



FCC PART 90

TEST AND MEASUREMENT REPORT

For

ADC Telecommunications Inc.

P.O. Box 1101, Minneapolis, MN 55440, USA

FCC ID: NOO-F0691-312

| | |
|--|--|
| Report Type: Original Report | Product Type: Remote Access Unit for InterReach Fusion System |
| Test Engineer: <u>Wei Sun</u> <i>Wei Sun</i> | |
| Report Number: <u>R1206146-90</u> | |
| Report Date: <u>2012-07-18</u> | |
| Reviewed By: <u>Victor Zhang</u> <i>Victor Zhang</i> EMC/RF Lead | |
| Bay Area Compliance Laboratories Corp. 1274 Anvilwood Avenue, Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732 9164 | |

Note: This test report is prepared for the customer shown above and for the device described herein. 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 A2LA* or any agency of the Federal Government.

* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*" 000-01

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DOCUMENT REVISION HISTORY

| Revision Number | Report Number | Description of Revision | Date of Revision |
|------------------------|----------------------|--------------------------------|-------------------------|
| 0 | R12006146-90 | Original Report | 2012-07-18 |

1. General Information

1.1 Product Description for Equipment under Test (EUT)

The *ADC Telecommunications Inc.* product, model: FSN-W2-088519-1, FCC ID: *NOO-F0691-312* or the “EUT” as referred to in this report, is a RAU for Indoor Wireless Repeater System. The system consists three modular components, the Main Hub (model number: FSN-W2-MH-1), Expansion Hub (model: FSN-W1-EH-2) and RAU - EUT (model: FSN-W2-808519-1). The downlink frequency bands are: Cellular Band: 869-894 MHz, PCS Band: 1930-1990 MHz and SMR band: 851-869 MHz. Modulation types of 800 MHz SMR band are iDEN, FM, P25, C4FM.

1.2 Mechanical Description

The EUT dimension is approximately 28.6cm (L) x 28.1cm (W) x 5.4cm (H) and weighs approximately 2.1 kg.

The test data gathered are from production sample. Serial number: M02001QT, provided by ADC Telecommunications Inc.

1.3 Objective

This type approval report is prepared on behalf of ADC Telecommunications Inc. in accordance with Part 90, 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 spurious emissions.

1.4 Related Submittal(s)/Grant(s)

NA.

1.5 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 90 – PRIVATE LAND MOBILE RADIO SERVICES

Applicable Standards: TIA/EIA 603-C

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.

1.6 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 CISPR16-4-2:2003, 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.

1.7 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 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 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2003, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

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.: A-0027. 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 an American Association for laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

<http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b>

2 System Test Configuration

2.1 Justification

The EUT 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 software used was HyperTerminal.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Local Support Equipment

| Manufacturer | Description | Model | Serial Number |
|-----------------------------|---------------|-------------|---------------|
| ADC Telecommunications Inc. | Main Hub | FSN-W2-MH-1 | MR220TTA |
| ADC Telecommunications Inc. | Expansion Hub | FSN-W1-EH-2 | FR2217V6 |

2.5 Internal Configuration

| Manufacturer | Description | Model | Serial Number |
|-----------------------------|----------------|-----------------|---------------|
| ADC Telecommunications Inc. | Main PCB Board | FSN-W2-808519-1 | M02001QT |

2.6 External I/O Cabling List and Details

| Cable Description | Length (m) | From | To |
|-------------------------------|------------|---------------|---------------|
| Shielded Detachable K/B Cable | 150 | Expansion Hub | RAU (EUT) |
| Fiber Cable | 2.0 | Main Hub | Expansion Hub |

3 Summary of Test Results

| FCC Rules | Description of Tests | Results |
|-----------------------------|---|-----------|
| §2.1091 | RF Exposure | Compliant |
| §2.1046, §90.635 | RF Output Power | Compliant |
| §2.1047 | Modulation Characteristics | NA* |
| §2.1049 | Occupied Bandwidth | Compliant |
| §2.1051 §90.669, §90.691 | Emission Mask | Compliant |
| §2.1053, §90.669 | Spurious Emissions at Antenna Terminals | Compliant |
| §2.1055, §90.669 | Frequency Stability | Compliant |
| §2.1053, §90.669 | Field Strength of Spurious Radiation | Compliant |

N/A According to FCC §2.1047(d), Part 90, there is no specific requirement for digital modulation and no oscillator circuit, therefore modulation characteristic is not presented.*

4 FCC §2.1091 - RF Exposure Information

4.1 Applicable Standards

FCC §2.1091, (a) Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See subpart I of part 1 of this chapter, in particular §1.1307(b).

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

Limits for Exposure

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm ²) | Averaging Time (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (B) Limits for General Population/Uncontrolled Exposure | | | | |
| 0.3-1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34-30 | 842/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 | 30 |

f = frequency in MHz

* = Plane-wave equivalent power density

4.2 MPE Prediction

Predication 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 anten

| | |
|---|---------------|
| <u>Maximum peak output power at antenna input terminal (dBm):</u> | <u>24.51</u> |
| <u>Maximum peak output power at antenna input terminal (mW):</u> | <u>282.49</u> |
| <u>Prediction distance (cm):</u> | <u>20</u> |
| <u>Prediction frequency (MHz):</u> | <u>851.1</u> |
| <u>Antenna Gain, typical (dBi):</u> | <u>15</u> |
| <u>Cable Loss (dB):</u> | <u>7.0</u> |
| <u>Maximum Net Gain (numeric):</u> | <u>6.31</u> |
| <u>Power density of prediction frequency at 20 cm (mW/cm²):</u> | <u>0.3546</u> |
| <u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u> | <u>0.5674</u> |

Conclusion

The device complies with the MPE requirements by providing a safe separation distance of at least 20 cm between the antenna with maximum 15 dBi gain and 7 dB cable loss, the max net gain should be less then 8 dBi.

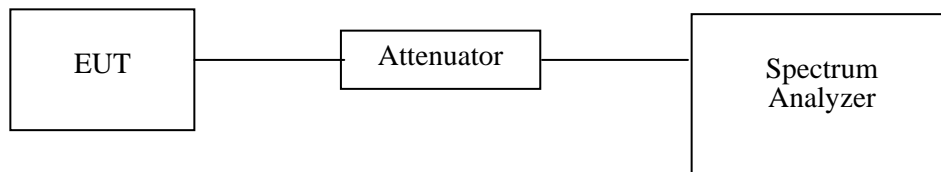
5 FCC §2.1046 & §90.635 – RF Output Power

5.1 Applicable Standard

FCC §2.1046 and §90.635.

5.2 Test Procedure

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



5.3 Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date |
|--------------|-------------------|--------|---------------|-------------------------|
| Agilent | Spectrum Analyzer | E4440A | US45303156 | 2010-08-09 ¹ |
| Agilent | Signal Generator | E4438C | MY45091309 | 2012-05-03 |

Note 1: Based on a two year calibration cycle

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

5.4 Test Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 21 °C |
| Relative Humidity: | 60 % |
| ATM Pressure: | 101.8 kPa |

The testing was performed by Wei Sun on 2012-07-09 on the RF Site.

5.5 Test Results

| Mode | | Channel | Frequency (MHz) | Input Power (dBm) | Output Power (dBm) |
|------|------------------|---------|-----------------|-------------------|--------------------|
| iDEN | 800 MHz Downlink | Low | 851.1 | 3 | 16.35 |
| | | Middle | 860 | 3 | 17.71 |
| | | High | 868.9 | 3 | 16.49 |

| Mode | | Channel | Frequency (MHz) | Input Power (dBm) | Output Power (dBm) |
|--------------|------------------|---------|-----------------|-------------------|--------------------|
| APCO25 CQPSK | 800 MHz Downlink | Low | 851.1 | 5 | 20.43 |
| | | Middle | 860 | 5 | 21.96 |
| | | High | 868.9 | 5 | 21.62 |

| Mode | | Channel | Frequency (MHz) | Input Power (dBm) | Output Power (dBm) |
|-------------|------------------|---------|-----------------|-------------------|--------------------|
| APCO25 C4FM | 800 MHz Downlink | Low | 851.1 | 9 | 24.51 |
| | | Middle | 860 | 9 | 24.39 |
| | | High | 868.9 | 9 | 24.16 |

| Mode | | Channel | Frequency (MHz) | Input Power (dBm) | Output Power (dBm) |
|-----------|------------------|---------|-----------------|-------------------|--------------------|
| Analog FM | 800 MHz Downlink | Low | 851.1 | 10 | 23.08 |
| | | Middle | 860 | 10 | 24.52 |
| | | High | 868.9 | 10 | 23.86 |

6 FCC §2.1049 – Occupied Bandwidth

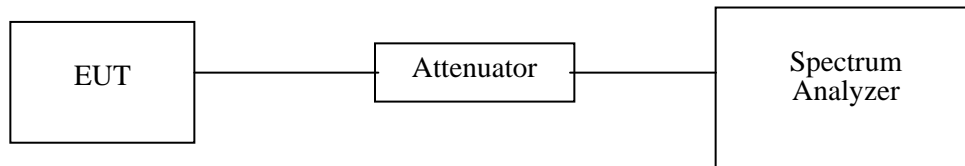
6.1 Applicable Standard

FCC §2.1047

6.2 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 1% of the authorized bandwidth and the 26 dB & 99% bandwidth was recorded.



