FCC CFR47 CERTIFICATION

PART 24E

TEST REPORT

FOR

KYOCERA CORPORATION

MODEL: UTC1900D-US-A

FCC ID: JOYIUC19AA

REPORT NUMBER: 04I2701-3

ISSUE DATE: JUNE 10, 2004

Prepared for

KYOCERA CORPORATION
2-1-1 KAGAHARA TSUZUKI-KU
YOKOHAMA-SHI,
JAPAN

Prepared by

COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD, ROUTE 2
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888

TABLE OF CONTENT

1. TEST RESULT CERTIFICATION

COMPANY NAME: KYOCERA CORPORATION
2-1-1 KAGAHARA TSUZUKI-KU YOKOHAMA-SHI
KANAGAWA 224-8502, JAPAN

EUT DESCRIPTION: USER TERMINAL (CARD TYPE) OF WIRELESS BROADBAND INTERNET SYSTEM

MODEL NUMBER: UTC1900D-US-A

DATE TESTED: JUNE 01 TO JUNE 6, 2004

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR, LICENSED TX MODULE IN MOBILE APPLICATION
MEASUREMENT PROCEDURE	ANSI C63.4 / 2001, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 24 Subpart E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 24 Subpart E-Broadband PCS. 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 TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

Released For CCS By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The EUT is a 1900MHz User Terminal (Card Type) of Wireless Broadband Internet System, which has an output power of 27.1dBm / 512mW (EIRP Peak Output Power), which is designed for the bands transmitting of frequency range 1900MHz to 1910MHz.

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
Spectrum Analyzer 20 Hz ~ 44 GHz	Agilent	E4446A	US42070220	1/13/2005
Peak Power Meter	Agilent	E4416A	GB41291160	11/7/2004
Power Sensor, 100 kHz ~ 4.2 GHz	HP	8482A	2349A08568	11/7/2004
10dB Attenuator	Weinschel	56-10	M2348	CNR
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	2/4/2005
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	2/4/2005
Signal Generator	R & S	SMP04	DE34210	5/25/2005

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 placed 0.80 meter above the ground plane, the X, Y, and Z positions shall be tested and the worst case reported if necessary. The transmitter shall be switched on with typical 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.

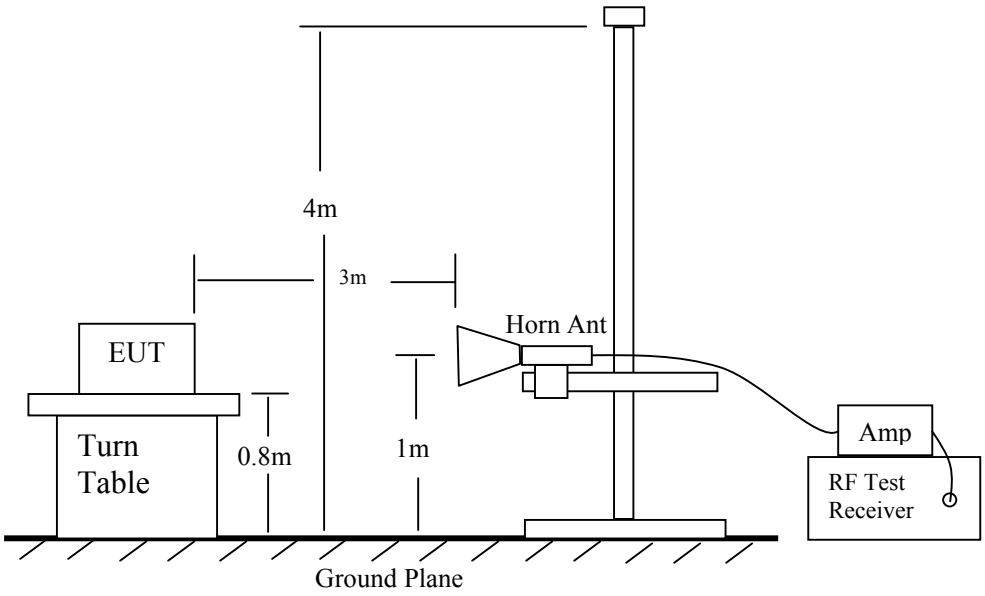
13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

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.

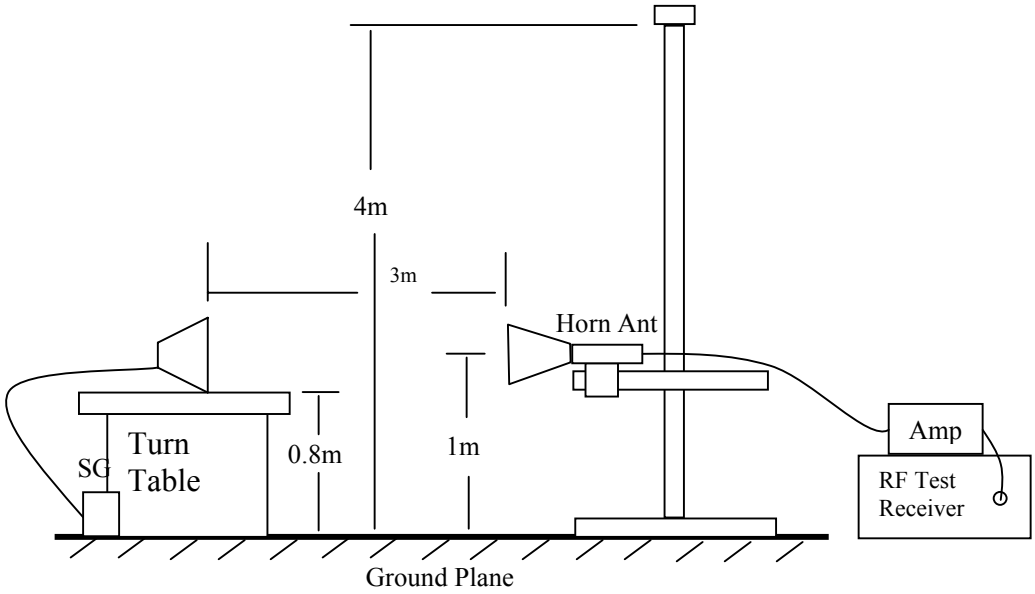
15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

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 Above 1000 MHz



Radiated Emission – Substitution Method setup

X position:

Y position:

Z position:

Test result:

Output Power:

BPSK

	Ch.#	Freq. (MHz)	EIRP Peak Power (dBm)	Conducted Average Power (dBm)
Low Ch.	0	1900.3125	24.10	16.35
Mid Ch.	7	1904.6875	23.80	17.42
High Ch.	15	1909.6875	26.40	17.28

QPSK

	Ch.#	Freq. (MHz)	EIRP Peak Power (dBm)	Conducted Average Power (dBm)
Low Ch.	0	1900.3125	25.90	16.25
Mid Ch.	7	1904.6875	26.50	16.22
High Ch.	15	1909.6875	25.70	17.10

8PSK

	Ch.#	Freq. (MHz)	EIRP Peak Power (dBm)	Conducted Average Power (dBm)
Low Ch.	0	1900.3125	26.40	16.40
Mid Ch.	7	1904.6875	25.10	16.92
High Ch.	15	1909.6875	27.10	17.10

12QAM

	Ch.#	Freq. (MHz)	EIRP Peak Power (dBm)	Conducted Average Power (dBm)
Low Ch.	0	1900.3125	26.00	14.37
Mid Ch.	7	1904.6875	25.40	15.26
High Ch.	15	1909.6875	27.10	15.40

16QAM

	Ch.#	Freq. (MHz)	EIRP Peak Power (dBm)	Conducted Average Power (dBm)
Low Ch.	0	1900.3125	24.20	14.77
Mid Ch.	7	1904.6875	24.20	15.30
High Ch.	15	1909.6875	25.90	15.32

Output Power (EIRP):

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
BPSK									
Low Ch, 1900.3125MHz									
1.900	85.7	18.3	1.4	7.2	5.1	24.1	33.0	-8.9	PK Vert @ Worst Position
Mid Ch, 1904.6875MHz									
1.904	85.3	17.9	1.4	7.2	5.1	23.8	33.0	-9.2	PK Vert @ Worst Position
High Ch, 1909.6875MHz									
1.91000	88.0	20.5	1.4	7.2	5.1	26.4	33.0	-6.6	PK Vert @ Worst Position
QPSK									
Low Ch, 1900.3125MHz									
1.90000	87.5	20.0	1.4	7.2	5.1	25.9	33.0	-7.1	PK Vert @ Worst Position
Mid Ch, 1904.6875MHz									
1.90447	88.1	20.7	1.4	7.2	5.1	26.5	33.0	-6.5	PK Vert @ Worst Position
High Ch, 1909.6875MHz									
1.90970	87.2	19.8	1.4	7.2	5.1	25.7	33.0	-7.3	PK Vert @ Worst Position
8PSK									
Low Ch, 1900.3125MHz									
1.90035	88.0	20.5	1.4	7.2	5.1	26.4	33.0	-6.6	PK Vert @ Worst Position
Mid Ch, 1904.6875MHz									
1.90447	86.7	19.2	1.4	7.2	5.1	25.1	33.0	-7.9	PK Vert @ Worst Position
High Ch, 1909.6875MHz									
1.90970	88.6	21.2	1.4	7.2	5.1	27.1	33.0	-5.9	PK Vert @ Worst Position
12QAM									
Low Ch, 1900.3125MHz									
1.90035	87.6	20.1	1.4	7.2	5.1	26.0	33.0	-7.0	PK Vert @ Worst Position
Mid Ch, 1904.6875MHz									
1.90447	86.9	19.5	1.4	7.2	5.1	25.4	33.0	-7.6	PK Vert @ Worst Position
High Ch, 1909.6875MHz									
1.90970	88.6	21.2	1.4	7.2	5.1	27.1	33.0	-5.9	PK Vert @ Worst Position
16QAM									
Low Ch, 1900.3125MHz									
1.90035	85.7	18.3	1.4	7.2	5.1	24.2	33.0	-8.8	PK Vert @ Worst Position
Mid Ch, 1904.6875MHz									
1.90035	85.7	18.3	1.4	7.2	5.1	24.2	33.0	-8.8	PK Vert @ Worst Position
High Ch, 1909.6875MHz									
1.90970	87.4	20.0	1.4	7.2	5.1	25.9	33.0	-7.1	PK Vert @ Worst Position

The peak reading is included the duty cycle factor of 10*log (0.33) = -4.8

7.2. SECTION 2.1047: MODULATION CHARACTERISTICS

Not applicable.

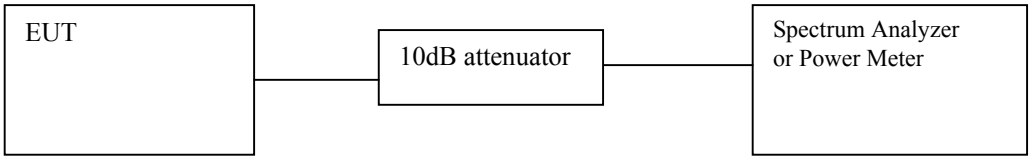
7.3. SECTION 2.1049: OCCUPIED BANDWIDTH

OCCUPIED BANDWIDTH:

INSTRUMENTS LIST

TEST EQUIPMENT LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
Spectrum Analyzer	**HP**	**E4446A**	**US42510266**	**7/23/2004**
10dB Attenuator	**Weinschel**	**56-10**	**M2348**	**CNR**
Power Meter	**HP**	**436A**	**2709A29209**	**7/15/2004**
Power Sensor, 100 kHz ~ 4.2 GHz	**HP**	**8482A**	**2349A08568**	**7/15/2004**

TEST SETUP



TEST PROCEDURE

The EUT's output RF connector (made solely for the purpose of the test) was connected with a short cable to the spectrum analyzer, RES BW was set to about 1% of emission BW , -26 dBc display line was placed on the screen (or 99% bandwidth), the occupied BW is the delta frequency between the two points where the display line intersects the signal trace.

RESULT

No non-compliance noted, reference only.

BPSK

	Ch.#	Freq. (MHz)	99% BW (KHz)	26dBc BW (KHz)
Low Ch.	0	1900.3125	521.544	607.622
Mid Ch.	7	1904.6875	523.036	533.110
High Ch.	15	1909.6875	516.173	613.784

QPSK

	Ch.#	Freq. (MHz)	99% BW (KHz)	26dBc BW (KHz)
Low Ch.	0	1900.3125	510.610	610.488
Mid Ch.	7	1904.6875	523.916	536.052
High Ch.	15	1909.6875	526.924	536.290

8PSK

	Ch.#	Freq. (MHz)	99% BW (KHz)	26dBc BW (KHz)
Low Ch.	0	1900.3125	521.132	610.952
Mid Ch.	7	1904.6875	516.716	607.554
High Ch.	15	1909.6875	528.401	536.526

12QAM

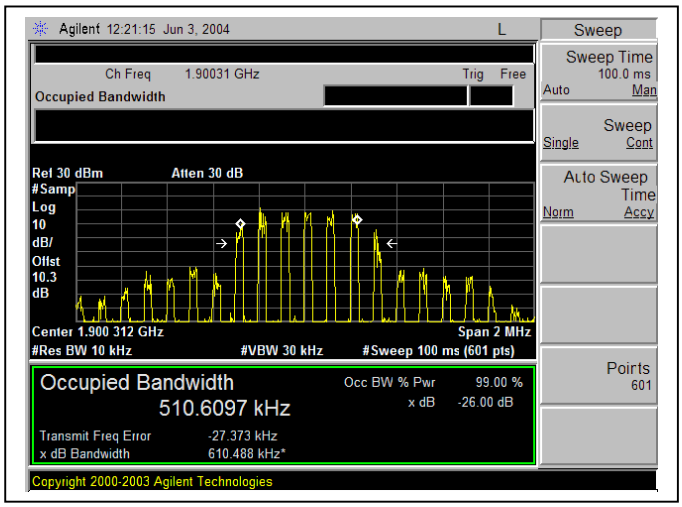
	Ch.#	Freq. (MHz)	99% BW (KHz)	26dBc BW (KHz)
Low Ch.	0	1900.3125	524.332	610.950
Mid Ch.	7	1904.6875	529.230	536.550
High Ch.	15	1909.6875	523.056	534.984

16QAM

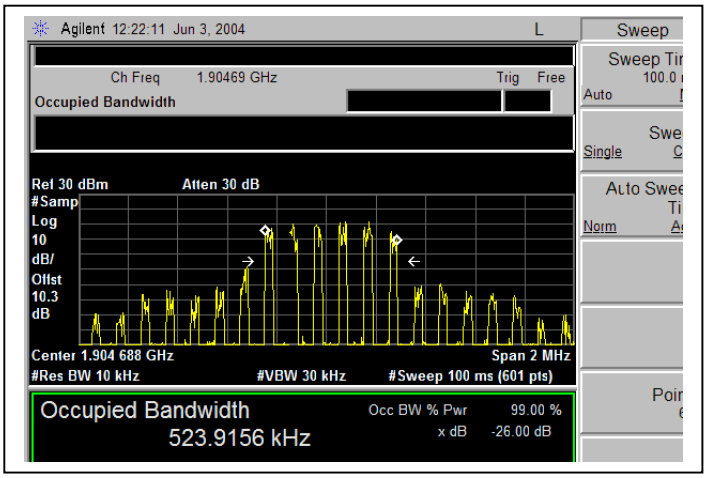
	Ch.#	Freq. (MHz)	99% BW (KHz)	26dBc BW (KHz)
Low Ch.	0	1900.3125	523.204	616.783
Mid Ch.	7	1904.6875	526.554	536.413
High Ch.	15	1909.6875	523.204	616.783

BPSK Modulation:

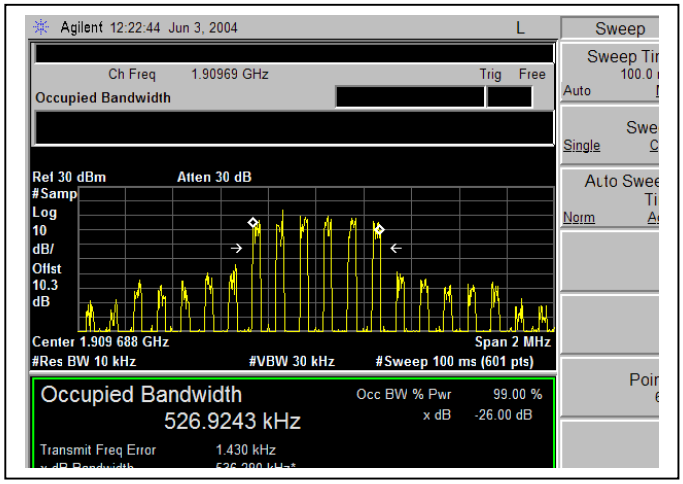
Low Channel



Mid Channel:

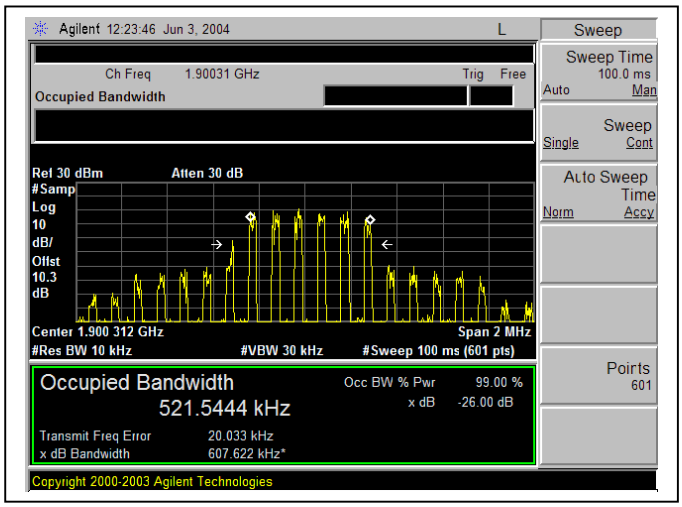


High Channel

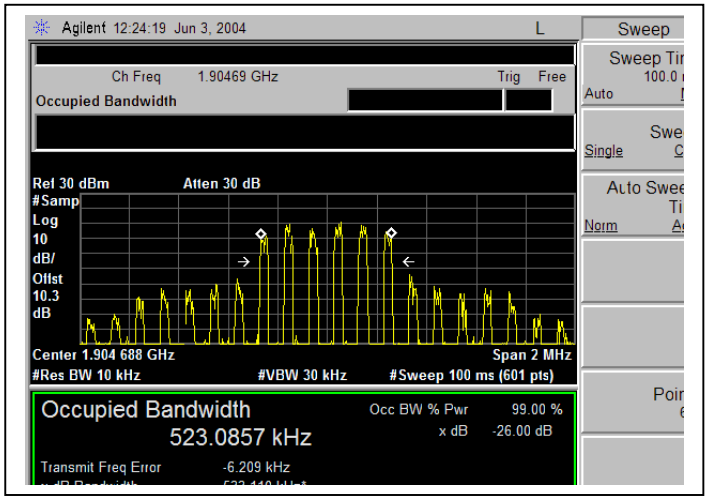


QPSK Modulation:

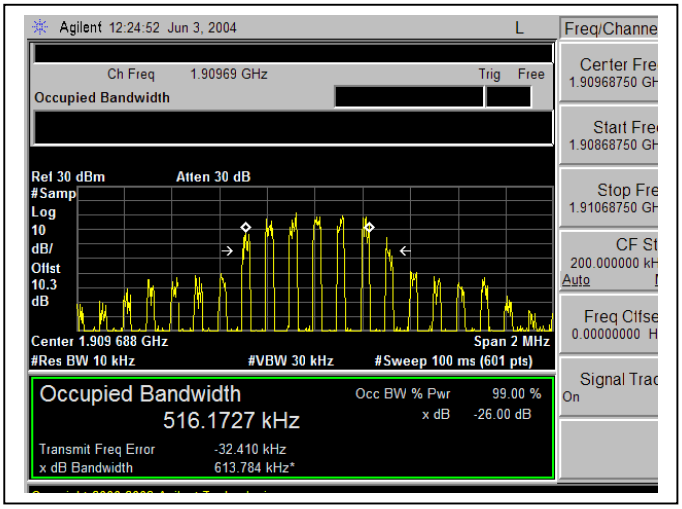
Low Channel



Mid Channel:

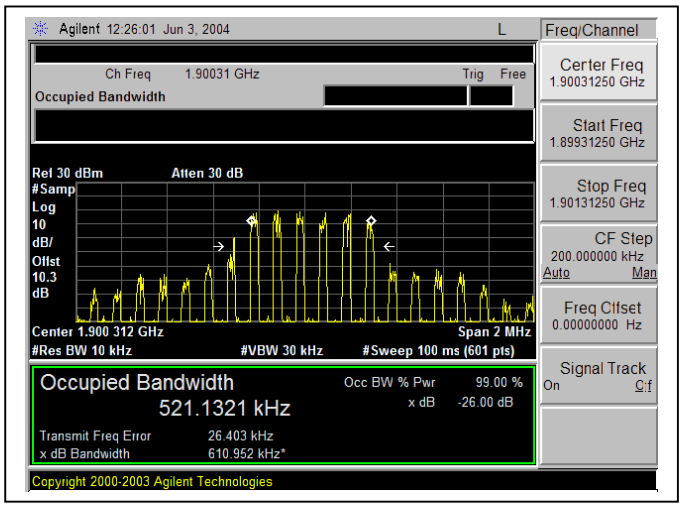


High Channel:

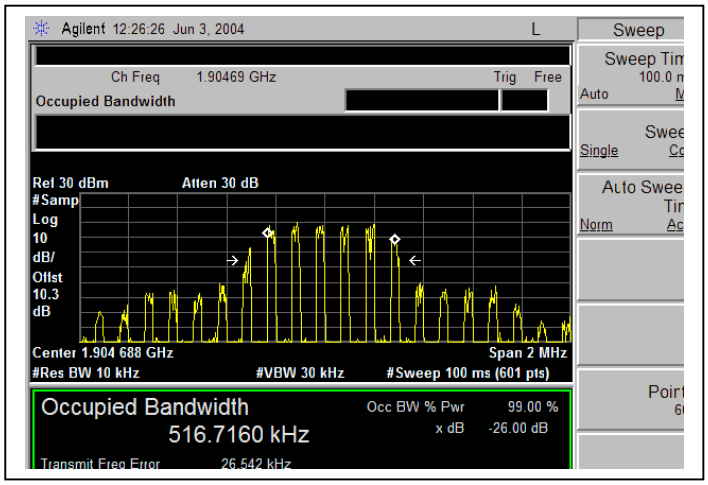


8PSK Modulation:

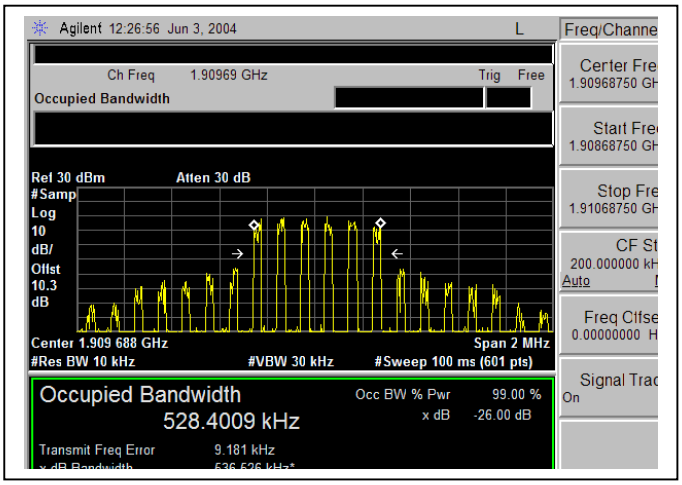
Low Channel



Mid Channel:

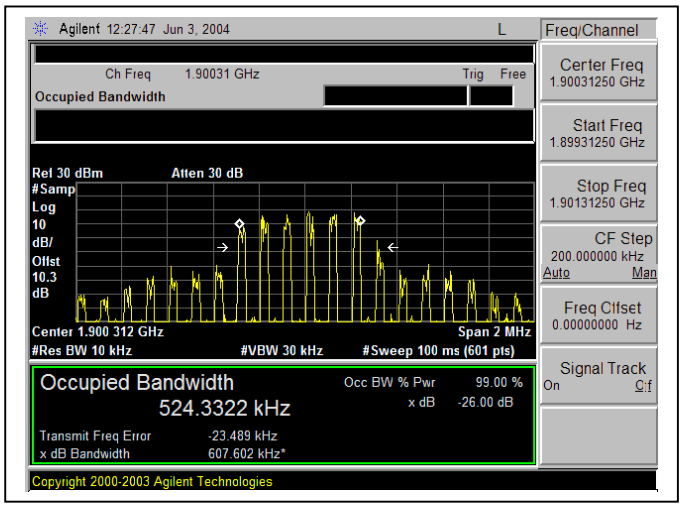


High Channel:

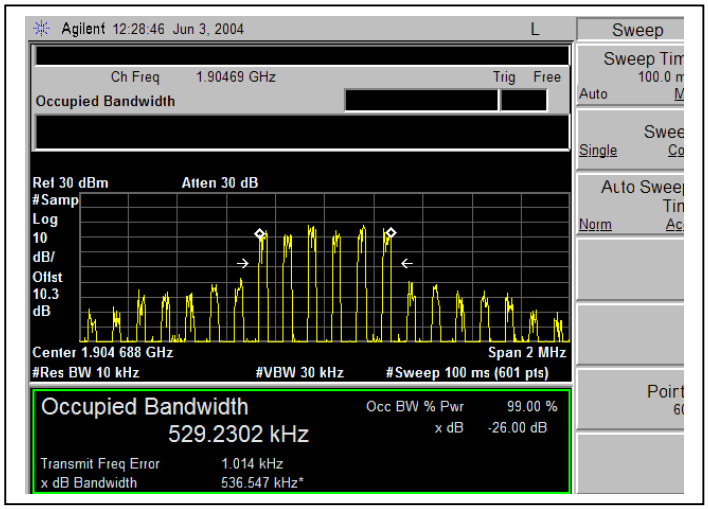


12QAM Modulation:

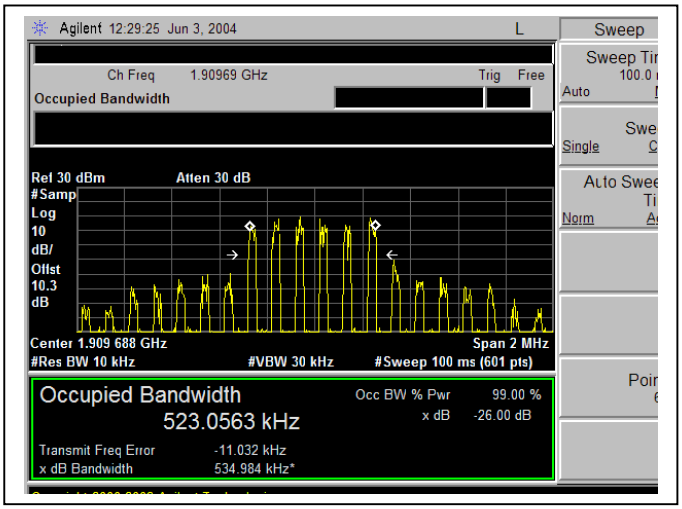
Low Channel



Mid Channel:

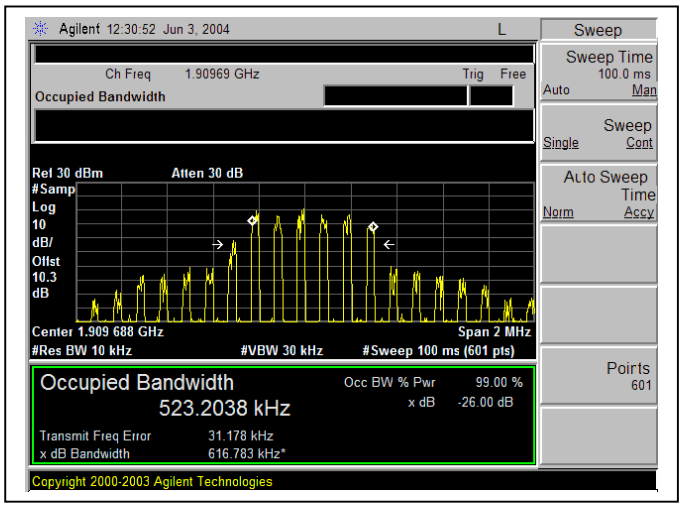


High Channel:

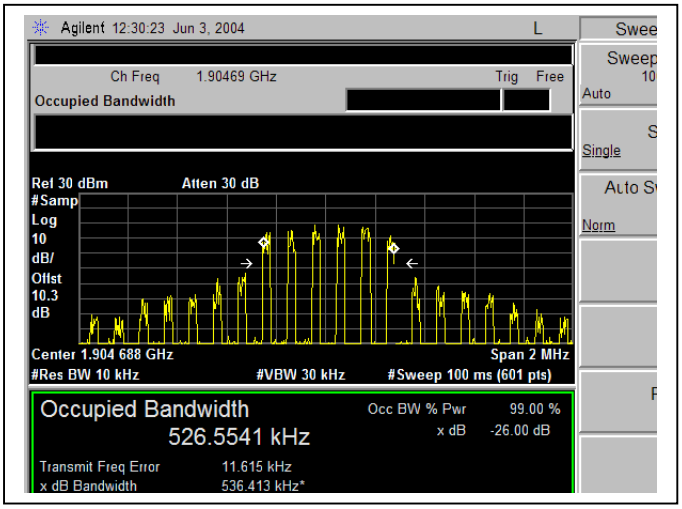


16QAM Modulation:

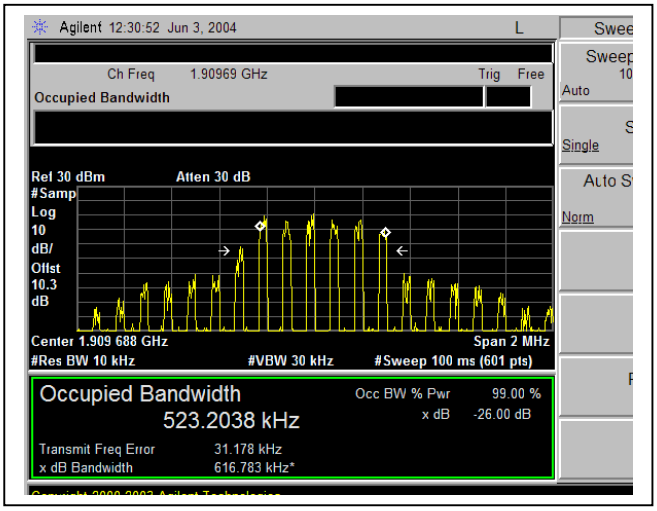
Low Channel



Mid Channel:



High Channel:

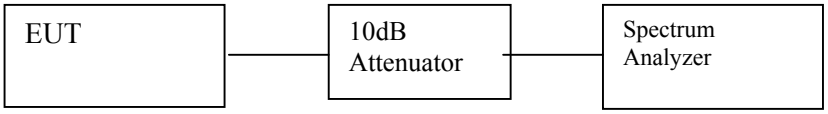


7.4. SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL

INSTRUMENTS LIST

TEST EQUIPMENT LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
Spectrum Analyzer	**HP**	**E4446A**	**US42510266**	**7/23/2004**
10dB Attenuator	**Weinschel**	**56-10**	**M2348**	**CNR**
Power Meter	**HP**	**436A**	**2709A29209**	**7/15/2004**
Power Sensor, 100 kHz ~ 4.2 GHz	**HP**	**8482A**	**2349A08568**	**7/15/2004**

TEST SETUP



TEST PROCEDURE

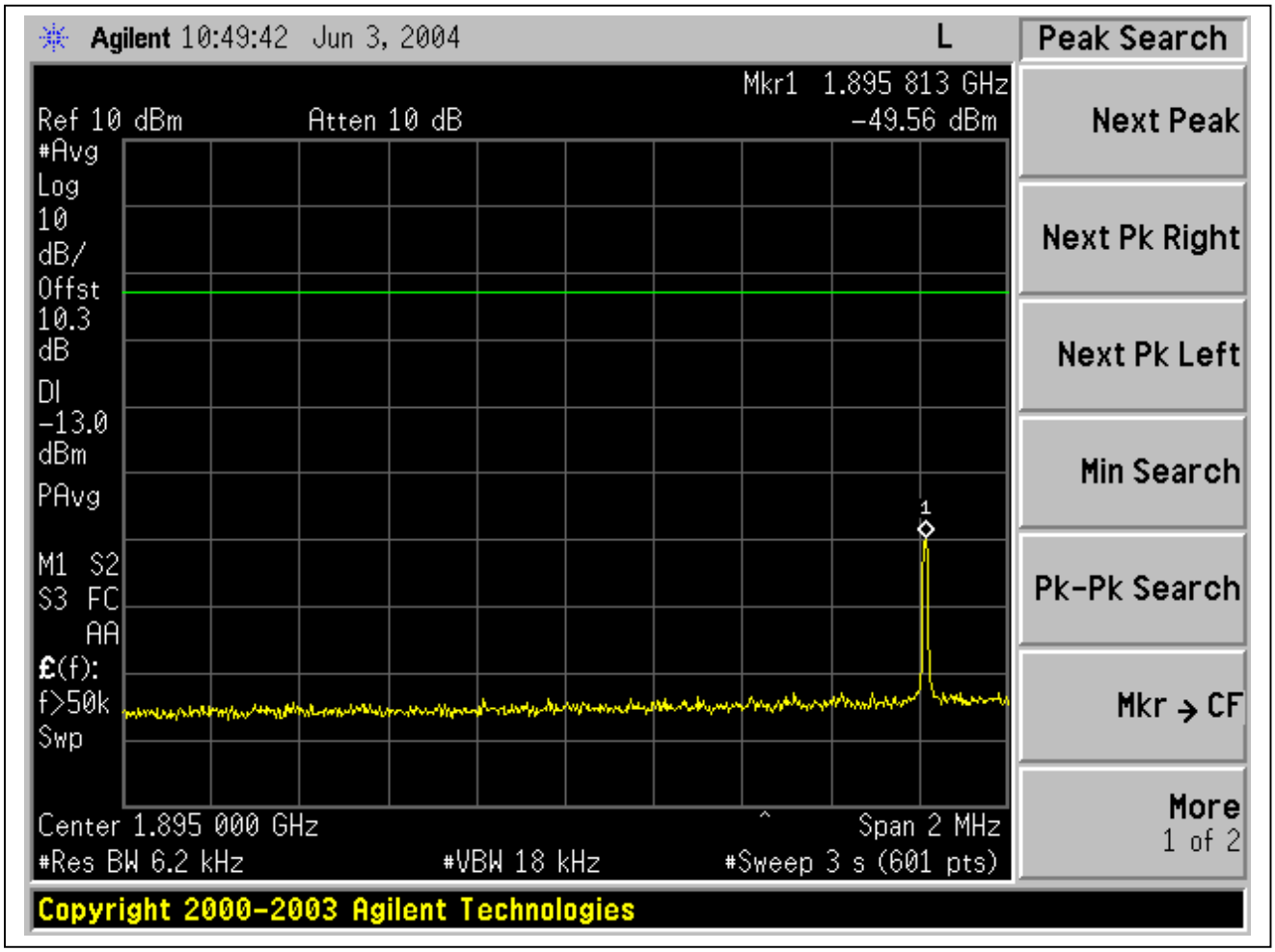
1) RF signal or three balanced signals (intermodulation measurement) were applied to the RF input. One set as close as possible to the bottom of the block edge and one set as close as possible to the top of the block edge. Set the RES BW to 1% of the emission bandwidth to show compliance with the –13dBm 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 10xfo of the fundamental carrier for all frequency block. A display line was placed at –13dBm to show compliance for spurious, harmonics, and intermodulation emissions.

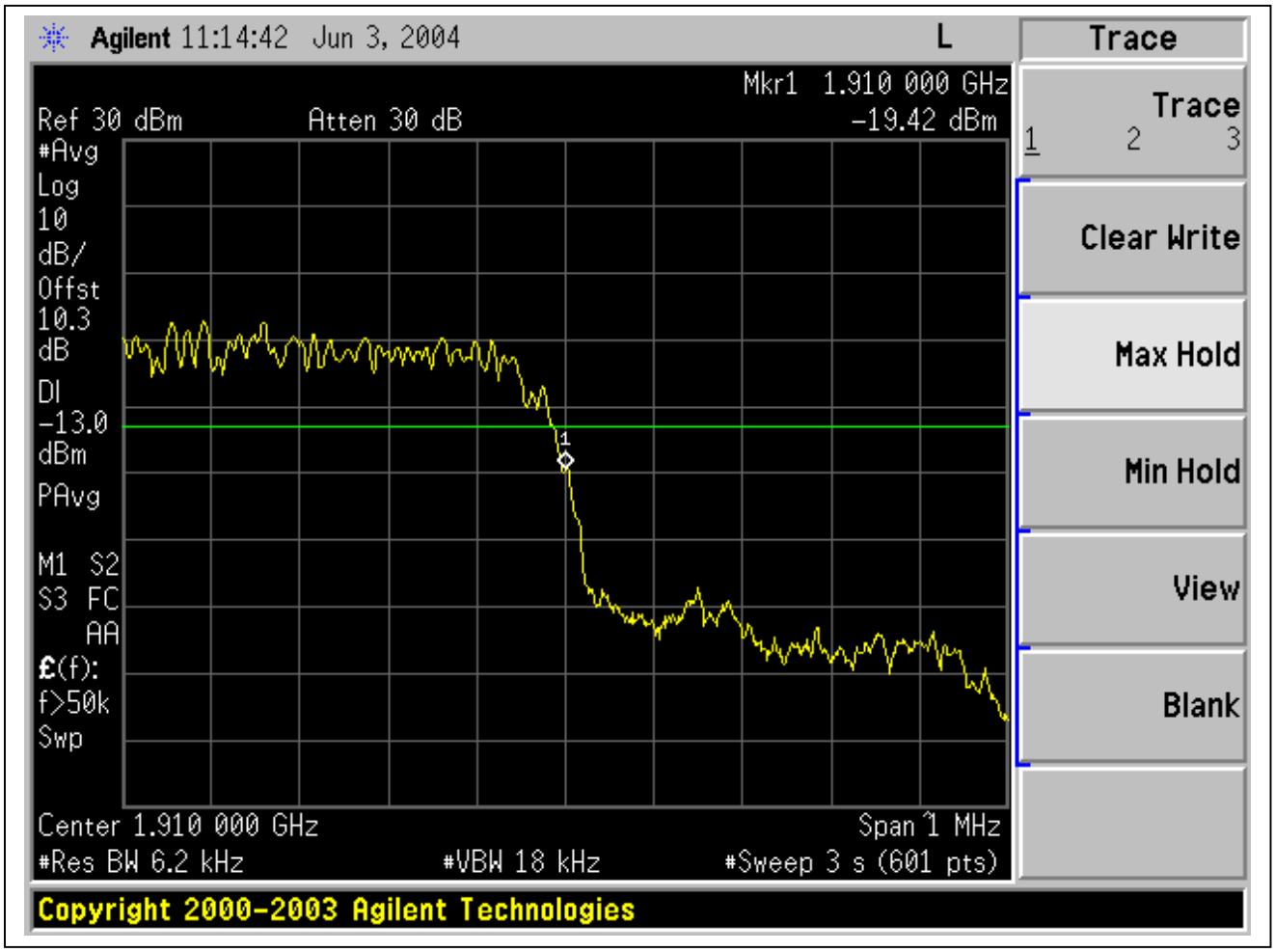
RESULT:

BPSK Modulation: Band Edges, Out-Of-Band Emissions

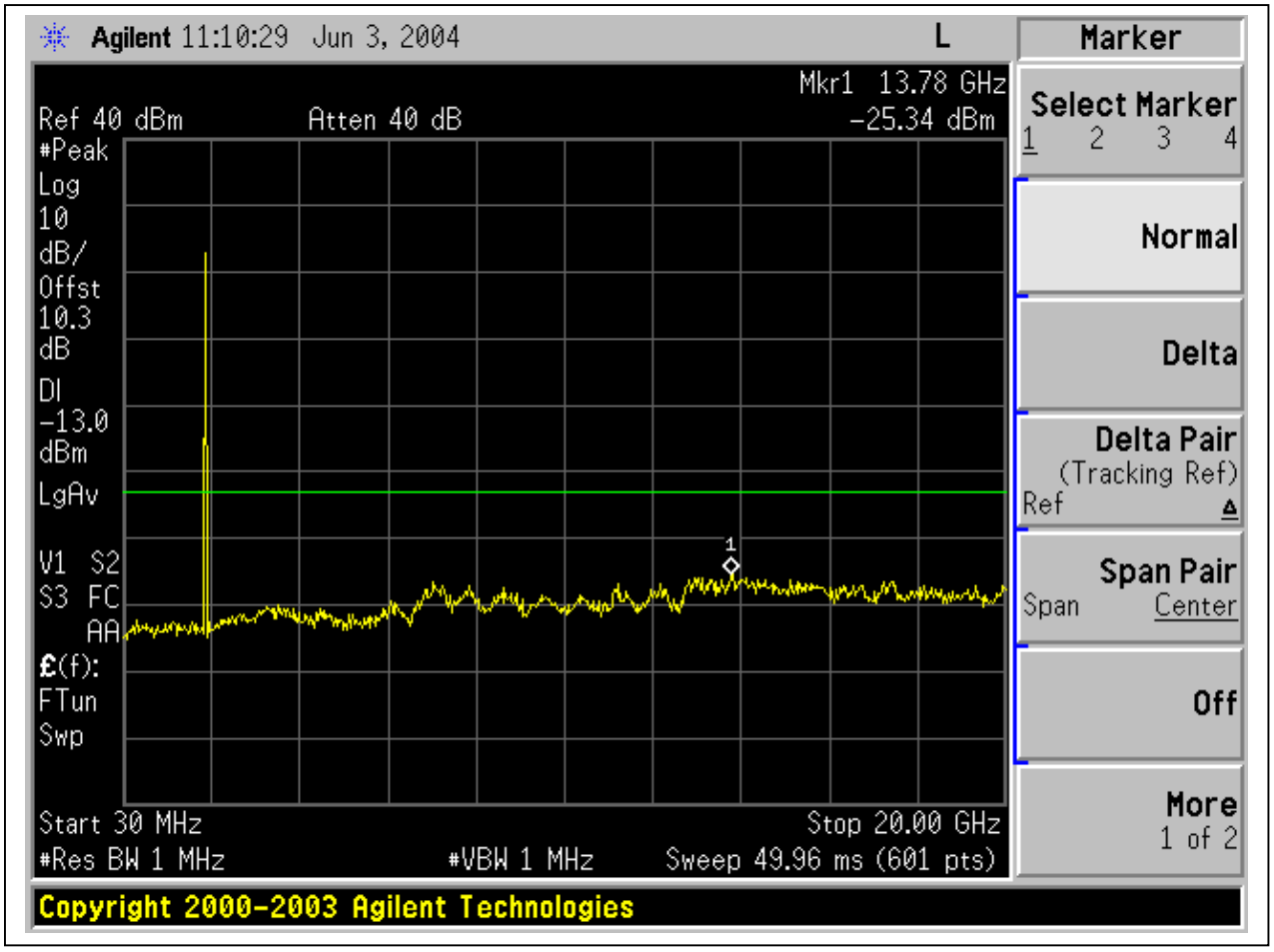
Low Channel Band Edge



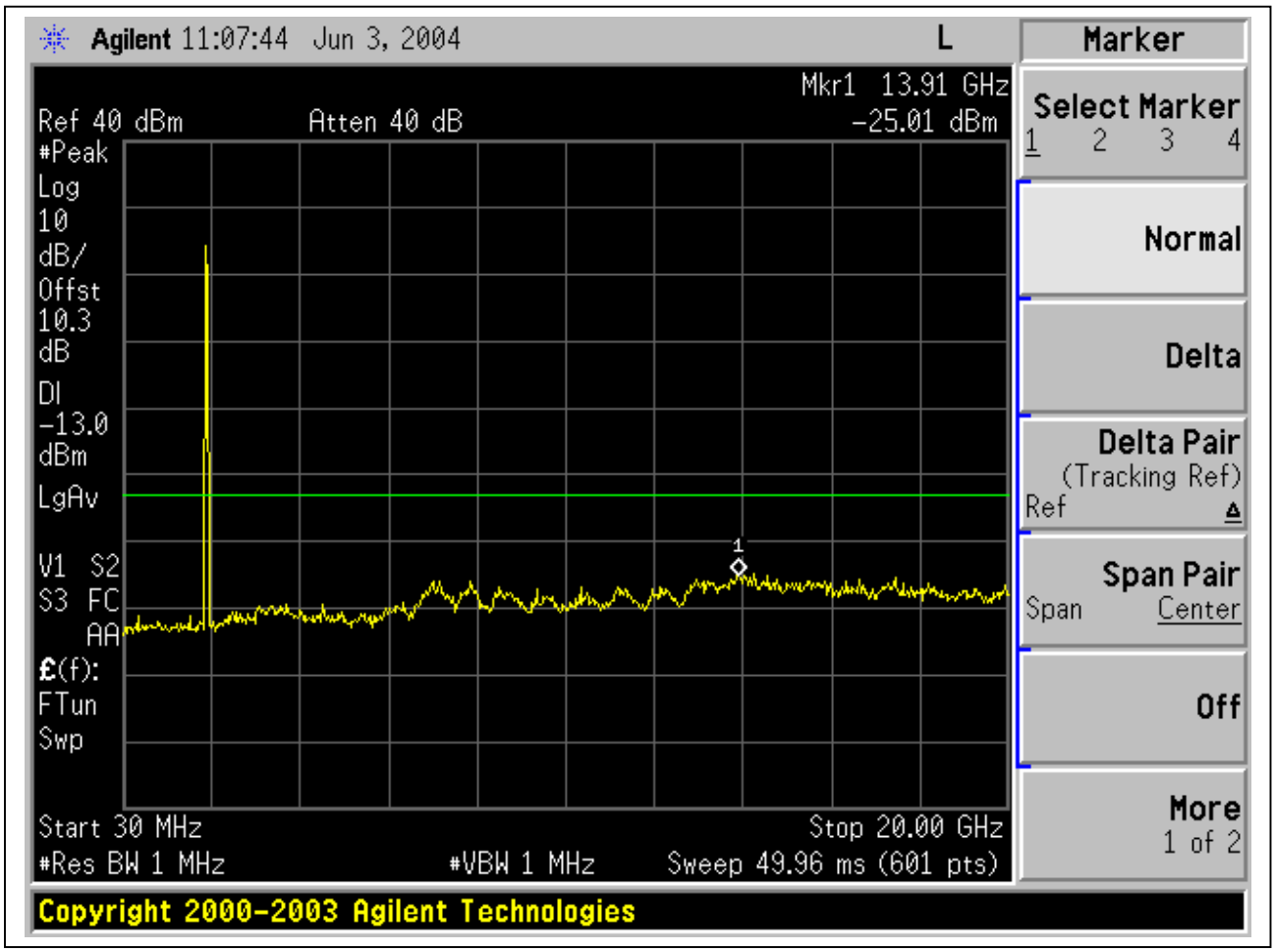
High Channel Band Edge



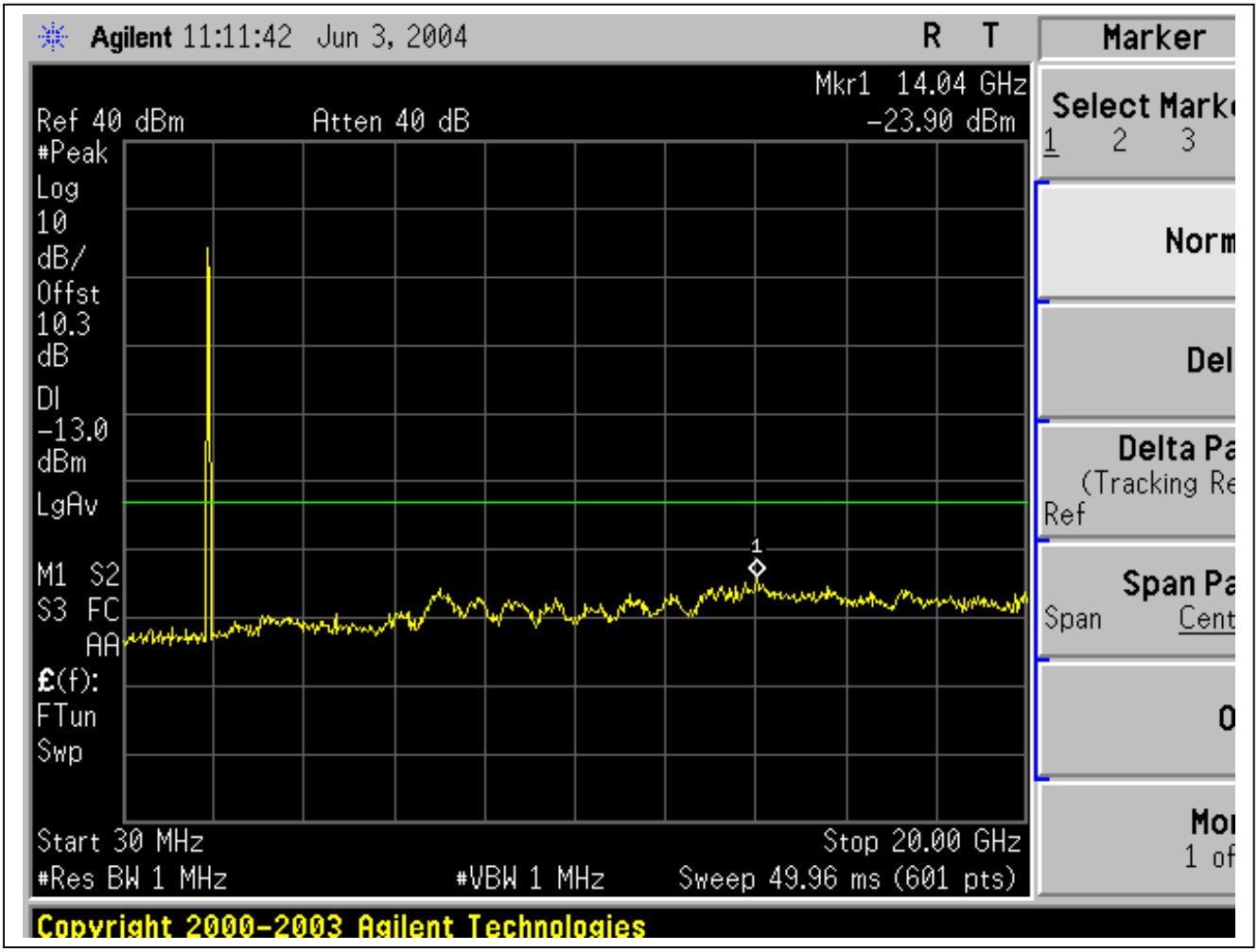
Low Channel, Out-Of-Band Emissions



Mid Channel, Out-Of-Band Emissions

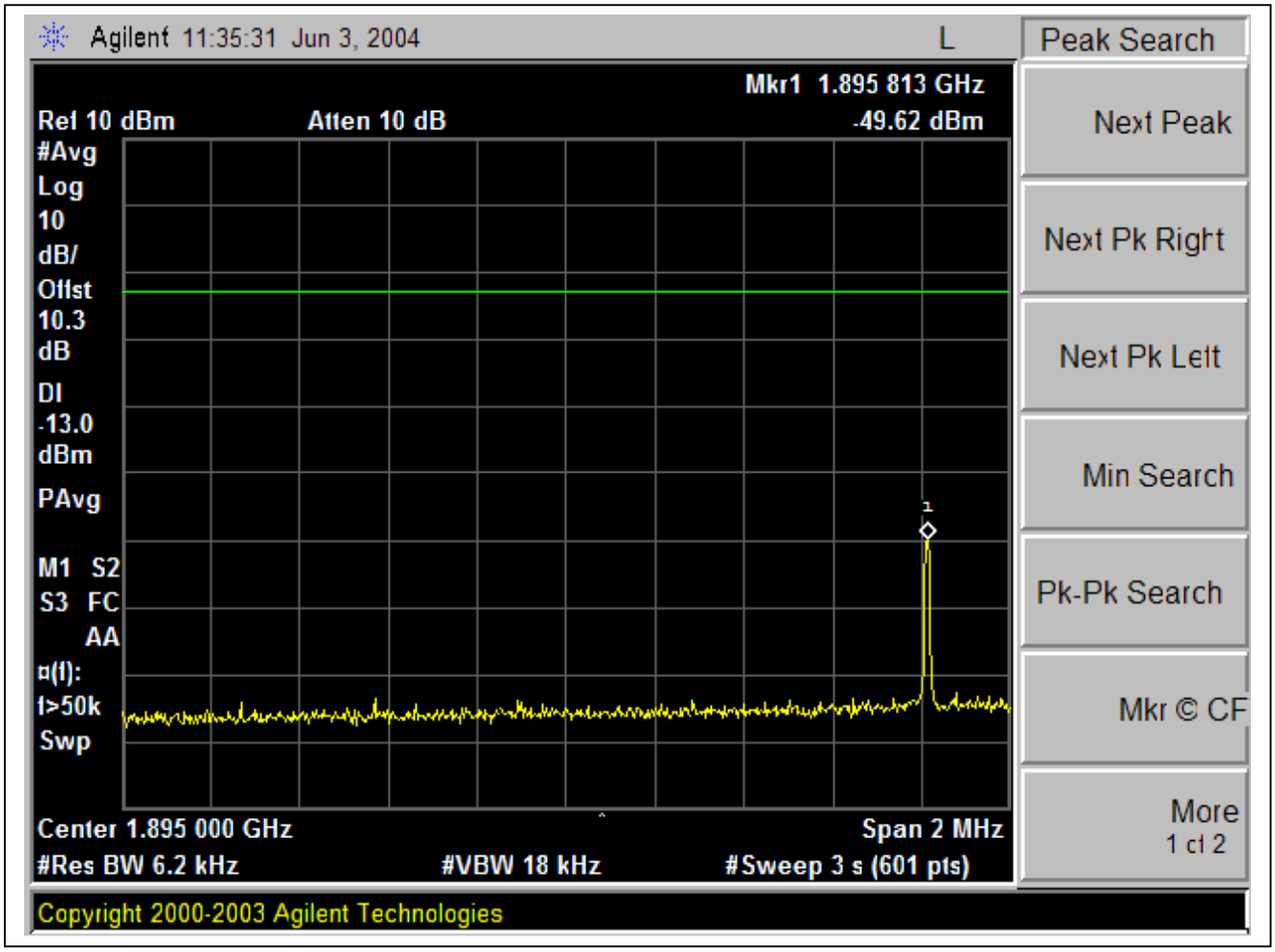


High Channel, Out-Of-Band Emissions

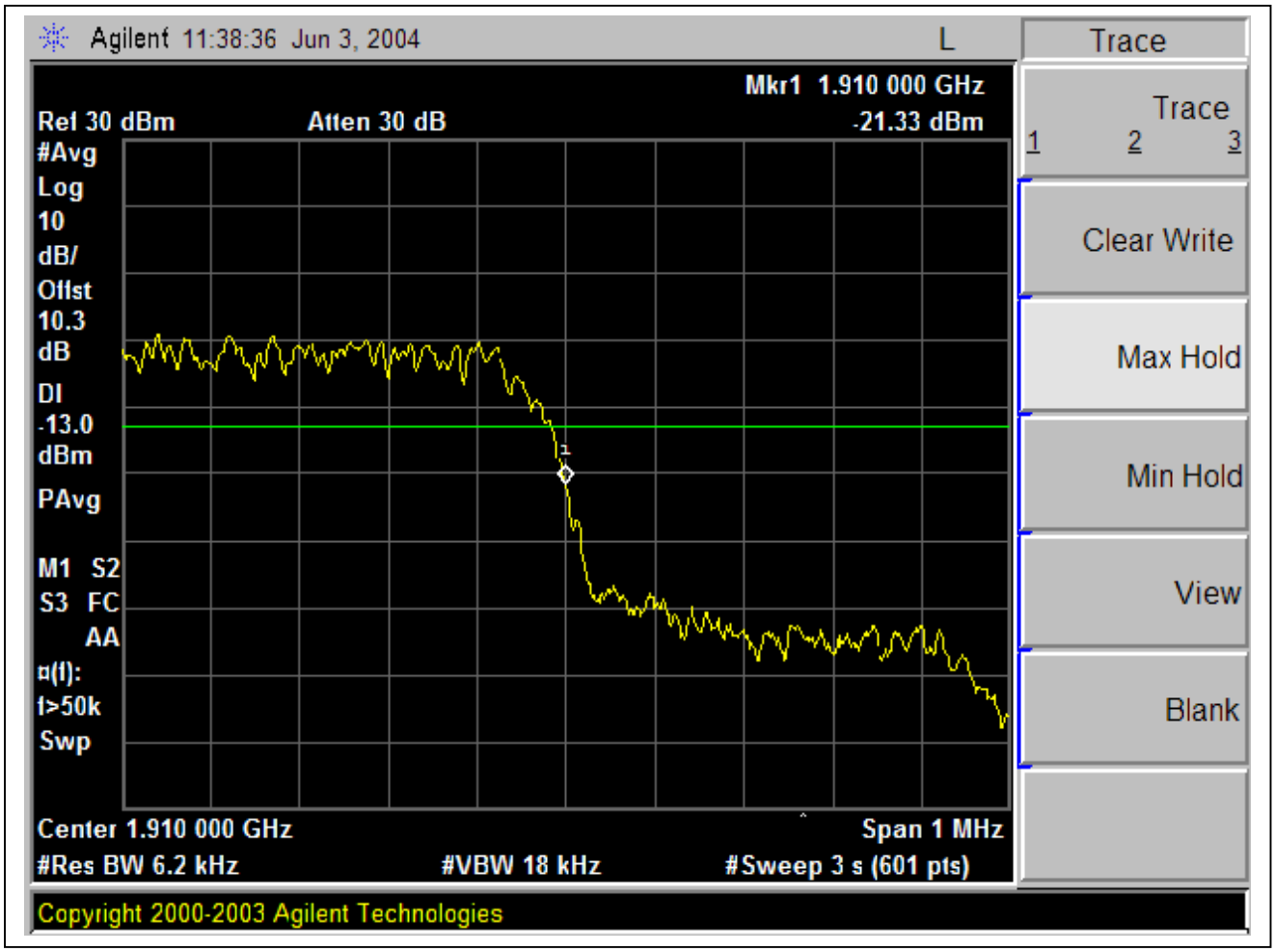


