9.4.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (2); IC RSS-210 A9.2 (2)

For the 5.47-5.725 GHz band, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 5.83 dBi, therefore the limit is 11 dBm.

The maximum antenna gain is 8.80 dBi, therefore the limit is 8.20 dBm.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Antenna Combination: Low PIFA / Hi Slot = 5.829 dBi

Channel	Frequency (MHz)	PPSD With Combiner (dBm)	Limit (dBm)	Margin (dB)
Middle	5590	9.00	11.00	-2.00
High	5670	8.88	11.00	-2.12

Note: The low channel at 15.5dBm meets the spec of highest & lowest antenna gain combinations. Data in the table above only shows the mid & high channels; see table below for low channel.

RESULTS

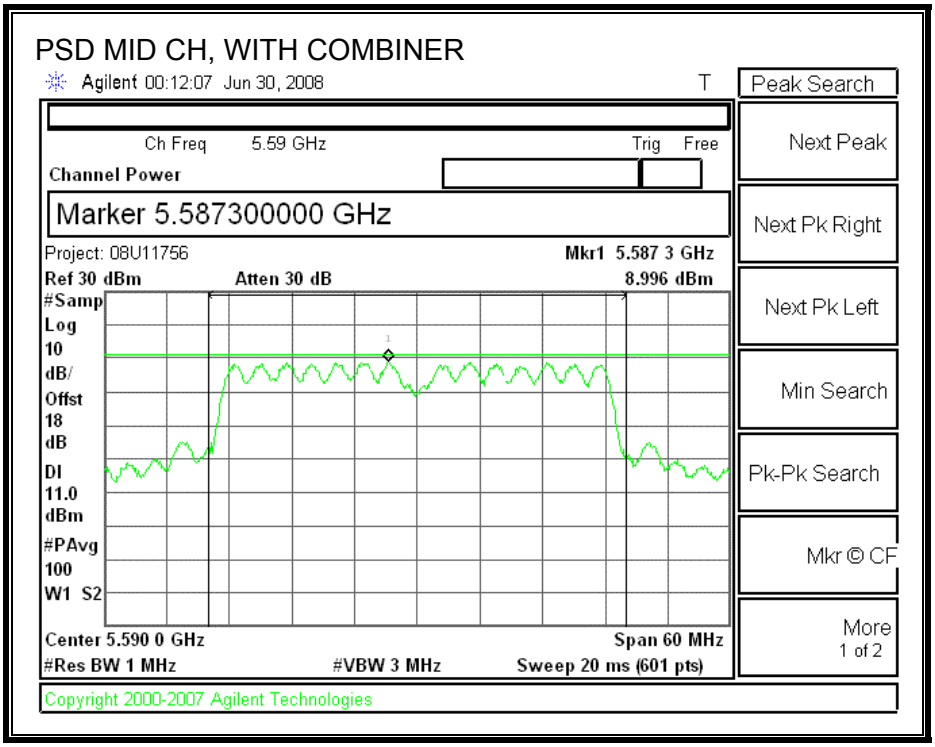
Antenna Combination: Hi PIFA / Low Slot = 8.80 dBi

Channel	Frequency (MHz)	PPSD With Combiner (dBm)	Limit (dBm)	Margin (dB)
Low	5510	7.38	8.20	-0.82
Middle	5590	7.98	8.20	-0.22
High	5670	7.93	8.20	-0.27

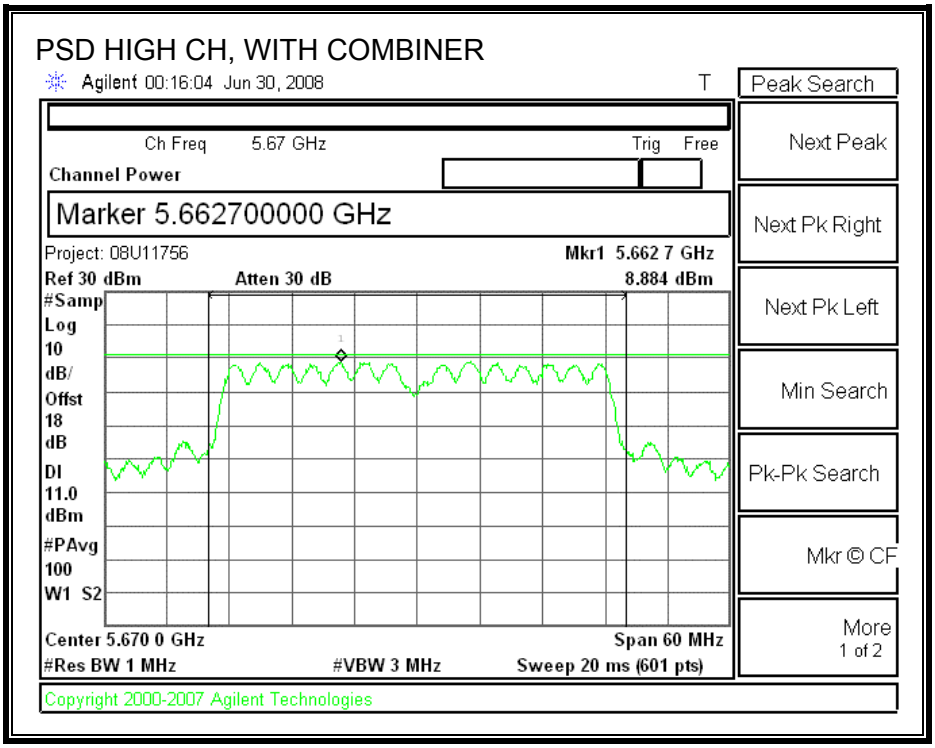
Antenna Combination: Low PIFA / Hi Slot = 5.829dBi

POWER SPECTRAL DENSITY WITH COMBINER

PSD MID CH, WITH COMBINER

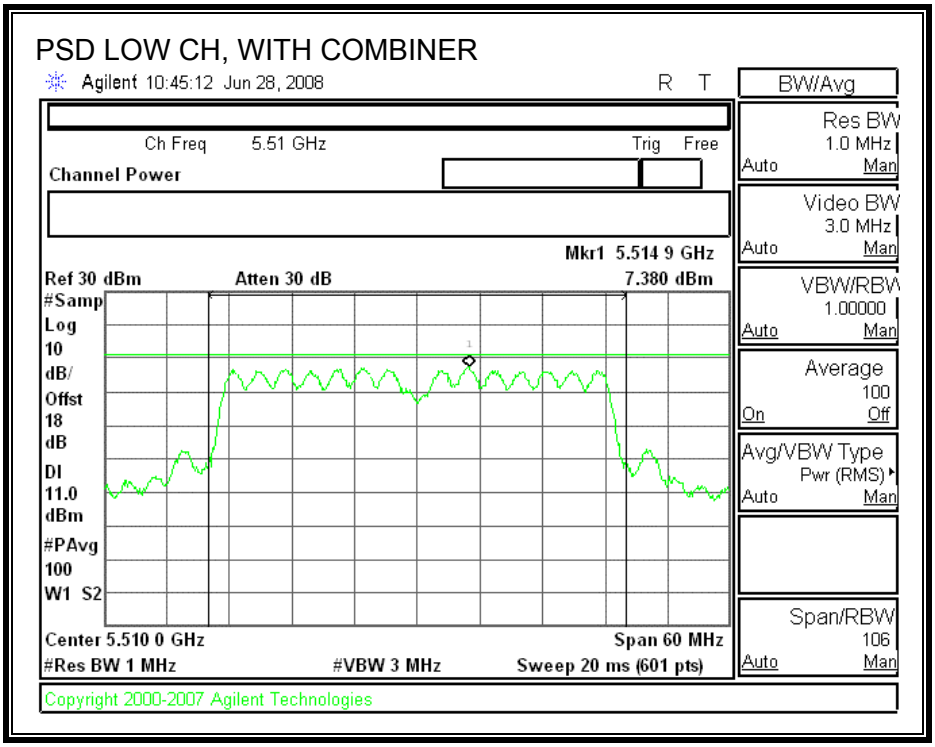


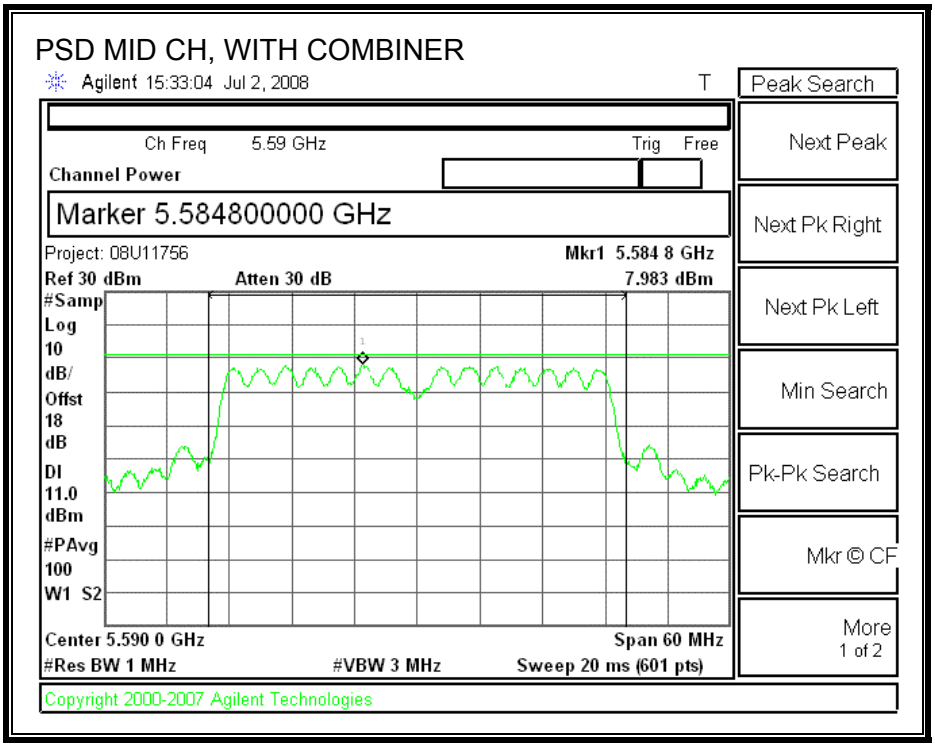
PSD HIGH CH, WITH COMBINER



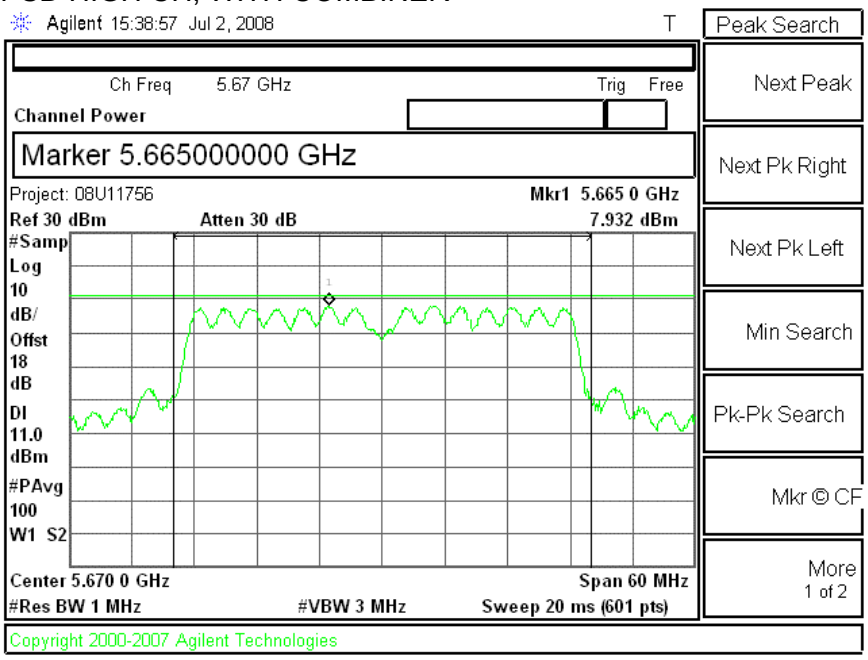
Antenna Combination: Hi PIFA / Low Slot = 8.80 dBi

POWER SPECTRAL DENSITY WITH COMBINER





PSD HIGH CH, WITH COMBINER



9.4.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer via a combiner.

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

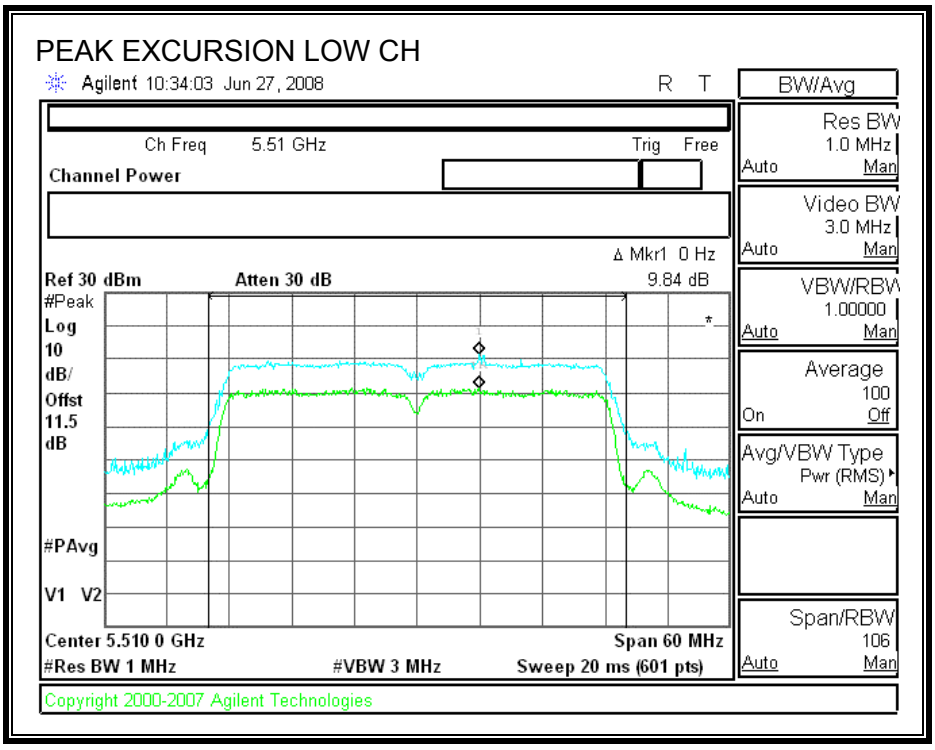
Chain 0

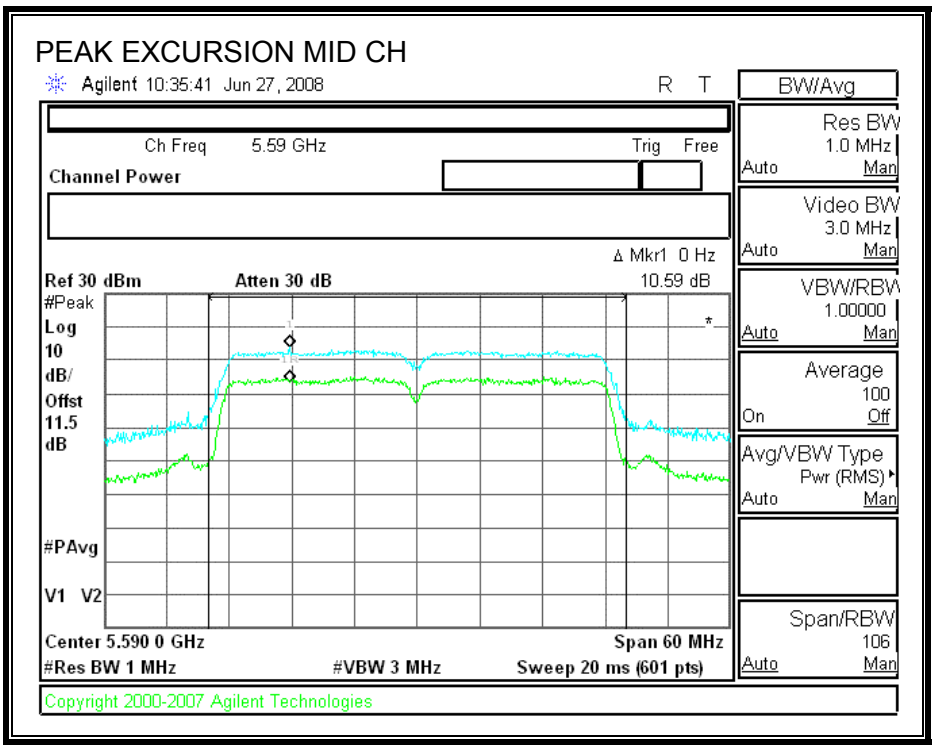
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	9.84	13	-3.16
Middle	5590	10.59	13	-2.41
High	5670	11.01	13	-1.99

Chain 1

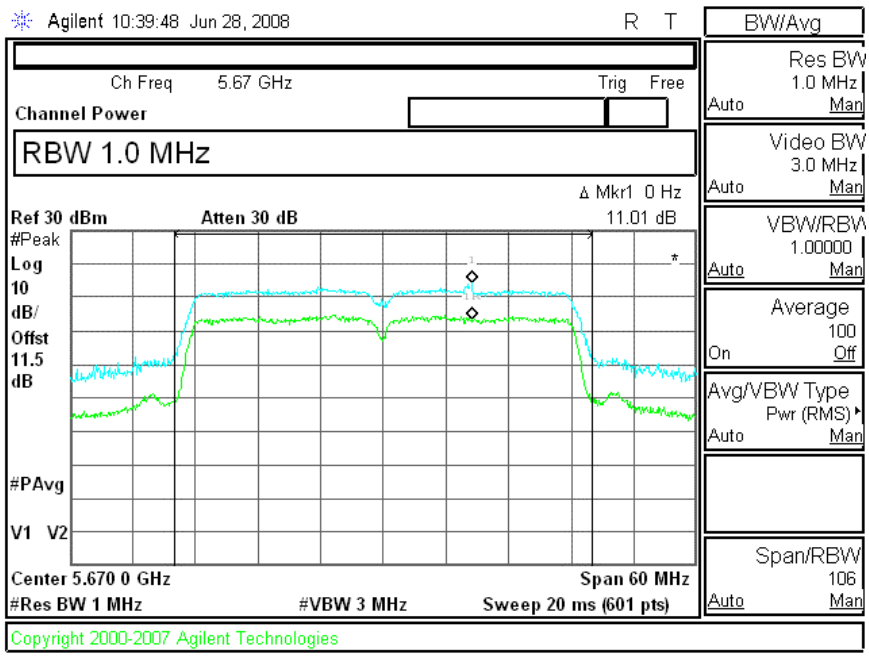
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	12.00	13	-1.00
Middle	5590	11.59	13	-1.41
High	5670	11.91	13	-1.09

PEAK EXCURSION (CHAIN 0)

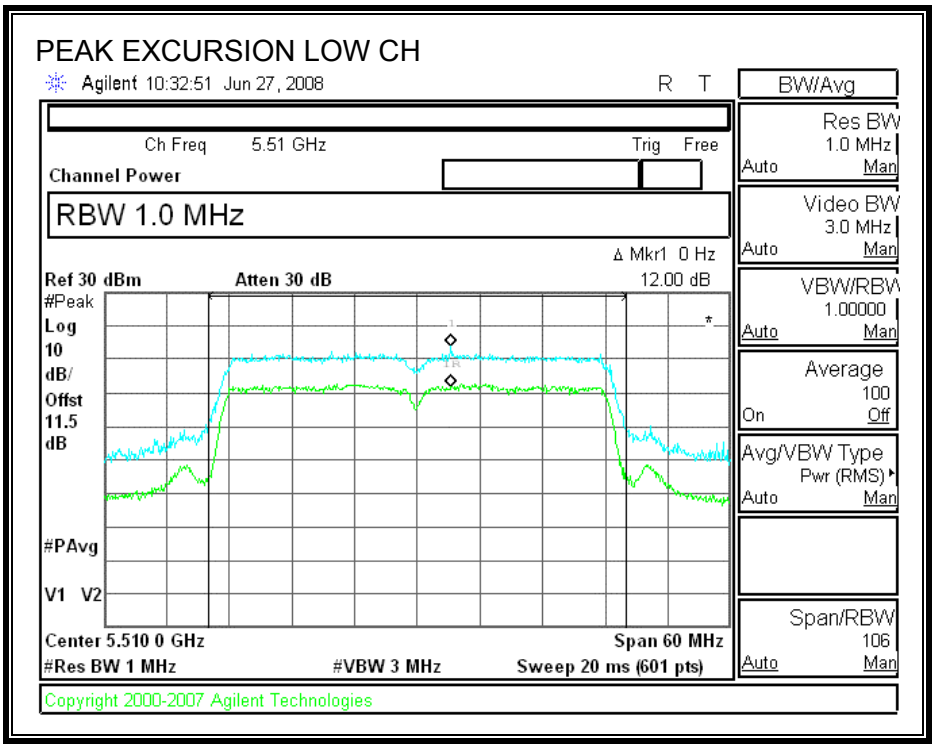


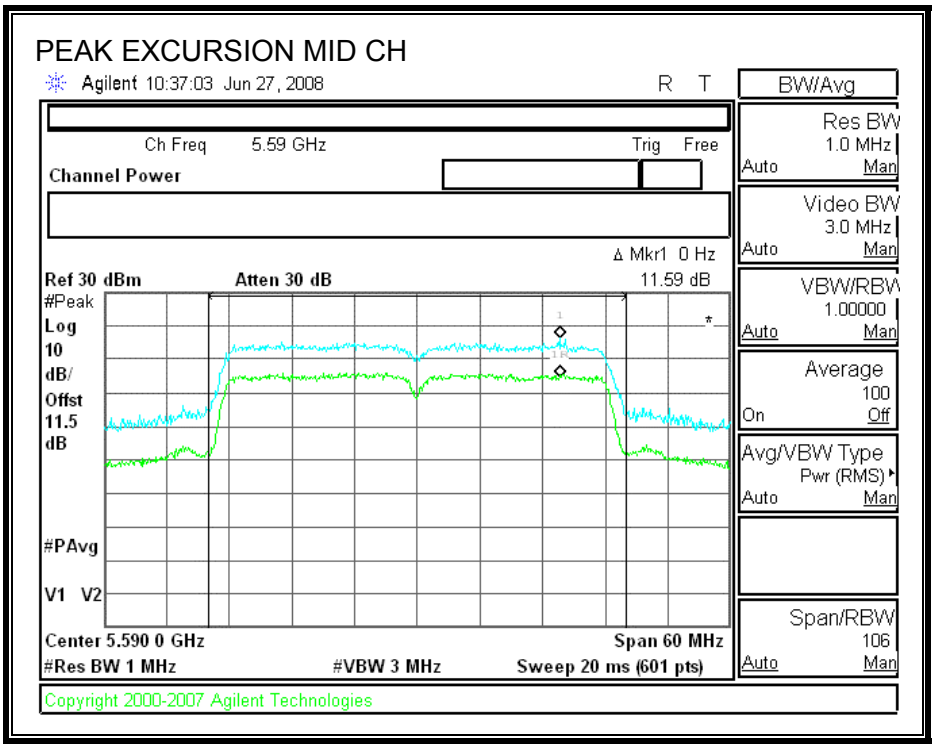


PEAK EXCURSION HIGH CH

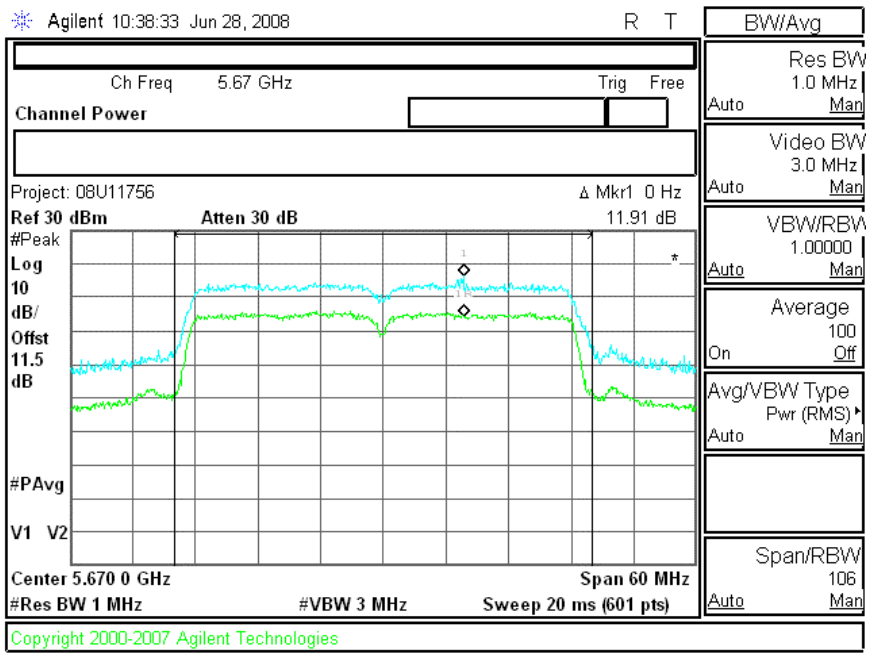


PEAK EXCURSION (CHAIN 1)





PEAK EXCURSION HIGH CH



9.4.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (3); IC RSS-210 A9.3 (3)

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm / MHz.

Limit line = -27 - EUT Antenna Gain

TEST PROCEDURE

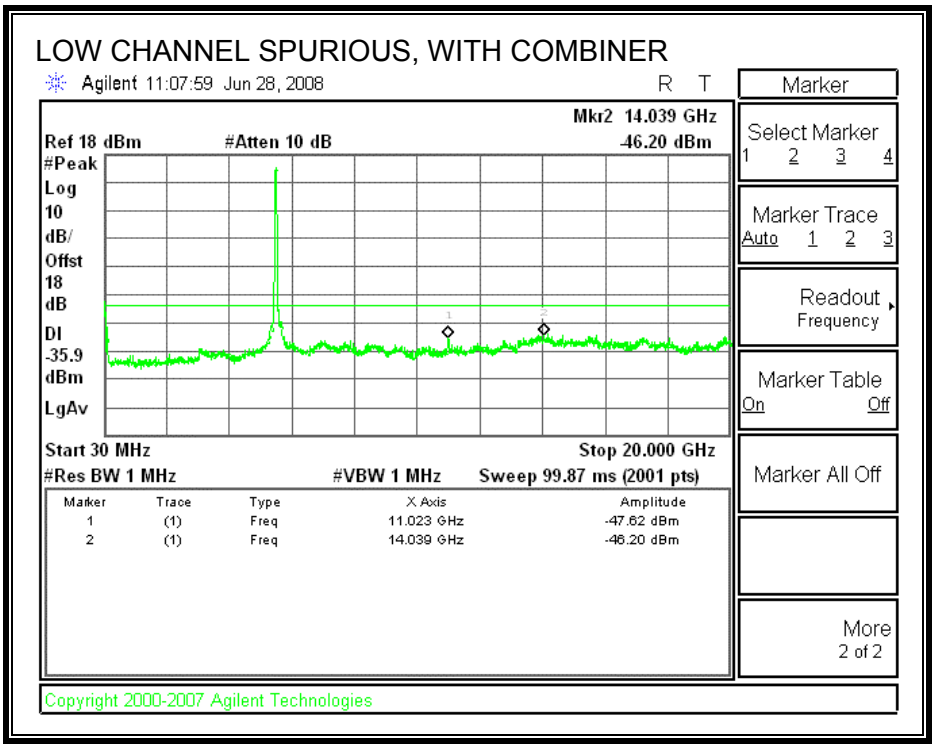
Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

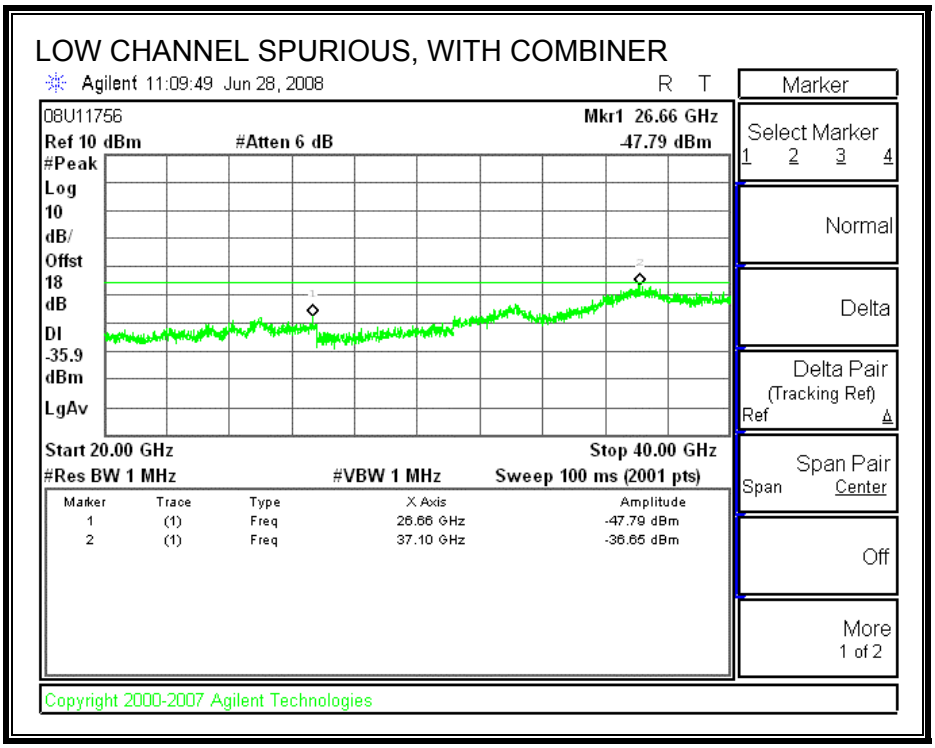
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

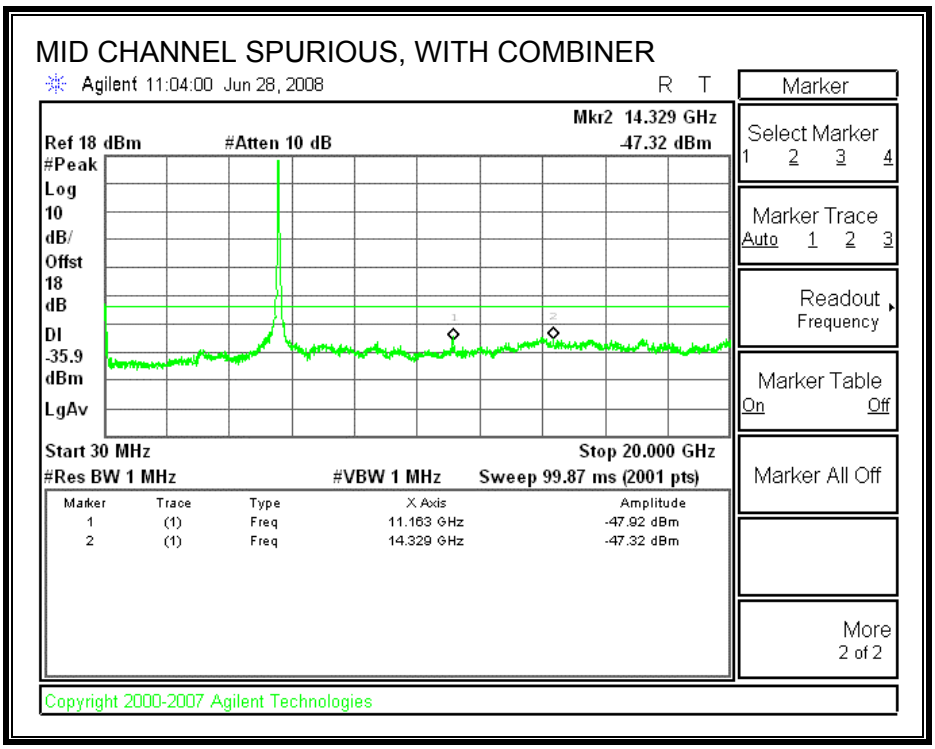
RESULTS

SPURIOUS EMISSIONS WITH COMBINER

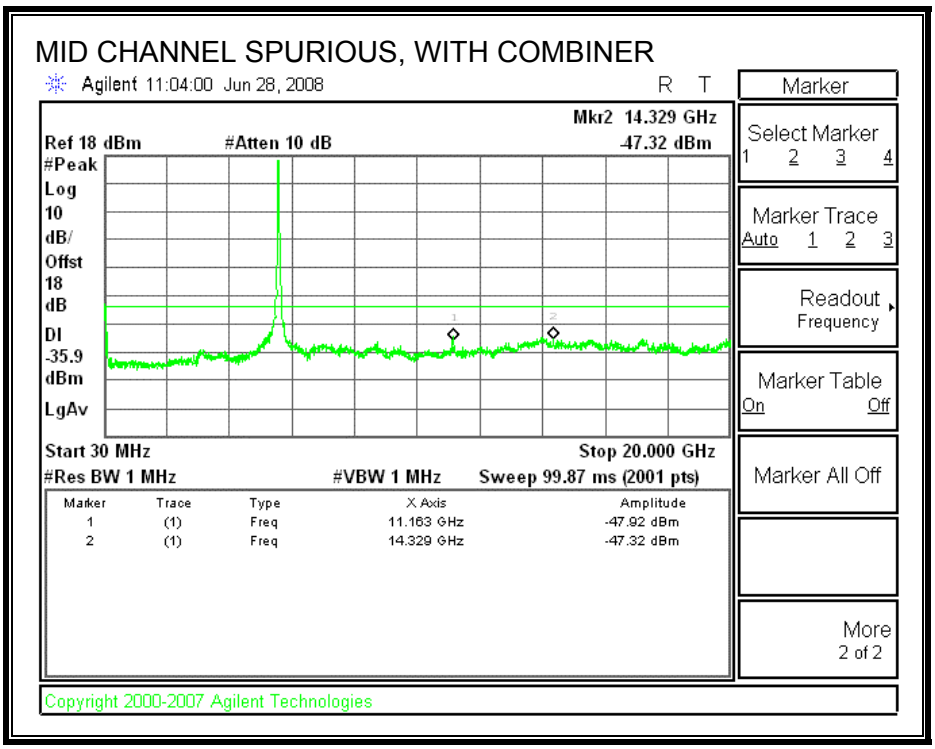


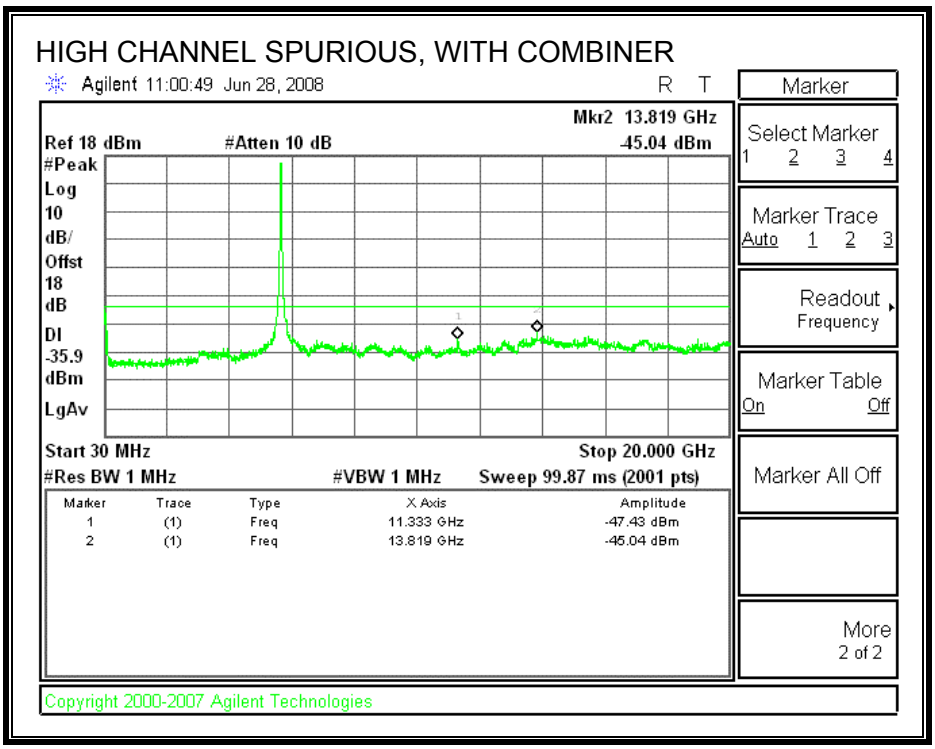


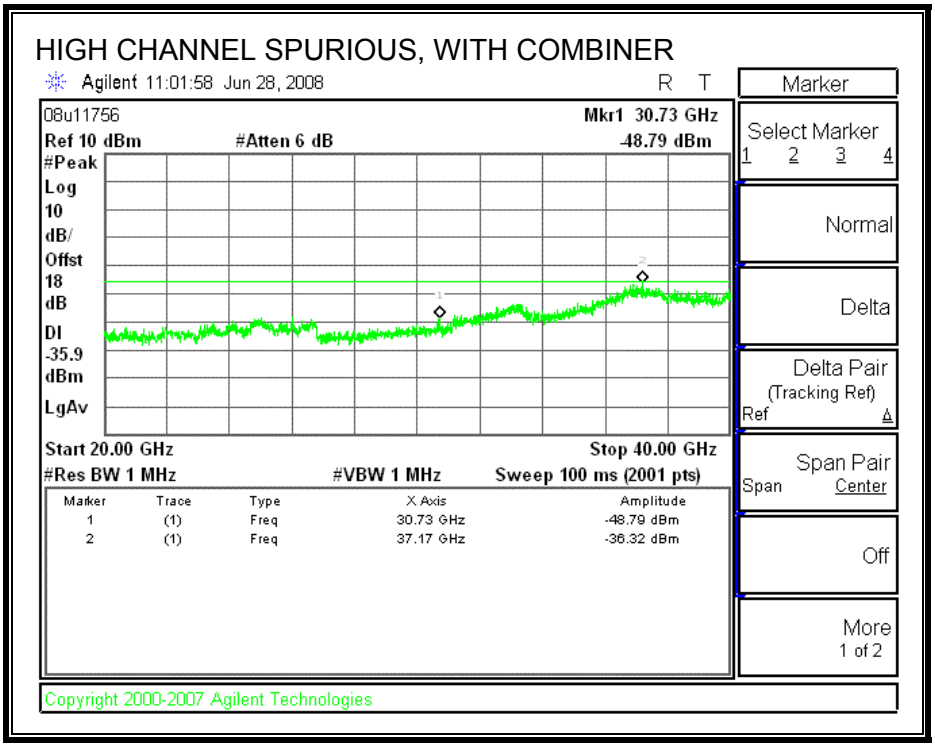
MID CHANNEL SPURIOUS, WITH COMBINER



MID CHANNEL SPURIOUS, WITH COMBINER







10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

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 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 5 GHz band.

