



Shenzhen CTL Testing Technology Co., Ltd.

Fl. A1, Bldg. A3, No. 2533 GuanGuang Road, Fenghuang Community

Fenghuang Street, Guangming District Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

Annex for 5G Wi-Fi BAND 2A

Test Report No.: CTL2603312051-WF04

TABLE OF CONTENTS

1. Duty Cycle.....	3
1.1 Test Result.....	3
1.1.1 Ant1.....	3
1.2 Test Graph.....	4
1.2.1 Ant1.....	4
2. Bandwidth.....	11
2.1 Test Result.....	11
2.1.1 OBW.....	11
2.1.2 26dB BW.....	11
2.2 Test Graph.....	12
2.2.1 OBW.....	12
2.2.2 26dB BW.....	19
3. Maximum Conducted Output Power.....	26

FCC ID: 2BWH8-S26-UITRA

3.1 Test Result.....	26
3.1.1 Power.....	26
4. Maximum Power Spectral Density.....	27
4.1 Test Result.....	27
4.1.1 PSD.....	27
4.2 Test Graph.....	28
4.2.1 PSD.....	28
5. Frequency Stability.....	35
5.1 Test Result.....	35
5.1.1 Ant1.....	35

FCC ID: 2BWH8-S26-UITRA

1. Duty Cycle

1.1 Test Result

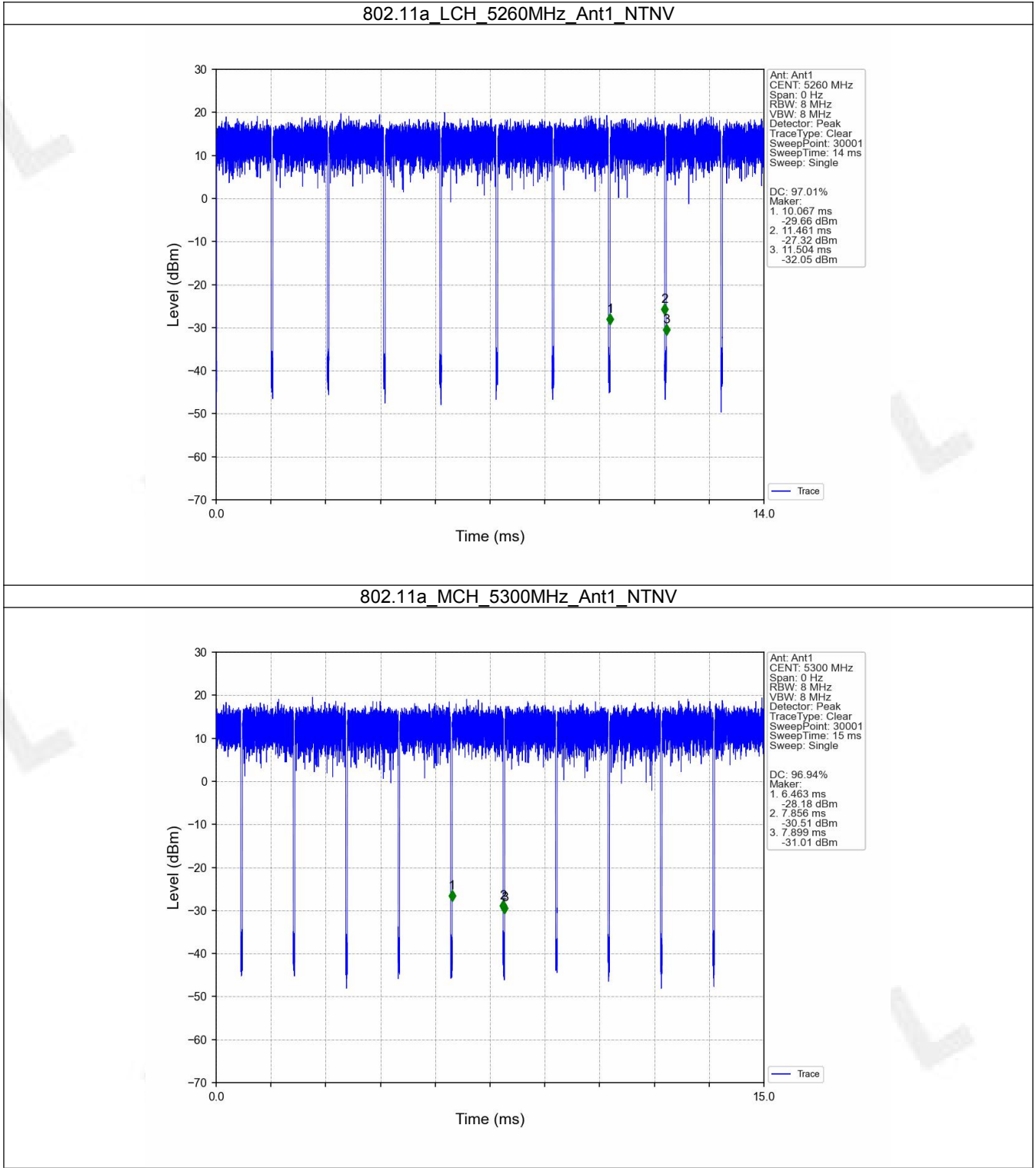
1.1.1 Ant1

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	1.394	1.437	97.01	0.13	0.06
		5300	1.393	1.437	96.94	0.14	0.04
		5320	1.393	1.436	97.01	0.13	0.03
802.11n (HT20)	SISO	5260	1.290	1.332	96.85	0.14	0.00
		5300	1.290	1.333	96.77	0.14	0.04
		5320	1.288	1.333	96.62	0.15	0.14
802.11n (HT40)	SISO	5270	0.638	0.680	93.82	0.28	0.00
		5310	0.638	0.680	93.82	0.28	0.03
802.11ac (VHT20)	SISO	5260	1.313	1.357	96.76	0.14	0.10
		5300	1.312	1.356	96.76	0.14	0.04
		5320	1.312	1.357	96.68	0.15	0.14
802.11ac (VHT40)	SISO	5270	0.653	0.696	93.82	0.28	0.03
		5310	0.653	0.697	93.69	0.28	0.06
802.11ac (VHT80)	SISO	5290	0.324	0.368	88.04	0.55	0.07

