

# FCC PART 24 TYPE APPROVAL EMI MEASUREMENT AND TEST REPORT

For

**Cellphone-Mate, Inc.**

36543 San Pedro Dr. Suite 277  
Fremont, CA 94536

**FCC ID: RSNCM2000**

|                                                                                                                                                                     |                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>This Report Concerns:</b><br><input checked="" type="checkbox"/> Original Report                                                                                 | <b>Equipment Type:</b><br>RF Amplifier |
| <b>Test Engineer:</b> Ming Jin /                                                  |                                        |
| <b>Report No.:</b> R0408232                                                                                                                                         |                                        |
| <b>Report Date:</b> 2004-09-08                                                                                                                                      |                                        |
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**Note:** The test report is specially limited to the above company and the product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the US Government.

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## GENERAL INFORMATION

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### Product Description for Equipment Under Test (EUT)

The CELLPHONE-MATE, INC. product, FCC ID: RSNCM2000, or "EUT" as referred to in this report, is a dual band RF amplifier. The EUT transmit and receive signals to improve communications of cellular band (850MHz) and PCS band (1900MHz) cellular phones. The EUT operates at the frequency 824.2 - 848.8/1850.2-1909.8 MHz (GSM), 824.73-848.19/1851.25-1908.75 MHz (CDMA), and 824.02-848.8/1850.2-1909.8 MHz (AMPS). The maximum output power 31.4 dBm (1.38W) per carrier, frequency tolerance 2.5ppm and emission designator GXW.

*\* The test data gathered are from typical production sample, serial number: 101, provided by the manufacturer.*

### Objective

This type approval report is prepared on behalf of *CELLPHONE-MATE, INC.* in accordance with Part 2, Subpart J, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, spurious emission at antenna terminal, field strength of spurious radiation, frequency stability, band edge 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 24 Subpart E - PCS

Applicable Standards: TIA EIA 137-A, TIA EIA 98-C, ANSI 63.4-1992, and TIA/EIA-603A.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters, except as noted below.

### Test Facility

The Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the building at 230 Commercial Street, Sunnyvale, CA 94085.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, CISPR 22: 1997, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

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## SYSTEM TEST CONFIGURATION

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### Justification

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

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

### Block Diagram

Please refer to Exhibit D.

### Equipment Modifications

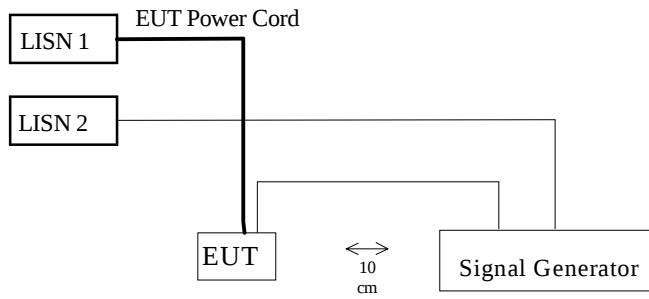
No modifications were made to the EUT.

### External I/O Cabling List and Details

| Cable Description | Length (M) | Port/From             | To            |
|-------------------|------------|-----------------------|---------------|
| Shielded cable    | 2.0        | RF Output / Generator | RF Port / EUT |

### Power Supply Information

| Manufacturer   | Description | Model | Serial Number | FCC ID |
|----------------|-------------|-------|---------------|--------|
| Cellphone-Mate | AC Adapter  | N/A   | N/A           | DOC    |

**Test Setup Block Diagram**

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## SUMMARY OF TEST RESULTS

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Results reported relate only to the product tested, serial number: 101.

| FCC RULE                | DESCRIPTION OF TEST                                                    | Result    |
|-------------------------|------------------------------------------------------------------------|-----------|
| §2.1046<br>§ 24.232     | RF power output                                                        | Compliant |
| § 2.1047                | Modulation Characteristics                                             | N/A       |
| § 2.1049<br>§ 24.238(b) | Emission Bandwidth                                                     | Compliant |
| 2.1051<br>§ 24.238(a)   | Spurious emissions at antenna terminals                                | Compliant |
| 2.1051<br>§ 24.238 (a)  | Two-Tone Test (Spurious emissions at antenna terminals)                | N/A       |
| 2.1053<br>§ 24.238 (a)  | Radiated Spurious Emissions                                            | Compliant |
| § 2.1055<br>§ 24.235    | Frequency stability vs. temperature<br>Frequency stability vs. voltage | N/A       |
| §24.238                 | Band Edge                                                              | Compliant |

**§2.1047 - MODULATION CHARACTERISTIC**

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This EUT is an amplifier, not a transmitter. There is no modulating circuit in the EUT, therefore there is no modulating characteristics measurement required.

