


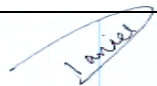
FCC PART 90 TYPE APPROVAL MEASUREMENT AND TEST REPORT

For

Kirmuss & Associates / Infinity Advance Technologies

13401 West 43rd Drive, Unit 11,
Golden, CO 80403, USA

FCC ID: ULXQZPUXING02
MODEL: PX-777

Report Type: <input checked="" type="checkbox"/> Class II Permissive Change	Product Type: VHF Portable Two-Way Radio
Test Engineer: Dan Corona	
Report Number: R0705037-90	
Report Date: 2007-05-15	
Reviewed By: Daniel Deng	
Prepared By (ct)	Bay Area Compliance Laboratories Corp. (BACL) 1274 Anvilwood Ave. Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732 9164

Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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1 GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *Kirmuss & Associates / Infinity Advanced Technologies* product, FCCID: *ULXQZPUXING02*, model number: *PX-777* or the "EUT" as referred to in this report is a VHF Portable Two-way Radio (operating frequency 136.00500 to 173.98750 MHz) using FM modulation. Rated input voltage: DC 7.2 V battery.

** The test data gathered are from production sample, serial number 070317B0002, provided by the manufacturer, EUT was received on 2007-05-03.*

1.2 Mechanical Description

The *Kirmuss & Associates / Infinity Advanced Technologies* product, FCCID: *ULXQZPUXING02*, model number: *PX-777* measures approximately 240 mmL x 60 mmW x 35 mmH and weighs 220g (Including battery).

** The test data gathered are from a production sample, serial number: 070317B0002, provided by the manufacturer.*

1.3 EUT Photo



Additional photos in Exhibit C

1.4 Objective

This type approval report is prepared on behalf of *Kirmuss & Associates / Infinity Advanced Technologies* in accordance with Part 2, Subpart J, and Part 90, Subpart F of the Federal Communication Commissions rules.

The objective is to determine continued compliance with FCC Part 90 rules for Radiated Emissions, Frequency Stability, Output Power, Spurious Emissions at Antenna Terminal, and Occupied Bandwidth after the class II permissive change made by *Kirmuss & Associates / Infinity Advanced Technologies*.

This Class II Permissive Change, extends the frequency of operation to include the 136-150 MHz.

FCCID: ULXQZPUXING02 is electrically identical to the FCC ID: UBYQZPUXING02 tested by Bay Area Compliance Lab Corp. (ShenZhen) report number: RSZ06052903 except the frequency expansion of the EUT. Please refer to *Kirmuss & Associates / Infinity Advanced Technologies* description letter filed along with this submission.

1.5 Related Submittal(s)/Grant(s)

This is a Class II Permissive Change application. The original application was granted on 2006-08-09. Please refer to original report, which was prepared by Bay Area Compliance Lab Corp. (ShenZhen), report number: RSZ06052903 (FCC ID: UBYQZPUXING02).

1.6 Test Methodology

All measurements contained in this report were conducted in accordance with TIA/EIA 603-C.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp.

1.7 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.

1.8 Test Facility

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

The 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 have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11, 1997 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 have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: R-2463 and C-2698. 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 Corp. 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>.

2 SYSTEM TEST CONFIGURATION

2.1 Justification

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

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

2.2 EUT Exercise Software

The EUT was operating at maximum power during radiated and conducted testing.

2.3 Special Accessories

NA

2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Local Support Equipment List and Details

None.

