FCC CFR47 PART 22 SUBPART H
CERTIFICATION
TEST REPORT

FOR

SINGLE BAND CDMA CELLULAR PHONE

MODEL NUMBER: VS500

FCC ID: GKRVS500

REPORT NUMBER: 05I3575

ISSUE DATE: AUGUST 10, 2005

Prepared for
COMPAL ELECTRONICS, INC.
8F, NO. 500, JUIKUANG ROAD
NEIHU, TAIPEI, TAIWAN ROC 114

Prepared by
COMPLIANCE ENGINEERING SERVICES, INC.
d.b.a.
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD,
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LAB CODE:200065-0

Revision History

Rev.	Revisions	Revised By
A	Initial Issue	Thu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: COMPAL ELECTRONICS INC.
8F, NO. 500, JUI-KUANG RD.
NEIHU, TAIPEI 114
TAIWAN

EUT DESCRIPTION: SINGLE BAND CDMA CELLULAR PHONE

MODEL: VS500

SERIAL NUMBER: 672558E3

DATE TESTED: AUGUST 3-5, 2005

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22 SUBPART H	NO NON-COMPLIANCE NOTED
DIGITAL DEVICE CONFIGURATION: FCC PART 15 SUBPART B	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

THANH NGUYEN
EMC TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603A (2001), ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC CFR 47 Part 22.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Single mode (CDMA only) portable mobile station of which frequency range is 824 - 849MHz

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum Peak Conducted and ERP as follows:

824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	Conducted Output (dBm)	Conducted Output Power (mW)	ERP Output Power (dBm)	ERP Output Power (mW)
824.76 - 848.31	CDMA	28.24	666.81	26.40	436.52

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an Internal PIFA antenna with 0.22dBi gain.

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 835.89 MHz.

5.5. DESCRIPTION OF TEST SETUP

SET UP FOR RF TEST

SUPPORT EQUIPMENT

The EUT is installed as a stand-alone device during the tests

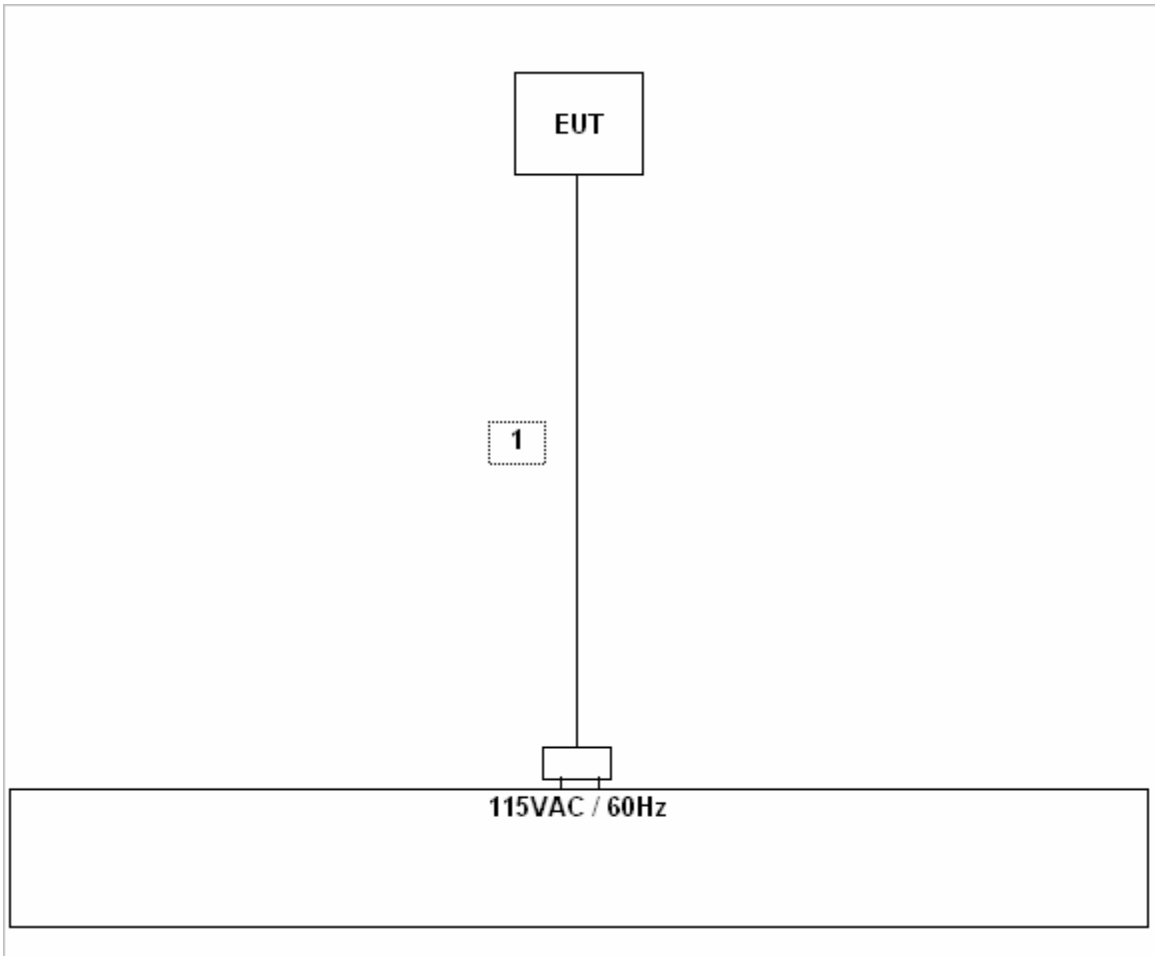
I/O CABLES

The EUT is installed as a stand-alone device during the tests

TEST SETUP

The EUT is installed as a stand-alone device during the tests

TEST SETUP



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4440A	MY44022875	3/22/2006
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/06
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/06
DC Power Supply	HP	HP6235A	CCS2499	CNR
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	6/10/06
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/06
RF Filter Section	HP	85420E	3705A00256	3/29/2006
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	3/3/06
Quasi-Peak Adaptor	HP	85650A	2521A01038	1/15/06
SA Display Section 3	HP	85662A	2314A04793	1/15/06
SA RF Section, 1.5 GHz	HP	85680A	2314A02604	1/15/06
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-SP	924341	12/23/05
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	4/22/06
Antenna, Log Periodic 200 ~ 1000 MHz	EMCO	3146	9107-3163	3/3/06
Signal Generator, 10 MHz ~ 20 GHz	HP	83732B	US34490599	2/10/06
Diopole Antenna	ETS LINGREN	3121C-DB4	22117	5/7/06
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/05
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/21/05
Site A Line Stabilizer/Conditioner	Tripplite	LC-1800a	A005181	CNR
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/06

7. LIMITS AND RESULTS

7.1. OCCUPIED BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the –26 dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal –26 dB bandwidth function is utilized.

RESULTS

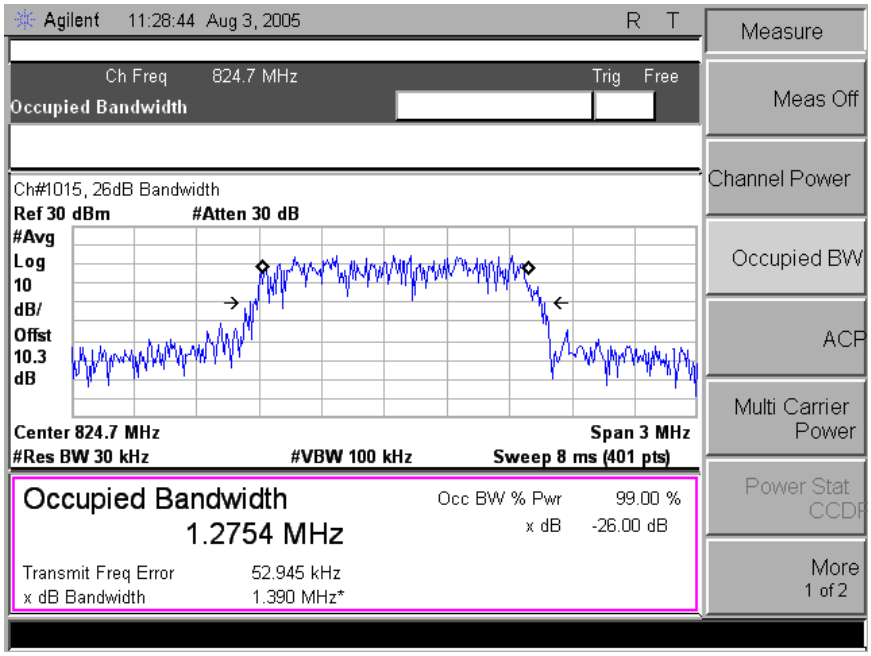
No non-compliance noted:

CDMA Modulation

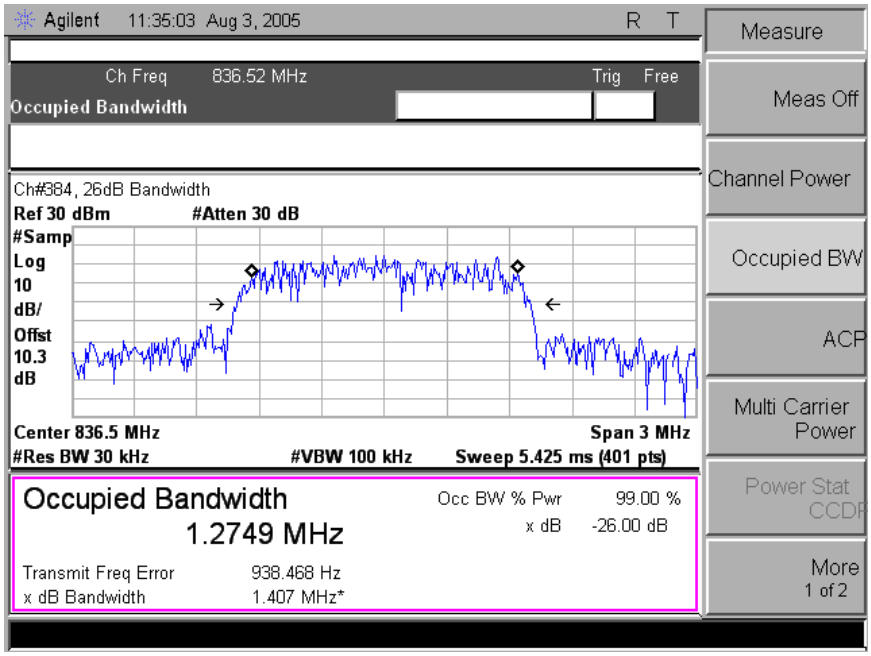
Channel	Frequency (MHz)	Bandwidth (MHz)
Low	824.76	1.2754
Middle	836.52	1.2749
High	848.31	1.2561

CDMA 26 dB BANDWIDTH

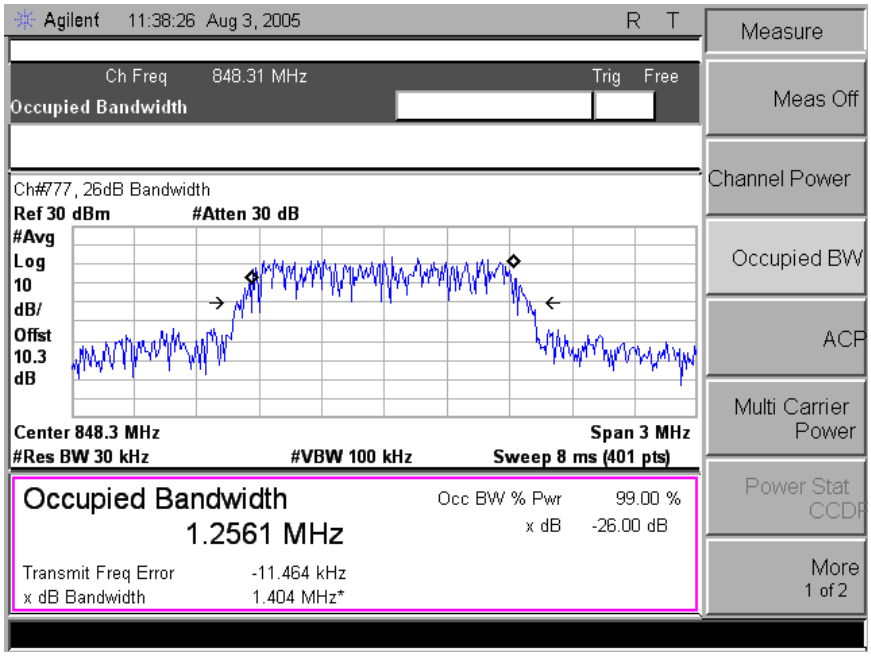
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.2. RF POWER OUTPUT

LIMIT

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

RESULTS

No non-compliance noted.

824 to 849 MHz Authorized Band

Frequency (MHz)	Modulation	Conducted Peak Output Power (dBm)	Radiated ERP (dBm)
824.76	CDMA	27.96	25.90
836.52	CDMA	28.24	26.20
848.31	CDMA	27.95	26.40

CDMA Output Power (ERP)

08/04/05 High Frequency Substitution Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thanh Nguyen
Project #: 05I3575
Company: Vacom Wireless Inc.
EUT Descrip.: Single Band CDMA cellular Phone
EUT M/N: VS500 (FCC ID: GKRVS500)
Test Target: FCC Part 22
Mode Oper: TX LOW, MID & HI CHANNELS FUNDAMENTAL SUBSTITUTION

Test Equipment:

EMCO Horn 1-18 GHz	Pre-amplifer 1-26 GHz	Spectrum Analyzer	Horn > 18 GHz	Limit
				ERP

Hi Frequency Cables
☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☐ (12 ft)

Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW, VBW=RBW
Bandedge: RBW=>1% Emissions BW, VBW=> 3*RBW
Spurious: RBW=3MHz, VBW=3MHz

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 1015									
0.8248	94.6	26.2	0.3	2.2	0.0	25.9	38.0	-12.1	Low Ch, V
0.8248	89.2	19.9	0.3	2.2	0.0	19.6	38.0	-18.4	Low Ch, H
Mid Channel 384									
0.8365	95.1	26.5	0.3	2.2	0.0	26.2	38.0	-11.8	Mid Ch, V
0.8365	90.4	20.9	0.3	2.2	0.0	20.6	38.0	-17.4	Mid Ch, H
High Channel 777									
0.8483	95.8	26.7	0.3	2.2	0.0	26.4	38.0	-11.6	High Ch, V
0.8483	90.2	20.6	0.3	2.2	0.0	20.3	38.0	-17.7	High Ch, H

7.3. FREQUENCY STABILITY

LIMIT

§22.355 Except as otherwise provided in this part, 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.

For Mobile devices operating in the 824 to 849 MHz band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.3.1 and 2.3.2

RESULTS

No non-compliance noted.

Reference Frequency: CDMA Mid Channel 835.890000MHz @ 25°C Limit: ± 2.5 ppm = 2089.578 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	835.83067800	0.532	± 2.5
3.80	40	835.83097650	0.174	± 2.5
3.80	30	835.83092468	0.236	± 2.5
3.80	***25***	***835.83112226***	***0***	***± 2.5***
3.80	20	835.83115678	-0.041	± 2.5
3.80	10	835.83115220	-0.036	± 2.5
3.80	0	835.83110368	0.022	± 2.5
3.80	-10	835.83118244	-0.072	± 2.5
3.80	-20	835.83126357	-0.169	± 2.5
3.80	-30	835.83118930	-0.08021	± 2.5
3.23	25	835.83112224	0.00002	± 2.5
4.37	25	835.83114222	-0.02389	± 2.5
3(endpoint)	25	*835.8302566*	1.03569	± 2.5

7.4. SPURIOUS EMISSION AT ANTENNA TERMINAL

LIMIT

§22.917 (e) Out of band emissions. 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.

