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Annex for 5G Wi-Fi Band 2A

Test Report No.:CTL2512053031-WF02

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FCC ID: 2BUPFTC-40EA-US

1. Bandwidth

1.1 Test Result

1.1.1 OBW

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	99% Occupied Bandwidth (MHz)		Verdict
						Result	Limit	
802.11a	SISO	5260	/	/	1	17.856	/	Pass
		5300	/	/	1	17.894	/	Pass
		5320	/	/	1	17.860	/	Pass
802.11n (HT20)	SISO	5260	/	/	1	19.254	/	Pass
		5300	/	/	1	19.338	/	Pass
		5320	/	/	1	19.209	/	Pass
802.11n (HT40)	SISO	5270	/	/	1	37.345	/	Pass
		5310	/	/	1	37.392	/	Pass
802.11ac (VHT20)	SISO	5260	/	/	1	19.247	/	Pass
		5300	/	/	1	19.378	/	Pass
		5320	/	/	1	19.198	/	Pass
802.11ac (VHT40)	SISO	5270	/	/	1	37.668	/	Pass
		5310	/	/	1	37.620	/	Pass
802.11ax (HEW20)	SISO	5260	SU	/	1	19.874	/	Pass
		5300	SU	/	1	19.662	/	Pass
		5320	SU	/	1	19.624	/	Pass
802.11ax (HEW40)	SISO	5270	SU	/	1	39.154	/	Pass
		5310	SU	/	1	38.918	/	Pass

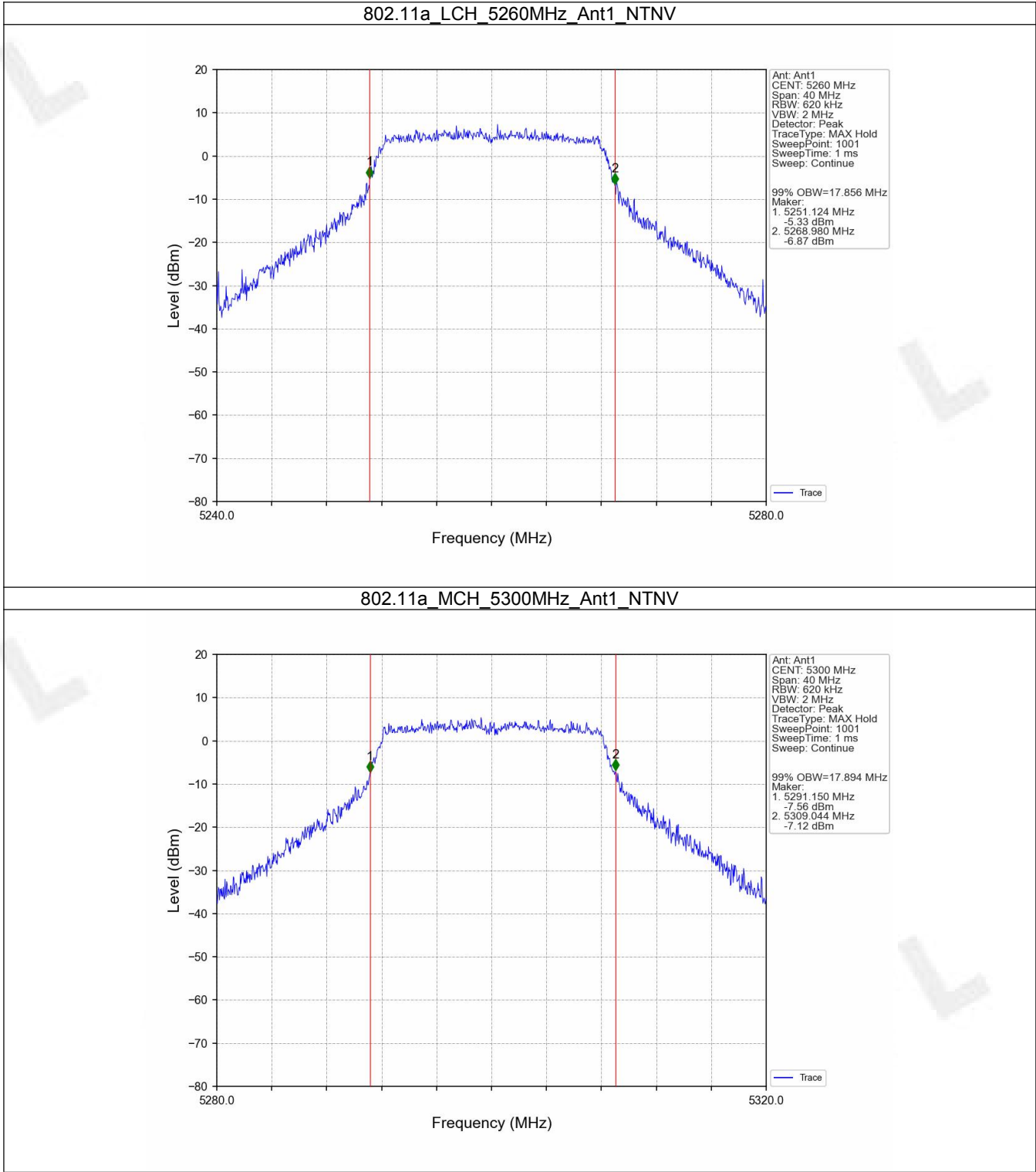
1.1.2 26dB BW

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	26dB Bandwidth (MHz)		Verdict
						Result	Limit	
802.11a	SISO	5260	/	/	1	25.714	/	Pass
		5300	/	/	1	25.490	/	Pass
		5320	/	/	1	26.655	/	Pass
802.11n (HT20)	SISO	5260	/	/	1	27.495	/	Pass
		5300	/	/	1	27.821	/	Pass
		5320	/	/	1	27.455	/	Pass
802.11n (HT40)	SISO	5270	/	/	1	48.085	/	Pass
		5310	/	/	1	47.231	/	Pass
802.11ac (VHT20)	SISO	5260	/	/	1	27.698	/	Pass
		5300	/	/	1	27.428	/	Pass
		5320	/	/	1	27.000	/	Pass
802.11ac (VHT40)	SISO	5270	/	/	1	47.432	/	Pass
		5310	/	/	1	48.005	/	Pass
802.11ax (HEW20)	SISO	5260	SU	/	1	28.554	/	Pass
		5300	SU	/	1	28.582	/	Pass
		5320	SU	/	1	27.146	/	Pass
802.11ax (HEW40)	SISO	5270	SU	/	1	48.839	/	Pass
		5310	SU	/	1	47.260	/	Pass

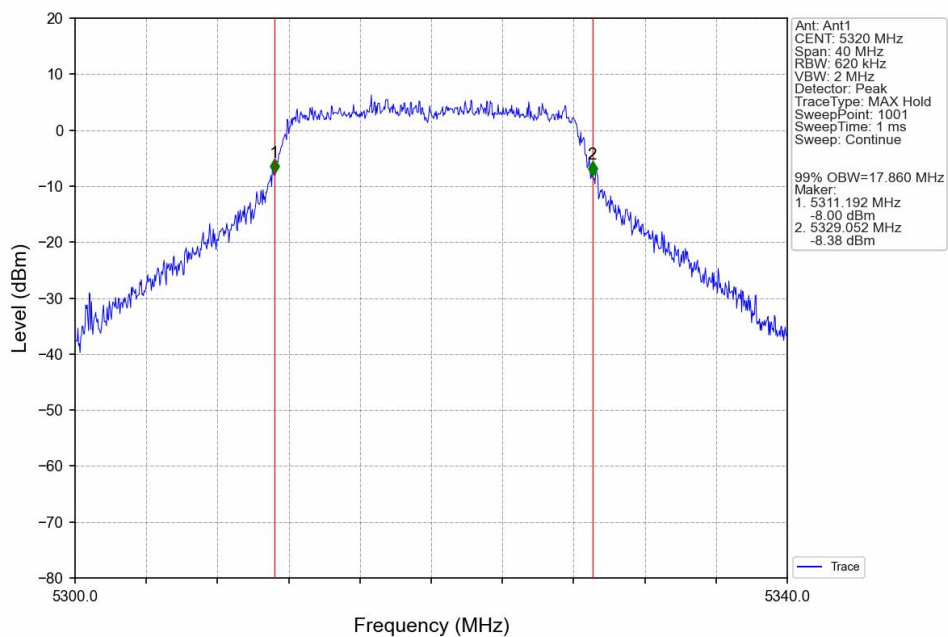
FCC ID: 2BUPFTC-40EA-US

1.2 Test Graph

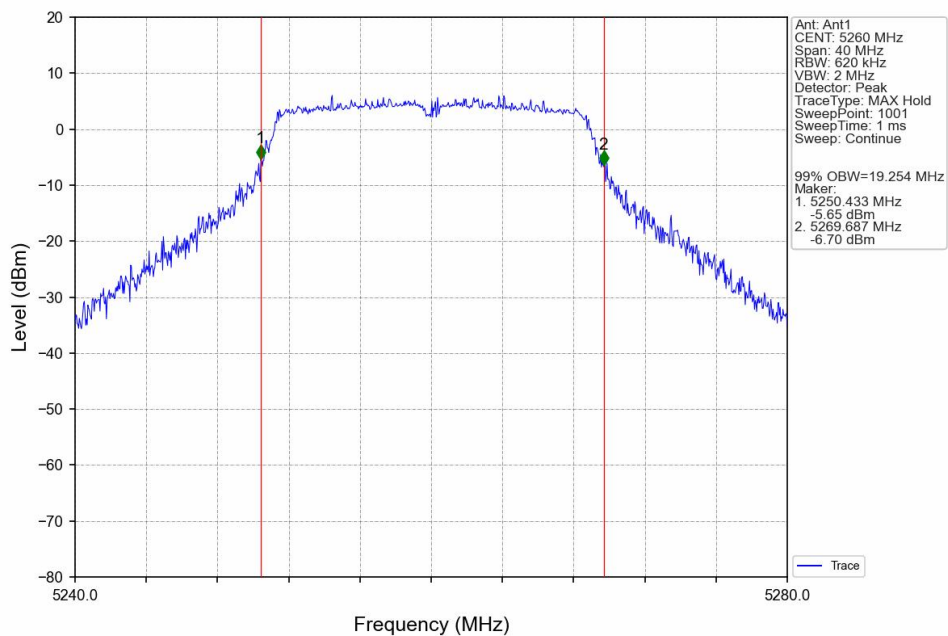
1.2.1 OBW



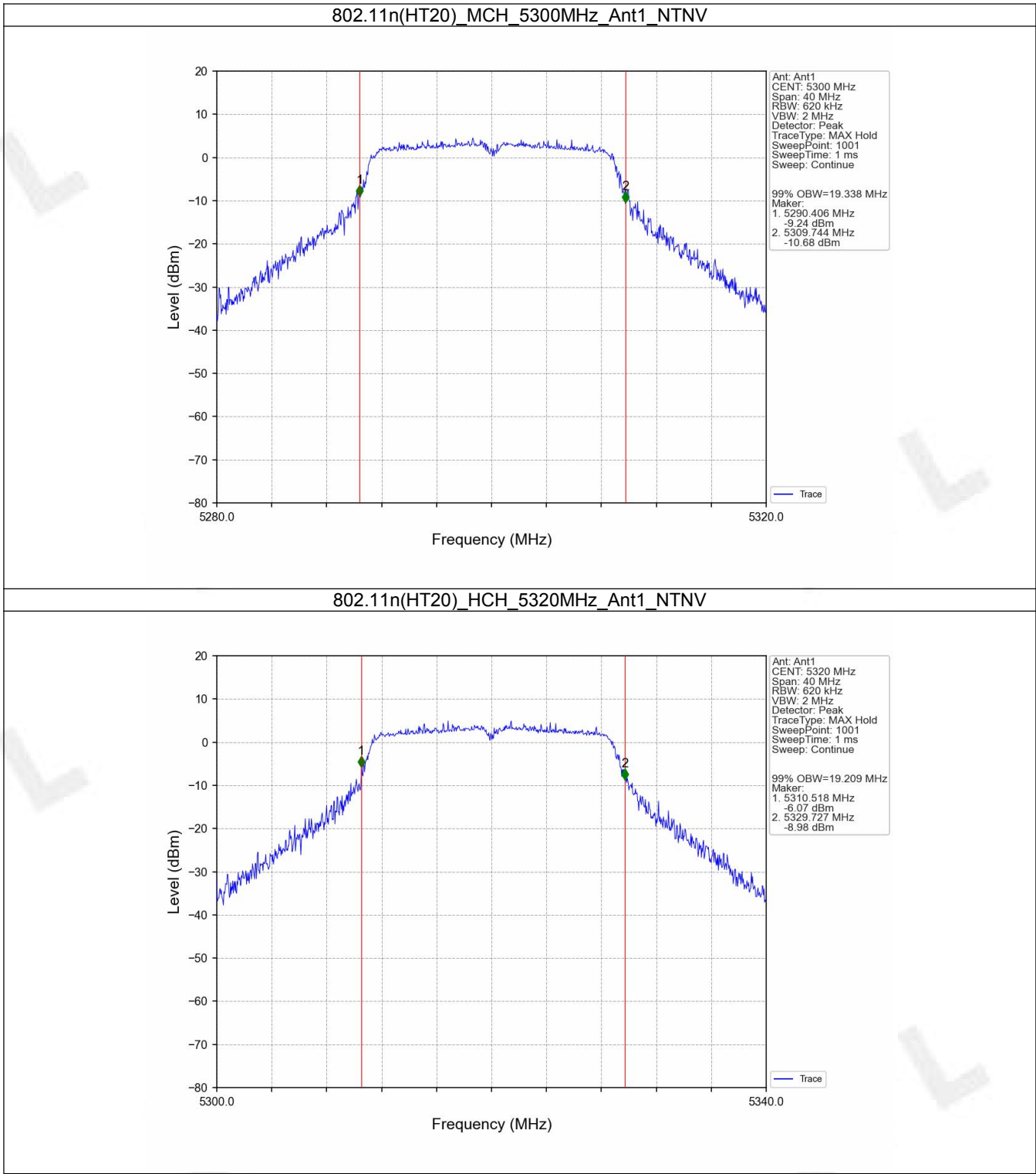
802.11a_HCH_5320MHz_Ant1_NTNV



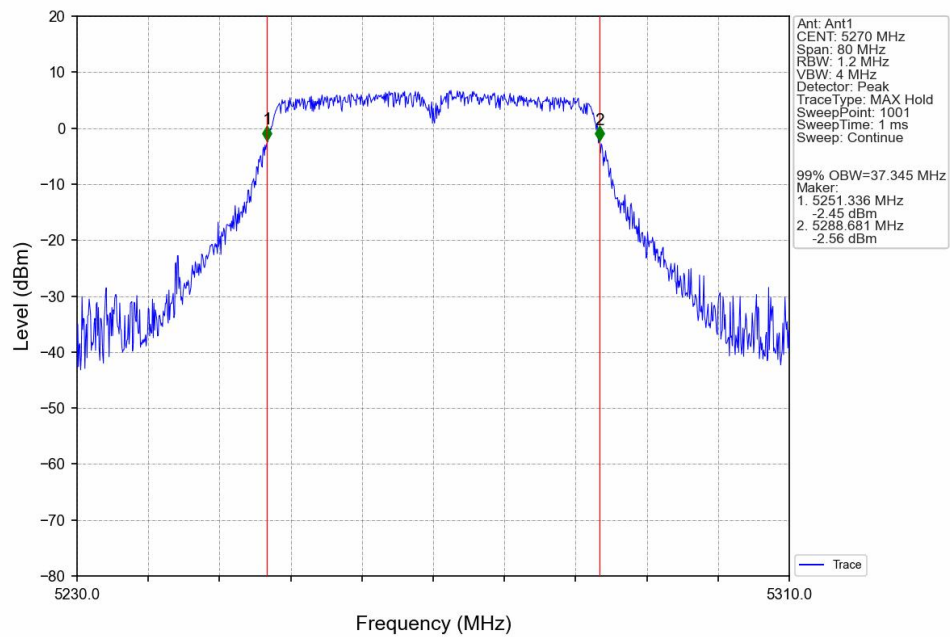
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



