



NVLAP LAB CODE 200707-0



FCC PART 22H, 24E

MEASUREMENT AND TEST REPORT

For

Shenzhen Concox Information Technology Co., Ltd.

Floor 4th, Building B, Gaoxinqi Industrial Park, Liuxian 1st Road,
District 67, Bao'an, Shenzhen, Guangdong

FCC ID: X7ICTG115

| | |
|--|------------------------------------|
| Report Type: Original Report | Product Type: GSM Module |
| Test Engineer: <u>Vicent Kang</u> | <i>Vicent Kang</i> |
| Report Number: <u>RSZ10021004</u> | |
| Report Date: <u>2010-04-02</u> | |
| Reviewed By: <u>Merry Zhao</u> | <i>Merry Zhao</i> |
| Prepared By: <u>EMC Engineer</u> | |
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.
* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" (Rev.2)

TABLE OF CONTENTS

| | |
|---|-----------|
| GENERAL INFORMATION..... | 4 |
| PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) | 4 |
| EUT PHOTO | 4 |
| OBJECTIVE | 4 |
| RELATED SUBMITTAL(S)/GRANT(S)..... | 5 |
| TEST METHODOLOGY | 5 |
| TEST FACILITY | 5 |
| SYSTEM TEST CONFIGURATION..... | 6 |
| JUSTIFICATION | 6 |
| EQUIPMENT MODIFICATIONS | 6 |
| CONFIGURATION OF TEST SETUP | 6 |
| BLOCK DIAGRAM OF TEST SETUP | 6 |
| SUMMARY OF TEST RESULTS | 7 |
| FCC §1.1307 & §2.1091 - RF EXPOSURE..... | 8 |
| APPLICABLE STANDARD | 8 |
| TEST DATA | 8 |
| FCC §2.1047 - MODULATION CHARACTERISTIC | 9 |
| FCC § 2.1046, § 22.913 (A) & § 24.232 (C) - RF OUTPUT POWER..... | 10 |
| APPLICABLE STANDARD | 10 |
| TEST PROCEDURE | 10 |
| TEST EQUIPMENT LIST AND DETAILS..... | 10 |
| TEST DATA | 11 |
| FCC §2.1049, §22.917, §22.905 & §24.238 - OCCUPIED BANDWIDTH | 15 |
| APPLICABLE STANDARDS..... | 15 |
| TEST PROCEDURE | 15 |
| TEST EQUIPMENT LIST AND DETAILS..... | 15 |
| TEST DATA | 15 |
| FCC §2.1051, §22.917(A) & §24.238(A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS | 19 |
| APPLICABLE STANDARDS..... | 19 |
| TEST PROCEDURE | 19 |
| TEST EQUIPMENT LIST AND DETAILS..... | 19 |
| TEST DATA | 19 |
| FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS | 23 |
| APPLICABLE STANDARDS..... | 23 |
| TEST PROCEDURE | 23 |
| TEST EQUIPMENT LIST AND DETAILS..... | 23 |
| TEST DATA | 24 |
| FCC §22.917(A) & §24.238(A) - BAND EDGES..... | 26 |
| APPLICABLE STANDARDS..... | 26 |
| TEST PROCEDURE | 26 |
| TEST EQUIPMENT LIST AND DETAILS..... | 26 |
| TEST DATA | 26 |

| | |
|---|-----------|
| FCC §2.1055, §22.355 & §24.235 - FREQUENCY STABILITY | 32 |
| APPLICABLE STANDARD | 32 |
| TEST PROCEDURE | 32 |
| TEST EQUIPMENT LIST AND DETAILS..... | 33 |
| TEST DATA | 33 |

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Shenzhen Concox Information Technology Co., Ltd.*'s product, model number: *G115* (FCC ID: *X7ICTG115*) or the "EUT" as referred to in this report is a *GSM Module*, which measures approximately: 3.3 cm L x 2.5 cm W x 0.3 cm H, rated input voltage: DC 3.7 V power source.

Frequency Range:

Cellular Band: 824.2-848.8 MHz (TX), 869-894 MHz (RX)
PCS Band: 1850-1910 MHz (TX), 1930-1990 MHz (RX)

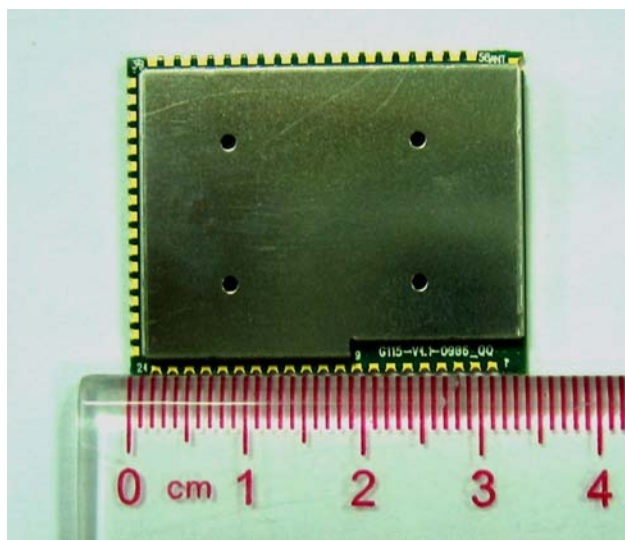
Modulation Mode: GMSK

Transmitter Output Power:

Cellular Band: 33±2 dBm
PCS Band: 30±2 dBm

** All measurement and test data in this report was gathered from production sample serial number: 1002027 (Assigned by BACL). The EUT was received on 2010-02-10.*

EUT Photo



Please see additional photos in Exhibit B & C

Objective

This type approval report is prepared on behalf of *Shenzhen Concox Information Technology Co., Ltd.* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

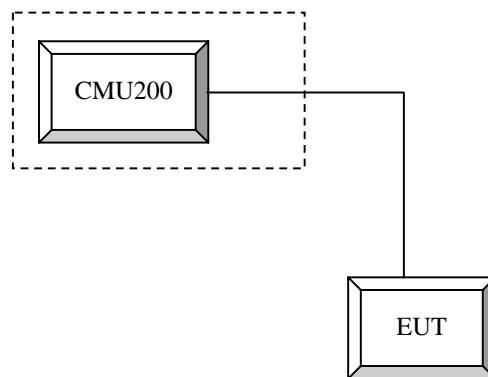
The EUT was configured for testing according to TIA/EIA-603-C.

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

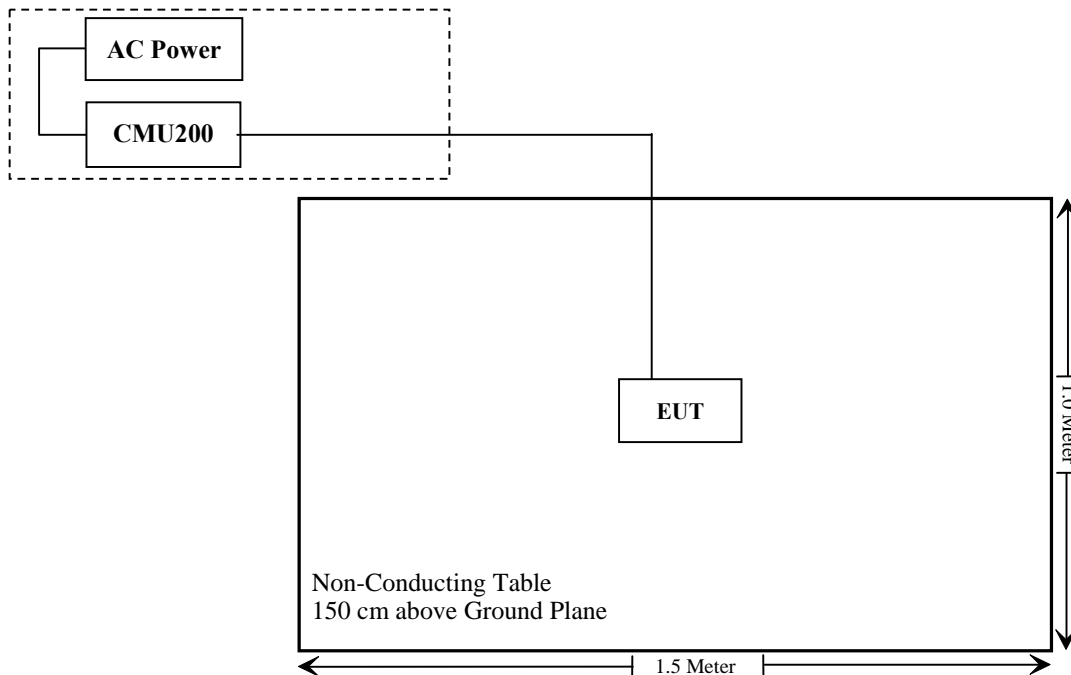
Equipment Modifications

No modifications were made to the EUT.

