




FCC Type Approval
EMI MEASUREMENT AND TEST REPORT

For
High Tech Computer, Corp.

23, Hsin-Hua Rd.,
Taoyuan, 330 Taiwan

FCC ID: NM8HARRIER

| | |
|---|--|
| This Report Concerns: <input checked="" type="checkbox"/> Original Report | Equipment Type: CDMA 800/1900 + Bluetooth PDA Phone |
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| Daniel Deng /  | |
| Report No.: R0407195 | |
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Note: This test report is specially limited to the above client company and 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 endorsement by NVLAP or any agency of the U.S. Government.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *High Tech Computer, Corp.*'s product, model no.:PH20A2 / PH20A3 or the "EUT" as referred to this report is a CDMA 800/1900 + Bluetooth PDA Phone which measures approximately 5.0"L x 2.8"W x 0.75"H. The EUT is a DSS + TNF composite device. The DSS part operates at 2402 – 2480MHz with maximum output power of 1.079mW. The TNF part operates at 824.73 - 848.19 MHz with maximum output power of 0.209W (ERP), frequency tolerance 2.5ppm and emission designator 1M28F9W for modulation of CDMA cellular band and operates at 1851.25 - 1908.75MHz with maximum output power of 0.200W (EIRP), frequency tolerance 0.41ppm and emission designator 1M29F9W for modulation of CDMA PCS band.

The manufacturer applied two models to the product. PH20A2 is with a camera, PH20A3 is without camera. Radiated Emission testing was performed on both models, while in the rest of the testings PH20A2 stands for the worst case. SAR testing was run on both models too. Please refer to the SAR report for details.

** The test data gathered are from typical production sample, serial number: H0002 & H0003, provided by the manufacturer.*

Objective

This type approval report is prepared on behalf of *High Tech Computer, Corp.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B, C, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

It is also prepared in accordance with Part 2, Subpart J, Part 15, Subparts A, B, C, Part 22 Subpart H and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC 15.247 rules for the bluetooth transmitter:

- Maximum Peak Output Power
- Hopping Channel Separation
- Number of Hopping Frequency Used
- 20 dB Bandwidth
- Dwell Time on Each Channel
- 100 kHz Bandwidth of Band Edge
- Conducted Emission
- Spurious Emission
- Radiated Emission
- Antenna Requirement

The objective is also to determine compliance with Part 22 Subpart H, and Part 24 Subpart E rules for the CDMA and PCS transmitter:

- output power
- modulation characteristic
- occupied bandwidth
- spurious emission at antenna terminal
- field strength of spurious radiation
- frequency stability
- conducted and radiated margin.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2001, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

Test Facility

The Open Area Test site used by BACL Corp. to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

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 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 C63.4-2001.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. 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 is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, CISPR 22: 1997, Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods.

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to ANSI C63.4-2001 & 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.

Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number | FCC ID |
|--------------|---------------------------------|----------|----------------|--------|
| SONY | Notebook PC | PCG-F150 | 28986303404240 | DOC |
| HP | Printer | 2225C | N/A | DOC |
| Agilent | Wireless communication test set | 8960 | GB43344477 | DOC |
| Anritsu | Base Simulator | MT8802A | None | DOC |

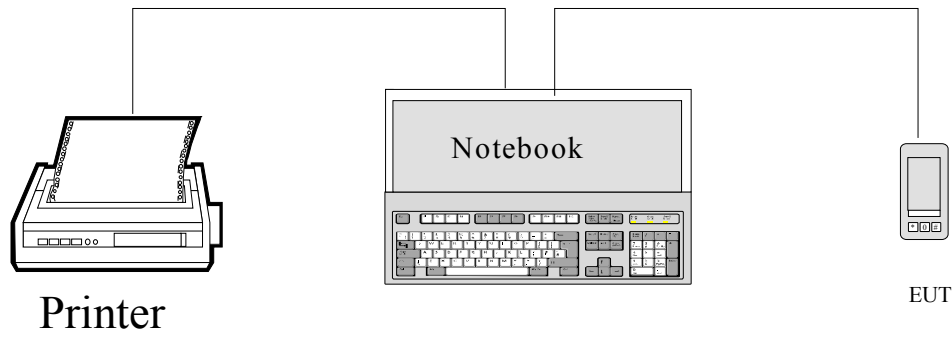
External I/O Cabling List and Details

| Cable Description | Length (M) | Port/From | To |
|------------------------|------------|---------------------------|-------------|
| Serial cable | 1.0 | EUT | Notebook PC |
| Shielded Printer Cable | 2.0 | Parallel Port/Notebook PC | Printer |

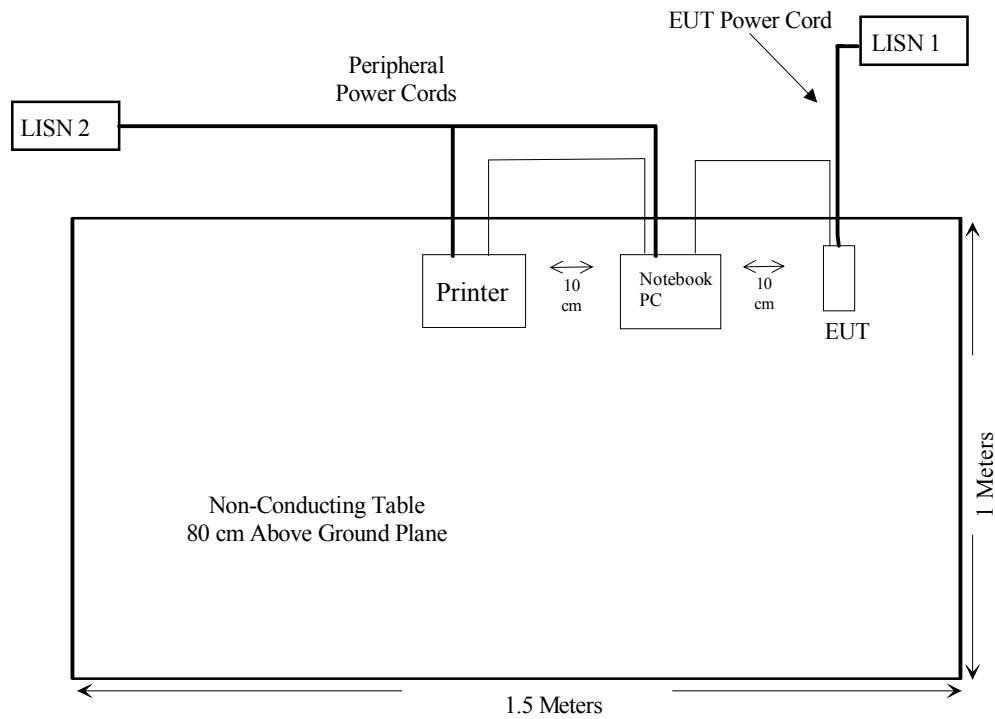
Power Supply Information

| Manufacturer | Description | Model | Serial Number | FCC ID |
|--------------|-------------|------------|---------------|--------|
| PHIHONG | AC Adapter | PSC11A-050 | N/A | DOC |

Configuration of Test System



Test Setup Block Diagram



SUMMARY OF TEST RESULTS FOR FCC PART 15

| FCC RULES | DESCRIPTION OF TEST | RESULT |
|-----------------------------|--|-----------|
| §15.203 | Antenna Requirement | Compliant |
| § 15.205 | Restricted Bands | Compliant |
| §15.207 (a) | Conducted Emission | Compliant |
| §15.209 | Radiated Emission | Compliant |
| §15.247 (a) (1) | Hopping Channel Separation | Compliant |
| §15.247 (a) (1) | Channel Bandwidth | Compliant |
| §15.247 (a) (1) (iii) | Number of Hopping Frequencies Used | Compliant |
| §15.247 (a) (1) (iii) | Dwell Time of Each Frequency within a 10 Second Period of time (0.4 x Number of Channel) | Compliant |
| §15.247 (b) (1) | Maximum Peak Output Power | Compliant |
| § 15.247 (b)(4) § 2.1093 | RF Safety Requirements | Compliant |
| § 15.247 (c) | 100 kHz Bandwidth of Frequency Band Edge | Compliant |

ANTENNA REQUIREMENT

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (1), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The gain of antenna used for transmitting is 0 dBi for cellular band and 2 dBi for PCS band, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

§15.207(a) - CONDUCTED EMISSION

Measurement Uncertainty

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

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

Test Setup

The measurement was performed at shield room, using the same setup per ANSI C63.4 – 2001 measurement procedure. The specification used was FCC Class B limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The notebook was connected with 120Vac/60Hz power source.

Spectrum Analyzer Setup

The spectrum analyzer was set to investigate the spectrum from 150 kHz to 30Mhz.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Due Date |
|-----------------|-------------------|---------|---------------|---------------|
| Rohde & Schwarz | Artificial LISN | ESH2-Z5 | 871884/039 | 2004-03-28 |
| Rohde & Schwarz | EMI Test Receiver | ESCS30 | 100176 | 2004-05-06 |

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

Test Procedure

During the conducted emission test, the power cord of the host system was connected to the auxiliary outlet of the first LISN.

Maximizing procedure were performed on the six (6) highest emissions of the EUT.

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 42% |
| ATM Pressure: | 1028 mbar |

The testing was performed by Ling Zhang on 2004-01-28.

Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC Conducted limit for a Class B device, with the *worst* margin reading of:

-13.4 dB μ V at 0.48 MHz in the Line conductor

Conducted Emissions Test Data

| Frequency MHz | LINE CONDUCTED EMISSIONS | | | FCC CLASS B | |
|------------------|--------------------------|-------------------------|-----------------------|---------------------|--------------|
| | Amplitude dB μ V | Detector Qp/Ave/Peak | Phase Line/Neutral | Limit dB μ V | Margin dB |
| 0.48 | 32.9 | AVG | Line | 46.3 | -13.4 |
| 0.48 | 38.2 | QP | Line | 56.3 | -18.1 |
| 0.48 | 37.4 | QP | Neutral | 56.4 | -19.0 |
| 6.80 | 29.6 | AVG | Line | 50.0 | -20.4 |
| 6.60 | 28.8 | AVG | Neutral | 50.0 | -21.2 |
| 0.48 | 24.7 | AVG | Neutral | 46.3 | -21.6 |
| 0.18 | 41.3 | QP | Line | 64.5 | -23.2 |
| 0.18 | 29.5 | AVG | Line | 54.5 | -25.0 |
| 6.80 | 34.2 | QP | Line | 60.0 | -25.8 |
| 6.60 | 34.0 | QP | Neutral | 60.0 | -26.0 |
| 0.18 | 37.2 | QP | Neutral | 64.5 | -27.3 |
| 0.18 | 27.2 | AVG | Neutral | 54.5 | -27.3 |

Plot of Conducted Emissions Test Data

Plot(s) of Conducted Emissions Test Data is presented in the following page as reference.

Bay Area Compliance Laboratory Corp
Class B

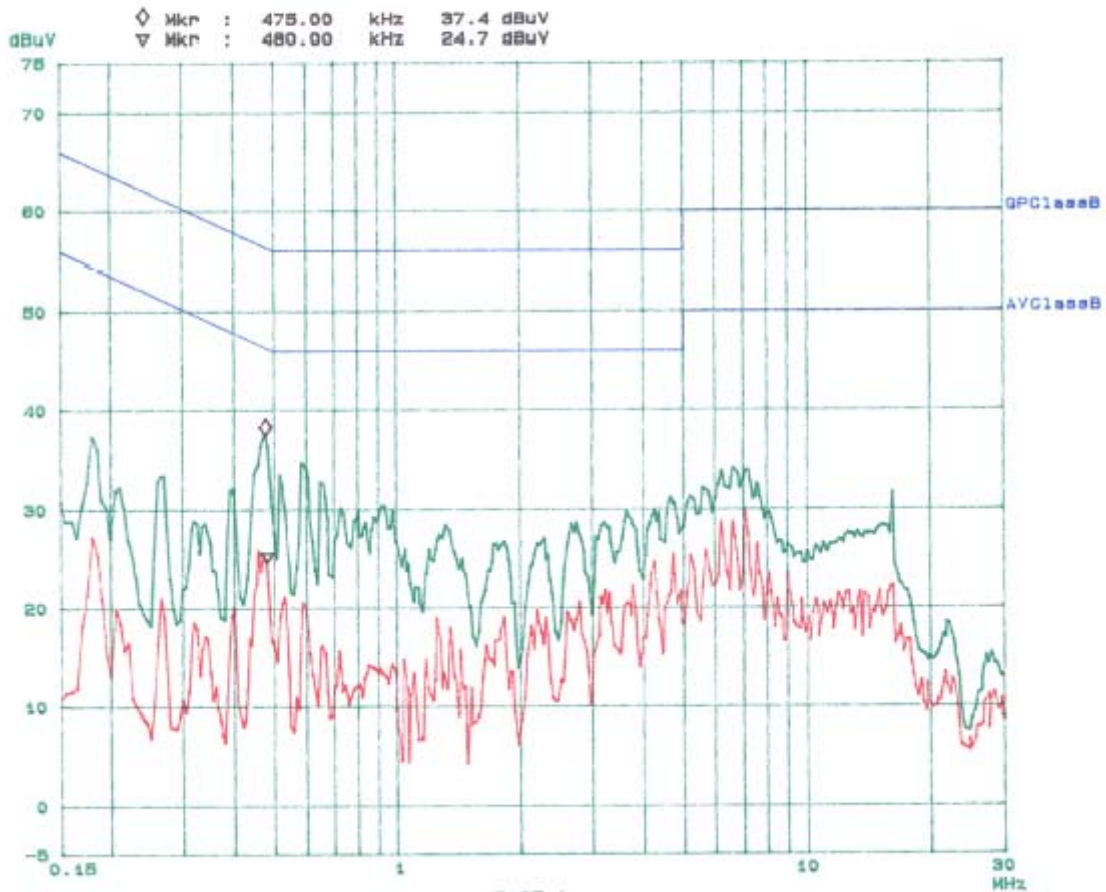
28. Jan 04 14:22

EUT: PH20A2
Manuf: HTC
Op Cond: Term1
Operator: LINS
Comment: N

Scan Settings (3 Ranges)

| Frequencies | | | Receiver Settings | | | | |
|-------------|------|------|-------------------|----------|--------|---------|--------|
| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp |
| 100k | 1M | 5k | 5k | QP+AV | 20ms | 15dB LN | OFF |
| 1M | 5M | 10k | 9k | QP+AV | 1ms | 15dB LN | OFF |
| 5M | 30M | 100k | 9k | QP+AV | 1ms | 15dB LN | OFF |

Final Measurement: x QP / + AV
Meas Time: 1 s
Subrange: 25
Acc Margin: 6dB



Ins 2004-1-28

Bay Area Compliance Laboratory Corp
Class B

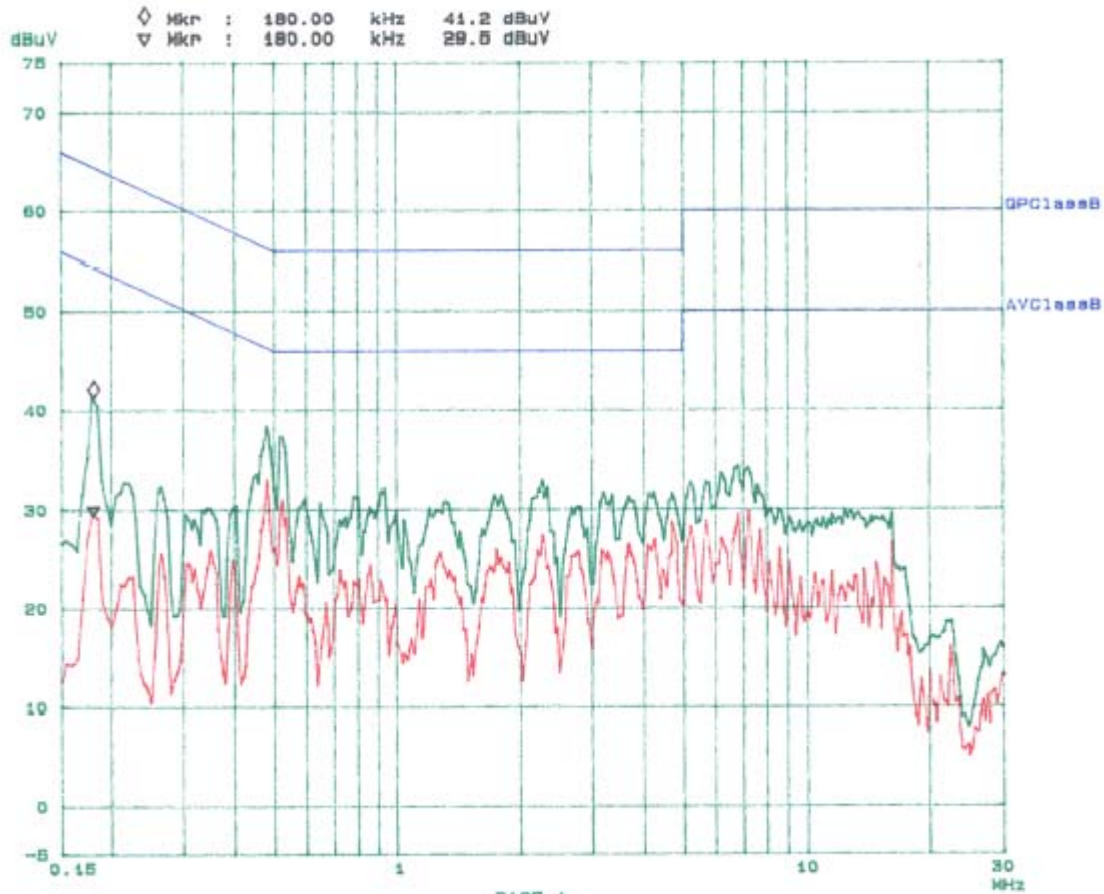
28. Jan 04 13: 57

EUT: PH20A2
Manuf: HTC
Op Cond: Normal
Operator: LING
Comment: L

Scan Settings (3 Ranges)

| Frequencies | | | Receiver Settings | | | |
|-------------|------|------|-------------------|----------|--------|--------------|
| Start | Stop | Step | IF BW | Detector | M-Time | Atten Preamp |
| 150k | 1M | 5k | 9k | QP+AV | 20ms | 15dB LN OFF |
| 1M | 5M | 10k | 9k | QP+AV | 1ms | 15dB LN OFF |
| 5M | 30M | 100k | 9k | QP+AV | 1ms | 15dB LN OFF |

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



lv 2004-1-28

§15.205 & §15.209 - RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in 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 best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

Test Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with ANSI C63.4-2001. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The notebook was connected with 120Vac/60Hz power source.

Spectrum Analyzer Setup

According to FCC Rules, 47 CFR §15.33 (a) (1), the system was tested to 25GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

| <i>Frequency Range</i> | <i>RBW</i> | <i>Video B/W</i> |
|------------------------|------------|------------------|
| Below 30MHz | 10kHz | 10kHz |
| 30 – 1000MHz | 100kHz | 100kHz |
| Above 1000MHz | 1MHz | 1MHz |

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Due Date |
|---------------------|---------------------------|--------------|----------------------|----------------------|
| HP | Amplifier, Pre, microwave | 8449B | 3147A00400 | 3/14/2004 |
| HP | Amplifier, Pre | 8447E | 1937A01057 | 8/4/2003 |
| HP | Analyzer, Spectrum | 8565EC | 3946A00131 | 6/30/2004 |
| ETS | Antenna, Biconical | 3110B | 9603-2315 | 10/11/2003 |
| A.R.A. | Antenna, Horn, DRG | DRG-118/A | 1132 | 9/30/2003 |
| A. H. Systems | Antenna, Horn, DRG | SAS-200/571 | 2455-261 | 8/1/2003 |
| ETS | Antenna, logperiodic | 3148 | 0004-1155 | 10/11/2003 |

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 12° C |
| Relative Humidity: | 51% |
| ATM Pressure: | 1041 mbar |

The testing was performed by Ling Zhang on 2004-01-21 for Model PH20A2.

| | |
|--------------------|-----------|
| Temperature: | 25° C |
| Relative Humidity: | 49% |
| ATM Pressure: | 1038 mbar |

The testing was performed by Daniel Deng on 2004-07-27 for Model PH20A3.

Test Procedure

For the radiated emissions test, both the laptop and all peripheral power cords were connected to the AC floor outlet since the power supply used in the laptop did not provide an accessory power outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations.

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

Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.207, and 15.247, and had the worst margin of:

PH20A2:

Transmitter:

- 14.025 dB at 7206 MHz in the **Horizontal** polarization, Low Channel.
- 14.155 dB at 7323 MHz in the **Vertical** polarization, Middle Channel.
- 14.055 dB at 7440 MHz in the **Vertical** polarization, High Channel.
- 12.00 dB at 122.887 MHz in the **Vertical** polarization, Unintentional Emission.

Receiver:

- 1.47 dB at 331.75 MHz in the **Vertical** polarization

PH20A3:

Transmitter:

- 13.055 dB at 7206 MHz in the **Vertical** polarization, Low Channel.
- 13.055 dB at 7323 MHz in the **Vertical** polarization, Middle Channel.
- 13.955 dB at 7440 MHz in the **Vertical** polarization, High Channel.
- 6.2 dB at 450.01 MHz in the **Vertical** polarization, Unintentional Emission.

Receiver:

- 5.26 dB at 670.21 MHz in the **Vertical** polarization

Transmitter Radiated Emission Test Data for PH20A2

| Frequency MHz | Indicated | | Antenna Height Meter | Antenna | | Correction Factor | | | FCC 15 Subpart C | | | |
|------------------|-----------------|---------------------|----------------------------|--------------|-------------------|-----------------------------|------------|--------------------------|------------------|--------------|-----------|--|
| | Ampl. dBµV/m | Direction Degree | | Polar H/V | Antenna dBµV/m | Cable Loss dBµV/ m | Amp. dB | Corr. Ampl. dBµV/m | Limit dBµV/m | Margin dB | Mode | |
| Low Channel | | | | | | | | | | | | |
| 2402 | 83.9 | 180 | 1.6 | v | 28.1 | 3.35 | 35.2 | 80.15 | | | Fund/Peak | |
| 2402 | 81.9 | 180 | 1.5 | h | 28.1 | 3.35 | 35.2 | 78.15 | | | Fund/Peak | |
| 2402 | 83.1 | 180 | 1.6 | v | 28.1 | 3.35 | 35.2 | 79.35 | | | Fund/Ave | |
| 2402 | 81.3 | 180 | 1.5 | h | 28.1 | 3.35 | 35.2 | 77.55 | | | Fund/Ave | |
| 7206 | 32.73 | 150 | 1 | h | 35.1 | 5.645 | 33.5 | 39.975 | 54 | -14.025 | Ave | |
| 7206 | 32.7 | 120 | 1.6 | v | 35.1 | 5.645 | 33.5 | 39.945 | 54 | -14.055 | Ave | |
| 4804 | 32.2 | 300 | 1.6 | v | 32.5 | 4.91 | 33 | 36.61 | 54 | -17.39 | Ave | |
| 4804 | 32.07 | 270 | 1.4 | h | 32.5 | 4.91 | 33 | 36.48 | 54 | -17.52 | Ave | |
| 7206 | 45.73 | 120 | 1.6 | v | 35.1 | 5.645 | 33.5 | 52.975 | 74 | -21.025 | Peak | |
| 7206 | 45.07 | 150 | 1 | h | 35.1 | 5.645 | 33.5 | 52.315 | 74 | -21.685 | Peak | |
| 4804 | 45.1 | 300 | 1.6 | v | 32.5 | 4.91 | 33 | 49.51 | 74 | -24.49 | Peak | |
| 4804 | 44.9 | 270 | 1.4 | h | 32.5 | 4.91 | 33 | 49.31 | 74 | -24.69 | Peak | |
| Middle Channel | | | | | | | | | | | | |
| 2441 | 82.8 | 180 | 1.8 | v | 28.1 | 3.35 | 35.2 | 79.05 | | | Fund/Peak | |
| 2441 | 80.9 | 180 | 1.6 | h | 28.1 | 3.35 | 35.2 | 77.15 | | | Fund/Peak | |
| 2441 | 82 | 180 | 1.8 | v | 28.1 | 3.35 | 35.2 | 78.25 | | | Fund/Ave | |
| 2441 | 80.4 | 180 | 1.6 | h | 28.1 | 3.35 | 35.2 | 76.65 | | | Fund/Ave | |
| 7323 | 32.6 | 180 | 2 | v | 35.1 | 5.645 | 33.5 | 39.845 | 54 | -14.155 | Ave | |
| 7323 | 32.5 | 200 | 1.8 | h | 35.1 | 5.645 | 33.5 | 39.745 | 54 | -14.255 | Ave | |
| 4882 | 32 | 150 | 1.8 | v | 32.5 | 4.91 | 33 | 36.41 | 54 | -17.59 | Ave | |
| 4882 | 32 | 90 | 1.5 | h | 32.5 | 4.91 | 33 | 36.41 | 54 | -17.59 | Ave | |
| 7323 | 46.2 | 180 | 2 | v | 35.1 | 5.645 | 33.5 | 53.445 | 74 | -20.555 | Peak | |
| 7323 | 45.3 | 200 | 1.8 | h | 35.1 | 5.645 | 33.5 | 52.545 | 74 | -21.455 | Peak | |
| 4882 | 44.8 | 150 | 1.8 | v | 32.5 | 4.91 | 33 | 49.21 | 74 | -24.79 | Peak | |
| 4882 | 44.5 | 90 | 1.5 | h | 32.5 | 4.91 | 33 | 48.91 | 74 | -25.09 | Peak | |
| High Channel | | | | | | | | | | | | |
| 2480 | 82.2 | 180 | 1.4 | v | 28.1 | 3.35 | 35.2 | 78.45 | | | Fund/Peak | |
| 2480 | 79.7 | 180 | 1.5 | h | 28.1 | 3.35 | 35.2 | 75.95 | | | Fund/Peak | |
| 2480 | 81.5 | 180 | 1.4 | v | 28.1 | 3.35 | 35.2 | 77.75 | | | Fund/Ave | |
| 2480 | 79.4 | 180 | 1.5 | h | 28.1 | 3.35 | 35.2 | 75.65 | | | Fund/Ave | |
| 7440 | 32.7 | 0 | 1.5 | v | 35.1 | 5.645 | 33.5 | 39.945 | 54 | -14.055 | Ave | |
| 7440 | 32.6 | 30 | 1.6 | h | 35.1 | 5.645 | 33.5 | 39.845 | 54 | -14.155 | Ave | |
| 4960 | 32.3 | 200 | 1.5 | v | 32.5 | 4.91 | 33 | 36.71 | 54 | -17.29 | Ave | |
| 4960 | 32.1 | 330 | 1.8 | h | 32.5 | 4.91 | 33 | 36.51 | 54 | -17.49 | Ave | |
| 7440 | 46 | 0 | 1.5 | v | 35.1 | 5.645 | 33.5 | 53.245 | 74 | -20.755 | Peak | |
| 7440 | 45.4 | 30 | 1.6 | h | 35.1 | 5.645 | 33.5 | 52.645 | 74 | -21.355 | Peak | |
| 4960 | 45 | 200 | 1.5 | v | 32.5 | 4.91 | 33 | 49.41 | 74 | -24.59 | Peak | |
| 4960 | 44.83 | 330 | 1.8 | h | 32.5 | 4.91 | 33 | 49.24 | 74 | -24.76 | Peak | |

Note:

FUND: Fundamental
 AVG: Average

Unintentional Emission, transmitter

| Frequency MHz | Indicated | | Antenna | Antenna | | Correction Factor | | | FCC 15 Subpart C | |
|------------------|-----------------------|---------------------|-----------------|--------------|-------------------------|-----------------------------------|------------|--------------------------------|-----------------------|--------------|
| | Ampl. dB μ V/m | Direction Degree | Height Meter | Polar H/V | Antenna dB μ V/m | Cable Loss dB μ V/ m | Amp. dB | Corr. Ampl. dB μ V/m | Limit dB μ V/m | Margin dB |
| 122.887 | 46.83 | 60 | 1.8 | v | 11.7 | 1.57 | 28.6 | 31.5 | 43.5 | -12.00 |
| 246.81 | 43.33 | 250 | 1.8 | h | 13.8 | 2.17 | 28.2 | 31.1 | 46 | -14.90 |
| 486.017 | 37.83 | 200 | 1.8 | v | 18.3 | 3.10 | 28.9 | 30.33 | 46 | -15.67 |
| 170.017 | 41.00 | 270 | 1.2 | h | 13 | 1.86 | 28.8 | 27.06 | 43.5 | -16.44 |
| 110.747 | 42.83 | 180 | 1.5 | h | 11.3 | 1.54 | 28.7 | 26.97 | 43.5 | -16.53 |
| 485.98 | 36.5 | 180 | 1.5 | h | 18.3 | 3.10 | 28.9 | 29 | 46 | -17.00 |

Radiated Emission, receiver

| Frequency MHz | Indicated | | Antenna | Antenna | | Correction Factor | | | FCC 15 B | |
|------------------|-----------------------|---------------------|-----------------|--------------|-------------------------|-----------------------------------|------------|--------------------------------|-----------------------|--------------|
| | Ampl. dB μ V/m | Direction Degree | Height Meter | Polar H/V | Antenna dB μ V/m | Cable Loss dB μ V/ m | Amp. dB | Corr. Ampl. dB μ V/m | Limit dB μ V/m | Margin dB |
| 331.75 | 54.2 | 60 | 1.6 | v | 15.8 | 2.33 | 27.8 | 44.53 | 46 | -1.47 |
| 552.2 | 51.2 | 100 | 1.6 | h | 19.3 | 2.84 | 28.9 | 44.44 | 46 | -1.56 |
| 597.1 | 48.67 | 90 | 1.5 | h | 20 | 3.24 | 28.9 | 43.01 | 46 | -2.99 |
| 375.64 | 51.67 | 45 | 1.6 | v | 15.3 | 2.4 | 28.3 | 41.07 | 46 | -4.93 |
| 287.06 | 52.67 | 30 | 1.5 | h | 13.4 | 2.3 | 27.8 | 40.57 | 46 | -5.43 |
| 353.36 | 49.17 | 0 | 1.8 | h | 15.5 | 2.33 | 28.3 | 38.7 | 46 | -7.30 |
| 486.37 | 45.5 | 100 | 1.5 | h | 18.3 | 3.1 | 28.9 | 38 | 46 | -8.00 |
| 420.51 | 46.17 | 90 | 1.5 | h | 16.5 | 2.69 | 28.3 | 37.06 | 46 | -8.94 |
| 509.49 | 43.33 | 90 | 1.5 | v | 18.6 | 3.17 | 28.9 | 36.2 | 46 | -9.80 |
| 173.28 | 45.83 | 45 | 2 | h | 13 | 1.86 | 28.2 | 32.49 | 43.5 | -11.01 |
| 439.88 | 43.17 | 90 | 1.8 | h | 16.9 | 2.79 | 28.3 | 34.56 | 46 | -11.44 |
| 463.6 | 40.67 | 180 | 1.6 | v | 17.5 | 3 | 28.9 | 32.27 | 46 | -13.73 |