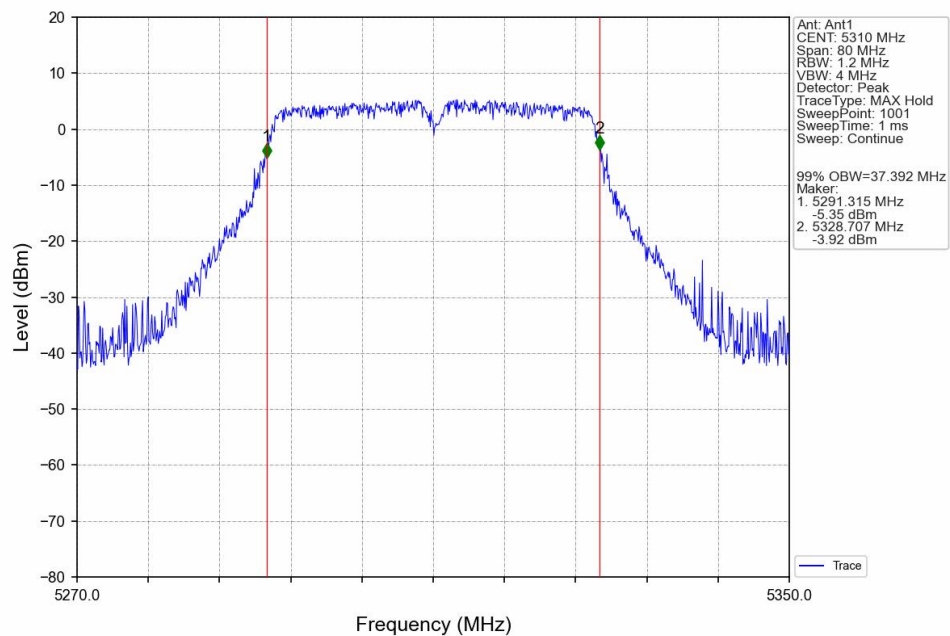
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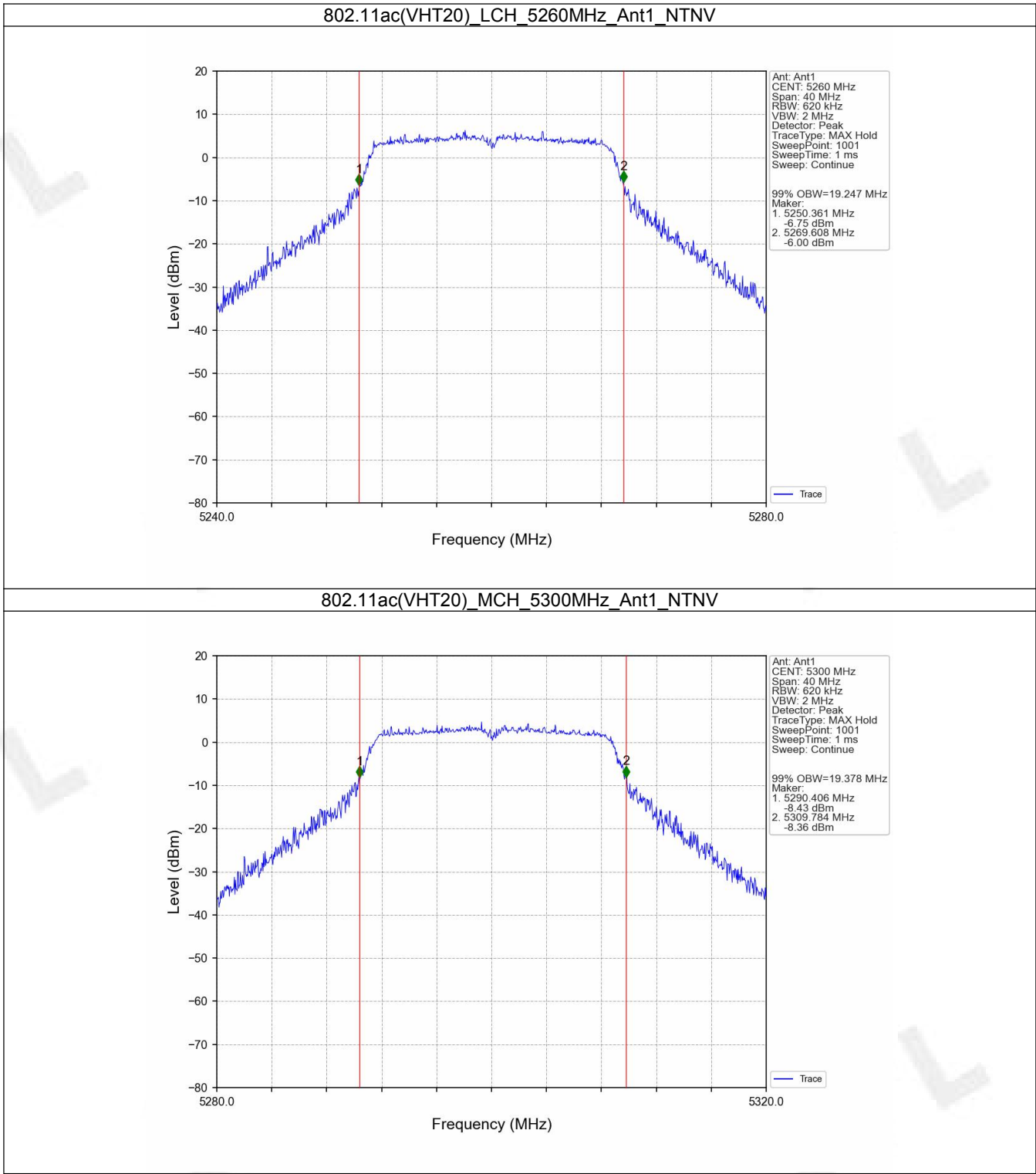
802.11n(HT40)_LCH_5270MHz_Ant1_NTNV



802.11n(HT40)_HCH_5310MHz_Ant1_NTNV

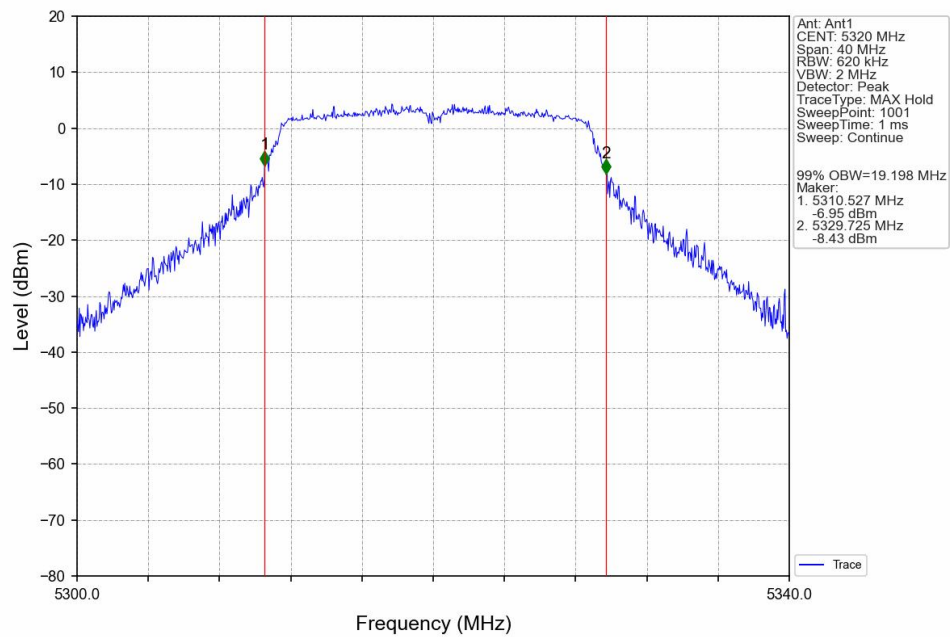


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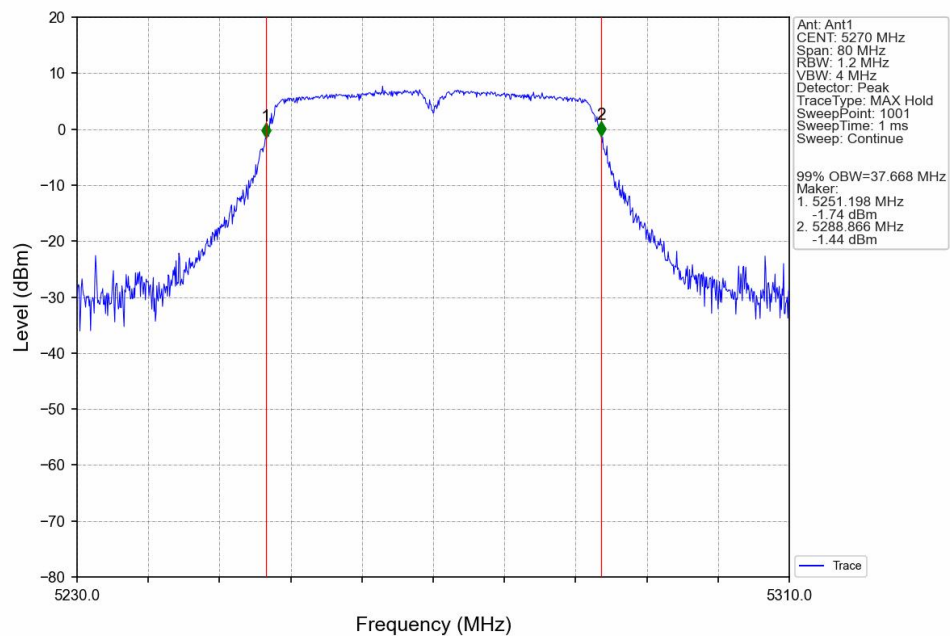