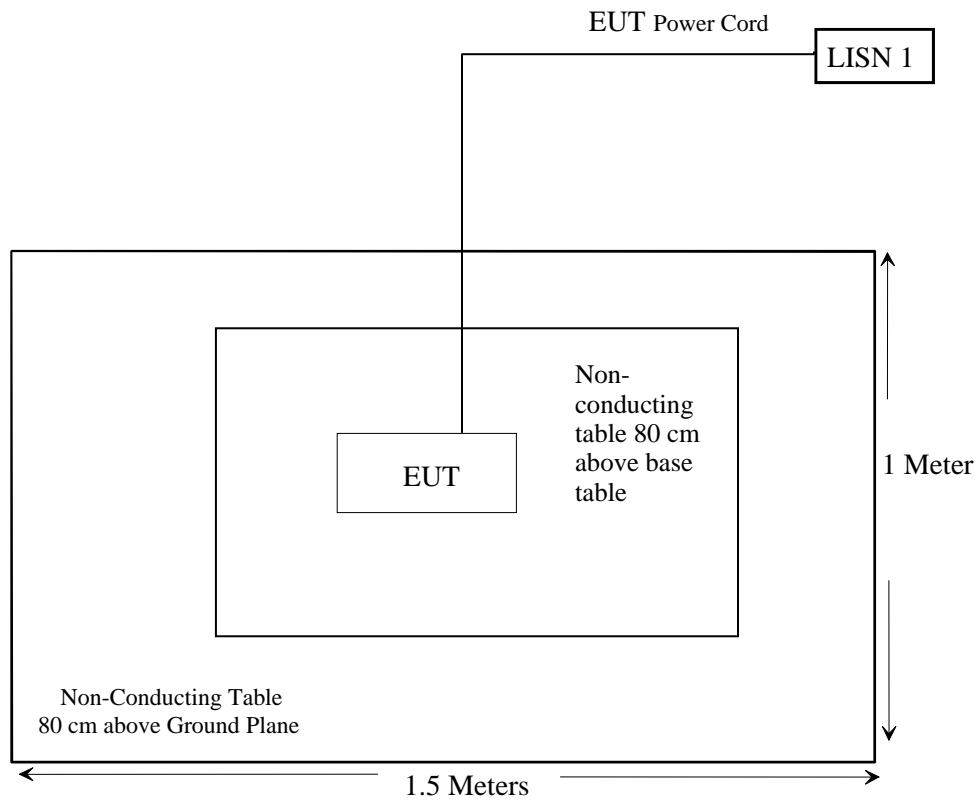
2.6 Power Supply Information

None.

2.7 External I/O Cabling List and Details

None.

2.8 Test Setup Block Diagram



3 SUMMARY OF TEST RESULTS

Fcc Rules	Description Of Test	Result
§1.1310 §2.1093	RF Exposure	Not Required
§2.1046, §902.05	Conducted Output Power	Compliant
§2.1046, §90.205	Radiated Output Power	Compliant
§2.1047 §90.207	Modulation Characteristic	Compliant
§2.1049, §90.209	Occupied Bandwidth	Compliant
§2.1051 §90.210	Spurious Emission at Antenna Terminal	Compliant
§ 2.1053 § 90.210	Spurious Radiated Emissions	Compliant
§ 2.1055 § 90.213	Frequency stability	Compliant
§ 90.214	Transient Frequency Behavior	Not Required

4 §2.1046 and §90.205 - CONDUCTED OUTPUT POWER

4.1 Applicable Standard

According to FCC §2.1046, and §90.205, maximum ERP is dependent upon the station's antenna HAAT and required service area.

4.2 Test Procedure

TIA-603-C clause 2.2.17.2

4.3 Test Equipment List and Details

Equipment Description	Model Number	Manufacturer	Serial Numbers	Calibration Date
Spectrum Analyzer	E4440A	Agilent	MY44303352	2007-02-23