Transmitter Radiated Emission Test Data for PH20A3

| Frequency MHz | Indicated | | Antenna Height Meter | Antenna | | Correction Factor | | | FCC 15 Subpart C | | | |
|------------------|-----------------------|---------------------|----------------------------|--------------|-------------------------|-----------------------------------|------------|--------------------------------|-----------------------|--------------|-----------|--|
| | Ampl. dB μ V/m | Direction Degree | | Polar H/V | Antenna dB μ V/m | Cable Loss dB μ V/ m | Amp. dB | Corr. Ampl. dB μ V/m | Limit dB μ V/m | Margin dB | Mode | |
| Low Channel | | | | | | | | | | | | |
| 2402 | 87.3 | 180 | 1.8 | v | 28.1 | 3.35 | 35.2 | 83.55 | | | Fund/Peak | |
| 2402 | 85.6 | 180 | 1.6 | h | 28.1 | 3.35 | 35.2 | 81.85 | | | Fund/Peak | |
| 2402 | 87.1 | 180 | 1.8 | v | 28.1 | 3.35 | 35.2 | 83.35 | | | Fund/Ave | |
| 2402 | 85.2 | 180 | 1.6 | h | 28.1 | 3.35 | 35.2 | 81.45 | | | Fund/Ave | |
| 7206 | 33.7 | 180 | 1.4 | v | 35.1 | 5.645 | 33.5 | 40.945 | 54 | -13.055 | Ave | |
| 7206 | 32.1 | 150 | 1 | h | 35.1 | 5.645 | 33.5 | 39.345 | 54 | -14.655 | Ave | |
| 4804 | 32.8 | 120 | 1.3 | v | 32.5 | 4.91 | 33 | 37.21 | 54 | -16.79 | Ave | |
| 4804 | 32.2 | 300 | 1.4 | h | 32.5 | 4.91 | 33 | 36.61 | 54 | -17.39 | Ave | |
| 7206 | 45.8 | 180 | 1.4 | v | 35.1 | 5.645 | 33.5 | 53.045 | 74 | -20.955 | Peak | |
| 7206 | 44.6 | 150 | 1 | h | 35.1 | 5.645 | 33.5 | 51.845 | 74 | -22.155 | Peak | |
| 4804 | 45.2 | 120 | 1.3 | v | 32.5 | 4.91 | 33 | 49.61 | 74 | -24.39 | Peak | |
| 4804 | 44.7 | 300 | 1.4 | h | 32.5 | 4.91 | 33 | 49.11 | 74 | -24.89 | Peak | |
| Middle Channel | | | | | | | | | | | | |
| 2441 | 88.1 | 180 | 1.8 | v | 28.1 | 3.35 | 35.2 | 84.35 | | | Fund/Peak | |
| 2441 | 86.2 | 180 | 1.6 | h | 28.1 | 3.35 | 35.2 | 82.45 | | | Fund/Peak | |
| 2441 | 87.8 | 180 | 1.8 | v | 28.1 | 3.35 | 35.2 | 84.05 | | | Fund/Ave | |
| 2441 | 86.1 | 180 | 1.6 | h | 28.1 | 3.35 | 35.2 | 82.35 | | | Fund/Ave | |
| 7323 | 33.7 | 180 | 1.8 | v | 35.1 | 5.645 | 33.5 | 40.945 | 54 | -13.055 | Ave | |
| 7323 | 33.4 | 180 | 1.8 | h | 35.1 | 5.645 | 33.5 | 40.645 | 54 | -13.355 | Ave | |
| 4882 | 32.3 | 270 | 1.6 | v | 32.5 | 4.91 | 33 | 36.71 | 54 | -17.29 | Ave | |
| 4882 | 32.1 | 180 | 1.5 | h | 32.5 | 4.91 | 33 | 36.51 | 54 | -17.49 | Ave | |
| 7323 | 47.2 | 180 | 1.8 | v | 35.1 | 5.645 | 33.5 | 54.445 | 74 | -19.555 | Peak | |
| 7323 | 46.5 | 180 | 1.8 | h | 35.1 | 5.645 | 33.5 | 53.745 | 74 | -20.255 | Peak | |
| 4882 | 44.5 | 270 | 1.6 | v | 32.5 | 4.91 | 33 | 48.91 | 74 | -25.09 | Peak | |
| 4882 | 43.9 | 180 | 1.5 | h | 32.5 | 4.91 | 33 | 48.31 | 74 | -25.69 | Peak | |
| High Channel | | | | | | | | | | | | |
| 2480 | 87.1 | 150 | 1.6 | v | 28.1 | 3.35 | 35.2 | 83.35 | | | Fund/Peak | |
| 2480 | 85.9 | 180 | 1.5 | h | 28.1 | 3.35 | 35.2 | 82.15 | | | Fund/Peak | |
| 2480 | 86.9 | 150 | 1.6 | v | 28.1 | 3.35 | 35.2 | 83.15 | | | Fund/Ave | |
| 2480 | 85.8 | 180 | 1.5 | h | 28.1 | 3.35 | 35.2 | 82.05 | | | Fund/Ave | |
| 7440 | 32.8 | 180 | 1.5 | v | 35.1 | 5.645 | 33.5 | 40.045 | 54 | -13.955 | Ave | |
| 7440 | 32.5 | 30 | 1.6 | h | 35.1 | 5.645 | 33.5 | 39.745 | 54 | -14.255 | Ave | |
| 4960 | 32.1 | 120 | 1.5 | v | 32.5 | 4.91 | 33 | 36.51 | 54 | -17.49 | Ave | |
| 4960 | 31.8 | 270 | 1.6 | h | 32.5 | 4.91 | 33 | 36.21 | 54 | -17.79 | Ave | |
| 7440 | 45.3 | 180 | 1.5 | v | 35.1 | 5.645 | 33.5 | 52.545 | 74 | -21.455 | Peak | |
| 7440 | 44.8 | 30 | 1.6 | h | 35.1 | 5.645 | 33.5 | 52.045 | 74 | -21.955 | Peak | |
| 4960 | 46.3 | 120 | 1.5 | v | 32.5 | 4.91 | 33 | 50.71 | 74 | -23.29 | Peak | |
| 4960 | 45.8 | 270 | 1.6 | h | 32.5 | 4.91 | 33 | 50.21 | 74 | -23.79 | Peak | |

Note:

FUND: Fundamental

AVG: Average

Unintentional Emission, transmitter

| Frequency MHz | Indicated | | Antenna | Antenna | | Correction Factor | | | FCC 15 Subpart C | |
|------------------|-----------------------|---------------------|-----------------|--------------|-------------------------|-----------------------------------|------------|--------------------------------|-----------------------|--------------|
| | Ampl. dB μ V/m | Direction Degree | Height Meter | Polar H/V | Antenna dB μ V/m | Cable Loss dB μ V/ m | Amp. dB | Corr. Ampl. dB μ V/m | Limit dB μ V/m | Margin dB |
| 450.01 | 48.3 | 0 | 2 | v | 17.1 | 3 | 28.6 | 39.8 | 46 | -6.2 |
| 670.25 | 43.6 | 200 | 1.6 | v | 21.2 | 3.24 | 28.9 | 39.14 | 46 | -6.86 |
| 924.34 | 38.7 | 180 | 1.1 | h | 23.4 | 4.03 | 28.6 | 37.53 | 46 | -8.47 |
| 34.85 | 45.6 | 0 | 1 | h | 13.4 | 1 | 28.7 | 31.3 | 40 | -8.7 |
| 51.34 | 46.5 | 0 | 1 | v | 10.2 | 1.01 | 28.8 | 28.91 | 40 | -11.09 |
| 41.64 | 40.6 | 30 | 2.5 | h | 11.9 | 1.18 | 28.9 | 24.78 | 40 | -15.22 |

Radiated Emission, receiver

| Frequency MHz | Indicated | | Antenna | Antenna | | Correction Factor | | | FCC 15 B | |
|------------------|-----------------------|---------------------|-----------------|--------------|-------------------------|-----------------------------------|------------|--------------------------------|-----------------------|--------------|
| | Ampl. dB μ V/m | Direction Degree | Height Meter | Polar H/V | Antenna dB μ V/m | Cable Loss dB μ V/ m | Amp. dB | Corr. Ampl. dB μ V/m | Limit dB μ V/m | Margin dB |
| 670.21 | 45.2 | 0 | 2.1 | v | 21.2 | 3.24 | 28.9 | 40.74 | 46 | -5.26 |
| 39.7 | 48.9 | 0 | 1 | v | 11.9 | 1.2 | 28.9 | 33.1 | 40 | -6.9 |
| 331.88 | 49.5 | 0 | 2 | h | 15.8 | 2.33 | 28.7 | 38.93 | 46 | -7.07 |
| 870.2 | 40.2 | 180 | 1.1 | v | 22.4 | 3.8 | 28.5 | 37.9 | 46 | -8.1 |
| 43.58 | 46.7 | 90 | 1.6 | h | 11.9 | 1.18 | 28.9 | 30.88 | 40 | -9.12 |
| 286.58 | 45.3 | 60 | 1.5 | h | 13.4 | 2.3 | 28.3 | 32.7 | 46 | -13.3 |

§15.247 (a) (1) - HOPPING CHANNEL SEPARATION

Standard Applicable

According to §15.247(a)(1), frequency hopping system shall have, hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies.

Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on a bench without connection to measurement instrument Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the Max-Hold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function, and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment

| Manufacturer | Model No. | Description | Calibration Date |
|--------------|-----------|-------------------|------------------|
| Agilent | 8564E | Spectrum Analyzer | 2003-08-01 |

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 42% |
| ATM Pressure: | 1028 mbar |

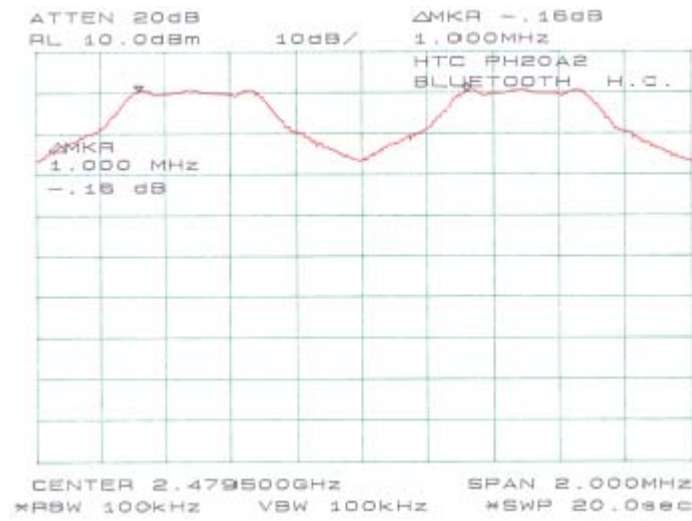
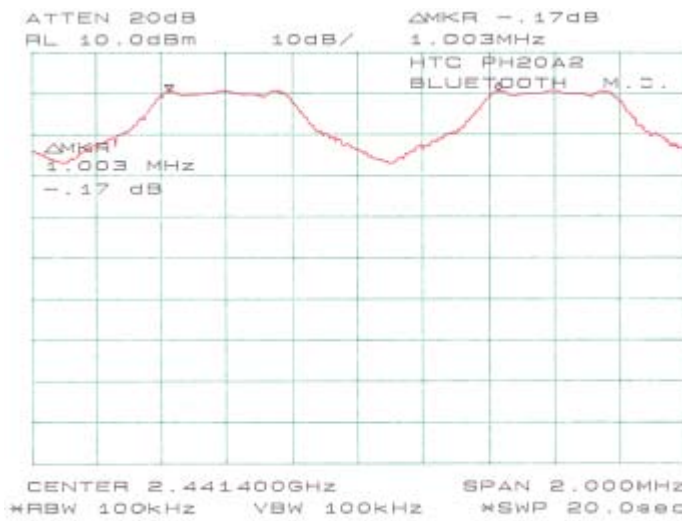
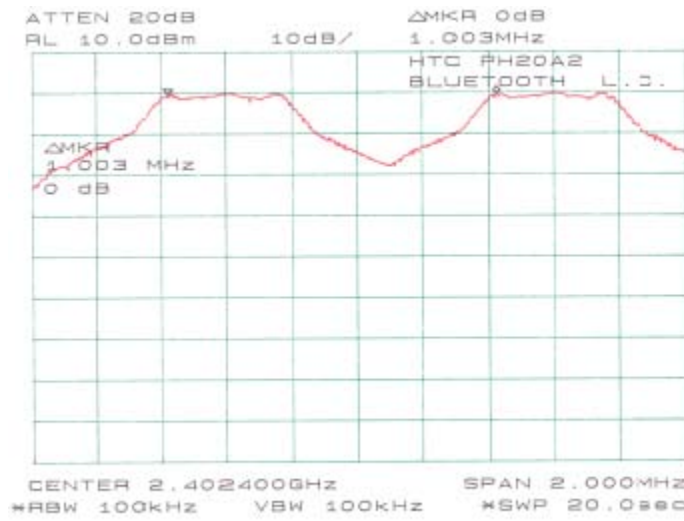
The testing was performed by Ling Zhang on 2004-01-26.

Measurement Results

| Channel | Measurement (MHz) | Result |
|---------|-------------------|-----------|
| Low | 1.003 | Compliant |
| Middle | 1.003 | Compliant |
| High | 1.000 | Compliant |

Plots of Hopping Channel Separation

Please refer to the following plots.



§15.247 (a) (1) - CHANNEL BANDWIDTH

Standard Applicable

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment

| Manufacturer | Model No. | Serial No. | Calibration Date |
|--------------|-----------|-------------------|------------------|
| Agilent | 8564E | Spectrum Analyzer | 2003-08-01 |

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 42% |
| ATM Pressure: | 1028 mbar |

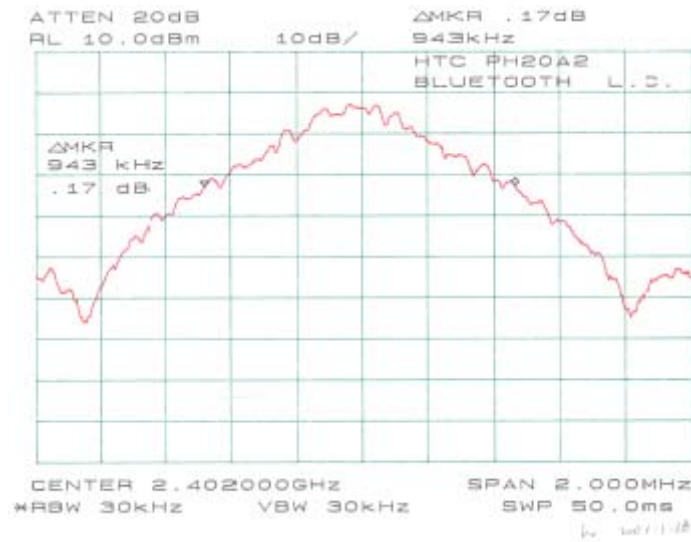
The testing was performed by Ling Zhang on 2004-01-26.

Measurement Result

| Frequency | Measurement (kHz) | Standard | Result |
|-----------|-------------------|----------|-----------|
| Low | 943 | ≤ 1MHz | Compliant |
| Middle | 950 | ≤ 1MHz | Compliant |
| High | 953 | ≤ 1MHz | Compliant |

Plot of Channel Bandwidth

Please refer to following plots.



§15.247 (a) (1) (iii) - NUMBER OF HOPPING FREQUENCY USED

Standard Applicable

According to §15.247(a)(1)(iii), frequency hopping systems operating in the 2400-2483.5Mhz band shall use at least 75 hopping frequencies.

Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the bench without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the SA on Max-Hold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment

| Manufacturer | Model No. | Serial No. | Calibration Date |
|--------------|-----------|-------------------|------------------|
| Agilent | 8564E | Spectrum Analyzer | 2003-08-01 |

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 42% |
| ATM Pressure: | 1028 mbar |

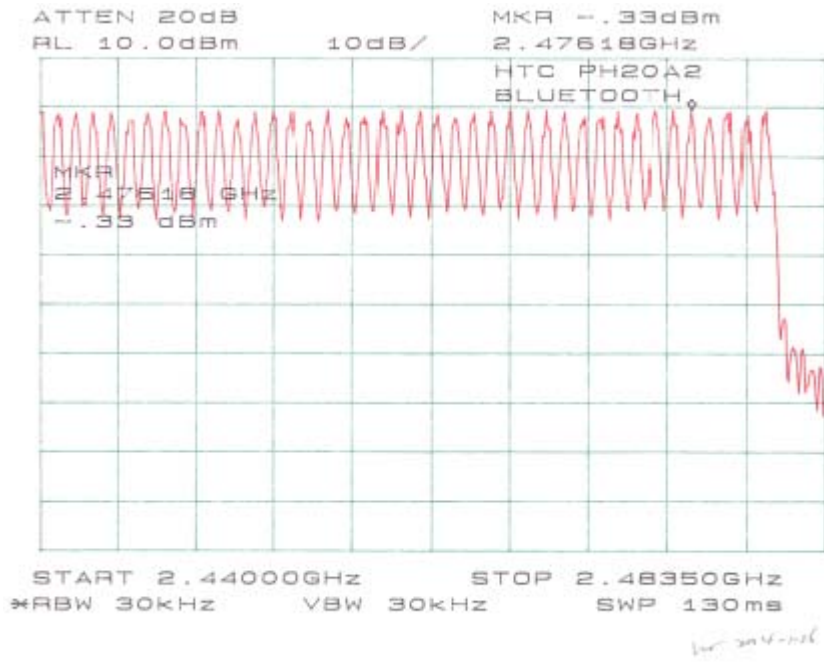
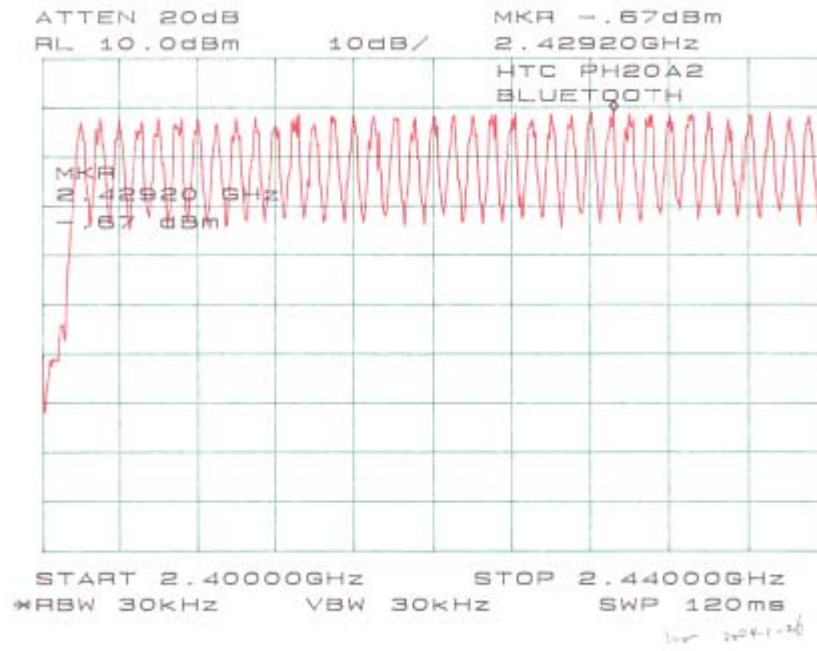
The testing was performed by Ling Zhang on 2004-01-26.

Measurement Results

| Measurement | Standard | Result |
|-------------|----------|-----------|
| 79 | 75 | Compliant |

Plots of Number of Hopping Frequency

Please refer to the attached plots.



§15.247 9 (a) (1) (iii) - DWELL TIME

Standard Applicable

According to §15.247 (a)(1)(iii), the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment

| Manufacturer | Model No. | Serial No. | Calibration Date |
|--------------|-----------|-------------------|------------------|
| Agilent | 8564E | Spectrum Analyzer | 2003-08-01 |

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 42% |
| ATM Pressure: | 1028 mbar |

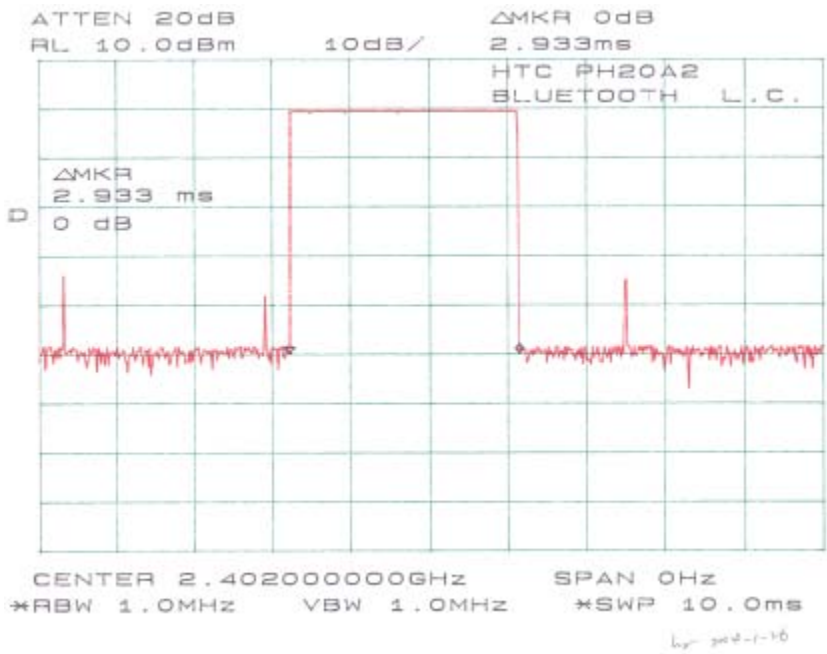
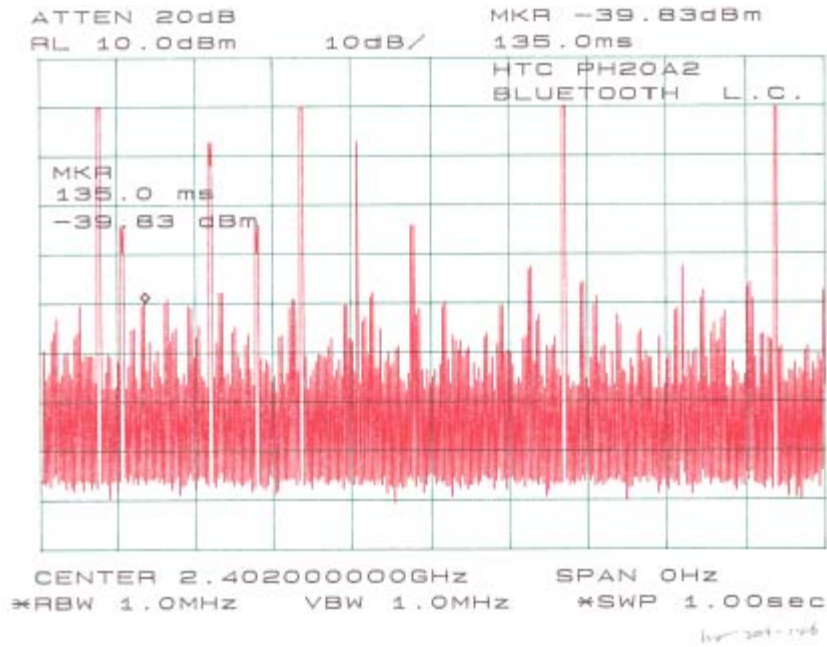
The testing was performed by Ling Zhang on 2004-01-26.

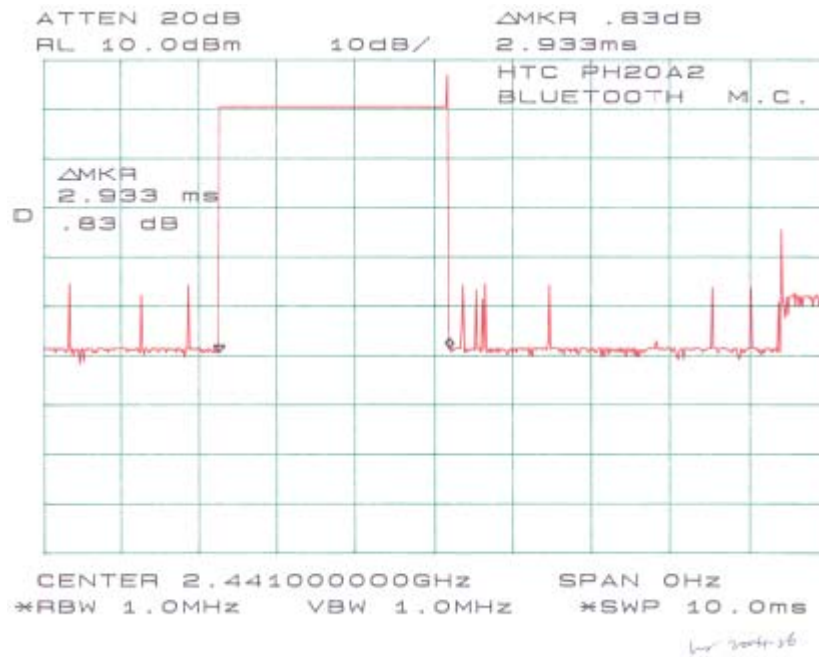
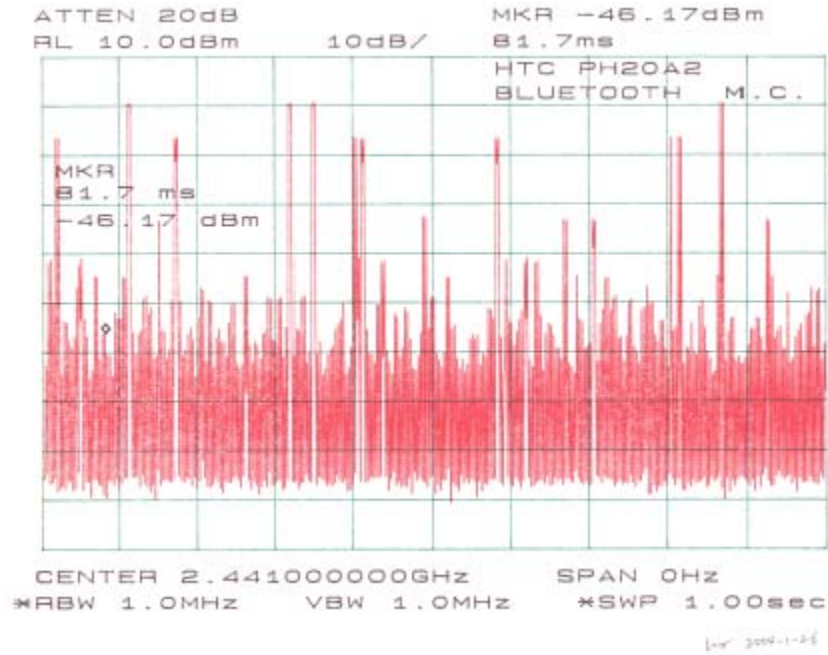
Measurement Results

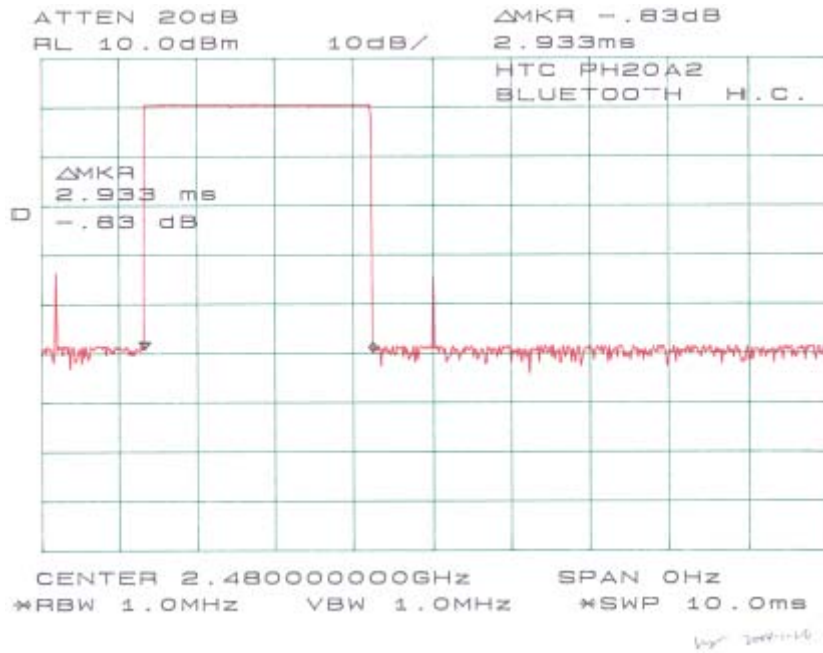
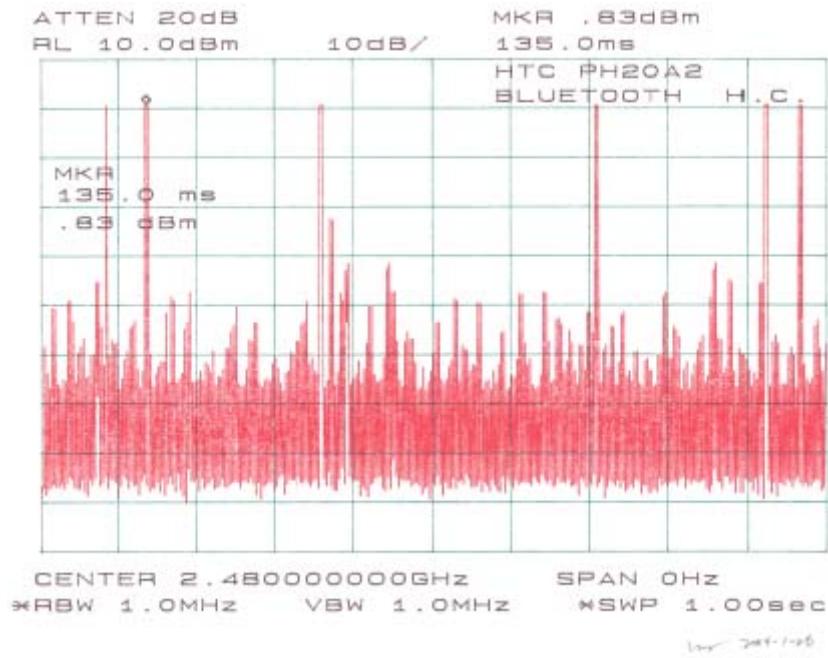
Low Channel: $4 \times 2.933(\text{ms}) \times [(79 \times 0.4) / 1 (\text{s})] = 0.370 \text{ s} < 0.4 \text{ s}$
 Middle Channel: $4 \times 2.933(\text{ms}) \times [(79 \times 0.4) / 1 (\text{s})] = 0.370 \text{ s} < 0.4 \text{ s}$
 High Channel: $4 \times 2.933(\text{ms}) \times [(79 \times 0.4) / 1 (\text{s})] = 0.370 \text{ s} < 0.4 \text{ s}$

Plots of Dwell Time

Please refer the following plots.







§15.247 (b) (1) - MAXIMUM PEAK OUTPUT POWER

Standard Applicable

According to §15.247(b) (1), for frequency hopping systems in the 2400-2483.5MHz band employing at least 75 hopping channels, and all direct sequence systems, the maximum peak output power of the transmitter shall not exceed 1 Watt.

Measurement Procedure

1. Place the EUT on the turntable and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Test Equipment

| Manufacturer | Model No. | Serial No. | Calibration Date |
|--------------|-----------|-------------------|------------------|
| Agilent | 8564E | Spectrum Analyzer | 2003-08-01 |

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 42% |
| ATM Pressure: | 1028 mbar |

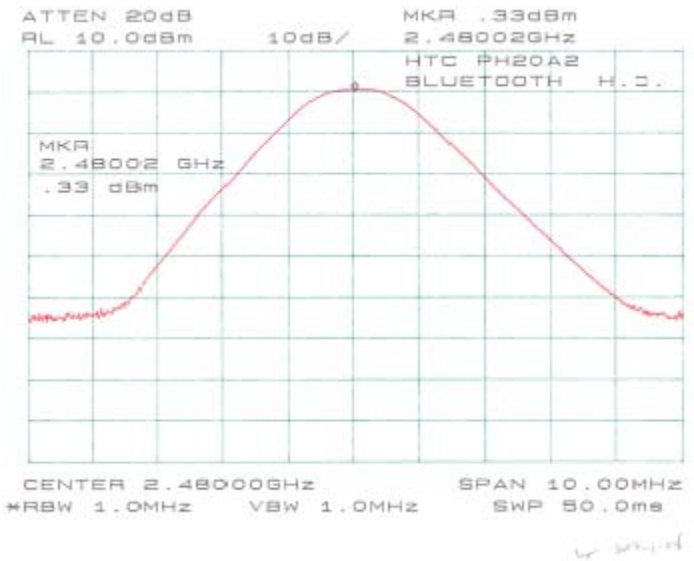
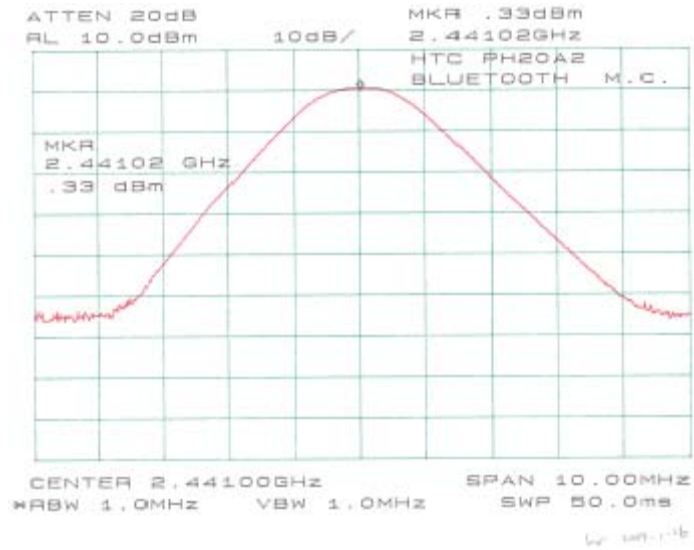
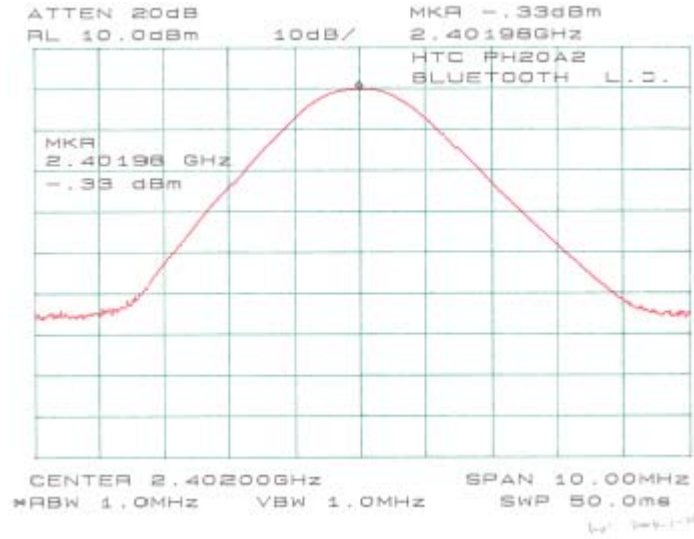
The testing was performed by Ling Zhang on 2004-01-26.

