

FCC TEST REPORT

for

47 CFR, Part 22H, 24E

Equipment : USB GSM Modem

Model No. : SCMi250u

FCC ID : NIT-SCMi250u

Filing Type : Certification

Applicant : **SOLOMON Technology Corp.**
No. 42, Sing Shong Rd., Nei Hu Dist., Taipei, Taiwan, R.O.C.

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

The applicant has been cautioned as to the following:

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

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Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) **Test Report**

b) Laboratory: Sporton International Inc.
No.52, Hwa-Ya 1st RD., Hwa Ya Technology Park, Kwei-Shan
Hsiang, TaoYuan Hsien, Taiwan, R.O.C.

c) Report Number: F3O1301

d) Client: SOLOMON Technology Corp.
No. 42, Sing Shong Rd., Nei Hu Dist., Taipei, Taiwan, R.O.C.

e) Identification: SCMi250u
FCC ID: NIT-SCMi250u
Description: GSM850/1900 Radio

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: November 17, 2003
EUT Received: October 16, 2003

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with Sporton internal quality manual.

m) Supervised by:



Joe Yang

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Accessories Used During Testing:

Type	Model
EUT	SCMi250u
USB Cable	N/A

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to

22H, 24E, Confidentiality

Sub-Part 2.1033**(c)(1): Name and Address of Applicant:**

SOLOMON Technology Corp.
No. 42, Sing Shong Rd., Nei Hu Dist., Taipei,
Taiwan, R.O.C.

Manufacturer

As above

(c)(2): FCC ID: NIT-SCMi250u

Model Number: SCMi250u

(c)(3): Instruction Manual(s):

Please See Attached Exhibits

(c)(4): Type of Emission: Link Mode

(c)(5): FREQUENCY RANGE, MHz: 824.2 to 848.8 GSM850
1850.2 to 1909.8 GSM1900

(c)(6): Power Rating, Watts: 0.142 ERP (850)
0.477 EIRP (1900)
Switchable Variable N/A

(c)(7): Maximum Power Rating, Watts: 2 GSM 850
1 GSM 1900

Subpart 2.1033 (continued)

(c)(8): Voltages & Currents in All Elements in Final RF Stage, Including Final Transistor or Solid State Device:

Collector Current, A = 0.5

Collector Voltage, Vdc = 5.0

Supply Voltage, Vdc = 5.0

(c)(9): Tune-Up Procedure:

Please See Attached Exhibits

(c)(10): Circuit Diagram/Circuit Description:

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please See Attached Exhibits

(c)(11): Label Information:

Please See Attached Exhibits

(c)(12): Photographs:

Please See Attached Exhibits

(c)(13): Digital Modulation Description:

Attached Exhibits

N/A

(c)(14): Test and Measurement Data:

Follows

Certificate of NVLAP Accreditation



Sub-part

2.1033(c)(14): Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

- 21 – Domestic Public Fixed Radio Services
- 22 – Public Mobile Services
 - 22 Subpart H - Cellular Radiotelephone Service
 - 22.901(d) - Alternative technologies and auxiliary services
 - 23 – International Fixed Public Radiocommunication services
- 24 – Personal Communications Services
 - 74 Subpart H - Low Power Auxiliary Stations
 - 80 – Stations in the Maritime Services
 - 80 Subpart E - General Technical Standards
 - 80 Subpart F - Equipment Authorization for Compulsory Ships
 - 80 Subpart K - Private Coast Stations and Marine Utility Stations
 - 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
 - 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
 - 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
 - 80 Subpart V - Emergency Position Indicating Radio Beacons (EPIRB'S)
 - 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
 - 80 Subpart X - Voluntary Radio Installations
 - 87 – Aviation Services
 - 90 – Private Land Mobile Radio Services
 - 94 – Private Operational-Fixed Microwave Service
 - 95 Subpart A - General Mobile Radio Service (GMRS)
 - 95 Subpart C - Radio Control (R/C) Radio Service
 - 95 Subpart D - Citizens Band (CB) Radio Service
 - 95 Subpart E - Family Radio Service
 - 95 Subpart F - Interactive Video and Data Service (IVDS)
 - 97 - Amateur Radio Service
 - 101 – Fixed Microwave Services

General Information

Product Feature & Specification	
1. Host/Radio Interface	USB Ver 1.1
2. Type of Modulation	GMSK
3. Number of Channels	GSM850 : 128 to 251 GSM1900 : 512 to 810
4. Tx Frequency Band	GSM850 : 824 to 849 GSM1900 : 512 to 810
5. Bandwidth of each channel	200 kHz
6. Maximum Output Power to Antenna	GSM850 : 29 dBm GSM1900 : 30 dBm
7. Power Rating (DC/AC , Voltage)	DC 5V, 500mA max
8. Duty Cycle	12%
9. Basic function of product	USB GPRS Modem
10. Temperature Range (Operating)	0~60C
11. Humidity	0~95%
12. Other Special	N/A
13. Remark	N/A

Standard Test Conditions**and****Engineering Practices**

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with TIA603, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

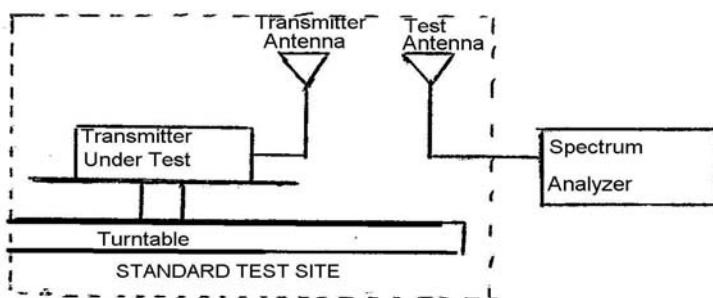
Name of Test: ERP/EIRP Carrier Power (Radiated)

Specification: TIA/EIA 603A (Substitution Method)

Definition: The average radiated power of device is the equivalent power required, when delivered to a substitution antenna, to produce at a distant point the same average received power as produced by the licensed device.

Method Of Measurement:

a) Connect the equipment as illustrated. Place the transmitter to be tested on the turntable in the standard test site.



b) Raise and lower the test antenna from 1m to 4m and rotate turntable from 0° to 360°. Record the highest received signal showed in spectrum analyzer as R_t .

Calculate electric field strength in receive antenna as E_t .

$$E_t = R_t + AF$$

AF (dB/m): Receive Antenna Factor

c) Replace the transmitter under test with a substitution antenna. The center of the antenna should be at the same location as the transmitter under test. Connect the antenna to a signal generator with a known output power level P_s . Raise and lower the test antenna like in step b) and record the highest received signal showed in spectrum analyzer as R_s . Calculate electric field strength in receive antenna as E_s .

$$E_s = R_s + AF$$

AF (dB/m): Receive Antenna Factor

d) Calculate radiated power as following:

$$E(I)RP = P_s + E_t - E_s + G_s$$

P_s (dBm): Input Power to Substitution Antenna

G_s (dBd or dBi): Substitution Antenna Gain

Results Attached

Test Results For: ERP/EIRP Carrier Power (Radiated)

Conducted Power

Bands	Channel	Frequency (MHz)	Conducted Power (dBm)
GSM850	128	824.2 (Low)	28.3
	189	836.4 (Mid)	28.4
	251	848.8 (High)	28.5
GSM1900	512	1850.2 (Low)	29.2
	661	1880.0 (Mid)	28.9
	810	1909.8 (High)	28.3

GSM850 ERP

Freq MHz	Ps (dBm)	Gs (dBd)	Et	Es	Et – Es dB	Pol	Radiated P Out dBm	Radiated P Out Watts
824.4	-0.36	26.5	113.1	125.0	-11.9	H	14.3	0.027
836.4	-0.37	26.7	113.4	124.5	-11.1	H	15.2	0.033
848.8	-0.35	26.8	113.6	123.9	-10.3	H	16.1	0.041
824.4	-0.36	26.5	114.9	119.6	-4.7	V	21.5	0.141
836.4	-0.37	26.7	115.5	120.6	-5.1	V	21.2	0.132
848.8	-0.35	26.8	115.7	121.7	-6.0	V	20.4	0.110

GSM1900 EIRP

Freq MHz	Ps (dBm)	Gs (dBd)	Et	Es	Et – Es dB	Pol	Radiated P Out dBm	Radiated P Out Watts
1850.2	-0.6	6.7	126.3	105.6	20.7	H	26.8	0.479
1880	-0.6	6.7	125.7	105.7	20.0	H	26.1	0.407
1909.8	-0.6	6.8	125.6	105.9	19.7	H	25.9	0.389
1850.2	-0.6	6.7	123.1	105.3	17.8	V	23.9	0.245
1880	-0.6	6.7	122.4	105.3	17.1	V	23.2	0.209
1909.8	-0.6	6.8	122.5	105.4	17.1	V	23.3	0.214

Name of Test: Emission Masks (Occupied Bandwidth)

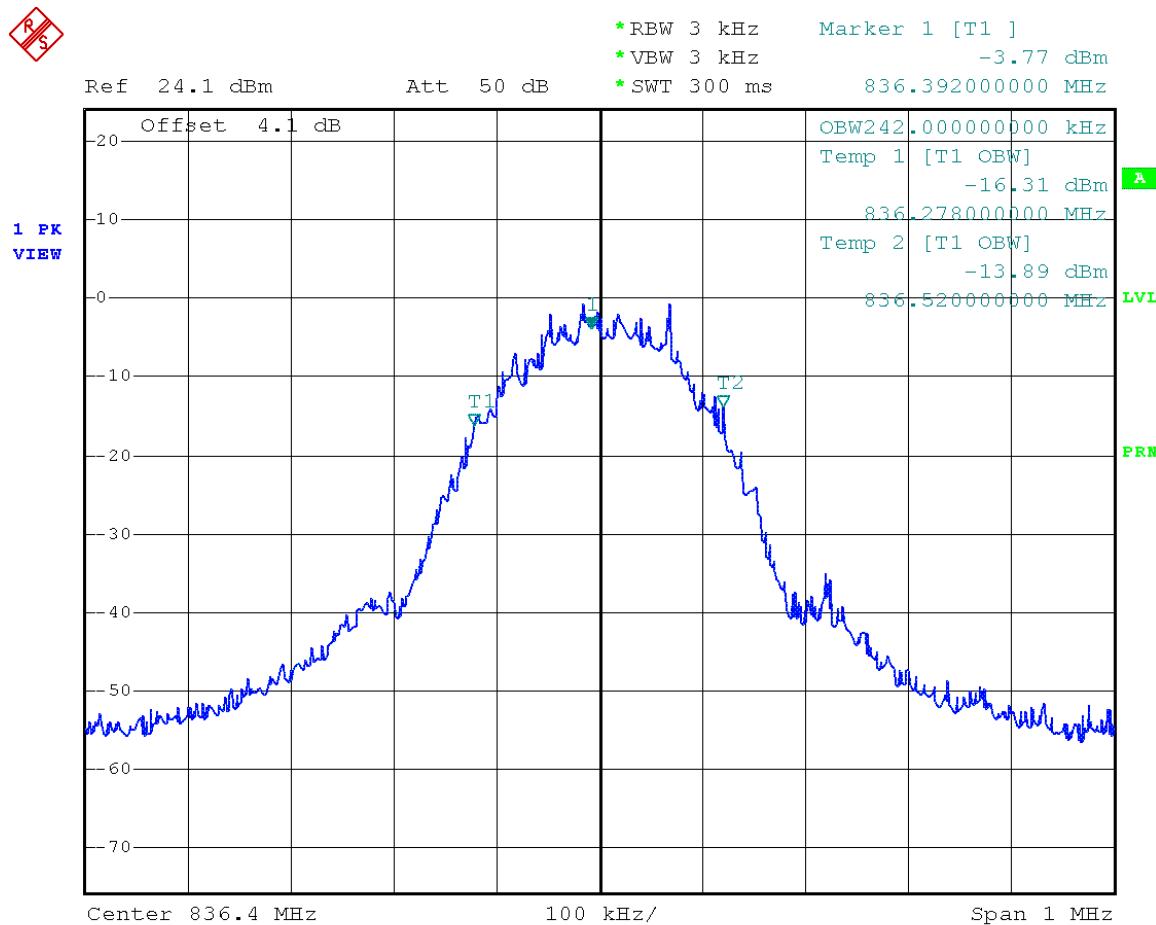
Specification: 47 CFR 2.1049(c)(1), 22

Test Equipment: As per previous page

Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer connected.
3. For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.
4. The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.
5. Measurement Results: Attached

