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

FOR

MC85 MINI CARD 802.11a/b/g/n RADIO CARD

MODEL NUMBER: MC85

FCC ID: UAY-MMC85M

REPORT NUMBER: 07U11286-2

ISSUE DATE: OCTOBER 30, 2007

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/30/07	Initial Issue	Frank Ibrahim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	MARVELL SEMICONDUCTOR, INC. 5488 MARVELL LANE SANTA CLARA, CA 95054, USA
EUT DESCRIPTION:	MC85 MINI CARD 802.11a/b/g/n RADIO CARD
MODEL:	MC85
SERIAL NUMBER:	MC85-V18-032
DATE TESTED:	SEPTEMBER 5 – 14, 2007

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:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

THANH NGUYEN
EMC TECHNICIAN
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/n transceiver.

The radio module is manufactured by Marvell Semiconductor.

5.2. CLASS II PERMISSIVE CHANGE DESCRIPTION

The purpose of this Class II Permissive Change is to add various kinds of antennas.
For RF conducted testing results refer to Compliance Certification Service report 06U10359-2D issued on JULY 18, 2006 for 5.15-5.35 GHz band, and refer to Compliance Certification Services report 06U10699-1 issued on APRIL 25, 2007 for 5.47-5.725 GHz band.

5.3. MAXIMUM OUTPUT POWER

As measured and covered in report number 06U10359-2D, and report number 06U10699, the transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5150 to 5250 MHz Authorized Band			
5180 - 5240	802.11a 20MHz	11.32	13.55
5190 - 5230	802.11a 40MHz	14.93	31.12
5180 - 5240	802.11n HT20	13.53	22.54
5190 - 5230	802.11n HT40	15.90	38.90
5250 to 5350 MHz Authorized Band			
5260 - 5320	802.11a 20MHz	17.19	52.36
5270 - 5310	802.11a 40MHz	16.60	45.71
5260 - 5320	802.11n HT20	19.75	94.41
5270 - 5310	802.11n HT40	17.51	56.36

5470 to 5725 MHz Authorized Band			
Frequency Band (MHz)	**Mode**	**Output Power (dBm)**	**Output Power (mW)**
5500 - 5700	802.11a	14.60	28.84
5500 - 5700	802.11n HT20	16.09	40.64
5510 - 5670	802.11a 40MHz	15.36	34.36
5510 - 5670	802.11n HT40	16.19	41.59

5.4. DESCRIPTION OF ADDITIONAL ANTENNAS

This is a list of the additional antennas covered in this class II permissive change report:

Antennas Part number	Manufacture MODEL	Band	Ant Main (Tx1)	Ant Aux (Tx2)	Ant MIMO Tx3/Rx3)
Tx1:AR350WIPI01+C Tx2:AR350WIPI02+C Tx3:AR350WIPI03+D (Rx3)	**ARIMA W350 Triton**	2.4 - 2.5 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.725 - 5.85 GHz	2.57 -0.16 0.51 0.86	0.44 -0.95 -0.47 0.2	0.18 0.64 0.63 1.17
Tx1:AR650WIPI01+B Tx2:AR650WIPI02+B Tx3:AR650WIPI03+C (Rx3)	**ARIMA 650 Tempest**	2.4 - 2.5 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.725 - 5.85 GHz	2.25 1.52 0.74 1.17	1.43 1.15 -0.36 -0.36	1.25 0.49 1.36 1.36
Main:021020168NC3586 AUX:021020168NC3586-1 MIMO:021020168NC3586-2	**GATEWAY Triton**	2.4 - 2.5 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.725 - 5.85 GHz	-0.04 -1.13 -0.35 -0.45	3.25 1.48 1.27 0.83	0.84 1.13 1.26 2.26
Main:021020168NC3587 AUX:021020168NC3587-1 MIMO:021020168NC3587-2	**GATEWAY Tempest**	2.4 - 2.5 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.725 - 5.85 GHz	-0.25 0 0.58 1.03	3.64 0.5 1.26 0.73	1.77 -0.01 -0.31 -0.52
WLAN:021020168NC3709 WLAN MIMO: 021020168NC3709-1	**GATEWAY MA8**	2.4 - 2.5 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.725 - 5.85 GHz	0.91 0.57 0.98 0.99	2.04 -0.33 -0.83 -0.047	1.77 -0.01 -0.31 -0.52

5.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was PCI rev. 1.0.0.0.2, MFG 2.1.0.36

The EUT driver software installed in the Laptop during testing was Marvell Semiconductor, Inc. Labtools rev. 1.0.5.00.

The board revision of the EUT tested is 1.8.

The test utility software used during testing was DutApiclient_PCI.exe. Version. 1.0.5.01

5.6. WORST-CASE CONFIGURATION AND MODE

The 2x3 configuration was used for all testing in this report.

The worst- case data rates are determined to be as follows for each mode based on investigation by measuring the average power, peak power and PPSD across all data rates, bandwidths, and modulations.

The worst-case data rates for the 2GHz bands are: 11 Mbps for 802.11b; 54Mbps for 802.11g; MCS11 for 802.11n HT20; MCS15 for 802.11n HT40. These are based on baseline testing with this chipset.

The worst-case data rates for the 5GHz bands are: 9 Mbps for 802.11a 20MHz and 802.11a 40MHz; MCS0 for 802.11n HT20 and 802.11n HT40. These are based on baseline testing with this chipset.

All emissions tests were made with the worst-case data rates. The worst case spurious emissions from 30MHz to 1GHz is 802.11a 40MHz.

5.7. MODIFICATIONS

There were no modifications made to the revision EUT during the testing.

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop PC	IBM	ThinkPad T60	L3-M5679	DoC
Extension PCB	Marvell	EC-MC-Extender	N/A	N/A
AC/DC Adapter	Lenovo	92P1109	BTZ63G167	DoC

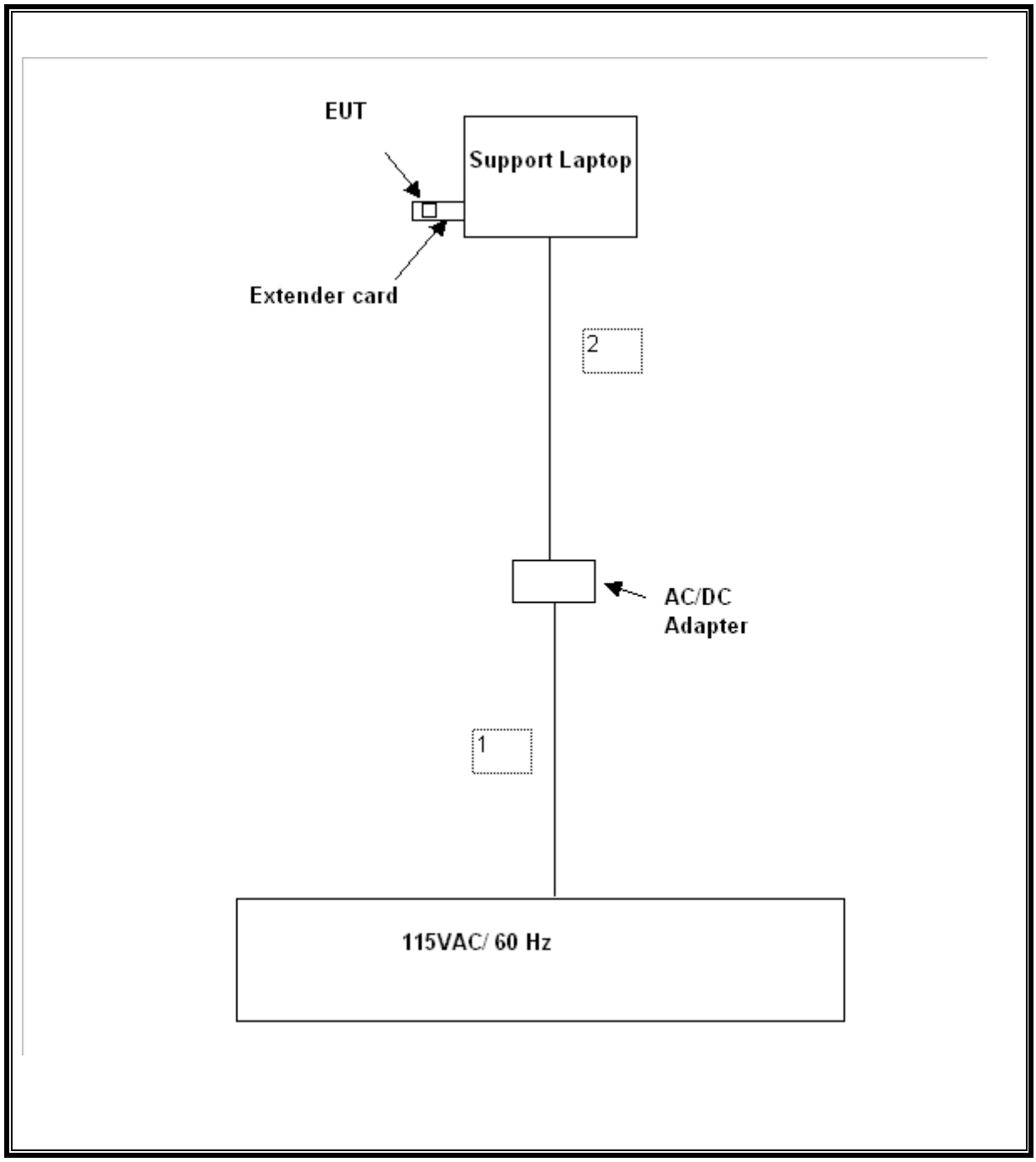
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	US 115V	Un-shielded	1m	N/A
2	DC	1	DC Plug	Un-shielded	2m	Ferrites bead Laptop ends

TEST SETUP

The EUT is placed in the extender card and installed to a host laptop computer. 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**
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	06/12/08
RF Filter Section	Agilent / HP	85420E	3705A00256	06/12/08
Antenna, Bilog 30 MHz ~ 2 GHz	Sunol Sciences	JB1	A121003	08/13/08
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29310	04/15/08
Preamplifier, 1300 MHz	Agilent / HP	8447D	1937A02062	05/09/08
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00561	10/03/07
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/02/07
Power Meter	Agilent / HP	438B	3125U09516	06/02/08
Power Sensor 10MHz - 18GHz	Agilent / HP	8481A	2237A31744	04/30/08
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42070220	11/26/07

7. LIMITS AND RESULTS

7.1. RF CONDUCTED TESTS

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 11.5 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 A (dBm)	Average Power Chain B (dBm)	Average Power Total (dBm)
802.11a 20M Mode				
Low	5180	7.86	8.26	11.07
Middle	5260	13.15	13.12	16.15
High	5320	13.00	13.06	16.04
802.11a 40M Mode				
Low	5190	11.21	11.58	14.41
Middle	5270	12.65	12.72	15.70
High	5310	9.35	9.47	12.42
802.11n HT20 Mode				
Low	5180	9.78	10.22	13.02
Middle	5260	16.45	16.24	19.36
High	5320	13.98	13.52	16.77
802.11n HT40 Mode				
Low	5190	11.97	11.89	14.94
Middle	5270	13.32	13.46	16.40
High	5310	12.36	11.90	15.15

Mode Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)	Average Power Total (dBm)
802.11a 20 MHz Mode				
Low	5500	12.27	11.67	15.0
Middle	5600	11.83	11.73	14.8
High	5700	11.58	10.50	14.1
802.11n HT20 Mode				
Low	5500	12.03	11.78	14.9
Middle	5600	11.52	13.26	15.5
High	5700	10.45	13.33	15.1
802.11n 11a 40MHz Mode				
Low	5510	12.30	11.55	15.0
Middle	5590	12.50	11.89	15.2
High	5670	12.71	12.80	15.8
802.11n HT40 Mode				
Low	5510	11.20	10.68	14.0
Middle	5590	12.10	12.14	15.1
High	5670	11.50	11.06	14.3

7.1.2. MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

Given

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

and

$S = E ^ 2 / 3770$

where

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

Combining equations, rearranging the terms to express the distance as a function of the remaining variables, changing to units of Power to mW and Distance to cm, and substituting the logarithmic form of power and gain yields:

$d = 0.282 * 10 ^ ((P + G) / 20) / \sqrt{S}$

where

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

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

$S = 0.0795 * 10 ^ ((P + G) / 10) / (d^2)$

The power density in units of mW/cm^2 is converted to units of W/m^2 by multiplying by a factor of 10.

LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm^2

Mode	Band	FCC Limit (mW/cm^2)	Output (dBm)	Antenna (dBi)	MPE Distance (cm)
WLAN	5.2 GHz	1.0	19.75	4.349	4.52
WLAN	5.5 GHz	1.0	16.19	3.944	2.86

RESULTS

No non-compliance noted:

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.

7.2. 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.

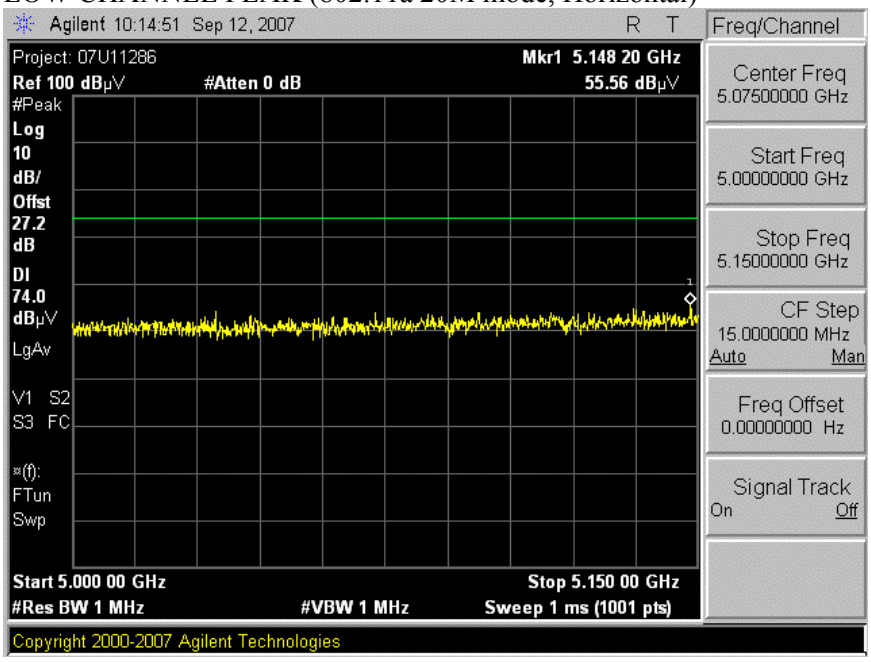
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

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.

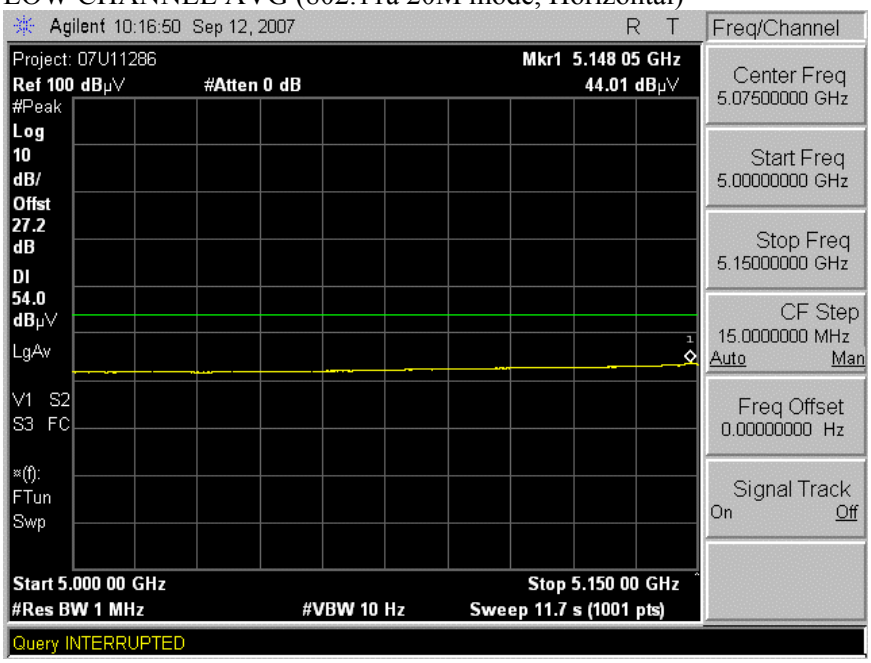
7.2.2. TRANSMITTER ABOVE 1 GHz FOR 5150 TO 5350 MHz BAND

RESTRICTED BANDEDGE (802.11a 20M MODE, LOW CHANNEL)

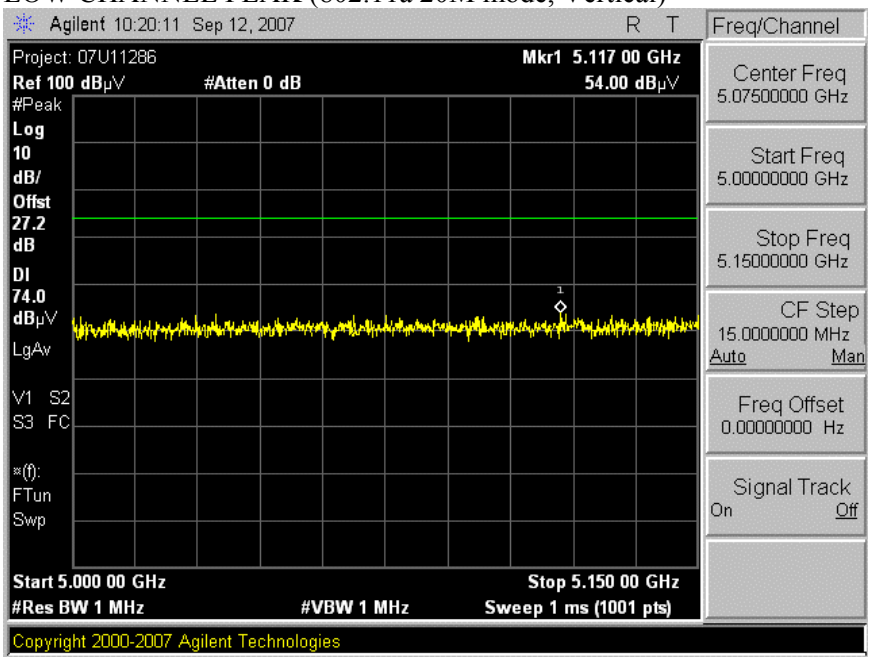
LOW CHANNEL PEAK (802.11a 20M mode, Horizontal)



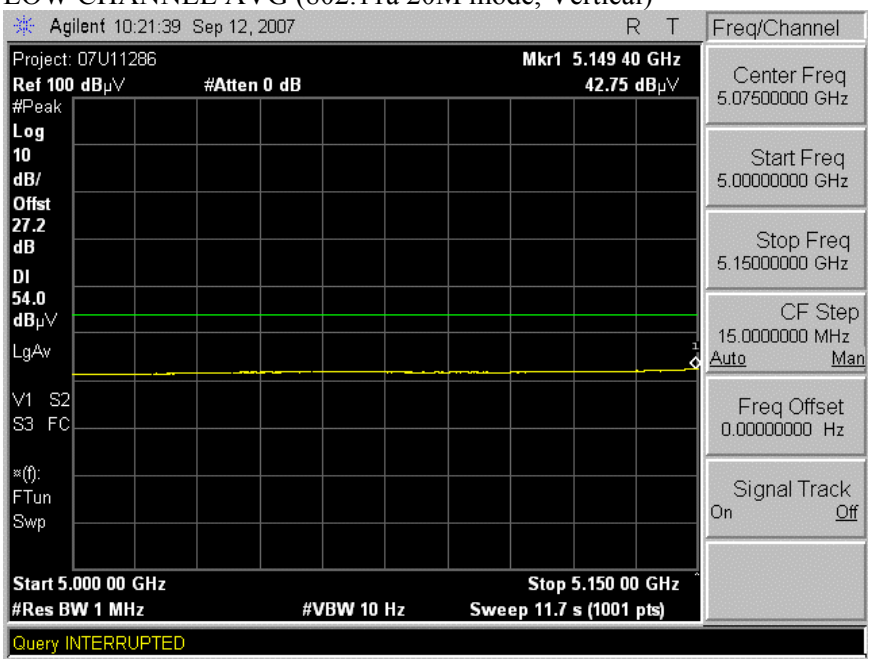
LOW CHANNEL AVG (802.11a 20M mode, Horizontal)