6.3 Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date |
|--------------|-------------------|--------|---------------|-------------------------|
| Agilent | Spectrum Analyzer | E4440A | US45303156 | 2010-08-09 ¹ |
| Agilent | Signal Generator | E4438C | MY45091309 | 2012-05-03 |

Note 1: Based on a two year calibration cycle.

Statement of Traceability: BACL Corp. attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

6.4 Test Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 22 °C |
| Relative Humidity: | 60 % |
| ATM Pressure: | 101.6 kPa |

The testing was performed by Wei Sun on 2012-07-09 on the RF Site.

6.5 Test Results

Please refer to the following table and plots.

| Mode | | Channel | Frequency (MHz) | Emission Bandwidth | |
|------|------------------|---------|-----------------|--------------------|--------------|
| | | | | Input (kHz) | Output (kHz) |
| iDEN | 800 MHz Downlink | Middle | 860 | 16.3648 | 16.3006 |

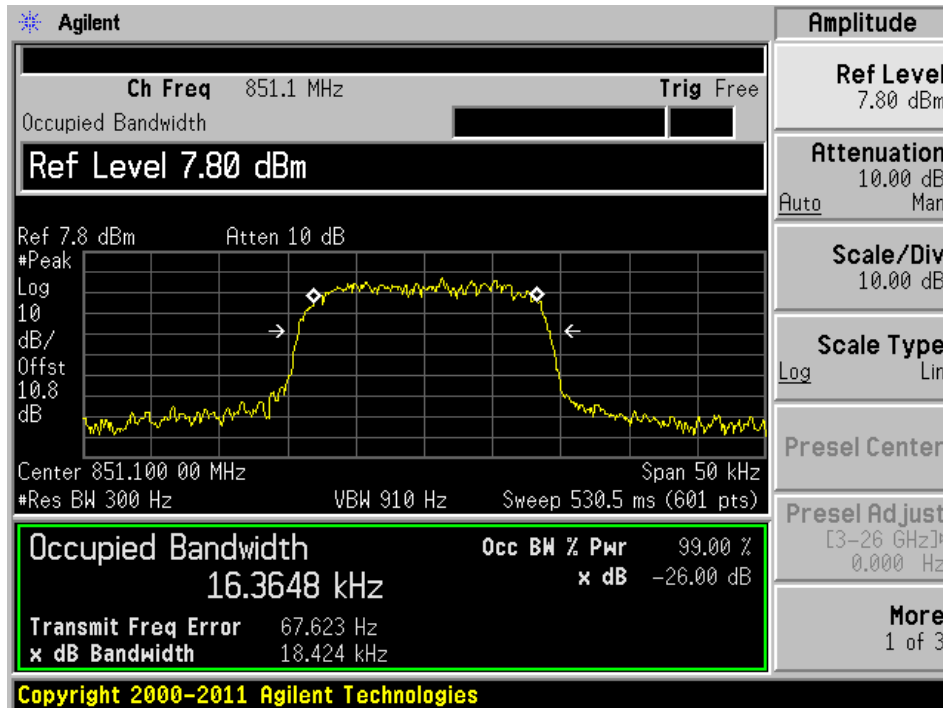
| Mode | | Channel | Frequency (MHz) | Emission Bandwidth | |
|--------------|------------------|---------|-----------------|--------------------|--------------|
| | | | | Input (kHz) | Output (kHz) |
| APCO25 CQPSK | 800 MHz Downlink | Middle | 860 | 4.9985 | 4.9942 |

| Mode | | Channel | Frequency (MHz) | Emission Bandwidth | |
|-------------|------------------|---------|-----------------|--------------------|--------------|
| | | | | Input (kHz) | Output (kHz) |
| APCO25 C4FM | 800 MHz Downlink | Middle | 860 | 8.3989 | 8.4113 |

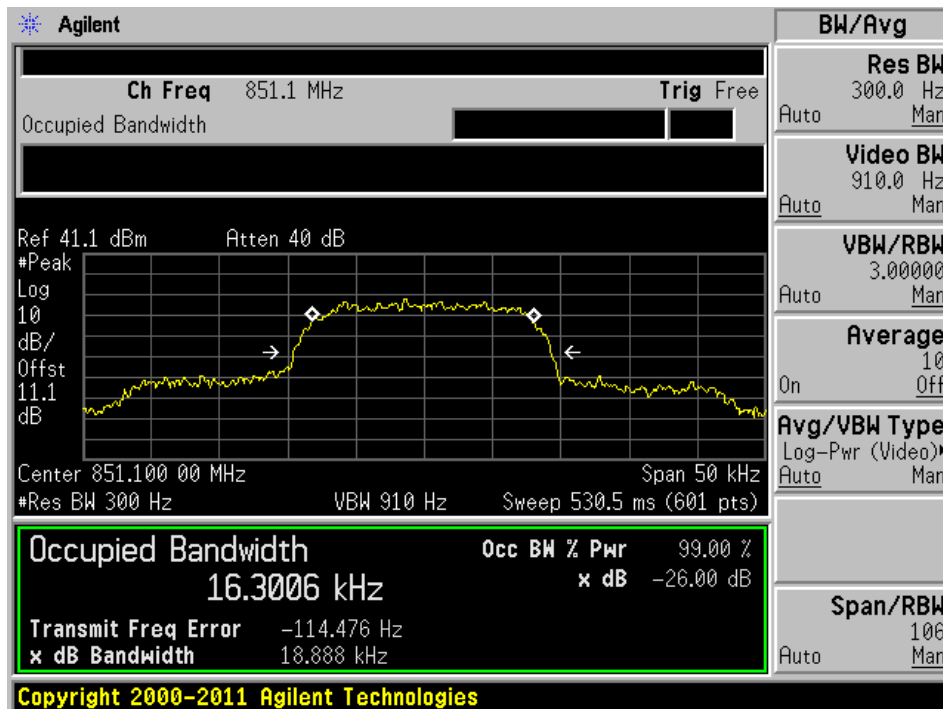
| Mode | | Channel | Frequency (MHz) | Emission Bandwidth | |
|-----------|------------------|---------|-----------------|--------------------|--------------|
| | | | | Input (kHz) | Output (kHz) |
| Analog FM | 800 MHz Downlink | Middle | 860 | 8.8761 | 8.8916 |

