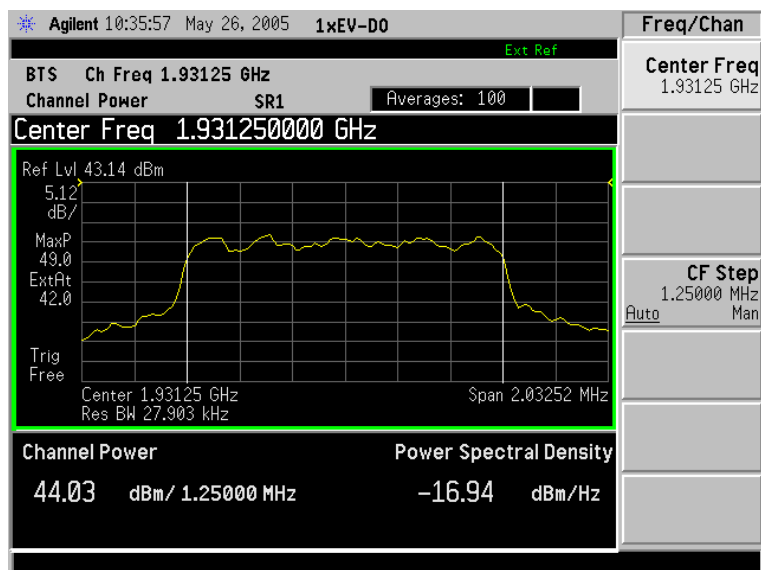


Test Mode: Transmitting/CDMA2000 1X EV DO

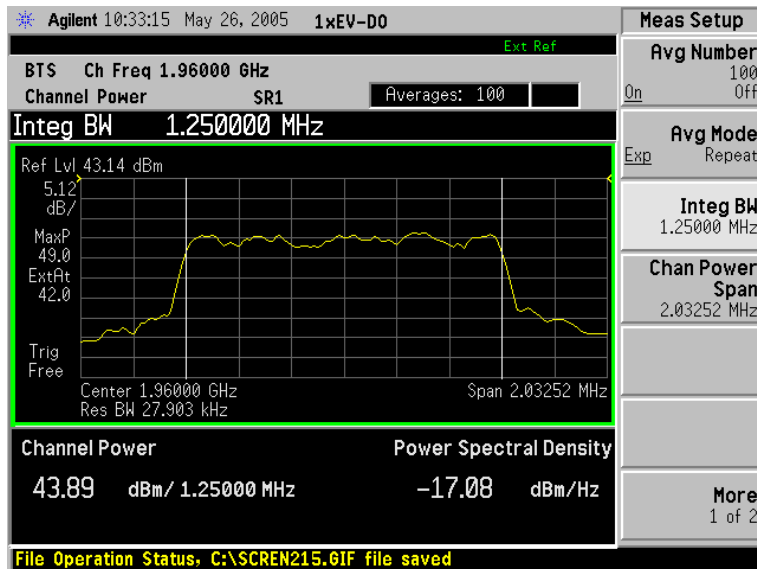
1 Carrier

Channel	Frequency (MHz)	Total Power in dBm	Total Power in W	Limit in W
Channel 25	1931.25	44.03	25.29	100
Channel 600	1960	43.89	24.49	100
Channel 1175	1988.75	43.63	23.07	100

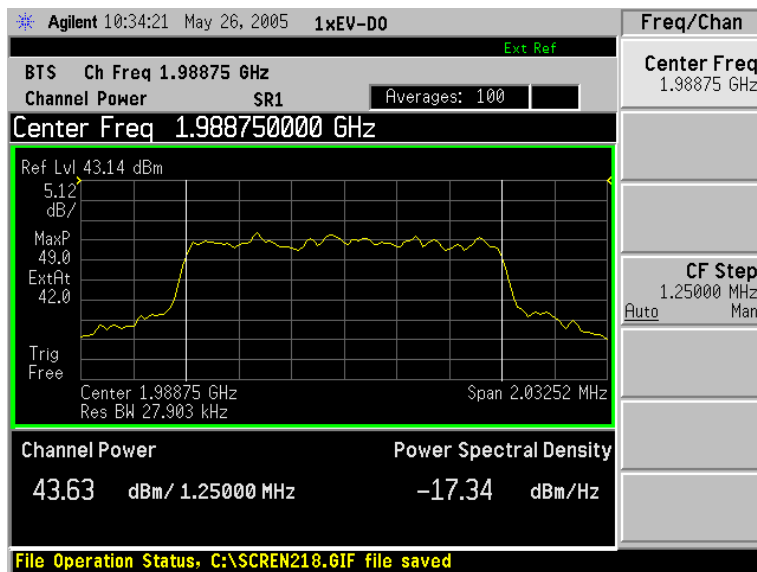
Channel 25



Channel 600



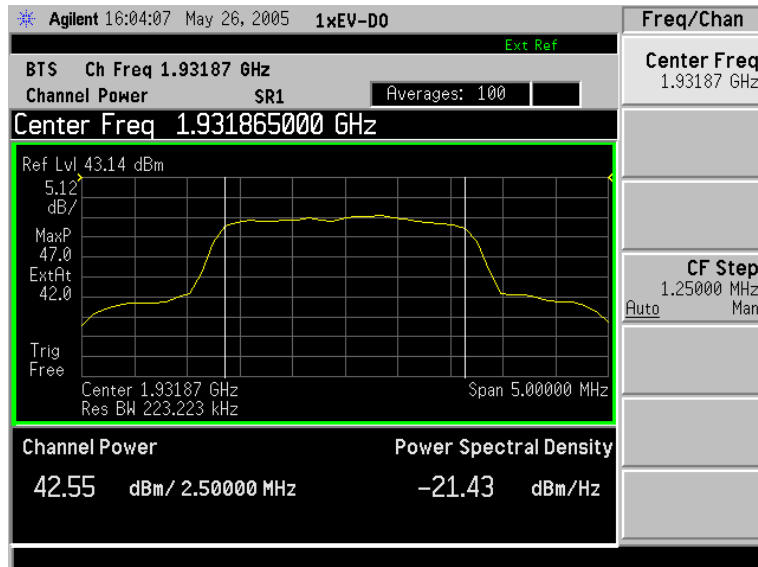
Channel 1175



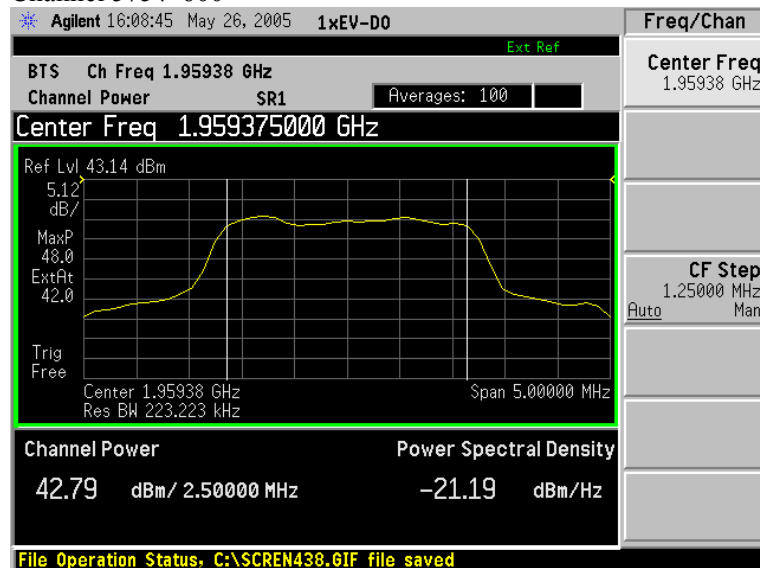
2 Carrier

Channel	Frequency (MHz)	Total Power in dBm	Total Power in W	Limit in W
Channel 25、50	1931.875	42.55	17.99	100
Channel 575、600	1959.375	42.79	19.01	100
Channel 1150、1175	1988.125	42.69	18.58	100

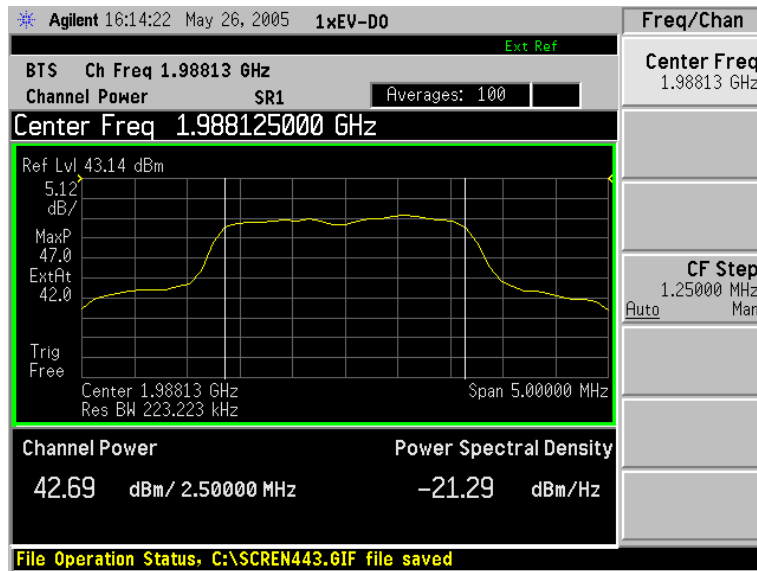
Channel 25、50



Channel 575、600



Channel 1150、1175



§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.

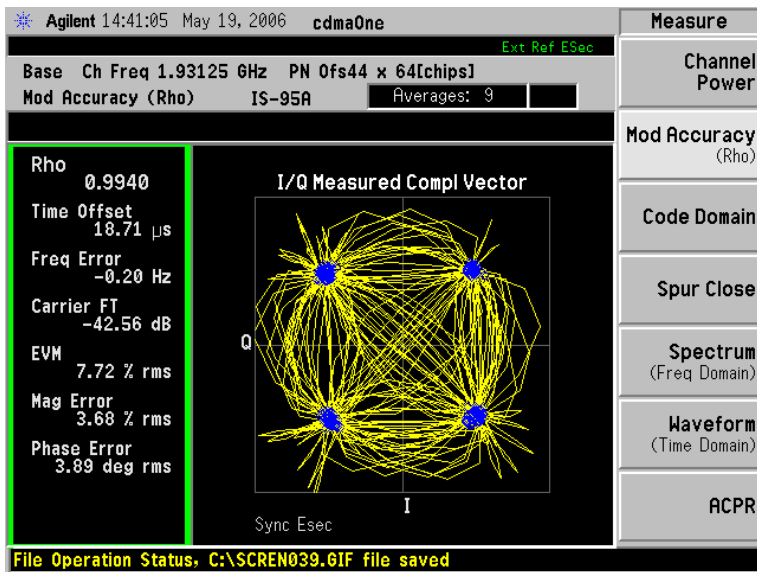
Test Result: Pass

Test Mode: Transmitting/CDMA2000 1X EV

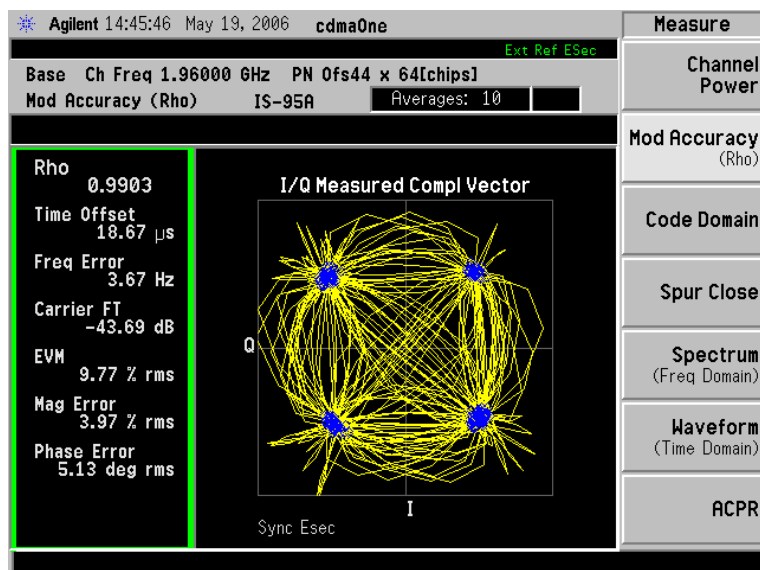
1 Carrier

Channel	Frequency (MHz)	Rho
Channel 25	1931.25	0.9940
Channel 600	1960	0.9903
Channel 1175	1988.125	0.9853

