



FCC CFR47 CERTIFICATION

PART 22H

TEST REPORT

FOR

800 MHZ CDMA WLL PHONE

MODEL: ACW-1XP800

FCC ID: RFLACW1XP800

REPORT NUMBER: 03I2101-1

ISSUE DATE: Aug. 24, 2003

Prepared for
AXESS TELECOM CO., LTD
3F, SIN YOUNG B/D, 689-47, KUMJEONG-DONG, KUNPO-SI
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1. TEST RESULT CERTIFICATION

COMPANY NAME: AXESS TELECOM CO., LTD
3F, SIN YOUNG B/D, 689-47, KUMJEONG-DONG, KUNPO-SI
KYUNGGI-DO, 435-862 KOREA

EUT DESCRIPTION: 800 MHZ CDMA WLL PHONE

MODEM NAME: ACW-1XP800

DATE TESTED: AUGUST 11, 2003 TO AUGUST 15, 2003

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR
EQUIPMENT TYPE	LICENSED TX MODULE IN MOBILE APPLICATION
MEASUREMENT PROCEDURE	ANSI 63.4 / 2001, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 22 Subpart H

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 22 Subpart H-Cellular Radiotelephone Service. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

Note : This document reports conditions under which testing was conducted and results of tests performed. 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.

Tested By:



VIEN TRAN
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Released For CCS By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The WLL Phone has an output power 29.1dBm (CDMA, ERP). It has a PIFA type antenna, 2dBi gain which is designed for the bands transmitting of frequency range 824 ~ 849MHz.

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

4. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

6. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

7. TEST SETUP, PROCEDURE AND RESULT

7.1. SECTION 2.1046: RF POWER OUTPUT

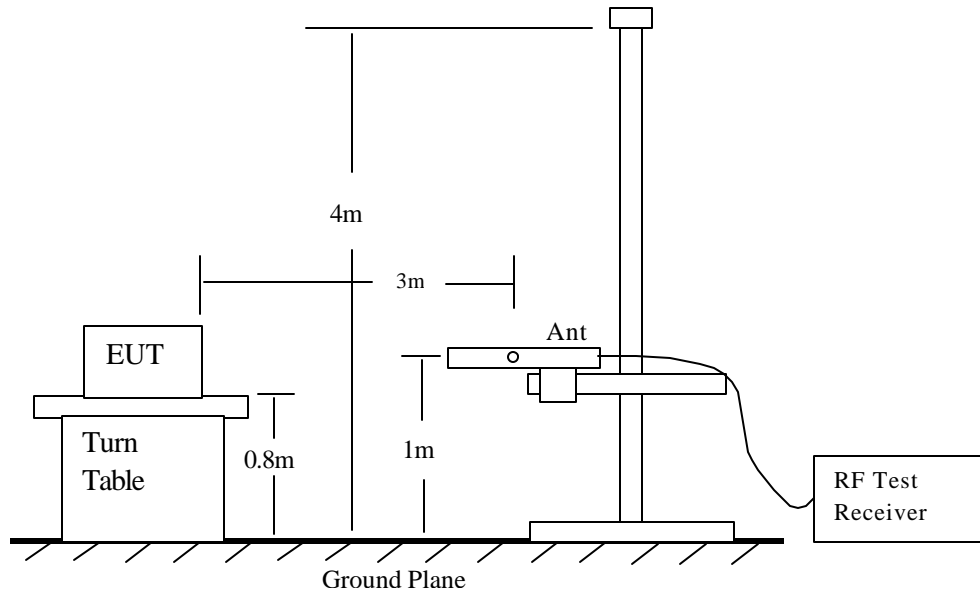
INSTRUMENTS LIST

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	9/6/2003
Line Filter	Lindgren	LMF-3489	497	CNR
LISN, 10 kHz ~ 30 MHz	Solar	012-50-R-24-BN	837990	9/6/2003
EMI Test Receiver	R & S	ESHS 20	827129/006	4/17/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	2/4/2004
Quasi-Peak Adaptor	HP	85650A	2811A01155	5/16/2004
SA RF Section, 1.5 GHz	HP	85680B	2732A03661	5/16/2004
Preamplifier, 1300 MHz	HP	8447D	2944A06589	8/22/2004
Antenna, Bilog	Chase	CBL6112B	2586	3/6/2004
SA Display Section 2	HP	85662A	2816A16696	5/16/2004
Spectrum Analyzer	HP	E4446A	US42070220	1/13/2004
Dipole Antenna	ETS	DB-4	1629	5/15/2004
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	11/20/2004
RF Filter Section	HP	85420E	3705A00256	11/21/2004
Bilog Antenna	A.R.A	LPB-2520/A	1185	6/24/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	9001-3245	2/4/2004

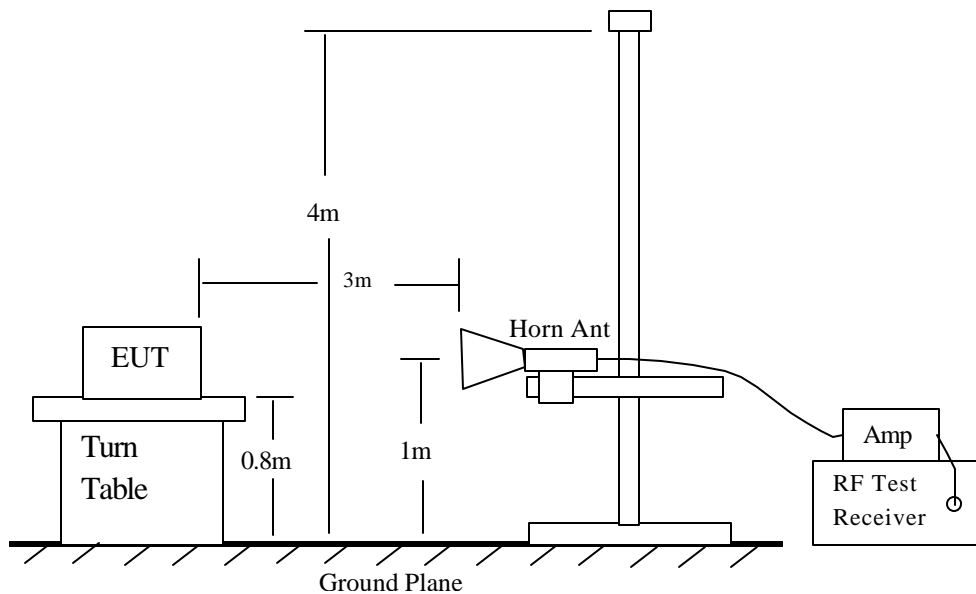
MEASUREMENT PROCEDURE

- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

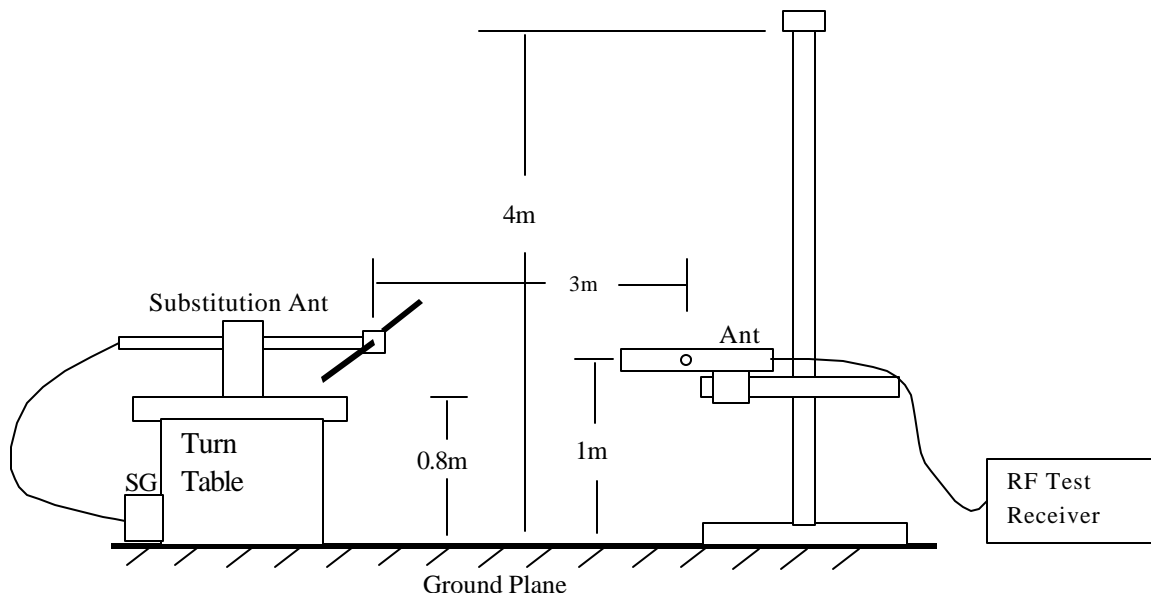
- 6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8). The maximum signal level detected by the measuring receiver shall be noted.
- 9). The transmitter shall be replaced by a tuned dipole (substitution antenna).
- 10). The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- 11). The substitution antenna shall be connected to a calibrated signal generator.
- 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- 14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
- 17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.



Radiated Emission Measurement 30 to 1000 MHz



Radiated Emission Above 1000 MHz



Radiated Emission – Substitution Method Set-up

MEASUREMENT RESULT:

Conducted Output Power Measurement:

	CH#	FREQ (MHz)	AVERAGE POWER (dBm)	PEAK POWER (dBm)
LOW CH	1014	824.64	23.54	28.78
MID CH	363	835.89	23.55	28.27
HI CH	776	848.37	24.21	29.03

RF CABLE + ATTENUATOR + CONNECTOR = 10.4dBm

Radiated Emissions

X-Position



Y-Position



Z-Position



Output Power (ERP), Low / Mid / High Channels:

08/12/03 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: VIEN TRAN
Project #: 03I2101-1
Company: AXESS
EUT Descrip.: 800MHz CDMA WIRELESS PHONE
EUT M/N:ACW-1XP800
Test Target: FCC PART 22
Mode Oper: LOW/MID/HI FUNDAMENTAL_EUT ANTENNA AT Y POSITION

Test Equipment:

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

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=1MHz
VBW=1MHz

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
LOW CH									
0.82464	127.0	29.0	0.5	0.0	0.0	28.5	38.5	-10.0	V
0.82464	115.1	15.7	0.5	0.0	0.0	15.2	38.5	-23.3	H
MID CH									
0.83598	126.5	28.5	0.5	0.0	0.0	28.0	38.5	-10.5	V
0.83598	116.1	16.7	0.5	0.0	0.0	16.2	38.5	-22.3	H
HI CH									
0.84837	127.6	29.6	0.5	0.0	0.0	29.1	38.5	-9.4	V
0.84837	117.3	17.9	0.5	0.0	0.0	17.4	38.5	-21.1	H

Note: Y position is the worst case.

7.2. SECTION 2.1047: MODULATION CHARACTERISTICS

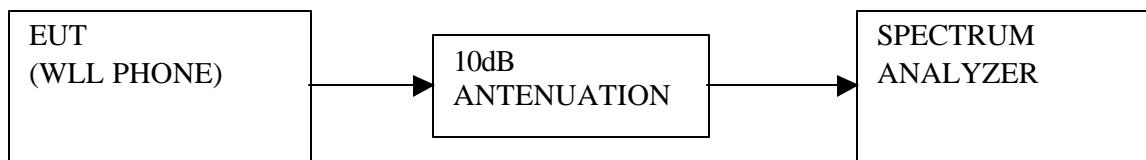
Not Applicable.

7.3. SECTION 2.1049: EMISSION MASK & OCCUPIED BANDWIDTH

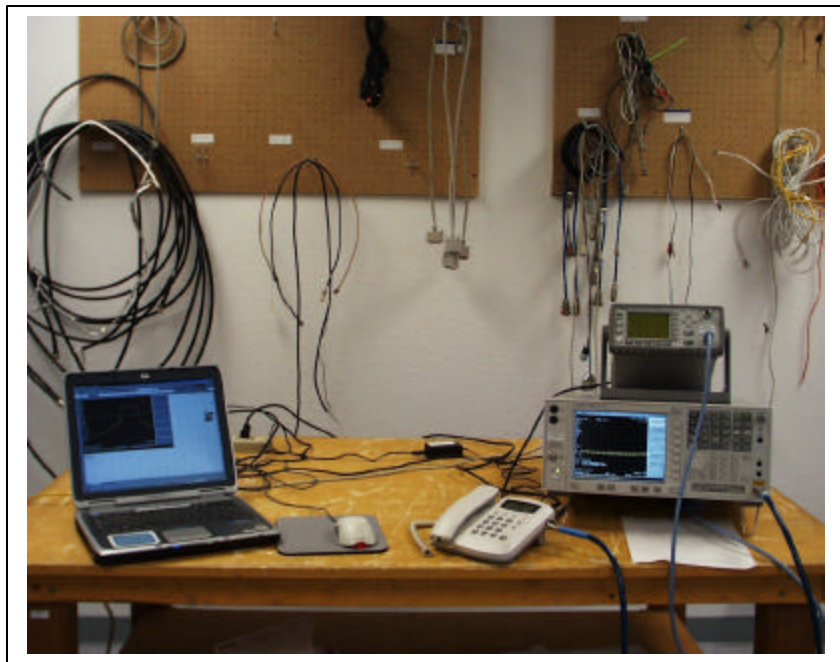
PROVISIONS APPLICABLE

According to CFR 47 section 22.917.