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

4.4 Environmental Conditions

Temperature:	20 °C
Relative Humidity:	59 %
ATM Pressure:	102.0 kPa

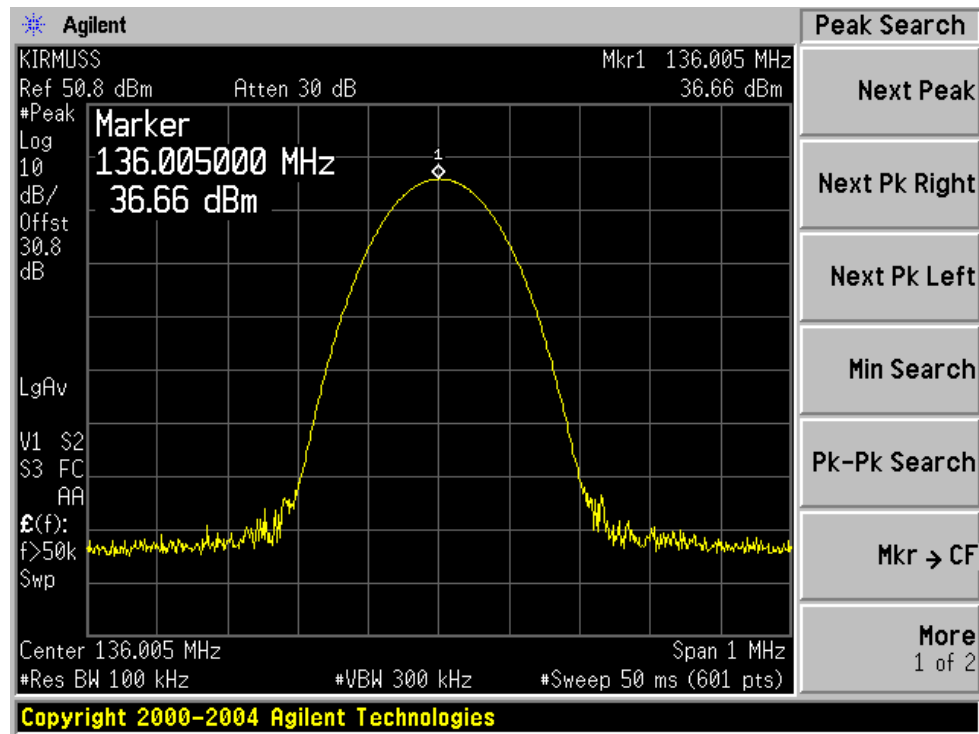
* The testing was performed by Dan Corona on 2007-05-10 to 11

4.5 Test Result

No non-compliance noted.

Frequency Channel Spacing: 12.5 kHz

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Conducted Output Power (Watt)
CH1	136.00500	36.66	4.634



5 §2.1046 and §90.205 – RADIATED OUTPUT POWER

5.1 Applicable Standard

According to FCC §2.1046, and §90.205, maximum ERP is dependent upon the station's antenna HAAT and required service area.

5.2 Test Procedure

TIA-603-C clause 2.2.17.2

5.3 Test Equipment List and Details

Equipment Description	Model Number	Manufacturer	Serial Numbers	Calibration Date
Spectrum Analyzer	E4440A	Agilent	MY44303352	2007-02-23
Spectrum Analyzer	8565E	Agilent	3964A00131	2007-01-24
Antenna	JB1	Sunol	A013105-3	2007-03-13
Pre-amplifier	317	Sonoma Instrument	260407	2007-04-26
Antenna, Dipole	AD-100	Com-Power	2219	2007-04-26

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

5.4 Environmental Conditions

Temperature:	20 °C
Relative Humidity:	59 %
ATM Pressure:	102.0 kPa

* The testing was performed by Dan Corona on 2007-05-10 to 11

5.5 Test Result

Indicated		Table	Test Antenna		Substituted			Antenna Gain Correction	Path Loss dB	FCC Part 90
Frequency MHz	Meter Reading dBm/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V			Absolute Level dBm
136.00500	6.00	303	1.0	V	136.0050	-26.79	V	0	26.79	32.8
136.00500	5.80	224	2.3	H	136.0050	-26.80	H	0	26.80	32.6

6 §2.1047, and §90.207 - MODULATION CHARACTERISTIC

6.1 Applicable Standard

§2.1047 & §90.207:

- (a) Equipment which utilizes voice modulated communication shall show the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz. for equipment which is required to have a low pass filter, the frequency response of the filter, or all of the circuitry installed between the modulation limited and the modulated stage shall be supplied.
- (b) Equipment which employs modulation limiting, a curve showing the percentage of modulation versus the modulation input voltage shall be supplied.

6.2 Test Procedure

At different modulating frequencies, the output level of the audio generator was varied and the AM deviation level was recorded.

