



**FCC CFR47 PART 15 SUBPART E
CLASS II PERMISSIVE CHANGE
TEST REPORT
FOR**

Wireless WiFi Link 4965AGN

MODEL NUMBER: PA3538U-1MPC

FCC ID: CJ6UPA3538WL

REPORT NUMBER: 06U10752-2B

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Prepared for
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Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	12/29/06	Initial Issue	Thu
B	1/9/07	Corrected some typos	HS

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: TOSHIBA CORPORATION
DIGITAL MEDIA NETWORK COMPANY
OME COMPLEX, 2-9, SUEHIRO-CHO
TOKYO, 198-8710, JAPAN

EUT DESCRIPTION: Wireless WiFi Link 4965AGN

MODEL: PA3538U-1MPC

SERIAL NUMBER: D73379-002

DATE TESTED: DECEMBER 5-15, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART E	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

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 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 an 802.11a/b/g/n transceiver in Toshiba Protégé R400 Tablet.

5.2. CLASS II PERMISSIVE CHANGE DESCRIPTION

The major change filed under this application is:

The EUT module is being used in a Toshiba Protégé R400 Tablet.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a same maximum peak conducted output power on the original grant of FCC ID: PD94965AGN.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two PIFA antennas for diversity, each with a maximum gain of 0.8 dBi @ 5.2 GHz.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was Intel PRO/Wireless 4965AGN Network Connection xVT, version 11.1.0.53.

The test utility software used during testing was CRTU, rev. 4.1.20.0000.

5.6. WORST-CASE CONFIGURATION AND MODE

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

The worst-case channel is determined as the channel with the highest output power. The highest measured output powers were at 5320 MHz for 802.11a 6Mb/s, 5320MHz for 802.11n 20MHz BW HT0 and HT8, 5310MHz for 802.11n 40MHz BW HT0 and 5270MHz for 802.11n 40MHz BW HT8.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Toshiba Potege	TOMEU-AAA11	PCN1932CCZ01	DoC
AC Adapter	Toshiba	PA3282U-1ACA	71C00002SC10	DoC

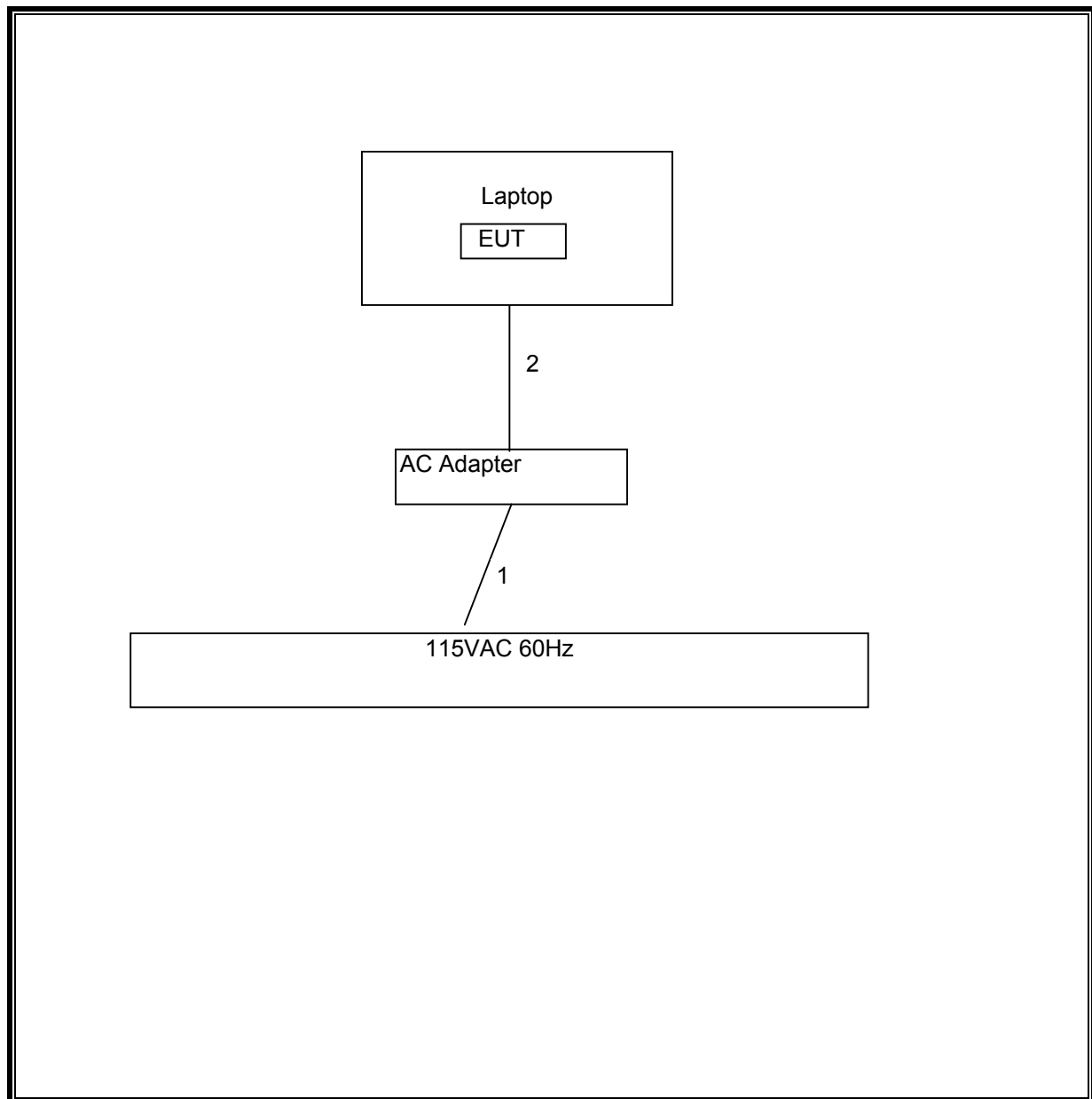
I/O CABLES

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	N/A
2	DC	1	DC	Un-shielded	2m	N/A

TEST SETUP

The EUT is installed inside 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	EMCO	3115	9001-3245	4/22/2007
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	4/22/2007
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00561	10/3/2007
Preamplifier, 26 ~ 40 GHz	Miteq	NSP4000-SP2	924343	8/18/2007
Antenna, Horn 18 ~ 26 GHz	ARA	MWH-1826/B	1049	9/12/2007
Antenna, Horn 26 ~ 40 GHz	ARA	MWH-2640/B	1029	4/13/2007
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/2007
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2007
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/2007
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	2/4/2007
RF Filter Section	Agilent / HP	85420E	3705A00256	2/4/2007
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/2/2007
Peak / Average Power Sensor	Agilent	E9327A	US40440755	12/2/2007
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY43360112	5/3/07
7.6GHz HPF	MicroTronic	HPM13195	1	CNR

7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR THE 5150 TO 5350 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 = $10 \log (10^{\text{Chain 0 Power} / 10} + 10^{\text{Chain 2 Power} / 10})$

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11a

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)	Average Power Total (dBm)
Low	5180	16.4	16.4	19.4
Middle	5260	17.5	17.6	20.5
High	5320	16.5	16.5	19.5

802.11n 20MHz BW

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)	Average Power Total (dBm)
Low	5180	17.5	17.5	20.5
Middle	5260	17.5	17.5	20.5
High	5320	16.5	16.5	19.5

802.11n 40MHz BW

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)	Average Power Total (dBm)
Low	5190	15.4	15.4	18.4
Middle	5270	17.4	17.4	20.4
High	5310	15.3	15.4	18.4

802.11n MIMO 20MHz BW

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)	Average Power Total (dBm)
Low	5180	12.6	12.5	15.6
Middle	5260	14.6	14.4	17.5
High	5320	14.4	14.3	17.4

802.11n MIMO 40MHz BW

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)	Average Power Total (dBm)
Low	5190	12.5	12.6	15.5
Middle	5270	14.5	14.6	17.5
High	5310	14.4	14.6	17.5

7.2. RADIATED EMISSIONS

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.

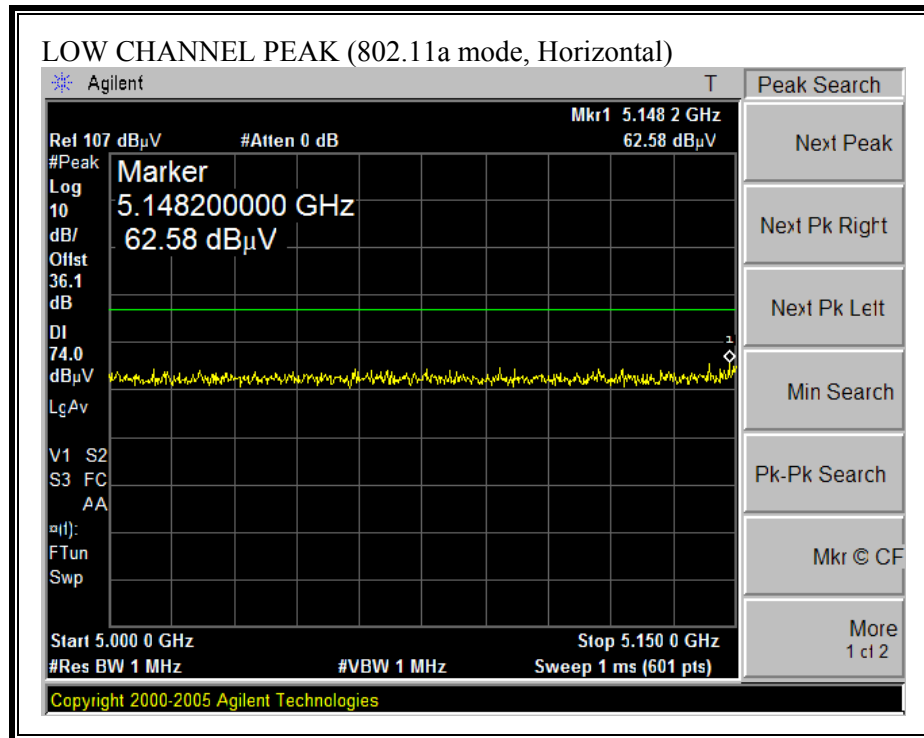
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

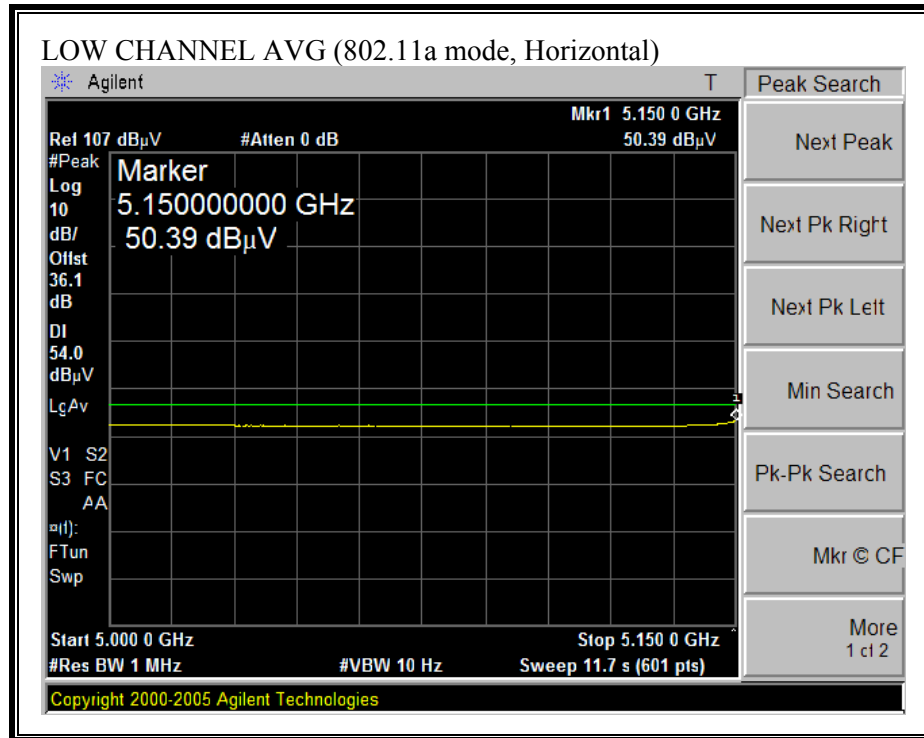
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

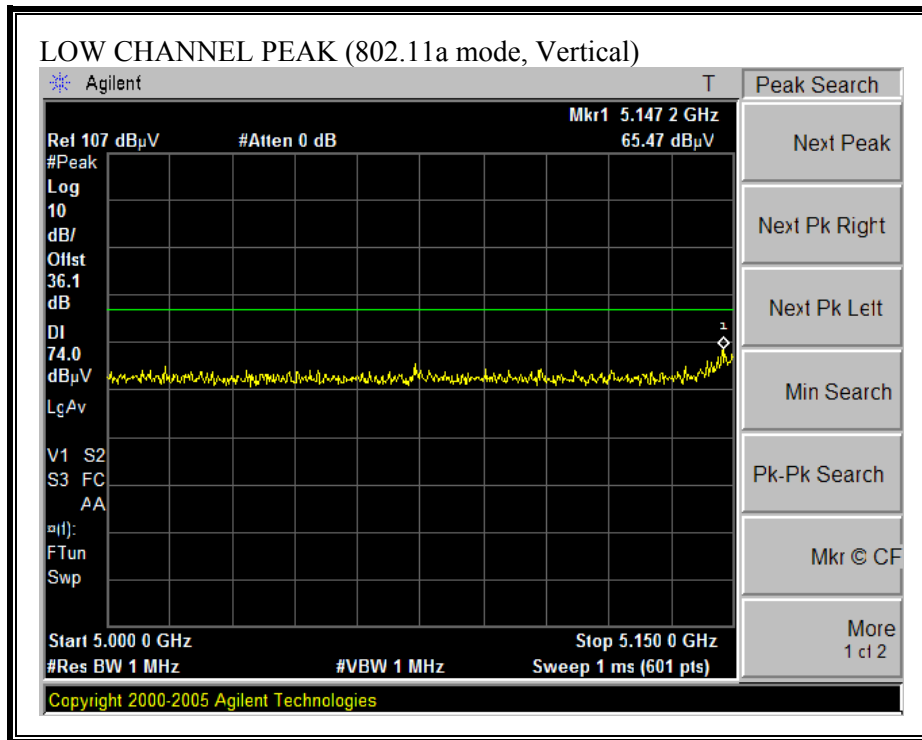
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