Measurement Result

| Channel | Frequency | Output Power in dBm | Output Power in W | Standard | Result |
|---------|-----------|---------------------|-------------------|----------|-----------|
| Low | 2402 | -0.33 | 0.00093 | ≤ 1W | Compliant |
| Middle | 2442 | 0.33 | 0.00108 | ≤ 1W | Compliant |
| High | 2480 | 0.33 | 0.00108 | ≤ 1W | Compliant |

Plots of Maximum Peak Output Power

Please refer to following plots.



§15.247 (b) (4) - RF EXPOSURE

According to the TCB Exclusions List, the limit for general population of portable transmitters that are used less than 2.5cm from a person's body is :

Low Threshold : $(60/f_{\text{GHz}}) \text{ mW}, d < 2.5 \text{ cm} \Rightarrow (60/2.4) = 25\text{mW}$

The maximum output power for the device is 0.00108W (1.08mW) which is less than the limit listed in the TCB exclusions lists (25mW). Therefore, SAR test is not required for the Part15 portion of this device.

§15.247 (c) - 100 KHZ BANDWIDTH OF BAND EDGES

Standard Applicable

According to §15.247(c), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required.

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment

| Manufacturer | Model No. | Serial No. | Calibration Date |
|--------------|-----------|-------------------|------------------|
| Agilent | 8564E | Spectrum Analyzer | 2003-08-01 |

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

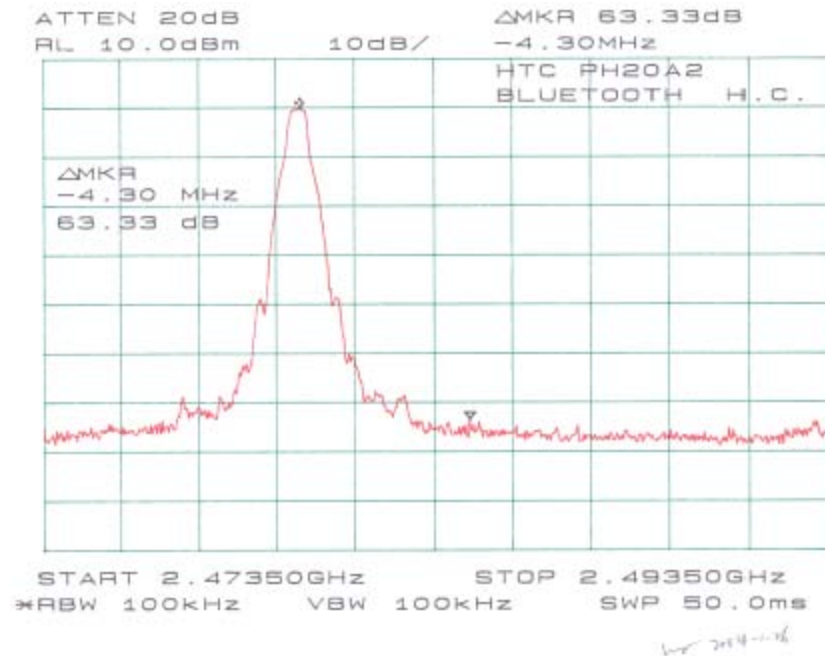
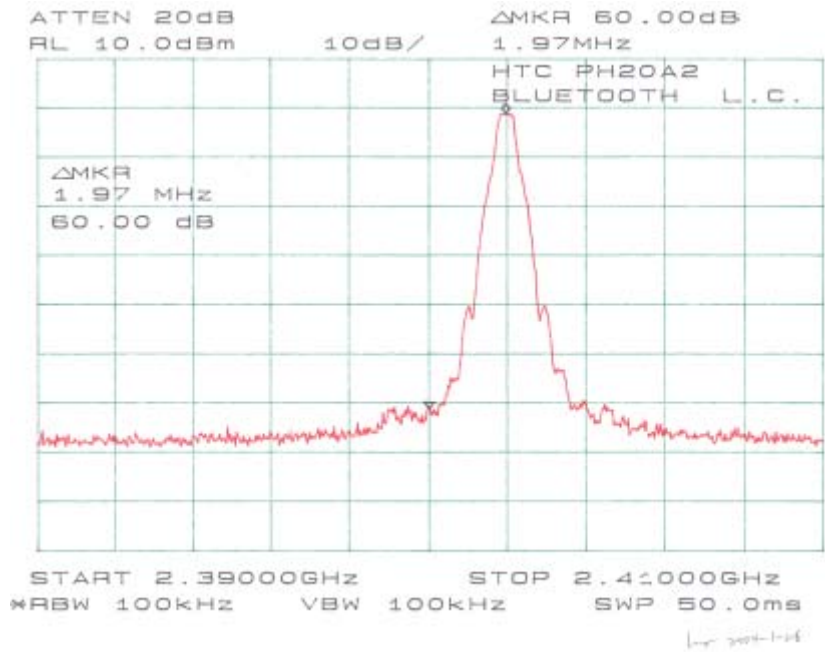
Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 42% |
| ATM Pressure: | 1028 mbar |

The testing was performed by Ling Zhang on 2004-01-26.

Plots of 100kHz Bandwidth of Band Edge

Please refer the following plots.



SPURIOUS EMISSION AT ANTENNA PORT

Standard Applicable

According to §15.209 (f) and §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit.

Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on a bench without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the SA on Max-Hold Mode, and then keep the EUT in transmitting mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment

| Manufacturer | Model No. | Serial No. | Calibration Date |
|--------------|-----------|-------------------|------------------|
| Agilent | 8564E | Spectrum Analyzer | 2003-08-01 |

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

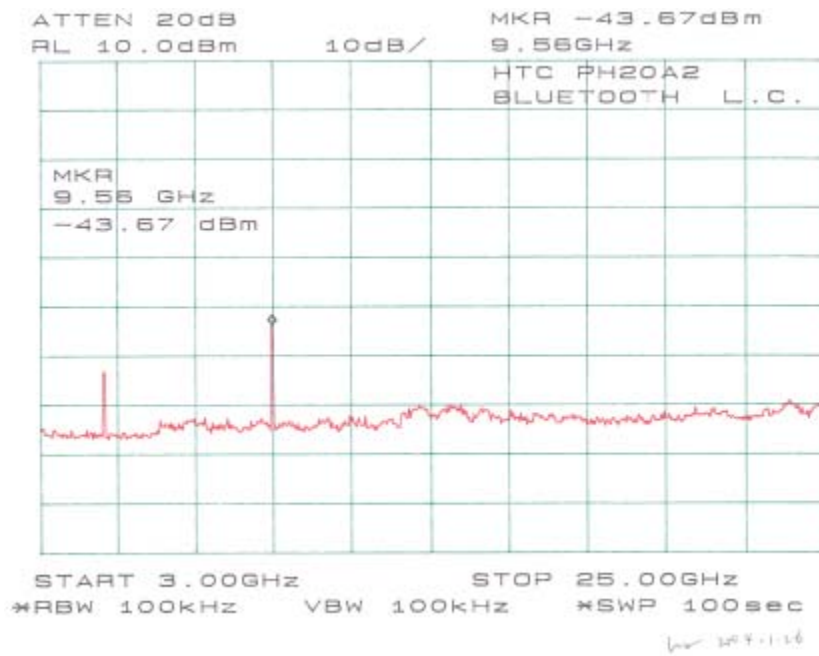
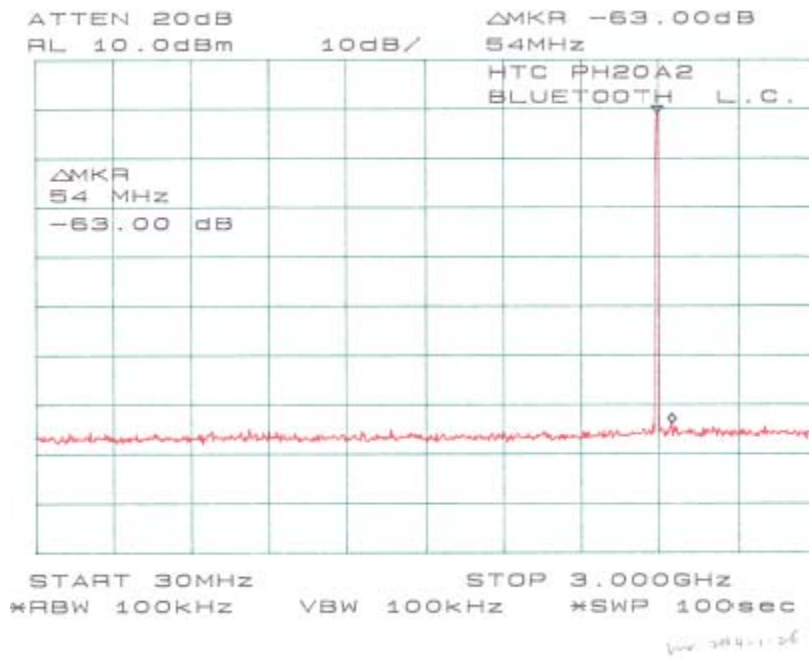
Environmental Conditions

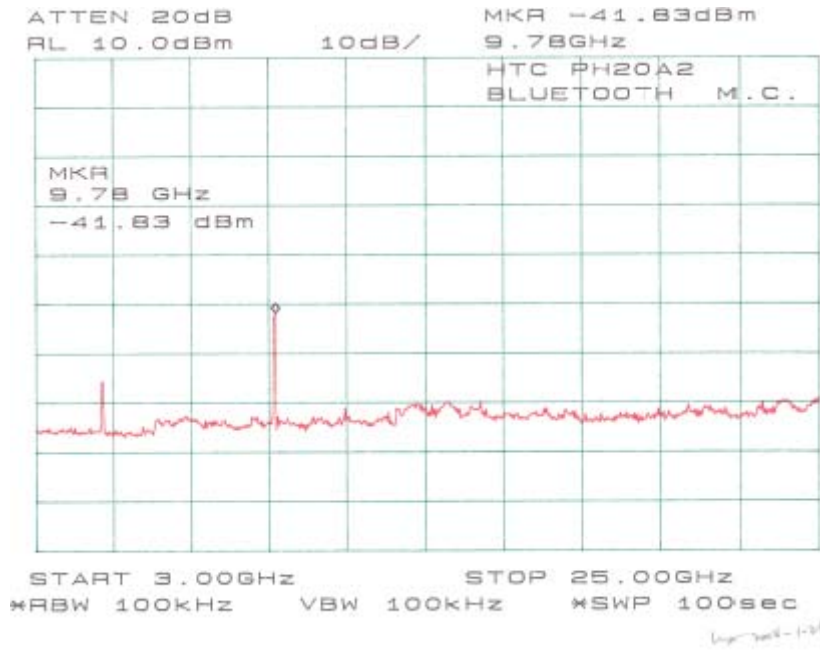
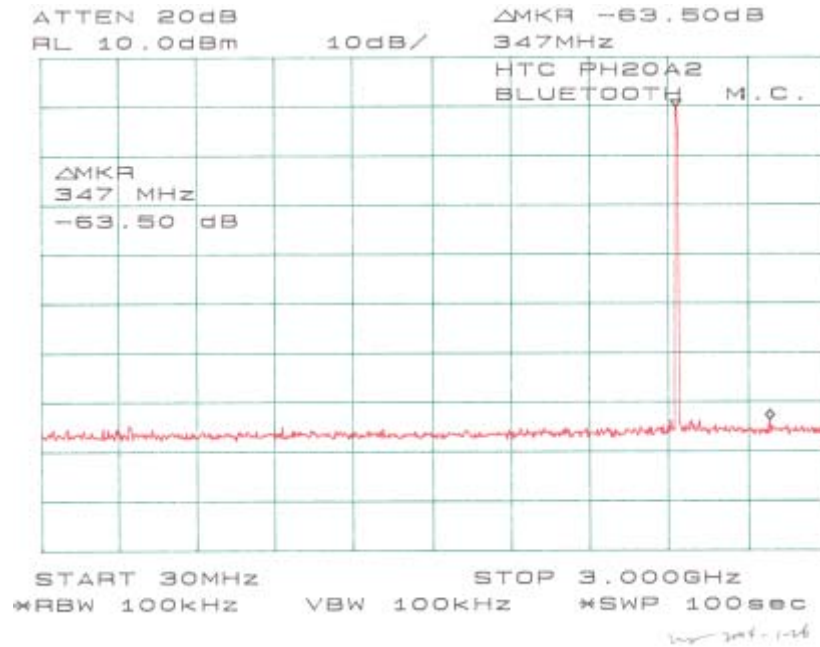
| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 42% |
| ATM Pressure: | 1028 mbar |

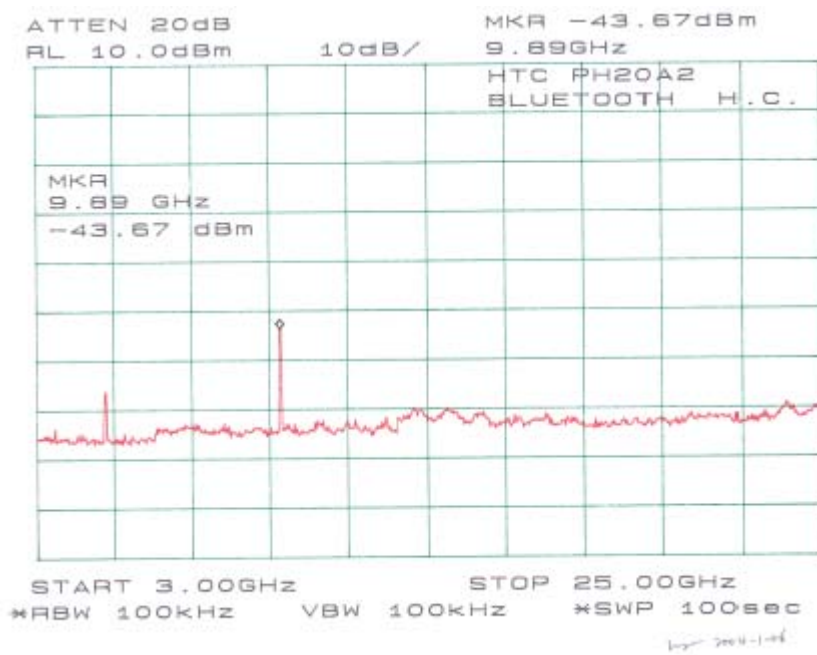
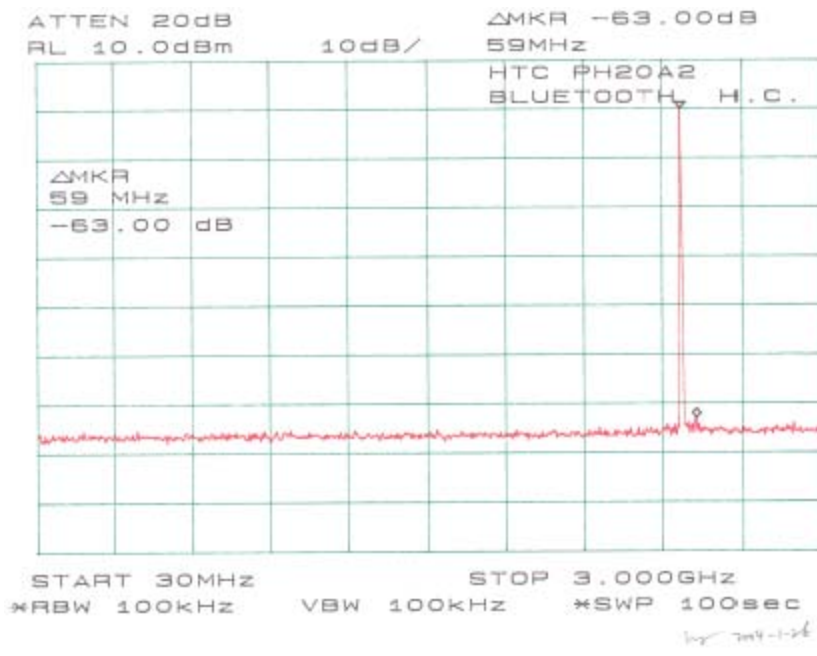
The testing was performed by Ling Zhang on 2004-01-26.

Measurement Results

Please refer to the following plots.







SUMMARY OF TEST RESULTS FOR FCC PART 22 & 24

| FCC RULE | DESCRIPTION OF TEST | RESULT |
|--|--|-----------|
| § 2.1047 | Modulation Characteristics | Compliant |
| § 2.1053 | Field Strength of Spurious Radiation | Compliant |
| §2.1093 | RF Exposure (SAR) | Compliant |
| § 2.1046, § 22.912 (d) § 24.232 | RF Output Power | Compliant |
| § 2.1046, § 22.913 (a) § 24.232 | Conducted Output Power | Compliant |
| § 2.1049 § 22.917 § 22.905 § 24.238 | Out of Band Emission, Occupied Bandwidth | Compliant |
| § 2.1051, § 22.917 § 24.238(a) | Spurious Emissions at Antenna Terminals | Compliant |
| § 2.1055 (a) § 2.1055 (d) § 22.355 § 24.235 | Frequency stability vs. temperature Frequency stability vs. voltage | Compliant |
| § 22.917 §24.238 | Band Edge | Compliant |

§2.1047 - MODULATION CHARACTERISTIC

Applicable Standard

Requirement: FCC § 2.1047.

Test Procedure

CDMA digital mode is used by EUT.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|--------------|-------------------|---------|---------------|--------------|
| HP | Spectrum Analyzer | HP8564E | 3943A01781 | 2003-08-01 |
| HP | Plotter | HP7470A | 2541A49659 | Not Required |

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

Environmental Conditions

| | |
|--------------------|------------|
| Temperature: | 13° C |
| Relative Humidity: | 47% |
| ATM Pressure: | 1035 mbar |
| Test date: | 2004-01-24 |

| | |
|--------------------|------------|
| Temperature: | 12° C |
| Relative Humidity: | 51% |
| ATM Pressure: | 1041 mbar |
| Test date: | 2004-01-20 |

The testing was performed by Ling Zhang.

Test Results

Please refer to the hereinafter plots.

Plots of Modulation Characteristic for CDMA800, Part22



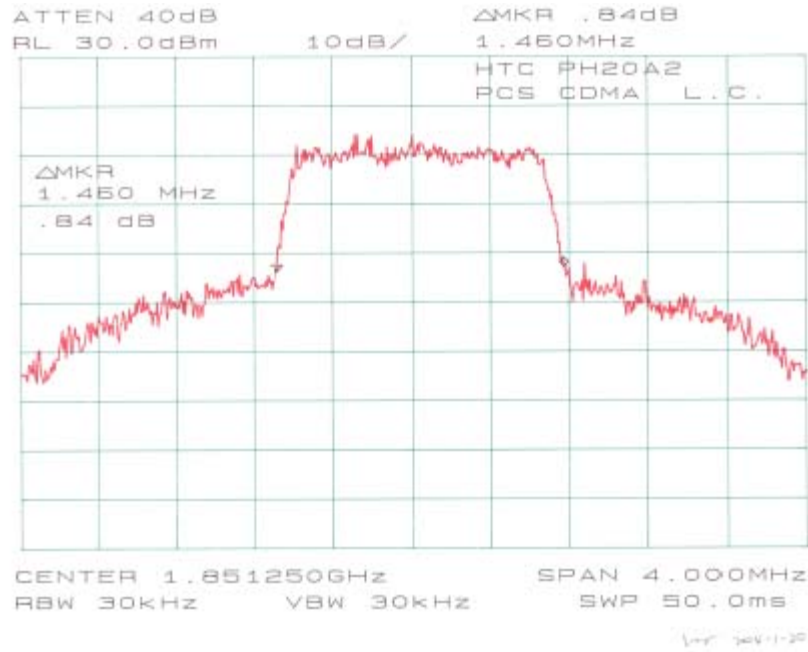
by 2009-1-24

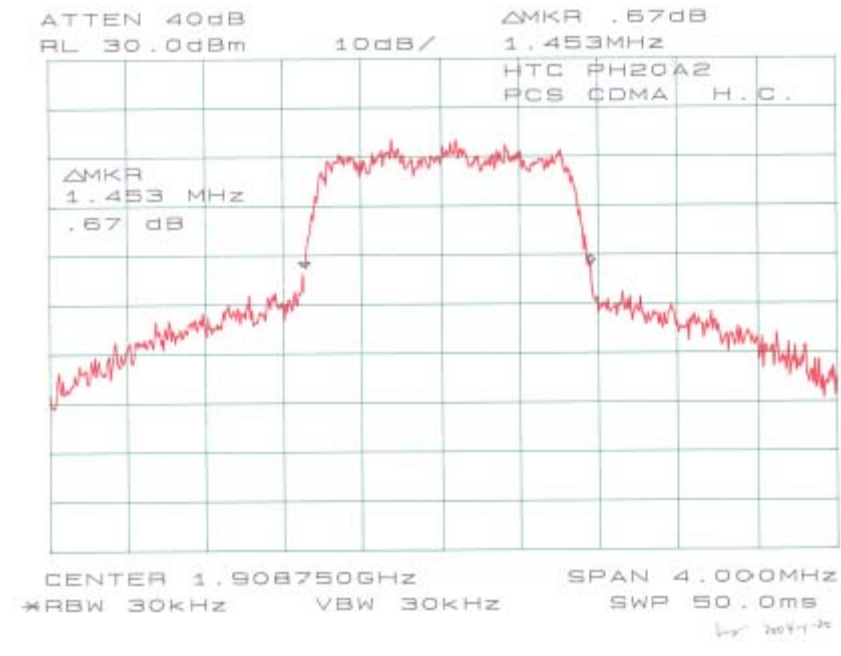
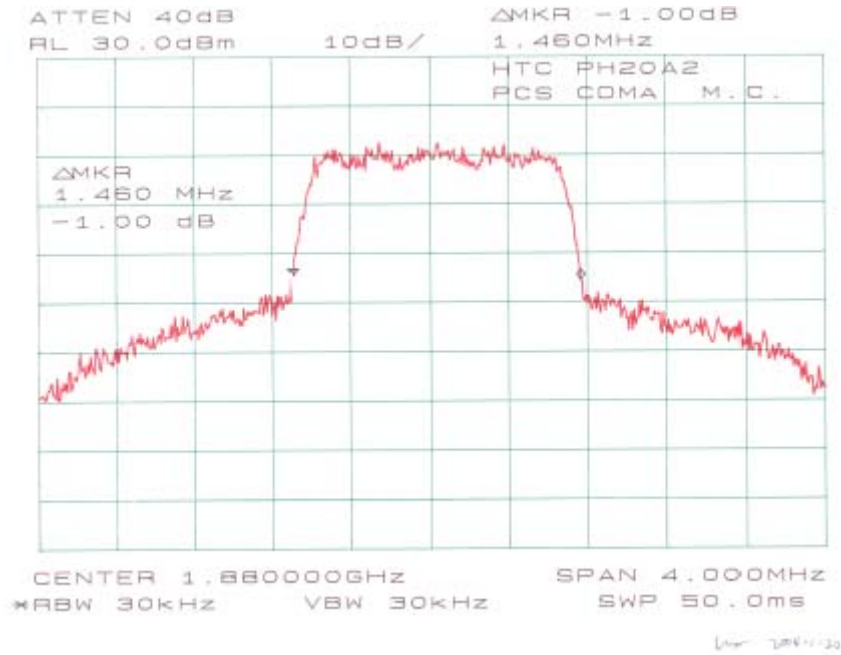


by 2009-1-24

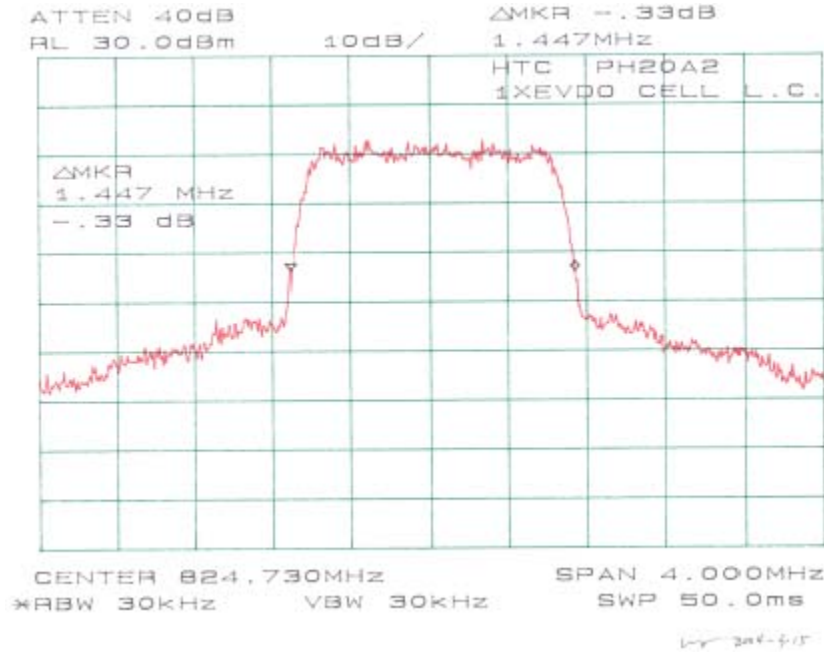


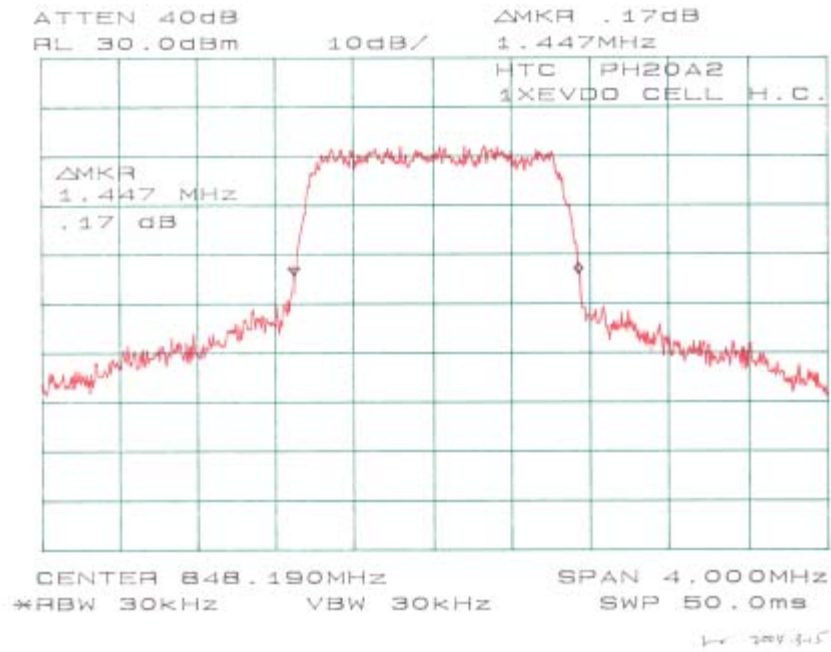
Plots of Modulation Characteristic for CDMA1900, Part22



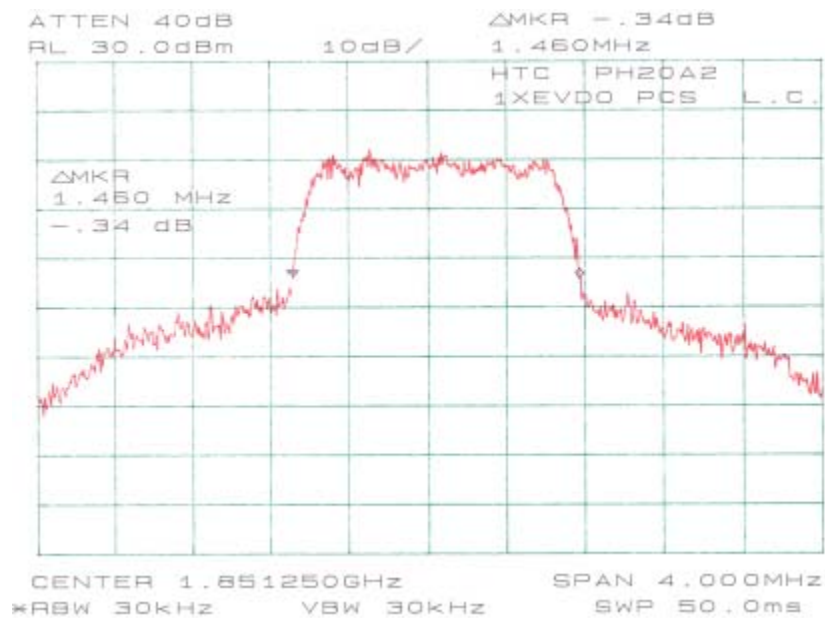


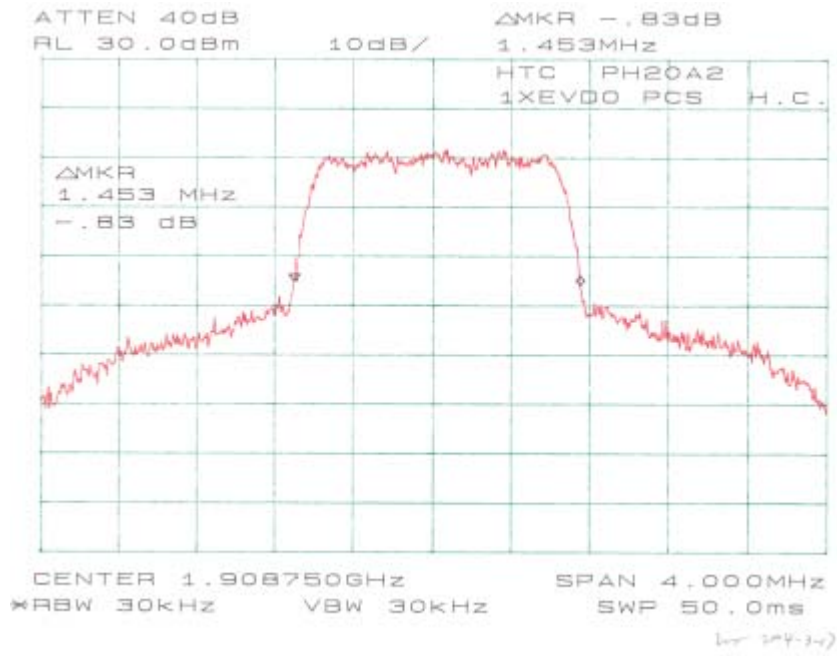
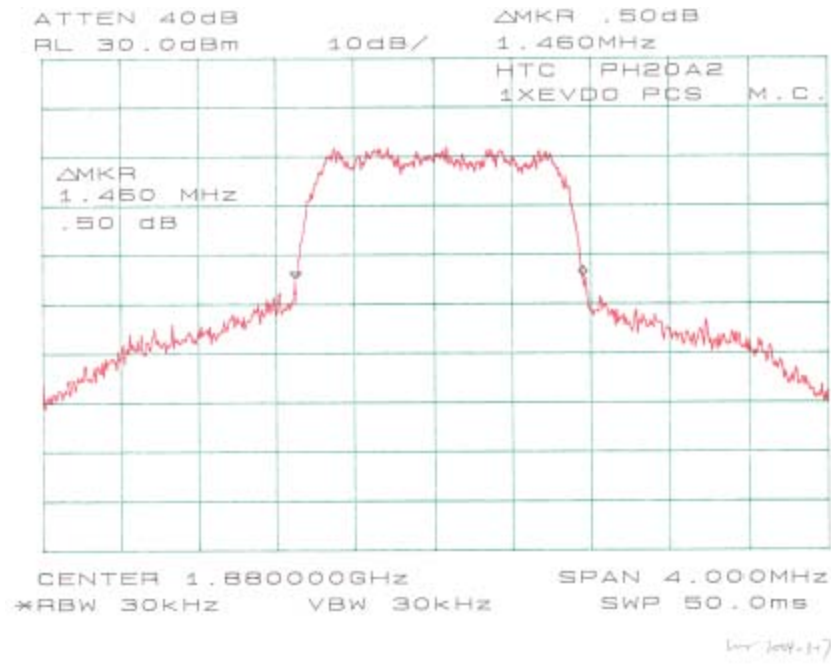
Plots of Modulation Characteristic for CDMA2000 Cellular Band, Part22





Plots of Modulation Characteristic for CDMA2000 PCS Band, Part24





§2.1053 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

Requirements: CFR 47, § 2.1053.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

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

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

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

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

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|--------------|----------------------|-------------|---------------|------------|
| HP | Spectrum Analyzer | 8568B | 2601A02165 | 2003-07-03 |
| HP | Amplifier | 8447E | 2944A10187 | 2003-09-23 |
| HP | Quasi-Peak Adapter | 85650A | 3019A05393 | 2003-06-13 |
| 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 | 2003-08-02 |
| Com-Power | Antenna, Dipole | AD-100 | 2229 | 2003-09-26 |

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 47% |
| ATM Pressure: | 1035 mbar |

The testing was performed by Ling Zhang on 2004-01-24 for Model: PH20A2.

| | |
|--------------------|-----------|
| Temperature: | 24° C |
| Relative Humidity: | 49% |
| ATM Pressure: | 1044 mbar |

The testing was performed by Daniel Deng on 2004-07-26 for Model: PH20A3.

