



**FCC CFR47 PART 15 SUBPART C
CERTIFICATION
TEST REPORT**

FOR

PDA PHONE

MODEL NUMBER: PA10A

FCC ID: NM8PA10A

REPORT NUMBER: 05T3291-2

ISSUE DATE: APRIL 15, 2005

Prepared for
**HIGH TECH COMPUTER CORP.
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TAIPEI, 231 TAIWAN**

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Revision History

<u>Rev.</u>	<u>Revisions</u>	<u>Revised By</u>
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: HIGH TECH COMPUTER CORP.
1F, 6-3, BAU-CHIAN RD., HSINTIEN
TAIPEI, 231 TAIWAN

EUT DESCRIPTION: PDA PHONE

MODEL: PA10A

SERIAL NUMBER: HT510E600023

DATE TESTED: APRIL 03-05, 2005

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	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:

Tested By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES



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EMC TECHCIAN
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

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 PDA phone.

This report is for the Bluetooth performance of the PDA phone.

The software that resides on the phone does not allow co-transmission of the Bluetooth and the WLAN.

EUT auxiliary equipment

Auxiliary Equipment	Brand	Model No.
Li-Ion Rechargeable Battery	Celxpert Energy Co.	PA16A
AC adaptor	Delta Electronic	ADP-5FH B
USB Cable	MEC	60-4008-201A
Cradle	High Tech Computer	PA15A
Headset	Merry	EMC147-012-01

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output BT power as follows:

2400 to 2483.5 MHz Authorized Band

Frequency Range (MHz)	Output Power (dBm)	Output Power (mW)
2402 - 2480	0.74	1.19

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a monopole and patch Antenna, with a peak gain of -2.0dBi . on CDMA, WLAN and Bluetooth modulation

5.4. SOFTWARE AND FIRMWARE

The test software is installed in the EUT during testing is BTTestMode Rev 0.1

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 2402 MHz.

5.6. DESCRIPTION OF TEST SETUP

SETUP FOR RF WIRELESS TESTS

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Delta Electronic	ADP-5FH B	3UW0450071925	NA
Headset	Merry	EMC147-012-01	NA	NA

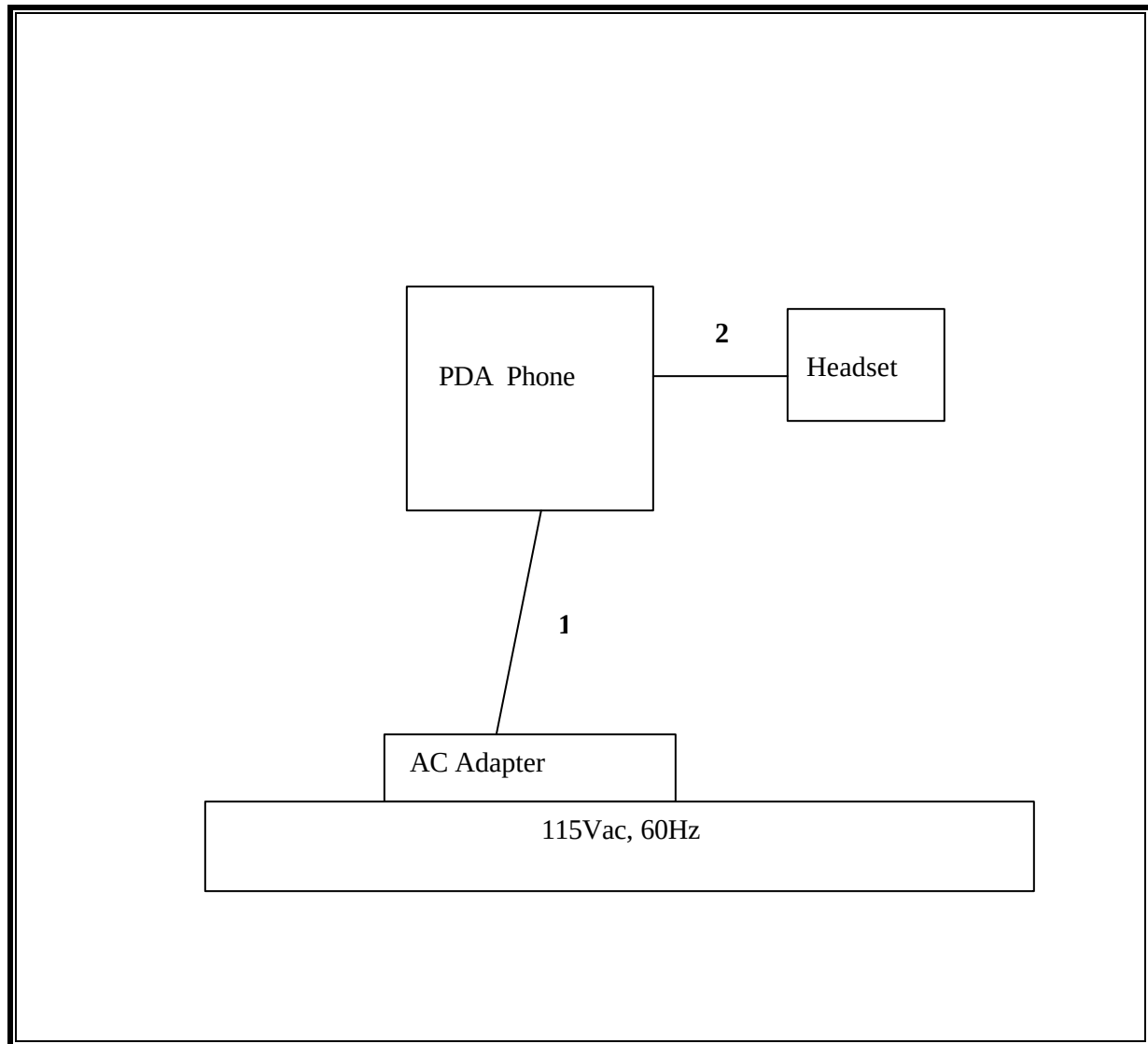
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	DC	Un-shielded	2m	No
2	Mic	1	Din	Un-shielded	2m	No

TEST SETUP

The EUT is a PDA unit and operates either standalone or connected to a PC via USB port or USB interface cable. Test software exercised the EUT is BTTestMode

SETUP DIAGRAM FOR RF WIRELESS TESTS



SETUP FOR DIGITAL DEVICE TESTS

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Printer	HP	2225C	2930S52614	DSI6XU2225
Modem	ACEEX	1414	NA	IFAXDM1415
Mouse	HP	M-S34	LZB75062022	DZL211029
Laptop	HP	Ze4101	CN24600011	DoC
AC Adapter	HP	ADP-75HB	MVT0240165286	DoC
AC Adapter	Delta Electronic	ADP-5FH B	3UW0450072243	DoC
Headset	MERRY	EMC147-012-01	NA	NA
Cradle	High Tech Computer	PA15A	NA	NA

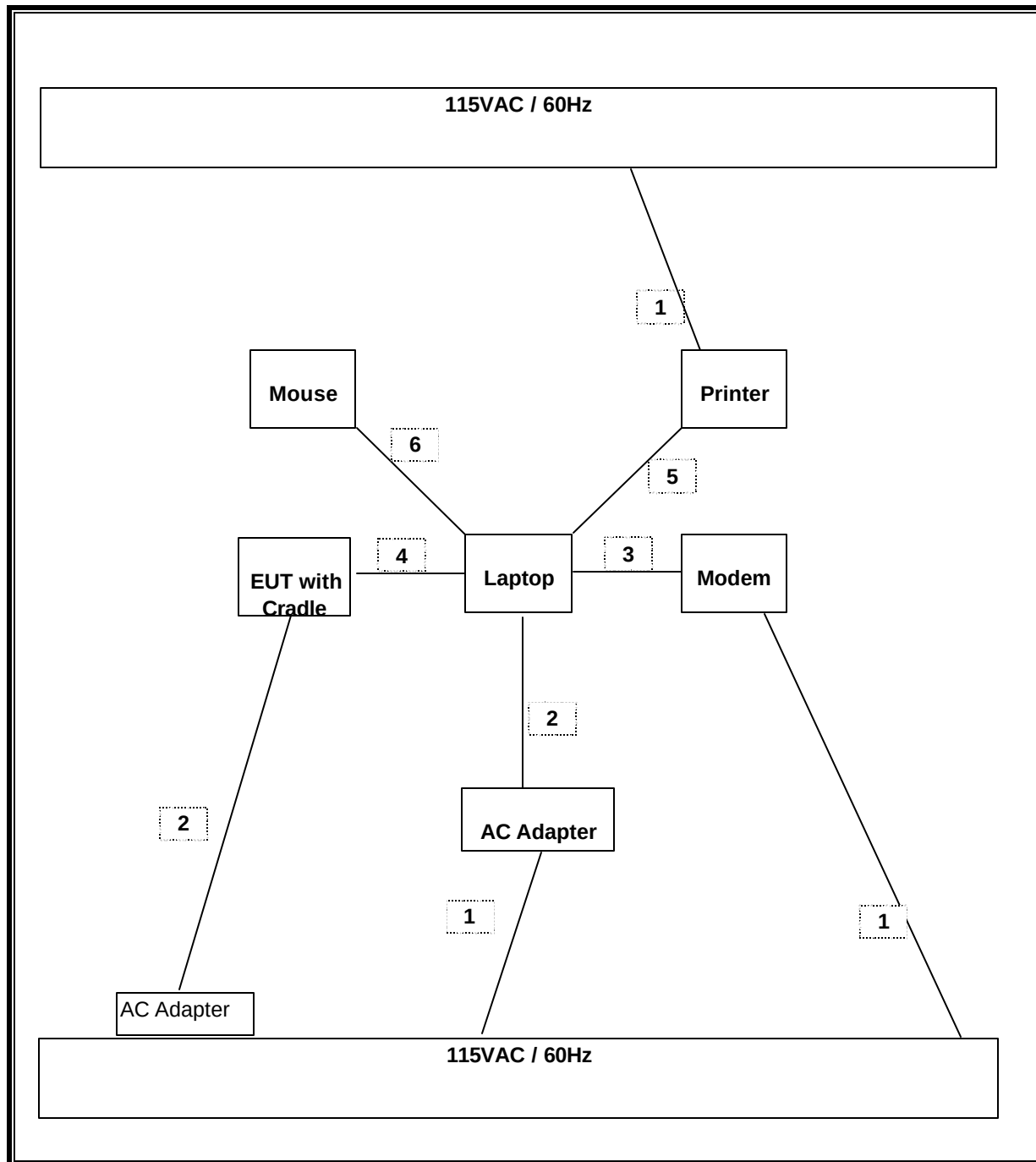
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	3	US 115V	Un-shielded	2m	Bundled EUT Power Cable for LC test
2	DC	2	DC	Un-shielded	1m	N/A
3	Serial	1	DB9	Shielded	1m	N/A
4	USB	1	USB	Shielded	2m	N/A
5	Parallel	1	DB25	Shielded	2m	N/A
6	Mouse	1	PS/2	Un-shielded	2m	N/A

TEST SETUP

The EUT is installed in the cradle. The cradle is connected to a laptop computer system with minimum configuration during the tests. Test software exercised and linked with the EUT.

SETUP DIAGRAM FOR DIGITAL DEVICE TESTS (WORST CASE)



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Spectrum Analyzer	HP	E4446A	US42510266	8/25/2005
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/06
RF Filter Section	HP	85420E	3705A00256	3/29/06
30MHz---- 2Ghz	Sunol Sciences	JB1 Antenna	A121003	9/12/05
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	9/12/05
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-44	646456	8/17/05
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/05
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	837990	10/21/05
EMI Test Receiver	R & S	ESHS 20	827129/006	10/22/05
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/06
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/06
Antenna, Horn 18-26GHz	ARA	MWH-1826/B	1013	9/12/05

7. LIMITS AND RESULTS

7.1. ANTENNA PORT CHANNEL TESTS

7.1.1. 20 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

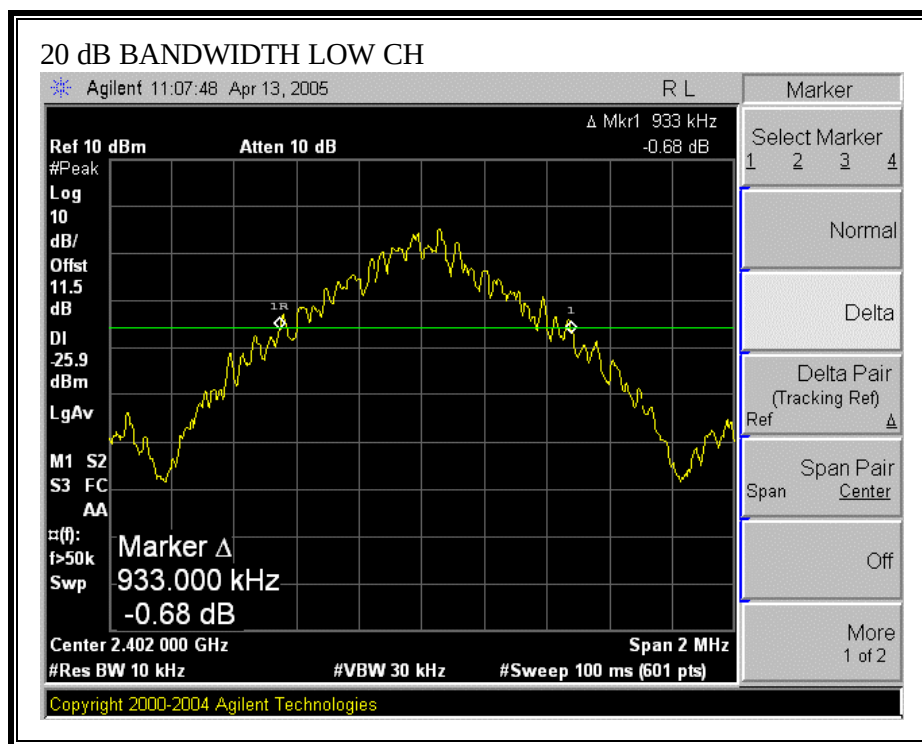
The transmitter output is connected to a spectrum analyzer. The RBW is set to 1% to 3% of the 20 dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

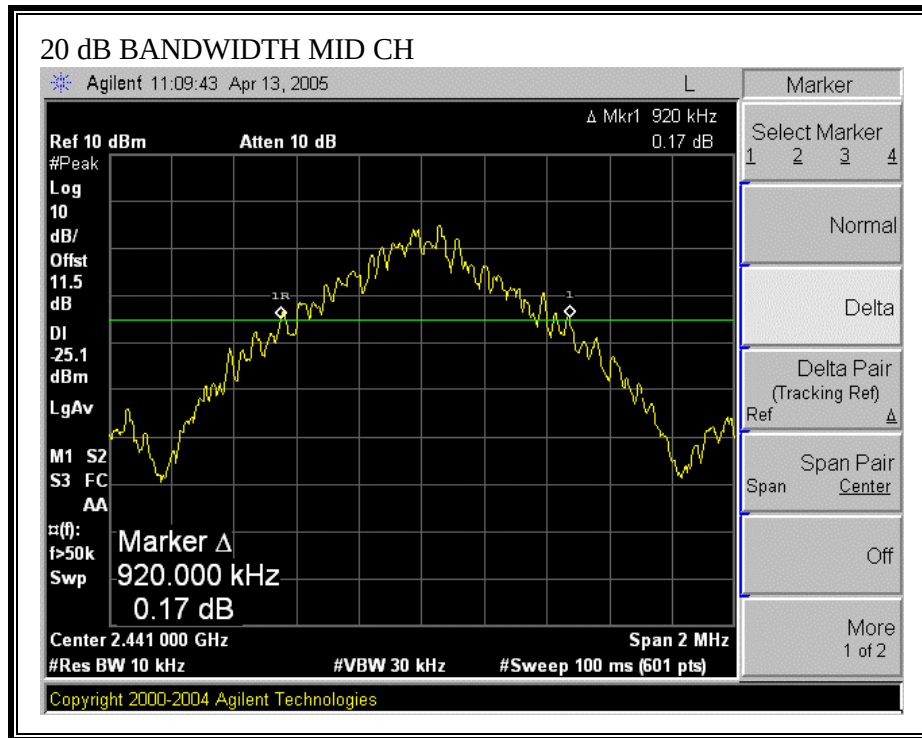
RESULTS

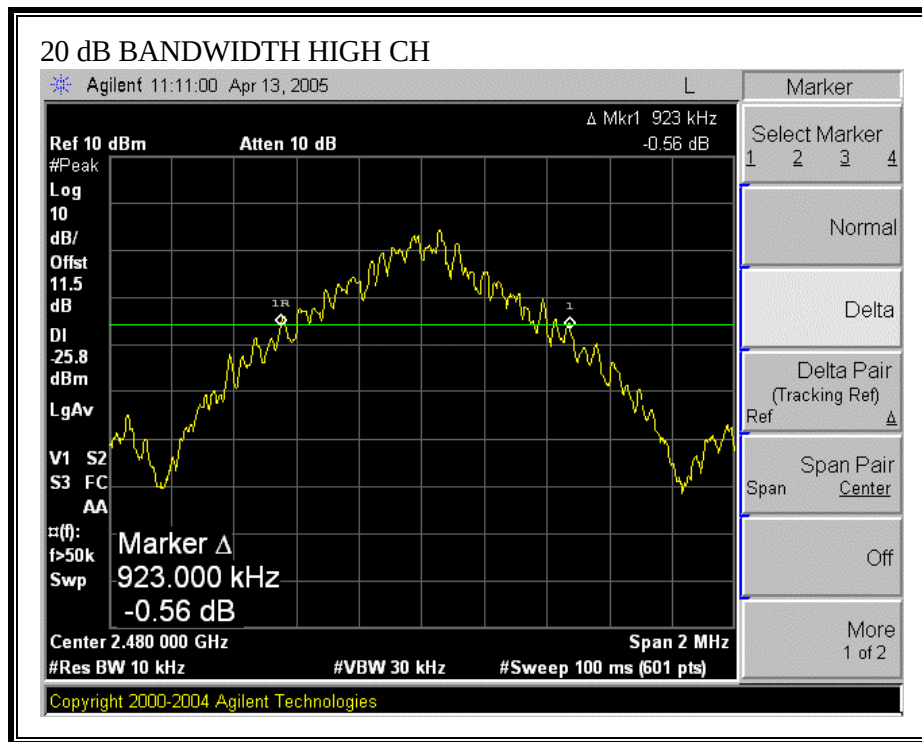
No non-compliance noted:

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	2402	933
Middle	2441	920
High	2480	923

