FCC CFR47 PART 15 SUBPART C
CLASS II PERMISSIVE CHANGE
CERTIFICATION TEST REPORT

FOR

802.11A/B/G INTEL WIRELESS WIFI LINK 4965AGN

MODEL NUMBER: 4965AGN

FCC ID: PD9LEN4965AGN

REPORT NUMBER: 07U10925-1, REVISION B

ISSUE DATE: APRIL 13, 2007

Prepared for
INTEL CORPORATION
2111 N.E.25TH AVE.
HILLSBORO, OR 97124, USA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/01/07	Initial Issue	T. Chan
B	04/13/07	Corrected Section 5.1	T. Hong

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: INTEL CORPORATION
2111 N.E. 25TH AVE.
HILLSBORO, OR 97124, USA

EUT DESCRIPTION: 802.11A/B/G INTEL WIRELESS WIFI LINK 4965AGN

MODEL: 4965AGN

SERIAL NUMBER: LV-00161

DATE TESTED: MARCH 17 - 23, 2007

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:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CHIN PANG
EMC ENGINEER
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 47173 Benicia Street, Fremont, 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 an 802.11a/b/g Wireless WiFi Link.

The radio module is manufactured by Intel.

5.2. DESCRIPTION OF CLASS II CHANGE

1. Add WLAN Main Antenna-1: 25.90354.001, Main Antenna-2: 25.90424.001 and Aux Antenna: 25.90355.001
2. Add Lenovo ThinkPad X61Tablet Notebook.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two PIFA antennas for diversity, at 2.4GHz Band with maximum peak gain of 1.52dBi, and at 5.8GHz Band with maximum peak gain of 2.97dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was CRTU, version 9.7.34.0

The test utility software used during testing was CRTU version 4.1.26.0000

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 powers were at 2462 MHz for 11b, g mode and 802.11n 20M and 2422MHz for 802.11n MIMO 20M. For 5.8GHz Band, 5745MHz were the highest measured power for 802.11 a mode, 802.11n 20M, 802.11n 40M and 802.11n MIMO 20M; For 802.11n MIMO 40M, 5795 was the highest measured power.

The worst-case data rate for this channel is determined to be 6 Mb/s, based on previous experience with 2.4GHz WLAN product design architectures.

The Mobile position and portable X, Y and Z positions have been investigated, Mobile position was determined as the worst-case position for 2.4GHz band and Y position for the 5GHz band.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	ThinkPad X61 Tablet	LV-00161	DoC
AC Adaptop	Lenovo	Lenovo	11S92P1160Z1ZBGH6C6KK0	DoC

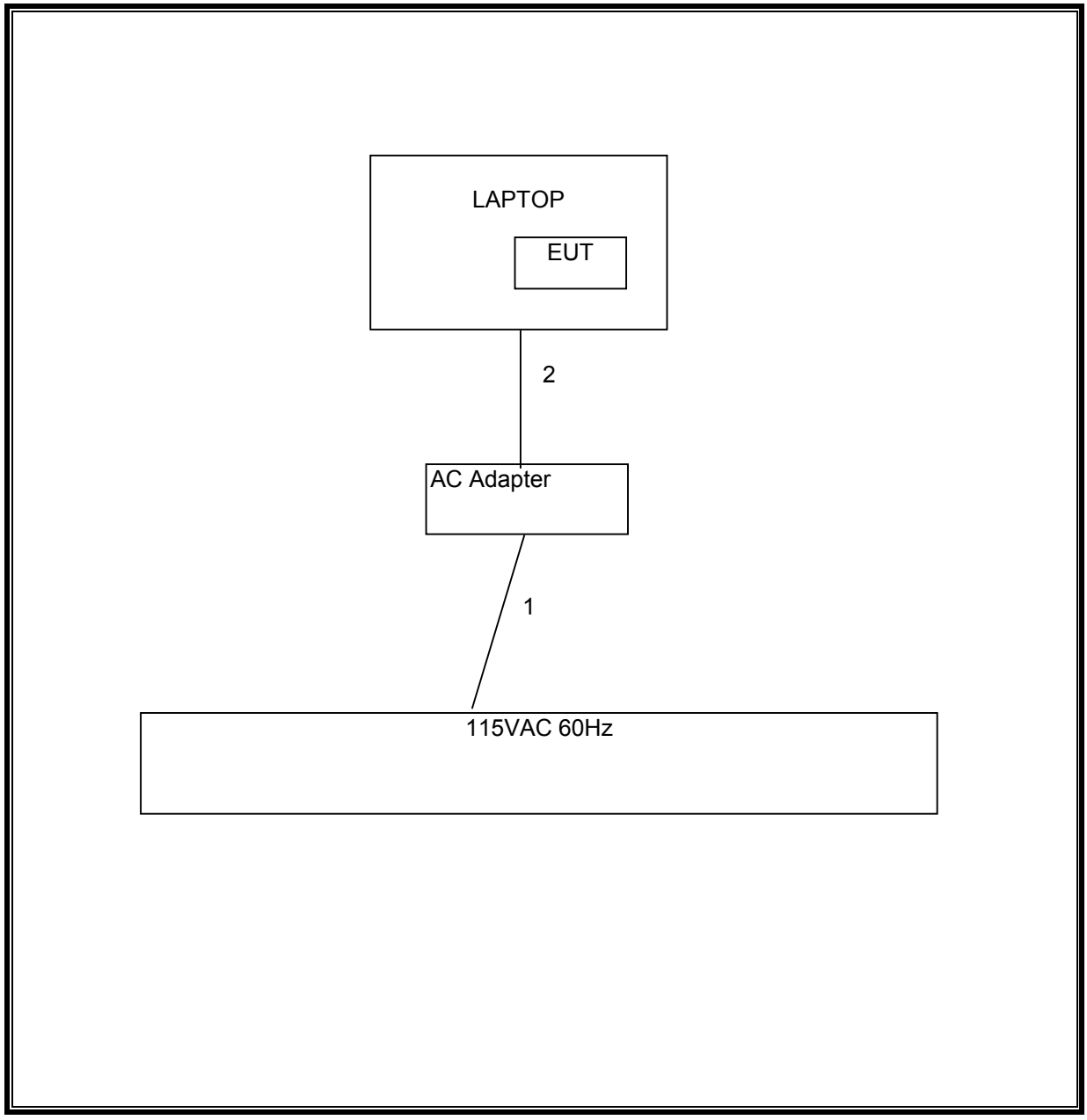
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	US 115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	2m	Ferrite on laptop end

TEST SETUP

The EUT is installed in a host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	04/22/07
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00561	10/03/07
Antenna, Horn 18 ~ 26 GHz	ARA	MWH-1826/B	1049	09/12/07
Preamplifier, 1300 MHz	Agilent / HP	8447D	1937A02062	01/23/08
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A0022704	09/03/07
SA RF Section, 1.5 GHz	Agilent / HP	85680B	2814A04227	01/07/08
SA Display Section 2	Agilent / HP	85662A	2816A16696	04/07/08
Quasi-Peak Adaptor	Agilent / HP	85650A	3145A01654	01/21/08
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	08/30/07
EMI Test Receiver	R & S	ESHS 20	827129/006	06/03/07
Peak / Average Power Sensor	Agilent	E9327A	US40440755	12/02/07
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/02/07
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY43360112	05/03/07
2.4 - 2.5 Reject Filter	Micro Tronics	BRM50702	3	N/A
7.6 GHz High Pass Filter	Micro Tronics	HPM13350	1	N/A

7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR THE 2400 TO 2483.5 MHz BAND

7.1.1. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

Each chain is measured separately and the total power is calculated using:

Total Power = 10 log (10^ (Chain 0 Power / 10) + 10^ (Chain 2 Power / 10))

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11.0 dB (including 10 dB pad and 1.0 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Mode Channel	Frequency (MHz)	Average Power Chain 0 (dBm)	Average Power Chain 2 (dBm)	Average Power Total (dBm)
802.11b Mode				
Low	2412	15.5	15.4	18.5
Middle	2437	15.7	15.6	18.7
High	2462	16.7	16.7	19.7
802.11g Mode				
Low	2412	16.7	16.5	19.6
Middle	2437	17.6	17.6	20.6
High	2462	16.3	16.4	19.4
802.11n 20M				
Low	2412	15.6	15.6	18.6
Middle	2437	15.6	15.6	18.6
High	2462	15.6	15.6	18.6
802.11n MIMO 20M				
Low	2422	14.7	14.4	17.6
Middle	2437	14.6	14.4	17.5
High	2452	14.6	14.4	17.5

7.2. CHANNEL TESTS FOR THE 5725 TO 5850 MHz BAND

7.2.1. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

Each chain is measured separately and the total power is calculated using:

Total Power = 10 log (10^ (Chain 0 Power / 10) + 10^ (Chain 2 Power / 10))

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Mode Channel	Frequency (MHz)	Average Power Chain 0 (dBm)	Average Power Chain 2 (dBm)	Average Power Total (dBm)
802.11a Mode				
Low	5745	17.6	17.5	20.6
Middle	5785	17.6	17.6	20.6
High	5825	17.6	17.6	20.6
802.11n 20M				
Low	5745	17.6	17.5	20.6
Middle	5785	17.4	17.5	20.5
High	5825	17.5	17.5	20.5
802.11n 40M				
Low	5755	17.3	17.4	20.4
High	5795	17.6	17.5	20.6
802.11n MIMO 20M				
Low	5745	14.5	14.4	17.5
Middle	5785	14.5	14.5	17.5
High	5825	14.5	14.6	17.6
802.11n MIMO 40M				
Low	5755	14.6	14.7	17.7
High	5795	14.6	14.6	17.6

7.3. RADIATED EMISSIONS

7.3.1. 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.

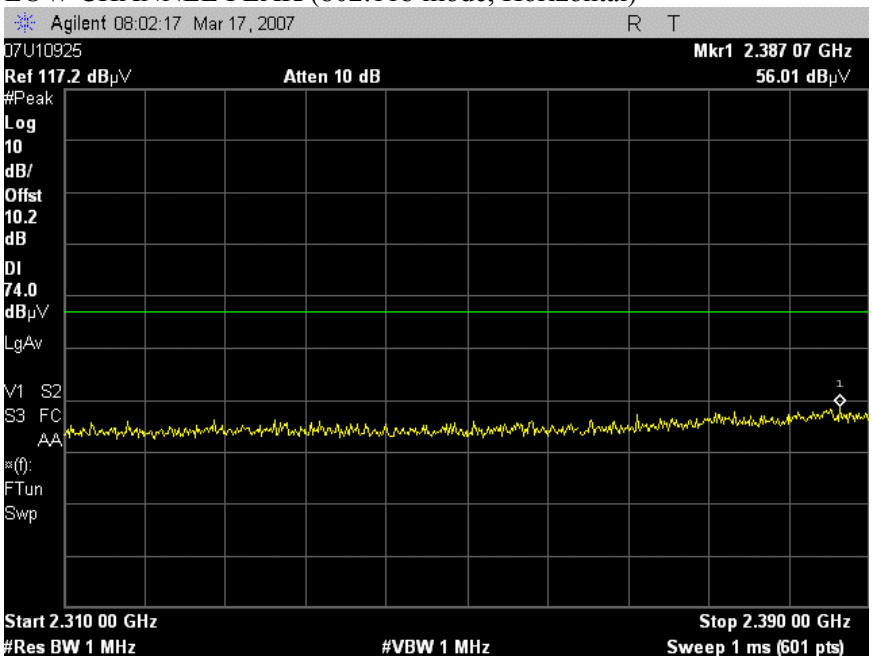
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

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.