FCC ID: 2BWH8-S26-UITRA

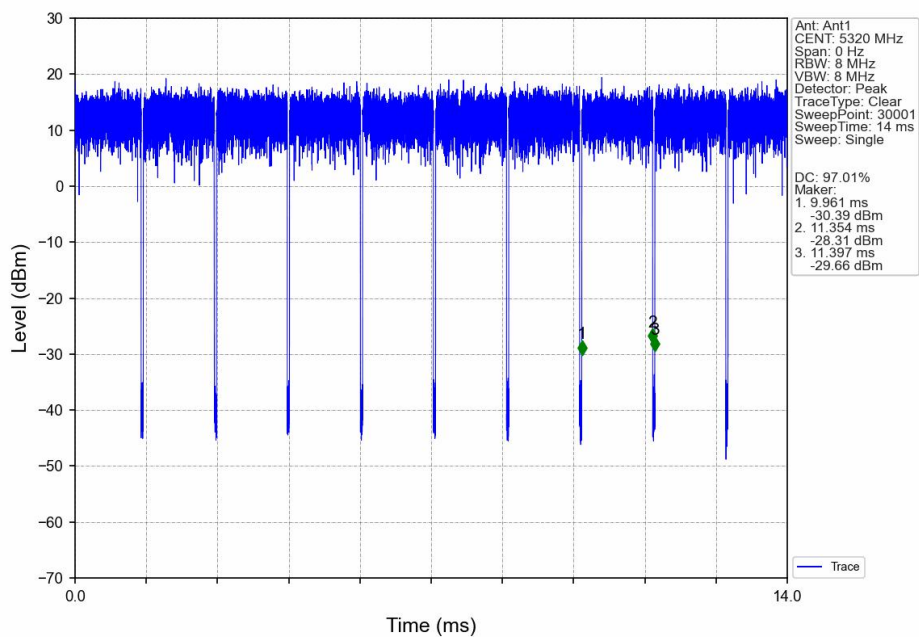
1.2 Test Graph

1.2.1 Ant1

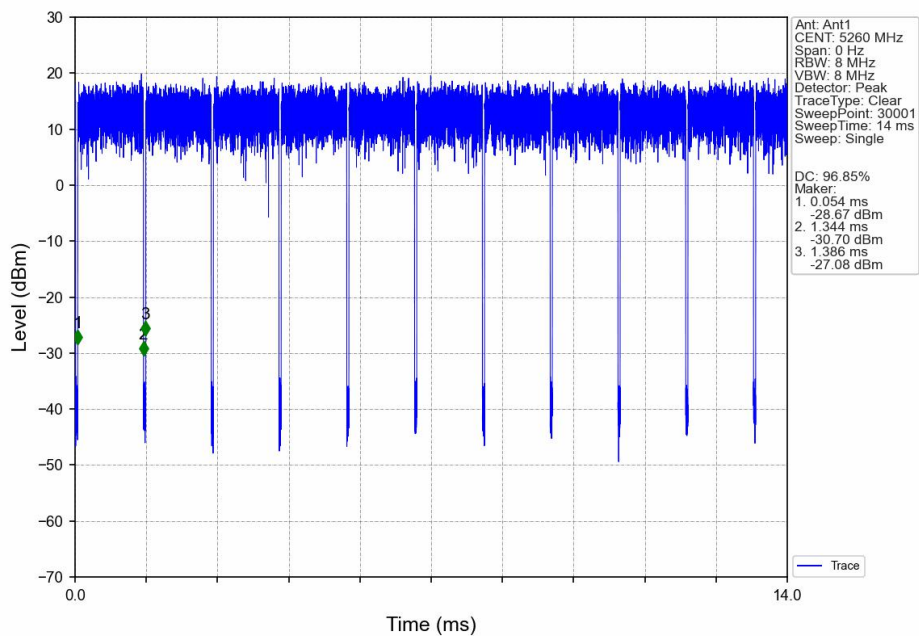


FCC ID: 2BWH8-S26-UITRA

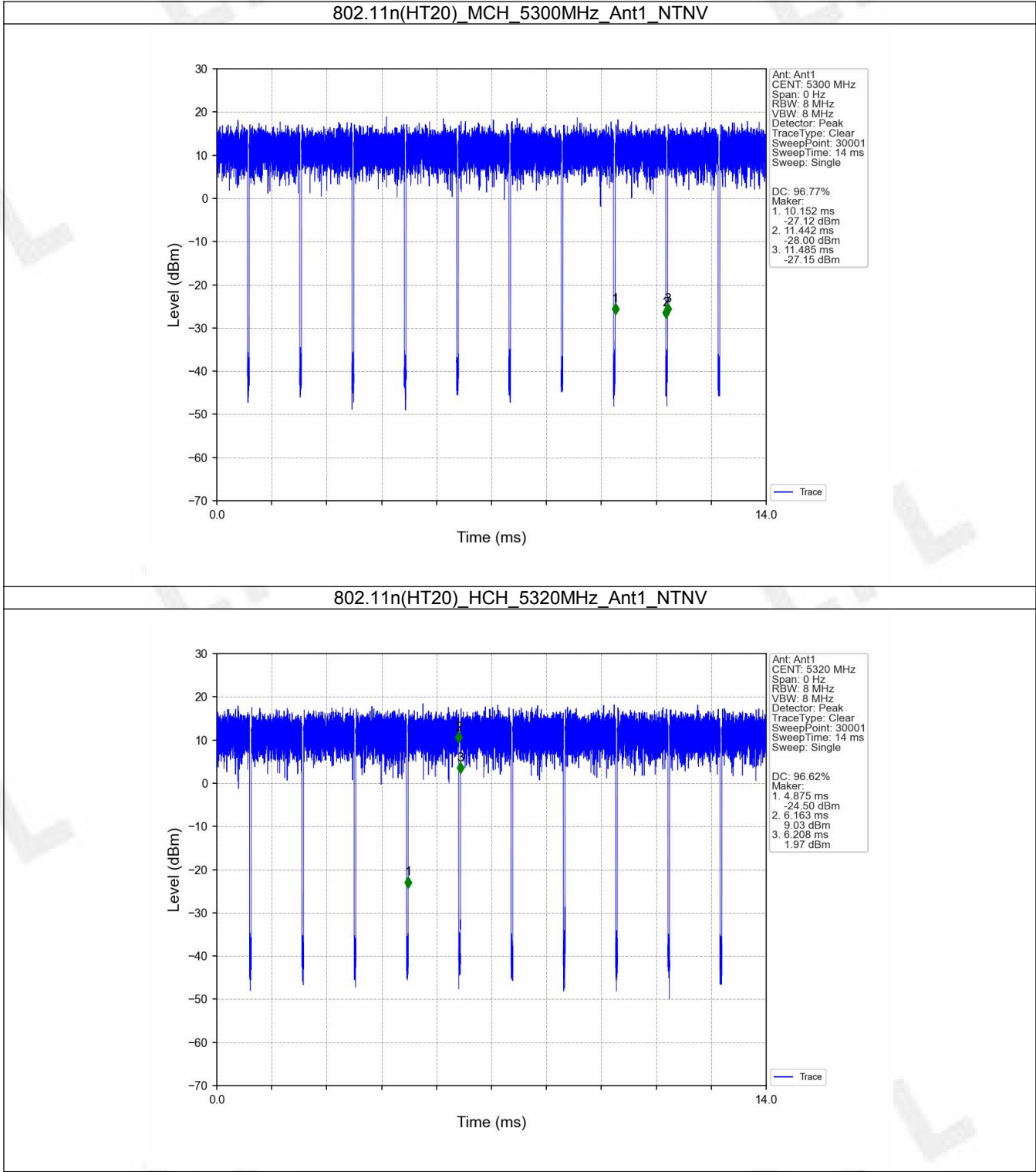
802.11a_HCH_5320MHz_Ant1_NTNV



802.11n(HT20)_LCH_5260MHz_Ant1_NTNV

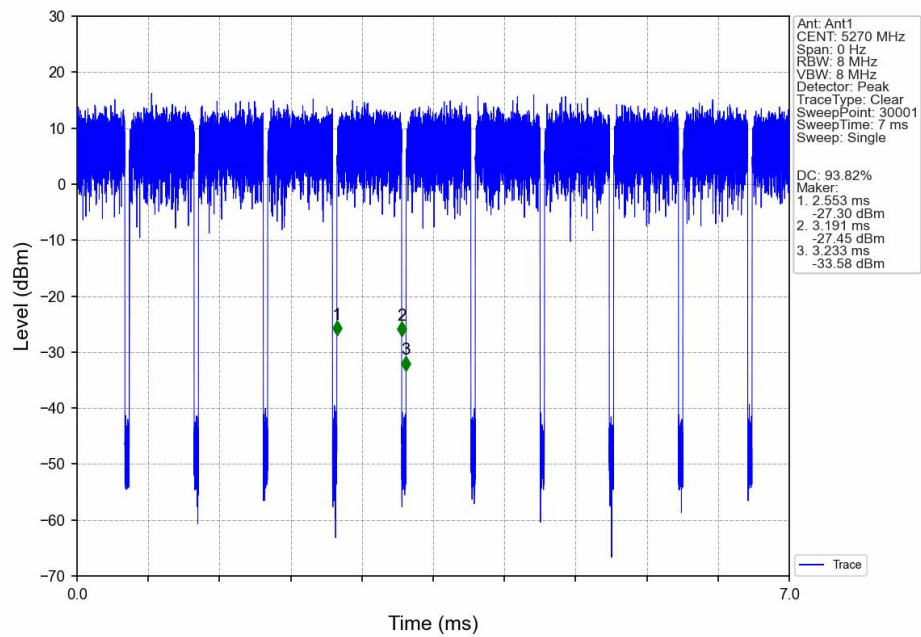


FCC ID: 2BWH8-S26-UITRA

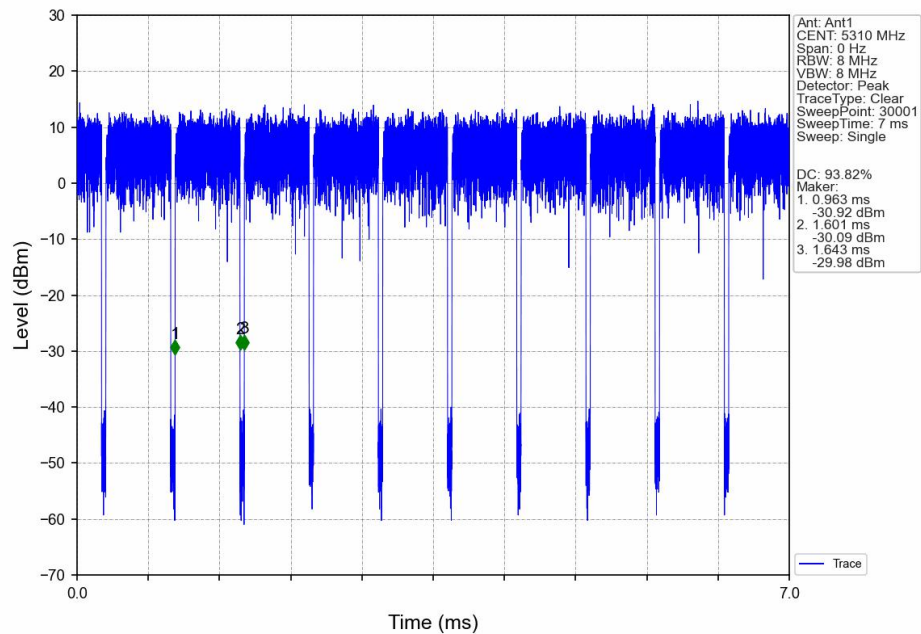


FCC ID: 2BWH8-S26-UITRA

802.11n(HT40)_LCH_5270MHz_Ant1_NTNV

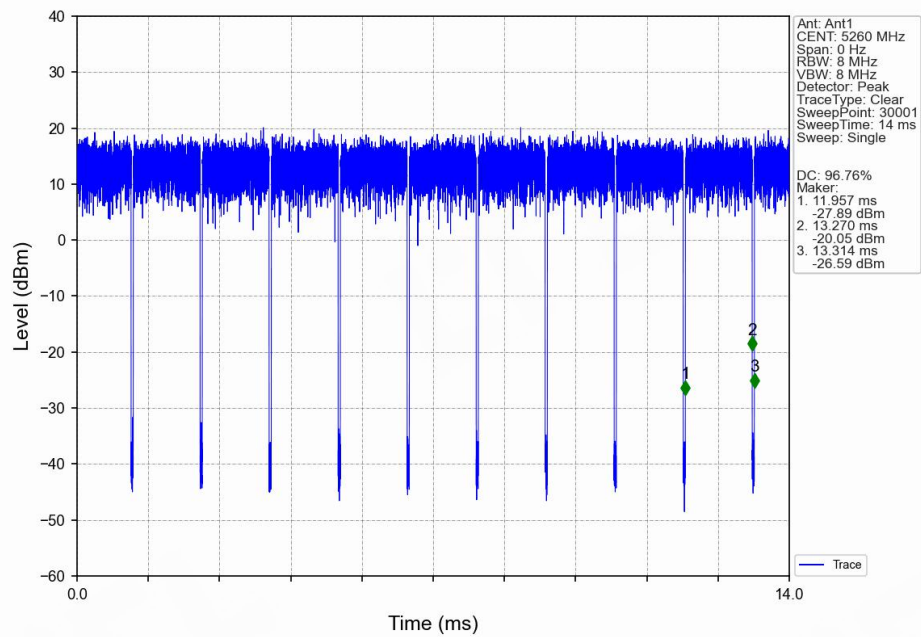


802.11n(HT40)_HCH_5310MHz_Ant1_NTNV

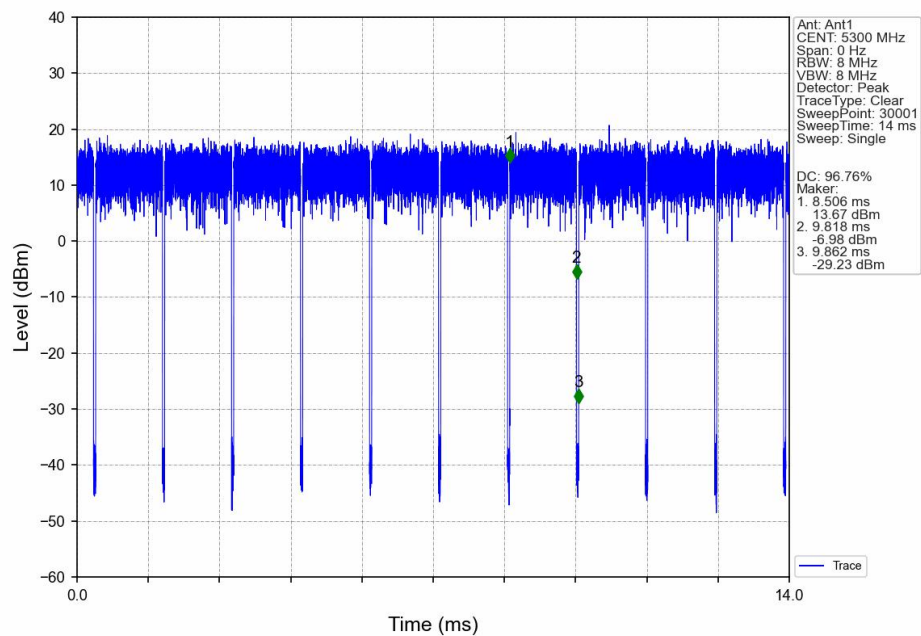


FCC ID: 2BWH8-S26-UITRA

802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV

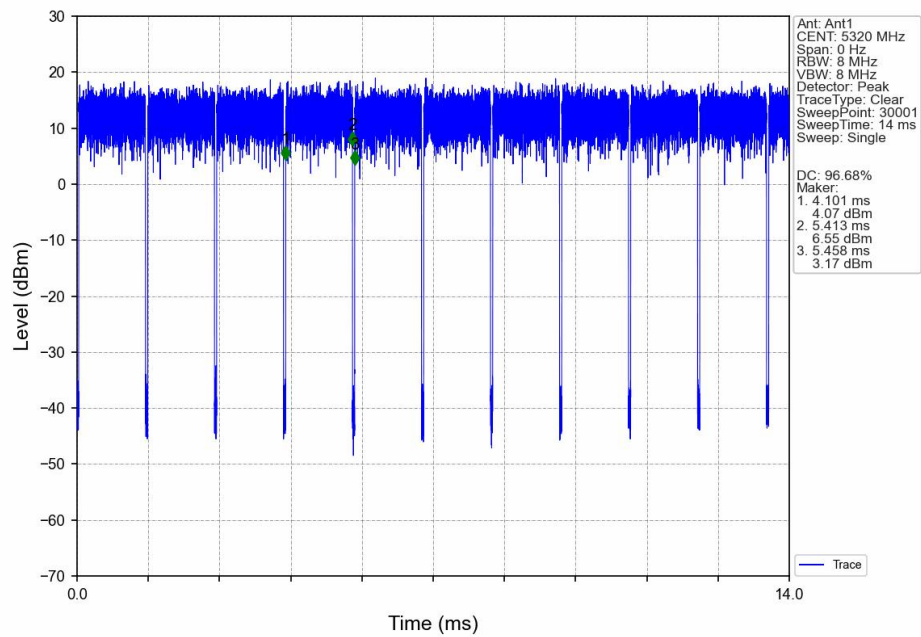


802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV

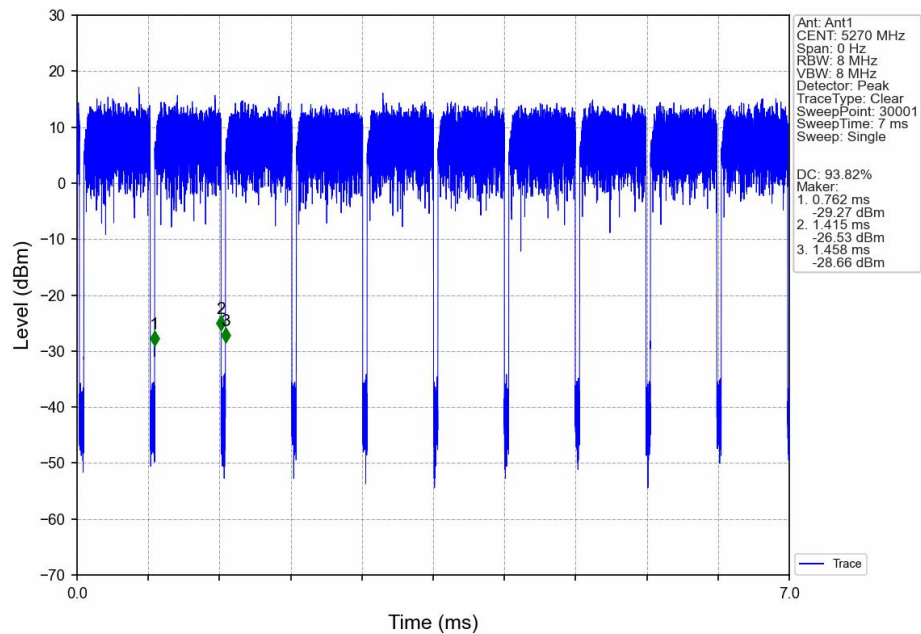


FCC ID: 2BWH8-S26-UITRA