Name of Test: Emission Masks (Occupied Bandwidth)
State: 1:Low Power



Date: 16.NOV.2003 01:20:39

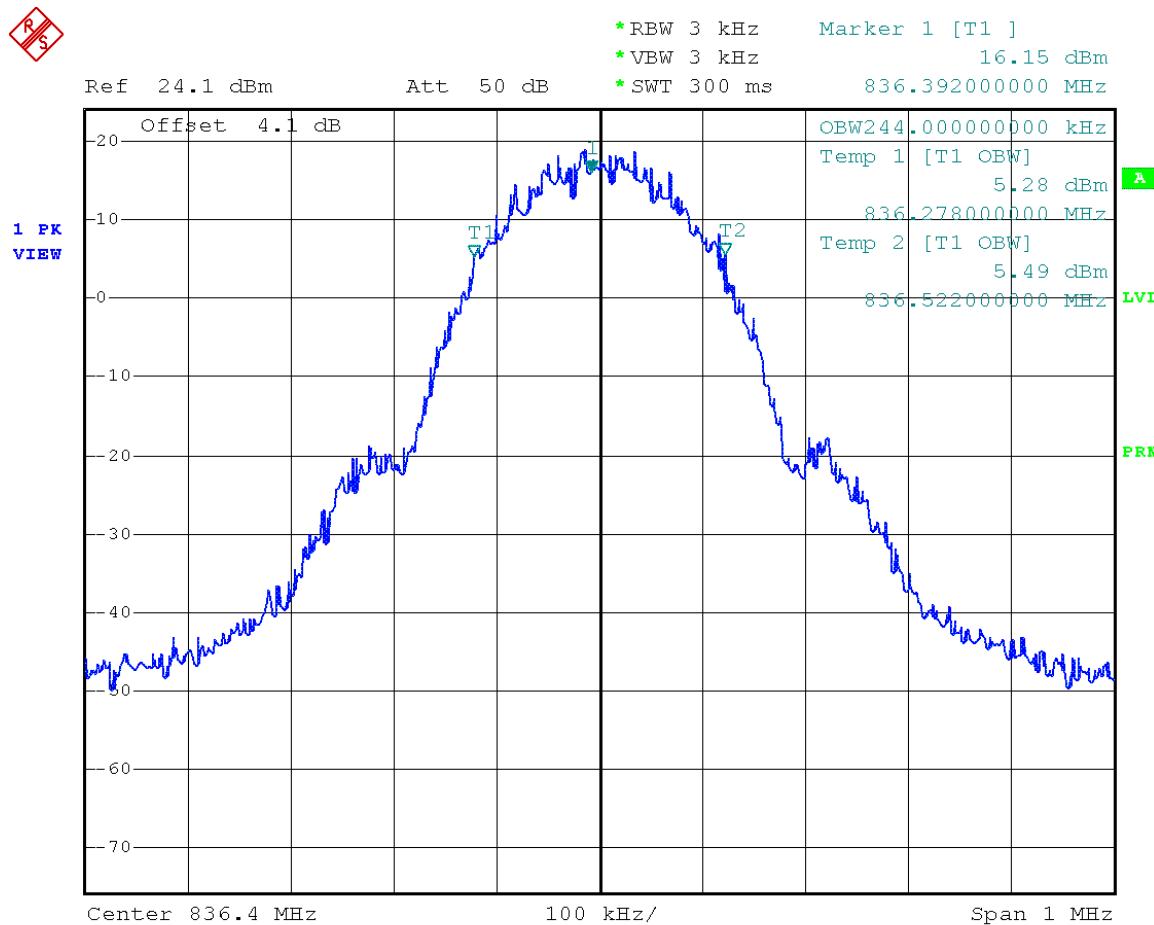
Power: LOW
 Modulation: GSM/GPRS850
 99% BANDWIDTH

Hendry Yang

Performed By:

Hendry Yang

Name of Test: Emission Masks (Occupied Bandwidth)
State: 2:High Power



Date: 16.NOV.2003 01:21:48

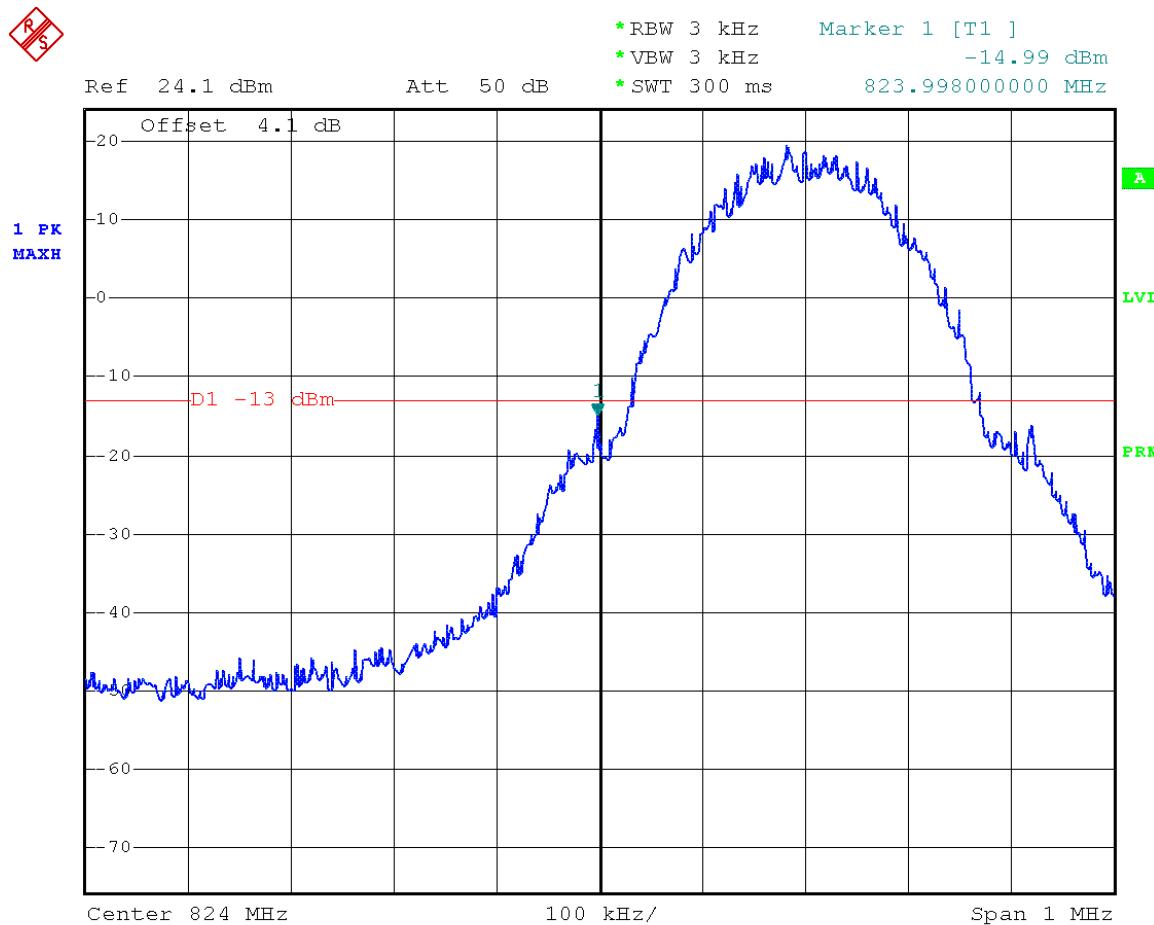
Power: HIGH
 Modulation: GSM/GPRS850
 99% BANDWIDTH

Hendry Yang

Performed By:

Hendry Yang

Name of Test: Emission Masks (Occupied Bandwidth)
State: 2:High Power



Date: 31.OCT.2003 22:08:47

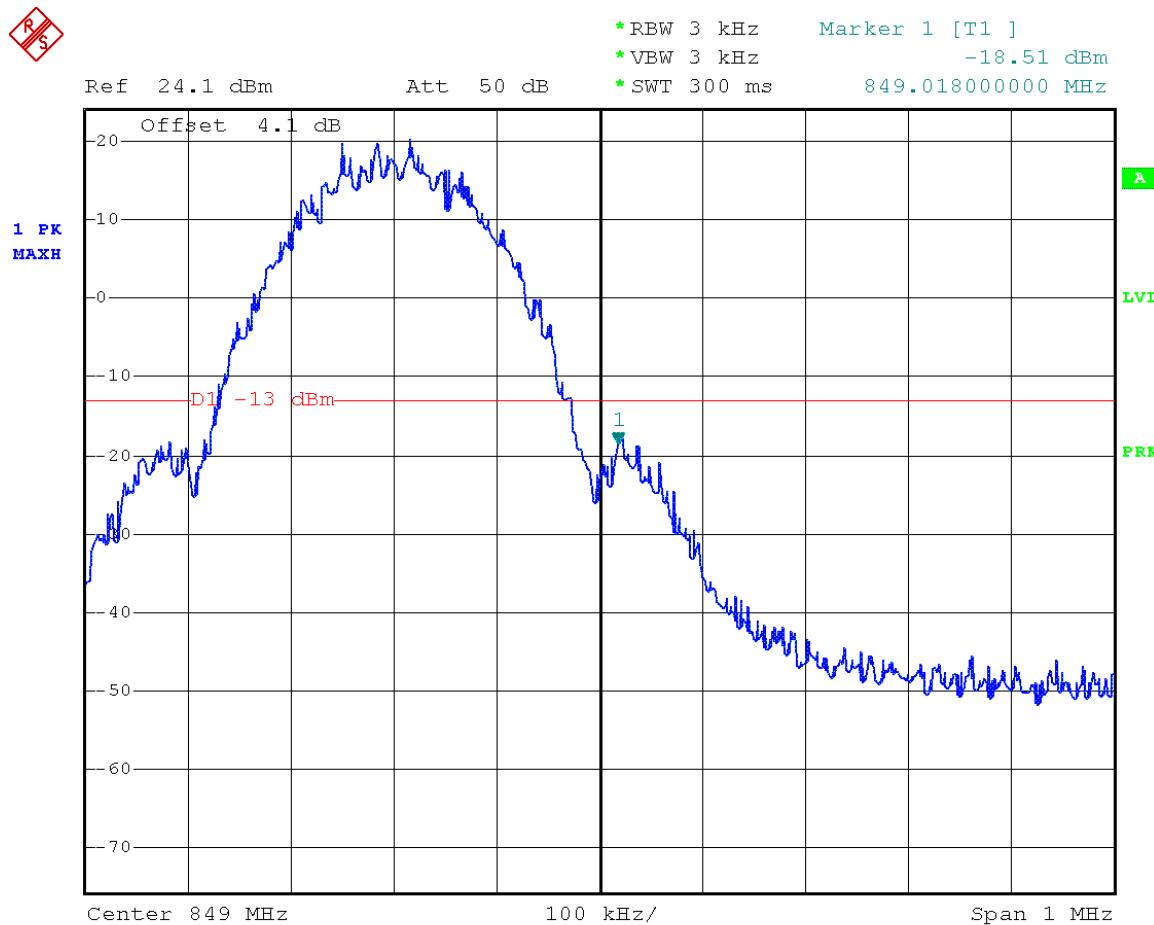
Power: HIGH
Modulation: GSM/GPRS850
A LOWER BAND EDGE