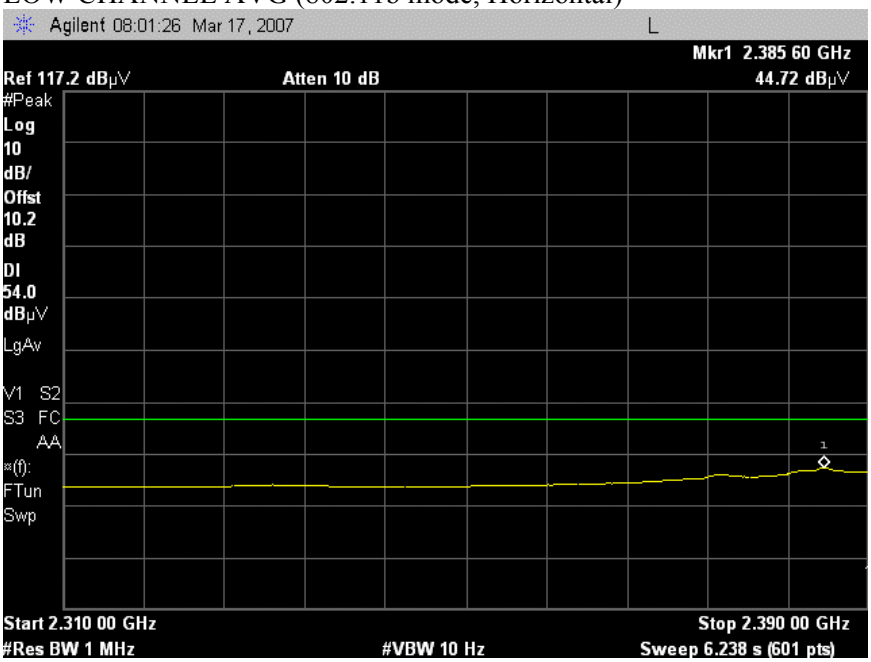
7.3.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

RESTRICTED BANDEDGE (802.11b MODE, LOW CHANNEL)

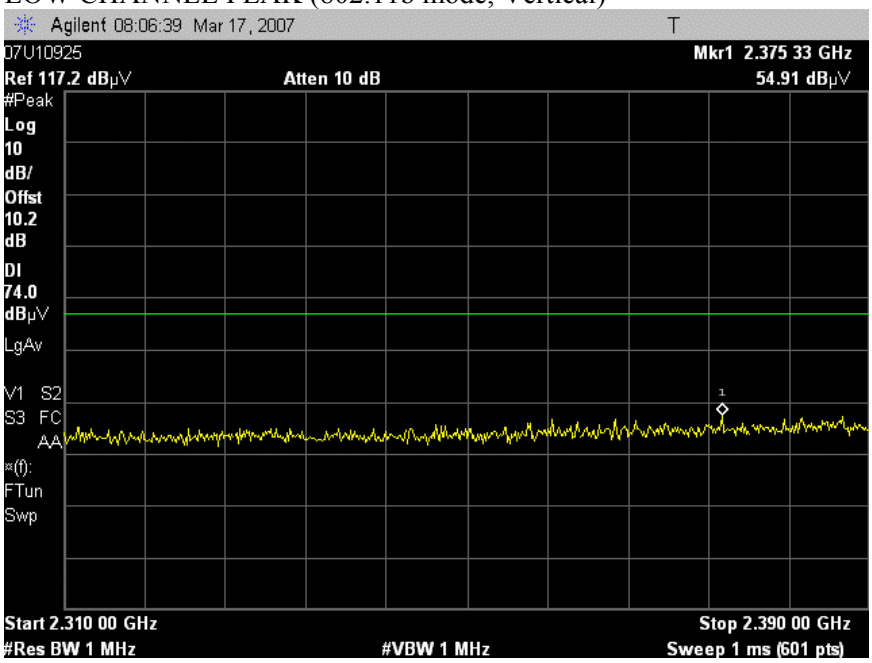
LOW CHANNEL PEAK (802.11b mode, Horizontal)



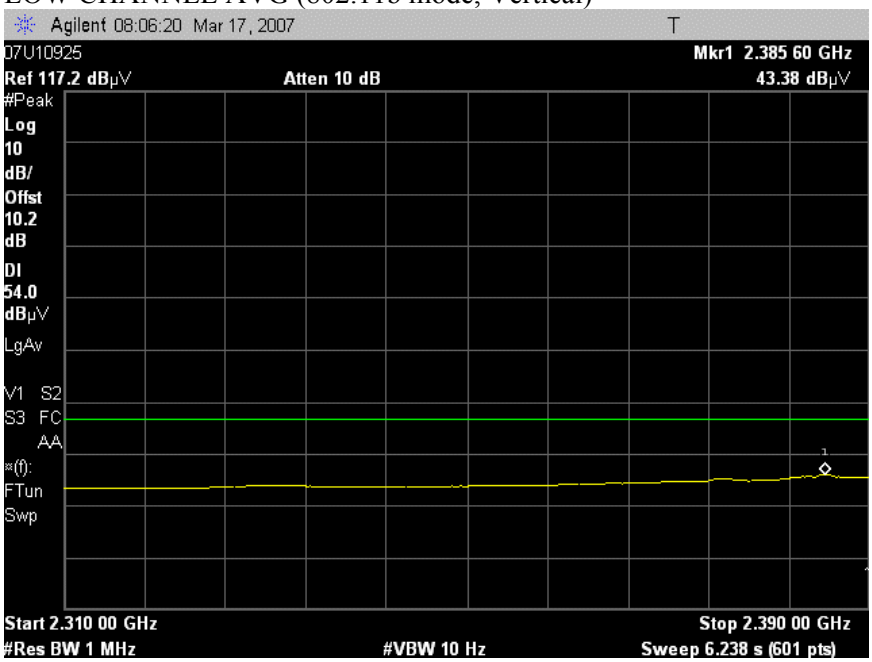
LOW CHANNEL AVG (802.11b mode, Horizontal)



LOW CHANNEL PEAK (802.11b mode, Vertical)

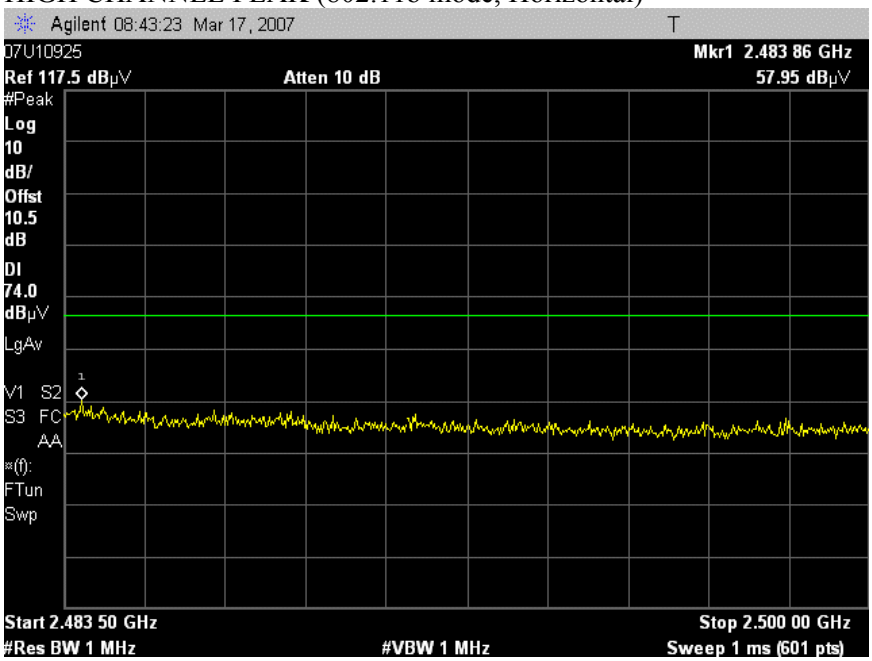


LOW CHANNEL AVG (802.11b mode, Vertical)

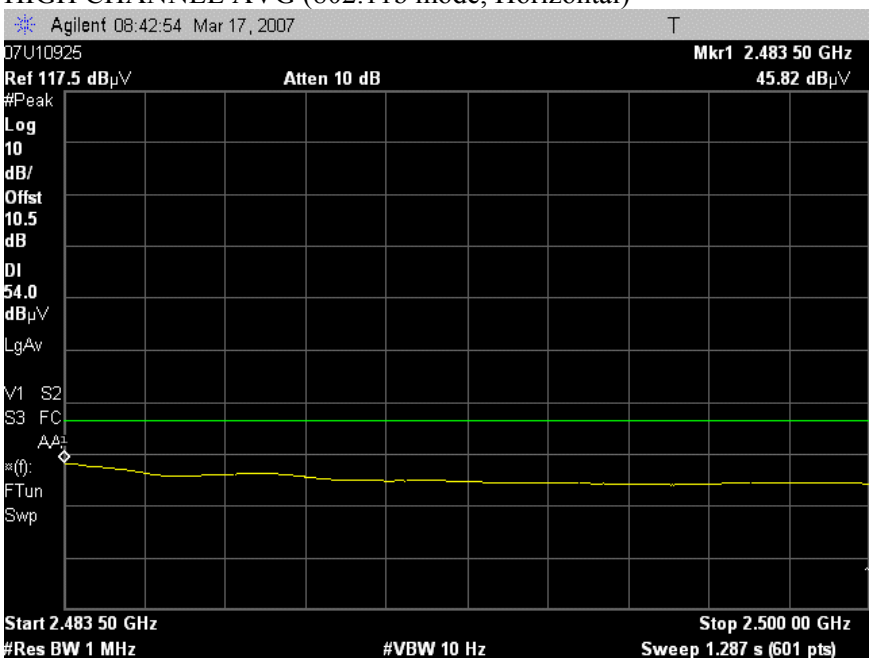


RESTRICTED BANDEDGE (802.11b MODE, HIGH CHANNEL)

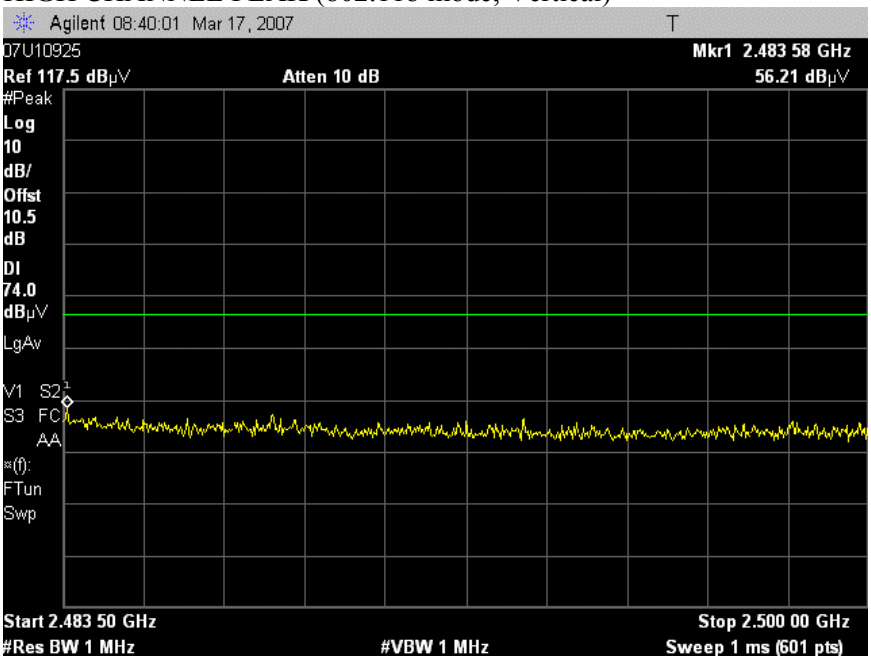
HIGH CHANNEL PEAK (802.11b mode, Horizontal)



