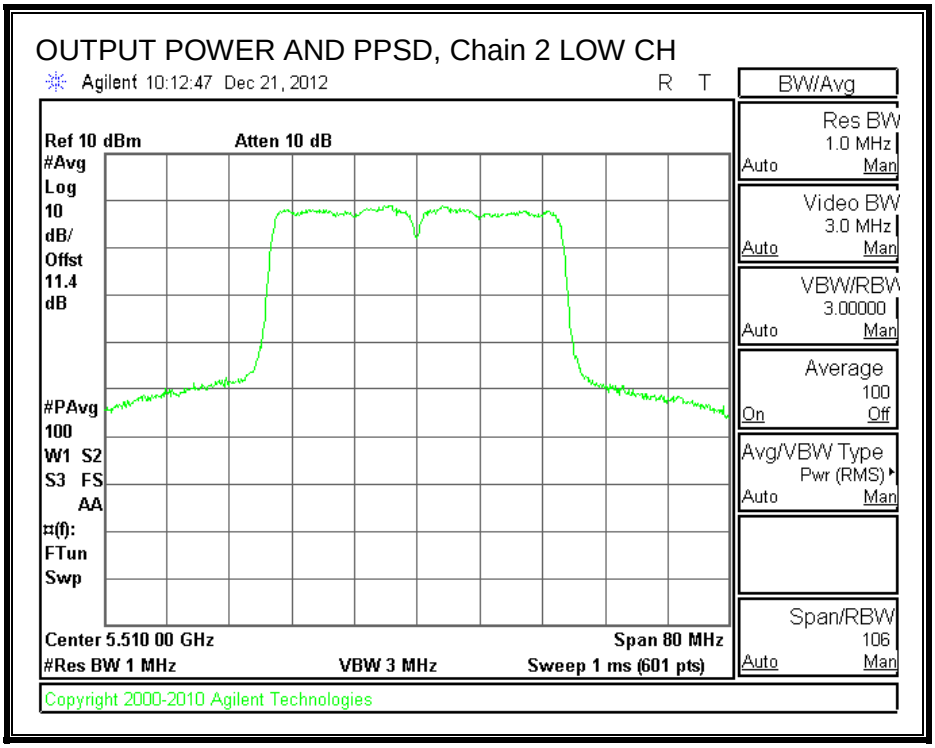
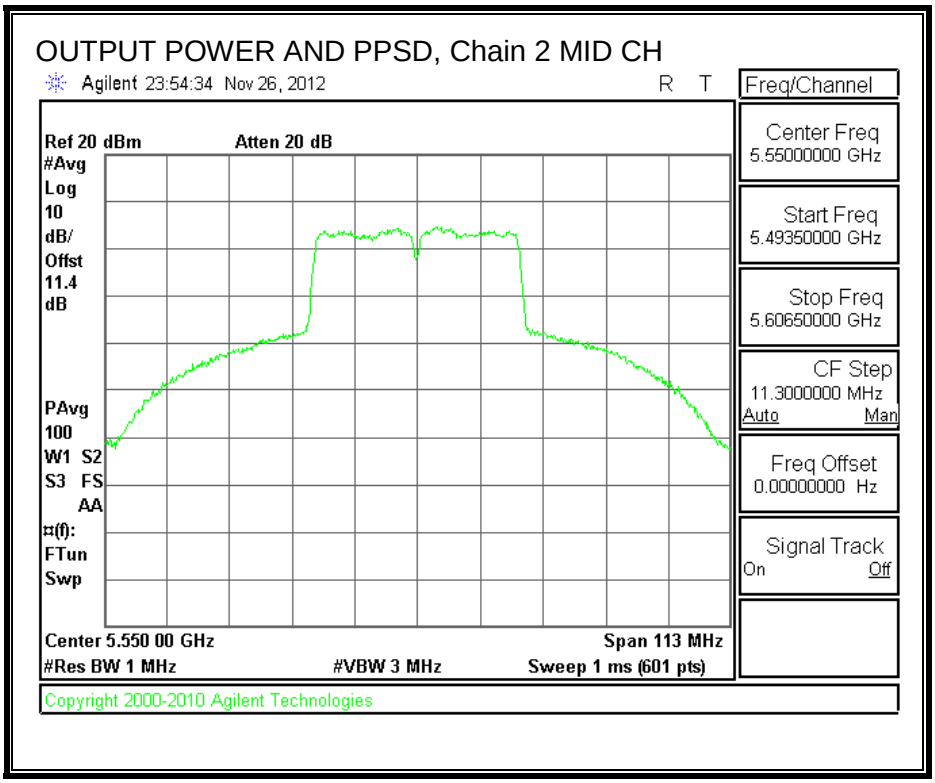
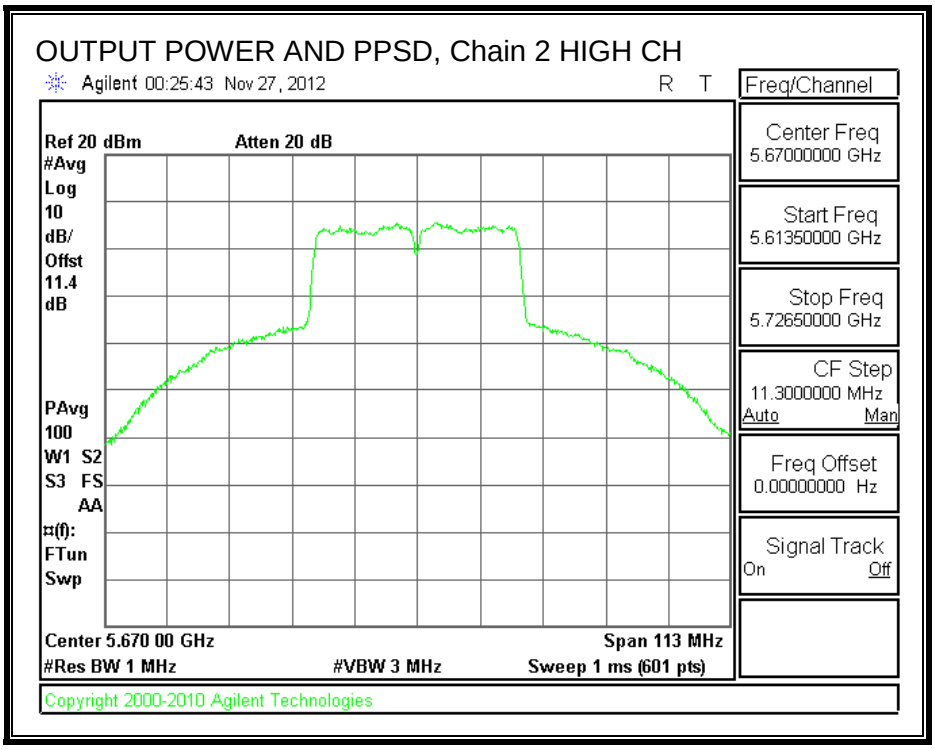
OUTPUT POWER AND PPSD, Chain 2







7.82.4. 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.

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5550	8.94	4.53	0.57	3.84	13	-9.16

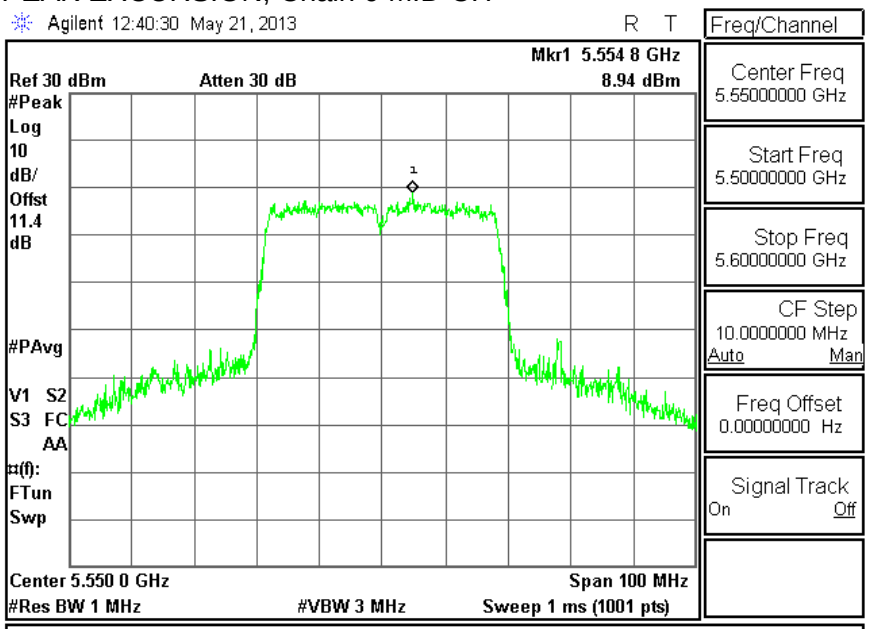
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5550	8.71	4.95	0.57	3.19	13	-9.81

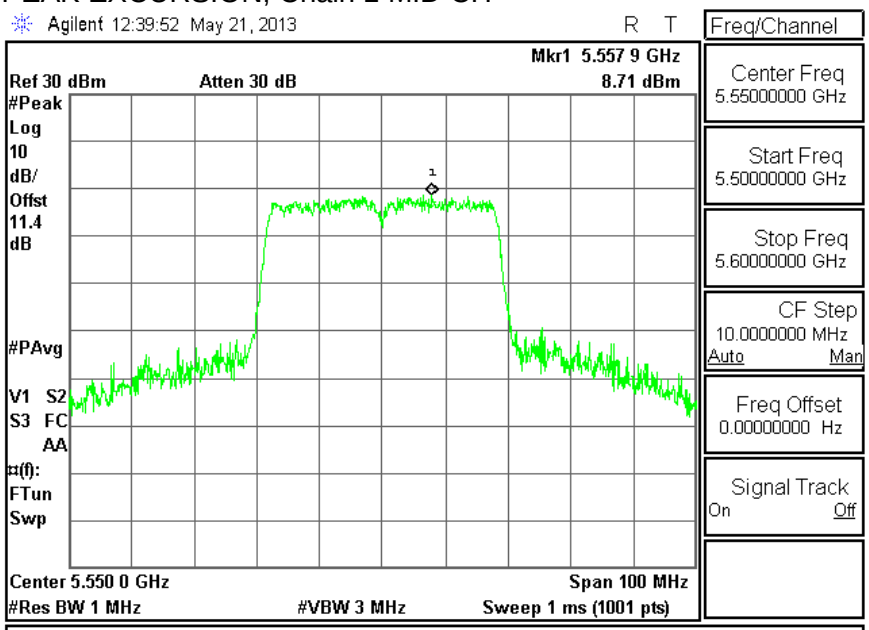
Chain 2

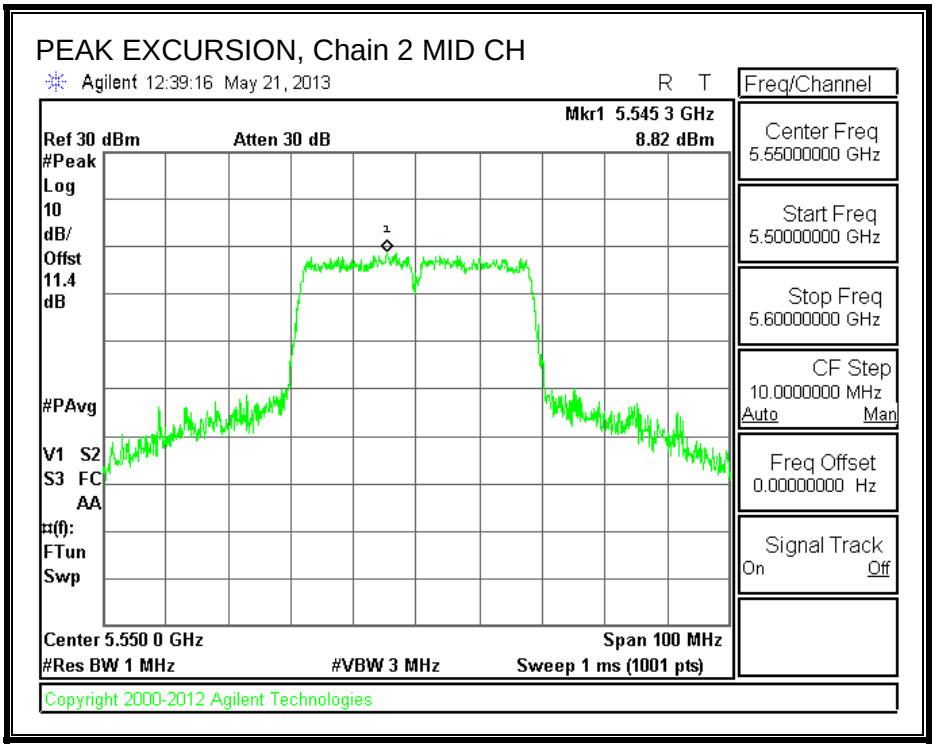
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5550	8.82	3.77	0.57	4.48	13	-8.52

PEAK EXCURSION, Chain 0 MID CH



PEAK EXCURSION, Chain 1 MID CH





7.83. 802.11n HT40 STBC 3TX MODE CHANNEL 142 IN THE 5.6 GHz BAND

7.83.1. **26 dB BANDWIDTH- UNII**

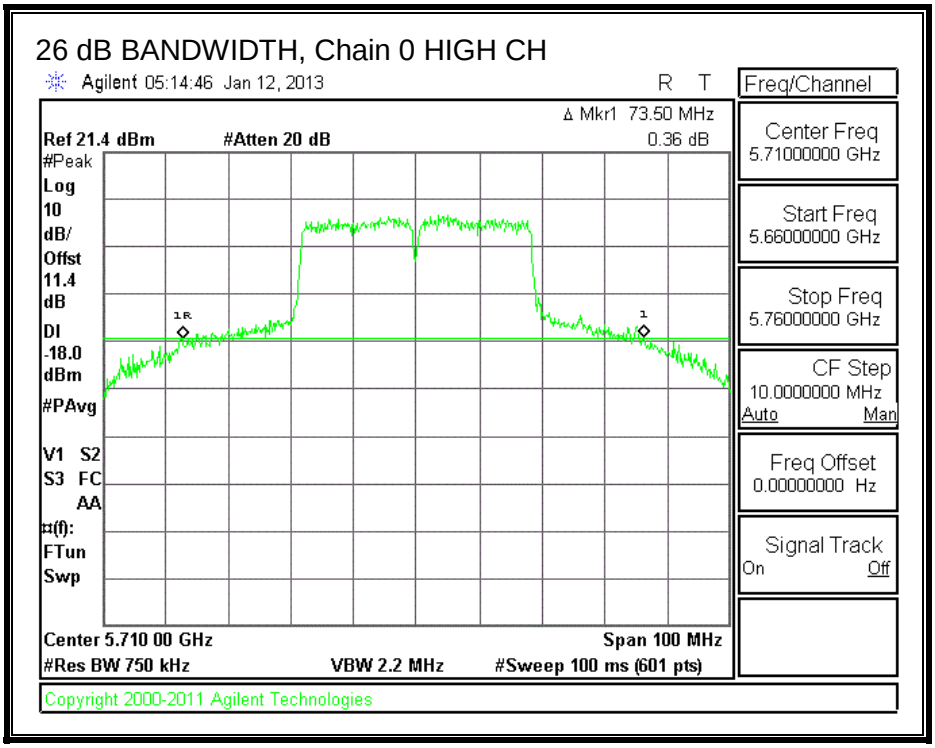
LIMITS

None; for reporting purposes only.

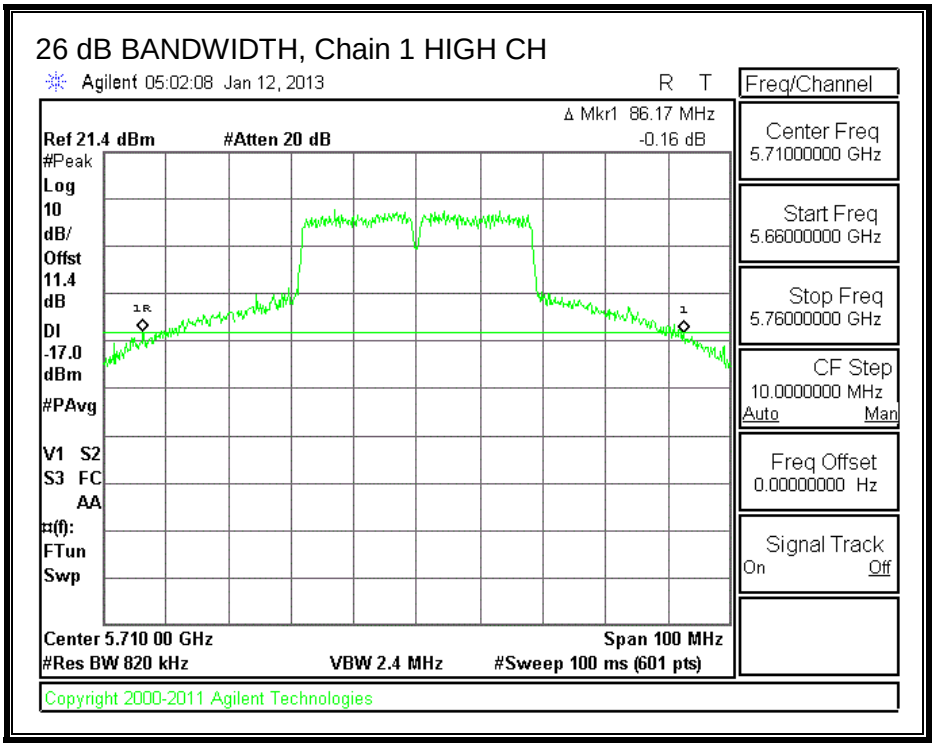
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5710	73.500	86.170	75.170

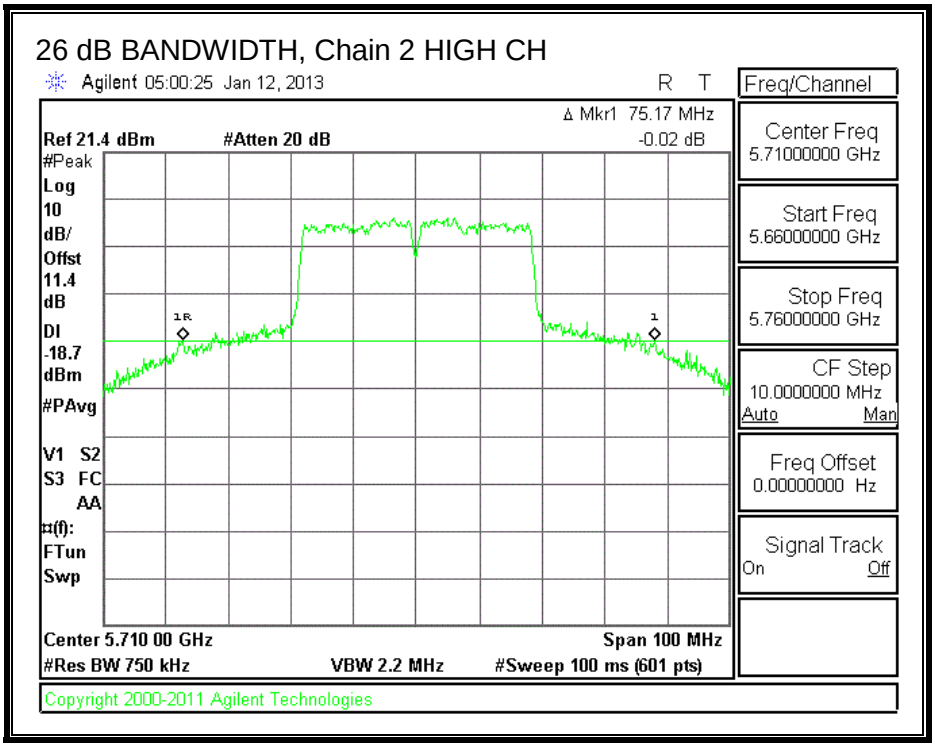
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.83.2. **99% BANDWIDTH**

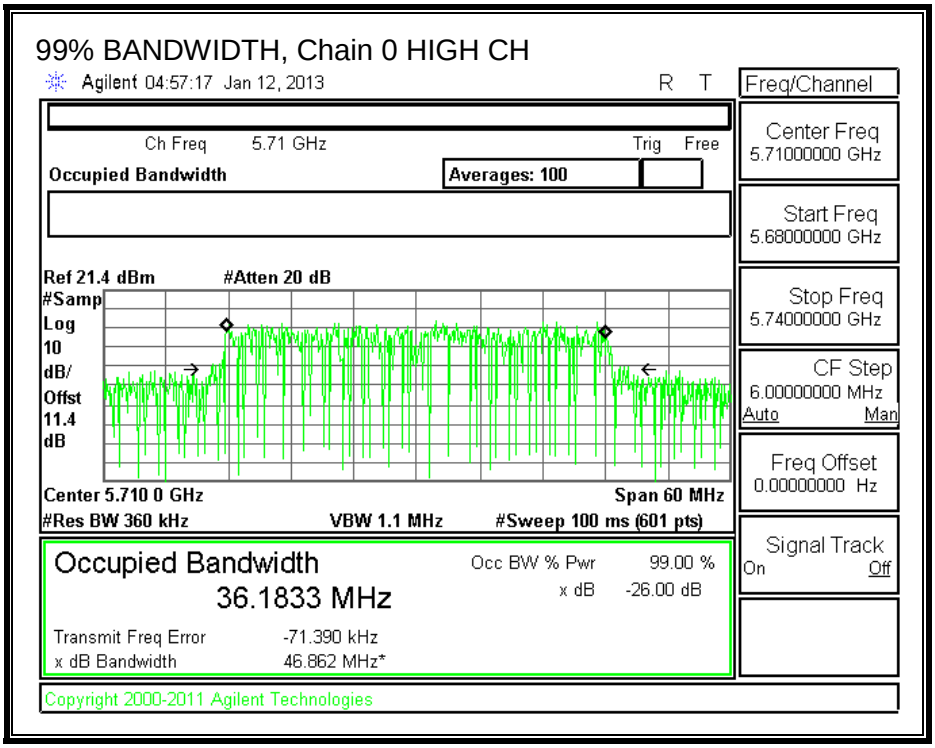
LIMITS

None; for reporting purposes only.

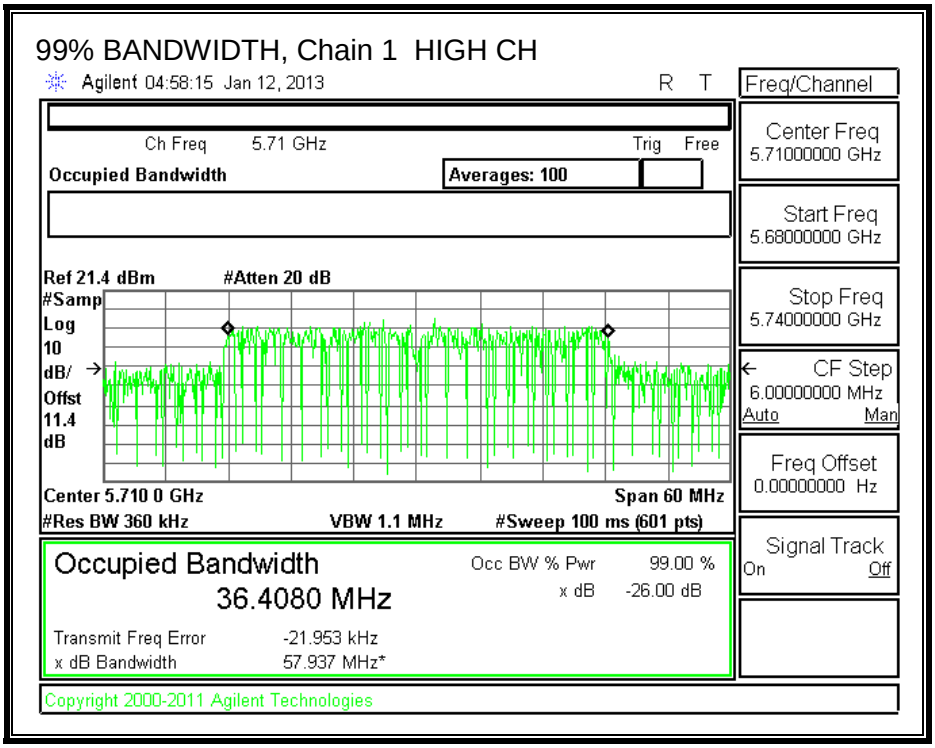
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5710	36.1833	36.4080	36.2800

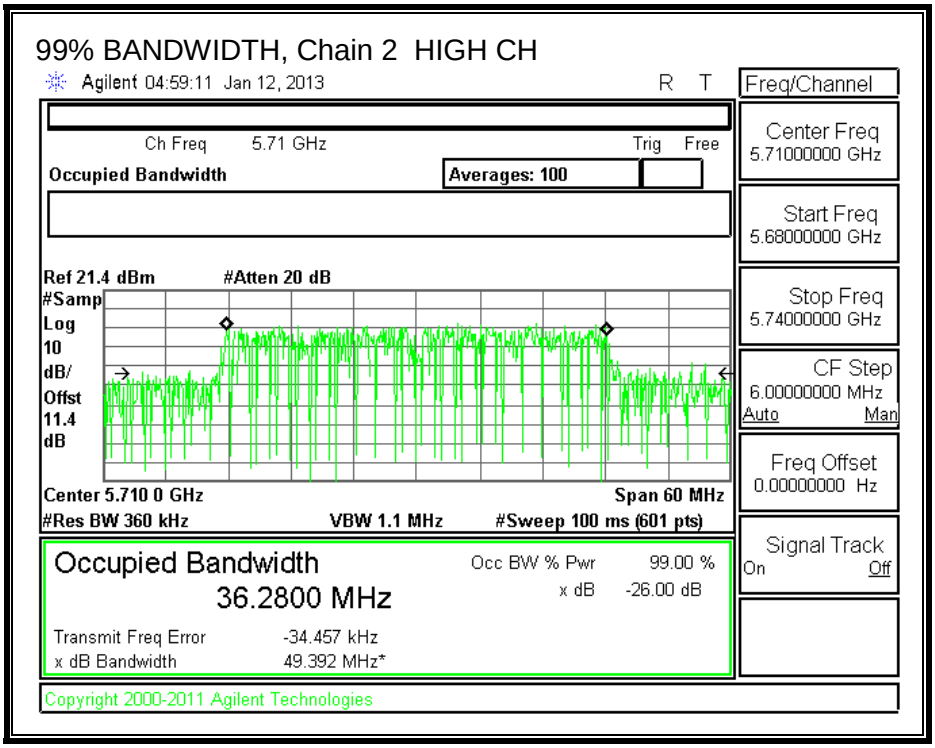
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.83.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.03	6.66	3.94	5.36

RESULTS

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Uncorrelated Gain (dBi)
High	5710	51.750	33.0917	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5710	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.57	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5710	16.30	17.30	16.69	22.12	24.00	-1.88

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5710	2.524	3.375	3.438	8.47	11.00	-2.53

Limits (FCC), portion in 5.8 GHz DTS band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Uncorrelated Gain (dBi)
High	5710	3.092	3.0917	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5710	15.90	15.90	21.90	15.90	11.00	11.00	11.00

Duty Cycle CF (dB)	0.57	Included in Calculations of Corr'd Power & PPSD

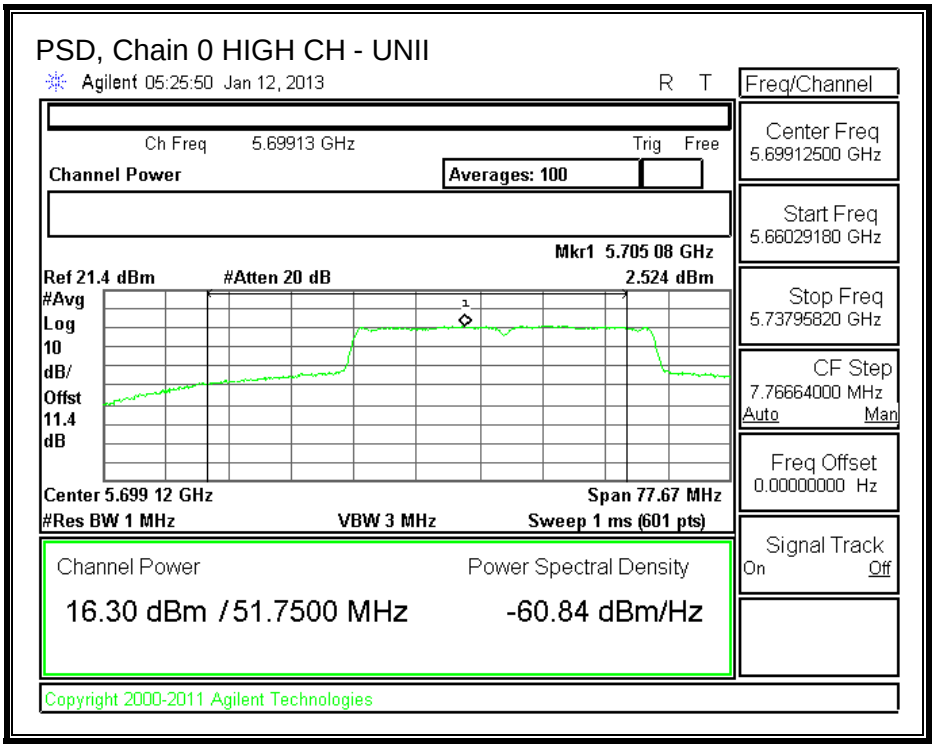
Output Power Results

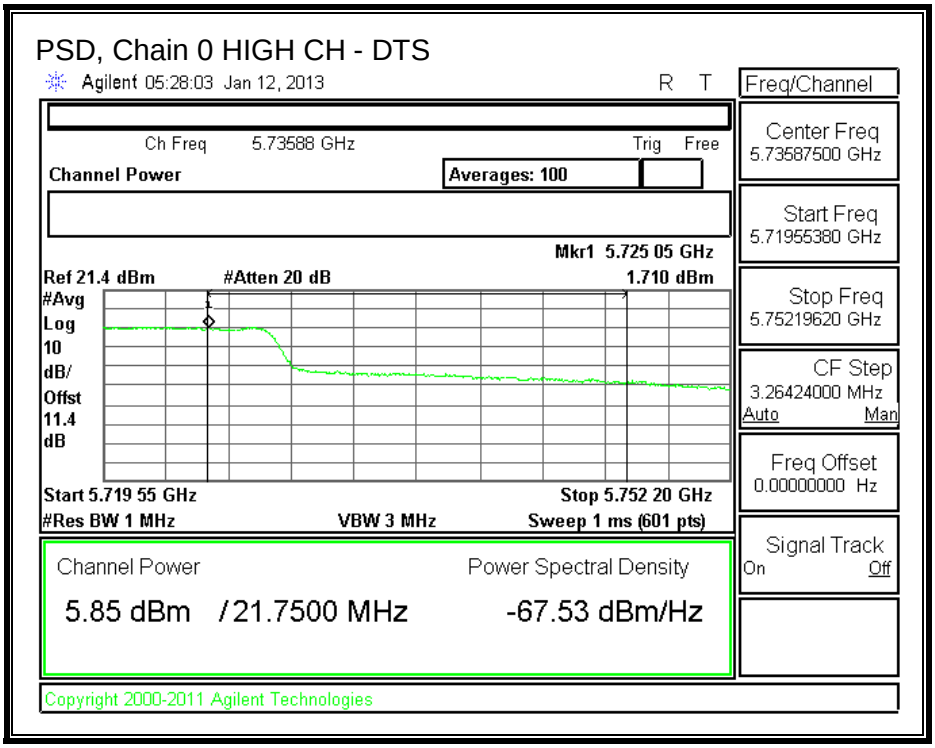
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5710	5.85	7.49	6.75	12.09	15.90	-3.81

PPSD Results

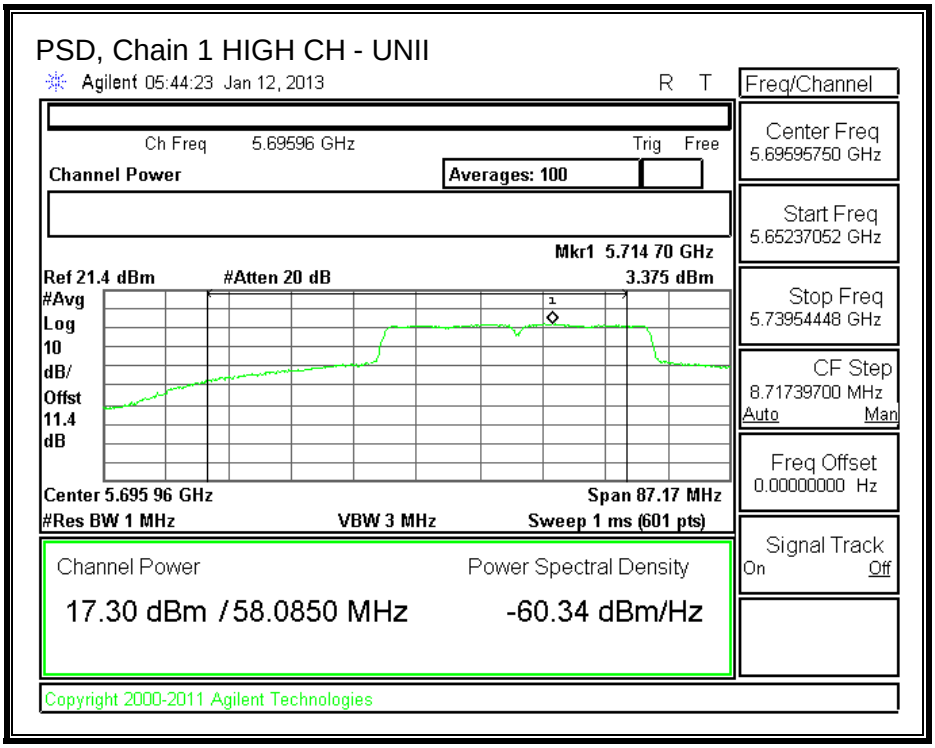
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5710	1.710	2.894	2.43	7.71	11.00	-3.29

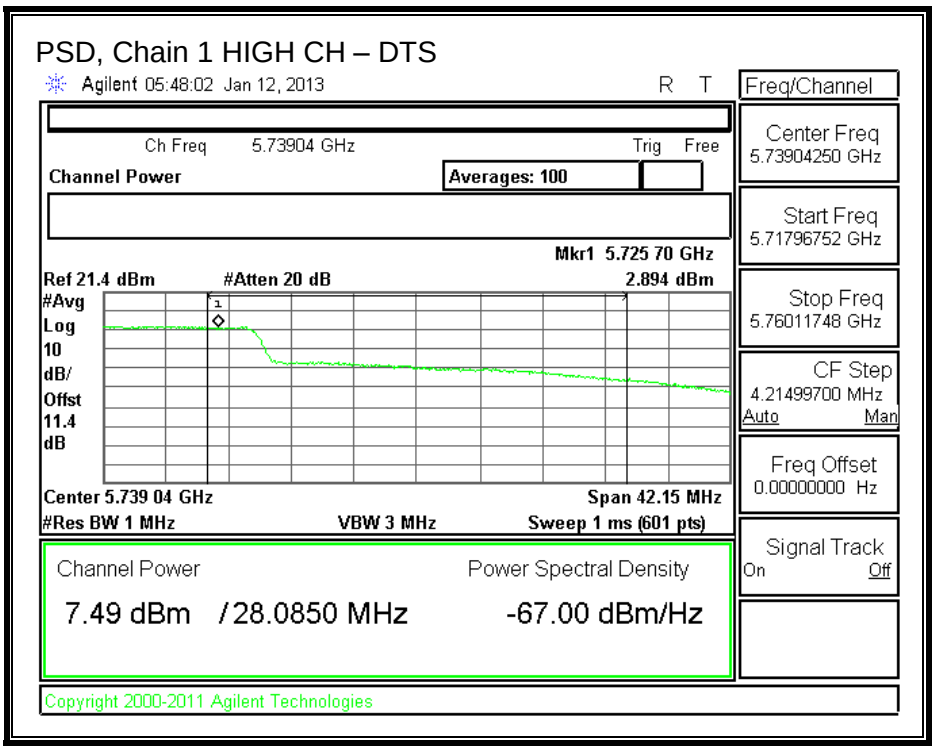
OUTPUT POWER & PPSD, Chain 0



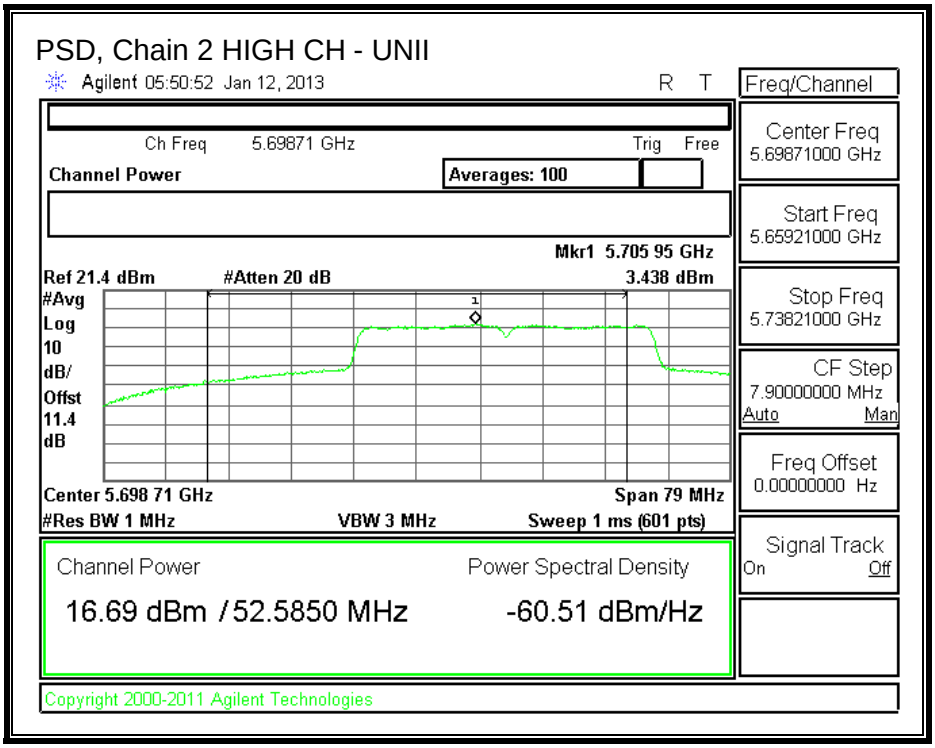


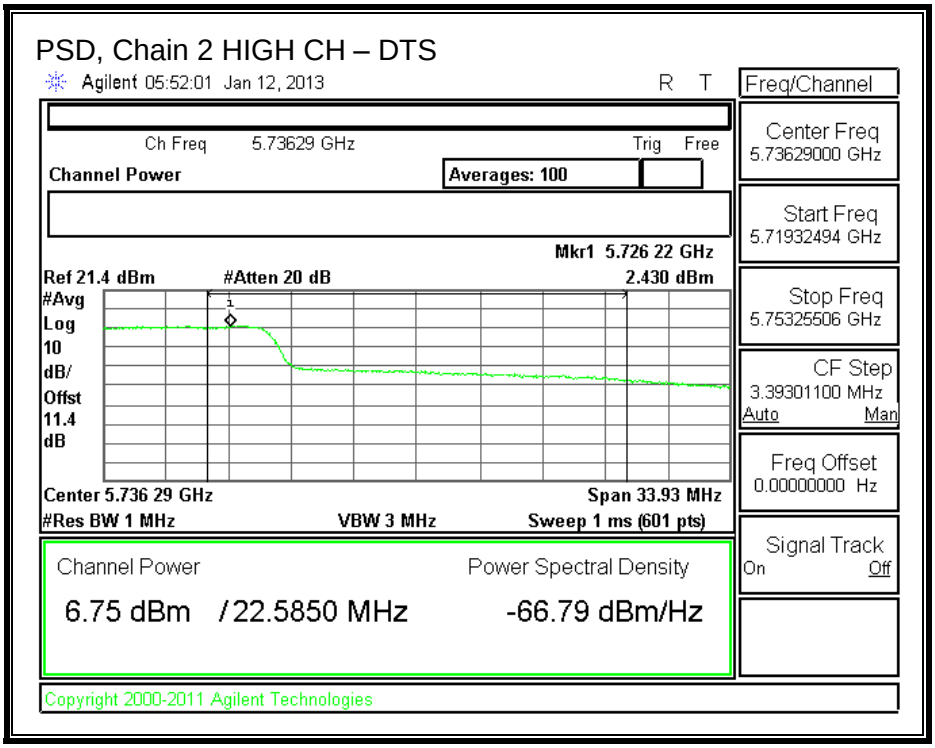
OUTPUT POWER & PPSD, Chain 1





OUTPUT POWER & PPSD, Chain 2





7.84. 802.11n HT40 BF 2TX MODE IN THE 5.6 GHz BAND

Covered by testing 802.11ac VHT40 BF 2TX mode, total power across the two chains is higher than the power level the device will operate at.

7.85. 802.11n HT40 BF 3TX MODE IN THE 5.6 GHz BAND

Covered by testing 802.11ac VHT40 BF 3TX mode, total power across the two chains is higher than the power level the device will operate at.

7.86. 802.11ac VHT40 BF 2TX MODE IN THE 5.6 GHz BAND

7.86.1. 26 dB BANDWIDTH

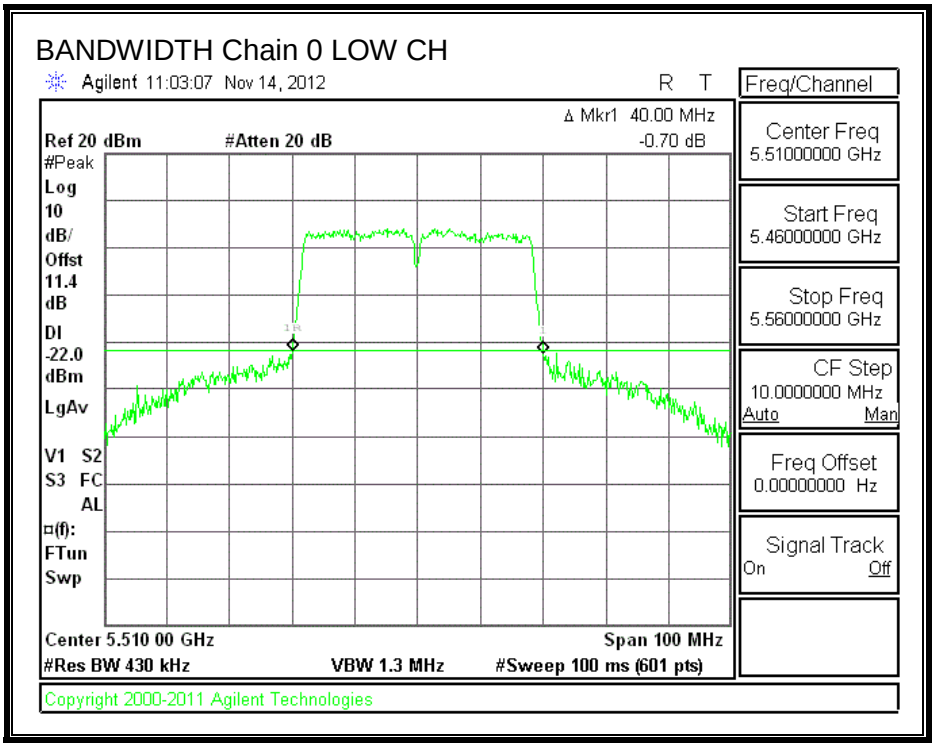
LIMITS

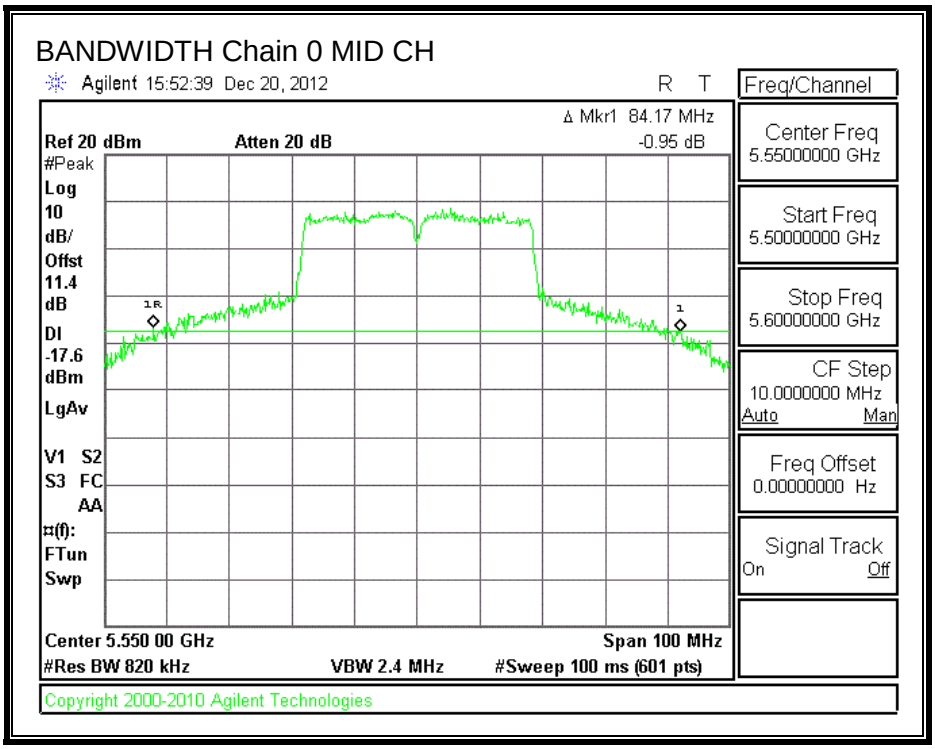
None; for reporting purposes only.

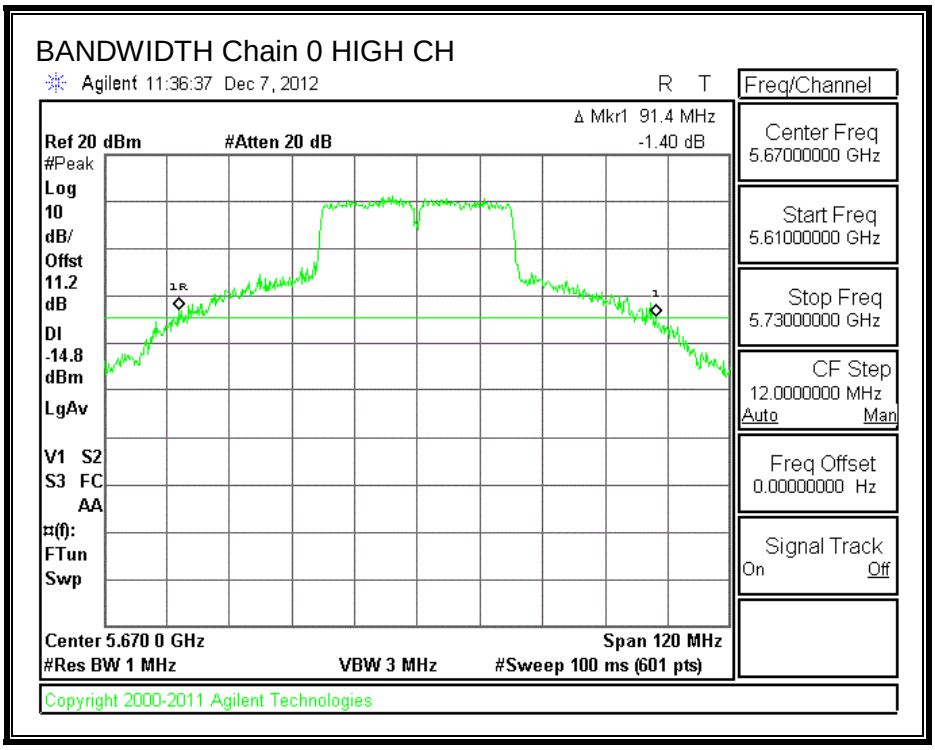
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5510	40.00	46.17
Mid	5550	84.17	89.17
High	5670	91.40	95.60

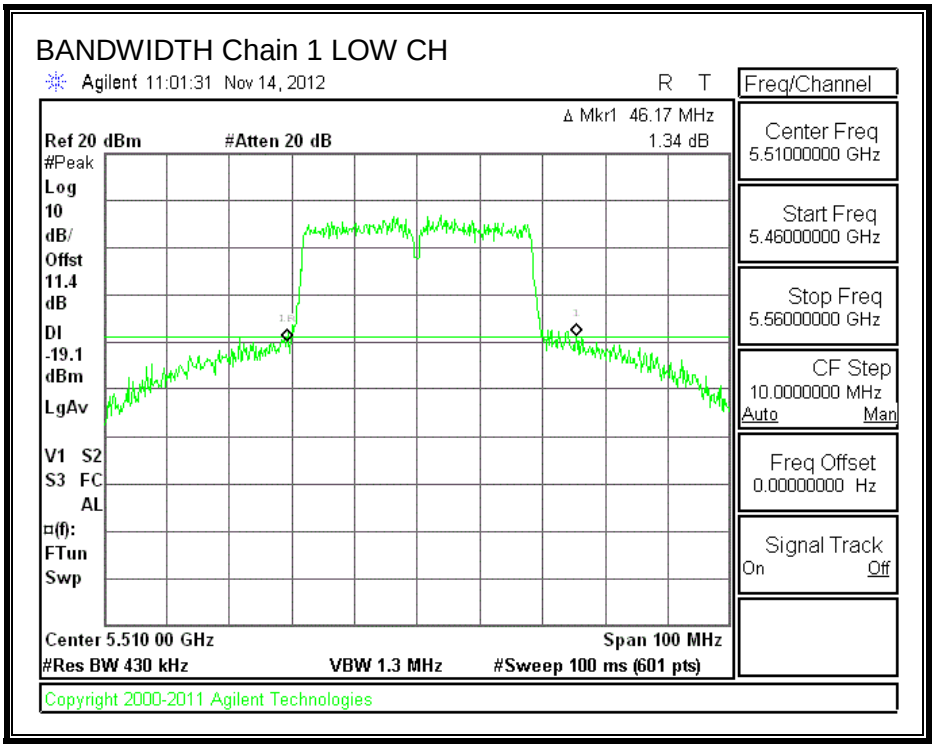
26 dB BANDWIDTH, Chain 0



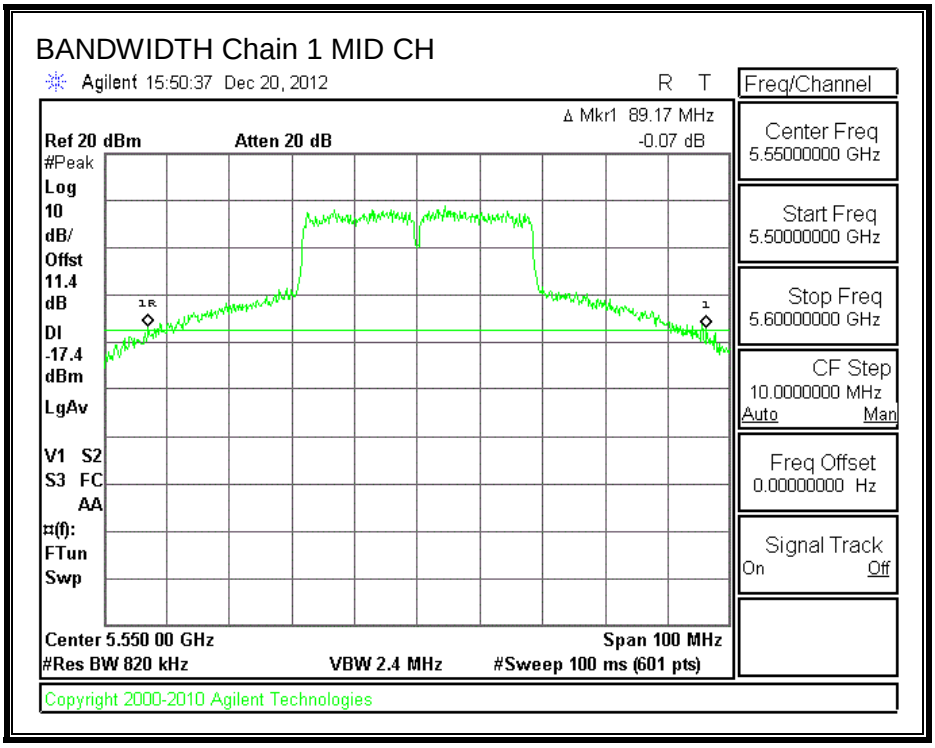




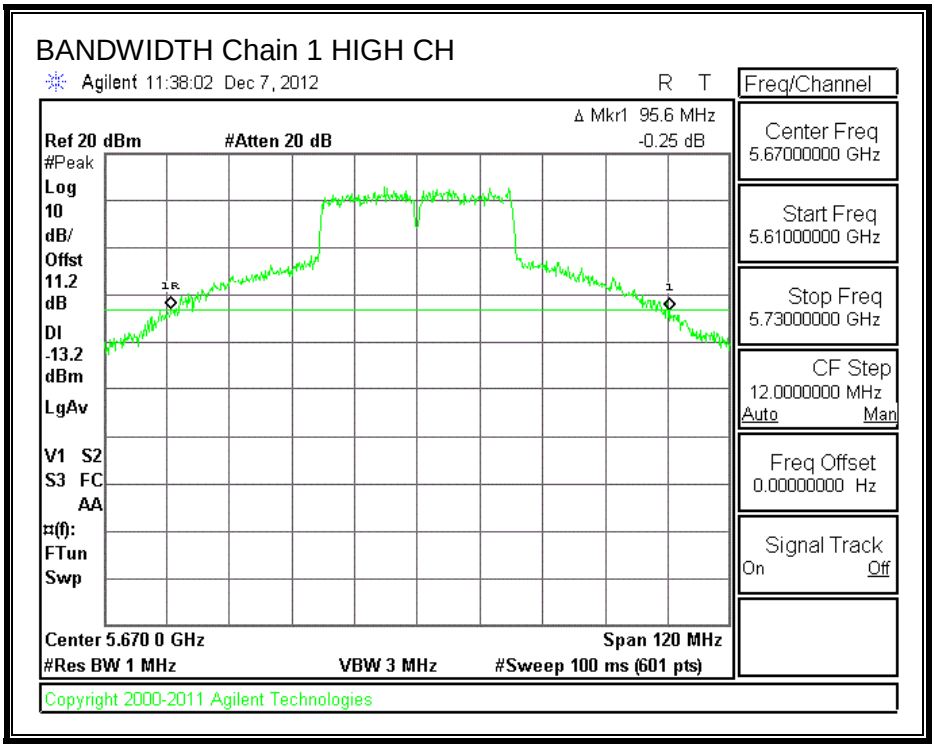
26 dB BANDWIDTH, Chain 1



BANDWIDTH Chain 1 MID CH



BANDWIDTH Chain 1 HIGH CH



7.86.2. 99% BANDWIDTH

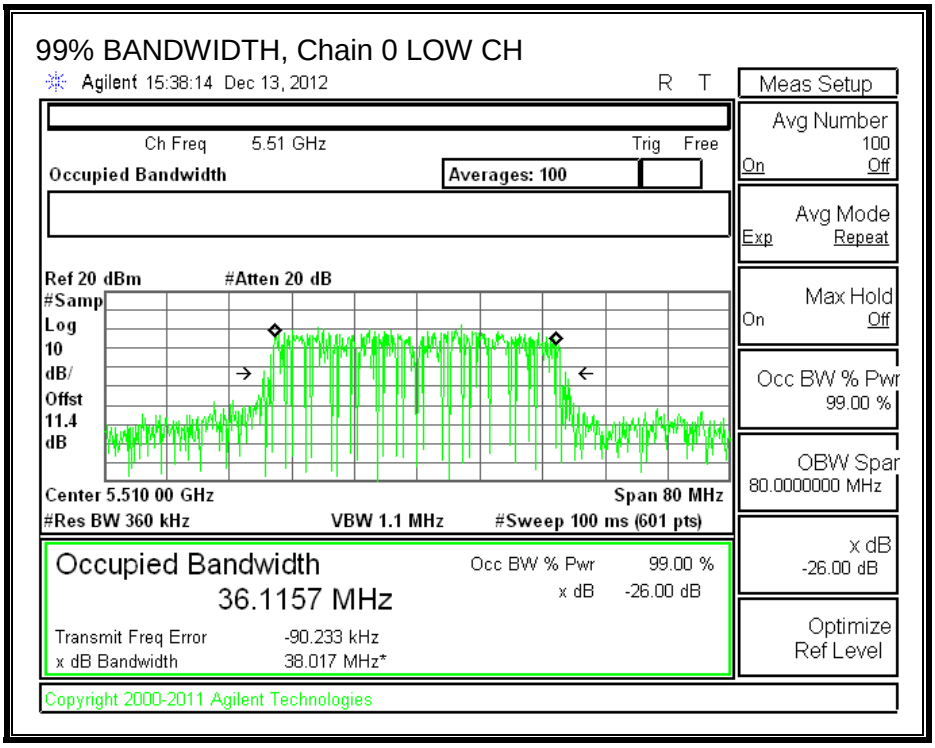
LIMITS

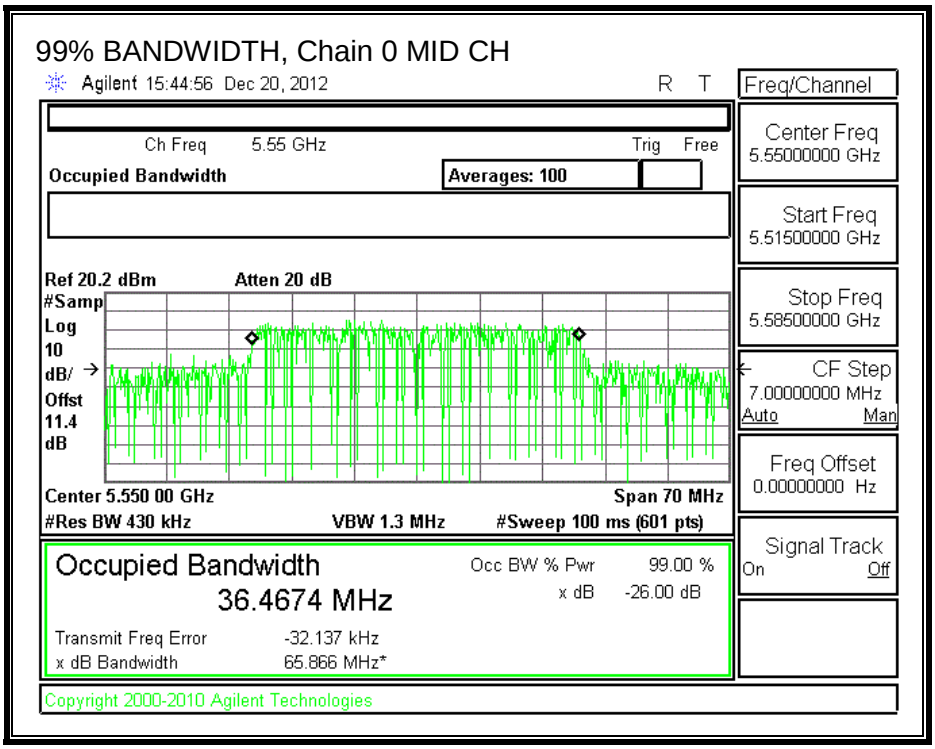
None; for reporting purposes only.