QPSK Modulation: Band Edges, Out-Of-Band Emissions

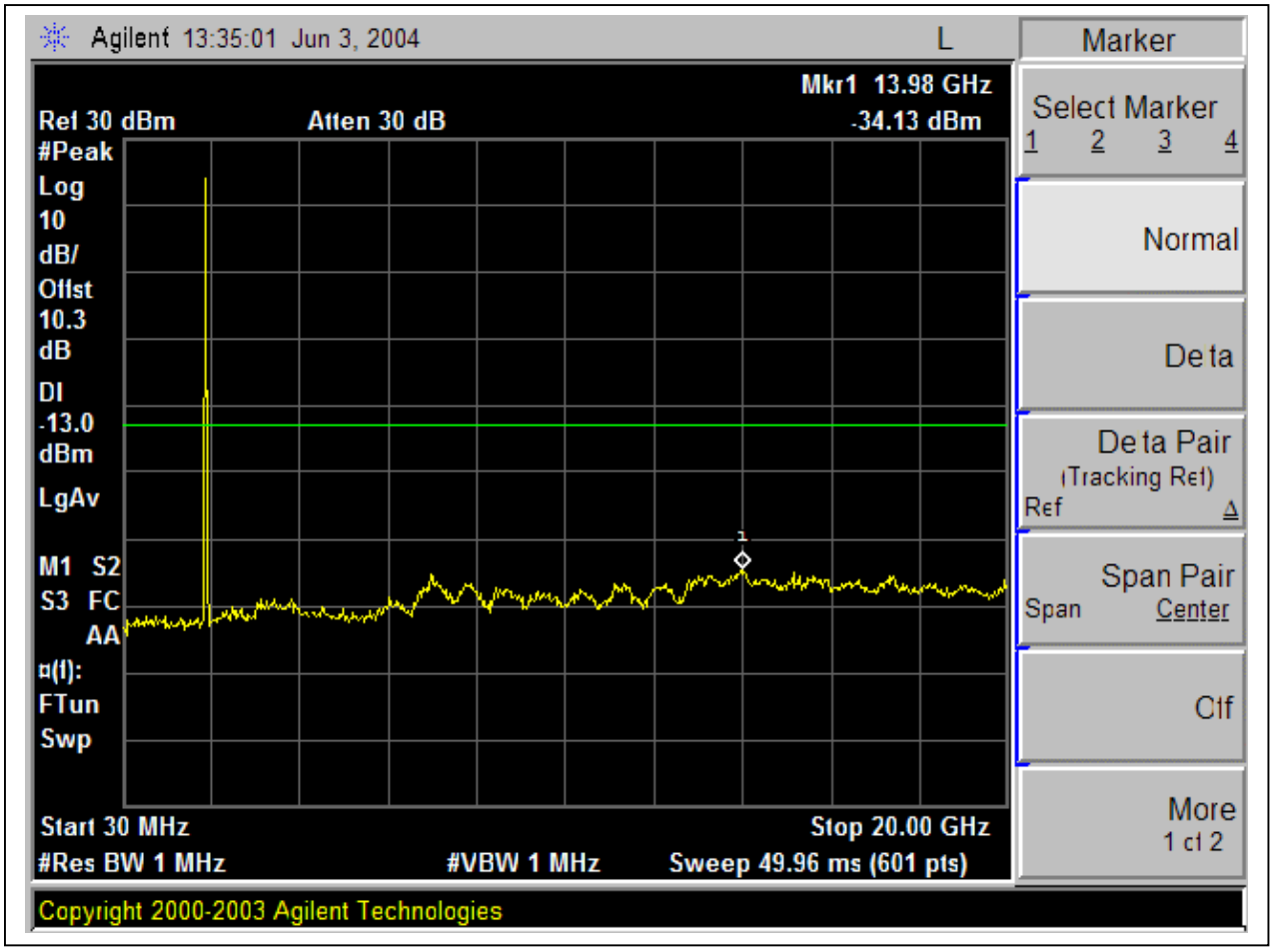
Low Channel Band Edge



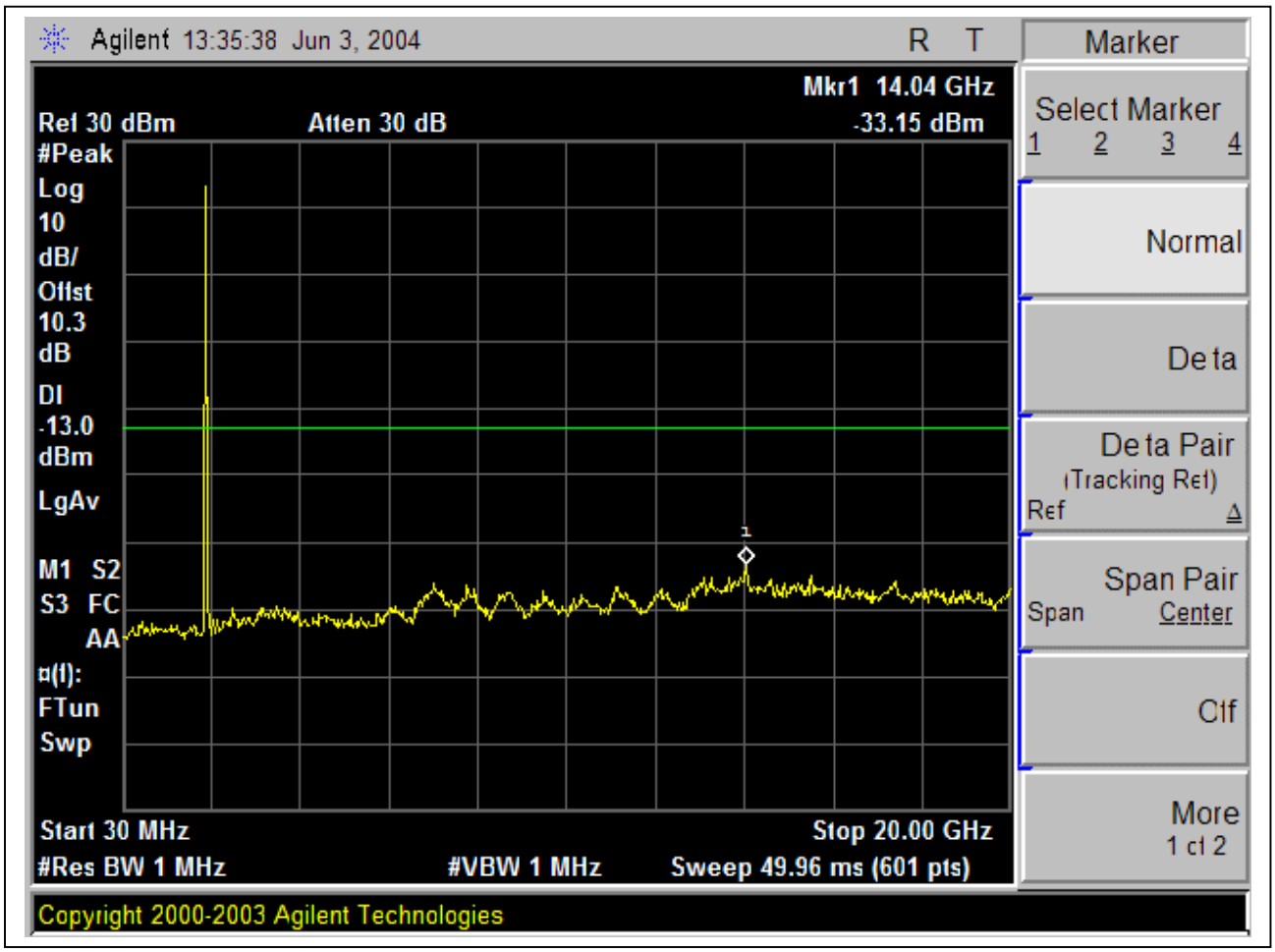
High Channel Band Edge



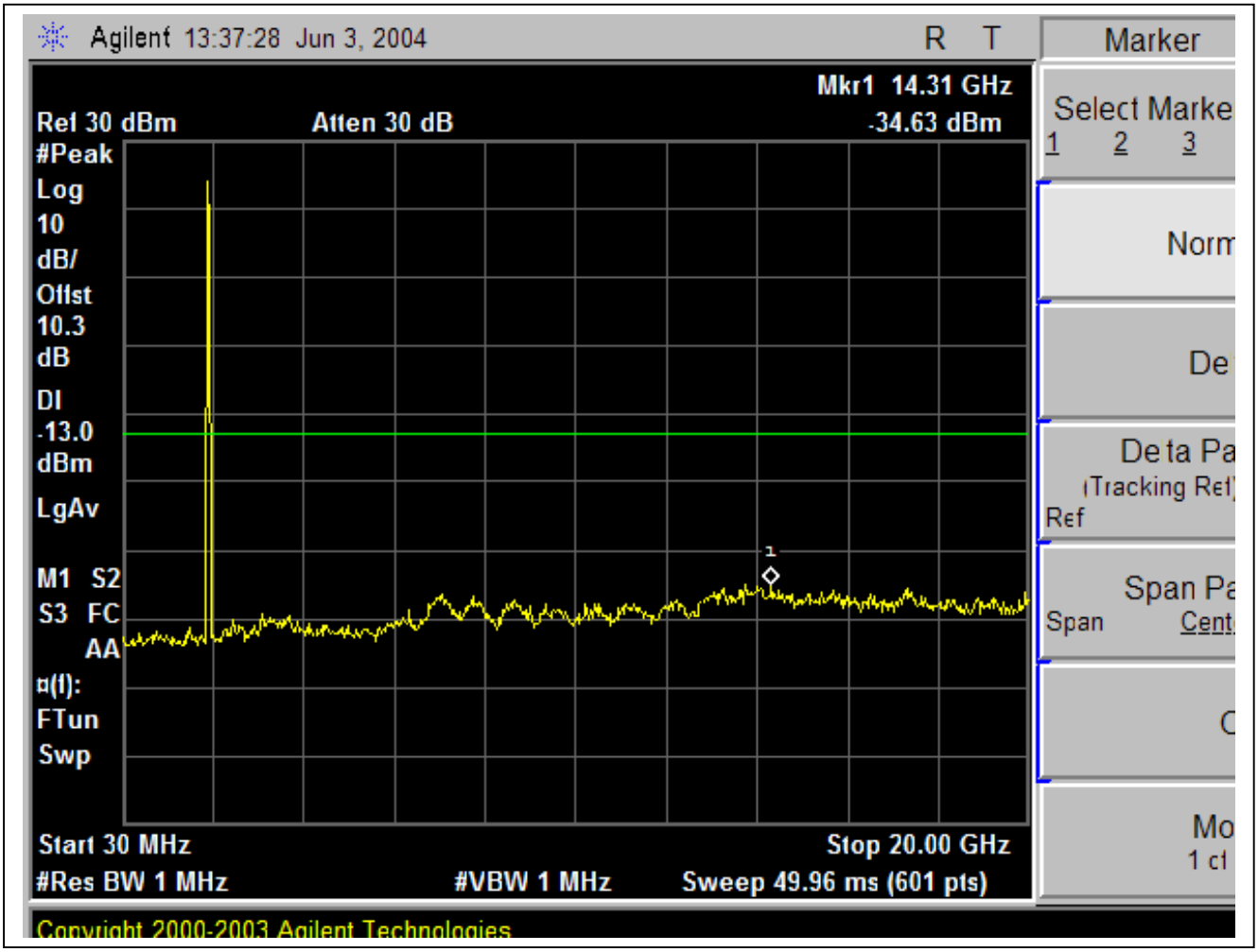
Low Channel, Out-Of-Band Emissions



Mid Channel, Out-Of-Band Emissions

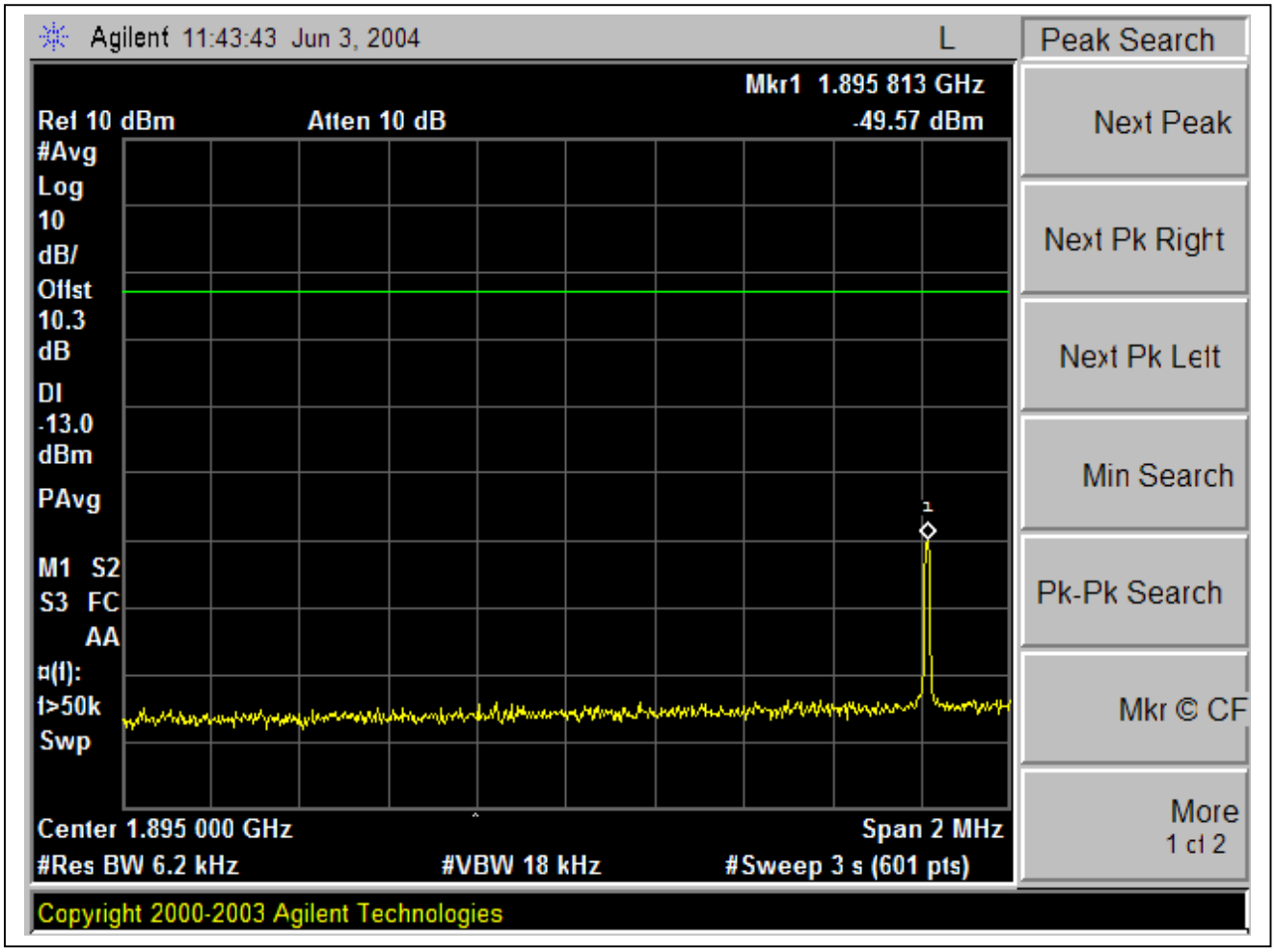


High Channel, Out-Of-Band Emissions



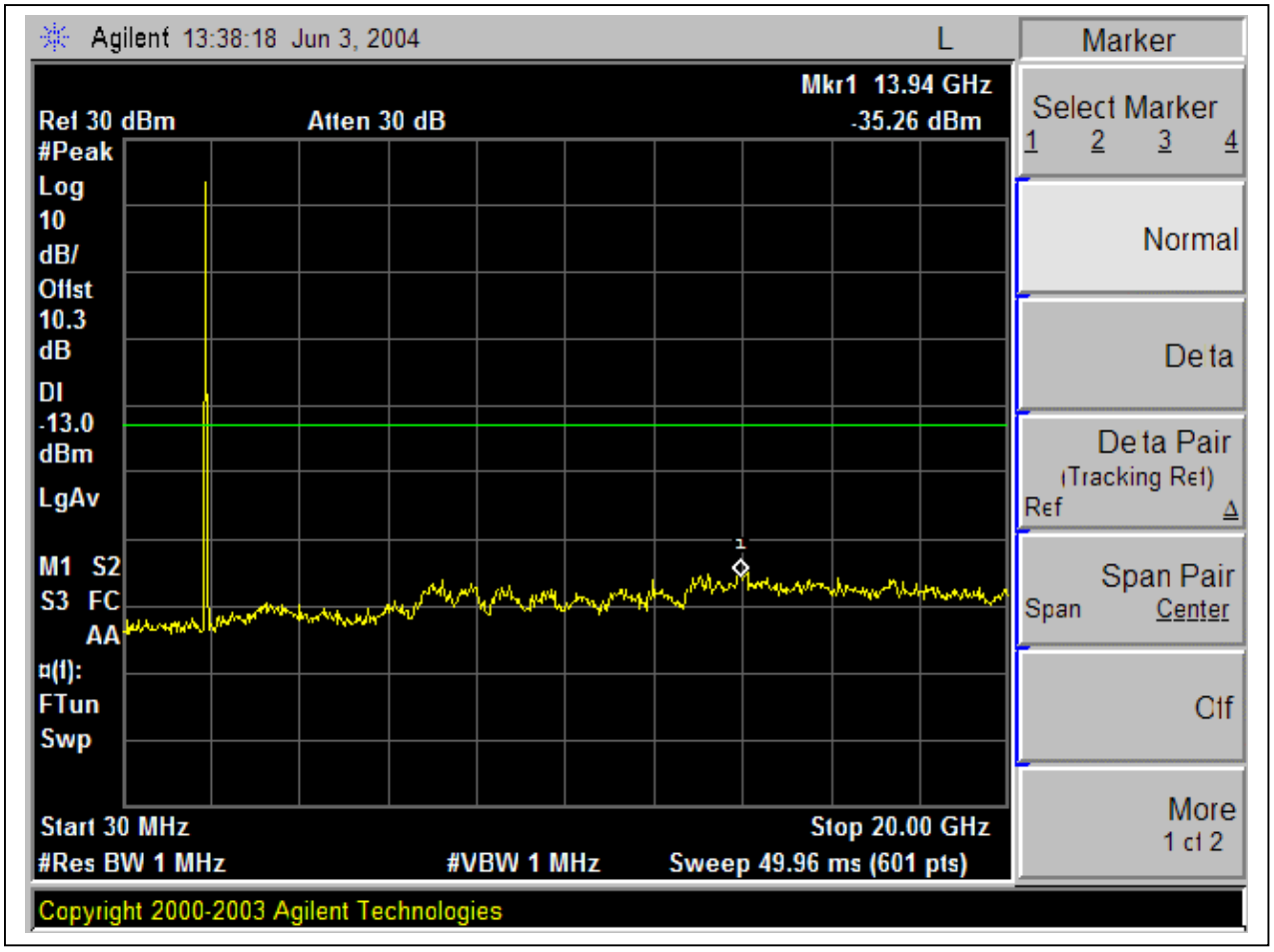
8PSK Modulation: Band Edges, Out-Of-Band Emissions

