

FCC PART 22H

MEASUREMENT AND TEST REPORT

For

New POS Technology Ltd.6FRM, 6F, China Economic Trade Building, 7Rd Zizhu,
Zhuzilin, Futian District, 518034 ShenZhen, China.**FCC ID: WALNEW8110**

Report Type:	Product Type:
<input checked="" type="checkbox"/> Original Report	CDMA Mobile Payment Terminal
Test Engineer:	Xiao Ming Hu 
Report Number:	R0805153-22
Report Date:	2008-06-05
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* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk “*”

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The New POS Technology, Ltd. 's product, FCC ID: WALNEW8110 model: NEW 8110 is a Powerful mobile payment terminal provided by NEW POS TECHNOLOGY LIMITED, with secure ARM9 CPU, 24M large memory, compact design, and supports GPRS, CDMA or WIFI wireless communication methods and multi-application. NEW POS TECHNOLOGY LIMITED is a high tech company registered in Shenzhen China; focus on EFT-POS terminal R&D, Sales and providing related Service. Our goal is to become a leading Professional EFT-POS Terminal Vendor in China. The EUT operates on GSM and GPRS modulation techniques. It is powered by AC/ 12 VDC adapters or by 7.4 V rechargeable battery pack.

Mechanical Description

The EUT is of plastic construction and measures approximately 215 mm (L) x 89.5 mm (W) x 62.8 mm (H) and weighs approximately 566 g.

** The test data gathered are from typical production sample, serial number: 10000056, provided by the manufacturer.*

EUT Photo



Please see additional photos in Exhibit C

Objective

This type approval report is prepared on behalf of *New POS Technology, Ltd.* in accordance with Part 2, Subpart J Part 22 Subpart H of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristic, occupied bandwidth, spurious emissions 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 - Cellular Radiotelephone Service

Applicable Standards: TIA EIA 98-C, TIA/EIA603-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.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the 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 values ranging from ± 2.0 dB for Conducted Emissions tests and ± 4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

Detailed instrumentation measurement uncertainties can be found in BACL Corp. report QAP-018.

Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test sites at BACL have 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 radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: C-2463 and R-2698. 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.

Equipment Modifications

No modifications were made to the EUT.

Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
Jewel	AC Adapter	JS-12030-2E	-
Shenzhen B&K Electronics Co., Ltd	7.4V Battery pack	E425085	BK08040400100

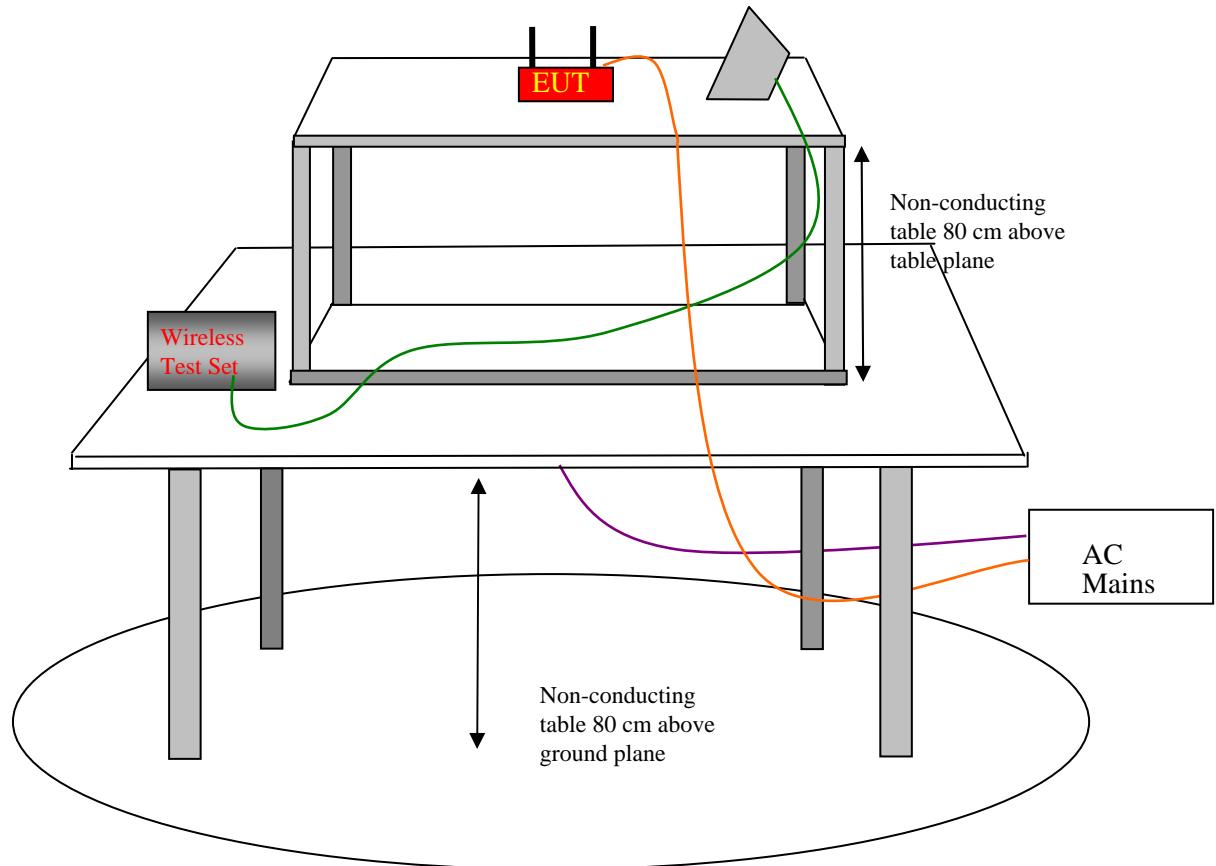
**Battery pack was freshly and completely charged before the start of testing*

