Appendix Test Data

Report No.:	18220WC10109304	Test Date:	2021.7.9
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	24.3℃	Relative Humidity:	56.3%
Pressure:	1012 hPa		

1. Duty Cycle

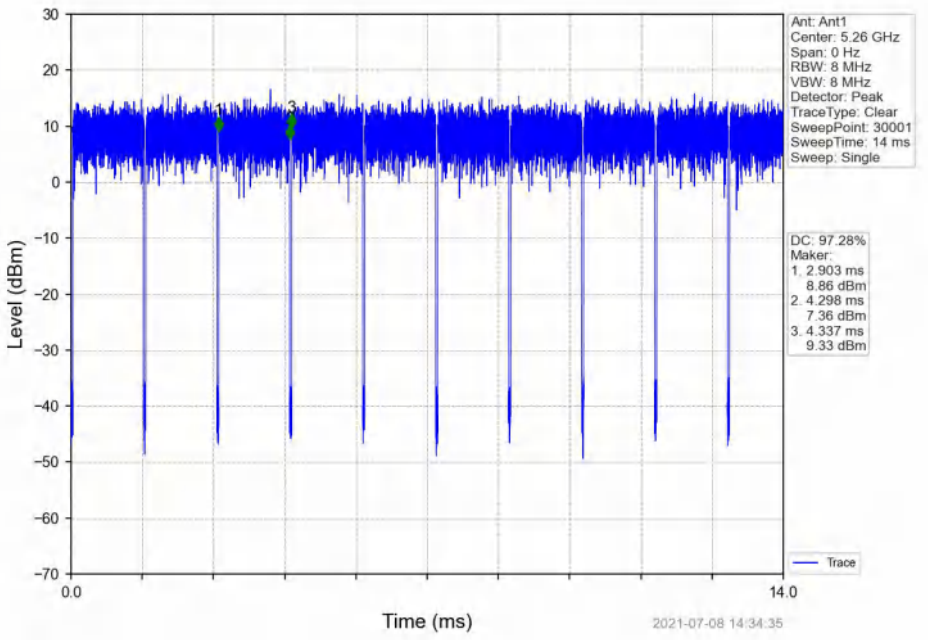
1.1 Ant1

1.1.1 Test Result

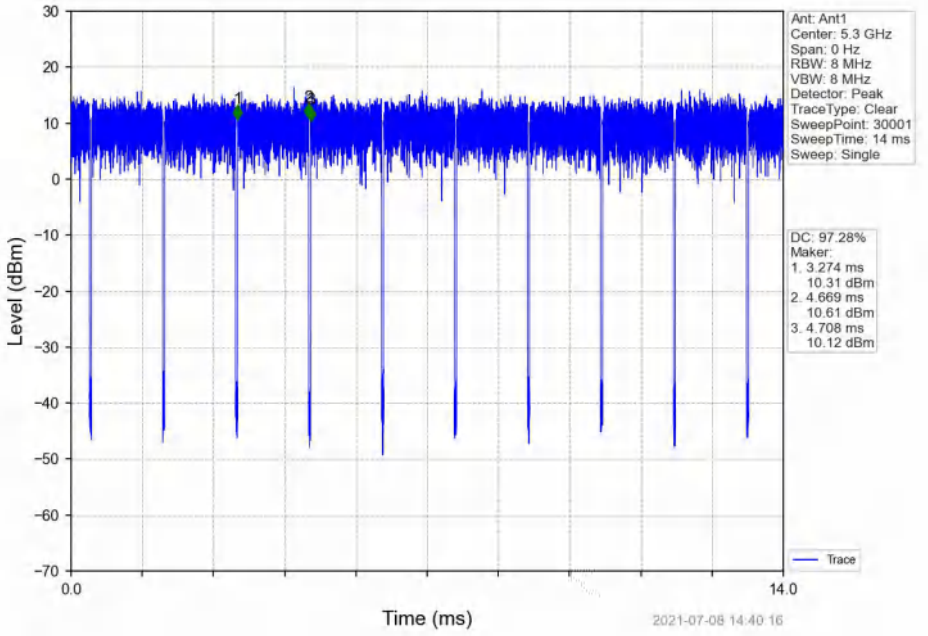
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11a	SISO	5260	1.40	1.43	97.28	0.12	0.03
		5300	1.40	1.43	97.28	0.12	0.03
		5320	1.40	1.44	97.28	0.12	0.03
802.11n (HT20)	MIMO	5260	1.31	1.35	96.96	0.13	0.03
		5300	1.31	1.35	97.10	0.13	0.03
		5320	1.31	1.35	97.03	0.13	0.03
802.11n (HT40)	MIMO	5270	0.65	0.69	94.19	0.26	0.07
		5310	0.65	0.69	94.32	0.25	0.00
802.11ac (VHT20)	MIMO	5260	1.31	1.35	96.97	0.13	0.03
		5300	1.32	1.36	97.05	0.13	0.03
		5320	1.31	1.35	96.97	0.13	0.03
802.11ac (VHT40)	MIMO	5270	0.66	0.70	94.11	0.26	0.07
		5310	0.66	0.69	94.39	0.25	0.03
802.11ac (VHT80)	MIMO	5290	0.32	0.36	88.98	0.51	0.00

1.1.2 Test Graph

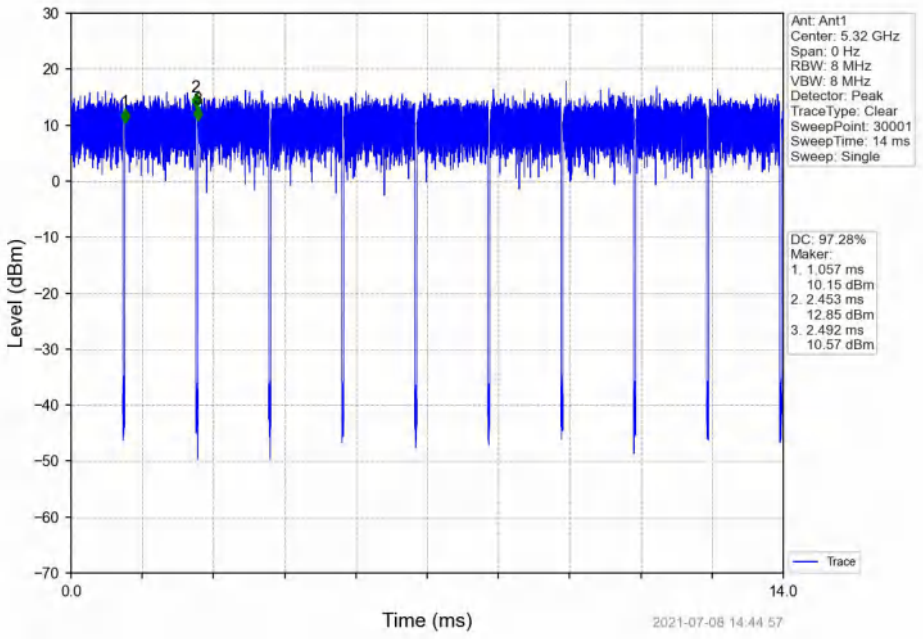
802.11a_LCH_5260MHz_Ant1_NTNV



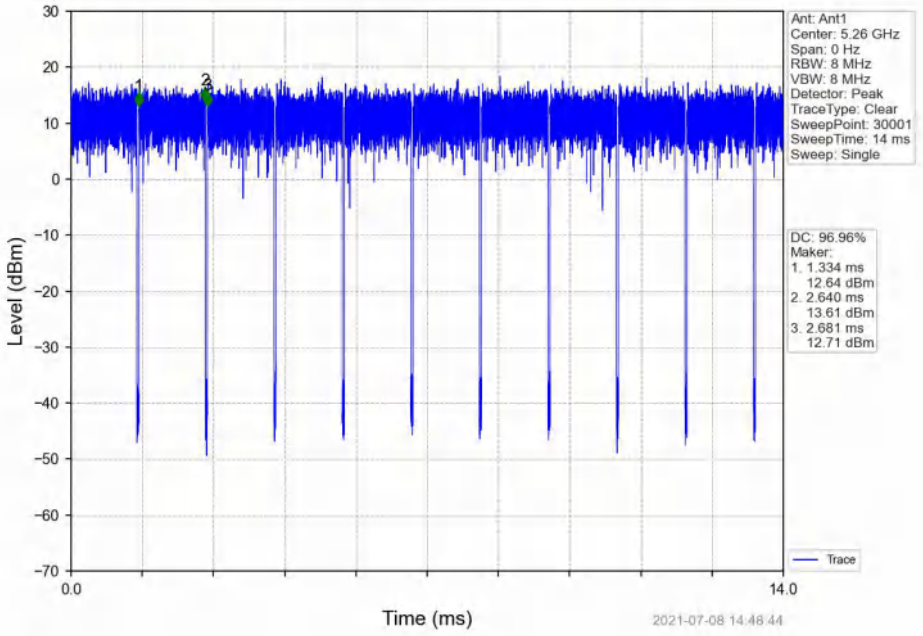
802.11a_MCH_5300MHz_Ant1_NTNV



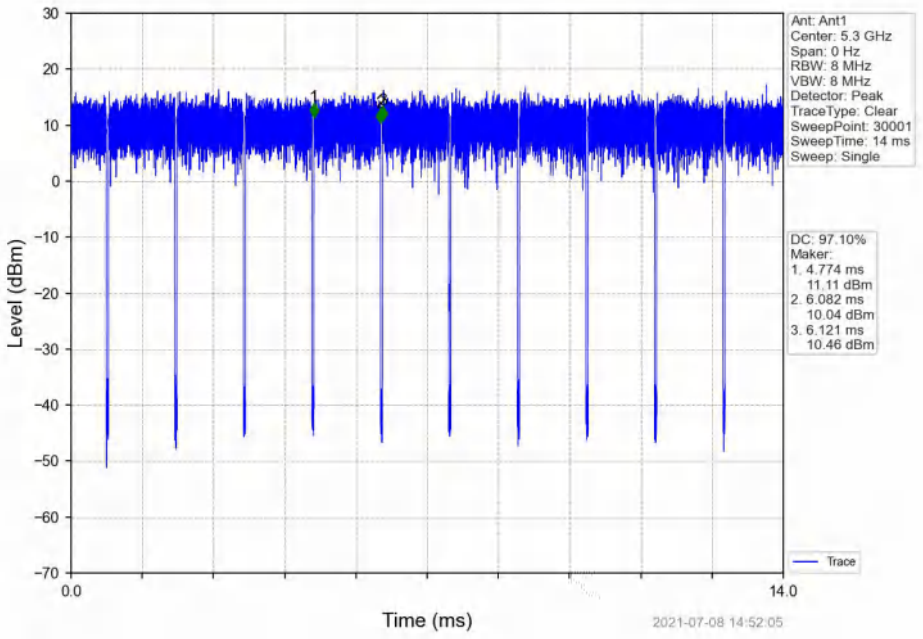
802.11a_HCH_5320MHz_Ant1_NTNV



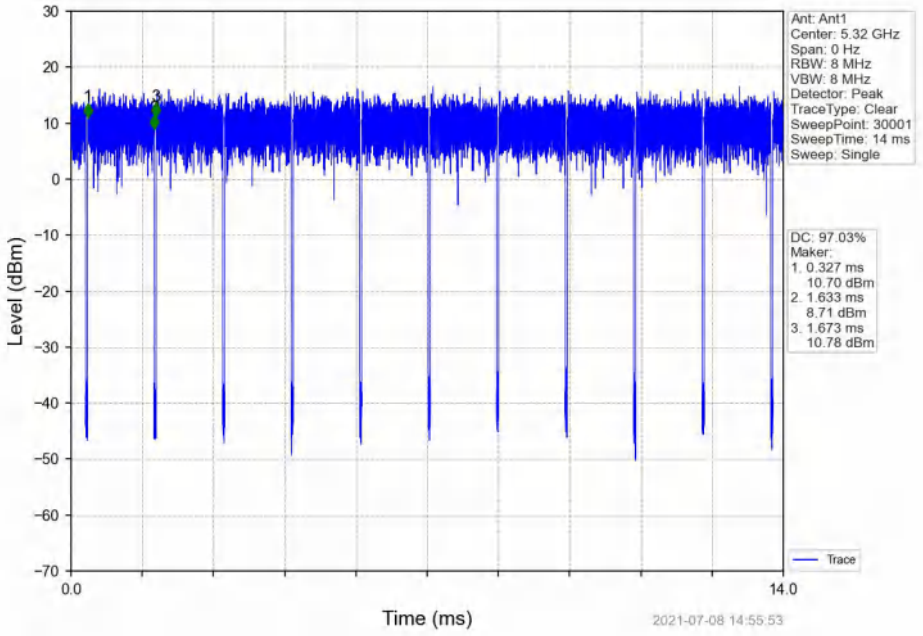
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



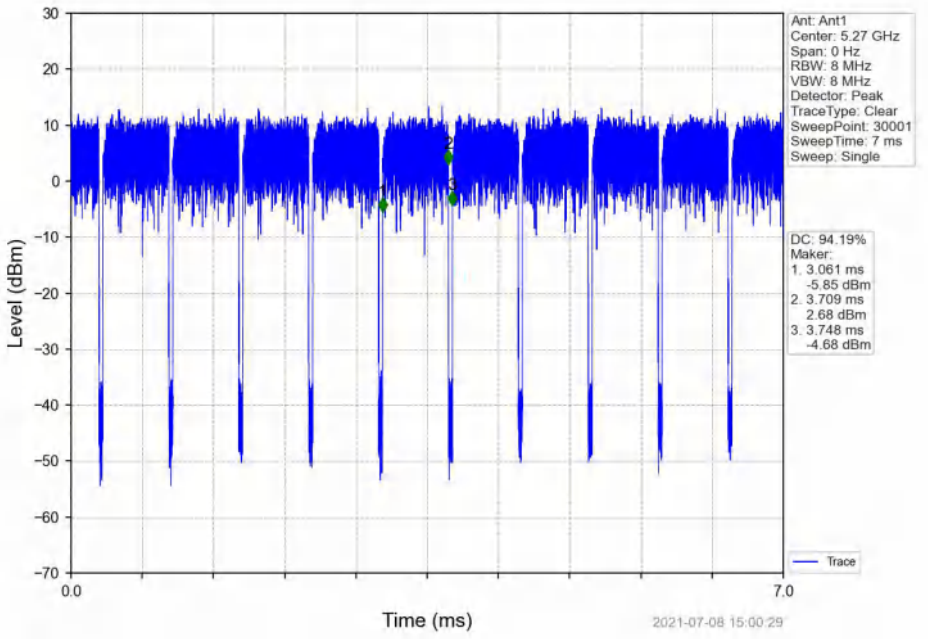
802.11n(HT20)_MCH_5300MHz_Ant1_NTNV



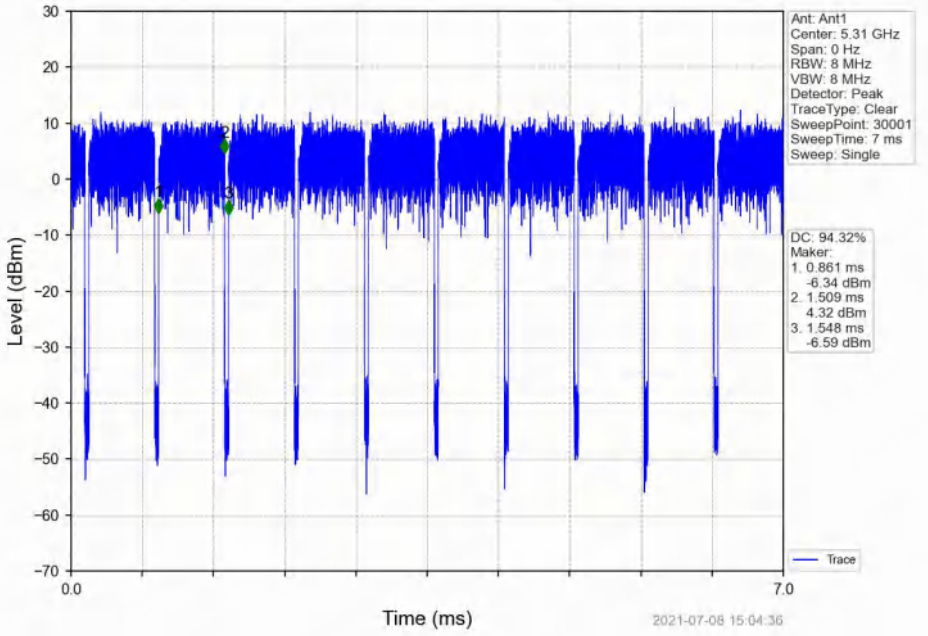
802.11n(HT20)_HCH_5320MHz_Ant1_NTNV



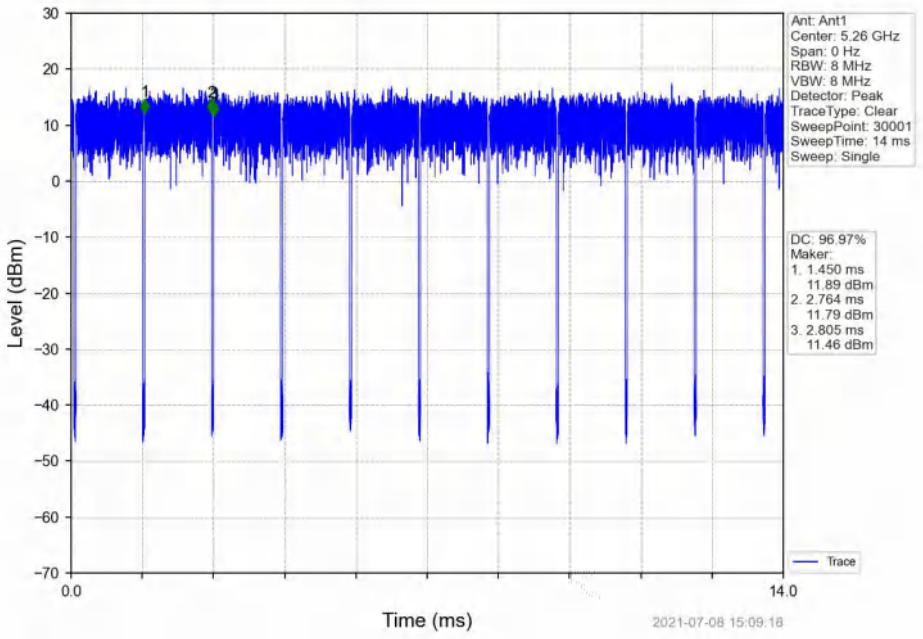
802.11n(HT40)_LCH_5270MHz_Ant1_NTNV



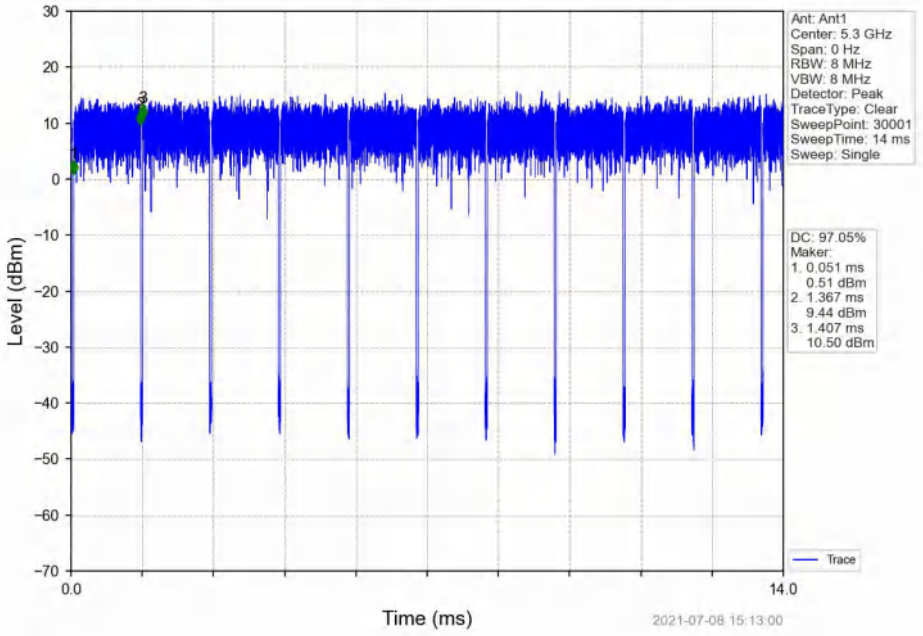
802.11n(HT40)_HCH_5310MHz_Ant1_NTNV



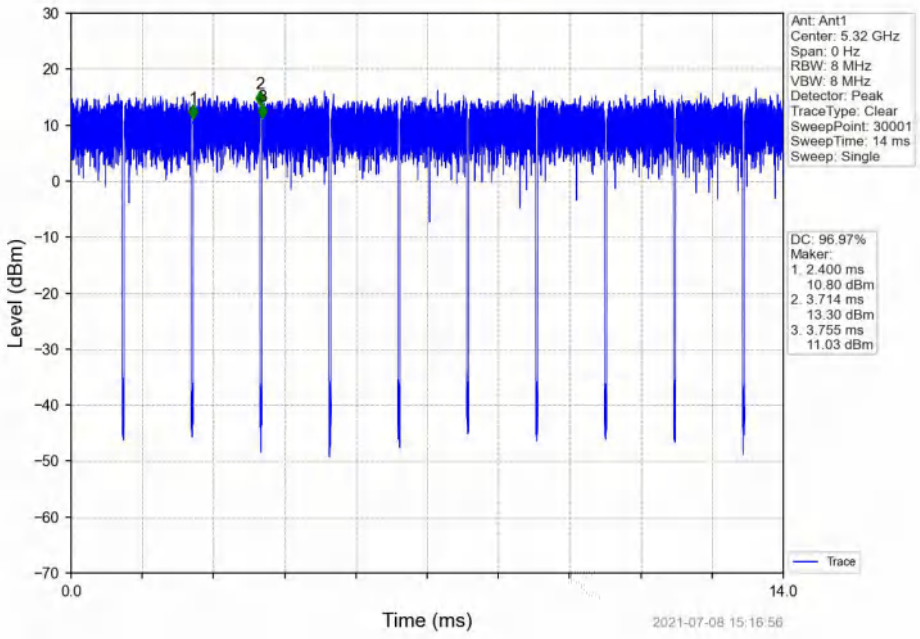
802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV



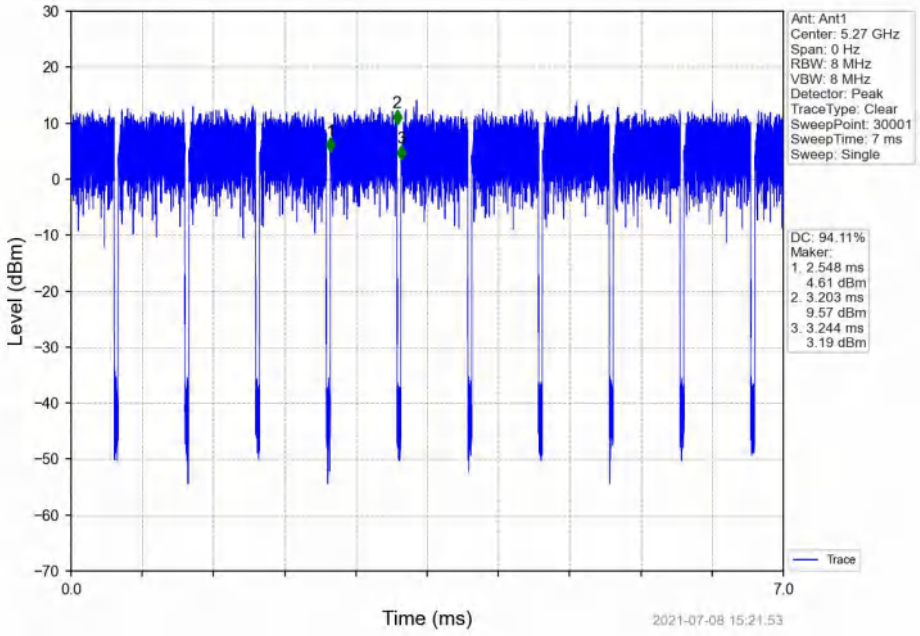
802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV



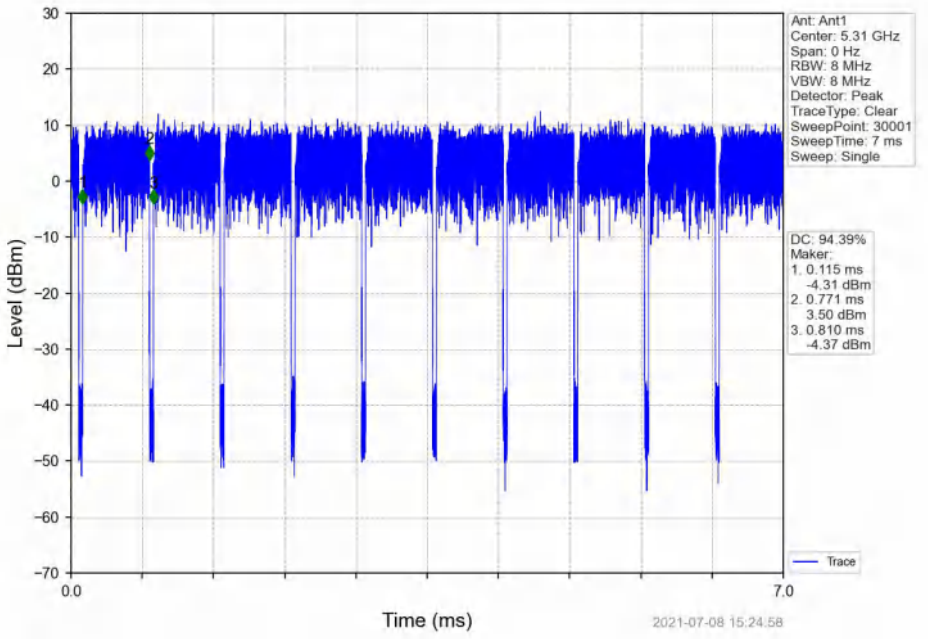
802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV



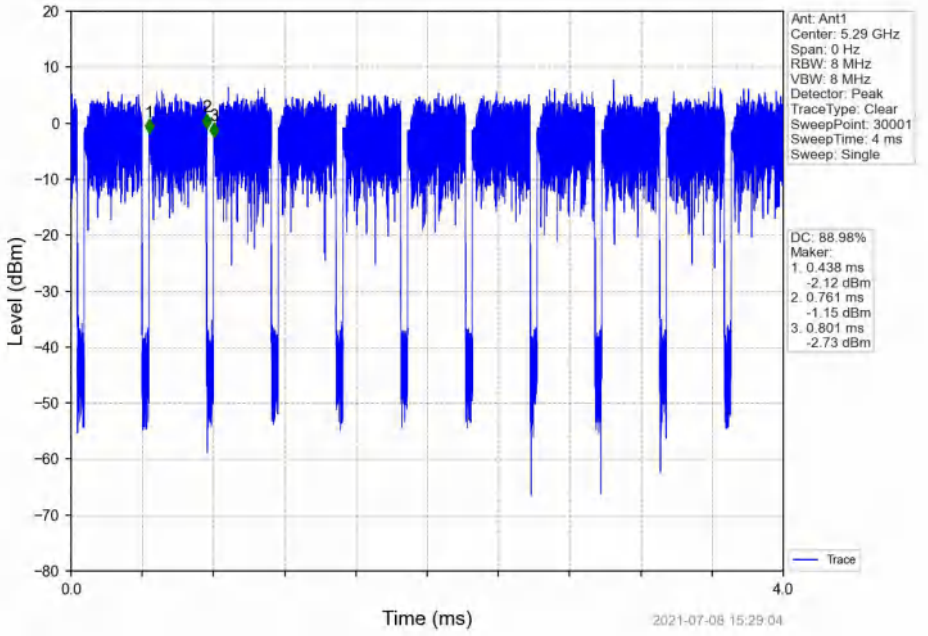
802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV



802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant1_NTNV



2. Bandwidth

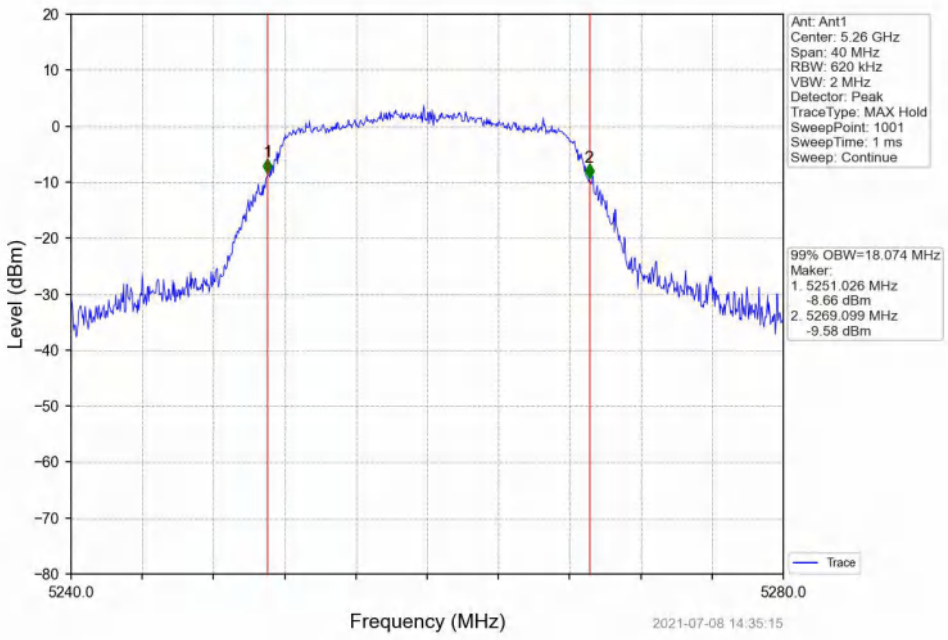
2.1 OBW

2.1.1 Test Result

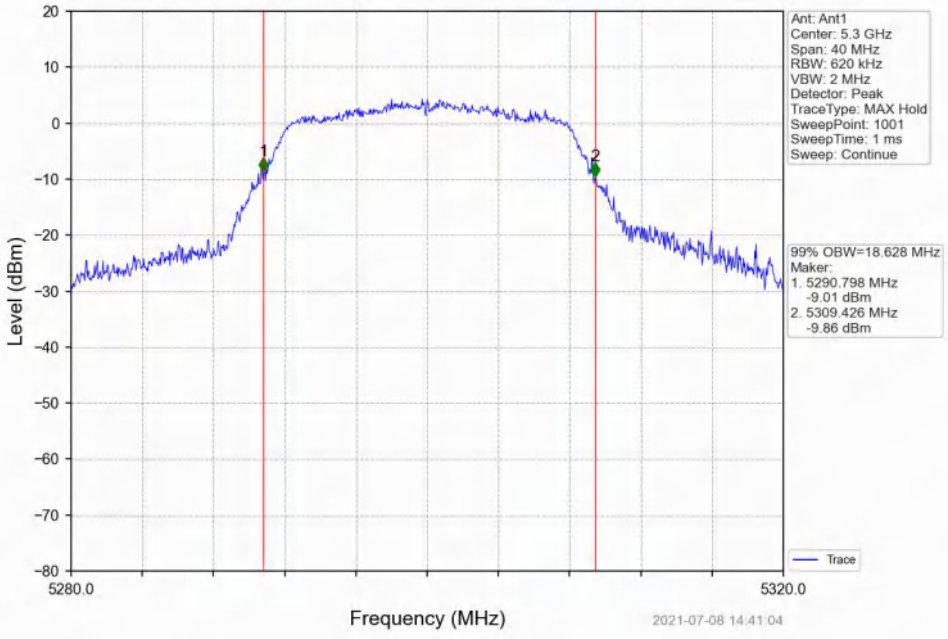
Mode	TX Type	Frequency (MHz)	Ant	99% Occupied Bandwidth (MHz)	Limit	Verdict
802.11a	SISO	5260	1	18.07	/	Pass
		5300	1	18.63	/	Pass
		5320	1	18.35	/	Pass
802.11n (HT20)	MIMO	5260	1	19.30	/	Pass
		5300	1	19.26	/	Pass
		5320	1	19.18	/	Pass
802.11n (HT40)	MIMO	5270	1	37.57	/	Pass
		5310	1	37.40	/	Pass
802.11ac (VHT20)	MIMO	5260	1	19.36	/	Pass
		5300	1	19.26	/	Pass
		5320	1	19.10	/	Pass
802.11ac (VHT40)	MIMO	5270	1	37.50	/	Pass
		5310	1	37.29	/	Pass
802.11ac (VHT80)	MIMO	5290	1	77.24	/	Pass

2.1.2 Test Graph

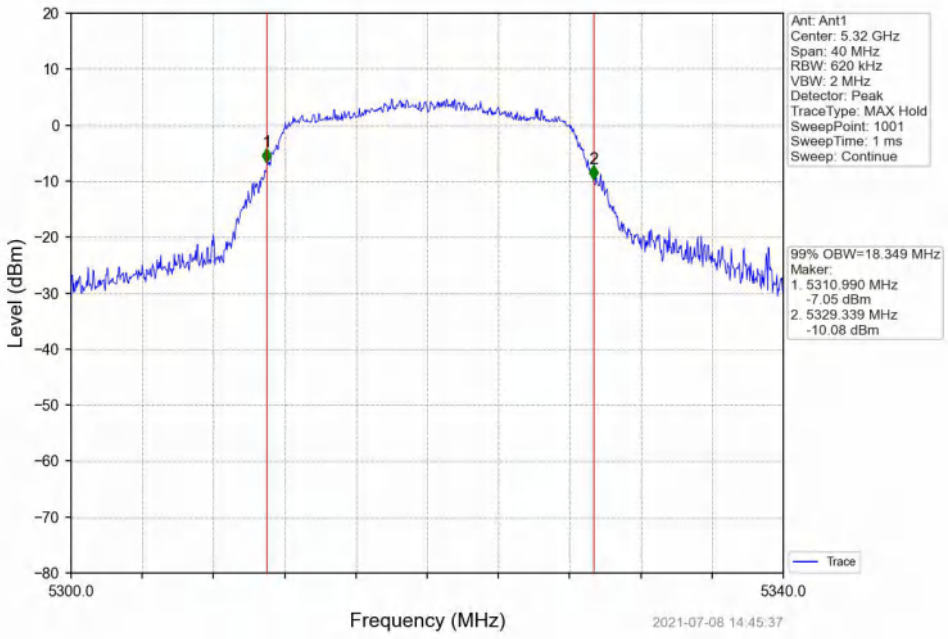
802.11a_LCH_5260MHz_Ant1_NTNV



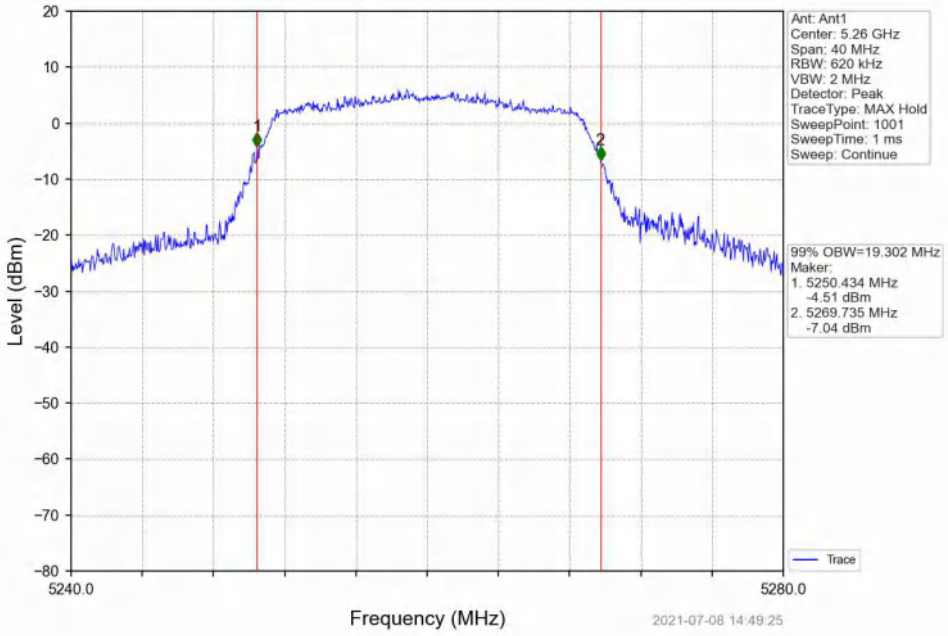
802.11a_MCH_5300MHz_Ant1_NTNV



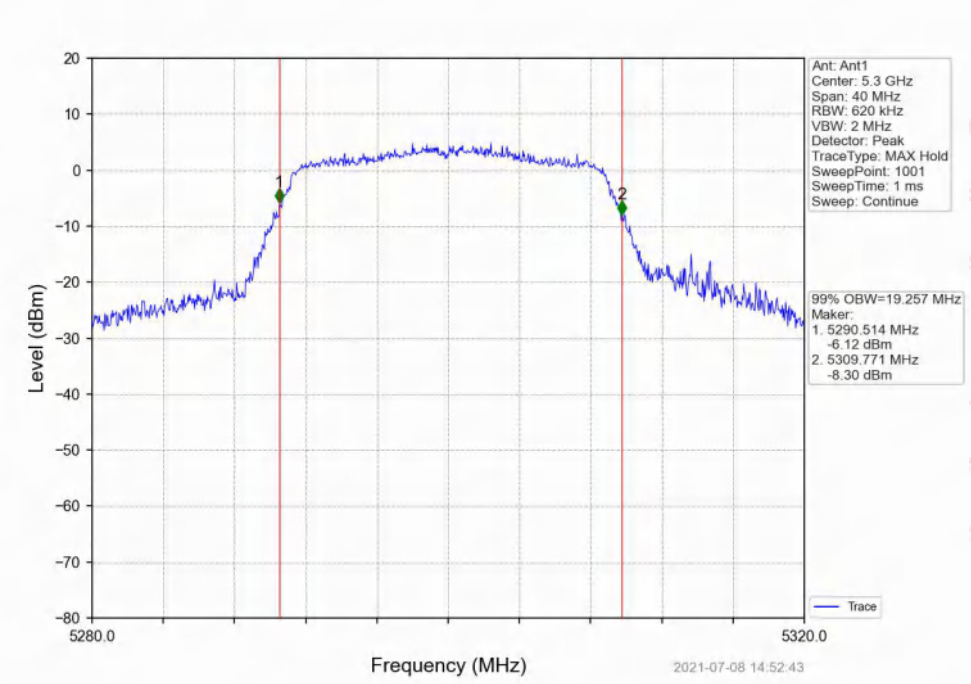
802.11a_HCH_5320MHz_Ant1_NTNV



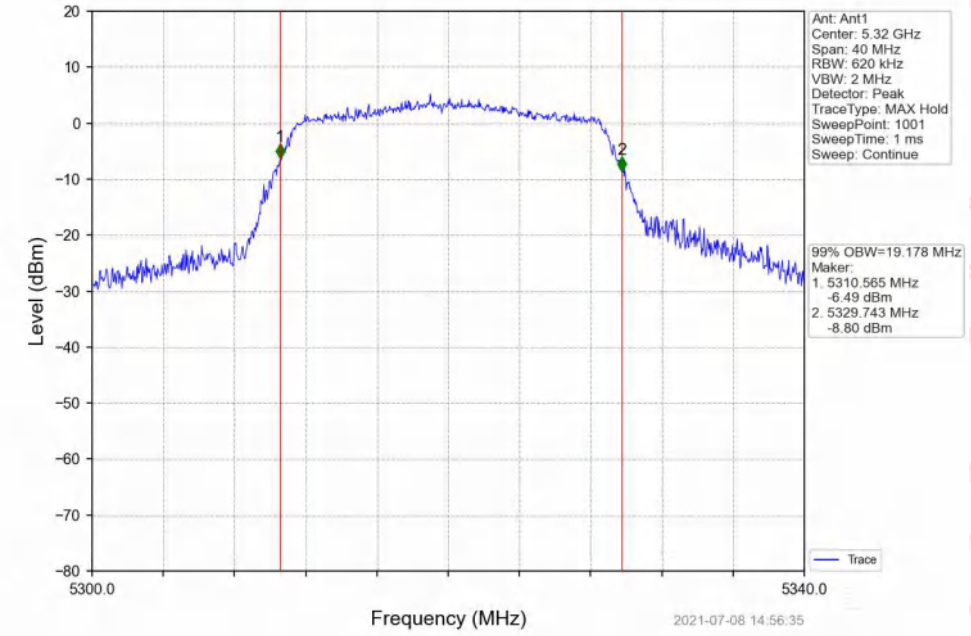
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



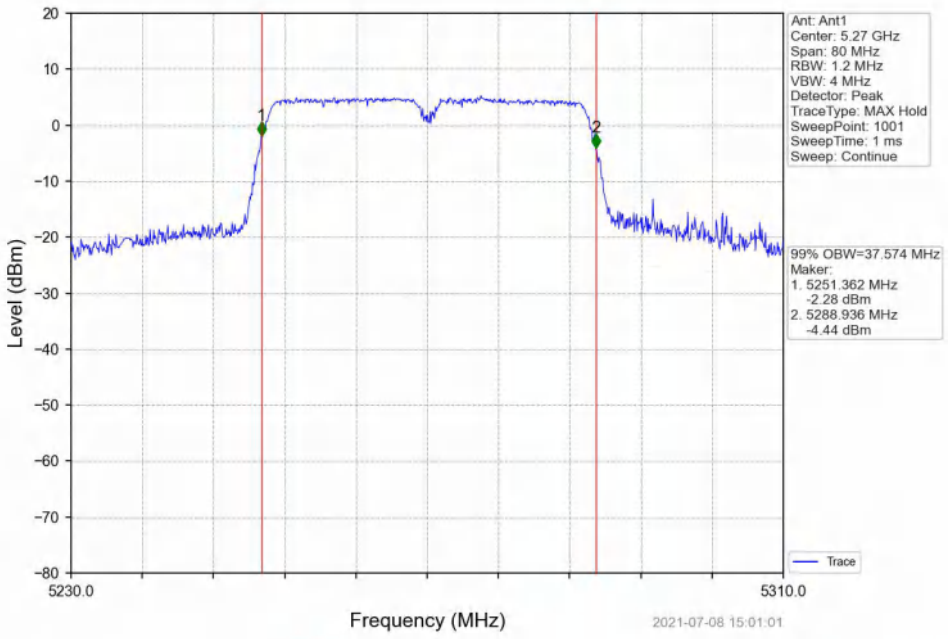
802.11n(HT20)_MCH_5300MHz_Ant1_NTNV



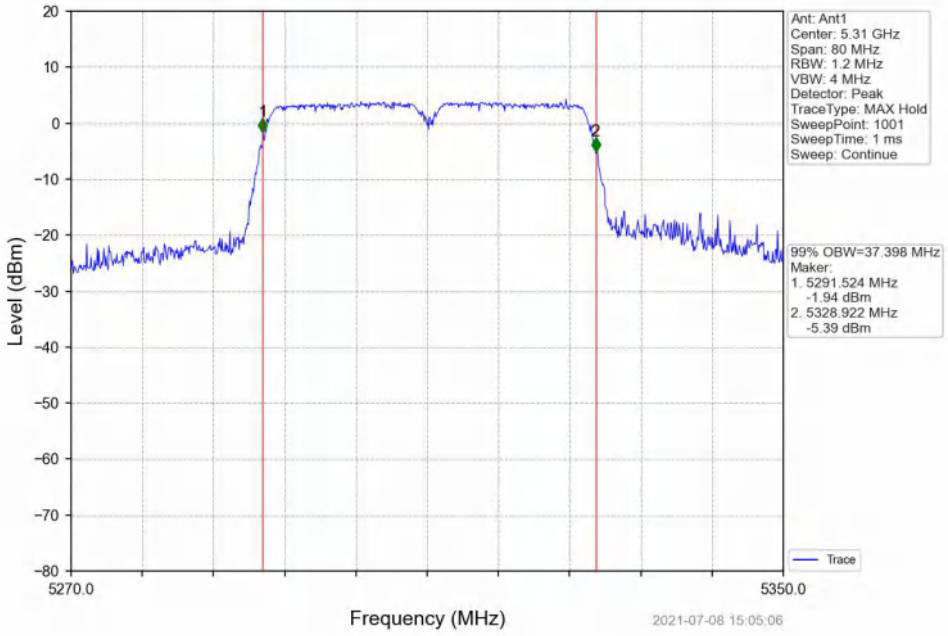
802.11n(HT20)_HCH_5320MHz_Ant1_NTNV



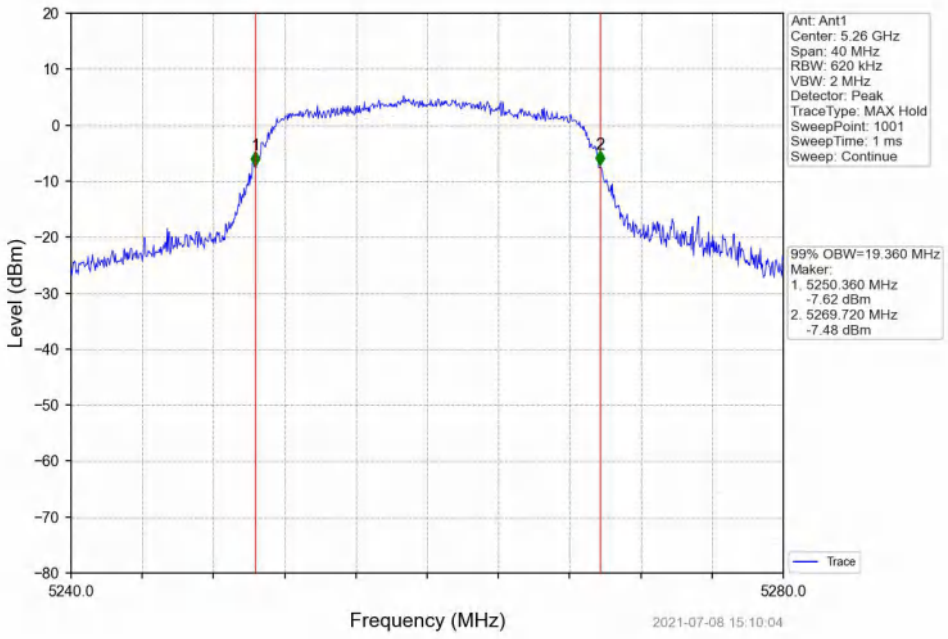
802.11n(HT40)_LCH_5270MHz_Ant1_NTNV



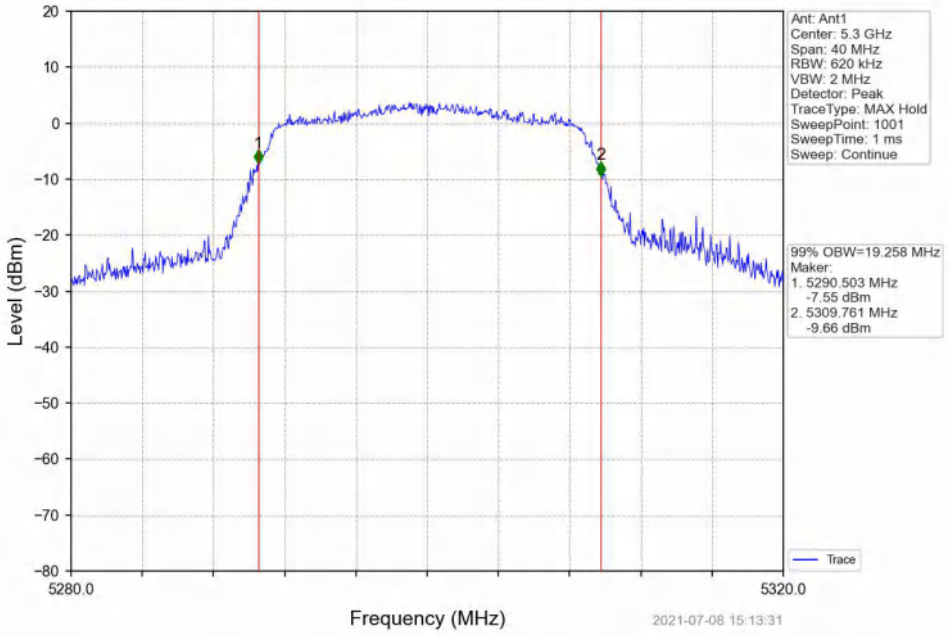
802.11n(HT40)_HCH_5310MHz_Ant1_NTNV



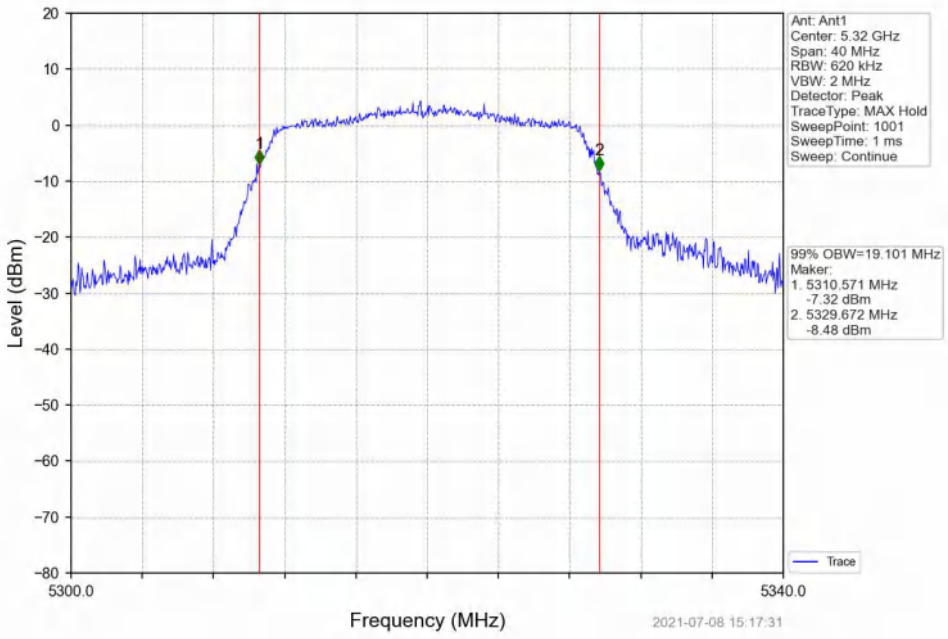
802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV



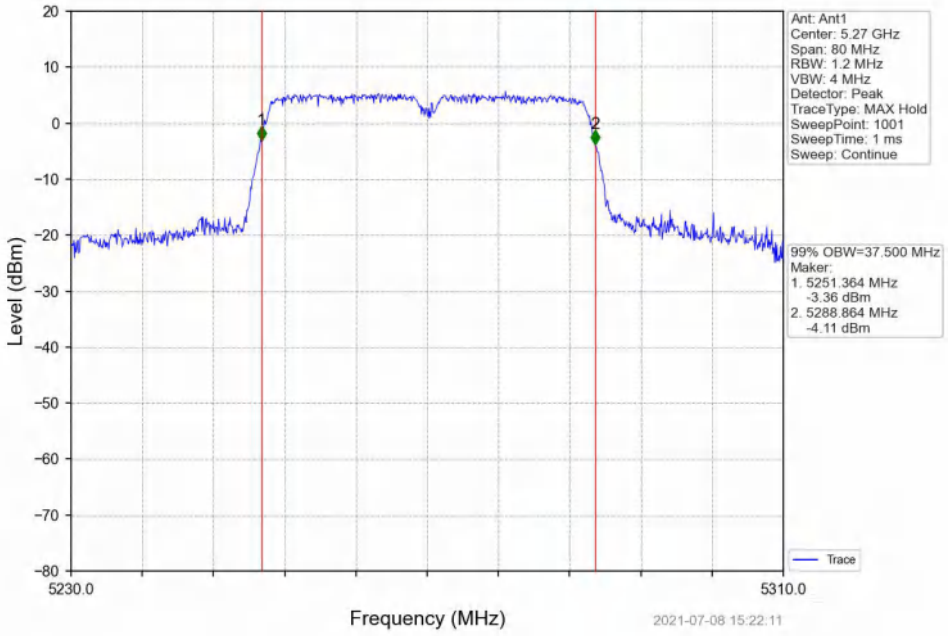
802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV



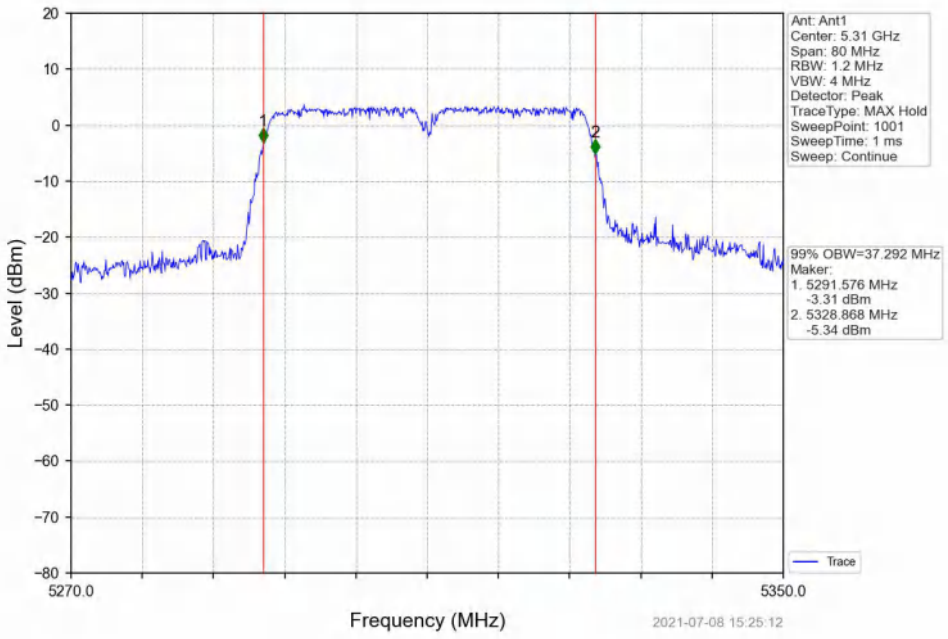
802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV



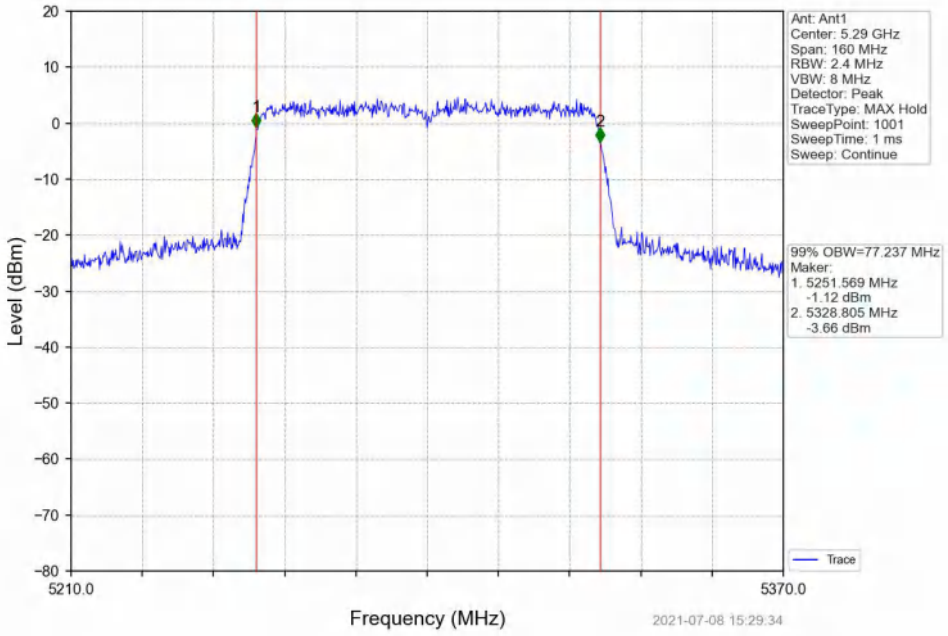
802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV



802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant1_NTNV



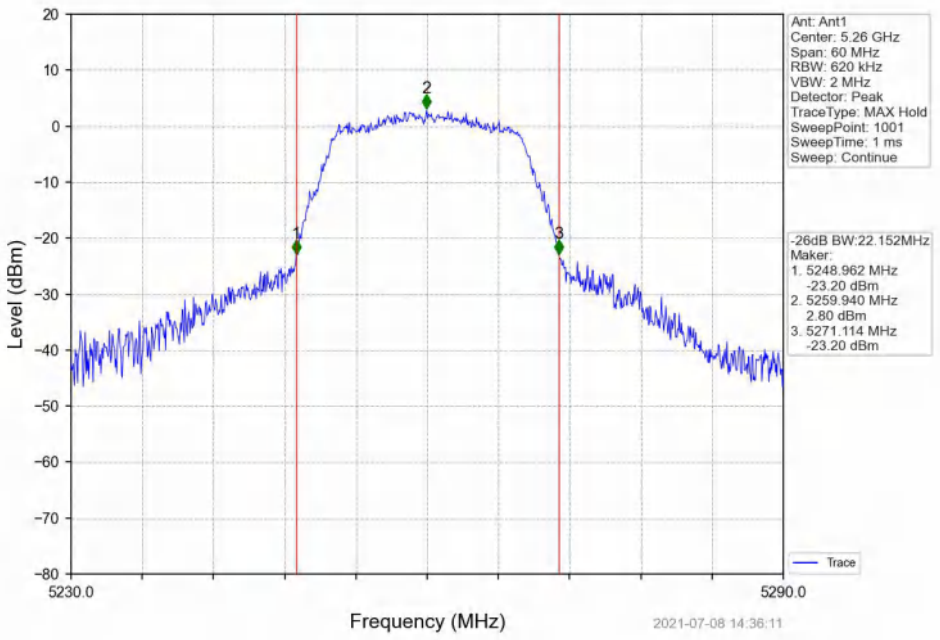
2.2 26dB BW

2.2.1 Test Result

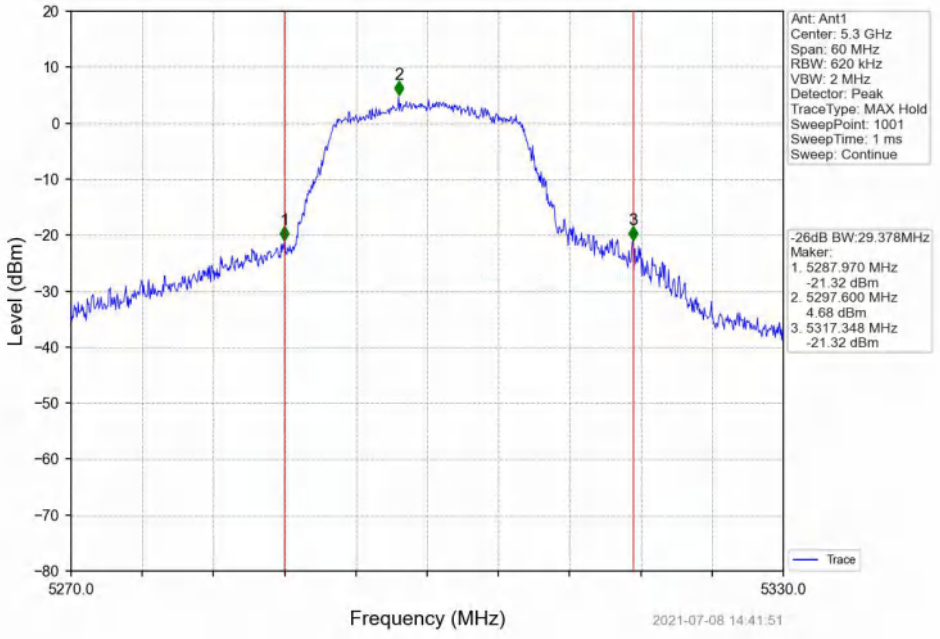
Mode	TX Type	Frequency (MHz)	Ant	26dB Bandwidth (MHz)	Limit	Verdict
802.11a	SISO	5260	1	22.15	/	Pass
		5300	1	29.38	/	Pass
		5320	1	27.36	/	Pass
802.11n (HT20)	MIMO	5260	1	27.77	/	Pass
		5300	1	29.37	/	Pass
		5320	1	28.60	/	Pass
802.11n (HT40)	MIMO	5270	1	83.30	/	Pass
		5310	1	68.34	/	Pass
802.11ac (VHT20)	MIMO	5260	1	32.37	/	Pass
		5300	1	33.27	/	Pass
		5320	1	27.83	/	Pass
802.11ac (VHT40)	MIMO	5270	1	90.63	/	Pass
		5310	1	75.52	/	Pass
802.11ac (VHT80)	MIMO	5290	1	124.74	/	Pass

2.2.2 Test Graph

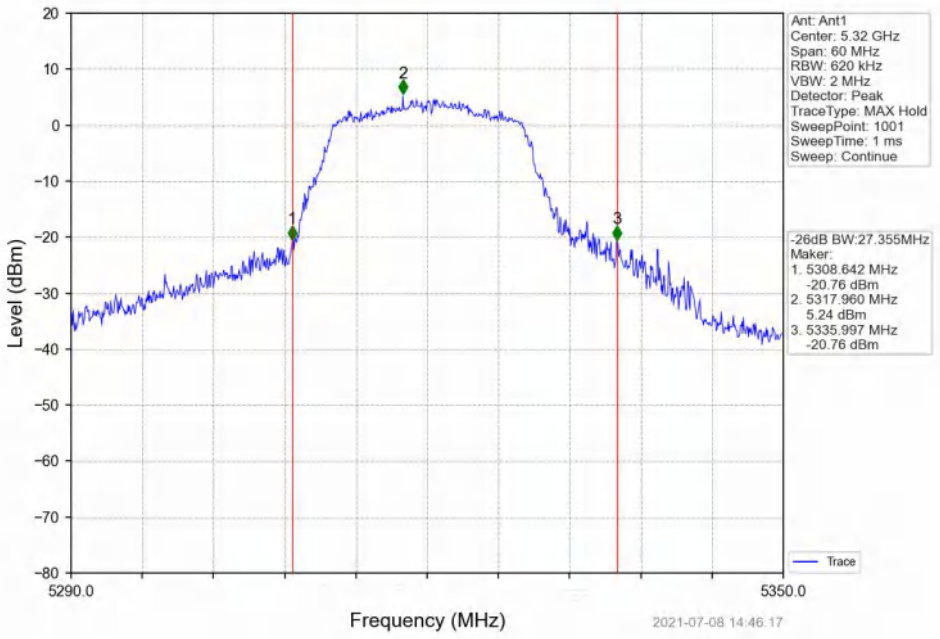
802.11a_LCH_5260MHz_Ant1_NTNV



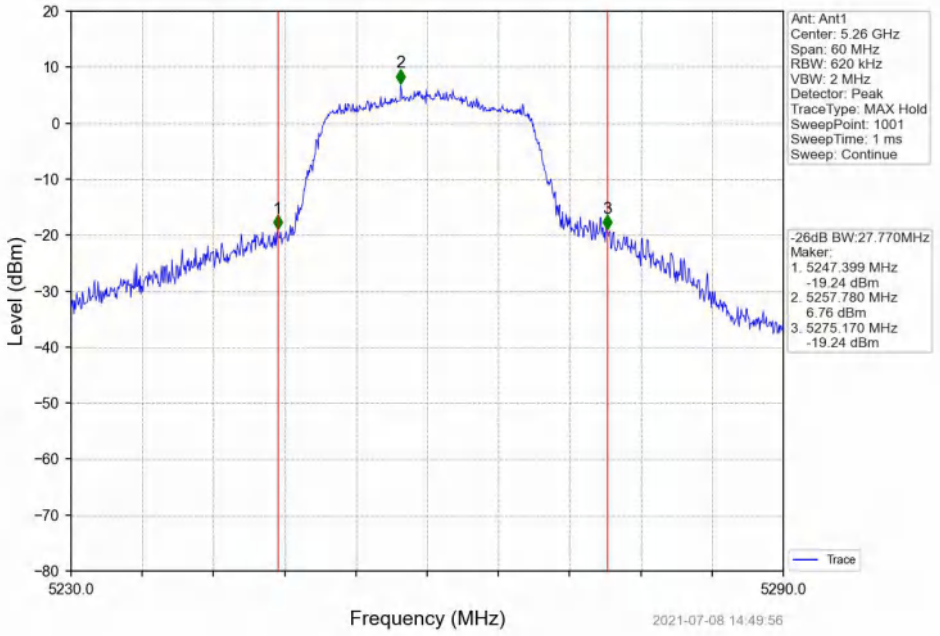
802.11a_MCH_5300MHz_Ant1_NTNV



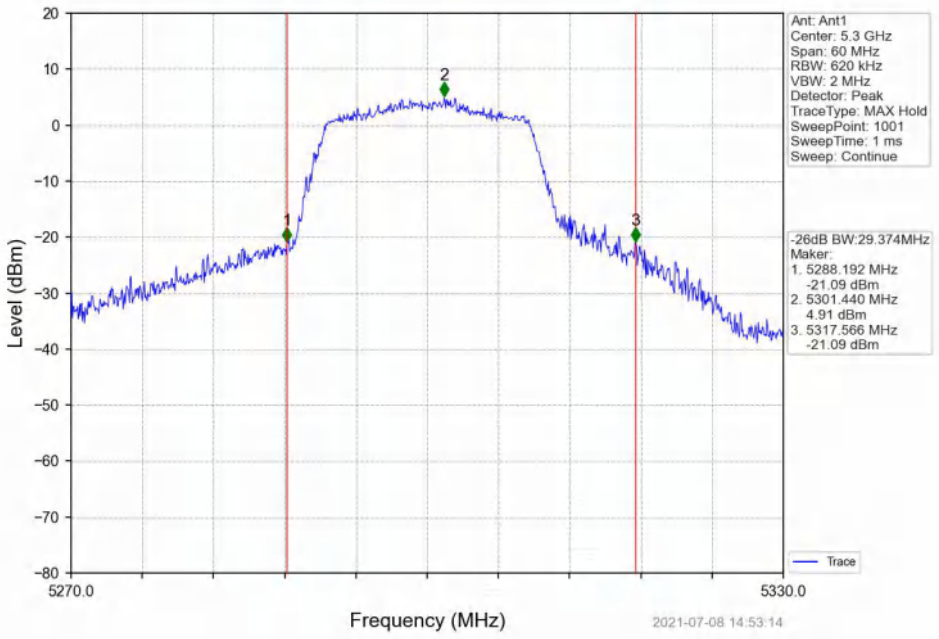
802.11a_HCH_5320MHz_Ant1_NTNV



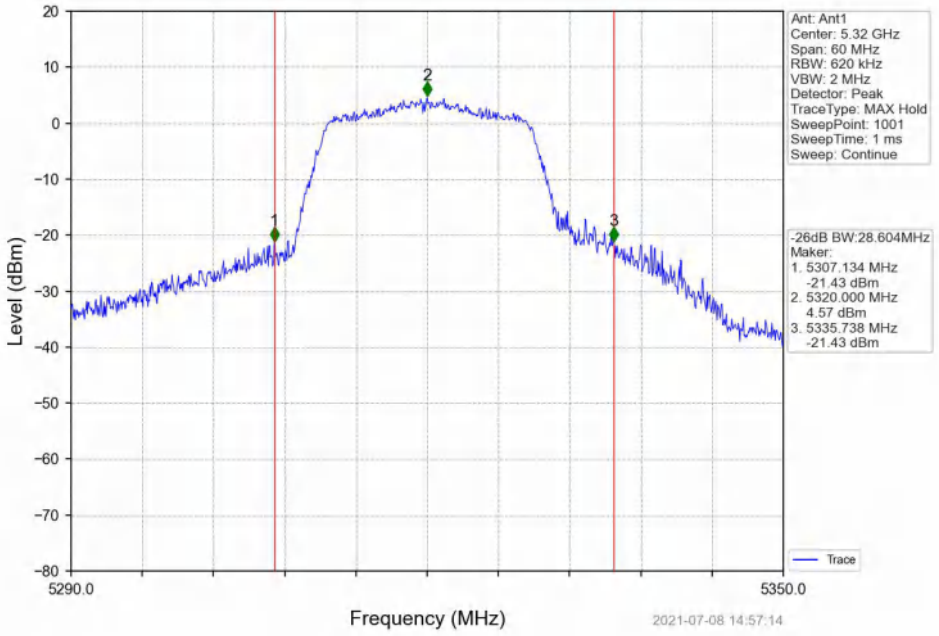
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



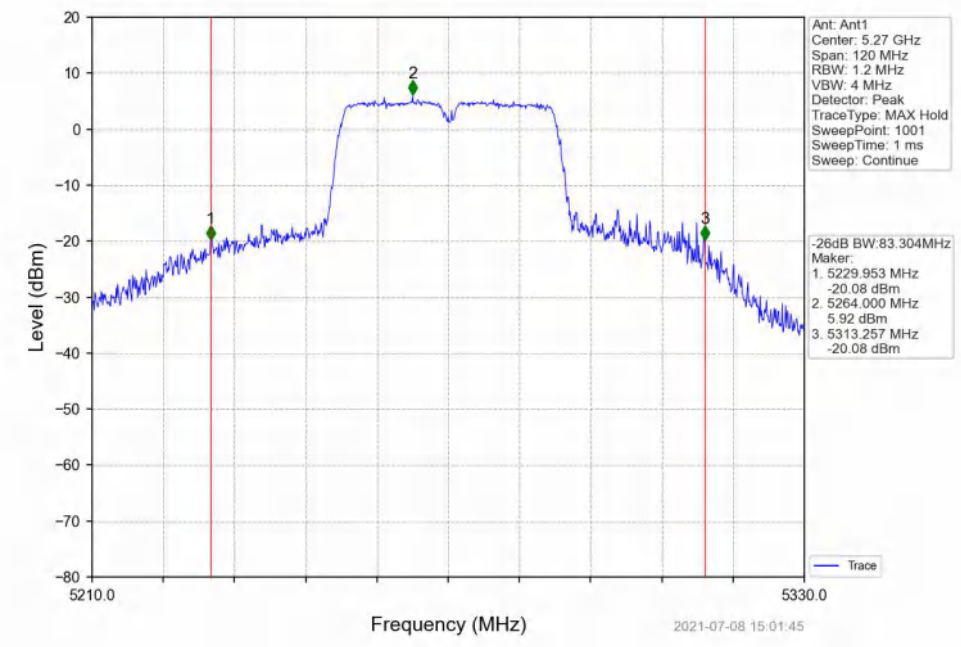
802.11n(HT20)_MCH_5300MHz_Ant1_NTNV



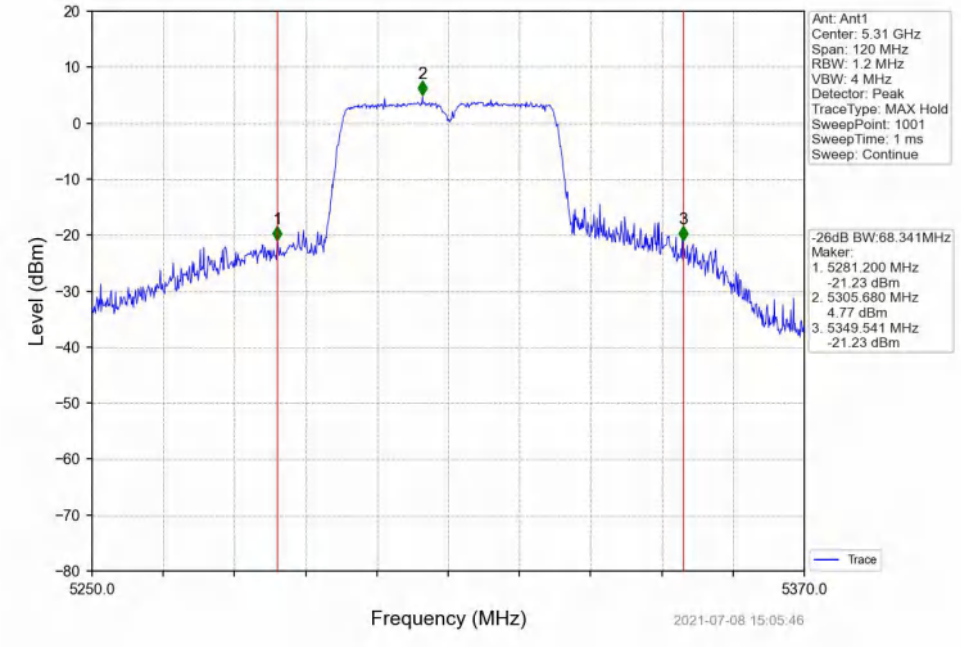
802.11n(HT20)_HCH_5320MHz_Ant1_NTNV



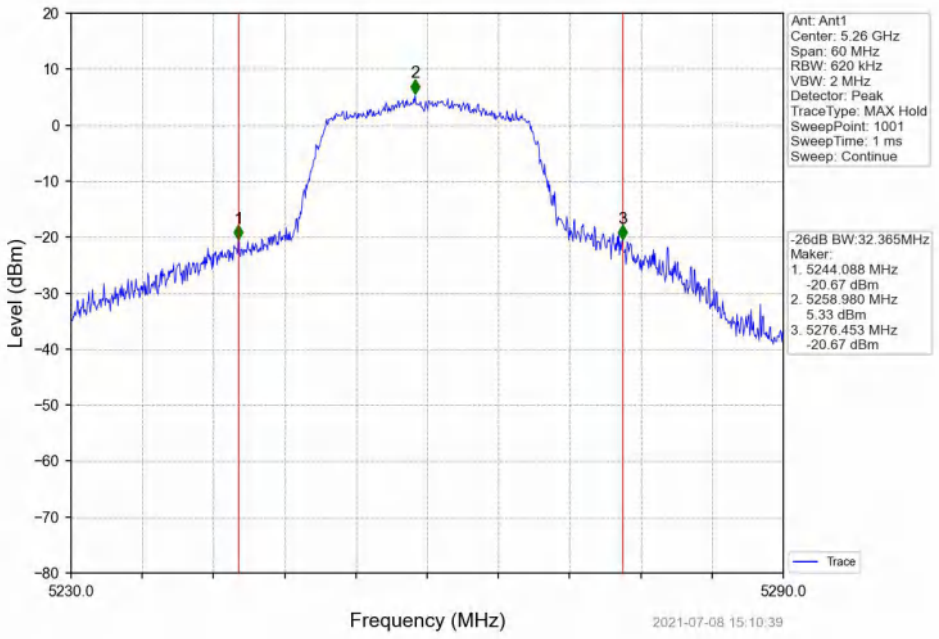
802.11n(HT40)_LCH_5270MHz_Ant1_NTNV



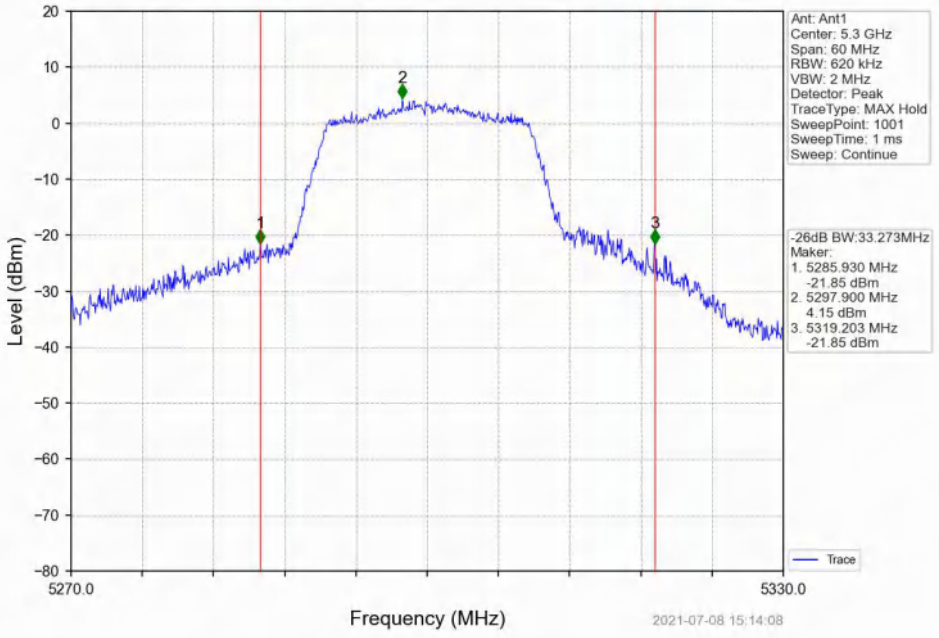
802.11n(HT40)_HCH_5310MHz_Ant1_NTNV



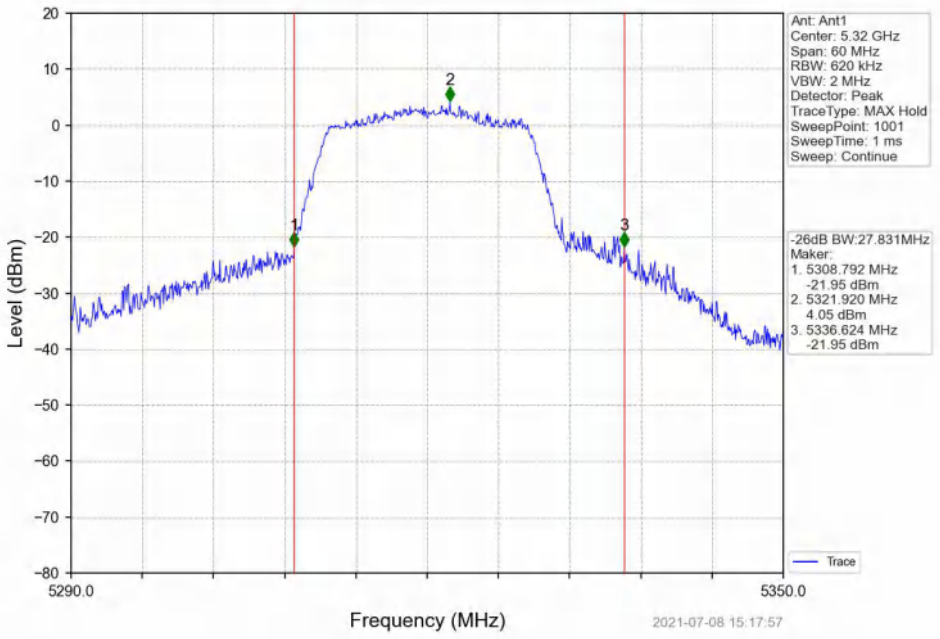
802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV



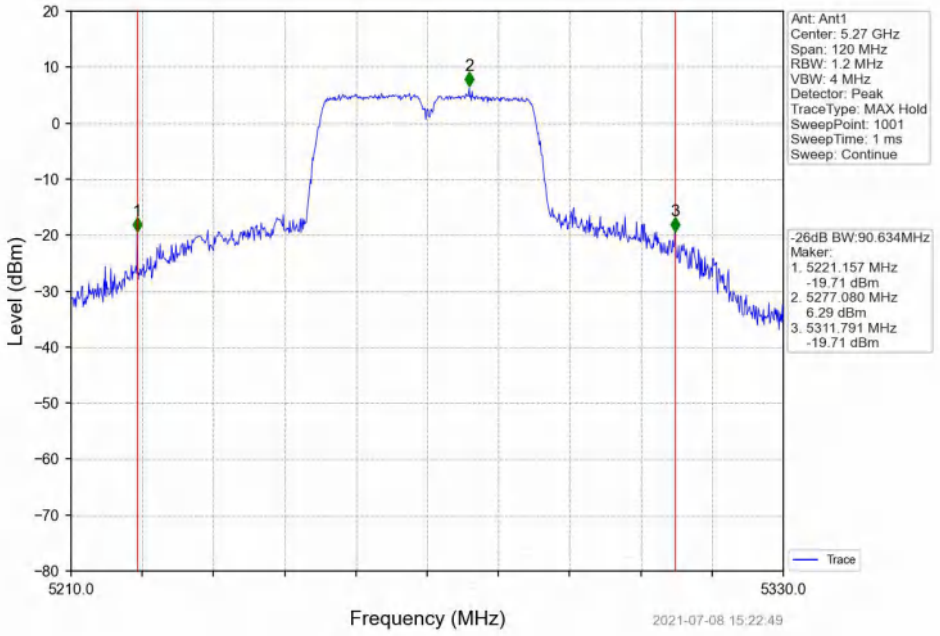
802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV



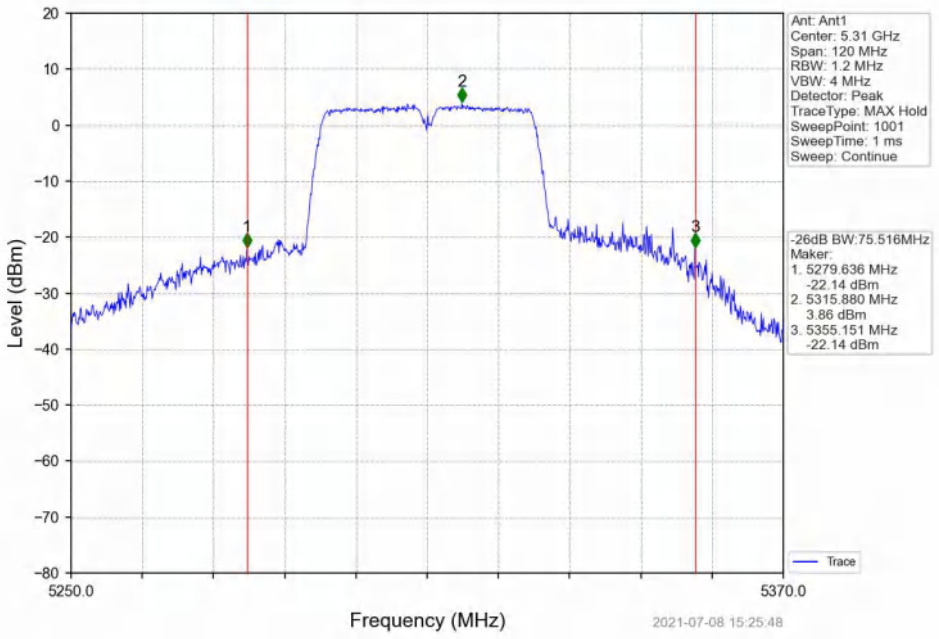
802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV



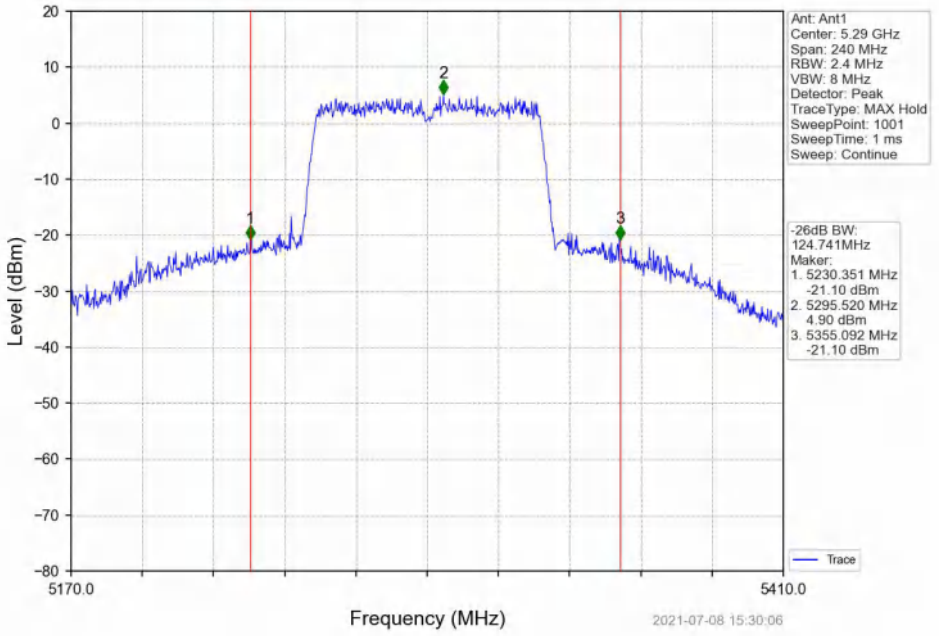
802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV



802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant1_NTNV



3. Maximum Conducted Output Power

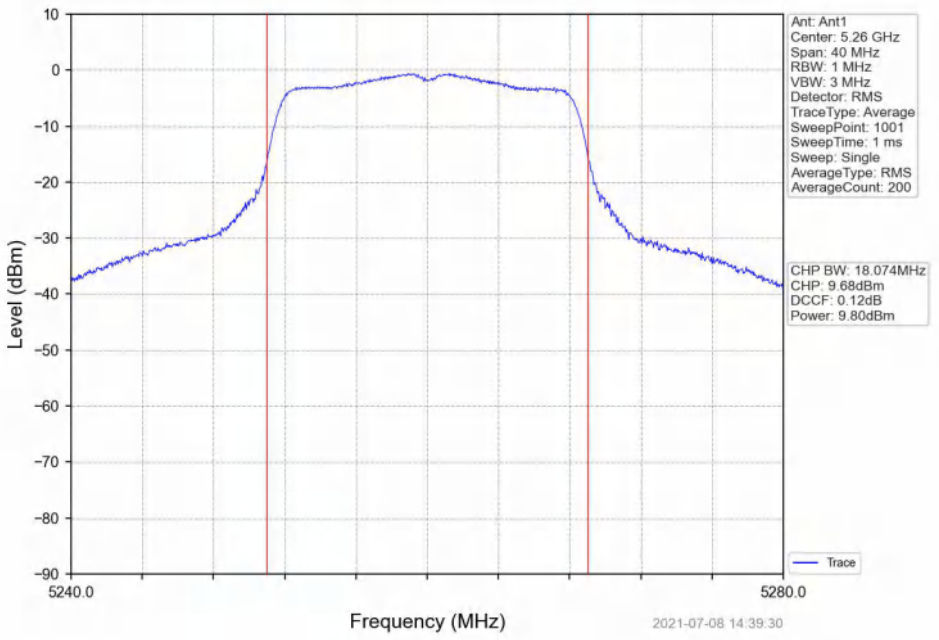
3.1 Power

3.1.1 Test Result

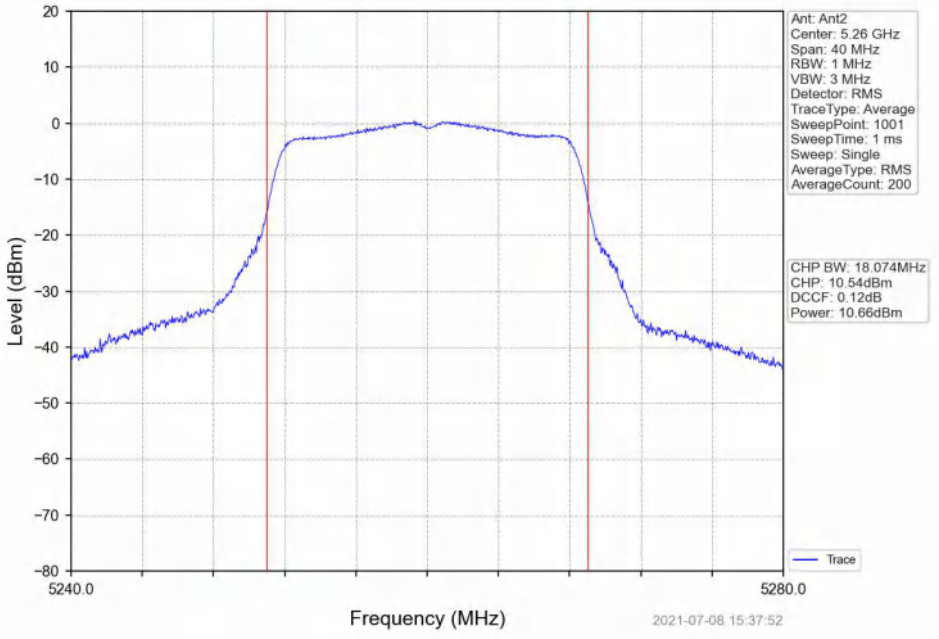
Mode	TX Type	Frequency (MHz)	Measured Average Output Power (dBm)				Verdict
			Ant1	Ant2	Sum	Limit	
802.11a	SISO	5260	9.80	10.66	/	<=23.57	Pass
		5300	8.64	12.02	/	<=23.7	Pass
		5320	9.17	12.53	/	<=23.64	Pass
802.11n (HT20)	MIMO	5260	10.68	10.67	13.69	<=23.86	Pass
		5300	9.69	11.77	13.86	<=23.85	Pass
		5320	9.17	12.50	14.16	<=23.83	Pass
802.11n (HT40)	MIMO	5270	10.18	10.70	13.46	<=23.98	Pass
		5310	9.00	11.90	13.70	<=23.98	Pass
802.11ac (VHT20)	MIMO	5260	9.83	10.53	13.20	<=23.87	Pass
		5300	8.70	11.96	13.64	<=23.85	Pass
		5320	8.42	12.58	13.99	<=23.81	Pass
802.11ac (VHT40)	MIMO	5270	10.18	10.59	13.40	<=23.98	Pass
		5310	8.50	11.92	13.55	<=23.98	Pass
802.11ac (VHT80)	MIMO	5290	7.55	11.17	12.74	<=23.98	Pass
Note1: Antenna Gain: Ant1: 1.83dBi; Ant2: 1.61dBi;							

3.1.2 Test Graph

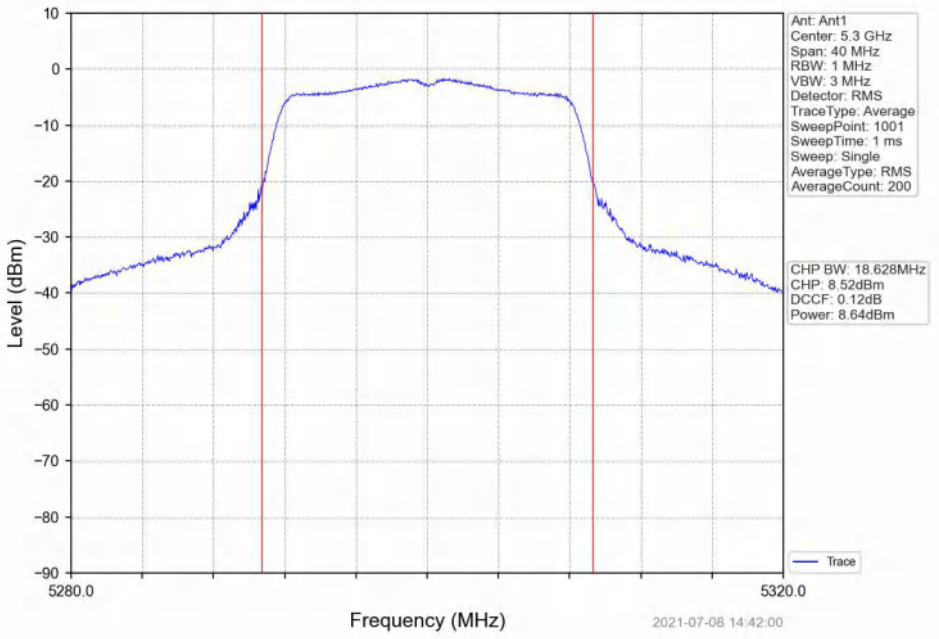
802.11a_LCH_5260MHz_Ant1_NTNV



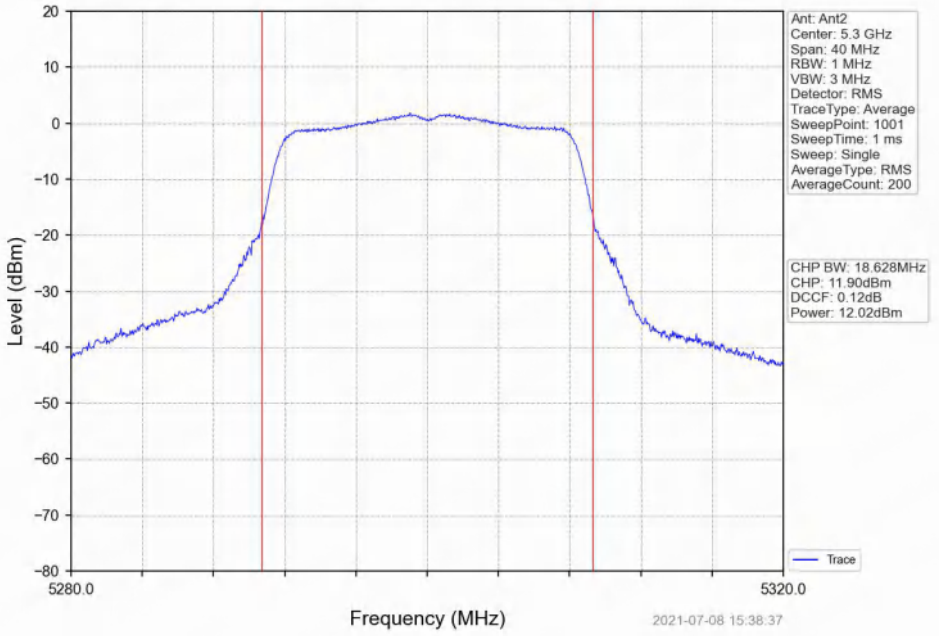
802.11a_LCH_5260MHz_Ant2_NTNV



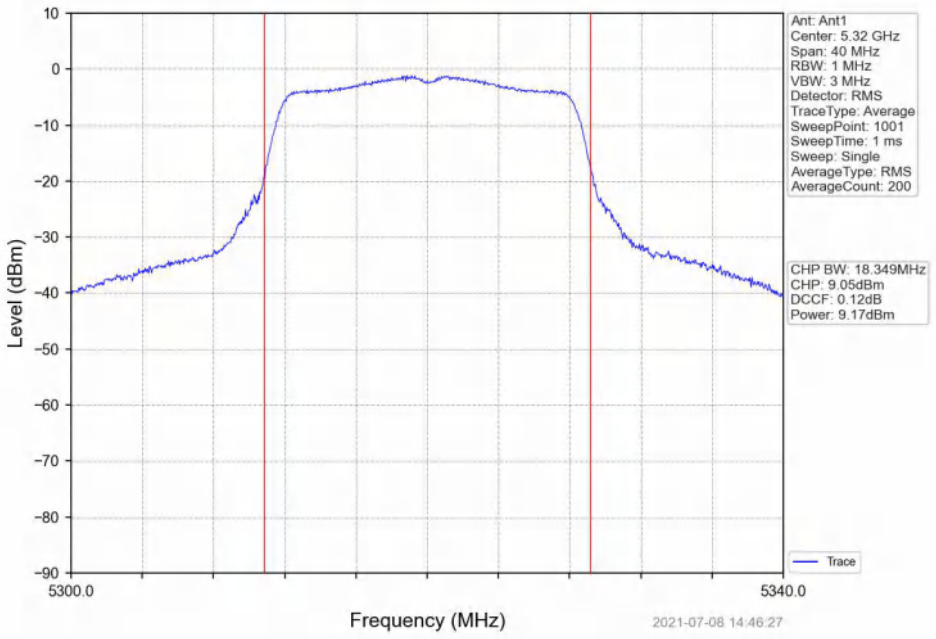
802.11a_MCH_5300MHz_Ant1_NTNV



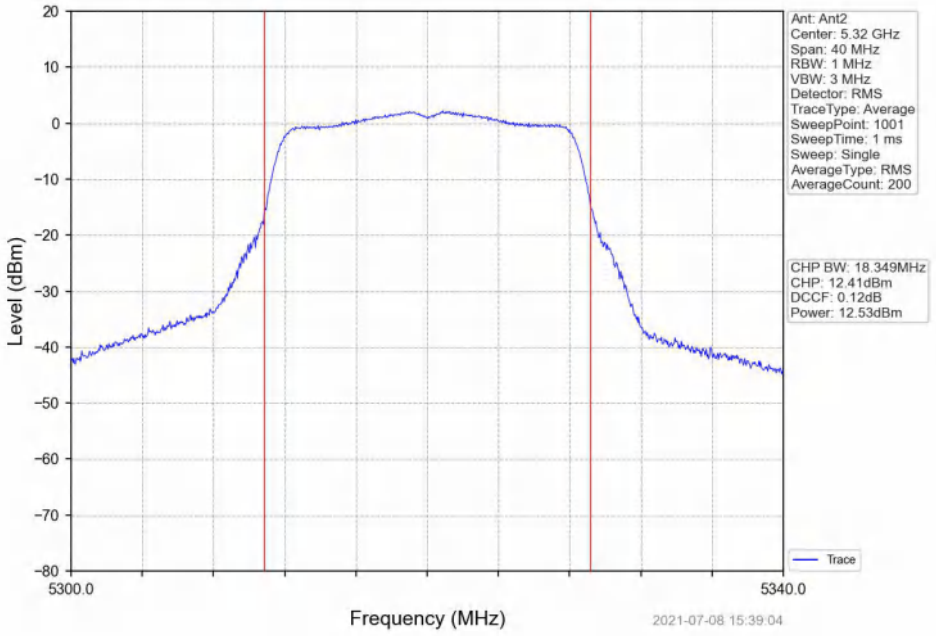
802.11a_MCH_5300MHz_Ant2_NTNV



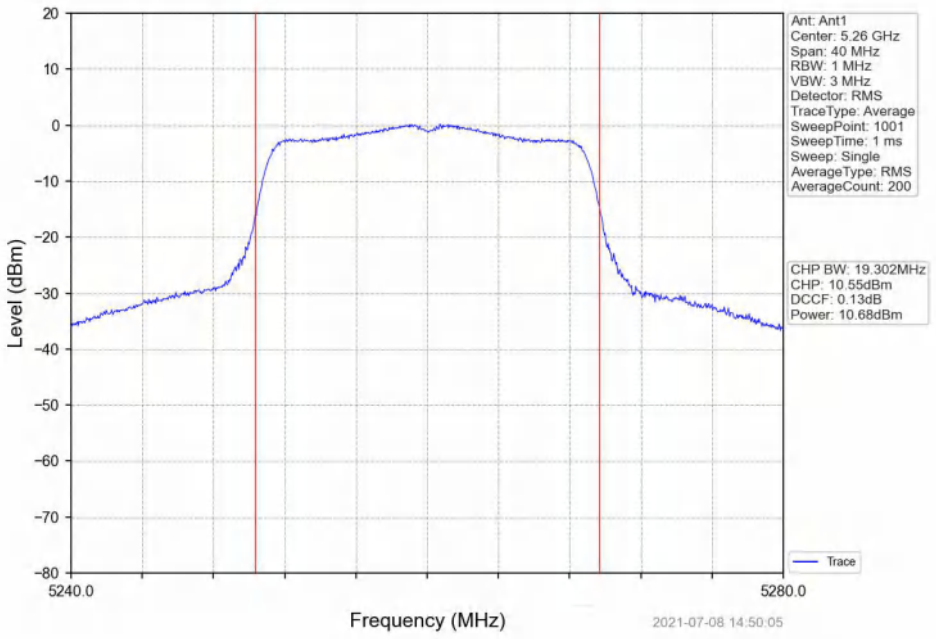
802.11a_HCH_5320MHz_Ant1_NTNV



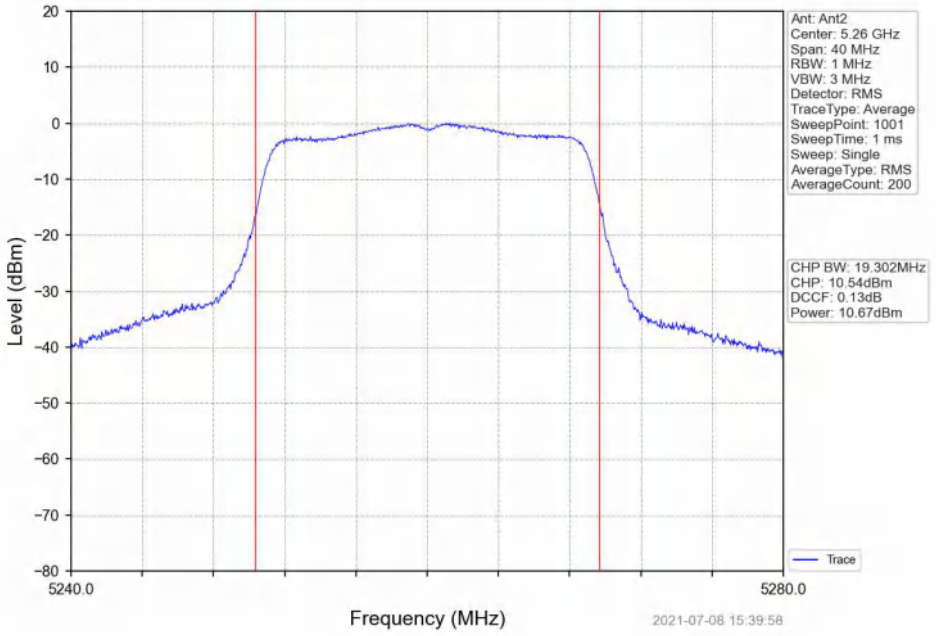
802.11a_HCH_5320MHz_Ant2_NTNV



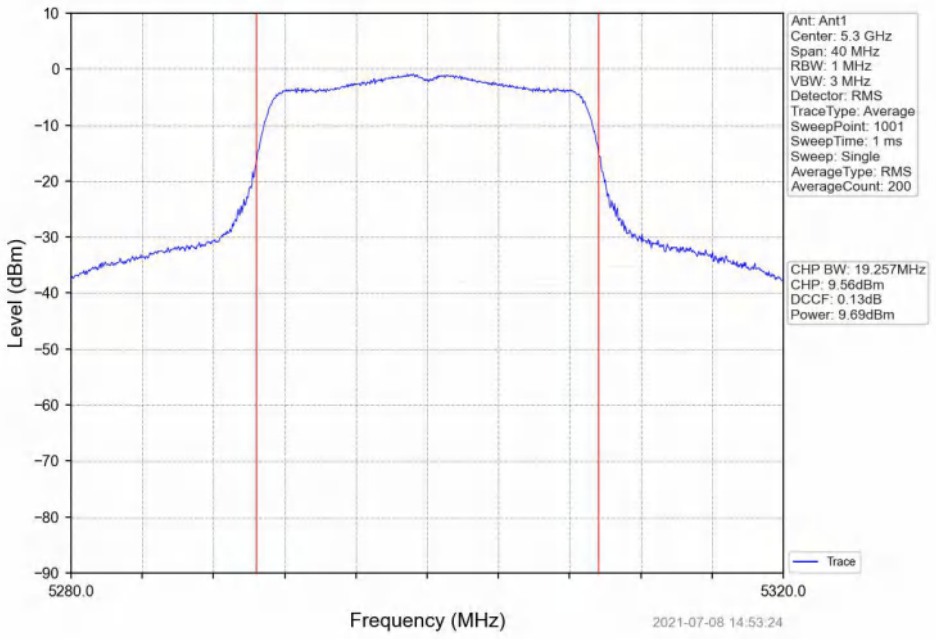
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