Low Channel Band Edge

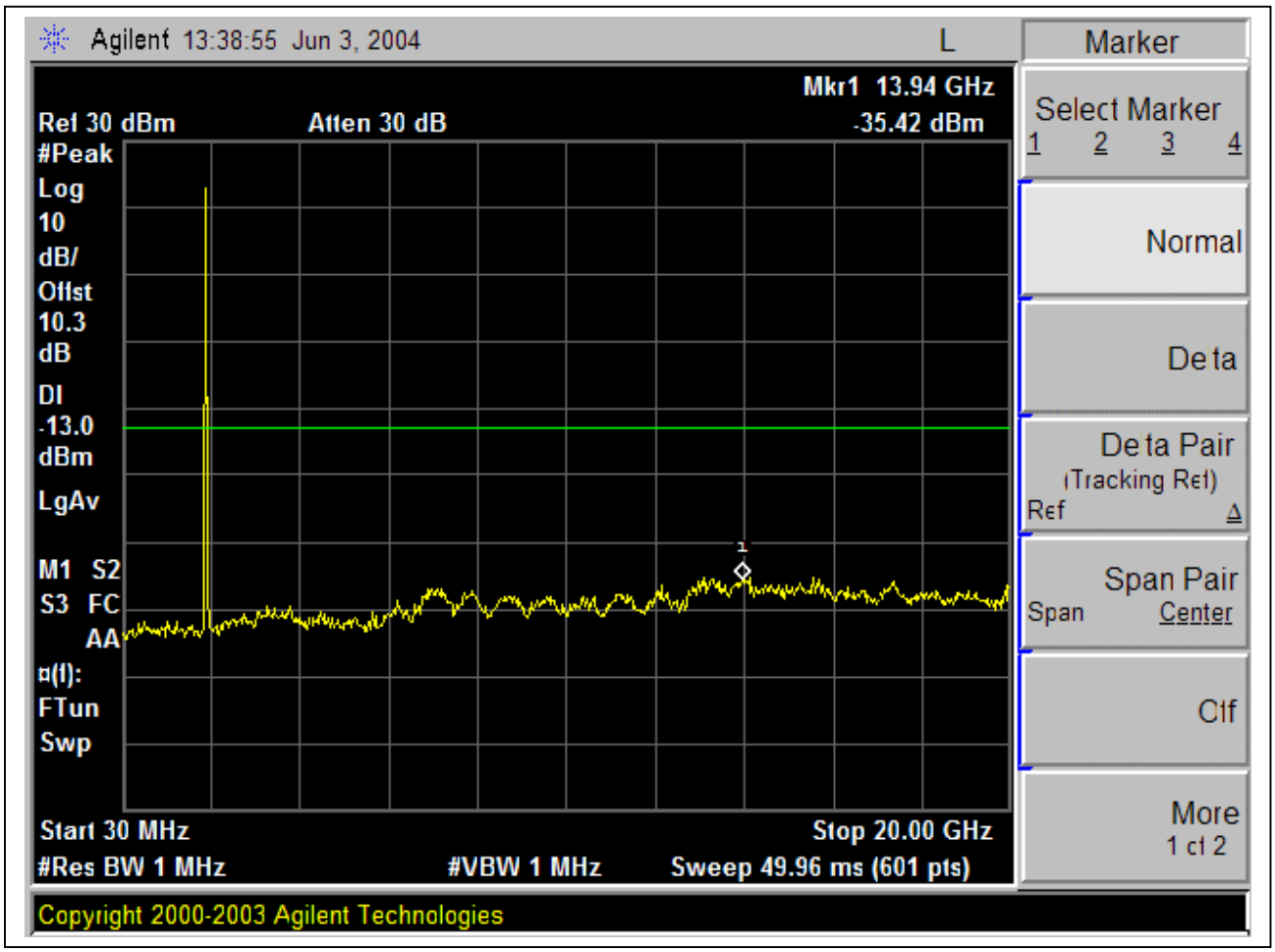


High Channel Band Edge

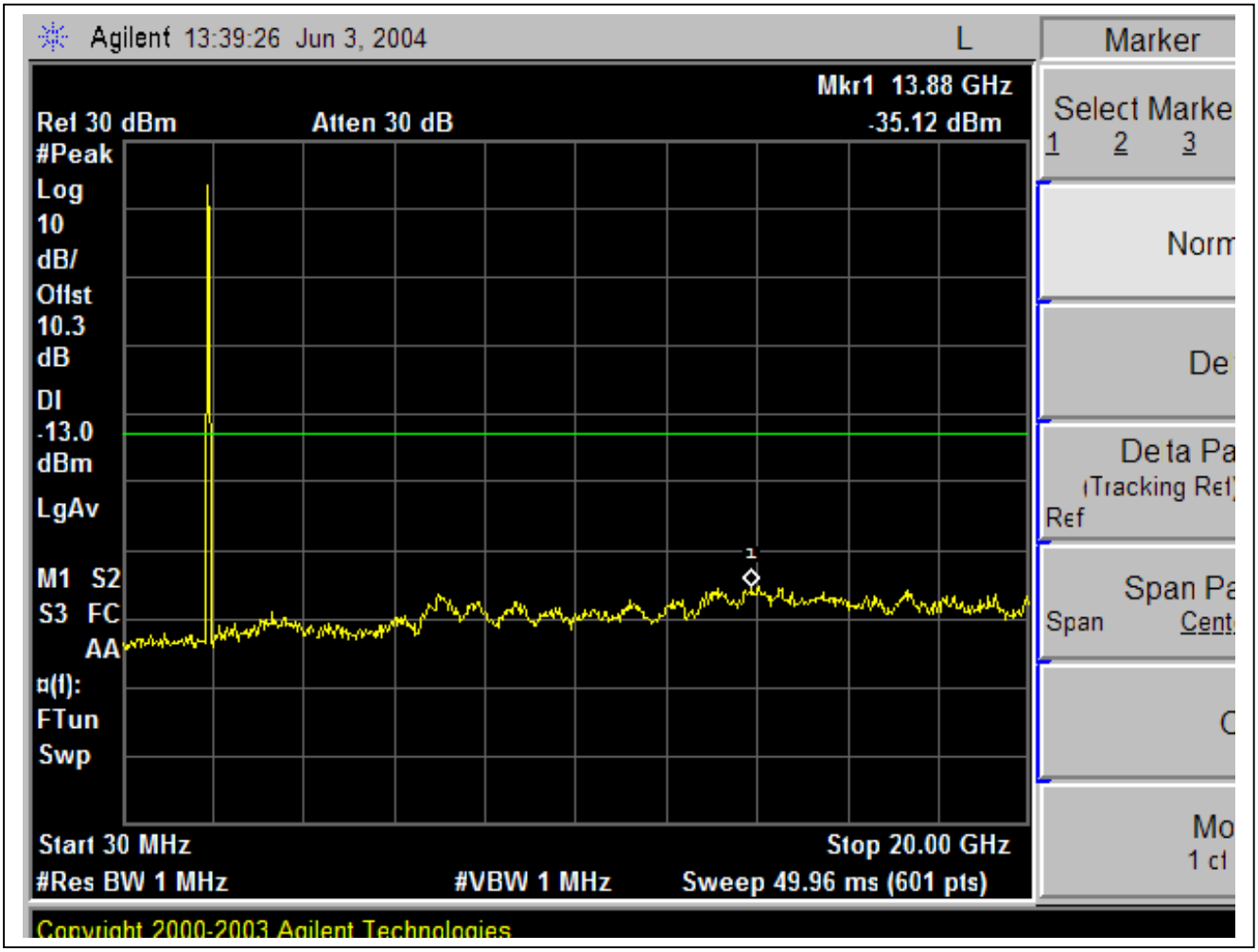
Low Channel, Out-Of-Band Emissions



Mid Channel, Out-Of-Band Emissions

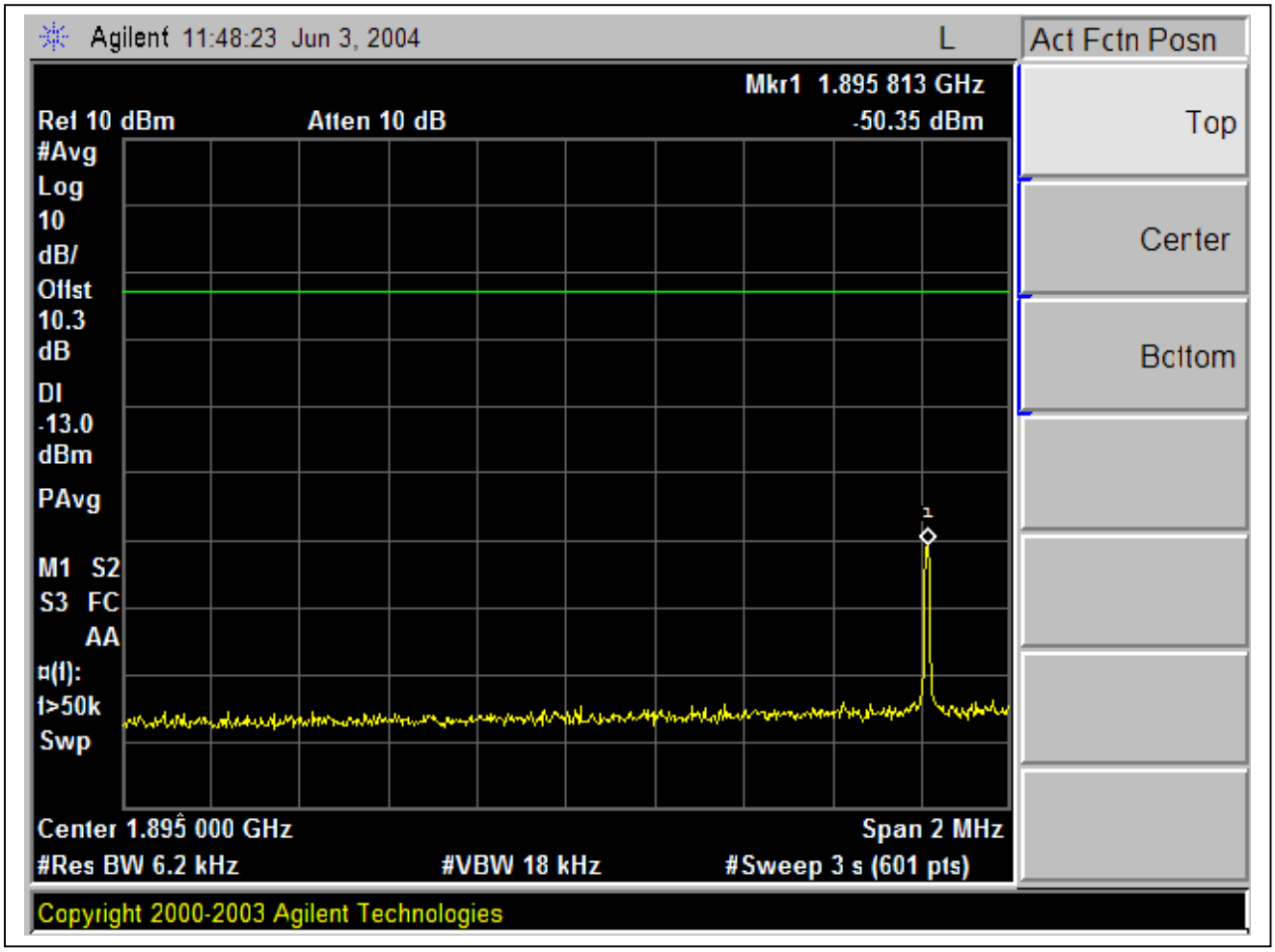


High Channel, Out-Of-Band Emissions



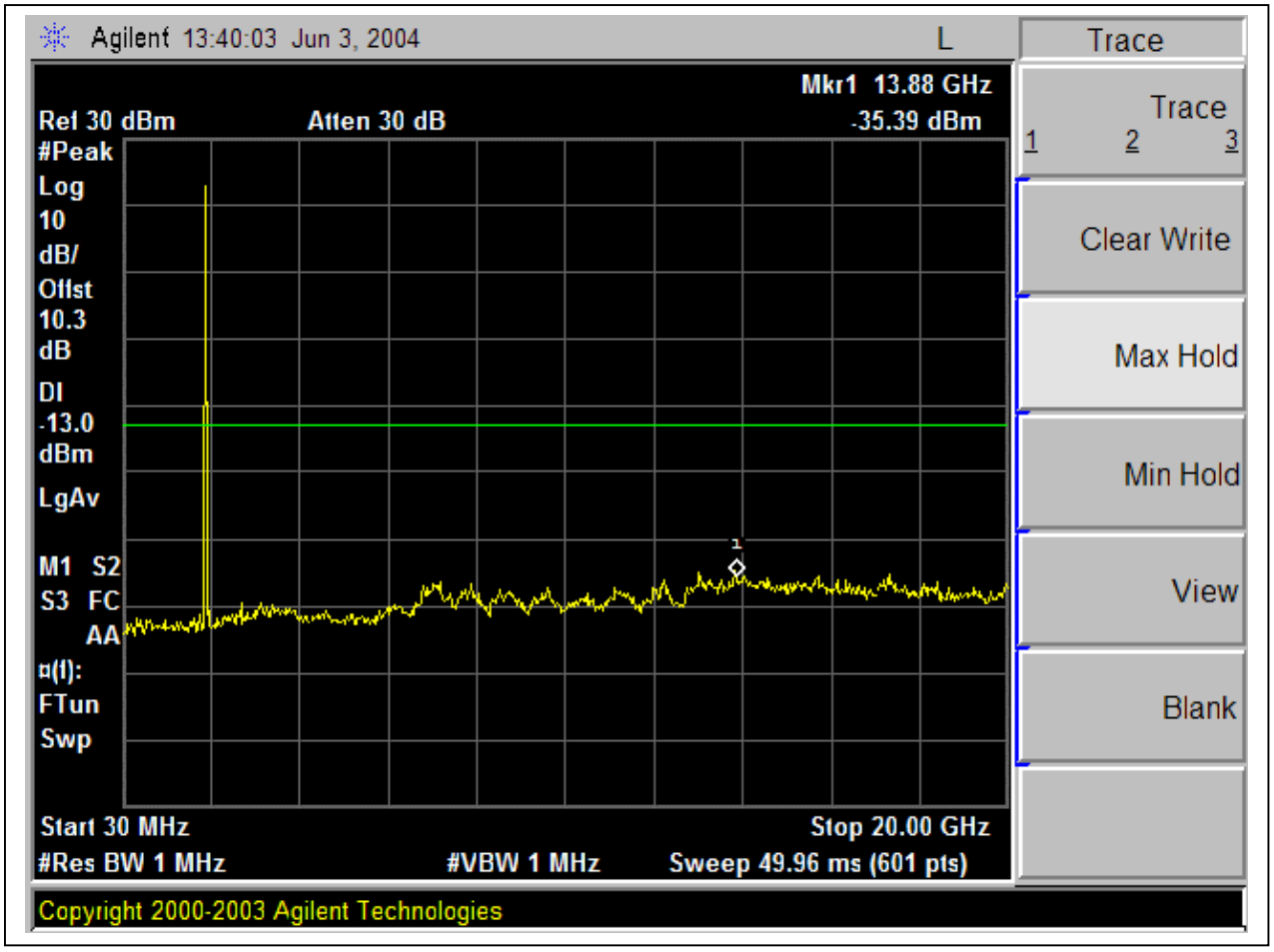
12QAM Modulation: Band Edges, Out-Of-Band Emissions