20 dB BANDWIDTH







7.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

§15.247 (a) (1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

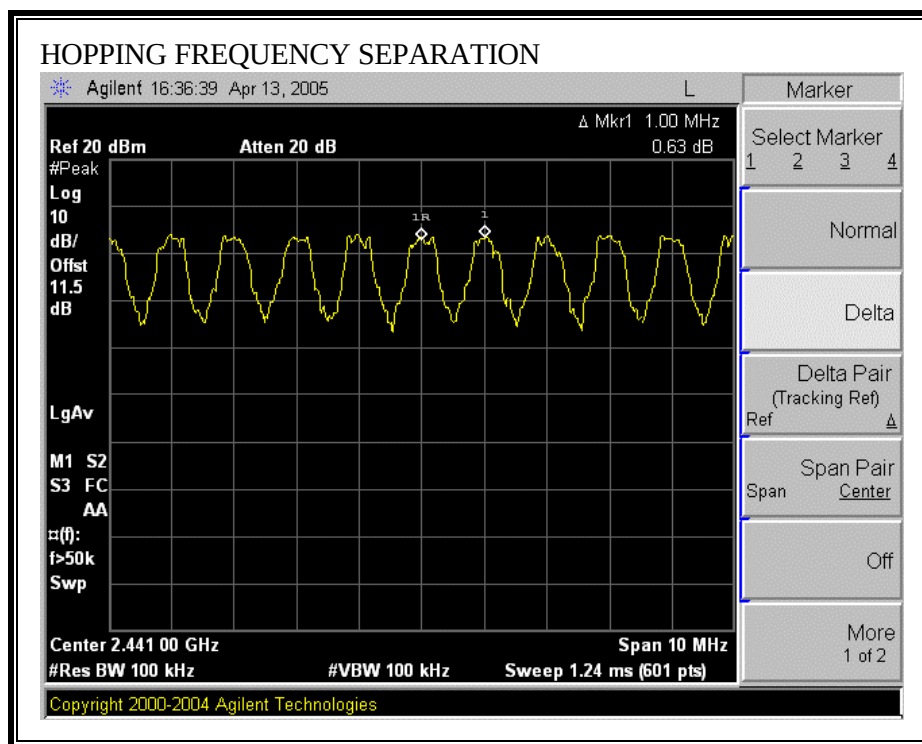
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

No non-compliance noted:

HOPPING FREQUENCY SEPARATION



7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

§15.247 (a) (1) (iii) Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

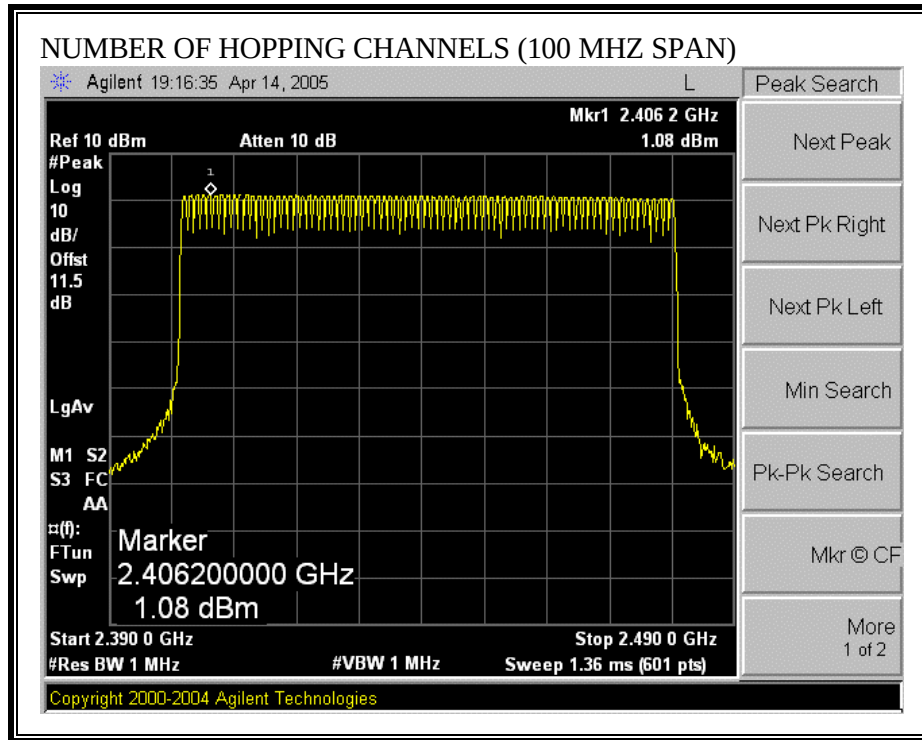
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to 1 % of the span. The analyzer is set to Max Hold.

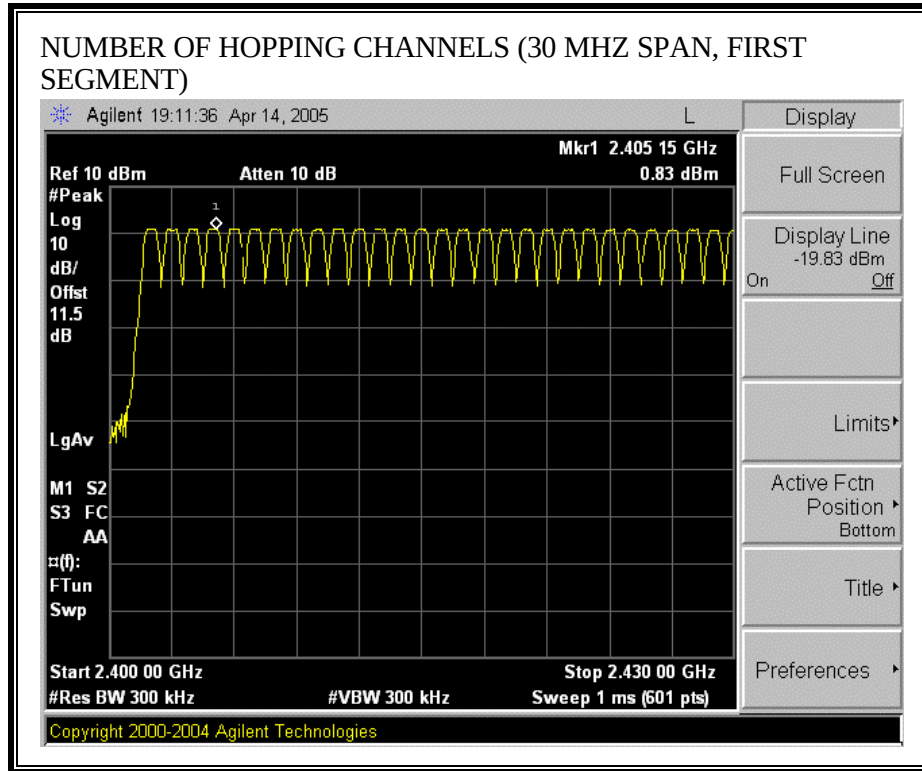
RESULTS

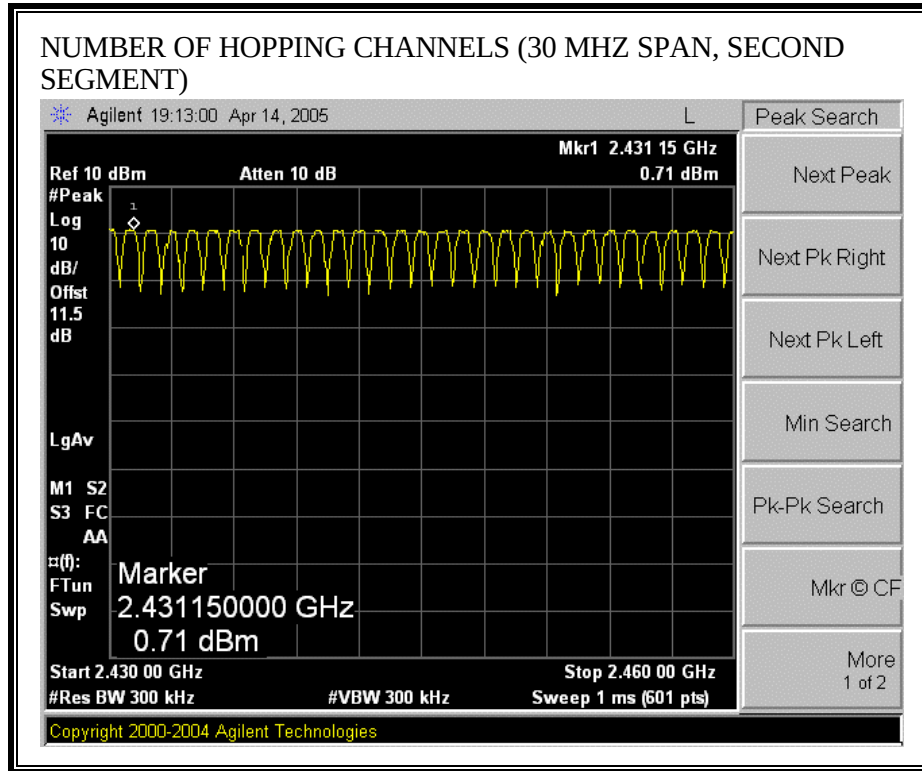
No non-compliance noted:

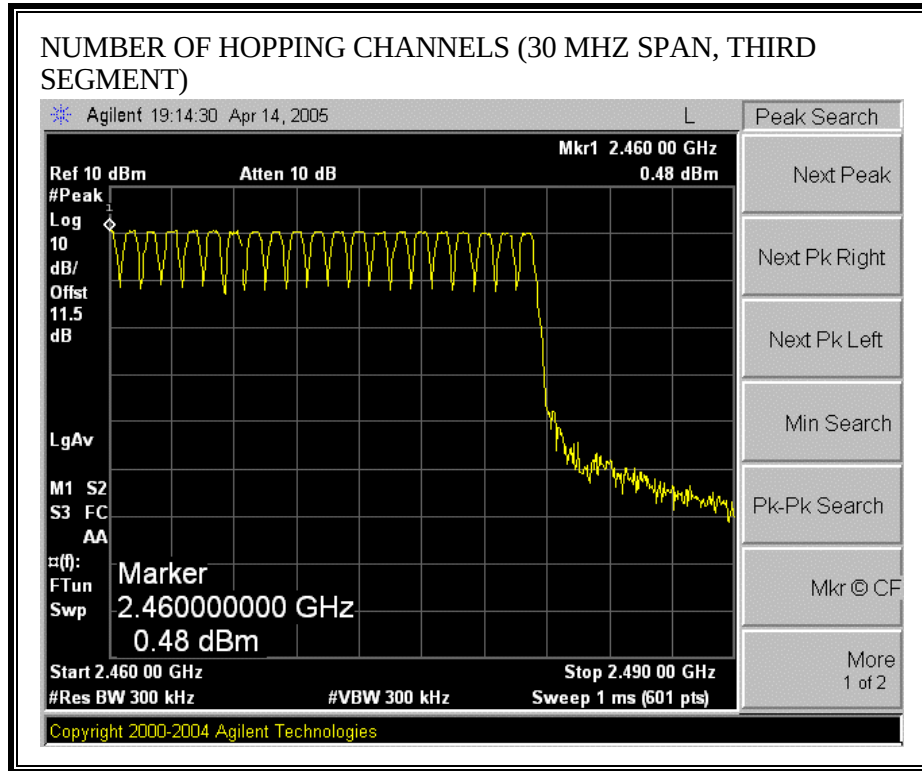
79 Channels observed.

NUMBER OF HOPPING CHANNELS









7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

§15.247 (a) (1) (iii) Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

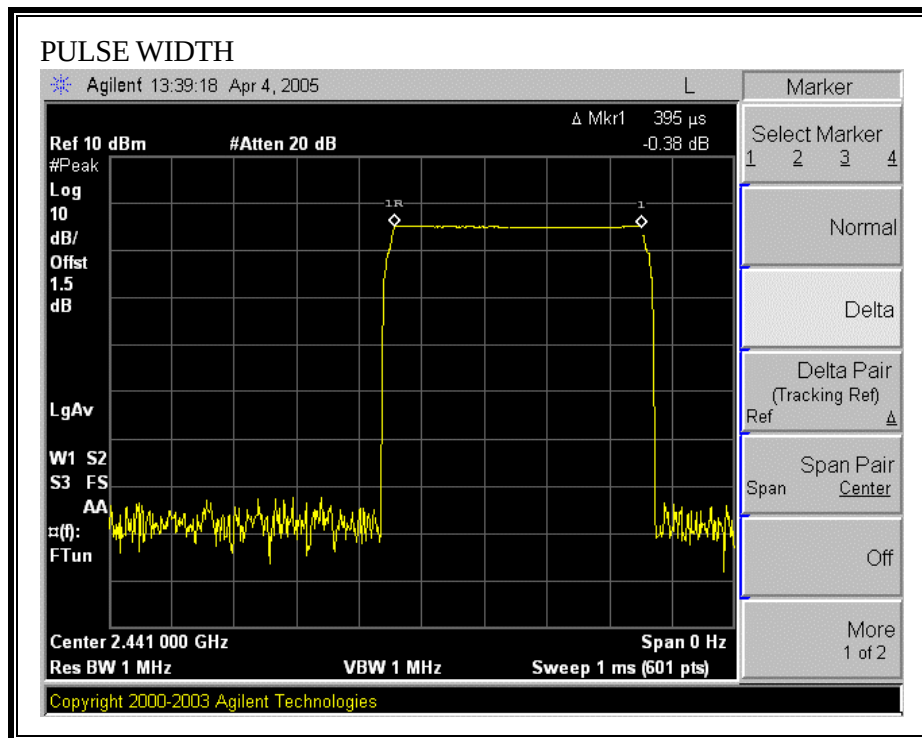
RESULTS

No non-compliance noted:

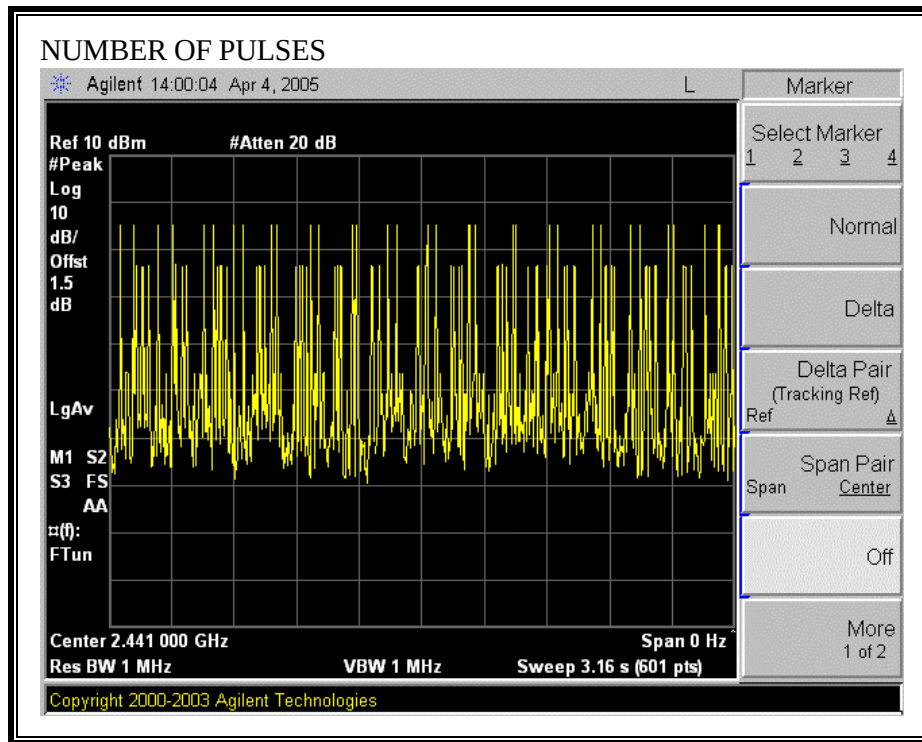
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
1	0.395	33	0.130	0.4	0.270
3	1.625	17	0.276	0.4	0.124
5	2.845	14	0.398	0.4	0.002