FCC ID: 2BUPFTC-40EA-US

802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV

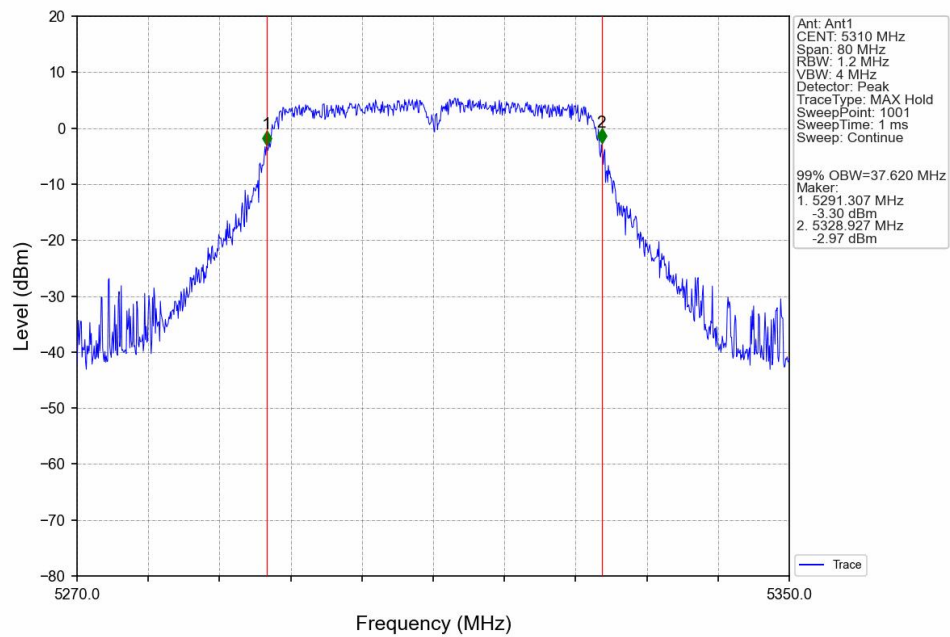


802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV

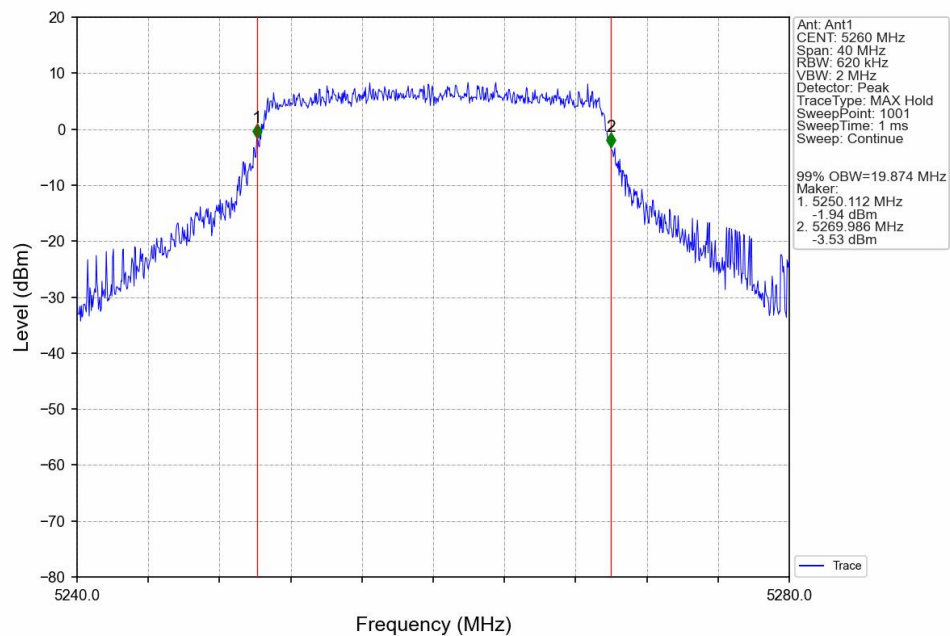


FCC ID: 2BUPFTC-40EA-US

802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV

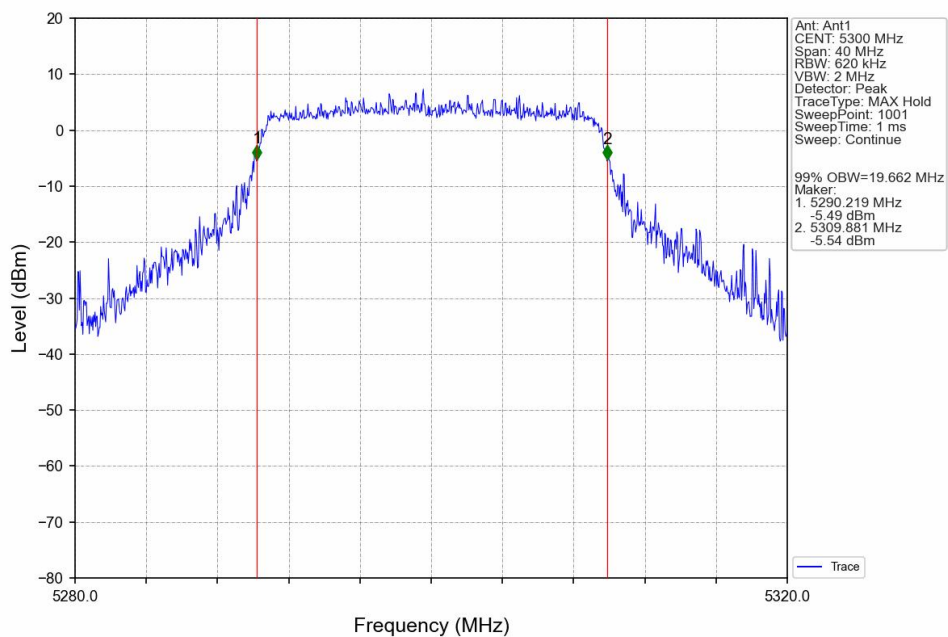


802.11ax(HEW20)_LCH_5260MHz_SU_/_Ant1_NTNV

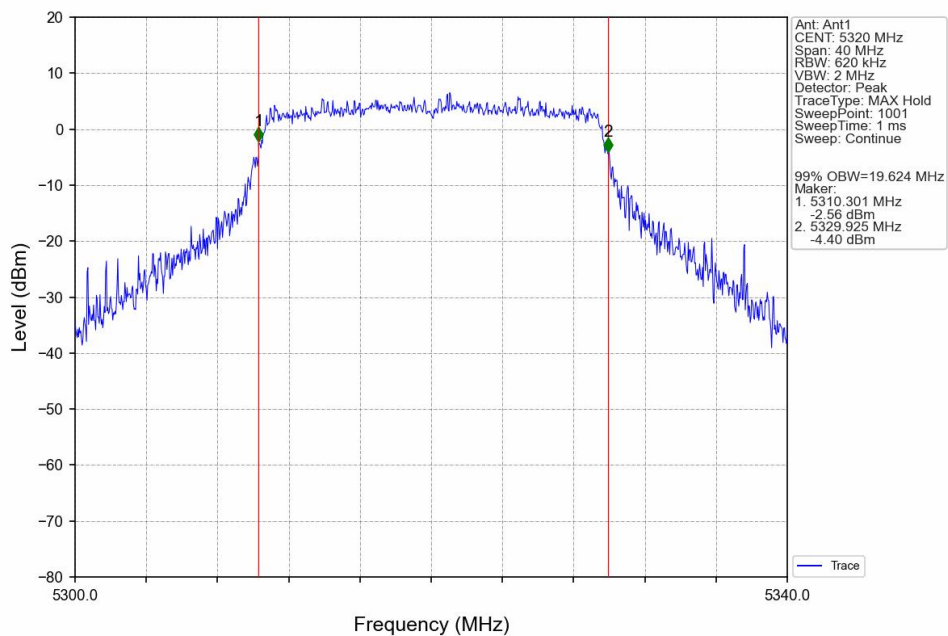


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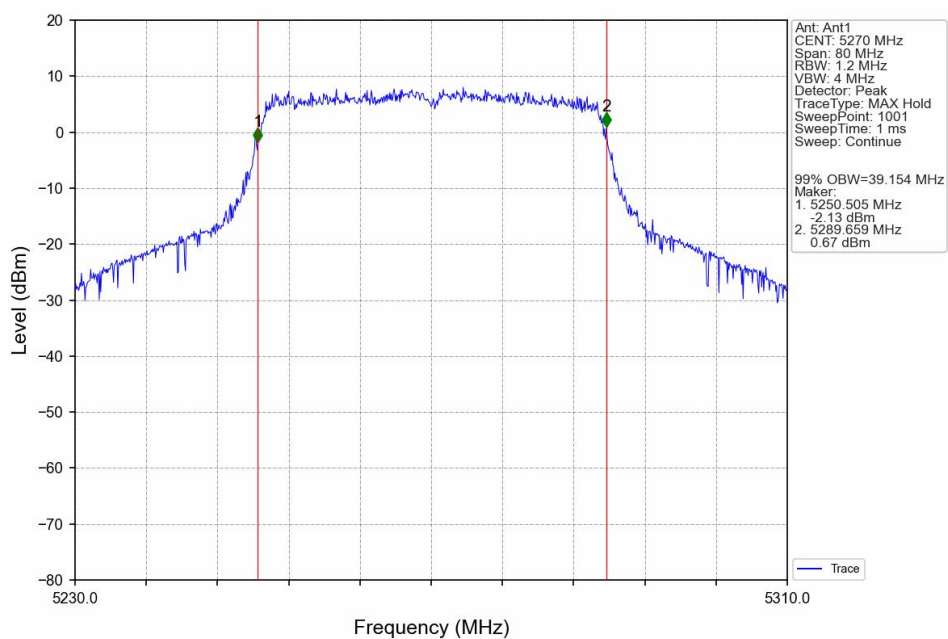
802.11ax(HEW20)_MCH_5300MHz_SU_/_Ant1_NTNV



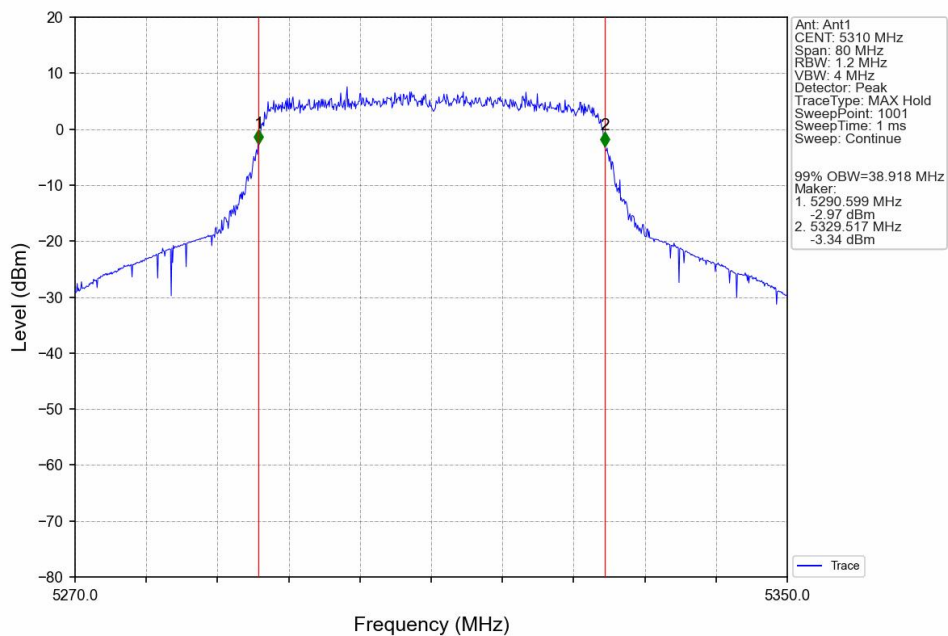
802.11ax(HEW20)_HCH_5320MHz_SU_/_Ant1_NTNV