Occupied Bandwidth

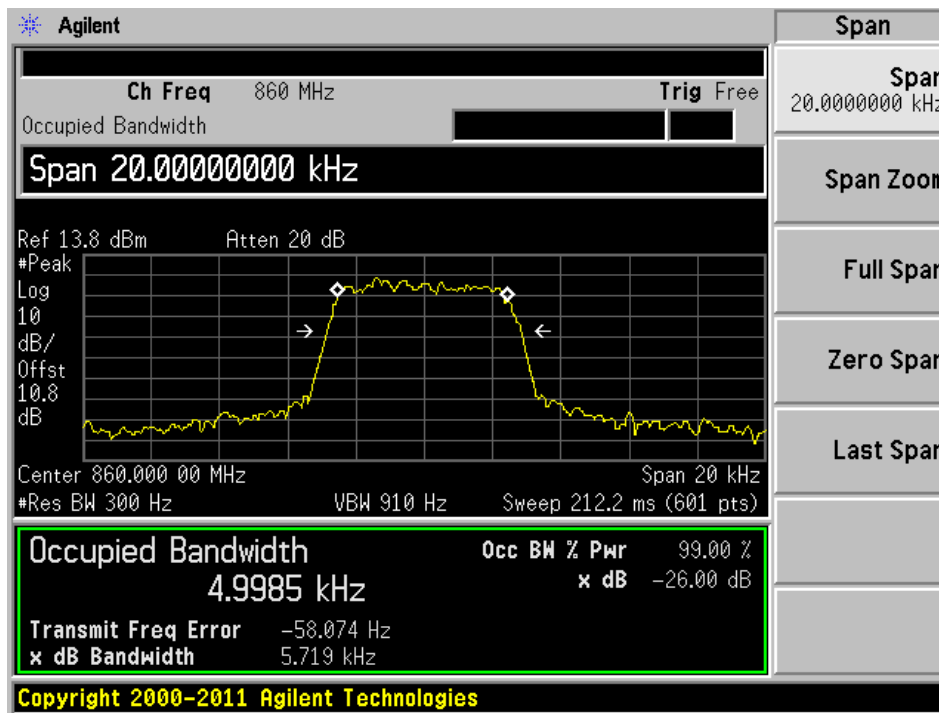
Input of 800 MHz Downlink iDEN Modulation Middle Channel



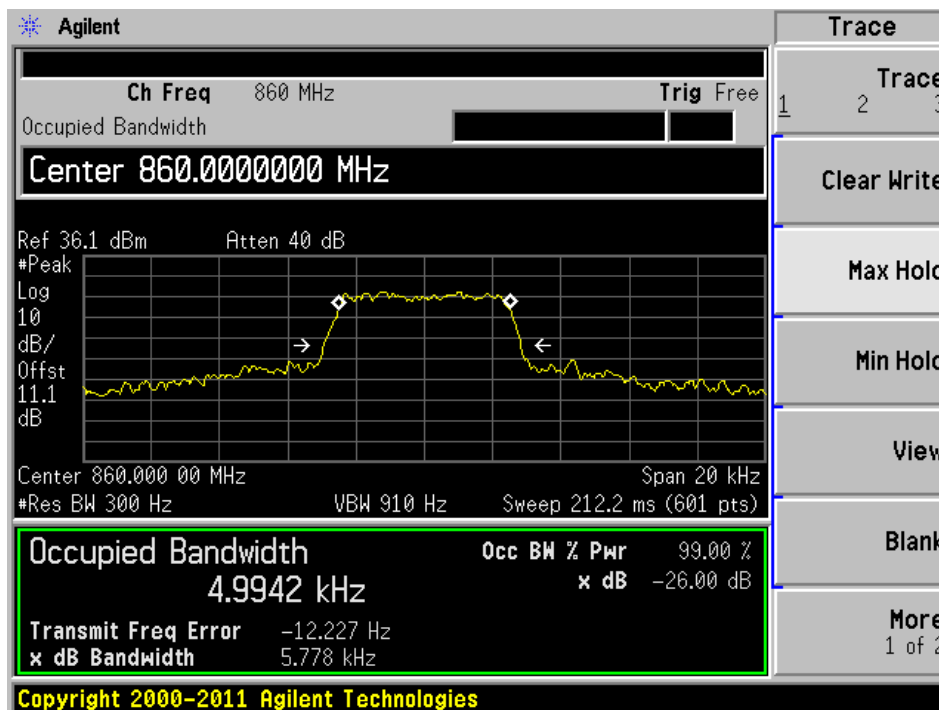
Output of 800 MHz Downlink iDEN Modulation Middle Channel



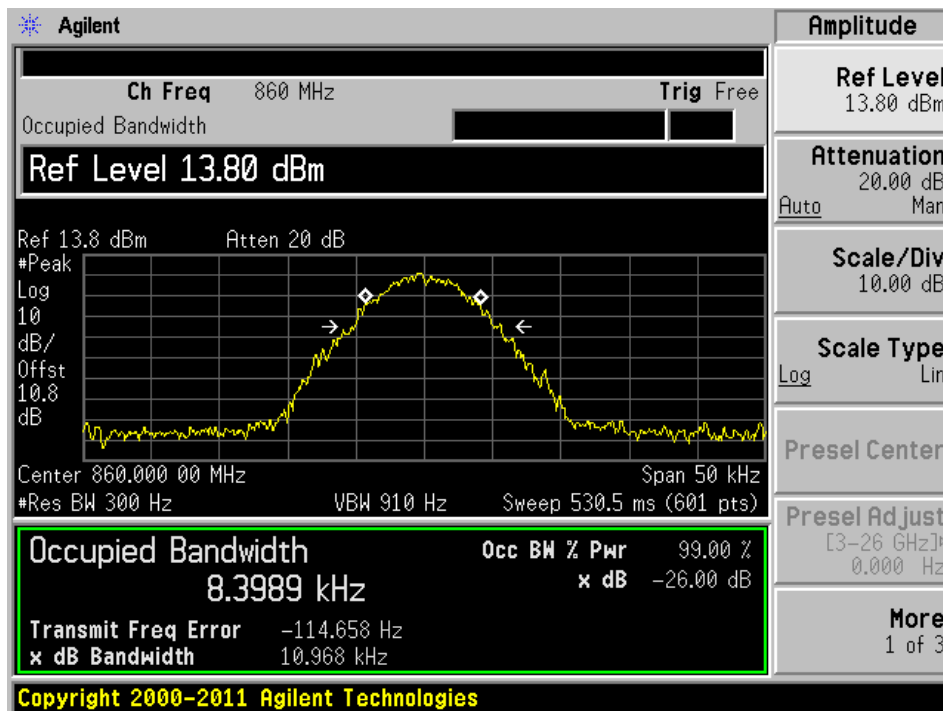
Input of 800 MHz Downlink APCO25 CQPSK Modulation Middle Channel



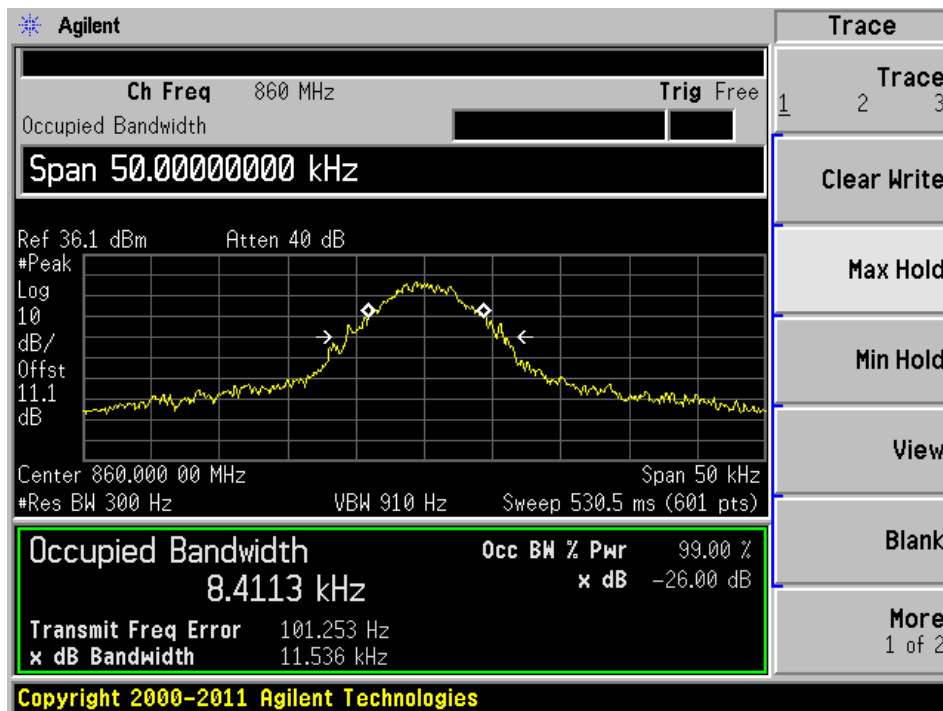
Output of 800 MHz Downlink APCO25 CQPSK Modulation Middle Channel