Test Result**Model: PH20A2***FCC Part 22: CDMA800*

Low Frequency: -17.9 dBm at 2474.19 MHz
Middle Frequency: -17.8 dBm at 2509.2 MHz
High Frequency: -17.4 dBm at 2544.57 MHz

FCC Part 24: CDMA1900

Low Frequency: -26.8 dBm at 3702.5 MHz
Middle Frequency: -26.9 dBm at 3760.0 MHz
High Frequency: -27.1 dBm at 3817.5 MHz

FCC Part 22: CDMA2000 1XEVD0, Cellular band

Low Frequency: -17.9 dBm at 2474.19 MHz
Middle Frequency: -18.0 dBm at 2509.2 MHz
High Frequency: -17.9 dBm at 2544.57 MHz

FCC Part 24: CDMA2000 1XEVD0, PCS band

Low Frequency: -27.3 dBm at 3702.5 MHz
Middle Frequency: -26.4 dBm at 3760.0 MHz
High Frequency: -26.3 dBm at 3817.5 MHz

Model: PH20A3*FCC Part 22: CDMA800*

Low Frequency: -18.0 dBm at 2474.19 MHz
Middle Frequency: -17.9 dBm at 2509.2 MHz
High Frequency: -17.6 dBm at 2544.57 MHz

FCC Part 24: CDMA1900

Low Frequency: -26.7 dBm at 3702.5 MHz
Middle Frequency: -27.1 dBm at 3760.0 MHz
High Frequency: -27.3 dBm at 3817.5 MHz

FCC Part 22: CDMA2000 1XEVD0, Cellular band

Low Frequency: -18.0 dBm at 2474.19 MHz
Middle Frequency: -18.1 dBm at 2509.2 MHz
High Frequency: -18.0 dBm at 2544.57 MHz

FCC Part 24: CDMA2000 1XEVD0, PCS band

Low Frequency: -27.1 dBm at 3702.5 MHz
Middle Frequency: -26.2 dBm at 3760.0 MHz
High Frequency: -26.2 dBm at 3817.5 MHz

PH20A2, Test Data for CDMA800 (Cellular Band, part22)

| Indicated | | EUT | | | Substitution | | Generator | | | Standard | |
|------------------|-----------------|--------------------------|---------------------------------|--------------|------------------|--------------|------------------------------|----------------------|-------------------------|---------------------|----------------------|
| Frequency MHz | Ampl. dBuV/m | Table Angle Degree | Test Antenna Height Meter | Polar H/V | Frequency MHz | Level dBm | Antenna Gain Corrected | Cable Loss dBm | Absolute Level dB | FCC Limit dBm | FCC Margin DBm |
| LOW CHANNEL | | | | | | | | | | | |
| 824.73 | 119.83 | 0 | 2.1 | v | 824.73 | 21.5 | 0 | 0.1 | 21.4 (ERP) | | |
| 824.73 | 122 | 60 | 1.6 | h | 824.73 | 23.2 | 0 | 0.1 | 23.1 (ERP) | | |
| 2474.19 | 39.33 | 120 | 2.2 | h | 2474.19 | -37.8 | 7.6 | 0.7 | -30.9 | -13 | -17.9 |
| 2474.19 | 38.67 | 30 | 2.2 | v | 2474.19 | -38.2 | 7.6 | 0.7 | -31.3 | -13 | -18.3 |
| 1649.46 | 37.15 | 90 | 1.5 | h | 1649.46 | -37.8 | 6.8 | 0.5 | -31.5 | -13 | -18.5 |
| 1649.46 | 36.5 | 180 | 1.8 | v | 1649.46 | -38.4 | 6.8 | 0.5 | -32.1 | -13 | -19.1 |
| MIDDLE CHANNEL | | | | | | | | | | | |
| 836.4 | 120.17 | 0 | 2 | v | 836.4 | 21.7 | 0 | 0.1 | 21.6 (ERP) | | |
| 836.4 | 122.1 | 90 | 1.5 | h | 836.4 | 23.3 | 0 | 0.1 | 23.2 (ERP) | | |
| 1672.8 | 37.67 | 90 | 1.8 | h | 1672.8 | -37.1 | 6.8 | 0.5 | -30.8 | -13 | -17.8 |
| 2509.2 | 39.5 | 100 | 2 | h | 2509.2 | -37.7 | 7.6 | 0.7 | -30.8 | -13 | -17.8 |
| 2509.2 | 39.17 | 270 | 2.5 | v | 2509.2 | -37.9 | 7.6 | 0.7 | -31 | -13 | -18.0 |
| 1672.8 | 36.33 | 300 | 1.7 | v | 1672.8 | -38.5 | 6.8 | 0.5 | -32.2 | -13 | -19.2 |
| HIGH CHANNEL | | | | | | | | | | | |
| 848.19 | 119.83 | 30 | 2.2 | v | 848.19 | 21.3 | 0 | 0.1 | 21.2 (ERP) | | |
| 848.19 | 121.5 | 270 | 1.8 | h | 848.19 | 22.8 | 0 | 0.1 | 22.7 (ERP) | | |
| 2544.57 | 39.83 | 45 | 1.8 | h | 2544.57 | -37.3 | 7.6 | 0.7 | -30.4 | -13 | -17.4 |
| 2544.57 | 39 | 180 | 2.2 | v | 2544.57 | -38.0 | 7.6 | 0.7 | -31.1 | -13 | -18.1 |
| 1696.38 | 36.9 | 90 | 2 | h | 1696.38 | -38.0 | 6.8 | 0.5 | -31.7 | -13 | -18.7 |
| 1696.38 | 36.5 | 0 | 1.8 | v | 1696.38 | -38.4 | 6.8 | 0.5 | -32.1 | -13 | -19.1 |

Note: No pre-amplifier for harmonic test.

PH20A2, Test Data for CDMA1900 (PCS band, part24)

| Indicated | | EUT | | | Substitution | | Generator | | | Standard | |
|------------------|-----------------|--------------------------|---------------------------------|--------------|------------------|--------------|------------------------------|----------------------|-------------------------|---------------------|----------------------|
| Frequency MHz | Ampl. dBuV/m | Table Angle Degree | Test Antenna Height Meter | Polar H/V | Frequency MHz | Level dBm | Antenna Gain Corrected | Cable Loss dBm | Absolute Level dB | FCC Limit dBm | FCC Margin DBm |
| LOW CHANNEL | | | | | | | | | | | |
| 1851.25 | 119.67 | 270 | 2 | v | 1851.25 | 17 | 8.3 | 3.4 | 21.9 (EIRP) | | |
| 1851.25 | 120.33 | 60 | 2.3 | h | 1851.25 | 17.5 | 8.3 | 3.4 | 22.4 (EIRP) | | |
| 3702.5 | 48.83 | 300 | 2.2 | h | 3702.5 | -45.8 | 10.3 | 4.3 | -39.8 | -13 | -26.8 |
| 3702.5 | 48.17 | 180 | 2.1 | v | 3702.5 | -46.3 | 10.3 | 4.3 | -40.33 | -13 | -27.33 |
| 5553.75 | 43.67 | 270 | 2 | h | 5553.75 | -48.9 | 10.6 | 5.4 | -43.7 | -13 | -30.7 |
| 5553.75 | 43.17 | 180 | 1.8 | v | 5553.75 | -49.1 | 10.6 | 5.4 | -43.9 | -13 | -30.9 |
| MIDDLE CHANNEL | | | | | | | | | | | |
| 1880 | 119.1 | 300 | 2.3 | v | 1880 | 16.6 | 8.3 | 3.4 | 21.5 (EIRP) | | |
| 1880 | 120.67 | 120 | 1.7 | h | 1880 | 17.8 | 8.3 | 3.4 | 22.7 (EIRP) | | |
| 3760 | 48.67 | 90 | 2 | h | 3760 | -45.9 | 10.3 | 4.3 | -39.9 | -13 | -26.9 |
| 3760 | 48.5 | 180 | 1.8 | v | 3760 | -46.0 | 10.3 | 4.3 | -40 | -13 | -27.0 |
| 5640 | 44.17 | 120 | 1.6 | h | 5640 | -48.7 | 10.6 | 5.4 | -43.5 | -13 | -30.5 |
| 5640 | 43.83 | 180 | 2 | v | 5640 | -48.8 | 10.6 | 5.4 | -43.6 | -13 | -30.6 |
| HIGH CHANNEL | | | | | | | | | | | |
| 1908.75 | 119.83 | 0 | 2.2 | v | 1908.75 | 17.1 | 8.3 | 3.4 | 22 (EIRP) | | |
| 1908.75 | 121 | 90 | 2 | h | 1908.75 | 18.1 | 8.3 | 3.4 | 23 (EIRP) | | |
| 3817.5 | 48.33 | 100 | 2 | h | 3817.5 | -46.1 | 10.3 | 4.3 | -40.1 | -13 | -27.1 |
| 3817.5 | 48 | 200 | 1.8 | v | 3817.5 | -46.4 | 10.3 | 4.3 | -40.4 | -13 | -27.4 |
| 5726.25 | 44.1 | 270 | 2.2 | v | 5726.25 | -48.7 | 10.6 | 5.4 | -43.5 | -13 | -30.5 |
| 5726.25 | 44.4 | 120 | 1.5 | h | 5726.25 | -48.9 | 10.6 | 5.4 | -43.7 | -13 | -30.7 |

Note: No pre-amplifier for harmonic test.

PH20A2, Test Data for CDMA2000 1XEVD0 (Cellular Band, part22)

| Indicated | | EUT | | | Substitution | | Generator | | | Standard | |
|----------------|--------|--------|--------------|-------|--------------|-------|-----------|-------|------------|----------|--------|
| Frequency | Ampl. | Table | Test Antenna | | Frequency | Level | Antenna | Cable | Absolute | FCC | FCC |
| MHz | dBuV/m | Angle | Height | Polar | MHz | dBm | Gain | Loss | Level | Limit | Margin |
| | | Degree | Meter | H/V | | | Corrected | dBm | dB | dBm | DBm |
| LOW CHANNEL | | | | | | | | | | | |
| 824.73 | 119.67 | 90 | 1.6 | v | 824.73 | 21.2 | 0 | 0.1 | 21.1 (ERP) | | |
| 824.73 | 121 | 90 | 1.8 | h | 824.73 | 22.4 | 0 | 0.1 | 22.3 (ERP) | | |
| 2474.19 | 39.33 | 100 | 2.3 | h | 2474.19 | -37.8 | 7.6 | 0.7 | -30.9 | -13 | -17.9 |
| 2474.19 | 38.17 | 270 | 2 | v | 2474.19 | -38.6 | 7.6 | 0.7 | -31.7 | -13 | -18.7 |
| 1649.46 | 36.83 | 60 | 1.6 | h | 1649.46 | -38.1 | 6.8 | 0.5 | -31.8 | -13 | -18.8 |
| 1649.46 | 35.3 | 30 | 2 | v | 1649.46 | -39.5 | 6.8 | 0.5 | -33.2 | -13 | -20.2 |
| MIDDLE CHANNEL | | | | | | | | | | | |
| 836.4 | 119.33 | 180 | 1.5 | v | 836.4 | 20.8 | 0 | 0.1 | 20.7 (ERP) | | |
| 836.4 | 121.33 | 90 | 1.6 | h | 836.4 | 22.6 | 0 | 0.1 | 22.5 (ERP) | | |
| 2509.2 | 39.1 | 90 | 2 | v | 2509.2 | -37.9 | 7.6 | 0.7 | -31 | -13 | -18.0 |
| 2509.2 | 38.83 | 60 | 2.2 | h | 2509.2 | -38.1 | 7.6 | 0.7 | -31.2 | -13 | -18.2 |
| 1672.8 | 36.5 | 270 | 2 | h | 1672.8 | -38.4 | 6.8 | 0.5 | -32.1 | -13 | -19.1 |
| 1672.8 | 35.17 | 90 | 1.8 | v | 1672.8 | -39.6 | 6.8 | 0.5 | -33.3 | -13 | -20.3 |
| HIGH CHANNEL | | | | | | | | | | | |
| 848.19 | 118.67 | 30 | 2.2 | v | 848.19 | 20.3 | 0 | 0.1 | 20.2 (ERP) | | |
| 848.19 | 120.33 | 270 | 1.8 | h | 848.19 | 21.7 | 0 | 0.1 | 21.6 (ERP) | | |
| 2544.57 | 39.33 | 45 | 1.8 | h | 2544.57 | -37.8 | 7.6 | 0.7 | -30.9 | -13 | -17.9 |
| 2544.57 | 38.5 | 180 | 2.2 | v | 2544.57 | -38.3 | 7.6 | 0.7 | -31.4 | -13 | -18.4 |
| 1696.38 | 35.17 | 90 | 2 | h | 1696.38 | -39.5 | 6.8 | 0.5 | -33.2 | -13 | -20.2 |
| 1696.38 | 34.89 | 0 | 1.8 | v | 1696.38 | -39.8 | 6.8 | 0.5 | -33.5 | -13 | -20.5 |

Note: No pre-amplifier for harmonic test.

PH20A2, Test Data for CDMA2000 1XEVD0 (PCS Band, part24)

| Indicated | | EUT | | | Substitution | | Generator | | | Standard | |
|----------------|--------|--------|--------------|-------|--------------|-------|-----------|-------|-------------|----------|--------|
| Frequency | Ampl. | Table | Test Antenna | | Frequency | Level | Antenna | Cable | Absolute | FCC | FCC |
| MHz | dBuV/m | Angle | Height | Polar | MHz | dBm | Gain | Loss | Level | Limit | Margin |
| | | Degree | Meter | H/V | | | Corrected | dBm | dB | dBm | DBm |
| Low Channel | | | | | | | | | | | |
| 1851.25 | 118.33 | 90 | 2 | v | 1851.25 | 15.6 | 8.3 | 3.4 | 20.5 (EIRP) | | |
| 1851.25 | 120.17 | 90 | 2.2 | h | 1851.25 | 17.3 | 8.3 | 3.4 | 22.2 (EIRP) | | |
| 3702.5 | 48.17 | 60 | 1.8 | h | 3702.5 | -46.3 | 10.3 | 4.3 | -40.3 | -13 | -27.3 |
| 3702.5 | 47.5 | 90 | 2 | v | 3702.5 | -47.5 | 10.3 | 4.3 | -41.5 | -13 | -28.5 |
| 5553.75 | 44.15 | 90 | 1.6 | h | 5553.75 | -48.4 | 10.6 | 5.4 | -43.2 | -13 | -30.2 |
| 5553.75 | 43.67 | 270 | 1.4 | v | 5553.75 | -48.9 | 10.6 | 5.4 | -43.7 | -13 | -30.7 |
| MIDDLE CHANNEL | | | | | | | | | | | |
| 1880 | 118.5 | 90 | 1.5 | v | 1880 | 15.7 | 8.3 | 3.4 | 20.6 (EIRP) | | |
| 1880 | 119.83 | 90 | 2 | h | 1880 | 17 | 8.3 | 3.4 | 21.9 (EIRP) | | |
| 3760 | 49.17 | 90 | 2 | h | 3760 | -45.4 | 10.3 | 4.3 | -39.4 | -13 | -26.4 |
| 3760 | 48.33 | 150 | 1.8 | v | 3760 | -46.2 | 10.3 | 4.3 | -40.2 | -13 | -27.2 |
| 5640 | 44.67 | 180 | 1.8 | h | 5640 | -48.0 | 10.6 | 5.4 | -42.8 | -13 | -29.8 |
| 5640 | 43.1 | 220 | 1.6 | v | 5640 | -49.3 | 10.6 | 5.4 | -44.1 | -13 | -31.1 |
| HIGH CHANNEL | | | | | | | | | | | |
| 1908.75 | 118.17 | 120 | 1.6 | v | 1908.75 | 15.5 | 8.3 | 3.4 | 20.4 (EIRP) | | |
| 1908.75 | 119.5 | 90 | 2 | h | 1908.75 | 16.6 | 8.3 | 3.4 | 21.5 (EIRP) | | |
| 3817.5 | 49.33 | 90 | 2.2 | h | 3817.5 | -45.3 | 10.3 | 4.3 | -39.3 | -13 | -26.3 |
| 3817.5 | 48.67 | 100 | 1.5 | v | 3817.5 | -46.0 | 10.3 | 4.3 | -40 | -13 | -27.0 |
| 5726.25 | 44.83 | 180 | 2 | h | 5726.25 | -47.9 | 10.6 | 5.4 | -42.7 | -13 | -29.7 |
| 5726.25 | 43.67 | 200 | 1.8 | v | 5726.25 | -48.9 | 10.6 | 5.4 | -43.7 | -13 | -30.7 |

Note: No pre-amplifier for harmonic test.

PH20A3, Test Data for CDMA800 (Cellular Band, part22)

| Indicated | | EUT | | | Substitution | | Generator | | | Standard | |
|------------------|-----------------|--------------------------|---------------------------------|--------------|------------------|--------------|------------------------------|----------------------|-------------------------|---------------------|----------------------|
| Frequency MHz | Ampl. dBuV/m | Table Angle Degree | Test Antenna Height Meter | Polar H/V | Frequency MHz | Level dBm | Antenna Gain Corrected | Cable Loss dBm | Absolute Level dB | FCC Limit dBm | FCC Margin DBm |
| LOW CHANNEL | | | | | | | | | | | |
| 824.73 | 120.17 | 90 | 1.8 | v | 824.73 | 21.6 | 0 | 0.1 | 21.5 (ERP) | | |
| 824.73 | 121.87 | 0 | 1.5 | h | 824.73 | 23.1 | 0 | 0.1 | 23 (ERP) | | |
| 2474.19 | 39.17 | 120 | 2 | h | 2474.19 | -37.9 | 7.6 | 0.7 | -31 | -13 | -18.0 |
| 2474.19 | 38.87 | 0 | 1.8 | v | 2474.19 | -38.1 | 7.6 | 0.7 | -31.2 | -13 | -18.2 |
| 1649.46 | 37 | 90 | 1.5 | h | 1649.46 | -37.9 | 6.8 | 0.5 | -31.6 | -13 | -18.6 |
| 1649.46 | 36.33 | 0 | 1.6 | v | 1649.46 | -38.6 | 6.8 | 0.5 | -32.3 | -13 | -19.3 |
| MIDDLE CHANNEL | | | | | | | | | | | |
| 836.4 | 119.67 | 90 | 1.6 | v | 836.4 | 21.6 | 0 | 0.1 | 21.5 (ERP) | | |
| 836.4 | 121.83 | 90 | 1.4 | h | 836.4 | 23.5 | 0 | 0.1 | 23.4 (ERP) | | |
| 2509.2 | 39.33 | 150 | 1.8 | h | 2509.2 | -37.8 | 7.6 | 0.7 | -30.9 | -13 | -17.9 |
| 1672.8 | 37.17 | 90 | 1.6 | h | 1672.8 | -37.4 | 6.8 | 0.5 | -31.1 | -13 | -18.1 |
| 2509.2 | 39 | 120 | 1.8 | v | 2509.2 | -38 | 7.6 | 0.7 | -31.1 | -13 | -18.1 |
| 1672.8 | 35.87 | 90 | 1.6 | v | 1672.8 | -38.6 | 6.8 | 0.5 | -32.3 | -13 | -19.3 |
| HIGH CHANNEL | | | | | | | | | | | |
| 848.19 | 120 | 0 | 1.7 | v | 848.19 | 21.4 | 0 | 0.1 | 21.3 (ERP) | | |
| 848.19 | 122.17 | 30 | 1.8 | h | 848.19 | 23 | 0 | 0.1 | 22.9 (ERP) | | |
| 2544.57 | 39.67 | 45 | 1.6 | h | 2544.57 | -37.5 | 7.6 | 0.7 | -30.6 | -13 | -17.6 |
| 2544.57 | 38.87 | 180 | 2 | v | 2544.57 | -38.2 | 7.6 | 0.7 | -31.3 | -13 | -18.3 |
| 1696.38 | 36.87 | 90 | 1.8 | h | 1696.38 | -38.1 | 6.8 | 0.5 | -31.8 | -13 | -18.8 |
| 1696.38 | 36.33 | 0 | 1.7 | v | 1696.38 | -38.5 | 6.8 | 0.5 | -32.2 | -13 | -19.2 |

Note: No pre-amplifier for harmonic test.

PH20A2, Test Data for CDMA1900 (PCS band, part24)

| Indicated | | EUT | | | Substitution | | Generator | | | Standard | |
|----------------|--------|--------|--------------|-------|--------------|-------|-----------|-------|-------------|----------|--------|
| Frequency | Ampl. | Table | Test Antenna | | Frequency | Level | Antenna | Cable | Absolute | FCC | FCC |
| MHz | dBuV/m | Angle | Height | Polar | MHz | dBm | Gain | Loss | Level | Limit | Margin |
| | | Degree | Meter | H/V | | | Corrected | dBm | dB | dBm | DBm |
| LOW CHANNEL | | | | | | | | | | | |
| 1851.25 | 119.17 | 30 | 1.8 | v | 1851.25 | 17.3 | 8.3 | 3.4 | 22.2 (EIRP) | | |
| 1851.25 | 120.67 | 60 | 2 | h | 1851.25 | 17.6 | 8.3 | 3.4 | 22.5 (EIRP) | | |
| 3702.5 | 48.87 | 60 | 2 | h | 3702.5 | -45.7 | 10.3 | 4.3 | -39.7 | -13 | -26.7 |
| 3702.5 | 48.67 | 180 | 1.8 | v | 3702.5 | -46 | 10.3 | 4.3 | -40 | -13 | -27.0 |
| 5553.75 | 42.87 | 0 | 1.6 | v | 5553.75 | -49.3 | 10.6 | 5.4 | -44.1 | -13 | -31.1 |
| 5553.75 | 43.17 | 30 | 1.8 | h | 5553.75 | -50.1 | 10.6 | 5.4 | -44.9 | -13 | -31.9 |
| MIDDLE CHANNEL | | | | | | | | | | | |
| 1880 | 119.33 | 90 | 2 | v | 1880 | 16.7 | 8.3 | 3.4 | 21.6 (EIRP) | | |
| 1880 | 120.87 | 90 | 1.7 | h | 1880 | 17.8 | 8.3 | 3.4 | 22.7 (EIRP) | | |
| 3760 | 48.33 | 90 | 1.8 | h | 3760 | -46.1 | 10.3 | 4.3 | -40.1 | -13 | -27.1 |
| 3760 | 47.87 | 0 | 1.8 | v | 3760 | -46.5 | 10.3 | 4.3 | -40.5 | -13 | -27.5 |
| 5640 | 44.67 | 120 | 1.7 | h | 5640 | -48.5 | 10.6 | 5.4 | -43.3 | -13 | -30.3 |
| 5640 | 43.67 | 180 | 1.8 | v | 5640 | -48.9 | 10.6 | 5.4 | -43.7 | -13 | -30.7 |
| HIGH CHANNEL | | | | | | | | | | | |
| 1908.75 | 119.17 | 0 | 2 | v | 1908.75 | 16.9 | 8.3 | 3.4 | 21.8 (EIRP) | | |
| 1908.75 | 121.17 | 90 | 2 | h | 1908.75 | 18.3 | 8.3 | 3.4 | 23.2 (EIRP) | | |
| 3817.5 | 48.1 | 90 | 1.8 | h | 3817.5 | -46.3 | 10.3 | 4.3 | -40.3 | -13 | -27.3 |
| 3817.5 | 47.87 | 150 | 1.6 | v | 3817.5 | -46.5 | 10.3 | 4.3 | -40.5 | -13 | -27.5 |
| 5726.25 | 43.87 | 30 | 2.1 | v | 5726.25 | -48.8 | 10.6 | 5.4 | -43.6 | -13 | -30.6 |
| 5726.25 | 44.17 | 90 | 1.5 | h | 5726.25 | -50.1 | 10.6 | 5.4 | -44.9 | -13 | -31.9 |

Note: No pre-amplifier for harmonic test.

PH20A2, Test Data for CDMA2000 1XEVD0 (Cellular Band, part22)

| Indicated | | EUT | | | Substitution | | Generator | | | Standard | |
|----------------|--------|--------|--------------|-------|--------------|-------|-----------|-------|------------|----------|--------|
| Frequency | Ampl. | Table | Test Antenna | | Frequency | Level | Antenna | Cable | Absolute | FCC | FCC |
| MHz | dBuV/m | Angle | Height | Polar | MHz | dBm | Gain | Loss | Level | Limit | Margin |
| | | Degree | Meter | H/V | | | Corrected | dBm | dB | dBm | DBm |
| LOW CHANNEL | | | | | | | | | | | |
| 824.73 | 119.87 | 90 | 1.6 | v | 824.73 | 21.3 | 0 | 0.1 | 21.2 (ERP) | | |
| 824.73 | 120.87 | 90 | 1.7 | h | 824.73 | 22.3 | 0 | 0.1 | 22.2 (ERP) | | |
| 2474.19 | 38.87 | 90 | 2 | h | 2474.19 | -37.9 | 7.6 | 0.7 | -31 | -13 | -18.0 |
| 2474.19 | 38.17 | 30 | 1.8 | v | 2474.19 | -38.5 | 7.6 | 0.7 | -31.6 | -13 | -18.6 |
| 1649.46 | 36.67 | 90 | 1.6 | h | 1649.46 | -38.2 | 6.8 | 0.5 | -31.9 | -13 | -18.9 |
| 1649.46 | 36.17 | 30 | 1.8 | v | 1649.46 | -39.2 | 6.8 | 0.5 | -32.9 | -13 | -19.9 |
| MIDDLE CHANNEL | | | | | | | | | | | |
| 836.4 | 119.17 | 0 | 1.6 | v | 836.4 | 20.7 | 0 | 0.1 | 20.6 (ERP) | | |
| 836.4 | 121.17 | 90 | 1.6 | h | 836.4 | 22.5 | 0 | 0.1 | 22.4 (ERP) | | |
| 2509.2 | 38.87 | 90 | 1.9 | v | 2509.2 | -38 | 7.6 | 0.7 | -31.1 | -13 | -18.1 |
| 2509.2 | 38.67 | 45 | 2 | h | 2509.2 | -38.3 | 7.6 | 0.7 | -31.4 | -13 | -18.4 |
| 1672.8 | 36.67 | 90 | 1.8 | h | 1672.8 | -38.3 | 6.8 | 0.5 | -32 | -13 | -19.0 |
| 1672.8 | 35.87 | 30 | 1.8 | v | 1672.8 | -39.4 | 6.8 | 0.5 | -33.1 | -13 | -20.1 |
| HIGH CHANNEL | | | | | | | | | | | |
| 848.19 | 118.33 | 60 | 2 | v | 848.19 | 20.2 | 0 | 0.1 | 20.1 (ERP) | | |
| 848.19 | 120.17 | 30 | 1.7 | h | 848.19 | 21.6 | 0 | 0.1 | 21.5 (ERP) | | |
| 2544.57 | 39.17 | 60 | 1.8 | h | 2544.57 | -37.9 | 7.6 | 0.7 | -31 | -13 | -18.0 |
| 2544.57 | 37.87 | 180 | 2 | v | 2544.57 | -38.6 | 7.6 | 0.7 | -31.7 | -13 | -18.7 |
| 1696.38 | 35.33 | 90 | 1.8 | h | 1696.38 | -39.6 | 6.8 | 0.5 | -33.3 | -13 | -20.3 |
| 1696.38 | 34.67 | 0 | 1.6 | v | 1696.38 | -40.1 | 6.8 | 0.5 | -33.8 | -13 | -20.8 |

Note: No pre-amplifier for harmonic test.

PH20A2, Test Data for CDMA2000 1XEVD0 (PCS, part24)

| Indicated | | EUT | | | Substitution | | Generator | | | Standard | |
|----------------|--------|--------|--------------|-------|--------------|-------|-----------|-------|-------------|----------|--------|
| Frequency | Ampl. | Table | Test Antenna | | Frequency | Level | Antenna | Cable | Absolute | FCC | FCC |
| MHz | dBuV/m | Angle | Height | Polar | MHz | dBm | Gain | Loss | Level | Limit | Margin |
| | | Degree | Meter | H/V | | | Corrected | dBm | dB | dBm | DBm |
| Low Channel | | | | | | | | | | | |
| 1851.25 | 118.67 | 90 | 1.8 | v | 1851.25 | 15.8 | 8.3 | 3.4 | 20.7 (EIRP) | | |
| 1851.25 | 120.67 | 90 | 2 | h | 1851.25 | 17.5 | 8.3 | 3.4 | 22.4 (EIRP) | | |
| 3702.5 | 48 | 45 | 1.6 | h | 3702.5 | -46.1 | 10.3 | 4.3 | -40.1 | -13 | -27.1 |
| 3702.5 | 48.17 | 90 | 1.8 | v | 3702.5 | -47.6 | 10.3 | 4.3 | -41.6 | -13 | -28.6 |
| 5553.75 | 44.33 | 90 | 1.5 | h | 5553.75 | -48.2 | 10.6 | 5.4 | -43 | -13 | -30.0 |
| 5553.75 | 43.87 | 30 | 1.5 | v | 5553.75 | -48.8 | 10.6 | 5.4 | -43.6 | -13 | -30.6 |
| MIDDLE CHANNEL | | | | | | | | | | | |
| 1880 | 118.67 | 90 | 1.6 | v | 1880 | 15.8 | 8.3 | 3.4 | 20.7 (EIRP) | | |
| 1880 | 120.17 | 90 | 1.8 | h | 1880 | 17.2 | 8.3 | 3.4 | 22.1 (EIRP) | | |
| 3760 | 49.33 | 90 | 1.8 | h | 3760 | -45.2 | 10.3 | 4.3 | -39.2 | -13 | -26.2 |
| 3760 | 48.87 | 120 | 1.6 | v | 3760 | -46 | 10.3 | 4.3 | -40 | -13 | -27.0 |
| 5640 | 44.87 | 180 | 1.6 | h | 5640 | -47.8 | 10.6 | 5.4 | -42.6 | -13 | -29.6 |
| 5640 | 43.17 | 60 | 1.6 | v | 5640 | -49.2 | 10.6 | 5.4 | -44 | -13 | -31.0 |
| HIGH CHANNEL | | | | | | | | | | | |
| 1908.75 | 118.33 | 90 | 1.6 | v | 1908.75 | 15.6 | 8.3 | 3.4 | 20.5 (EIRP) | | |
| 1908.75 | 119.87 | 90 | 1.8 | h | 1908.75 | 16.8 | 8.3 | 3.4 | 21.7 (EIRP) | | |
| 3817.5 | 49.67 | 90 | 2 | h | 3817.5 | -45.2 | 10.3 | 4.3 | -39.2 | -13 | -26.2 |
| 3817.5 | 48.87 | 90 | 1.6 | v | 3817.5 | -45.8 | 10.3 | 4.3 | -39.8 | -13 | -26.8 |
| 5726.25 | 44.67 | 0 | 1.8 | h | 5726.25 | -48.1 | 10.6 | 5.4 | -42.9 | -13 | -29.9 |
| 5726.25 | 43.33 | 120 | 1.7 | v | 5726.25 | -50.1 | 10.6 | 5.4 | -44.9 | -13 | -31.9 |

Note: No pre-amplifier for harmonic test.

§2.1046, §22.912(d), & §24.232 - RF POWER OUTPUT

Applicable Standard

According to FCC §2.1046 and §24.232 (1), mobile/portable stations are limited to 2 watts EIRP. According to FCC §22.912(d), the ERP of mobile transmitters must not exceed 7 watts.

Test Procedure

1. On a test site, the EUT shall be placed at 1.5m height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the quasi-peak detector is used for the measurement.
4. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a horn (substitution antenna) for Part24 (EIRP) and replaced by dipole antenna for Part22 (ERP).
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

17. The measure of the effective radiated power is the large of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|--------------|----------------------|-------------|---------------|------------|
| HP | Spectrum Analyzer | 8568B | 2601A02165 | 2003-07-03 |
| HP | Amplifier | 8447E | 2944A10187 | 2003-09-23 |
| HP | Quasi-Peak Adapter | 85650A | 3019A05393 | 2003-06-13 |
| 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 | 2003-08-02 |
| Com-Power | Antenna, Dipole | AD-100 | 2229 | 2003-09-26 |

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

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 13° C |
| Relative Humidity: | 47% |
| ATM Pressure: | 1035 mbar |

The testing was performed by Ling Zhang on 2004-01-24 for Model: PH20A2.

| | |
|--------------------|-----------|
| Temperature: | 24° C |
| Relative Humidity: | 49% |
| ATM Pressure: | 1044 mbar |

The testing was performed by Daniel Deng on 2004-07-26 for Model: PH20A3.