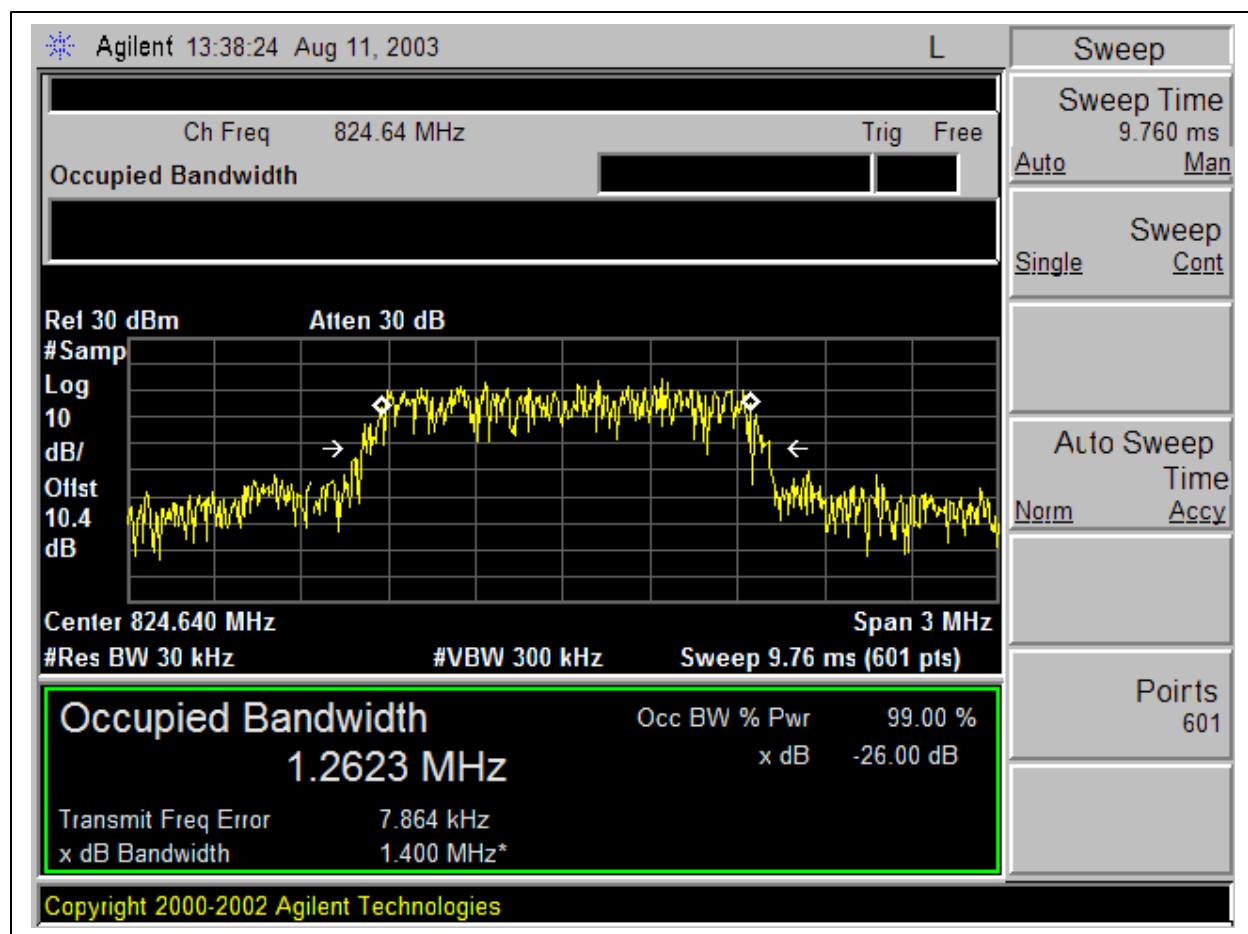
TEST SETUP



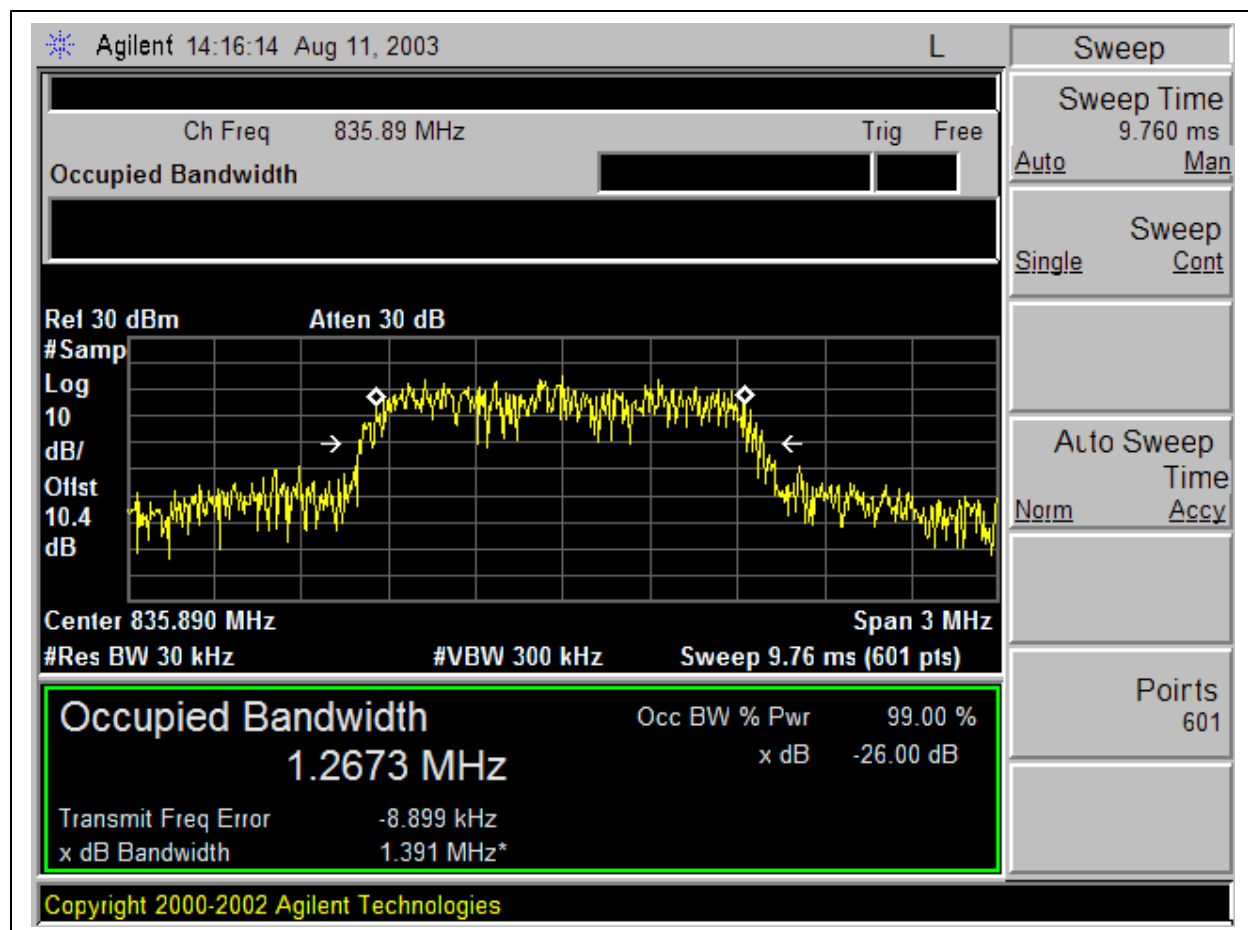
Set-up Configuration



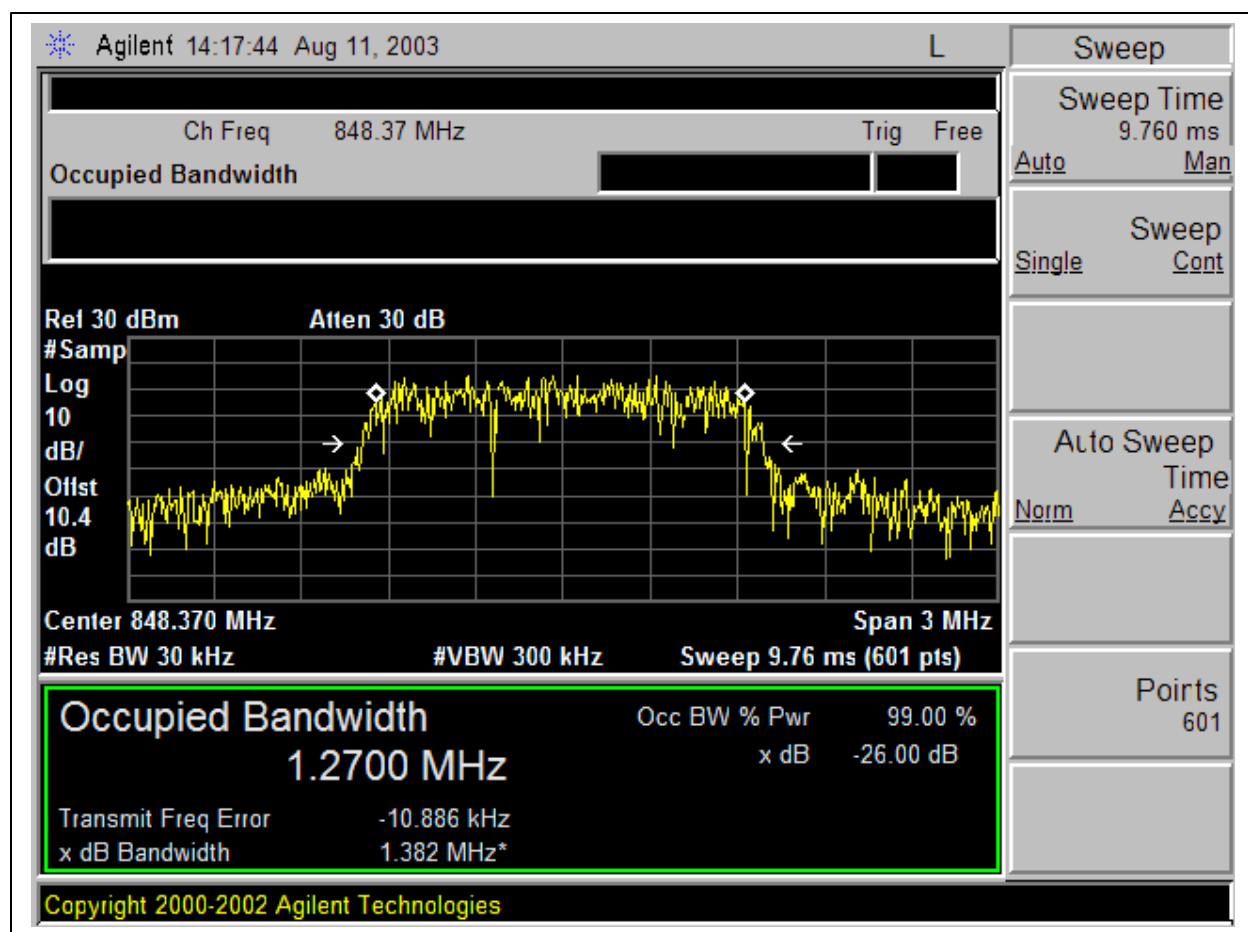
CDMA Low Channel Occupied Bandwidth:



CDMA Mid Channel Occupied Bandwidth:



CDMA High Channel Occupied Bandwidth:

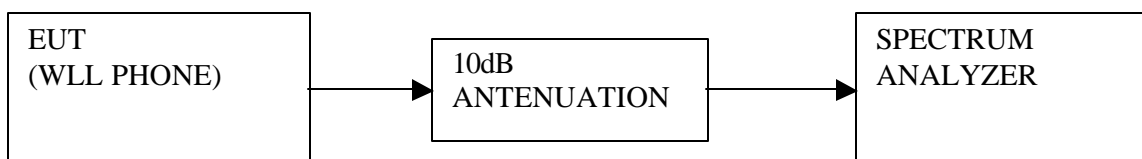


7.4. SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
PSA Analyzer	Agilent	E446A	US42070220	1/13/04
Mobile Test Set	Agilent	E8285A	GB4131011	9/11/04
10dB Attenuator	Agilent	8493C	59028	N/A

