FCC CFR47 PART 22H and 24E
CERTIFICATION
TEST REPORT

FOR

DUAL BAND TRI MODE PCS/AMPS/CDMA CELLULAR PHONE

MODEL NUMBER: VT820

FCC ID: GKRVT820

REPORT NUMBER: 05I3576-1

ISSUE DATE: AUGUST 18, 2005

Prepared for
COMPAL ELECTRONICS, INC.
8F, No.500, JUIKANG ROAD, NEIHU,
TAIPEI (114),
TAIWAN, R.O.C

Prepared by
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Revision History

Rev.	Issue Date	Revisions	Revised By
A	8/18/2005	Initial Issue	Thu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	COMPAL ELECTRONICS, INC. 8F, No.500, JUIKANG ROAD TAIPEI (114), TAIWAN, R.O.C.
EUT DESCRIPTION:	DUAL BAND TRI MODE PCS/AMPS/CDMA CELLULAR PHONE
MODEL:	VT820
SERIAL NUMBER:	67255602/672555FF/67255600
DATE TESTED:	AUGUST 10 – 17, 2005

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22 SUBPART H	NO NON-COMPLIANCE NOTED
FCC PART 24 SUBPART E	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:

EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

WILLIAM ZHUANG
EMC ENGINEER
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 22, and FCC CFR 47 Part 24.

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 dual band tri mode PCS/AMPS/CDMA cellular phone.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power, ERP and EIRP as follows:

Frequency Range (MHz)	Modulation	Output Power (dBm)	Output Power (mW)	Output ERP/EIRP (dBm)	Output ERP/EIRP (mW)
824.04 - 848.97	AMPS	27.17	521.19	24.90	309.03
824.7 - 848.31	CDMA	29.36	862.98	28.30	676.08
1851.25 - 1908.75	PCS	29.2	831.76	29.40	870.96

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Helical fixed type antenna, with a maximum gain of 1 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was manually operation.

5.5. 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 836.49 MHz for AMPS, 835.89 for CDMA and 1851MHz for PCS mode.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Level Translator	VACOM	DL-LT--DC1	N/A	N/A
AC/DC Adaptor	VACOM	DRL-091000C	SA10022-4009	N/A

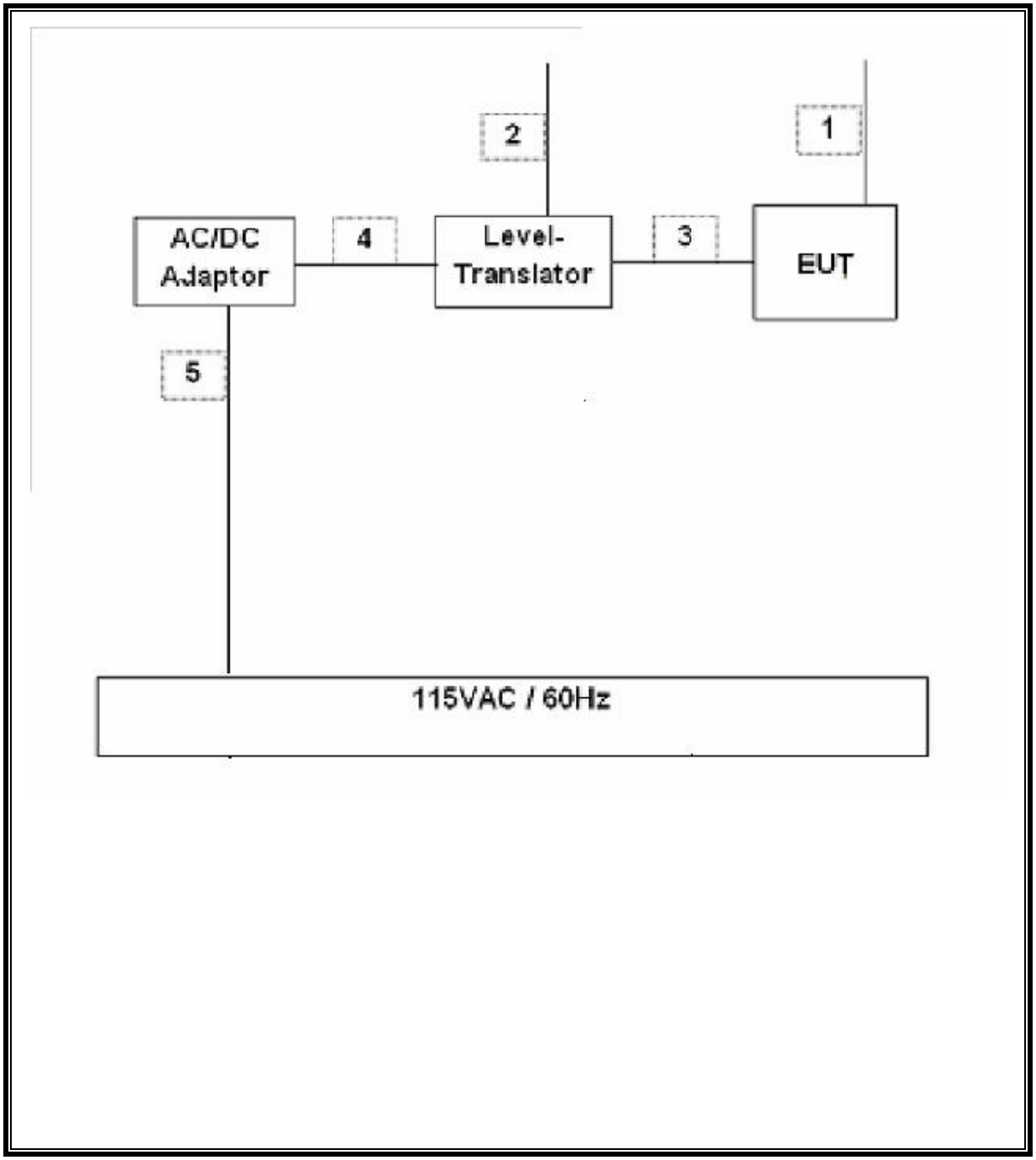
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	1	1	SMA	RF cable	0.2m	
2	2	1	BNC	RF cable	0.2m	
3	VC-5U	1	25 pin	Serial	0.2m	
4	DC	1	DC	Un-shield	1.5m	
5	AC	1	US 115V	Un-shield	1m	

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



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**
Function Generator	HP	3325A	2652A24749	11/5/2005
Modulation Analyzer	HP	8901B	3438A05272	9/23/05
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/06
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/06
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	US42070220	1/1/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/22/06
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-44	646456	8/17/05
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/06
RF Filter Section	HP	85420E	3705A00256	3/29/06
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	3/3/06
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/06
Site A Line Stabilizer/Conditioner	Tripplite	LC-1800a	A005181	CNR
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/05
Spectrum Analyzer, 26.5 GHz	HP	8593EM	3710A00205	1/6/06
DC Power Supply	HP	E3610A	KN24104150	N/A
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	6/10/06

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:

AMPS Modulation

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	824.04	0.040657
Middle	836.49	0.040601
High	848.97	0.040588

CDMA Modulation

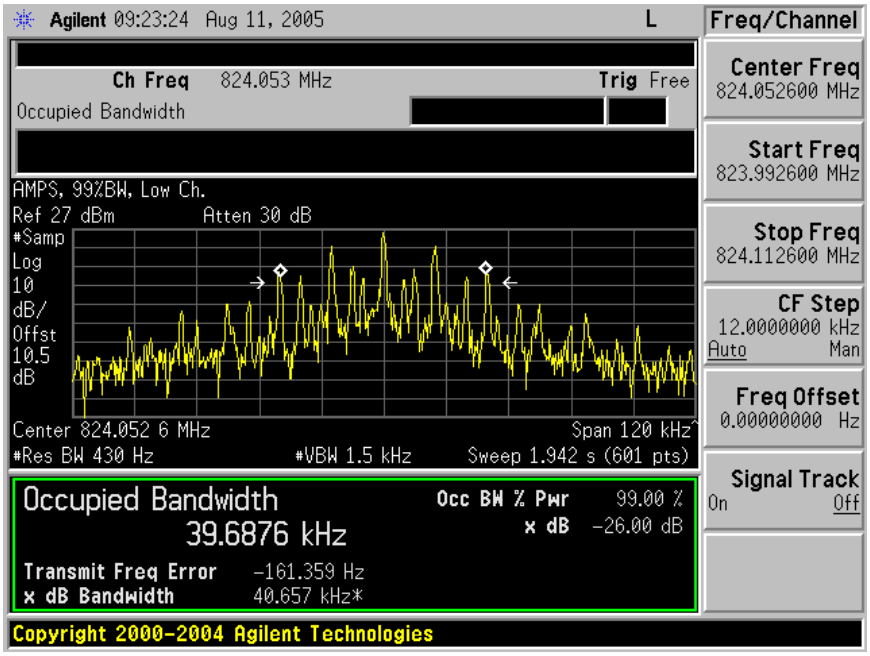
Channel	Frequency (MHz)	Bandwidth (MHz)
Low	824.76	1.414
Middle	835.89	1.383
High	848.25	1.398

PCS Modulation

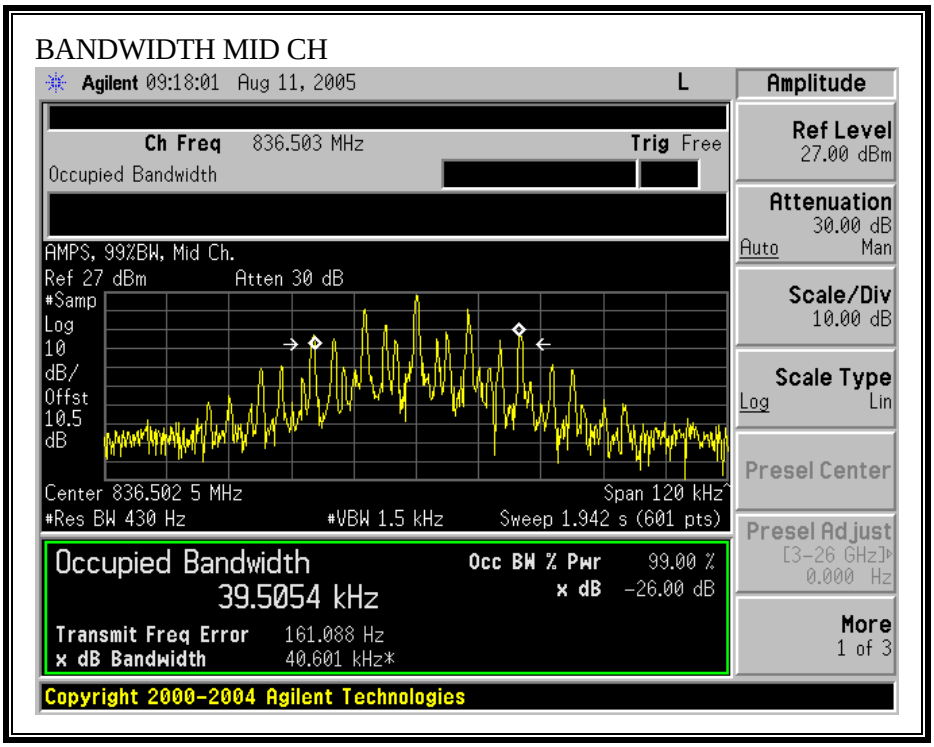
Channel	Frequency (MHz)	Bandwidth (MHz)
Low	1851.25	1.405
Middle	1880	1.381
High	1908.75	1.446

AMPS 26 dB BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH



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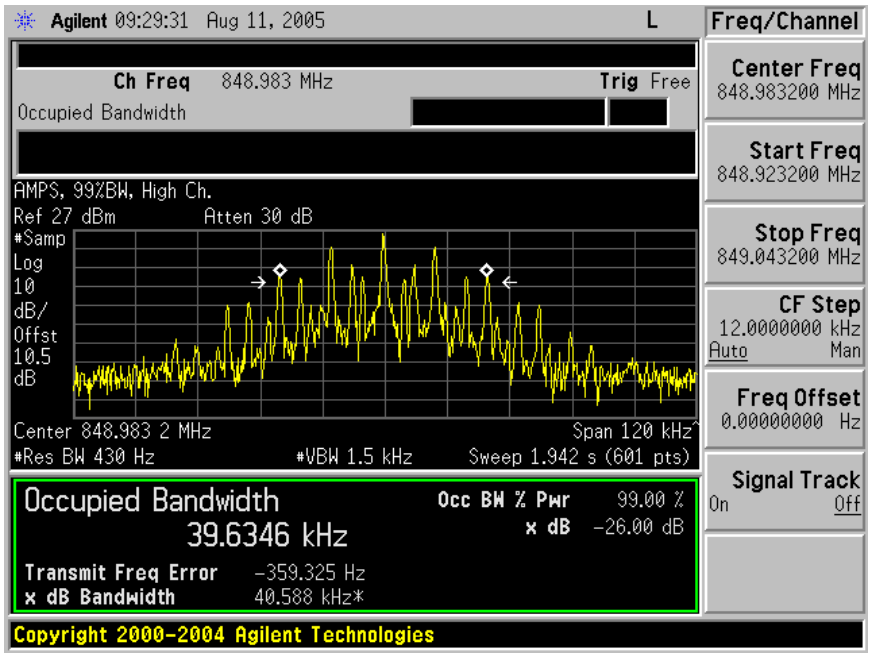

CDMA 26 dB BANDWIDTH

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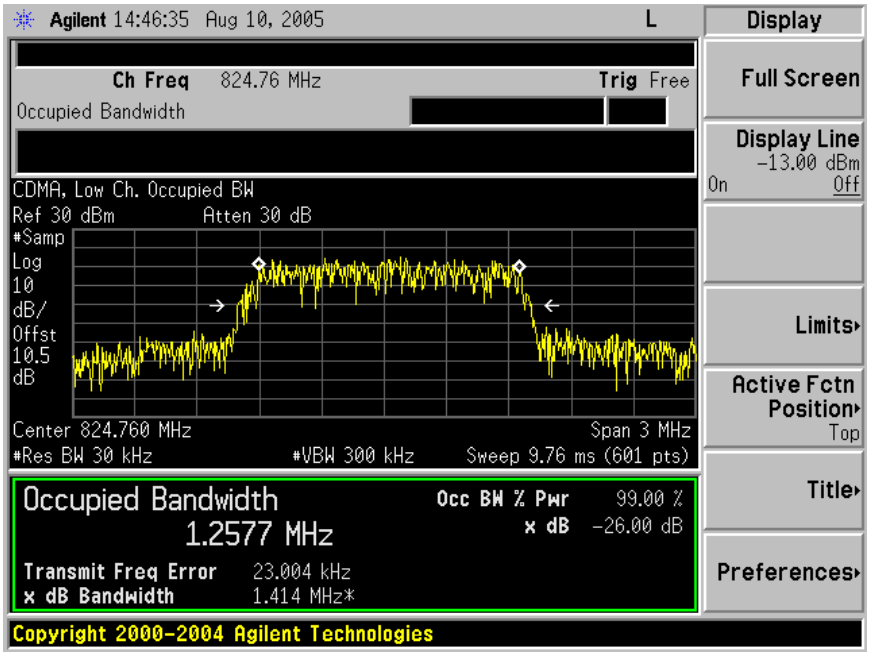

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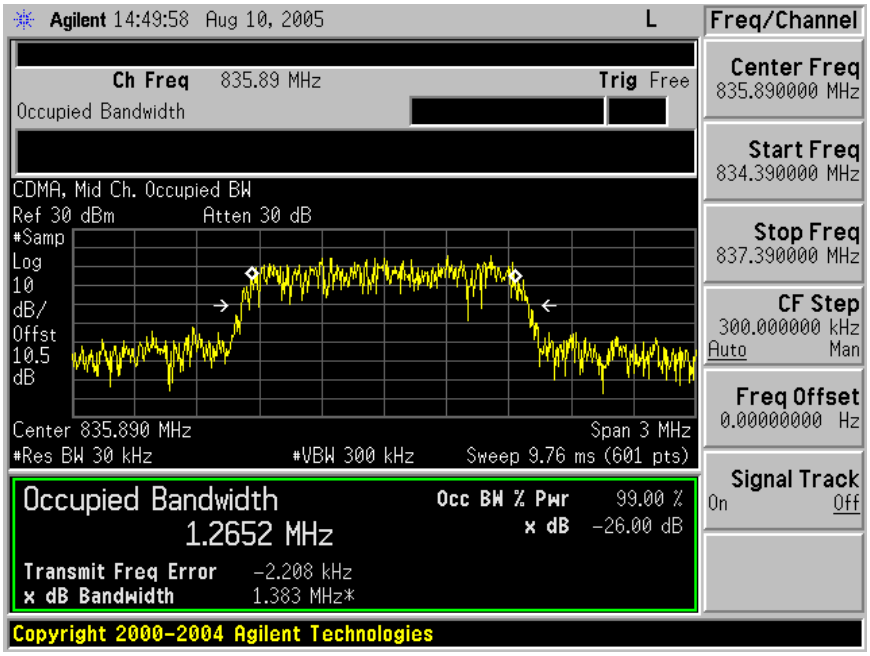

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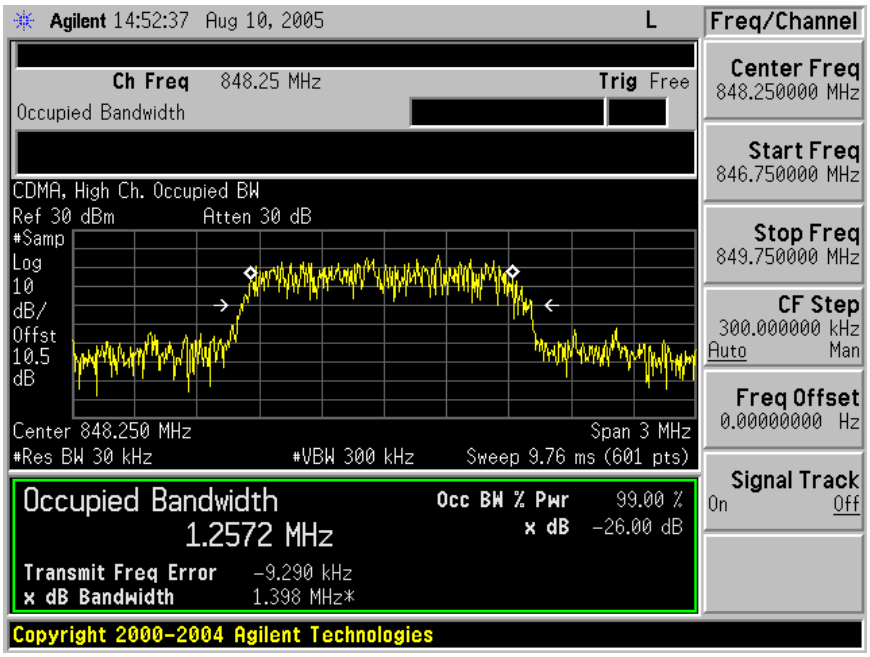
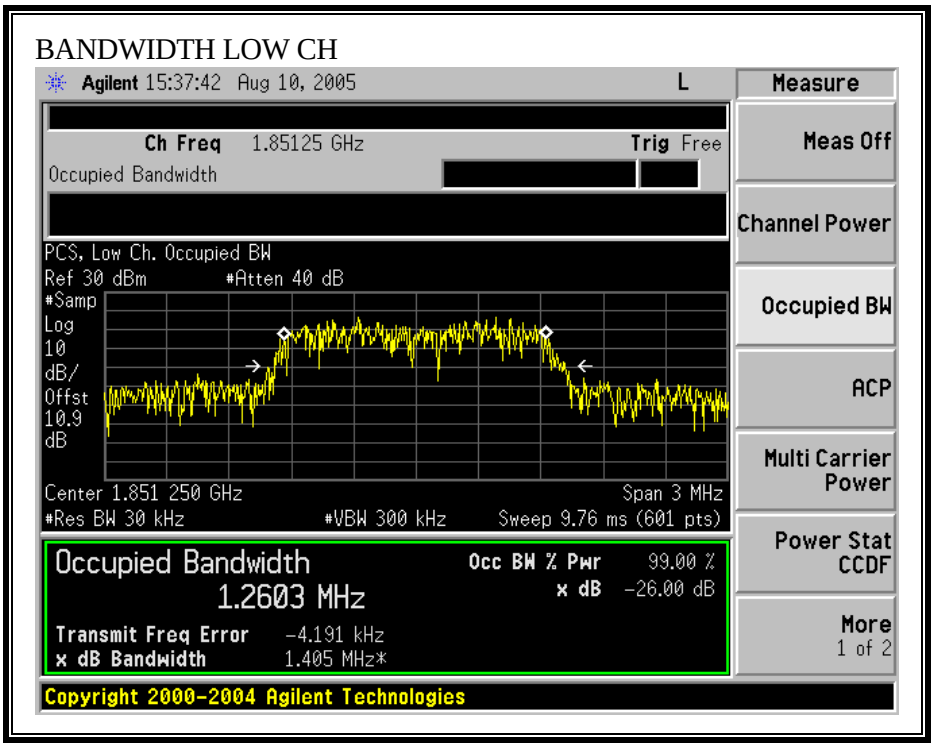
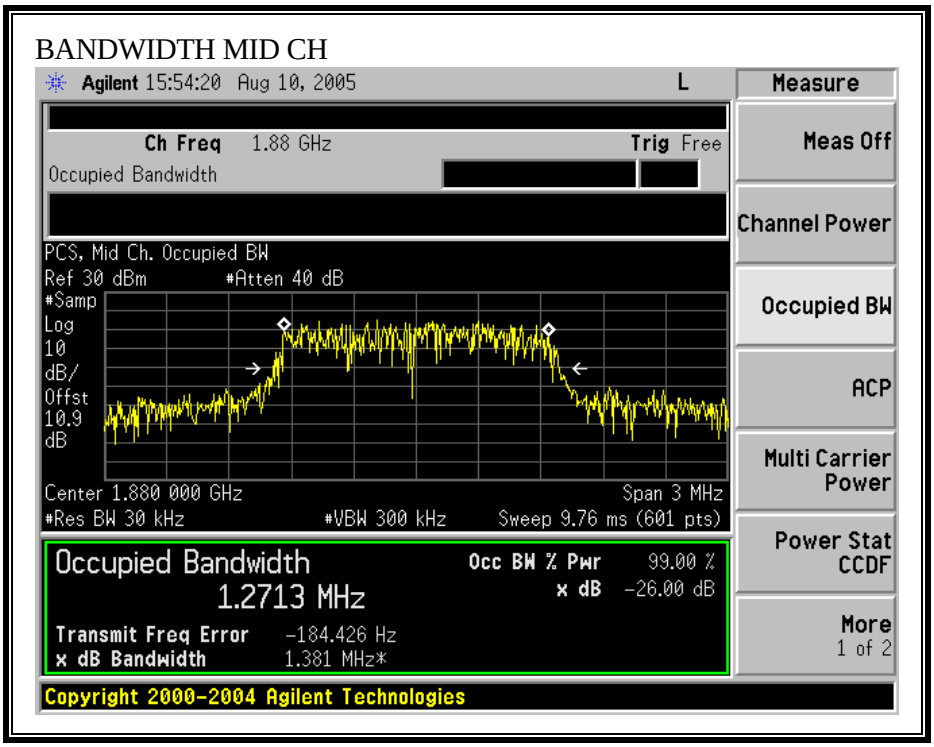


