

FCC PART 22, 24 TYPE APPROVALS EMI MEASUREMENT AND TEST REPORT

For

ZTE Corporation

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Guangdong, China 518057

FCC ID: Q78-ZTEMY39

This Report Concerns: ☒ Original Report	Equipment Type: 800/1900 MHz CDMA 1X-EVDO PCMCIA Card
Test Engineer: Snell Leong / 	
Report No.: R0601253	
Report Date: 2006-02-09	
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *ZTE Corporation*.’s product, FCC ID: Q78-ZTEMY39 or the “EUT” as referred to in this report is a 800/1900 MHz CDMA 1X-EVDO PCMCIA Card, which measures approximately 118mmL x 54mmW x 5mmH.

** The test data gathered are from typical production sample, serial number: 699ECA25 provided by the manufacturer.*

Objective

This type approval report is prepared on behalf of *ZTE Corporation* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristic, occupied bandwidth, spurious emission at antenna terminal, field strength of spurious radiation, frequency stability, band edge, and conducted and radiated margin.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

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

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - PCS

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

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

Test Facility

The Test site used by BACL Corp. to collect radiated and conducted emission measurement data is located in the chamber of the building at 1274 Anvilwood Ave. Sunnyvale, California 94089, USA with registration number: 90464.

Test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003& TIA/EIA-603.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234.

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

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations is attached hereinafter and can also be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

SYSTEM TEST CONFIGURATION

Justification

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

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

Block Diagram

Please refer to Exhibit D.

Equipment Modifications

No modifications were made to the EUT.

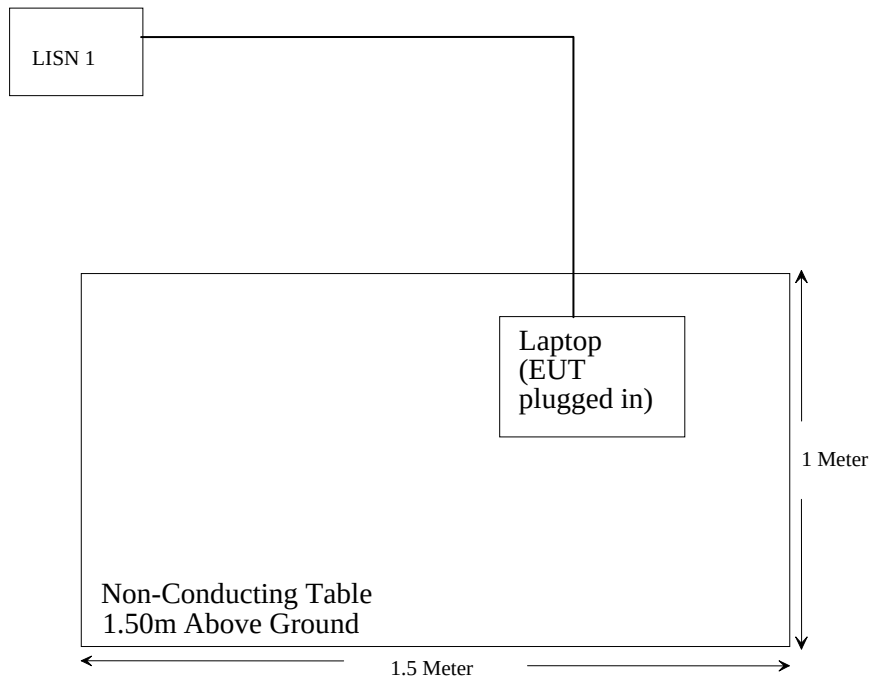
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Sony	Laptop	PCG885L	283520304516747	DOC

Configuration of Test System



Laptop (EUT plugged in)

Test Setup Block Diagram

SUMMARY OF TEST RESULTS

FCC RULE	DESCRIPTION OF TEST	RESULT
§ 2.1047	Modulation Characteristics	Compliant
§ 2.1053	Field Strength of Spurious Radiation	Compliant
§2.1093	RF Exposure	SAR report
§ 2.1046, § 22.912 (d) § 24.232	RF Output Power	Compliant
§ 2.1049 § 22.917 § 22.905 § 24.238	Out of Band Emission, Occupied Bandwidth	Compliant
§ 2.1051, § 22.917 § 24.238(a)	Spurious Emissions at Antenna Terminals	Compliant
§ 2.1055 (a) § 2.1055 (d) § 22.355 § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§ 22.917 §24.238	Band Edge	Compliant

§2.1047 - MODULATION CHARACTERISTIC

Applicable Standard

Requirement: FCC § 2.1047(d). As part 22H & 24E has not specific requirement for CDMA modulation, therefore modulation characteristic is not presented.

§2.1053 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

Requirements: CFR 47, § 2.1053.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a 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 = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	8/8/2005
Agilent	Analyzer, Spectrum	E4446A	US44300386	11/10/2005
HP	Amplifier, Pre	8447D	2944A10198	8/17/2005
HP	Amplifier, Pre, Microwave	8449B	3147A00400	8/10/2005
Rohde & Schwarz	Generator, Signal	SMIQ03	849192/0085	5/2/2005
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	261	4/20/2005
HP	Generator, Signal	83650B	3614A00276	5/10/2005
A.R.A.	Antenna, Horn	DRG-118/A	1132	8/17/2005
Wainwright	Filter, Band Reject	WRCG823/850-813/860-40/8SS	2	N/A
Wainwright	Filter, Band Reject	WRCG1850/1910-1835/1925-40/8SS	5	N/A

*** Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	72%
ATM Pressure:	1026mbar

* The testing was performed by Snell Leong on 2006-02-07.

Test Result

Worst case reading as follows:

Part22:

-22.5 dB at 1673.04 MHz

Part24:

-28.1 dB at 3760.00 MHz

TX Spurious Emission Primary scan 30 MHz - 9GHZ (TX) 836.52MHz

Indicated		Table Angle	Test Antenna		Substituted		Antenna Gain	Cable Loss	Absolute Level	Limit	Margin
Frequency	Ampl.		Height	Polar	Frequency	Level					
MHz	dBuV/m	Degree	Meter	H/V	MHz	dBm	Correction	dB	dBm	dBm	dB
1673.04	55.3	90	1.2	v	1673.04	-43.6	8.8	1.76	-36.6	-13	-23.6
1673.04	56.4	0	1.4	h	1673.04	-42.5	8.8	1.76	-35.5	-13	-22.5
2509.56	52.6	0	1.4	v	2509.56	-45.6	9.9	2.26	-38.0	-13	-25.0
2509.56	53.3	0	1.4	h	2509.56	-44.1	9.9	2.26	-36.5	-13	-23.5
3346.08	42.1	0	1.4	v	3346.08	-54.5	9.6	3.31	-48.2	-13	-35.2
3346.08	40.7	0	1.4	h	3346.08	-57.1	9.6	3.31	-50.8	-13	-37.8

TX Spurious Emission Primary scan 30 MHz - 20GHZ (TX) 1880MHz

Indicated		Table Angle	Test Antenna		Substituted		Antenna Gain	Cable Loss	Absolute Level	Limit	Margin
Frequency	Ampl.		Height	Polar	Frequency	Level					
MHz	dBuV/m	Degree	Meter	H/V	MHz	dBm	Correction	dB	dBm	dBm	dB
3760	46.7	90	1.2	v	3760	-48.9	10.3	2.5	-41.1	-13	-28.1
3760	45.2	0	1.4	h	3760	-49.9	10.3	2.5	-42.1	-13	-29.1
5640	43.6	0	1.4	v	5640	-50.6	10.6	3.1	-43.1	-13	-30.1
5640	43.3	0	1.4	h	5640	-50.8	10.6	3.1	-43.3	-13	-30.3
7520	42.6	0	1.4	v	7520	-51.6	10.2	3.6	-45.0	-13	-32.0
7520	40.5	0	1.4	h	7520	-53.5	10.2	3.6	-46.9	-13	-33.9

§2.1046, §22.913(a), & §24.232 – RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

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

Test Procedure

Conducted:

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	8/8/2005
Agilent	Analyzer, Spectrum	E4446A	US44300386	11/10/2005

*** Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	72%
ATM Pressure:	1026mbar

** The testing was performed by Snell Leong on 2006-02-07.*

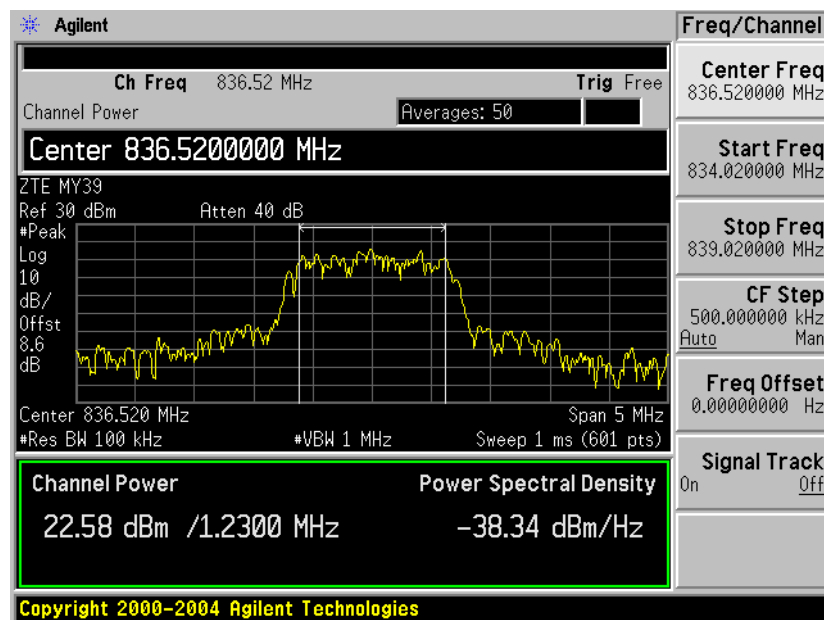
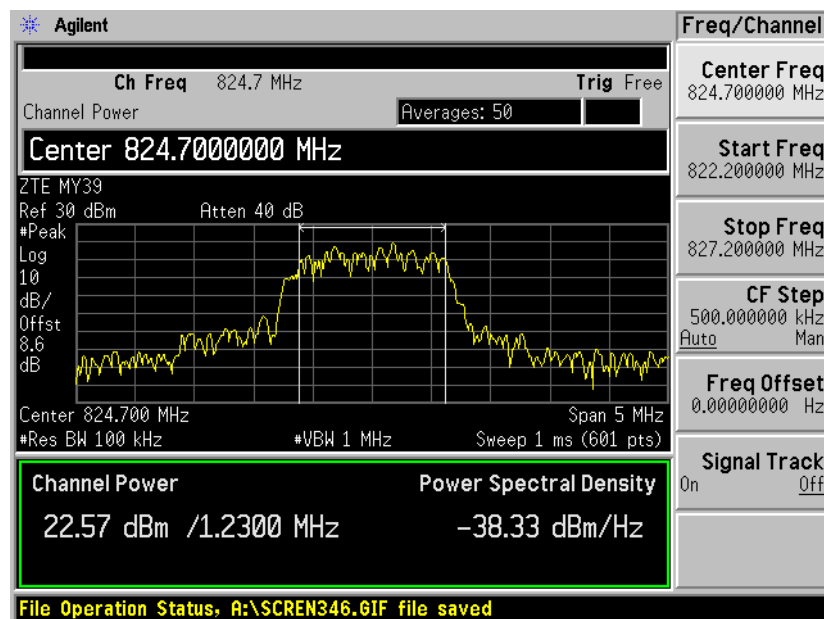
Test Results

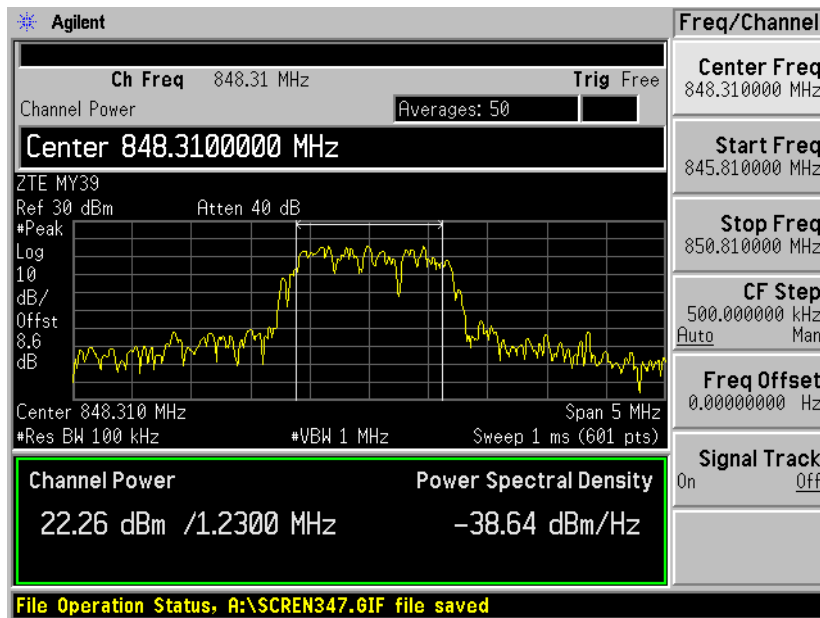
Part22:

Frequency	Measured Power	Limit
MHz	dBm	dBm
824.70	22.57	38.45
836.52	22.58	38.45
848.30	22.26	38.45

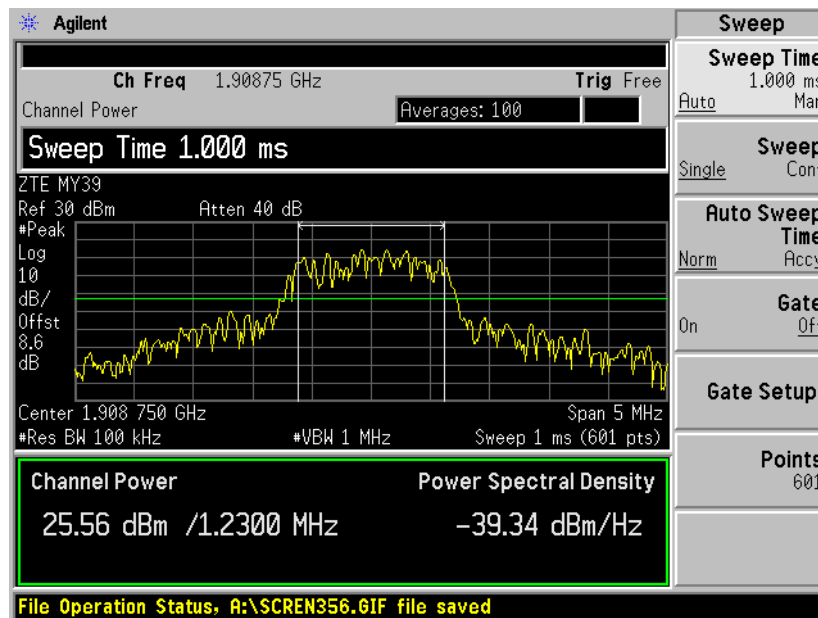
Part24:

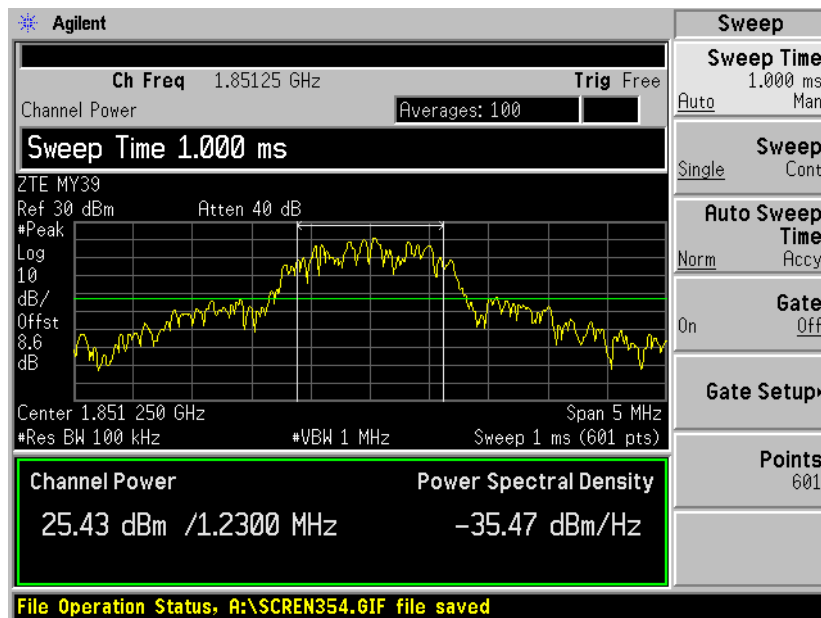
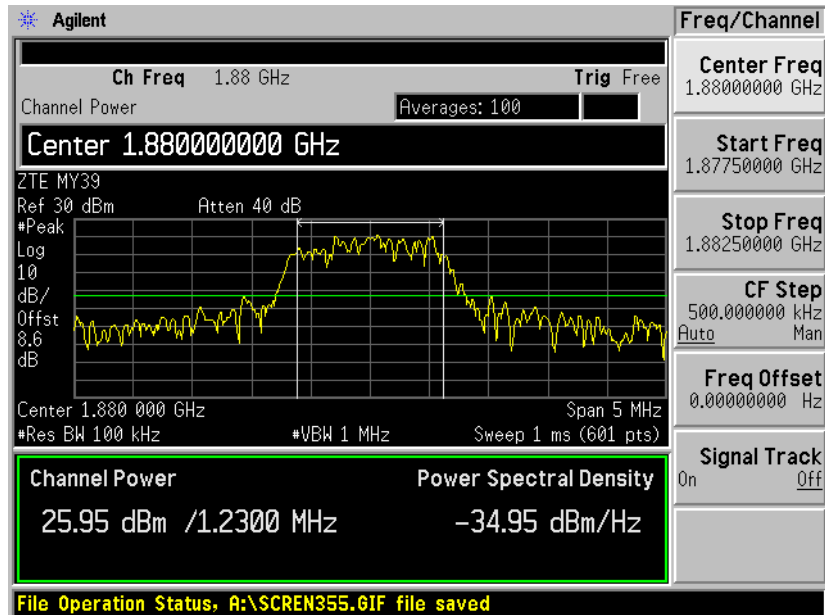
Frequency	Measured Power	Limit
MHz	dBm	dBm
1851.26	25.56	33
1880.00	25.95	33
1908.75	25.43	33