DH1 PACKET

PULSE WIDTH

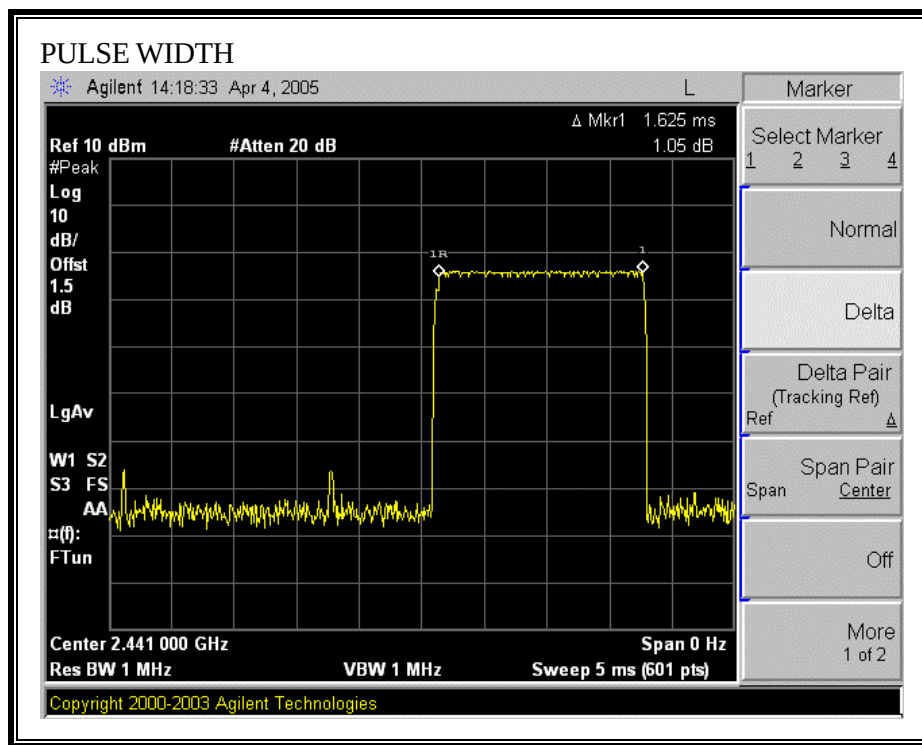


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

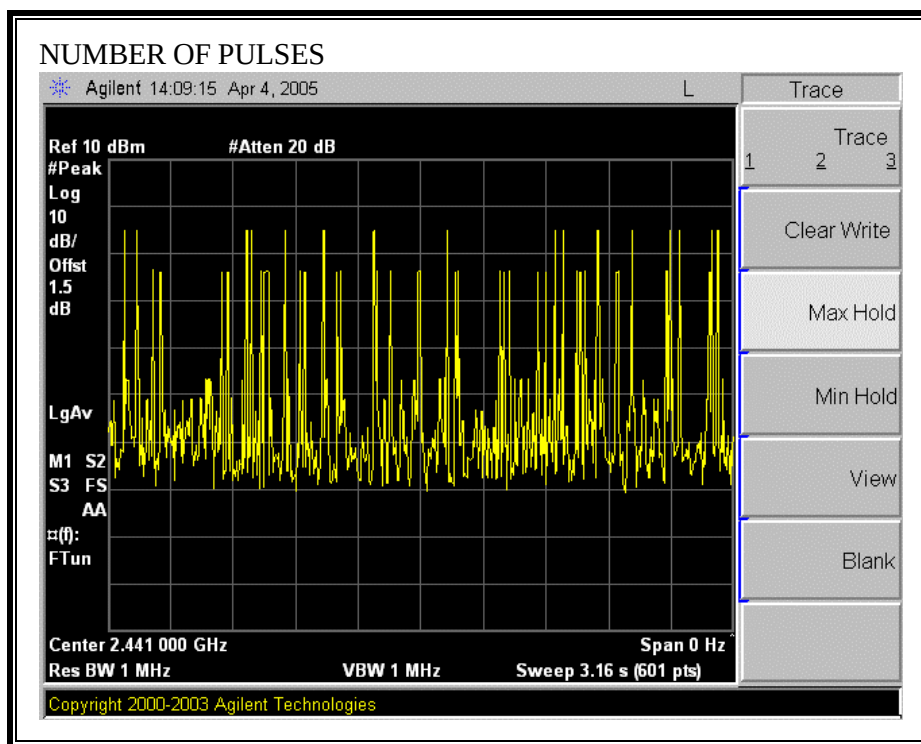


DH3 PACKET

PULSE WIDTH

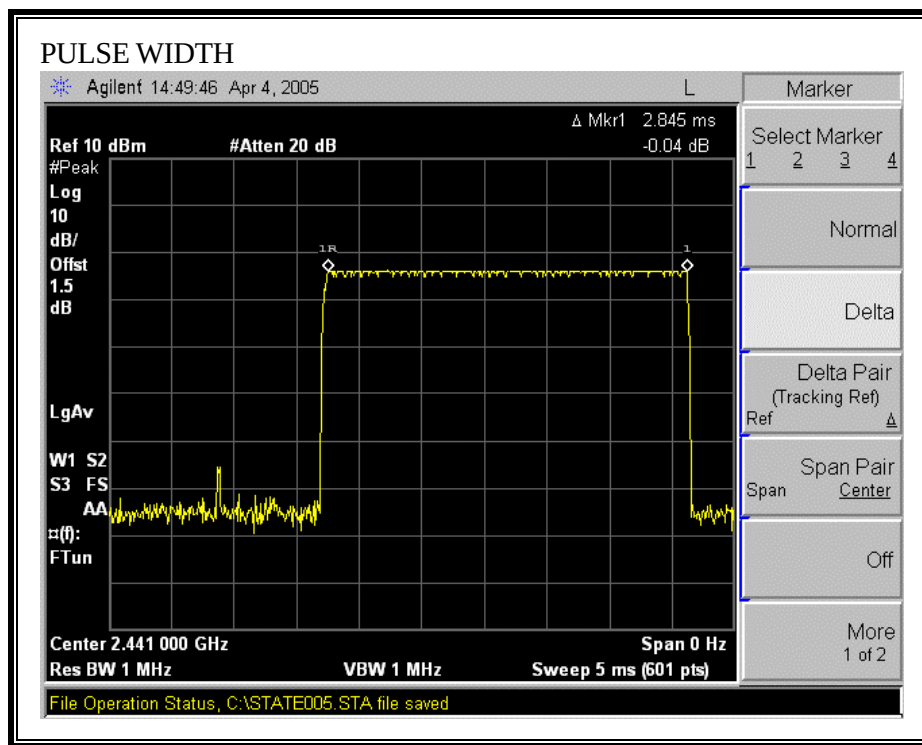


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

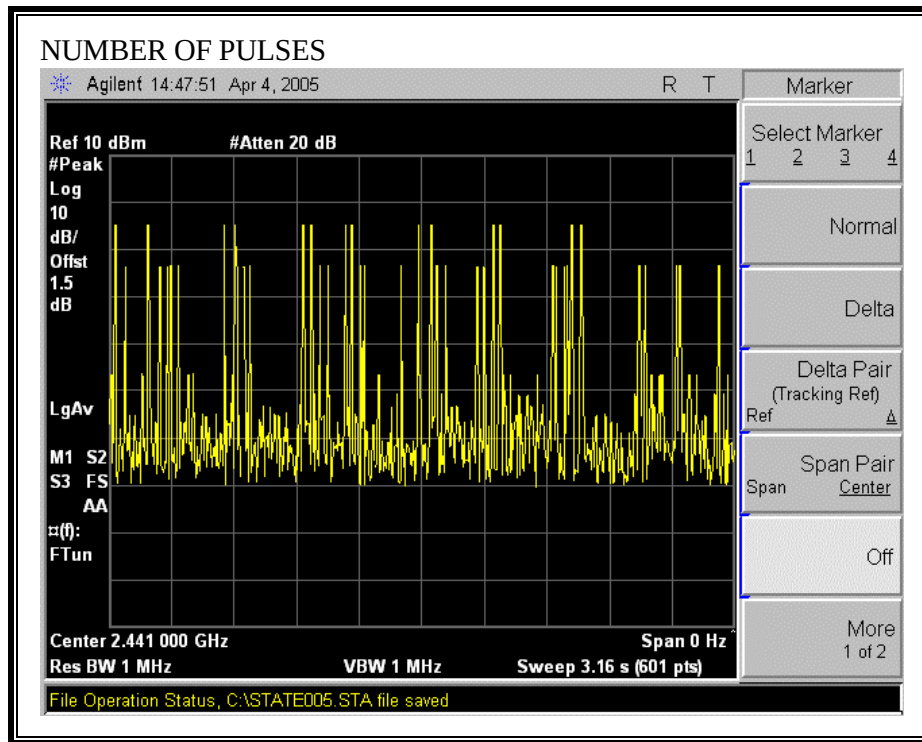


DH5 PACKET

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.1.5. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels: 1 watt.

§15.247 (b) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 0 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

The transmitter output is connected to a Peak Power Meter.

RESULTS

No non-compliance noted:

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	0.74	30	-29.26
Middle	2441	0.58	30	-29.42
High	2480	0.04	30	-29.96

7.1.6. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	0.51
Middle	2441	0.33
High	2480	-0.30

7.1.7. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

§15.247 (f) The digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

TEST PROCEDURE

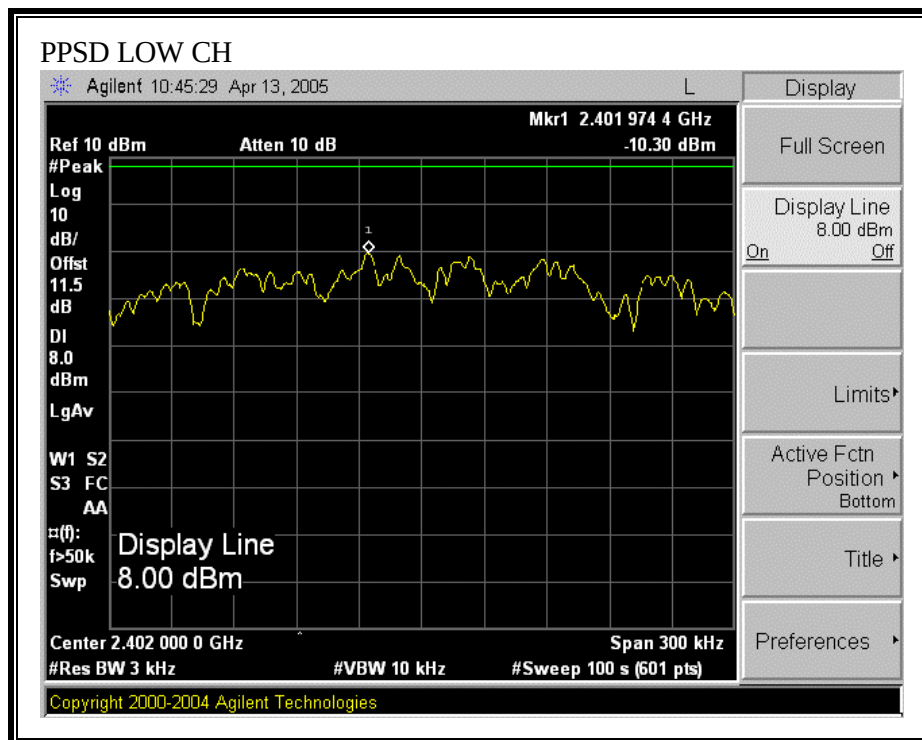
The transmitter output is connected to a spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

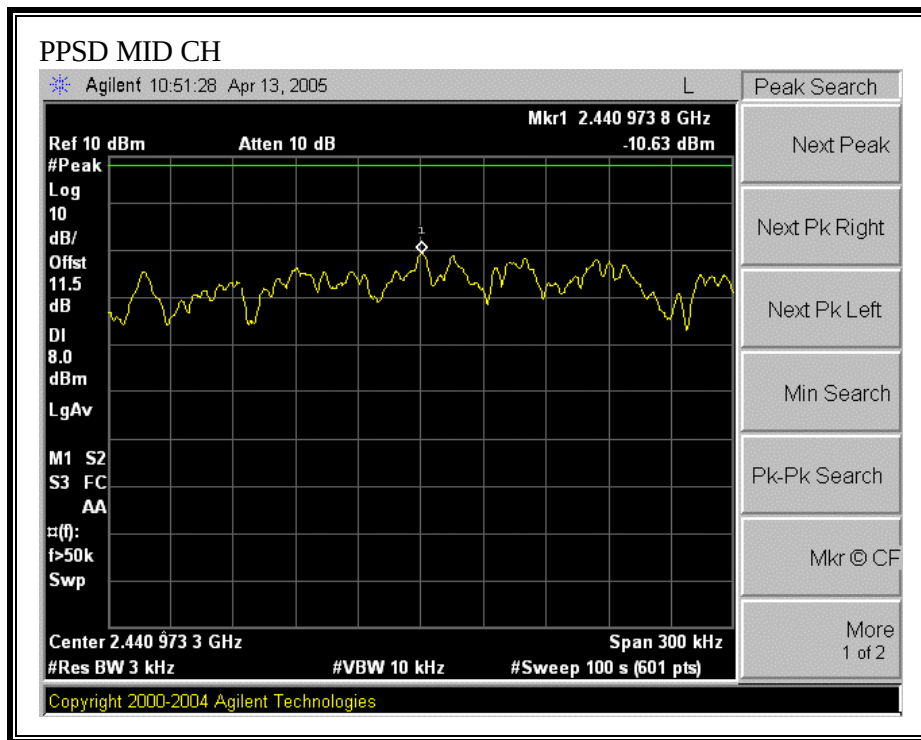
RESULTS

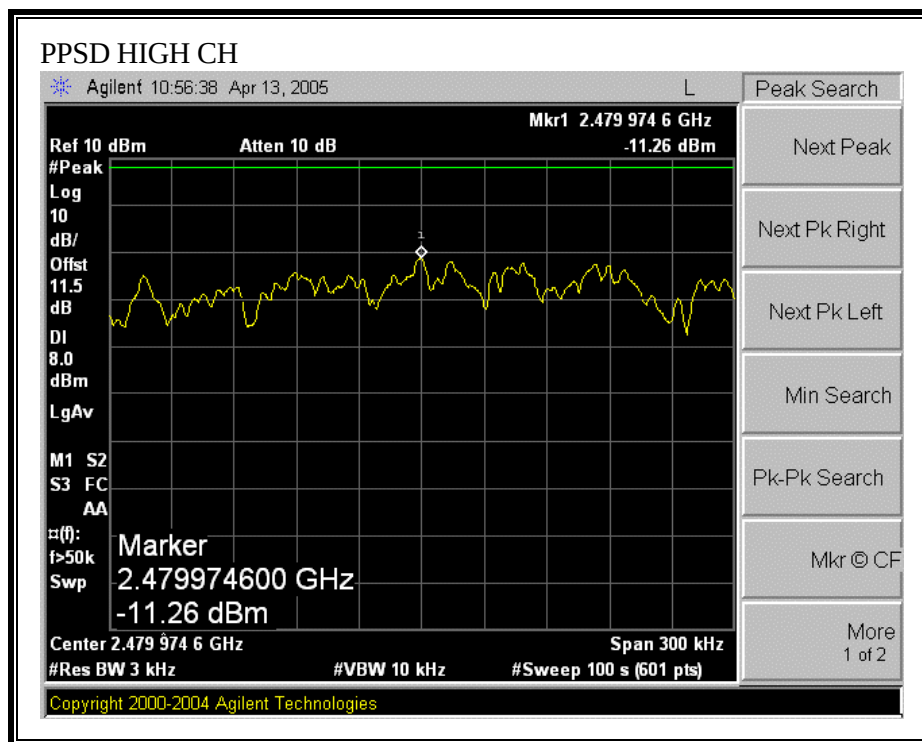
No non-compliance noted:

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-10.30	8	-18.30
Middle	2441	-10.63	8	-18.63
High	2480	-11.26	8	-19.26

PEAK POWER SPECTRAL DENSITY







7.1.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

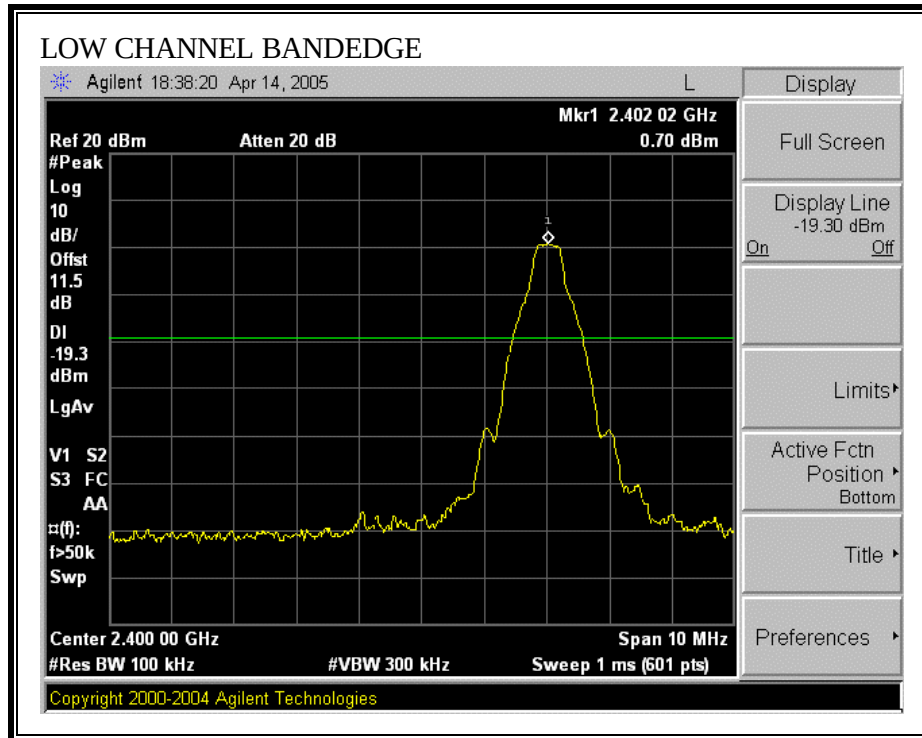
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

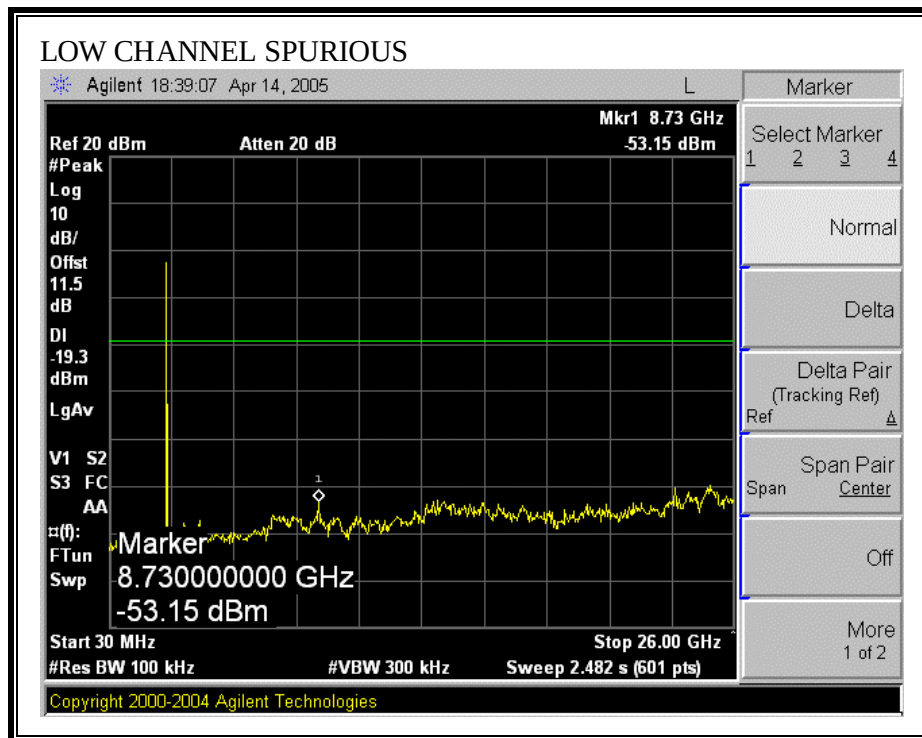
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

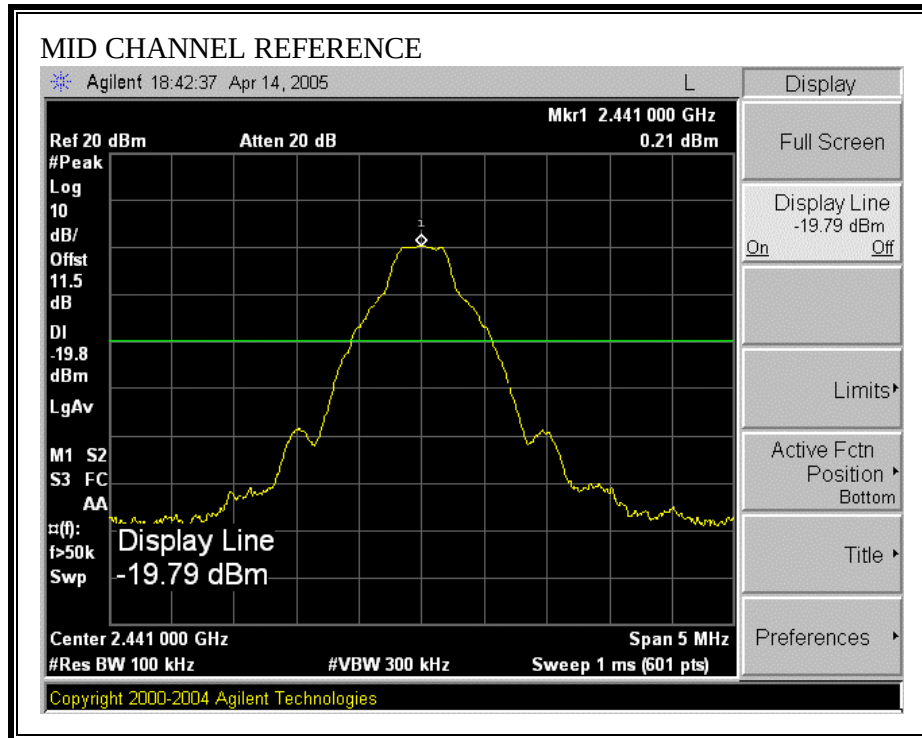
No non-compliance noted:

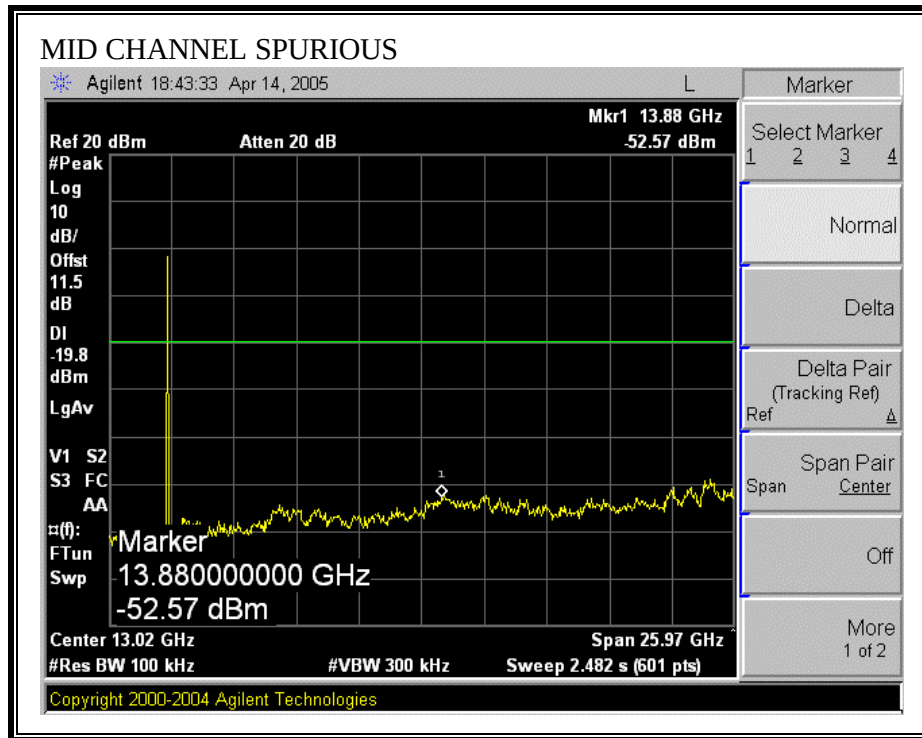
SPURIOUS EMISSIONS, LOW CHANNEL



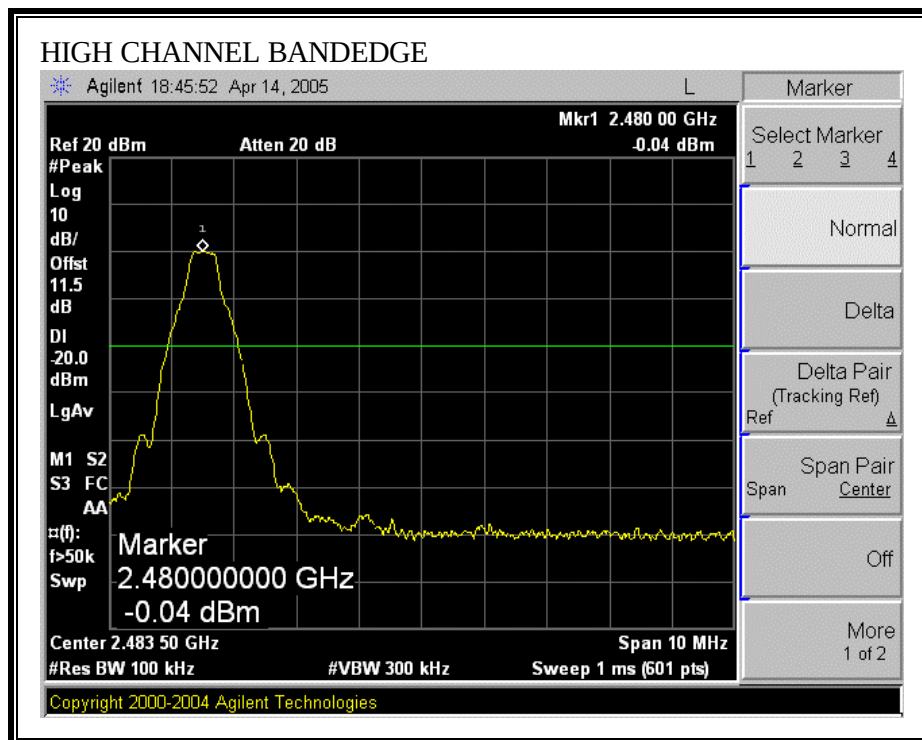


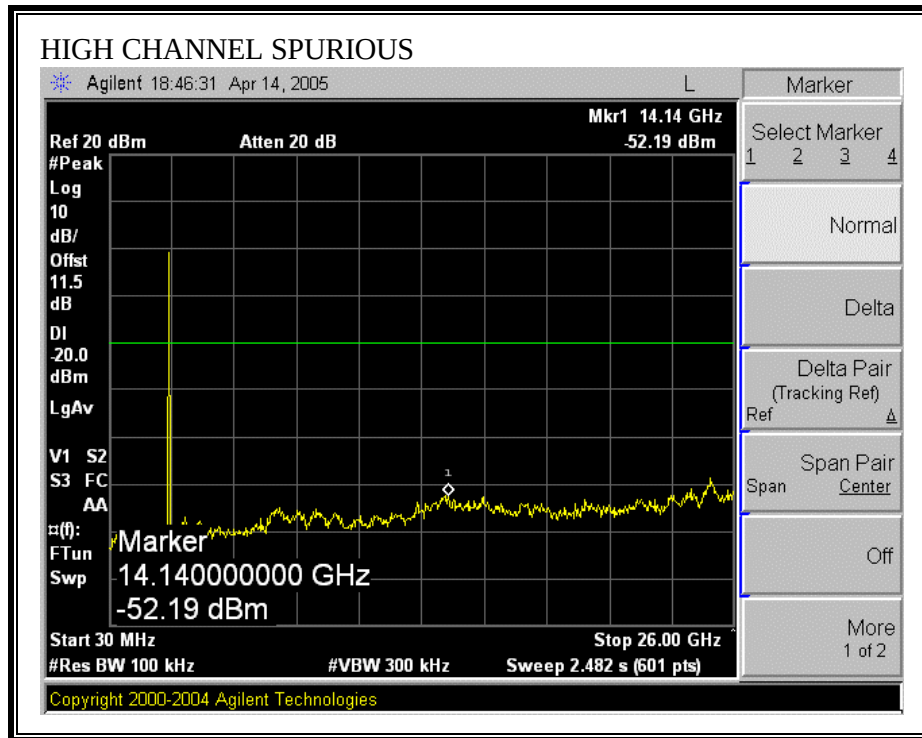
SPURIOUS EMISSIONS, MID CHANNEL



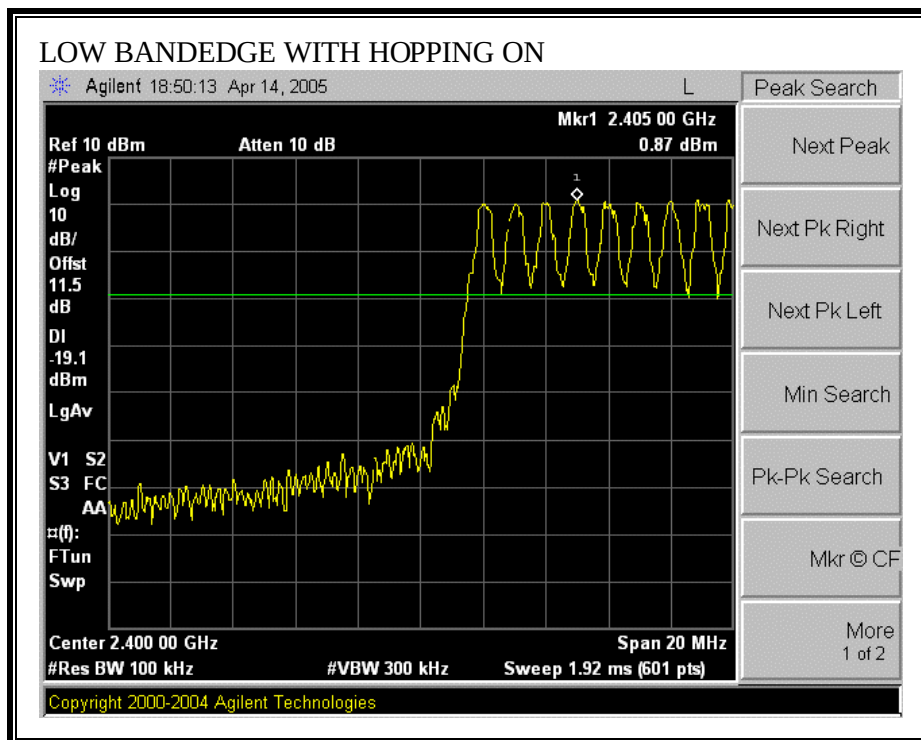


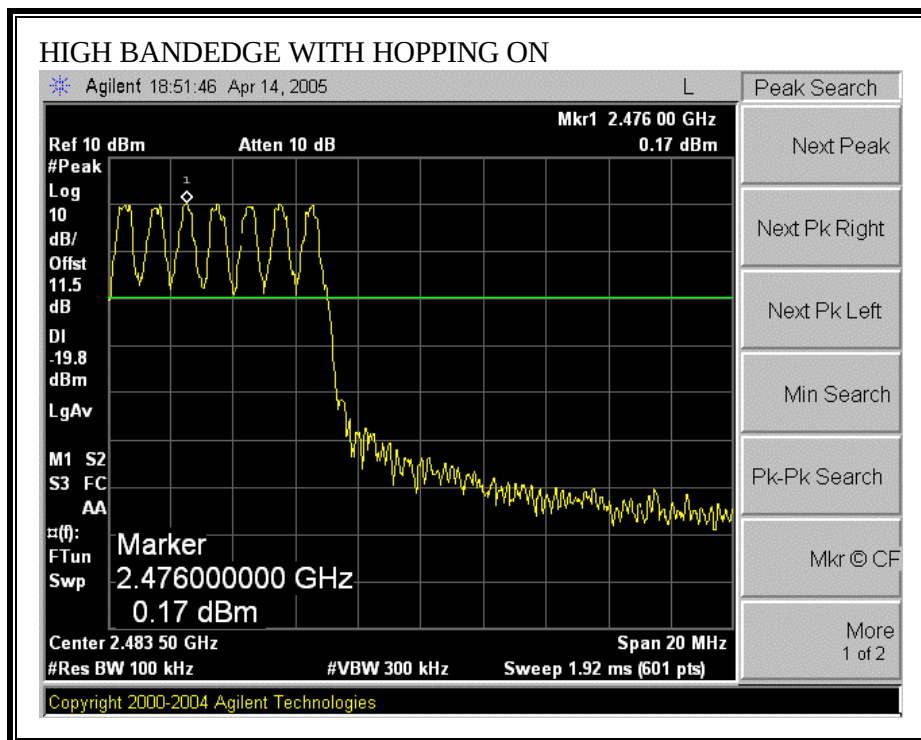
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON





7.2. RADIATED EMISSIONS ABOVE 1GHz

7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

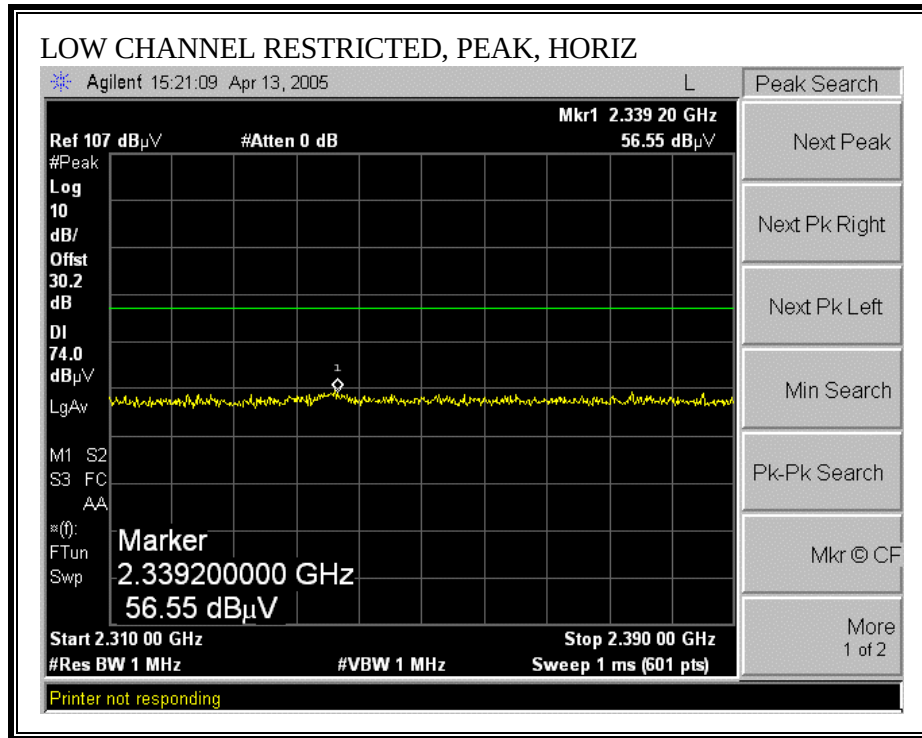
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

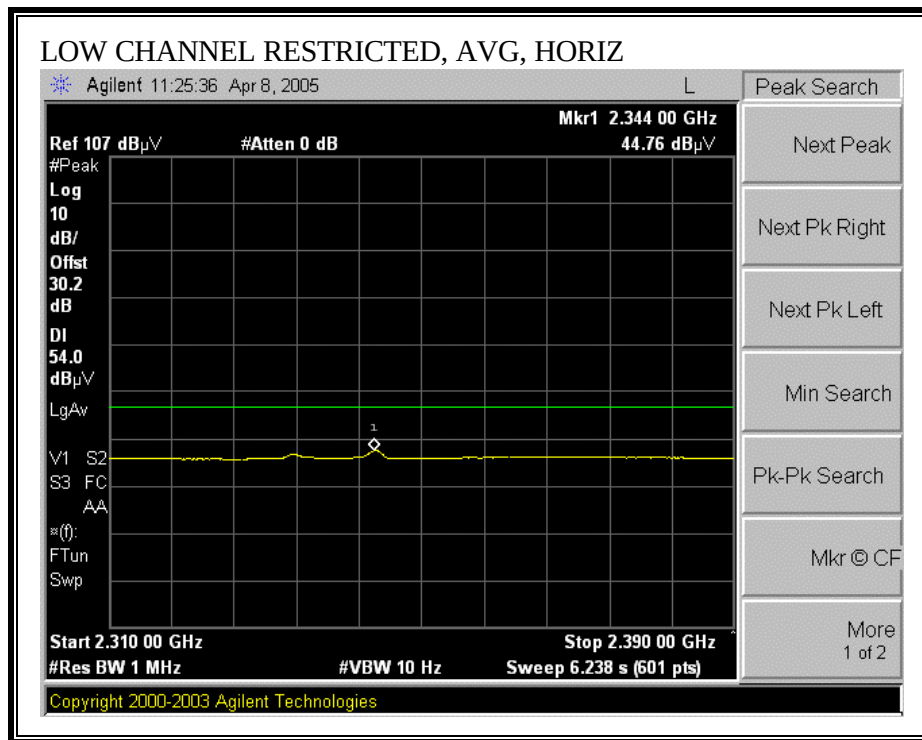
SUPPLEMENTAL TEST PROCEDURE FOR CO-LOCATED TRANSMITTERS

The dominant transmitter is set to the worst case channel. The spurious emissions performance of the dominant transmitter is investigated as the settings of the non-dominant transmitter are varied. The spectrum is searched for intermodulation products. Worst-case results are reported.

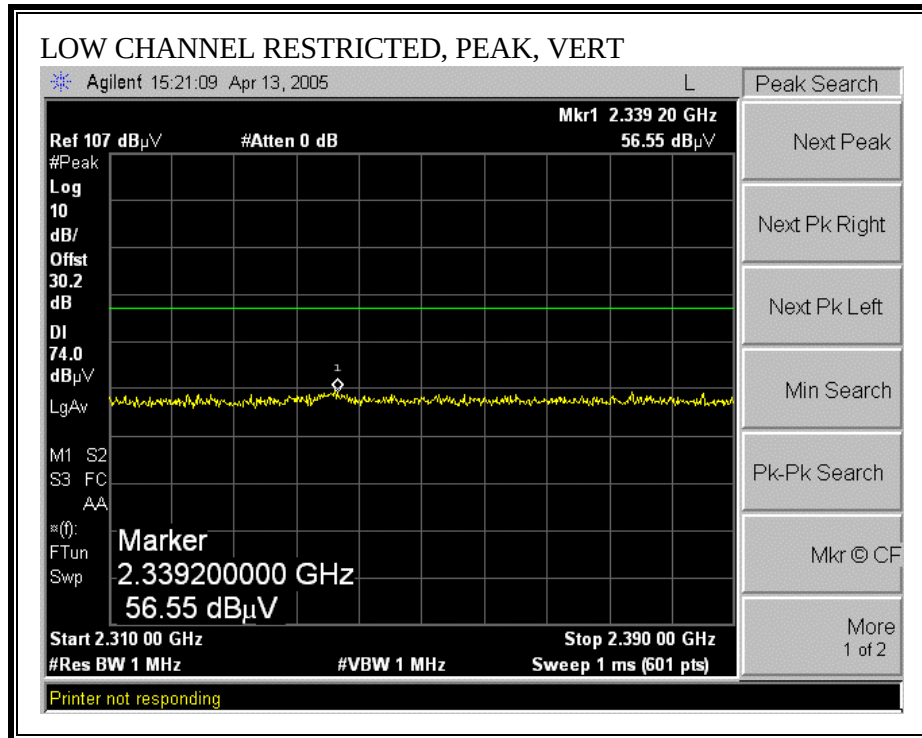
7.2.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ

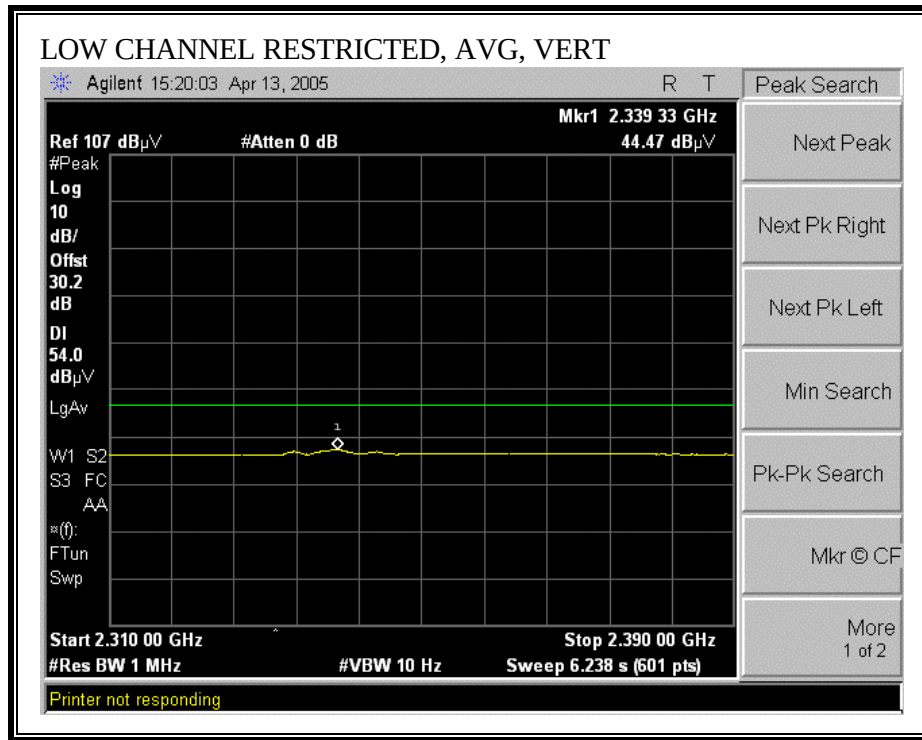
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



