4.5 Transmitter Spurious Emissions

Transmitter spurious emissions are emissions outside the frequency range of the equipment when the equipment is in transmit mode; per requirement of CFR47 15.205, 15.209, 15.407(b), RSS 210 Sect. A.9.2

4.5.1 **Test Methodology**

4.5.1.1 Preliminary Test

A test program that controls instrumentation and data logging was used to automate the preliminary RF emission test procedure. The frequency range of interest was divided into sub-ranges to yield a frequency resolution of approximately 120 kHz and provide a reading at each frequency for no more than 12° of turntable rotation. For each frequency sub-range the turntable was rotated 360° while peak emission data was recorded and plotted over the frequency range of interest in horizontal and vertical antenna polarization's.

Preliminary emission profile testing was performed inside the anechoic chamber. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the floor. The EUT was positioned as shown in the setup photographs. The receiving antenna was placed at a distance of 3m at a fixed height of 1m. Measurement equipment was located outside of the chamber. A video camera was placed inside the chamber to view the EUT.

Pres-scans were performed to determine the worst axis, data rate/ chains.

4.5.1.2 Final Test

For each frequency measured, the peak emission was maximized by manipulating the receiving antenna from 1 to 4 meters above the ground plane and placing it at the position that produced the maximum signal strength reading. The turntable was then rotated through 360° while observing the peak signal and placing the EUT at the position that produced maximum radiation. The six highest emissions relative to the limit were measured unless such emissions were more than 20 dB below the limit. If less than six emissions are within 20 dB of the limit, than the noise level of the receiver is measured at frequencies where emissions are expected. Multiples of all oscillator and microprocessor frequencies were also checked.

Final testing was performed on an NSA compliant test site. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane. The placement of EUT and cables were the same as for preliminary testing and is shown in the setup photographs.

The final scans performed on the worst axis, Y-Axis, for three operating channels;

6 Mbps for 802.11a Mode: 5260 MHz, 5300 MHz, 5320 MHz

MCS0 for 802.11n HT20 Mode: 5260 MHz, 5300 MHz, 5320 MHz

MCS0 for 802.11n HT40 Mode: 5270 MHz, 5310 MHz

MCS0 for 802.11ac VHT20 Mode: 5260 MHz, 5300 MHz, 5320 MHz

MCS0 for 802.11ac VHT40 Mode: 5270 MHz, 5310 MHz

MCS0 for 802.11ac VHT80 Mode: 5290 MHz

4.5.1.3 Deviations

None.

4.5.2 **Transmitter Spurious Emission Limit**

The spurious emissions of the transmitter shall not exceed the values in CFR47 Part 15.205, 15.209: 2013 and RSS 210 A1.1.2 2010.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490.....	2400/F(kHz)	300
0.490-1.705.....	24000/F(kHz)	30
1.705-30.0.....	30	30
30-88.....	100 **	3
88-216.....	150 **	3
216-960.....	200 **	3
Above 960.....	500	3

According to CFR47 15.407 (b), all harmonics and spurious emissions which are outside the 5150 MHz - 5250 MHz, 5250 MHz – 5350 MHz, or 5470 MHz – 5725MHz shall not exceed -27 dBm/MHz. This is equivalent to 68.2 dBuV/m at 3 meter distance.

4.5.3 **Test Results**

The final measurement data was taken under the worst case operating modes, configurations, and/or cable positions. It also reflects the results including any modifications and/or special accessories listed in Sections 1.4 and test plan.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 7: Transmit Spurious Emission at Band-Edge Requirements

Test Conditions: Radiated Measurement, Normal Temperature and Voltage only								
Antenna Type: Integrated				**Power Setting:** See test plan				
Max. Directional Gain: +8.0 dBi				**Signal State:** Modulated at 100%				
Ambient Temp.: 23 °C				**Relative Humidity:**31%				
Band-Edge Results								
Freq. (MHz)	Level (dBuV/m)	Polarity (H/V)	Limit (dBuV/m)	Margin (dB)	Det.	Table Deg.	Tower (cm)	Note
5150	62.98	H	74.00	-11.02	Pk	49	248	11a-5260MHz-6Mbps
5150	49.03	H	54.00	-4.97	Ave	49	248	11a-5260MHz-6Mbps
5350	62.85	V	74.00	-11.15	Pk	174	147	11a-5260MHz-6Mbps
5350	43.40	V	54.00	-10.60	Ave	174	147	11a-5260MHz-6Mbps
5350	67.85	H	74.00	-6.15	Pk	272	230	11a-5320MHz-6Mbps
5350	52.95	H	54.00	-1.05	Ave	272	230	11a-5320MHz-6Mbps
5350	64.44	V	74.00	-9.56	Pk	79	400	11a-5320MHz-6Mbps
5350	48.46	V	54.00	-5.54	Ave	79	400	11a-5320MHz-6Mbps
5350	63.06	H	74.00	-10.94	Pk	285	275	HT20-5260MHz-MCS0
5350	43.76	H	54.00	-10.24	Ave	285	275	HT20-5260MHz-MCS0
5350	64.02	V	74.00	-9.98	Pk	294	306	HT20-5260MHz-MCS0
5350	43.57	V	54.00	-10.43	Ave	294	306	HT20-5260MHz-MCS0
5350	68.11	H	74.00	-5.89	Pk	281	290	HT20-5320MHz-MCS0
5350	52.68	H	54.00	-1.32	Ave	281	290	HT20-5320MHz-MCS0
5350	65.05	V	74.00	-8.95	Pk	291	321	HT20-5320MHz-MCS0
5350	47.80	V	54.00	-6.20	Ave	291	321	HT20-5320MHz-MCS0
5350	63.65	H	74.00	-10.35	Pk	76	272	HT40-5270MHz-MCS0
5350	45.73	H	54.00	-8.27	Ave	76	272	HT40-5270MHz-MCS0
5350	64.16	V	74.00	-9.84	Pk	301	256	HT40-5270MHz-MCS0
5350	44.50	V	54.00	-9.50	Ave	301	256	HT40-5270MHz-MCS0
5350	65.59	H	74.00	-8.41	Pk	284	294	HT40-5310MHz-MCS0
5350	53.02	H	54.00	-0.98	Ave	284	294	HT40-5310MHz-MCS0
5350	64.78	V	74.00	-9.22	Pk	293	255	HT40-5310MHz-MCS0
5350	48.35	V	54.00	-5.65	Ave	293	255	HT40-5310MHz-MCS0
5350	63.78	H	74.00	-10.22	Pk	287	218	VHT20-5260MHz-MCS0
5350	44.80	H	54.00	-9.20	Ave	287	218	VHT20-5260MHz-MCS0
5350	63.48	V	74.00	-10.52	Pk	293	219	VHT20-5260MHz-MCS0
5350	44.34	V	54.00	-9.66	Ave	293	219	VHT20-5260MHz-MCS0
5350	68.89	H	74.00	-5.11	Pk	284	291	VHT20-5320MHz-MCS0
5350	52.25	H	54.00	-1.75	Ave	284	291	VHT20-5320MHz-MCS0
5350	64.00	V	74.00	-10.00	Pk	293	274	VHT20-5320MHz-MCS0

5350	48.64	V	54.00	−5.36	Ave	293	274	VHT20−5320MHz−MCS0
5350	64.47	H	74.00	−9.53	Pk	288	236	VHT40−5270MHz−MCS0
5350	45.53	H	54.00	−8.47	Ave	288	236	VHT40−5270MHz−MCS0
5350	63.22	V	74.00	−10.78	Pk	297	326	VHT40−5270MHz−MCS0
5350	44.00	V	54.00	−10.00	Ave	297	326	VHT40−5270MHz−MCS0
5350	65.21	H	74.00	−8.79	Pk	191	152	VHT40−5310MHz−MCS0
5350	51.70	H	54.00	−2.30	Ave	191	152	VHT40−5310MHz−MCS0
5350	63.62	V	74.00	−10.38	Pk	46	219	VHT40−5310MHz−MCS0
5350	49.21	V	54.00	−4.79	Ave	46	219	VHT40−5310MHz−MCS0
5350	68.81	H	74.00	−5.19	Pk	54	146	VHT80−5290MHz−MCS0
5350	52.64	H	54.00	−1.36	Ave	54	146	VHT80−5290MHz−MCS0
5350	68.53	V	74.00	−5.47	Pk	10	146	VHT80−5290MHz−MCS0
5350	49.48	V	54.00	−4.52	Ave	10	146	VHT80−5290MHz−MCS0

Note: 1. Band-edge frequency at 5150 MHz and 5350 MHz are at the restricted bands.

2. All the band-edge measurements met the restricted band requirements of CFR47 15.205.

3. Out of band emission also complied with the -27 dBm/MHz (68.2 dBuV/m at 3m) requirements as stated in CFR47 15.407 (b) (1) to 15.407 (b) (3), or it met both peak and average limit per CFR47 15.205.