Test Results

Model PH20A2:

Test Data for CDMA800 (Cellular Band, part22)

| Frequency MHz | Level dBm | Gain Corrected | Loss dB | Level dBm (ERP) |
|------------------|--------------|-------------------|------------|--------------------|
| 824.73 | 23.2 | 0 | 0.1 | 23.1 |
| 836.4 | 23.3 | 0 | 0.1 | 23.2 |
| 848.19 | 22.8 | 0 | 0.1 | 22.7 |

Test Data for CDMA1900 (PCS band, part24)

| Frequency MHz | Level dBm | Gain Corrected | Loss dB | Level dBm (EIRP) |
|------------------|--------------|-------------------|------------|---------------------|
| 1851.25 | 17.5 | 8.3 | 3.4 | 22.4 |
| 1880 | 17.8 | 8.3 | 3.4 | 22.7 |
| 1908.75 | 18.1 | 8.3 | 3.4 | 23.0 |

Test Data for CDMA2000 1XEVD0 (Cellular Band, part22)

| Frequency MHz | Level dBm | Gain Corrected | Loss dB | Level dBm (ERP) |
|------------------|--------------|-------------------|------------|--------------------|
| 824.73 | 22.4 | 0 | 0.1 | 22.3 |
| 836.4 | 22.6 | 0 | 0.1 | 22.5 |
| 848.19 | 21.7 | 0 | 0.1 | 21.6 |

Test Data for CDMA2000 1XEVD0 (Cellular Band, part24)

| Frequency MHz | Level dBm | Gain Corrected | Loss dB | Level dBm (EIRP) |
|------------------|--------------|-------------------|------------|---------------------|
| 1851.25 | 17.3 | 8.3 | 3.4 | 22.2 |
| 1880 | 17 | 8.3 | 3.4 | 21.9 |
| 1908.75 | 16.6 | 8.3 | 3.4 | 21.5 |

Model PH20A3:

Test Data for CDMA800 (Cellular Band, part22)

| Frequency MHz | Level dBm | Gain Corrected | Loss dB | Level dBm (ERP) |
|------------------|--------------|-------------------|------------|--------------------|
| 824.73 | 23.1 | 0 | 0.1 | 23.0 |
| 836.4 | 23.5 | 0 | 0.1 | 23.4 |
| 848.19 | 23 | 0 | 0.1 | 22.9 |

Test Data for CDMA1900 (PCS band, part24)

| Frequency MHz | Level dBm | Gain Corrected | Loss dB | Level dBm (EIRP) |
|------------------|--------------|-------------------|------------|---------------------|
| 1851.25 | 17.6 | 8.3 | 3.4 | 22.5 |
| 1880 | 17.8 | 8.3 | 3.4 | 22.7 |
| 1908.75 | 18.3 | 8.3 | 3.4 | 23.2 |

Test Data for CDMA2000 1XEVD0 (Cellular Band, part22)

| Frequency MHz | Level dBm | Gain Corrected | Loss dB | Level dBm (ERP) |
|------------------|--------------|-------------------|------------|--------------------|
| 824.73 | 22.3 | 0 | 0.1 | 22.2 |
| 836.4 | 22.5 | 0 | 0.1 | 22.4 |
| 848.19 | 21.6 | 0 | 0.1 | 21.5 |

Test Data for CDMA2000 1XEVD0 (Cellular Band, part24)

| Frequency MHz | Level dBm | Gain Corrected | Loss dB | Level dBm (EIRP) |
|------------------|--------------|-------------------|------------|---------------------|
| 1851.25 | 17.5 | 8.3 | 3.4 | 22.4 |
| 1880 | 17.2 | 8.3 | 3.4 | 22.1 |
| 1908.75 | 16.8 | 8.3 | 3.4 | 21.7 |

Sample calculation:

Absolute level = substitution reading + antenna gain - cable loss

For example:

$$20.2 + 8.3 - 3.4 = 25.1$$

§2.1046, §22.913(a), & §24.232 – CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (b), Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

Test Procedure

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

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---------------------|---------------------|--------------|----------------------|------------------|
| HP | Spectrum Analyzer | HP8564E | 3943A01781 | 2003-08-01 |
| HP | Plotter | HP7470A | 2541A49659 | Not Required |
| A.H. Systems | Horn Antenna | SAS200 | 261 | 2004-05-31 |
| ETS | Logperiodic Antenna | 3148 | 0004-1155 | 2003-10-11 |
| EMCO | Biconical Antenna | 3110B | 9603-2315 | 2003-10-11 |

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

Environmental Conditions

| | |
|--------------------|------------|
| Temperature: | 13° C |
| Relative Humidity: | 47% |
| ATM Pressure: | 1035 mbar |
| Test date: | 2004-01-24 |

| | |
|--------------------|------------|
| Temperature: | 12° C |
| Relative Humidity: | 51% |
| ATM Pressure: | 1041 mbar |
| Test date: | 2004-01-20 |

| | |
|--------------------|------------|
| Temperature: | 24° C |
| Relative Humidity: | 44% |
| ATM Pressure: | 1012 mbar |
| Test date: | 2004-03-15 |

| | |
|--------------------|------------|
| Temperature: | 25° C |
| Relative Humidity: | 41% |
| ATM Pressure: | 1015 mbar |
| Test date: | 2004-03-17 |

The testing was performed by Ling Zhang for Model: PH20A2.

| | |
|--------------------|------------|
| Temperature: | 25° C |
| Relative Humidity: | 41% |
| ATM Pressure: | 1015 mbar |
| Test date: | 2004-07-26 |

The testing was performed by Daniel Deng for Model: PH20A3.

Test Results

Model: PH20A2

CDMA800, Cellular band, Part 22:

| Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit in W |
|---------|-----------------|---------------------|-------------------|------------|
| LOW | 824.73 | 24.67 | 0.293 | 7 |
| MIDDLE | 836.40 | 24.67 | 0.293 | 7 |
| HIGH | 848.19 | 24.50 | 0.281 | 7 |

CDMA1900, PCS band, Part 24:

| Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit in W |
|---------|-----------------|---------------------|-------------------|------------|
| LOW | 1851.25 | 24.50 | 0.281 | 2 |
| MIDDLE | 1880.00 | 24.67 | 0.293 | 2 |
| HIGH | 1908.75 | 24.50 | 0.281 | 2 |

CDMA2000, Cellular band, Part 22:

| Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit in W |
|---------|-----------------|---------------------|-------------------|------------|
| LOW | 824.73 | 24.50 | 0.281 | 7 |
| MIDDLE | 836.40 | 24.50 | 0.281 | 7 |
| HIGH | 848.19 | 24.67 | 0.293 | 7 |

CDMA2000, PCS band, Part 24:

| Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit in W |
|---------|-----------------|---------------------|-------------------|------------|
| LOW | 1851.25 | 24.17 | 0.261 | 2 |
| MIDDLE | 1880.00 | 24.33 | 0.271 | 2 |
| HIGH | 1908.75 | 24.50 | 0.282 | 2 |

Model: PH20A3

CDMA800, Cellular band, Part 22:

| Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit in W |
|---------|-----------------|---------------------|-------------------|------------|
| LOW | 824.70 | 24.67 | 0.293 | 7 |
| MIDDLE | 836.20 | 24.50 | 0.281 | 7 |
| HIGH | 848.20 | 24.67 | 0.293 | 7 |

CDMA1900, PCS band, Part 24:

| Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit in W |
|---------|-----------------|---------------------|-------------------|------------|
| LOW | 1851.00 | 24.50 | 0.281 | 2 |
| MIDDLE | 1880.00 | 24.50 | 0.281 | 2 |
| HIGH | 1908.75 | 24.67 | 0.293 | 2 |

CDMA2000, Cellular band, Part 22:

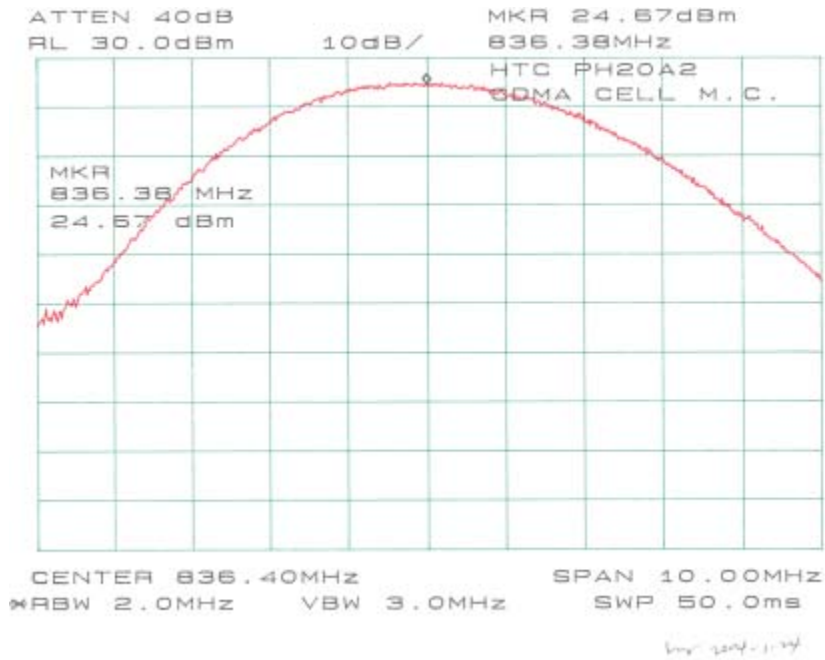
| Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit in W |
|---------|-----------------|---------------------|-------------------|------------|
| LOW | 824.73 | 24.67 | 0.293 | 7 |
| MIDDLE | 836.40 | 24.50 | 0.281 | 7 |
| HIGH | 848.19 | 24.67 | 0.293 | 7 |

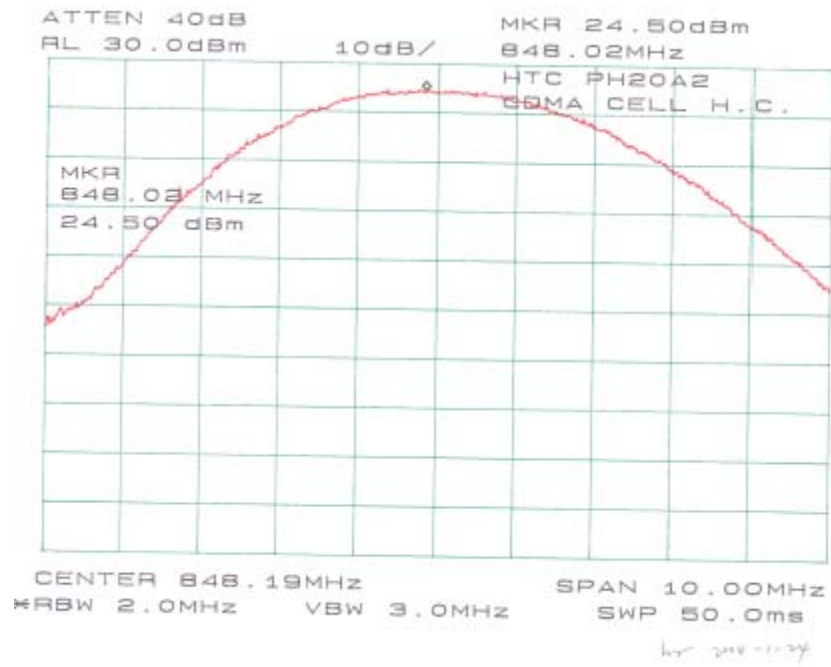
CDMA2000, PCS band, Part 24:

| Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit in W |
|---------|-----------------|---------------------|-------------------|------------|
| LOW | 1851.00 | 24.33 | 0.271 | 2 |
| MIDDLE | 1880.00 | 24.50 | 0.281 | 2 |
| HIGH | 1908.75 | 24.50 | 0.281 | 2 |

Model: PH20A2

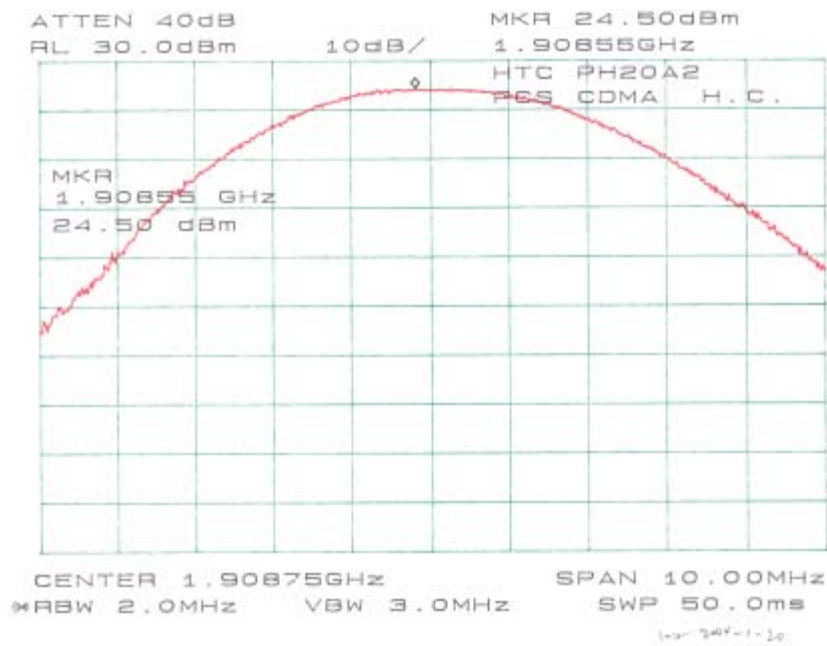
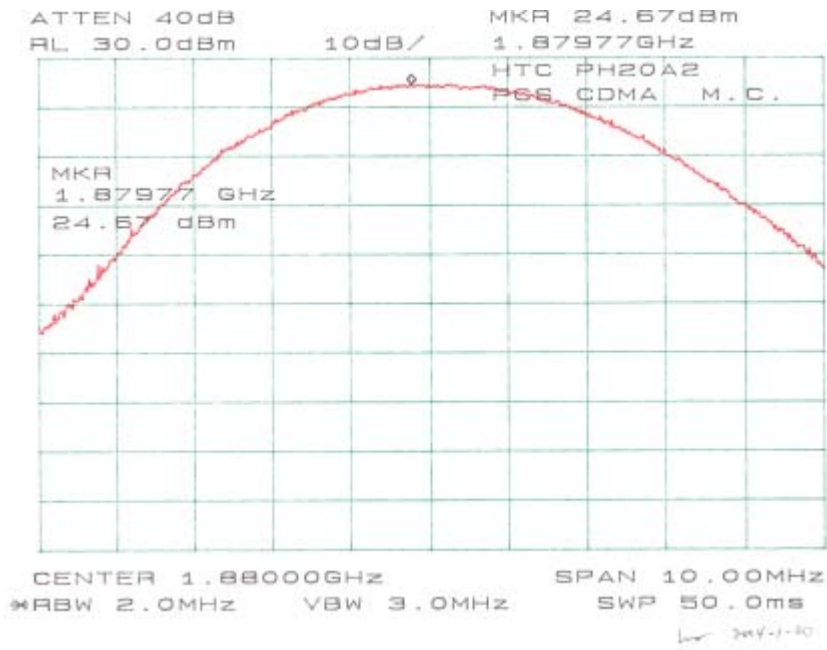
Plots of Conducted Output Power for CDMA800, Cellular band, Part 22



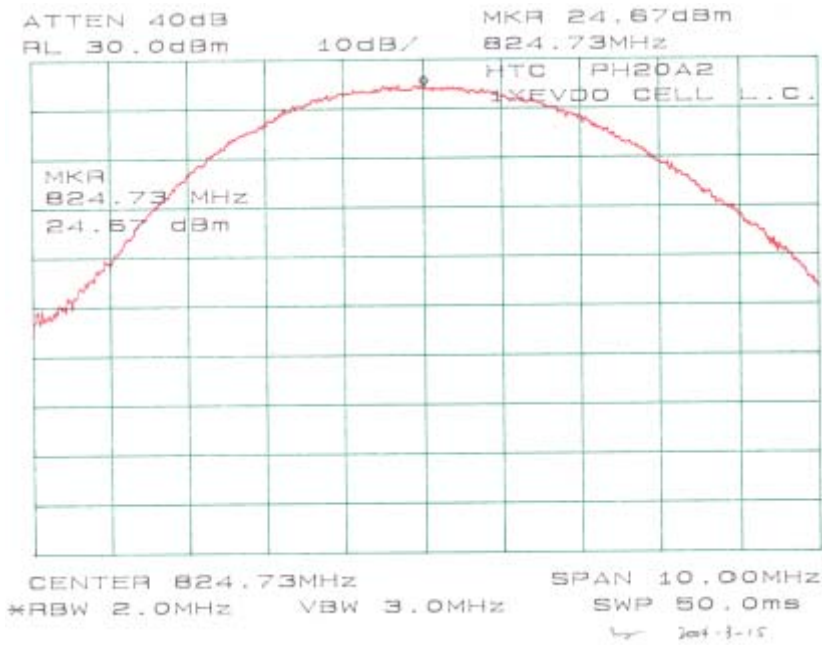


Plots of Conducted Output Power for CDMA1900, PCS band, Part 24





Plots of Conducted Output Power for CDMA2000, Cellular band, Part 22





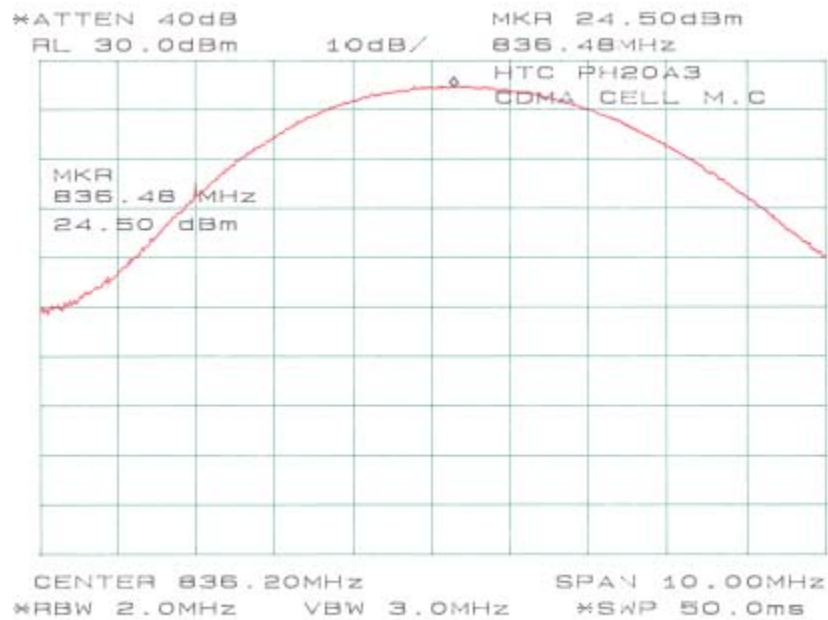
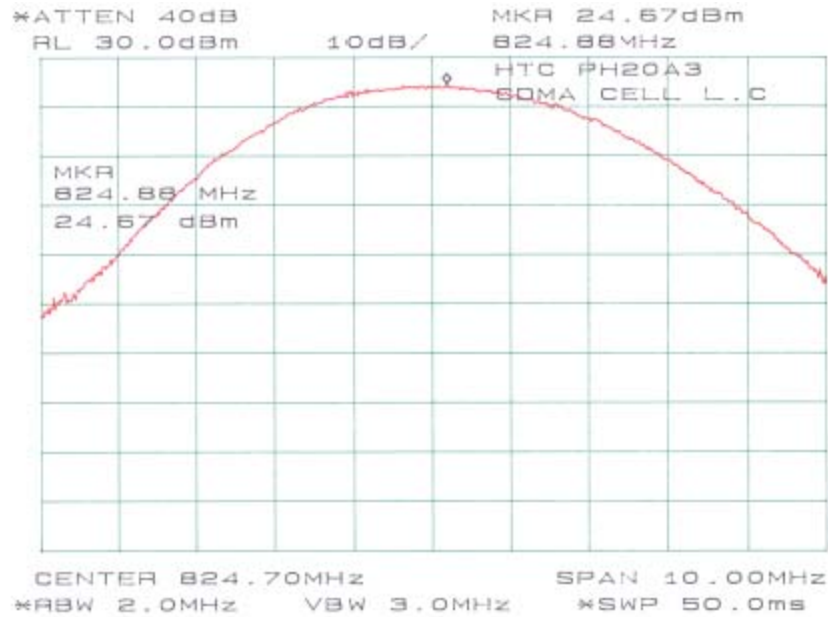
Plots of Conducted Output Power for CDMA2000, PCS band, Part 24:

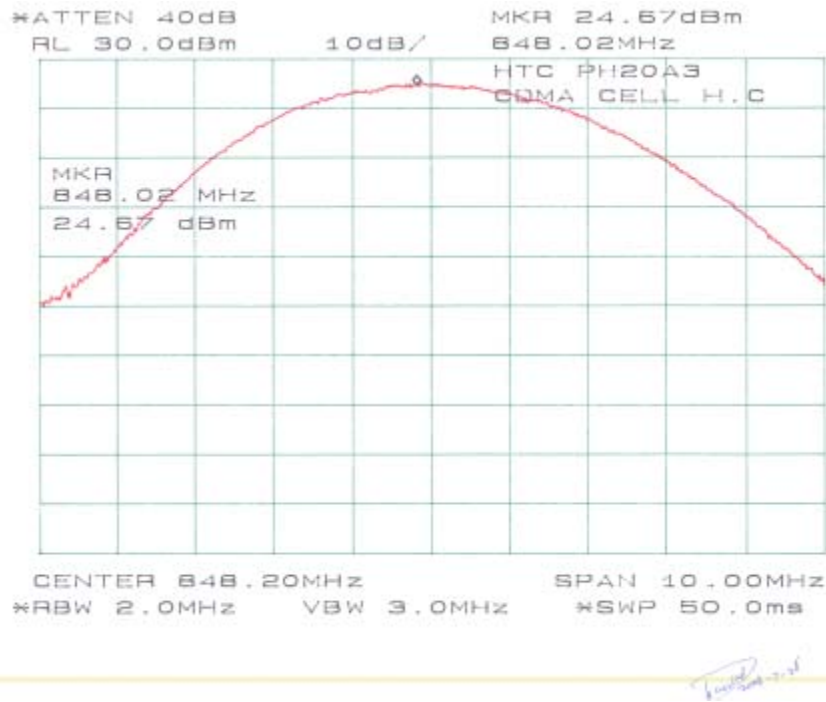




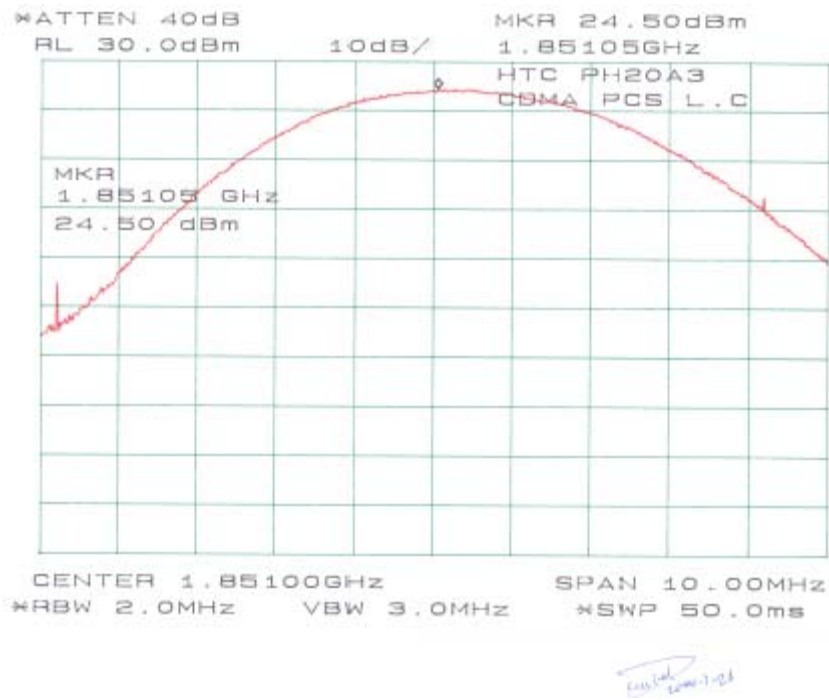
Model: PH20A3

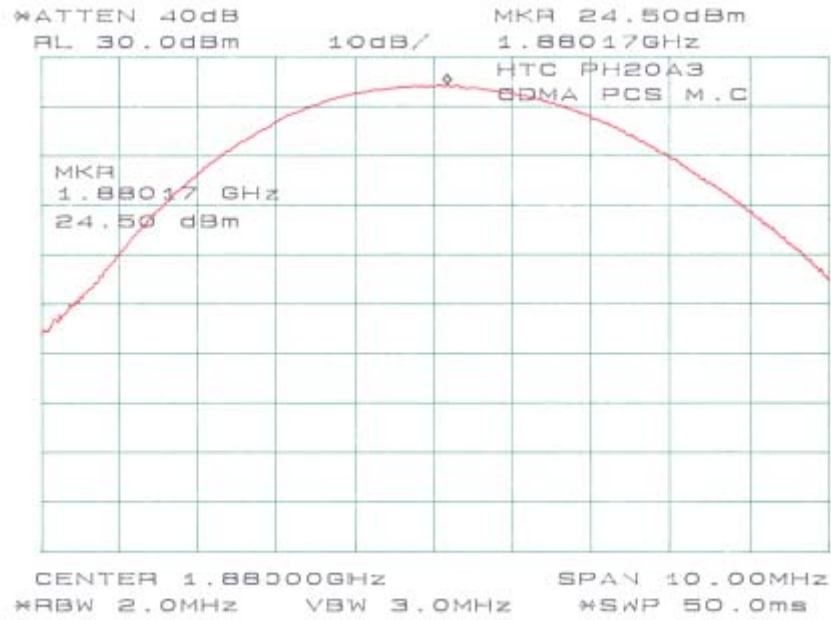
Plots of Conducted Output Power for CDMA800, Cellular band, Part 22



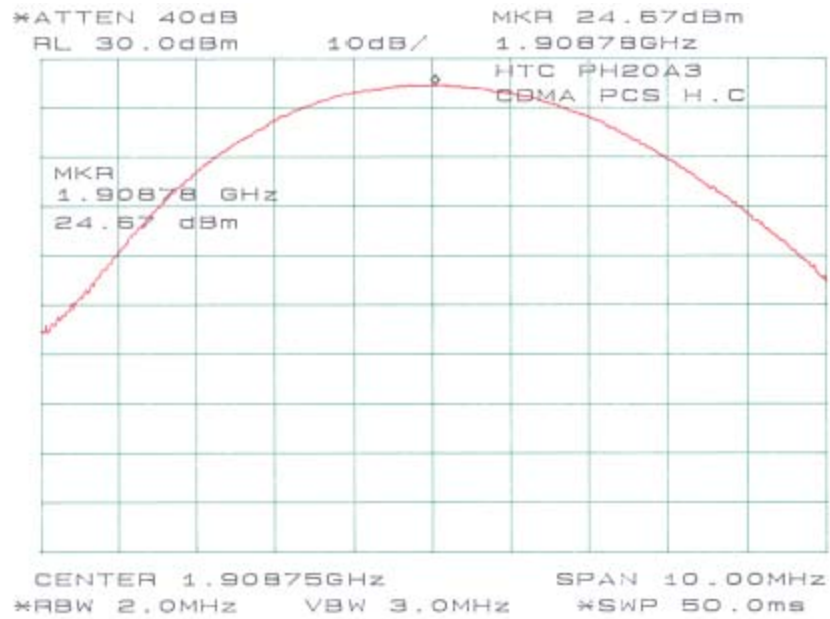


Plots of Conducted Output Power for CDMA1900, PCS band, Part 24



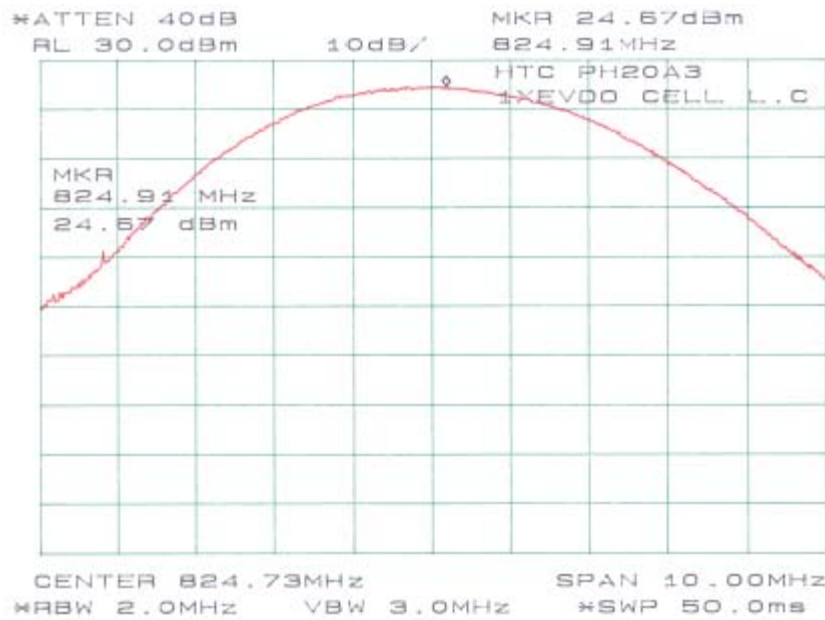


Luigi 2009-7-26

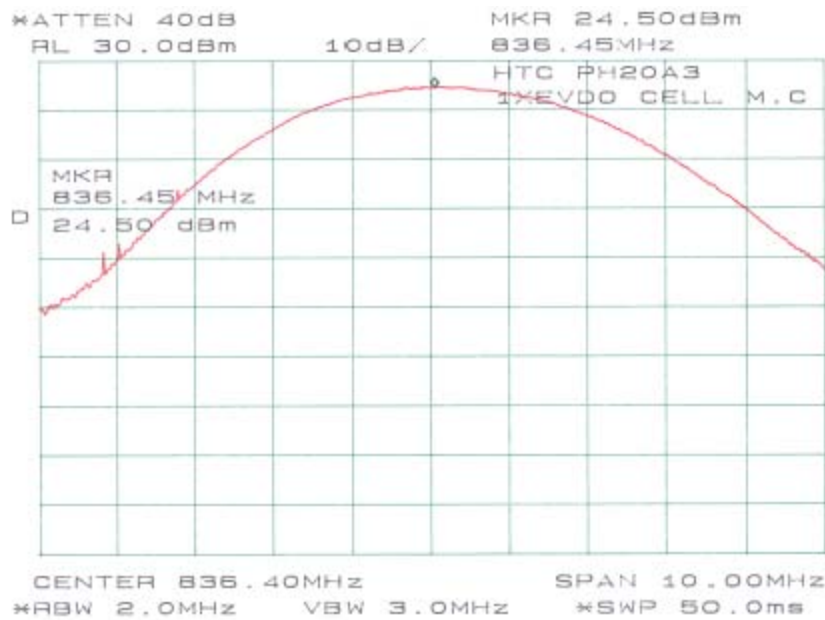


Luigi 2009-7-26

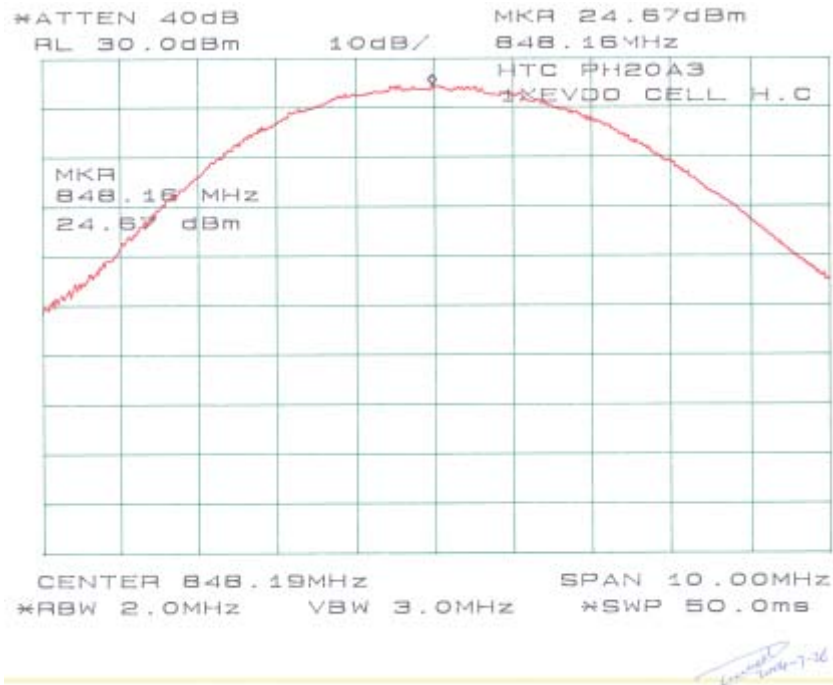
Plots of Conducted Output Power for CDMA2000, Cellular band, Part 22