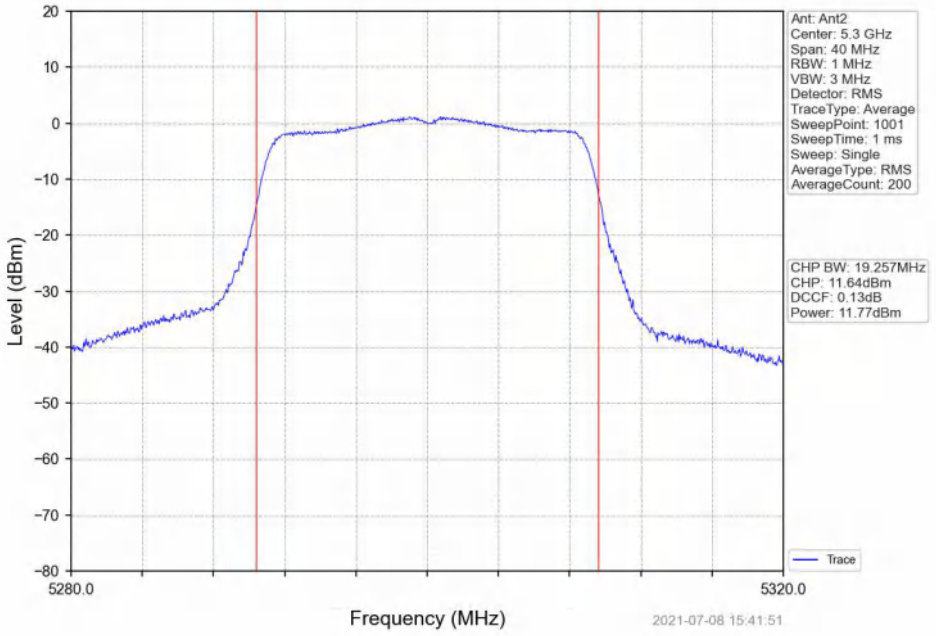
802.11n(HT20)_LCH_5260MHz_Ant2_NTNV



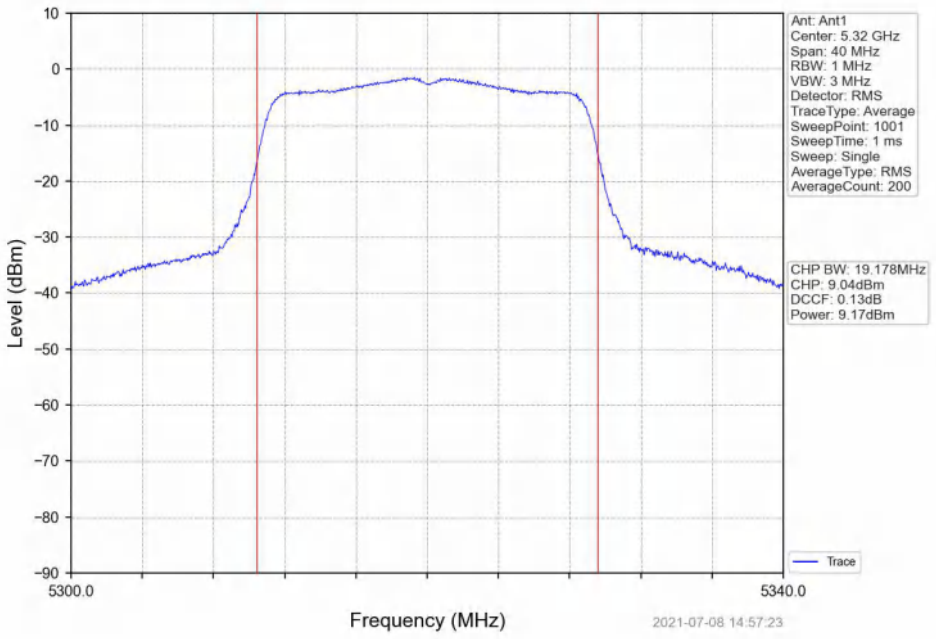
802.11n(HT20)_MCH_5300MHz_Ant1_NTNV



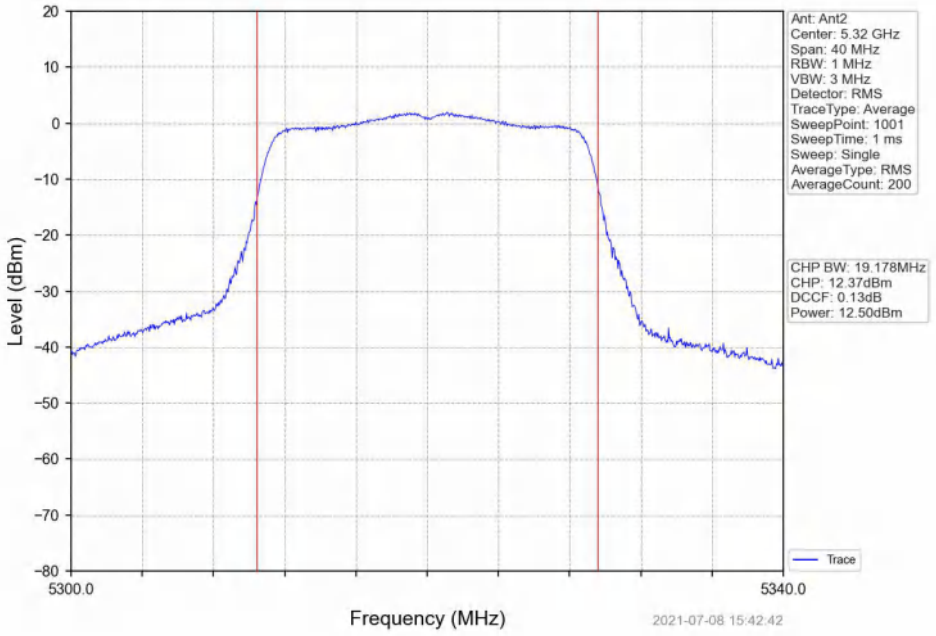
802.11n(HT20)_MCH_5300MHz_Ant2_NTNV



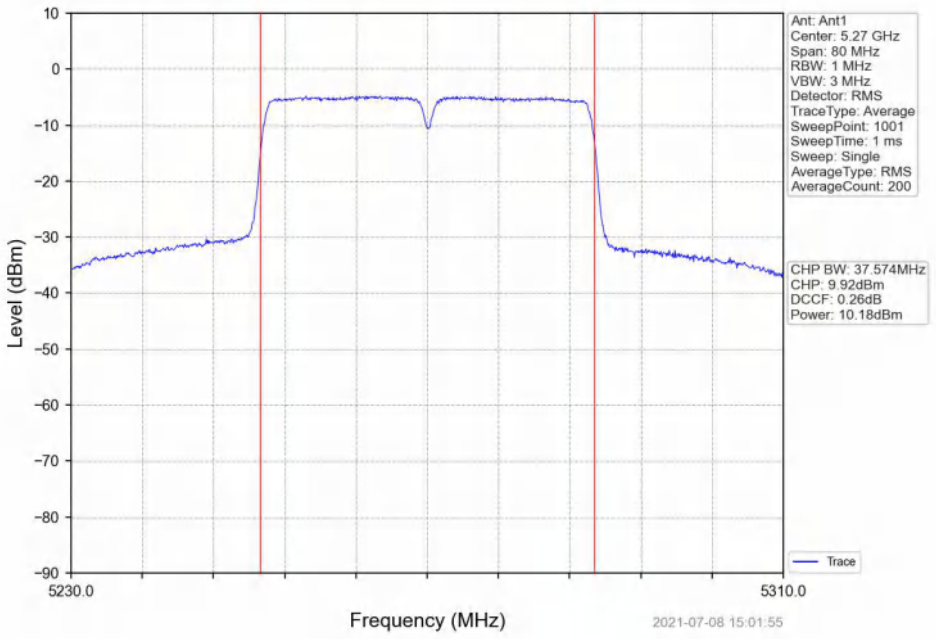
802.11n(HT20)_HCH_5320MHz_Ant1_NTNV



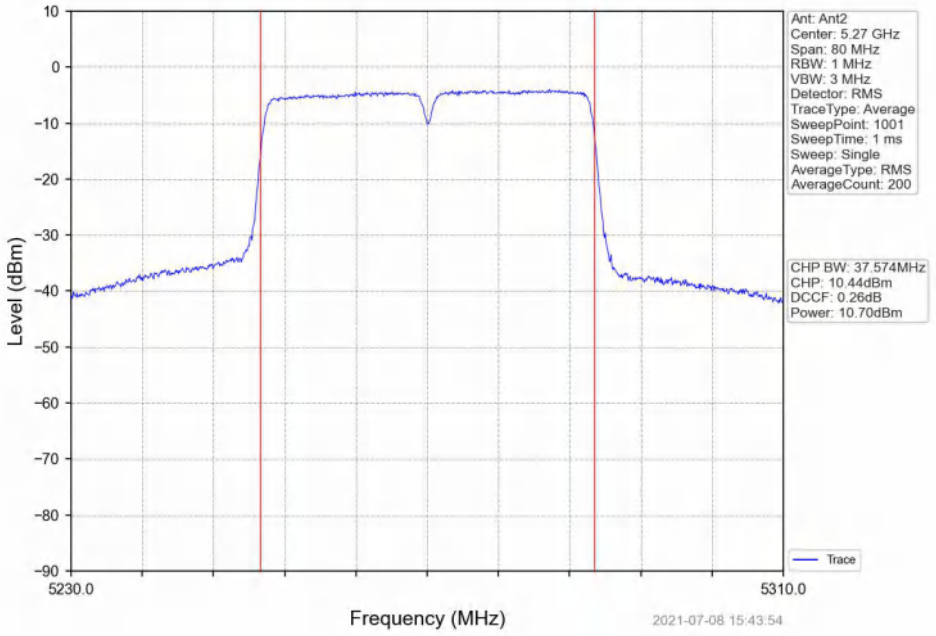
802.11n(HT20)_HCH_5320MHz_Ant2_NTNV



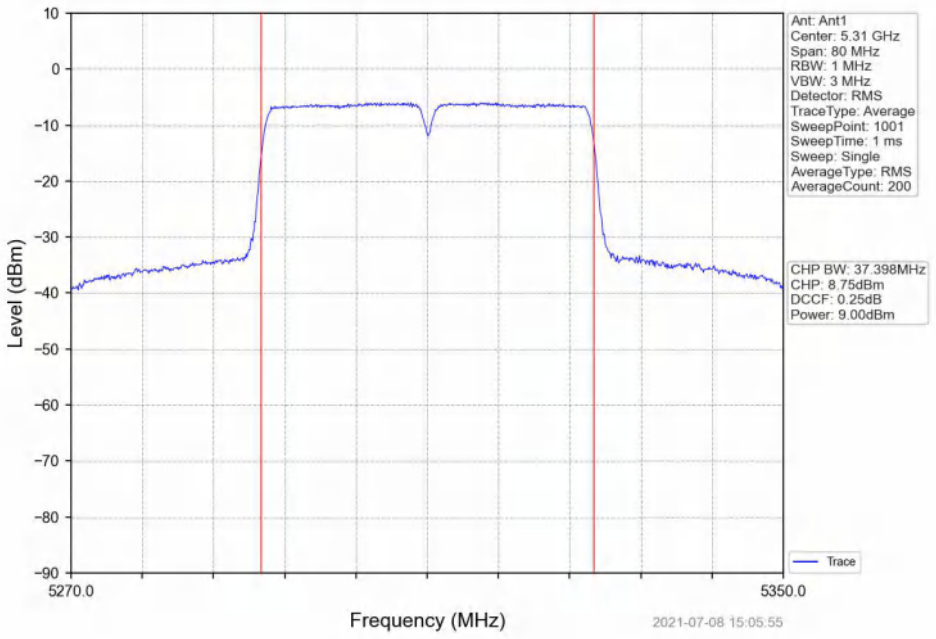
802.11n(HT40)_LCH_5270MHz_Ant1_NTNV



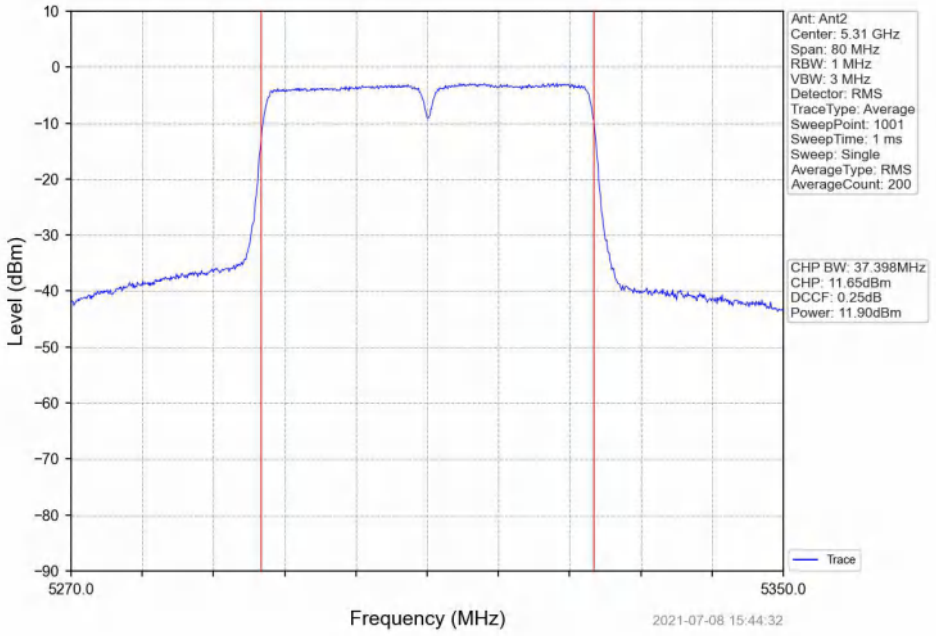
802.11n(HT40)_LCH_5270MHz_Ant2_NTNV



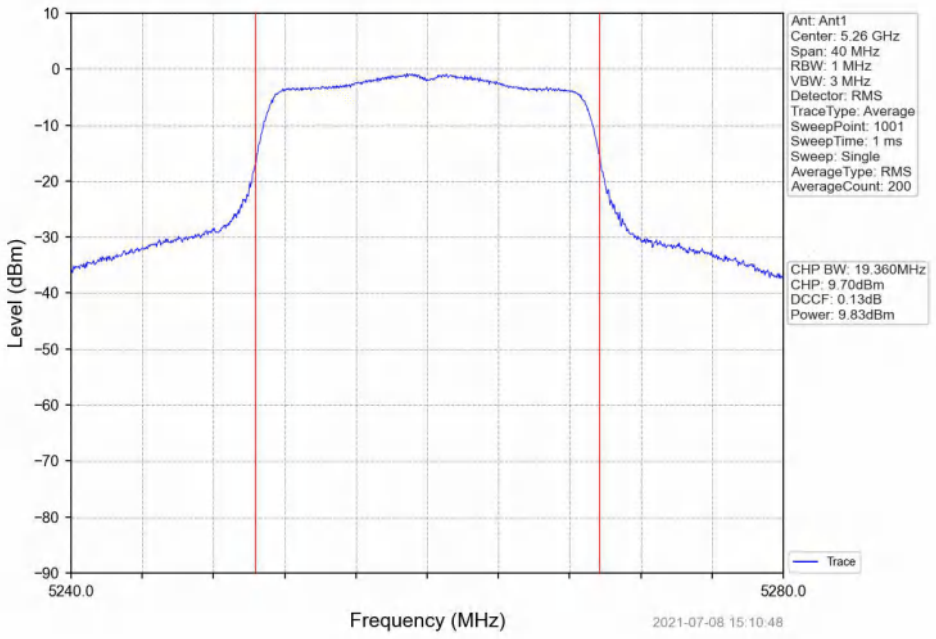
802.11n(HT40)_HCH_5310MHz_Ant1_NTNV



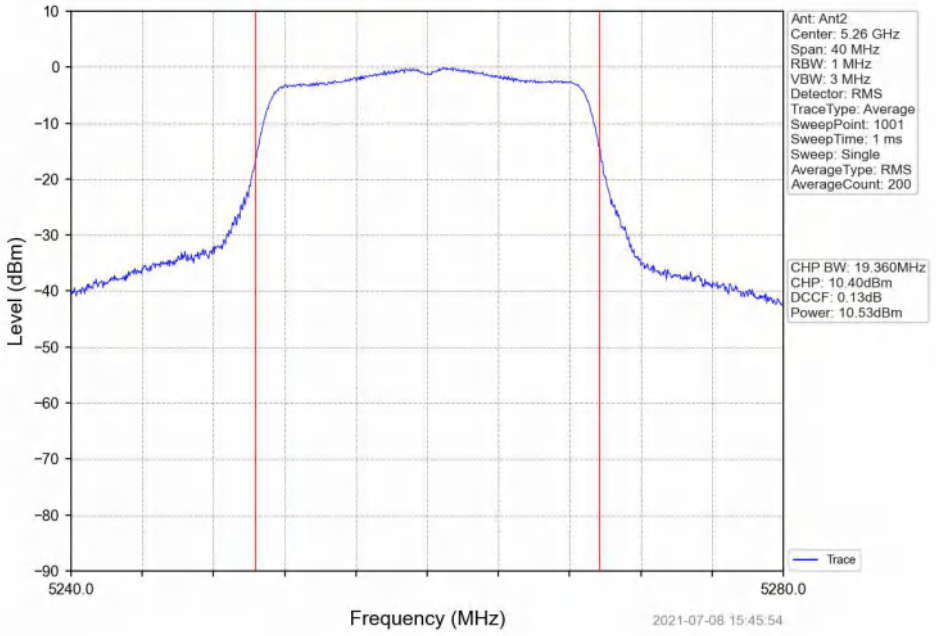
802.11n(HT40)_HCH_5310MHz_Ant2_NTNV



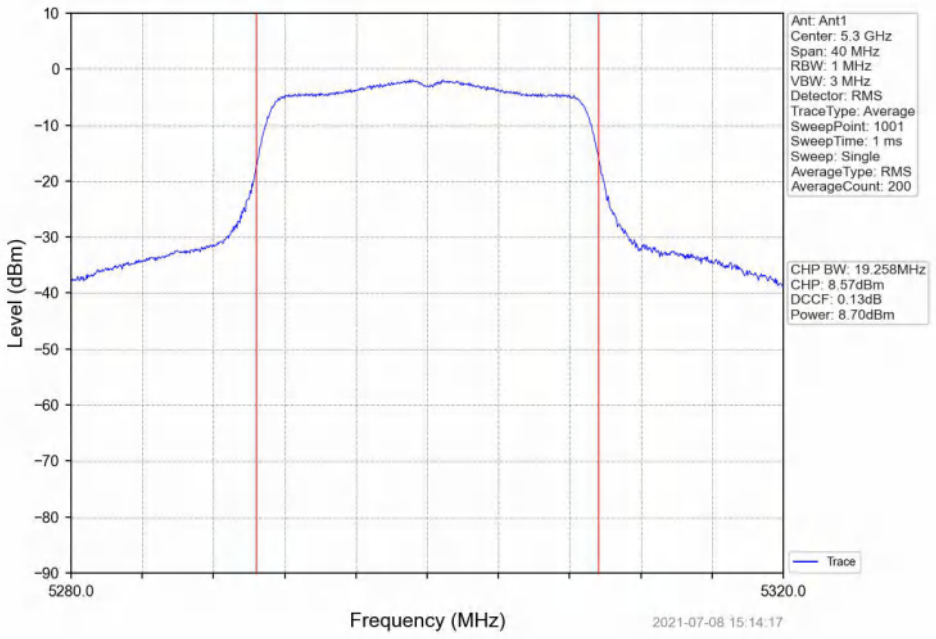
802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV



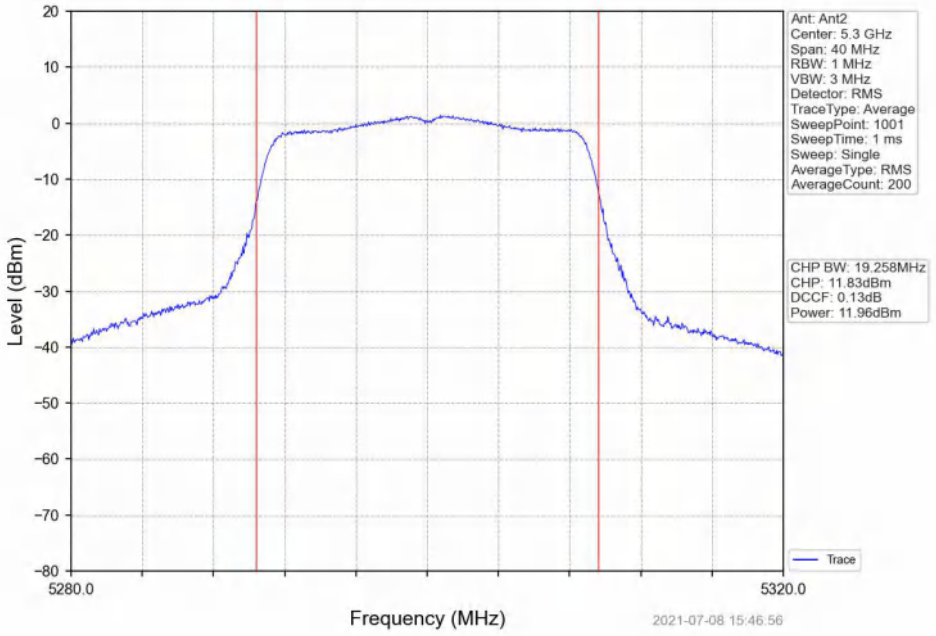
802.11ac(VHT20)_LCH_5260MHz_Ant2_NTNV



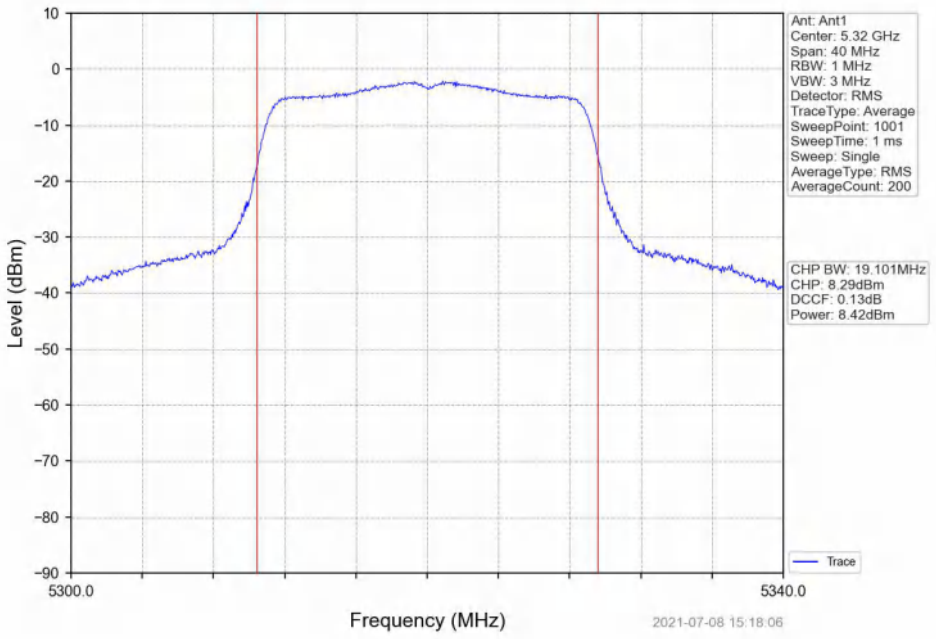
802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV



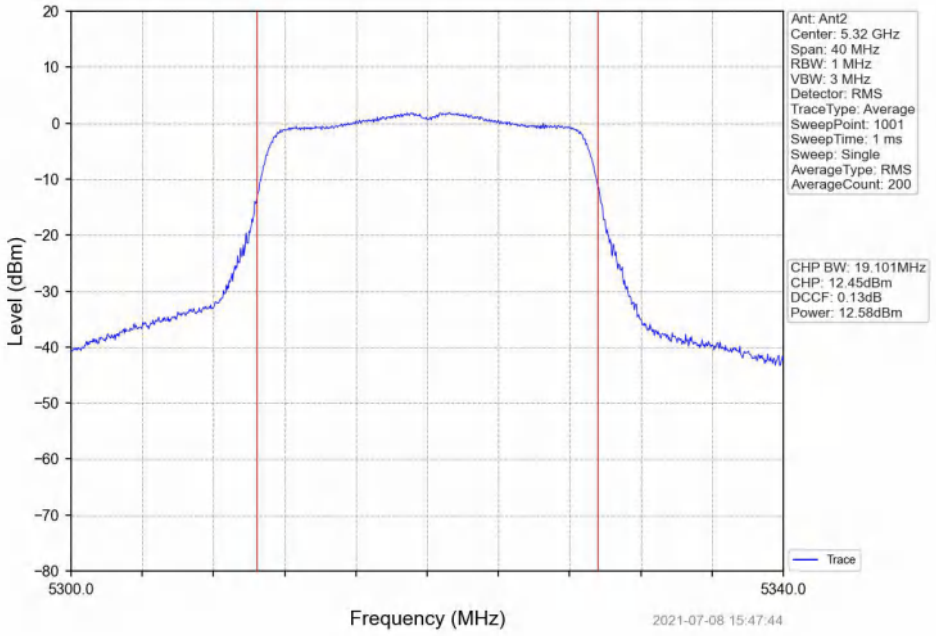
802.11ac(VHT20)_MCH_5300MHz_Ant2_NTNV



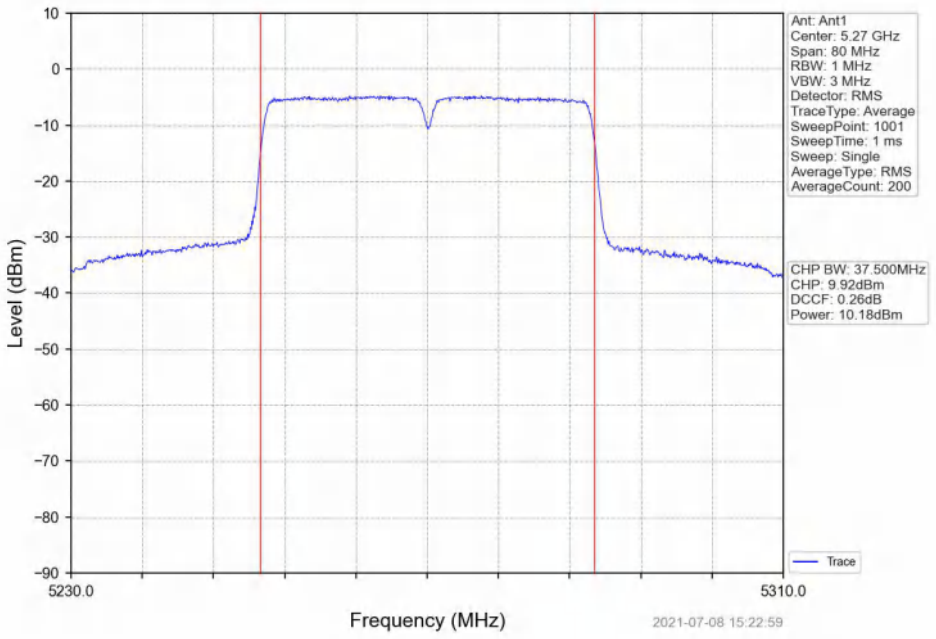
802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV



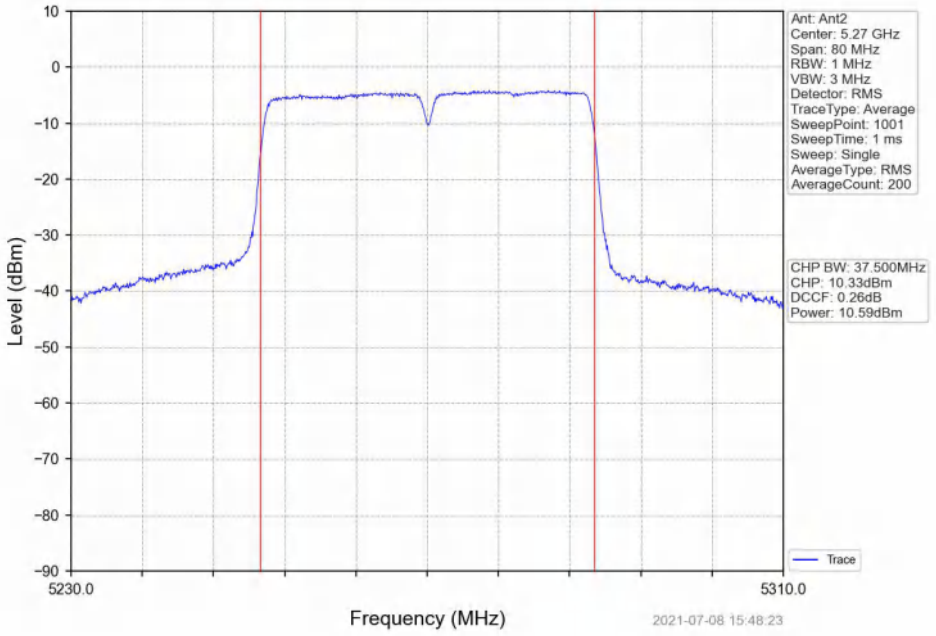
802.11ac(VHT20)_HCH_5320MHz_Ant2_NTNV



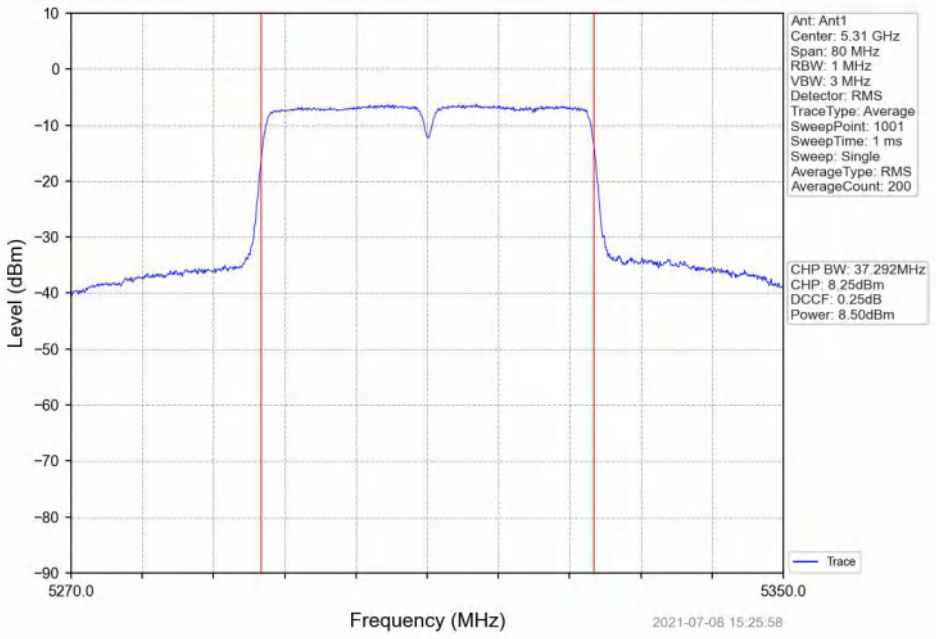
802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV



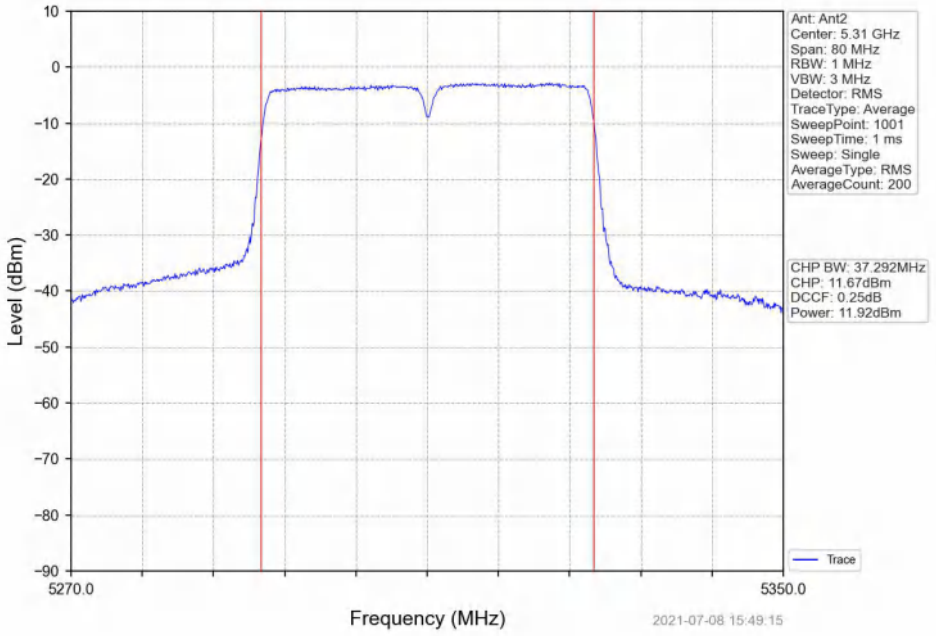
802.11ac(VHT40)_LCH_5270MHz_Ant2_NTNV



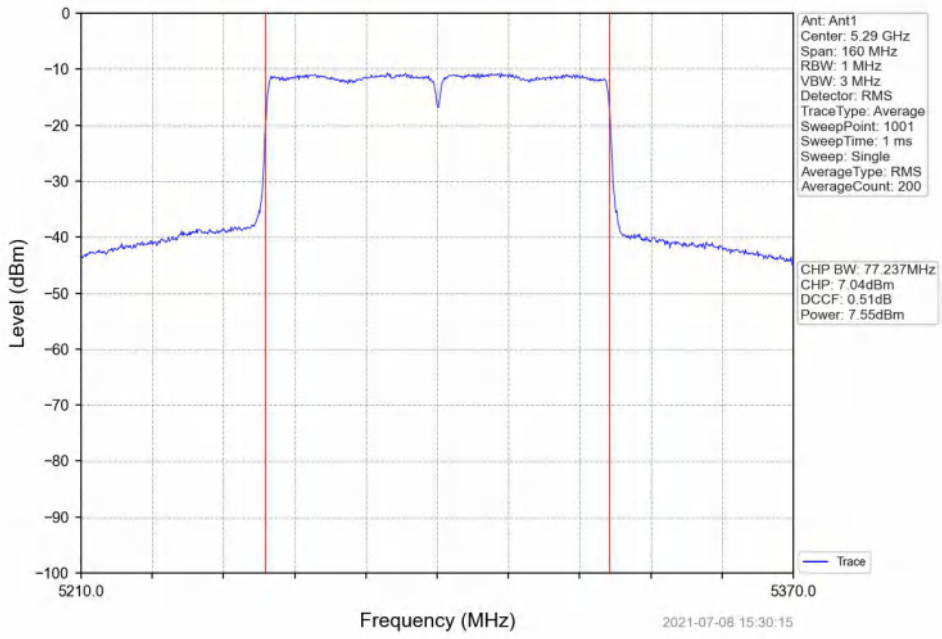
802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



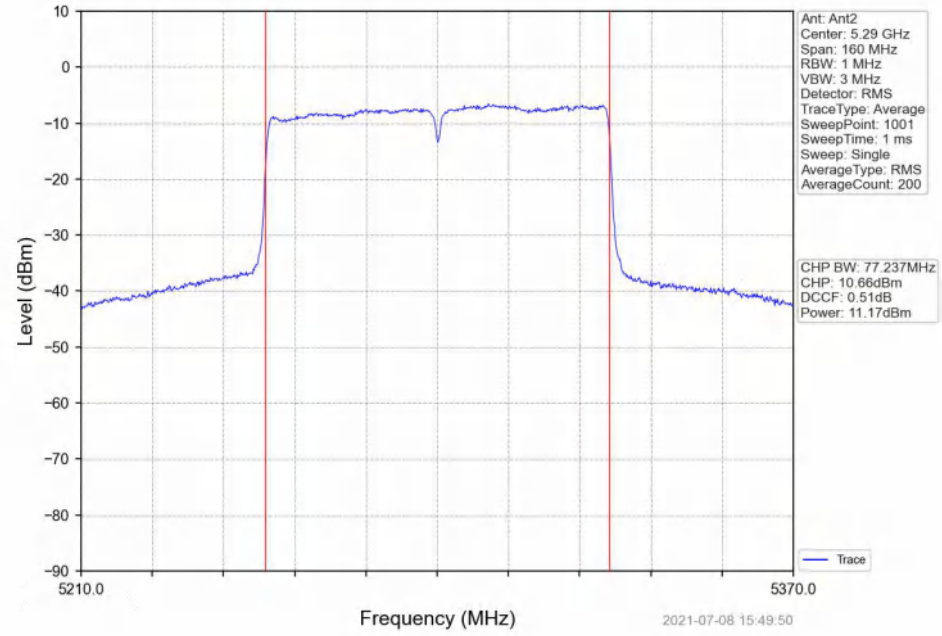
802.11ac(VHT40)_HCH_5310MHz_Ant2_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant2_NTNV



3.2 EIRP

3.2.1 Test Result

Mode	TX Type	Frequency (MHz)	E.I.R.P (dBm)				Verdict
			Ant1	Ant2	Sum	Limit	
802.11a	SISO	5260	11.63	12.27	/	<=29.57	Pass
		5300	10.47	13.63	/	<=29.7	Pass
		5320	11.00	14.14	/	<=29.64	Pass
802.11n (HT20)	MIMO	5260	12.51	12.28	13.69	<=29.86	Pass
		5300	11.52	13.38	13.86	<=29.85	Pass
		5320	11.00	14.11	14.16	<=29.83	Pass
802.11n (HT40)	MIMO	5270	12.01	12.31	13.46	<=30	Pass
		5310	10.83	13.51	13.70	<=30	Pass
802.11ac (VHT20)	MIMO	5260	11.66	12.14	13.20	<=29.87	Pass
		5300	10.53	13.57	13.64	<=29.85	Pass
		5320	10.25	14.19	13.99	<=29.81	Pass
802.11ac (VHT40)	MIMO	5270	12.01	12.20	13.40	<=30	Pass
		5310	10.33	13.53	13.55	<=30	Pass
802.11ac (VHT80)	MIMO	5290	9.38	12.78	12.74	<=30	Pass