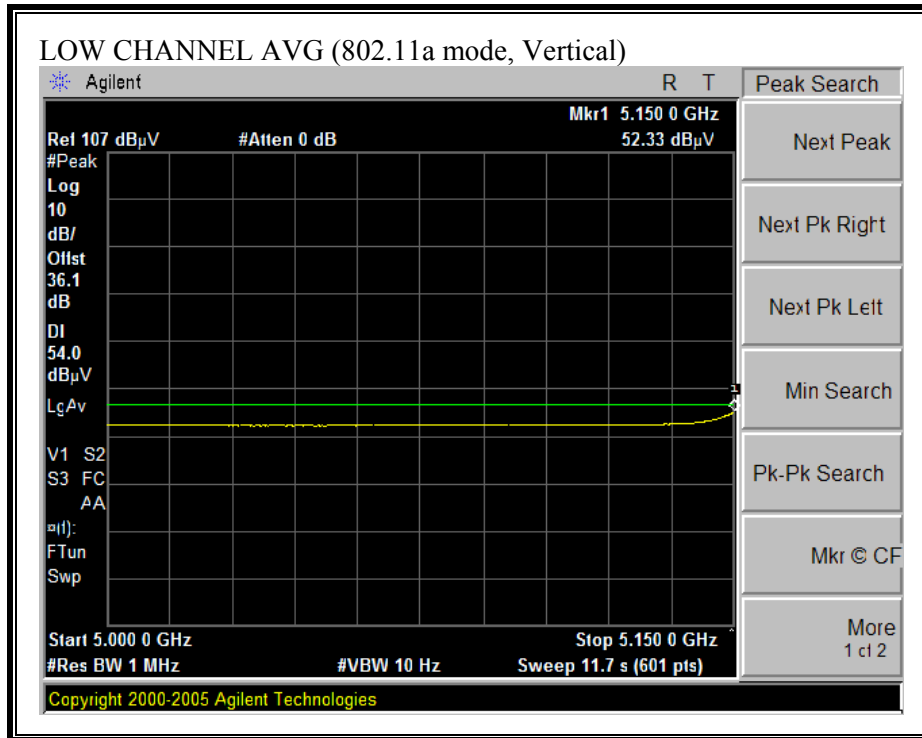
7.2.2. TRANSMITTER ABOVE 1 GHz FOR 5150 TO 5350 MHz BAND

RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL)

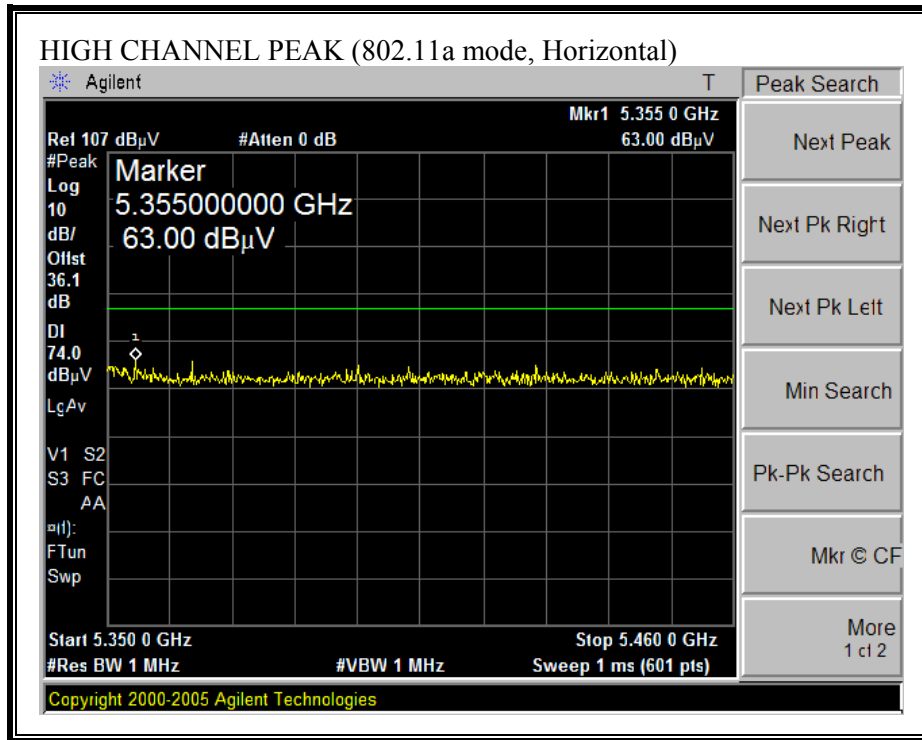


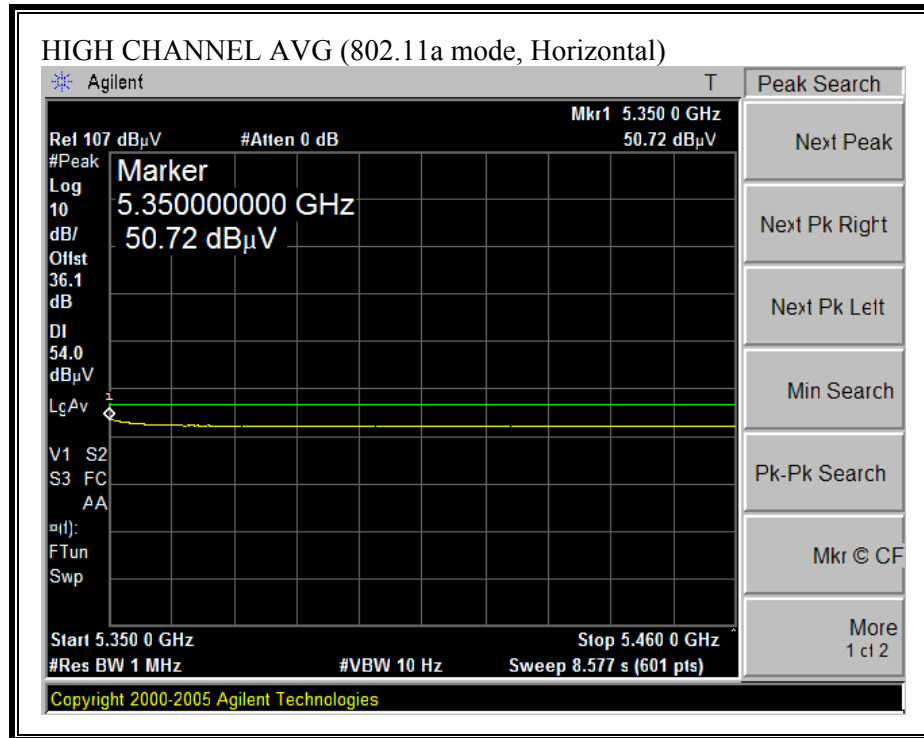


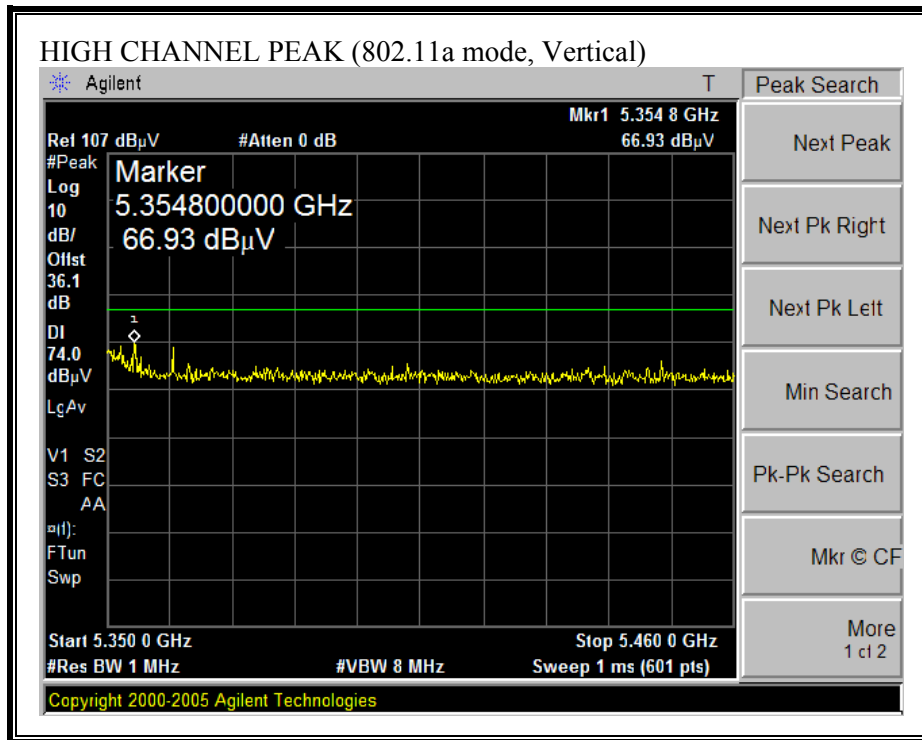


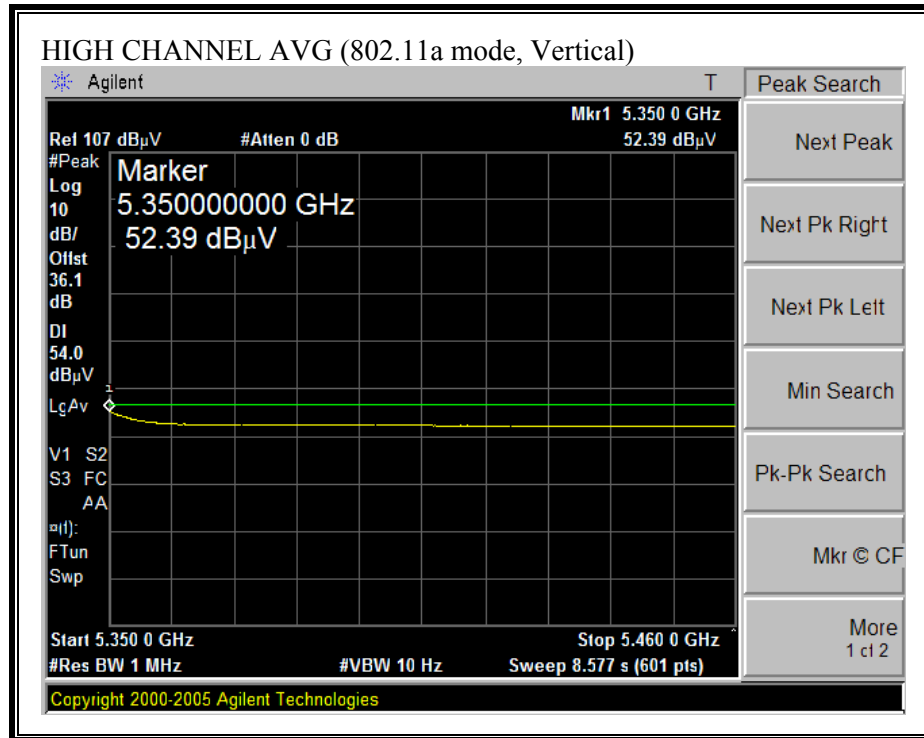


RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL)





