

10.5.20. 802.11ac VHT80 MODE AT STRADDLE CHANNEL

Bandwidth and Antenna Gain

Portion	Frequency [MHz]	Chain 0 26 dB BW [MHz]	Chain 1 26 dB BW [MHz]	Chain 0 99% BW [MHz]	Chain 1 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
UNII-2C	5690	75.40	75.40	72.48	72.88	0.45	2.98
UNII-3	5690	5.40	5.40	2.48	2.88	0.45	2.98
Whole	5690	80.80	80.80	74.95	75.77	0.45	2.98

Limits

Portion	Frequency [MHz]	FCC Power Limit [dBm]	IC EIRP Limit [dBm]	Max IC Power [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]	IC eirp PSD Limit [dBm]	PPSD Limit [dBm]
UNII-2C	5690	24.00	23.00	23.55	23.55	11.00	11.00	11.00
UNII-3	5690	18.32	13.94	17.88	17.88	11.00	11.00	11.00
Whole	5690	24.00	23.00	23.55	23.55	11.00	11.00	11.00

Duty Cycle CF [dB]	1.16	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Portion	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
UNII-2C	5690	7.15	7.51	11.50	23.55	-12.05
UNII-3	5690	-8.54	-7.42	-3.77	17.88	-21.65
Whole	5690	7.26	7.64	11.63	23.55	-11.93

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]
138	5690	-8.51	-7.75	-3.94	11.00	-14.94