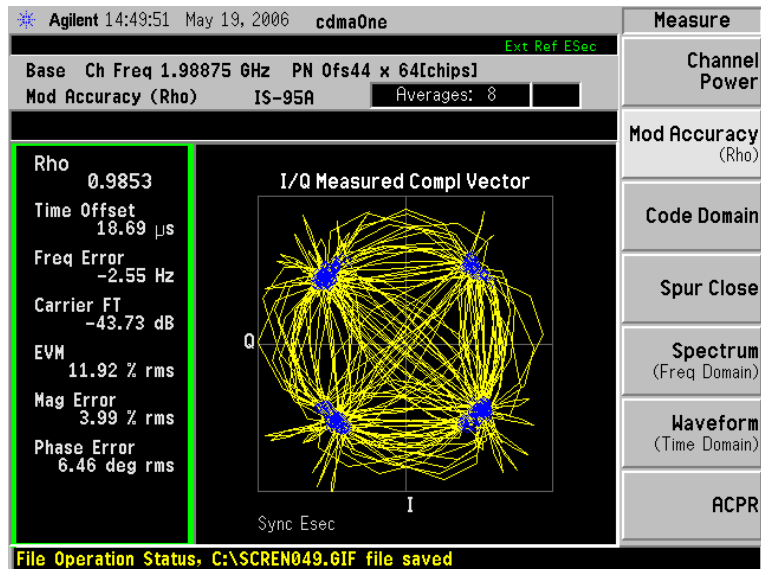
Channel 25



Channel 600



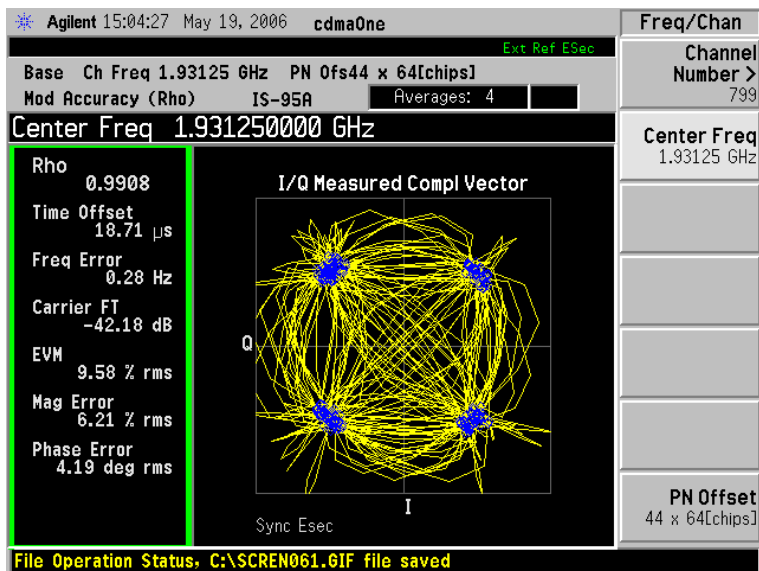
Channel 1175



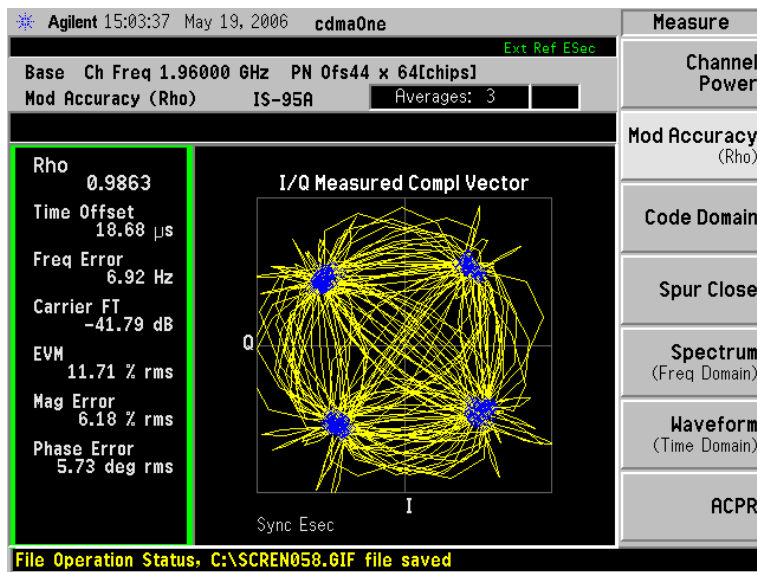
2 Carrier

Channel	Frequency (MHz)	Rho
Channel 25、50	1931.875	0.9908
Channel 575、600	1959.375	0.9863
Channel 1150、1175	1988.125	0.9810

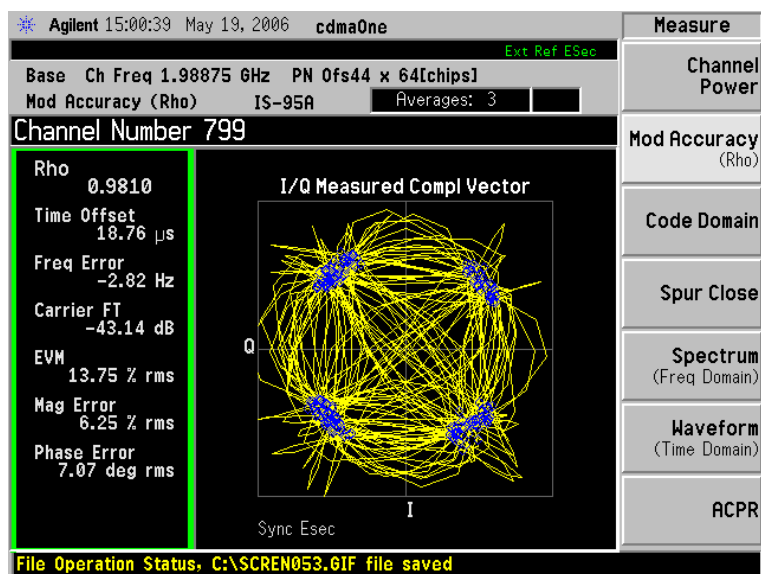
Channel 25、50



Channel 575、600



Channel 1150、1175

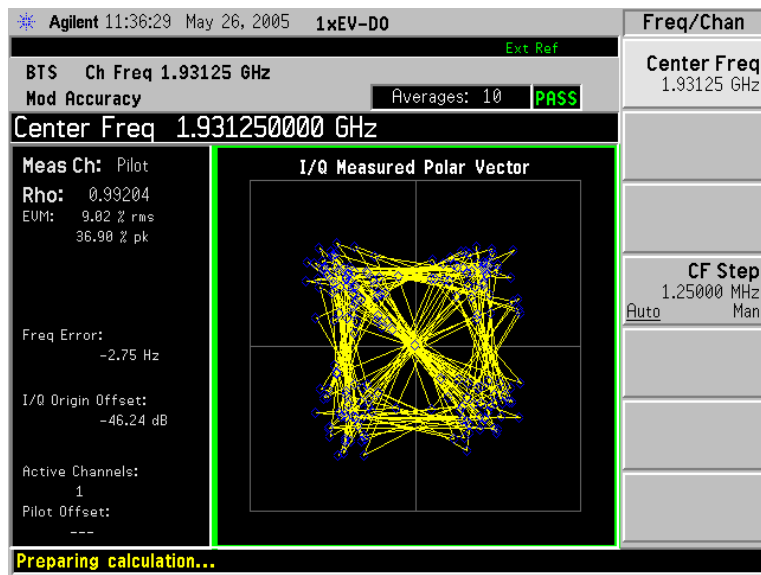


Test Mode: Transmitting/ CDMA2000 1X EV DO

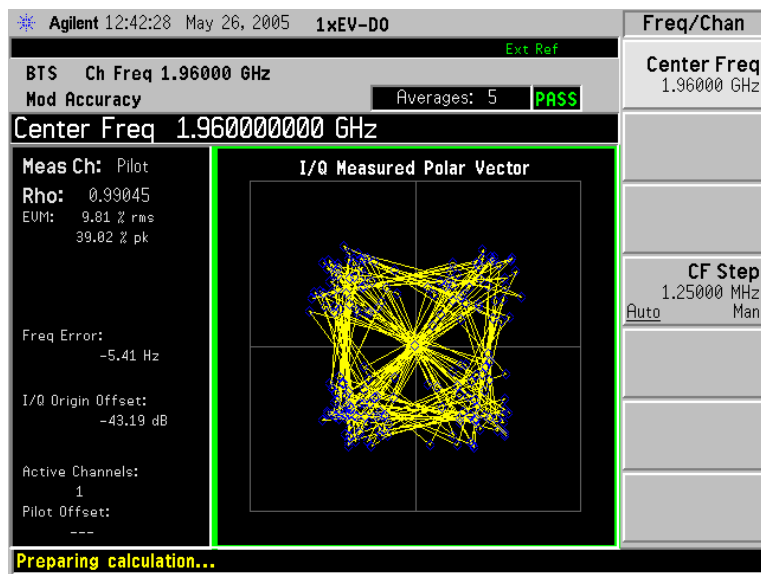
1 Carrier

Channel	Frequency (MHz)	Rho
Channel 25	1931.25	0.99204
Channel 600	1960	0.99045
Channel 1175	1988.75	0.98818