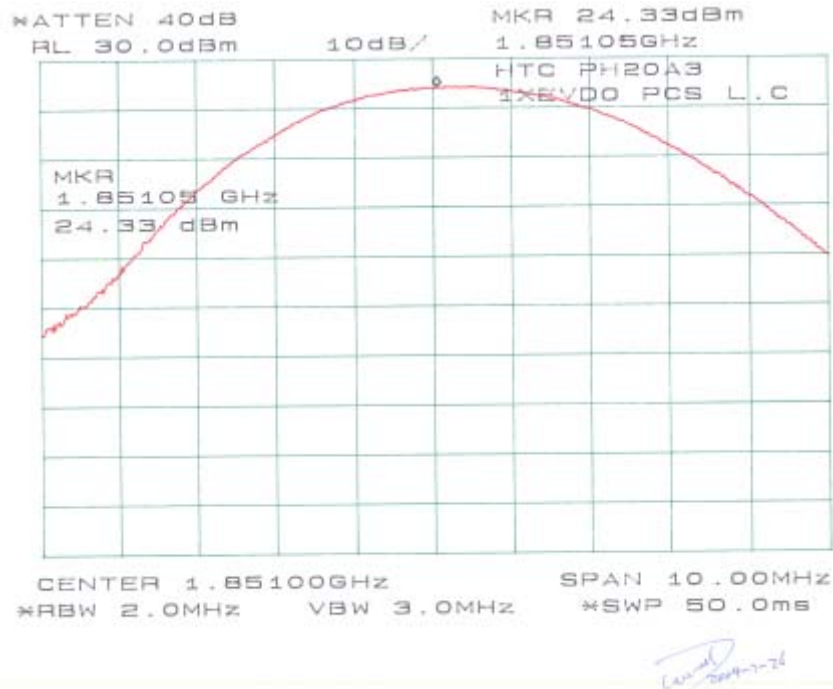
Handwritten signature and date: 1/24/07-1-20

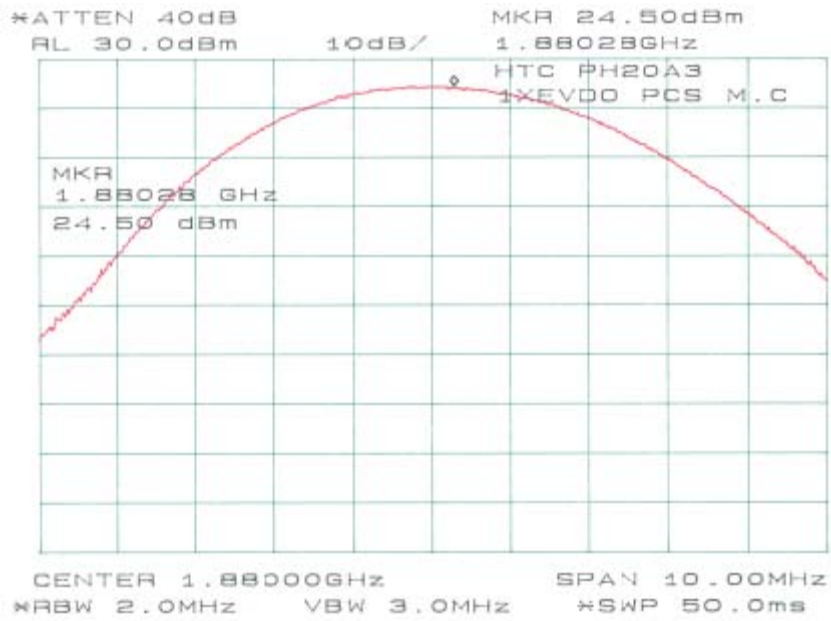


Handwritten signature and date: 1/24/07-1-20

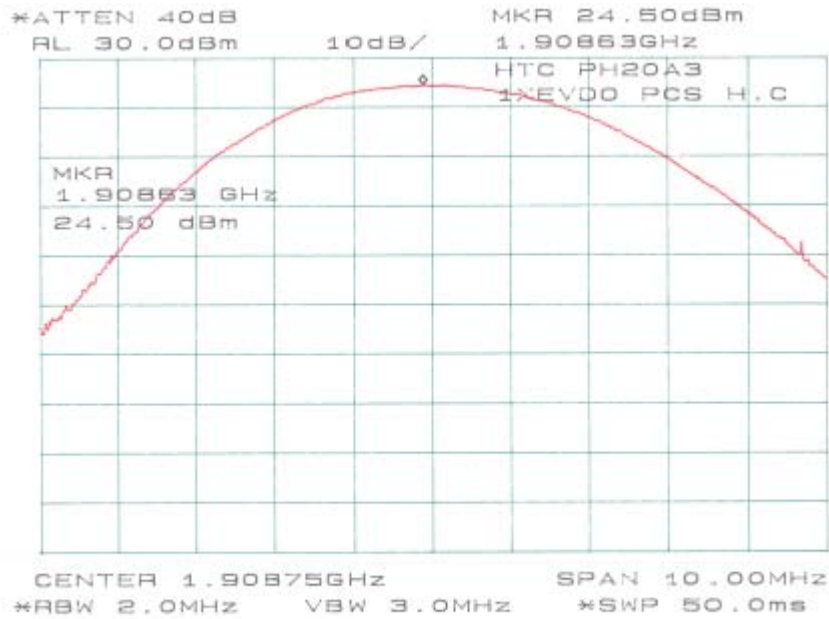


Plots of Conducted Output Power for CDMA2000, PCS band, Part 24:





Carroll 2007-06



Carroll 2007-06

§2.1049, §22.917, §22.905, & §24.238 - OCCUPIED BANDWIDTH

Applicable Standard

Requirements: CFR 47, Section 2.1049, Section 22.901, Section 22.917 and Section 24.238.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 30 KHz and the 26 dB bandwidth was recorded.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---------------------|--------------------|--------------|----------------------|------------------|
| HP | Spectrum Analyzer | HP8564E | 3943A01781 | 2003-08-01 |
| HP | Plotter | HP7470A | 2541A49659 | Not Required |

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

Environmental Conditions

| | |
|--------------------|------------|
| Temperature: | 13° C |
| Relative Humidity: | 47% |
| ATM Pressure: | 1035 mbar |
| Test date: | 2004-01-24 |

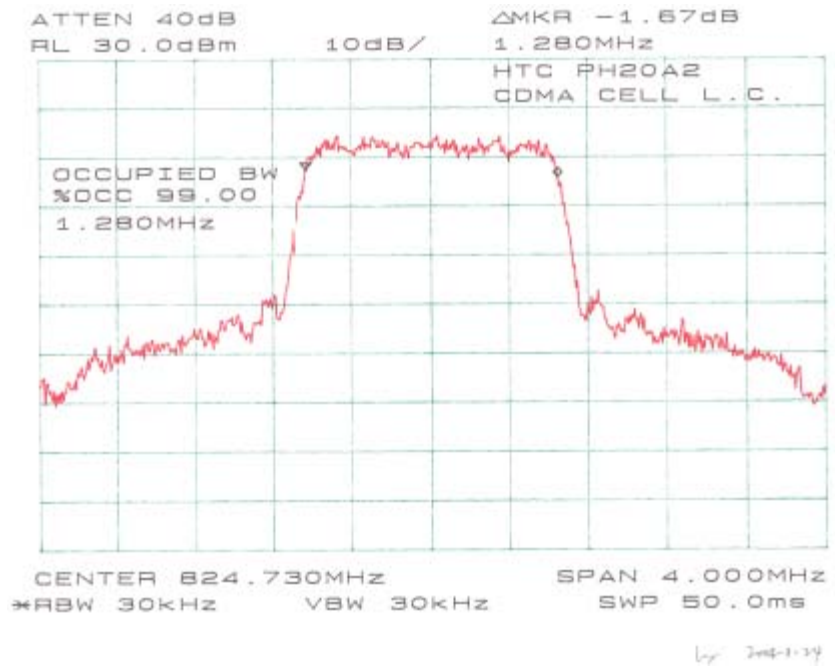
| | |
|--------------------|------------|
| Temperature: | 12° C |
| Relative Humidity: | 51% |
| ATM Pressure: | 1041 mbar |
| Test date: | 2004-01-20 |

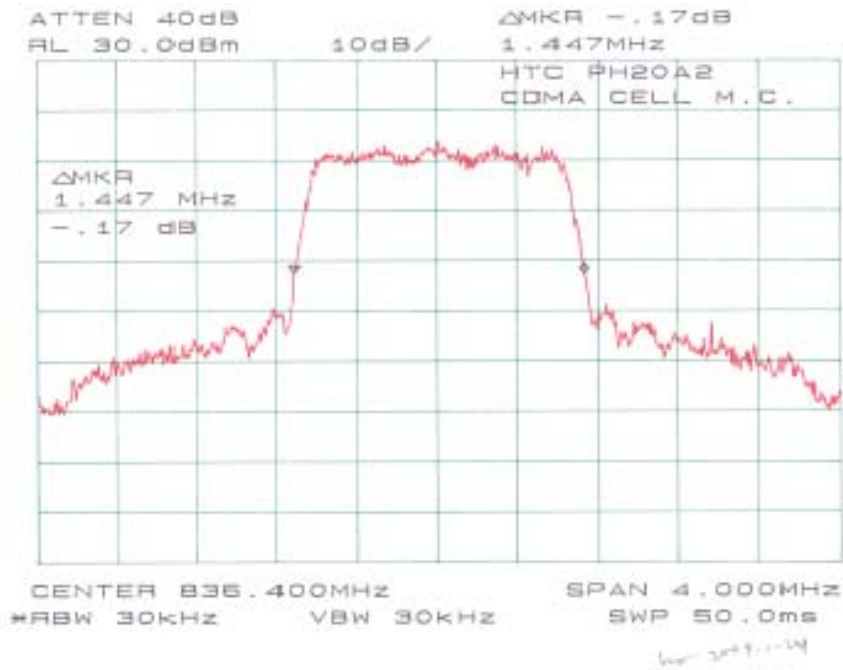
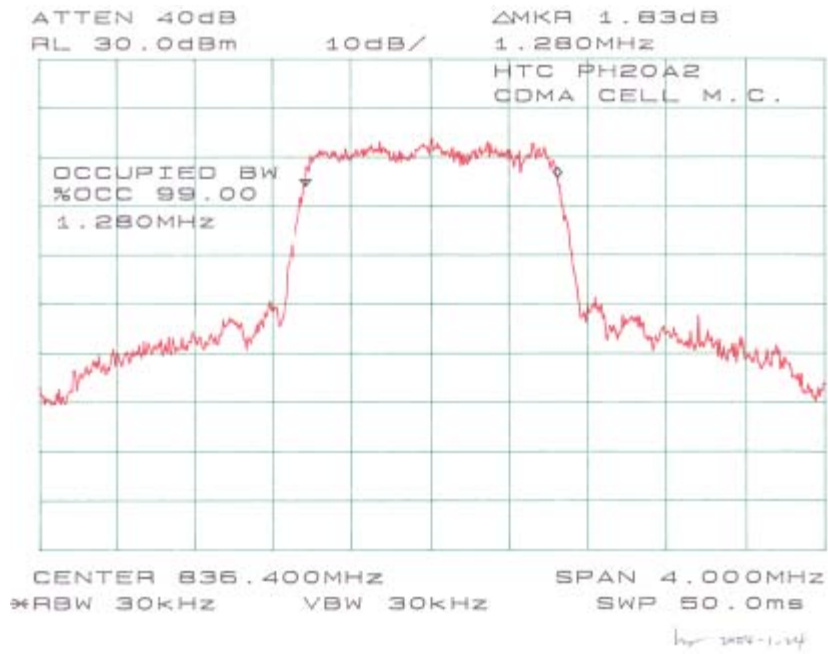
The testing was performed by Ling Zhang.

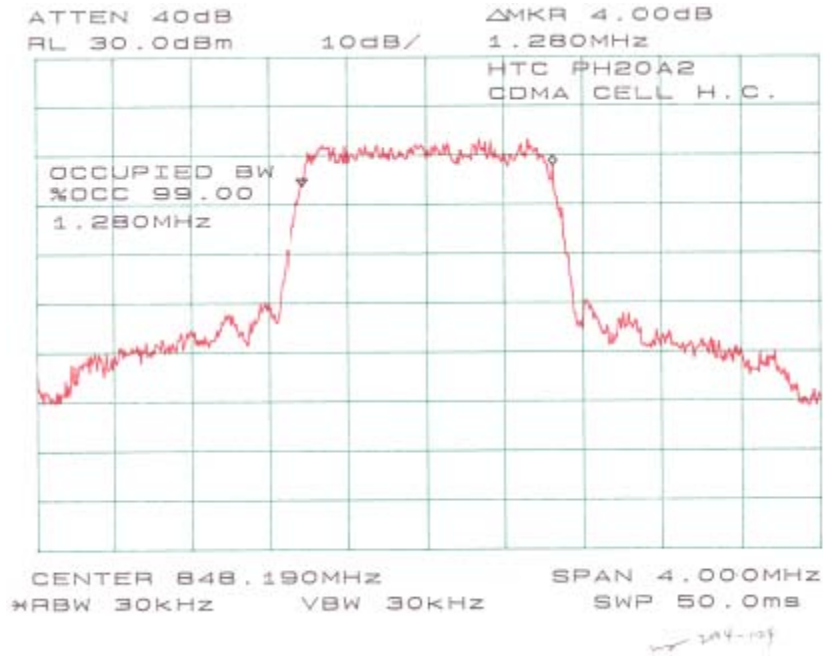
Test Results

Please refer to the following plots.

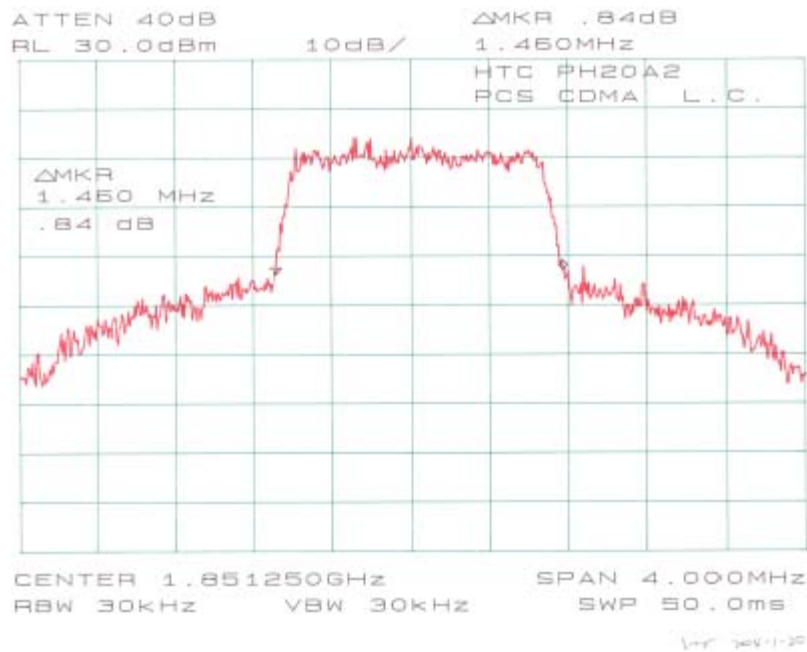
Plots of Occupied Bandwidth and 99% Bandwidth for CDMA800, Part22:

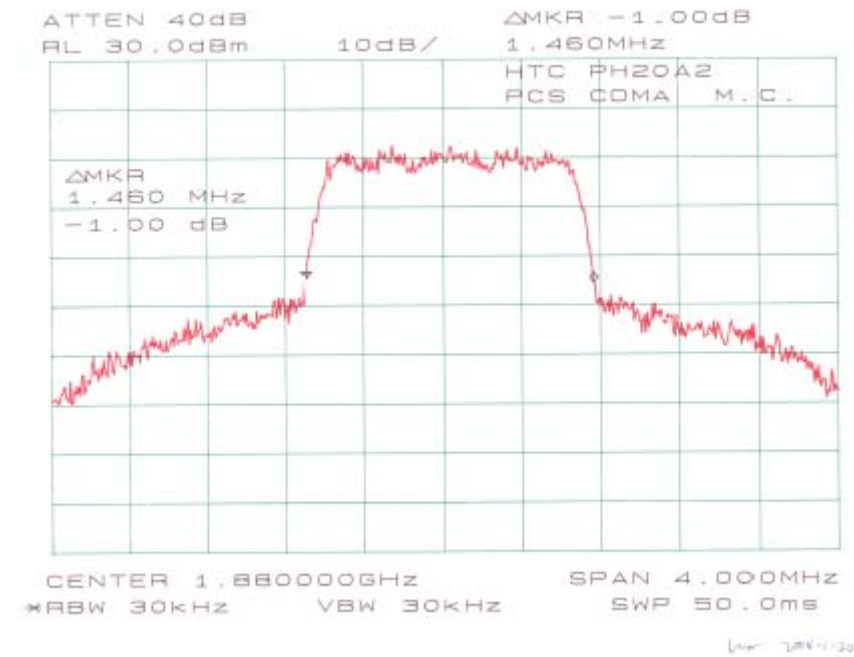
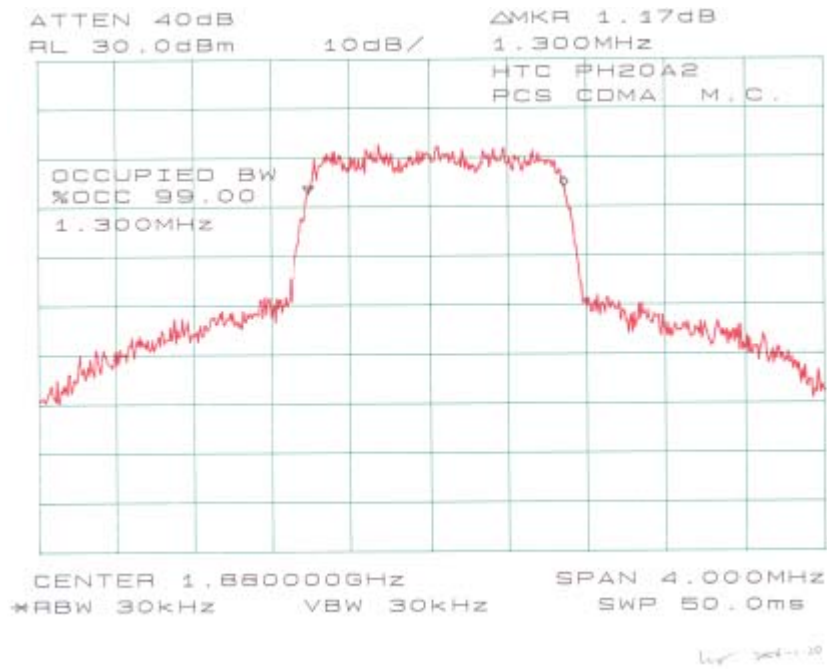


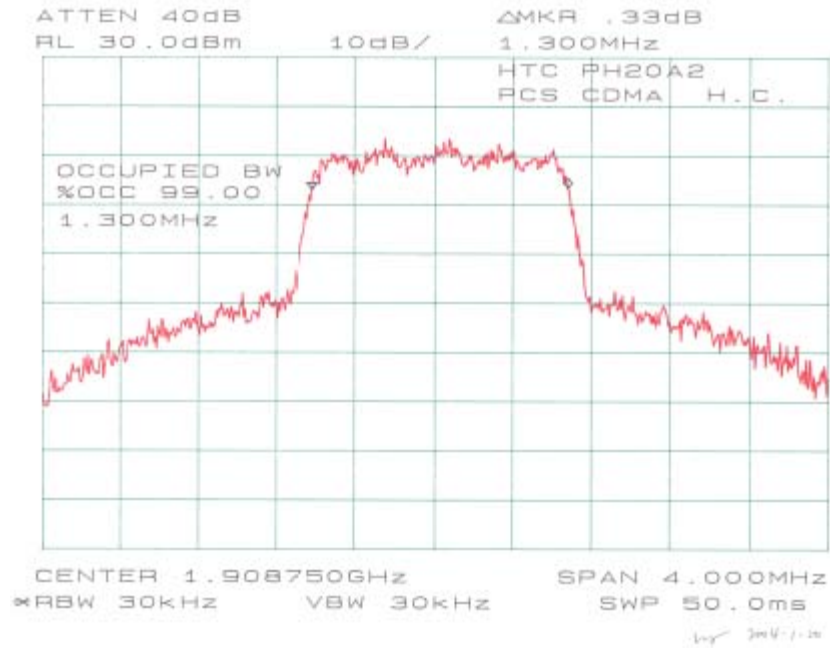




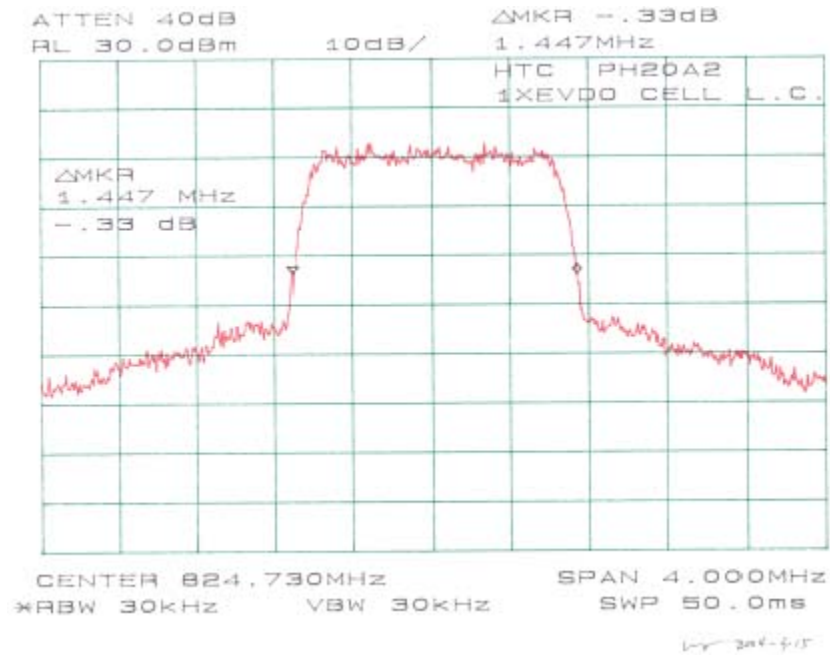
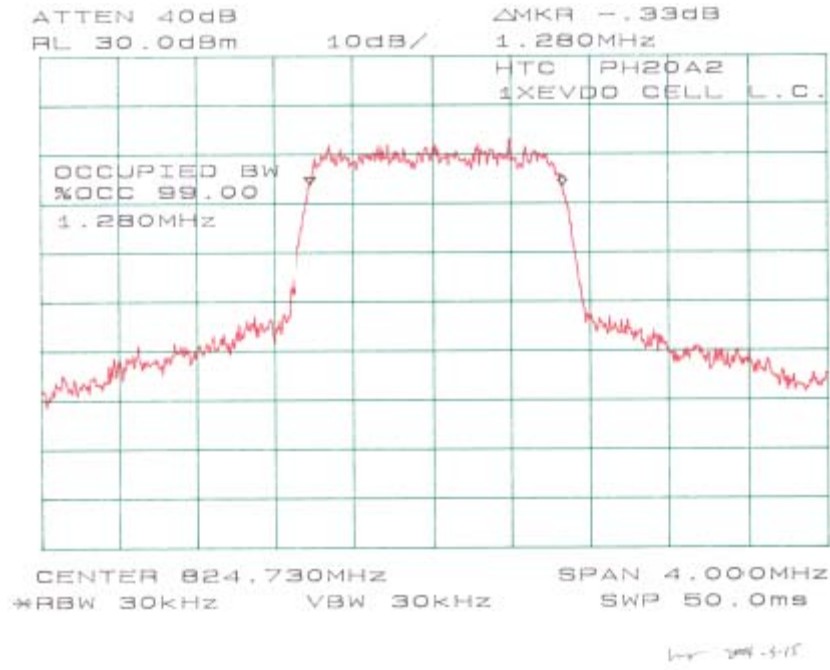
Plots of Occupied Bandwidth and 99% Bandwidth for CDMA1900, Part22

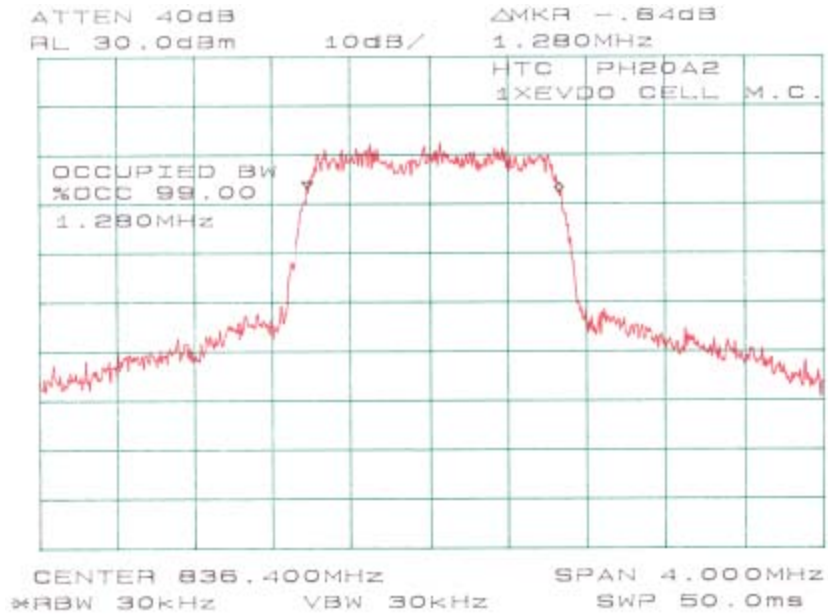






Plots of Occupied Bandwidth and 99% Bandwidth for CDMA2000 Cellular Band, Part22

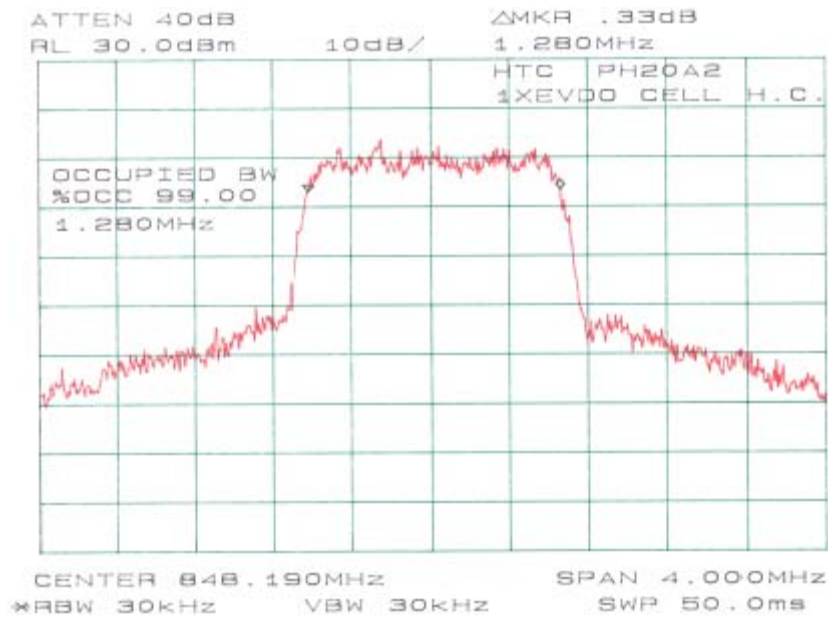




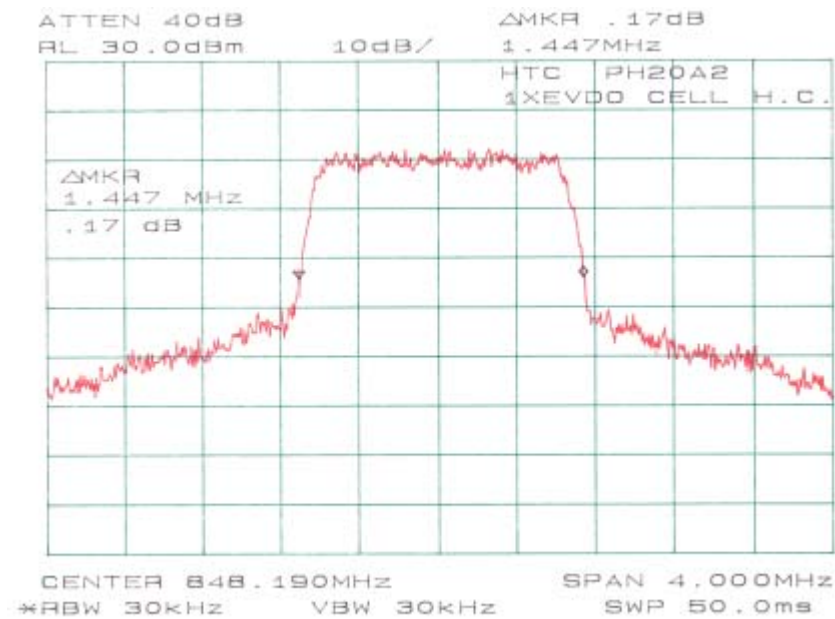
11-15-15



11-15-15

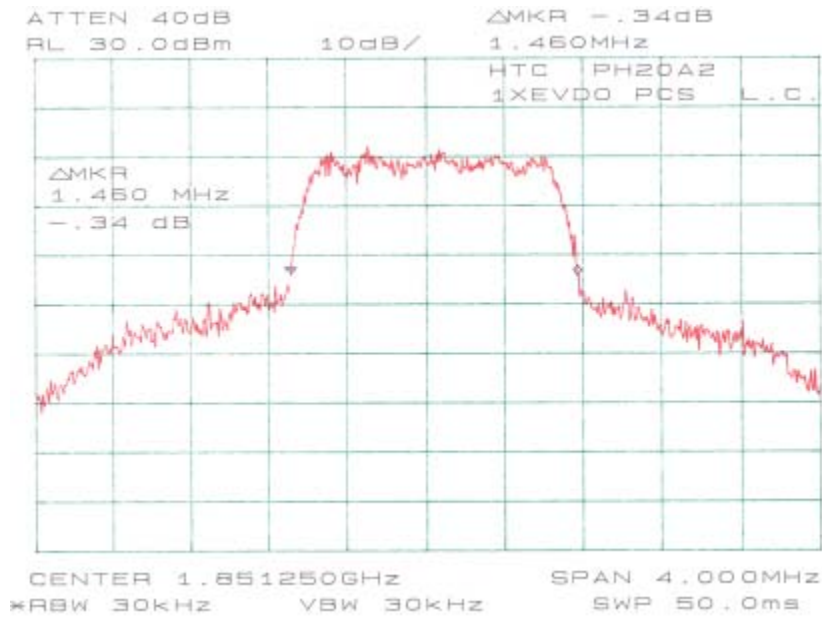
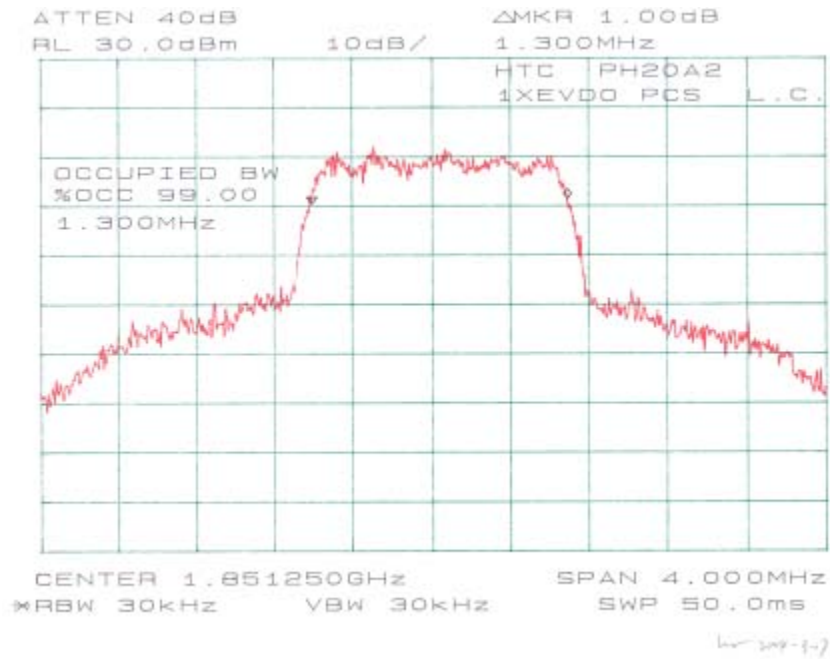


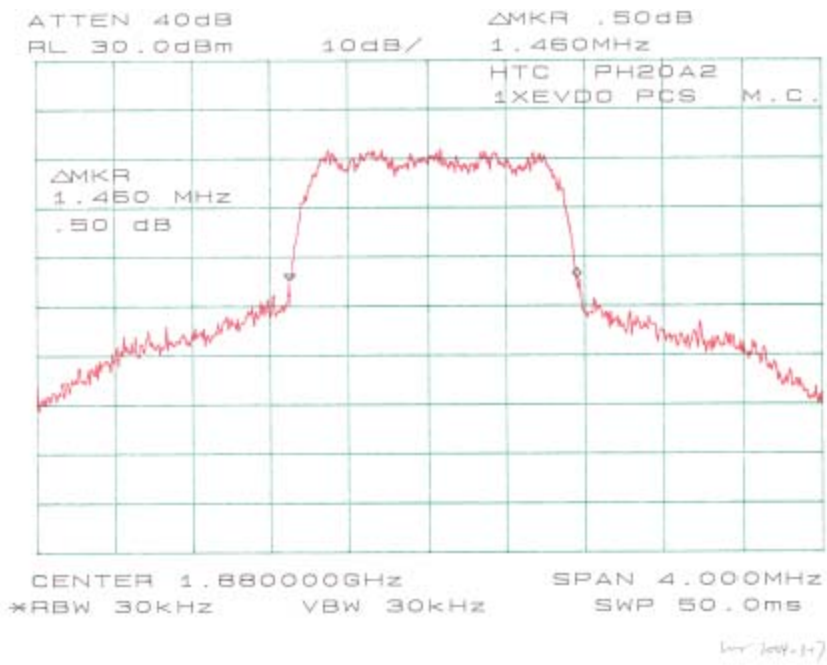
by 2013-15

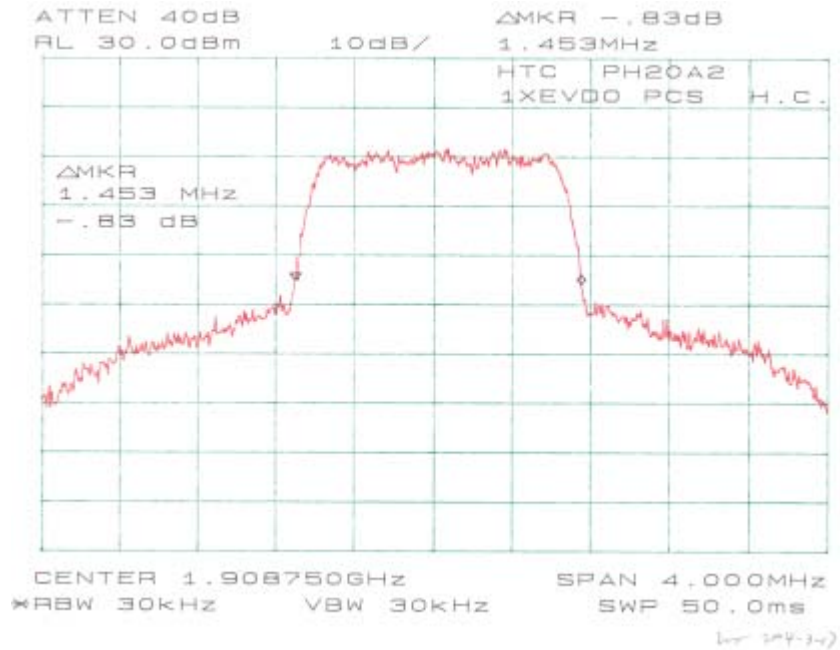
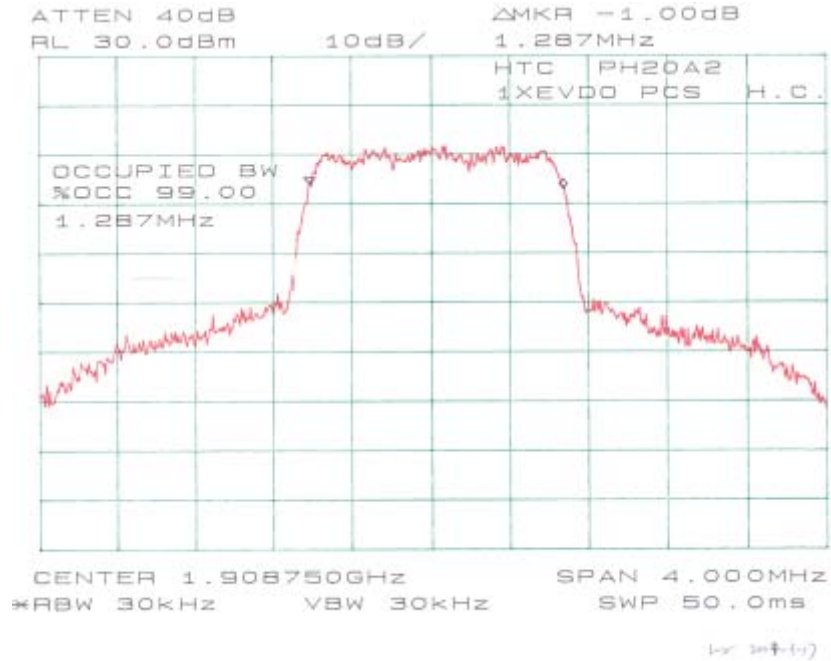


by 2013-15

Plots of Occupied Bandwidth and 99% Bandwidth for CDMA2000 PCS Band, Part24







§2.1051, §22.917, & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Requirements: CFR 47, § 2.1051, § 22.917 & §24.238(a).