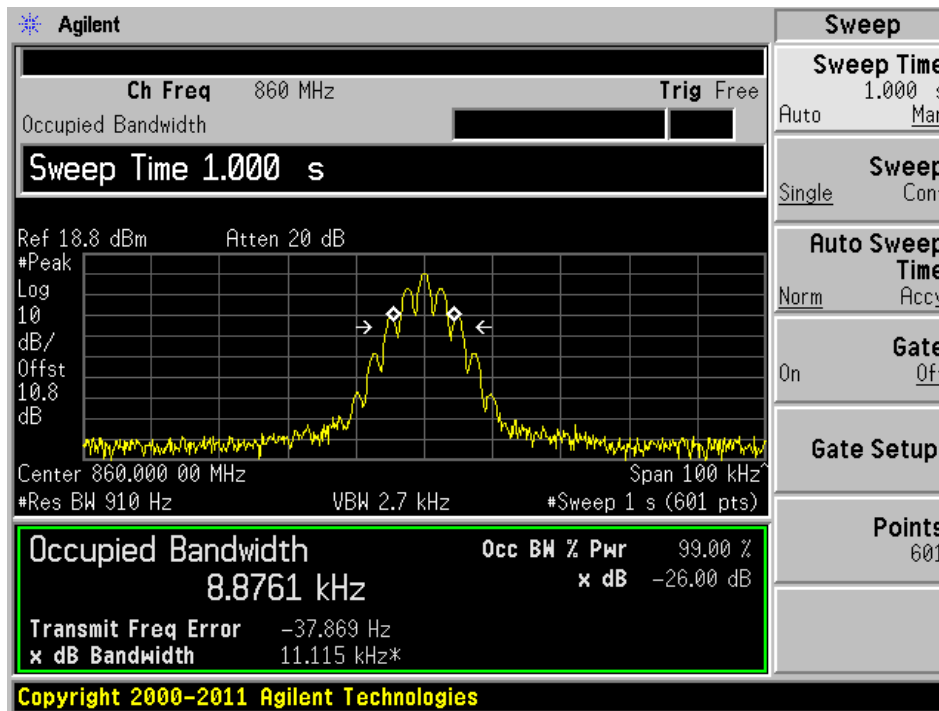
Input of 800 MHz Downlink APCO25 C4FM Modulation Middle Channel



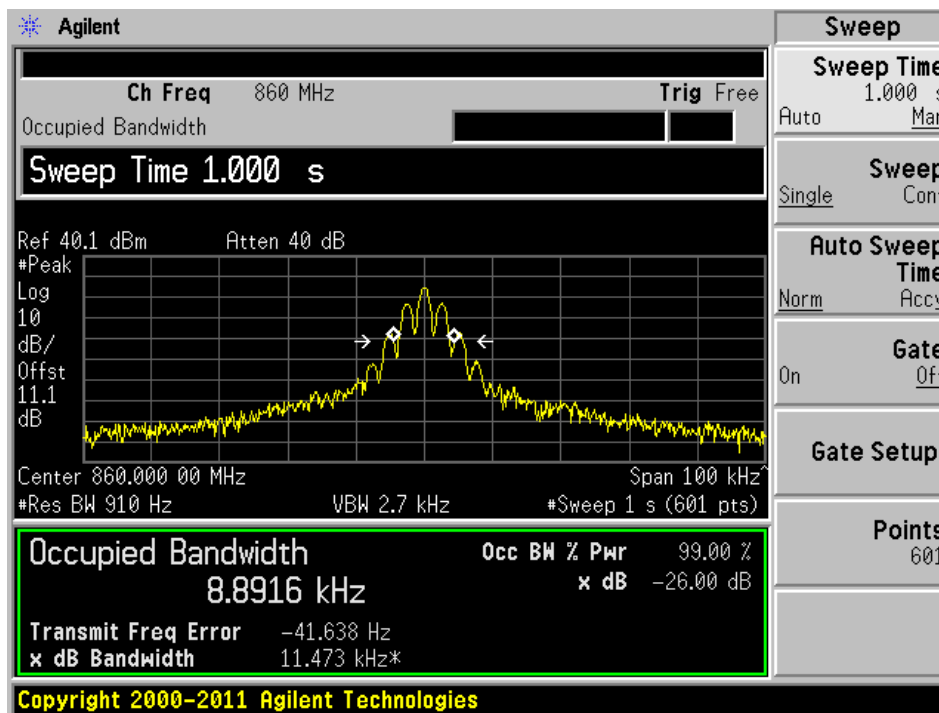
Output of 800 MHz Downlink APCO25 C4FM Modulation Middle Channel



Input of 800 MHz Downlink Analog FM Modulation Middle Channel



Output of 800 MHz Downlink Analog FM Modulation Middle Channel



7 FCC §2.1051, §90.669 & §90.691 – Emission Mask

7.1 Applicable Standard

As per FCC §90.691 Emission Masks Requirements for EA-based systems

a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

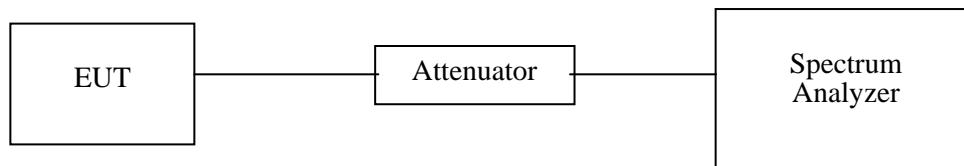
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \text{ Log}_{10}(f/6.1)$ decibels or $50 + 10 \text{ Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \text{ Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

7.2 Test Procedure

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



7.3 Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date |
|--------------|-------------------|--------|---------------|-------------------------|
| Agilent | Spectrum Analyzer | E4440A | US45303156 | 2010-08-09 ¹ |
| Agilent | Signal Generator | E4438C | MY45091309 | 2012-05-03 |

Note 1: Based on a two year calibration cycle.

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

7.4 Test Environmental Conditions

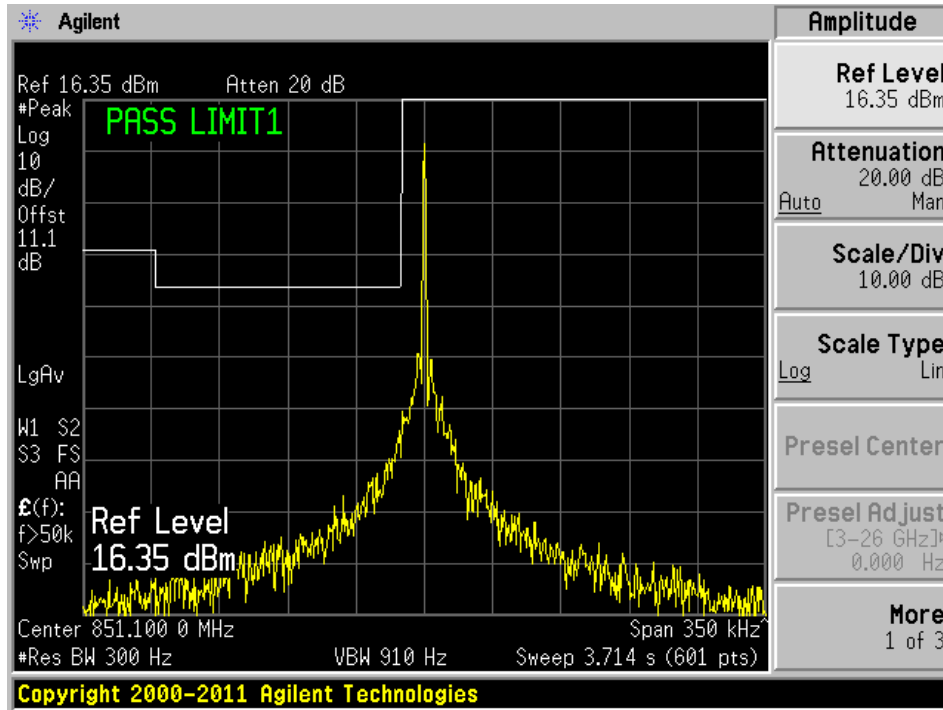
| | |
|--------------------|-----------|
| Temperature: | 22 °C |
| Relative Humidity: | 60 % |
| ATM Pressure: | 101.6 kPa |

The testing was performed by Wei Sun on 2012-07-09 on the RF Site.

