Lab Code: 200167-0

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

For

AnyDATA Corporation

18902 Bardeen Ave.
Irvine, CA 92612-1522

FCC ID: P4M-ADUE100D

Model: ADU-E100D

This Report Concerns:	**Product Type:**
☒ Original Report	CDMA EVDO Dual Band USB Modem

Test Engineer:	Daniel Deng, Jerry Wang
Report No.:	R06052310
Report Date:	2006-08-17
Reviewed By:	Staff Engineer: James Ma
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *AnyDATA* EVDO USB modem, FCCID: *P4M-ADUE100D*, offers the appropriate solution to home and mobile connectivity by using internal antenna technology supporting diversity. It provides extensive and reliable wireless data communication and enables better data speed in a poor signal environment. In addition, it supports USB 2.0 interface with PC and connects easily to any Windows based PC for access the Internet. The features are listed as below:

- It supports for major air interfaces including CDMA ® 1X, CDMA2000 1xEV-DO Rev.0, cdmaOne™ IS-95 A/B.
- It supports for multimedia data applications with offering data transmission up to 307 kbps data in forward and reverse links simultaneously.
- It supports IS-856 1xEV-DO and provides high-speed peak data rates up to 2.4 Mbps downlink and 153 kbps uplink.
- It is easy to connect to Internet by using Easy Wireless Net running on Windows 2000 and XP.

Mechanical Description

The *AnyDATA* product, FCCID: *P4M-ADUE100D*, or the "EUT" as referred as to this report, is a CDMA EVDO Dual Band USB Modem which measured approximately *100 mmL x 56 mmW x 25 mmH*.

** The test data gathered are from typical production sample, serial number: 0071223 provided by the manufacturer.*

EUT Photo

Additional photos in Exhibit B

Objective

This type approval report is prepared on behalf of *AnyDATA 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.

This report is provided to the *AnyDATA* for compliance and regulatory testing needs. The manufacturer declares that the model *ADU-E100D is* identical in construction and operation with the original tested device in respect to software, circuitries, PCB layout, RF module, features and functionality.

This is the second edition of the report for *ADU-E100D*. For the original testing, please refer to BACL Corp. report R0512053.

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 Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located at the facility in Sunnyvale, California 94089, USA.

The test site at Bay Area Compliance Laboratory Corporation 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 have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules and Article 8 of the VCCI regulations. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference have the reports on file and are listed under FCC file 31040/SIT 1300F2, IC registration number: 3062A, and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC, IC, 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 can 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.

Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
Best Technology Co. Ltd	Power Adaptor	BPA-072(PLA-10-5)	0508 08541

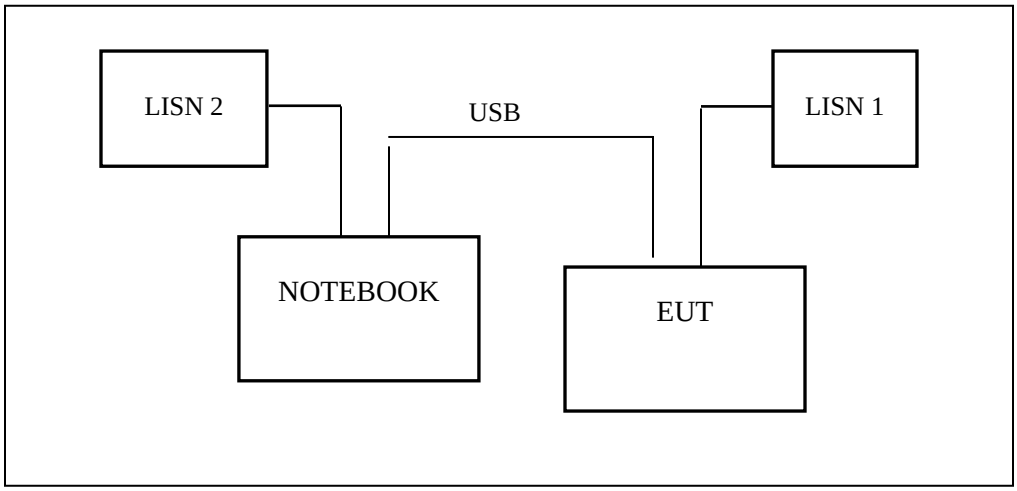
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Compaq	Laptop	CRVSA-07T1-75	CNF43403FB

Interface Ports and Cabling

Cable Description	Length (M)	From	To
Power Cable	1.5	DC Power supply	EUT
USB Cable	1.00	Laptop	EUT

Test Setup Block Diagram



SUMMARY OF TEST RESULTS

FCC RULE	DESCRIPTION OF TEST	RESULT
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Emissions	Compliant
§ 2.1047	Modulation Characteristics	Compliant
§ 2.1053	Field Strength of Spurious Radiation	Compliant
§2.1091	RF Exposure	Compliant
§ 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

§15.107 - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are receiver, cable loss, and LISN.

Based on NIS 81, the Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emission measurement at BACL is ±2.4 dB.

EUT Setup

The measurements were performed in the shielded room by using the same setup per ANSI C63.4-2003 measurement procedure. The specification used was FCC 15 Class B limits.

The adaptor of EUT was connected to 120VAC/60Hz power source.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Rohde & Schwarz	Artificial-Mains Network	ESH2-Z5	871884/039	2005-11-14
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2006-03-13
Agilent	AC Powersource Generator	6812B	US38390366	N/A
EM Test	Coupling and De-coupling Networks	T8RJ45	0504-01	2005-08-05

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

Test Procedure

During the conducted emission test, the power cord of the EUT was connected to the main outlet of the LISN-1, and the power cord of the monitor and modem were connected to the LISN-2.

Maximizing procedure was performed on the twelve (12) highest provided emissions of the EUT.

All data were recorded in the peak detection mode, quasi-peak and average. Average readings are distinguished with an "Ave" when Quasi-Peak readings are distinguished with a "QP".

Environmental Conditions

Temperature:	23°C
Relative Humidity:	35 %
ATM Pressure:	1019 mbar

**Testing was performed by Jerry Wang 2006-06-07.*

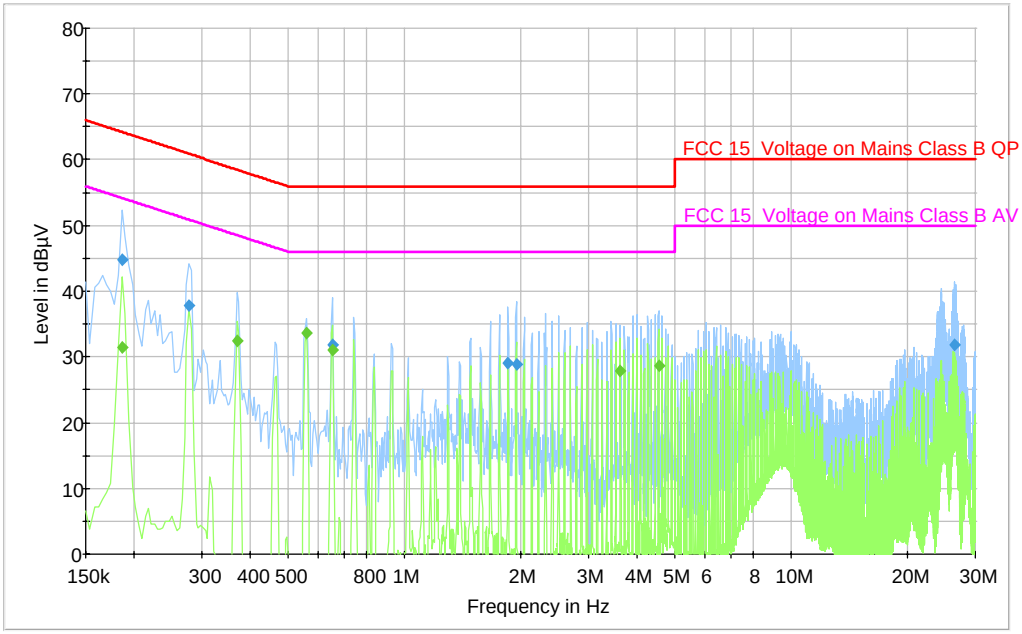
Test Results Summary

According to the recorded data in the following tables, the EUT complied with the FCC 15 Class B conducted limits for a Class B device, with the worst margin reading of:

-6.7 dB at **0.650000 MHz** in the **Neutral** conductor mode.