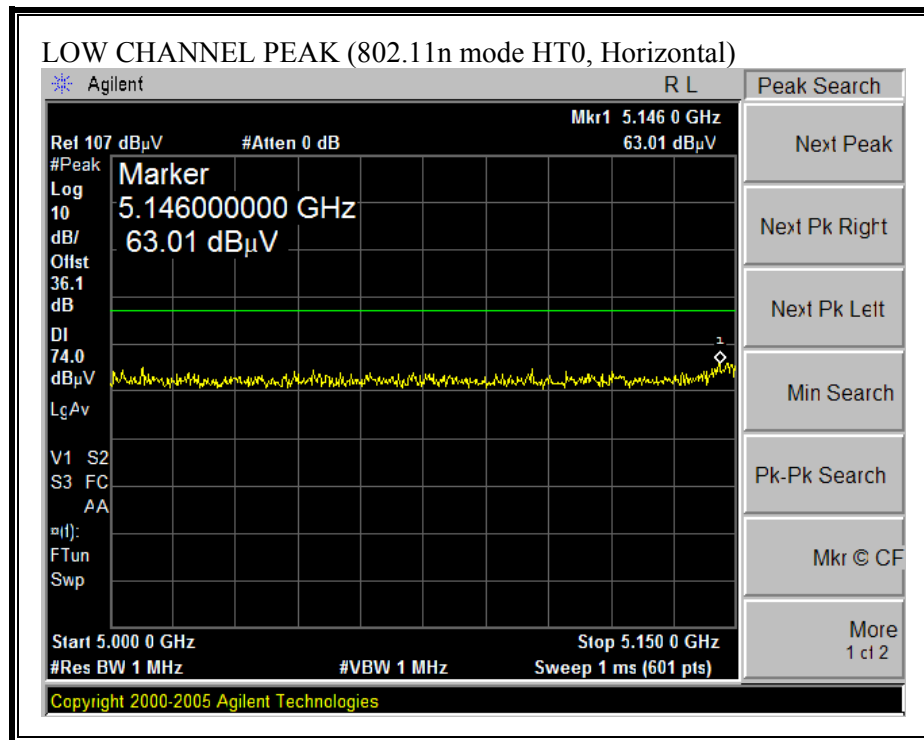


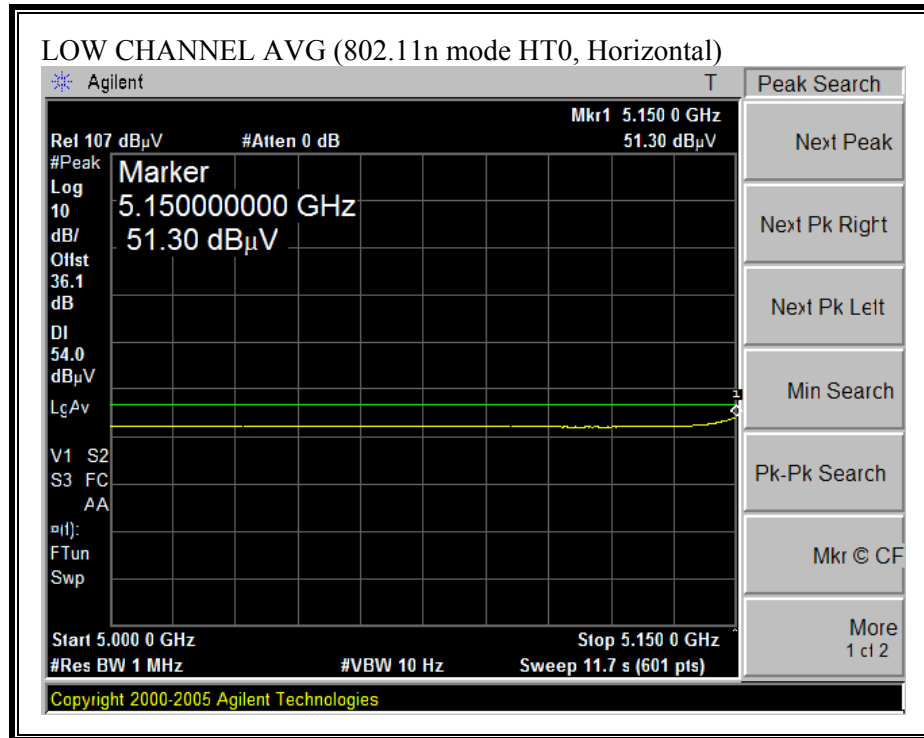


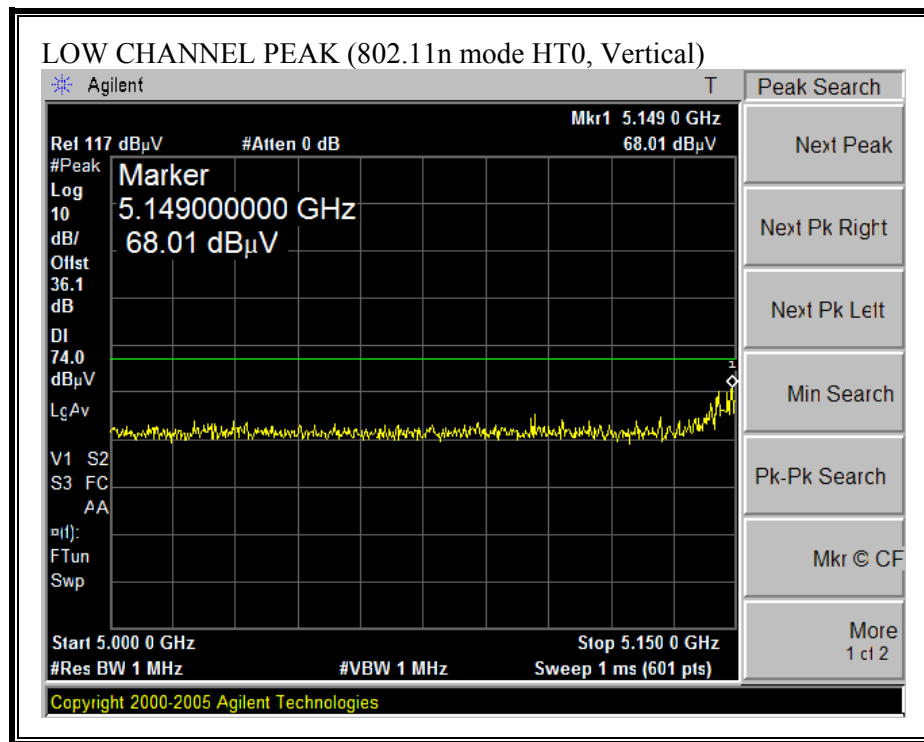
HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

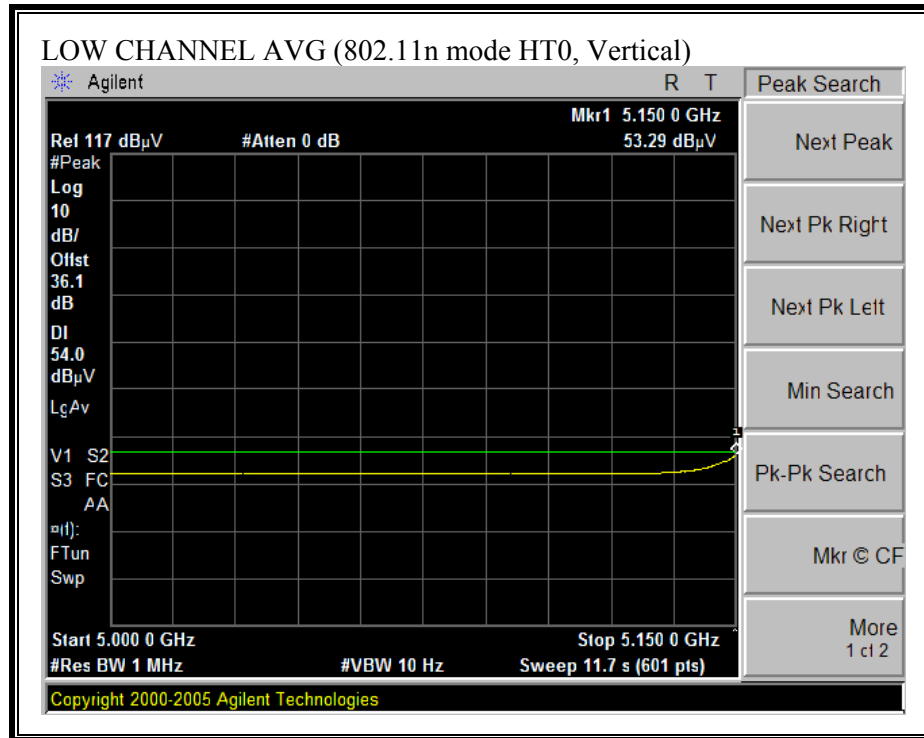
High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Company: Toshiba																
Project #:06U10752																
Date:12/8/2006																
Test Engineer:Chin Pang																
Configuration:EUT inside the Laptop																
Mode:TX, 5.2GHz Band, 6Mbps																
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T59; S/N: 3245 @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			Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz	
			Chin 197538001			Chin 200354001			HPF_7.6GHz							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr 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																
15.540	3.0	46.0	33.6	38.5	5.8	-32.3	0.0	0.7	58.7	46.3	74	54	-15.3	-7.7	V	
15.540	3.0	45.0	33.0	38.5	5.8	-32.3	0.0	0.7	57.7	45.7	74	54	-16.3	-8.3	H	
Mid Ch																
15.780	3.0	46.5	34.0	38.3	5.9	-32.2	0.0	0.7	59.2	46.7	74	54	-14.8	-7.3	V	
15.780	3.0	45.7	32.8	38.3	5.9	-32.2	0.0	0.7	58.4	45.5	74	54	-15.6	-8.5	H	
High Ch																
10.640	3.0	56.2	43.9	37.3	4.3	-34.2	0.0	0.8	64.3	52.0	74	54	-9.7	-2.0	V	
15.960	3.0	46.2	33.5	38.2	5.9	-32.2	0.0	0.7	58.8	46.1	74	54	-15.2	-7.9	V	
10.640	3.0	54.5	42.0	37.3	4.3	-34.2	0.0	0.8	62.6	50.1	74	54	-11.4	-3.9	H	
15.960	3.0	45.0	32.6	38.2	5.9	-32.2	0.0	0.7	57.6	45.2	74	54	-16.4	-8.8	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 MODE HT0, LOW CHANNEL)