## §2.1053 - SPURIOUS RADIATED EMISSIONS

### Applicable Standard

Requirements: CFR 47, § 24.238 (a), on any frequency outside a licensee's frequency block. The power of any emission shall be attenuated below the transmitter power (P) by at least  $43+10\lg(P)$  dB, equivalent to -13dBm.

In the event it is either impractical or impossible to make open field measurement [e.g. a broadcast transmitter installed in a building] measurement will be accepted of equipment as installed.

### Test Procedure

The EUT was placed beside the base station and connected to the base station transmitter. The transmitter was RF enabled and the EUT amplified the signal into a non-radiating load. The test antenna was placed at a distance of 3 meters from the EUT. In order to identify the maximum level of emissions from the EUT, the antenna height and polarization were varied during the test, and the antenna azimuth was varied by moving the antenna around the EUT.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

The EUT was replaced with a substitution antenna, and a signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured.

Spurious emissions in dB =  $10 \lg(\text{TXpwr in Watts}/0.001)$  – the absolute level

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

### Test Equipment List and Details

| Manufacturer | Description          | Model       | Serial Number | Cal. Date  |
|--------------|----------------------|-------------|---------------|------------|
| HP           | Spectrum Analyzer    | 8568B       | 2601A02165    | 2004-07-03 |
| HP           | Amplifier            | 8447E       | 2944A10187    | 2003-09-23 |
| HP           | Quasi-Peak Adapter   | 85650A      | 3019A05393    | 2004-06-13 |
| EMCO         | Biconical Antenna    | 3110B       | 9309-1165     | 2003-10-11 |
| EMCO         | Log Periodic Antenna | 3146        | 2101          | 2003-10-11 |
| AH System    | Horn Antenna         | SAS-200/511 | 261           | 2004-08-02 |
| HP           | Spectrum Analyzer    | HP8564E     | 3943A01781    | 2004-08-01 |

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

### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 28° C     |
| Relative Humidity: | 37%       |
| ATM Pressure:      | 1032 mbar |