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|--------------------------------------|--|---------------|
| §1.1307, §2.1091 | RF Exposure | Compliant |
| §2.1046; §22.913(a); §24.232(c) | RF Output Power | Compliant |
| §2.1047 | Modulation Characteristics | N/A |
| §2.1049; §22.905 §22.917; §24.238 | 99% & -26 dB Occupied Bandwidth | Compliant |
| §2.1051, §22.917(a); §24.238(a) | Spurious Emissions at Antenna Terminal | Compliant |
| §2.1053 §22.917(a); §24.238(a) | Field Strength of Spurious Radiation | Compliant |
| §22.91 (a); §24.238(a) | Out of band emission, Band Edge | Compliant |
| § 2.1055 §22.355; §24.235 | Frequency stability vs. temperature Frequency stability vs. voltage | Compliant |

FCC §1.1307 & §2.1091 - RF EXPOSURE

Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

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

Limits for General Population/Uncontrolled Exposure

| Limits for General Population/Uncontrolled Exposure | | | | |
|---|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm ²) | Averaging Time (minutes) |
| 0.3-1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34-30 | 824/f | 2.19/f | *(180/f ²) | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | f/1500 | 30 |
| 1500-100,000 | / | / | 1.0 | 30 |

f = frequency in MHz

* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = output power to antenna

G = Antenna Gain

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Table: Maximum Permissible Exposure (MPE) Calculations

| Band | Frequency (MHz) | Ant. Gain (dBi) | Max Conducted Power | | Duty Cycle | Evaluation Distance (cm) | Power Density (mW/cm ²) | MPE Limit (mW/cm ²) |
|--------------------|-----------------|-----------------|---------------------|---------|------------|--------------------------|-------------------------------------|---------------------------------|
| | | | (dBm) | (mW) | | | | |
| GSM 850 (2 Slots) | 824.2 | 2.0 | 32.16 | 1644.37 | 25% | 20 | 0.130 | 0.549 |
| PCS 1900 (3 Slots) | 1909.8 | 2.5 | 30.79 | 1198.91 | 37.5% | 20 | 0.159 | 1.0 |

Result: Module meets the mobile 20 cm separation distance as specified in Section 2.1091 of the FCC rules. An appropriate RF exposure compliance statement will be placed in the User's Guide.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c) - RF OUTPUT POWER

Applicable Standard

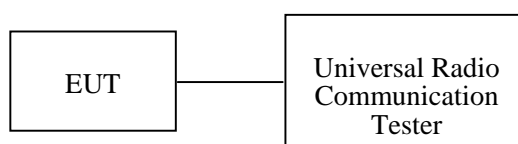
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), in no case may the peak output power of a base station transmitter exceed 2 watt EIRP.

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-C section 2.2.17

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|--------------------------------------|-------------|---------------|------------------|----------------------|
| Sunol Sciences | Horn Antenna | DRH-118 | A052604 | 2009-05-05 | 2010-05-04 |
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2009-07-08 | 2010-07-07 |
| Sunol Sciences | Broadband Antenna | JB1 | A040904-1 | 2010-03-11 | 2011-03-11 |
| HP | Preamplifier | 8449B | 3008A00277 | 2009-09-12 | 2010-09-11 |
| HP | Signal Generator | HP8657A | 2849U00982 | 2009-10-28 | 2010-10-27 |
| HP | Amplifier | HP8447D | 2944A09795 | 2009-08-02 | 2010-08-02 |
| HP | Synthesized Sweeper | 8341B | 2624A00116 | 2009-11-07 | 2010-11-06 |
| COM POWER | Dipole Antenna | AD-100 | 041000 | 2009-09-25 | 2010-09-25 |
| A.H. System | Horn Antenna | SAS-200/571 | 135 | 2009-05-17 | 2010-05-17 |
| Rohde & Schwarz | Universal Radio Communication Tester | CMU200 | 109038 | 2009-05-09 | 2010-05-09 |

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data**Environmental Conditions**

| | |
|---------------------------|----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 100.0kPa |

The testing was performed by Vicent Kang on 2010-02-21 to 2010-04-02.

Conducted Power

Cellular Band (Part 22H)

| Mode | Channel No. | Frequency (MHz) | Output Power (dBm) | Limit (dBm) |
|------|-------------|-----------------|--------------------|-------------|
| GSM | 128 | 824.2 | 31.89 | 38.45 |
| | 190 | 836.6 | 31.78 | 38.45 |
| | 251 | 848.8 | 31.34 | 38.45 |

| Mode | Channel No. | Frequency (MHz) | Output Power (dBm) | | | | | |
|------|-------------|-----------------|--------------------|---------|-------|---------|-------|-------|
| | | | 1 slot | 2 slots | | 3 slots | | |
| GPRS | 128 | 824.2 | 31.90 | 29.15 | 29.14 | 27.17 | 27.12 | 27.10 |
| | 190 | 836.6 | 31.68 | 29.08 | 29.07 | 27.11 | 27.16 | 27.17 |
| | 251 | 848.8 | 31.07 | 29.04 | 29.03 | 26.22 | 26.21 | 26.21 |

PCS Band (Part 24E)

| Mode | Channel No. | Frequency (MHz) | Output Power (dBm) | Limit (dBm) |
|------|-------------|-----------------|--------------------|-------------|
| GSM | 512 | 1850.2 | 28.30 | 33 |
| | 661 | 1880.0 | 28.17 | 33 |
| | 810 | 1909.8 | 28.65 | 33 |

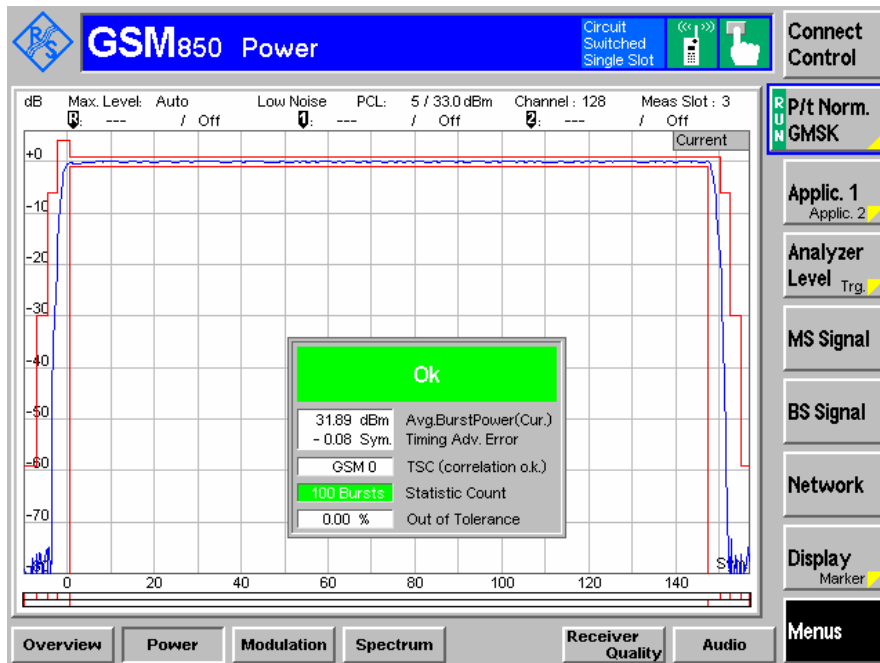
| Mode | Channel No | Frequency (MHz) | Output Power (dBm) | | | | | |
|------|------------|-----------------|--------------------|---------|-------|---------|-------|-------|
| | | | 1 slot | 2 slots | | 3 slots | | |
| GPRS | 512 | 1850.2 | 28.43 | 26.44 | 26.45 | 25.23 | 25.25 | 25.27 |
| | 661 | 1880.0 | 28.95 | 26.95 | 26.98 | 25.75 | 25.77 | 25.79 |
| | 810 | 1909.8 | 29.23 | 27.24 | 27.25 | 26.01 | 26.02 | 26.02 |

Note: The data above is collector from the antenna connector, but based on the test jig (PCB board), there should be a loss of 0.3 for GSM850 and 0.5 for PCS1900, because of the microstrip between the module and the antenna collector on the PCB board.