Plots of Conducted Output Power for Part 22



Plots of Conducted Output Power for Part24





§2.1049, §22.917, §22.905, & §24.238 - OCCUPIED BANDWIDTH

Applicable Standard

Requirements: CFR 47, Section 2.1049, Section 22.901, Section 22.917 and Section 24.238.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 30kHz and the 26 dB & 99% bandwidth was recorded.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	8/8/2005
Agilent	Analyzer, Spectrum	E4446A	US44300386	11/10/2005

* **Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	72%
ATM Pressure:	1026mbar

* The testing was performed by Snell Leong on 2006-02-07.

Test Results

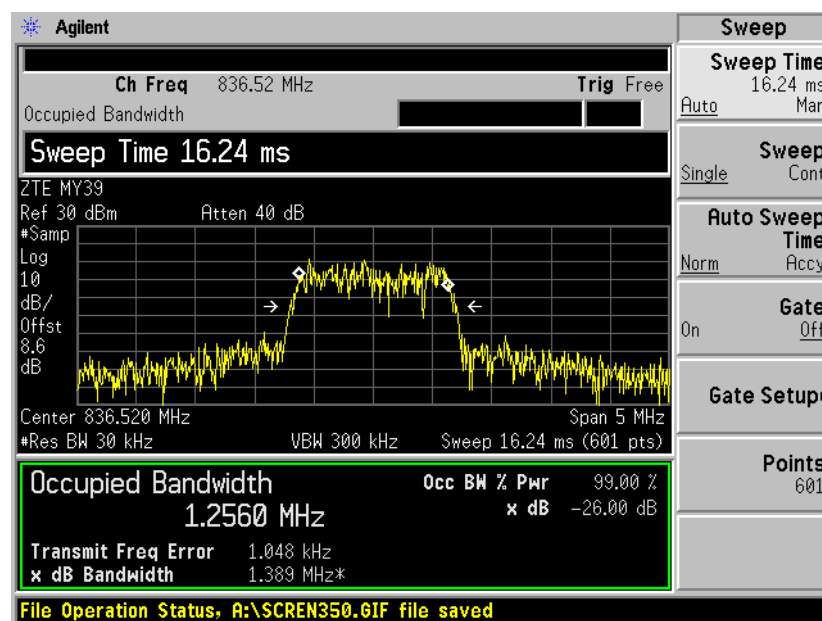
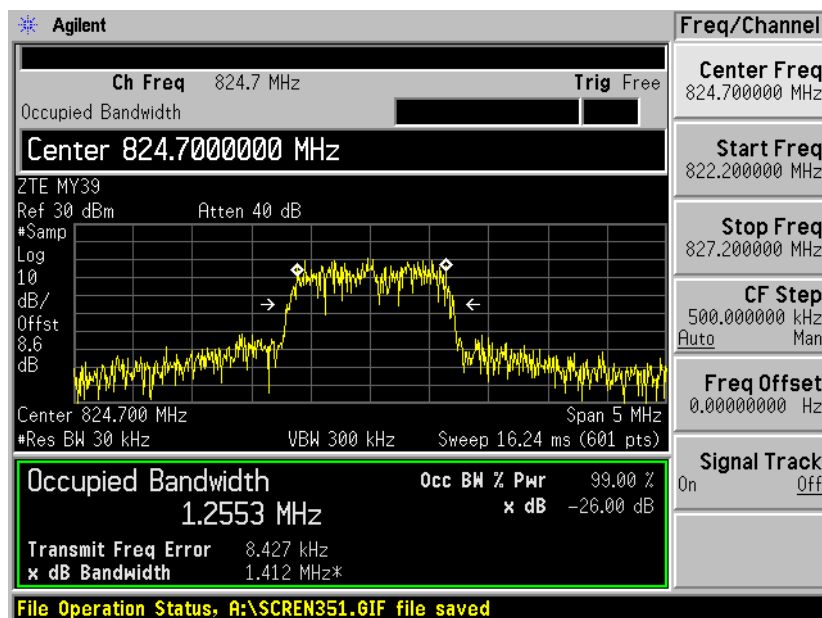
Part 22:

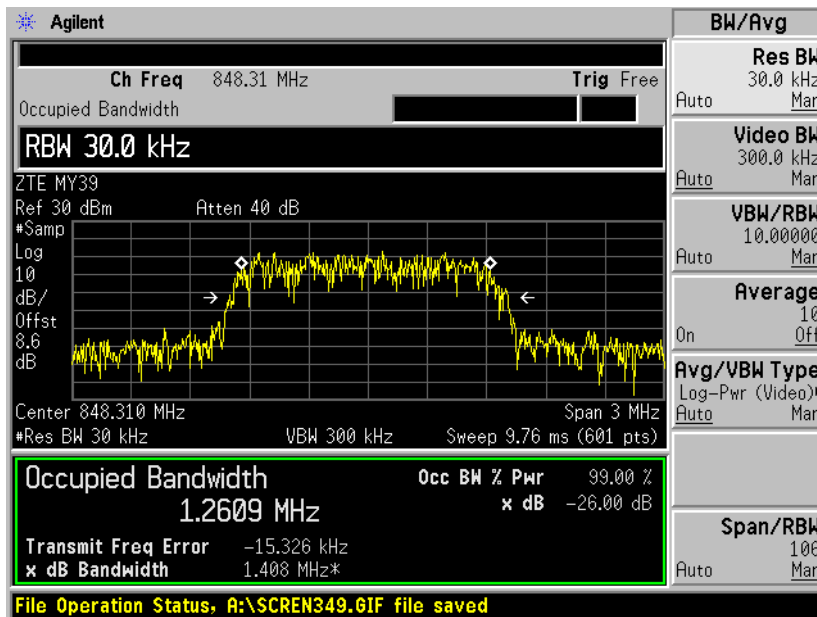
Frequency	Measured Bandwidth
MHz	MHz
824.69	1.256
836.52	1.255
848.32	1.26

Part 24:

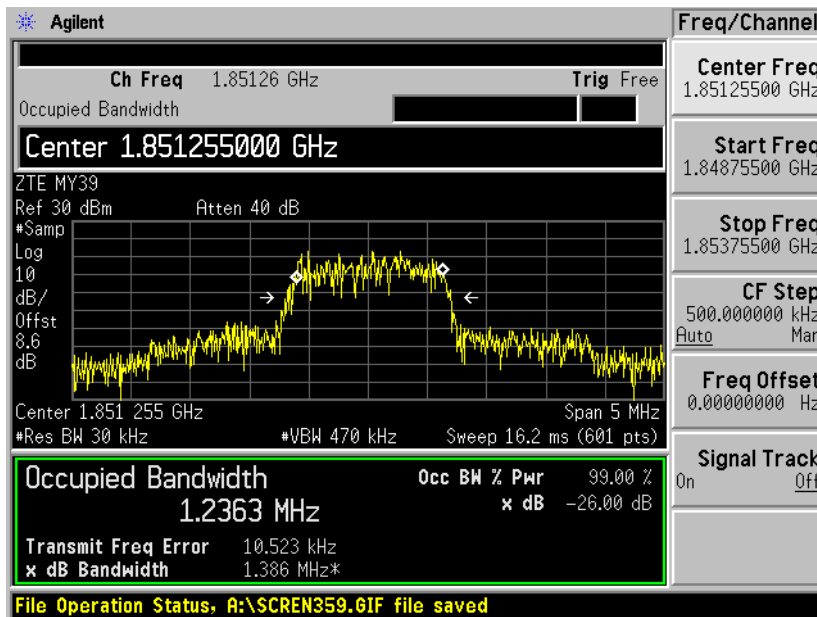
Frequency	Measured Bandwidth
MHz	MHz
1851.26	1.236
1880.00	1.244
1908.75	1.249