802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV

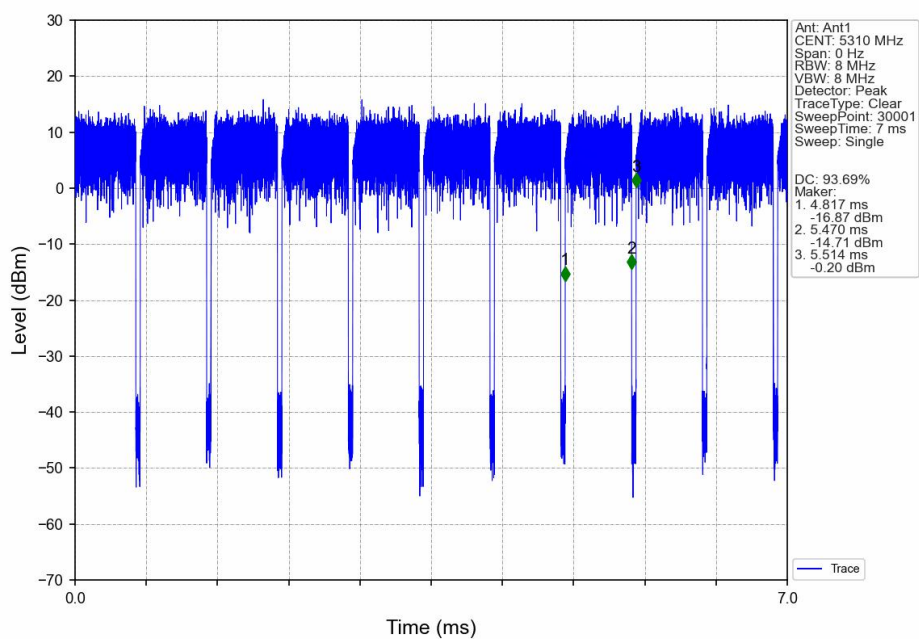


802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV

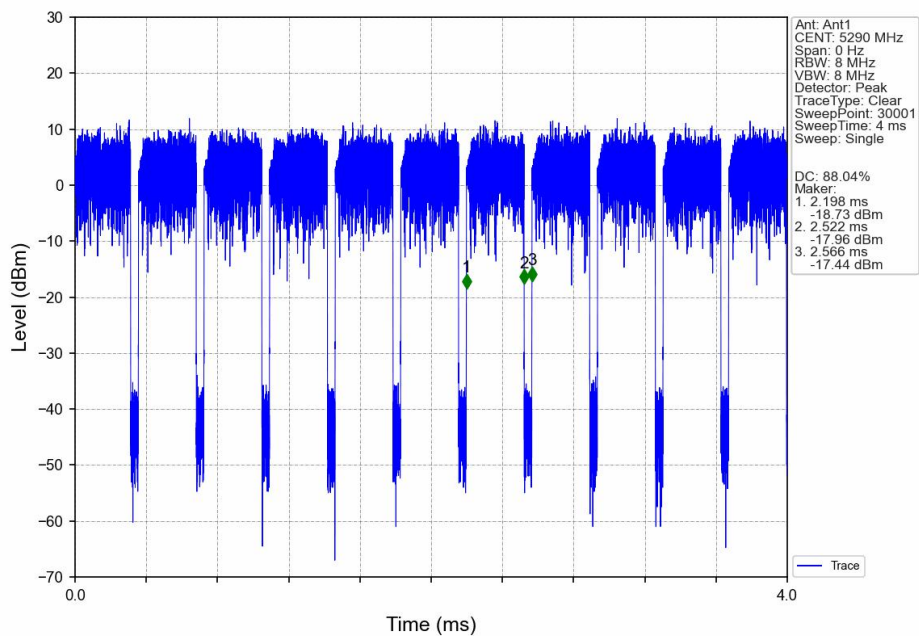


FCC ID: 2BWH8-S26-UITRA

802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant1_NTNV



FCC ID: 2BWH8-S26-UITRA

2. Bandwidth

2.1 Test Result

2.1.1 OBW

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5260	1	16.479	/	Pass
		5300	1	16.434	/	Pass
		5320	1	16.475	/	Pass
802.11n (HT20)	SISO	5260	1	17.608	/	Pass
		5300	1	17.585	/	Pass
		5320	1	17.615	/	Pass
802.11n (HT40)	SISO	5270	1	36.362	/	Pass
		5310	1	36.249	/	Pass
802.11ac (VHT20)	SISO	5260	1	17.613	/	Pass
		5300	1	17.622	/	Pass
		5320	1	17.590	/	Pass
802.11ac (VHT40)	SISO	5270	1	36.272	/	Pass
		5310	1	36.194	/	Pass
802.11ac (VHT80)	SISO	5290	1	75.286	/	Pass