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

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer 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.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|--------------|-------------------|---------|---------------|--------------|
| HP | Spectrum Analyzer | HP8564E | 3943A01781 | 2003-08-01 |
| HP | Plotter | HP7470A | 2541A49659 | Not Required |

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

Environmental Conditions

| | |
|--------------------|------------|
| Temperature: | 13° C |
| Relative Humidity: | 47% |
| ATM Pressure: | 1035 mbar |
| Test date: | 2004-01-24 |

| | |
|--------------------|------------|
| Temperature: | 12° C |
| Relative Humidity: | 51% |
| ATM Pressure: | 1041 mbar |
| Test date: | 2004-01-20 |

| | |
|--------------------|------------|
| Temperature: | 24° C |
| Relative Humidity: | 44% |
| ATM Pressure: | 1012 mbar |
| Test date: | 2004-03-15 |

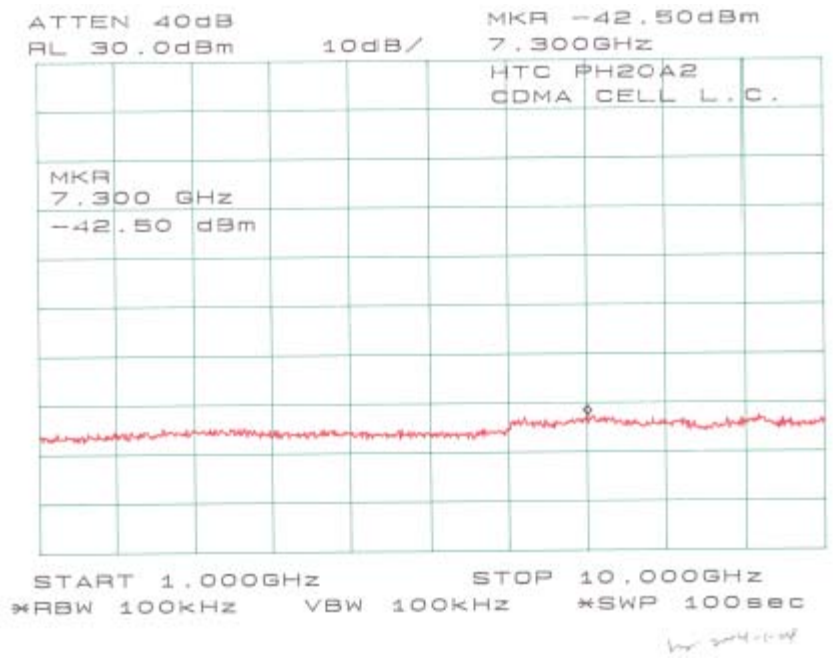
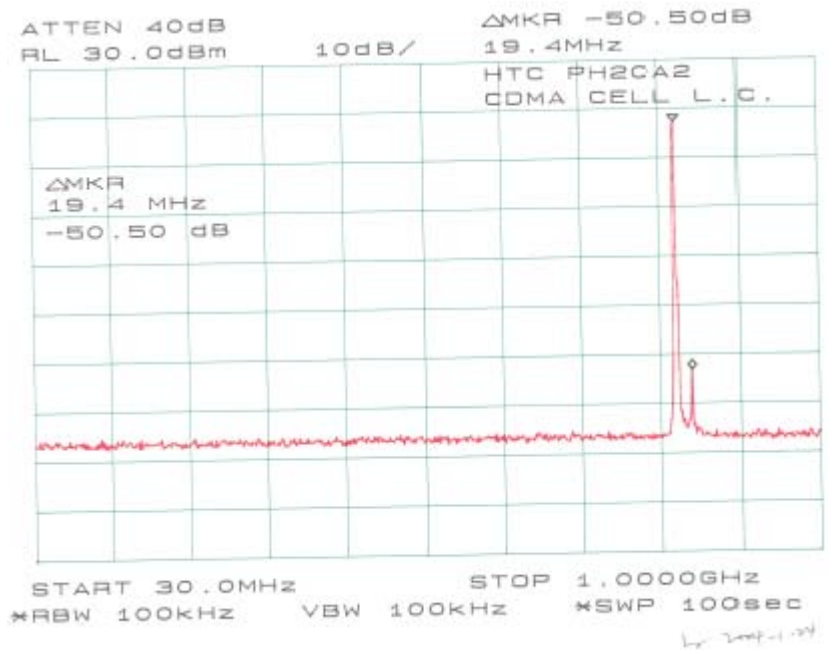
| | |
|--------------------|------------|
| Temperature: | 25° C |
| Relative Humidity: | 41% |
| ATM Pressure: | 1015 mbar |
| Test date: | 2004-03-17 |

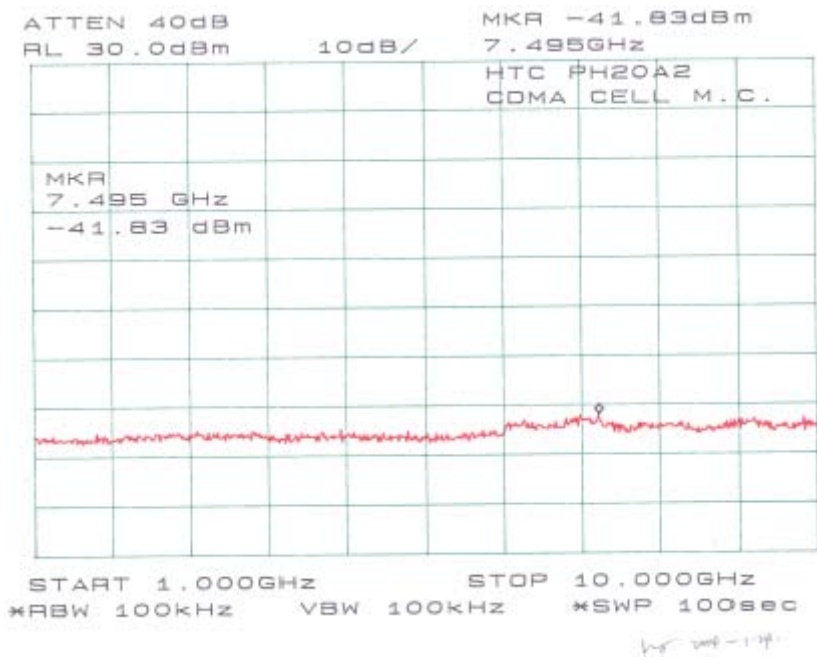
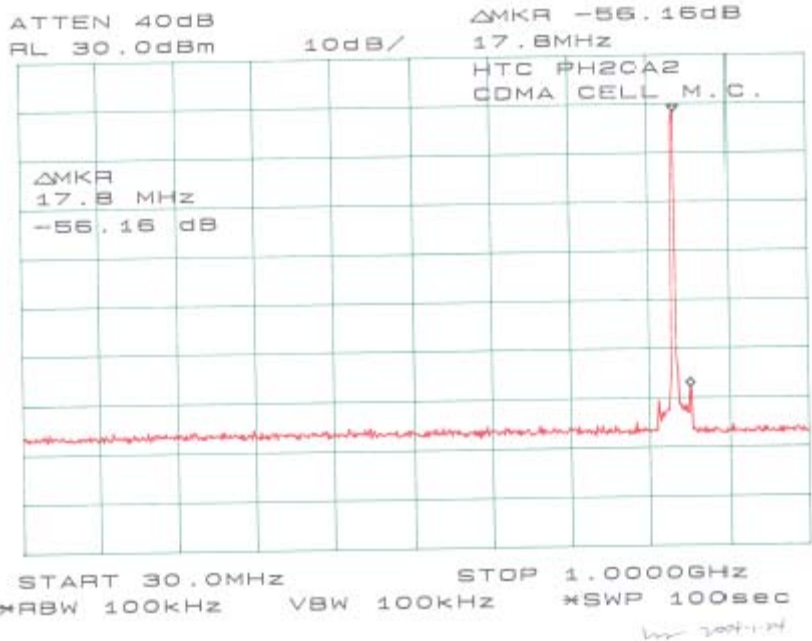
The testing was performed by Ling Zhang.

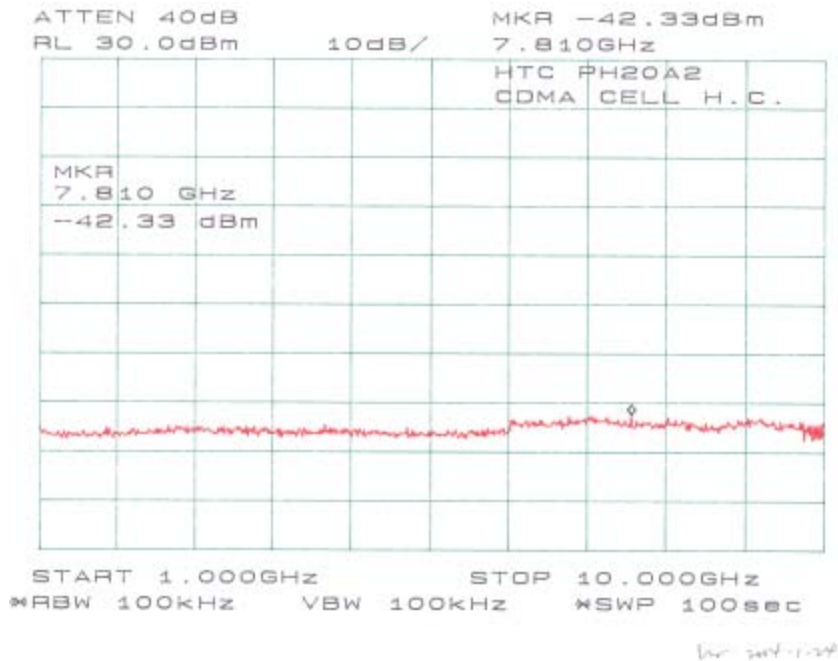
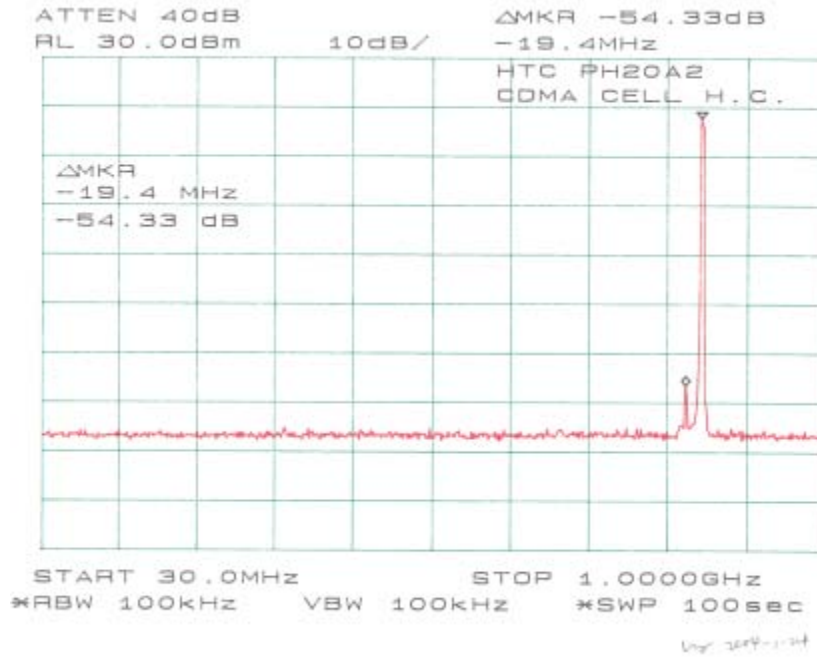
Test Results

Please refer to the hereinafter plots.

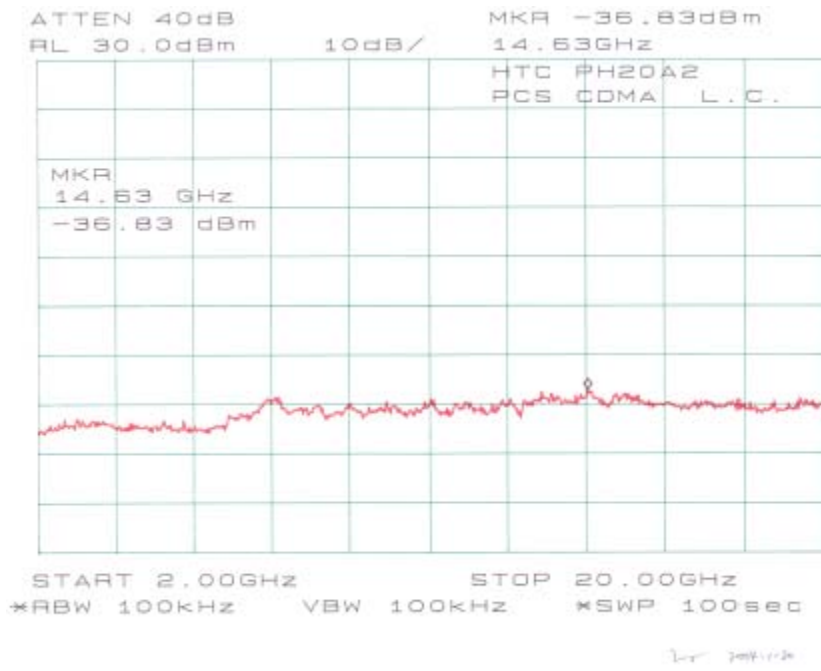
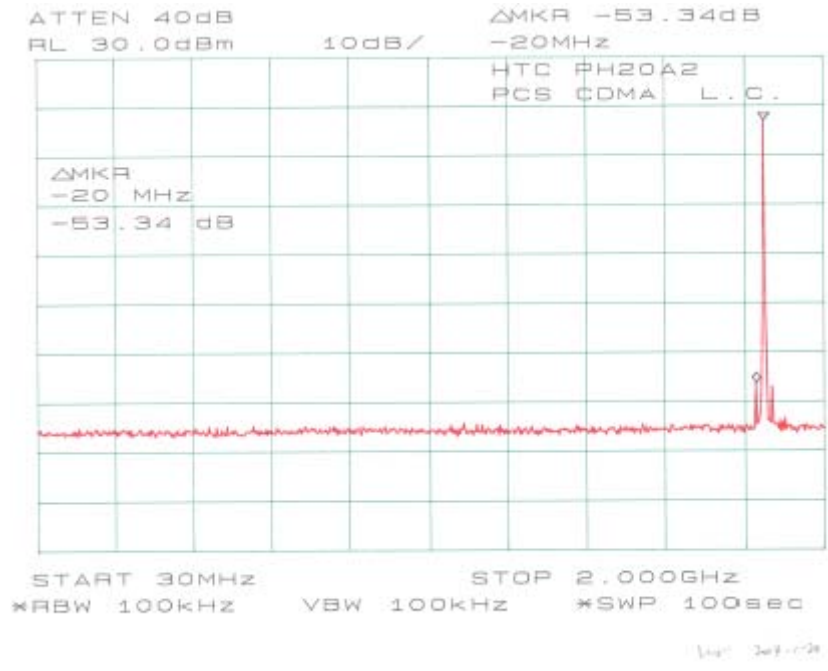
Plots of Spurious Emission for CDMA800, Part22

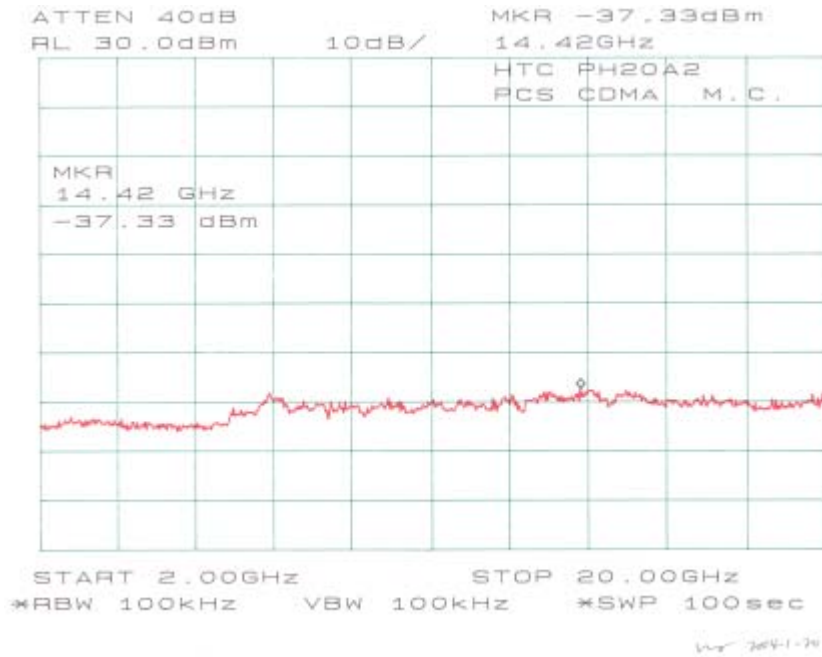
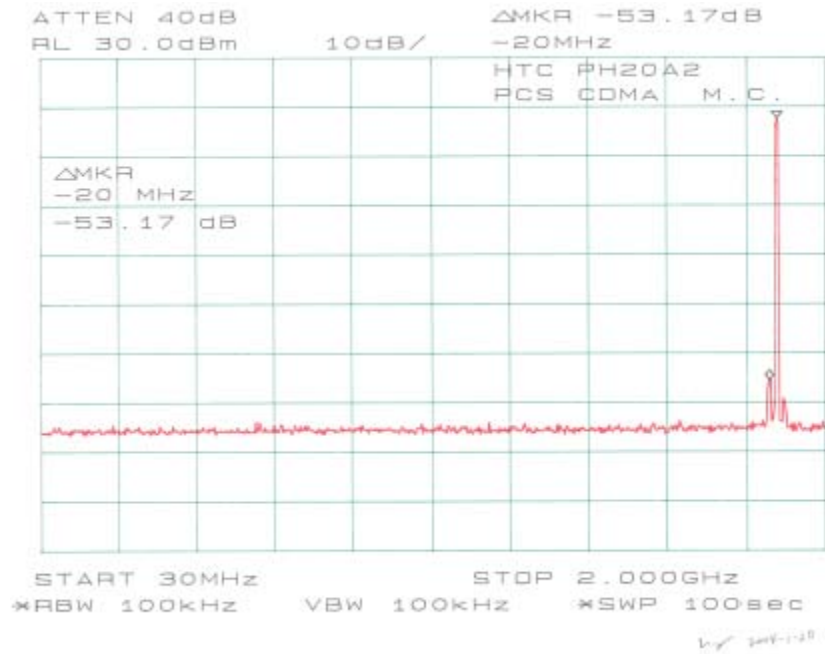


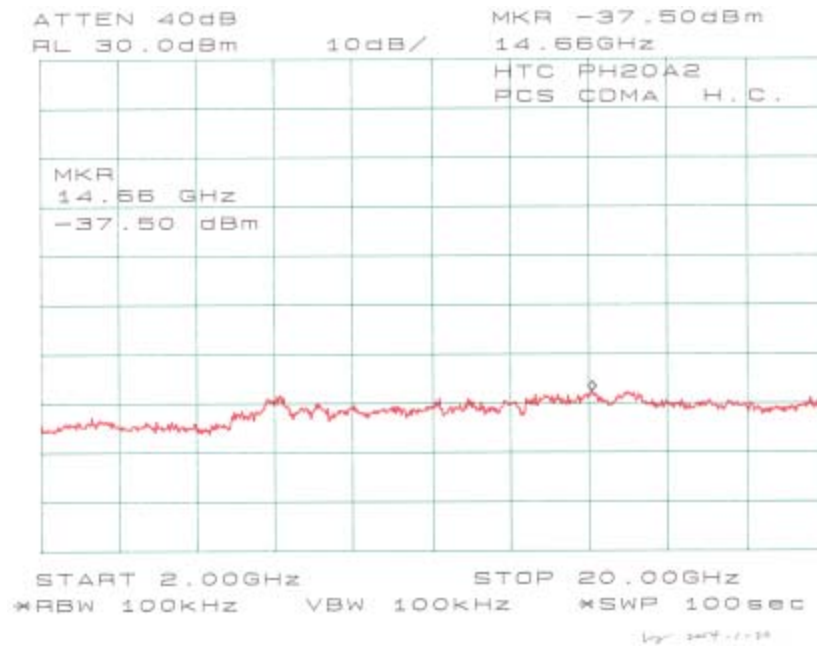
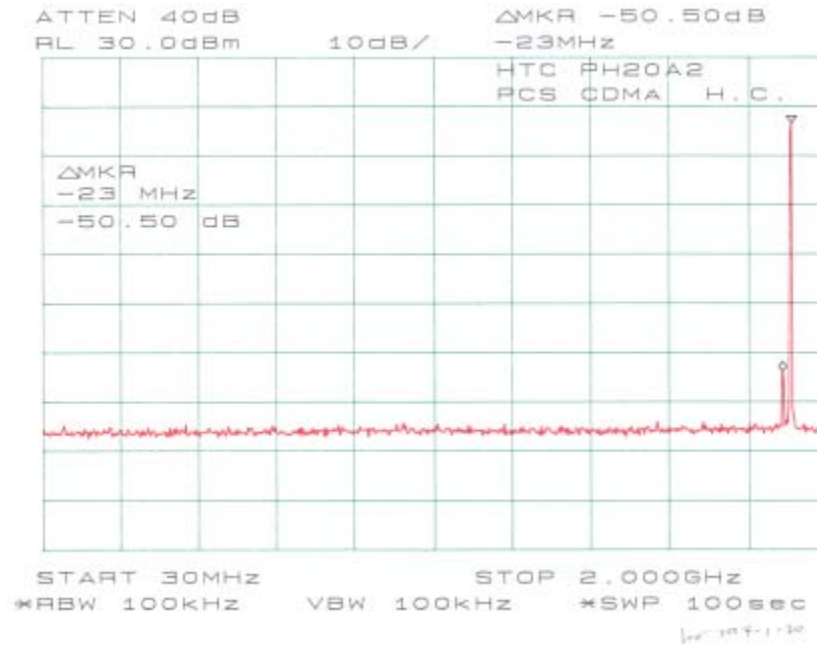




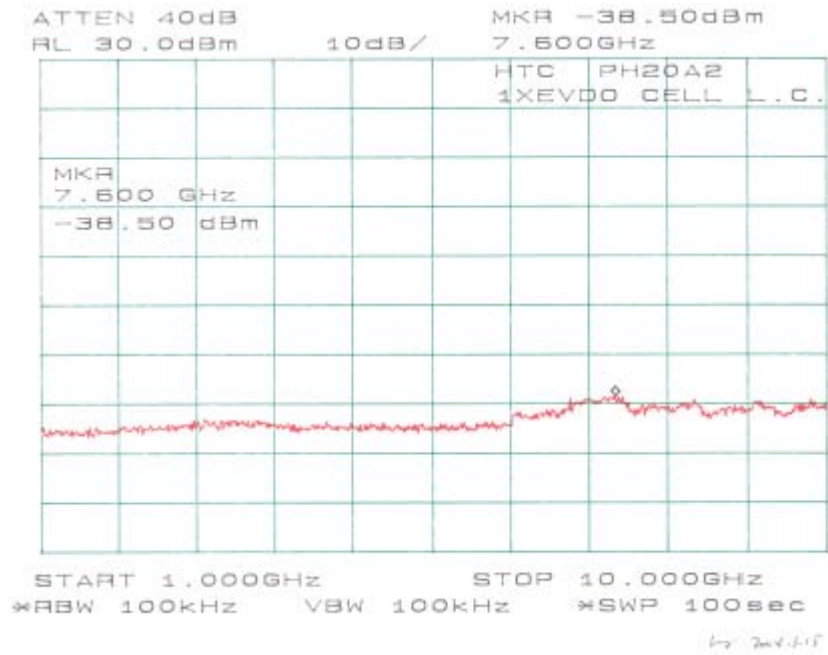
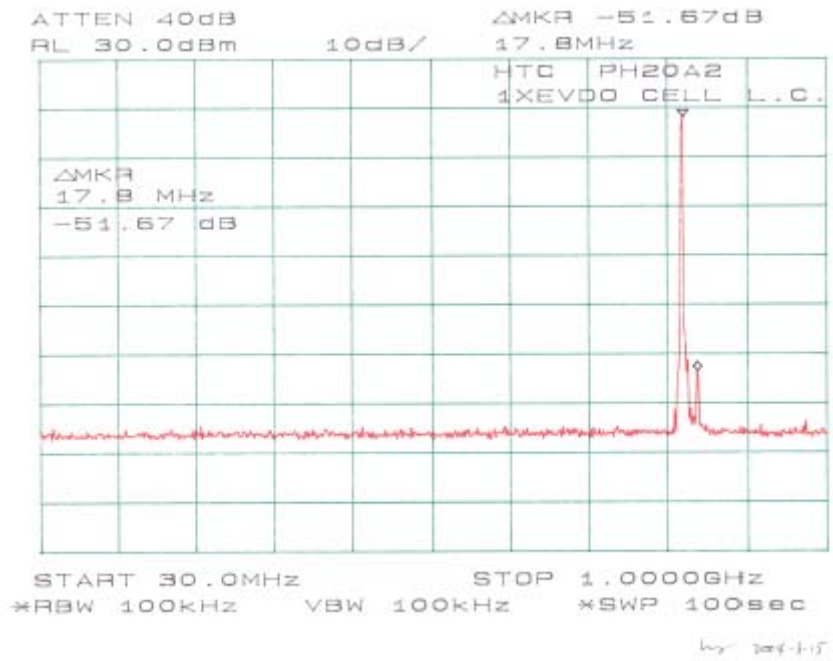
Plots of Spurious Emission for CDMA1900, Part22

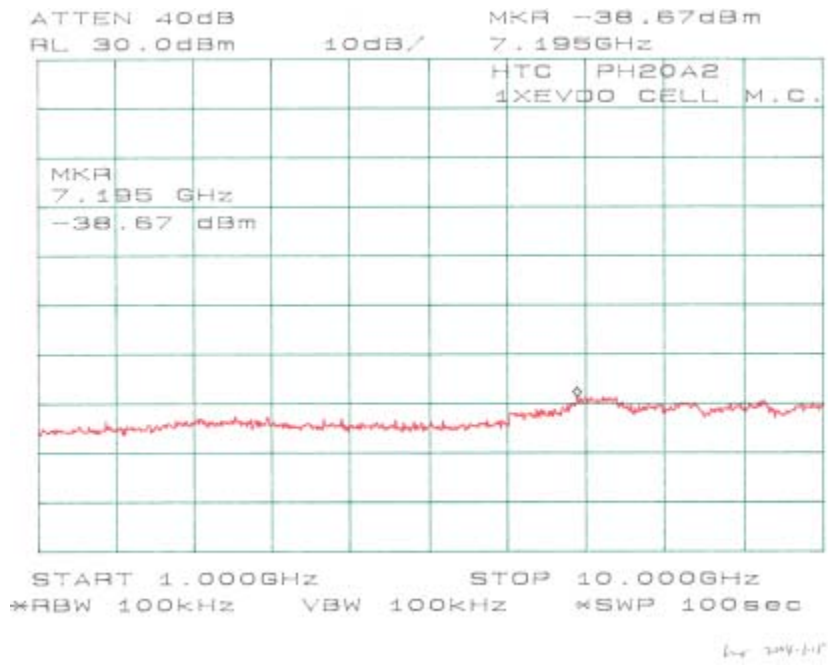
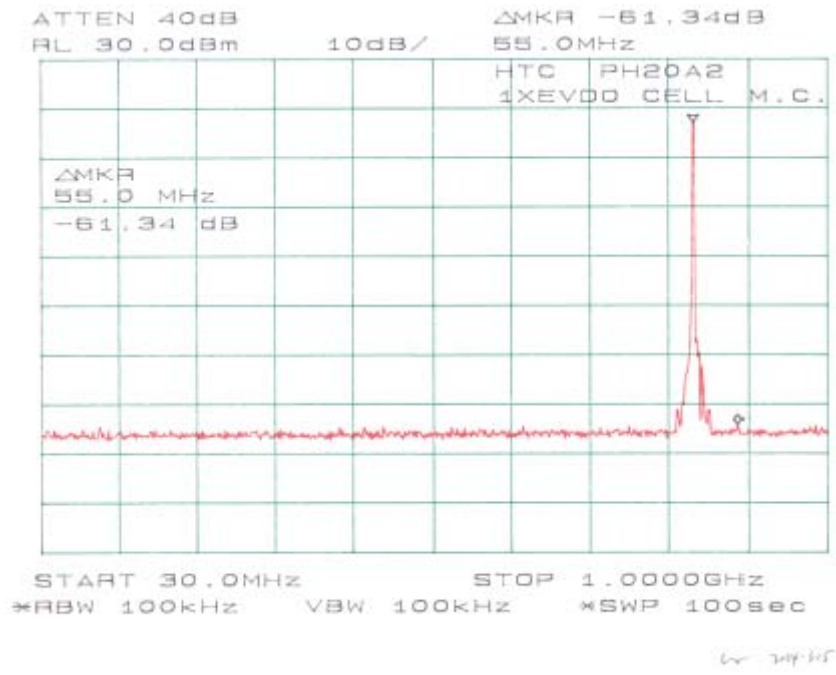