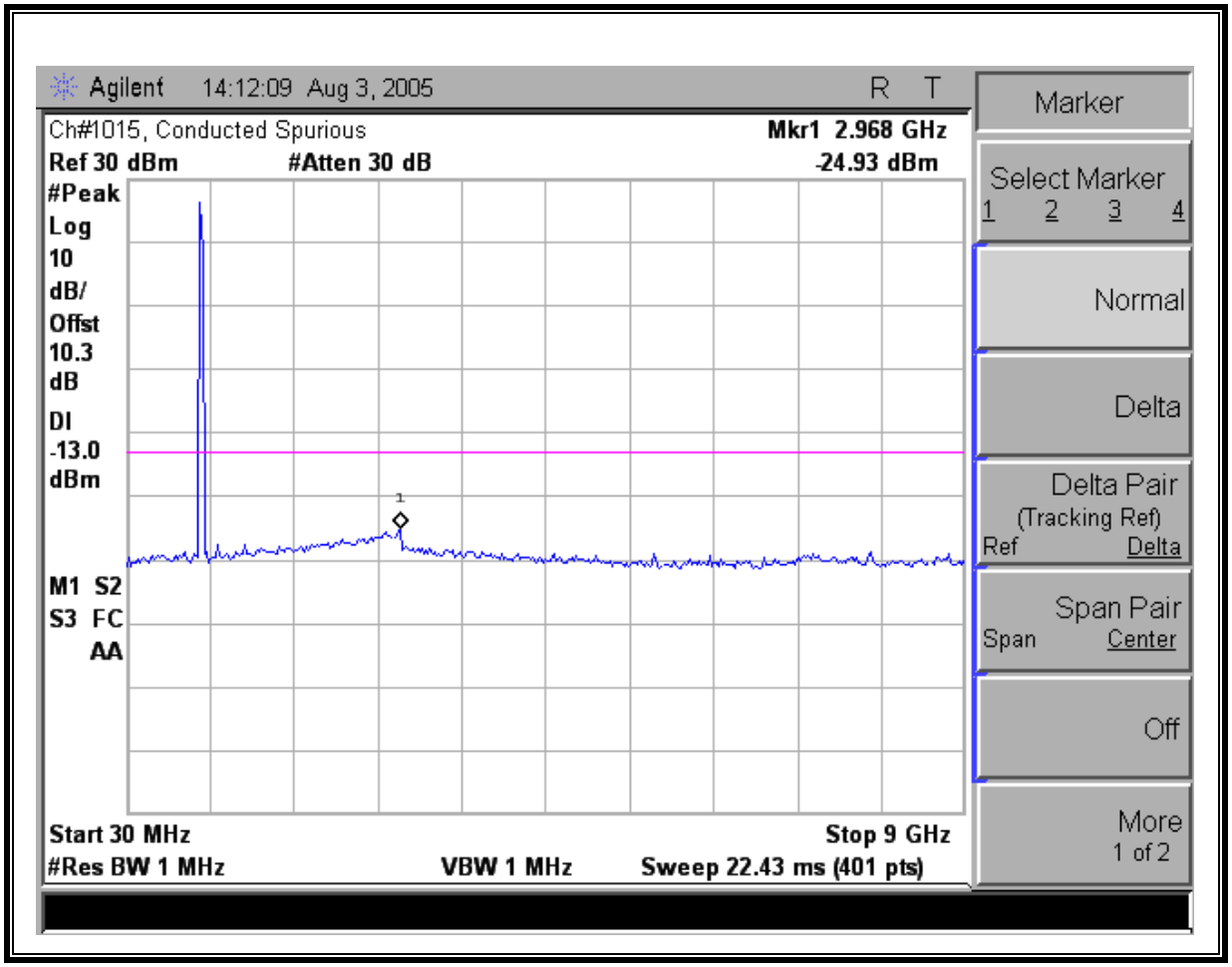
TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.13 & FCC 22.917 (h)

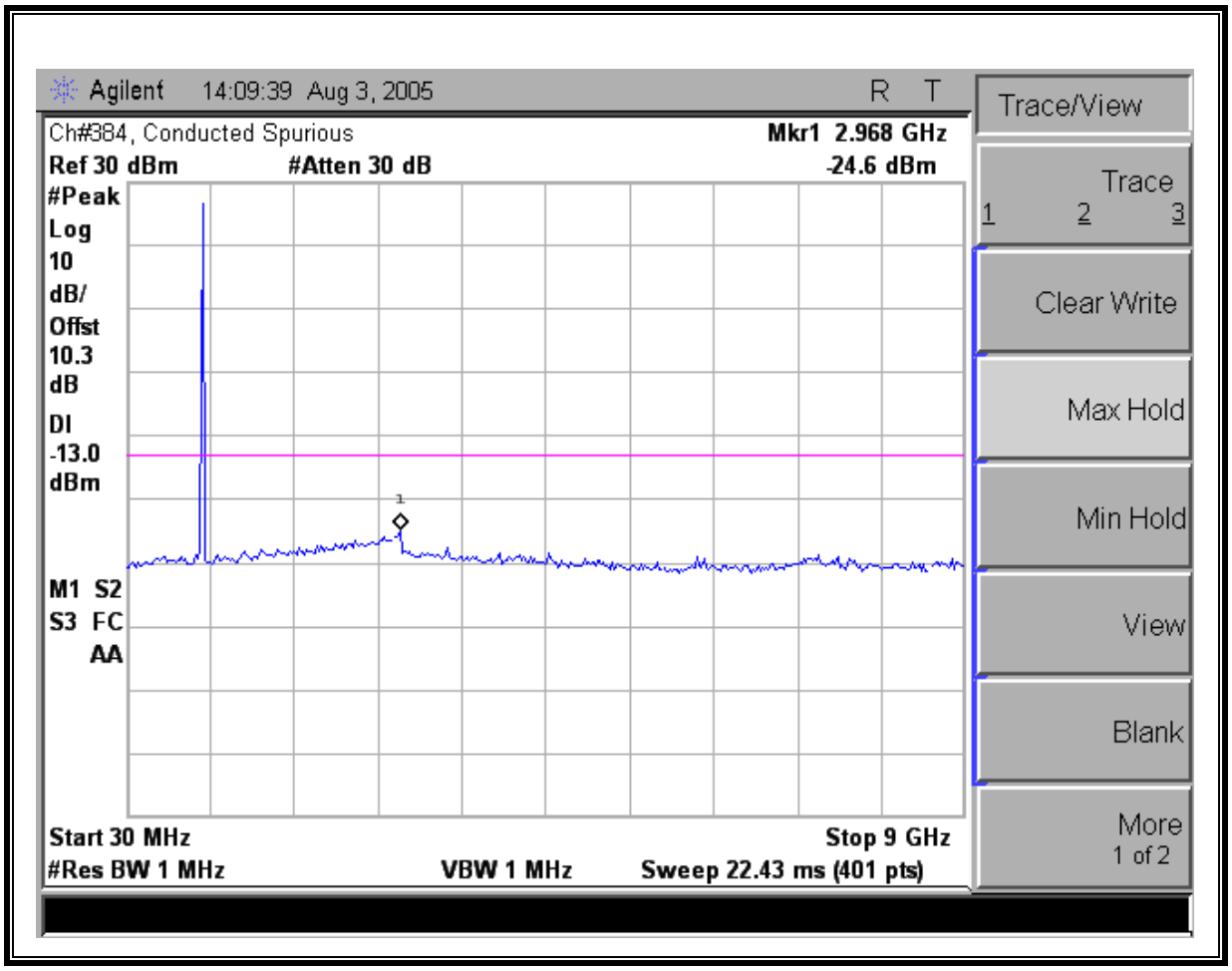
RESULTS

No non-compliance noted.