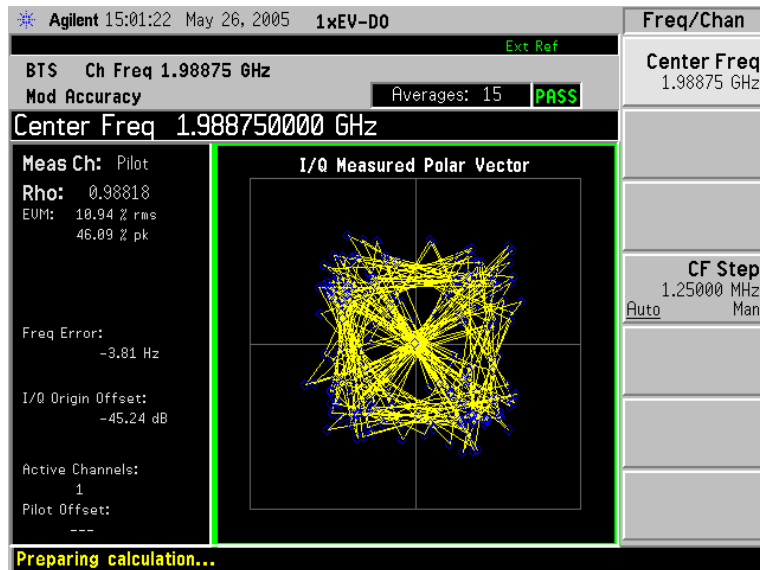
Channel 25



Channel 600



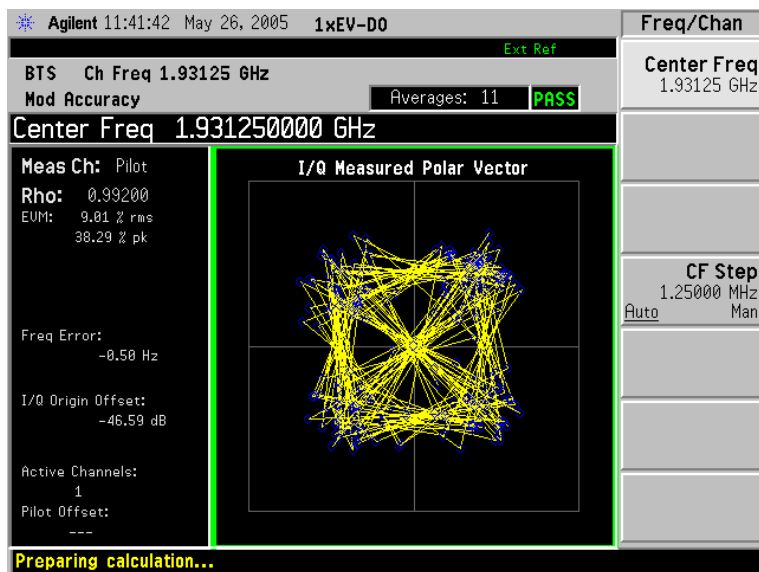
Channel 1175



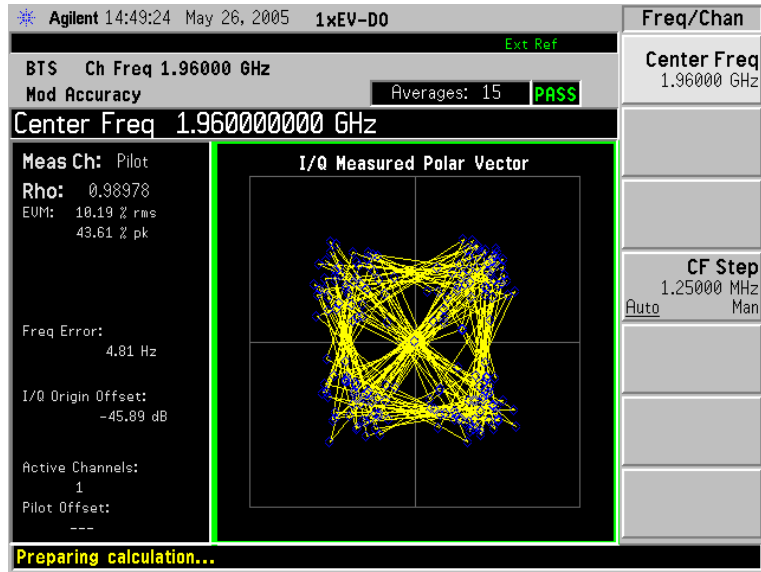
2 Carrier

Channel	Frequency (MHz)	Rho
Channel 25、50	1931.875	0.99200
Channel 575、600	1959.375	0.98978
Channel 1150、1175	1988.125	0.98146

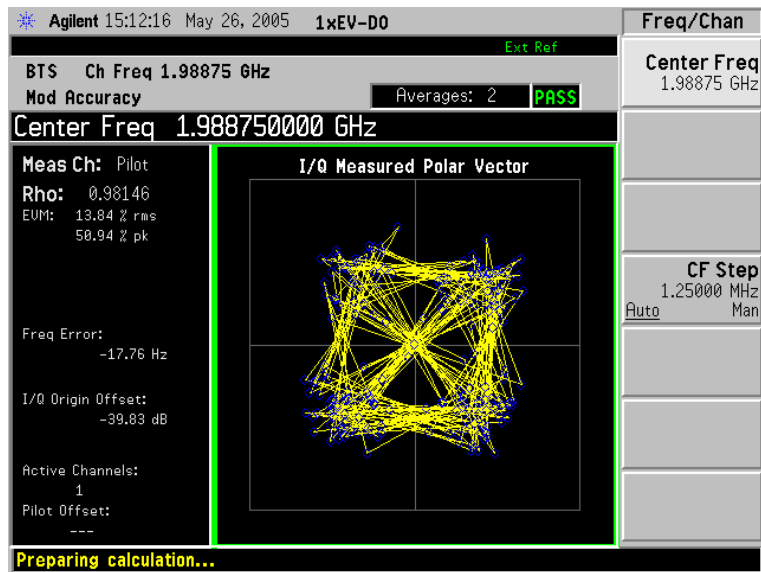
Channel 25、50



Channel 575、600



Channel 1150、1175



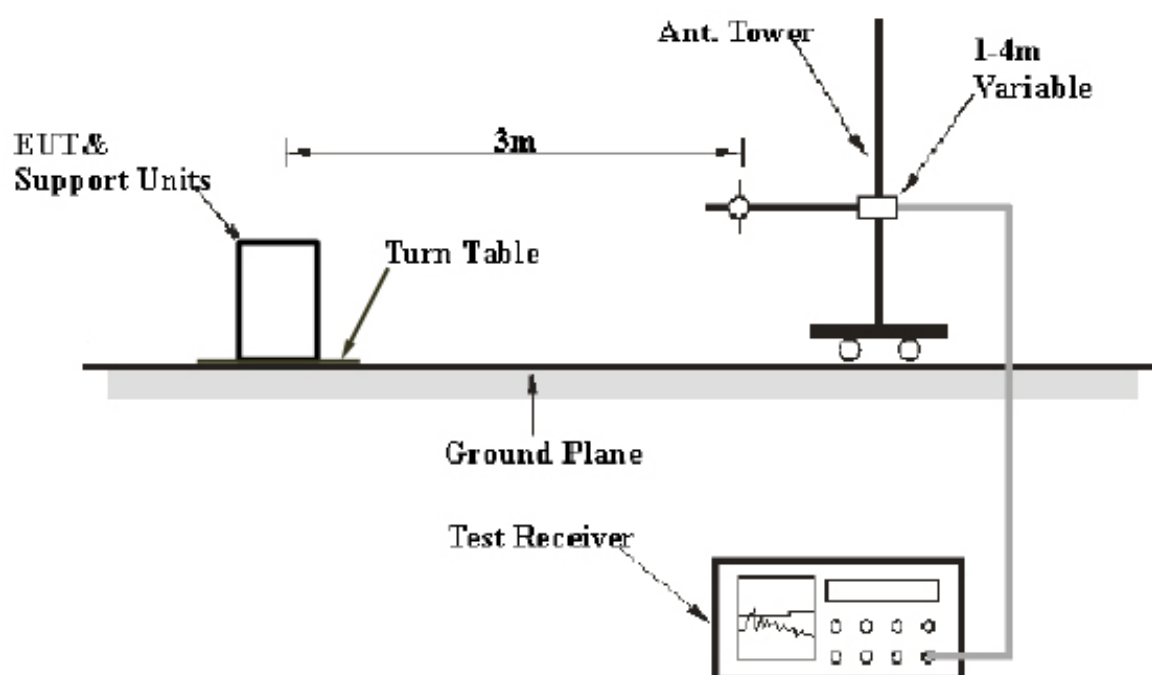
§15.109(a)- RADIATED EMISSION

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:

8.1 dB at 156.35 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

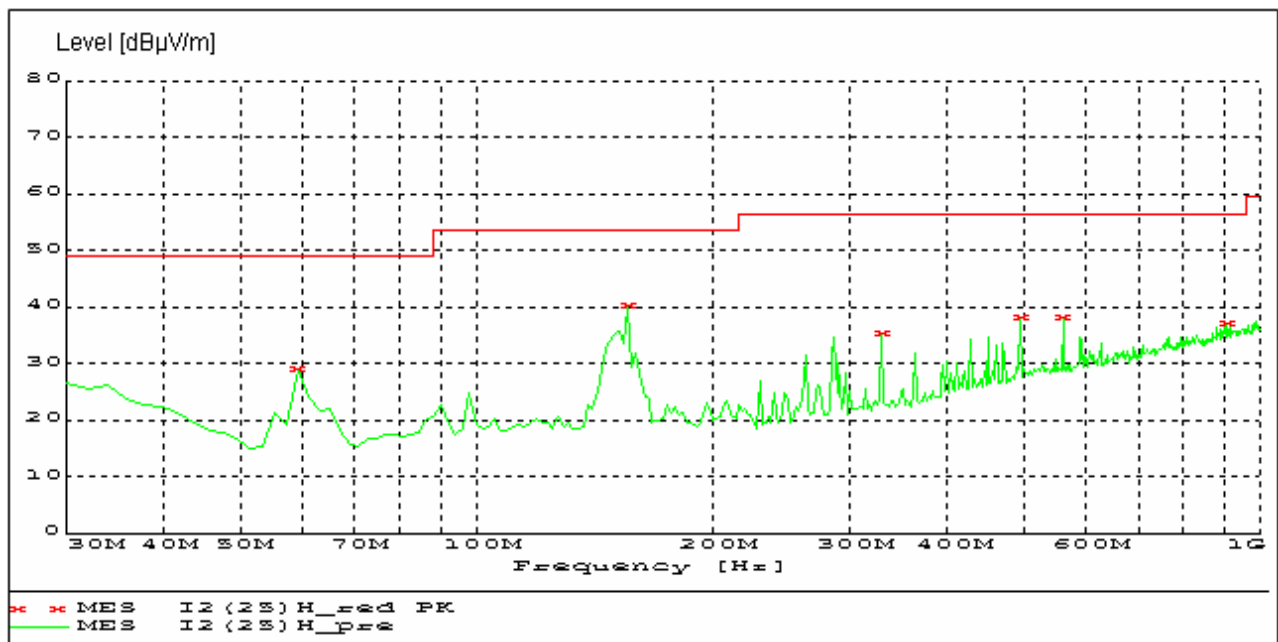
Test Mode: Transmitting

Plot(s) of Test Data

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

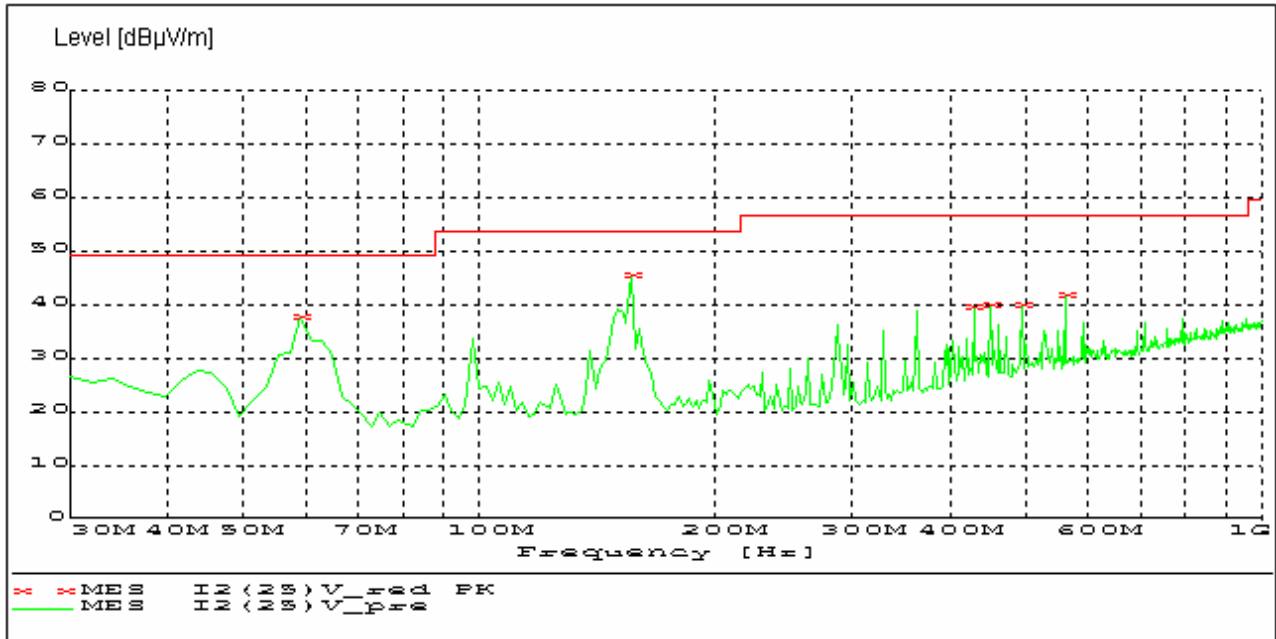
Channel 25

EUT: ZXC10 CBTS I219
 Manufacturer: ZTE
 Operating Condition: Running
 Test Site: Anechoic Chamber
 Operator:
 Test Specification: FCC Part15 Class A
 Comment: Horizontal, channel 25
 Start of Test: 2006-5-24 / 17:15:37


MEASUREMENT RESULT: "I2(25)H_red PK"

Frequency MHz	Level dBμV/m	Azimuth deg	Height cm	Polarisation	Transd dB	Limit dBμV/m	Margin dB
59.158317	28.94	283.00	200.0	HOR	-20.8	49.1	20.1
156.352705	40.06	312.00	200.0	HOR	-15.8	53.5	13.5
329.358717	34.98	54.00	100.0	HOR	-10.4	56.4	21.5
494.589178	37.90	8.00	100.0	HOR	-5.8	56.4	18.5
560.681363	37.83	84.00	100.0	HOR	-4.5	56.4	18.6
906.693387	36.90	173.00	100.0	HOR	1.3	56.4	19.5

EUT: ZXC10 CBTS I219
 Manufacturer: ZTE
 Operating Condition: Running
 Test Site: Anechoic Chamber
 Operator:
 Test Specification: FCC Part15 Class A
 Comment: Vertical, channel 25
 Start of Test: 2006-5-24 / 17:11:15



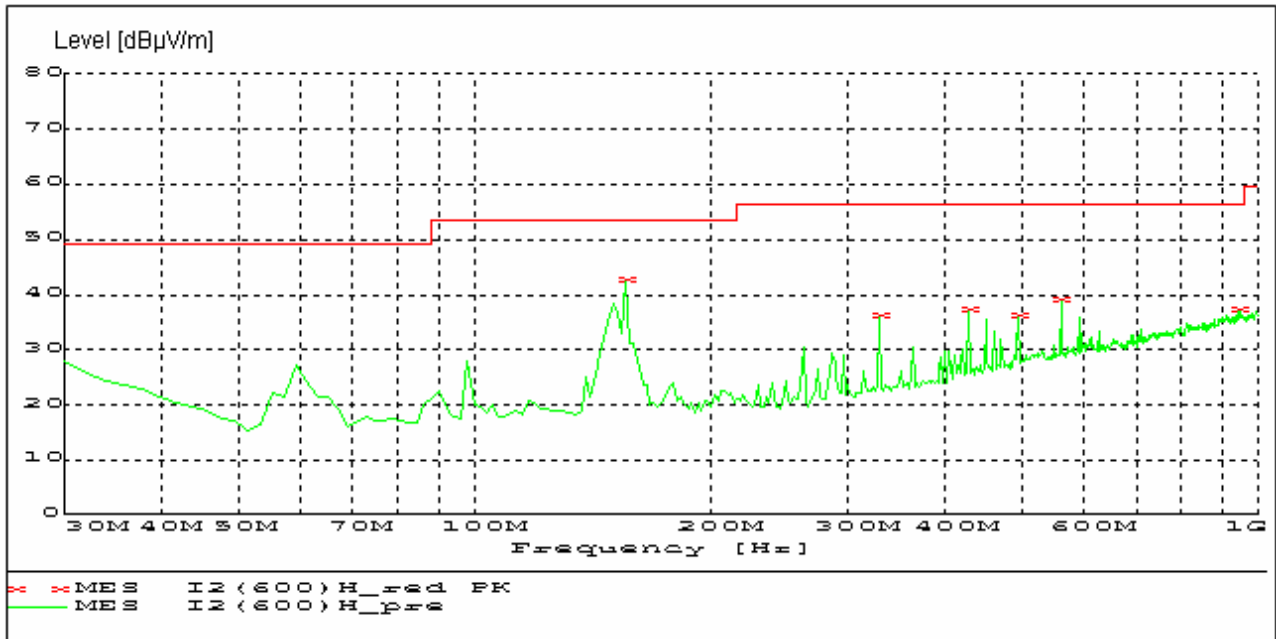
MEASUREMENT RESULT: "I2(25)V_red PK"

Frequency MHz	Level dBμV/m	Azimuth deg	Height cm	Polarisation	Transd dB	Limit dBμV/m	Margin dB
59.158317	37.56	360.00	200.0	VER	-20.8	49.1	11.5
156.352705	45.37	66.00	100.0	VER	-15.8	53.5	8.1
428.496994	39.30	52.00	100.0	VER	-7.5	56.4	17.1
449.879760	39.79	66.00	100.0	VER	-7.0	56.4	16.6
494.589178	39.72	66.00	100.0	VER	-5.8	56.4	16.7
560.681363	41.60	37.00	100.0	VER	-4.5	56.4	14.8

A

Channel 600

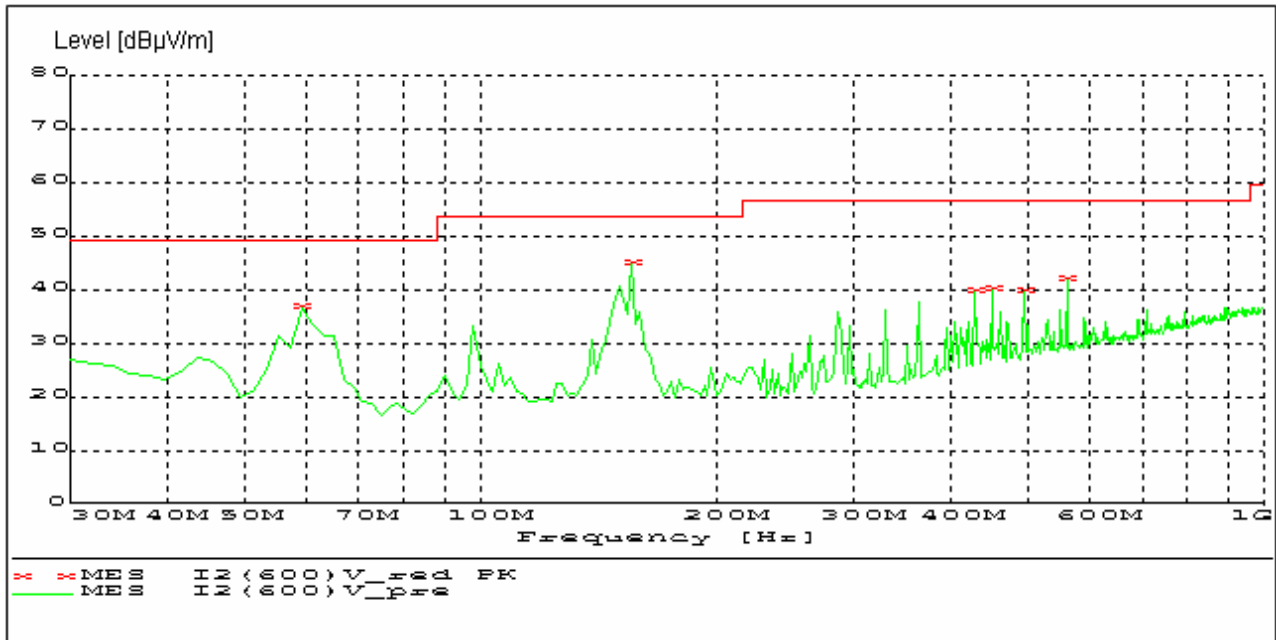
EUT: ZXC10 CBTS I219
 Manufacturer: ZTE
 Operating Condition: Running
 Test Site: Anechoic Chamber
 Operator:
 Test Specification: FCC Part15 Class A
 Comment: Horizontal, channel 600
 Start of Test: 2006-5-24 / 17:00:08



MEASUREMENT RESULT: "I2(600)H_red PK"

Frequency MHz	Level dBμV/m	Azimuth deg	Height cm	Polarisation	Transd dB	Limit dBμV/m	Margin dB
156.352705	42.51	296.00	200.0	HOR	-15.8	53.5	11.0
329.358717	35.95	51.00	100.0	HOR	-10.4	56.4	20.5
428.496994	37.14	78.00	200.0	HOR	-7.5	56.4	19.3
494.589178	36.12	360.00	100.0	HOR	-5.8	56.4	20.3
560.681363	38.79	91.00	100.0	HOR	-4.5	56.4	17.6
943.627255	37.02	5.00	200.0	HOR	1.6	56.4	19.4

EUT: ZXC10 CBTS I219
 Manufacturer: ZTE
 Operating Condition: Running
 Test Site: Anechoic Chamber
 Operator:
 Test Specification: FCC Part15 Class A
 Comment: Vertical, channel 600
 Start of Test: 2006-5-24 / 17:04:27