*The testing was performed by Ming Jin on 2004-08-25*

**Test Result****Data for GSM Cell 800**

Low Frequency: -4.9 dB at 1648.4 MHz

Middle Frequency: -5.2 dB at 1673.2 MHz

High Frequency: -5.3 dB at 1697.6 MHz

| EUT              |                 |                 |                 |              |                  |              | Generator         |            |              | Standard     |              |
|------------------|-----------------|-----------------|-----------------|--------------|------------------|--------------|-------------------|------------|--------------|--------------|--------------|
| Indicated        |                 | Table           | Test Antenna    |              | Substitution     |              | Antenna           | Cable      | Absolute     | FCC          | FCC          |
| Frequency<br>MHz | Ampl.<br>dBuV/m | Angle<br>Degree | Height<br>Meter | Polar<br>H/V | Frequency<br>MHz | Level<br>dBm | Gain<br>Corrected | Loss<br>dB | Level<br>dBm | Limit<br>dBm | Margin<br>dB |
| Low Channel      |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 824.2            | 103.6           | 60              | 1.2             | V            | 824.2            | 26.9         | 5.6               | 0.8        | 31.7         |              |              |
| 824.2            | 91.2            | 0               | 1.5             | H            | 824.2            | 17.7         | 5.6               | 0.8        | 22.5         |              |              |
| 1648.4           | 52.4            | 180             | 1.5             | V            | 1648.4           | -23.5        | 6.8               | 1.2        | -17.9        | -13          | -4.9         |
| 1648.4           | 50.3            | 210             | 1.2             | H            | 1648.4           | -24.9        | 6.8               | 1.2        | -19.3        | -13          | -6.3         |
| 2472.6           | 35.7            | 30              | 1.5             | V            | 2472.6           | -36.1        | 7.6               | 1.5        | -30          | -13          | -17          |
| 2472.6           | 33.8            | 180             | 1.5             | H            | 2472.6           | -37.9        | 7.6               | 1.5        | -31.8        | -13          | -18.8        |
| MIDDLE CHANNEL   |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 836.6            | 102.5           | 120             | 1.6             | V            | 836.6            | 25.7         | 5.6               | 0.8        | 30.5         |              |              |
| 836.6            | 89.3            | 45              | 1.5             | H            | 836.6            | 16.4         | 5.6               | 0.8        | 21.2         |              |              |
| 1673.2           | 52.2            | 110             | 1.6             | V            | 1673.2           | -23.8        | 6.8               | 1.2        | -18.2        | -13          | -5.2         |
| 1673.2           | 50.1            | 180             | 1.5             | H            | 1673.2           | -25.1        | 6.8               | 1.2        | -19.5        | -13          | -6.5         |
| 2509.8           | 35.4            | 45              | 1.6             | V            | 2509.8           | -36.4        | 7.6               | 1.5        | -30.3        | -13          | -17.3        |
| 2509.8           | 33.5            | 150             | 1.5             | H            | 2509.8           | -38.3        | 7.6               | 1.5        | -32.2        | -13          | -19.2        |
| HIGH CHANNEL     |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 848.8            | 100.7           | 270             | 1.5             | V            | 848.8            | 23.5         | 5.6               | 0.8        | 28.3         |              |              |
| 848.8            | 88.9            | 290             | 1.6             | H            | 848.8            | 15.3         | 5.6               | 0.8        | 20.1         |              |              |
| 1697.6           | 52.1            | 0               | 1.4             | V            | 1697.6           | -23.9        | 6.8               | 1.2        | -18.3        | -13          | -5.3         |
| 1697.6           | 49.9            | 15              | 1.5             | H            | 1697.6           | -25.4        | 6.8               | 1.2        | -19.8        | -13          | -6.8         |
| 2546.4           | 35.2            | 0               | 1.2             | V            | 2546.4           | -36.7        | 7.6               | 1.5        | -30.6        | -13          | -17.6        |
| 2546.4           | 33.1            | 270             | 1.5             | H            | 2546.4           | -38.9        | 7.6               | 1.5        | -32.8        | -13          | -19.8        |