TIA-603-C section 2.2.3, 2.2.6

6.3 Test Equipment List and Details

Equipment Description	Model Number	Manufacturer	Serial Numbers	Calibration Date
Spectrum Analyzer	E4440A	Agilent	MY44303352	2007-02-23
Spectrum Analyzer	8565E	Agilent	3964A00131	2007-01-24
Modulation Analyzer	8901A	HP	2026A00847	2007-04-26
Generator	33220A	Agilent	MY43004878	2005-05-18*

***Two year calibration cycle**

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

6.4 Environmental Conditions

Temperature:	20 °C
Relative Humidity:	59 %
ATM Pressure:	102.0 kPa

** The testing was performed by Dan Corona on 2007-05-10 to 11*

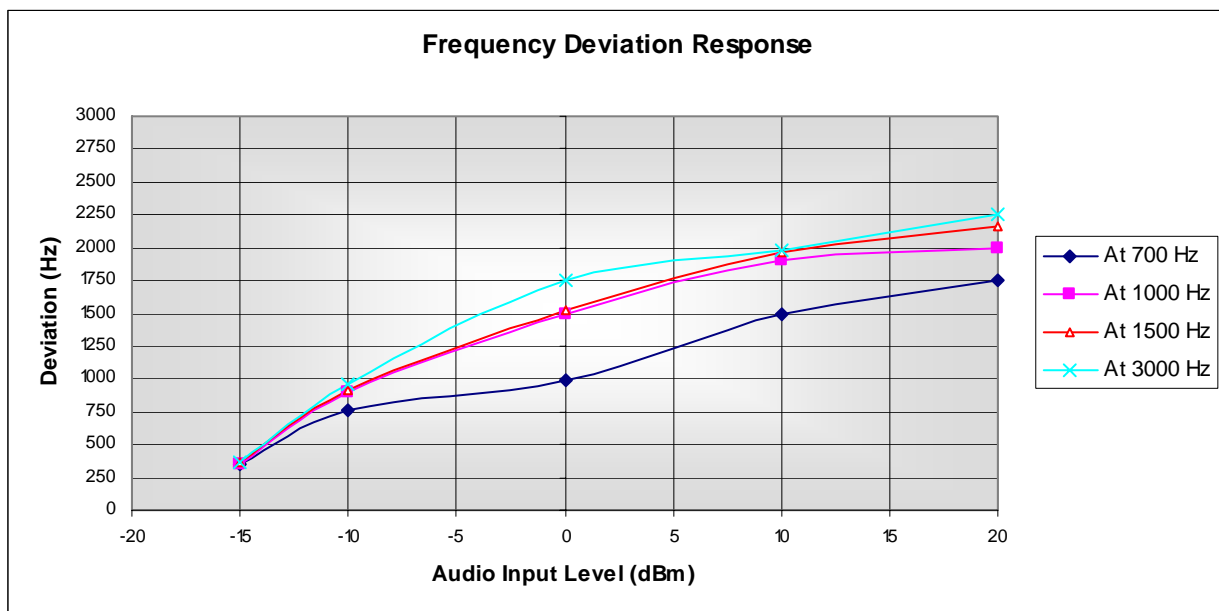
6.5 Test Results

Compliant, please refer to the plots.