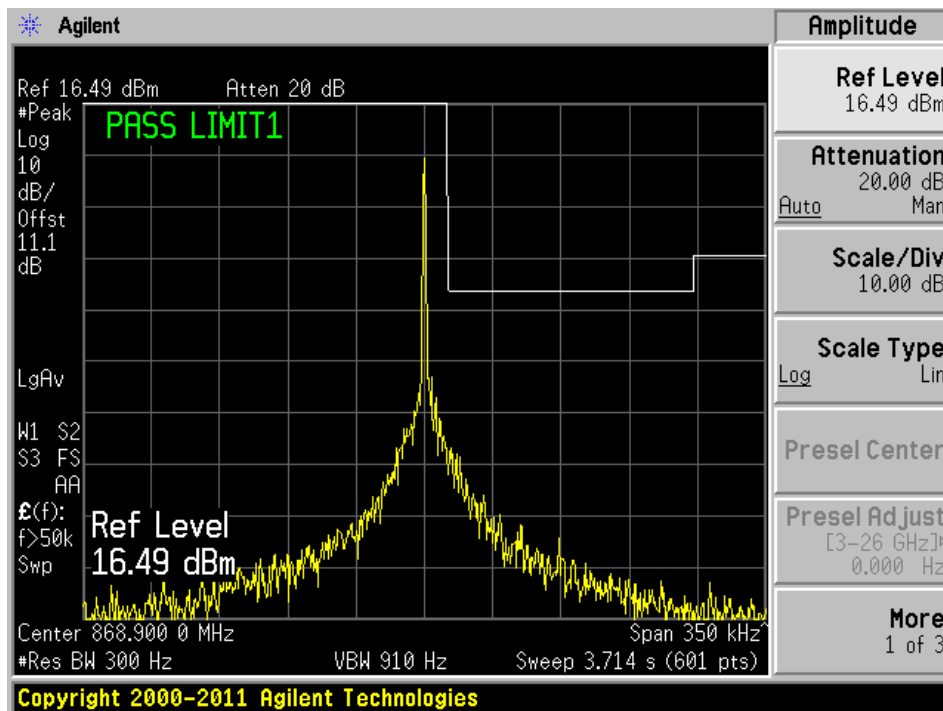
7.5 Test Results

Please refer to the following plots.

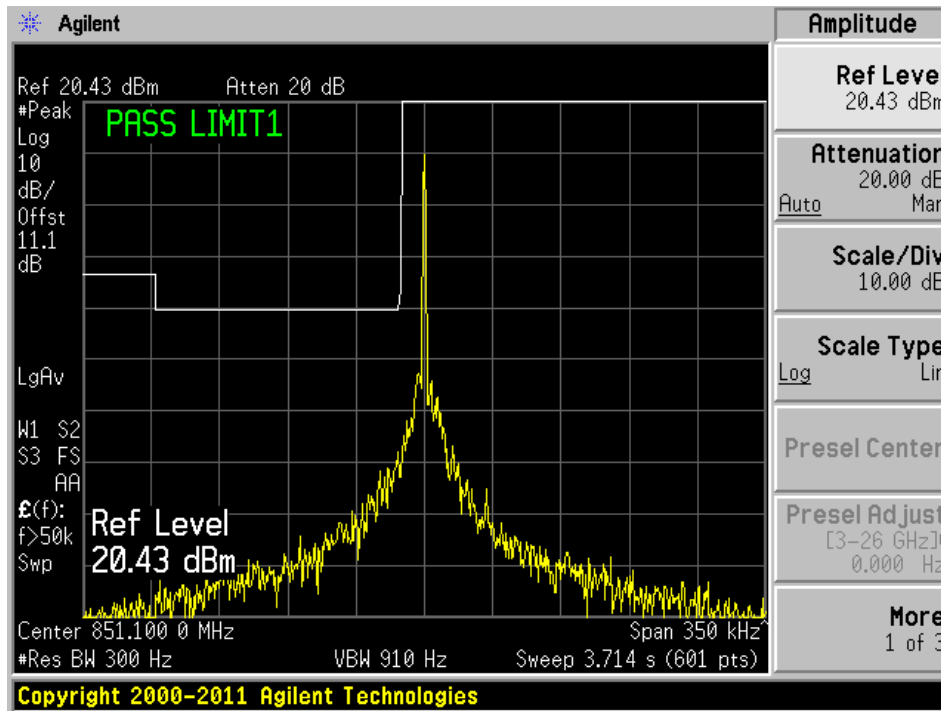
800 MHz Downlink iDEN Modulation Low Channel



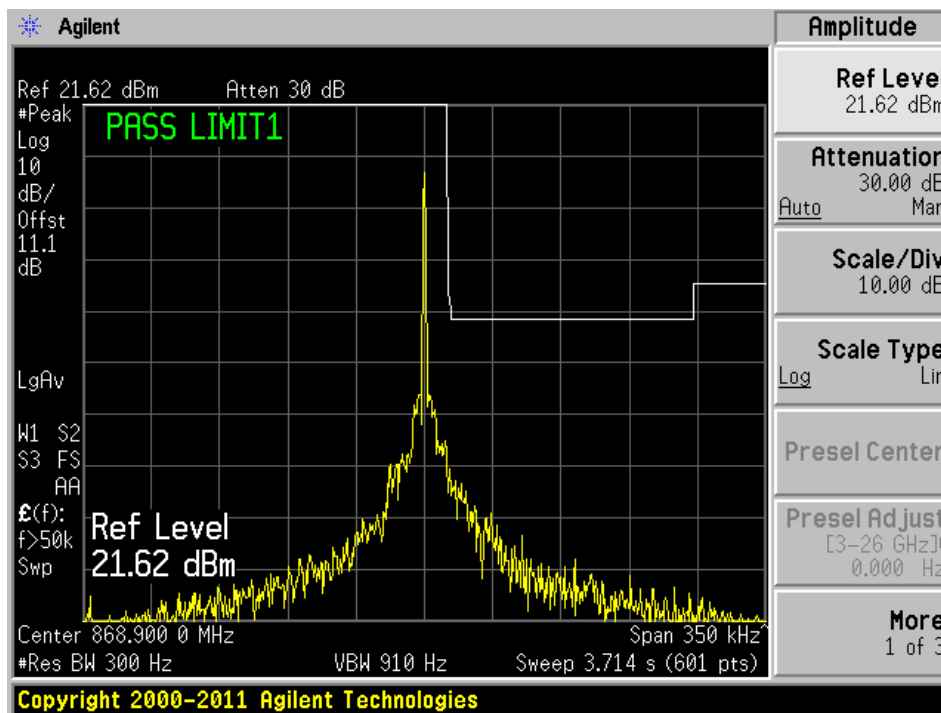
800 MHz Downlink iDEN Modulation High Channel



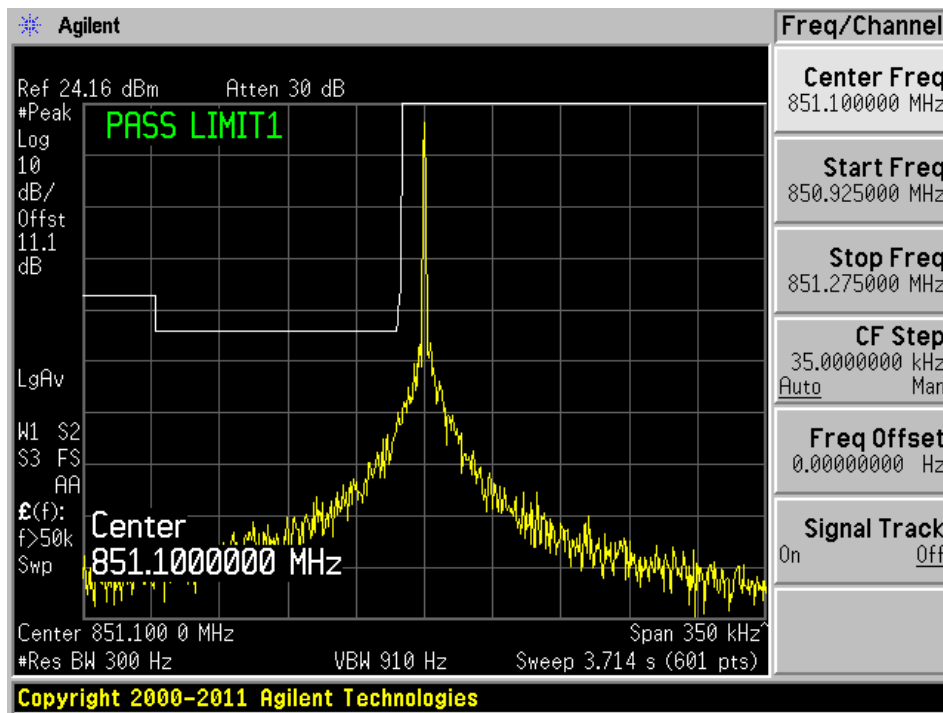
800 MHz Downlink APCO25 CQPSK Modulation Low Channel