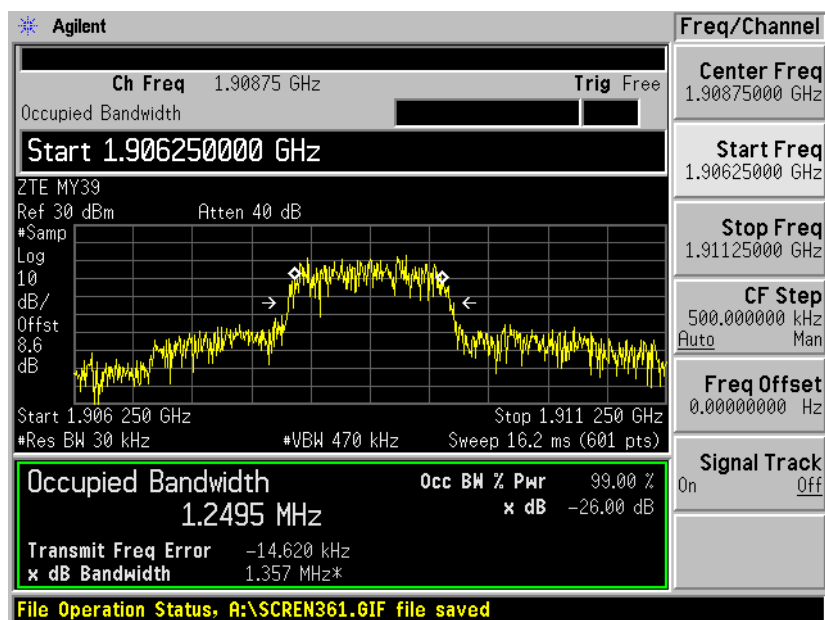
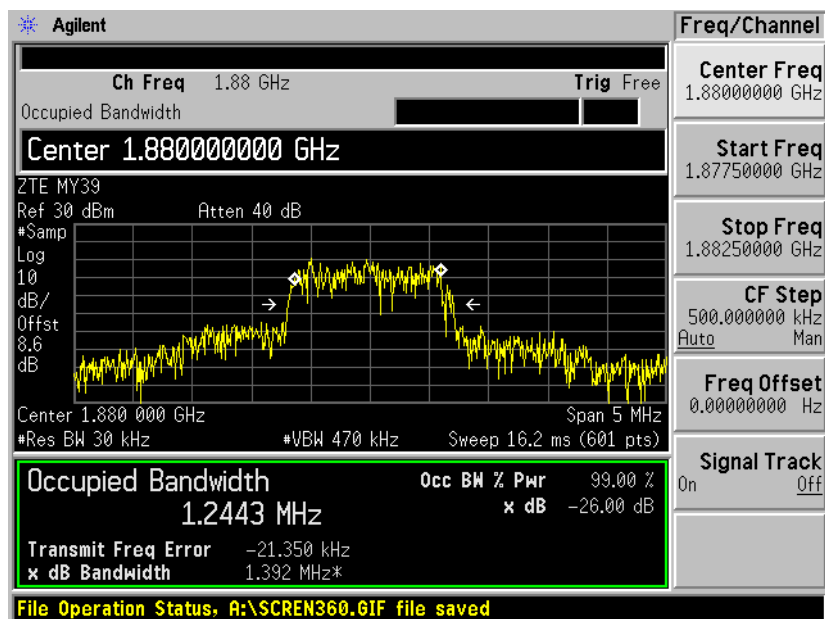
Please refer to the following plots.

Plots of Occupied Bandwidth for Part22



Plots of Occupied Bandwidth for Part24





§2.1051, §22.917, & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Requirements: CFR 47, § 2.1051, § 22.917 & §24.238(a).

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

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	8/8/2005
Agilent	Analyzer, Spectrum	E4446A	US44300386	11/10/2005
Wainwright	Filter, Band Reject	WRCG1850/19 10-1835/1925- 40/8SS	5	8/11/2004
Wainwright	Filter, Band Reject	WRCG823/850 -813/860- 40/8SS	2	8/11/2004

*** Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

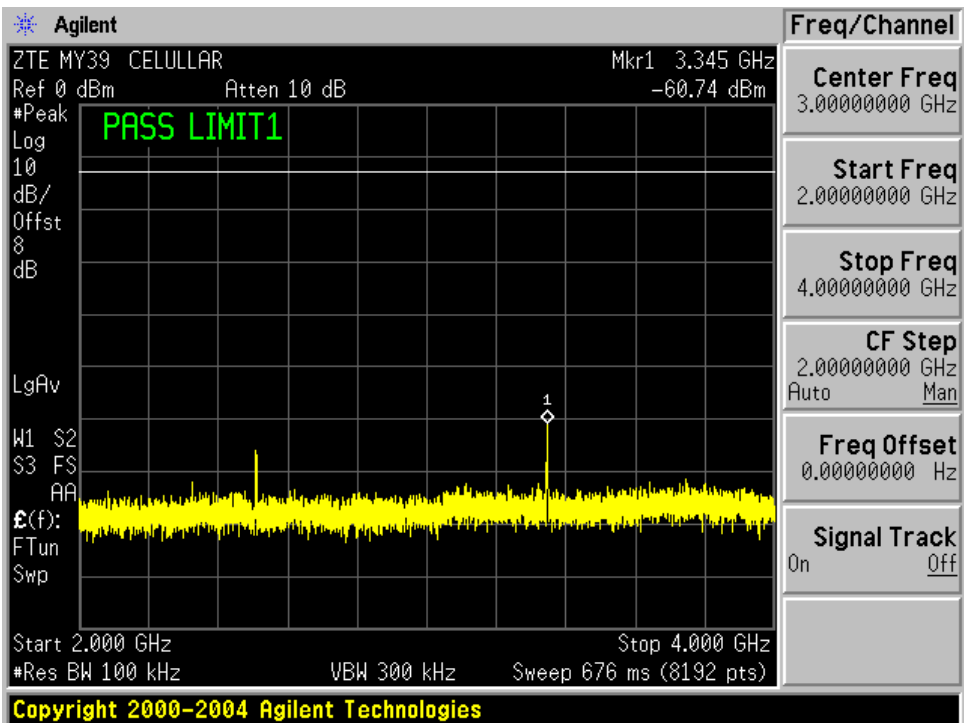
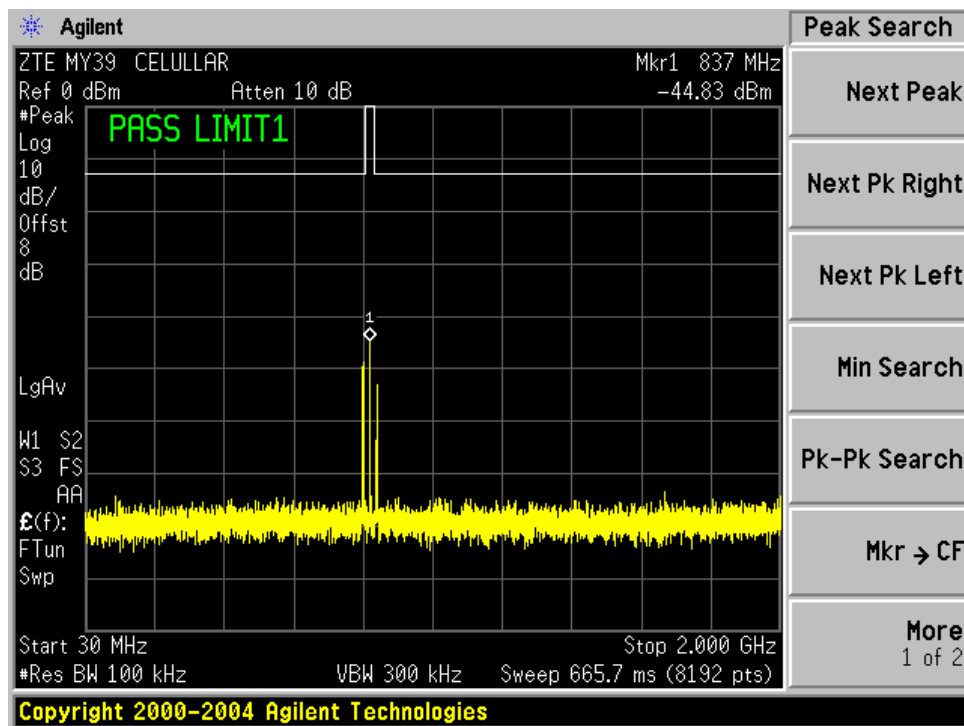
Environmental Conditions