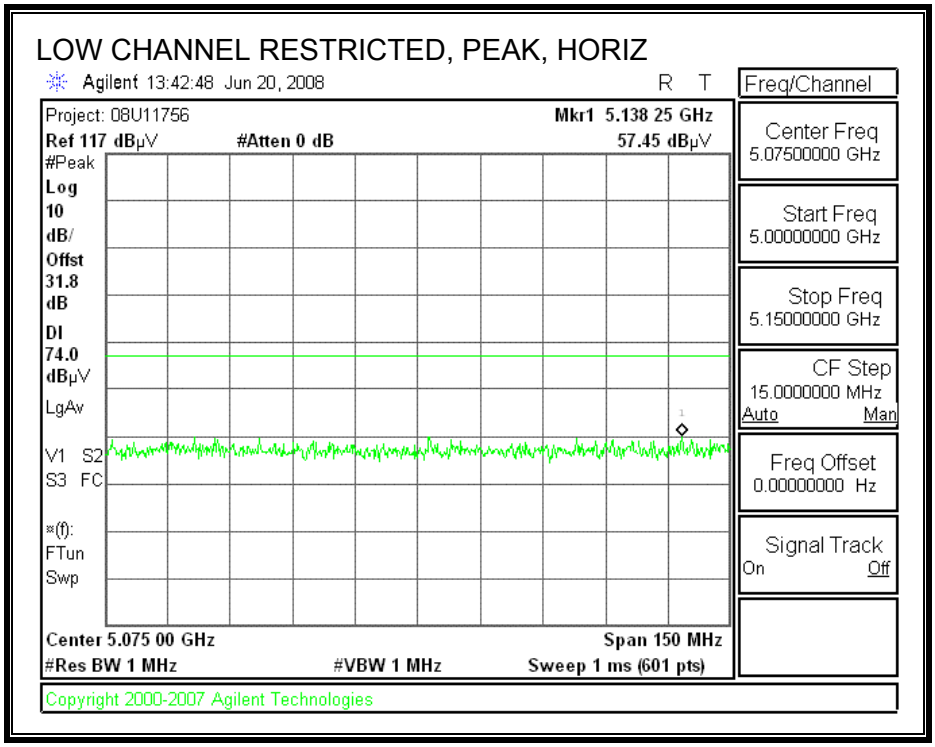
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

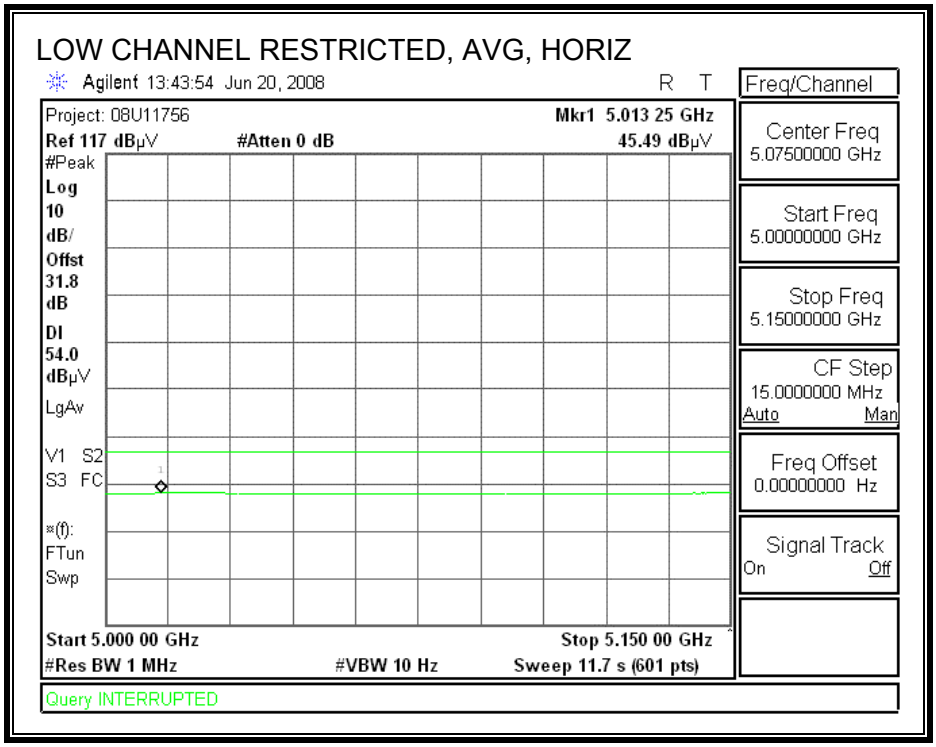
10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. 5.15–5.25 GHz BAND

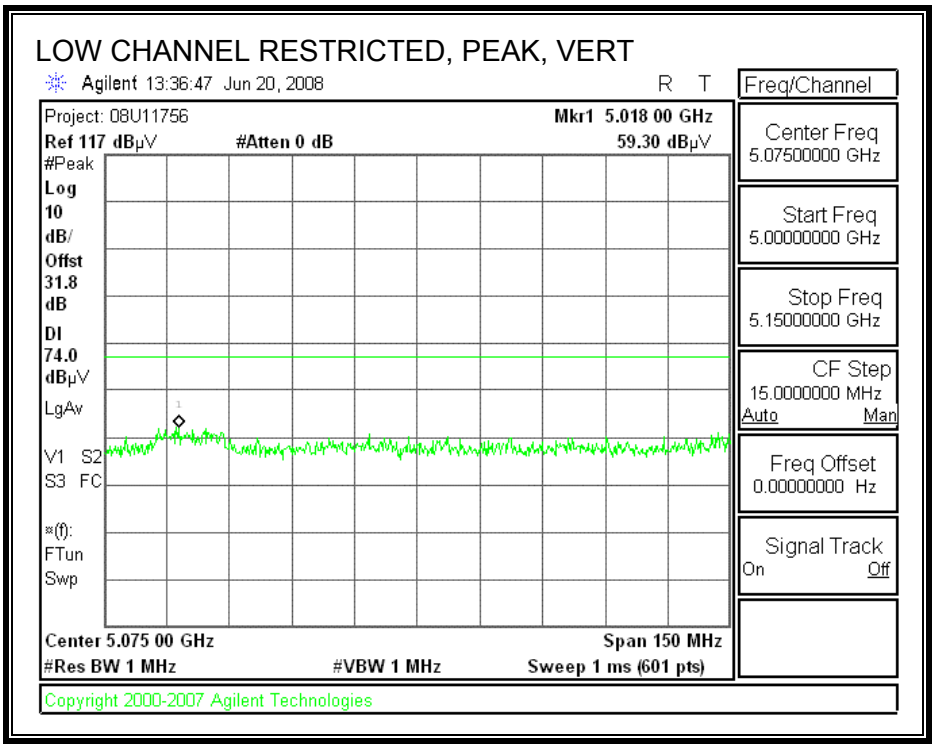
10.2.1.1 802.11a MODE With Hi Slot Antenna Gain

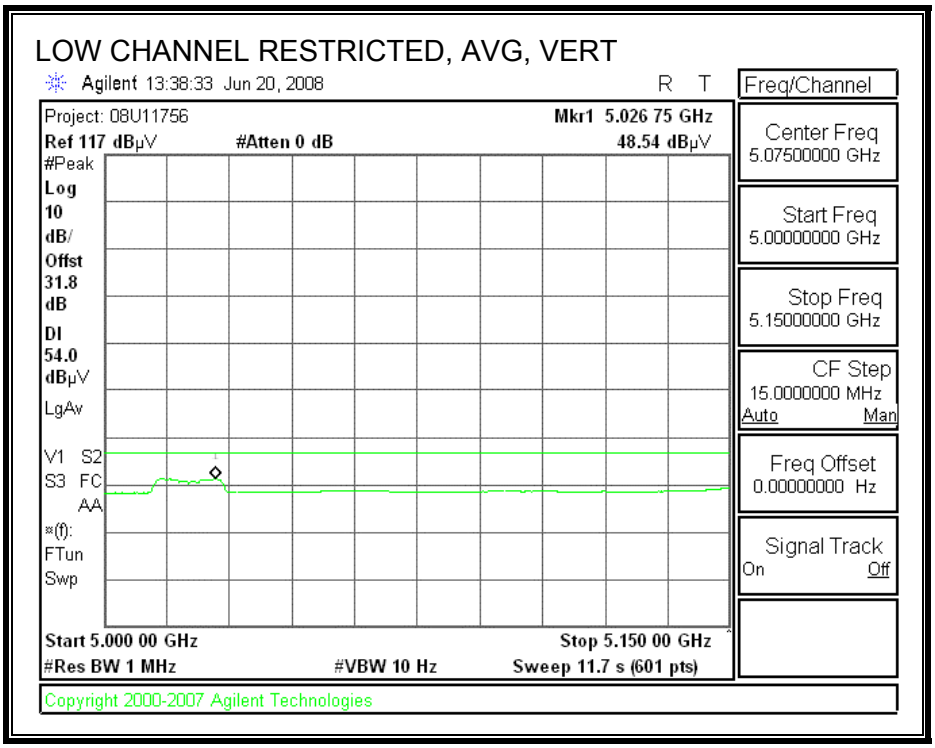
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL)

The EUT passes Conducted Spurious test; therefore this test is not performed.

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/21/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.2GHz a mode Tx, slot Antennna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T119; S/N: 29301 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber		R_001

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

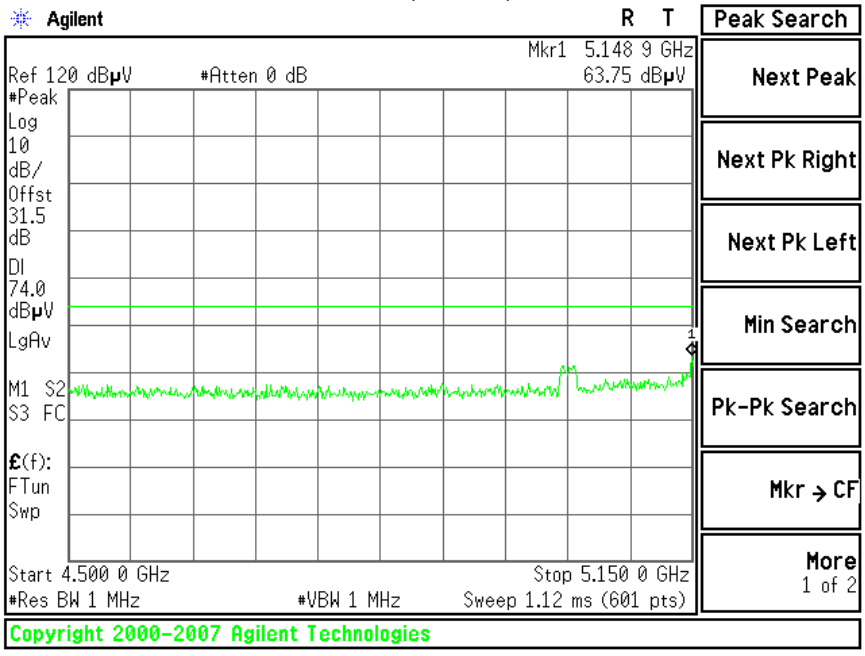
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5180MHz															
10.360	3.0	39.9	28.4	36.7	10.7	-32.6	0.0	0.0	54.7	43.1	74	54	-19.3	-10.9	H
10.360	3.0	39.7	27.3	36.7	10.7	-32.6	0.0	0.0	54.4	42.1	74	54	-19.6	-11.9	V
Mid Ch. 5200MHz															
10.400	3.0	40.5	27.6	36.7	10.7	-32.6	0.0	0.0	55.3	42.4	74	54	-18.7	-11.6	H
10.400	3.0	40.3	27.6	36.7	10.7	-32.6	0.0	0.0	55.1	42.4	74	54	-18.9	-11.6	V
High Ch. 5240MHz															
10.480	3.0	40.7	27.3	36.8	10.8	-32.6	0.0	0.0	55.6	42.3	74	54	-18.4	-11.7	H
10.480	3.0	39.8	27.6	36.8	10.8	-32.6	0.0	0.0	54.7	42.5	74	54	-19.3	-11.5	V

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		

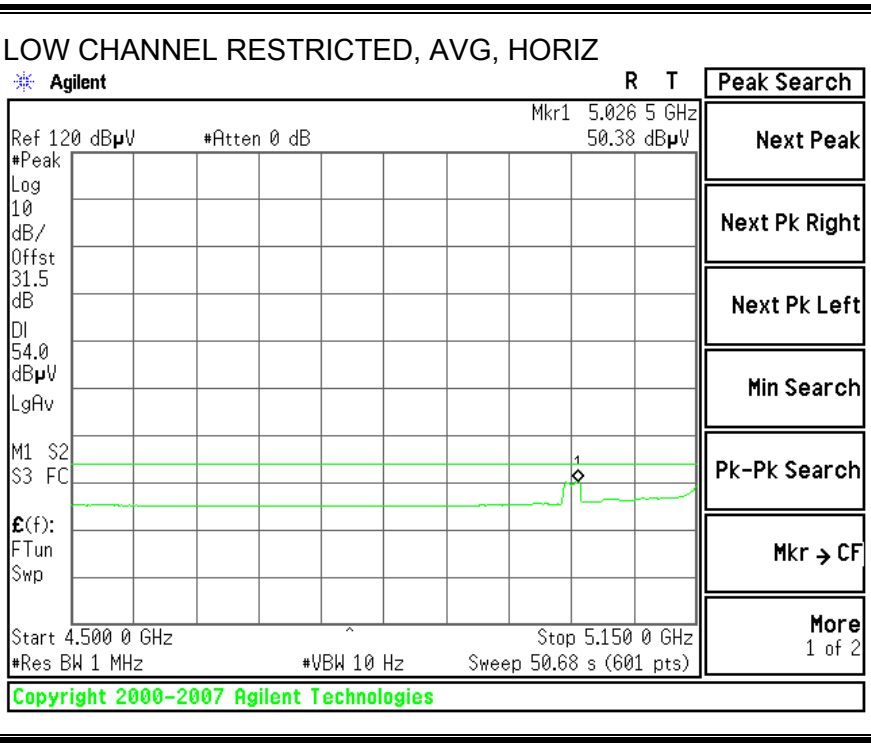
10.2.1.2 802.11a MODE With Hi PIFA Antenna Gain

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

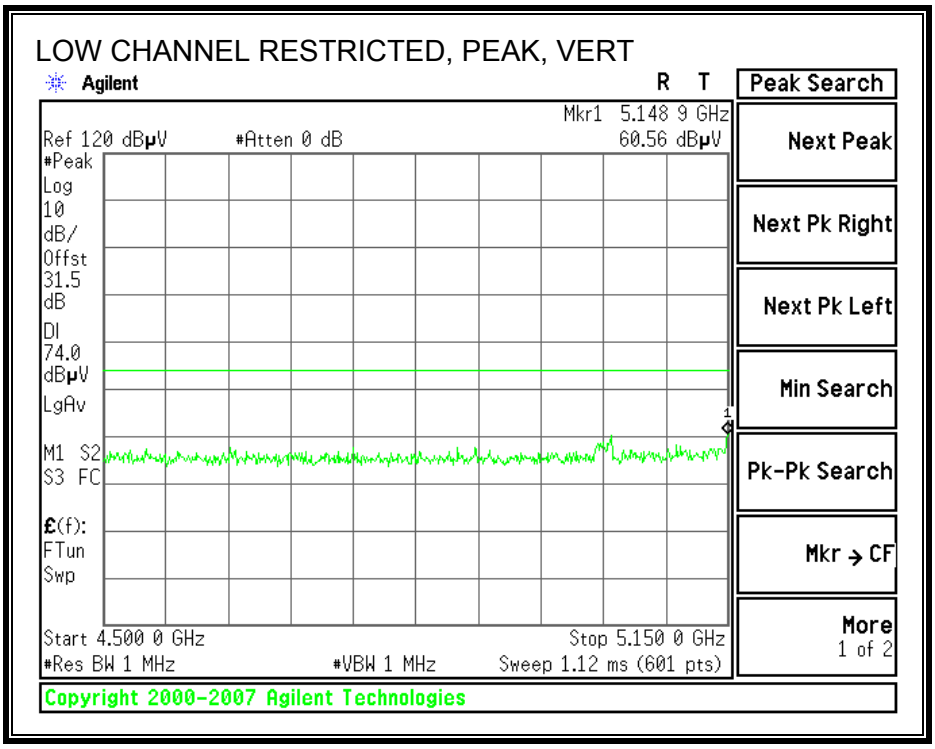
LOW CHANNEL RESTRICTED, PEAK, HORIZ

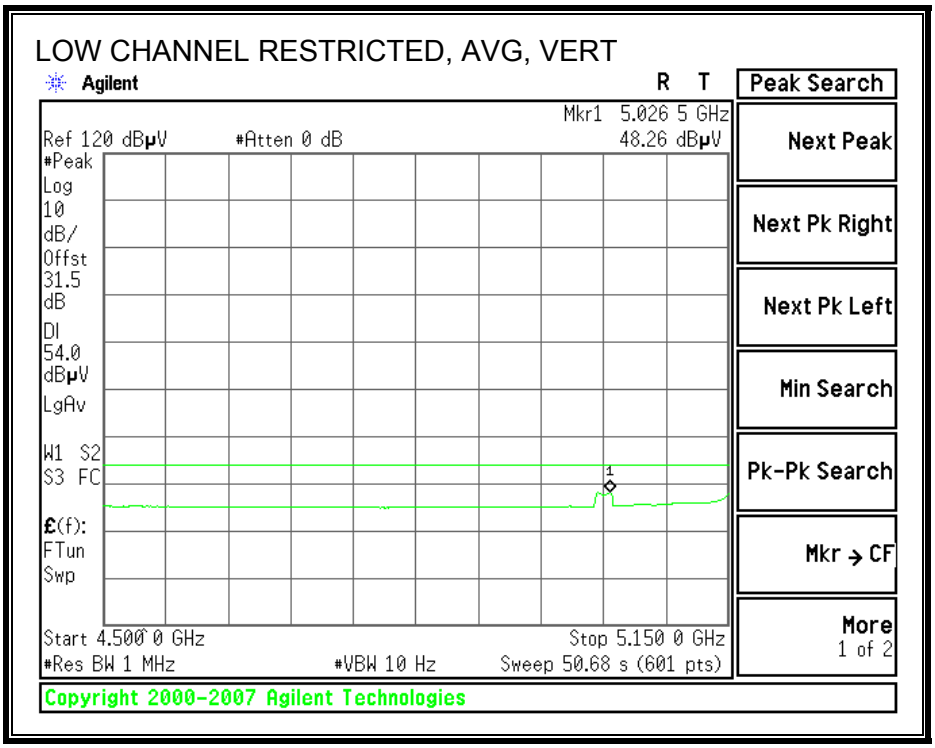


LOW CHANNEL RESTRICTED, AVG, HORIZ



RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Devin Chang
Configuration: EUT With desktop
Mode: 5.2GHz a mode Tx, PIFA Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

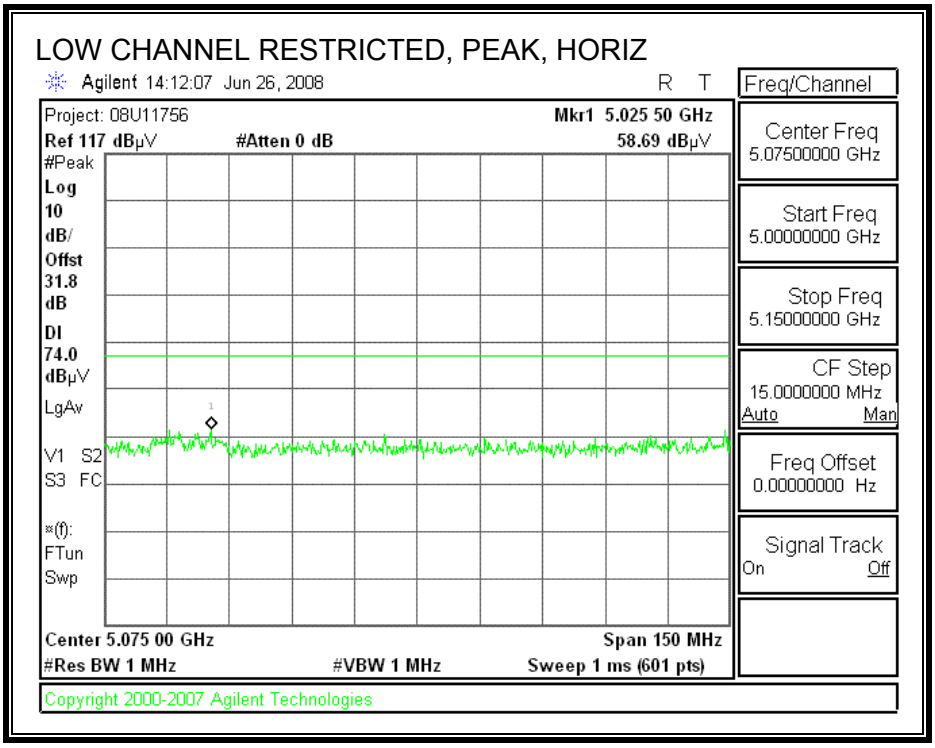
Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

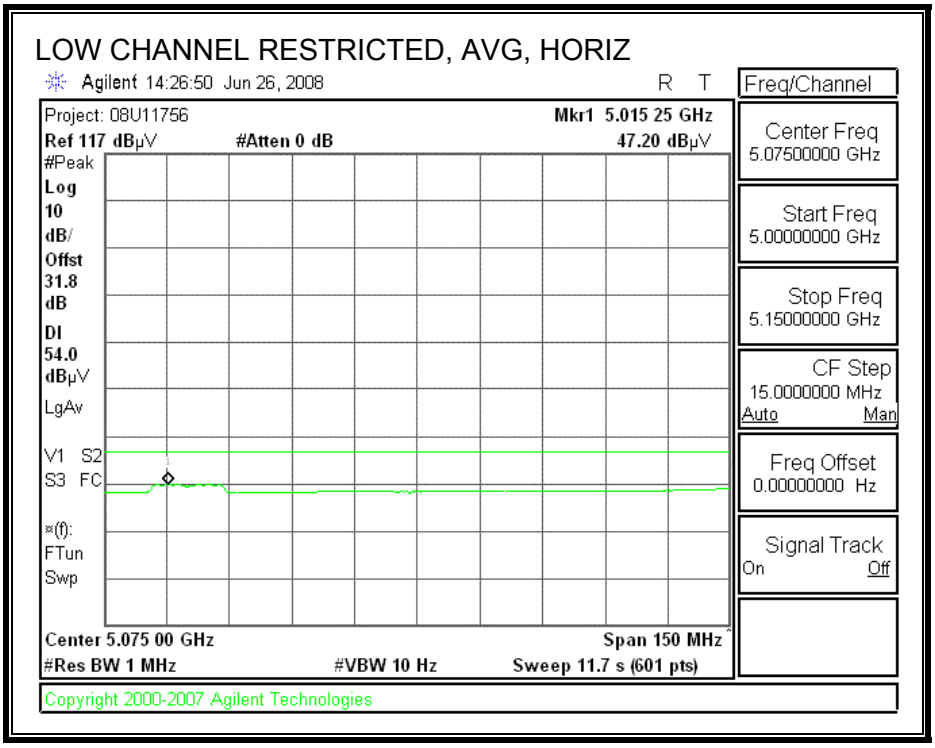
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5180MHz															
10.360	3.0	38.4	24.0	37.5	10.7	-32.6	0.0	0.8	54.7	40.3	74	54	-19.3	-13.7	H
10.360	3.0	38.0	23.0	37.5	10.7	-32.6	0.0	0.8	54.3	39.3	74	54	-19.7	-14.7	V
Mid Ch. 5200MHz															
10.400	3.0	39.2	25.7	37.5	10.7	-32.6	0.0	0.8	55.6	42.0	74	54	-18.4	-12.0	H
10.400	3.0	39.1	24.8	37.5	10.7	-32.6	0.0	0.8	55.4	41.1	74	54	-18.6	-12.9	V
High Ch. 5240MHz															
10.480	3.0	40.8	27.9	37.5	10.8	-32.6	0.0	0.8	57.3	44.3	74	54	-16.7	-9.7	H
10.480	3.0	41.6	27.6	37.5	10.8	-32.6	0.0	0.8	58.1	44.0	74	54	-15.9	-10.0	V

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		

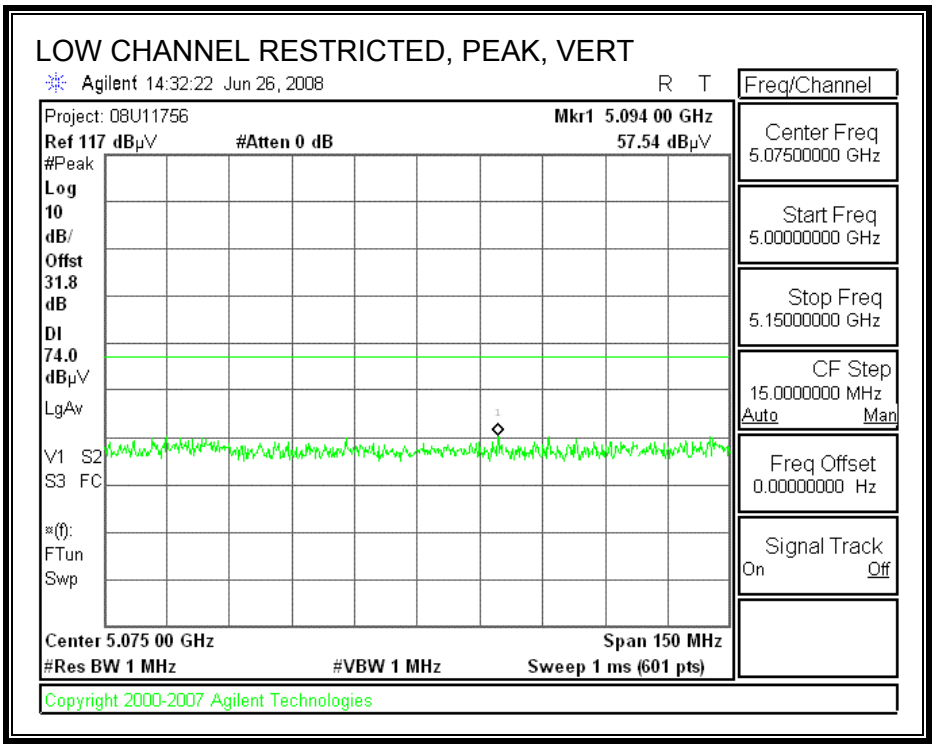
10.2.1.3 802.11n HT20 MODE With Hi PIFA and Hi SLOT Antenna Gains

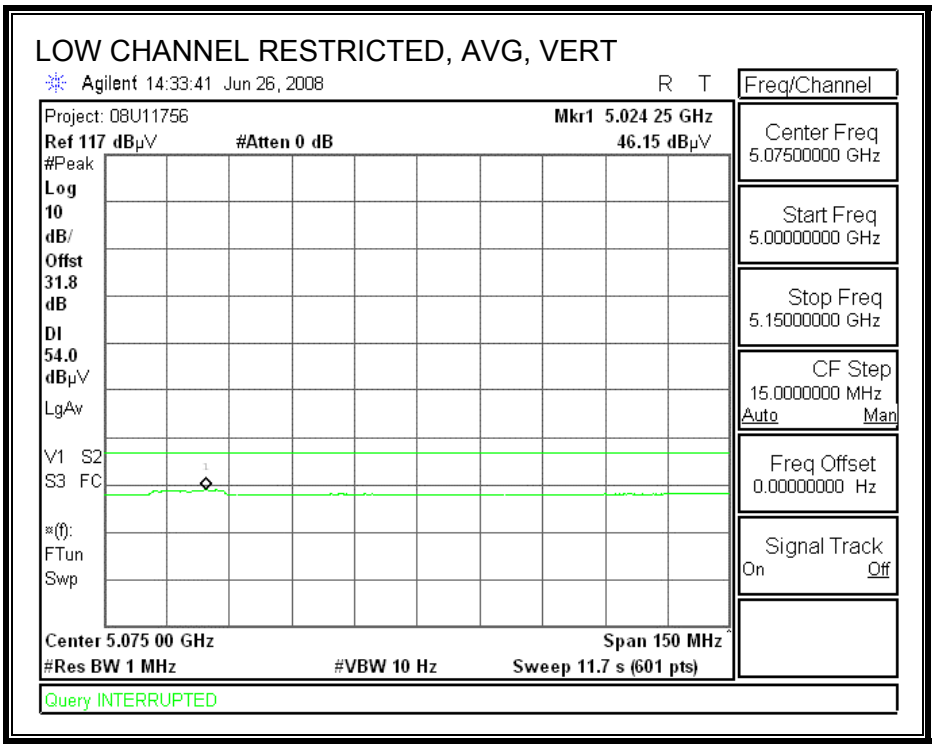
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL)

The EUT passes Conducted Spurious test; therefore this test is not performed.

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.2GHz HT20 mode Tx, PIFA Hi and Slot Hi

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

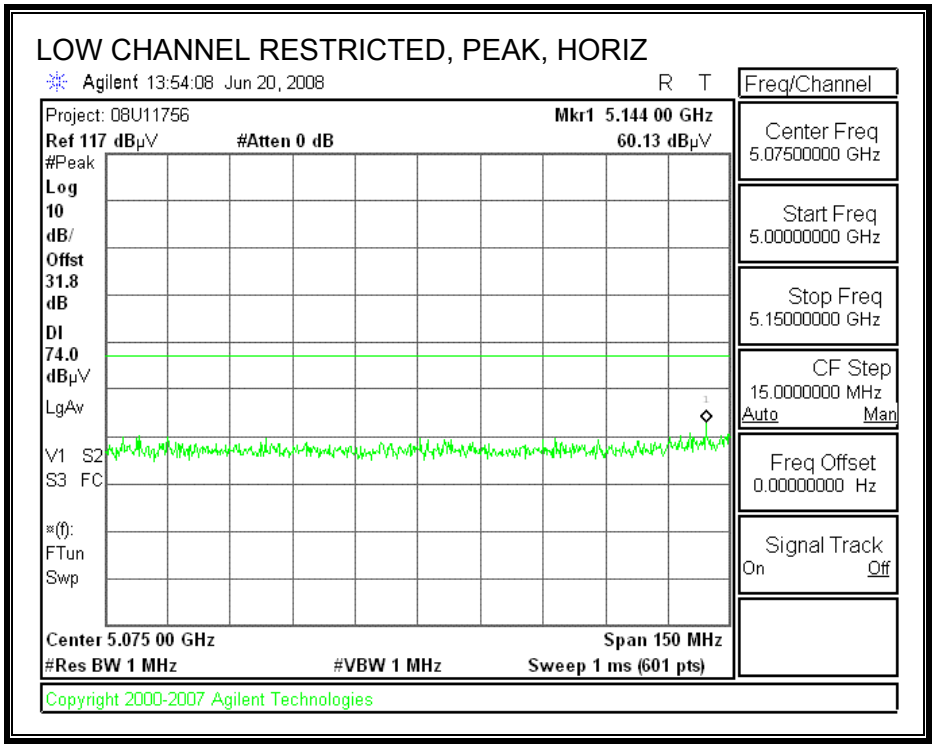
Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

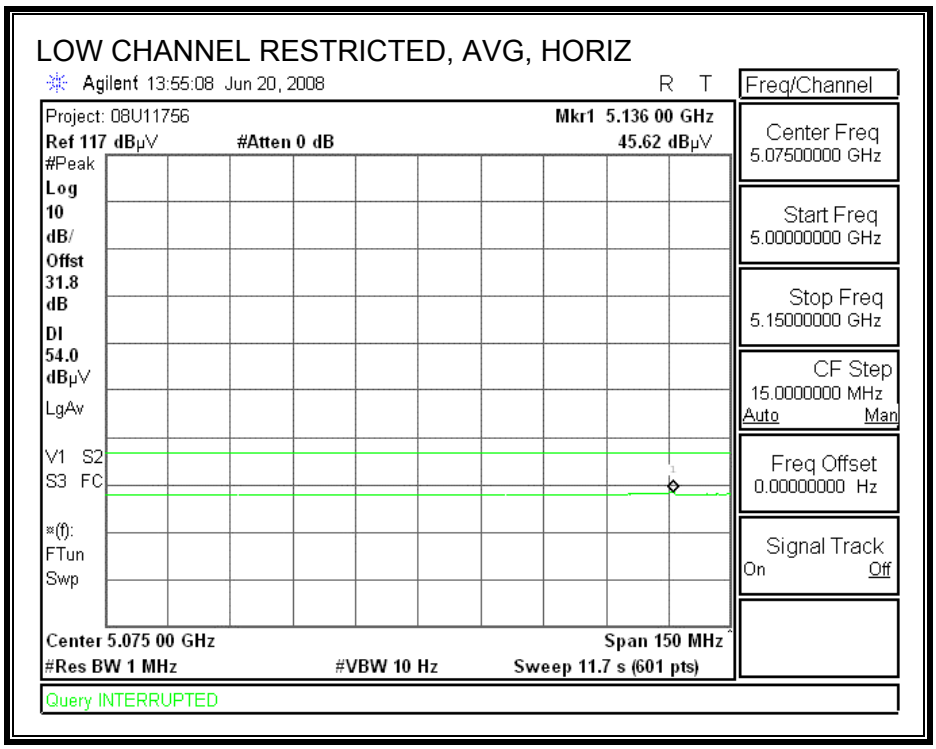
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5180MHz															
15.540	3.0	41.3	29.1	38.0	12.9	-32.2	0.0	0.7	60.7	48.6	74	54	-13.3	-5.4	H
15.540	3.0	41.5	29.0	38.0	12.9	-32.2	0.0	0.7	61.0	48.5	74	54	-13.0	-5.5	V
Mid Ch. 5200MHz															
15.600	3.0	41.1	28.3	38.0	12.9	-32.2	0.0	0.7	60.5	47.8	74	54	-13.5	-6.2	H
15.600	3.0	41.1	28.6	38.0	12.9	-32.2	0.0	0.7	60.5	48.0	74	54	-13.5	-6.0	V
High Ch. 5240MHz															
15.720	3.0	41.7	28.1	37.9	13.0	-32.2	0.0	0.7	61.1	47.6	74	54	-12.9	-6.4	H
15.720	3.0	41.5	28.5	37.9	13.0	-32.2	0.0	0.7	60.9	48.0	74	54	-13.1	-6.0	V

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		

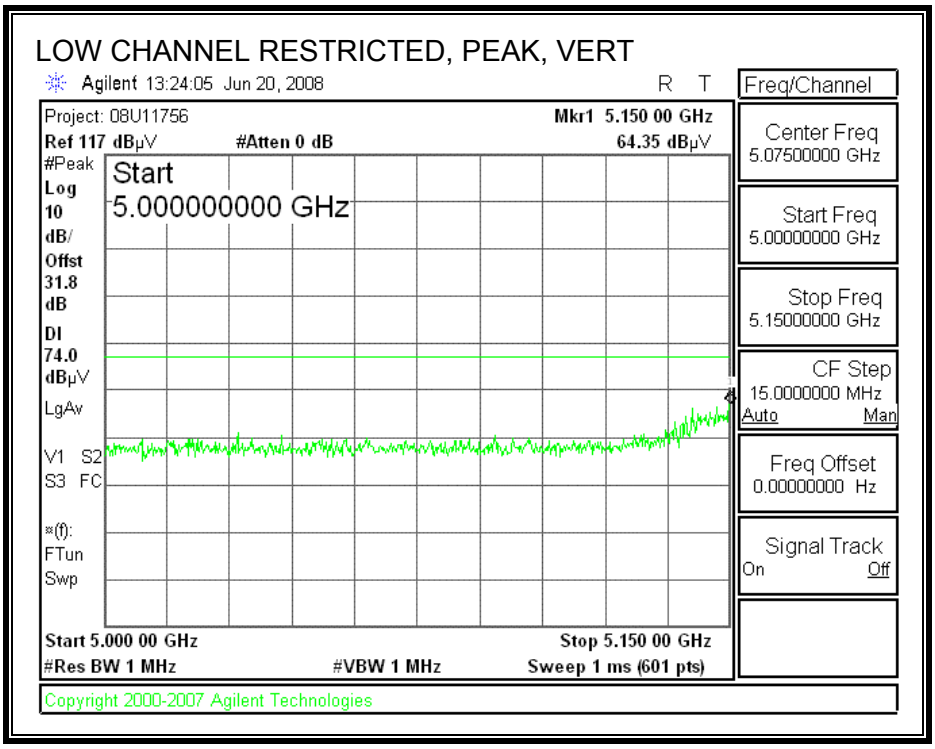
10.2.1.4 802.11n HT40 SISO MODE With Hi Slot Antenna Gain

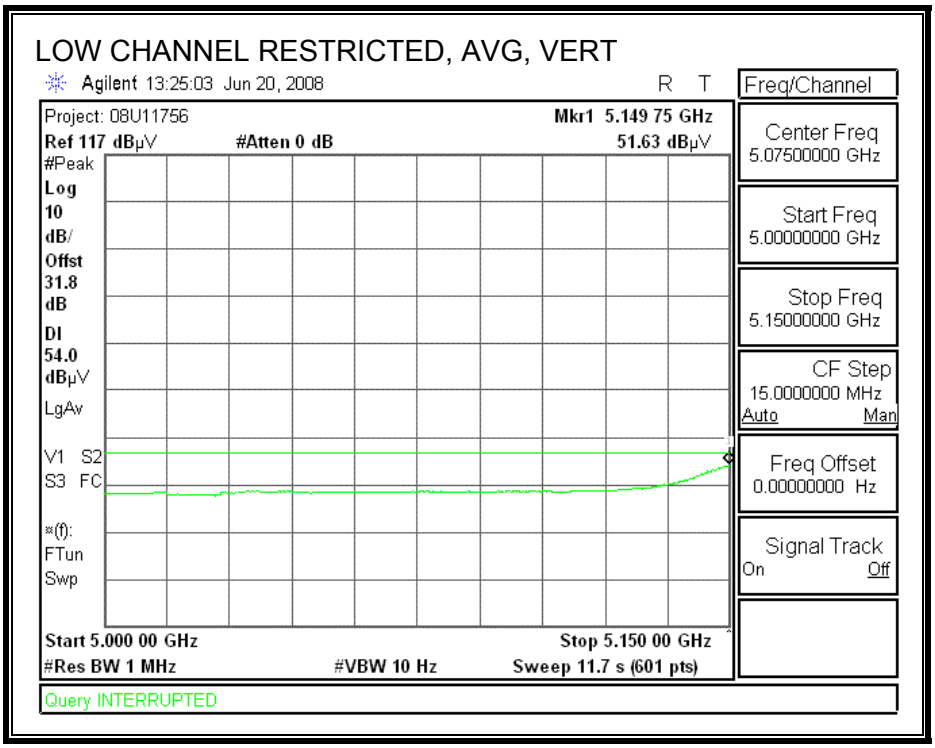
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL)

The EUT passes Conducted Spurious test; therefore this test is not performed.