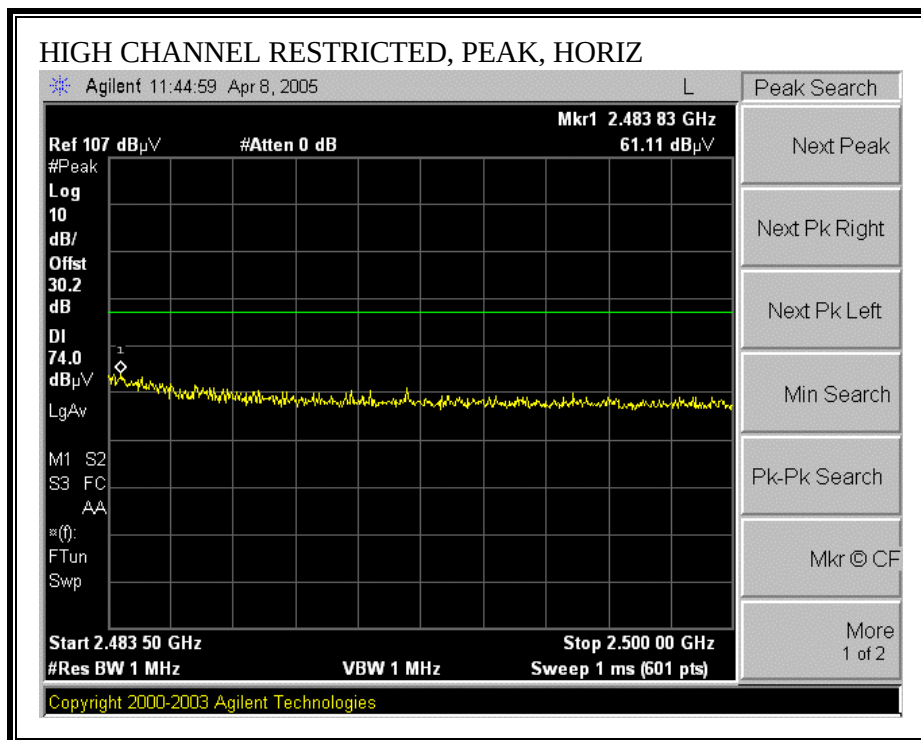


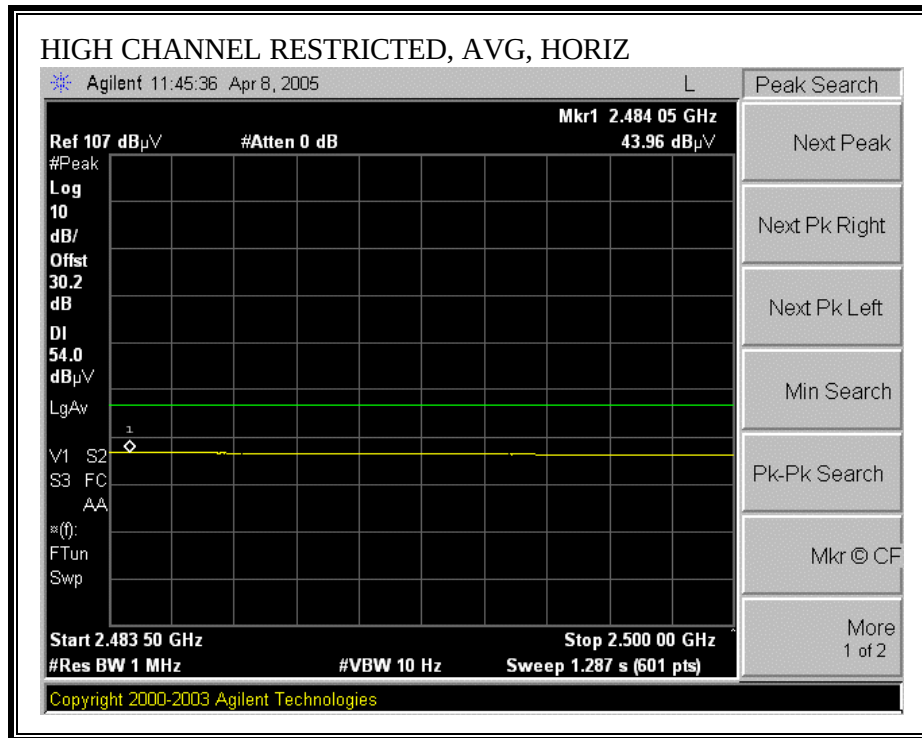
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



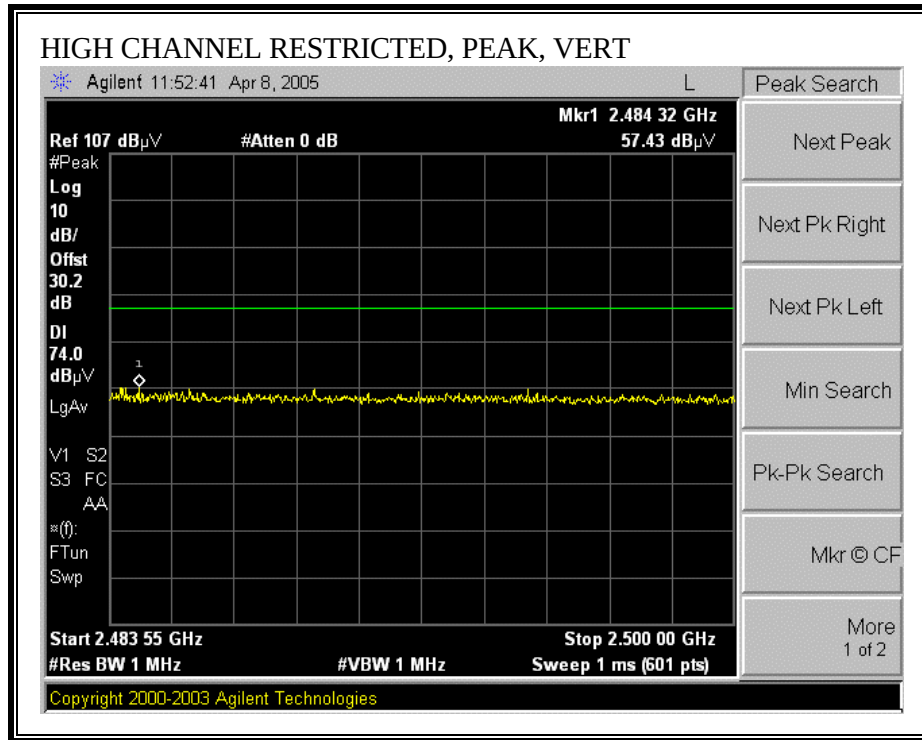


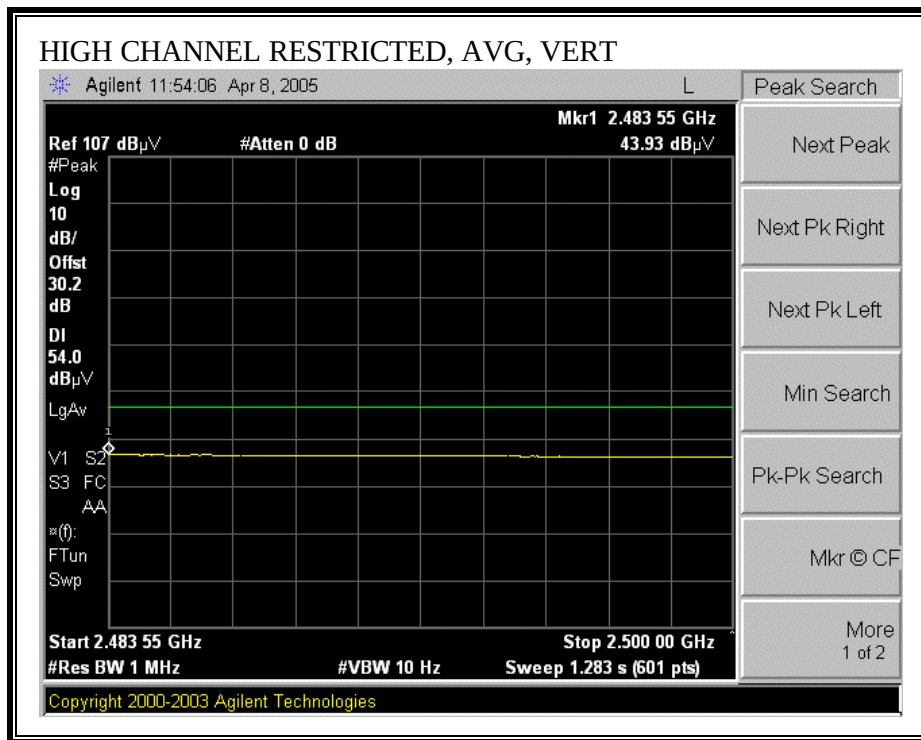
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

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

Test Engr: Chin Pang
Project #: 05T3291-2
Company: High Tech Computer, Corp
EUT Descr: PDA Phone
EUT M/N: PA10A
Test Target: FCC 15.247
Mode Oper: TX, Bluetooth
Average Power Meter: Low = -0.5 dBm, Mid = 0.0 dBm, High = -0.3 dBm

Test Equipment:

EMCO Horn 1-18GHz
T73; S/N: 6717 @3m

Pre-amplifier 1-26GHz
T63 Miniq 646456

Pre-amplifier 26-40GHz

Horn > 18GHz

Limit
FCC 15.205

Hi Frequency Cables

2 foot cable

3 foot cable

4 foot cable
4_Vna

12 foot cable
12_Neckish

HPF
HPF_4.0GHz

Reject Filter

Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz, VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Flt dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
low ch															
4.804	3.0	49.0	36.2	32.9	3.9	-37.9	0.0	0.6	48.4	35.6	74	54	-25.6	-18.4	V
4.804	3.0	49.5	36.3	32.9	3.9	-37.9	0.0	0.6	48.9	35.7	74	54	-25.1	-18.3	H
mid ch															
4.882	3.0	49.0	36.3	32.9	3.9	-37.9	0.0	0.6	48.6	35.9	74	54	-25.4	-18.1	V
7.323	3.0	49.5	37.2	35.9	4.7	-36.9	0.0	0.6	53.8	41.5	74	54	-20.2	-12.5	V
4.882	3.0	49.4	36.7	32.9	3.9	-37.9	0.0	0.6	49.0	36.3	74	54	-25.0	-17.7	H
7.323	3.0	50.3	37.4	35.9	4.7	-36.9	0.0	0.6	54.6	41.7	74	54	-19.4	-12.3	H
high ch															
4.960	3.0	50.5	37.0	33.0	4.0	-37.9	0.0	0.6	50.2	36.7	74	54	-23.8	-17.3	V
7.440	3.0	50.0	37.6	36.1	4.7	-36.8	0.0	0.6	54.6	42.2	74	54	-19.4	-11.8	V
4.960	3.0	49.7	36.8	33.0	4.0	-37.9	0.0	0.6	49.4	36.5	74	54	-24.6	-17.5	H
7.440	3.0	49.6	37.4	36.1	4.7	-36.8	0.0	0.6	54.2	42.0	74	54	-19.8	-12.0	H

Note: No other emissions were detected above the system noise floor.

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Page 57 of 105

COMPLIANCE CERTIFICATION SERVICES
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TEL: (408) 463-0885 FAX: (408) 463-0888

7.2.3. CO-LOCATED TRANSMITTER RADIATED EMISSIONS

RESULTS

Worst-case configurations are determined as:

Lower bandedge: BT at low channel and CDMA 800MHz at low channel;

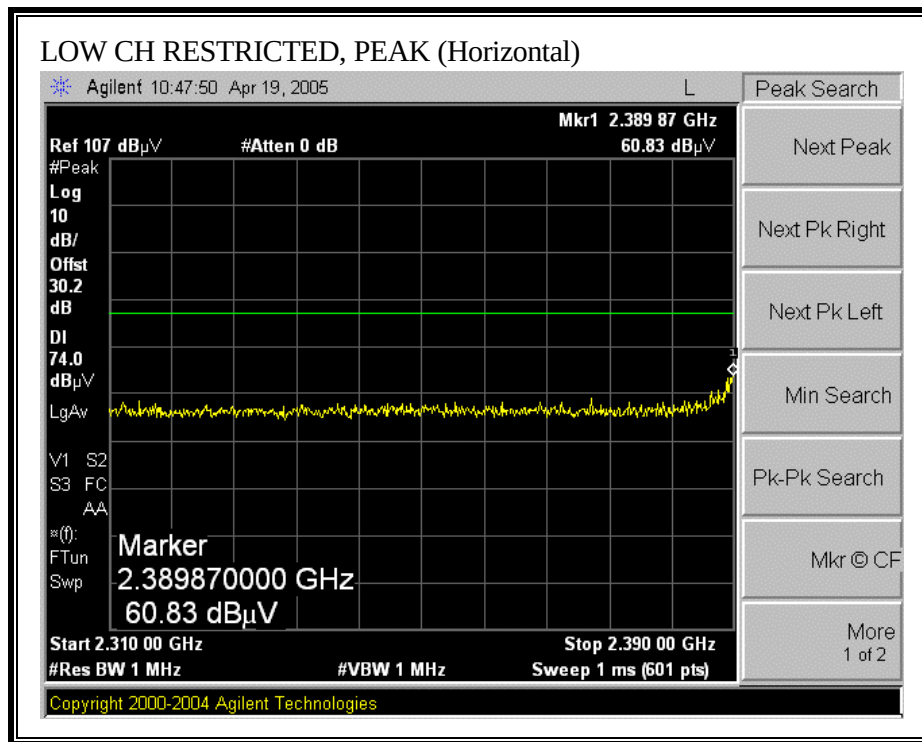
Upper bandedge: BT at high channel and CDMA 800MHz at high channel;

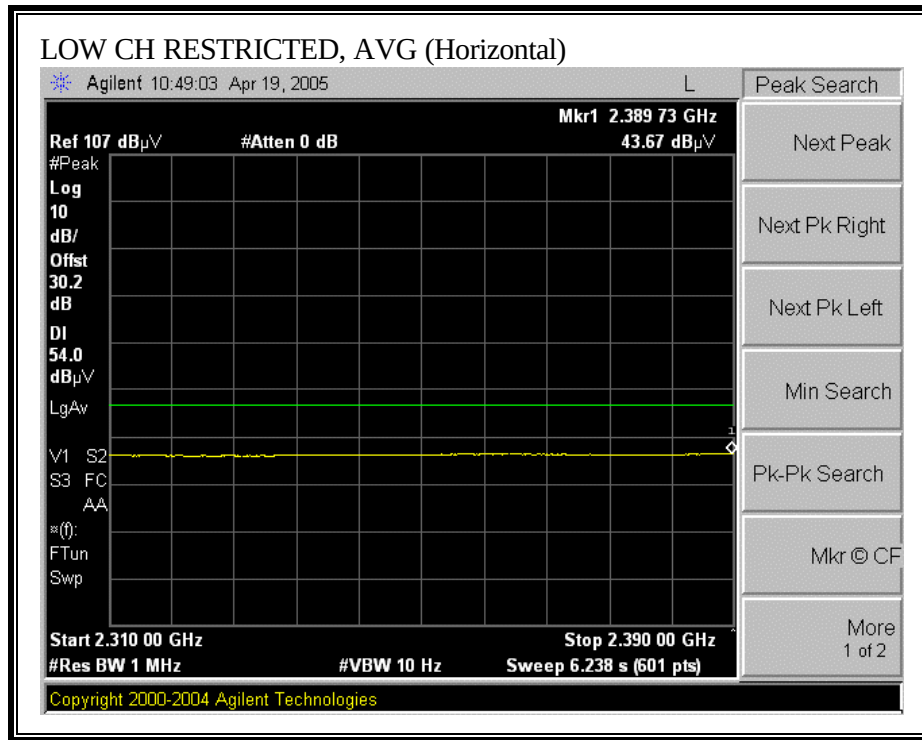
Harmonics and spurious emissions: BT at mid channel and CDMA 800MHz at mid channel

No non-compliance noted:

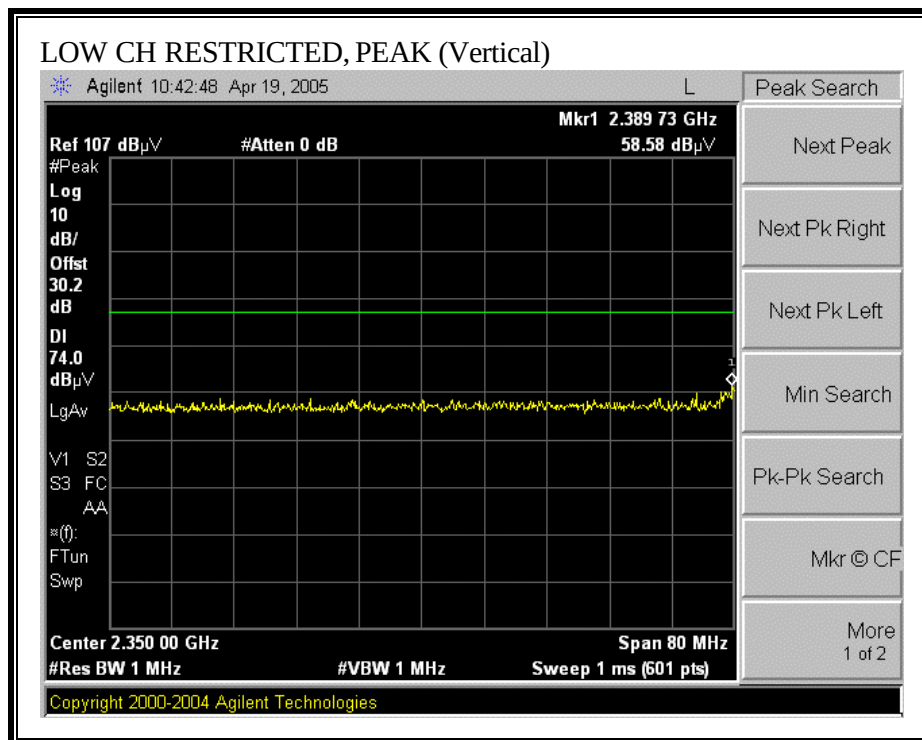
The dominant transmitter is the BT, and the non-dominant transmitter is CDMA 800MHz.