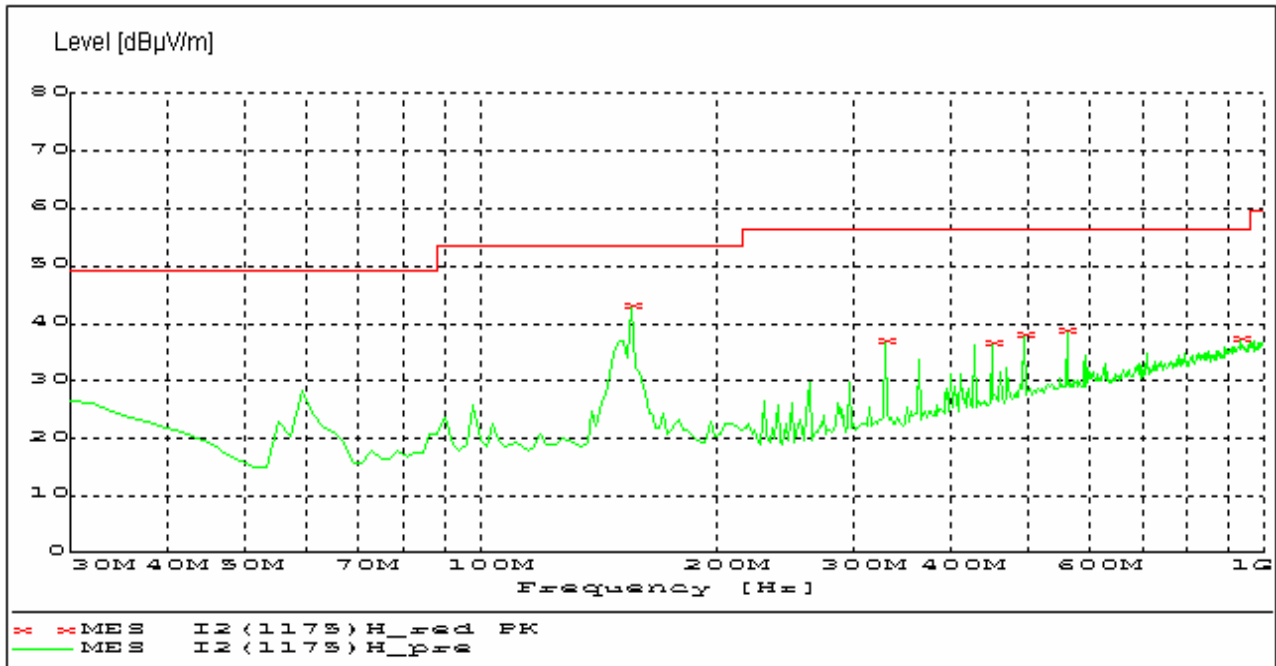


MEASUREMENT RESULT: "I2(600)V_red PK"

Frequency MHz	Level dBμV/m	Azimuth deg	Height m	Polarisation cm	Transd dB	Limit dBμV/m	Margin dB
59.158317	36.65	339.00	200.0	VER	-20.8	49.1	12.4
156.352705	44.93	83.00	100.0	VER	-15.8	53.5	8.6
428.496994	39.70	23.00	200.0	VER	-7.5	56.4	16.7
449.879760	40.26	97.00	100.0	VER	-7.0	56.4	16.2
494.589178	39.58	83.00	100.0	VER	-5.8	56.4	16.9
560.681363	41.99	23.00	200.0	VER	-4.5	56.4	14.5

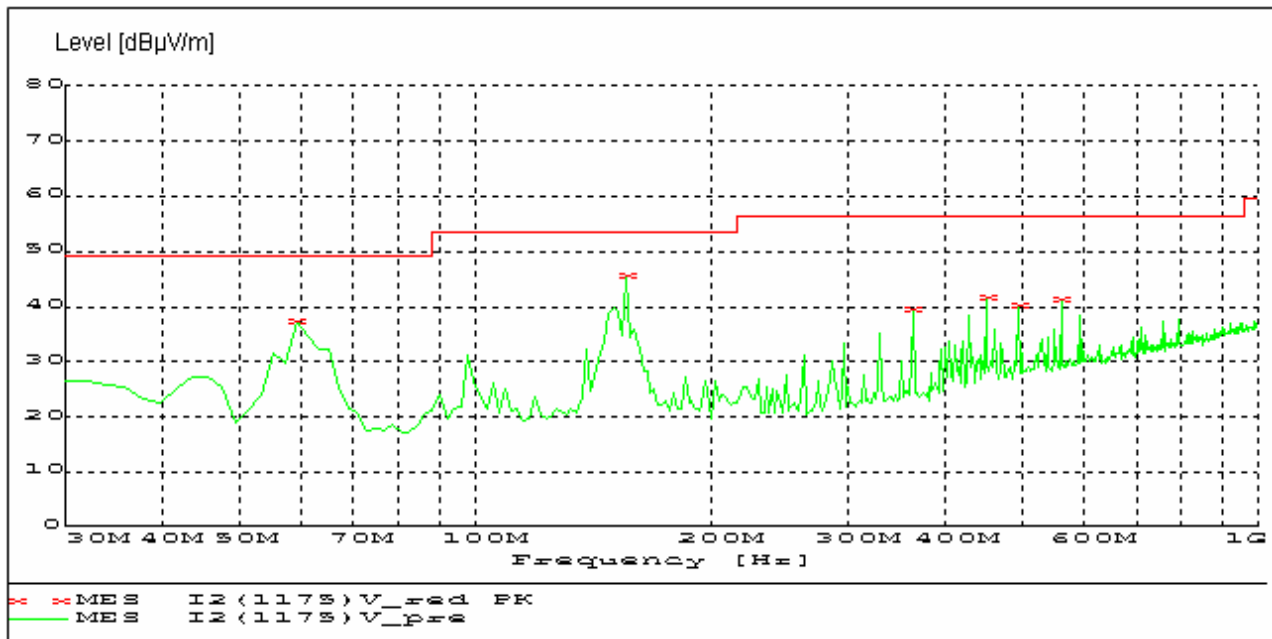
Channel 1175

EUT: ZXC10 CBTS I219
 Manufacturer: ZTE
 Operating Condition: Running
 Test Site: Anechoic Chamber
 Operator:
 Test Specification: FCC Part15 Class A
 Comment: Horizontal, channel 1175
 Start of Test: 2006-5-24 / 16:53:58


MEASUREMENT RESULT: "I2(1175)H_red PK"

Frequency MHz	Level dBμV/m	Azimuth deg	Height cm	Polarisation	Transd dB	Limit dBμV/m	Margin dB
156.352705	43.06	310.00	200.0	HOR	-15.8	53.5	10.5
329.358717	36.74	66.00	100.0	HOR	-10.4	56.4	19.7
449.879760	36.39	81.00	200.0	HOR	-7.0	56.4	20.0
494.589178	37.95	360.00	100.0	HOR	-5.8	56.4	18.5
560.681363	38.64	95.00	100.0	HOR	-4.5	56.4	17.8
933.907816	37.23	51.00	100.0	HOR	1.7	56.4	19.2

EUT: ZXC10 CBTS I219
 Manufacturer: ZTE
 Operating Condition: Running
 Test Site: Anechoic Chamber
 Operator:
 Test Specification: FCC Part15 Class A
 Comment: Vertical, channel 1175
 Start of Test: 2006-5-24 / 16:49:22



MEASUREMENT RESULT: "I2(1175)V_red PK"

Frequency MHz	Level dBμV/m	Azimuth deg	Height cm	Polarisation	Transd dB	Limit dBμV/m	Margin dB
59.158317	37.16	338.00	200.0	VER	-20.8	49.1	11.9
156.352705	45.36	83.00	100.0	VER	-15.8	53.5	8.2
362.404810	39.28	336.00	100.0	VER	-9.4	56.4	17.2
449.879760	41.29	83.00	100.0	VER	-7.0	56.4	15.2
494.589178	40.06	54.00	200.0	VER	-5.8	56.4	16.4
560.681363	40.96	83.00	100.0	VER	-4.5	56.4	15.5

§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 Log₁₀ (power out in Watts)

Test Results Summary

Channel 25: -30.24 dB at 3861.72 MHz
 Channel 600: -27 dB at 19505.01 MHz
 Channel 1175: -29.7 dB at 18410.82MHz

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		Table	Test Antenna		Substituted			Antenna	Cable	Absolute	Limit	Margin
Frequency	Meter	Angle	Height	Polar	Frequency	Level	Polar	Gain	Loss	Level		
MHz	Reading	Degree	Meter	H/V	MHz	dBm	H/V	Correction	dB	dBm	dBm	dB
Channel 25 f= 1931.25MHz												
3861.72	57.92	342	100	H	3861.72	-43.64	H	5.2	7.75	-43.24	-13	-30.24
18202.4	69.74	224	200	H	18202.4	-36.7	H	12.2	6.45	-44.6	-13	-31.6
17993.99	69.73	70	200	V	17993.99	-41.2	V	12.2	8.95	-46.6	-13	-33.6
6158.32	52.65	0	200	H	6158.32	-50.74	H	6.9	9.05	-50.74	-13	-37.74
13617.23	61.13	342	100	H	13617.23	-50.5	H	10.3	10.45	-52.5	-13	-39.5
9240.48	55.56	172	200	H	9240.48	-52.41	H	8.5	9.75	-53.31	-13	-40.31
3861.72	51.27	360	100	V	3861.72	-53.9	V	5.2	7.75	-53.5	-13	-40.5
13721.44	60.96	360	100	V	13721.44	-52.5	V	10.4	10.45	-54.6	-13	-41.6
8927.86	55.17	360	100	V	8927.86	-54	V	8.4	9.65	-54.9	-13	-41.9
6182.36	51.81	122	200	V	6182.36	-57.2	V	6.9	9.05	-57.2	-13	-44.2
3032.06	41.58	331	200	V	3032.06	-60.2	V	4.7	7.75	-59.3	-13	-46.3
1252.51	35.82	135	100	H	1252.51	-69.58	H	3	4.25	-70.48	-13	-57.48
Channel 600 f=1960MHz												
19505.01	69.87	28	100	H	19505.01	-32.1	H	12.2	6.45	-40	-13	-27
3921.84	61.74	277	200	H	3921.84	-41.9	H	5.2	7.75	-41.5	-13	-28.5
3921.84	61.75	0	200	V	3921.84	-44.3	V	5.2	7.75	-43.9	-13	-30.9
18150.3	70.04	20	200	V	18150.3	-40	V	12.2	6.45	-47.9	-13	-34.9
1709.42	44.11	0	200	V	1709.42	-52.5	V	3.5	6.55	-51.6	-13	-38.6
6158.32	51.69	287	100	H	6158.32	-52.1	H	6.9	9.05	-52.1	-13	-39.1
13747.49	61.09	277	200	H	13747.49	-50.5	H	10.4	10.45	-52.6	-13	-39.6
13434.87	61.25	123	200	V	13434.87	-52.2	V	10.3	11.85	-52.8	-13	-39.8
9318.64	54.67	132	100	H	9318.64	-54.3	H	8.6	9.75	-55.3	-13	-42.3
9370.74	54.59	278	200	V	9370.74	-54.3	V	8.6	9.75	-55.3	-13	-42.3
6170.34	51.59	278	200	V	6170.34	-55.9	V	6.9	9.05	-55.9	-13	-42.9
1420.84	35.48	18	200	H	1420.84	-70.6	H	3.2	4.25	-71.7	-13	-58.7