**Data for GSM PCS 1900**

Low Frequency: -5.0 dB at 3700.4 MHz

Middle Frequency: -5.4 dB at 3760.0 MHz

High Frequency: -5.6 dB at 3819.6 MHz

| EUT              |                 |                 |                 |              | Generator        |              |                   |            |              | Standard     |              |
|------------------|-----------------|-----------------|-----------------|--------------|------------------|--------------|-------------------|------------|--------------|--------------|--------------|
| Indicated        |                 | Table           | Test Antenna    |              | Substitution     |              | Antenna           | Cable      | Absolute     | FCC          | FCC          |
| Frequency<br>MHz | Ampl.<br>dBuV/m | Angle<br>Degree | Height<br>Meter | Polar<br>H/V | Frequency<br>MHz | Level<br>dBm | Gain<br>Corrected | Loss<br>dB | Level<br>dBm | Limit<br>dBm | Margin<br>dB |
| Low Channel      |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 1850.2           | 92.3            | 120             | 1.5             | V            | 1850.2           | 21.4         | 8.3               | 1.30       | 28.40        |              |              |
| 1850.2           | 81.9            | 90              | 1.5             | H            | 1850.2           | 12.5         | 8.3               | 1.30       | 19.50        |              |              |
| 3700.4           | 50.3            | 0               | 1.2             | V            | 3700.4           | -26.3        | 10.3              | 2.00       | -18.00       | -13          | -5.00        |
| 3700.4           | 48.4            | 310             | 1.6             | H            | 3700.4           | -27.5        | 10.3              | 2.00       | -19.20       | -13          | -6.20        |
| 5550.6           | 33.9            | 180             | 1.6             | V            | 5550.6           | -38.8        | 10.6              | 2.55       | -30.75       | -13          | -17.75       |
| 5550.6           | 31.7            | 270             | 1.5             | H            | 5550.6           | -40.1        | 10.6              | 2.55       | -32.05       | -13          | -19.05       |
| MIDDLE CHANNEL   |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 1880             | 90.5            | 270             | 1.6             | V            | 1880             | 20.3         | 8.3               | 1.30       | 27.3         |              |              |
| 1880             | 81.4            | 330             | 1.4             | H            | 1880             | 12.5         | 8.3               | 1.30       | 19.5         |              |              |
| 3760             | 49.8            | 90              | 1.4             | V            | 3760             | -26.7        | 10.3              | 2.00       | -18.4        | -13          | -5.4         |
| 3760             | 47.2            | 90              | 2.2             | H            | 3760             | -28.2        | 10.3              | 2.00       | -19.9        | -13          | -6.9         |
| 5640             | 33.6            | 60              | 2               | V            | 5640             | -39.1        | 10.6              | 2.55       | -31.05       | -13          | -18.05       |
| 5640             | 31.5            | 60              | 1.5             | H            | 5640             | -40.3        | 10.6              | 2.55       | -32.25       | -13          | -19.25       |
| HIGH CHANNEL     |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 1909.8           | 89.8            | 300             | 2.2             | V            | 1909.8           | 19.9         | 8.3               | 1.30       | 26.9         |              |              |
| 1909.8           | 80.2            | 330             | 1.8             | H            | 1909.8           | 11.8         | 8.3               | 1.30       | 18.8         |              |              |
| 3819.6           | 49.5            | 60              | 1.6             | V            | 3819.6           | -26.9        | 10.3              | 2.00       | -18.6        | -13          | -5.6         |
| 3819.6           | 47.1            | 90              | 2               | H            | 3819.6           | -28.3        | 10.3              | 2.00       | -20.0        | -13          | -7.0         |
| 5729.4           | 33.2            | 60              | 2.2             | V            | 5729.4           | -40.3        | 10.6              | 2.55       | -32.25       | -13          | -19.25       |
| 5729.4           | 31.4            | 0               | 1.8             | H            | 5729.4           | -40.7        | 10.6              | 2.55       | -32.65       | -13          | -19.65       |

**Data for CDMA Cell 800**

Low Frequency: -5.1 dB at 1649.46 MHz  
 Middle Frequency: -6.3 dB at 1672.8 MHz  
 High Frequency: -5.5 dB at 1696.38 MHz

| EUT              |                 |                 |                 |              |                  |              | Generator         |            |              | Standard     |              |
|------------------|-----------------|-----------------|-----------------|--------------|------------------|--------------|-------------------|------------|--------------|--------------|--------------|
| Indicated        |                 | Table           | Test Antenna    |              | Substitution     |              | Antenna           | Cable      | Absolute     | FCC          | FCC          |
| Frequency<br>MHz | Ampl.<br>dBuV/m | Angle<br>Degree | Height<br>Meter | Polar<br>H/V | Frequency<br>MHz | Level<br>dBm | Gain<br>Corrected | Loss<br>dB | Level<br>dBm | Limit<br>dBm | Margin<br>dB |
| Low Channel      |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 824.73           | 102.7           | 30              | 1.5             | V            | 824.73           | 25.8         | 5.6               | 0.8        | 30.6         |              |              |
| 824.73           | 90.4            | 0               | 1.5             | H            | 824.73           | 17.1         | 5.6               | 0.8        | 21.9         |              |              |
| 1649.46          | 52.2            | 120             | 1.5             | V            | 1649.46          | -23.7        | 6.8               | 1.2        | -18.1        | -13          | -5.1         |
| 1649.46          | 50.1            | 210             | 1.2             | H            | 1649.46          | -25.2        | 6.8               | 1.2        | -19.6        | -13          | -6.6         |
| 2474.19          | 35.5            | 60              | 1.5             | V            | 2474.19          | -36.1        | 7.6               | 1.5        | -30.0        | -13          | -17.0        |
| 2474.19          | 33.6            | 90              | 1.5             | H            | 2474.19          | -38.3        | 7.6               | 1.5        | -32.2        | -13          | -19.2        |
| MIDDLE CHANNEL   |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 836.4            | 102.1           | 90              | 1.6             | V            | 836.4            | 25.1         | 5.6               | 0.8        | 29.9         |              |              |
| 836.4            | 88.9            | 45              | 1.5             | H            | 836.4            | 15.8         | 5.6               | 0.8        | 20.6         |              |              |
| 1672.8           | 52.1            | 180             | 1.6             | V            | 1672.8           | -24.9        | 6.8               | 1.2        | -19.3        | -13          | -6.3         |
| 1672.8           | 49.8            | 0               | 1.5             | H            | 1672.8           | -25.3        | 6.8               | 1.2        | -19.7        | -13          | -6.7         |
| 2509.2           | 35.2            | 30              | 1.6             | V            | 2509.2           | -36.7        | 7.6               | 1.5        | -30.6        | -13          | -17.6        |
| 2509.2           | 33.4            | 150             | 1.5             | H            | 2509.2           | -38.5        | 7.6               | 1.5        | -32.4        | -13          | -19.4        |
| HIGH CHANNEL     |                 |                 |                 |              |                  |              |                   |            |              |              |              |
| 848.19           | 100.5           | 230             | 1.5             | V            | 848.19           | 23.3         | 5.6               | 0.8        | 28.1         |              |              |
| 848.19           | 88.6            | 290             | 1.2             | H            | 848.19           | 15.1         | 5.6               | 0.8        | 19.9         |              |              |
| 1696.38          | 51.9            | 60              | 1.4             | V            | 1696.38          | -24.1        | 6.8               | 1.2        | -18.5        | -13          | -5.5         |
| 1696.38          | 49.7            | 0               | 1.5             | H            | 1696.38          | -25.8        | 6.8               | 1.2        | -20.2        | -13          | -7.2         |
| 2544.57          | 35.1            | 45              | 1.2             | V            | 2544.57          | -36.9        | 7.6               | 1.5        | -30.8        | -13          | -17.8        |
| 2544.57          | 32.8            | 120             | 1.5             | H            | 2544.57          | -39.1        | 7.6               | 1.5        | -33.0        | -13          | -20.0        |