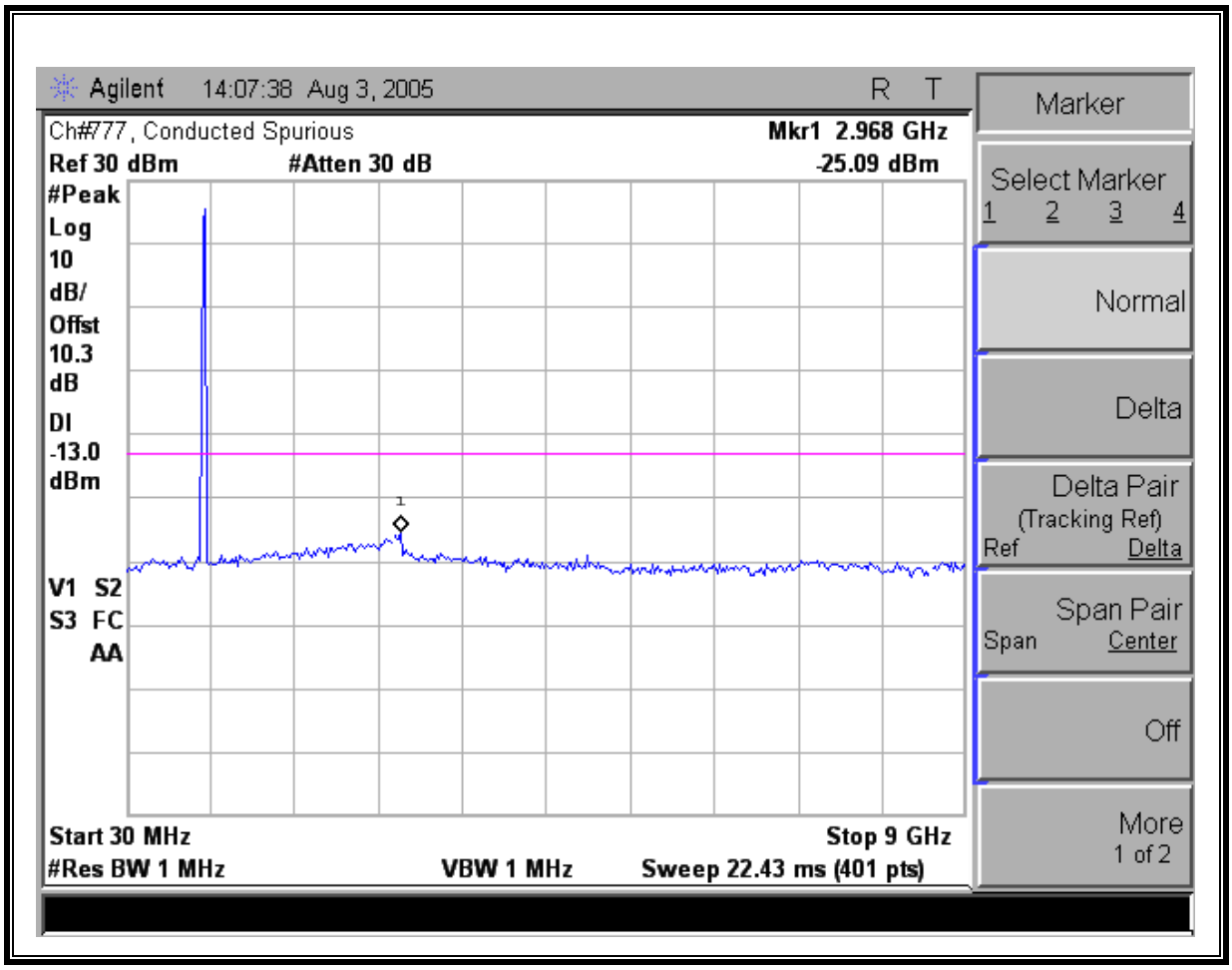
CDMA Modulation: Low Channel Out-Of-Band Emissions



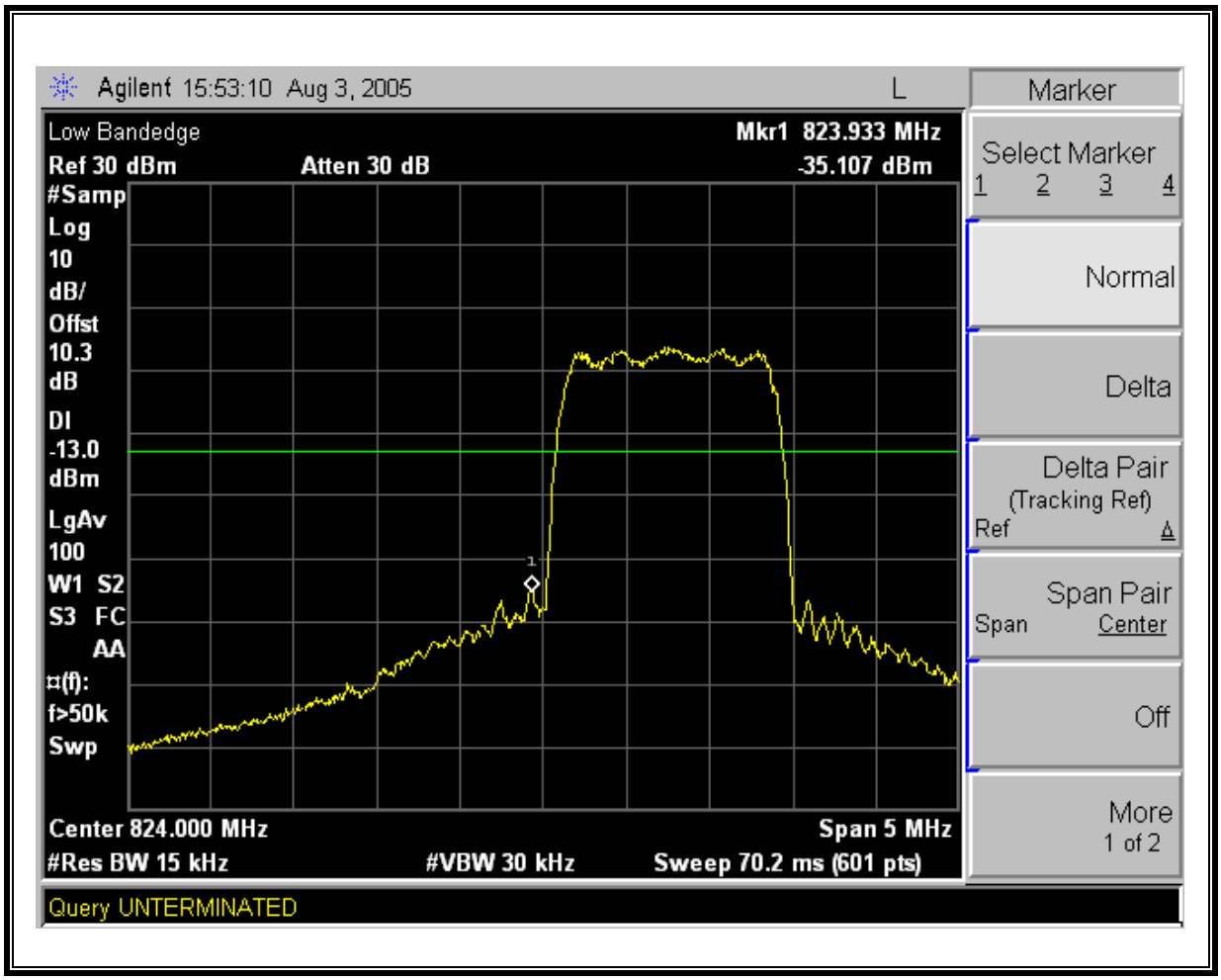
CDMA Modulation: Mid Channel Out-Of-Band Emissions



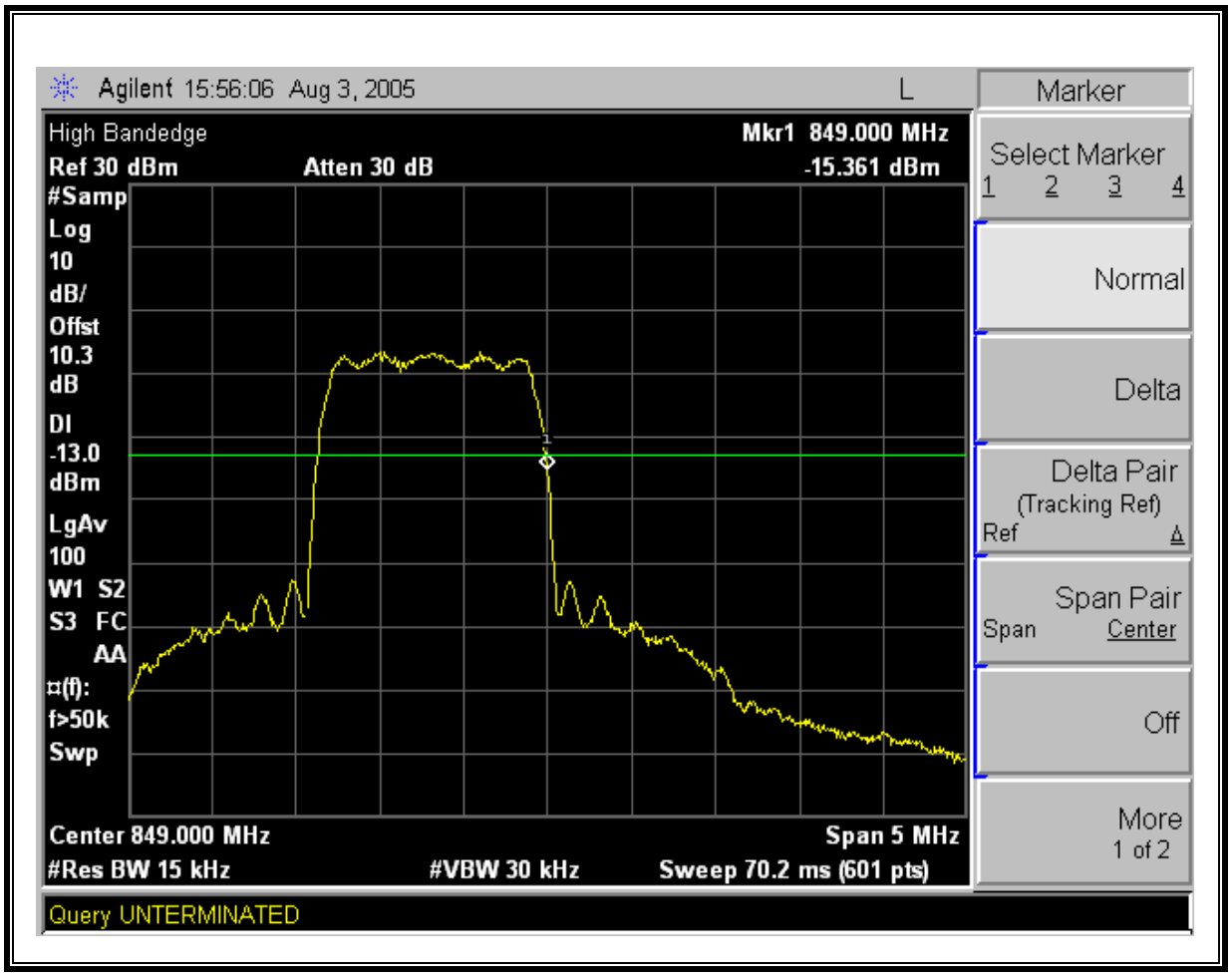
CDMA Modulation: High Channel Out-Of-Band Emissions