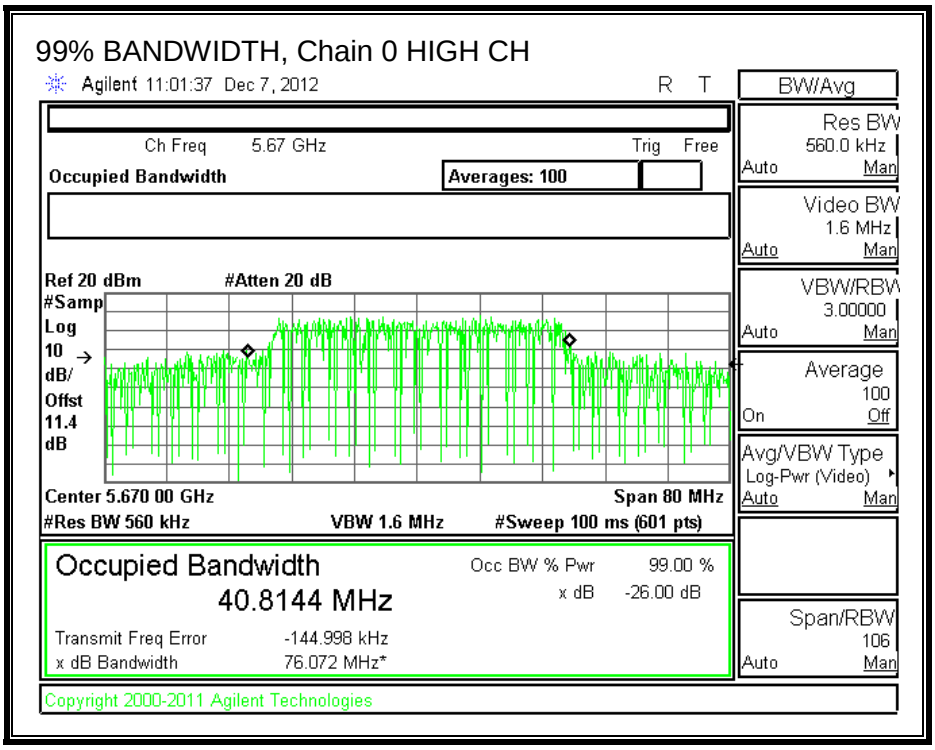
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5510	36.1157	36.1365
Mid	5550	36.4674	36.9126
High	5670	40.8144	36.4150

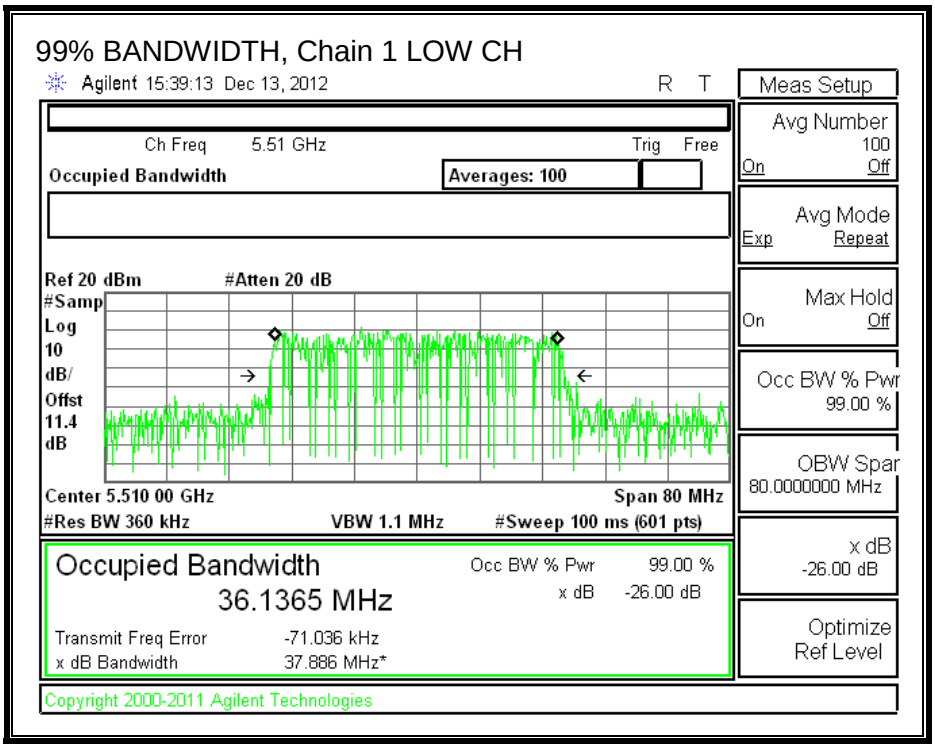
99% BANDWIDTH, Chain 0



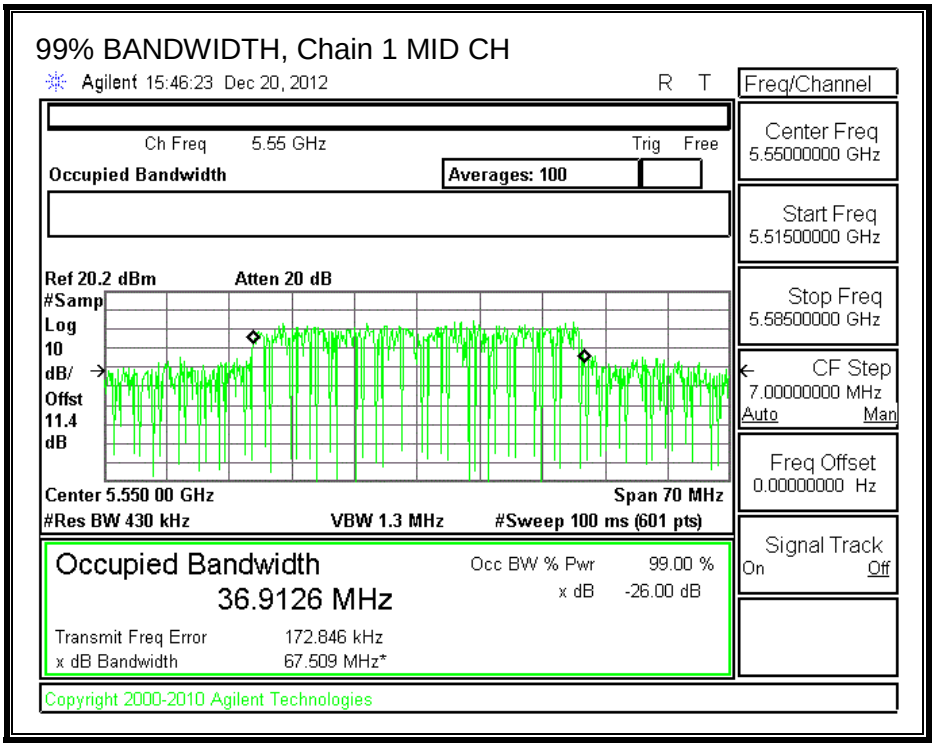




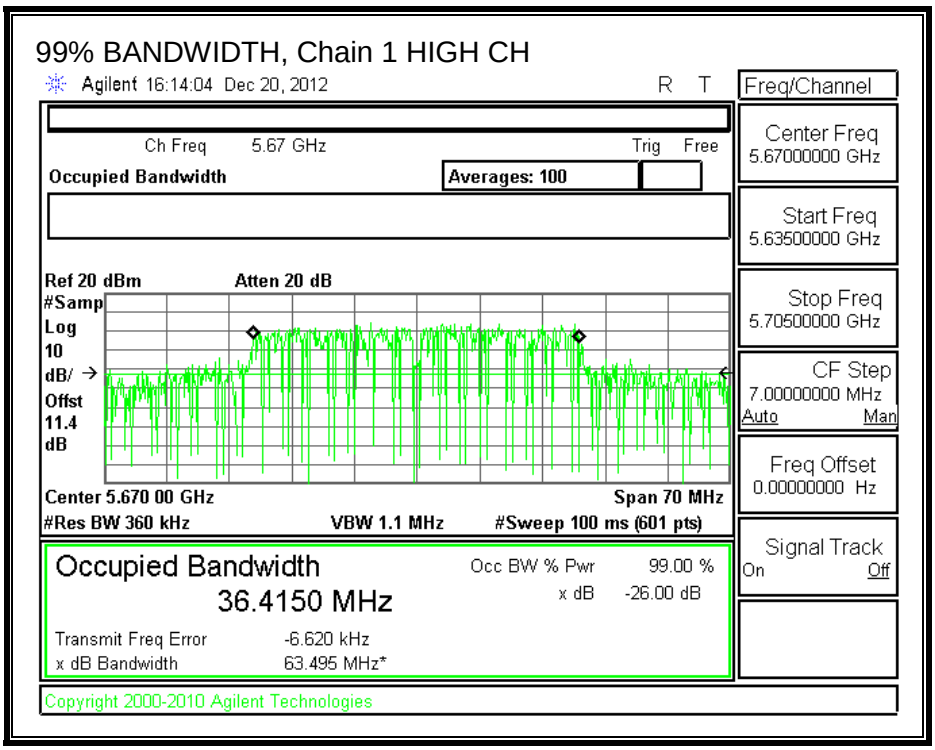
99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 1 MID CH



99% BANDWIDTH, Chain 1 HIGH CH



7.86.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	8.89

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	40.00	36.1157	8.89
Mid	5550	84.17	36.4674	8.89
High	5670	91.40	36.4150	8.89

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5510	21.11	24.00	30.00	21.11	8.11	11.00	8.11
Mid	5550	21.11	24.00	30.00	21.11	8.11	11.00	8.11
High	5670	21.11	24.00	30.00	21.11	8.11	11.00	8.11

Duty Cycle CF (dB)	0.43	Included in Calculations of PPSD

Output Power Results

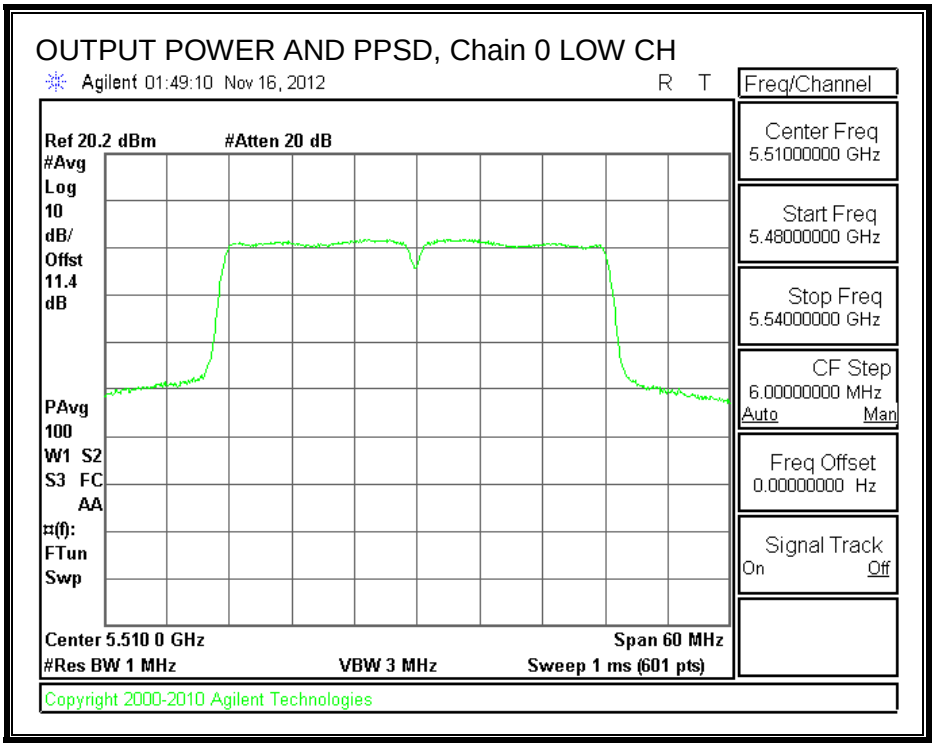
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	13.65	14.53	17.12	21.11	-3.99
Mid	5550	18.09	18.01	21.06	21.11	-0.05
High	5670	17.84	18.04	20.95	21.11	-0.16

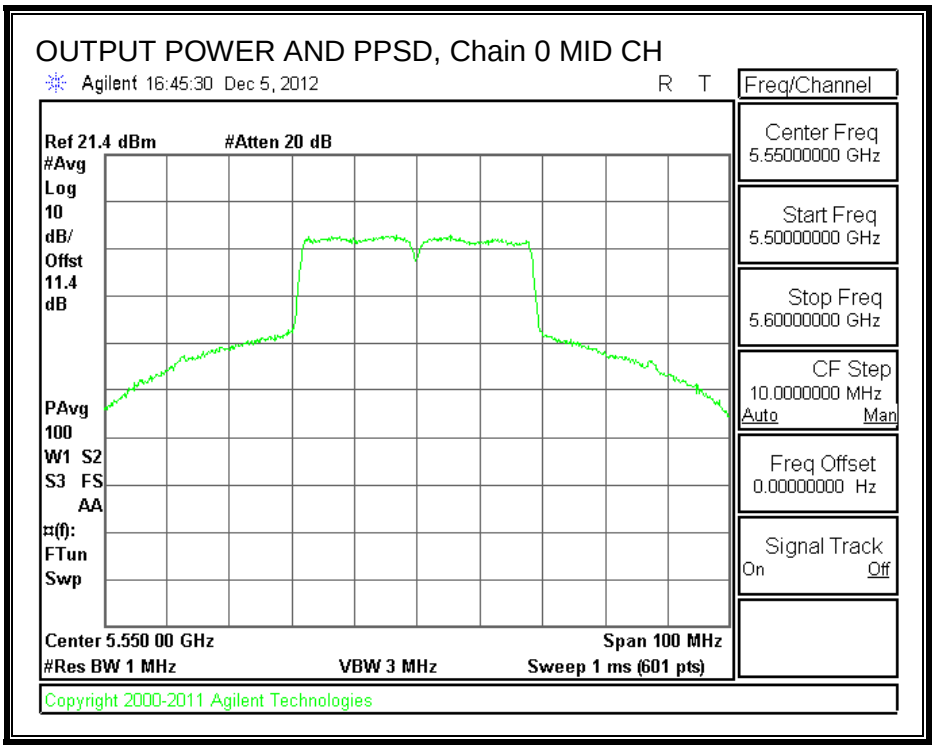
PPSD Results

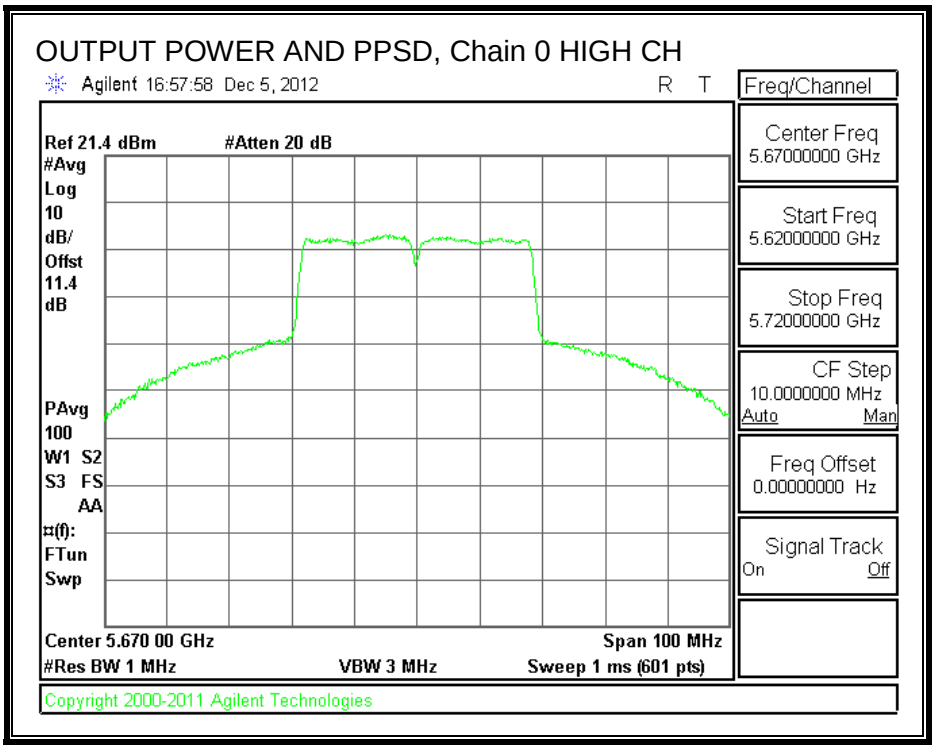
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-1.15	0.73	3.33	8.11	-4.78
Mid	5550	3.62	4.69	7.63	8.11	-0.48
High	5670	4.53	4.09	7.76	8.11	-0.35

Note: method (1) “Measure and sum the spectra across the outputs” as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

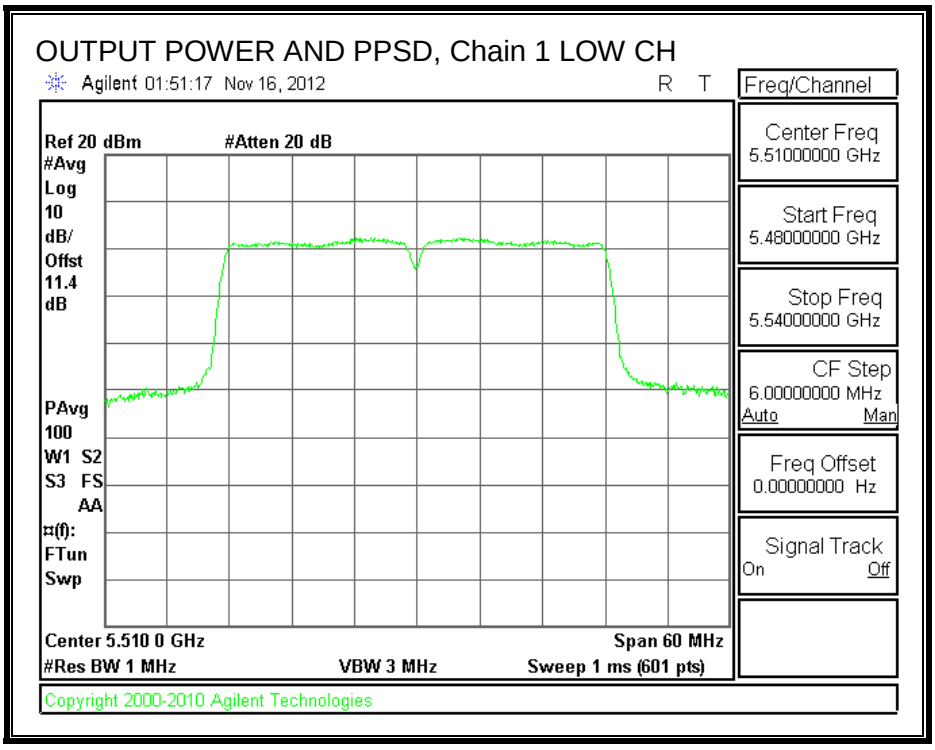
OUTPUT POWER AND PPSD, Chain 0



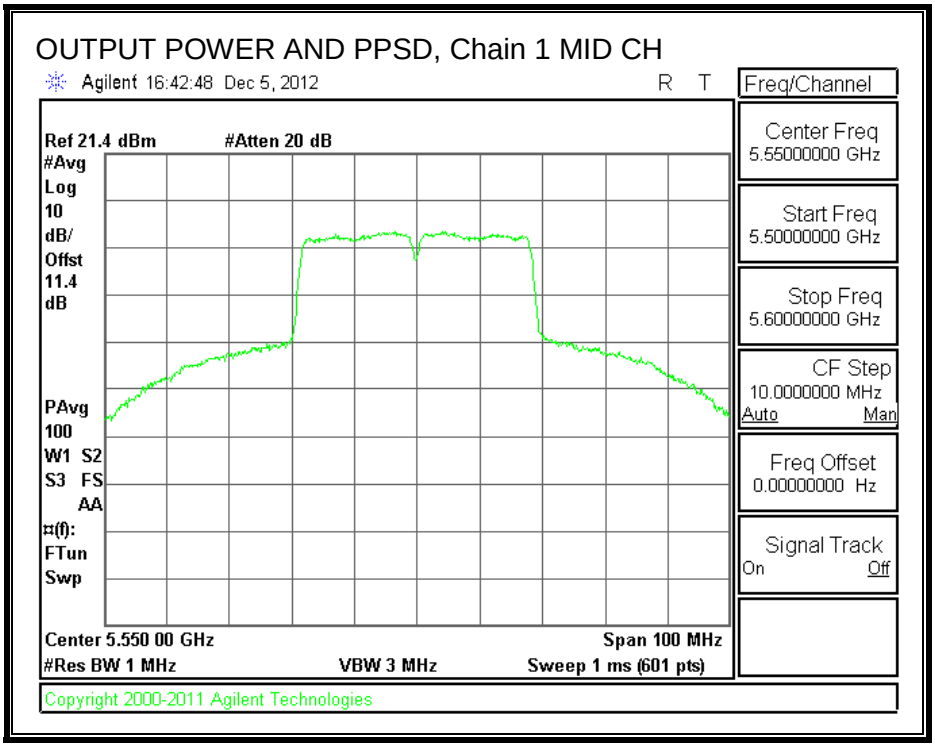




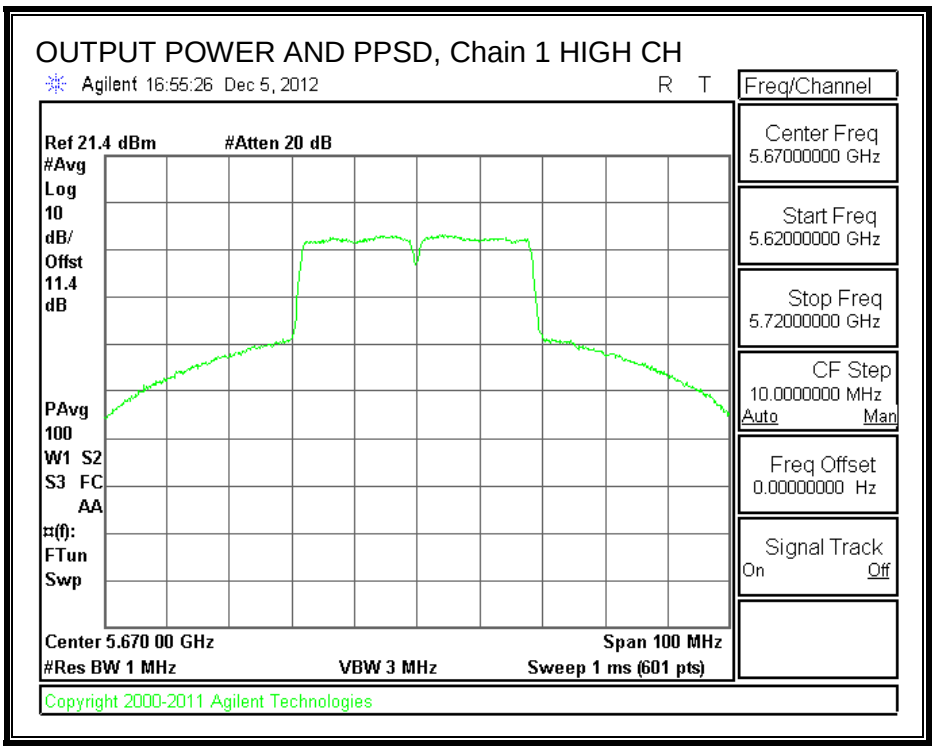
OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 1 MID CH



OUTPUT POWER AND PPSD, Chain 1 HIGH CH



7.87. 802.11ac VHT40 BF 2TX MODE, CHANNEL 142 IN THE 5.6 GHz BAND

7.87.1. 26 dB BANDWIDTH- UNII

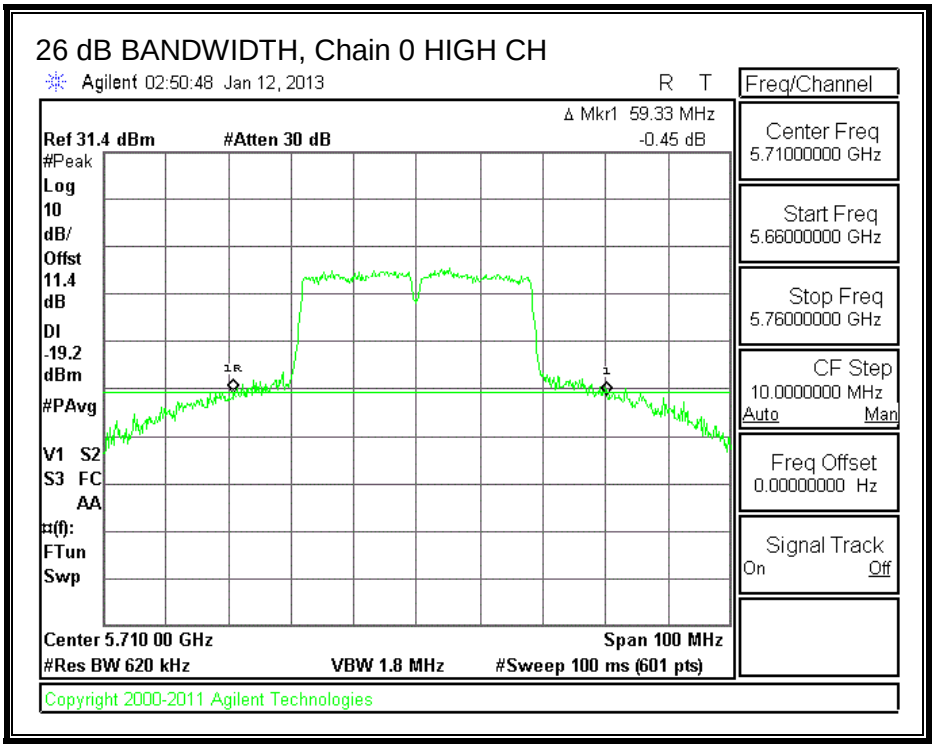
LIMITS

None; for reporting purposes only.

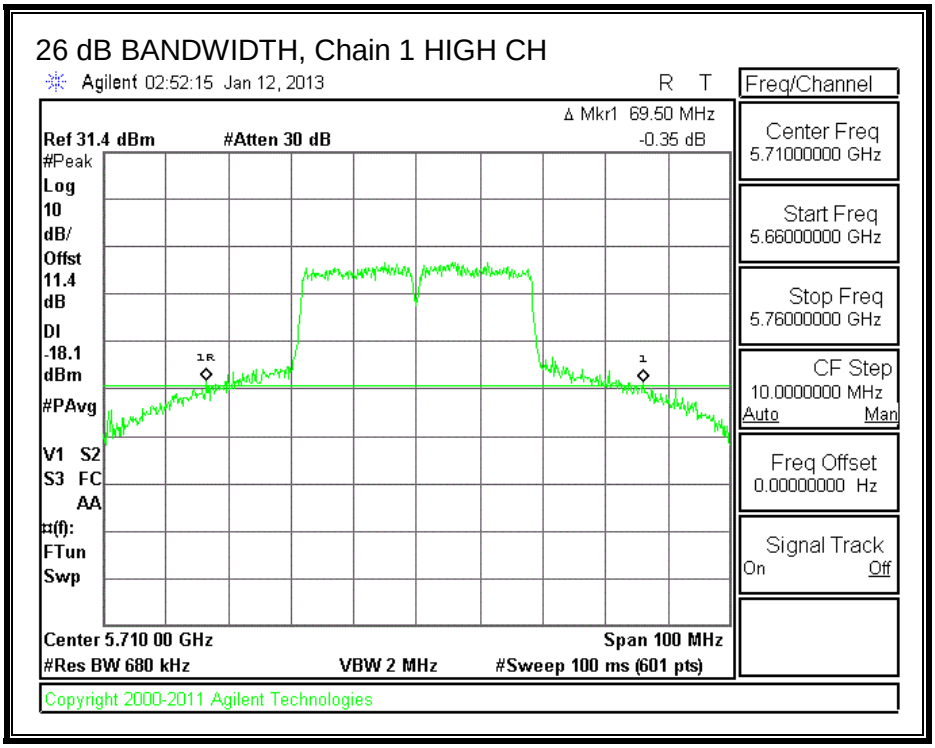
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
High	5710	59.33	69.50

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.87.2. 99% BANDWIDTH

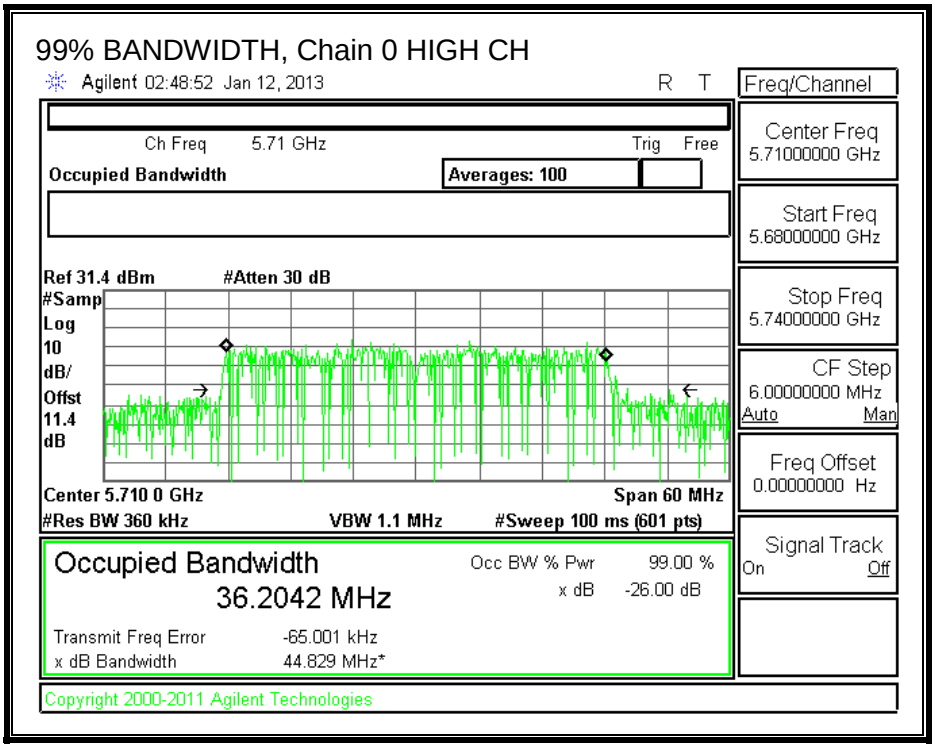
LIMITS

None; for reporting purposes only.

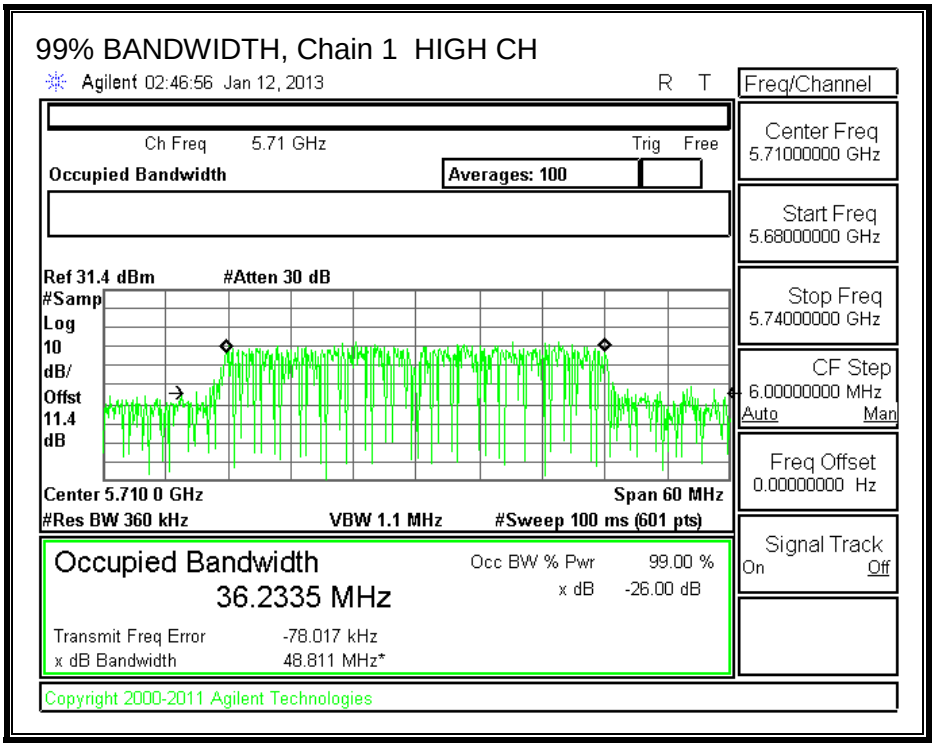
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
High	5710	36.2042	36.2335

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.87.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	8.89

RESULTS

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)
Mid	5710	44.67	33.1021	8.89

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Mid	5710	21.11	24.00	30.00	21.11	8.11	11.00	8.11

Duty Cycle CF (dB)	0.43	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5710	16.11	16.29	19.64	21.11	-1.47

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Mid	5710	2.233	2.567	5.84	8.11	-2.27

Limits (FCC), portion in 5.8 GHz DTS band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)
Mid	5710	14.67	3.1021	8.89

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Mid	5710	19.77	15.92	21.92	13.03	8.11	11.00	8.11

Duty Cycle CF (dB)	0.43	Included in Calculations of Corr'd Power & PPSD

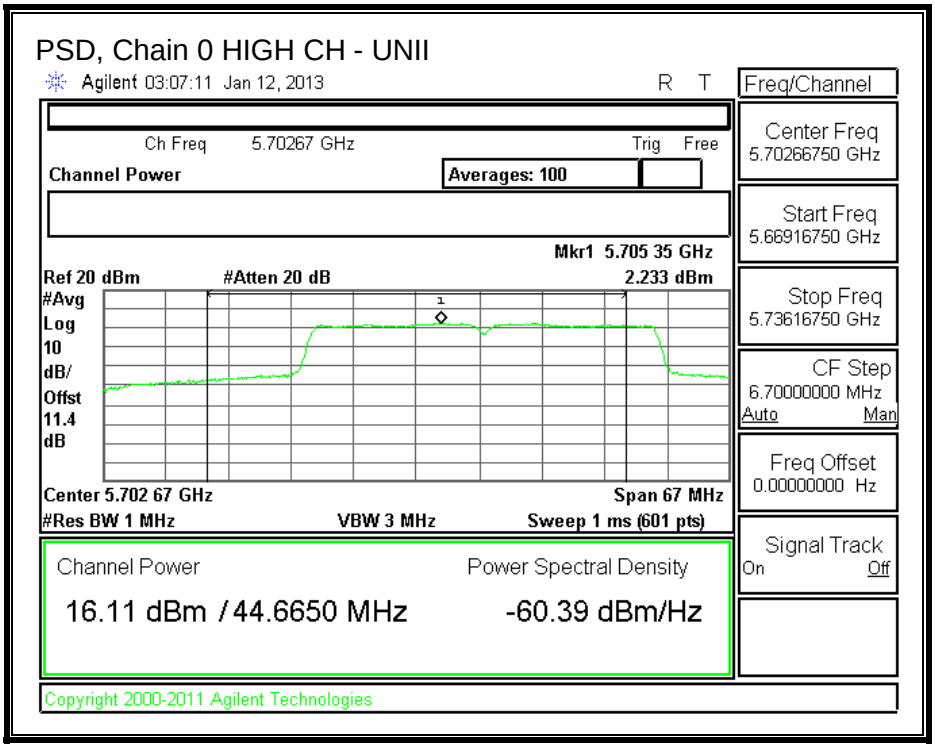
Output Power Results

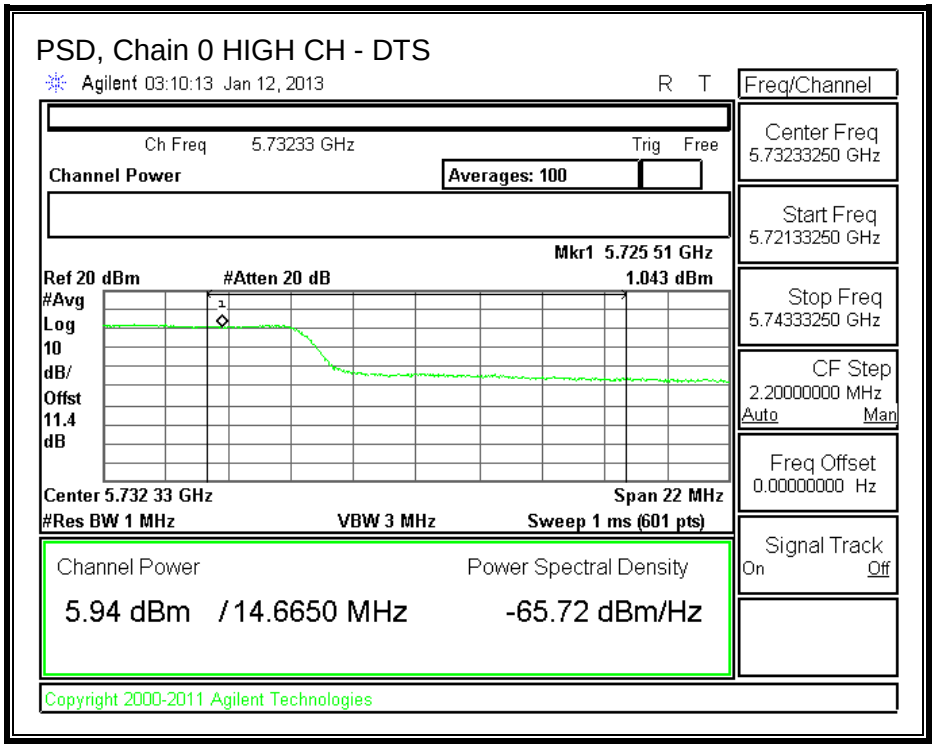
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5710	5.94	6.32	9.57	13.03	-3.45

PPSD Results

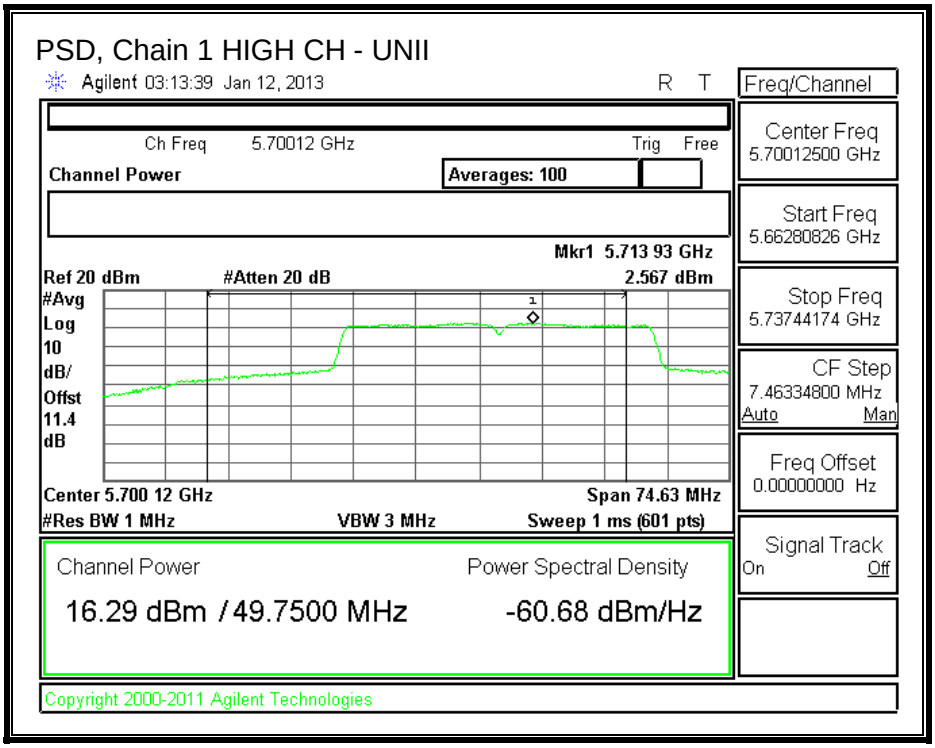
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Mid	5710	1.043	1.349	4.64	8.11	-3.47

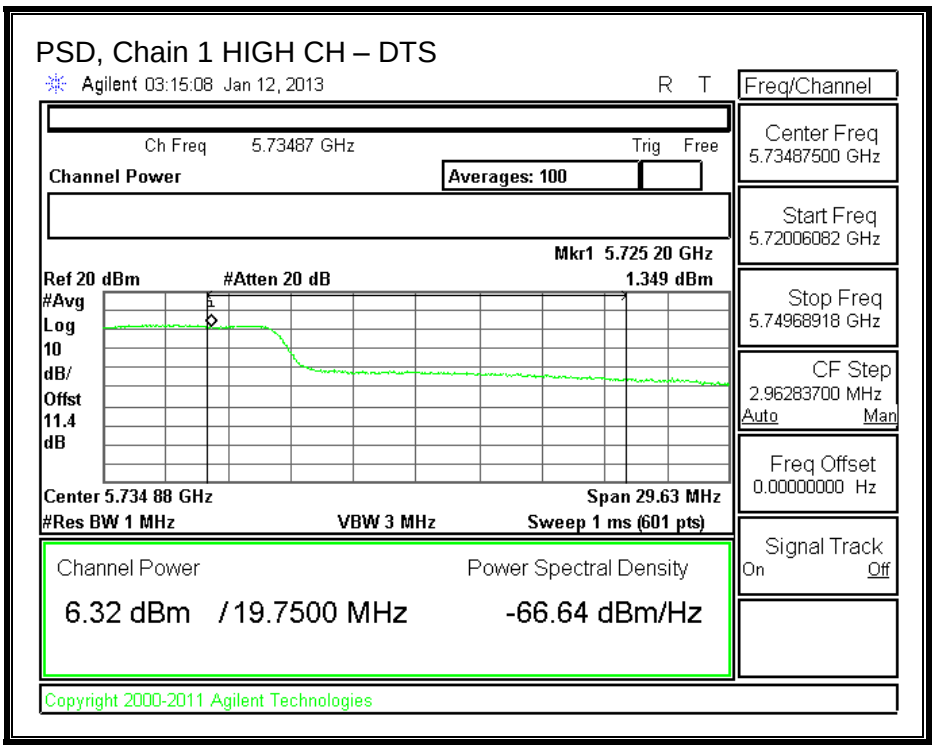
PSD, Chain 0





PSD, Chain 1





7.88. 802.11ac VHT40 BF 3TX MODE IN THE 5.6 GHz BAND

This mode has same antenna port results as 802.11n HT20 CDD 3TX, except for output power, as shown below.

7.88.1. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For PPSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	3.94	10.05

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	39.625	36.0770	10.05
Mid	5550	39.625	36.1113	10.05
High	5670	39.500	36.0829	10.05

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5510	19.95	24.00	30.00	19.95
Mid	5550	19.95	24.00	30.00	19.95
High	5670	19.95	24.00	30.00	19.95

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	13.45	14.10	13.60	18.50	19.95	-1.45
Mid	5550	15.04	15.08	15.11	19.85	19.95	-0.10
High	5670	15.01	15.18	15.00	19.84	19.95	-0.11

7.89. 802.11ac VHT80 1TX MODE IN THE 5.6 GHz BAND

7.89.1. 26 dB BANDWIDTH

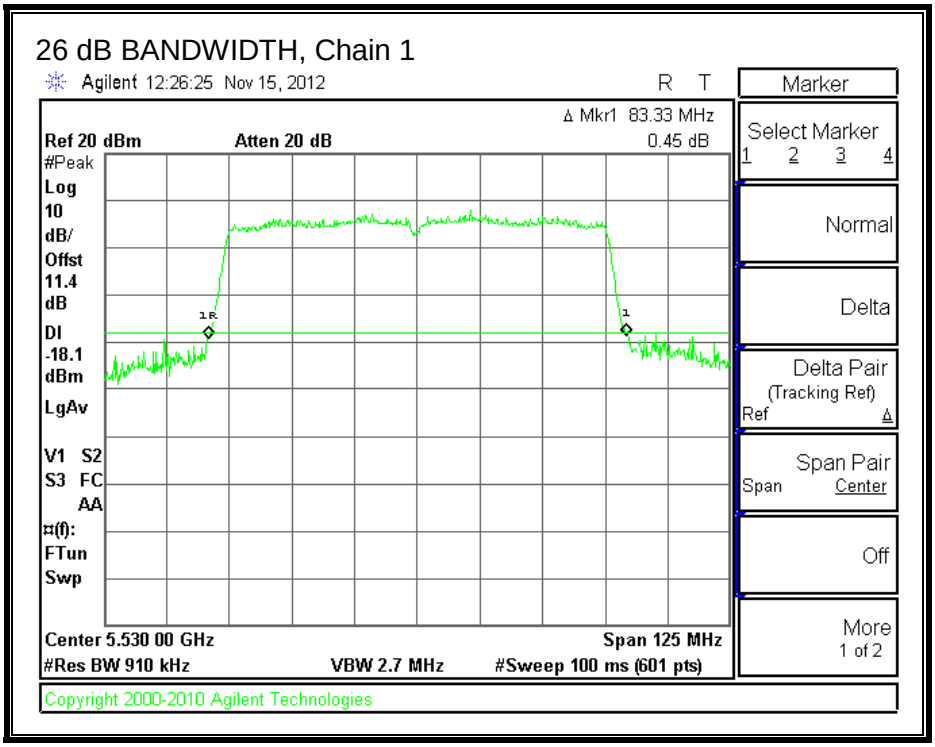
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)
Mid	5530	83.33

26 dB BANDWIDTH, Chain 1



7.89.2. 99% BANDWIDTH

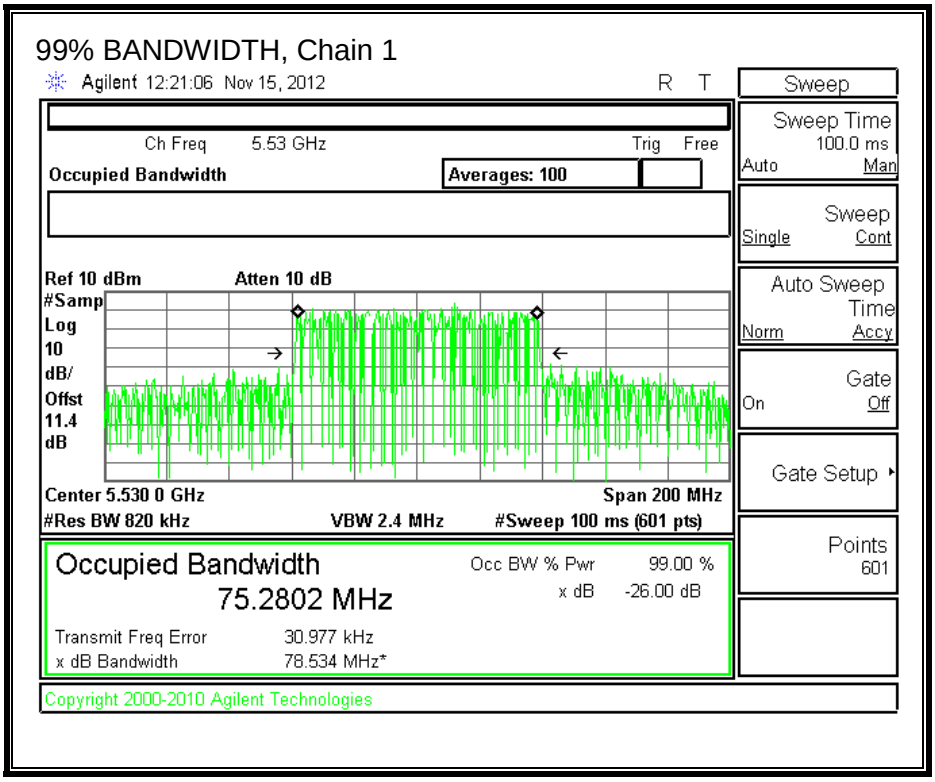
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% BW Chain 1 (MHz)
Mid	5530	75.2802

99% BANDWIDTH, Chain 1



7.89.3. OUTPUT POWER AND PPSD

FCC §15.407 (a) (1)

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5530	83.33	75.2802	6.66

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Mid	5530	23.34	24.00	30.00	23.34	10.34	11.00	10.34

Duty Cycle CF (dB)	0.85	Included in Calculations of Corr'd Power & PPSD

Output Power Results

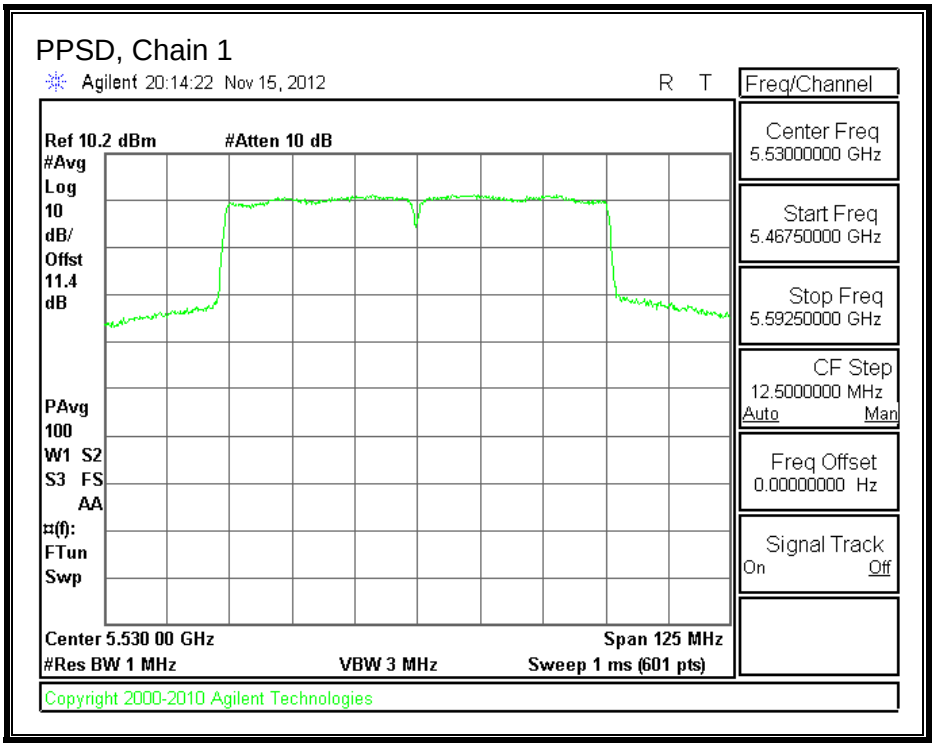
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5530	19.40	19.40	23.34	-3.94

PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Mid	5530	1.34	2.19	10.34	-8.15

Note: method (1) “Measure and sum the spectra across the outputs” as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

PPSD, Chain 1



7.89.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

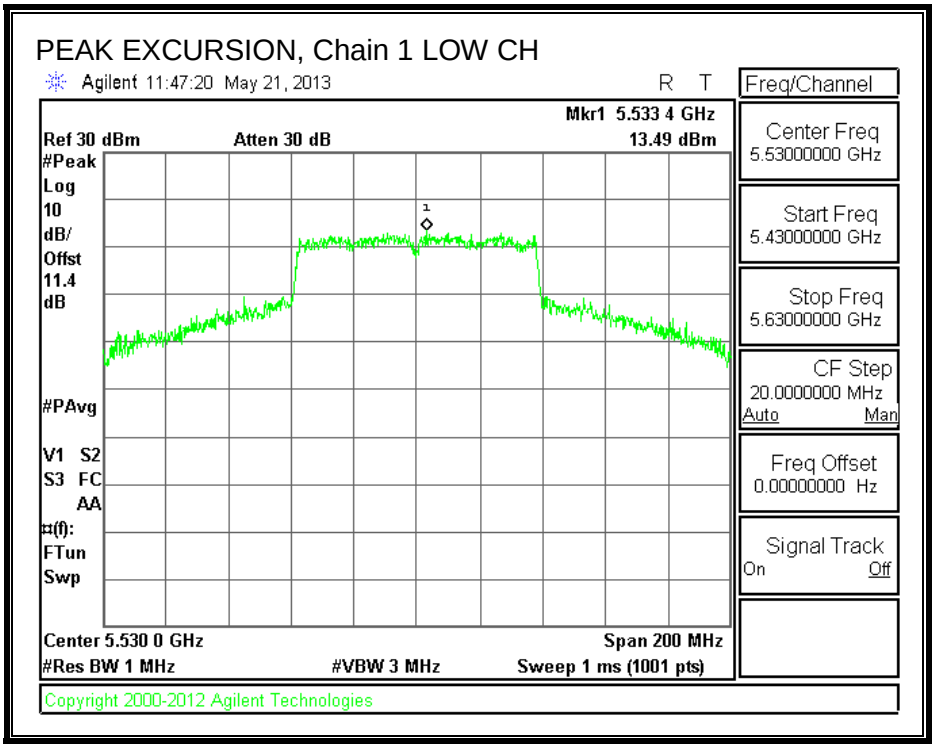
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5530	13.49	1.34	0.85	11.30	13	-1.70

PEAK EXCURSION, Chain 1 LOW CH



7.90. 802.11ac VHT80 1TX MODE CHANNEL 138 IN THE 5.6 GHz BAND

7.90.1. 26 dB BANDWIDTH

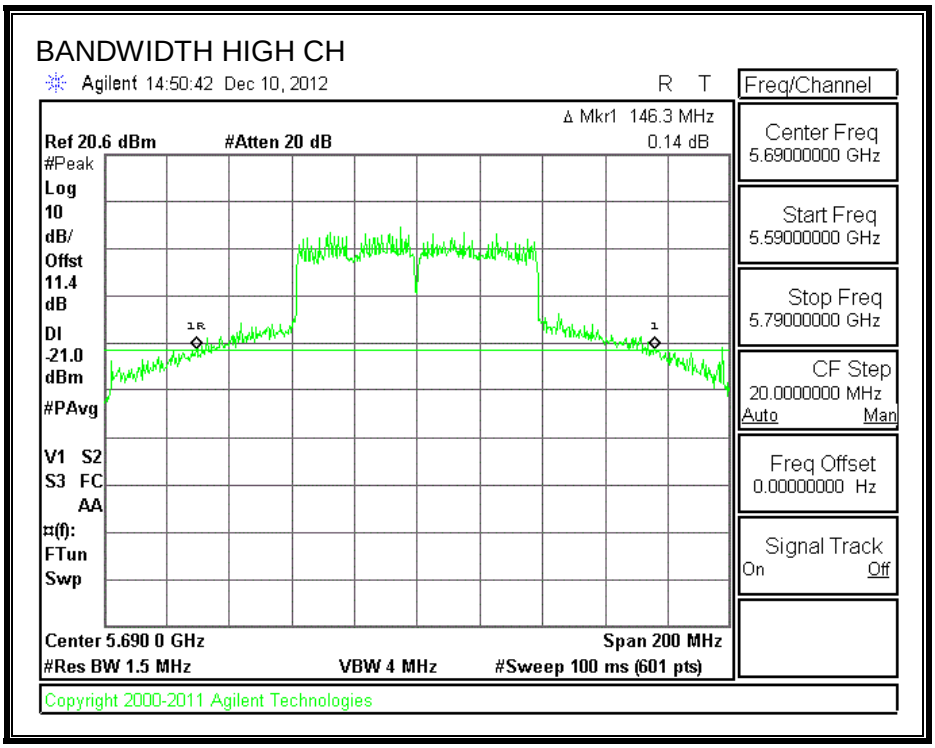
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
High	5690	146.3

26 dB BANDWIDTH



7.90.2. 99% BANDWIDTH

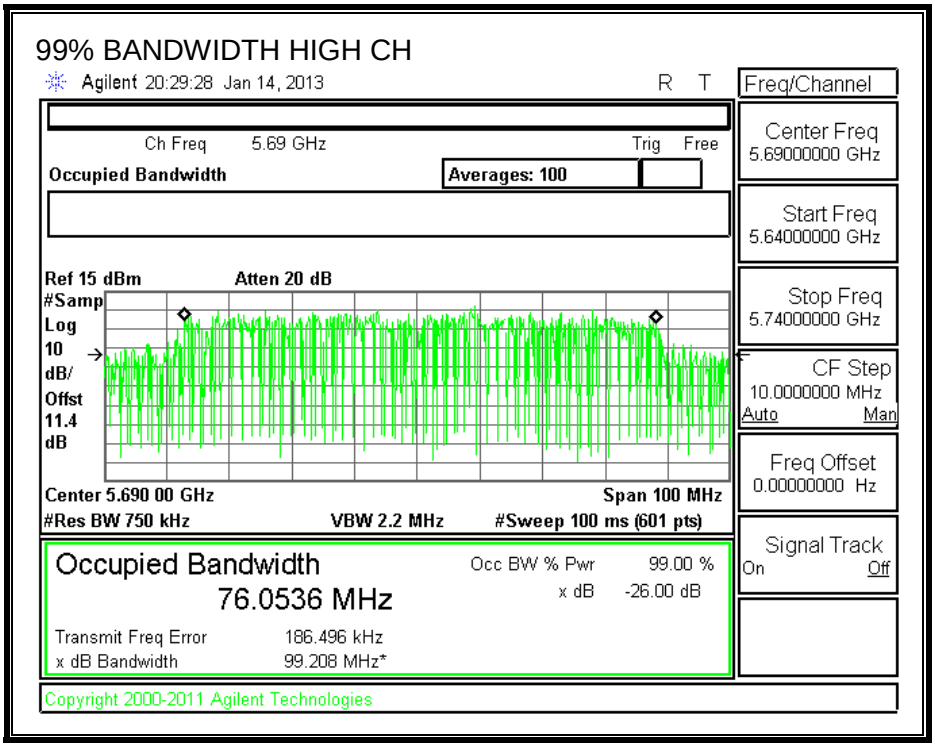
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
High	5690	76.0536

99% BANDWIDTH



7.90.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
High	5690	108.50	73.0268	6.66

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	24.00	24.00	30.00	24.00	10.34	11.00	10.34

Duty Cycle CF (dB)	0.85	Included in Calculations of PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	19.89	20.74	24.00	-3.26

PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	1.376	2.23	10.34	-8.11

Limits (FCC), portion in 5.8 GHz DTS band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
High	5690	60.35	3.0268	6.66

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	24.00	15.81	21.81	15.81	10.34	11.00	10.34

Duty Cycle CF (dB)	0.85	Included in Calculations of PPSD

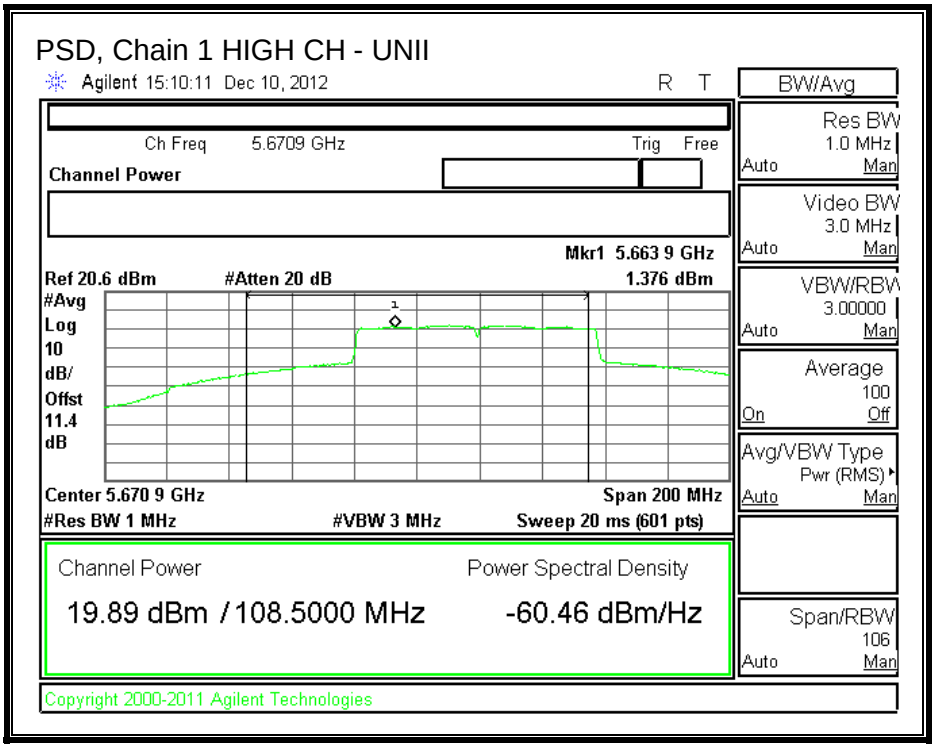
Output Power Results

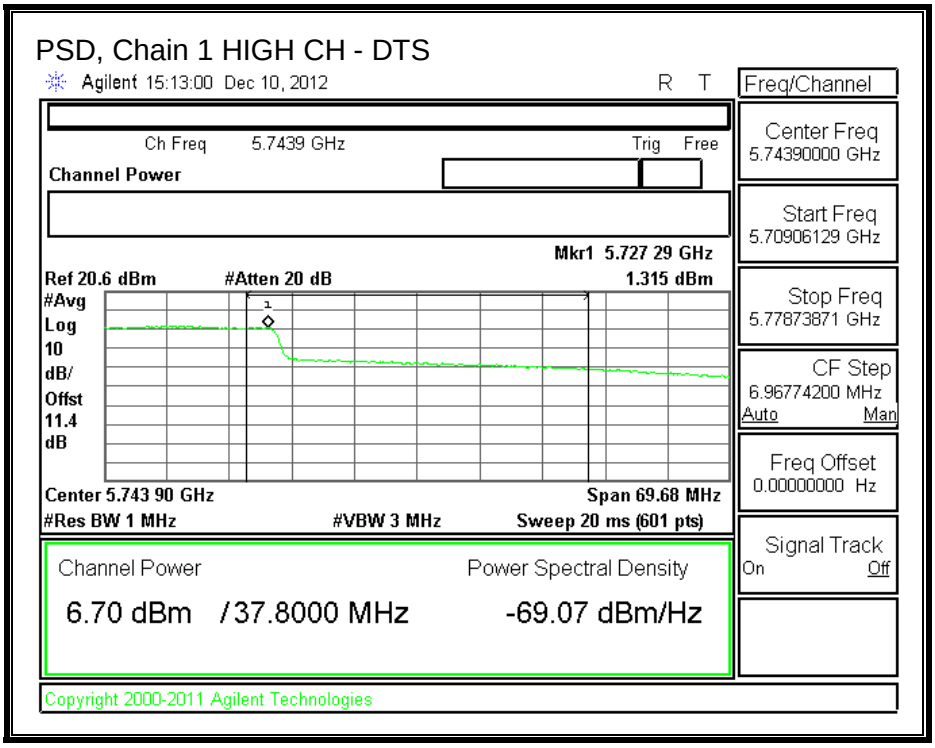
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	6.70	7.55	15.81	-8.26

PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	1.315	2.17	10.34	-8.18

PSD, Chain 1





7.91. 802.11ac VHT80 CDD 2TX MODE IN THE 5.6 GHz BAND

7.91.1. 26 dB BANDWIDTH

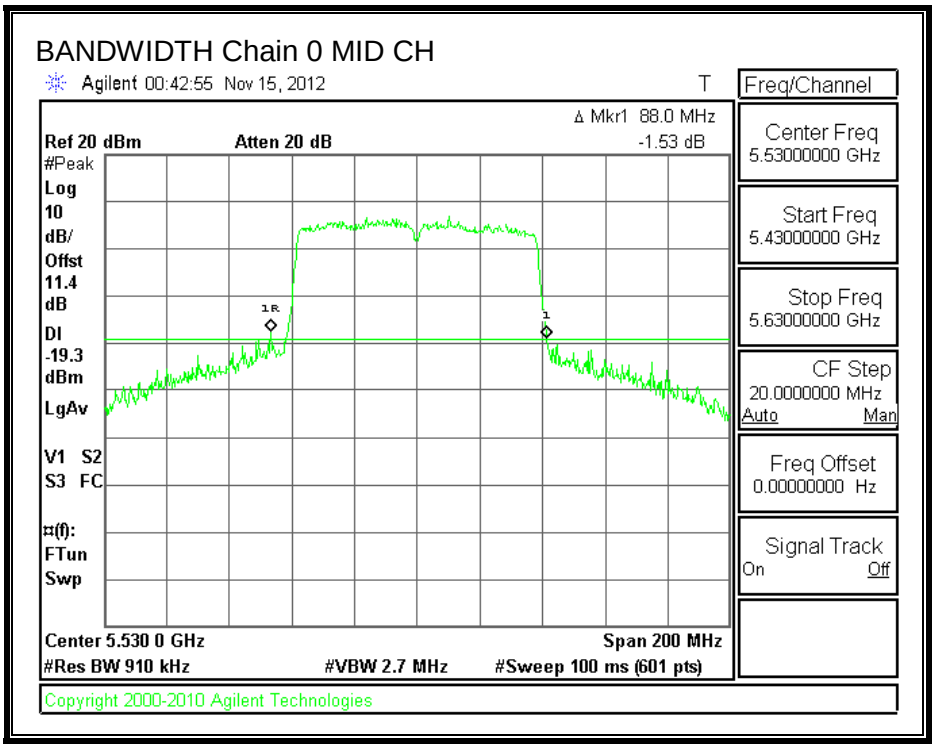
LIMITS

None; for reporting purposes only.

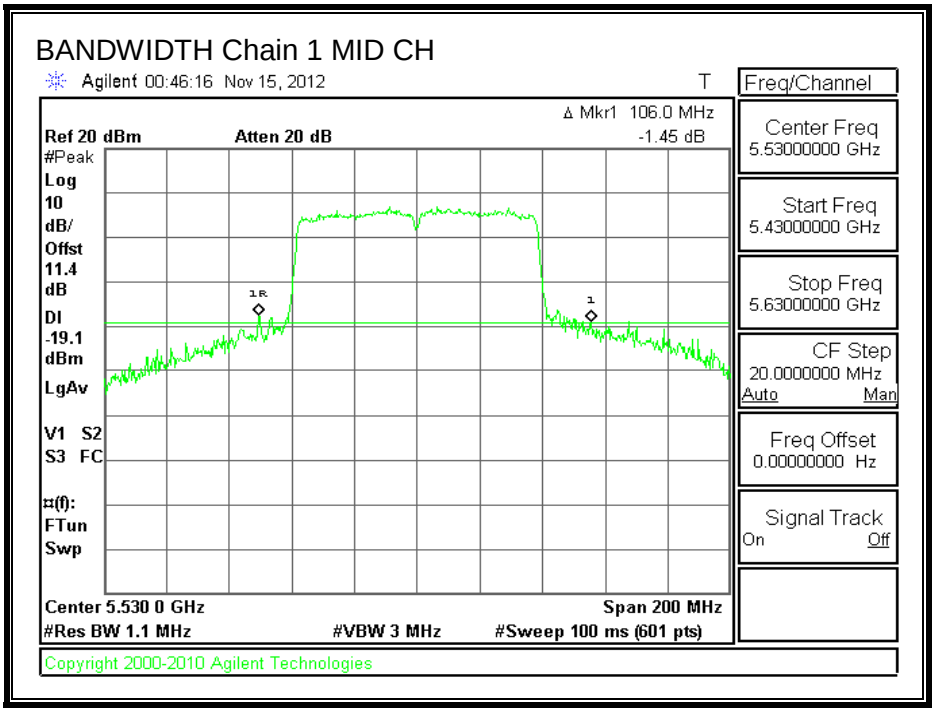
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5530	88.0	106.0

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.91.2. 99% BANDWIDTH

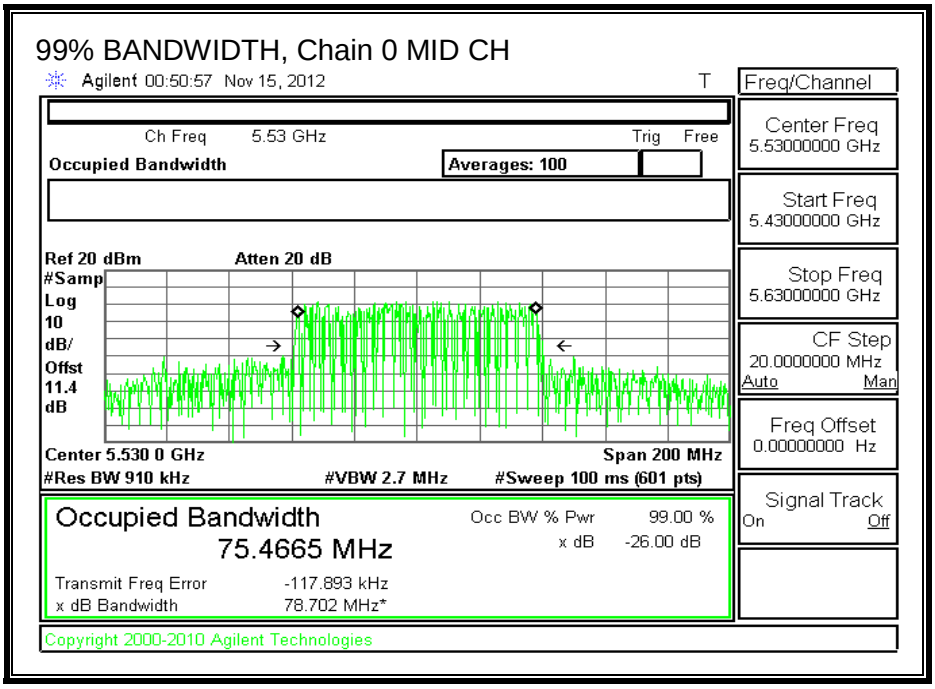
LIMITS

None; for reporting purposes only.

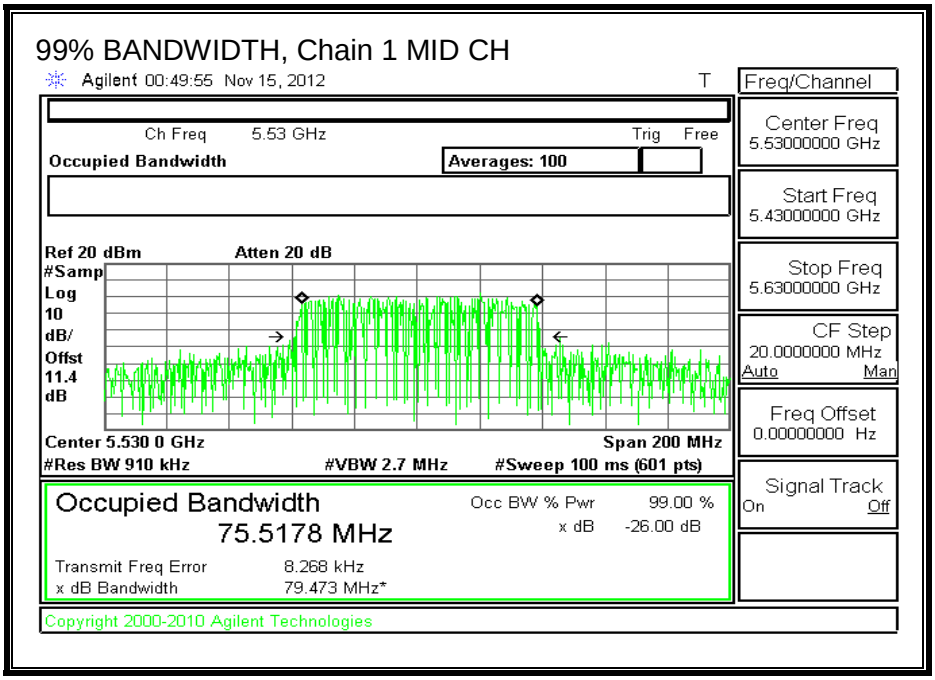
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5530	75.4665	75.5178

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.91.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.03	6.66	5.92

For PPSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	8.89

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5530	88.00	75.4665	5.92

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Mid	5530	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5530	14.38	14.45	17.43	24.00	-6.57

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5530	88.00	75.4665	8.89

Limits

Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Mid	5530	8.11	11.00	8.11

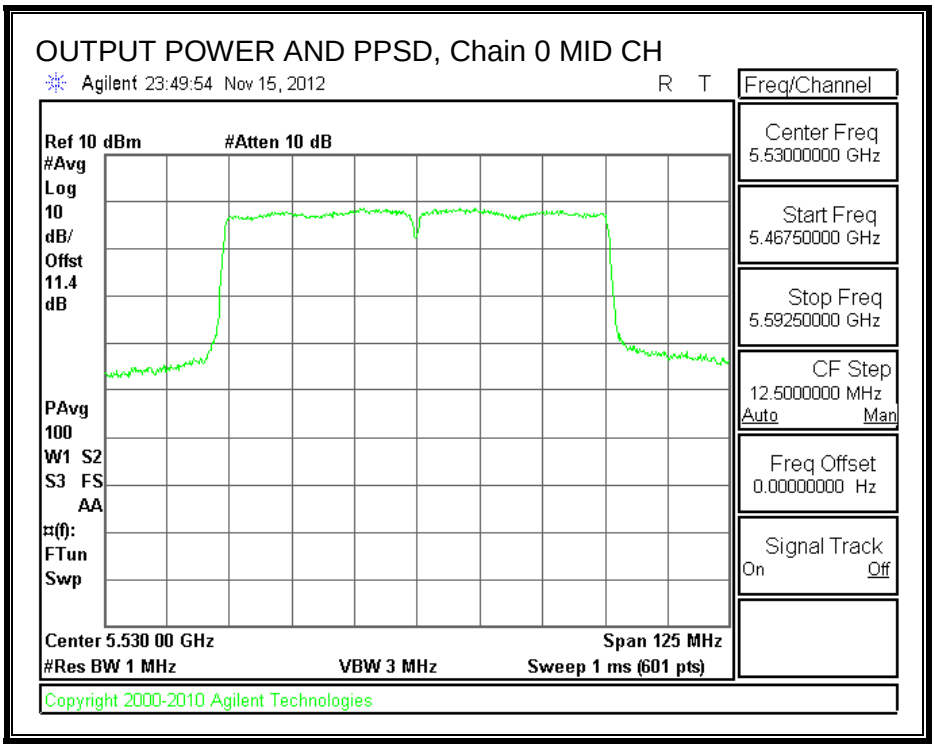
Duty Cycle CF (dB)	0.85	Included in Calculations of PPSD

PPSD Results

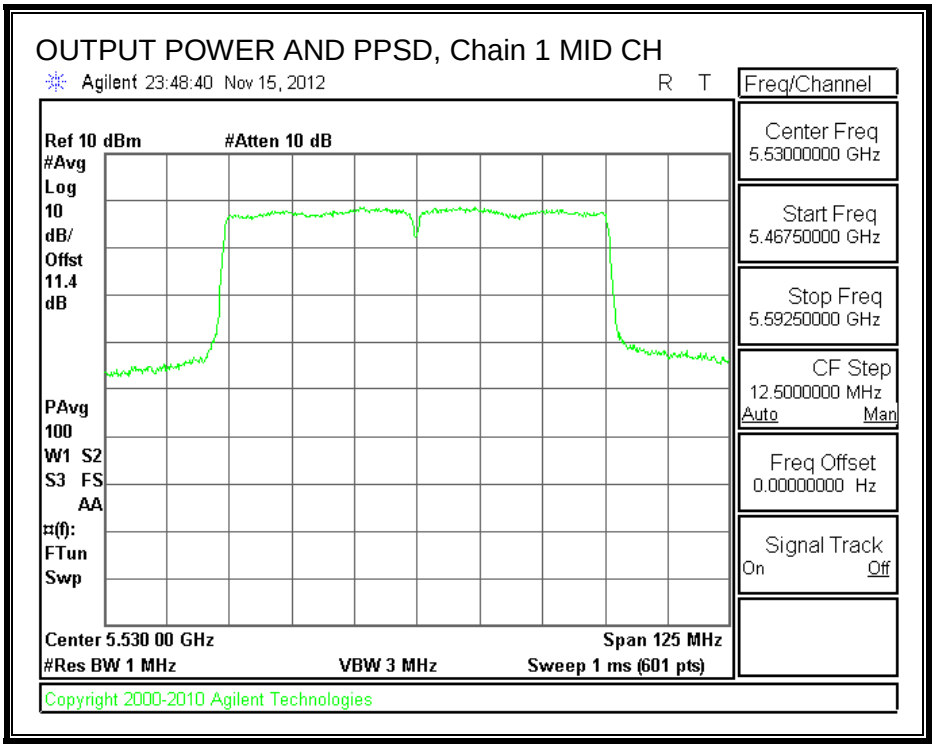
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Mid	5530	-1.93	-1.62	2.09	8.11	-6.02

Note: method (1) “Measure and sum the spectra across the outputs” as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



7.92. 802.11ac VHT80 CDD 2TX MODE CHANNEL 138 IN THE 5.6 GHz BAND

7.92.1. **26 dB BANDWIDTH- UNII**

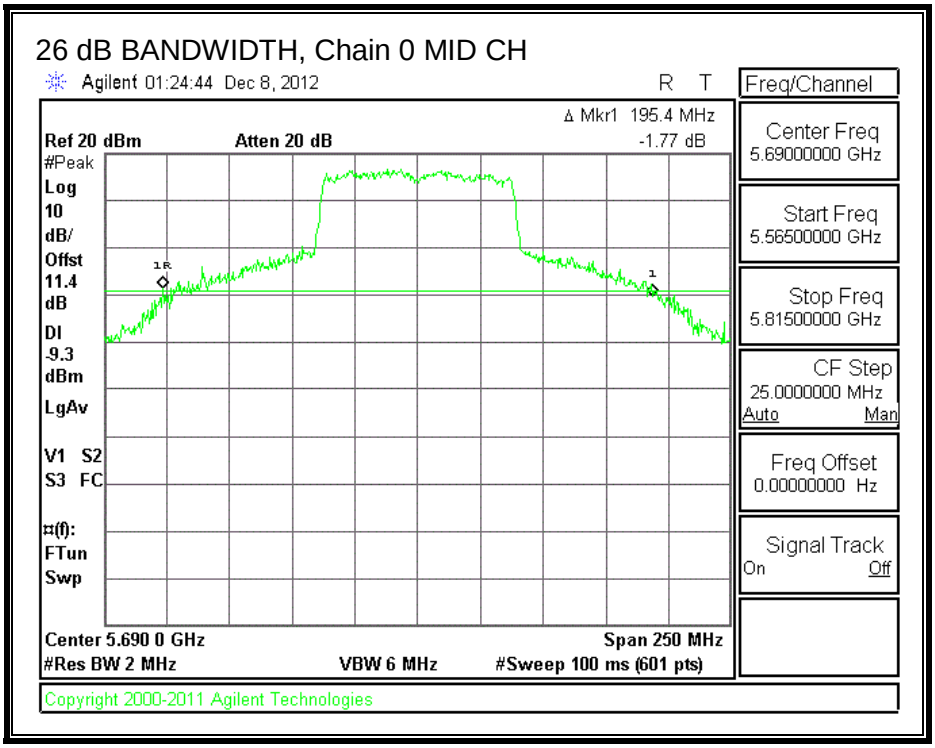
LIMITS

None; for reporting purposes only.