**Data for CDMA PCS 1900**

Low Frequency: -5.2 dB at 3702.5 MHz  
 Middle Frequency: -5.6 dB at 3760.0 MHz  
 High Frequency: -5.8 dB at 3817.5 MHz

| Indicated        |                 | EUT             |                 | Test Antenna |                  | Substitution |  | Generator         |            |              | Standard     |              |
|------------------|-----------------|-----------------|-----------------|--------------|------------------|--------------|--|-------------------|------------|--------------|--------------|--------------|
|                  |                 | Table           |                 |              |                  |              |  | Antenna           | Cable      | Absolute     | FCC          | FCC          |
| Frequency<br>MHz | Ampl.<br>dBuV/m | Angle<br>Degree | Height<br>Meter | Polar<br>H/V | Frequency<br>MHz | Level<br>dBm |  | Gain<br>Corrected | Loss<br>dB | Level<br>dBm | Limit<br>dBm | Margin<br>dB |
| Low Channel      |                 |                 |                 |              |                  |              |  |                   |            |              |              |              |
| 1851.25          | 92.1            | 110             | 1.5             | V            | 1851.25          | 21.2         |  | 8.3               | 1.30       | 28.20        |              |              |
| 1851.25          | 81.6            | 70              | 1.2             | H            | 1851.25          | 12.3         |  | 8.3               | 1.30       | 19.30        |              |              |
| 3702.5           | 50.2            | 0               | 1.5             | V            | 3702.50          | -26.5        |  | 10.3              | 2.00       | -18.20       | -13          | -5.20        |
| 3702.5           | 48.1            | 330             | 1.6             | H            | 3702.50          | -27.7        |  | 10.3              | 2.00       | -19.40       | -13          | -6.40        |
| 5553.75          | 33.7            | 150             | 1.6             | V            | 5553.75          | -40.1        |  | 10.6              | 2.55       | -32.05       | -13          | -19.05       |
| 5553.75          | 31.5            | 290             | 1.5             | H            | 5553.75          | -40.3        |  | 10.6              | 2.55       | -32.25       | -13          | -19.25       |
| MIDDLE CHANNEL   |                 |                 |                 |              |                  |              |  |                   |            |              |              |              |
| 1880             | 90.3            | 220             | 1.5             | V            | 1880             | 20.1         |  | 8.3               | 1.30       | 27.10        |              |              |
| 1880             | 81.2            | 330             | 1.4             | H            | 1880             | 11.9         |  | 8.3               | 1.30       | 18.90        |              |              |
| 3760             | 49.7            | 0               | 1.5             | V            | 3760             | -26.9        |  | 10.3              | 2.00       | -18.60       | -13          | -5.60        |
| 3760             | 47.1            | 90              | 2.0             | H            | 3760             | -28.4        |  | 10.3              | 2.00       | -20.10       | -13          | -7.10        |
| 5640             | 33.4            | 60              | 1.8             | V            | 5640             | -39.3        |  | 10.6              | 2.55       | -31.25       | -13          | -18.25       |
| 5640             | 31.2            | 210             | 1.5             | H            | 5640             | -40.5        |  | 10.6              | 2.55       | -32.45       | -13          | -19.45       |
| HIGH CHANNEL     |                 |                 |                 |              |                  |              |  |                   |            |              |              |              |
| 1908.75          | 89.7            | 310             | 1.5             | V            | 1908.75          | 19.6         |  | 8.3               | 1.30       | 26.60        |              |              |
| 1908.75          | 80.1            | 0               | 1.8             | H            | 1908.75          | 11.6         |  | 8.3               | 1.30       | 18.60        |              |              |
| 3817.5           | 49.3            | 60              | 1.6             | V            | 3817.5           | -27.1        |  | 10.3              | 2.00       | -18.80       | -13          | -5.80        |
| 3817.5           | 46.8            | 120             | 2               | H            | 3817.5           | -28.5        |  | 10.3              | 2.00       | -20.20       | -13          | -7.20        |
| 5726.25          | 33.1            | 0               | 1.5             | V            | 5726.25          | -40.5        |  | 10.6              | 2.55       | -32.45       | -13          | -19.45       |
| 5726.25          | 31.2            | 15              | 1.8             | H            | 5726.25          | -40.9        |  | 10.6              | 2.55       | -32.85       | -13          | -19.85       |

