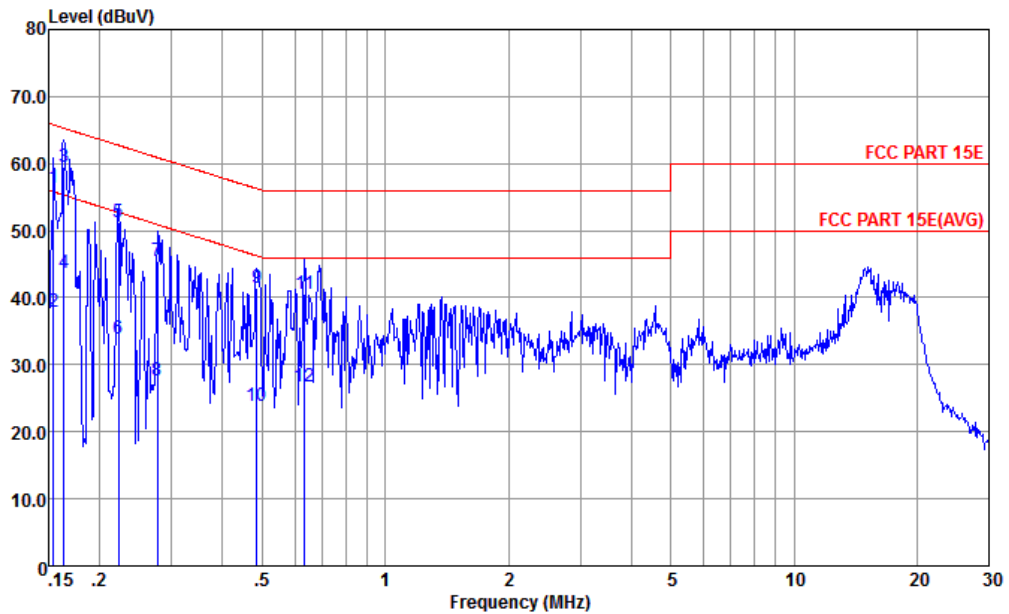




Appendix B. AC Conducted Emission Test Results

Test Engineer :	Amos Zhao	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

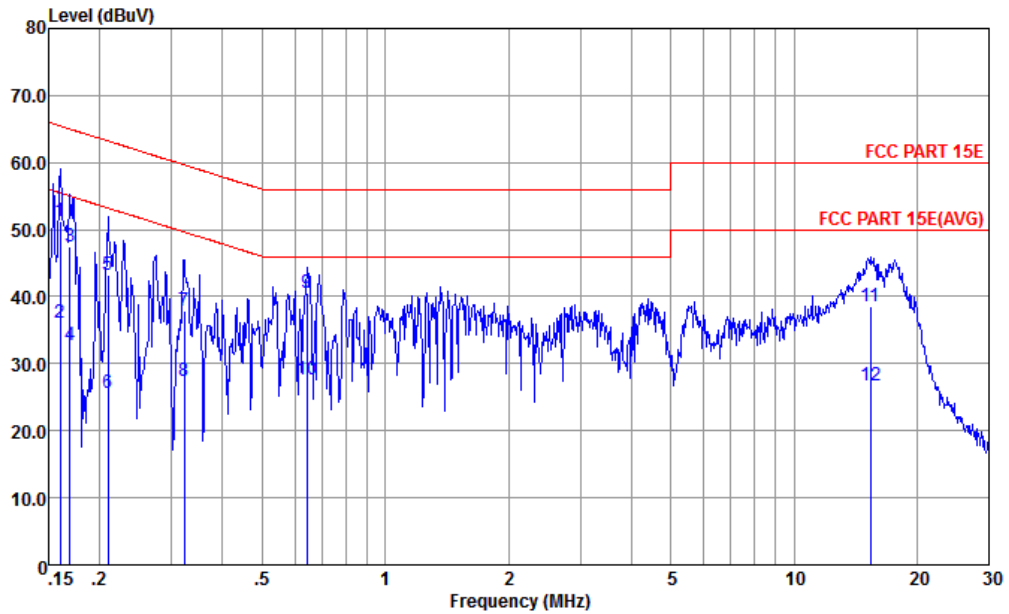


Site : CO01-KS
 Condition : FCC PART 15E LISN-060105-L LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.154	56.29	-9.49	65.78	45.80	0.02	10.47	QP
2	0.154	37.99	-17.79	55.78	27.50	0.02	10.47	Average
3 *	0.163	59.57	-5.73	65.30	49.09	0.03	10.45	QP
4	0.163	43.77	-11.53	55.30	33.29	0.03	10.45	Average
5	0.222	51.20	-11.54	62.74	40.80	0.05	10.35	QP
6	0.222	33.90	-18.84	52.74	23.50	0.05	10.35	Average
7	0.277	45.48	-15.42	60.90	35.10	0.06	10.32	QP
8	0.277	27.58	-23.32	50.90	17.20	0.06	10.32	Average
9	0.484	41.44	-14.83	56.27	31.10	0.10	10.24	QP
10	0.484	23.94	-22.33	46.27	13.60	0.10	10.24	Average
11	0.634	40.54	-15.46	56.00	30.19	0.11	10.24	QP
12	0.634	26.64	-19.36	46.00	16.29	0.11	10.24	Average