PCS 26 dB BANDWIDTH

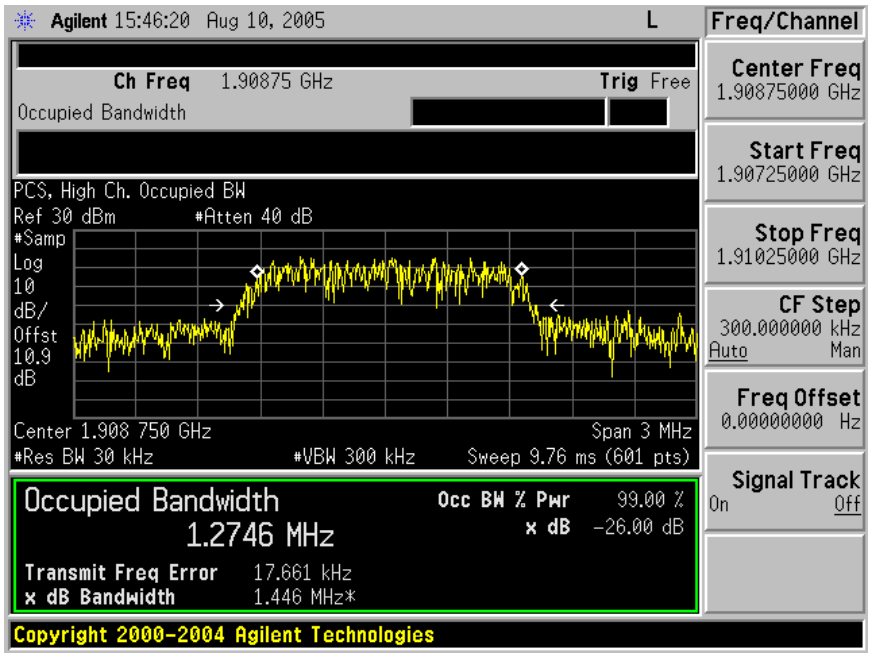
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.2. AMPS EMISSION LIMITATION

LIMIT

§22.917 (b)

a. On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the sideband is at least 26 dB below the carrier.
b. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency, the sideband is at least 60dB below the carrier or 43 +10 $\log_{10}$ (mean output power in W) dB, whichever is the smaller attenuation

§22.917 (d)

a. On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the sideband is at least 26 dB below the carrier.
b. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to and including 90 kHz, the sideband is at least 45 dB below the carrier.
c. On any frequency removed from the assigned carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency, the sideband is at least 60 dB below the carrier or 43 +10 $\log_{10}$ (mean output power in W) dB, whichever is the smaller attenuation.

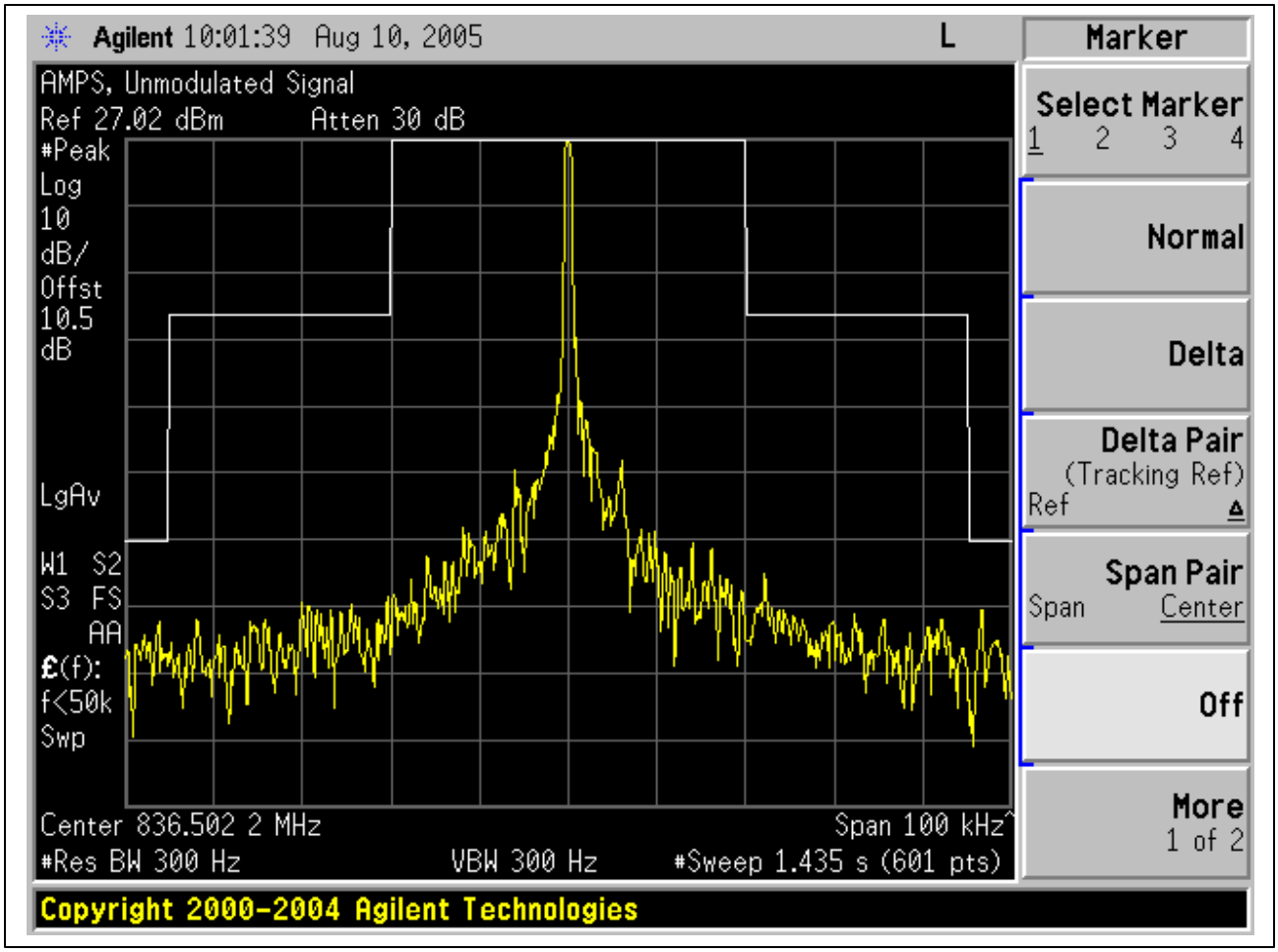
TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.4.10

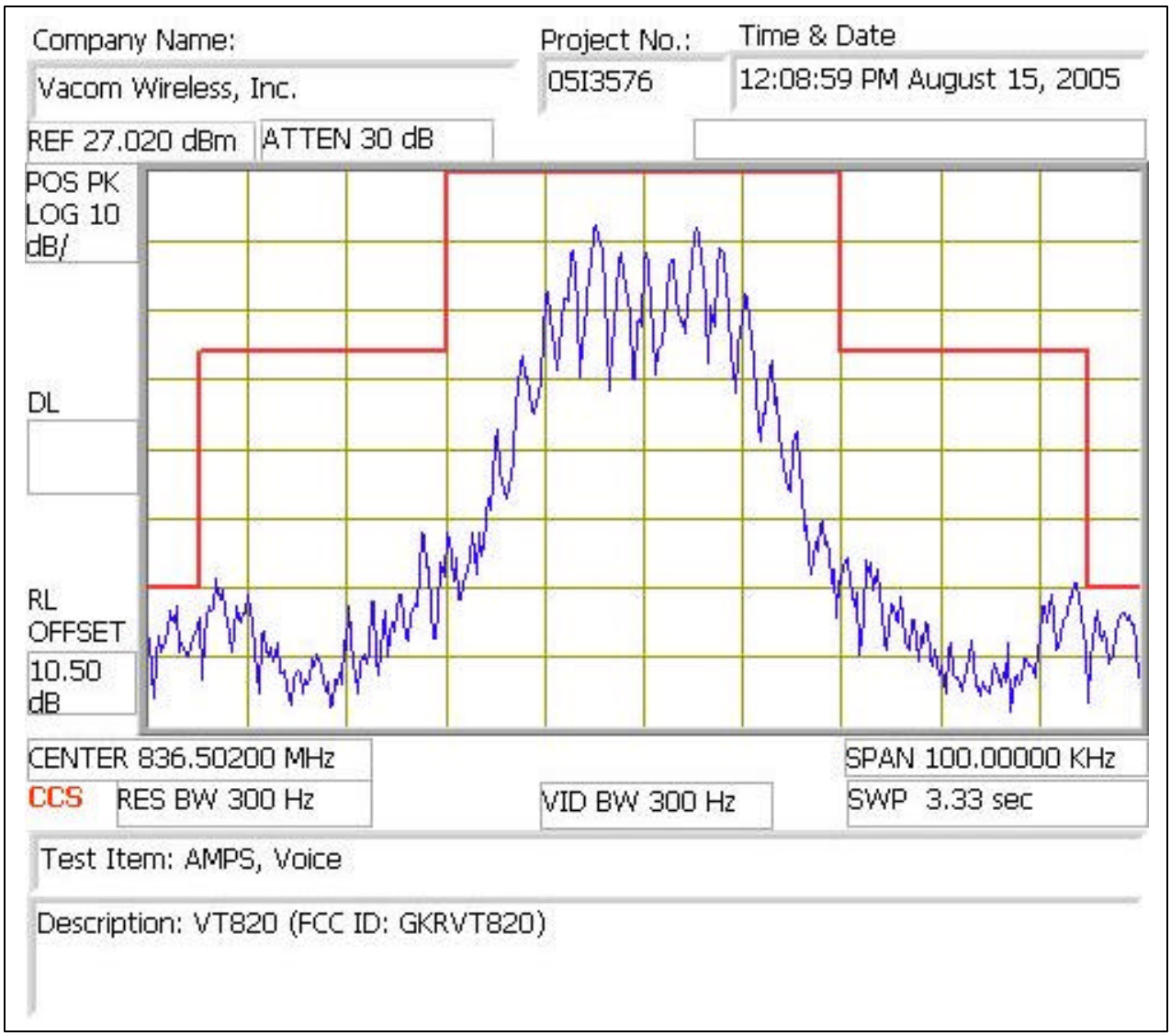
RESULTS

No non-compliance noted:

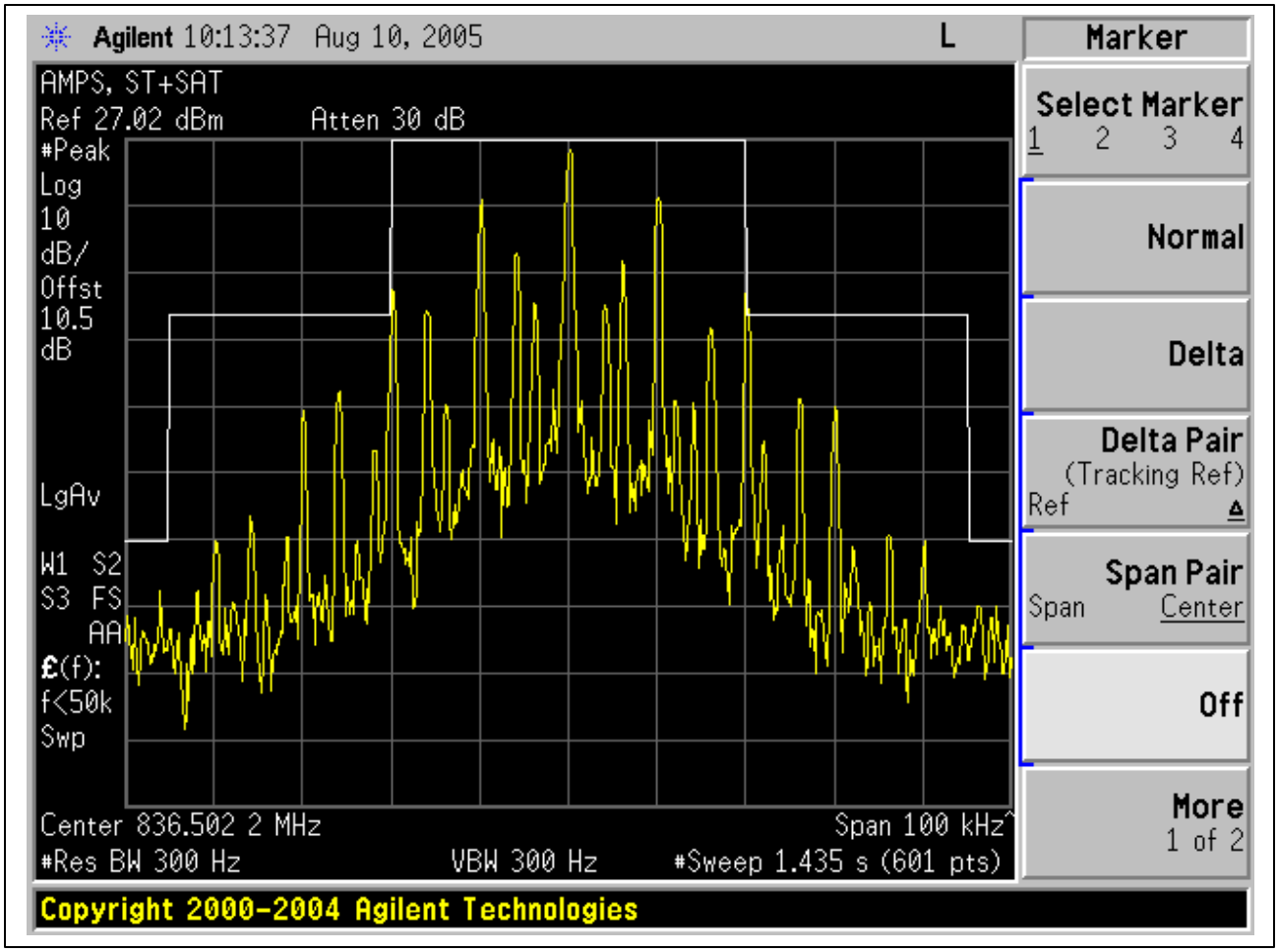
Un-modulated Signal



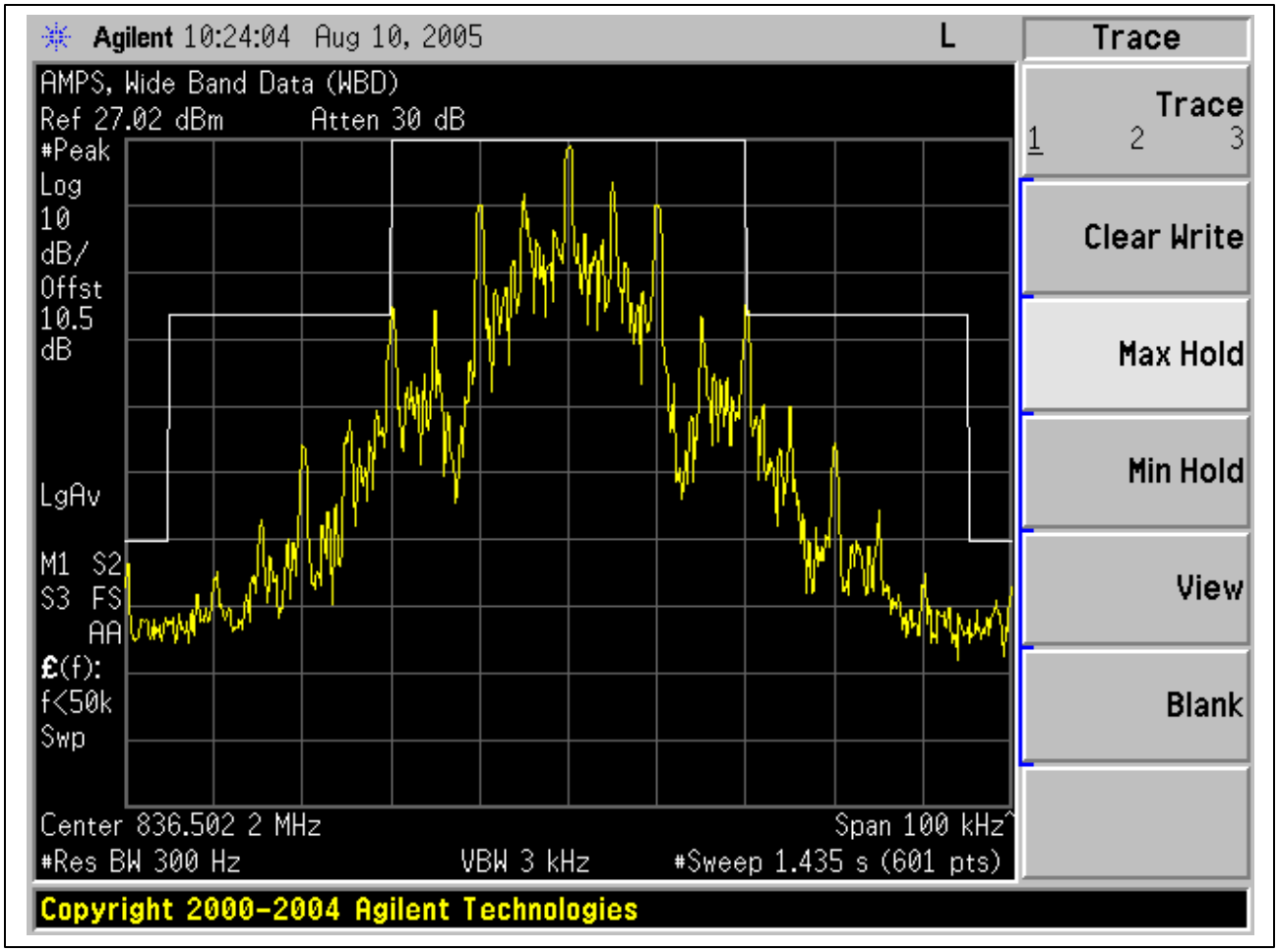
Voice



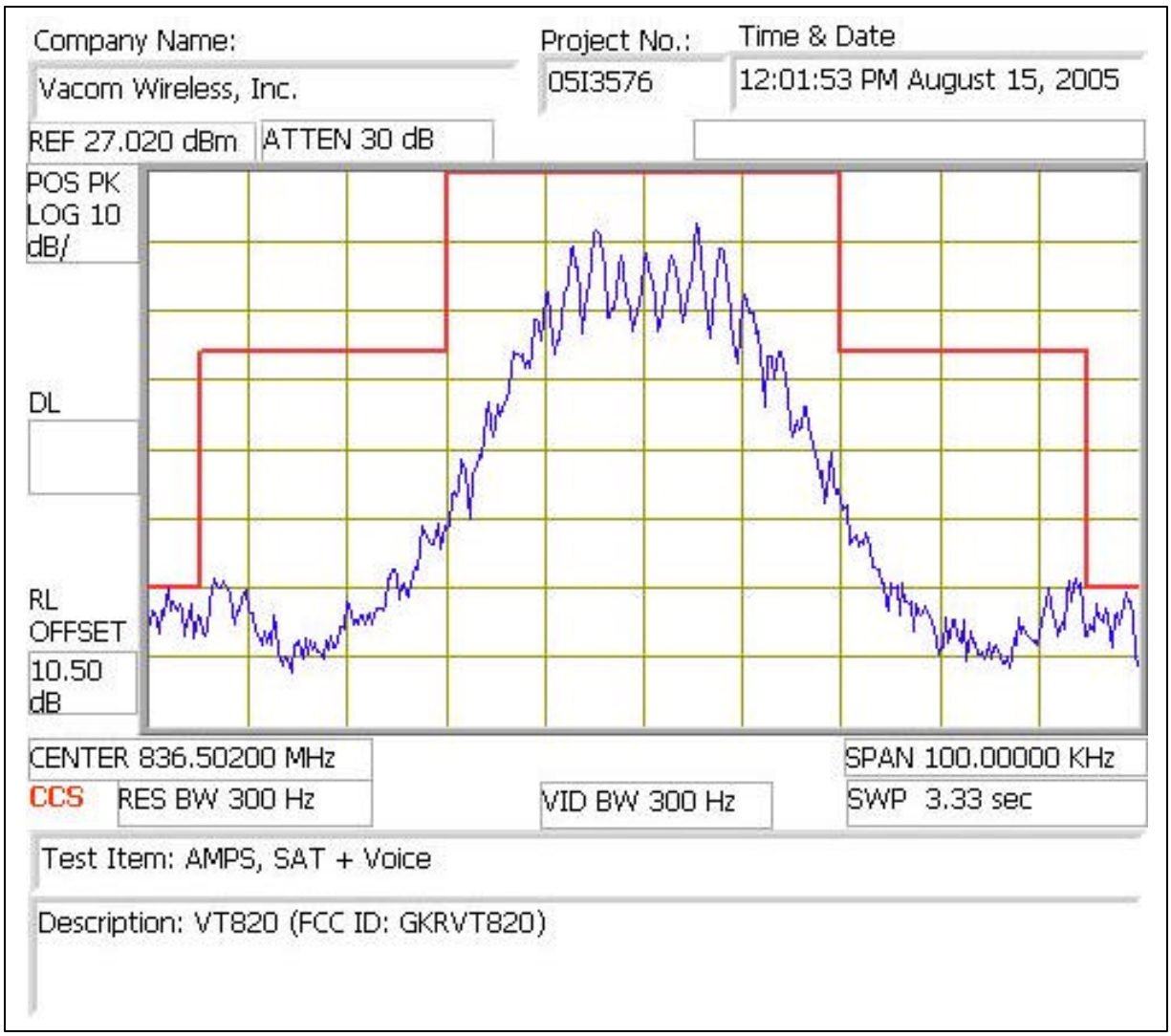
Signalling Tone (ST) + Supervisory Audio Tone (SAT)



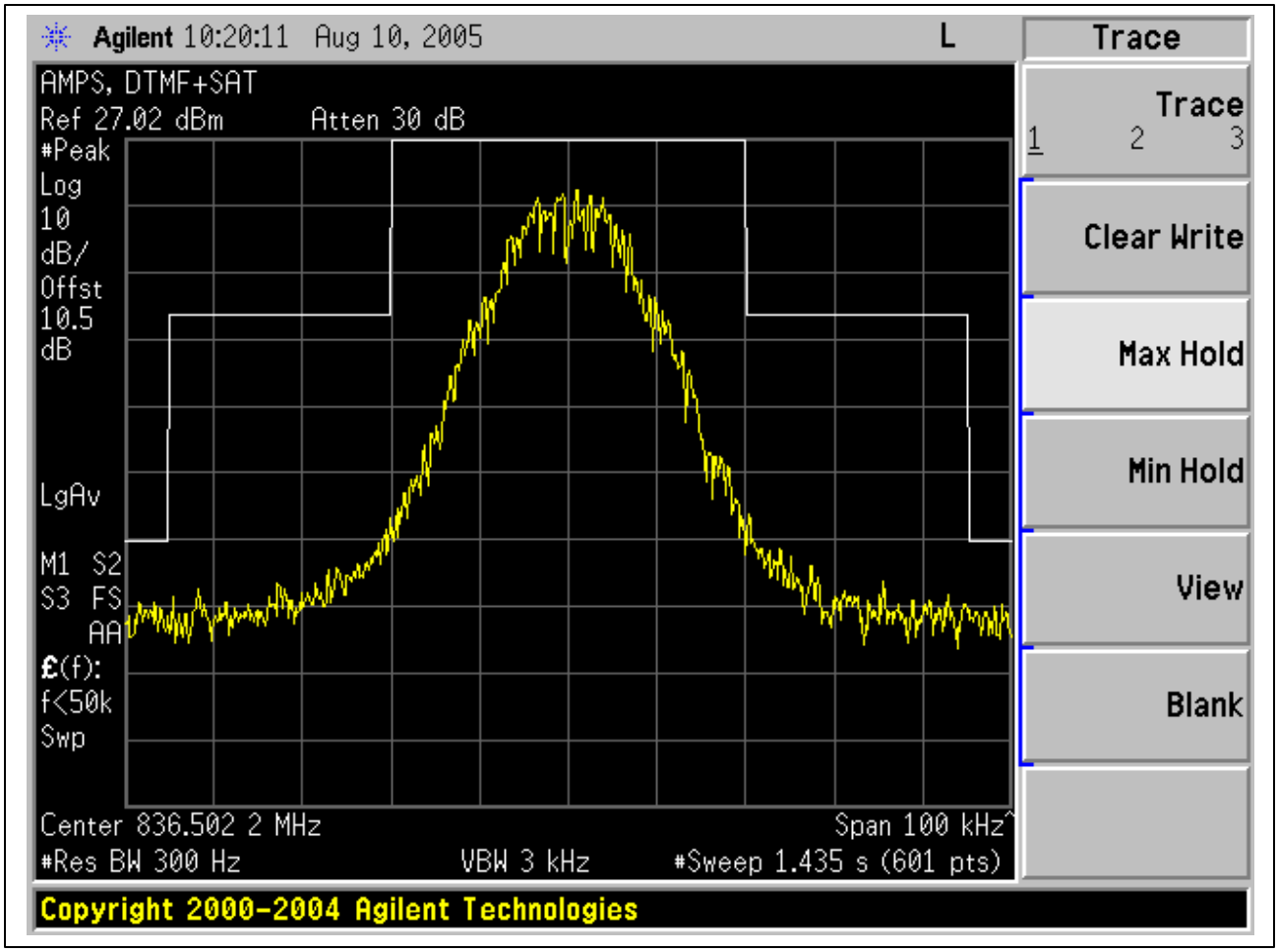
Wide Band Data (WBD)



Voice + Supervisory Audio Tone (SAT)



DTMF + Supervisory Audio Tone (SAT)



7.3. MODULATION CHARACTERISTICS

LIMIT

§22.915 Audio Filter Characteristics

For mobile stations, these signals must be attenuated, relative to the level at 1 kHz, as follows:

(i) In the frequency ranges of 3.0 to 5.9 khz and 6.1 to 15.0 kHz, signals must be attenuated by at least 40 log (f / 3) dB, where f is the frequency of the signal in kHz.

(ii) In the frequency ranges of 5.9 to 6.1 kHz, signals must be attenuated at least 35 dB.

(iii) In the frequency ranges above 15 kHz, signals must be attenuated at least 28 dB.

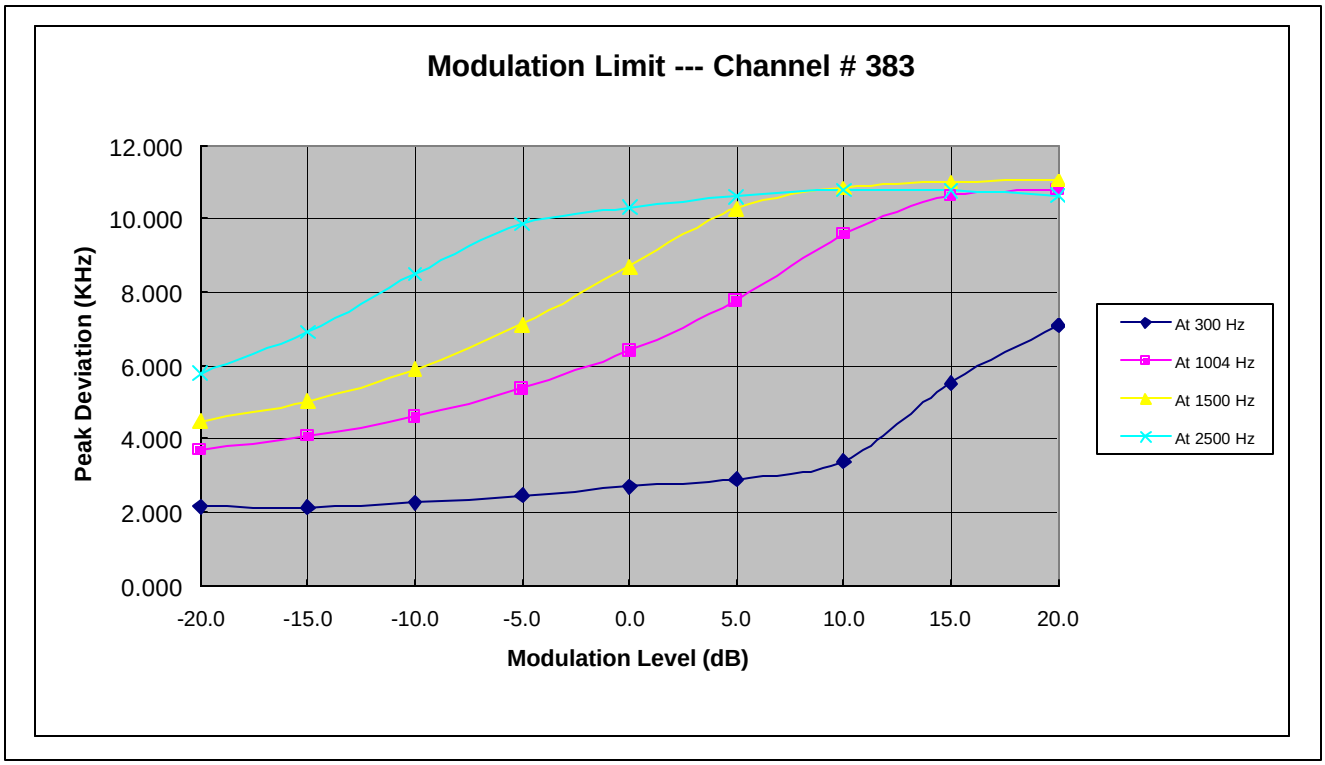
TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.3.1 and 2.3.2

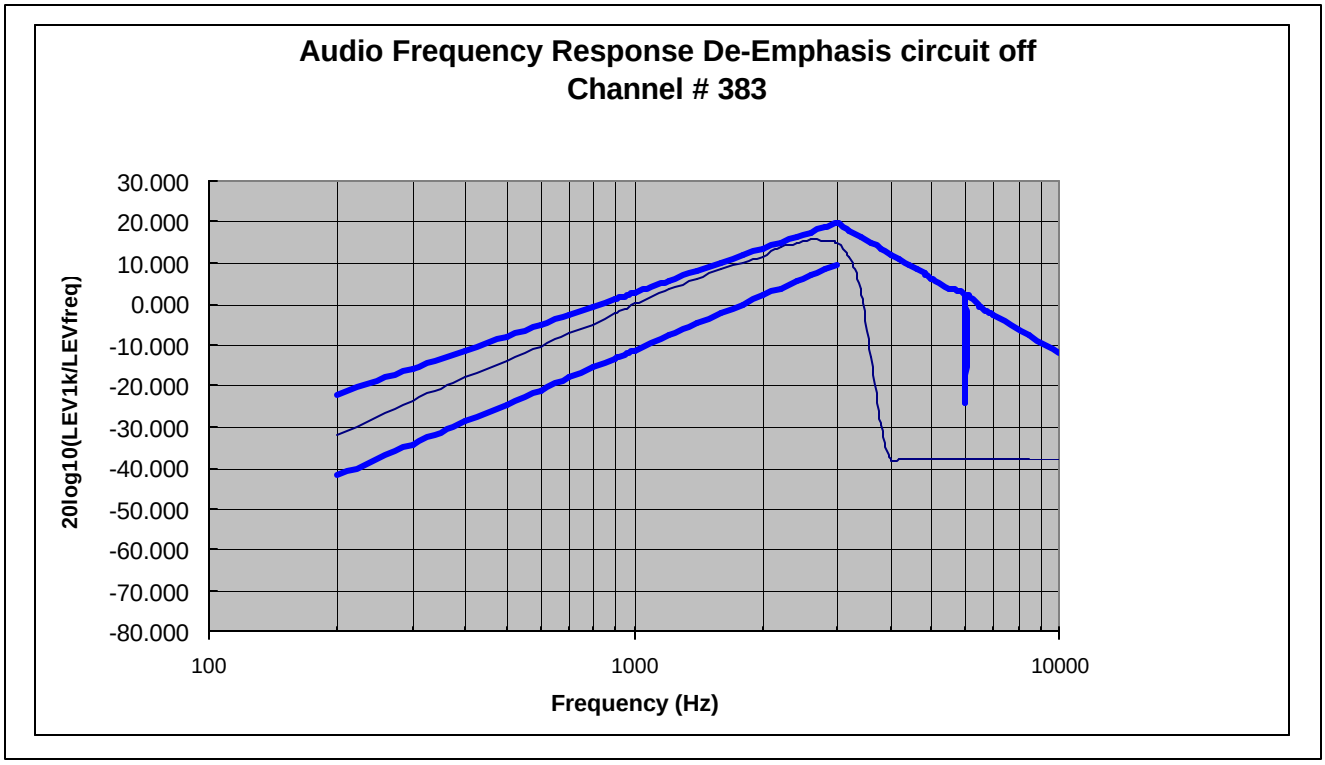
RESULTS

No non-compliance noted.

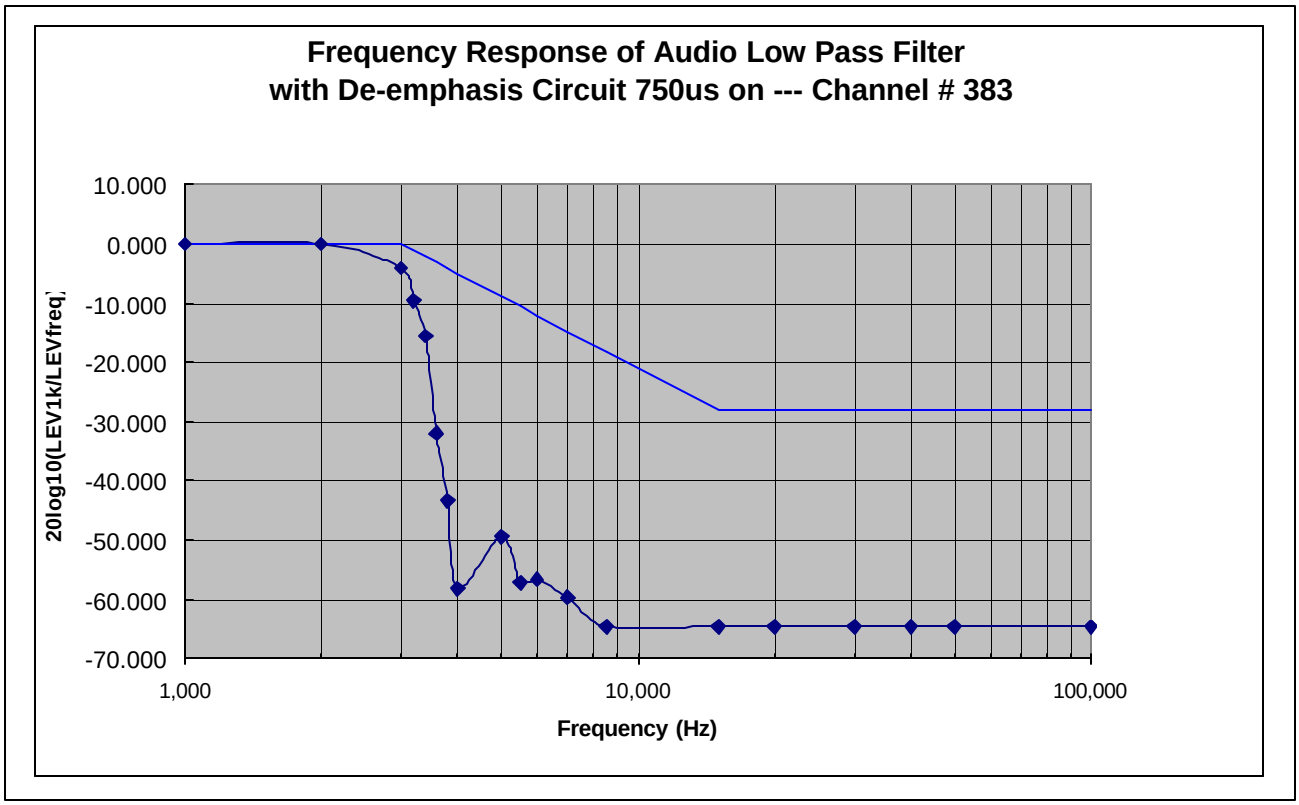
Modulation Limit:



Audio Frequency Response



Audio low pass filter response



7.4. RF POWER OUTPUT

LIMIT

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

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

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

RESULTS

No non-compliance noted.

CDMA Output Power (ERP)

08/15/05 **30 - 1000MHz Substitution Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr:William Zhuang
Project #:05I3576-1
Company:VACOM WIRELESS, INC.
EUT Descrip.:Dual band Tri mode PCS/AMPS/CDMA cellular Phone
EUT M/N:VT820 (FCC ID: GKRVT820)
Test Target:FCC 22/24
Mode Oper:Transmit CDMA mode

Test Equipment:

Bilog Antenna	Cable	Pre-amplifer 8447D	Limit
5m Chamber Sunol Bilog	5m Chamber Cable		ERP

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
835.89	97.4	V	27.2	3.5	6.7	4.6	28.3	38.0	-9.7	X position
835.89	94.3	H	23.6	3.5	6.7	4.6	24.7	38.0	-13.3	X position
835.89	93.7	V	23.5	3.5	6.7	4.6	24.6	38.0	-13.4	Y position
835.89	96.0	H	25.4	3.5	6.7	4.6	26.5	38.0	-11.5	Y position
835.89	93.7	V	23.5	3.5	6.7	4.6	24.6	38.0	-13.4	Z position
835.89	90.6	H	20.0	3.5	6.7	4.6	21.1	38.0	-16.9	Z position
Worst case X position										
824.76	95.9	V	25.6	3.4	6.7	4.6	26.7	38.0	-11.3	Low Ch.
824.76	93.2	H	22.4	3.4	6.7	4.6	23.5	38.0	-14.5	Low Ch.
835.89	97.4	V	27.2	3.5	6.7	4.6	28.3	38.0	-9.7	Mid Ch.
835.89	94.3	H	23.6	3.5	6.7	4.6	24.7	38.0	-13.3	Mid Ch.
848.25	94.7	V	24.6	3.5	6.7	4.6	25.7	38.0	-12.3	High Ch.
848.25	91.7	H	21.2	3.5	6.7	4.6	22.2	38.0	-15.8	High Ch.