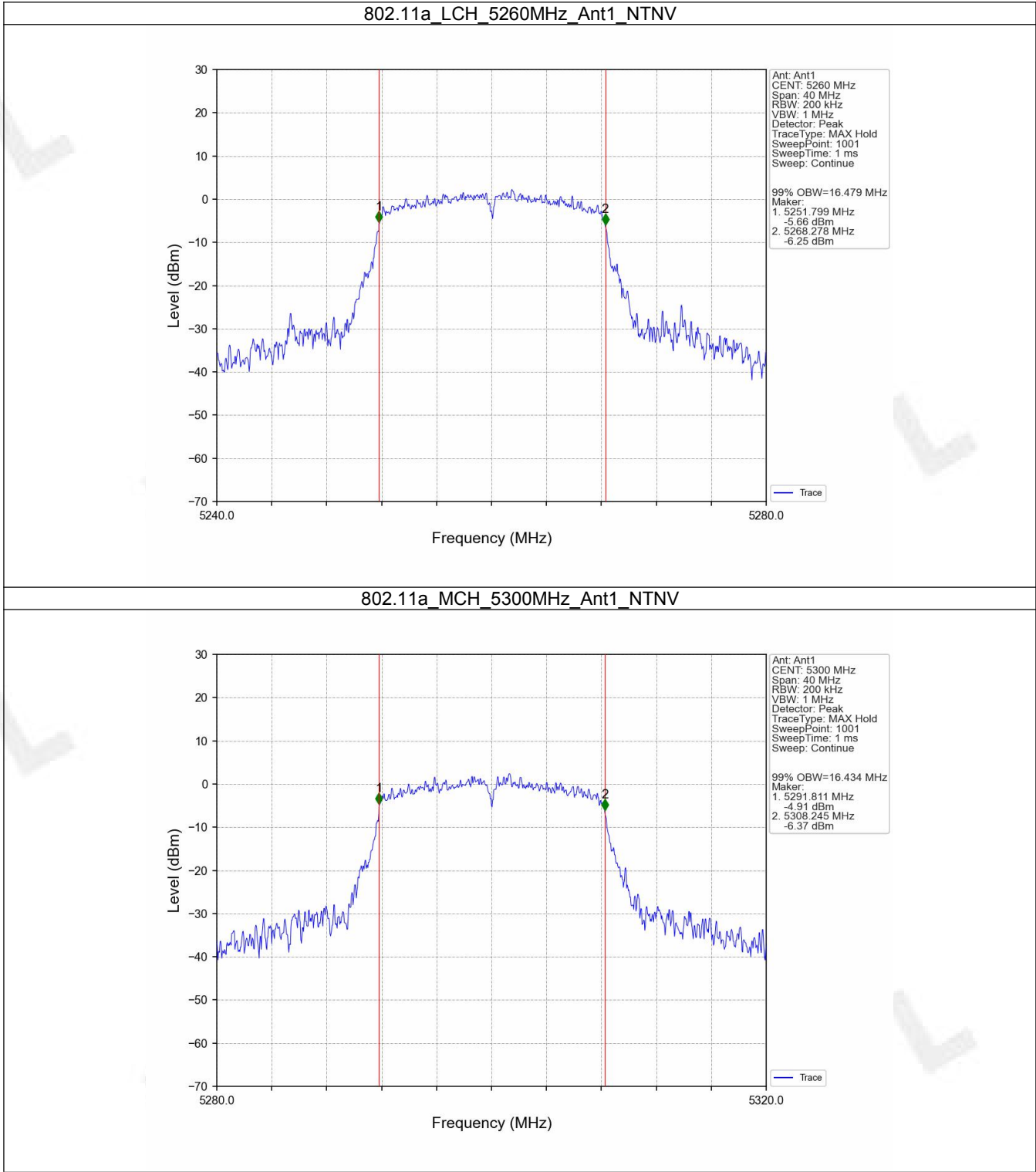
2.1.2 26dB BW

Mode	TX Type	Frequency (MHz)	ANT	26dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5260	1	19.920	/	Pass
		5300	1	19.807	/	Pass
		5320	1	20.295	/	Pass
802.11n (HT20)	SISO	5260	1	24.148	/	Pass
		5300	1	20.832	/	Pass
		5320	1	22.766	/	Pass
802.11n (HT40)	SISO	5270	1	41.219	/	Pass
		5310	1	41.518	/	Pass
802.11ac (VHT20)	SISO	5260	1	20.476	/	Pass
		5300	1	23.079	/	Pass
		5320	1	21.556	/	Pass
802.11ac (VHT40)	SISO	5270	1	42.814	/	Pass
		5310	1	41.597	/	Pass
802.11ac (VHT80)	SISO	5290	1	80.434	/	Pass