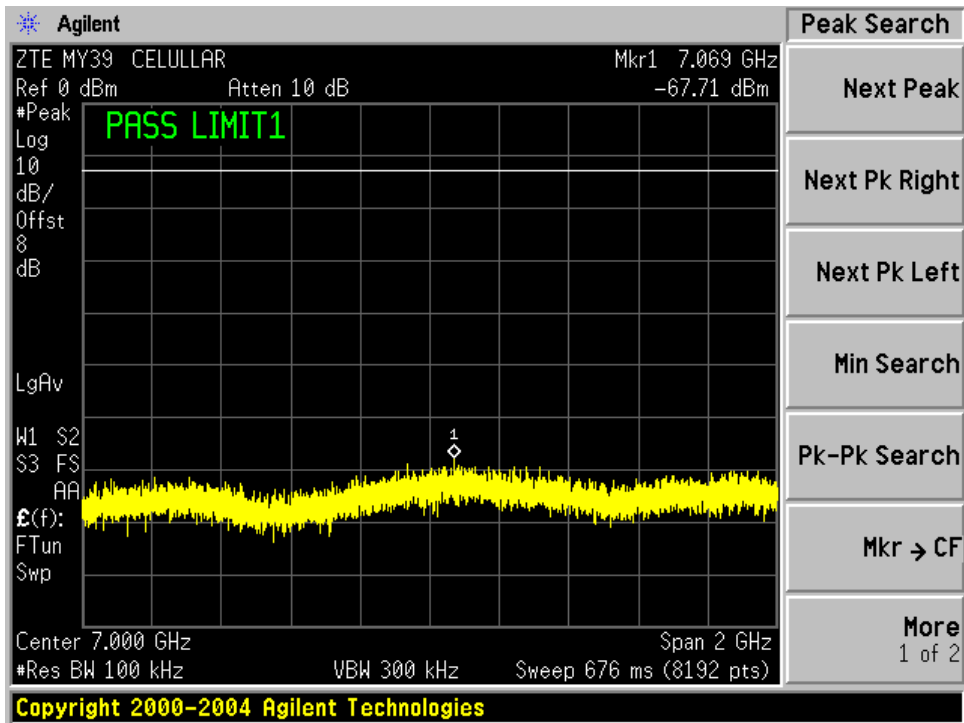
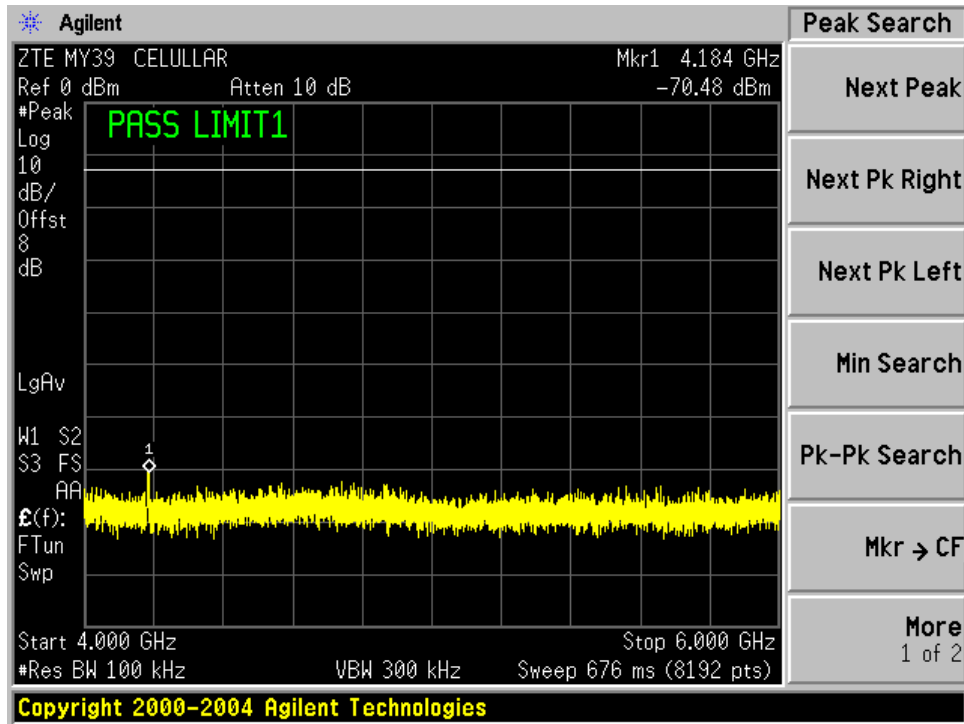
Temperature:	22° C
Relative Humidity:	72%
ATM Pressure:	1026mbar

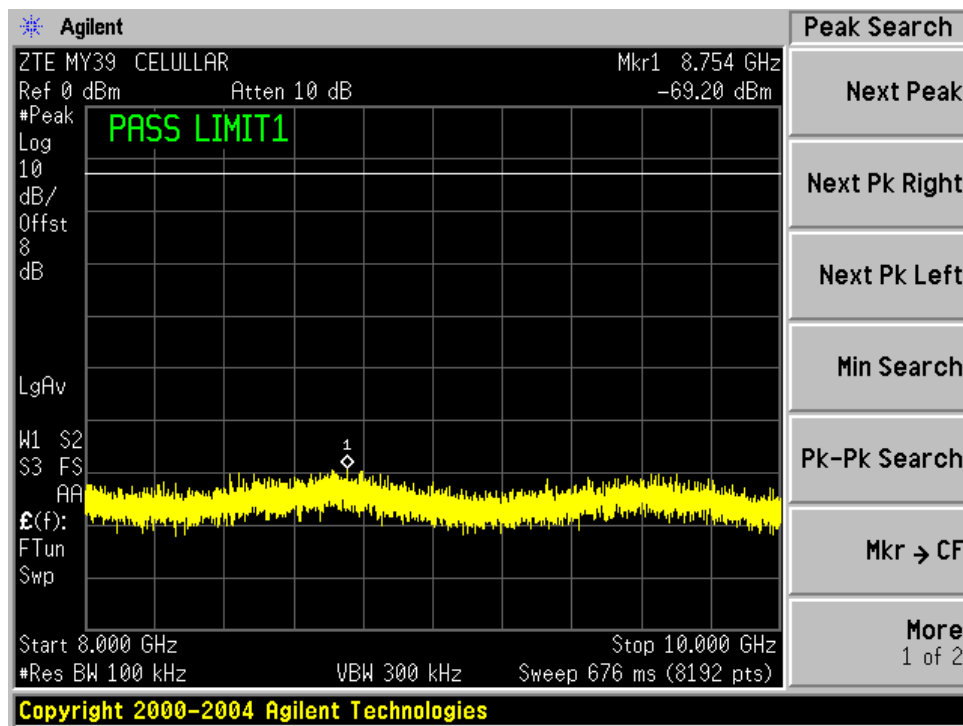
** The testing was performed by Snell Leong on 2006-02-07.*

Test Results

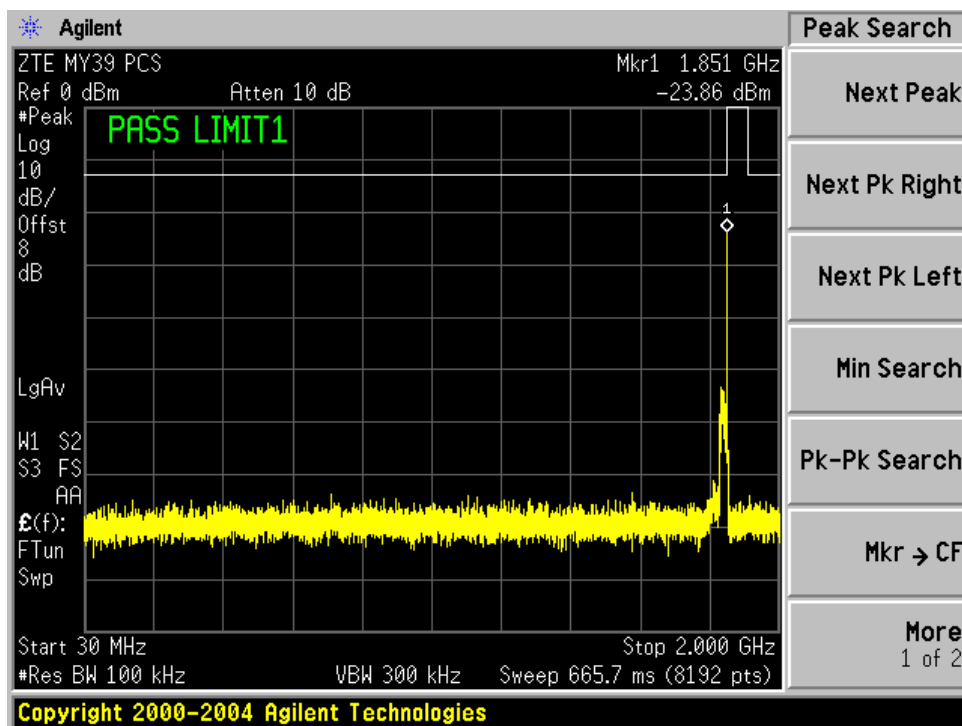
Please refer to the hereinafter plots.