Indicated		Table	Test Antenna		Substituted			Antenna	Cable	Absolute	Limit	Margin
Frequency	Meter	Angle	Height	Polar	Frequency	Level	Polar	Gain	Loss	Level		
MHz	Reading											
Channel 1175 f=1988.75MHz												
18410.82	70.05	18	200	H	18410.82	-34.8	H	12.2	6.45	-42.7	-13	-29.7
3981.96	55.54	27	100	H	3981.96	-47.9	H	5.3	7.75	-47.6	-13	-34.6
18645.29	70.22	29	100	V	18645.29	-40	V	12.2	6.45	-47.9	-13	-34.9
6158.32	51.94	133	100	H	6158.32	-51.4	H	6.9	9.05	-51.4	-13	-38.4
1733.47	52.44	27	100	H	1733.47	-52.8	H	3.5	6.55	-51.9	-13	-38.9
1733.47	43.87	29	100	V	1733.47	-52.8	V	3.5	6.55	-51.9	-13	-38.9
3981.96	53.28	278	200	V	3981.96	-52.7	V	5.3	7.75	-52.4	-13	-39.4
13513.03	60.75	236	100	H	13513.03	-51	H	10.4	10.45	-53.1	-13	-40.1
13513.03	61.33	290	100	V	13513.03	-52.1	V	10.4	10.45	-54.2	-13	-41.2
9240.48	54.99	278	200	H	9240.48	-53.6	H	8.5	9.75	-54.5	-13	-41.5
6723.45	52.14	70	200	V	6723.45	-56	V	7.2	9.25	-56.1	-13	-43.1
6158.32	51.8	18	200	V	6158.32	-56.6	V	6.9	9.05	-56.6	-13	-43.6

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	US44302705	2005-11-24	2006-11-24

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 10th harmonic.

Test Data

Environmental Conditions

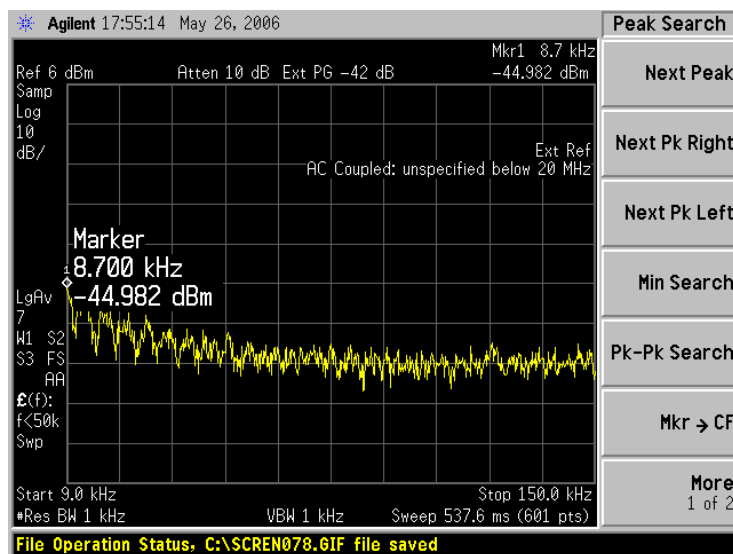
Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

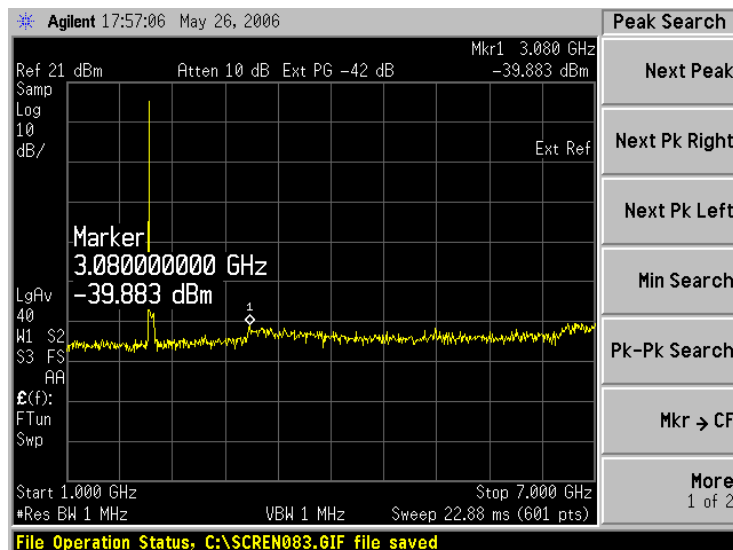
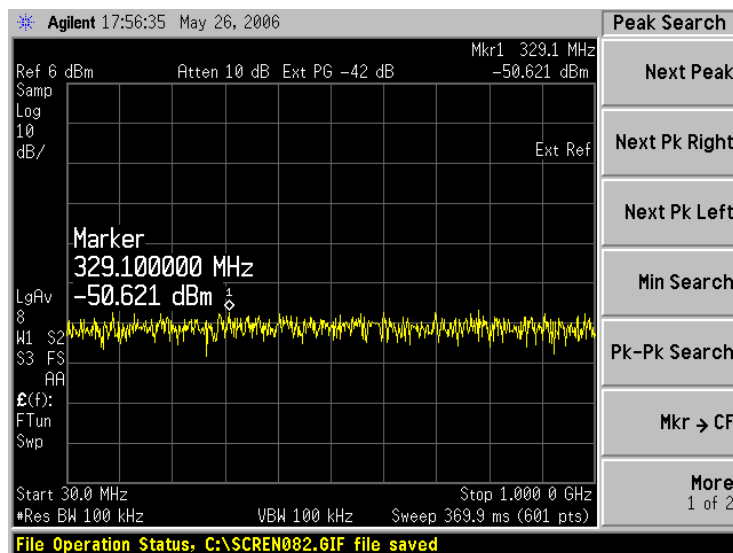
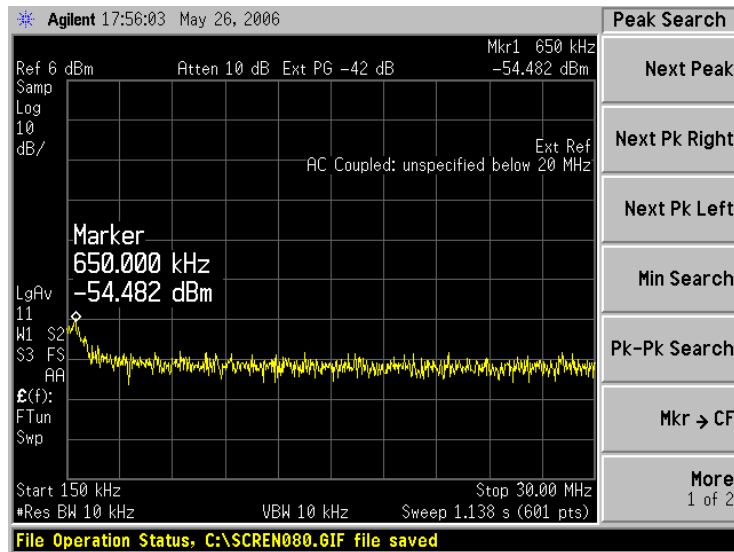
The testing was performed by JX HE on 2006-5-30.

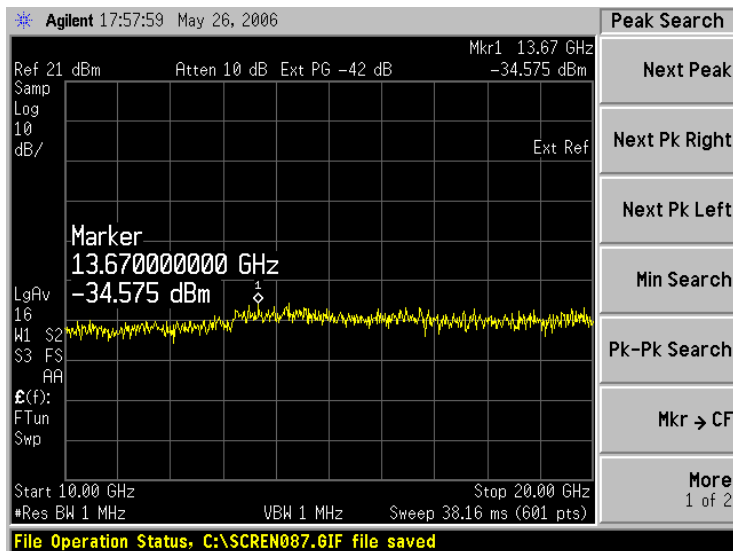
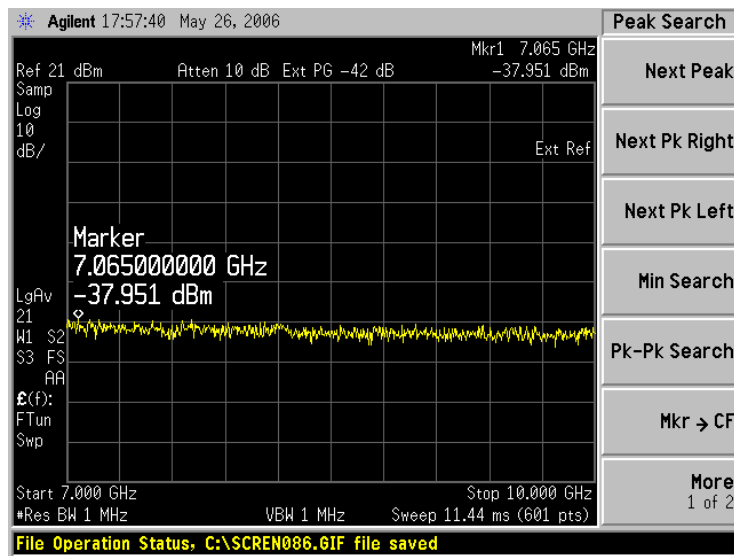
Test Result: Pass