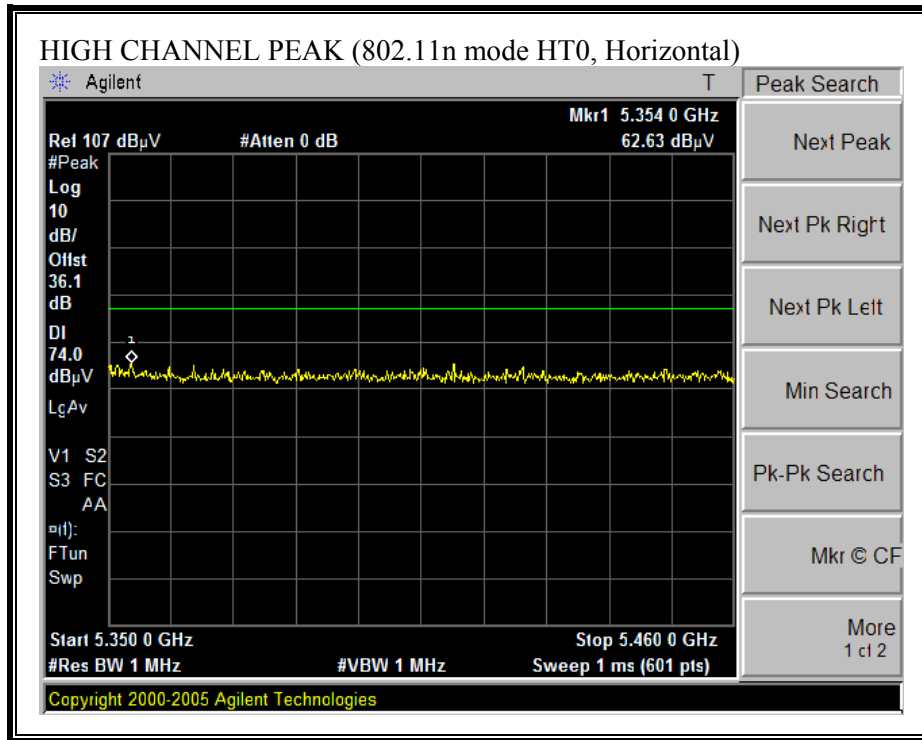


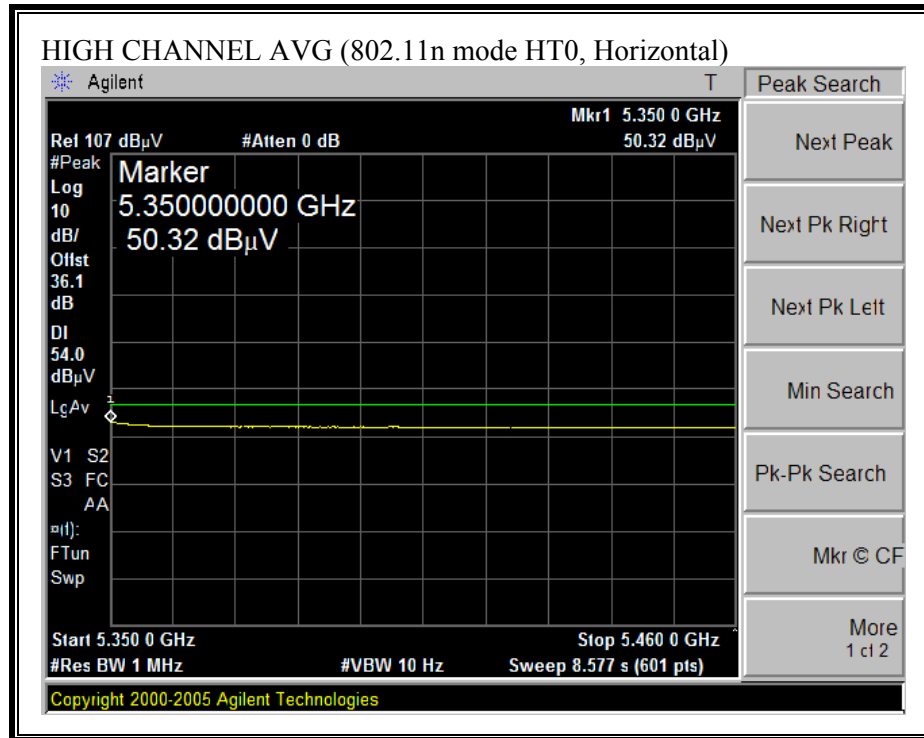


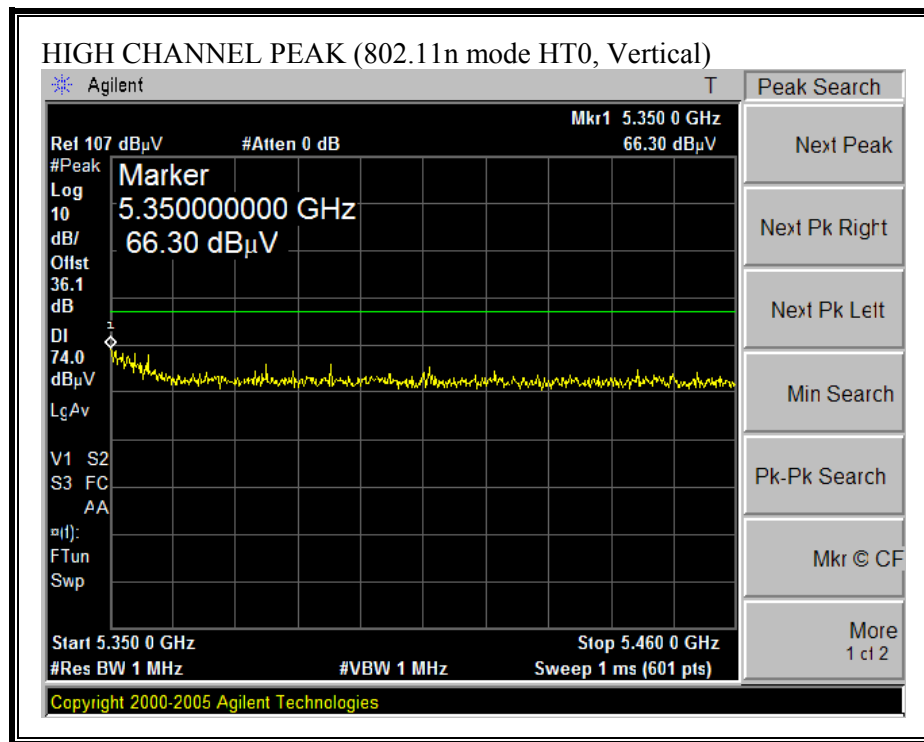


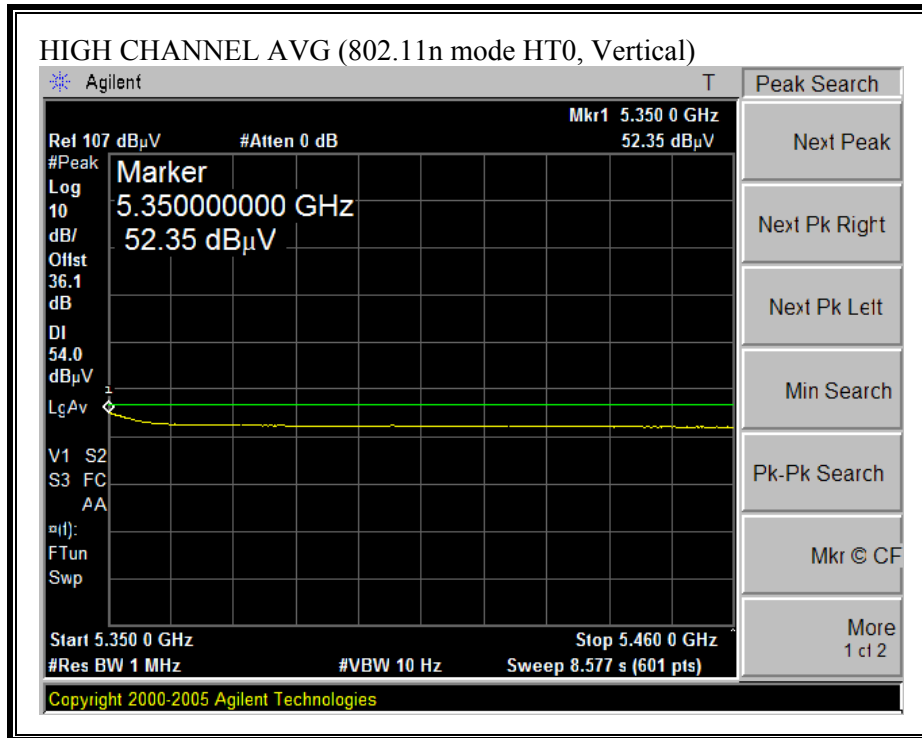


RESTRICTED BANDEDGE (802.11n MODE20MHz BW HT0, HIGH CHANNEL)





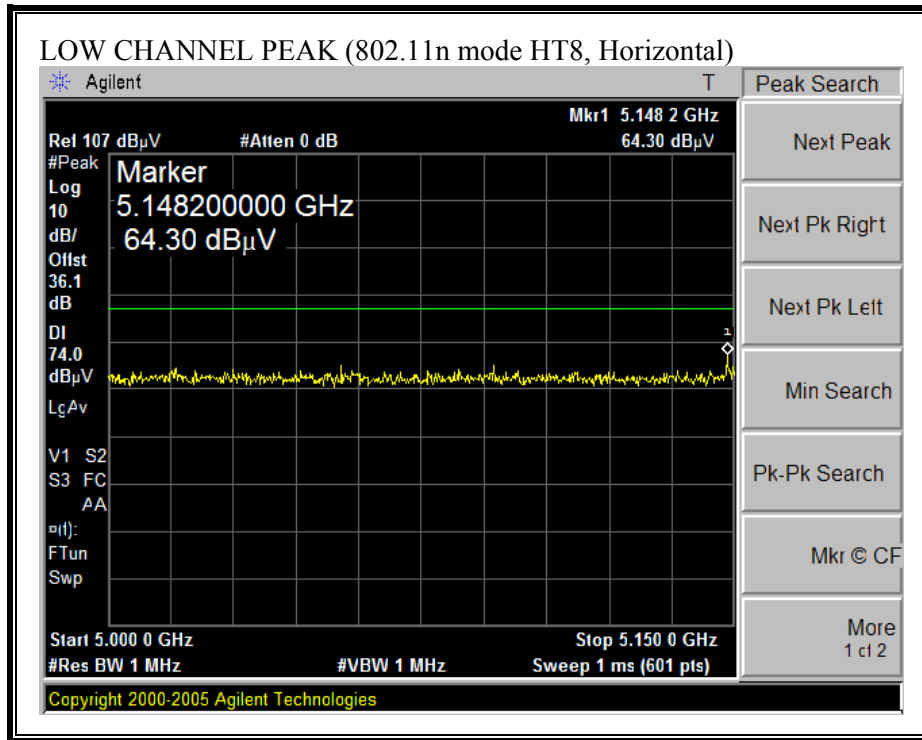


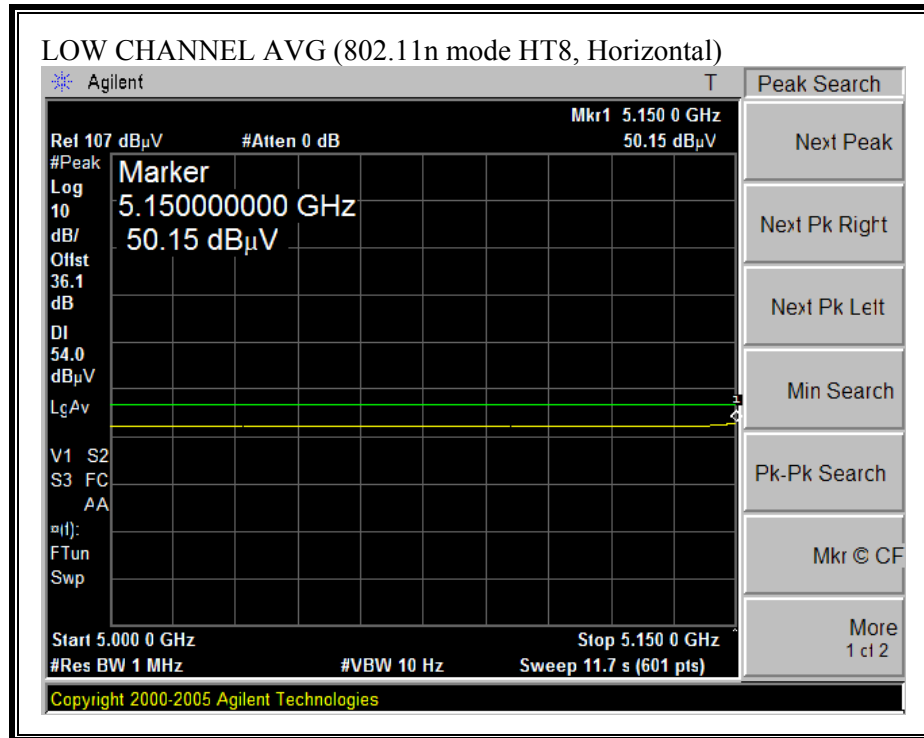


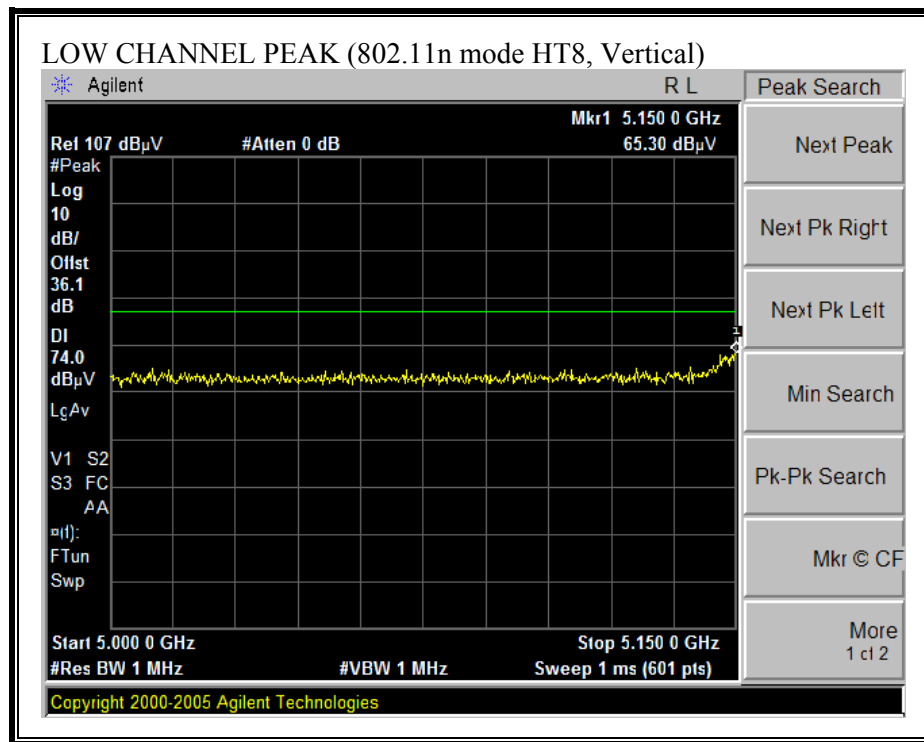
HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT0)

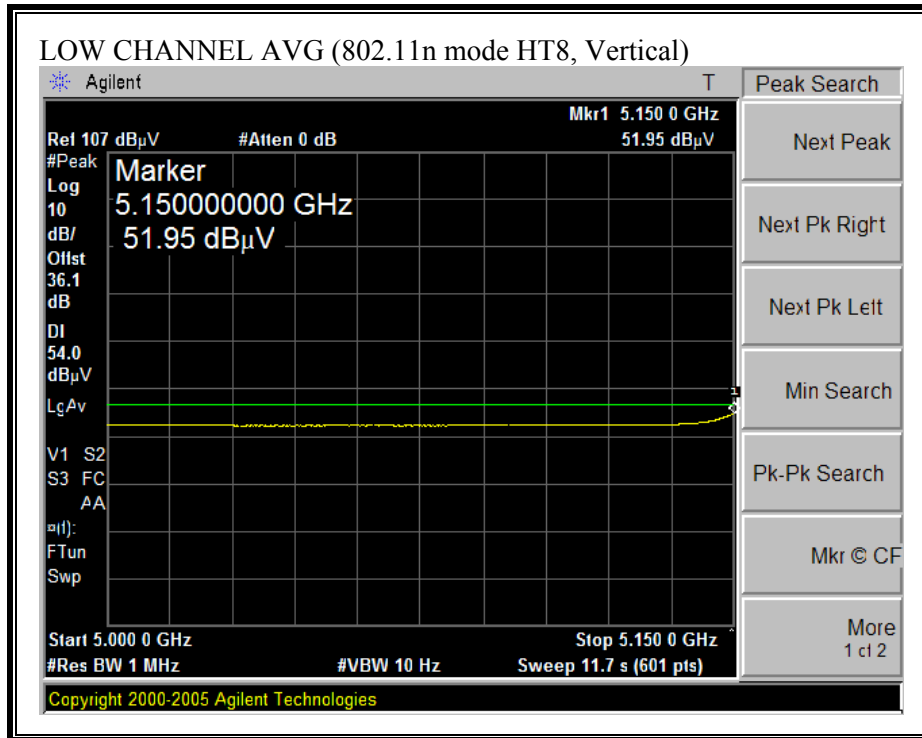
High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Company: Toshiba																
Project #:06U10752																
Date:12/8/2006																
Test Engineer:Chin Pang																
Configuration:EUT inside the Laptop																
Mode:TX, 5.2GHz Band, 20MHz BW, HT0																
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T59; S/N: 3245 @3m			T145 Agilent 3008A005r			T88 Miteq 26.40GHz			T39-T88 ARA 18-40GHz & Mixer > 40GHz			FCC 15.205				
Hi Frequency Cables																
2 foot cable			3 foot cable			12 foot cable			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz	
			Chin 197538001			Chin 200354001			HPF_7.6GHz							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr 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																
15.540	3.0	45.5	33.0	38.5	5.8	-32.3	0.0	0.7	58.2	45.7	74	54	-15.8	-8.3	V	
15.540	3.0	45.0	32.2	38.5	5.8	-32.3	0.0	0.7	57.7	44.9	74	54	-16.3	-9.1	H	
Mid Ch																
15.780	3.0	45.8	33.0	38.3	5.9	-32.2	0.0	0.7	58.5	45.7	74	54	-15.5	-8.3	V	
15.780	3.0	45.5	32.8	38.3	5.9	-32.2	0.0	0.7	58.2	45.5	74	54	-15.8	-8.5	H	
High Ch																
10.640	3.0	59.0	45.5	37.3	4.3	-34.2	0.0	0.8	67.1	53.6	74	54	-6.9	-0.4	V	
15.960	3.0	46.0	33.0	38.2	5.9	-32.2	0.0	0.7	58.6	45.6	74	54	-15.4	-8.4	V	
10.640	3.0	54.2	41.0	37.3	4.3	-34.2	0.0	0.8	62.3	49.1	74	54	-11.7	-4.9	H	
15.960	3.0	45.5	32.5	38.2	5.9	-32.2	0.0	0.7	58.1	45.1	74	54	-15.9	-8.9	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									

RESTRICTED BANDEDGE (802.11n MODE 20MHz BW HT8, LOW CHANNEL)