Test Engineer :	Amos Zhao	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
 Condition : FCC PART 15E LISN-060105-N NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.160	51.16	-14.31	65.47	40.60	0.11	10.45	QP
2	0.160	36.16	-19.31	55.47	25.60	0.11	10.45	Average
3	0.169	47.44	-17.55	64.99	36.90	0.11	10.43	QP
4	0.169	32.74	-22.25	54.99	22.20	0.11	10.43	Average
5	0.209	43.26	-19.97	63.23	32.80	0.10	10.36	QP
6	0.209	25.66	-27.57	53.23	15.20	0.10	10.36	Average
7	0.322	37.90	-21.76	59.66	27.50	0.10	10.30	QP
8	0.322	27.30	-22.36	49.66	16.90	0.10	10.30	Average
9	0.644	40.55	-15.45	56.00	30.20	0.11	10.24	QP
10	0.644	27.55	-18.45	46.00	17.20	0.11	10.24	Average
11	15.388	38.53	-21.47	60.00	27.80	0.33	10.40	QP
12	15.388	26.63	-23.37	50.00	15.90	0.33	10.40	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



Appendix C. Radiated Spurious Emission

UNII-1- 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5147.36	63.83	-10.17	74	55.54	34.42	10.6	36.73	100	99	P	H
		5149.92	49.68	-4.32	54	41.39	34.42	10.6	36.73	100	99	A	H
	*	5182	105.58	-	-	97.18	34.45	10.64	36.69	100	99	P	H
		5182	99.67	-	-	91.27	34.45	10.64	36.69	100	99	A	H
		5149.76	60.02	-13.98	74	51.73	34.42	10.6	36.73	295	86	P	V
		5149.92	48.17	-5.83	54	39.88	34.42	10.6	36.73	295	86	A	V
	*	5176	105.18	-	-	96.78	34.45	10.64	36.69	295	86	P	V
		5176	98.96	-	-	90.56	34.45	10.64	36.69	295	86	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII-15150~5250MHz
WIFI 802.11a (Harmonic @ 3m)

Table with 14 columns: WIFI Ant., Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). It contains two rows of test data and a 'Remark' section with two points.



UNII-2A - 5250~5350MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 58 5290MHz		5140.64	50.72	-23.28	74	42.43	34.42	10.6	36.73	113	100	P	H
		5148.48	42.2	-11.8	54	33.91	34.42	10.6	36.73	113	100	A	H
	*	5278	95.7	-	-	87.06	34.53	10.7	36.59	113	100	P	H
		5278	89.18	-	-	80.54	34.53	10.7	36.59	113	100	A	H
		5350.7	57.6	-16.4	74	48.79	34.58	10.75	36.52	113	100	P	H
		5350	49.26	-4.74	54	40.45	34.58	10.75	36.52	113	100	A	H
		5136.64	49.8	-24.2	74	41.53	34.41	10.6	36.74	298	73	P	V
		5138.08	42.2	-11.8	54	33.93	34.41	10.6	36.74	298	73	A	V
	*	5284	96.19	-	-	87.55	34.53	10.7	36.59	298	73	P	V
		5284	88.51	-	-	79.87	34.53	10.7	36.59	298	73	A	V
		5351.4	55.01	-18.99	74	46.2	34.58	10.75	36.52	298	73	P	V
		5350.4	48.01	-5.99	54	39.2	34.58	10.75	36.52	298	73	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII-2A 5250~5350MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include data for 802.11ac VHT80 CH 58 5290MHz and a Remark section.



UNII-2C - 5470~5725MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 102 5510MHz		5457.04	57.22	-16.78	74	48.13	34.66	10.85	36.42	128	102	P	H
		5467.92	63.54	-4.76	68.3	54.42	34.67	10.85	36.4	128	102	P	H
		5459.92	44.5	-9.5	54	35.41	34.66	10.85	36.42	128	102	A	H
	*	5506	102.08	-	-	92.86	34.7	10.89	36.37	128	102	P	H
		5506	95.61	-	-	86.39	34.7	10.89	36.37	128	102	A	H
		5742.6	50.11	-18.19	68.3	40.53	34.99	11.21	36.62	128	102	P	H
		5457.52	56.07	-17.93	74	46.98	34.66	10.85	36.42	294	85	P	V
		5468.72	65.03	-3.27	68.3	55.91	34.67	10.85	36.4	294	85	P	V
		5458.8	45.1	-8.9	54	36.01	34.66	10.85	36.42	294	85	A	V
	*	5512	102.43	-	-	93.21	34.7	10.89	36.37	294	85	P	V
		5512	95.86	-	-	86.64	34.7	10.89	36.37	294	85	A	V
		5733.32	50.46	-17.84	68.3	40.91	34.97	11.18	36.6	294	85	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII-2C - 5470~5725MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include test results for 802.11n HT40 CH 102 5510MHz and a Remark section.