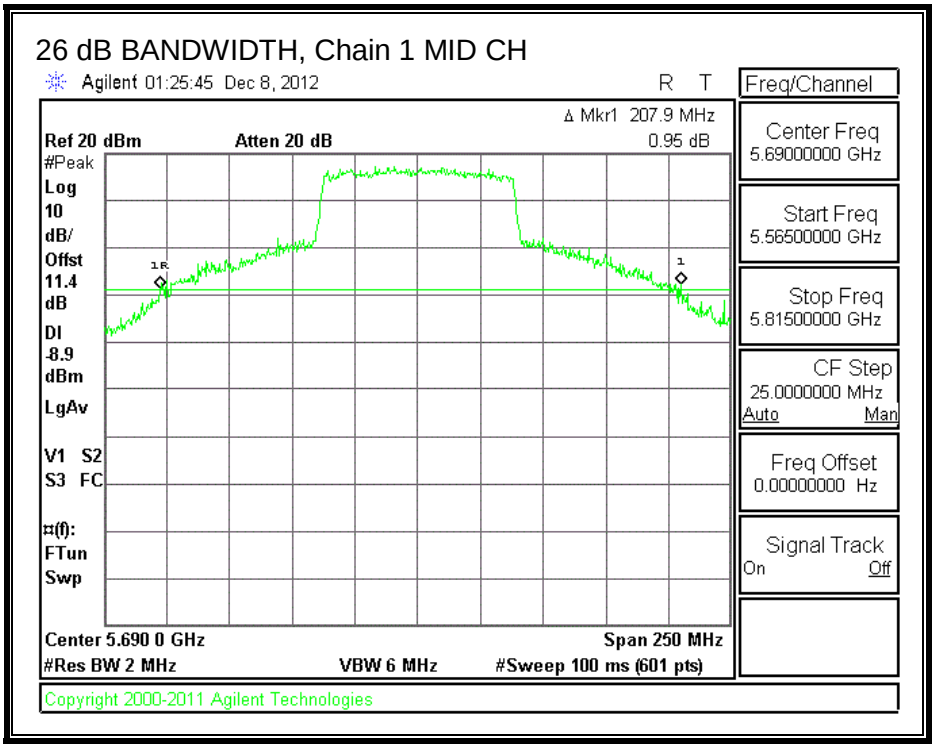
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5690	195.40	207.90

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.92.2. **99% BANDWIDTH**

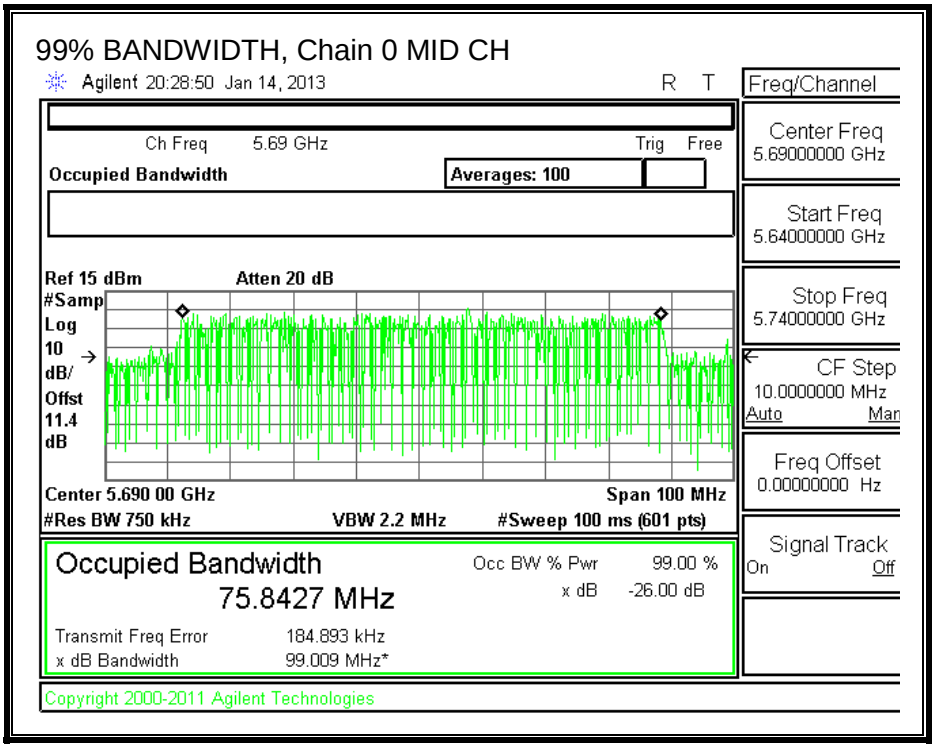
LIMITS

None; for reporting purposes only.

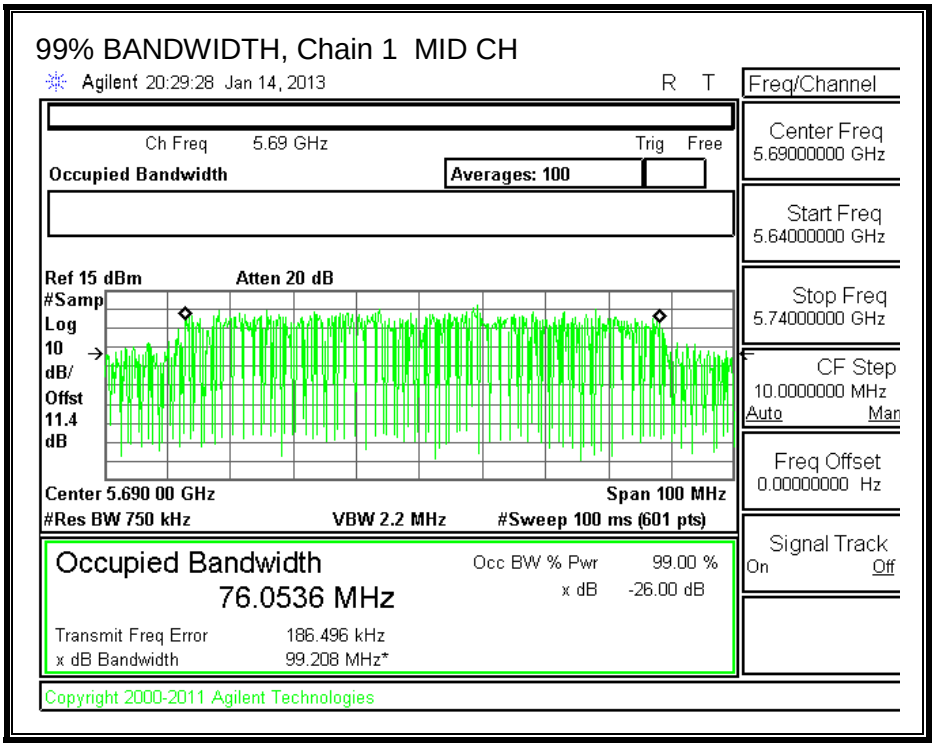
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5690	75.8427	76.0536

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.92.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.03	6.66	5.92

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	8.89

RESULTS

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)	Uncorrelated Gain (dBi)
High	5690	128.50	72.9214	8.89	5.92

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	24.00	24.00	30.00	24.00	8.11	11.00	8.11

Duty Cycle CF (dB)	0.85	Included in Calculations of PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	19.46	20.18	23.70	24.00	-0.30

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	2.35	2.24	6.15	8.11	-1.96

Limits (FCC), portion in 5.8 GHz DTS band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)	Uncorrelated Gain (dBi)
High	5690	62.70	6.8060	8.89	5.92

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	24.00	19.33	25.33	19.33	8.11	11.00	8.11

Duty Cycle CF (dB)	0.85	Included in Calculations of Corr'd Power & PPSD

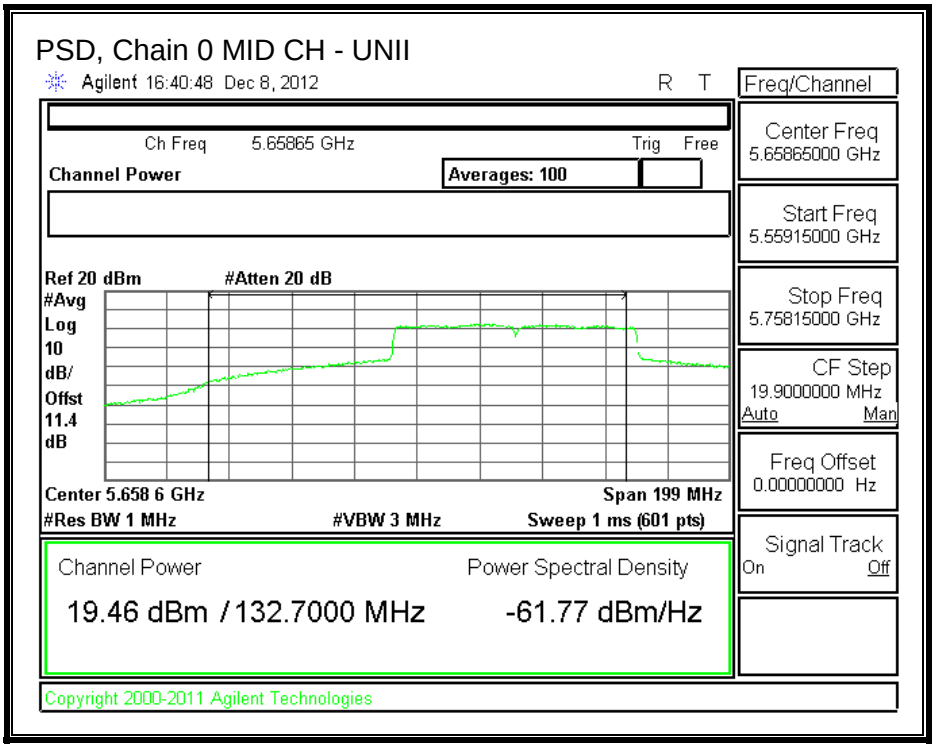
Output Power Results

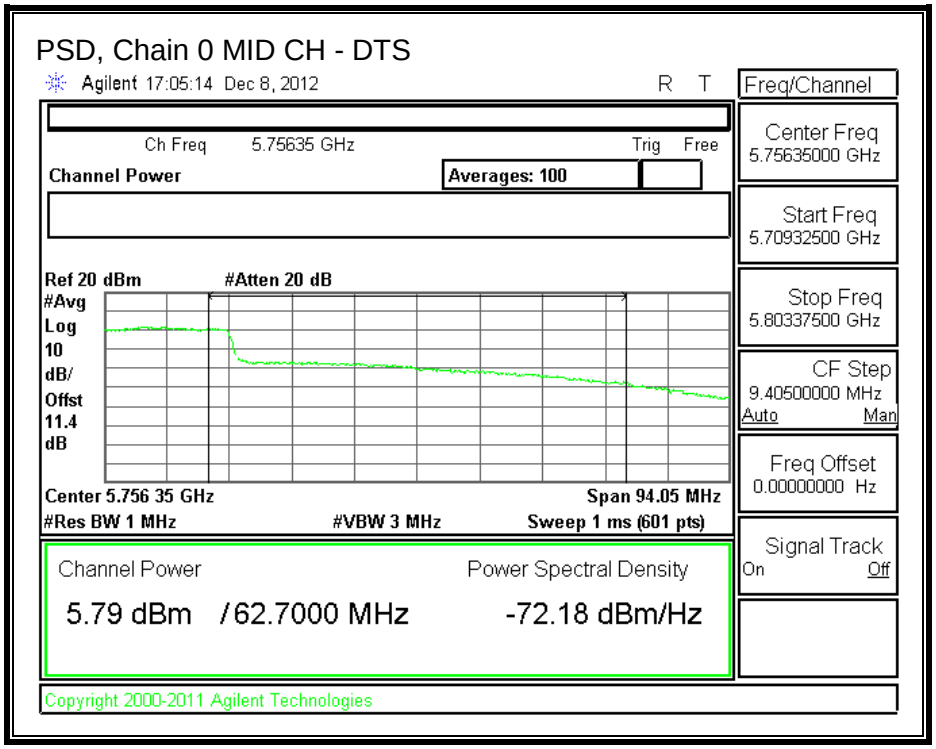
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	5.79	6.57	10.06	19.33	-9.27

PPSD Results

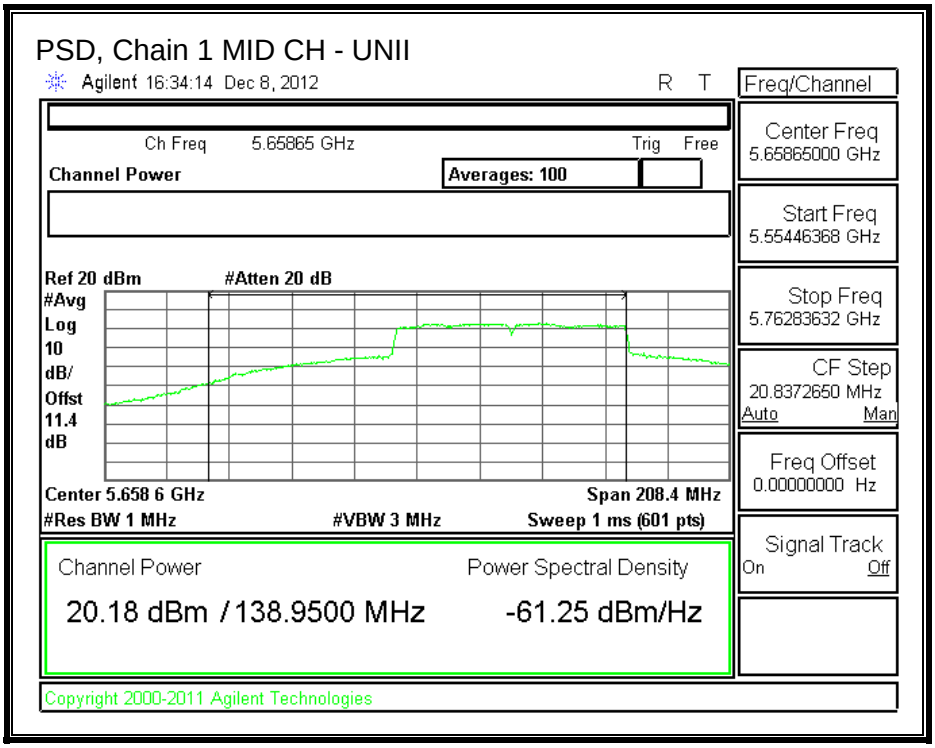
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	1.501	2.10	5.67	8.11	-2.44

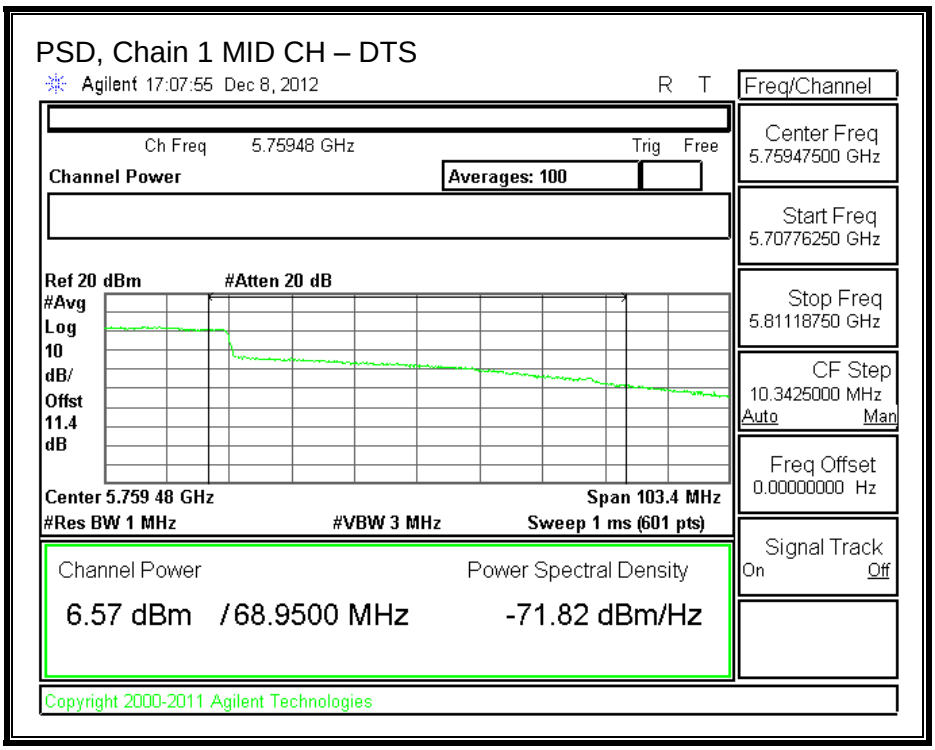
PSD, Chain 0





PSD, Chain 1





7.93. 802.11ac VHT80 CDD 3TX MODE IN THE 5.6 GHz BAND

7.93.1. 26 dB BANDWIDTH

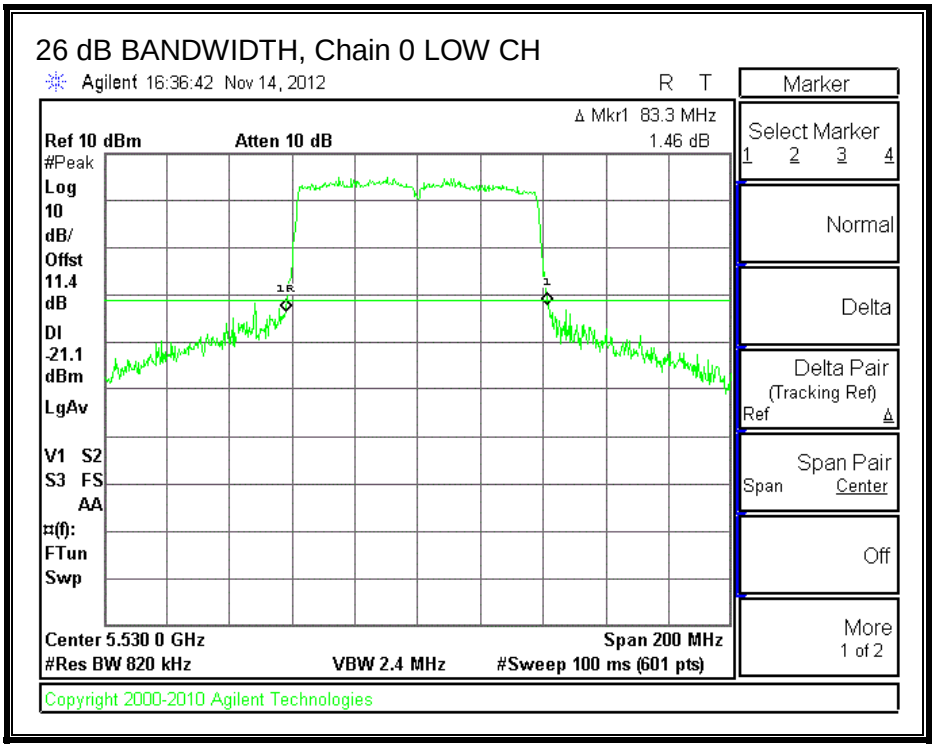
LIMITS

None; for reporting purposes only.

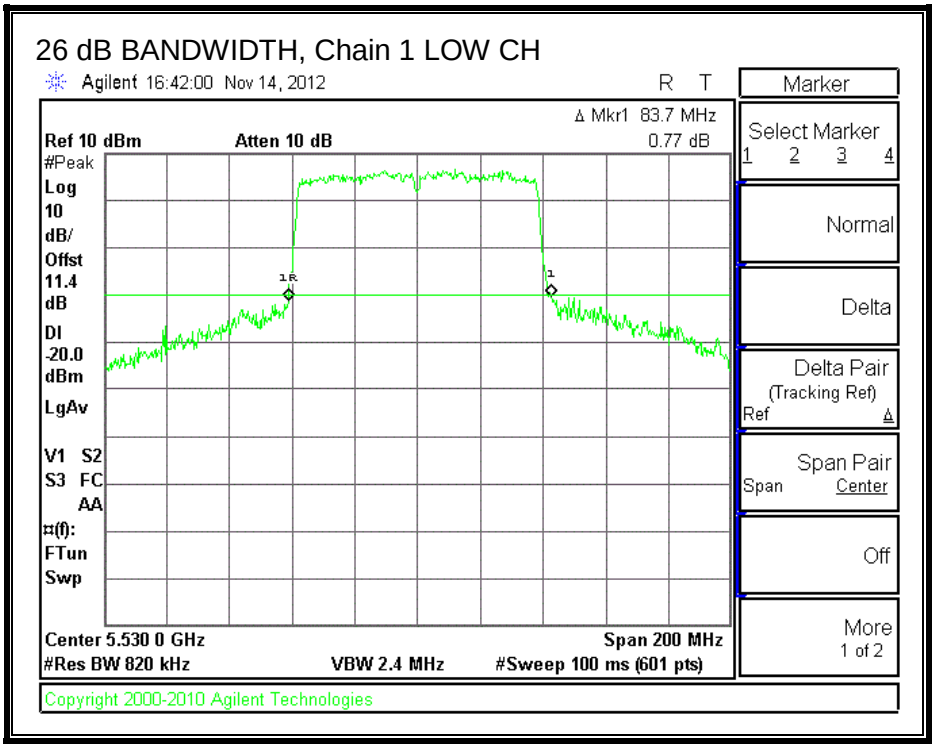
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5530	83.3	83.7	82.3

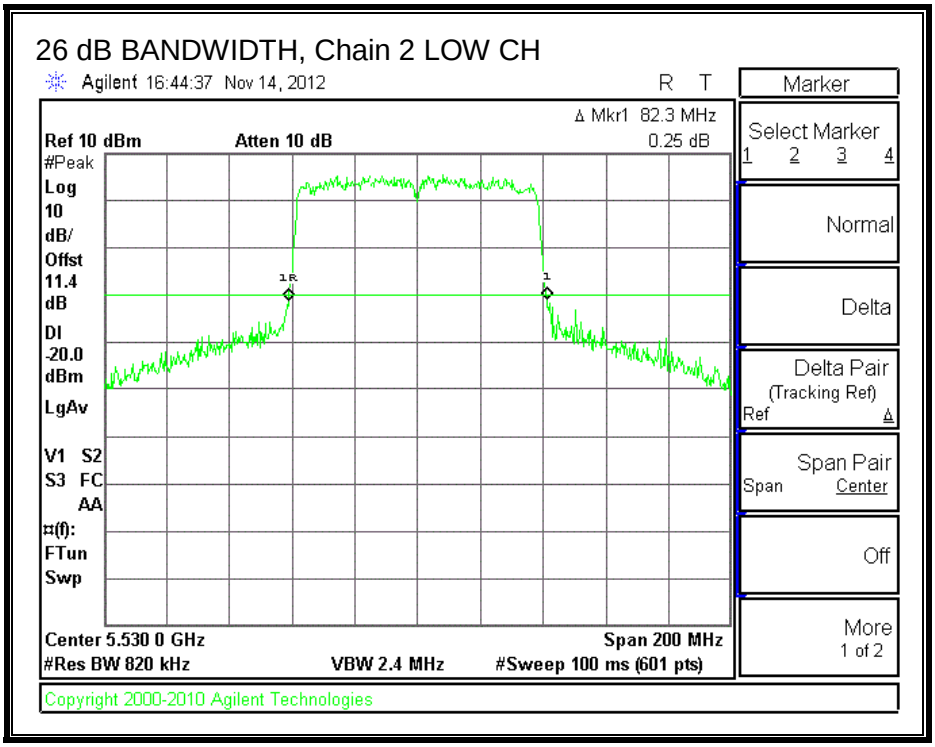
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.93.2. 99% BANDWIDTH

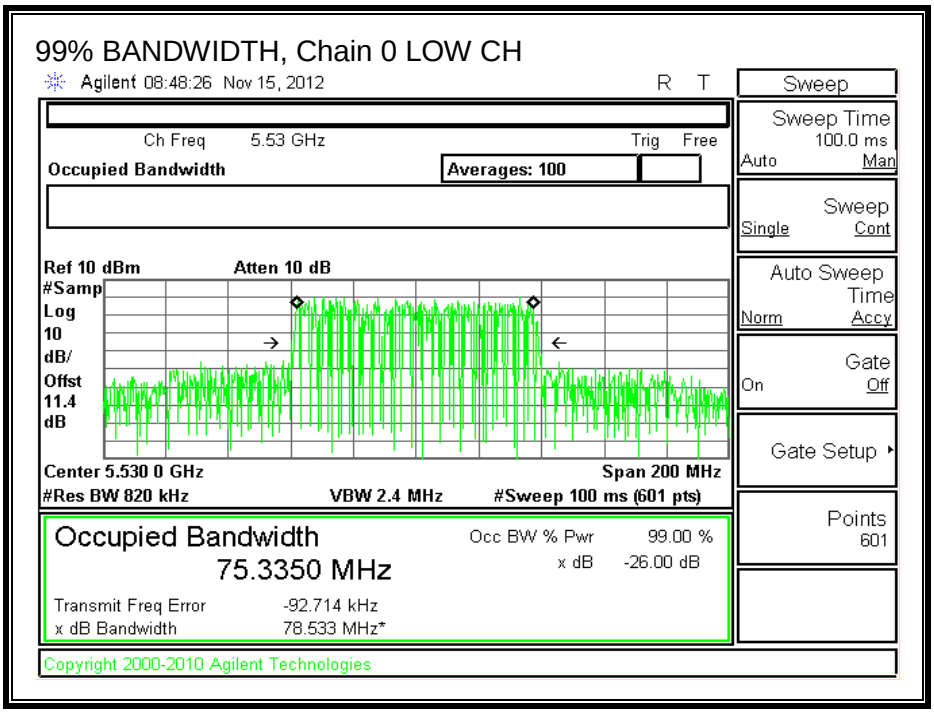
LIMITS

None; for reporting purposes only.

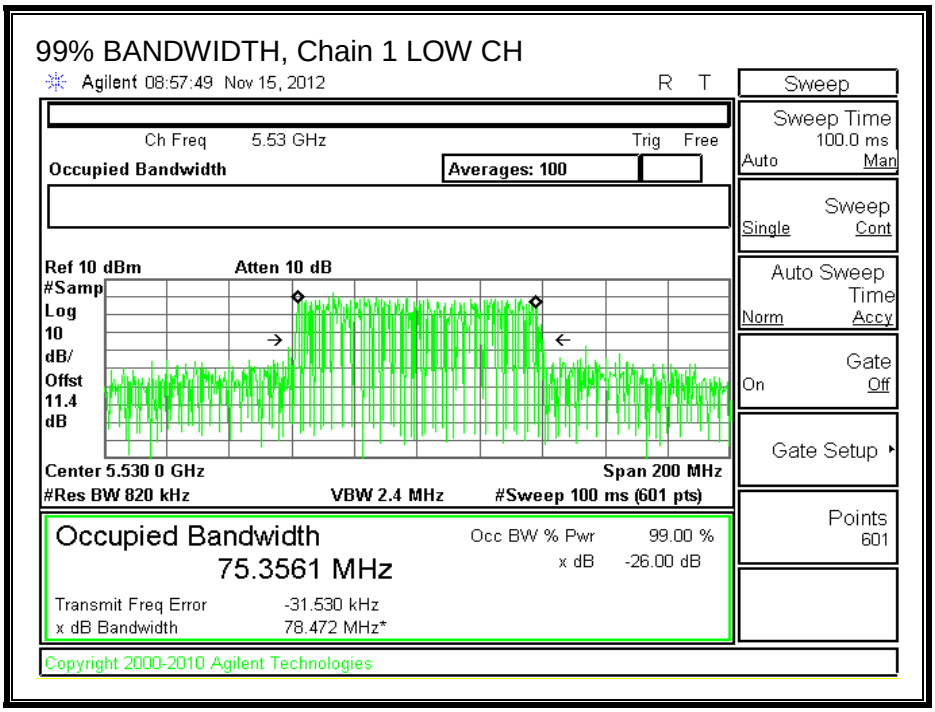
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5530	75.3350	75.3561	75.2941

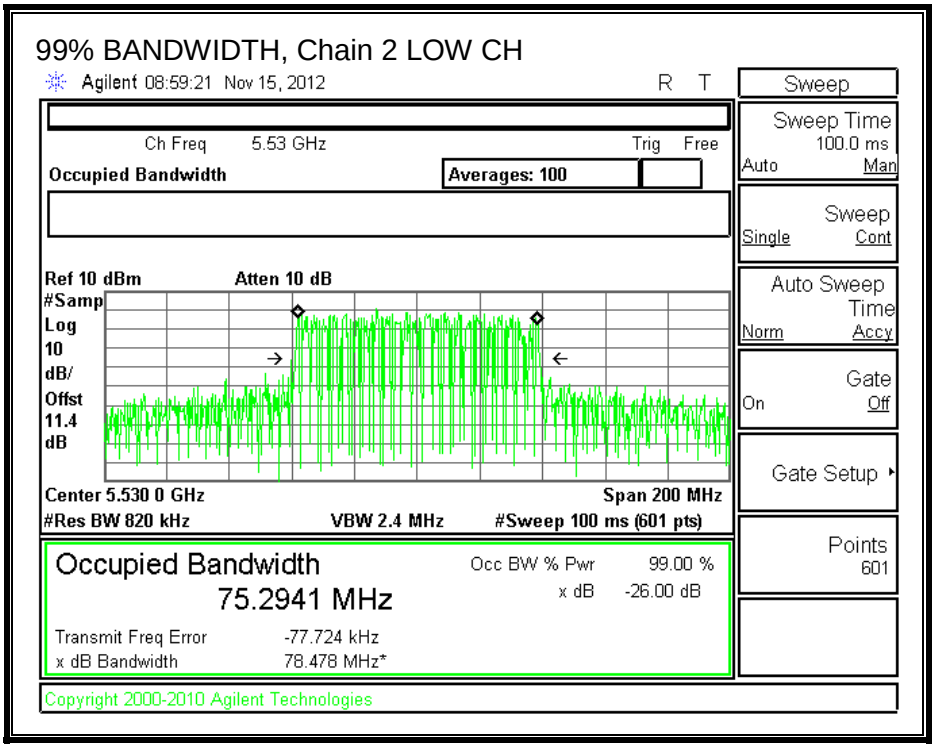
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.93.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.03	6.66	3.94	5.36

For PPSD, The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	3.94	10.05

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5530	82.30	75.2941	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5530	24.00	24.00	30.00	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	12.82	13.14	12.87	17.72	24.00	-6.28

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5530	82.30	75.2941	10.05

Limits

Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5530	6.95	11.00	6.95

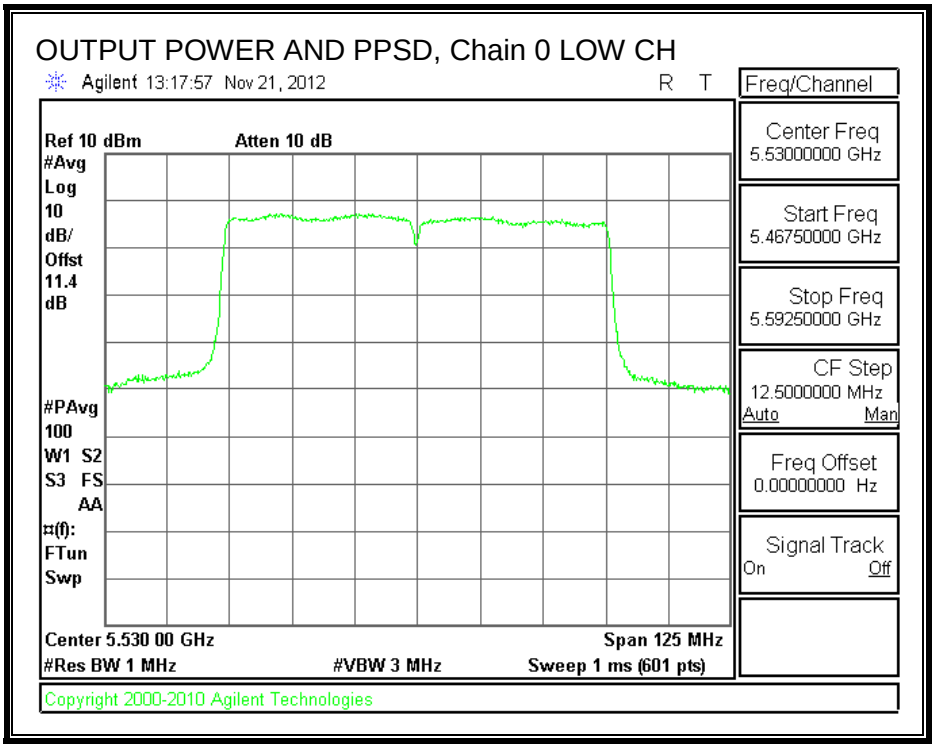
Duty Cycle CF (dB)	0.85	Included in PPSD

PPSD Results

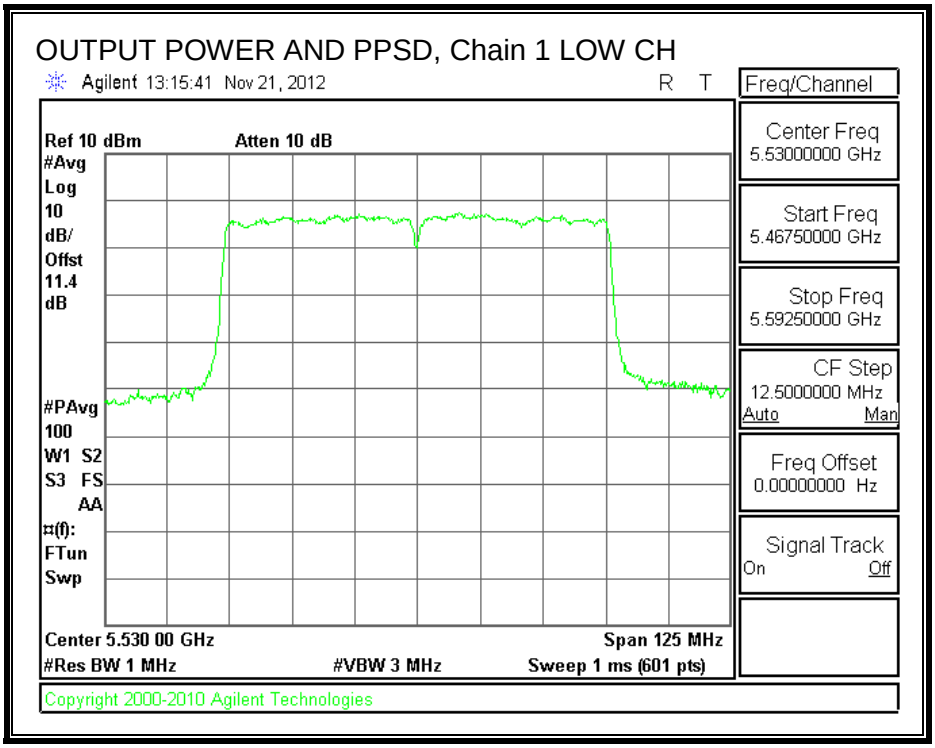
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5530	-2.98	-3.00	-2.47	2.81	6.95	-4.14

Note: method (1) “Measure and sum the spectra across the outputs” as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

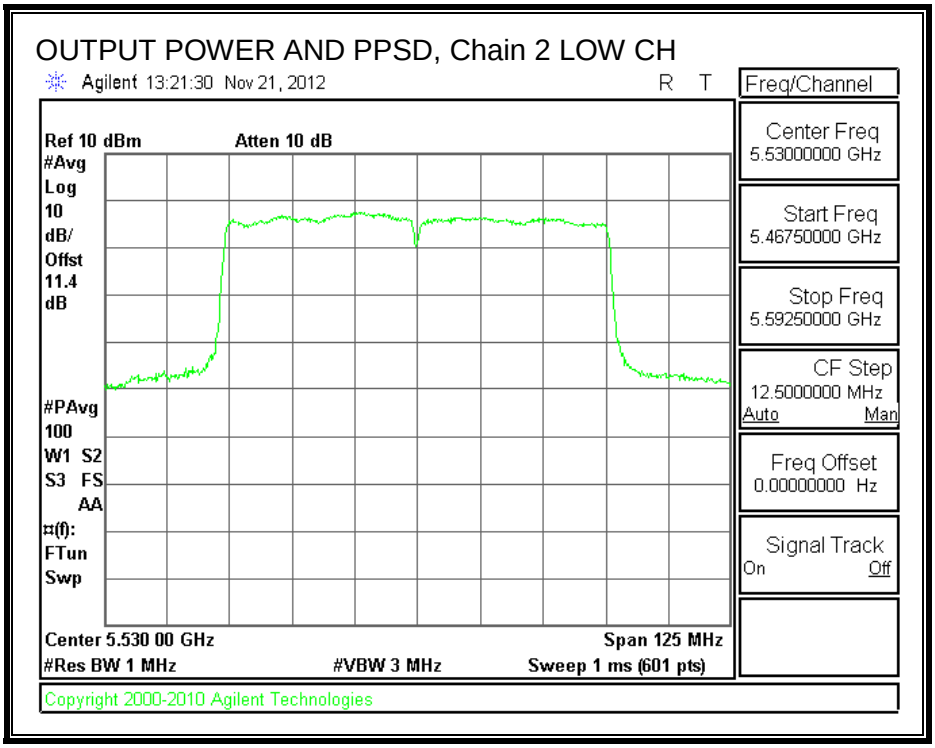
OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



7.93.4. 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.

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5530	1.63	-2.98	0.85	3.76	13	-9.24

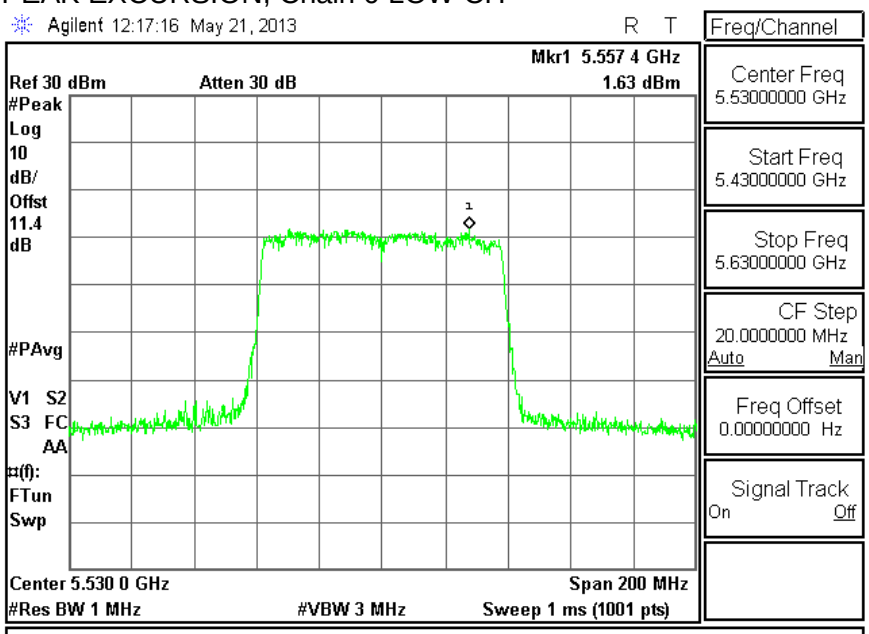
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5530	3.81	-3.00	0.85	5.96	13	-7.04

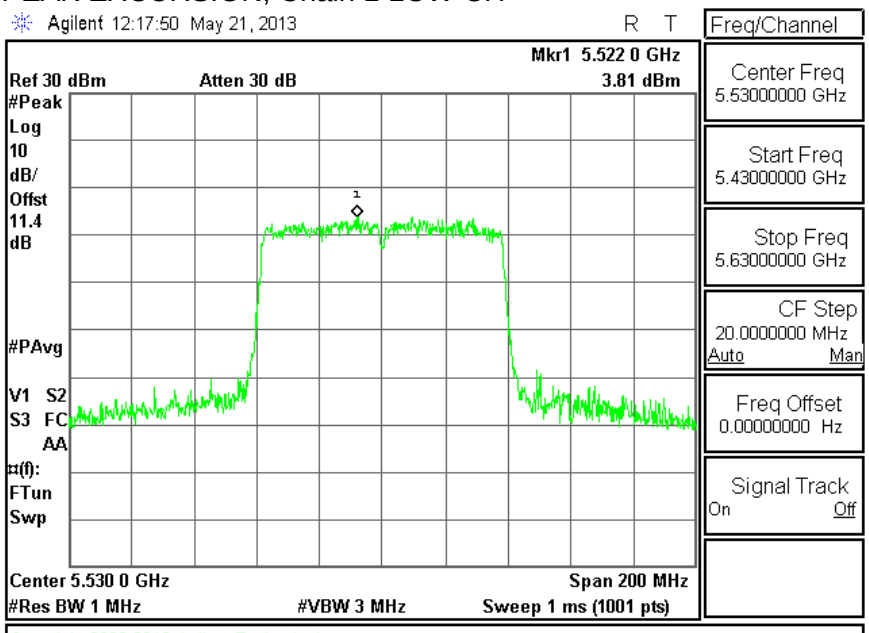
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5530	2.43	-2.47	0.85	4.05	13	-8.95

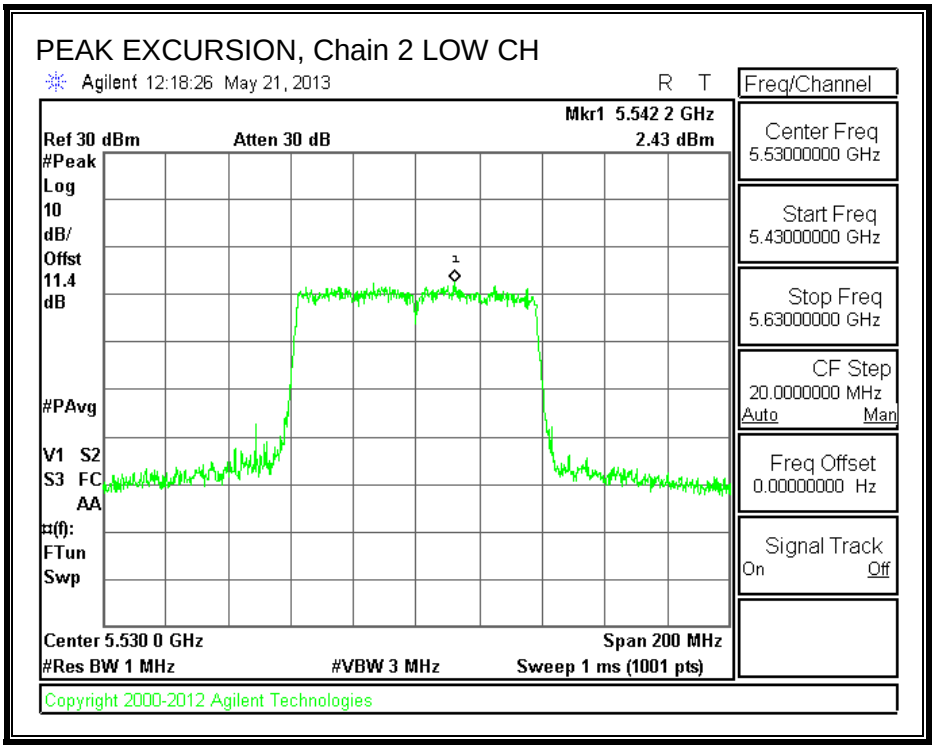
PEAK EXCURSION, Chain 0 LOW CH



PEAK EXCURSION, Chain 1 LOW CH



PEAK EXCURSION, Chain 2 LOW CH



7.94. 802.11ac VHT80 CDD 3TX MODE CHANNEL 138 IN THE 5.6 GHz BAND

7.94.1. 26 dB BANDWIDTH- UNII

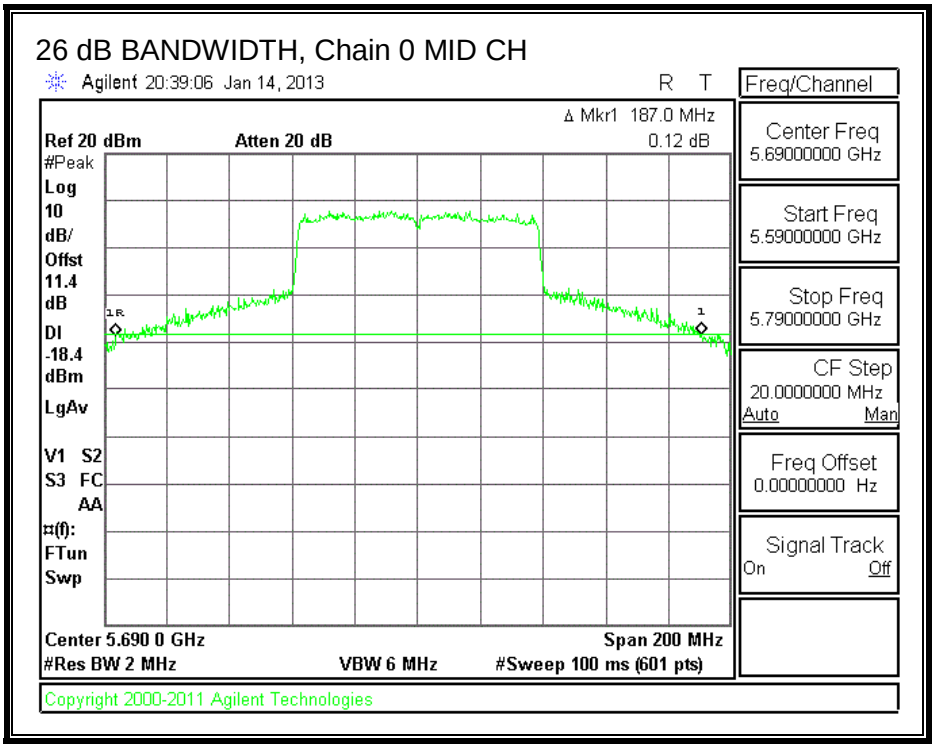
LIMITS

None; for reporting purposes only.

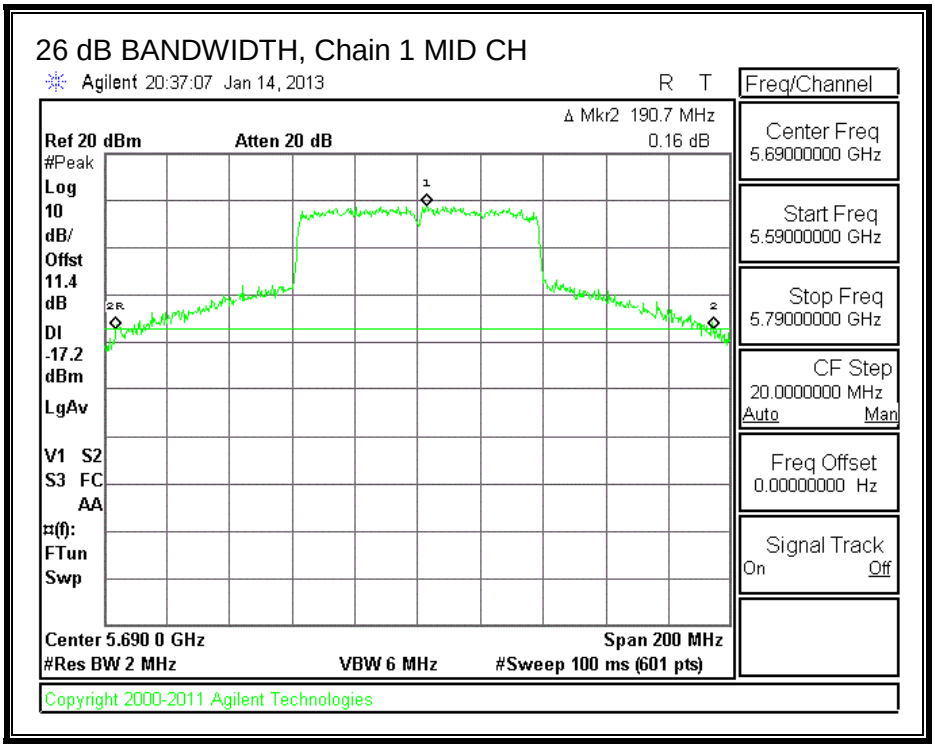
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5690	187.00	190.70	182.70

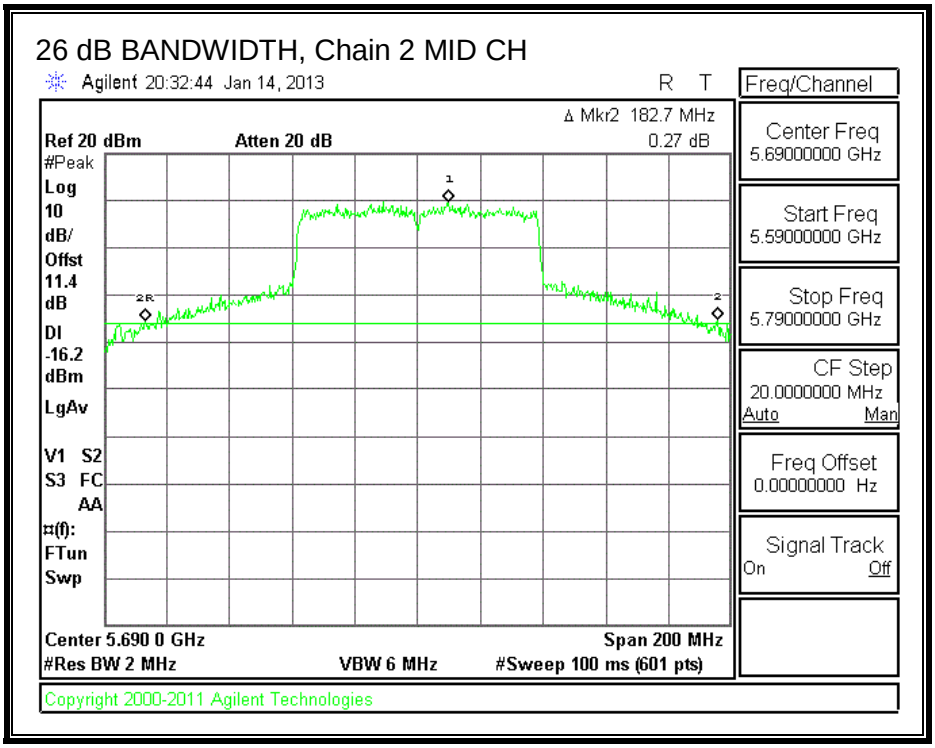
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.94.2. **99% BANDWIDTH**

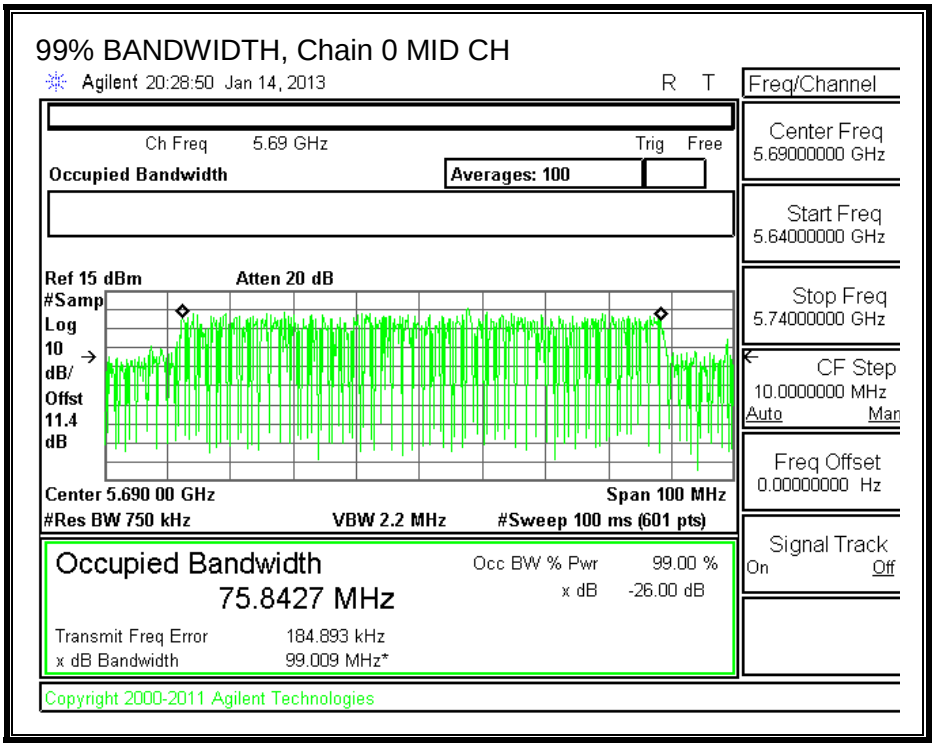
LIMITS

None; for reporting purposes only.

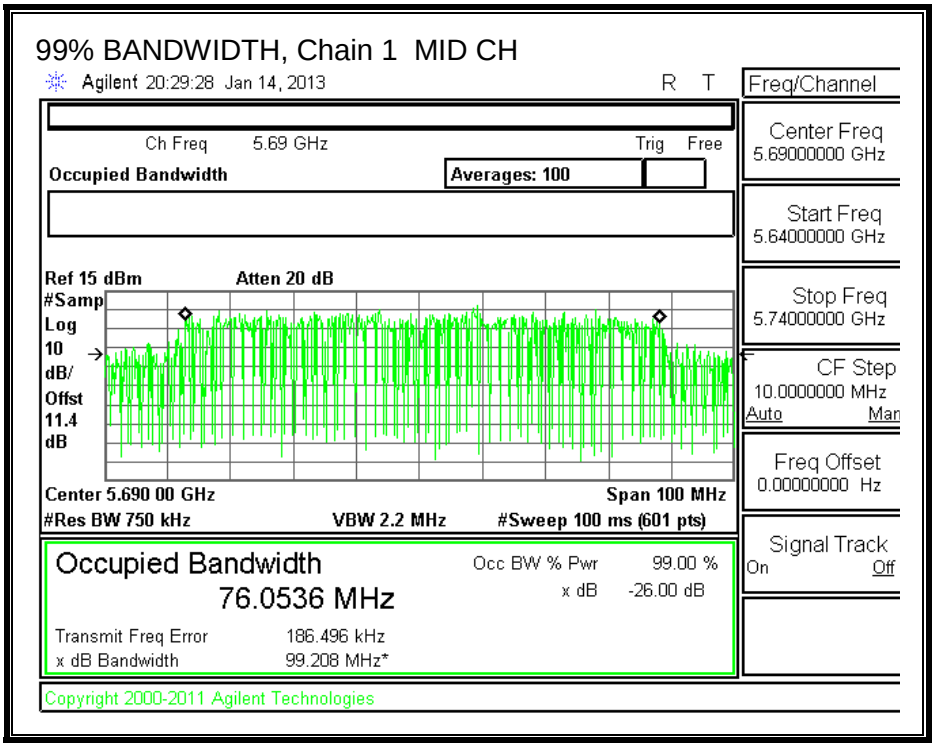
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5690	75.8427	76.0536	75.9943

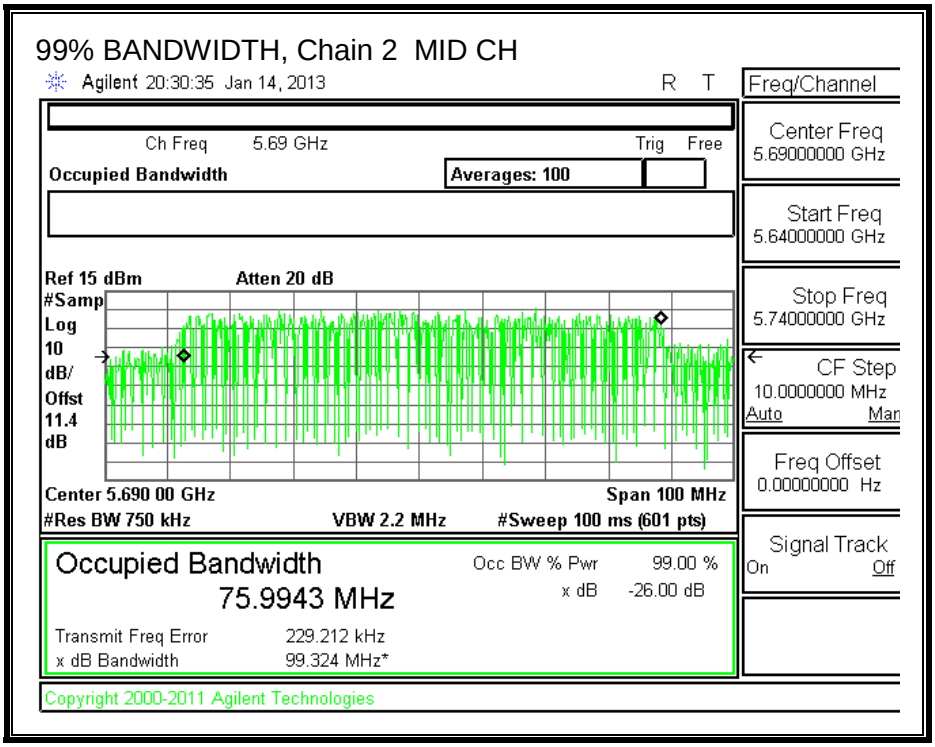
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.94.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.03	6.66	3.94	5.36

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	3.94	10.05

RESULTS

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)	Uncorrelated Gain (dBi)
High	5690	126.35	72.9213	10.05	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	24.00	24.00	30.00	24.00	6.95	11.00	6.95

Duty Cycle CF (dB)	0.85	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	17.92	17.98	18.35	23.71	24.00	-0.29

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	0.368	0.976	1.242	6.50	6.95	-0.45

Limits (FCC), portion in 5.8 GHz DTS band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)	Uncorrelated Gain (dBi)
High	5690	56.35	2.9213	10.05	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	24.00	15.66	21.66	15.66	6.95	11.00	6.95

Duty Cycle CF (dB)	0.85	Included in Calculations of Corr'd Power & PPSD

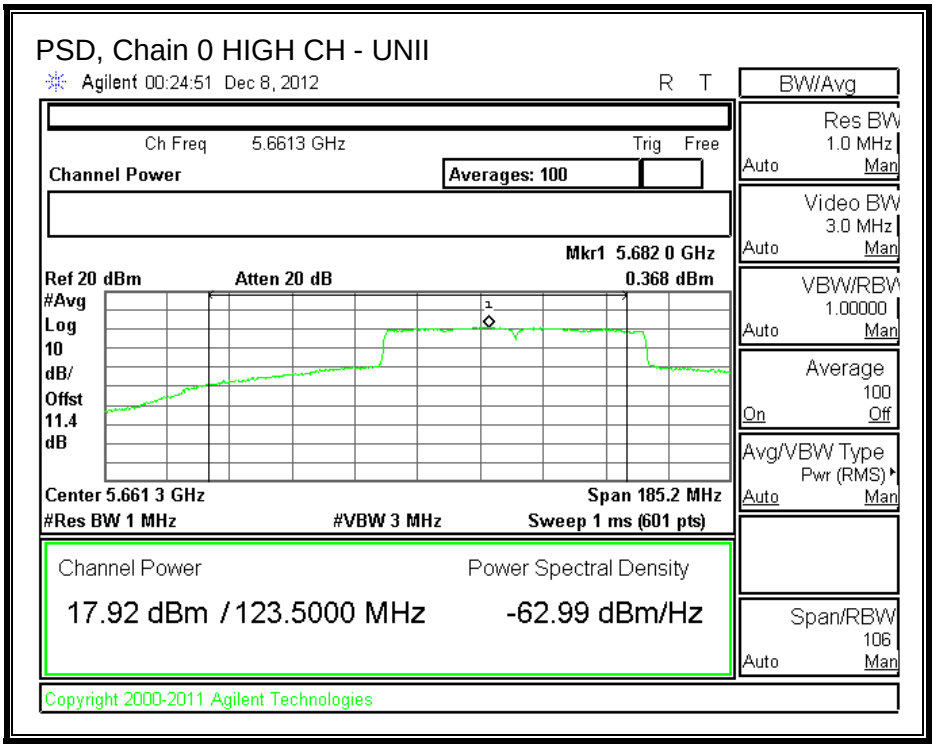
Output Power Results

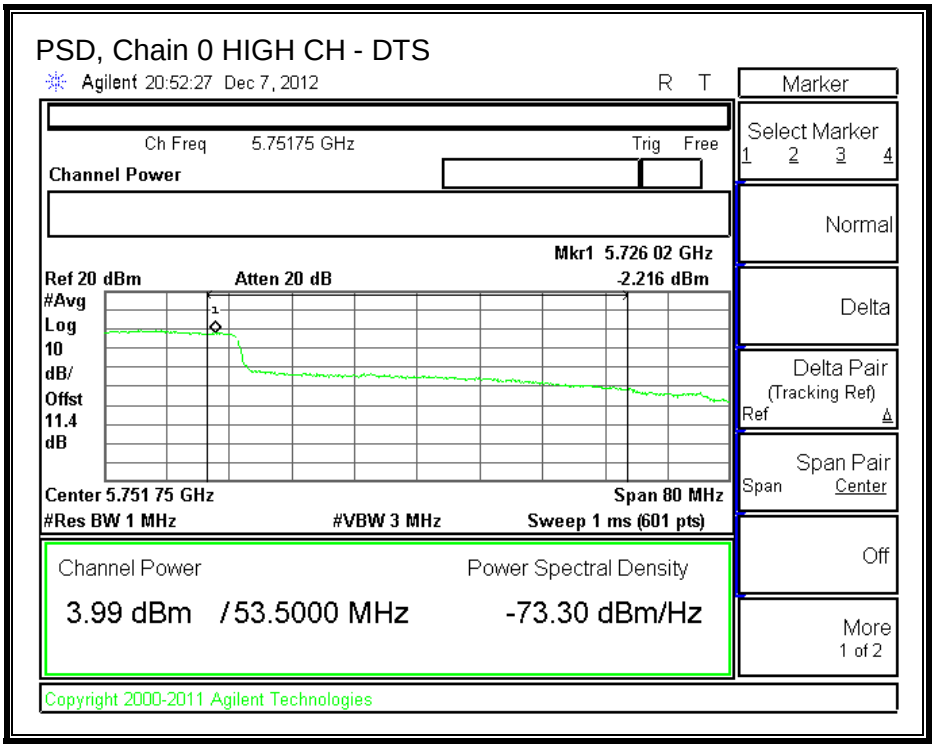
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	3.99	5.05	5.13	10.37	15.66	-5.28