Low Channel Band Edge

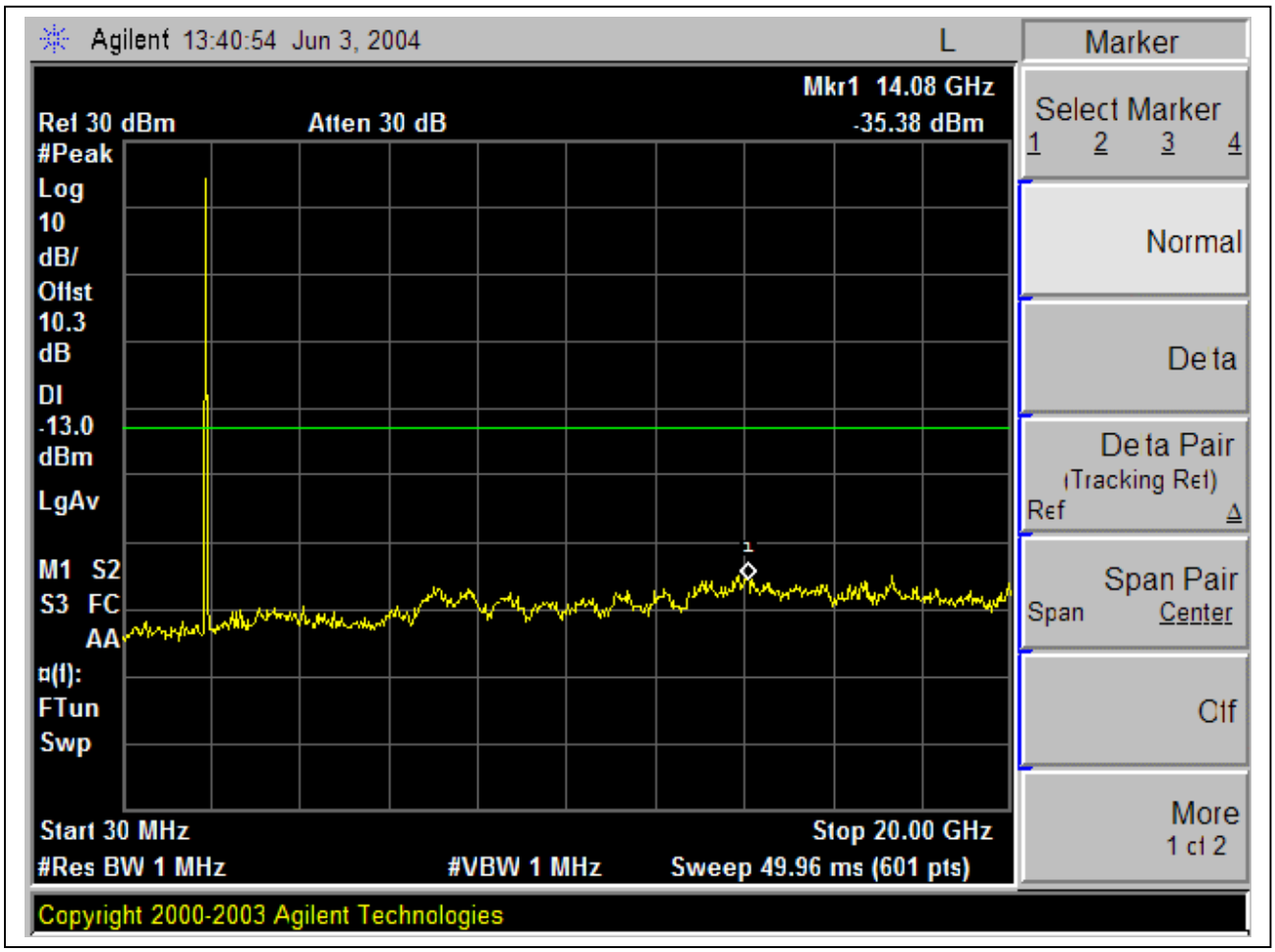


High Channel Band Edge

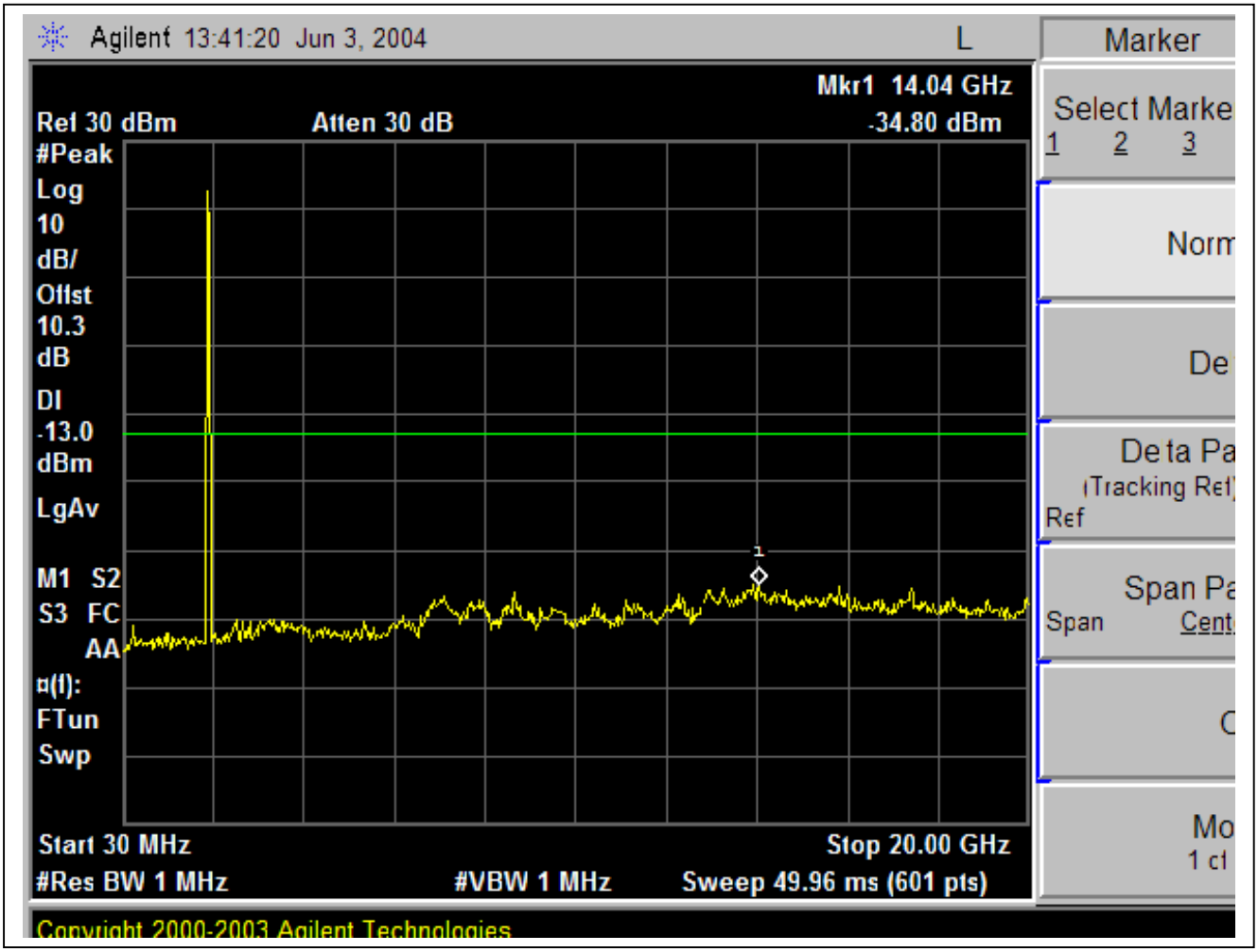
Low Channel, Out-Of-Band Emissions



Mid Channel, Out-Of-Band Emissions

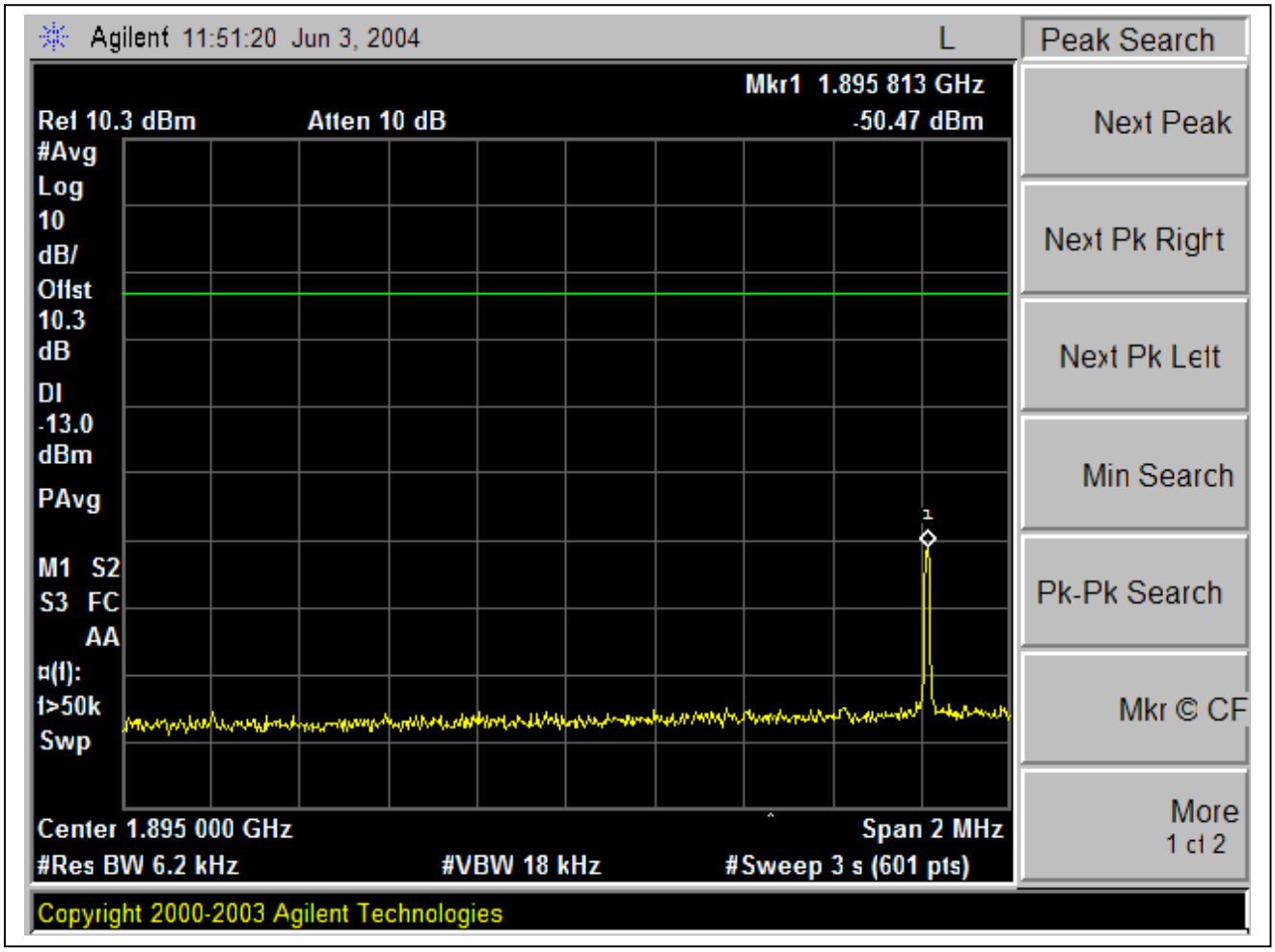


High Channel, Out-Of-Band Emissions



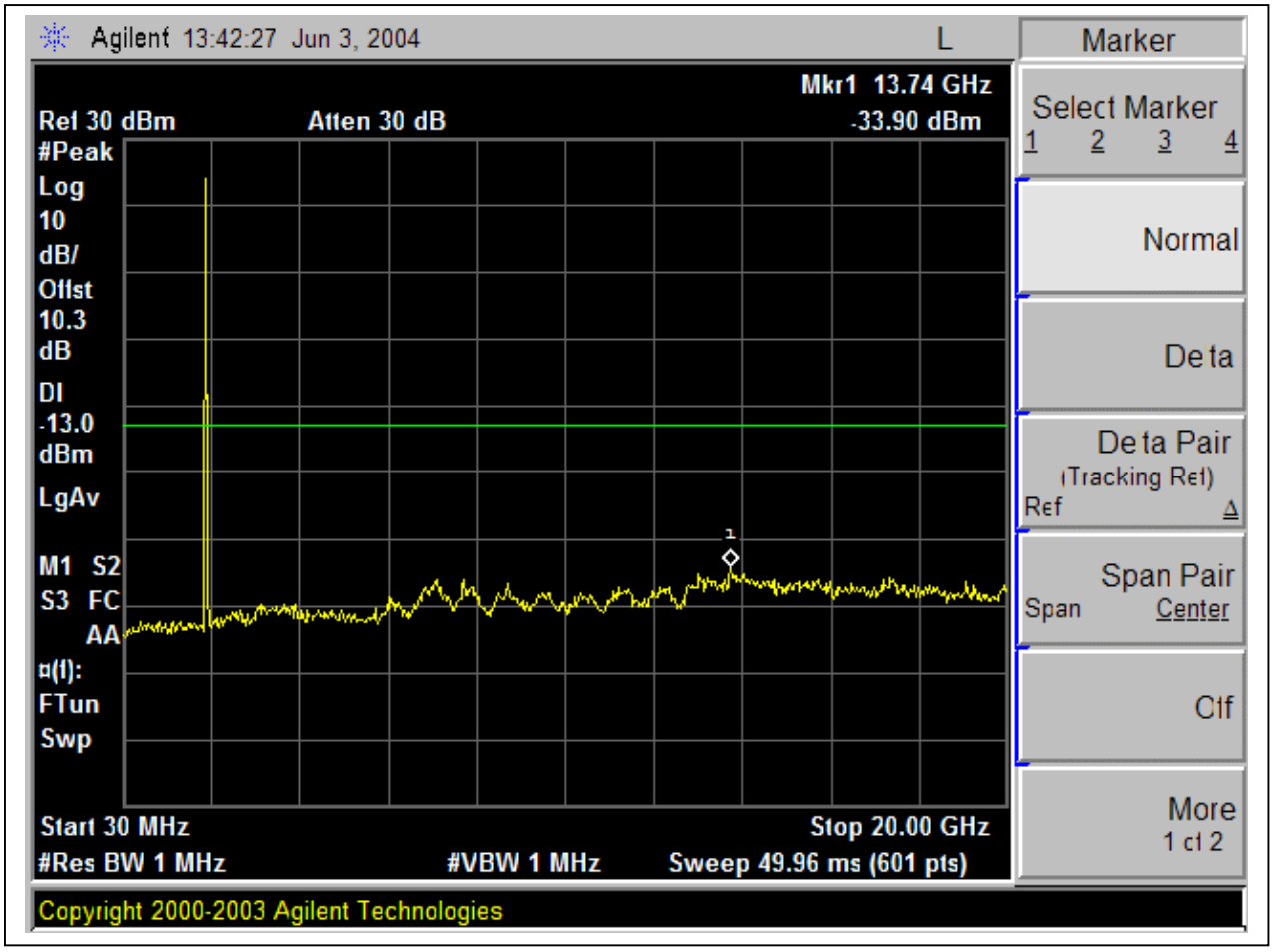
16QAM Modulation: Band Edges, Out-Of-Band Emissions

Low Channel Band Edge

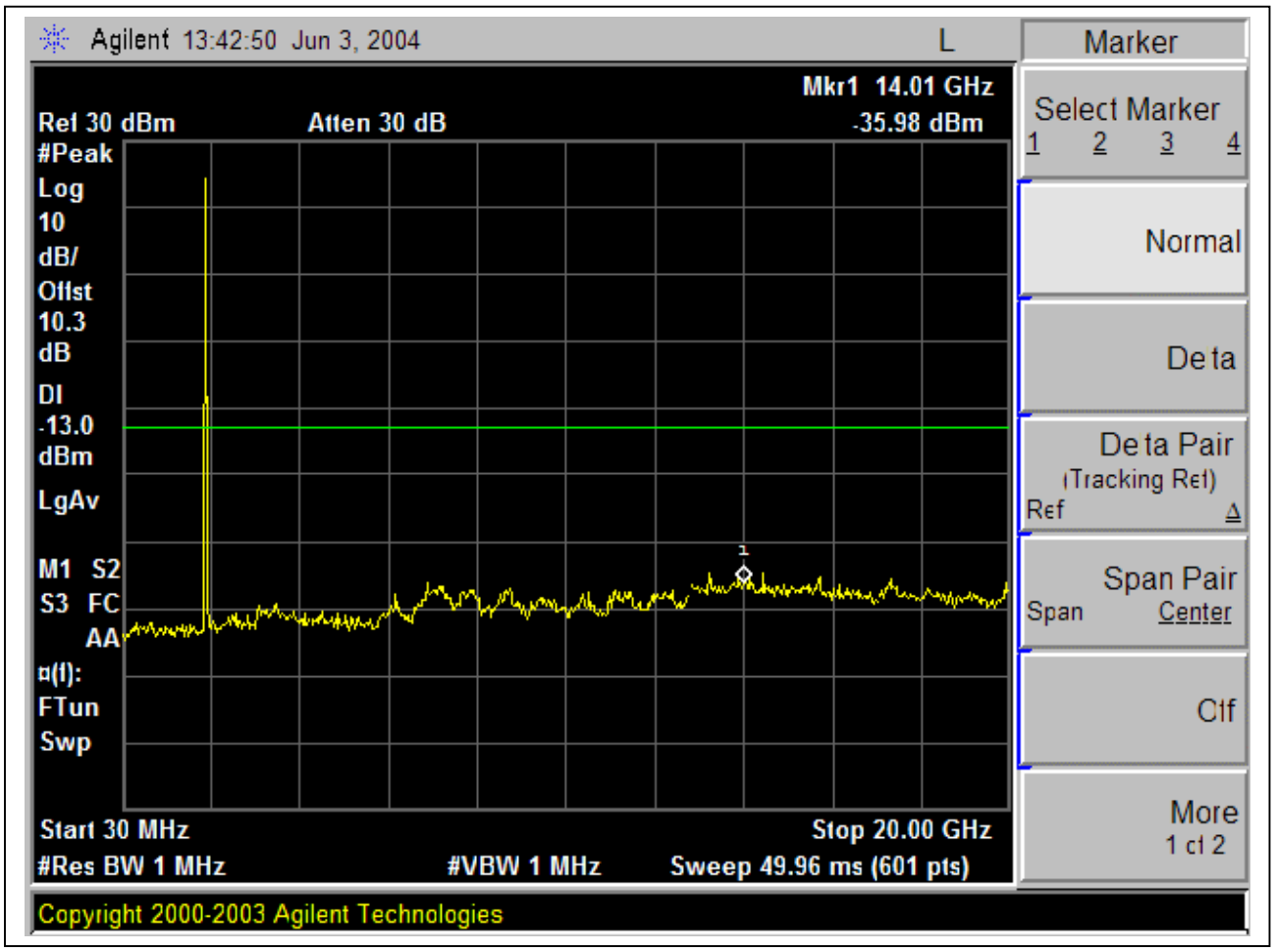


High Channel Band Edge

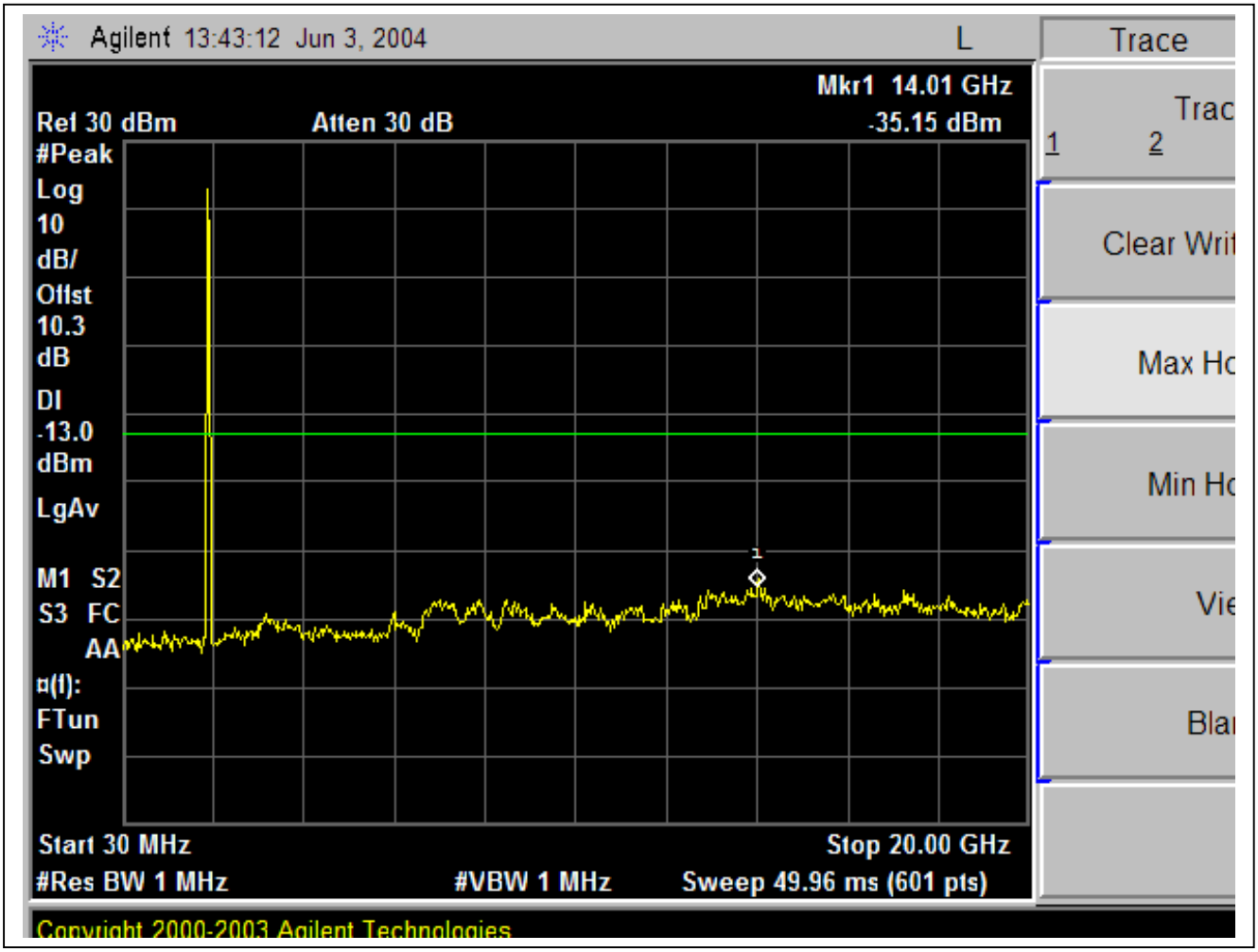
Low Channel, Out-Of-Band Emissions



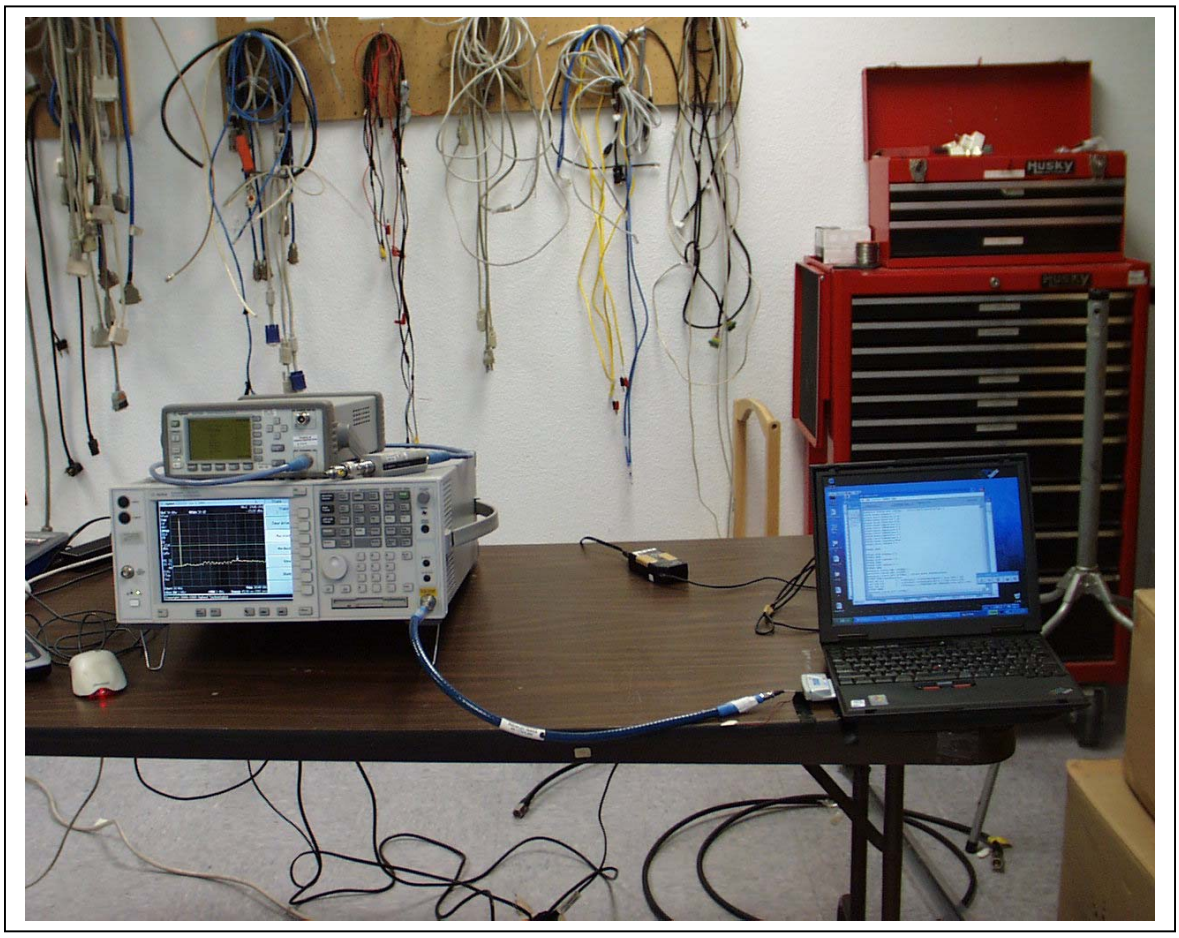
Mid Channel, Out-Of-Band Emissions



High Channel, Out-Of-Band Emissions



Test Setup Photos



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**
Spectrum Analyzer	**Agilent**	**E4446A**	**MY43360112**	**1/13/2005**
Amplifier 1-26GHz	**MITEQ**	**NSP2600-SP**	**924342**	**4/26/2005**
Antenna, Horn 1 ~ 18 GHz	**EMCO**	**3115**	**6717**	**2/4/2005**
Antenna, Tuned Dipole	**CDI**	**Roberts**	**116**	**5/15/2005**
Peak Power Meter	**Agilent**	**E4416A**	**GB41291160**	**11/7/2004**
Signal Generator	**R & S**	**SMP04**	**DE34210**	**5/25/2005**
2.7GHz HPF	**MicroTronic**	**HPM13194**	**1**	**CNR**
Antenna, Horn 1 ~ 18 GHz	**EMCO**	**3115**	**2238**	**2/4/2005**

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak ☐ Average	☒ 1 MHz ☐ 1 MHz	☒ 1 MHz ☐ 10 Hz