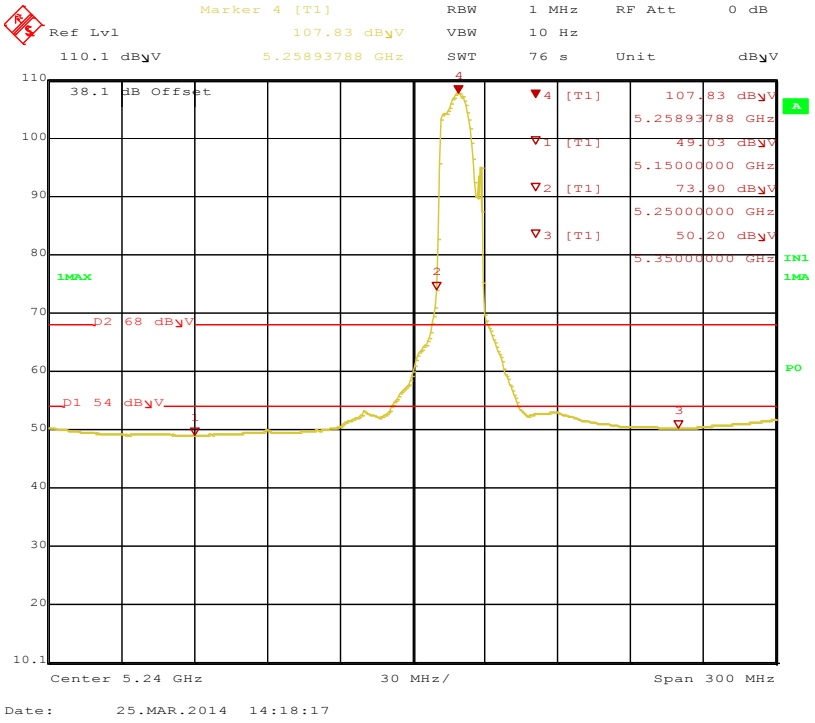

Figure 183: Bandedge-5260MHz-11a-MCS0-H-Ave

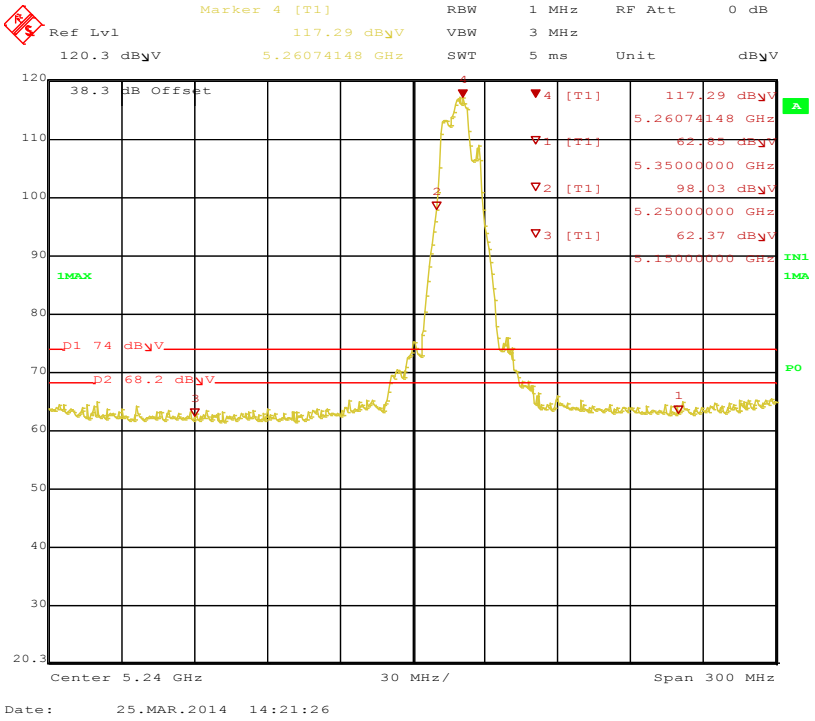

Figure 184: Bandedge-5260MHz-11a-MCS0-V-pk

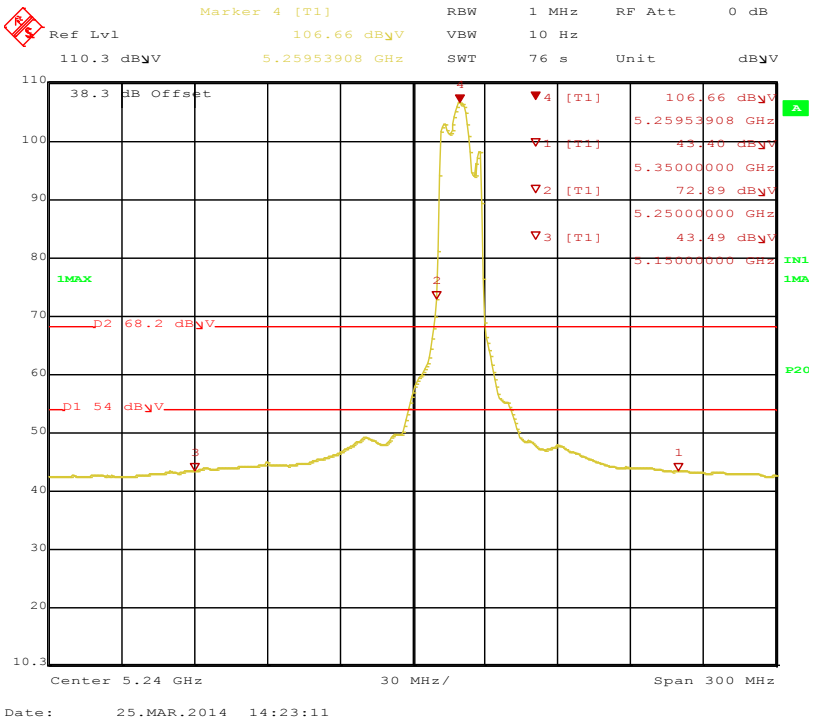

Figure 185: Bandedge-5260MHz-11a-MCS0-V-Ave

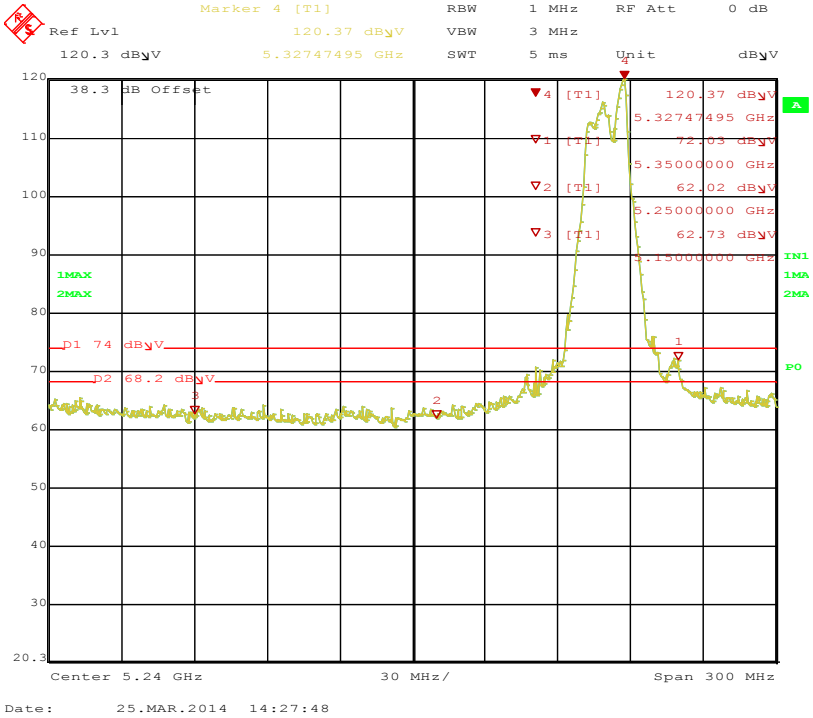

Figure 186: Bandedge-5320MHz-11a-MCS0-H-Pk

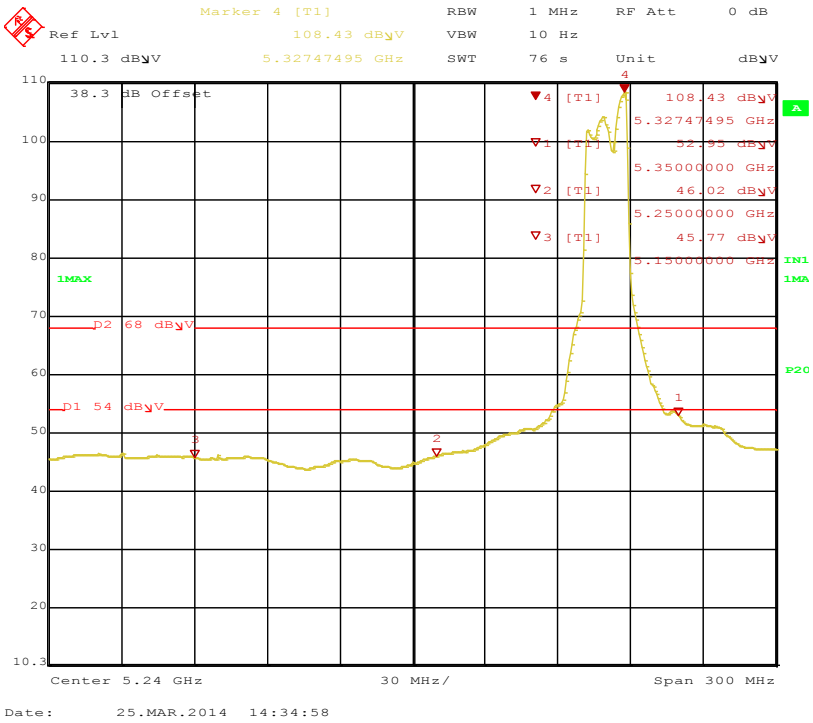

Figure 187: Bandedge-5320MHz-11a-MCS0-H-ave

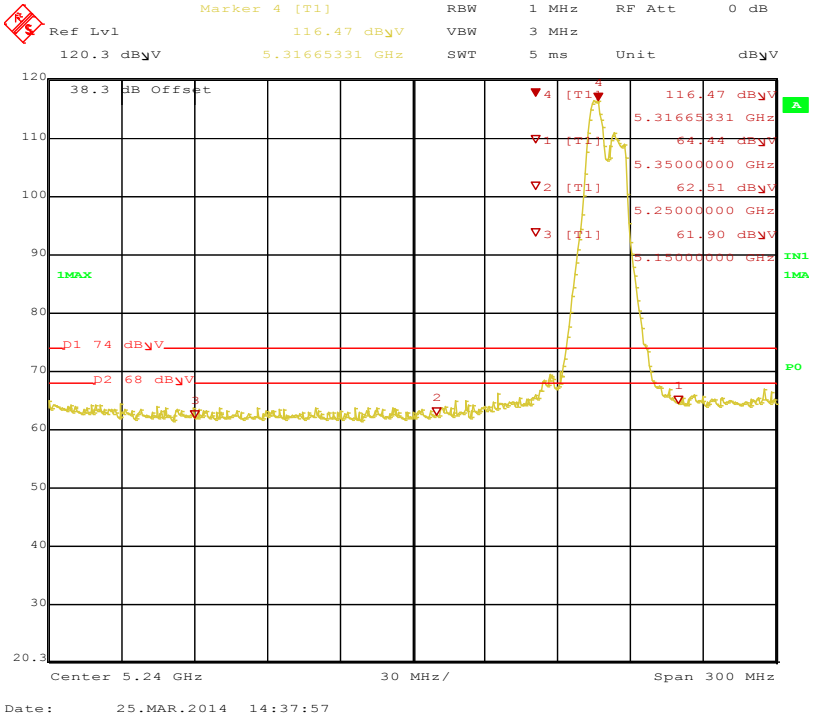

Figure 188: Bandedge-5320MHz-11a-MCS0-V-Pk

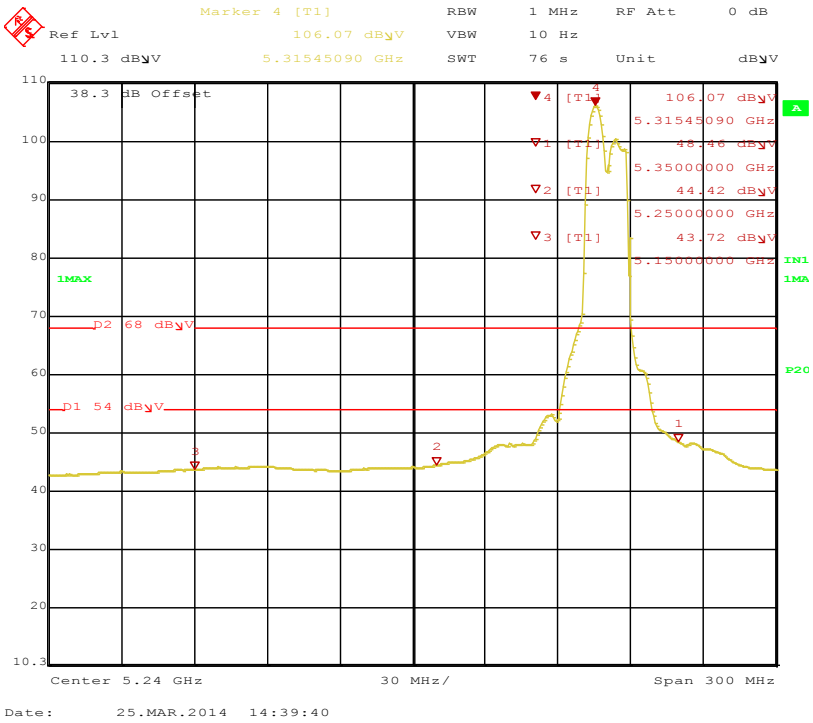

Figure 189: Bandedge-5320MHz-11a-MCS0-V-ave

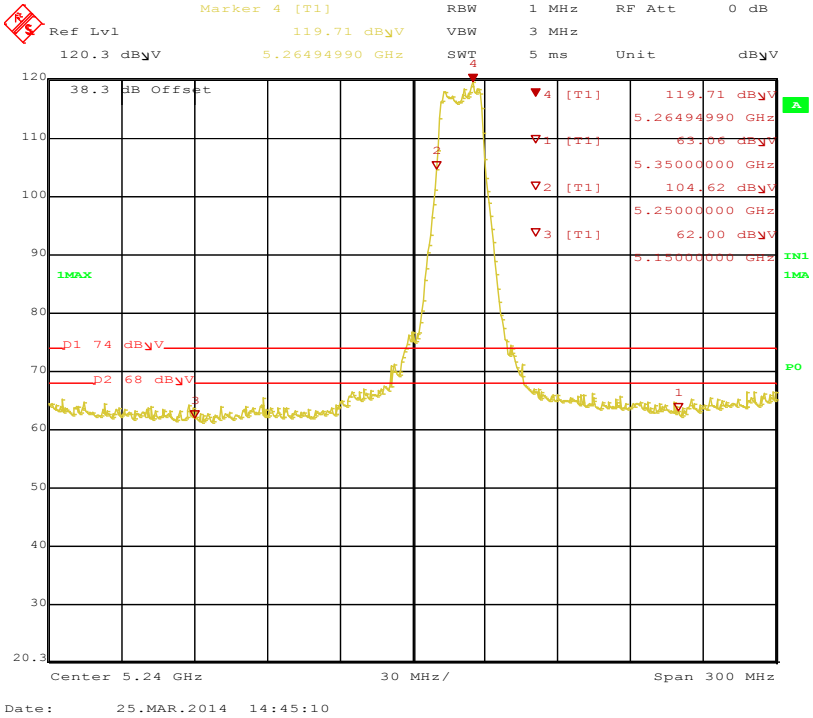

Figure 190: Bandedge-5260MHz-HT20-MCS0-H-Pk

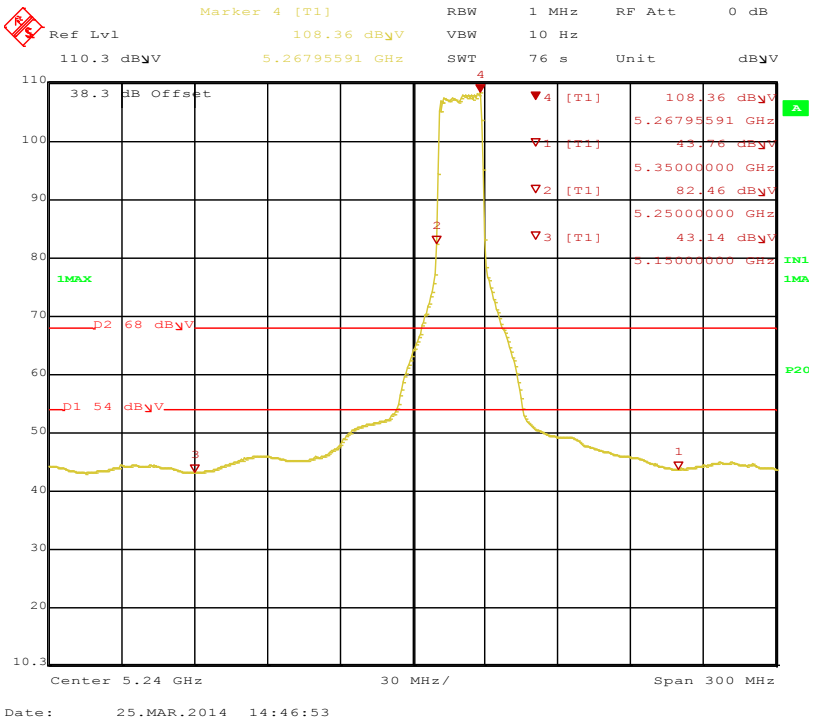

Figure 191: Bandedge-5260MHz-HT20-MCS0-H-Ave

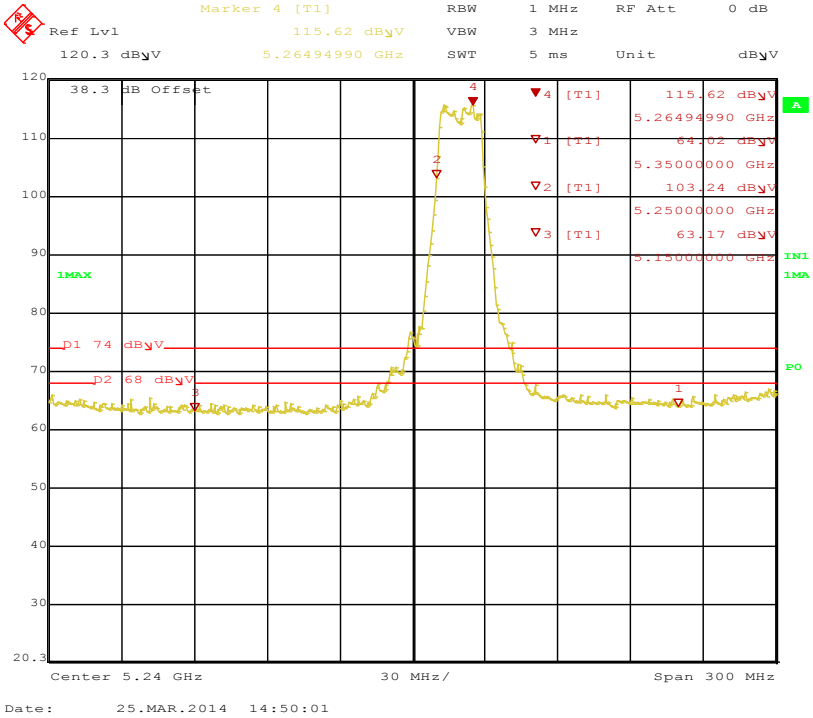

Figure 192: Bandedge-5260MHz-HT20-MCS0-V-pk

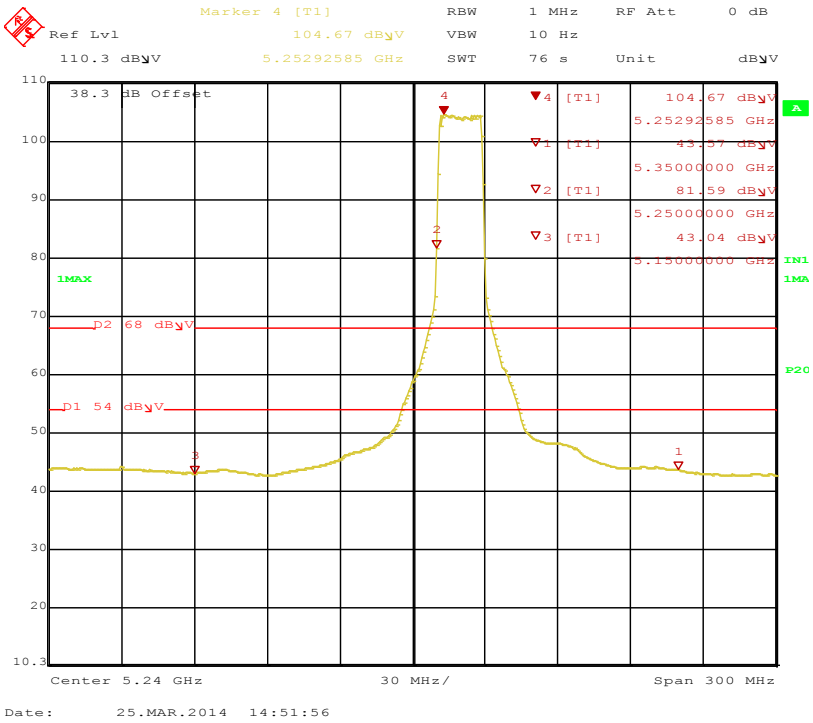

Figure 193: Bandedge-5260MHz-HT20-MCS0-V-ave

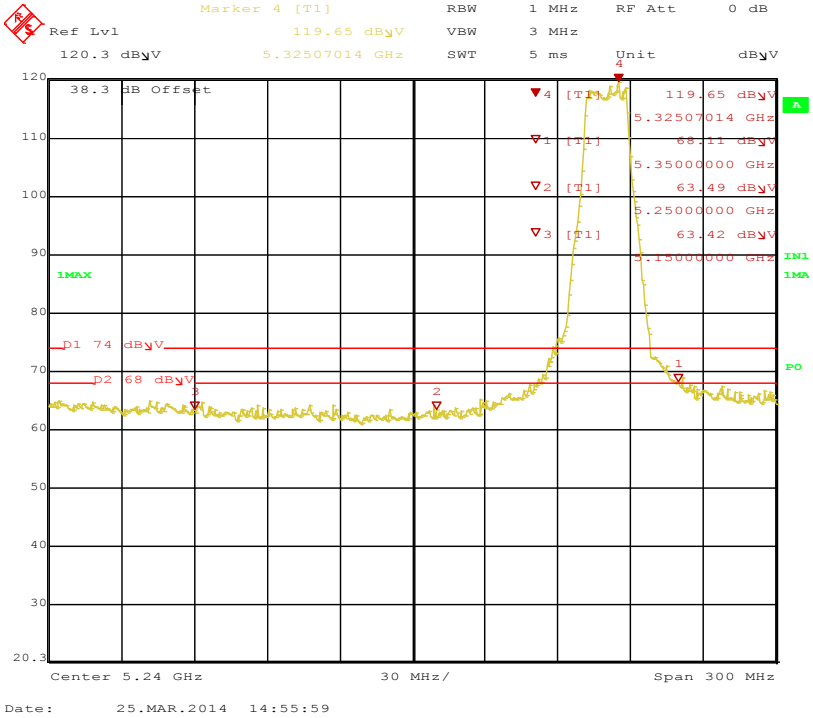

Figure 194: Bandedge-5320MHz-HT20-MCS0-H-Pk

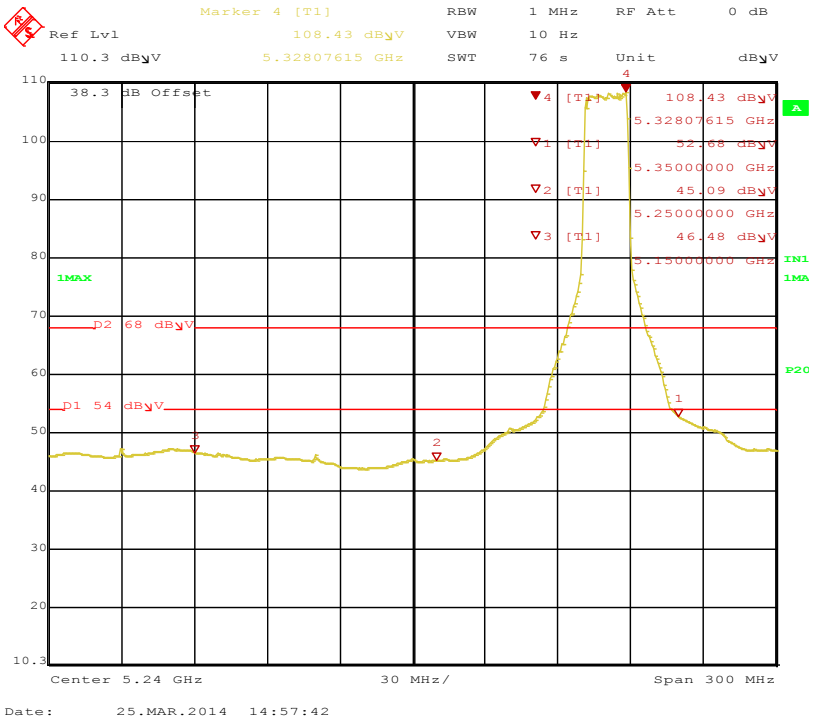

Figure 195: Bandedge-5320MHz-HT20-MCS0-H-Ave

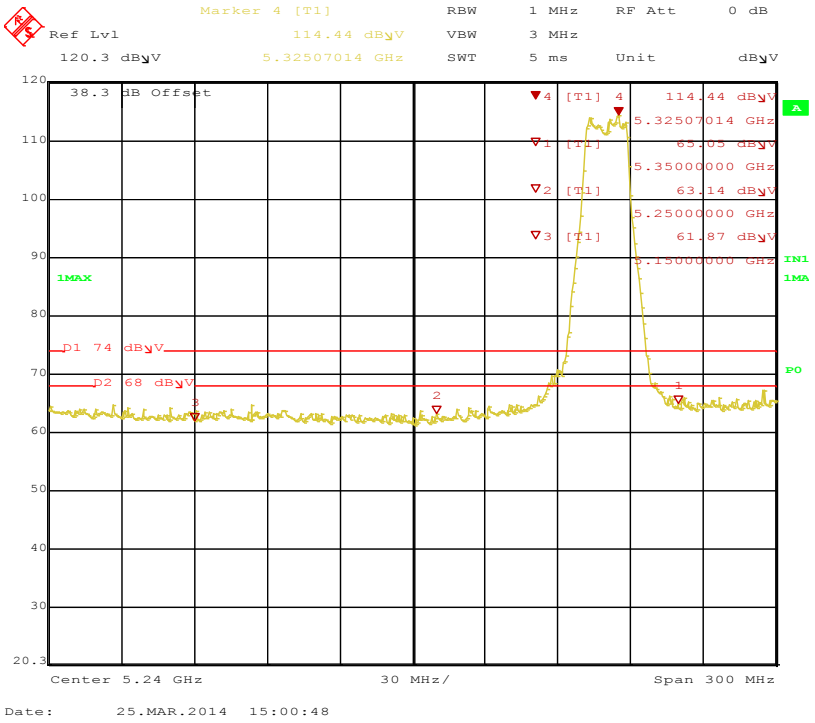

Figure 196: Bandedge-5320MHz-HT20-MCS0-V-Pk

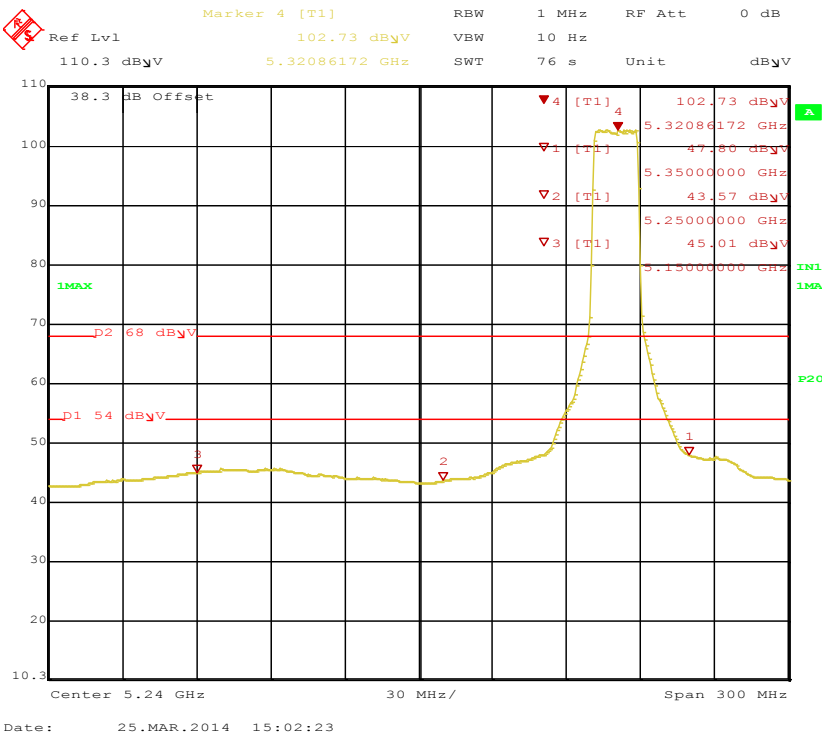

Figure 197: Bandedge-5320MHz-HT20-MCS0-V-Ave

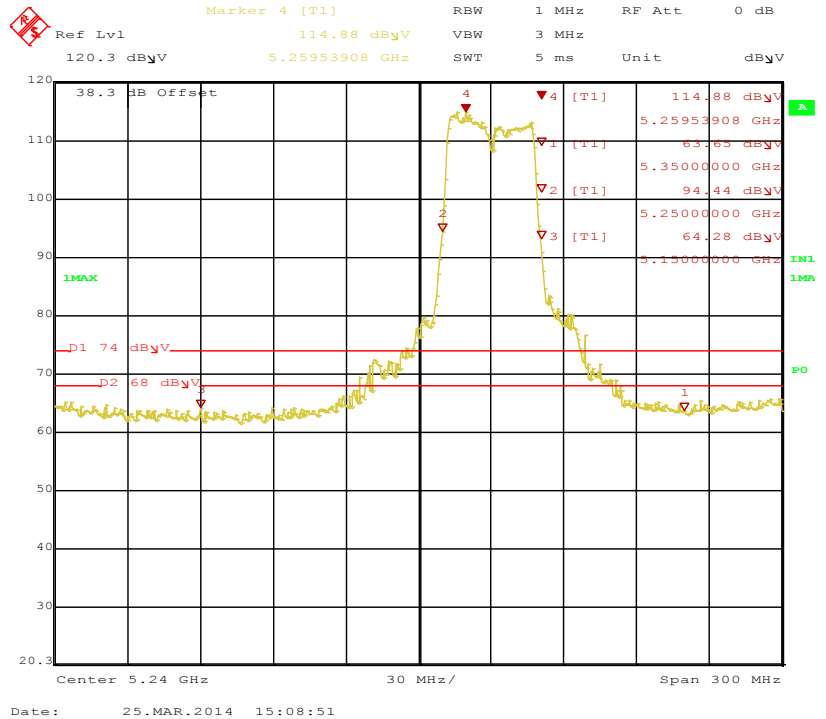

Figure 198: Bandedge-5270MHz-HT40-MCS0-H-Pk

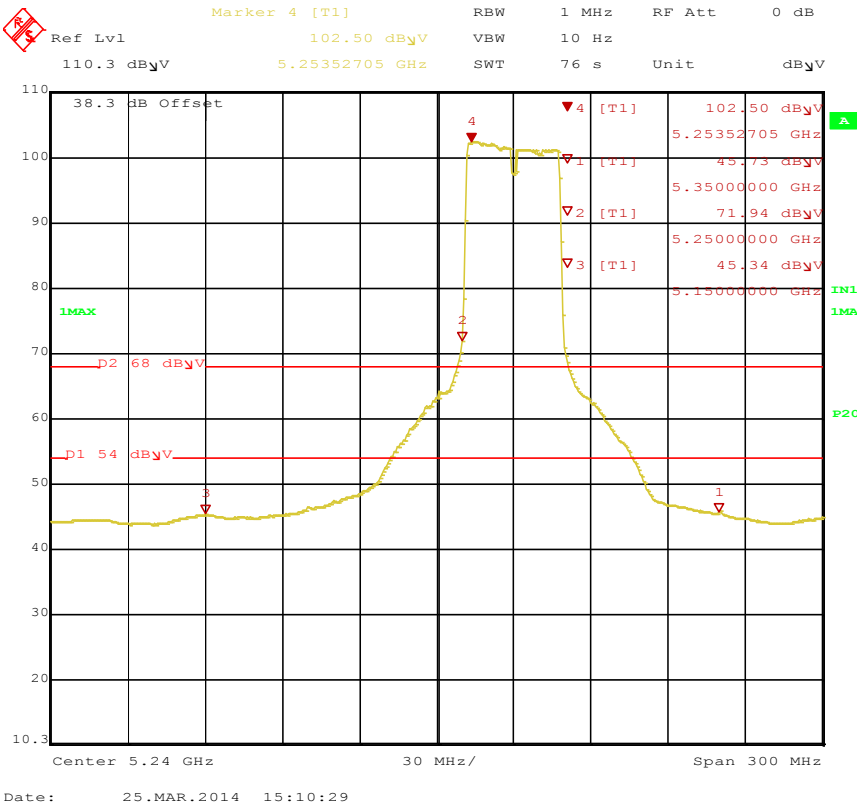

Figure 199: Bandedge-5270MHz-HT40-MCS0-H-ave

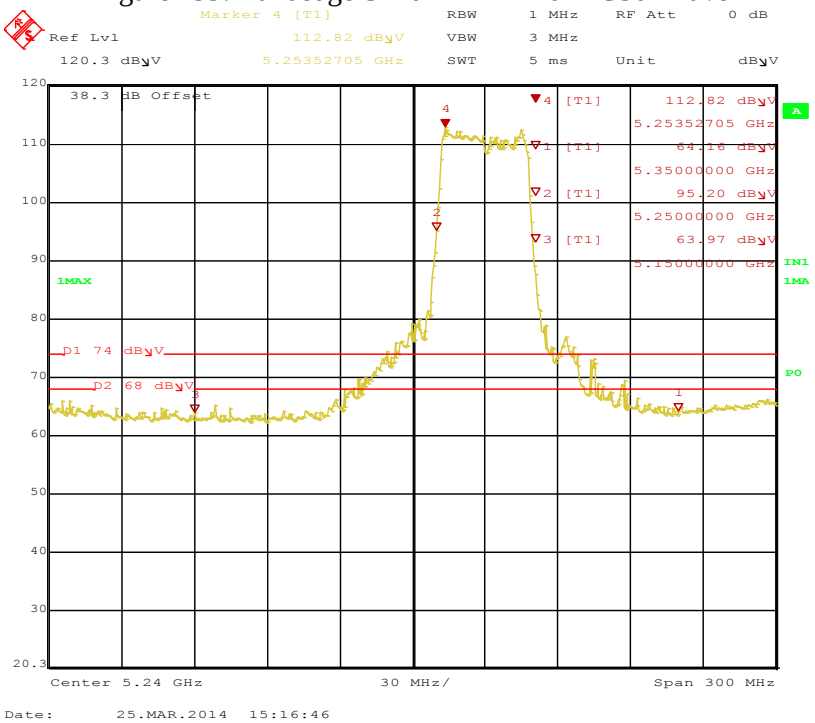

Figure 200: Bandedge-5270MHz-HT40-MCS0-V-Pk

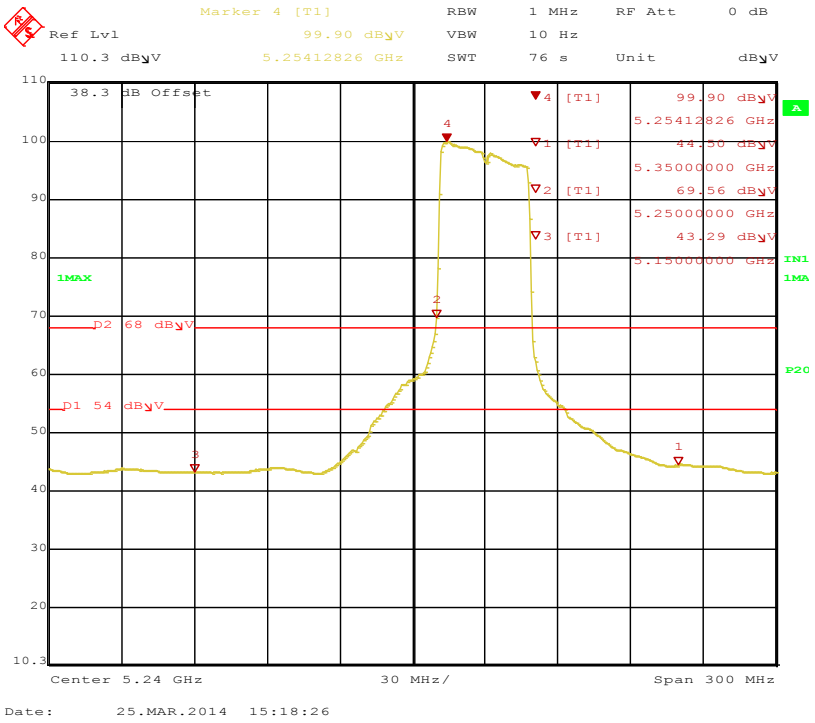

Figure 201: Bandedge-5270MHz-HT40-MCS0-V-ave

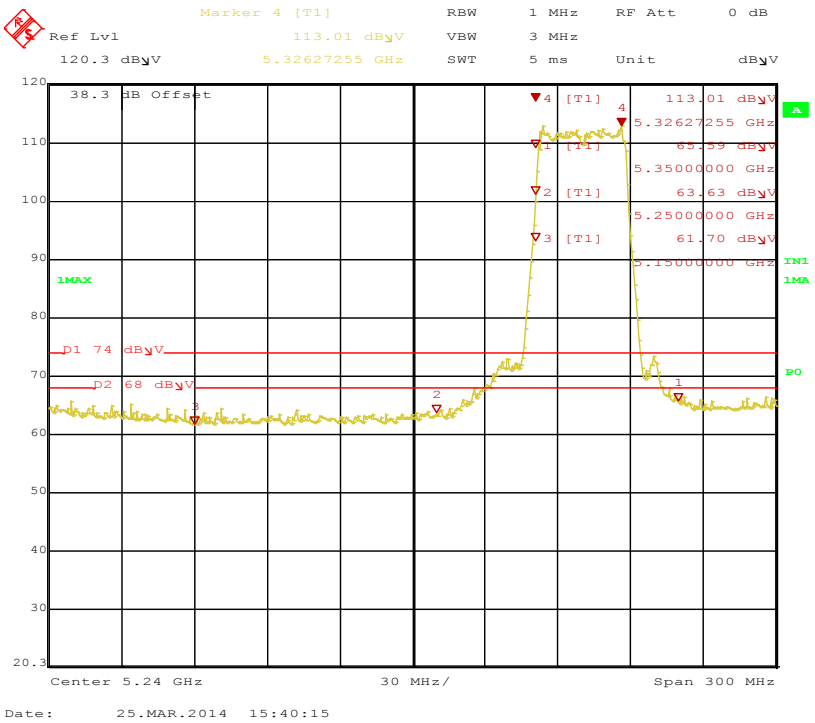

Figure 202: Bandedge-5310MHz-HT40-MCS0-H-pk

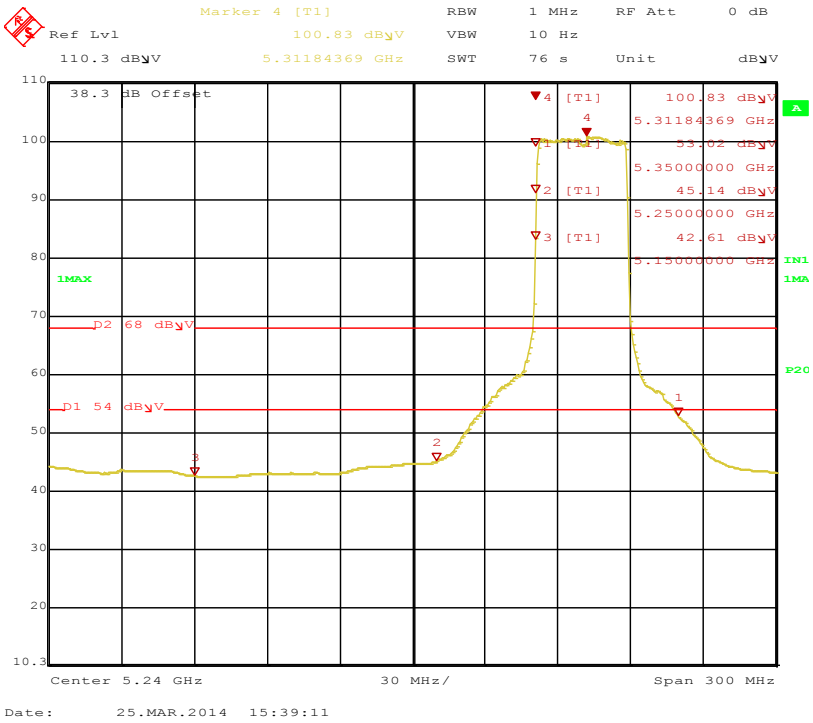

Figure 203: Bandedge-5310MHz-HT40-MCS0-H-Ave

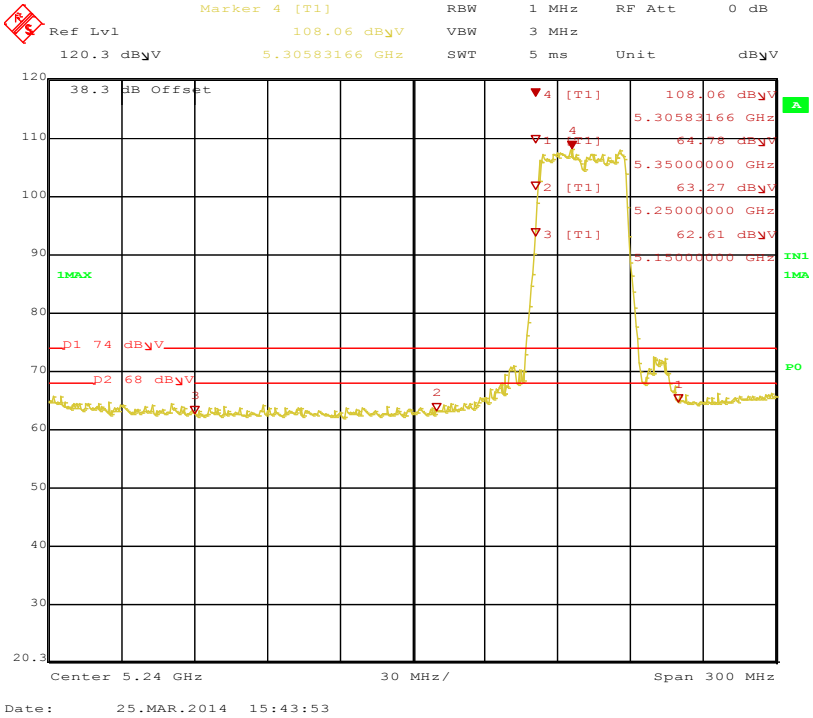

Figure 204: Bandedge-5310MHz-HT40-MCS0-V-Pk

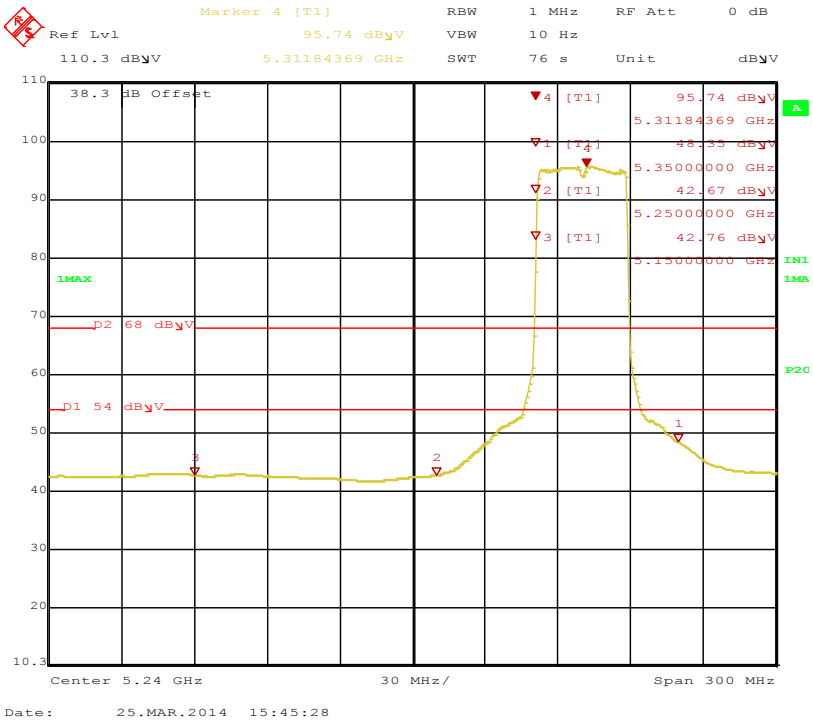

Figure 205: Bandedge-5310MHz-HT40-MCS0-V-Ave

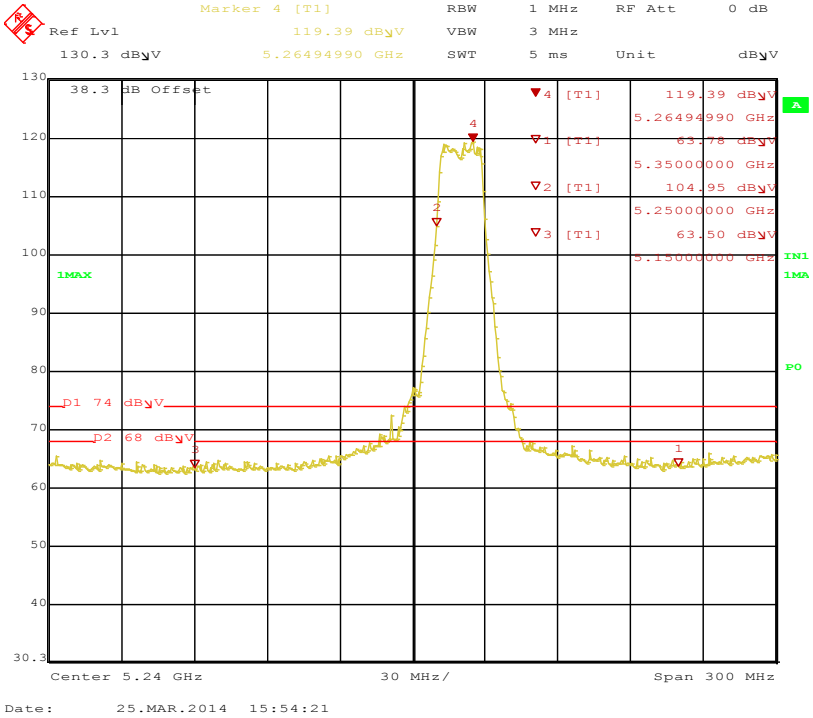

Figure 206: Bandedge-5260MHz-VHT20-MCS0-H-Pk