TEST SETUP



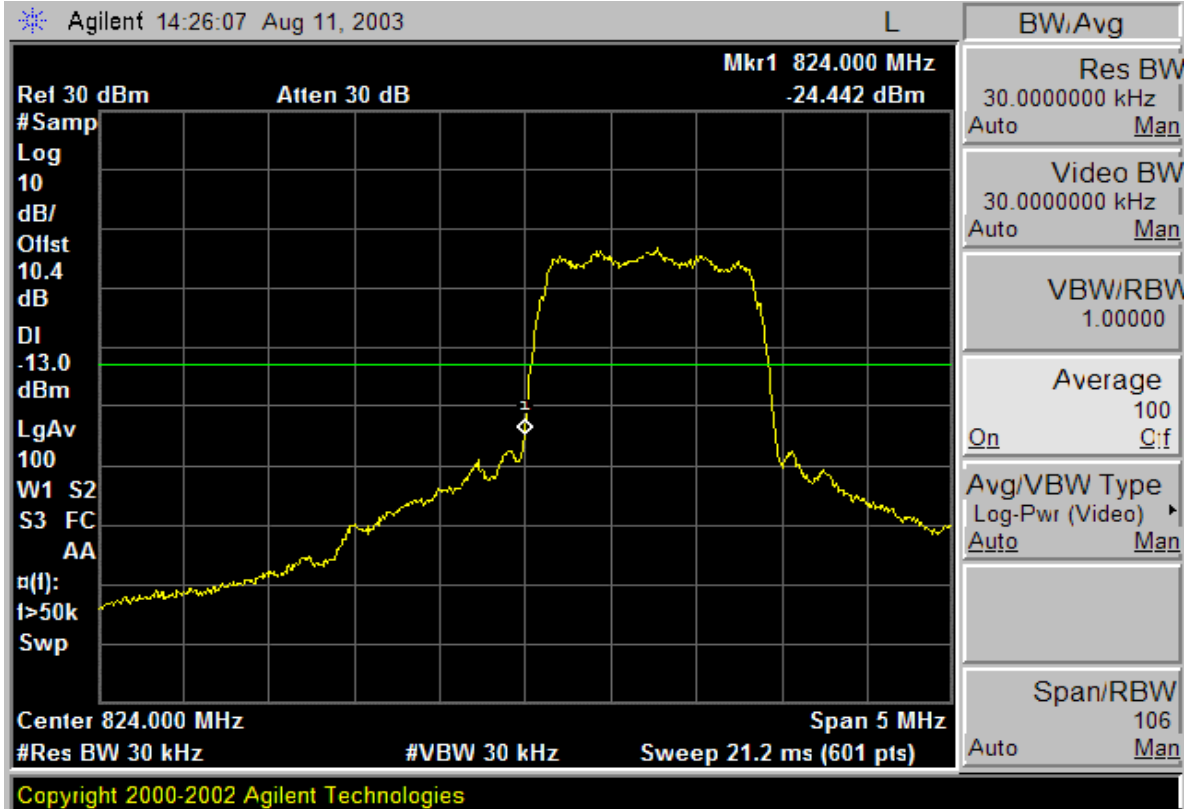
Set-up Configuration

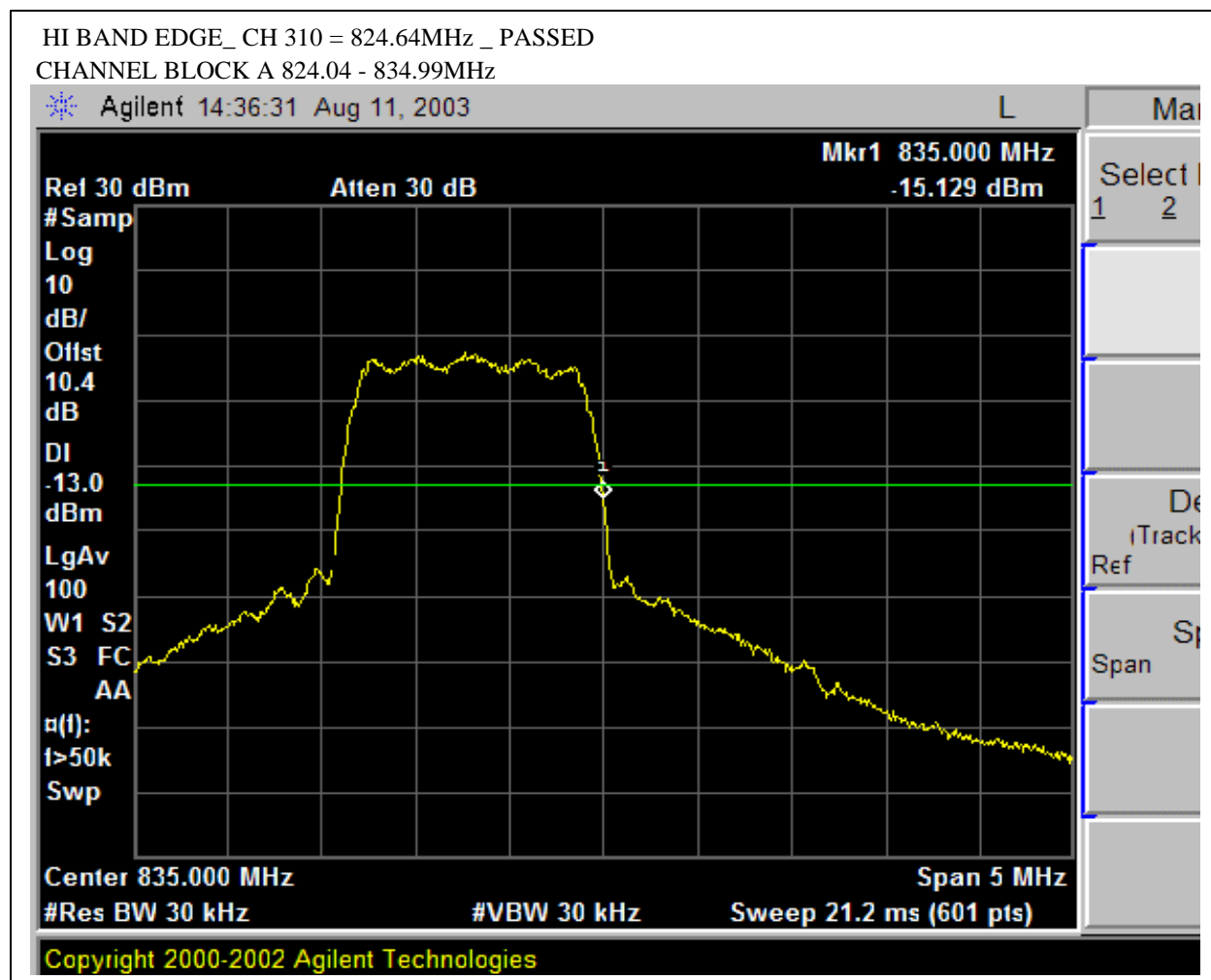
TEST PROCEDURE

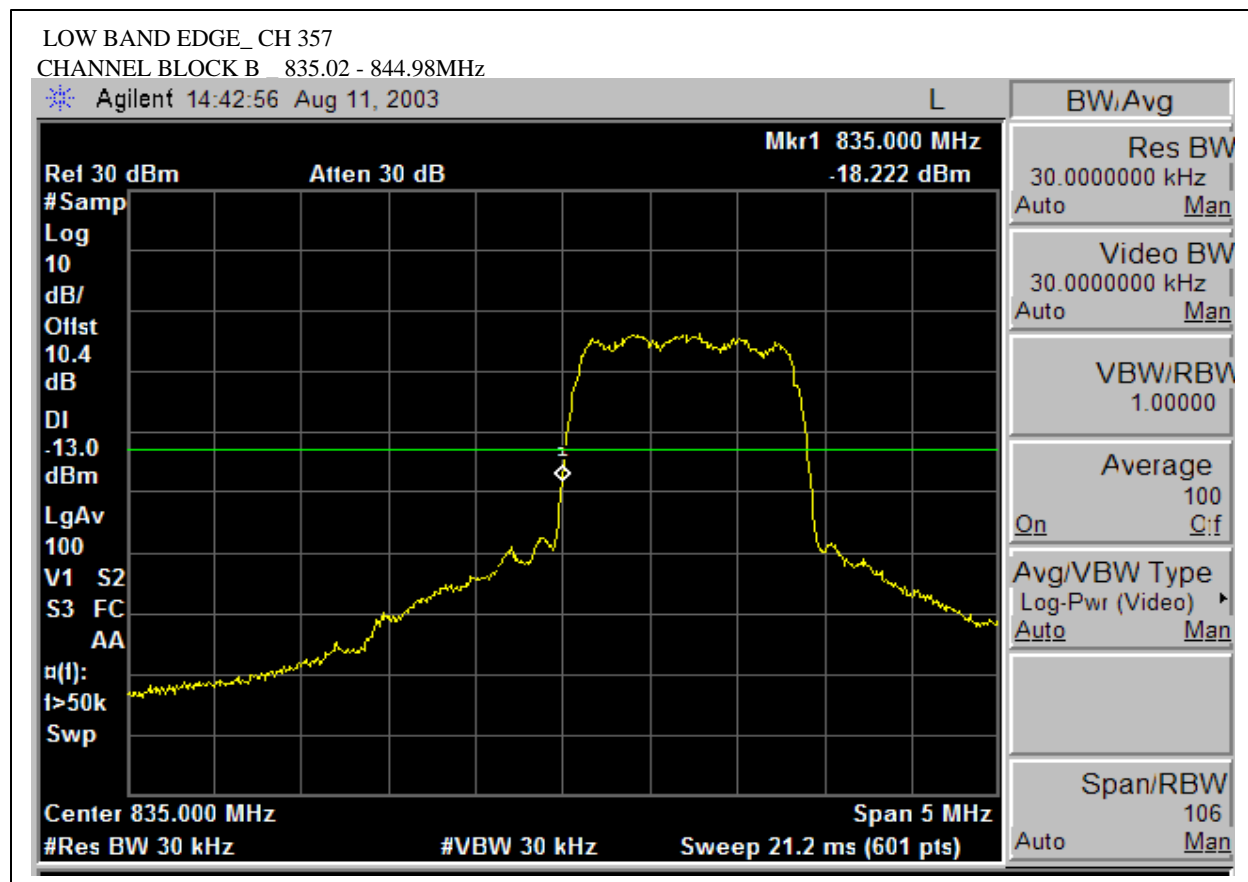
- 1) EUT's RF output connector (made solely for the purpose of the test) is connected to the spectrum analyzer, and set as close as possible to the bottom of the block edge and one set as close as possible to the top of the block edge. Set the RES BW to 1% of the emission bandwidth to show compliance with the -13dBm limit, in the 1 MHz bands immediately outside and adjacent to the top and bottom edges of the frequency block.
- 2) For the Out-of-Band measurements a 1 MHz RES BW was used to scan from 15 MHz to $10 \times f_0$ of the fundamental carrier for all frequency block. A display line was placed at -13dBm to show compliance for spurious, and harmonics.
- 3) 22.917(f): Mobile emissions in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitter operated must be attenuated to a level not to exceed -80dBm at the transmit antenna connector.

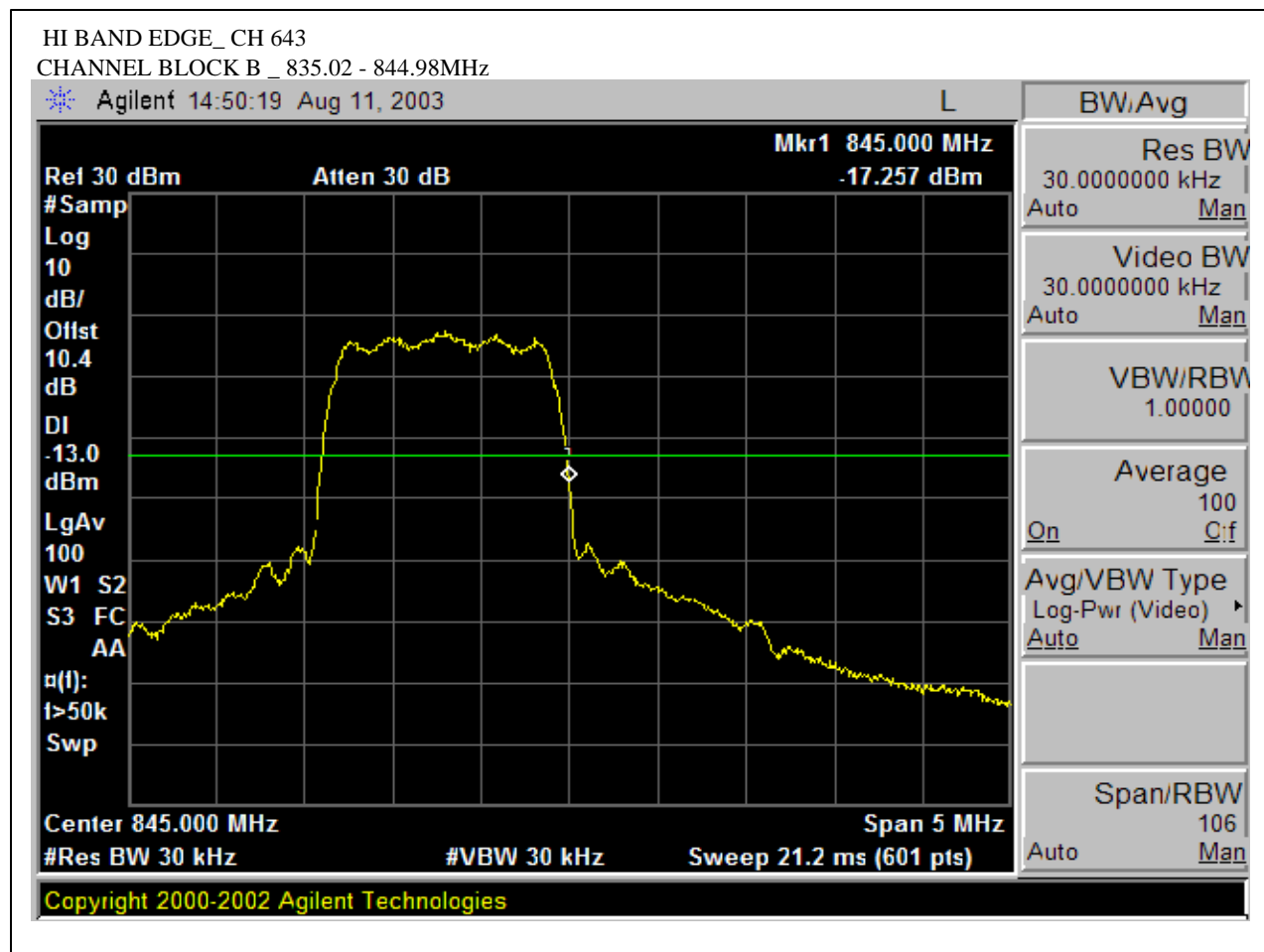
MEASUREMENT RESULT:

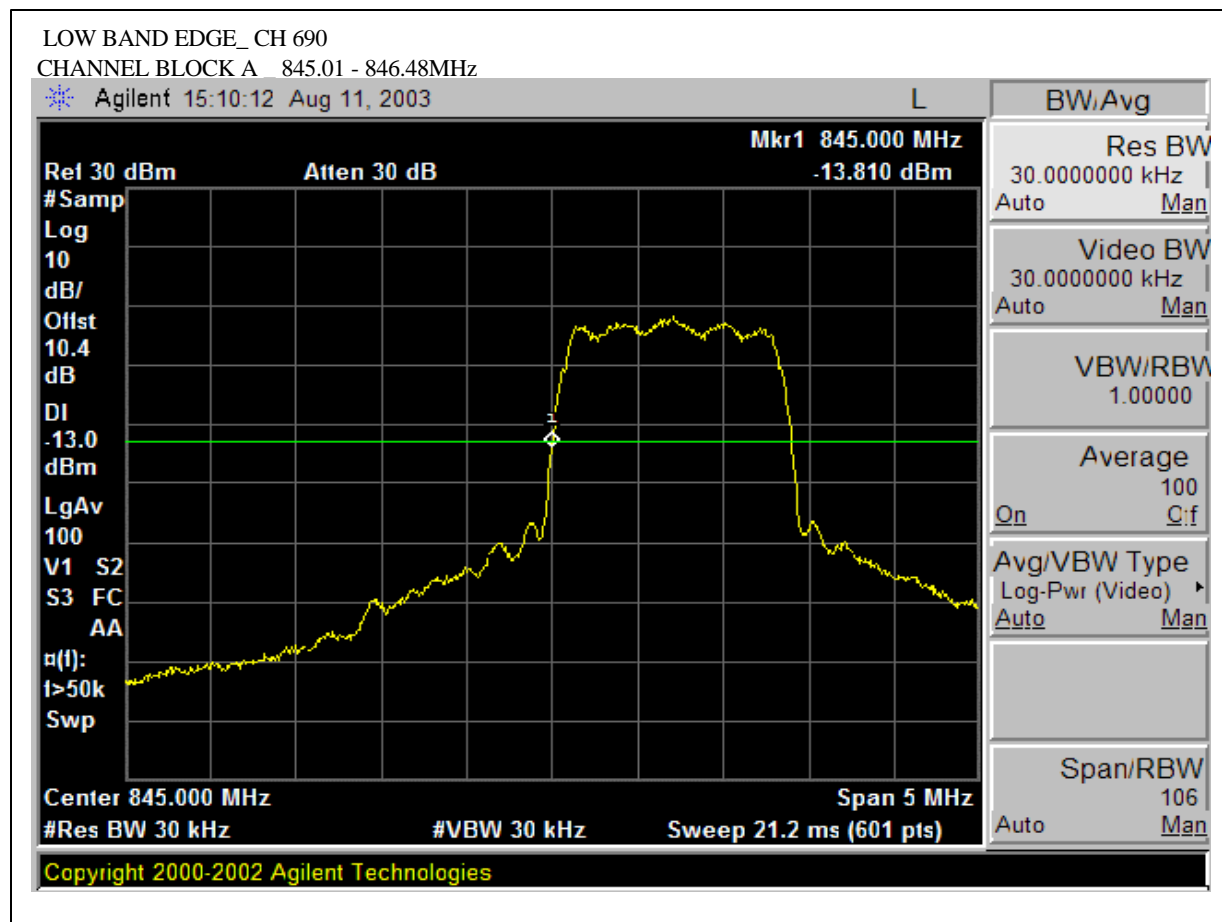
BAND EDGE_ LOW CH 1014 = 824.64MHz _ PASSED
CHANNEL BLOCK A 824.04 - 834.99MHz