Emission below 1GHz
WIFI 802.11n HT40 (LF @ 3m)

Table with 14 columns: WIFI, Note, Frequency, Level, Over, Limit, Read, Antenna, Path, Preamp, Ant, Table, Peak, Pol. It contains 12 rows of test data for 802.11n HT40 LF and a final Remark row.



Band 4 - 5725~5850MHz
WIFI 802.11a (Band Edge @ 3m)

Table with 14 columns: WIFI, Note, Frequency, Level, Over, Limit, Read, Antenna, Path, Preamp, Ant, Table, Peak, Pol. It contains 12 rows of test data for 802.11a CH 149 and a Remark section at the bottom.



Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11488	44.88	-29.12	74	56.82	38.19	16.35	66.48	300	0	P	H
		11488	45	-29	74	56.94	38.19	16.35	66.48	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		5650	51.46	-16.84	68.3	42.02	34.89	11.08	36.53	100	113	P	H
		5687.2	55.68	-40.18	95.86	46.18	34.93	11.13	36.56	100	113	P	H
		5718.8	73.42	-37.14	110.56	63.89	34.97	11.16	36.6	100	113	P	H
		5721.6	75.16	-39.39	114.55	65.61	34.97	11.18	36.6	100	113	P	H
		5752	101.66	-	-	92.07	35.01	11.21	36.63	100	113	P	H
		5752	94.45	-	-	84.86	35.01	11.21	36.63	100	113	A	H
		5852.8	49.47	-66.45	115.92	39.75	35.11	11.33	36.72	100	113	P	H
		5857.6	50.1	-60.07	110.17	40.37	35.13	11.34	36.74	100	113	P	H
		5885.6	49.79	-47.64	97.43	40.03	35.16	11.36	36.76	100	113	P	H
		5940.8	49.52	-18.78	68.3	39.69	35.24	11.42	36.83	100	113	P	H
		5636.8	49.58	-18.72	68.3	40.17	34.87	11.05	36.51	300	88	P	V
		5694.4	58.32	-42.85	101.17	48.82	34.93	11.13	36.56	300	88	P	V
		5716.8	71.33	-38.68	110.01	61.8	34.95	11.16	36.58	300	88	P	V
		5721.6	75.63	-38.92	114.55	66.08	34.97	11.18	36.6	300	88	P	V
		5758	103.68	-	-	94.09	35.01	11.21	36.63	300	88	P	V
		5758	95.31	-	-	85.72	35.01	11.21	36.63	300	88	A	V
		5851.6	48.61	-70.04	118.65	38.89	35.11	11.33	36.72	300	88	P	V
		5864	50.02	-58.36	108.38	40.29	35.13	11.34	36.74	300	88	P	V
	5879.2	49.71	-52.47	102.18	39.95	35.16	11.36	36.76	300	88	P	V	
	5973.6	49.69	-18.61	68.3	39.82	35.28	11.45	36.86	300	88	P	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include test results for 802.11n HT40 CH 151 at 5755MHz and a Remark section.



Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include test data for 802.11ac VHT80 CH 155 5775MHz and a Remark section.



Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). It contains two data rows and a Remark section.



Emission below 1GHz
WIFI 802.11n HT40 (LF @ 3m)

Table with 14 columns: WIFI, Note, Frequency, Level, Over, Limit, Read, Antenna, Path, Preamp, Ant, Table, Peak, Pol. It contains 12 rows of test data for 802.11n HT40 LF and a final Remark row.