AMPS Output Power (ERP)

Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: William Zhuang
Project #: 05I3576-1
Company: VACOM WIRELESS, INC.
EUT Descrip.: Dual band Tri mode PCS/AMPS/CDMA cellular Phone
EUT M/N: VT820 (FCC ID: GKRVT820)
Test Target: FCC 22/24
Mode Oper: Transmit AMPS mode

Test Equipment:

Bilog Antenna	Cable	Pre-amplifer 8447D	Limit
5m Chamber Sunol Bilog	5m Chamber Cable		ERP

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
836.49	94.0	V	23.8	3.5	6.7	4.6	24.9	38.0	-13.1	Xposition
836.49	91.7	H	21.0	3.5	6.7	4.6	22.1	38.0	-15.9	Xposition
836.49	89.0	V	18.8	3.5	6.7	4.6	19.9	38.0	-18.1	Yposition
836.49	94.5	H	23.8	3.5	6.7	4.6	24.9	38.0	-13.1	Yposition
836.49	90.8	V	20.6	3.5	6.7	4.6	21.7	38.0	-16.3	Zposition
836.49	84.9	H	14.3	3.5	6.7	4.6	15.3	38.0	-22.7	Zposition
Worst case Xposition										
824.04	92.2	V	21.9	3.4	6.7	4.6	23.0	38.0	-15.0	Low Ch.
824.04	92.5	H	21.7	3.4	6.7	4.6	22.8	38.0	-15.2	Low Ch.
836.49	94.0	V	23.8	3.5	6.7	4.6	24.9	38.0	-13.1	Mid Ch.
836.49	91.7	H	21.0	3.5	6.7	4.6	22.1	38.0	-15.9	Mid Ch.
848.97	91.4	V	21.4	3.5	6.7	4.6	22.5	38.0	-15.5	High Ch.
848.97	92.4	H	21.9	3.5	6.7	4.6	23.0	38.0	-15.0	High Ch.

PCS Output Power (EIRP)

08/12/05 High Frequency Substitution Measurement
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: William Zhuang
Project #: 05I3576-1
Company: VACOM WIRELESS, INC.
EUT Descrip.: Dual band Tri mode PCS/AMPS/CDMA cellular Phone
EUT M/N: VT820 (FCC ID: GKRVT820)
Test Target: FCC 22/24
Mode Oper: Transmit PCS mode

Test Equipment:

EMCO Horn 1-18GHz: T73; S/N: 6717 @3m
Horn > 18GHz:
Limit: FCC 24
☐ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz:
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
1.880	88.0	V	19.8	1.4	7.9	5.7	26.3	38.0	-11.7	X position
1.880	88.9	H	21.4	1.4	7.9	5.7	27.9	38.0	-10.1	X position
1.880	85.5	H	17.9	1.4	7.9	5.7	24.4	38.0	-13.6	Y position
1.880	88.1	V	19.8	1.4	7.9	5.7	26.3	38.0	-11.7	Y position
1.880	89.9	V	21.6	1.4	7.9	5.7	28.2	38.0	-9.8	Z position
1.880	83.1	H	15.5	1.4	7.9	5.7	22.0	38.0	-16.0	Z position
Worst case X position										
1.851	90.6	H	22.9	1.4	7.8	5.7	29.4	38.0	-8.6	Low Ch.
1.851	87.7	V	19.3	1.4	7.8	5.7	25.8	38.0	-12.2	Low Ch.
1.880	88.0	V	19.8	1.4	7.9	5.7	26.3	38.0	-11.7	Mid Ch.
1.880	88.9	H	21.4	1.4	7.9	5.7	27.9	38.0	-10.1	Mid Ch.
1.909	86.6	V	18.5	1.4	7.9	5.8	25.1	38.0	-12.9	High Ch.
1.909	88.6	H	21.3	1.4	7.9	5.8	27.8	38.0	-10.2	High Ch.

7.5. 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.

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

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.3.1 and 2.3.2

RESULTS

No non-compliance noted.

Reference Frequency: AMPS Mid Channel 836.490000MHz @ 25°C Limit: to stay ± 2.5 ppm = 2091.255 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.50219	-0.285	± 2.5
3.80	40	836.50208	-0.149	± 2.5
3.80	30	836.50199	-0.045	± 2.5
3.80	***25***	***836.50195***	***0***	***± 2.5***
3.80	20	836.50194	0.014	± 2.5
3.80	10	836.50194	0.014	± 2.5
3.80	0	836.50193	0.029	± 2.5
3.80	-10	836.50190	0.066	± 2.5
3.80	-20	836.50184	0.134	± 2.5
3.80	-30	836.50149	0.552	± 2.5
3.08 (end point)	25	836.50179	0.194	± 2.5
3.23	25	836.50190	0.060	± 2.5
4.37	25	836.50195	0.000	± 2.5

Reference Frequency: CDMA Mid Channel 835.890000MHz @ 25°C Limit: to stay ± 2.5 ppm = 2091.434 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.57392	-0.383	± 2.5
3.80	40	836.57377	-0.203	± 2.5
3.80	30	836.57368	-0.086	± 2.5
3.80	***25***	***836.57360***	***0***	***± 2.5***
3.80	20	836.57354	0.073	± 2.5
3.80	10	836.57327	0.400	± 2.5
3.80	0	836.57314	0.551	± 2.5
3.80	-10	836.57278	0.984	± 2.5
3.80	-20	836.57253	1.281	± 2.5
3.80	-30	836.57247	1.357	± 2.5
2.97 (end point)	25	836.57569	-2.489	± 2.5
3.23	25	836.57541	-2.160	± 2.5
4.37	25	836.57336	0.294	± 2.5

Reference Frequency: PCS Mid Channel 1880.000000MHz @ 25°C Limit: to stay ± 2.5 ppm = 4701.715 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1880.68632	-0.234	± 2.5
3.80	40	1880.68621	-0.175	± 2.5
3.80	30	1880.68599	-0.056	± 2.5
3.80	***25***	***1880.68588***	***0***	***± 2.5***
3.80	20	1880.68556	0.168	± 2.5
3.80	10	1880.68524	0.340	± 2.5
3.80	0	1880.68513	0.399	± 2.5
3.80	-10	1880.68496	0.491	± 2.5
3.80	-20	1880.68478	0.584	± 2.5
3.80	-30	1880.68469	0.633	± 2.5
2.95 (end point)	25	1880.69043	-2.419	± 2.5
3.23	25	1880.68902	-1.671	± 2.5
4.37	25	1880.68546	0.221	± 2.5

7.6. SPURIOUS EMISSION AT ANTENNA TERMINAL

LIMIT

§22.917 (e) and §24.238 (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

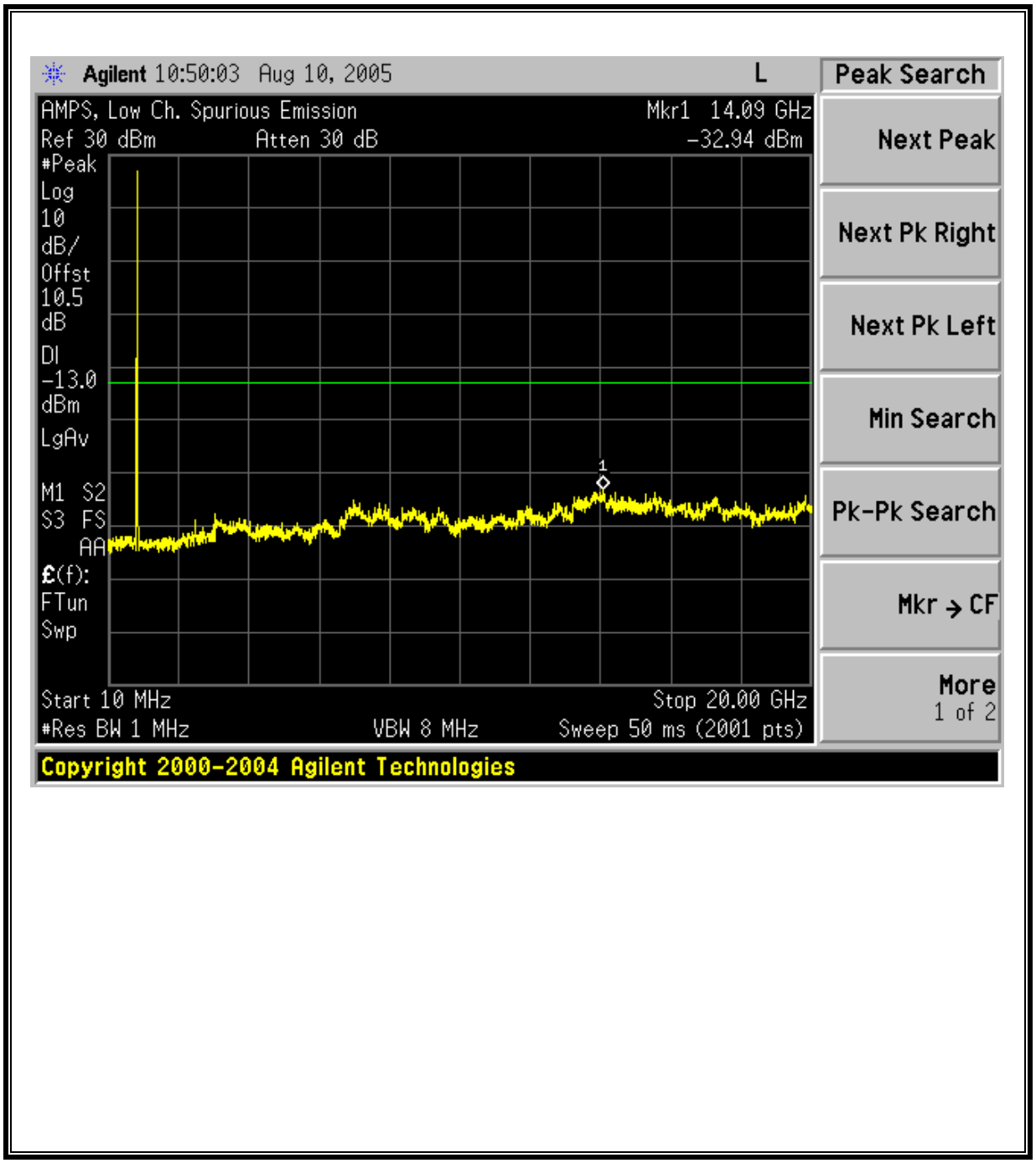
ANSI / TIA / EIA 603 Clause 3.2.13 & FCC 22.917 (h) and FCC 24.238 (b)

RESULTS

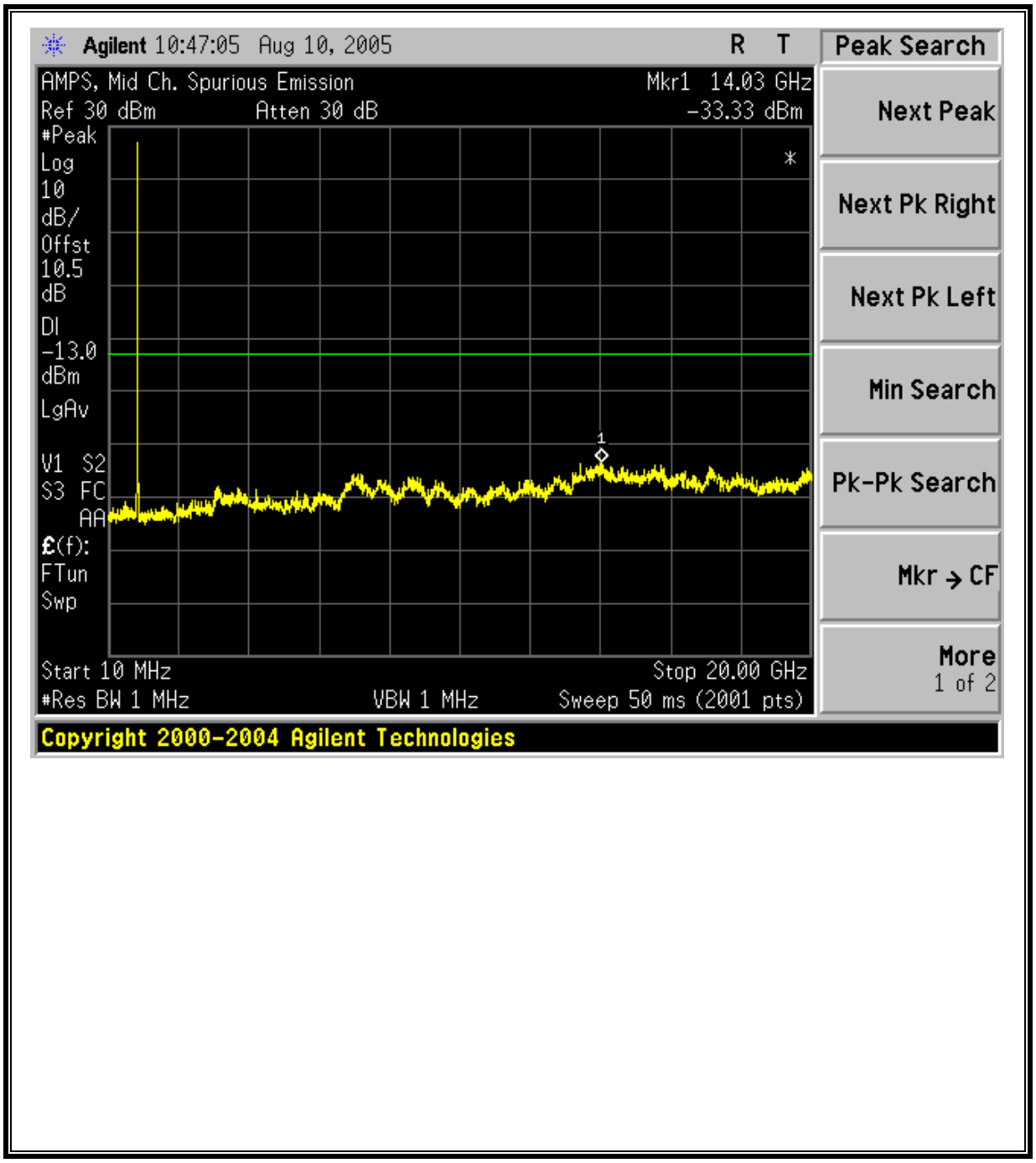
No non-compliance noted.

AMPS MODULATION RESULTS

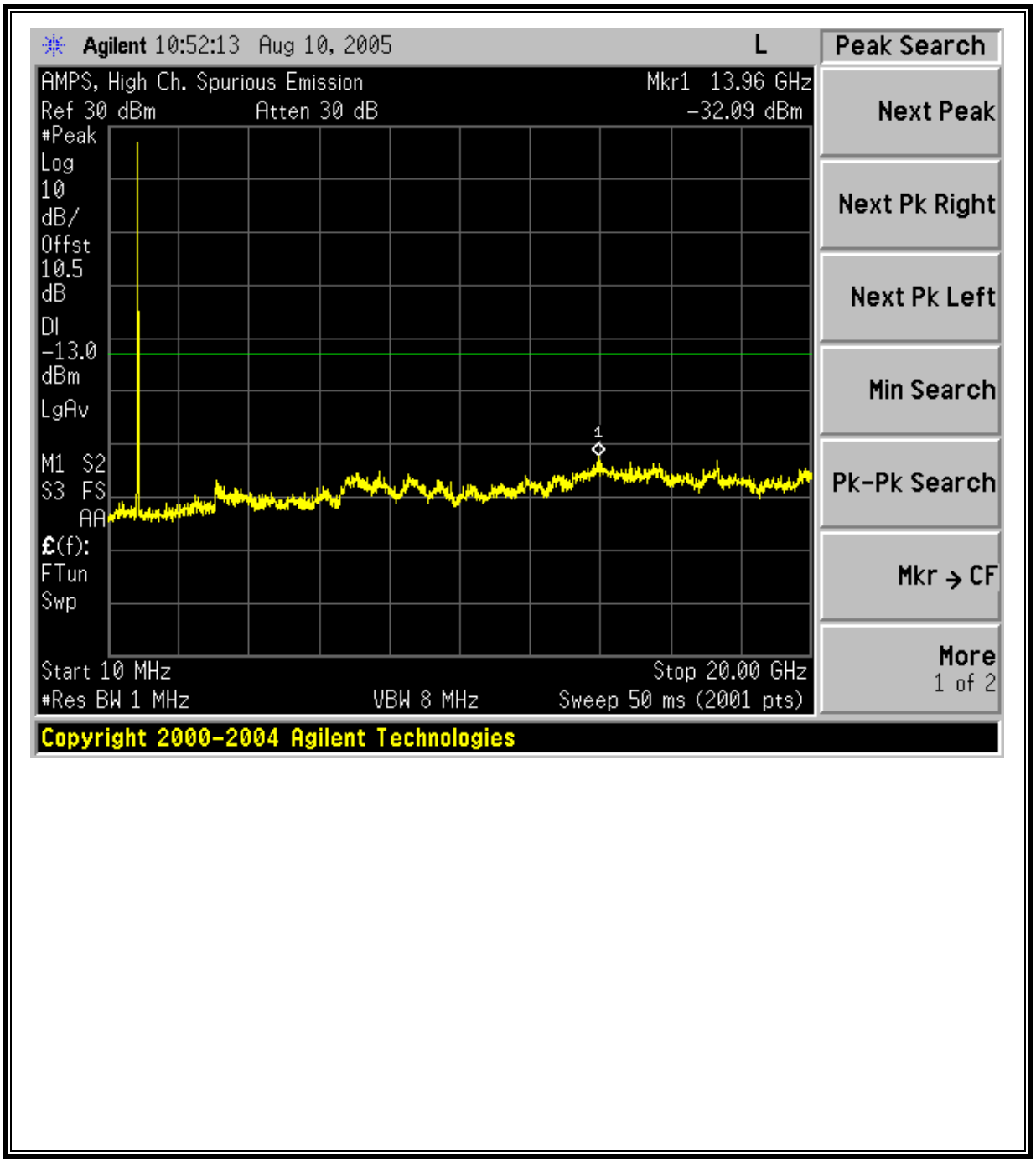
AMPS Modulation: Low Channel, Out-Of-Band Emissions