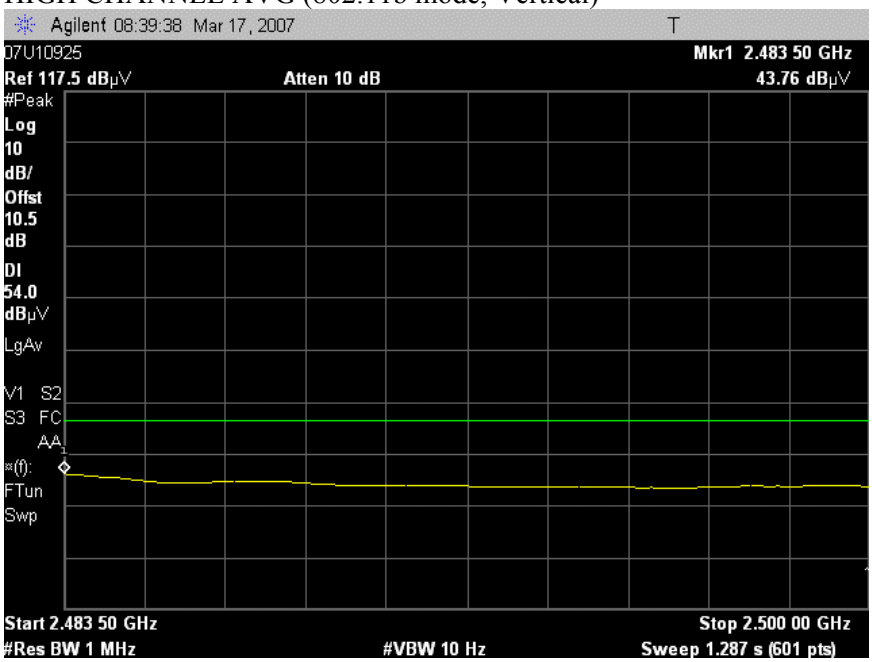
HIGH CHANNEL AVG (802.11b mode, Horizontal)



HIGH CHANNEL PEAK (802.11b mode, Vertical)



HIGH CHANNEL AVG (802.11b mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11b MODE)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/22/2007
Test Engineer:Mengistu Mekuria
Configuration:EUT Only
Mode: Transmit, 11b mode 2.4GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	HPF_4.0GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

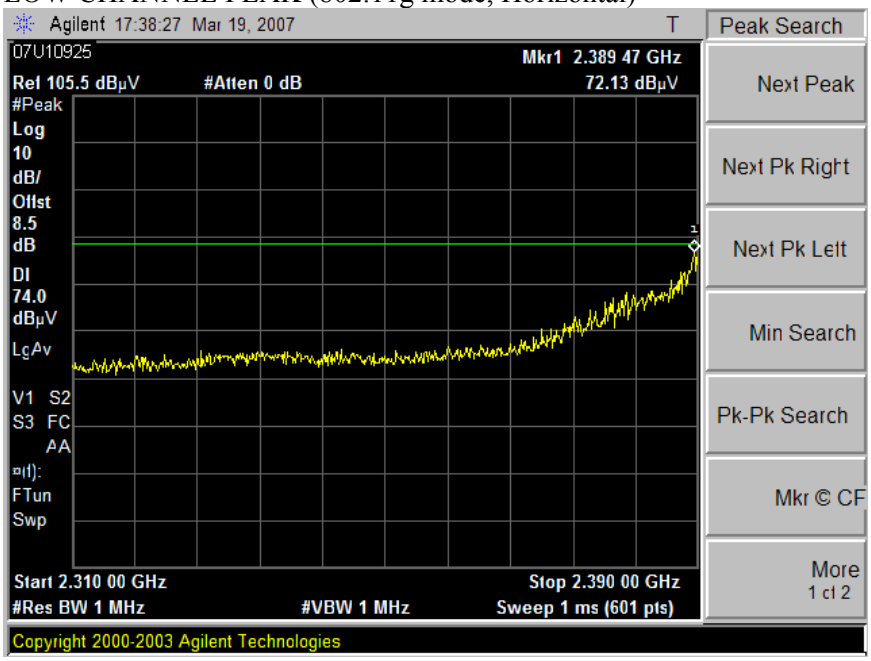
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2412MHz															
4.824	3.0	41.8	31.1	33.3	6.9	-34.8	0.0	0.6	47.8	37.1	74	54	-26.2	-16.9	V
4.824	3.0	43.0	31.3	33.3	6.9	-34.8	0.0	0.6	48.9	37.2	74	54	-25.1	-16.8	H
Mid Ch, 2437MHz															
4.874	3.0	42.6	33.9	33.4	6.9	-34.9	0.0	0.6	48.7	39.9	74	54	-25.3	-14.1	V
7.311	3.0	43.2	33.5	35.0	8.4	-34.7	0.0	0.6	52.6	42.9	74	54	-21.4	-11.1	V
4.874	3.0	43.2	34.6	33.4	6.9	-34.9	0.0	0.6	49.3	40.6	74	54	-24.7	-13.4	H
7.311	3.0	44.5	38.9	35.0	8.4	-34.7	0.0	0.6	53.9	48.3	74	54	-20.1	-5.7	H
High Ch 2462 MHz															
4.924	3.0	45.0	37.7	33.4	7.0	-34.9	0.0	0.6	51.1	43.8	74	54	-22.9	-10.2	V
7.386	3.0	45.0	40.0	35.0	8.4	-34.6	0.0	0.6	54.5	49.5	74	54	-19.5	-4.5	V
4.924	3.0	43.4	34.5	33.4	7.0	-34.9	0.0	0.6	49.5	40.6	74	54	-24.5	-13.4	H
7.386	3.0	44.4	38.8	35.0	8.4	-34.6	0.0	0.6	53.9	48.3	74	54	-20.1	-5.7	H

Rev. 5.1.6
Note: No other emissions were detected above the system noise floor.

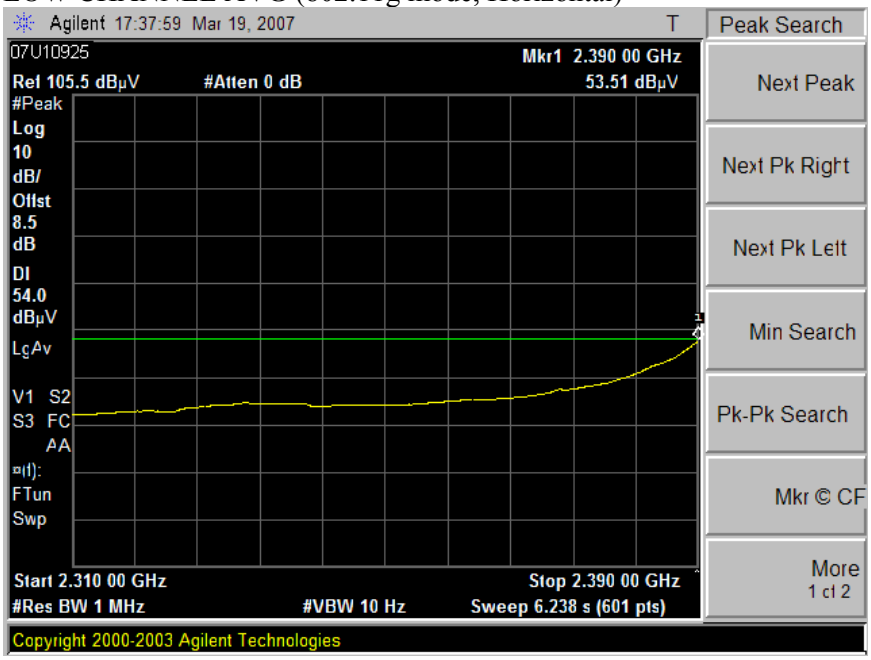
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11g MODE, LOW CHANNEL)

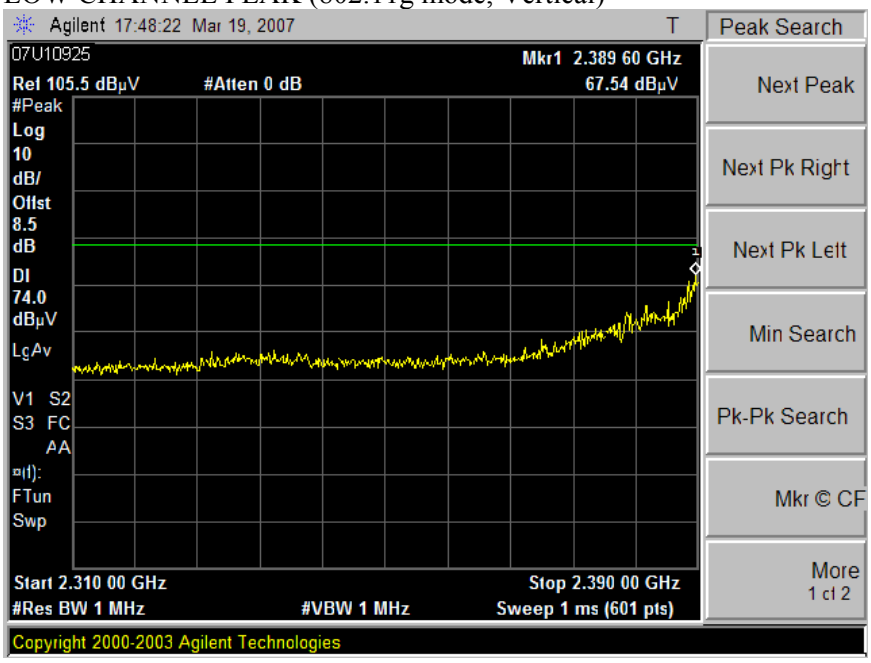
LOW CHANNEL PEAK (802.11g mode, Horizontal)



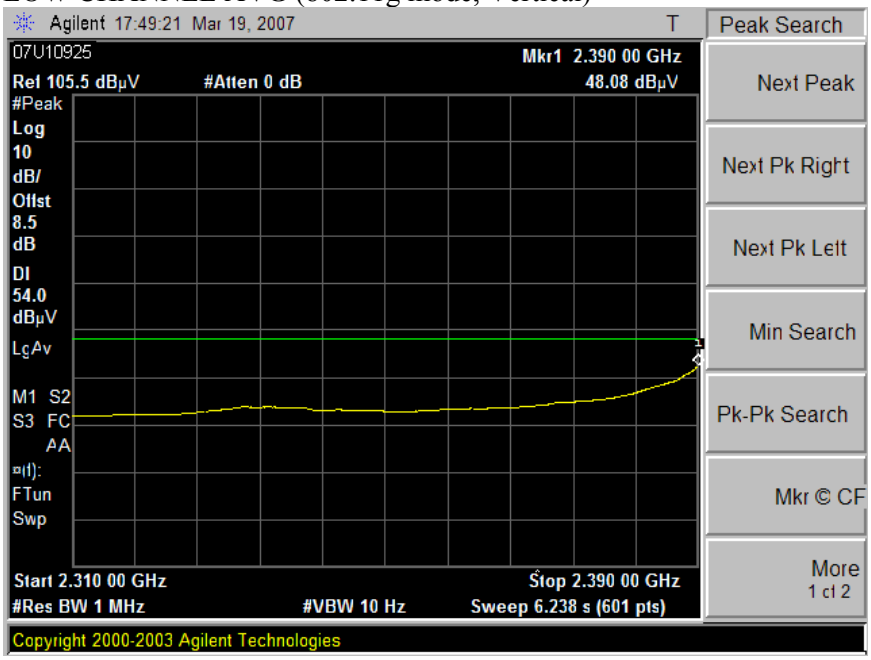
LOW CHANNEL AVG (802.11g mode, Horizontal)



LOW CHANNEL PEAK (802.11g mode, Vertical)

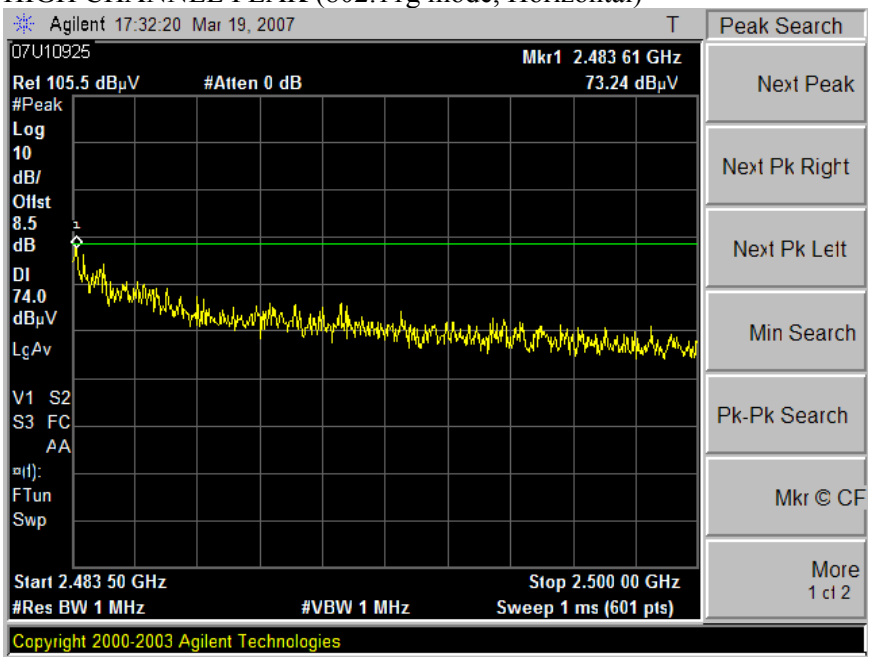


LOW CHANNEL AVG (802.11g mode, Vertical)