PPSD Results

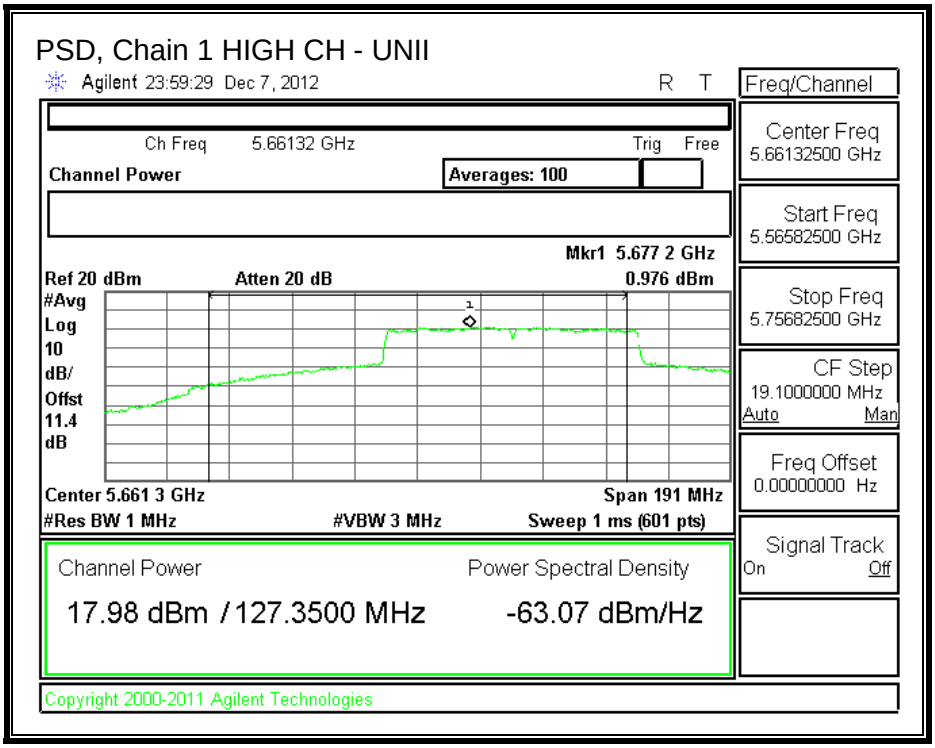
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	-2.216	-0.068	-0.742	4.70	6.95	-2.25

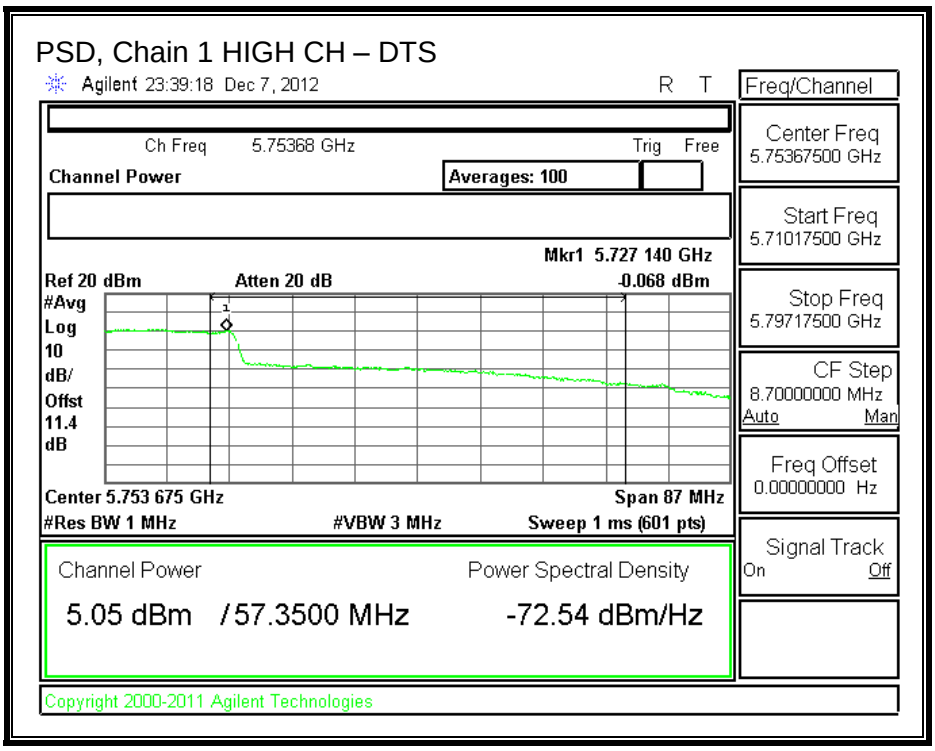
PSD, Cain 0



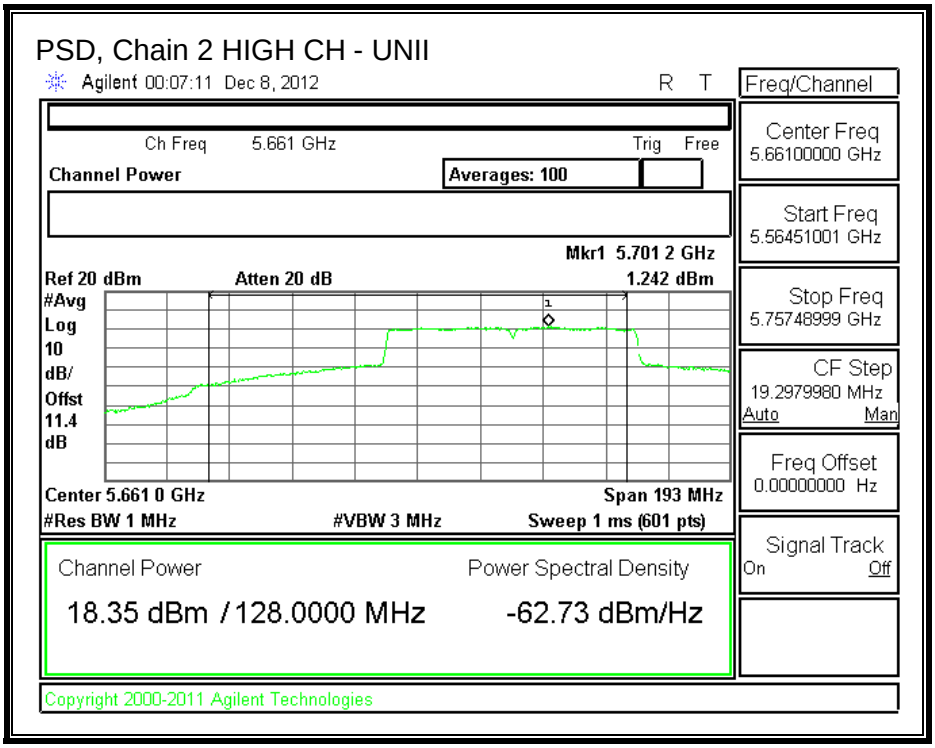


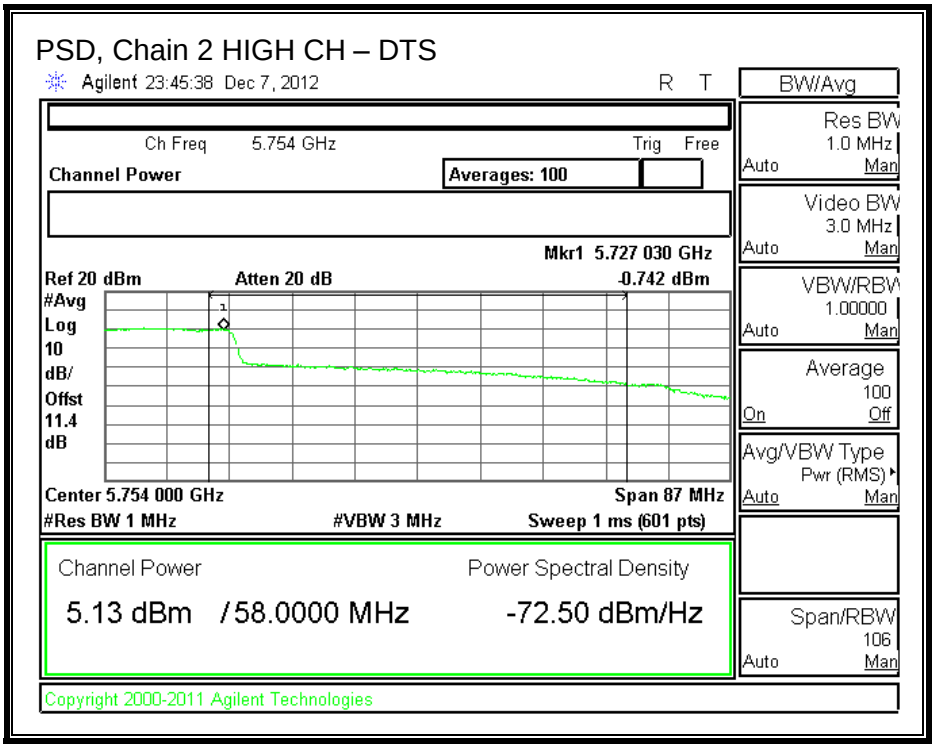
PSD, Cain 1





PSD, Cain 2





7.95. 802.11ac VHT80 BF 2TX MODE IN THE 5.6 GHz BAND

7.95.1. 26 dB BANDWIDTH

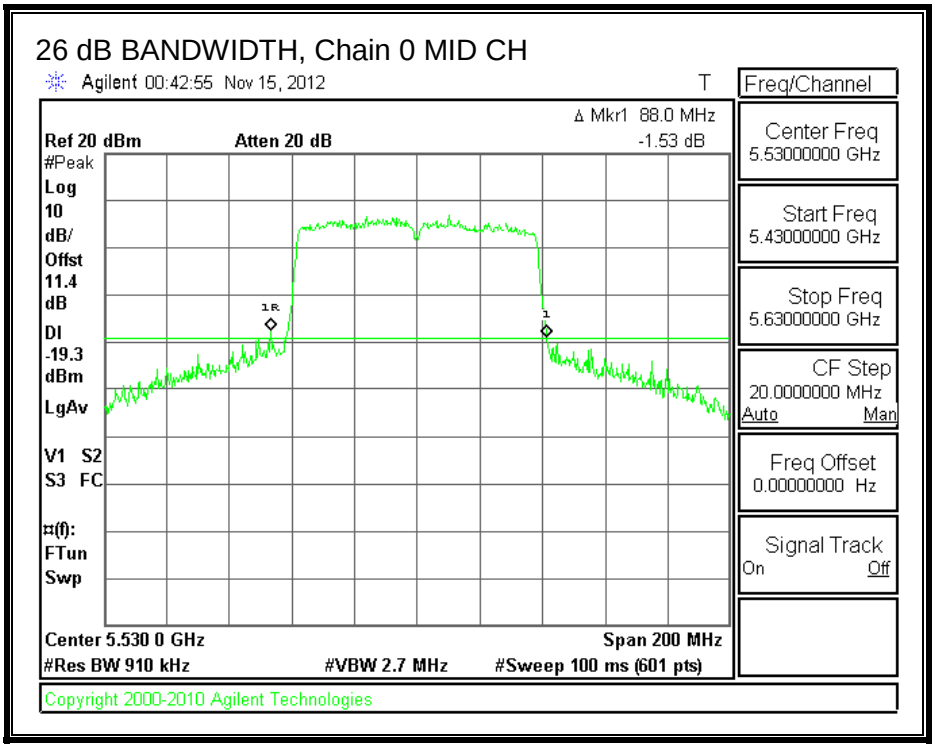
LIMITS

None; for reporting purposes only.

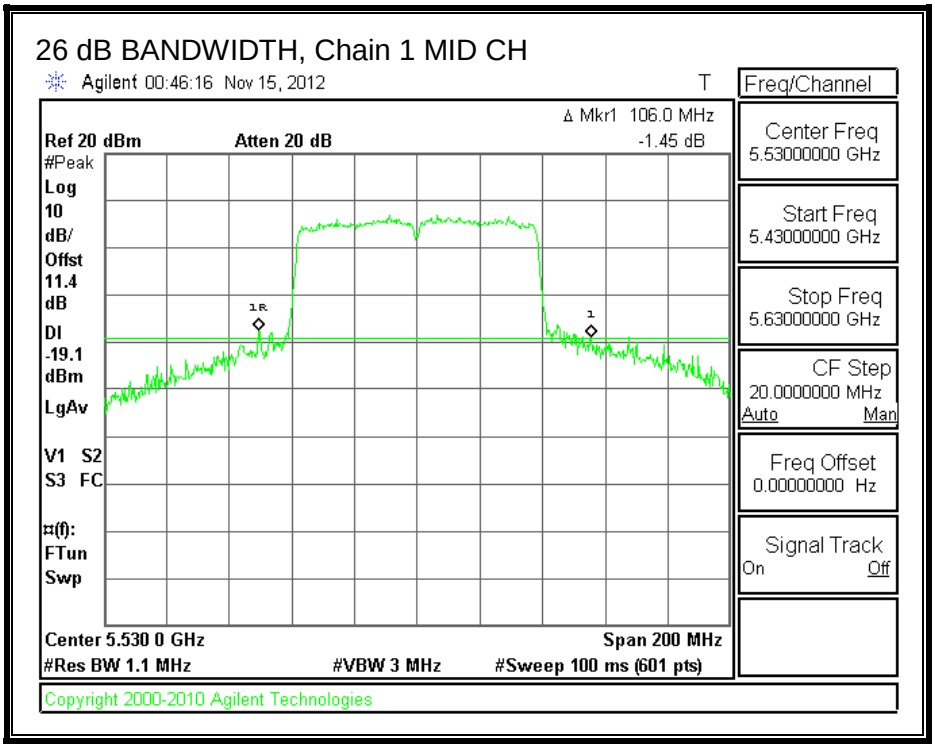
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5530	88.0	106.0

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.95.2. 99% BANDWIDTH

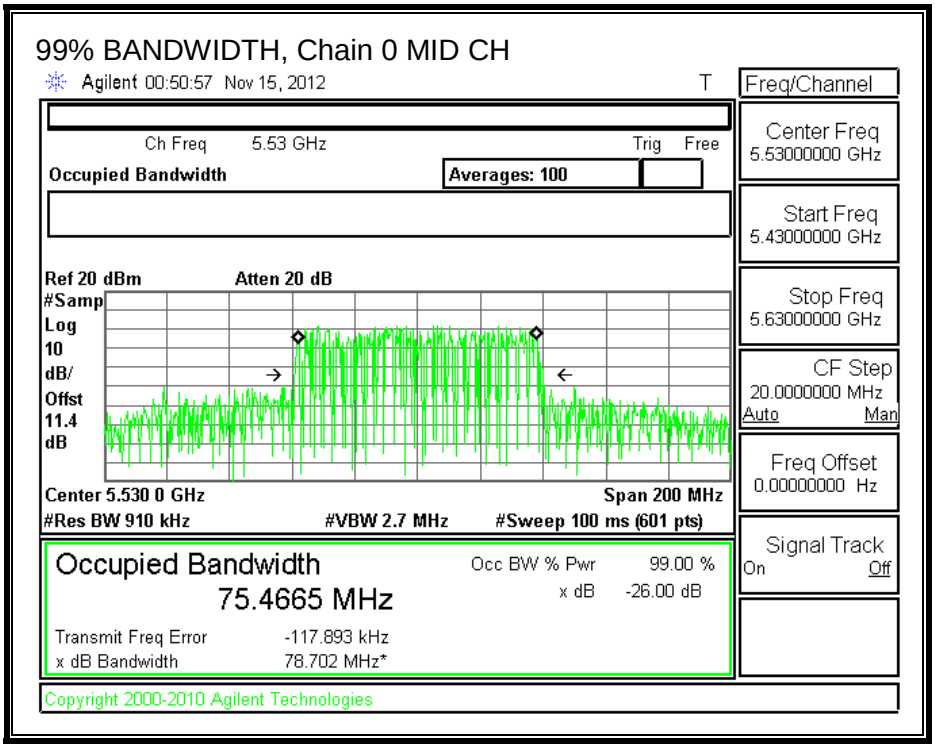
LIMITS

None; for reporting purposes only.

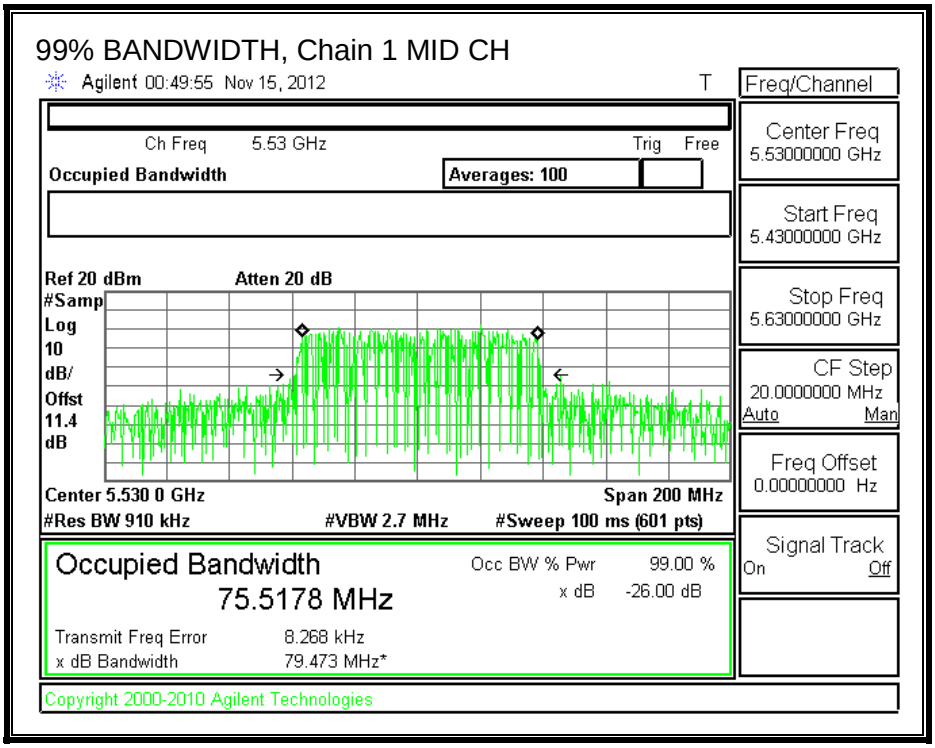
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5530	75.4665	75.5178

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.95.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	8.89

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5530	88.0	75.4665	8.89

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5530	21.11	24.00	30.00	21.11	8.11	11.00	8.11

Duty Cycle CF (dB)	0.85	Included in Calculations of Corr'd Power & PPSD

Output Power Results

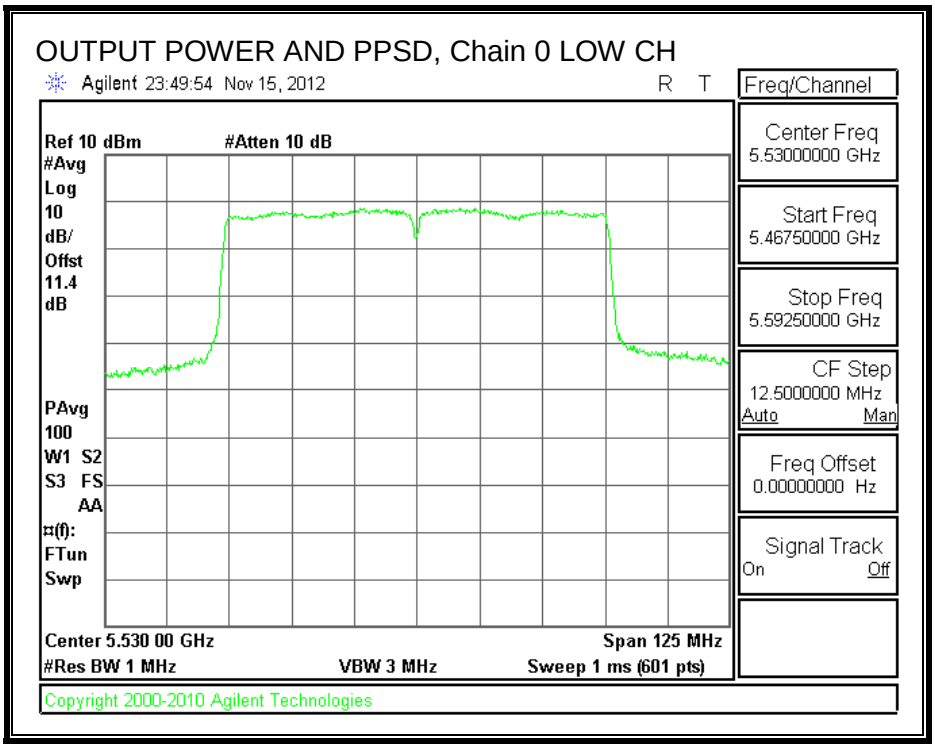
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	14.81	15.59	18.23	21.11	-2.88

PPSD Results

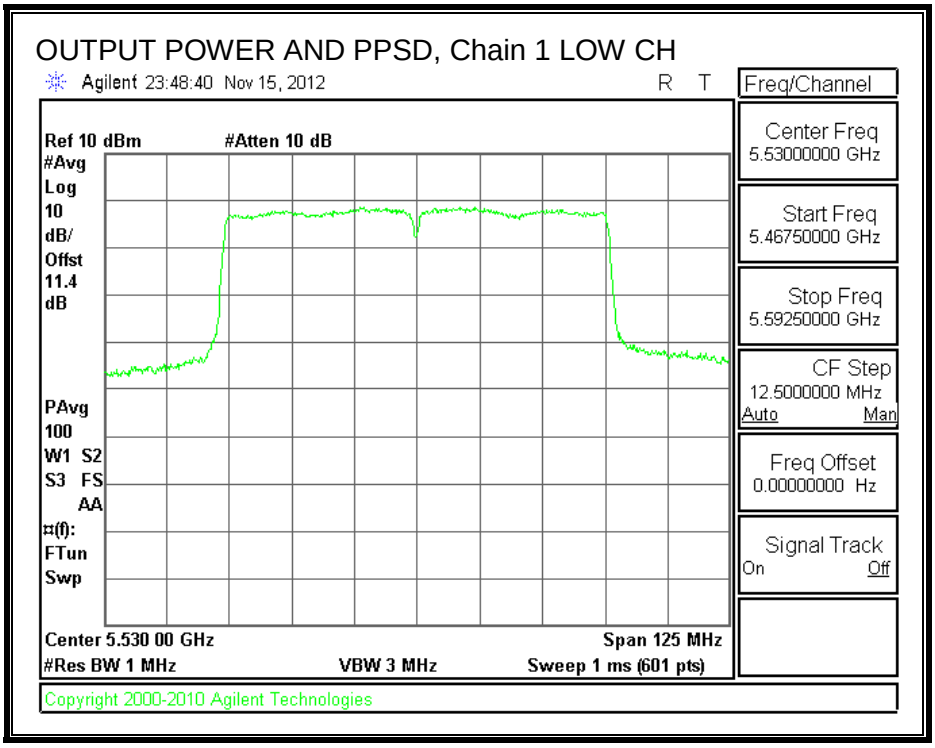
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5530	-1.93	-1.62	2.09	8.11	-6.02

Note: method (1) “Measure and sum the spectra across the outputs” as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



7.95.4. 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.

RESULTS

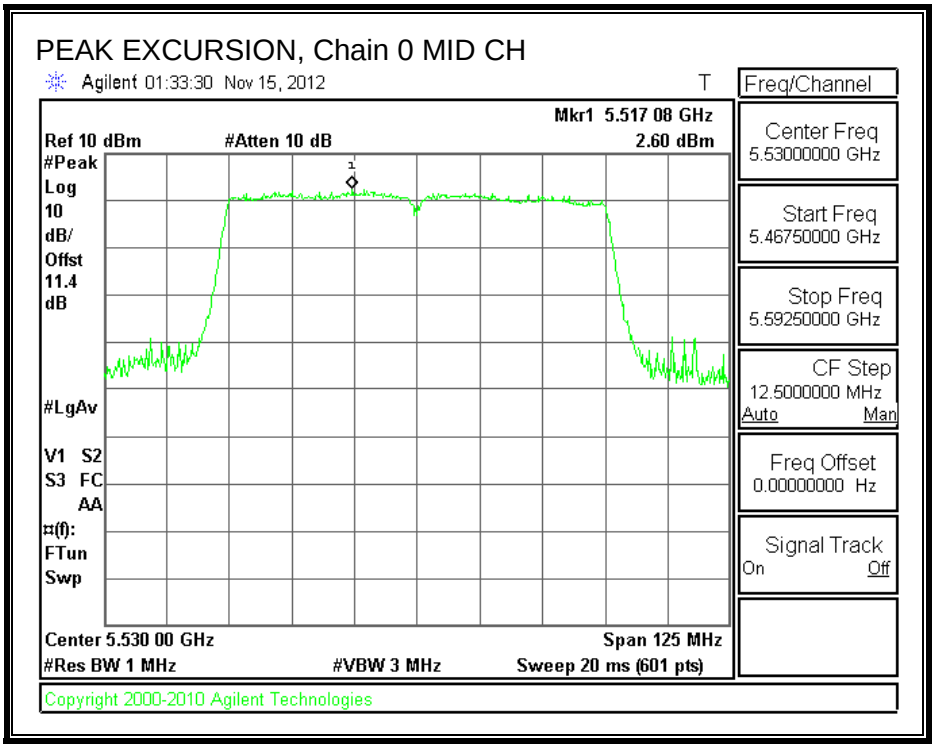
Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5530	2.60	-1.93	0.85	3.68	13	-9.32

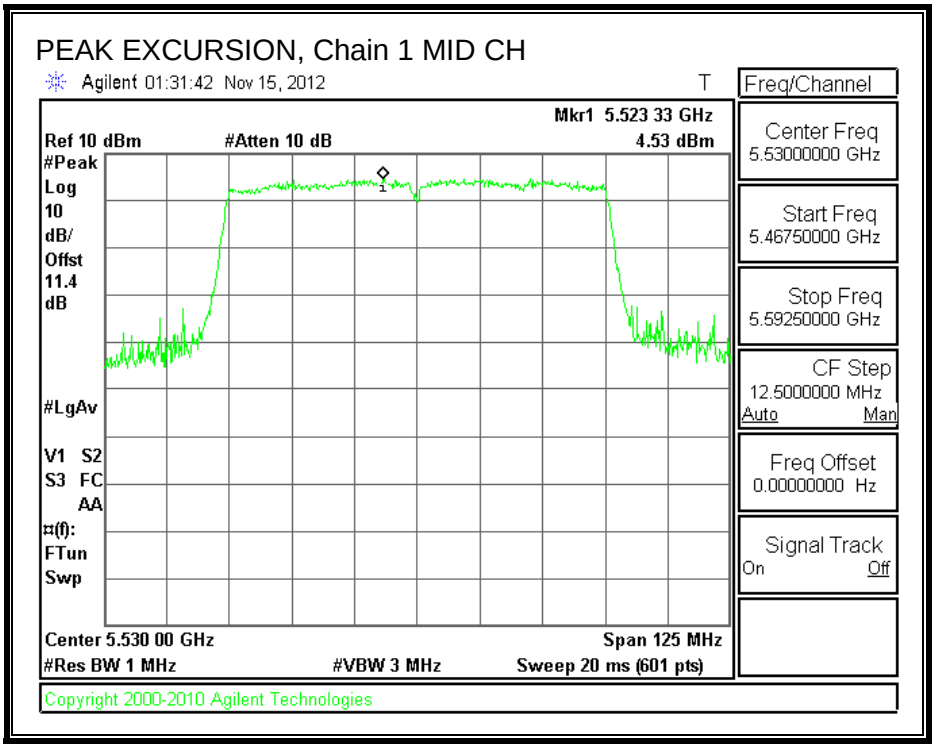
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5530	4.53	-1.62	0.85	5.30	13	-7.70

PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



7.96. 802.11ac VHT80 BF 2TX MODE CHANNEL 138 IN THE 5.6 GHz BAND

7.96.1. 26 dB BANDWIDTH- UNII

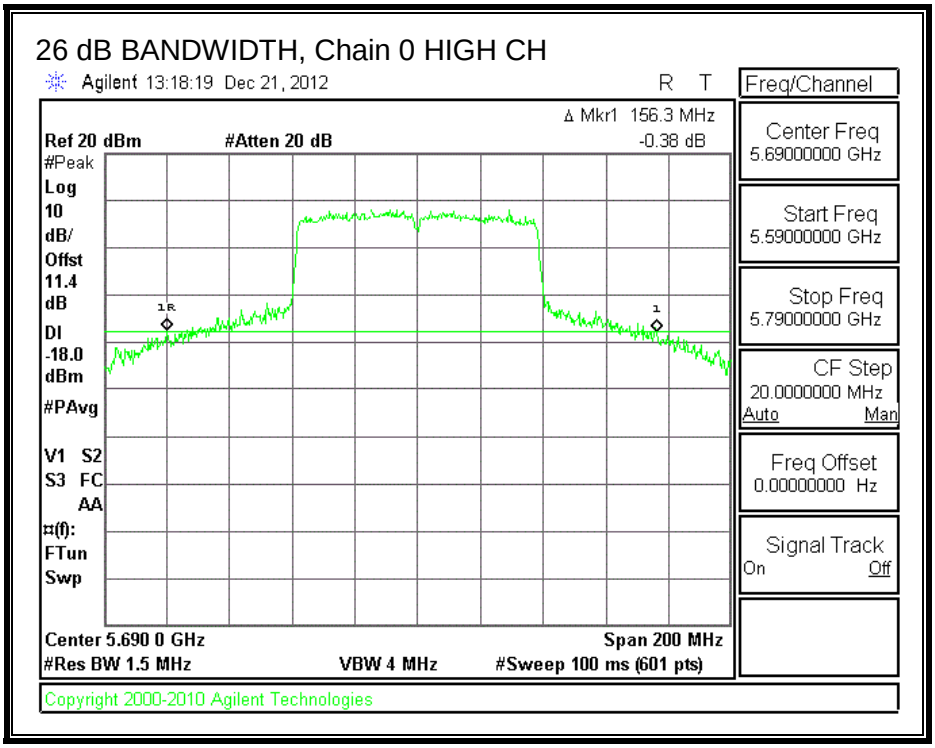
LIMITS

None; for reporting purposes only.

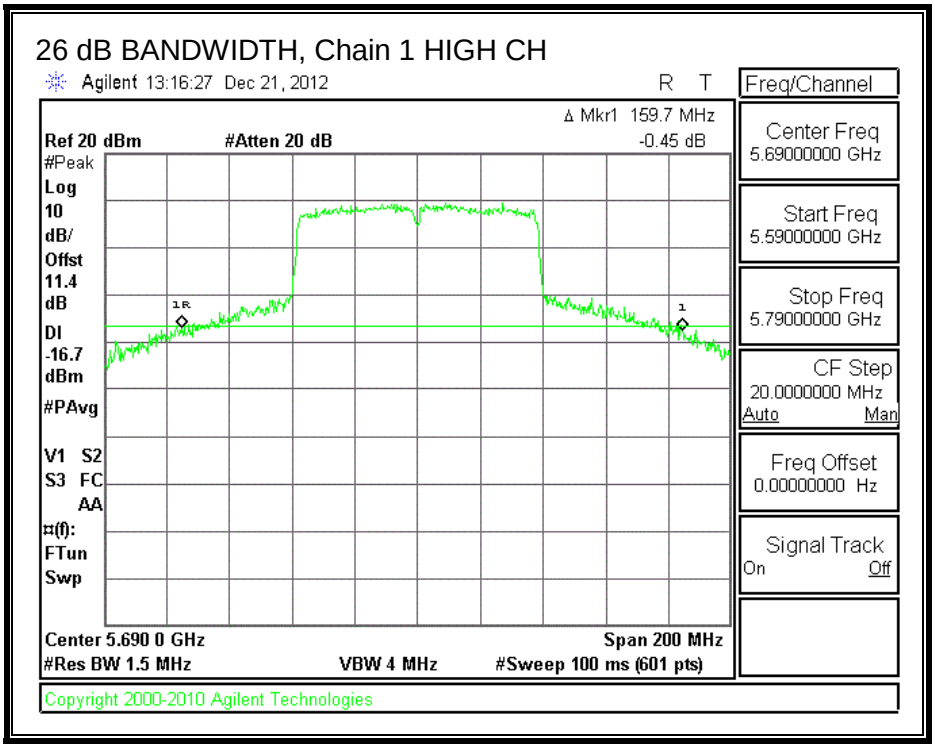
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
High	5690	156.30	159.70

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.96.2. **99% BANDWIDTH**

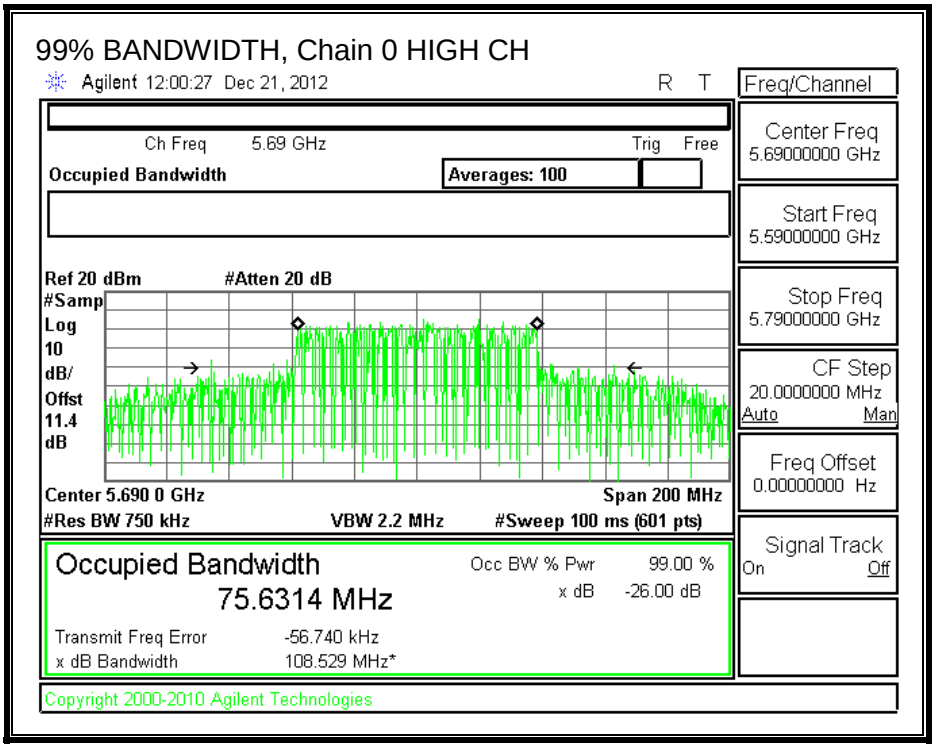
LIMITS

None; for reporting purposes only.

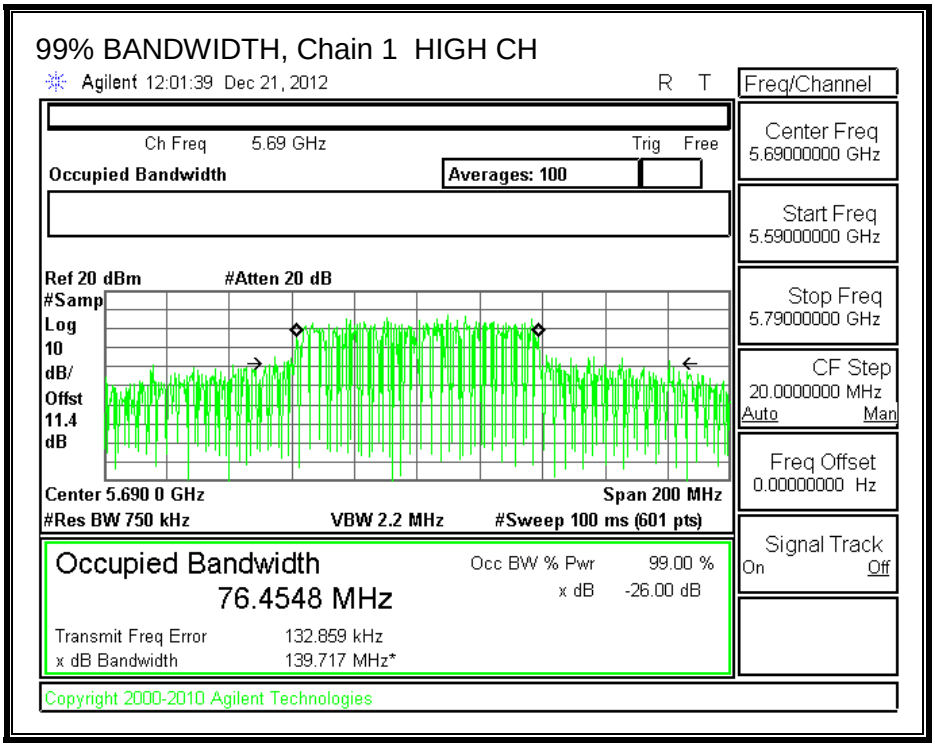
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
High	5690	75.6314	76.4548

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.96.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	8.89

RESULTS

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)
High	5690	113.15	72.8157	8.89

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	21.11	24.00	30.00	21.11	8.11	11.00	8.11

Duty Cycle CF (dB)	0.85	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	17.27	17.12	21.06	21.11	-0.05

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	-1.057	-0.261	3.22	8.11	-4.89

Limits (FCC), portion in 5.8 GHz DTS band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)
High	5690	43.15	44.8500	8.89

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	21.11	24.00	30.00	21.11	8.11	11.00	8.11

Duty Cycle CF (dB)	0.85	Included in Calculations of Corr'd Power & PPSD

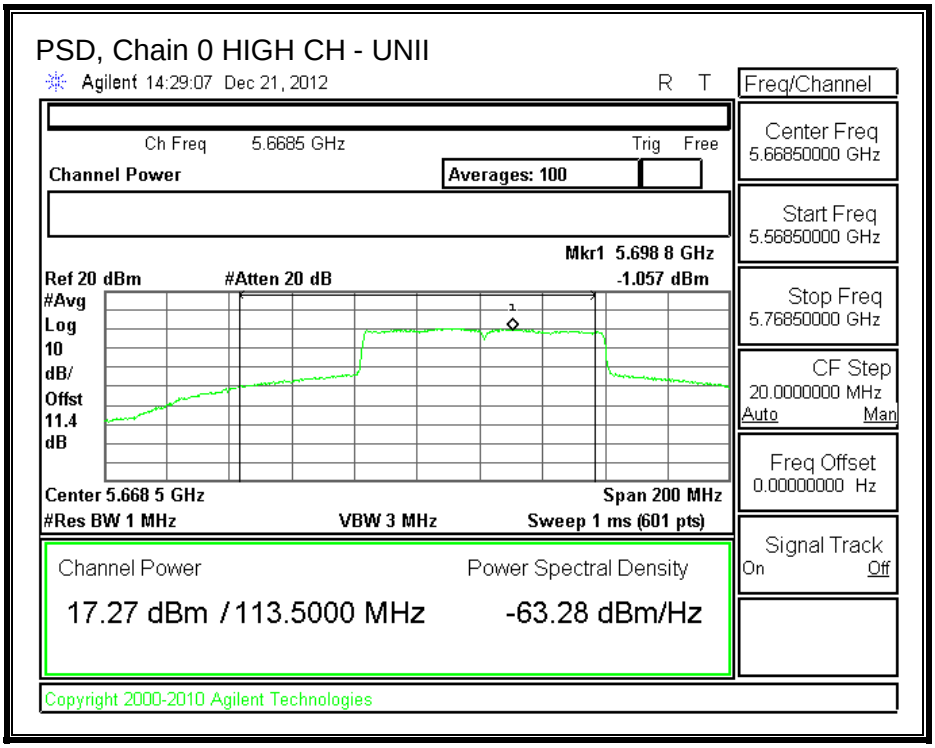
Output Power Results

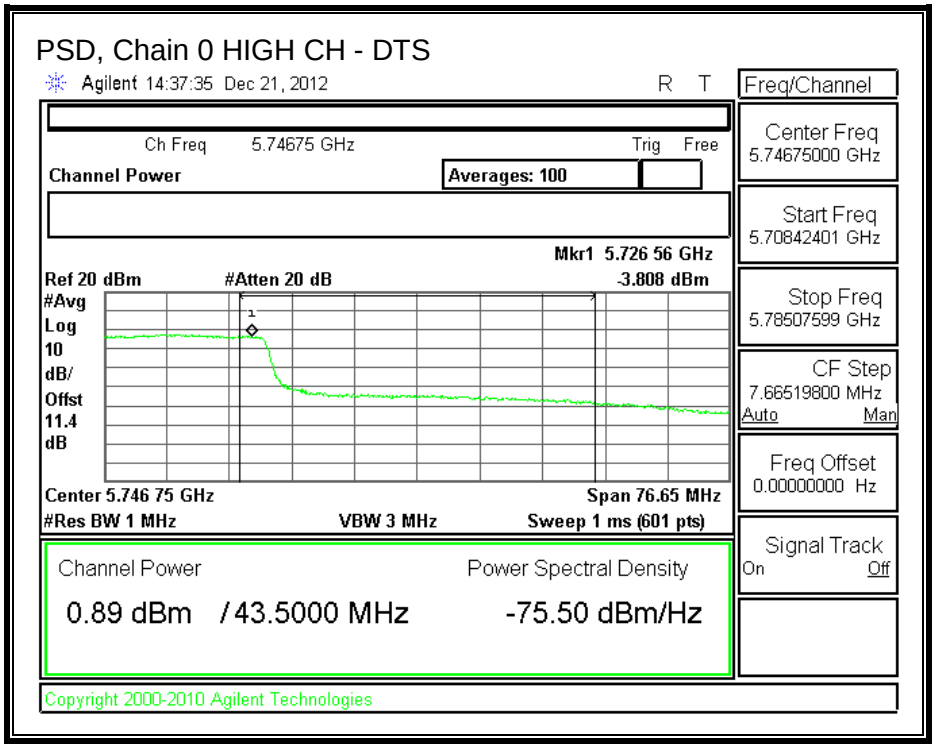
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	0.89	2.86	5.85	21.11	-15.26

PPSD Results

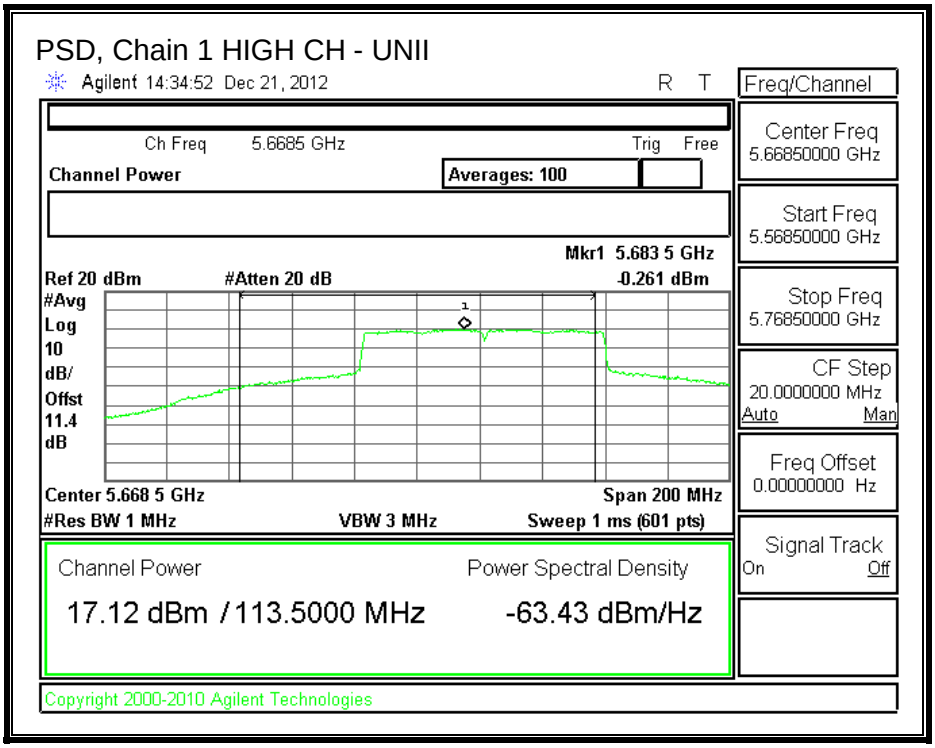
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	-3.808	-1.696	1.24	8.11	-6.87

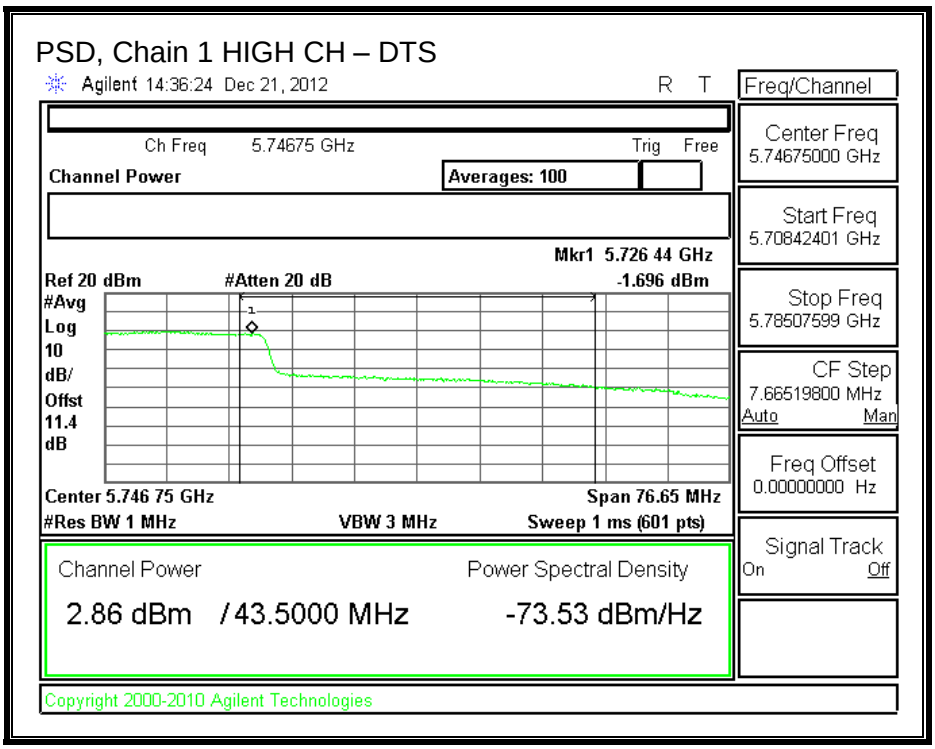
PSD, Chain 0





PSD, Chain 1





7.97. 802.11ac VHT80 BF 3TX MODE IN THE 5.6 GHz BAND

7.97.1. 26 dB BANDWIDTH

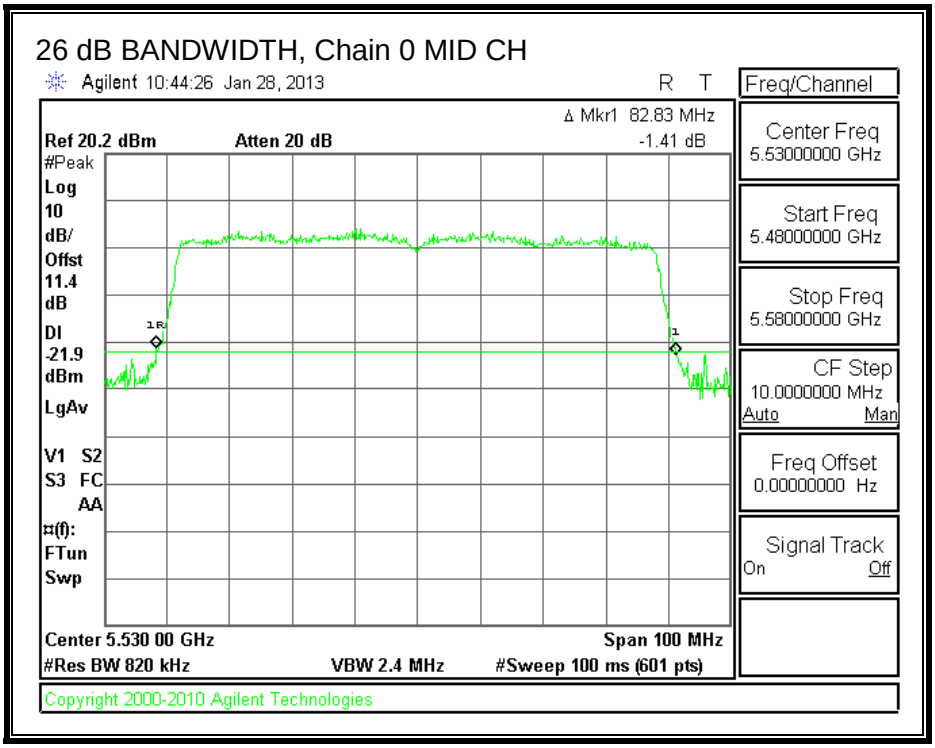
LIMITS

None; for reporting purposes only.

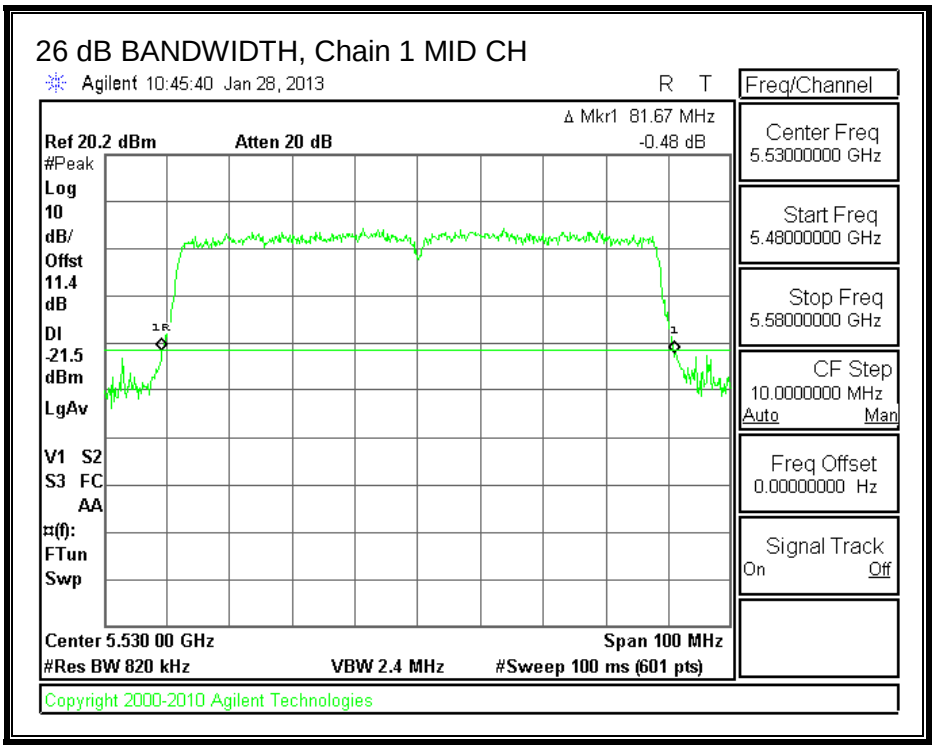
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5530	82.83	81.67	82.00

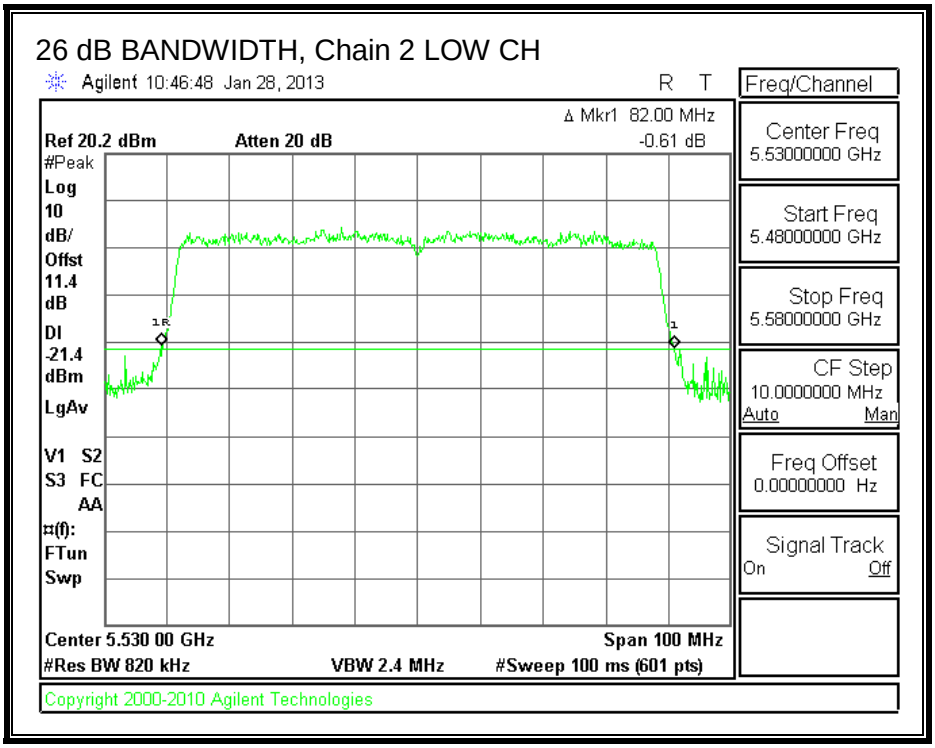
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.97.2. 99% BANDWIDTH

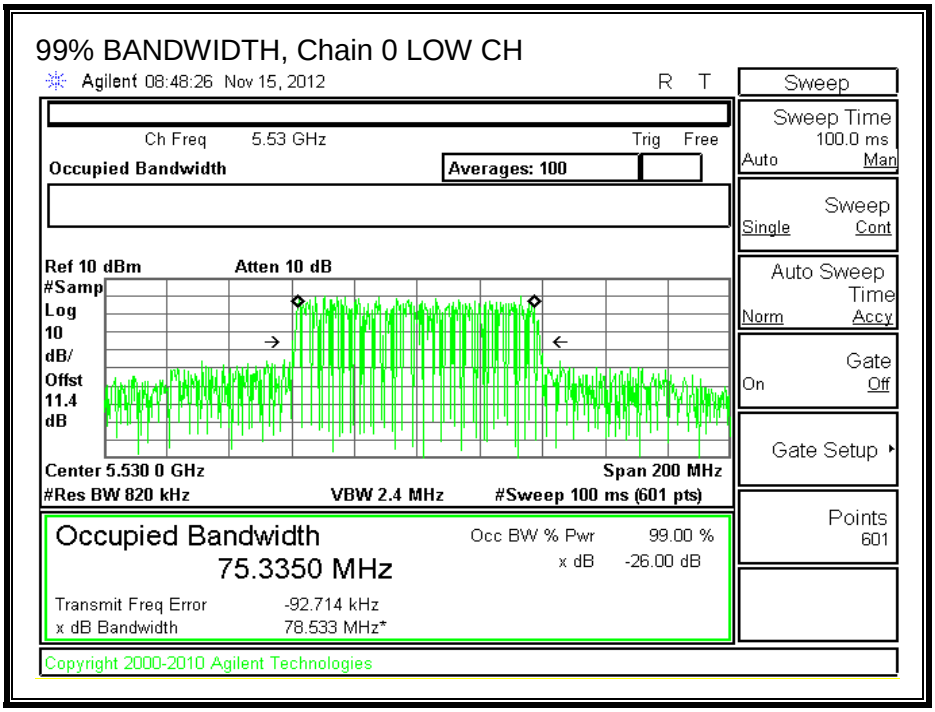
LIMITS

None; for reporting purposes only.

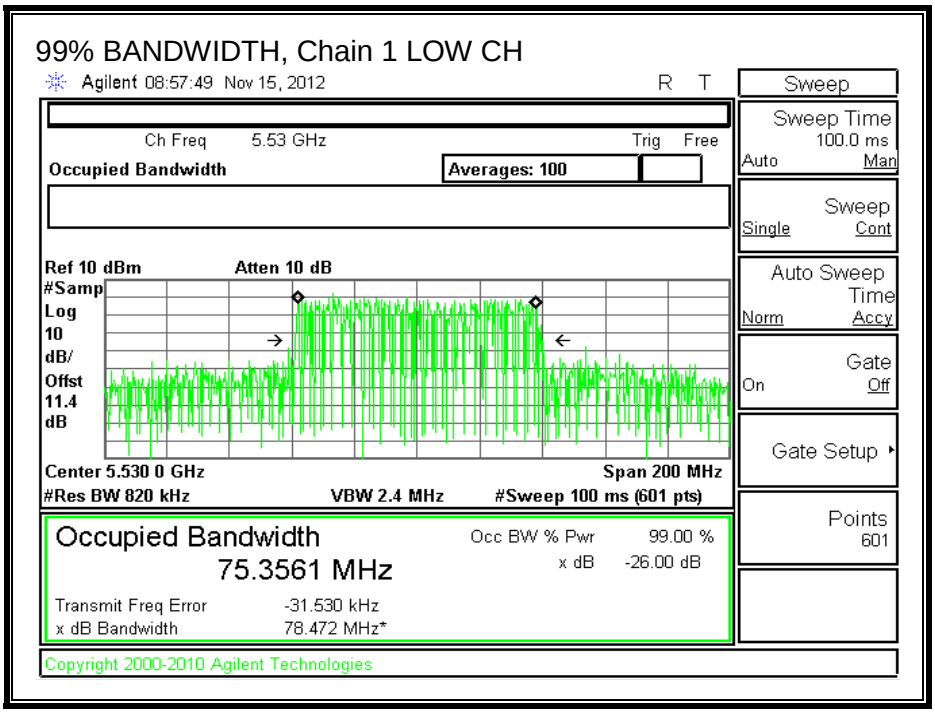
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5530	75.3350	75.3561	75.2941

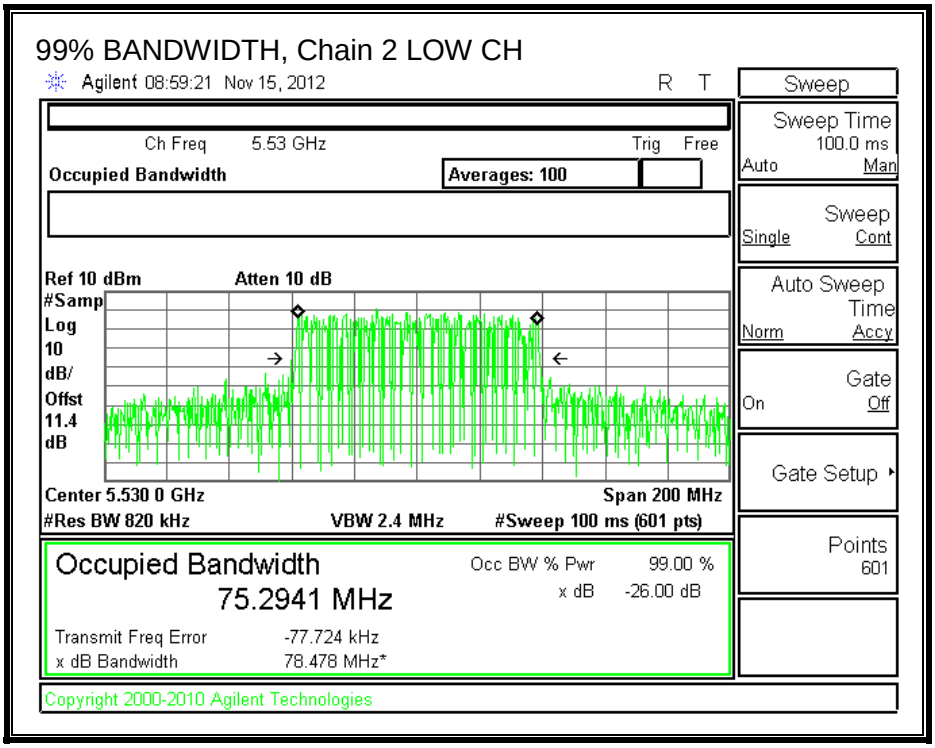
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.97.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	3.94	10.05

OUTPUT POWER RESULTS

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
MID	5530	81.67	75.2941	10.05

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
MID	5530	19.95	24.00	30.00	19.95

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
MID	5530	13.42	13.00	13.12	17.95	19.95	-2.00

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5530	81.67	75.2941	10.05

Limits

Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5530	6.95	11.00	6.95

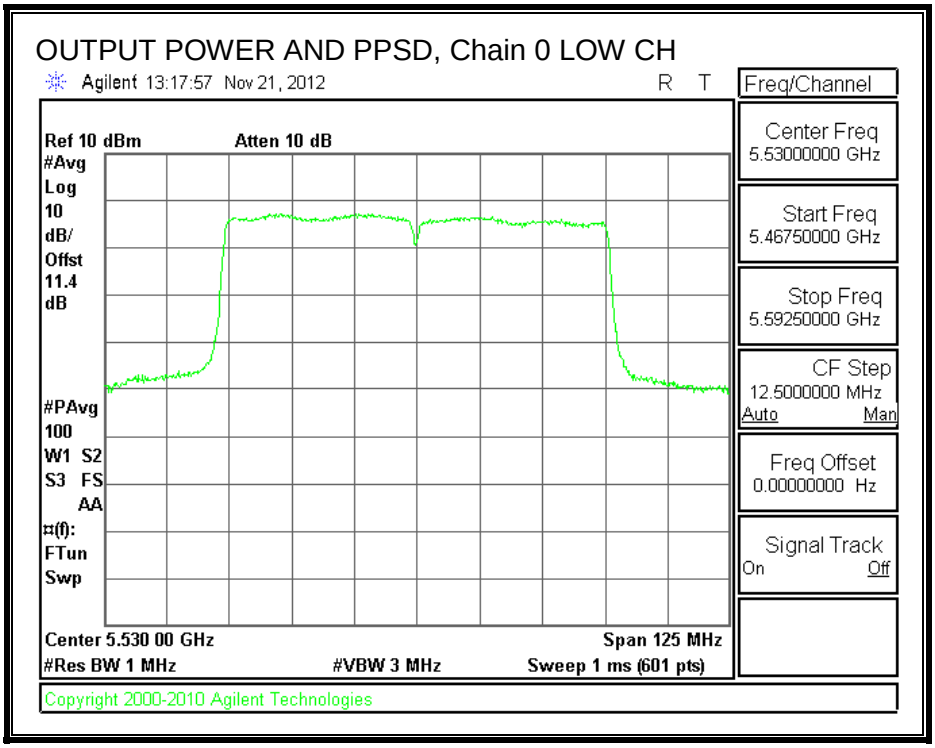
Duty Cycle CF (dB)	0.85	Included in PPSD

PPSD Results

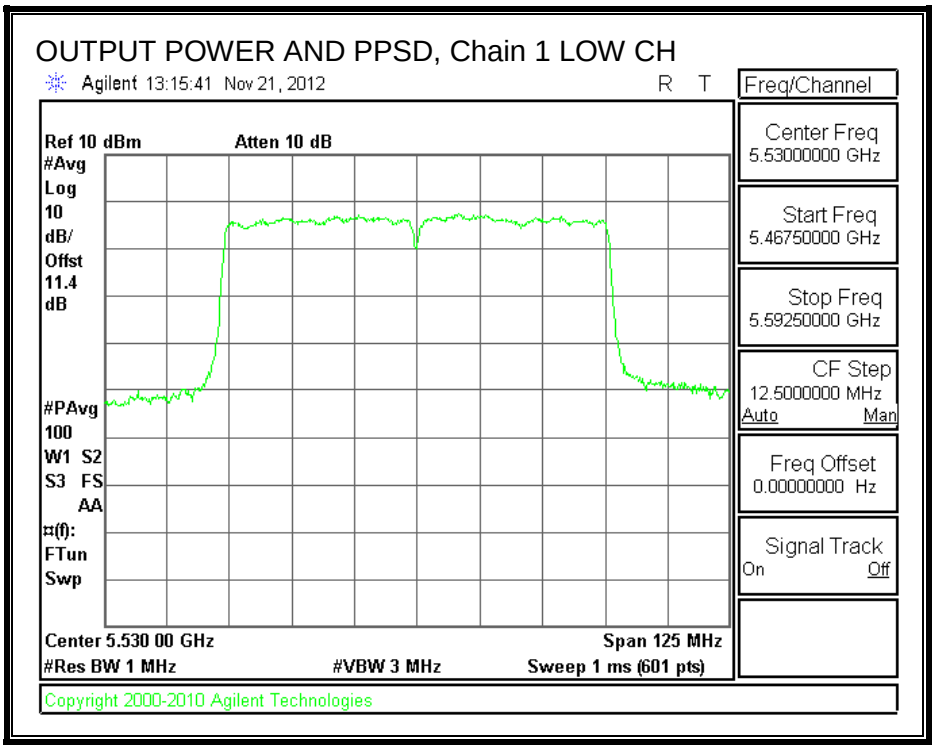
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5530	-2.98	-3.00	-2.47	2.81	6.95	-4.14

Note: method (1) “Measure and sum the spectra across the outputs” as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

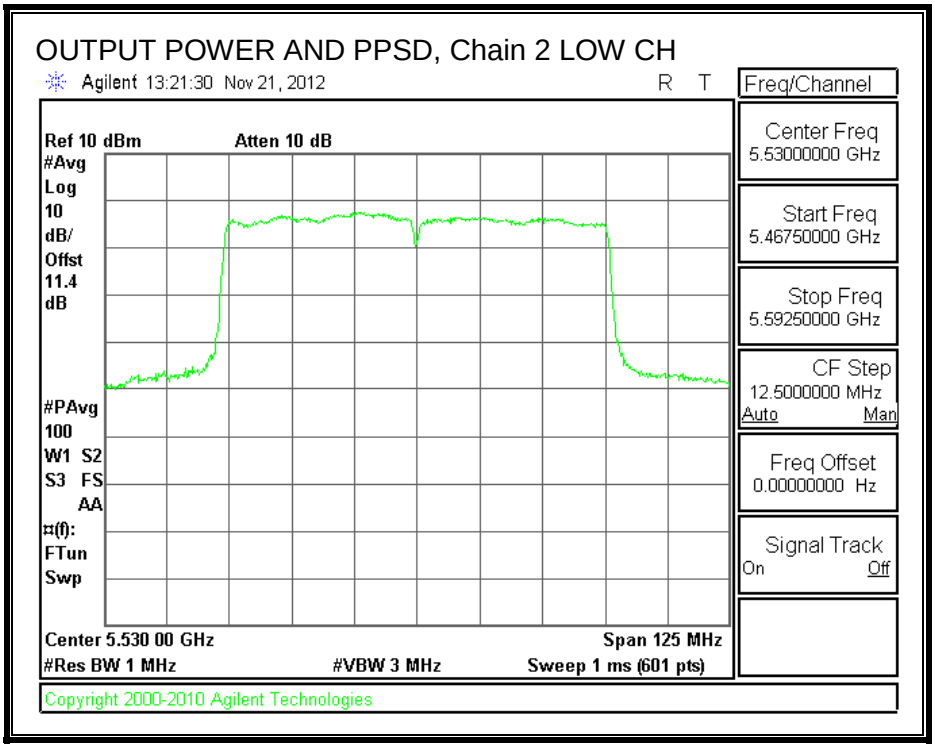
OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



7.98. 802.11ac VHT80 BF 3TX MODE CHANNEL 138 IN THE 5.6 GHz BAND

7.98.1. 26 dB BANDWIDTH- UNII

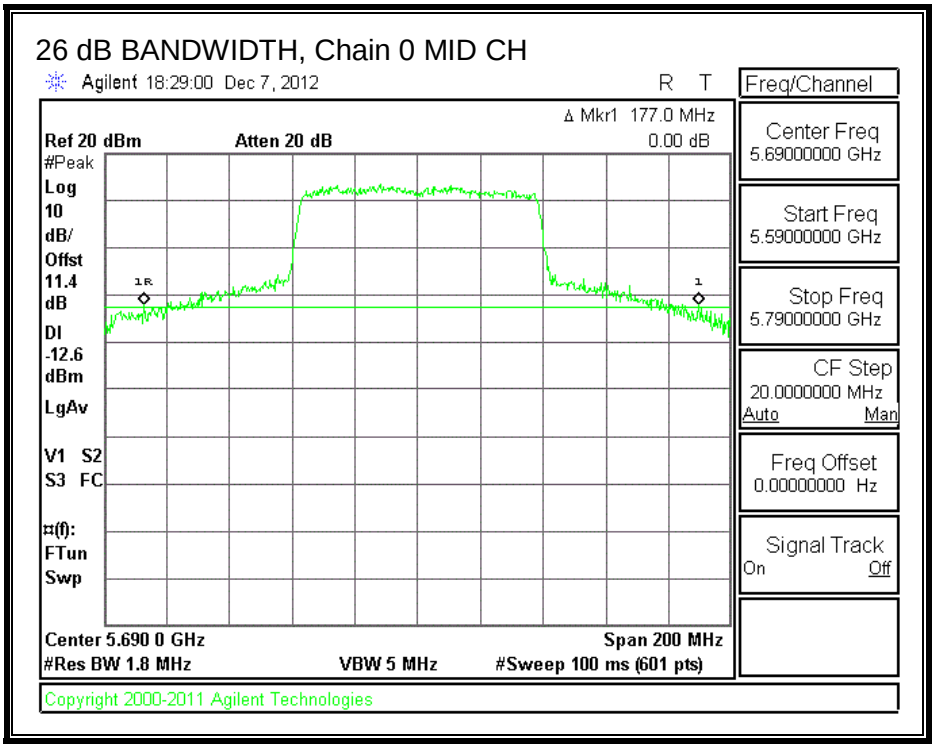
LIMITS

None; for reporting purposes only.