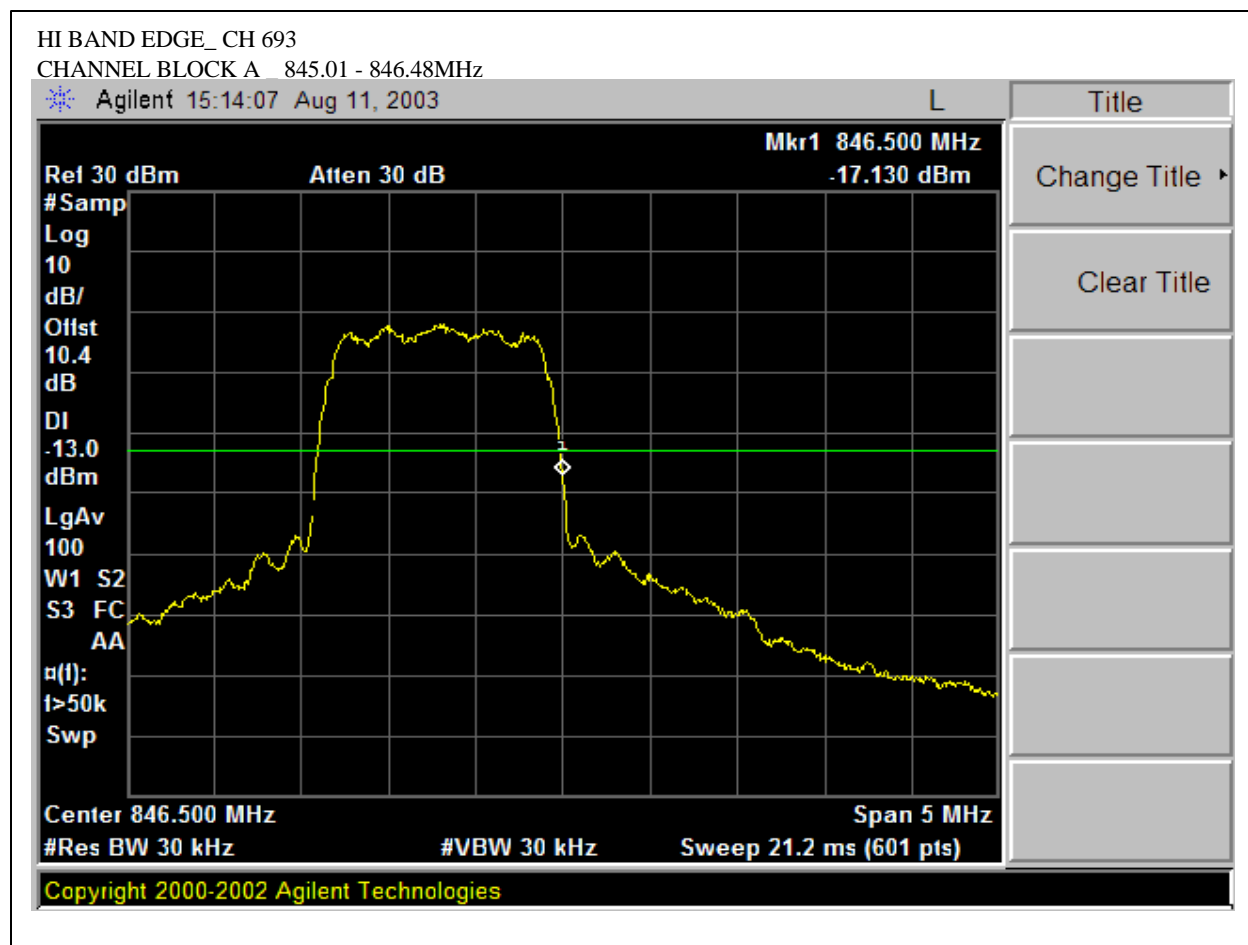


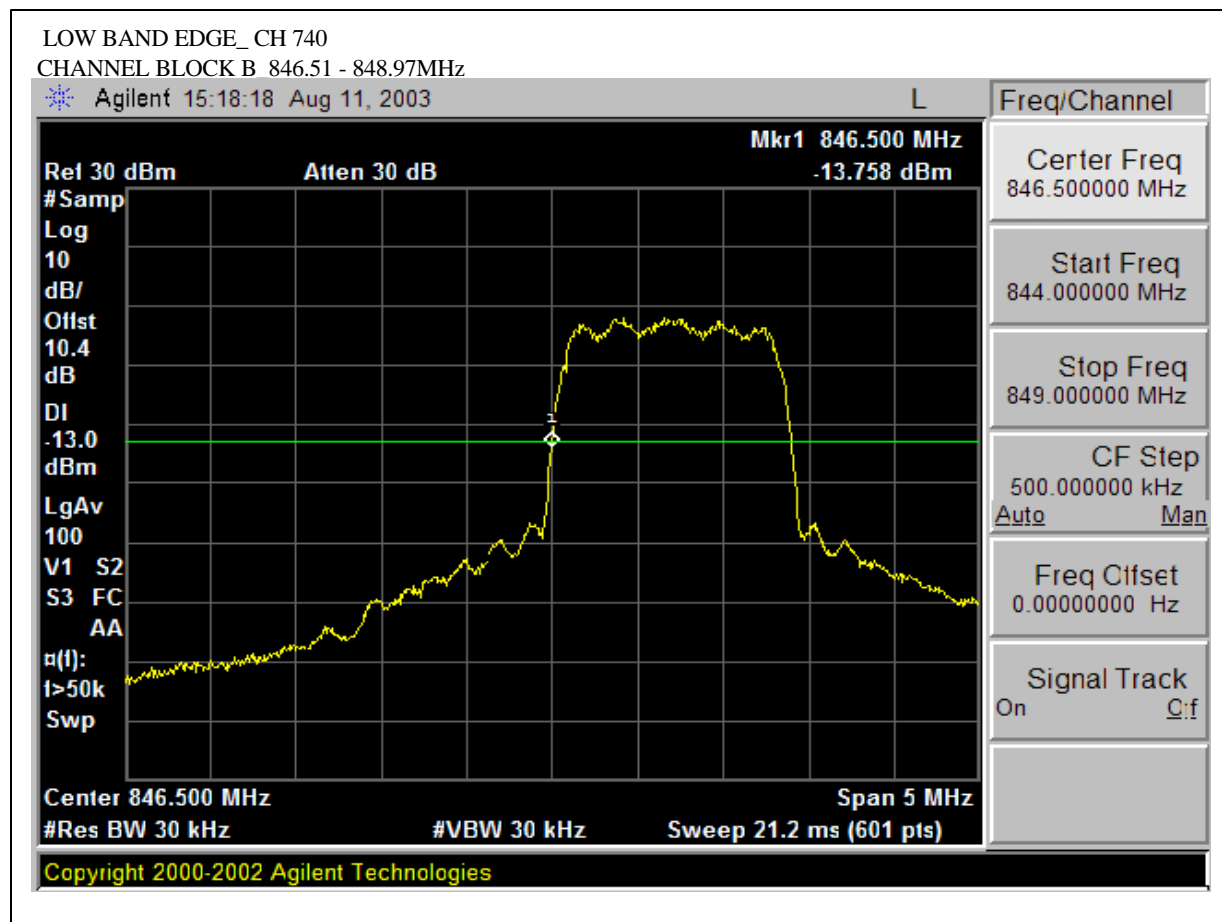


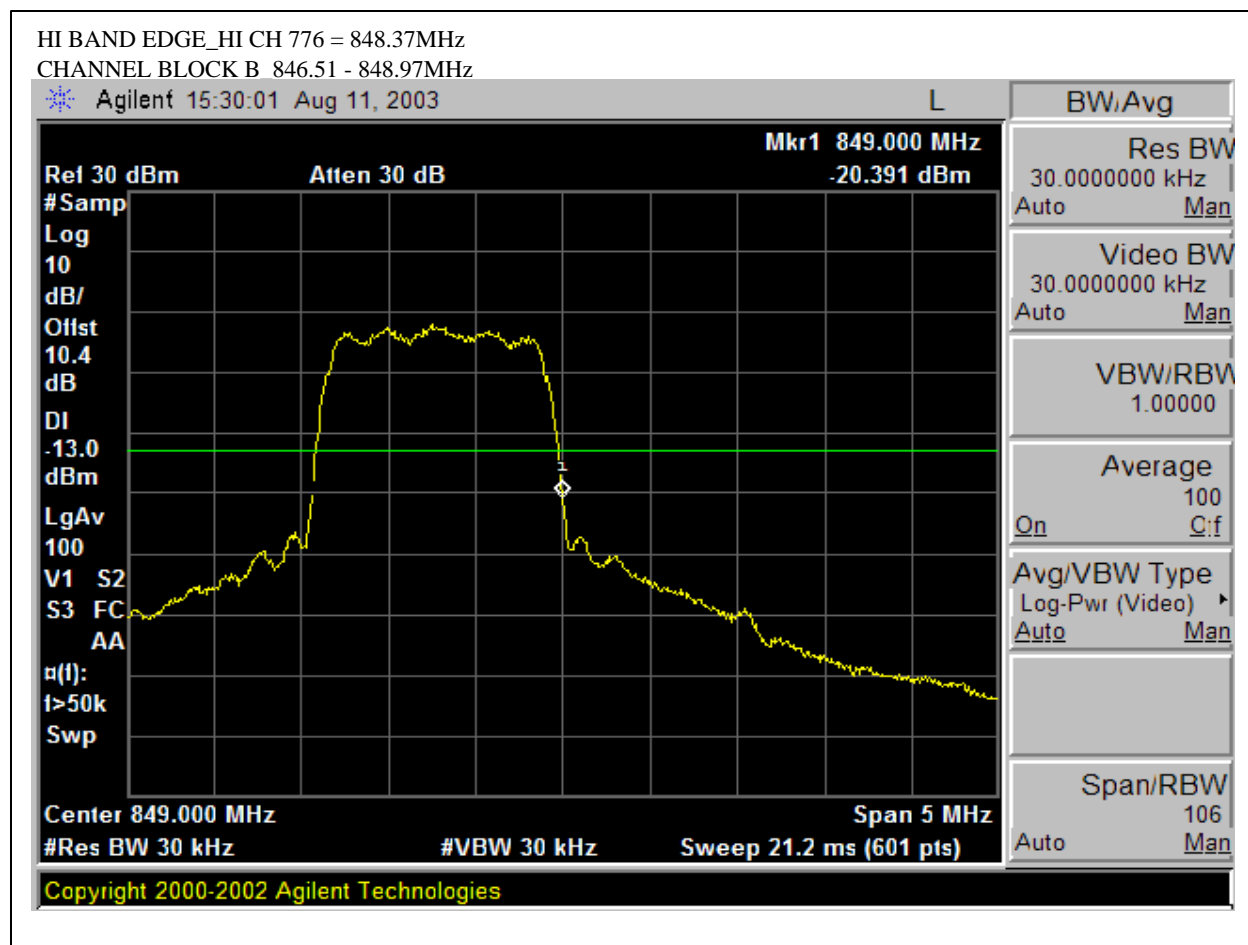


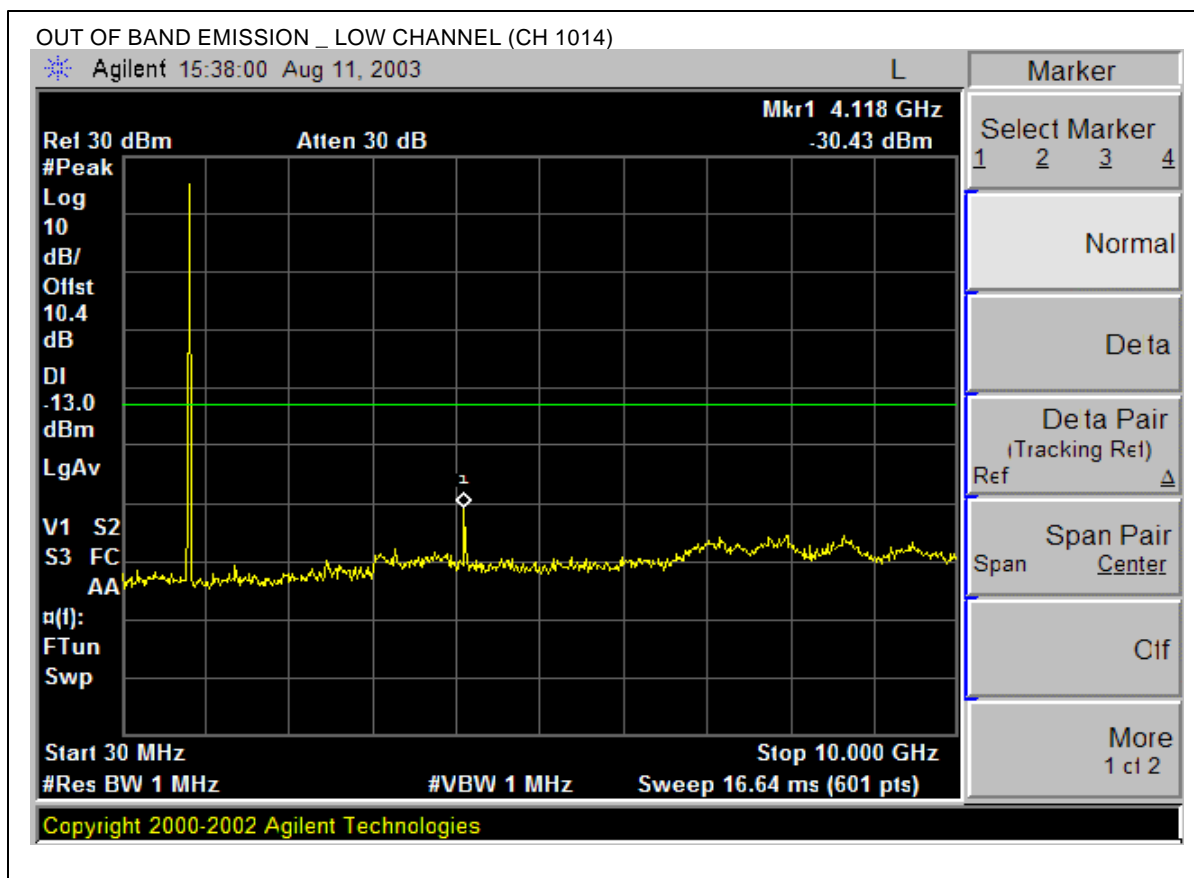


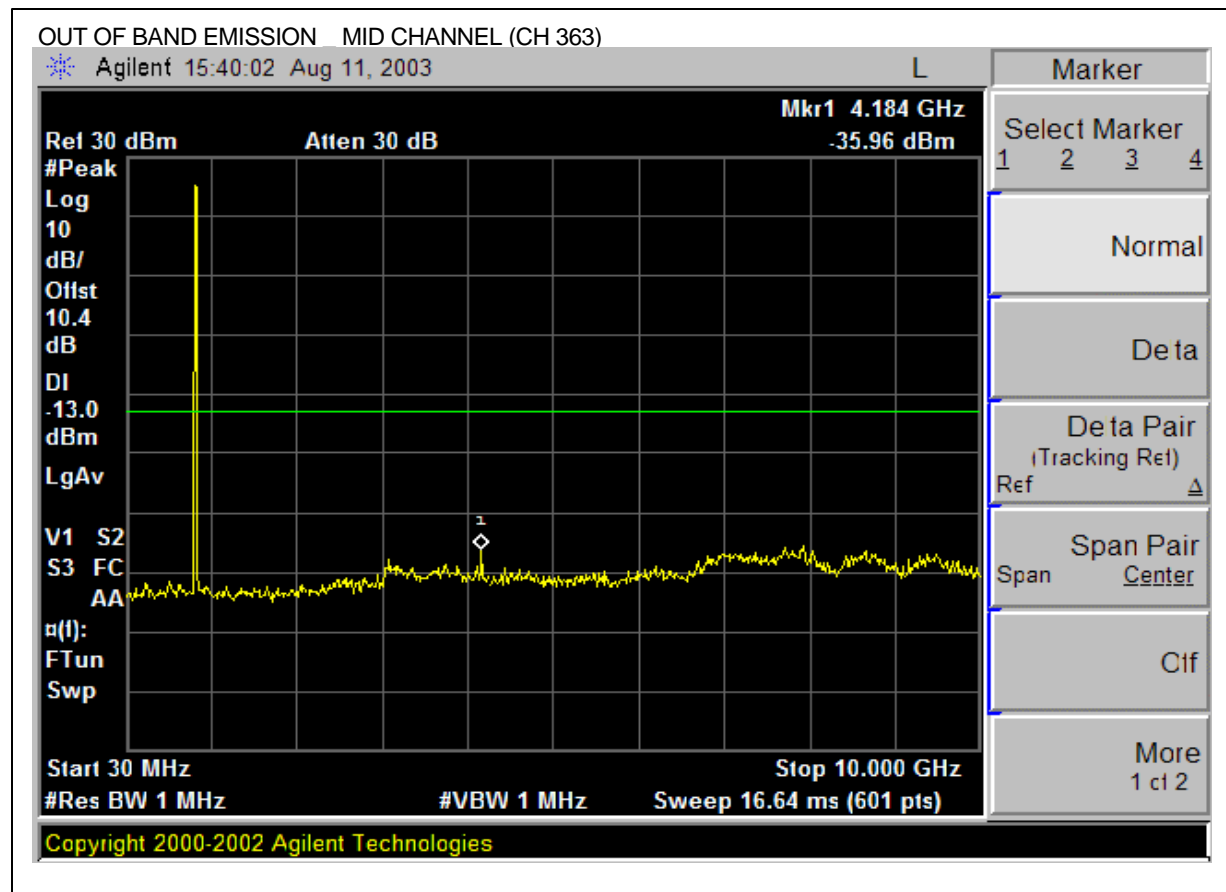


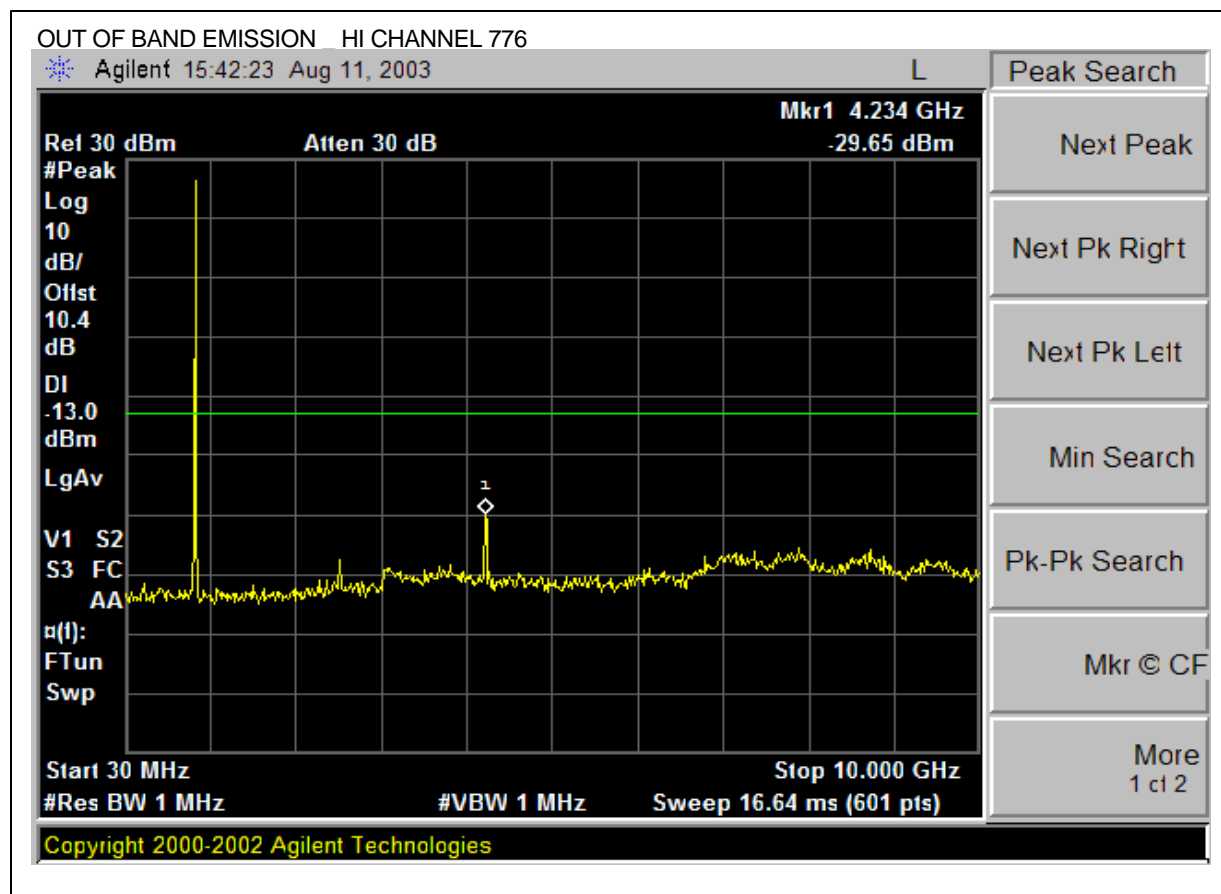


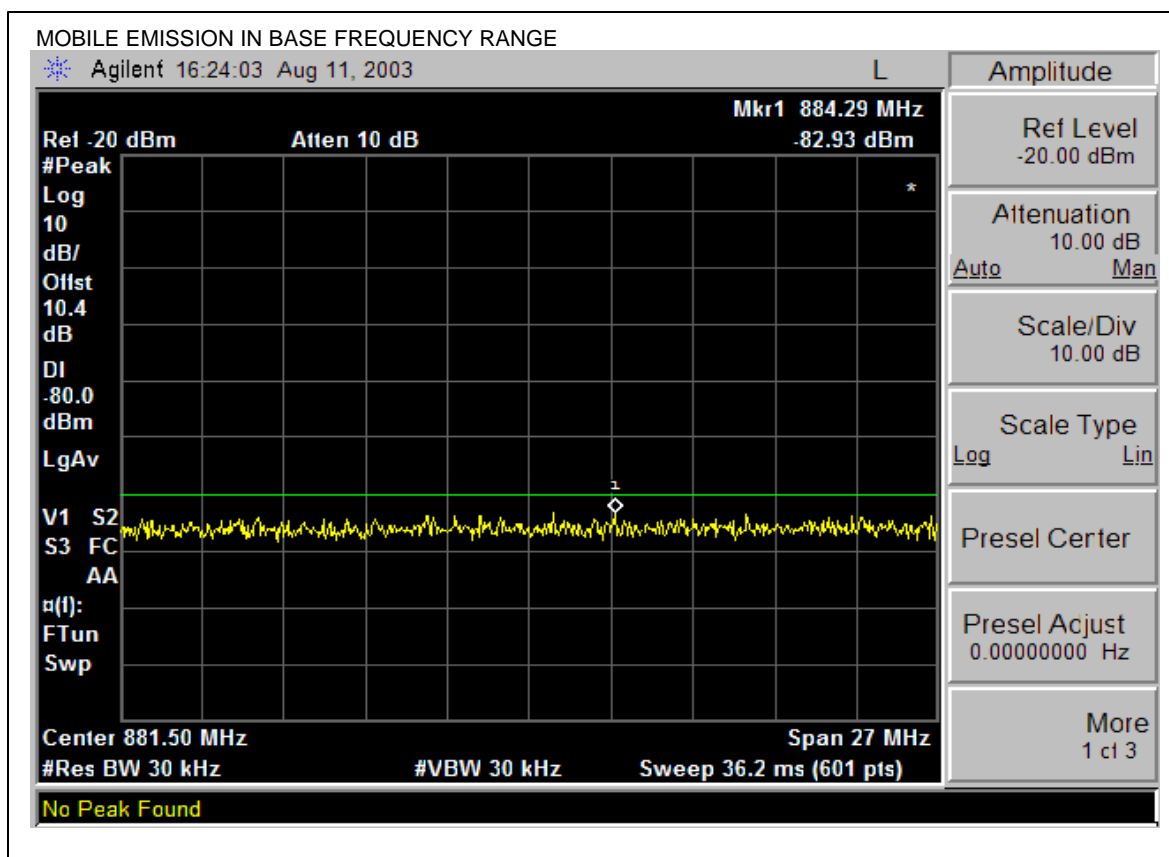












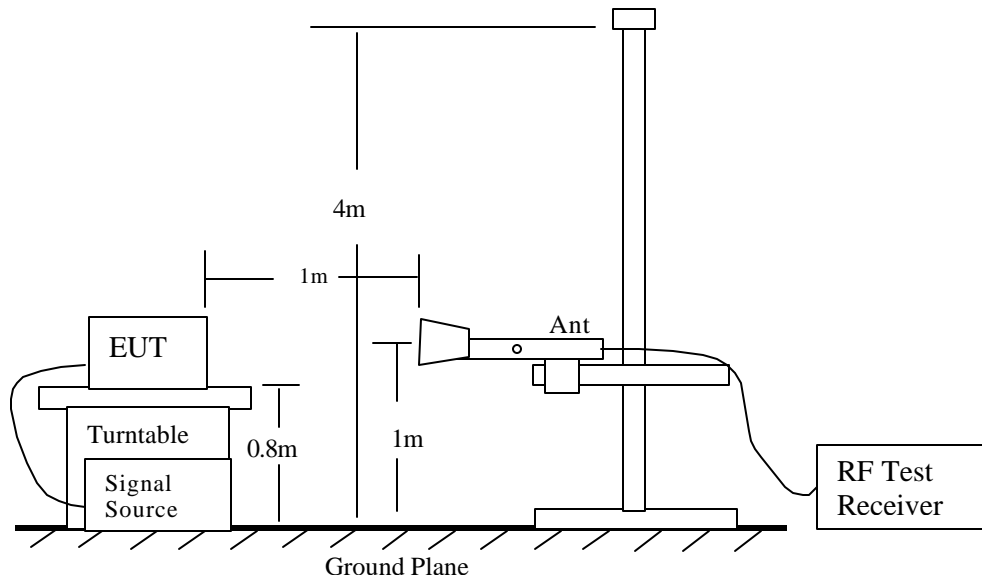
7.5. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION

INSTRUMENTS LIST

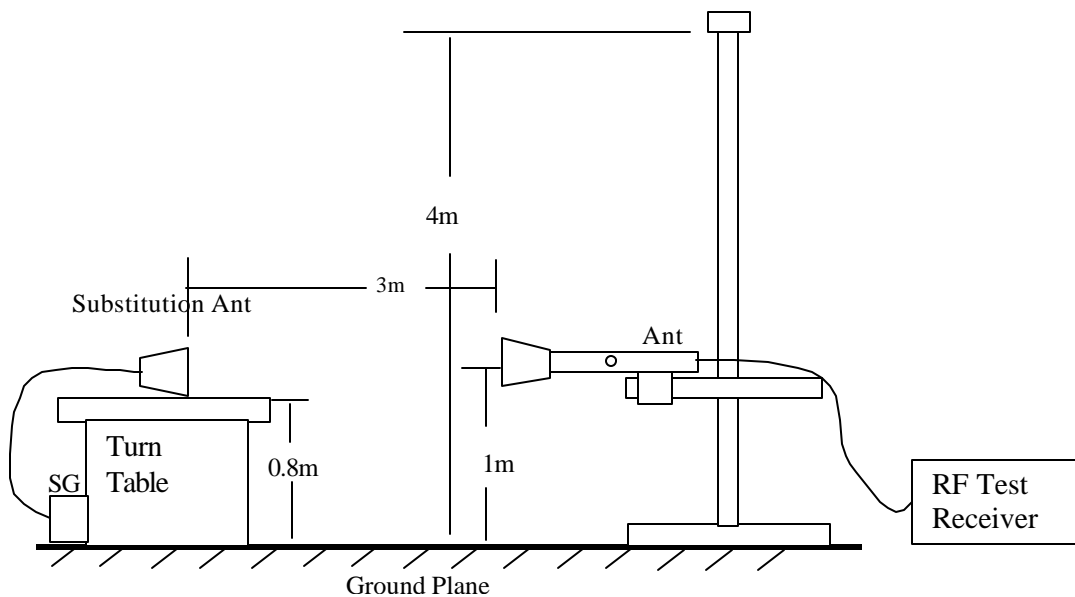
TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	9/6/2003
Line Filter	Lindgren	LMF-3489	497	CNR
LISN, 10 kHz ~ 30 MHz	Solar	012-50-R-24-BN	837990	9/6/2003
EMI Test Receiver	R & S	ESHS 20	827129/006	4/17/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	2/4/2004
Quasi-Peak Adaptor	HP	85650A	2811A01155	5/16/2004
SA RF Section, 1.5 GHz	HP	85680B	2732A03661	5/16/2004
Preamplifier, 1300 MHz	HP	8447D	2944A06589	8/22/2004
Antenna, Bilog	Chase	CBL6112B	2586	3/6/2004
SA Display Section 2	HP	85662A	2816A16696	5/16/2004
Spectrum Analyzer	HP	E4446A	US42070220	1/13/2004
Dipole Antenna	ETS	DB-4	1629	5/15/2004
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	11/20/2004
RF Filter Section	HP	85420E	3705A00256	11/21/2004
Bilog Antenna	A.R.A	LPB-2520/A	1185	6/24/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	9001-3245	2/4/2004

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 1 MHz
	<input type="checkbox"/> Average	<input type="checkbox"/> 1 MHz	<input type="checkbox"/> 10 Hz



Radiated Emission Measurement



Radiated Emission – Substitution Method set-up

TEST PROCEDURE

- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 1m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or average detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 6). The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8). The maximum signal level detected by the measuring receiver shall be noted.
- 9). The transmitter shall be replaced by a substitution antenna.
- 10). The substitution antenna shall be oriented for vertical polarization.
- 11). The substitution antenna shall be connected to a calibrated signal generator.
- 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- 14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
- 17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

MEASUREMENT RESULT

No non-compliance noted, as shown below

CDMA Harmonics / Spurious and Substitution Emissions, Low / Mid / High Channels:

08/12/03 High Frequency Substitution Measurement Compliance Certification Services, Morgan Hill Open Field Site									
Test Engr: VIEN TRAN Project #: 03I2101-1 Company: AXESS TELECOM CO EUT Descrip.: WLL PHONE EUT M/N: ACW-1xP800 Test Target: FCC PART 22 Mode Oper: Tx at LOW/MID/HI CH'S_EUT ANTENNA AT Y POSITION									
Test Equipment:									
EMCO Horn 1-18GHz T60; S/N: 2238 @3m		Pre-amplifier 1-26GHz T86 Mitroq 924341		Spectrum Analyzer Agilent E4446A Analyzer		Horn > 18GHz		Limit FCC 22	
Hi Frequency Cables <input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input checked="" type="checkbox"/> (4 ~ 6 ft) <input type="checkbox"/> (12 ft)				Peak Measurements: Fundamental: RBW>99% or 26dB Emissions BW VBW=RBW Bandedge: RBW>1% Emissions BW VBW> 3*RBW Spurious: RBW=1MHz VBW=1MHz					
f GHz	SA reading (dBuV)	SG reading (dBuV)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
LOW CH = 824.64MHz									
1.649	54.5	-62.5	0.4	7.0	4.8	-58.1	-13.0	-45.1	V
2.474	66.2	-48.7	0.6	8.2	6.0	-43.2	-13.0	-30.2	V
3.297	59.5	-54.6	0.7	9.3	7.1	-48.2	-13.0	-35.2	V
4.123	69.3	-44.3	0.8	9.8	7.6	-37.5	-13.0	-24.5	V
4.948	52.0	-62.6	1.0	10.9	8.8	-54.8	-13.0	-41.8	V, NOISE FLOOR
1.649	53.4	-63.6	0.4	7.0	4.8	-59.2	-13.0	-46.2	H
2.474	57.2	-57.7	0.6	8.2	6.0	-52.2	-13.0	-39.2	H
3.297	54.3	-59.8	0.7	9.3	7.1	-53.4	-13.0	-40.4	H
4.123	62.0	-51.6	0.8	9.8	7.6	-44.8	-13.0	-31.8	H
4.948	50.1	-64.5	1.0	10.9	8.8	-56.7	-13.0	-43.7	H, NOISE FLOOR
MID CH = 835.89MHz									
1.672	58.5	-50.2	0.4	7.0	4.8	-45.7	-13.0	-32.7	V
2.508	61.3	-45.3	0.6	8.3	6.1	-39.8	-13.0	-26.8	V
3.344	54.0	-51.9	0.8	9.3	7.2	-45.5	-13.0	-32.5	V
4.179	64.6	-40.8	0.9	9.9	7.7	-34.0	-13.0	-21.0	V
5.015	52.4	-54.1	1.0	11.0	8.8	-46.2	-13.0	-33.2	V, NOISE FLOOR
1.672	53.6	-55.1	0.4	7.0	4.8	-50.6	-13.0	-37.6	H
2.508	54.4	-52.2	0.6	8.3	6.1	-46.7	-13.0	-33.7	H
3.344	52.5	-53.4	0.8	9.3	7.2	-47.0	-13.0	-34.0	H
4.179	59.0	-46.4	0.9	9.9	7.7	-39.6	-13.0	-26.6	H
5.015	51.0	-55.5	1.0	11.0	8.8	-47.6	-13.0	-34.6	H, NOISE FLOOR
HIGH CH = 848.37MHz									
1.697	56.4	-52.2	0.4	7.0	4.9	-47.7	-13.0	-34.7	V
2.545	63.0	-43.6	0.6	8.3	6.2	-38.0	-13.0	-25.0	V
3.393	58.2	-47.6	0.8	9.3	7.2	-41.2	-13.0	-28.2	V
4.242	73.0	-32.5	0.9	10.0	7.8	-25.6	-13.0	-12.6	V
5.090	54.0	-52.4	1.0	11.0	8.9	-44.5	-13.0	-31.5	V, NOISE FLOOR
1.697	56.0	-52.6	0.4	7.0	4.9	-48.1	-13.0	-35.1	H
2.545	58.0	-48.6	0.6	8.3	6.2	-43.0	-13.0	-30.0	H
3.393	54.5	-51.3	0.8	9.3	7.2	-44.9	-13.0	-31.9	H
4.242	68.2	-37.3	0.9	10.0	7.8	-30.4	-13.0	-17.4	H
5.090	53.1	-53.3	1.0	11.0	8.9	-45.4	-13.0	-32.4	H, NOISE FLOOR
						0.0			

7.6. SECTION 2.1055: FREQUENCY STABILITY

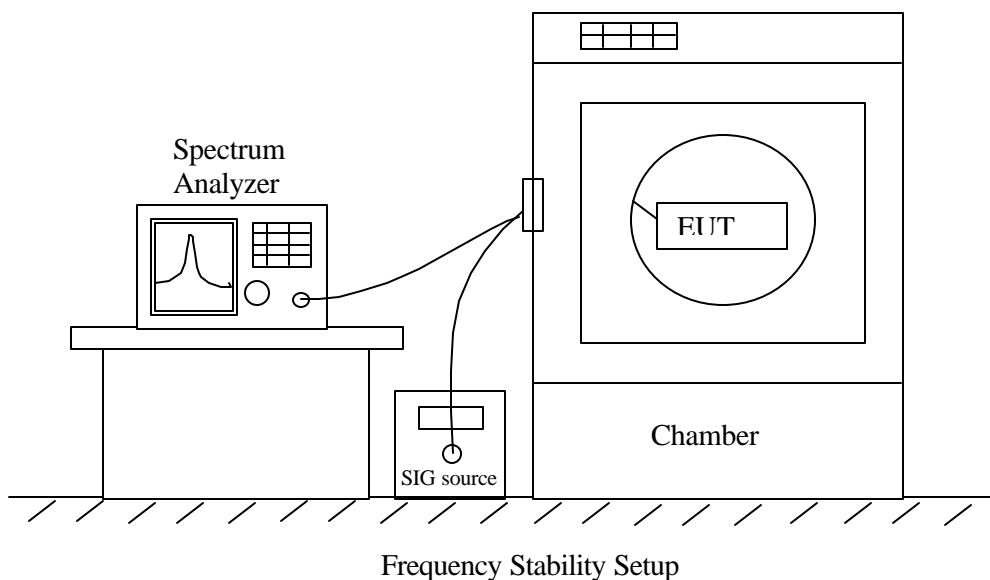
INSTRUMENTS LIST

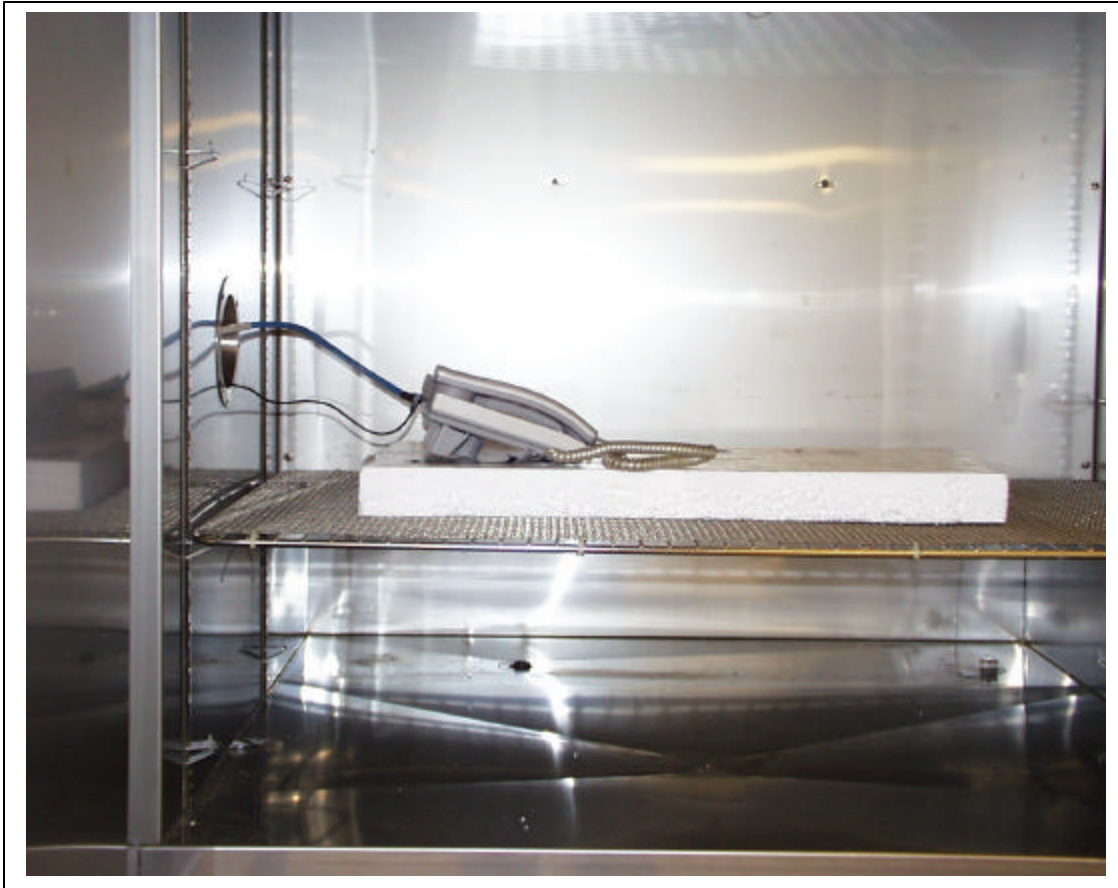
EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
PSA Analyzer	Agilent	E446A	US42070220	1/13/04
Environmental Chamber	Thermotron	SE 600-10-10	2980	4/23/04
10dB Attenuator	Agilent	8493C	59028	N/A
DC Power Supply	Kenwood	PA36-3A	7060074	N/A

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	Peak	300 Hz	300 Hz

TEST SETUP





TEST PROCEDURE

- **Frequency stability versus environmental temperature**

- 1). Setup the configuration per figure 6 for frequencies measurement inside the environmental chamber. Set the temperature of the chamber to 25°C. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.
- 2). Turn EUT off and set Chamber temperature to -30°C.
- 3). Allow sufficient time (approximately 20 to 30 minus after chamber reach the assigned temperature) for EUT to stabilize. Turn on EUT and measure the EUT operating frequency. Turn off EUT after the measurement.
- 4). Repeat step 3 with a 10°C increased per stage until the highest temperature of +50°C reached, record all measured frequencies on each temperature step.