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/21/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.2GHz HT40 SISO mode Tx, Slot Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	C-5m Chamber		

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

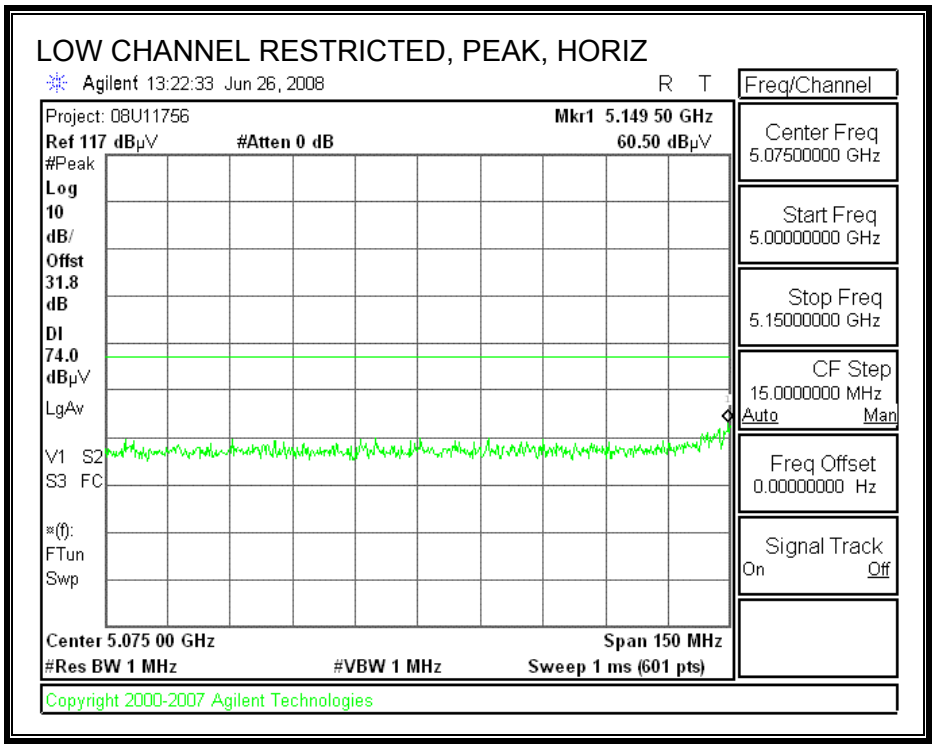
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5190MHz															
15.570	3.0	42.3	30.4	38.0	1.2	-32.3	0.0	0.0	49.1	37.3	74	54	-24.9	-16.7	H
15.570	3.0	43.5	31.0	38.0	1.2	-32.3	0.0	0.0	50.3	37.9	74	54	-23.7	-16.1	V
High Ch. 5230MHz															
15.690	3.0	45.0	31.0	37.9	1.2	-32.3	0.0	0.0	51.9	37.9	74	54	-22.1	-16.1	H
15.690	3.0	44.2	30.9	37.9	1.2	-32.3	0.0	0.0	51.1	37.8	74	54	-22.9	-16.2	V

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		

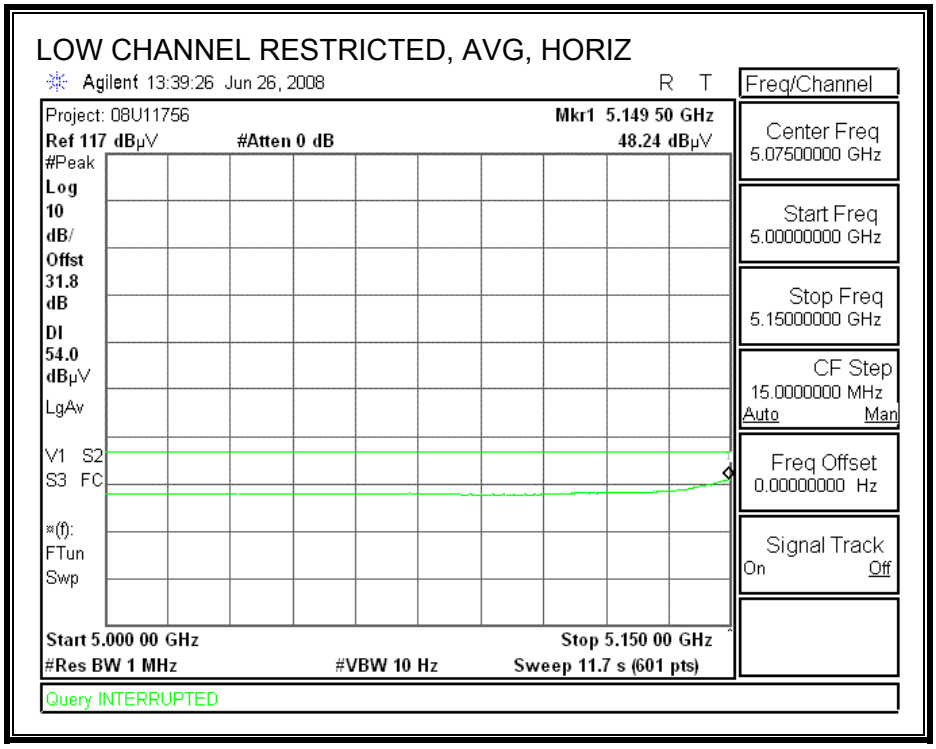
10.2.1.5 802.11n HT40 SISO MODE With Hi PIFA Antenna Gain

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

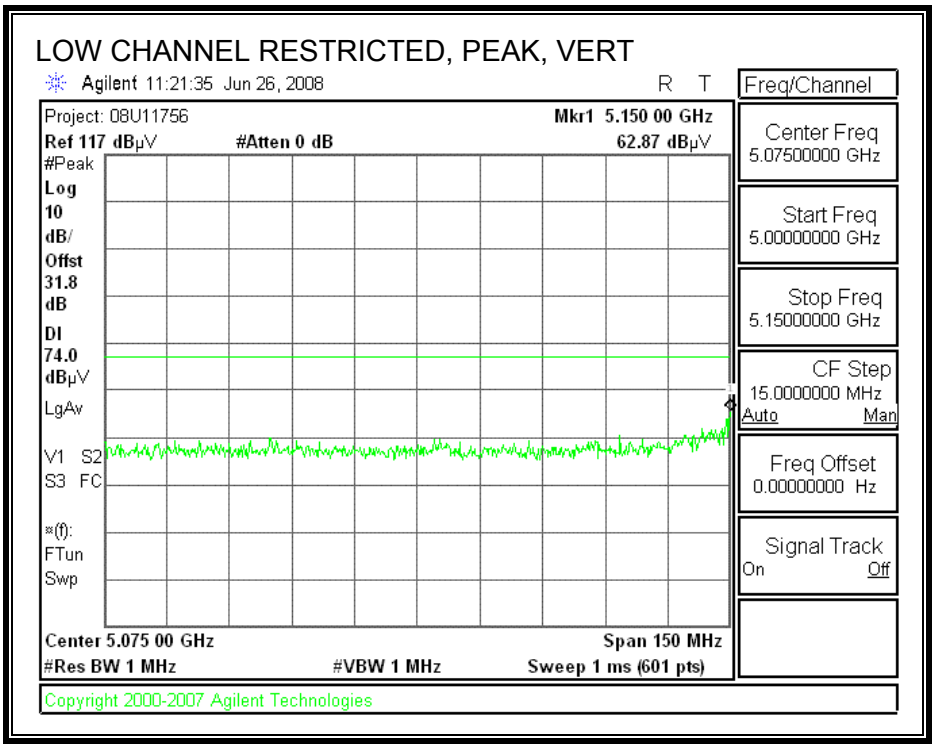
LOW CHANNEL RESTRICTED, PEAK, HORIZ

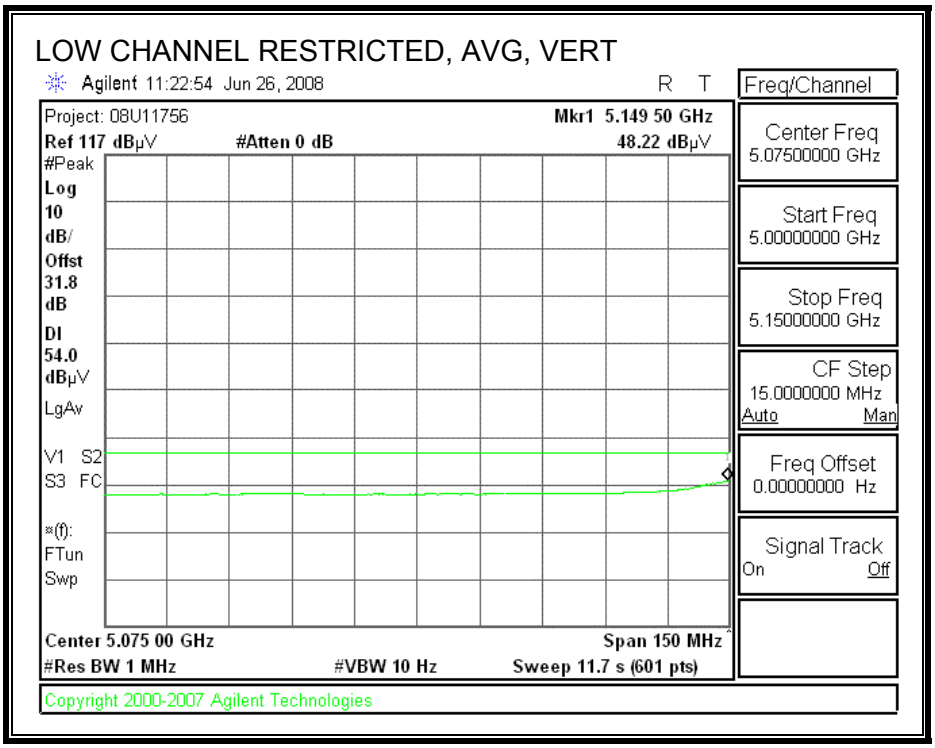


LOW CHANNEL RESTRICTED, AVG, HORIZ



RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL)

The EUT passes Conducted Spurious test; therefore this test is not performed.

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Devin Chang
Configuration: EUT With desktop
Mode: 5.2GHz HT40 SISO mode Tx, PIFA Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

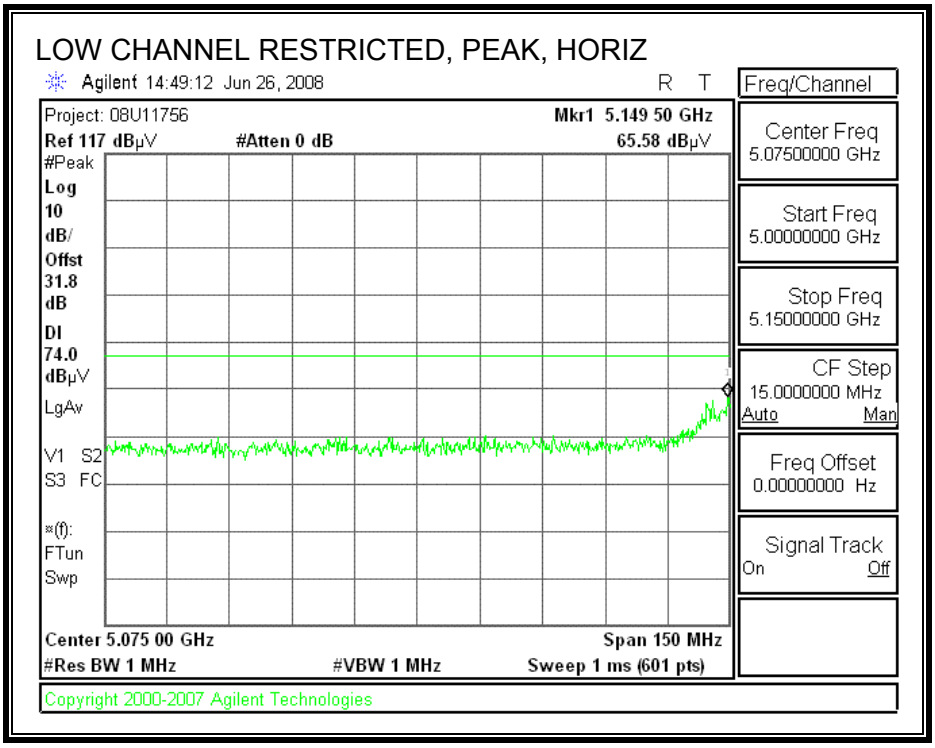
Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

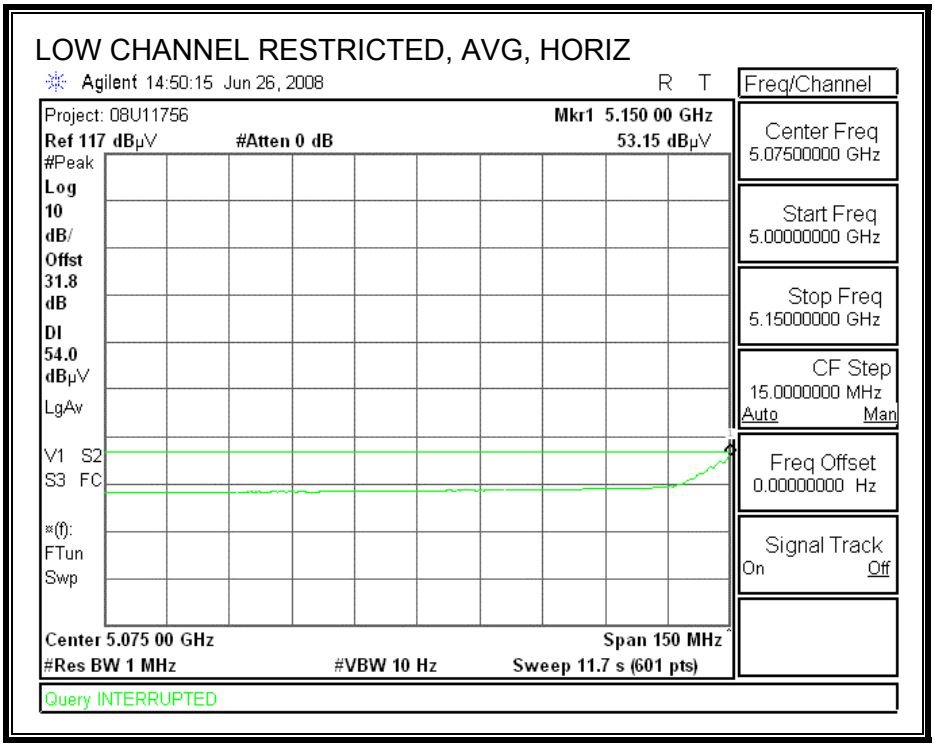
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5190MHz															
10.380	3.0	33.9	23.1	37.5	10.7	-32.6	0.0	0.8	50.2	39.4	74	54	-23.8	-14.6	H
10.380	3.0	34.5	23.7	37.5	10.7	-32.6	0.0	0.8	50.8	40.0	74	54	-23.2	-14.0	V
High Ch. 5230MHz															
10.460	3.0	34.6	23.5	37.5	10.8	-32.6	0.0	0.8	51.0	40.0	74	54	-23.0	-14.0	H
10.460	3.0	34.1	23.9	37.5	10.8	-32.6	0.0	0.8	50.5	40.3	74	54	-23.5	-13.7	V

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		

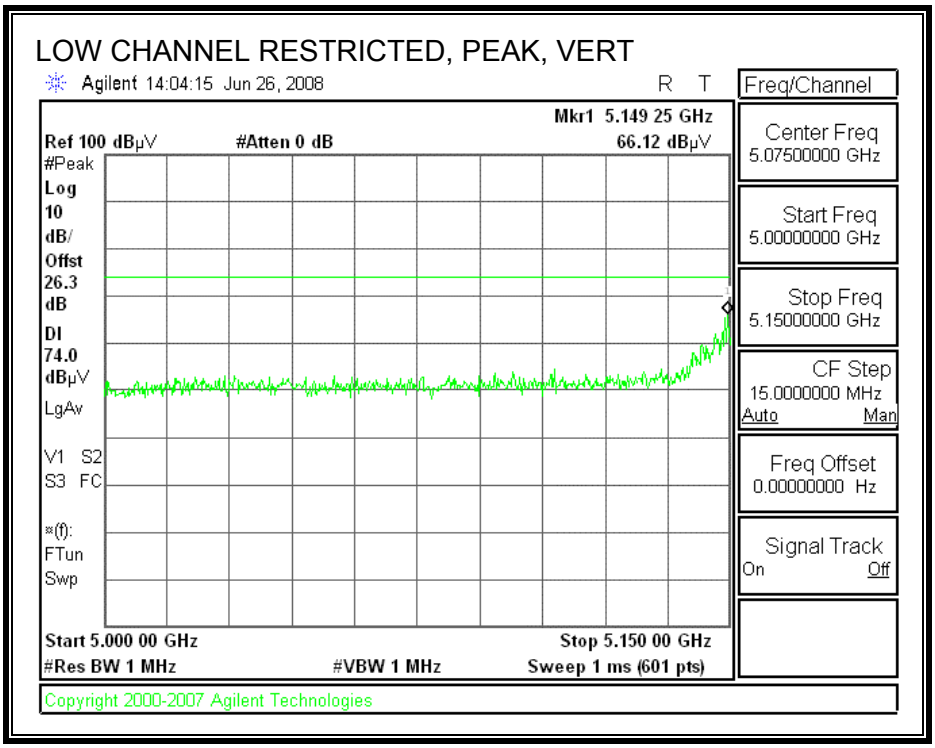
10.2.1.6 802.11n HT40 MODE With Hi PIFA & Hi Slot Antenna Gains

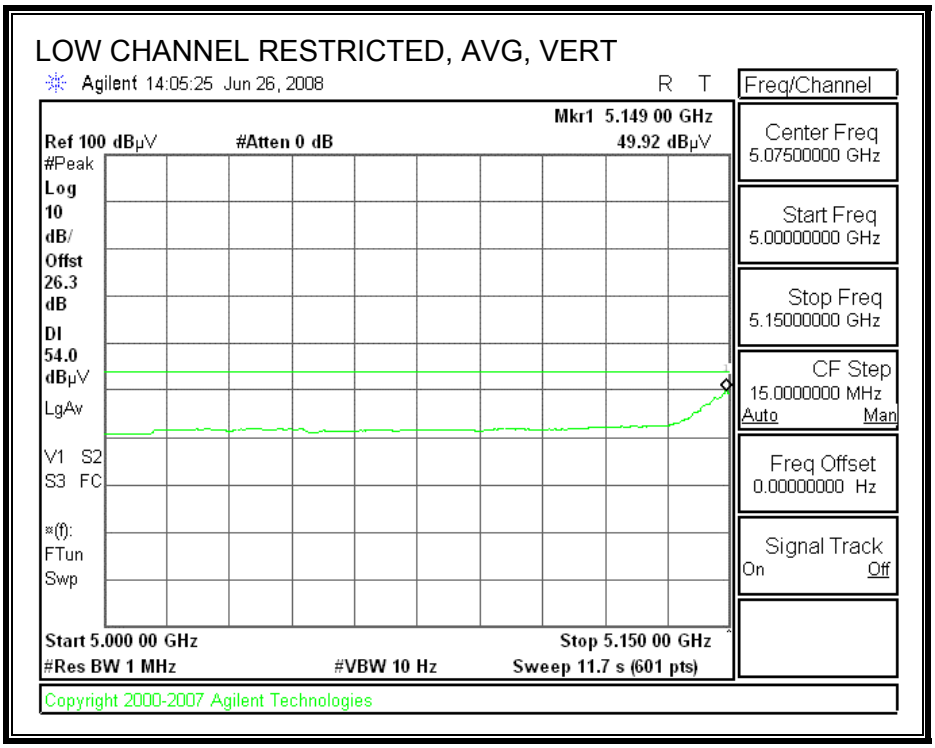
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL)

The EUT passes Conducted Spurious test; therefore this test is not performed.

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.2GHz HT40 mode Tx, PIFA Hi & Slot Hi

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5190MHz															
15.570	3.0	41.3	28.1	38.0	12.9	-32.2	0.0	0.7	60.8	47.6	74	54	-13.2	-6.4	H
15.570	3.0	40.8	28.1	38.0	12.9	-32.2	0.0	0.7	60.2	47.5	74	54	-13.8	-6.5	V
High Ch. 5230MHz															
15.690	3.0	40.2	27.4	37.9	13.0	-32.2	0.0	0.7	59.6	46.9	74	54	-14.4	-7.1	H
15.690	3.0	39.6	27.1	37.9	13.0	-32.2	0.0	0.7	59.0	46.6	74	54	-15.0	-7.4	V

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		

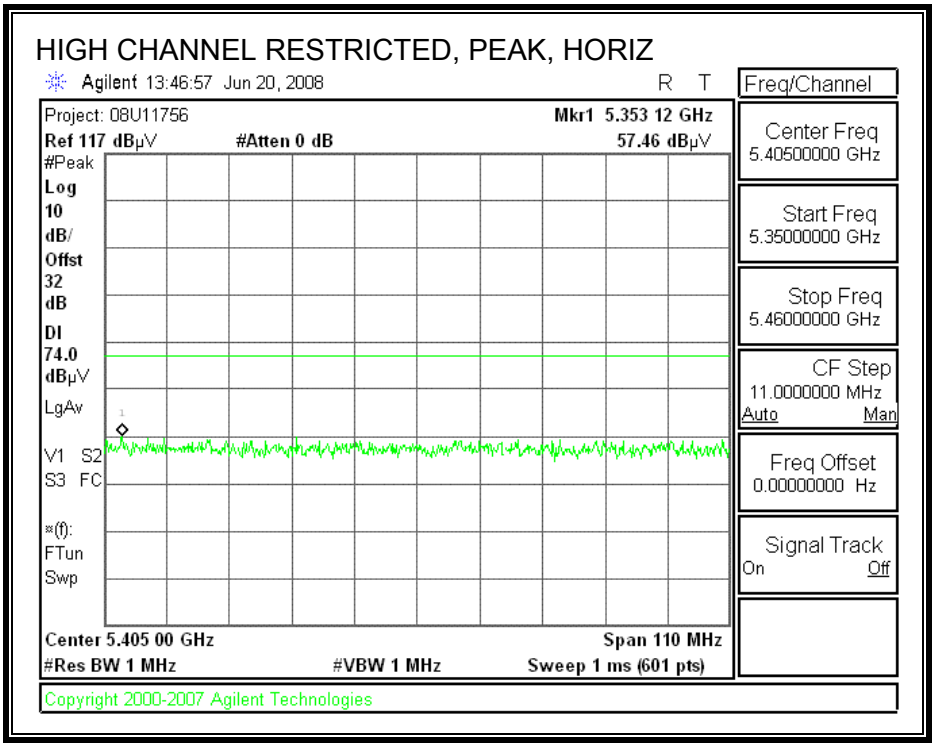
10.2.2. 5.25–5.35 GHz BAND

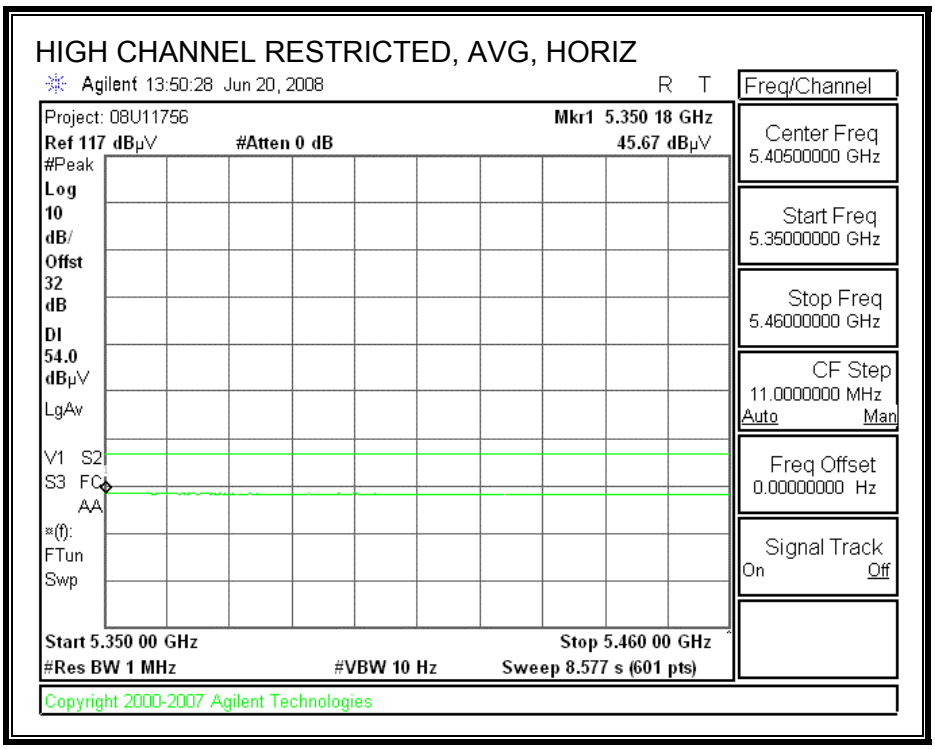
10.2.2.1 802.11a MODE With Hi Slot Antenna Gain

AUTHORIZED BANDEDGE (LOW CHANNEL)

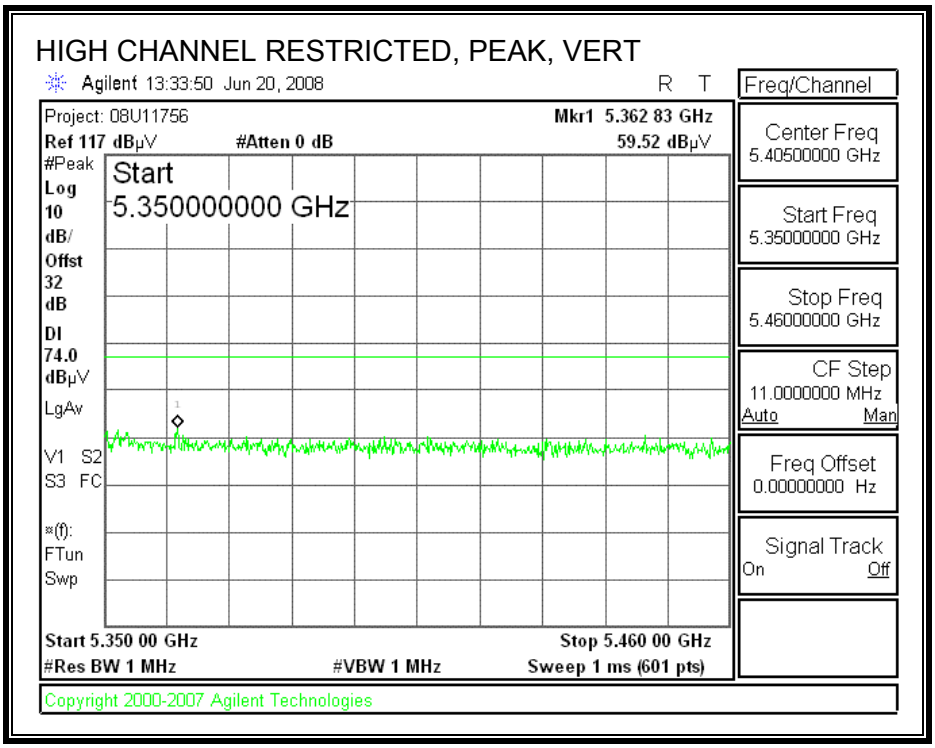
The EUT passes Conducted Spurious test; therefore this test is not performed.

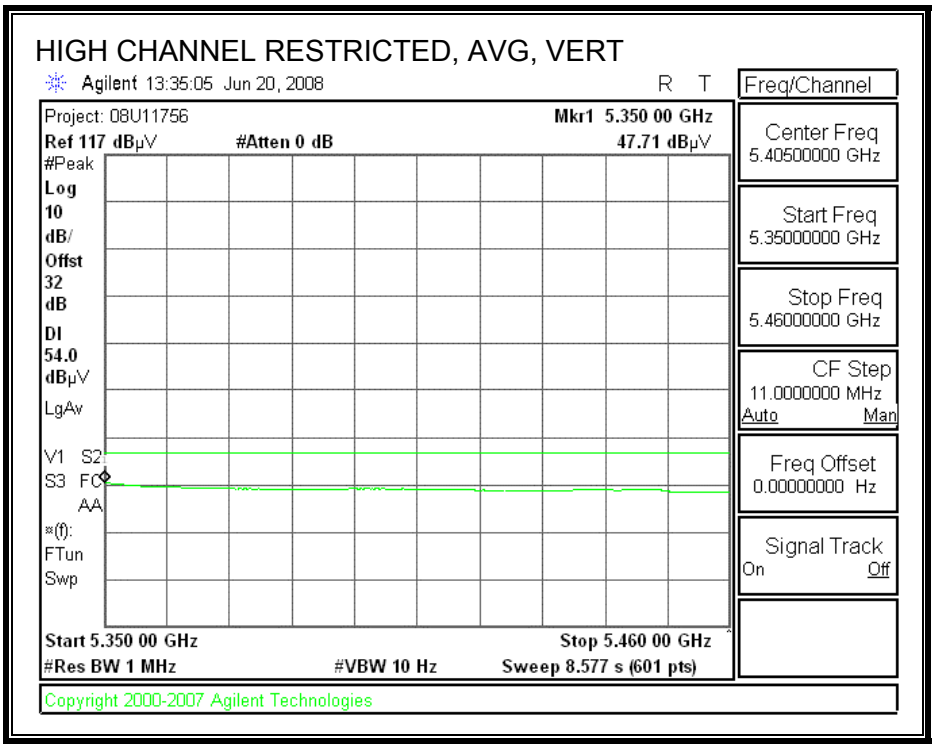
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/21/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.3GHz a mode Tx, Slot Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	C-5m Chamber		R_001

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5260MHz															
15.780	3.0	45.7	32.4	37.9	1.2	-32.2	0.0	0.0	52.5	39.3	74	54	-21.5	-14.7	H
15.780	3.0	52.0	35.1	37.9	1.2	-32.2	0.0	0.0	58.9	42.0	74	54	-15.1	-12.0	V
Mid Ch. 5300MHz															
10.600	3.0	43.5	31.0	37.4	0.8	-34.3	0.0	0.0	47.4	34.9	74	54	-26.6	-19.1	H
15.900	3.0	44.0	32.1	37.9	1.2	-32.2	0.0	0.0	50.9	39.0	74	54	-23.1	-15.0	H
10.600	3.0	46.3	33.2	37.4	0.8	-34.3	0.0	0.0	50.2	37.1	74	54	-23.8	-16.9	V
15.900	3.0	46.8	33.9	37.9	1.2	-32.2	0.0	0.0	53.7	40.8	74	54	-20.3	-13.2	V
High Ch. 5320MHz															
10.640	3.0	43.8	31.0	37.3	0.8	-34.2	0.0	0.0	47.8	34.9	74	54	-26.2	-19.1	H
15.960	3.0	44.1	30.2	37.8	1.2	-32.2	0.0	0.0	51.0	37.1	74	54	-23.0	-16.9	H
10.640	3.0	45.1	30.9	37.3	0.8	-34.2	0.0	0.0	49.0	34.9	74	54	-25.0	-19.1	V
15.960	3.0	44.2	30.4	37.8	1.2	-32.2	0.0	0.0	51.1	37.3	74	54	-22.9	-16.7	V

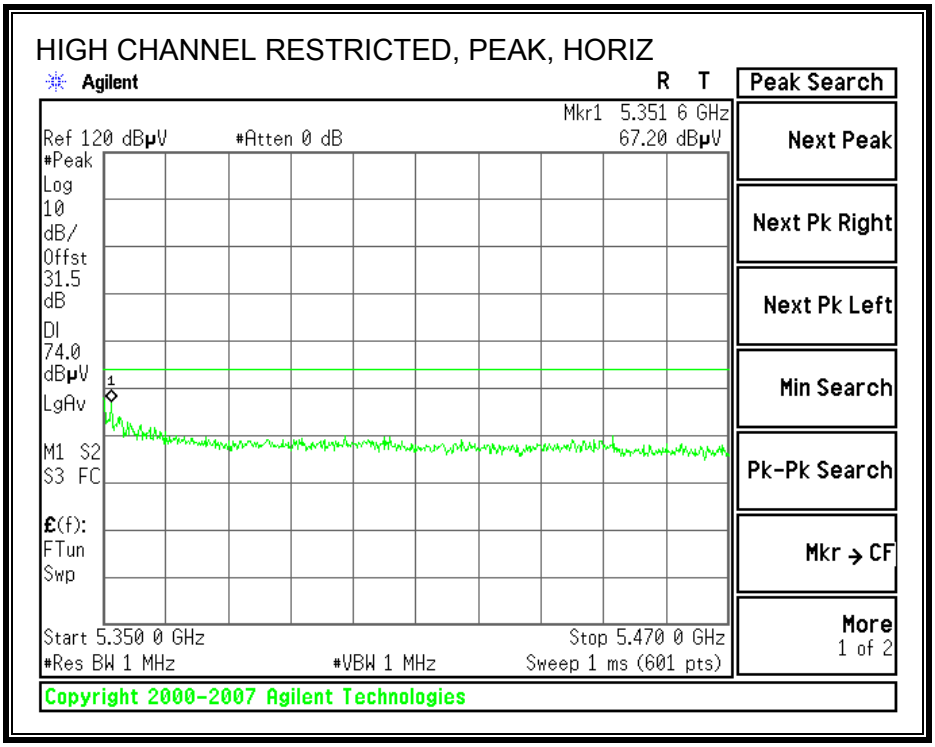
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

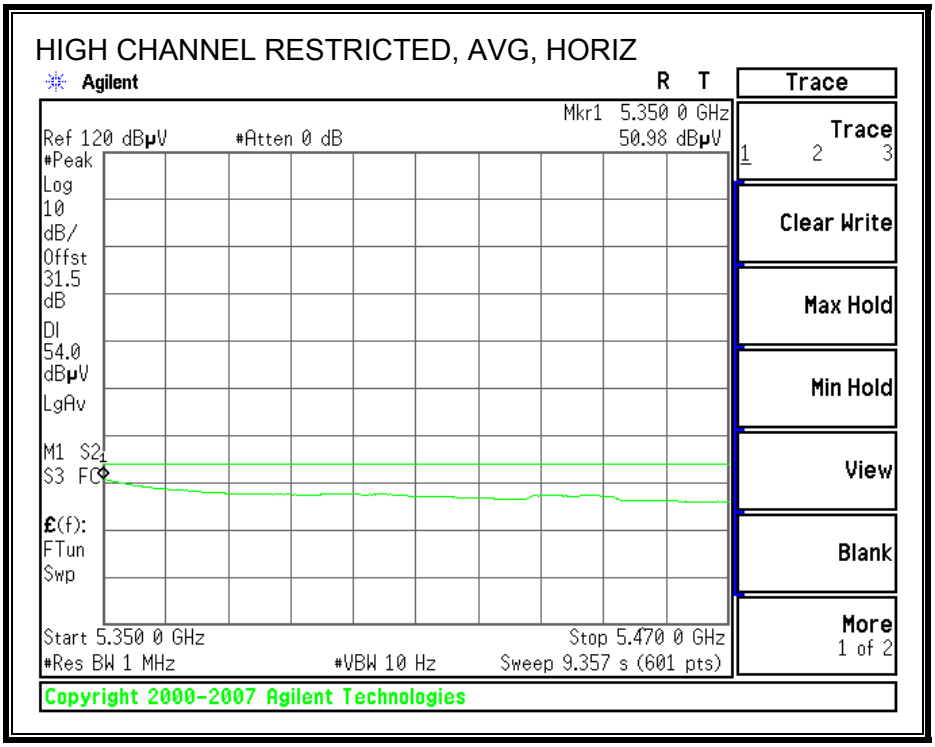
10.2.2.2 802.11a MODE With Hi PIFA Antenna Gain

AUTHORIZED BANDEDGE (LOW CHANNEL)

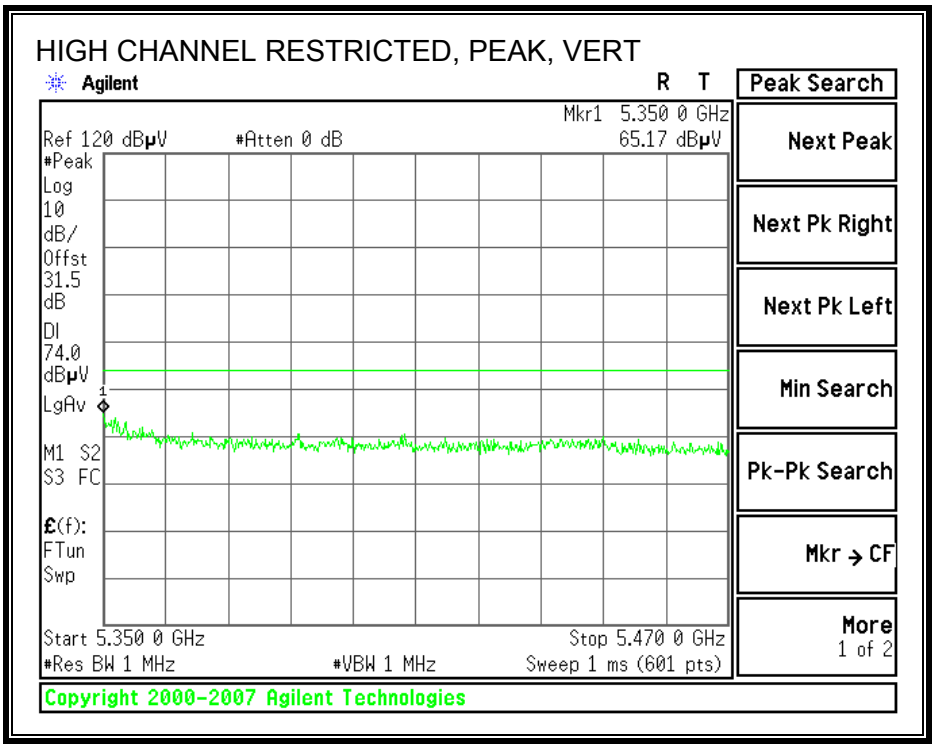
The EUT passes Conducted Spurious test; therefore this test is not performed.

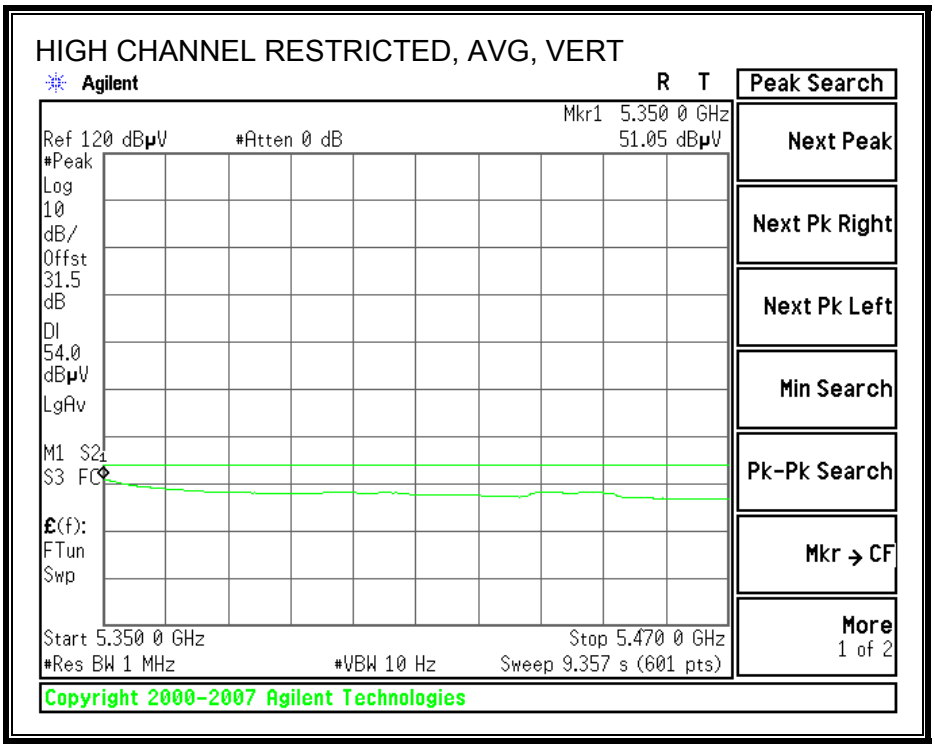
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Devin Chang
Configuration: EUT With desktop
Mode: 5.3GHz HT40 SISO mode Tx, PIFA Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5270MHz															
10.540	3.0	41.8	28.0	37.5	10.9	-32.6	0.0	0.8	58.3	44.5	74	54	-15.7	-9.5	H
10.540	3.0	41.9	27.3	37.5	10.9	-32.6	0.0	0.8	58.4	43.8	74	54	-15.6	-10.2	V
High Ch. 5310MHz															
10.620	3.0	41.6	27.6	37.5	10.9	-32.6	0.0	0.8	58.2	44.2	74	54	-15.8	-9.8	H
10.620	3.0	42.2	27.2	37.5	10.9	-32.6	0.0	0.8	58.8	43.8	74	54	-15.2	-10.2	V

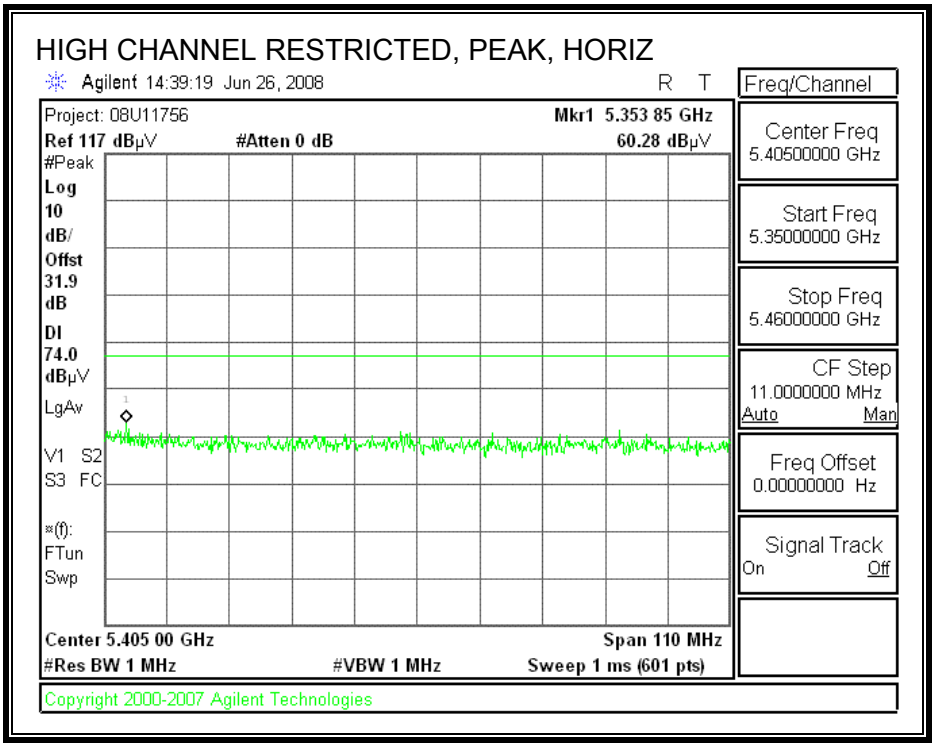
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

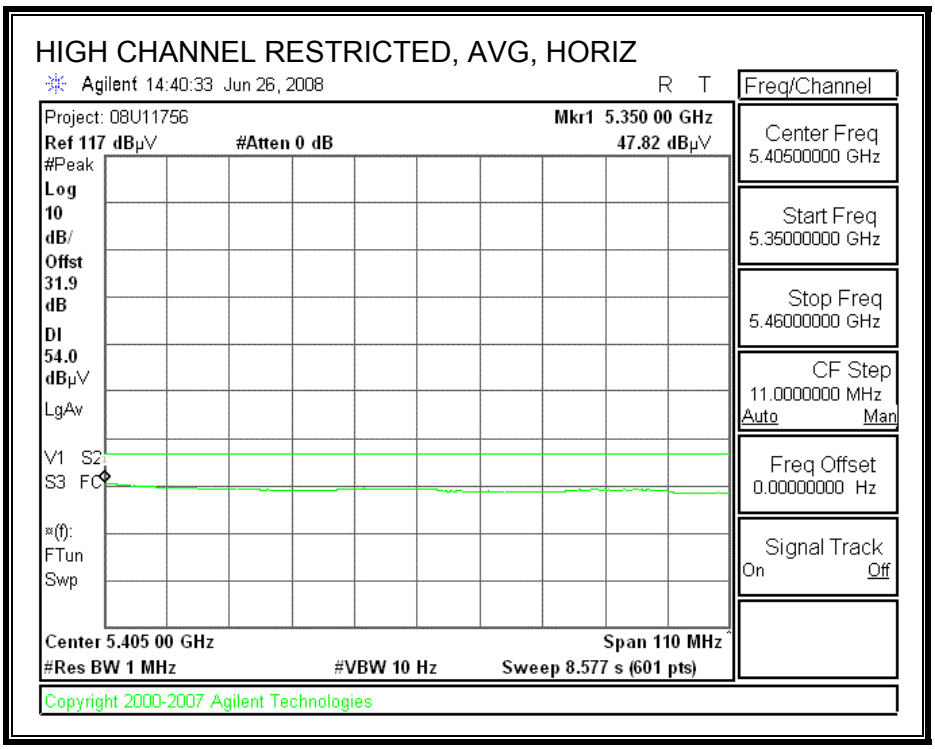
10.2.2.3 802.11n HT20 MODE With Hi PIFA & Hi SLOT Antenna Gains

AUTHORIZED BANDEDGE (LOW CHANNEL)

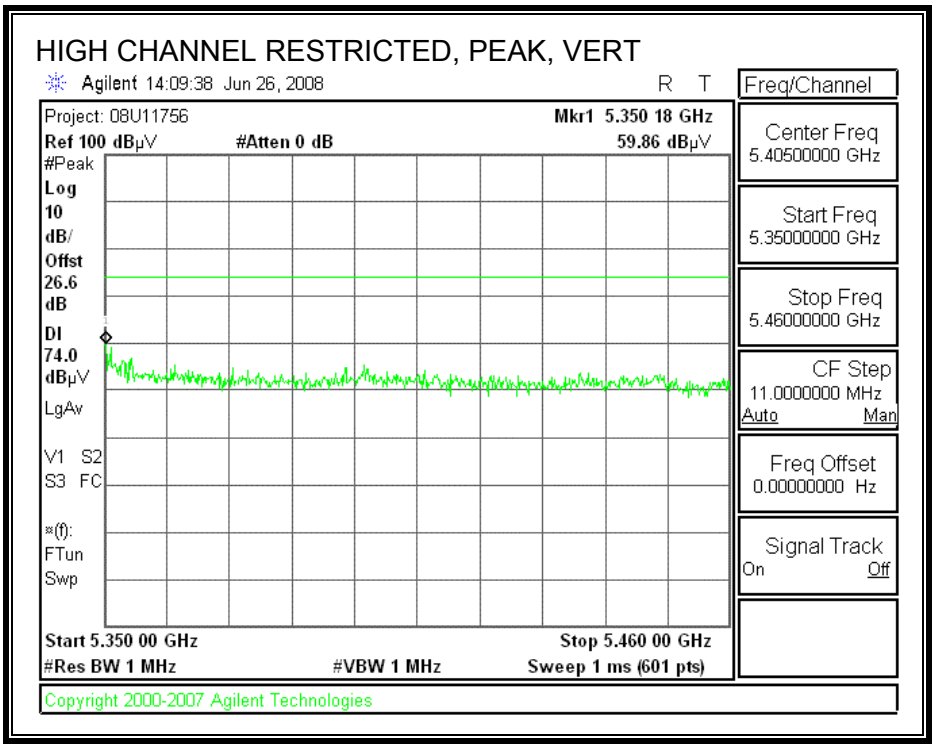
The EUT passes Conducted Spurious test; therefore this test is not performed.