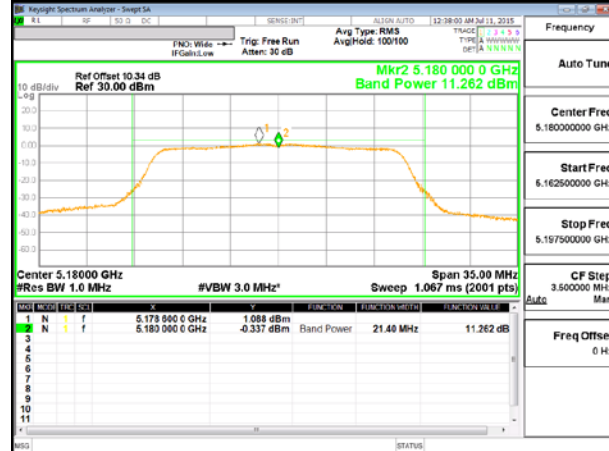
10.5.21. OUTPUT POWER AND PPSD PLOTS

UNII 5.2 GHz IEEE 802.11a mode



UNII 5.2 GHz IEEE 802.11n HT20 mode

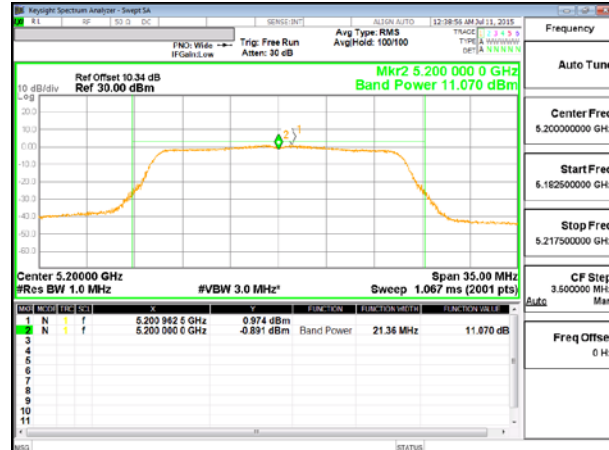
11n HT20 Mode Low Channel Chain 0



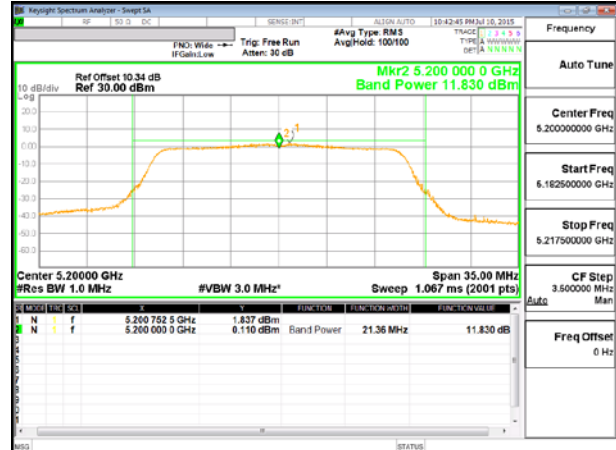
11n HT20 Mode Low Channel Chain 1



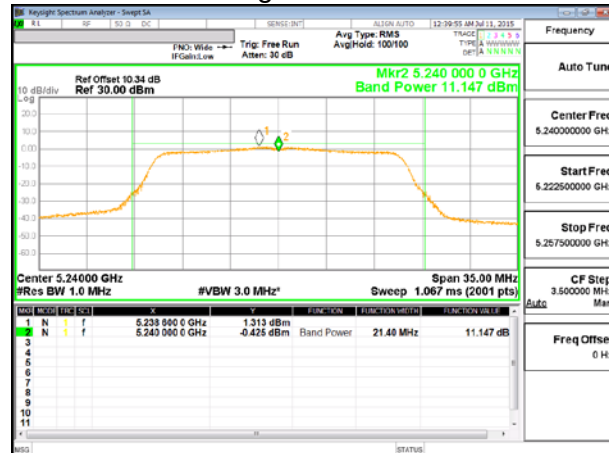
11n HT20 Mode Middle Channel Chain 0



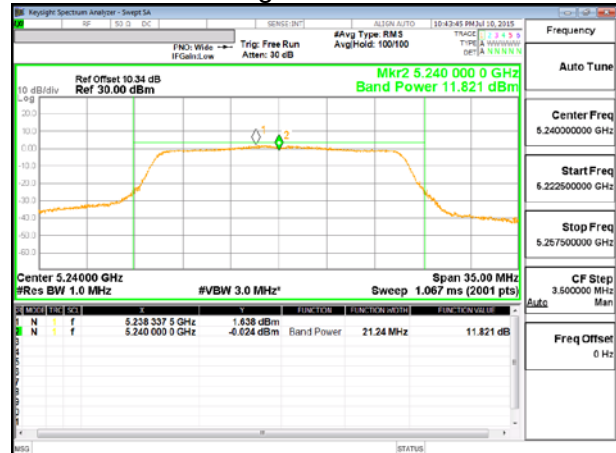
11n HT20 Mode Middle Channel Chain 1



11n HT20 Mode High Channel Chain 0

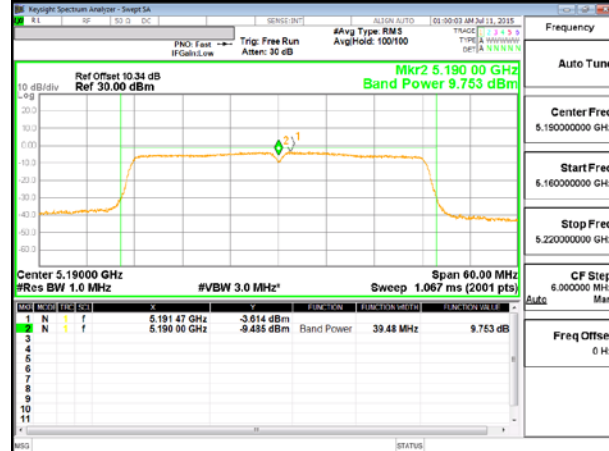


11n HT20 Mode High Channel Chain 1

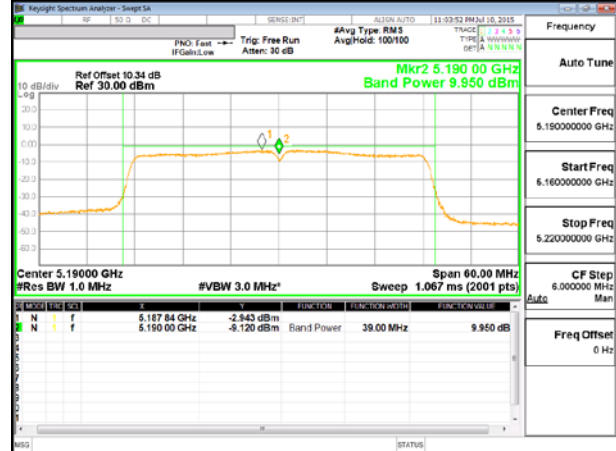


UNII 5.2 GHz IEEE 802.11n HT40 mode

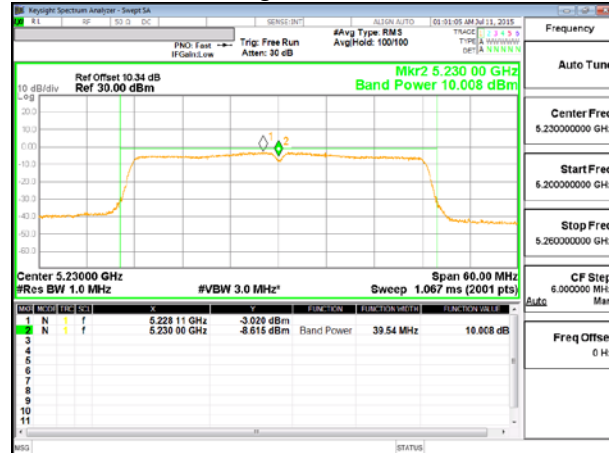
11n HT40 Mode Low Channel Chain 0



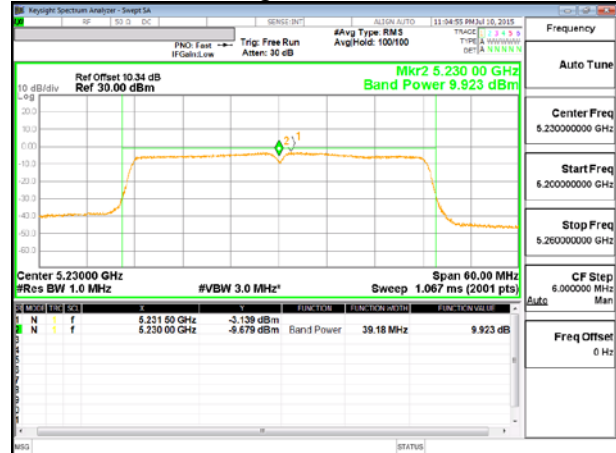
11n HT40 Mode Low Channel Chain 1



11n HT40 Mode High Channel Chain 0

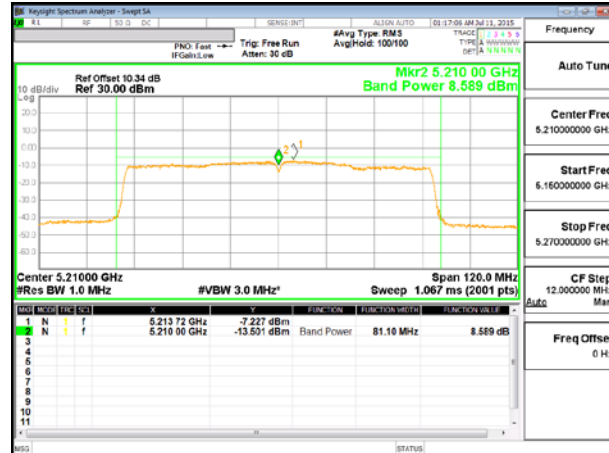


11n HT40 Mode High Channel Chain 1

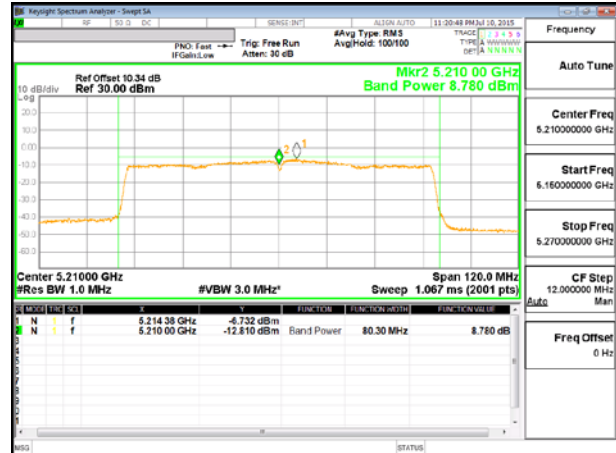


UNII 5.2 GHz IEEE 802.11ac VHT80 mode

11ac HT80 Mode Middle Channel Chain 0

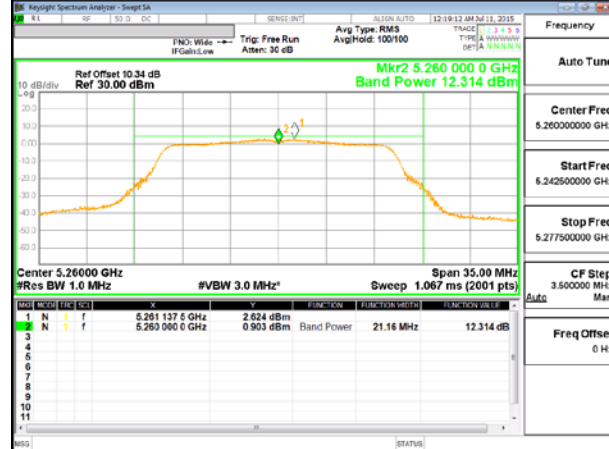


11ac HT80 Mode Middle Channel Chain 1