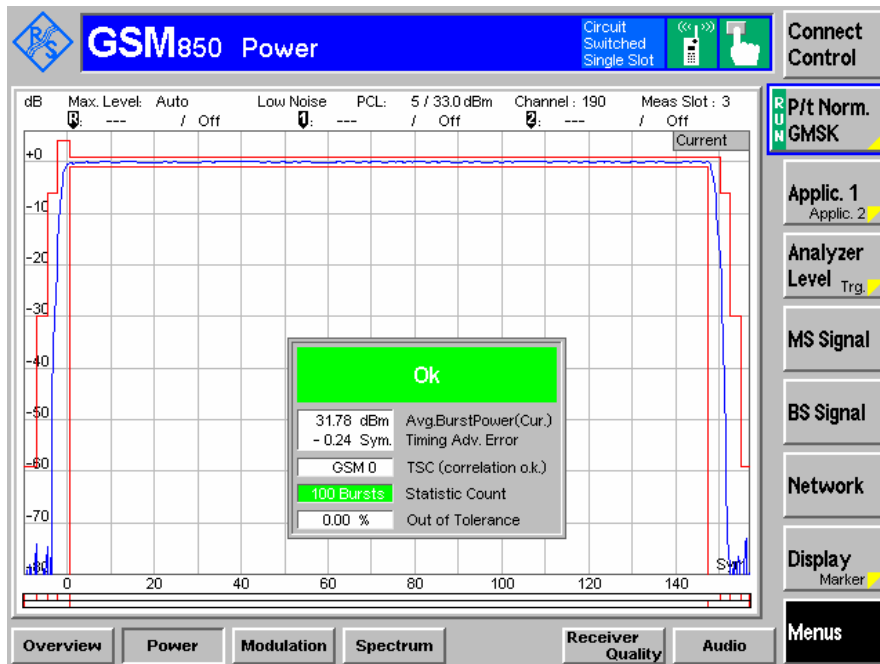
Plots of Conducted Output Power

Cellular Band (Part 22H)

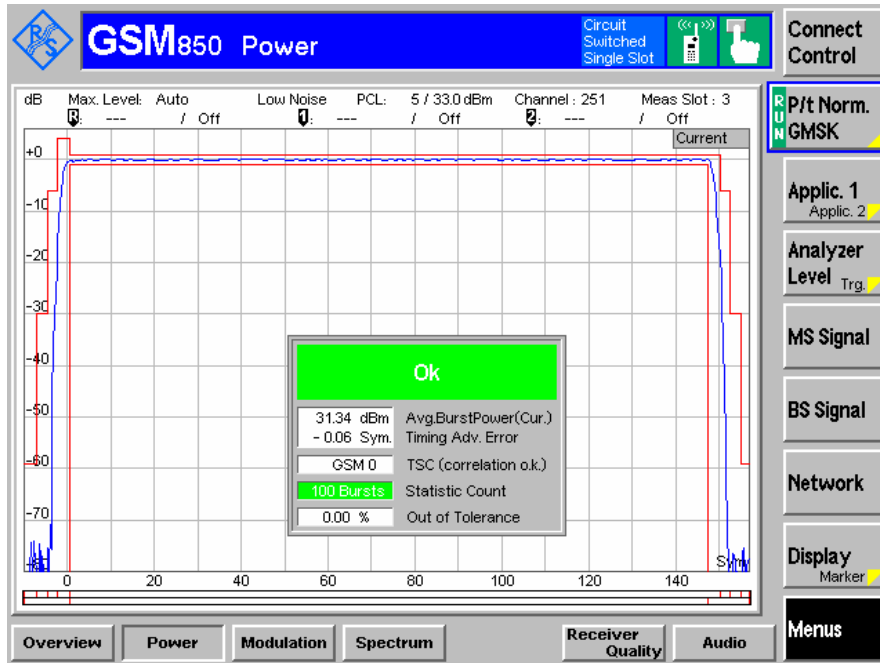
Low Channel (GSM)



Middle Channel (GSM)

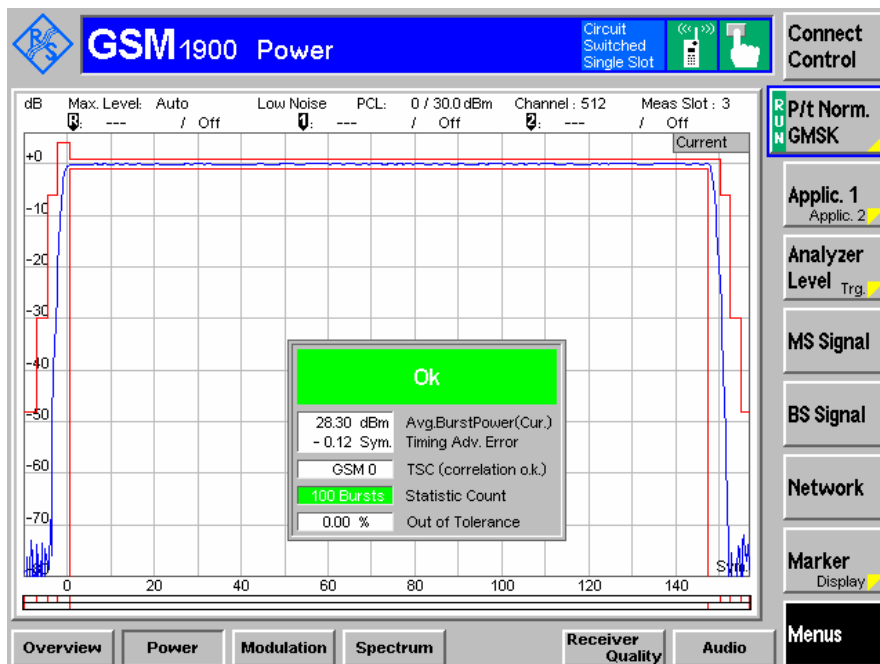


High Channel (GSM)

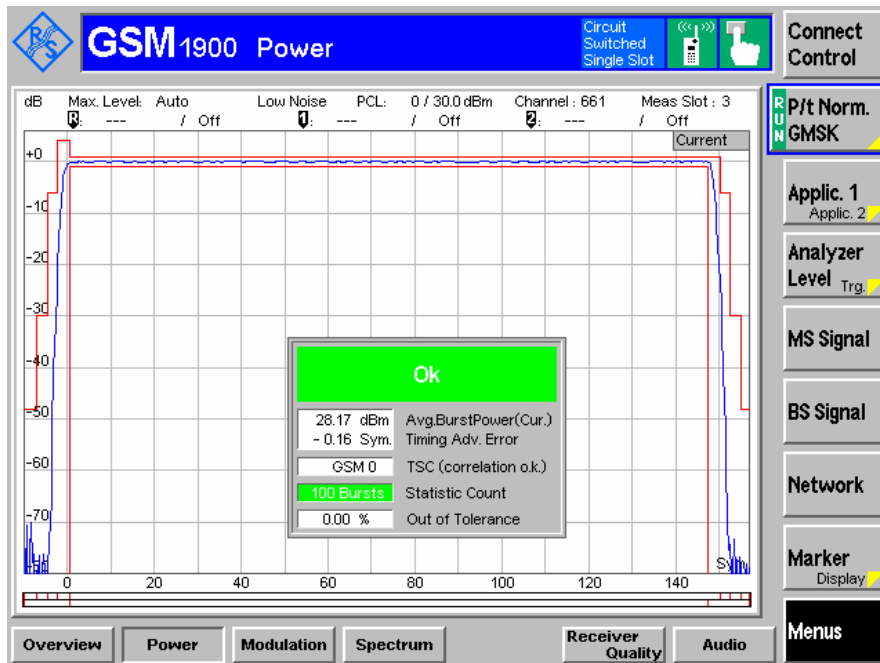


PCS Band (Part 24E)

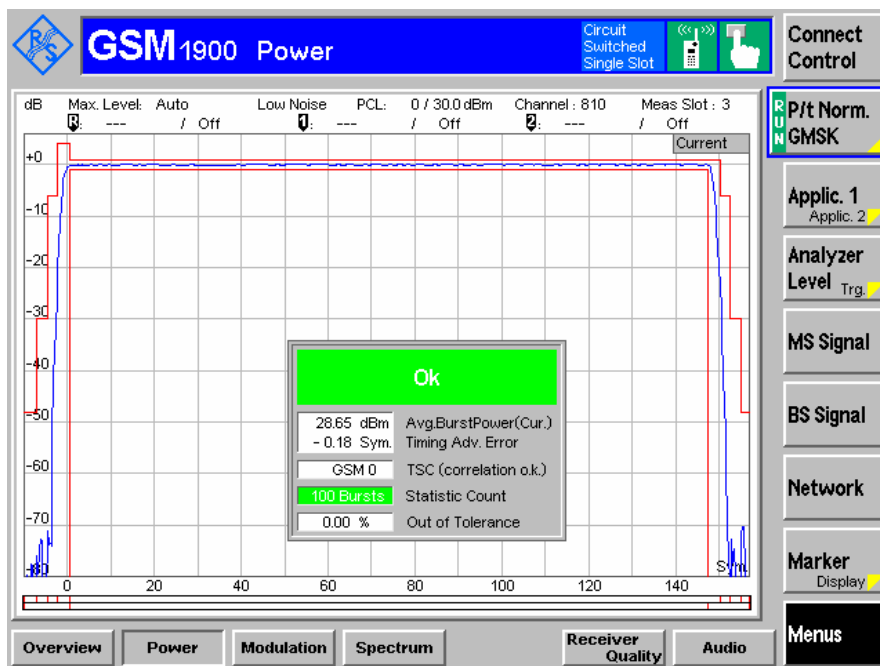
Low Channel (GSM)



Middle Channel (GSM)



High Channel (GSM)



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

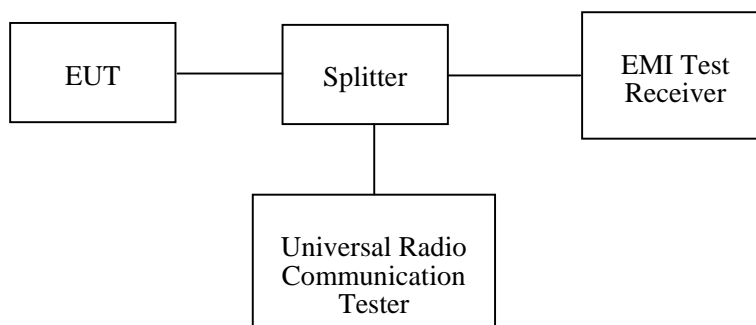
Applicable Standards

CFR 47 §2.1049, §22.917, §22.905 and §24.238.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 30 kHz (Cellular /PCS) and the 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|--------------------------------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100224 | 2009-11-24 | 2010-11-23 |
| Rohde & Schwarz | Universal Radio Communication Tester | CMU200 | 109038 | 2009-06-11 | 2010-06-10 |

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

| | |
|---------------------------|----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56% |
| ATM Pressure: | 100.0kPa |

The testing was performed by Vicent Kang on 2010-03-15.