Hendry Yang

Performed By:

Hendry Yang

Name of Test: Emission Masks (Occupied Bandwidth)
State: 2:High Power



Date: 31.OCT.2003 22:12:13

Power: HIGH
 Modulation: GSM/GPRS850
 UPPER BAND EDGE

Hendry Yang

Performed By:

Hendry Yang

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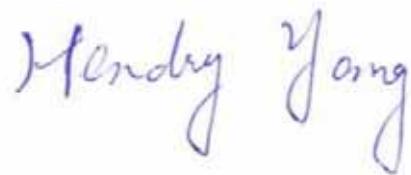
Name of Test: Transmitter Conducted Measurements

Specification: 47 CFR 2.1051: Unwanted (spurious) Emissions
2.1049(c), 24.238(b): Occupied Bandwidth
24: Emissions at Band Edges

Test Equipment: As per attached page

Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page with the Spectrum Analyzer connected.
2. The low and high channels for all RF powers within the Transmitting frequency band were measured.
3. Measurement Results: Attached

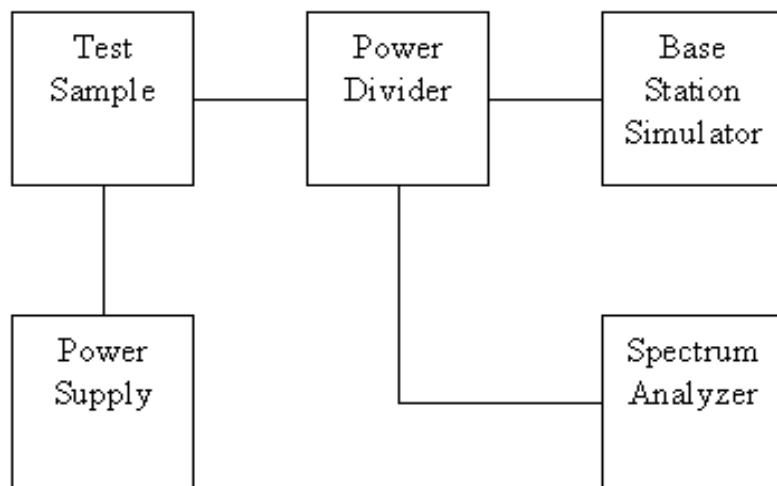


Performed By:

Hendry Yang

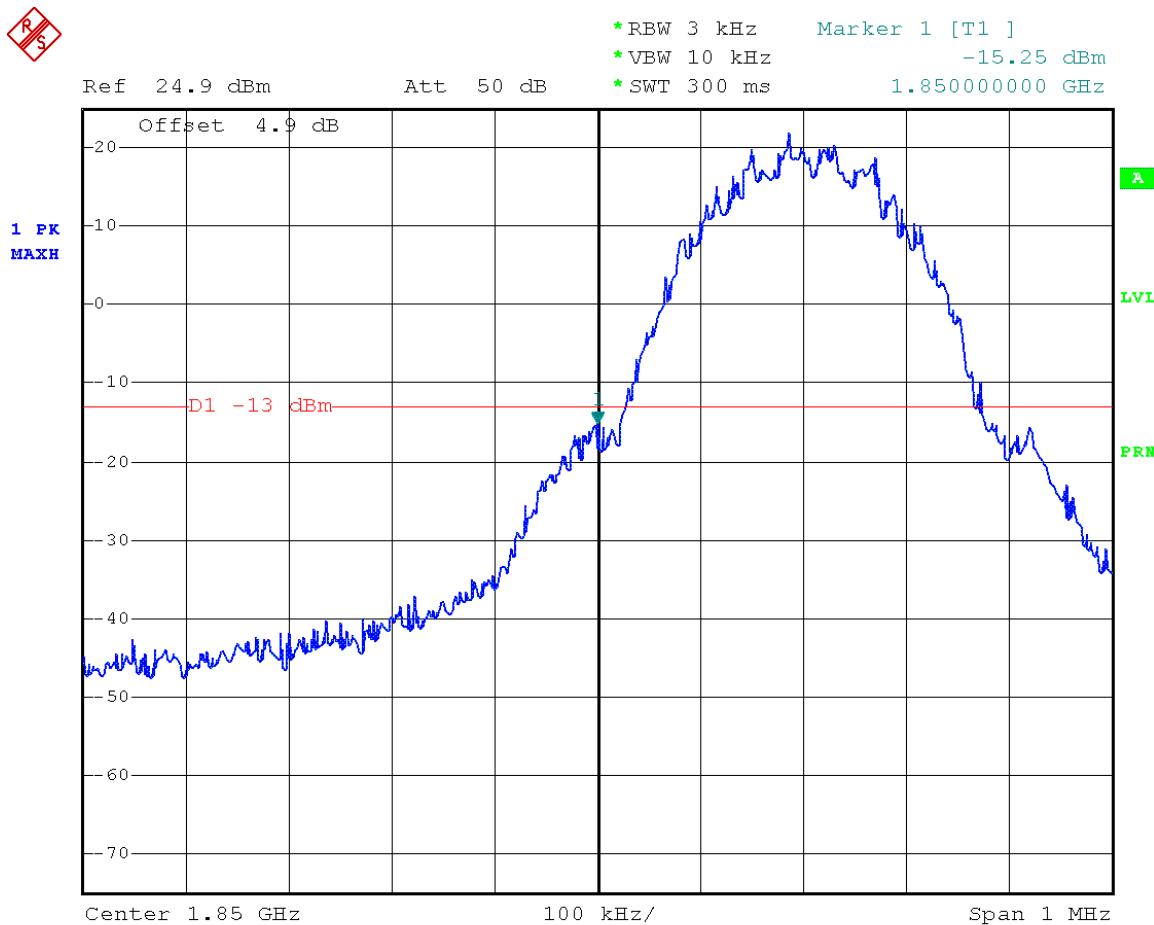
Transmitter Spurious Emission

Test A. Occupied Bandwidth (In-Band Spurious)
Test B. Out-of-Band Spurious



Asset	Model Name	S/N
Base Station Simulator	CMU200	102278
Spectrum Analyzer	FSP30	838858/014
AC/DC Power Source	HPA-500W	HPA0100024

Name of Test: Emission Masks (Occupied Bandwidth)
State: 2:High Power



Date: 31.OCT.2003 22:26:58

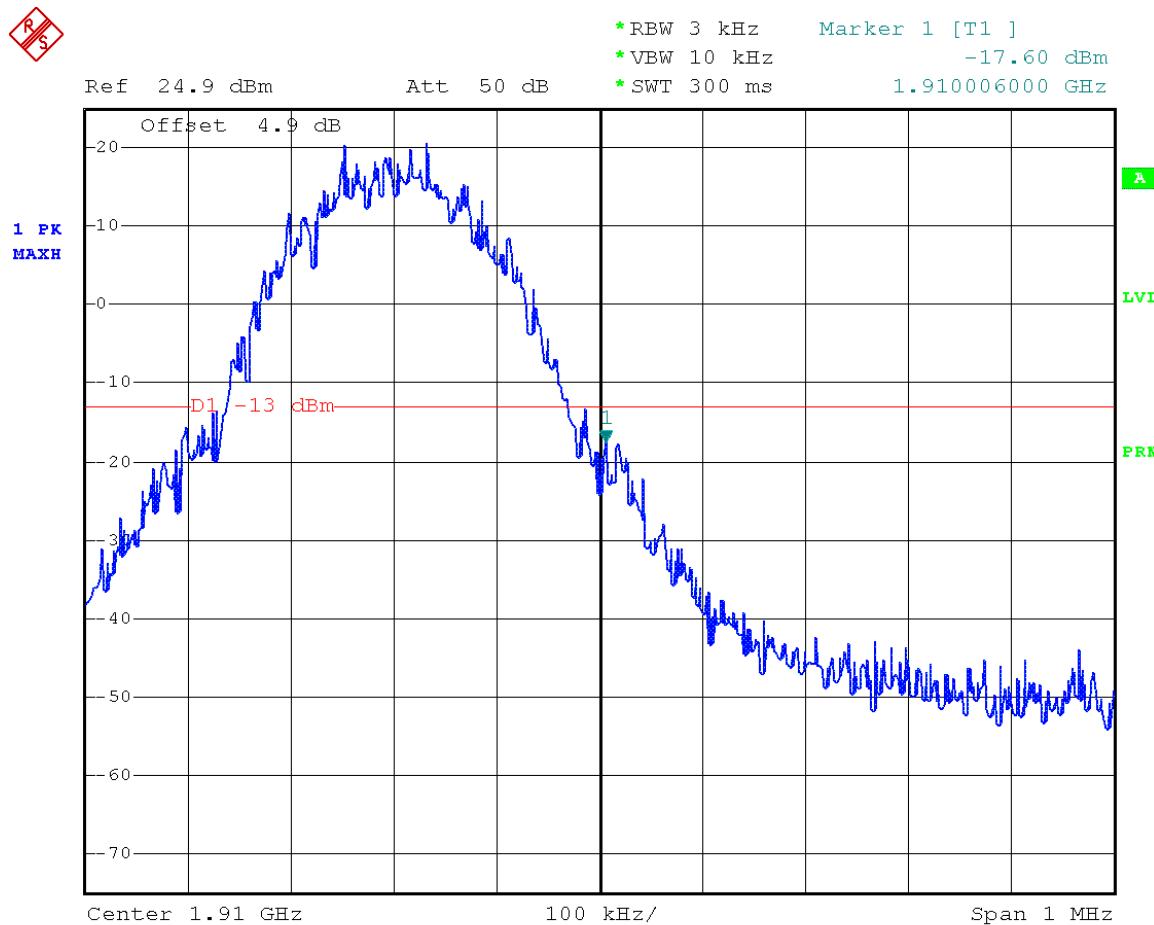
Power: HIGH
Modulation: GSM/GPRS1900
LOWER BAND EDGE

Hendry Yang

Performed By:

Hendry Yang

Name of Test: Emission Masks (Occupied Bandwidth)
State: 2:High Power



Date: 31.OCT.2003 22:38:05

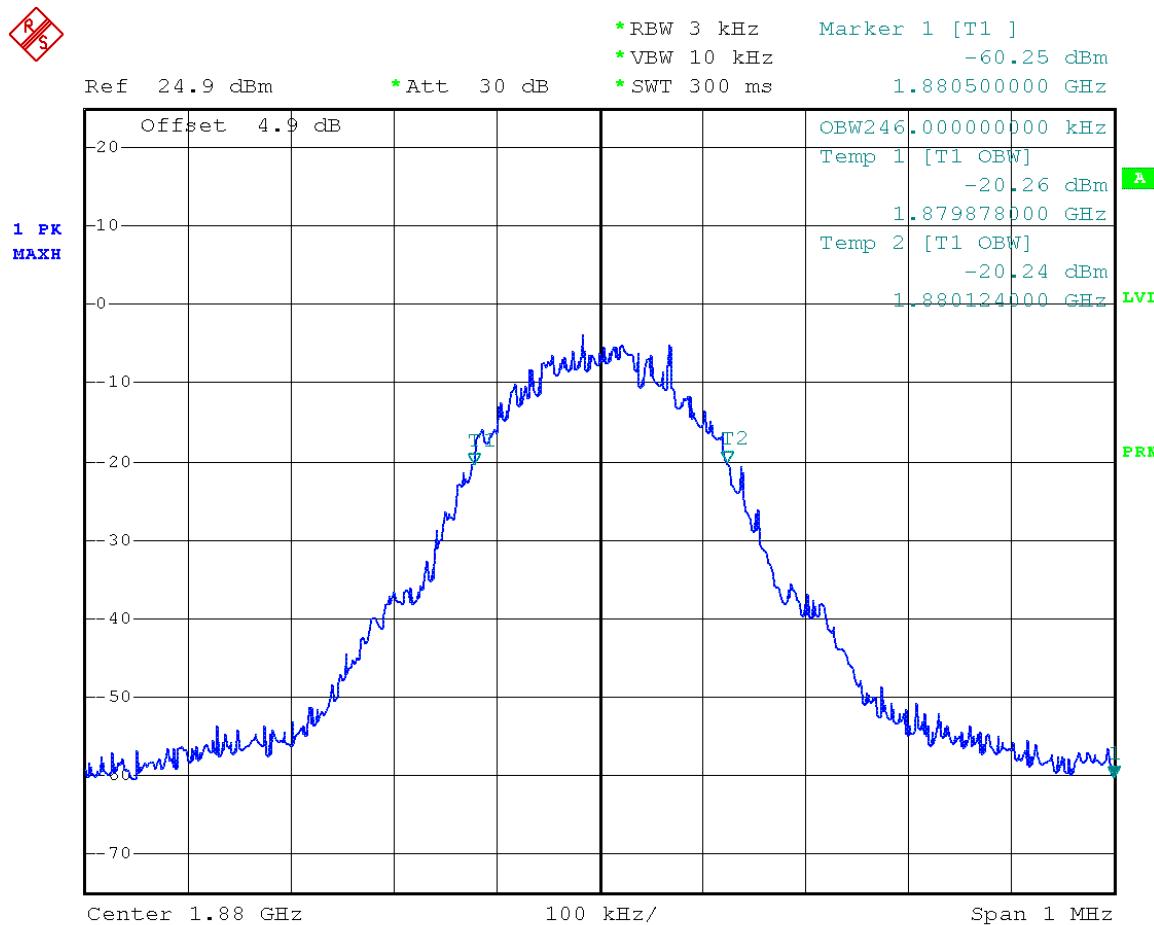
Power: HIGH
 Modulation: GSM/GPRS1900
 UPPER BAND EDGE

Hendry Yang

Performed By:

Hendry Yang

Name of Test: Emission Masks (Occupied Bandwidth)
State: 1:Low Power



Date: 24.OCT.2003 05:42:11

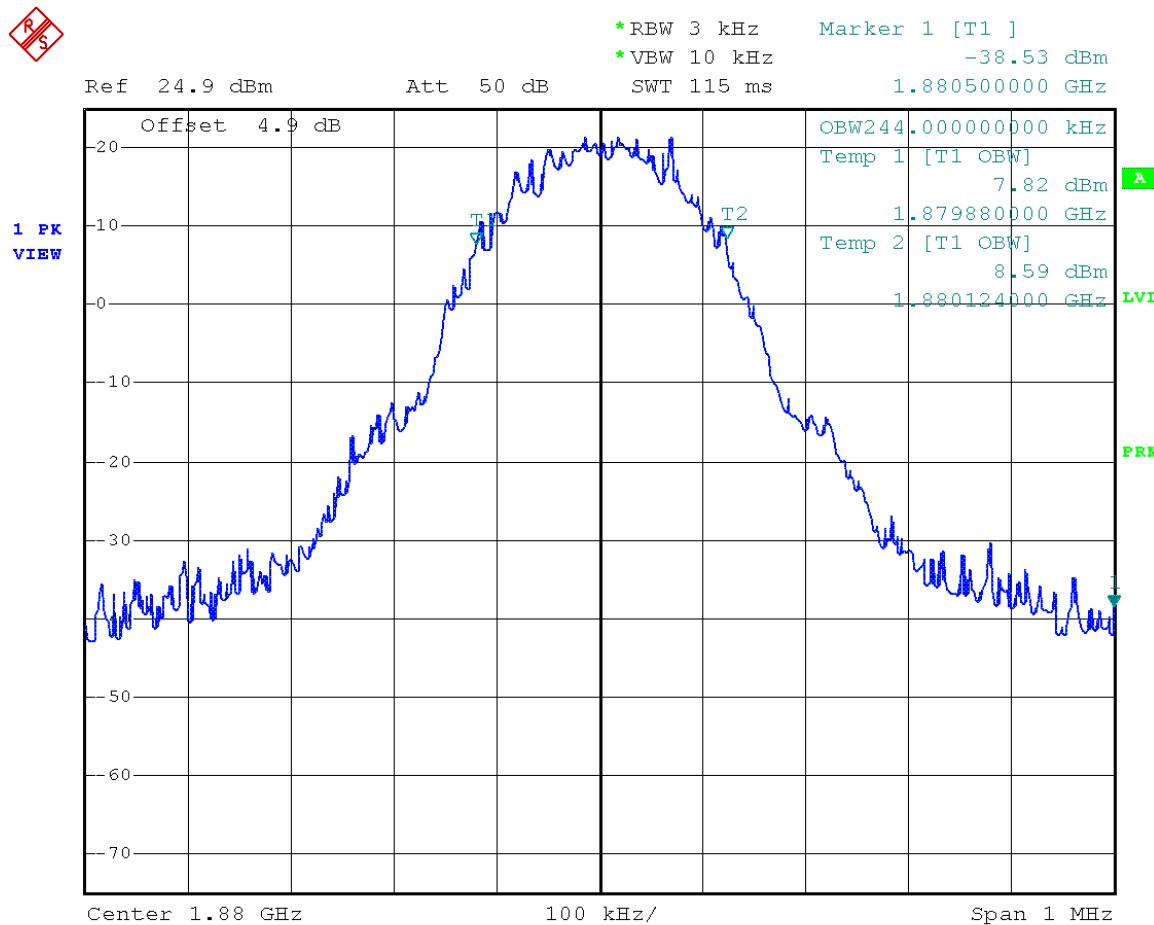
Power: LOW
 Modulation: GSM/GPRS1900
 99% BANDWIDTH

Hendry Yang

Performed By:

Hendry Yang

Name of Test: Emission Masks (Occupied Bandwidth)
State: 2:High Power



Date: 29.OCT.2003 17:12:41

Power: HIGH
 Modulation: GSM/GPRS1900
 99% BANDWIDTH

Hendry Yang

Performed By:

Hendry Yang

Name of Test: Field Strength of Spurious Radiation

Specification: 47 CFR 2.1053(a)

Guide: ANSI/TIA/EIA-603-1992/2001, Paragraph 1.2.12 and Table 16, 47 CFR 22.917

Measurement Procedure

1.2.12.1 Definition: Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

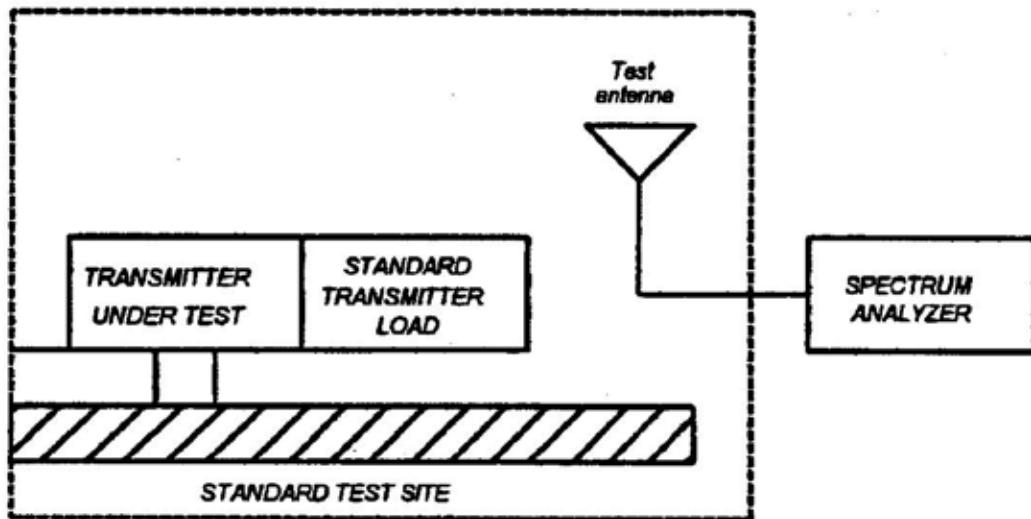
1.2.12.2 Method of Measurement

A) Connect the equipment as illustrated

B) Adjust the spectrum analyzer for the following settings:

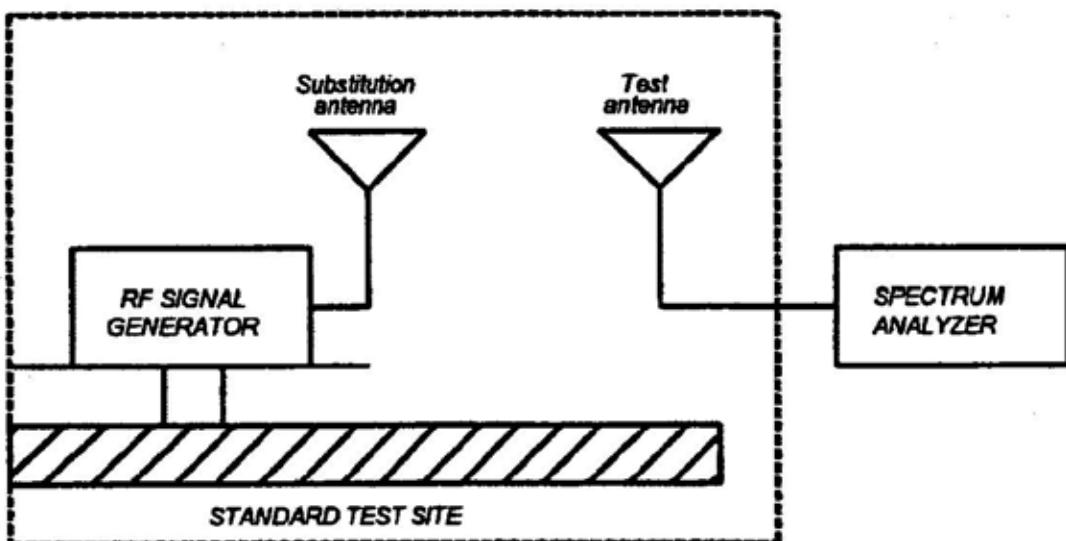
- 1) Resolution Bandwidth 100 kHz (<1 GHz), 1 MHz (> 1GHz).
- 2) Video Bandwidth \geq 3 times Resolution Bandwidth
- 3) Sweep Speed \leq 2000 Hz/second
- 4) Detector Mode = Mean or Average Power

C) Place the transmitter to be tested on the turntable in the standard test site. If the antenna is detatchable, The transmitter is transmitting into a non-radiating load which is placed on the turntable. The RF cable to this load should be of minimum length.



Name of Test: Field Strength of Spurious Radiation (Cont.)

- D) For each spurious measurement the test antenna should cover the measured frequency. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to \pm the test bandwidth (see section 1.3.4.4).
- E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
- F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.



- G) Reconnect the equipment as illustrated.
- H) Keep the spectrum analyzer adjusted as in step B).
- I) Remove the transmitter and replace it with a substitution antenna. The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

Name of Test: Field Strength of Spurious Radiation (Cont.)