- **Frequency stability versus AC input voltage**

- 1). Setup the configuration per figure 6 and set chamber temperature to 25°C. Use a variable AC power supply to power the EUT and set AC output voltage to EUT nominal input AC voltage. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.
- 2). Slowly reduce the EUT input voltage to specified extreme voltage variation ($\pm 15\%$) and record the maximum frequency change.

MEASUREMENT RESULT

No non-compliance noted, as shown below.

Reference Frequency: CDMA Mid Channel 835.195730MHz @ 25 C				
Limit: to stay ± 2.5 ppm = 2087.989 Hz				
Power Supply (Vdc)	Environment Temperature (?C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
5.00	50	835.195790	-0.072	± 2.5
5.00	40	835.195780	-0.060	± 2.5
5.00	30	835.195770	-0.048	± 2.5
5.00	25	835.195730	0	± 2.5
5.00	20	835.195700	0.036	± 2.5
5.00	10	835.195810	-0.096	± 2.5
5.00	0	835.195690	0.048	± 2.5
5.00	-10	835.195620	0.132	± 2.5
5.00	-20	835.195530	0.239	± 2.5
5.00	-30	835.195640	0.108	± 2.6
Reference Frequency: CDMA Mid Channel 836.195730MHz @ 25?C				
Limit: to stay ± 2.5 ppm = 2087.989 Hz				
Power Supply (Vac)	Environment Temperature (?C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
120.00	25	835.195730	0	± 2.5
102	25	835.195770	-0.048	± 2.5
138	25	835.195780	-0.060	± 2.5

7.7. RADIATED EMISSION

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	9/6/2003
Line Filter	Lindgren	LMF-3489	497	CNR
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	837990	9/6/2003
EMI Test Receiver	R & S	ESHS 20	827129/006	4/17/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	2/4/2004
Quasi-Peak Adaptor	HP	85650A	2811A01155	5/16/2004
SA RF Section, 1.5 GHz	HP	85680B	2732A03661	5/16/2004
Preamplifier, 1300 MHz	HP	8447D	2944A06589	8/22/2004
Antenna, Bilog	Chase	CBL6112B	2586	3/6/2004
SA Display Section 2	HP	85662A	2816A16696	5/16/2004
Spectrum Analyzer	HP	E4446A	US42070220	1/13/2004
Dipole Antenna	ETS	DB-4	1629	5/15/2004
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	11/20/2004
RF Filter Section	HP	85420E	3705A00256	11/21/2004
Bilog Antenna	A.R.A	LPB-2520/A	1185	6/24/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	9001-3245	2/4/2004

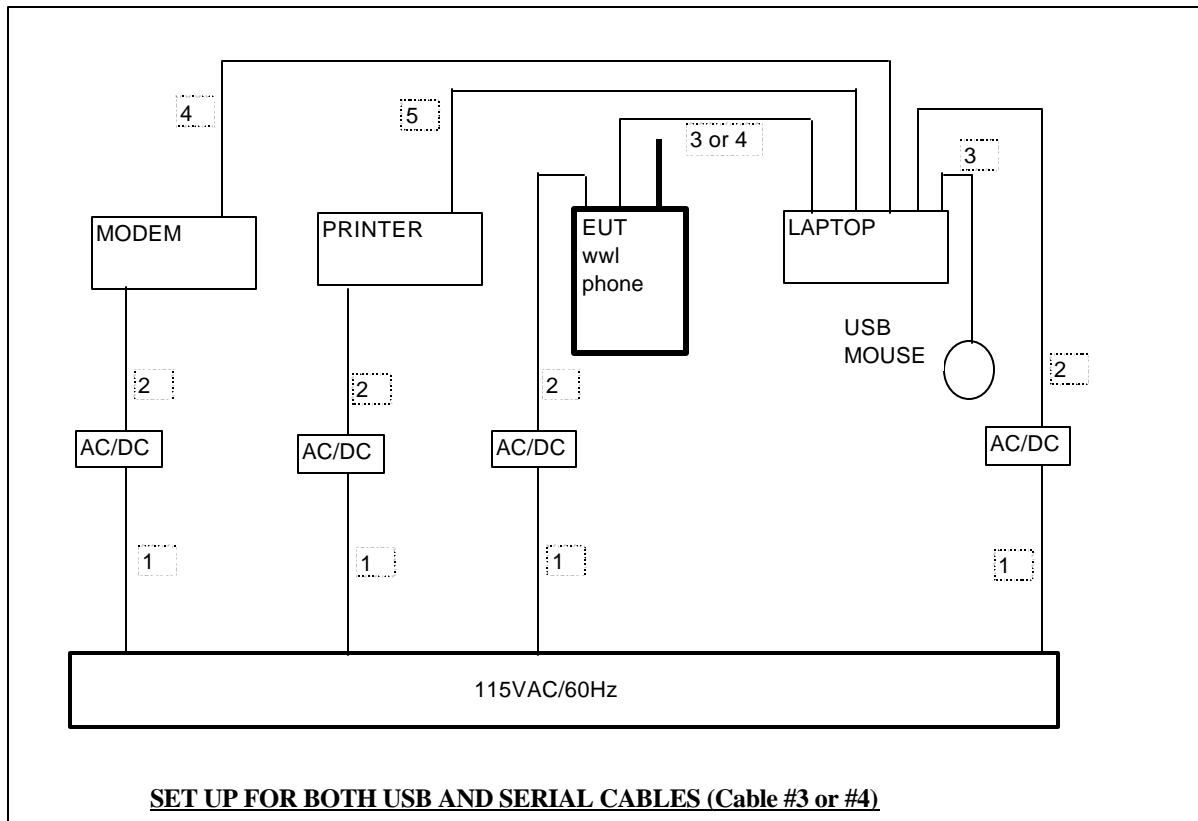
TEST PERIPHERALS				
Device Type	Manufacturer	Model Number	Serial Number	FCC ID
LAPTOP	HP	ZE4205	CN25110353	DOC
MOUSE	MICROSOFT	N/A	X08-7118	DOC
AC ADAPTER	AXESS	SP1006A	N/A	DOC
AC ADAPTER	HP	N/A	MVT0243196915	DOC
AC ADAPTER	CREPTRE	N/A	PD1215APL05	DOC
AC ADAPTER	GOOD POWER	GP4813.51000D	N/A	DOC
MODEM	ACEEX	1414	N/A	IFAXDM1414
PRINTER	HP	2225C	N/A	DS16XU2225

TEST I / O CABLES								
Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	AC	2	US115V	SHIELED	2m	NO	NO	
2	DC	2	DC	SHIELED	2m	NO	NO	
3	SERIAL	4	DB9	SHIELED	1m	YES	YES	

Detector Setting of Spectrum Analyzer

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	<input checked="" type="checkbox"/> Peak <input checked="" type="checkbox"/> Quasi Peak	<input checked="" type="checkbox"/> 100 KHz <input checked="" type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 100 KHz <input checked="" type="checkbox"/> 1 MHz

TEST SETUP



TEST PROCEDURE

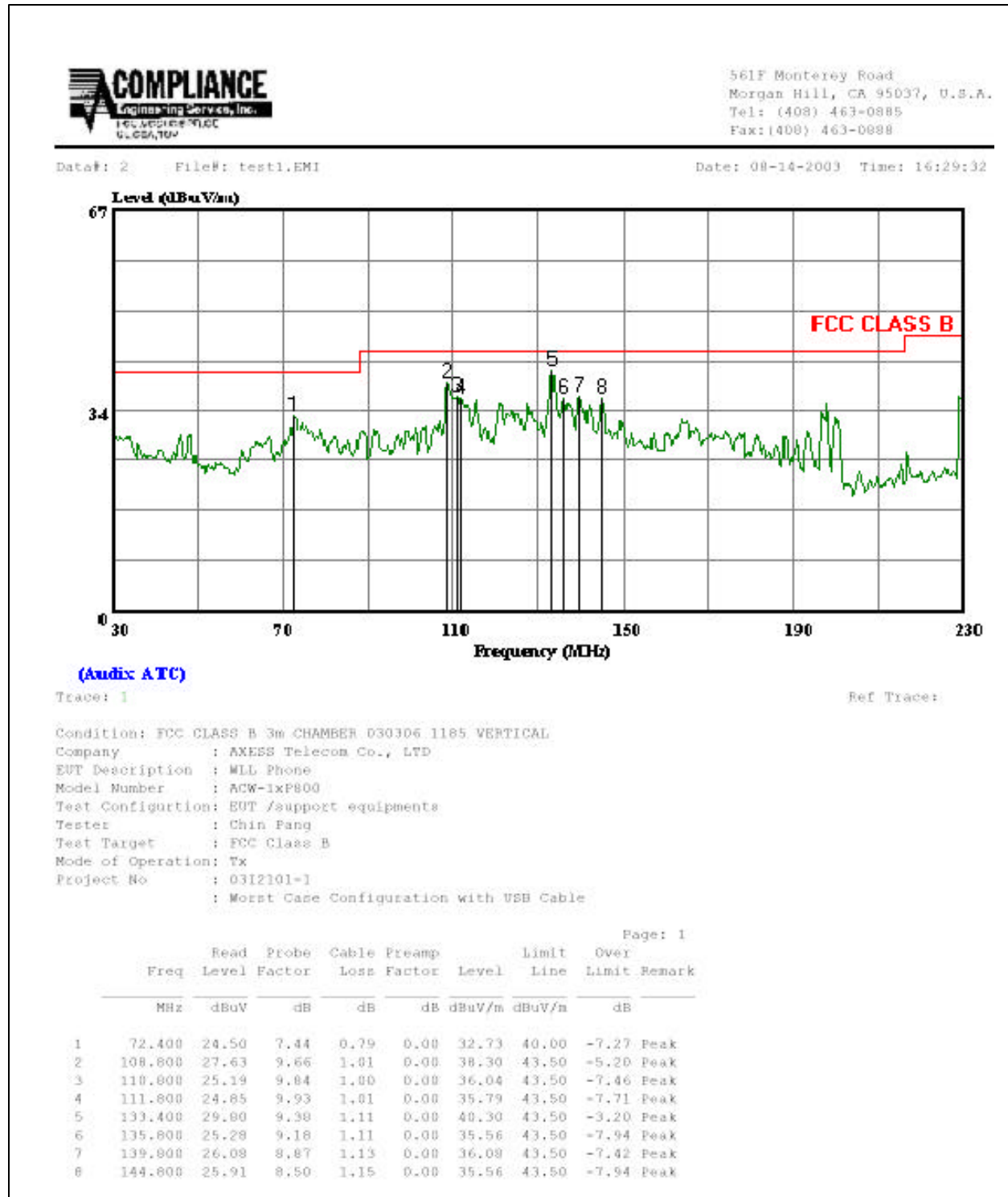
1. The EUT was placed on the turn table 0.8 meter above ground inside 3 meter Anechoic Chamber.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures (3)~(6). If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.

MEASUREMENT RESULT

No non-compliance noted, as shown below.

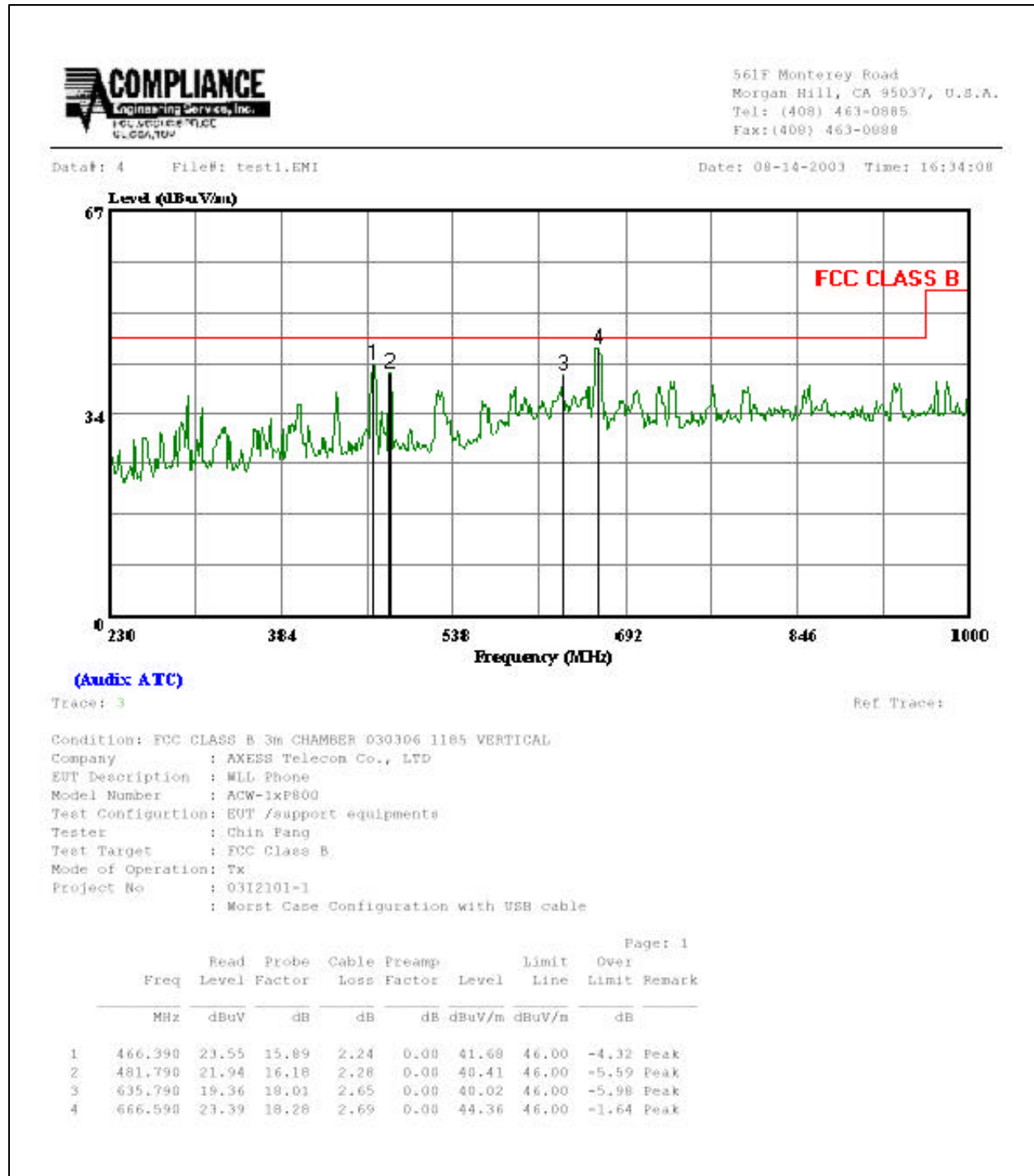
RADIATED EMISSION FROM 30MHz TO 230MHz VERTICAL