Conducted Emissions Test Plots and Data

120V/60Hz – Line



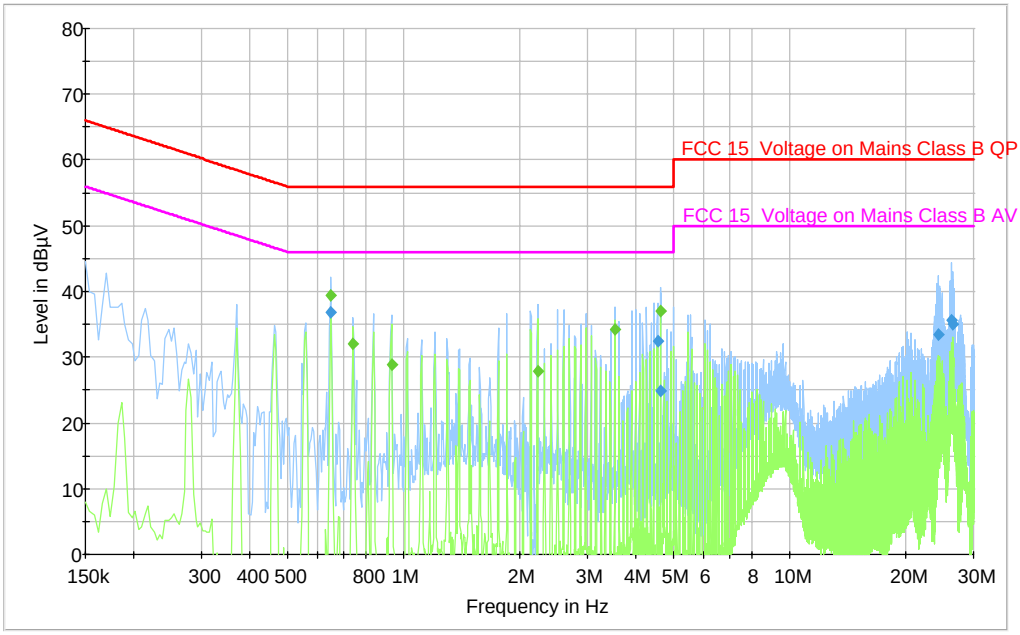
QP Measurements

Frequency (MHz)	Quasi-Peak	PE	Line	Limit (dBuV)	Margin (dB)
0.186000	44.8	GND	L1	64.2	19.4
0.278000	37.8	GND	L1	60.9	23.1
0.654000	31.8	GND	L1	56.0	24.2
1.858000	29.1	GND	L1	56.0	26.9
1.950000	28.9	GND	L1	56.0	27.1
26.462000	31.9	GND	L1	60.0	28.1

AVE Measurements

Frequency (MHz)	Average (dBuV)	PE	Line	Limit (dBuV)	Margin (dB)
0.558000	33.6	GND	L1	46.0	12.4
0.654000	31.0	GND	L1	46.0	15.0
0.370000	32.4	GND	L1	48.5	16.1
4.550000	28.6	GND	L1	46.0	17.4
3.622000	27.9	GND	L1	46.0	18.1
0.186000	31.5	GND	L1	54.2	22.7

120V/60Hz – Neutral



QP Measurements

Frequency (MHz)	Quasi-Peak (dBuV)	PE	Line	Limit (dBuV)	Margin (dB)
0.650000	36.8	GND	N	56.0	19.2
4.550000	32.4	GND	N	56.0	23.6
26.378000	35.6	GND	N	60.0	24.4
26.478000	35.1	GND	N	60.0	24.9
24.238000	33.4	GND	N	60.0	26.6
4.634000	24.8	GND	N	56.0	31.2

AVE Measurements

Frequency (MHz)	Average (dBuV)	PE	Line	Limit (dBuV)	Margin (dB)
0.650000	39.3	GND	N	46.0	6.7
4.642000	37.1	GND	N	46.0	8.9
3.526000	34.3	GND	N	46.0	11.7
0.742000	32.0	GND	N	46.0	14.0
0.930000	28.9	GND	N	46.0	17.1
2.230000	27.9	GND	N	46.0	18.1

§15.109 - RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are receiver, 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 EMI Measurements, the best estimate of the uncertainty of a radiation emission measurement at BACL is $\pm$4.0 dB.

EUT Setup

The radiated emission tests were performed in the 10 meter chamber site by using the setup in accordance with the ANSI C63.4-2003. The specification used was the FCC15 Class B.

The EUT was connected to 120VAC/60Hz power source.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal Date
Sonoma Instruments	Pre amplifier	317	260408	2006-02-03
Agilent	Pre amplifier	8449B	3008A01978	2005-08-10
Sunol Science Corp	Combination Antenna	JB3 Antenna	A020106-3	2006-03-14
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.595 0K03	20-174821	2006-02-24
Sunol Science Corp	System Controller	SC99V	113005-1	N/A

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

Test Procedure

For the radiated emissions test, the EUT all support equipment were connected to the AC outlet on the turntable.

Maximizing procedure was performed on the six (6) highest emissions in the described configurations.

All data were recorded in the peak detection mode. Quasi-peak readings were distinguished with a "QP" in the data table and performed only when an emission was found to be marginal (within -4 dB of specification limits).

Environmental Conditions

Temperature:	24°C
Relative Humidity:	34 %
ATM Pressure:	1020 mbar

**Testing was performed by Jerry Wang 2006-06-07.*

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - 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:

Margin = Corrected Amplitude - Class B Limit

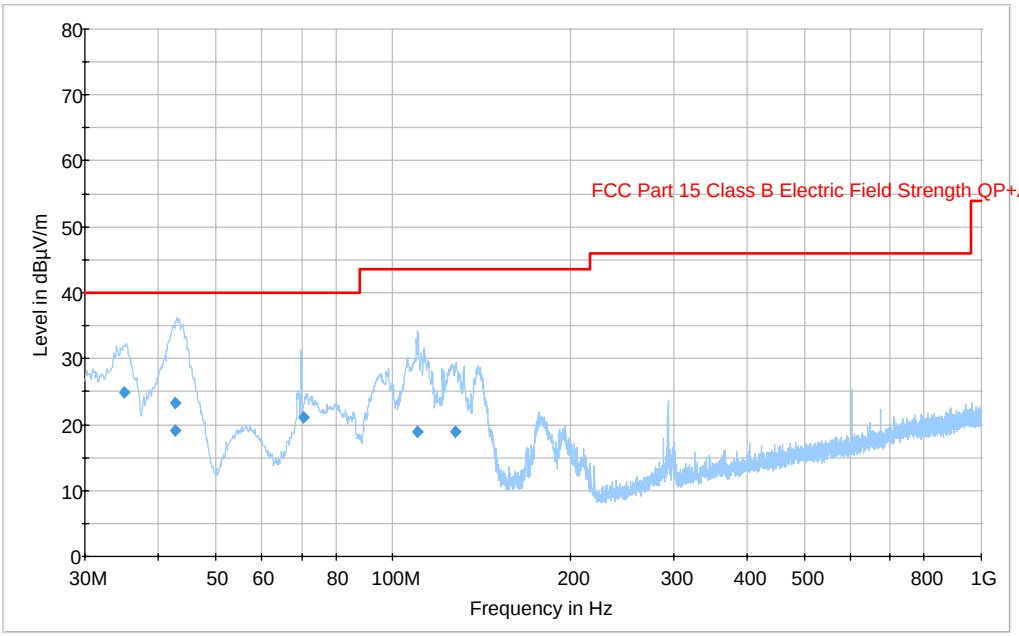
Summary of Test Results

According to the data in the following table, the EUT complied with the FCC Part 15 Class B standards and the test results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations, and had the worst margin of:

-15.1 dB at **34.975000 MHz** in the **Horizontal** polarization.

Radiated Emissions Test Data @ 3m Distance

30 – 1000 MHZ



QP Measurements

Frequency (MHz)	Quasi-Peak (dBuV/m)	Antenna Height (cm)	Polarity	Turntable Position (deg)	Limit (dBuV/m)	Margin (dB)
34.975000	24.9	157.5	H	262.0	40.0	15.1
42.793750	23.2	110.2	H	12.0	40.0	16.8
70.371250	21.1	102.3	H	170.0	40.0	18.9
42.607500	19.1	230.0	H	183.0	40.0	20.9
127.672500	19.0	139.3	H	100.0	43.5	24.5
110.267500	18.9	221.0	V	297.0	43.5	24.6

§2.1047 - MODULATION CHARACTERISTIC

Applicable Standard

Requirement: FCC § 2.1047(d). FCC parts 22H & 24E do not have any specific CDMA modulation requirements, therefore modulation characteristics are 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 log (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	2005-08-08
Agilent	Analyzer, Spectrum	E4446A	US44300386	2005-11-10
HP	Amplifier, Pre	8447D	2944A10198	2005-08-17
HP	Amplifier, Pre, Microwave	8449B	3147A00400	2005-08-10
Rohde & Schwarz	Generator, Signal	SMIQ03	849192/0085	2005-05-02
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	261	2005-04-20
HP	Generator, Signal	83650B	3614A00276	2005-05-10
A.R.A.	Antenna, Horn	DRG-118/A	1132	2005-08-17
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:	18° C
Relative Humidity:	55%
ATM Pressure:	1020mbar