- J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
- K) Repeat step J) with both antennas vertically polarized for each spurious frequency.
- L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

Name of Test: Field Strength of Spurious Radiation

Frequency Tuned : 836.4 MHz

Freq MHz	Pol	Substitution Antenna Input Level (dBm)	Substitution Antenna Gain dBd	ERP, dBm	Limit (dBm)	Margin (dBm)
1670.0	H	-40.7	4.4	-36.2	-13.0	-23.2
2510.0	H	-50.8	5.5	-45.3	-13.0	-32.3
3108.0	H	-48.6	7.6	-41.1	-13.0	-28.1
3330.0	H	-49.1	7.8	-41.3	-13.0	-28.3
4182.0	H	-69.1	8.2	-60.9	-13.0	-47.9
5010.0	H	-64.9	7.5	-57.4	-13.0	-44.4
5850.0	H	-64.1	8.5	-55.6	-13.0	-42.6
6690.0	H	-59.0	8.0	-51.0	-13.0	-38.0
7530.0	H	-58.4	5.7	-52.7	-13.0	-39.7
8364.0	H	-59.8	6.7	-53.1	-13.0	-40.1
<hr/>						
1670.0	V	-39.5	4.4	-35.0	-13.0	-22.0
2510.0	V	-49.6	5.5	-44.1	-13.0	-31.1
3114.0	V	-55.7	7.6	-48.1	-13.0	-35.1
3252.0	V	-54.3	7.8	-46.6	-13.0	-33.6
3330.0	V	-54.4	7.9	-46.2	-13.0	-33.2
4176.0	V	-69.0	8.2	-61.5	-13.0	-48.5
5004.0	V	-65.5	7.5	-57.0	-13.0	-44.0
5856.0	V	-66.3	8.5	-58.2	-13.0	-45.2
6690.0	V	-54.0	8.0	-48.2	-13.0	-35.2
7548.0	V	-62.9	5.7	-56.2	-13.0	-43.2
8364.0	V	-52.3	6.7	-52.3	-13.0	-39.3

Name of Test: Field Strength of Spurious Radiation

Frequency Tuned : 1880 MHz

Freq MHz	Pol	Substitution Antenna Input Level (dBm)	Substitution Antenna Gain dBi	EIRP, dBm	Limit (dBm)	Margin (dBm)
140.6	H	-56.4	1.7	-54.7	-13.0	-41.7
3105.0	H	-50.1	9.5	-40.6	-13.0	-27.6
3749.0	H	-55.6	10.3	-45.3	-13.0	-32.3
3798.0	H	-56.1	10.3	-45.7	-13.0	-32.7
5646.0	H	-53.1	10.4	-42.7	-13.0	-29.7
7522.0	H	-53.1	7.7	-45.4	-13.0	-32.4
9405.0	H	-52.8	10.9	-41.9	-13.0	-28.9
11280.0	H	-63.8	10.4	-53.5	-13.0	-40.5
13160.0	H	-73.9	10.1	-63.9	-13.0	-50.9
15040.0	H	-84.6	11.9	-72.6	-13.0	-59.6
16920.0	H	-79.7	9.2	-70.5	-13.0	-57.5
140.6	V	-50.2	1.7	-48.5	-13.0	-35.5
3105.0	V	-57.3	9.5	-47.8	-13.0	-34.8
3749.0	V	-53.6	10.3	-43.3	-13.0	-30.3
5625.0	V	-60.5	10.4	-50.1	-13.0	-37.1
7522.0	V	-61.3	7.7	-53.6	-13.0	-40.6
9405.0	V	-62.4	10.9	-51.5	-13.0	-38.5
11288.0	V	-65.0	10.4	-54.7	-13.0	-41.7
13064.0	V	-76.8	10.1	-66.7	-13.0	-53.7
15040.0	V	-83.9	11.9	-71.9	-13.0	-58.9
16920.0	V	-77.2	9.2	-67.9	-13.0	-54.9

Name of Test: Frequency Stability (Temperature Variation)

Specification: 47 CFR 2.1055(a)(1)

Test Conditions: As Indicated

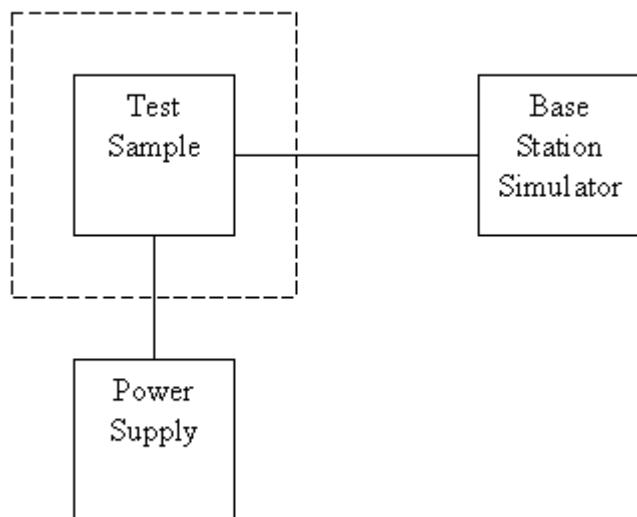
Test Equipment: As per previous page

Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The temperature tests were performed for the worst case.
5. Measurement Results: Attached

Transmitter Test Set-Up

Frequency Stability: Temperature Variation
Frequency Stability: Voltage Variation



Asset	Model Name	S/N
Temperature & Humidity Controller	P-9000	612
AC/DC Power Source	HPA-500W	HPA0100024
Base Station Simulator	CMU200	102278

Name of Test: Frequency Stability (Temperature Variation)

GSM/GPRS CELLULAR BAND

Frequency Tuned : 836.4 MHz

Temperature(°C)	Change, Hz	Change, ppm
-30	-284	-0.33
-20	-172	-0.20
-10	-75	-0.09
0	-67	-0.08
10	-75	-0.09
20	-64	-0.08
30	-58	-0.07
40	-44	-0.05
50	-84	-0.10

GSM/GPRS PCS BAND

Frequency Tuned : 1880 MHz

Temperature(°C)	Change, Hz	Change, ppm
-30	-345	-0.18
-20	-232	-0.12
-10	-192	-0.10
0	-187	-0.10
10	-205	-0.11
20	-143	-0.08
30	-126	-0.07
40	-164	-0.09
50	-176	-0.09

Name of Test: Frequency Stability (Voltage Variation)

Specification: 47 CFR 2.1055 (b)(1)

Test Equipment: As per previous page

Measurement Procedure

1. The EUT was placed in a temperature chamber at $25\pm5^{\circ}\text{C}$ and connected as for "Frequency Stability - Temperature Variation" test.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

Results: Frequency Stability (Voltage Variation)

GSM/GPRS CELLULAR BAND

Frequency Tuned : 836.4 MHz

Nominal Value (Voltage) = 5.0

Voltage(Volt)	Change, Hz	Change, ppm
5.00	-44	-0.05
4.25	-39	-0.05
5.75	-59	-0.07

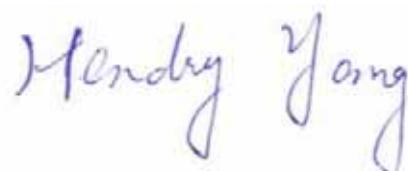
GSM/GPRS PCS BAND

Frequency Tuned : 1880 MHz

Nominal Value (Voltage) = 5.0

Voltage(Volt)	Change, Hz	Change, ppm
5.00	-110	-0.06
4.25	-161	-0.08
5.75	-101	-0.05

Limit: Must remain within authorized frequency block.

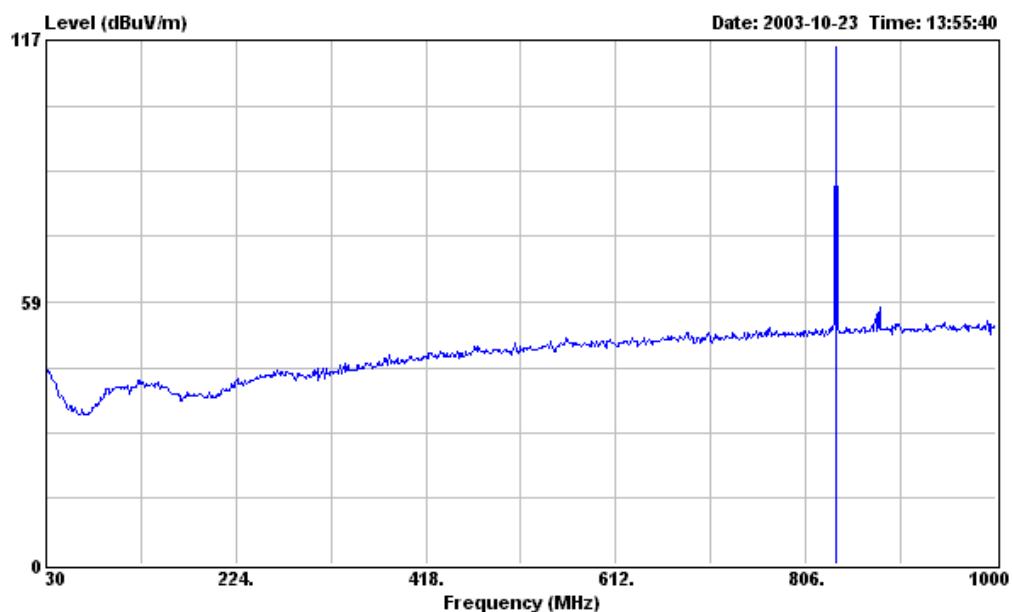


Performed By:

Hendry Yang

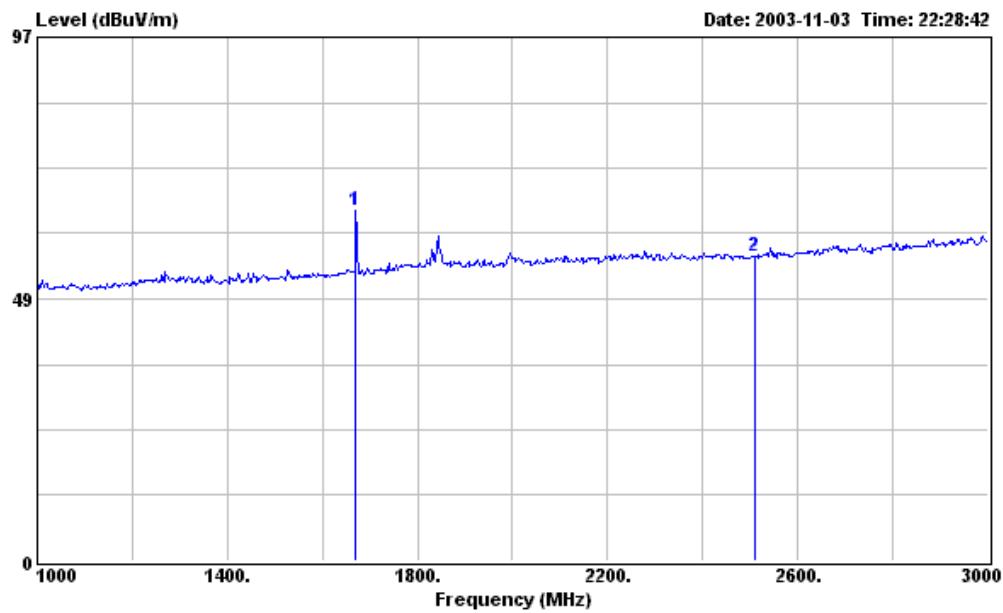
Radiated Scanned Data

GSM850, Horizontal Polarization



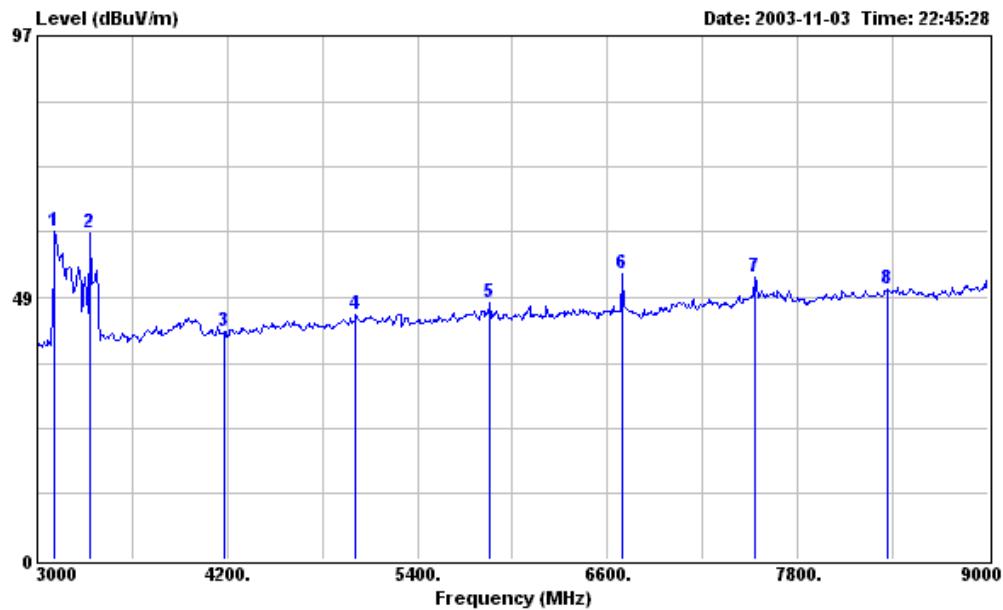
Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM850 CH189