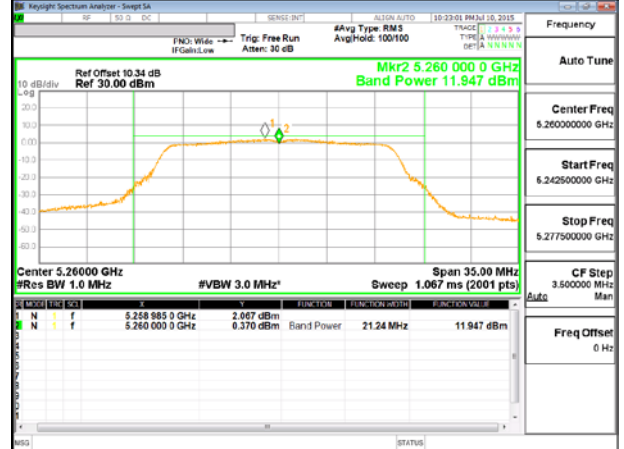


UNII 5.3 GHz IEEE 802.11a mode

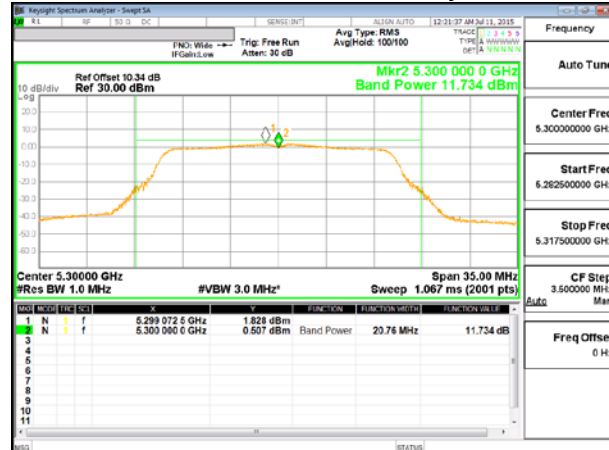
11a Mode Low Channel Primary



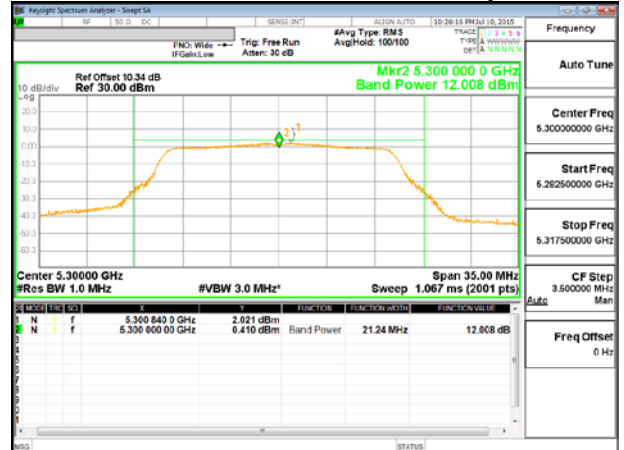
11a Mode Low Channel Secondary



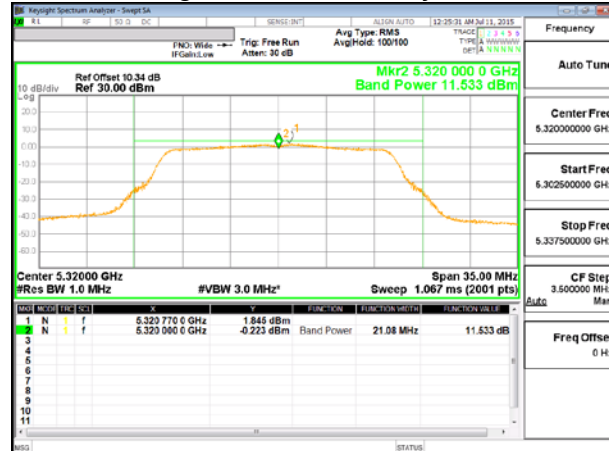
11a Mode Middle Channel Primary



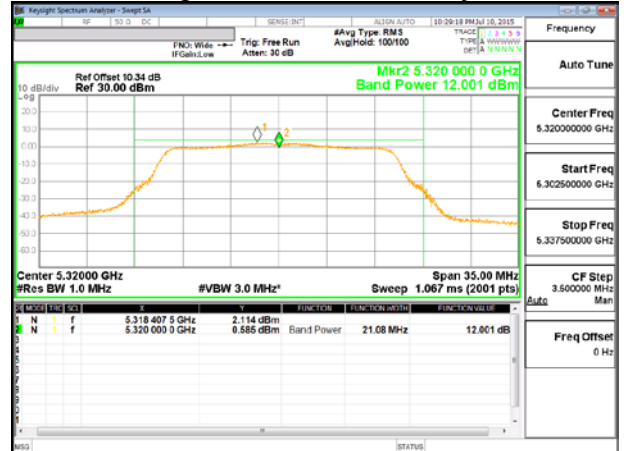
11a Mode Middle Channel Secondary



11a Mode High Channel Primary

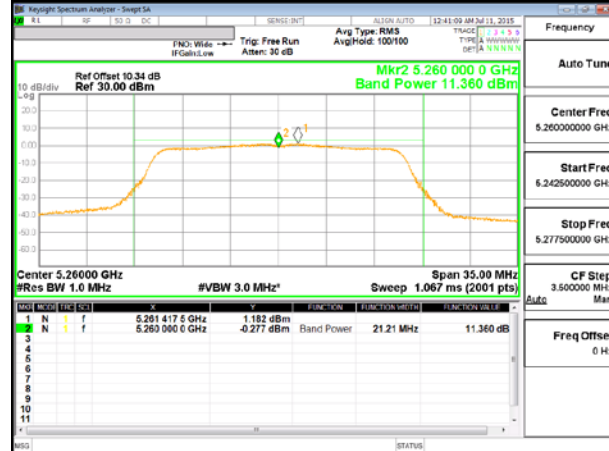


11a Mode High Channel Secondary

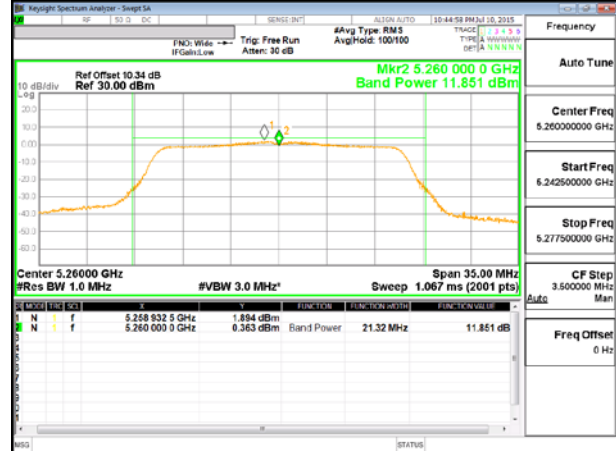


UNII 5.3 GHz IEEE 802.11n HT20 mode

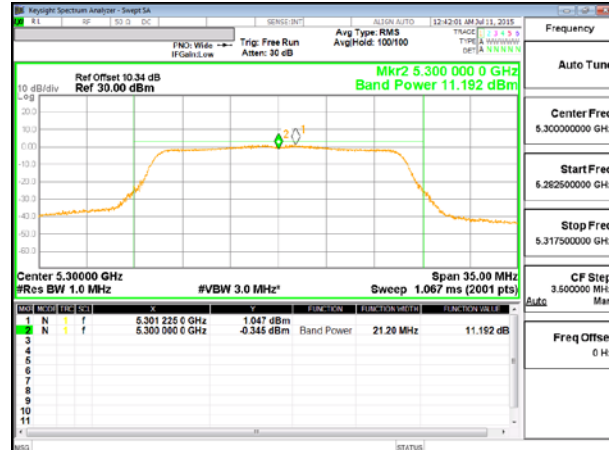
11n HT20 Mode Low Channel Chain 0



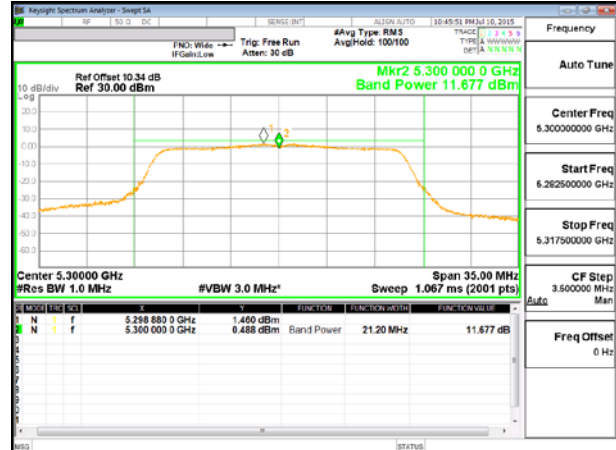
11n HT20 Mode Low Channel Chain 1



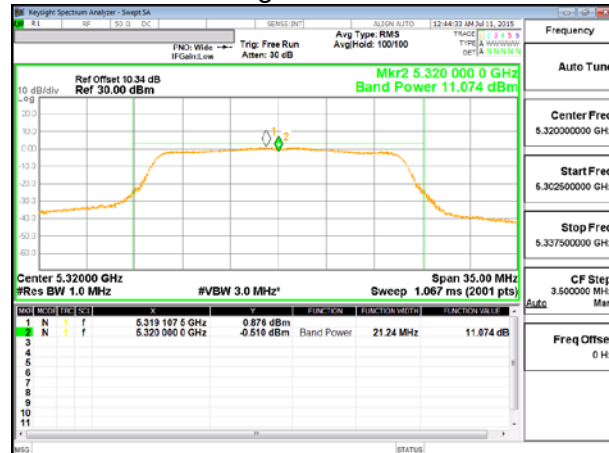
11n HT20 Mode Middle Channel Chain 0



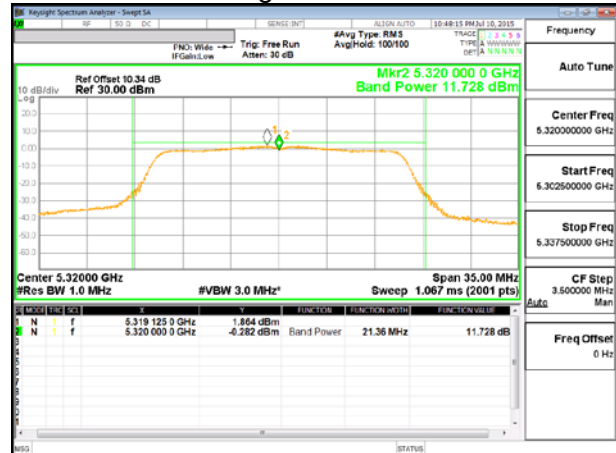
11n HT20 Mode Middle Channel Chain 1



11n HT20 Mode High Channel Chain 0

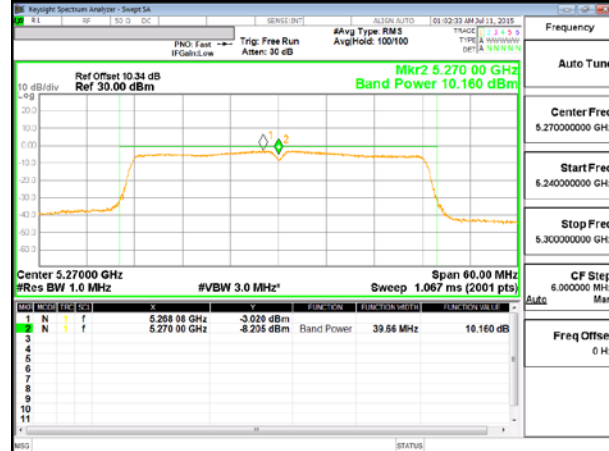


11n HT20 Mode High Channel Chain 1

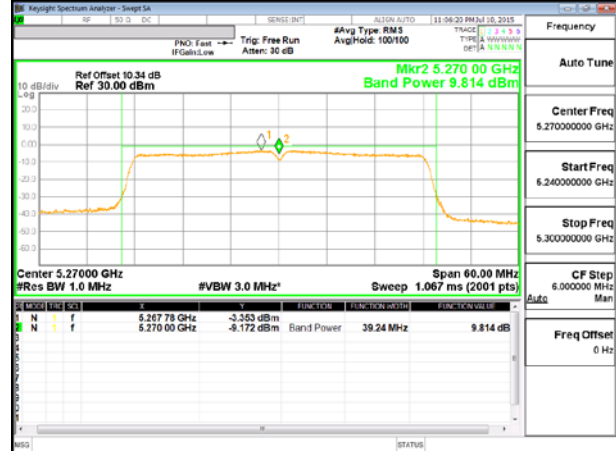


UNII 5.3 GHz IEEE 802.11n HT40 mode

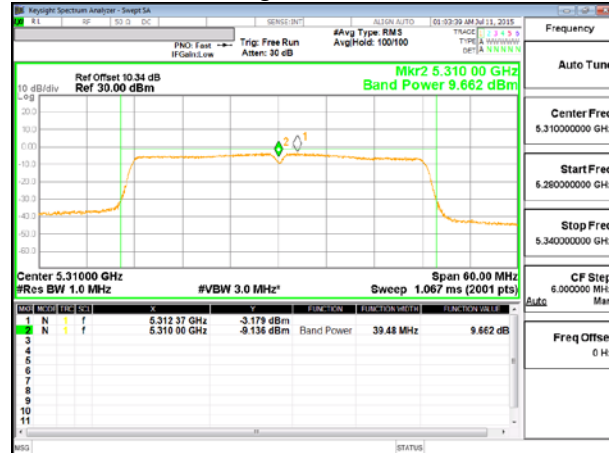
11n HT40 Mode Low Channel Chain 0