USB CABLE

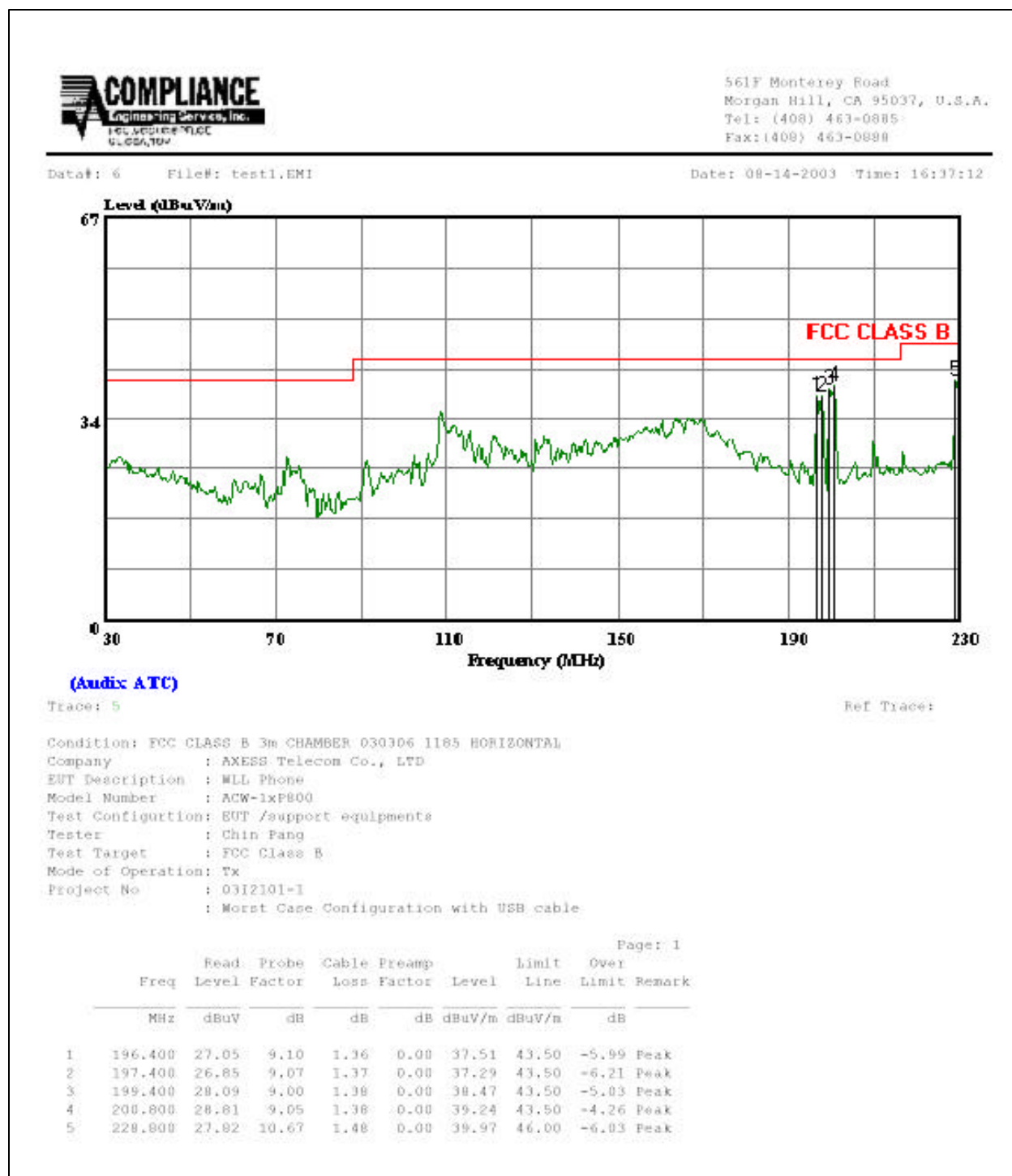


RADIATED EMISSION FROM 230MHz TO 1000MHz VERTICAL

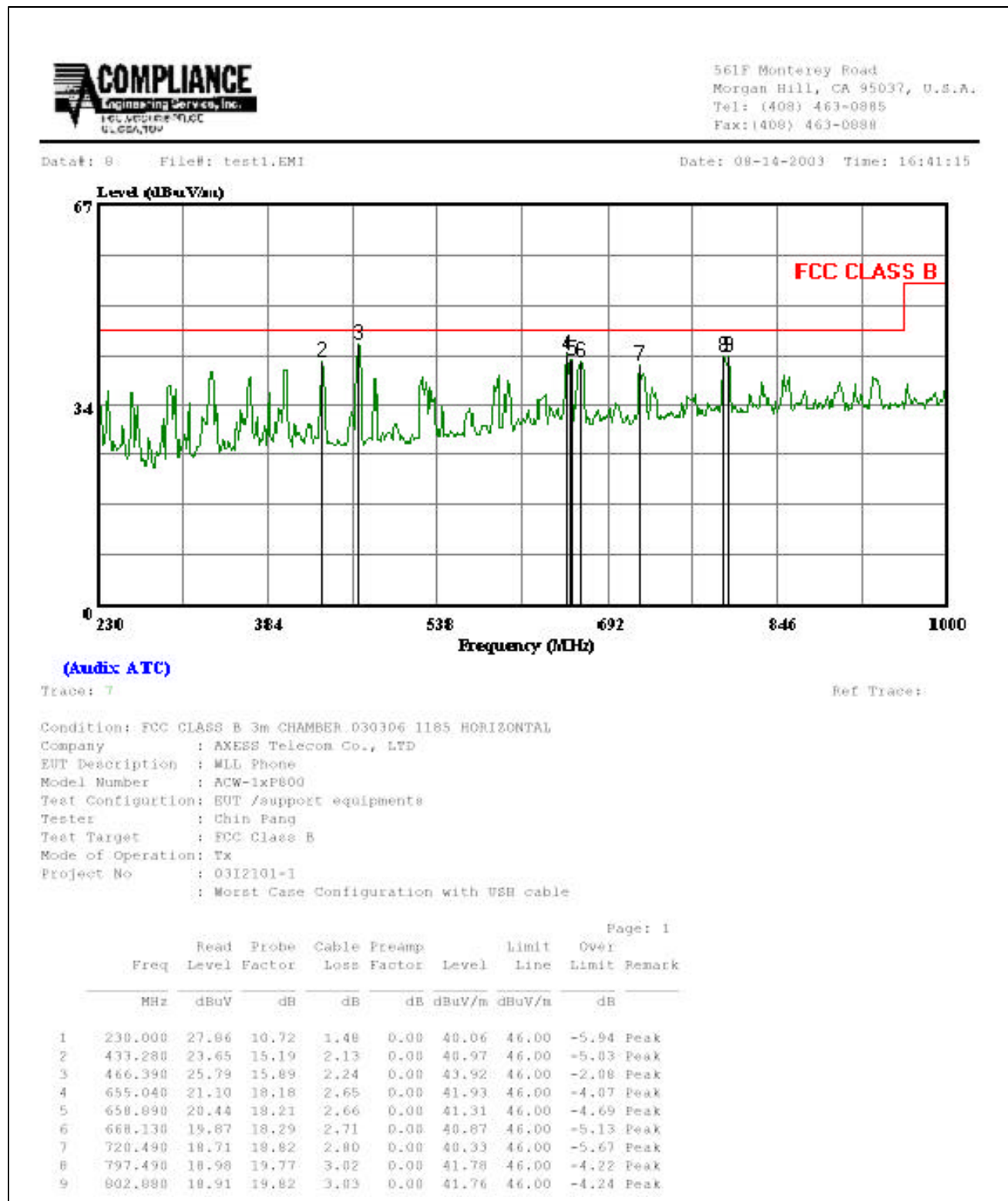
USB CABLE



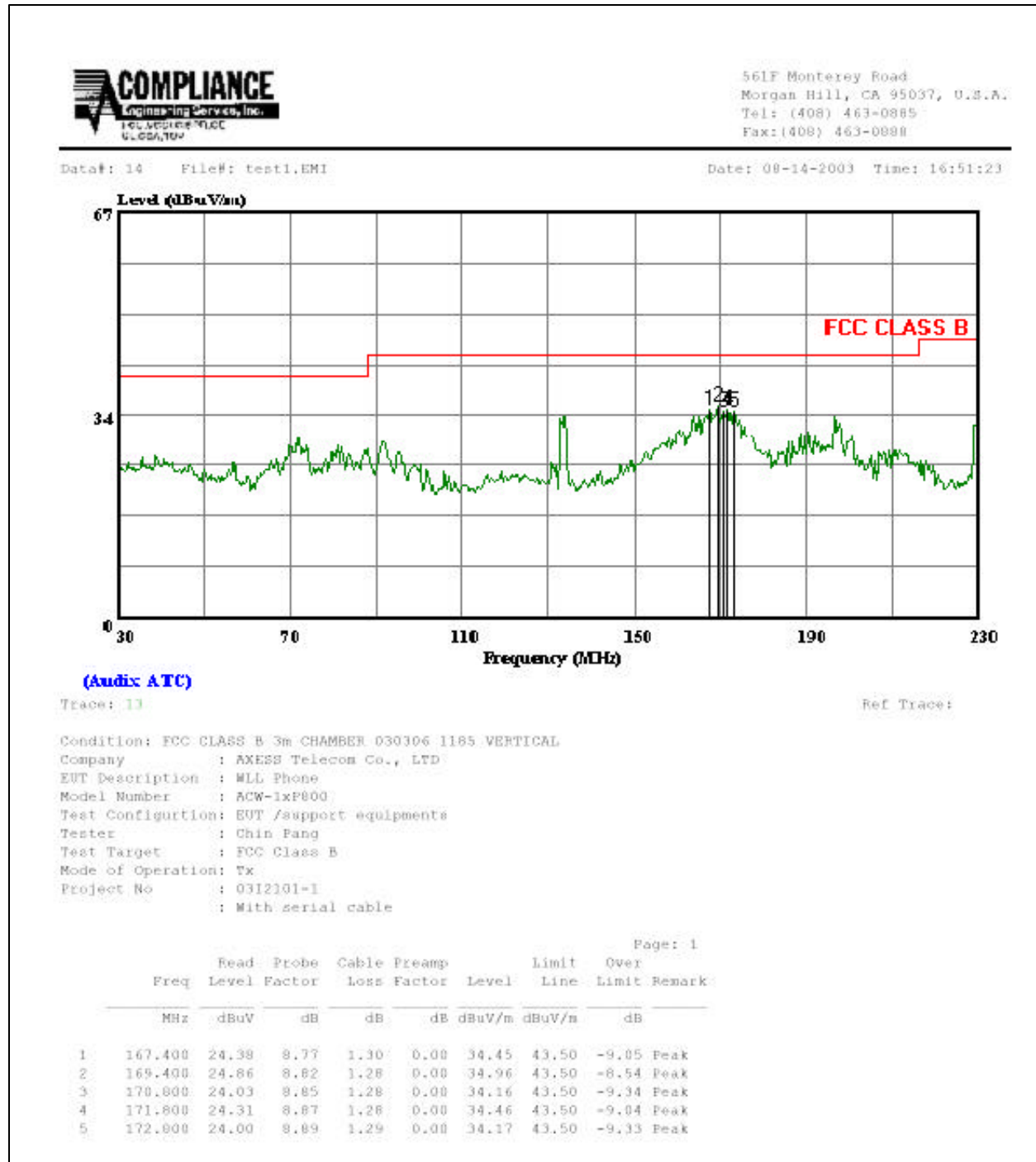
**RADIATED EMISSION FROM 30MHz TO 230MHz - HORIZONTAL
USB CABLE**