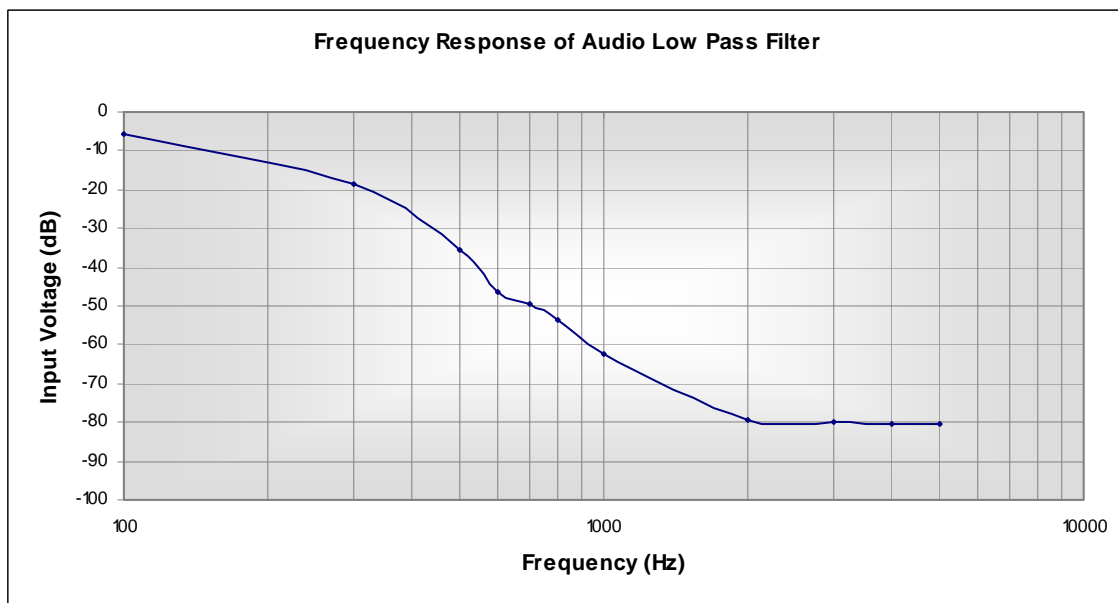
Test Mode: Transmitting

For 12.5 kHz Channel Bandwidth:

Modulation Limiting



Frequency Response of Audio Low Pass Filter



7 §2.1049 and § 90.209 – OCCUPIED BANDWIDTH

7.1 Applicable Standard

§2.1049, §90.209 and §90.210

Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- 1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 , 0dB.
- 2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.626kHz but no more than 12.5kHz, at least 7.27 ($f_d - 2.88$ kHz) dB.
- 3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5kHz at least:

$$50 + 10 \log P = 50 + 10 \log (P) \text{ dB or } 70 \text{ dB}$$

7.2 Test Procedure

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

7.3 Test Equipment List and Details

Equipment Description	Model Number	Manufacturer	Serial Numbers	Calibration Date
Spectrum Analyzer	E4440A	Agilent	MY44303352	2007-02-23
Modulation Analyzer	8901A	HP	2026A00847	2007-04-26
Generator	33220A	Agilent	MY43004878	2005-05-18*

* two year calibration cycle.

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

7.4 Environmental Conditions

Temperature:	20 °C
Relative Humidity:	59 %
ATM Pressure:	102.0 kPa

* The testing was performed by Dan Corona on 2007-05-10 to 11

7.5 Test Results

Compliant, please refer to the plots.