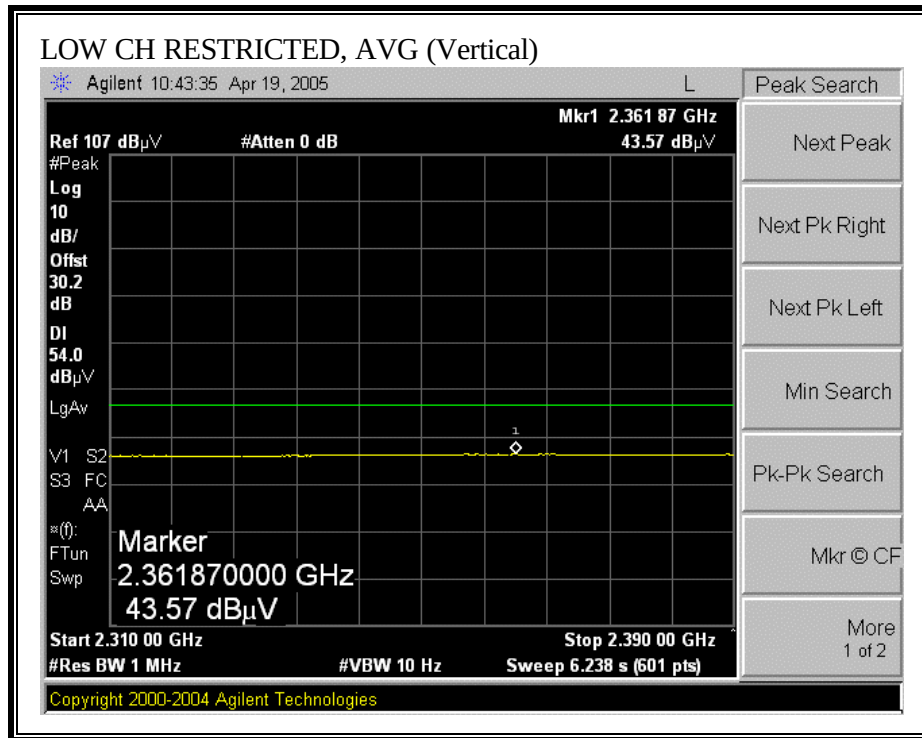
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



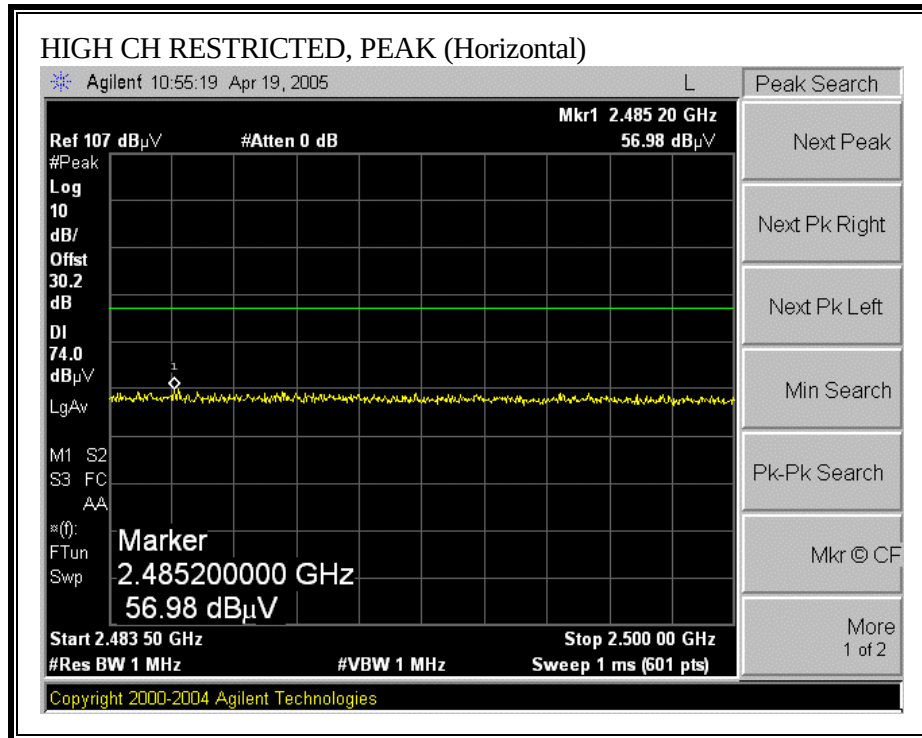


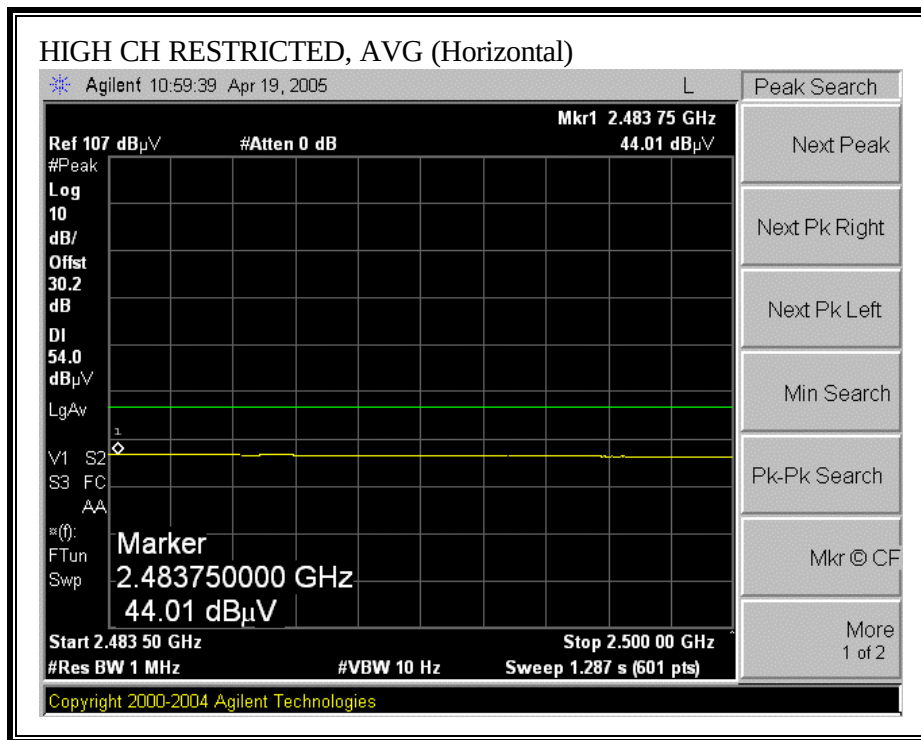
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



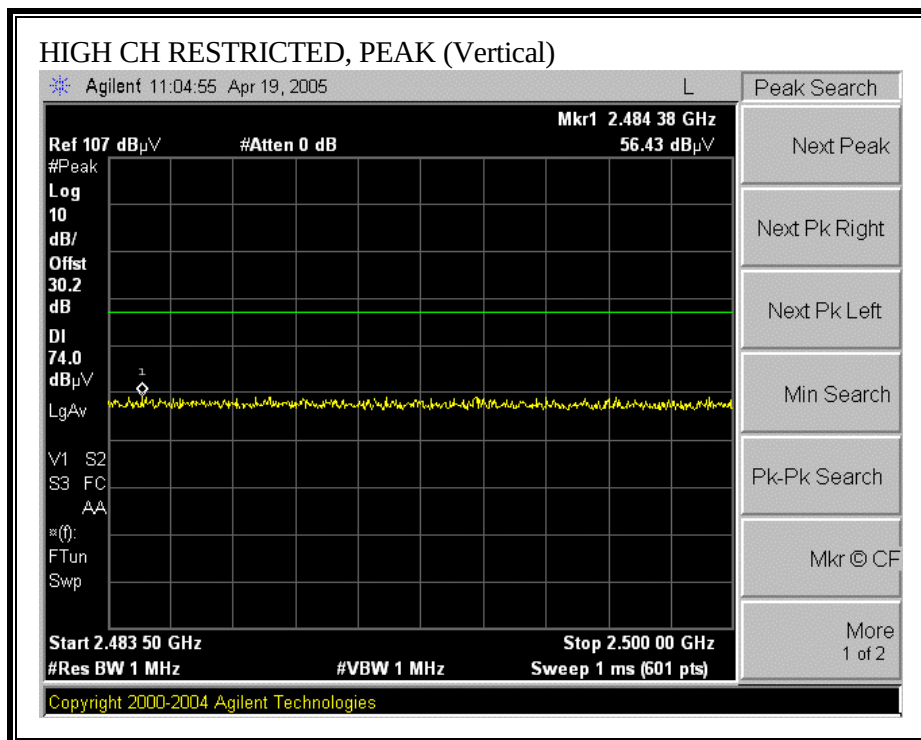


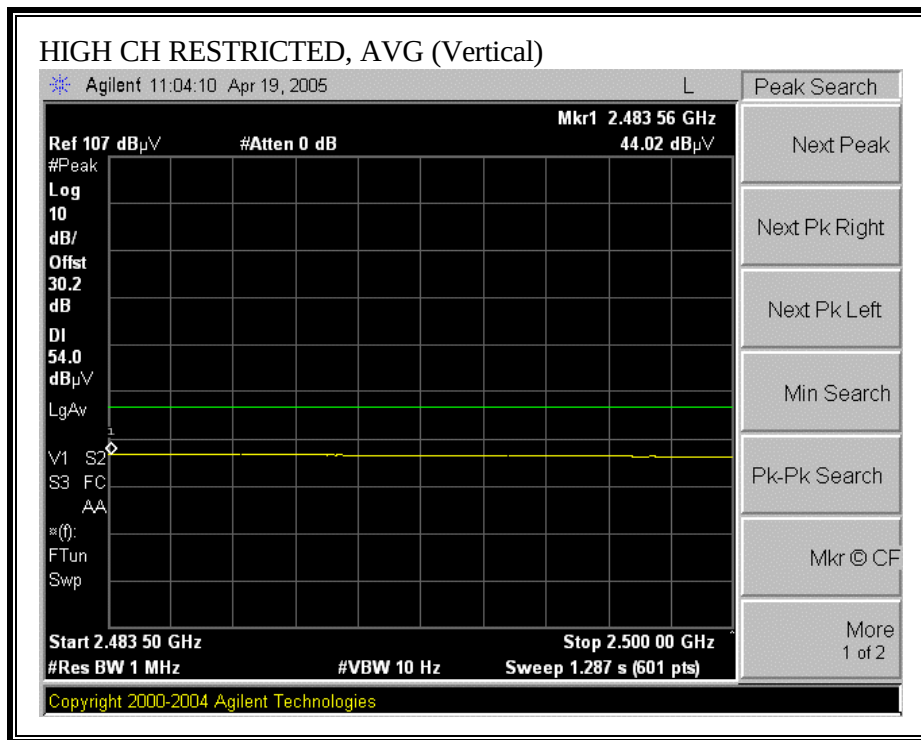
WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





WORST-CASE HARMONICS AND SPURIOUS EMISSIONS

04/19/05 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Eng: Chin Pang
Project #: 05T3291-4
Company: High Tech Computer
EUT Descr: PDA Phone
EUT M/N: PA10A
Test Target: FCC 15.247
Mode Oper: Co-Location, TX Dominant is BT and non-dominant is CDMA 800MHz
Average Power Meter: Low = 0.5dBm, Mid = 0.3dBm, High = 0 dBm

Test Equipment:

EMCO Horn 1-18GHz
T73; S/N: 6717 @3m

Pre-amplifier 1-26GHz
T86 Miniq 924341

Pre-amplifier 26-40GHz

Horn > 18GHz

Limit
FCC 15.205

H Frequency Cables

2 foot cable

3 foot cable

4 foot cable
4_View

12 foot cable
12_Neckash

HPF

Reject Filter

HPF_4.0GHz

Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
m4 ch															
4.882	3.0	52.3	39.8	32.9	3.9	-44.1	0.0	0.6	45.7	33.2	74	54	-28.3	-20.8	V
7.323	3.0	52.0	39.7	32.9	4.7	-44.7	0.0	0.6	45.5	36.2	74	54	-25.5	-17.8	V
4.882	3.0	52.5	40.0	32.9	3.9	-44.1	0.0	0.6	45.9	33.4	74	54	-28.1	-20.6	H
7.323	3.0	52.4	39.9	32.9	4.7	-44.7	0.0	0.6	45.9	36.4	74	54	-25.1	-17.6	H
Note: No other emissions were detected above the system noise floor.															

f Measurement Frequency
Dist Distance to Antenna
Read Analyzer Reading
AF Antenna Factor
CL Cable Loss

Amp Preamp Gain
D Corr Distance Correct to 3 meters
Avg Average Field Strength @ 3 m
Peak Calculated Peak Field Strength
HPF High Pass Filter

Avg Lim Average Field Strength Limit
Pk Lim Peak Field Strength Limit
Avg Mar Margin vs. Average Limit
Pk Mar Margin vs. Peak Limit

Page 66 of 105

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TEL: (408) 463-0885 FAX: (408) 463-0888

RESULTS

Worst-case configurations are determined as:

Lower bandedge: BT at low channel and CDMA 1900MHz at low channel;

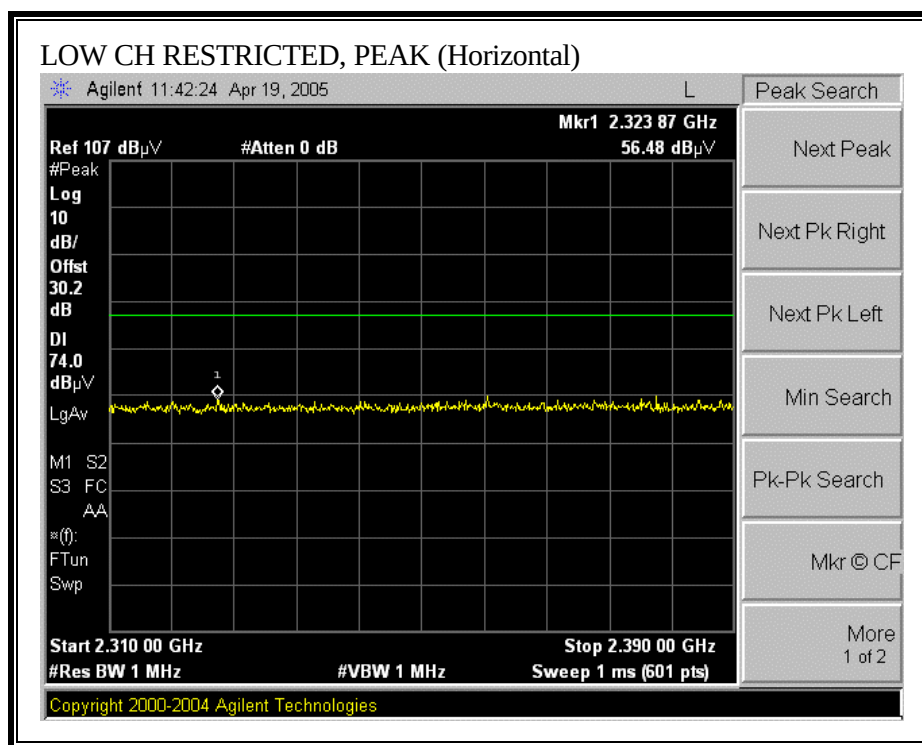
Upper bandedge: BT at high channel and CDMA 1900MHz at high channel;

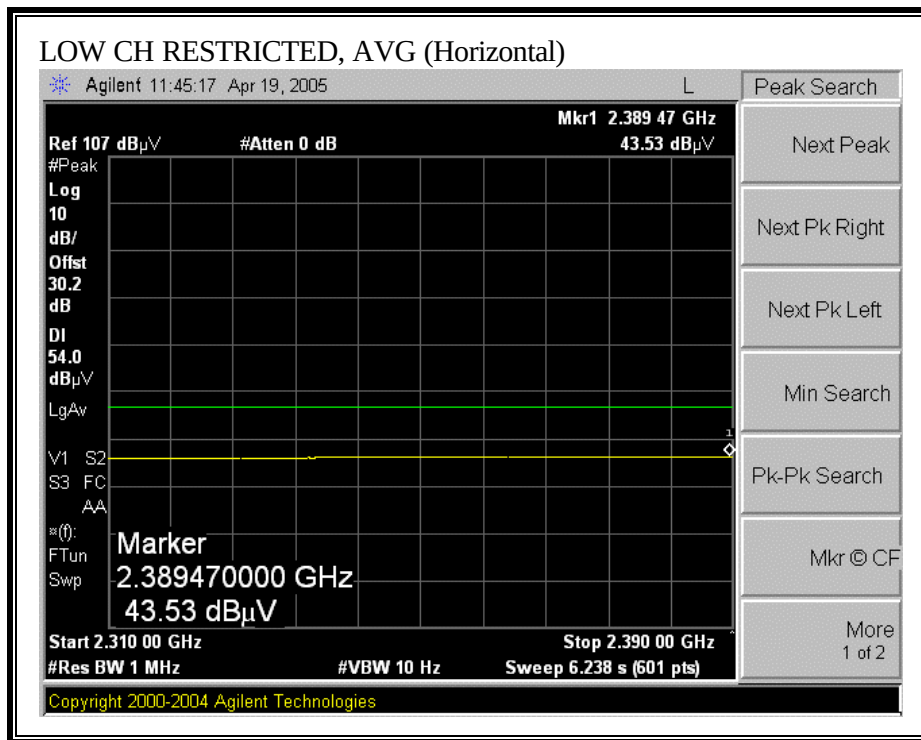
Harmonics and spurious emissions: BT at mid channel and CDMA 1900MHz at mid channel

No non-compliance noted:

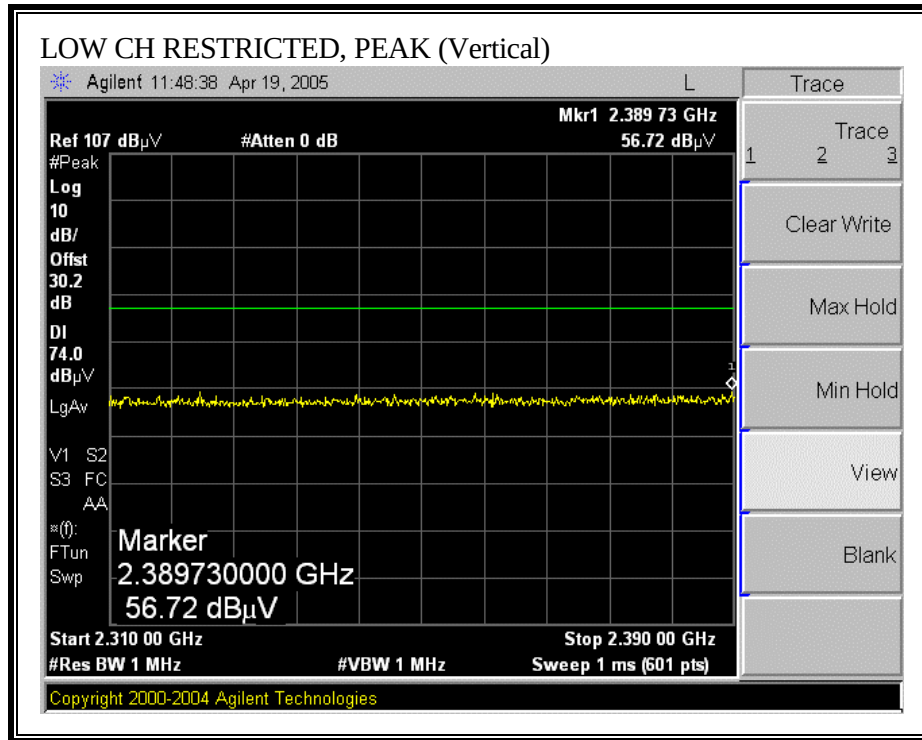
The dominant transmitter is the BT, and the non-dominant transmitter is CDMA 1900MHz.