	Over Freq	Limit Level	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB		cm	deg
1	836.070	115.47	-----	91.04	19.02	5.41	0.00	Peak	---	---



Site : 03CH03-HY
Condition : 3m HORN-ANT-6741 HORIZONTAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM850 CH189

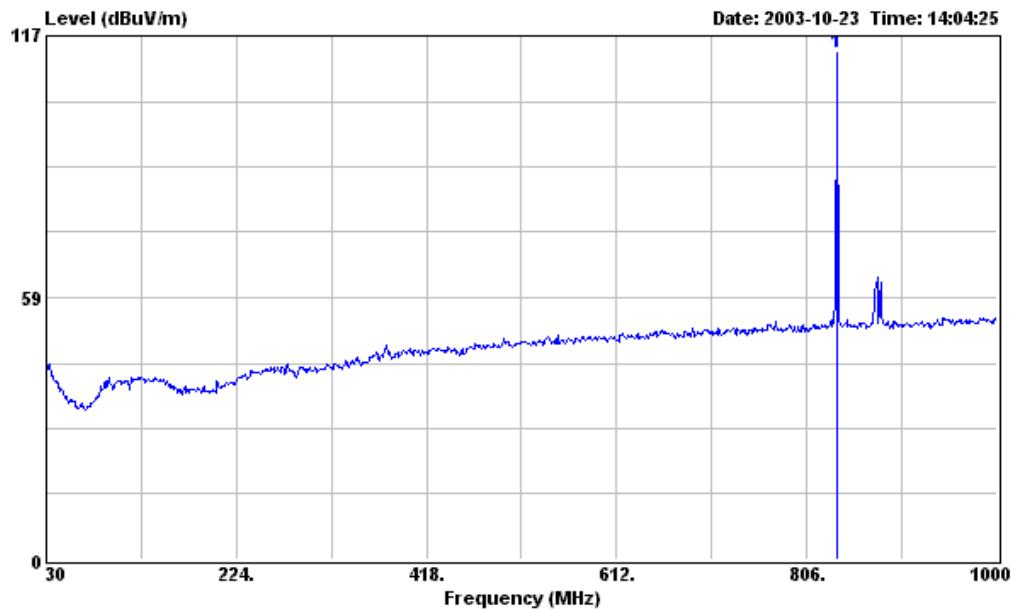
Freq	Over Limit		Read Line		Probe	Cable Preamp		Ant Remark	Ant	Table
	Level	Limit	Limit	Line	Level	Factor	Cable	Preamp	Pos	Pos
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg	
1	1670.000	64.97	-----	-----	36.53	26.06	2.38	0.00	Peak	---
2	2510.000	56.45	-----	-----	25.06	28.47	2.92	0.00	Peak	---

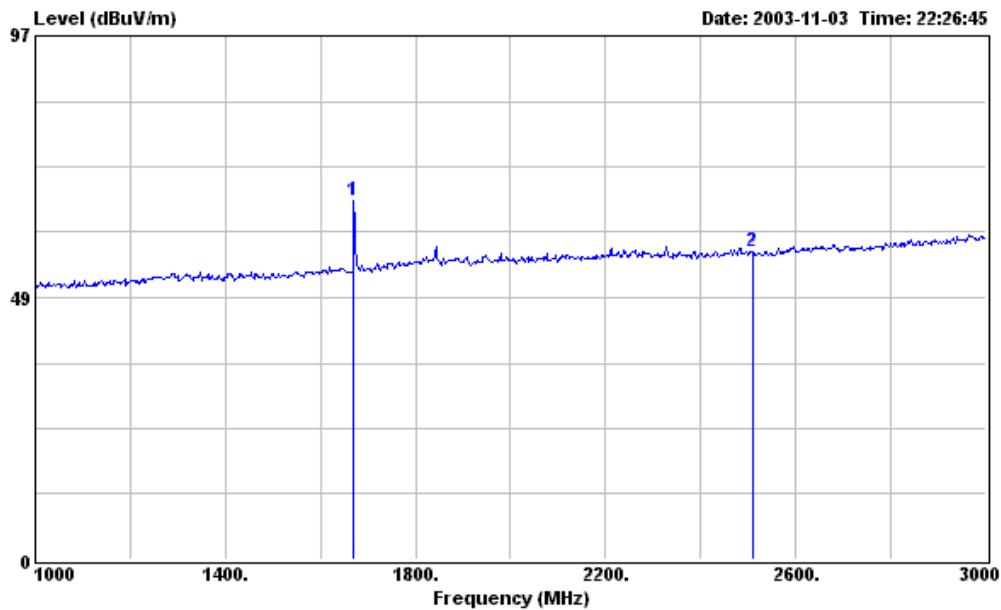


Site : 03CH03-HY
 Condition : 3m HORN-ANT-6741 HORIZONTAL
 EUT : GPRS Modem
 Power :
 MODEL : SCMi250u
 MEMO : GSM850 CH189

Freq	MHz	Over	Limit	Read	Probe	Cable	Preamp	Ant	Table	
		Level	Limit	Line	Level	Factor	Loss			
1	3108.000	60.76	-----	-----	68.70	30.26	3.02	41.22	Peak	---
2	3330.000	60.46	-----	-----	66.54	30.80	4.39	41.27	Peak	---
3	4182.000	42.12	-----	-----	46.73	32.52	4.52	41.65	Peak	---
4	5010.000	45.41	-----	-----	50.35	33.43	4.25	42.62	Peak	---
5	5850.000	47.70	-----	-----	52.02	34.14	4.78	43.24	Peak	---
6	6690.000	52.92	-----	-----	56.21	34.68	5.21	43.18	Peak	---
7	7530.000	52.39	-----	-----	52.98	36.53	5.25	42.37	Peak	---
8	8364.000	49.96	-----	-----	48.29	37.64	5.73	41.70	Peak	---

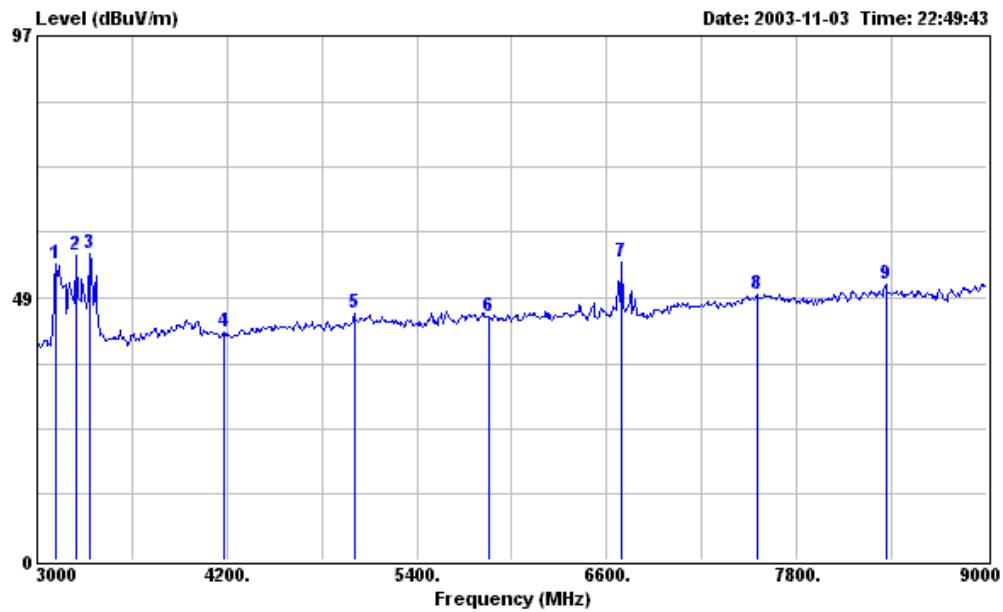
GSM850, Vertical Polarization





Site : 03CH03-HY
Condition : 3m HORN-ANT-6741 VERTICAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM850 CH189

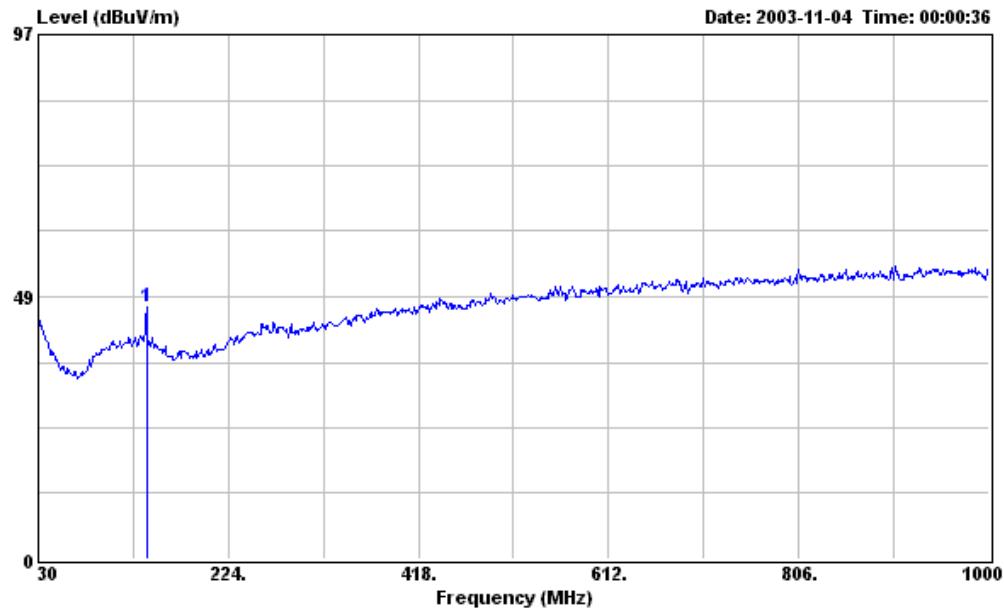
Freq	MHz	Over	Limit	Read	Probe	Cable	Preamp	Ant Pos	Table Pos
		Level	Limit	Line	Level	Factor	Loss		
1	1670.000	66.37	-----	-----	37.93	26.06	2.38	0.00 Peak	---
2	2510.000	56.97	-----	-----	25.58	28.47	2.92	0.00 Peak	---



Site : 03CH03-HY
 Condition : 3m HORN-ANT-6741 VERTICAL
 EUT : GPRS Modem
 Power :
 MODEL : SCMi250u
 MEMO : GSM850 CH189