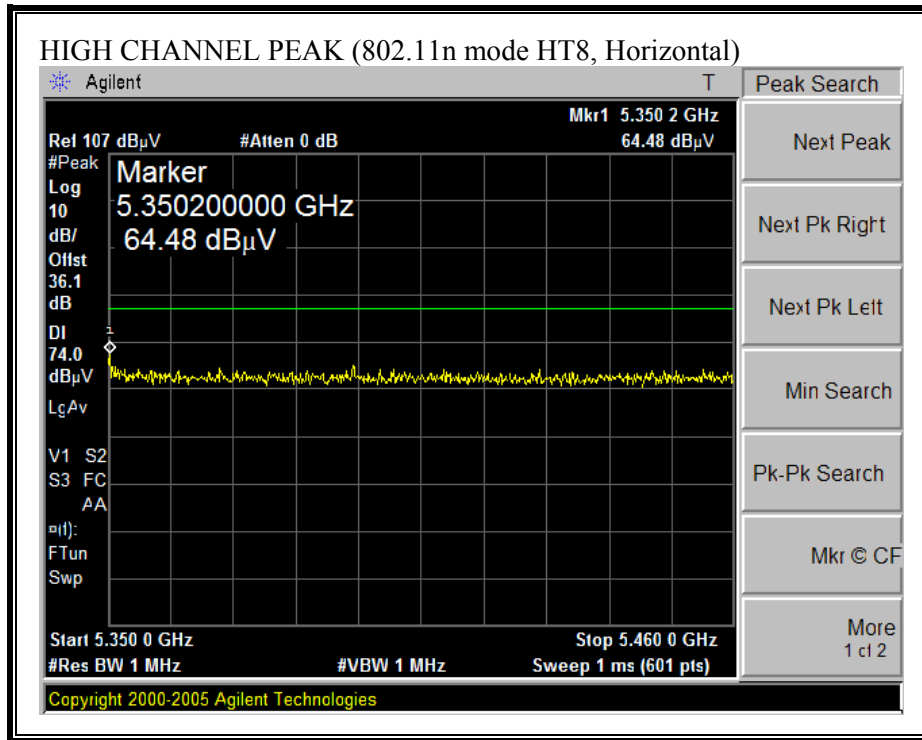


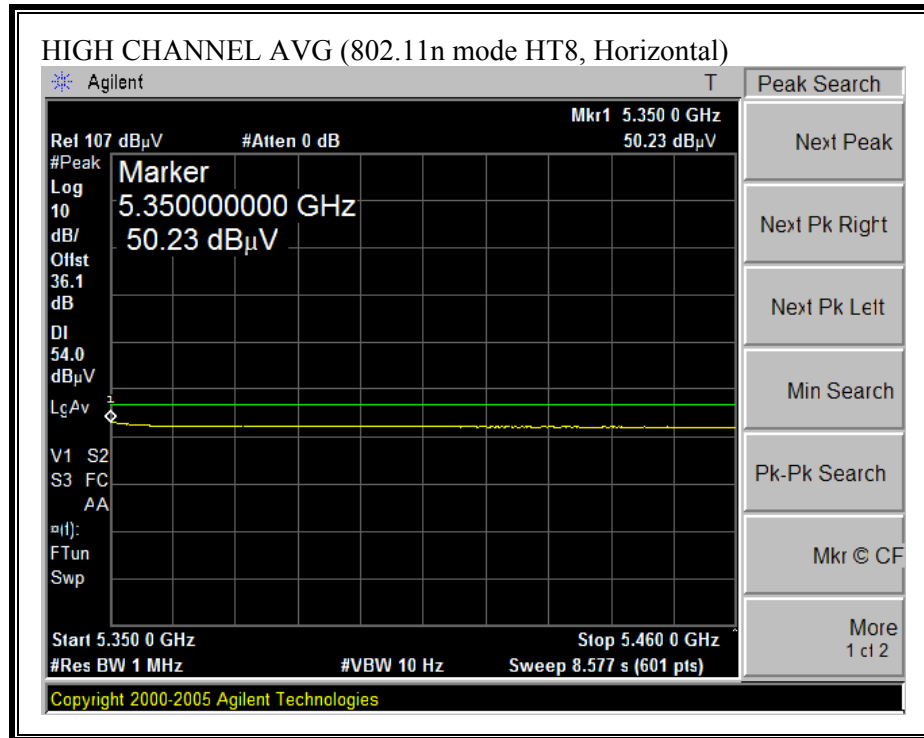


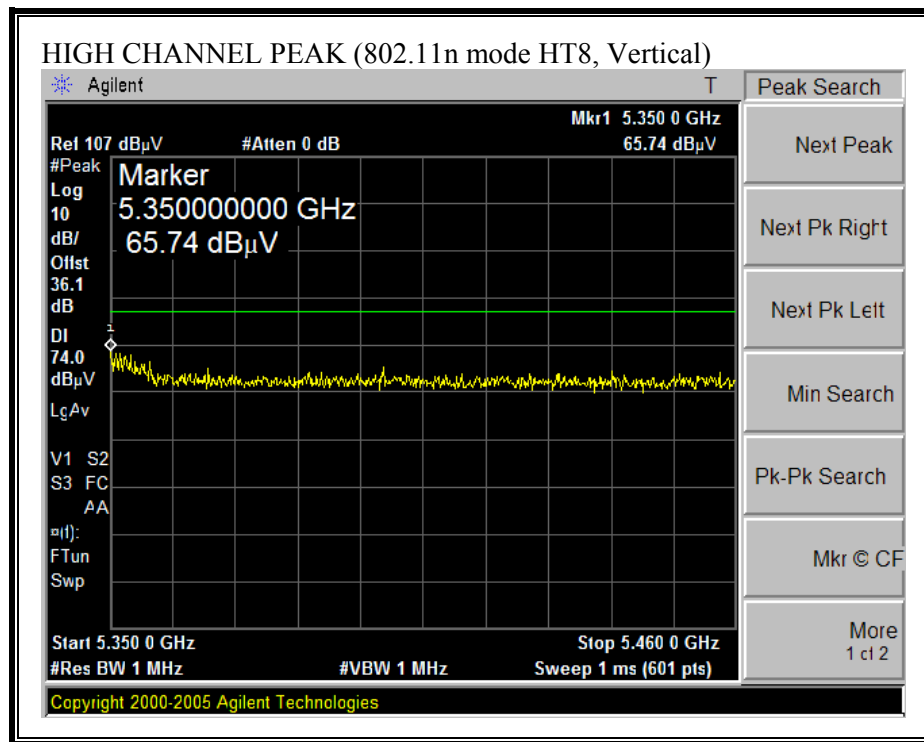


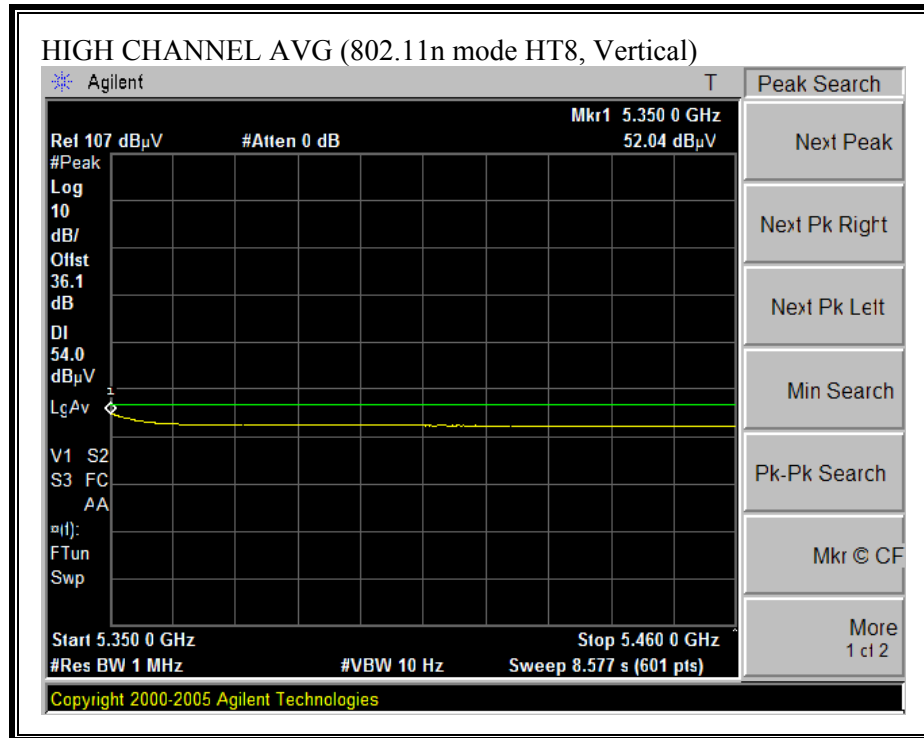


RESTRICTED BANDEDGE (802.11n MODE 20MHz BW HT8, HIGH CHANNEL)





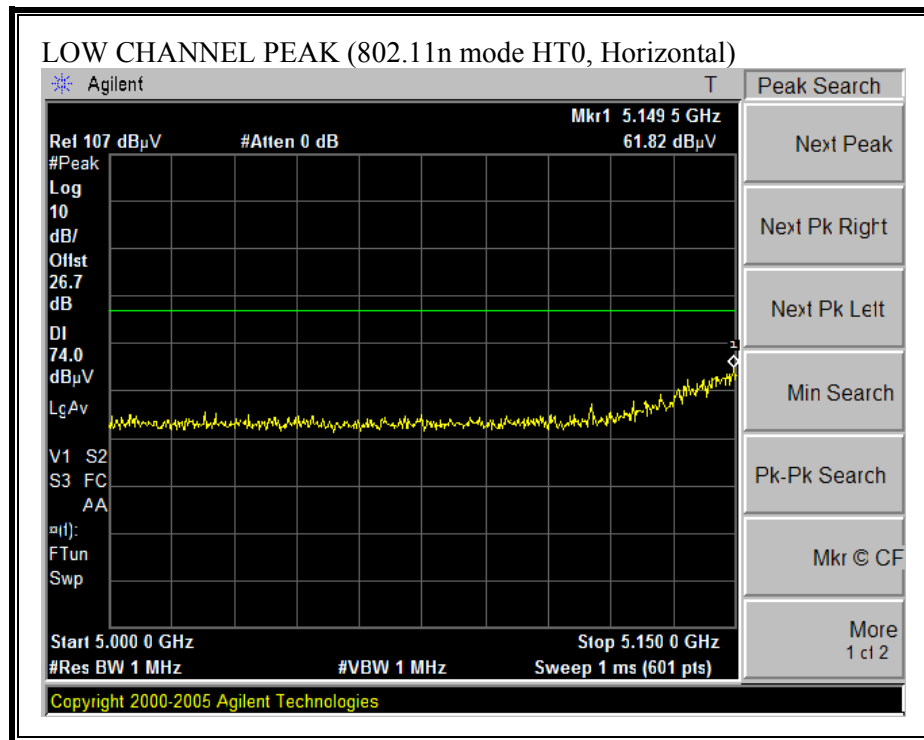


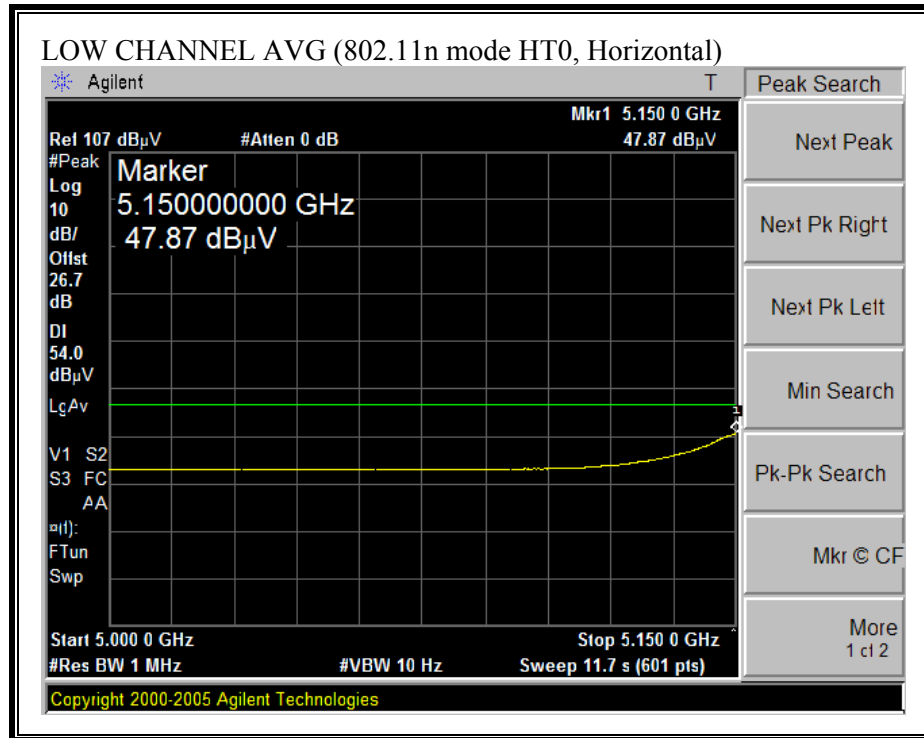


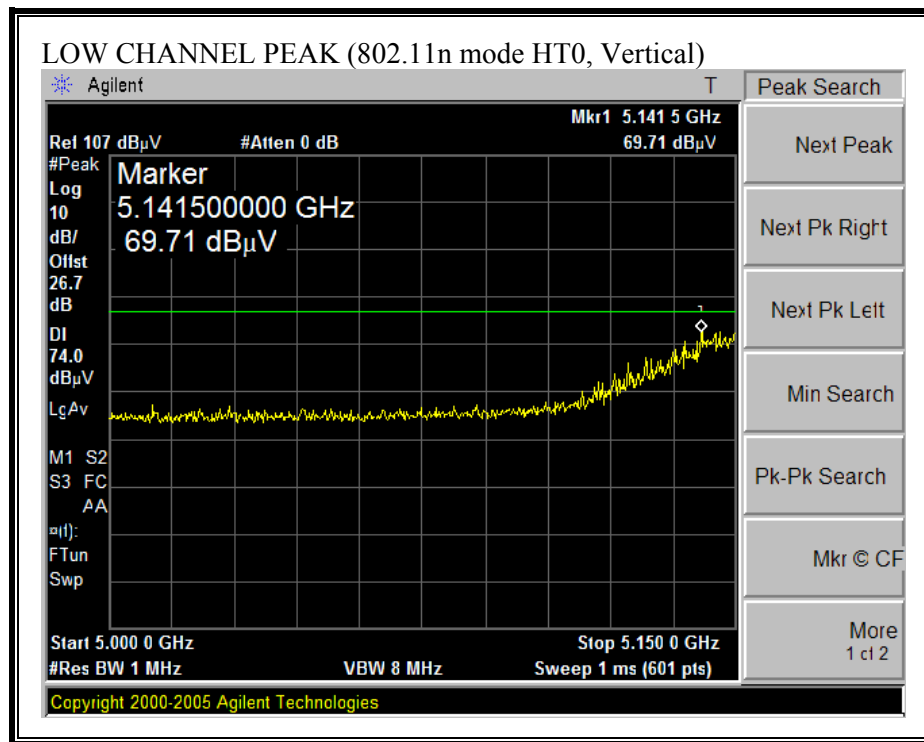
HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT8)