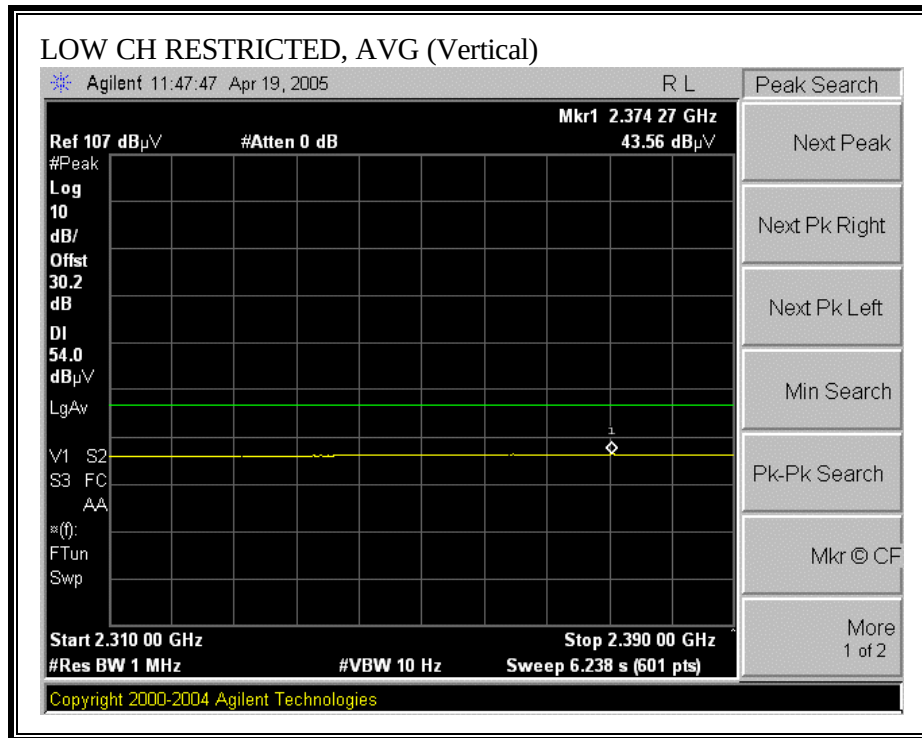
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



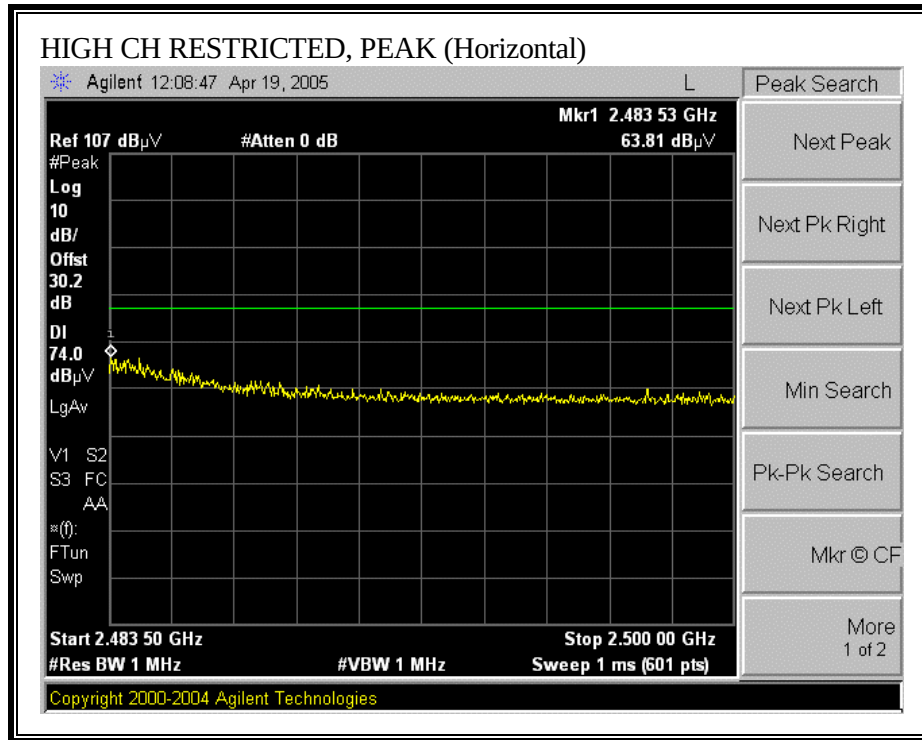


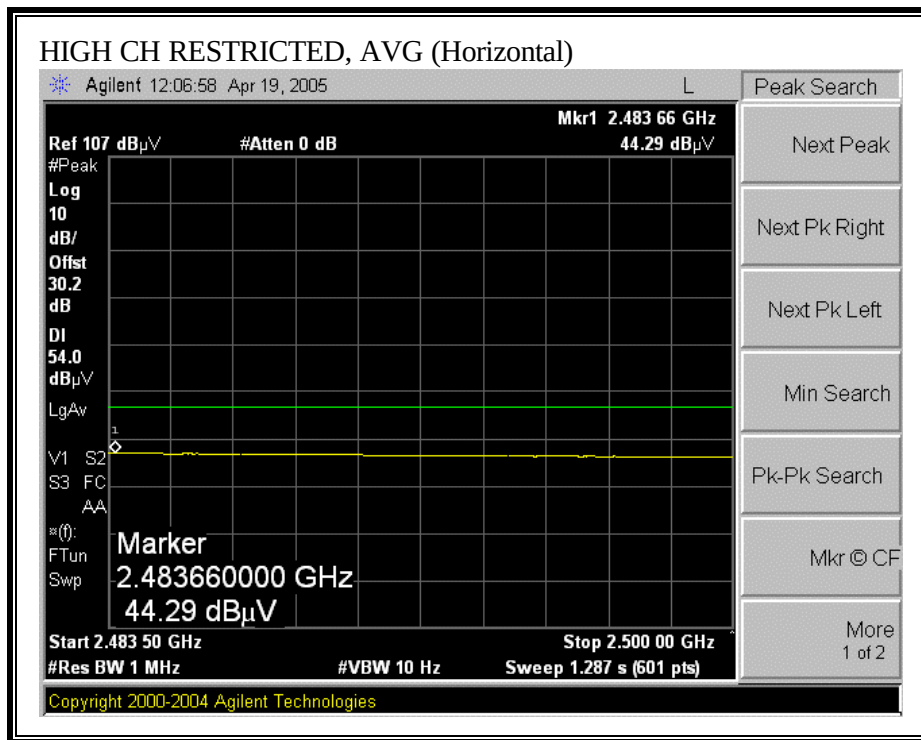
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



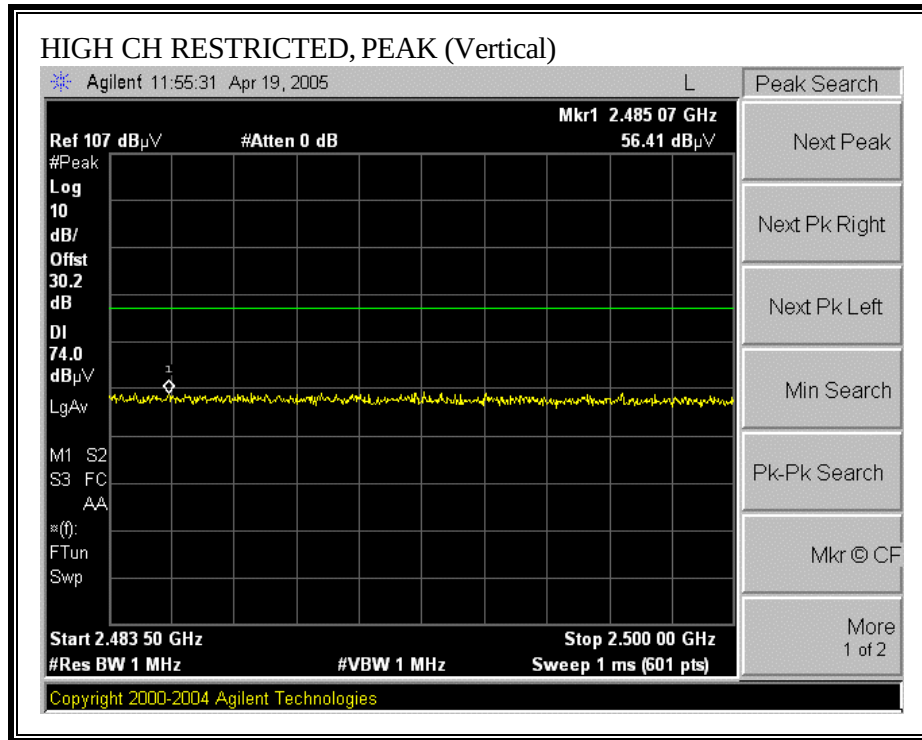


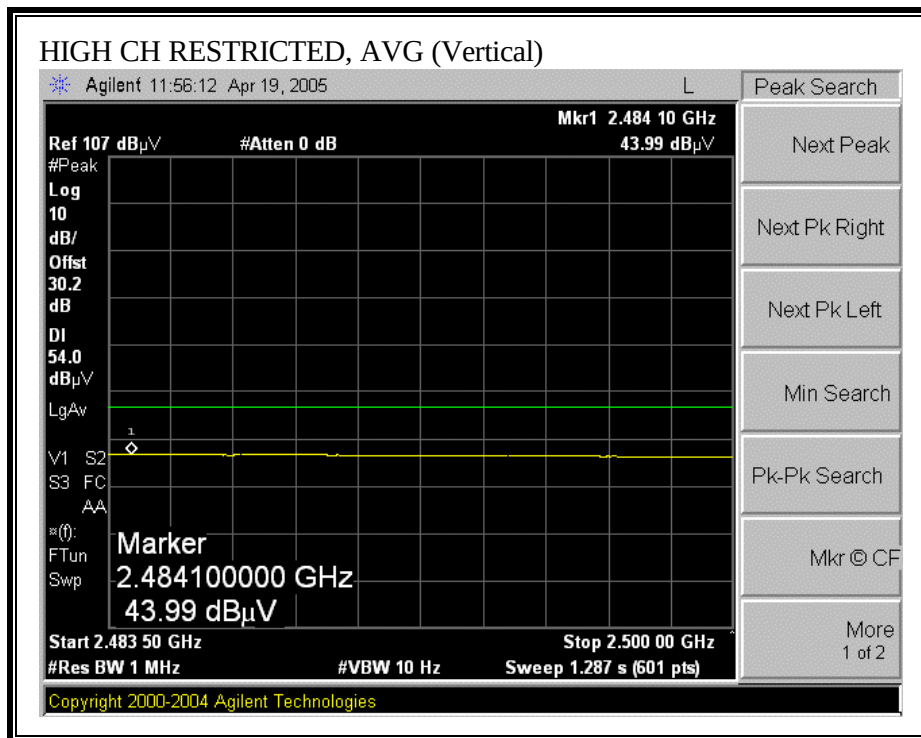
WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





7.3. RADIATED EMISSIONS BELOW 1 GHz

7.3.1. WORST-CASE RADIATED EMISSIONS (TX MODE)

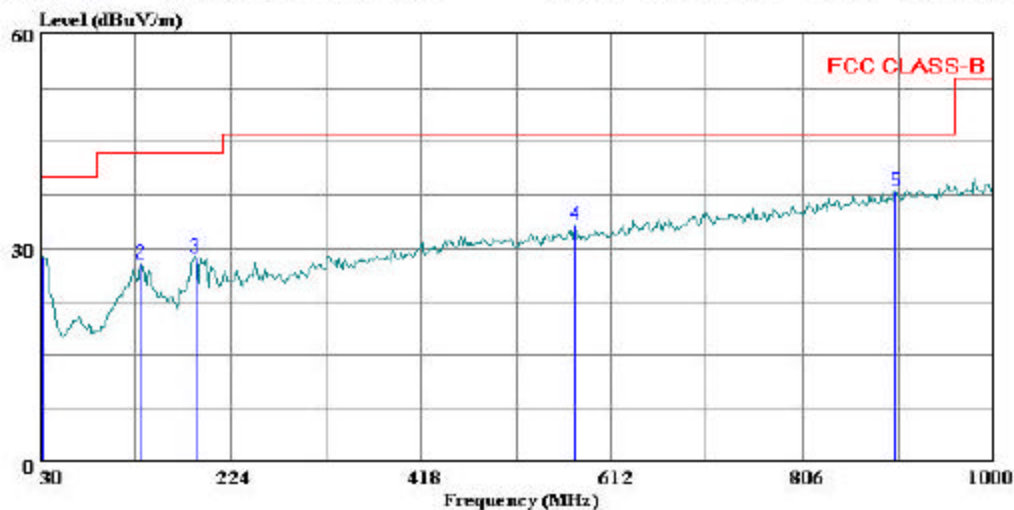
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

Data#: 22 File#: Htc 3291.emi Date: 04-05-2005 Time: 21:12:15



(Auxiliary ATC)

Trace: 21

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin Pang
Project #: : 05T3291-1
Company: : High Tech Computer
EUT: : PDA Phone
Model No : PA10A
Configuration: : EUT/AC Adapter
Target of Test: : FCC Class B
Mode of Operation: TX, Bluetooth , Mid Ch

HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	32.910	8.88	19.94	28.82	40.00	-11.18	Peak
2	133.790	12.80	15.02	27.82	43.50	-15.68	Peak
3	189.080	15.81	12.93	28.74	43.50	-14.76	Peak
4	575.140	11.94	21.20	33.14	46.00	-12.86	Peak
5	900.090	12.18	25.88	38.06	46.00	-7.94	Peak

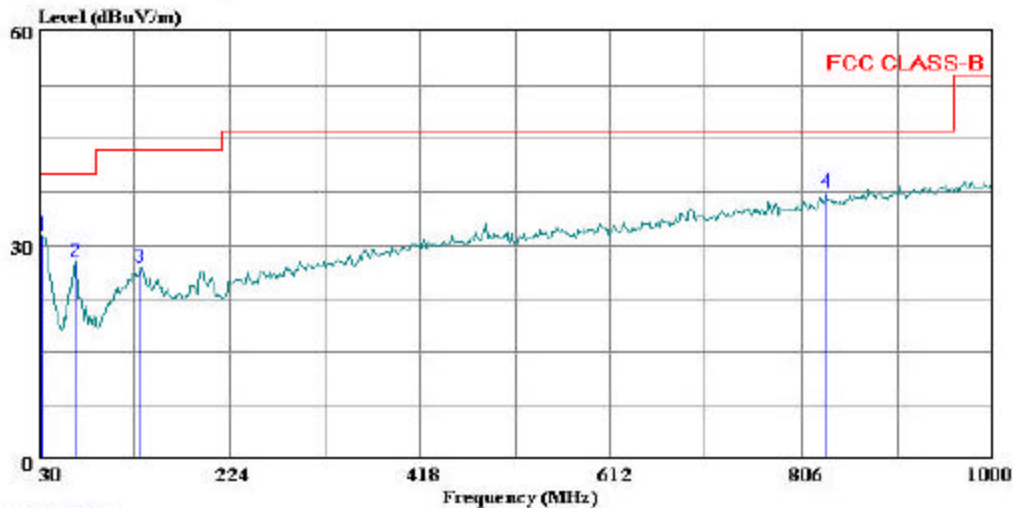
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



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

Data#: 20 File#: Htc 3291.emi Date: 04-05-2005 Time: 21:09:31



(Auxiliary ATC)

Trace: 19

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin Pang
Project #: : 05T3291-1
Company: : High Tech Computer
EUT: : PDA Phone
Model No : PA10A
Configuration: : EUT/AC Adapter
Target of Test: : FCC Class B
Mode of Operation: TX, Bluetooth , Mid Ch

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	12.25	19.05	31.30	40.00	-8.70	Peak
2	66.860	18.38	9.15	27.53	40.00	-12.47	Peak
3	133.790	11.85	15.02	26.87	43.50	-16.63	Peak
4	829.280	12.41	24.92	37.33	46.00	-8.67	Peak

7.3.2. WORST-CASE RADIATED EMISSIONS (DIGITAL MODE)

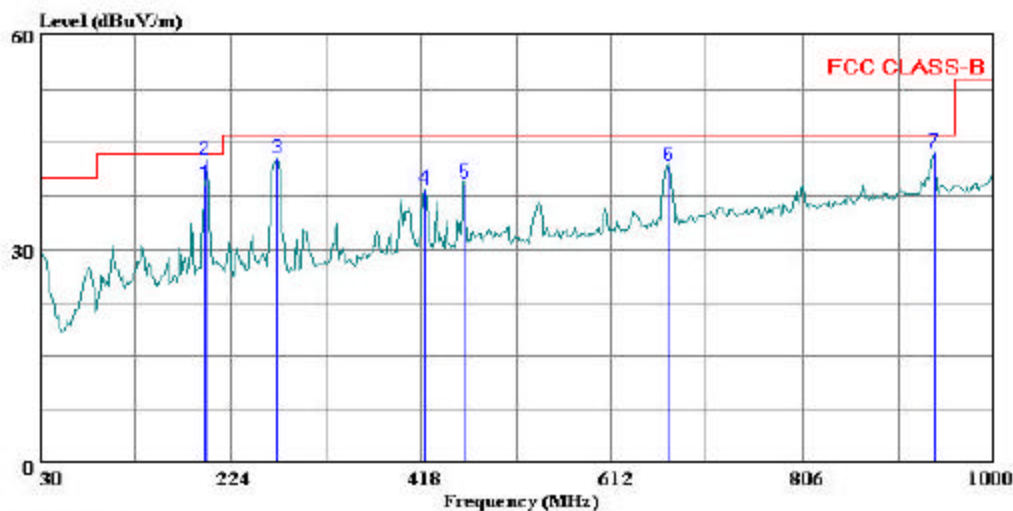
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

Data#: 14 File#: Htc.emi Date: 04-22-2005 Time: 11:06:33



(Aux1x ATC)

Trace: 11

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL

Test Operator: : Chin Pang

Project #: : 05T3291-1

Company: : High Tech Computer

EUT: : PDA Phone with Cradle

Model No : PA10A

Configuration: : EUT/Laptop/Printer/Modem/Mouse

Target of Test: : FCC Class B

Mode of Operation: Link to Laptop

HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	198.170	24.87	14.24	39.11	43.50	-4.39	QP
2	198.780	28.17	14.37	42.54	43.50	-0.96	Peak
3	271.530	28.14	14.65	42.79	46.00	-3.21	Peak
4	421.880	19.80	18.58	38.38	46.00	-7.62	Peak
5	463.590	19.84	19.50	39.34	46.00	-6.66	Peak
6	670.200	19.14	22.66	41.80	46.00	-4.20	Peak
7	938.890	17.14	26.43	43.57	46.00	-2.43	Peak

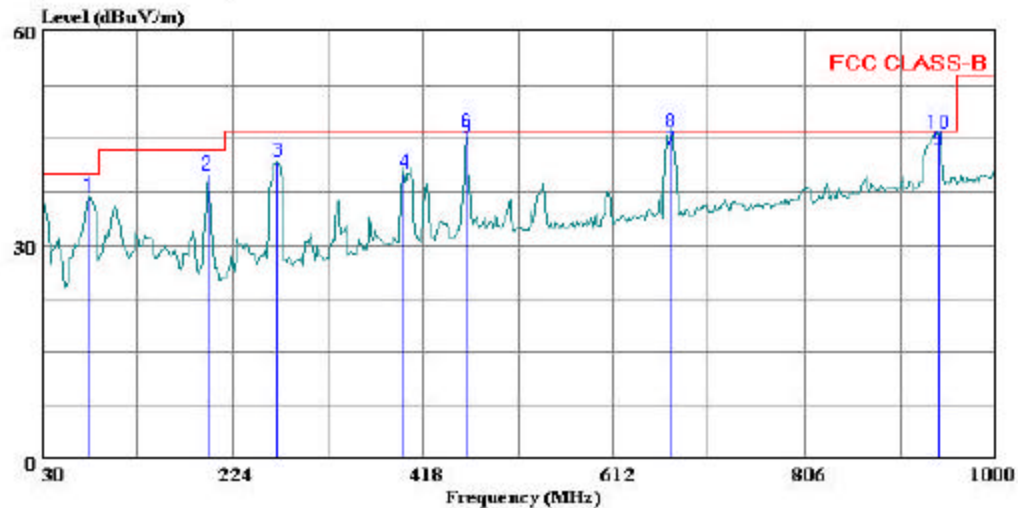
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



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

Data#: 10 File#: Htc.emi Date: 04-22-2005 Time: 10:48:00



(Auxiliary ATC)

Trace: 7

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin Pang
Project #: : 05T3291-1
Company: : High Tech Computer
EUT: : PDA Phone with Cradle
Model No : PA10A
Configuration: : EUT/Laptop/Printer/Modem/Mouse
Target of Test: : FCC Class B
Mode of Operation: Link to Laptop

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	78.500	27.87	8.95	36.83	40.00	-3.17	Peak
2	198.780	25.41	14.37	39.78	43.50	-3.72	Peak
3	269.590	27.04	14.61	41.65	46.00	-4.35	Peak
4	398.600	22.16	18.01	40.17	46.00	-5.83	Peak
5	463.590	25.60	19.49	45.09	46.00	-0.91	QP
6	463.590	26.31	19.50	45.81	46.00	-0.19	Peak
7	671.170	20.71	22.66	43.37	46.00	-2.63	QP
8	671.170	23.29	22.67	45.95	46.00	-0.05	Peak
9	941.800	17.05	26.43	43.48	46.00	-2.52	QP
10	941.800	19.16	26.43	45.60	46.00	-0.40	Peak

7.4. POWERLINE CONDUCTED EMISSIONS

LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator 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 μ H/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 boundary between the frequency ranges.