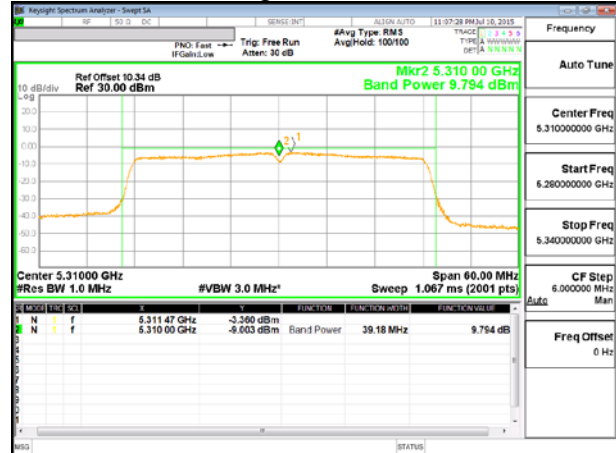
11n HT40 Mode Low Channel Chain 1



11n HT40 Mode High Channel Chain 0

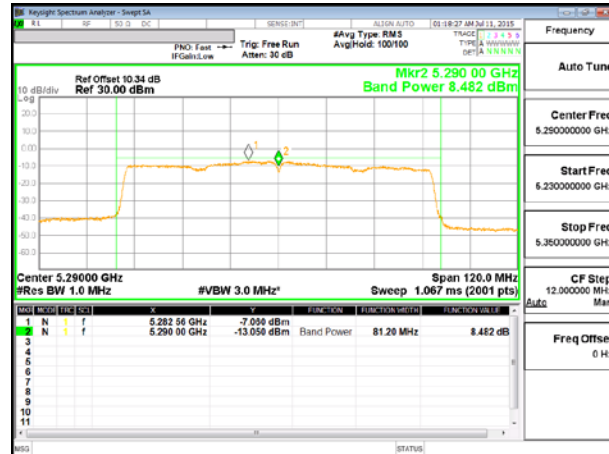


11n HT40 Mode High Channel Chain 1

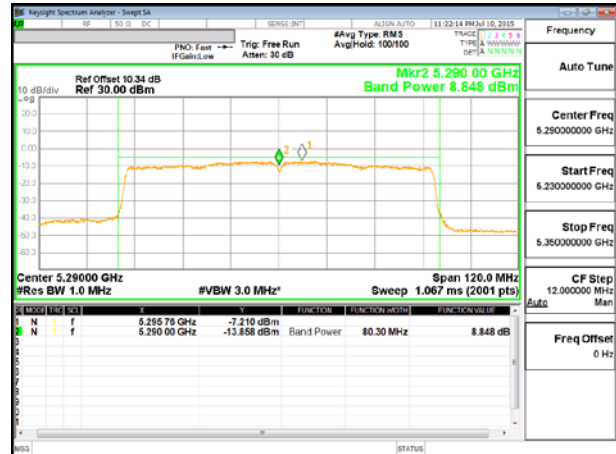


UNII 5.3 GHz IEEE 802.11ac VHT80 mode

11ac HT80 Mode Middle Channel Chain 0

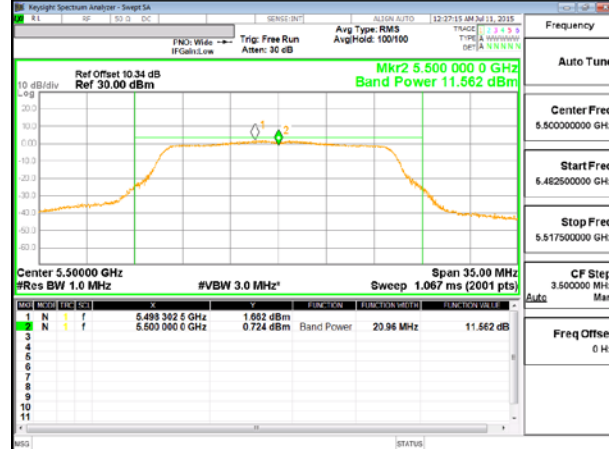


11ac HT80 Mode Middle Channel Chain 1

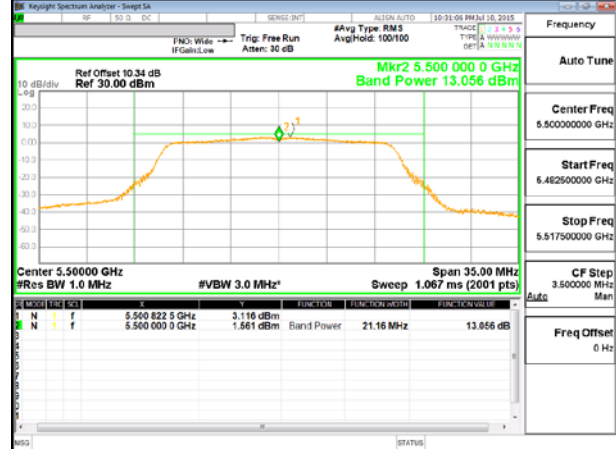


UNII 5.5 GHz IEEE 802.11a mode

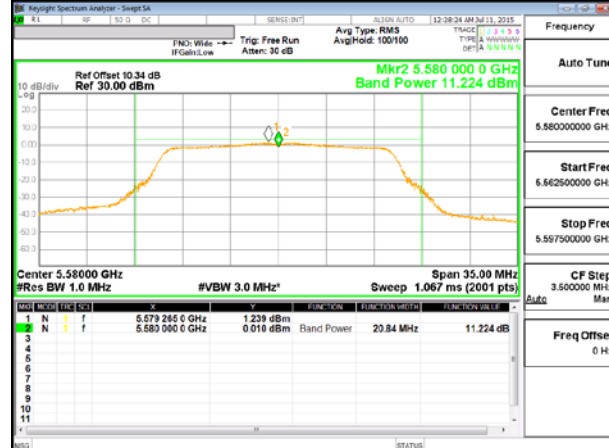
11a Mode Low Channel Primary



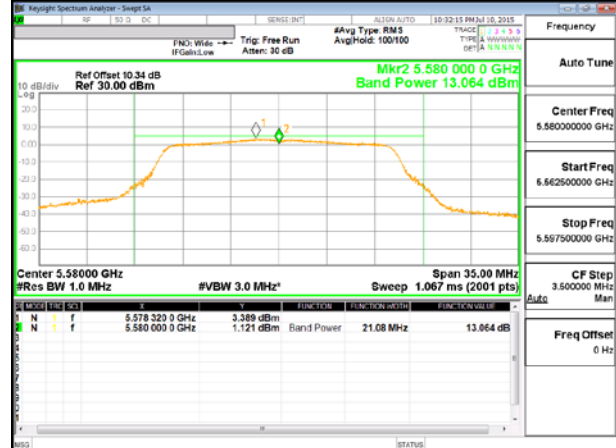
11a Mode Low Channel Secondary



11a Mode Middle Channel Primary



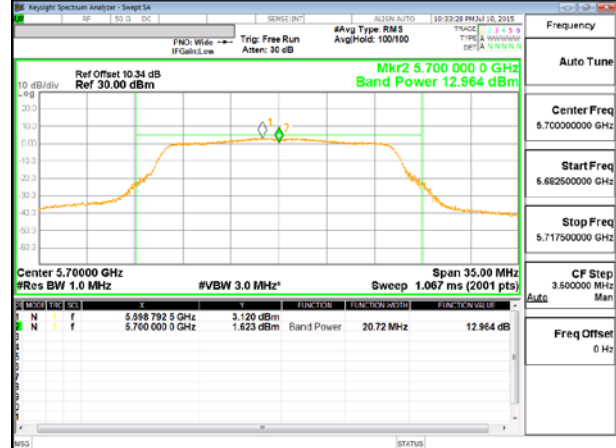
11a Mode Middle Channel Secondary



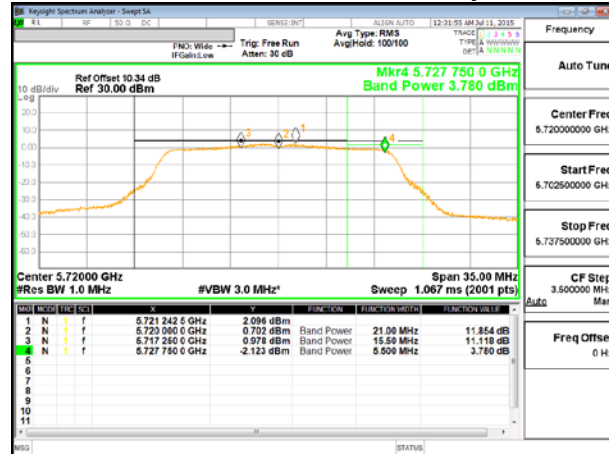
11a Mode High Channel Primary



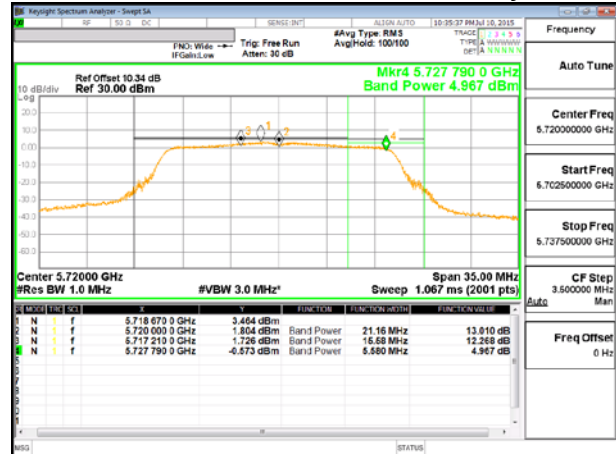
11a Mode High Channel Secondary



11a Mode Straddle Channel Primary

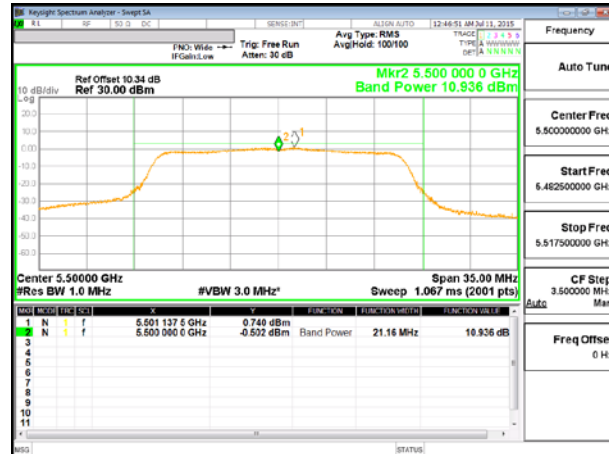


11a Mode Straddle Channel Secondary

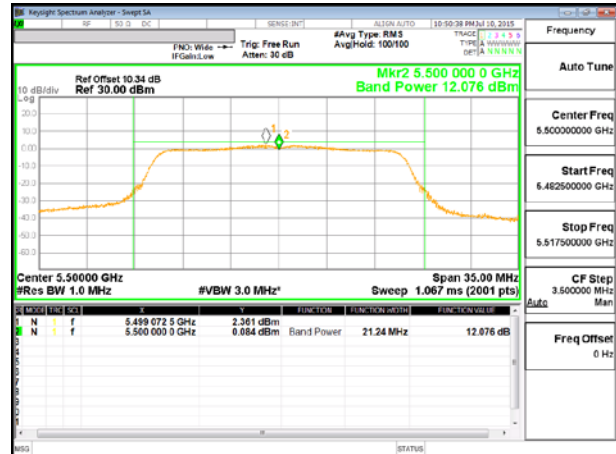


UNII 5.5 GHz IEEE 802.11n HT20 mode

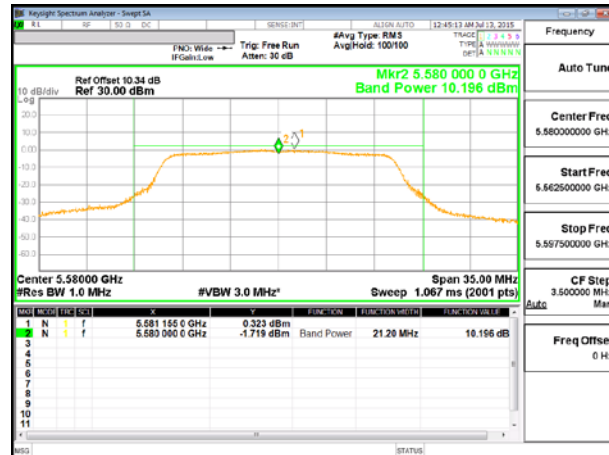