According to CFR47 § 2.201 & § 2.202

$$B_n = 2M + 2DK$$

$$M = 3000$$

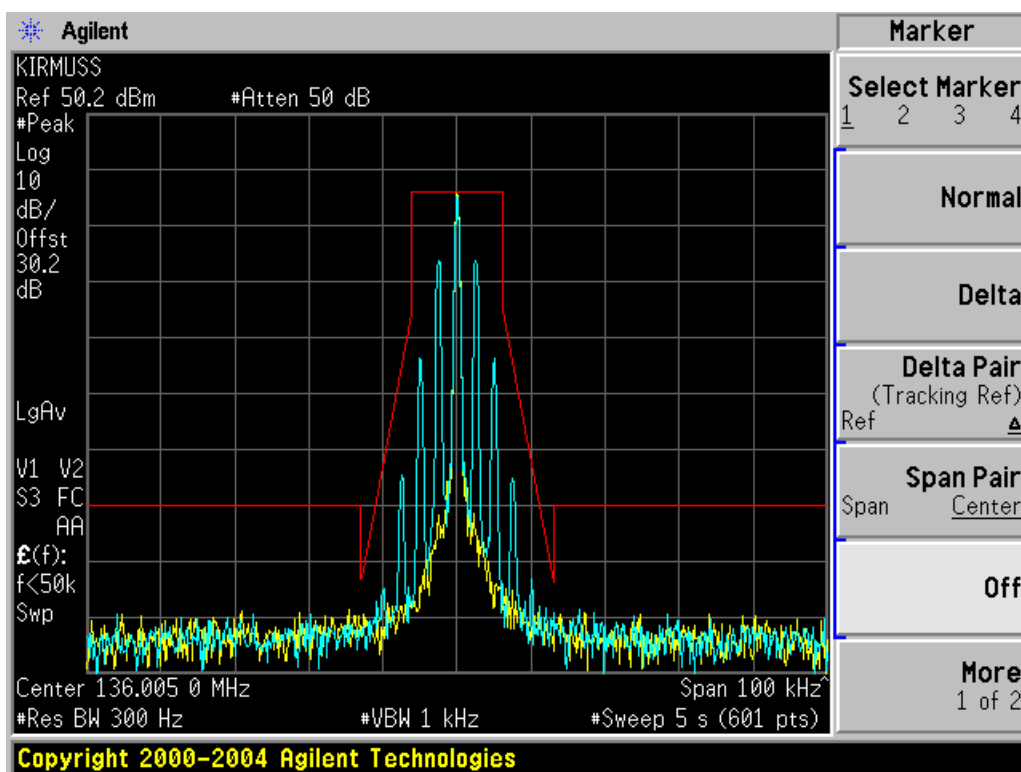
$$D = 2.5 \text{ k}$$

$$K = 1$$

$$B_n = 2(3000) + 2(2500) = 11$$

Type of Emission: 11k0F3E

Emission Mask D for 12.5 kHz Channel Bandwidth:



8 §2.1051 and §90.210 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

8.1 Applicable Standard

§90.210 (12.5 kHz bandwidth only)

On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5kHz at least:

$$50+10\log P=50+10\log (P) \text{ or } 70 \text{ dB}$$

8.2 Test Procedure

Conducted:

TIA 603-C Clause 2.2.13

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation.

8.3 Test Equipment List and Details

Equipment Description	Model Number	Manufacturer	Serial Numbers	Calibration Date
Spectrum Analyzer	E4440A	Agilent	MY44303352	2007-02-23
Modulation Analyzer	8901A	HP	2026A00847	2007-04-26
Generator	33220A	Agilent	MY43004878	2005-05-18*
Spectrum Analyzer	8565E	Agilent	3964A00131	2007-01-24

* Two years calibration cycle.