Test Mode: Transmitting

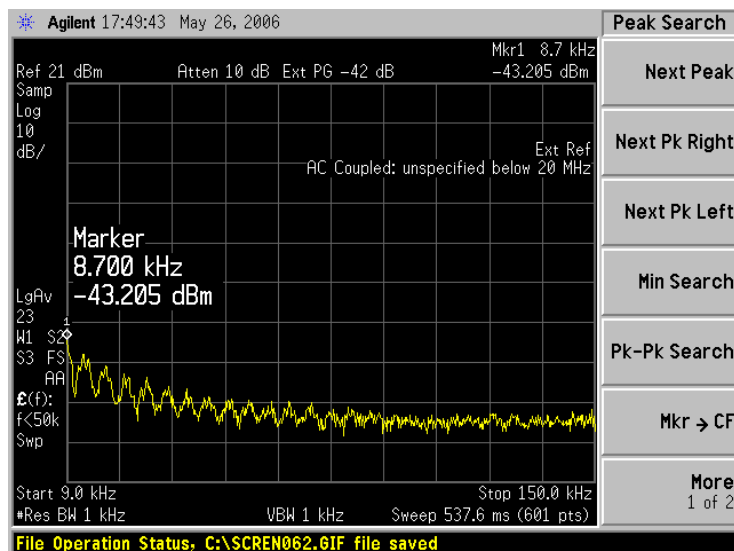
Channel 25

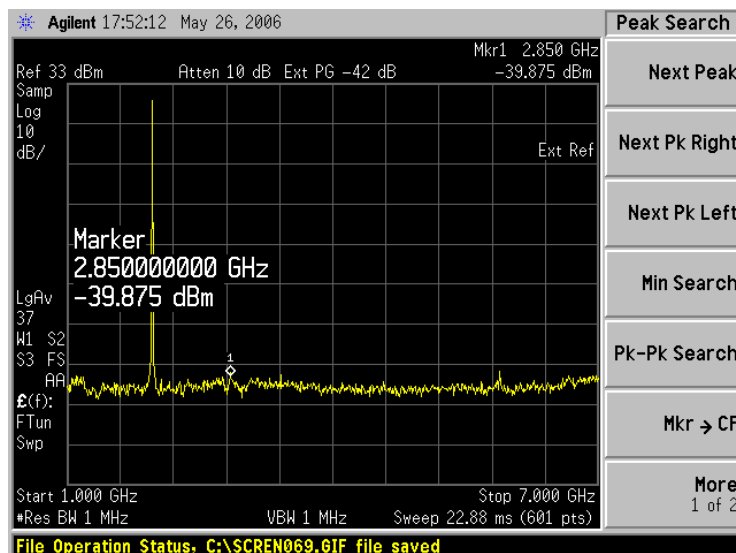
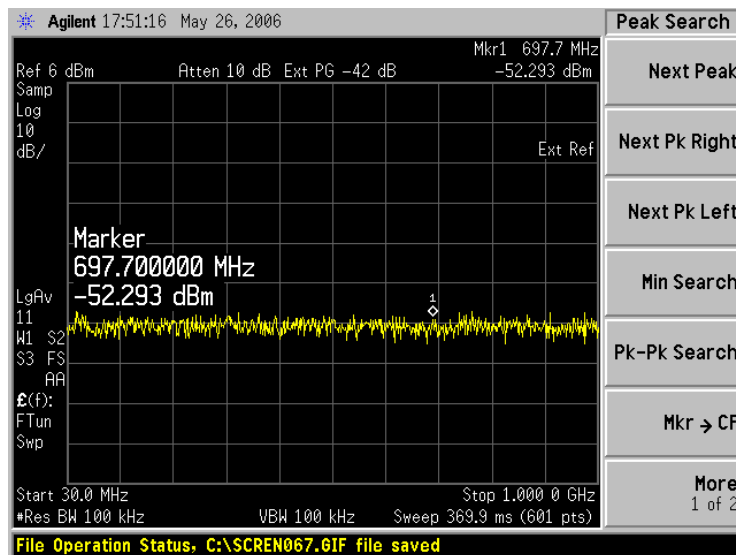
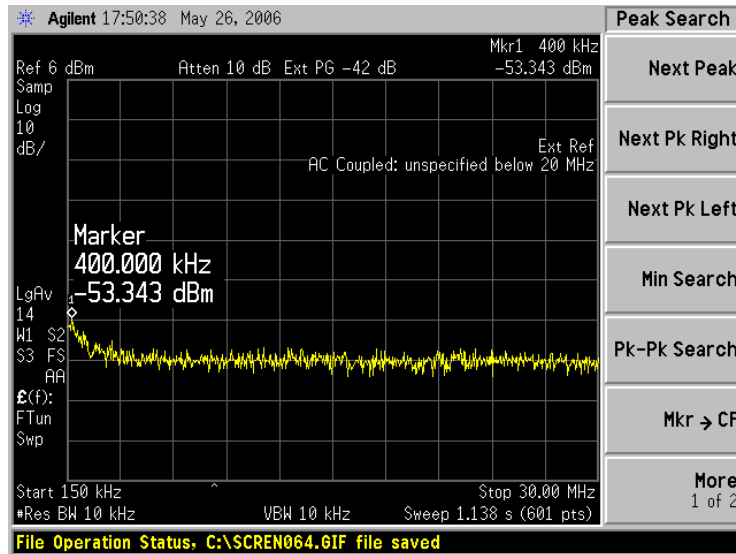


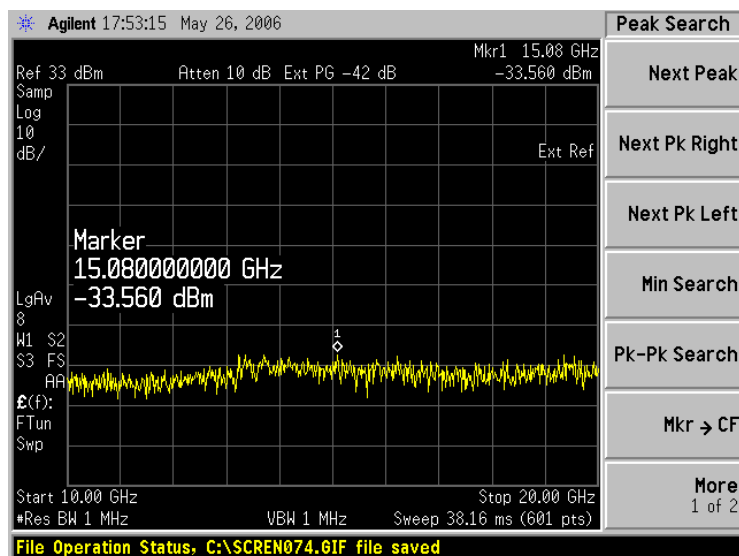
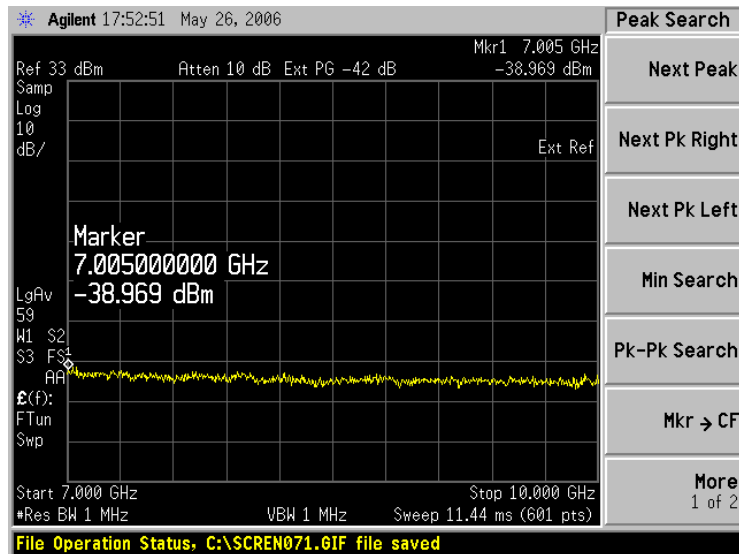




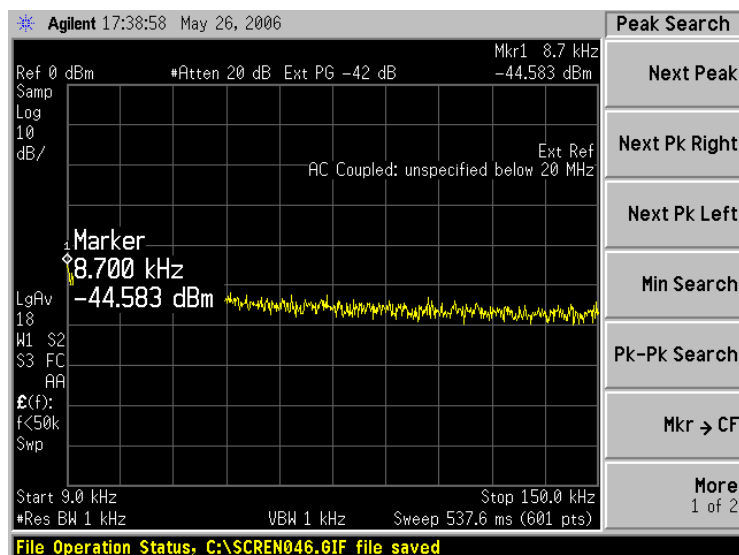
Channel 600

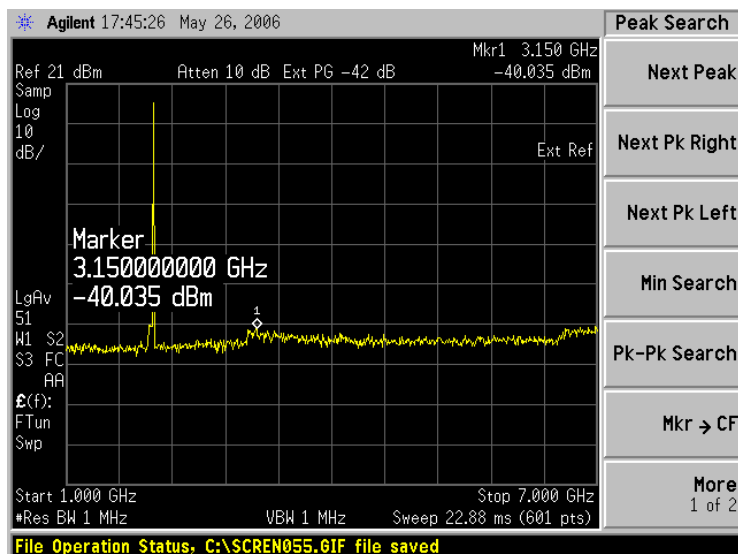
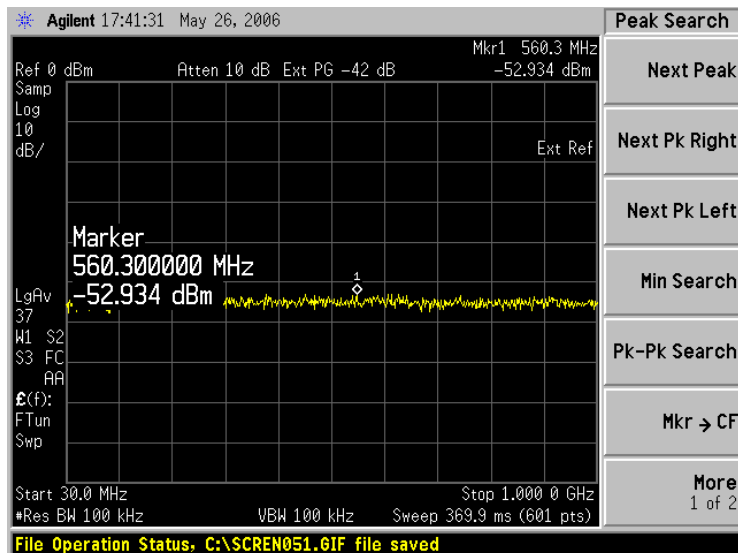
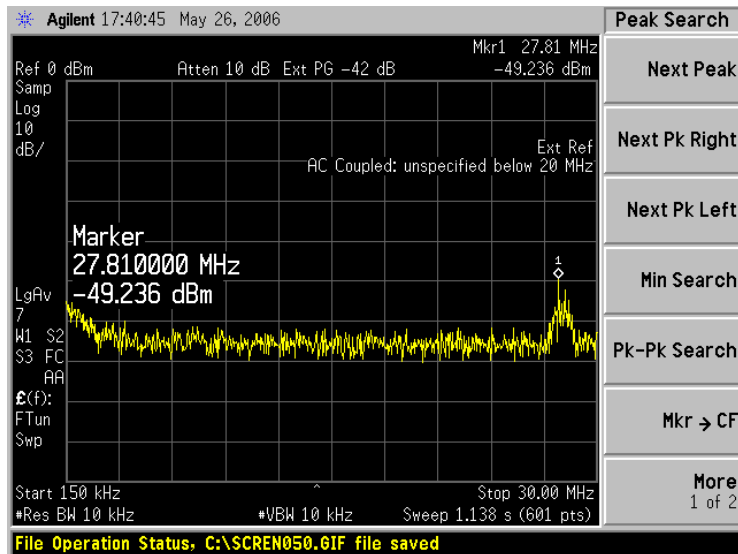