11n HT20 Mode Low Channel Chain 0



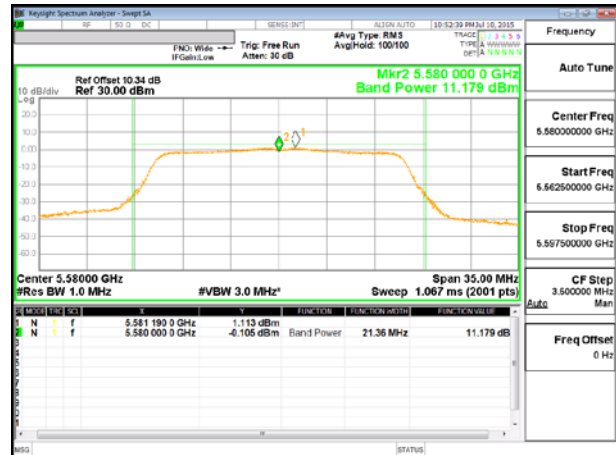
11n HT20 Mode Low Channel Chain 1



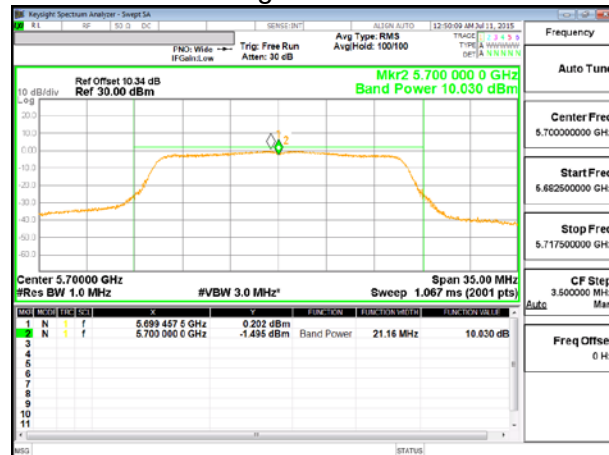
11n HT20 Mode Middle Channel Chain 0



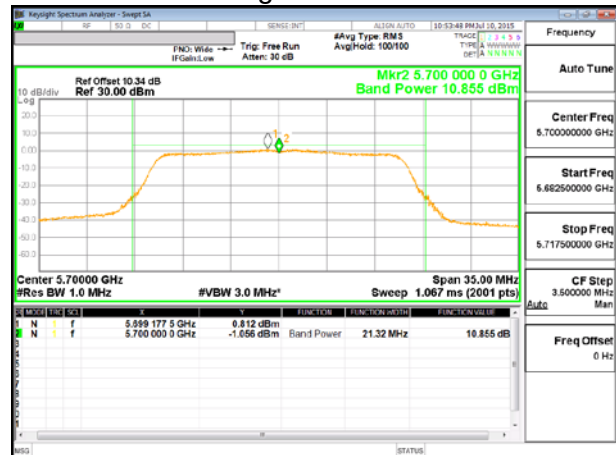
11n HT20 Mode Middle Channel Chain 1



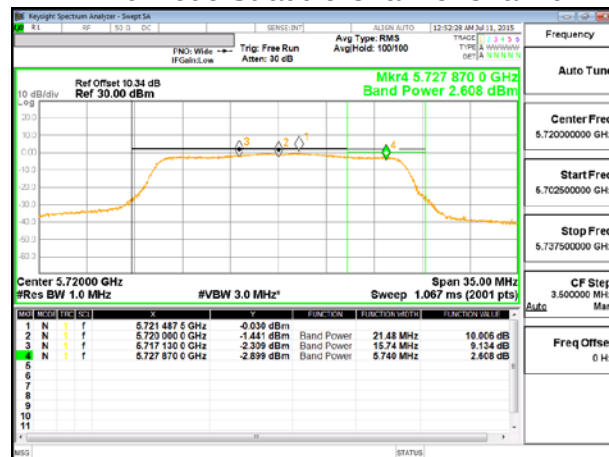
11n HT20 Mode High Channel Chain 0



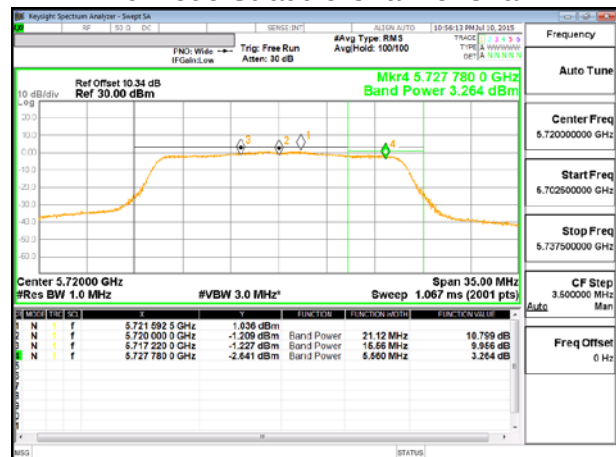
11n HT20 Mode High Channel Chain 1



11n HT20 Mode Straddle Channel Chain 0

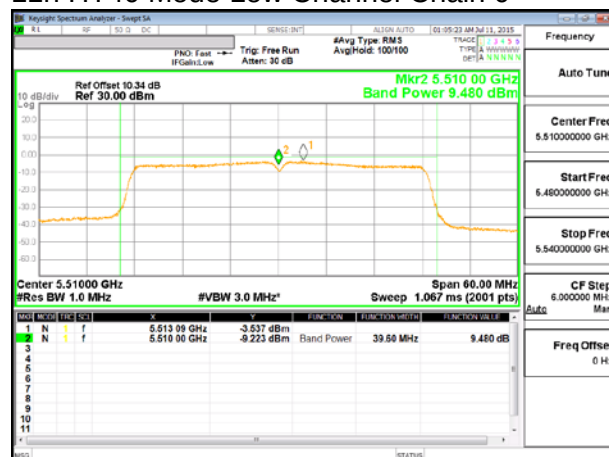


11n HT20 Mode Straddle Channel Chain 1

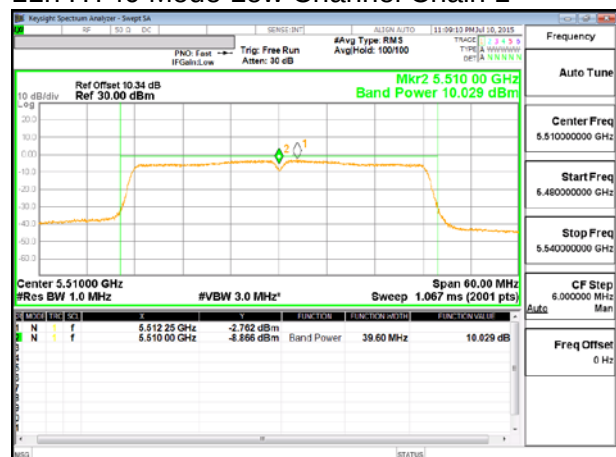


UNII 5.5 GHz IEEE 802.11n HT40 mode

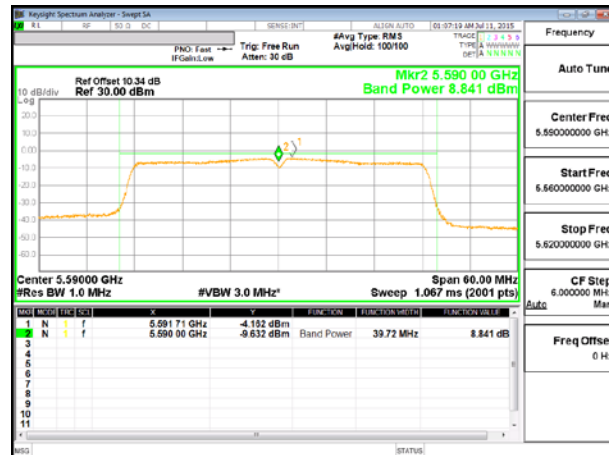
11n HT40 Mode Low Channel Chain 0



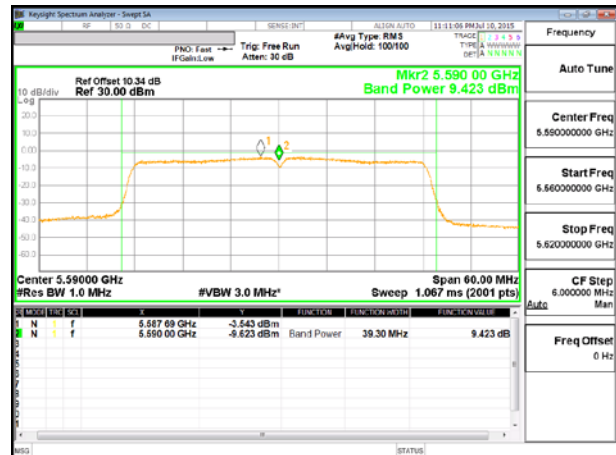
11n HT40 Mode Low Channel Chain 1



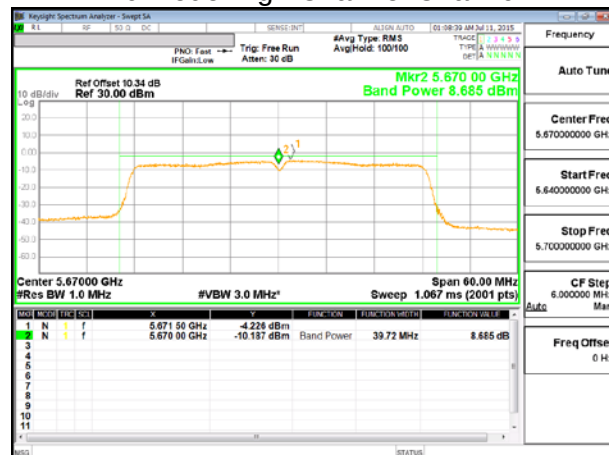
11n HT40 Mode Middle Channel Chain 0



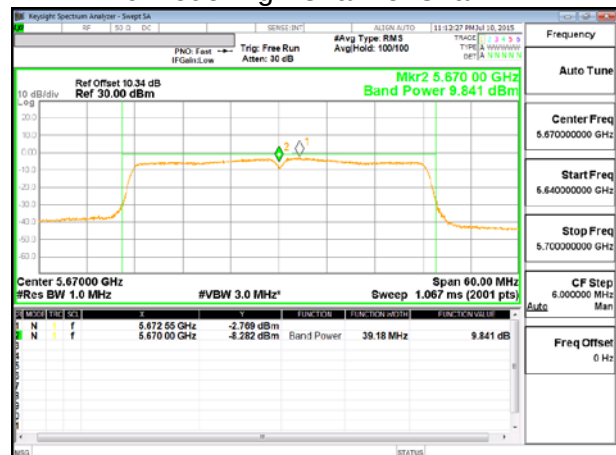
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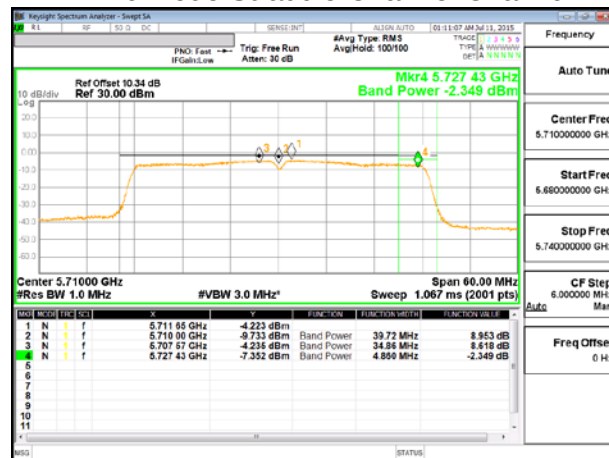
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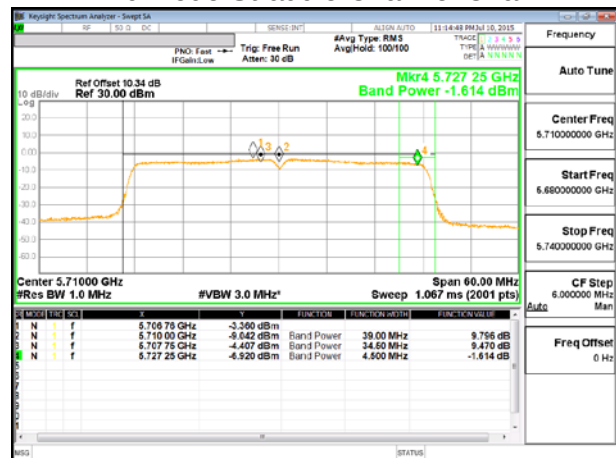
11n HT40 Mode High Channel Chain 1