LOW CHANNEL PEAK (802.11a 20M mode, Vertical)

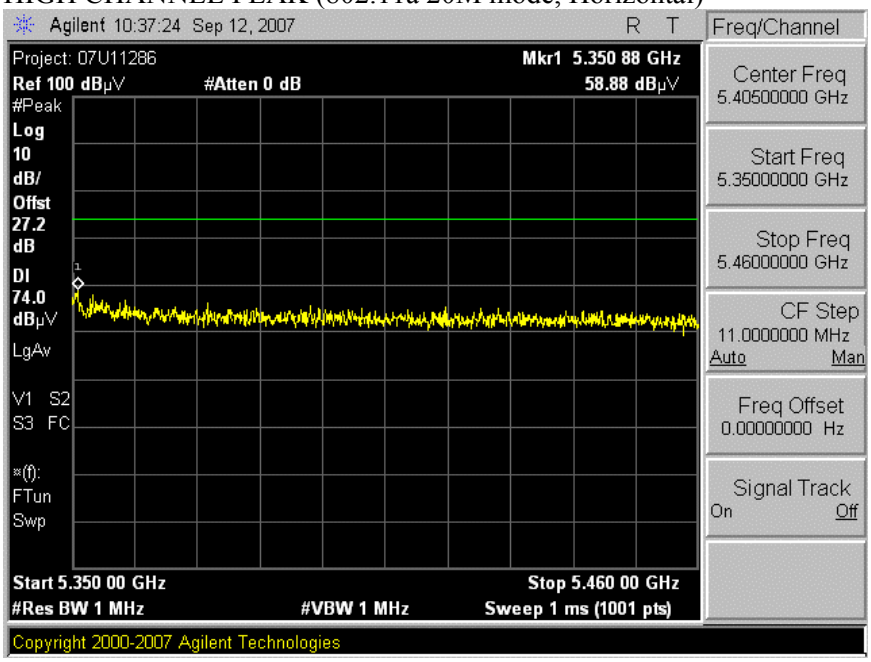


LOW CHANNEL AVG (802.11a 20M mode, Vertical)

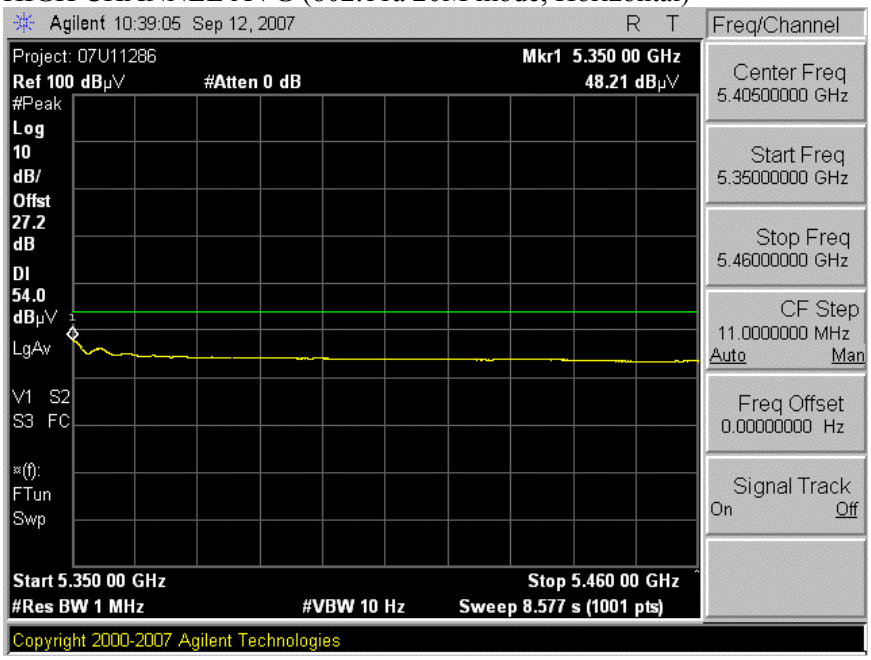


RESTRICTED BANDEDGE (802.11a 20M MODE, HIGH CHANNEL)

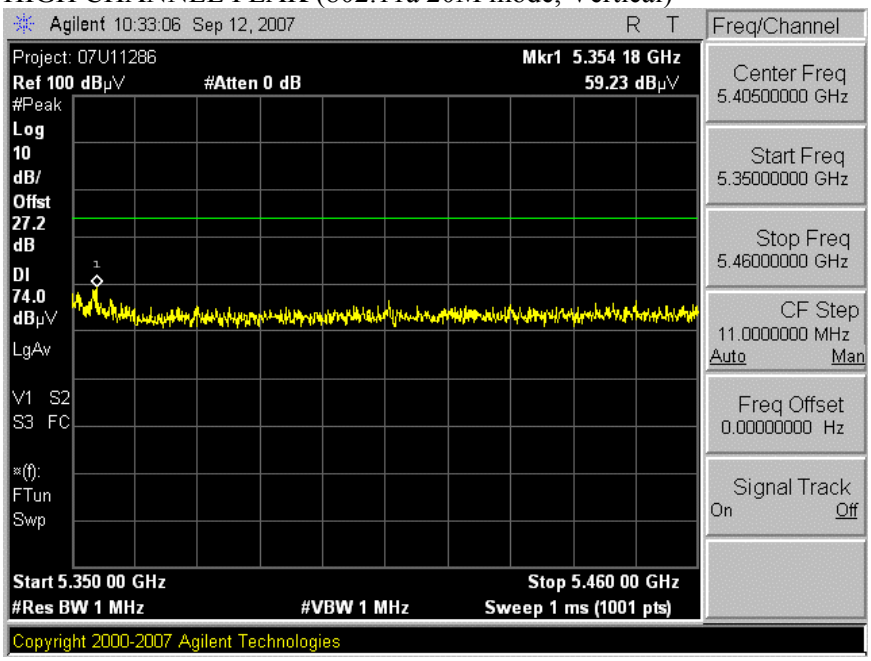
HIGH CHANNEL PEAK (802.11a 20M mode, Horizontal)



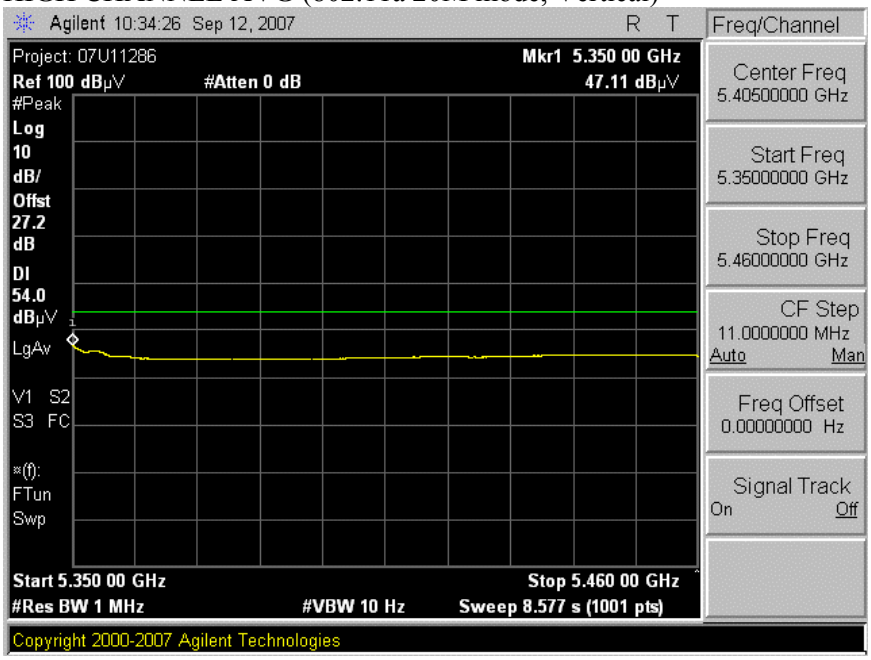
HIGH CHANNEL AVG (802.11a 20M mode, Horizontal)



HIGH CHANNEL PEAK (802.11a 20M mode, Vertical)



HIGH CHANNEL AVG (802.11a 20M mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a 20M MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: MARVELL Semiconductor, Inc.
Project #: 07U11286
Date: 9-12-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, Laptop and Extender Card with with Galtronics Tempest Antenna
Mode: Transmit 5.3GHz Band a mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A0056			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
William 177079009		Sunny 197539001	HPF_7.6GHz	

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

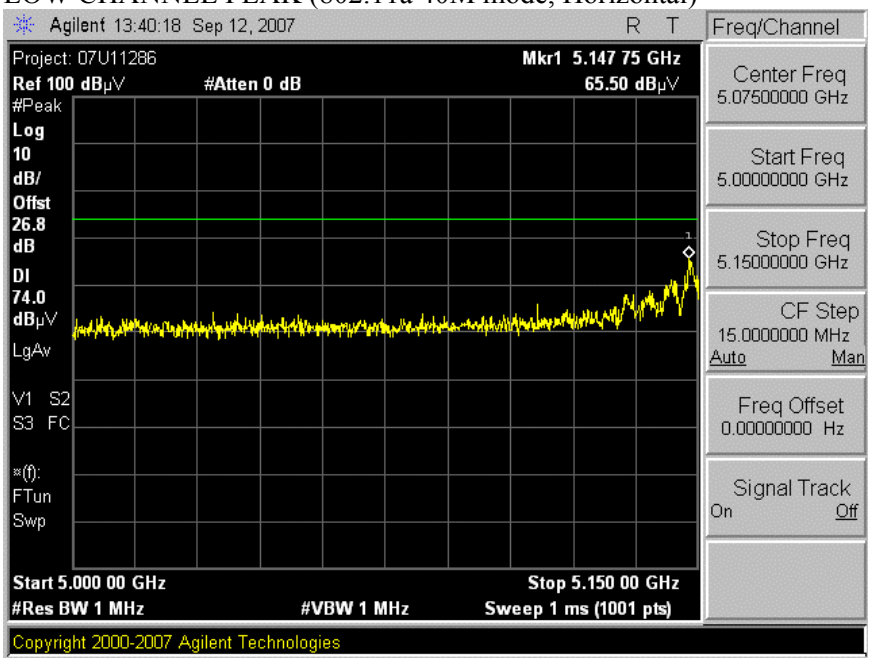
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Ch 5180MHz															
10.360	3.0	45.6	32.8	37.5	5.1	-34.6	0.0	0.8	54.4	41.5	74	54	-19.6	-12.5	V
15.540	3.0	46.5	33.6	39.0	6.6	-32.3	0.0	0.7	60.5	47.6	74	54	-13.5	-6.4	Noise Floor
10.360	3.0	45.9	31.6	37.5	5.1	-34.6	0.0	0.8	54.6	40.4	74	54	-19.4	-13.6	H
15.540	3.0	46.9	33.5	39.0	6.6	-32.3	0.0	0.7	60.9	47.5	74	54	-13.1	-6.5	Noise Floor
CH 5260MHz															
10.520	3.0	51.3	40.4	37.5	5.2	-34.4	0.0	0.8	60.3	49.4	74	54	-13.7	-4.6	V
15.780	3.0	47.6	33.7	39.1	6.7	-32.2	0.0	0.7	61.8	48.0	74	54	-12.2	-6.0	Noise Floor
10.520	3.0	49.5	38.3	37.5	5.2	-34.4	0.0	0.8	58.5	47.3	74	54	-15.5	-6.7	H
15.780	3.0	46.4	33.4	39.1	6.7	-32.2	0.0	0.7	60.7	47.7	74	54	-13.3	-6.3	Noise Floor
CH 5320MHz															
10.640	3.0	49.5	36.5	37.5	5.2	-34.2	0.0	0.8	58.8	45.7	74	54	-15.2	-8.3	V
15.960	3.0	45.8	33.3	39.3	6.7	-32.2	0.0	0.7	60.3	47.8	74	54	-13.7	-6.2	Noise Floor
10.640	3.0	47.1	36.0	37.5	5.2	-34.2	0.0	0.8	56.3	45.2	74	54	-17.7	-8.8	H
15.960	3.0	45.3	32.6	39.3	6.7	-32.2	0.0	0.7	59.8	47.0	74	54	-14.2	-7.0	Noise Floor
No other spurious emissions were detected above system noise floor.															

Rev. 5.1.6

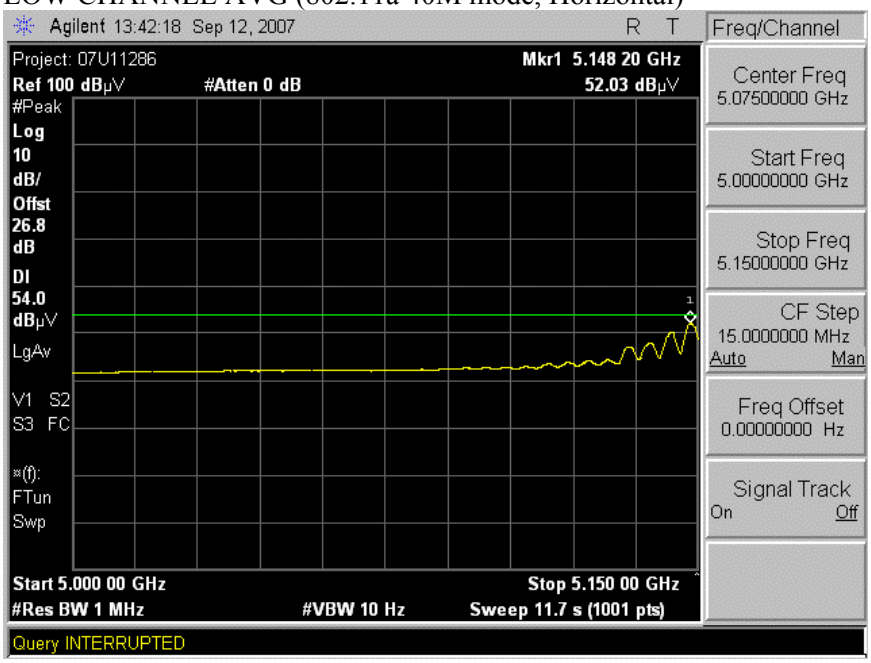
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11a 40M MODE, LOW CHANNEL)

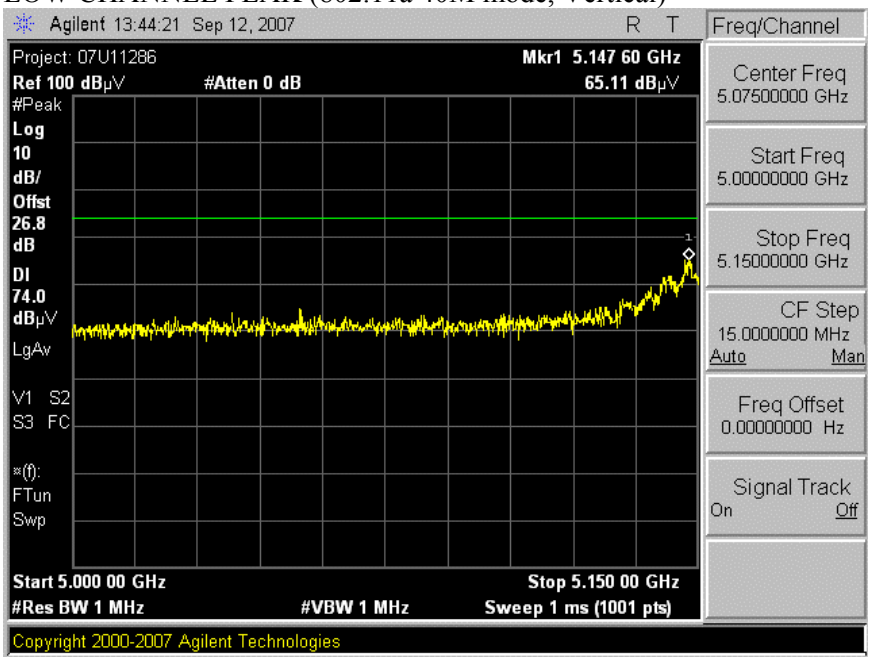
LOW CHANNEL PEAK (802.11a 40M mode, Horizontal)



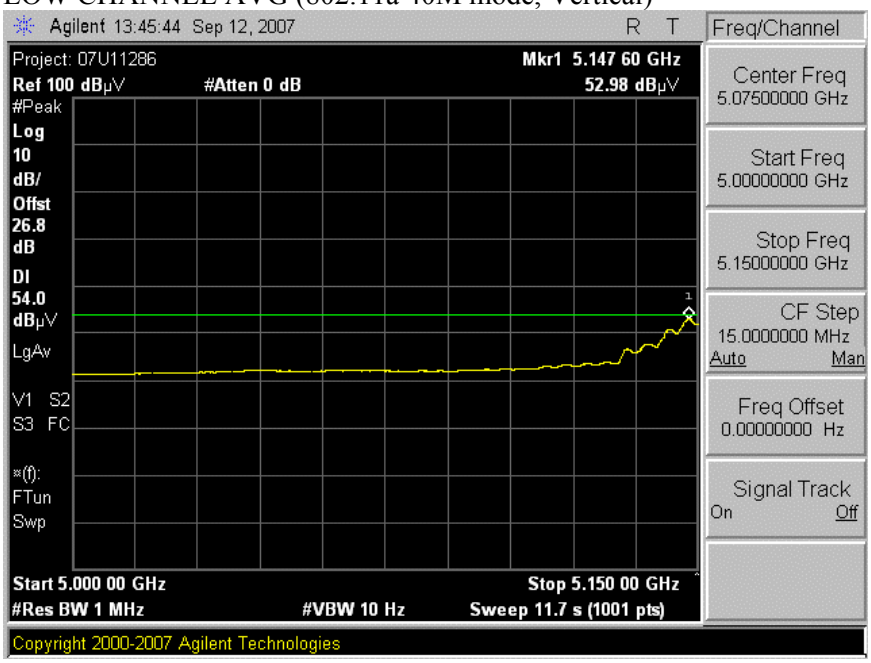
LOW CHANNEL AVG (802.11a 40M mode, Horizontal)



LOW CHANNEL PEAK (802.11a 40M mode, Vertical)

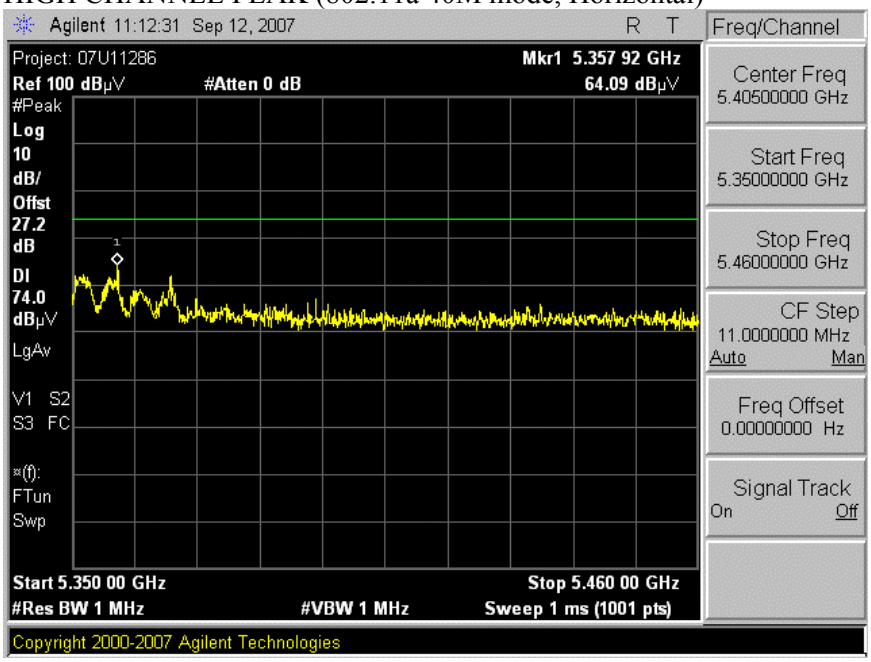


LOW CHANNEL AVG (802.11a 40M mode, Vertical)