** The testing was performed by Daniel Deng on 2005-12-29.*

Test Results

Worst case readings as follows:

Cellular Band, Part22:

-18.2 dB at 1673.08 MHz

PCS Band, Part24:

-19.7 dB at 3759.98 MHz

Run # 1 : 30MHz -10GHz Cellular Band Mid Channel

Indicated		Table	Test Antenna		Substituted		Antenna	Cable	Absolute	Limit	Margin
Frequency MHz	Amp. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Correction	Loss dB	Level dBm	dBm	dB
1673.08	71.83	90	1.4	v	1673.08	-39.2	9.3	1.3	-31.2	-13	-18.2
1673.08	61.50	180	1.6	h	1673.08	-49.4	9.3	1.3	-41.4	-13	-28.4
2509.65	46.00	180	1.7	v	2509.65	-56.3	9.3	1.6	-48.6	-13	-35.6
3346.13	39.00	180	1.3	v	3346.13	-58.1	10	2.2	-50.3	-13	-37.3
3346.13	36.80	0	1.4	h	3346.13	-60.1	10	2.2	-52.3	-13	-39.3
2509.65	41.83	270	1.5	h	2509.65	-60.2	9.3	1.6	-52.5	-13	-39.5
1202.72	45.85	90	1.3	v	1202.72	-63.6	7.5	1.2	-57.3	-13	-44.3
1202.72	43.50	180	1.5	h	1202.72	-65.8	7.5	1.2	-59.5	-13	-46.5
1753.63	42.20	90	1.5	v	1753.63	-67.5	9.3	1.3	-59.5	-13	-46.5
1753.63	38.50	90	2	h	1753.63	-69.8	9.3	1.3	-61.8	-13	-48.8

Run # 2 : 30MHz -20GHz PCS Band Mid Channel

Indicated		Table	Test Antenna		Substituted		Antenna	Cable	Absolute	Limit	Margin
Frequency MHz	Amp. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Correction	Loss dB	Level dBm	dBm	dB
3759.98	57.33	30	1.3	v	3759.98	-41.1	10.7	2.3	-32.7	-13	-19.7
5640.50	56.12	0	1.6	v	5640.50	-45.2	11.2	3.1	-37.1	-13	-24.1
3759.98	50.60	270	1.4	h	3759.98	-47.7	10.7	2.3	-39.3	-13	-26.3
5640.50	53.50	180	2	h	5640.50	-47.9	11.2	3.1	-39.8	-13	-26.8
2336.60	46.33	90	1.7	v	2336.60	-55.8	9.9	1.6	-47.5	-13	-34.5
7520.05	36.20	180	1.8	v	7520.05	-58.7	11.1	3.5	-51.1	-13	-38.1
2336.60	41.80	90	1.5	h	2336.60	-60.1	9.9	1.6	-51.8	-13	-38.8
7520.05	33.60	90	1.7	h	7520.05	-61.4	11.1	3.5	-53.8	-13	-40.8

§1.1307(b)(1) & §2.1091 - RF EXPOSURE

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

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

f = frequency in MHz
* = Plane-wave equivalent power density

MPE Prediction

Prediction of MPE limit at a given distance

Equation from 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

Cellular band

Maximum peak output power at antenna input terminal: 26.03 (dBm)
Maximum peak output power at antenna input terminal: 400 (mW)
Prediction distance: 20 (cm)
Predication frequency: 836.52 (MHz)
Antenna Gain (typical): 1 (dBi)
Antenna gain: 1.26 (numeric)
Power density at predication frequency at 20 cm: 0.1 (mW/cm^2)

MPE limit for uncontrolled exposure at prediction frequency: 0.558 (mW/cm^2)

PCS band

Maximum peak output power at antenna input terminal: 25.97 (dBm)
Maximum peak output power at antenna input terminal: 395 (mW)
Prediction distance: 20 (cm)
Predication frequency: 1880 (MHz)
Antenna Gain (typical): 1(dBi)
Antenna gain: 1.26 (numeric)
Power density at predication frequency at 20 cm: 0.1 (mW/cm^2)

MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)

Test Result

The EUT is a mobile device. The power density level at 20 cm is 0.1 mW/cm², which is below the uncontrolled exposure limit of 0.558 mW/cm² at 836.52 MHz for Cellular band. The power density level at 20 cm is 0.1 mW/cm², which is below the uncontrolled exposure limit of 1mW/cm² at 1880 MHz for PCS band.

§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	2005-08-08
Agilent	Analyzer, Spectrum	E4446A	US44300386	2005-11-10

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

Environmental Conditions

Temperature:	19° C
Relative Humidity:	58%
ATM Pressure:	1018mbar

** The testing was performed by Daniel Deng on 2005-12-28.*

Test Results

Cellular band, Part22:

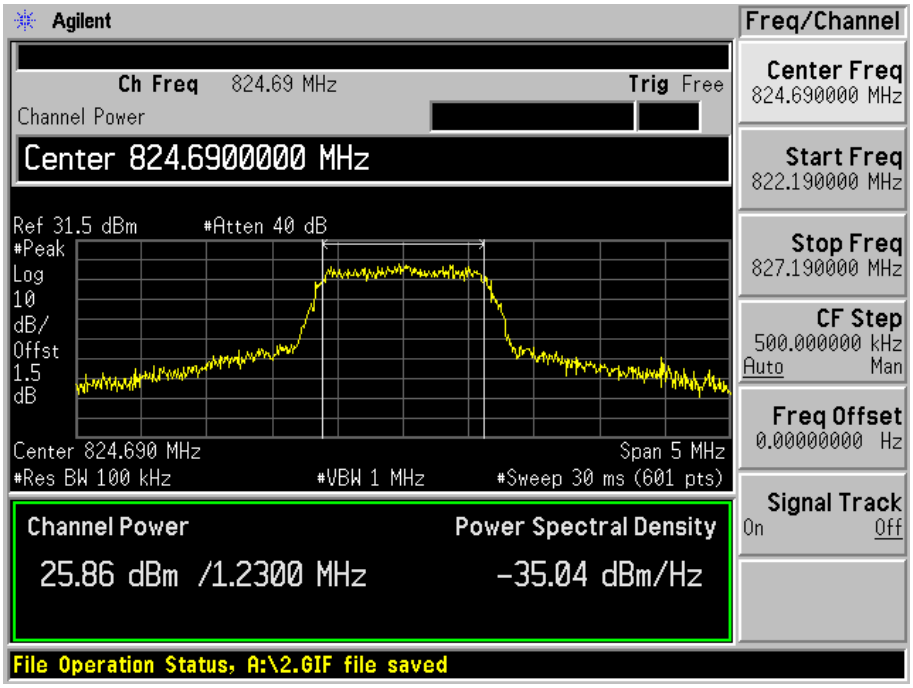
Channel	Frequency (MHz)	Conducted Output Power in dBm	Conducted Output Power in Watt	Calculated ERP Power in Watt	Limit in W (ERP)
LOW	824.69	25.86	0.385	295.8	7
MIDDLE	836.52	26.03	0.400	307.6	7
HIGH	848.31	25.65	0.367	281.8	7

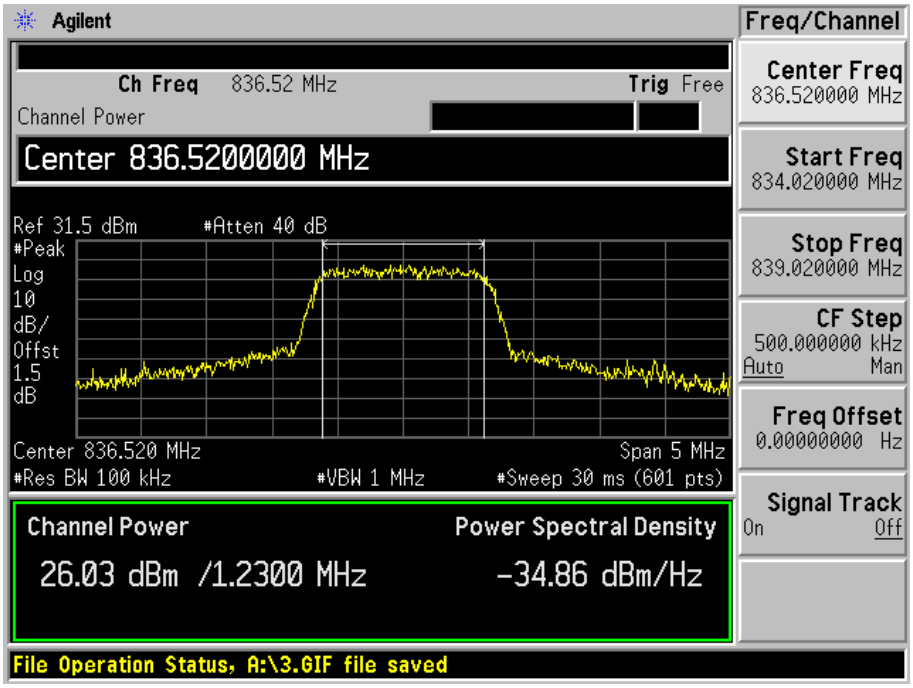
PCS band, Part24:

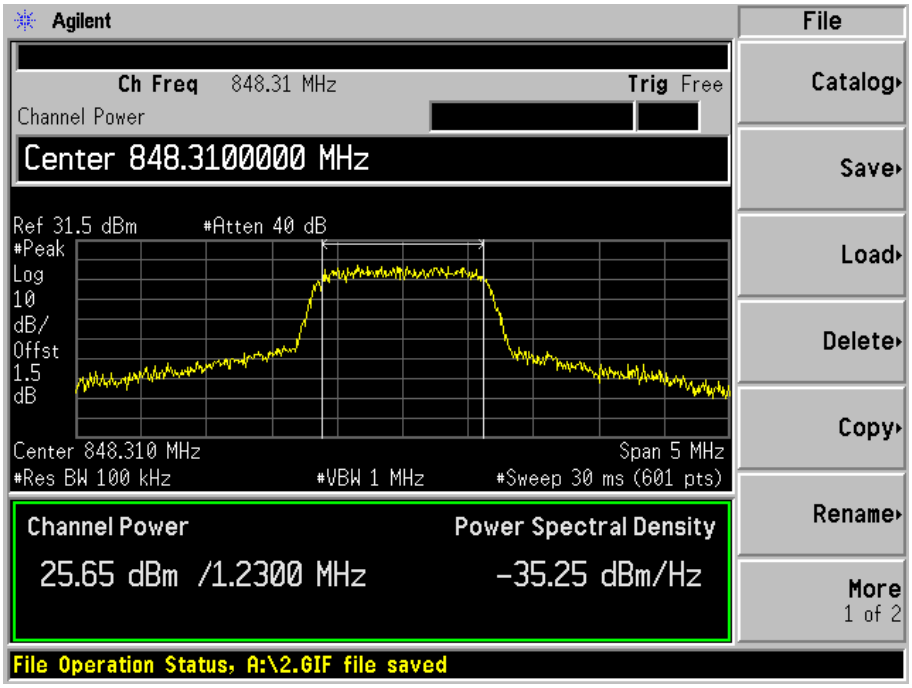
Channel	Frequency (MHz)	Conducted Output Power in dBm	Conducted Output Power in Watt	Calculated EIRP Power in Watt	Limit in W (EIRP)
LOW	1851.25	25.91	0.390	490.9	2
MIDDLE	1880.00	25.97	0.395	497.7	2
HIGH	1908.7	25.89	0.388	488.7	2

Note : The maximum gain for the antenna is 1 dBi.

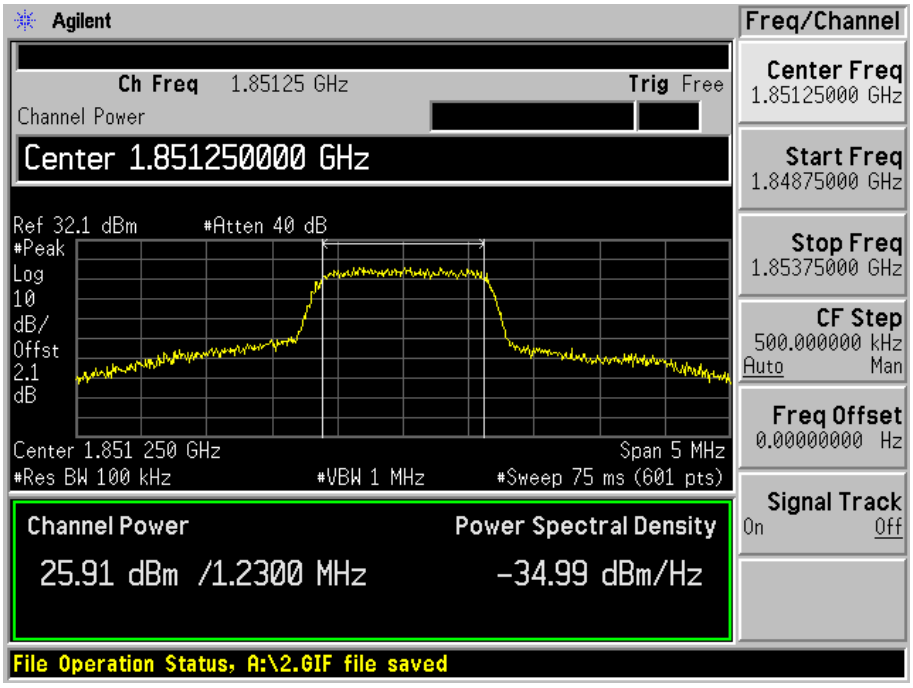
Plots of Conducted Output Power for Part 22

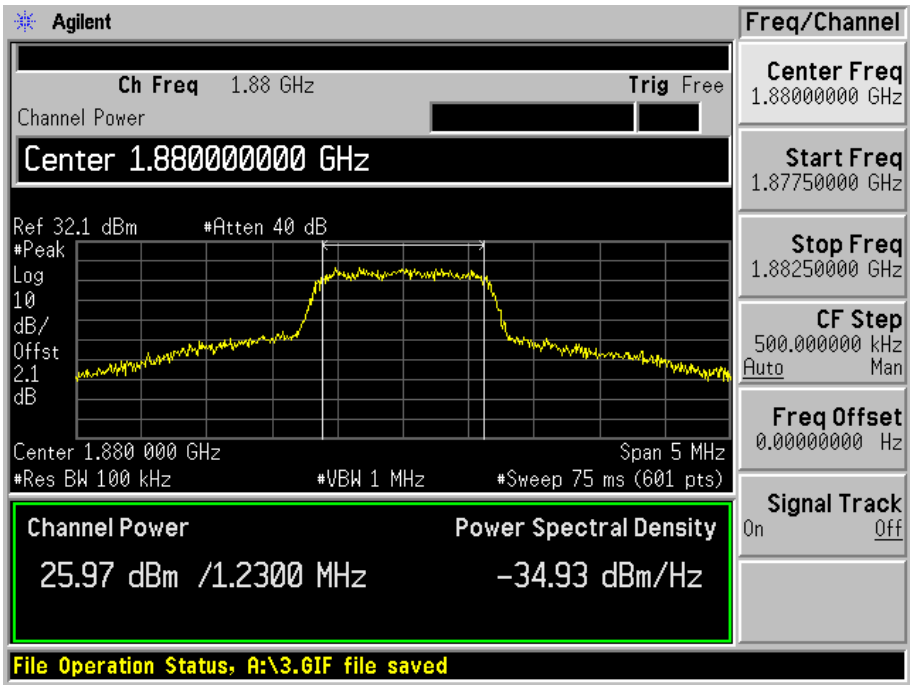


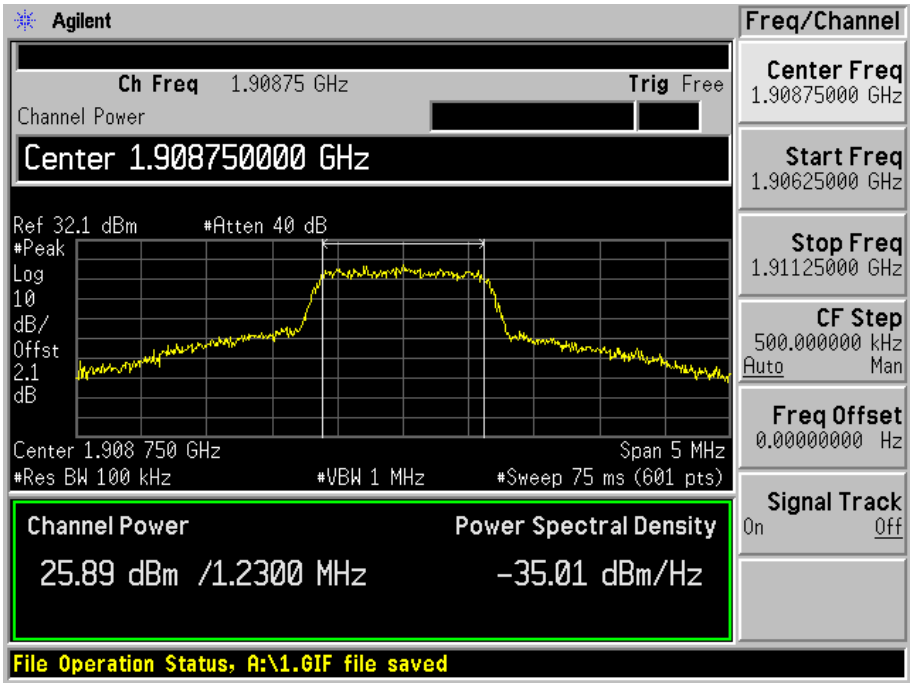




Plots of Conducted Output Power for Part24




Agilent
Freq/Channel
Ch Freq 1.88 GHz
Trig Free
Channel Power
Center 1.880000000 GHz
Ref 32.1 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
2.1
dB
Center 1.880 000 GHz
Span 5 MHz
#Res BW 100 kHz
#VBW 1 MHz
#Sweep 75 ms (601 pts)
Channel Power
25.97 dBm /1.2300 MHz
Power Spectral Density
-34.93 dBm/Hz
Center Freq
1.88000000 GHz
Start Freq
1.87750000 GHz
Stop Freq
1.88250000 GHz
CF Step
500.000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, A:\3.GIF file saved