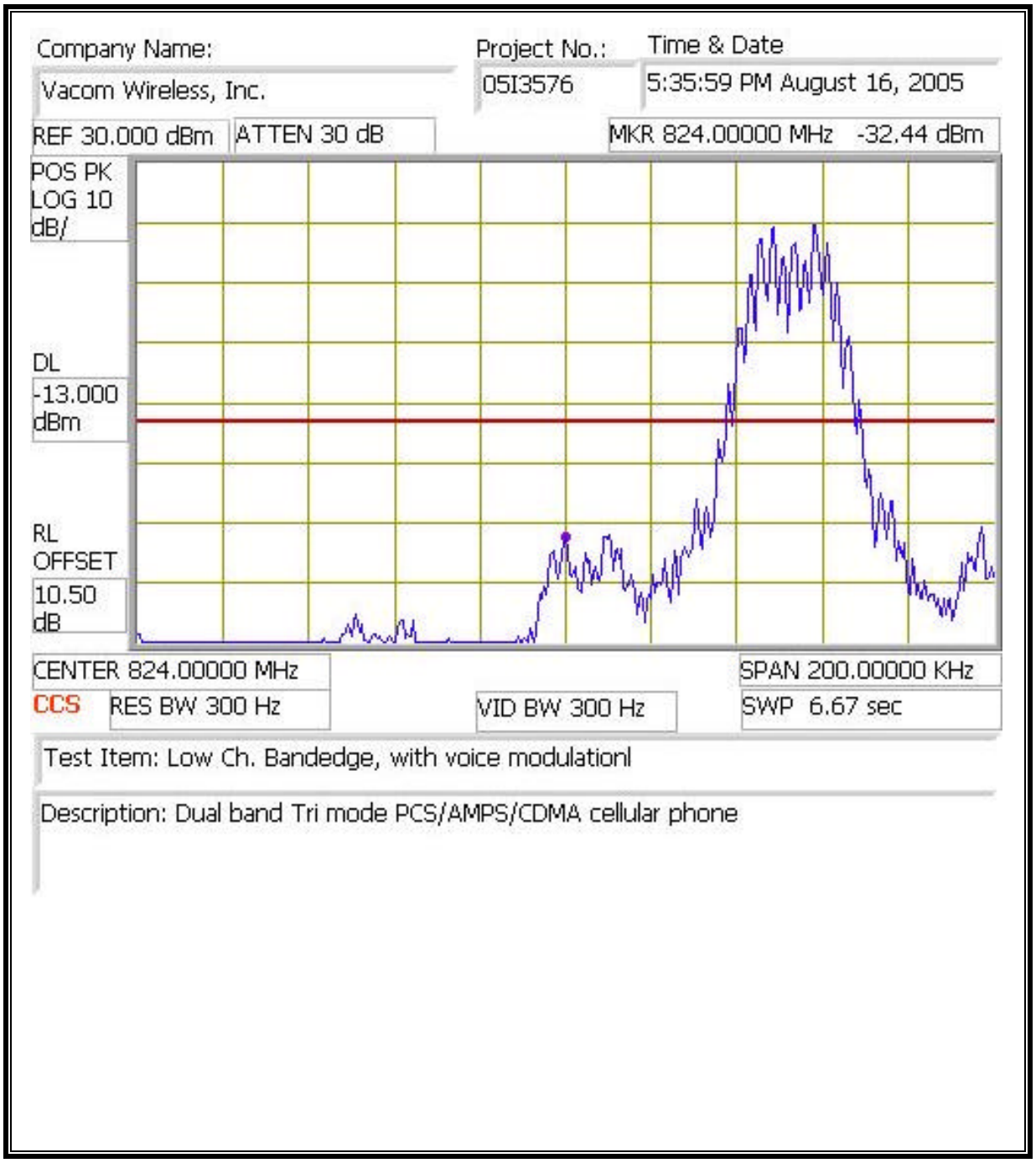
AMPS Modulation: Mid Channel, Out-Of-Band Emissions



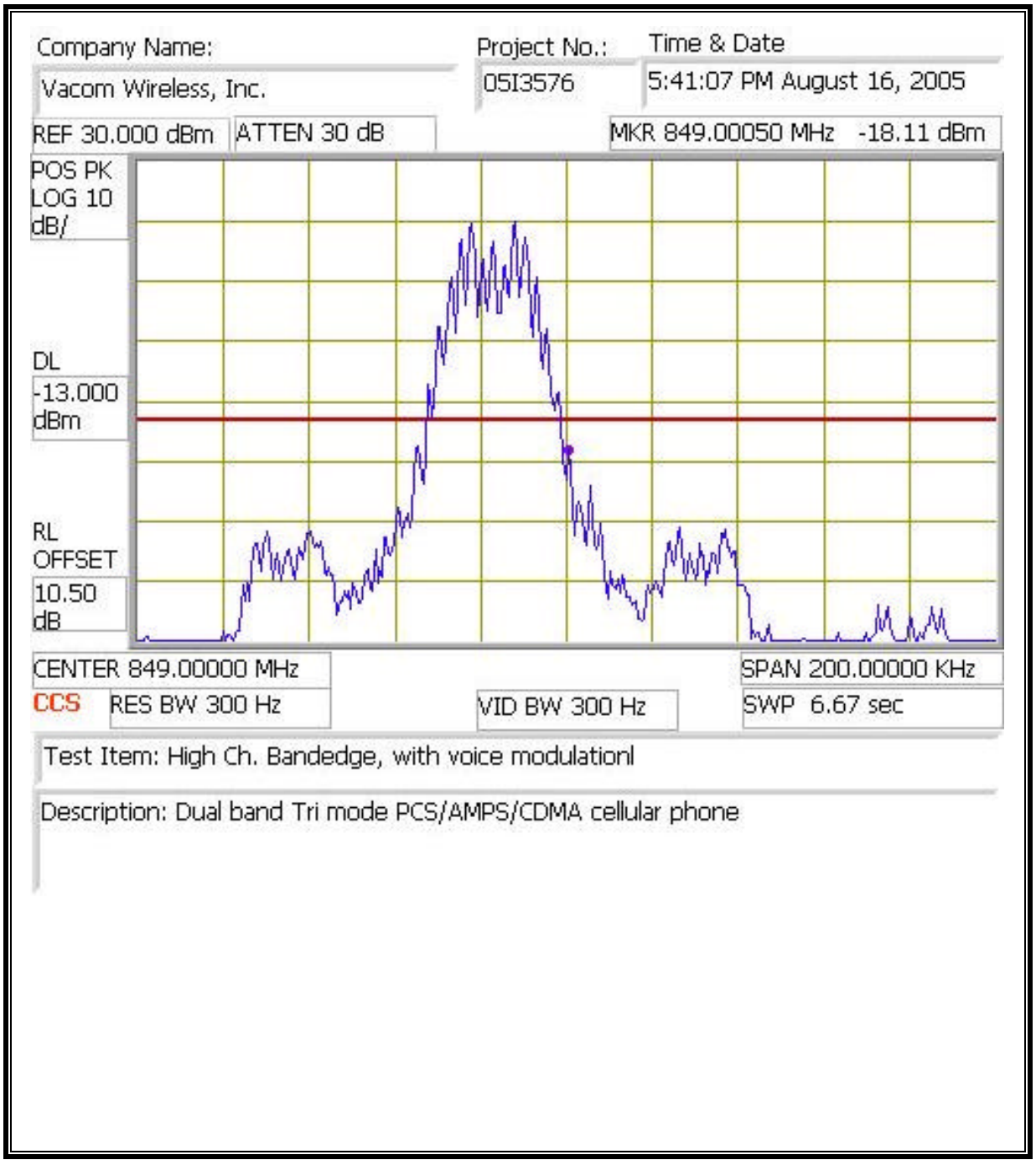
AMPS Modulation: High Channel, Out-Of-Band Emissions



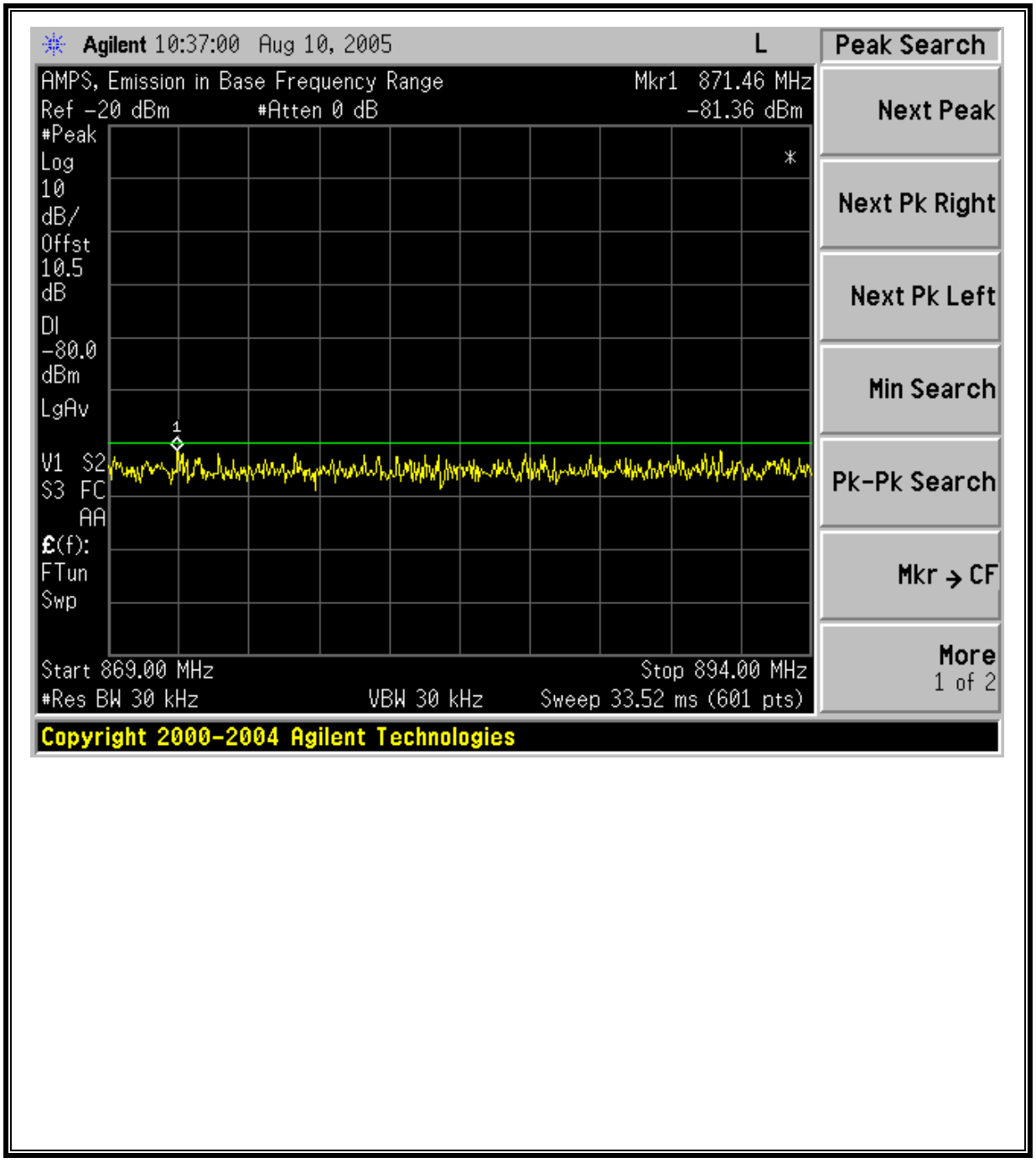
AMPS Modulation: Low Channel Band Edge



AMPS Modulation: High Channel Band Edge

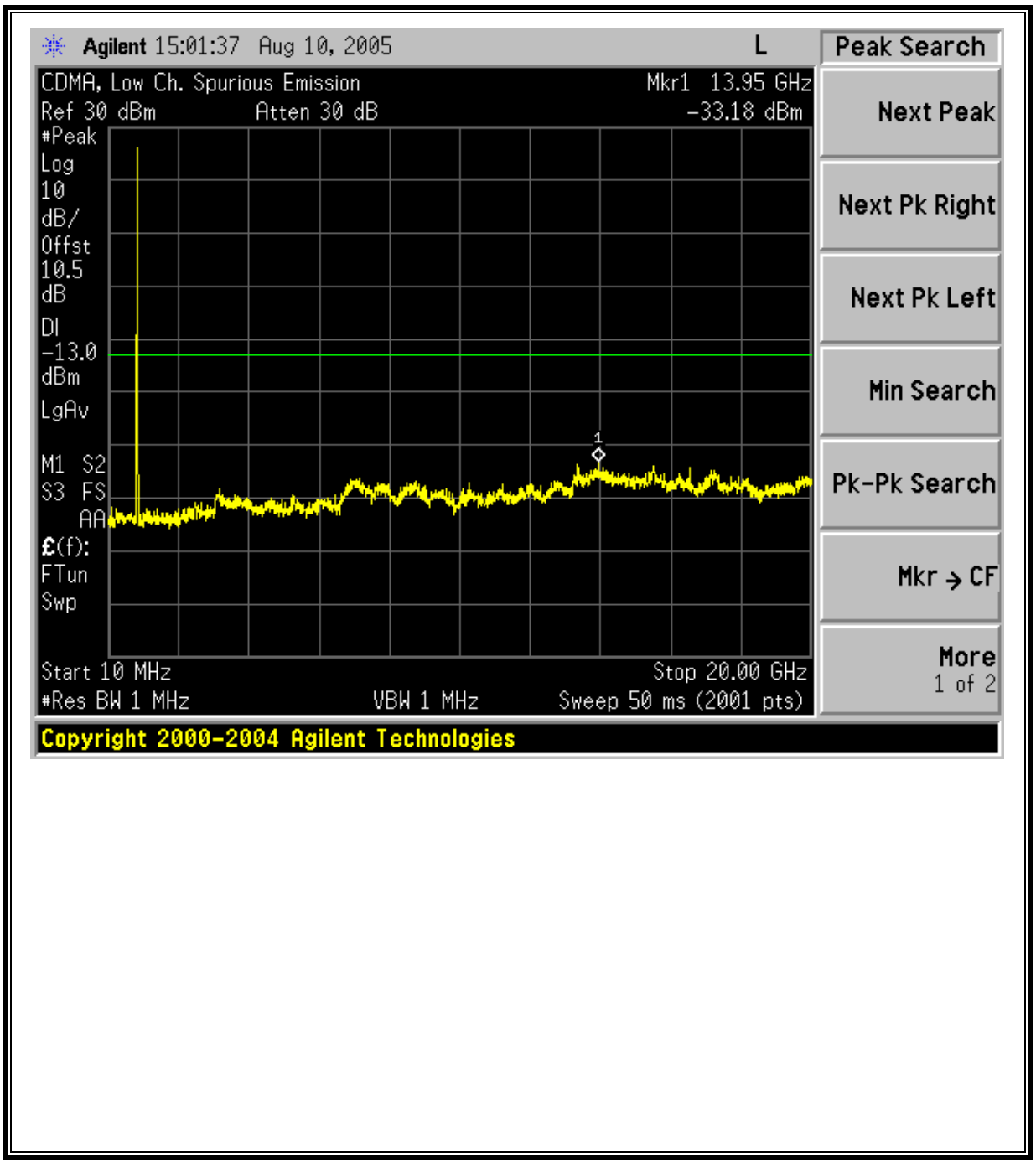


AMPS Mobile Emissions in Base Frequency Range

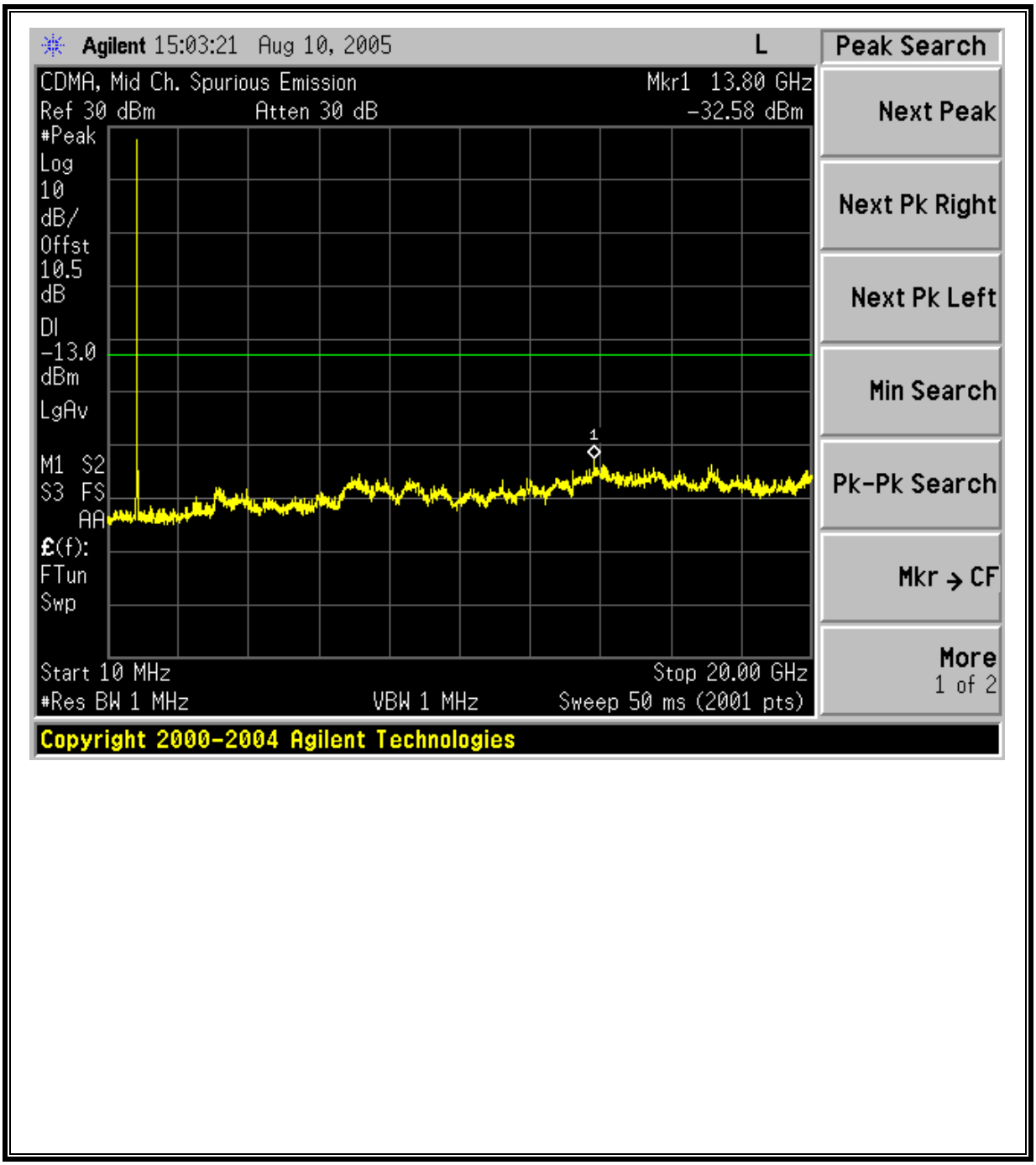


CDMA MODULATION RESULTS

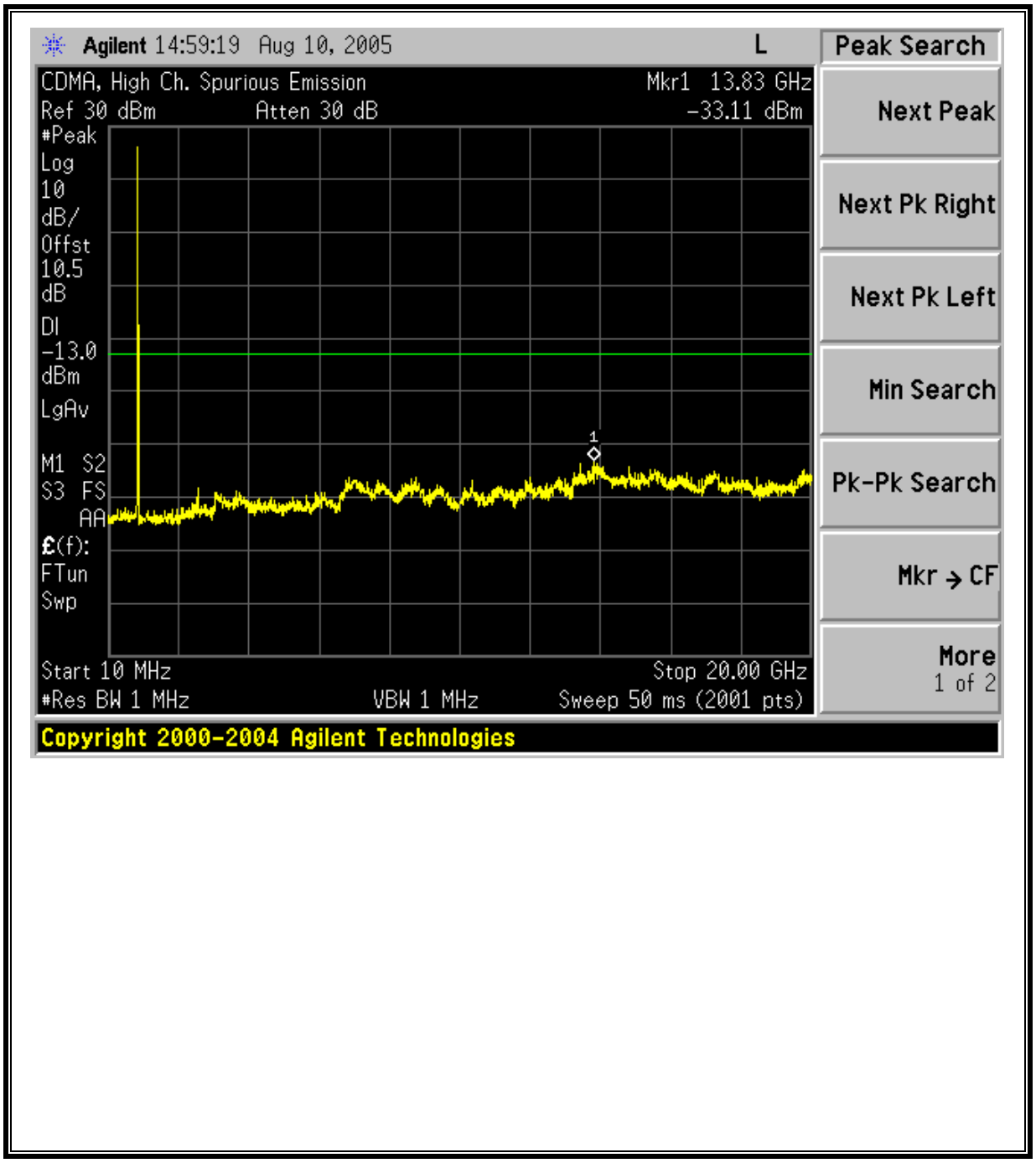
CDMA Modulation: Low Channel Out-Of-Band Emissions