CDMA Modulation: Low Channel Band Edge

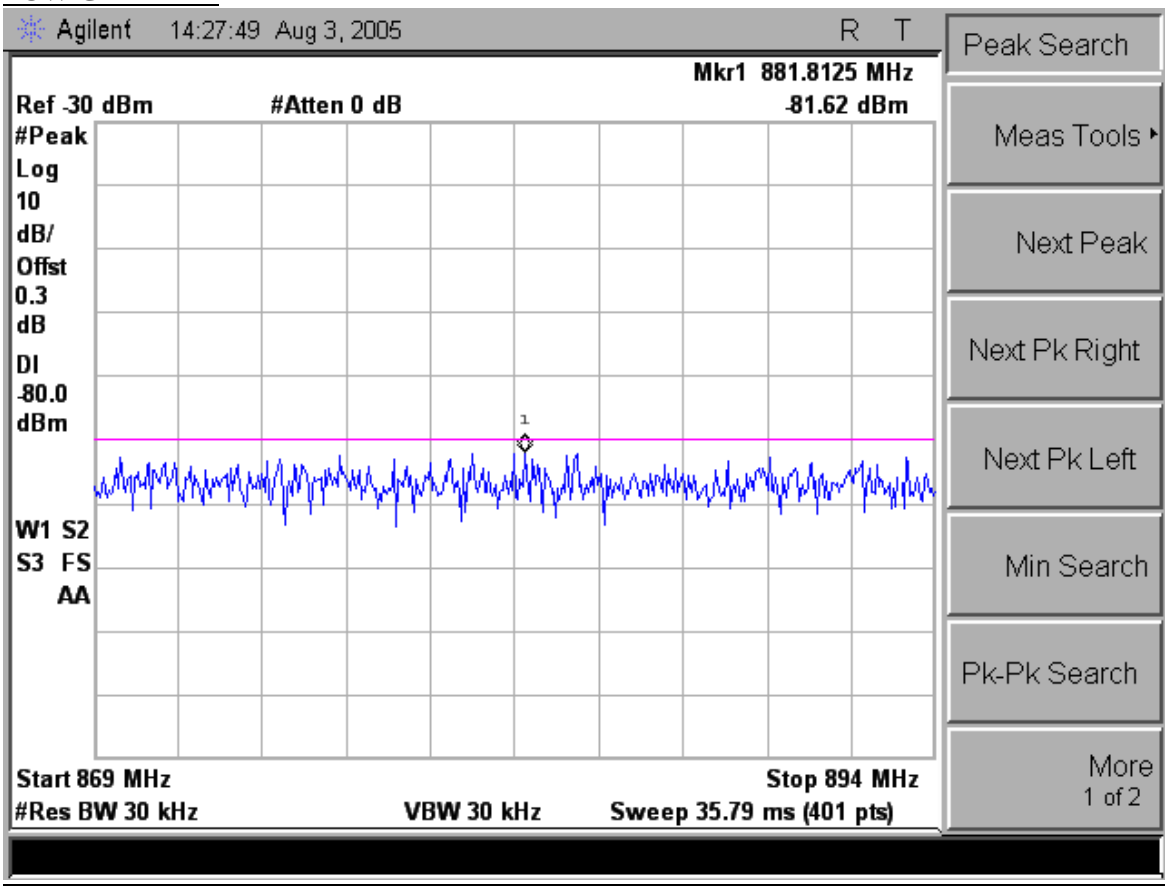


CDMA Modulation: High Channel Band Edge

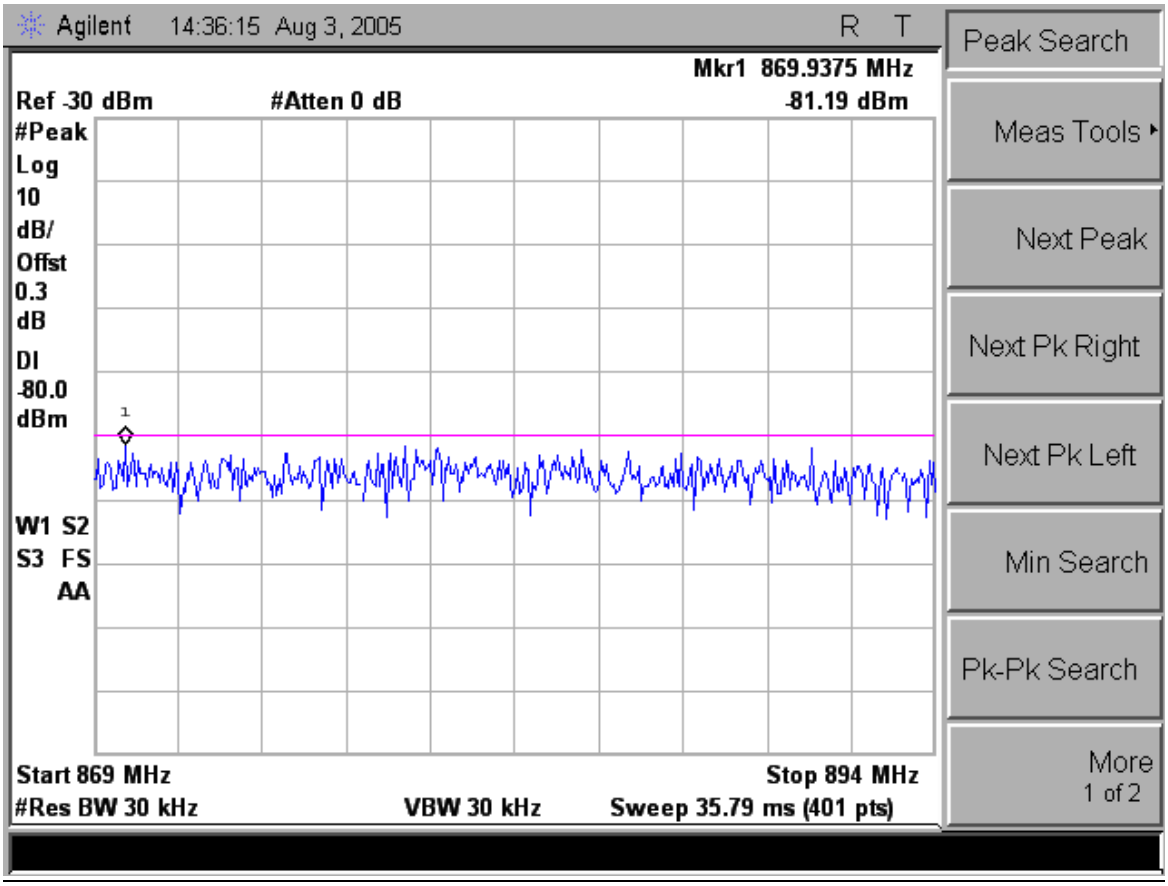


CDMA Mobile Emissions in Base Frequency Range

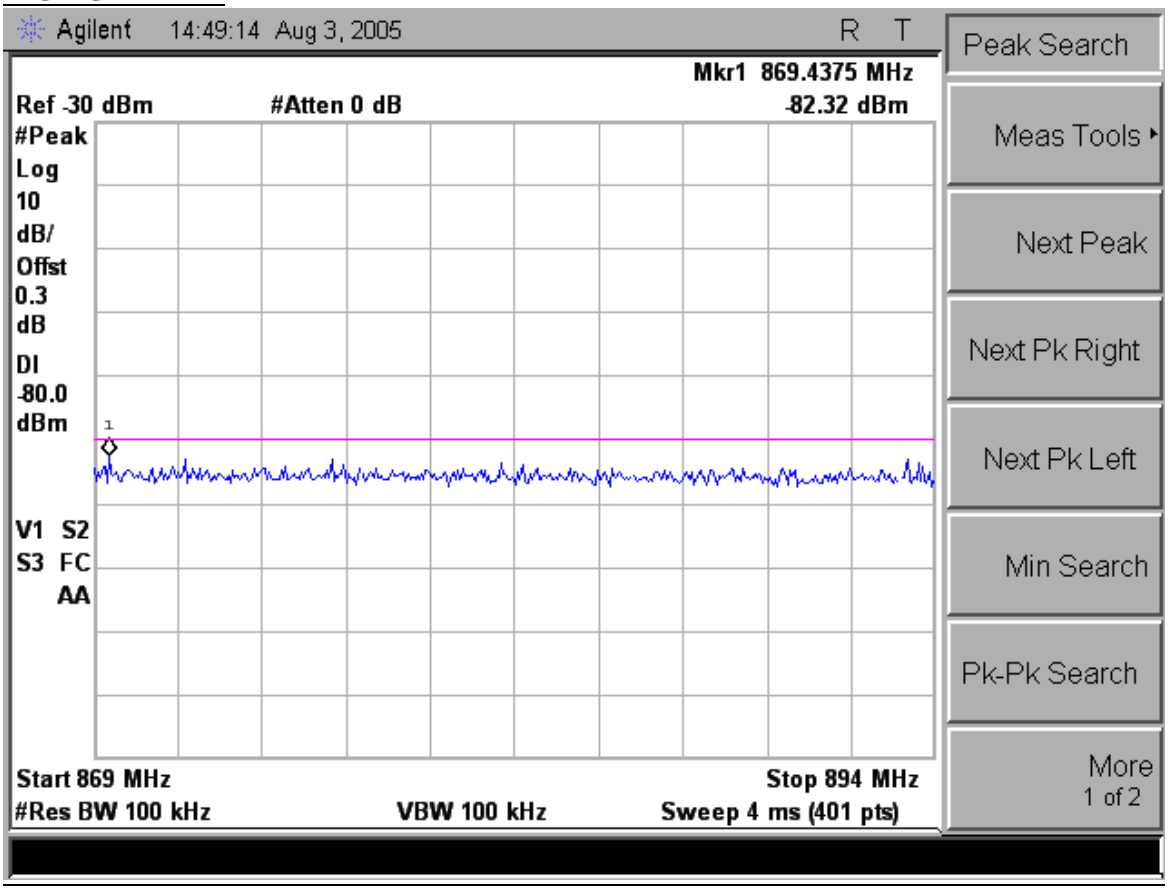
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



7.5. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (a) Out of band emissions. 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

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 22.917 (b)

RESULTS

No non-compliance noted.

CDMA Spurious & Harmonic (ERP)

08/05/05 High Frequency Substitution Measurement
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Thanh Nguyen
Project #: 05I3575-1
Company: VACOM WIRELESS, INC.
EUT Descrip.: Single Band CDMA Cellular Phone.
EUT M/N: VS500
Test Target: FCC part 22
Mode Oper: Transmitting

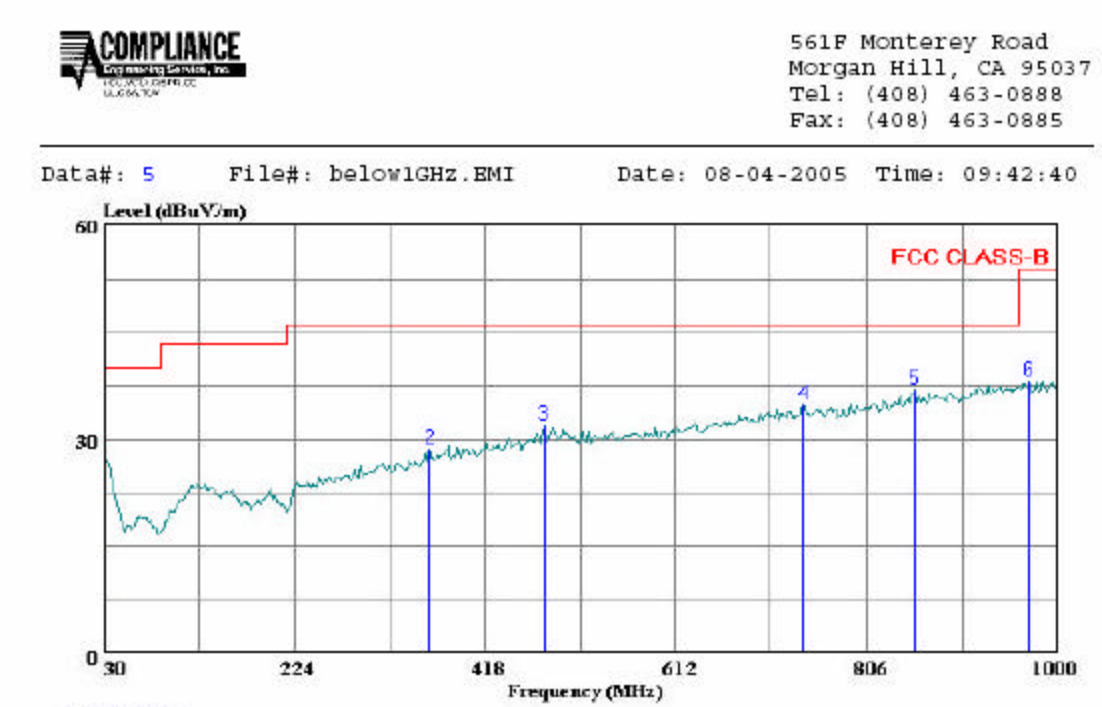
Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: FCC 22
High Pass Filter: ☑
Hi Frequency Cables: ☐ (2 ft) ☑ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T86 Miteq 924341