802.11ax(HEW40)_LCH_5270MHz_SU_/_Ant1_NTNV

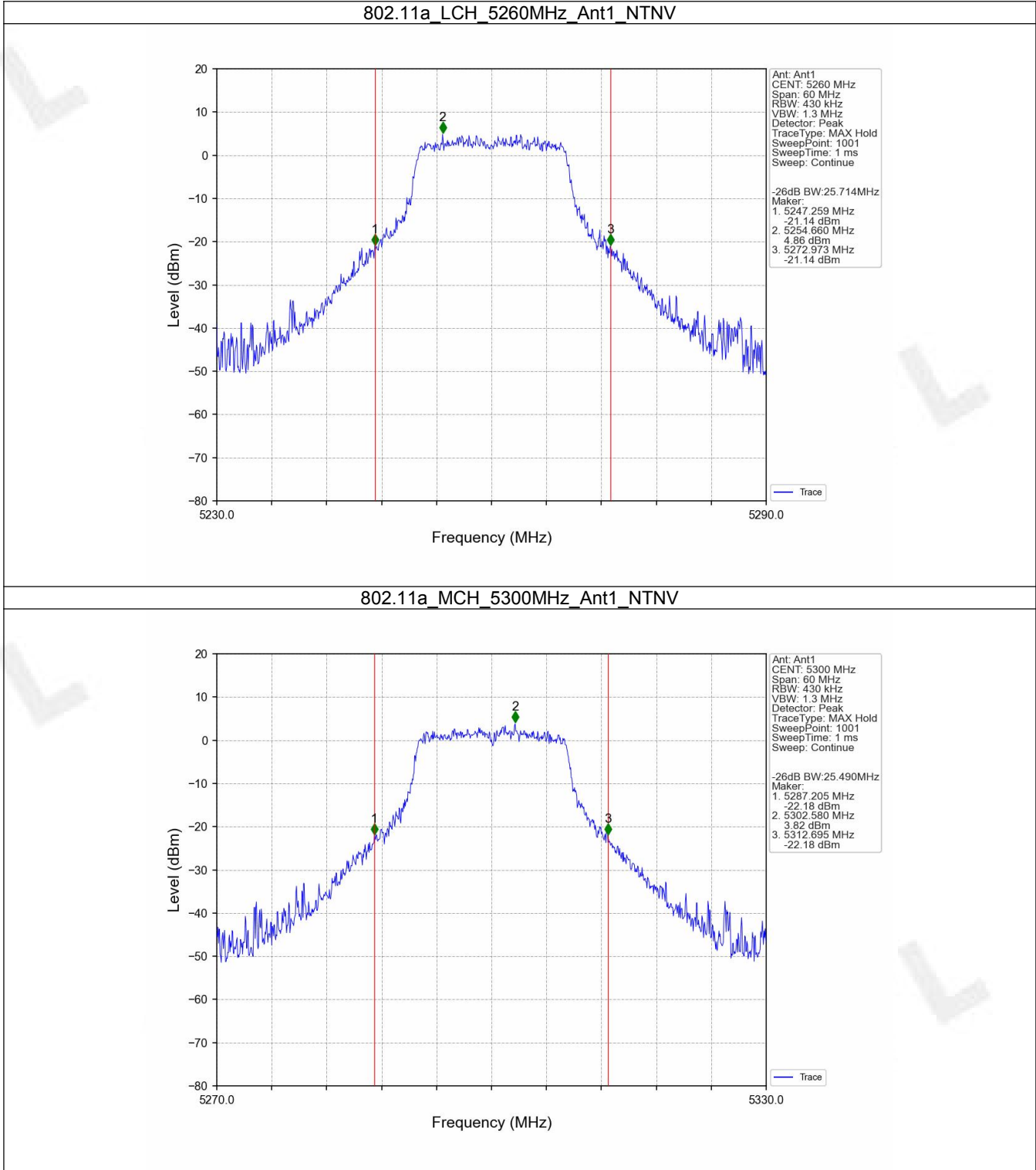


802.11ax(HEW40)_HCH_5310MHz_SU_/_Ant1_NTNV

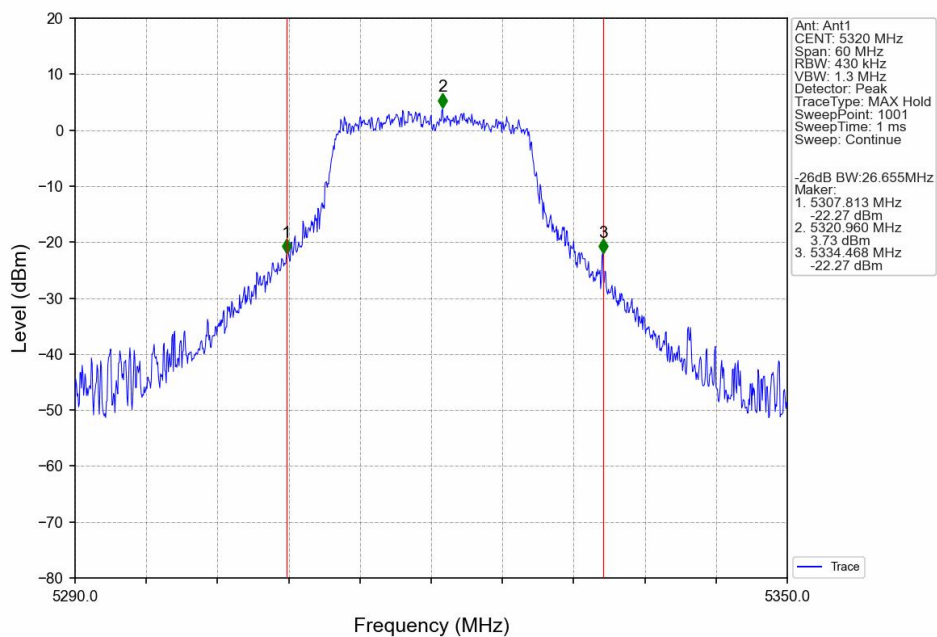


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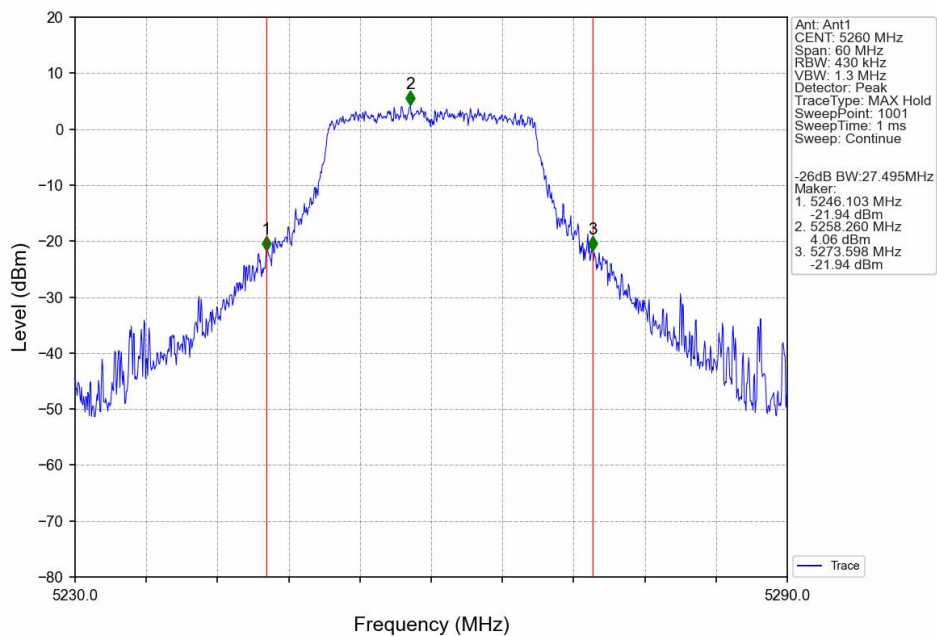
1.2.2 26dB BW



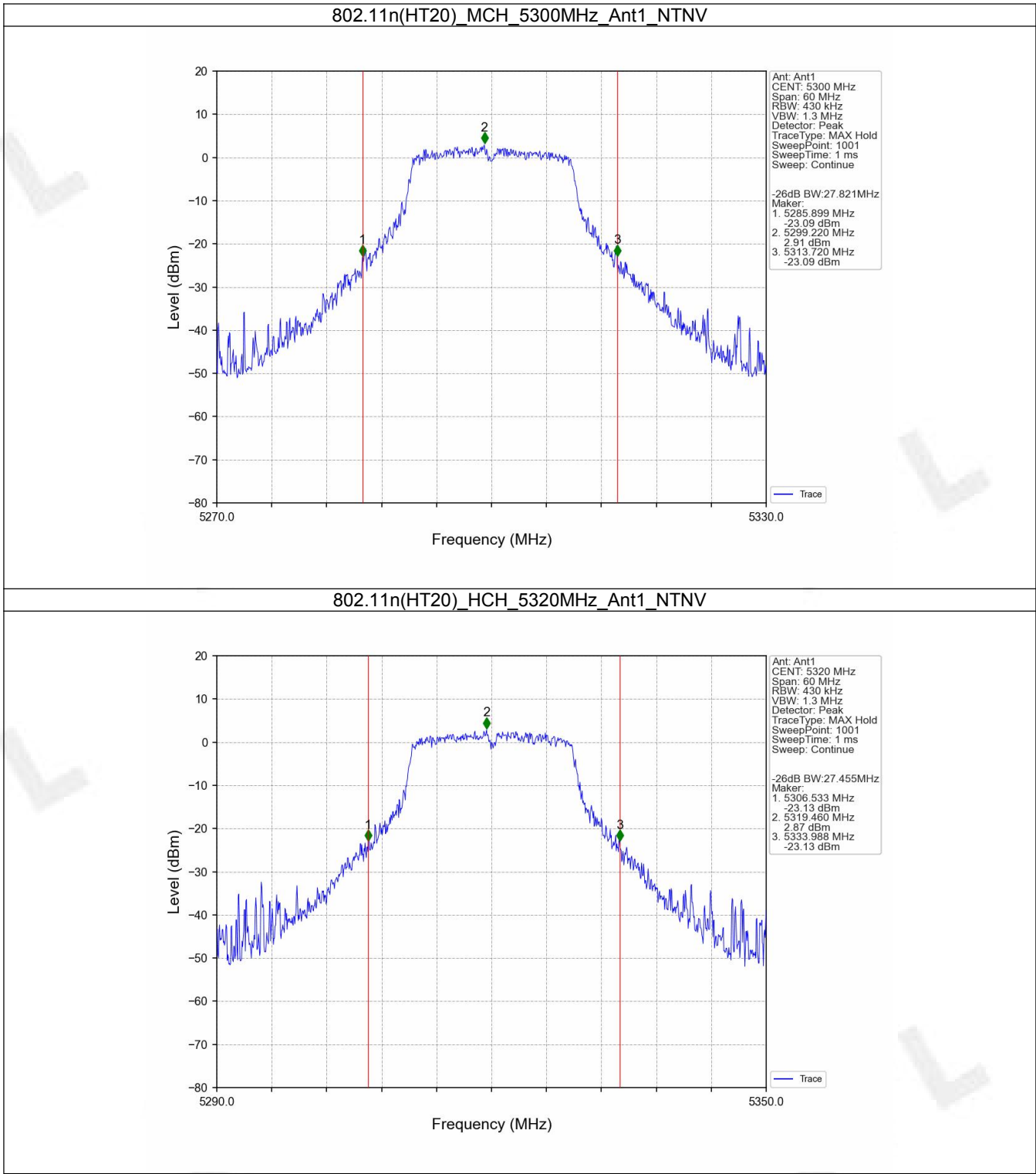
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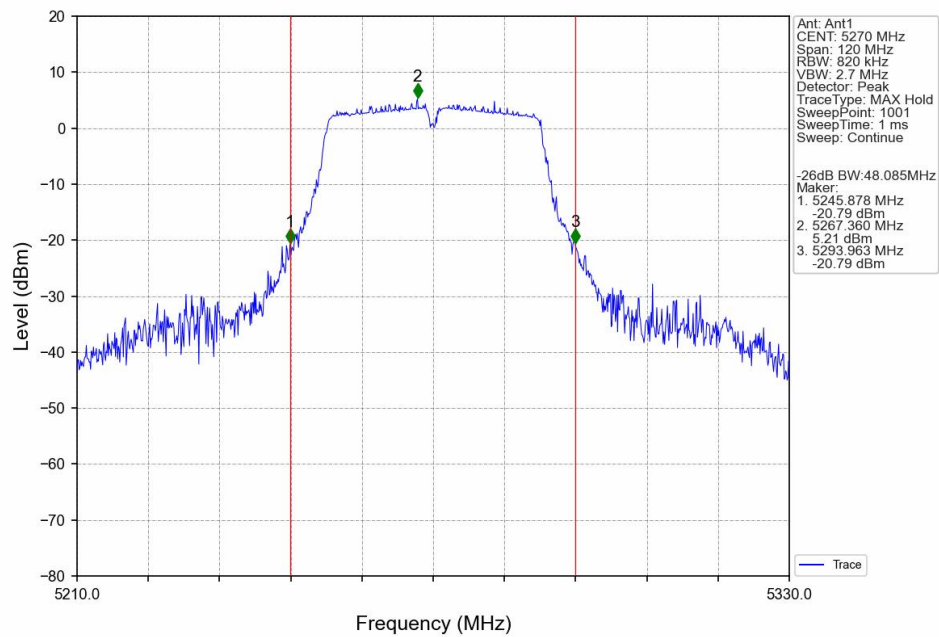
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



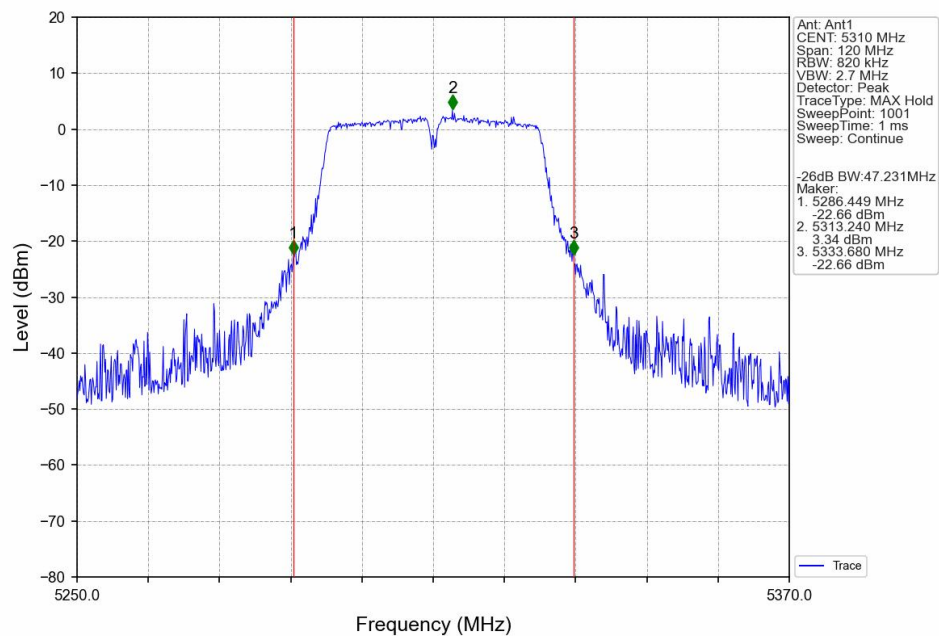
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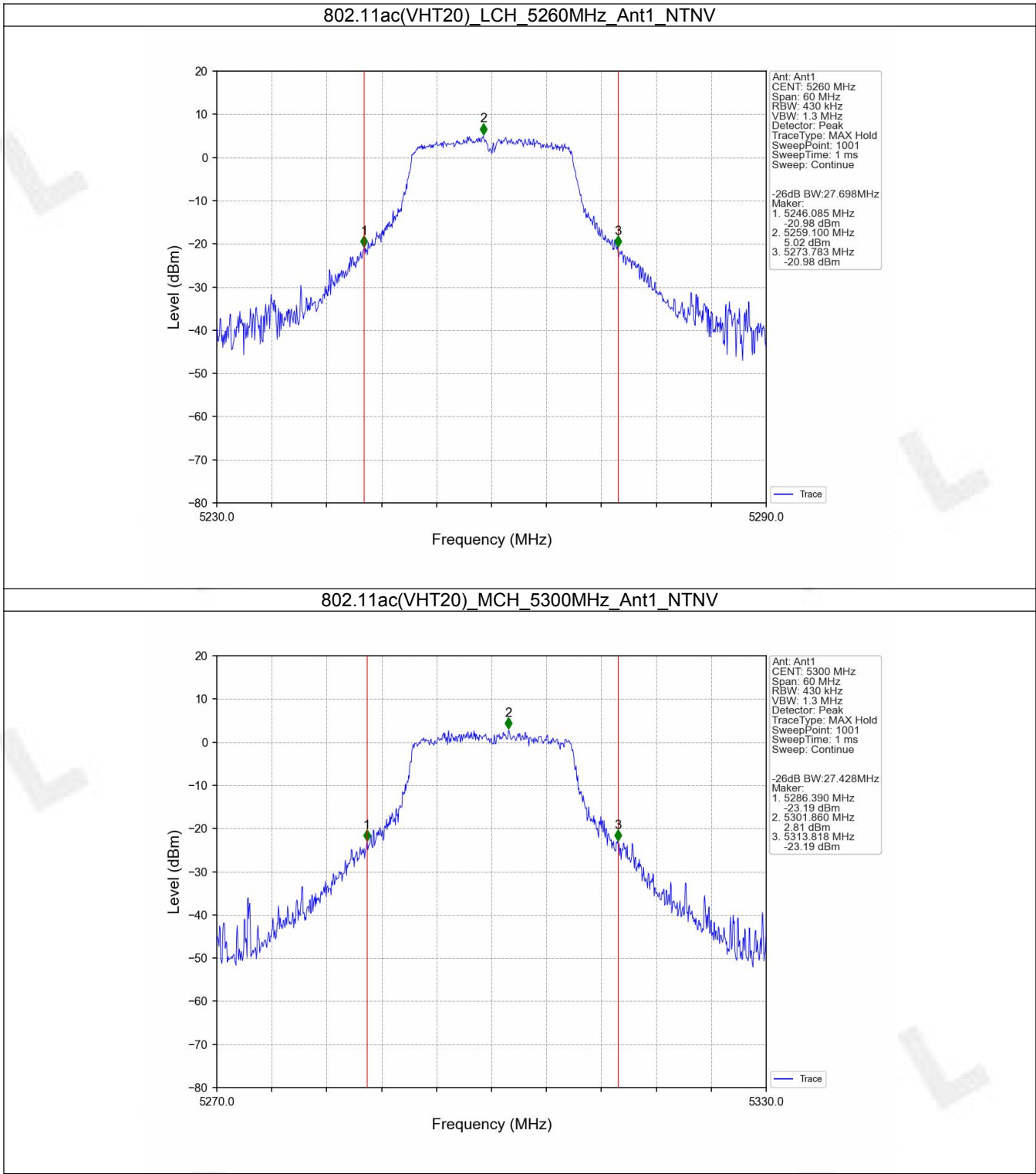
802.11n(HT40)_LCH_5270MHz_Ant1_NTNV