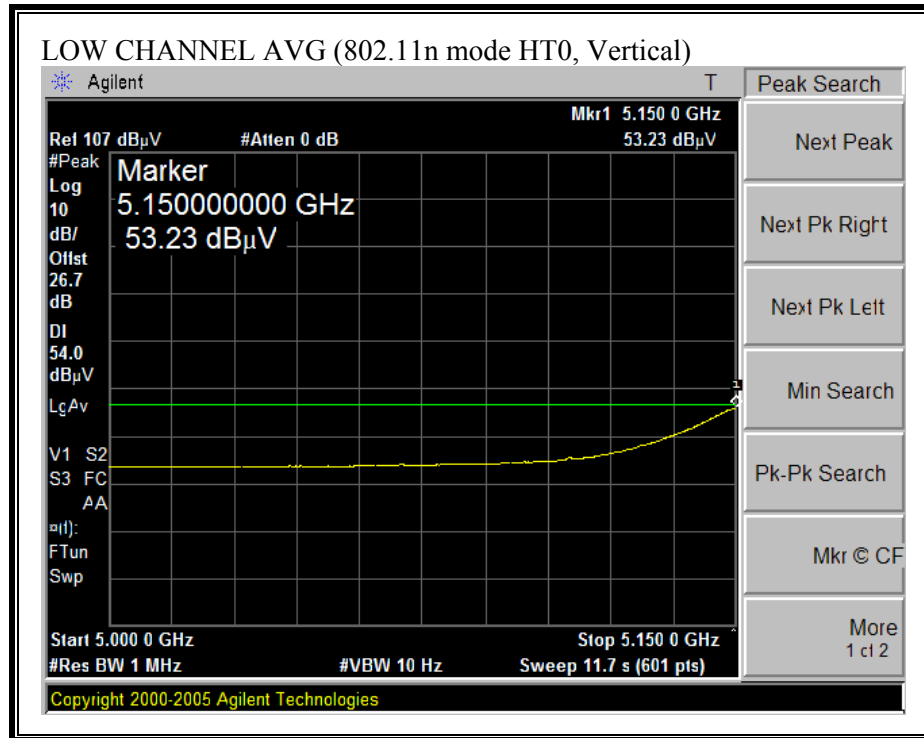
High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Company: Toshiba																
Project #:06U10752																
Date:12/8/2006																
Test Engineer:Chin Pang																
Configuration:EUT inside the Laptop																
Mode:TX, 5.2GHz Band, 20MHz BW, HT8																
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T59; S/N: 3245 @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			Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz	
			Chin 197538001			Chin 200354001			HPF_7.6GHz							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr 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																
15.540	3.0	46.0	33.0	38.5	5.8	-32.3	0.0	0.7	58.7	45.7	74	54	-15.3	-8.3	V	
15.540	3.0	45.4	32.5	38.5	5.8	-32.3	0.0	0.7	58.1	45.2	74	54	-15.9	-8.8	H	
Mid Ch																
15.780	3.0	46.7	33.7	38.3	5.9	-32.2	0.0	0.7	59.4	46.4	74	54	-14.6	-7.6	V	
15.780	3.0	46.0	33.0	38.3	5.9	-32.2	0.0	0.7	58.7	45.7	74	54	-15.3	-8.3	H	
High Ch																
10.640	3.0	59.2	45.6	37.3	4.3	-34.2	0.0	0.8	67.3	53.7	74	54	-6.7	-0.3	V	
15.960	3.0	46.5	33.5	38.2	5.9	-32.2	0.0	0.7	59.1	46.1	74	54	-14.9	-7.9	V	
10.640	3.0	55.0	41.6	37.3	4.3	-34.2	0.0	0.8	63.1	49.7	74	54	-10.9	-4.3	H	
15.960	3.0	45.8	32.7	38.2	5.9	-32.2	0.0	0.7	58.4	45.3	74	54	-15.6	-8.7	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 (802.11n MODE 40MHz BW HT0, LOW CHANNEL)

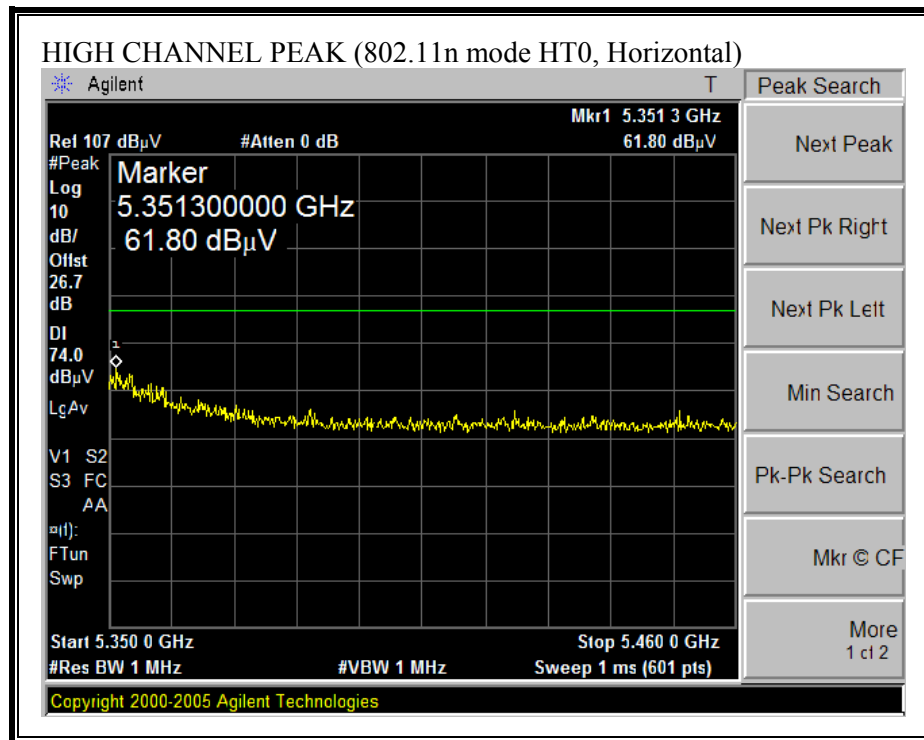


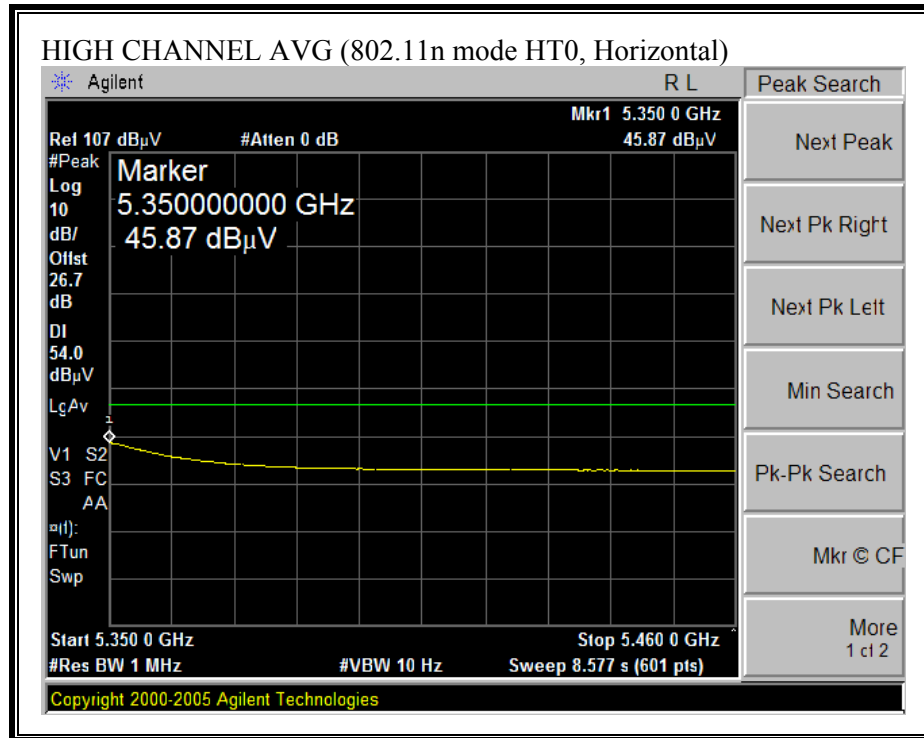


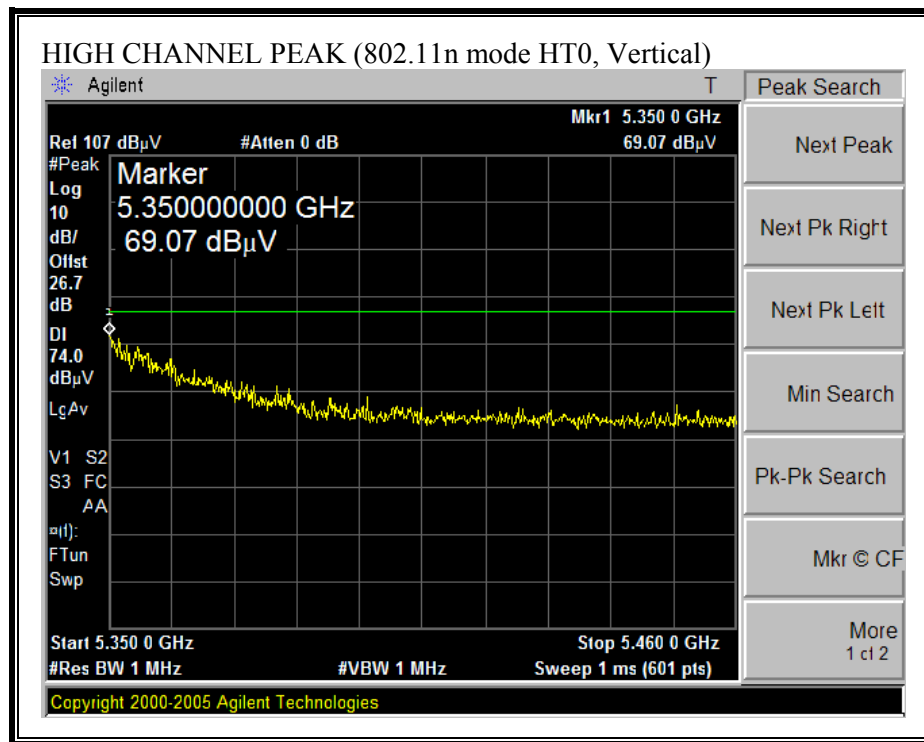


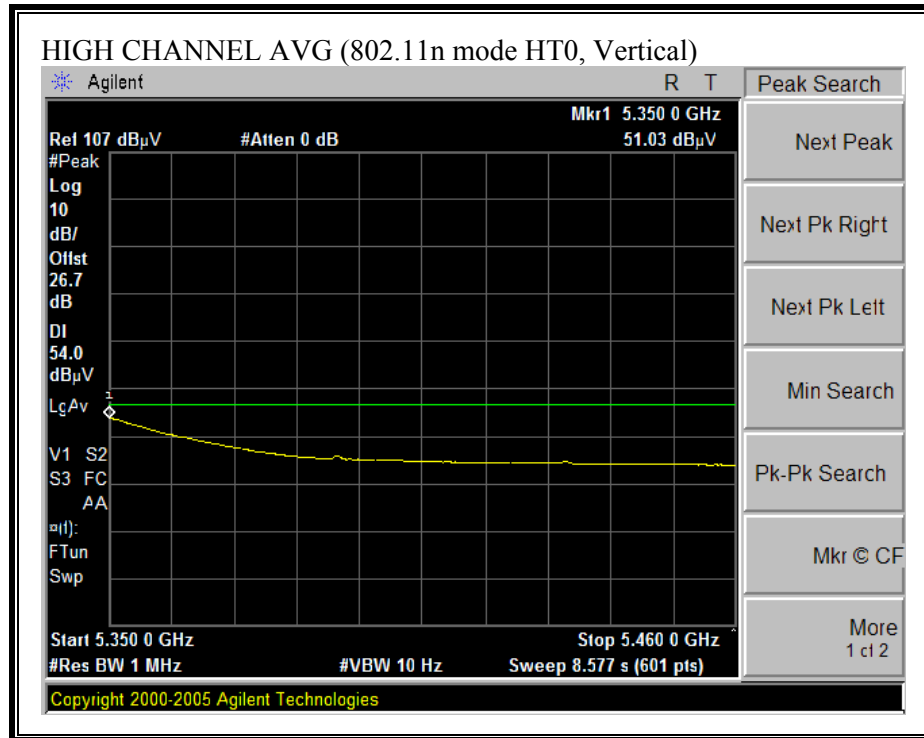


RESTRICTED BANDEDGE (802.11n MODE 40MHz BW HT0, HIGH CHANNEL)