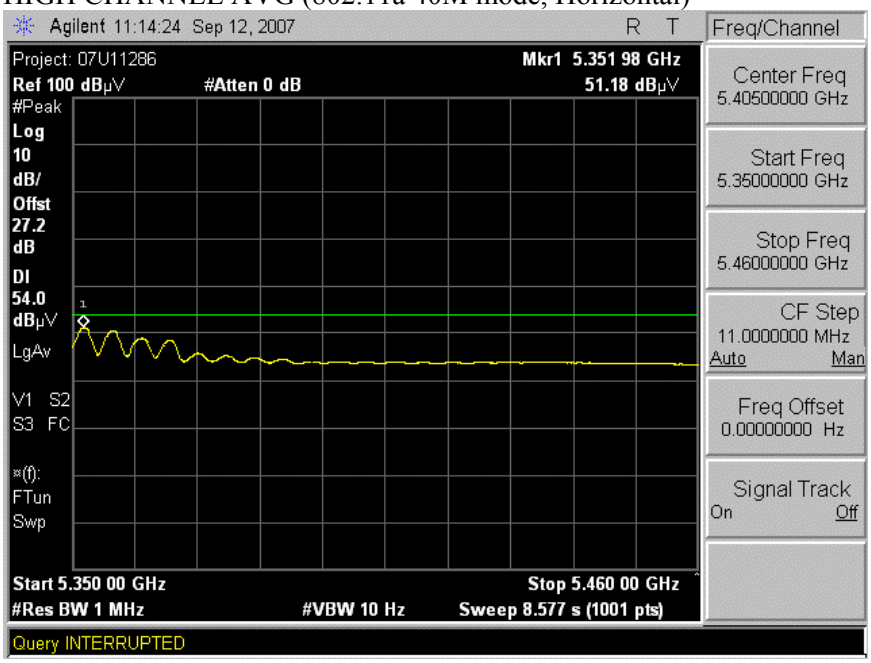


RESTRICTED BANDEDGE (802.11a 40M MODE, HIGH CHANNEL)

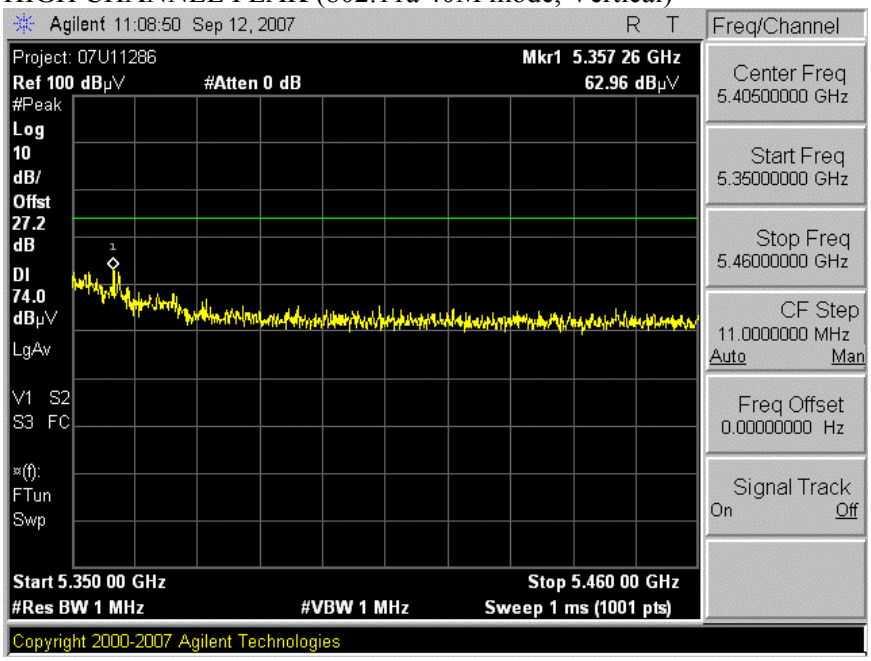
HIGH CHANNEL PEAK (802.11a 40M mode, Horizontal)



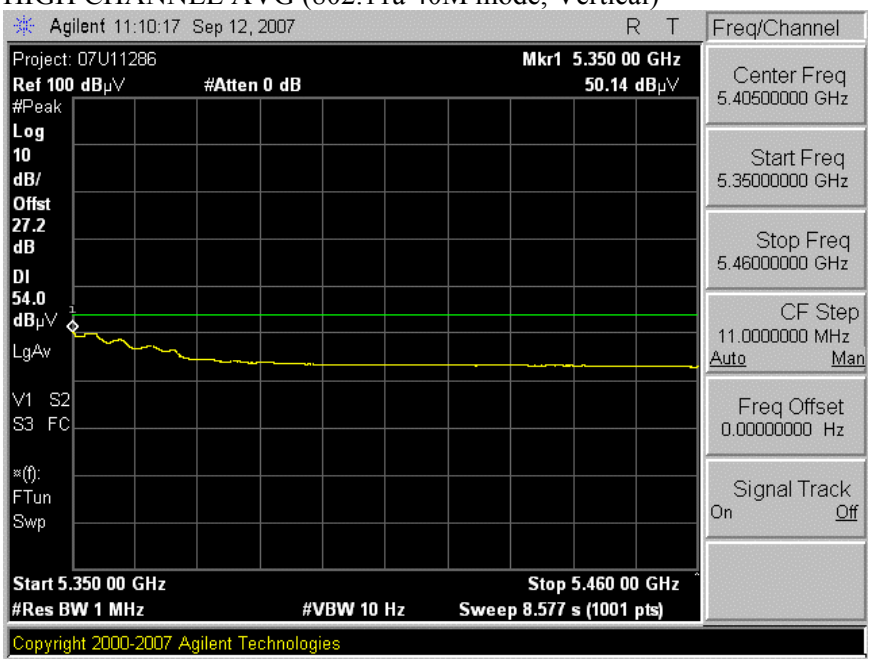
HIGH CHANNEL AVG (802.11a 40M mode, Horizontal)



HIGH CHANNEL PEAK (802.11a 40M mode, Vertical)



HIGH CHANNEL AVG (802.11a 40M mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a 40M MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: MARVELL Semiconductor, Inc.
Project #: 07U11286
Date: 9-12-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, Laptop and Extender Card with Galtronics Tempest Antenna
Mode: Transmit 5.3GHz Band a40 MHz mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
William 177079009		Joseph 208946001	HPF_7.6GHz	

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

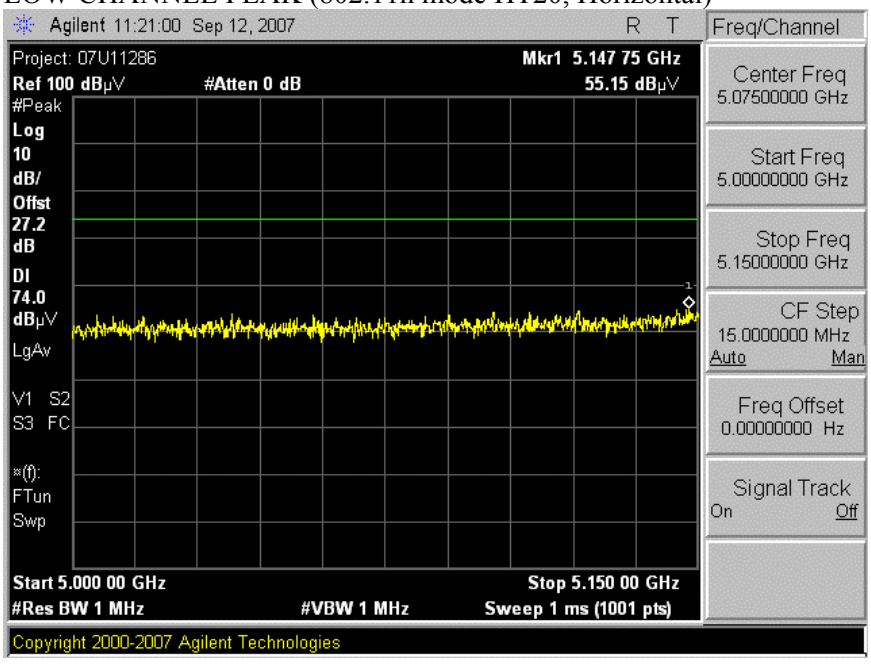
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
CH5190															
10.380	3.0	46.5	31.7	37.5	3.9	-34.6	0.0	0.8	54.1	39.3	74	54	-19.9	-14.7	V
15.570	3.0	44.0	31.3	39.0	5.2	-32.3	0.0	0.7	56.6	43.9	74	54	-17.4	-10.1	Noise Floor
10.380	3.0	44.0	31.1	37.5	3.9	-34.6	0.0	0.8	51.6	38.7	74	54	-22.4	-15.3	H
15.570	3.0	43.7	31.0	39.0	5.2	-32.3	0.0	0.7	56.3	43.6	74	54	-17.7	-10.4	Noise Floor
Ch5270															
10.540	3.0	46.4	35.8	37.5	4.0	-34.4	0.0	0.8	54.3	43.6	74	54	-19.7	-10.4	V
15.810	3.0	44.2	31.7	39.2	5.3	-32.2	0.0	0.7	57.1	44.6	74	54	-16.9	-9.4	Noise Floor
10.540	3.0	47.2	35.4	37.5	4.0	-34.4	0.0	0.8	55.0	43.2	74	54	-19.0	-10.8	H
15.810	3.0	44.9	31.6	39.2	5.3	-32.2	0.0	0.7	57.8	44.5	74	54	-16.2	-9.5	Noise Floor
Ch5310															
10.620	3.0	44.1	31.3	37.5	4.0	-34.3	0.0	0.8	52.1	39.2	74	54	-21.9	-14.8	V
15.930	3.0	43.4	30.9	39.2	5.3	-32.2	0.0	0.7	56.4	43.9	74	54	-17.6	-10.1	Noise Floor
10.620	3.0	43.6	30.1	37.5	4.0	-34.3	0.0	0.8	51.5	38.1	74	54	-22.5	-15.9	H
15.930	3.0	44.1	30.6	39.2	5.3	-32.2	0.0	0.7	57.2	43.6	74	54	-16.8	-10.4	Noise Floor
No other spurious emissions were detected above system noise floor.															

Rev. 5.1.6

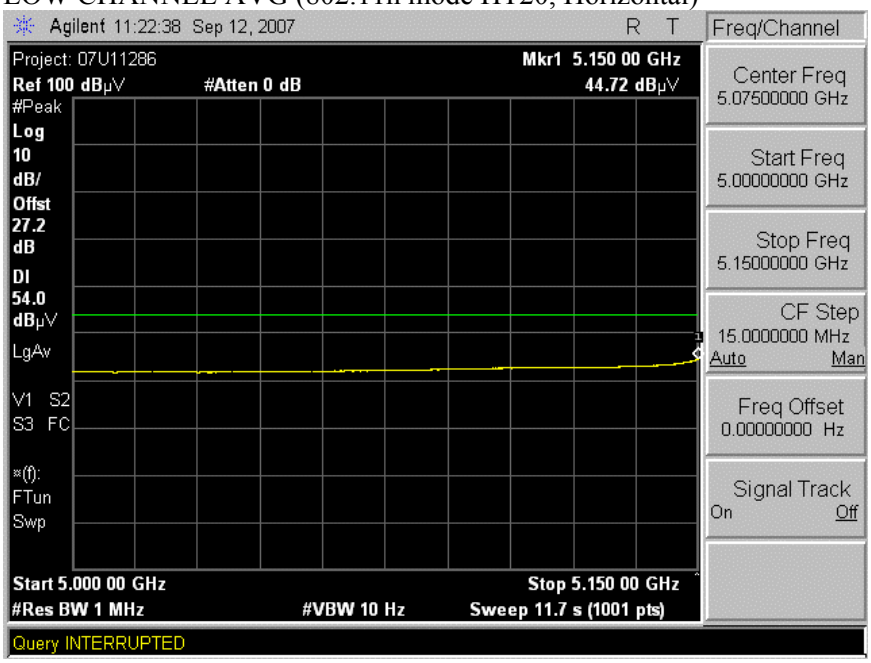
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11n MODE HT20, LOW CHANNEL)

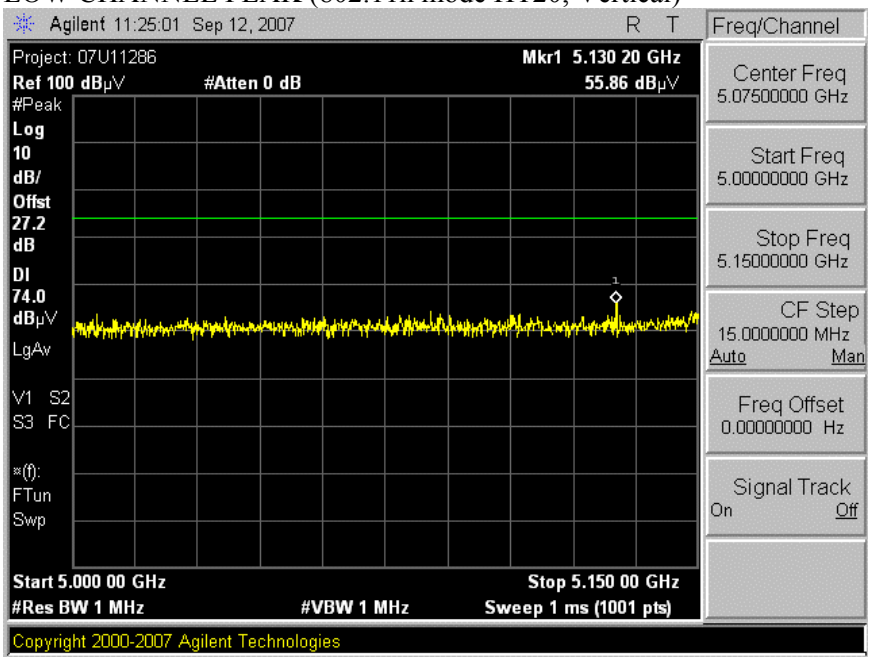
LOW CHANNEL PEAK (802.11n mode HT20, Horizontal)



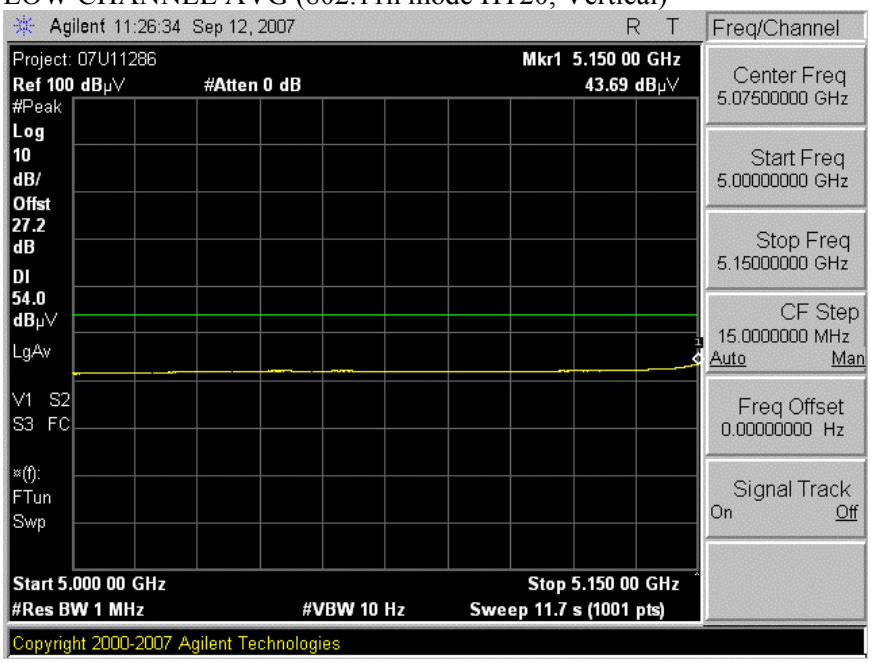
LOW CHANNEL AVG (802.11n mode HT20, Horizontal)



LOW CHANNEL PEAK (802.11n mode HT20, Vertical)

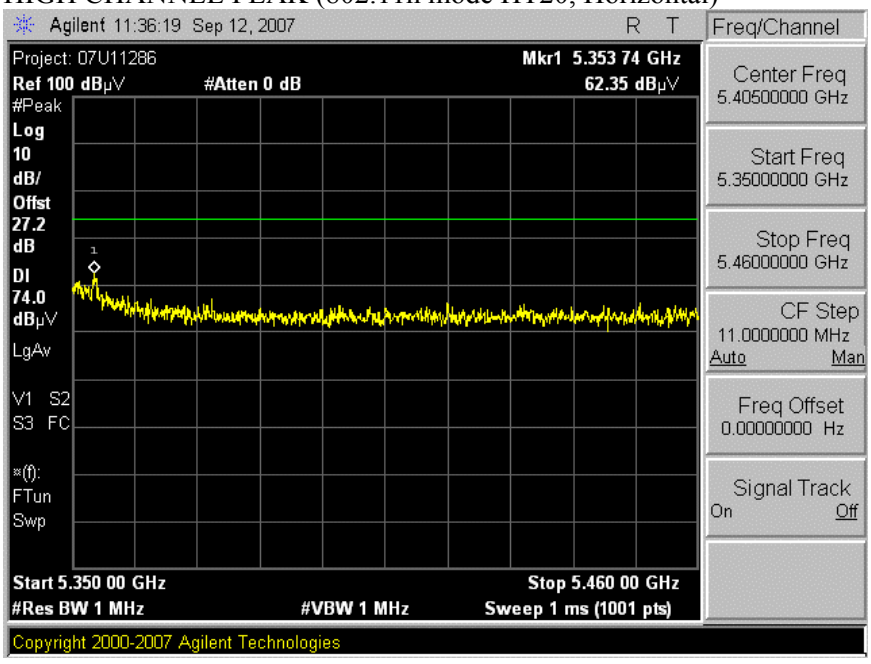


LOW CHANNEL AVG (802.11n mode HT20, Vertical)

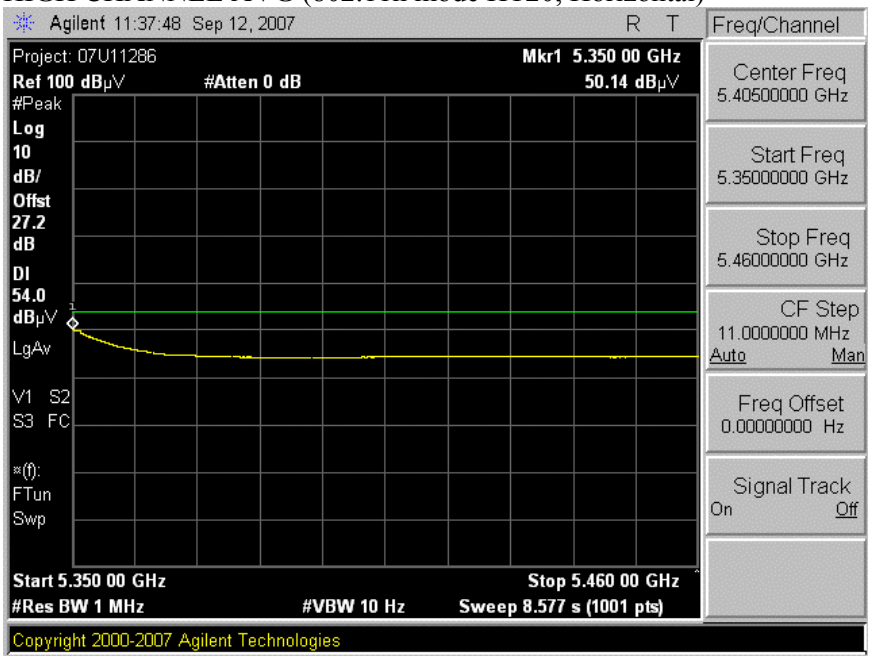


RESTRICTED BANDEDGE (802.11n MODE HT20, HIGH CHANNEL)

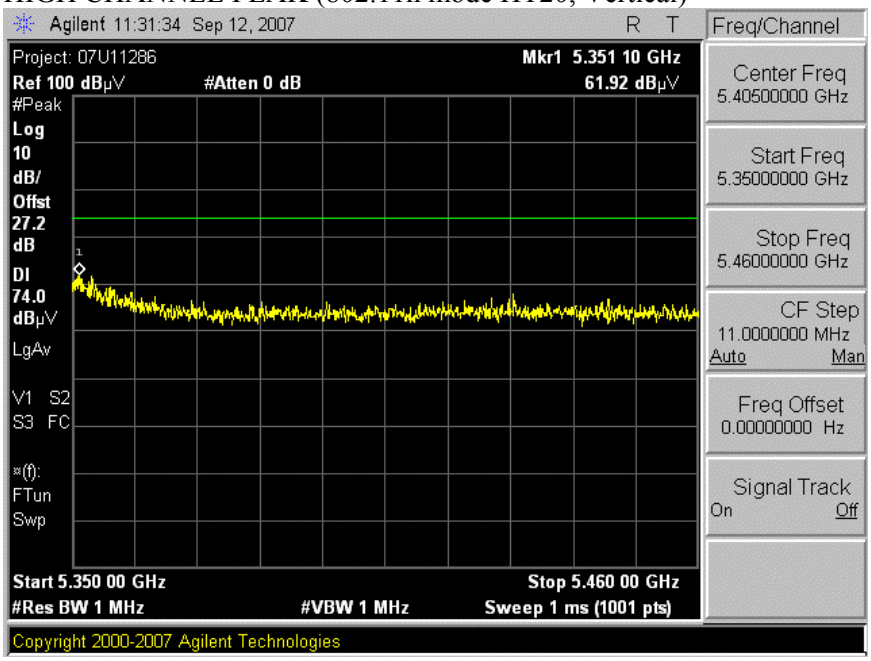
HIGH CHANNEL PEAK (802.11n mode HT20, Horizontal)