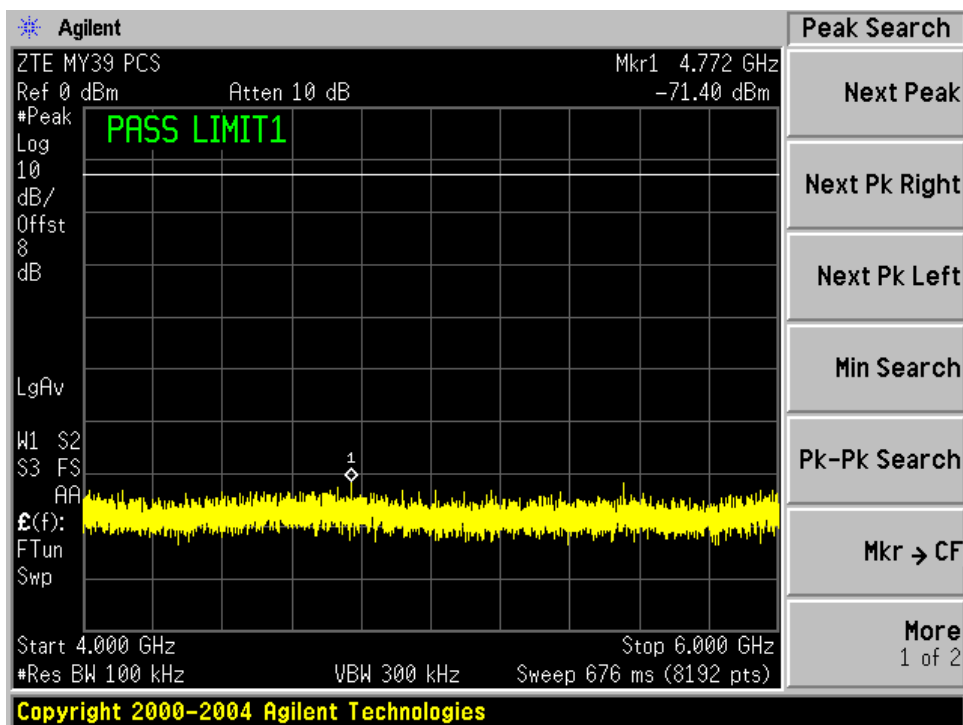
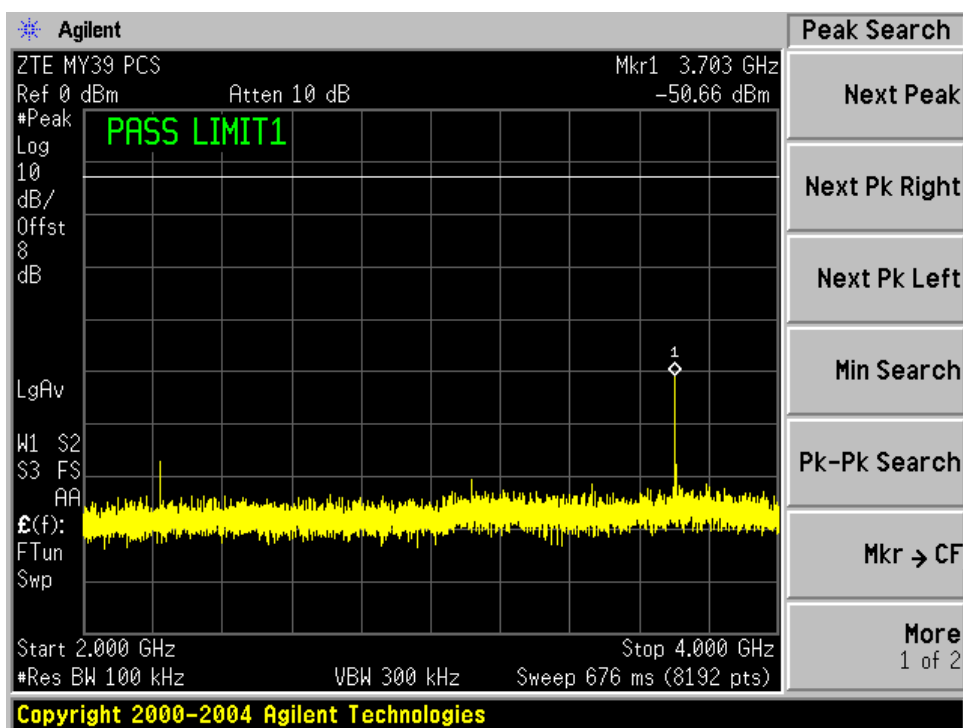
Plots of Spurious Emission for Part22

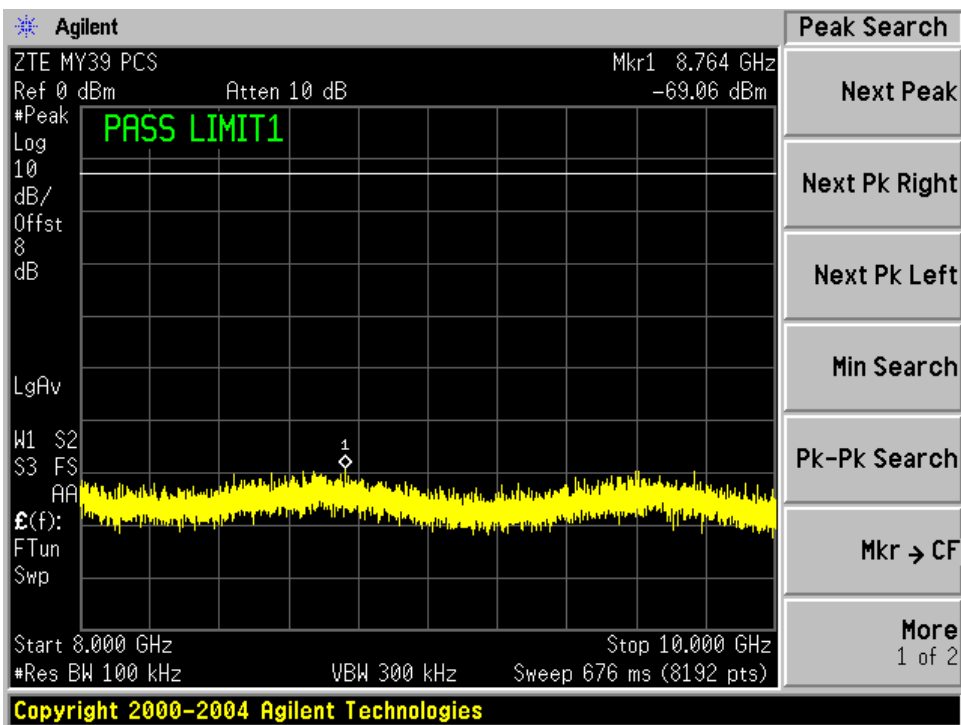
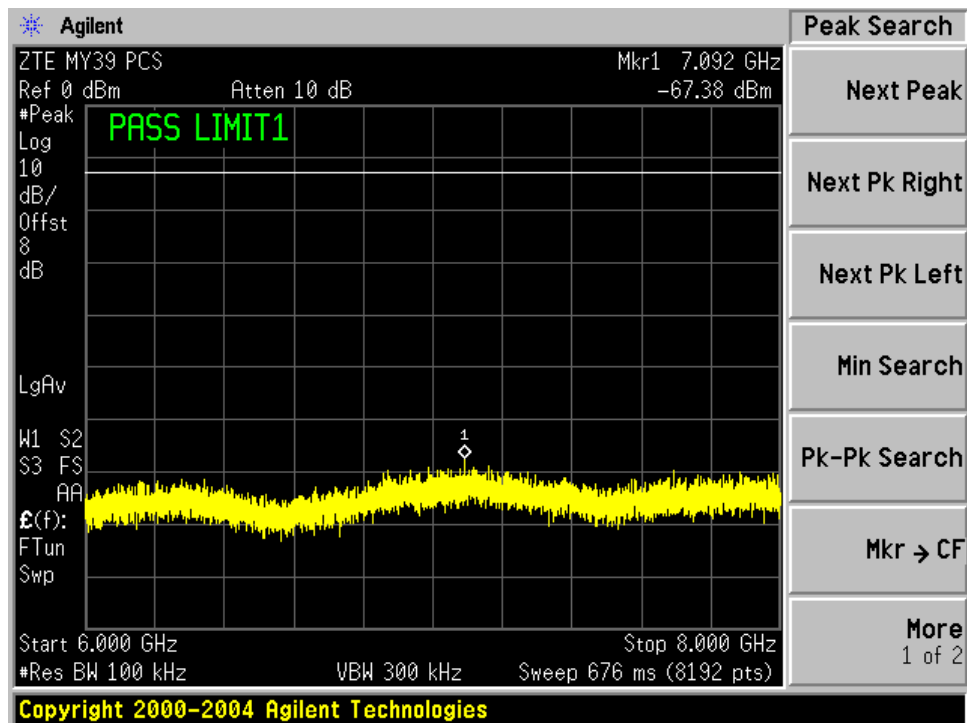