11n HT40 Mode Straddle Channel Chain 0



11n HT40 Mode Straddle Channel Chain 1

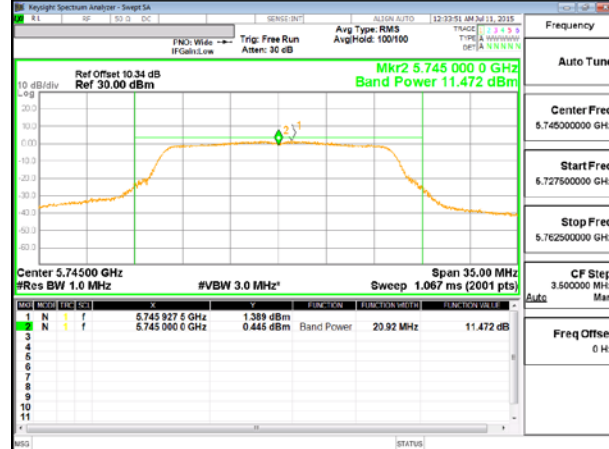


UNII 5.5 GHz IEEE 802.11ac VHT80 mode

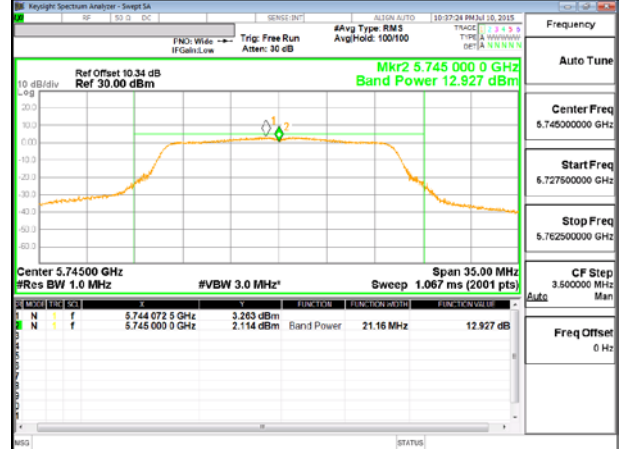


UNII 5.8 GHz IEEE 802.11a mode

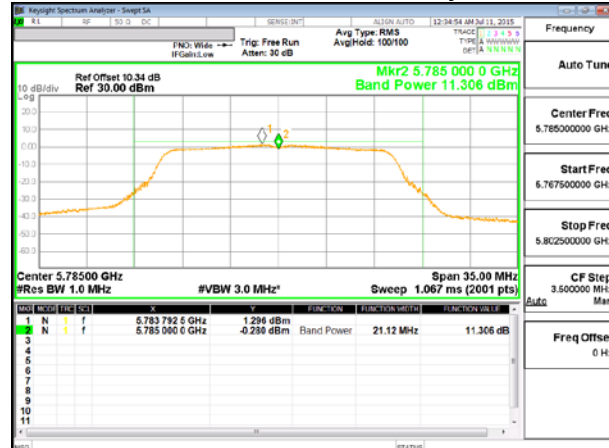
11a Mode Low Channel Primary



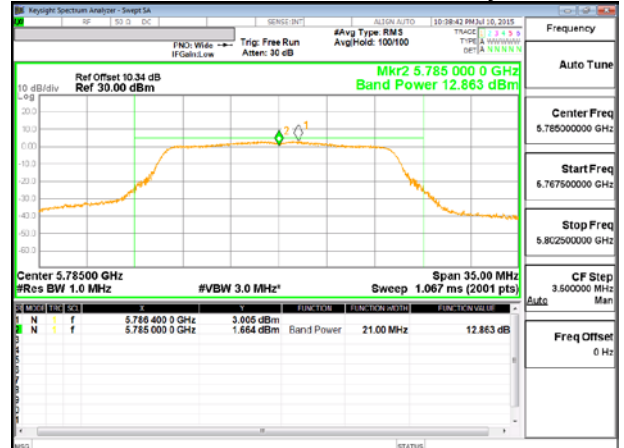
11a Mode Low Channel Secondary



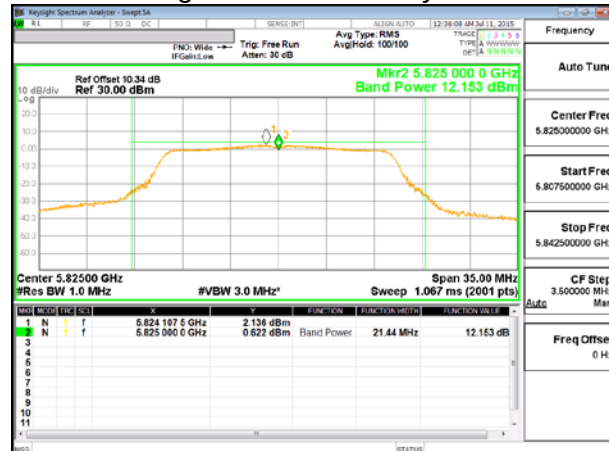
11a Mode Middle Channel Primary



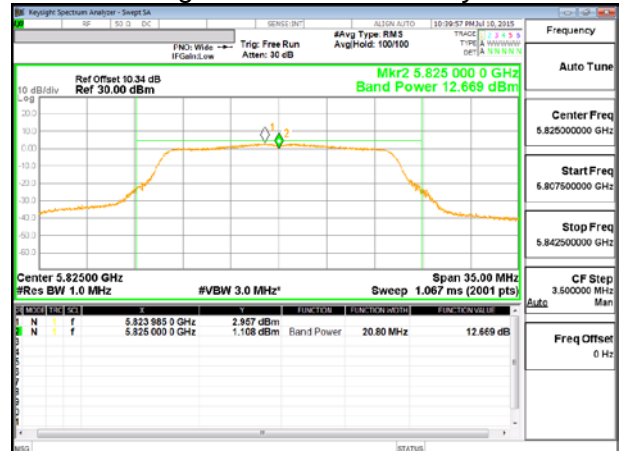
11a Mode Middle Channel Secondary



11a Mode High Channel Primary

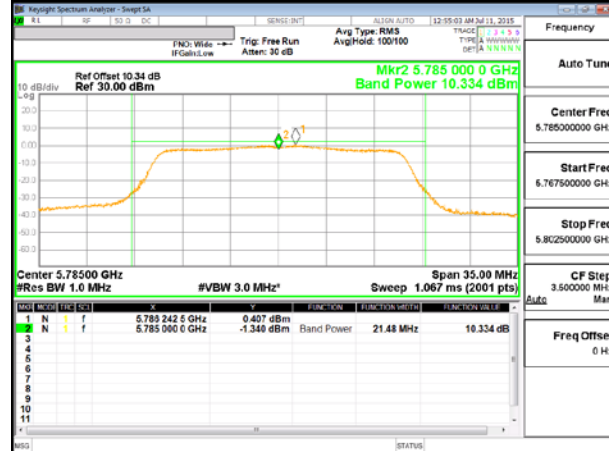


11a Mode High Channel Secondary



UNII 5.8 GHz IEEE 802.11n HT20 mode

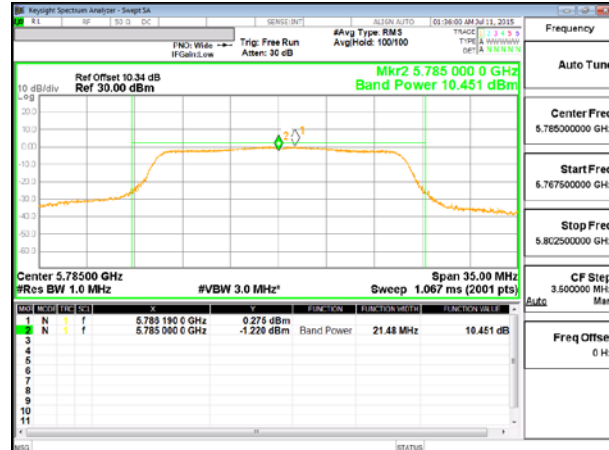
11n HT20 Mode Low Channel Chain 0



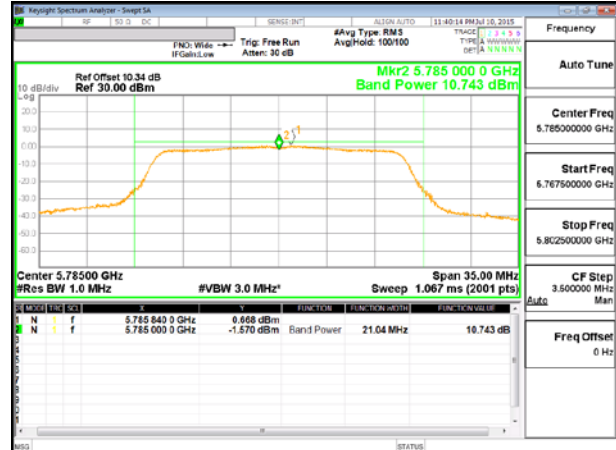
11n HT20 Mode Low Channel Chain 1



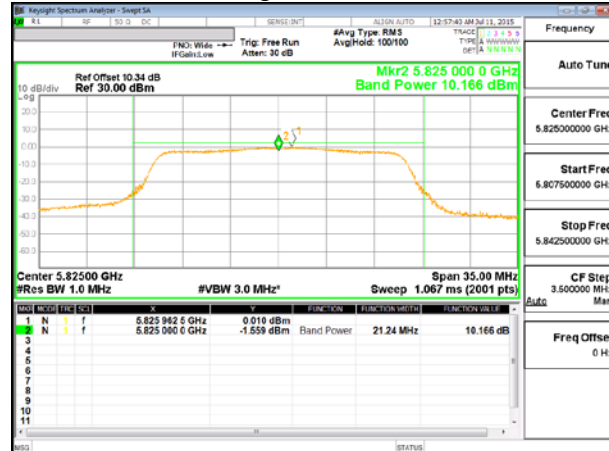
11n HT20 Mode Middle Channel Chain 0



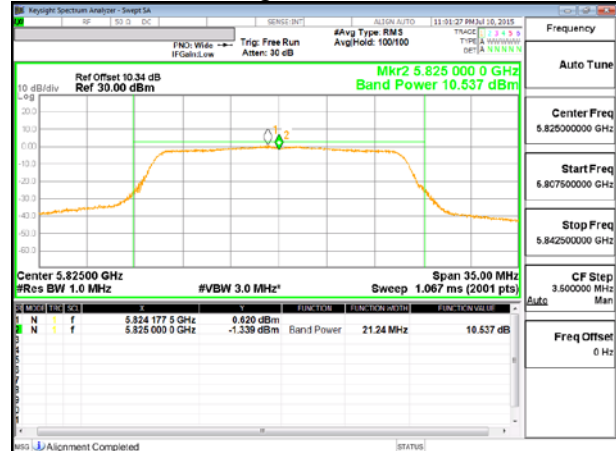
11n HT20 Mode Middle Channel Chain 1



11n HT20 Mode High Channel Chain 0

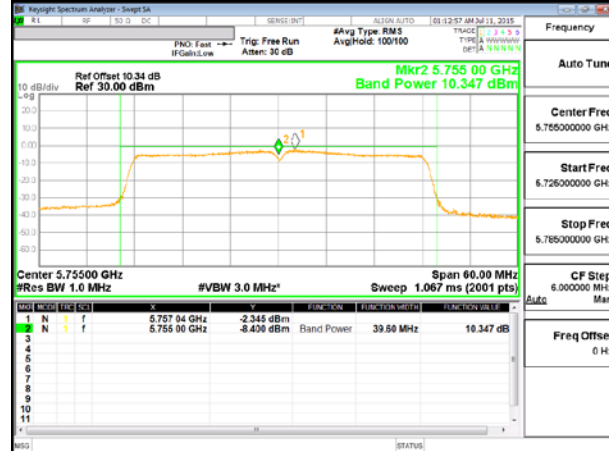


11n HT20 Mode High Channel Chain 1

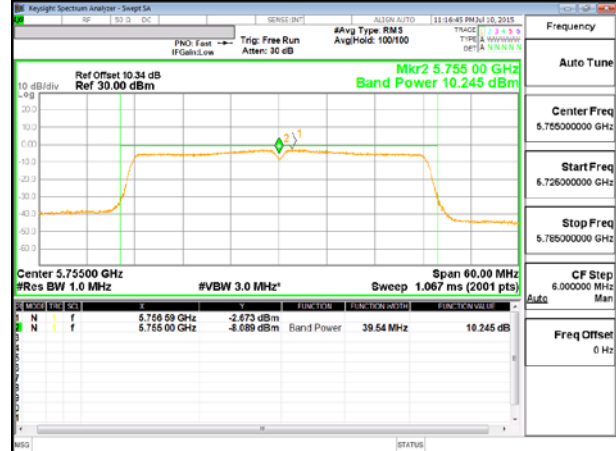


UNII 5.8 GHz IEEE 802.11n HT40 mode

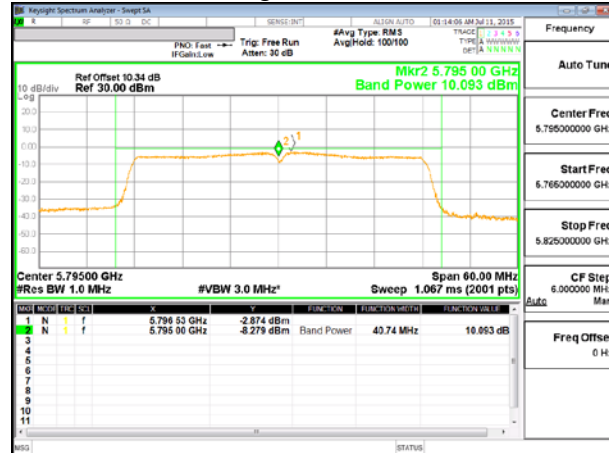
11n HT40 Mode Low Channel Chain 0



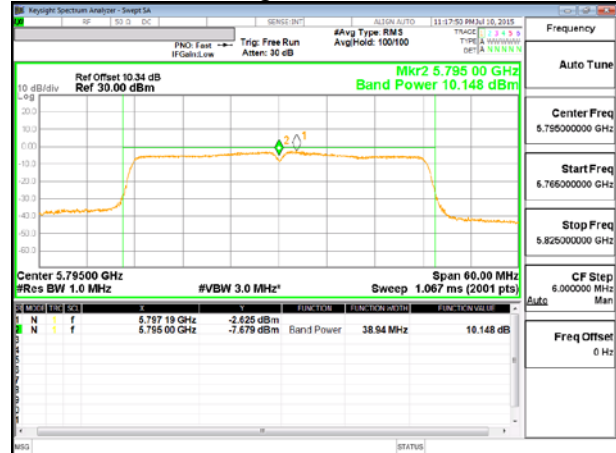
11n HT40 Mode Low Channel Chain 1



11n HT40 Mode High Channel Chain 0



11n HT40 Mode High Channel Chain 1

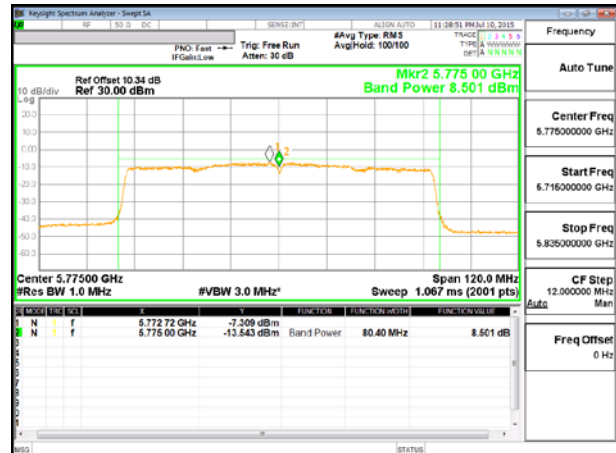


UNII 5.8 GHz IEEE 802.11ac VHT80 mode

11ac HT80 Mode Middle Channel Chain 0



11ac HT80 Mode Middle Channel Chain 1



11. TRANSMITTER ABOVE 1 GHz

LIMITS

FCC §15.205 and §15.209

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.