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Agilent	Wireless Communications Test Set	8960 Series 10 E5515C	GB44051221
Mini-Circuits	Splitter	ZFRSC-42	SF874700404

Interface Ports and Cabling

Cable Description	Length (m)	From	To
RF cable	0.2	Communications test set	Splitter
RF cable	0.2	Antenna port on EUT	Splitter

Test setup Block Diagram for radiated emissions tests

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 2.1047	Modulation Characteristics	N/A
§ 2.1053	Field Strength of Spurious Radiation	Compliant
§2.1093	RF Exposure	Compliant Please See SAR report R0805153- SAR
§ 2.1046, § 22.912 (d)	RF Output Power	Compliant
§ 2.1049 § 22.917 § 22.905	Out of Band Emissions, Occupied Bandwidth	Compliant
§ 2.1051, § 22.917	Spurious Emissions at Antenna Terminals	Compliant
§ 2.1055 (a) § 2.1055 (d) § 22.355	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§ 22.917	Band Edge	Compliant

§2.1047 - MODULATION CHARACTERISTIC

Applicable Standard

According to FCC § 2.1047(d), part 22H there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

§1.1307(b) (1) & §2.1093 - RF EXPOSURE

Applicable Standard

CFR47 §1.1310 and §2.1093.

Test Result

Compliant: The EUT is a portable device and thus requires SAR evaluation, please see BACL SAR report R0805153-SAR for measurement and testing details.

§2.1053 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

Requirements: CFR 47, § 2.1053, § 22.917.

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 = $43 + 10 \log_{10} (\text{power out in Watts})$

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

* The testing was performed by Xiao Ming Hu on 2008-06-04.

Test Equipment List and Details

Manufacturer	Description		Model	Serial Number	Calibration Date
HP	Generator, Signal		83650B	3426A00417	2008-05-28
HP	Pre amplifier		8447D	2944A07030	2007-11-12
Agilent	Pre amplifier		8449B	3008A01978	2007-11-02
Antenna Research Associates, Inc.	Horn Antenna		DRG-118/A	1132	2007-06-18
Rohde & Schwarz	EMI Test Receiver		ESCI 1166.595 0K03	1000337	2008-04-21
Sunol Science	System Controller		SC99V	122303-1	NR
Agilent	Spectrum analyzer		E4440A	MY44303352	2008-04-28

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

6.4 Test Result

Worst case reading as follows:

-21.20 dB at 3346.08 MHz in the Vertical Polarization

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

Indicated		Table Angle (Degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Freq. (MHz)	Amp. (dBuV)	Height (m)	Polar (H/V)	Freq. (MHz)	Level (dBm)	Ant. Correction (dB)	Cable Loss (dB)	
3346.08	59.27	140	1.78	V	3346.08	-43.1	10.2	1.30	-34.20	-13	-21.20
3346.08	52.66	140	1.90	H	3346.08	-45.3	10.2	1.30	-36.40	-13	-23.40
2509.56	49.23	160	1.41	V	2509.56	-49.7	9.0	1.13	-41.83	-13	-28.83
1673.04	59.32	180	1.86	V	1673.04	-49.9	8.9	0.86	-41.86	-13	-28.86
1673.04	56.00	180	1.76	H	1673.04	-51.4	8.9	0.86	-43.36	-13	-30.36
2509.56	48.17	160	2.50	H	2509.56	-52.1	9.0	1.13	-44.23	-13	-31.23
1399.251	50.17	0	1.37	V	1399.251	-58.5	8.2	0.76	-51.06	-13	-38.06
1399.251	48.75	0	1.84	H	1399.251	-59.5	8.2	0.76	-52.06	-13	-39.06

7 - §2.1046, §22.913(a) – RF OUTPUT POWER

7.1 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.

7.2 Test Procedure

Conducted:

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

Radiated Output Power (ERP)

TIA 603-C Section 2.2.17

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

* The testing was performed by Xiao Ming Hu on 2008-06-04.

7.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
HP	Generator, Signal	83650B	3426A00417	2008-05-28
HP	Pre amplifier	8447D	2944A07030	2007-11-12
Agilent	Pre amplifier	8449B	3008A01978	2007-11-02
Antenna Research Associates, Inc.	Horn Antenna	DRG-118/A	1132	2007-06-18
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.595 0K03	1000337	2008-04-21
Sunol Science	System Controller	SC99V	122303-1	NR
Agilent	Spectrum analyzer	E4440A	MY44303352	2008-04-28

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

7.4 Test Results

Conducted Output Power:

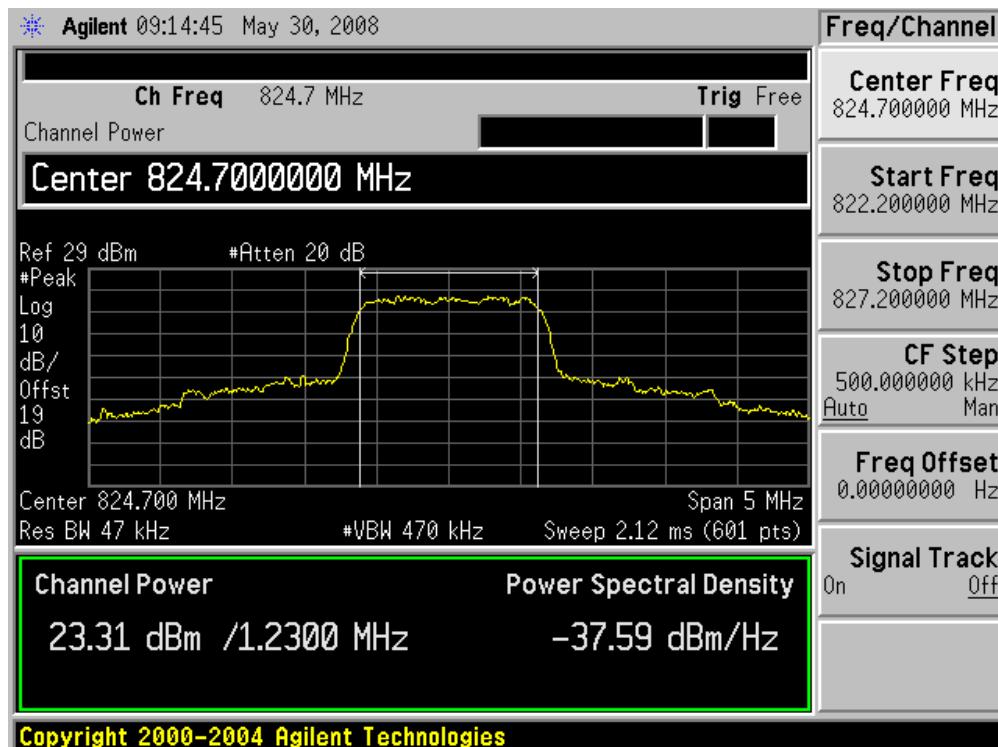
Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)
Low	824.70	23.31	38.45
Mid	836.52	23.38	38.45
High	848.31	23.39	38.45