GMSK:

Cellular Band (Part 22H)

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Occupied Bandwidth (kHz) |
|---------|-----------------|------------------------------|--------------------------------|
| 190 | 836.6 | 254.00 | 342.00 |

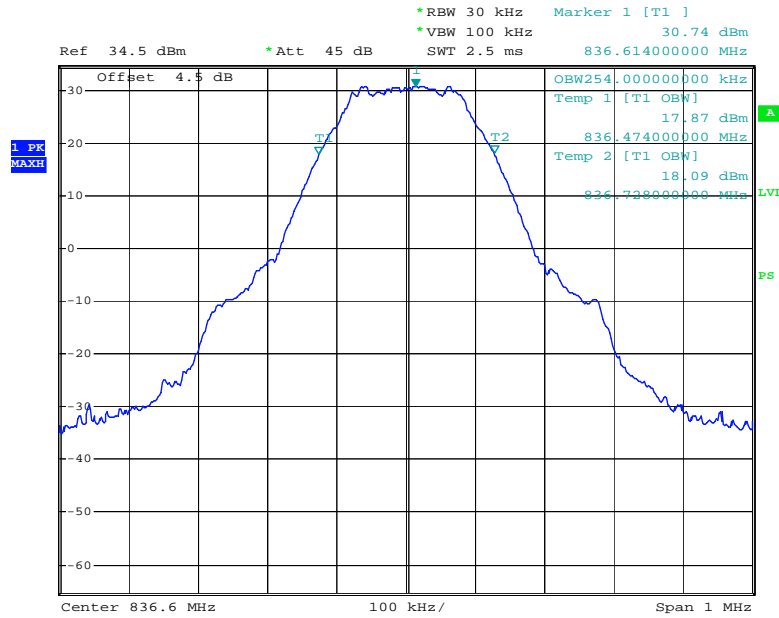
PCS Band (Part 24E)

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Occupied Bandwidth (kHz) |
|---------|-----------------|------------------------------|--------------------------------|
| 661 | 1880.0 | 252.00 | 336.00 |

Please refer to the following plots.

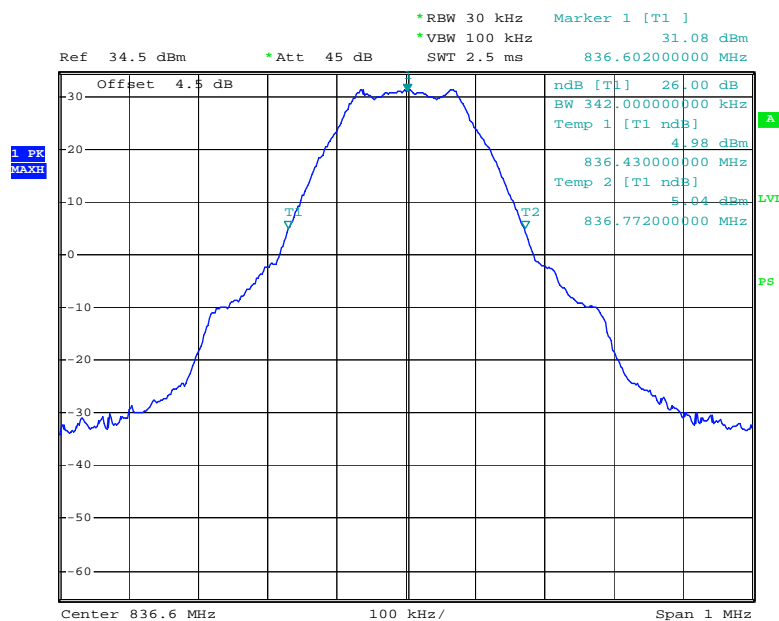
Cellular Band (Part 22H)

99% Occupied Bandwidth



Date: 15.MAR.2010 13:31:26

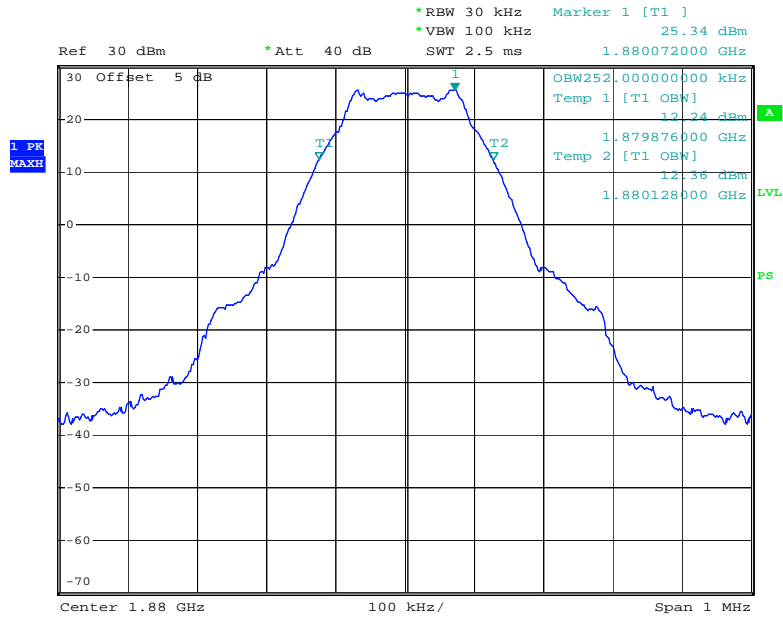
26 dB Occupied Bandwidth



Date: 15.MAR.2010 13:30:37

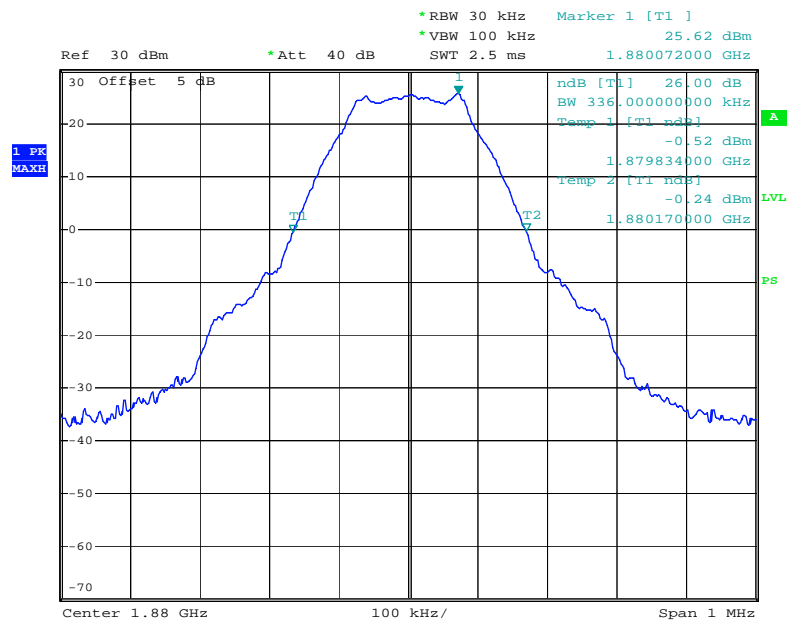
PCS Band (Part 24E)

99% Occupied Bandwidth



Date: 15.MAR.2010 13:59:09

26 dB Occupied Bandwidth



Date: 15.MAR.2010 14:00:44

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

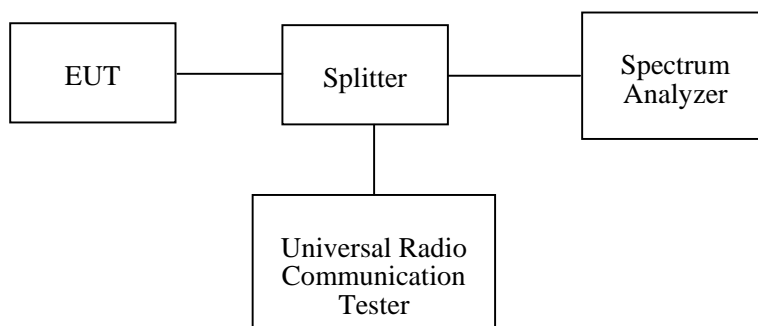
Applicable Standards

CFR 47 §2.1051, §22.917(a) and §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