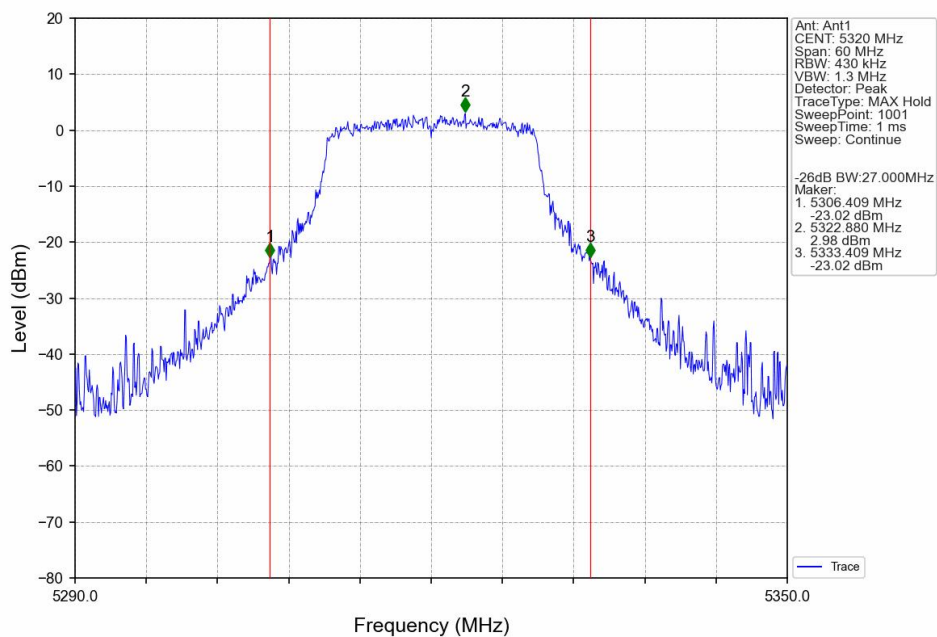
802.11n(HT40)_HCH_5310MHz_Ant1_NTNV



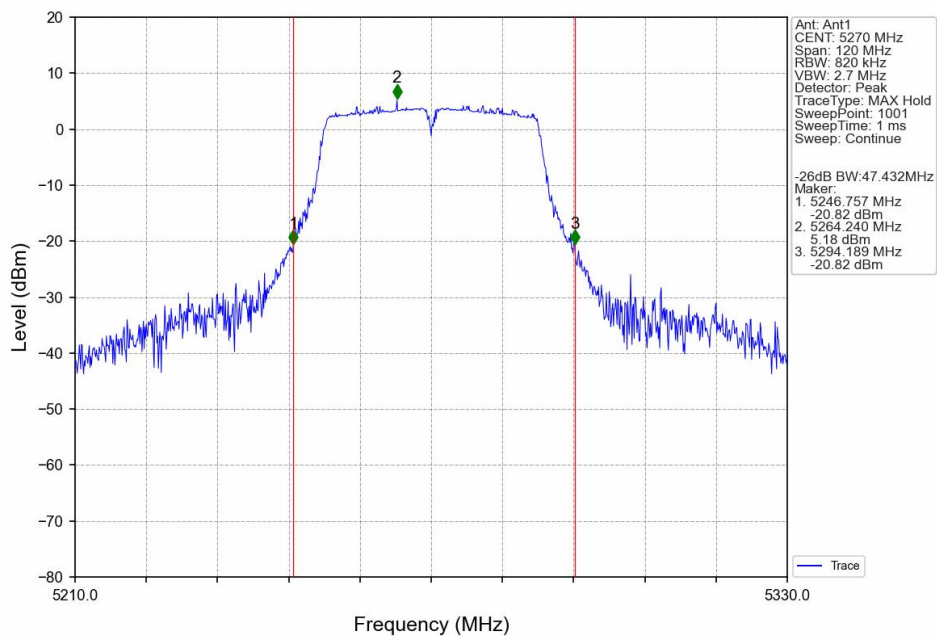
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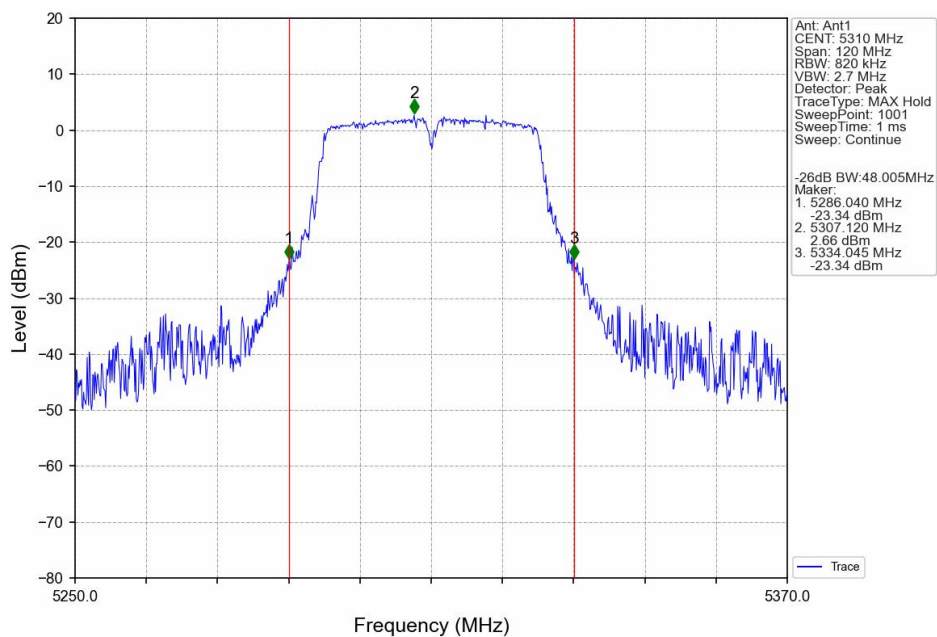
802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV



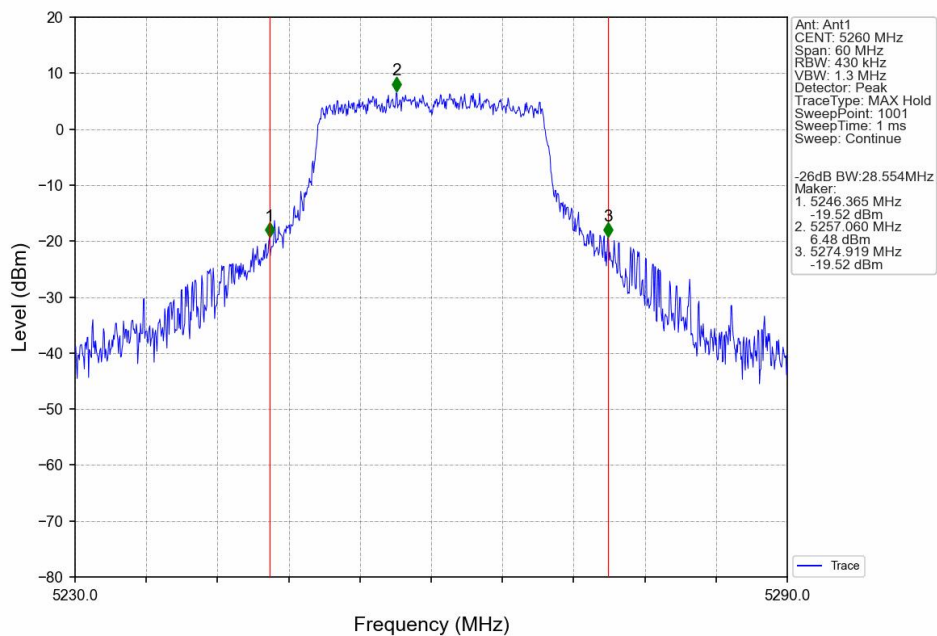
802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV



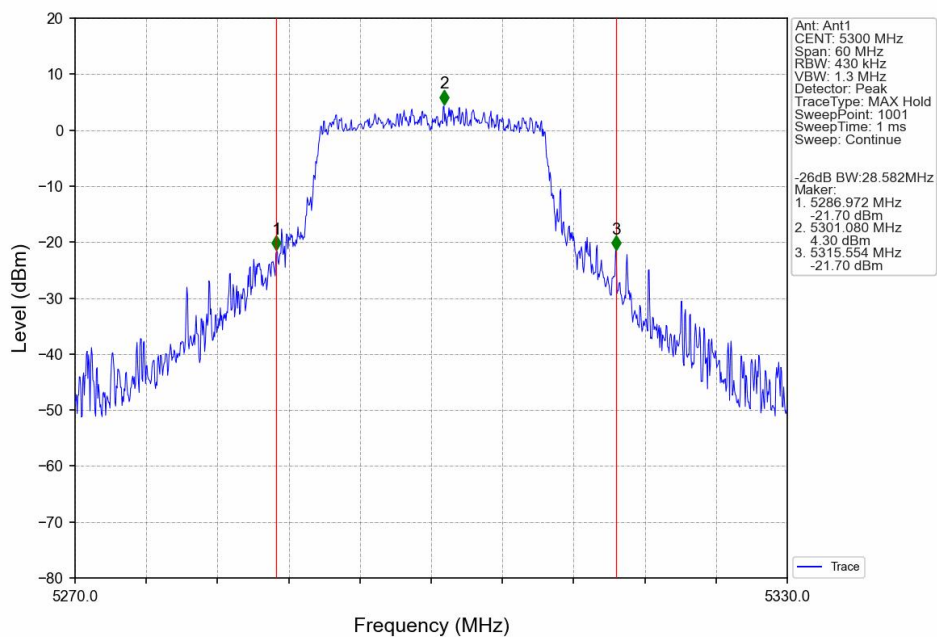
802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



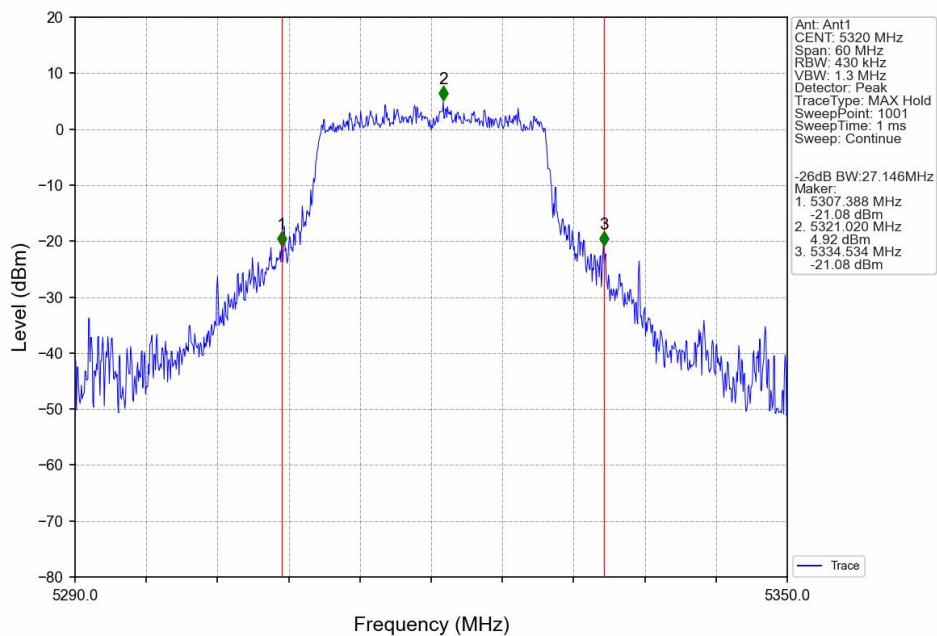
802.11ax(HEW20)_LCH_5260MHz_SU_ / _Ant1_NTNV



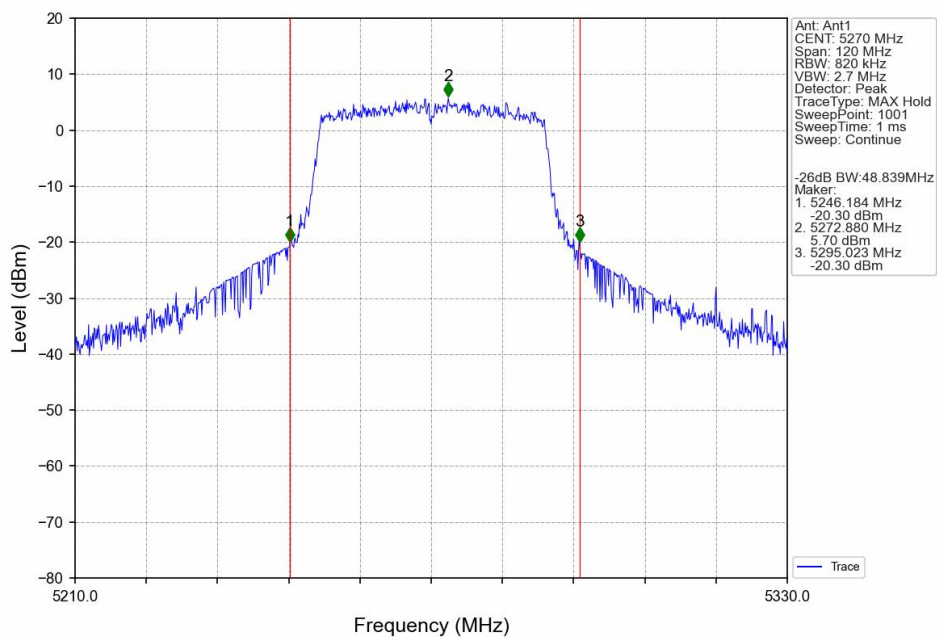
802.11ax(HEW20)_MCH_5300MHz_SU_ / Ant1_NTNV