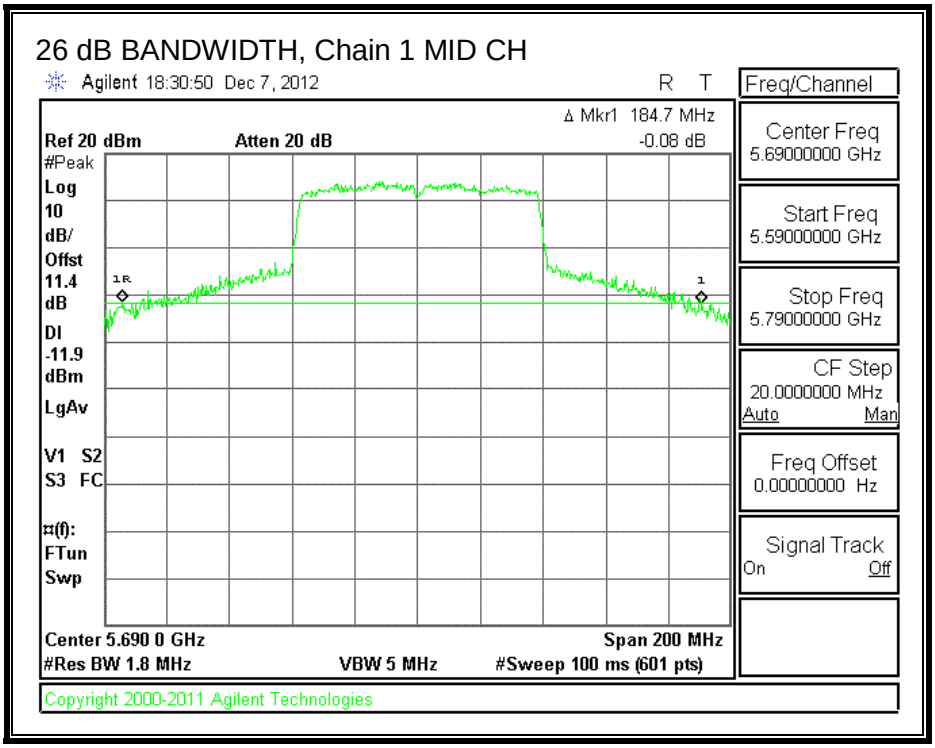
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5690	177.0	184.7	186.0

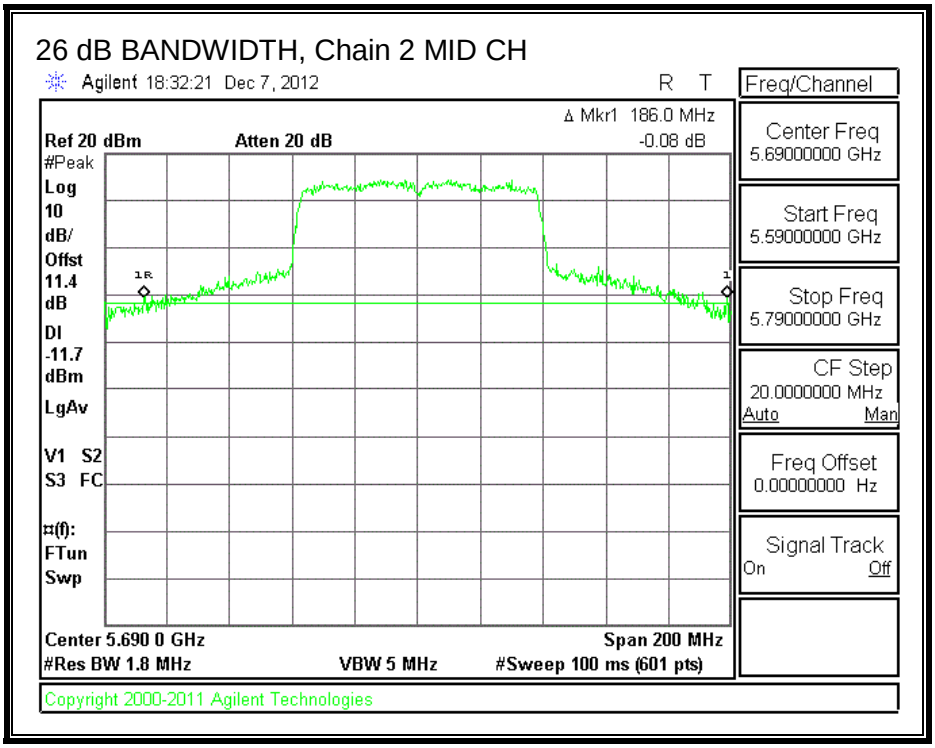
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.98.2. **99% BANDWIDTH**

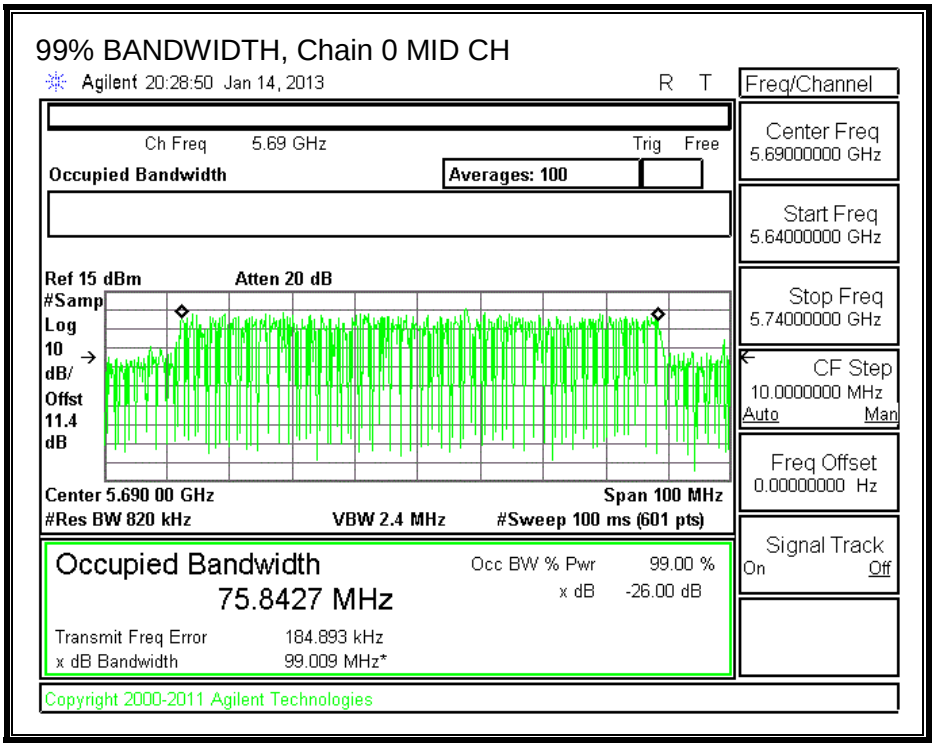
LIMITS

None; for reporting purposes only.

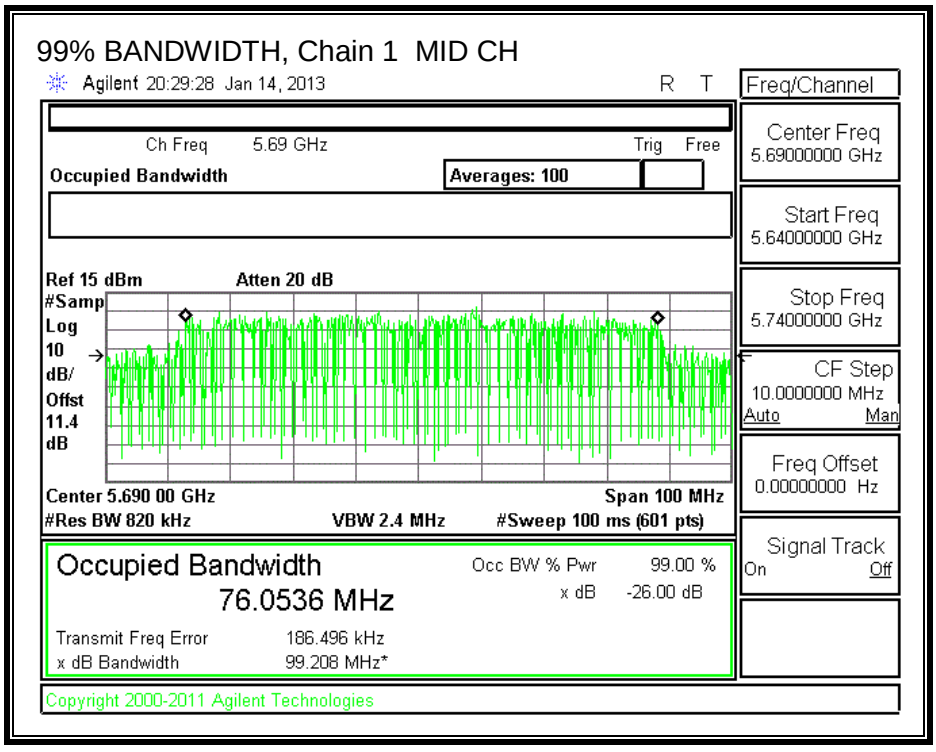
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5690	75.8427	76.0536	75.9943

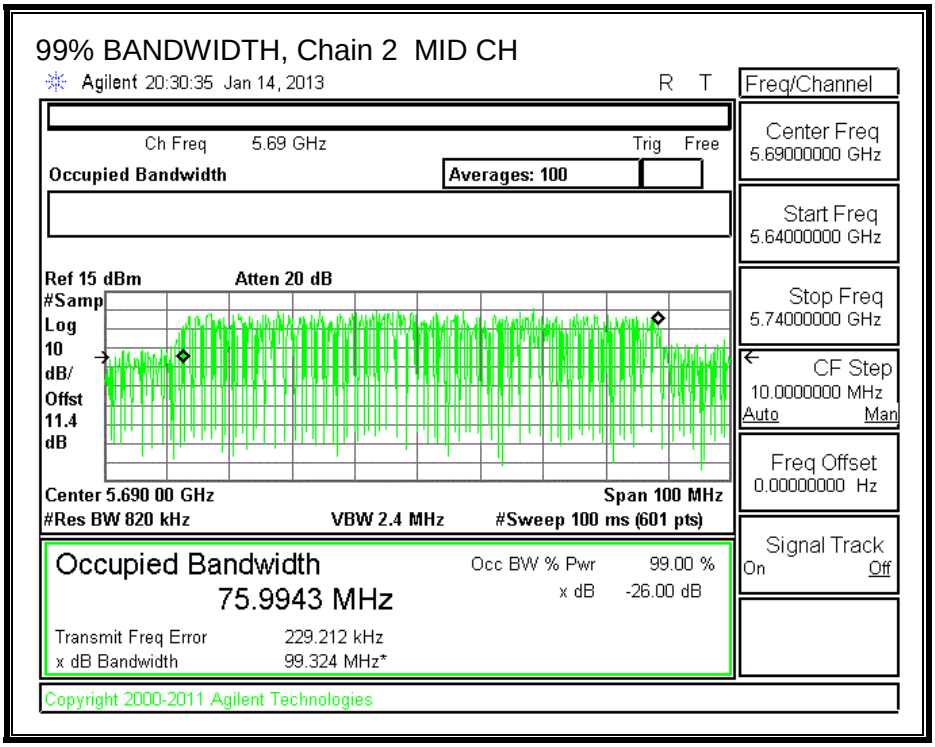
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.98.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.03	6.66	3.94	10.05

RESULTS

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)
High	5690	123.50	74.0295	10.05

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	24.00	24.00	30.00	19.95	6.95	11.00	6.95

Duty Cycle CF (dB)	0.85	Included in Calculations of PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	14.11	14.65	14.19	19.94	19.95	-0.01

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	-3.60	-2.355	-3.205	2.60	6.95	-4.35

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Gain (dBi)
High	5690	53.50	4.0295	10.05

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
High	5690	24.00	17.05	23.05	13.00	6.95	11.00	6.95

Duty Cycle CF (dB)	0.85	Included in Calculations of PPSD

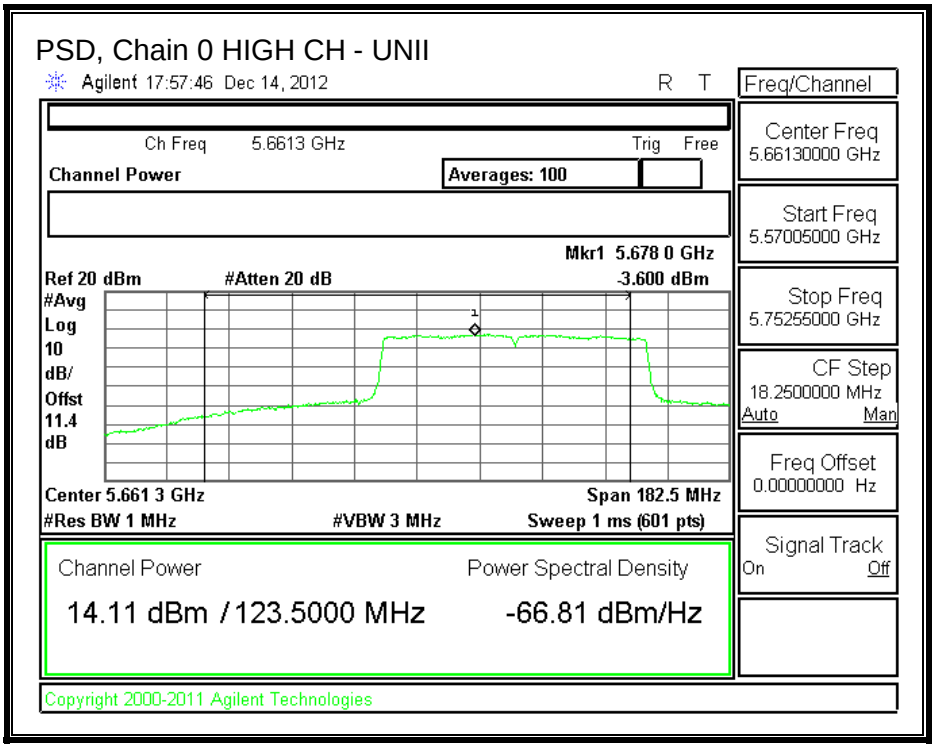
Output Power Results

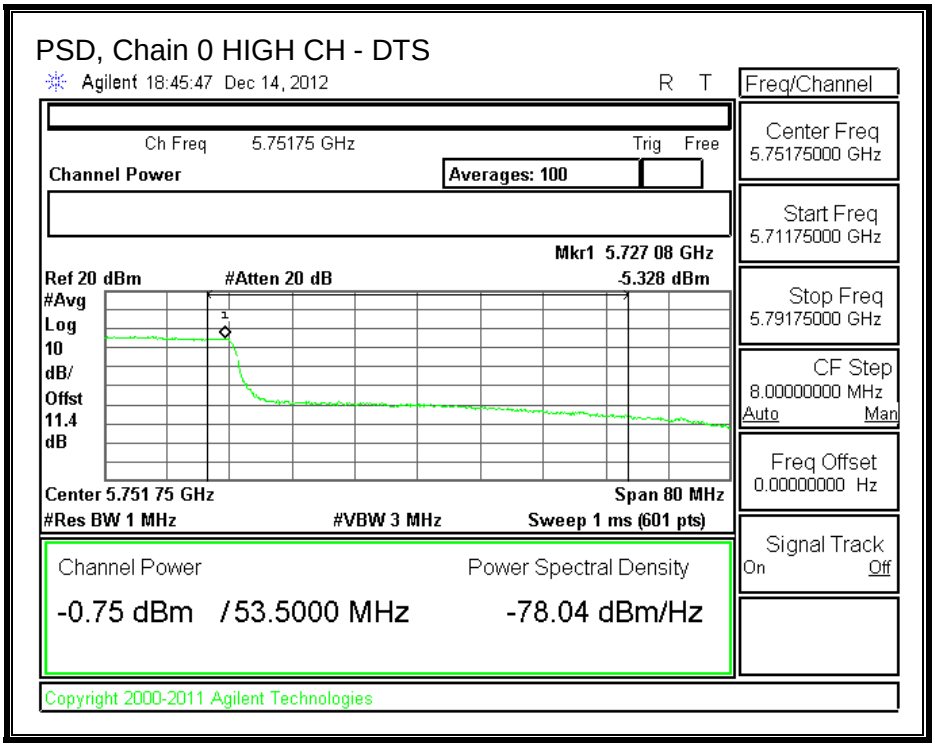
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5690	-0.75	0.14	-0.55	5.25	13.00	-7.75

PPSD Results

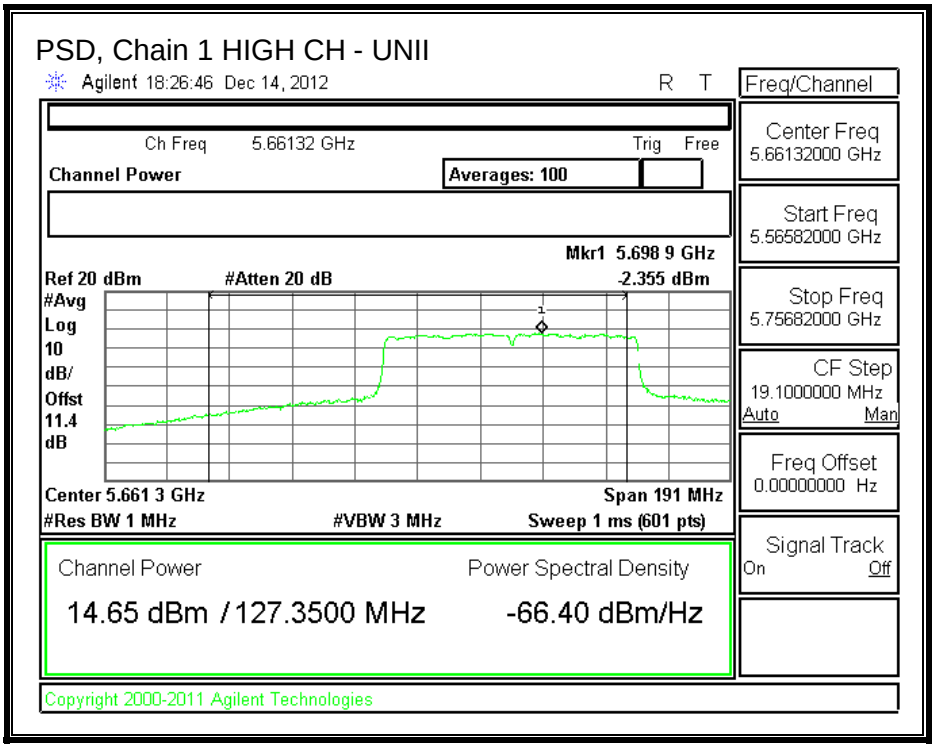
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
High	5690	-5.328	-4.204	-4.630	0.92	6.95	-6.03

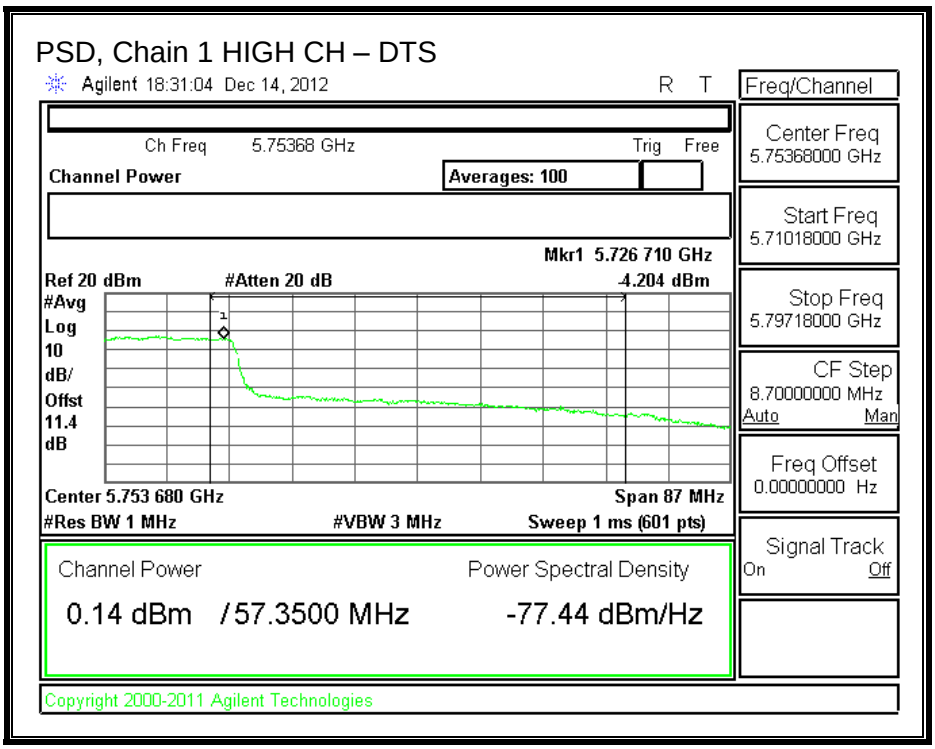
PSD, Chain 0



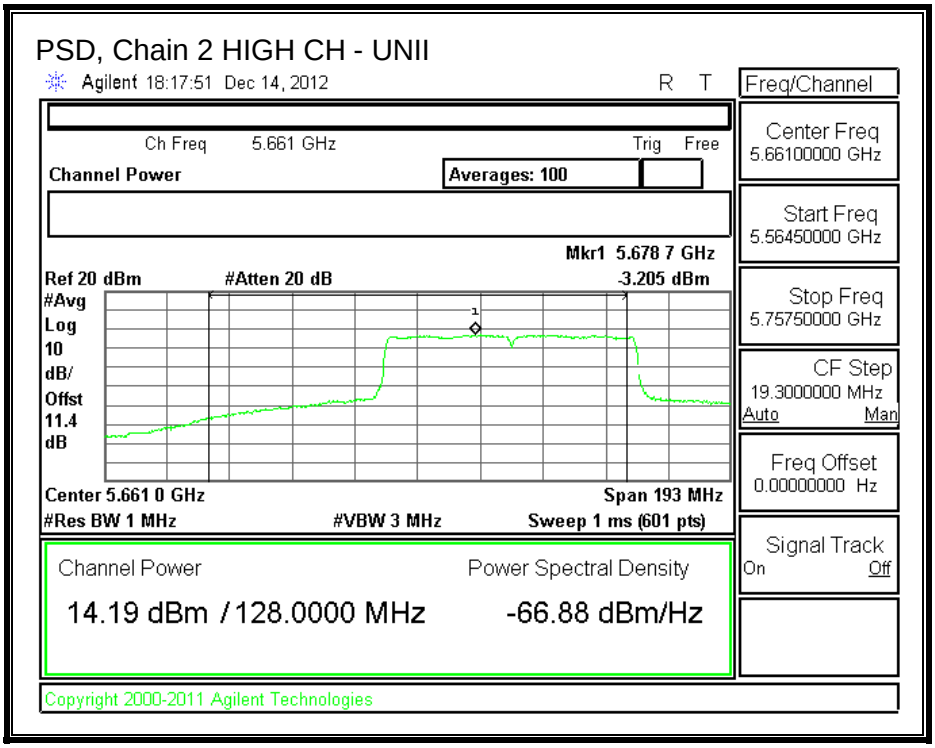


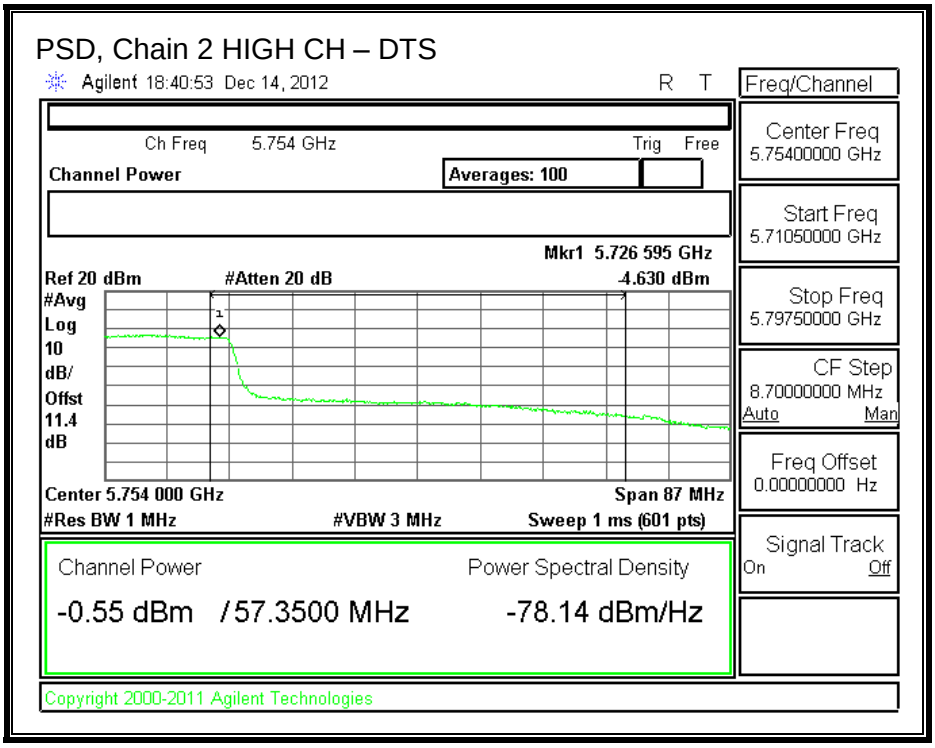
PSD, Chain 1





PSD, Chain 2





8. RADIATED TEST RESULTS

8.1. 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.

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; the video bandwidth is set to 1 MHz for peak measurements and as applicable 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 each applicable 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.

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. **802.11a LEGACY 1TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.2. **802.11a CDD 2TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.3. **802.11a CDD 3TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.4. **802.11a BF 2TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.5. **802.11a BF 3TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.6. **802.11n HT20 1TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.7. **802.11n HT20 CDD 2TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.8. **802.11n HT20 STBC 2TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.9. **802.11n HT20 STBC 3TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.10. **802.11n HT20 BF 2TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.11. **802.11n HT20 BF 3TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.12. **802.11ac VHT20 BF 2TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

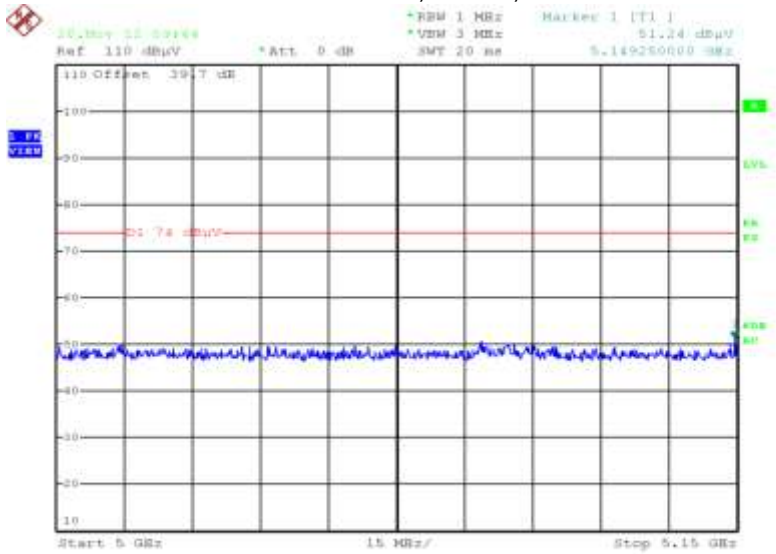
8.2.13. **802.11ac VHT20 BF 3TX MODE IN THE 5.2 GHz BAND**

This mode is disabled in driver; the power level is less than 8dBm due to composite gain of antennas.

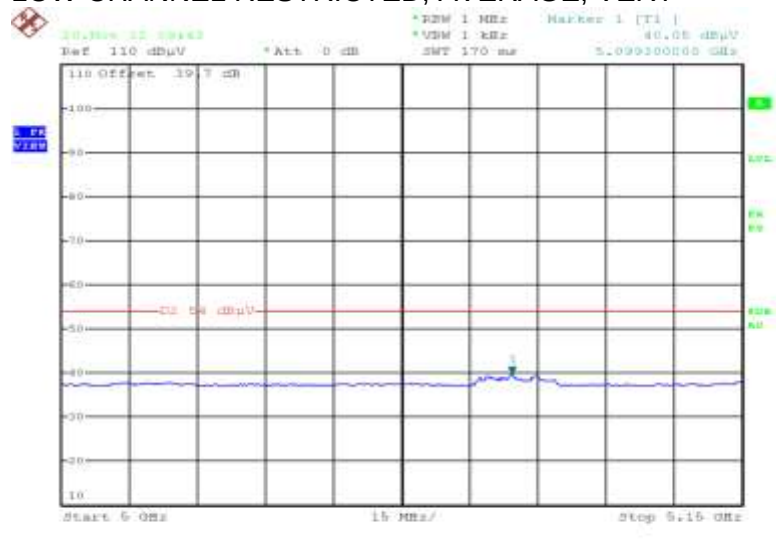
8.2.14. **802.11n HT20 CDD 3TX MODE IN THE 5.2 GHz BAND**

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 11/29/12
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: 5.2GHz band_HT20 CDD MCS0 3Tx

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

Average Field Strength Limit
Peak Field Strength Limit
Margin vs. Average Limit
Margin vs. Peak Limit

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel 5180 MHz															
15.540	3.0	36.5	39.0	12.5	-34.0	0.0	0.0	54.0	74.0	-20.0	H	P	180.7	248.2	
15.540	3.0	26.9	39.0	12.5	-34.0	0.0	0.0	44.5	54.0	-9.5	H	A	180.7	248.2	
15.540	3.0	36.3	39.0	12.5	-34.0	0.0	0.0	53.8	74.0	-20.2	V	P	189.9	348.6	
15.540	3.0	26.1	39.0	12.5	-34.0	0.0	0.0	43.7	54.0	-10.3	V	A	189.9	348.6	
Mid Channel 5200 MHz															
15.600	3.0	38.4	38.8	12.5	-34.0	0.0	0.0	55.8	74.0	-18.2	H	P	100.7	41.5	
15.600	3.0	29.1	38.8	12.5	-34.0	0.0	0.0	46.5	54.0	-7.5	H	A	100.7	41.5	
15.600	3.0	39.5	38.8	12.5	-34.0	0.0	0.0	56.9	74.0	-17.1	V	P	100.2	345.0	
15.600	3.0	30.2	38.8	12.5	-34.0	0.0	0.0	47.6	54.0	-6.4	V	A	100.2	345.0	
High Channel 5240 MHz															
15.720	3.0	34.9	38.4	12.6	-34.0	0.0	0.0	51.9	74.0	-22.1	H	P	138.5	45.9	
15.720	3.0	25.2	38.4	12.6	-34.0	0.0	0.0	42.2	54.0	-11.8	H	A	138.5	45.9	
15.720	3.0	35.3	38.4	12.6	-34.0	0.0	0.0	52.4	74.0	-21.6	V	P	194.1	86.7	
15.720	3.0	25.3	38.4	12.6	-34.0	0.0	0.0	42.3	54.0	-11.7	V	A	194.1	86.7	

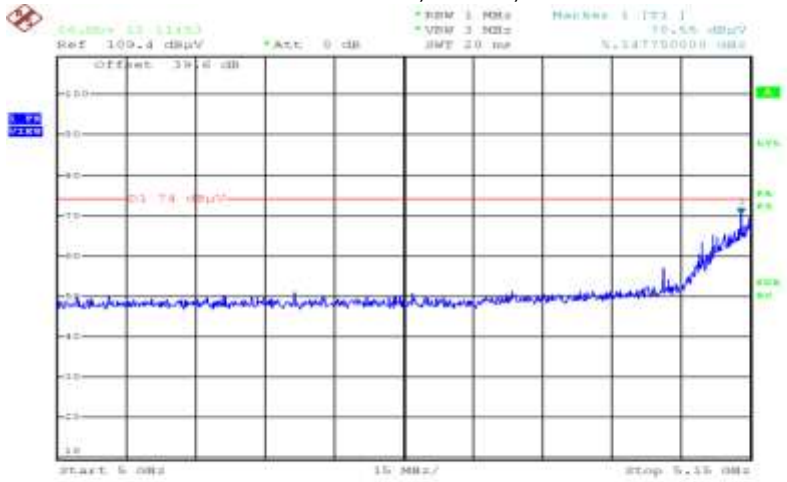
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 1TX & 2TX.

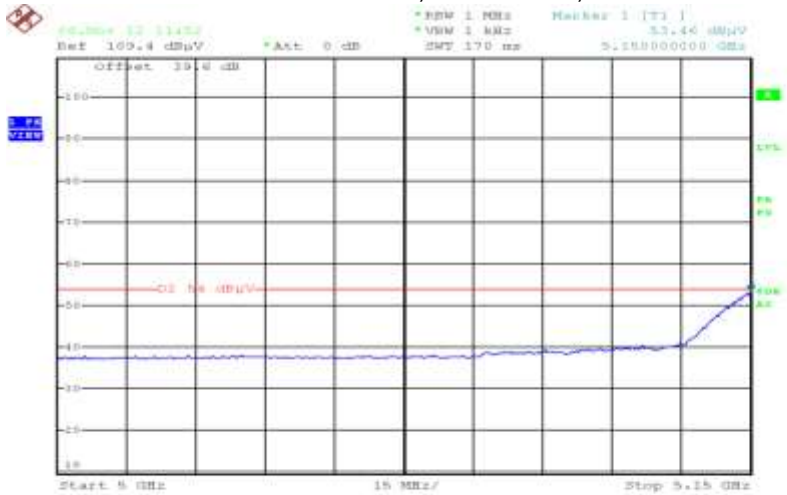
8.2.15. **802.11n HT40 1TX MODE IN THE 5.2 GHz BAND**

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



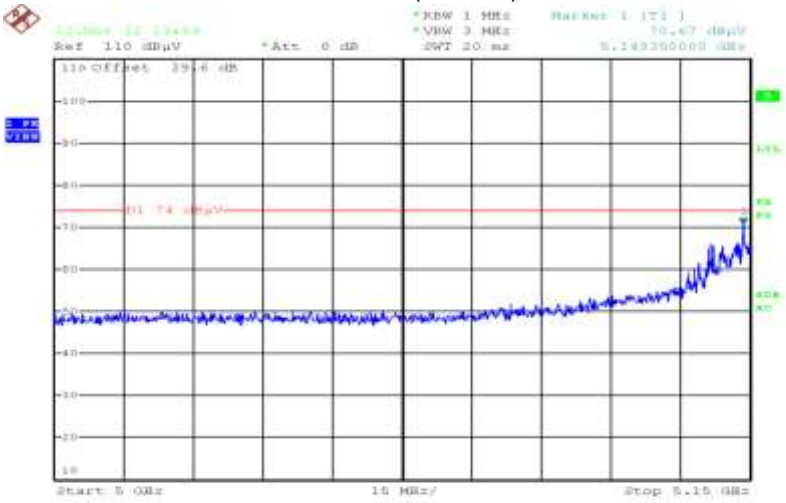
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.16. **802.11n HT40 CDD 2TX MODE IN THE 5.2 GHz BAND**

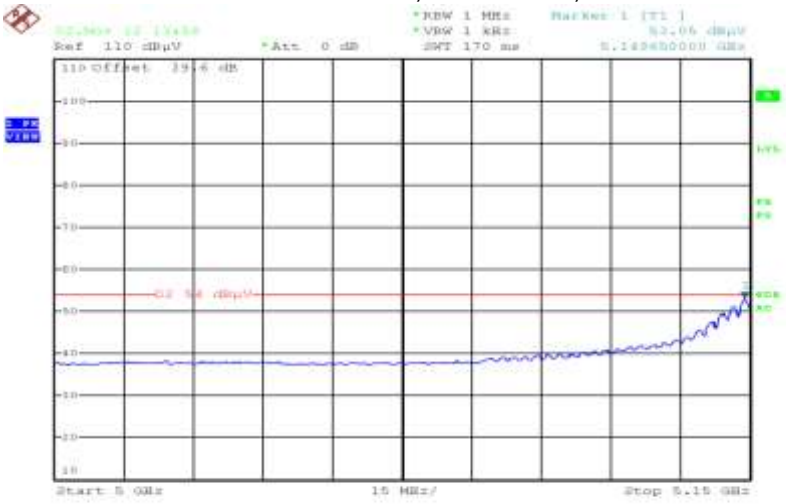
RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, VERT



Date: 2.NOV.2012 13:59:08

LOW CHANNEL RESTRICTED, AVERAGE, VERT



Date: 2.NOV.2012 13:58:30

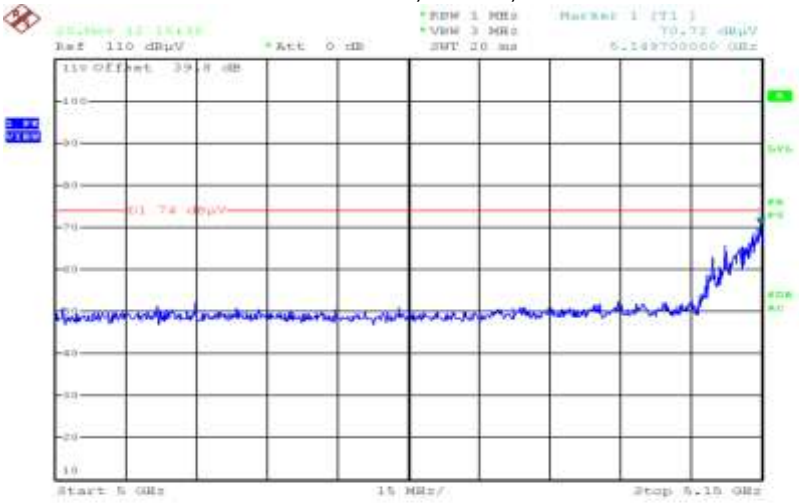
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

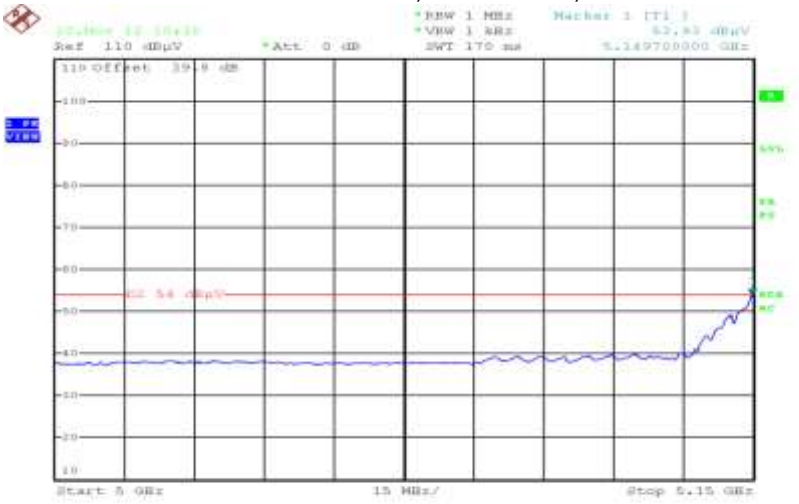
8.2.17. **802.11n HT40 CDD 3TX MODE IN THE 5.2 GHz BAND**

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 12/03/12
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT40 CDD MCS0 3Tx 5.2GHz band. With 7.6-18GHz HPF

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel 5190 MHz															
15.570	3.0	43.6	38.9	12.5	-34.0	0.0	0.7	61.8	74.0	-12.2	V	P	101.6	347.8	
15.570	3.0	34.6	38.9	12.5	-34.0	0.0	0.7	52.7	54.0	-1.3	V	A	101.6	347.8	
15.570	3.0	39.1	38.9	12.5	-34.0	0.0	0.7	57.2	74.0	-16.8	H	P	125.4	14.5	
15.570	3.0	29.1	38.9	12.5	-34.0	0.0	0.7	47.2	54.0	-6.8	H	A	125.4	14.5	
High Channel 5230 MHz															
15.690	3.0	39.8	38.5	12.6	-34.0	0.0	0.7	57.6	74.0	-16.4	H	P	139.9	11.1	
15.690	3.0	30.6	38.5	12.6	-34.0	0.0	0.7	48.4	54.0	-5.6	H	A	139.9	11.1	
15.690	3.0	43.7	38.5	12.6	-34.0	0.0	0.7	61.6	74.0	-12.4	V	P	114.4	0.0	
15.690	3.0	34.5	38.5	12.6	-34.0	0.0	0.7	52.3	54.0	-1.7	V	A	114.4	0.0	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 1TX & 2TX.

8.2.18. **802.11n HT40 STBC 2TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.19. **802.11n HT40 STBC 3TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.20. **802.11n HT40 BF 2TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11ac VHT40 BF 2TX, total power across the three chains is higher than the power level the device will operate at.

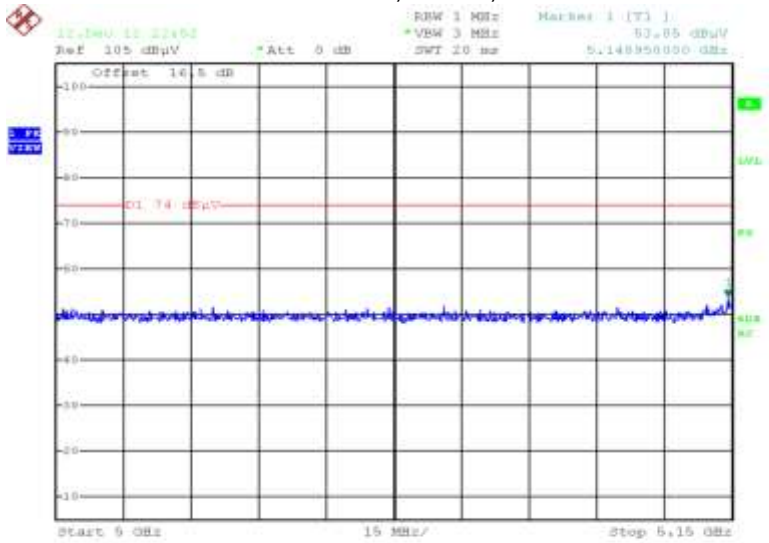
8.2.21. **802.11n HT40 BF 3TX MODE IN THE 5.2 GHz BAND**

Covered by testing 11ac VHT40 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.22. 802.11ac VHT40 BF 2TX MODE IN THE 5.2 GHz BAND

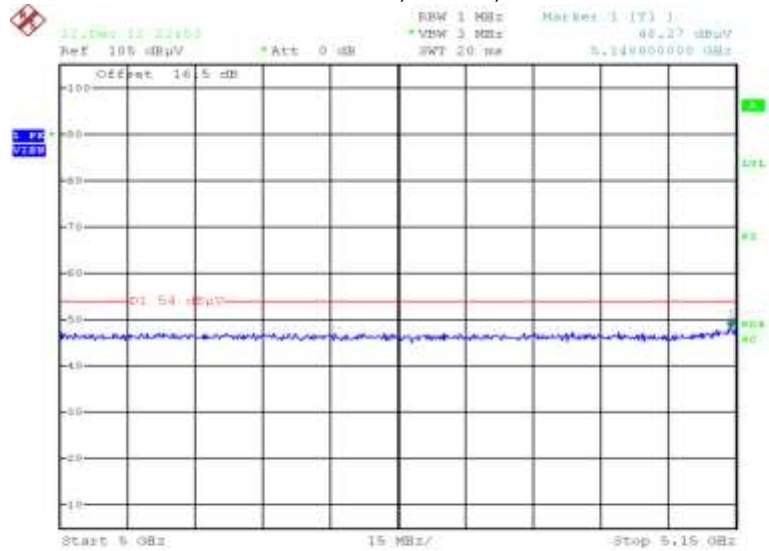
AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL BANDEDGE, PEAK, VERT



Date: 12.DEC.2012 22:52:13

LOW CHANNEL BANDEDGE, PEAK, VERT



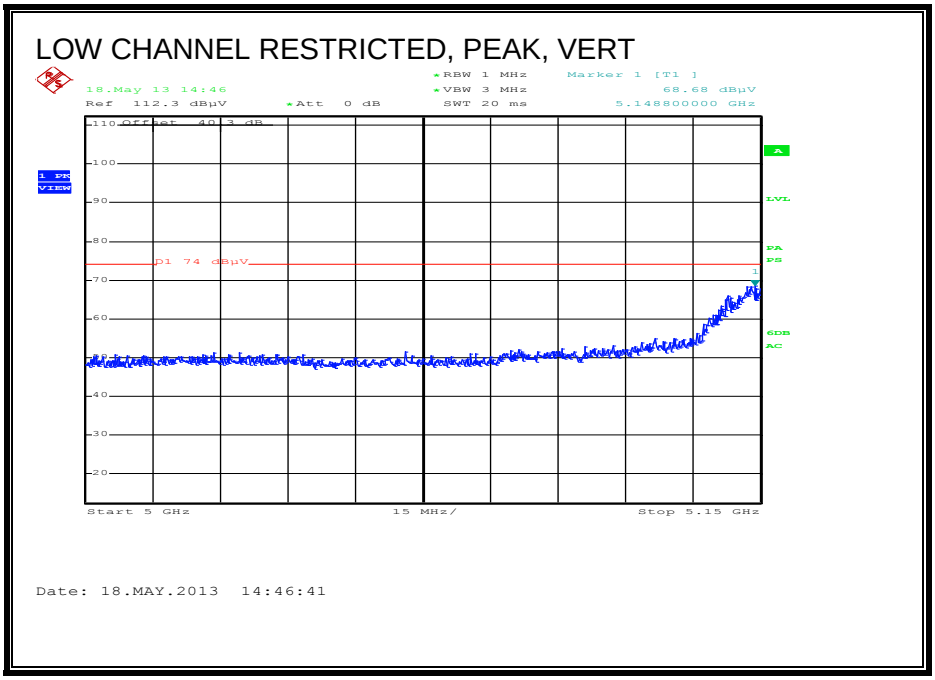
Date: 12.DEC.2012 22:53:53

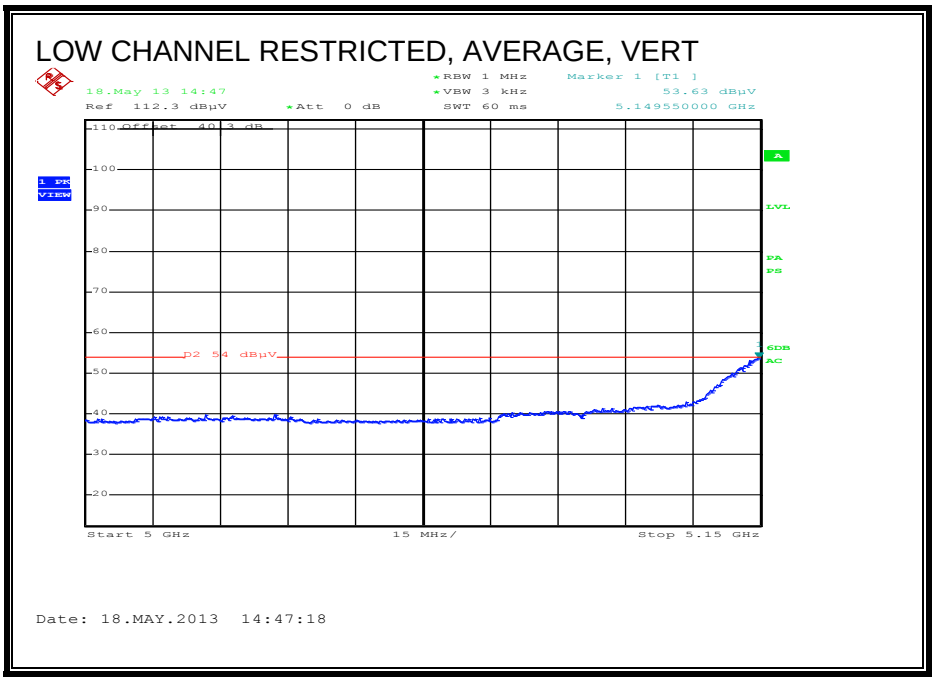
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT40 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.23. 802.11ac VHT40 BF 3TX MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Broadcom
Project #: 12U14668
Date: 5/18/2013
Test Engineer: K. Nguyen
Configuration: EUT with laptop
Mode: Tx; 11ac 40 MHz TxBF

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T136; M/N: 3117 @3m	T144 Miteq 3008A00931			FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		

Peak Measurements
RBW=1 MHz; VBW=3MHz
Average Measurements
RBW=1MHz ; VBW=3kHz

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)
Channel 38 (5190 MHz)															
15.570	3.0	35.5	27.3	40.1	13.2	-34.6	0.0	0.0	54.2	46.0	74	54	-19.8	-8.0	V
15.570	3.0	33.5	26.5	40.1	13.2	-34.6	0.0	0.0	52.2	45.2	74	54	-21.8	-8.8	H
Channel 46 (5230 MHz)															
15.690	3.0	35.7	28.2	40.1	13.3	-34.6	0.0	0.0	54.5	47.1	74	54	-19.5	-6.9	V
15.690	3.0	35.5	27.9	40.1	13.3	-34.6	0.0	0.0	54.3	46.7	74	54	-19.7	-7.3	H

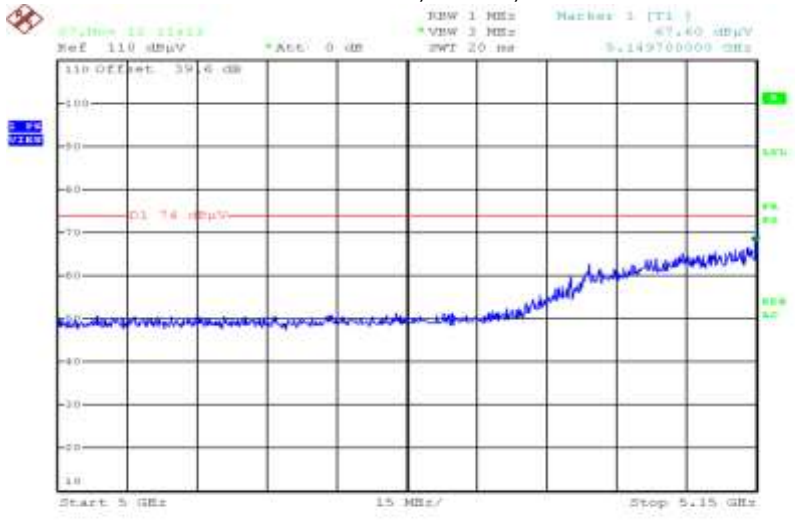
Rev. 01.30.13

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		

8.2.24. **802.11ac VHT80 1TX MODE IN THE 5.2 GHz BAND**

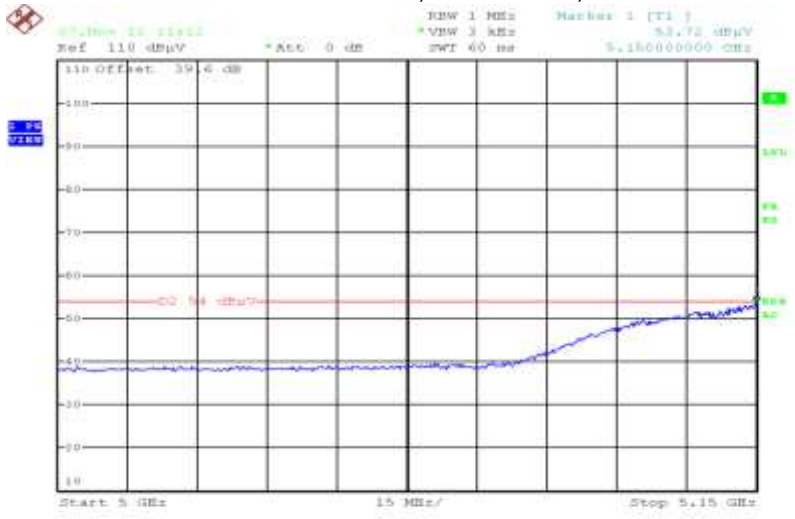
RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, VERT



Date: 7.NOV.2012 11:13:43

LOW CHANNEL RESTRICTED, AVERAGE, VERT



Date: 7.NOV.2012 11:12:52

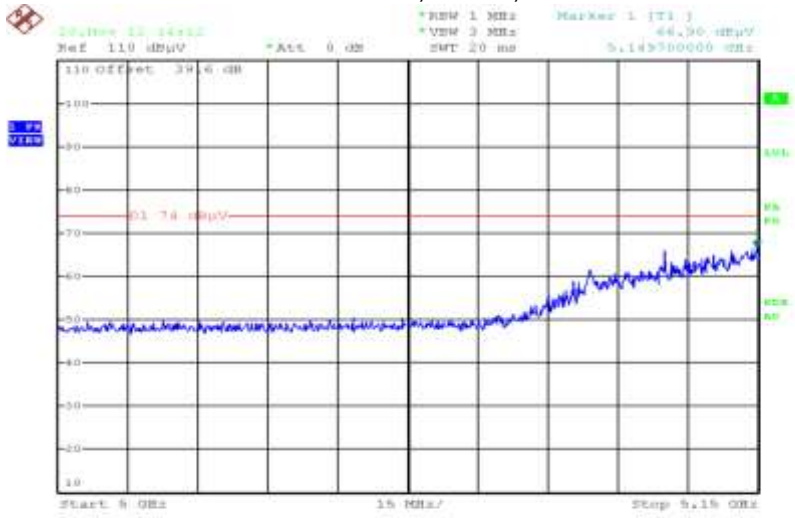
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.25. **802.11ac HT80 CDD 2TX MODE IN THE 5.2 GHz BAND**

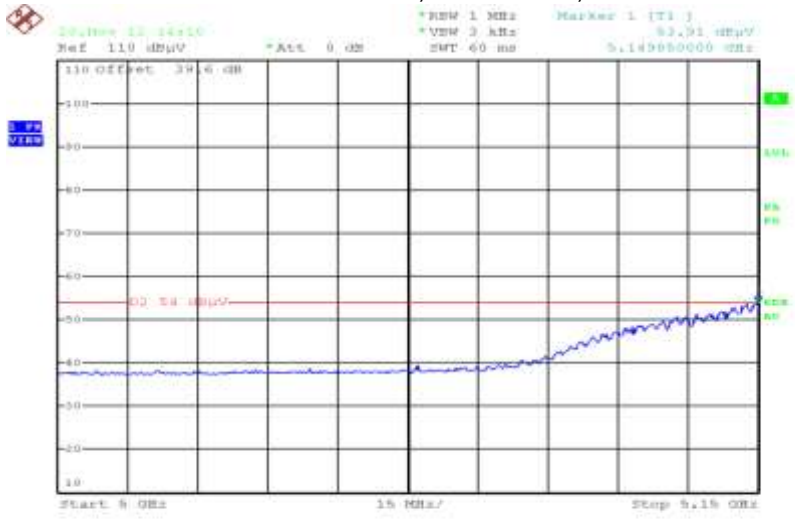
RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, VERT



Date: 20.NOV.2012 14:12:05

LOW CHANNEL RESTRICTED, AVERAGE, VERT



Date: 20.NOV.2012 14:10:32

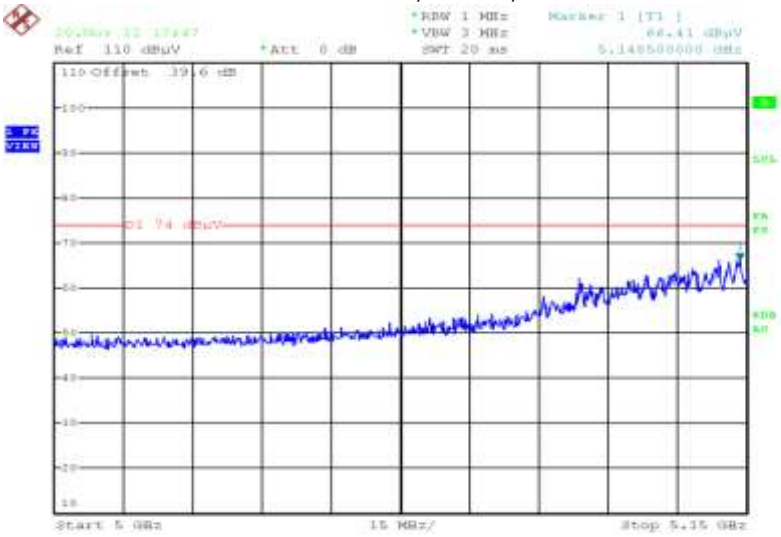
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 CDD 3TX, total power across three two chains is higher than the power level the device will operate at.

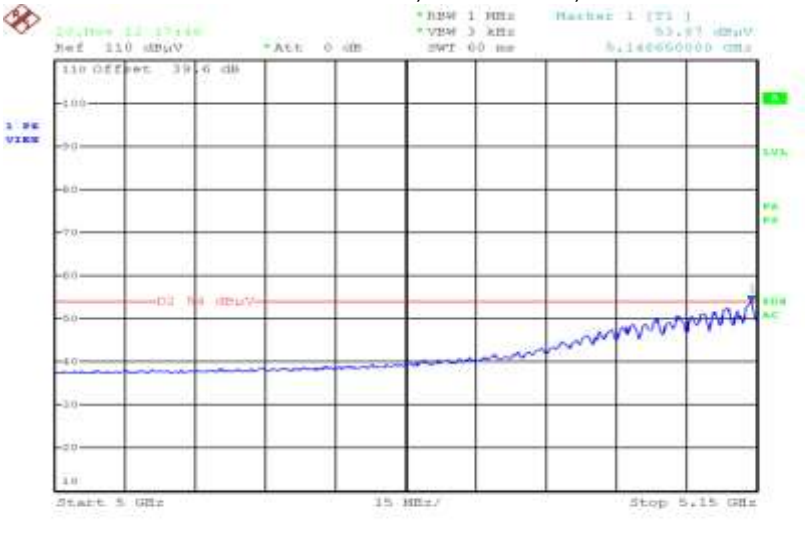
8.2.26. **802.11ac VHT80 CDD 3TX MODE IN THE 5.2 GHz BAND**

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 11/30/12
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT80 CDD MCS0 3Tx 5.2GHz band.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Mid Channel 5210 MHz															
15.630	3.0	41.1	38.7	12.6	-34.0	0.0	0.7	59.0	74.0	-15.0	V	P	140.1	345.3	
15.630	3.0	32.7	38.7	12.6	-34.0	0.0	0.7	50.7	54.0	-3.3	V	A	140.1	345.3	
15.630	3.0	35.6	38.7	12.6	-34.0	0.0	0.7	53.6	74.0	-20.4	H	P	162.8	354.6	
15.630	3.0	26.2	38.7	12.6	-34.0	0.0	0.7	44.2	54.0	-9.8	H	A	162.8	354.6	

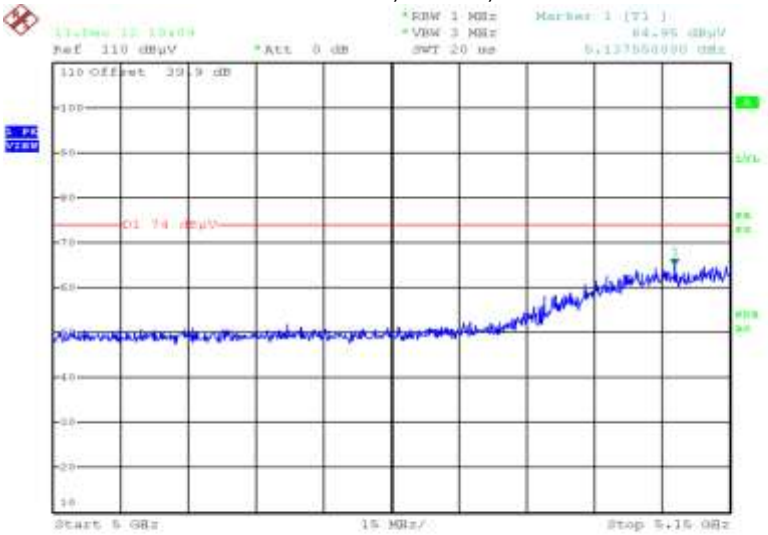
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 1TX & 2TX.

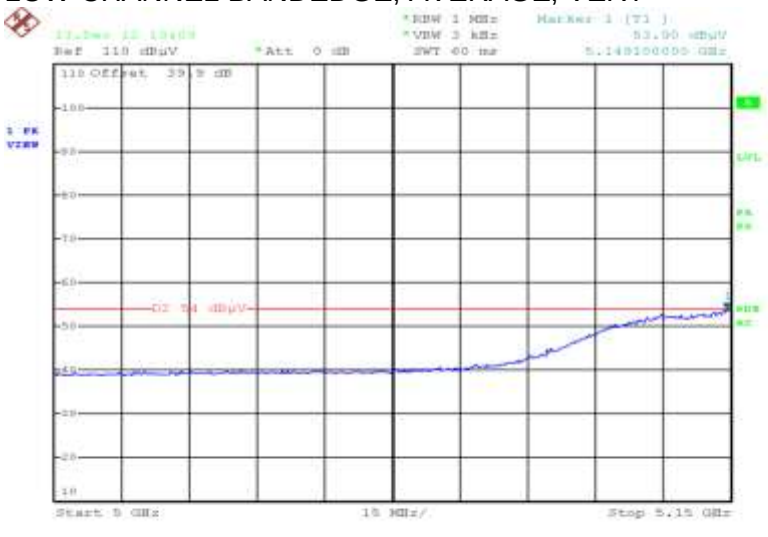
8.2.27. **802.11ac VHT80 BF 2TX MODE IN THE 5.2 GHz BAND**

AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL BANDEDGE, PEAK, VERT



LOW CHANNEL BANDEDGE, AVERAGE, VERT



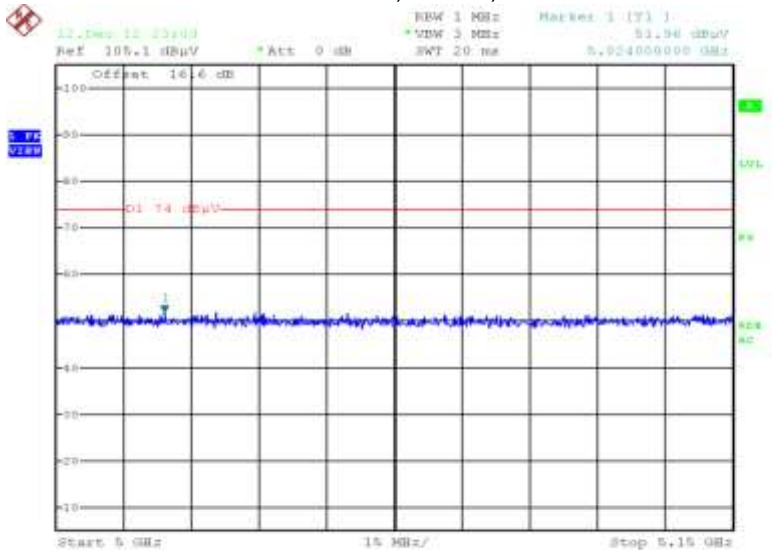
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

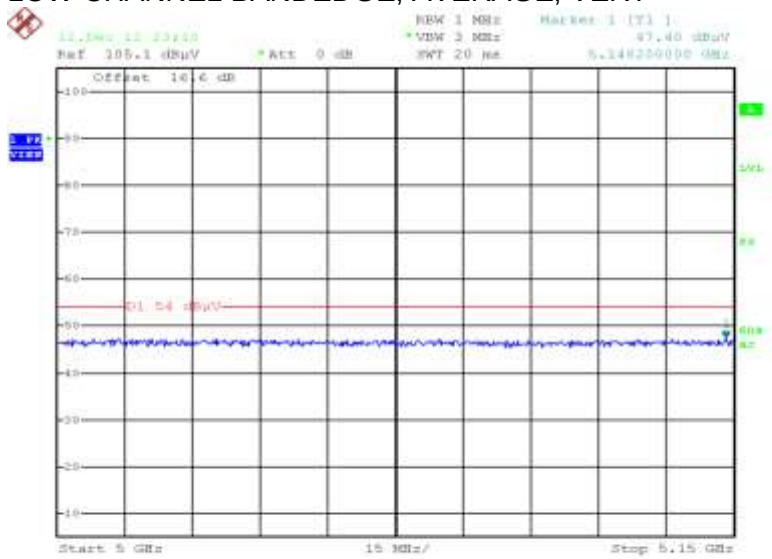
8.2.28. 802.11ac VHT80 BF 3TX MODE IN THE 5.2 GHz BAND

AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL BANDEDGE, PEAK, VERT



LOW CHANNEL BANDEDGE, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: S. Aguilar
Date: 12/10/12
Project #: 12U25668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT80 MCS0 3TX 5.2 Ghz band. Beamforming. Laptop with antenna and adapter setup as Beamformee setup in chamber.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Mid Channel 5210 MHz															
15.630	3.0	34.7	38.7	13.0	-31.9	0.0	0.7	55.2	74.0	-18.8	H	P	184.0	197.0	CH 42
15.630	3.0	25.2	38.7	13.0	-31.9	0.0	0.7	45.7	54.0	-8.3	H	A	184.0	197.0	CH 42
15.630	3.0	38.8	38.7	13.0	-31.9	0.0	0.7	59.3	74.0	-14.7	V	P	120.0	308.0	CH 42
15.630	3.0	28.2	38.7	13.0	-31.9	0.0	0.7	48.8	54.0	-5.2	V	A	120.0	308.0	CH 42

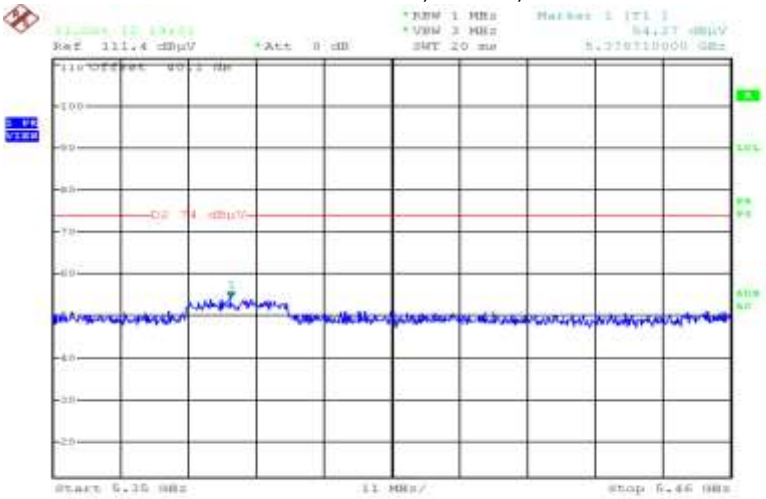
Rev. 4.1.2.7

Note: tested with highest output powers at 20dBm to cover 2TX.