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Tx Low Ch 1015, 824.7MHz										
1.6940	58.4	V	-52.2	1.6	8.0	5.8	-48.0	-13.0	-35.0	
2.4741	42.3	V	-66.1	1.9	9.8	7.6	-60.4	-13.0	-47.4	
3.2988	42.6	V	-63.0	2.3	9.7	7.6	-57.7	-13.0	-44.7	
1.6940	57.2	H	-52.8	1.6	8.0	5.8	-48.6	-13.0	-35.6	
2.4741	44.6	H	-63.6	1.9	9.8	7.6	-57.9	-13.0	-44.9	
3.2988	48.4	H	-57.2	2.3	9.7	7.6	-51.9	-13.0	-38.9	
Tx MID Ch 384, 836.52MHz										
1.6730	48.4	V	-62.4	1.6	7.9	5.8	-58.2	-13.0	-45.2	
2.0596	44.5	V	-64.7	1.8	8.7	6.6	-59.9	-13.0	-46.9	
3.3456	44.5	V	-61.0	2.3	9.7	7.6	-55.7	-13.0	-42.7	
1.6730	51.3	H	-58.8	1.6	7.9	5.8	-54.6	-13.0	-41.6	
2.0596	45.6	H	-63.4	1.8	8.7	6.6	-58.6	-13.0	-45.6	
3.3456	50.0	H	-55.4	2.3	9.7	7.6	-50.2	-13.0	-37.2	
Tx HIGH Ch 777, 848.31MHz										
1.69662	56.7	V	-54.0	1.6	8.0	5.8	-49.8	-13.0	-36.8	
2.54493	46.6	V	-61.5	2.0	9.8	7.6	-55.9	-13.0	-42.9	
3.39324	43.3	V	-62.1	2.3	9.7	7.6	-56.9	-13.0	-43.9	
1.69662	55.2	H	-54.8	1.6	8.0	5.8	-50.5	-13.0	-37.5	
2.54493	47.1	H	-60.8	2.0	9.8	7.6	-55.2	-13.0	-42.2	
3.39324	48.8	H	-56.5	2.3	9.7	7.6	-51.3	-13.0	-38.3	
No other emissions were detected above 3.4GHz										