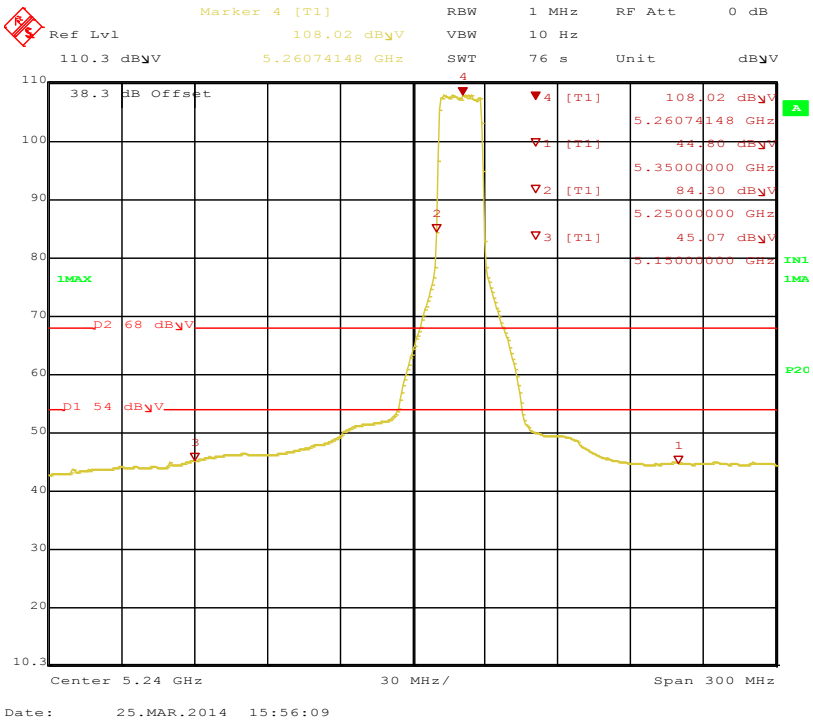

Figure 207: Bandedge-5260MHz-VHT20-MCS0-H-Ave

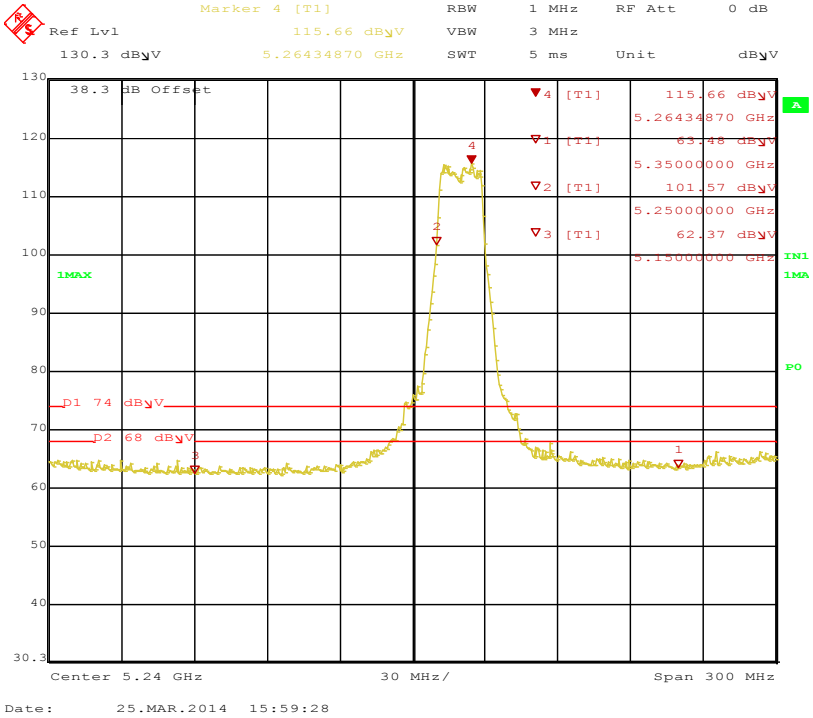

Figure 208: Bandedge-5260MHz-VHT20-MCS0-V-pk

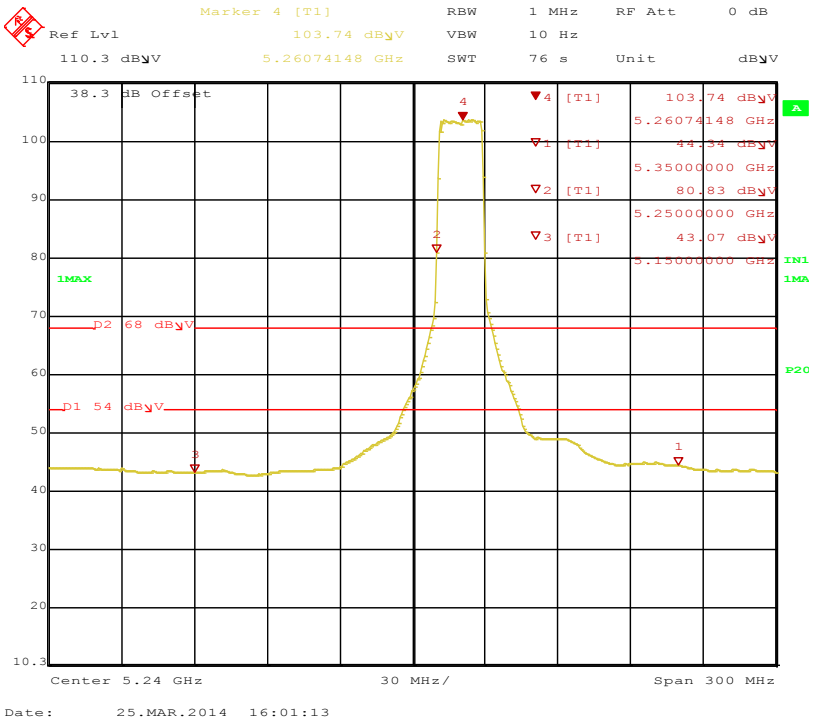

Figure 209: Bandedge-5260MHz-VHT20-MCS0-V-Ave

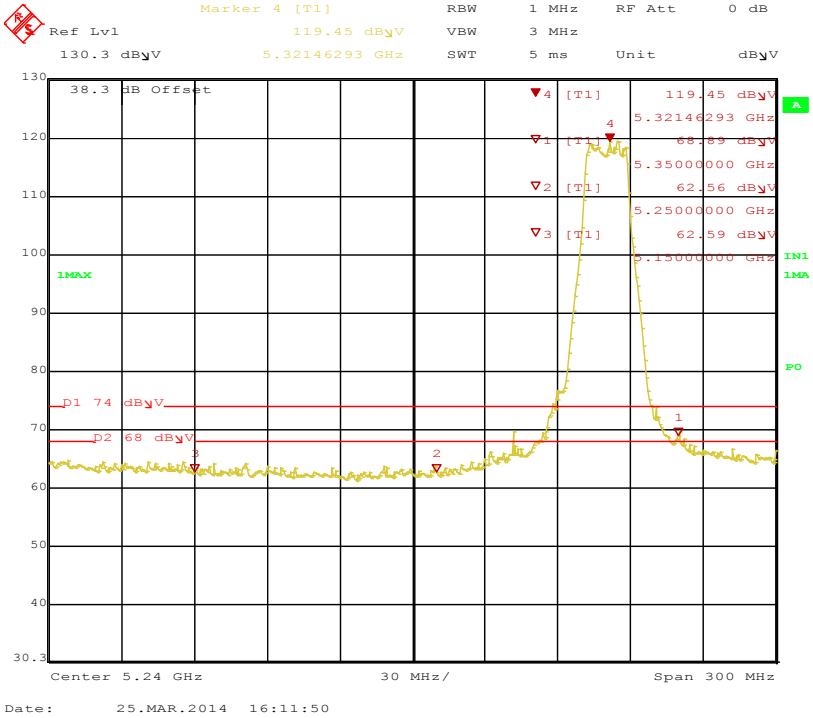

Figure 210: Bandedge-5320MHz-VHT20-MCS0-H-Pk

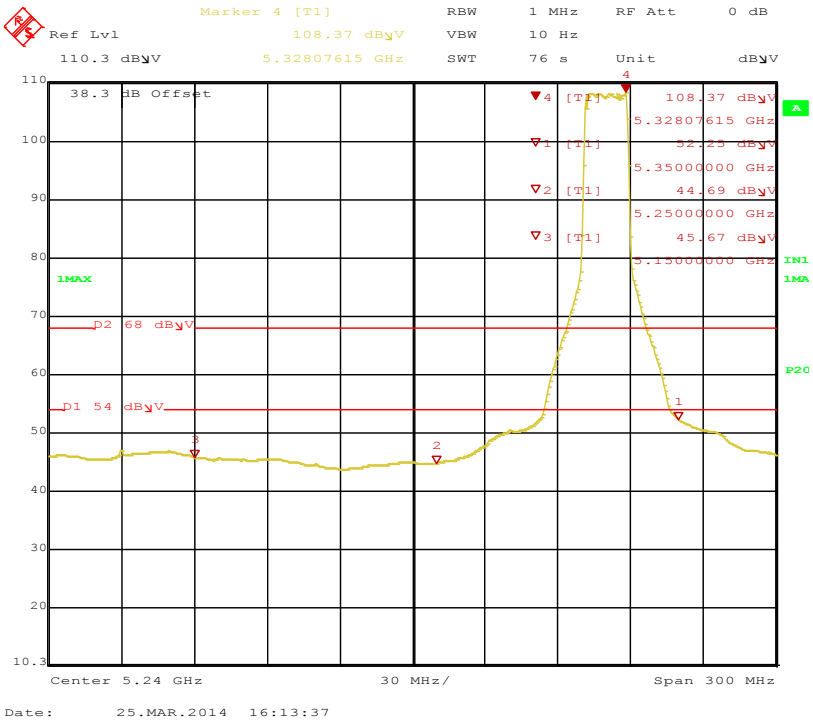

Figure 211: Bandedge-5320MHz-VHT20-MCS0-H-Ave

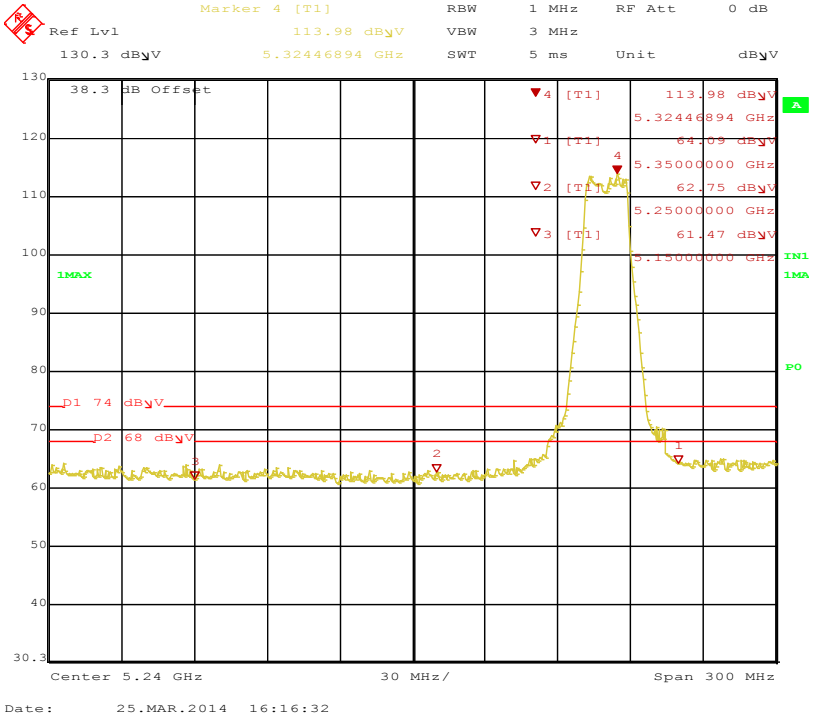

Figure 212: Bandedge-5320MHz-VHT20-MCS0-V-Pk

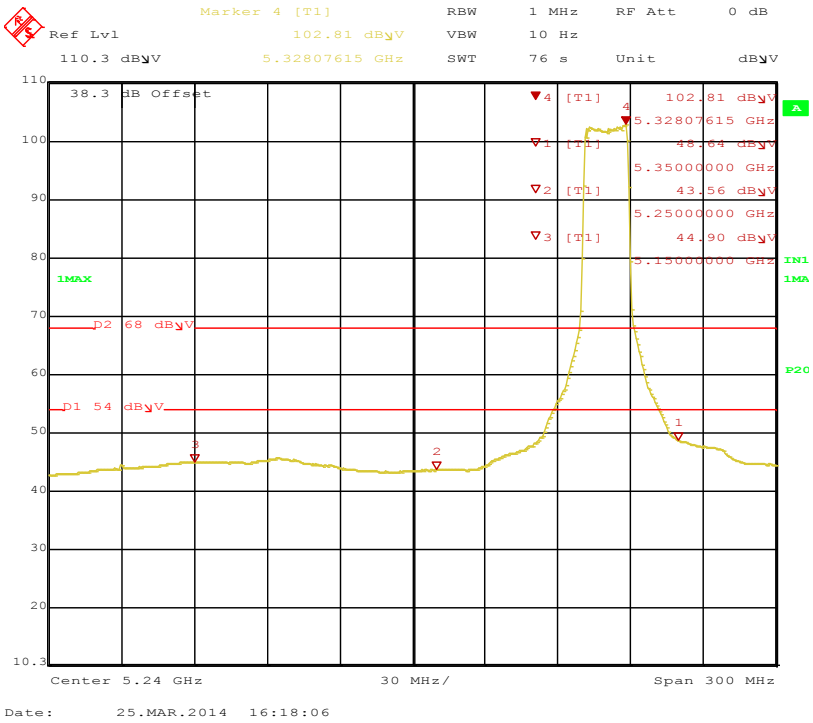

Figure 213: Bandedge-5320MHz-VHT20-MCS0-V-Ave

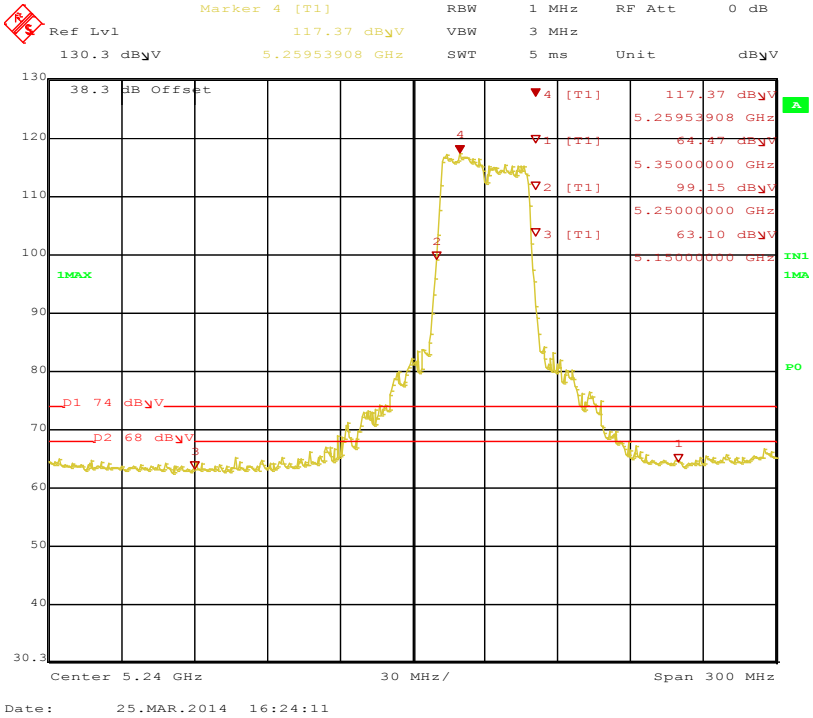

Figure 214: Bandedge-5270MHz-VHT40-MCS0-H-Pk

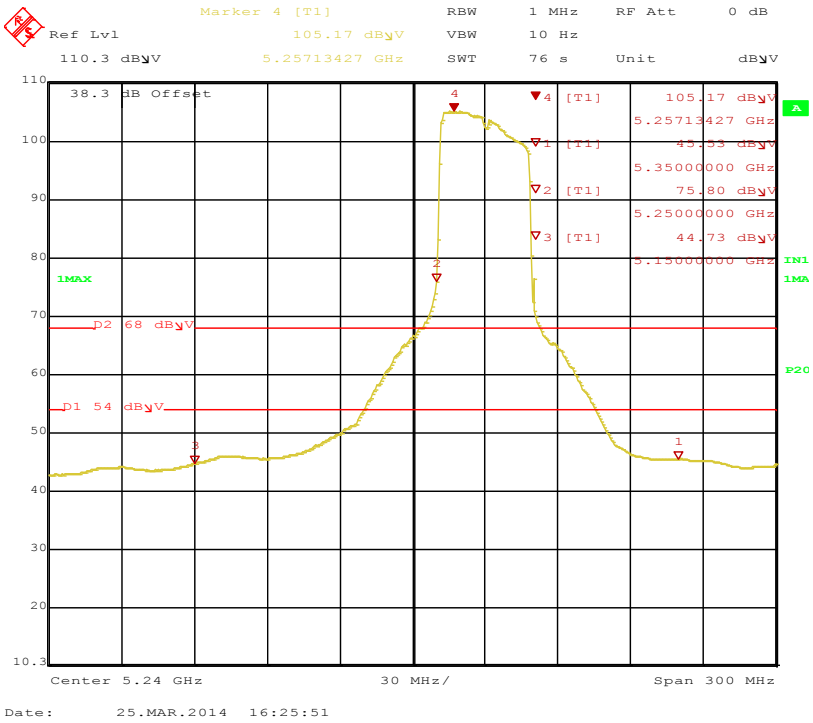

Figure 215: Bandedge-5270MHz-VHT40-MCS0-H-Ave

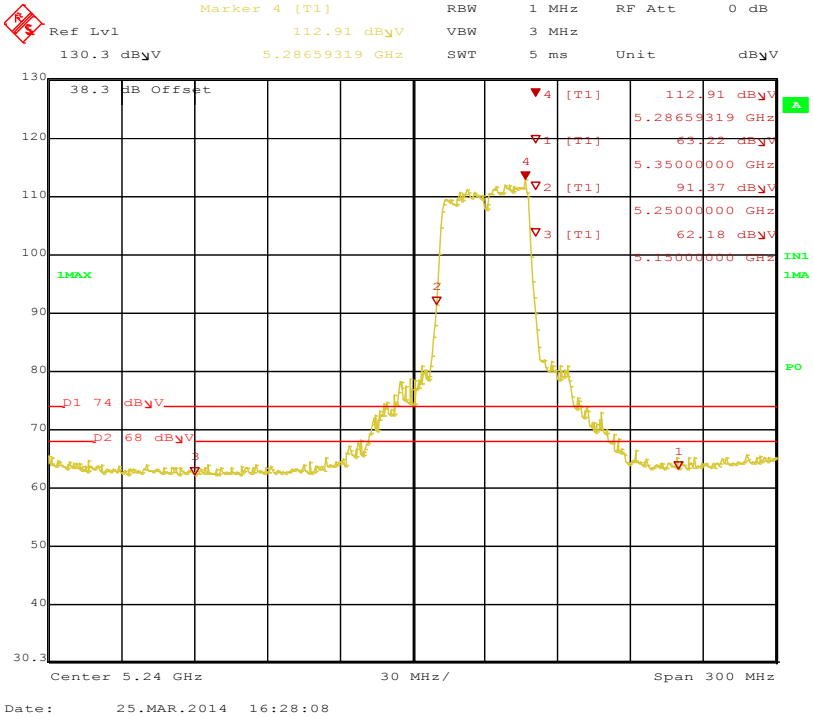

Figure 216: Bandedge-5270MHz-VHT40-MCS0-V-Pk

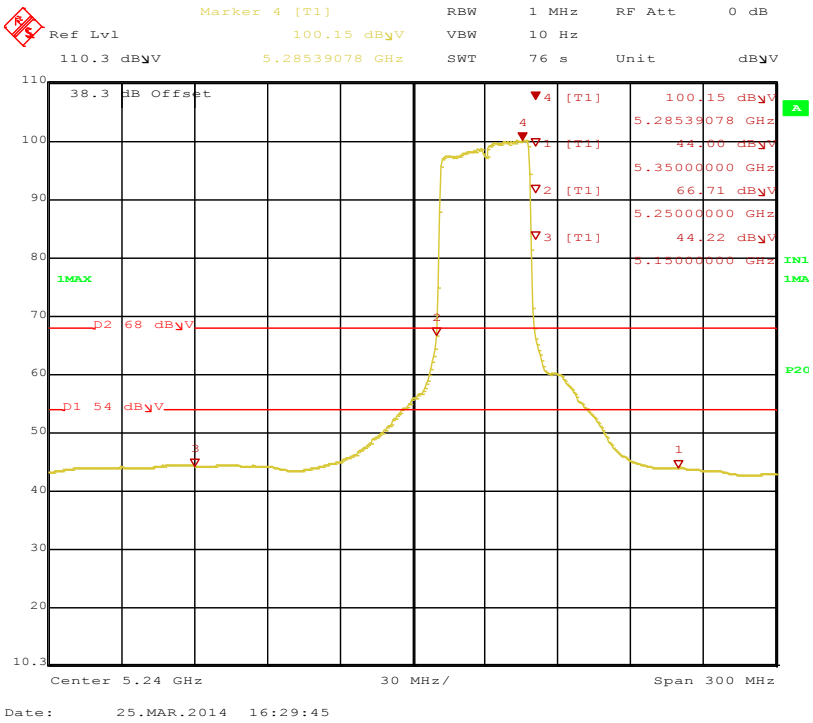

Figure 217: Bandedge-5270MHz-VHT40-MCS0-V-Ave

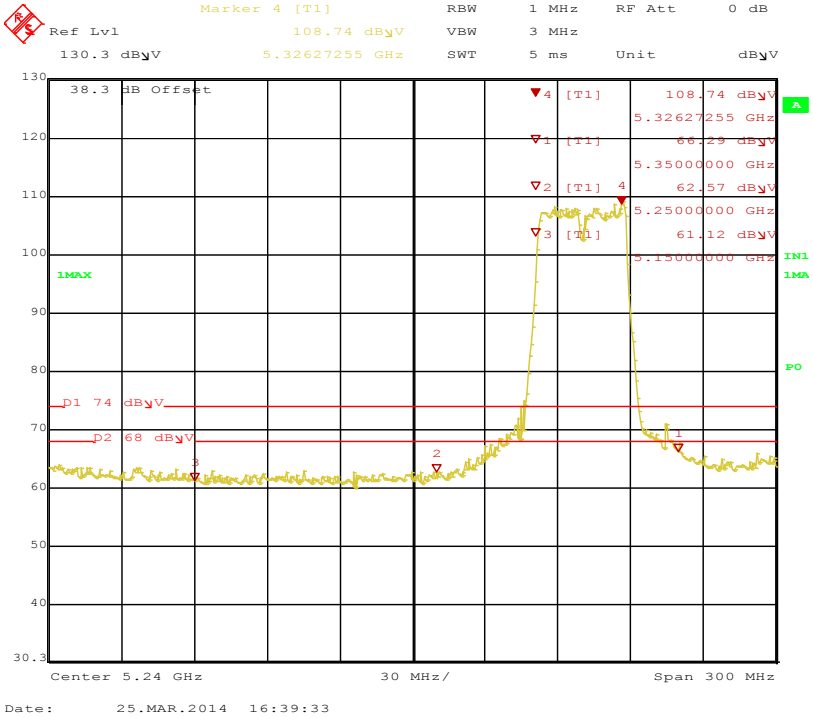

Figure 218: Bandedge-5310MHz-VHT40-MCS0-H-Pk

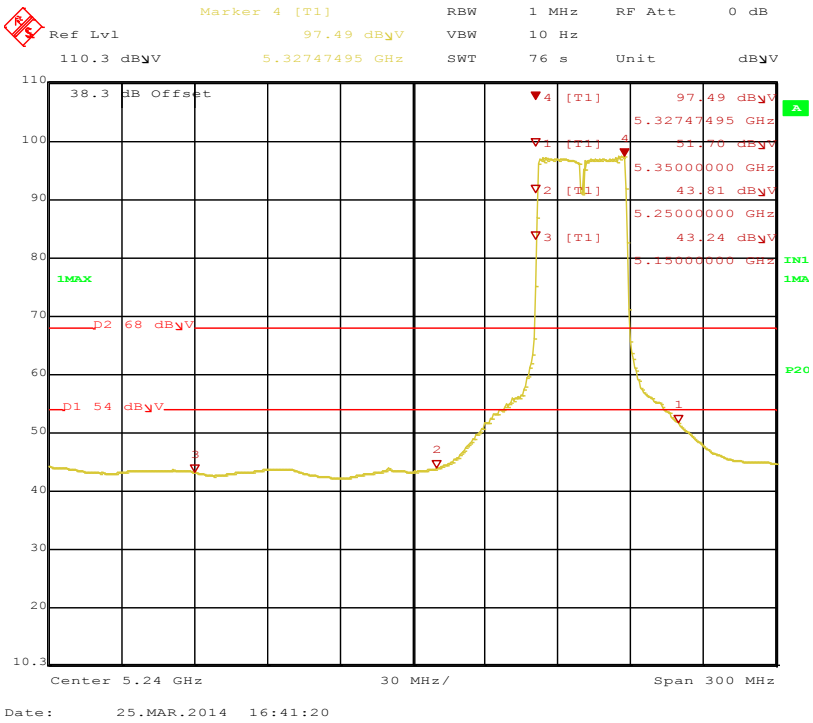

Figure 219: Bandedge-5310MHz-VHT40-MCS0-H-Ave

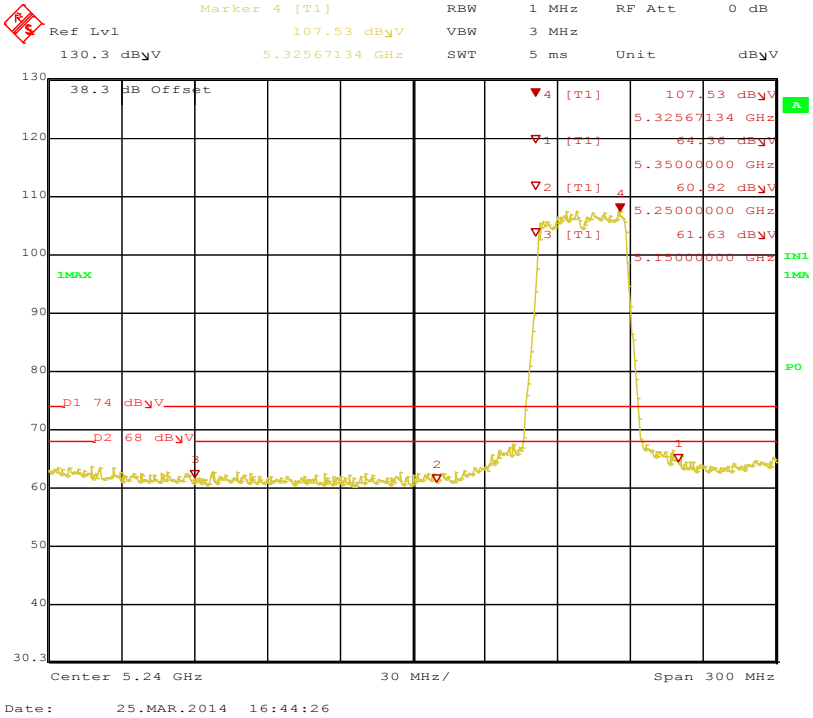

Figure 220: Bandedge-5310MHz-VHT40-MCS0-V-Pk

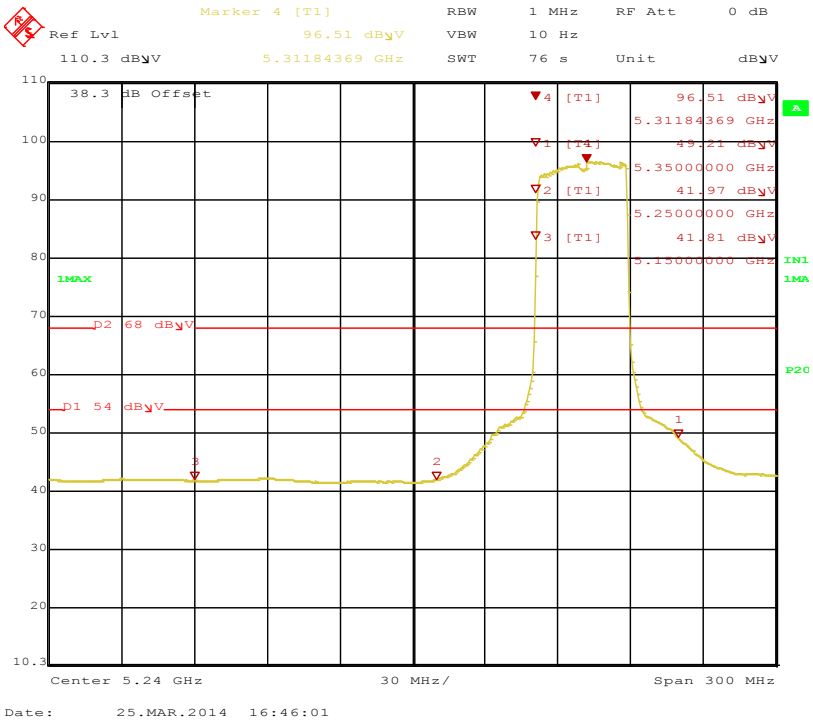

Figure 221: Bandedge-5310MHz-VHT40-MCS0-V-Ave

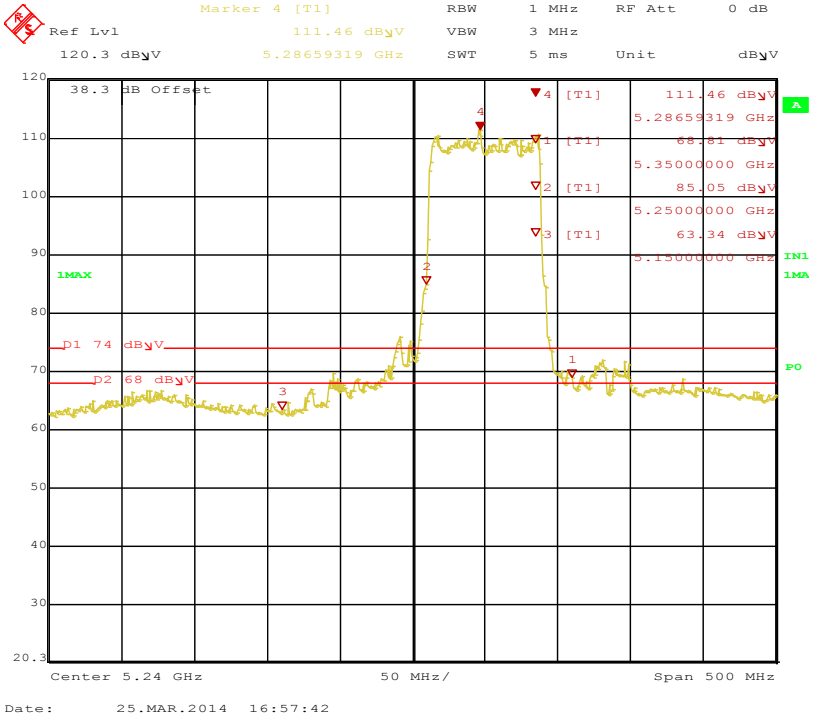

Figure 222: Bandedge-5290MHz-VHT80-MCS0-H-Pk

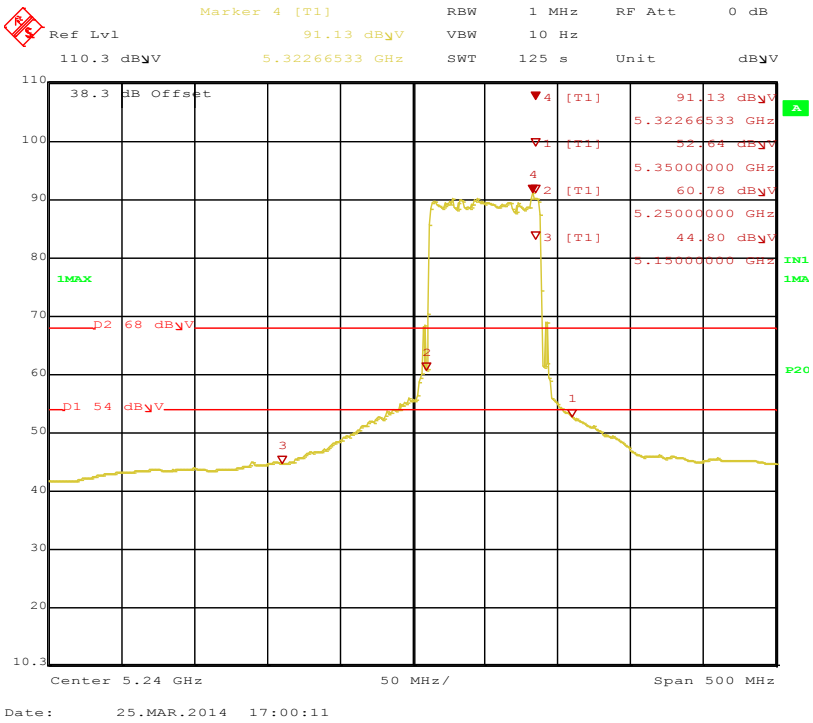

Figure 223: Bandedge-5290MHz-VHT80-MCS0-H-Ave

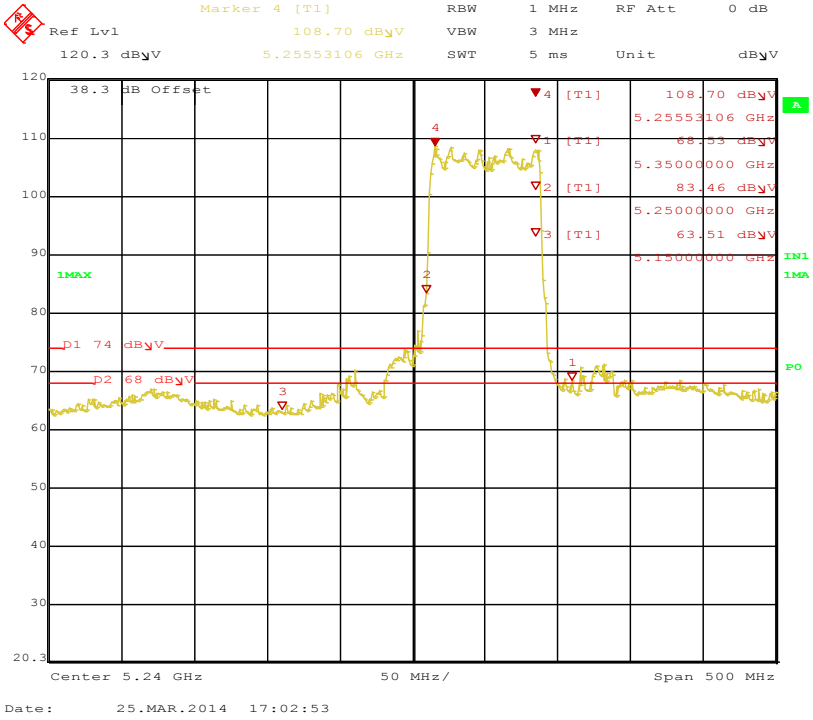

Figure 224: Bandedge-5290MHz-VHT80-MCS0-V-Pk

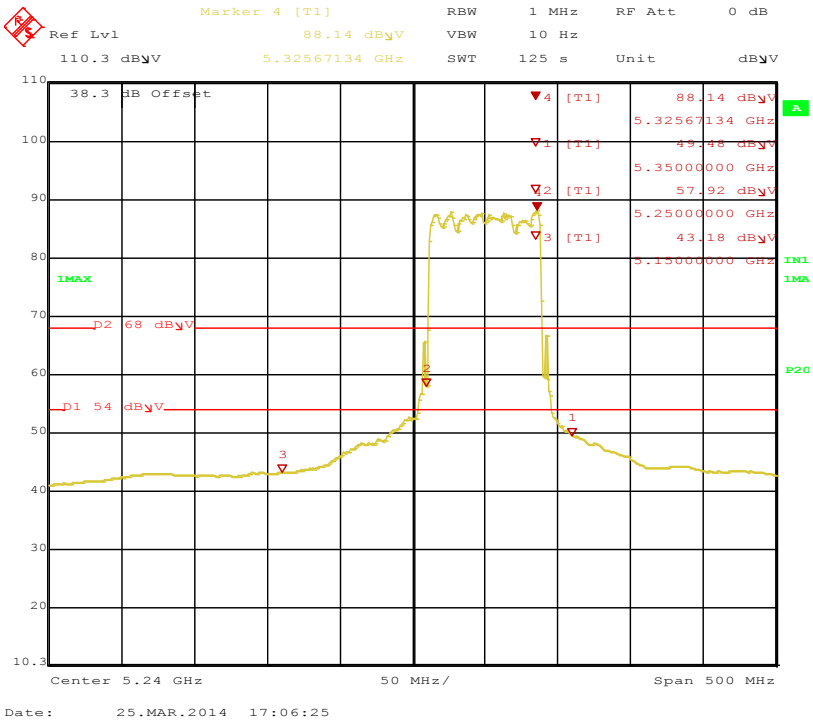

Figure 225: Bandedge-5290MHz-VHT80-MCS0-V-Ave

SOP 1 Radiated Emissions		Tracking # 31153119.003 Page 1 of 36	
EUT Name	Wireless Residential Gateway	**Date**	March 31, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 40%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11a at Y-Axis (30 MHz-1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	120 kHz/ 300 kHz
Dist/Ant Used	3m / JB3	**Performed by**	Jeremy Luong