FCC ID: 2BWH8-S26-UITRA

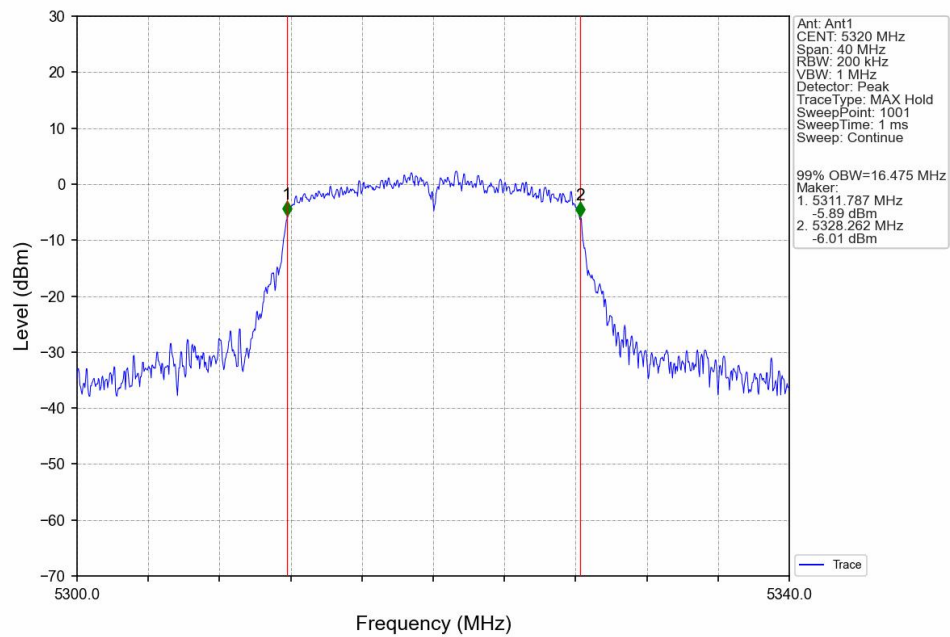
2.2 Test Graph

2.2.1 OBW

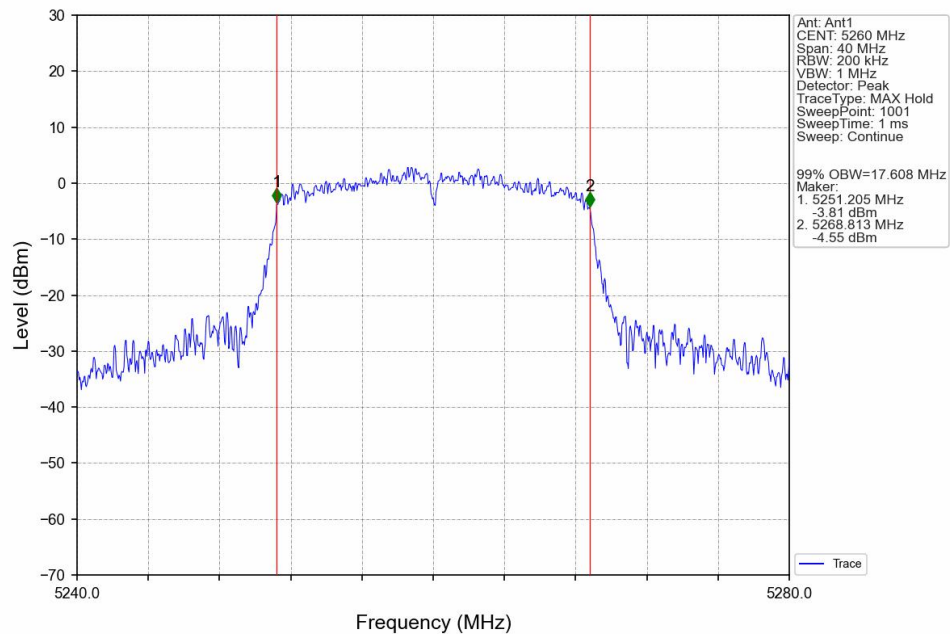


FCC ID: 2BWH8-S26-UITRA

802.11a_HCH_5320MHz_Ant1_NTNV

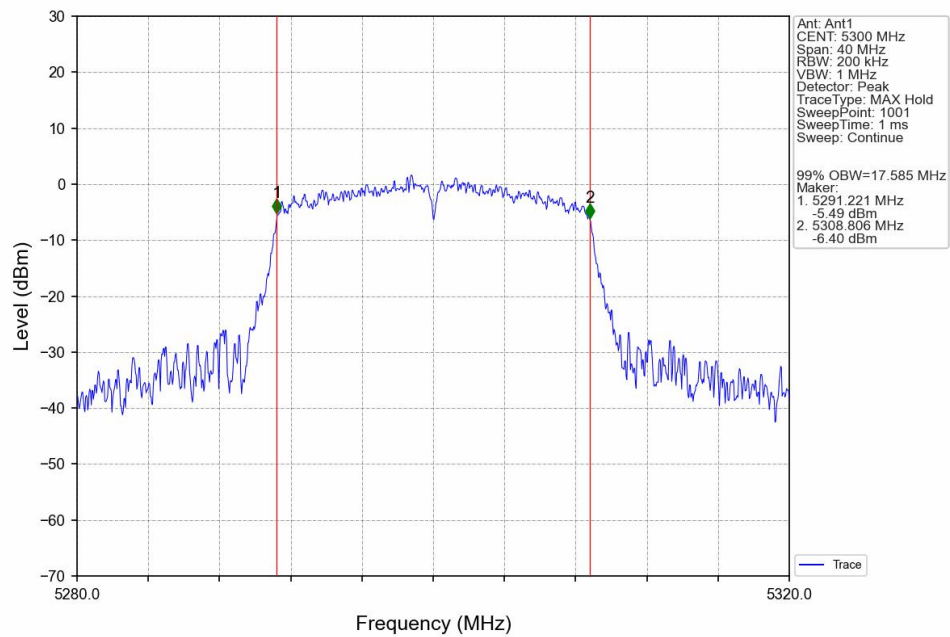


802.11n(HT20)_LCH_5260MHz_Ant1_NTNV

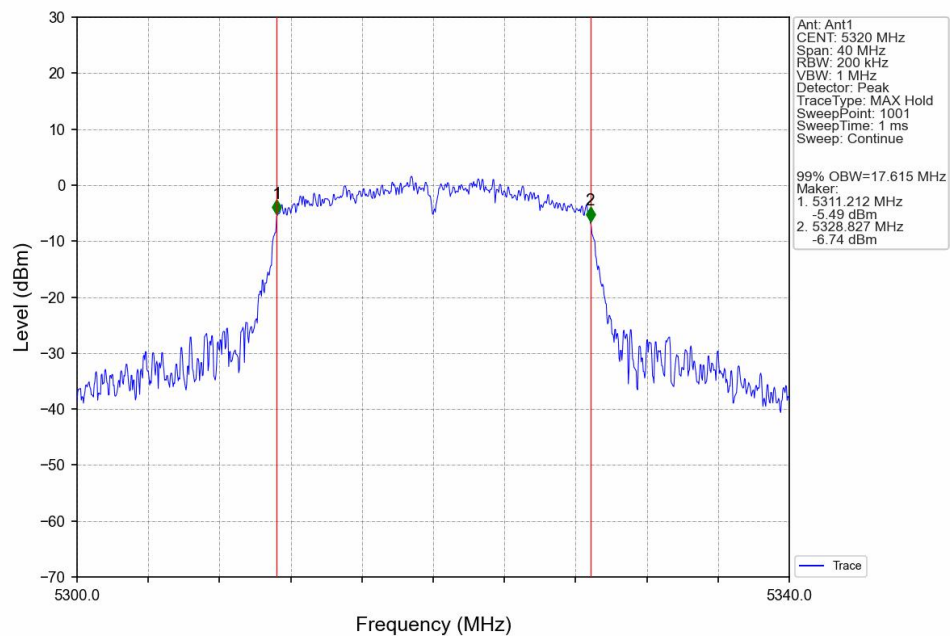


FCC ID: 2BWH8-S26-UITRA

802.11n(HT20)_MCH_5300MHz_Ant1_NTNV

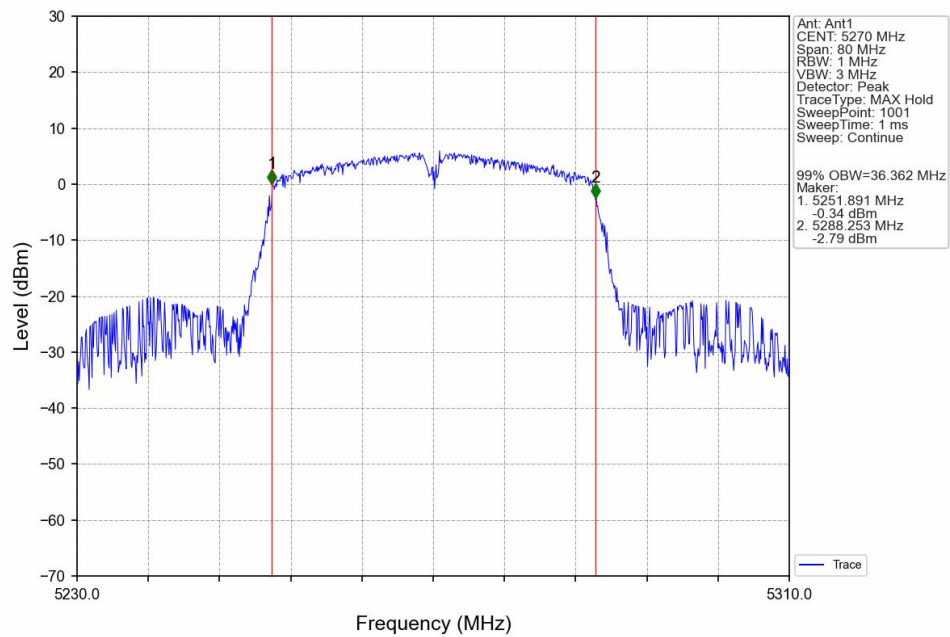


802.11n(HT20)_HCH_5320MHz_Ant1_NTNV