8.2.29. **802.11a LEGACY MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (MID CHANNEL 60)

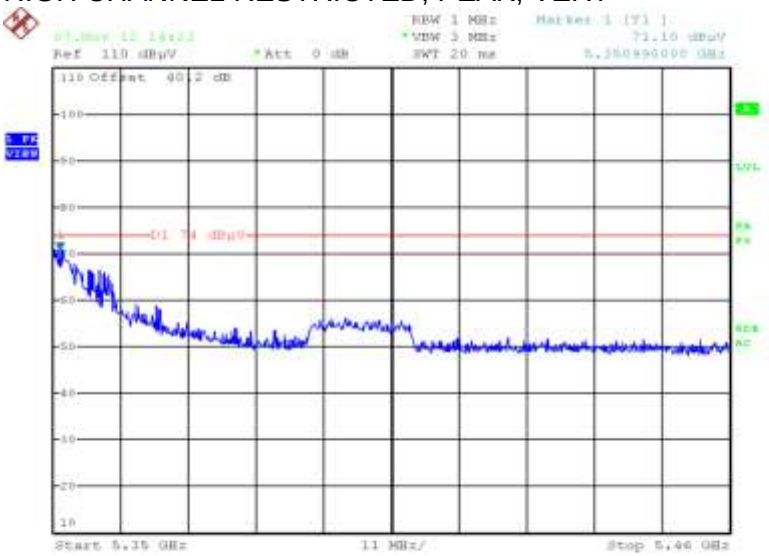
HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT

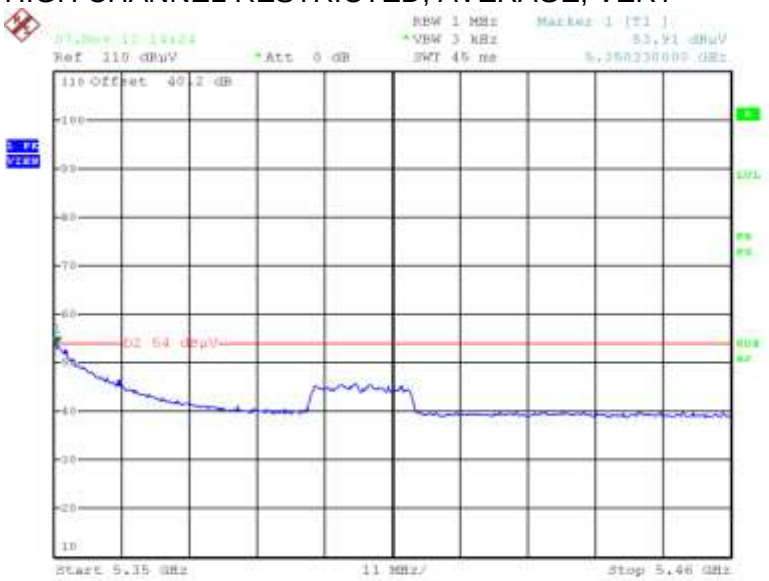
RESTRICTED BANDEDGE (HIGH CHANNEL 64)

HIGH CHANNEL RESTRICTED, PEAK, VERT



Date: 7.NOV.2012 14:23:45

HIGH CHANNEL RESTRICTED, AVERAGE, VERT



Date: 7.NOV.2012 14:24:31

HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.30. **802.11a CDD 2Tx MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.31. **802.11a CDD 3Tx MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.32. **802.11a BF 2TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.33. **802.11a BF 3TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.34. **802.11n HT20 1TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.35. **802.11n HT20 CDD 2TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.36. **802.11n HT20 STBC 2TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.37. **802.11n HT20 STBC 3TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.38. **802.11n HT20 BF 2TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

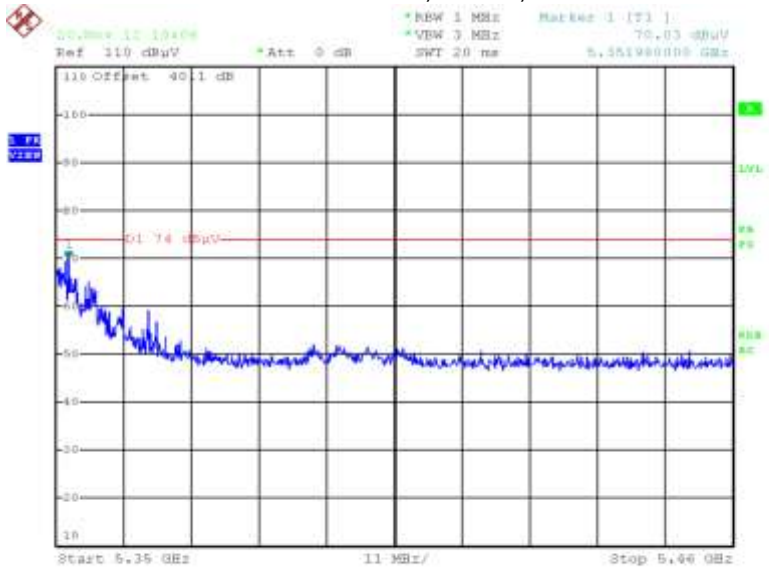
8.2.39. **802.11n HT20 BF 3TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

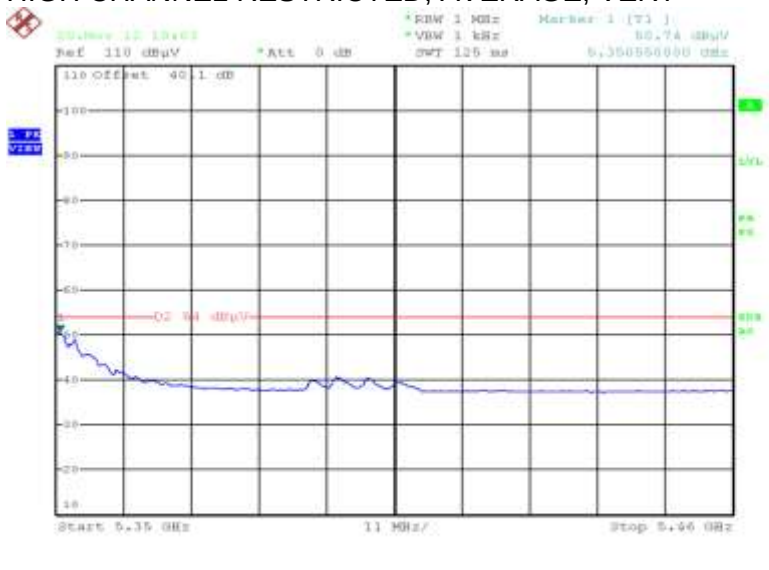
8.2.40. 802.11n HT20 CDD 3TX MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 11/30/2012
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT20 CDD MCS0 3Tx 5.3GHz band.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel 5260 MHz															
15.780	3.0	37.8	38.2	12.6	-33.9	0.0	0.0	54.6	74.0	-19.4	H	P	100.0	30.3	
15.780	3.0	29.2	38.2	12.6	-33.9	0.0	0.0	46.1	54.0	-7.9	H	A	100.0	30.3	
15.780	3.0	40.0	38.2	12.6	-33.9	0.0	0.0	56.8	74.0	-17.2	V	P	100.1	344.3	
15.780	3.0	30.7	38.2	12.6	-33.9	0.0	0.0	47.6	54.0	-6.4	V	A	100.1	344.3	
Mid Channel 5300 MHz															
10.600	3.0	37.5	38.3	9.7	-35.7	0.0	0.0	49.7	74.0	-24.3	H	P	125.2	327.7	
10.600	3.0	28.6	38.3	9.7	-35.7	0.0	0.0	40.7	54.0	-13.3	H	A	125.2	327.7	
15.900	3.0	44.4	37.8	12.7	-33.9	0.0	0.0	60.9	74.0	-13.1	H	P	100.0	31.2	
15.900	3.0	34.8	37.8	12.7	-33.9	0.0	0.0	51.3	54.0	-2.7	H	A	100.0	31.2	
10.600	3.0	43.9	38.3	9.7	-35.7	0.0	0.0	56.1	74.0	-17.9	V	P	157.9	21.2	
10.600	3.0	34.7	38.3	9.7	-35.7	0.0	0.0	46.8	54.0	-7.2	V	A	157.9	21.2	
15.900	3.0	47.6	37.8	12.7	-33.9	0.0	0.0	64.1	74.0	-9.9	V	P	117.4	349.0	
15.900	3.0	37.1	37.8	12.7	-33.9	0.0	0.0	53.7	54.0	-0.3	V	A	117.4	349.0	
High Channel, 5320															
10.640	3.0	39.1	38.3	9.7	-35.7	0.0	0.0	51.4	74.0	-22.7	H	P	138.2	319.9	
10.640	3.0	31.2	38.3	9.7	-35.7	0.0	0.0	43.5	54.0	-10.5	H	A	138.2	319.9	
15.960	3.0	42.8	37.6	12.7	-33.9	0.0	0.0	59.2	74.0	-14.8	H	P	142.6	11.2	
15.960	3.0	33.8	37.6	12.7	-33.9	0.0	0.0	50.3	54.0	-3.7	H	A	142.6	11.2	
10.640	3.0	42.8	38.3	9.7	-35.7	0.0	0.0	55.0	74.0	-19.0	V	P	154.4	24.3	
10.640	3.0	32.8	38.3	9.7	-35.7	0.0	0.0	45.1	54.0	-8.9	V	A	154.4	24.3	
15.960	3.0	47.8	37.6	12.7	-33.9	0.0	0.0	64.2	74.0	-9.8	V	P	122.8	345.7	
15.960	3.0	37.4	37.6	12.7	-33.9	0.0	0.0	53.8	54.0	-0.2	V	A	122.8	345.7	

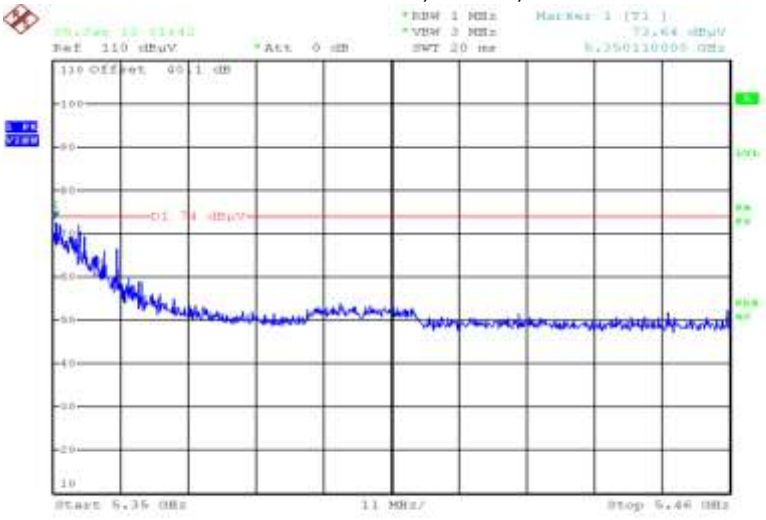
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm for low & mid channels, 19dBm for high channel to cover 1TX & 2TX.

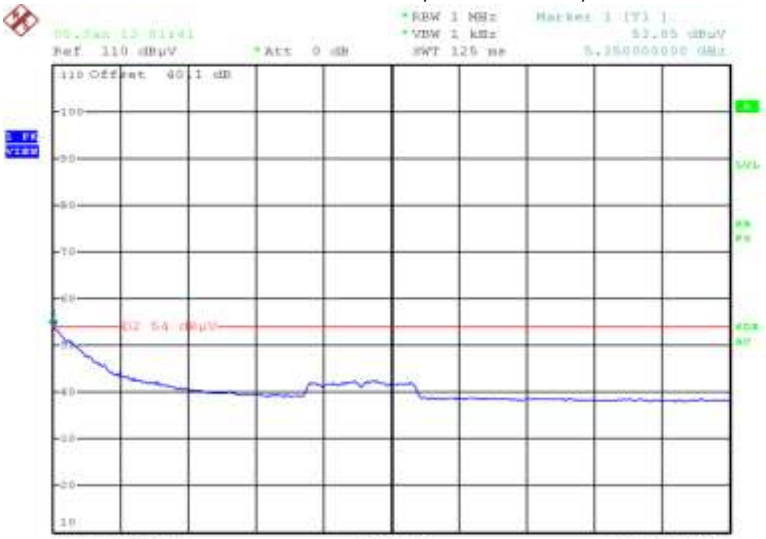
8.2.41. **802.11ac VHT20 BF 3TX MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: V. Tran / S. Aguilar
Date: 01/04/13
Project #: 12U14668
Company: Broadcom
Test Target: FCC 15.247
Mode Oper: EUT with antenna setup, laptop and AC Adapter_5.3 G HT20 MCS0 3TX TX Beamforming
Laptop with antenna and adapter setup as Beamformee setup in chamber.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
LOW CHANNEL (52) 5260MHz															
15.780	3.0	38.9	38.2	12.6	-33.9	0.0	0.7	56.5	74.0	-17.5	H	P	141.1	253.8	
15.780	3.0	29.8	38.2	12.6	-33.9	0.0	0.7	47.4	54.0	-6.6	H	A	141.1	253.8	
15.780	3.0	42.8	38.2	12.6	-33.9	0.0	0.7	60.4	74.0	-13.6	V	P	117.3	331.2	
15.780	3.0	32.8	38.2	12.6	-33.9	0.0	0.7	50.4	54.0	-3.6	V	A	117.3	331.2	
MID CHANNEL (60) 5300MHz															
15.900	3.0	41.0	37.8	12.7	-33.9	0.0	0.7	58.3	74.0	-15.7	H	P	133.2	240.8	
15.900	3.0	30.1	37.8	12.7	-33.9	0.0	0.7	47.4	54.0	-6.6	H	A	133.2	240.8	
15.900	3.0	41.3	37.8	12.7	-33.9	0.0	0.7	58.6	74.0	-15.4	V	P	118.0	237.8	
15.900	3.0	32.1	37.8	12.7	-33.9	0.0	0.7	49.4	54.0	-4.6	V	A	118.0	237.8	
HIGH CHANNEL (64) 5320MHz															
10.640	3.0	38.0	38.3	9.7	-35.7	0.0	0.8	51.0	74.0	-23.0	H	P	145.4	257.8	
10.640	3.0	28.9	38.3	9.7	-35.7	0.0	0.8	41.9	54.0	-12.1	H	A	145.4	257.8	
10.640	3.0	43.1	38.3	9.7	-35.7	0.0	0.8	56.1	74.0	-17.9	V	P	142.4	353.6	
10.640	3.0	34.1	38.3	9.7	-35.7	0.0	0.8	47.1	54.0	-6.9	V	A	142.4	353.6	
15.960	3.0	37.8	37.6	12.7	-33.9	0.0	0.7	54.9	74.0	-19.1	H	P	100.0	241.3	
15.960	3.0	28.4	37.6	12.7	-33.9	0.0	0.7	45.5	54.0	-8.5	H	A	100.0	241.3	
15.960	3.0	41.4	37.6	12.7	-33.9	0.0	0.7	58.6	74.0	-15.4	V	P	106.3	236.3	
15.960	3.0	32.7	37.6	12.7	-33.9	0.0	0.7	49.9	54.0	-4.1	V	A	106.3	236.3	

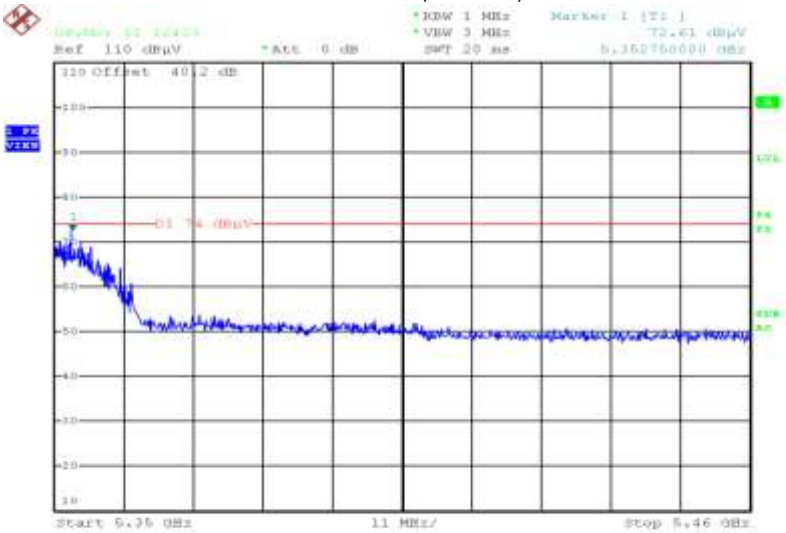
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 2TX.

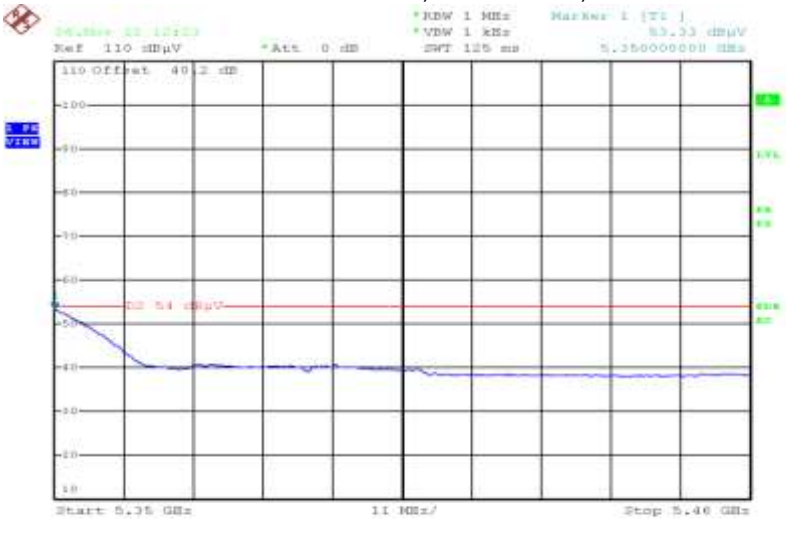
8.2.42. **802.11n HT40 1TX MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



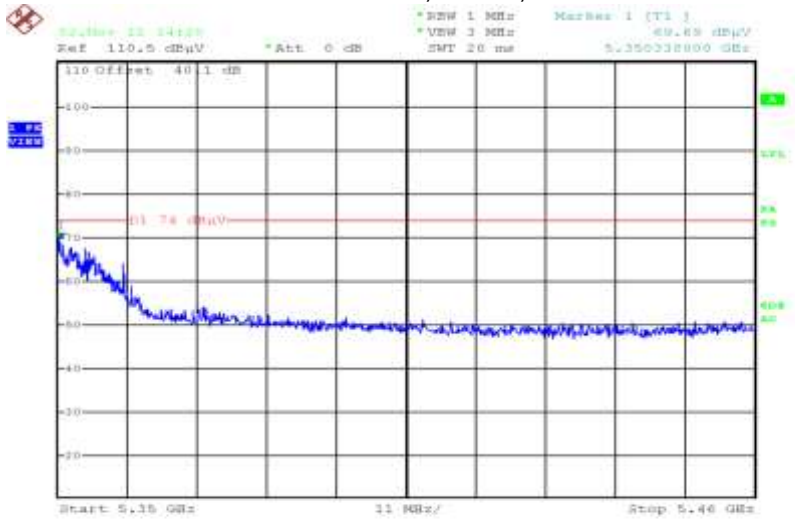
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

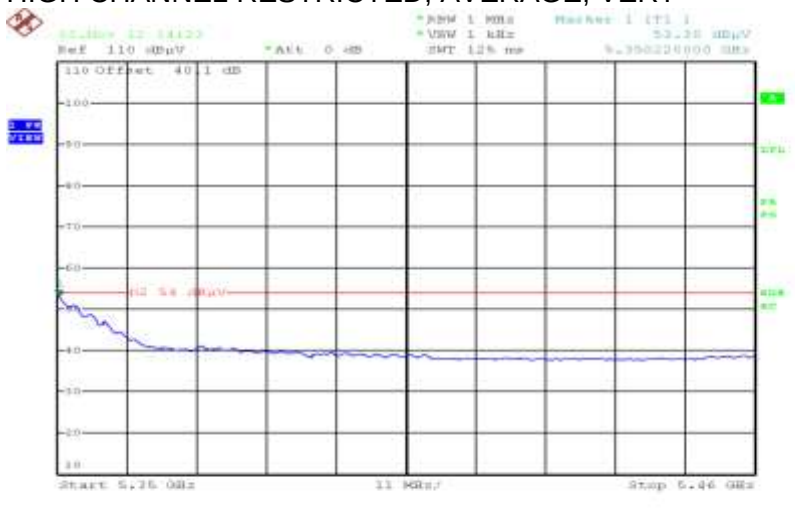
8.2.43. **802.11n HT40 CDD 2TX MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



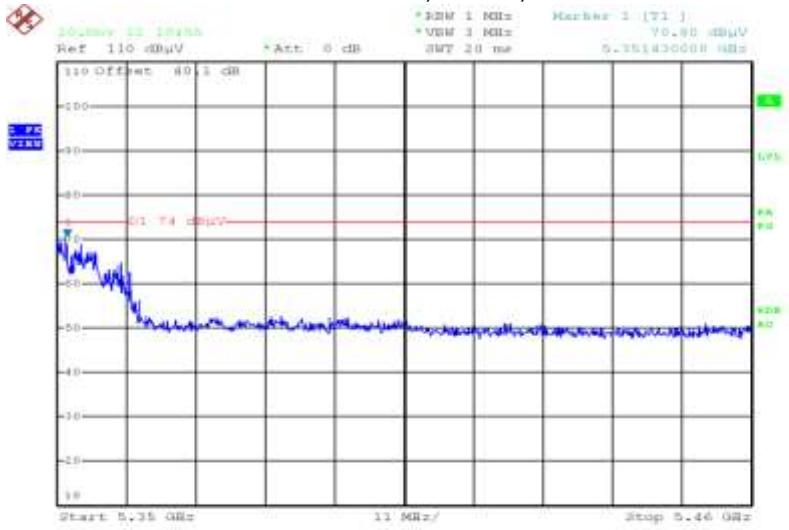
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

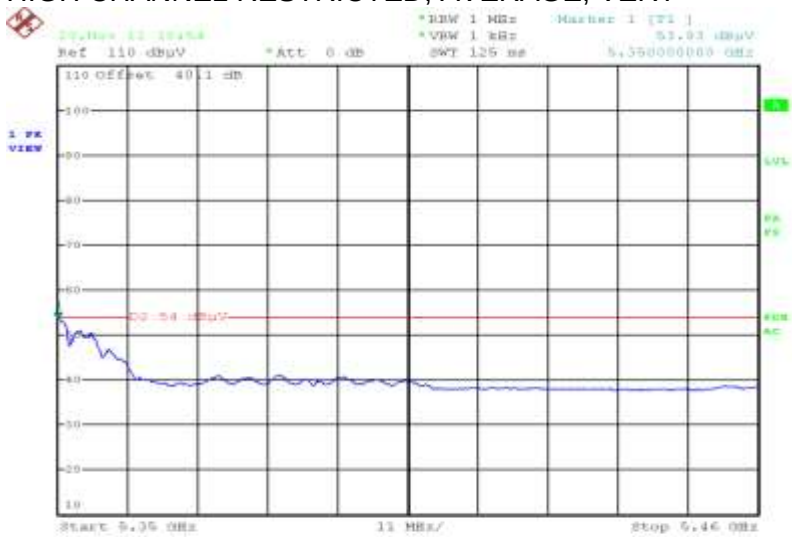
8.2.44. **802.11n HT40 CDD 3TX MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 12/03/12
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT40 CDD MCS0 3Tx 5.3GHz band. With 7.6-18GHz HPF

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel 5270 MHz															
15.810	3.0	44.2	38.1	12.6	-33.9	0.0	0.7	61.7	74.0	-12.3	V	P	100.0	0.0	
15.810	3.0	35.4	38.1	12.6	-33.9	0.0	0.7	52.9	54.0	-1.1	V	A	100.0	0.0	
15.810	3.0	39.6	38.1	12.6	-33.9	0.0	0.7	57.1	74.0	-16.9	H	P	100.4	16.4	
15.810	3.0	30.4	38.1	12.6	-33.9	0.0	0.7	47.9	54.0	-6.1	H	A	100.4	16.4	
High Channel 5310 MHz								0.0							
10.620	3.0	42.1	38.3	9.7	-35.7	0.0	0.8	55.1	74.0	-18.9	V	P	144.0	27.6	
10.620	3.0	33.5	38.3	9.7	-35.7	0.0	0.8	46.5	54.0	-7.5	V	A	144.0	27.6	
10.620	3.0	39.1	38.3	9.7	-35.7	0.0	0.8	52.1	74.0	-21.9	H	P	137.5	325.3	
10.620	3.0	30.2	38.3	9.7	-35.7	0.0	0.8	43.2	54.0	-10.8	H	A	137.5	325.3	
15.930	3.0	44.7	37.7	12.7	-33.9	0.0	0.7	61.9	74.0	-12.1	V	P	102.2	360.0	
15.930	3.0	35.3	37.7	12.7	-33.9	0.0	0.7	52.5	54.0	-1.5	V	A	102.2	360.0	
15.930	3.0	41.0	37.7	12.7	-33.9	0.0	0.7	58.2	74.0	-15.8	H	P	147.6	14.4	
15.930	3.0	31.5	37.7	12.7	-33.9	0.0	0.7	48.7	54.0	-5.3	H	A	147.6	14.4	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 1TX & 2TX.

8.2.45. **802.11n HT40 STBC 1TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.46. **802.11n HT40 STBC 2TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.47. **802.11n HT40 STBC 3TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.48. **802.11n HT40 BF 2TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11ac VHT40 BF 2TX, total power across the two chains is higher than the power level the device will operate at.

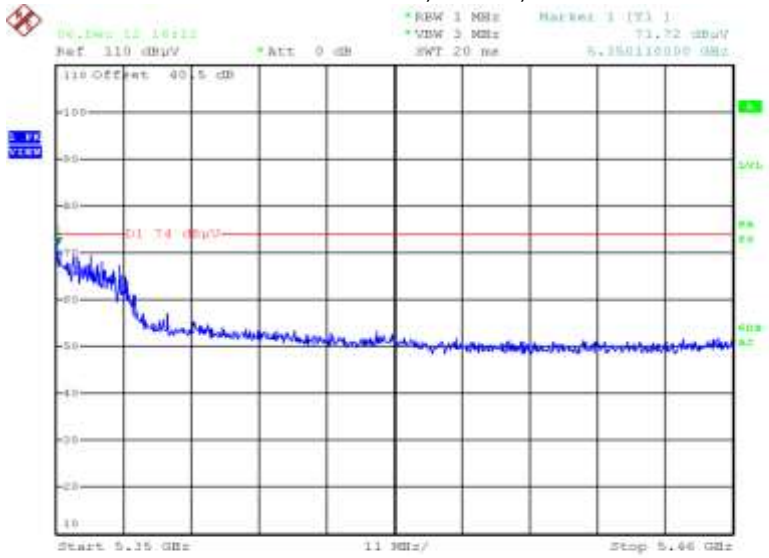
8.2.49. **802.11n HT40 BF 3TX MODE IN THE 5.3 GHz BAND**

Covered by testing 11ac VHT40 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

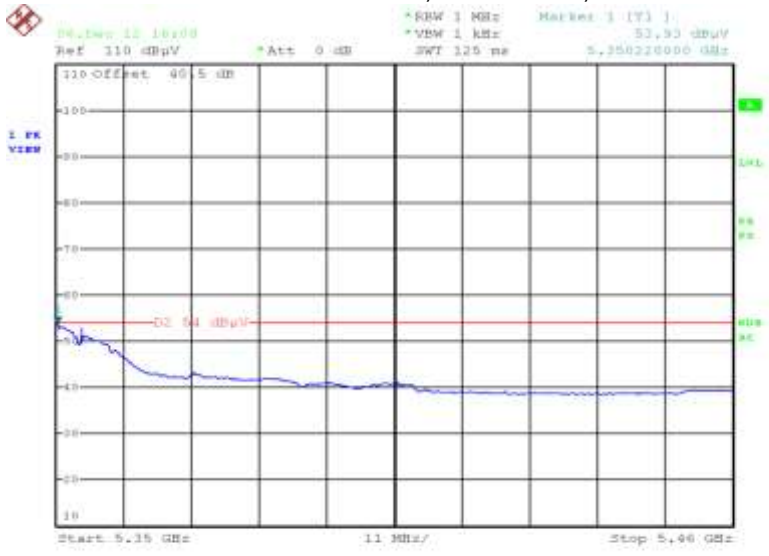
8.2.50. **802.11ac VHT40 BF 2TX MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



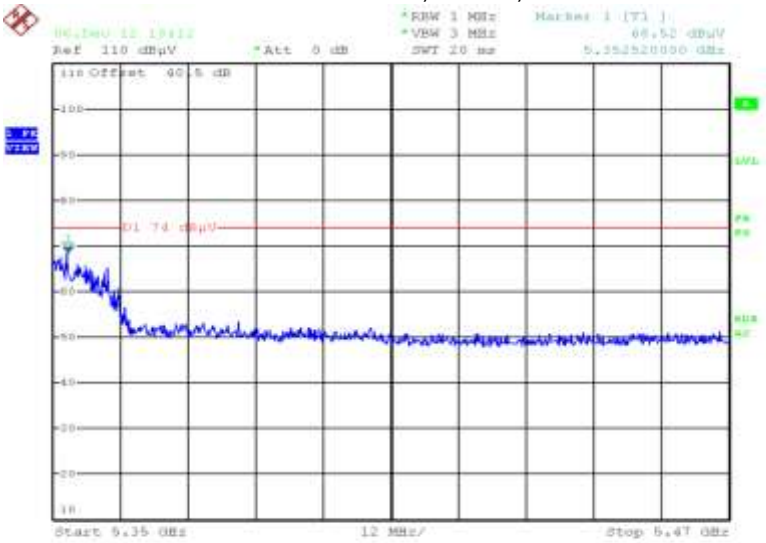
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT40 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.51. **802.11ac VHT40 BF 3TX MODE IN THE 5.3 GHz BAND**

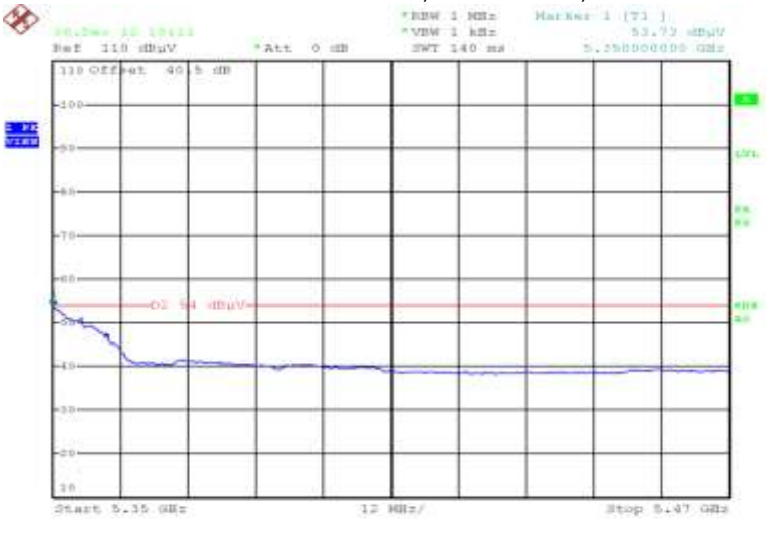
RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



Date: 6.DEC.2012 18:12:50

HIGH CHANNEL RESTRICTED, AVERAGE, VERT



Date: 6.DEC.2012 18:11:57

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: S. Aguilar
Date: 12/10/12
Project #: 12U25668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: Tx 5.3G_11ac HT40 MCS0 3TX (TxBF)
Laptop with antenna and adapter setup as Beamformee setup in chamber.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel 5270 MHz															
15.810	3.0	36.1	38.1	12.6	-33.9	0.0	0.7	53.6	74.0	-20.4	H	P	126.8	255.5	
15.810	3.0	26.8	38.1	12.6	-33.9	0.0	0.7	44.3	54.0	-9.7	H	A	126.8	255.5	
15.810	3.0	39.6	38.1	12.6	-33.9	0.0	0.7	57.1	74.0	-16.9	V	P	100.3	237.0	
15.810	3.0	30.1	38.1	12.6	-33.9	0.0	0.7	47.6	54.0	-6.4	V	A	100.3	237.0	
High Channel 5310 MHz															
10.620	3.0	36.5	38.3	10.0	-34.0	0.0	0.8	51.6	74.0	-22.4	H	P	137.0	155.0	
10.620	3.0	26.0	38.3	10.0	-34.0	0.0	0.8	41.0	54.0	-13.0	H	A	137.0	155.0	
10.620	3.0	38.6	38.3	10.0	-34.0	0.0	0.8	53.6	74.0	-20.4	V	P	99.0	356.0	
10.620	3.0	27.3	38.3	10.0	-34.0	0.0	0.8	42.3	54.0	-11.7	V	A	99.0	356.0	
15.930	3.0	35.4	37.7	13.2	-31.8	0.0	0.7	55.1	74.0	-18.9	H	P	215.0	140.0	
15.930	3.0	24.6	37.7	13.2	-31.8	0.0	0.7	44.4	54.0	-9.6	H	A	215.0	140.0	
15.930	3.0	40.6	37.7	13.2	-31.8	0.0	0.7	60.3	74.0	-13.7	V	P	130.0	302.0	
15.930	3.0	30.1	37.7	13.2	-31.8	0.0	0.7	49.8	54.0	-4.2	V	A	130.0	302.0	

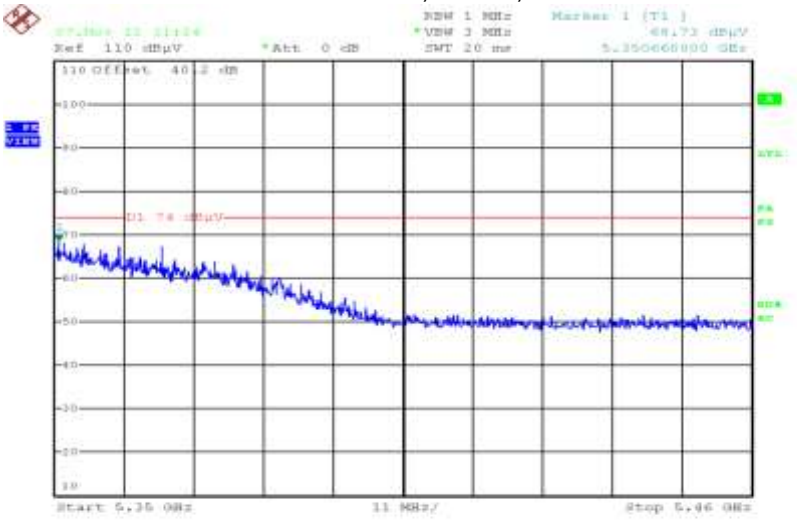
Rev. 4.1.2.7

Note: tested with highest output powers to cover 2TX; low channel=17.5dBm & high channel=20dBm.

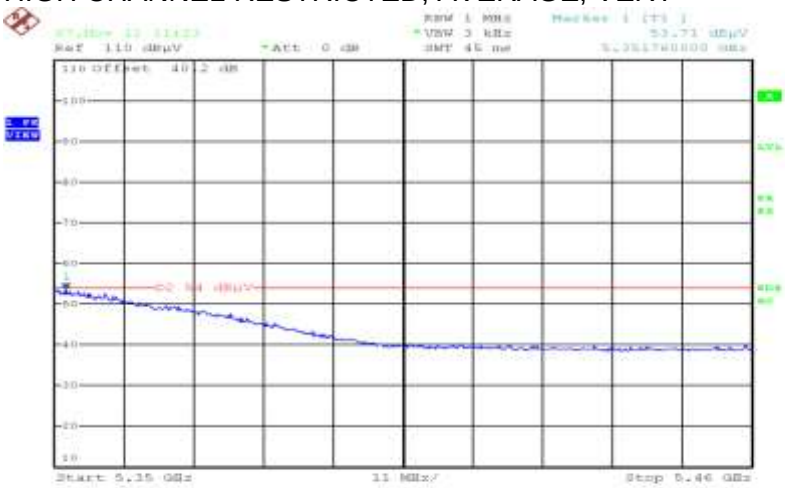
8.2.52. 802.11ac VHT80 1TX MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



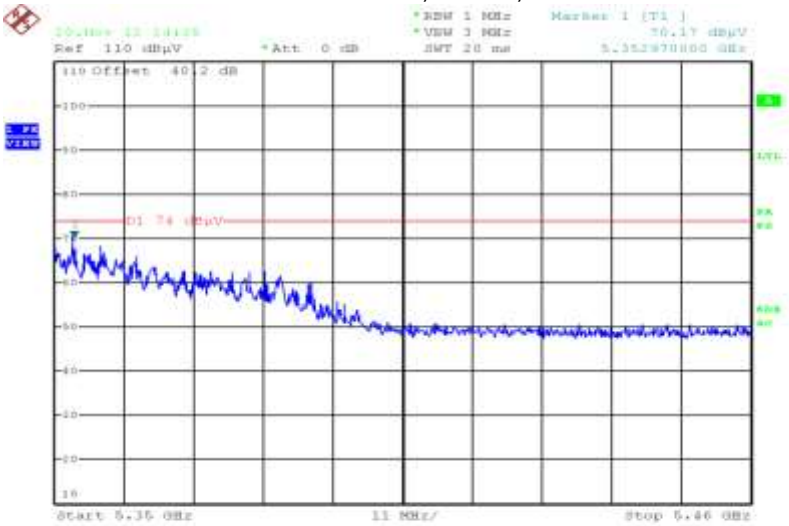
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

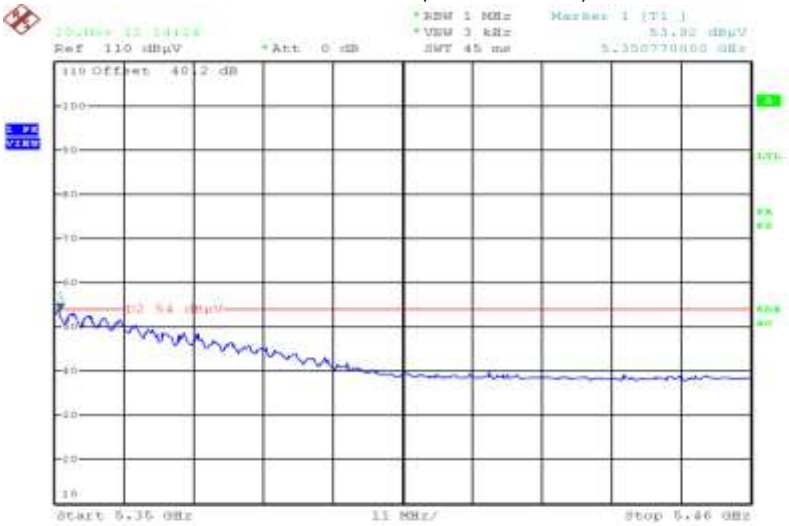
8.2.53. 802.11ac HT80 CDD 2TX MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



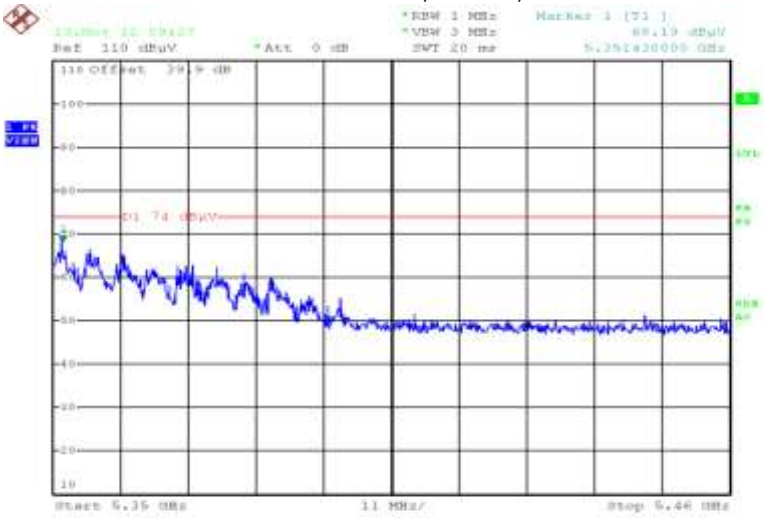
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

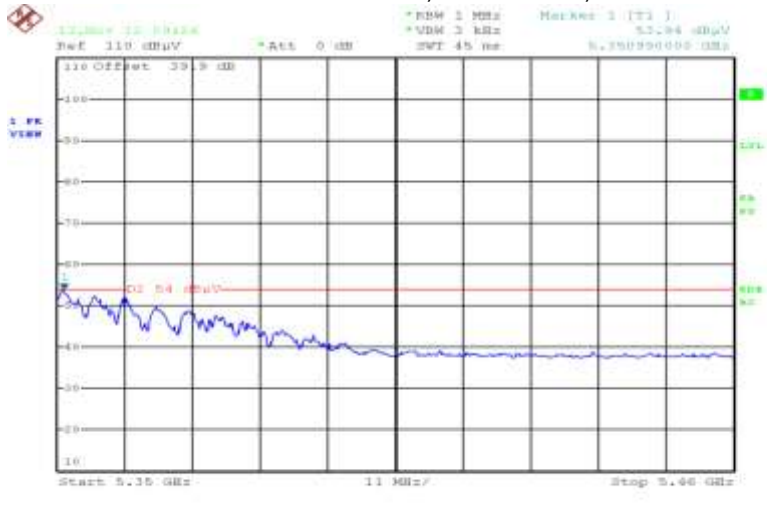
8.2.54. **802.11ac HT80 CDD 3TX MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 11/30/12
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT80 CDD MCS0 3Tx 5.2GHz band.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Mid Channel 5290 MHz															
15.870	3.0	42.4	37.9	12.7	-33.9	0.0	0.7	59.8	74.0	-14.2	V	P	104.2	308.2	
15.870	3.0	33.4	37.9	12.7	-33.9	0.0	0.7	50.7	54.0	-3.3	V	A	104.2	308.2	
15.870	3.0	37.2	37.9	12.7	-33.9	0.0	0.7	54.6	74.0	-19.4	H	P	152.4	359.4	
15.870	3.0	27.6	37.9	12.7	-33.9	0.0	0.7	44.9	54.0	-9.1	H	A	152.4	359.4	

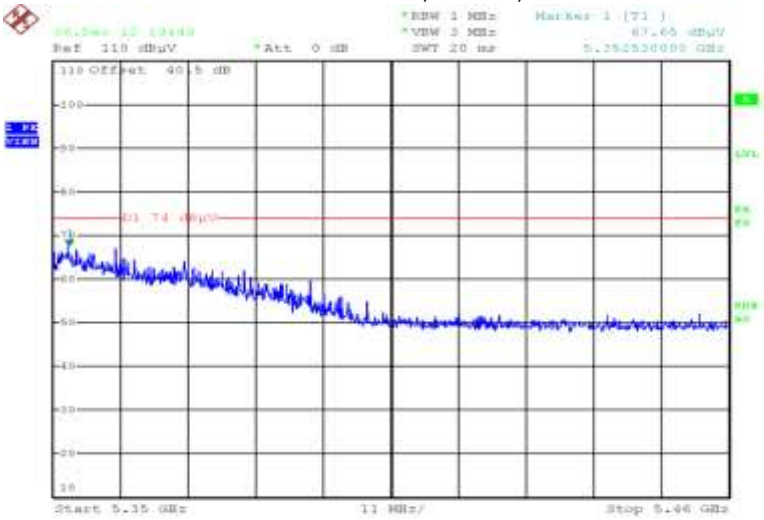
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 1TX & 2TX.

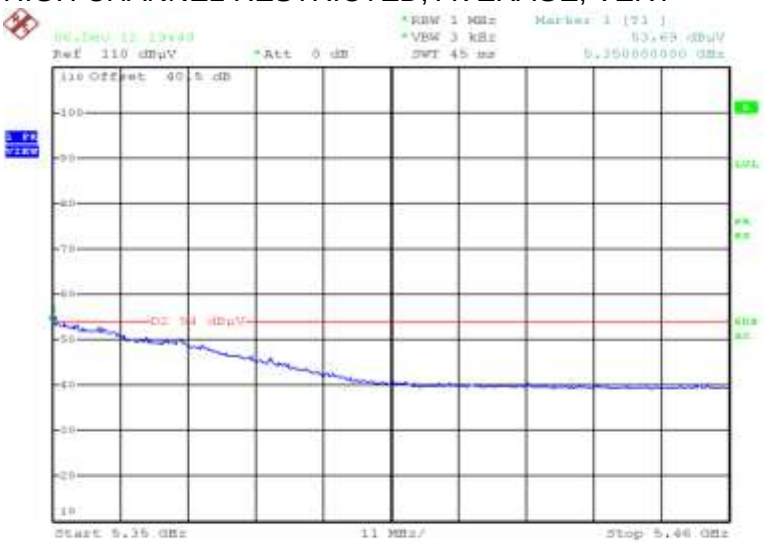
8.2.55. **802.11ac VHT80 BF 2TX MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



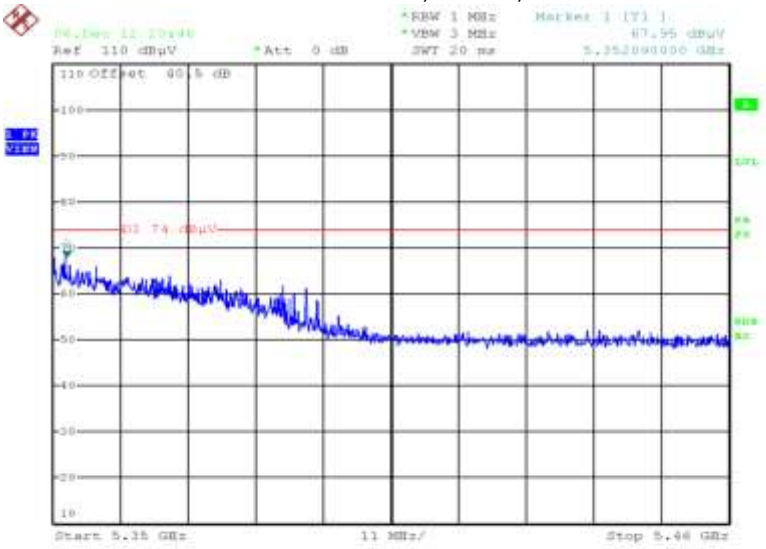
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.56. **802.11ac VHT80 BF 3TX MODE IN THE 5.3 GHz BAND**

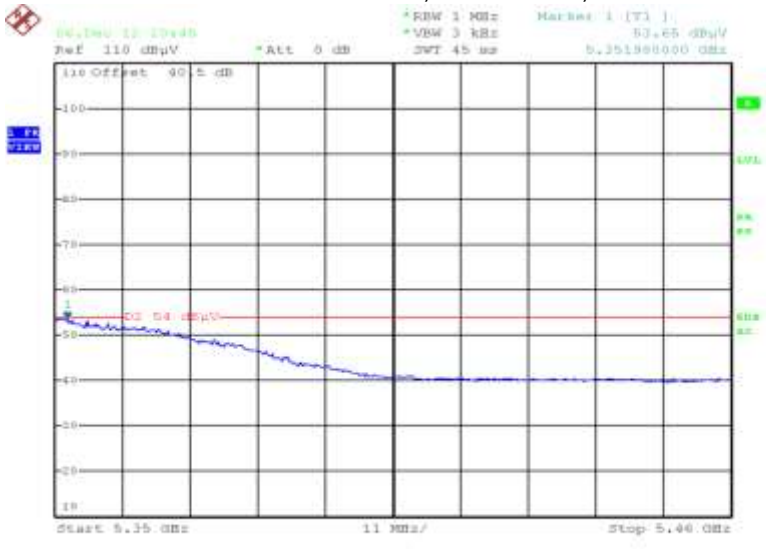
RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



Date: 6.DEC.2012 20:46:09

HIGH CHANNEL RESTRICTED, AVERAGE, VERT



Date: 6.DEC.2012 20:45:35

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: S. Aguilar
Date: 12/10/12
Project #: 12U25668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT80 MCS0 3TX 5.2 Ghz band. Beamforming.
Laptop with antenna and adapter setup as Beamformee setup in chamber.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Channel 58, 5290 MHz															
15.870	3.0	35.1	37.9	13.1	-31.8	0.0	0.7	55.0	74.0	-19.0	H	P	139.0	0.0	CH 58
15.870	3.0	25.3	37.9	13.1	-31.8	0.0	0.7	45.2	54.0	-8.8	H	A	139.0	0.0	CH 58
15.870	3.0	36.9	37.9	13.1	-31.8	0.0	0.7	56.8	74.0	-17.2	V	P	126.0	300.0	CH 58
15.870	3.0	27.1	37.9	13.1	-31.8	0.0	0.7	47.0	54.0	-7.0	V	A	126.0	300.0	CH 58

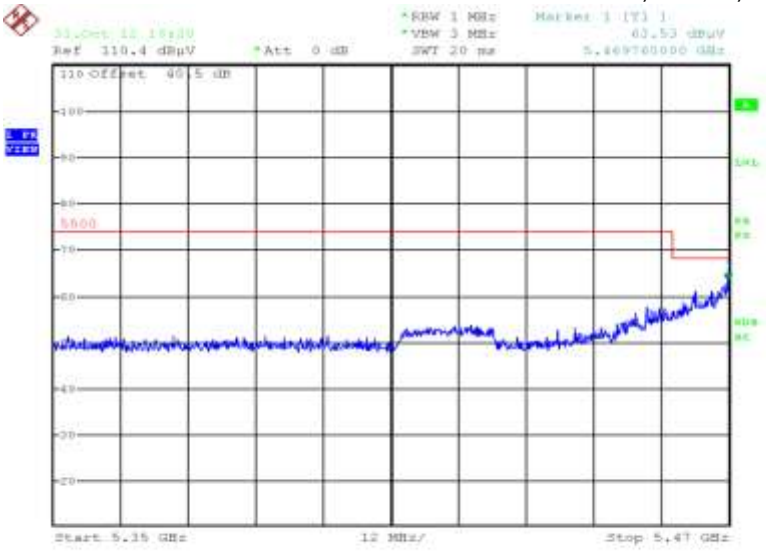
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 2TX.

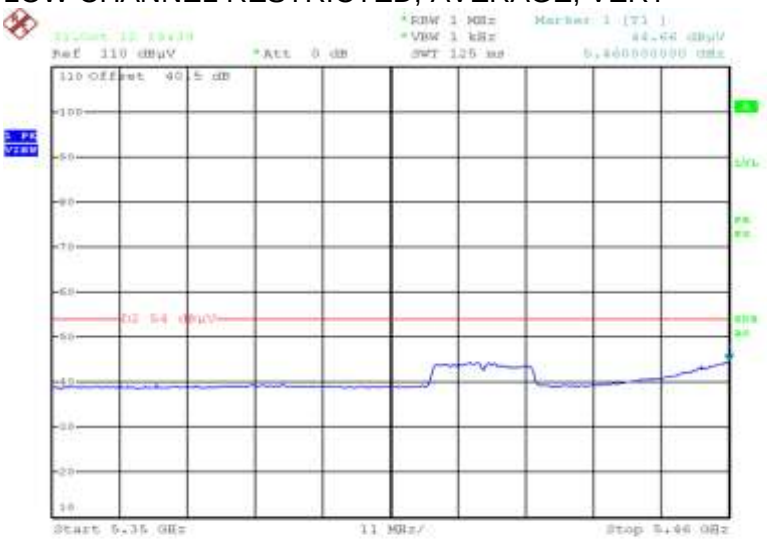
8.2.57. 802.11a LEGACY 1TX MODE IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

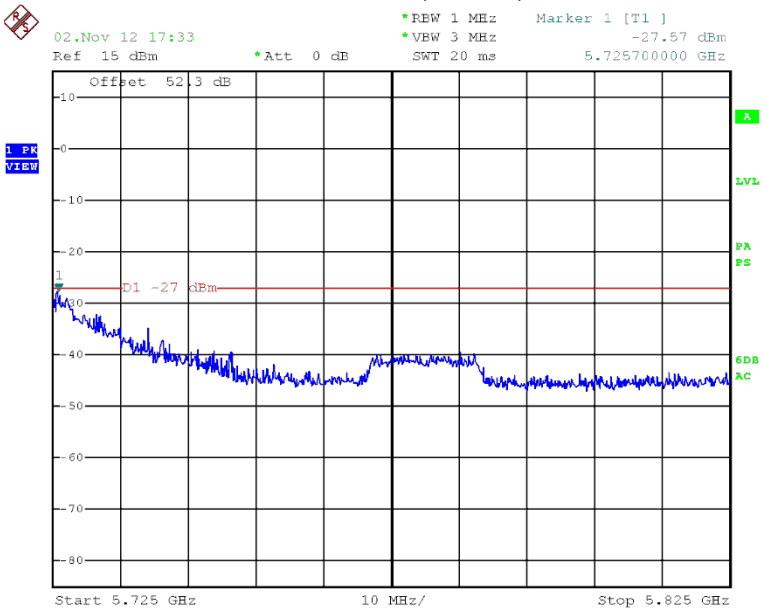


LOW CHANNEL RESTRICTED, AVERAGE, VERT



RESTRICTED & AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



8.2.58. **802.11a CDD 2Tx MODE IN THE 5.6 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.59. **802.11a CDD 3Tx MODE IN THE 5.6 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.60. **802.11a BF 2TX MODE IN THE 5.6 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.61. **802.11a BF 3TX MODE IN THE 5.6 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.62. **802.11n HT20 1TX MODE IN THE 5.6 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.63. **802.11n HT20 STBC 3TX MODE IN THE 5.6 GHz BAND**

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.64. **802.11n HT20 BF 2TX MODE IN THE 5.6 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.65. **802.11n HT20 BF 3TX MODE IN THE 5.6 GHz BAND**

Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.66. **802.11ac VHT20 BF 2TX MODE IN THE 5.6 GHz BAND**

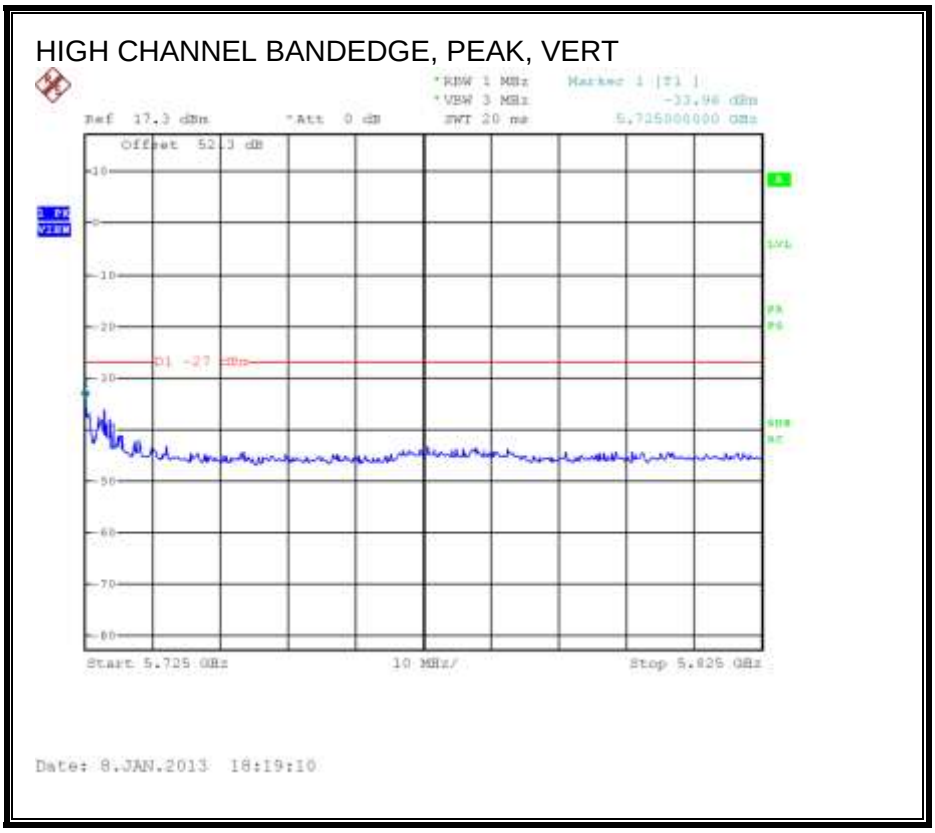
Covered by testing 11ac VHT20 BF 3TX, total power across the three chains is equal or higher than the power level the device will operate at.

8.2.67. **802.11n HT20 CDD 2TX MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

AUTHORIZED BANDEDGE (HIGH CHANNEL)



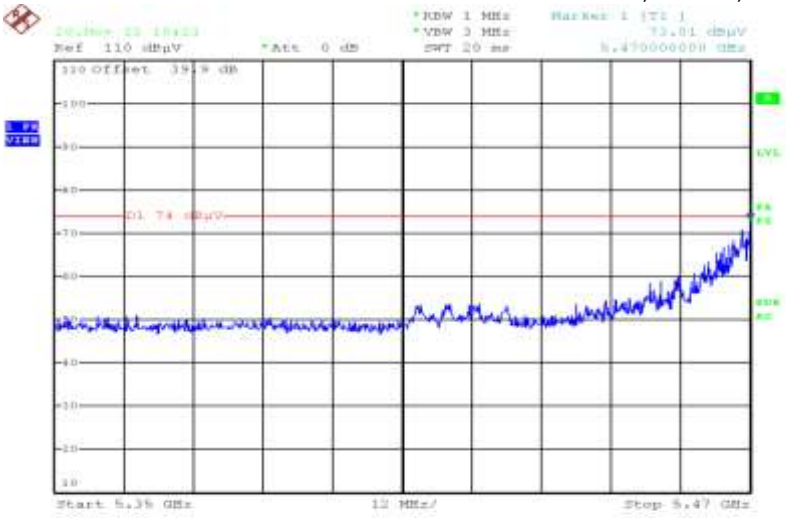
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

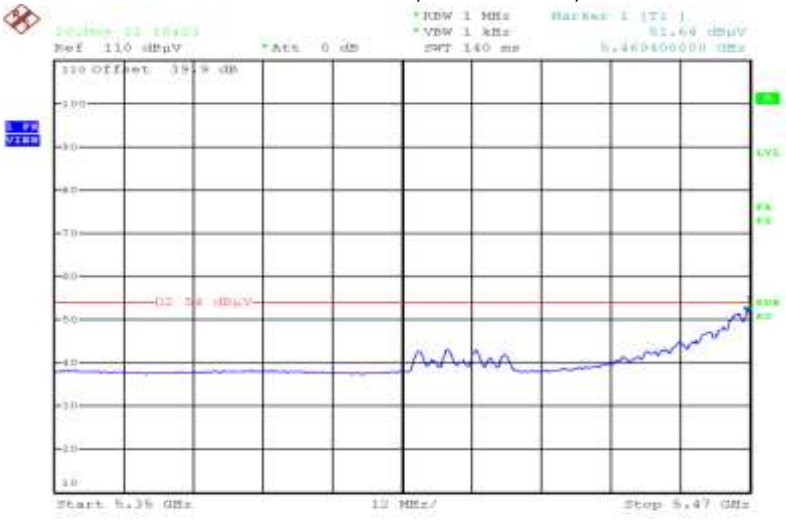
8.2.68. **802.11n HT20 CDD 3TX MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

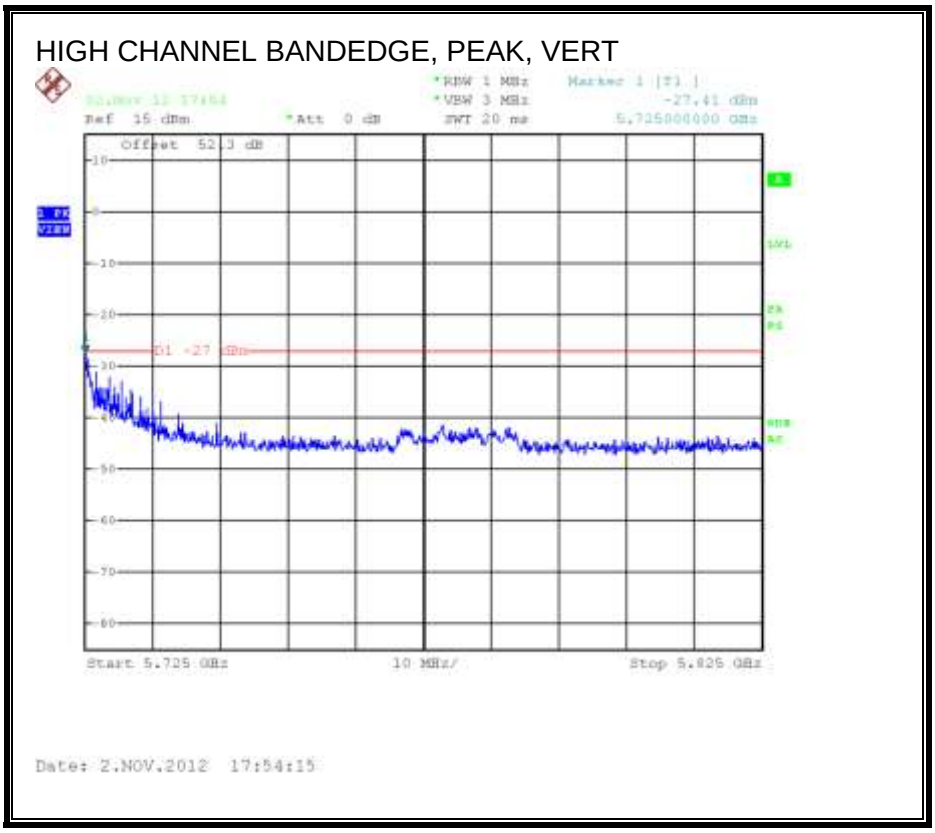
LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 11/30/2012
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT20 CDD MCS0 3Tx 5.6GHz band.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel 5500 MHz															
11.000	3.0	39.9	38.4	10.1	-35.6	0.0	0.0	52.7	74.0	-21.3	H	P	126.8	332.3	
11.000	3.0	29.7	38.4	10.1	-35.6	0.0	0.0	42.5	54.0	-11.5	H	A	126.8	332.3	
11.000	3.0	50.8	38.4	10.1	-35.6	0.0	0.0	63.6	74.0	-10.4	V	P	164.3	345.2	
11.000	3.0	41.2	38.4	10.1	-35.6	0.0	0.0	53.9	54.0	-0.1	V	A	164.3	345.2	
Mid Channel 5580 MHz															
11.160	3.0	47.1	38.5	10.2	-35.6	0.0	0.0	60.2	74.0	-13.8	H	P	168.5	321.0	
11.160	3.0	37.6	38.5	10.2	-35.6	0.0	0.0	50.7	54.0	-3.3	H	A	168.5	321.0	
11.160	3.0	52.1	38.5	10.2	-35.6	0.0	0.0	65.2	74.0	-8.8	V	P	174.5	327.1	
11.160	3.0	40.7	38.5	10.2	-35.6	0.0	0.0	53.8	54.0	-0.2	V	A	174.5	327.1	
High Channel 5700 MHz															
11.400	3.0	38.8	38.7	10.4	-35.6	0.0	0.0	58.6	74.0	-21.5	H	P	152.2	317.6	
11.400	3.0	29.9	38.7	10.4	-35.6	0.0	0.0	43.6	54.0	-10.4	H	A	152.2	317.6	
11.400	3.0	44.0	38.7	10.4	-35.6	0.0	0.0	57.6	74.0	-16.4	V	P	102.0	28.9	
11.400	3.0	32.2	38.7	10.4	-35.6	0.0	0.0	45.8	54.0	-8.2	V	A	102.0	28.9	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

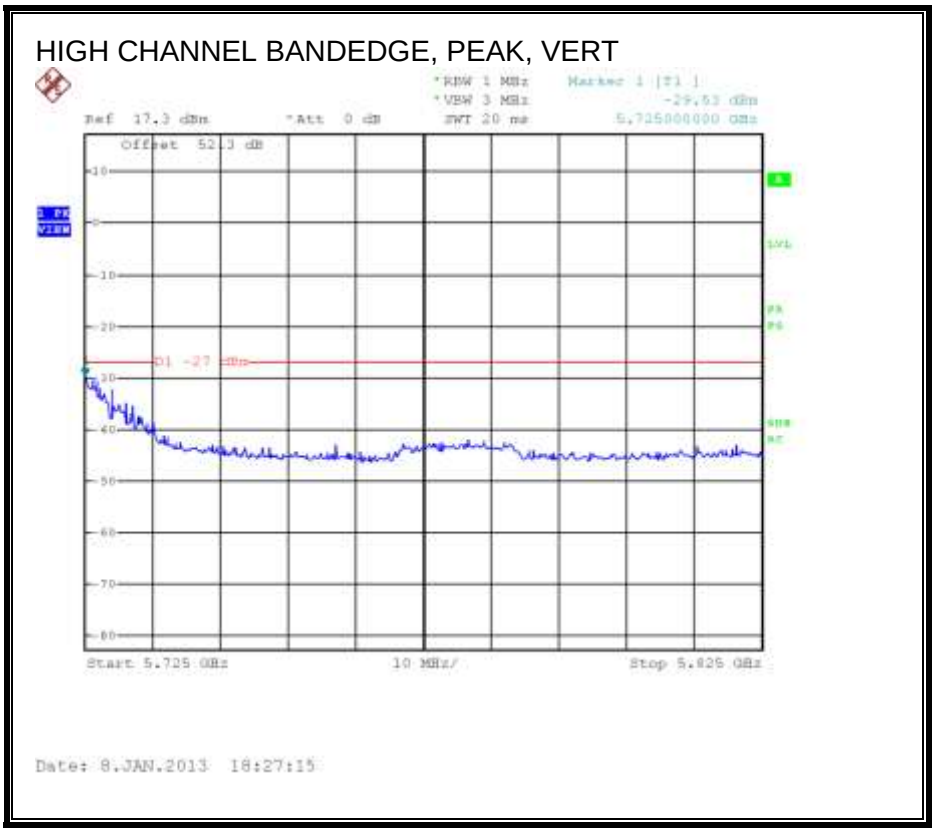
Note: tested with highest output powers at Low & Mid channels = 19dBm and High channel = 20dBm to cover 1TX & 2TX.