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



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|--------------------------------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2009-07-08 | 2010-07-07 |
| Rohde & Schwarz | Universal Radio Communication Tester | CMU200 | 109038 | 2009-06-11 | 2010-06-10 |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100224 | 2009-11-24 | 2010-11-23 |

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

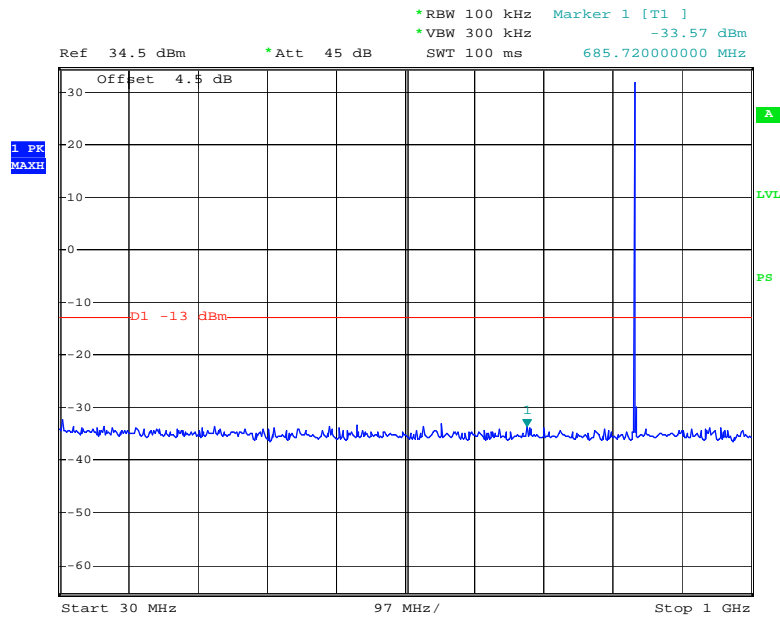
| | |
|--------------------|----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 100.0kPa |

The testing was performed by Vicent Kang on 2010-03-15.

Please refer to the following plots.

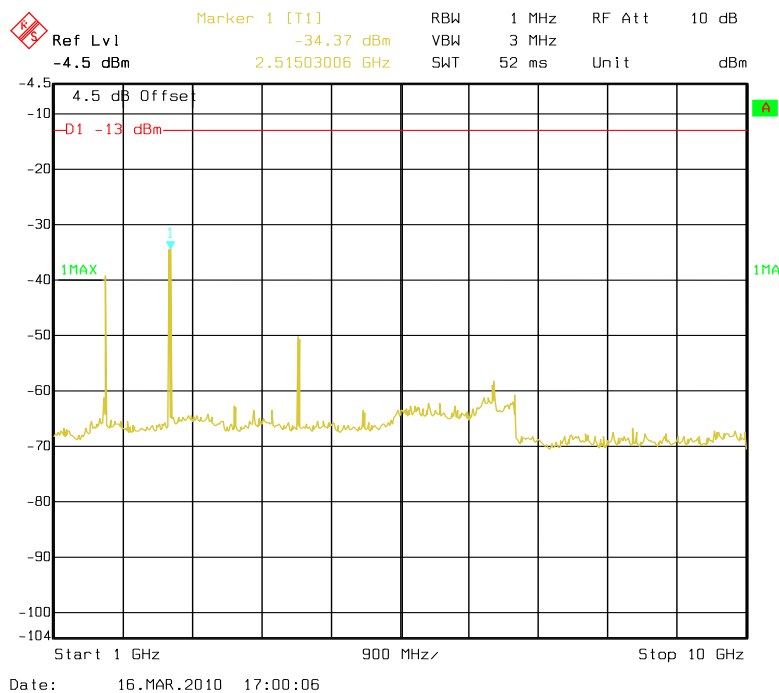
Cellular Band (Part 22H)

30 – 1000 MHz - Middle Channel



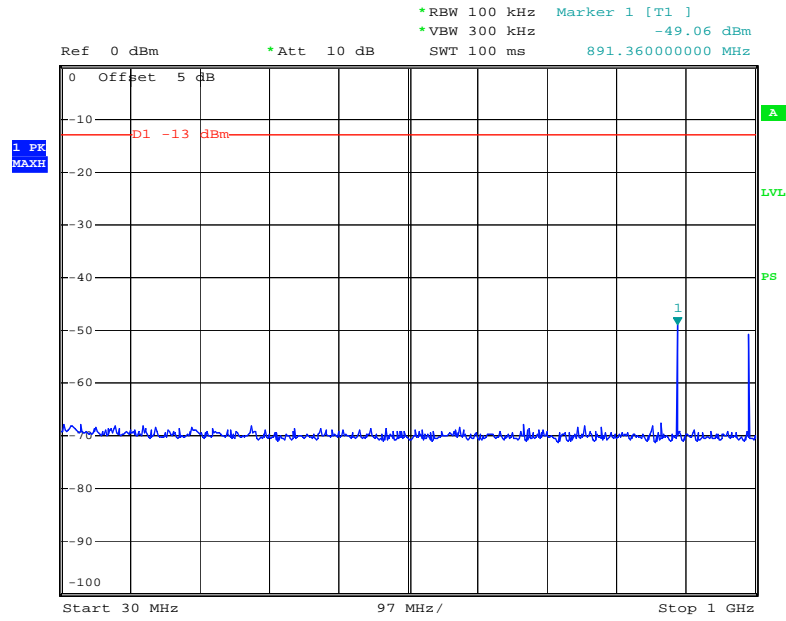
Date: 15.MAR.2010 13:33:07

1 – 10 GHz - Middle Channel



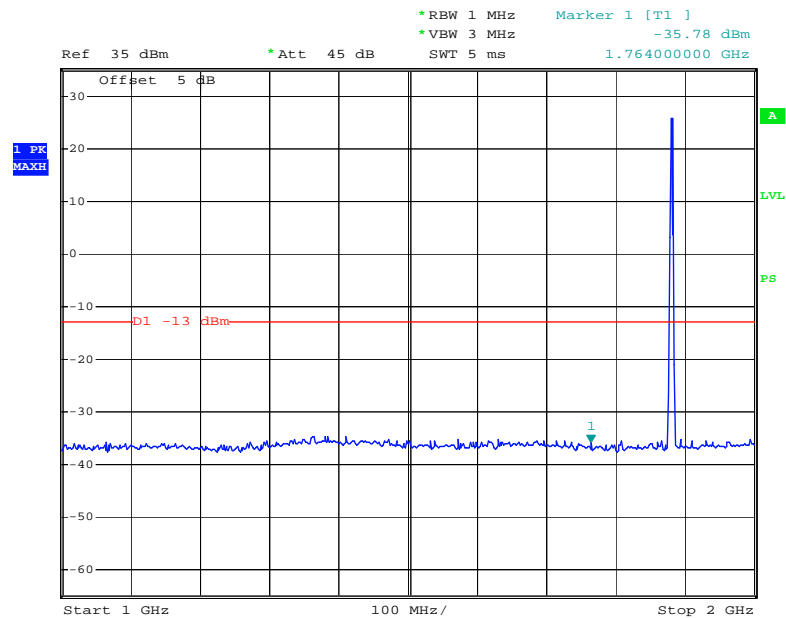
PCS Band (Part24E)

30 – 1000 MHz - Middle Channel



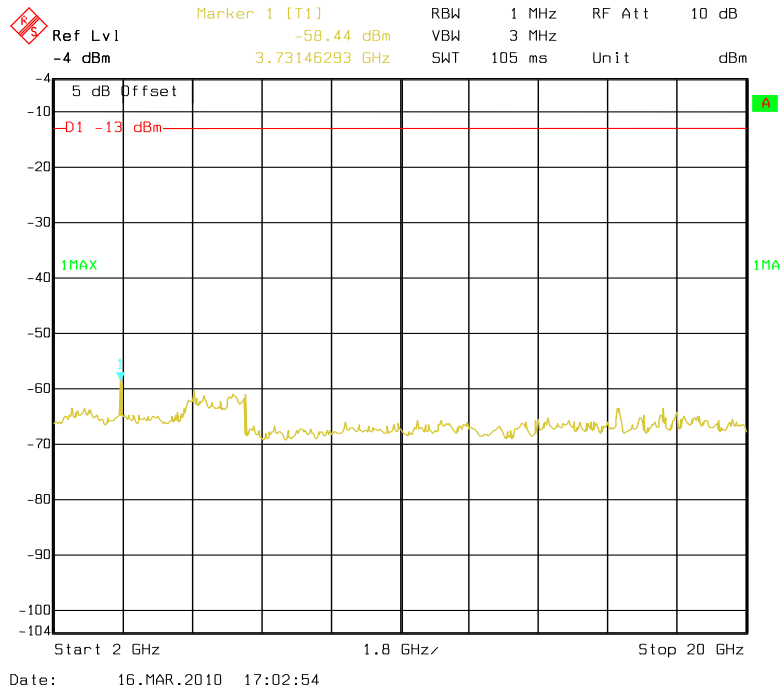
Date: 15.MAR.2010 13:52:29

1 - 2 GHz - Middle Channel



Date: 15.MAR.2010 13:51:47

2 – 20 GHz - Middle Channel



FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

CFR 47 § 2.1053, §22.917 and § 24.238.