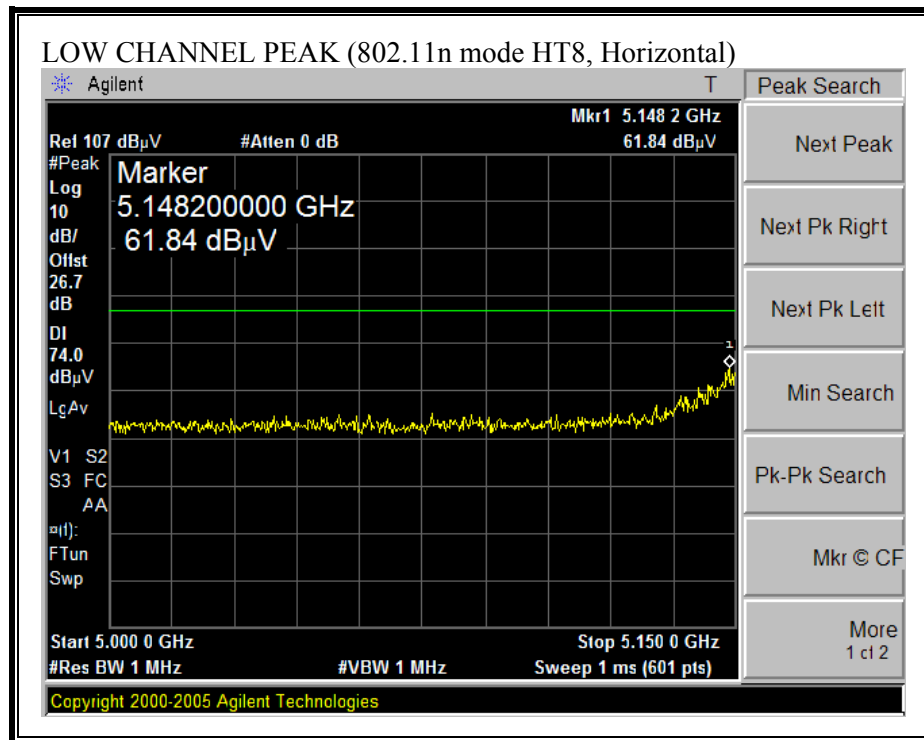


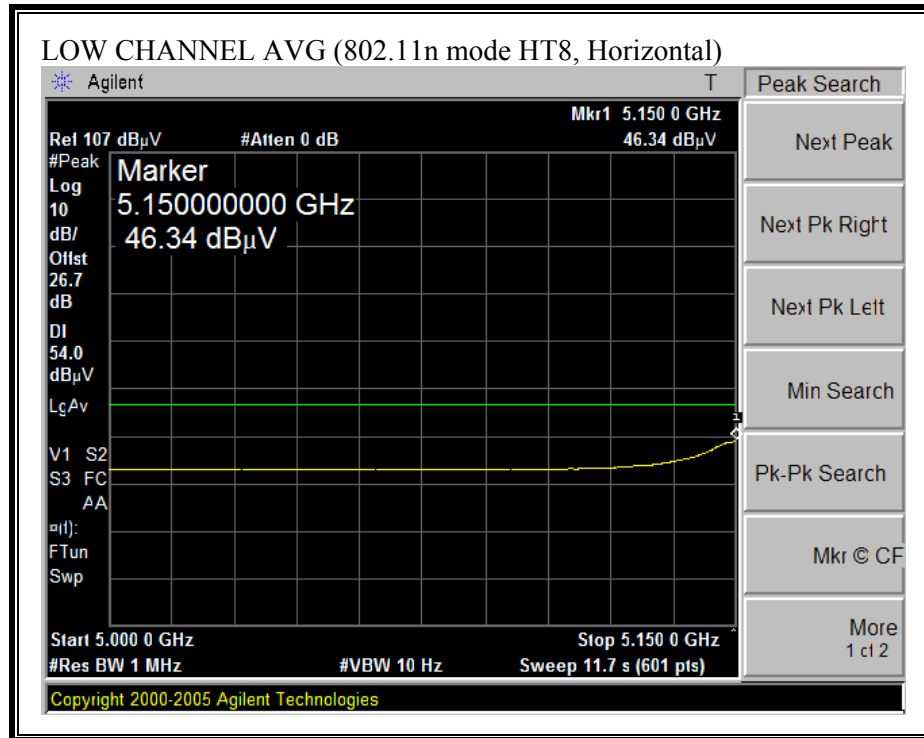


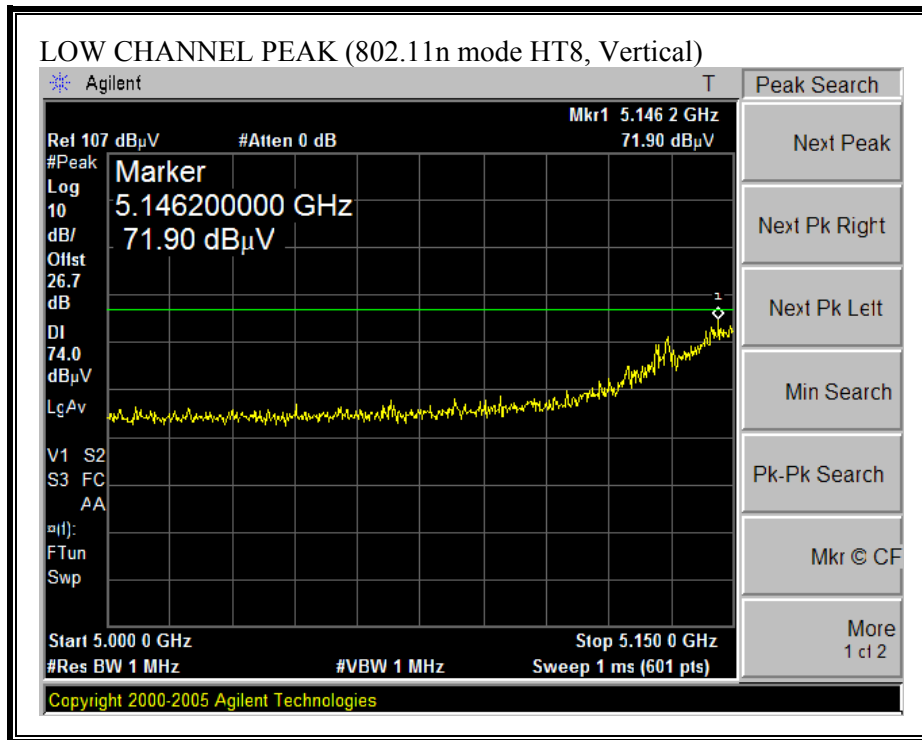
HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE 40MHz HT0)

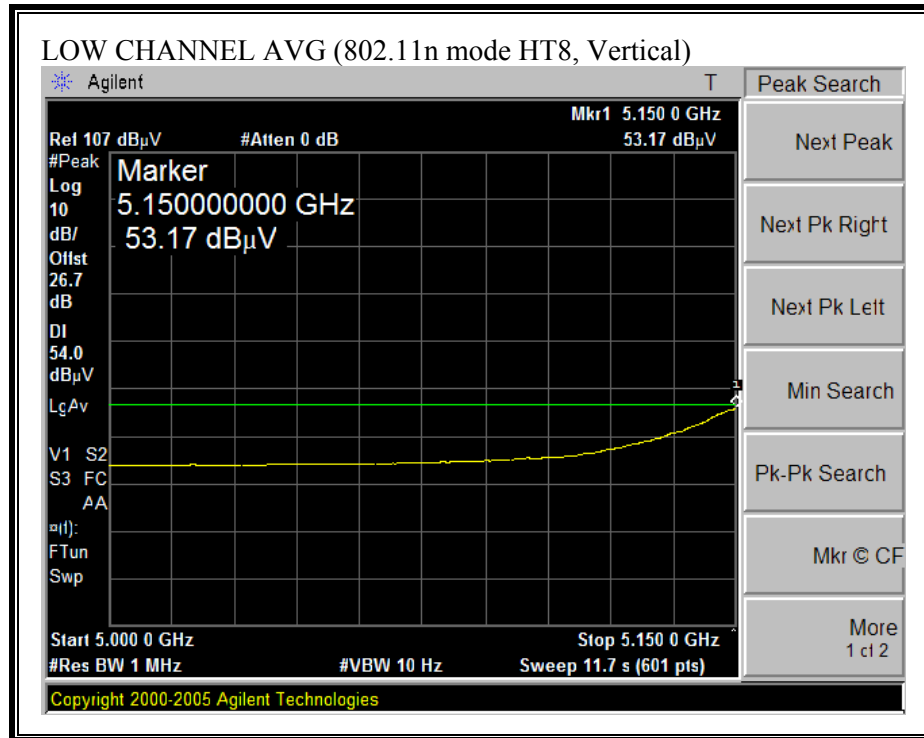
High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Company: Toshiba																
Project #:06U10752																
Date:12/13/2006																
Test Engineer:Mengistu Mekuria																
Configuration:EUT inside the Laptop																
Mode:TX, 5.2GHz Band, 40MHz BW, HT0																
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T59; S/N: 3245 @3m			T145 Agilent 3008A005r			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			Peak Measurements RBW=VBW=1MHz	
			Chin 197538001			Chin 200354001			HPF_7.6GHz						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	Filtr 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, 5190MHz																
15.570	3.0	46.0	33.0	38.4	5.8	-32.3	0.0	0.7	58.7	45.7	74	54	-15.3	-8.3	V	
15.570	3.0	45.8	32.8	38.4	5.8	-32.3	0.0	0.7	58.5	45.5	74	54	-15.5	-8.5	H	
Mid Ch, 5270MHz																
15.810	3.0	46.4	33.0	38.3	5.9	-32.2	0.0	0.7	59.1	45.7	74	54	-14.9	-8.3	V	
15.810	3.0	45.6	32.5	38.3	5.9	-32.2	0.0	0.7	58.3	45.2	74	54	-15.7	-8.8	H	
High Ch, 5310 MHz																
10.610	3.0	56.0	41.0	37.3	4.2	-34.3	0.0	0.8	64.0	49.0	74	54	-10.0	-5.0	V	
15.930	3.0	45.5	32.6	38.2	5.9	-32.2	0.0	0.7	58.1	45.2	74	54	-15.9	-8.8	V	
10.610	3.0	52.0	38.0	37.3	4.2	-34.3	0.0	0.8	60.0	46.0	74	54	-14.0	-8.0	H	
15.930	3.0	45.3	32.3	38.2	5.9	-32.2	0.0	0.7	57.9	44.9	74	54	-16.1	-9.1	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 MODE 40MHZ BW HT8, LOW CHANNEL)