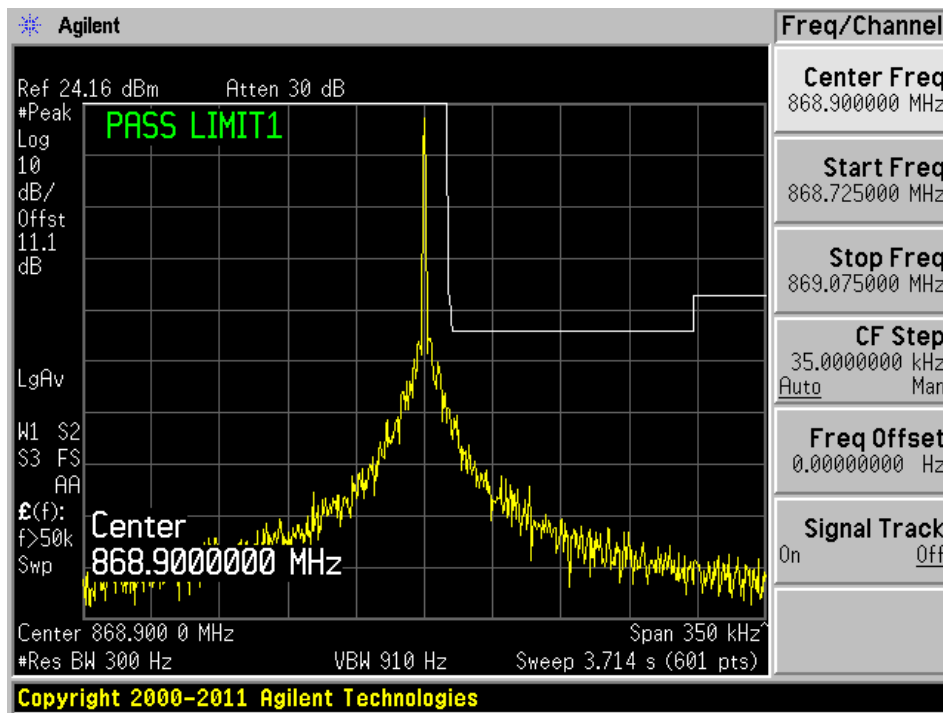
800 MHz Downlink APCO25 CQPSK Modulation High Channel



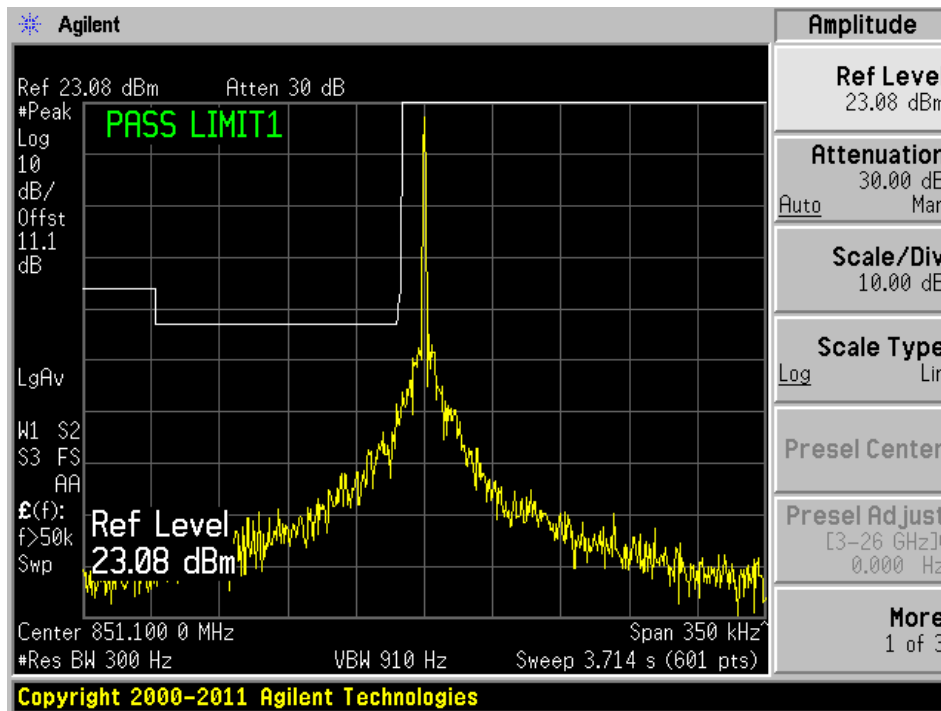
800 MHz Downlink APCO25 C4FM Modulation Low Channel



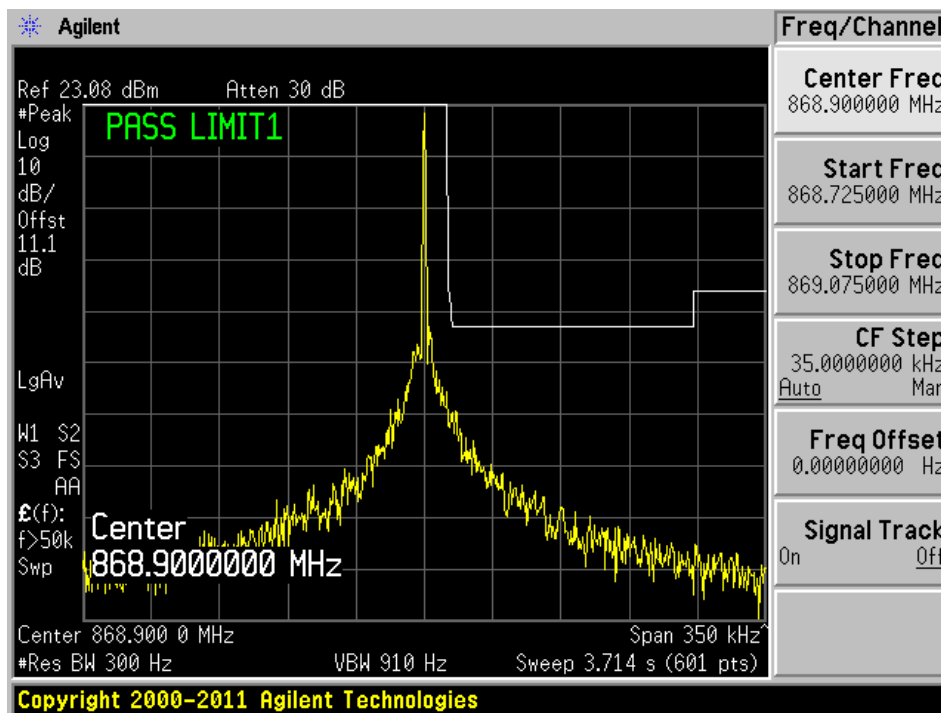
800 MHz Downlink APCO25 C4FM Modulation High Channel



800 MHz Downlink Analog FM Modulation Low Channel



800 MHz Downlink Analog FM Modulation High Channel



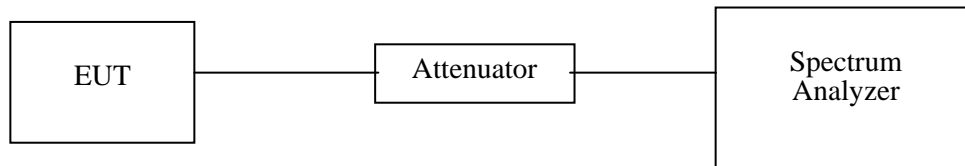
8 FCC §2.1053 & §90.669 - Spurious Emissions at Antenna Terminals

8.1 Applicable Standard

The spectrum shall be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1053.

8.2 Test Procedure

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



8.3 Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date |
|--------------|-------------------|--------|---------------|-------------------------|
| Agilent | Spectrum Analyzer | E4440A | US45303156 | 2010-08-09 ¹ |
| Agilent | Signal Generator | E4438C | MY45091309 | 2012-05-03 |

Note 1: Based on a two year calibration cycle.