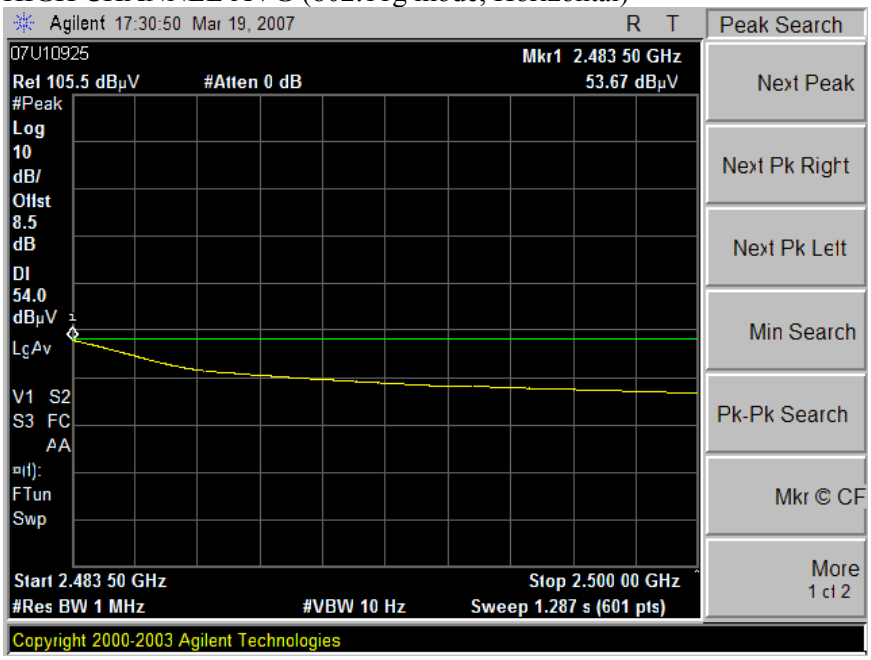


RESTRICTED BANDEDGE (802.11g MODE, HIGH CHANNEL)

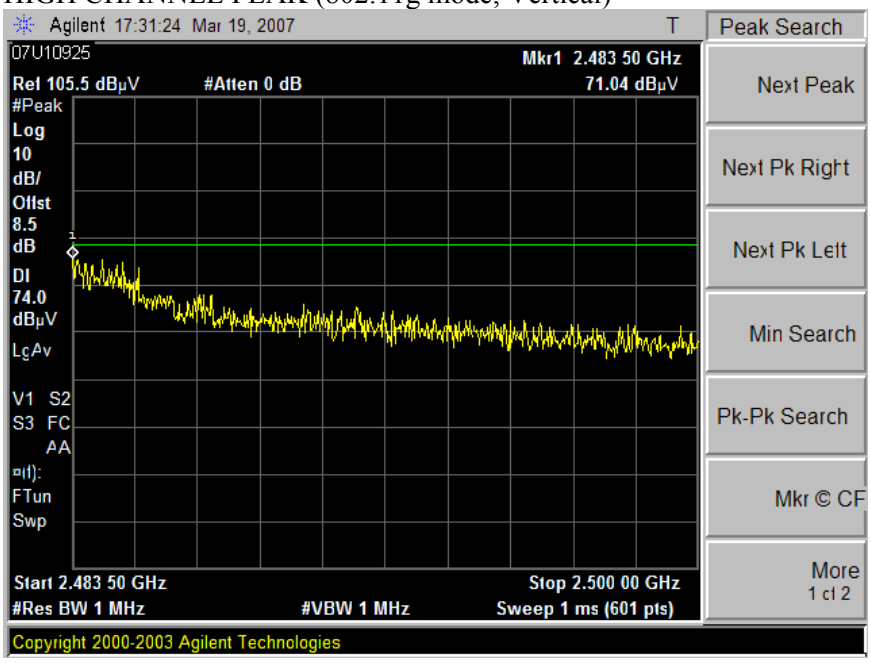
HIGH CHANNEL PEAK (802.11g mode, Horizontal)



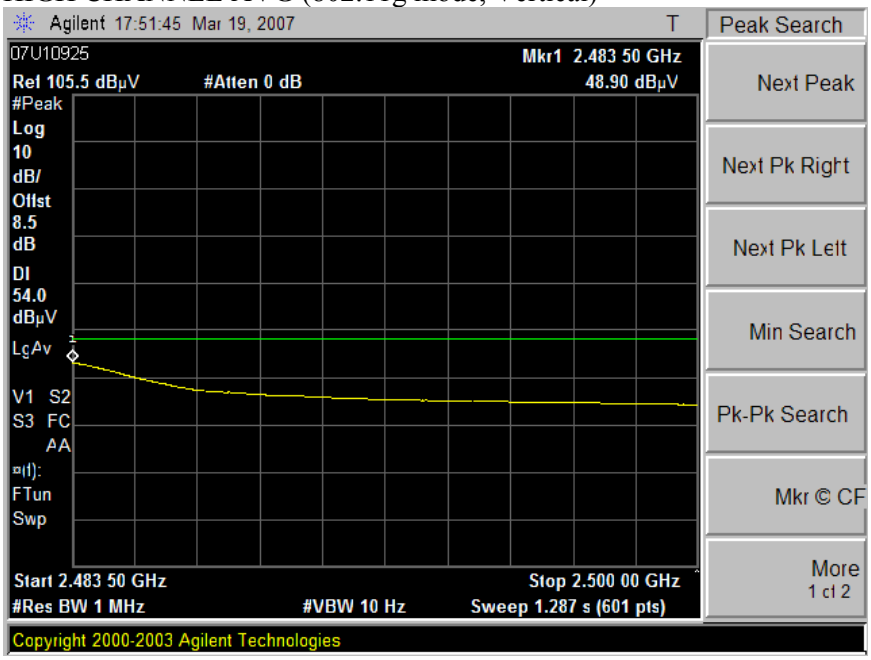
HIGH CHANNEL AVG (802.11g mode, Horizontal)



HIGH CHANNEL PEAK (802.11g mode, Vertical)



HIGH CHANNEL AVG (802.11g mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11g MODE)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/22/2007
Test Engineer:Mengistu Mekuria
Configuration:EUT Only
Mode: Transmit, 11g mode 2.4GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	HPF_4.0GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

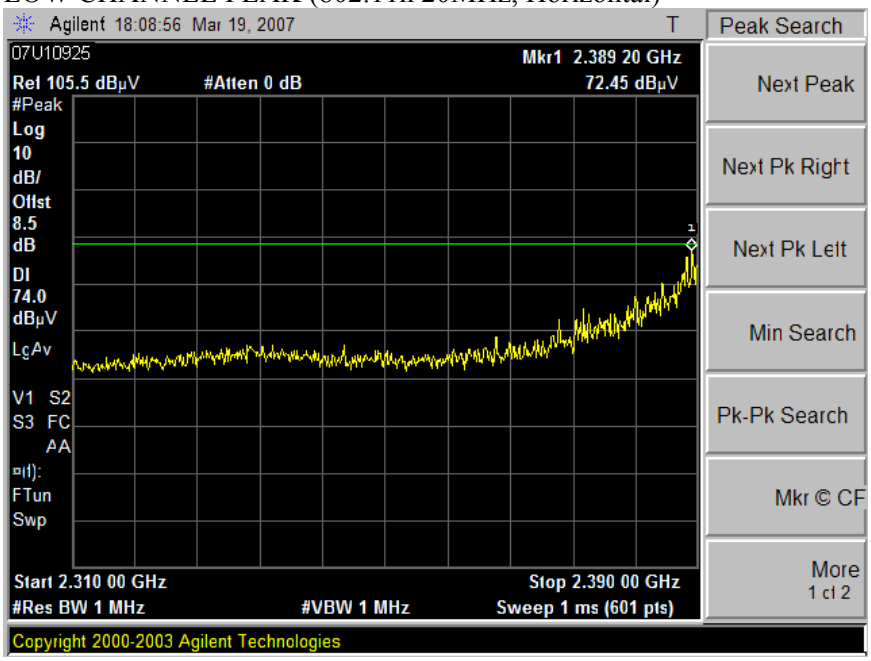
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2412MHz															
4.824	3.0	42.4	30.5	33.3	6.9	-34.8	0.0	0.6	48.3	36.4	74	54	-25.7	-17.6	V
4.824	3.0	41.0	29.2	33.3	6.9	-34.8	0.0	0.6	46.9	35.2	74	54	-27.1	-18.8	H
Mid Ch, 2437MHz															
4.874	3.0	42.2	30.0	33.4	6.9	-34.9	0.0	0.6	48.2	36.1	74	54	-25.8	-17.9	V
7.311	3.0	46.4	32.6	35.0	8.4	-34.7	0.0	0.6	55.8	41.9	74	54	-18.2	-12.1	V
4.874	3.0	41.2	29.5	33.4	6.9	-34.9	0.0	0.6	47.3	35.6	74	54	-26.7	-18.4	H
7.311	3.0	44.2	31.6	35.0	8.4	-34.7	0.0	0.6	53.6	41.0	74	54	-20.4	-13.0	H
High Ch 2462 MHz															
4.924	3.0	43.5	31.4	33.4	7.0	-34.9	0.0	0.6	49.6	37.5	74	54	-24.4	-16.5	V
7.386	3.0	46.1	32.2	35.0	8.4	-34.6	0.0	0.6	55.6	41.7	74	54	-18.4	-12.3	V
4.924	3.0	42.5	29.4	33.4	7.0	-34.9	0.0	0.6	48.6	35.6	74	54	-25.4	-18.4	H
7.386	3.0	44.3	31.4	35.0	8.4	-34.6	0.0	0.6	53.7	40.9	74	54	-20.3	-13.1	H

Rev. 5.1.6
Note: No other emissions were detected above the system noise floor.

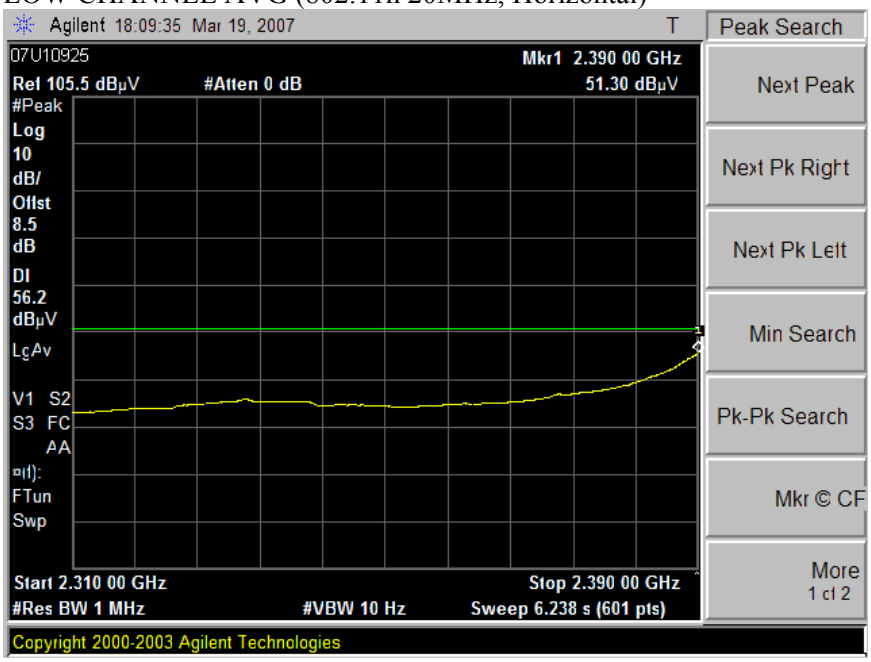
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11n 20MHz, LOW CHANNEL)