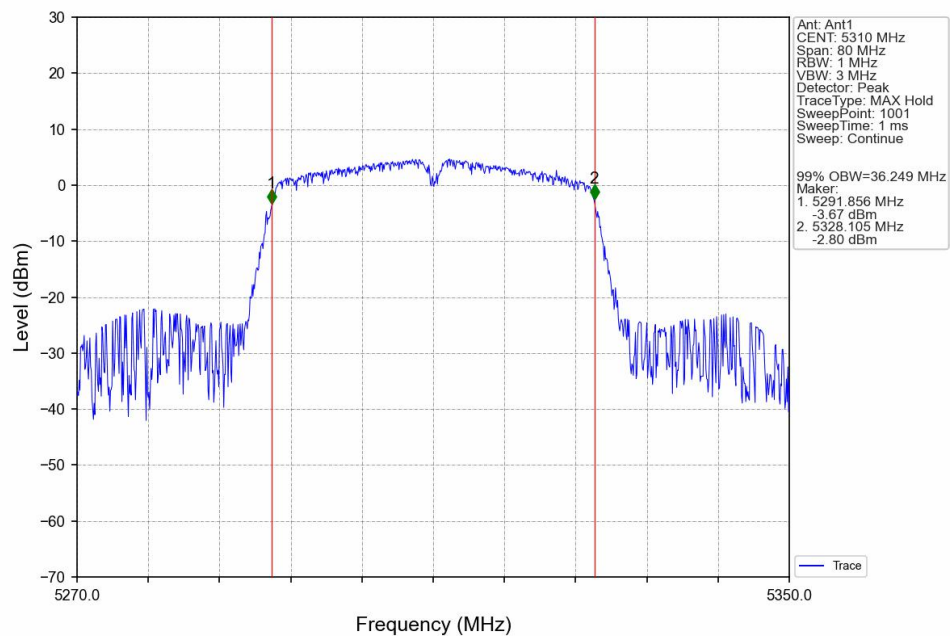


FCC ID: 2BWH8-S26-UITRA

802.11n(HT40)_LCH_5270MHz_Ant1_NTNV

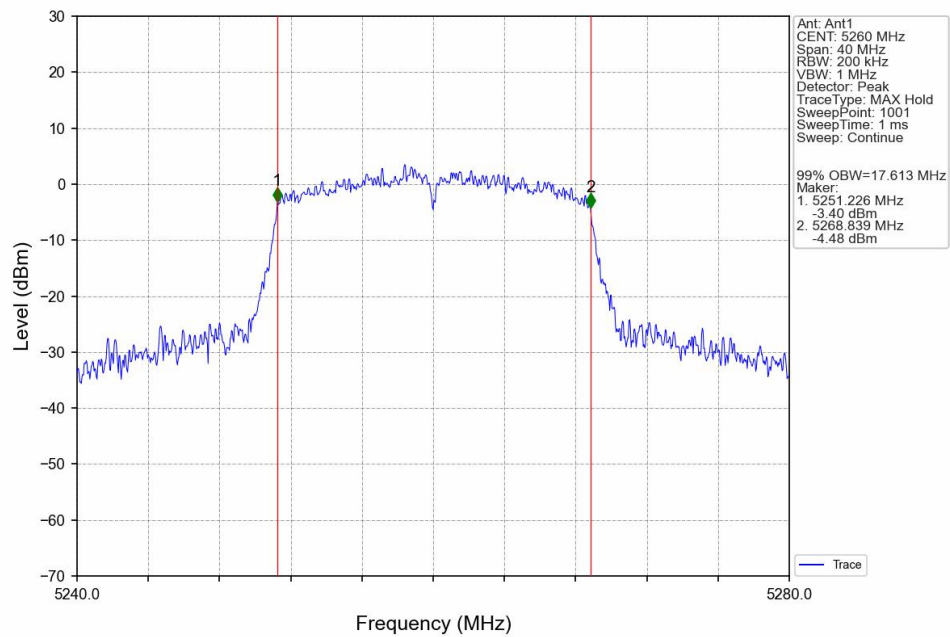


802.11n(HT40)_HCH_5310MHz_Ant1_NTNV

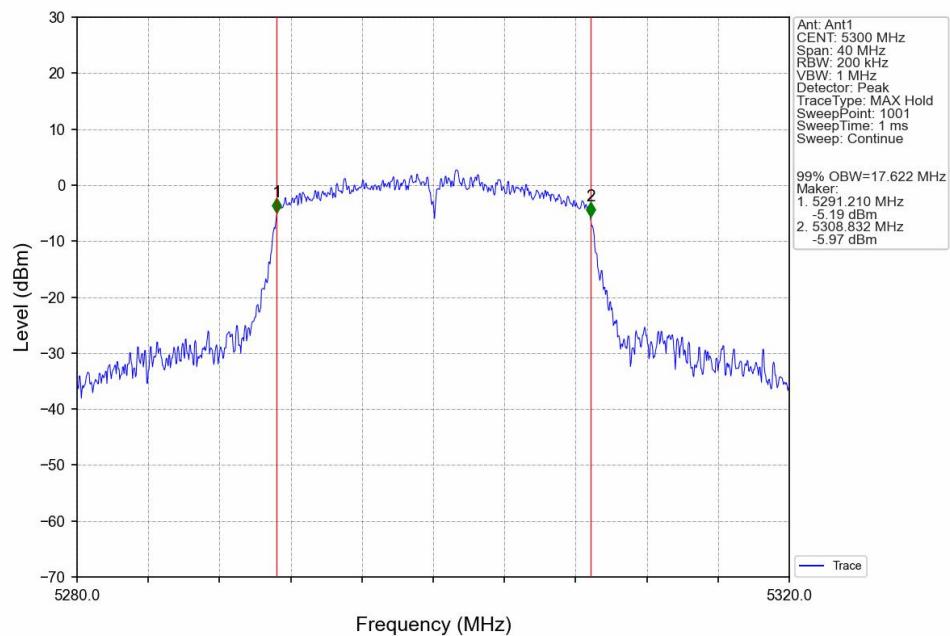


FCC ID: 2BWH8-S26-UITRA

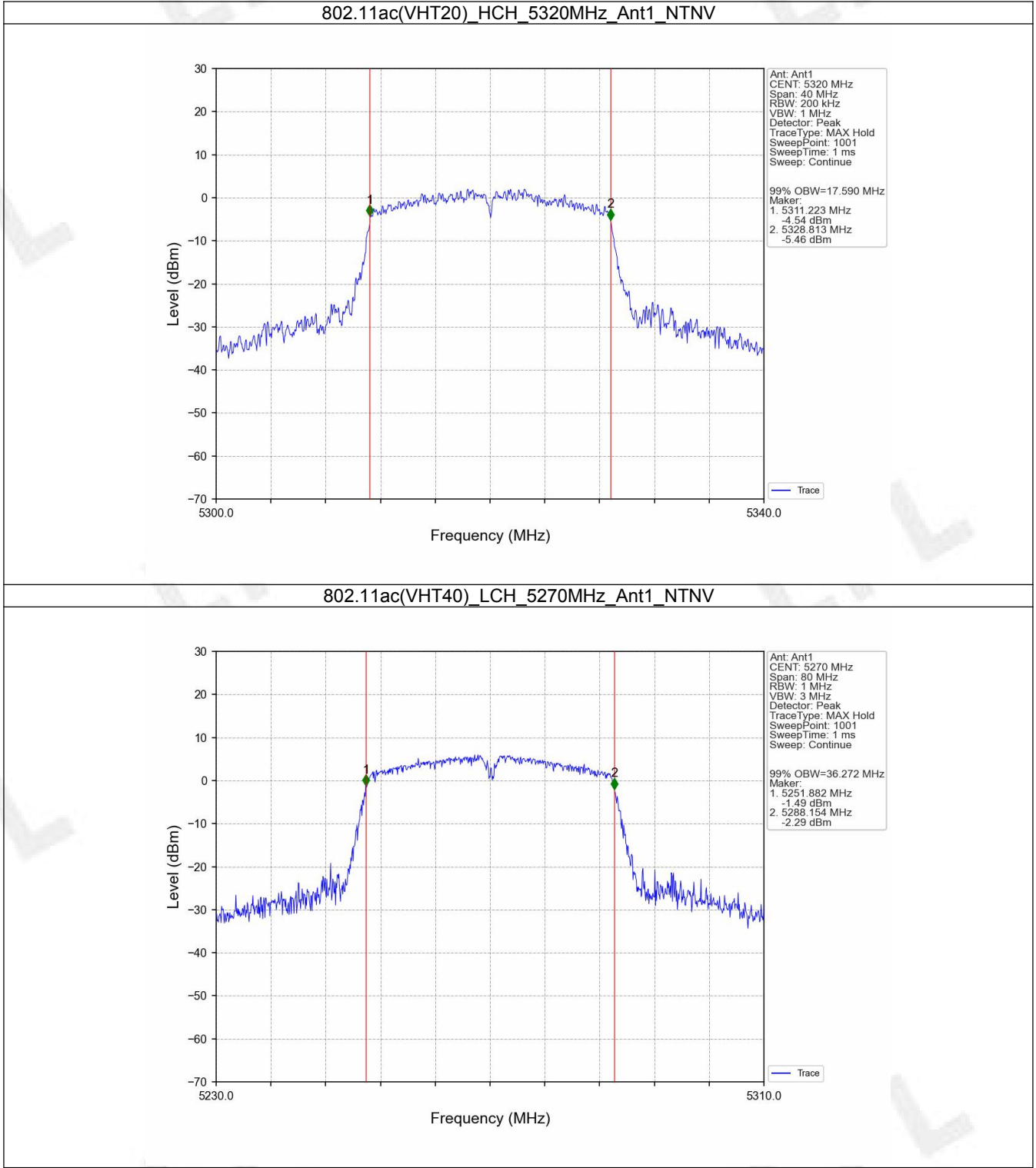
802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV



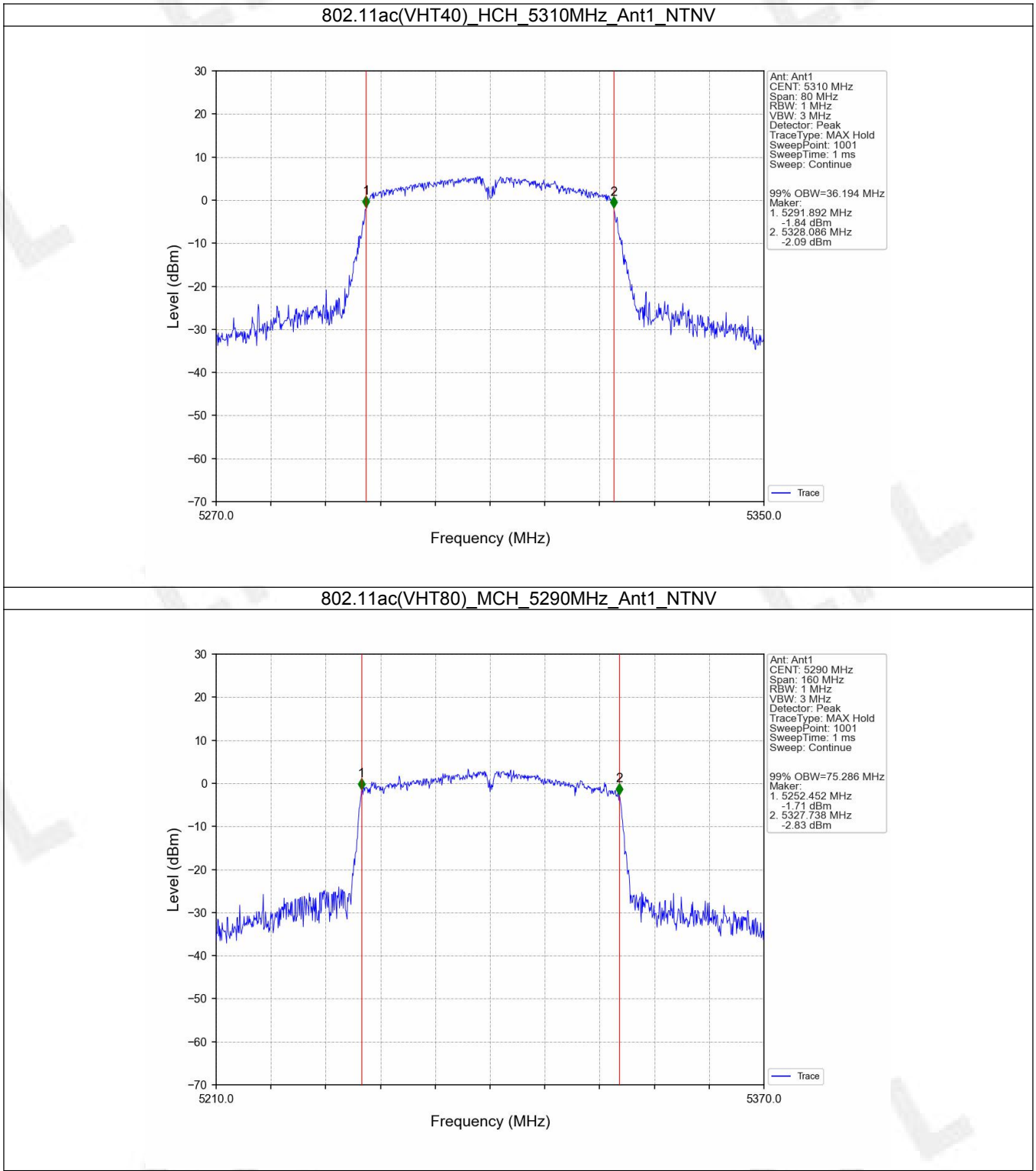
802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV



FCC ID: 2BWH8-S26-UITRA

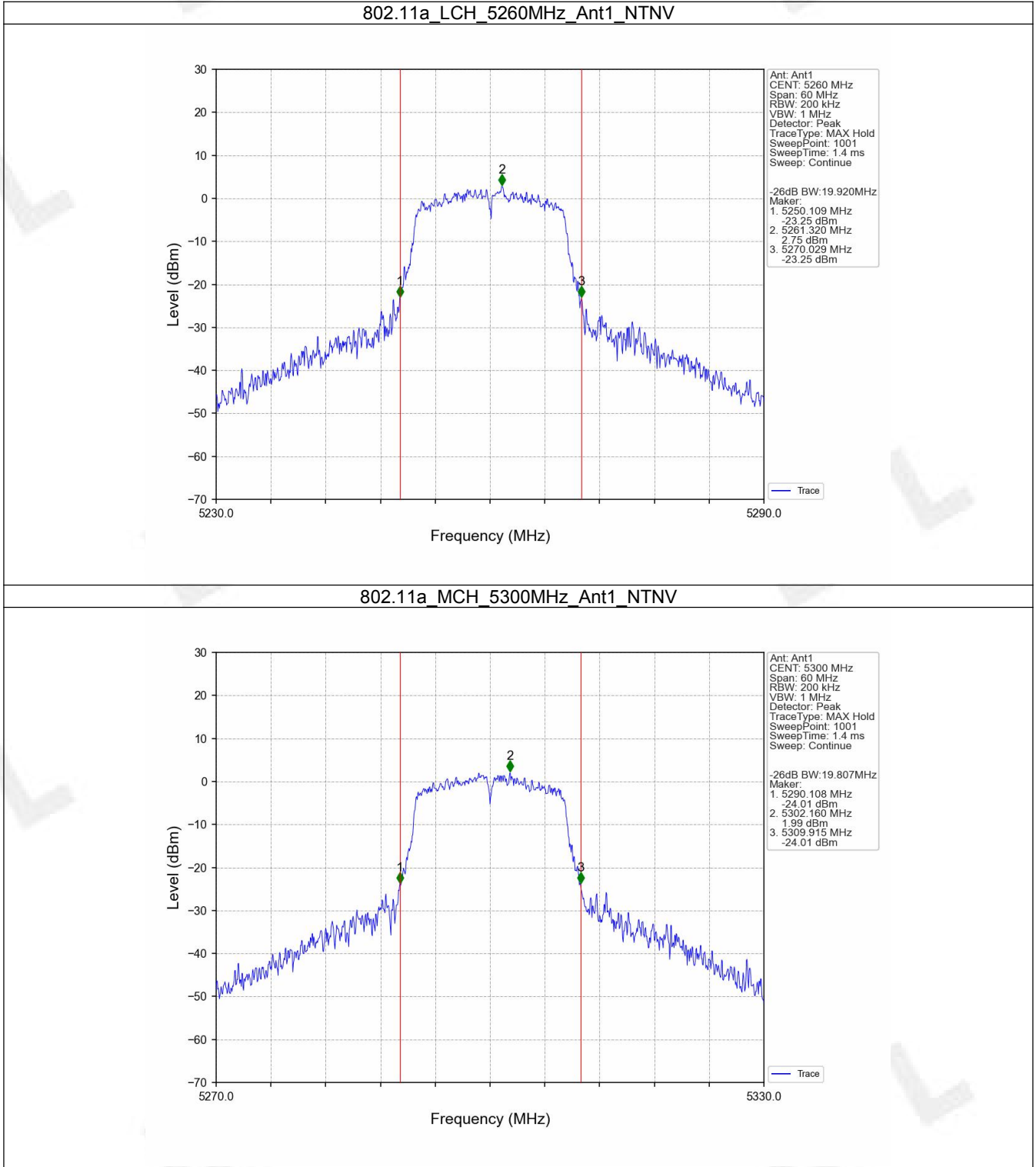


FCC ID: 2BWH8-S26-UITRA



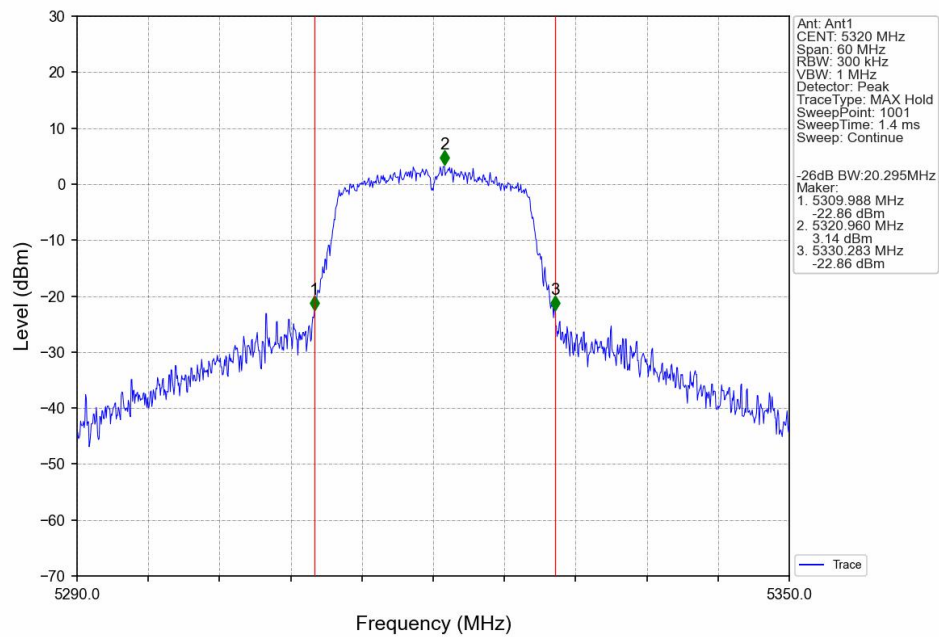
FCC ID: 2BWH8-S26-UITRA

2.2.2 26dB BW

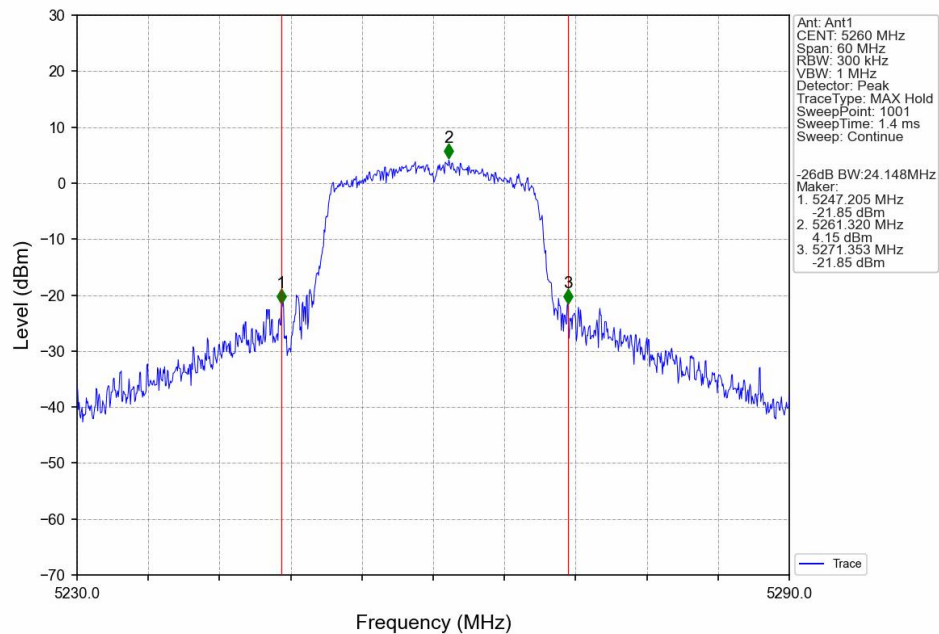


FCC ID: 2BWH8-S26-UITRA

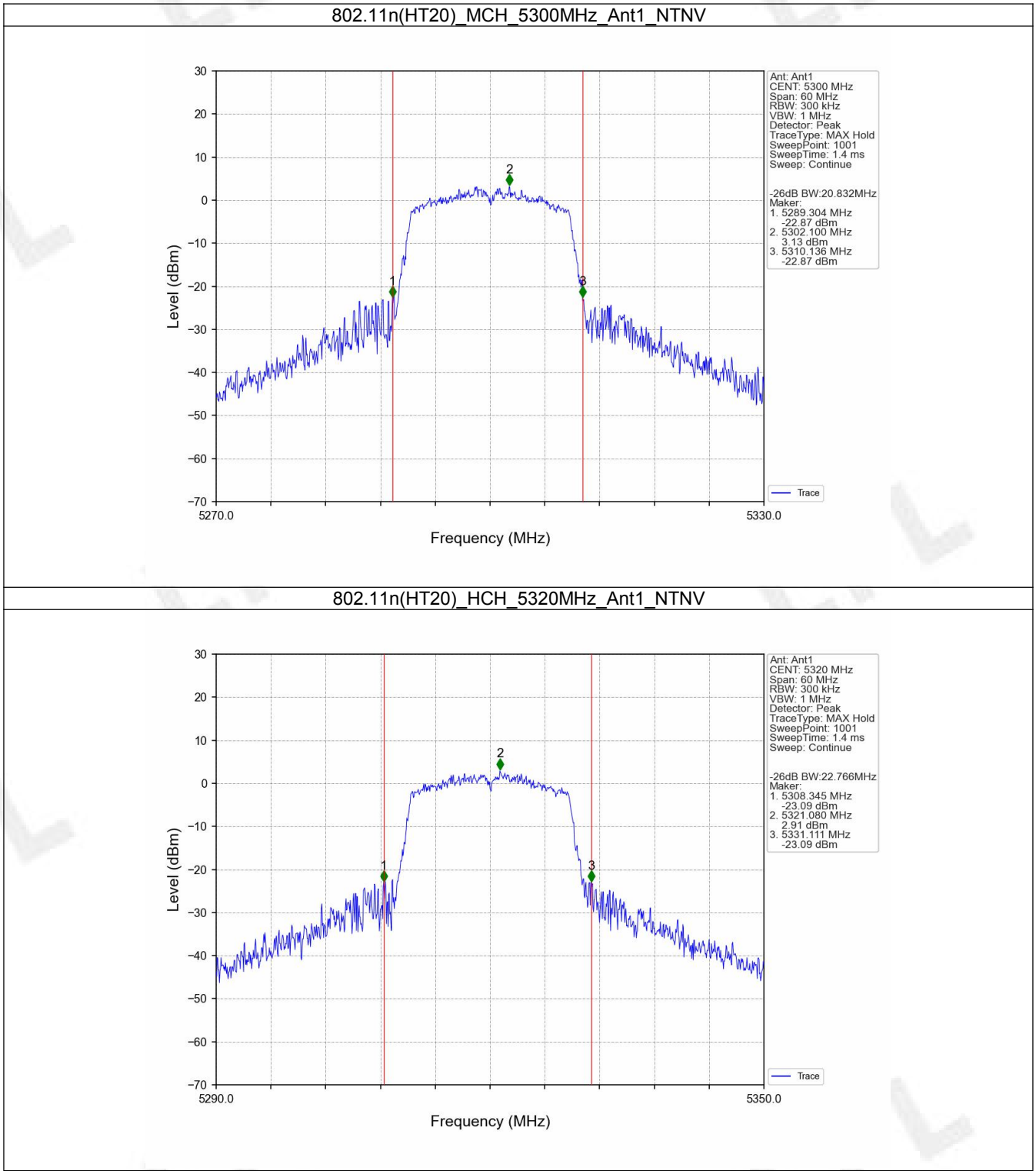
802.11a_HCH_5320MHz_Ant1_NTNV