Agilent
Freq/Channel
Ch Freq 1.90875 GHz
Trig Free
Channel Power
Center 1.908750000 GHz
Ref 32.1 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
2.1
dB
Center 1.908 750 GHz
Span 5 MHz
#Res BW 100 kHz
#VBW 1 MHz
#Sweep 75 ms (601 pts)
Channel Power
25.89 dBm /1.2300 MHz
Power Spectral Density
-35.01 dBm/Hz
Center Freq
1.90875000 GHz
Start Freq
1.90625000 GHz
Stop Freq
1.91125000 GHz
CF Step
500.000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, A:\1.GIF file saved

§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 30/47 (Cellular /PCS) 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	2005-08-08
Agilent	Analyzer, Spectrum	E4446A	US44300386	2005-11-10

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

Environmental Conditions

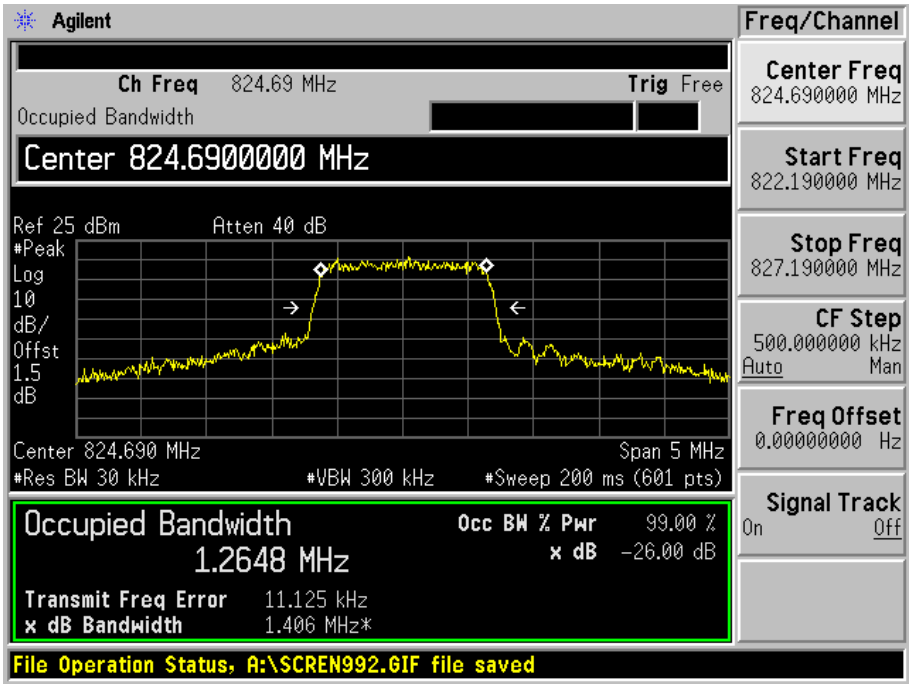
Temperature:	19° C
Relative Humidity:	58%
ATM Pressure:	1018 mbar

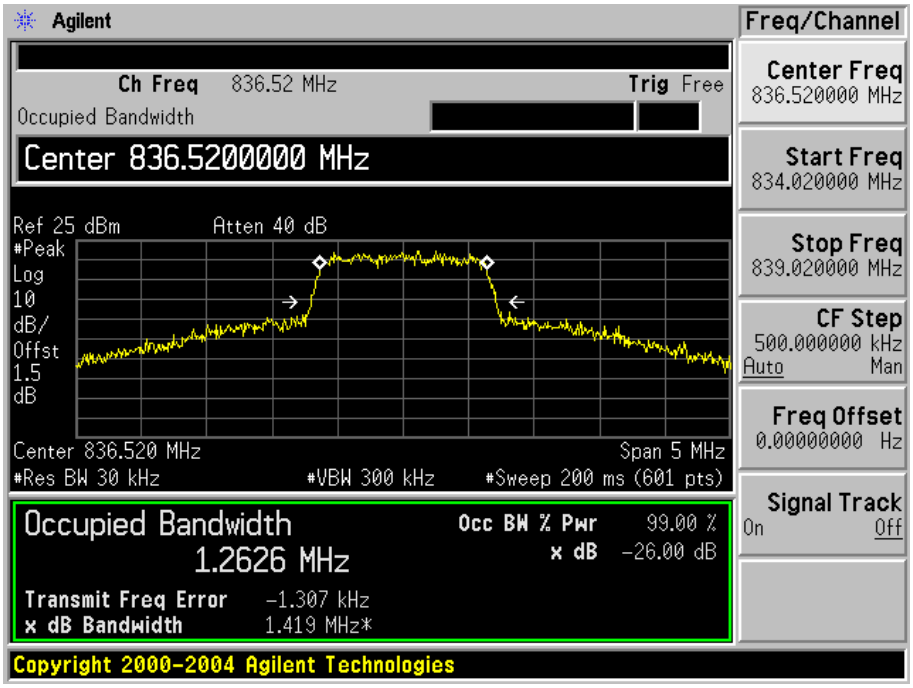
** The testing was performed by Daniel Deng on 2005-12-28.*

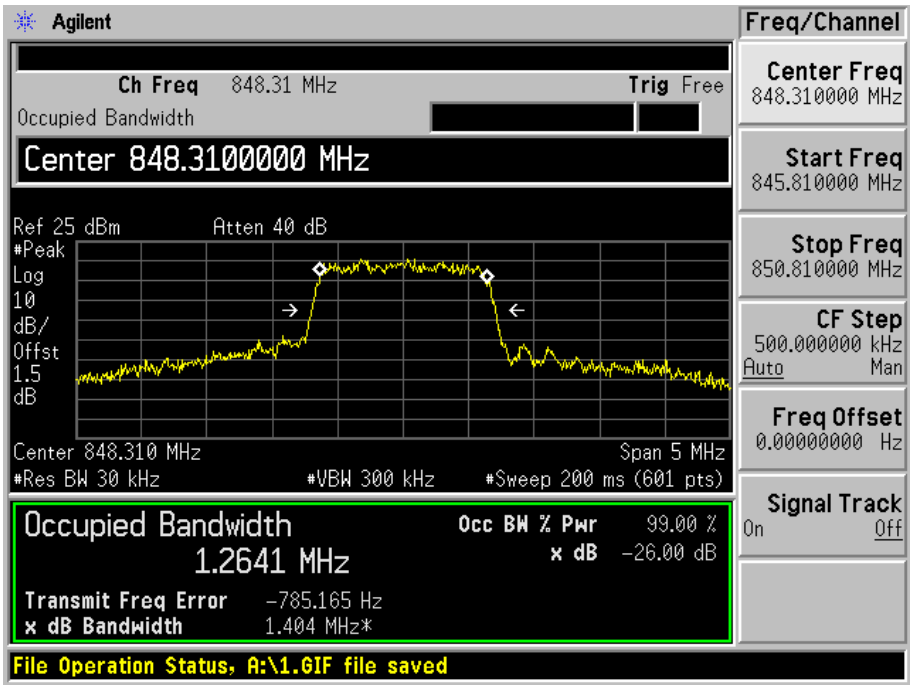
Test Results

Please refer to the following plots.