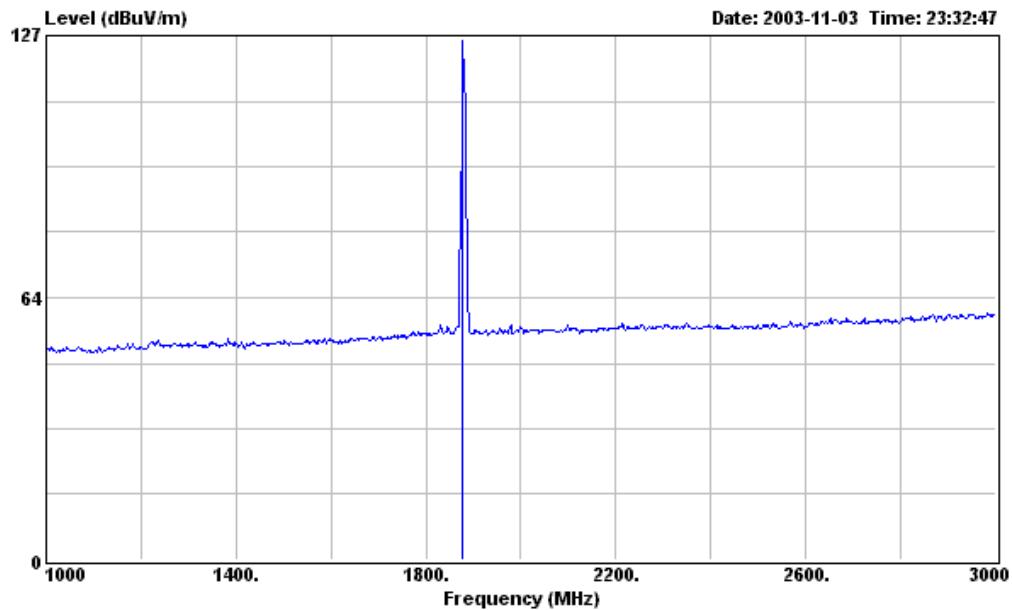
Freq	Over Limit		Read Line	Probe Level	Cable Factor	Preamp Factor	Ant Loss	Table Pos	
	MHz	dBuV/m	dB	dBuV/m	dB	dB	dB	cm	deg
1	3114.000	54.88	-----	62.86	30.28	2.96	41.22	Peak	---
2	3252.000	56.33	-----	63.59	30.61	3.38	41.25	Peak	---
3	3330.000	56.62	-----	62.70	30.80	4.39	41.27	Peak	---
4	4176.000	42.09	-----	46.59	32.53	4.62	41.65	Peak	---
5	5004.000	45.58	-----	50.53	33.42	4.24	42.61	Peak	---
6	5856.000	44.95	-----	49.27	34.14	4.79	43.25	Peak	---
7	6690.000	55.17	-----	58.46	34.68	5.21	43.18	Peak	---
8	7548.000	49.16	-----	49.83	36.55	5.13	42.35	Peak	---
9	8364.000	51.01	-----	49.34	37.64	5.73	41.70	Peak	---

GSM1900, Horizontal Polarization



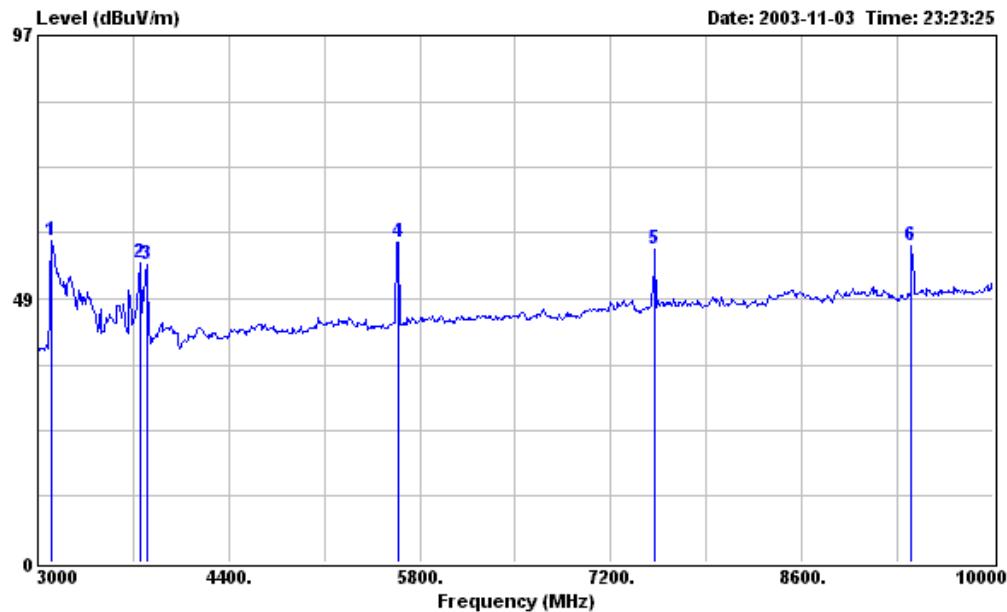
Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM1900 CH661

	Over Freq	Level MHz	Limit dBuV/m	Limit dB	Line dBuV/m	Read dBuV	Probe dB	Cable dB	Preamp dB	Remark	Ant Pos	Table Pos
1	140.580	46.58	-----	-----	34.16	10.24	2.18	0.00	Peak	---	---	---



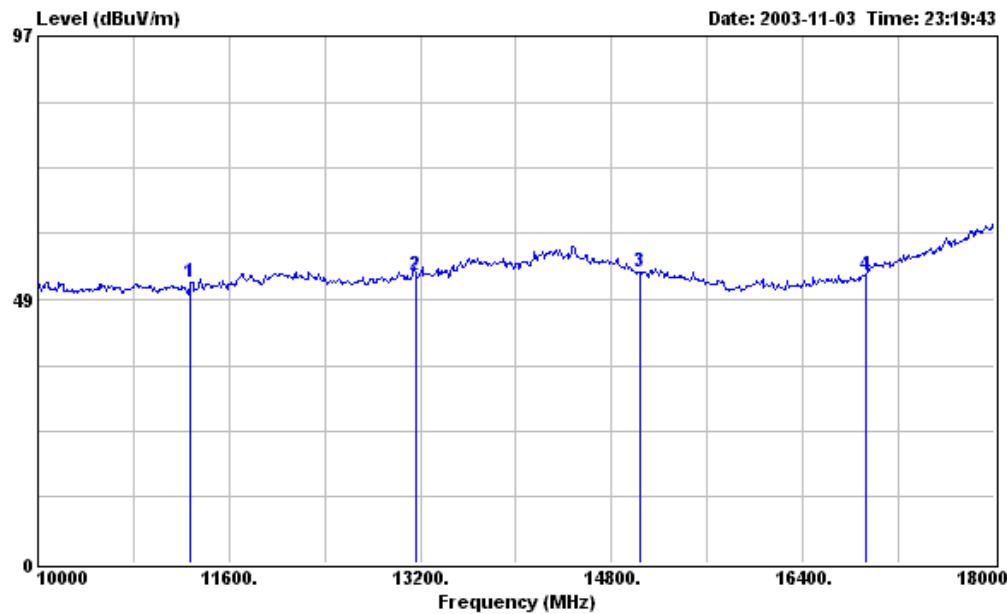
Site : 03CH03-HY
Condition : 3m HORN-ANT-6741 HORIZONTAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM1900 CH661

	Freq	Over Level	Limit	Limit	Read Line	Probe Level	Cable Factor	Preamp Factor	Ant Loss	Table Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm		
1	1878.000	125.66	-----	-----	96.23	26.92	2.51	0.00	Peak	---	---



Site : 03CH03-HY
 Condition : 3m HORN-ANT-6741 HORIZONTAL
 EUT : GPRS Modem
 Power :
 MODEL : SCMi250u
 MEMO : GSM1900 CH661

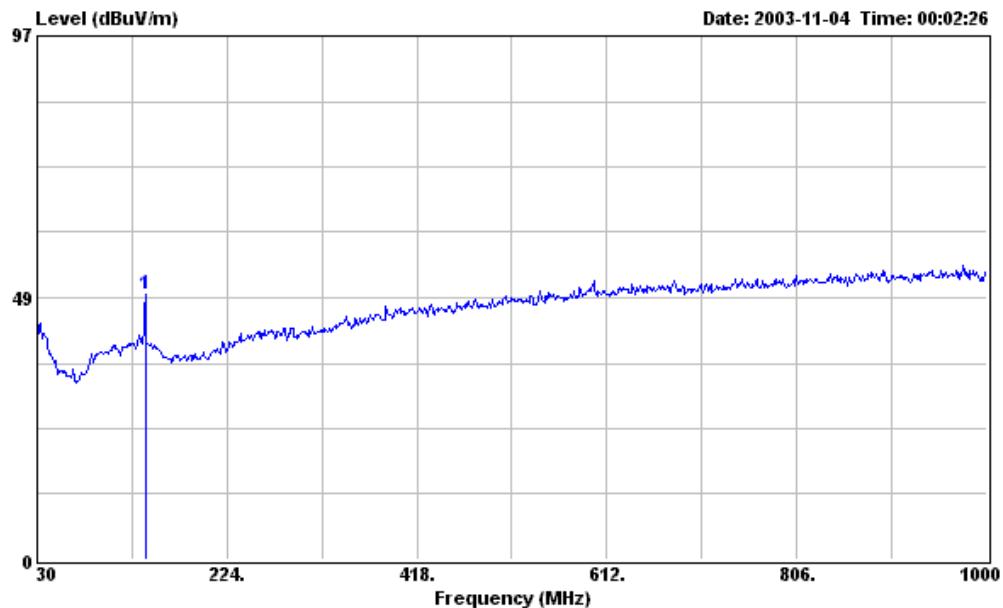
Freq	Over Limit		Read		Probe		Cable Preamp		Ant Pos	Table Pos
	Level	Limit	Line	Level	Factor	Loss	Factor	Remark		
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 3105.000	59.11	-----	-----	67.00	30.25	3.08	41.22	Peak	---	---
2 3749.000	55.19	-----	-----	60.93	31.92	3.74	41.40	Peak	---	---
3 3798.000	54.88	-----	-----	60.84	32.07	3.39	41.42	Peak	---	---
4 5646.000	58.98	-----	-----	63.56	34.06	4.52	43.16	Peak	---	---
5 7522.000	57.55	-----	-----	58.11	36.53	5.29	42.38	Peak	---	---
6 9405.000	58.39	-----	-----	54.30	37.94	6.31	40.16	Peak	---	---



Site : 03CH03-HY
Condition : 3m HORN-ANT-6741 HORIZONTAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM1900 CH661