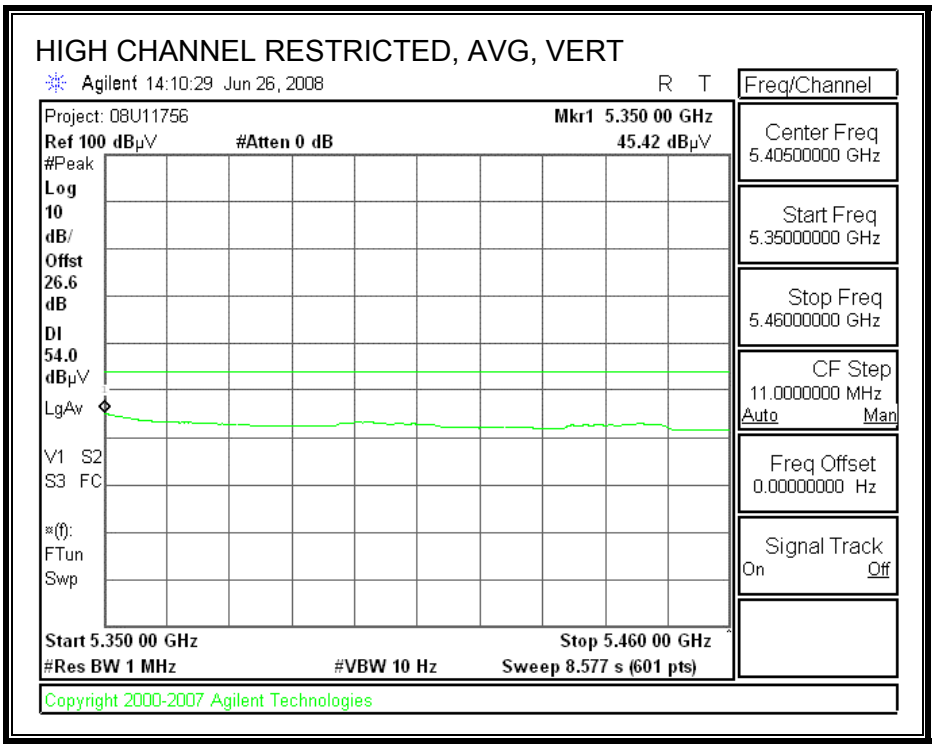
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.3GHz HT20 mode Tx, PIFA Hi and Slot Hi

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5260MHz															
15.780	3.0	42.4	28.7	37.9	13.0	-32.2	0.0	0.7	61.9	48.1	74	54	-12.1	-5.9	H
15.780	3.0	41.1	28.8	37.9	13.0	-32.2	0.0	0.7	60.6	48.3	74	54	-13.4	-5.7	V
Mid Ch. 5280MHz															
15.840	3.0	40.9	28.6	37.9	13.0	-32.1	0.0	0.7	60.4	48.1	74	54	-13.6	-5.9	H
15.840	3.0	41.3	28.1	37.9	13.0	-32.1	0.0	0.7	60.8	47.6	74	54	-13.2	-6.4	V
High Ch. 5320MHz															
10.640	3.0	43.5	29.6	37.3	11.0	-32.6	0.0	0.8	60.0	46.0	74	54	-14.0	-8.0	H
15.960	3.0	44.1	30.2	37.8	13.1	-32.1	0.0	0.7	63.6	49.7	74	54	-10.4	-4.3	H
10.640	3.0	43.5	29.6	37.3	11.0	-32.6	0.0	0.8	60.0	46.0	74	54	-14.0	-8.0	V
15.960	3.0	44.2	30.4	37.8	13.1	-32.1	0.0	0.7	63.7	49.9	74	54	-10.3	-4.1	V

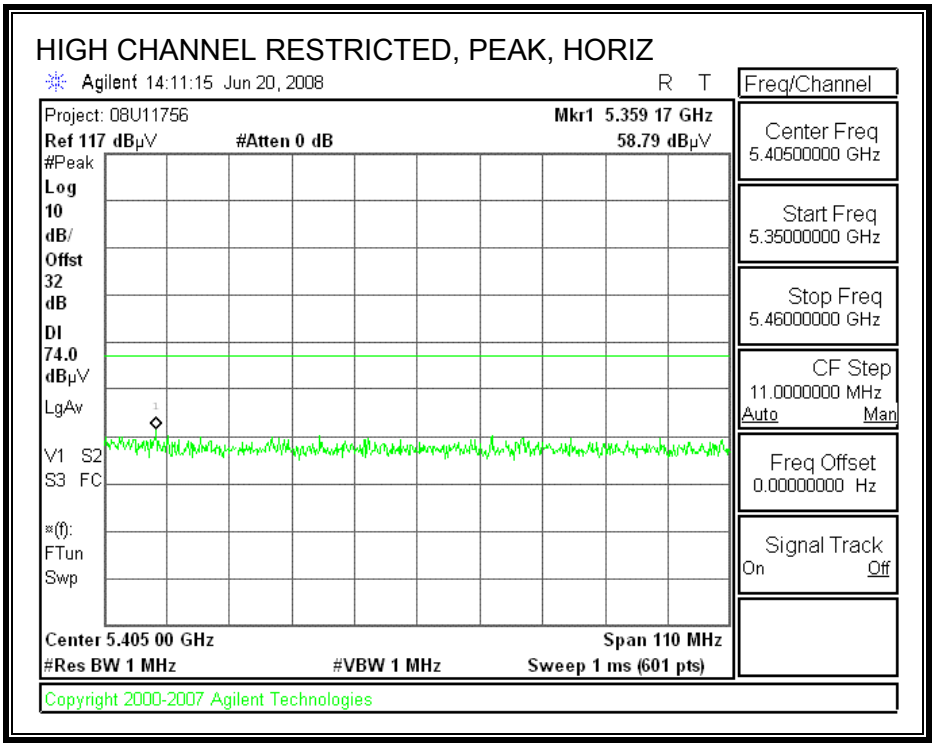
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

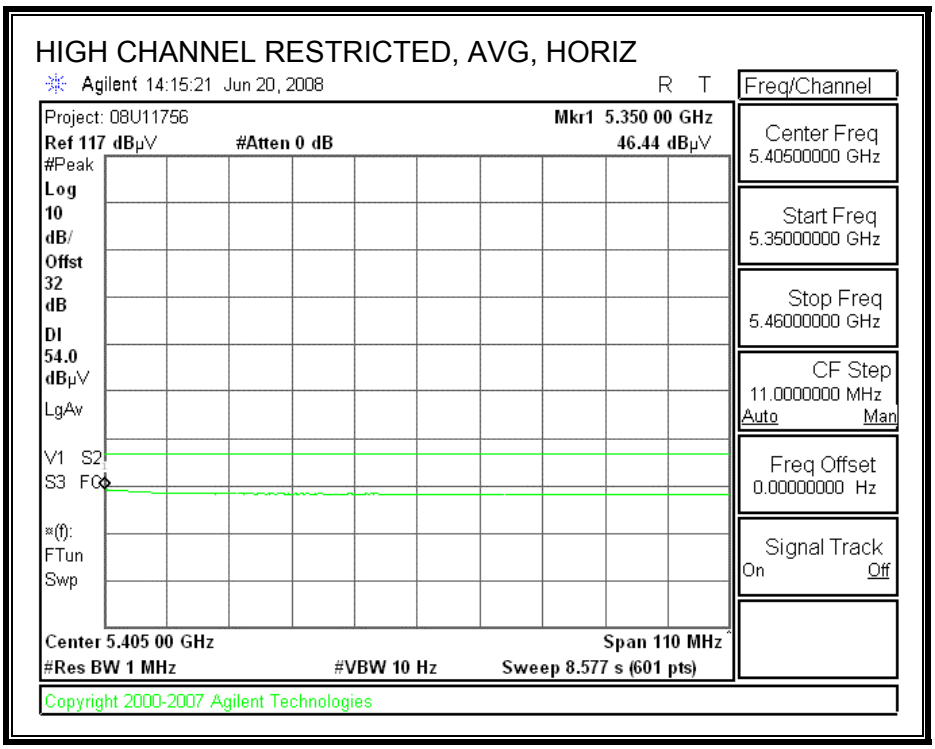
10.2.2.4 802.11n HT40 SISO MODE Hi With Slot Antenna Gain

AUTHORIZED BANDEDGE (LOW CHANNEL)

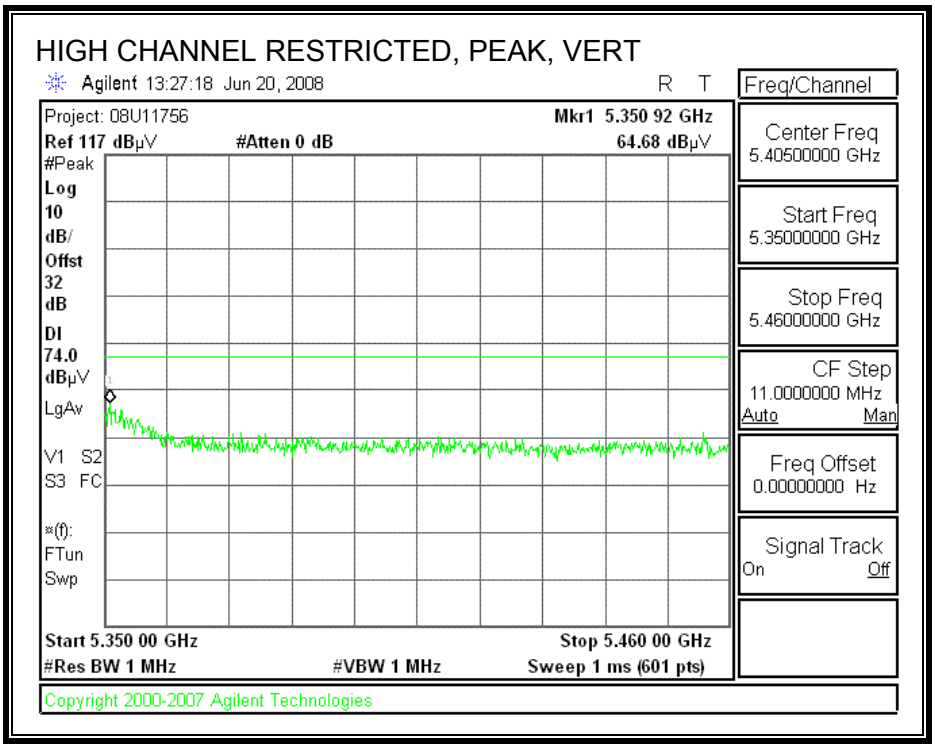
The EUT passes Conducted Spurious test; therefore this test is not performed.

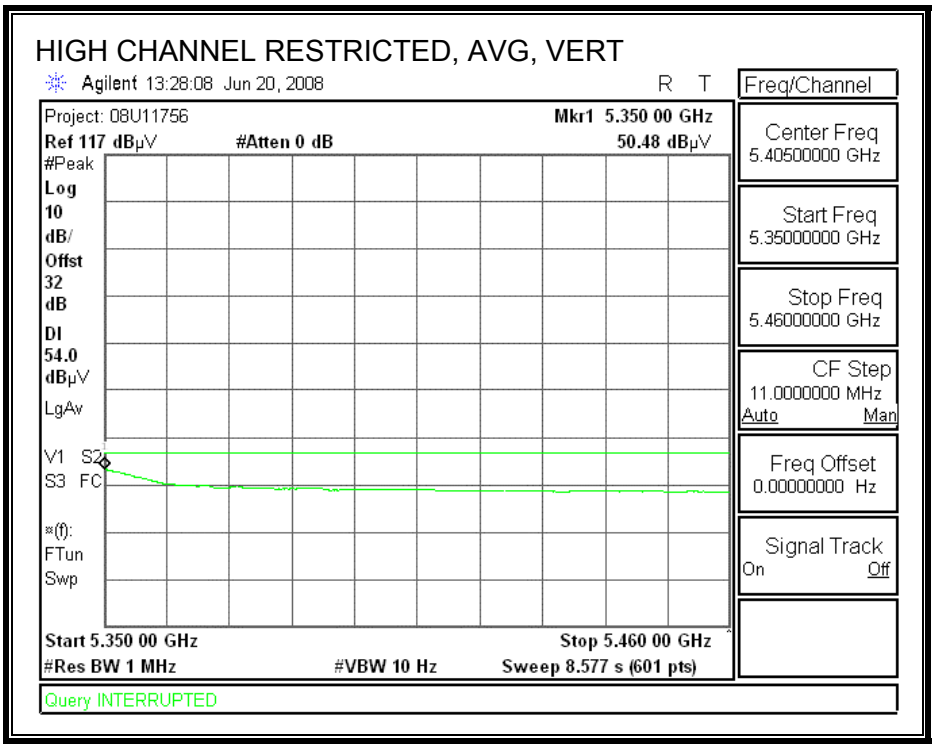
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/21/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.3GHz HT40 SISO mode Tx, Slot Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	C-5m Chamber		R_001

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5270MHz															
15.810	3.0	43.3	30.8	37.9	1.2	-32.2	0.0	0.0	50.1	37.6	74	54	-23.9	-16.4	H
15.810	3.0	44.0	32.5	37.9	1.2	-32.2	0.0	0.0	50.9	39.4	74	54	-23.1	-14.6	V
High Ch. 5310MHz															
10.620	3.0	43.0	30.5	37.4	0.8	-34.3	0.0	0.0	46.9	34.4	74	54	-27.1	-19.6	H
15.930	3.0	45.1	31.5	37.8	1.2	-32.2	0.0	0.0	52.0	38.4	74	54	-22.0	-15.6	H
10.620	3.0	43.2	30.7	37.4	0.8	-34.3	0.0	0.0	47.1	34.6	74	54	-26.9	-19.4	V
15.930	3.0	44.4	31.1	37.8	1.2	-32.2	0.0	0.0	51.3	38.0	74	54	-22.7	-16.0	V

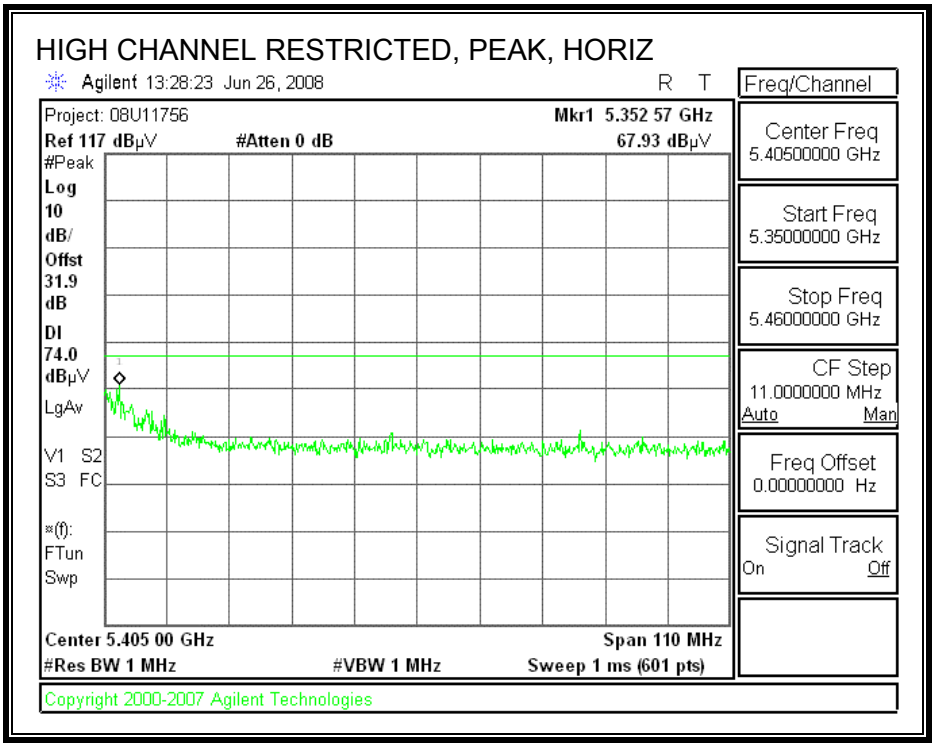
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

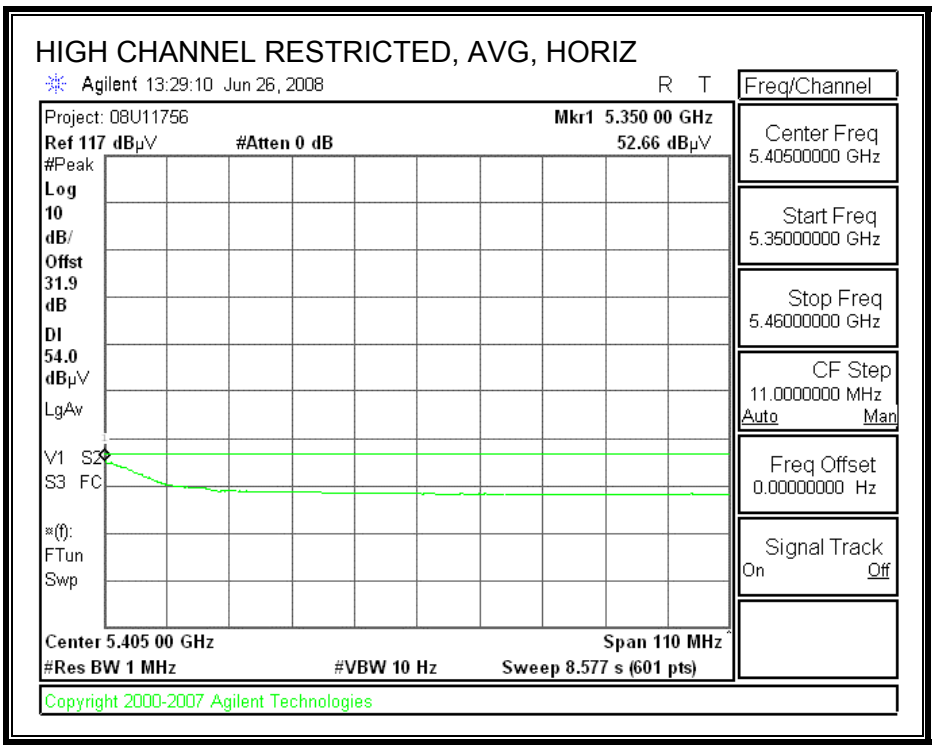
10.2.2.5 802.11n HT40 SISO MODE With Hi PIFA Antenna Gain

AUTHORIZED BANDEDGE (LOW CHANNEL)

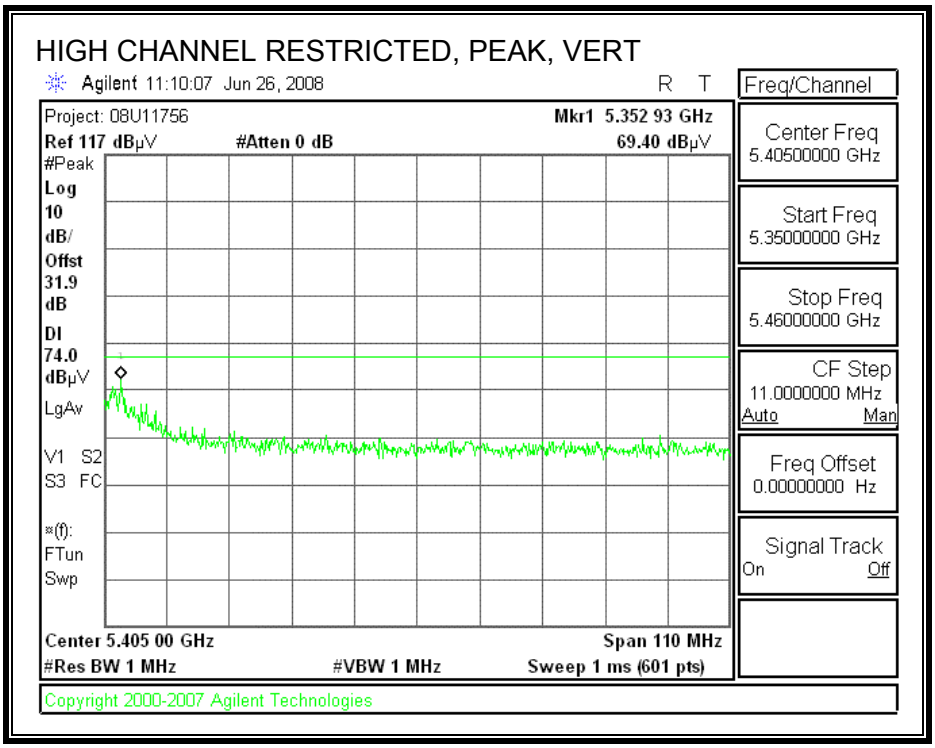
The EUT passes Conducted Spurious test; therefore this test is not performed.

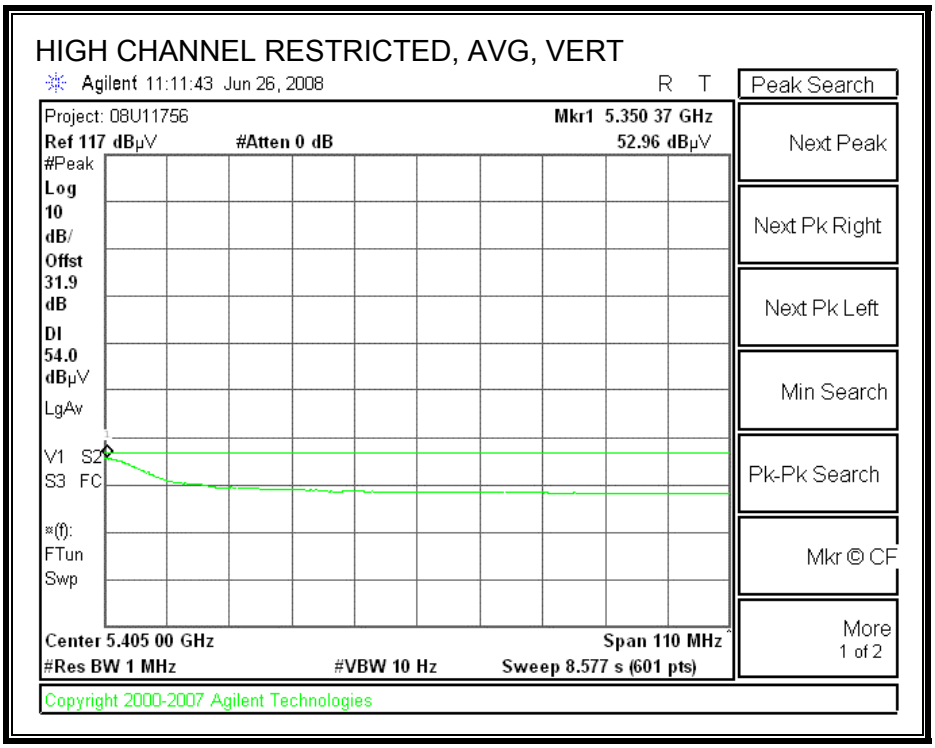
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Devin Chang
Configuration: EUT With desktop
Mode: 5.3GHz HT40 SISO mode Tx, PIFA Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5270MHz															
10.540	3.0	41.8	28.0	37.5	10.9	-32.6	0.0	0.8	58.3	44.5	74	54	-15.7	-9.5	H
10.540	3.0	41.9	27.3	37.5	10.9	-32.6	0.0	0.8	58.4	43.8	74	54	-15.6	-10.2	V
High Ch. 5310MHz															
10.620	3.0	41.6	27.6	37.5	10.9	-32.6	0.0	0.8	58.2	44.2	74	54	-15.8	-9.8	H
10.620	3.0	42.2	27.2	37.5	10.9	-32.6	0.0	0.8	58.8	43.8	74	54	-15.2	-10.2	V

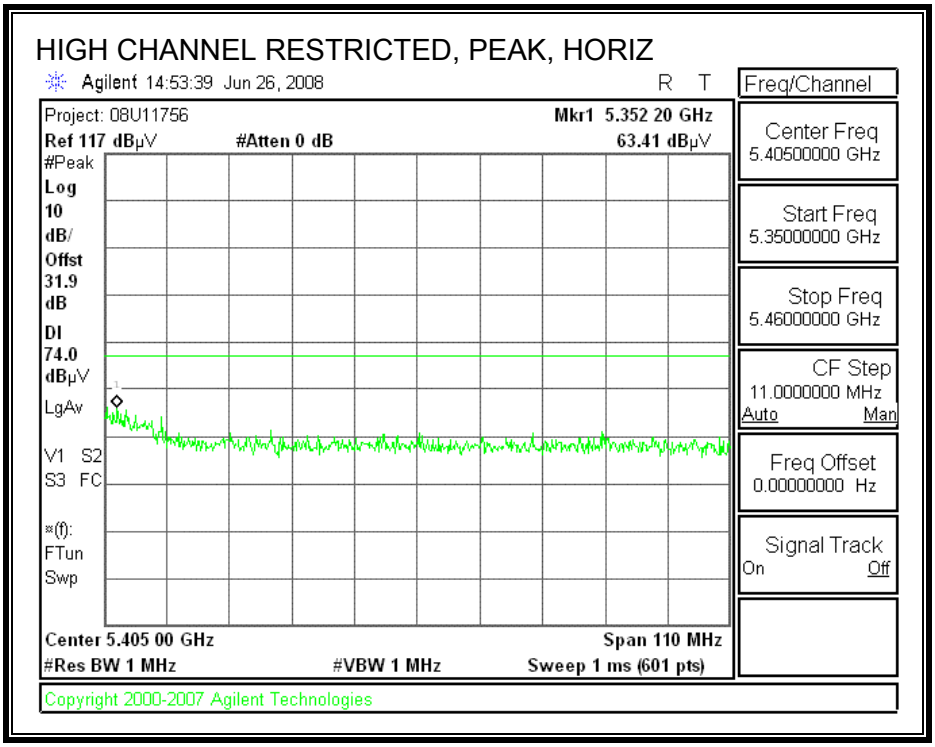
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

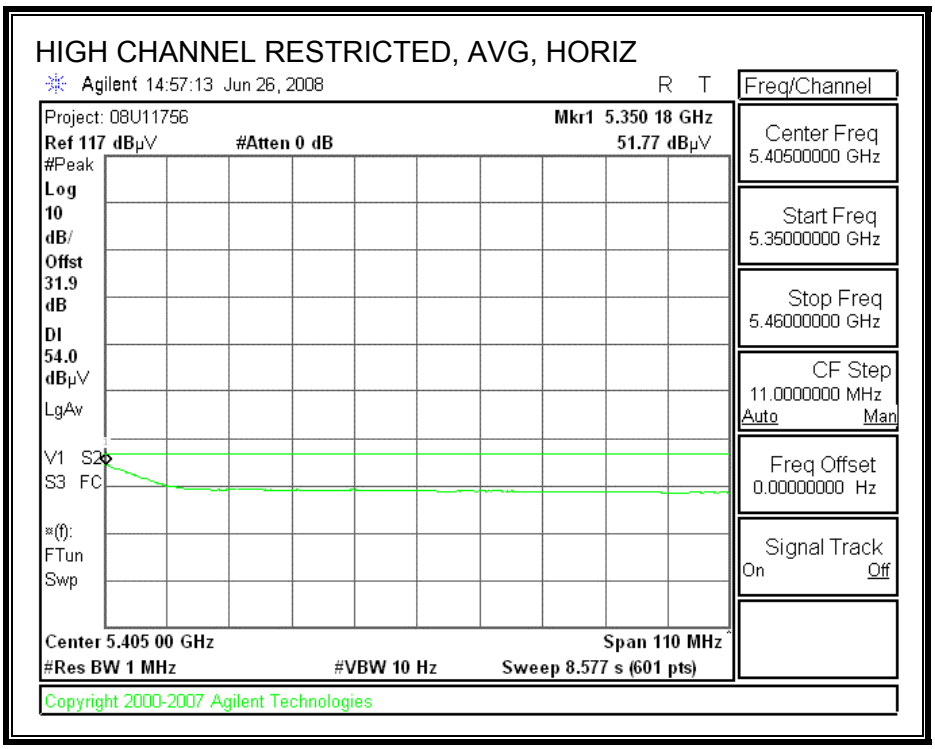
10.2.2.6 802.11n HT40 MODE With Hi PIFA & Hi SLOT Antenna Gains

AUTHORIZED BANDEDGE (LOW CHANNEL)

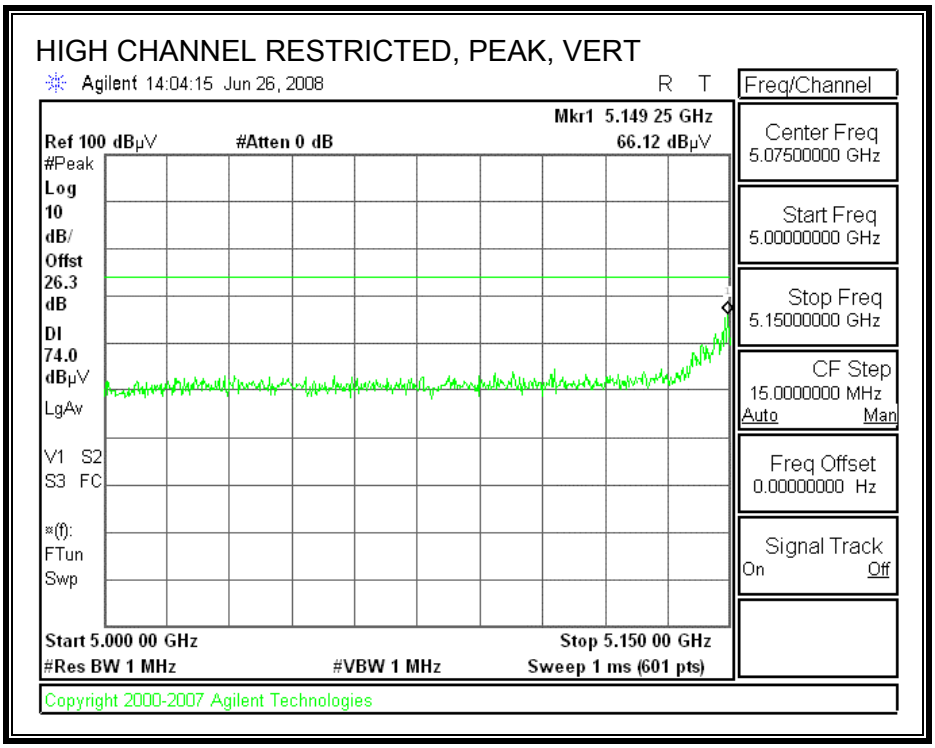
The EUT passes Conducted Spurious test; therefore this test is not performed.

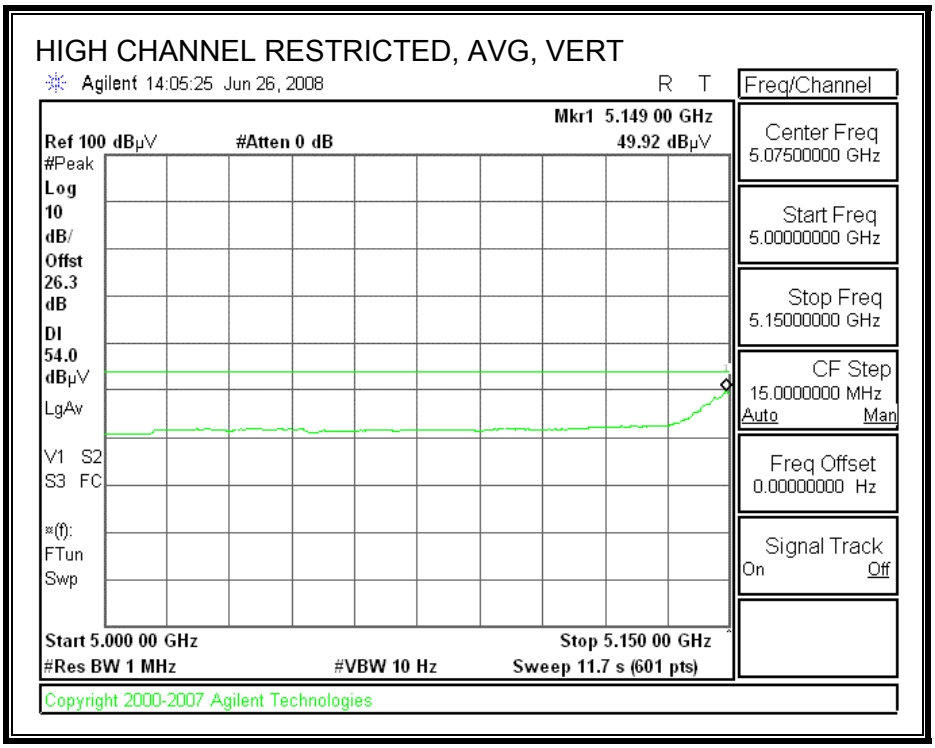
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.3GHz HT40 mode Tx, PIFA Hi and Slot Hi

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

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

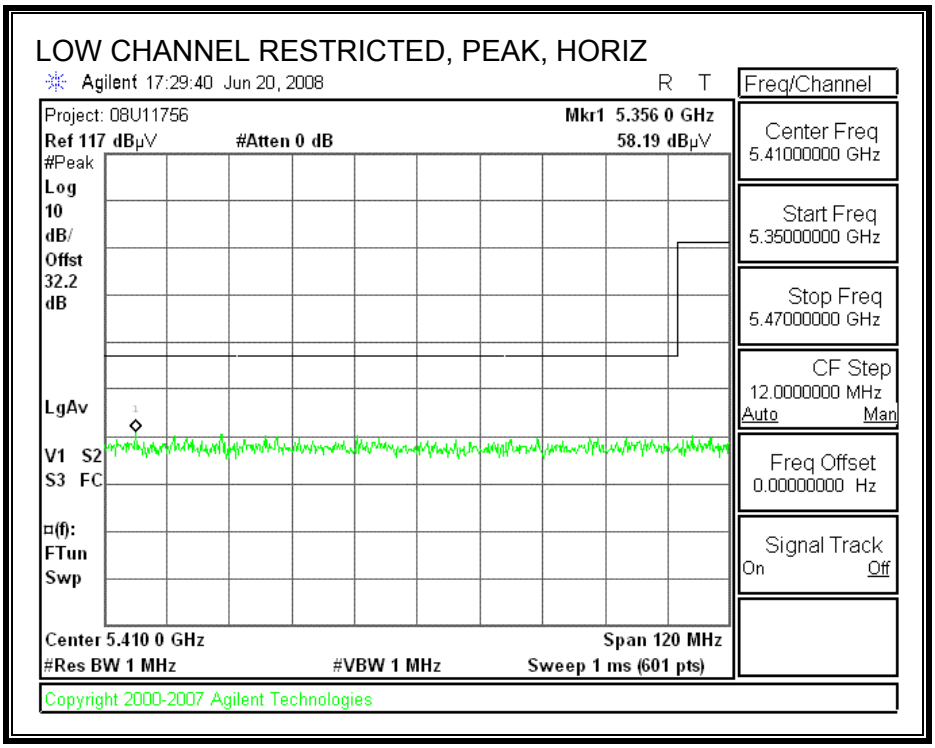
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5270MHz															
15.810	3.0	40.8	28.4	37.9	13.0	-32.2	0.0	0.7	60.3	47.9	74	54	-13.7	-6.1	H
15.810	3.0	41.0	28.2	37.9	13.0	-32.2	0.0	0.7	60.4	47.7	74	54	-13.6	-6.3	V
High Ch. 5310MHz															
10.620	3.0	41.1	28.0	37.4	10.9	-32.6	0.0	0.8	57.6	44.4	74	54	-16.4	-9.6	H
15.930	3.0	40.2	27.6	37.8	13.1	-32.1	0.0	0.7	59.7	47.1	74	54	-14.3	-6.9	H
10.620	3.0	40.1	27.9	37.4	10.9	-32.6	0.0	0.8	56.6	44.3	74	54	-17.4	-9.7	V
15.930	3.0	39.3	26.8	37.8	13.1	-32.1	0.0	0.7	58.8	46.3	74	54	-15.2	-7.7	V