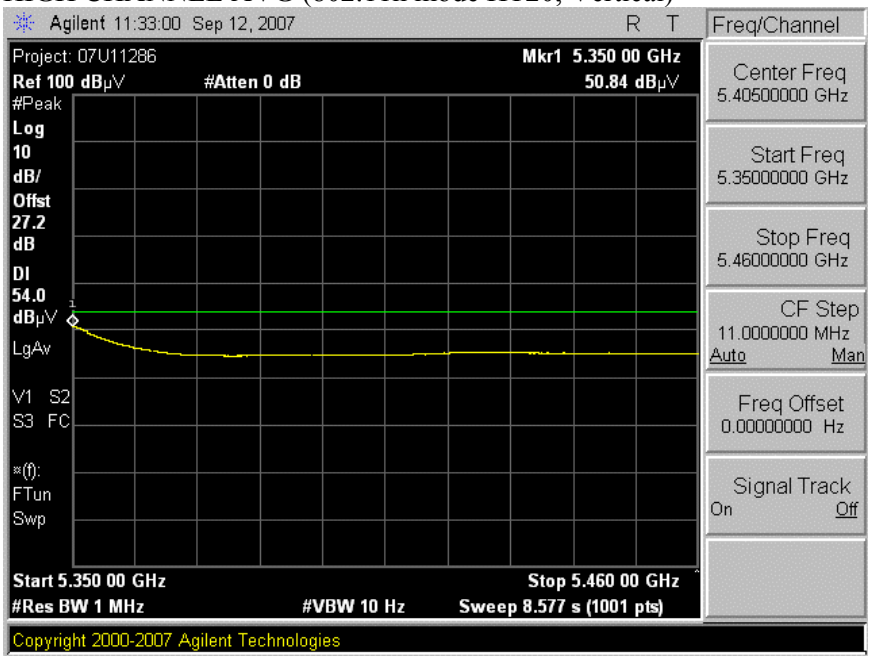
HIGH CHANNEL AVG (802.11n mode HT20, Horizontal)



HIGH CHANNEL PEAK (802.11n mode HT20, Vertical)



HIGH CHANNEL AVG (802.11n mode HT20, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT20)

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: MARVELL Semiconductor, Inc.
Project #: 07U11286
Date: 9-12-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, Laptop and Extender Card with Galtronics Tempest Antenna
Mode: Transmit 5.3GHz HT20 mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
William 177079009		Sunny 197539001	HPF_7.6GHz	

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

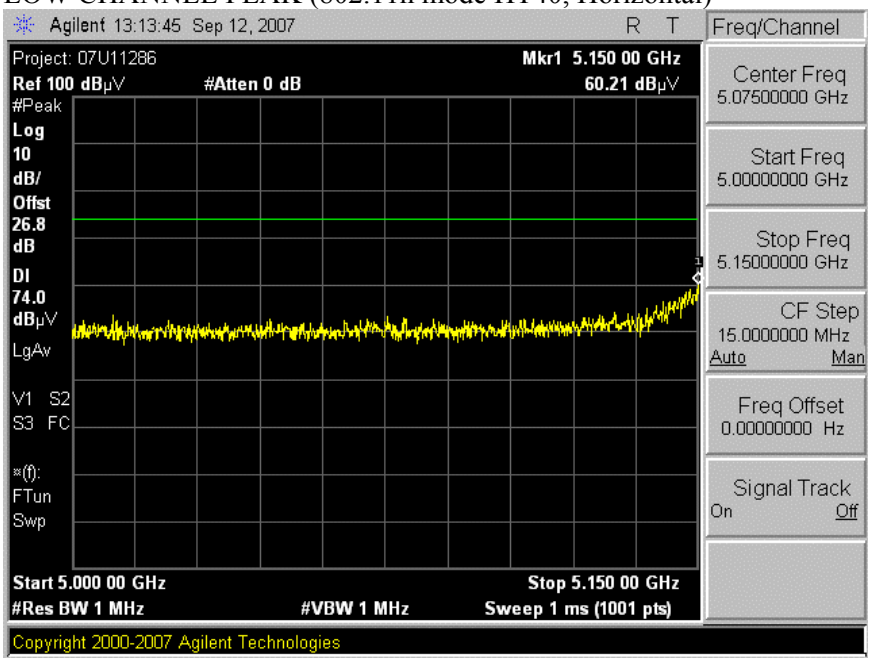
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Ch 5180MHz															
10.360	3.0	43.9	31.3	37.5	5.1	-34.6	0.0	0.8	52.6	40.1	74	54	-21.4	-13.9	V
15.540	3.0	43.4	33.6	39.0	6.6	-32.3	0.0	0.7	57.4	47.6	74	54	-16.6	-6.4	Noise Floor
10.360	3.0	43.4	32.5	37.5	5.1	-34.6	0.0	0.8	52.1	41.2	74	54	-21.9	-12.8	H
15.540	3.0	43.7	30.9	39.0	6.6	-32.3	0.0	0.7	57.7	44.9	74	54	-16.3	-9.1	Noise Floor
CH 5260MHz															
10.520	3.0	49.4	36.5	37.5	5.2	-34.4	0.0	0.8	58.4	45.5	74	54	-15.6	-8.5	V
15.780	3.0	47.2	32.6	39.1	6.7	-32.2	0.0	0.7	61.4	46.9	74	54	-12.6	-7.1	Noise Floor
10.520	3.0	44.9	32.3	37.5	5.2	-34.4	0.0	0.8	53.9	41.3	74	54	-20.1	-12.7	H
15.780	3.0	44.6	30.9	39.1	6.7	-32.2	0.0	0.7	58.9	45.2	74	54	-15.1	-8.8	Noise Floor
CH 5320MHz															
10.640	3.0	49.5	36.5	37.5	5.2	-34.2	0.0	0.8	58.8	45.7	74	54	-15.2	-8.3	V
15.960	3.0	45.8	33.3	39.3	6.7	-32.2	0.0	0.7	60.3	47.8	74	54	-13.7	-6.2	Noise Floor
10.640	3.0	45.7	31.5	37.5	5.2	-34.2	0.0	0.8	54.9	40.7	74	54	-19.1	-13.3	H
15.960	3.0	43.8	30.5	39.3	6.7	-32.2	0.0	0.7	58.3	45.0	74	54	-15.7	-9.0	Noise Floor
No other spurious emissions were detected above system noise floor.															

Rev. 5.1.6

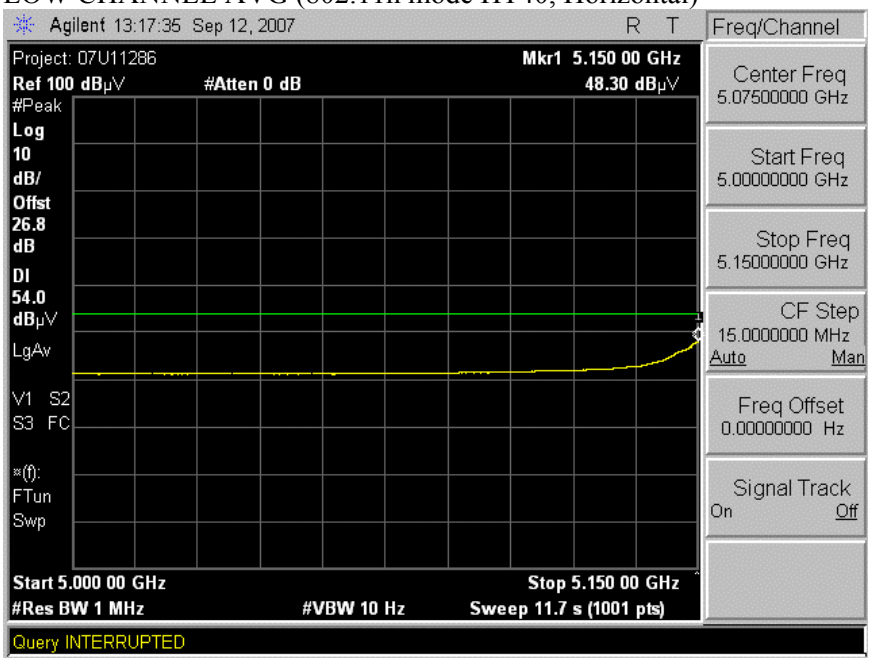
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11n MODE HT40, LOW CHANNEL)

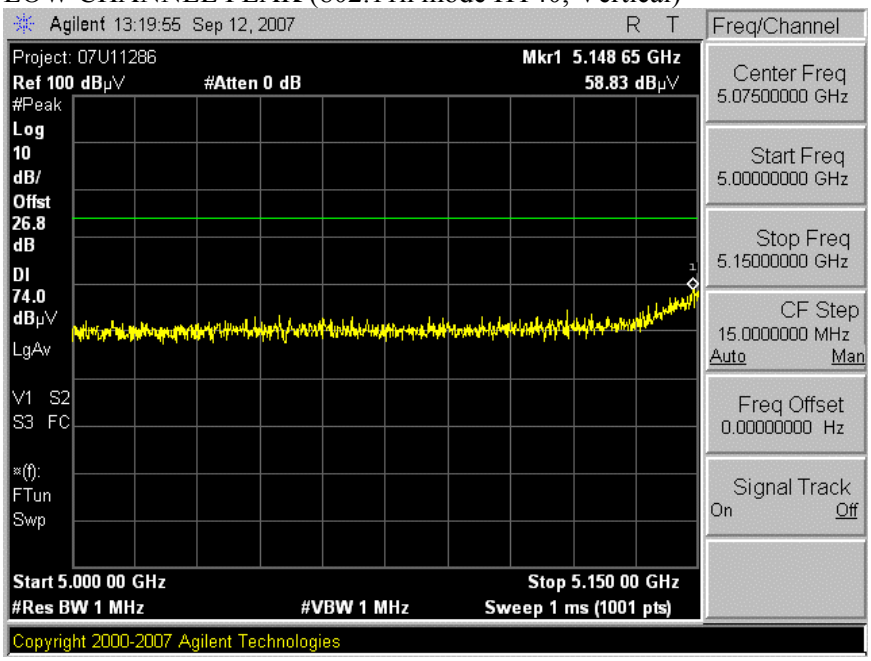
LOW CHANNEL PEAK (802.11n mode HT40, Horizontal)



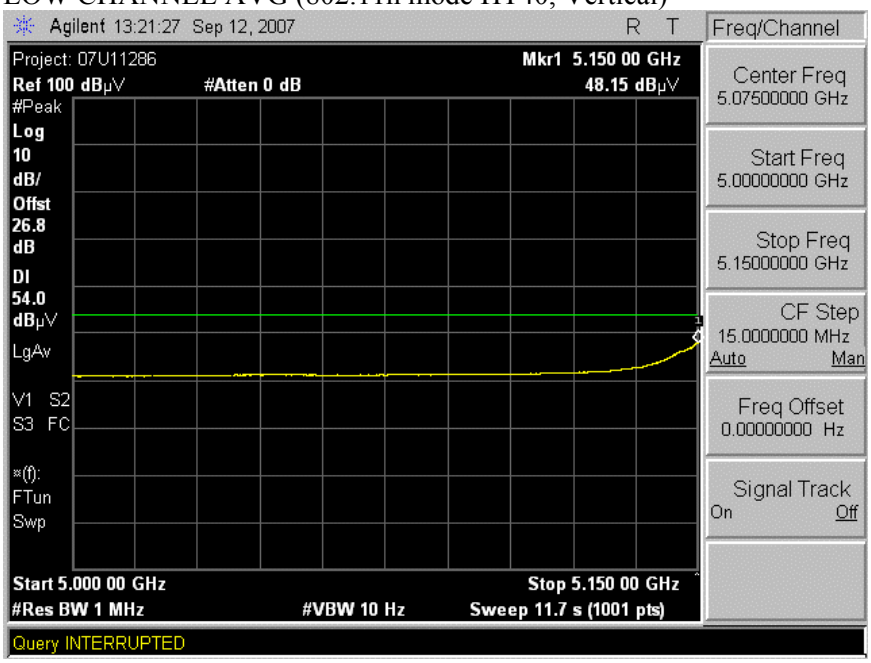
LOW CHANNEL AVG (802.11n mode HT40, Horizontal)



LOW CHANNEL PEAK (802.11n mode HT40, Vertical)

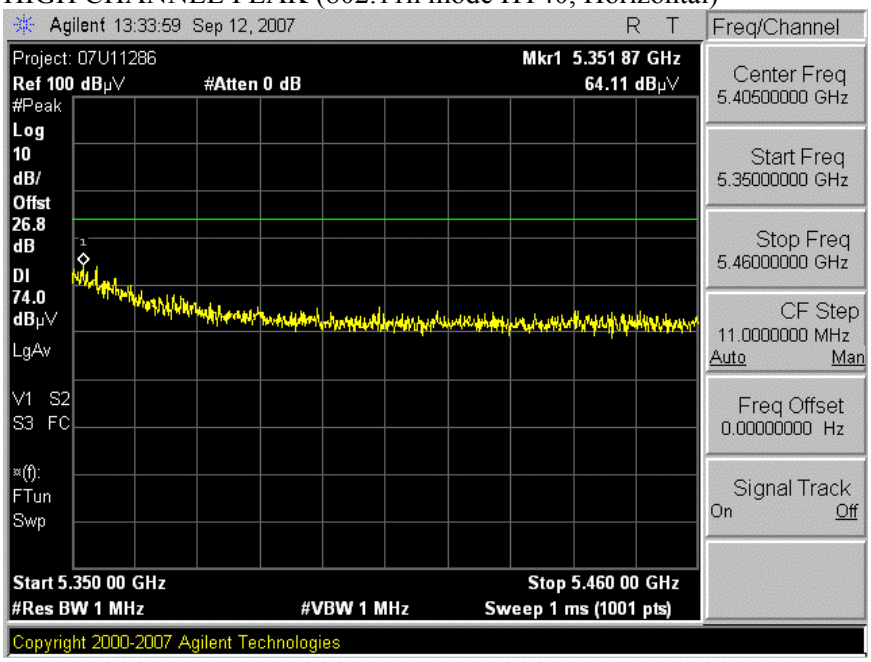


LOW CHANNEL AVG (802.11n mode HT40, Vertical)

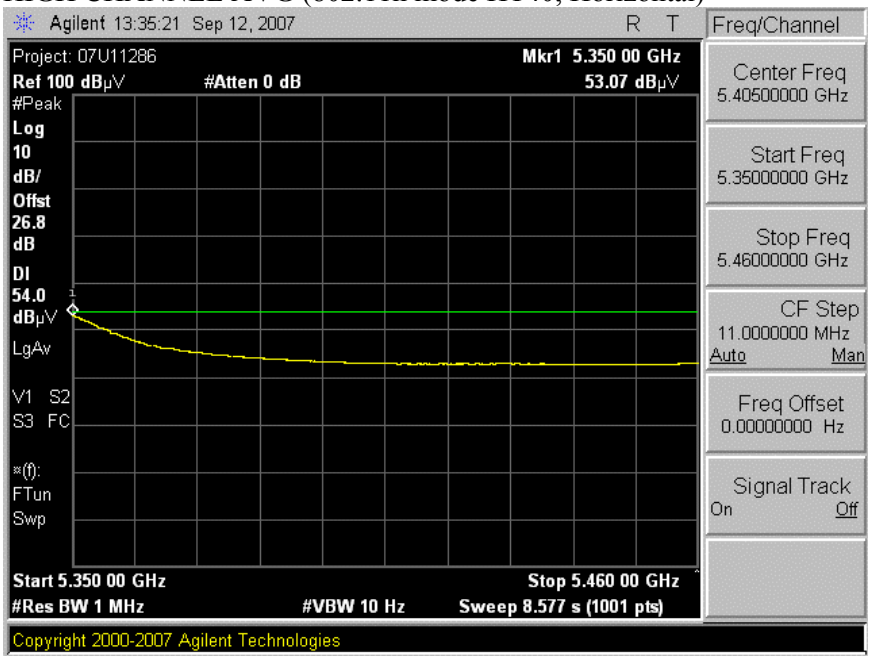


RESTRICTED BANDEDGE (802.11n MODE HT40, HIGH CHANNEL)

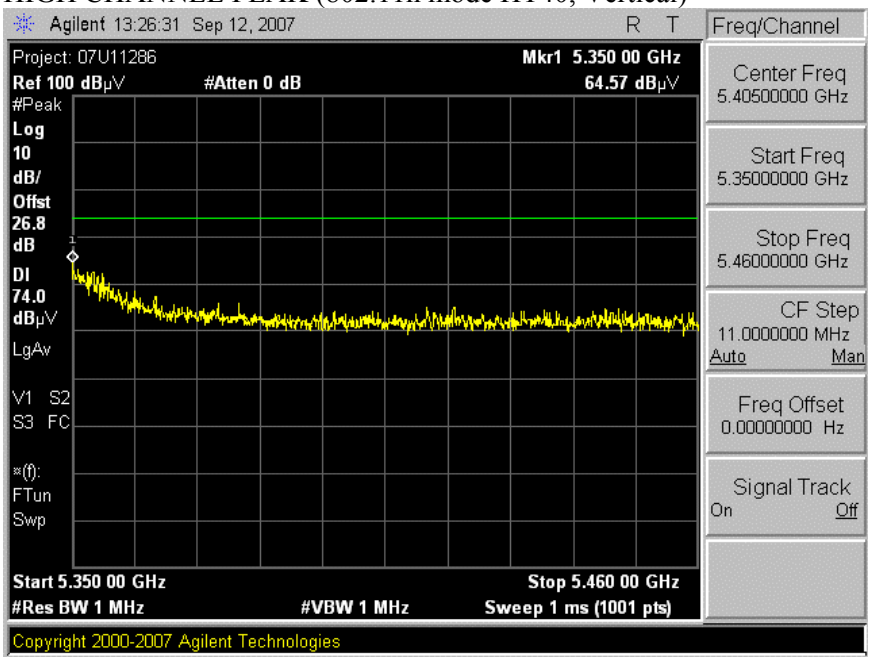
HIGH CHANNEL PEAK (802.11n mode HT40, Horizontal)



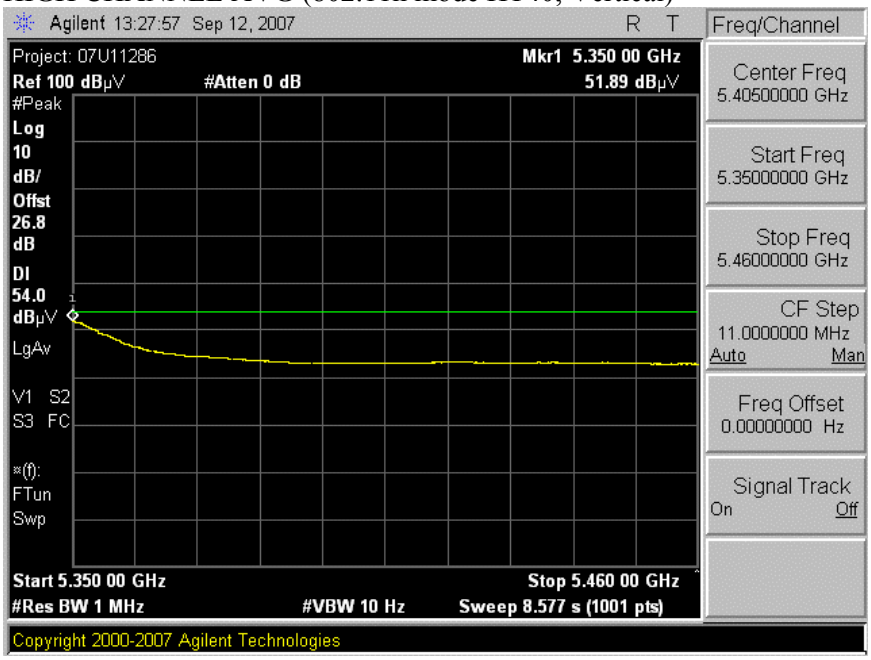
HIGH CHANNEL AVG (802.11n mode HT40, Horizontal)



HIGH CHANNEL PEAK (802.11n mode HT40, Vertical)



HIGH CHANNEL AVG (802.11n mode HT40, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT40)

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: MARVELL Semiconductor, Inc.
Project #: 07U11286
Date: 9-12-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, Laptop and Extender Card with Galtronics Tempest Antenna
Mode: Transmit 5.3GHz Band HT 40 mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
William 177079009		Joseph 208946001	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)
CH5190															
10.380	3.0	44.6	31.6	37.5	3.9	-34.6	0.0	0.8	52.2	39.2	74	54	-21.8	-14.8	V
15.570	3.0	43.0	30.6	39.0	5.2	-32.3	0.0	0.7	55.7	43.2	74	54	-18.3	-10.8	Noise Floor
10.380	3.0	43.1	31.4	37.5	3.9	-34.6	0.0	0.8	50.7	39.0	74	54	-23.3	-15.0	H
15.570	3.0	43.2	30.8	39.0	5.2	-32.3	0.0	0.7	55.9	43.4	74	54	-18.1	-10.6	Noise Floor
Ch5270															
10.540	3.0	45.6	31.9	37.5	4.0	-34.4	0.0	0.8	53.5	39.8	74	54	-20.5	-14.2	V
15.810	3.0	43.6	30.9	39.2	5.3	-32.2	0.0	0.7	56.5	43.8	74	54	-17.5	-10.2	Noise Floor
10.540	3.0	43.0	30.8	37.5	4.0	-34.4	0.0	0.8	50.9	38.6	74	54	-23.1	-15.4	H
15.810	3.0	43.7	30.8	39.2	5.3	-32.2	0.0	0.7	56.6	43.7	74	54	-17.4	-10.3	Noise Floor
Ch5310															
10.620	3.0	47.1	33.8	37.5	4.0	-34.3	0.0	0.8	55.1	41.7	74	54	-18.9	-12.3	V
15.930	3.0	44.0	30.6	39.2	5.3	-32.2	0.0	0.7	57.0	43.6	74	54	-17.0	-10.4	Noise Floor
10.620	3.0	43.0	30.5	37.5	4.0	-34.3	0.0	0.8	51.0	38.4	74	54	-23.0	-15.6	H
15.930	3.0	42.9	30.4	39.2	5.3	-32.2	0.0	0.7	55.9	43.5	74	54	-18.1	-10.5	Noise Floor
No other spurious emissions were detected above system noise floor.															