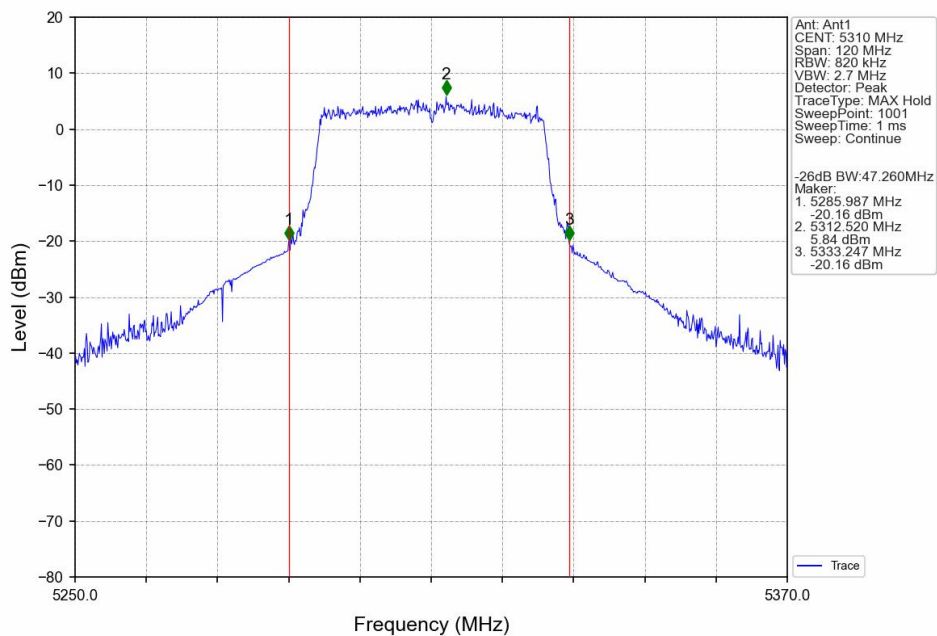
802.11ax(HEW20)_HCH_5320MHz_SU_ / Ant1_NTNV



802.11ax(HEW40)_LCH_5270MHz_SU_/_Ant1_NTNV



802.11ax(HEW40)_HCH_5310MHz_SU_/_Ant1_NTNV



FCC ID: 2BUPFTC-40EA-US

2. Maximum Conducted Output Power

2.1 Test Result

2.1.1 Power

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum Average Conducted Output Power (dBm)		Verdict
					ANT1	Limit	
802.11a	SISO	5260	/	/	11.87	<=23.98	Pass
		5300	/	/	10.53	<=23.98	Pass
		5320	/	/	10.58	<=23.98	Pass
802.11n (HT20)	SISO	5260	/	/	11.81	<=23.98	Pass
		5300	/	/	10.35	<=23.98	Pass
		5320	/	/	10.51	<=23.98	Pass
802.11n (HT40)	SISO	5270	/	/	11.74	<=23.98	Pass
		5310	/	/	10.28	<=23.98	Pass
802.11ac (VHT20)	SISO	5260	/	/	11.90	<=23.98	Pass
		5300	/	/	10.32	<=23.98	Pass
		5320	/	/	10.47	<=23.98	Pass
802.11ac (VHT40)	SISO	5270	/	/	11.78	<=23.98	Pass
		5310	/	/	10.30	<=23.98	Pass
802.11ax (HEW20)	SISO	5260	SU	/	11.90	<=23.98	Pass
		5300	SU	/	10.29	<=23.98	Pass
		5320	SU	/	10.40	<=23.98	Pass
802.11ax (HEW40)	SISO	5270	SU	/	12.47	<=23.98	Pass
		5310	SU	/	10.34	<=23.98	Pass

Note1: Antenna Gain: Ant1: 3.00dBi;

3. Maximum Power Spectral Density

3.1 Test Result

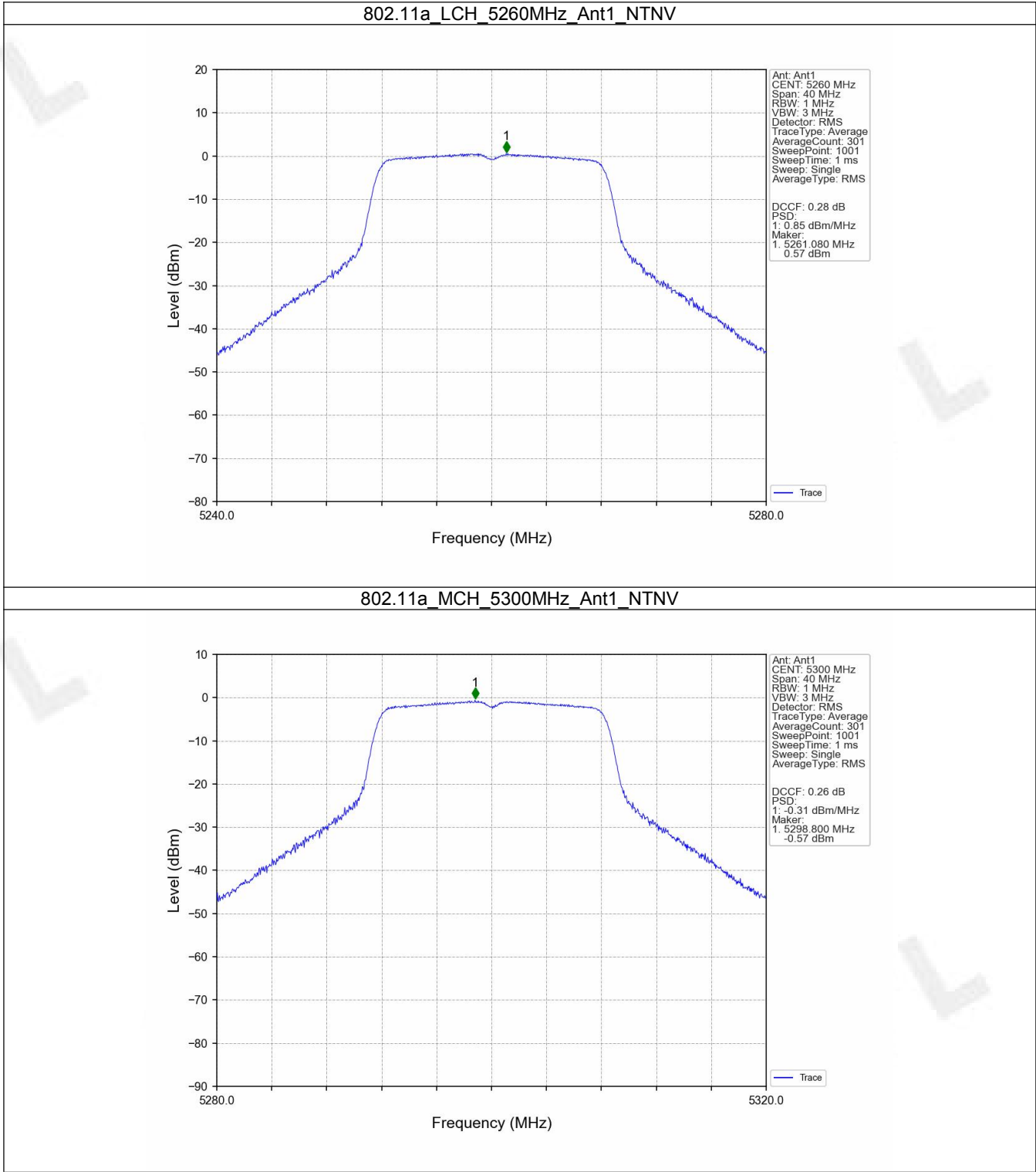
3.1.1 PSD

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum PSD (dBm/MHz)		Verdict
					ANT1	Limit	
802.11a	SISO	5260	/	/	0.85	<=11	Pass
		5300	/	/	-0.31	<=11	Pass
		5320	/	/	-0.55	<=11	Pass
802.11n (HT20)	SISO	5260	/	/	0.53	<=11	Pass
		5300	/	/	-0.99	<=11	Pass
		5320	/	/	-0.71	<=11	Pass
802.11n (HT40)	SISO	5270	/	/	-2.70	<=11	Pass
		5310	/	/	-4.21	<=11	Pass
802.11ac (VHT20)	SISO	5260	/	/	0.73	<=11	Pass
		5300	/	/	-0.81	<=11	Pass
		5320	/	/	-0.69	<=11	Pass
802.11ac (VHT40)	SISO	5270	/	/	-2.68	<=11	Pass
		5310	/	/	-4.19	<=11	Pass
802.11ax (HEW20)	SISO	5260	SU	/	0.51	<=11	Pass
		5300	SU	/	-1.45	<=11	Pass
		5320	SU	/	-1.28	<=11	Pass
802.11ax (HEW40)	SISO	5270	SU	/	-2.72	<=11	Pass
		5310	SU	/	-4.41	<=11	Pass
Note1: Antenna Gain: Ant1: 3.00dBi;							

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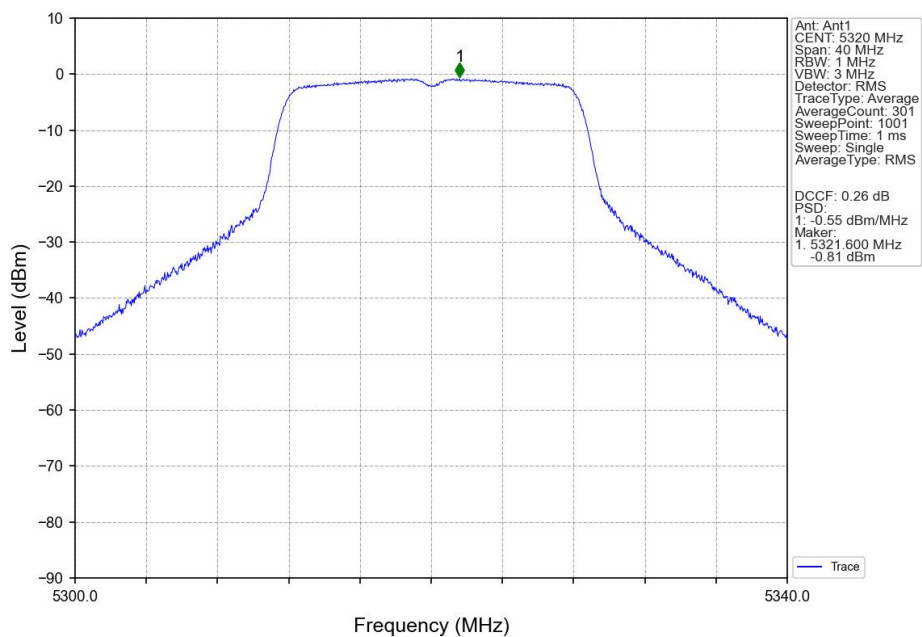
3.2 Test Graph

3.2.1 PSD

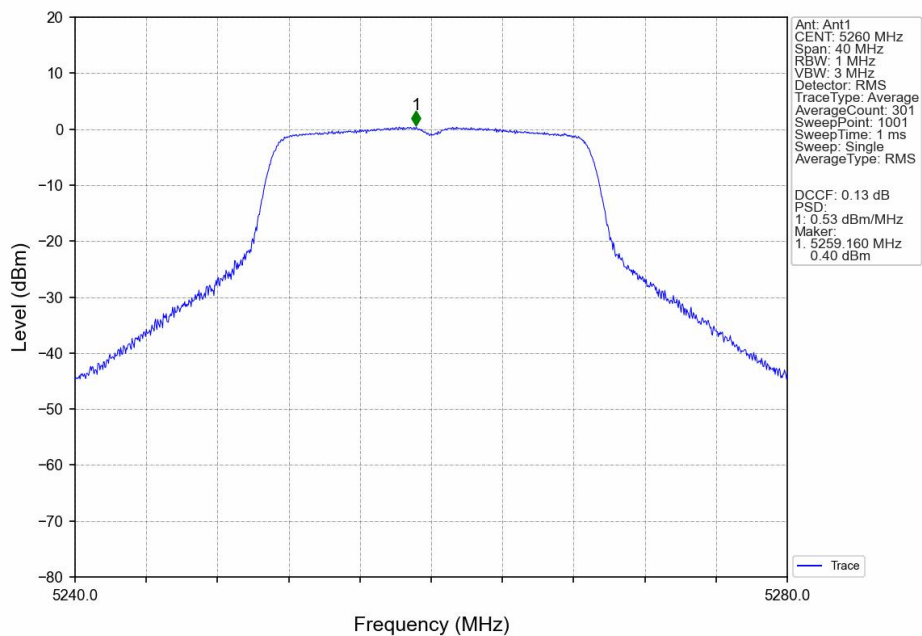


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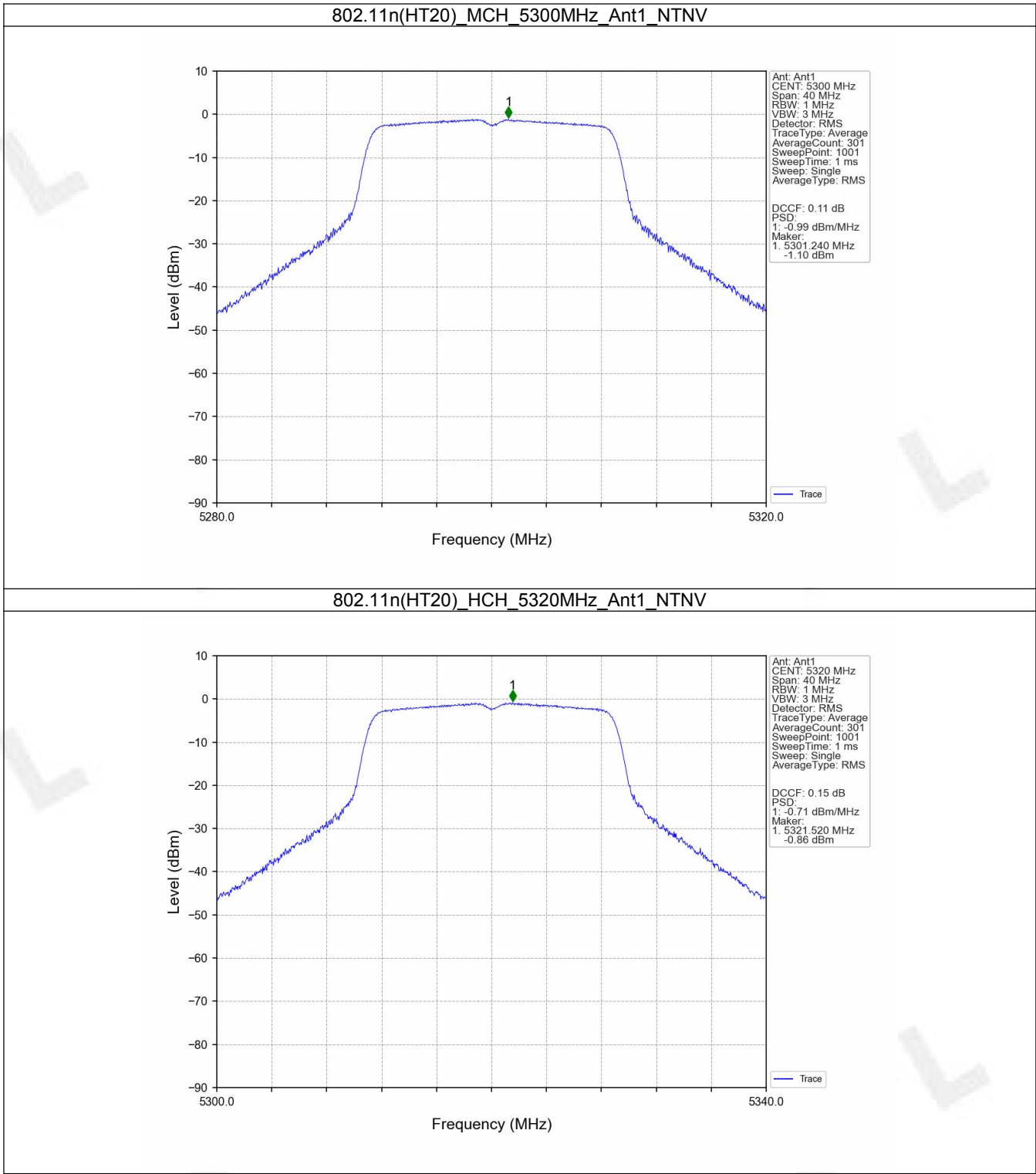
802.11a_HCH_5320MHz_Ant1_NTNV