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

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

No non-compliance noted:

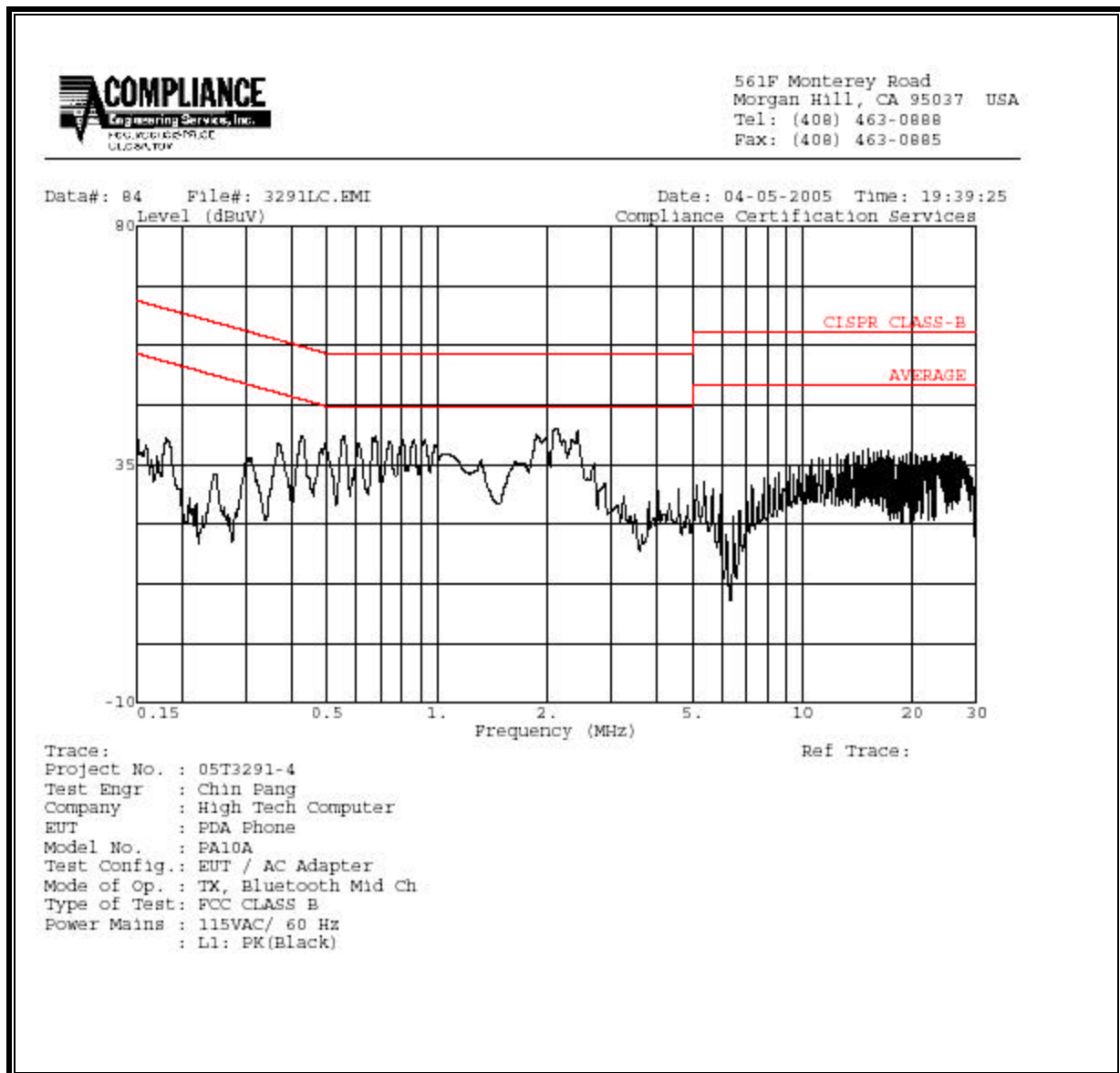
7.4.1. WORST-CASE LINE CONDUCTED EMISSIONS (TX MODE)

EUT AND AC ADAPTER:

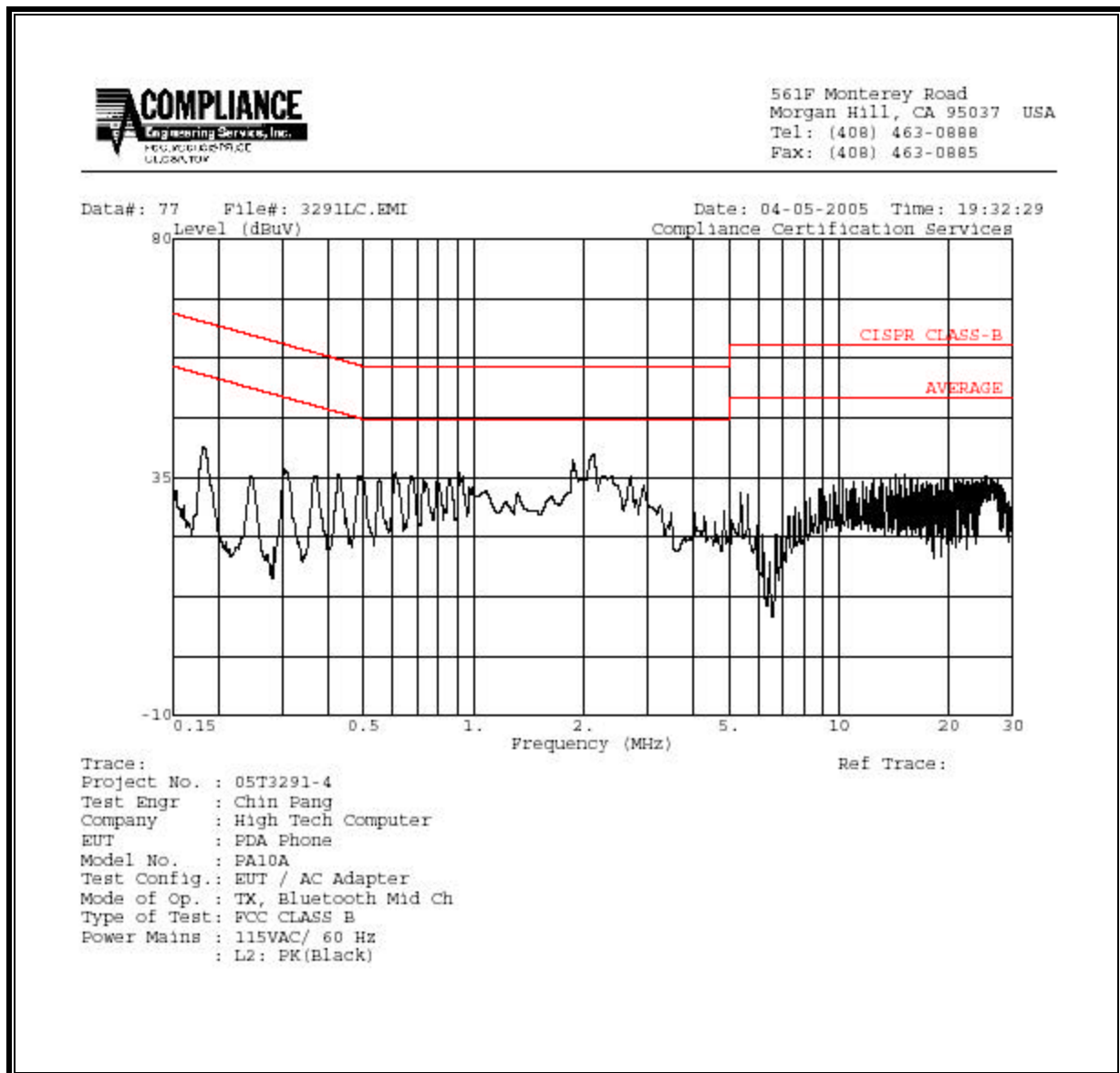
6 WORST EMISSIONS:

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.18	39.73	--	--	0.00	64.39	54.39	-24.66	-14.66	L1
0.56	40.52	--	--	0.00	56.00	46.00	-15.48	-5.48	L1
2.13	41.84	--	--	0.00	56.00	46.00	-14.16	-4.16	L1
0.18	40.81	--	--	0.00	64.39	54.39	-23.58	-13.58	L2
0.61	35.38	--	--	0.00	56.00	46.00	-20.62	-10.62	L2
2.17	39.38	--	--	0.00	56.00	46.00	-16.62	-6.62	L2
6 Worst Data									

LINE 1 RESULT



LINE 2 RESULT



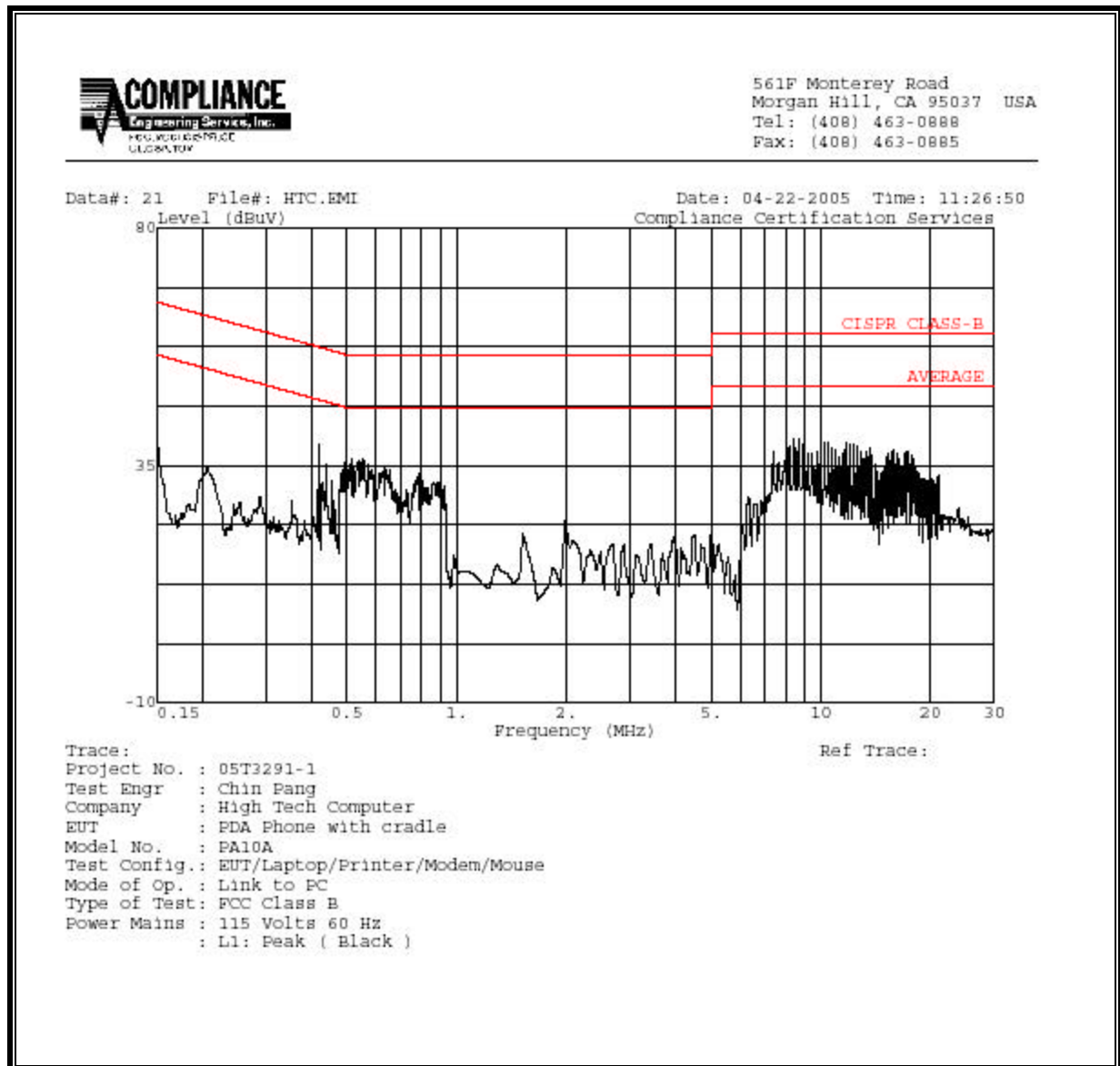
7.4.2. WORST-CASE LINE CONDUCTED EMISSIONS (DIGITAL MODE)

EUT WITH CRADLE VIA LAPTOP

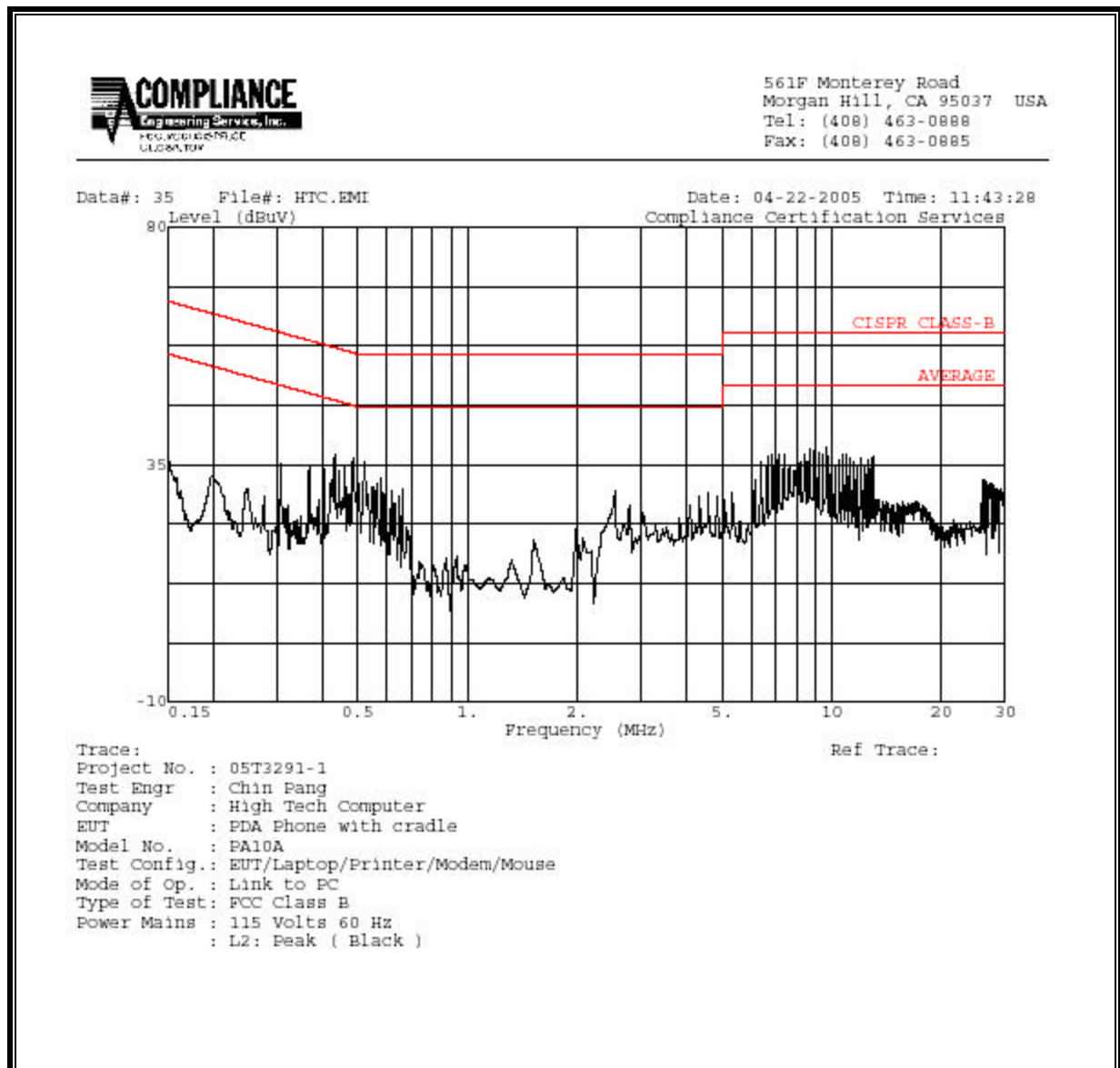
6 WORST EMISSIONS:

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
0.42	39.16	--	--	0.00	57.47	47.47	-18.31	-8.31	L1
8.46	40.10	--	--	0.00	60.00	50.00	-19.90	-9.90	L1
11.81	39.40	--	--	0.00	60.00	50.00	-20.60	-10.60	L1
0.43	36.96	--	--	0.00	57.19	47.19	-20.23	-10.23	L2
6.66	36.74	--	--	0.00	60.00	50.00	-23.26	-13.26	L2
9.71	38.34	--	--	0.00	60.00	50.00	-21.66	-11.66	L2
6 Worst Data									

LINE 1 RESULT



LINE 2 RESULT



(Note: The setup photos on pages 91 through 105 have been extracted under a separate file purposely.)