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

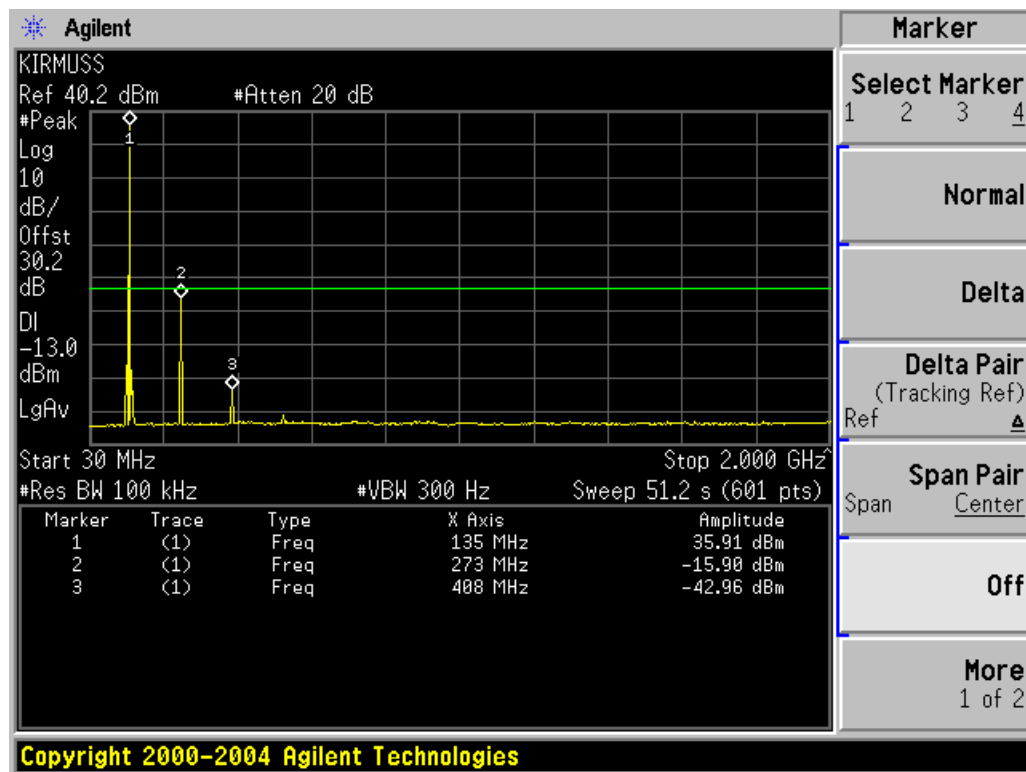
8.4 Environmental Conditions

Temperature:	20 °C
Relative Humidity:	59 %
ATM Pressure:	102.0 kPa

* The testing was performed by Dan Corona on 2007-05-10 to 11

8.5 Test Results

Compliant, please refer to the plots.



9 §2.1053 and §90.210 - RADIATED SPURIOUS EMISSION

9.1 Applicable Standard

§2.1053 and §90.210

9.2 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 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)

Spurious attenuation limit in dB = 50 + 10 Log₁₀ (power out in Watts) for EUT with a 12.5 KHz channel bandwidth.

9.3 Test Equipment List and Details

Equipment Description	Model Number	Manufacturer	Serial Numbers	Calibration Date
Spectrum Analyzer	E4440A	Agilent	MY44303352	2007-02-23
Modulation Analyzer	8901A	HP	2026A00847	2007-04-26
Generator	33220A	Agilent	MY43004878	2005-05-18*
Antenna, Bi-log	JB1	Sunol	A013105-3	2006-04-26
Pre-amplifier	317	Sonoma Instrument	260407	2006-04-26
Antenna, Dipole	AD-100	Com-Power	2219	2006-04-26

*Two years calibration cycle.

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

9.4 Environmental Conditions

Temperature:	20 °C
Relative Humidity:	59 %
ATM Pressure:	102.0 kPa

* The testing was performed by Dan Corona on 2007-05-10 to 11

9.5 Test Results

CH 1: Below 1GHz

-18.0 dB at 272 MHz in the Vertical Polarization

CH 1: Above 1GHz

-12.1 dB at 1088 MHz in the Vertical Polarization

CH 1: Below 1GHz

Indicated		Azimuth Degrees	Antenna Height (m)	Polar. H/V	Substitution					Limit (dBm)	Margin (dB)
Frequency (MHz)	Amp. (dBm)				Frequency (MHz)	Level (dBm)	Antenna Gain Correction	Cable Loss (dB)	Absolute Level (dBm)		
272.010	-42.67	256	1.50	V	272.010	-37.65	0.00	0.36	-38.0	-20	-18.0
272.010	-40.67	175	1.90	H	272.010	-37.77	0.00	0.36	-38.1	-20	-18.1
408.015	-37.33	342	2.00	V	408.015	-42.30	0.00	0.39	-42.7	-20	-22.7
408.015	-39.33	227	1.30	H	408.015	-45.60	0.00	0.39	-46.0	-20	-26.0
544.020	-43.67	296	1.70	V	544.020	-50.10	0.00	0.44	-50.5	-20	-30.5
544.020	-41.67	23	2.10	H	544.020	-52.30	0.00	0.44	-52.7	-20	-32.7
680.025	-44.5	257	2.40	V	680.025	-53.60	0.00	0.56	-54.2	-20	-34.2
680.025	-40.67	347	2.10	H	680.025	-54.50	0.00	0.56	-55.1	-20	-35.1
816.030	-58.00	275	1.50	V	816.030	-55.60	0.00	0.66	-56.3	-20	-36.3
816.030	-56.50	267	1.40	H	816.030	-56.40	0.00	0.66	-57.1	-20	-37.1
952.035	-40.67	272	0.59	H	816.030	-58.40	0.00	0.66	-59.1	-20	-39.1
952.035	-42.67	276	0.95	V	952.035	-58.60	0.00	0.66	-59.3	-20	-39.3