Effective Radiated Power (ERP):

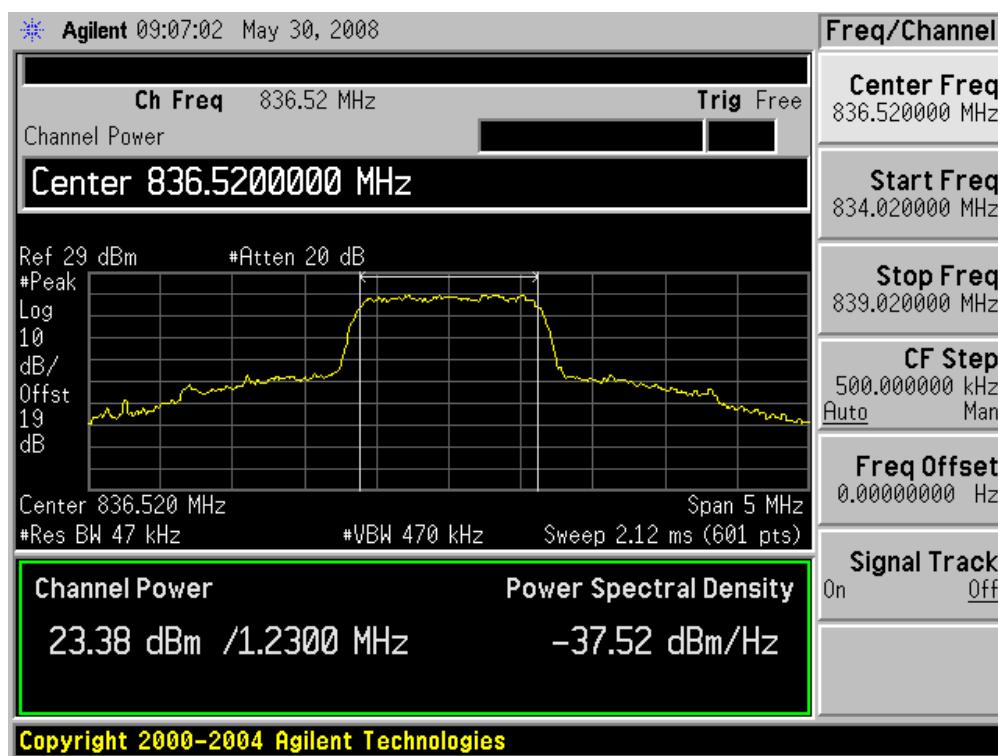
Indicated		Table Angle (Degree)	Test Antenna		Substituted				ERP (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar (H/V)	Freq. (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)			
824.70	90.00	242	1.00	H	824.70	17.43	6.3	0.5	23.23	38.45	-15.22
836.52	90.08	246	1.00	H	836.52	17.05	6.3	0.5	22.85	38.45	-15.60
848.31	91.08	240	1.00	H	848.31	17.30	6.3	0.5	23.10	38.45	-15.35