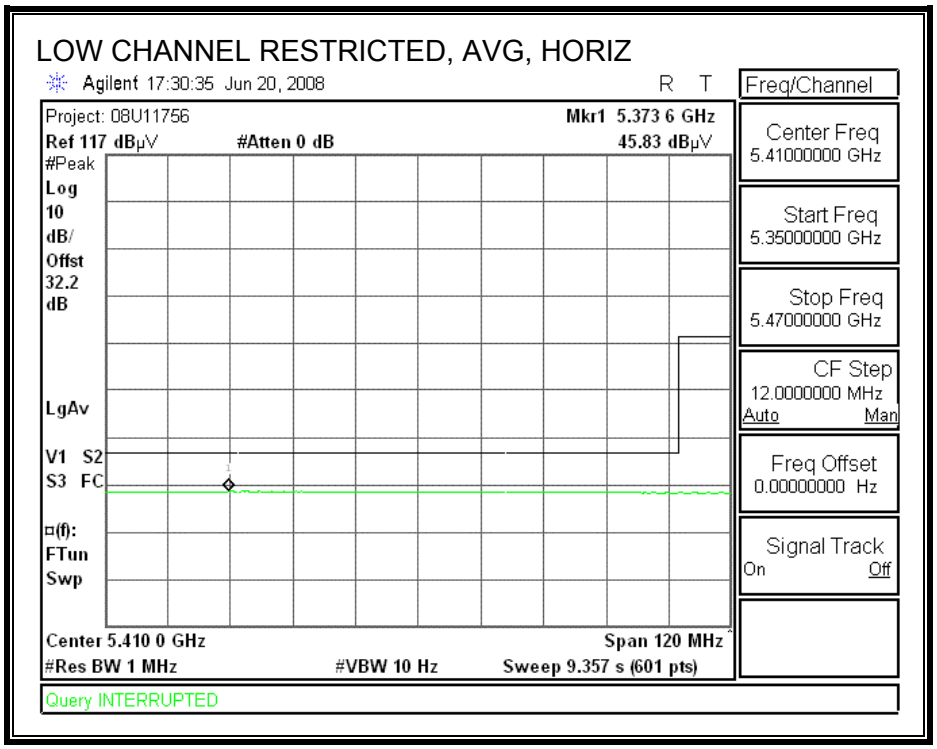
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

10.2.3. 5.47–5.725 GHz Band

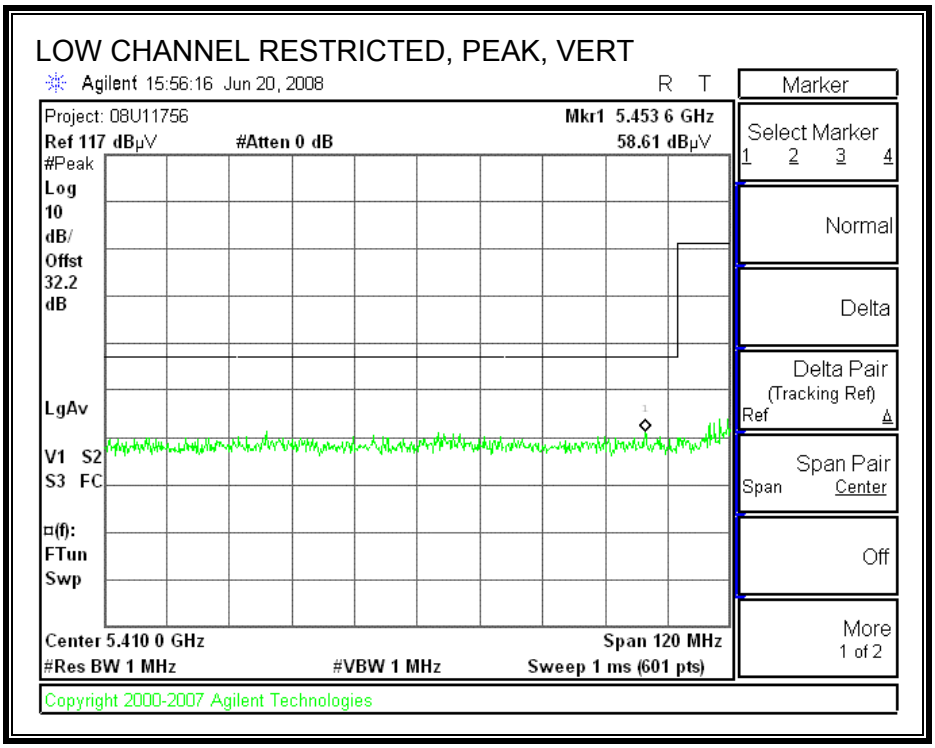
10.2.3.1 802.11a MODE With Hi Slot Antenna Gain

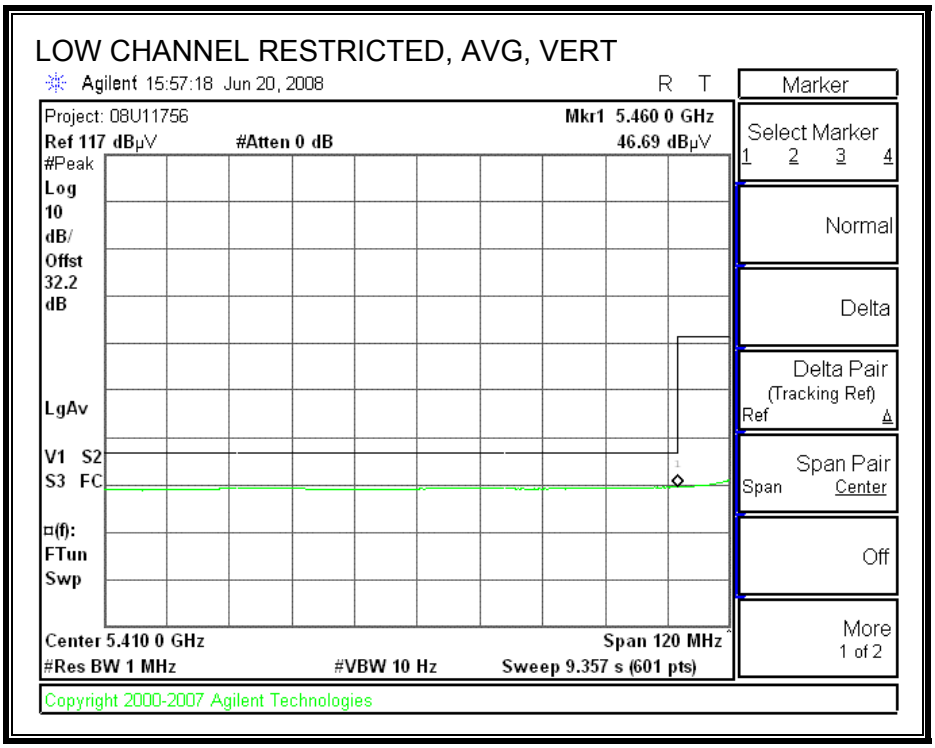
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



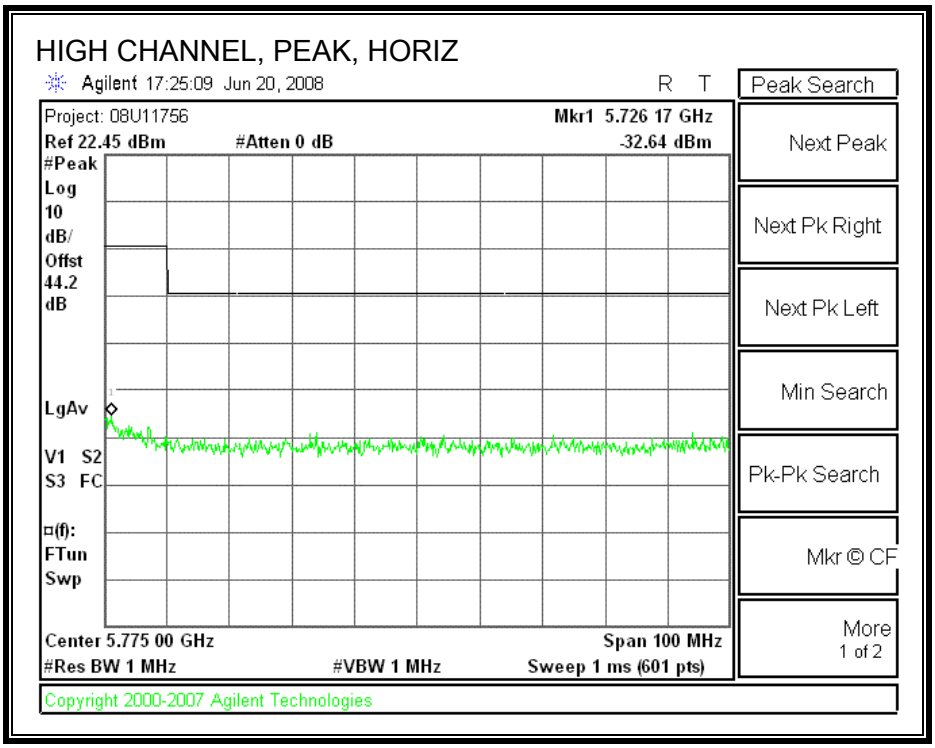


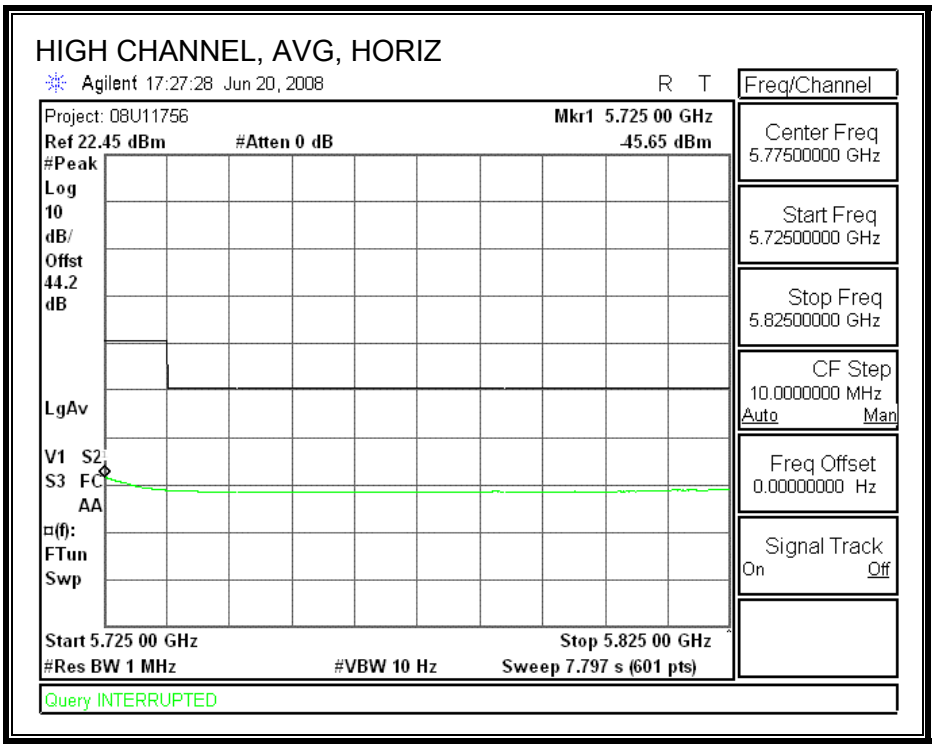
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



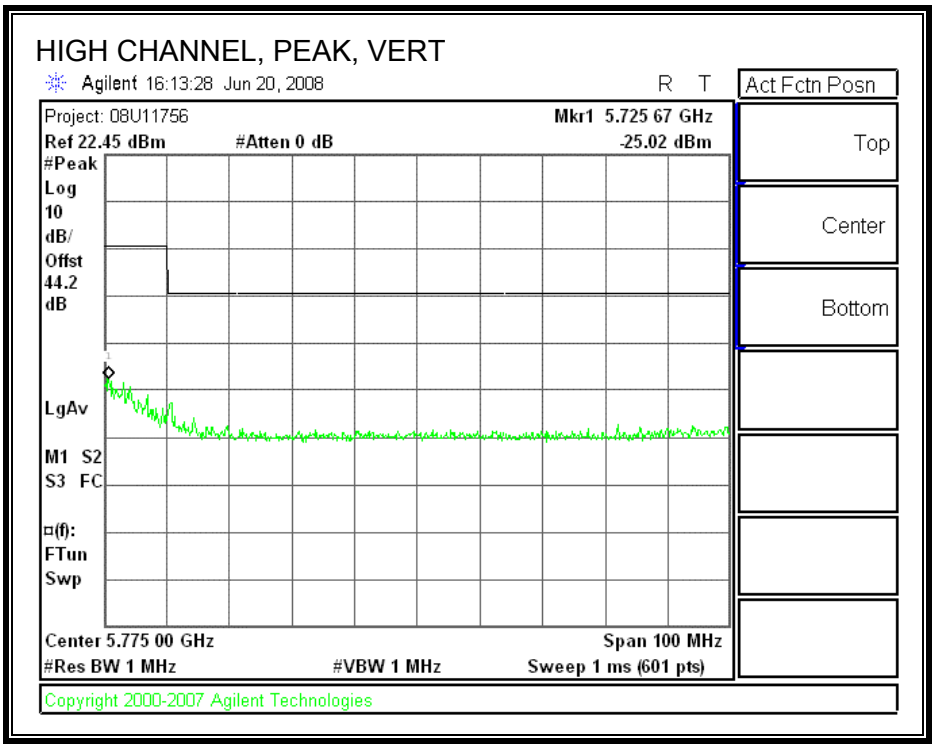


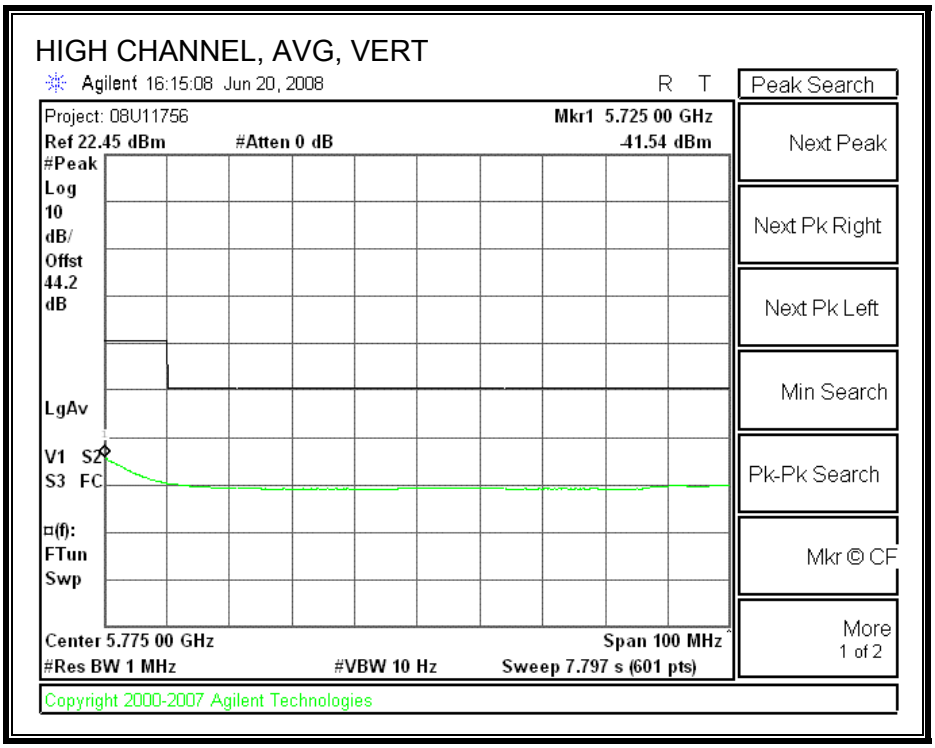
AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/21/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.5GHz a mode Tx, Slot Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	C-5m Chamber		R_001

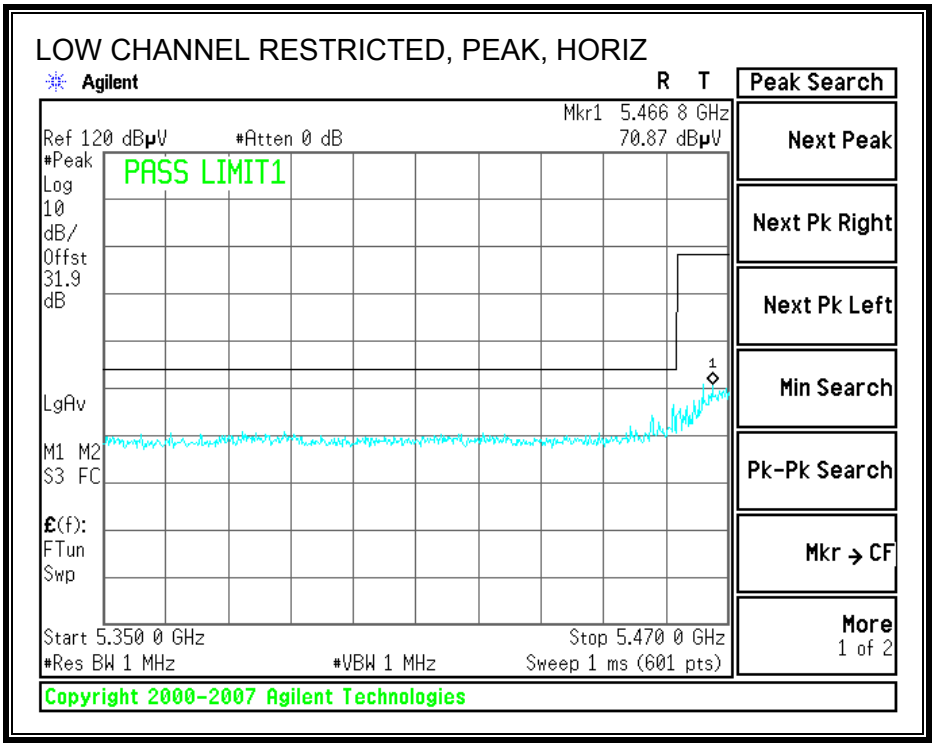
Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

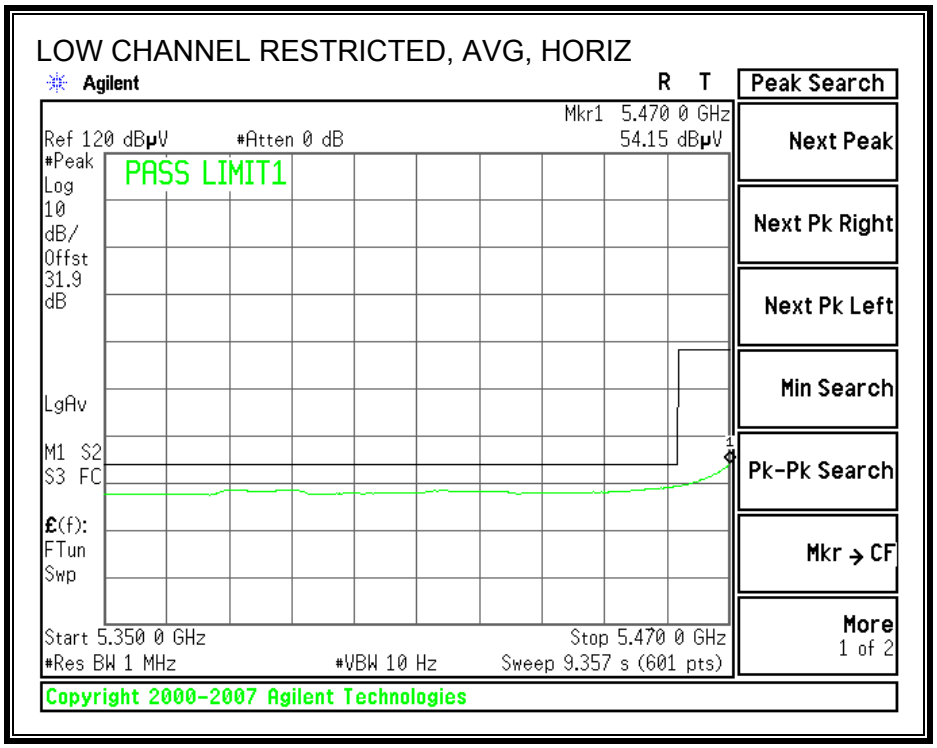
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5500MHz															
11.000	3.0	43.8	30.7	37.2	0.8	-33.8	0.0	0.0	48.1	35.0	74	54	-25.9	-19.0	H
11.000	3.0	44.7	31.6	37.2	0.8	-33.8	0.0	0.0	49.0	35.9	74	54	-25.0	-18.1	V
Mid Ch. 5600MHz															
11.200	3.0	43.3	30.6	37.3	0.8	-33.5	0.0	0.0	47.9	35.3	74	54	-26.1	-18.7	H
11.200	3.0	42.5	31.2	37.3	0.8	-33.5	0.0	0.0	47.1	35.8	74	54	-26.9	-18.2	V
High Ch. 5700MHz															
11.400	3.0	43.1	30.5	37.4	0.8	-33.2	0.0	0.0	48.0	35.5	74	54	-26.0	-18.5	H
11.400	3.0	42.9	30.6	37.4	0.8	-33.2	0.0	0.0	47.9	35.6	74	54	-26.1	-18.4	V

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		

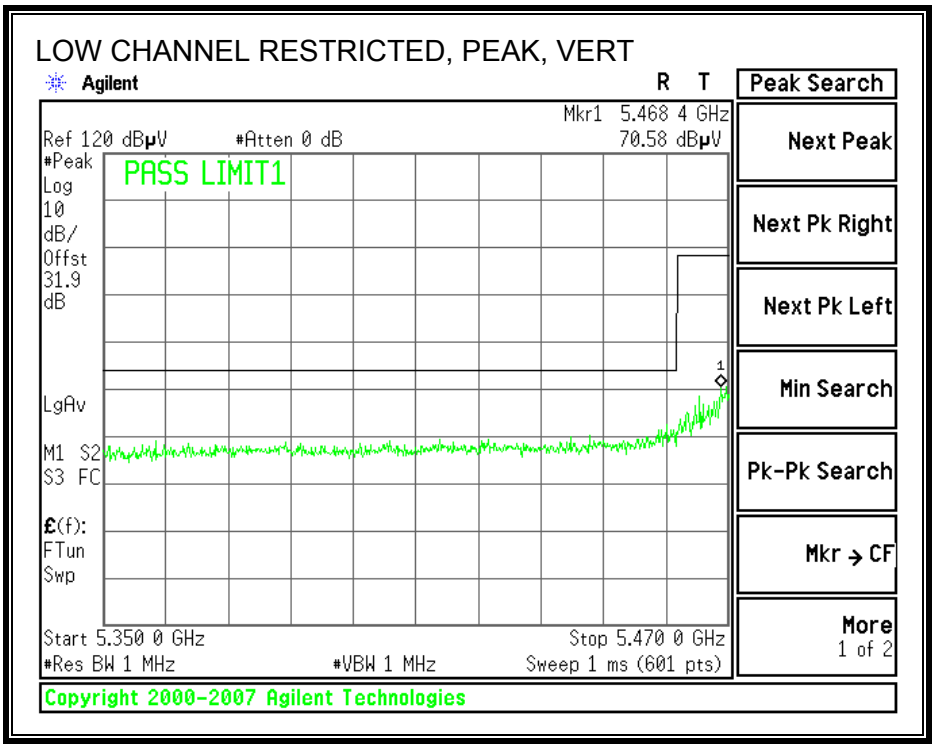
10.2.3.2 802.11a MODE With Hi PIFA Antenna Gain

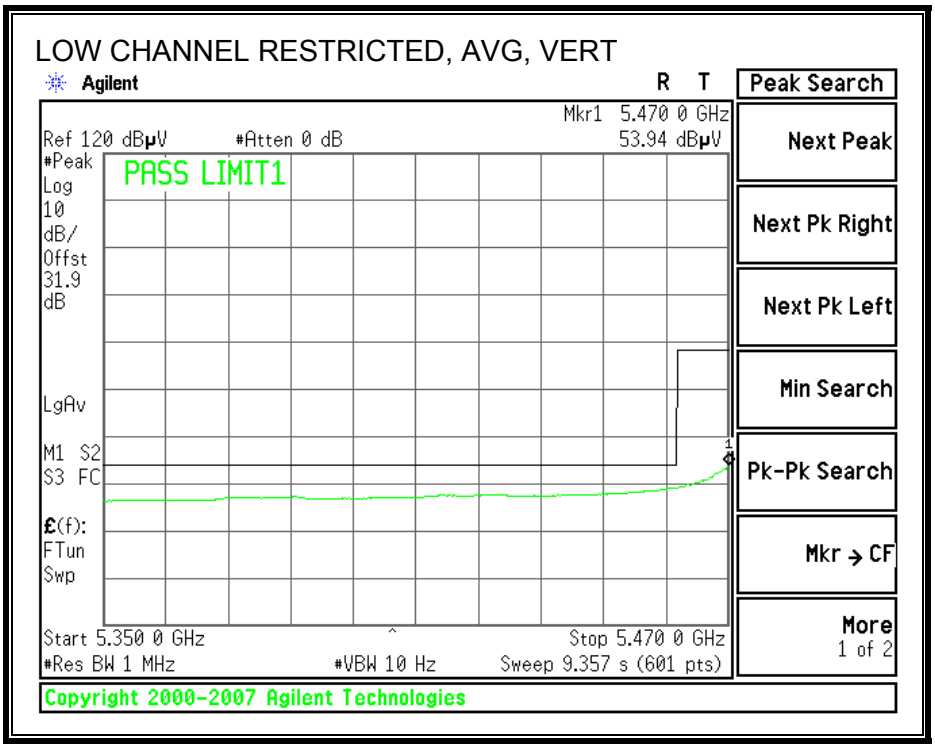
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





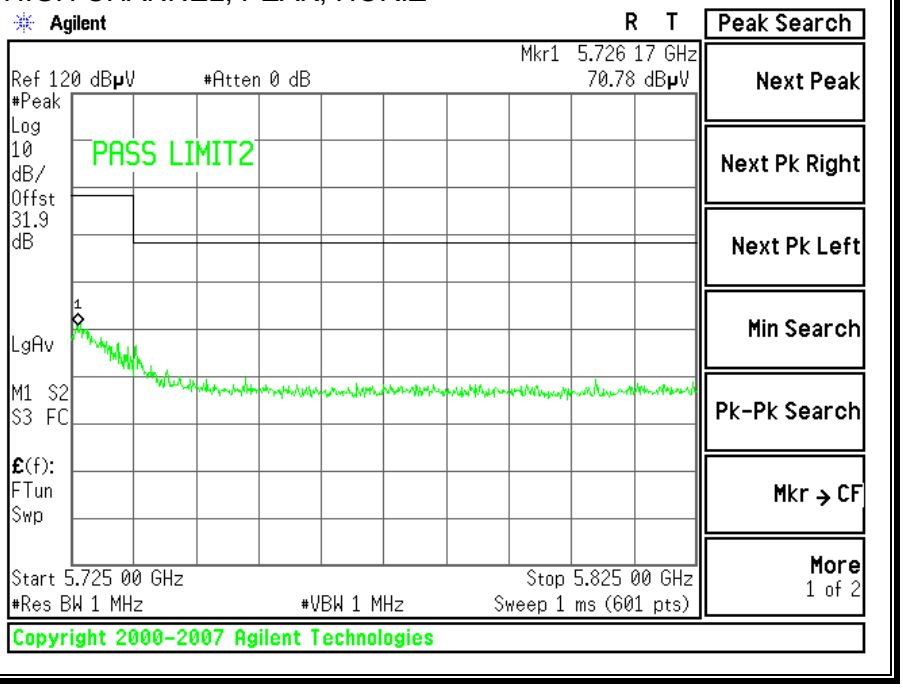
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



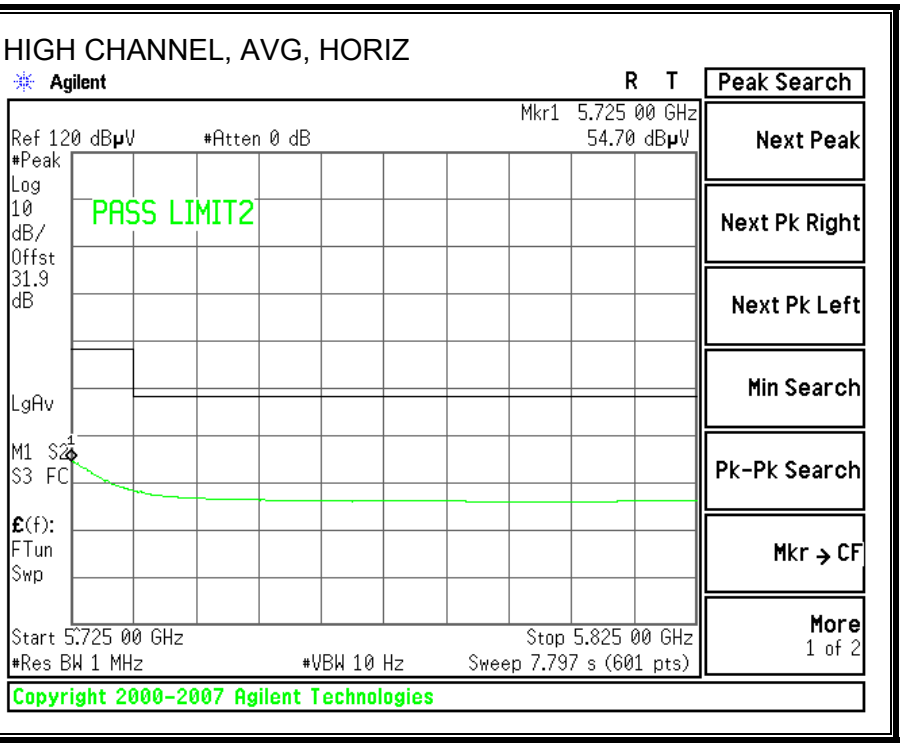


AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

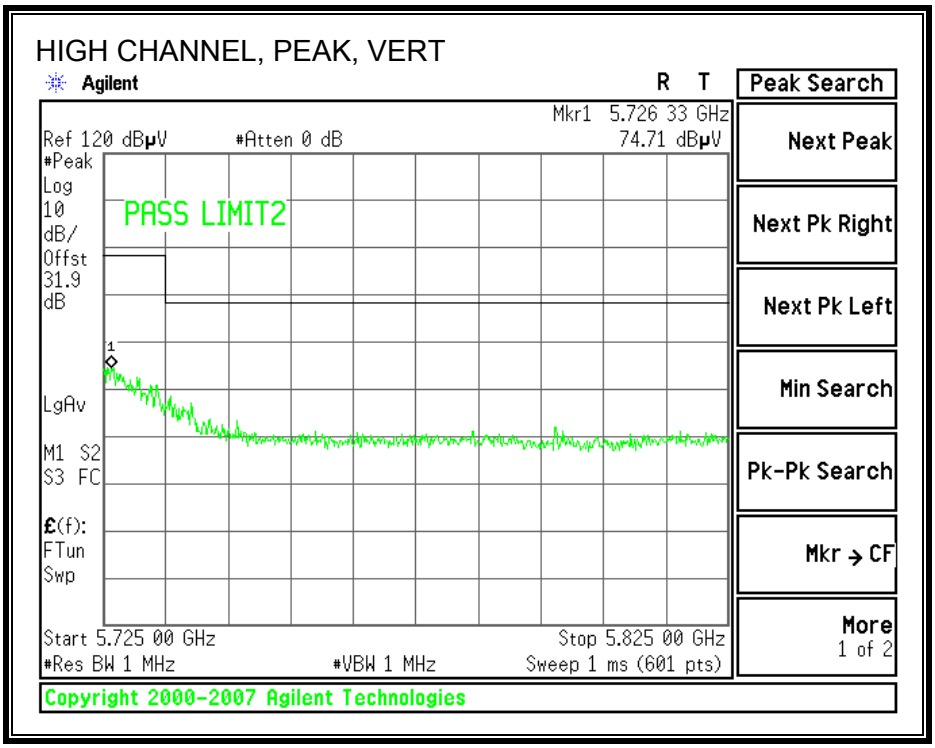
HIGH CHANNEL, PEAK, HORIZ

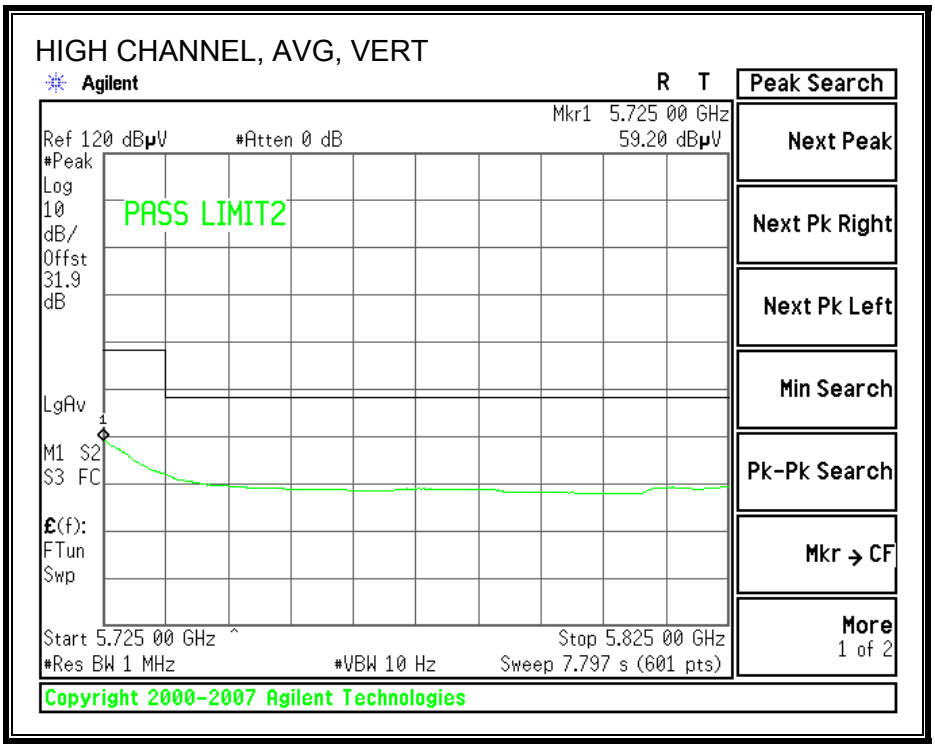


HIGH CHANNEL, AVG, HORIZ



AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Devin Chang
Configuration: EUT With desktop
Mode: 5.5GHz a mode Tx, PIFA Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

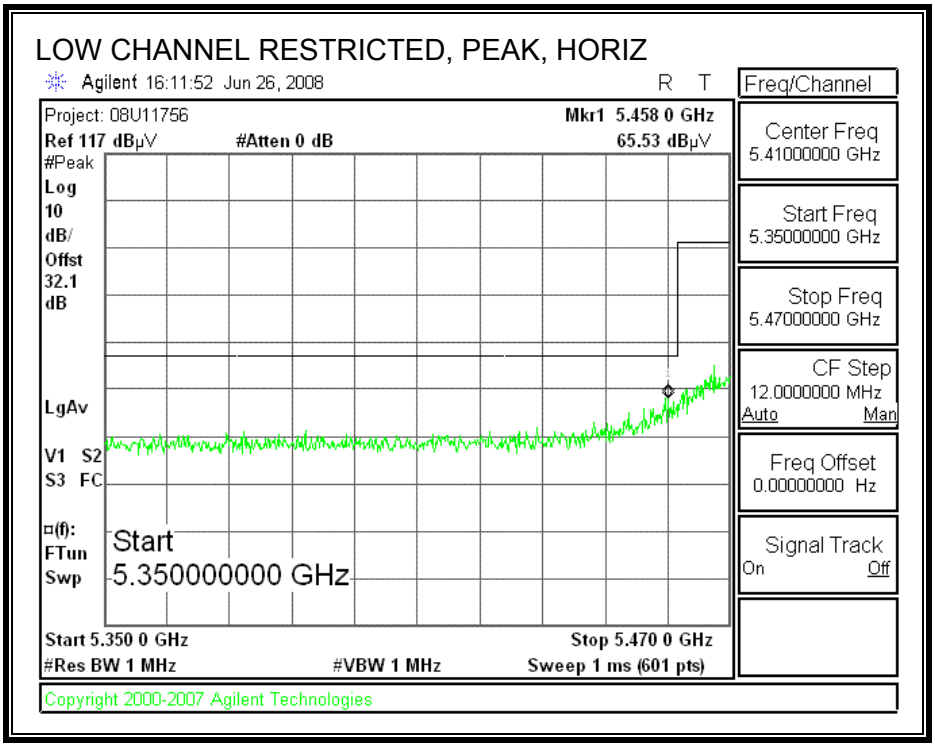
Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

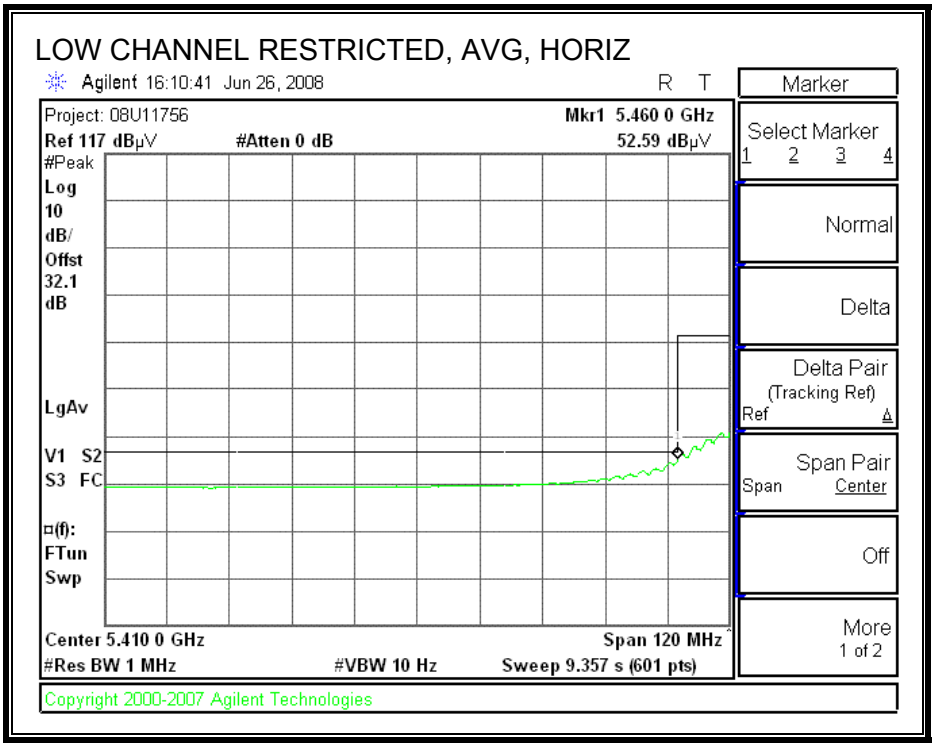
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5500MHz															
11.000	3.0	37.7	23.8	37.5	11.3	-32.6	0.0	0.7	54.7	40.8	74	54	-19.3	-13.2	H
11.000	3.0	36.8	23.1	37.5	11.3	-32.6	0.0	0.7	53.8	40.1	74	54	-20.2	-13.9	V
Mid Ch. 5600MHz															
11.200	3.0	36.6	23.7	37.6	11.5	-32.6	0.0	0.7	53.9	41.0	74	54	-20.1	-13.0	H
11.200	3.0	36.5	23.4	37.6	11.5	-32.6	0.0	0.7	53.7	40.7	74	54	-20.3	-13.3	V
High Ch. 5700MHz															
11.400	3.0	37.0	23.6	37.6	11.8	-32.5	0.0	0.7	54.5	41.1	74	54	-19.5	-12.9	H
11.400	3.0	36.6	23.3	37.6	11.8	-32.5	0.0	0.7	54.1	40.8	74	54	-19.9	-13.2	V

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		

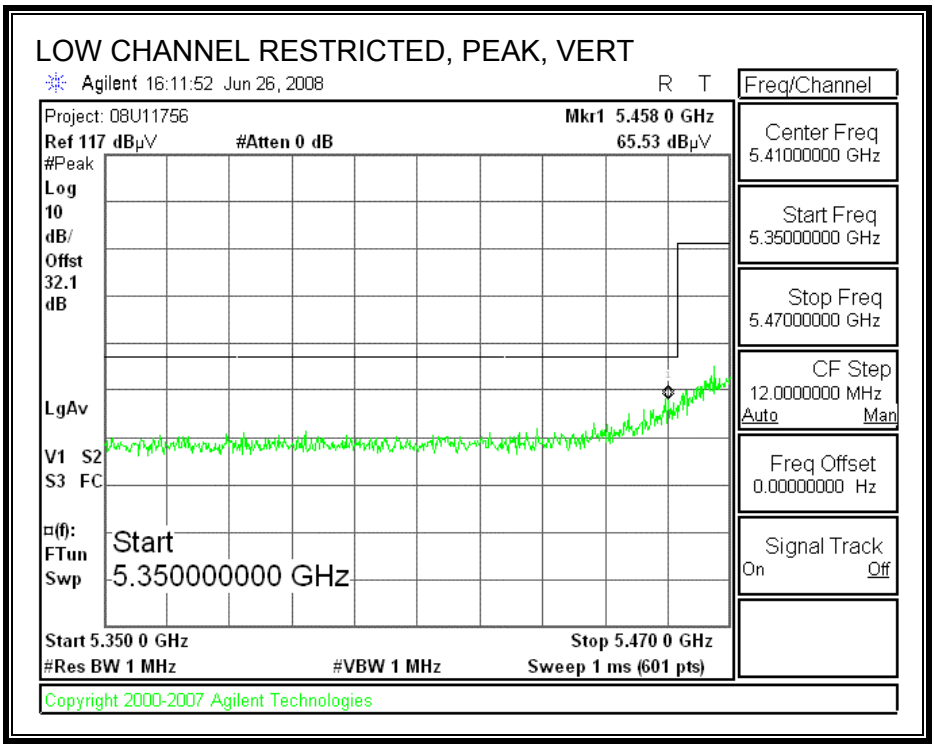
10.2.3.3 802.11n HT20 MODE With Hi PIFA & Hi SLOT Antenna Gains