Freq.	Raw	Cbl	AF	Level	Det.	Pol.	Hght.	Azt	Limit	Margin	Result
MHz	dBuV/ m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 802.11a											
624.92	47.20	3.00	-18.67	31.54	QP	H	117	86	37.00	-5.47	Pass
874.83	42.04	3.62	-15.36	30.29	QP	H	135	60	37.00	-6.71	Pass
30.00	33.82	0.59	-15.89	18.53	QP	V	120	240	30.00	-11.47	Pass
45.26	47.17	0.73	-27.38	20.53	QP	V	133	42	30.00	-9.47	Pass
57.67	49.84	0.83	-30.34	20.33	QP	V	108	70	30.00	-9.67	Pass
99.99	50.80	1.11	-27.28	24.62	QP	V	103	304	30.00	-5.38	Pass
400.01	48.80	2.36	-21.55	29.62	QP	V	128	252	37.00	-7.38	Pass
530.00	42.60	2.75	-19.90	25.45	QP	V	105	46	37.00	-11.55	Pass

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.52 dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Note: All other emissions passed Class B limit.

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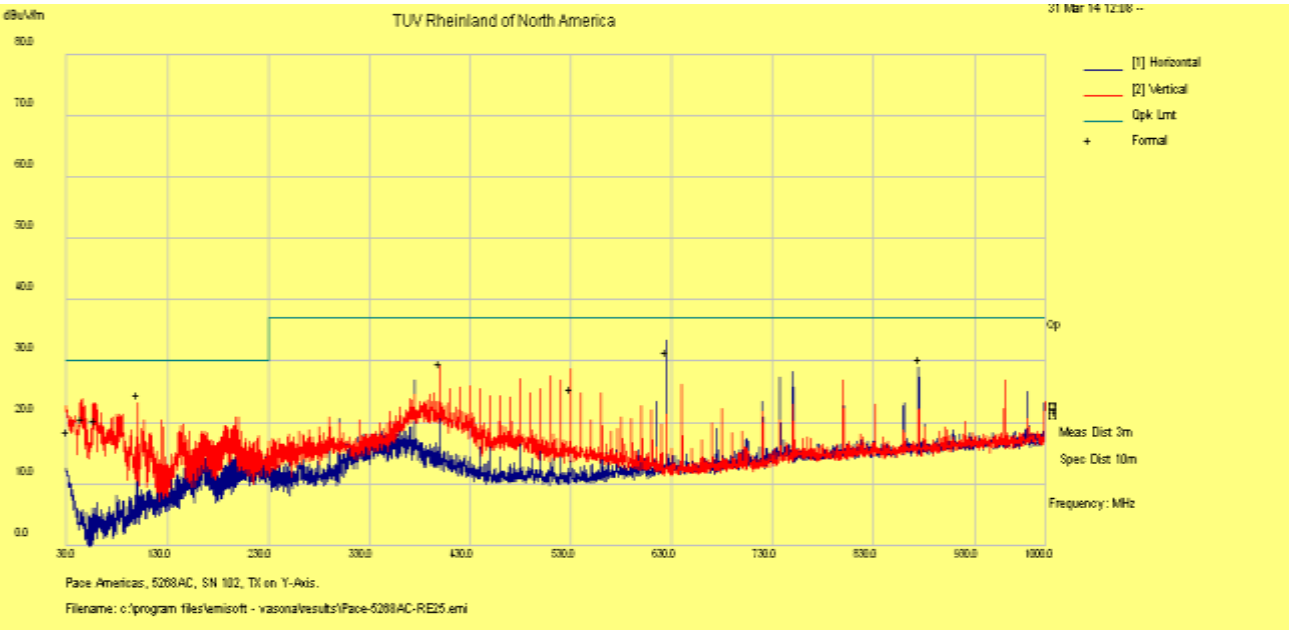
EUT Name	Wireless Residential Gateway	**Date**	March 31, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 40%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11a at Y-Axis (30 MHz-1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	120 kHz/ 300 kHz
Dist/Ant Used	3m / JB3	**Performed by**	Jeremy Luong

30 MHz to 1GHz Plots for Transmit Mode



Notes: FCC Class B Limit.

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EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11a at 6Mbps	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 5260 MHz at 802.11a, 6Mbit/s											
15785.79	36.30	7.83	-8.83	35.30	Ave	H	107	104	54.00	-18.70	Harmonics
10523.52	39.87	6.21	-9.37	36.71	Ave	V	277	96	54.00	-17.29	Harmonics
14026.46	49.82	7.31	-9.70	47.44	Ave	V	192	78	54.00	-6.56	Spurious
21039.80	48.86	5.33	3.59	57.78	Ave	V	133	160	63.98	-6.20	Harmonics
Transmitted Data at 5300 MHz at 802.11a, 6Mbit/s											
15896.70	40.68	7.87	-8.84	39.71	Ave	H	111	20	54.00	-14.29	Harmonics
10604.79	39.04	6.24	-9.60	35.68	Ave	V	154	96	54.00	-18.32	Harmonics
14135.62	37.00	7.40	-9.50	34.90	Ave	V	135	4	54.00	-19.10	Spurious
21195.40	48.92	5.35	3.69	57.96	Ave	V	126	160	63.98	-6.02	Harmonics
Transmitted Data at 5320 MHz at 802.11a, 6Mbit/s											
15955.89	35.90	7.90	-9.00	34.70	Ave	H	259	156	54.00	-19.30	Harmonics
10641.87	41.14	6.28	-9.74	37.68	Ave	V	150	102	54.00	-16.32	Harmonics
21274.20	48.10	5.35	3.74	57.19	Ave	V	125	148	63.98	-6.79	Harmonics
26599.90	64.42	6.12	-19.29	45.13	Ave	H	128	164	63.98	-18.85	Harmonics

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: All emissions passed the spurious emission limit.

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EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT20 at MCS0	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 5260 MHz at 802.11n HT20 at MCS0											
15775.53	38.20	7.80	-8.80	37.20	Ave	H	132	0	54.00	-16.80	Harmonics
10520.06	39.66	6.21	-9.34	36.53	Ave	V	152	82	54.00	-17.47	Harmonics
21040.20	46.20	5.33	3.59	55.12	Ave	V	126	91	63.98	-8.86	Harmonics
Transmitted Data at 5300 MHz at 802.11n HT20 at MCS0											
15890.08	36.20	7.90	-8.80	35.20	Ave	H	148	64	54.00	-18.80	Harmonics
10599.67	38.71	6.23	-9.58	35.37	Ave	V	220	70	54.00	-18.63	Harmonics
21200.50	46.46	5.35	3.70	55.51	Ave	V	125	90	63.98	-8.47	Harmonics
Transmitted Data at 5320 MHz at 802.11n HT20 at MCS0											
15963.38	36.60	7.90	-9.00	35.50	Ave	H	107	66	54.00	-18.50	Harmonics
10635.99	39.39	6.27	-9.71	35.95	Ave	V	174	82	54.00	-18.05	Harmonics
14186.50	47.43	7.30	-9.34	45.39	Ave	V	251	78	54.00	-8.61	Spurious
21280.00	46.33	5.35	3.74	55.42	Ave	V	130	91	63.98	-8.56	Harmonics
26599.90	62.81	6.12	-19.29	43.52	Ave	H	125	167	63.98	-20.46	Harmonics

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: All emissions passed the spurious emission limit.

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EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT40 at MCS0	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 5270 MHz at 802.11n HT40 at MCS0											
15812.76	35.30	7.80	-8.90	34.20	Ave	H	143	52	54.00	-19.80	Harmonics
15848.43	34.50	7.90	-8.70	33.60	Ave	H	236	55	54.00	-20.40	Harmonics
10543.93	33.72	6.29	-9.48	30.53	Ave	V	238	50	54.00	-23.47	Harmonics
14053.14	46.69	7.30	-9.66	44.33	Ave	V	299	108	54.00	-9.67	Spurious
21078.60	46.77	5.33	3.61	55.71	Ave	V	136	163	63.98	-8.27	Harmonics
Transmitted Data at 5310 MHz at 802.11n HT40 at MCS0											
15913.80	35.10	7.90	-8.80	34.10	Ave	H	130	146	54.00	-19.90	Harmonics
15969.20	34.90	7.90	-9.00	33.80	Ave	H	148	67	54.00	-20.20	Harmonics
10619.99	36.67	6.25	-9.65	33.28	Ave	V	276	117	54.00	-20.72	Harmonics
14159.94	50.39	7.33	-9.41	48.31	Ave	V	119	100	54.00	-5.69	Spurious
21238.50	46.79	5.35	3.72	55.86	Ave	V	133	160	63.98	-8.12	Harmonics

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: All emissions passed the spurious emission limit.

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EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102 and 111	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT20 at MCS0	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 5260 MHz at 802.11ac VHT20 at MCS0											
15781.24	37.97	7.82	-8.82	36.98	Ave	H	163	148	54.00	-17.03	Harmonics
14026.52	48.33	7.31	-9.70	45.95	Ave	V	291	110	54.00	-8.05	Spurious
21039.80	46.52	5.33	3.59	55.44	Ave	V	137	160	63.98	-8.54	Harmonics
Transmitted Data at 5300 MHz at 802.11ac VHT20 at MCS0											
15901.39	35.09	7.87	-8.84	34.12	Ave	H	143	82	54.00	-19.89	Harmonics
10600.80	40.66	6.23	-9.58	37.31	Ave	V	153	108	54.00	-16.69	Harmonics
14133.34	45.71	7.36	-9.46	43.62	Ave	V	109	114	54.00	-10.38	Spurious
21199.70	45.74	5.35	3.69	54.78	Ave	V	137	158	63.98	-9.20	Harmonics
Transmitted Data at 5320 MHz at 802.11ac VHT20 at MCS0											
15897.76	38.52	7.87	-8.84	37.55	Ave	H	99	30	54.00	-16.45	Harmonics
10599.90	40.74	6.23	-9.58	37.39	Ave	V	257	252	54.00	-16.61	Harmonics
14133.25	49.81	7.36	-9.46	47.72	Ave	V	218	106	54.00	-6.28	Spurious
21281.00	46.52	5.35	3.74	55.61	Ave	V	135	159	63.98	-8.37	Harmonics
26599.90	63.79	6.12	-19.29	44.50	Ave	H	125	169	63.98	-19.48	Harmonics

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: All emissions passed the spurious emission limit.

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EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT40 at MCS0	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 5270 MHz at 802.11ac VHT40 at MCS0											
10544.63	34.88	6.30	-9.48	31.70	Ave	H	213	46	54.00	-22.30	Harmonics
15798.71	36.00	7.80	-8.80	35.00	Ave	H	185	155	54.00	-19.00	Harmonics
14053.17	42.82	7.30	-9.66	40.45	Ave	V	130	100	54.00	-13.55	Spurious
21078.40	46.06	5.33	3.61	55.00	Ave	V	135	89	63.98	-8.98	Harmonics
Transmitted Data at 5310 MHz at 802.11ac VHT40 at MCS0											
15918.81	34.37	7.88	-8.84	33.40	Ave	H	101	138	54.00	-20.60	Harmonics
15938.83	35.10	7.90	-9.00	34.00	Ave	H	126	44	54.00	-20.00	Harmonics
10623.64	37.00	6.30	-9.70	33.60	Ave	V	167	310	54.00	-20.40	Harmonics
14159.88	51.89	7.33	-9.41	49.81	Ave	V	196	78	54.00	-4.19	Spurious
21239.90	47.54	5.35	3.72	56.61	Ave	V	135	161	63.98	-7.37	Harmonics

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: All emissions passed the spurious emission limit.

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EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT80 at MCS0	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 5290 MHz at 802.11ac VHT80 at MCS0											
15849.77	35.52	7.86	-8.72	34.66	Ave	H	103	24	54.00	-19.34	Harmonics
15912.73	35.80	7.90	-8.80	34.80	Ave	H	171	72	54.00	-19.20	Harmonics
10598.70	34.14	6.24	-9.57	30.81	Ave	V	127	149	54.00	-23.19	Harmonics
21159.90	44.22	5.34	3.67	53.23	Ave	V	135	159	63.98	-10.75	Harmonics

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: All emissions passed the spurious emission limit.