Note1: Antenna Gain: Ant1: 1.83dBi; Ant2: 1.61dBi;
Note2: E.I.R.P = Measured Power + Antenna Gain
Note3: Directional Gain: Uncorrelated(Directional Gain = Ant Gain)

4. Maximum Power Spectral Density

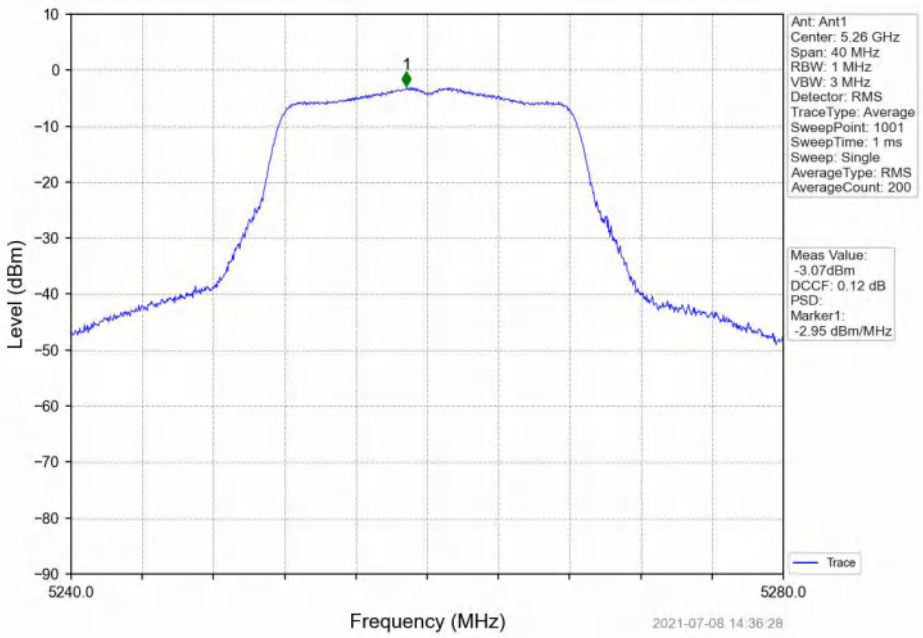
4.1 PSD

4.1.1 Test Result

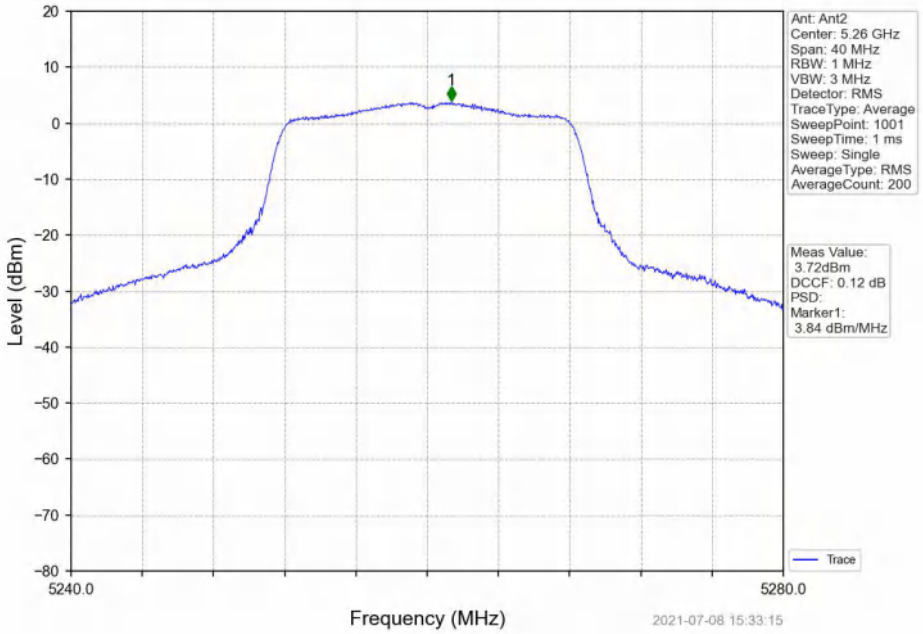
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/MHz)				Verdict
			Ant1	Ant2	Sum	Limit	
802.11a	SISO	5260	-2.95	3.84	/	<=11	Pass
		5300	-1.44	5.08	/	<=11	Pass
		5320	-0.99	5.61	/	<=11	Pass
802.11n (HT20)	MIMO	5260	0.27	0.17	3.21	<=11	Pass
		5300	-0.80	1.24	3.20	<=11	Pass
		5320	-1.35	1.99	3.57	<=11	Pass
802.11n (HT40)	MIMO	5270	-4.51	-3.85	-1.29	<=11	Pass
		5310	-5.63	-2.51	-0.90	<=11	Pass
802.11ac (VHT20)	MIMO	5260	-0.54	0.04	2.68	<=11	Pass
		5300	-1.77	1.47	3.06	<=11	Pass
		5320	-1.87	2.05	3.42	<=11	Pass
802.11ac (VHT40)	MIMO	5270	-4.32	-3.59	-1.11	<=11	Pass
		5310	-6.04	-2.52	-1.07	<=11	Pass
802.11ac (VHT80)	MIMO	5290	-10.15	-5.97	-4.63	<=11	Pass
Note1: Antenna Gain: Ant1: 1.83dBi; Ant2: 1.61dBi;							

4.1.2 Test Graph

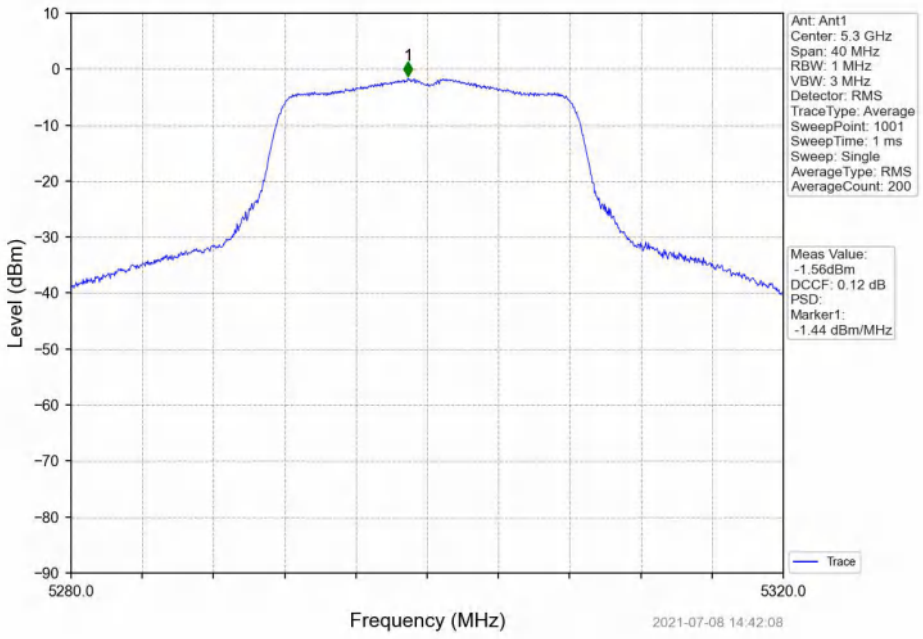
802.11a_LCH_5260MHz_Ant1_NTNV



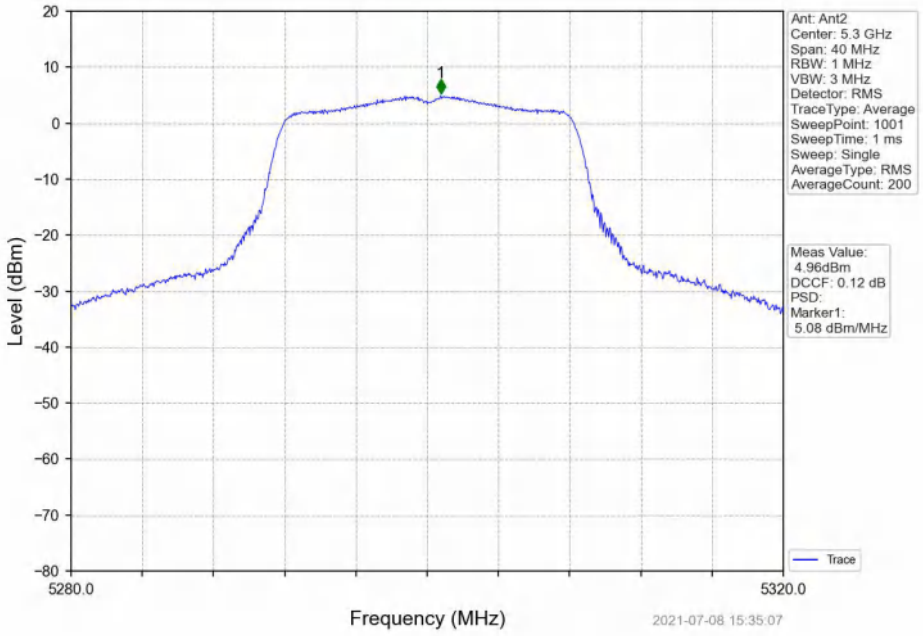
802.11a_LCH_5260MHz_Ant2_NTNV



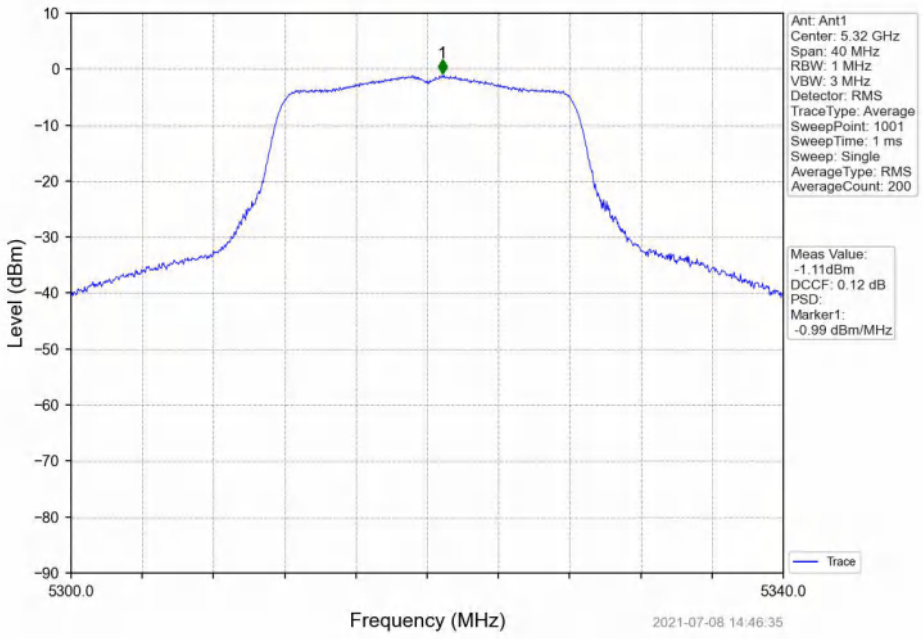
802.11a_MCH_5300MHz_Ant1_NTNV



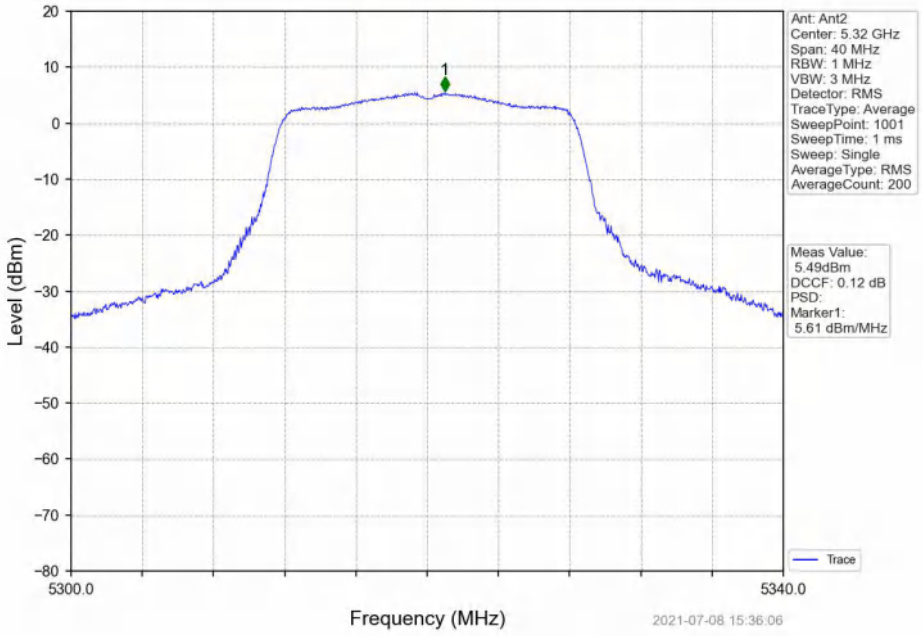
802.11a_MCH_5300MHz_Ant2_NTNV



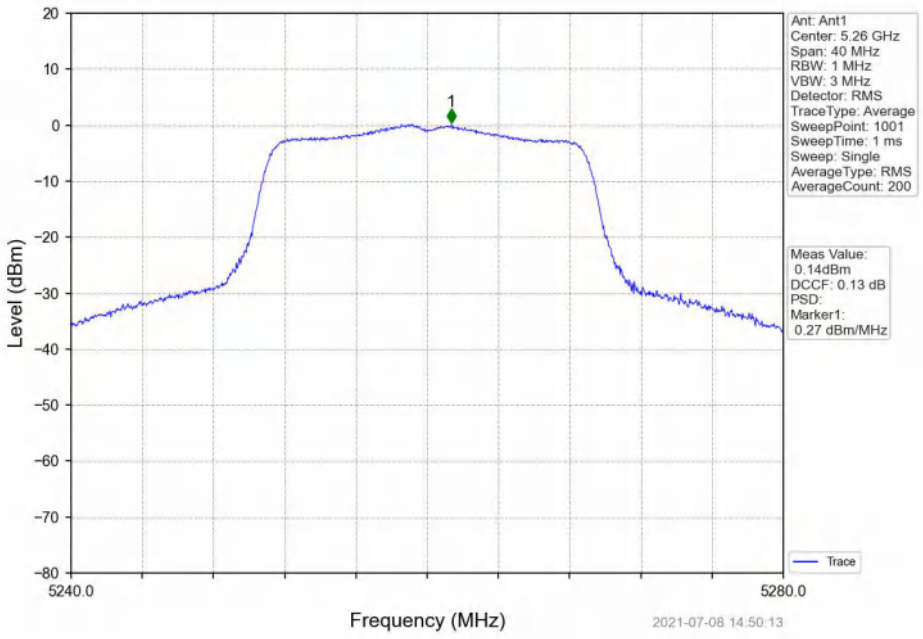
802.11a_HCH_5320MHz_Ant1_NTNV



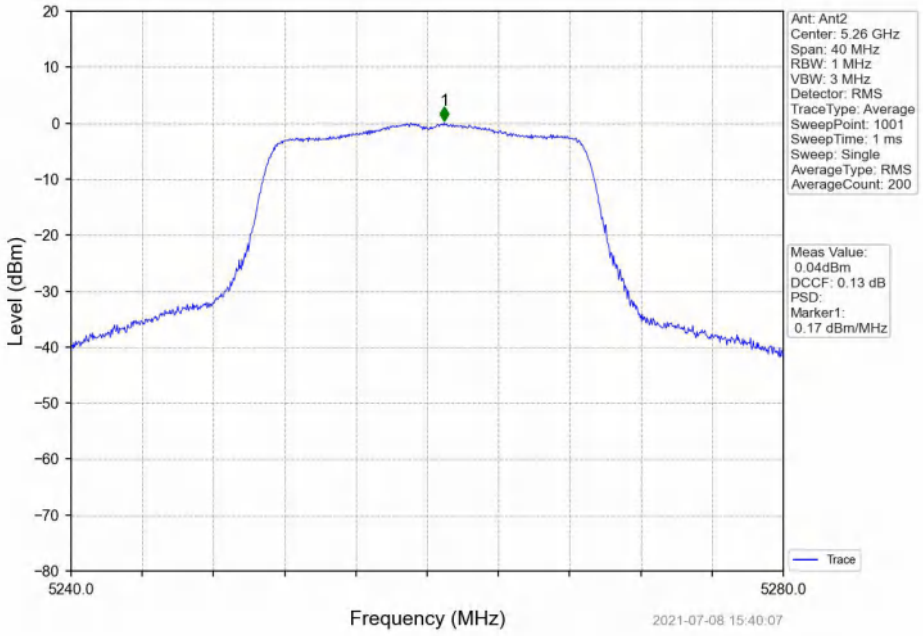
802.11a_HCH_5320MHz_Ant2_NTNV



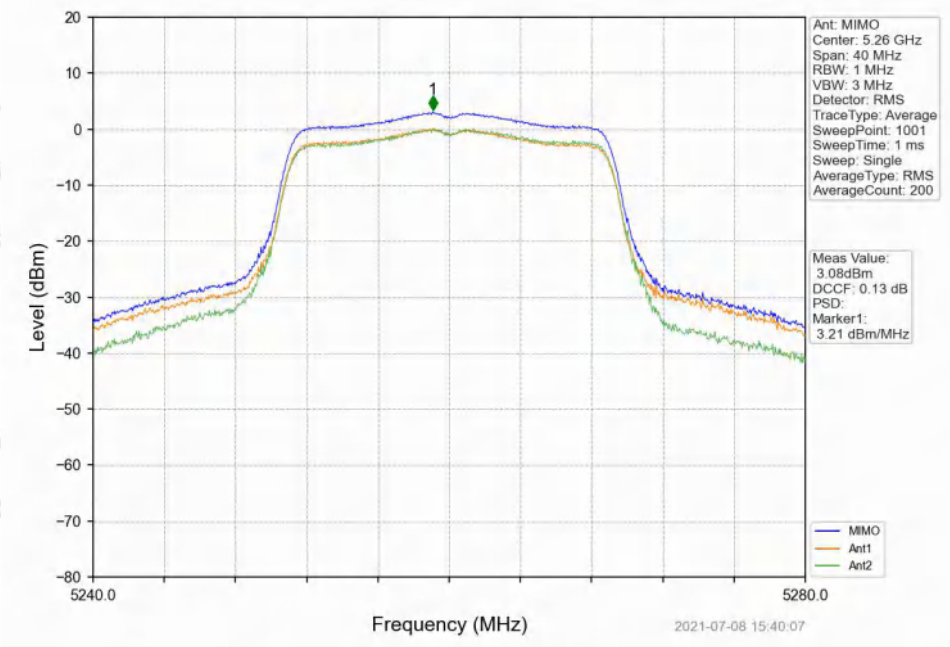
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