Rev. 5.1.6

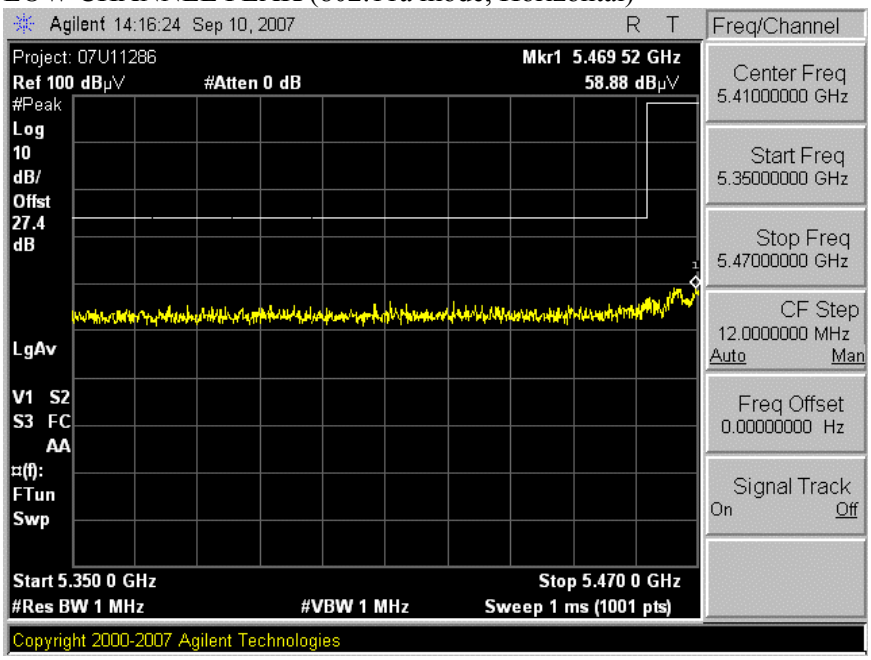
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

7.2.3. TRANSMITTER ABOVE 1 GHz FOR 5470 TO 5725 MHz BAND

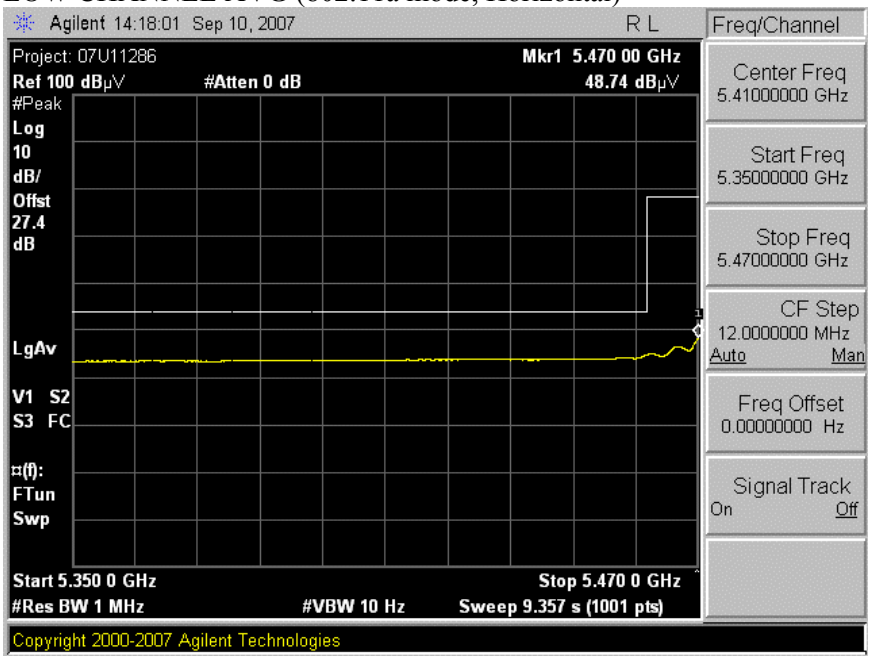
Galtronics Tempest Antenna

RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL)

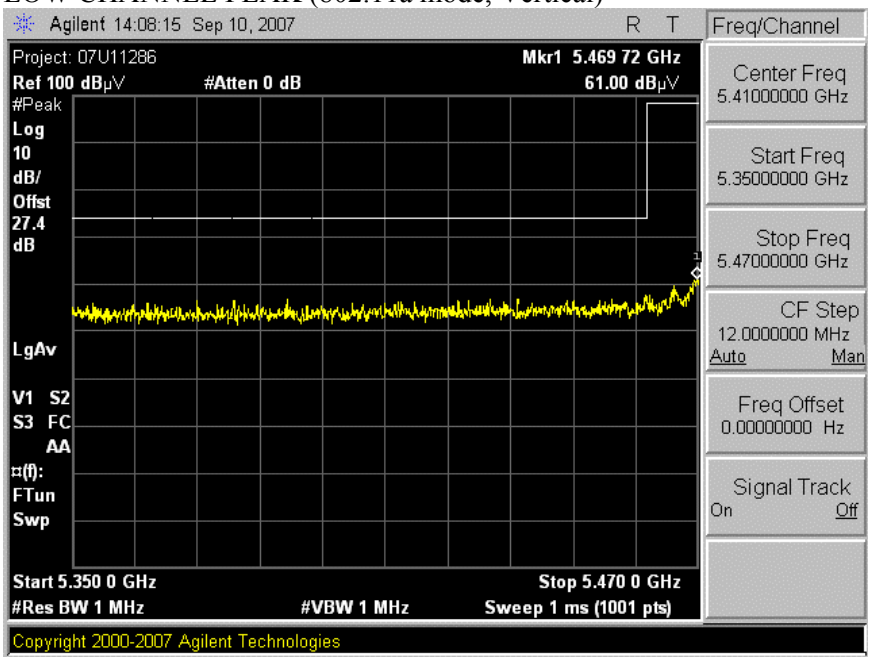
LOW CHANNEL PEAK (802.11a mode, Horizontal)



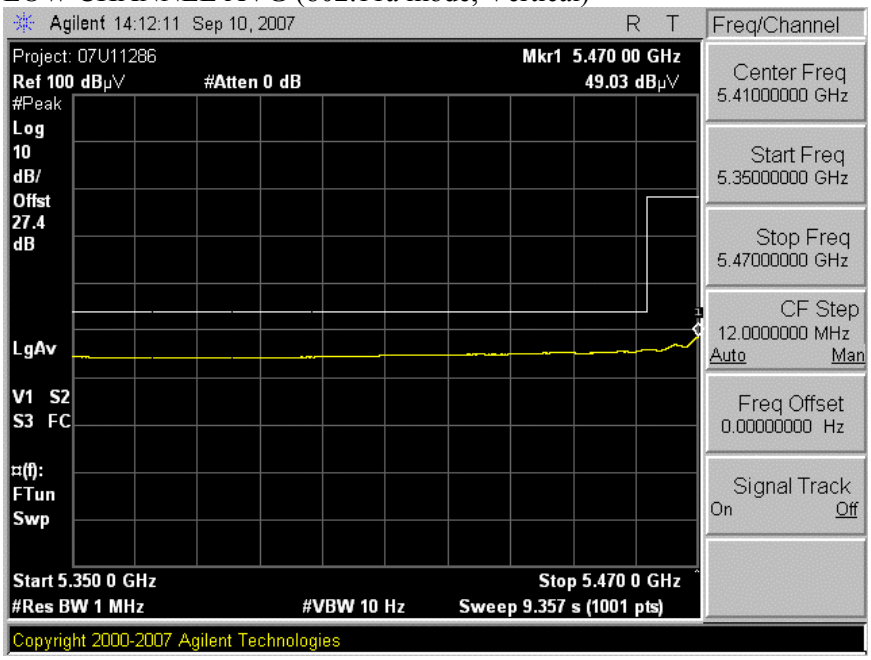
LOW CHANNEL AVG (802.11a mode, Horizontal)



LOW CHANNEL PEAK (802.11a mode, Vertical)

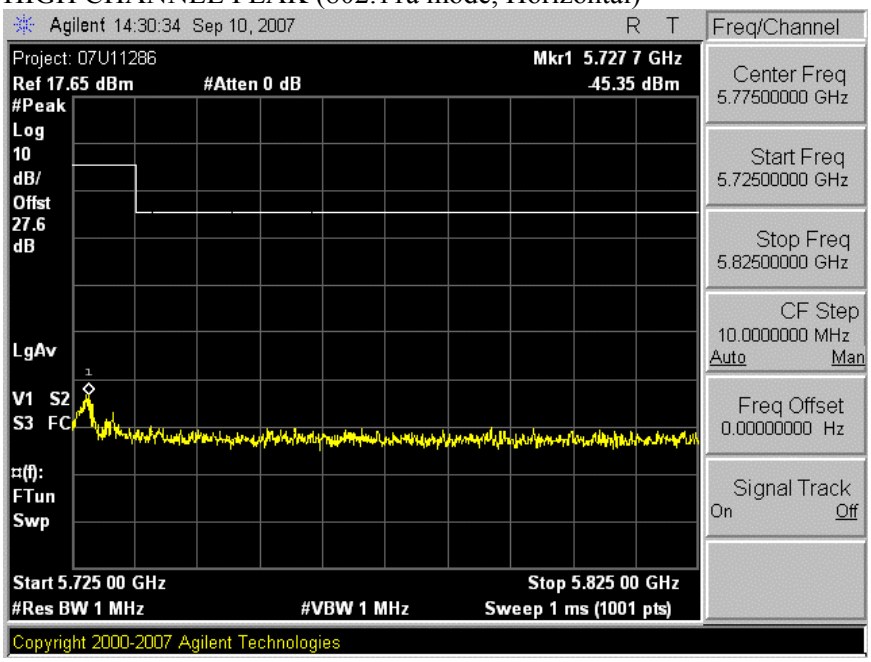


LOW CHANNEL AVG (802.11a mode, Vertical)

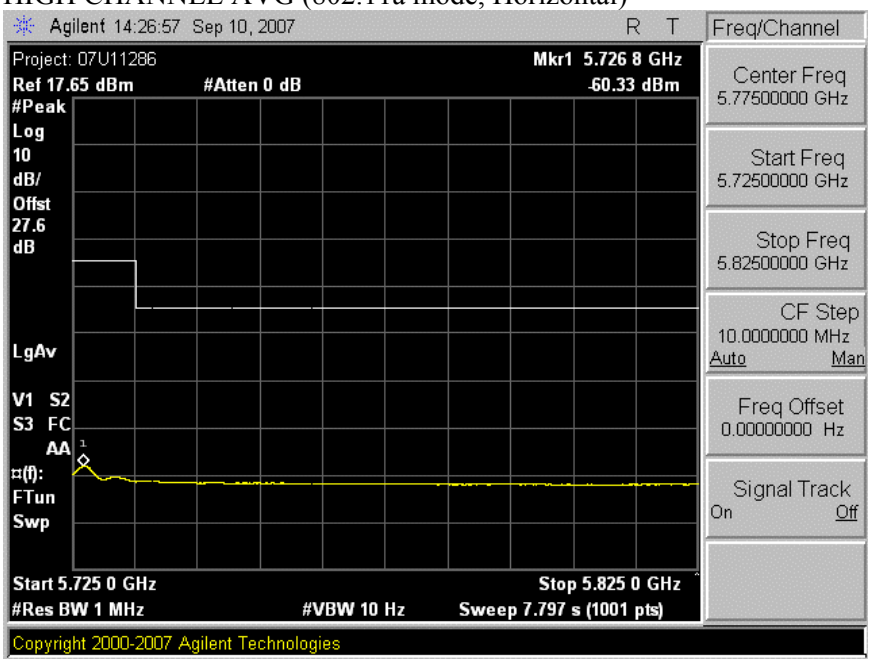


RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL)

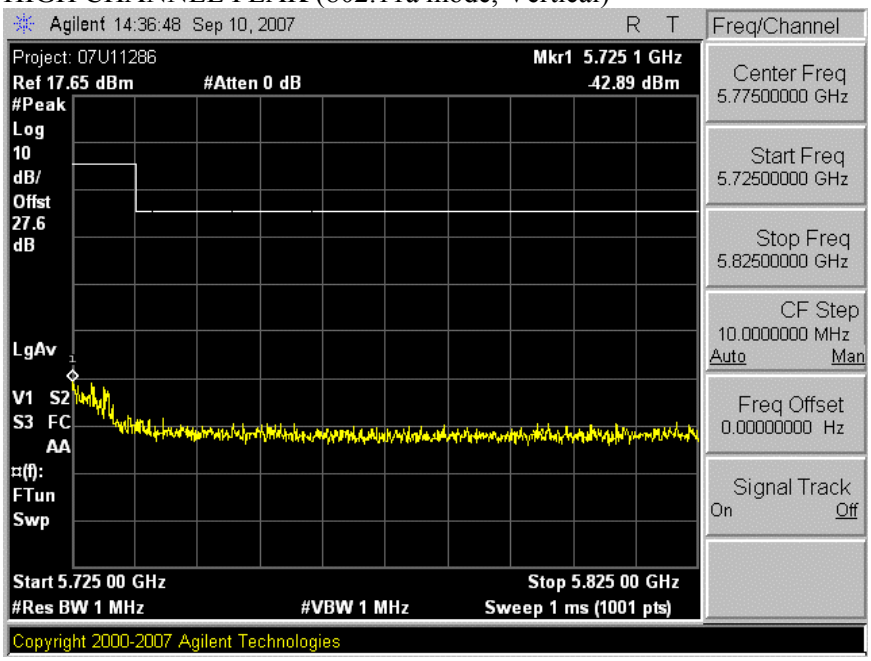
HIGH CHANNEL PEAK (802.11a mode, Horizontal)



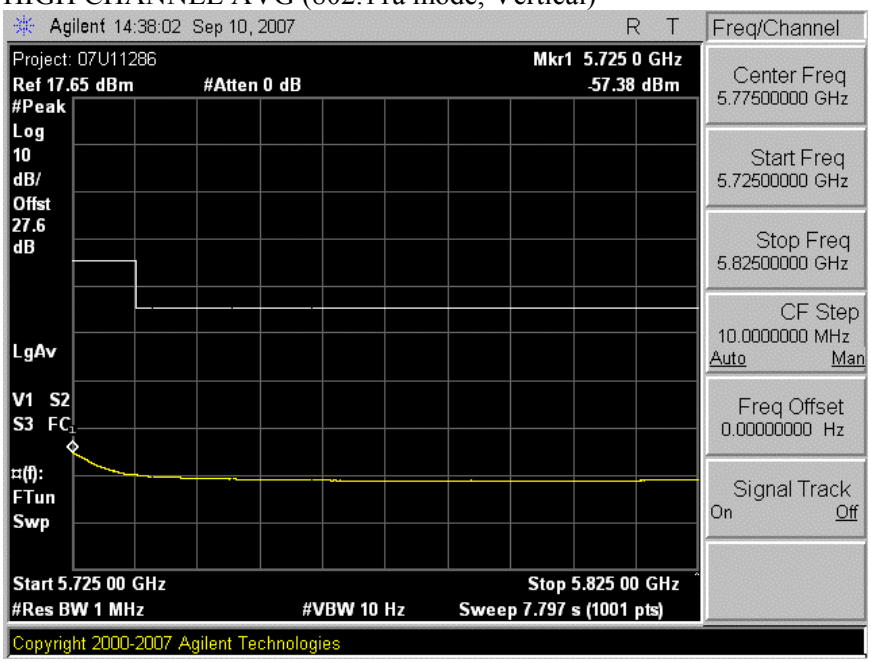
HIGH CHANNEL AVG (802.11a mode, Horizontal)



HIGH CHANNEL PEAK (802.11a mode, Vertical)



HIGH CHANNEL AVG (802.11a mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: MARVELL Semiconductor, Inc.
Project #: 07U11286
Date: 9-10-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, Laptop and Extender Card with Galtronics Tempest Antenna
Mode: Transmit 5.5GHz Band a 20MHz mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
William 177079009		Sunny 197539001	HPF_7.6GHz	

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

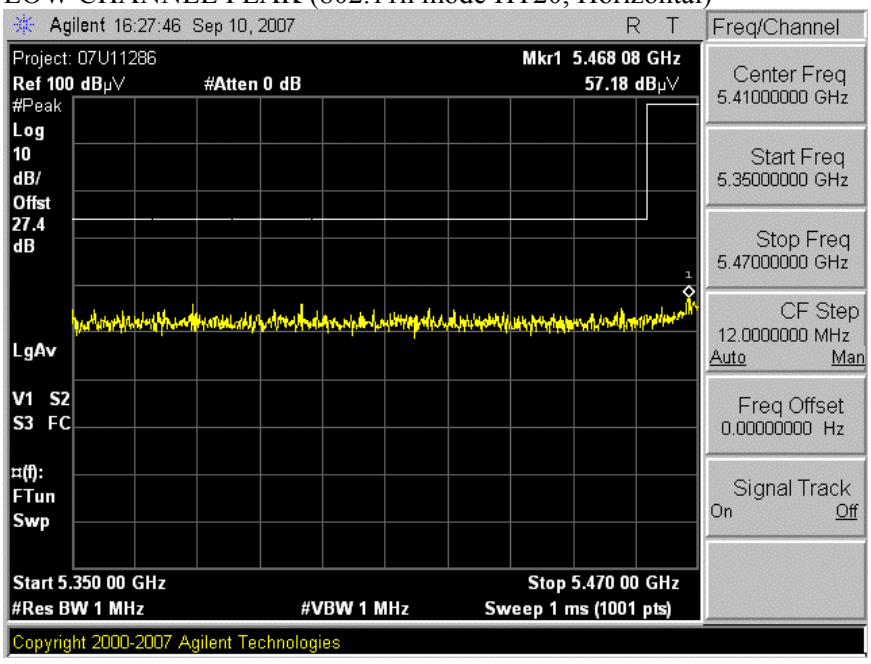
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Ch 5500MHz															
11.000	3.0	48.6	38.7	37.5	5.3	-33.8	0.0	0.7	58.4	48.5	74	54	-15.6	-5.5	V
16.500	3.0	44.4	30.2	39.7	6.8	-32.1	0.0	0.7	59.4	45.3	74	54	-14.6	-8.7	V
22.000	3.0	45.5	32.2	32.3	8.2	-32.3	0.0	0.0	53.8	40.5	74	54	-20.2	-13.5	Noise floor
11.000	3.0	46.6	36.9	37.5	5.3	-33.8	0.0	0.7	56.4	46.7	74	54	-17.6	-7.3	H
16.500	3.0	43.3	31.2	39.7	6.8	-32.1	0.0	0.7	58.4	46.3	74	54	-15.6	-7.7	H
22.000	3.0	45.6	32.5	32.3	8.2	-32.3	0.0	0.0	53.9	40.7	74	54	-20.1	-13.3	Noise floor
CH 5600MHz															
11.200	3.0	49.7	37.8	37.6	5.4	-33.5	0.0	0.7	59.8	48.0	74	54	-14.2	-6.0	V
16.800	3.0	43.7	31.3	39.9	6.9	-32.0	0.0	0.7	59.1	46.7	74	54	-14.9	-7.3	V
22.400	3.0	45.3	31.2	32.5	8.3	-32.3	0.0	0.0	53.8	39.7	74	54	-20.2	-14.3	Noise floor
11.200	3.0	47.9	35.3	37.6	5.4	-33.5	0.0	0.7	58.1	45.5	74	54	-15.9	-8.5	H
16.800	3.0	42.6	30.6	39.9	6.9	-32.0	0.0	0.7	58.0	45.9	74	54	-16.0	-8.1	H
22.400	3.0	45.7	30.8	32.5	8.3	-32.3	0.0	0.0	54.1	39.2	74	54	-19.9	-14.8	Noise floor
CH 5700MHz															
11.400	3.0	50.2	38.8	37.6	5.4	-33.2	0.0	0.7	60.8	49.3	74	54	-13.2	-4.7	V
17.100	3.0	41.6	30.8	40.1	7.0	-32.0	0.0	0.7	57.4	46.5	74	54	-16.6	-7.5	V
22.800	3.0	45.4	32.5	32.7	8.4	-32.4	0.0	0.0	54.2	41.2	74	54	-19.8	-12.8	Noise floor
11.400	3.0	49.7	37.6	37.6	5.4	-33.2	0.0	0.7	60.2	48.1	74	54	-13.8	-5.9	H
17.100	3.0	40.4	30.3	40.1	7.0	-32.0	0.0	0.7	56.2	46.1	74	54	-17.8	-7.9	H
22.800	3.0	45.3	32.5	32.7	8.4	-32.4	0.0	0.0	54.1	41.2	74	54	-19.9	-12.8	Noise floor
No other spurious emissions were detected above system noise floor.															