8.2.69. **802.11n HT20 STBC 2TX MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

AUTHORIZED BANDEDGE (HIGH CHANNEL)



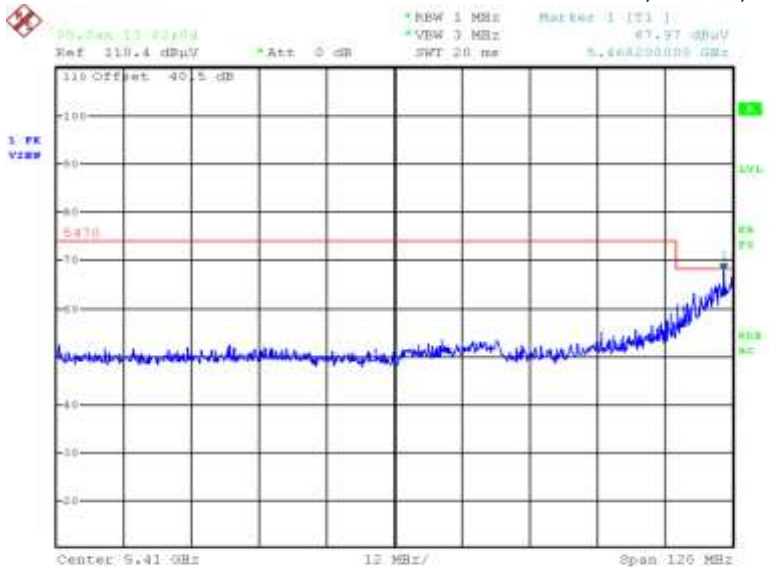
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT20 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

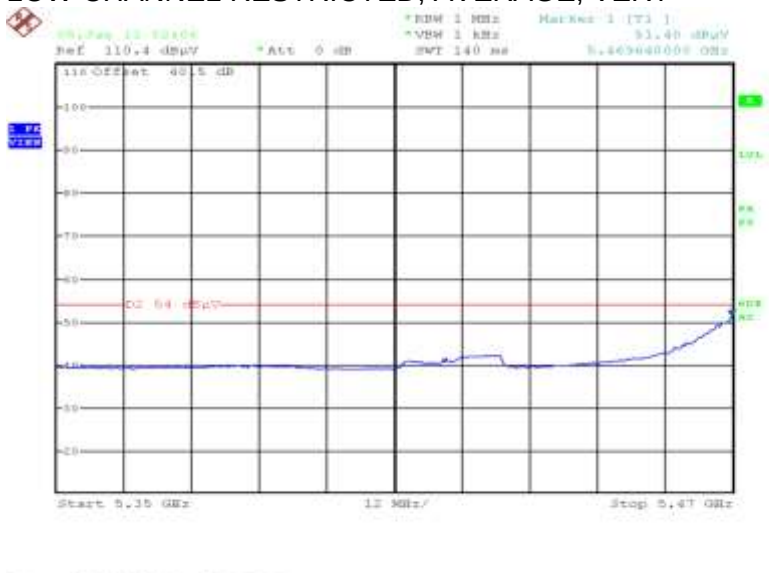
8.2.70. **802.11ac VHT20 BF 3TX MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

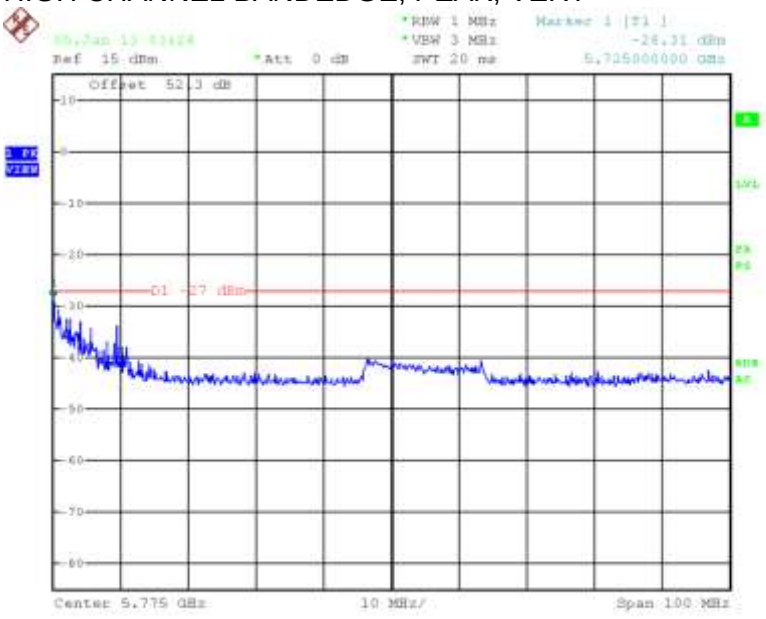


LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 01/03/13
Project #: 12U14668
Company: Broadcom
Test Target: FCC 15.407
Mode Oper: Tx BeamForming_5.5GHz Band_11ac HT20 MCS0 3TX

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
LOW CHANNEL (100), 5500MHz															
11.000	3.0	41.2	38.3	10.1	-33.5	0.0	0.7	56.8	74.0	-17.2	V	P	133.6	336.7	
11.000	3.0	33.0	38.3	10.1	-33.5	0.0	0.7	48.6	54.0	-5.4	V	A	133.6	336.7	
11.000	3.0	37.2	38.3	10.1	-33.5	0.0	0.7	52.8	74.0	-21.2	H	P	100.7	8.5	
11.000	3.0	28.0	38.3	10.1	-33.5	0.0	0.7	43.7	54.0	-10.3	H	A	100.7	8.5	
MID CHANNEL (116), 5580MHz															
11.160	3.0	40.8	38.5	10.2	-33.3	0.0	0.7	57.0	74.0	-17.0	V	P	179.2	50.5	
11.160	3.0	32.3	38.5	10.2	-33.3	0.0	0.7	48.5	54.0	-5.5	V	A	179.2	50.5	
11.160	3.0	40.1	38.5	10.2	-33.3	0.0	0.7	56.3	74.0	-17.7	H	P	103.8	52.0	
11.160	3.0	31.1	38.5	10.2	-33.3	0.0	0.7	47.3	54.0	-6.7	H	A	103.8	52.0	
HIGH CHANNEL (140), 5700MHz															
11.400	3.0	41.9	38.7	10.4	-33.0	0.0	0.7	58.8	74.0	-15.2	V	P	166.0	4.7	
11.400	3.0	32.7	38.7	10.4	-33.0	0.0	0.7	49.6	54.0	-4.4	V	A	166.0	4.7	
11.400	3.0	40.3	38.7	10.4	-33.0	0.0	0.7	57.2	74.0	-16.8	H	P	149.0	302.9	
11.400	3.0	31.3	38.7	10.4	-33.0	0.0	0.7	48.2	54.0	-5.8	H	A	149.0	302.9	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 2TX.

8.2.71. 802.11ac VHT20 BF 3TX MODE CHANNEL 144 IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE

NOT APPLICABLE.

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 1/14/2013
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.205
Mode Oper: EUT with Laptop and AC adapter and Beamformee, 11ac 20 MHz 3Tx TXBF

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Channel 144 (5720 MHz)															
11.440	3.0	44.5	38.8	11.1	-35.5	0.0	0.0	58.8	74.0	-15.2	V	P	140.8	263.1	
11.440	3.0	31.2	38.8	11.1	-35.5	0.0	0.0	45.5	54.0	-8.5	V	A	140.8	263.1	
11.440	3.0	39.9	38.8	11.1	-35.5	0.0	0.0	54.3	74.0	-19.7	H	P	142.1	281.7	
11.440	3.0	30.5	38.8	11.1	-35.5	0.0	0.0	44.9	54.0	-9.1	H	A	142.1	281.7	

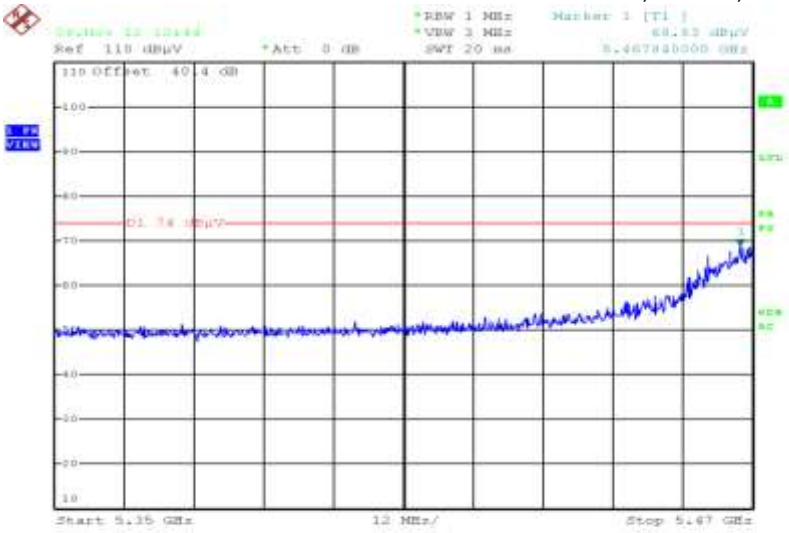
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 2TX.

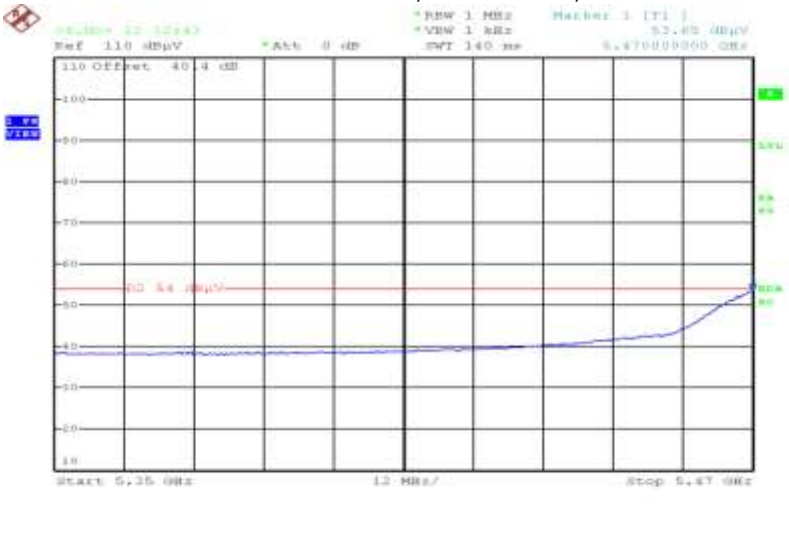
8.2.72. 802.11n HT40 1TX MODE IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

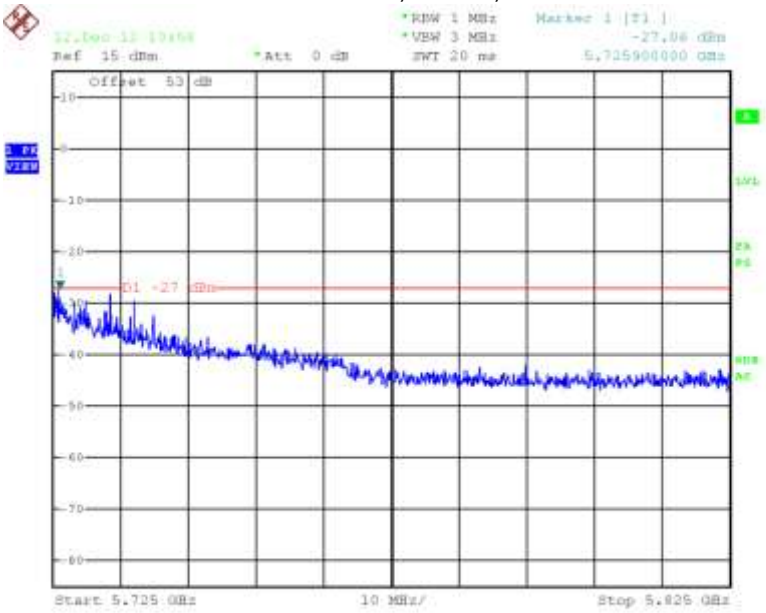


LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, VERT



Date: 12.DEC.2012 10:58:54

HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.73. 802.11n HT40 1TX MODE CHANNEL 142 IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE

NOT APPLICABLE.

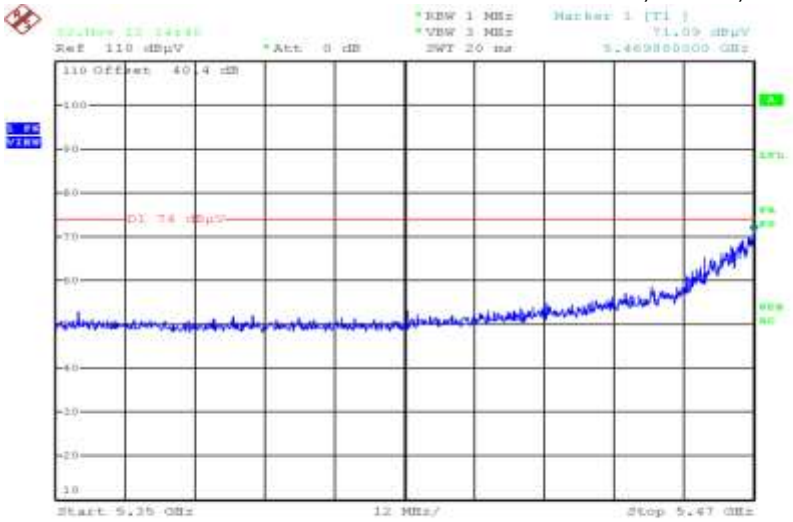
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

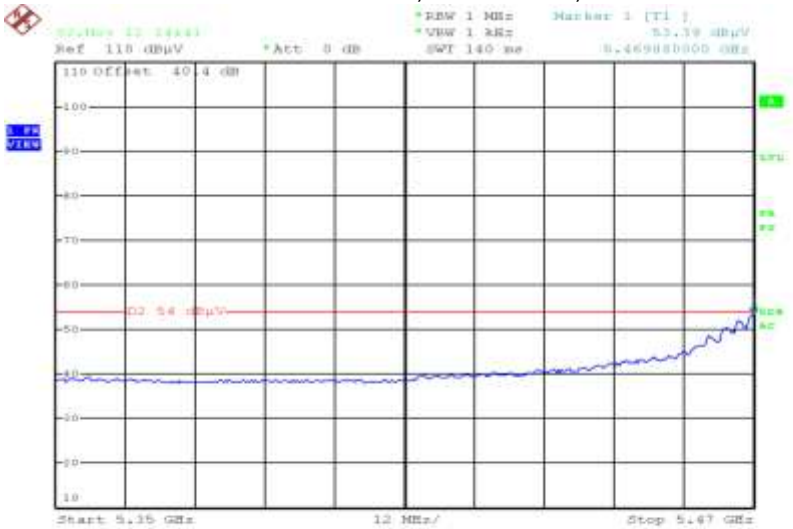
8.2.74. 802.11n HT40 CDD 2TX MODE IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.75. 802.11n HT40 CDD 2TX MODE CHANNEL 142 IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE

NOT APPLICABLE.

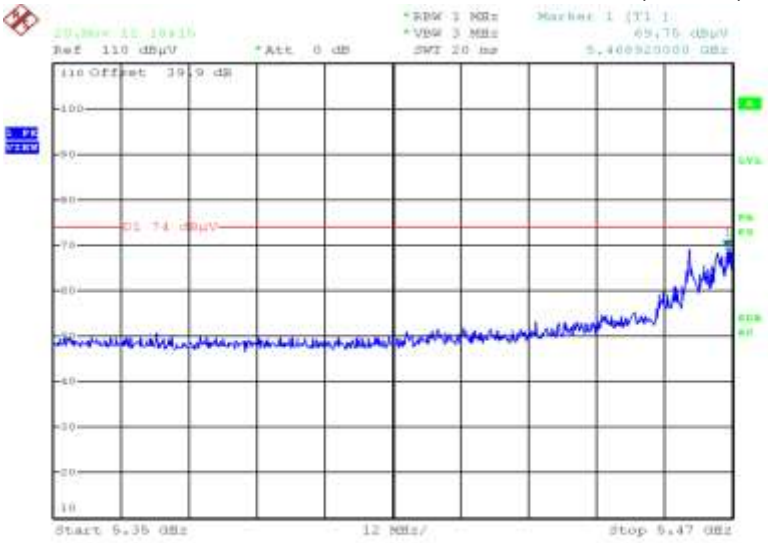
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

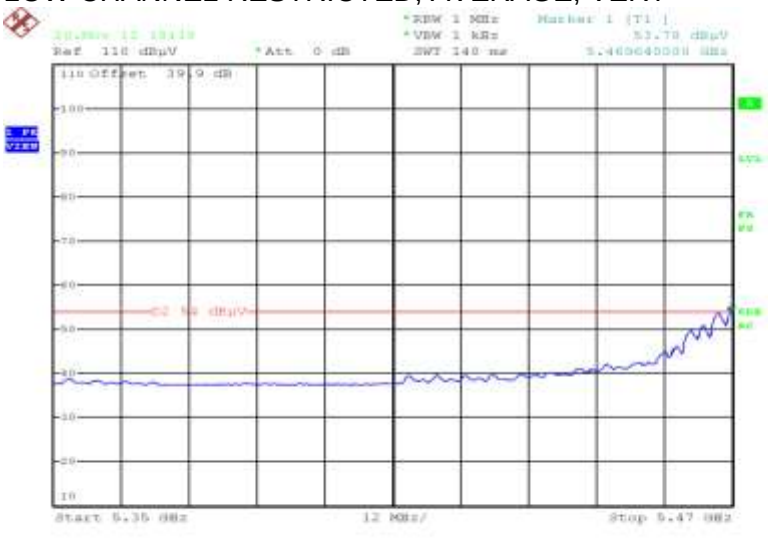
8.2.76. **802.11n HT40 CDD 3TX MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

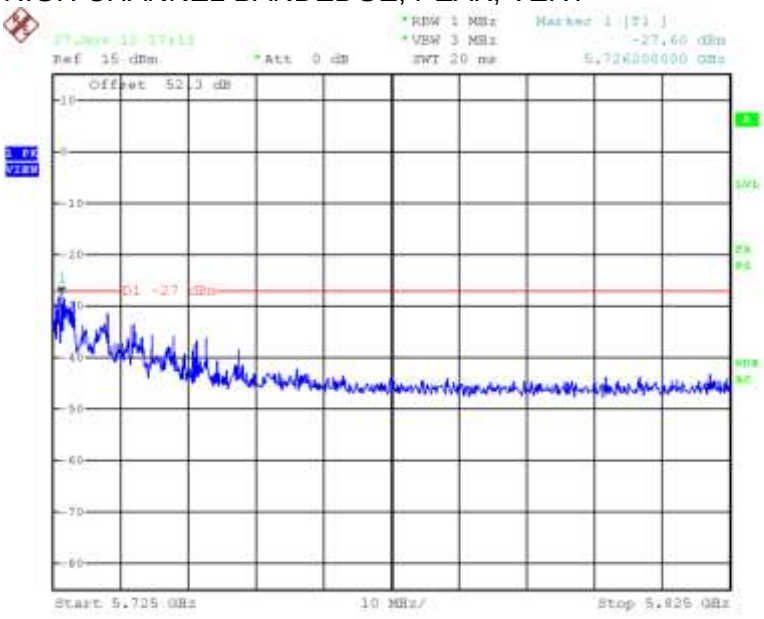


LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 12/03/12
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT40 CDD MCS0 3Tx 5.6GHz band. With 7.6-18GHz HPF

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel 5510 MHz															
11.020	3.0	39.3	38.4	10.1	-35.6	0.0	0.7	52.8	74.0	-21.2	V	P	167.0	3.3	
11.020	3.0	29.9	38.4	10.1	-35.6	0.0	0.7	43.4	54.0	-10.6	V	A	167.0	3.3	
11.020	3.0	34.9	38.4	10.1	-35.6	0.0	0.7	48.4	74.0	-25.6	H	P	197.2	110.8	
11.020	3.0	24.9	38.4	10.1	-35.6	0.0	0.7	38.4	54.0	-15.6	H	A	197.2	110.8	
Mid Channel 5550 MHz															
11.100	3.0	39.0	38.5	10.1	-35.6	0.0	0.7	52.7	74.0	-21.3	V	P	100.3	19.7	
11.100	3.0	30.4	38.5	10.1	-35.6	0.0	0.7	44.1	54.0	-9.9	V	A	100.3	19.7	
11.100	3.0	39.5	38.5	10.1	-35.6	0.0	0.7	53.2	74.0	-20.8	H	P	130.0	323.2	
11.100	3.0	26.1	38.5	10.1	-35.6	0.0	0.7	39.8	54.0	-14.2	H	A	130.0	323.2	
High Channel 5670 MHz															
11.340	3.0	43.0	38.7	10.4	-35.6	0.0	0.7	57.2	74.0	-16.8	V	P	105.0	29.2	
11.340	3.0	33.3	38.7	10.4	-35.6	0.0	0.7	47.5	54.0	-6.5	V	A	105.0	29.2	
11.340	3.0	35.8	38.7	10.4	-35.6	0.0	0.7	50.0	74.0	-24.0	H	P	198.8	237.0	
11.340	3.0	25.7	38.7	10.4	-35.6	0.0	0.7	39.9	54.0	-14.1	H	A	198.8	237.0	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 1TX & 2TX.

8.2.77. 802.11n HT40 CDD 3TX MODE CHANNEL 142 IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE

NOT APPLICABLE.

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 1/14/2013
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with Laptop and AC adapter, 11n HT40 CDD MCS0 3Tx

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Channel 142 (5710 MHz)															
11.420	3.0	39.9	38.8	11.2	-35.6	0.0	0.0	54.3	74.0	-19.7	V	P	132.5	255.6	
11.420	3.0	30.0	38.8	11.2	-35.6	0.0	0.0	44.4	54.0	-9.6	V	A	132.5	255.6	
11.420	3.0	37.7	38.8	11.2	-35.6	0.0	0.0	52.1	74.0	-21.9	H	P	129.9	282.7	
11.420	3.0	29.1	38.8	11.2	-35.6	0.0	0.0	43.4	54.0	-10.6	H	A	129.9	282.7	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 1TX & 2TX.

8.2.78. **802.11n HT40 STBC 3TX MODE IN THE 5.6 GHz BAND**

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

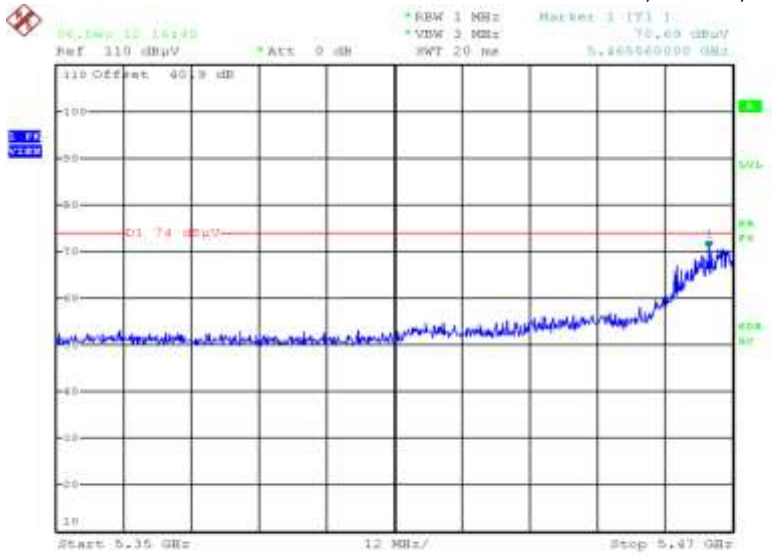
8.2.79. **802.11n HT40 STBC 3TX MODE CHANNEL 142 IN THE 5.6 GHz BAND**

Covered by testing 11n HT40 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.80. **802.11ac VHT40 BF 2TX MODE IN THE 5.6 GHz BAND**

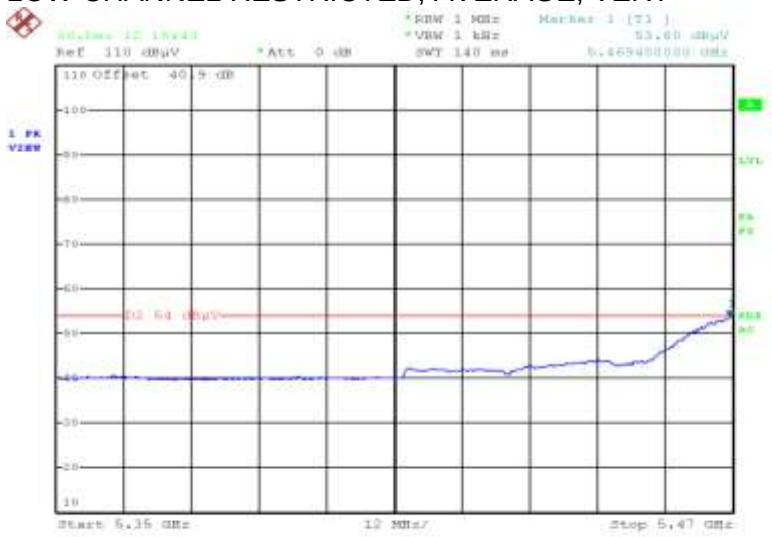
RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT



Date: 6.DEC.2012 16:45:32

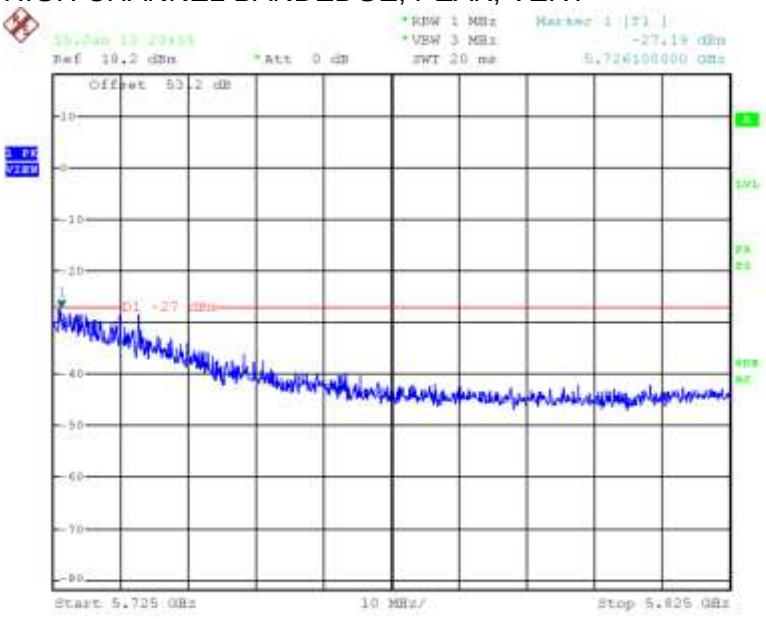
LOW CHANNEL RESTRICTED, AVERAGE, VERT



Date: 6.DEC.2012 16:43:55

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, VERT



Date: 15.JAN.2013 20:35:15

HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT40 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

8.2.81. 802.11ac VHT40 BF 2TX MODE CHANNEL 142 IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE

NOT APPLICABLE.

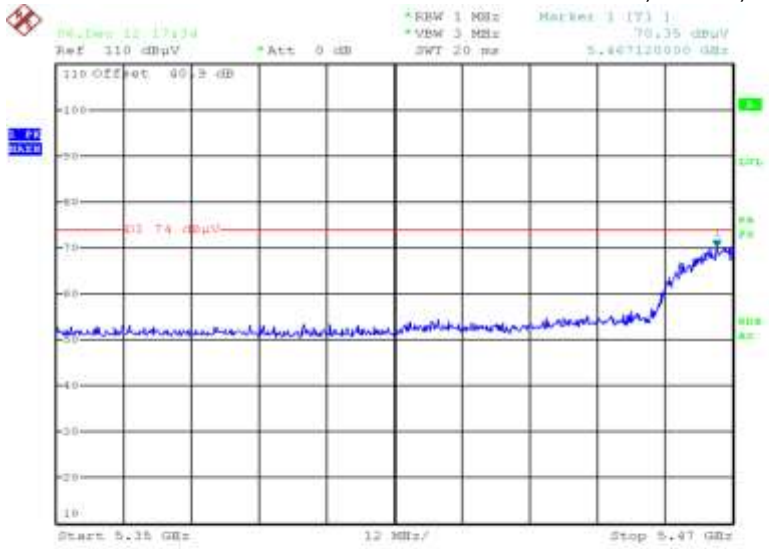
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT40 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

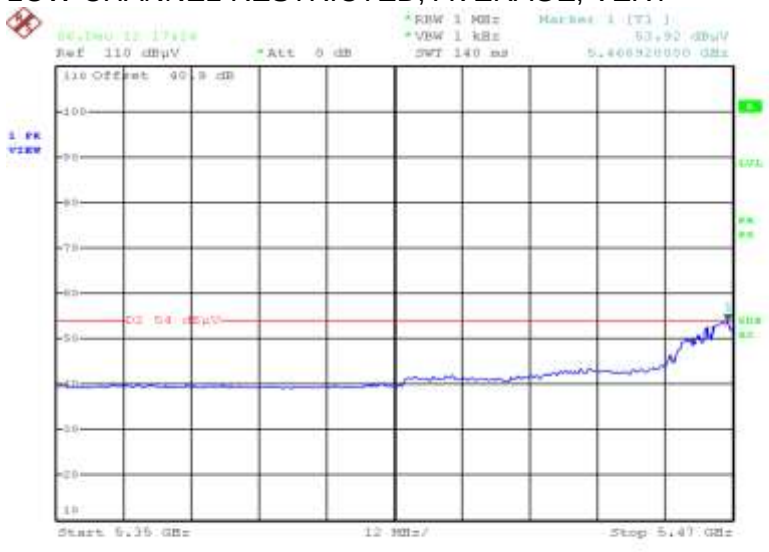
8.2.82. **802.11ac VHT40 BF 3TX MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

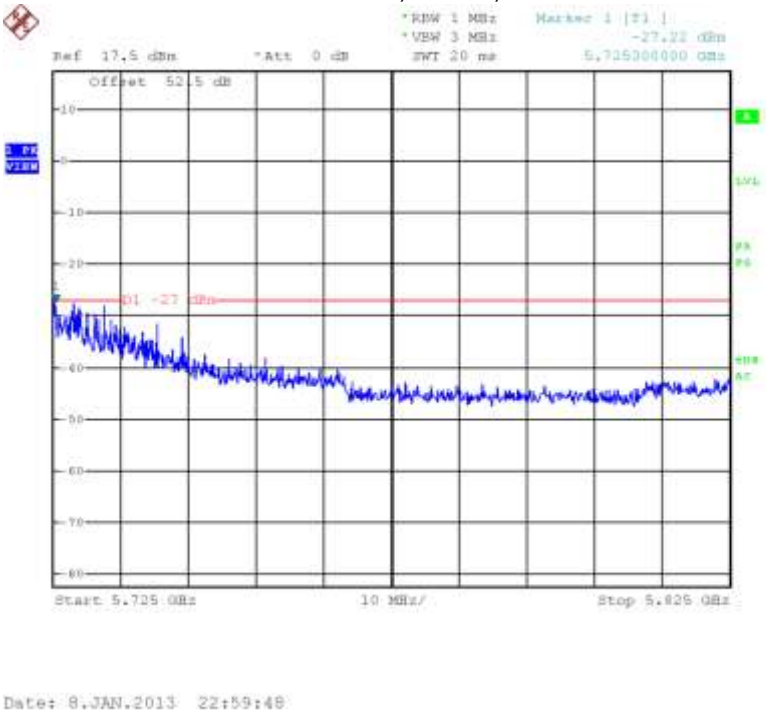


LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: S. Aguilar
Date: 01/03/13
Project #: 12U14668
Company: Broadcom
Test Target: FCC 15.407
Mode Oper: Tx 5.6 G_11ac HT40 MCS0 3TX (TxBF)
Laptop with antenna and adapter setup as Beamformee setup in chamber.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel 5510 MHz															
11.020	3.0	35.0	38.4	10.5	-33.6	0.0	0.7	51.0	74.0	-23.0	H	P	157.0	173.0	
11.020	3.0	24.6	38.4	10.5	-33.6	0.0	0.7	40.7	54.0	-13.3	H	A	157.0	173.0	
11.020	3.0	34.8	38.4	10.5	-33.6	0.0	0.7	50.9	74.0	-23.1	V	P	121.0	0.0	
11.020	3.0	24.8	38.4	10.5	-33.6	0.0	0.7	40.9	54.0	-13.1	V	A	121.0	0.0	
Mid Channel 110 5550 MHz															
11.100	3.0	42.8	38.4	10.1	-33.3	0.0	0.7	58.79	74.0	-15.2	H	P	139.2	300.8	
11.100	3.0	34.1	38.4	10.1	-33.3	0.0	0.7	50.04	54.0	-4.0	H	A	139.2	300.8	
11.100	3.0	45.4	38.4	10.1	-33.3	0.0	0.7	61.37	74.0	-12.6	V	P	152.9	359.2	
11.100	3.0	34.6	38.4	10.1	-33.3	0.0	0.7	50.58	54.0	-3.4	V	A	152.9	359.2	
High Channel 134 5670 MHz															
11.340	3.0	39.0	38.7	10.4	-33.0	0.0	0.7	55.71	74.0	-18.3	H	P	146.8	320.3	
11.340	3.0	29.2	38.7	10.4	-33.0	0.0	0.7	45.92	54.0	-8.1	H	A	146.8	320.3	
11.340	3.0	40.4	38.7	10.4	-33.0	0.0	0.7	57.10	74.0	-16.9	V	P	148.3	285.9	
11.340	3.0	33.4	38.7	10.4	-33.0	0.0	0.7	50.07	54.0	-3.9	V	A	148.3	285.9	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 2TX.

8.2.83. 802.11ac VHT40 BF 3TX MODE CHANNEL 142 IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE

NOT APPLICABLE.

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 1/14/2013
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.205
Mode Oper: EUT with Laptop and AC adapter and beamformee; 11ac HT40 3Tx TXBF

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
CHANNEL 142, 5710MHz															
11.420	3.0	38.7	38.8	11.2	-35.6	0.0	0.0	53.1	74.0	-20.9	V	P	138.7	160.3	
11.420	3.0	28.1	38.8	11.2	-35.6	0.0	0.0	42.4	54.0	-11.6	V	A	138.7	160.3	
11.420	3.0	36.9	38.8	11.2	-35.6	0.0	0.0	51.2	74.0	-22.8	H	P	117.0	291.4	
11.420	3.0	27.1	38.8	11.2	-35.6	0.0	0.0	41.4	54.0	-12.6	H	A	117.0	291.4	

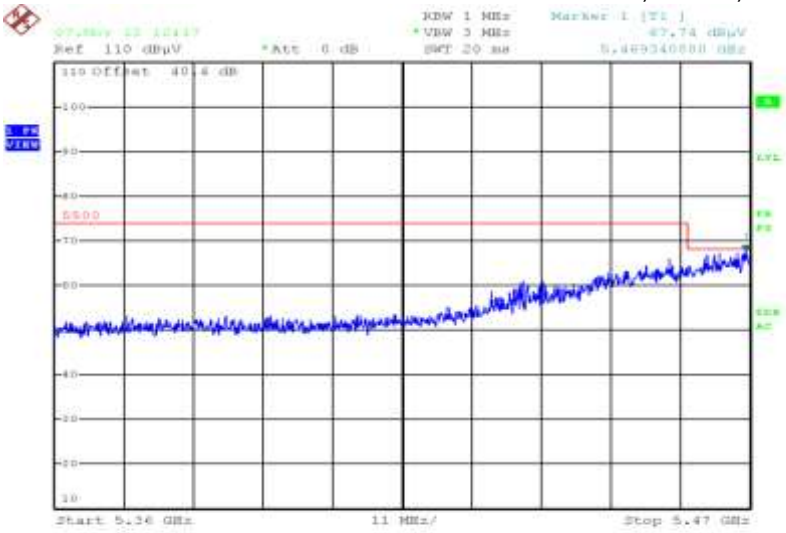
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 2TX.

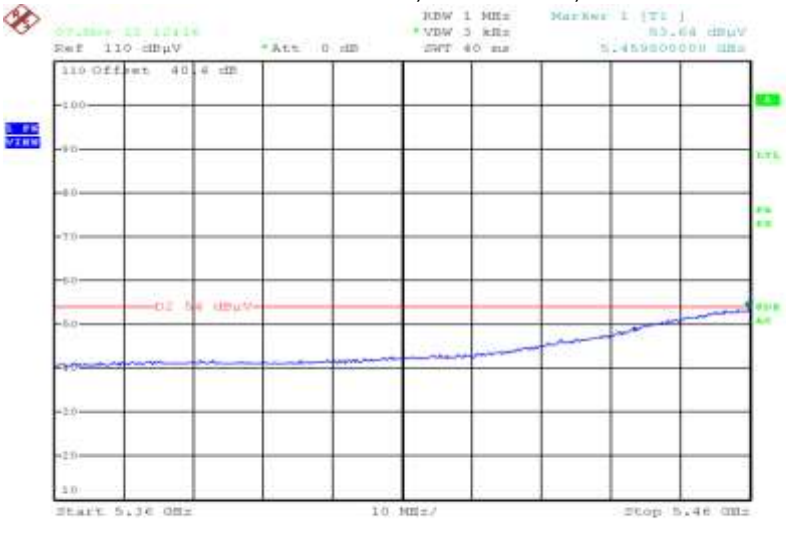
8.2.84. **802.11ac VHT80 1TX MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



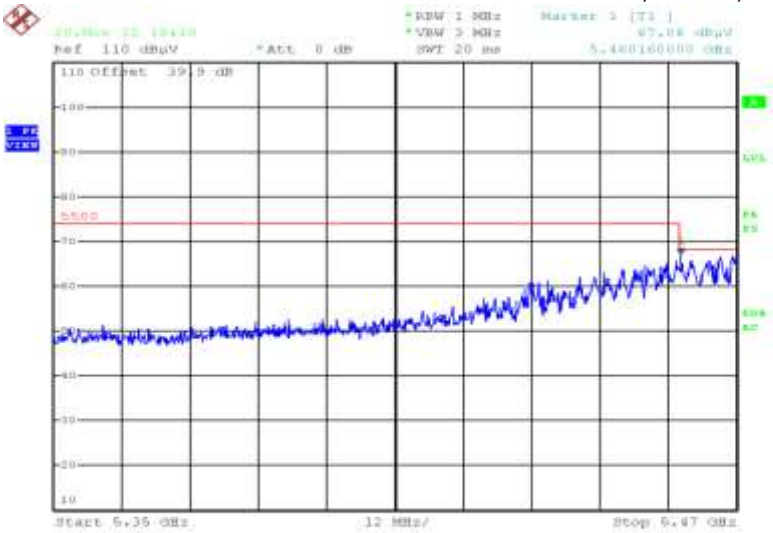
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

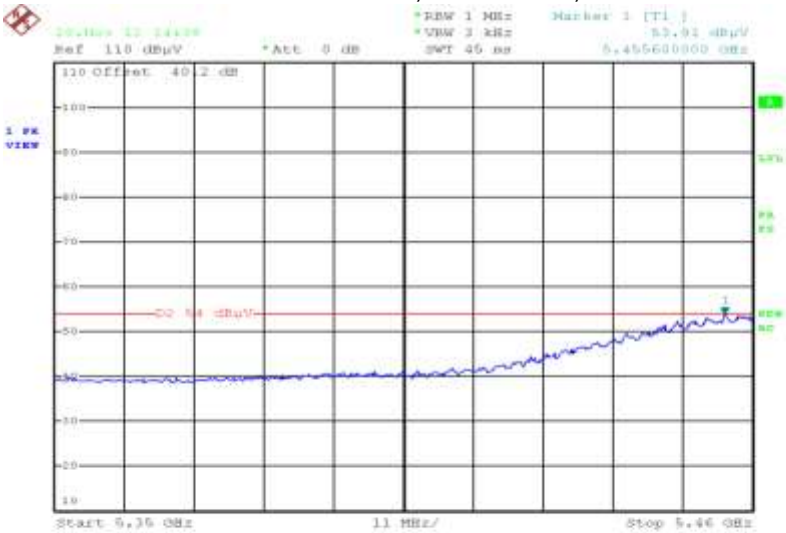
8.2.85. 802.11ac VHT80 CDD 2TX MODE IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



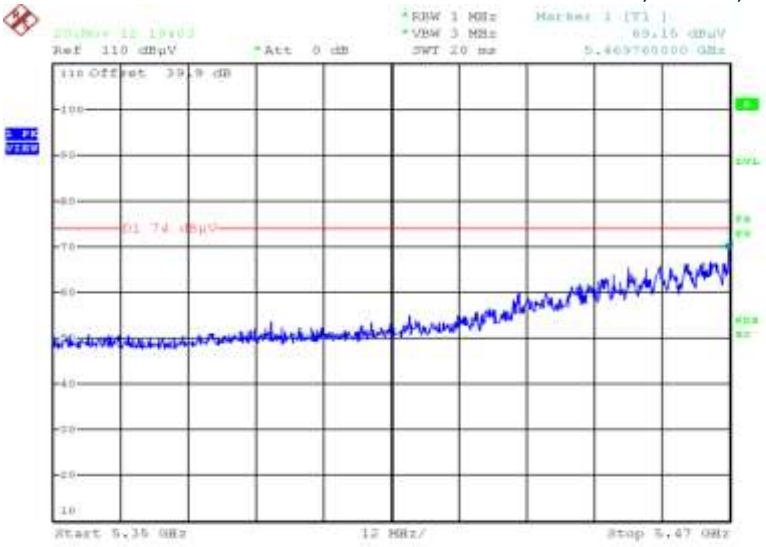
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 CDD 3TX, total power across the three chains is higher than the power level the device will operate at.

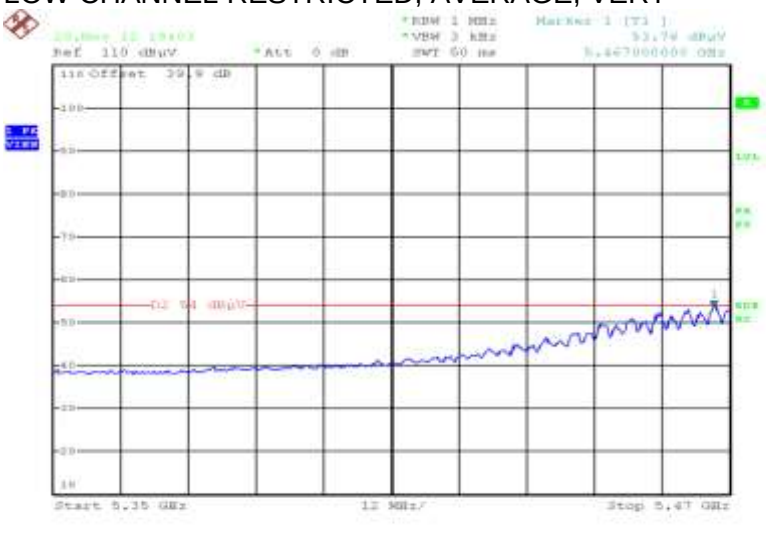
8.2.86. **802.11ac VHT80 CDD 3TX MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Kristopher Nguyen
Date: 12/03/12
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: EUT with antenna setup, laptop and AC adapter. HT80 CDD MCS0 3Tx 5.6GHz band.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel (106) 5530 MHz															
11.060	3.0	39.3	38.4	10.1	-35.6	0.0	0.7	52.9	74.0	-21.1	V	P	159.1	317.3	
11.060	3.0	30.8	38.4	10.1	-35.6	0.0	0.7	44.4	54.0	-9.6	V	A	159.1	317.3	
11.060	3.0	34.5	38.4	10.1	-35.6	0.0	0.7	48.1	74.0	-25.9	H	P	102.0	241.7	
11.060	3.0	25.2	38.4	10.1	-35.6	0.0	0.7	38.9	54.0	-15.1	H	A	102.0	241.7	
Channel 138 (5690 MHz)															
11.380	3.0	34.88	38.7	10.4	-33.0	0.0	0.7	51.7	74.0	-22.3	H	P	182.2	166.0	
11.380	3.0	25.41	38.7	10.4	-33.0	0.0	0.7	42.2	54.0	-11.8	H	A	182.2	166.0	
11.380	3.0	34.86	38.7	10.4	-33.0	0.0	0.7	51.7	74.0	-22.3	V	P	165.5	33.1	
11.380	3.0	25.54	38.7	10.4	-33.0	0.0	0.7	42.4	54.0	-11.6	V	A	165.5	33.1	

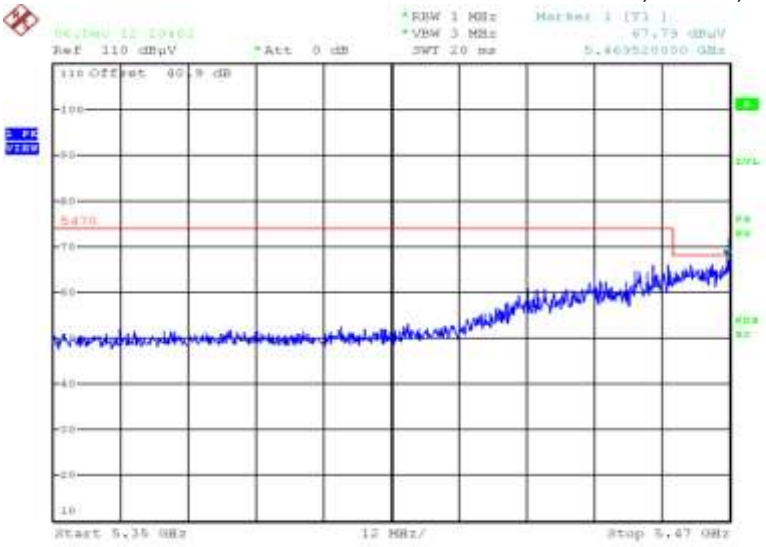
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 1TX & 2TX.

8.2.87. 802.11ac VHT80 BF 2TX MODE IN THE 5.6 GHz BAND

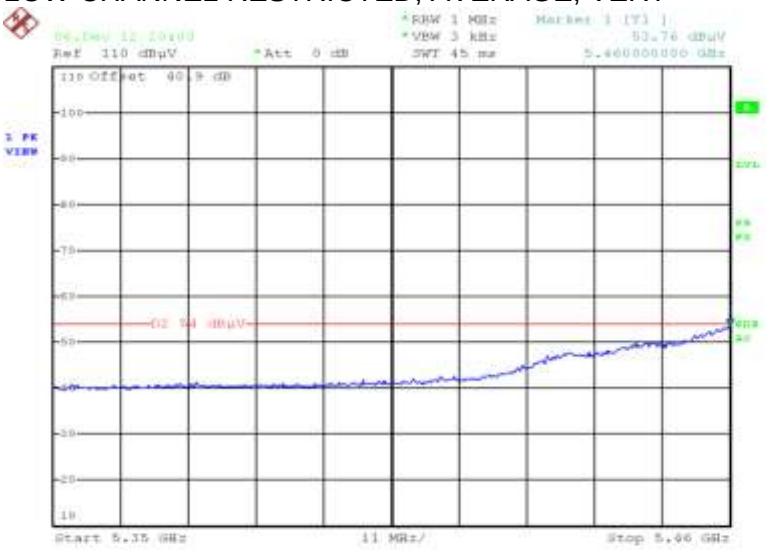
RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT



Date: 6.DEC.2012 20:02:14

LOW CHANNEL RESTRICTED, AVERAGE, VERT



Date: 6.DEC.2012 20:00:15

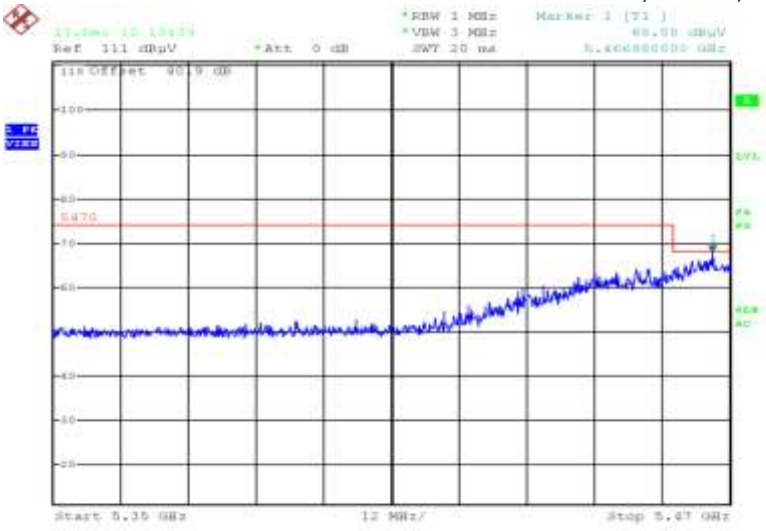
HARMONICS AND SPURIOUS EMISSIONS

Covered by testing 11ac VHT80 BF 3TX, total power across the three chains is higher than the power level the device will operate at.

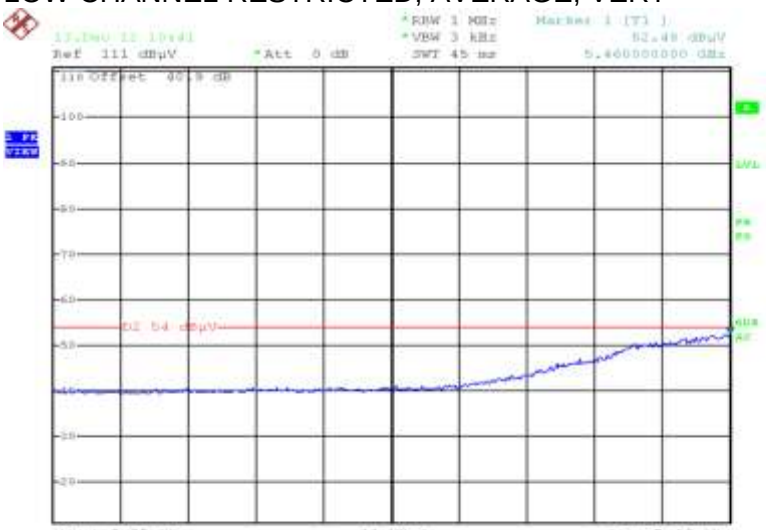
8.3. 802.11ac VHT80 BF 3TX MODE IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: S. Aguilar
Date: 12/10/12
Project #: 12U14668
Company: Broadcom Corporation
Test Target: FCC 15.407
Mode Oper: Tx 5.6G Band_11ac HT80 MCS0 3TX (TxBF)
Laptop with antenna and adapter setup as Beamformee setup in chamber.

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
Low Channel (106), 5530MHz															
11.060	3.0	35.0	38.4	10.6	-33.5	0.0	0.7	51.2	74.0	-22.8	H	P	183.0	237.0	
11.060	3.0	25.0	38.4	10.6	-33.5	0.0	0.7	41.2	54.0	-12.8	H	A	183.0	237.0	
11.060	3.0	34.4	38.4	10.6	-33.5	0.0	0.7	50.6	74.0	-23.4	V	P	102.0	360.0	
11.060	3.0	25.4	38.4	10.6	-33.5	0.0	0.7	41.6	54.0	-12.4	V	A	102.0	360.0	
High Channel (138), 5690 MHz															
11.380	3.0	35.7	38.7	11.0	-33.2	0.0	0.7	53.0	74.0	-21.0	H	P	156.0	279.0	
11.380	3.0	24.2	38.7	11.0	-33.2	0.0	0.7	41.5	54.0	-12.5	H	A	156.0	279.0	
11.380	3.0	33.2	38.7	11.0	-33.2	0.0	0.7	50.5	74.0	-23.5	V	P	104.0	360.0	
11.380	3.0	23.6	38.7	11.0	-33.2	0.0	0.7	40.9	54.0	-13.1	V	A	104.0	360.0	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

Note: tested with highest output powers at 20dBm to cover 2TX.

8.4. WORST-CASE BELOW 1 GHz

HORIZONTAL & VERTICAL DATA

Project No: 12U14668
Client Name:Broadcom Corporation
Model / Device: BCM94360CS
Config / Other:EUT with Laptop and AC adapter; Tx Worst Case
Test By:Kristopher Nguyen

Horizontal 30 - 1000MHz

Test Frequency (MHz)	Meter Reading (dBuV)	Detector	25MHz-1GHz Amplified (dB)	T243 Sunol Bilog (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin (dB)	Height [cm]	Polarity
184.23	51.65	PK	11.1	-28	34.75	43.5	-8.75	200	Horz
230.79	55.46	PK	10.9	-28	38.36	46	-7.64	100	Horz
240.49	53.89	PK	11.4	-28	37.29	46	-8.71	100	Horz
399.57	54.74	PK	15.6	-27.9	42.44	46	-3.56	100	Horz
697.36	44.03	PK	19.6	-27	36.63	46	-9.37	100	Horz

Vertical 30 - 1000MHz

Test Frequency (MHz)	Meter Reading (dBuV)	Detector	25MHz-1GHz Amplified (dB)	T243 Sunol Bilog (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin (dB)	Height [cm]	Polarity
33.88	43.34	PK	18.4	-28.2	33.54	40	-6.46	100	Vert
144.46	58.61	PK	12.4	-28.1	42.91	43.5	-0.59	200	Vert
144.46	49.29	QP	12.4	-28.1	33.59	43.5	-9.91	200	Vert
199.75	55.54	PK	12.3	-28	39.84	43.5	-3.66	200	Vert
497.54	53.99	PK	17.5	-27.6	43.89	46	-2.11	100	Vert
796.3	38.41	PK	20.9	-27.1	32.21	46	-13.79	200	Vert

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection
TAVG - Trace Averaging RMS detection

9. 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

Company Name:	Broadcom
Project:	12U14668
Model/Device:	BCM94360CS
Date:	12/21/2012
Configuraiton:	TX WLAN Worst case
Test Voltage/Frequency:	120VAC 60Hz
Tested by:	Steve Aguilar

Line-L1 .15 - 30MHz

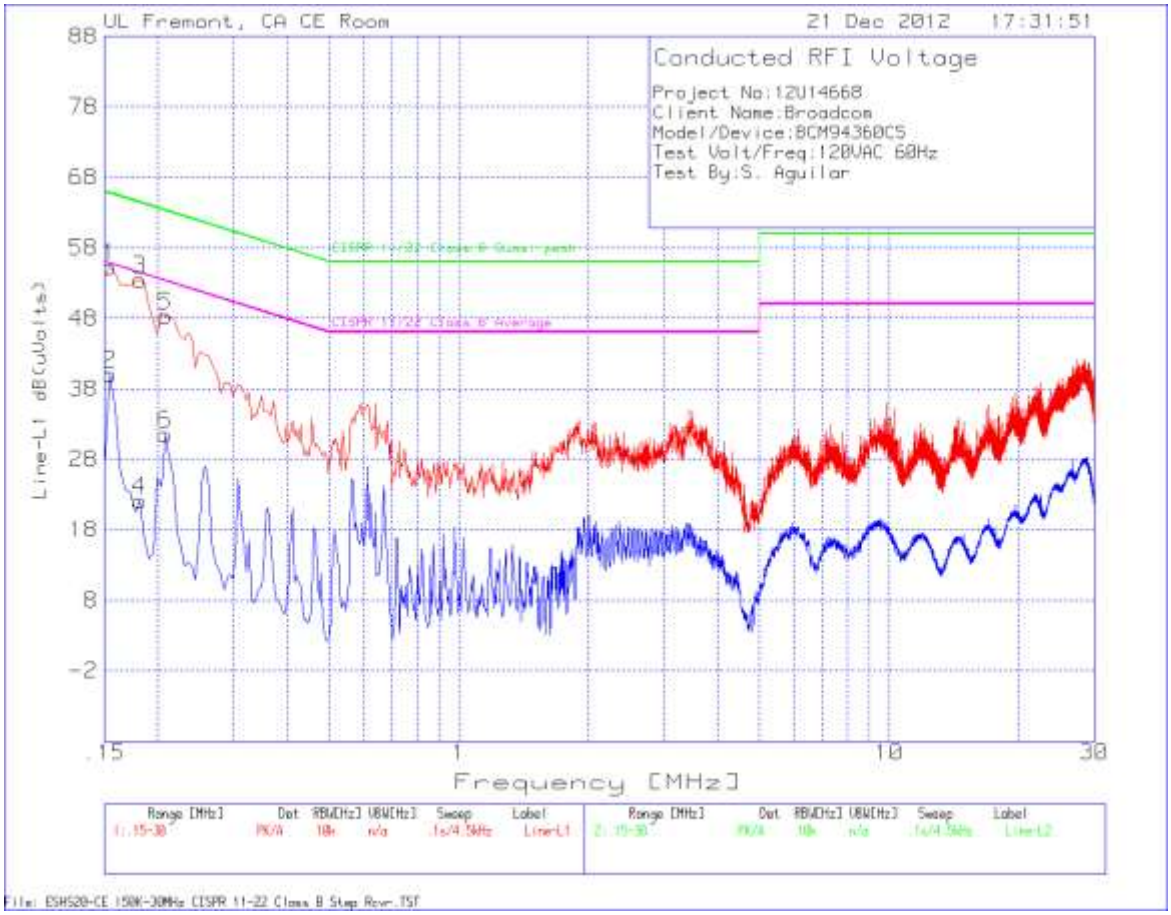
Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.1545	55.11	PK	0.1	0	55.21	65.8	-10.59	-	-
0.1545	39.99	Av	0.1	0	40.09	-	-	55.8	-15.71
0.1815	53.37	PK	0.1	0	53.47	64.4	-10.93	-	-
0.1815	22.05	Av	0.1	0	22.15	-	-	54.4	-32.25
0.2085	48.17	PK	0.1	0	48.27	63.3	-15.03	-	-
0.2085	31.45	Av	0.1	0	31.55	-	-	53.3	-21.75

Line-L2 .15 - 30MHz

Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.1545	52.78	PK	0.1	0	52.88	65.8	-12.92	-	-
0.1545	34.68	Av	0.1	0	34.78	-	-	55.8	-21.02
0.168	50.95	PK	0.1	0	51.05	65.1	-14.05	-	-
0.168	22.76	Av	0.1	0	22.86	-	-	55.1	-32.24
0.204	47.04	PK	0.1	0	47.14	63.4	-16.26	-	-
0.204	30.88	Av	0.1	0	30.98	-	-	53.4	-22.42

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector

LINE 1 RESULTS



LINE 2 RESULTS

10. DYNAMIC FREQUENCY SELECTION

10.1. OVERVIEW

10.1.1. 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

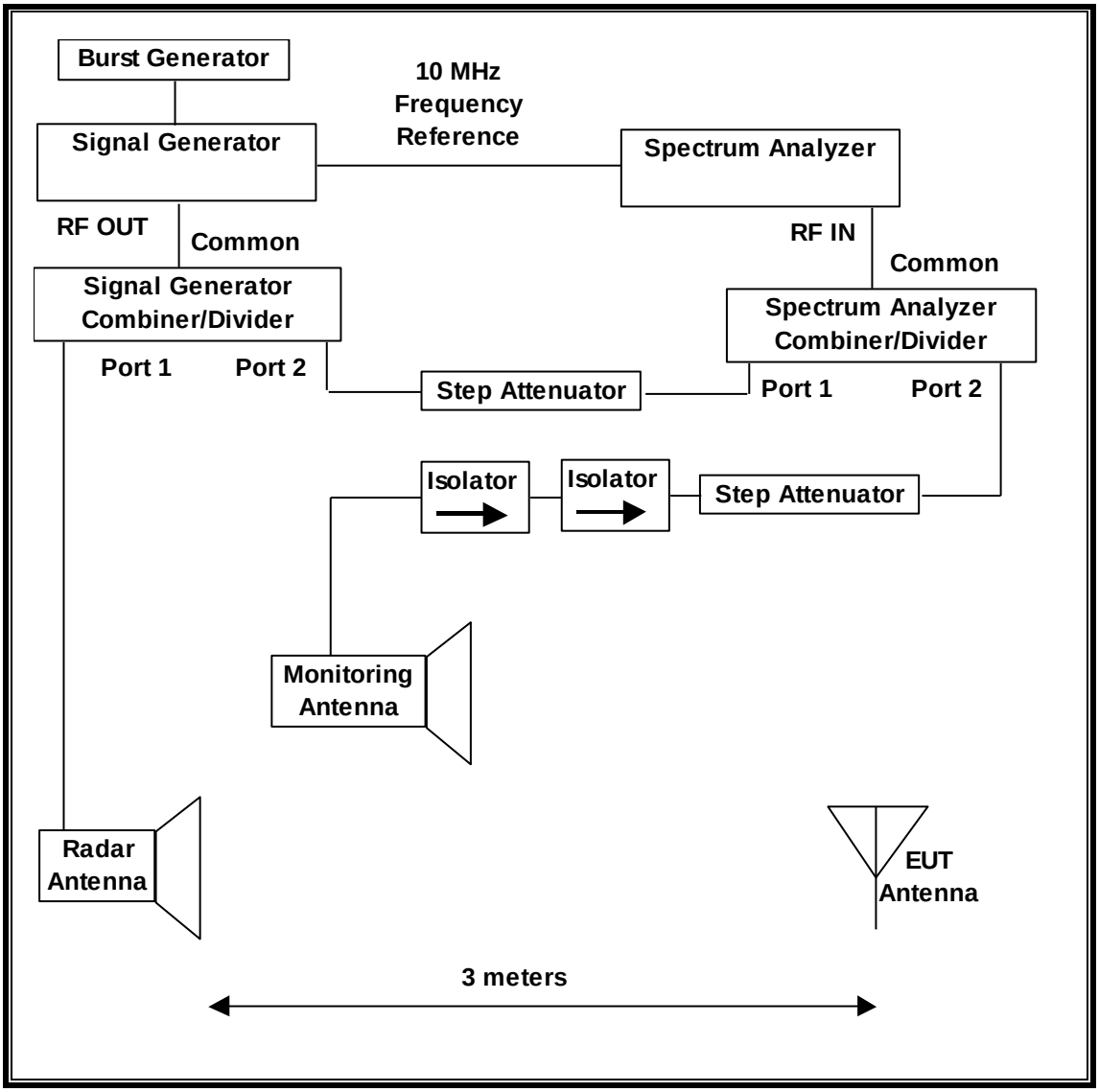
Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

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

10.1.2. 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 short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Freqeuncy Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. 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 analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

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.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

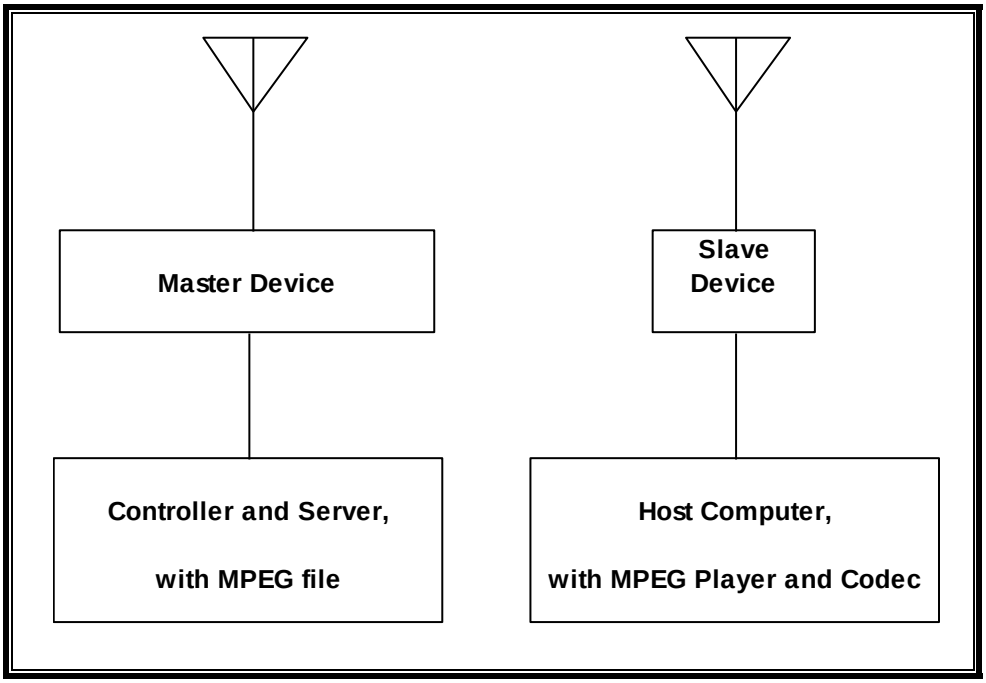
TEST AND MEASUREMENT EQUIPMENT

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**
N600 Wireless Dual Band Router (Master Device)	Netgear	WNDR3400	2BK311730FF6B	PY309300116
AC Adapter (AP)	Netgear	FA-1201500SJA / FA-1201500SUA	4F105116T10209045B	DoC
Notebook PC (Controller/Server)	HP	Pavilion zv6000	CND5290401	DoC
AC Adapter (Controller/Server PC)	HP	PA-1121-12HD	58B240ALLRK0HU	DoC
Notebook PC (Host)	Apple	MacBook Pro A1297	C02H30KADV10	DoC
AC Adapter (Host PC)	Lite On Technology	PA-1850-3 NSW24629	C06151702P5DJ94A8	DoC

10.1.3. SETUP OF EUT (CLIENT MODE)

RADIATED METHOD EUT TEST SETUP



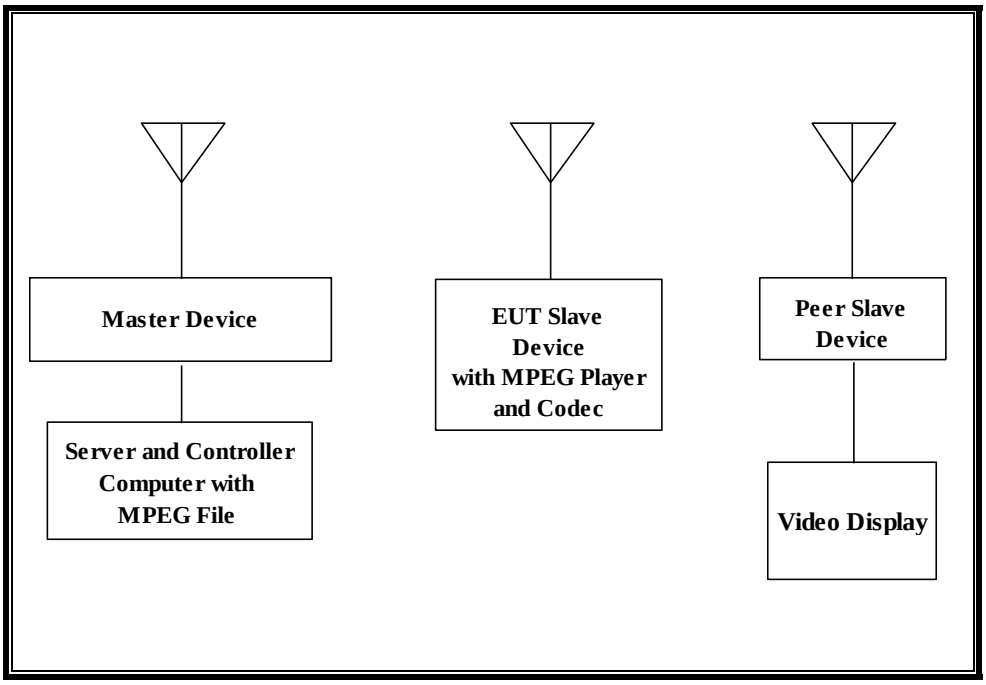
SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
N600 Wireless Dual Band Router (Master Device)	Netgear	WNDR3400	2BK311730FF6B	PY309300116
AC Adapter (AP)	Netgear	FA-1201500SJA / FA-1201500SUA	4F105116T10209045B	DoC
Notebook PC (Controller/Server)	HP	Pavilion zv6000	CND5290401	DoC
AC Adapter (Controller/Server PC)	HP	PA-1121-12HD	58B240ALLRK0HU	DoC
Notebook PC (Host)	Apple	MacBook Pro A1297	C02H30KADV10	DoC
AC Adapter (Host PC)	Lite On Technology	PA-1850-3 NSW24629	C06151702P5DJ94A8	DoC

10.1.4. SETUP OF EUT (CLIENT-TO-CLIENT COMMUNICATIONS MODE)

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
N600 Wireless Dual Band Router (Master Device)	Netgear	WNDR3400	2BK311730FF6B	PY309300116
AC Adapter (AP)	Netgear	FA-1201500SJA / FA-1201500SUA	4F105116T10209045B	DoC
Notebook PC (Controller/Server)	HP	Pavilion zv6000	CND5290401	DoC
AC Adapter (Controller/Server PC)	HP	PA-1121-12HD	58B240ALLRK0HU	DoC
Notebook PC (EUT Host)	Apple	A1465	C02JF8GSDRV6	DoC
AC Adapter (Host PC)	Lite On	PA_1450-8	C0623350GF4F6V7AR	DoC
Apple TV (Peer Slave)	Apple	A1427	DY3J8RZ3DRHN	BCGA1427
Video Display	Coby Electronics	LEDVD1596	LGWH4XXXT07T02S01	DoC

10.1.5. 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 capabilities.