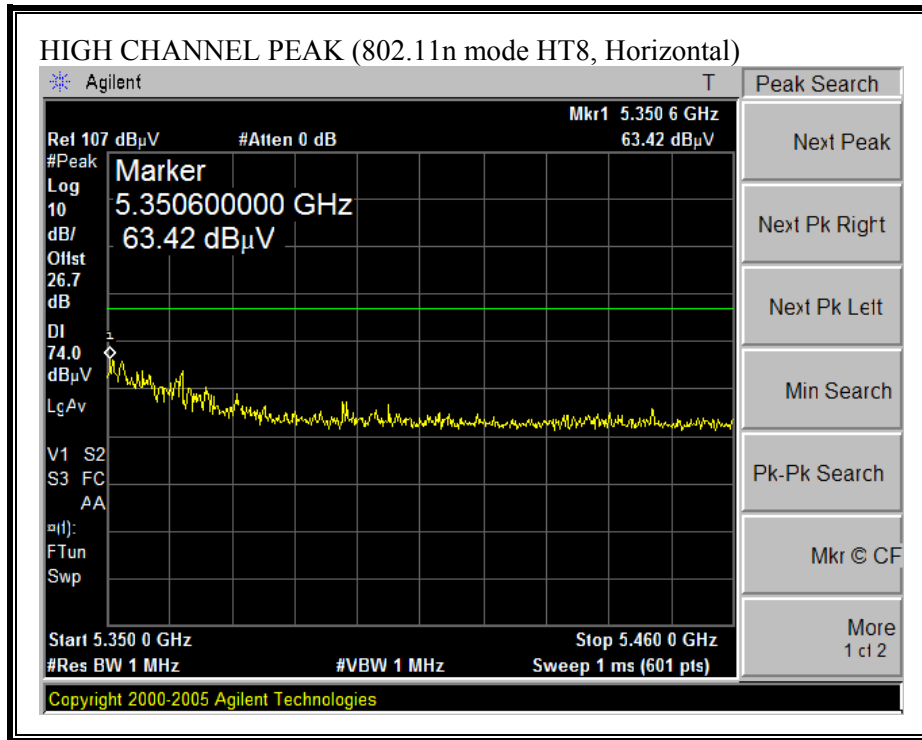


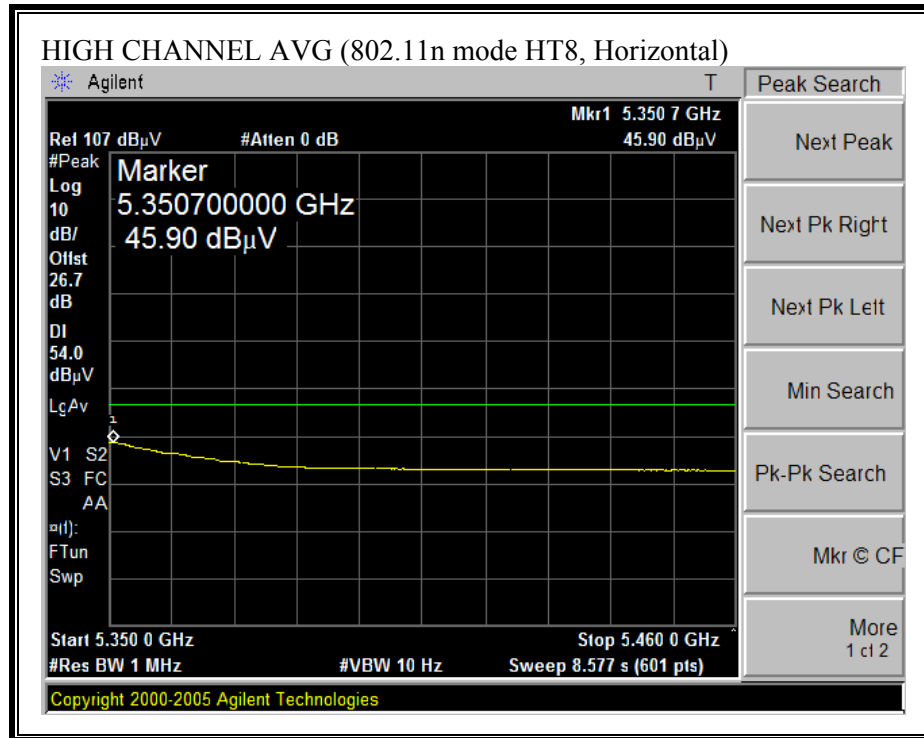


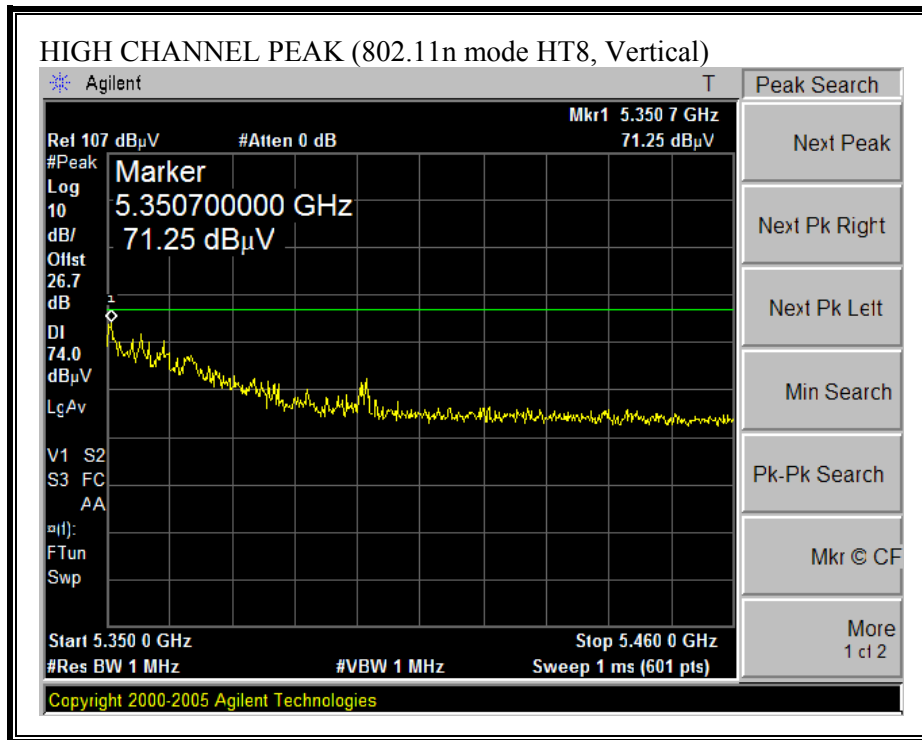


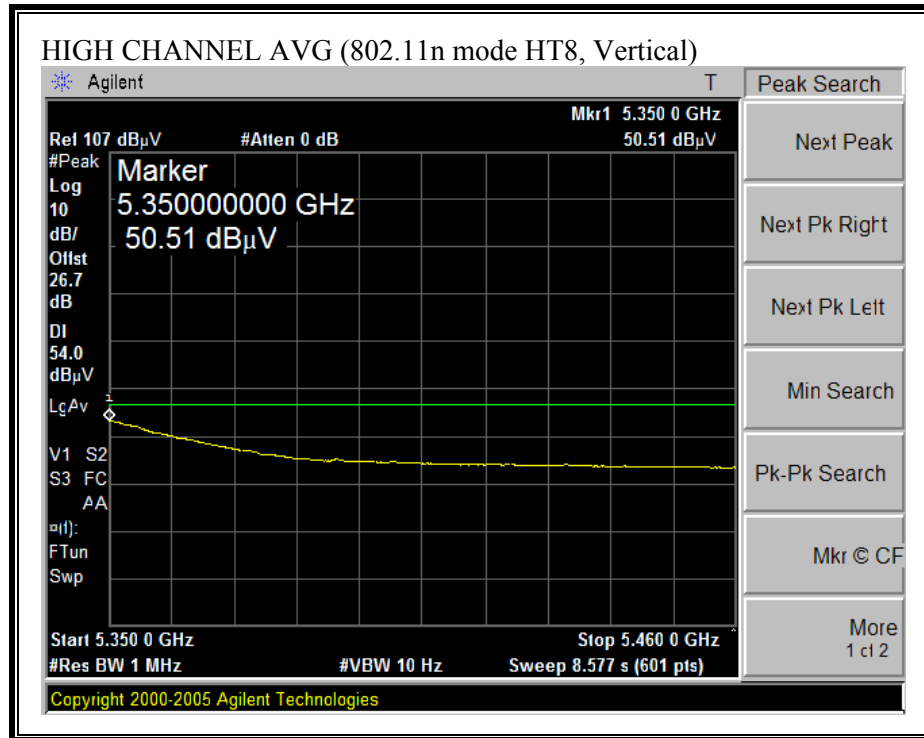


RESTRICTED BANDEDGE (802.11n MODE 40MHz BW HT8, HIGH CHANNEL)









HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE 40MHz HT8)

High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Company: Toshiba																
Project #:06U10752																
Date:12/13/2006																
Test Engineer: Megistu Mekuria																
Configuration: EUT inside the Laptop																
Mode: TX, 5.2GHz Band, 40MHz BW, HT8																
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T59; S/N: 3245 @3m			T145 Agilent 3008A005t			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			Peak Measurements RBW=VBW=1MHz	
			Chin 197538001			Chin 200354001			HPF_7.6GHz						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	Filtr 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, 5190MHz																
15.570	3.0	48.0	35.4	38.4	5.8	-32.3	0.0	0.7	60.7	48.1	74	54	-13.3	-5.9	V	
15.570	3.0	46.0	32.8	38.4	5.8	-32.3	0.0	0.7	58.7	45.5	74	54	-15.3	-8.5	H	
Mid Ch, 5270MHz																
15.810	3.0	50.0	36.0	38.3	5.9	-32.2	0.0	0.7	62.7	48.7	74	54	-11.3	-5.3	v	
15.810	3.0	45.6	32.5	38.3	5.9	-32.2	0.0	0.7	58.3	45.2	74	54	-15.7	-8.8	H	
High Ch, 5310 MHz																
10.610	3.0	57.1	40.4	37.3	4.2	-34.3	0.0	0.8	65.1	48.4	74	54	-8.9	-5.6	V	
15.930	3.0	46.0	33.0	38.2	5.9	-32.2	0.0	0.7	58.6	45.6	74	54	-15.4	-8.4	V	
10.610	3.0	53.4	37.0	37.3	4.2	-34.3	0.0	0.8	61.4	45.0	74	54	-12.6	-9.0	H	
15.930	3.0	45.5	32.4	38.2	5.9	-32.2	0.0	0.7	58.1	45.0	74	54	-15.9	-9.0	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											

7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

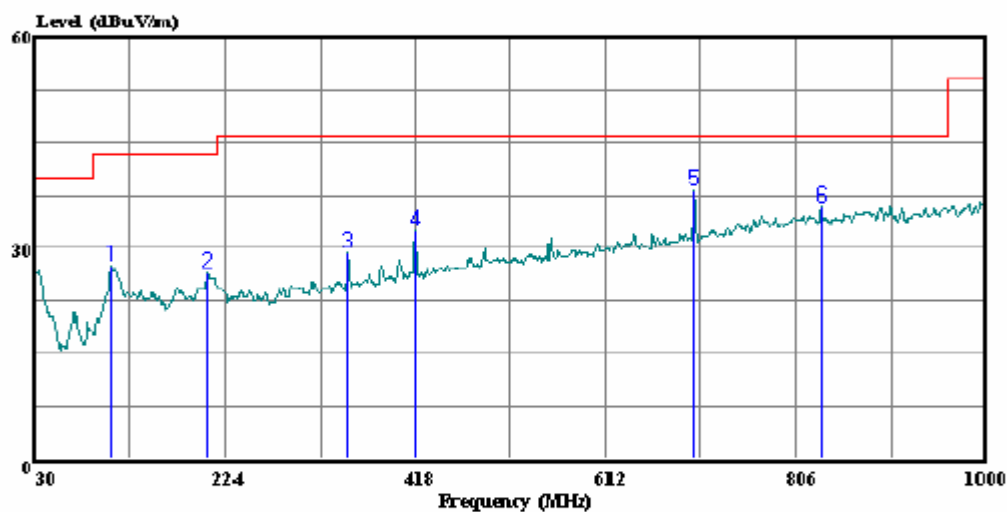
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

Data#: 8 File#: 06U10752 emi.EMI Date: 12-12-2006 Time: 11:19:37



(Audix A TC)

Trace: 7

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Chin Pang
Company: : Toshiba
Project #: : 06U10752
Configuration:: EUT/Laptop
Mode of Oper.: TX, 5 GHz Band
Target: : FCC Class B

HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	106.630	14.56	12.87	27.43	43.50	-16.07	Peak
2	206.540	12.84	13.61	26.45	43.50	-17.05	Peak
3	349.130	12.35	16.89	29.24	46.00	-16.76	Peak
4	417.030	14.12	18.47	32.59	46.00	-13.41	Peak
5	703.180	14.94	23.12	38.06	46.00	-7.94	Peak
6	832.190	10.88	24.95	35.83	46.00	-10.17	Peak

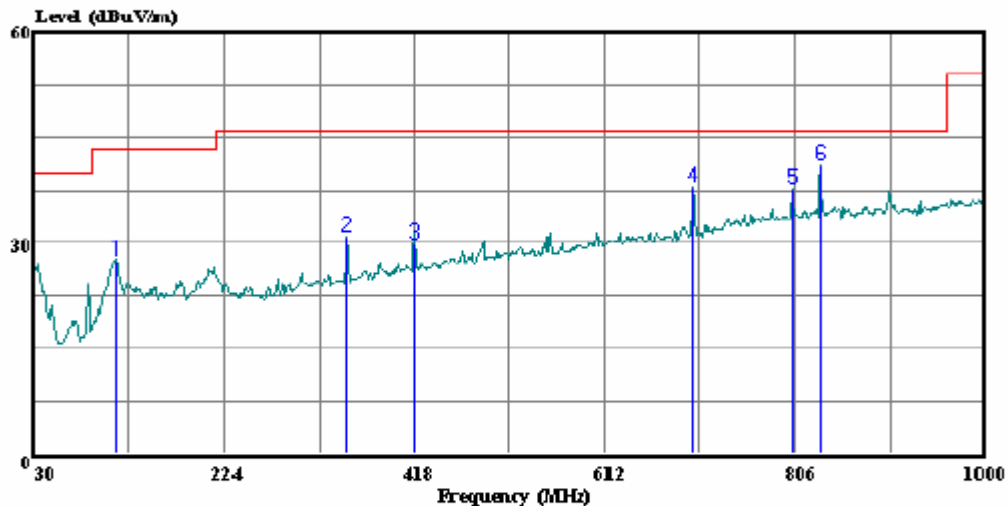
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



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

Data#: 6 File#: 06U10752 emi.EMI Date: 12-12-2006 Time: 11:14:40



(Auxiliary TC)

Trace: 5

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator:: Chin Pang
Company: : Toshiba
Project #: : 06U10752
Configuration: EUT/Laptop
Mode of Oper.: TX, 5 GHz Band
Target: : FCC Class B

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	113.420	13.33	14.22	27.55	43.50	-15.95	Peak
2	349.130	13.98	16.89	30.87	46.00	-15.13	Peak
3	418.000	11.31	18.48	29.79	46.00	-16.21	Peak
4	703.180	14.87	23.12	37.99	46.00	-8.01	Peak
5	803.090	13.16	24.59	37.75	46.00	-8.25	Peak
6	832.190	16.16	24.95	41.11	46.00	-4.89	Peak

7.3. 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:

6 WORST EMISSIONS

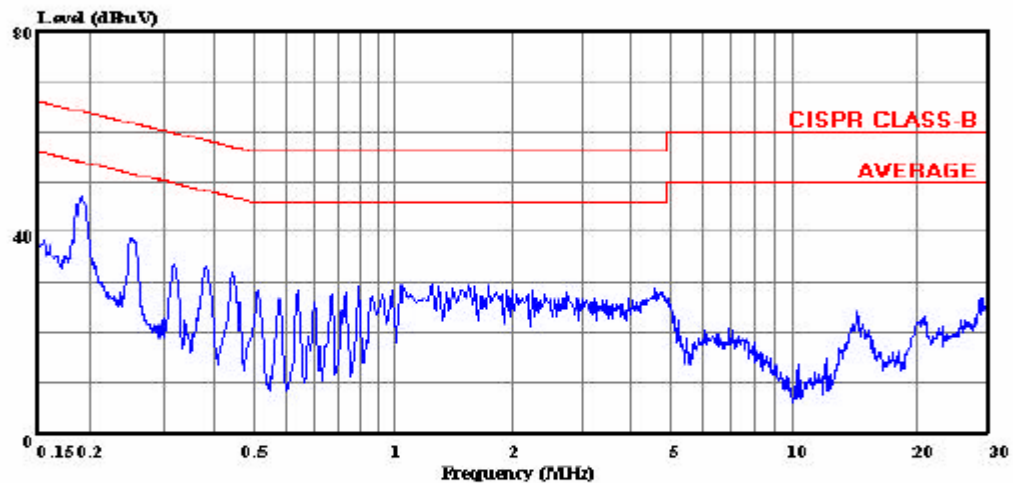
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.19	46.97	--	--	0.00	64.04	54.04	-17.07	-7.07	L1
0.25	38.69	--	--	0.00	61.66	51.66	-22.97	-12.97	L1
4.67	28.65	--	--	0.00	56.00	46.00	-27.35	-17.35	L1
0.19	47.27	--	--	0.00	64.04	54.04	-16.77	-6.77	L2
0.25	39.25	--	--	0.00	61.66	51.66	-22.41	-12.41	L2
26.28	33.00	--	--	0.00	60.00	50.00	-27.00	-17.00	L2
6 Worst Data									

LINE 1 RESULTS



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

Data#: 28 File#: 06U10752 LC.EMI Date: 12-11-2006 Time: 12:11:17



Trace:

Ref Trace:

Condition: CISPR CLASS-B
Test Operator : Chin Pang
Project # : 06U10752
Company : Toshiba
EUT configuration: EUT inside the Laptop
Mode of operation: Tx worst case 5 GHz Band
Power Source : 115VAC / 60Hz
: L1: Peak (Blue)
: FCC Class B

LINE 2 RESULTS