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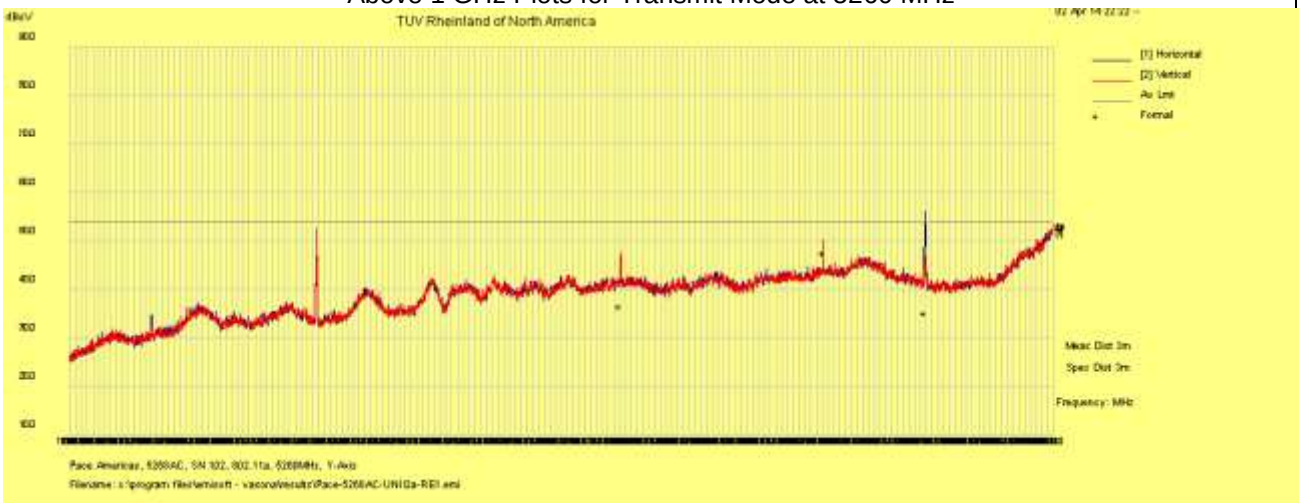
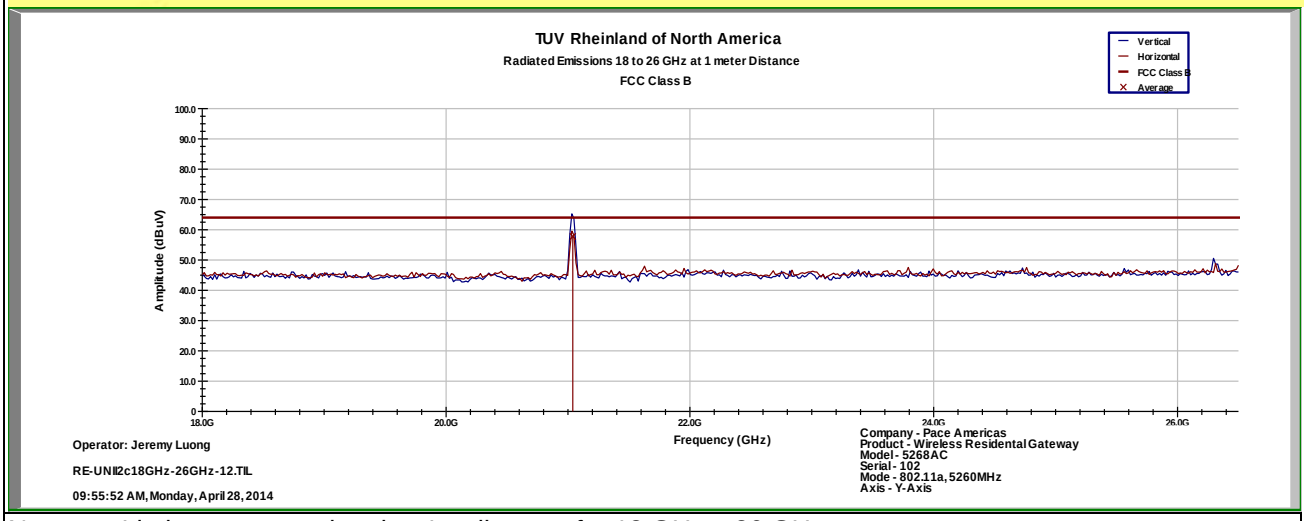
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11a at 6 Mbps	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5260 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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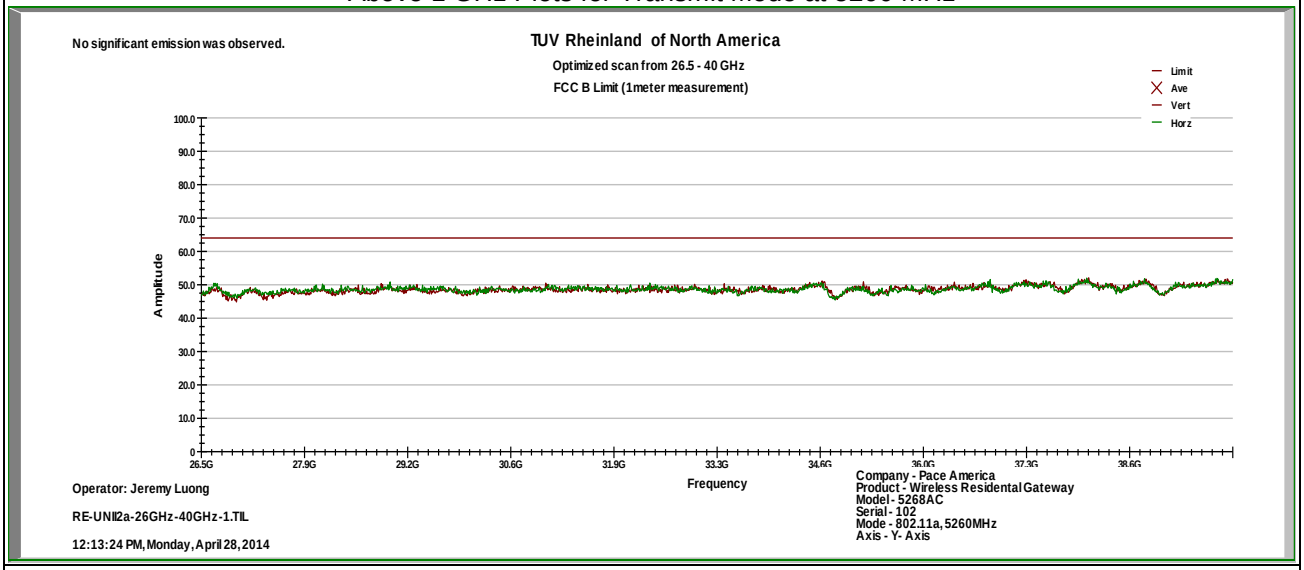
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11a at 6 Mbps	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5260 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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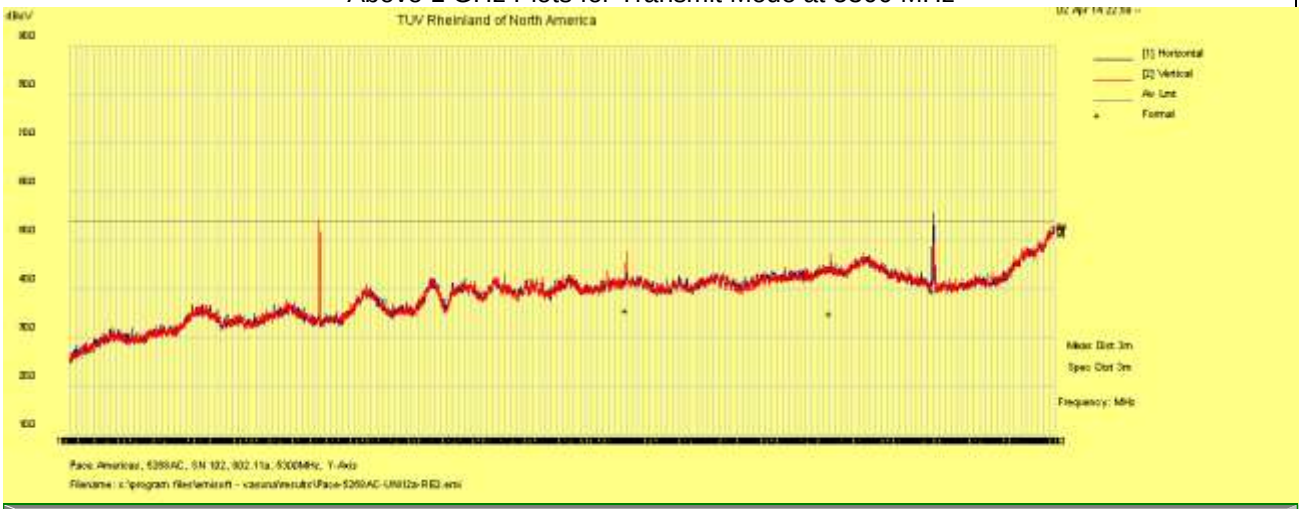
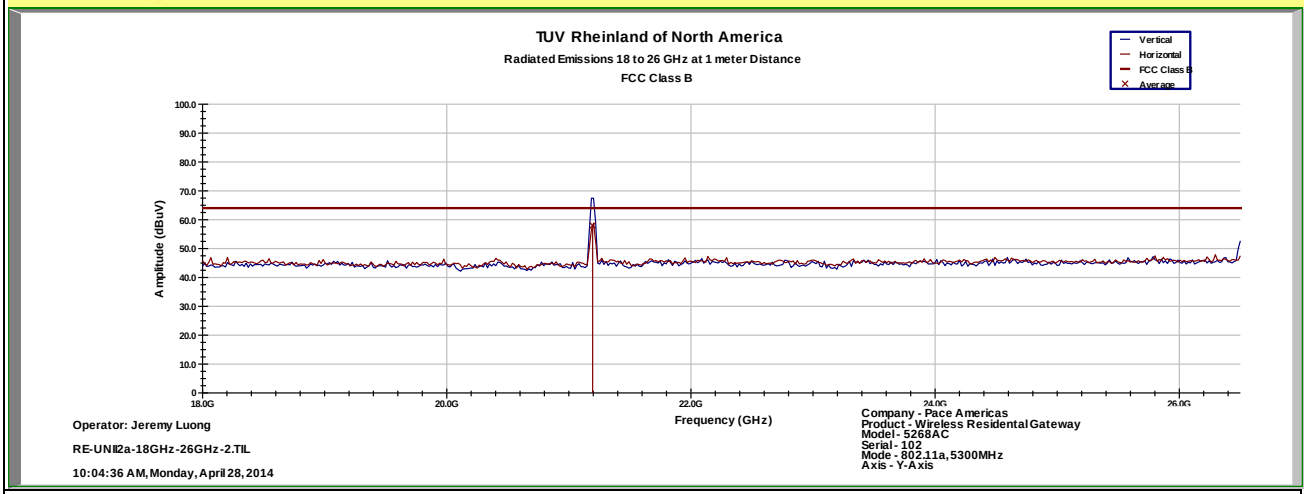
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11a at 6 Mbps	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5300 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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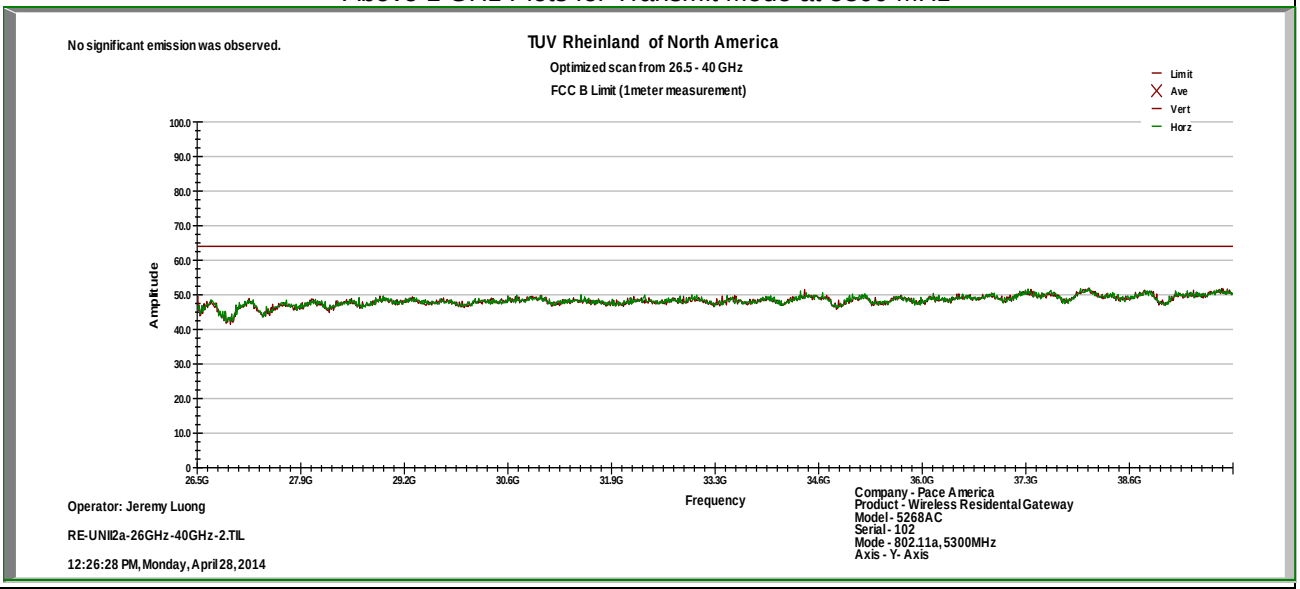
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11a at 6 Mbps	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5300 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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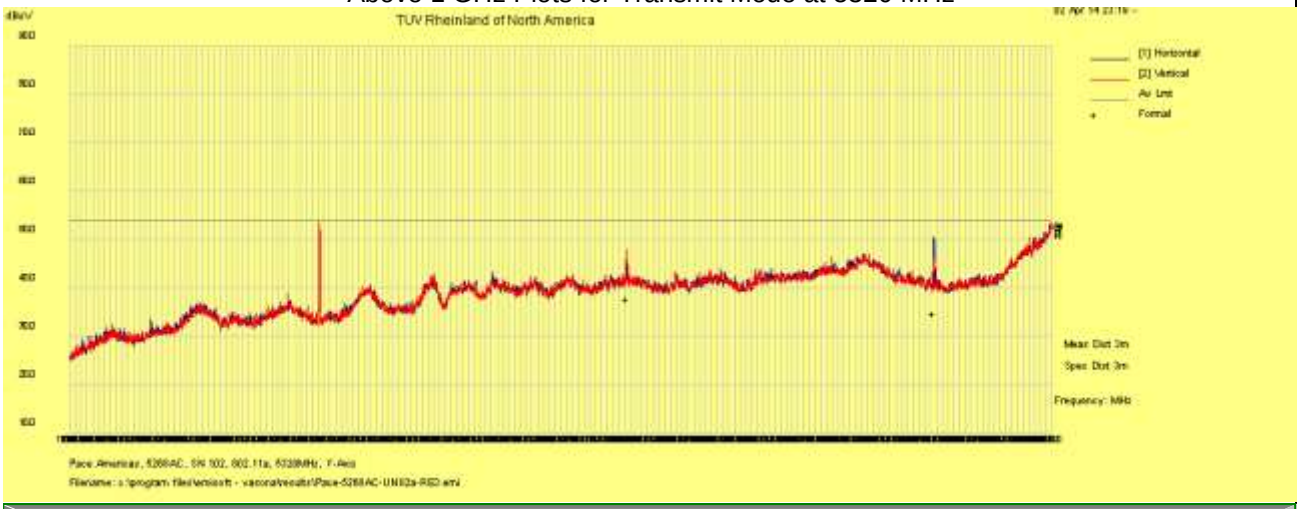
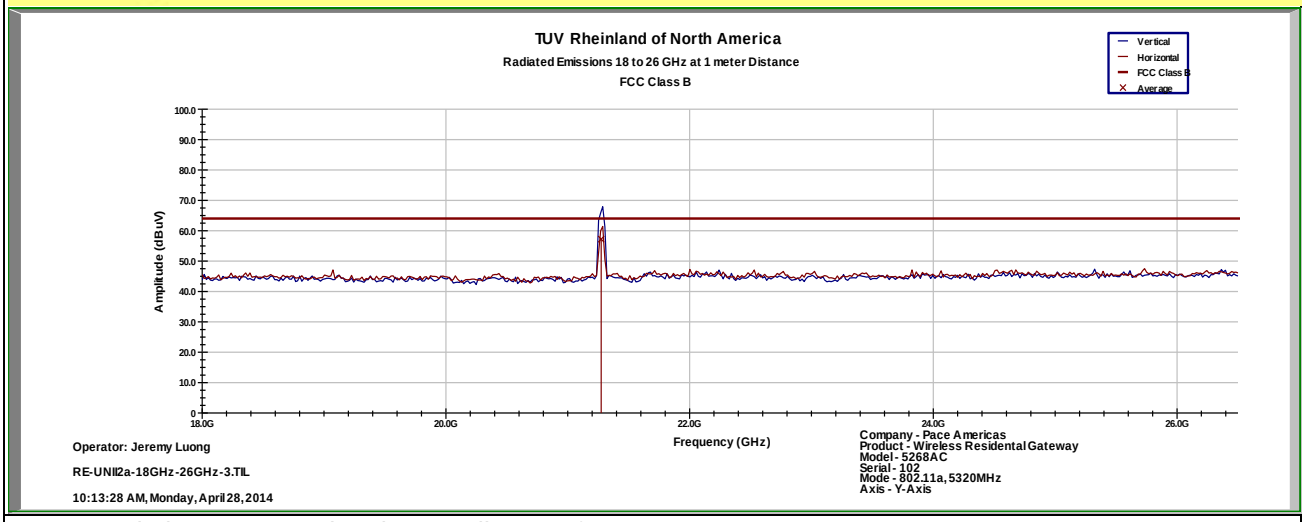
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11a at 6 Mbps	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5320 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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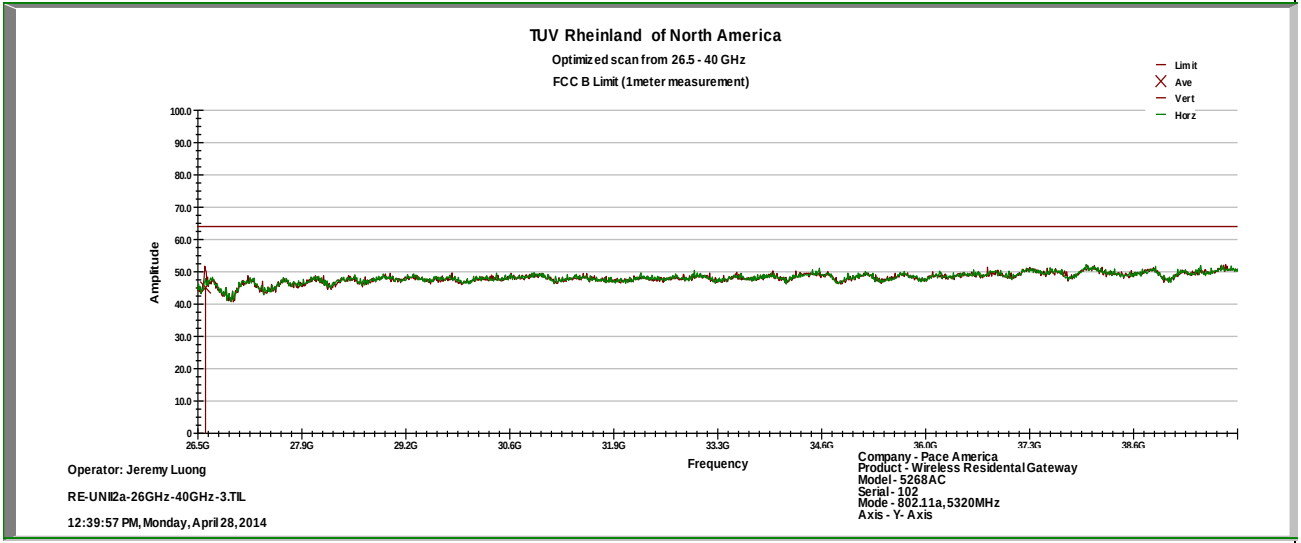
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11a at 6 Mbps	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5320 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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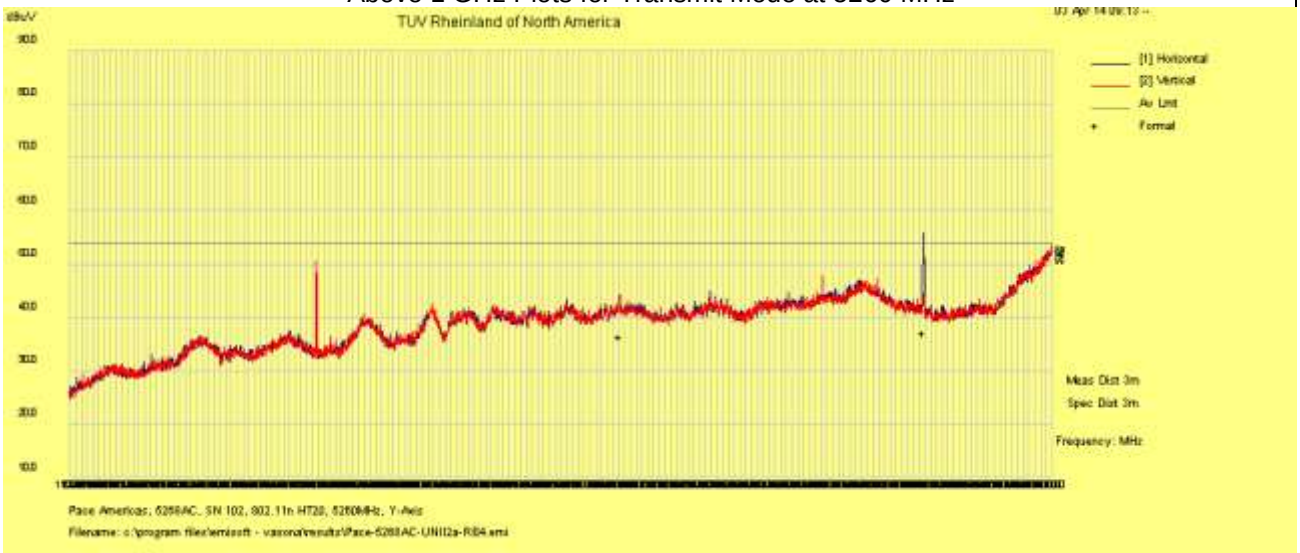
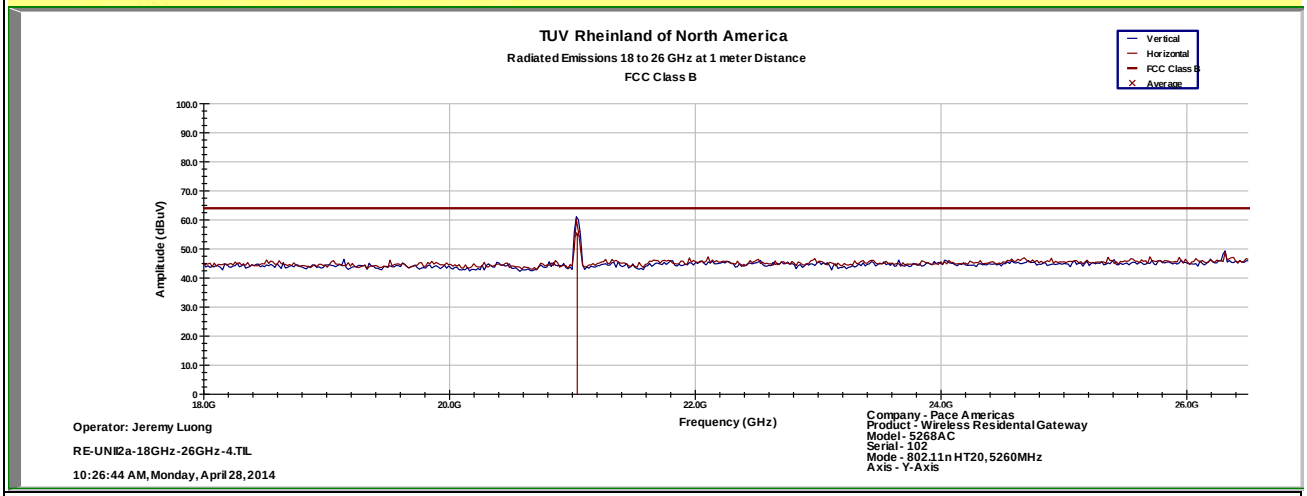
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5260 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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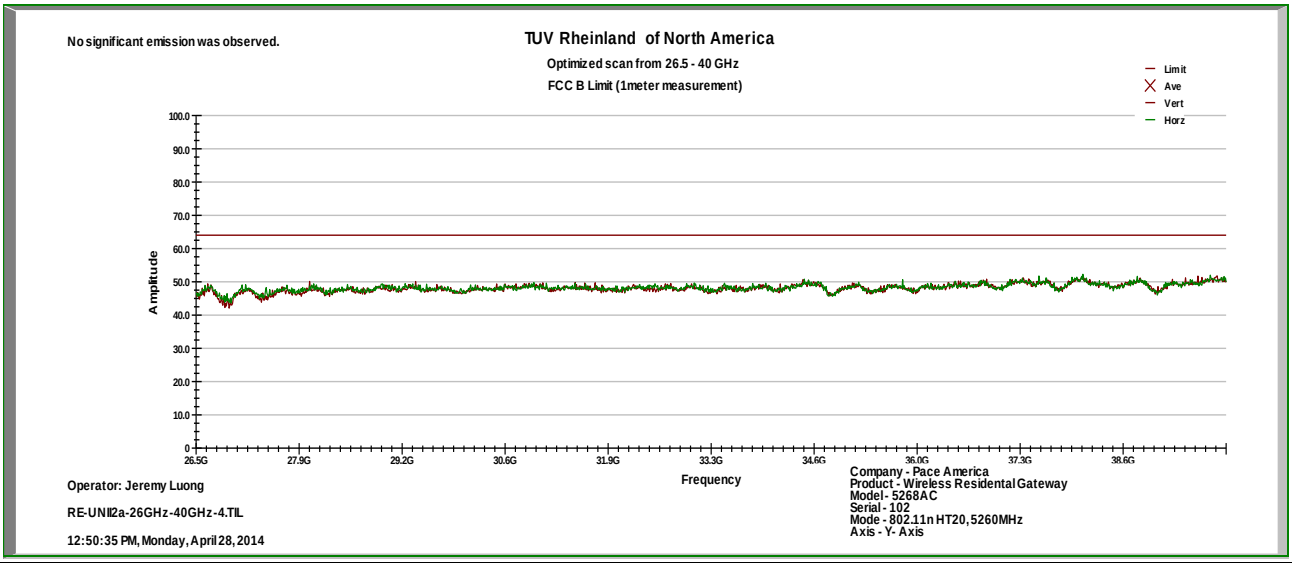
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5260 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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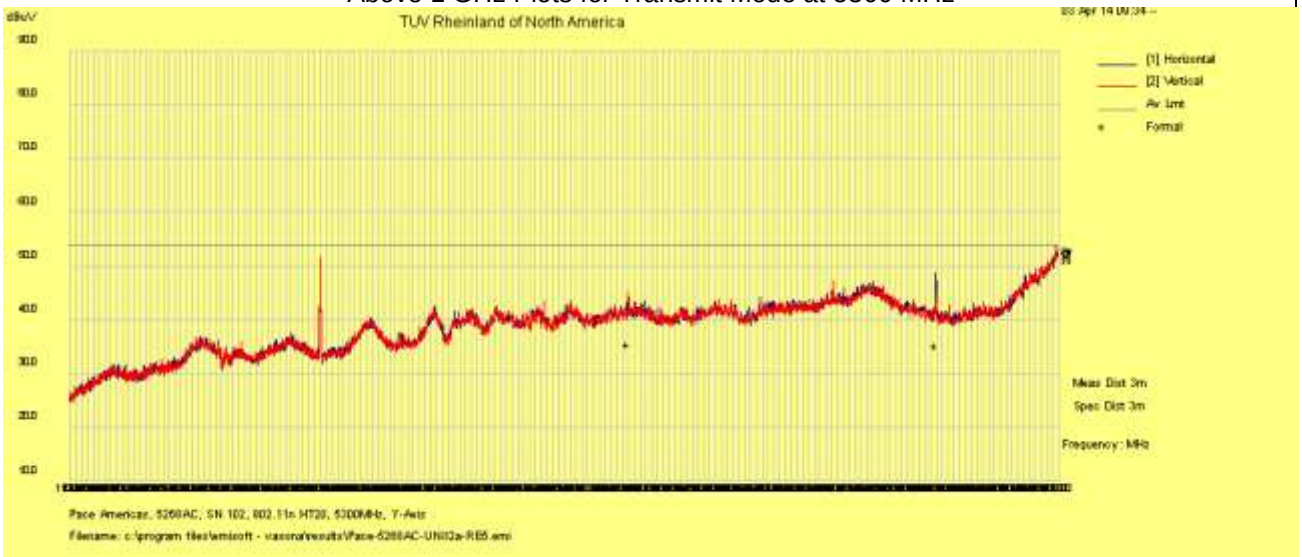
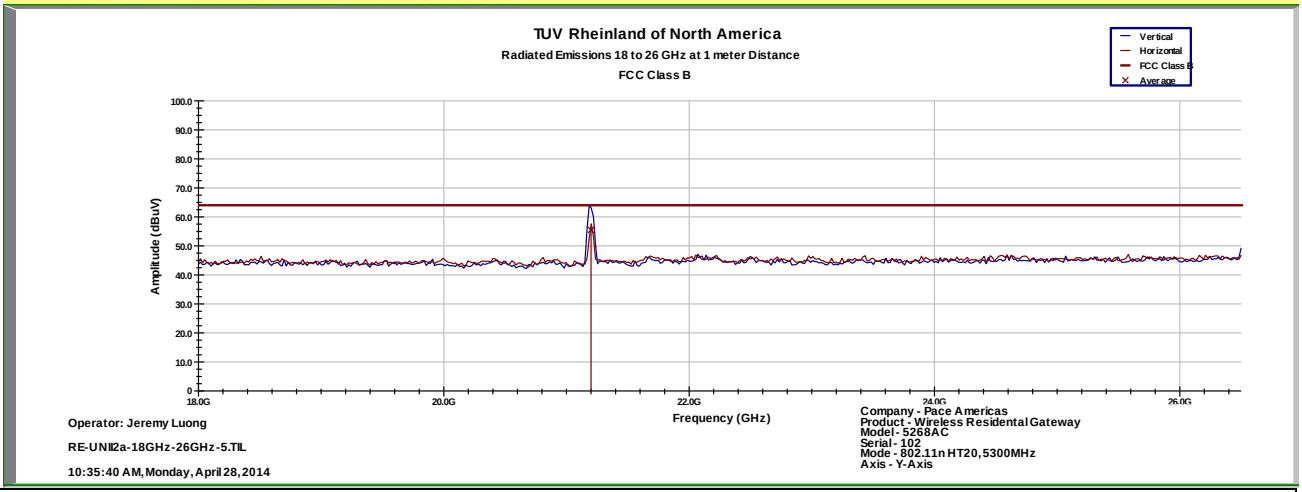
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5300 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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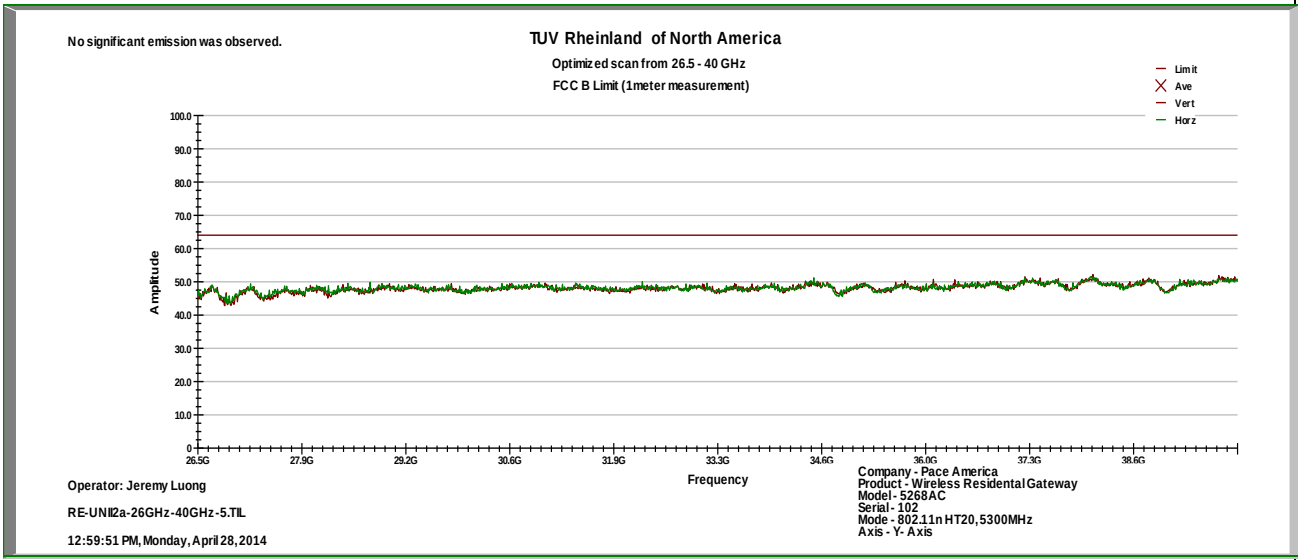
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5300 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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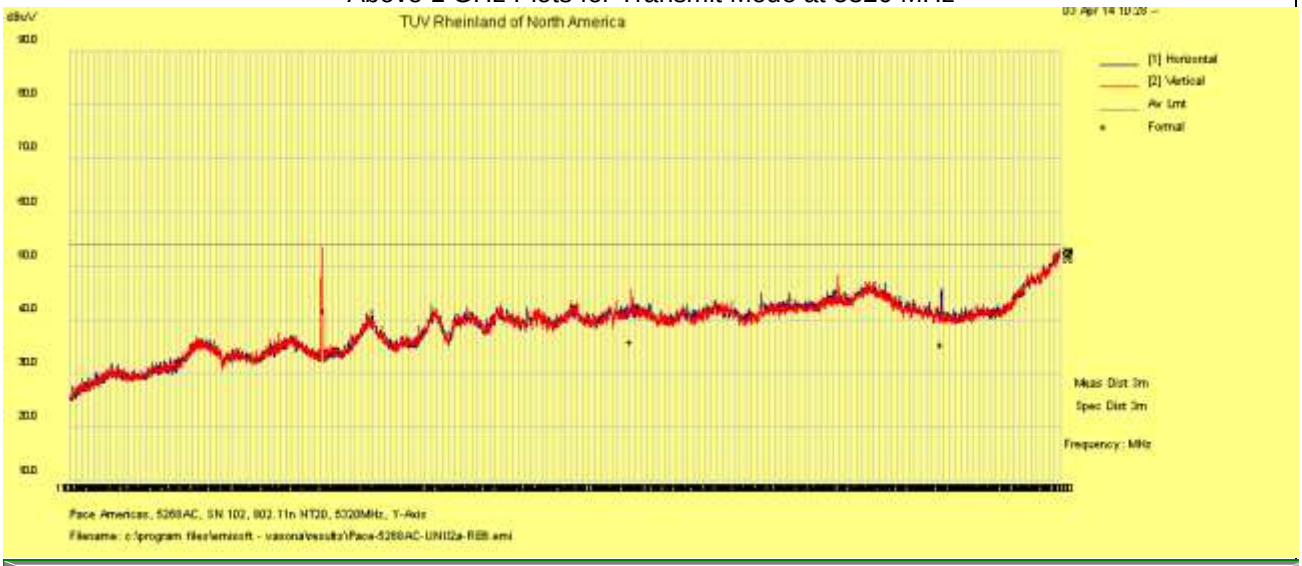
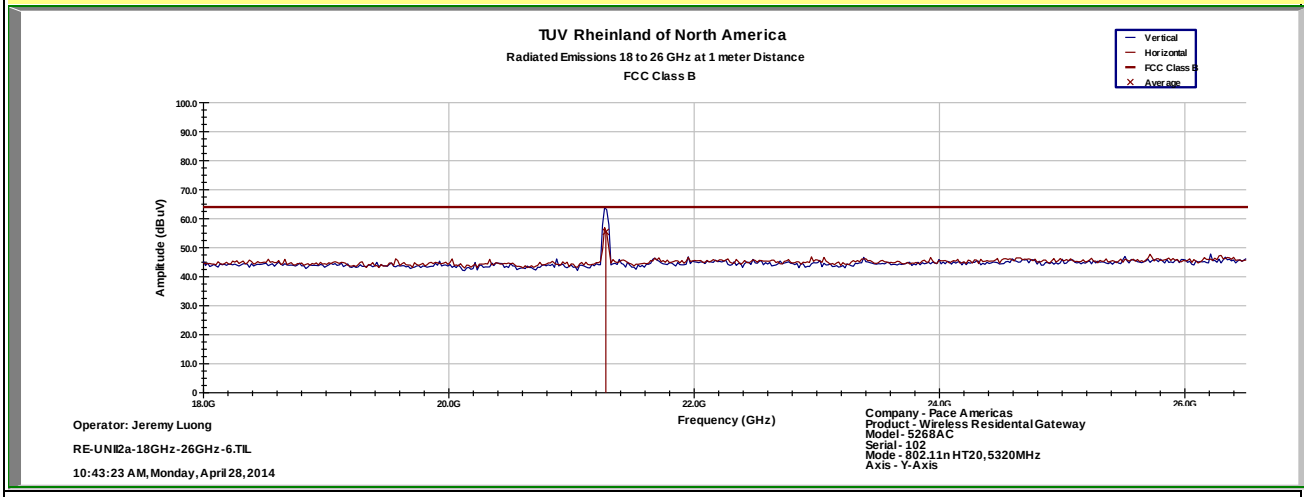
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5320 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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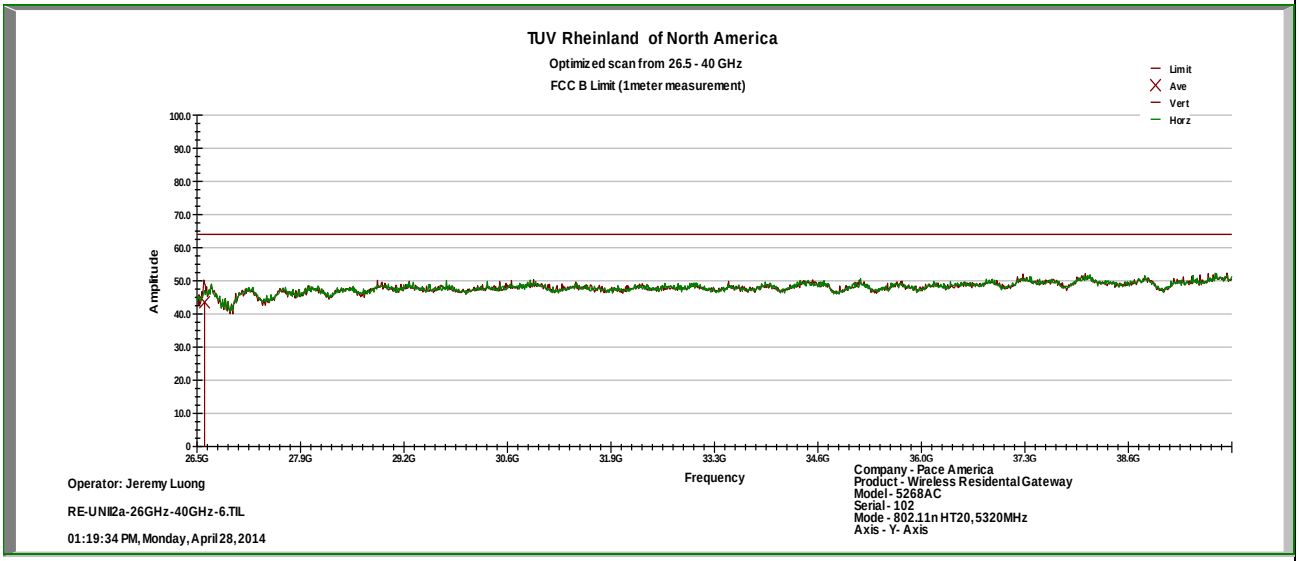
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5300 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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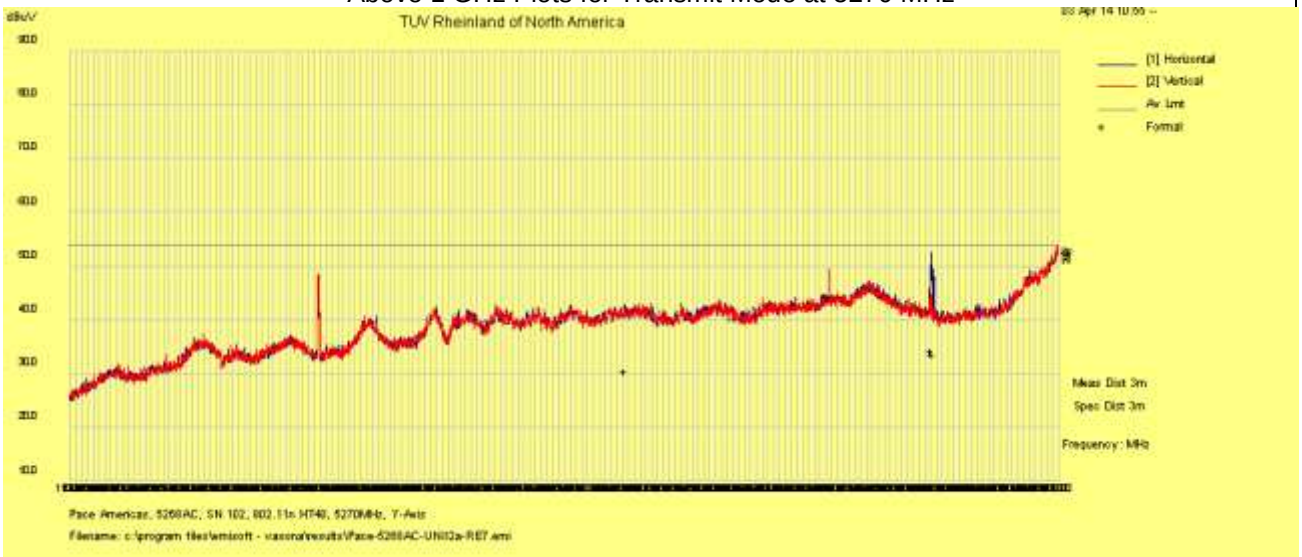
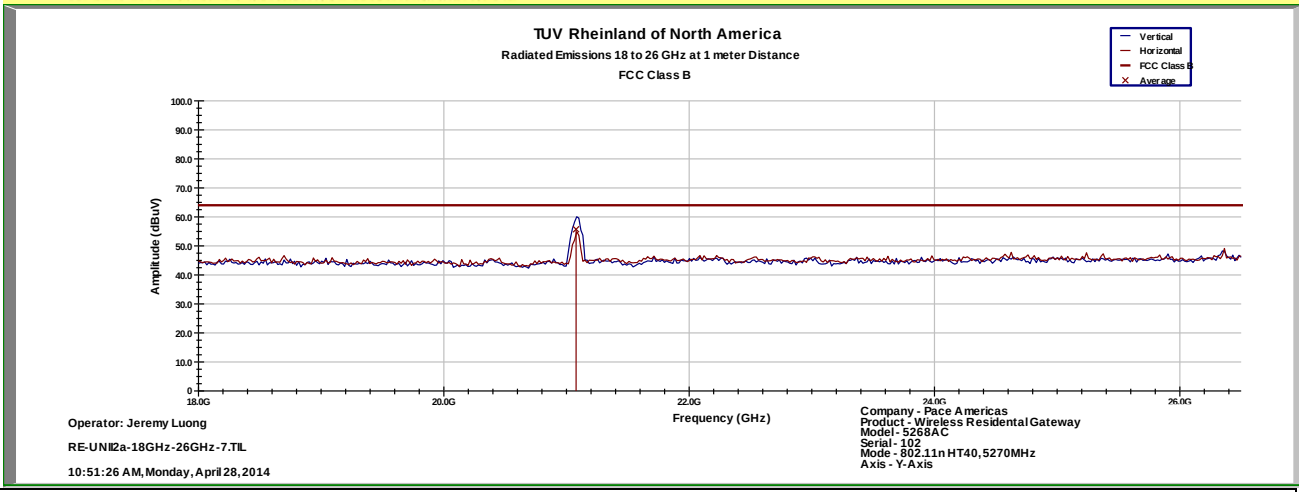
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11 HT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5270 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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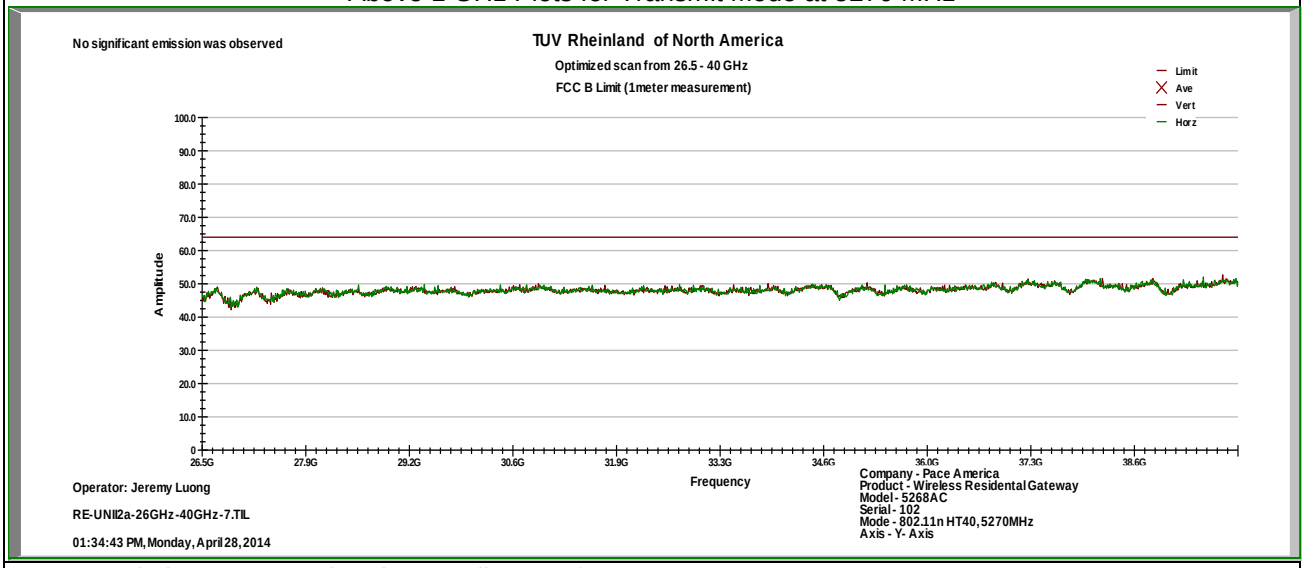
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11 HT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5270 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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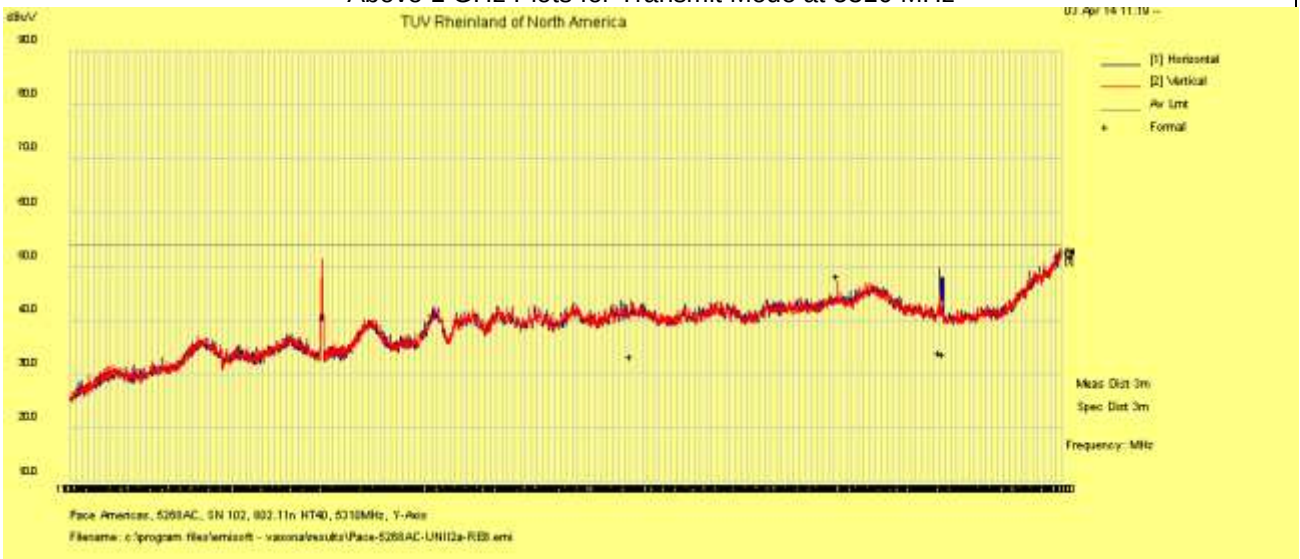
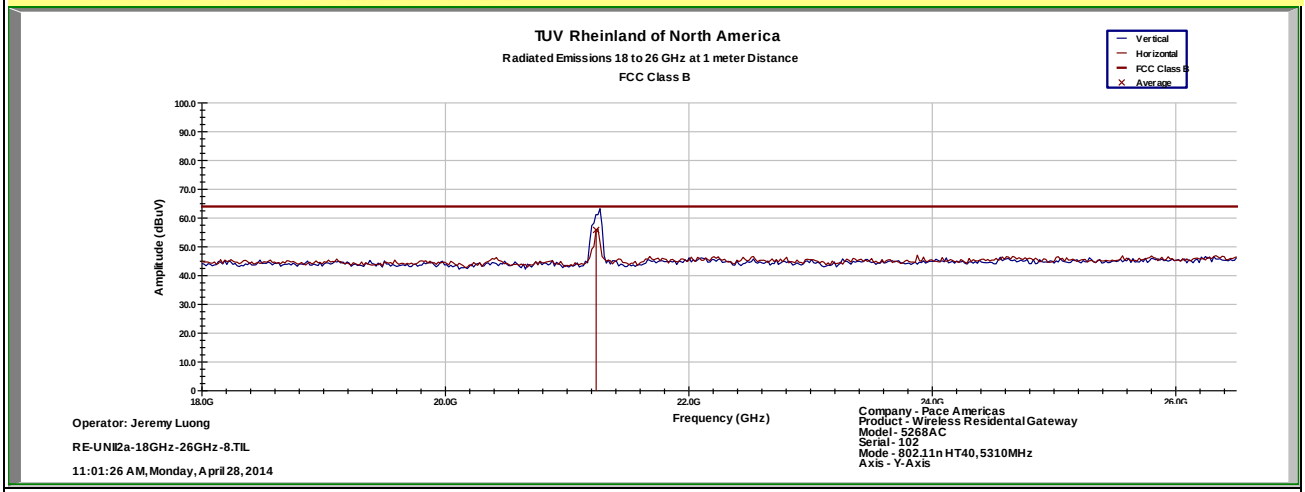
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11 HT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5310 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.
1 GHz – 26 GHz Setting: RBW = 1 MHz/ VBW = 3 MHz