## §2.1046, & §24.232 –CONDCUTED POWER OUTPUT

### Applicable Standard

According to FCC §2.1046 and §24.232 (a), in no case may the peak output power of a base station transmitter exceed 100 watt.

### Test Procedure

The GSM and EDGE signals were provided by the Nortel S8000 Base Transceiver Station (BTS). The EUT output was connected to a calibrated coaxial attenuator (50 Ohm), which was then connected to an Agilent Power Sensor. The EUT output power was calculated by adding the value observed on the Power Meter (dBm) with the measurement loss of the attenuator.

The test was performed at three frequencies (GSM channels 513, 661, and 809) with the BTS power set to 39dBm.

### Test Equipment List and Details

| Manufacturer | Description | Model  | Serial Number | Cal. Date  |
|--------------|-------------|--------|---------------|------------|
| Agilent      | Power Meter | E4419B | MY41291511    | 2004-04-29 |

\* **Statement of Traceability:** BACL Corp. certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 28.9° C   |
| Relative Humidity: | 37%       |
| ATM Pressure:      | 1032 mbar |

*The testing was performed by Ming Jin on 2004-08-25.*

**Test Results**

| Modulation | Band         | Channel | Frequency<br>MHz | Input Power<br>dBm | Output Power<br>dBm | Output Power<br>W |
|------------|--------------|---------|------------------|--------------------|---------------------|-------------------|
| GSM        | Cellular 850 | Low     | 824.02           | 15                 | 31.2                | 1.318             |
|            |              | Mid     | 836.60           | 15                 | 31.4                | 1.380             |
|            |              | High    | 848.80           | 15                 | 28.5                | 0.708             |
|            | PCS 1900     | Low     | 1850.20          | 13                 | 24.1                | 0.257             |
|            |              | Mid     | 1880.00          | 13                 | 26.8                | 0.479             |
|            |              | High    | 1909.80          | 13                 | 23.7                | 0.234             |
| CDMA       | Cellular 850 | Low     | 824.73           | 15                 | 30.9                | 1.230             |
|            |              | Mid     | 836.40           | 15                 | 31.1                | 1.288             |
|            |              | High    | 848.19           | 15                 | 28.2                | 0.661             |
|            | PCS 1900     | Low     | 1851.25          | 13                 | 23.8                | 0.240             |
|            |              | Mid     | 1880.00          | 13                 | 26.2                | 0.417             |
|            |              | High    | 1908.75          | 13                 | 23.1                | 0.204             |
| AMPS       | Cellular 850 | Low     | 824.02           | 15                 | 31.1                | 1.288             |
|            |              | Mid     | 836.60           | 15                 | 31.3                | 1.349             |
|            |              | High    | 848.80           | 15                 | 28.4                | 0.692             |
|            | PCS 1900     | Low     | 1850.20          | 13                 | 23.9                | 0.245             |
|            |              | Mid     | 1880.00          | 13                 | 26.5                | 0.447             |
|            |              | High    | 1909.80          | 13                 | 23.4                | 0.219             |