Reference to KDB 789033 D02 UNII part G) 6) c) Method AD:

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor to the reading offset 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.

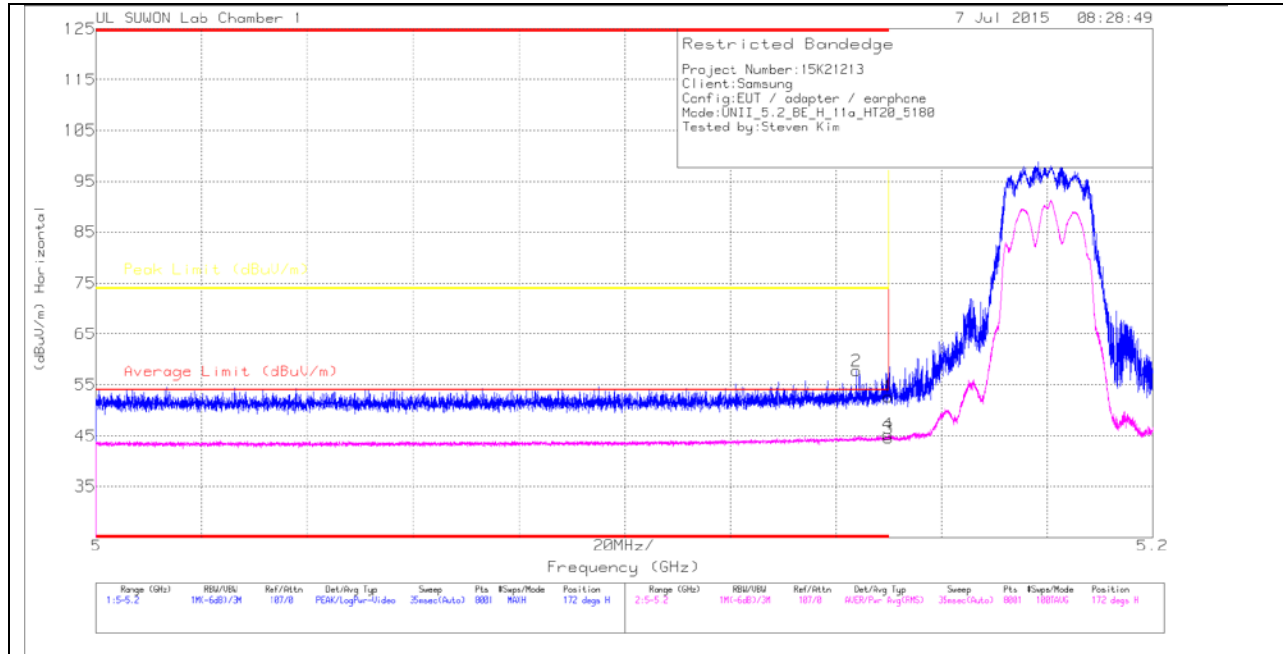
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

11.1. 5.2 GHz

11.1.1. TX Above 1GHz 802.11a 2TX CDD MODE IN THE 5.2GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

TRACE MARKERS

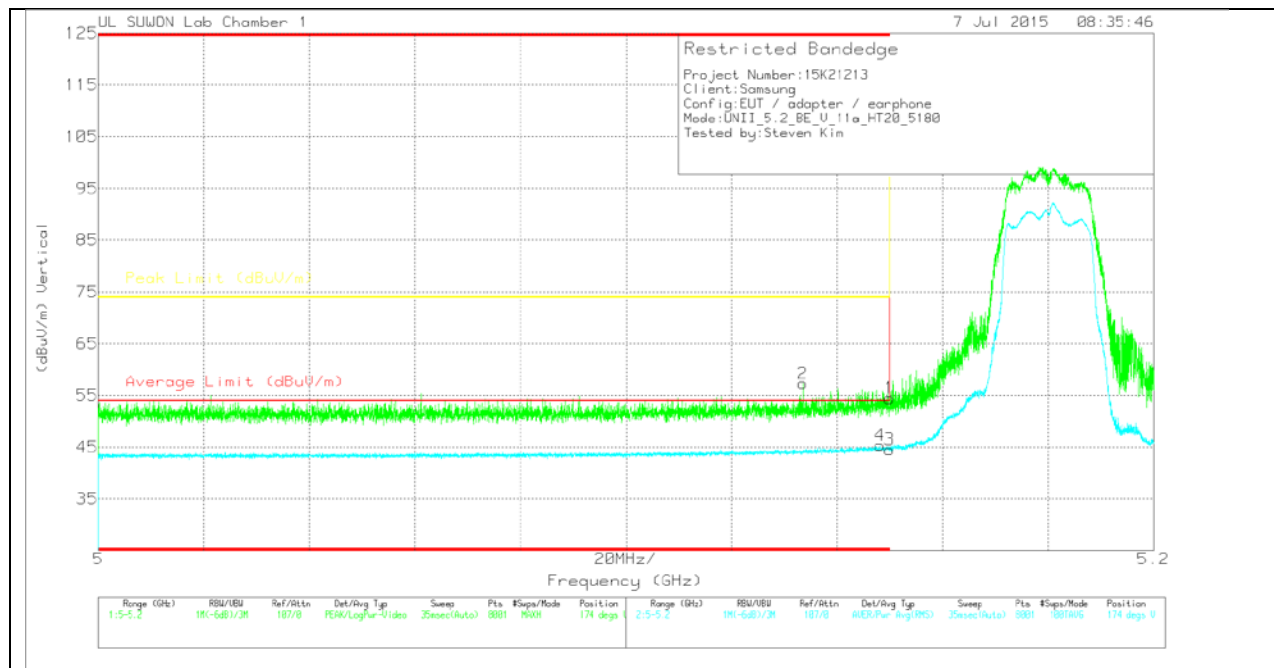
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_2_10d B	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.87	Pk		-19.4	0	52.67	-	-	74	-21.33	172	272	H
2	* 5.144	42.92	Pk		-19.4	0	57.72	-	-	74	-16.28	172	272	H
3	* 5.15	29.4	RMS		-19.4	.3	44.5	54	-9.5	-	-	172	272	H
4	* 5.15	30.14	RMS		-19.4	.3	45.24	54	-8.76	-	-	172	272	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_2_10d B	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	39.65	Pk	34.2	-19.4	0	54.45	-	-	74	-19.55	174	324	V
2	* 5.134	42.6	Pk	34.2	-19.5	0	57.3	-	-	74	-16.7	174	324	V
3	* 5.15	29.46	RMS	34.2	-19.4	.3	44.56	54	-9.44	-	-	174	324	V
4	* 5.148	30.25	RMS	34.2	-19.4	.3	45.35	54	-8.65	-	-	174	324	V

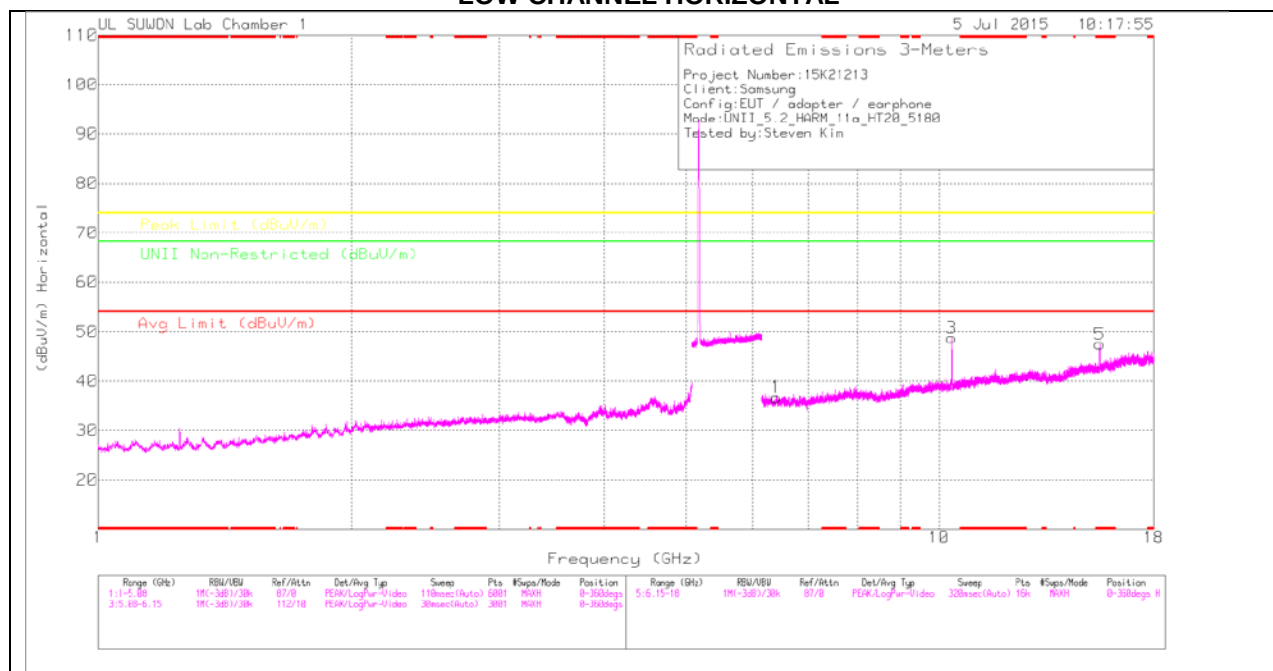
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