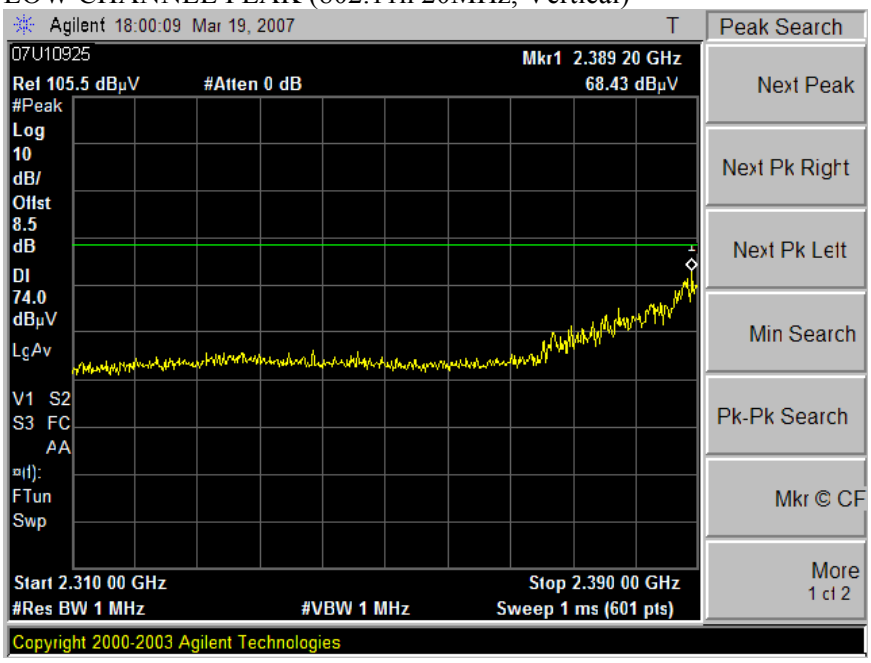
LOW CHANNEL PEAK (802.11n 20MHz, Horizontal)



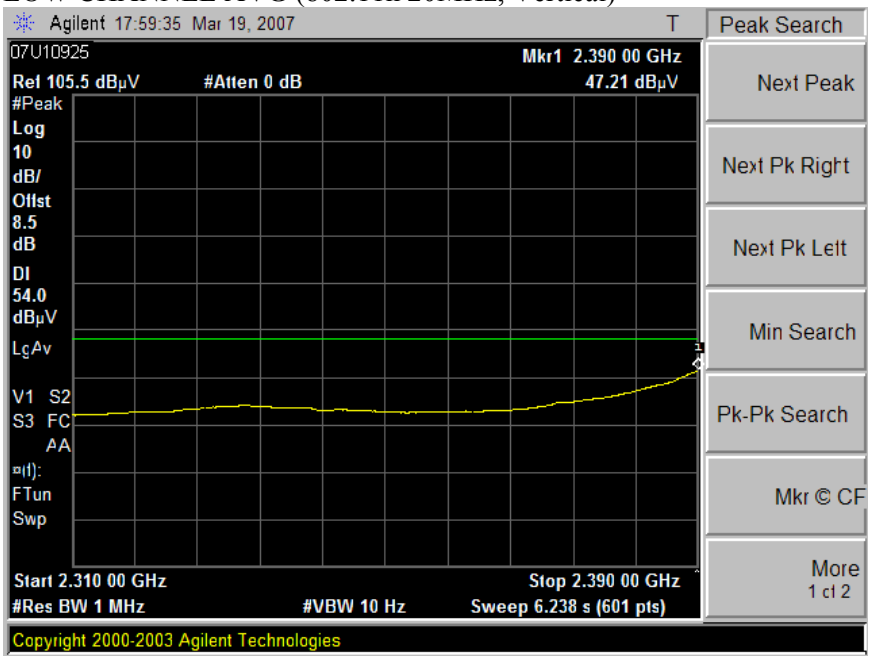
LOW CHANNEL AVG (802.11n 20MHz, Horizontal)



LOW CHANNEL PEAK (802.11n 20MHz, Vertical)

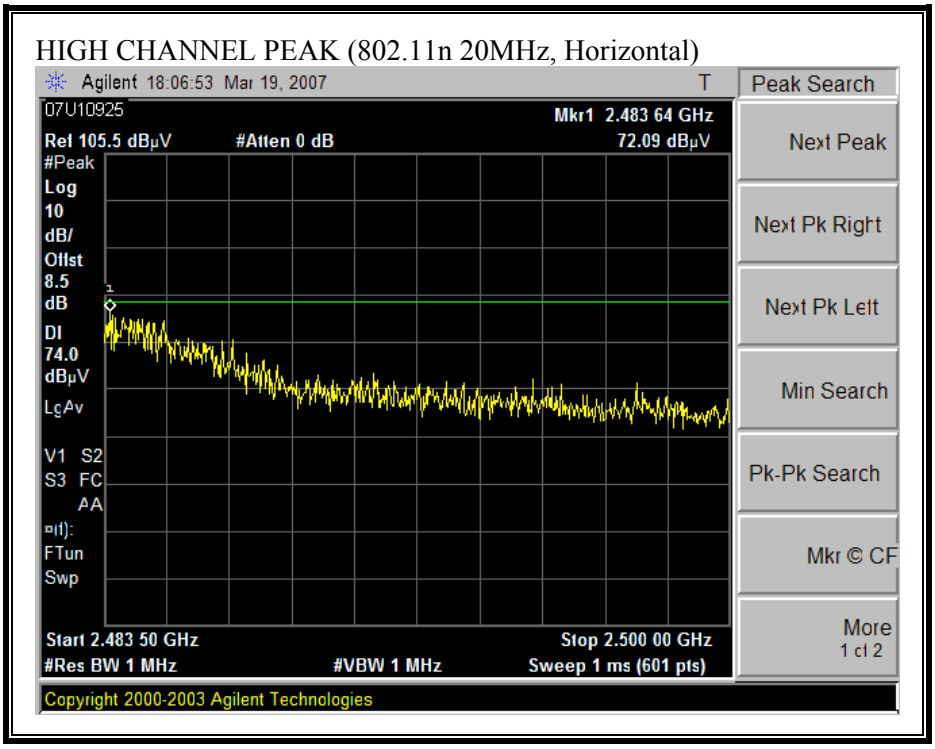


LOW CHANNEL AVG (802.11n 20MHz, Vertical)

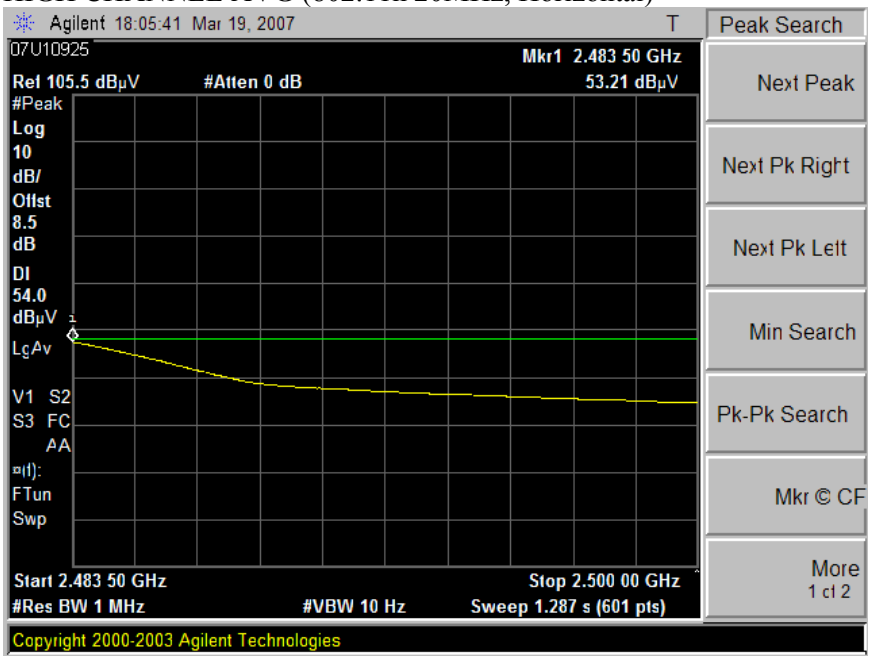


RESTRICTED BANDEDGE (802.11n 20M, HIGH CHANNEL)

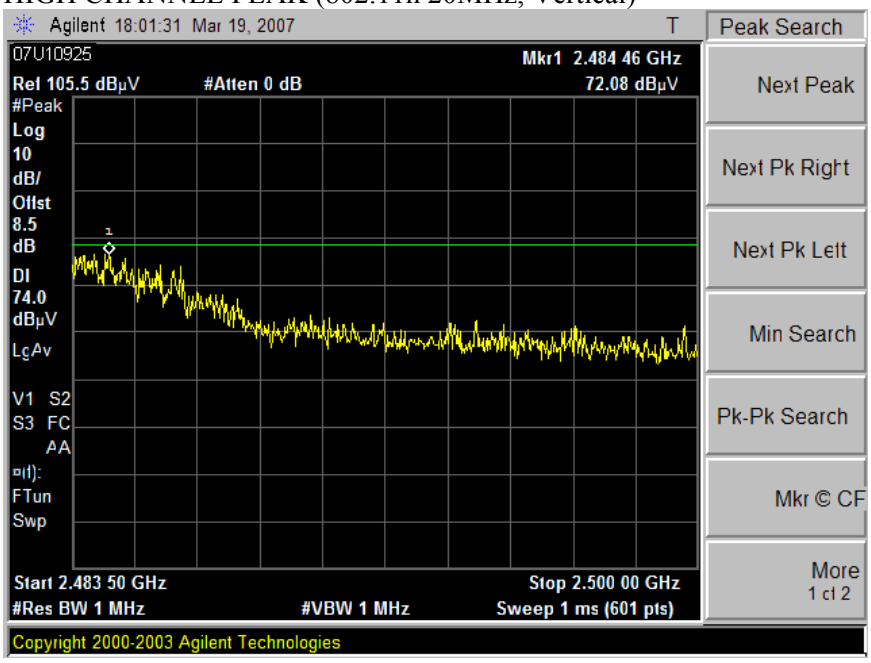
HIGH CHANNEL PEAK (802.11n 20MHz, Horizontal)



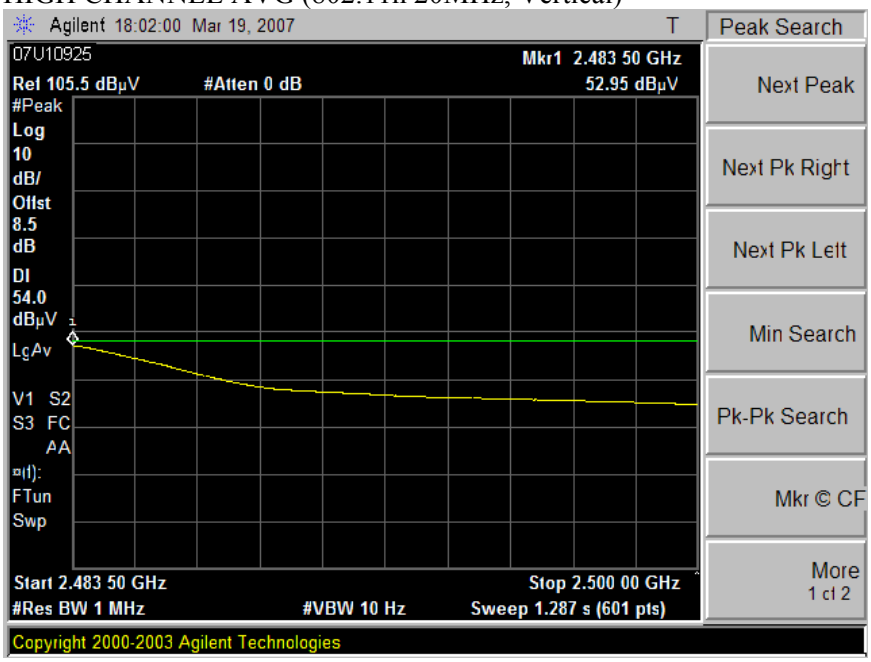
HIGH CHANNEL AVG (802.11n 20MHz, Horizontal)