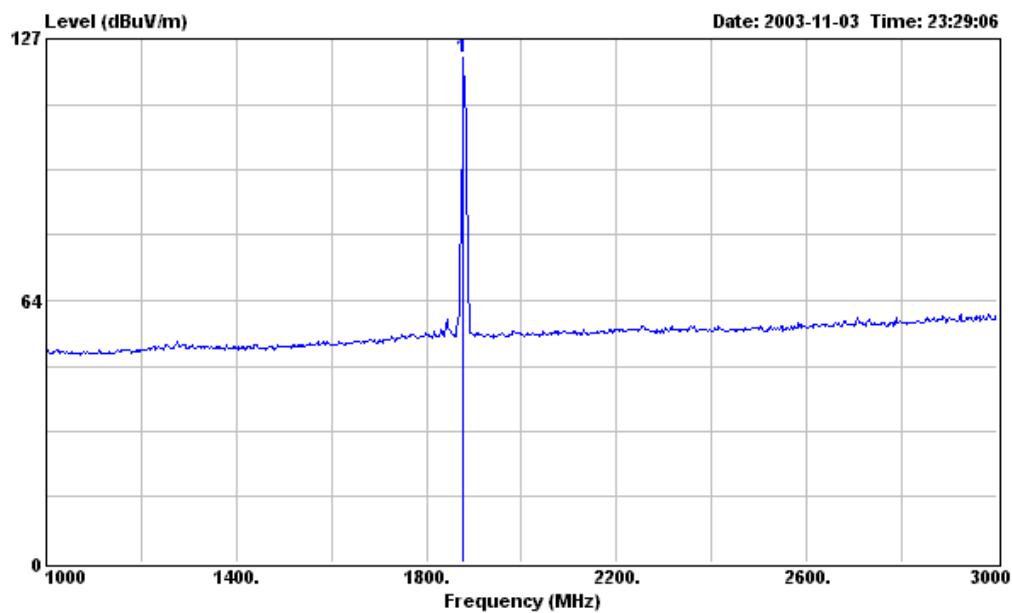
Freq	Over Limit		Read Line		Probe Factor		Cable Preamp		Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		
	MHz	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg	
1	11280.000	51.58	-----	45.94	38.94	6.64	39.94	Peak	---	---
2	13160.000	53.02	-----	47.63	39.63	7.46	41.70	Peak	---	---
3	15040.000	53.64	-----	49.61	40.42	7.27	43.66	Peak	---	---
4	16920.000	52.94	-----	47.60	39.84	8.36	42.86	Peak	---	---

GSM1900, Vertical Polarization



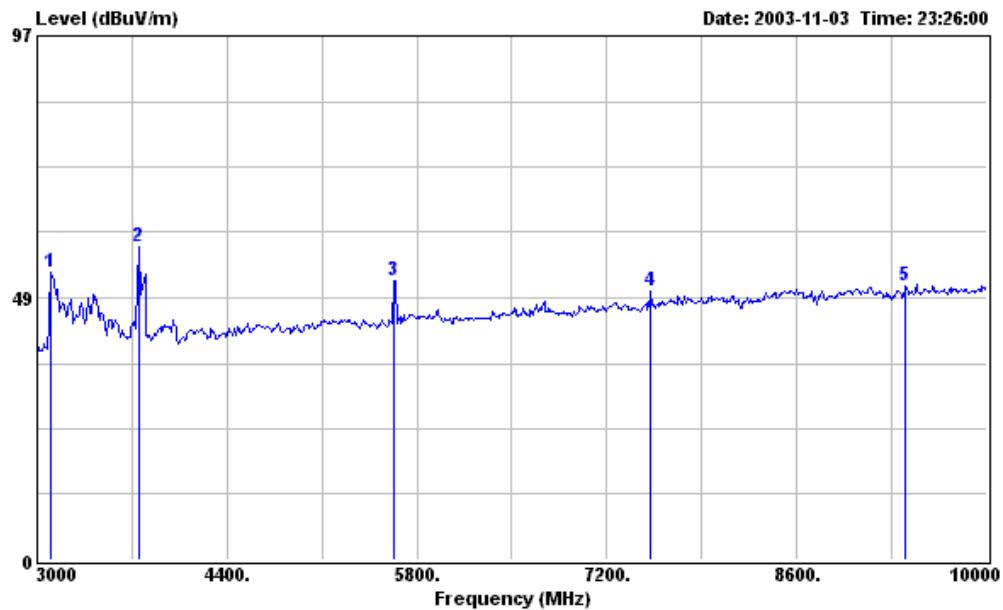
Site : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM1900 CH661

	Over Freq	Level MHz	Limit dB	Limit dBuV/m	Line dBuV	Read dB	Probe dB	Cable dB	Preamp dB	Remark	Ant Pos	Table Pos
1	140.580	49.27	-----	-----	36.85	10.24	2.18	0.00	Peak	---	---	---



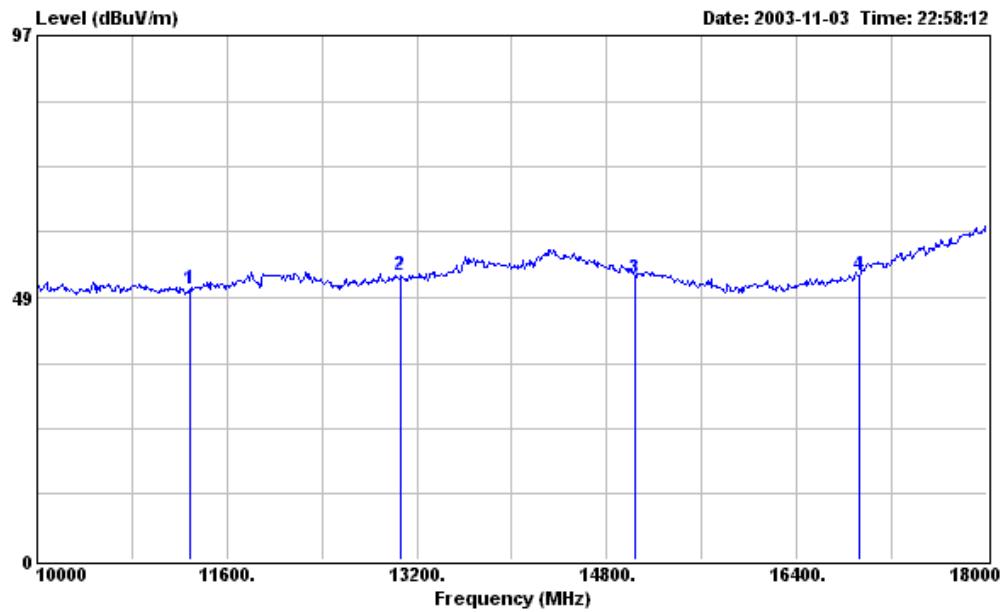
Site : 03CH03-HY
Condition : 3m HORN-ANT-6741 VERTICAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM1900 CH661

	Freq	Over Level	Limit	Read Line	Probe Level	Cable Factor	Preamp Factor	Ant Loss	Table Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	1878.000	122.37	-----	-----	92.94	26.92	2.51	0.00	Peak	---



Site : 03CH03-HY
 Condition : 3m HORN-ANT-6741 VERTICAL
 EUT : GPRS Modem
 Power :
 MODEL : SCMi250u
 MEMO : GSM1900 CH661

Freq	Over Limit		Read Line	Probe Level	Cable Preamp		Ant	Table
	Level	Limit			Factor	Loss		
MHz	dBuV/m	dB	dBuV/m	dB	dB	dB	cm	deg
1 3105.000	53.09	-----	-----	60.98	30.25	3.08	41.22	Peak
2 3749.000	58.06	-----	-----	63.80	31.92	3.74	41.40	Peak
3 5625.000	51.58	-----	-----	56.11	34.05	4.57	43.15	Peak
4 7522.000	49.63	-----	-----	50.19	36.53	5.29	42.38	Peak
5 9405.000	50.70	-----	-----	46.61	37.94	6.31	40.16	Peak



Site : 03CH03-HY
Condition : 3m HORN-ANT-6741 VERTICAL
EUT : GPRS Modem
Power :
MODEL : SCMi250u
MEMO : GSM1900 CH661

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Ant Pos	Table Pos
		Limit	Line	Level	Factor	Cable	Preamp		
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1 11288.000	50.16	-----	-----	44.42	38.95	6.75	39.96	Peak	---
2 13064.000	52.46	-----	-----	47.19	39.44	7.53	41.70	Peak	---
3 15040.000	51.99	-----	-----	47.96	40.42	7.27	43.66	Peak	---
4 16920.000	52.53	-----	-----	47.19	39.84	8.36	42.86	Peak	---

Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	15.35	1.01	1000	24.10	3.92
35	13.63	1.04	2000	27.40	5.66
40	11.11	1.09	3000	30.00	7.20
45	10.59	1.24	4000	32.60	9.36
50	6.47	1.43	5000	33.40	9.16
55	5.83	1.39	6000	34.20	10.70
60	5.18	1.59	7000	35.30	12.16
65	4.81	1.41	8000	36.90	13.12
70	4.43	1.43	9000	38.10	13.81
75	5.10	1.55	10000	39.00	14.83
80	5.91	1.56	11000	38.60	15.83
85	7.33	1.62	12000	39.50	17.11
90	8.74	1.41	13000	39.30	17.62
95	9.05	1.81	14000	41.60	18.37
100	9.36	1.68	15000	40.60	19.10
110	9.65	1.73	16000	37.20	19.72
120	9.97	1.79	17000	40.20	21.98
130	10.51	1.93	18000	48.90	21.22
140	10.32	2.06	19000	37.60	23.90
150	9.42	2.09	20000	37.30	24.07
160	8.09	2.12	21000	37.00	25.49
170	7.43	2.12	22000	38.00	24.92
180	7.60	2.12	23000	38.70	25.60
190	7.43	2.21	24000	38.60	25.70
200	7.26	2.29	25000	24.10	3.92
220	9.11	2.42	14000	27.40	5.66
240	10.88	2.54	15000	30.00	7.20
260	11.75	2.66	16000	32.60	9.36
280	11.55	2.76	17000	33.40	9.16
300	11.36	2.85	18000	34.20	10.70
320	12.03	3.10	19000	35.30	12.16
340	12.69	3.36	20000	36.90	13.12
360	13.33	3.49	21000	38.10	13.81
380	14.00	3.50	22000	39.00	14.83
400	14.63	3.51	23000	38.60	15.83
450	15.33	3.55	24000	39.50	17.11
500	16.03	3.81	25000	39.30	17.62
550	16.65	4.05			
600	17.29	4.23			
650	17.64	4.63			
700	18.00	4.74			
750	18.39	4.95			
800	18.79	5.06			
850	19.10	5.18			
900	19.42	5.40			
950	19.58	5.91			
1000	19.75	5.58			

List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2003	Radiation (03CH03-HY)
Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 07, 2003	Radiation (03CH03-HY)
Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 23, 2003	Radiation (03CH03-HY)
Horn Antenna	COM-POWER	AH-118	10094	1GHz – 18GHz	Apr. 10, 2003	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Mar. 14, 2003	Radiation (03CH03-HY)
Temperature & Humidity Controller	LABTEK	P-9000	612	-40°C~+70°C	Oct. 01,2003	Conductive (TMH)
AC/DC Power Source	HPA	HPA-500W	HPA-9100024	0V~240V	Mar 05, 2003	Conductive (TMH)
Spectrum analyzer	R&S	FSP30	100004	9KHZ~30GHz	Sep. 03, 2003	Conductive (TMH)
Base Station Simulator	R&S	CMU200	102278	9KHz~2.7GHz	Mar. 26, 2003	Both Radiation and Conductive

Calibration Interval of instruments listed above is one year, except for Horn Antenna, BBHA9170.

Uncertainty of Test Site

Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	3m
Antenna factor calibration	normal(k=2)	±1
cable loss calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
Antenna Directivity	rectangular	±3
Antenna Factor V.S. Height	rectangular	±2
Antenna Factor Interpolation for Frequency	rectangular	±0.25
site imperfection	rectangular	±2
Mismatch Receiver VSWR Γ1=0.09 Antenna VSWR Γ2=0.67 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	±0.54
combined standard uncertainty Ue(y)	normal	±2.7
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±5.4

$$U = \{(1/2)^2 + (0.3/2)^2 + (2^2 + 0.5^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\} = 2.2 \text{ for 10m test distance}$$

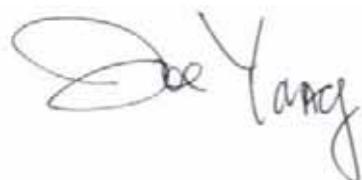
$$U = \{(1/2)^2 + (0.3/2)^2 + (2^2 + 3^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\} = 2.7 \text{ for 3m test distance}$$

END OF TEST REPORT

**Testimonial
and
Statement of Certification**

This is to certify that:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.



Certified by:

Joe Yang