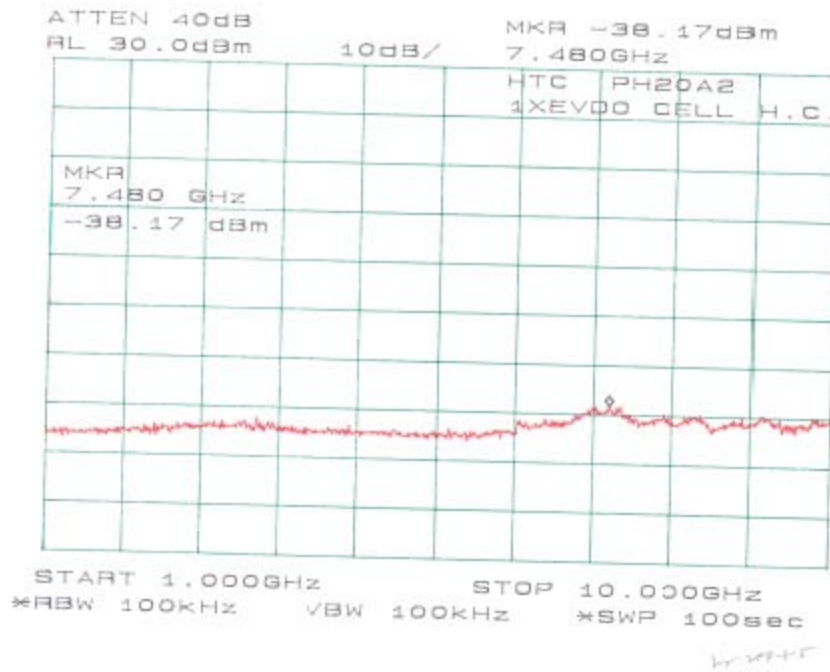
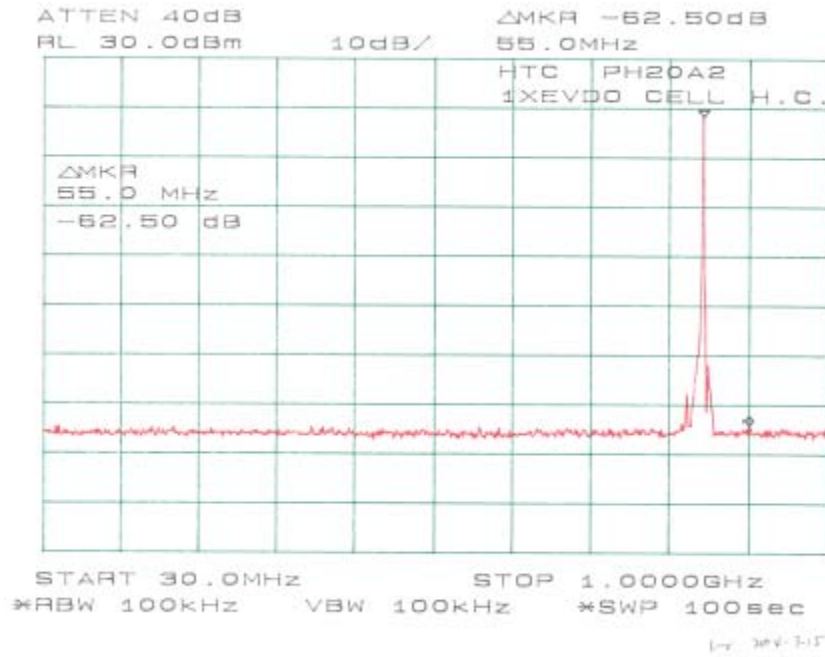




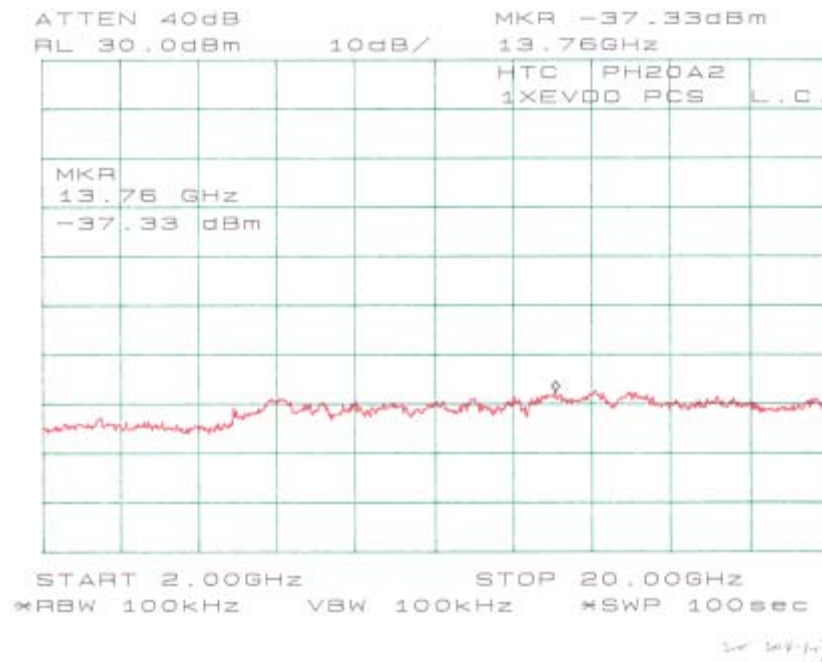
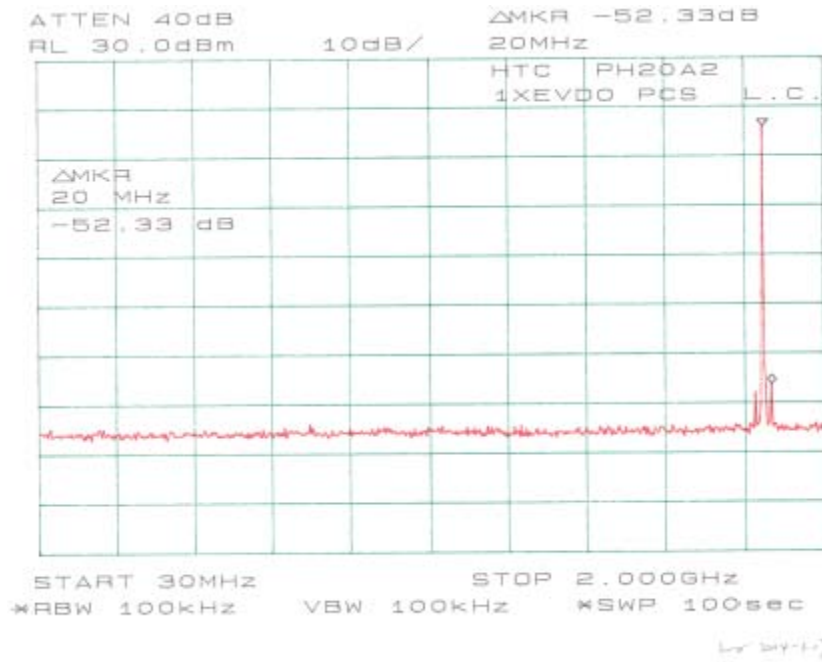
Plots of Spurious Emission for CDMA2000 Cellular Band, Part22

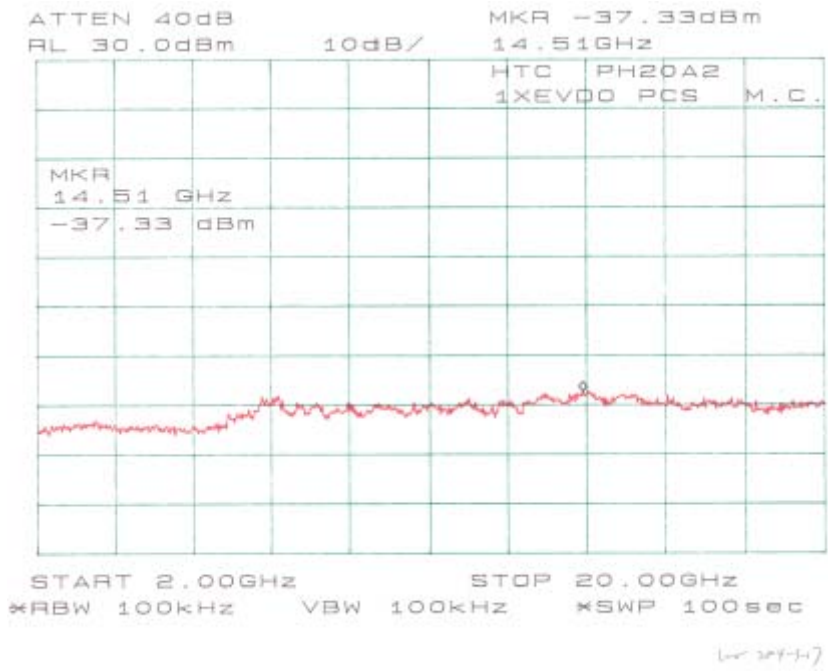
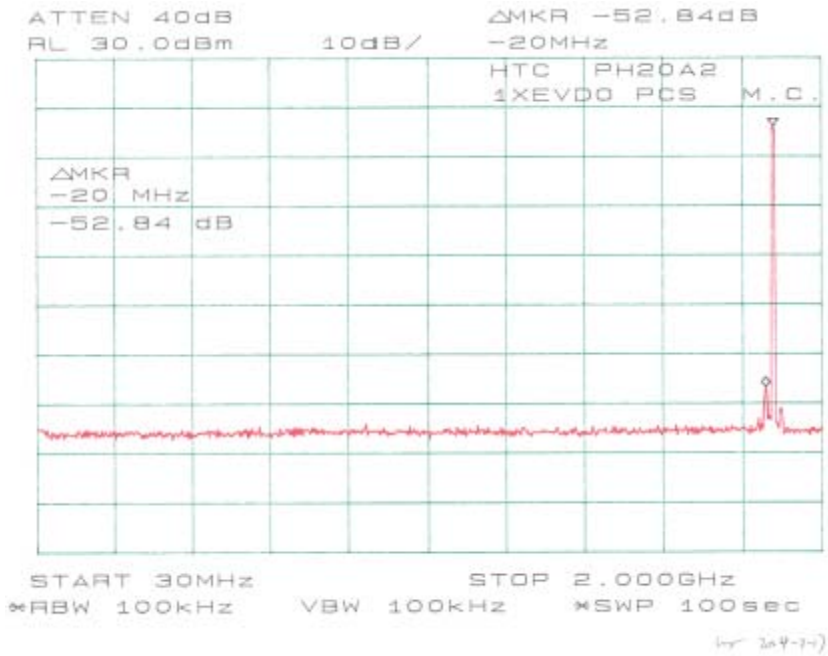


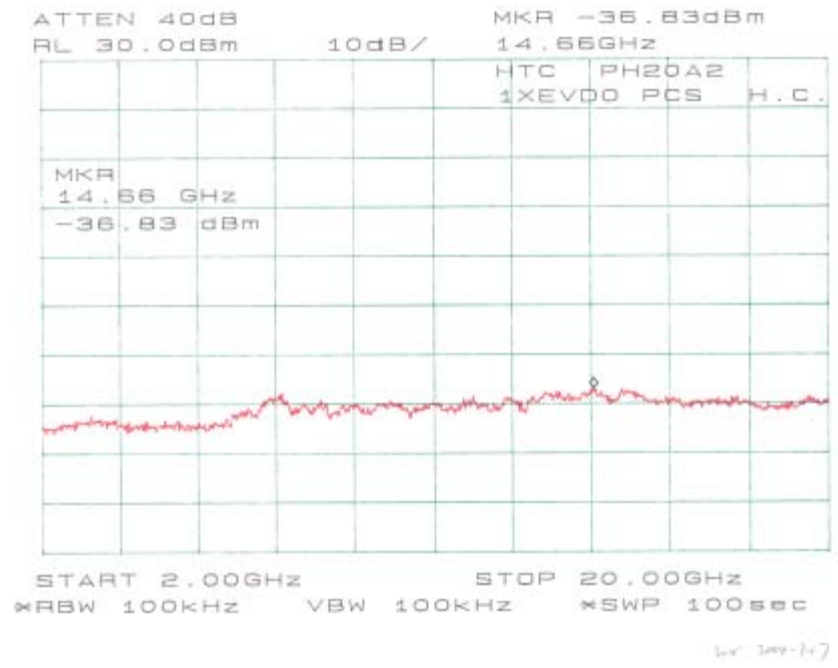
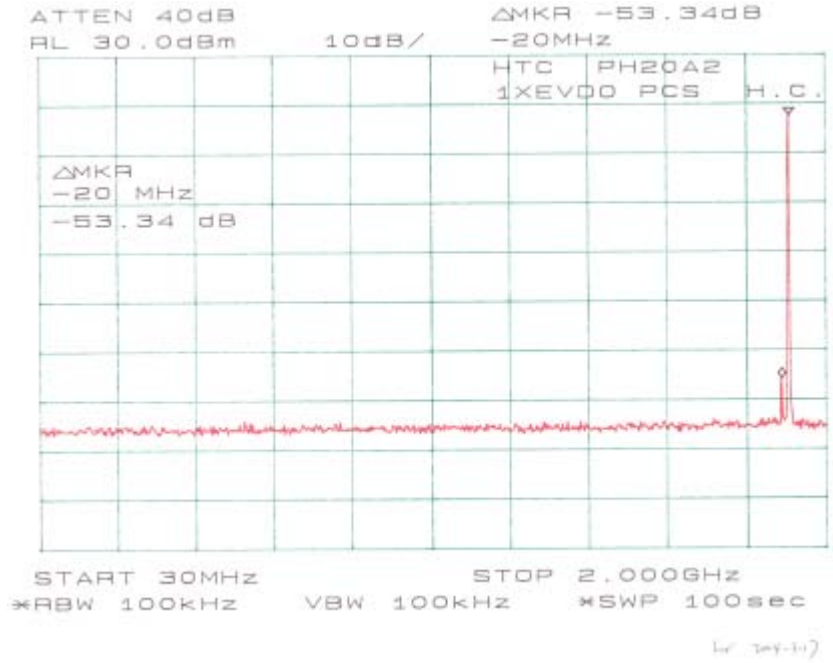




Plots of Spurious Emission for CDMA2000 PCS Band, Part24







§2.1055 (a), §2.1055 (d), §22.355, & §24.235 - FREQUENCY STABILITY

Applicable Standard

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

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

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

| Frequency range (MHz) | Mobile | | Mobile SU3 watts [le]3 watts |
|-----------------------|----------------------|--------------------|------------------------------------|
| | Base, fixed (ppm) | [SU][le]/ (ppm) | |
| 25 to 50..... | 20.0 | 20.0 | 50.0 |
| 50 to 450..... | 5.0 | 5.0 | 50.0 |
| 450 to 512..... | 2.5 | 5.0 | 5.0 |
| 821 to 896..... | 1.5 | 2.5 | 2.5 |
| 928 to 929..... | 5.0 | n/a | n/a |
| 929 to 960..... | 1.5 | n/a | n/a |
| 2110 to 2220..... | 10.0 | n/a | n/a |

According to §24.235, The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter 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 counter.

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.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Due Date |
|---------------------|--------------------|--------------|----------------------|----------------------|
| HP | Spectrum Analyzer | HP8564E | 3943A01781 | 2003-08-01 |
| HP | Plotter | HP7470A | 2541A49659 | Not Required |

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

Environmental Conditions

| | |
|--------------------|------------|
| Temperature: | 13° C |
| Relative Humidity: | 47% |
| ATM Pressure: | 1035 mbar |
| Test date: | 2004-01-24 |

| | |
|--------------------|------------|
| Temperature: | 12° C |
| Relative Humidity: | 51% |
| ATM Pressure: | 1041 mbar |
| Test date: | 2004-01-20 |

The testing was performed by Ling Zhang.

Test Results

Test Result for CDMA800

Frequency Stability Versus Temperature

| Reference Frequency: 836.4 MHz, Limit: 2.5ppm | | | |
|---|-------------------------|-------------------------------------|-----------|
| Environment Temperature (°C) | Power Supplied (Vdc) | Frequency Measure with Time Elapsed | |
| | | MHz | PPM Error |
| 50 | 4 | 836.39985 | -0.18 |
| 40 | 4 | 836.39991 | -0.11 |
| 30 | 4 | 836.39995 | -0.06 |
| 20 | 4 | 836.40002 | 0.02 |
| 10 | 4 | 836.40001 | 0.01 |
| 0 | 4 | 836.40008 | 0.10 |
| -10 | 4 | 836.40011 | 0.13 |
| -20 | 4 | 836.40015 | 0.18 |
| -30 | 4 | 836.40022 | 0.26 |

Frequency Stability Versus Battery Voltage

| Reference Frequency: 836.4MHz, Limit: 2.5ppm | | | |
|--|---------------------------------|-----------|------|
| Power Supplied (Vdc) | Environment Temperature (°C) | MHz | ppm |
| 3.42 | 20 | 836.40010 | 0.12 |

Note: Battery normal operating voltage: 4 Vdc
 Battery end point: 3.42 Vdc.

Test Result for CDMA1900

Frequency Stability Versus Temperature

| Reference Frequency: 1880 MHz, Limit: 2.5ppm | | | |
|--|-------------------------|-------------------------------------|-----------|
| Environment Temperature (°C) | Power Supplied (Vdc) | Frequency Measure with Time Elapsed | |
| | | MHz | PPM Error |
| 50 | 4 | 1879.99988 | -0.06 |
| 40 | 4 | 1879.99992 | -0.04 |
| 30 | 4 | 1879.99995 | -0.03 |
| 20 | 4 | 1879.99996 | -0.02 |
| 10 | 4 | 1880.00005 | 0.03 |
| 0 | 4 | 1880.00008 | 0.04 |
| -10 | 4 | 1880.00015 | 0.08 |
| -20 | 4 | 1880.00023 | 0.12 |
| -30 | 4 | 1880.00030 | 0.16 |

Frequency Stability Versus Battery Voltage

| Reference Frequency: 1880MHz, Limit: 2.5ppm | | | |
|---|---------------------------------|------------|------|
| Power Supplied (Vdc) | Environment Temperature (°C) | MHz | ppm |
| 3.42 | 20 | 1880.00031 | 0.16 |

Note: Battery normal operating voltage: 4 Vdc
 Battery end point: 3.42 Vdc.

Test Result for CDMA2000 1XEVD0, Cellular band

Frequency Stability Versus Temperature

| Reference Frequency: 836.4 MHz, Limit: 2.5ppm | | | |
|---|-------------------------|-------------------------------------|-----------|
| Environment Temperature (°C) | Power Supplied (Vdc) | Frequency Measure with Time Elapsed | |
| | | MHz | PPM Error |
| 50 | 4 | 836.39981 | -0.23 |
| 40 | 4 | 836.39989 | -0.13 |
| 30 | 4 | 836.39993 | -0.08 |
| 20 | 4 | 836.39998 | -0.02 |
| 10 | 4 | 836.40003 | 0.04 |
| 0 | 4 | 836.40010 | 0.12 |
| -10 | 4 | 836.40015 | 0.18 |
| -20 | 4 | 836.40018 | 0.22 |
| -30 | 4 | 836.40025 | 0.30 |

Frequency Stability Versus Battery Voltage

| Reference Frequency: 836.4MHz, Limit: 2.5ppm | | | |
|--|---------------------------------|------|-----|
| Power Supplied (Vdc) | Environment Temperature (°C) | MHz | ppm |
| | | 3.42 | 20 |

Battery End Point: 3.42V

Test Result for CDMA2000 1XEVD0, PCS band

Frequency Stability Versus Temperature

| Reference Frequency: 1880 MHz, Limit: 2.5ppm | | | |
|--|-------------------------|-------------------------------------|-----------|
| Environment Temperature (°C) | Power Supplied (Vdc) | Frequency Measure with Time Elapsed | |
| | | MHz | PPM Error |
| 50 | 4 | 1880.00078 | 0.41 |
| 40 | 4 | 1880.00062 | 0.33 |
| 30 | 4 | 1880.00025 | 0.13 |
| 20 | 4 | 1879.99997 | -0.02 |
| 10 | 4 | 1879.99995 | -0.03 |
| 0 | 4 | 1879.99991 | -0.05 |
| -10 | 4 | 1879.99983 | -0.09 |
| -20 | 4 | 1879.99959 | -0.22 |
| -30 | 4 | 1879.99948 | -0.28 |

Frequency Stability Versus Battery Voltage

| Reference Frequency: 1880MHz, Limit: 2.5ppm | | | |
|---|---------------------------------|------------|-------|
| Power Supplied (Vdc) | Environment Temperature (°C) | MHz | ppm |
| 3.42 | 20 | 1879.99970 | -0.16 |

Battery End Point: 3.42V

§22.917 & §24.238 – BAND EDGE

Applicable Standard

According to § 22.917, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Procedure

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

The center of the spectrum analyzer was set to block edge frequency, RBW set to 30KHz.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|--------------|-------------------|---------|---------------|--------------|
| HP | Spectrum Analyzer | HP8564E | 3943A01781 | 2003-08-01 |
| HP | Plotter | HP7470A | 2541A49659 | Not Required |

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

Environmental Conditions

| | |
|--------------------|------------|
| Temperature: | 13° C |
| Relative Humidity: | 47% |
| ATM Pressure: | 1035 mbar |
| Test date: | 2004-01-24 |

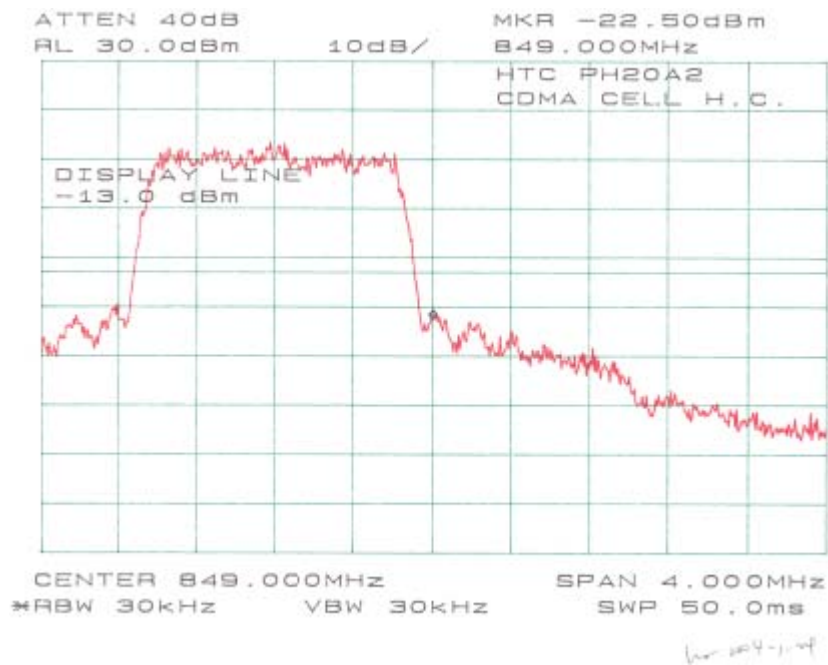
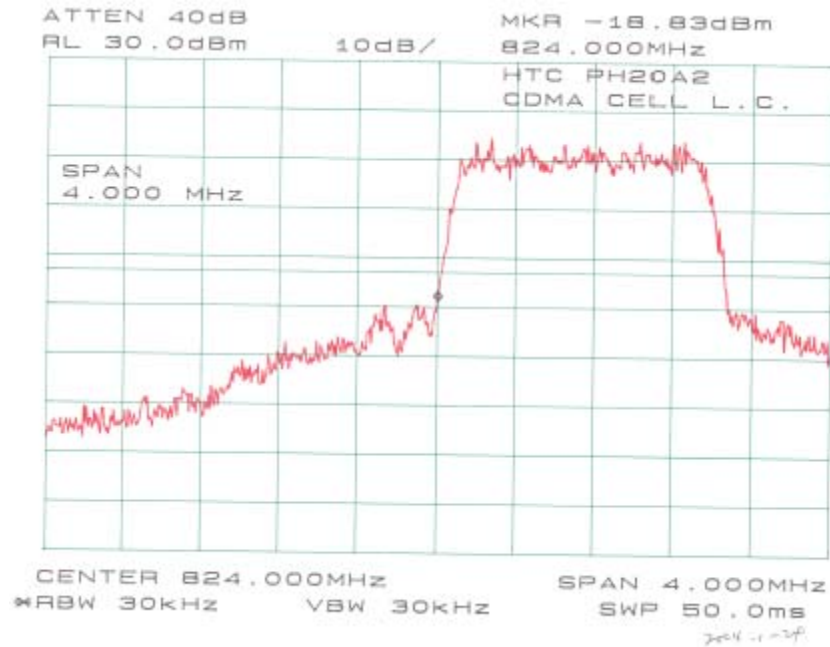
| | |
|--------------------|------------|
| Temperature: | 12° C |
| Relative Humidity: | 51% |
| ATM Pressure: | 1041 mbar |
| Test date: | 2004-01-20 |

The testing was performed by Ling Zhang.

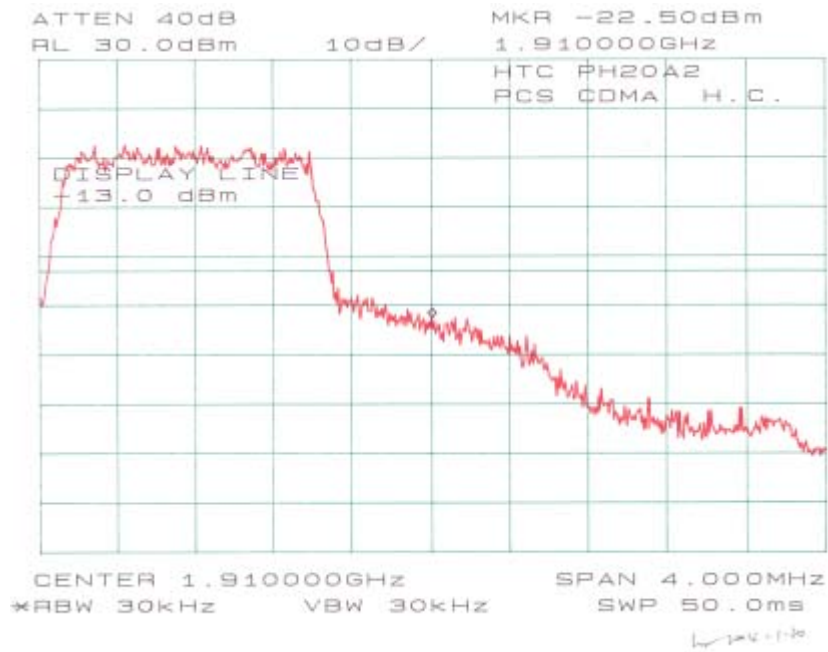
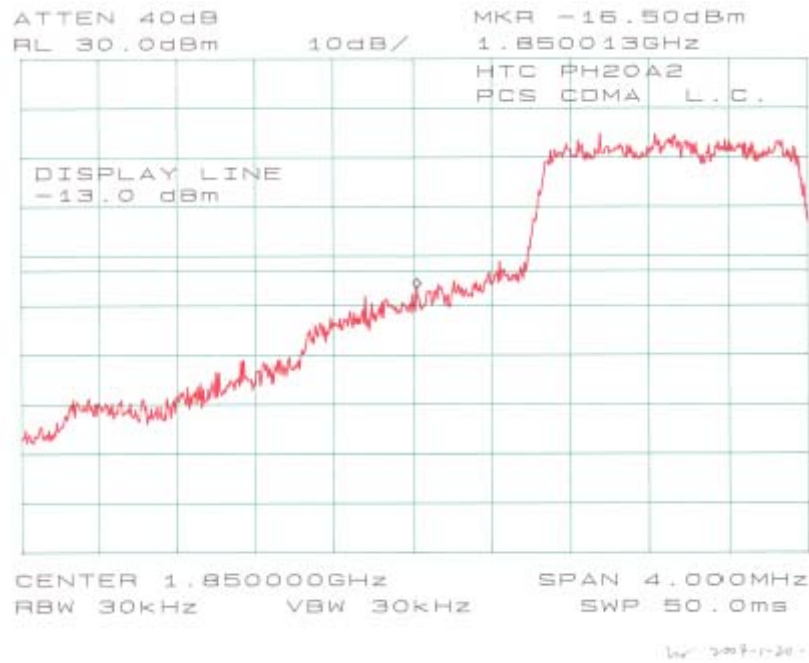
Test Results

Please refer to the following plots.

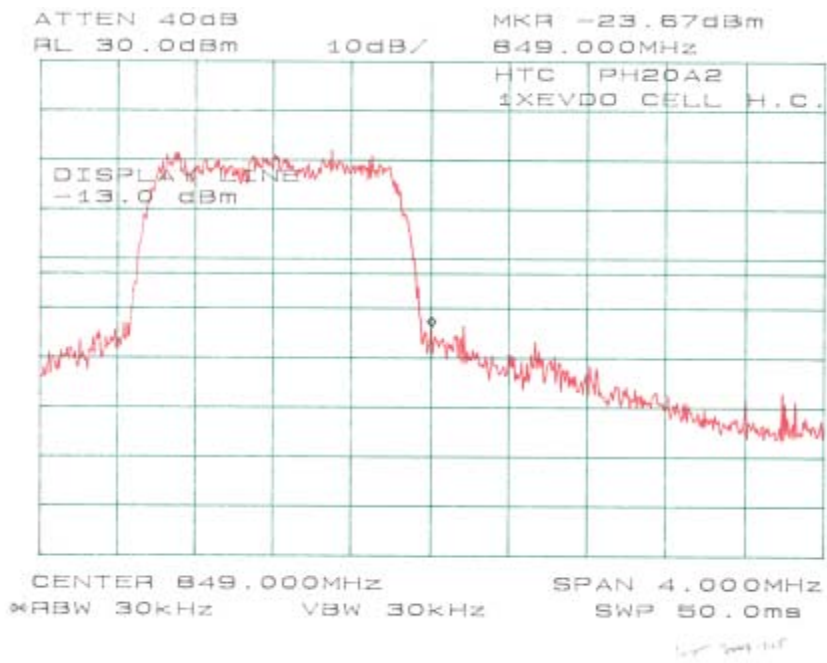
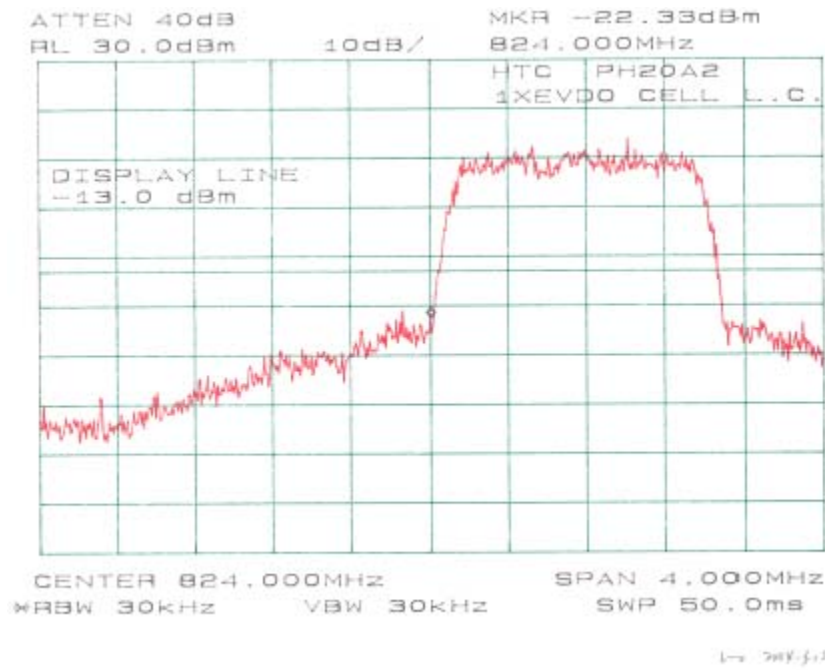
Plots of Band Edge for CDMA800, Part 22



Plots of Band Edge for CDMA1900, Part 24



Plots of Band Edge for CDMA2000, Cellular Band, Part 22



Plots of Band Edge for CDMA2000, PCS Band, Part 24