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

8.4 Test Environmental Conditions

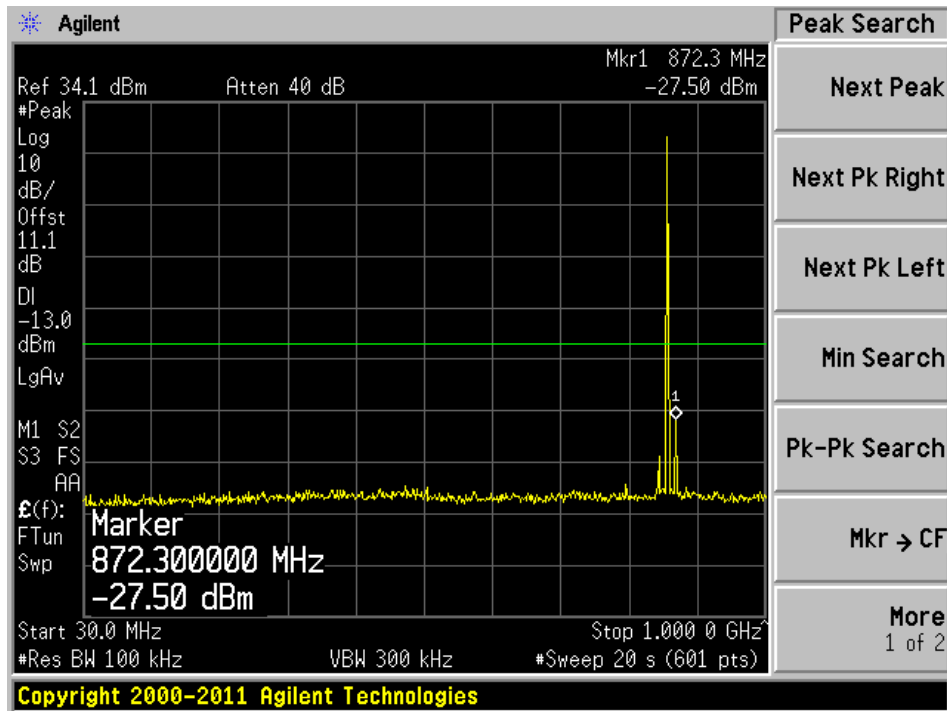
| | |
|---------------------------|-----------|
| Temperature: | 22 °C |
| Relative Humidity: | 60 % |
| ATM Pressure: | 101.6 kPa |

The testing was performed by Wei Sun on 2012-07-09 on the RF Site.

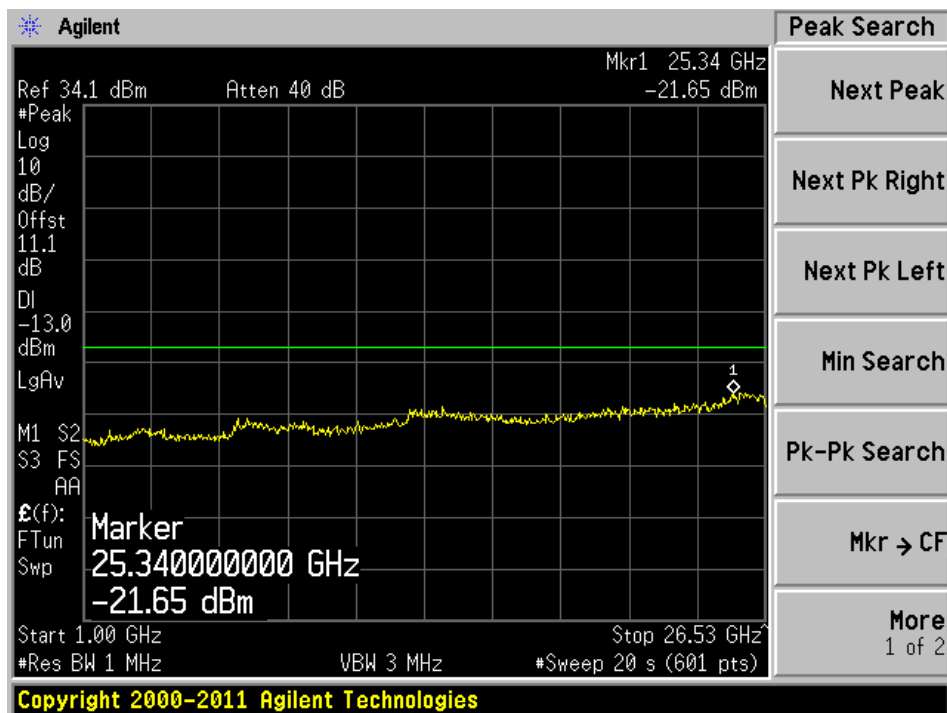
8.5 Test Results

Please refer to the following plots.

800 MHz Downlink Middle Channel, below 1 GHz



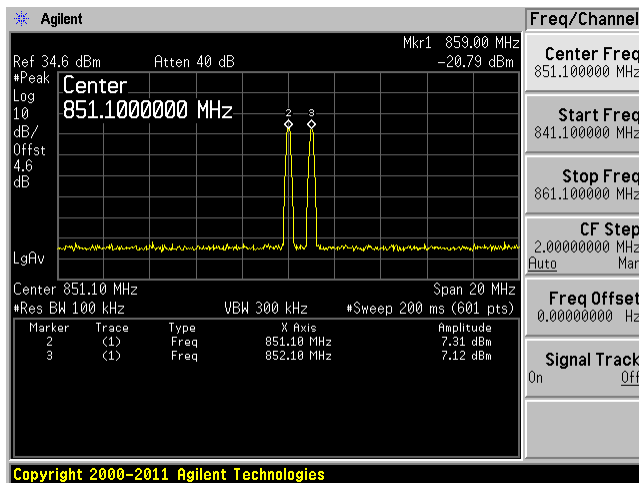
800 MHz Downlink Middle Channel, above 1 GHz