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 (TXpwr in Watts/0.001) – the absolute level

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

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---------------------|--------------------------------------|--------------|----------------------|-------------------------|-----------------------------|
| Sunol Sciences | Horn Antenna | DRH-118 | A052604 | 2009-05-05 | 2010-05-04 |
| Sunol Sciences | Broadband Antenna | JB1 | A040904-1 | 2010-03-11 | 2011-03-11 |
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2009-07-08 | 2010-07-07 |
| HP | Preamplifier | 8449B | 3008A00277 | 2009-09-12 | 2010-09-11 |
| HP | Signal Generator | HP8657A | 2849U00982 | 2009-10-28 | 2010-10-27 |
| HP | Amplifier | HP8447D | 2944A09795 | 2009-08-02 | 2010-08-02 |
| HP | Synthesized Sweeper | 8341B | 2624A00116 | 2009-11-07 | 2010-11-06 |
| COM POWER | Dipole Antenna | AD-100 | 041000 | 2009-09-25 | 2010-09-25 |
| A.H. System | Horn Antenna | SAS-200/571 | 135 | 2009-05-17 | 2010-05-17 |
| Rohde & Schwarz | Universal Radio Communication Tester | CMU200 | 109038 | 2009-06-11 | 2010-06-10 |

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data**Environmental Conditions**

| | |
|---------------------------|----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 100.0kPa |

The testing was performed by Vicent Kang on 2010-03-15.

Test mode: Transmitting

Below 1GHz:

Cellular Band (Part 22H)

| Indicated | | Table Angle Degree | Test Antenna | | Substituted | | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|---------------------|--------------------|--------------|-------------|-----------------|-------------|-----------------|-----------------|----------------------|-------------|-------------|
| Frequency (MHz) | S.A. Reading (dBμV) | | Height (m) | Polar (H/V) | Frequency (MHz) | Level (dBm) | Ant. Gain (dBi) | Cable Loss (dB) | | | |
| Middle Channel | | | | | | | | | | | |
| 270.51 | 45.09 | 150 | 1.5 | H | 270.51 | -51.9 | 0 | 0.6 | -52.50 | -13 | 39.50 |
| 36.09 | 41.06 | 140 | 1 | V | 36.09 | -53.4 | 0 | 0.42 | -53.82 | -13 | 40.82 |
| 566.78 | 40.98 | 210 | 1 | H | 566.78 | -56.1 | 0 | 0.65 | -56.75 | -13 | 43.75 |
| 695.54 | 42.11 | 242 | 1.2 | V | 695.54 | -56.3 | 0 | 0.74 | -57.04 | -13 | 44.04 |
| 270.51 | 37.7 | 70 | 1.5 | V | 270.51 | -59.6 | 0 | 0.6 | -60.20 | -13 | 47.20 |

PCS Band (Part 24E)

| Indicated | | Table Angle Degree | Test Antenna | | Substituted | | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|---------------------|--------------------|--------------|-------------|-----------------|-------------|-----------------|-----------------|----------------------|-------------|-------------|
| Frequency (MHz) | S.A. Reading (dBμV) | | Height (m) | Polar (H/V) | Frequency (MHz) | Level (dBm) | Ant. Gain (dBi) | Cable Loss (dB) | | | |
| Middle Channel | | | | | | | | | | | |
| 270.51 | 44.04 | 150 | 1.5 | H | 270.51 | -52.9 | 0 | 0.6 | -53.5 | -13 | 40.50 |
| 36.25 | 39.28 | 242 | 1.2 | V | 36.25 | -55.1 | 0 | 0.42 | -55.52 | -13 | 42.52 |
| 695.54 | 41.46 | 70 | 1.5 | V | 695.54 | -56.7 | 0 | 0.74 | -57.44 | -13 | 44.44 |
| 695.54 | 39.94 | 210 | 1 | H | 695.54 | -57.7 | 0 | 0.74 | -58.44 | -13 | 45.44 |
| 33.79 | 34.42 | 260 | 1.5 | H | 33.79 | -59.8 | 0 | 0.42 | -60.22 | -13 | 47.22 |

Above 1GHz:**Cellular Band (Part 22H)**

| Indicated | | Table Angle Degree | Test Antenna | | Substituted | | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|---------------------|--------------------|--------------|-------------|-----------------|-------------|-----------------|-----------------|----------------------|-------------|-------------|
| Frequency (MHz) | S.A. Reading (dBμV) | | Height (m) | Polar (H/V) | Frequency (MHz) | Level (dBm) | Ant. Gain (dBi) | Cable Loss (dB) | | | |
| Middle Channel | | | | | | | | | | | |
| 1673.2 | 52.14 | 220 | 1.0 | V | 1673.2 | -49.1 | 6.2 | 0.94 | -43.84 | -13 | 30.84 |
| 1673.2 | 48.45 | 75 | 1.15 | H | 1673.2 | -51.7 | 6.2 | 0.94 | -46.44 | -13 | 33.44 |
| 2509.8 | 46.38 | 130 | 1.5 | V | 2509.8 | -55.4 | 7.3 | 1.19 | -49.29 | -13 | 36.29 |
| 2509.8 | 46.09 | 210 | 1.8 | H | 2509.8 | -56.2 | 7.3 | 1.19 | -50.09 | -13 | 37.09 |
| 3346.6 | 42.36 | 150 | 1.4 | V | 3346.6 | -61.3 | 6.7 | 1.38 | -55.98 | -13 | 42.98 |
| 3346.6 | 41.12 | 130 | 1.6 | H | 3346.6 | -62.8 | 6.7 | 1.38 | -57.48 | -13 | 44.48 |

PCS Band (Part 24E)

| Indicated | | Table Angle Degree | Test Antenna | | Substituted | | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|---------------------|--------------------|--------------|-------------|-----------------|-------------|-----------------|-----------------|----------------------|-------------|-------------|
| Frequency (MHz) | S.A. Reading (dBμV) | | Height (m) | Polar (H/V) | Frequency (MHz) | Level (dBm) | Ant. Gain (dBi) | Cable Loss (dB) | | | |
| Middle Channel | | | | | | | | | | | |
| 7520 | 42.26 | 110 | 1.5 | V | 7520 | -57.7 | 7.6 | 2.09 | -52.19 | -13 | 39.19 |
| 7520 | 41.35 | 180 | 1.5 | H | 7520 | -58.6 | 7.6 | 2.09 | -53.09 | -13 | 40.09 |
| 5640 | 42.05 | 80 | 1.5 | V | 5640 | -59.9 | 8.3 | 1.76 | -53.36 | -13 | 40.36 |
| 3760 | 44.11 | 200 | 1 | V | 3760 | -59.4 | 6.9 | 1.47 | -53.97 | -13 | 40.97 |
| 5640 | 41.41 | 170 | 1.6 | H | 5640 | -60.8 | 8.3 | 1.76 | -54.26 | -13 | 41.26 |
| 3760 | 43.53 | 190 | 2 | H | 3760 | -59.8 | 6.9 | 1.47 | -54.37 | -13 | 41.37 |

FCC §22.917(a) & §24.238(a) - BAND EDGES

Applicable Standards

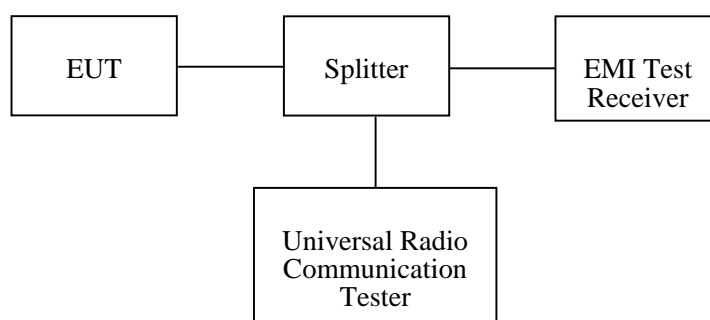
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

Test Procedure

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

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|--------------------------------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100224 | 2009-11-24 | 2010-11-23 |
| Rohde & Schwarz | Universal Radio Communication Tester | CMU200 | 109038 | 2009-06-11 | 2010-06-10 |

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

| | |
|--------------------|----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 100.0kPa |

The testing was performed by Vicent Kang on 2010-03-15.

Please refer to the following tables and plots.