Rev. 5.1.6

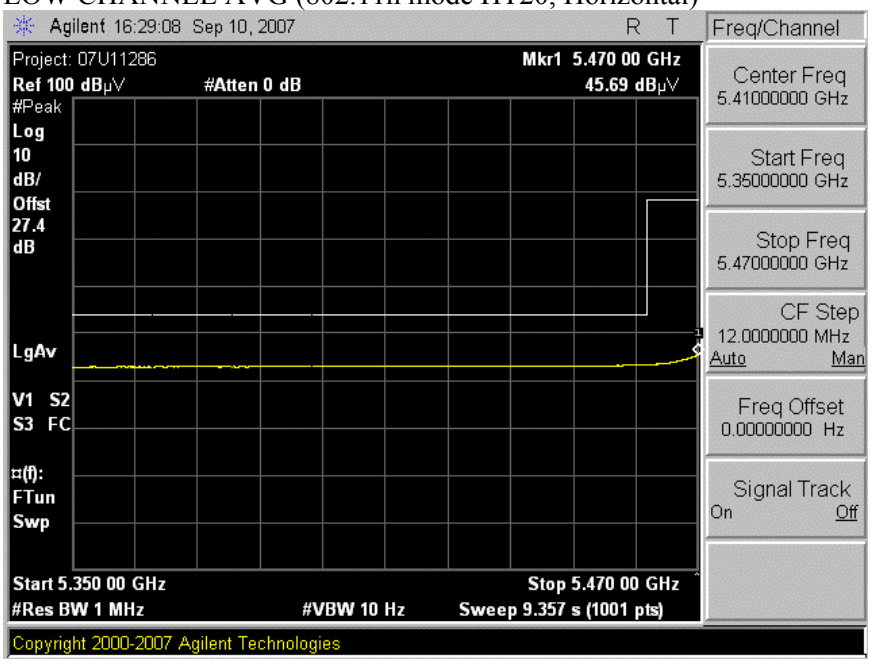
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

ESTRICTED BANDEDGE (802.11n MODE HT20, LOW CHANNEL)

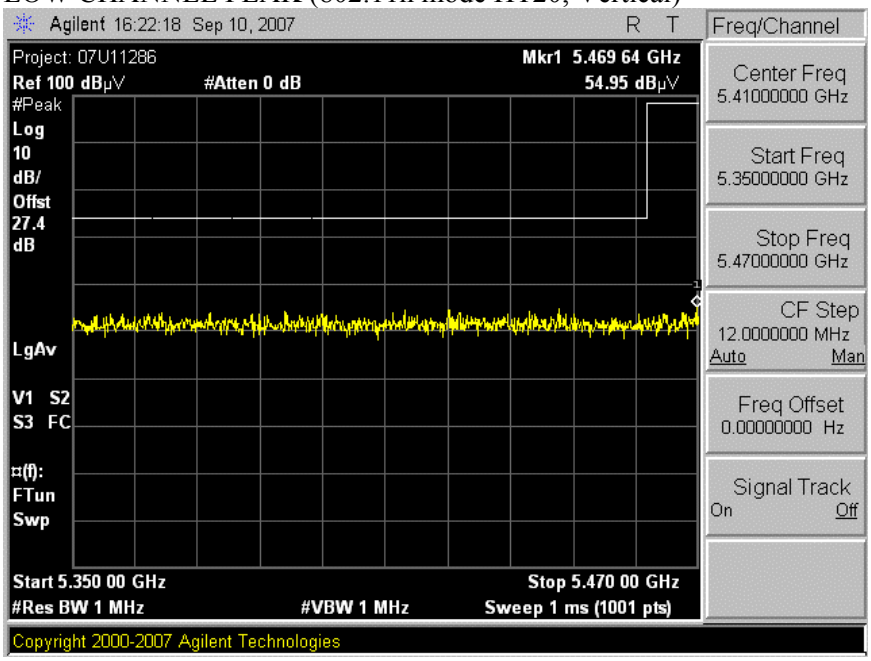
LOW CHANNEL PEAK (802.11n mode HT20, Horizontal)



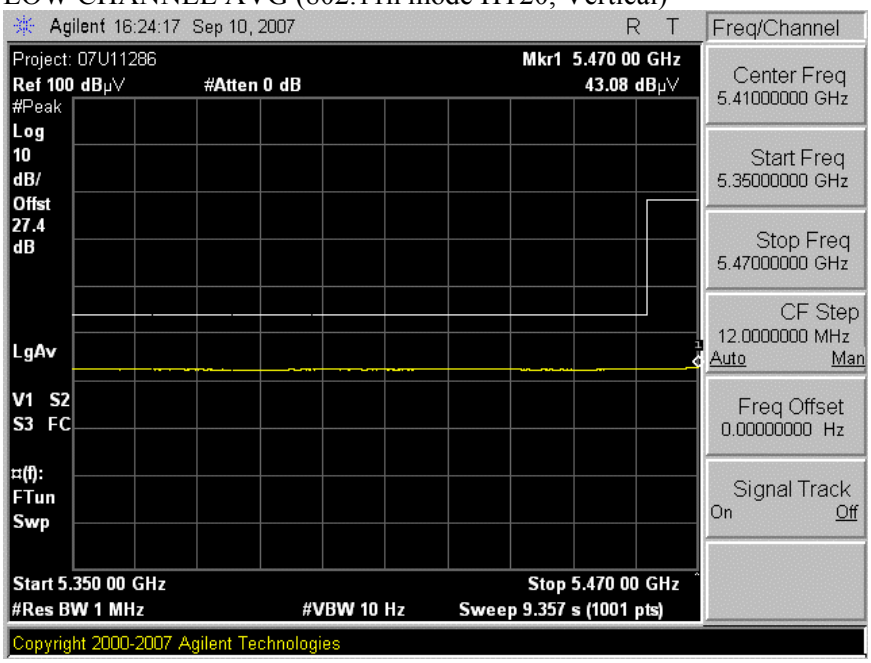
LOW CHANNEL AVG (802.11n mode HT20, Horizontal)



LOW CHANNEL PEAK (802.11n mode HT20, Vertical)

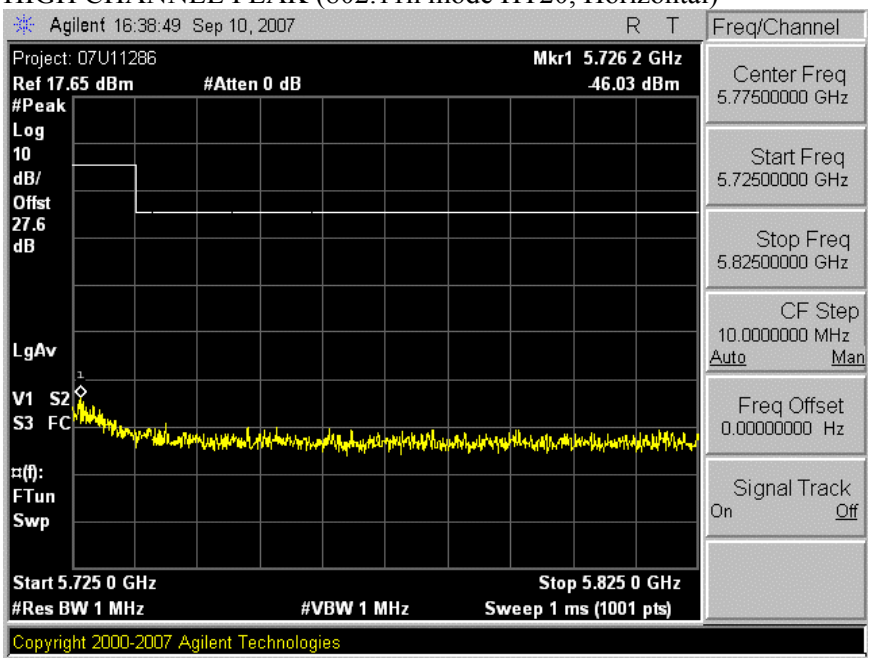


LOW CHANNEL AVG (802.11n mode HT20, Vertical)

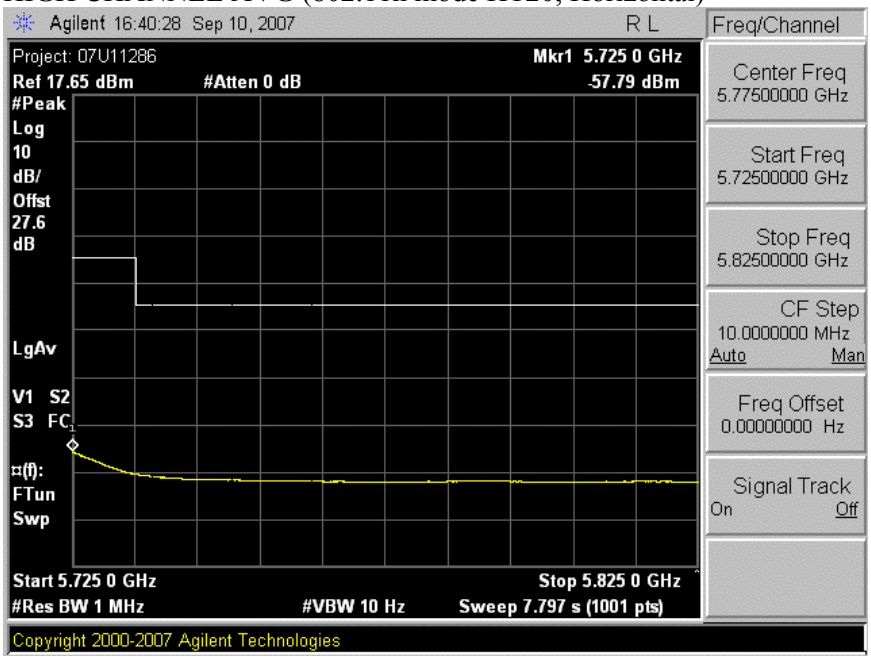


RESTRICTED BANDEDGE (802.11n MODE HT20, HIGH CHANNEL)

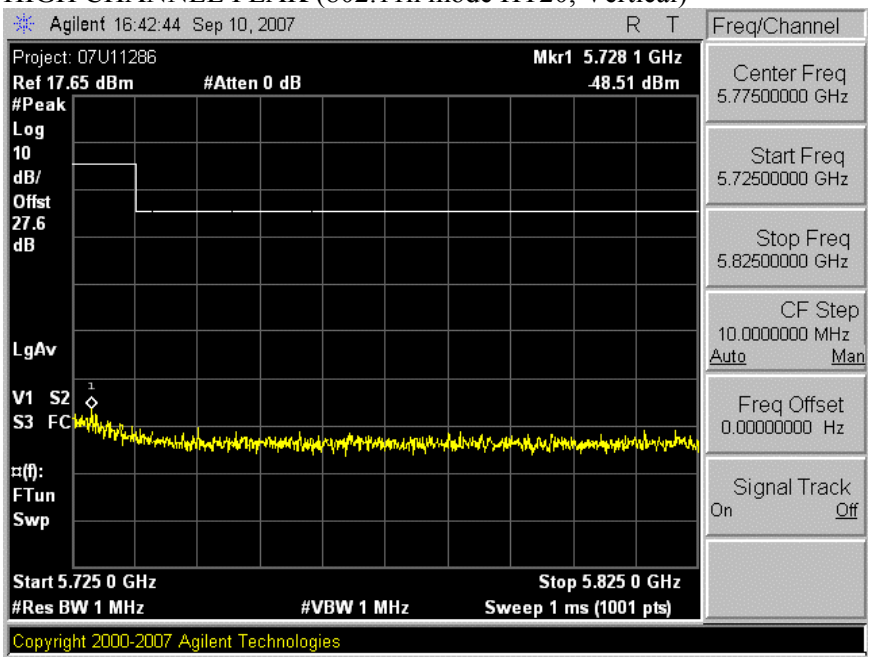
HIGH CHANNEL PEAK (802.11n mode HT20, Horizontal)



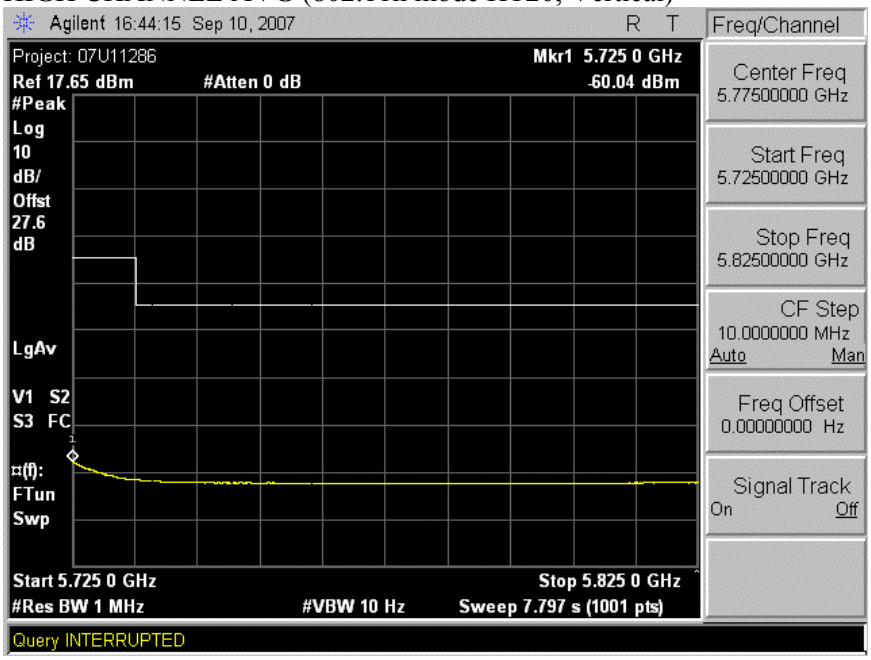
HIGH CHANNEL AVG (802.11n mode HT20, Horizontal)



HIGH CHANNEL PEAK (802.11n mode HT20, Vertical)



HIGH CHANNEL AVG (802.11n mode HT20, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT20)

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: MARVELL Semiconductor, Inc.
Project #: 07U11286
Date: 9-10-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, Laptop and Extender Card with Galtronics Tempest Antenna
Mode: Transmit 5.5GHz Band HT20 mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
Thanh 177079008		Thanh 208946003	HPF_7.6GHz	

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

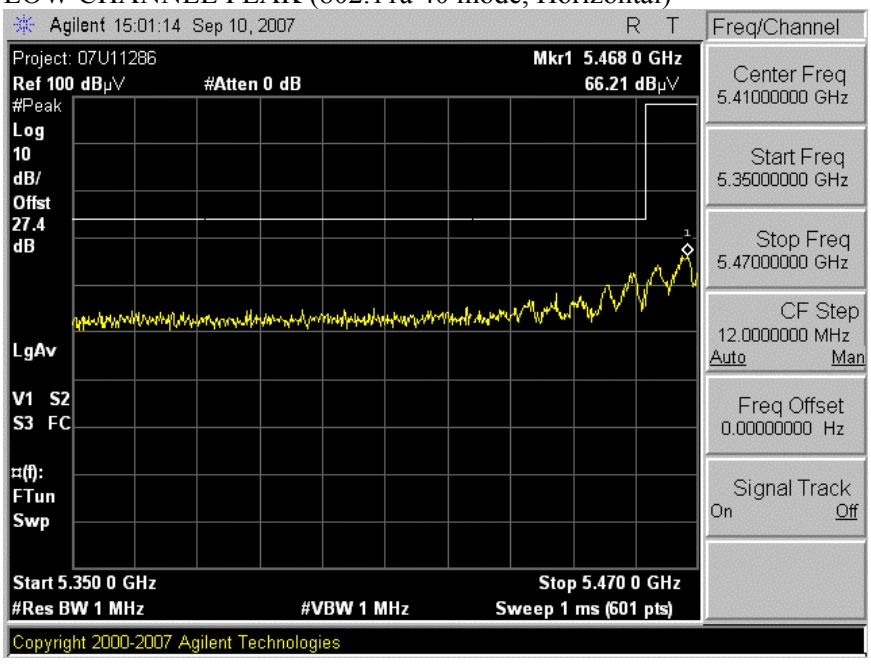
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Ch 5500MHz															
11.000	3.0	48.4	38.3	37.5	4.1	-33.8	0.0	0.7	57.0	46.9	74	54	-17.0	-7.1	V
16.500	3.0	43.7	30.6	39.7	5.0	-32.1	0.0	0.7	56.9	43.8	74	54	-17.1	-10.2	V
22.000	3.0	45.8	32.6	32.3	6.0	-32.3	0.0	0.0	51.8	38.6	74	54	-22.2	-15.4	Noise floor
11.000	3.0	48.4	37.7	37.5	4.1	-33.8	0.0	0.7	57.0	46.2	74	54	-17.0	-7.8	H
16.500	3.0	42.7	30.2	39.7	5.0	-32.1	0.0	0.7	55.9	43.5	74	54	-18.1	-10.5	H
22.000	3.0	45.2	32.1	32.3	6.0	-32.3	0.0	0.0	51.3	38.1	74	54	-22.7	-15.9	Noise floor
CH 5600MHz															
11.200	3.0	49.3	39.6	37.6	4.1	-33.5	0.0	0.7	58.2	48.5	74	54	-15.8	-5.5	V
16.800	3.0	44.1	31.3	39.9	5.1	-32.0	0.0	0.7	57.7	44.9	74	54	-16.3	-9.1	V
22.400	3.0	45.7	32.3	32.5	6.1	-32.3	0.0	0.0	51.9	38.5	74	54	-22.1	-15.5	Noise floor
11.200	3.0	48.4	38.6	37.6	4.1	-33.5	0.0	0.7	57.3	47.5	74	54	-16.7	-6.5	H
16.800	3.0	42.7	31.3	39.9	5.1	-32.0	0.0	0.7	56.3	44.9	74	54	-17.7	-9.1	H
22.400	3.0	45.6	32.3	32.5	6.1	-32.3	0.0	0.0	51.8	38.6	74	54	-22.2	-15.4	Noise floor
CH 5700MHz															
11.400	3.0	48.6	38.4	37.6	4.2	-33.2	0.0	0.7	57.8	47.6	74	54	-16.2	-6.4	V
17.100	3.0	43.3	30.3	40.1	5.2	-32.0	0.0	0.7	57.2	44.3	74	54	-16.8	-9.7	V
22.800	3.0	42.5	31.6	32.7	6.2	-32.4	0.0	0.0	49.0	38.1	74	54	-25.0	-15.9	Noise floor
11.400	3.0	48.6	38.6	37.6	4.2	-33.2	0.0	0.7	57.8	47.8	74	54	-16.2	-6.2	H
17.100	3.0	42.5	30.2	40.1	5.2	-32.0	0.0	0.7	56.4	44.1	74	54	-17.6	-9.9	H
22.800	3.0	45.3	32.4	32.7	6.2	-32.4	0.0	0.0	51.8	38.9	74	54	-22.2	-15.1	Noise floor
No other spurious emissions were detected above system noise floor.															