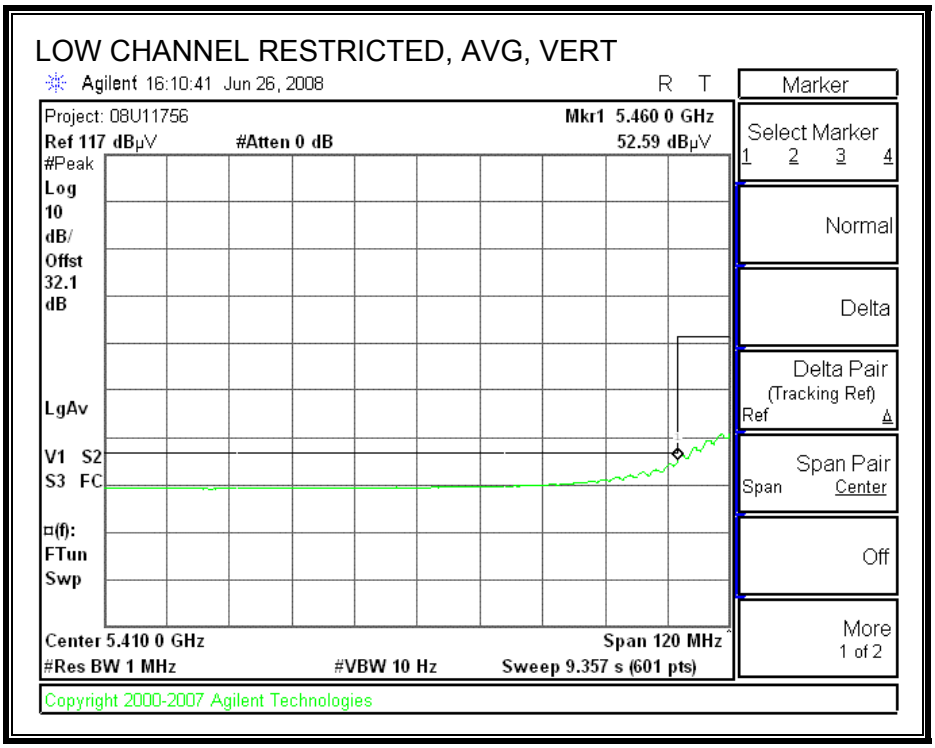
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



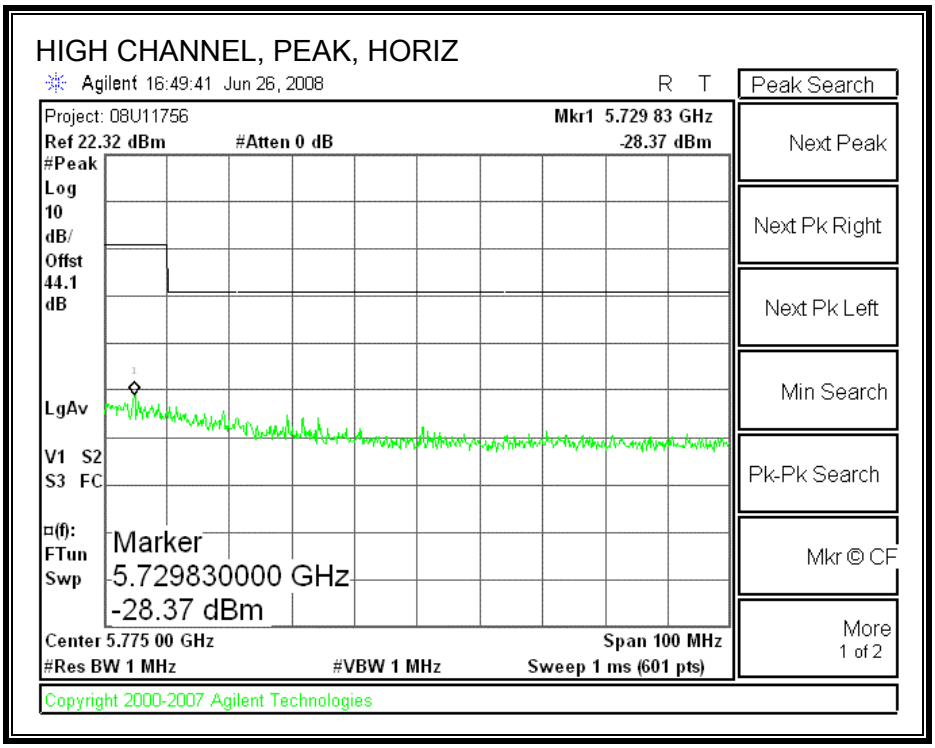


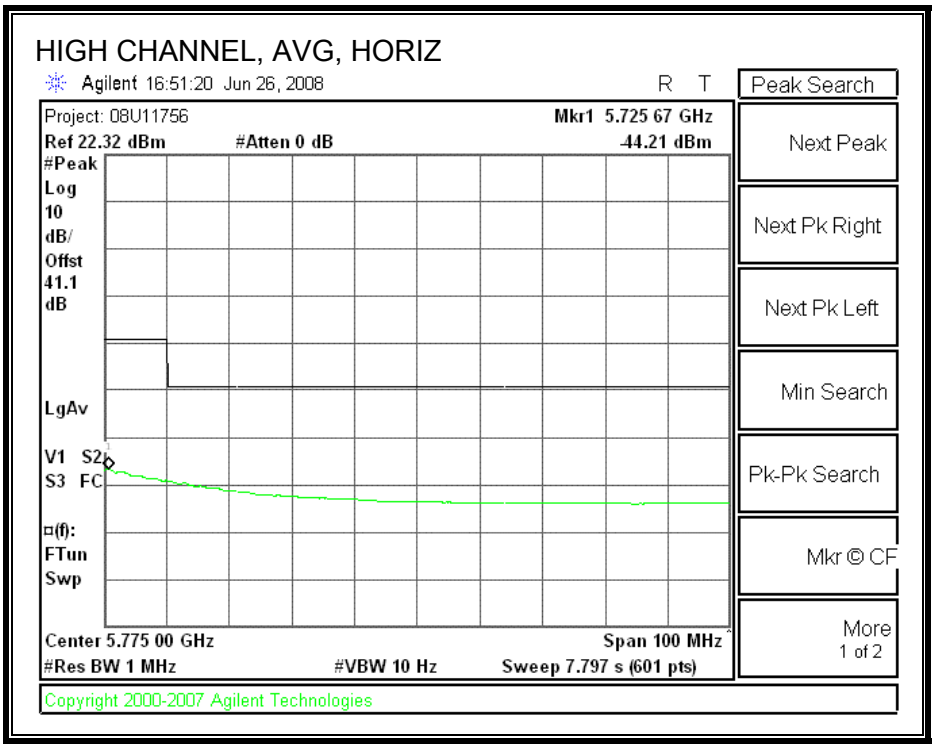
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



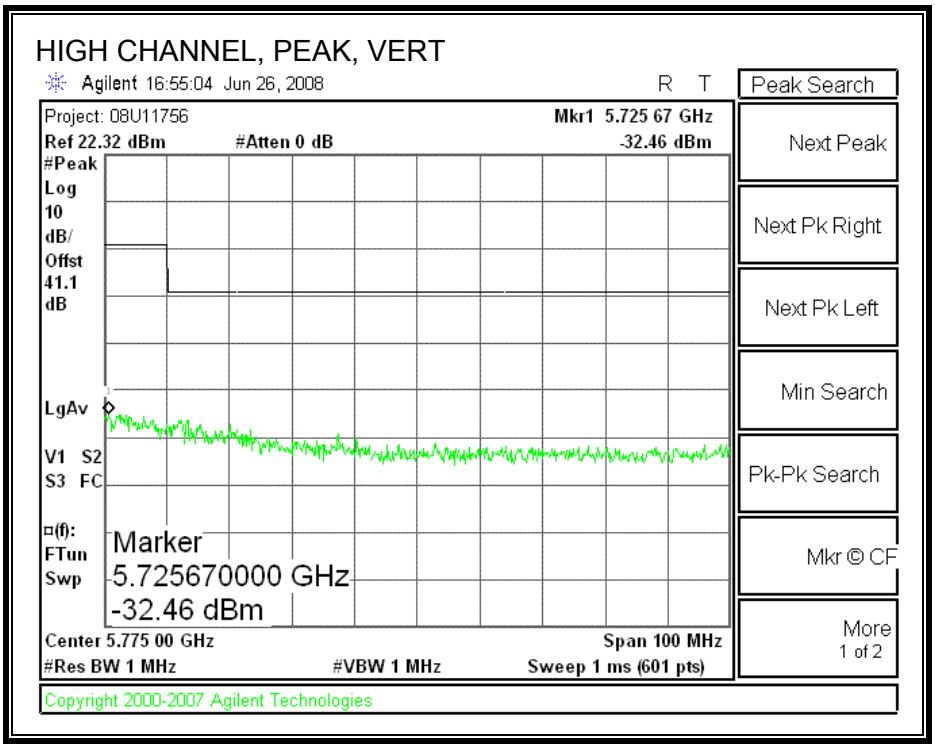


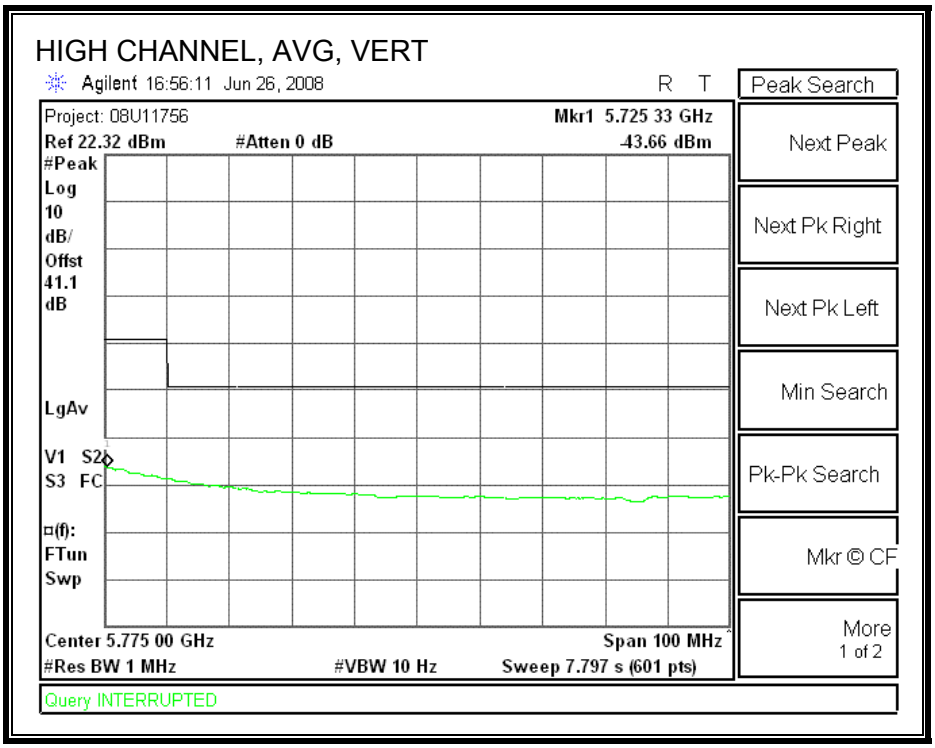
AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/26/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.5GHz HT 20 mode Tx, PIFA Hi AND SLOT Hi

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	C-5m Chamber	HPF_7.6GHz	

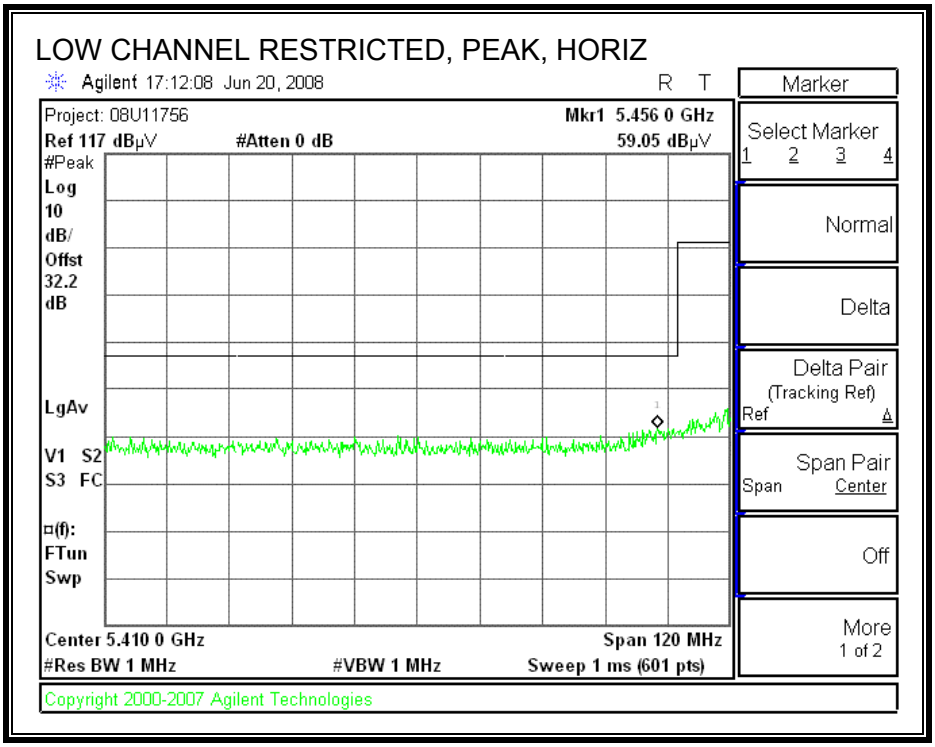
Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

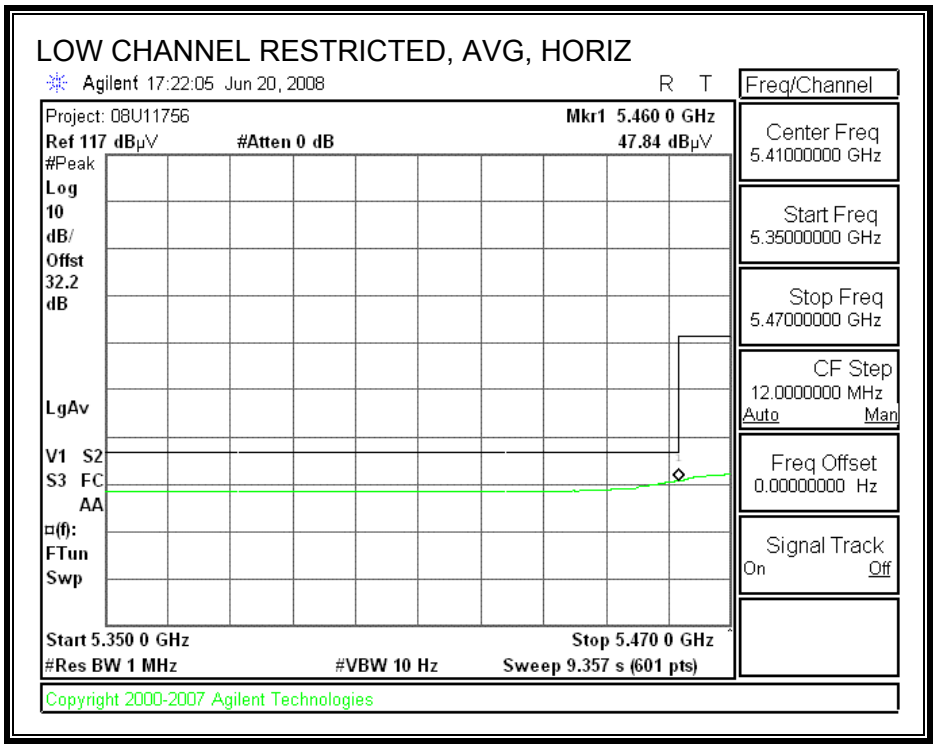
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5500MHz															
11.000	3.0	45.7	36.8	37.3	0.8	-33.8	0.0	0.7	50.7	41.9	74	54	-23.3	-12.1	H
11.000	3.0	46.0	35.8	37.3	0.8	-33.8	0.0	0.7	51.1	40.9	74	54	-22.9	-13.1	V
Mid Ch. 5600MHz															
11.200	3.0	44.5	33.8	37.3	0.8	-33.5	0.0	0.7	49.9	39.1	74	54	-24.1	-14.9	H
11.200	3.0	44.0	33.9	37.3	0.8	-33.5	0.0	0.7	49.3	39.3	74	54	-24.7	-14.7	V
High Ch. 5700MHz															
11.400	3.0	46.3	34.3	37.4	0.8	-33.2	0.0	0.7	51.9	39.9	74	54	-22.1	-14.1	H
11.400	3.0	46.4	34.2	37.4	0.8	-33.2	0.0	0.7	52.0	39.8	74	54	-22.0	-14.2	V

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		

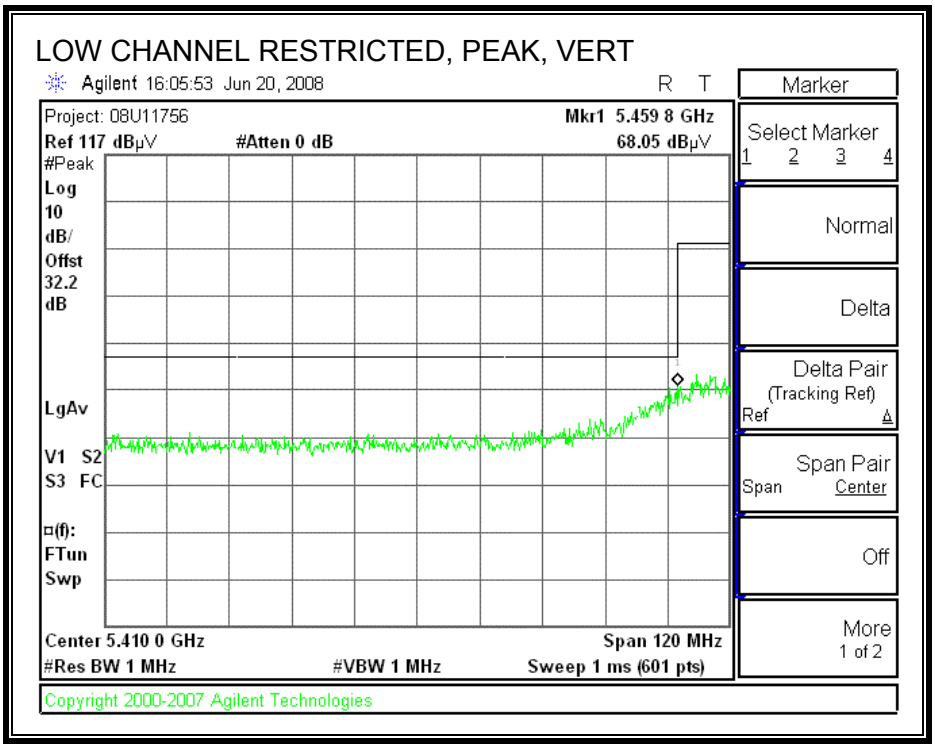
10.2.3.4 802.11n HT40 SISO MODE With Hi Slot Antenna Gain

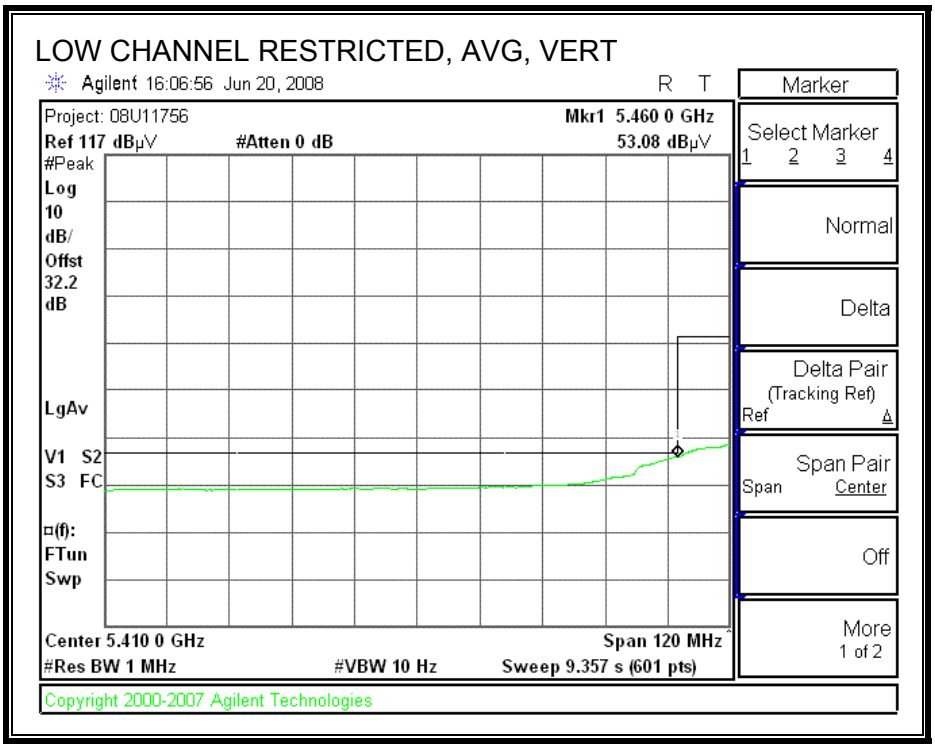
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



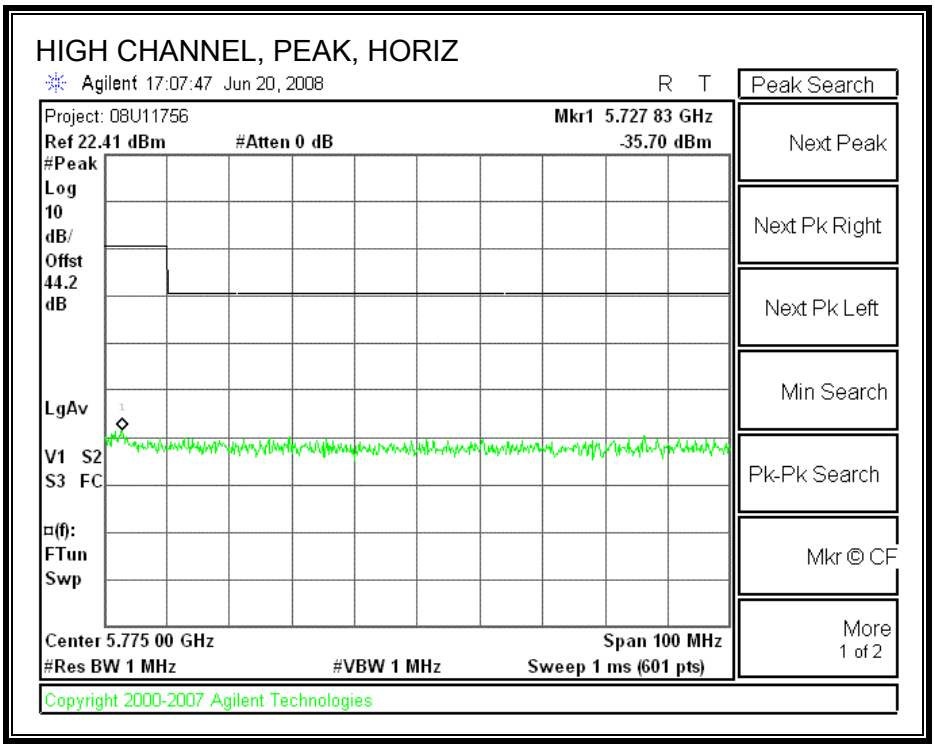


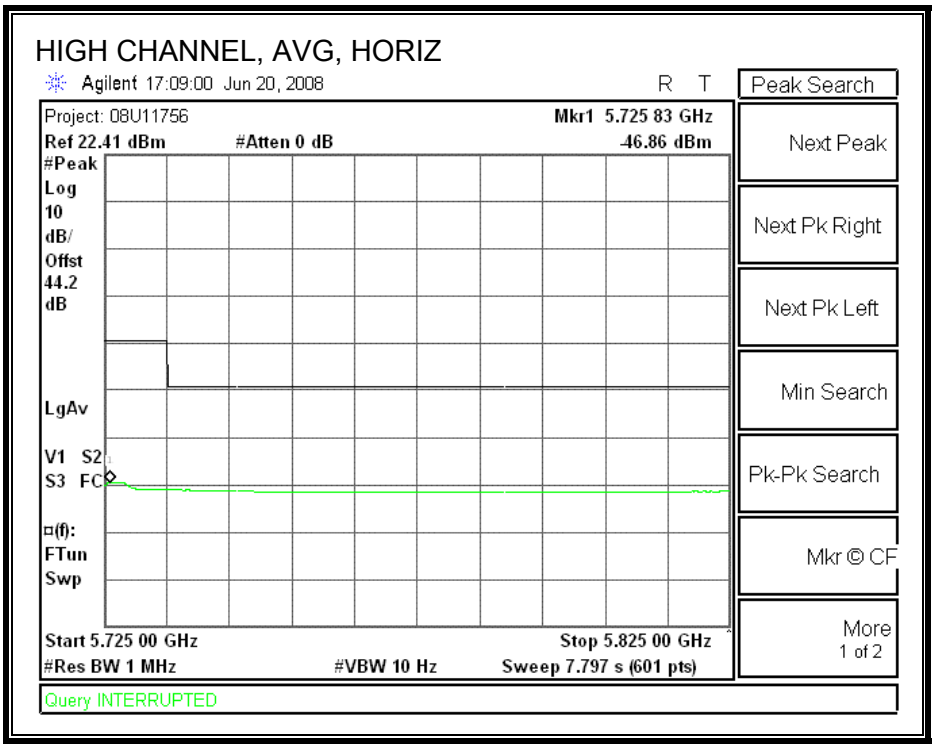
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



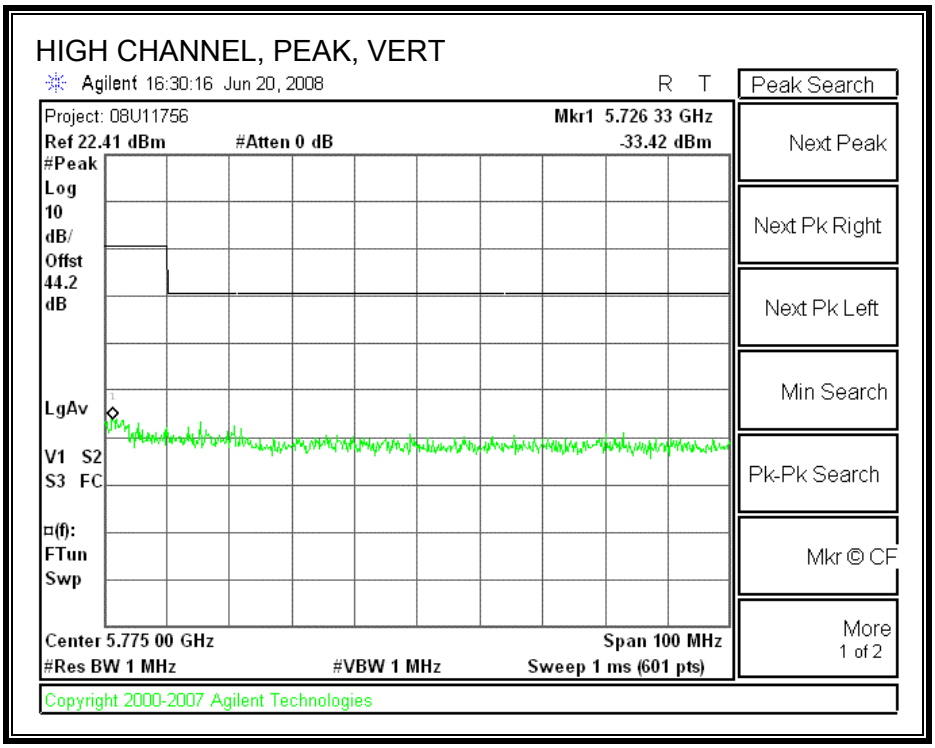


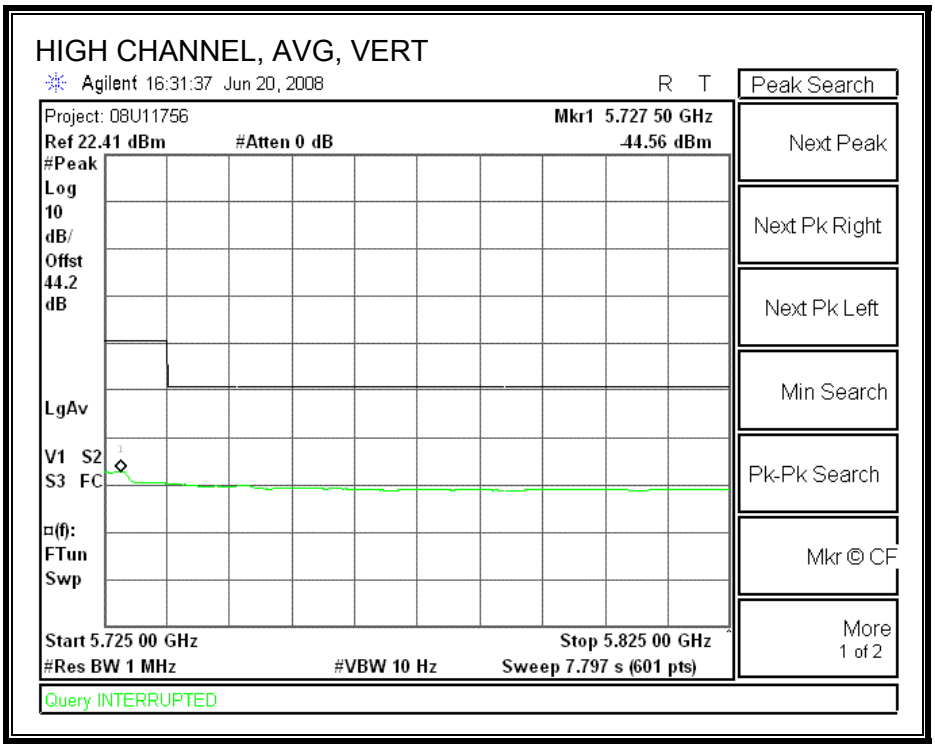
AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/21/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.5GHz HT40 SISO mode Tx, Slot Antenna

Test Equipment:

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

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		C-5m Chamber		R_001

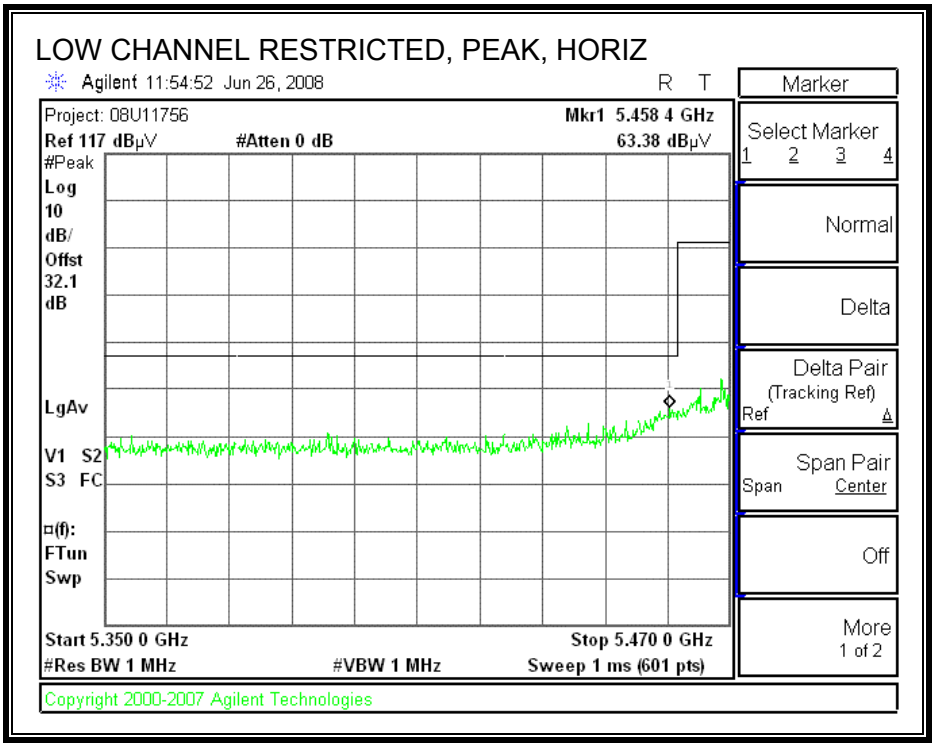
Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

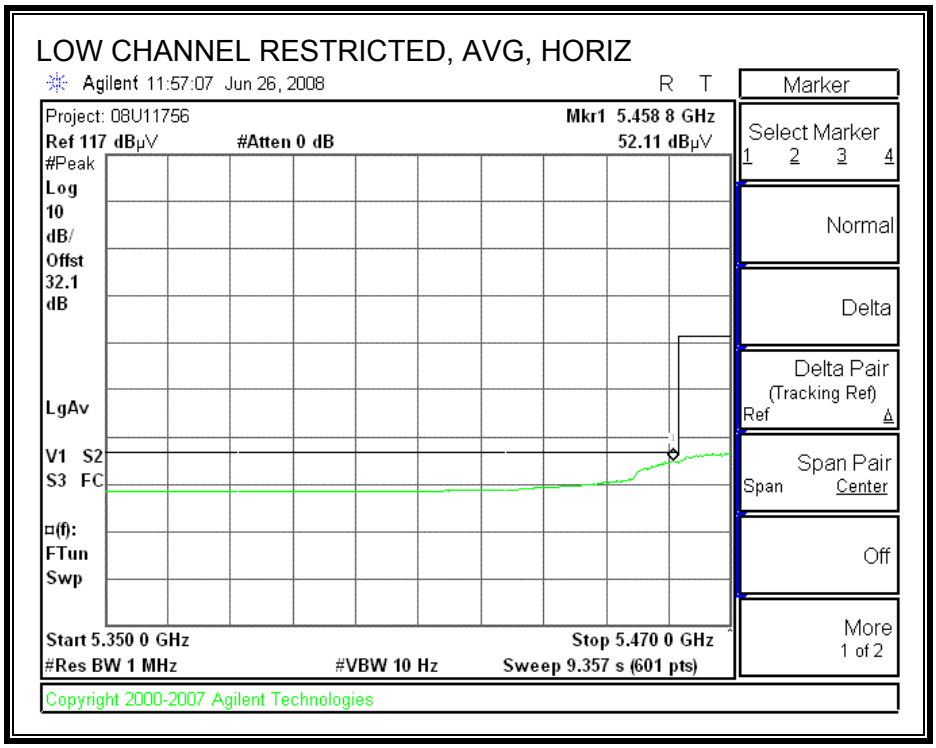
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5510MHz															
11.020	3.0	43.7	30.8	37.3	0.0	-33.7	0.0	0.0	47.2	34.3	74	54	-26.8	-19.7	H
11.020	3.0	43.6	30.8	37.3	0.0	-33.7	0.0	0.0	47.1	34.3	74	54	-26.9	-19.7	V
Mid Ch. 5590MHz															
11.180	3.0	43.3	30.9	37.3	0.0	-33.5	0.0	0.0	47.1	34.7	74	54	-26.9	-19.3	H
11.180	3.0	46.7	32.5	37.3	0.0	-33.5	0.0	0.0	50.5	36.3	74	54	-23.5	-17.7	V
High Ch. 5670MHz															
11.340	3.0	43.4	31.1	37.4	0.0	-33.3	0.0	0.0	47.4	35.2	74	54	-26.6	-18.8	H
11.340	3.0	44.7	32.2	37.4	0.0	-33.3	0.0	0.0	48.8	36.3	74	54	-25.2	-17.7	V

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		

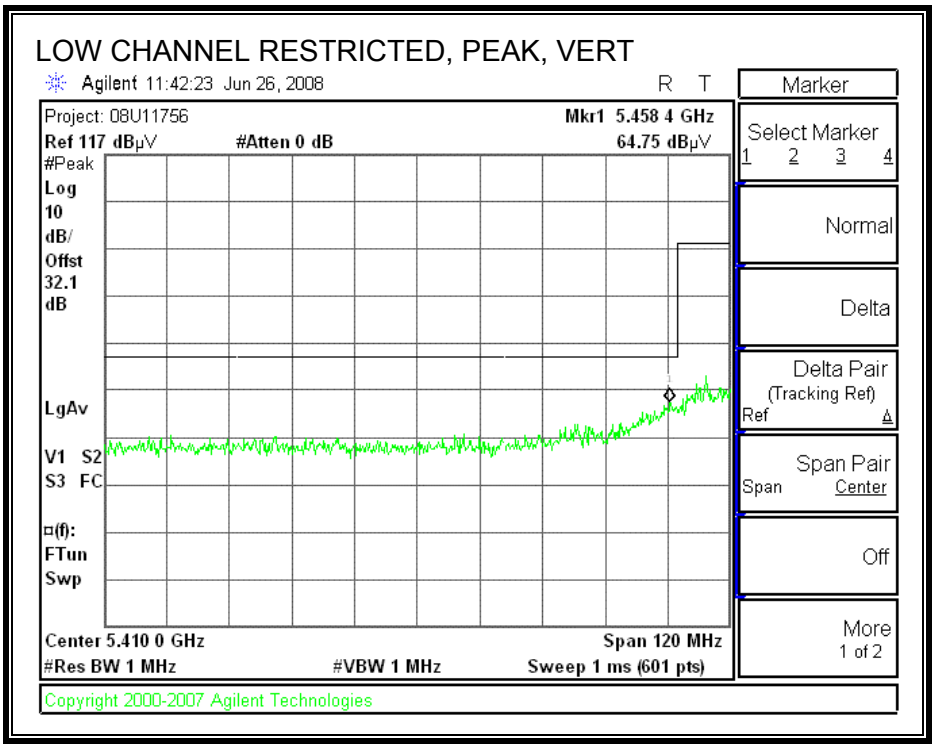
10.2.3.5 802.11n HT40 SISO MODE With Hi PIFA Antenna Gain

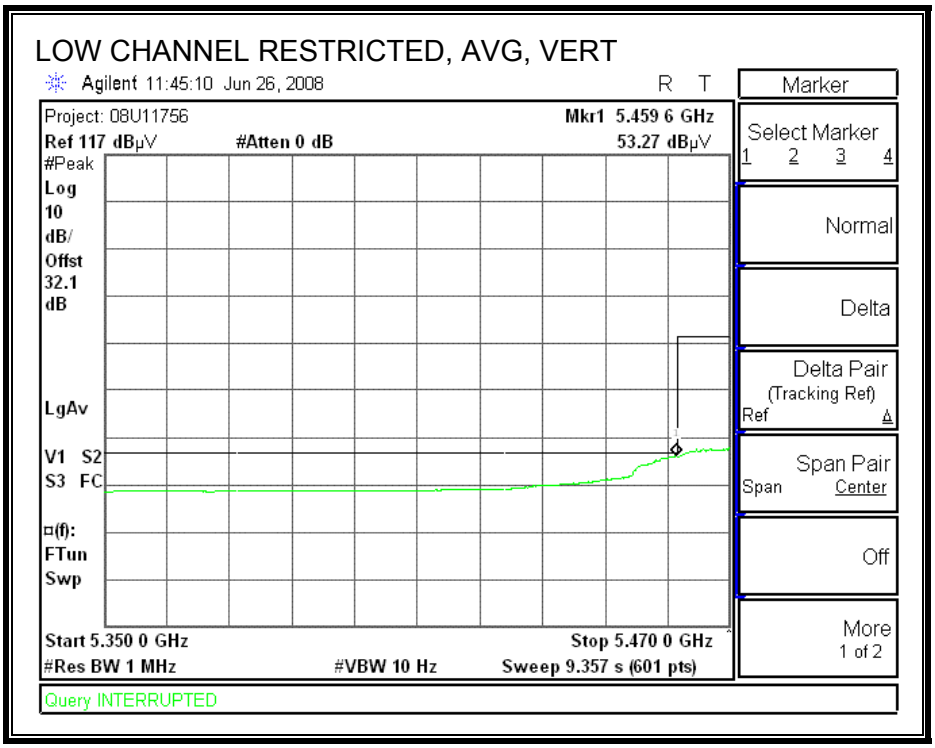
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