GSM Mode:

Cellular Band (Part 22H)

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 824 | -15.84 | -13 |
| 849 | -16.65 | -13 |

PCS Band (Part 24E)

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 1850 | -17.24 | -13 |
| 1910 | -21.54 | -13 |

GPRS Mode:

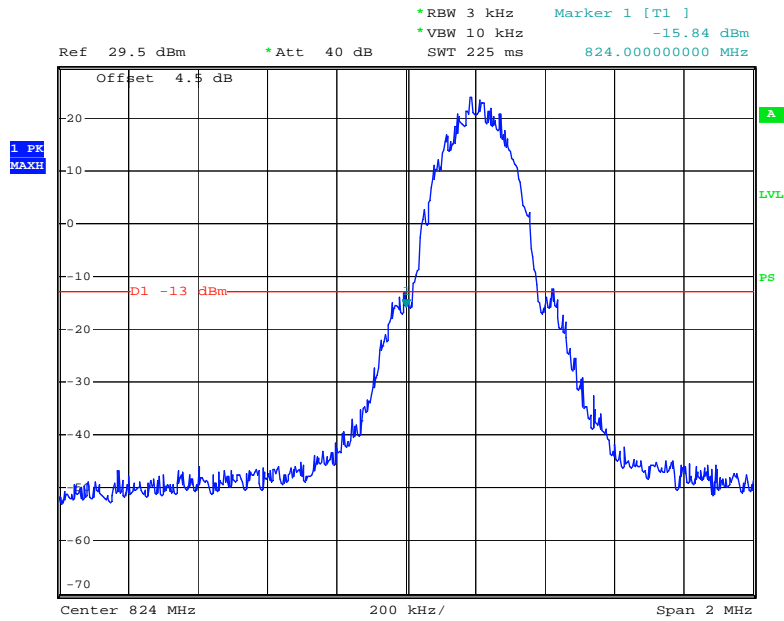
Cellular Band (Part 22H)

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 824 | -14.60 | -13 |
| 849 | -16.76 | -13 |

PCS Band (Part 24E)

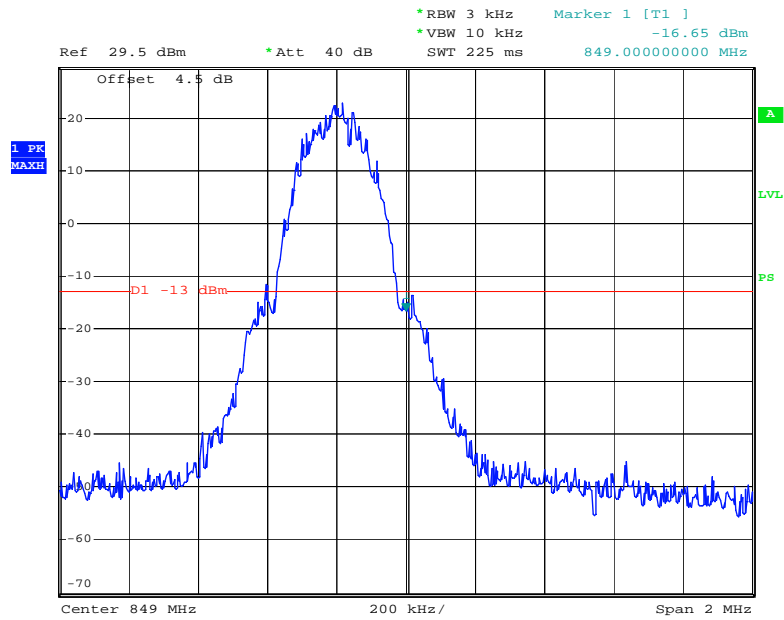
| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 1850 | -15.95 | -13 |
| 1910 | -19.63 | -13 |

Cellular Band, Lowest Channel (GSM)



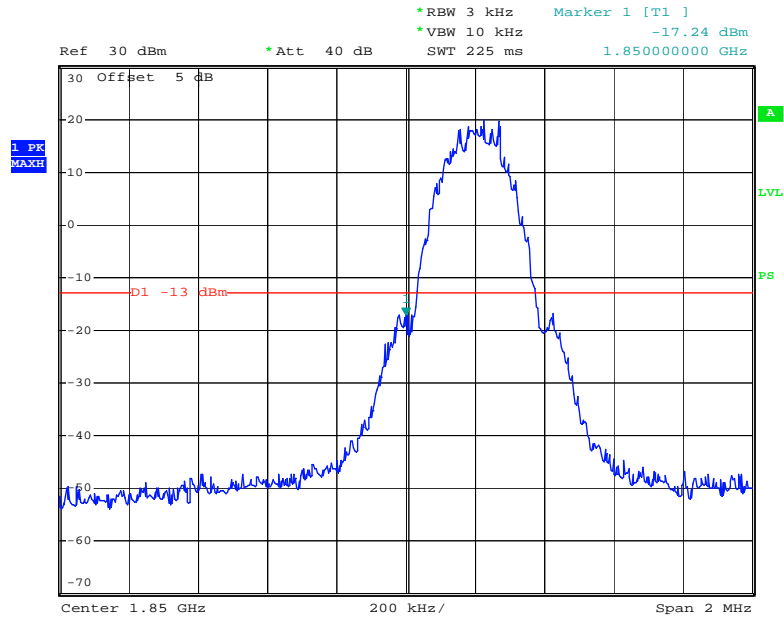
Date: 15.MAR.2010 13:34:23

Cellular Band, Highest Channel (GSM)



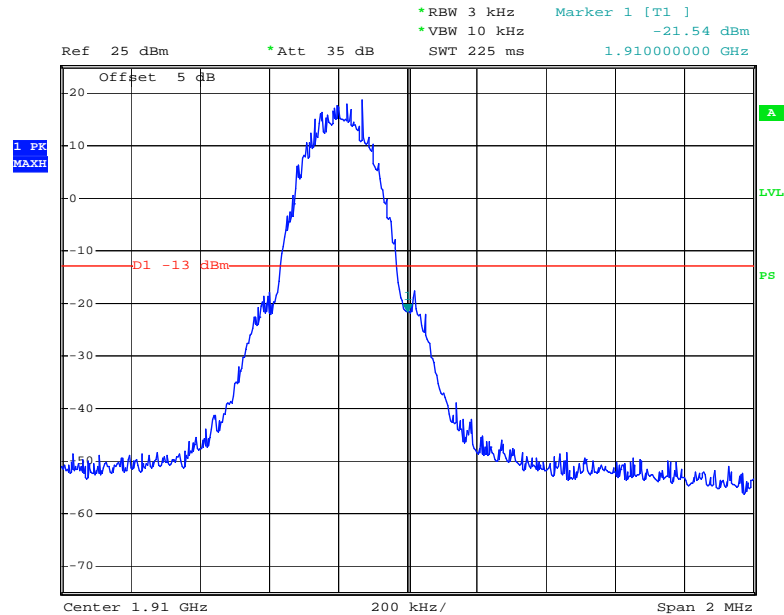
Date: 15.MAR.2010 13:36:12

PCS Band, Lowest Channel (GSM)



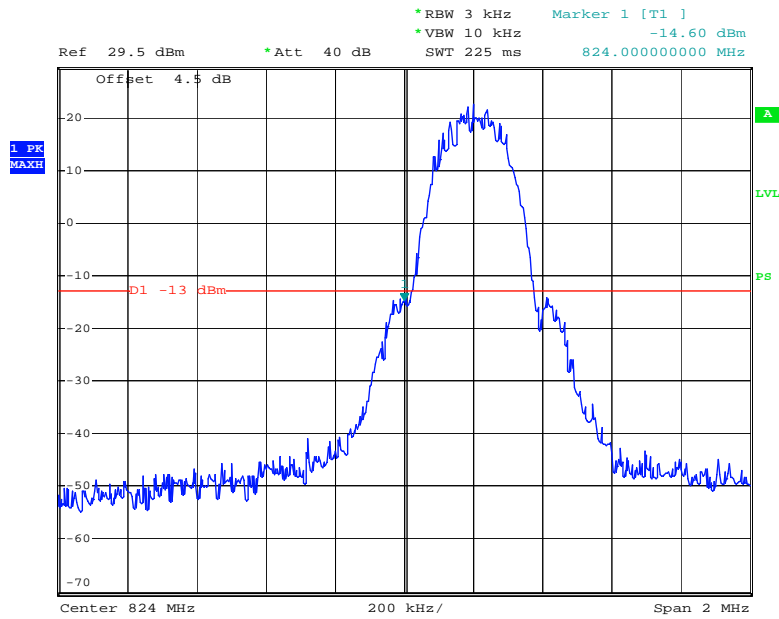
Date: 15.MAR.2010 13:56:07

PCS Band, Highest Channel (GSM)



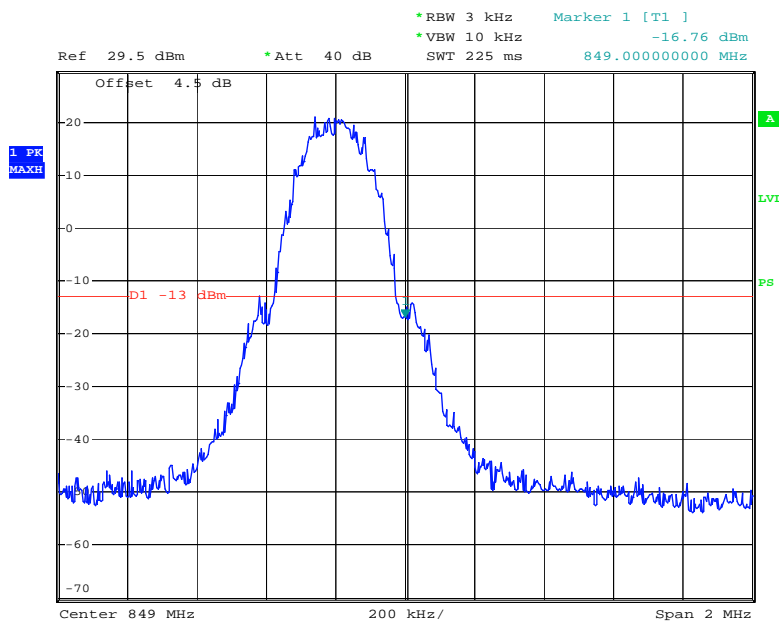
Date: 15.MAR.2010 13:57:54

Cellular Band, Lowest Channel (GPRS)