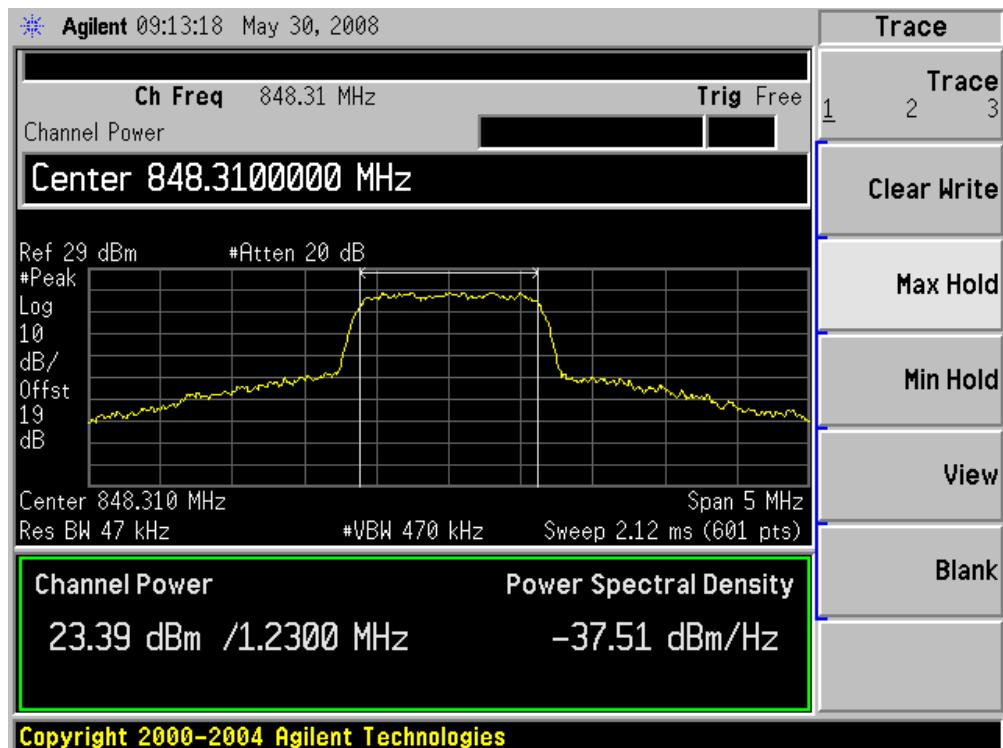
Plots of Conducted Output Power for Part 22H

Low Channel



Middle Channel



High Channel

8 - §2.1049, §22.917 - OCCUPIED BANDWIDTH

8.1 Applicable Standard

Requirements: CFR 47, § 2.1049, § 22.917.

8.2 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 kHz (Cellular /PCS) and the 26 dB & 99% bandwidth was recorded.

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

* The testing was performed by Xiao Ming Hu on 2008-06-04.

8.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2008-04-28

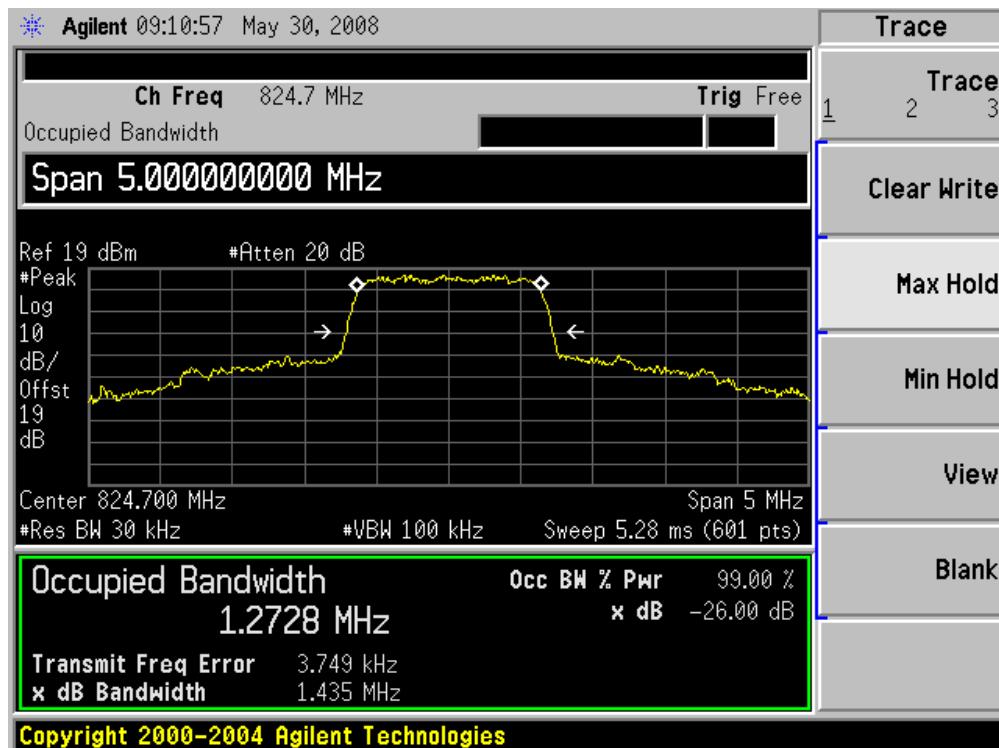
* **Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