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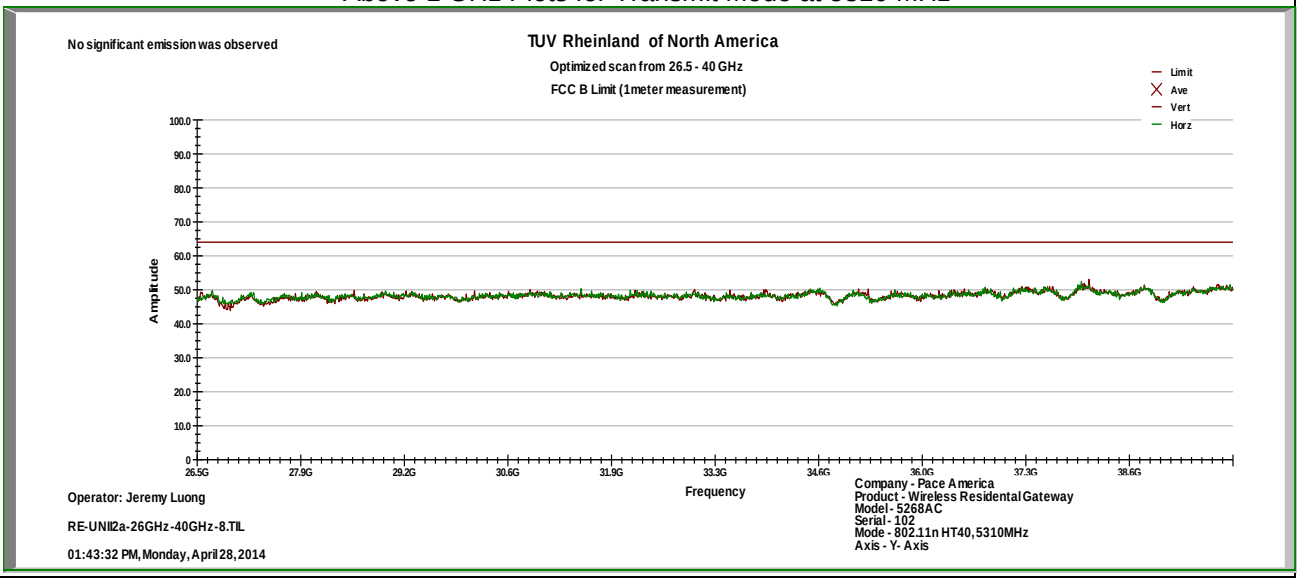
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11n HT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5310 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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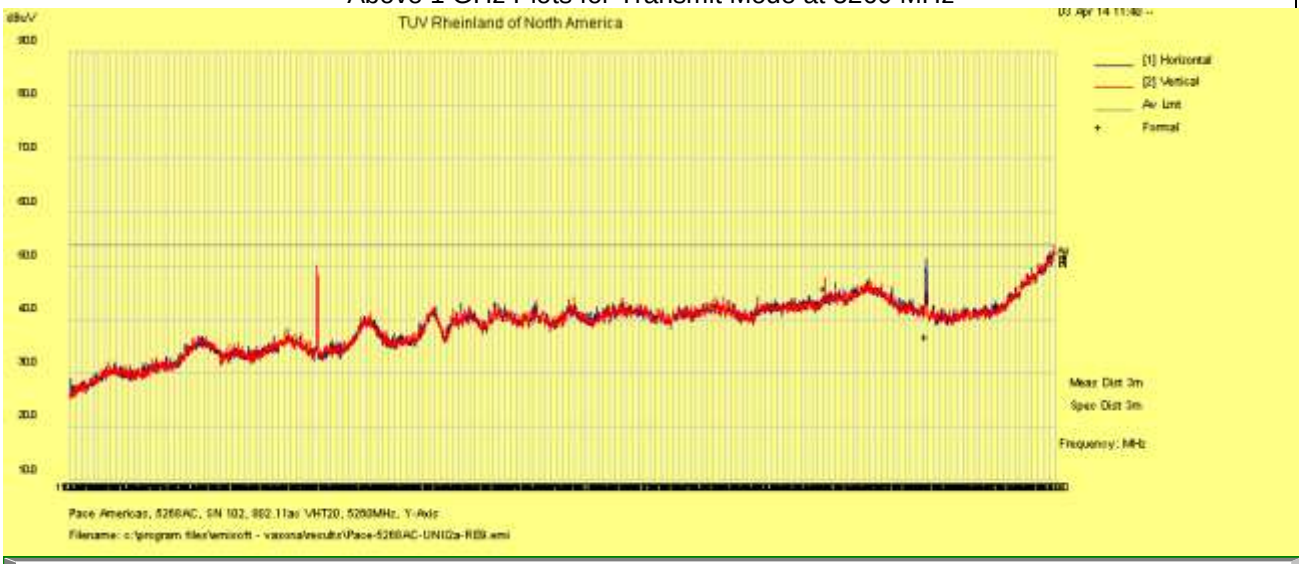
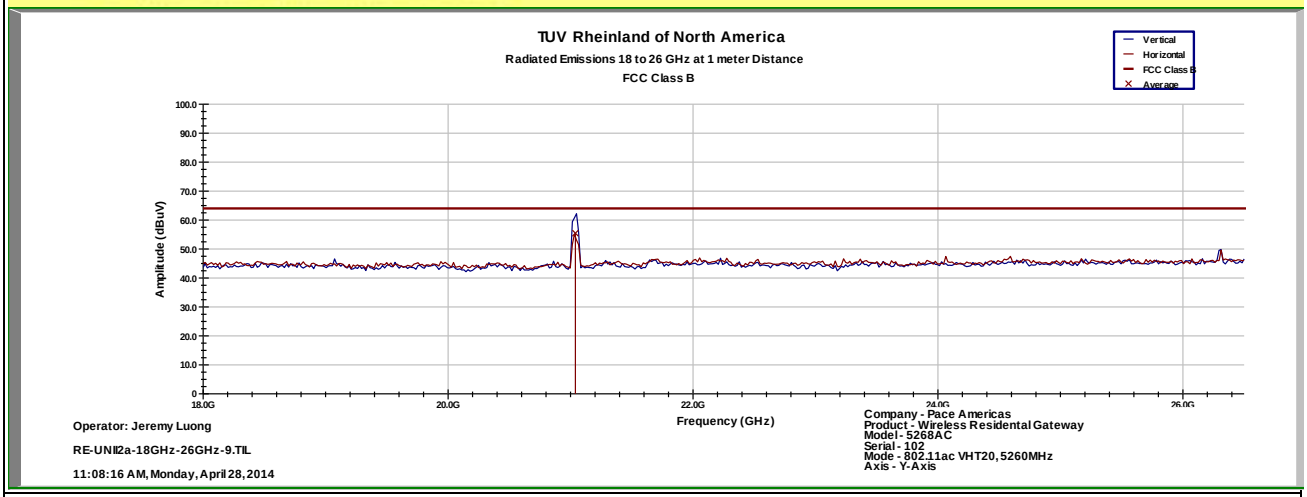
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5260 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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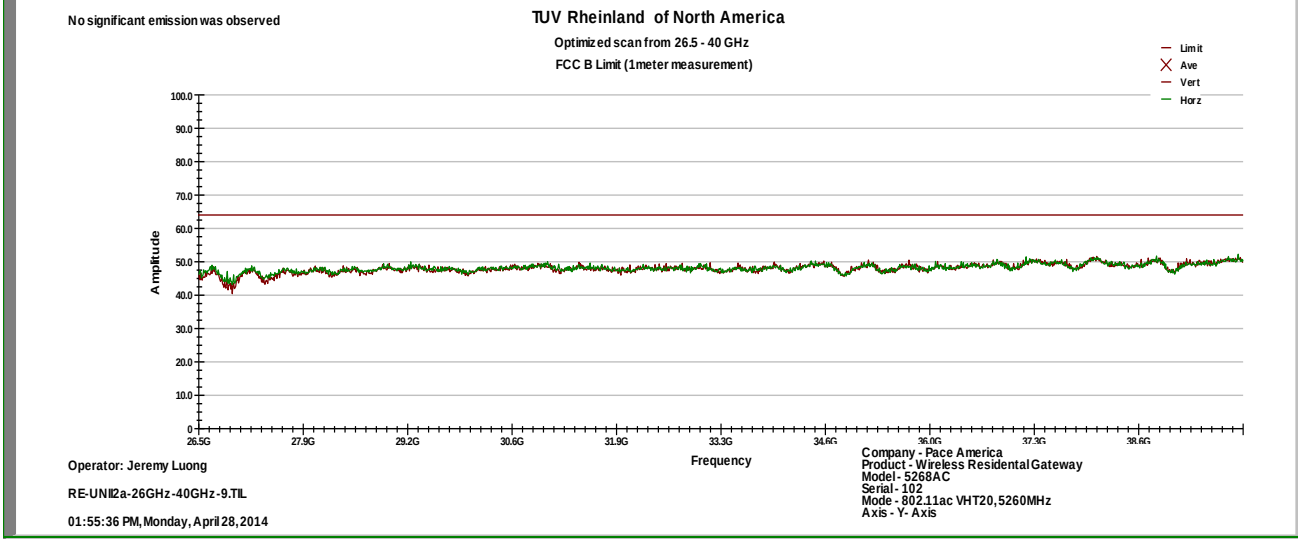
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5260 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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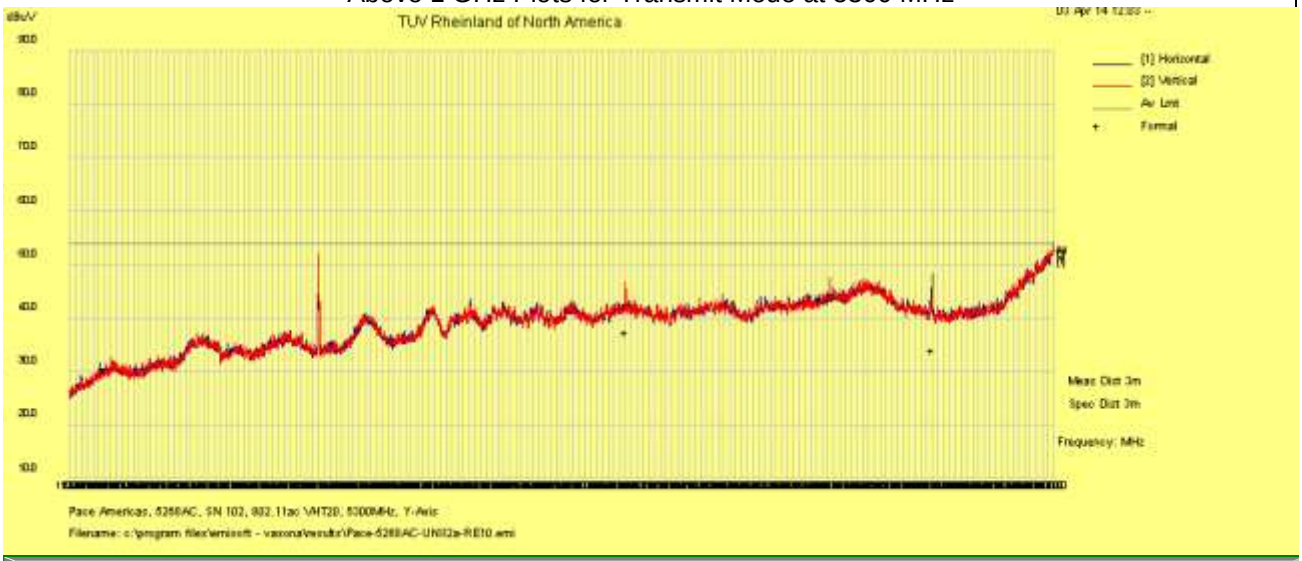
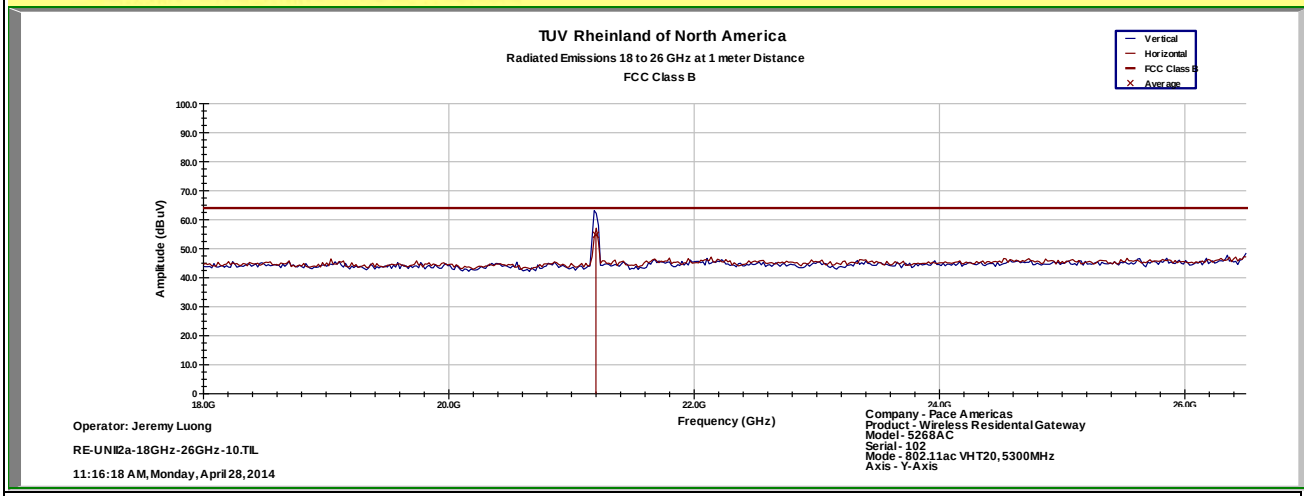
EUT Name	Wireless Residential Gateway	**Date**	April 3 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5300 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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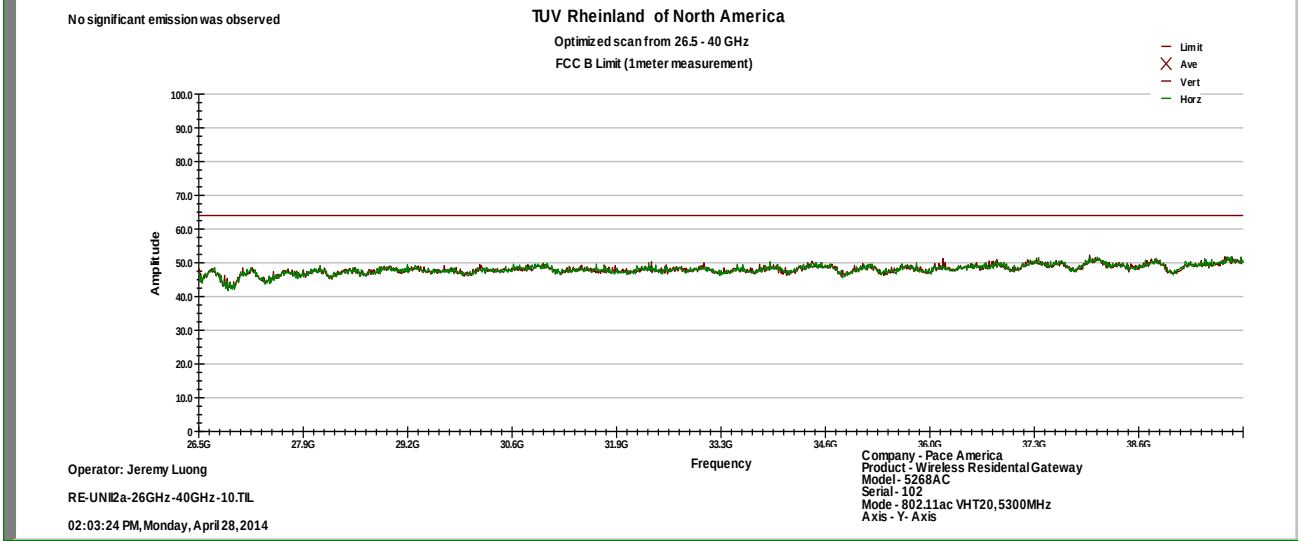
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5300 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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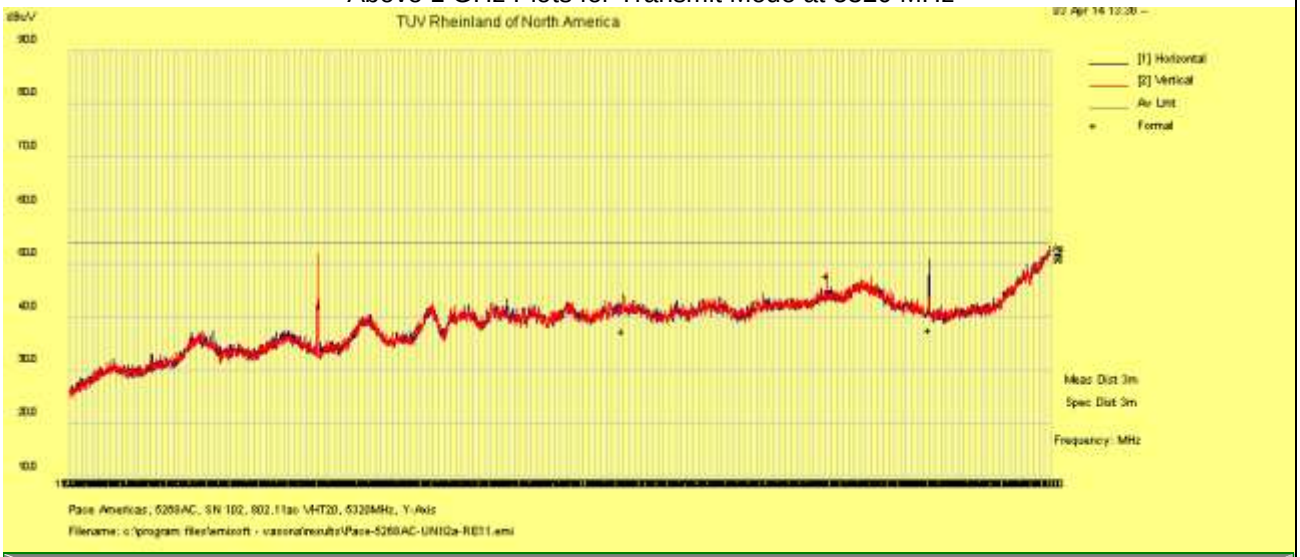
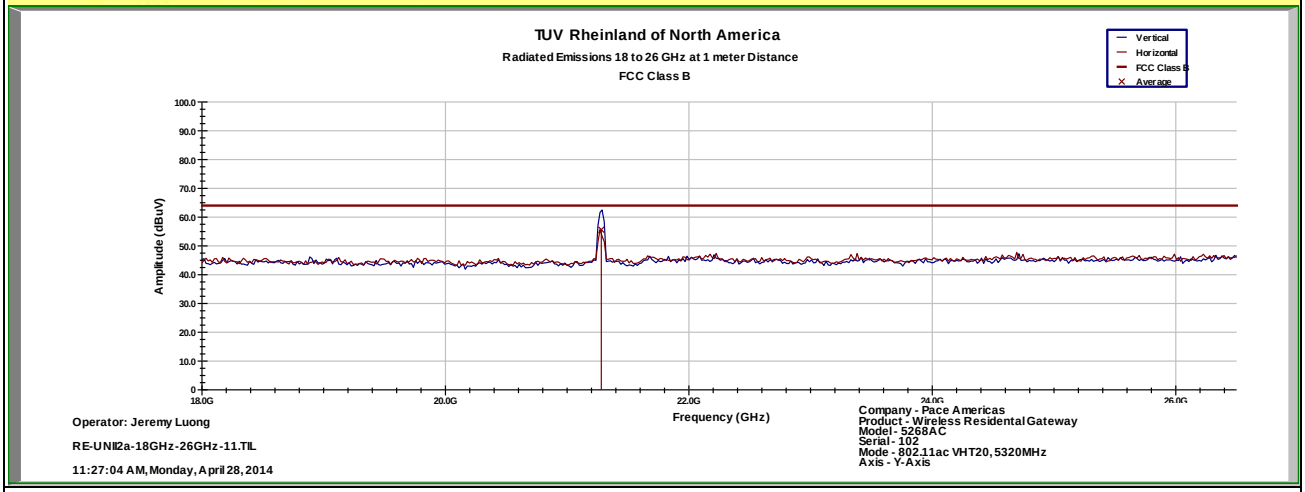
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5320 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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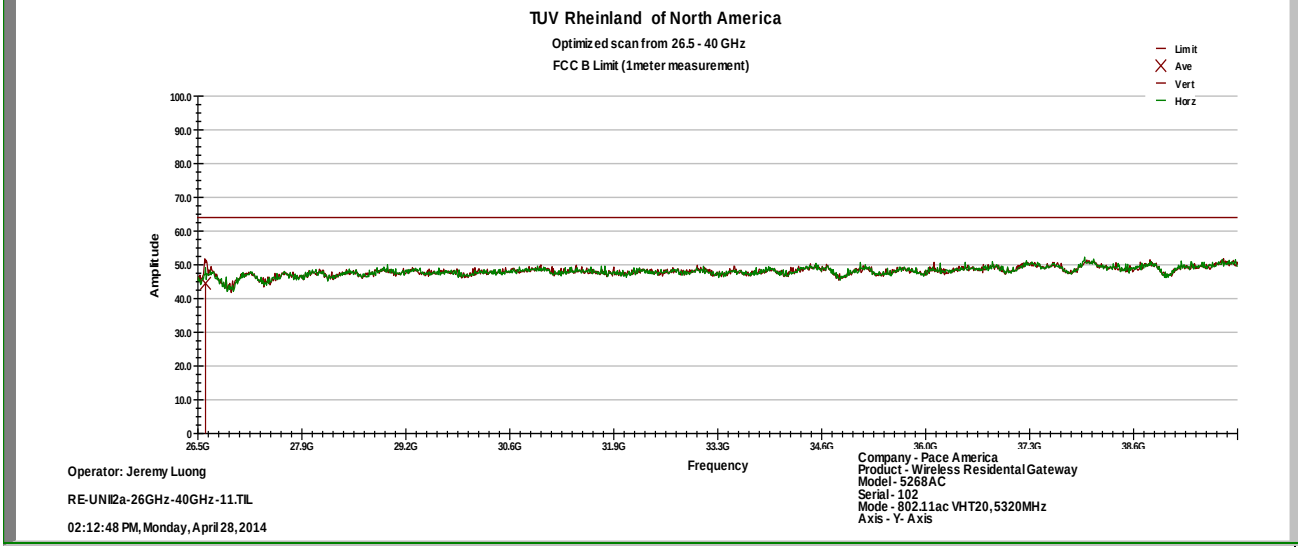
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT20 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5320 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