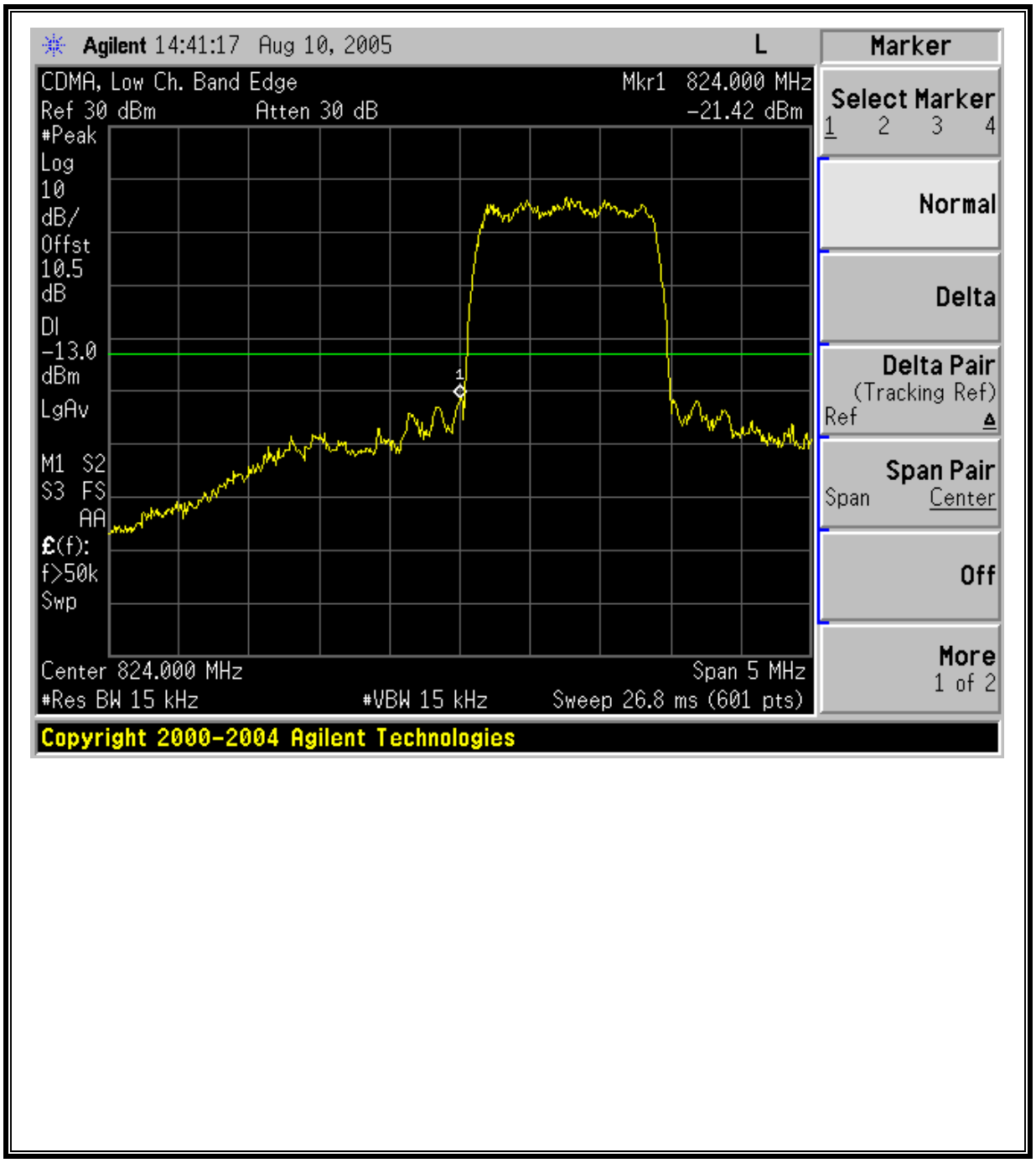
CDMA Modulation: Mid Channel Out-Of-Band Emissions



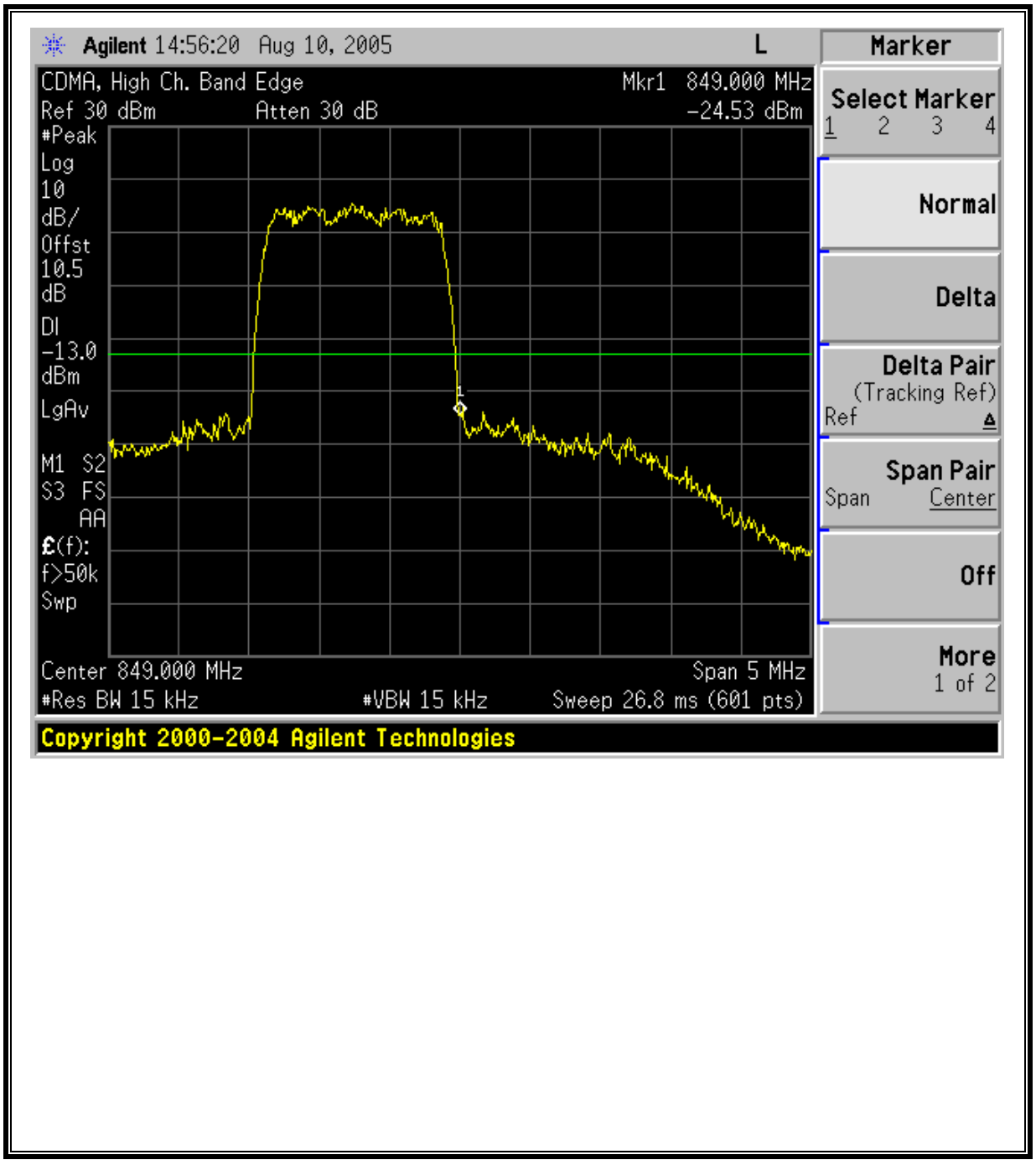
CDMA Modulation: High Channel Out-Of-Band Emissions