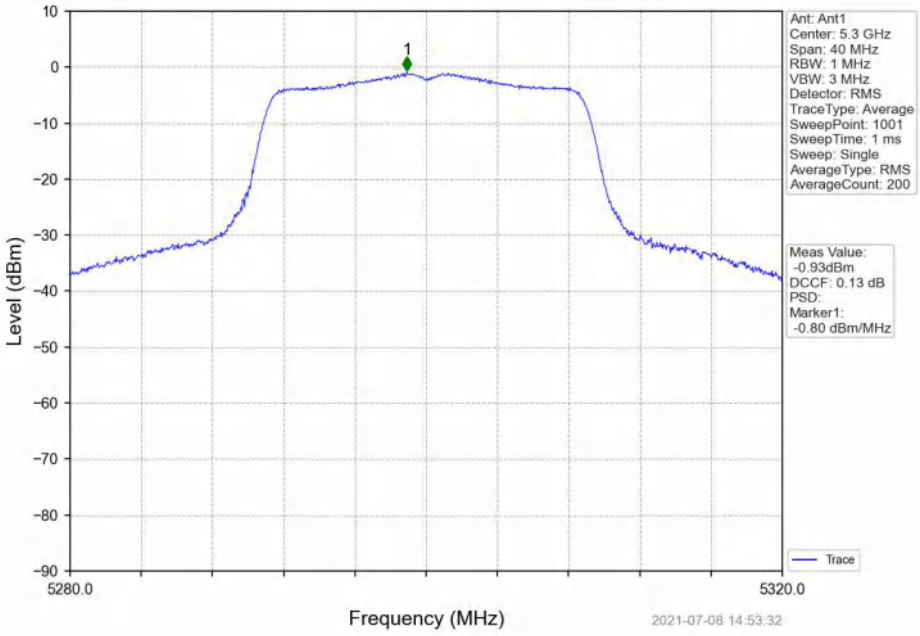
802.11n(HT20)_LCH_5260MHz_Ant2_NTNV



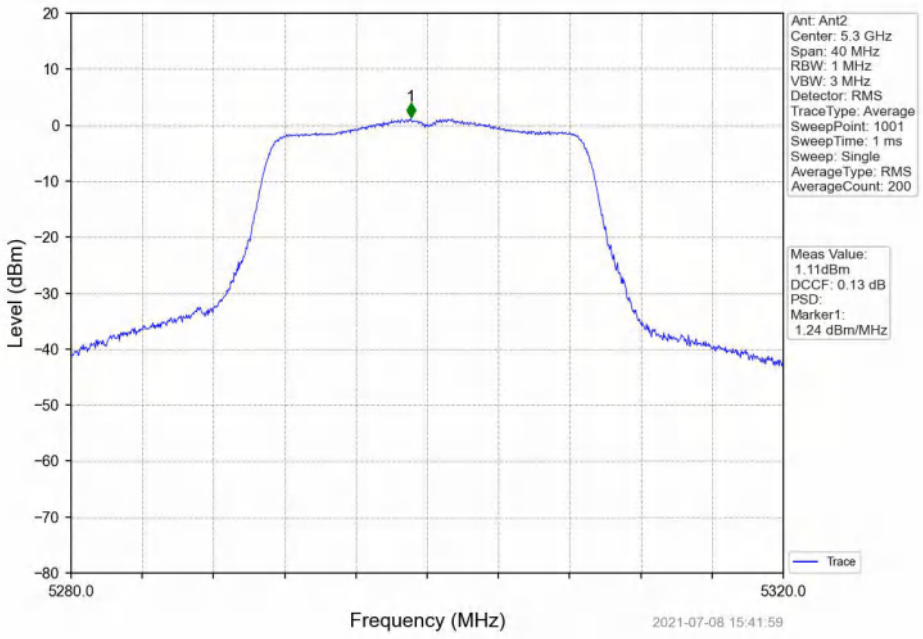
802.11n(HT20)_LCH_5260MHz_MIMO_NTNV



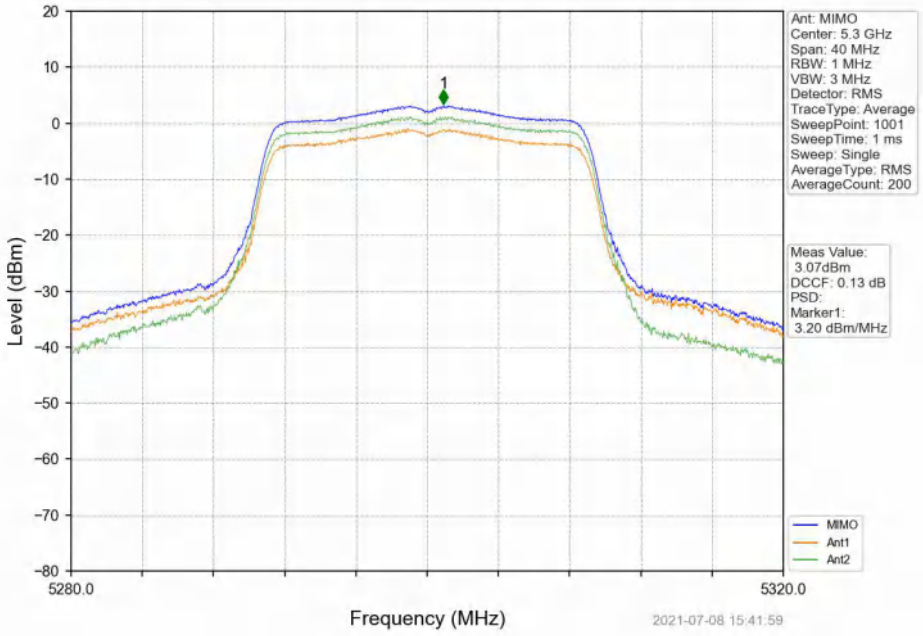
802.11n(HT20)_MCH_5300MHz_Ant1_NTNV



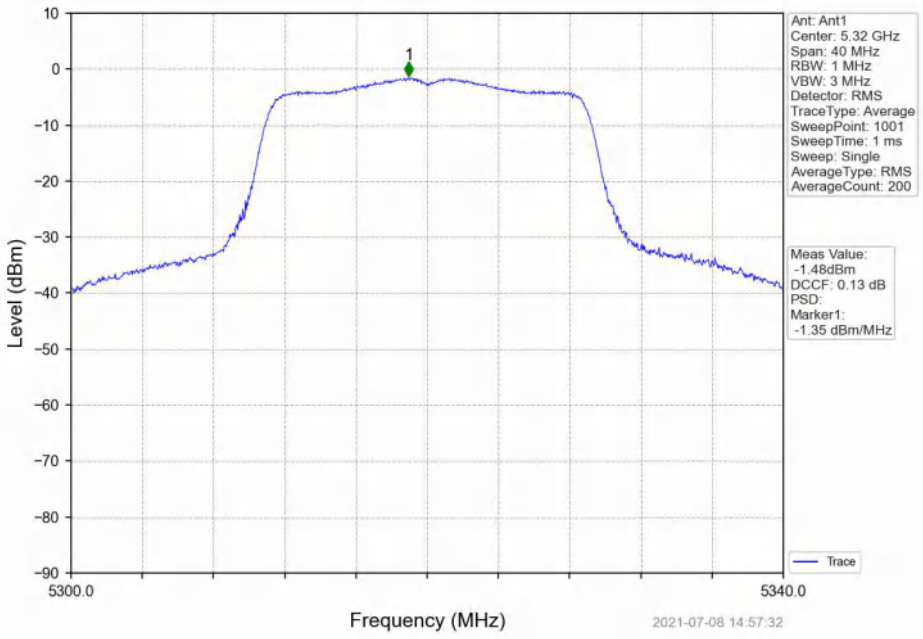
802.11n(HT20)_MCH_5300MHz_Ant2_NTNV



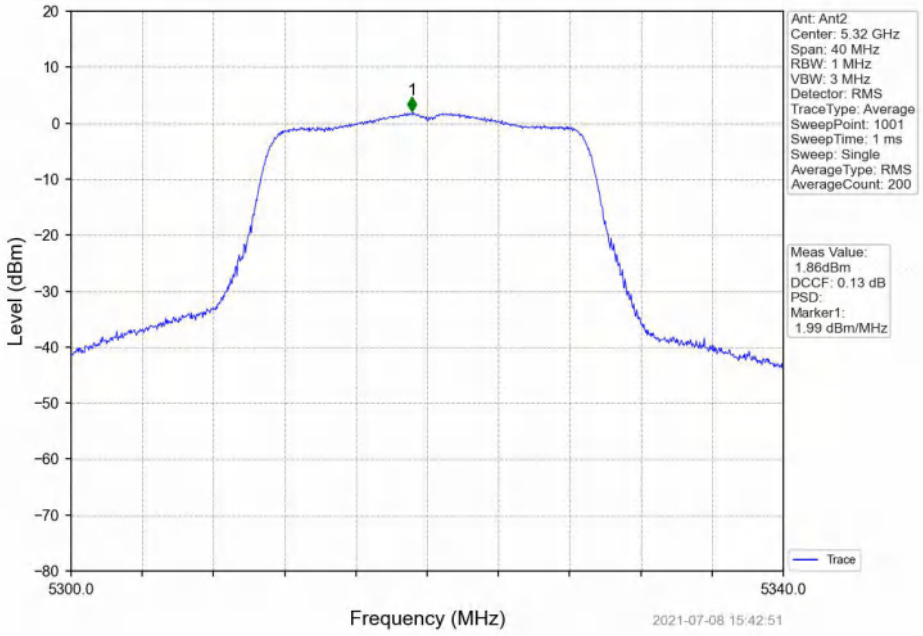
802.11n(HT20)_MCH_5300MHz_MIMO_NTNV



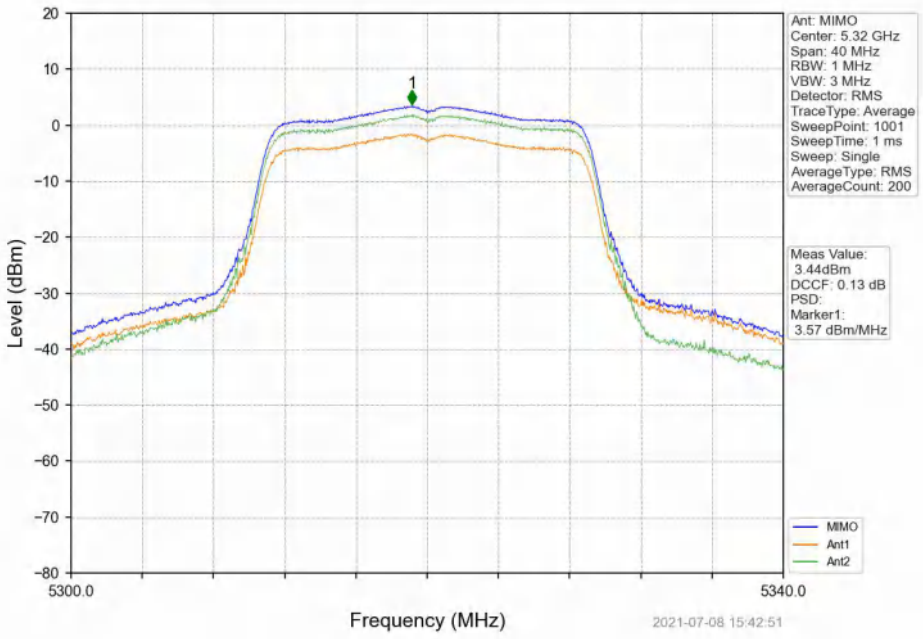
802.11n(HT20)_HCH_5320MHz_Ant1_NTNV



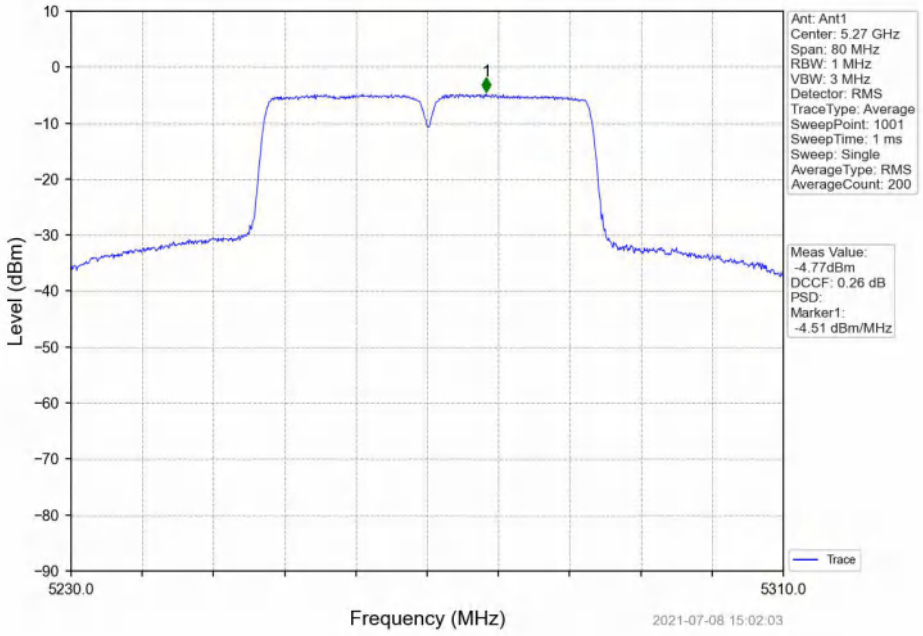
802.11n(HT20)_HCH_5320MHz_Ant2_NTNV



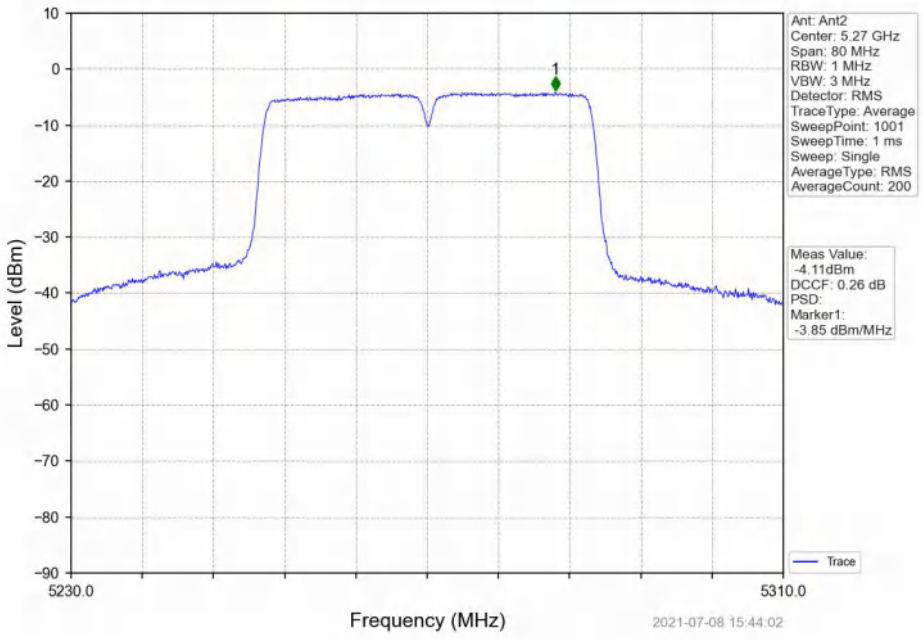
802.11n(HT20)_HCH_5320MHz_MIMO_NTNV



802.11n(HT40)_LCH_5270MHz_Ant1_NTNV



802.11n(HT40)_LCH_5270MHz_Ant2_NTNV



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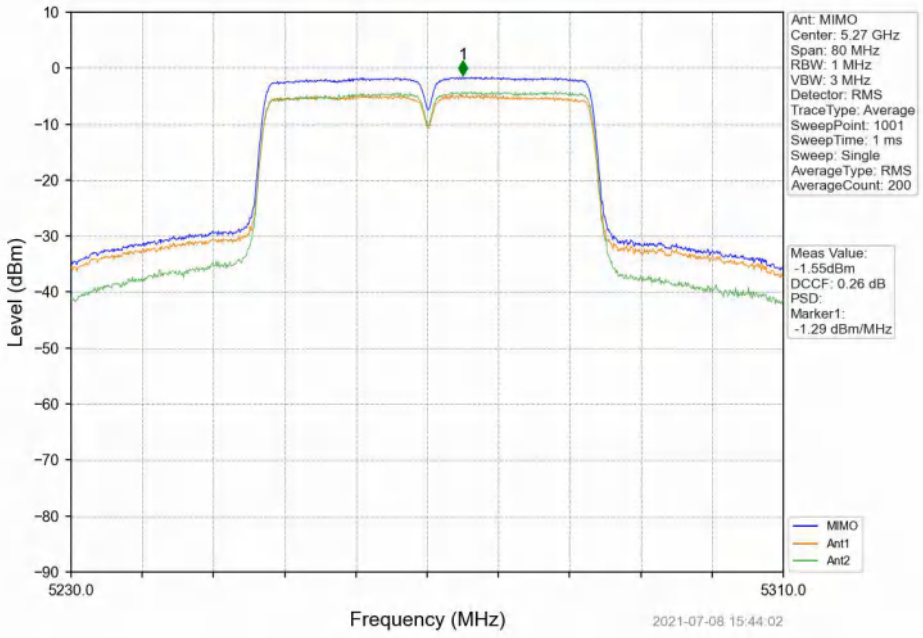
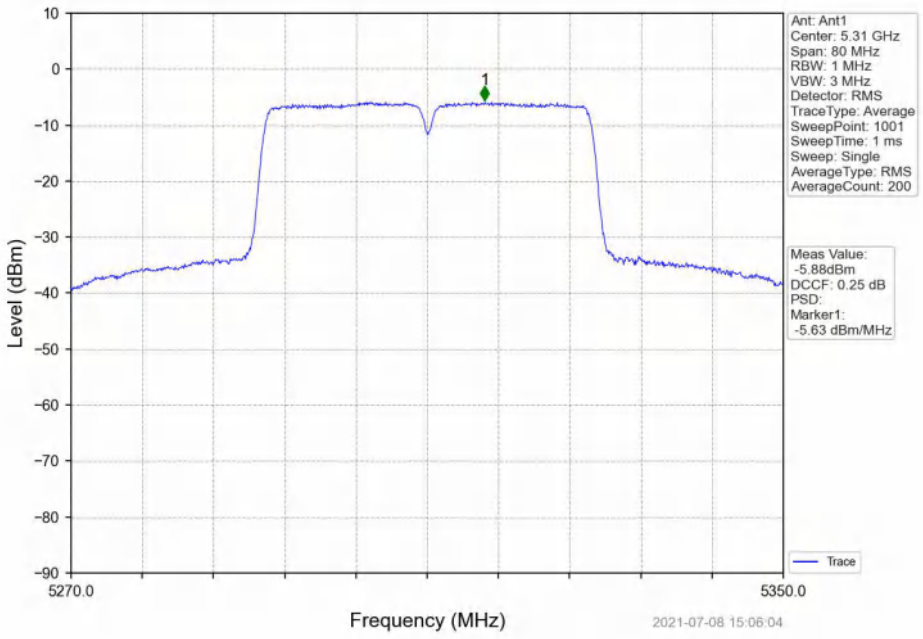
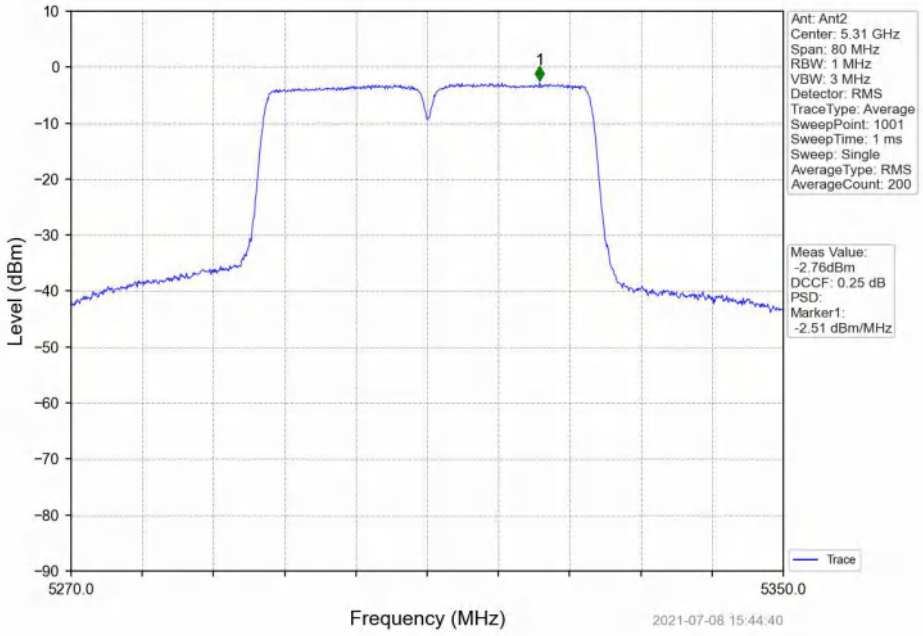


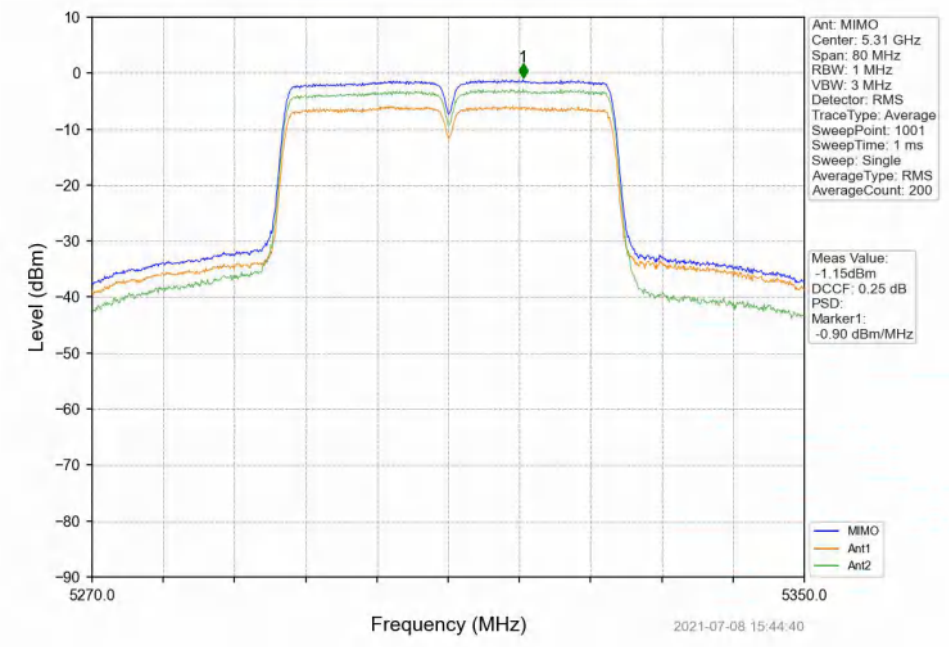
802.11n(HT40)_HCH_5310MHz_Ant1_NTNV



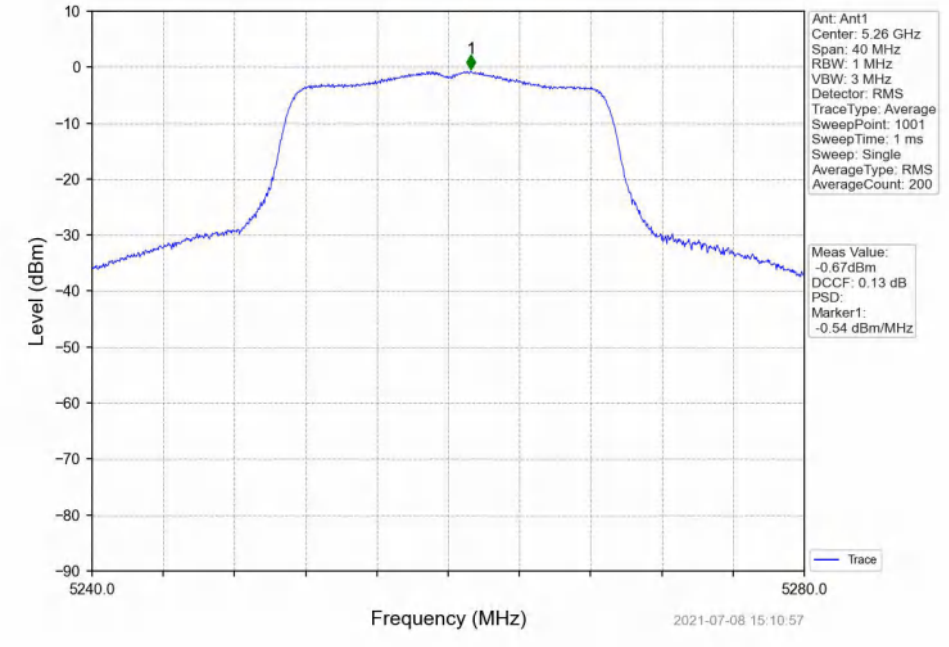
802.11n(HT40)_HCH_5310MHz_Ant2_NTNV



802.11n(HT40)_HCH_5310MHz_MIMO_NTNV



802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV



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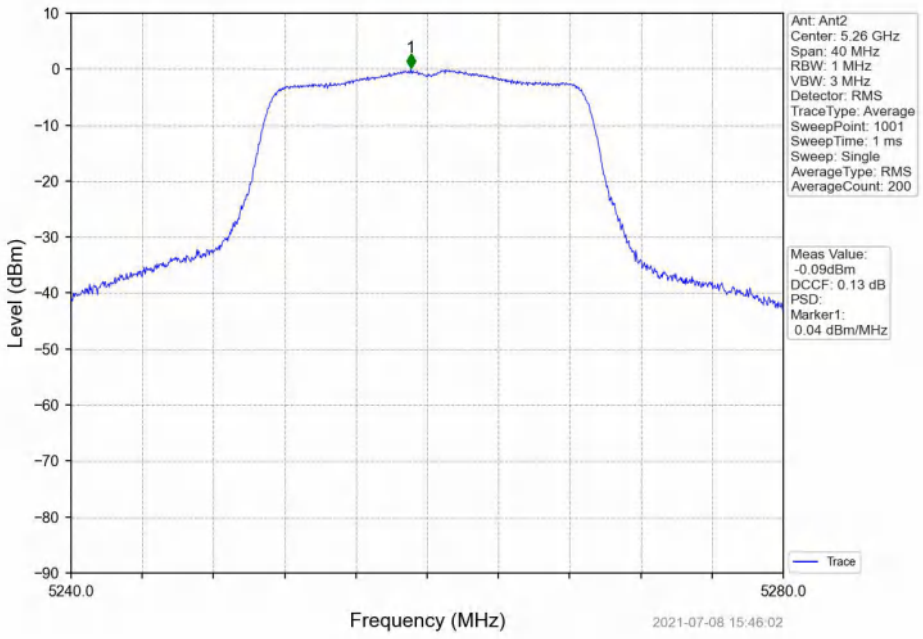
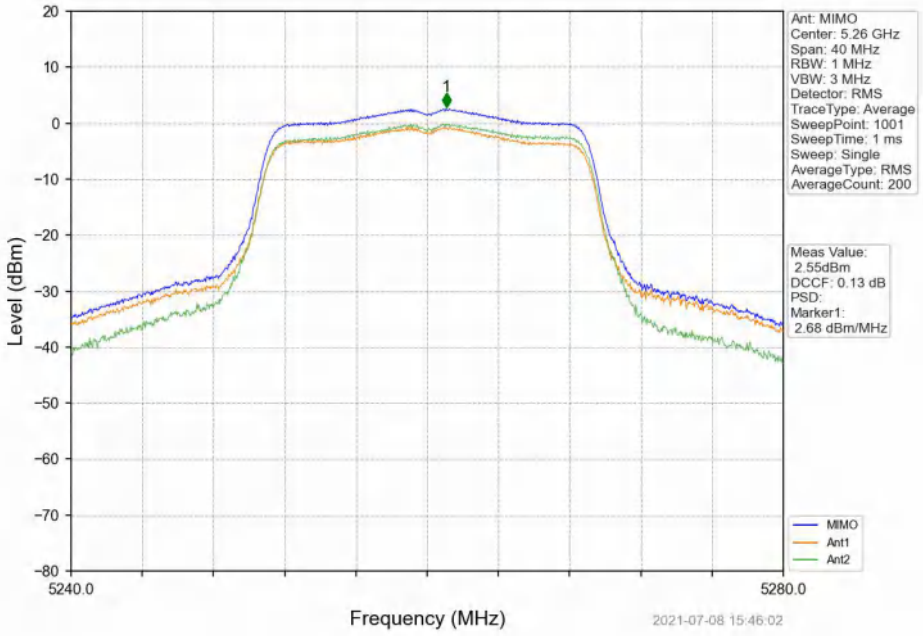
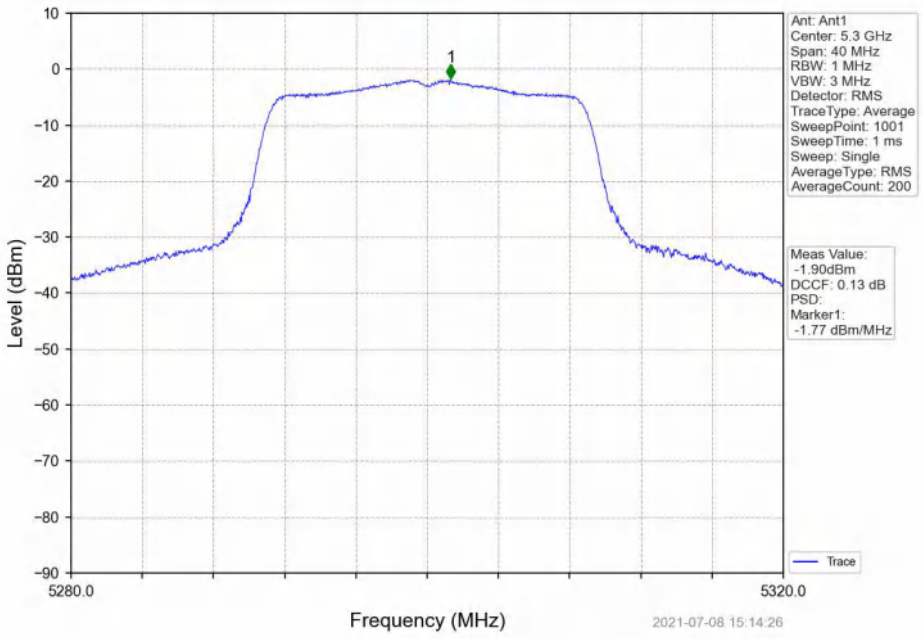


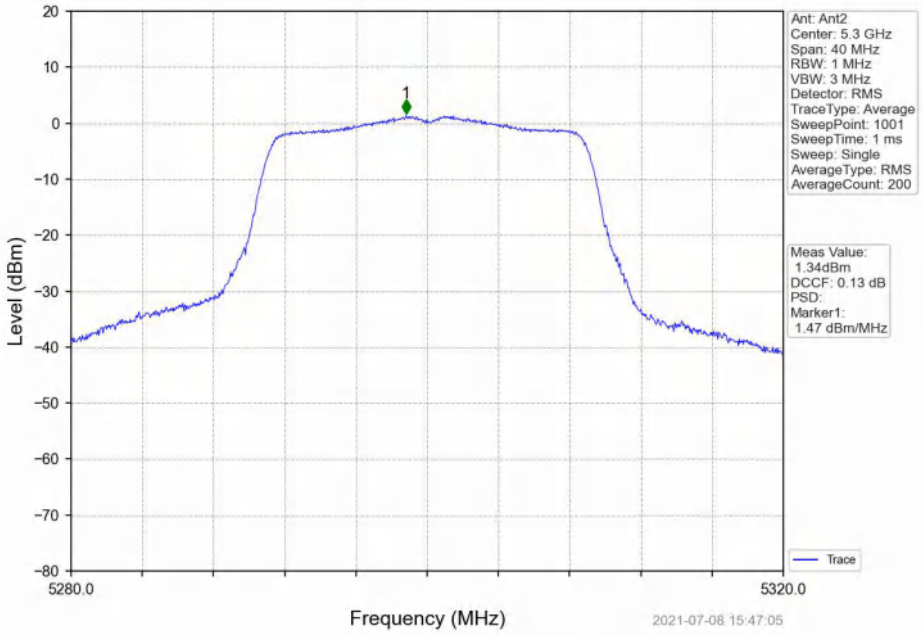
802.11ac(VHT20)_LCH_5260MHz_MIMO_NTNV



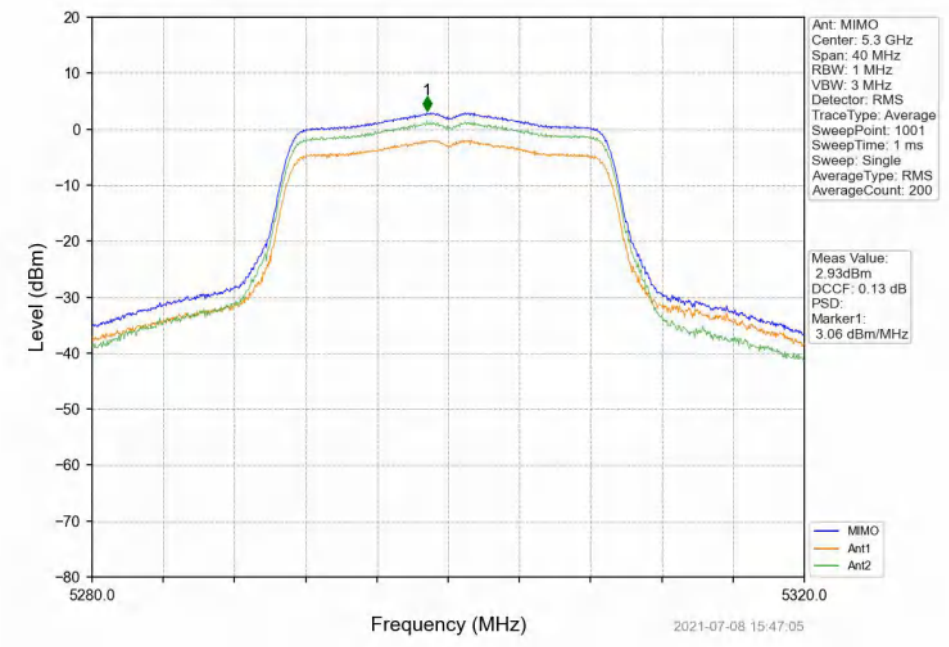
802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV



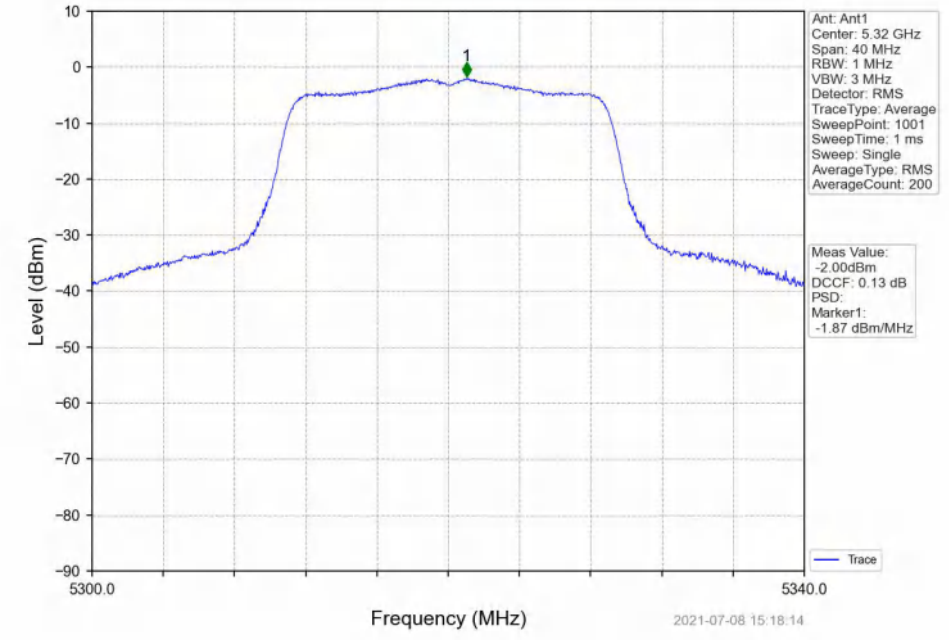
802.11ac(VHT20)_MCH_5300MHz_Ant2_NTNV



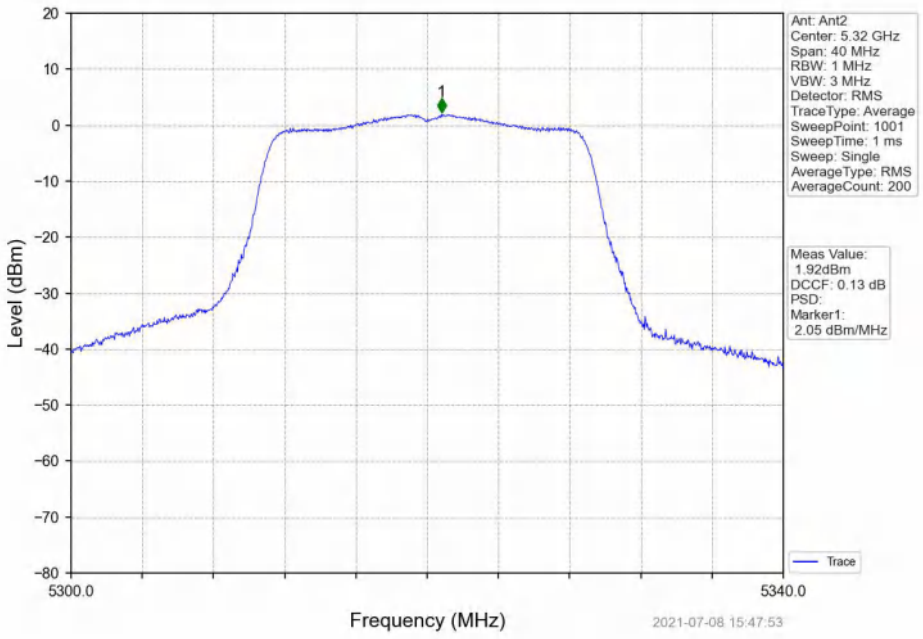
802.11ac(VHT20)_MCH_5300MHz_MIMO_NTNV



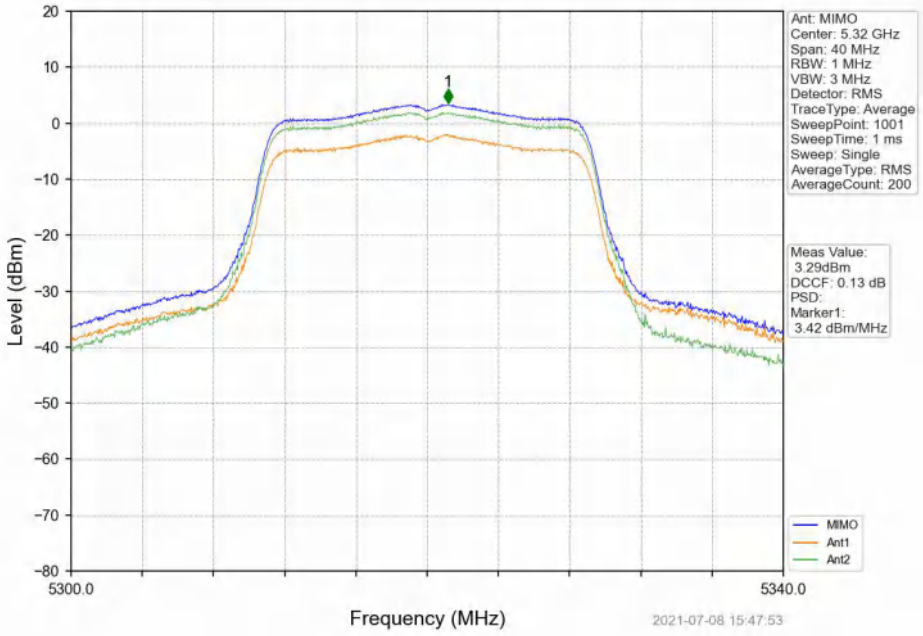
802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV



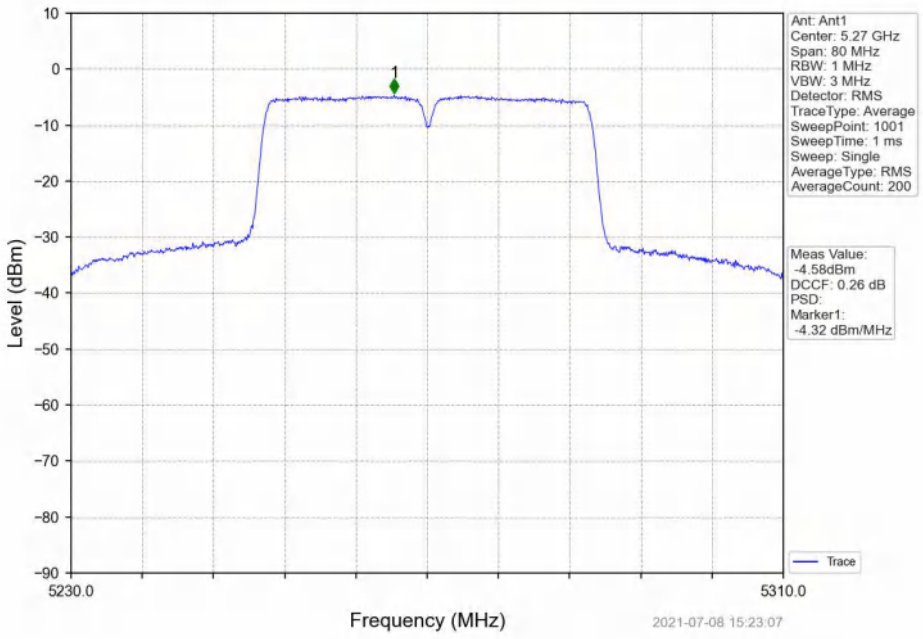
802.11ac(VHT20)_HCH_5320MHz_Ant2_NTNV



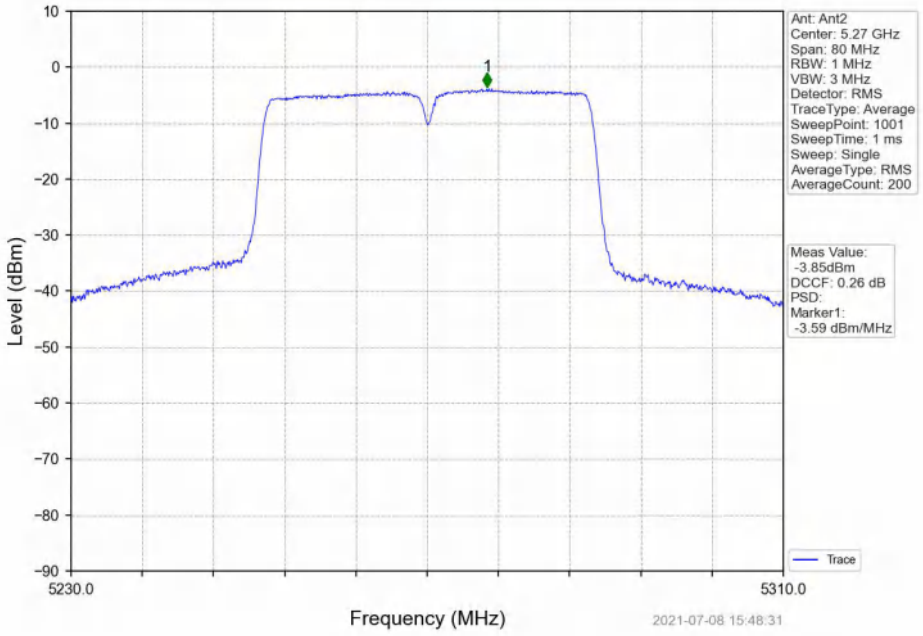
802.11ac(VHT20)_HCH_5320MHz_MIMO_NTNV



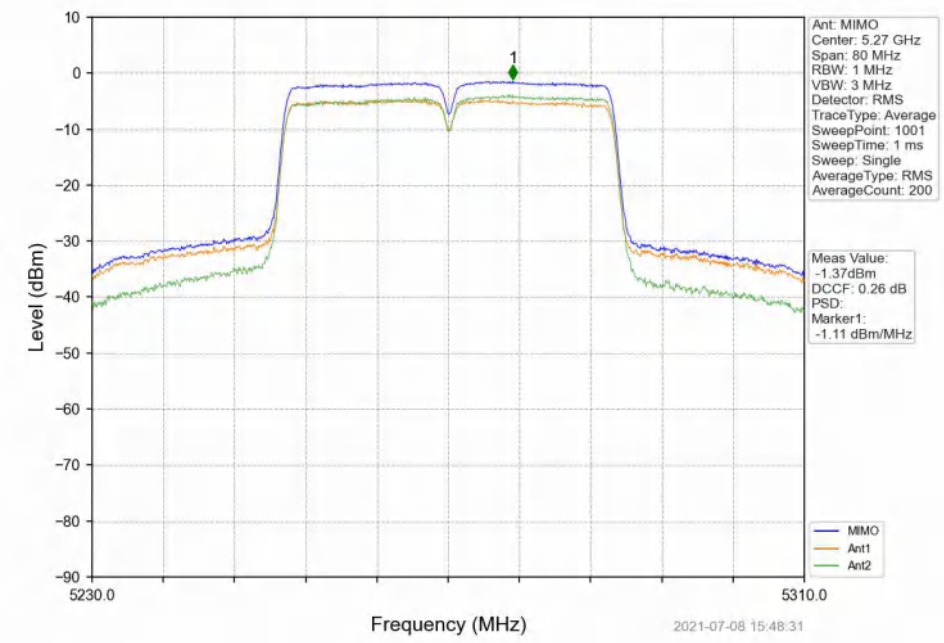
802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV



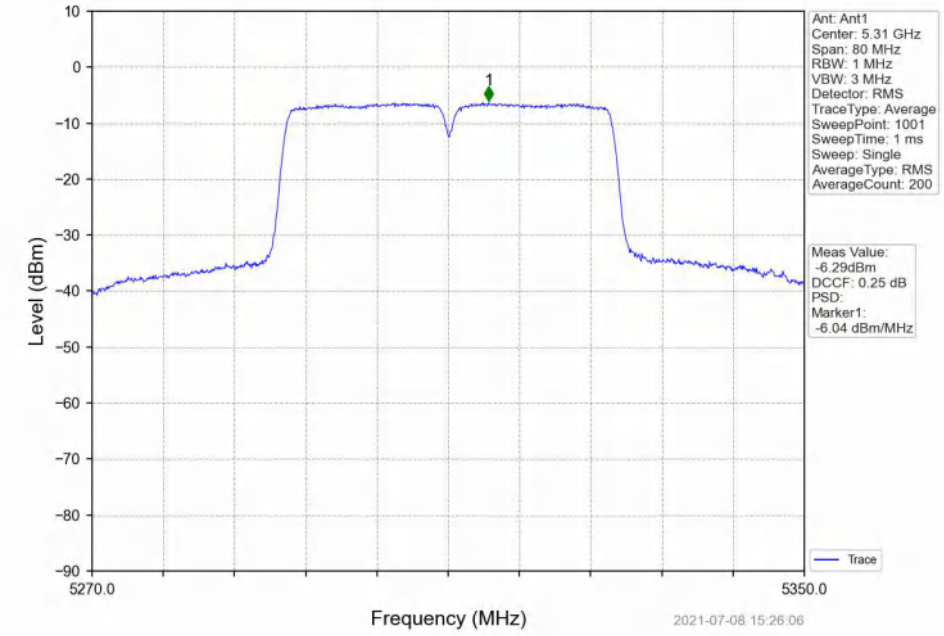
802.11ac(VHT40)_LCH_5270MHz_Ant2_NTNV



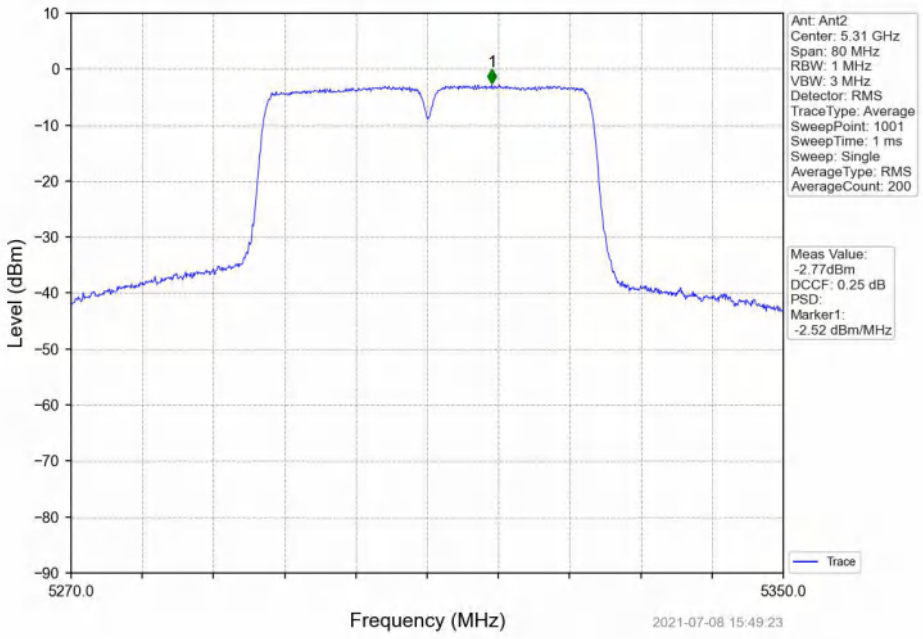
802.11ac(VHT40)_LCH_5270MHz_MIMO_NTNV



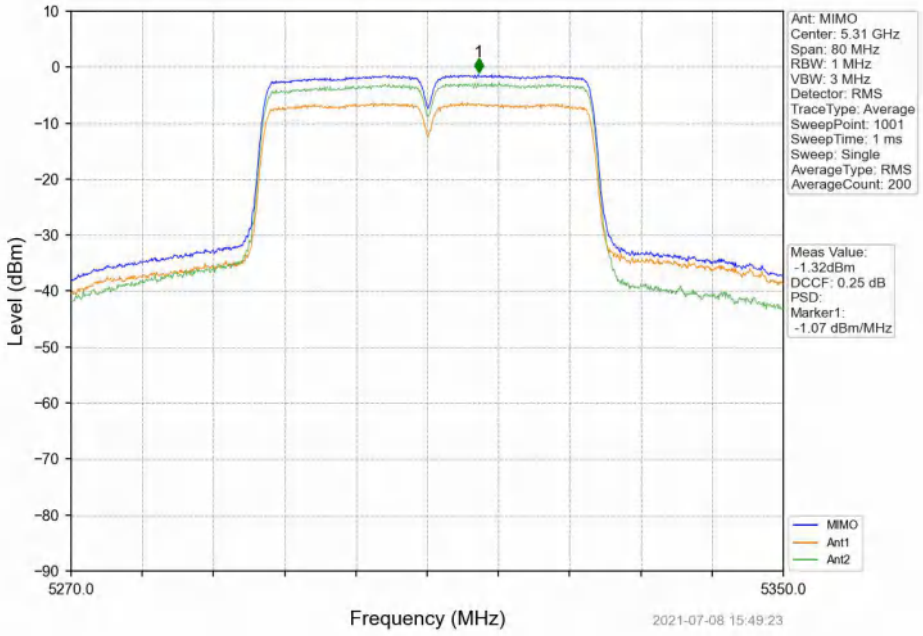
802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



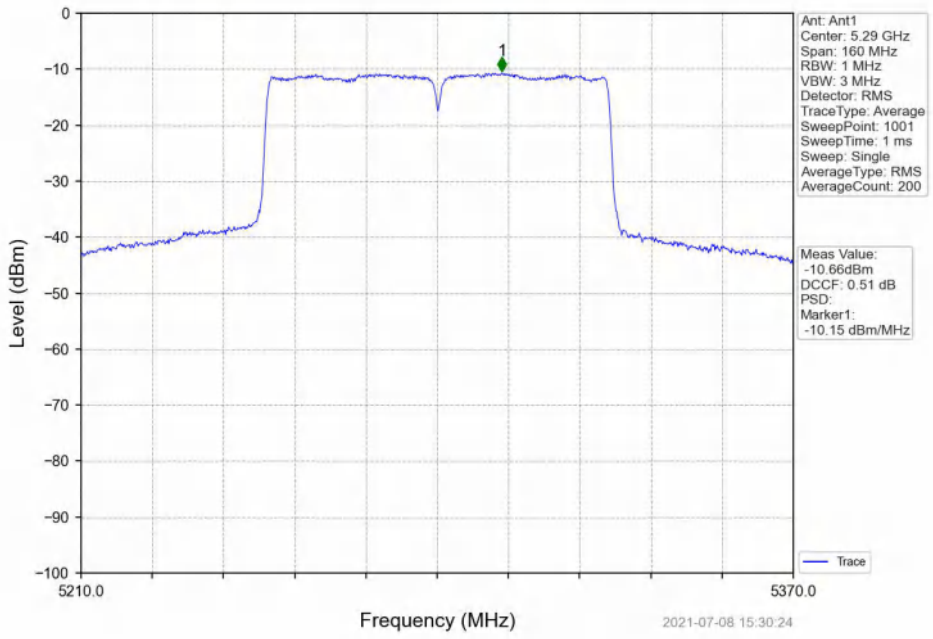
802.11ac(VHT40)_HCH_5310MHz_Ant2_NTNV



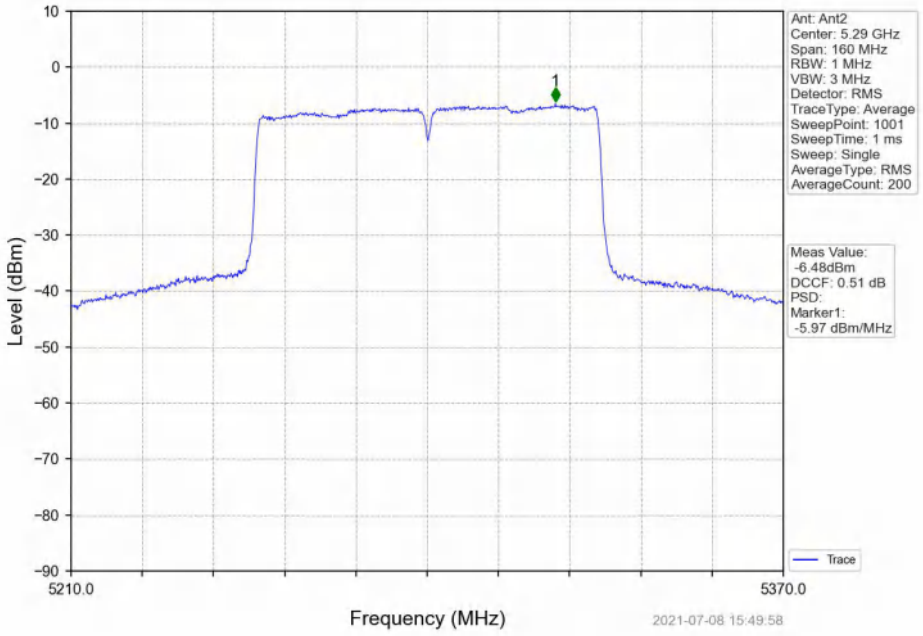
802.11ac(VHT40)_HCH_5310MHz_MIMO_NTNV



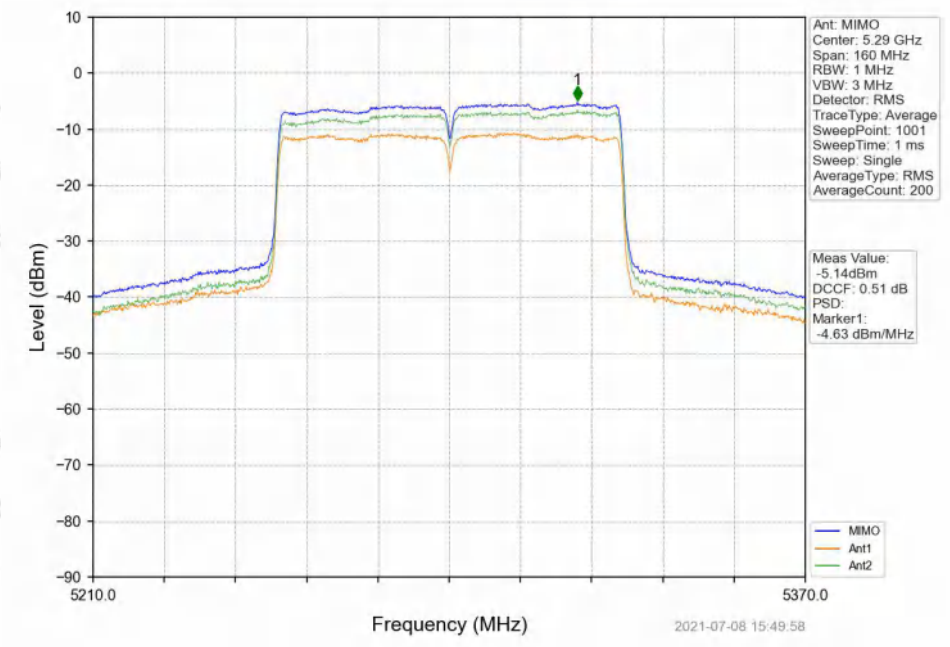
802.11ac(VHT80)_MCH_5290MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant2_NTNV



802.11ac(VHT80)_MCH_5290MHz_MIMO_NTNV



5. Frequency Stability

5.1 Ant1

5.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	Temperature (°C)	Voltage (VAC)	Measured Frequency (MHz)	Limit	Verdict
802.11a	SISO	5260	20	102	5260.080	5252 to 5268	Pass
				120	5260.040	5252 to 5268	Pass
				138	5260.080	5252 to 5268	Pass
			-30	120	5260.040	5252 to 5268	Pass
			-20	120	5260.040	5250 to 5350	Pass
			-10	120	5260.080	5250 to 5350	Pass
			0	120	5260.040	5250 to 5350	Pass
			10	120	5260.060	5250 to 5350	Pass
			30	120	5260.080	5250 to 5350	Pass
			40	120	5260.100	5250 to 5350	Pass
			50	120	5260.080	5252 to 5268	Pass
		5300	20	102	5300.120	5292 to 5308	Pass
				120	5300.120	5292 to 5308	Pass
				138	5300.040	5292 to 5308	Pass
			-30	120	5300.080	5292 to 5308	Pass
			-20	120	5300.040	5250 to 5350	Pass
			-10	120	5300.100	5250 to 5350	Pass
			0	120	5300.020	5250 to 5350	Pass
			10	120	5300.040	5250 to 5350	Pass
			30	120	5300.020	5250 to 5350	Pass
			40	120	5300.080	5250 to 5350	Pass
			50	120	5300.100	5292 to 5308	Pass
		5320	20	102	5320.120	5312 to 5328	Pass
				120	5320.080	5312 to 5328	Pass
				138	5320.060	5312 to 5328	Pass
			-30	120	5320.020	5312 to 5328	Pass
			-20	120	5320.060	5250 to 5350	Pass
			-10	120	5320.100	5250 to 5350	Pass
			0	120	5320.020	5250 to 5350	Pass
			10	120	5320.100	5250 to 5350	Pass
			30	120	5320.040	5250 to 5350	Pass
			40	120	5320.080	5250 to 5350	Pass
			50	120	5320.080	5312 to 5328	Pass
802.11n (HT20)	MIMO	5260	20	102	5260.100	5252 to 5268	Pass
				120	5260.080	5252 to 5268	Pass
				138	5260.000	5252 to 5268	Pass
			-30	120	5260.060	5252 to 5268	Pass
			-20	120	5260.120	5250 to 5350	Pass
			-10	120	5260.100	5250 to 5350	Pass
			0	120	5260.060	5250 to 5350	Pass
			10	120	5260.060	5250 to 5350	Pass
			30	120	5260.080	5250 to 5350	Pass
			40	120	5260.040	5250 to 5350	Pass
			50	120	5260.060	5252 to 5268	Pass
		5300	20	102	5300.060	5292 to 5308	Pass
				120	5300.020	5292 to 5308	Pass
				138	5300.060	5292 to 5308	Pass
			-30	120	5299.980	5292 to 5308	Pass
			-20	120	5300.080	5250 to 5350	Pass

			-10	120	5300.020	5250 to 5350	Pass
			0	120	5300.080	5250 to 5350	Pass
			10	120	5300.140	5250 to 5350	Pass
			30	120	5300.100	5250 to 5350	Pass
			40	120	5300.140	5250 to 5350	Pass
			50	120	5300.060	5292 to 5308	Pass
		5320	20	102	5320.020	5312 to 5328	Pass
				120	5320.120	5312 to 5328	Pass
				138	5320.100	5312 to 5328	Pass
			-30	120	5320.040	5312 to 5328	Pass
			-20	120	5320.040	5250 to 5350	Pass
			-10	120	5320.080	5250 to 5350	Pass
			0	120	5320.080	5250 to 5350	Pass
			10	120	5320.100	5250 to 5350	Pass
			30	120	5320.100	5250 to 5350	Pass
			40	120	5320.060	5250 to 5350	Pass
			50	120	5320.060	5312 to 5328	Pass
802.11n (HT40)	MIMO	5270	20	102	5270.120	5254 to 5286	Pass
				120	5270.080	5254 to 5286	Pass
				138	5270.160	5254 to 5286	Pass
			-30	120	5270.080	5254 to 5286	Pass
			-20	120	5270.000	5250 to 5350	Pass
			-10	120	5270.080	5250 to 5350	Pass
			0	120	5270.080	5250 to 5350	Pass
			10	120	5270.080	5250 to 5350	Pass
			30	120	5270.160	5250 to 5350	Pass
			40	120	5270.120	5250 to 5350	Pass
			50	120	5270.120	5254 to 5286	Pass
		5310	20	102	5310.160	5294 to 5326	Pass
				120	5310.080	5294 to 5326	Pass
				138	5310.040	5294 to 5326	Pass
			-30	120	5310.040	5294 to 5326	Pass
			-20	120	5310.200	5250 to 5350	Pass
			-10	120	5310.120	5250 to 5350	Pass
			0	120	5310.120	5250 to 5350	Pass
			10	120	5310.080	5250 to 5350	Pass
			30	120	5310.080	5250 to 5350	Pass
			40	120	5310.120	5250 to 5350	Pass
			50	120	5310.160	5294 to 5326	Pass
802.11ac (VHT20)	MIMO	5260	20	102	5259.980	5252 to 5268	Pass
				120	5260.040	5252 to 5268	Pass
				138	5260.020	5252 to 5268	Pass
			-30	120	5260.060	5252 to 5268	Pass
			-20	120	5260.020	5250 to 5350	Pass
			-10	120	5260.060	5250 to 5350	Pass
			0	120	5260.080	5250 to 5350	Pass
			10	120	5260.060	5250 to 5350	Pass
			30	120	5260.100	5250 to 5350	Pass
			40	120	5260.040	5250 to 5350	Pass
			50	120	5260.060	5252 to 5268	Pass
		5300	20	102	5300.060	5292 to 5308	Pass
				120	5300.120	5292 to 5308	Pass
				138	5300.120	5292 to 5308	Pass
			-30	120	5300.020	5292 to 5308	Pass
			-20	120	5300.060	5250 to 5350	Pass
			-10	120	5300.020	5250 to 5350	Pass
			0	120	5300.040	5250 to 5350	Pass
			10	120	5300.080	5250 to 5350	Pass
			30	120	5300.040	5250 to 5350	Pass
			40	120	5300.100	5250 to 5350	Pass
			50	120	5300.060	5292 to 5308	Pass

		5320	20	102	5320.040	5312 to 5328	Pass
				120	5320.080	5312 to 5328	Pass
				138	5320.120	5312 to 5328	Pass
			-30	120	5320.100	5312 to 5328	Pass
			-20	120	5320.040	5250 to 5350	Pass
			-10	120	5320.060	5250 to 5350	Pass
			0	120	5320.060	5250 to 5350	Pass
			10	120	5320.040	5250 to 5350	Pass
			30	120	5320.040	5250 to 5350	Pass
			40	120	5320.060	5250 to 5350	Pass
			50	120	5320.080	5312 to 5328	Pass
802.11ac (VHT40)	MIMO	5270	20	102	5270.080	5254 to 5286	Pass
				120	5270.000	5254 to 5286	Pass
				138	5270.120	5254 to 5286	Pass
			-30	120	5270.120	5254 to 5286	Pass
			-20	120	5270.120	5250 to 5350	Pass
			-10	120	5270.120	5250 to 5350	Pass
			0	120	5270.120	5250 to 5350	Pass
			10	120	5270.160	5250 to 5350	Pass
			30	120	5270.120	5250 to 5350	Pass
			40	120	5270.120	5250 to 5350	Pass
			50	120	5270.120	5254 to 5286	Pass
		5310	20	102	5310.080	5294 to 5326	Pass
				120	5310.160	5294 to 5326	Pass
				138	5310.200	5294 to 5326	Pass
			-30	120	5310.160	5294 to 5326	Pass
			-20	120	5310.160	5250 to 5350	Pass
			-10	120	5310.120	5250 to 5350	Pass
			0	120	5310.120	5250 to 5350	Pass
			10	120	5310.120	5250 to 5350	Pass
			30	120	5310.160	5250 to 5350	Pass
			40	120	5310.120	5250 to 5350	Pass
			50	120	5310.160	5294 to 5326	Pass
802.11ac (VHT80)	MIMO	5290	20	102	5290.075	5258 to 5322	Pass
				120	5290.225	5258 to 5322	Pass
				138	5290.150	5258 to 5322	Pass
			-30	120	5290.150	5258 to 5322	Pass
			-20	120	5290.225	5250 to 5350	Pass
			-10	120	5290.150	5250 to 5350	Pass
			0	120	5290.075	5250 to 5350	Pass
			10	120	5290.225	5250 to 5350	Pass
			30	120	5290.075	5250 to 5350	Pass
			40	120	5290.150	5250 to 5350	Pass
			50	120	5290.150	5258 to 5322	Pass

---End---