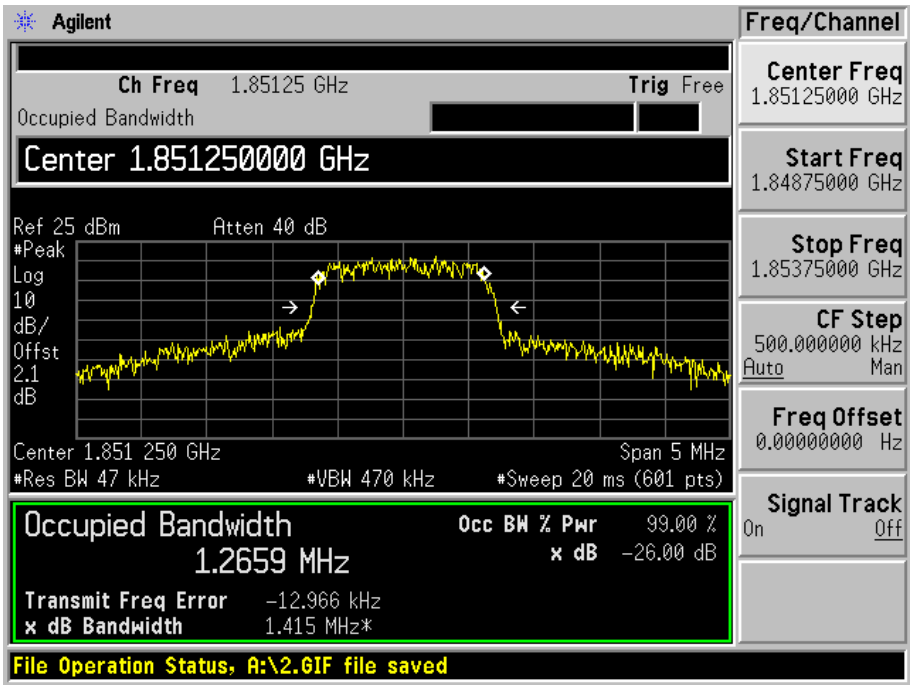
Plots of Occupied Bandwidth for Part22

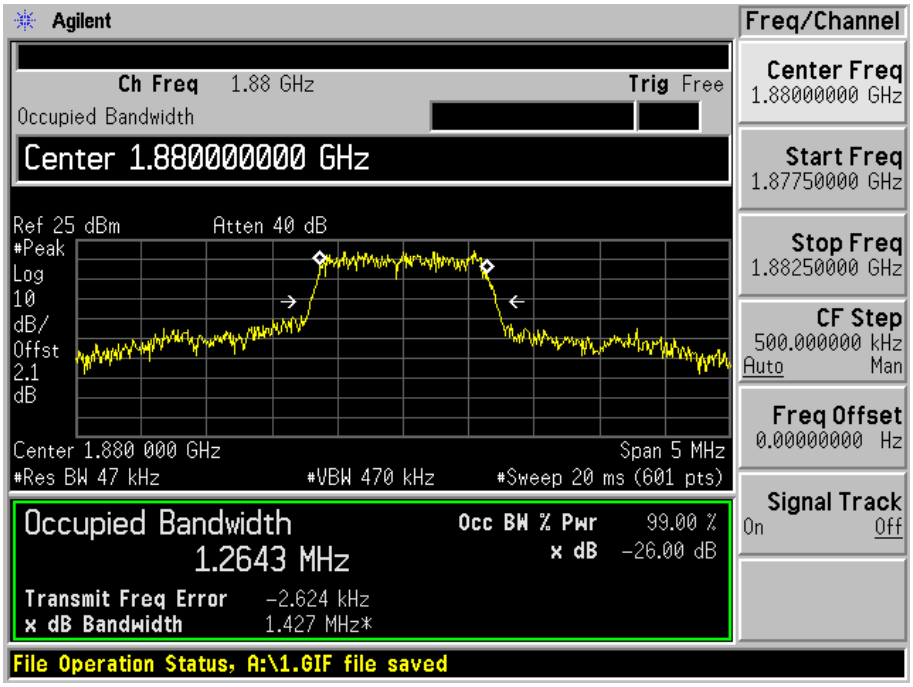


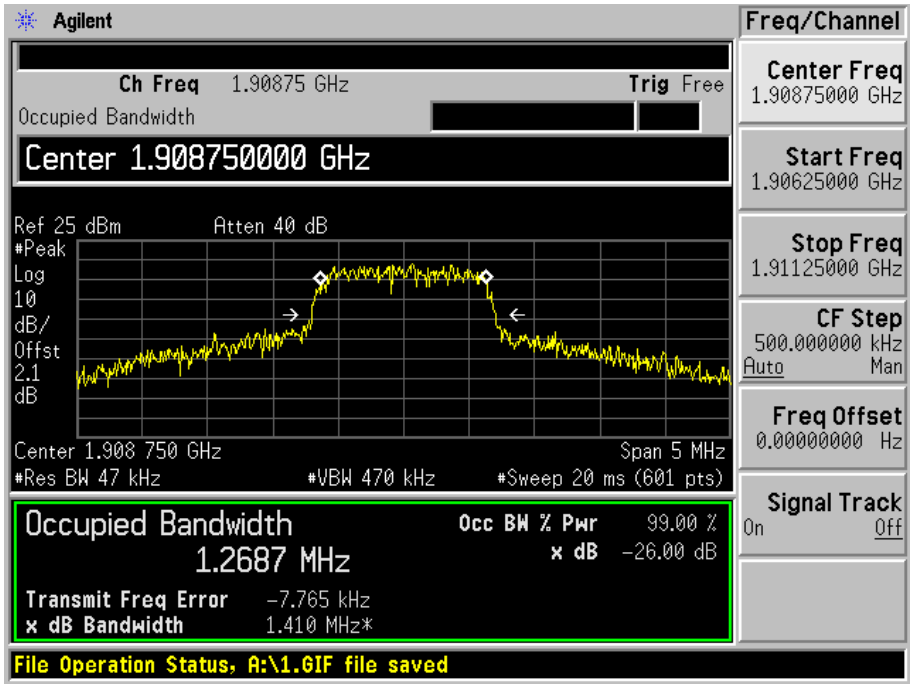




Plots of Occupied Bandwidth for Part24




Agilent
Freq/Channel
Ch Freq 1.88 GHz
Trig Free
Occupied Bandwidth
Center 1.880000000 GHz
Ref 25 dBm
Atten 40 dB
#Peak
Log
10
dB/
Offst
2.1
dB
Center 1.880 000 GHz
Span 5 MHz
#Res BW 47 kHz
#VBW 470 kHz
#Sweep 20 ms (601 pts)
Occupied Bandwidth
1.2643 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -2.624 kHz
x dB Bandwidth 1.427 MHz*
Center Freq
1.88000000 GHz
Start Freq
1.87750000 GHz
Stop Freq
1.88250000 GHz
CF Step
500.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, A:\1.GIF file saved


Agilent
Freq/Channel
Ch Freq 1.90875 GHz
Trig Free
Occupied Bandwidth
Center 1.908750000 GHz
Ref 25 dBm
Atten 40 dB
#Peak
Log
10
dB/
Offst
2.1
dB
Center 1.908 750 GHz
Span 5 MHz
#Res BW 47 kHz
#VBW 470 kHz
#Sweep 20 ms (601 pts)
Occupied Bandwidth
1.2687 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -7.765 kHz
x dB Bandwidth 1.410 MHz*
Center Freq
1.90875000 GHz
Start Freq
1.90625000 GHz
Stop Freq
1.91125000 GHz
CF Step
500.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, A:\1.GIF file saved

§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 10^{th} harmonic.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	2005-08-08
Agilent	Analyzer, Spectrum	E4446A	US44300386	2005-11-10

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

Environmental Conditions

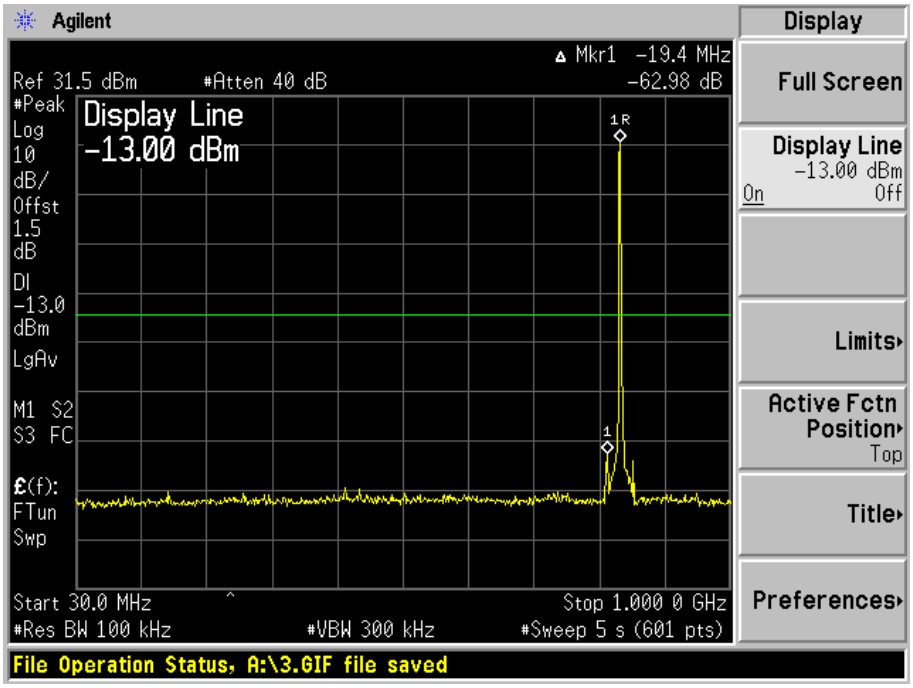
Temperature:	19° C
Relative Humidity:	58%
ATM Pressure:	1018 mbar