8.4 Test Results

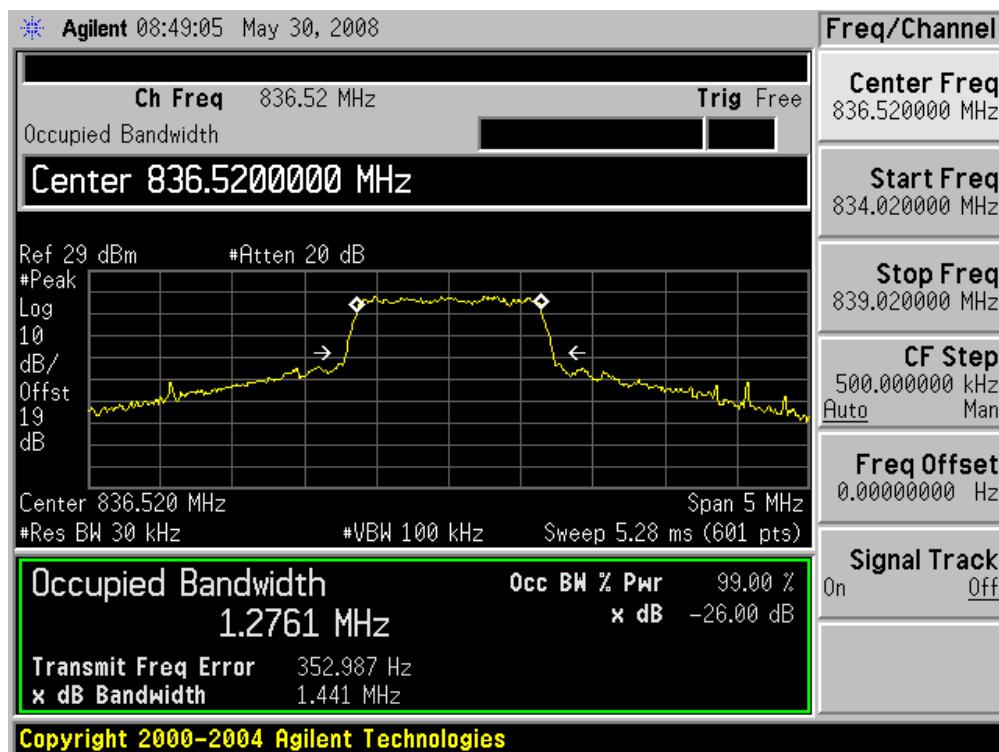
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26 dB Occupied Bandwidth (MHz)
Low	824.70	1.2728	1.435
Middle	836.52	1.2761	1.441
High	848.30	1.2683	1.440