DIGITAL SPURIOUS EMISSIONS 30 TO 1000 MHz HORIZONTAL

HORIZONTAL PLOT



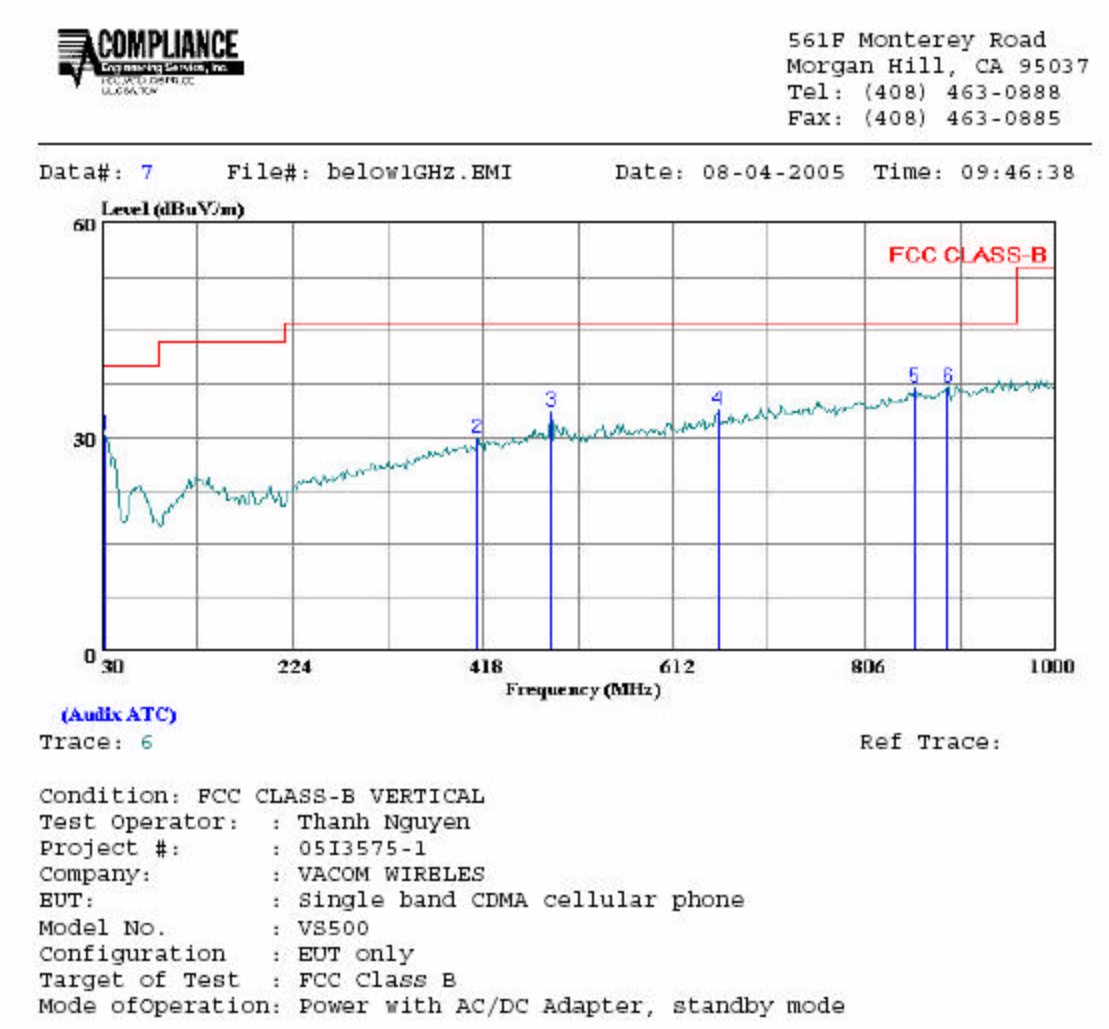
Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Thanh Nguyen
Project #: : 05I3575-1
Company: : VACOM WIRELES
EUT: : Single band CDMA cellular phone
Model No. : VS500
Configuration : EUT only
Target of Test : FCC Class B
Mode ofOperation: Power with AC/DC Adapter, standby mode

HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.000	8.00	20.45	28.45	40.00	-11.55	Peak
2	361.740	11.47	17.20	28.67	46.00	-17.33	Peak
3	478.140	12.10	19.79	31.89	46.00	-14.11	Peak
4	741.980	11.24	23.74	34.98	46.00	-11.02	Peak
5	853.530	11.63	25.30	36.93	46.00	-9.07	Peak
6	969.930	11.55	26.66	38.21	54.00	-15.79	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz VERTICAL

VERTICAL PLOT



VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	11.26	19.05	30.31	40.00	-9.69	Peak
2	412.180	11.64	18.34	29.98	46.00	-16.02	Peak
3	487.840	13.63	20.00	33.63	46.00	-12.37	Peak
4	657.590	11.42	22.46	33.88	46.00	-12.12	Peak
5	856.440	11.66	25.39	37.05	46.00	-8.95	Peak
6	889.420	11.27	25.78	37.05	46.00	-8.95	Peak

7.6. AC MAINS LINE CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.4

LIMIT

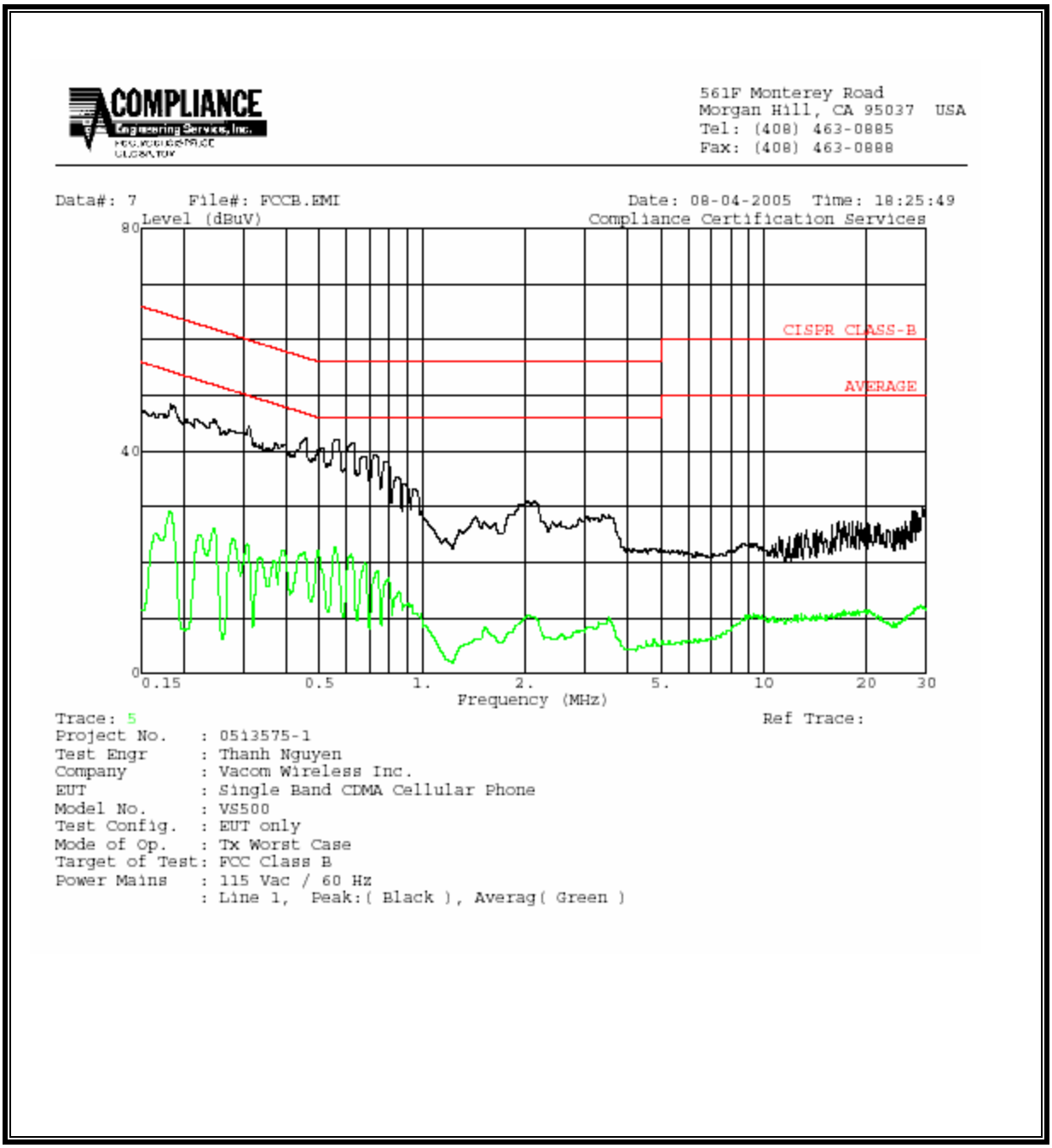
§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Notes: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