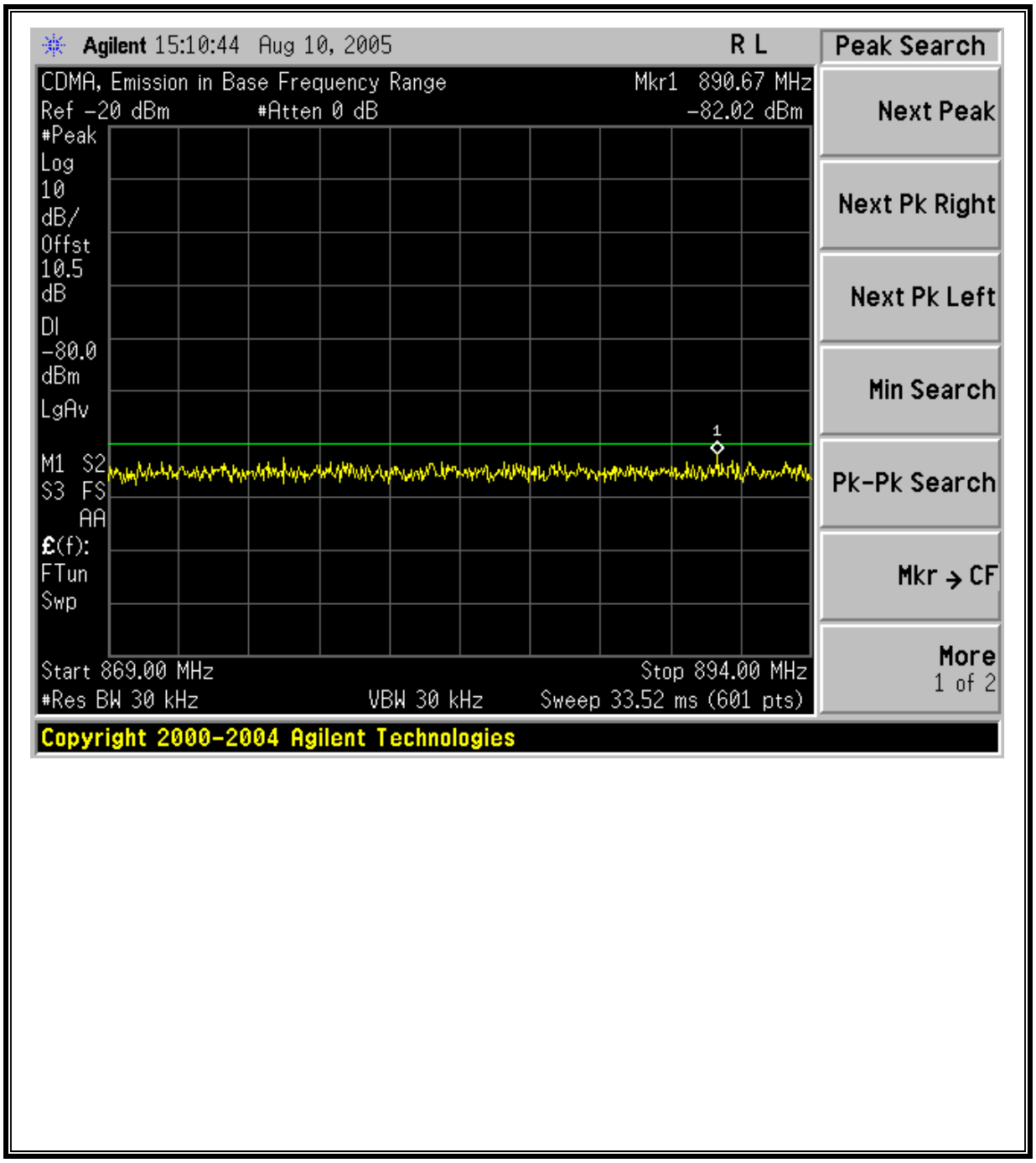
CDMA Modulation: Low Channel Band Edge



CDMA Modulation: High Channel Band Edge

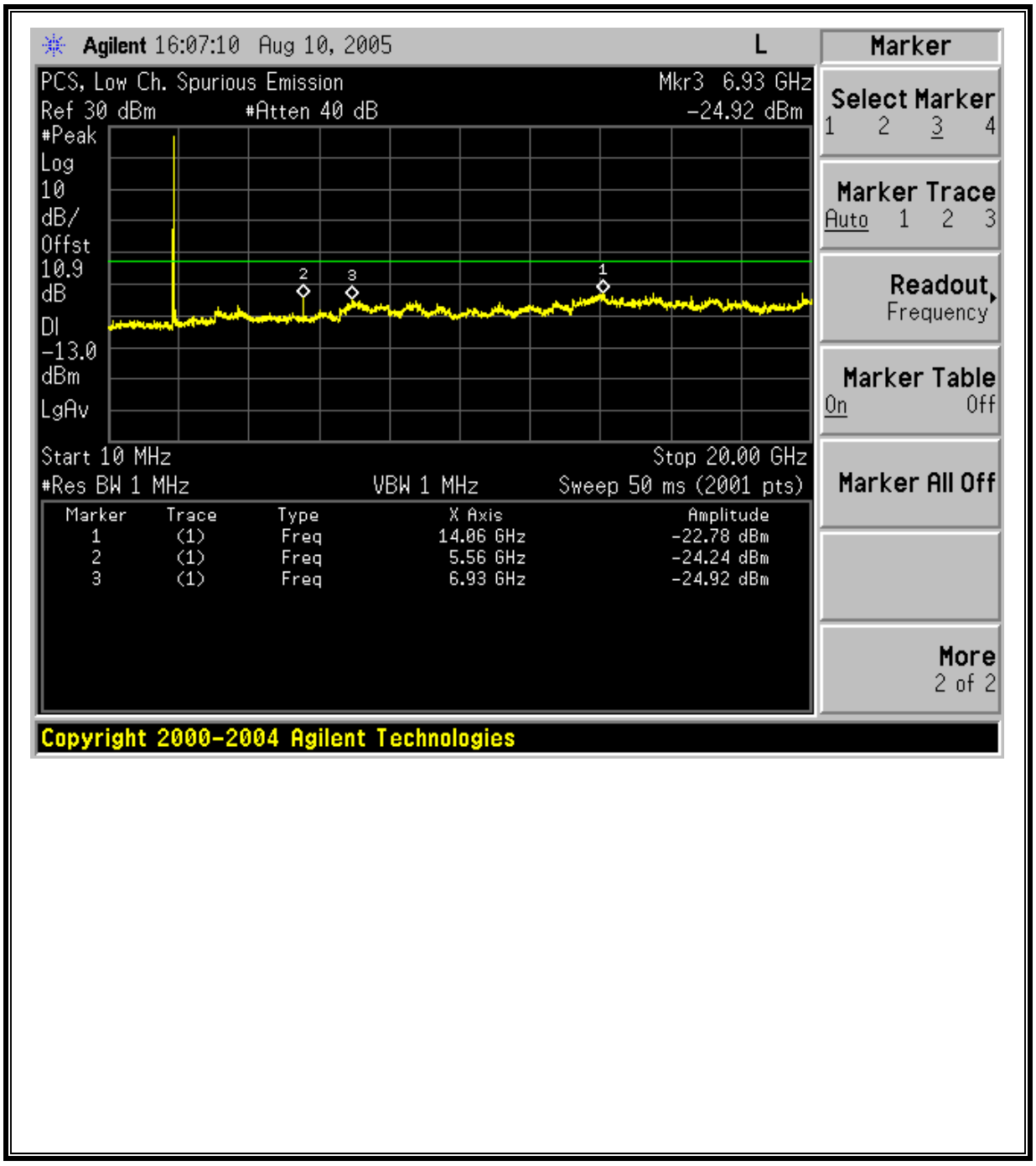


CDMA Mobile Emissions in Base Frequency Range

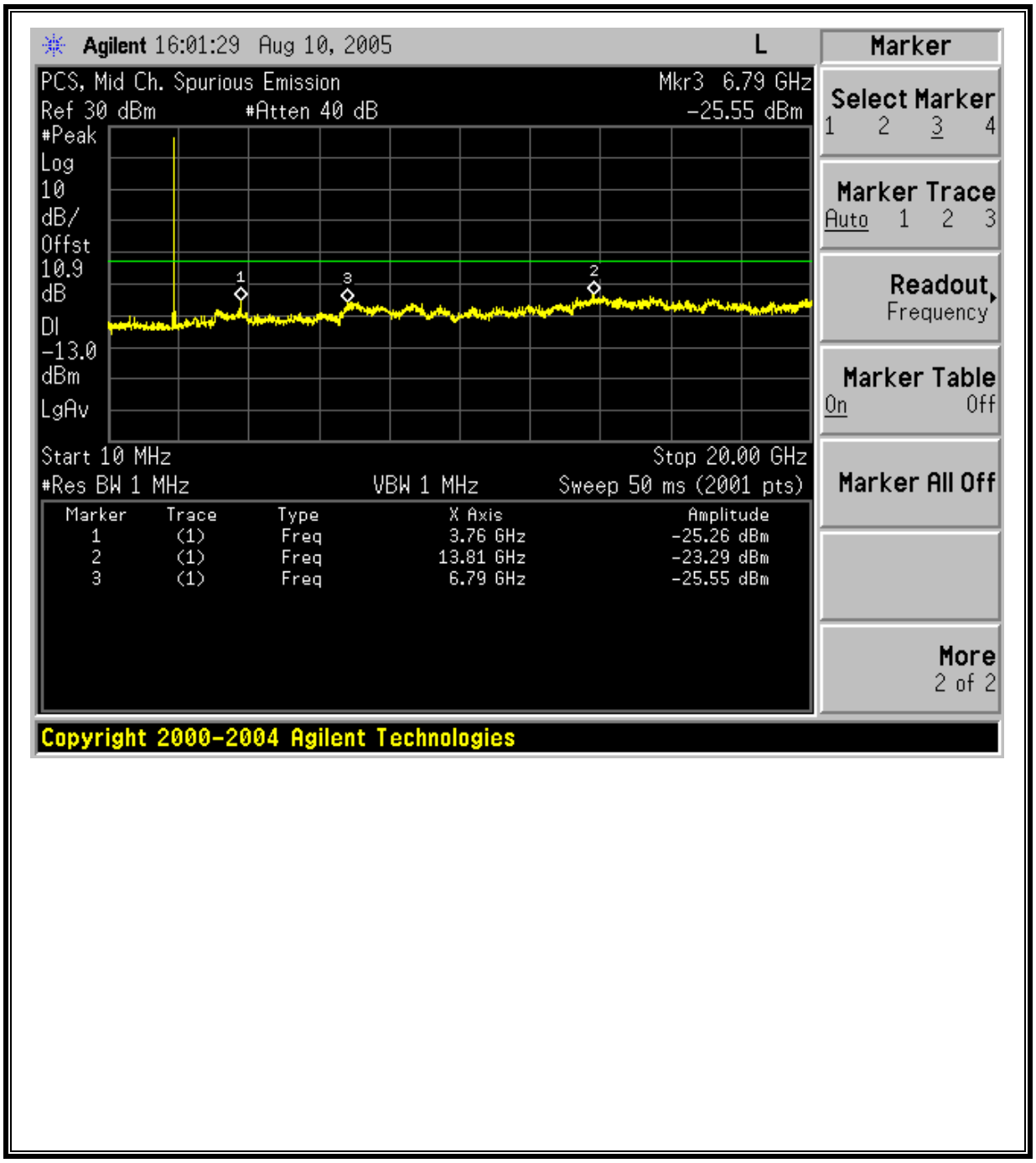


PCS MODULATION RESULTS

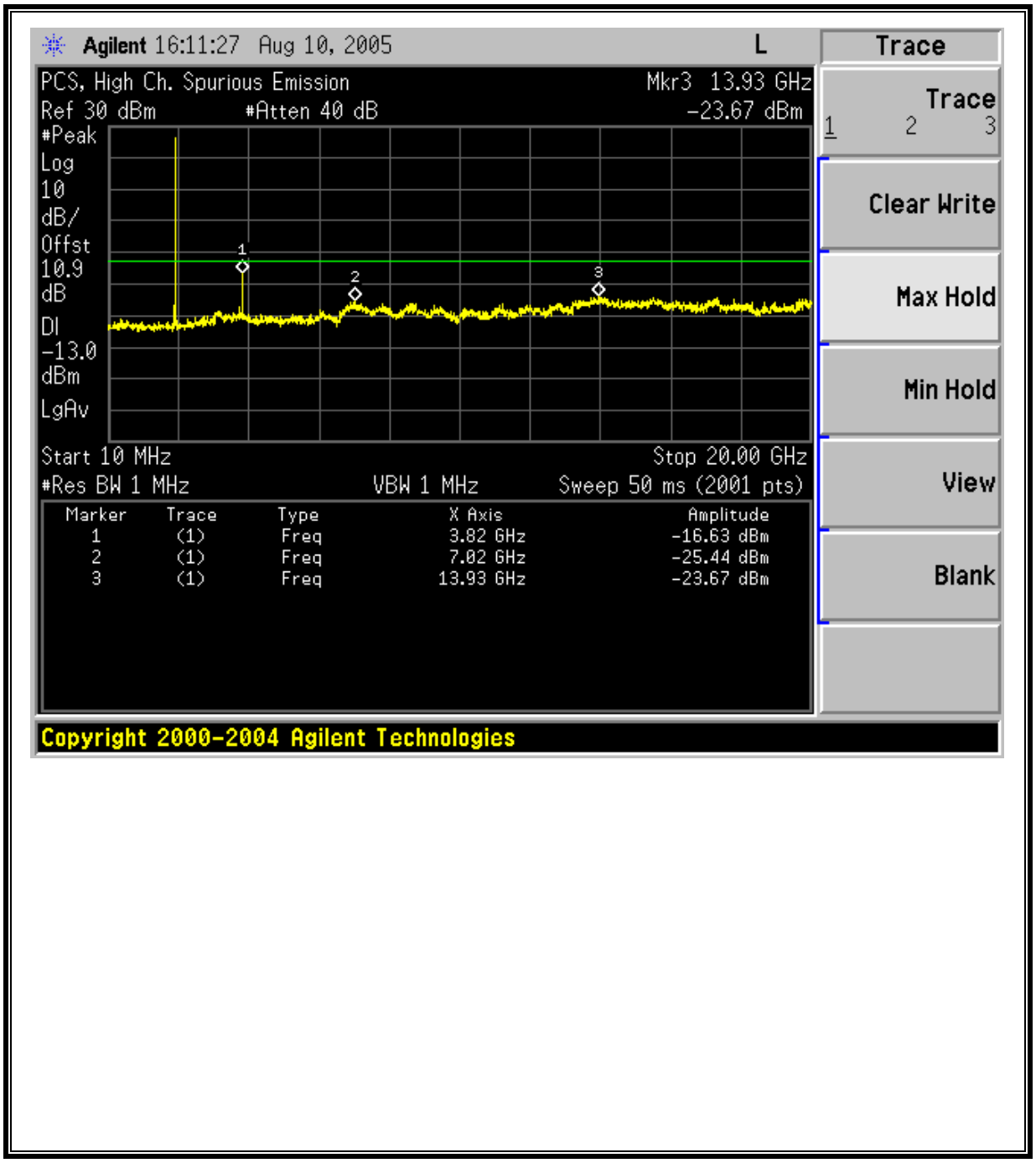
Low Channel, Out-Of-Band Emissions



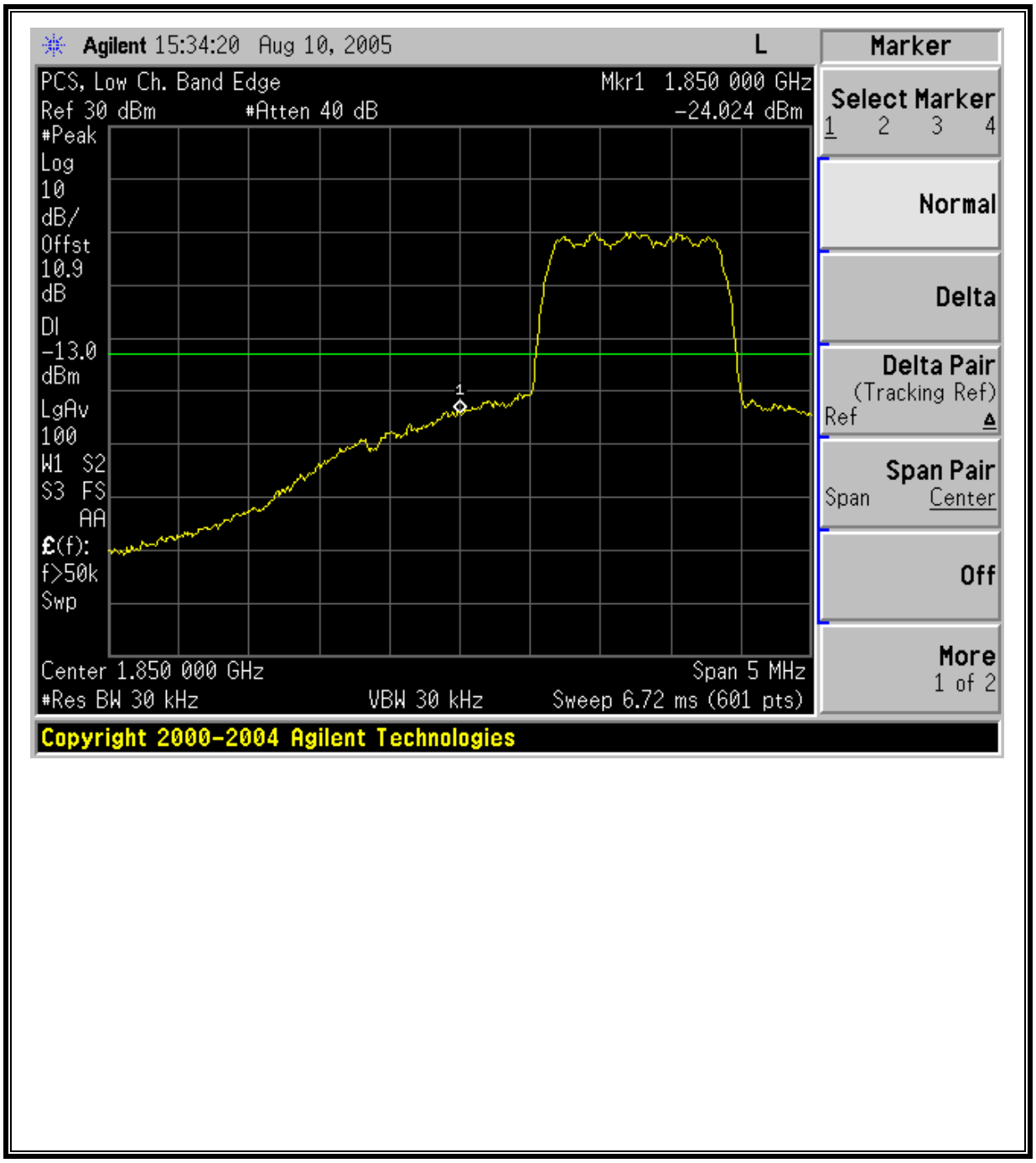
Mid Channel, Out-Of-Band Emissions



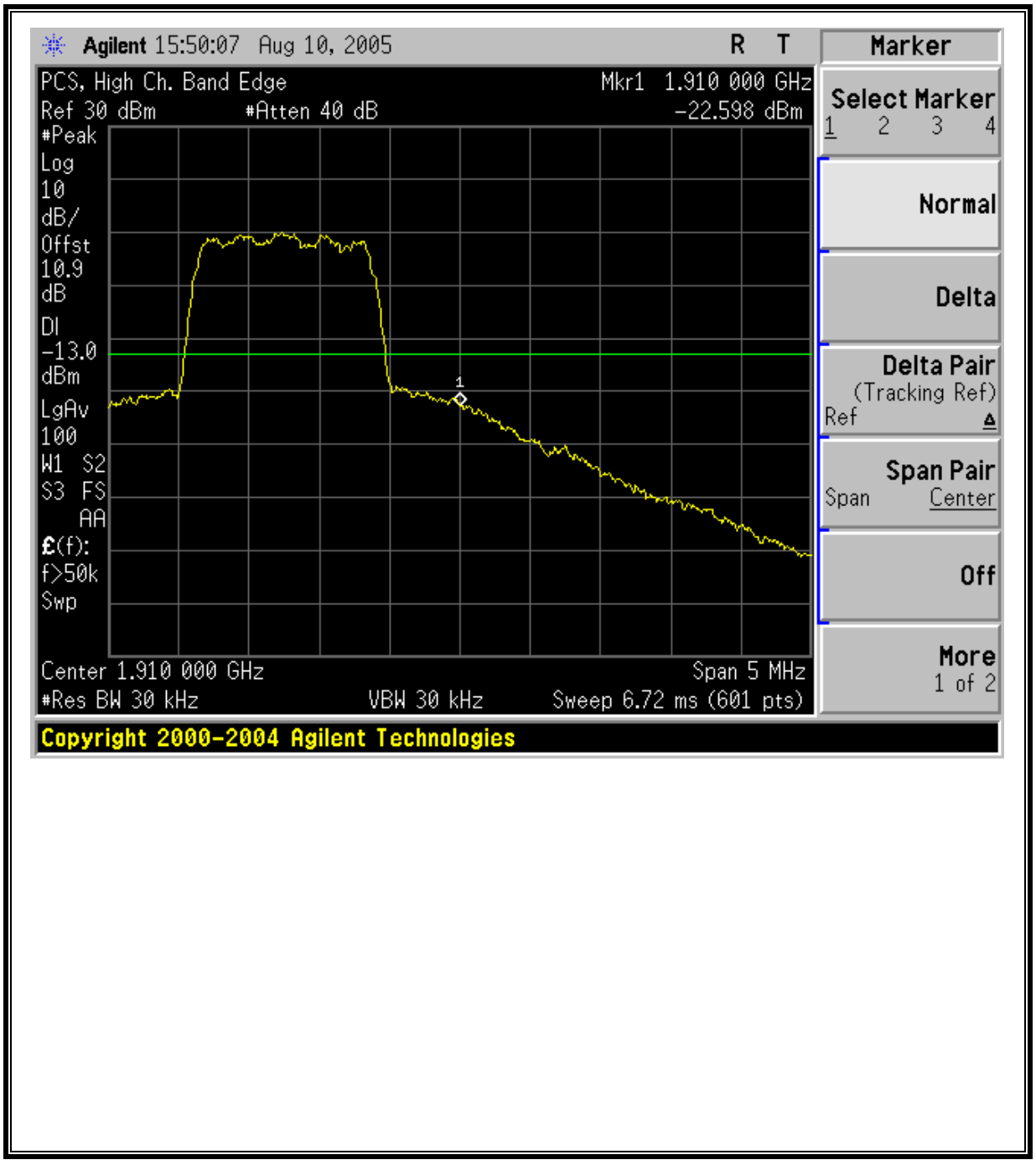
High Channel, Out-Of-Band Emissions



Low Channel Band Edge



High Channel Band Edge



7.7. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (a) and §24.238 (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) and FCC 24.238 (b)

RESULTS

No non-compliance noted.

AMPS Spurious & Harmonic (ERP)

08/16/05 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr:William Zhuang
Project #:05I3576-1
Company:VACOM WIRELESS, INC.
EUT Descrip.:Dual band Tri mode PCS/AMPS/CDMA cellular Phone
EUT M/N:VT820 (FCC ID: GKRVT820)
Test Target:FCC 22/24
Mode Oper:Transmit AMPS mode at worst position

Test Equipment:

EMCO Horn 1-18GHz: T73; S/N: 6717 @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: T63 Miteq 646456
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
Low Ch.										
1.648	61.7	V	-42.8	1.6	7.5	5.4	-39.0	-13.0	-26.0	
2.472	66.2	V	-34.7	1.9	8.6	6.4	-30.2	-13.0	-17.2	
3.296	70.1	V	-28.2	2.3	9.3	7.2	-23.4	-13.0	-10.4	
4.120	67.1	V	-29.1	2.7	9.8	7.7	-24.1	-13.0	-11.1	
4.944	51.9	V	-42.9	3.0	10.6	8.4	-37.5	-13.0	-24.5	
1.648	66.6	H	-37.3	1.6	7.5	5.4	-33.4	-13.0	-20.4	
2.472	70.5	H	-30.3	1.9	8.6	6.4	-25.8	-13.0	-12.8	
3.296	68.6	H	-29.6	2.3	9.3	7.2	-24.7	-13.0	-11.7	
4.120	70.2	H	-25.7	2.7	9.8	7.7	-20.7	-13.0	-7.7	
4.944	49.4	H	-42.7	3.0	10.6	8.4	-37.3	-13.0	-24.3	
Mid Ch.										
1.673	65.6	V	-38.8	1.6	7.6	5.4	-35.0	-13.0	-22.0	
2.510	57.3	V	-43.5	1.9	8.6	6.4	-39.0	-13.0	-26.0	
3.346	63.0	V	-35.2	2.3	9.3	7.2	-30.3	-13.0	-17.3	
4.182	60.5	V	-35.6	2.7	9.9	7.8	-30.6	-13.0	-17.6	
1.673	67.6	H	-36.1	1.6	7.6	5.4	-32.2	-13.0	-19.2	
2.510	66.2	H	-34.3	1.9	8.6	6.4	-29.8	-13.0	-16.8	
3.346	61.5	H	-36.5	2.3	9.3	7.2	-31.7	-13.0	-18.7	
4.182	66.1	H	-29.7	2.7	9.9	7.8	-24.6	-13.0	-11.6	
High Ch.										
1.698	68.0	V	-36.3	1.6	7.6	5.5	-32.5	-13.0	-19.5	
2.547	65.9	V	-34.8	2.0	8.6	6.5	-30.2	-13.0	-17.2	
3.396	64.7	V	-33.4	2.3	9.4	7.2	-28.5	-13.0	-15.5	
4.245	61.7	V	-34.4	2.7	10.0	7.8	-29.3	-13.0	-16.3	
1.698	70.1	H	-33.4	1.6	7.6	5.5	-29.6	-13.0	-16.6	
2.547	74.4	H	-26.0	2.0	8.6	6.5	-21.5	-13.0	-8.5	
3.396	66.0	H	-32.0	2.3	9.4	7.2	-27.1	-13.0	-14.1	
4.245	63.7	H	-32.0	2.7	10.0	7.8	-26.9	-13.0	-13.9	

CDMA Spurious & Harmonic (ERP)

08/12/05 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr:William Zhuang
Project #:05I3576-1
Company:VACOM WIRELESS, INC.
EUT Descrip.:Dual band Tri mode PCS/AMPS/CDMA cellular Phone
EUT M/N:VT820 (FCC ID: GKRVT820)
Test Target:FCC 22/24
Mode Oper:Transmit CDMA mode at worst position

Test Equipment:

EMCO Horn 1-18GHz: T73; S/N: 6717 @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: T63 Miteq 646456
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
Low Ch.										
1.650	58.0	V	-46.5	1.6	7.5	5.4	-42.7	-13.0	-29.7	
2.474	58.9	V	-42.1	1.9	8.6	6.4	-37.6	-13.0	-24.6	
3.299	56.3	V	-42.0	2.3	9.3	7.2	-37.1	-13.0	-24.1	
4.124	50.0	V	-46.2	2.7	9.9	7.7	-41.2	-13.0	-28.2	
1.650	59.8	H	-44.0	1.6	7.5	5.4	-40.2	-13.0	-27.2	
2.474	59.2	H	-41.5	1.9	8.6	6.4	-37.0	-13.0	-24.0	
3.299	56.5	H	-41.7	2.3	9.3	7.2	-36.9	-13.0	-23.9	
4.124	49.5	H	-46.4	2.7	9.9	7.7	-41.3	-13.0	-28.3	
Mid Ch.										
1.672	59.6	V	-44.8	1.6	7.6	5.4	-41.0	-13.0	-28.0	
2.508	58.6	V	-42.2	1.9	8.6	6.4	-37.7	-13.0	-24.7	
3.344	58.7	V	-39.4	2.3	9.3	7.2	-34.6	-13.0	-21.6	
1.672	62.6	H	-41.1	1.6	7.6	5.4	-37.3	-13.0	-24.3	
2.508	65.0	H	-35.6	1.9	8.6	6.4	-31.1	-13.0	-18.1	
3.344	63.8	H	-34.3	2.3	9.3	7.2	-29.5	-13.0	-16.5	
High Ch.										
1.697	57.2	V	-47.1	1.6	7.6	5.5	-43.2	-13.0	-30.2	
2.545	57.7	V	-43.0	2.0	8.6	6.5	-38.5	-13.0	-25.5	
3.393	56.9	V	-41.2	2.3	9.4	7.2	-36.3	-13.0	-23.3	
1.697	65.0	H	-38.6	1.6	7.6	5.5	-34.7	-13.0	-21.7	
2.545	68.2	H	-32.3	2.0	8.6	6.5	-27.8	-13.0	-14.8	
3.393	57.6	H	-40.3	2.3	9.4	7.2	-35.5	-13.0	-22.5	

PCS Spurious & Harmonic (EIRP):

08/12/05 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr:William Zhuang
Project #:05I3576-1
Company:VACOM WIRELESS, INC.
EUT Descrip.:Dual band Tri mode PCS/AMPS/CDMA cellular Phone
EUT M/N:VT820 (FCC ID: GKRVT820)
Test Target:FCC 22/24
Mode Oper:Transmit PCS mode at worst position

Test Equipment:

EMCO Horn 1-18GHz: T73; S/N: 6717 @3m
Horn > 18GHz:
Limit: FCC 24
High Pass Filter
Hi Frequency Cables: (2 ft) (2 – 3 ft) (4 – 6 ft) (12 ft)
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch.										
3.703	68.5	V	-28.8	2.5	9.6	7.4	-21.7	-13.0	-8.7	
5.554	62.7	V	-30.0	3.3	11.1	9.0	-22.2	-13.0	-9.2	
7.405	53.2	V	-36.3	3.7	11.6	9.4	-28.3	-13.0	-15.3	
9.256	43.7	V	-42.2	4.0	10.5	8.4	-35.7	-13.0	-22.7	
3.703	71.4	H	-25.8	2.5	9.6	7.4	-18.7	-13.0	-5.7	
5.554	61.1	H	-30.6	3.3	11.1	9.0	-22.8	-13.0	-9.8	
7.405	48.5	H	-40.2	3.7	11.6	9.4	-32.3	-13.0	-19.3	
9.256	43.7	H	-42.2	4.0	10.5	8.4	-35.7	-13.0	-22.7	
Mid Ch.										
3.760	69.5	V	-27.6	2.5	9.6	7.4	-20.5	-13.0	-7.5	
5.640	53.3	V	-39.3	3.3	11.2	9.0	-31.5	-13.0	-18.5	
7.520	50.6	V	-38.6	3.7	11.5	9.4	-30.8	-13.0	-17.8	
3.760	73.4	H	-23.7	2.5	9.6	7.4	-16.6	-13.0	-3.6	
5.640	60.3	H	-31.3	3.3	11.2	9.0	-23.4	-13.0	-10.4	
7.520	50.0	H	-38.4	3.7	11.5	9.4	-30.5	-13.0	-17.5	
High Ch.										
3.818	67.7	V	-29.3	2.5	9.6	7.5	-22.2	-13.0	-9.2	
5.726	51.1	V	-41.3	3.4	11.2	9.1	-33.5	-13.0	-20.5	
7.635	49.7	V	-39.2	3.7	11.5	9.3	-31.4	-13.0	-18.4	
3.818	73.6	H	-23.3	2.5	9.6	7.5	-16.2	-13.0	-3.2	
5.726	56.5	H	-35.0	3.4	11.2	9.1	-27.1	-13.0	-14.1	
7.635	48.4	H	-39.7	3.7	11.5	9.3	-31.9	-13.0	-18.9	