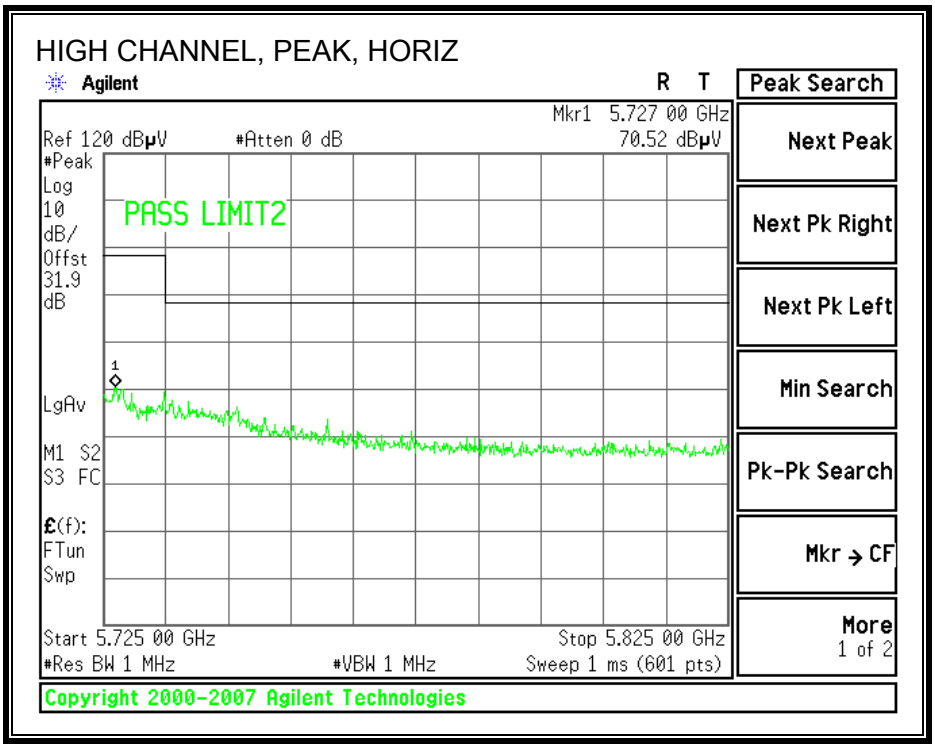
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



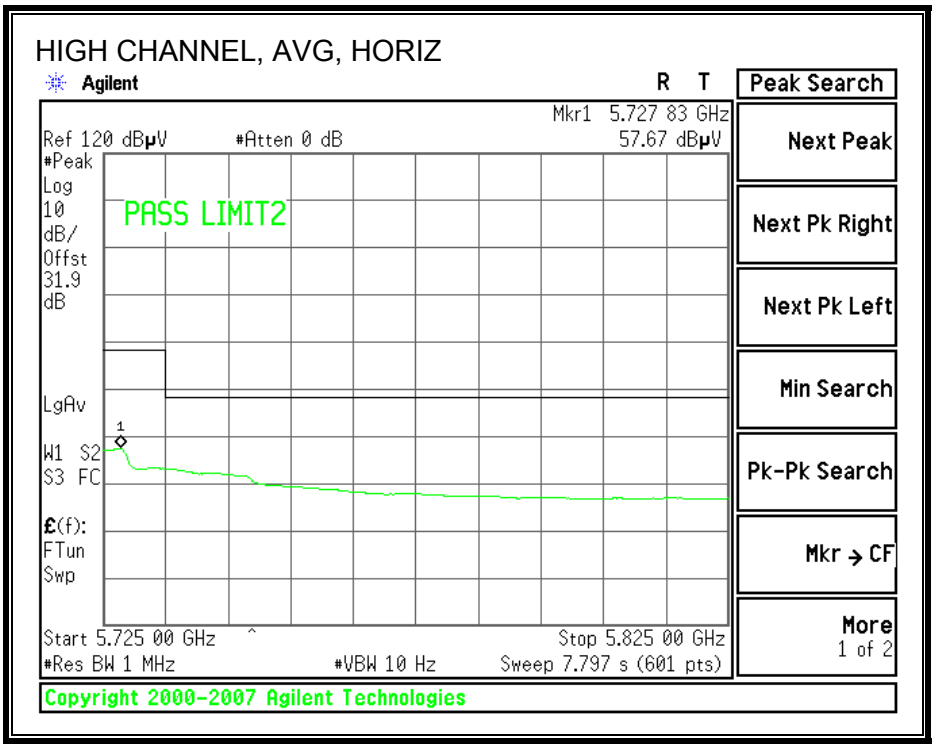


AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

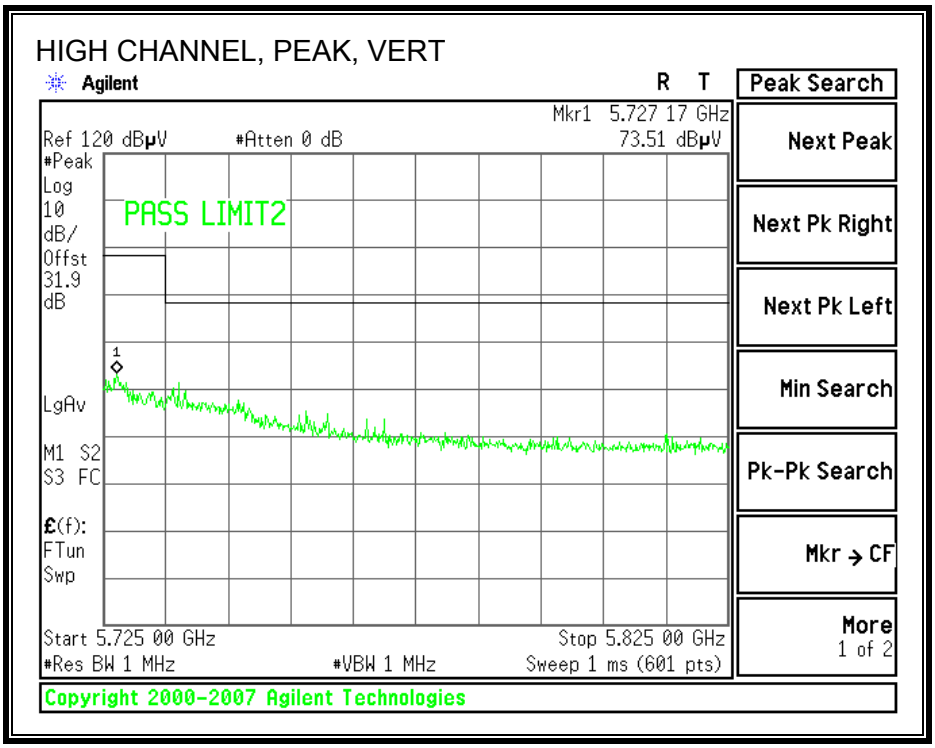
HIGH CHANNEL, PEAK, HORIZ

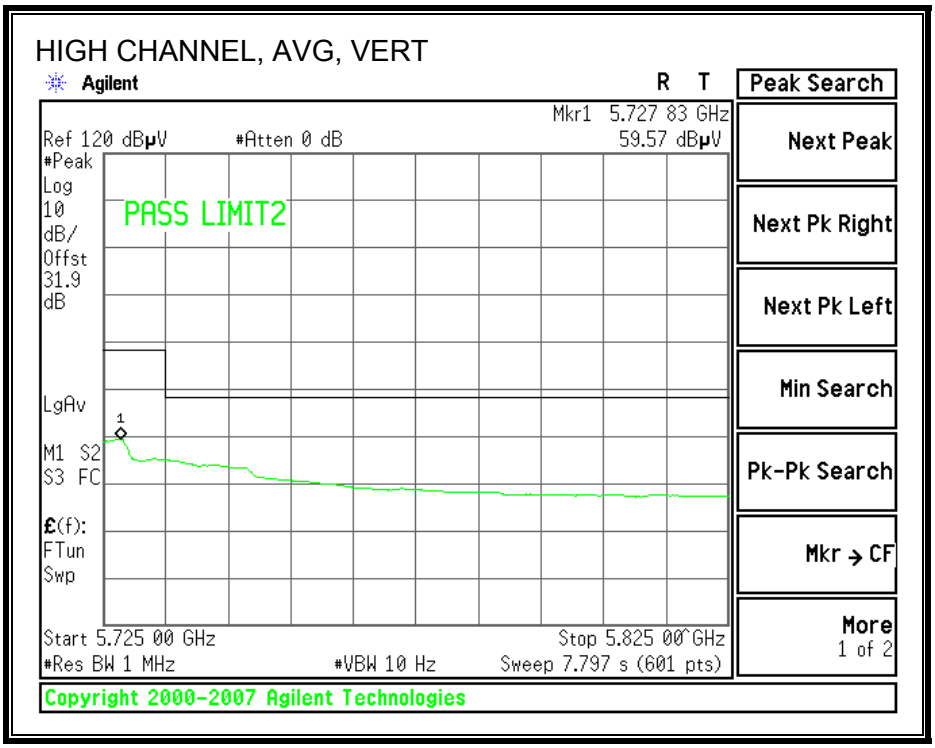


HIGH CHANNEL, AVG, HORIZ



AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/15/2008
Test Engineer: Devin Chang
Configuration: EUT With desktop
Mode: 5.5GHz HT40 SISO mode Tx, PIFA Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber	HPF_7.6GHz	

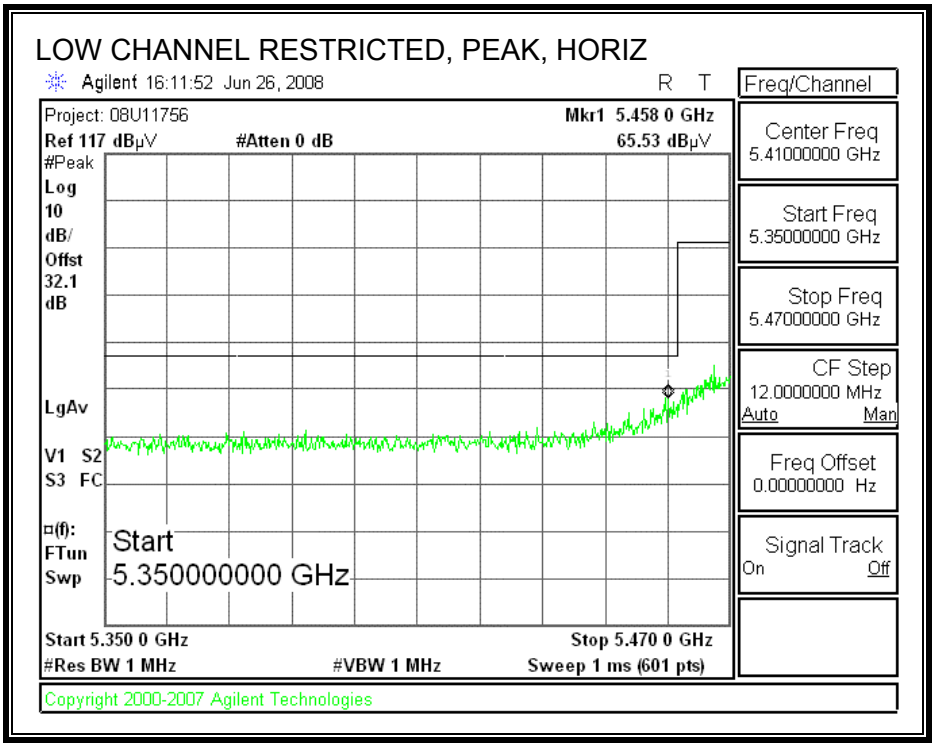
Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

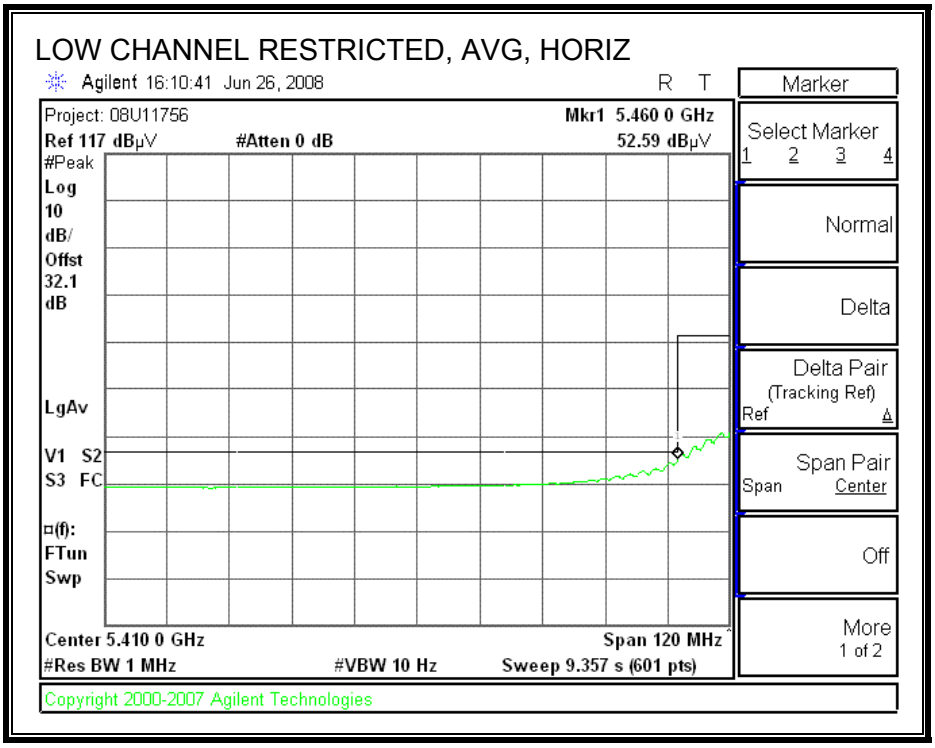
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5510MHz															
11.020	3.0	37.4	23.5	37.5	11.4	-32.6	0.0	0.7	54.4	40.5	74	54	-19.6	-13.5	H
11.020	3.0	36.2	22.7	37.5	11.4	-32.6	0.0	0.7	53.2	39.7	74	54	-20.8	-14.3	V
Mid Ch. 5590MHz															
11.180	3.0	36.4	23.4	37.6	11.5	-32.6	0.0	0.7	53.6	40.7	74	54	-20.4	-13.3	H
11.180	3.0	36.1	23.0	37.6	11.5	-32.6	0.0	0.7	53.3	40.2	74	54	-20.7	-13.8	V
High Ch. 5670MHz															
11.340	3.0	37.0	22.9	37.6	11.7	-32.6	0.0	0.7	54.4	40.3	74	54	-19.6	-13.7	H
11.340	3.0	35.8	22.3	37.6	11.7	-32.6	0.0	0.7	53.2	39.8	74	54	-20.8	-14.2	V

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		

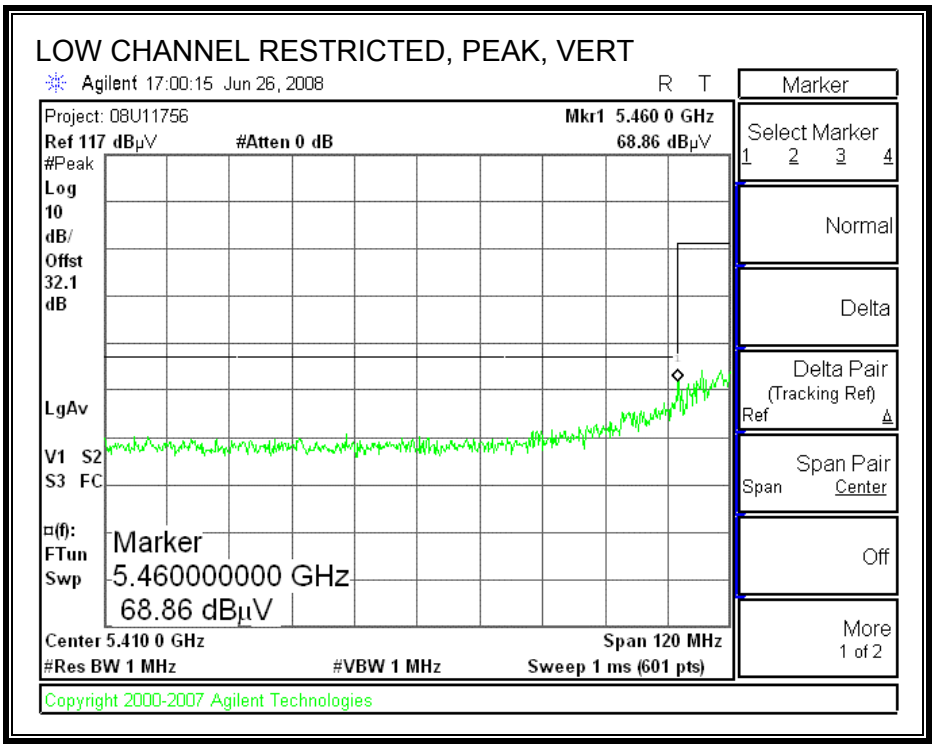
10.2.3.6 802.11n HT40 MODE With Hi PIFA & Hi Slot Antenna Gains

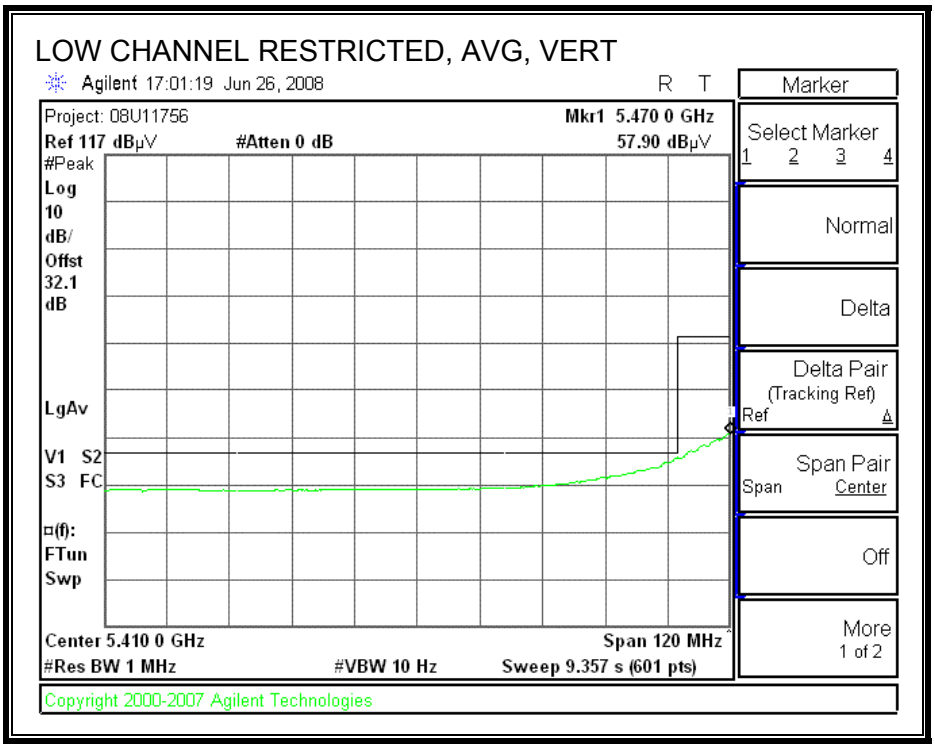
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



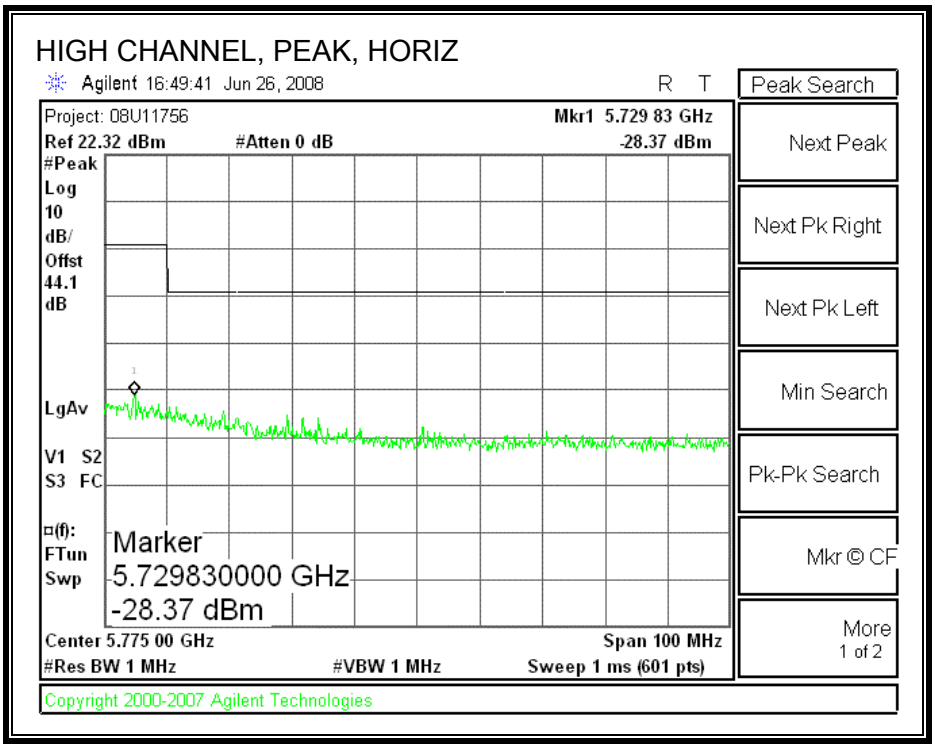


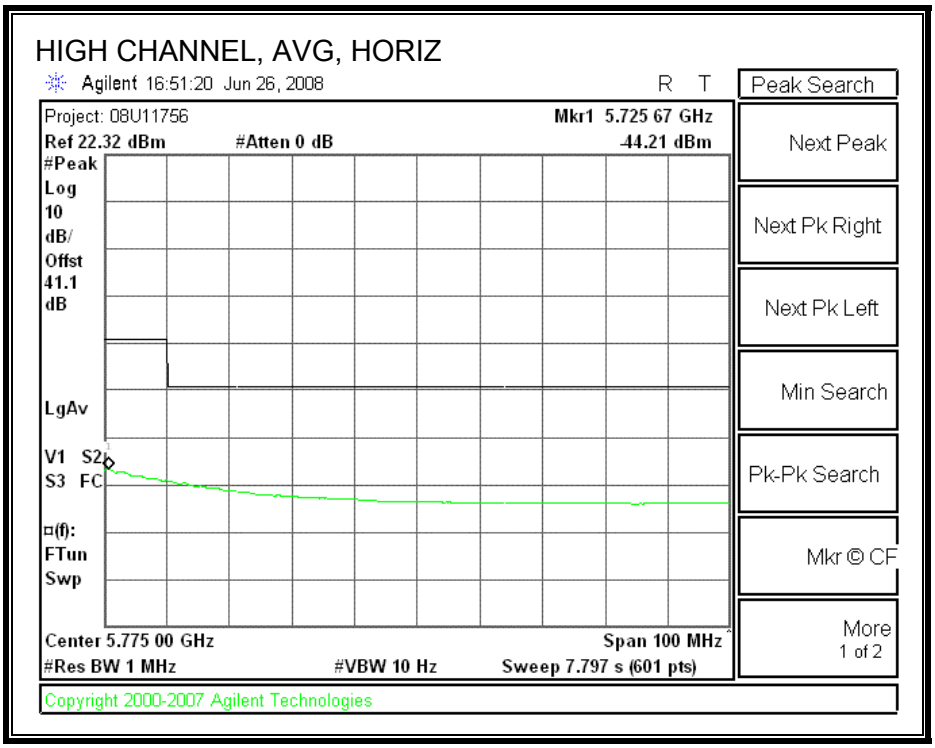
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



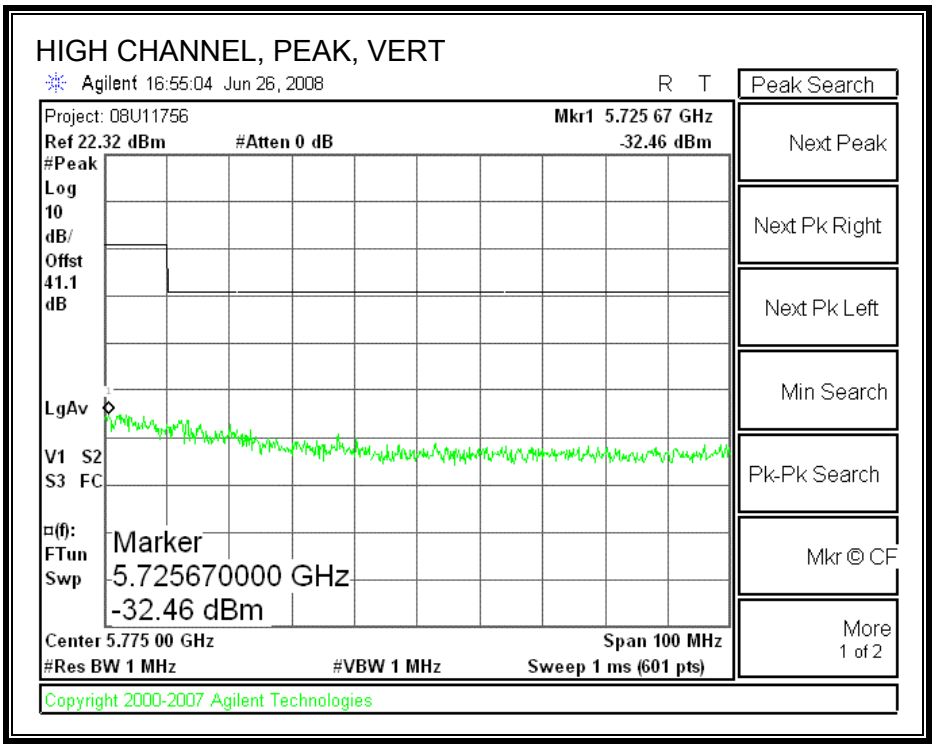


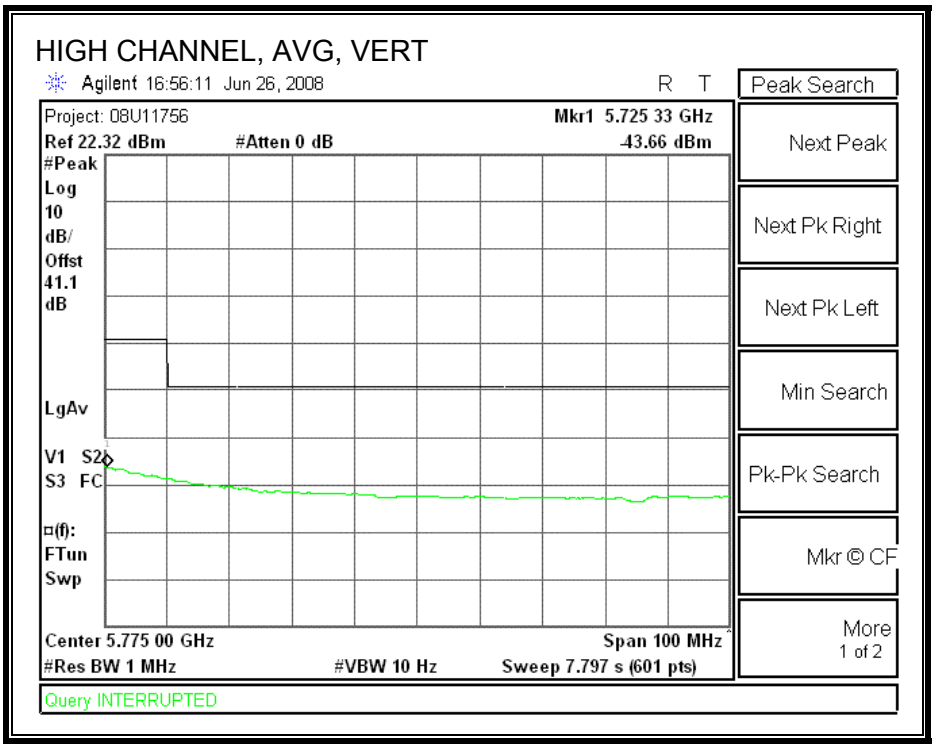
AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/26/2008
Test Engineer: Can Ming Chung
Configuration: EUT With desktop
Mode: 5.5GHz HT 40 mode Tx, PIFA Hi AND SLOT Hi ANTENNAS

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	C-5m Chamber	HPF_7.6GHz	

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch. 5510MHz															
11.020	3.0	43.9	33.4	37.3	0.8	-33.7	0.0	0.7	49.1	38.5	74	54	-24.9	-15.5	H
11.020	3.0	44.4	32.2	37.3	0.8	-33.7	0.0	0.7	49.5	37.3	74	54	-24.5	-16.7	V
Mid Ch. 5590MHz															
11.180	3.0	45.7	34.2	37.3	0.8	-33.5	0.0	0.7	51.1	39.6	74	54	-22.9	-14.4	H
11.180	3.0	43.9	33.0	37.3	0.8	-33.5	0.0	0.7	49.2	38.3	74	54	-24.8	-15.7	V
High Ch. 5670MHz															
11.340	3.0	44.7	33.5	37.4	0.8	-33.3	0.0	0.7	50.2	39.0	74	54	-23.8	-15.0	H
11.340	3.0	44.2	32.3	37.4	0.8	-33.3	0.0	0.7	49.8	37.9	74	54	-24.2	-16.1	V

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		

10.3. RECEIVER ABOVE 1 GHz

10.3.1. 20 MHz BANDWIDTH

High Frequency Measurement
Compliance Certification Services, 3 Meter_C Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/23/2008
Test Engineer: Vien Tran
Configuration: EUT with Worst-case Combination Antenna Gain
Mode: Rx Mode_5GHz Band_HT20

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T145 Agilent 3008A005(			60.05FCC 15.20

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	Ninous 208946002		

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)
1.205	3.0	57.8	44.7	25.9	1.6	-36.0	0.0	0.0	49.4	36.3	74	54	-24.6	-17.7	H
1.607	3.0	53.2	37.3	27.0	1.8	-35.7	0.0	0.0	46.2	30.3	74	54	-27.8	-23.7	H
2.494	3.0	62.3	43.2	28.9	2.0	-35.1	0.0	0.0	58.1	39.0	74	54	-15.9	-15.0	H
4.987	3.0	53.0	34.6	33.1	2.7	-34.9	0.0	0.0	54.0	35.6	74	54	-20.0	-18.4	H
1.205	3.0	60.1	46.4	25.9	1.6	-36.0	0.0	0.0	51.6	37.9	74	54	-22.4	-16.1	V
1.607	3.0	56.2	41.5	27.0	1.8	-35.7	0.0	0.0	49.2	34.5	74	54	-24.8	-19.5	V
2.494	3.0	62.3	43.4	28.9	2.0	-35.1	0.0	0.0	58.1	39.2	74	54	-15.9	-14.8	V
4.987	3.0	51.2	33.6	33.1	2.7	-34.9	0.0	0.0	52.2	34.5	74	54	-21.8	-19.5	V

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		

10.3.2. 40 MHz BANDWIDTH

High Frequency Measurement
Compliance Certification Services, 3 Meter_C Chamber

Company: Broadcom
Project #: 08U11756
Date: 6/23/2008
Test Engineer: Vien Tran
Configuration: EUT with Worst-case Antenna
Mode: Rx Mode_5GHz Band_HT40

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			60.05FCC 15.20

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	Ninous 208946002		

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)
1.205	3.0	57.8	44.7	24.5	1.6	-36.0	0.0	0.0	48.0	34.9	74	54	-26.0	-19.1	H
2.494	3.0	62.3	43.2	28.6	2.0	-35.1	0.0	0.0	57.8	38.7	74	54	-16.2	-15.3	H
4.987	3.0	53.0	34.6	33.5	2.7	-34.9	0.0	0.0	54.3	35.9	74	54	-19.7	-18.1	H
1.205	3.0	60.1	46.4	24.5	1.6	-36.0	0.0	0.0	50.2	36.5	74	54	-23.8	-17.5	V
1.607	3.0	56.2	41.5	26.0	1.8	-35.7	0.0	0.0	48.3	33.5	74	54	-25.7	-20.5	V
2.494	3.0	62.3	43.4	28.6	2.0	-35.1	0.0	0.0	57.8	38.9	74	54	-16.2	-15.1	V

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		

10.4. WORST-CASE BELOW 1 GHz

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

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

Data#: 33 File#: 08u11756.emi Date: 06-23-2008 Time: 15:50:20

Condition: FCC CLASS-B VERTICAL
Test Operator:: Vien Tran
Project #: : 08U11756
Company: : Broadcom
Configuration:: EUT with Worst-case Combination Antenna Gain
Mode : : Normal Tx in MIMO mode
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	253.100	52.00	-14.17	37.83	46.00	-8.17	Peak
2	294.810	52.50	-12.53	39.97	46.00	-6.03	Peak
3	413.150	46.67	-9.64	37.03	46.00	-8.97	Peak
4	500.450	43.00	-7.30	35.70	46.00	-10.30	Peak
5	698.330	41.42	-3.73	37.69	46.00	-8.31	Peak
6	995.150	43.17	-0.26	42.91	54.00	-11.09	Peak

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

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

Data#: 33 File#: 08u11756.emi Date: 06-23-2008 Time: 15:50:20

Condition: FCC CLASS-B VERTICAL
Test Operator:: Vien Tran
Project #: : 08U11756
Company: : Broadcom
Configuration:: EUT with Worst-case Combination Antenna Gain
Mode : : Normal Tx in MIMO mode
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	253.100	52.00	-14.17	37.83	46.00	-8.17	Peak
2	294.810	52.50	-12.53	39.97	46.00	-6.03	Peak
3	413.150	46.67	-9.64	37.03	46.00	-8.97	Peak
4	500.450	43.00	-7.30	35.70	46.00	-10.30	Peak
5	698.330	41.42	-3.73	37.69	46.00	-8.31	Peak
6	995.150	43.17	-0.26	42.91	54.00	-11.09	Peak

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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 receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

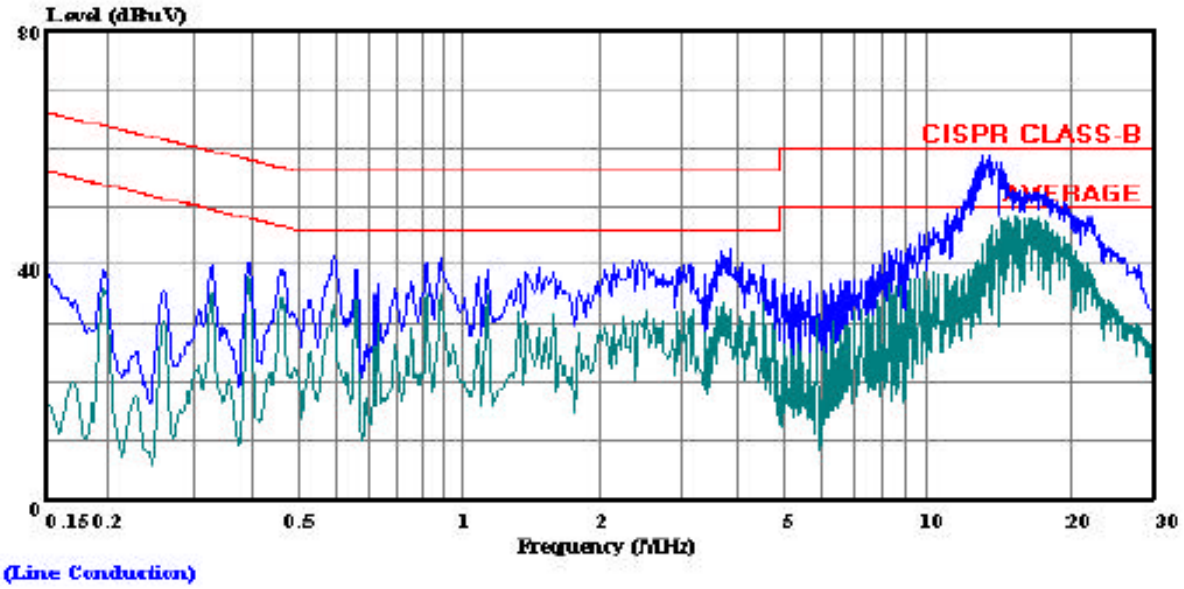
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit		Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.17	55.90	--	47.70	0.00	65.01	55.01	-9.11	-7.31	L1
0.25	50.83	--	41.10	0.00	61.66	51.66	-10.83	-10.56	L1
0.34	48.18	--	43.10	0.00	59.23	49.23	-11.05	-6.13	L1
0.17	55.83	--	47.36	0.00	65.01	55.01	-9.18	-7.65	L2
0.25	51.98	--	43.03	0.00	61.66	51.66	-9.68	-8.63	L2
0.34	48.25	--	42.10	0.00	59.23	49.23	-10.98	-7.13	L2
6 Worst Data									

LINE 1 RESULTS

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

Data#: 36 File#: LC 08U11756.EMI Date: 06-23-2008 Time: 09:35:30



(Line Conduction)

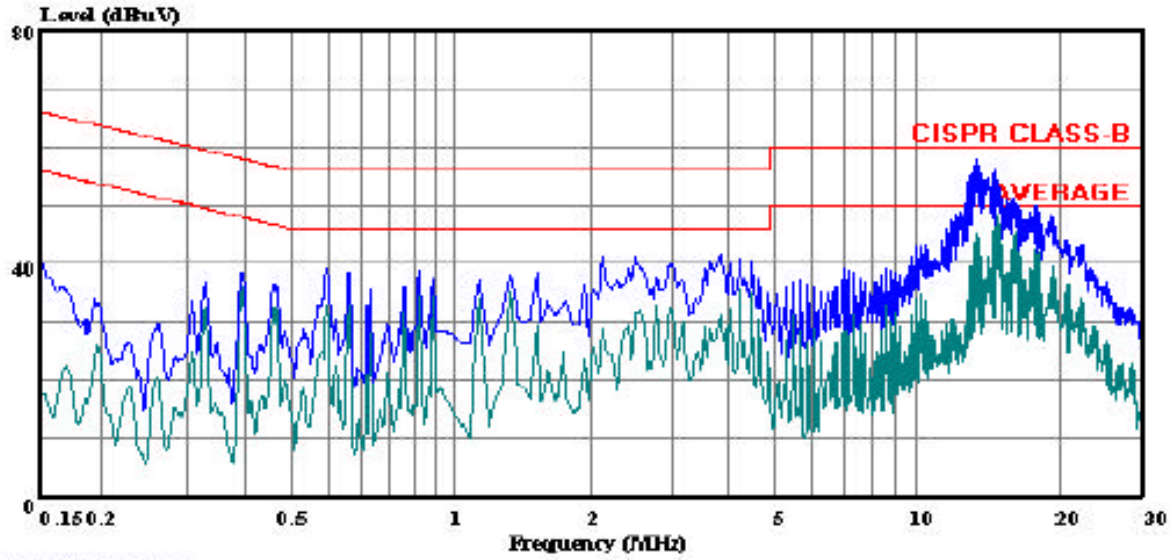
Trace: 26 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Vien Tran
Project #: : 08U11756
Company: : Broadcom
Configuration:: EUT with Worst-case Combination Antenna Gain
Mode: : Normal Tx in MIMO mode
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L1: Peak (Blue); Avg (Green)

LINE 2 RESULTS

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

Data#: 37 File#: LC 08U11756.EMI Date: 06-23-2008 Time: 09:54:11



(Line Conduction)

Trace: 33 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Vien Tran
Project #: : 08U11756
Company: : Broadcom
Configuration:: EUT with Worst-case Combination Antenna Gain
Mode: : Normal Tx in MIMO mode
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L2: Peak (Blue); Avg (Green)

12. DYNAMIC FREQUENCY SELECTION

12.1. OVERVIEW

12.1.1. LIMITS

INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) **Channel Availability Check Time:** …

Additional requirements for the band 5600-5650 MHz: Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

RSS-210 Issue 7 A9.4 (b) (iv) **Channel closing time:** the maximum channel closing time is 260 ms.

FCC

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client **(without DFS)**	Client **(with DFS)**
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period

The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

For the Short pulse radar Test Signals this instant is the end of the *Burst*.

For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated.