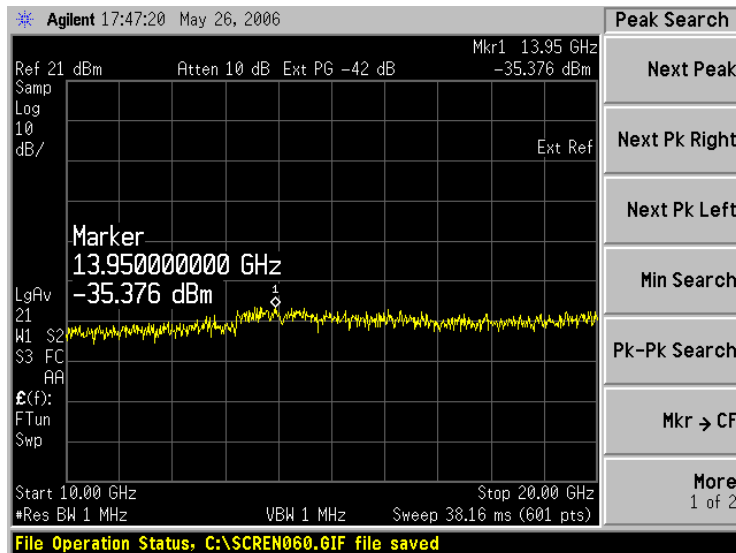
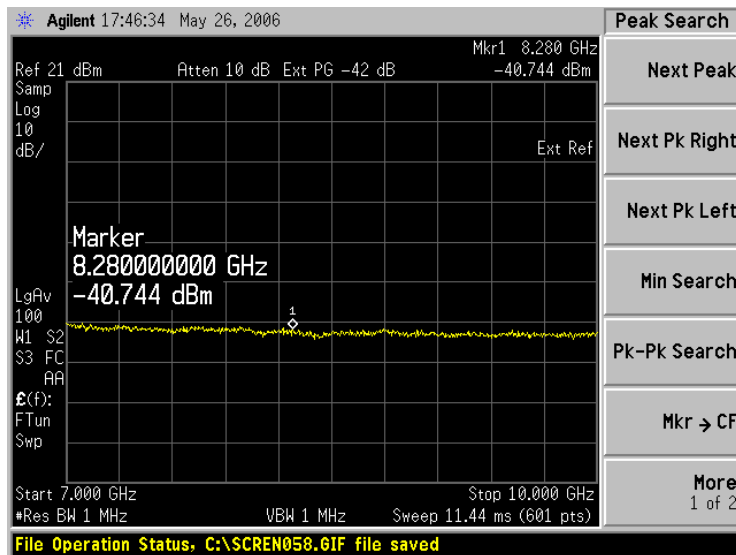




Channel 1175







§2.1049& §24.238-OCCUPIED BANDWIDTH

Applicable Standard

Requirements: CFR 47, Section 2.1049 and Section 24.238.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PSA Spectrum	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 2006-5-30.

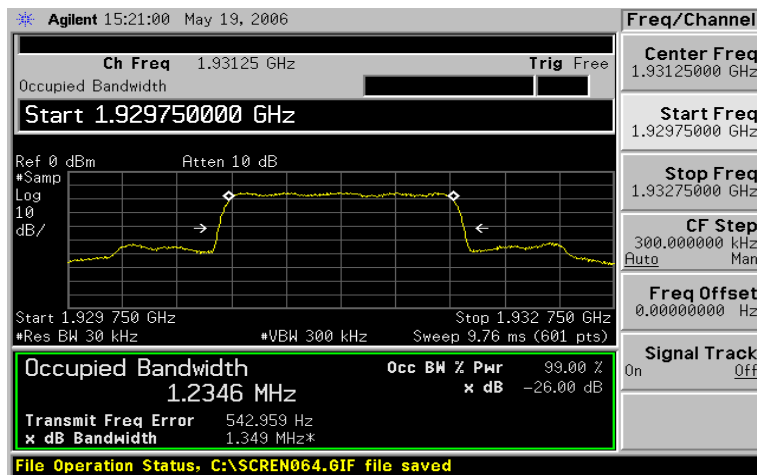
Test Result: Pass

The result has been complied with the §2.1049 & §24.238, see the following plot:

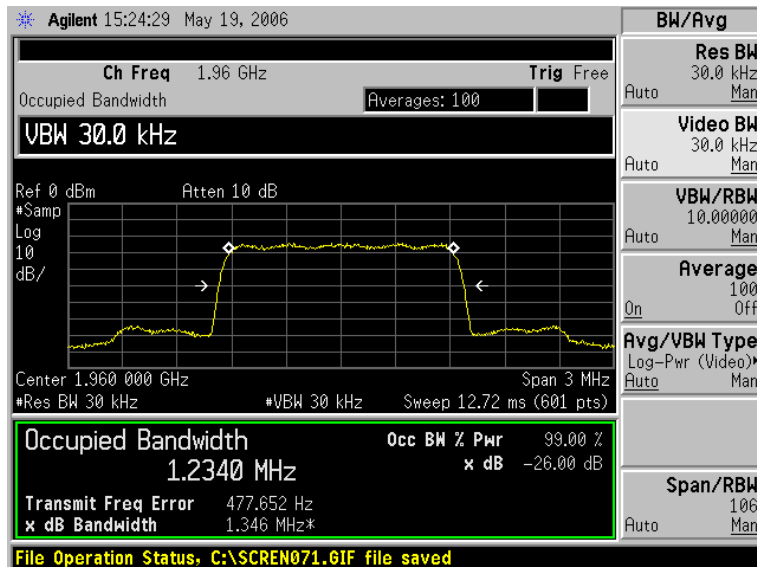
Test Mode: Transmitting

Channel	Channel frequency (MHz)	99% Power Bandwidth (MHz)
Channel 25	1931.25	1.2346
Channel 600	1960	1.2340
Channel 1175	1988.75	1.2322

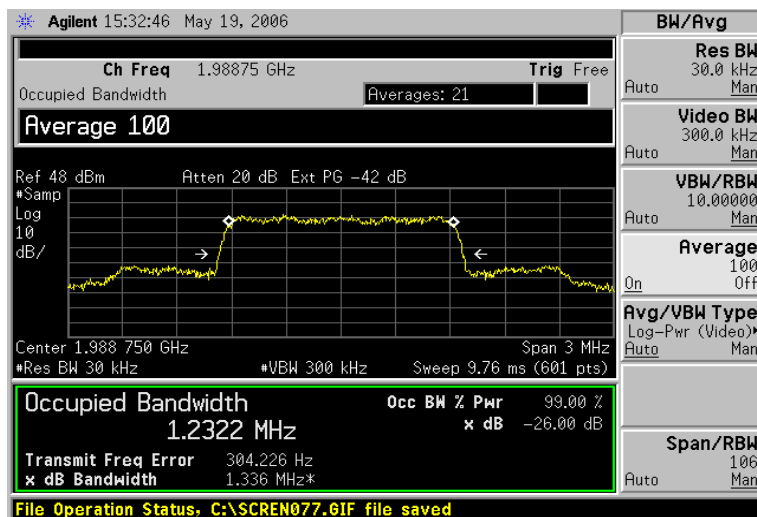
Channel 25



Channel 600



Channel 1175



§24.238- BAND EDGES

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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	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.

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:	1009 mbar

The testing was performed by JX HE on 2006-5-30.

Test Result: Pass

Test Mode: Transmitting

The result has been complied with the §24.238, see the following plot:

Frequency MHz	Emission dBm	Limit dBm
1930	-15.171	-13.00
1990	-14.206	-13.00



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

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.

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 2006-5-30.

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
CH25 f=1931.25MHz				
-5	-48	0.43	0.000222	1.5
5	-48	0.96	0.000497	1.5
15	-48	0.45	0.000233	1.5
25	-48	1.51.	0.000781	1.5
35	-48	2.95.	0.001527	1.5
45	-48	-1.20	0.000621	1.5
CH600 f=1960MHz				
-5	-48	0.24	0.000122	1.5
5	-48	1.46	0.00744	1.5
15	-48	0.28	0.00142	1.5
25	-48	-2.64	0.001346	1.5
35	-48	-1.40	0.000714	1.5
45	-48	1.46	0.000744	1.5
CH1175 f=1988.75MHz				
-5	-48	1.63	0.000819	1.5
5	-48	2.50	0.001257	1.5
15	-48	3.31	0.001664	1.5
25	-48	0.75	0.000377	1.5
35	-48	1.81	0.000910	1.5
45	-48	-0.52	0.000262	1.5

Frequency Stability Versus Voltage

Frequency Stability vs. Voltage				
Voltage Vdc	Temperature °C	Frequency Measure Error Hz	Error ppm	Limit 1.5ppm
CH25 f=1931.25MHz				
-42	20	-0.55	0.000284	1.5
-46	20	2.60	0.001346	1.5
-48	20	-1.21	0.000626	1.5
-50	20	-3.11	0.001610	1.5
-54	20	0.80	0.000414	1.5
-58	20	-3.28	0.001654	1.5
CH600 f=1960MHz				
-42	20	-1.68	0.000857	1.5
-46	20	2.36	0.001204	1.5
-48	20	-8.33	0.004250	1.5
-50	20	2.18	0.001112	1.5
-54	20	-1.36	0.000694	1.5
-58	20	-1.53	0.000781	1.5
CH1175 f=1988.75MHz				
-42	20	-1.16	0.000583	1.5
-46	20	0.68	0.000342	1.5
-48	20	1.01	0.000507	1.5
-50	20	-3.42	0.001720	1.5
-54	20	-7.67	0.003857	1.5
-58	20	-1.72	0.000865	1.5