HIGH CHANNEL PEAK (802.11n 20MHz, Vertical)



HIGH CHANNEL AVG (802.11n 20MHz, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11n 20MHz)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/22/2007
Test Engineer:Mengistu Mekuria
Configuration:EUT Only
Mode: Transmit, 11n 20M mode 2.4GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	HPF_4.0GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

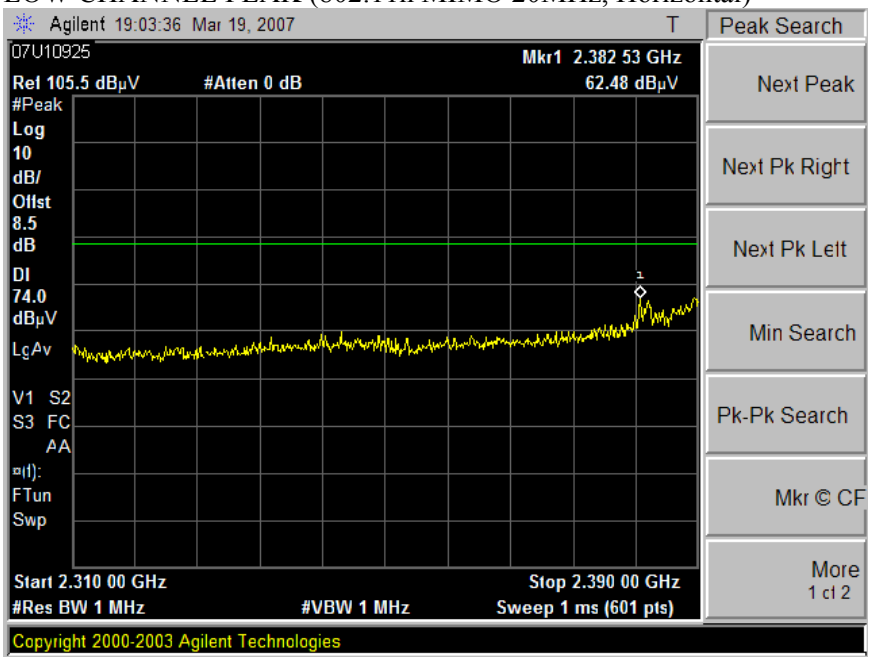
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2412MHz															
4.824	3.0	42.5	31.1	33.3	6.9	-34.8	0.0	0.6	48.5	37.0	74	54	-25.5	-17.0	V
4.824	3.0	41.2	29.5	33.3	6.9	-34.8	0.0	0.6	47.2	35.5	74	54	-26.8	-18.5	H
Mid Ch, 2437MHz															
4.874	3.0	42.9	32.3	33.4	6.9	-34.9	0.0	0.6	48.9	38.3	74	54	-25.1	-15.7	V
7.311	3.0	45.0	33.1	35.0	8.4	-34.7	0.0	0.6	54.4	42.5	74	54	-19.6	-11.5	V
4.874	3.0	42.4	31.0	33.4	6.9	-34.9	0.0	0.6	48.4	37.0	74	54	-25.6	-17.0	H
7.311	3.0	44.9	32.8	35.0	8.4	-34.7	0.0	0.6	54.3	42.2	74	54	-19.7	-11.8	H
High Ch 2462 MHz															
4.924	3.0	42.2	30.0	33.4	7.0	-34.9	0.0	0.6	48.3	36.1	74	54	-25.7	-17.9	V
7.386	3.0	46.1	31.0	35.0	8.4	-34.6	0.0	0.6	55.6	40.5	74	54	-18.4	-13.5	V
4.924	3.0	41.3	29.3	33.4	7.0	-34.9	0.0	0.6	47.4	35.5	74	54	-26.6	-18.5	H
7.386	3.0	43.3	31.0	35.0	8.4	-34.6	0.0	0.6	52.8	40.4	74	54	-21.2	-13.6	H

Rev. 5.1.6
Note: No other emissions were detected above the system noise floor.

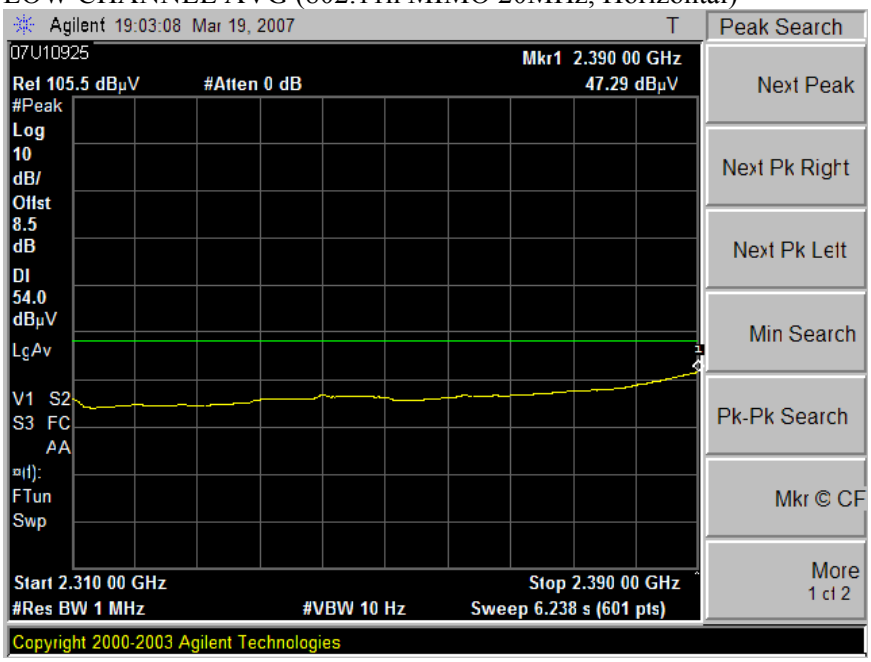
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11n MIMO 20MHz, LOW CHANNEL)

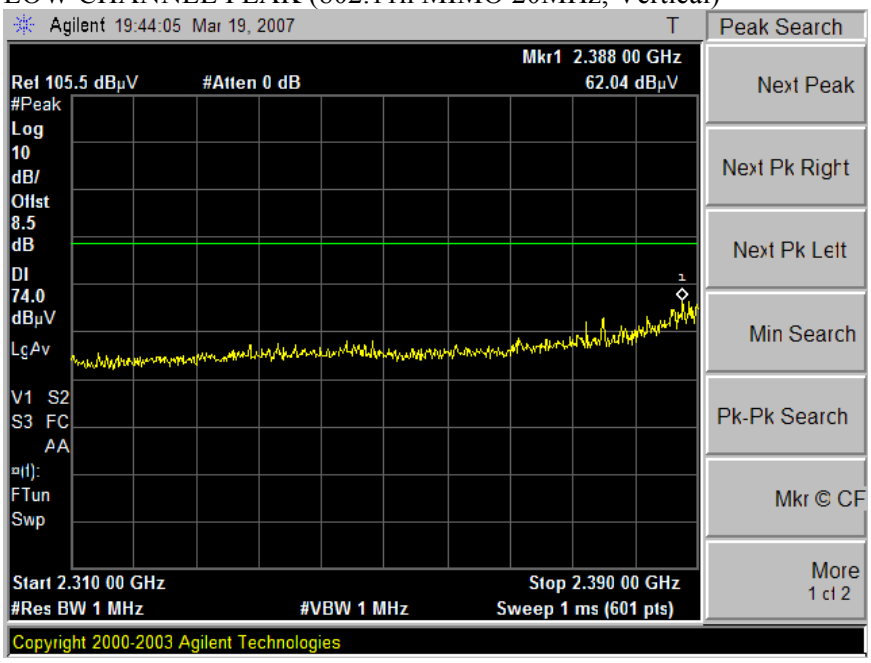
LOW CHANNEL PEAK (802.11n MIMO 20MHz, Horizontal)



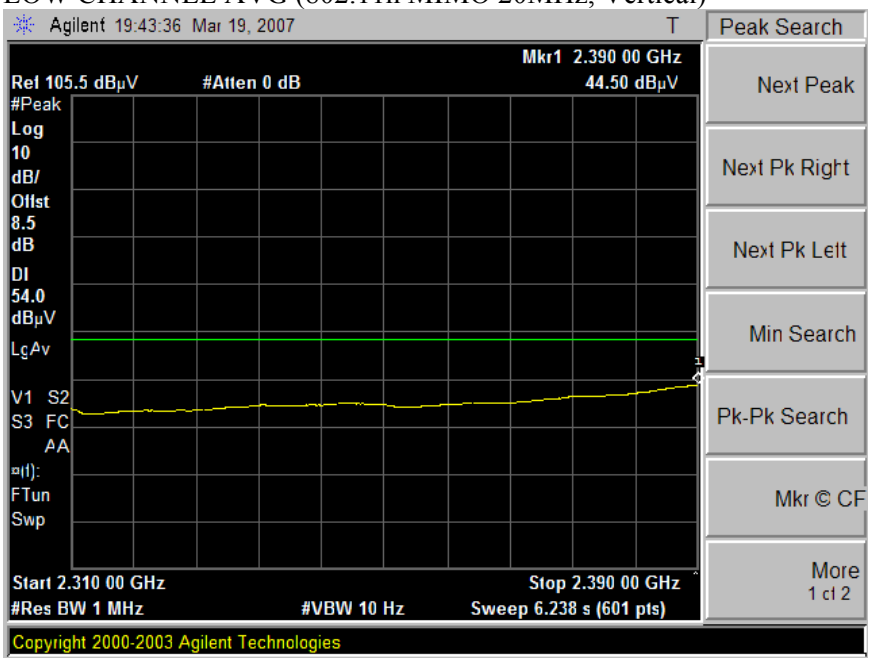
LOW CHANNEL AVG (802.11n MIMO 20MHz, Horizontal)



LOW CHANNEL PEAK (802.11n MIMO 20MHz, Vertical)

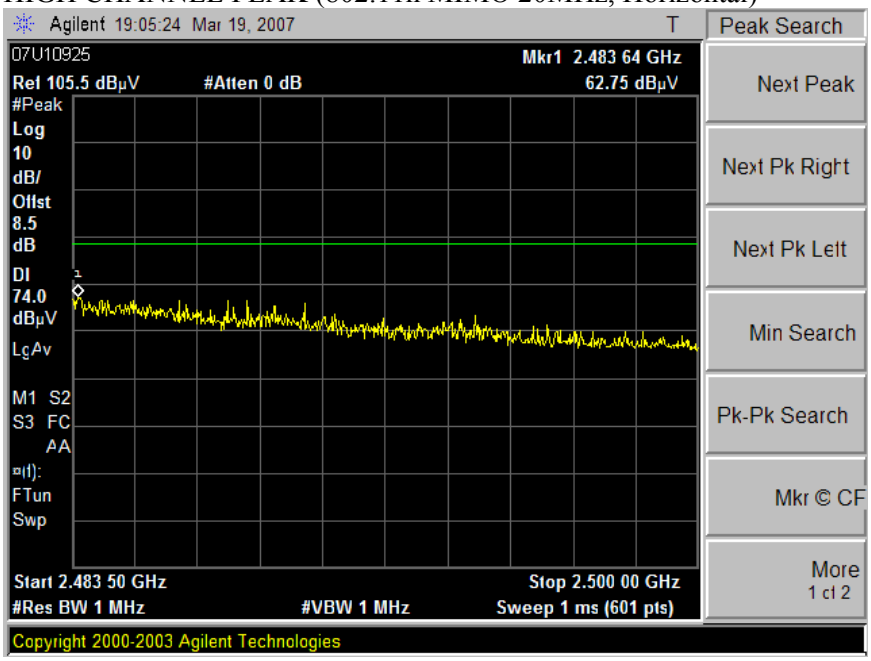


LOW CHANNEL AVG (802.11n MIMO 20MHz, Vertical)