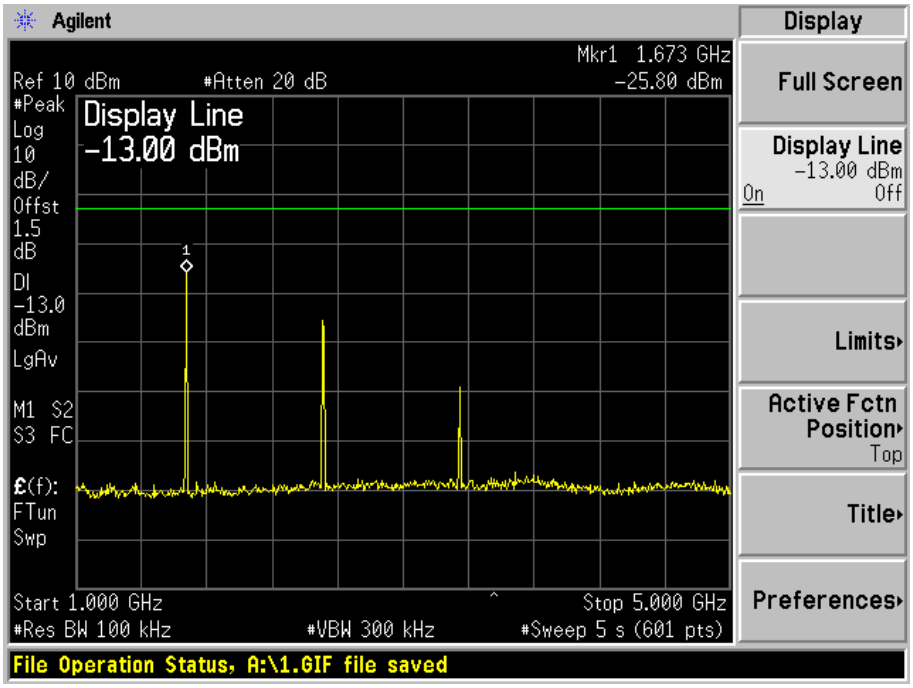
** The testing was performed by Daniel Deng on 2005-12-28.*

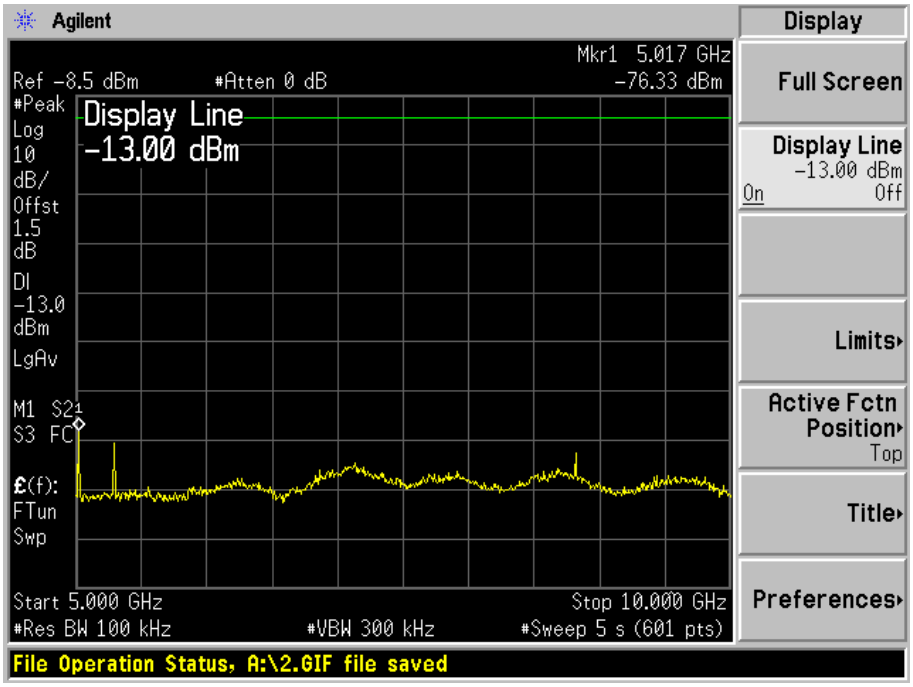
Test Results

Please refer to the hereinafter plots.