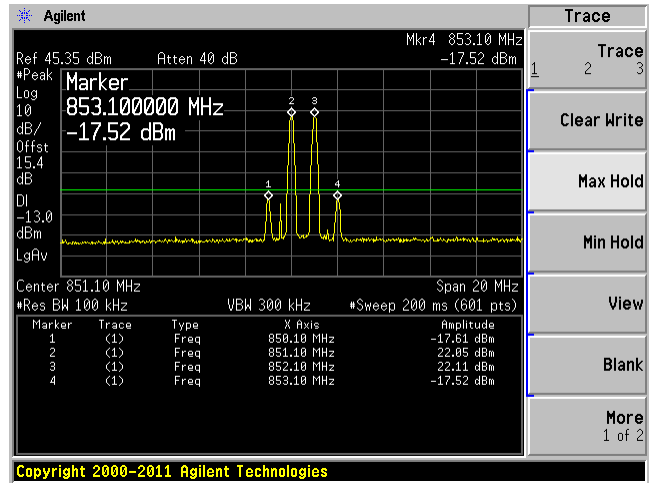
Intermodulation

800 MHz Downlink Low Channel

Input

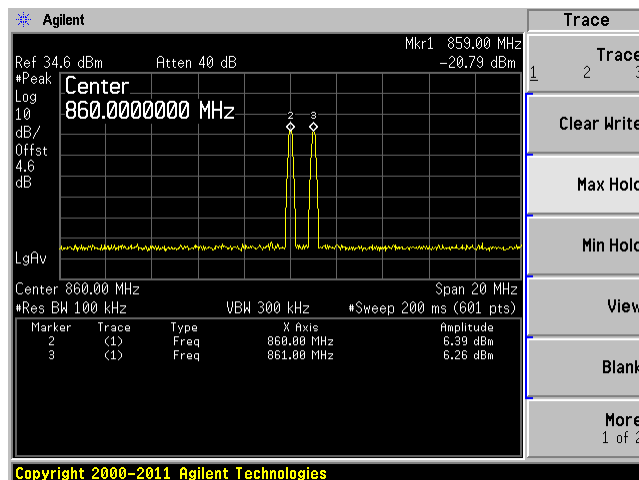


Output

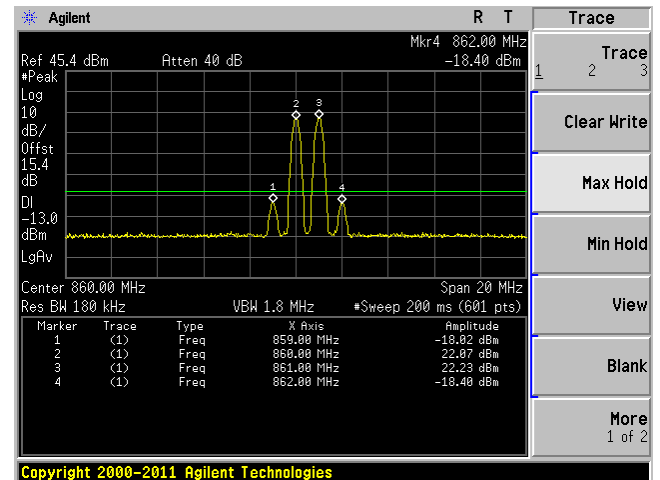


800 MHz Downlink Middle Channel

Input

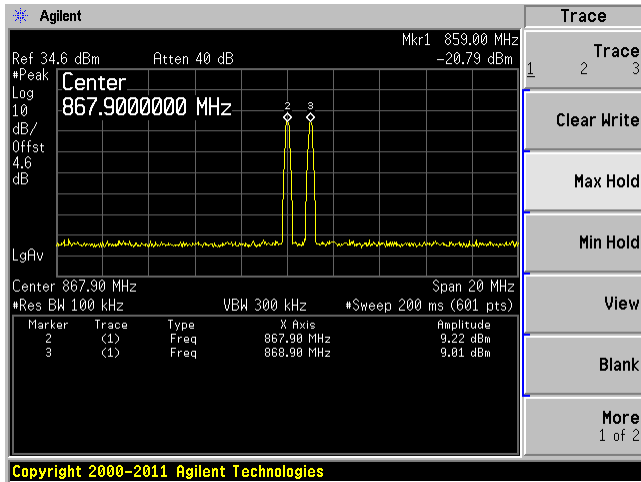


Output

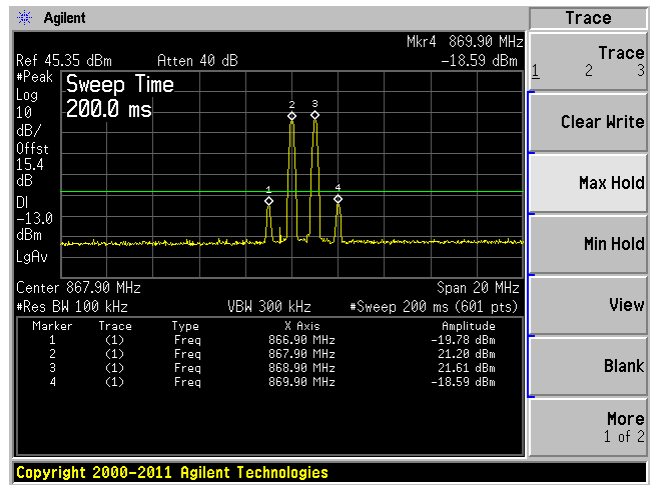


800 MHz Downlink High Channel

Input



Output



9 FCC §2.1055 & §90.669 - Frequency Stability

9.1 Applicable Standard

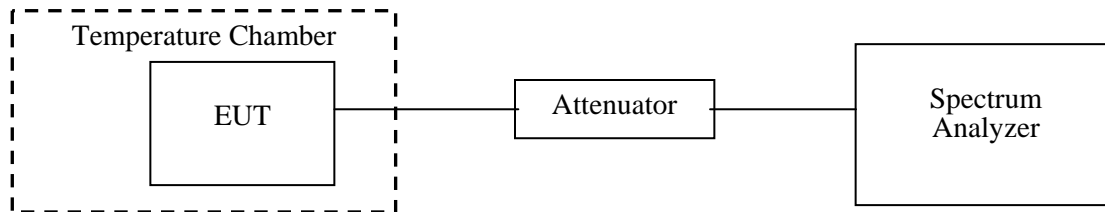
According to FCC §2.1055 the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

9.2 Test Procedure

The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification-the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.



9.3 Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date |
|--------------|-----------------------|---------|---------------|-------------------------|
| Agilent | Spectrum Analyzer | E4440A | US45303156 | 2010-08-09 ¹ |
| Agilent | Signal Generator | E4438C | MY45091309 | 2012-05-03 |
| Espec | Temp/Humidity Chamber | ESL-4CA | 18010 | 2012-02-10 |

Note 1: Based on a two year calibration cycle.

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

9.4 Test Environmental Conditions

| | |
|---------------------------|----------|
| Temperature: | 21 °C |
| Relative Humidity: | 57 % |
| ATM Pressure: | 101.4kPa |

The testing was performed by Wei Sun on 2012-06-25 at RF Site.

9.5 Test Results

800 MHz Downlink, Middle Channel

| Test Condition | | Reference Frequency (MHz) | Measured Frequency (MHz) | Frequency Error (PPM) | Limit (PPM) |
|---------------------------|------------------|---------------------------|--------------------------|-----------------------|-------------|
| Voltage (Vac) | Temperature (°C) | | | | |
| Frequency vs. Temperature | | | | | |
| 120 | 45 | 860 | 860.0001256 | 0.146 | ± 1.5 |
| 120 | 35 | 860 | 860.0001236 | 0.144 | ± 1.5 |
| 120 | 25 | 860 | 860.0001234 | 0.143 | ± 1.5 |
| 120 | 15 | 860 | 859.9999125 | -0.102 | ± 1.5 |
| 120 | 5 | 860 | 860.0001165 | 0.135 | ± 1.5 |
| 120 | -5 | 860 | 860.0001232 | 0.143 | ± 1.5 |
| 120 | -15 | 860 | 859.9999975 | -0.003 | ± 1.5 |
| 120 | -25 | 860 | 860.0001115 | 0.130 | ± 1.5 |
| Frequency vs. Voltage | | | | | |
| 108 | 25 | 860 | 859.9999858 | -0.017 | ± 1.5 |
| 132 | 25 | 860 | 860.0000125 | 0.014 | ± 1.5 |

10 FCC §2.1053 & §90.669 – Field Strength of Spurious Radiation

10.1 Applicable Standard

Requirements: FCC §2.1053, and §90.669.

10.2 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 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 (TX Power in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts)

10.3 Test Equipment List and Details

| Manufacturers | Descriptions | Models | Serial Numbers | Calibration Dates |
|--------------------|---------------------|-------------|----------------|-------------------------|
| Agilent | Spectrum Analyzer | E4440A | US45303156 | 2010-08-09 ¹ |
| Sunol Science Corp | System Controller | SC99V | 122303-1 | N/R |
| Sunol Science Corp | Combination Antenna | JB3 | A020106-2 | 2011-08-10 |
| Hewlett Packard | Pre-amplifier | 8447D | 2944A10187 | 2012-03-08 |
| Eaton | Horn antenna | 96001 | Mar-07 | 2011-10-03 |
| A.H. Systems | Horn antenna | SAS-200/571 | 261 | 2012-01-18 |
| Mini-Circuits | Pre-amplifier | ZVA-183-S | 667400960 | 2012-05-08 |
| HP | Signal Generator | 8648C | 3426A00417 | 2011-08-18 |
| HP | Signal Generator | 83650B | 3614A00276 | 2010-06-21 ¹ |

Note 1: Based on a two-year calibration cycle

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

10.4 Test Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 21 °C |
| Relative Humidity: | 40 % |
| ATM Pressure: | 101.6 kPa |

The testing was performed by Wei Sun on 2012-06-15 in 5 meters chamber 3.

10.5 Test Results

800 MHz Downlink, Middle Channel

| Indicated | | Turntable Azimuth Degrees | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|----------------|----------------|---------------------------------|----------------|----------------|----------------|----------------|---------------------------|-----------------------|----------------------------|----------------|----------------|
| Freq. (MHz) | Amp. (dBuV) | | Height (cm) | Polar (H/V) | Freq. (MHz) | Level (dBm) | Antenna Cord. (dBi) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 872 | 56.09 | 229 | 155 | V | 860 | -28.06 | 0 | 1.38 | -29.44 | -13 | -16.44 |
| 872 | 51.94 | 169 | 155 | H | 860 | -32.25 | 0 | 1.38 | -33.63 | -13 | -20.63 |