The highest power level within these bands is 29.45 dBm EIRP in the 5250-5350 MHz band and 29.14 dBm EIRP in the 5470-5725 MHz band.

The highest gain antenna assembly consists of 3 antennas with individual gains of 7.09 dBi, 7.06 dBi and 3.58 dBi in the 5250-5350 MHz band and 5.03 dBi, 6.66 dBi and 3.94 dBi in the 5470-5725 MHz band. The lowest gain antenna assembly consists of 3 antennas with individual gains of 3.35 dBi, 3.44 dBi and 3.01 dBi in the 5250-5350 MHz band and 3.32 dBi, 2.41 dBi and 4.63 dBi in the 5470-5725 MHz band.

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

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for procedural adjustments, the required radiated 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.

The EUT uses three transmitter/receiver chains, each connected to an antenna to perform radiated tests.

WLAN traffic exceeding the transmitter minimum activity ratio of 30% is generated by streaming the compressed video file “6 ½ Magic Hours” from the Master to the Slave in full motion video.

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.

The software installed in the access point is Linux revision 5.22.84.0.

MANUFACTURER'S STATEMENT REGARDING UNIFORM CHANNEL SPREADING

This is not applicable to slave devices.

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

The Master Device is a Netgear N600 Dual Band Router, FCC ID: PY309300116. The DFS software installed in the Master Device is Linux revision 5.22.84.0. The minimum antenna gain for the Master Device is 2.73 dBi.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm.

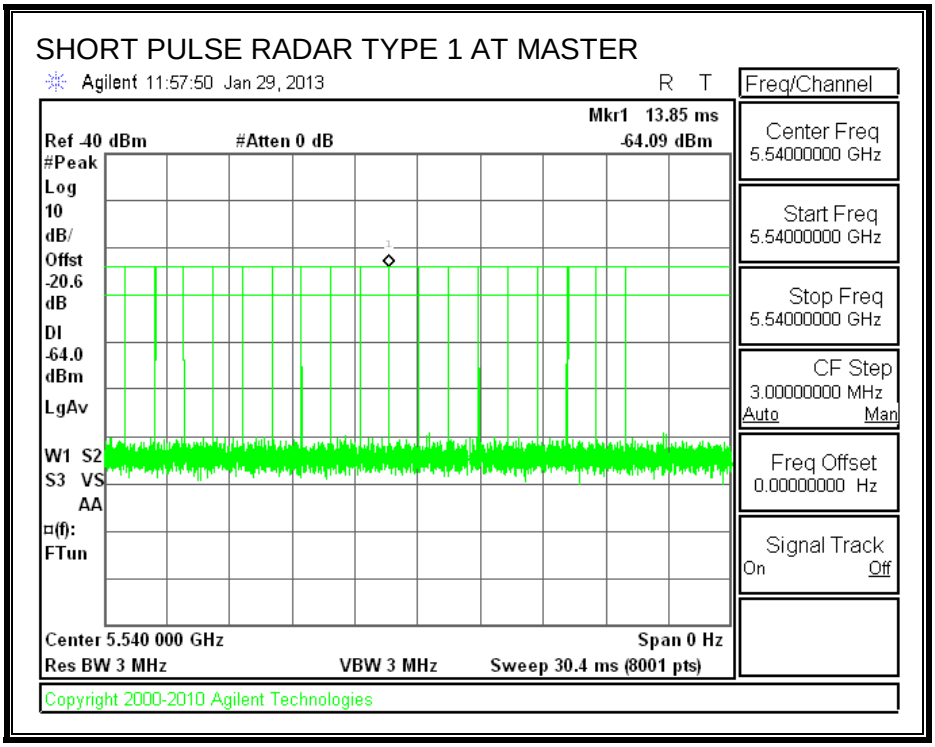
10.2. CLIENT MODE RESULTS FOR 20 MHz BANDWIDTH

10.2.1. TEST CHANNEL

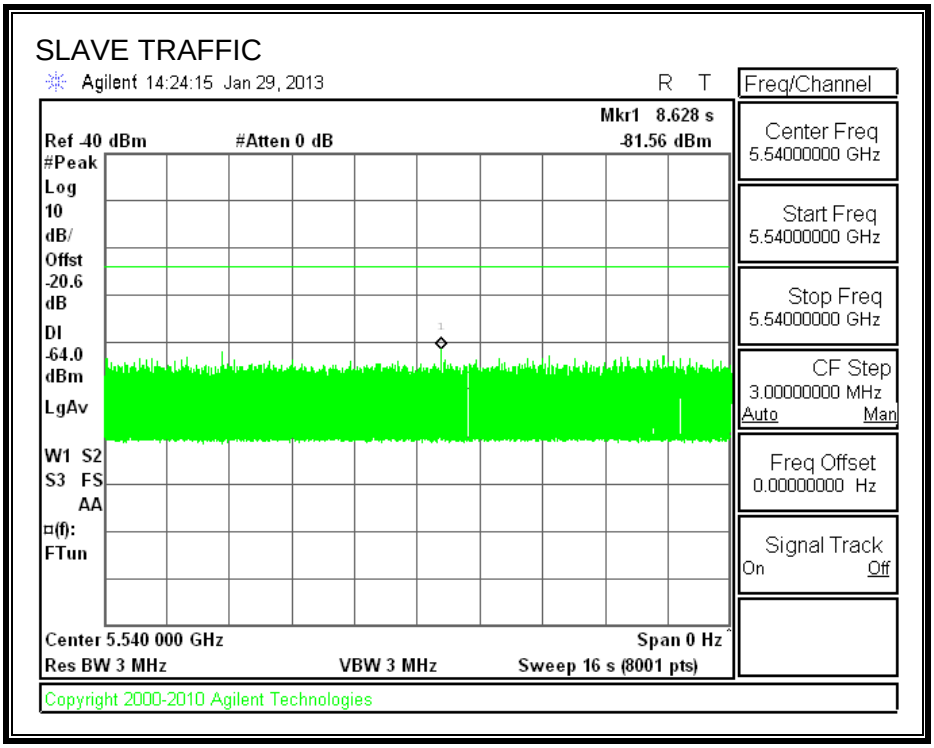
All tests were performed at a channel center frequency of 5540 MHz.

10.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



10.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

10.2.4. 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).

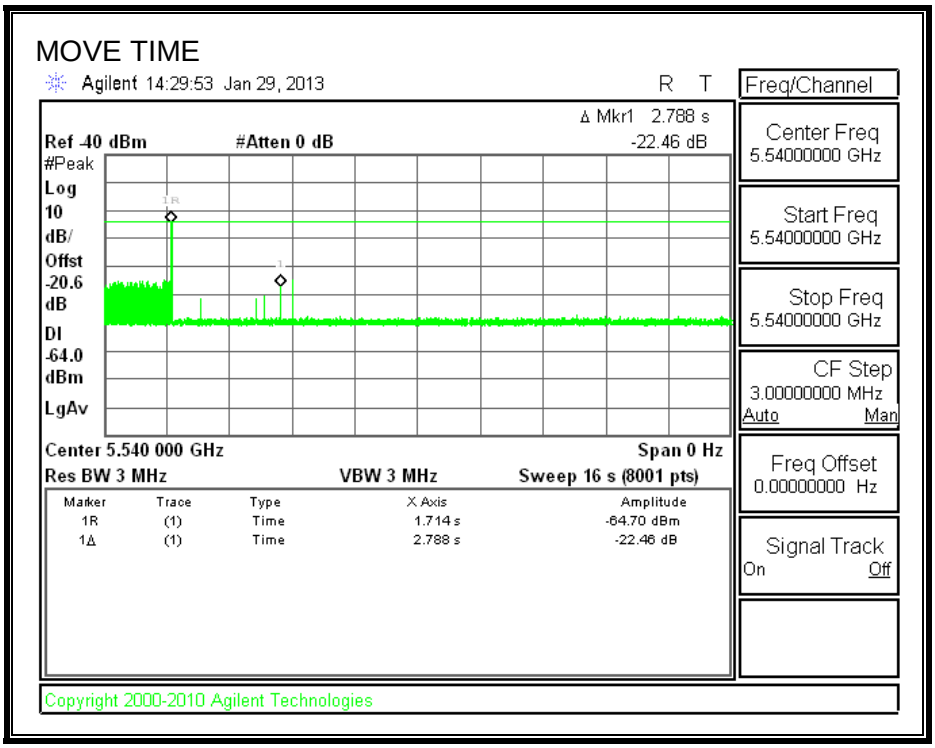
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

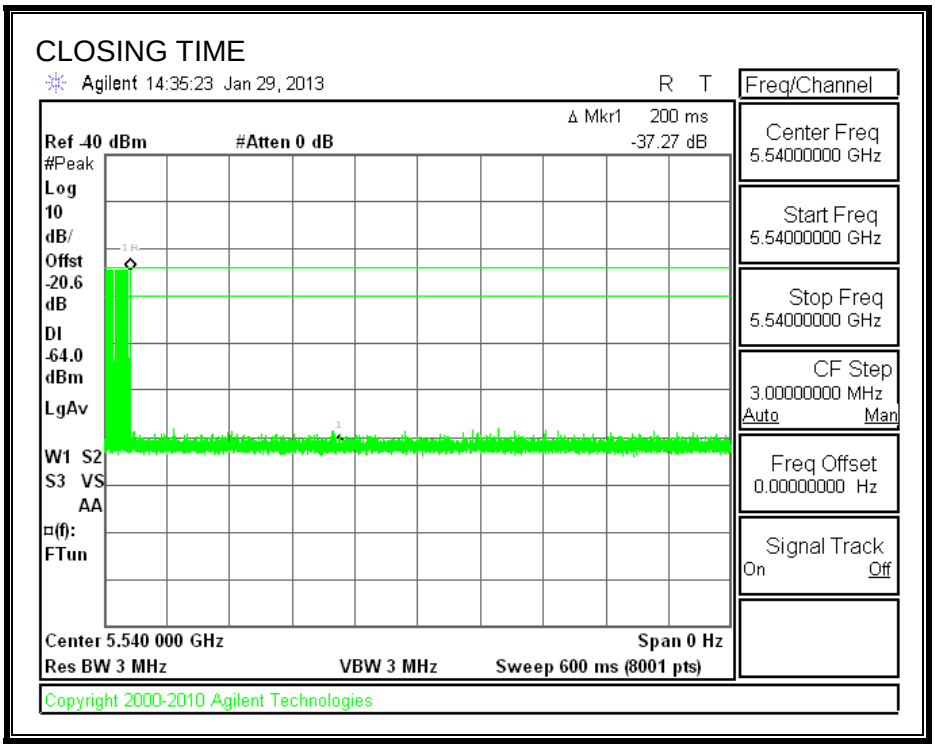
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	2.788	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	10.0	60
IC	12.0	260

MOVE TIME



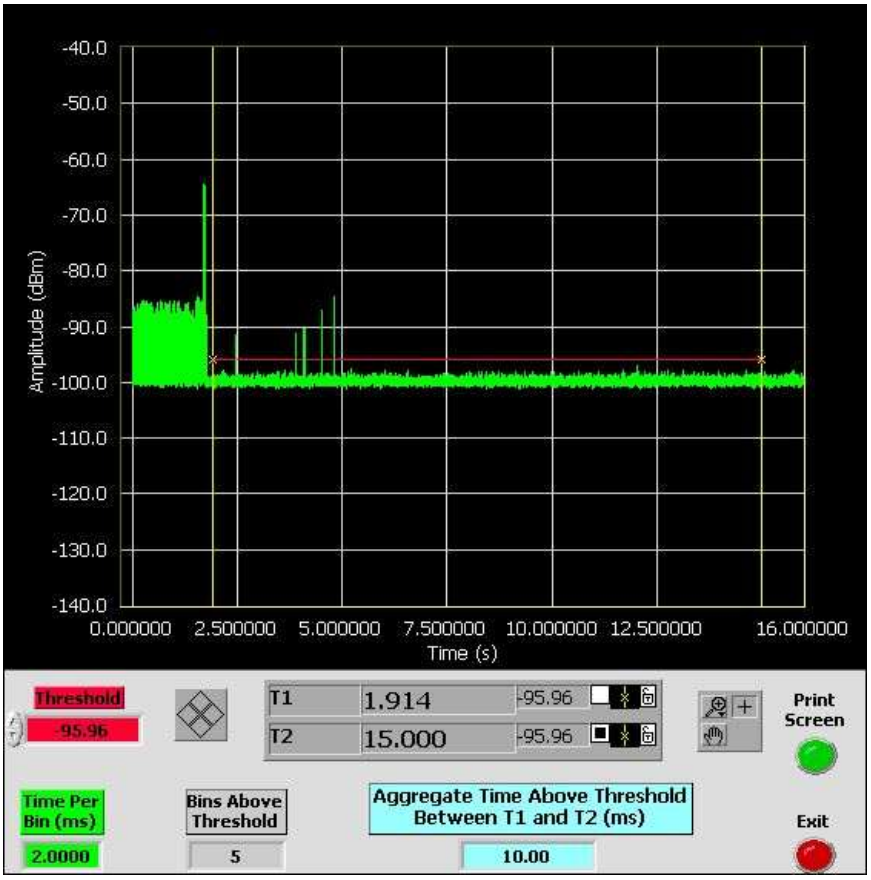
CHANNEL CLOSING TIME



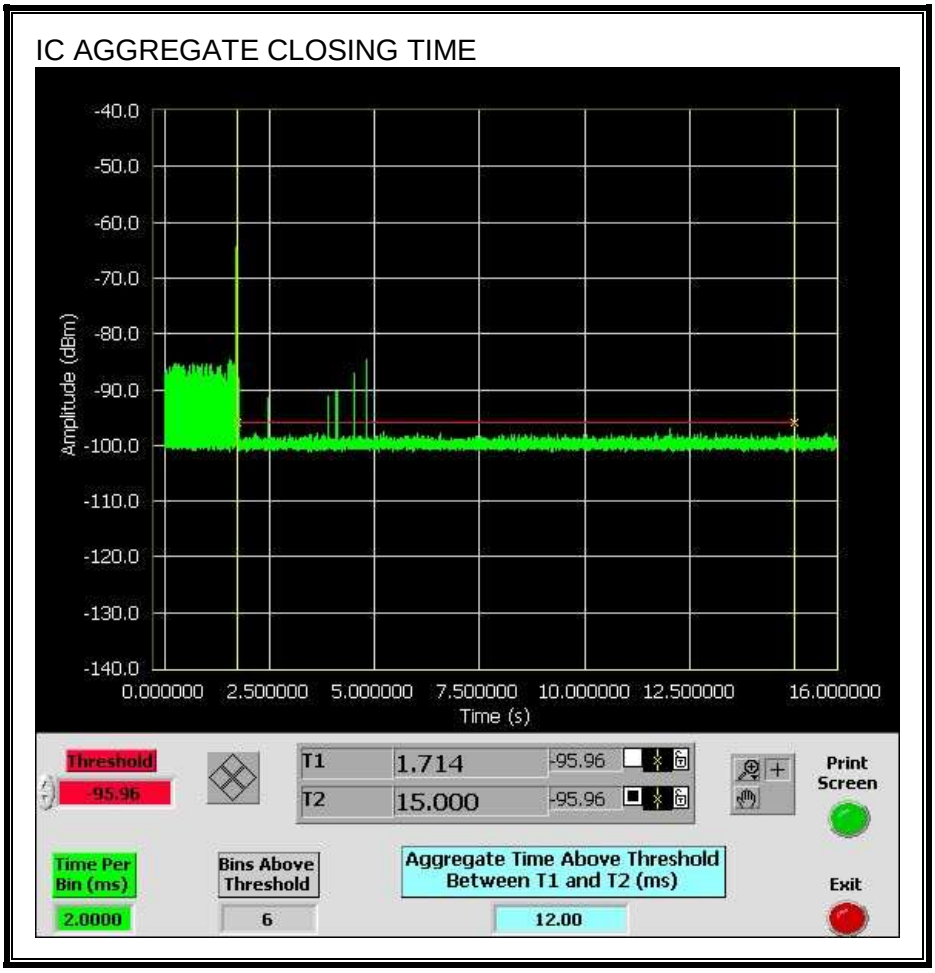
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

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

FCC AGGREGATE CLOSING TIME



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



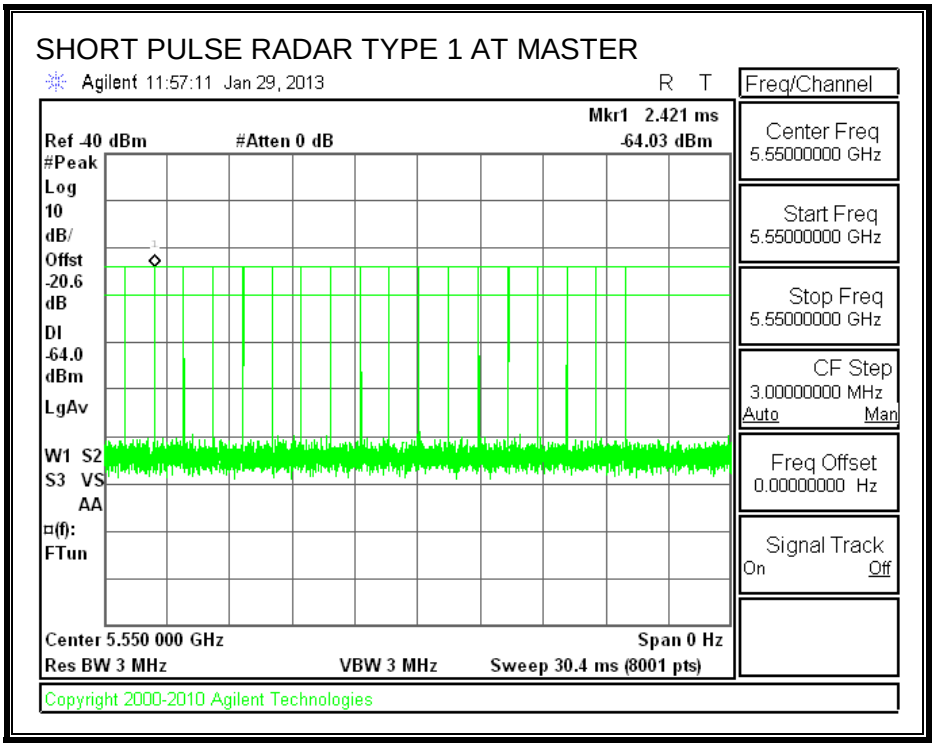
10.3. CLIENT MODE RESULTS FOR 40 MHz BANDWIDTH

10.3.1. TEST CHANNEL

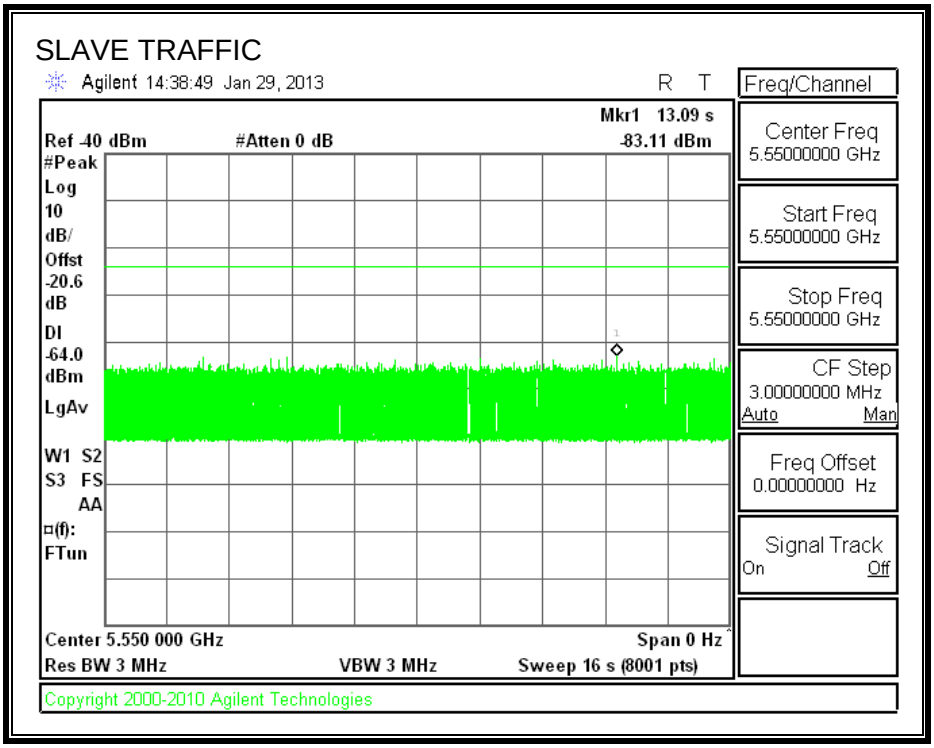
All tests were performed at a channel center frequency of 5550 MHz.

10.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



10.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

10.3.4. 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).

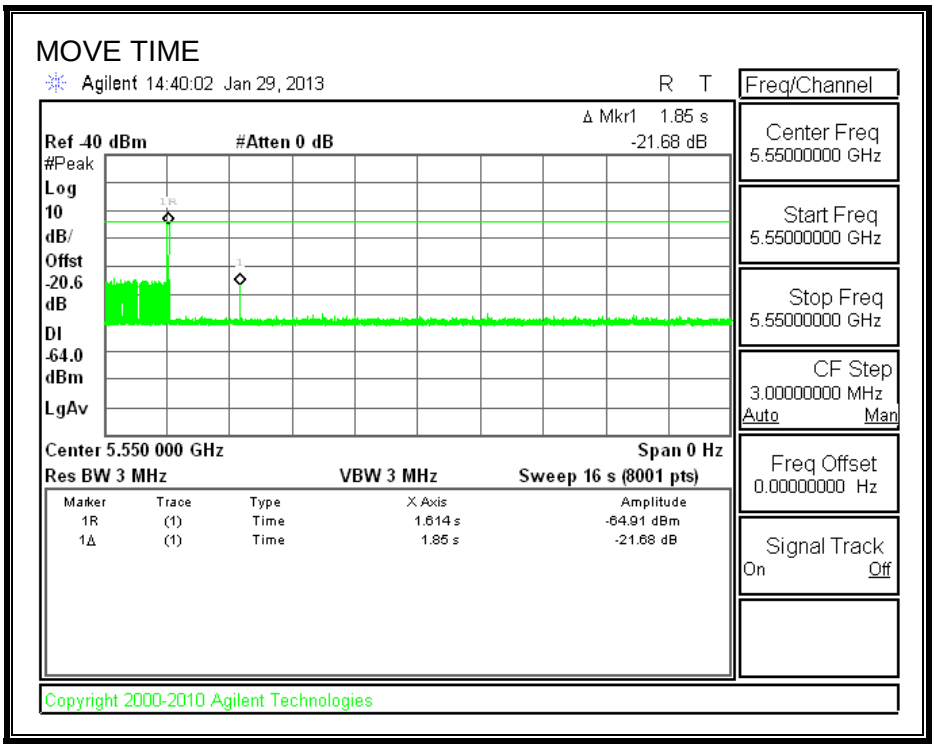
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

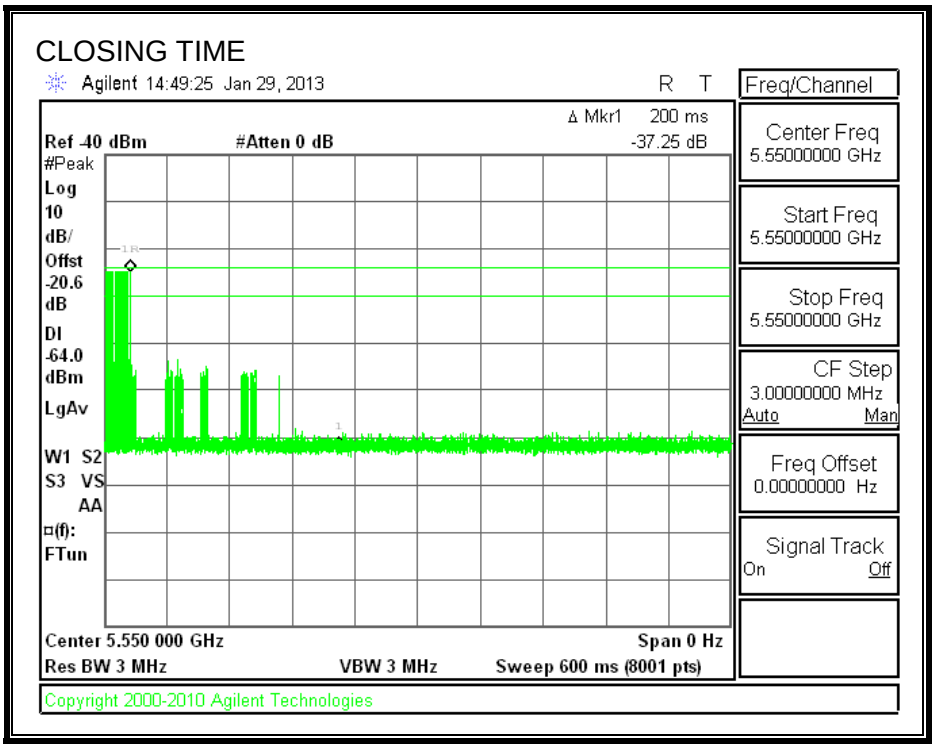
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	1.850	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	2.0	60
IC	16.0	260

MOVE TIME

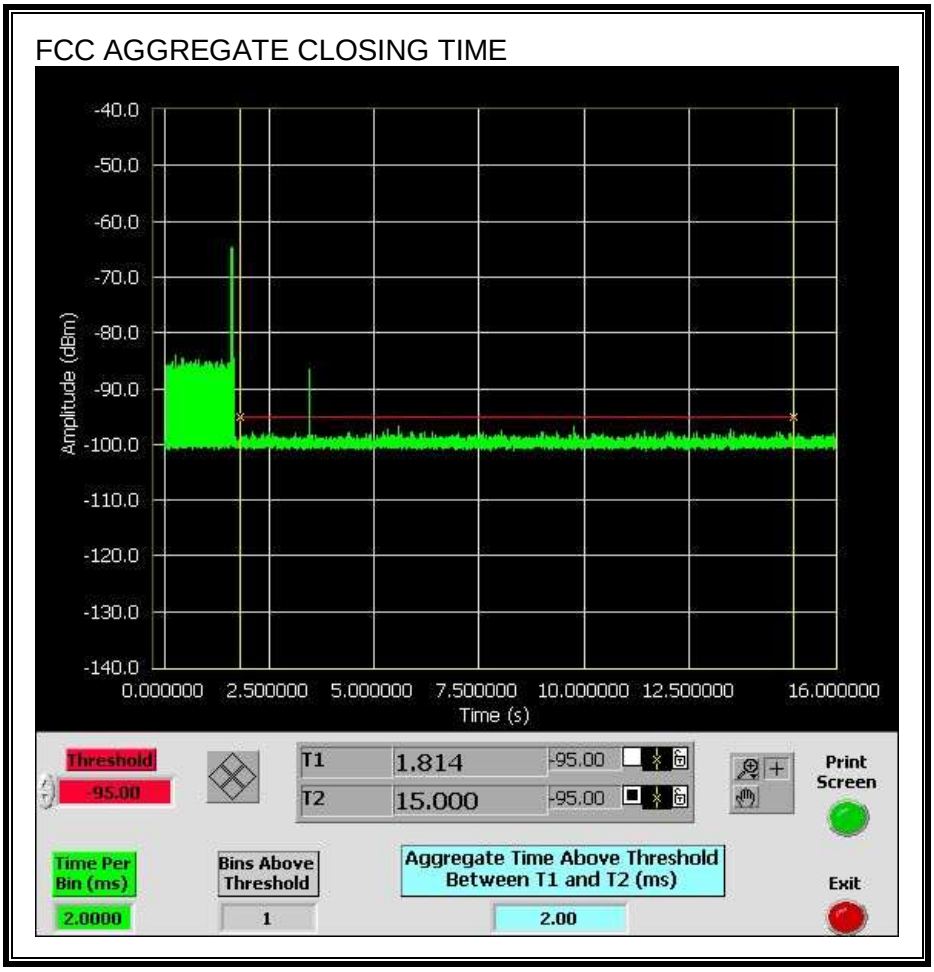


CHANNEL CLOSING TIME

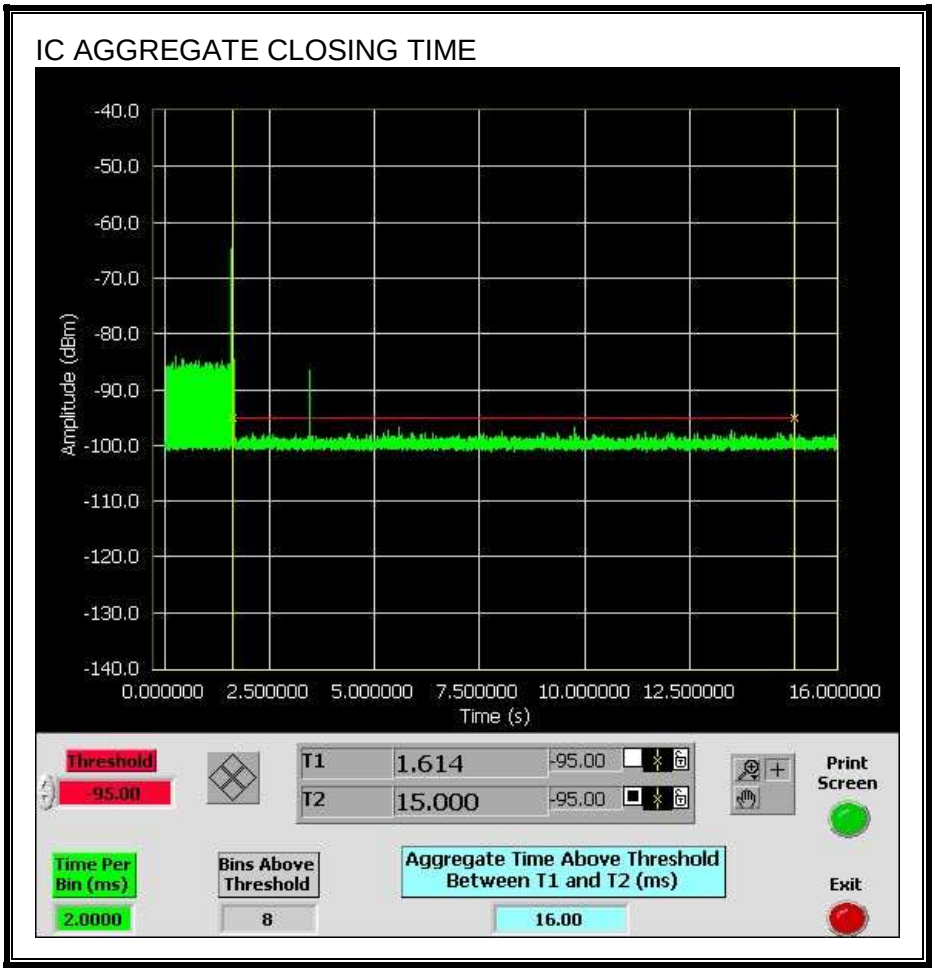


AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

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



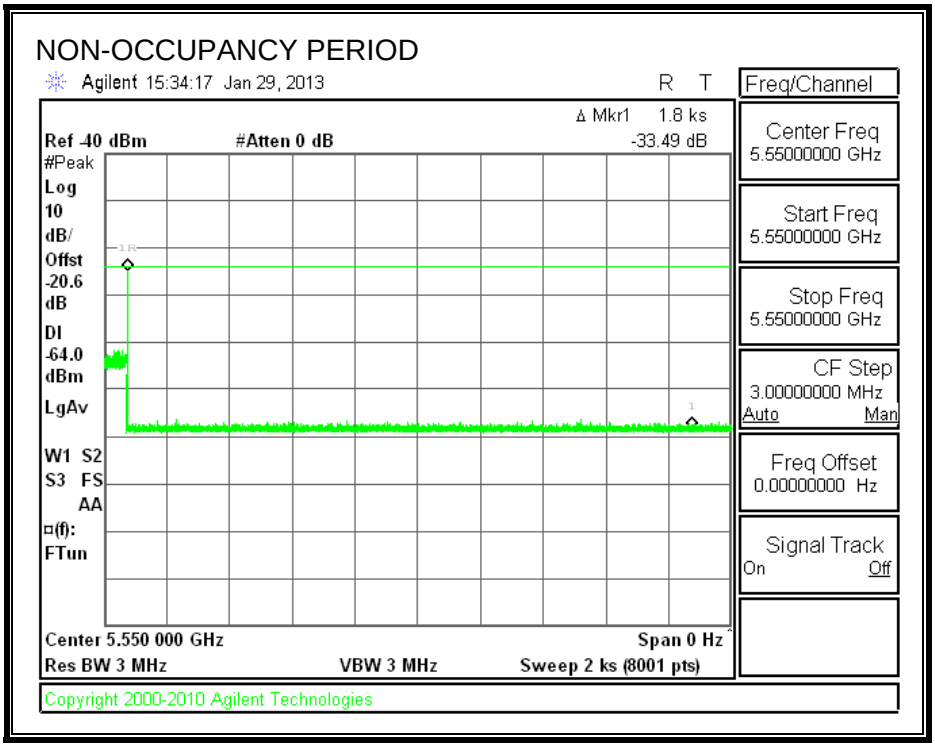
Only intermittent transmissions are observed during the IC aggregate monitoring period.



10.3.5. NON-OCCUPANCY PERIOD

RESULTS

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



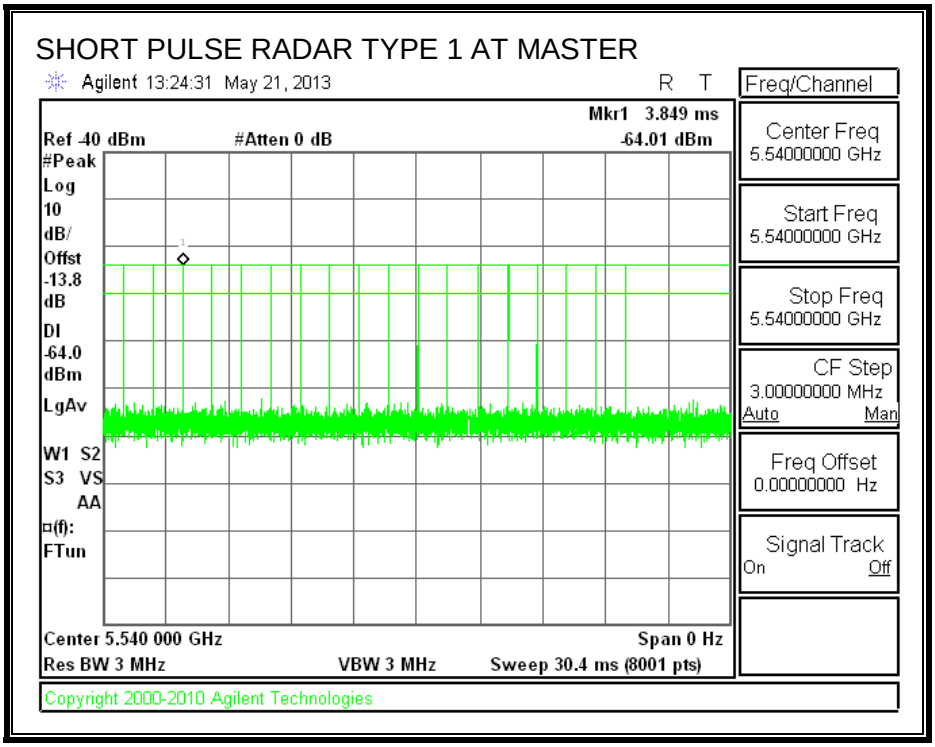
10.4. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 20 MHz BANDWIDTH

10.4.1. TEST CHANNEL

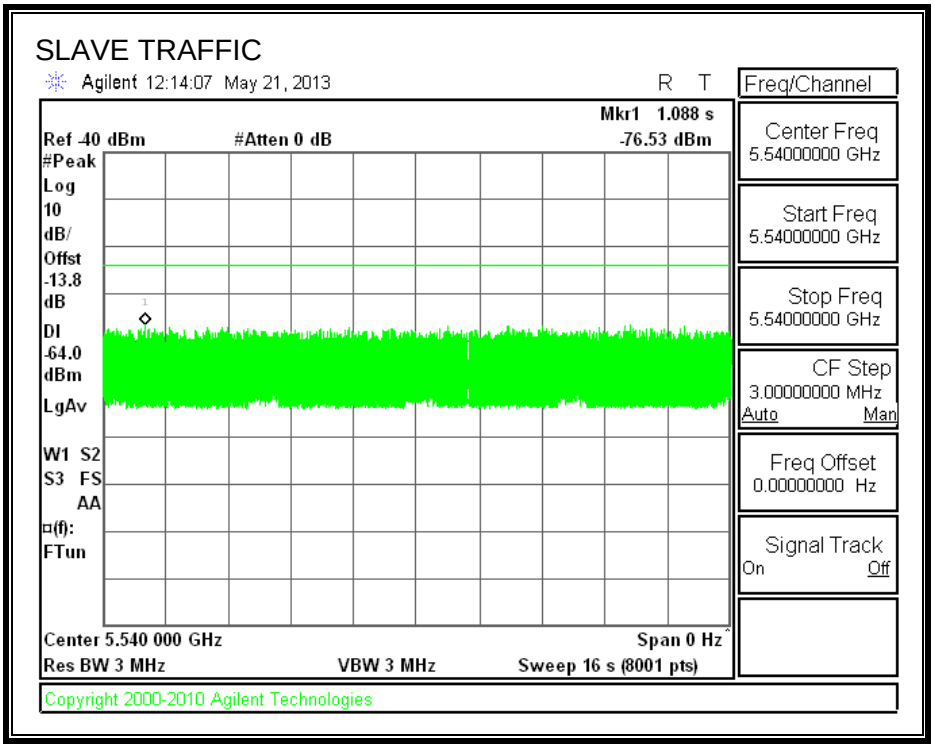
All tests were performed at a channel center frequency of 5540 MHz.

10.4.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



10.4.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

10.4.4. 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).

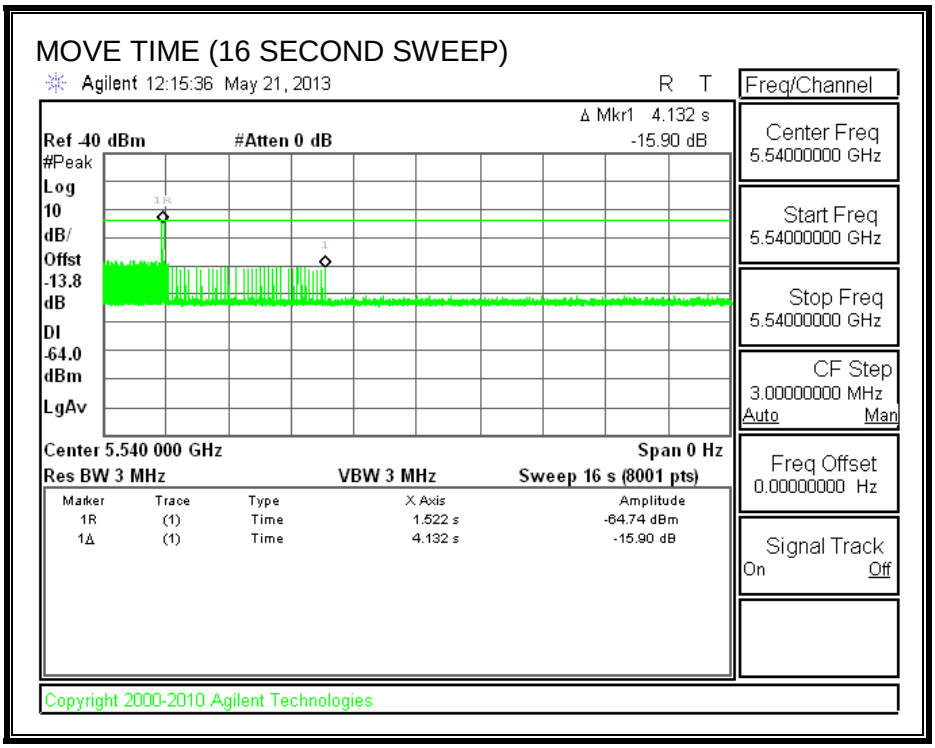
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

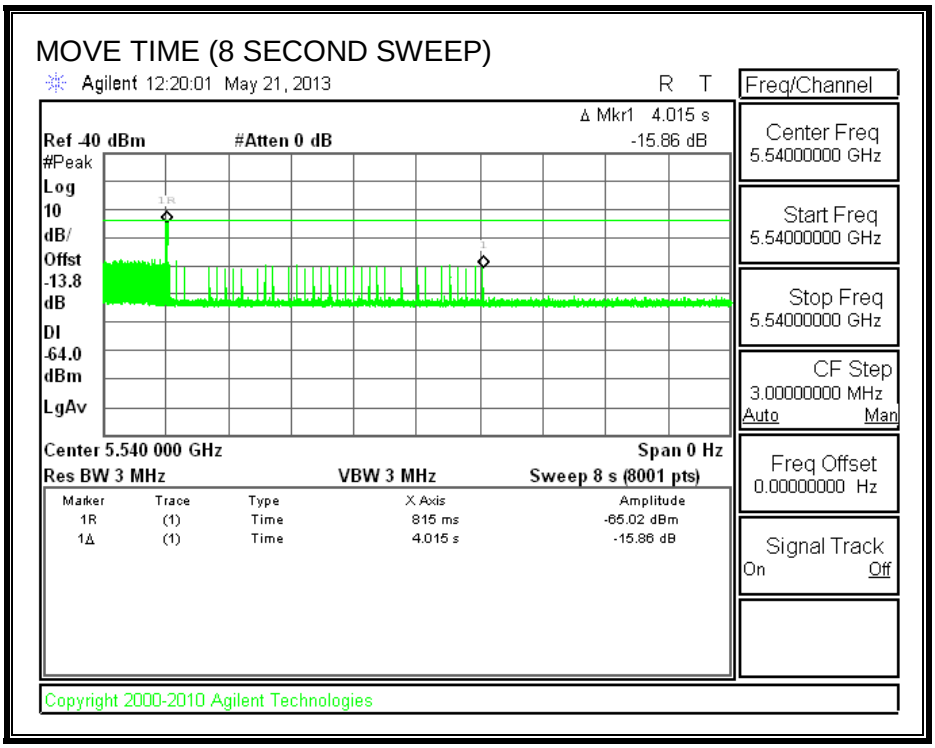
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	4.015	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	42.0	60
IC	54.0	260

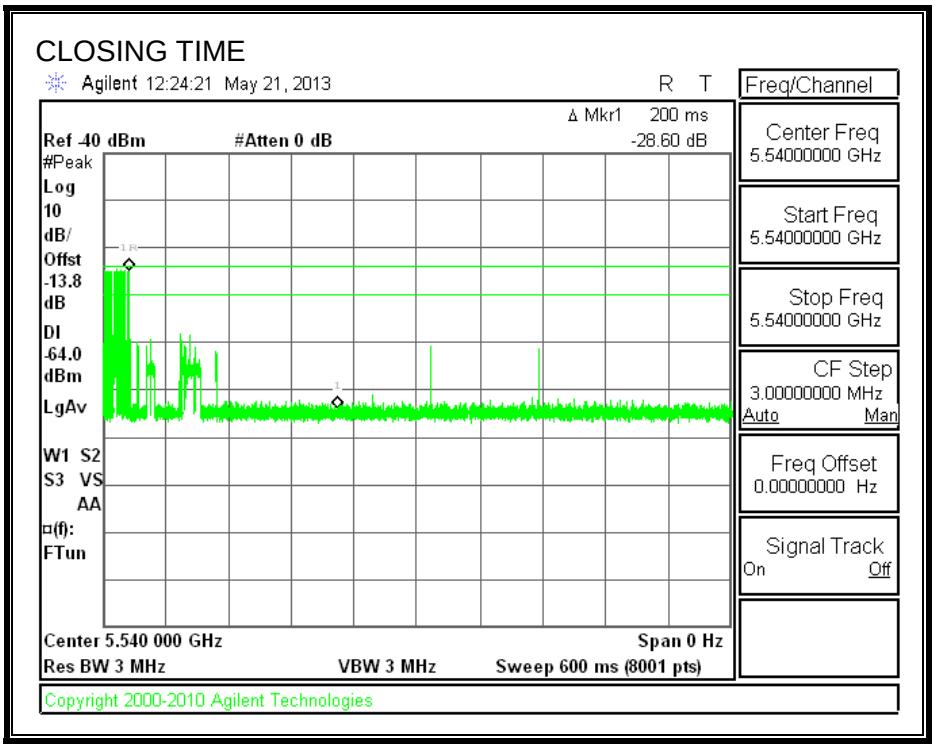
MOVE TIME (16 SECOND SWEEP)



MOVE TIME (8 SECOND SWEEP)

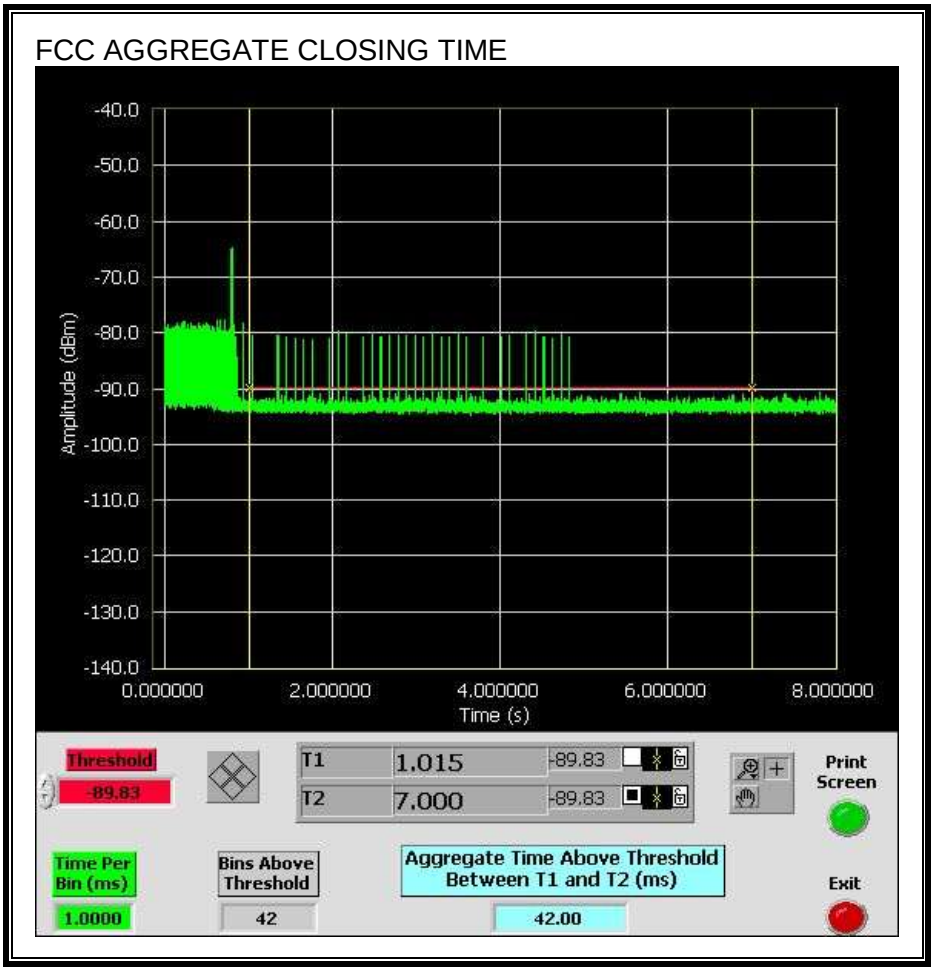


CHANNEL CLOSING TIME

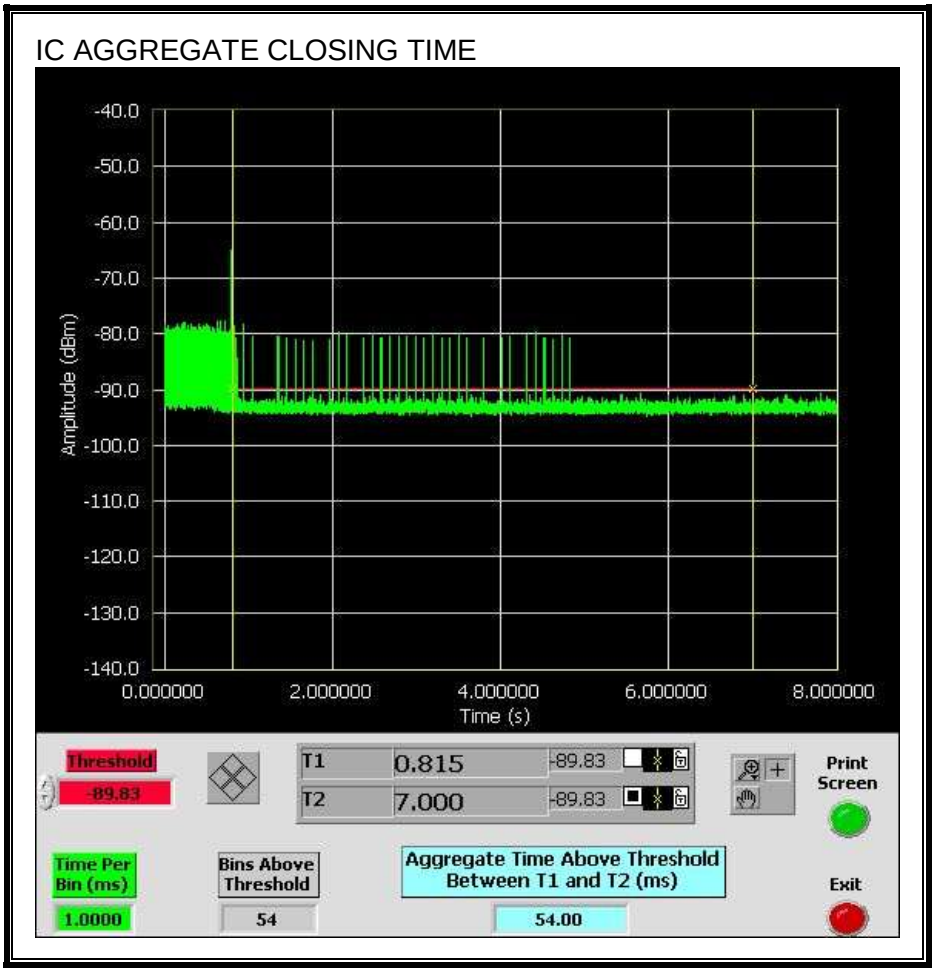


AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

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



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



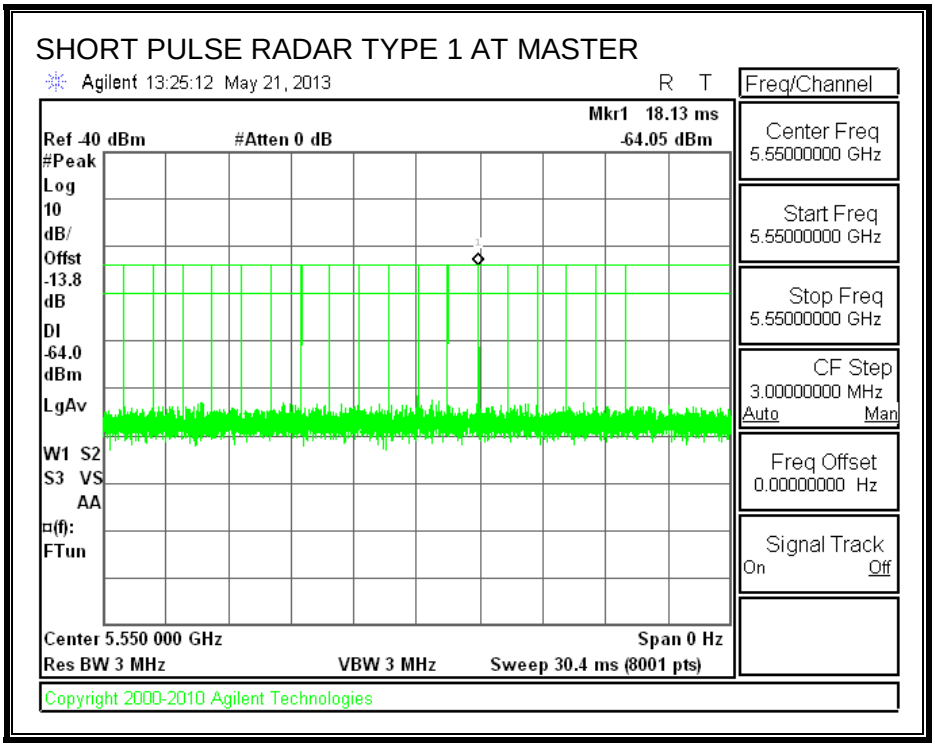
10.5. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 40 MHz BANDWIDTH

10.5.1. TEST CHANNEL

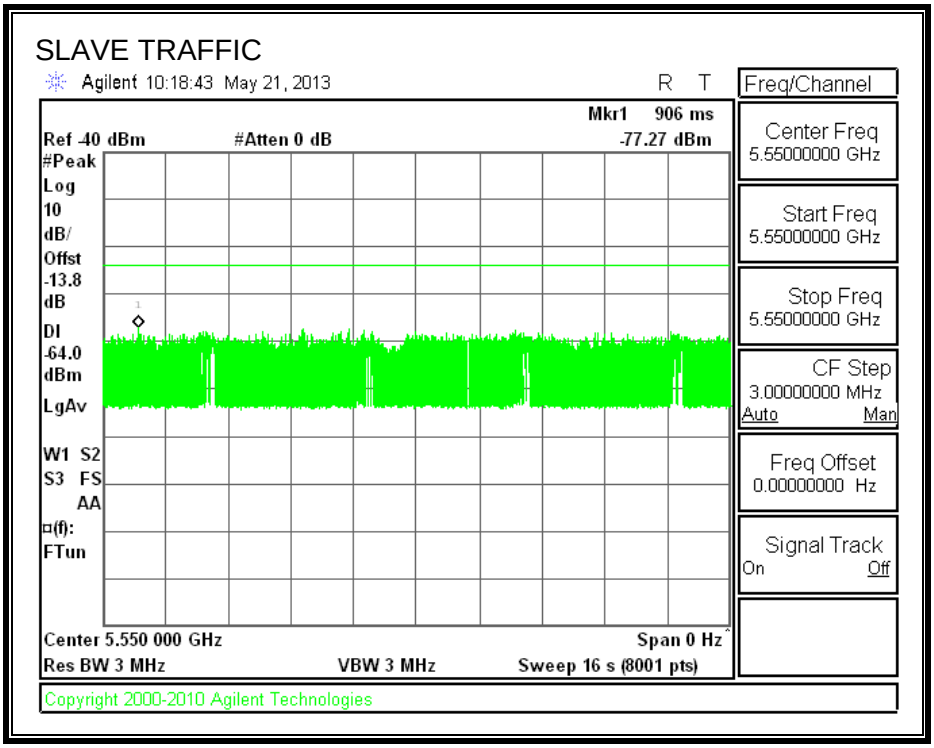
All tests were performed at a channel center frequency of 5550 MHz.

10.5.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



10.5.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

10.5.4. 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).

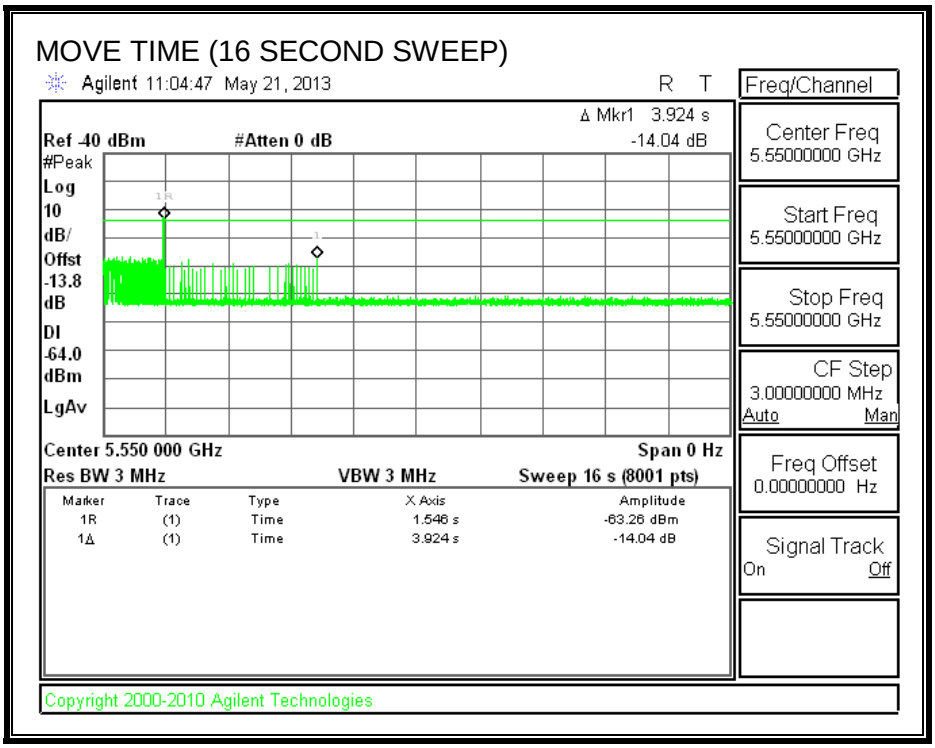
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

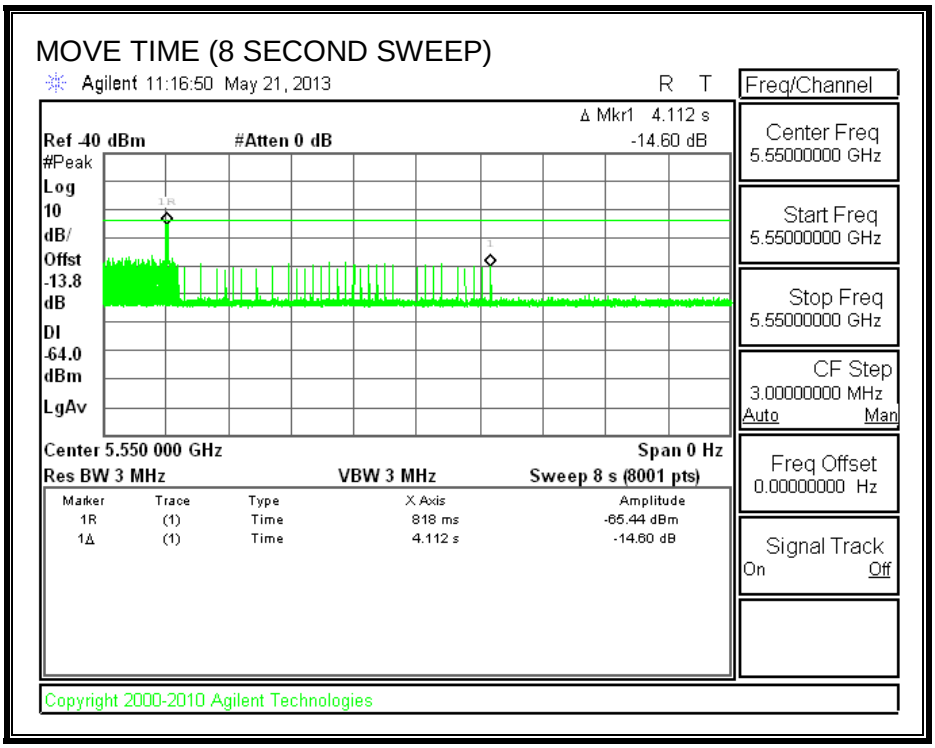
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	4.112	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	35.0	60
IC	73.0	260

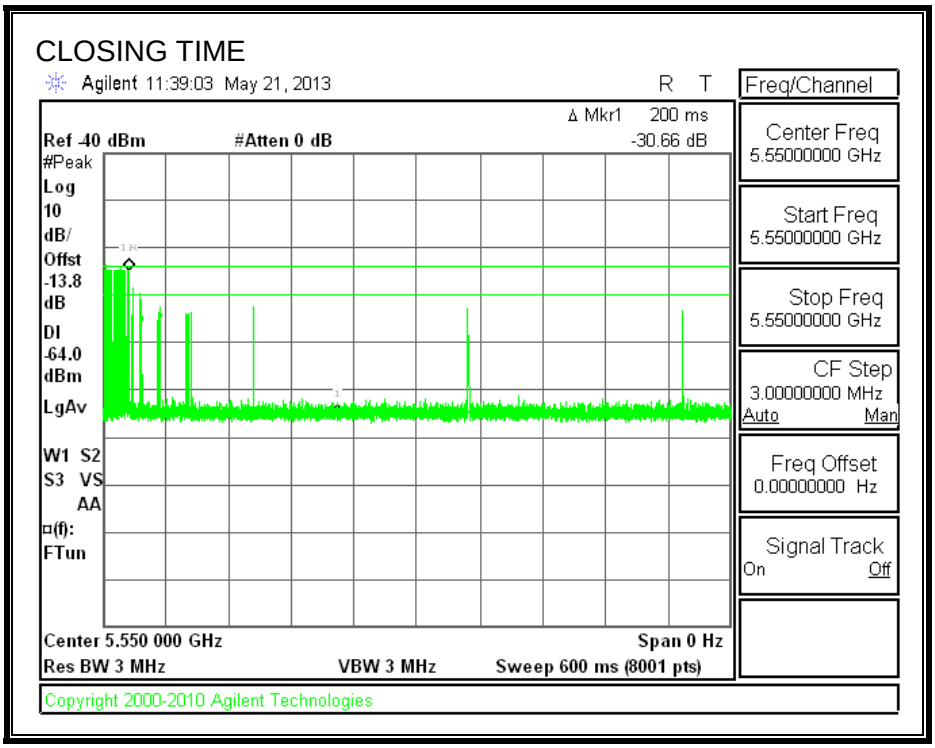
MOVE TIME (16 SECOND SWEEP)



MOVE TIME (8 SECOND SWEEP)



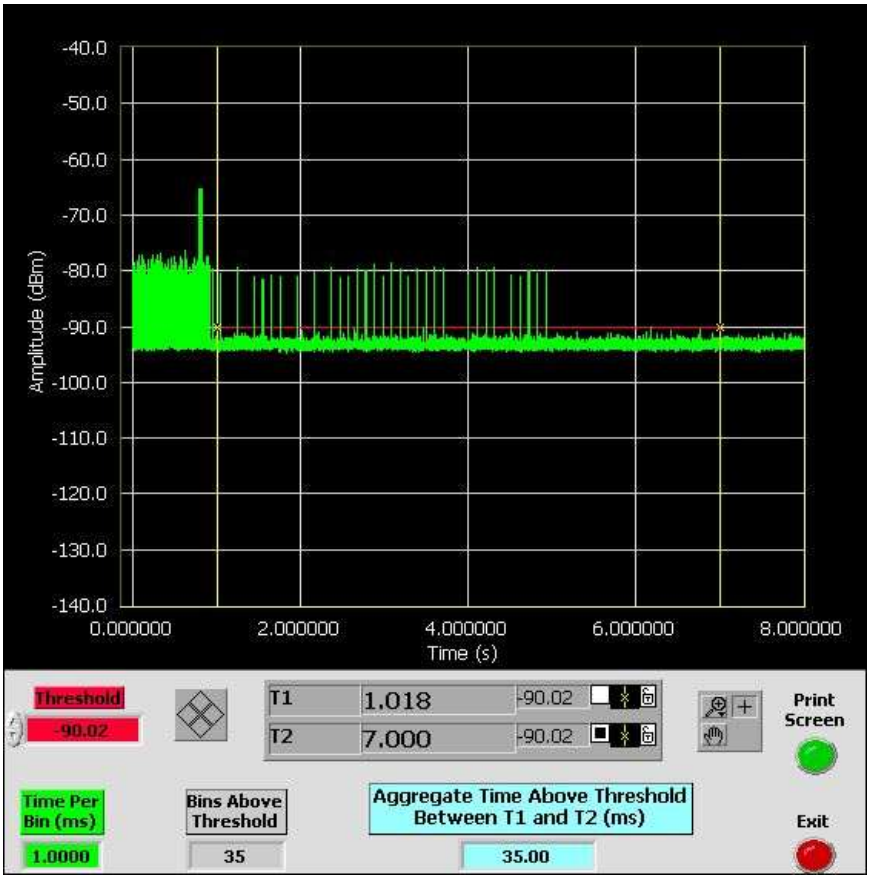
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

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

FCC AGGREGATE CLOSING TIME



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