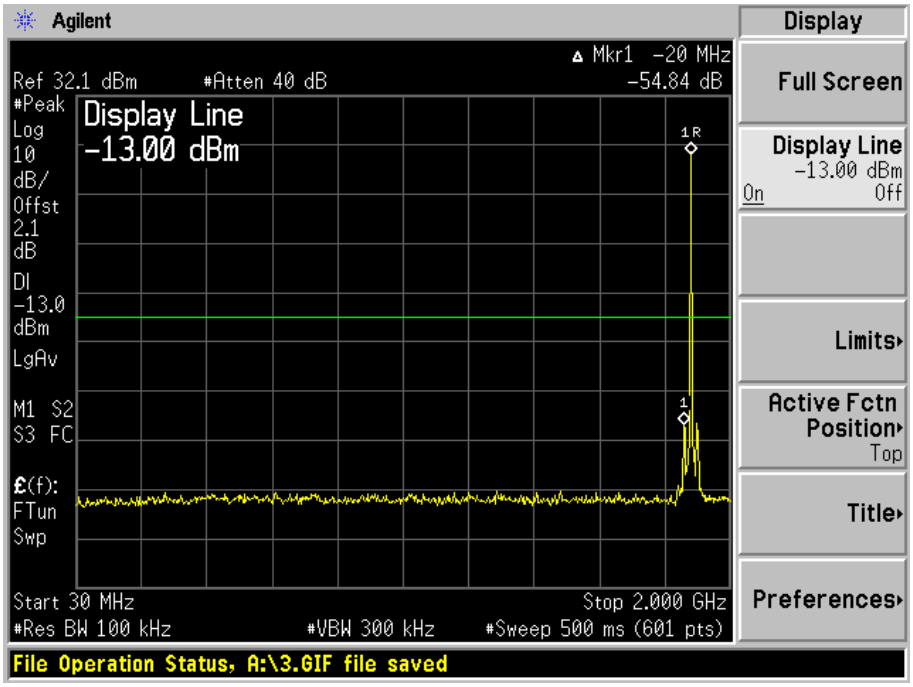
Plots of Spurious Emission for Part22

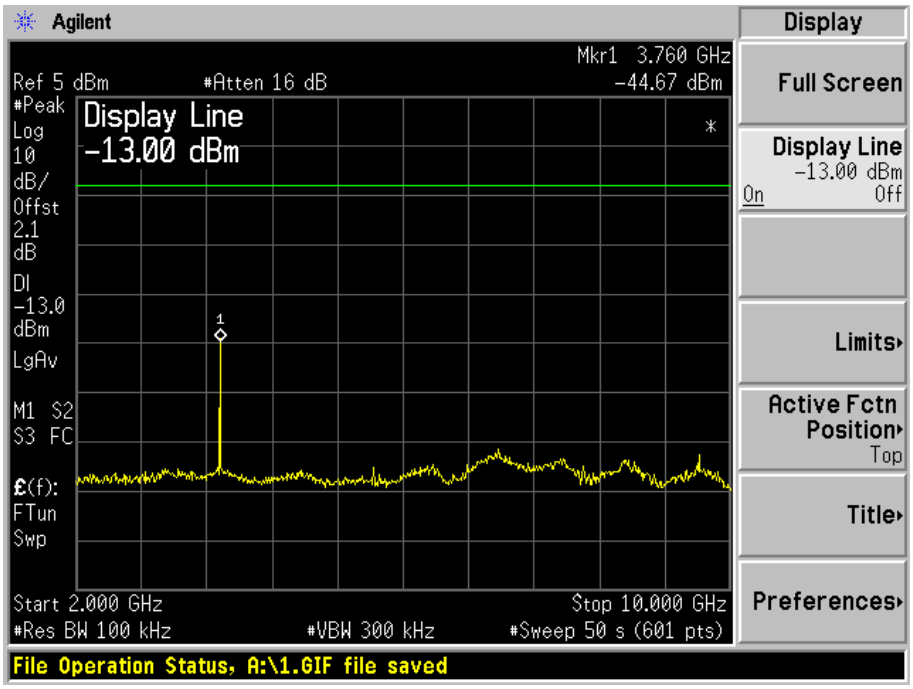


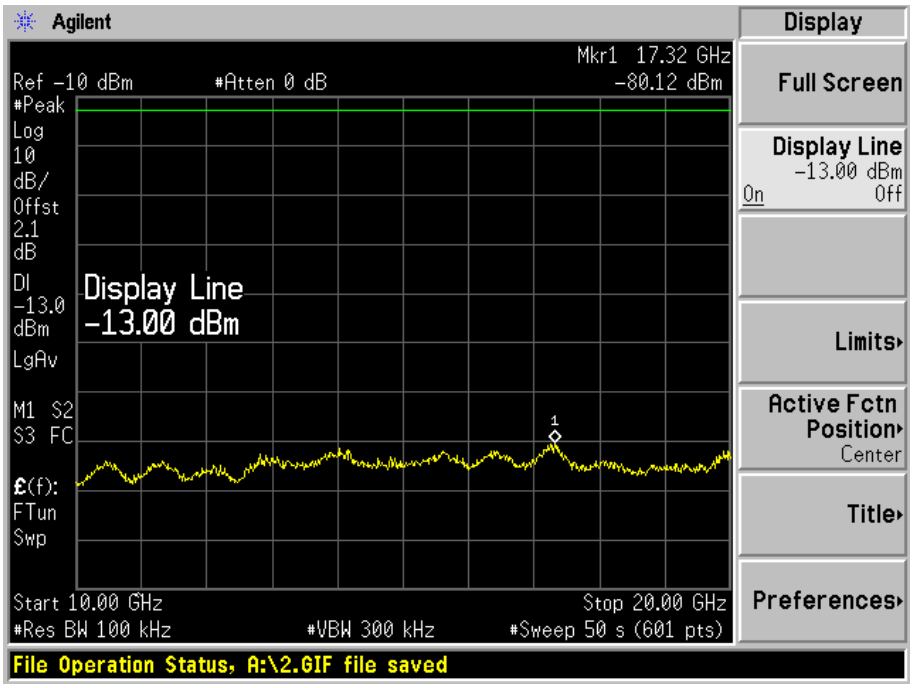




Plots of Spurious Emission for Part24




Agilent
Display
Mkr1 3.760 GHz
Ref 5 dBm
#Atten 16 dB
-44.67 dBm
#Peak
Log
10
dB/
Offst
2.1
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Display Line
-13.00 dBm
Start 2.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 50 s (601 pts)
Full Screen
Display Line
-13.00 dBm
On
Off
Limits
Active Fctn
Position
Top
Title
Preferences
File Operation Status, A:\1.GIF file saved


Agilent
Display
Mkr1 17.32 GHz
Ref -10 dBm
#Atten 0 dB
-80.12 dBm
#Peak
Log
10
dB/
Offst
2.1
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Display Line
-13.00 dBm
Start 10.00 GHz
Stop 20.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 50 s (601 pts)
Full Screen
Display Line
-13.00 dBm
On
Off
Limits
Active Fctn
Position
Center
Title
Preferences
File Operation Status, A:\2.GIF file saved

§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 110% 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	2005-08-08
Agilent	Analyzer, Spectrum	E4446A	US44300386	2005-11-10
Tenney	Oven, Temperature	VersaTenn	12.222-193	2005-06-04

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

Environmental Conditions

Temperature:	19° C
Relative Humidity:	58%
ATM Pressure:	1018 mbar

** The testing was performed by Daniel Deng on 2005-12-28.*

Test Results

Cellular Band

Reference Frequency: 836.52 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency error (HZ)	PPM Error
50	3.5	13.5	0.017
40	3.5	12.6	0.015
30	3.5	13.5	0.017
20	3.5	8.5	0.010
10	3.5	13.9	0.017
0	3.5	12.7	0.015
-10	3.5	15.5	0.019
-20	3.5	18.2	0.022
-30	3.5	17.6	0.021

Frequency Stability Versus Voltage

Reference Frequency: 836.52 MHz, Limit: 2.5ppm

Power Supplied (VDC)	Environment Temperature (°C)	Frequency error (HZ)	PPM Error
3.2	20	10.1	0.012

PCS Band

Frequency Stability Versus Temperature

Reference Frequency: 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency error (HZ)	PPM Error
50	3.5	33.5	0.018
40	3.5	30.5	0.016
30	3.5	25.9	0.014
20	3.5	23.5	0.013
10	3.5	20.6	0.011
0	3.5	22.5	0.012
-10	3.5	21.6	0.011
-20	3.5	26.6	0.014
-30	3.5	35.2	0.019

Frequency Stability Versus Voltage

Reference Frequency: 1880 MHz, Limit: 2.5ppm			
Power Supplied (VDC)	Environment Temperature (°C)	Frequency error (HZ)	PPM Error
3.2	20	25.5	0.014

§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	2005-08-08
Agilent	Analyzer, Spectrum	E4446A	US44300386	2005-11-10

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

Environmental Conditions

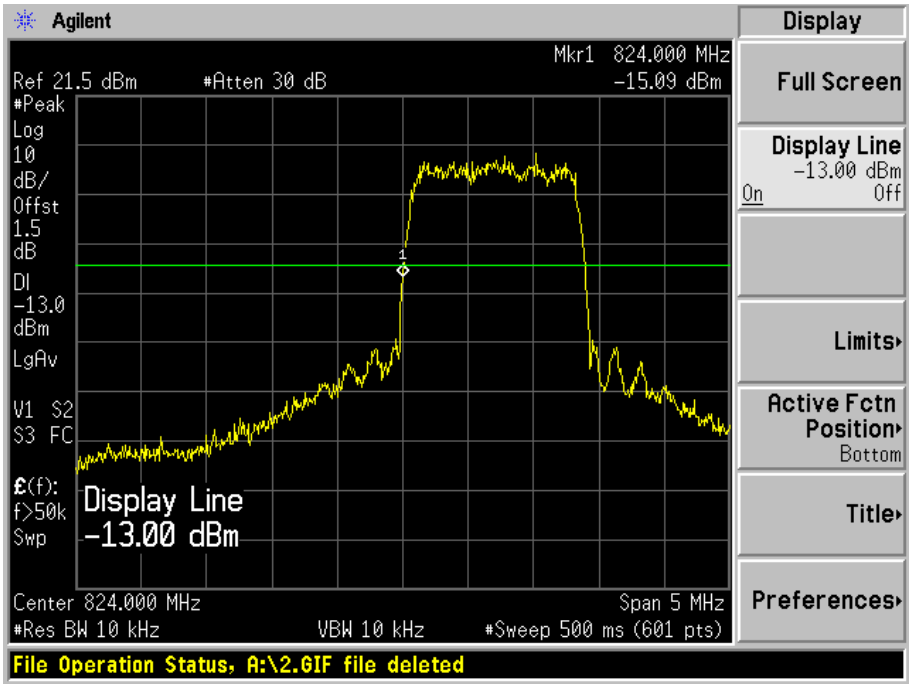
Temperature:	19° C
Relative Humidity:	58%
ATM Pressure:	1018 mbar

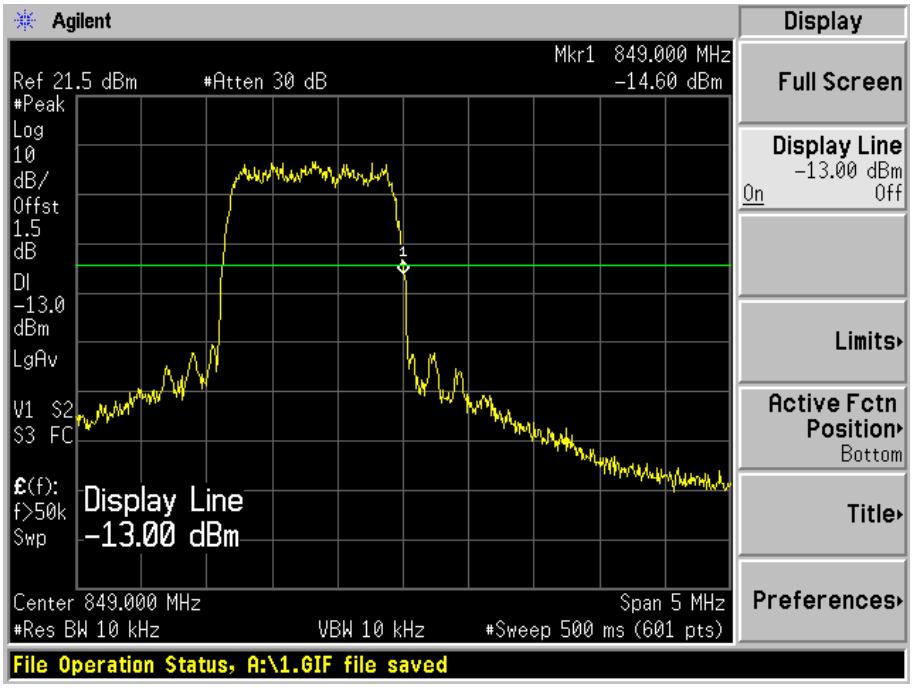
** The testing was performed by Daniel Deng on 2005-12-28.*

Test Results

Please refer to the following plots.

Plots of Band Edge for Part 22





Plots of Band Edge for Part 24