RADIATED EMISSION FROM 230MHz TO 1000MHz - HORIZONTAL
USB CABLE

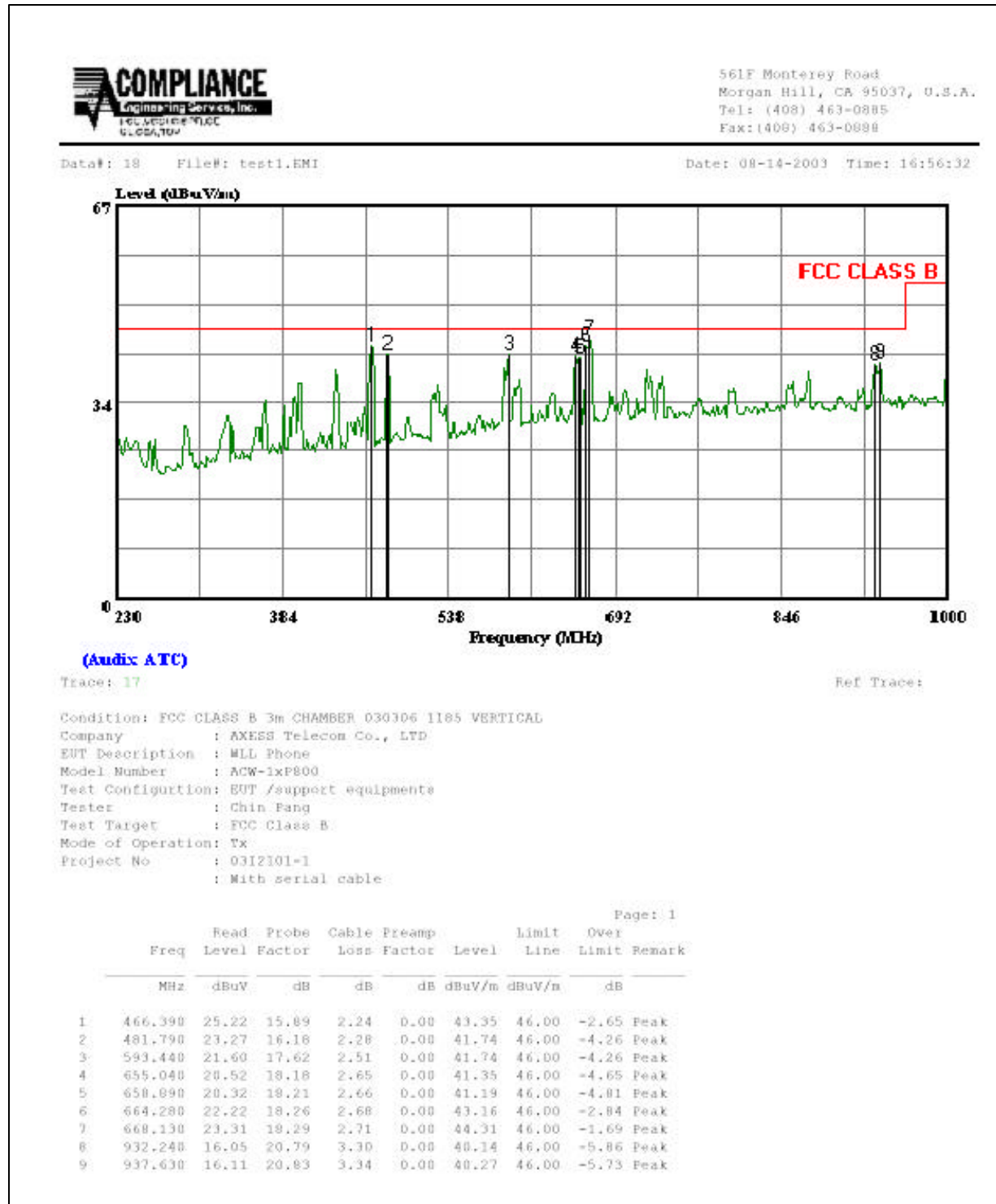


**RADIATED EMISSION FROM 30MHz TO 230MHz - VERTICAL
SERIAL CABLE**

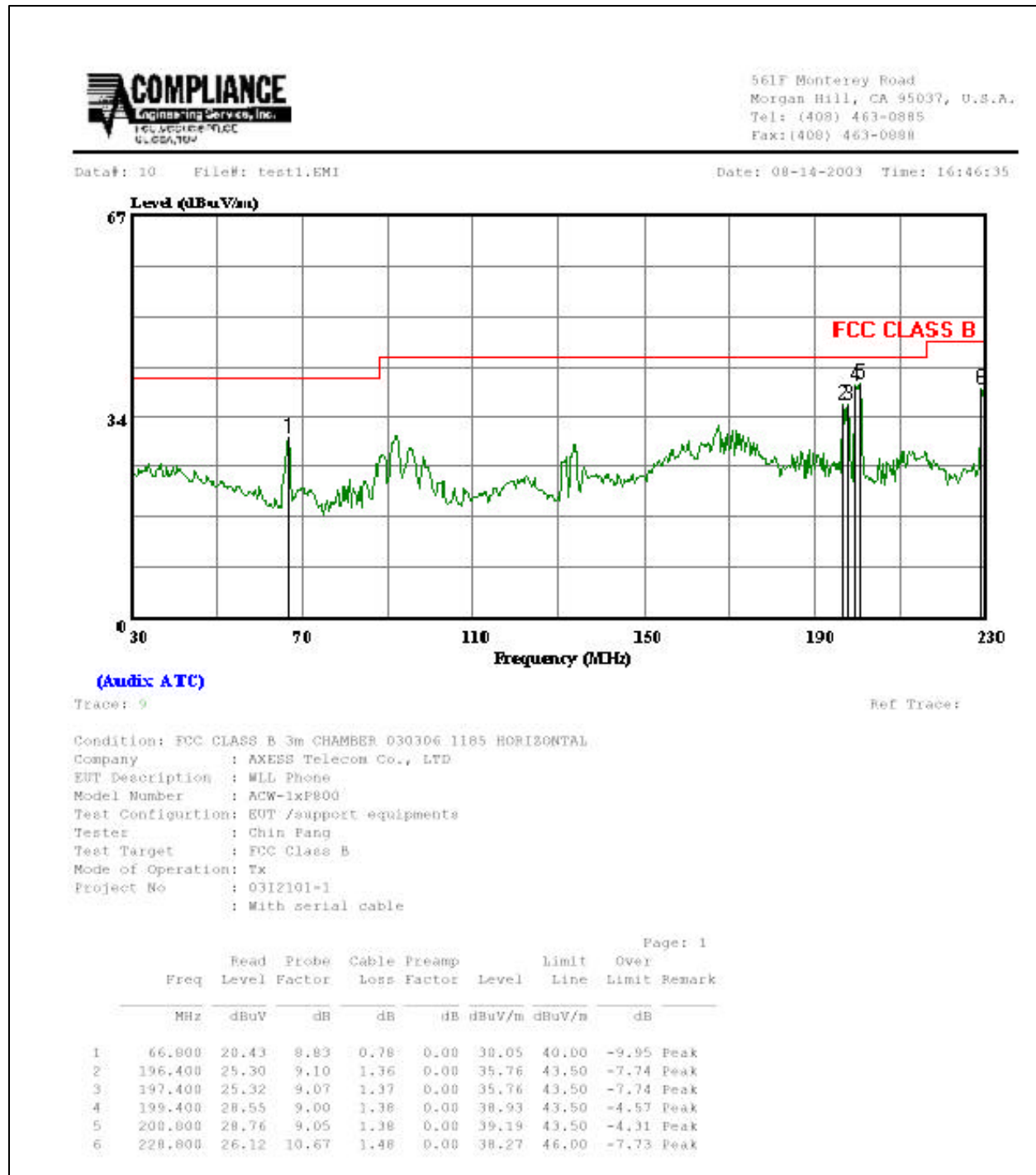


RADIATED EMISSION FROM 230MHz TO 1000MHz - VERTICAL

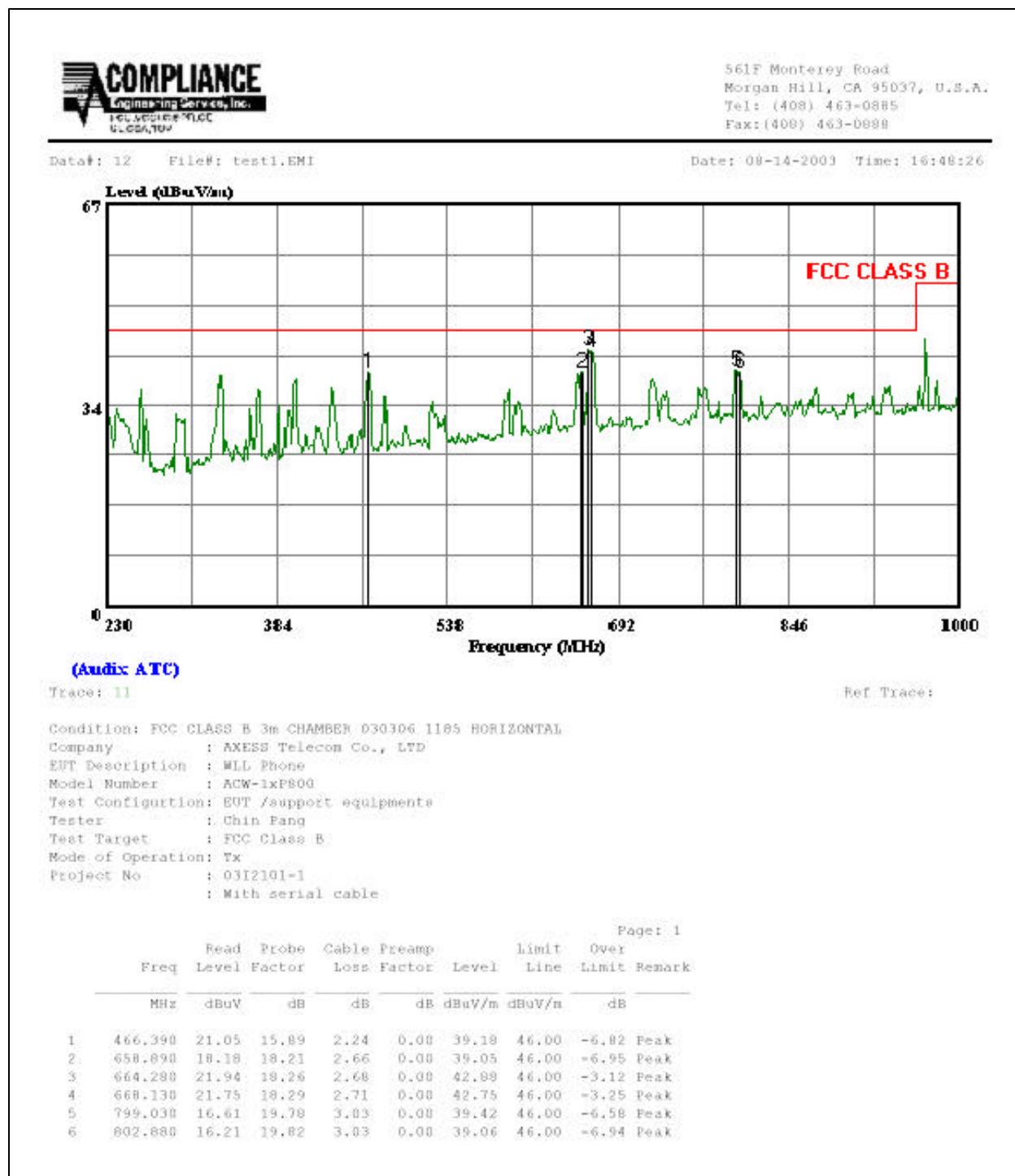
SERIAL CABLE



**RADIATED EMISSION FROM 30MHz TO 230MHz - HORIZONTAL
SERIAL CABLE**



**RADIATED EMISSION FROM 230MHz TO 1000MHz - HORIZONTAL
SERIAL CABLE**



Radiated Emission photos

Configuration 1, front view:



Configuration 1, rear view:

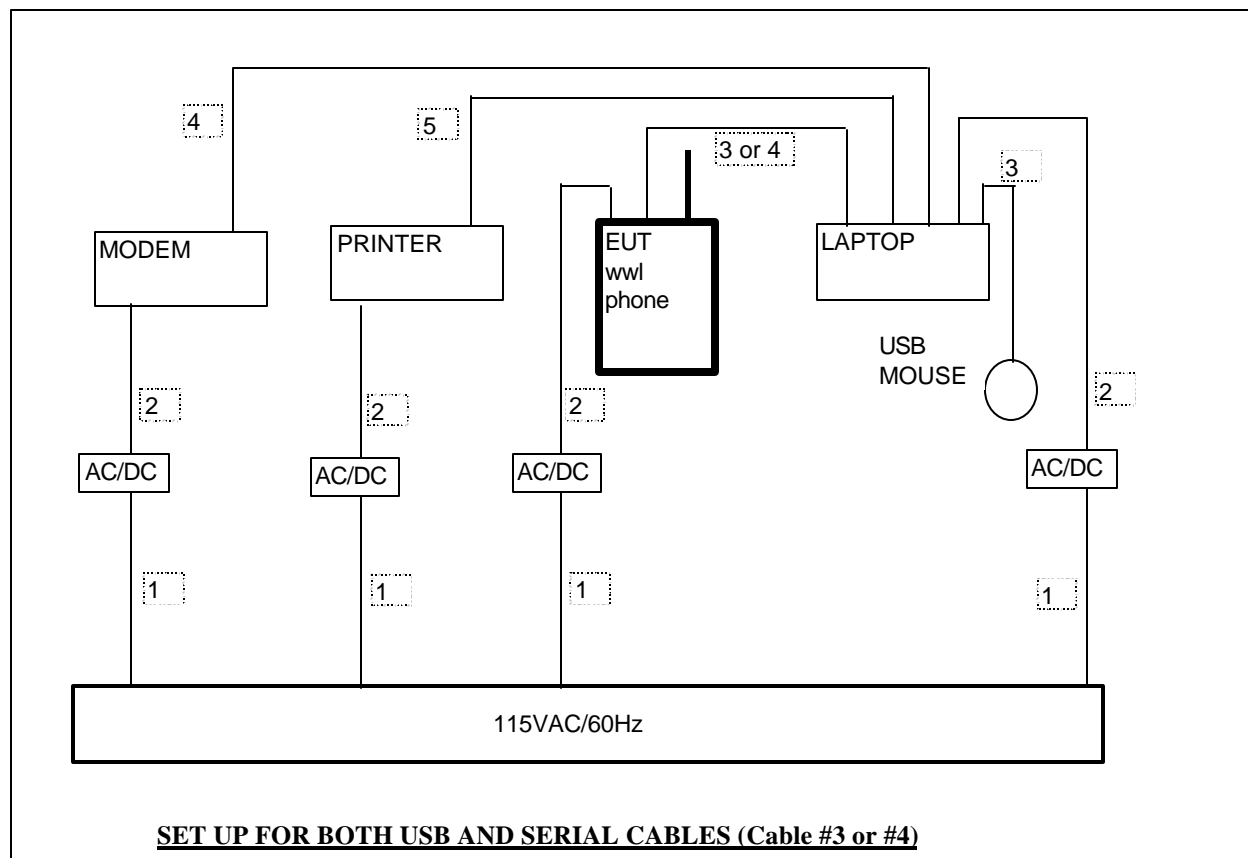


7.8. POWERLINE CONDUCTED EMISSION

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
150 KHz to 30 MHz	<input checked="" type="checkbox"/> Peak <input type="checkbox"/> CISPR Quasi Peak	<input checked="" type="checkbox"/> 9 KHz	<input checked="" type="checkbox"/> 9 KHz

TEST SETUP

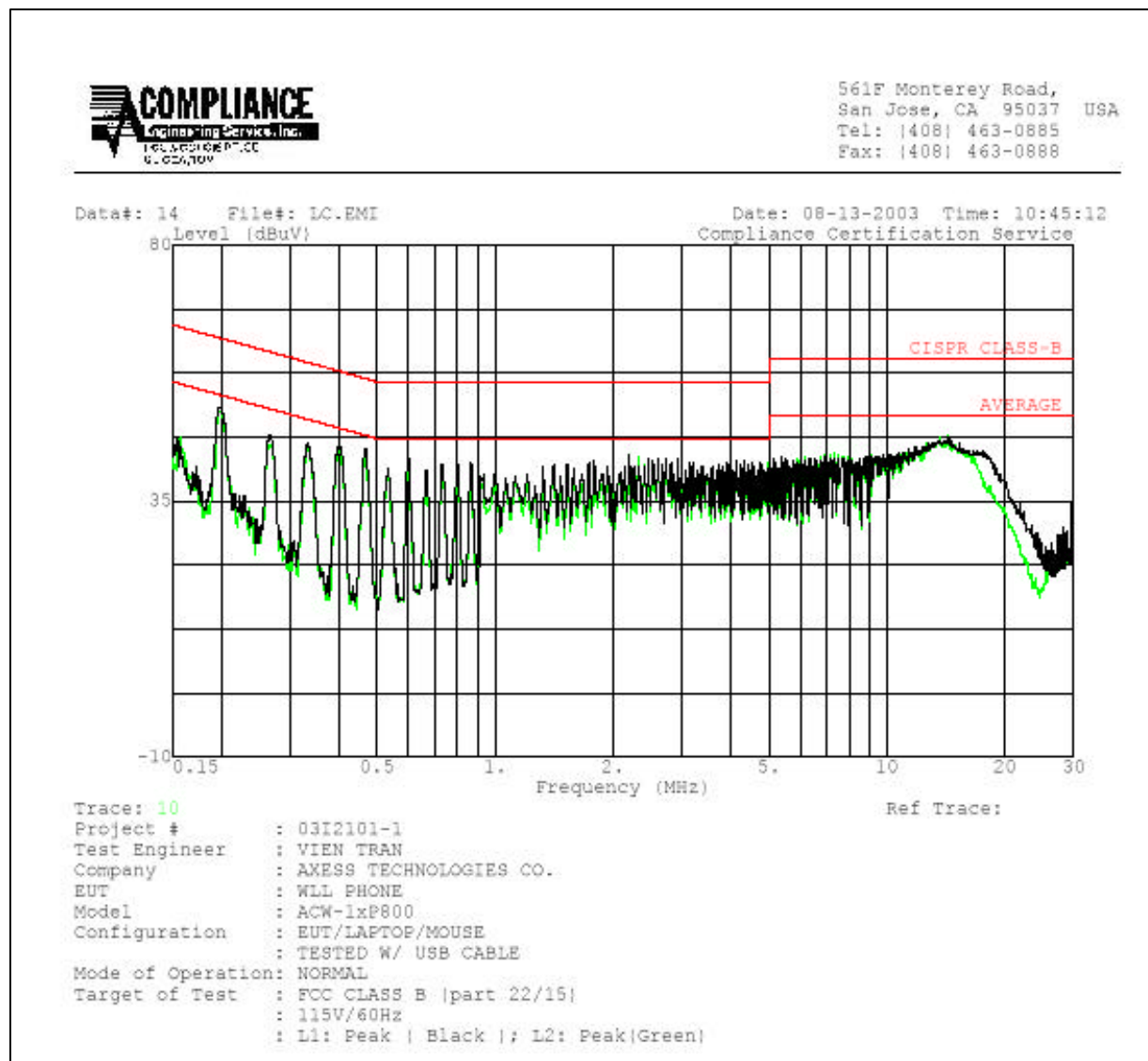


TEST PROCEDURE

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a continuous mode.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

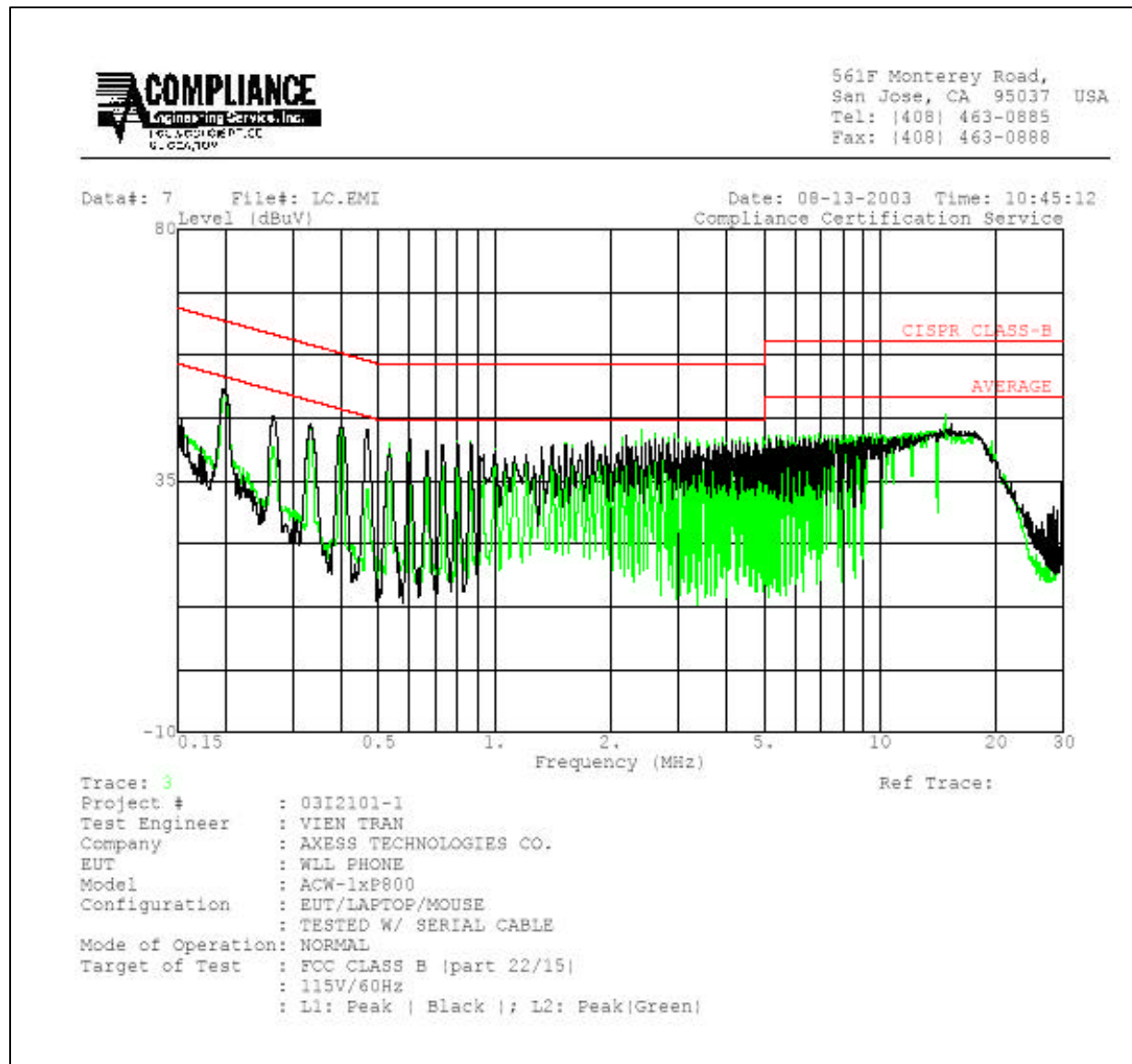
MEASUREMENT RESULT

TESTED WITH USB CABLE



TESTED WITH USB CABLE									
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
2.31	43.41	--	--	0.00	56.00	46.00	-12.59	-2.59	L1
0.20	50.70	--	--	0.00	64.57	54.57	-13.87	-3.87	L1
14.36	45.70	--	--	0.00	60.00	50.00	-14.30	-4.30	L1
2.31	43.23	--	--	0.00	56.00	46.00	-12.77	-2.77	L2
2.00	50.70	--	--	0.00	56.00	46.00	-5.30	4.70	L2
14.36	46.22	--	--	0.00	60.00	50.00	-13.78	-3.78	L2
6 Worst Data									

TESTED WITH SERIAL CABLE



TESTED WITH SERIAL CABLE

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
2.40	44.61	--	--	0.00	56.00	46.00	-11.39	-1.39	L1
0.20	51.58	--	--	0.00	64.63	54.63	-13.05	-3.05	L1
14.59	47.52	--	--	0.00	60.00	50.00	-12.48	-2.48	L1
2.40	43.95	--	--	0.00	56.00	46.00	-12.05	-2.05	L2
0.20	51.22	--	--	0.00	64.63	54.63	-13.41	-3.41	L2
14.59	46.26	--	--	0.00	60.00	50.00	-13.74	-3.74	L2
6 Worst Data									

LINE CONDUCTION - FRONT



LINE CONDUCTION - BACK



END OF REPORT