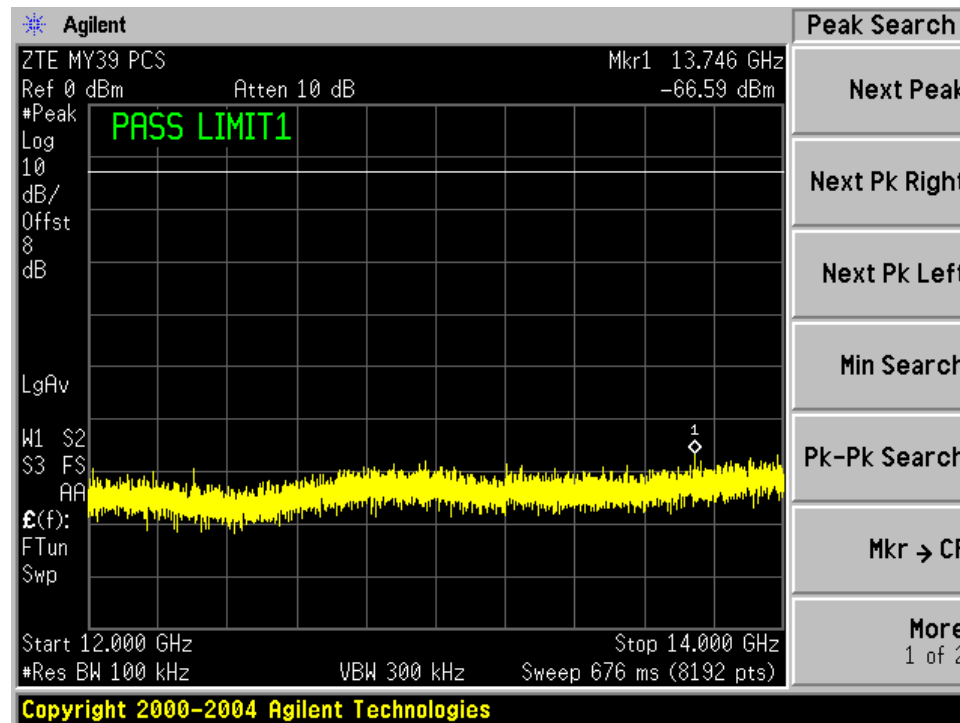
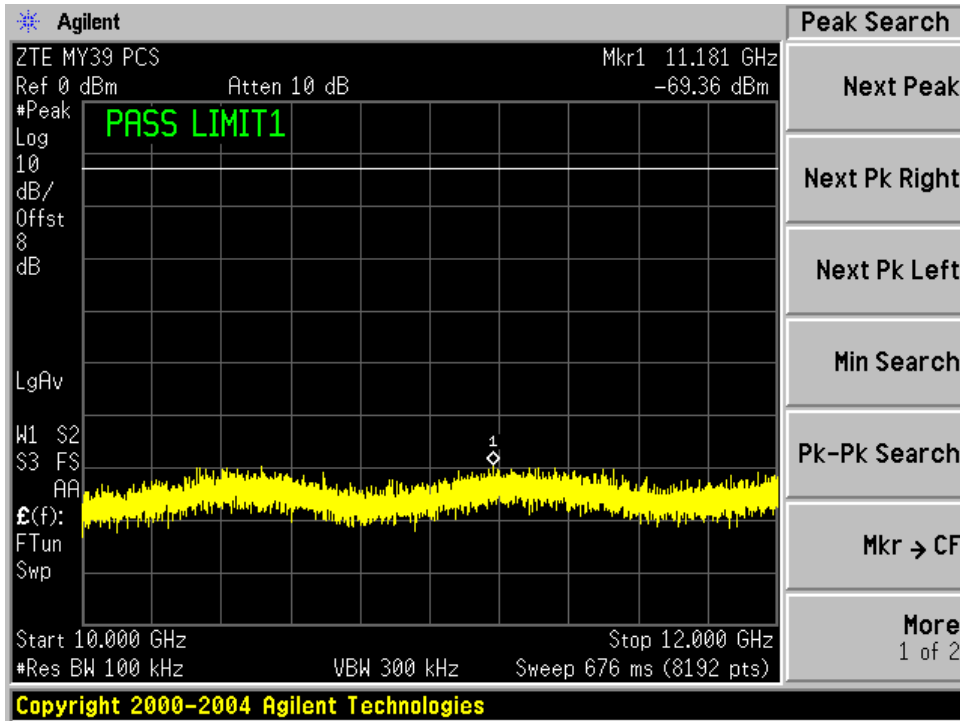


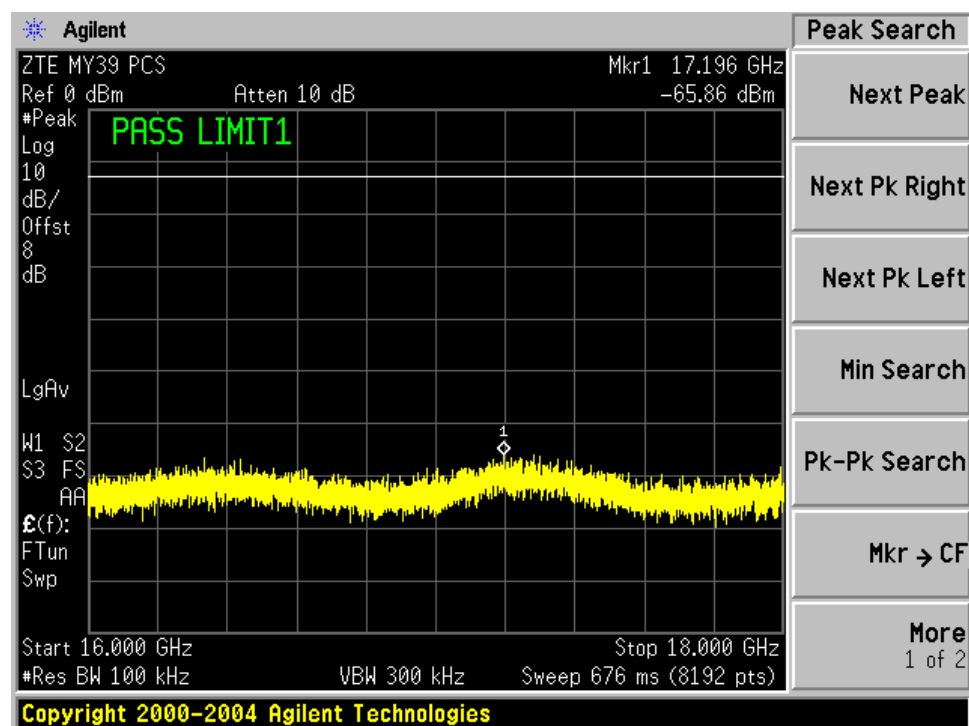
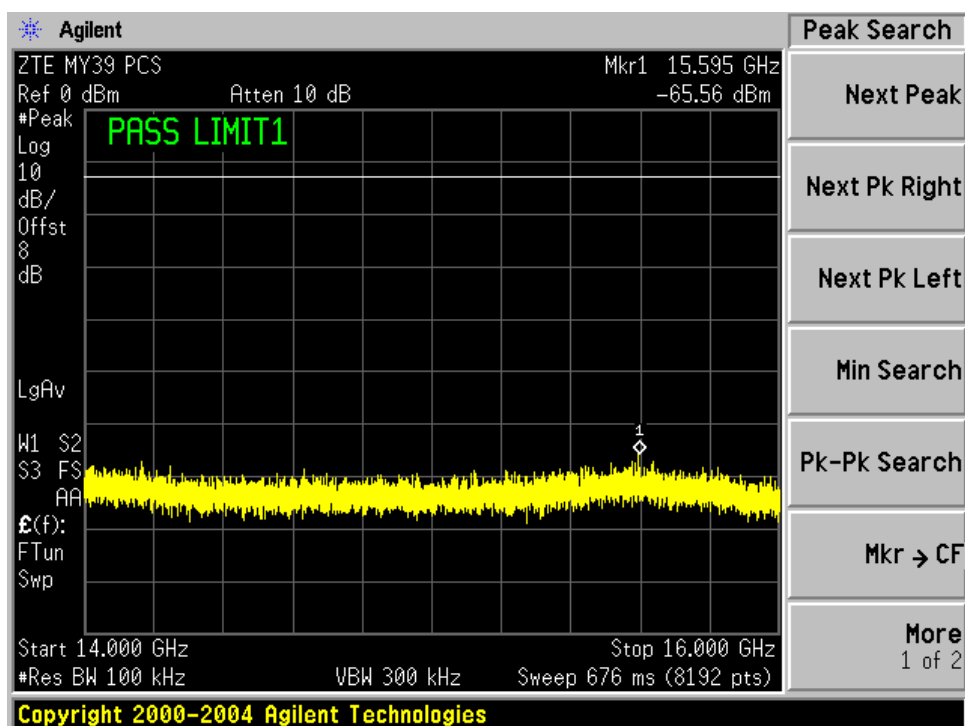
Plots of Spurious Emission for Part24