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
= 55.45 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
= 43.54 (dBμV/m)
2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

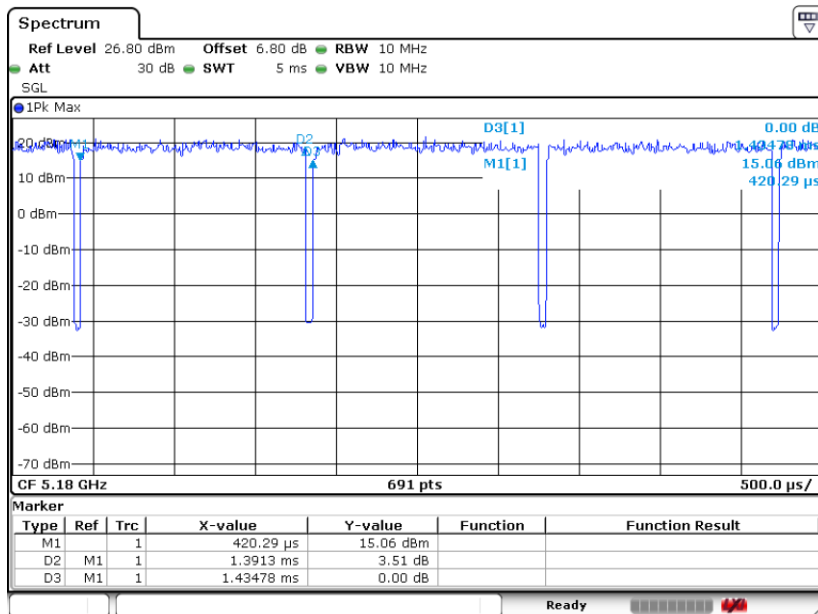
Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix D. Duty Cycle Plots

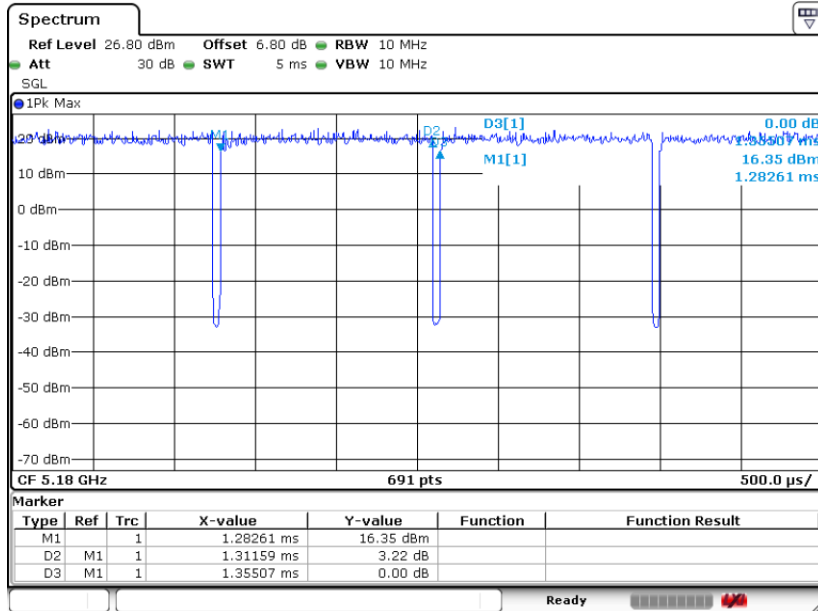
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	96.97	1.391	0.719	0.75KHz
802.11ac VHT20	96.79	1.312	0.762	0.82KHz
802.11n HT40	93.71	0.648	1.544	1.6KHz
802.11ac VHT80	87.50	0.325	3.080	3.3KHz

802.11a

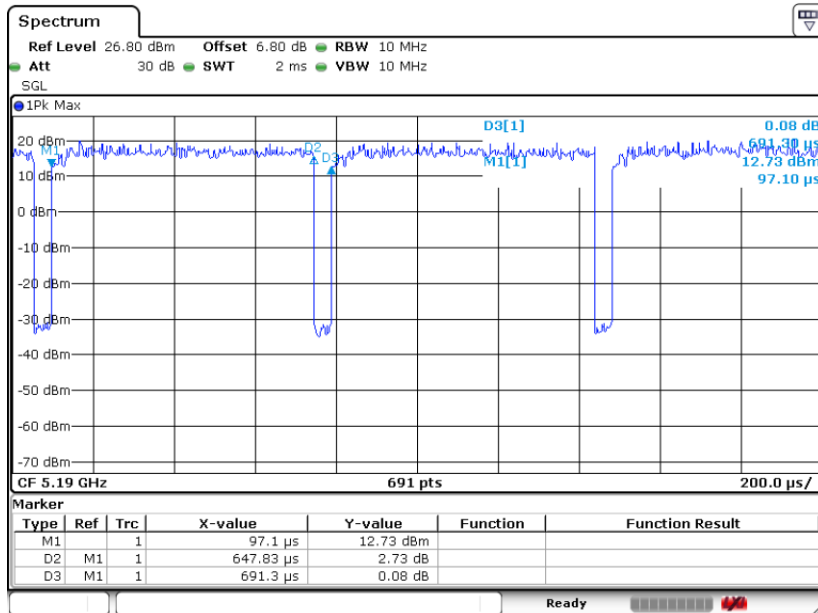




802.11ac VHT 20



802.11n HT40





802.11ac VHT80