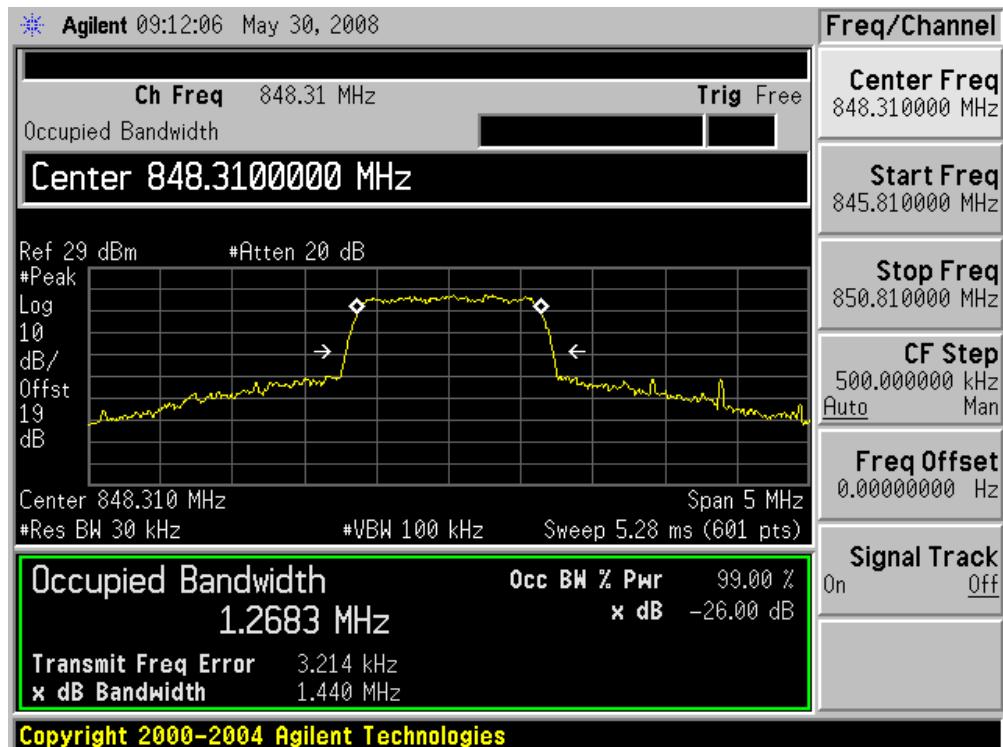
Please refer to the following plots.

Low Channel



Middle Channel



High Channel

9 - §2.1051, §22.917 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

9.1 Applicable Standard

Requirements: CFR 47, § 2.1051. § 22.917.

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

9.2 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.

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

* The testing was performed by Xiao Ming Hu on 2008-06-04.

9.3 Test Equipment List and Details

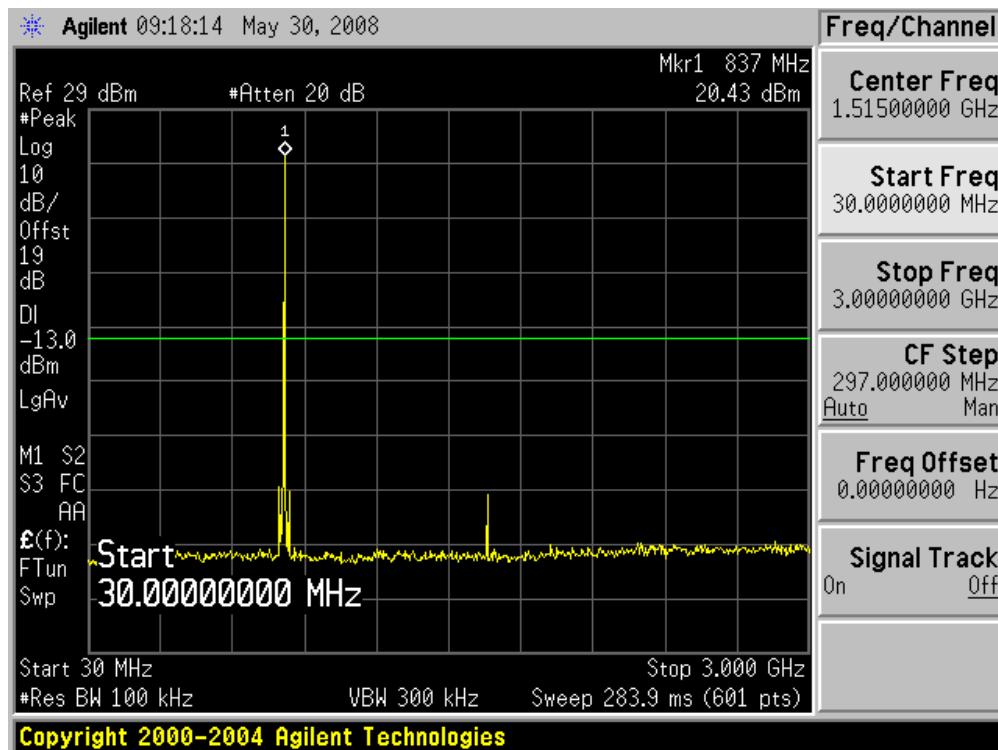
Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2008-04-28

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

9.4 Test Results

Please refer to the hereinafter plots.