TEST SETUP

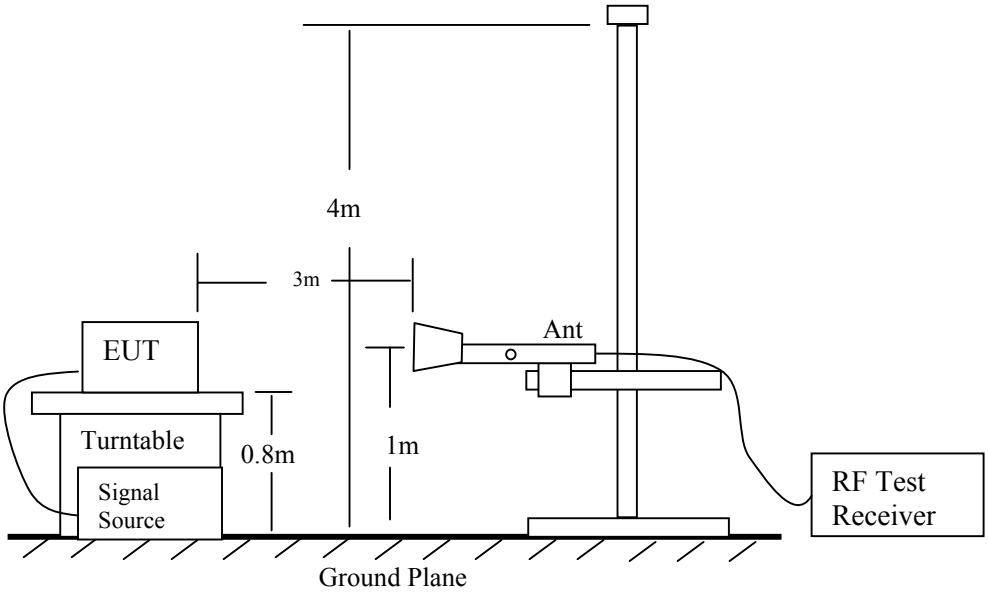


Fig 1: Radiated Emission Measurement

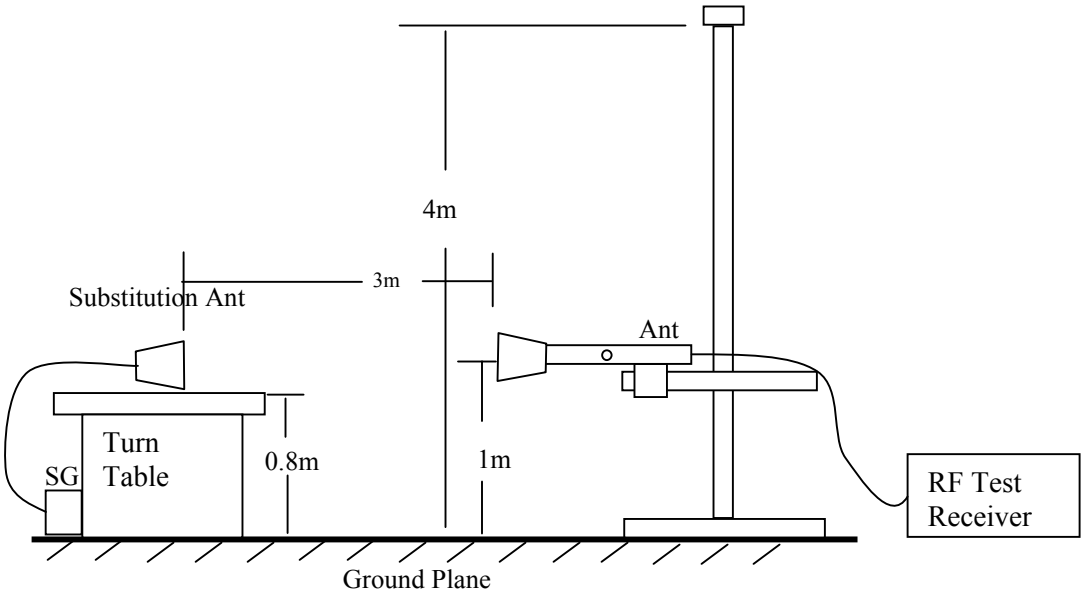


Fig 2: Radiated Emission – Substitution Method set-up

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 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 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.

RESULT

No non-compliance noted, as shown below

BPSK: Low, Mid, & High Channels:

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
low ch, 1900.3125MHz									
3.800	49.5	-47.5	2.5	9.5	7.4	-40.4	-13.0	-27.4	V
5.700	44.0	-48.5	3.3	11.2	9.0	-40.6	-13.0	-27.6	H, noise floor
3.80000	45.0	-51.9	2.5	9.5	7.4	-44.8	-13.0	-31.8	V
5.70000	43.0	-48.5	3.3	11.2	9.0	-40.6	-13.0	-27.6	H, noise floor
Mid Ch, 1904.6875MHz									
3.80900	47.5	-49.4	2.5	9.5	7.4	-42.4	-13.0	-29.4	V
5.71000	43.3	-49.2	3.3	11.2	9.0	-41.3	-13.0	-28.3	H, noise floor
3.80900	44.5	-52.3	2.5	9.5	7.4	-45.3	-13.0	-32.3	V
5.71400	42.8	-48.7	3.3	11.2	9.0	-40.8	-13.0	-27.8	H, noise floor
High ch, 1909.6875MHz									
3.81900	48.4	-48.5	2.5	9.5	7.4	-41.5	-13.0	-28.5	
5.72900	43.0	-49.5	3.3	11.2	9.1	-41.6	-13.0	-28.6	noise floor
3.81900	44.4	-52.4	2.5	9.5	7.4	-45.4	-13.0	-32.4	
5.72900	42.0	-49.5	3.3	11.2	9.1	-41.6	-13.0	-28.6	noise floor
Note: No other emissions were detected above the system noise floor up to 20GHz									

QPSK: Low, Mid, & High Channels:

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low ch, 1900.3125MHz									
3.800	46.8	-50.2	2.5	9.5	7.4	-43.1	-13.0	-30.1	V
5.700	43.7	-48.8	3.3	11.2	9.0	-40.9	-13.0	-27.9	H,noise floor
3.80000	44.9	-52.0	2.5	9.5	7.4	-45.0	-13.0	-32.0	V
5.70000	42.6	-48.9	3.3	11.2	9.0	-41.0	-13.0	-28.0	H, noise floor
Mid ch, 1904.6875MHz									
3.80900	48.2	-48.7	2.5	9.5	7.4	-41.7	-13.0	-28.7	V
5.71000	43.5	-49.0	3.3	11.2	9.0	-41.1	-13.0	-28.1	H,noise floor
3.80900	45.1	-51.7	2.5	9.5	7.4	-44.7	-13.0	-31.7	V
5.71400	43.0	-48.5	3.3	11.2	9.0	-40.6	-13.0	-27.6	H, noise floor
High ch, 1909.6875MHz									
3.81900	48.7	-48.2	2.5	9.5	7.4	-41.2	-13.0	-28.2	V
5.72900	43.4	-49.1	3.3	11.2	9.1	-41.2	-13.0	-28.2	H,noise floor
3.81900	45.2	-51.6	2.5	9.5	7.4	-44.6	-13.0	-31.6	V
5.72900	42.3	-49.2	3.3	11.2	9.1	-41.3	-13.0	-28.3	H, noise floor
Note: No other emissions were detected above the system noise floor up to 20GHz									

8PSK: Low, Mid, & High Channels:

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low ch, 1900.3125MHz									
3.800	**47.7**	**-49.3**	**2.5**	**9.5**	**7.4**	**-42.2**	**-13.0**	**-29.2**	**V**
5.700	**41.8**	**-50.7**	**3.3**	**11.2**	**9.0**	**-42.8**	**-13.0**	**-29.8**	**H,noise floor**
3.80000	**43.5**	**-53.4**	**2.5**	**9.5**	**7.4**	**-46.3**	**-13.0**	**-33.3**	**V**
5.70000	**42.2**	**-49.3**	**3.3**	**11.2**	**9.0**	**-41.4**	**-13.0**	**-28.4**	**H,noise floor**
Mid ch, 1904.6875MHz									
3.80900	**49.2**	**-47.7**	**2.5**	**9.5**	**7.4**	**-40.7**	**-13.0**	**-27.7**	**V**
5.71000	**43.8**	**-48.7**	**3.3**	**11.2**	**9.0**	**-40.8**	**-13.0**	**-27.8**	**H,noise floor**
3.80900	**44.3**	**-52.5**	**2.5**	**9.5**	**7.4**	**-45.5**	**-13.0**	**-32.5**	**V**
5.71400	**42.3**	**-49.2**	**3.3**	**11.2**	**9.0**	**-41.3**	**-13.0**	**-28.3**	**H,noise floor**
High ch, 1909.6875MHz									
3.81900	**48.0**	**-48.9**	**2.5**	**9.5**	**7.4**	**-41.9**	**-13.0**	**-28.9**	**V**
5.72900	**44.0**	**-48.5**	**3.3**	**11.2**	**9.1**	**-40.6**	**-13.0**	**-27.6**	**H,noise floor**
3.81900	**44.7**	**-52.1**	**2.5**	**9.5**	**7.4**	**-45.1**	**-13.0**	**-32.1**	**V**
5.72900	**43.7**	**-47.8**	**3.3**	**11.2**	**9.1**	**-39.9**	**-13.0**	**-26.9**	**H,noise floor**
Note: No other emissions were detected above the system noise floor up to 20GHz									

12QAM: Low, Mid, & High Channels:

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low ch, 1900.3125MHz									
3.800	**48.4**	**-48.6**	**2.5**	**9.5**	**7.4**	**-41.5**	**-13.0**	**-28.5**	**V**
5.700	**42.5**	**-50.0**	**3.3**	**11.2**	**9.0**	**-42.1**	**-13.0**	**-29.1**	**H, noise floor**
3.80000	**43.4**	**-53.5**	**2.5**	**9.5**	**7.4**	**-46.4**	**-13.0**	**-33.4**	**V**
5.70000	**42.1**	**-49.4**	**3.3**	**11.2**	**9.0**	**-41.5**	**-13.0**	**-28.5**	**H, noise floor**
Mid ch, 1904.6875MHz									
3.80900	**48.1**	**-48.8**	**2.5**	**9.5**	**7.4**	**-41.8**	**-13.0**	**-28.8**	**V**
5.71000	**43.2**	**-49.3**	**3.3**	**11.2**	**9.0**	**-41.4**	**-13.0**	**-28.4**	**H, noise floor**
3.80900	**43.6**	**-53.2**	**2.5**	**9.5**	**7.4**	**-46.2**	**-13.0**	**-33.2**	**V**
5.71400	**41.8**	**-49.7**	**3.3**	**11.2**	**9.0**	**-41.8**	**-13.0**	**-28.8**	**H, noise floor**
High ch, 1909.6875MHz									
3.81900	**48.9**	**-48.0**	**2.5**	**9.5**	**7.4**	**-41.0**	**-13.0**	**-28.0**	**V**
5.72900	**42.5**	**-50.0**	**3.3**	**11.2**	**9.1**	**-42.1**	**-13.0**	**-29.1**	**H, noise floor**
3.81900	**43.8**	**-53.0**	**2.5**	**9.5**	**7.4**	**-46.0**	**-13.0**	**-33.0**	**V**
5.72900	**42.0**	**-49.5**	**3.3**	**11.2**	**9.1**	**-41.6**	**-13.0**	**-28.6**	**H, noise floor**
Note: No other emissions were detected above the system noise floor up to 20GHz									

16QAM: Low, Mid, & High Channels:

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low ch, 1900.3125MHz									
3.800	**48.0**	**-49.0**	**2.5**	**9.5**	**7.4**	**-41.9**	**-13.0**	**-28.9**	**V**
5.700	**43.0**	**-49.5**	**3.3**	**11.2**	**9.0**	**-41.6**	**-13.0**	**-28.6**	**H, noise floor**
3.80000	**43.6**	**-53.3**	**2.5**	**9.5**	**7.4**	**-46.2**	**-13.0**	**-33.2**	**V**
5.70000	**41.8**	**-49.7**	**3.3**	**11.2**	**9.0**	**-41.8**	**-13.0**	**-28.8**	**H, noise floor**
Mid ch, 1904.6875MHz									
3.80900	**48.1**	**-48.9**	**2.5**	**9.5**	**7.4**	**-41.8**	**-13.0**	**-28.8**	**V**
5.71000	**43.1**	**-49.4**	**3.3**	**11.2**	**9.0**	**-41.5**	**-13.0**	**-28.5**	**H, noise floor**
3.80900	**44.0**	**-52.8**	**2.5**	**9.5**	**7.4**	**-45.8**	**-13.0**	**-32.8**	**V**
5.71400	**42.5**	**-49.0**	**3.3**	**11.2**	**9.0**	**-41.1**	**-13.0**	**-28.1**	**H, noise floor**
High ch, 1909.6875MHz									
3.81900	**47.5**	**-49.4**	**2.5**	**9.5**	**7.4**	**-42.4**	**-13.0**	**-29.4**	**V**
5.72900	**43.2**	**-49.3**	**3.3**	**11.2**	**9.1**	**-41.4**	**-13.0**	**-28.4**	**H, noise floor**
3.81900	**43.4**	**-53.4**	**2.5**	**9.5**	**7.4**	**-46.4**	**-13.0**	**-33.4**	**V**
5.72900	**42.3**	**-49.2**	**3.3**	**11.2**	**9.1**	**-41.3**	**-13.0**	**-28.3**	**H, noise floor**
Note: No other emissions were detected above the system noise floor up to 20GHz									

7.6. SECTION 2.1055: FREQUENCY STABILITY

INSTRUMENTS LIST

TEST EQUIPMENT LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
EMI Test Receiver	**R & S**	**ESIB40**	**100192**	**11/21/2004**
Temperature / Humidity Chamber	**Thermotron**	**SE 600-10-10**	**29800**	**5/30/2005**
Splitter	**Agilent**	**N/A**	**2339A06150**	**N/A**
10dB Pad	**Weinschel**	**56-10**	**M2348**	**N/A**
Signal Generator	**Agilent**	**E4432B**	**MY41000108**	**11/14/2005**

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Show entire High emissions	Peak	300 Hz	300 Hz

TEST SETUP

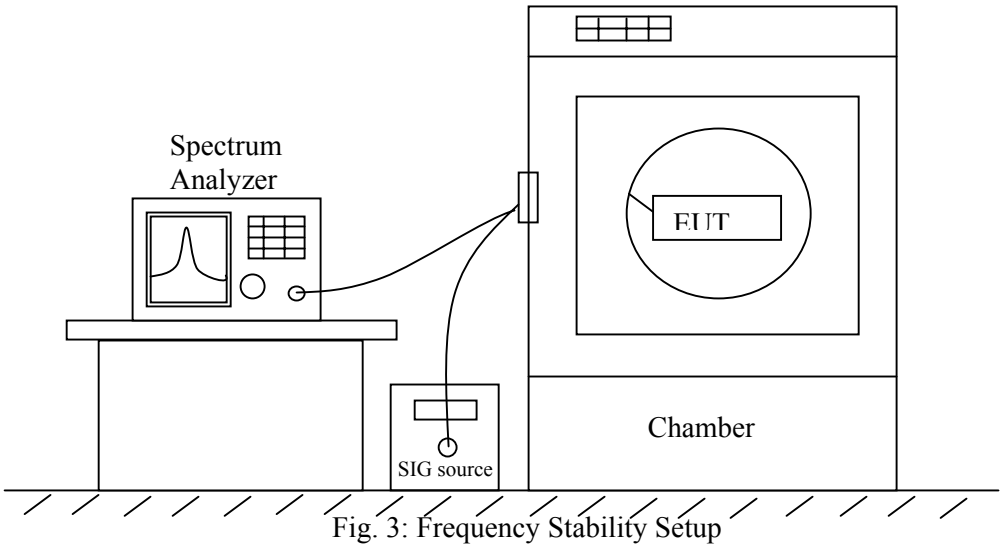
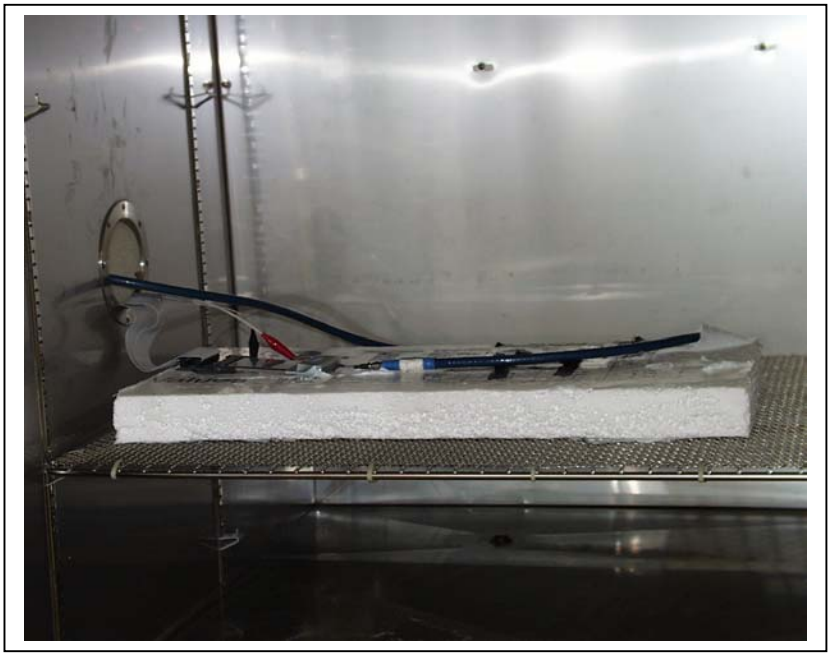


Fig. 3: Frequency Stability Setup

Test Setup Photos



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 (±15%) and record the maximum frequency change.

RESULT

No non-compliance noted, as shown below because the EUT uses the same OSC in both receiver and transmitter LO circuit. As a result, the frequency does not shift in Frequency Stability Test.

Frequency stability versus environmental temperature

Reference Frequency: Low or High Channel @ 25?C Limit: to stay within the authorized block					
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**			
(Vac)	**Temperature (?C)**	**(MHz)**	**Delta (ppm)**	**Limit (ppm)**	**Delta (Hz)**
115.00	50	1910.00780	-0.157	± 2.5	300.0000002
115.00	40	1910.00780	-0.157	± 2.5	300.0000002
115.00	30	1910.00760	-0.052	± 2.5	99.99999997
115.00	***25***	***1910.00750***	***0***	***± 2.5***	***0***
115.00	20	1910.00740	0.052	± 2.5	-100
115.00	10	1910.00720	0.157	± 2.5	-300
115.00	0	1910.00720	0.157	± 2.5	-300
115.00	-10	1910.00720	0.157	± 2.5	-300
115.00	-20	1910.00680	0.366	± 2.5	-700
115.00	-30	1910.00680	0.366	± 2.5	-700
97.75	25	1910.00850	-0.524	± 2.5	1000
132.25	25	1910.00780	-0.157	± 2.5	300.0000002

7.7. RADIATED EMISSION

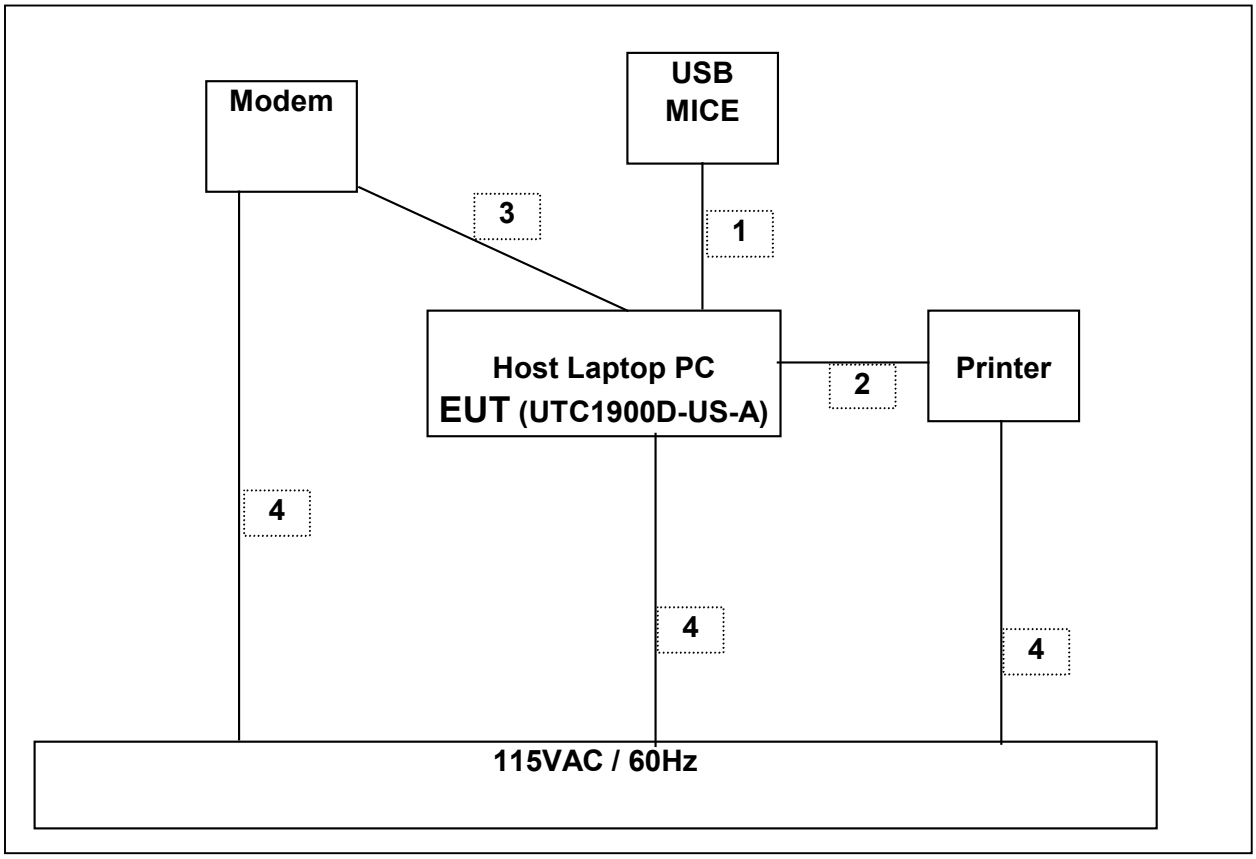
Detector Setting of Spectrum Analyzer

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	☒ Peak ☒ Quasi Peak	☒ 100 KHz ☒ 1 MHz	☒ 100 KHz ☒ 1 MHz

I/O Cables

Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	Mouse	1	USB	Un-shielded	2m	Yes	No	N/A
2	Paralell	1	DB25	Un-shielded	2m	Yes	Yes	N/A
3	Diel Up	1	RJ11	Un-shielded	2m	Yes	Yes	N/A
4	AC	3	US 115V	Un-shielded	2m	No	No	N/A

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.