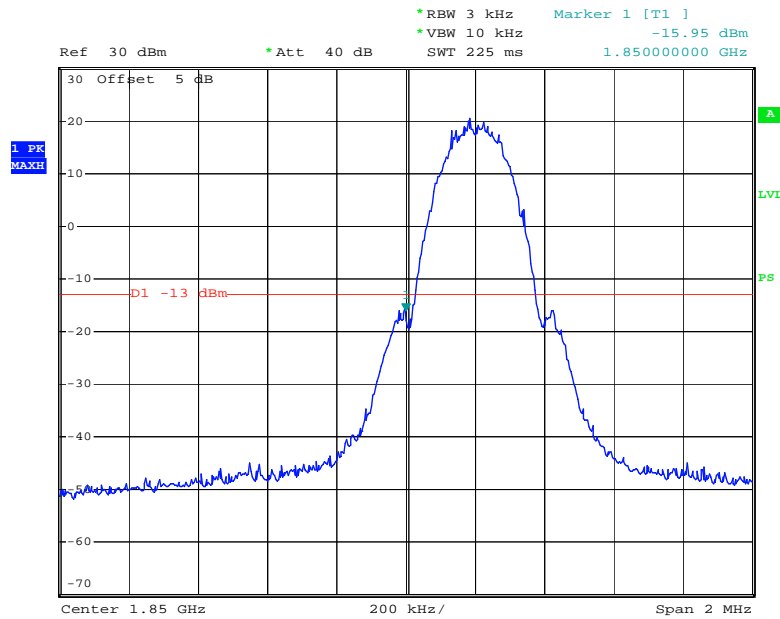
Date: 15.MAR.2010 14:38:39

Cellular Band, Highest Channel (GPRS)



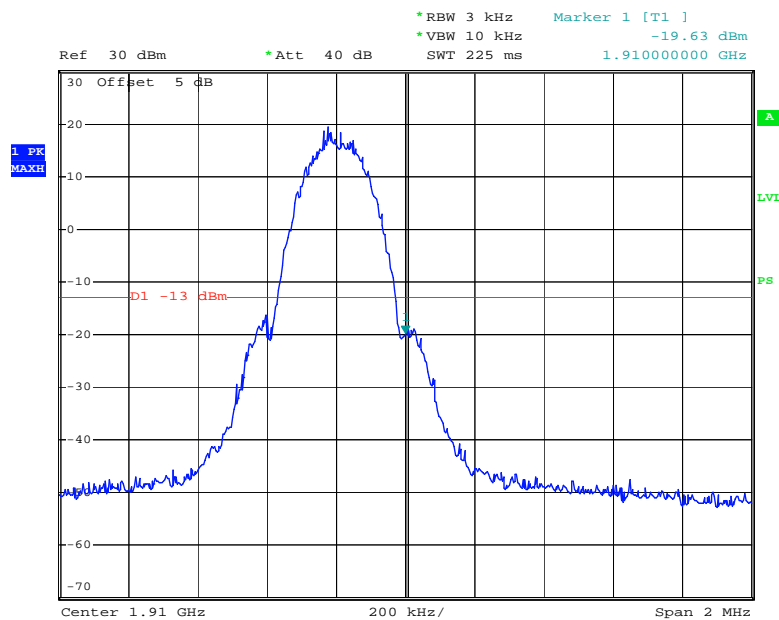
Date: 15.MAR.2010 14:39:25

PCS Band, Lowest Channel (GPRS)



Date: 15.MAR.2010 14:54:32

PCS Band, Highest Channel (GPRS)



Date: 15.MAR.2010 15:28:55

FCC §2.1055, §22.355 & §24.235 - FREQUENCY STABILITY

Applicable Standard

CFR47 § 2.1055 (a), § 2.1055 (d), §22.355, §24.235

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

| Frequency Range (MHz) | Base, fixed (ppm) | Mobile ≤ 3 watts (ppm) | Mobile ≤ 3 watts (ppm) |
|-----------------------|-------------------|------------------------|------------------------|
| 25 to 50 | 20.0 | 20.0 | 50.0 |
| 50 to 450 | 5.0 | 5.0 | 50.0 |
| 450 to 512 | 2.5 | 5.0 | 5.0 |
| 821 to 896 | 1.5 | 2.5 | 2.5 |
| 928 to 929. | 5.0 | N/A | N/A |
| 929 to 960. | 1.5 | N/A | N/A |
| 2110 to 2220 | 10.0 | N/A | N/A |

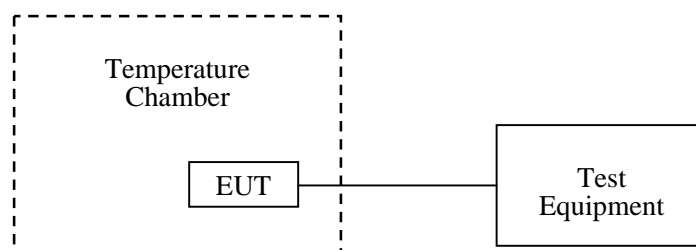
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|--------------------------------------|--------|---------------|------------------|----------------------|
| WUHUAN | Temperature & Humidity Chamber | HTP205 | 20021115 | 2009-05-09 | 2010-05-09 |
| Rohde & Schwarz | Universal Radio Communication Tester | CMU200 | 109038 | 2009-06-11 | 2010-06-10 |

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

| | |
|--------------------|----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 100.0kPa |

The testing was performed by Vicent Kang on 2010-03-15.

Cellular Band (Part 22H)

| Middle Channel, $f_0 = 836.6$ MHz | | | | |
|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Power Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.70 | -1 | -0.0012 | 2.5 |
| | 3.50 | -3 | -0.0036 | 2.5 |
| -25 | 3.70 | -3 | -0.0036 | 2.5 |
| | 3.50 | 1 | 0.0012 | 2.5 |
| -15 | 3.70 | -1 | -0.0012 | 2.5 |
| | 3.50 | 1 | 0.0012 | 2.5 |
| -5 | 3.70 | 3 | 0.0036 | 2.5 |
| | 3.50 | 2 | 0.0024 | 2.5 |
| 5 | 3.70 | 5 | 0.0060 | 2.5 |
| | 3.50 | 7 | 0.0084 | 2.5 |
| 15 | 3.70 | 11 | 0.0131 | 2.5 |
| | 3.50 | 14 | 0.0167 | 2.5 |
| 25 | 3.70 | 18 | 0.0215 | 2.5 |
| | 3.50 | 16 | 0.0191 | 2.5 |
| 35 | 3.70 | -15 | -0.0179 | 2.5 |
| | 3.50 | -7 | -0.0084 | 2.5 |
| 45 | 3.70 | -12 | -0.0143 | 2.5 |
| | 3.50 | -14 | -0.0167 | 2.5 |
| 55 | 3.70 | -17 | -0.0203 | 2.5 |
| | 3.50 | -16 | -0.0191 | 2.5 |

PCS Band (Part 24E)

| Middle Channel, $f_0 = 1880.0$ MHz | | | | |
|------------------------------------|--------------------------------------|----------------------------|-----------------------------|----------------|
| Temperature (°C) | Power Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 3.70 | 8 | 0.0043 | 2.5 |
| | 3.50 | 6 | 0.0032 | 2.5 |
| -25 | 3.70 | 6 | 0.0032 | 2.5 |
| | 3.50 | 10 | 0.0053 | 2.5 |
| -15 | 3.70 | 8 | 0.0043 | 2.5 |
| | 3.50 | 10 | 0.0053 | 2.5 |
| -5 | 3.70 | 2 | 0.0011 | 2.5 |
| | 3.50 | 11 | 0.0059 | 2.5 |
| 5 | 3.70 | 13 | 0.0069 | 2.5 |
| | 3.50 | 4 | 0.0021 | 2.5 |
| 15 | 3.70 | 10 | 0.0053 | 2.5 |
| | 3.50 | 13 | 0.0069 | 2.5 |
| 25 | 3.70 | 17 | 0.0090 | 2.5 |
| | 3.50 | 15 | 0.0080 | 2.5 |
| 35 | 3.70 | 4 | 0.0021 | 2.5 |
| | 3.50 | 12 | 0.0064 | 2.5 |
| 45 | 3.70 | 7 | 0.0037 | 2.5 |
| | 3.50 | 5 | 0.0027 | 2.5 |
| 55 | 3.70 | 2 | 0.0011 | 2.5 |
| | 3.50 | 3 | 0.0016 | 2.5 |

***** END OF REPORT *****