For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Table 6 – Long Pulse Radar Test Signal

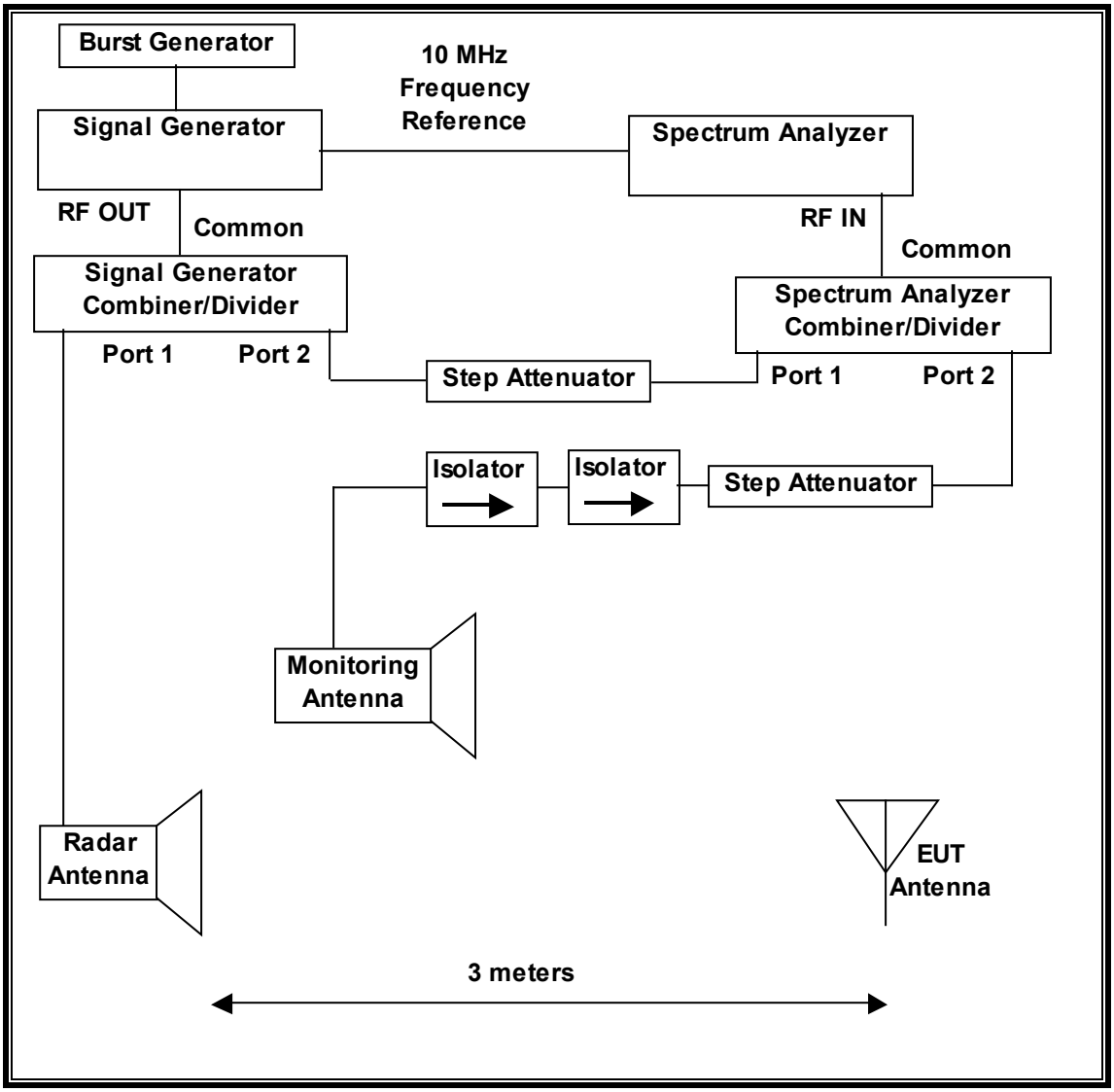
Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	300	9	.333	70%	30

12.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The signal monitoring equipment consists of a spectrum analyzer set to display 8001 bins on the horizontal axis. The time-domain resolution is 2 msec / bin with a 16 second sweep time, meeting the 10 second short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. Measure the amplitude and calculate the difference from –64 dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection threshold. Separate signal generator amplitude settings are determined as required for each radar type.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

Establish a link between the Master and Slave, adjusting the distance between the units as needed to provide a suitable received level at the Master and Slave devices. Stream the video test file to generate WLAN traffic. Confirm that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold. For Master Device testing confirm that the displayed traffic does not include Slave Device traffic. For Slave Device testing confirm that the displayed traffic does not include Master Device traffic.

If a different setting of the Step Attenuators are required to meet the above conditions, perform a new System Calibration for the new Step Attenuator settings.

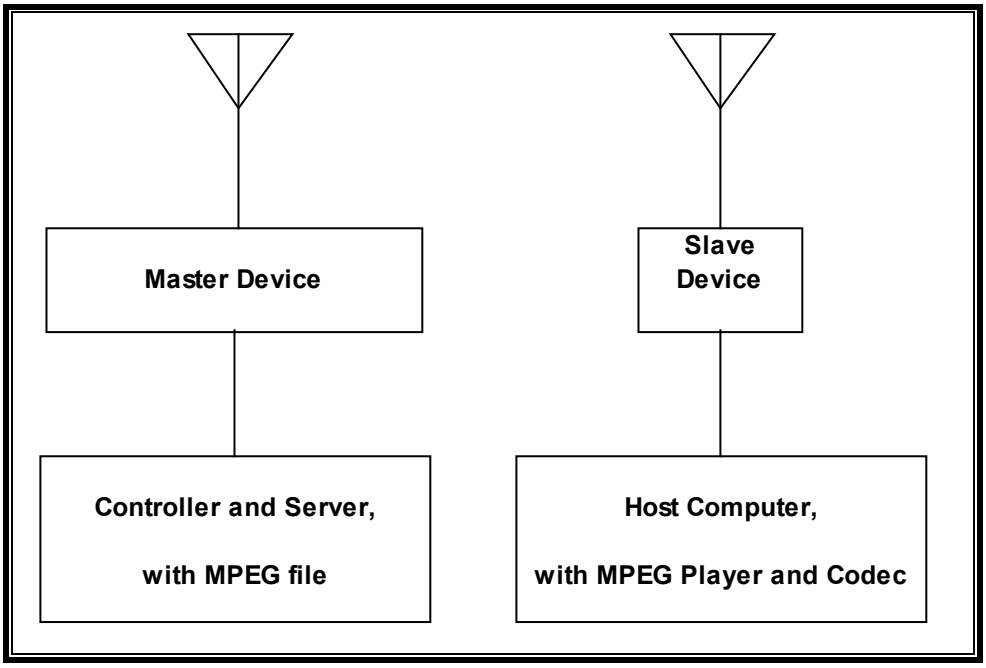
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer, 44 GHz	**Agilent / HP**	**E4446A**	**MY43360112**	**3/3/2009**
Vector Signal Generator, 20GHz	**Agilent / HP**	**E8267C**	**US43320336**	**11/16/2008**
Arbitrary Waveform Generator	**Agilent / HP**	**33220A**	**MY44026694**	**5/5/2009**

12.1.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

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

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Console Laptop	Dell	PP01L	CN-04P449-48643-2CH-201	DoC
Console AC Adapter	Dell	ADP-70EB	1791	DoC
Traffic Laptop	Dell	PP01L	CN-04P448-48155-29R-1869	DoC
Traffic AC Adapter	Dell	PA-2	12851-82A-1759	DoC
Wireless AP	Netgear	WNDR3300	L0 Alpha-3	PY308100078
AP AC Adapter	Netgear	DSA-20P-10US	2113	DoC
Desktop PC	Dell	DCNE	FR17YD1	DoC
Monitor	LG	Microline 186	512MXAY0A752	DoC
Keyboard	Microsoft	KC-0405	7619801926501	Doc
Mouse	Dell	0YH958	HC7030COC6Y	DoC

12.1.4. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Slave Device without Radar Detection.

Three antennas are utilized to meet the diversity and MIMO operational requirements.

The EUT uses two transmitter/receiver chains and one receive only chain, each connected to a 50-ohm coaxial antenna port. All antenna ports are connected to antennas to perform radiated tests.

The Slave device associated with the EUT during these tests does not have radar detection capability.

WLAN traffic is generated by streaming the video file TestFile.mp2 “6 ½ Magic Hours” from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

TPC is required since the maximum EIRP is greater than 500 mW (27 dBm).

The EUT utilizes the 802.11a/n architecture. Two nominal channel bandwidths are implemented: 20 MHz and 40 MHz.

DESCRIPTION OF TPC FUNCTION

The power level can be reduced to a conducted level of 12 dBm, which yields a maximum EIRP of 20.8 dBm based on the maximum array gain of 8.8 dBi, which is less than the 24 dBm EIRP limit for TPC level.

MANUFACTURER’S STATEMENT REGARDING UNIFORM CHANNEL SPREADING

This statement is in a separate document.

MANUFACTURER’S STATEMENT REGARDING NON-ASSOCIATED NON-OCCUPANCY

This statement is in a separate document.

OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Netgear Access Point, FCC ID: PY308100078. The minimum antenna gain for the Master Device is 3.5 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is –64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

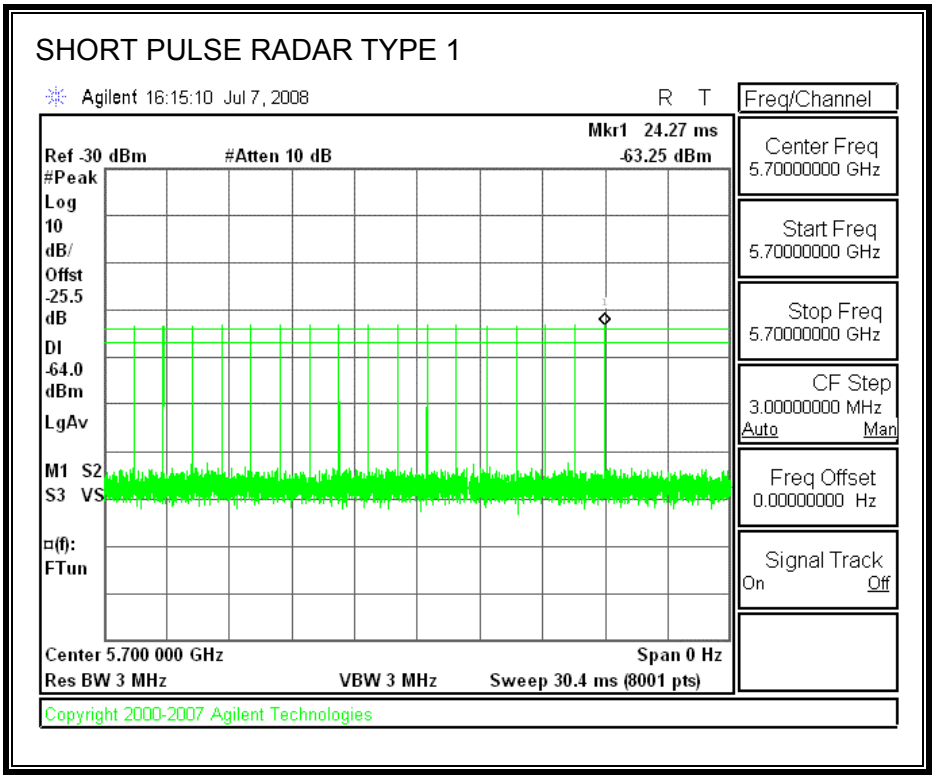
12.2. RESULTS FOR 20 MHz BANDWIDTH

12.2.1. TEST CHANNEL

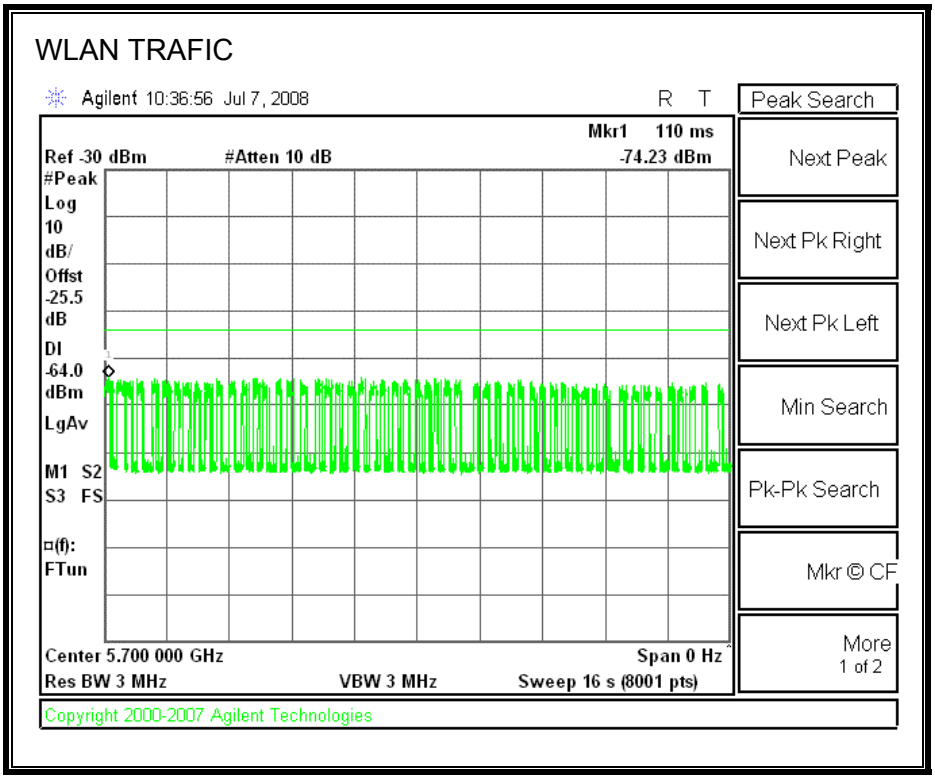
All tests were performed at a channel center frequency of 5700 MHz. Measurements were performed using conducted test methods.

12.2.2. PLOTS OF RADAR WAVEFORM AND WLAN TRAFFIC

PLOTS OF RADAR WAVEFORM



PLOT OF WLAN TRAFFIC



12.2.3. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =

(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

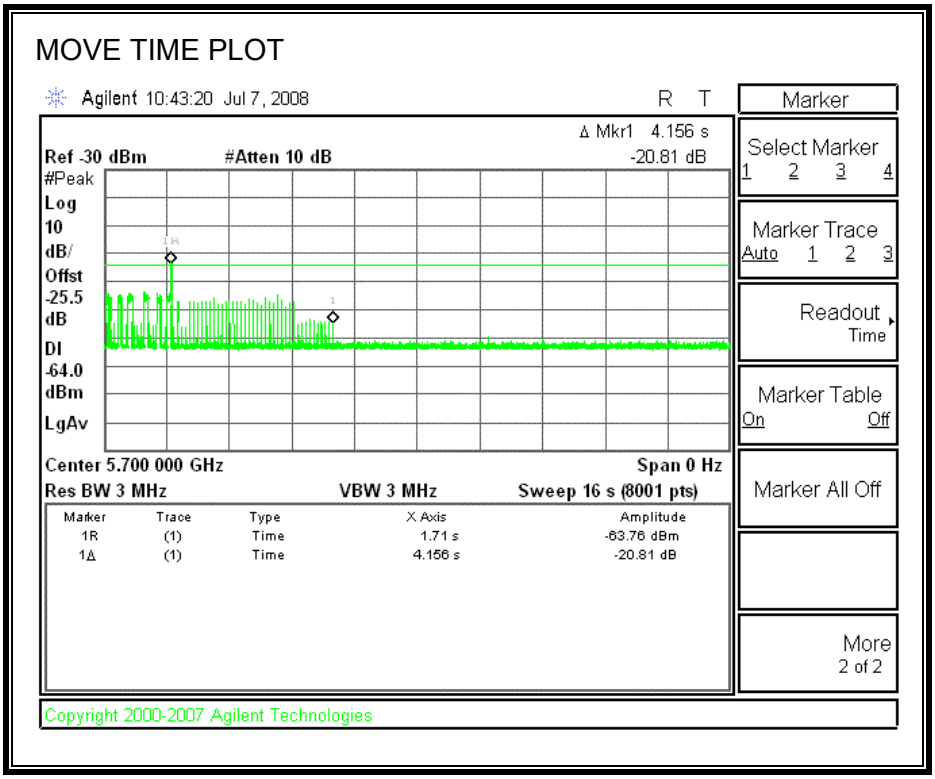
RESULTS

Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	4.2	10

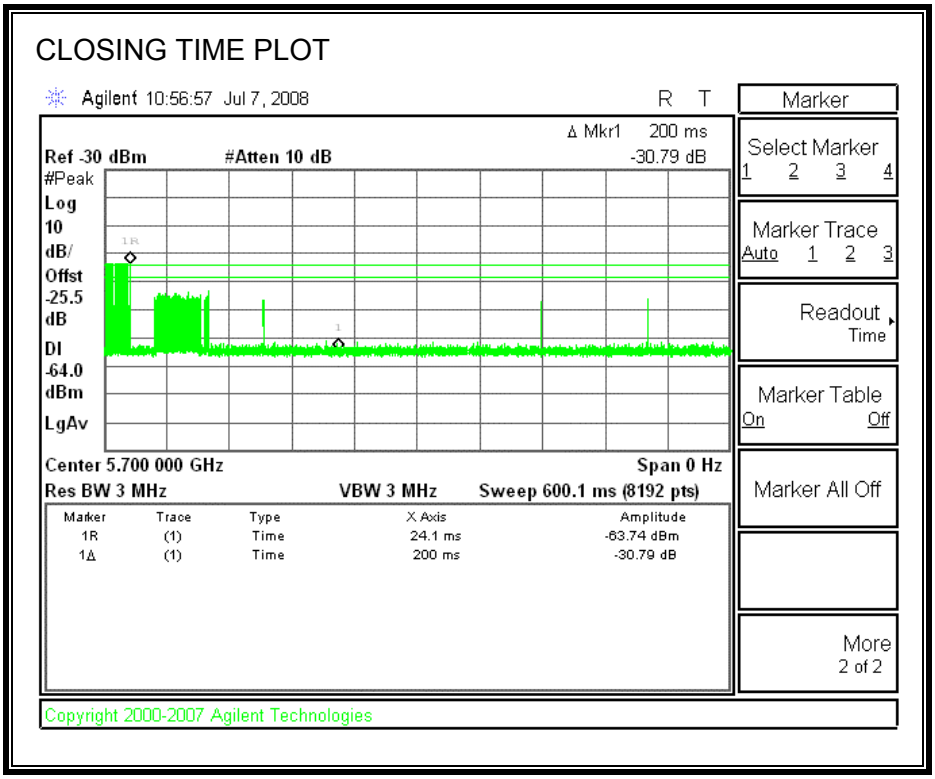
Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	50.6	60
IC	54.4	260

MOVE TIME

MOVE TIME PLOT



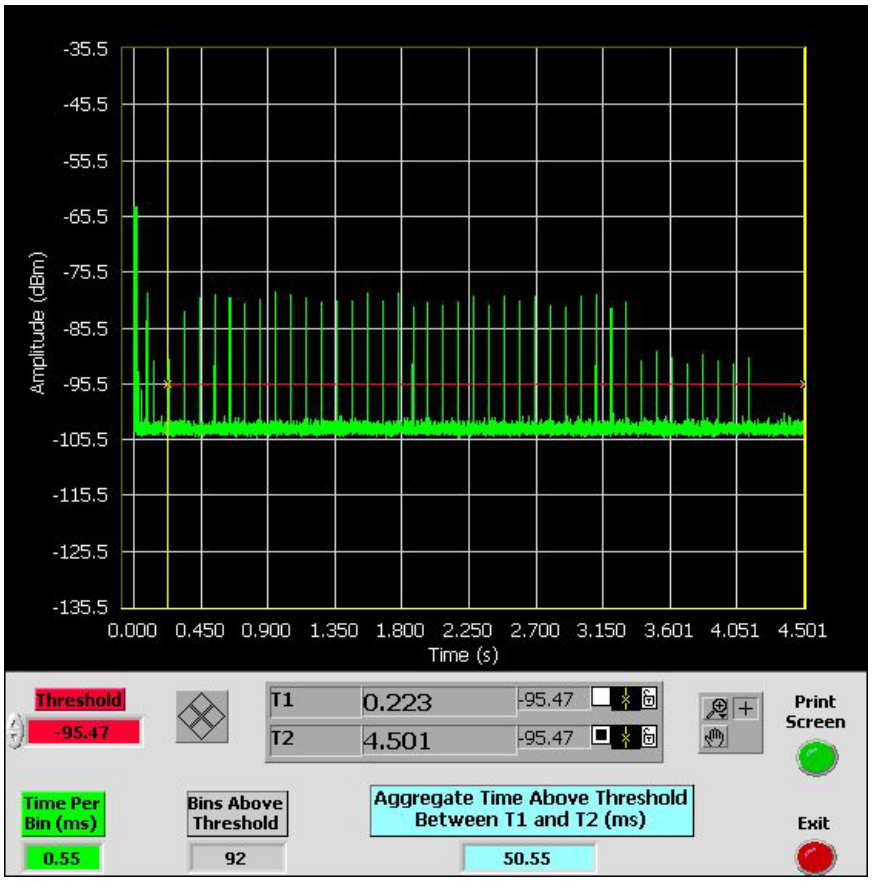
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

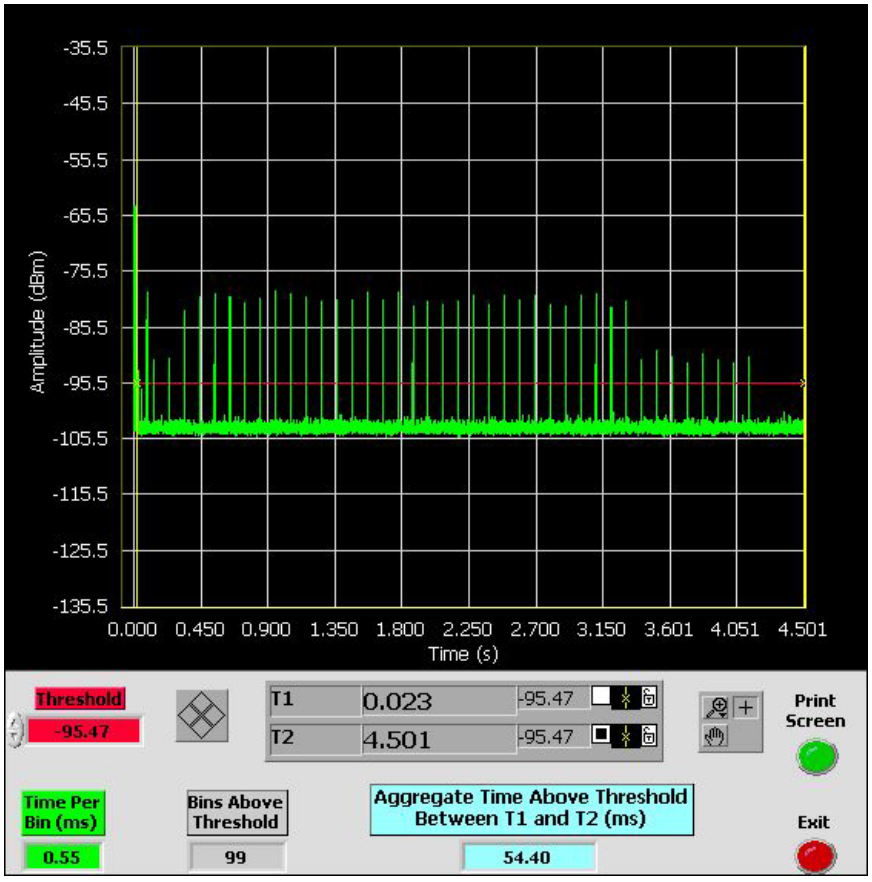
Only intermittent transmissions are observed during the FCC aggregate monitoring period.

FCC AGGREGATE CLOSING TIME PLOT



Only intermittent transmissions are observed during the IC aggregate monitoring period.

IC AGGREGATE CLOSING TIME PLOT

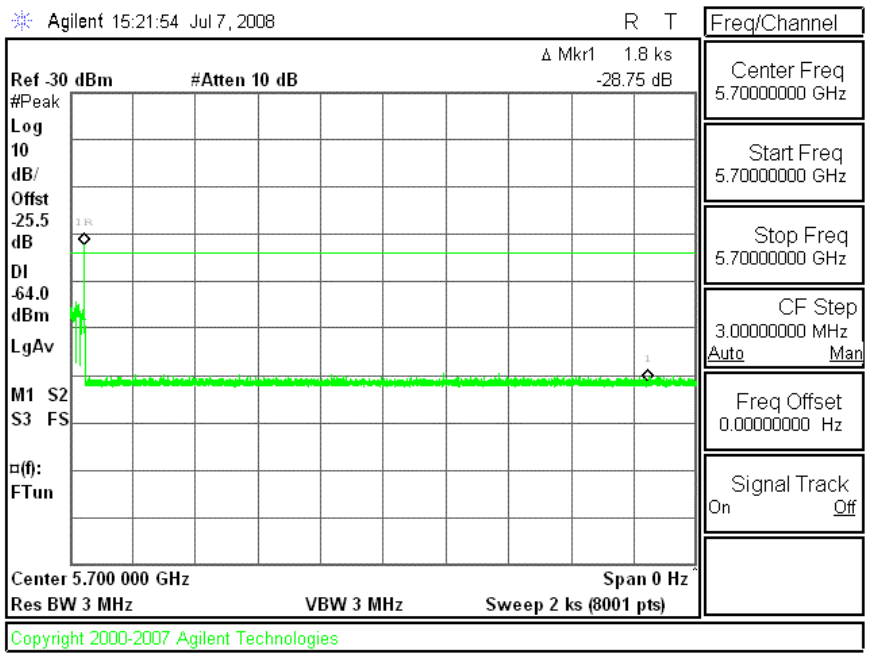


12.2.4. NON-OCCUPANCY

RESULTS

No EUT transmissions were observed on the test channel during the 30-minute observation time.

NON-OCCUPANCY PLOT



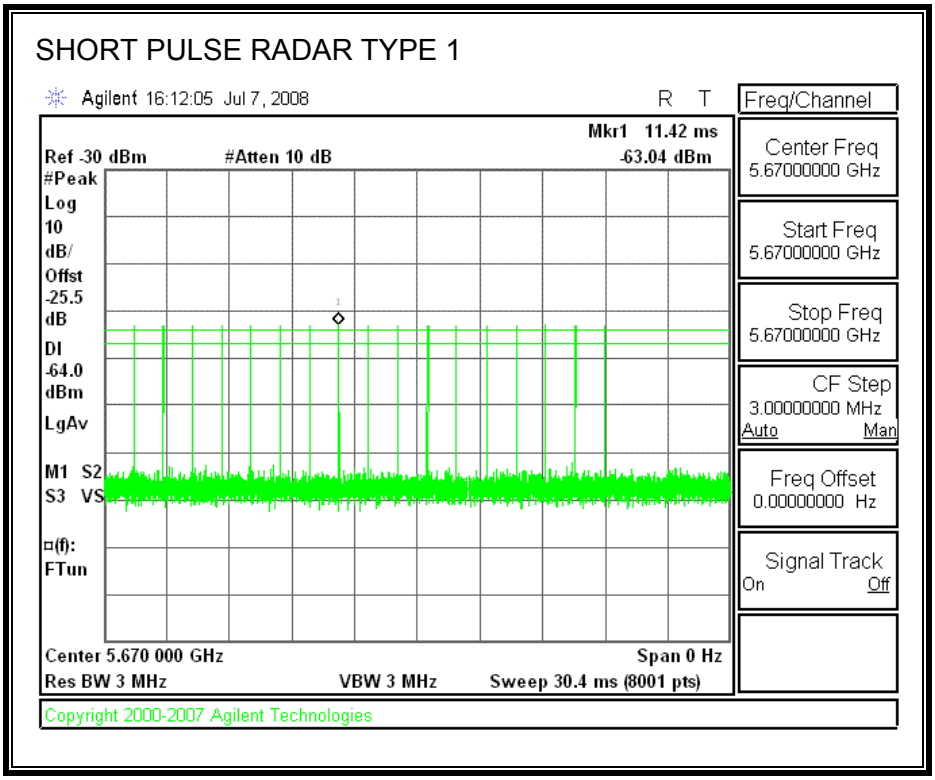
12.3. RESULTS FOR 40 MHz BANDWIDTH

12.3.1. TEST CHANNEL

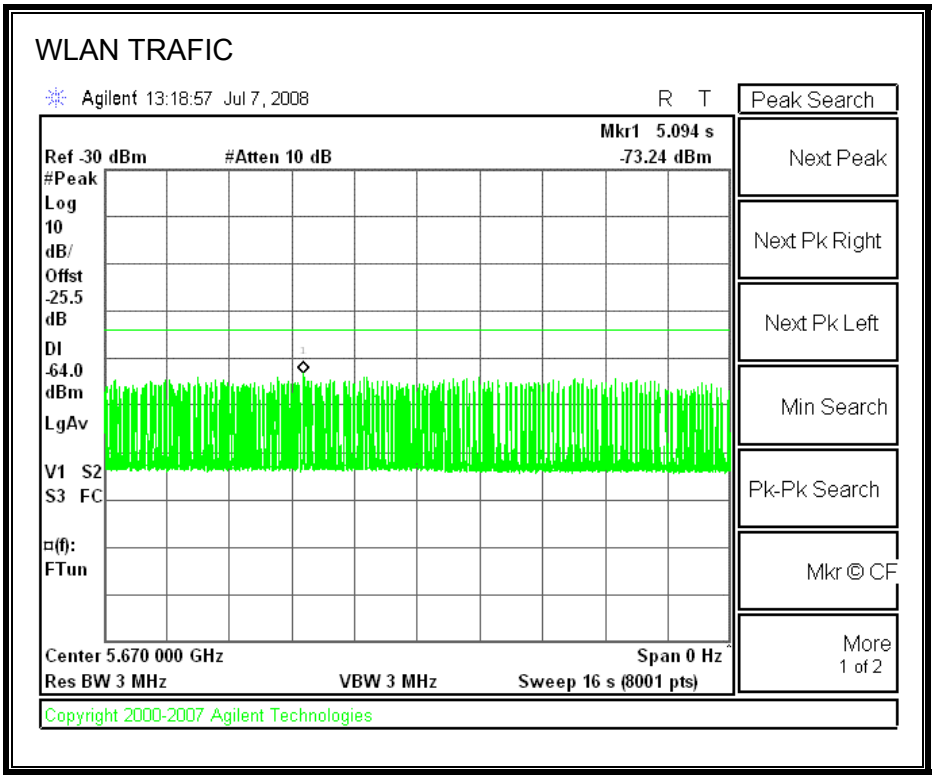
All tests were performed at a channel center frequency of 5670 MHz. Measurements were performed using conducted test methods.

12.3.2. PLOTS OF RADAR WAVEFORM AND WLAN TRAFFIC

PLOTS OF RADAR WAVEFORM



PLOT OF WLAN TRAFFIC



12.3.3. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =

(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

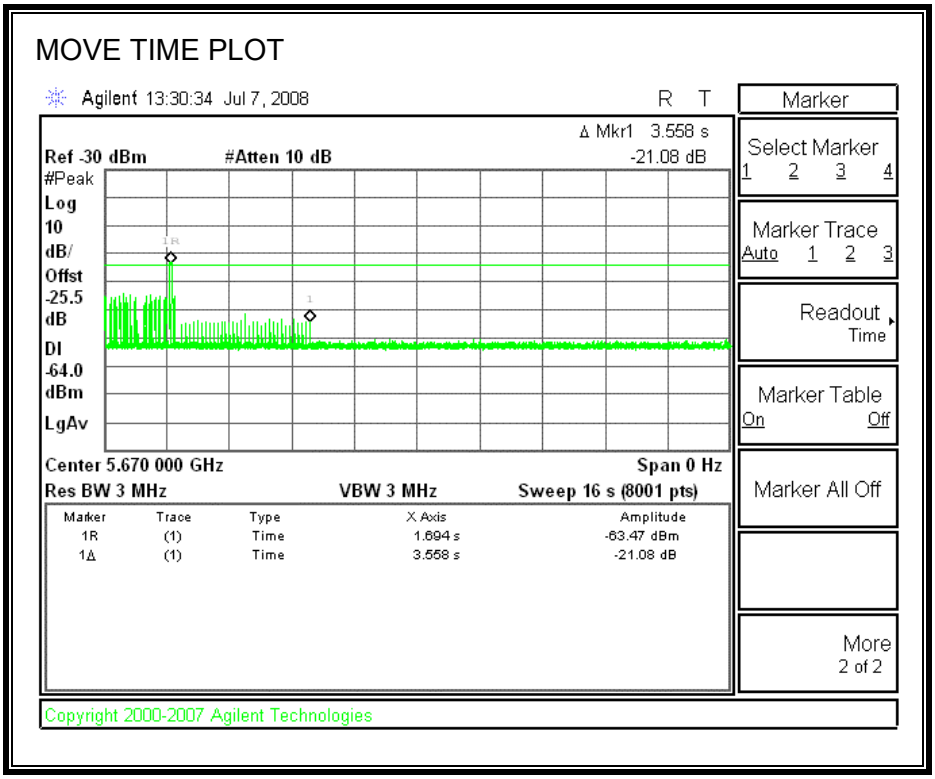
RESULTS

Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	3.6	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	50.0	60
IC	79.7	260

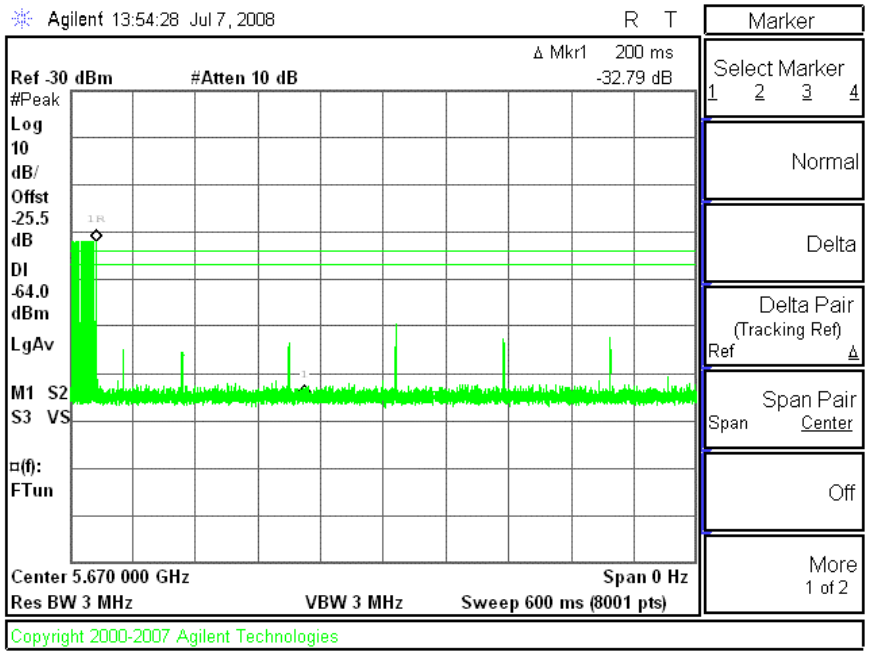
MOVE TIME

MOVE TIME PLOT



CHANNEL CLOSING TIME

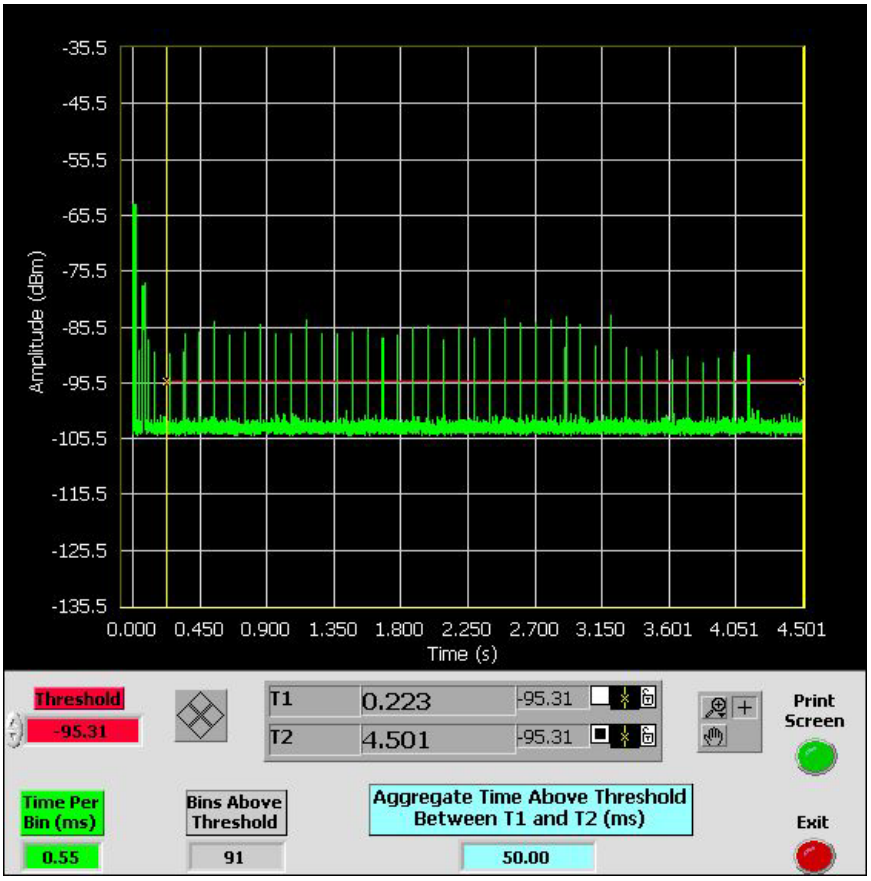
CLOSING TIME PLOT



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

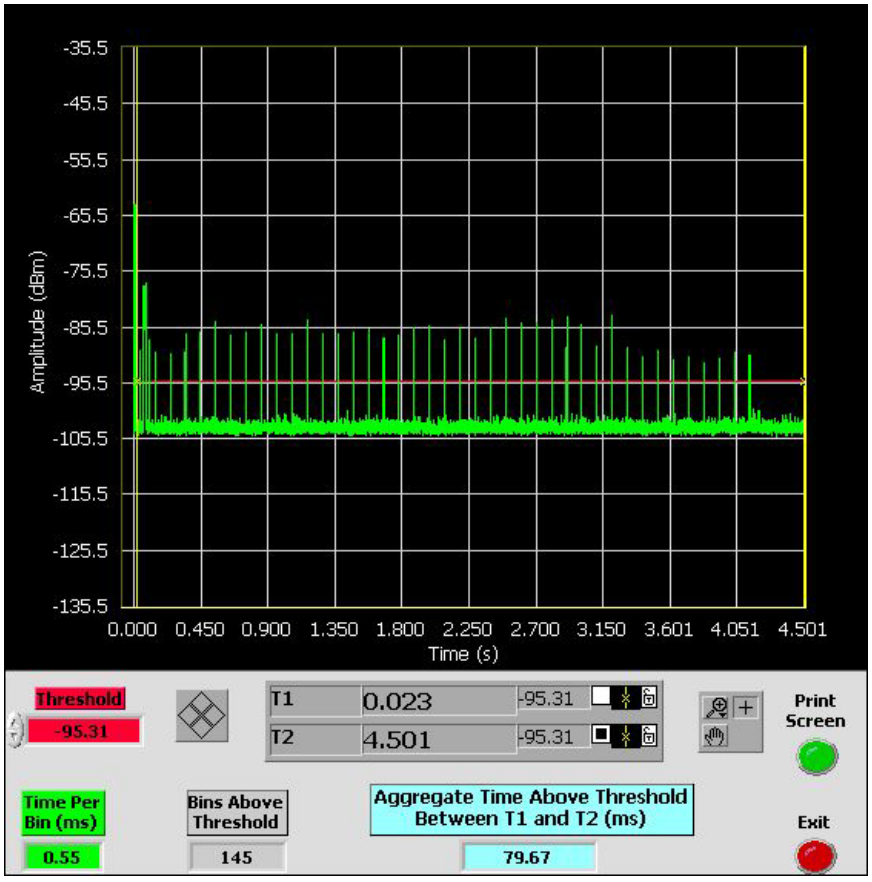
Only intermittent transmissions are observed during the FCC aggregate monitoring period.

FCC AGGREGATE CLOSING TIME PLOT



Only intermittent transmissions are observed during the IC aggregate monitoring period.

IC AGGREGATE CLOSING TIME PLOT



12.3.4. NON-OCCUPANCY

RESULTS

No EUT transmissions were observed on the test channel during the 30-minute observation time.

NON-OCCUPANCY PLOT