CH 1: Above 1GHz

Indicated		Azimuth Degrees	Antenna Height (m)	Polar. H/V	Substitution					Limit (dBm)	Margin (dB)
Frequency (MHz)	Amp. (dBm)				Frequency (MHz)	Level (dBm)	Antenna Gain Correction	Cable Loss (dB)	Absolute Level (dBm)		
1088.040	-37.33	268	0.23	V	952.035	-38.70	6.93	0.33	-32.1	-20	-12.1
1088.040	-39.33	263	-0.13	H	1088.040	-40.20	6.93	0.33	-33.6	-20	-13.6
1496.055	-58.00	242	-1.93	V	1088.040	-28.45	8.33	0.33	-37.9	-20	-17.9
1360.050	-40.67	247	-1.57	H	1496.055	-31.57	7.84	0.33	-38.3	-20	-18.3
1360.050	-44.5	251	-1.21	V	1360.050	-34.69	7.84	0.33	-38.5	-20	-18.5
1632.060	-56.50	234	-2.65	V	1360.050	-22.21	9.27	0.33	-40.3	-20	-20.3
1496.055	-56.50	238	-2.29	H	1632.060	-25.33	8.33	0.33	-40.5	-20	-20.5
1224.045	-43.67	259	-0.49	V	1496.055	-48.60	7.53	0.33	-41.4	-20	-21.4
1224.045	-41.67	255	-0.85	H	1224.045	-51.30	7.53	0.33	-44.1	-20	-24.1
1768.065	-43.67	226	-3.37	V	1224.045	-15.97	9.25	0.33	-45.2	-20	-25.2
1632.060	-43.67	230	-3.01	H	1768.065	-19.09	9.27	0.33	-45.3	-20	-25.3
1768.065	-43.67	221	-3.73	H	1632.060	-12.85	9.25	0.33	-45.3	-20	-25.3

10 §2.1055 (d) and §90.213- FREQUENCY STABILITY

10.1 Applicable Standard

(b) For the purpose of determining the frequency stability limits, the power of a transmitter is considered to be the maximum rated output power as specified by the manufacturer.

Specified by client: Transmitter Stability = +/- 15 PPM.

§2.1055 (d)

§90.213

For output power > 2 watts, the limit is 5.0ppm.

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 a frequency counter via feed through attenuators. 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 frequency counter.

Frequency Stability vs. Voltage:

An external variable DC power supply was connected to the EUT, The voltage was set to 115%, 100%, and 85% of the nominal operating input voltage, and the frequency output was recorded from the frequency counter.

10.3 Test Equipment List and Details

Equipment Description	Model Number	Manufacturer	Serial Number	Calibration Date
Frequency Counter	5342 A	HP	2232A06380	2007-01-16
Spectrum Analyzer	E4440A	Agilent	MY44303352	2007-02-23
Temperature Oven	VersaTenn	Tenney	12.222-193	2006-06-21

**Two year calibration cycle*

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

10.4 Environmental Conditions

Temperature:	20 °C
Relative Humidity:	59 %
ATM Pressure:	102.0 kPa

** The testing was performed by Dan Corona on 2007-05-10 to 11*

10.5 Test Results

Compliant.

10.5.1 Frequency stability versus temperature:

Reference Frequency 136.00500 MHz, Limit : 0.0005% or 5 PPM			
Environment Conditions		Frequency Measure with Time Elapsed	
Temperature (^o C)	Power supplied (V DC)	Measured Frequency (MHz)	Error (%)
50	7.2	136.00499	0.00001
40	7.2	136.00497	0.00003
30	7.2	136.00492	0.00008
20	7.2	136.00493	0.00007
10	7.2	136.00493	0.00007
0	7.2	136.00501	-0.00001
-10	7.2	136.00505	-0.00005
-20	7.2	136.00502	-0.00002
-30	7.2	136.00494	0.00006

10.5.2 Frequency Stability versus Voltage:

Reference Frequency 136.00500 MHz, Limit : 0.0005% or 5 PPM			
Environment Conditions		Frequency Measure with Time Elapsed	
Temperature (^o C)	Power supplied (V DC)	Measured Frequency (MHz)	Error (%)
20	6.4	136.00493	0.00007