Rev. 5.1.6

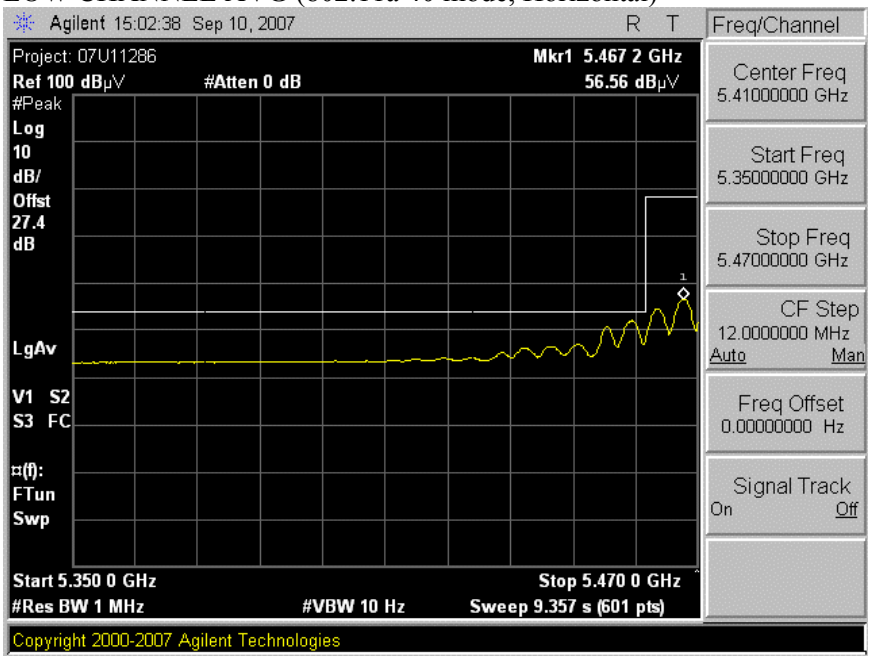
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11a 40 MODE, LOW CHANNEL)

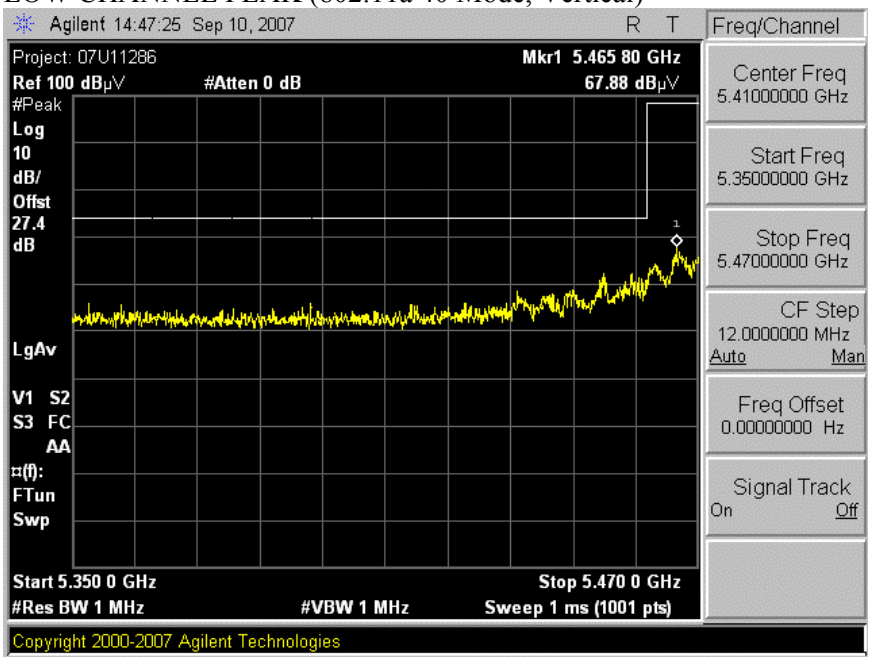
LOW CHANNEL PEAK (802.11a 40 mode, Horizontal)



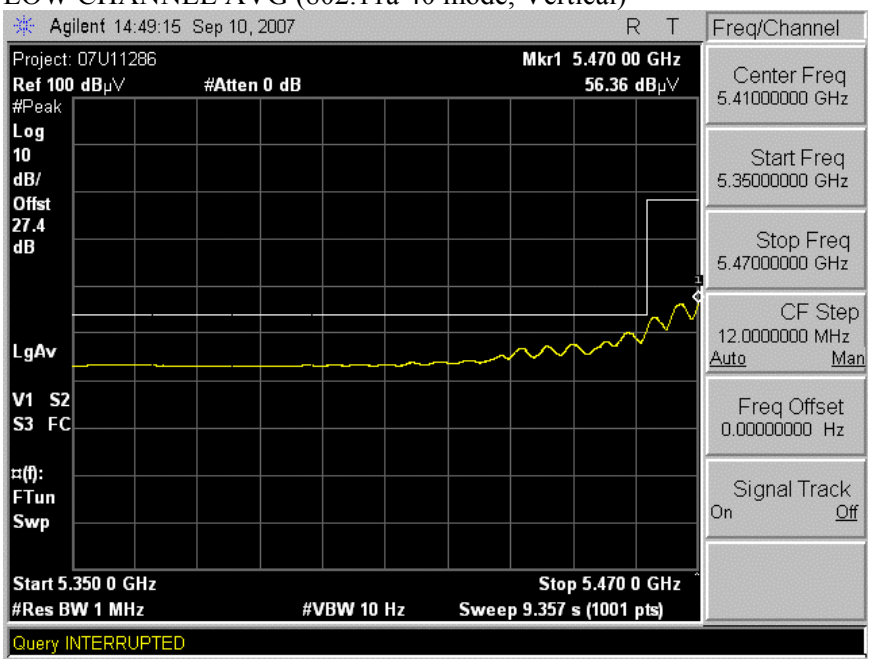
LOW CHANNEL AVG (802.11a 40 mode, Horizontal)



LOW CHANNEL PEAK (802.11a 40 Mode, Vertical)

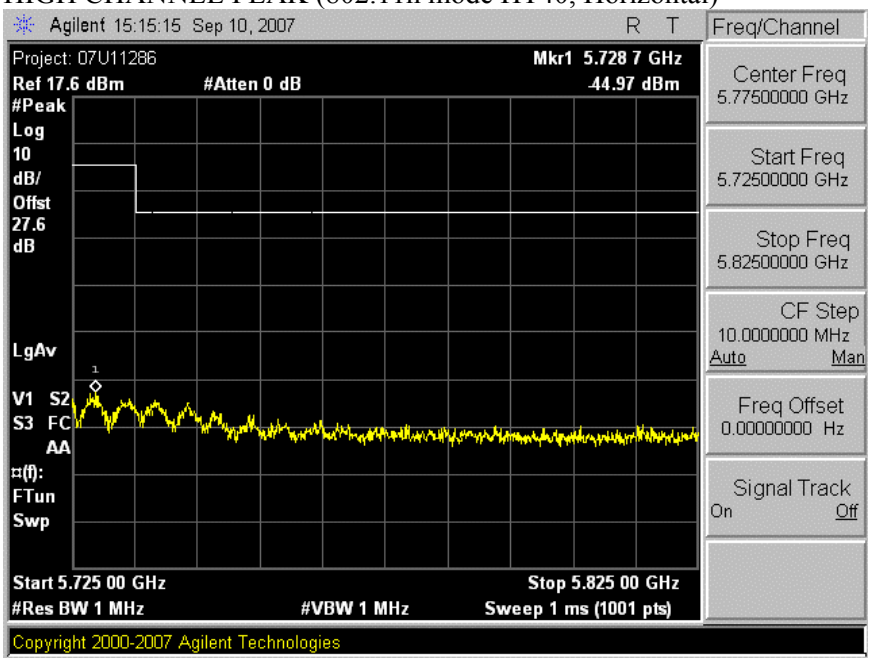


LOW CHANNEL AVG (802.11a 40 mode, Vertical)

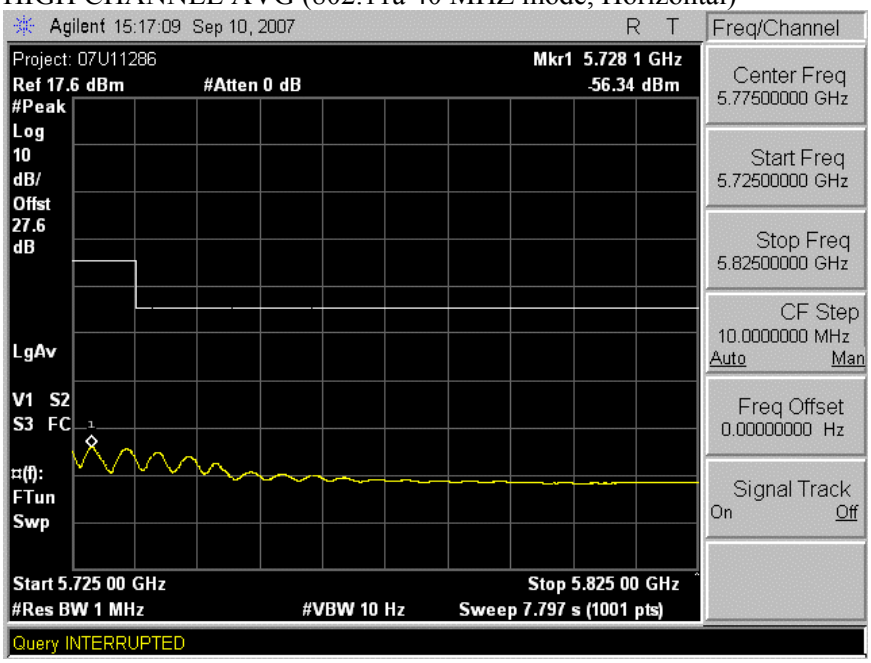


RESTRICTED BANDEDGE (802.11a 40MHZ MODE , HIGH CHANNEL)

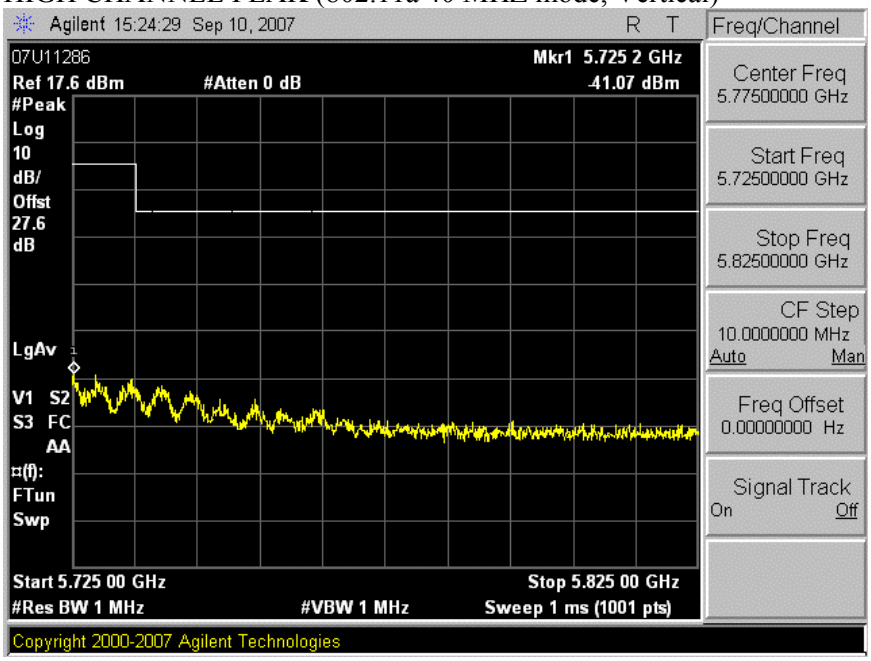
HIGH CHANNEL PEAK (802.11n mode HT40, Horizontal)



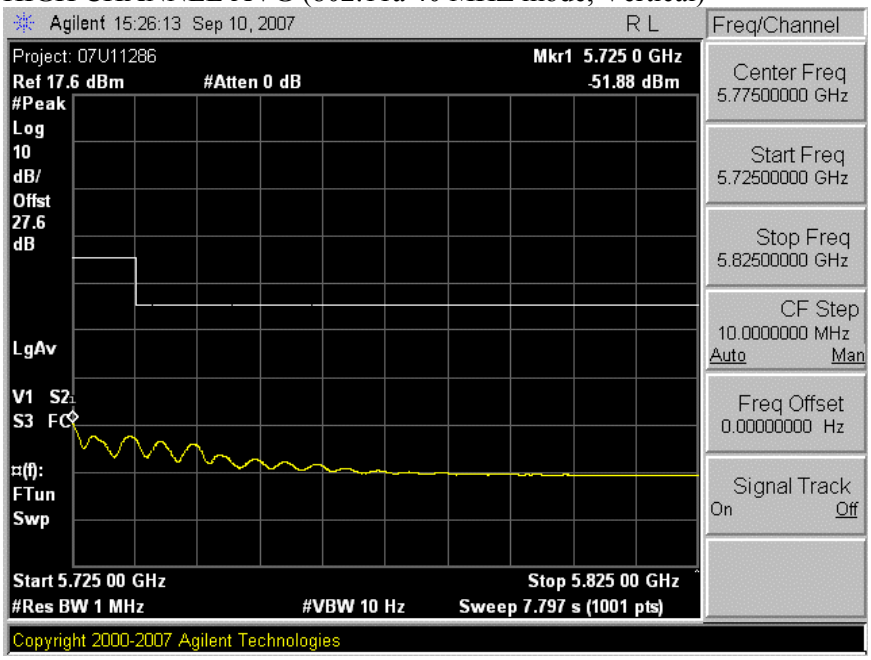
HIGH CHANNEL AVG (802.11a 40 MHZ mode, Horizontal)



HIGH CHANNEL PEAK (802.11a 40 MHZ mode, Vertical)



HIGH CHANNEL AVG (802.11a 40 MHZ mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a 40 MHZ MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: MARVELL Semiconductor, Inc.
Project #: 07U11286
Date: 9-10-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, Laptop and Extender Card with Galtronics Tempest Antenna
Mode: Transmit 5.5GHz Band a 40MHz mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
William 177079009		Sunny 197539001	HPF_7.6GHz	

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

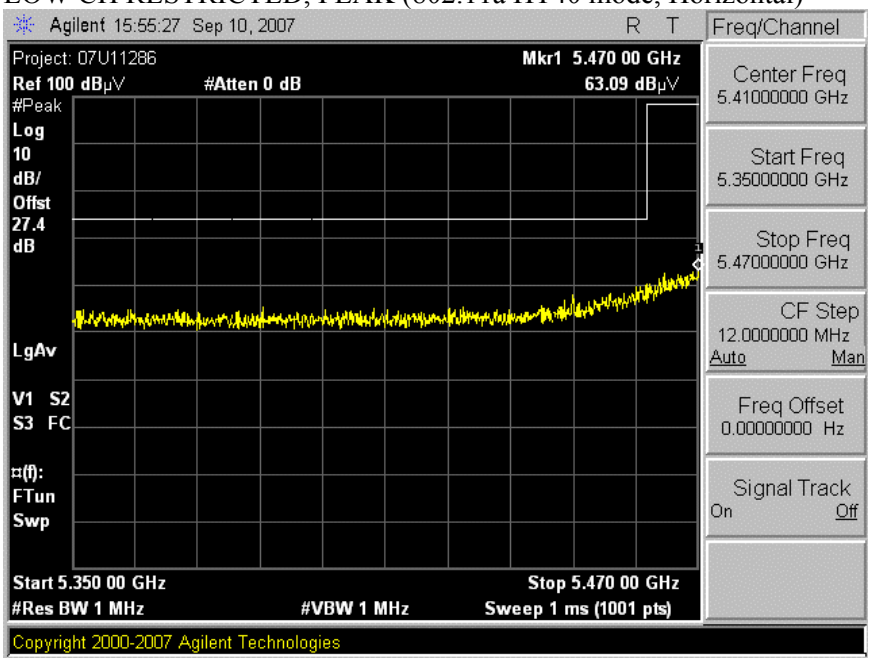
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Ch 5510MHz															
11.020	3.0	48.6	38.5	37.5	5.3	-33.7	0.0	0.7	58.4	48.3	74	54	-15.6	-5.7	V
16.500	3.0	44.8	32.6	39.7	6.8	-32.1	0.0	0.7	59.8	47.6	74	54	-14.2	-6.4	V
22.040	3.0	45.7	32.4	32.3	8.2	-32.3	0.0	0.0	53.9	40.7	74	54	-20.1	-13.3	Noise floor
11.020	3.0	47.6	37.4	37.5	5.3	-33.7	0.0	0.7	57.4	47.3	74	54	-16.6	-6.7	H
16.500	3.0	43.6	31.6	39.7	6.8	-32.1	0.0	0.7	58.6	46.6	74	54	-15.4	-7.4	H
22.040	3.0	45.6	32.4	32.3	8.2	-32.3	0.0	0.0	53.9	40.7	74	54	-20.1	-13.3	Noise floor
CH 5590MHz															
11.180	3.0	48.6	37.7	37.6	5.4	-33.5	0.0	0.7	58.7	47.8	74	54	-15.3	-6.2	V
16.800	3.0	43.2	31.8	39.9	6.9	-32.0	0.0	0.7	58.6	47.2	74	54	-15.4	-6.8	V
22.400	3.0	45.3	31.5	32.5	8.3	-32.3	0.0	0.0	53.8	39.9	74	54	-20.2	-14.1	Noise floor
11.180	3.0	47.6	35.4	37.6	5.4	-33.5	0.0	0.7	57.7	45.6	74	54	-16.3	-8.4	H
16.800	3.0	42.6	30.6	39.9	6.9	-32.0	0.0	0.7	58.0	45.9	74	54	-16.0	-8.1	H
22.400	3.0	45.2	30.5	32.5	8.3	-32.3	0.0	0.0	53.7	38.9	74	54	-20.3	-15.1	Noise floor
CH 5670MHz															
11.340	3.0	49.2	38.2	37.6	5.4	-33.3	0.0	0.7	59.7	48.7	74	54	-14.3	-5.3	V
17.010	3.0	42.5	31.2	40.0	6.9	-32.0	0.0	0.7	58.1	46.9	74	54	-15.9	-7.1	V
22.680	3.0	45.4	32.5	32.7	8.4	-32.3	0.0	0.0	54.2	41.2	74	54	-19.8	-12.8	Noise floor
11.340	3.0	48.3	37.5	37.6	5.4	-33.3	0.0	0.7	58.8	47.9	74	54	-15.2	-6.1	H
17.010	3.0	41.2	30.7	40.0	6.9	-32.0	0.0	0.7	56.9	46.3	74	54	-17.1	-7.7	H
22.680	3.0	45.6	31.6	32.7	8.4	-32.3	0.0	0.0	54.3	40.3	74	54	-19.7	-13.7	Noise floor
No other spurious emissions were detected above system noise floor.															