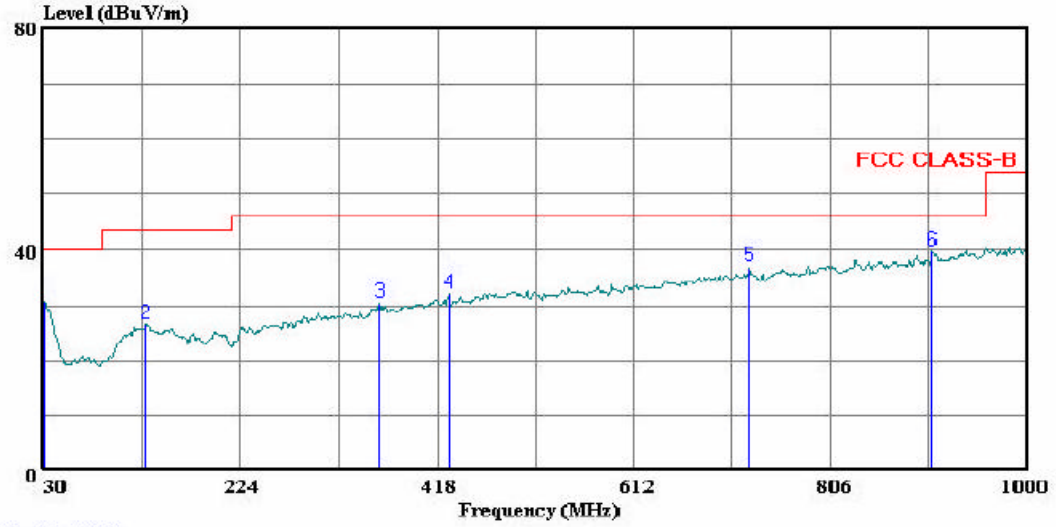
7.7.1. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz (DIGITAL)

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 5 File#: EMI.EMI Date: 08-15-2005 Time: 16:02:12



Trace: 4 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : William Zhuang
Project #: : 05I3576-1
Company: : Vacom Wireless, Inc.
EUT: : Dual band Tri mode PCS/AMPs/PCS phone
Model No. : VT820 (FCC ID: GKRVT820)
Configuration : EUT only
Target of Test : FCC Class B
Mode of Operation: PCS mode, worst case

HORIZONTAL DATA

Page: 1

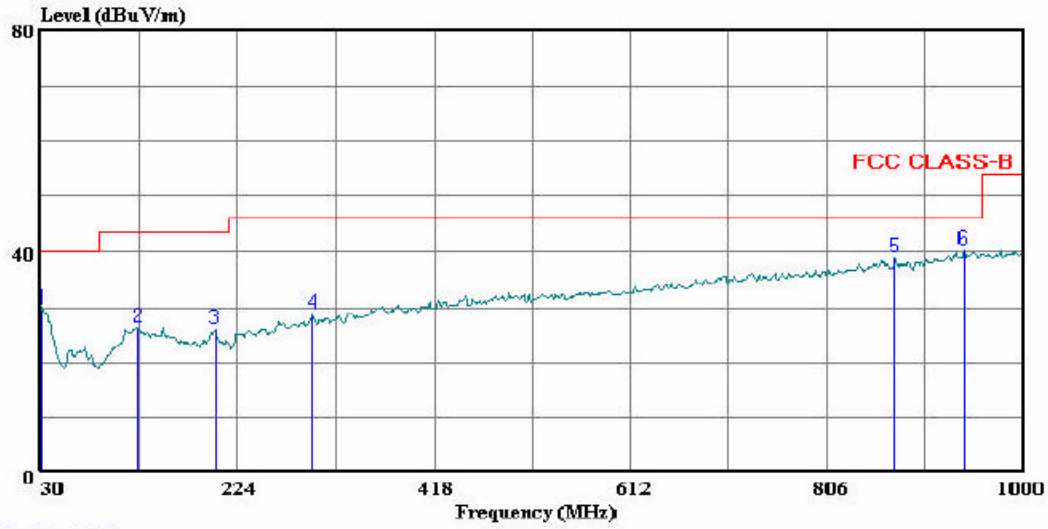
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Cable Loss	Probe Factor
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		dB	dB
1	30.970	10.35	20.45	30.80	40.00	-9.20	Peak	0.45	20.00
2	130.880	11.48	15.09	26.57	43.50	-16.93	Peak	0.93	14.16
3	361.740	13.29	17.20	30.49	46.00	-15.51	Peak	1.67	15.53
4	429.640	13.47	18.74	32.21	46.00	-13.79	Peak	1.83	16.91
5	725.490	13.31	23.53	36.84	46.00	-9.16	Peak	2.50	21.03
6	906.880	13.55	26.01	39.56	46.00	-6.44	Peak	2.99	23.02

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 3 File#: EMI.EMI Date: 08-15-2005 Time: 15:53:16



(Audix ATC)

Trace: 2 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : William Zhuang
Project #: : 05I3576-1
Company: : Vacom Wireless, Inc.
EUT: : Dual band Tri mode PCS/AMPs/PCS phone
Model No. : VT820 (FCC ID: GKRVT820)
Configuration : EUT only
Target of Test : FCC Class B
Mode of Operation: PCS mode, worst case

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Cable Loss	Probe Factor
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		dB	dB
1	31.940	9.81	19.94	29.75	40.00	-10.25	Peak	0.47	19.47
2	126.030	11.19	15.25	26.44	43.50	-17.06	Peak	0.93	14.32
3	201.690	11.59	14.32	25.91	43.50	-17.59	Peak	1.21	13.11
4	298.690	13.08	15.63	28.71	46.00	-17.29	Peak	1.56	14.07
5	872.930	13.13	25.61	38.74	46.00	-7.26	Peak	2.92	22.69
6	940.830	13.72	26.44	40.16	46.00	-5.84	Peak	3.15	23.29

7.8. POWERLINE CONDUCTED EMISSIONS

LIMIT

§15.107 (a) (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 of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.4

RESULTS

No non-compliance noted:

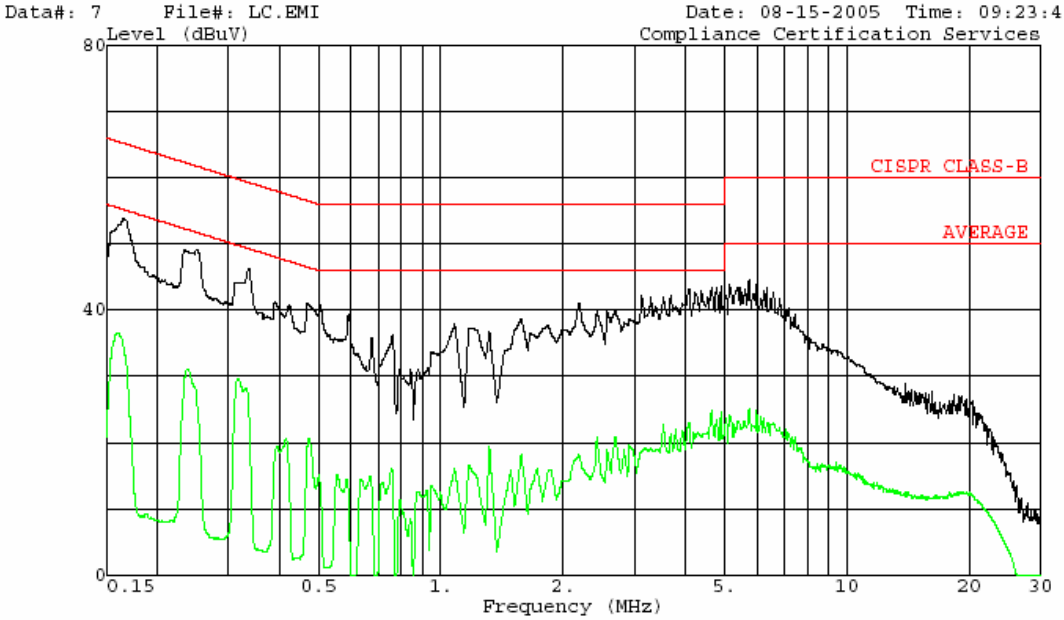
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA									
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.17	53.80	--	36.58	0.00	65.21	55.21	-11.41	-18.63	L1
0.25	49.14	--	31.20	0.00	61.72	51.72	-12.58	-20.52	L1
0.34	46.36	--	29.65	0.00	59.30	49.30	-12.94	-19.65	L1
0.17	51.20	--	34.80	0.00	65.06	55.06	-13.86	-20.26	L2
0.25	46.64	--	27.69	0.00	61.69	51.69	-15.05	-24.00	L2
0.35	43.88	--	26.01	0.00	59.08	49.08	-15.20	-23.07	L2
6 Worst Data									

LINE 1 RESULTS

COMPLIANCE Engineering Service, Inc.
FCC,VCCI,CISPR,CE
UL,CSA,TUV

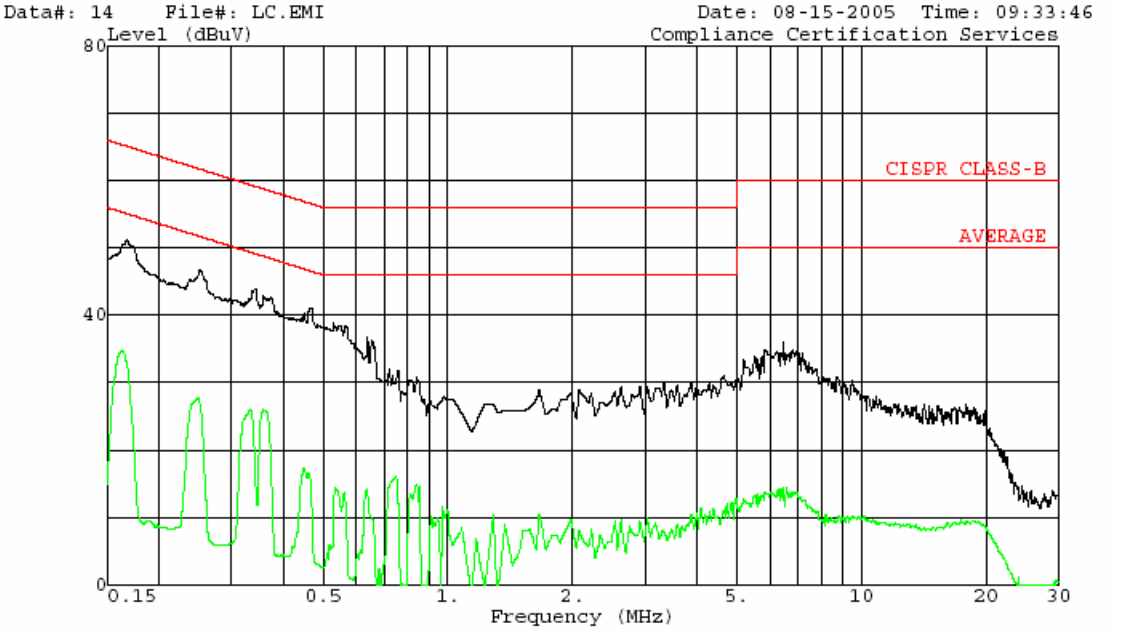
561F Monterey Road
Morgan Hill, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



Trace: 5 Ref Trace:
Project No. : 05I3576
Test Engr : William Zhuang
Company : VACOM WIRELESS, INC>
EUT : Dual band Tri mode PCS/AMPS/CDMA phone
Model No. : VT820 (FCC ID: GKRVT820)
Test Config. : EUT Only
Mode of Op. : Transmit
Target of Test: FCC Class B
Power Mains : 115 VAC / 60 Hz
: L1 : Peak(Black); AVG(Green)

LINE 2 RESULTS

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

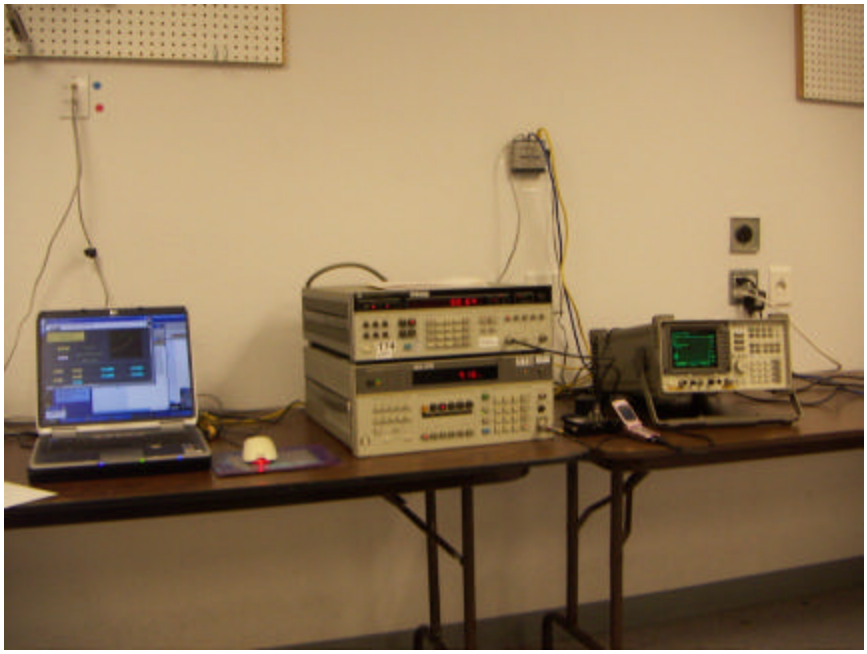


Trace: 12 Ref Trace:
Project No. : 05I3576
Test Engr : William Zhuang
Company : VACOM WIRELESS, INC>
EUT : Dual band Tri mode PCS/AMPS/CDMA phone
Model No. : VT820 (FCC ID: GKRVT820)
Test Config. : EUT Only
Mode of Op. : Transmit
Target of Test: FCC Class B
Power Mains : 115 VAC / 60 Hz
: L2 : Peak(Black); AVG(Green)

8. SETUP PHOTOS

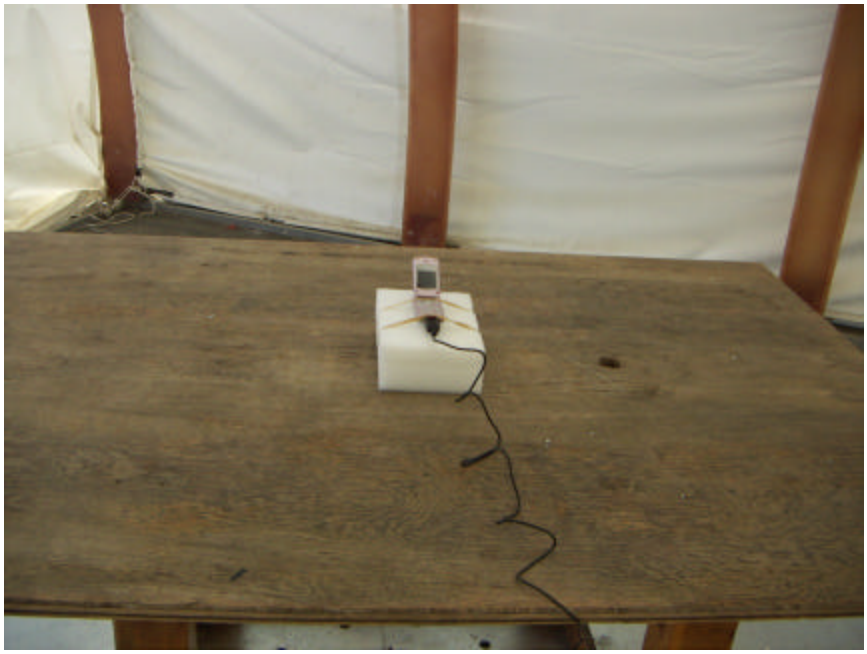
ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO



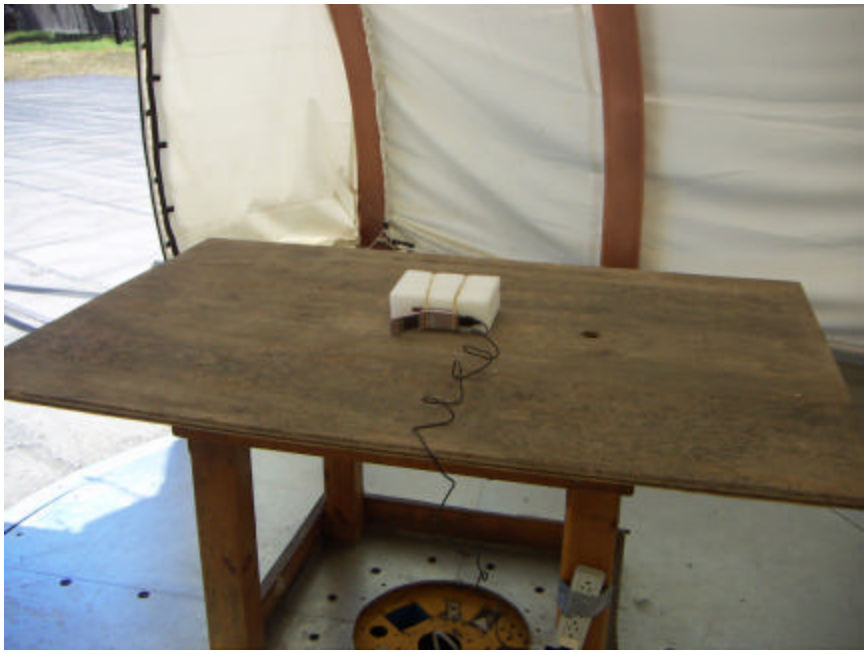
RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

X-AXIS FRONT PHOTO

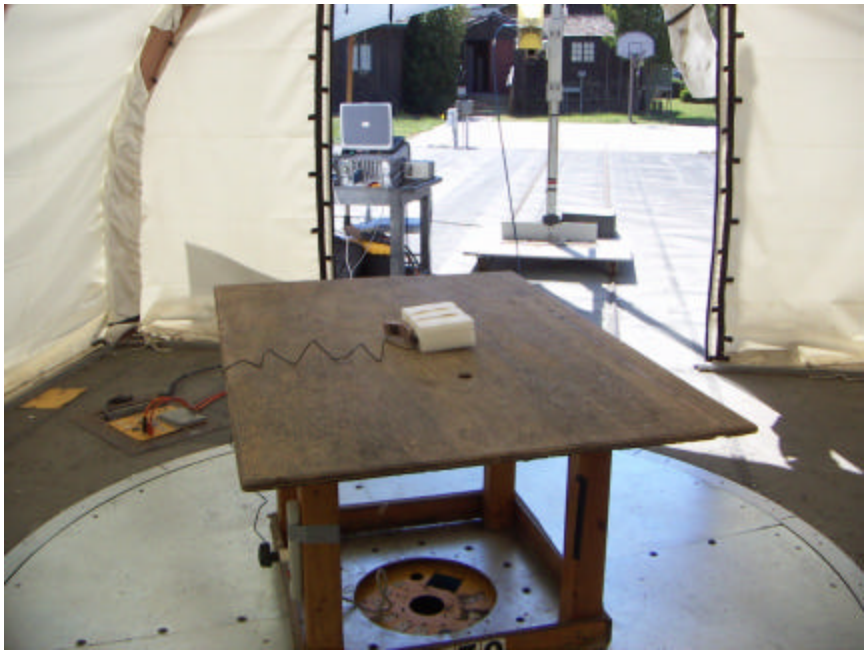


X-AXIS BACK PHOTO

Y-AXIS FRONT PHOTO



Y-AXIS BACK PHOTO



Z-AXIS FRONT PHOTO

Z-AXIS BACK PHOTO

DIGITAL DEVICE RADIATED EMISSIONS SETUP

DIGITAL DEVICE FRONT PHOTO

DIGITAL DEVICE BACK PHOTO

POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO

END OF REPORT