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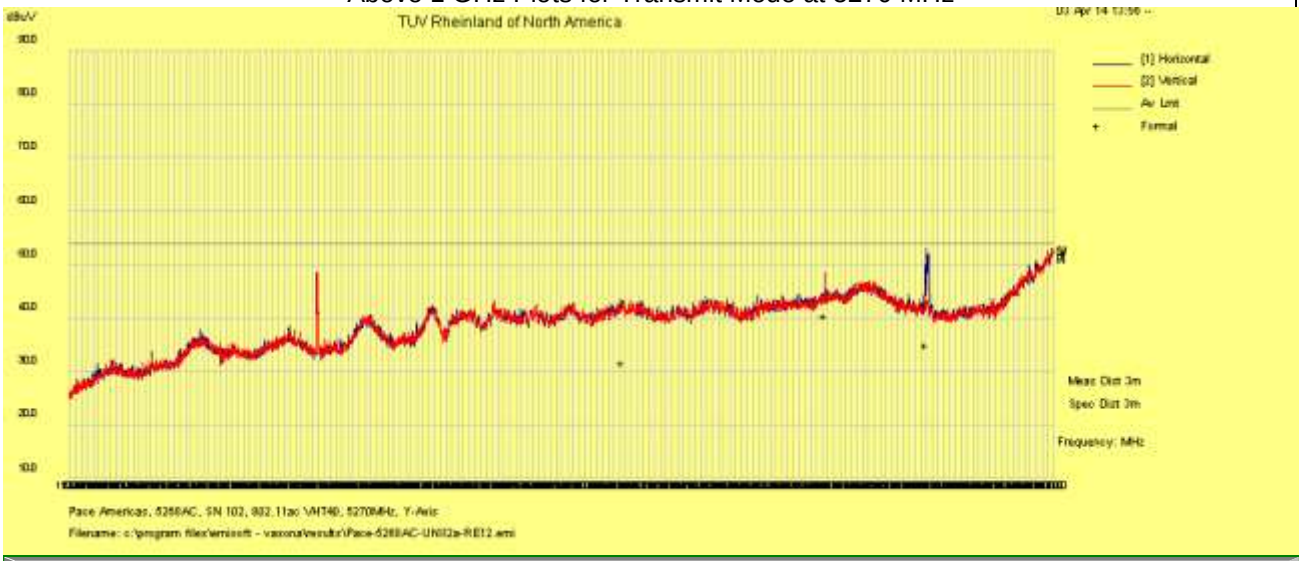
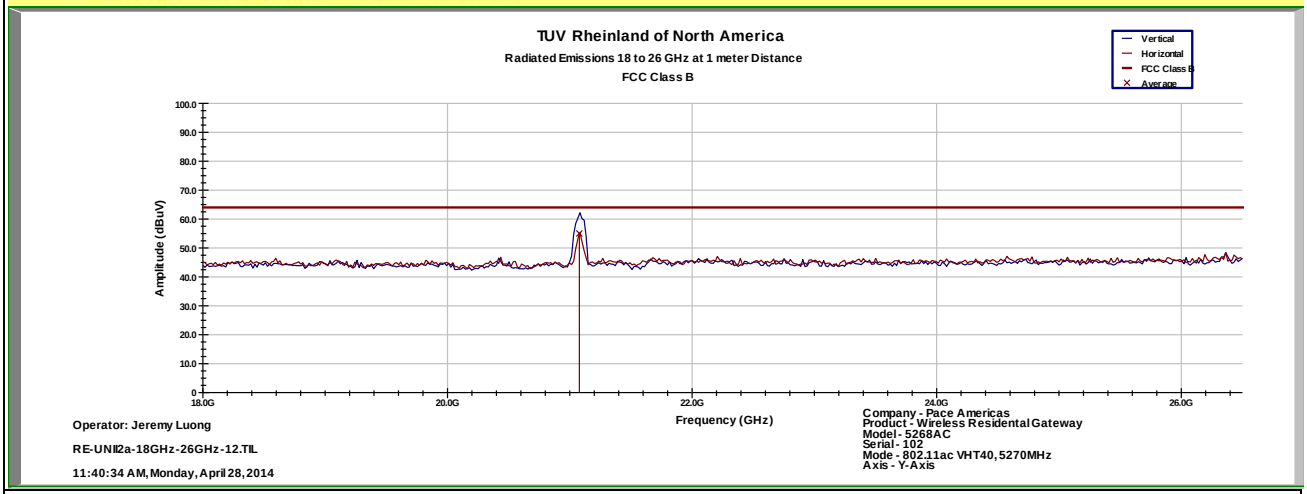
EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5270 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.

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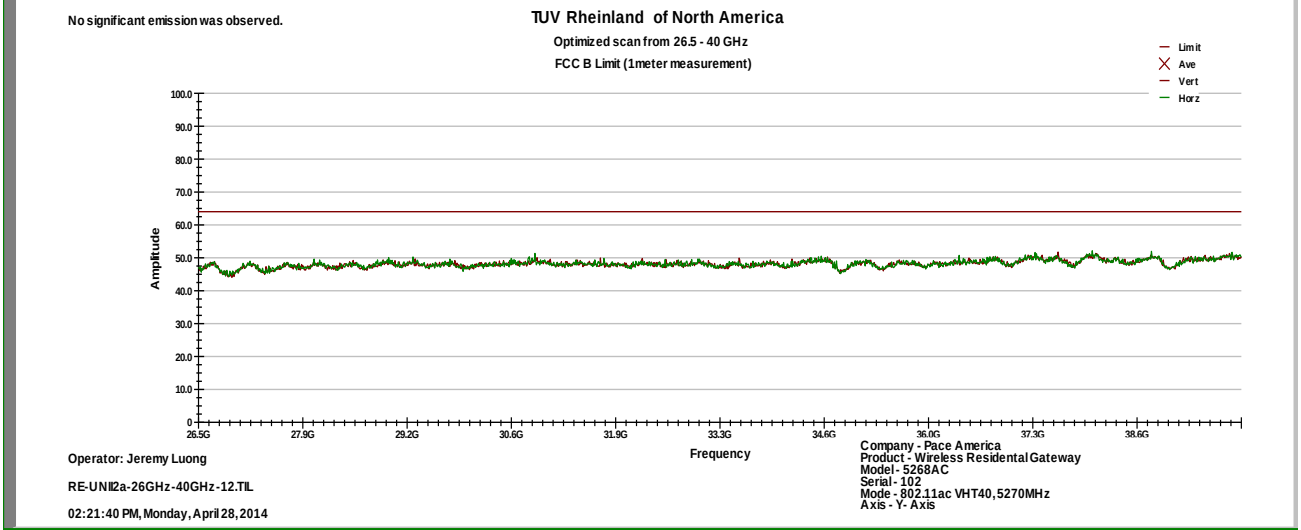
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5270 MHz

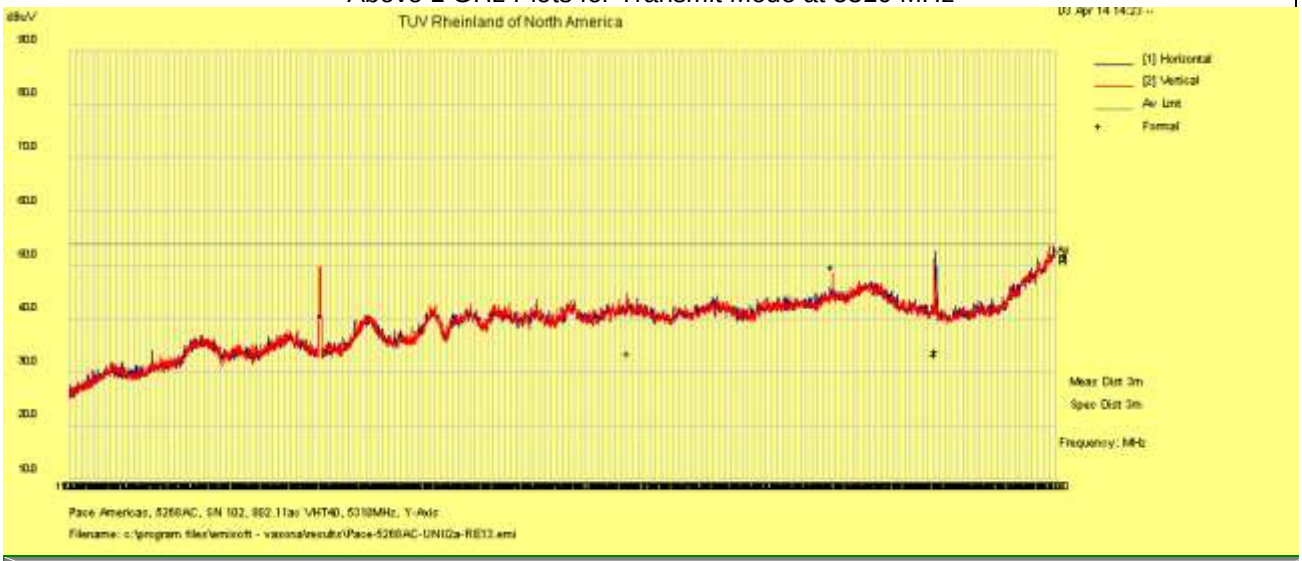


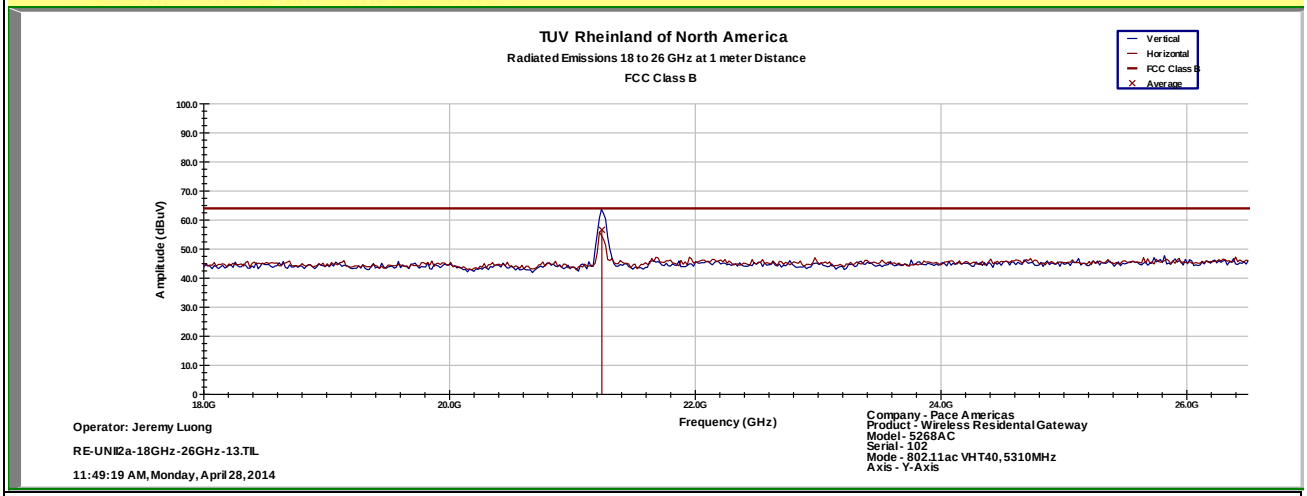
Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

SOP 1 Radiated Emissions

EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5310 MHz





Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.
1 GHz – 26 GHz Setting: RBW = 1 MHz/ VBW = 3 MHz

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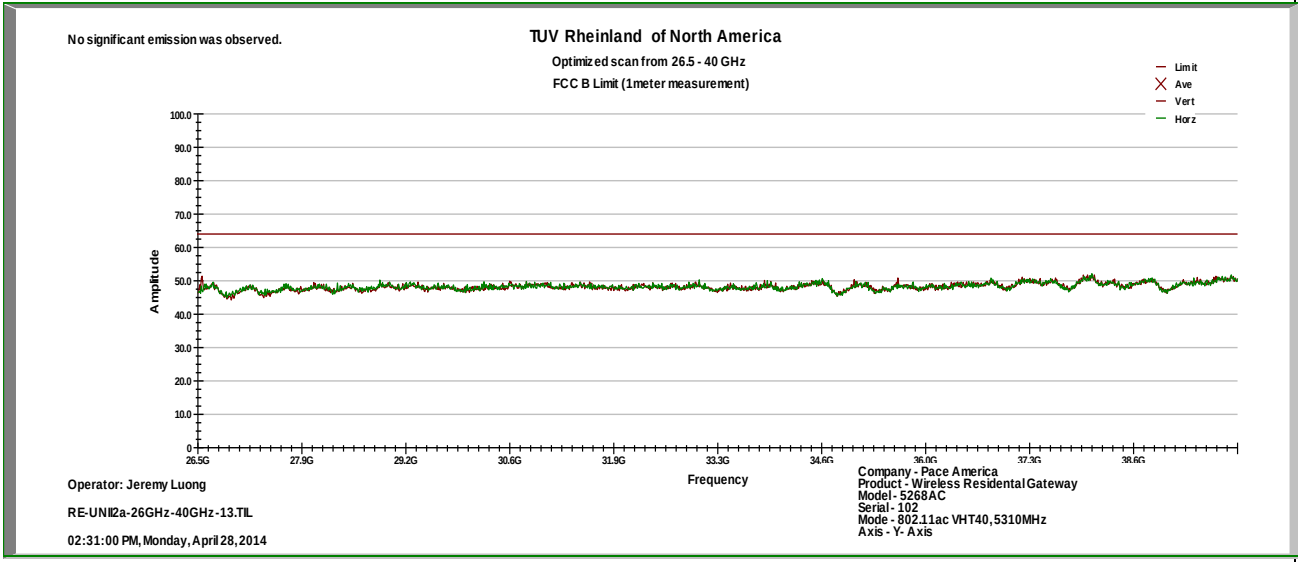
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5310 MHz

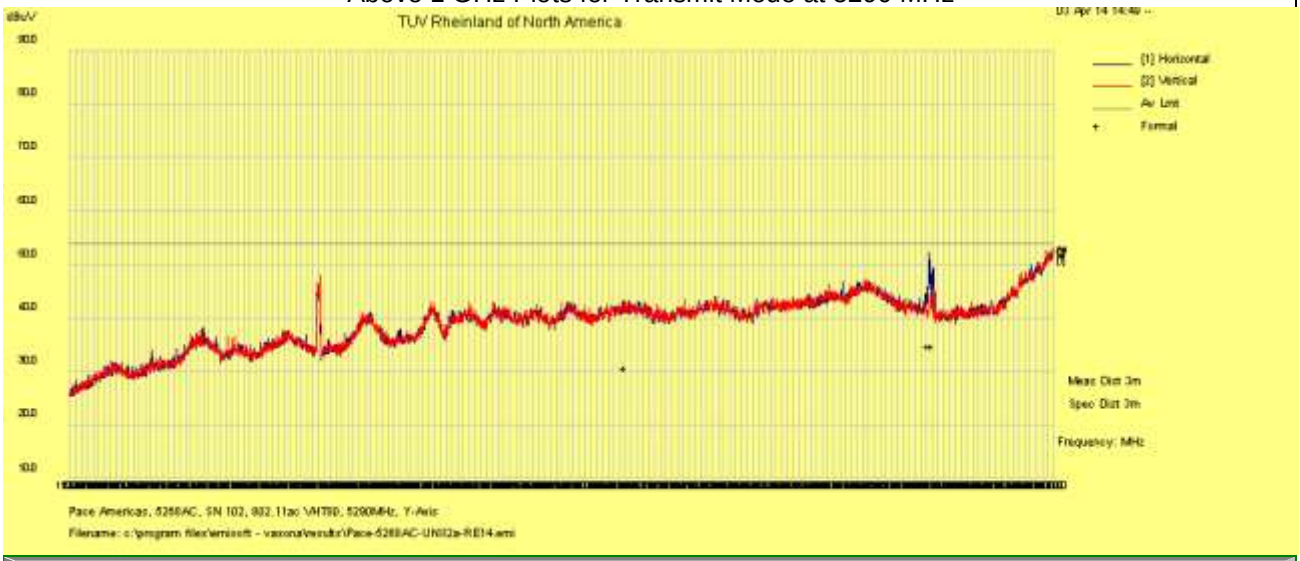


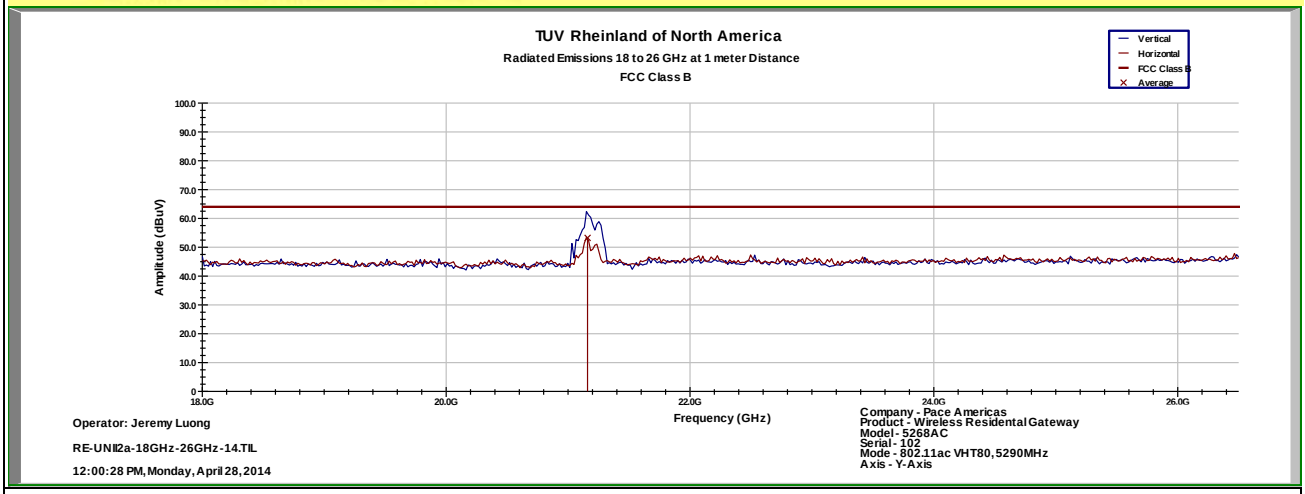
Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

SOP 1 Radiated Emissions

EUT Name	Wireless Residential Gateway	**Date**	April 3, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 30%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5290 MHz

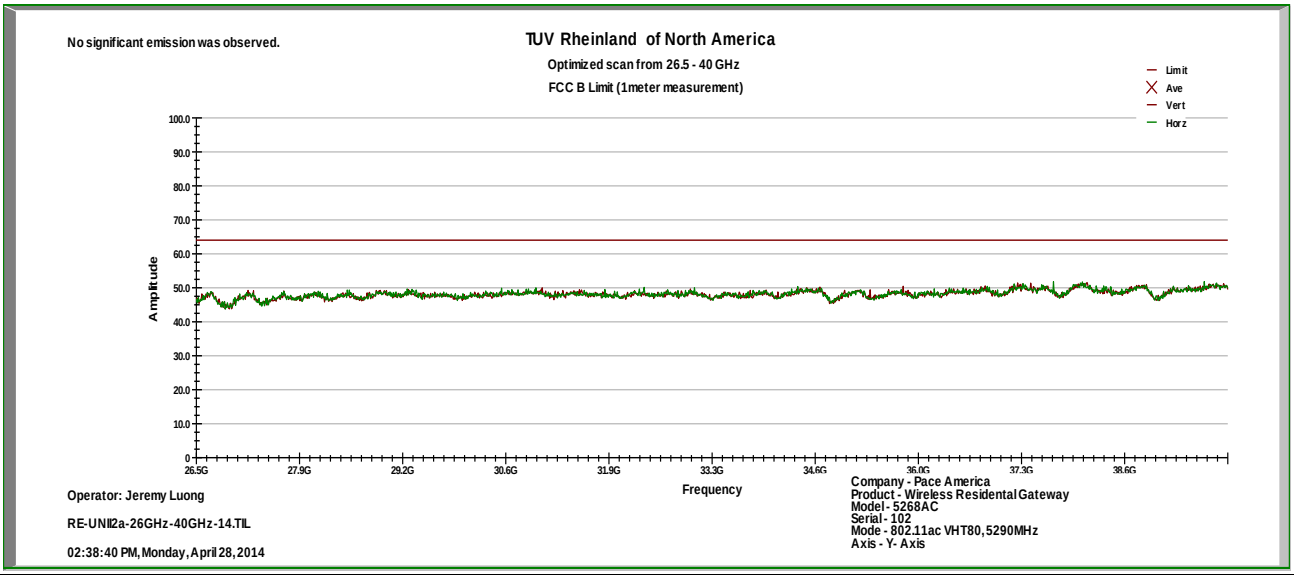




Notes: Limit was extrapolated to 1m distance for 18 GHz – 26 GHz range.
1 GHz – 26 GHz Setting: RBW = 1 MHz/ VBW = 3 MHz

SOP 1 Radiated Emissions		Tracking # 31153119.003 Page 36 of 36	
EUT Name	Wireless Residential Gateway	**Date**	April 28, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	Y-Axis, 802.11ac VHT40 at MCS0	**Line AC**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m - RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1 GHz Plots for Transmit Mode at 5290 MHz



Notes: Limit was extrapolated to 1m distance for 26.5 GHz – 40 GHz range.

4.5.4 **Sample Calculation**

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

Field Strength (dBμV/m) = FIM - AMP + CBL + ACF

Where: FIM = Field Intensity Meter (dBμV)
AMP = Amplifier Gain (dB)
CBL = Cable Loss (dB)
ACF = Antenna Correction Factor (dB/m)

$$\mu V/m = 10^{\frac{dB\mu V/m}{20}}$$

4.6 AC Conducted Emissions

Testing was performed in accordance with ANSI C63.4: 2010. These test methods are listed under the laboratory's A2LA Scope of Accreditation.

This test measures the levels emanating from the EUT's AC input port, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices.

The AC conducted emissions of equipment under test shall not exceed the values in CFR47 Part 15.207: 2012 and RSS 210: 2010.

4.6.1 **Test Methodology**

A test program that controls instrumentation and data logging was used to automate the AC Power Line Conducted emission test procedure. The frequency range of interest was divided into sub-ranges such as to yield a frequency resolution of 9 kHz. Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a set of 50μH / 50Ω LISNs.

Testing is performed in Lab 5. The setup photographs clearly identify which site was used. The vertical ground plane used in the semi-anechoic chamber is a 2m x 2m solid aluminum frame and panel, and it is bonded to the horizontal ground plane.

In the case of tabletop equipment, the EUT is placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane and 40cm from a vertical ground reference plane. The rear of the EUT was positioned flush with the backside of the table and directly over the LISNs. The power and I/O cables were routed over the edge of the table and bundled approximately 40cm from the ground plane. Support equipment was powered from a separate LISN.

4.6.1.1 Deviations

There were no deviations from this test methodology.

4.6.2 **Test Results**

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 8: AC Conducted Emissions – Test Results

Test Conditions: AC Conducted Measurement		**Test Date:** April 10, 2014
Antenna Type: Attached		**Power Level:** See Test Plan
AC Power: 120 Vac/60 Hz		**Configuration:** Tabletop
Ambient Temperature: 23° C		**Relative Humidity:** 35% RH
Configuration	**Frequency Range**	**Test Result**
Line 1 (Hot)	0.15 to 30 MHz	Pass
Line 2 (Neutral)	0.15 to 30 MHz	Pass

SOP 2 Conducted Emissions

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EUT Name	Wireless Residential Gateway	**Date**	April 10, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35% rh
EUT Serial	121404000111	**Temp / Hum out**	N/A
EUT Config.	Attached Antenna	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15.207	**RBW / VBW**	9 kHz / 30 kHz
Lab/LISN	Lab #2 /Com-Power, Line 1	**Performed by**	Jeremy Luong

Frequency	Raw	Cable Loss	Ins. Loss	Level	Detector	Line	Limit	Margin	Result
MHz	dBuV	dB	dB	dBuV			dBuV	dB	
0.150	41.71	10.15	-0.72	51.14	QP	Live	66.00	-14.86	Pass
0.150	29.33	10.15	-0.72	38.76	Ave	Live	56.00	-17.24	Pass
0.161	30.71	10.15	-0.69	40.17	QP	Live	65.42	-25.25	Pass
0.161	22.24	10.15	-0.69	31.70	Ave	Live	55.42	-23.72	Pass
0.496	27.50	10.18	-0.31	37.37	QP	Live	56.07	-18.70	Pass
0.496	14.57	10.18	-0.31	24.44	Ave	Live	46.07	-21.63	Pass
0.762	21.71	10.21	-0.24	31.68	QP	Live	56.00	-24.32	Pass
0.762	9.34	10.21	-0.24	19.31	Ave	Live	46.00	-26.69	Pass
1.448	18.07	10.27	-0.19	28.15	QP	Live	56.00	-27.85	Pass
1.448	7.81	10.27	-0.19	17.89	Ave	Live	46.00	-28.11	Pass
4.481	21.79	10.43	-0.14	32.08	QP	Live	56.00	-23.92	Pass
4.481	12.91	10.43	-0.14	23.20	Ave	Live	46.00	-22.80	Pass
4.632	23.76	10.43	-0.14	34.05	QP	Live	56.00	-21.95	Pass
4.632	14.73	10.43	-0.14	25.02	Ave	Live	46.00	-20.98	Pass

Spec Margin = QP./Ave. - Limit, ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 2.18 dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: EUT was setup as table top equipment and transmitted at 5300 MHz in 802.11a at 6 Mbps

SOP 2 Conducted Emissions

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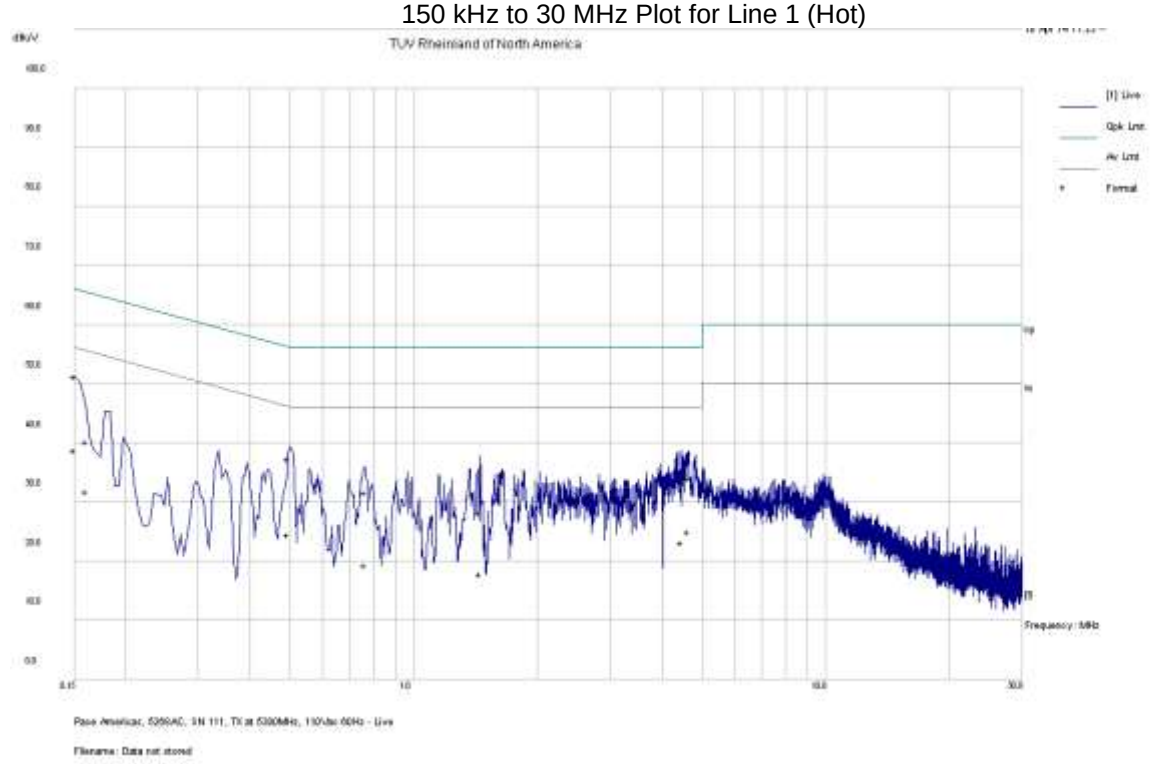
EUT Name	Wireless Residential Gateway	**Date**	April 10, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35% rh
EUT Serial	121404000111	**Temp / Hum out**	N/A
EUT Config.	Attached Antenna	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15.207	**RBW / VBW**	9 kHz / 30 kHz
Lab/LISN	Lab #2 /Com-Power, Line 1	**Performed by**	Jeremy Luong

150 kHz to 30 MHz Plot for Line 1 (Hot)



Notes: Meet FCC Class B limit.