RESULTS

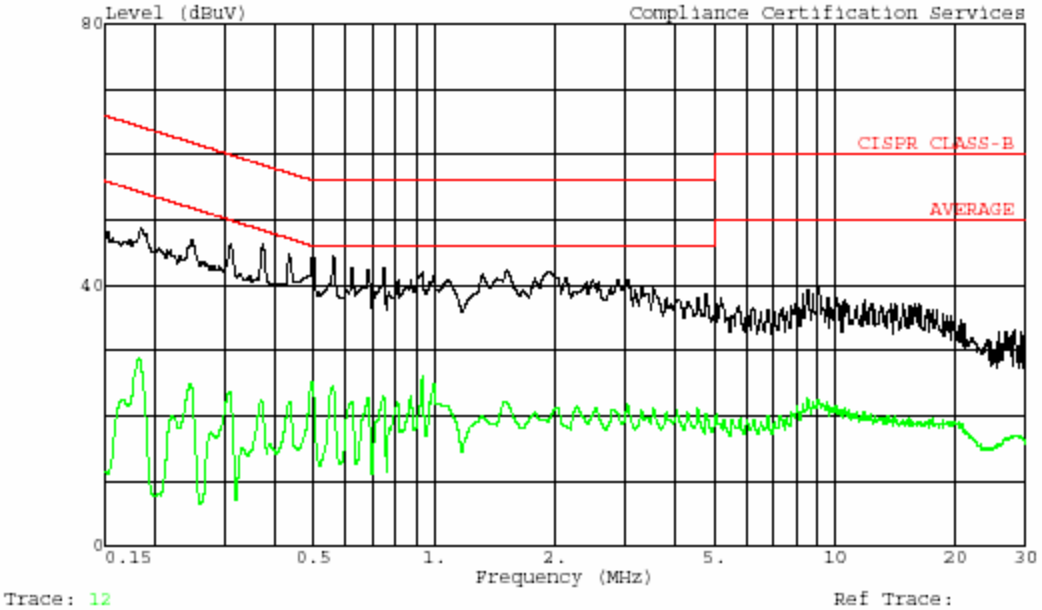
No non-compliance noted:

LINE 1 RESULTS



LINE 2 RESULTS

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

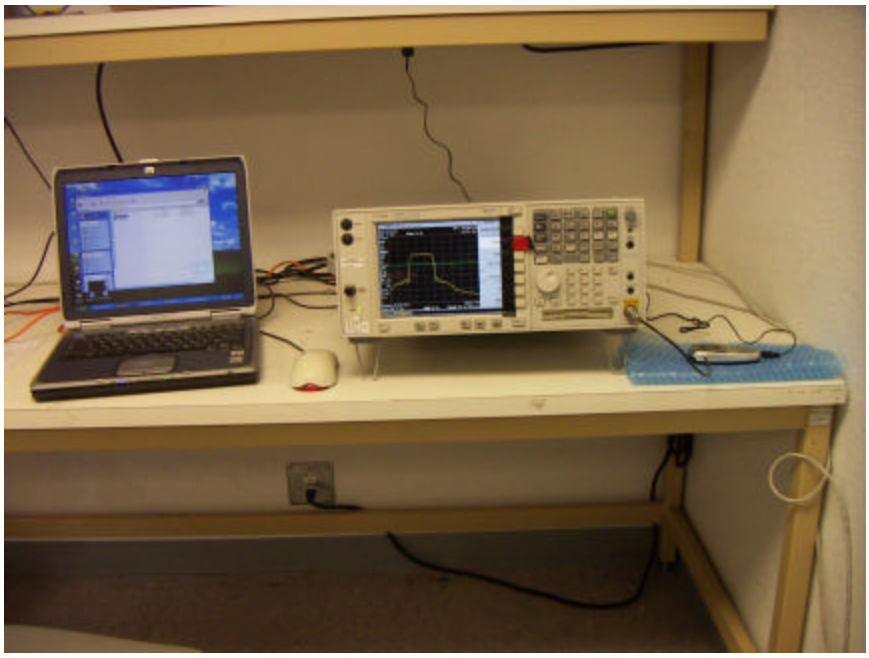


Trace: 12 Ref Trace:
Project No. : 05I3575-1
Test Engr : Thanh Nguyen
Company : Vacom Wireless Inc.
EUT : Single Band CDMA Cellular Phone
Model No. : VS500
Test Config. : EUT only
Mode of Op. : Tx Worst Case
Target of Test: FCC Class B
Power Mains : 115 Vac / 60 Hz
: Line 2, Peak:(Black), Averag(Green)

8. SETUP PHOTOS

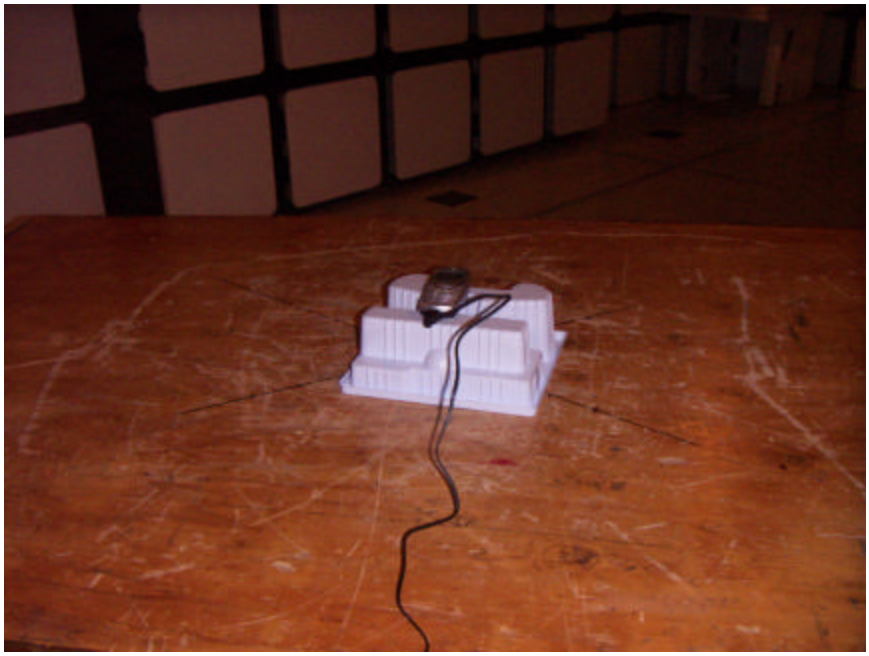
ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO

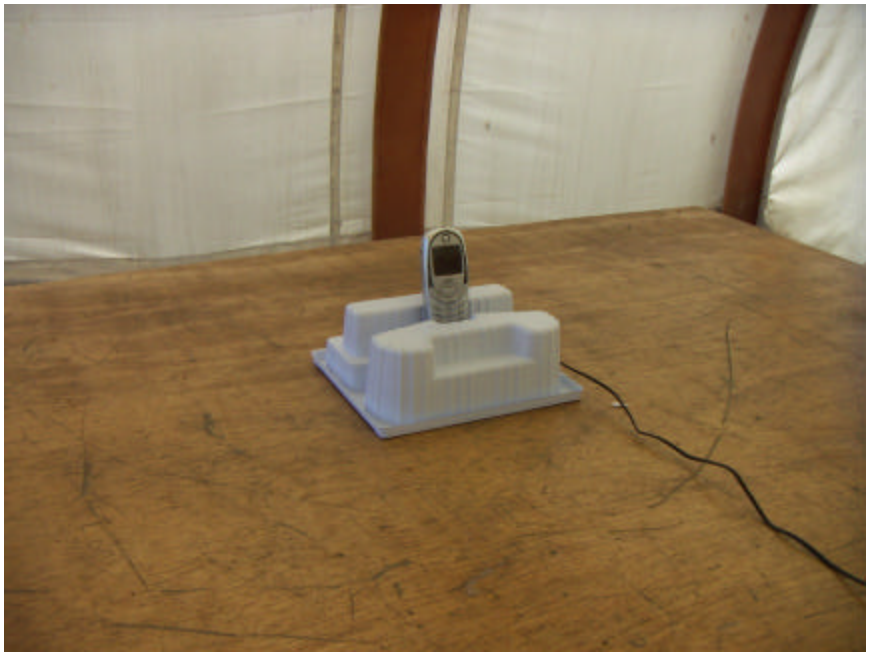


RADIATED RF MEASUREMENT SETUP

X-AXIS FRONT PHOTO



Y-AXIS.PHOTO



Z-AXIS PHOTO

STAND-ALONE

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO

END OF REPORT