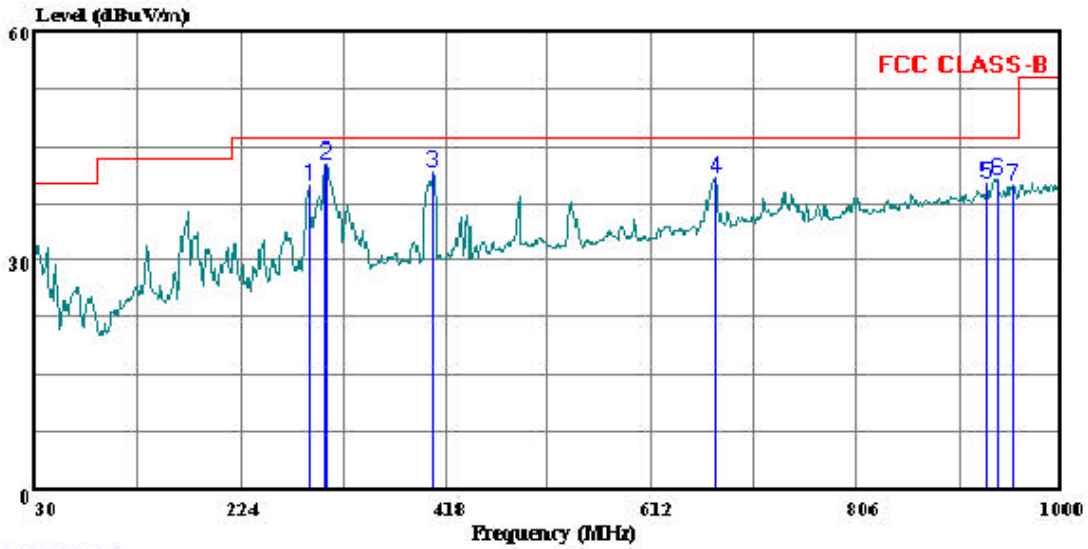
MEASUREMENT RESULT

No non-compliance noted, as shown below.

VERTICAL POLARIZATION, 30-1000MHz

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 32 File#: 04i2701.emi Date: 06-03-2004 Time: 18:50:31



(Audix ATC)

Trace: 31 Ref Trace:

Condition: 3m VERTICAL
Test Operator: : Ben Du
Project #: : 04U2701-3
Company: : KYOCERA Corp.
EUT: : UTC
Model No: : UTC1900D-US-A
Configuration: : EUT w/ Laptop PC ,Printer, Modem, MS
Target of Test: : FCC B
Mode of Operation: Tx & Communicating
: IBM Laptop PC

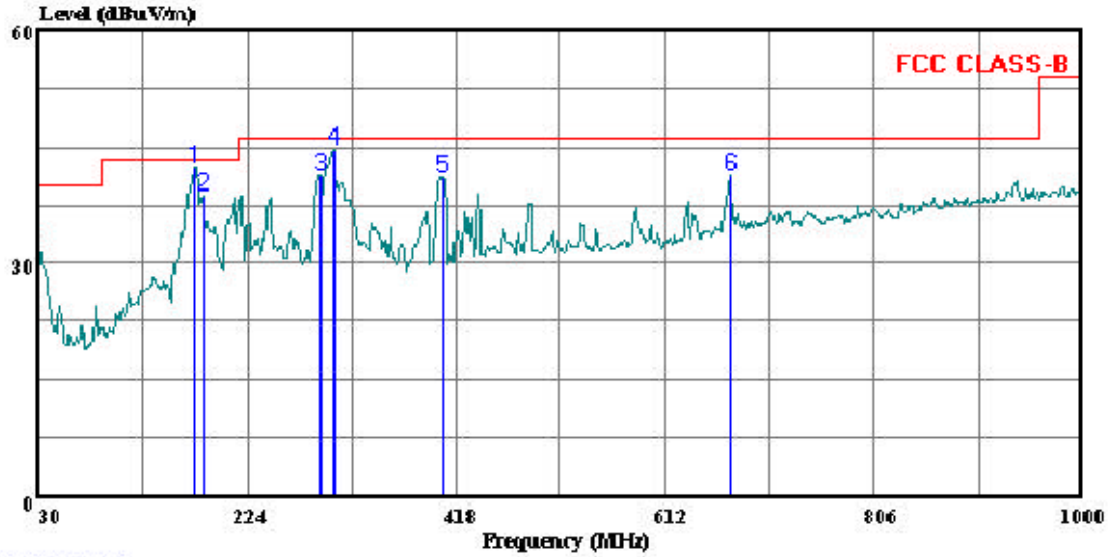
Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	288.990	Peak	24.05	15.65	39.70	46.00	-6.30
2	305.480	Peak	26.57	16.03	42.60	46.00	-3.40
3	405.390	Peak	23.13	18.32	41.45	46.00	-4.55
4	672.140	Peak	17.41	23.31	40.72	46.00	-5.28
5	929.190	Peak	13.13	26.76	39.89	46.00	-6.11
6	938.890	Peak	13.71	26.84	40.55	46.00	-5.45

HORIZONTAL POLARIZATION, 30-1000MHz

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 30 File#: 04i2701.emi Date: 06-03-2004 Time: 18:45:33



(Audix ATC)

Trace: 29 Ref Trace:

Condition: 3m HORIZONTAL
Test Operator: : Ben Du
Project #: : 04U2701-3
Company: : KYOCERA Corp.
EUT: : UTC
Model No: : UTC1900D-US-A
Configuration: : EUT w/ Laptop PC ,Printer, Modem, MS
Target of Test: : FCC B
Mode of Operation: Tx & Communicating
: IBM Laptop PC

Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	174.530	Peak	29.17	13.16	42.33	43.50	-1.17
2	182.290	Peak	25.67	12.94	38.61	43.50	-4.89
3	290.930	Peak	25.68	15.74	41.42	46.00	-4.58
4	303.540	Peak	28.71	15.99	44.70	46.00	-1.30
5	405.390	Peak	22.67	18.32	40.99	46.00	-5.01
6	672.140	Peak	18.00	23.31	41.31	46.00	-4.69

Radiated Emission photos

7.8. POWERLINE CONDUCTED EMISSION

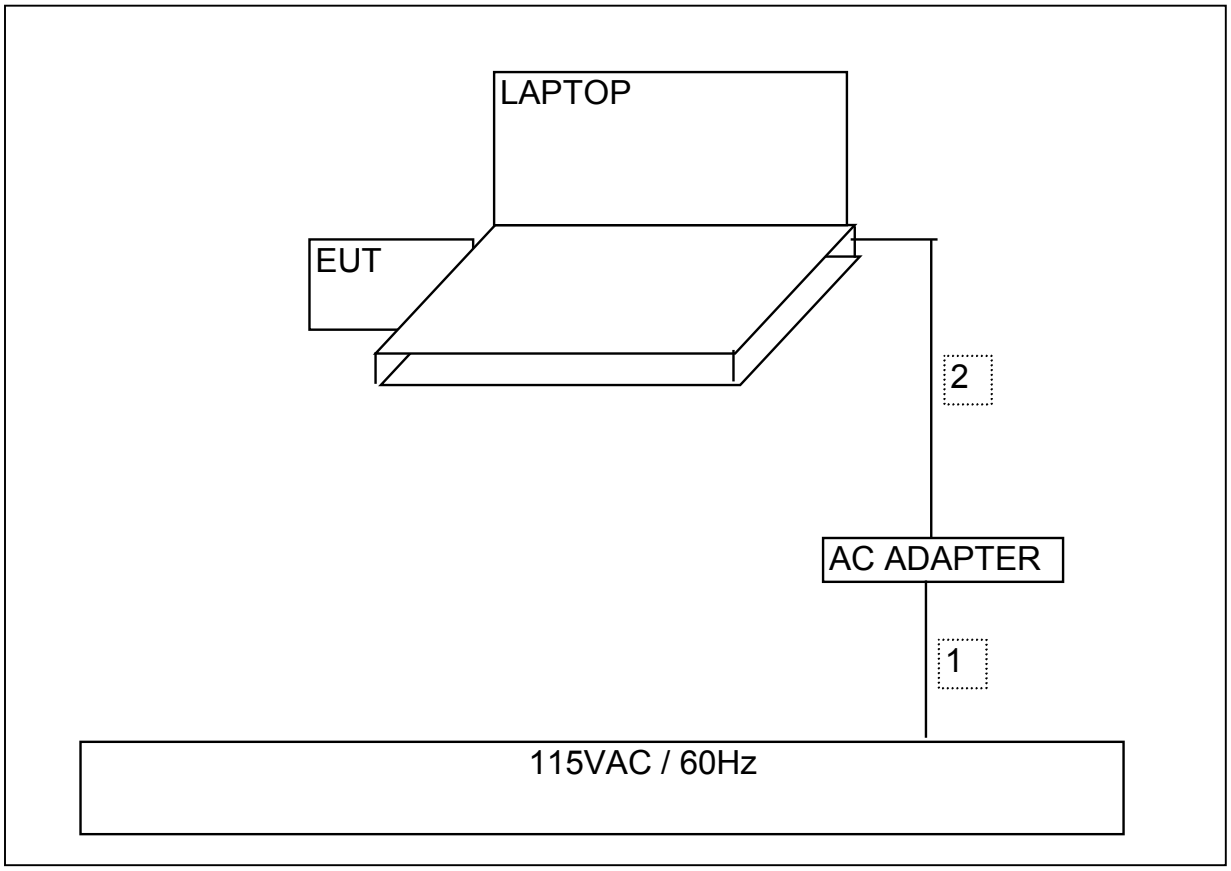
Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
150 KHz to 30 MHz	☒ Peak ☐ CISPR Quasi Peak	☒ 9 KHz	☒ 9 KHz

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	1	US115V	SHIELED	2	NO	NO	Bundled AC Cable for LC test
2	DC	1	DC	SHIELED	3	NO	NO	Ferrite on DC output end

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

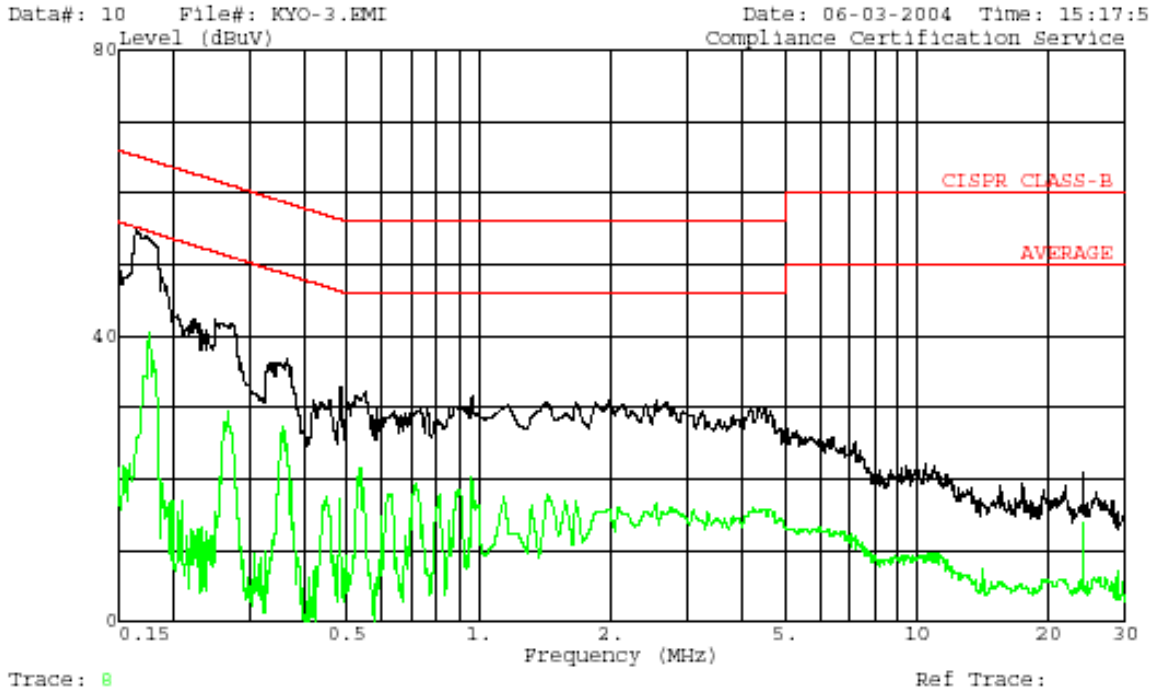
No non-compliance noted, as shown below.

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
0.16	55.49	--	41.26	0.00	65.63	55.63	-10.14	-14.37	L1
0.96	31.36	--	20.43	0.00	56.00	46.00	-24.64	-25.57	L1
5.36	26.56	--	16.30	0.00	60.00	50.00	-33.44	-33.70	L1
0.16	52.58	--	38.67	0.00	65.63	55.63	-13.05	-16.96	L2
0.96	32.30		20.96	0.00	56.00	46.00	-56.00	-25.04	L2
5.36	28.10	--	12.76	0.00	60.00	50.00	-31.90	-37.24	L2
6 Worst Data									

LINE ONE

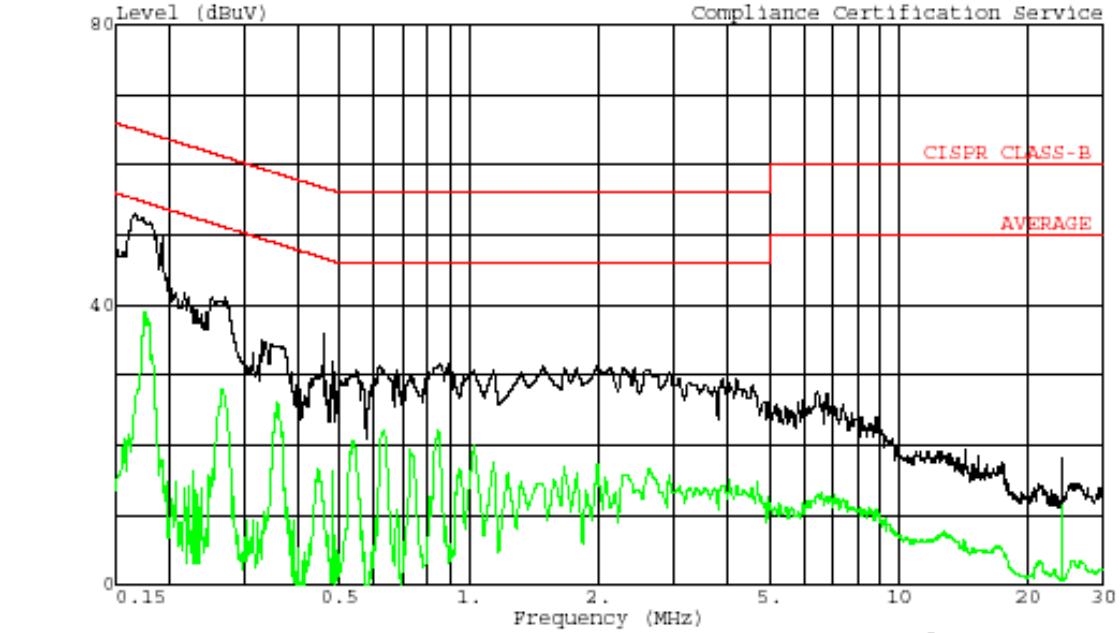
COMPLIANCE Engineering Services, Inc.
561F Monterey Road,
Morgan Hill, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



Trace: B Ref Trace:
Project # : 04I2701-3_L1 PEAK & AVERAGE
Test Operator : VIEN TRAN
Company : KYOCERA
EUT : USER TERMINAL_CARD TYPE
: WIRELESS BROADBAND INTERNET
Model : UTC1900D-US-A
Configuration : EUT/LAPTOP
Mode of Operation: Normal
Target of Test : FCC Class B
Voltage : 115VAC / 60 Hz
: L1: Peak(Black) , Average (Green)

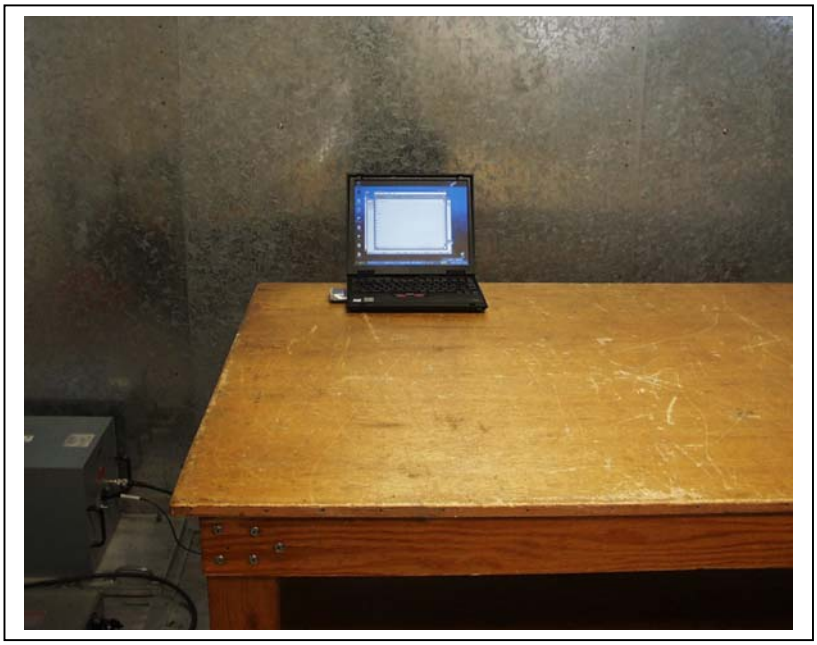
LINE TWO

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



Trace: 15 Ref Trace:
Project # : 04I2701-3_L2 PEAK & AVERAGE
Test Operator : VIEN TRAN
Company : KYOCERA
EUT : USER TERMINAL_CARD TYPE
: WIRELESS BROADBAND INTERNET
Model : UTC1900D-US-A
Configuration : EUT/LAPTOP
Mode of Operation: Normal
Target of Test : FCC Class B
Voltage : 115VAC / 60 Hz
: L2: Peak(Black) , Average(Green)

AC Conducted Emission photos



8. APENDIX

8.1. EXTERNAL & INTERNAL PHOTOS

Please refer to attached sheets.

8.2. SCHEMATICS

Please refer to attached sheets.

8.3. BLOCK DIAGRAM

Please refer to attached sheets.

8.4. USER MANUAL

Please refer to attached sheets.

END OF REPORT