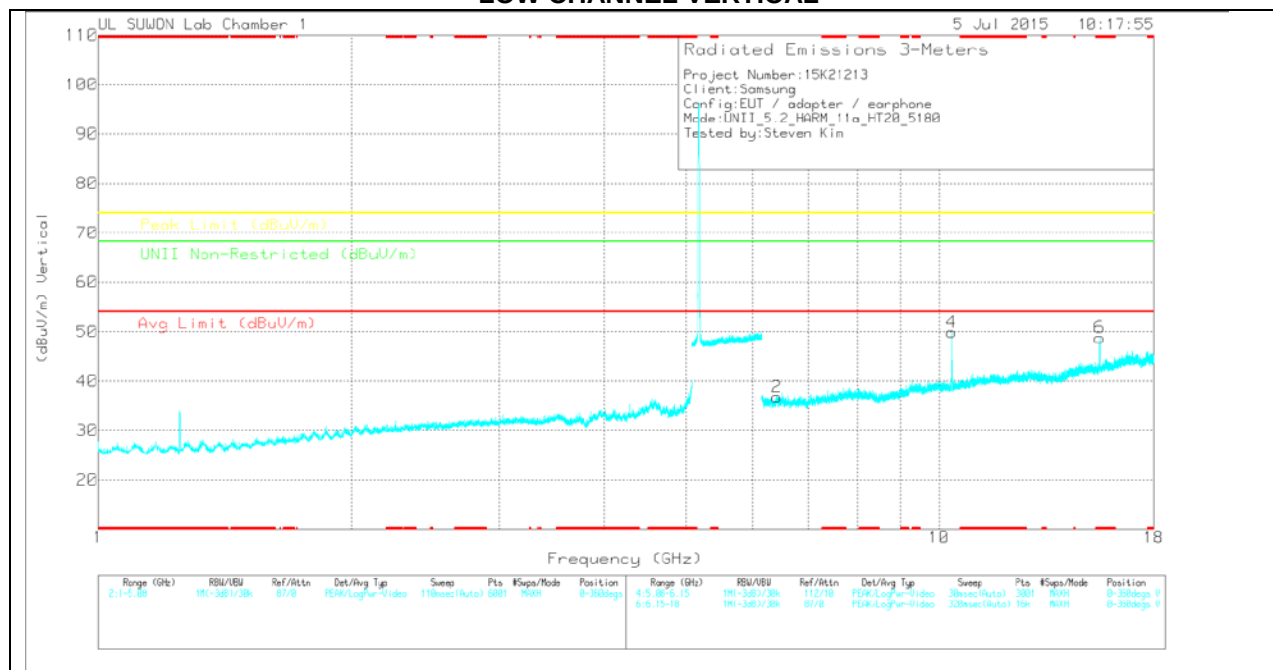
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8717)_150 619	Path_5_6G HP	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.403	27.32	PK	35.3	-25.9	0	36.72	-	-	-	-	68.2	-31.48	0-360	200	H
3	10.36	31.84	PK	37.8	-20.9	0	48.74	-	-	-	-	68.2	-19.46	0-360	200	H
5	* 15.536	27.08	PK	40.2	-19.8	0	47.48	-	-	74	-26.52	-	-	0-360	200	H
2	6.415	27.27	PK	35.3	-25.8	0	36.77	-	-	-	-	68.2	-31.43	0-360	100	V
4	10.36	33.09	PK	37.8	-21	0	49.89	-	-	-	-	68.2	-18.31	0-360	100	V
6	* 15.537	28.42	PK	40.2	-19.8	0	48.82	-	-	74	-25.18	-	-	0-360	200	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak detector

Radiated Emissions

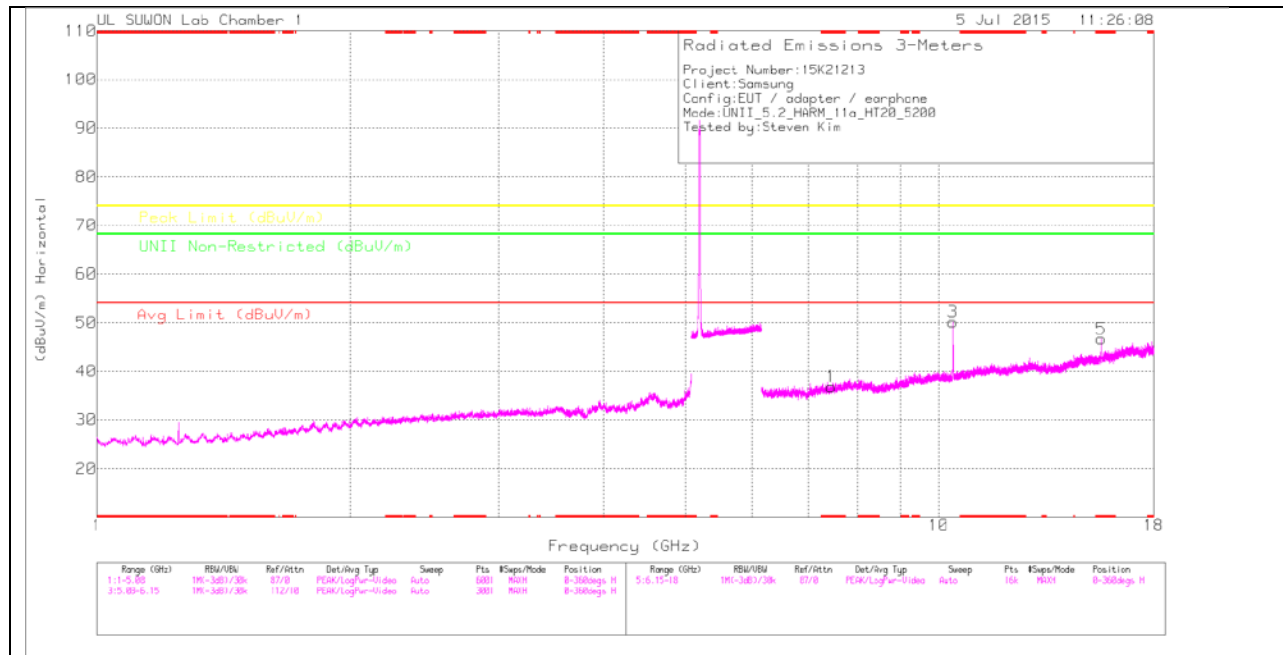
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_5_6GH P	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
10.36	40.88	PK1	37.8	-20.9	0	57.78	-	-	-	-	68.2	-10.42	256	273	H
* 15.544	39.29	PK1	40.3	-19.8	0	59.79	-	-	74	-14.21	-	-	167	221	H
* 15.538	25.12	AD1	40.2	-19.8	.3	45.82	54	-8.18	-	-	-	-	167	221	H
10.359	43.16	PK1	37.8	-21	0	59.96	-	-	-	-	68.2	-8.24	124	100	V
* 15.546	37.31	PK1	40.3	-19.8	0	57.81	-	-	74	-16.19	-	-	335	190	V
* 15.54	23.4	AD1	40.3	-19.8	.3	44.2	54	-9.8	-	-	-	-	335	190	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

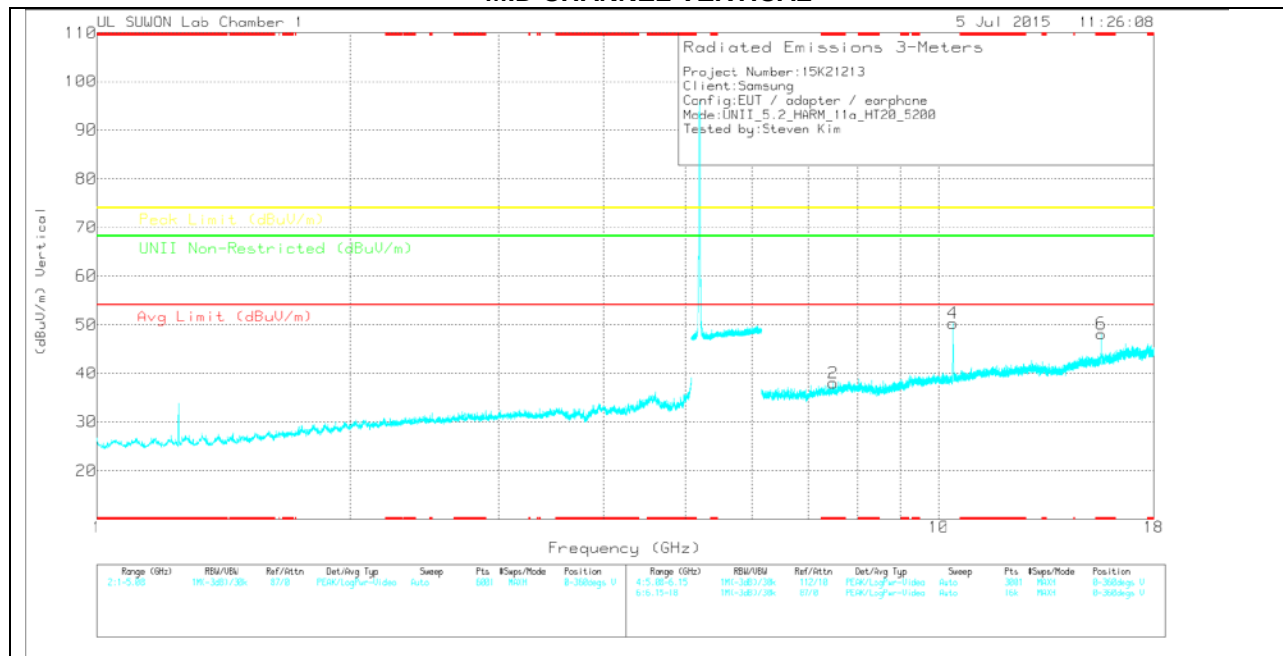
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117/0016 8717_150 619	Path_5_6G HP	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 7.454	25.94	PK	35.8	-24.9	0	36.84	-	-	74	-37.16	-	-	0-360	100	H
3	10.4	32.94	PK	37.8	-20.6	0	50.14	-	-	-	-	68.2	-18.06	0-360	200	H
5	* 15.6	26.14	PK	40.3	-19.8	0	46.64	-	-	74	-27.36	-	-	0-360	200	H
2	* 7.483	26.76	PK	35.8	-24.6	0	37.96	-	-	74	-36.04	-	-	0-360	100	V
4	10.4	33.04	PK	37.8	-20.6	0	50.24	-	-	-	-	68.2	-17.96	0-360	100	V
6	* 15.6	27.65	PK	40.3	-19.8	0	48.15	-	-	74	-25.85	-	-	0-360	200	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117/001687 17_150619	Path_5_6GHP	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
10.4	41.4	PK1	37.8	-20.6	0	58.6	-	-	-	-	68.2	-9.6	256	215	H
* 15.603	39.23	PK1	40.3	-19.8	0	59.73	-	-	74	-14.27	-	-	77	173	H
* 15.601	25.07	AD1	40.3	-19.8	.3	45.87	54	-8.13	-	-	-	-	77	173	H
10.4	42.55	PK1	37.8	-20.6	0	59.75	-	-	-	-	68.2	-8.45	125	101	V
* 15.604	39.04	PK1	40.3	-19.8	0	59.54	-	-	74	-14.46	-	-	150	214	V
* 15.602	24.89	AD1	40.3	-19.8	.3	45.69	54	-8.31	-	-	-	-	150	214	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average