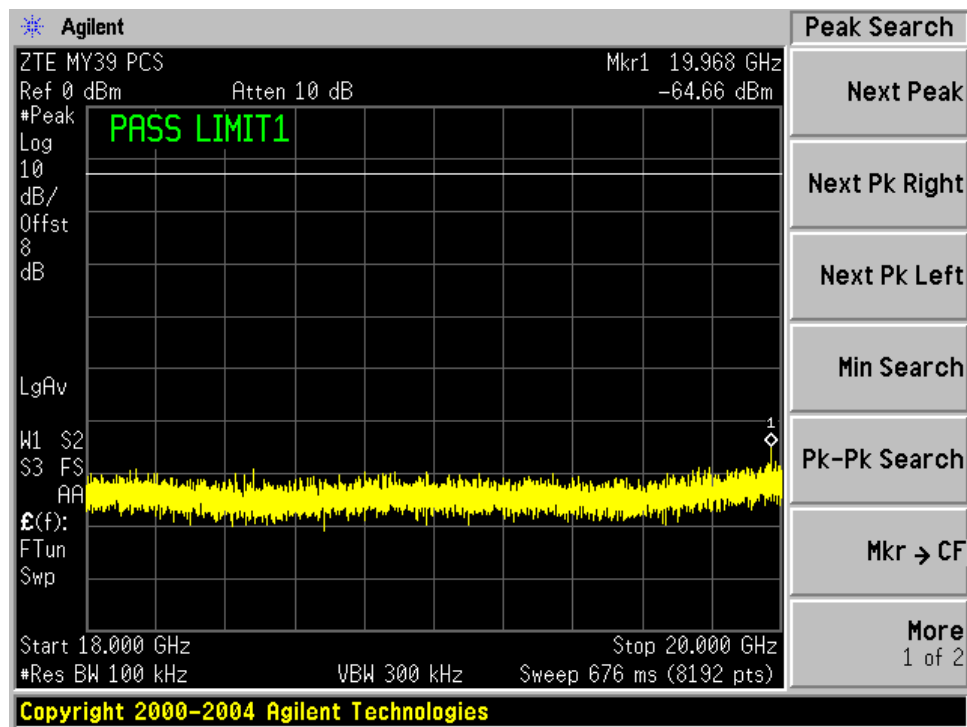












§2.1055 (a), §2.1055 (d), §22.355, & §24.235 - FREQUENCY STABILITY

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

Table C-1_Frequency Tolerance for Transmitters in the Public Mobile
Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile [le]3 watts (ppm)	Mobile [le]3 watts (ppm)
25 to 50.....	20.0	20.0	50.0
50 to 450.....	5.0	5.0	50.0
450 to 512.....	2.5	5.0	5.0
821 to 896.....	1.5	2.5	2.5
928 to 929.....	5.0	n/a	n/a
929 to 960.....	1.5	n/a	n/a
2110 to 2220.....	10.0	n/a	n/a

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

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	8/8/2005
Agilent	Analyzer, Spectrum	E4446A	US44300386	11/10/2005
Tenney	Oven, Temperature	VersaTenn	12.222-193	6/4/2005

* **Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	72%
ATM Pressure:	1026mbar

* The testing was performed by Snell Leong on 2006-02-07.

Test Results

Part 22:

Condition		Freq Error	Error	Limit
Voltage (v)	Temperature (C)	PPM	PPM	PPM
3.3	-30	13.40	0.016	2.5
3.3	0	12.50	0.015	2.5
3.3	20	13.60	0.016	2.5
3.3	30	8.60	0.010	2.5
3.3	50	13.40	0.016	2.5
3.3	-20	12.70	0.015	2.5
3.3	50	15.60	0.019	2.5
3.3	-20	18.10	0.022	2.5
3.3	50	17.40	0.021	2.5

Part 24:

Condition		Freq Error	Error	Limit
Voltage (v)	Temperature (C)	PPM	PPM	PPM
3.3	-30	35.20	0.019	2.5
3.3	0	34.60	0.018	2.5
3.3	20	10.20	0.005	2.5
3.3	30	12.50	0.007	2.5
3.3	50	25.60	0.014	2.5
3.3	-30	36.20	0.019	2.5
3.3	50	26.40	0.014	2.5
3.3	-30	35.80	0.019	2.5
3.3	50	27.10	0.014	2.5

§22.917 & §24.238 – BAND EDGE

Applicable Standard

According to § 22.917, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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 Procedure

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

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	8/8/2005
Agilent	Analyzer, Spectrum	E4446A	US44300386	11/10/2005

* **Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

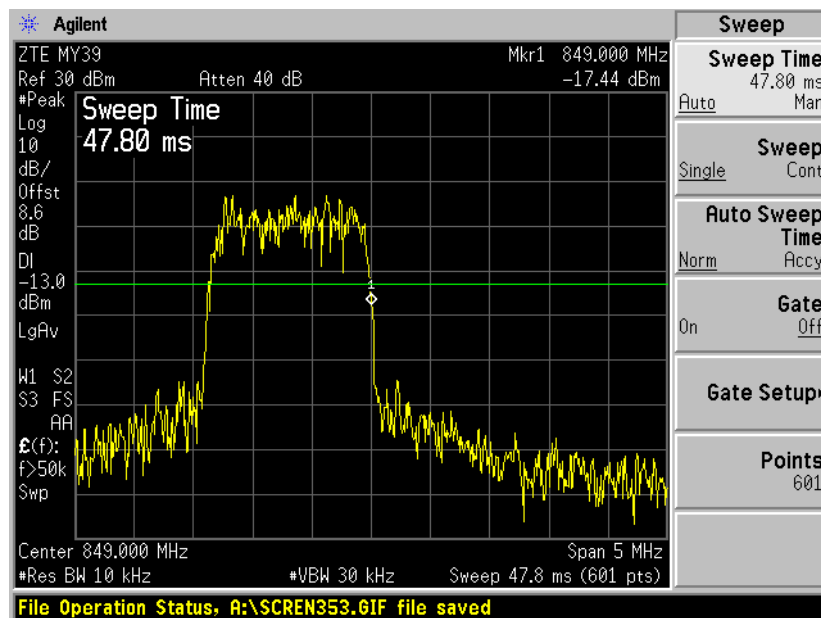
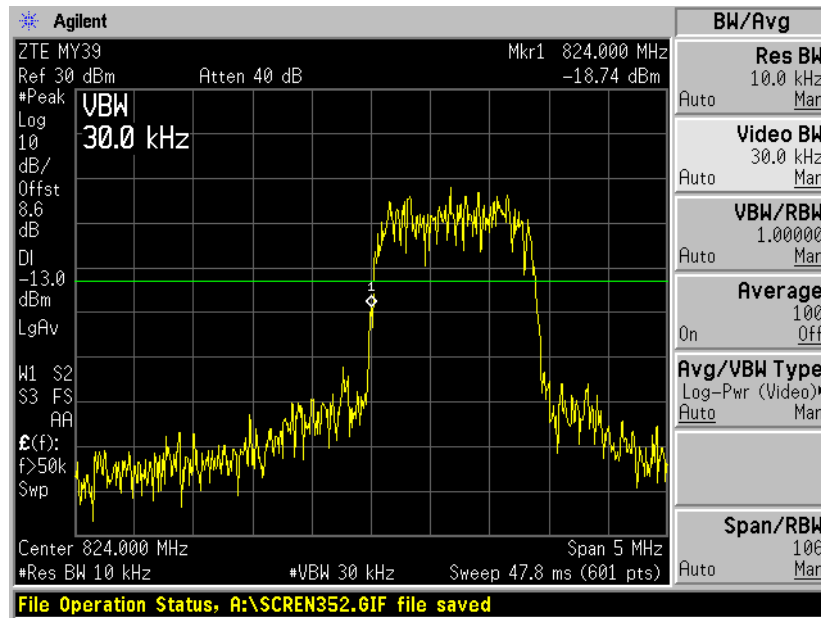
Environmental Conditions

Temperature:	22° C
Relative Humidity:	72%
ATM Pressure:	1026mbar

* The testing was performed by Snell Leong on 2006-02-07.

Test Results

Please refer to the following plots.

Plots of Band Edge for Part 22

Plots of Band Edge for Part 24