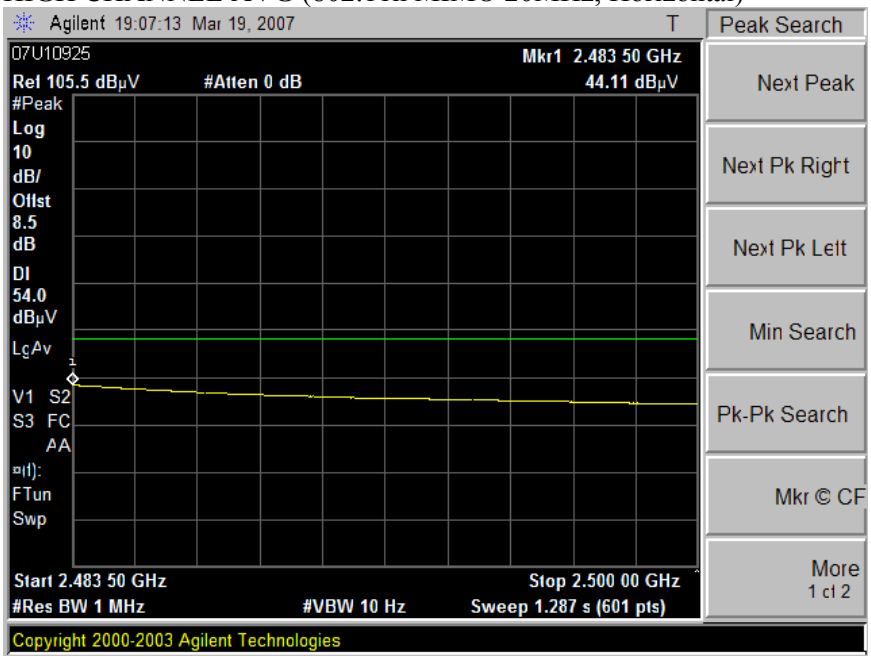


RESTRICTED BANDEDGE (802.11n MODE HT40, HIGH CHANNEL)

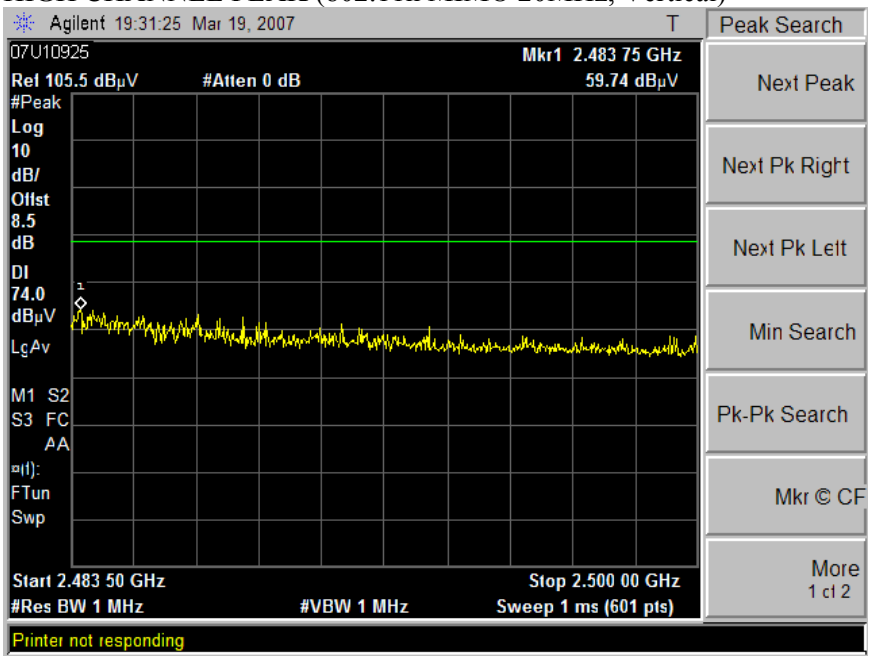
HIGH CHANNEL PEAK (802.11n MIMO 20MHz, Horizontal)



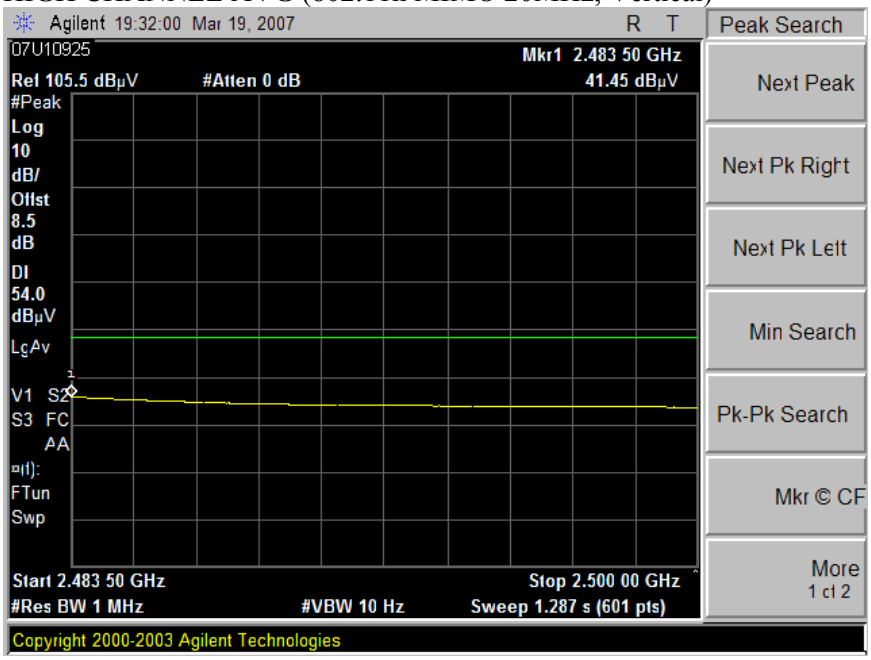
HIGH CHANNEL AVG (802.11n MIMO 20MHz, Horizontal)



HIGH CHANNEL PEAK (802.11n MIMO 20MHz, Vertical)



HIGH CHANNEL AVG (802.11n MIMO 20MHz, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11n MIMO 20MHz)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/22/2007
Test Engineer:Mengistu Mekuria
Configuration:EUT Only
Mode: Transmit, 11n MIMO 20M mode 2.4GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	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)
Low Ch, 2422MHz															
4.844	3.0	41.8	29.6	33.3	6.9	-34.8	0.0	0.6	47.8	35.6	74	54	-26.2	-18.4	V
7.266	3.0	50.8	35.0	35.0	8.4	-34.7	0.0	0.6	60.1	44.3	74	54	-13.9	-9.7	V
4.844	3.0	41.7	28.5	33.3	6.9	-34.8	0.0	0.6	47.7	34.5	74	54	-26.3	-19.5	H
7.266	3.0	44.6	32.1	35.0	8.4	-34.7	0.0	0.6	53.9	41.4	74	54	-20.1	-12.6	H
Mid Ch, 2437MHz															
4.874	3.0	44.6	30.9	33.4	6.9	-34.9	0.0	0.6	50.6	36.9	74	54	-23.4	-17.1	V
7.311	3.0	46.1	31.6	35.0	8.4	-34.7	0.0	0.6	55.5	40.9	74	54	-18.5	-13.1	V
4.874	3.0	41.5	29.2	33.4	6.9	-34.9	0.0	0.6	47.6	35.3	74	54	-26.4	-18.7	H
7.311	3.0	44.7	32.3	35.0	8.4	-34.7	0.0	0.6	54.1	41.7	74	54	-19.9	-12.3	H
High Ch 2452 MHz															
4.904	3.0	42.1	29.9	33.4	7.0	-34.9	0.0	0.6	48.2	36.0	74	54	-25.8	-18.0	V
7.356	3.0	41.5	31.6	35.0	8.4	-34.6	0.0	0.6	50.9	41.0	74	54	-23.1	-13.0	V
4.904	3.0	43.1	30.4	33.4	7.0	-34.9	0.0	0.6	49.2	36.5	74	54	-24.8	-17.5	H
7.356	3.0	43.8	30.7	35.0	8.4	-34.6	0.0	0.6	53.3	40.1	74	54	-20.7	-13.9	H

Rev. 5.1.6
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		

7.3.3. TRANSMITTER ABOVE 1 GHz FOR 5725 TO 5850 MHz BAND

HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/20/2007
Test Engineer:Chin Pang
Configuration:EUT Only
Mode: Transmit, a mode 5.8GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	HPF_7.6GHz	

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)
Low Ch, 5745MHz															
11.490	3.0	45.0	33.5	37.6	11.6	-33.1	0.0	0.7	61.8	50.3	74	54	-12.2	-3.7	V
11.490	3.0	47.8	35.0	37.6	11.6	-33.1	0.0	0.7	64.6	51.8	74	54	-9.4	-2.2	H
Mid Ch, 5785MHz															
11.570	3.0	47.0	33.0	37.6	11.7	-33.0	0.0	0.7	64.0	50.0	74	54	-10.0	-4.0	V
11.570	3.0	47.3	33.4	37.6	11.7	-33.0	0.0	0.7	64.3	50.4	74	54	-9.7	-3.6	H
High Ch															
11.650	3.0	44.6	32.5	37.7	11.8	-32.9	0.0	0.7	61.8	49.7	74	54	-12.2	-4.3	V
11.650	3.0	47.0	33.2	37.7	11.8	-32.9	0.0	0.7	64.2	50.4	74	54	-9.8	-3.6	H

Rev. 5.1.6
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		

HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT20)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/20/2007
Test Engineer:Mengistu Mekuria
Configuration:EUT Only
Mode: Transmit, 11n 20M mode 5.8GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	HPF_7.6GHz	

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)
Low Ch, 5745MHz															
11.490	3.0	48.0	34.3	37.6	11.6	-33.1	0.0	0.7	64.8	51.1	74	54	-9.2	-2.9	V
11.490	3.0	51.1	36.1	37.6	11.6	-33.1	0.0	0.7	67.9	53.0	74	54	-6.1	-1.0	H
Mid Ch, 5785MHz															
11.570	3.0	45.1	31.8	37.6	11.7	-33.0	0.0	0.7	62.2	48.8	74	54	-11.8	-5.2	V
11.570	3.0	46.9	33.0	37.6	11.7	-33.0	0.0	0.7	64.0	50.0	74	54	-10.0	-4.0	H
High Ch 5825 MHz															
11.650	3.0	43.1	30.8	37.7	11.8	-32.9	0.0	0.7	60.3	48.1	74	54	-13.7	-5.9	V
11.650	3.0	44.7	31.2	37.7	11.8	-32.9	0.0	0.7	61.9	48.4	74	54	-12.1	-5.6	H

Rev. 5.1.6
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		

HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT40)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/20/2007
Test Engineer:Mengistu Mekuria
Configuration:EUT Only
Mode: Transmit, 11n 40M mode 5.8GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	HPF_7.6GHz	

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)
Low Ch, 5755MHz															
11.510	3.0	44.1	31.5	37.6	11.6	-33.1	0.0	0.7	61.0	48.4	74	54	-13.0	-5.6	V
11.510	3.0	47.4	33.3	37.6	11.6	-33.1	0.0	0.7	64.3	50.2	74	54	-9.7	-3.8	H
High Ch 5795 MHz															
11.590	3.0	42.6	30.7	37.6	11.7	-33.0	0.0	0.7	59.7	47.8	74	54	-14.3	-6.2	V
11.590	3.0	44.9	31.0	37.6	11.7	-33.0	0.0	0.7	61.9	48.1	74	54	-12.1	-5.9	H

Rev. 5.1.6
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		

HARMONICS AND SPURIOUS EMISSIONS (802.11n MIMO HT20)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/20/2007
Test Engineer:Mengistu Mekuria
Configuration:EUT Only
Mode: Transmit, 11n MIMO 20M mode 5.8GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	HPF_7.6GHz	

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)
Low Ch, 5745MHz															
11.490	3.0	48.1	34.2	37.6	11.6	-33.1	0.0	0.7	64.9	51.0	74	54	-9.1	-3.0	V
11.490	3.0	52.4	36.4	37.6	11.6	-33.1	0.0	0.7	69.2	53.3	74	54	-4.8	-0.7	H
Mid Ch, 5785MHz															
11.570	3.0	48.3	33.8	37.6	11.7	-33.0	0.0	0.7	65.3	50.8	74	54	-8.7	-3.2	V
11.570	3.0	51.1	36.2	37.6	11.7	-33.0	0.0	0.7	68.1	53.2	74	54	-5.9	-0.8	H
High Ch 5825 MHz															
11.650	3.0	48.1	33.5	37.7	11.8	-32.9	0.0	0.7	65.3	50.8	74	54	-8.7	-3.2	V
11.650	3.0	50.4	35.0	37.7	11.8	-32.9	0.0	0.7	67.7	52.3	74	54	-6.3	-1.7	H