Rev. 5.1.6

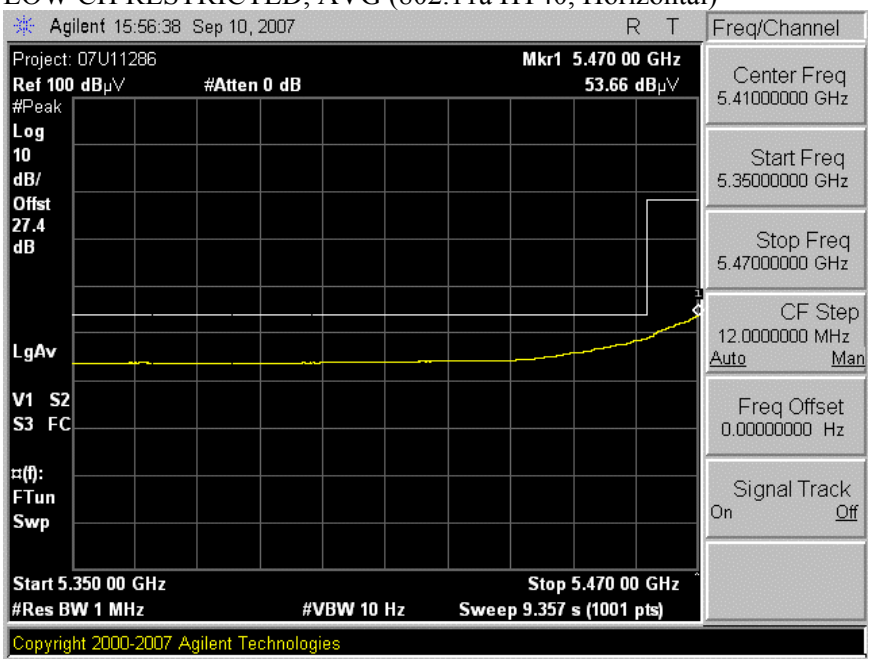
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11a HT40 MODE, LOW CHANNEL, HORIZONTAL)

LOW CH RESTRICTED, PEAK (802.11a HT40 mode, Horizontal)

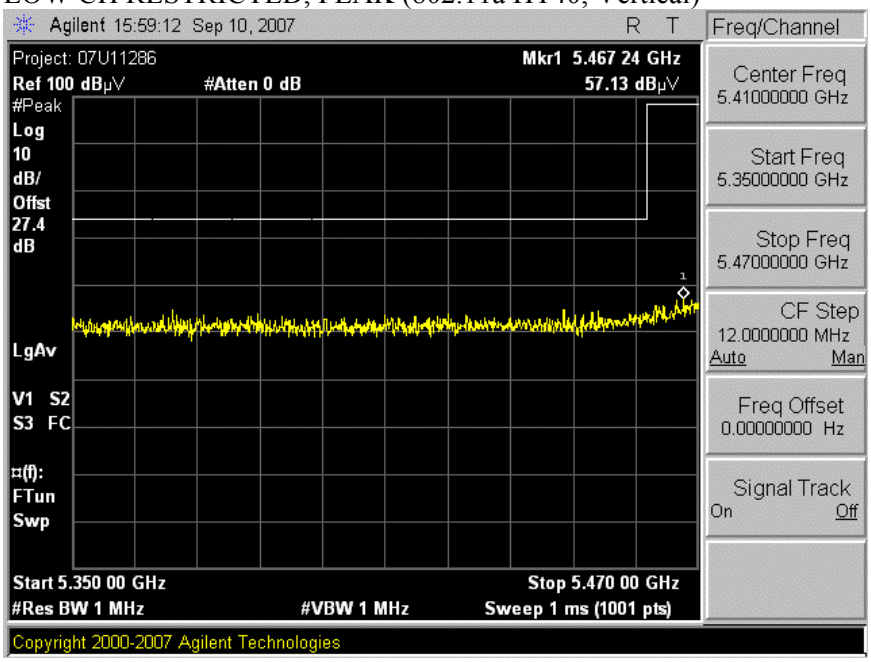


LOW CH RESTRICTED, AVG (802.11a HT40, Horizontal)

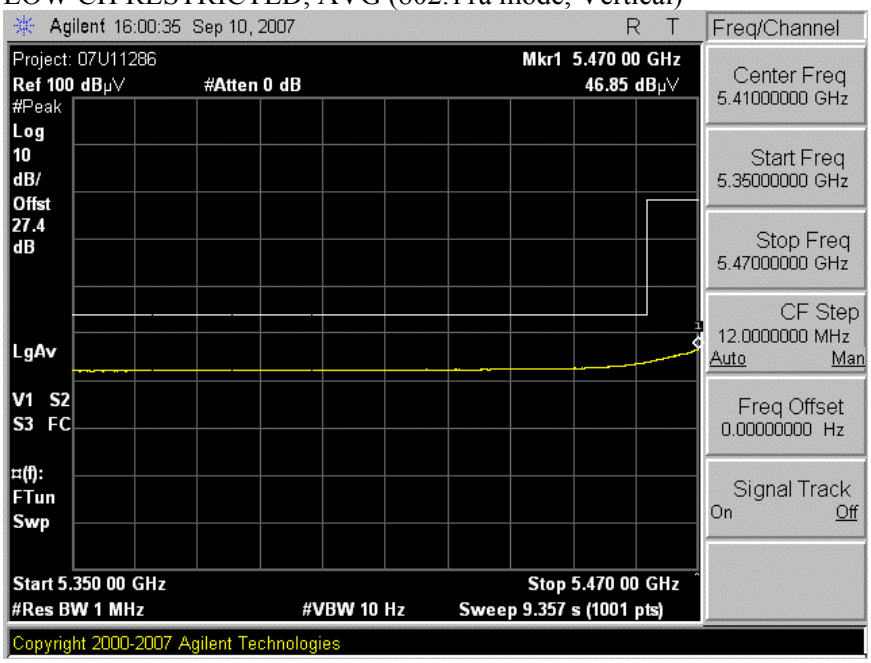


RESTRICTED BANDEDGE (802.11a HT40 MODE, LOW CHANNEL, VERTICAL)

LOW CH RESTRICTED, PEAK (802.11a HT40, Vertical)

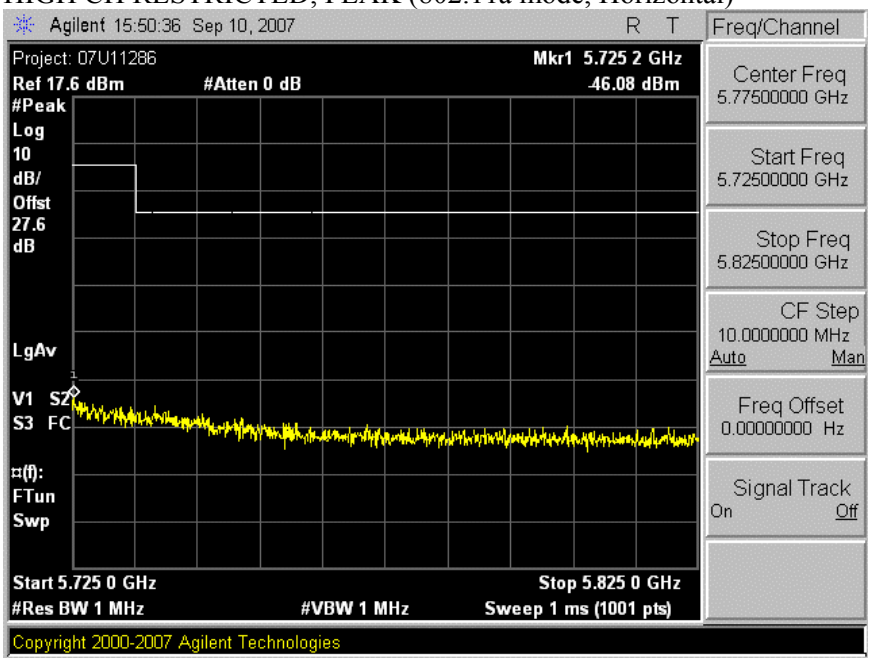


LOW CH RESTRICTED, AVG (802.11a mode, Vertical)

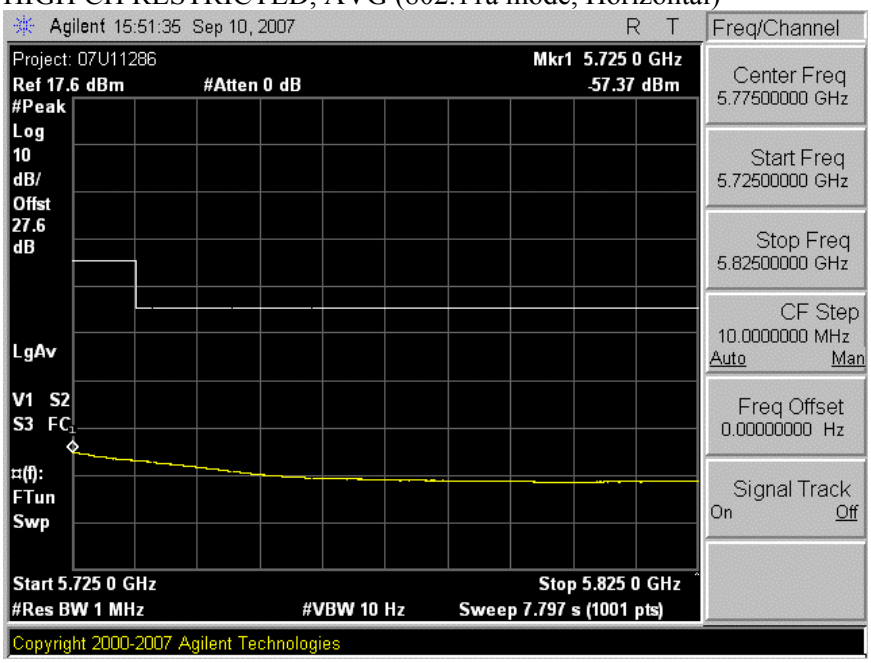


RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, HORIZONTAL)

HIGH CH RESTRICTED, PEAK (802.11a mode, Horizontal)

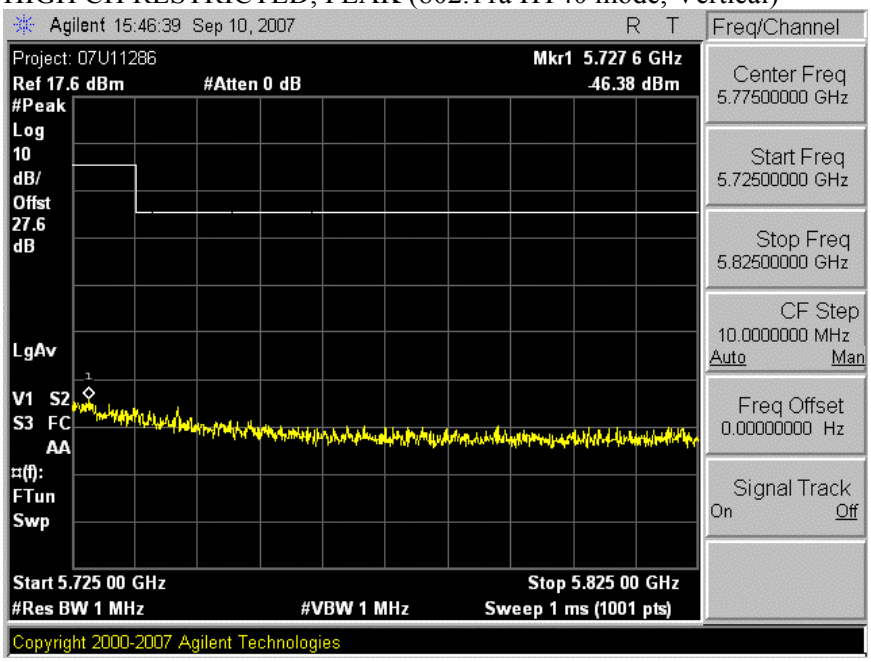


HIGH CH RESTRICTED, AVG (802.11a mode, Horizontal)

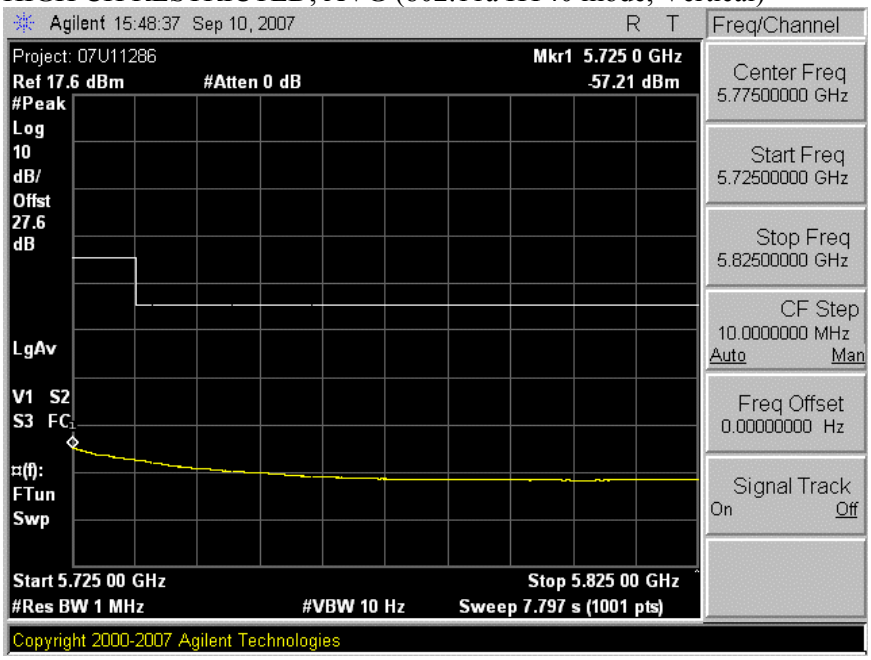


RESTRICTED BANDEDGE (802.11a HT40 MODE, HIGH CHANNEL, VERTICAL)

HIGH CH RESTRICTED, PEAK (802.11a HT40 mode, Vertical)



HIGH CH RESTRICTED, AVG (802.11a HT40 mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a HT40 MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company: MARVELL Semiconductor, Inc.
Project #: 07U11286
Date: 9-10-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, Laptop and Extender Card with Galtronics Tempest Antenna
Mode: Transmit 5.5GHz Band HT40 mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
Thanh 177079008		Thanh 208946003	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)
Ch 5510MHz															
11.020	3.0	48.5	39.0	37.5	4.1	-33.7	0.0	0.7	57.0	47.6	74	54	-17.0	-6.4	V
16.500	3.0	43.4	32.5	39.7	5.0	-32.1	0.0	0.7	56.7	45.7	74	54	-17.3	-8.3	V
22.040	3.0	45.3	32.6	32.3	6.0	-32.3	0.0	0.0	51.4	38.6	74	54	-22.6	-15.4	Noise floor
11.020	3.0	48.2	38.9	37.5	4.1	-33.7	0.0	0.7	56.8	47.5	74	54	-17.2	-6.5	H
16.500	3.0	42.8	32.5	39.7	5.0	-32.1	0.0	0.7	56.0	45.7	74	54	-18.0	-8.3	H
22.040	3.0	45.7	32.7	32.3	6.0	-32.3	0.0	0.0	51.7	38.7	74	54	-22.3	-15.3	Noise floor
CH 5590MHz															
11.180	3.0	49.4	39.2	37.6	4.1	-33.5	0.0	0.7	58.2	48.1	74	54	-15.8	-5.9	V
16.770	3.0	42.7	32.3	39.9	5.1	-32.1	0.0	0.7	56.2	45.9	74	54	-17.8	-8.1	V
22.360	3.0	45.3	32.7	32.5	6.1	-32.3	0.0	0.0	51.6	38.9	74	54	-22.4	-15.1	Noise floor
11.180	3.0	48.8	38.8	37.6	4.1	-33.5	0.0	0.7	57.6	47.7	74	54	-16.4	-6.3	V
16.770	3.0	42.4	31.6	39.9	5.1	-32.1	0.0	0.7	55.9	45.1	74	54	-18.1	-8.9	V
22.360	3.0	45.7	32.5	32.5	6.1	-32.3	0.0	0.0	51.9	38.7	74	54	-22.1	-15.3	Noise floor
CH 5670MHz															
11.340	3.0	49.5	38.6	37.6	4.2	-33.3	0.0	0.7	58.6	47.7	74	54	-15.4	-6.3	V
17.010	3.0	42.9	32.4	40.0	5.1	-32.0	0.0	0.7	56.7	46.3	74	54	-17.3	-7.7	V
22.680	3.0	45.4	32.3	32.7	6.1	-32.3	0.0	0.0	51.9	38.8	74	54	-22.1	-15.2	Noise floor
11.340	3.0	48.5	38.5	37.6	4.2	-33.3	0.0	0.7	57.6	47.6	74	54	-16.4	-6.4	H
17.010	3.0	42.4	31.3	40.0	5.1	-32.0	0.0	0.7	56.2	45.1	74	54	-17.8	-8.9	H
22.680	3.0	45.6	32.4	32.7	6.1	-32.3	0.0	0.0	52.1	38.8	74	54	-21.9	-15.2	Noise floor
No other spurious emissions were detected above system noise floor.															

Rev. 5.1.6

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		

7.2.4. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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

HORIZONTAL DATA

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

Data#: 7 File#: 07U11286.EMI Date: 09-13-2007 Time: 11:17:28

Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Thanh Nguyen
Project #: : 07U11286
Company: : Marvell Semiconductor, Inc.
Configuration:: EUT, Ext. card, Support Laptop, AC/DC
Mode : : Transmit Worst Case
Target: : FCC Class B

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	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	124.090	50.79	-13.05	37.74	43.50	-5.76	Peak
2	235.640	53.02	-14.67	38.35	46.00	-7.65	Peak
3	367.560	43.44	-10.62	32.82	46.00	-13.18	Peak
4	402.480	48.82	-9.86	38.96	46.00	-7.04	Peak
5	775.930	39.32	-2.39	36.93	46.00	-9.07	Peak
6	899.120	40.50	-1.04	39.46	46.00	-6.54	Peak

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

VERTICAL DATA

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

Data#: 6 File#: 07U11286.EMI Date: 09-13-2007 Time: 11:11:43

Condition: FCC CLASS-B VERTICAL
Test Operator:: Thanh Nguyen
Project #: : 07U11286
Company: : Marvell Semiconductor, Inc.
Configuration:: EUT, Ext. card, Support Laptop, AC/DC
Mode : : Transmit Worst Case
Target: : FCC Class B

Page: 1

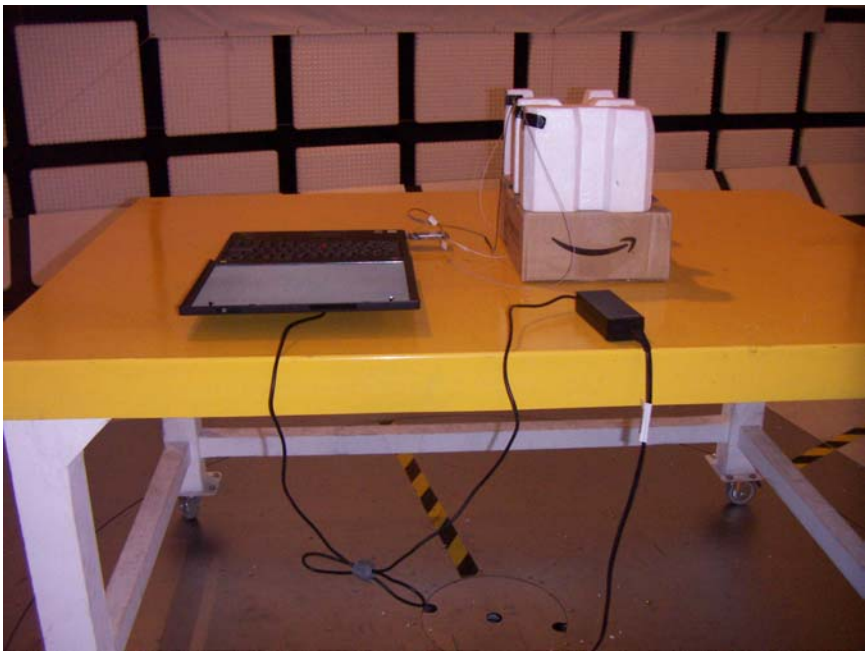
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	58.130	54.89	-19.59	35.30	40.00	-4.70	Peak
2	167.740	51.81	-14.52	37.29	43.50	-6.21	Peak
3	236.610	49.37	-14.63	34.74	46.00	-11.26	Peak
4	401.510	44.27	-9.87	34.39	46.00	-11.61	Peak
5	872.930	36.23	-1.35	34.88	46.00	-11.12	Peak

8. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP

RADIATED FRONT PHOTO

RADIATED BACK PHOTO



END OF REPORT