SOP 2 Conducted Emissions

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EUT Name	Wireless Residential Gateway	**Date**	April 10, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 35% rh
EUT Serial	121404000111	**Temp / Hum out**	N/A
EUT Config.	Attached Antenna	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15.207	**RBW / VBW**	9 kHz / 30 kHz
Lab/LISN	Lab #2 /Com-Power, Line 2	**Performed by**	Jeremy Luong

Frequency	Raw	Cable Loss	Ins. Loss	Level	Detector	Line	Limit	Margin	Result
MHz	dBuV	dB	dB	dBuV			dBuV	dB	
0.150	42.30	10.15	-0.72	51.73	QP	Neutral	66.00	-14.27	Pass
0.150	31.62	10.15	-0.72	41.05	Ave	Neutral	56.00	-14.95	Pass
0.334	21.62	10.16	-0.40	31.38	QP	Neutral	59.36	-27.98	Pass
0.334	1.22	10.16	-0.40	10.98	Ave	Neutral	49.36	-38.38	Pass
0.501	27.23	10.18	-0.31	37.10	QP	Neutral	56.00	-18.90	Pass
0.501	18.61	10.18	-0.31	28.48	Ave	Neutral	46.00	-17.52	Pass
0.969	20.51	10.23	-0.22	30.52	QP	Neutral	56.00	-25.48	Pass
0.969	10.39	10.23	-0.22	20.40	Ave	Neutral	46.00	-25.60	Pass
1.810	21.81	10.29	-0.17	31.93	QP	Neutral	56.00	-24.07	Pass
1.810	11.87	10.29	-0.17	21.99	Ave	Neutral	46.00	-24.01	Pass
4.364	26.01	10.42	-0.14	36.29	QP	Neutral	56.00	-19.71	Pass
4.364	15.86	10.42	-0.14	26.14	Ave	Neutral	46.00	-19.86	Pass
4.575	27.69	10.43	-0.14	37.98	QP	Neutral	56.00	-18.02	Pass
4.575	17.74	10.43	-0.14	28.03	Ave	Neutral	46.00	-17.97	Pass

Spec Margin = QP./Ave. - Limit, ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 2.18 dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: EUT was setup as table top equipment and transmitted at 5300 MHz in 802.11a at 6 Mbps

SOP 2 Conducted Emissions

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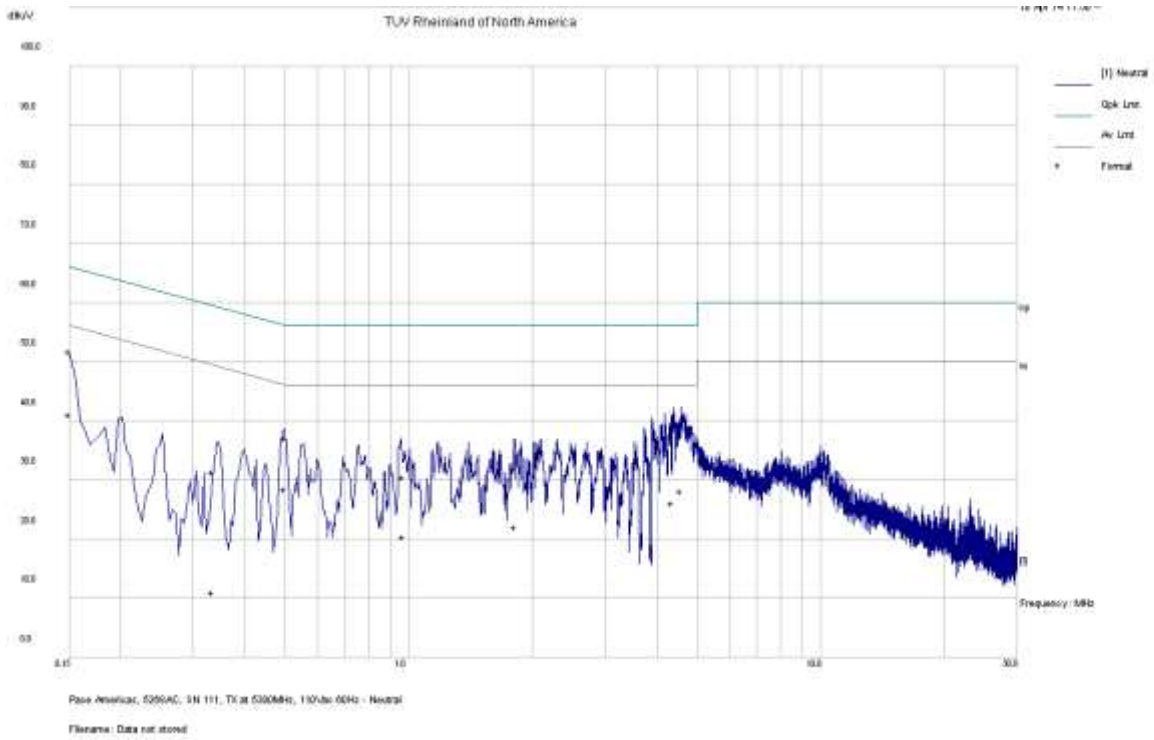
EUT Name	Wireless Residential Gateway	**Date**	May 16, 2013
EUT Model	5268AC	**Temp / Hum in**	23°C / 32%rh
EUT Serial	09130M000104	**Temp / Hum out**	N/A
EUT Config.	Attached Antenna	**Line AC**	120 Vac/60 Hz
Standard	CFR47 Part 15.107	**RBW / VBW**	9kHz / 30 kHz
Lab/LISN	Lab #2 /Com-Power, Line 2	**Performed by**	Jeremy Luong

150 kHz to 30 MHz Plot for Line 2 (Neutral)



Note: Meet FCC Class B Limit.

4.7 Frequency Stability

In accordance with 47 CFR Part 15.407(g) the frequency stability of U-NII devices must be such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual. The Manufacturer calls out operating temperature ranges of +0º to +40º C

4.7.1 **Test Methodology**

The manufacturer of the equipment is responsible for ensuring that the frequency stability is such that emissions are always maintained within the band of operation under all conditions. This test performs according to ANSI C63.10-2009 Section 6.8

4.7.2 **Manufacturer Declaration**

The frequency stability of the reference oscillator sets the frequency stability of the RF transceiver signals. Therefore all of the RF signal should have ±20ppm stability.

This stability accounts for room temp tolerance of the crystal oscillator circuit, frequency variation across temperature, and crystal ageing.

Worst case:
5.500 GHz - ±20ppm/104 kHz

±20ppm at 5 GHz translates to a maximum frequency shift of ±103 kHz. As the edge of the channels are at least one MHz from either of the band edges, ±103 kHz is more than sufficient to guarantee that the intentional emission will remain in the band over the entire operating range of the radio.

4.7.3 **Limit**

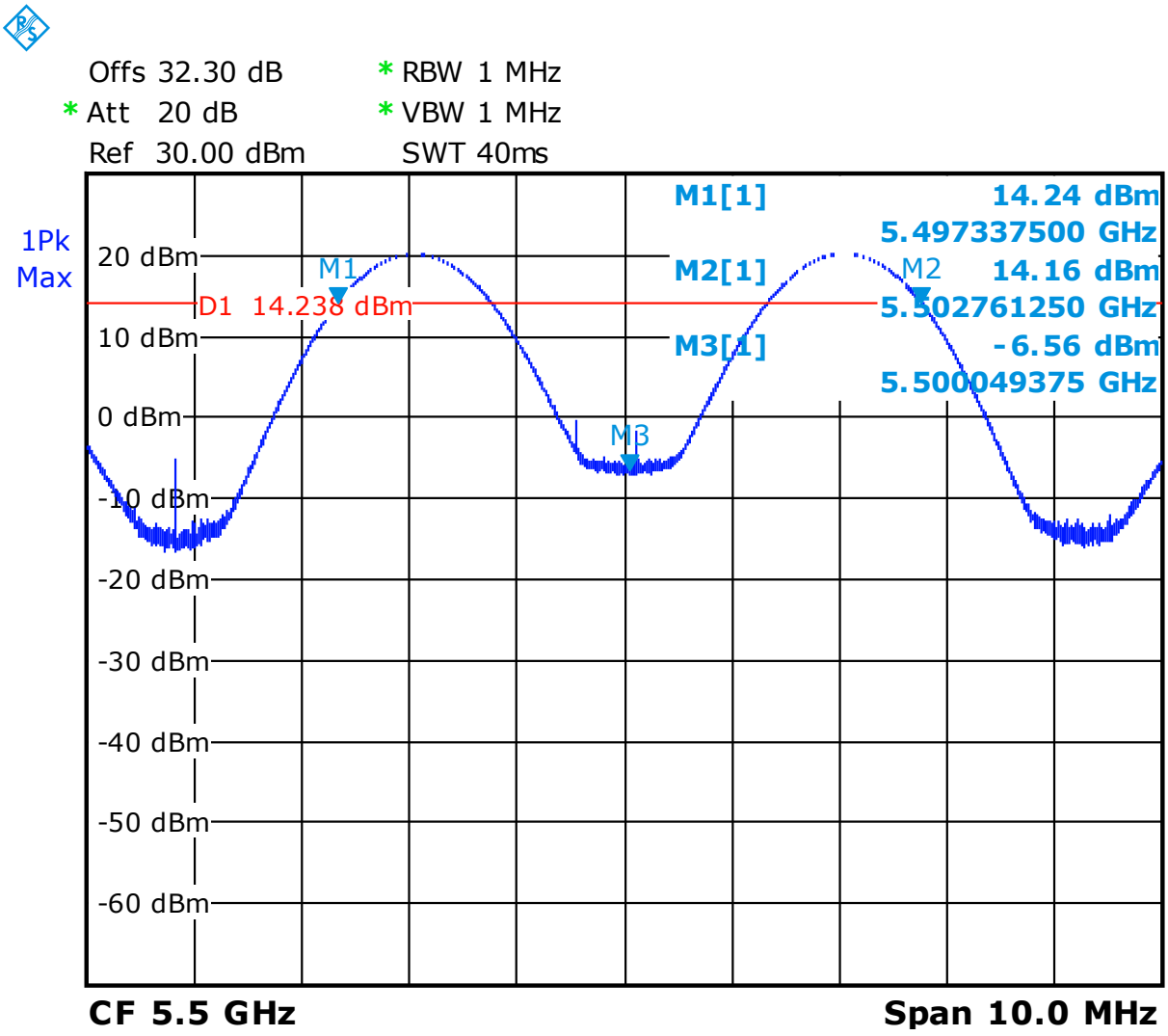
CFR47 Part 407(g) - Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

4.7.4 **Test results**

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s) since the maximum frequency drift was 8.977 ppm.

Table 9: Frequency Stability – Test Results

Temperature	Time	PPM
0° C	Start	8.977
	2 Min.	7.500
	5 Min	7.045
	10 min	8.409
10° C	Start	7.500
	2 Min.	4.318
	5 Min	3.750
	10 min	3.636
20° C	Start	5.341
	2 Min.	2.273
	5 Min	1.477
	10 min	1.591
30° C	Start	2.159
	2 Min.	0.341
	5 Min	0.114
	10 min	0.114
40° C	Start	0.455
	2 Min.	0.000
	5 Min	0.000
	10 min	0.114



Date: 27.MAR.2014 12:10:51

Figure 226: Frequency Stability – Worst Case

4.8 Voltage Variation

In accordance with 47 CFR Part 15.31 (e) intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

4.8.1 **Test Methodology**

The ac supply voltage was varied between 85% and 115% of the nominal rated supply voltage. The fundamental frequency was observed during the variation. The access point was powered 120 V/60 Hz by programmable power supply. The voltage was varied from 102 Vac to 138 Vac mean while the fundamental frequencies were observed and record for the maximum drift in ppm; part per millions.

4.8.2 **Test results**

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s). The fundamental frequencies drifted less than ±20 ppm.

Table 10: Voltage Variation – Test Results

Frequency MHz	**Nominal** (120Vac) ppm	**Lo Voltage** (102Vac) ppm	**Hi Voltage** (138Vac) ppm	**Max Drift** ppm
5500	0.568	0.227	0.341	0.568

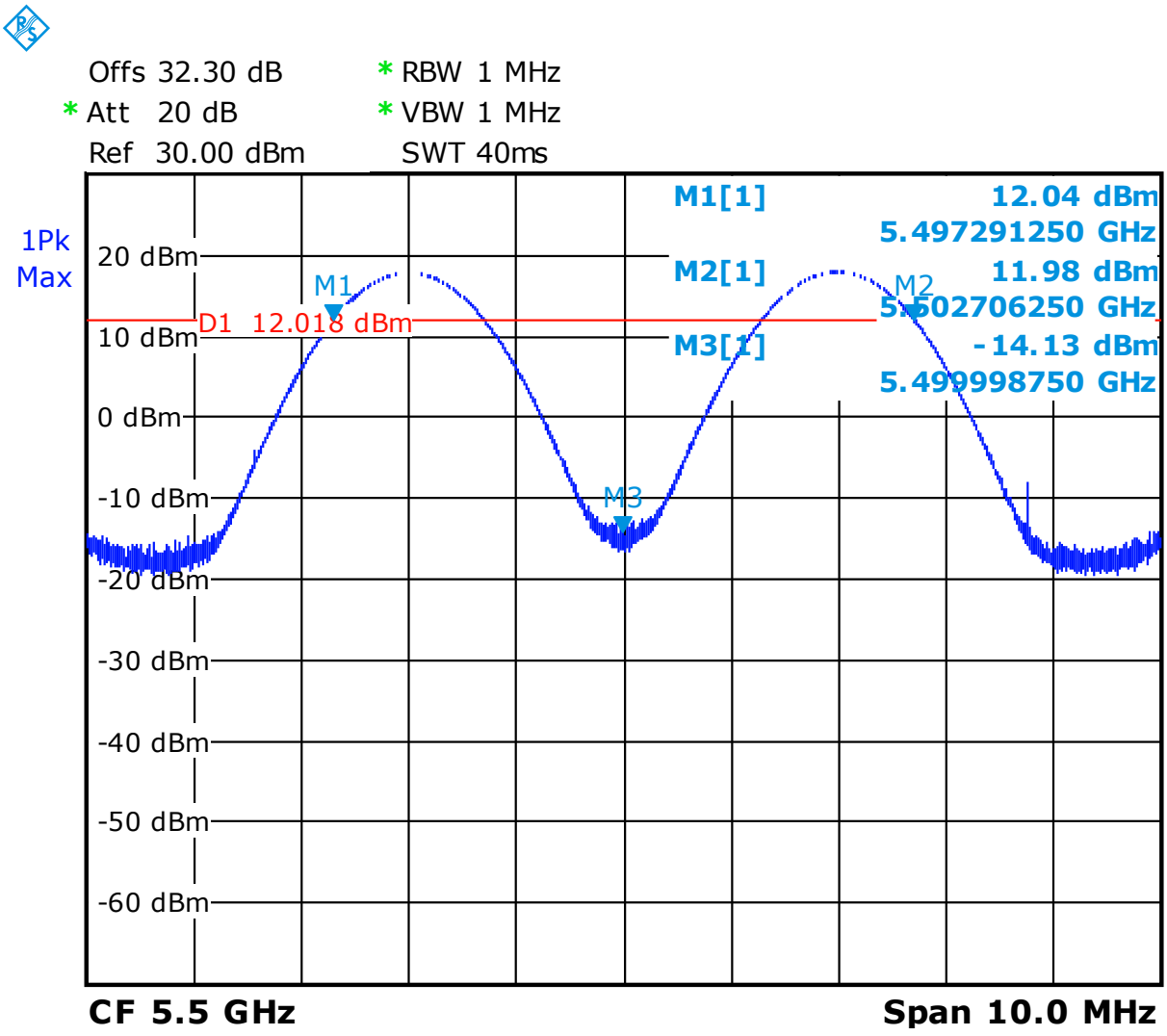


Figure 227: Voltage Variation – Worst Case

4.9 Maximum Permissible Exposure

4.9.1 Test Methodology

In this document, we try to prove the safety of radiation harmfulness to the human body for our product. The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The Gain of the antenna used in this calculation is declared by the manufacturer, and the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis transmission formula is a far field assumption, the calculated result of that is an over-prediction for near field power density. We will take that as the worst case to specify the safety range.

4.9.2 RF Exposure Limit

According to FCC 1.1310 table 1: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
(A)Limits For Occupational / Control Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	…	…	1.0	6
300 - 1500	…	…	f/300	6
1500 - 100,000	…	…	5	6
(B)Limits For General Population / Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/ f^2$)	30
30–300	27.5	0.037	0.2	30
300 - 1500	…	…	f/1500	30
1500 - 100,000	…	…	1.0	30

F = Frequency in MHz
* = Plane-wave equivalent power density

4.9.3 EUT Operating Condition

The software provided by Manufacturer enabled the EUT to transmit data at lowest, middle and highest channel individually.

4.9.4 Classification

The antenna of the product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance with the antenna should be included in user's manual. So, this device is classified as a **Mobile Device**.

4.9.5 Test Results

4.9.5.1 Antenna Gain

The transmitting antenna was integrated. The directional antenna gain was +8.08 dBi or 6.43 (numeric).

4.9.5.2 Output Power into Antenna & RF Exposure value at distance 20cm:

Calculations for this report are based on highest power measurement.

Limit for MPE (from FCC part 1.1310 table1) is 1.0 mW/cm^2

The highest measured total power is +22.76 dBm or 188.799mW

Using the Friss transmission formula, the EIRP is Pout*G, and R is 20cm.

Pd = (188.799*6.43) / (1600π) = 0.24164 mW/cm2, which is 0.75836 mW/cm2 below to the limit.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

4.9.6 Sample Calculation

The Friss transmission formula: $Pd = (Pout*G) / (4*\pi*R^2)$

Where;

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

$\pi \approx 3.1416$

R = distance between observation point and center of the radiator in cm

Ref. : David K. Cheng, *Field and Wave Electromagnetics*, Second Edition, Page 640, Eq. (11-133).

5 Test Equipment Use List

5.1 Equipment List

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal mm/dd/yy	Next Cal mm/dd/yy
Bilog Antenna	Sunol Sciences	JB3	A102606	05/15/2012	05/15/2014
Horn Antenna	Sunol Sciences	DRH-118	A040806	11/05/2012	11/05/2014
Antenna (18-26GHz)	CMT	RA42-K-F-4B-C	020131-004	06/19/2013	06/19/2014
Antenna (26-40 GHz)	CMT	RA28-K-F-4B-C	011469R-003	12/01/2013	12/01/2014
EMI Receiver	Hewlett Packard	8546A	3325A00168	11/14/2013	11/14/2014
Preselector	Hewlett Packard	85460A	3330A00174	11/14/2013	11/14/2014
Amplifier	Hewlett Packard	8447D	2944A07996	01/07/2014	02/07/2015
Spectrum Analyzer	Rohde & Schwarz	ESIB40	832427/002	01/08/2014	02/08/2015
Amplifier	Miteq	TTA1800-30-4G	1842452	01/08/2014	02/08/2015
Amplifier	Rohde & Schwarz	TS-PR26	100011	06/19/2013	06/19/2014
Amplifier	Rohde & Schwarz	TS-PR40	100012	12/01/2013	12/01/2014
Signal Generator	Anritsu	MG3694A	42803	01/07/2013	02/07/2015
Notch Filter	Micro-Tronics	BRM50702	9	01/16/2014	02/16/2016
Notch Filter	Micro-Tronics	BRC50703	1	01/16/2014	02/16/2016
Notch Filter	Micro-Tronics	BRC50704	8	01/16/2013	01/16/2015
Notch Filter	Micro-Tronics	BRC50705	9	01/16/2013	01/16/2015
High Pass Filter (3.5 GHz)	Hewlett Packard	84300-80038	820004	01/16/2013	01/16/2015
High Pass Filter (8.5 GHz)	Micro-Tronics	HPM50107	4	01/16/2013	01/16/2015
Power Supplier	California Instruments	1001P-232	L06329	VBU	VBU
Digital Multimeter	Fluke	83 III	84590116	01/07/2014	02/07/2015
Power Meter	Agilent	E4418B	MY45103902	01/09/2014	02/09/2015
Power Sensor	Hewlett Packard	8481A	US37295801	04/25/2014	04/25/2015
LISN	Com-Power	LI-215	12111	01/07/2014	02/07/2015
Transient Limiter	Com-Power	LIT-930	531582	01/08/2014	02/08/2015
Thermometer	Fluke	52II	96480032	08/07/2013	08/07/2014
Thermo Chamber	Espec	BTZ-133	0613436	03/17/2014	03/17/2015
Spectrum Analyzer	Rohde & Schwarz	FSL6	100169	01/08/2014	02/08/2015
Spectrum Analyzer	Agilent	N9038A	MY52260210	01/08/2014	02/08/2015
Spectrum Analyzer	Agilent	E4446A	MY46180348	03/24/2014	03/24/2016
Vector Signal Generator	Rohde & Schwarz	SMU 200A	1141.2005.02	06/13/2013	06/13/2015
Amplifier	Hewlett Packard	8449B	30008A01014	01/06/2014	02/06/2015

* Calibration of equipment past due for re-calibration will be performed expeditiously. If any equipment is found to be out of tolerance at that time, affected customers will be notified accordingly.

6 EMC Test Plan

6.1 Introduction

This section provides a description of the Equipment Under Test (EUT), configurations, operating conditions, and performance acceptance criteria. It is an overview of information provided by the manufacturer so that the test laboratory may perform the requested testing.

6.2 Customer

Table 11: Customer Information

Company Name	Pace Americas
Address	310 Providence Mine Road, Ste. 200
City, State, Zip	Nevada City, CA 95959
Country	USA
Phone	(530) 274-5440
Fax	(530) 273-6340

Table 12: Technical Contact Information

Name	Mark Rieger
E-mail	Mark.Rieger@pace.com
Phone	(530) 274-5440
Fax	(530) 273-6340

6.3 Equipment Under Test (EUT)

Table 13: EUT Specifications

EUT Specifications	
Dimensions	239mm (9.41") x 177mm (6.97") x 67mm (2.64")
AC Adapter (M/N:EADP-36FB A)	Input Voltage: 120 Vac 50-60 Hz Input Current: 680 mA Output Voltage: 12 dc Output Current: 1.5 A
Environment	Indoor and Outdoor
Operating Temperature Range:	0 to 40 degrees C
Multiple Feeds:	☐ Yes and how many ☒ No
Hardware Version	4.0.8
Part Number	186-2173101
RF Software Version	Busy Box V1.10.3
802.11-radio modules	
Operating Mode	802.11a, b, g, n, and ac
Transmitter Frequency Band	2.412 GHz – 2.462 GHz 5.15 GHz to 5.25 GHz (Indoor Use) 5.25 GHz to 5.35 GHz 5.47 GHz to 5.725 GHz (with band crossing channels) 5.725 GHz to 5.85 GHz
Max. Rated Power Output	See Channel Planning Table.
Power Setting @ Operating Channel	See Channel Planning Table.
Antenna Type	4 integrated metal stamped Antenna and 1 integrated PCB antenna (one metal stamped antenna used for both 2.4GHz and 5Ghz ranges)
Antenna Gain	Ant1 = 1.95 dBi, Ant2 = 2.27 dBi, Ant3 = 1.83 dBi, Ant4 = 2.03 dBi, Ant5 = 3.7 dBi, Ant6 = 1.9 dBi.
Modulation Type	☐ AM ☐ FM ☒ DSSS ☒ OFDM ☐ Other describe:

EUT Specifications	
Data Rate	*2.4 GHz Range:* 802.11b: 1, 2, 5.5, 11 Mbps at 1 Spatial Stream 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps at 1 Spatial Stream 802.11n HT20: 1 Spatial Stream: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps 2 Spatial Streams: 13, 26, 39, 58, 78, 104, 117, 130 Mbps 802.11n HT40: 1 Spatial Stream: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps 2 Spatial Streams: 27, 54, 81, 108, 162, 216, 243, 270 Mbps *5 GHz Range:* 802.11a: 4 Spatial Streams: 6, 9,12, 18, 24, 36, 48, 54 Mbps 802.11n HT20: 4 Spatial Streams: 26, 52, 78, 104, 156, 208, 234, 260 Mbps 802.11n HT40: 4 Spatial Streams: 54, 108, 162, 216, 324, 432, 486, 540 Mbps 802.11ac VHT20: 4 Spatial Streams: 26, 52, 78, 104, 156, 208, 234, 260, 312 Mbps 802.11ac VHT40: 4 Spatial Streams: 54, 108, 162, 216, 324, 432, 486, 540, 648, 720 Mbps 802.11ac VHT80: 4 Spatial Streams: 117, 234, 351, 468, 702, 936, 1053, 1170, 1404, 1560 Mbps
TX/RX Chain (s)	2x2 at 2.4GHz Range 4x4 at 5 GHz Ranges
Directional Gain Type	☒ Correlated ☒ Beam-Forming ☐ Other describe:
Type of Equipment	☒ Table Top ☐ Wall-mount ☐ Floor standing cabinet ☐ Other
Note: 1. All four chains will be on / transmitted at all time. 2. This report only documents the radio characteristics for 5250 – 5350 MHz bands.	

Table 14: EUT Channel Power Specifications

No.	Frequency (MHz)	Target Power Value for					
		802.11a	HT20	HT40	VHT20	VHT40	VHT80
36	5180	9	9	11	9	11	
40	5200	9	9		9		11
44	5220	9	9	11	9	11	
48	5240	9	9		9		
52	5260	16	16	16	16	16	
56	5280	16	16		16		16
60	5300	16	16	14	16	14	
64	5320	16	16		16		
100	5500	15	15	16	15	16	
104	5520	15	15		15		14
108	5540	15	15	16	15	16	
112	5560	15	15		15		
116	5580	15	15		15		
120	5600						
124	5620						
128	5640						
132	5660	15	15	16	15	16	
136	5680	15	15		15		16
140	5700	15	15		15	16	
144	5720				15		
149	5745	22	22	22	22	22	
153	5765	22	22		22		21
157	5785	22	22	22	22	22	
161	5805	22	22		22		
165	5825	22	22		22		
Note: The center operating frequency is shifted upward by 10 MHz for HT40, VHT40, and VHT80							

Table 15: Interface Specifications

Interface Type	Cabled with what type of cable?	Is the cable shielded?	Maximum potential length of the cable?	Metallic (M), Coax (C), Fiber (F), or Not Applicable?
RJ45	CAT-5 Ethernet	☐ No	☒ Metric: 10 m	☒ M

Table 16: Supported Equipment

Equipment	Manufacturer	Model	Serial	Used for
Laptop	Dell	PP23LB	9271001233	Setup EUT operating channel
Note: None.				

Table 17: Description of Sample used for Testing

Device	Serial	RF Connection	CFR47 Part 15.407
5268AC	121404000102 121404000111	Integrated Antenna	TX Emission, AC Conducted Emission
		Direct via Murada Connection	Transmitted Output Power, Power Spectral Density, Peak Excursion Ratio Occupied Bandwidth Frequency Stability Voltage Variation

Table 18: Description of Test Configuration used for Radiated Measurement.

Device	Antenna	Mode	Setup Photo (X-Axis)	Setup Photo (Y-Axis)	Setup Photo (Z-Axis)
5268AC	Integrated	Transmit	EUT laid flat.	EUT stood upright	Na.
Note: Pre-scans were performed in 2 supporting axis, and Y-axis was worst.					

Table 19: Final Test Mode for 5250 - 5355 Band

Test	802.11a	HT20	HT40	VHT20	VHT40	VHT80
Occupied Bandwidth FCC Part 15.407(a)	5260, 5300, 5320 MHz 4 Streams, 6Mbps	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5290MHz 4 Streams, MCS0
Output Power FCC Part 15.407(a)(1-2)	5260, 5300, 5320 MHz 4 Streams, 6Mbps	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5290MHz 4 Streams, MCS0
Peak Excursion Ratio FCC Part 15.407(a)(6)	5260, 5300, 5320 MHz 4 Streams, 6Mbps	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5290MHz 4 Streams, MCS0

Peak Power Spectral Density FCC Part 15.407(a)	5260, 5300, 5320 MHz 4 Streams, 6Mbps	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5290MHz 4 Streams, MCS0
Band-Edge (Radiated) FCC Part 15.205, 15.209, 15.407(b)	5260, 5320 MHz 4 Streams, 6Mbps	5260, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5260, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5290MHz 4 Streams, MCS0
Transmitted Spurious Emission (30 MHz – 1GHz) FCC Part 15.205, 15.209, 15.407(b)		Worst Case: 5300 MHz at 802.11a 4 Streams – MCS0 (Y-Axis)				
Transmitted Spurious Emission (Above 1GHz) FCC Part 15.205, 15.209, 15.407(b)	5260, 5300, 5320 MHz 4 Streams, 6Mbps	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5260, 5300, 5320 MHz 4 Streams, MCS0	5270, 5310 MHz 4 Streams, MCS0	5290MHz 4 Streams, MCS0
Conducted Spurious Emission (antenna port). FCC Part 15.407 (b)	According to CFR47 15.407 (b) EIPR shall not exceed -27 dBm/MHz. This is equivalent to the field strength of 68.2dBuV/m at 3 meter distance. The EUT is satisfied the requirement by meeting the limit under CFR47 Part 15.209.					
AC Conducted Emission FCC Part 15.207		5300 MHz at 802.11a 4 Data Stream: 6Mbps				
Frequency Stability FCC Part 15.407 (g)	CW Tone at 5500 MHz, (Send_cw_signal 40 0 0 3 1 0).					
Voltage Variation FCC Part 15.31 (e)	CW Tone at 5500 MHz, (Send_cw_signal 40 0 0 3 1 0).					
Dynamic Frequency Selection FCC Part 15.407 (h)	EUT support DFS for operational band 5250-5350MHz and 5470-5725MHz. See DFS test report for details.					

Note: 1. This report documented the UNII2a band for 802.11ac; 5250 MHz to 5350 MHz.
2. All radiated emission performed on Y-Axis.
3. All four chains will be on at all time.
4. All tests were pre-scanned for worst case before final testing.

6.4 Test Specifications

Testing requirements

Table 20: Test Specifications

Emissions and Immunity	
Standard	Requirement
CFR 47 Part 15.407: 2013	All
RSS 210 Issue 8, 2010	All

END OF REPORT