Rev. 5.1.6
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		

HARMONICS AND SPURIOUS EMISSIONS (802.11n MIMO HT40)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber B

Company:Intel
Project #:07U10925
Date:3/20/2007
Test Engineer:Mengistu Mekuria
Configuration:EUT Only
Mode: Transmit, 11n MIMO 40M mode 5.8GHz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001	HPF_7.6GHz	

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)
Low Ch, 5755MHz															
11.510	3.0	47.9	31.8	37.6	11.6	-33.1	0.0	0.7	64.8	48.6	74	54	-9.2	-5.4	V
11.510	3.0	50.7	34.6	37.6	11.6	-33.1	0.0	0.7	67.6	51.4	74	54	-6.4	-2.6	H
High Ch 5795 MHz															
11.590	3.0	47.7	33.0	37.6	11.7	-33.0	0.0	0.7	64.8	50.1	74	54	-9.2	-3.9	V
11.590	3.0	50.3	35.0	37.6	11.7	-33.0	0.0	0.7	67.4	52.1	74	54	-6.6	-1.9	H

Rev. 5.1.6
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		

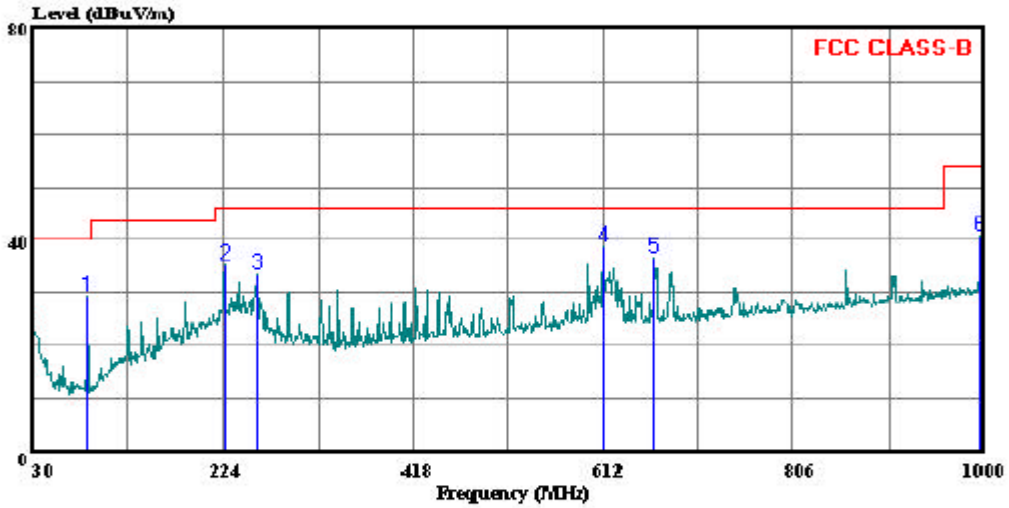
7.3.4. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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

HORIZONTAL PLOT

COMPLIANCE Engineering Services, Inc.
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 07U10925emi.EMI Date: 03-23-2007 Time: 00:31:39



Trace: 6 Ref Trace:

Condition: FCC CLASS-B
Test Operator: : Mengsitu Mekuria
Project #: : 07U10925
Company: : National Semiconductor
EUT: : Intel Wireless WiFi Link 4965AGN
Configuration: : EUT Inside Laptop
Mode of Operation:: TX (Worst Case 2.4GHz)
Standard: : FCC Class B

HORIZONTAL DATA

Page: 1

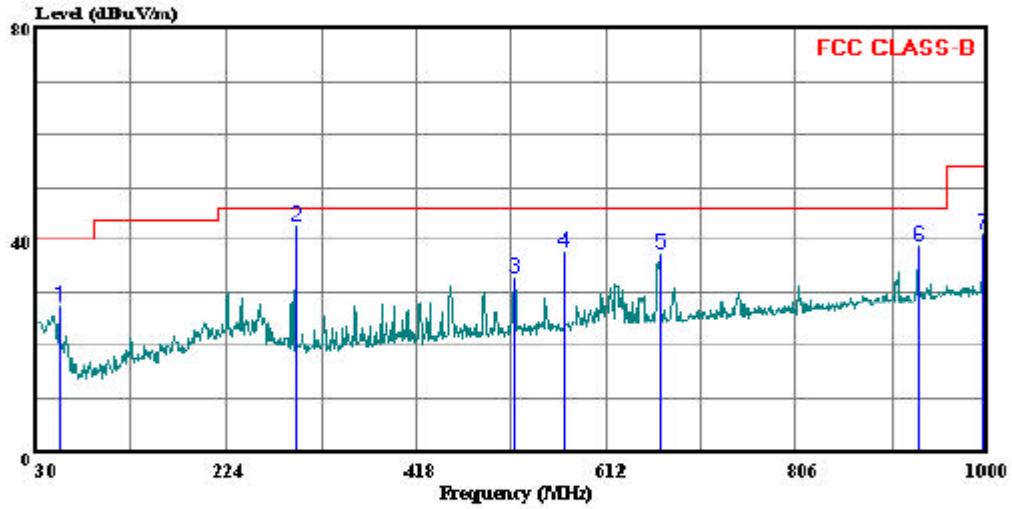
	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	85.290	52.30	7.90	0.97	31.69	29.48	40.00	-10.52	Peak
2	225.940	53.90	11.50	1.60	31.58	35.42	46.00	-10.58	Peak
3	258.920	51.00	12.53	1.72	31.64	33.61	46.00	-12.39	Peak
4	612.000	48.40	19.44	2.76	31.92	38.68	46.00	-7.32	Peak
5	663.410	45.60	20.11	2.83	31.96	36.59	46.00	-9.41	Peak
6	996.120	43.80	23.64	3.60	30.14	40.89	54.00	-13.11	Peak

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

VERTICAL PLOT

47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 5 File#: 07U10925emi.EMI Date: 03-23-2007 Time: 00:25:00



Trace: 4 Ref Trace:

Condition: FCC CLASS-B
Test Operator: : Mengsitu Mekuria
Project #: : 07U10925
Company: : National Semiconductor
EUT: : Intel Wireless WiFi Link 4965AGN
Configuration: : EUT Inside Laptop
Mode of Operation:: TX (Worst Case 2.4GHz)
Standard: : FCC Class B

VERTICAL DATA

Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	54.250	50.20	8.27	0.75	31.75	27.47	40.00	-12.53	Peak
2	295.780	58.70	13.79	1.84	31.59	42.74	46.00	-3.26	Peak
3	518.880	43.90	18.25	2.52	31.78	32.89	46.00	-13.11	Peak
4	568.350	48.20	18.89	2.62	31.81	37.90	46.00	-8.10	Peak
5	666.320	46.50	20.15	2.85	31.94	37.56	46.00	-8.44	Peak
6	930.160	43.30	23.03	3.55	30.95	38.93	46.00	-7.07	Peak
7	996.120	44.10	23.64	3.60	30.14	41.19	54.00	-12.81	Peak

7.3.5. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

IC Safety Code 6, Section 2.2.1 (a) A person other than an RF and microwave exposed worker shall not be exposed to electromagnetic radiation in a frequency band listed in Column 1 of Table 5, if the field strength exceeds the value given in Column 2 or 3 of Table 5, when averaged spatially and over time, or if the power density exceeds the value given in Column 4 of Table 5, when averaged spatially and over time.

Table 5
Exposure Limits for Persons Not Classed As RF and Microwave Exposed Workers (Including the General Public)

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m^2)	5 Averaging Time (min)
0.003–1	280	2.19		6
1–10	$280/f$	$2.19/f$		6
10–30	28	$2.19/f$		6
30–300	28	0.073	2*	6
300–1 500	$1.585f^{0.5}$	$0.0042f^{0.5}$	$f/150$	6
1 500–15 000	61.4	0.163	10	6
15 000–150 000	61.4	0.163	10	$616\,000/f^{1.2}$
150 000–300 000	$0.158f^{0.5}$	$4.21 \times 10^{-4}f^{0.5}$	$6.67 \times 10^{-5}f$	$616\,000/f^{1.2}$

* Power density limit is applicable at frequencies greater than 100 MHz.

Notes: 1. Frequency, f, is in MHz.
2. A power density of 10 W/m^2 is equivalent to 1 mW/cm^2.
3. A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

CALCULATIONS

Given

$E = \sqrt{(30 * P * G)} / d$

and

$S = E ^ 2 / 377$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in watts/square meter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (377 * S))}$

Changing Power to units of mW and Distance to units of cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (377 * S))}$
$d = 0.892 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in W/m^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (dBi) / 10)

yields

$d = 0.892 * 10 ^ ((P + G) / 20) / \sqrt{S}$

where

d = MPE distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in W/m^2

Rearranging terms to calculate the power density at a specific distance yields

$S = 0.795 * 10 ^ ((P + G) / 10) / (d^2)$

LIMITS

From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m^2

RESULTS

No non-compliance noted: (MPE distance equals 20 cm)

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (W/m^2)
2.4GHz Band	20.0	20.60	1.52	0.32
5.8GHz Band	20.0	20.60	2.13	0.37

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

7.3.6. 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 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the 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:

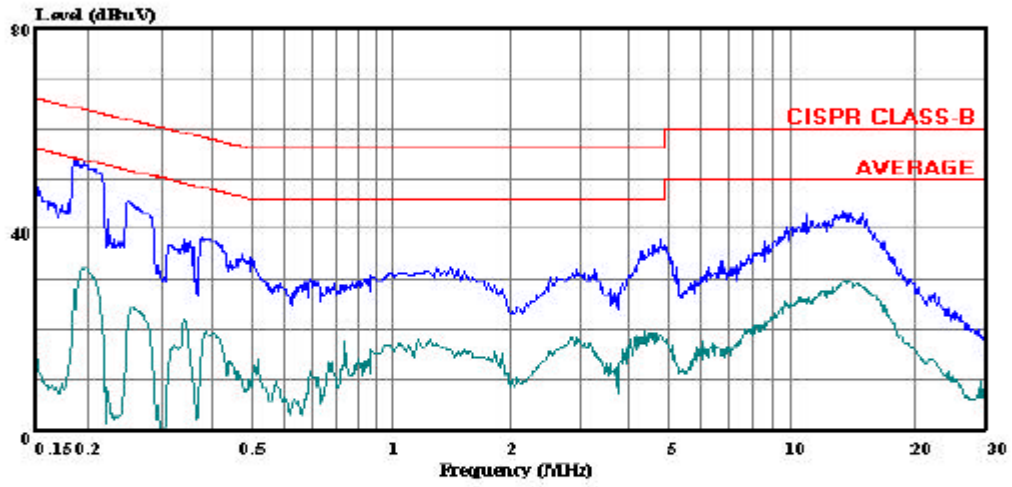
6 WORST EMISSIONS

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
0.19	53.62	--	32.38	0.00	64.12	54.12	-10.50	-21.74	L1
4.85	38.10	--	--	0.00	56.00	46.00	-17.90	-7.90	L1
13.62	43.12	--	--	0.00	60.00	50.00	-16.88	-6.88	L1
0.20	49.41	--	36.98	0.00	63.61	53.61	-14.20	-16.63	L2
4.53	35.88	--	--	0.00	56.00	46.00	-20.12	-10.12	L2
13.70	43.06	--	--	0.00	60.00	50.00	-16.94	-6.94	L2
6 Worst Data									

LINE 1 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 07U10925LC.EMI Date: 03-23-2007 Time: 01:01:30



Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Mengsitu Mekuria
Project #: : 07U10925
Company: : National Semiconductor
EUT: : Intel Wireless WiFi Link 4965AGN
Configuration: : EUT Inside Laptop
Mode of Operation:: TX Worst Case
Standard: : FCC Class B
: L1: Blue(Peak), Green(Average)

LINE 2 RESULTS