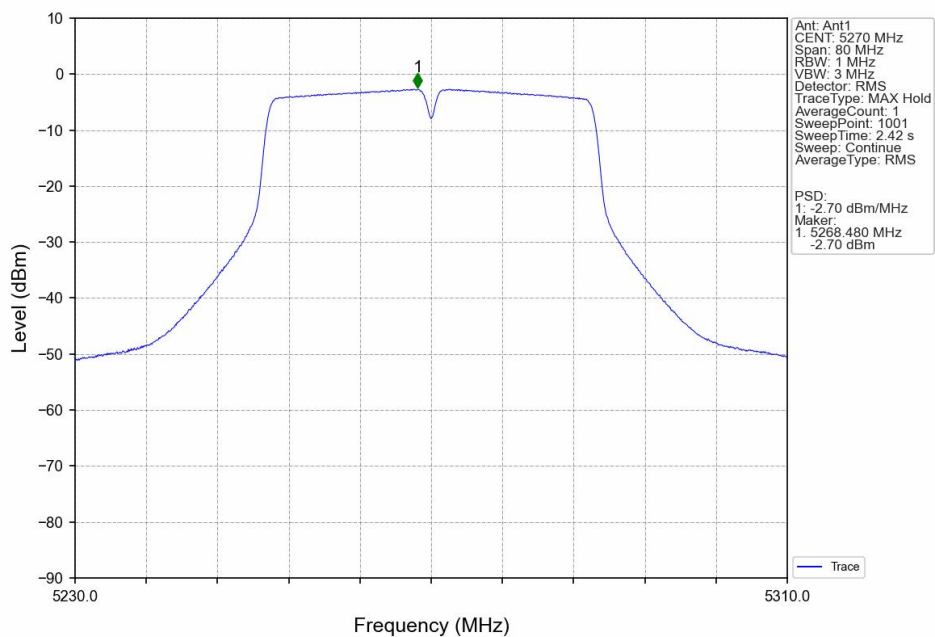
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



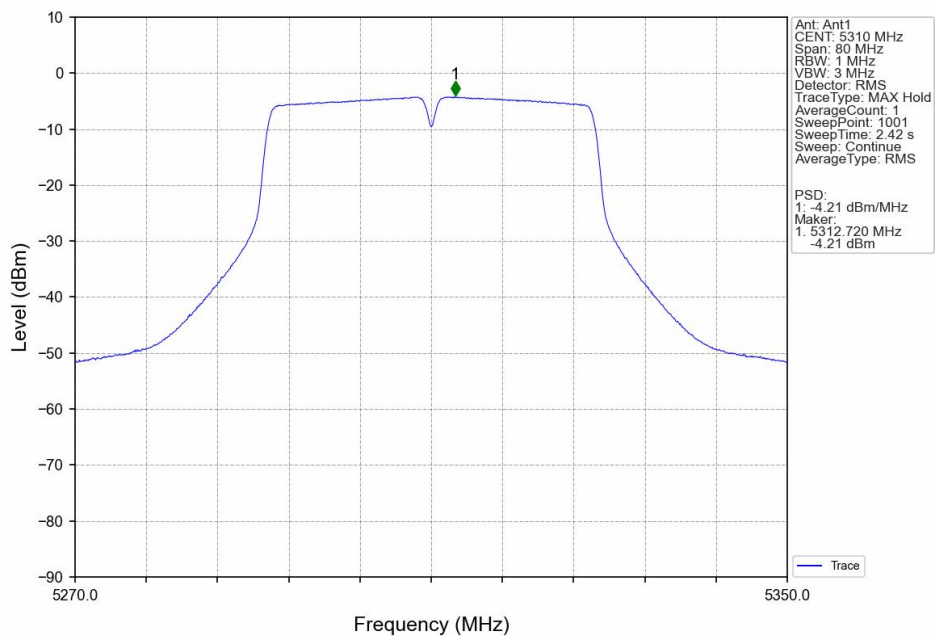
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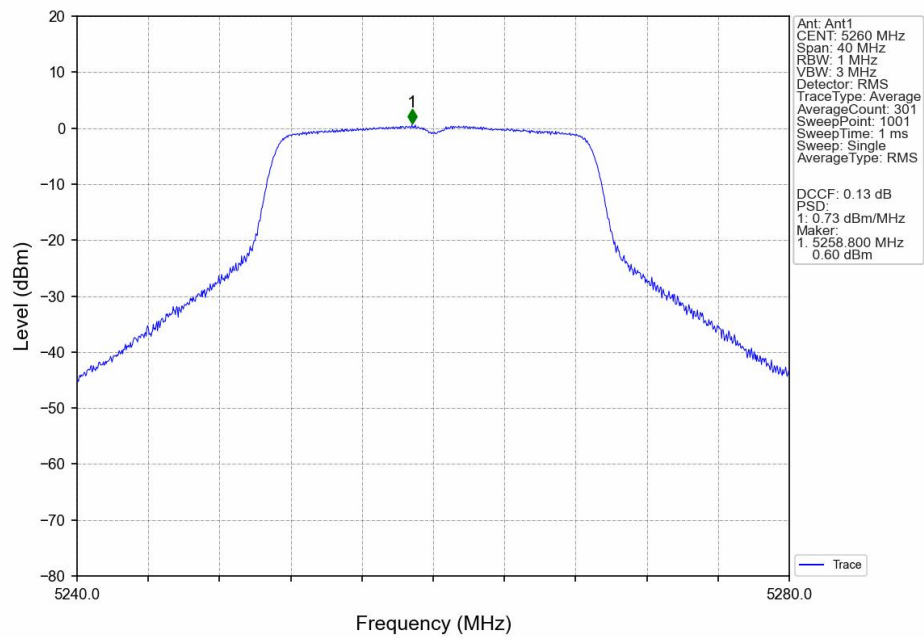
802.11n(HT40)_LCH_5270MHz_Ant1_NTNV



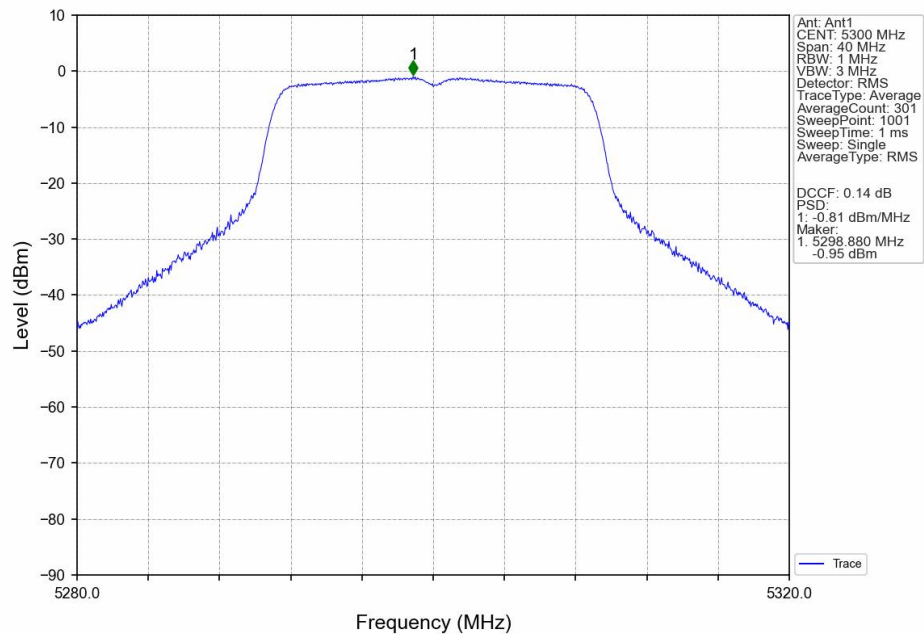
802.11n(HT40)_HCH_5310MHz_Ant1_NTNV



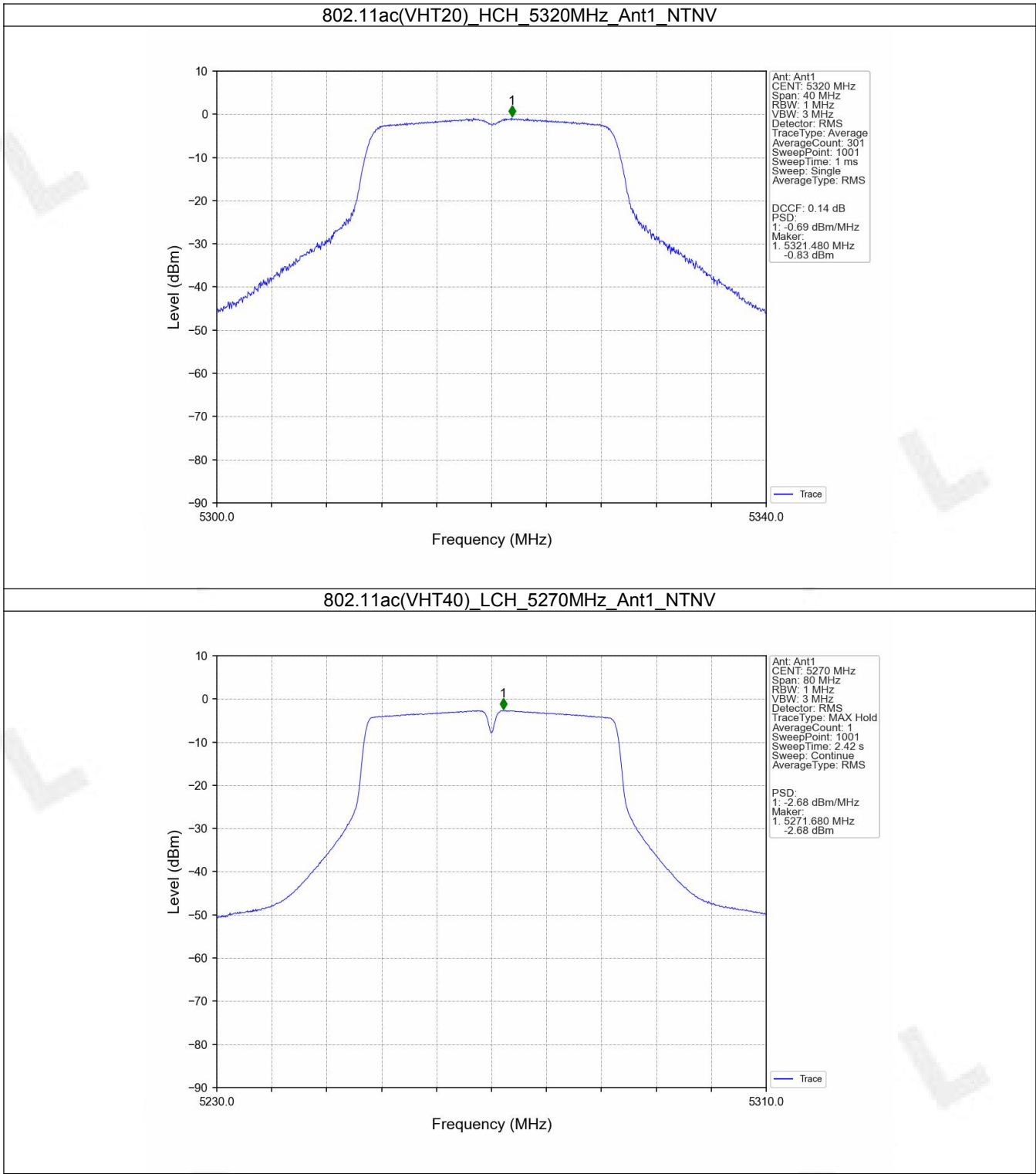
802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV



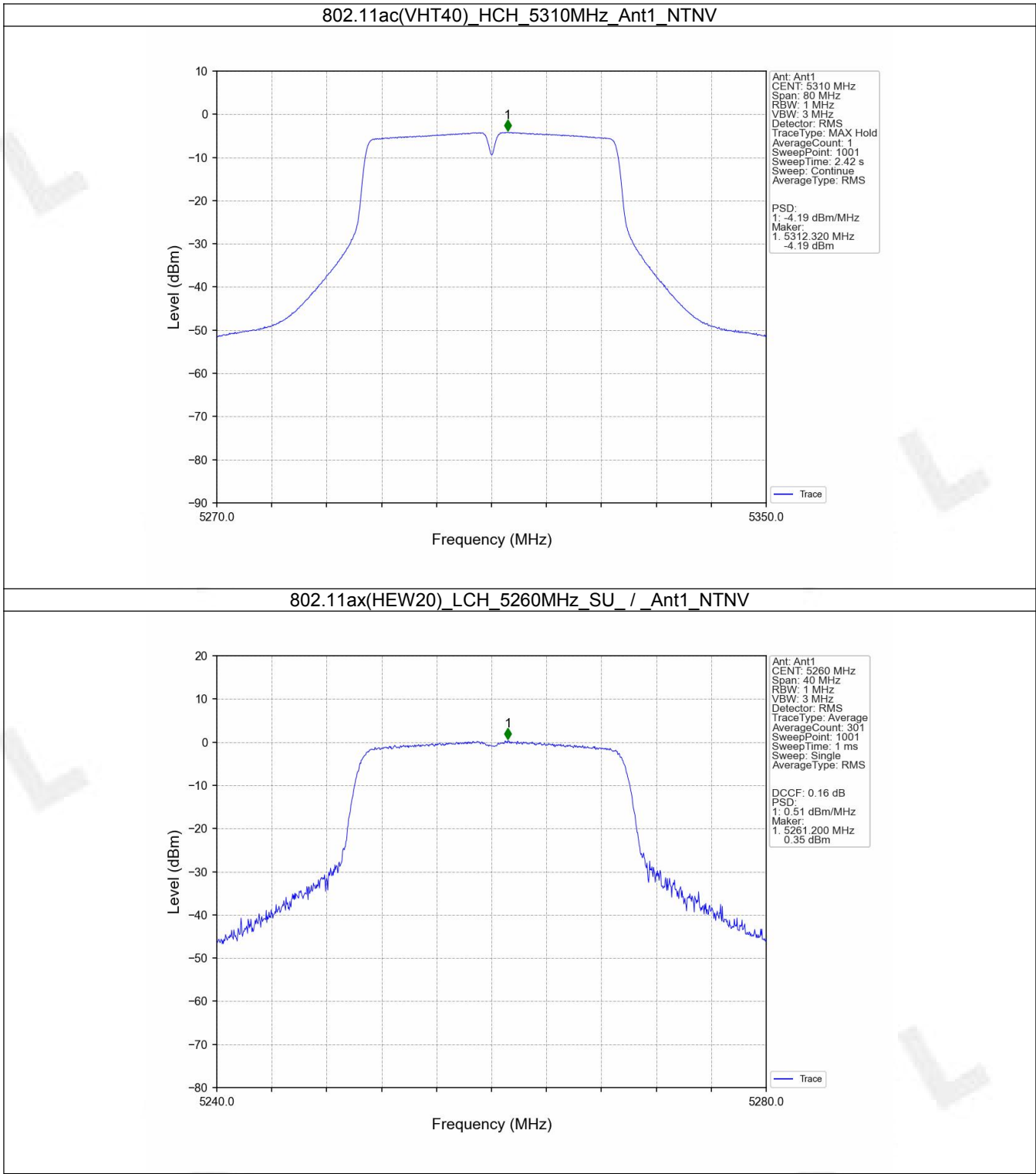
802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV



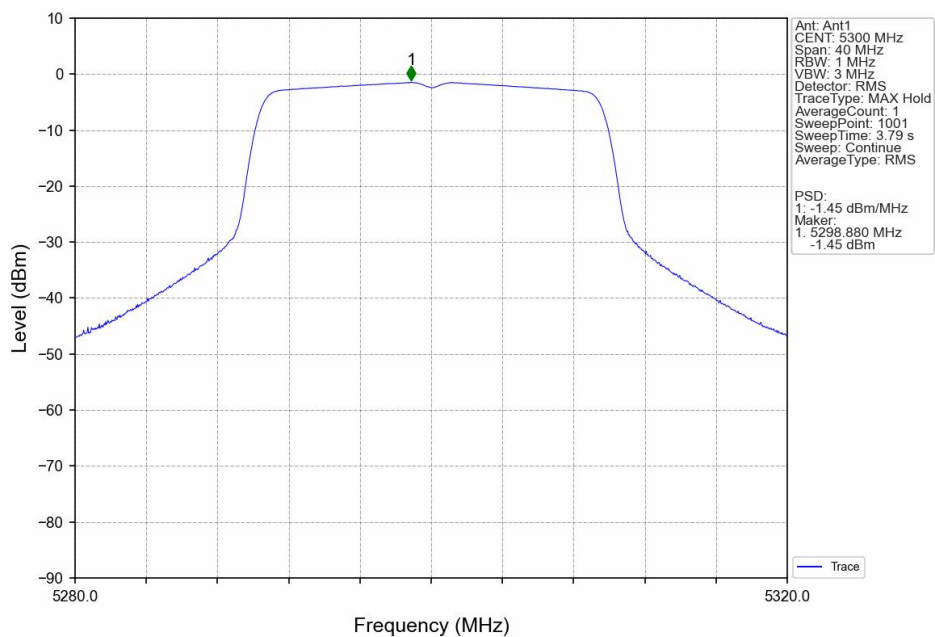
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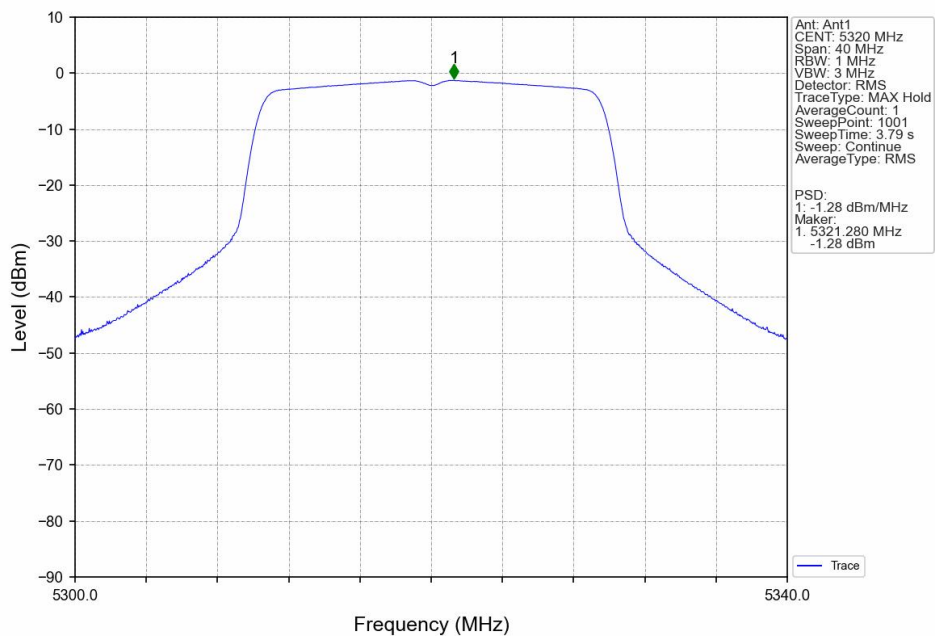
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802.11ax(HEW20)_MCH_5300MHz_SU_/_Ant1_NTNV

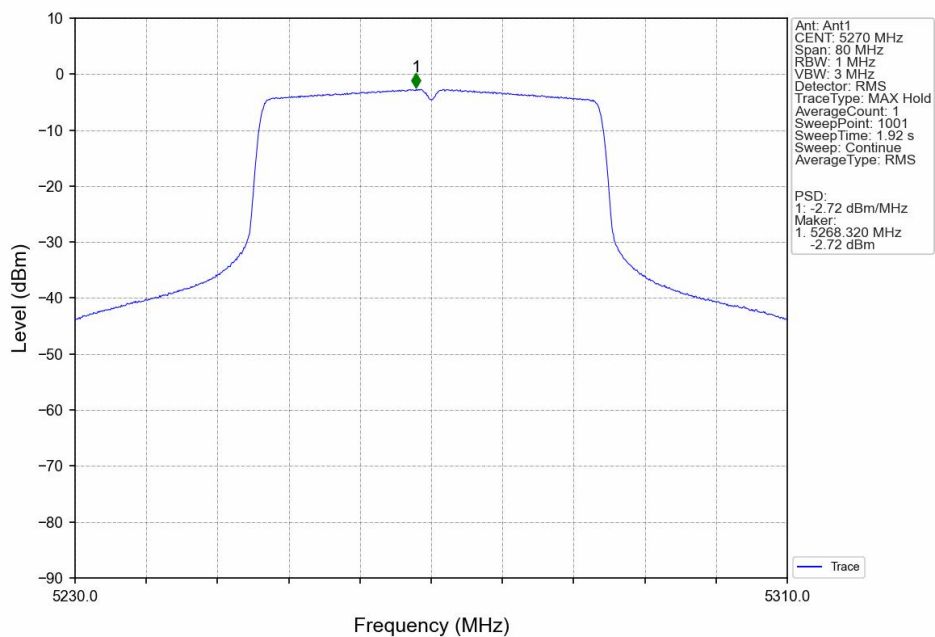


802.11ax(HEW20)_HCH_5320MHz_SU_/_Ant1_NTNV

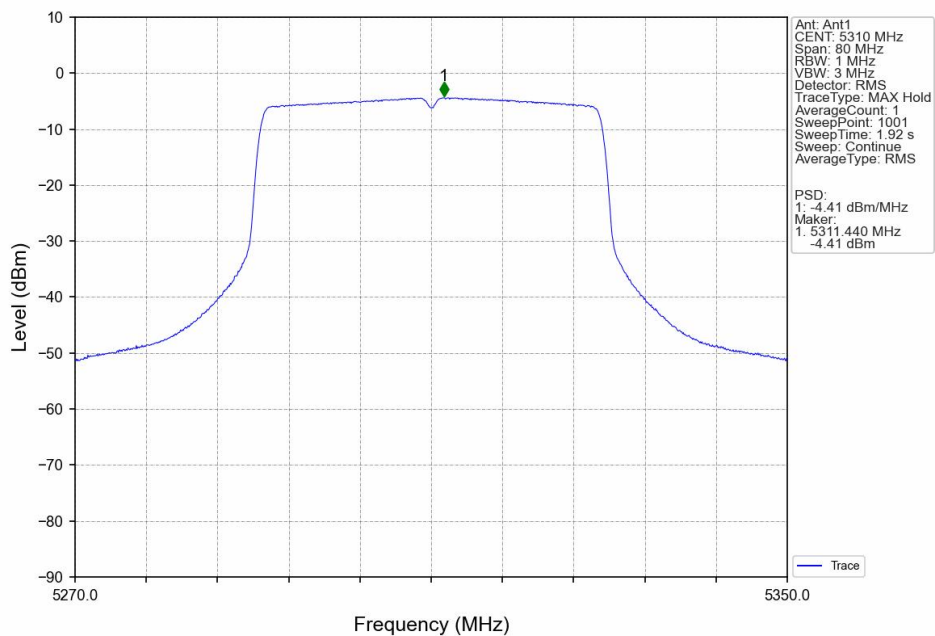


FCC ID: 2BUPFTC-40EA-US

802.11ax(HEW40)_LCH_5270MHz_SU_/_Ant1_NTNV



802.11ax(HEW40)_HCH_5310MHz_SU_/_Ant1_NTNV



4. Frequency Stability

4.1 Test Result

4.1.1 Ant1

Ant1							
Mode	Tx Type	Frequency (MHz)	Temperature (°C)	Voltage (VAC)	Measured Frequency (MHz)	Limit (MHz)	Verdict
Carrier Wave	SISO	5260	20	102	5260.038	5250 to 5350	Pass
				120	5260.038	5250 to 5350	Pass
				138	5260.038	5250 to 5350	Pass
			-30	120	5260.038	5250 to 5350	Pass
			-20	120	5260.038	5250 to 5350	Pass
			-10	120	5260.038	5250 to 5350	Pass
			0	120	5260.038	5250 to 5350	Pass
			10	120	5260.038	5250 to 5350	Pass
			30	120	5260.038	5250 to 5350	Pass
			40	120	5260.038	5250 to 5350	Pass
			50	120	5260.038	5250 to 5350	Pass
		5300	20	102	5300.031	5250 to 5350	Pass
				120	5300.031	5250 to 5350	Pass
				138	5300.031	5250 to 5350	Pass
			-30	120	5300.031	5250 to 5350	Pass
			-20	120	5300.031	5250 to 5350	Pass
			-10	120	5300.031	5250 to 5350	Pass
			0	120	5300.031	5250 to 5350	Pass
			10	120	5300.038	5250 to 5350	Pass
			30	120	5300.038	5250 to 5350	Pass
			40	120	5300.038	5250 to 5350	Pass
			50	120	5300.038	5250 to 5350	Pass
		5320	20	102	5320.031	5250 to 5350	Pass
				120	5320.031	5250 to 5350	Pass
				138	5320.031	5250 to 5350	Pass
			-30	120	5320.031	5250 to 5350	Pass
			-20	120	5320.031	5250 to 5350	Pass
			-10	120	5320.031	5250 to 5350	Pass
			0	120	5320.031	5250 to 5350	Pass
			10	120	5320.031	5250 to 5350	Pass
			30	120	5320.031	5250 to 5350	Pass
			40	120	5320.031	5250 to 5350	Pass
			50	120	5320.031	5250 to 5350	Pass
		5270	20	102	5270.031	5250 to 5350	Pass
				120	5270.031	5250 to 5350	Pass
				138	5270.031	5250 to 5350	Pass
			-30	120	5270.031	5250 to 5350	Pass
			-20	120	5270.031	5250 to 5350	Pass
			-10	120	5270.031	5250 to 5350	Pass
			0	120	5270.031	5250 to 5350	Pass
			10	120	5270.031	5250 to 5350	Pass
			30	120	5270.031	5250 to 5350	Pass
			40	120	5270.031	5250 to 5350	Pass
			50	120	5270.031	5250 to 5350	Pass

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		5310	20	102	5310.031	5250 to 5350	Pass
				120	5310.031	5250 to 5350	Pass
				138	5310.031	5250 to 5350	Pass
			-30	120	5310.031	5250 to 5350	Pass
			-20	120	5310.031	5250 to 5350	Pass
			-10	120	5310.031	5250 to 5350	Pass
			0	120	5310.031	5250 to 5350	Pass
			10	120	5310.031	5250 to 5350	Pass
			30	120	5310.031	5250 to 5350	Pass
			40	120	5310.031	5250 to 5350	Pass
			50	120	5310.031	5250 to 5350	Pass

5. Form731

5.1 Test Result

5.1.1 Form731

Lower Freq (MHz)	High Freq (MHz)	MAX Power (W)	MAX Power (dBm)
5260	5320	0.0155	11.90
5270	5310	0.0177	12.47