Mid Channel



10 - §2.1055 (a), §2.1055 (d), §22.355 - FREQUENCY STABILITY

10.1 Applicable Standard

Requirements: FCC § 2.1055 (a), § 2.1055 (d) & following:

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

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

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 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

10.2 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.

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

* The testing was performed by Xiao Ming Hu on 2008-06-04.

10.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2008-04-28
ESPEC	Oven, Temperature	ESL-4CA	18010	N/R

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

10.4 Test Results

Frequency Stability versus Temperature:

Reference Frequency: 836.52 MHz, Limit: 2.5ppm				
Test Environment		Measured Frequency (MHz)	Measurement Results	
Temperature (°C)	Power Supplied (Vdc)		Error (ppm)	Limit (ppm)
50	7.4	836.520	0	2.5
30	7.4	836.520	0	2.5
20	7.4	836.518	-2.39	2.5
0	7.4	836.520	0	2.5

Frequency Stability versus Voltage:

Reference Frequency: 836.52 MHz, Limit: 2.5ppm				
Test Environment		Frequency Error (Hz)	Measurement Results	
Temperature (°C)	Power Supplied (Vdc)		Error (ppm)	Limit (ppm)
20	6.29	836.522	2.39	2.5

11 – §22.917 – BAND EDGE

11.1 Applicable Standard

According to § 22.917, the power of any emissions 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.

11.2 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 10 kHz.

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

* The testing was performed by Xiao Ming Hu on 2008-06-04.

11.3 Test Equipment List and Details

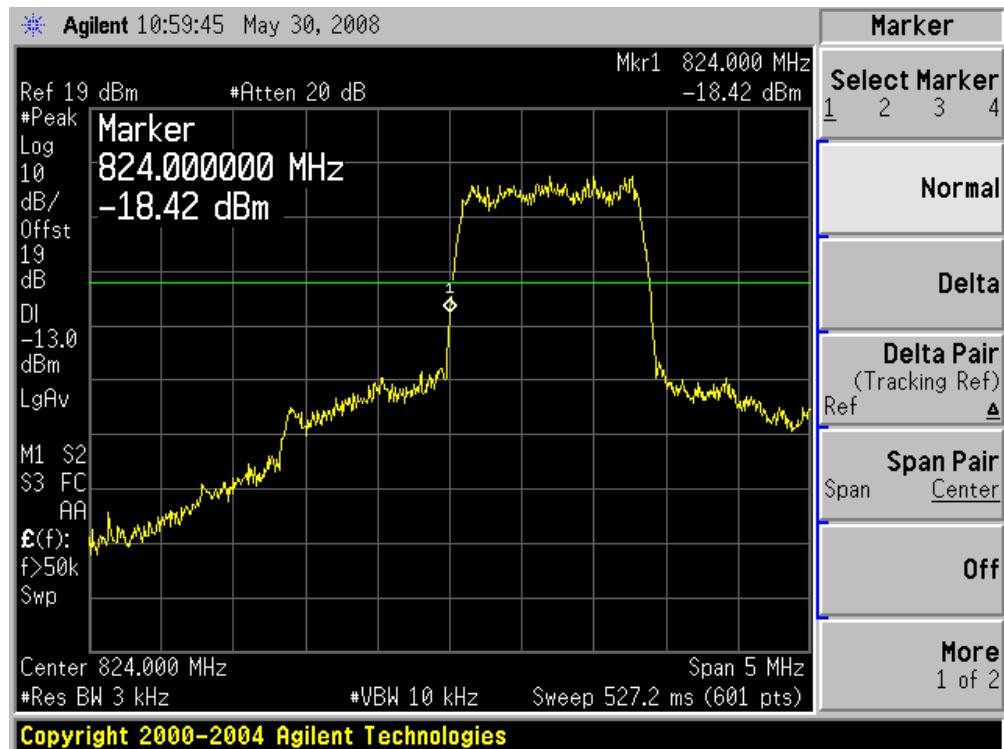
Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2008-04-28

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

11.4 Test Results

Please refer to the following plots.

Lowest Channel



Highest Channel