## §2.1049, & §24.238(b) - EMISSION BANDWIDTH

### Applicable Standards

According to FCC §2.1049 and §24.238 (b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

### Test Procedure

The EUT output was connected to the input of the Spectrum Analyzer through a calibrated attenuator.

The resolution bandwidth of the Spectrum Analyzer was set to 30Khz.

### Test Equipment

| Manufacturer | Description       | Model   | Serial Number | Cal. Date    |
|--------------|-------------------|---------|---------------|--------------|
| HP           | Spectrum Analyzer | HP8564E | 3943A01781    | 2003-08-01   |
| HP           | Plotter           | HP7470A | 2541A49659    | Not Required |
| Weinschel    | Attenuator        | MS015   | 58633         | N/A          |

**\* Statement of Traceability:** **BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 28° C     |
| Relative Humidity: | 37%       |
| ATM Pressure:      | 1032 mbar |

The testing was performed by Ming Jin on 2004-08-25.

### Test Results

| Modulation | BAND         | Channel | Type           | Measurement (KHz) | Result    |
|------------|--------------|---------|----------------|-------------------|-----------|
| GSM        | Cellular 850 | Low     | 26dB Bandwidth | 363               | Compliant |
|            |              |         | 99% Bandwidth  | 256.7             | Compliant |
|            |              | Mid     | 26dB Bandwidth | 367               | Compliant |
|            |              |         | 99% Bandwidth  | 256.7             | Compliant |
|            |              | High    | 26dB Bandwidth | 363               | Compliant |
|            |              |         | 99% Bandwidth  | 256.7             | Compliant |
|            | PCS 1900     | Low     | 26dB Bandwidth | 353               | Compliant |
|            |              |         | 99% Bandwidth  | 253.3             | Compliant |
|            |              | Mid     | 26dB Bandwidth | 350               | Compliant |
|            |              |         | 99% Bandwidth  | 253.3             | Compliant |
|            |              | High    | 26dB Bandwidth | 343               | Compliant |
|            |              |         | 99% Bandwidth  | 256.7             | Compliant |

| Modulation | BAND         | Channel | Type           | Measurement (MHz) | Result    |
|------------|--------------|---------|----------------|-------------------|-----------|
| CDMA       | Cellular 850 | Low     | 26dB Bandwidth | 1533              | Compliant |
|            |              |         | 99% Bandwidth  | 1325              | Compliant |
|            |              | Mid     | 26dB Bandwidth | 1450              | Compliant |
|            |              |         | 99% Bandwidth  | 1325              | Compliant |
|            |              | High    | 26dB Bandwidth | 1450              | Compliant |
|            |              |         | 99% Bandwidth  | 1333              | Compliant |
|            | PCS 1900     | Low     | 26dB Bandwidth | 1542              | Compliant |
|            |              |         | 99% Bandwidth  | 1292              | Compliant |
|            |              | Mid     | 26dB Bandwidth | 1493              | Compliant |
|            |              |         | 99% Bandwidth  | 1293              | Compliant |
|            |              | High    | 26dB Bandwidth | 1493              | Compliant |
|            |              |         | 99% Bandwidth  | 1287              | Compliant |

| Modulation | BAND         | Channel | Type           | Measurement (KHz) | Result    |
|------------|--------------|---------|----------------|-------------------|-----------|
| AMPS       | Cellular 850 | Low     | 26dB Bandwidth | 11.50             | Compliant |
|            |              | Mid     | 26dB Bandwidth | 11.67             | Compliant |
|            |              | High    | 26dB Bandwidth | 11.50             | Compliant |
|            | PCS 1900     | Low     | 26dB Bandwidth | 11.50             | Compliant |
|            |              | Mid     | 26dB Bandwidth | 11.67             | Compliant |
|            |              | High    | 26dB Bandwidth | 11.58             | Compliant |

Please refer to plots hereinafter.