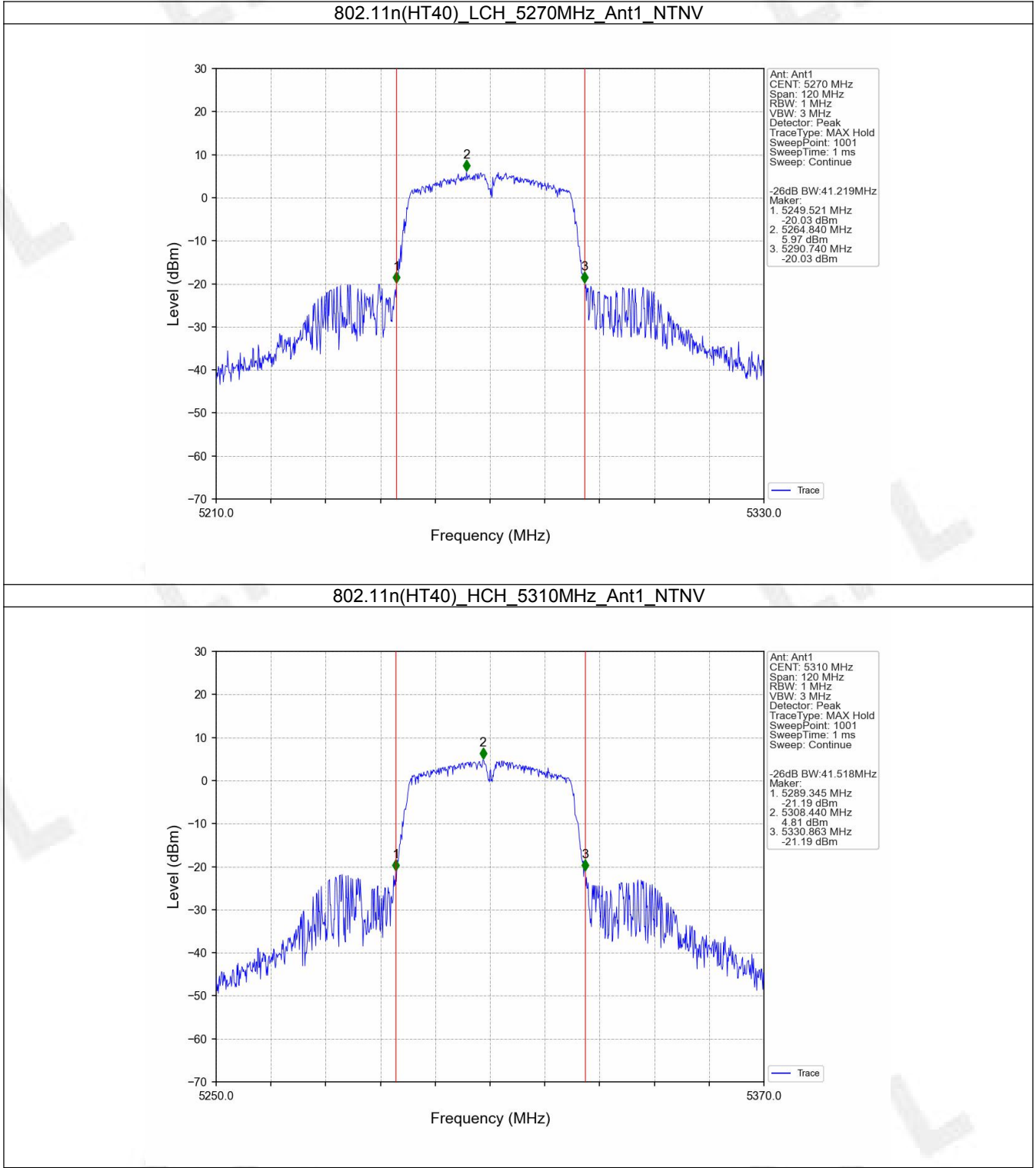
802.11n(HT20)_LCH_5260MHz_Ant1_NTNV



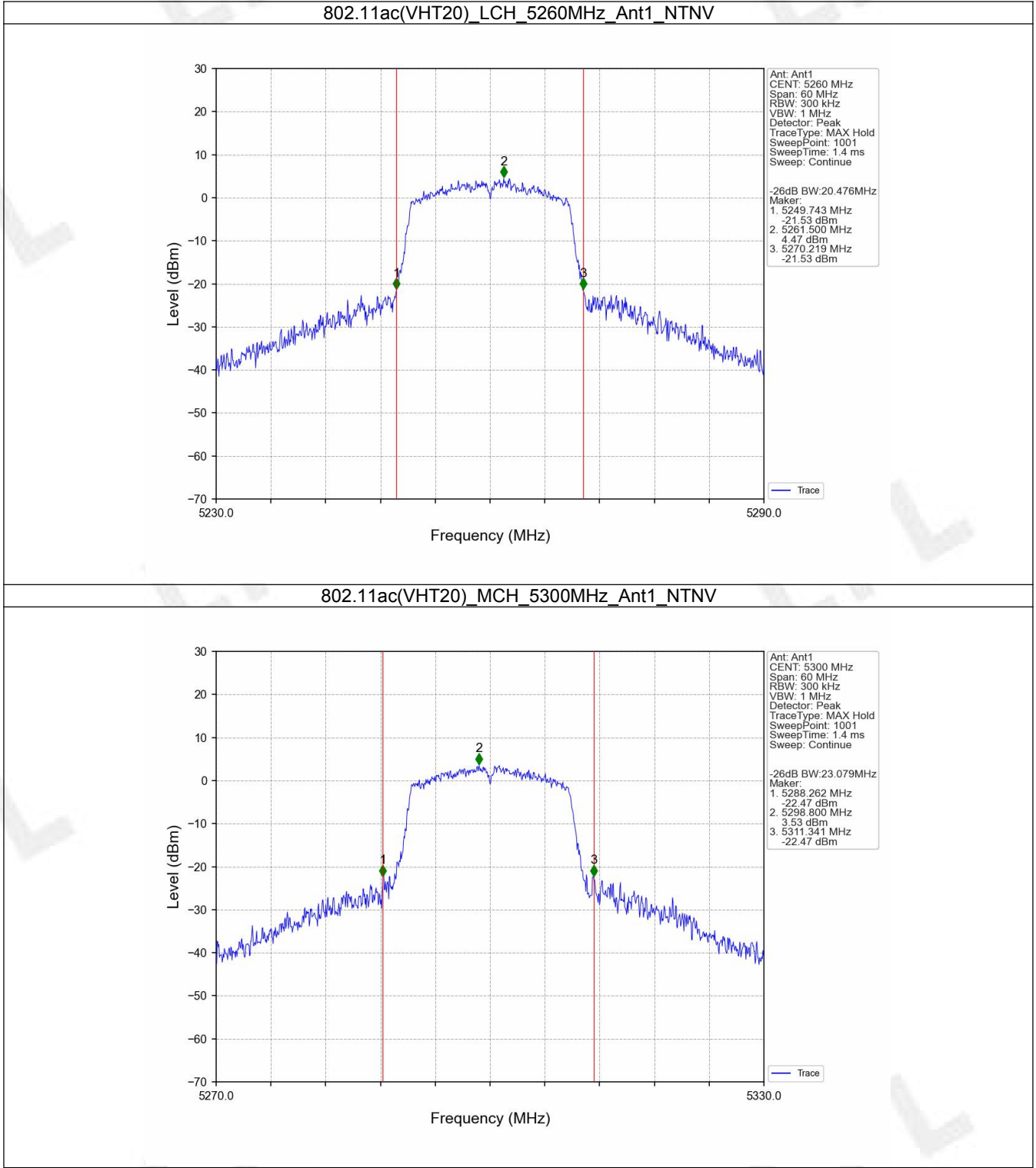
FCC ID: 2BWH8-S26-UITRA



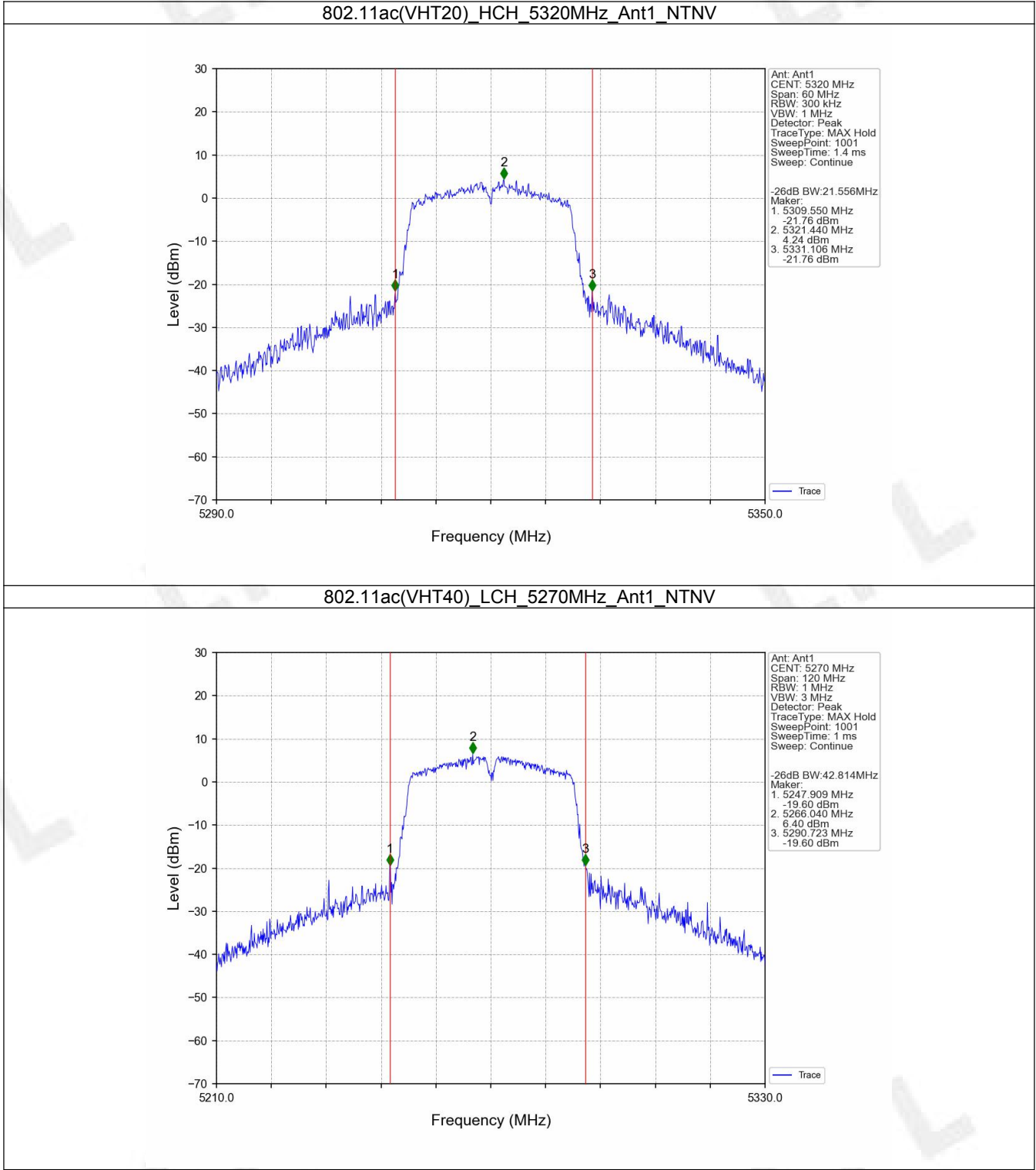
FCC ID: 2BWH8-S26-UITRA



FCC ID: 2BWH8-S26-UITRA

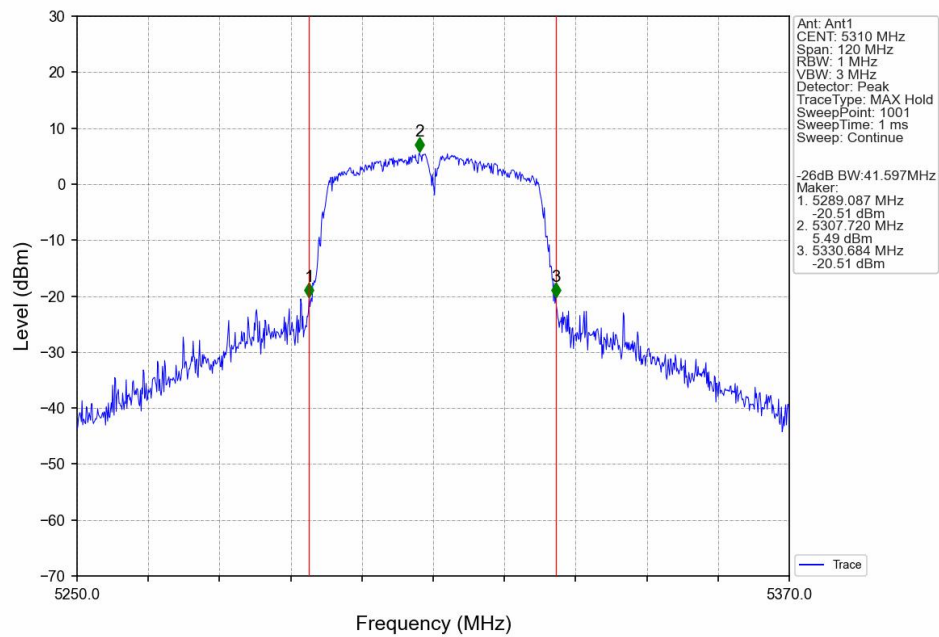


FCC ID: 2BWH8-S26-UITRA

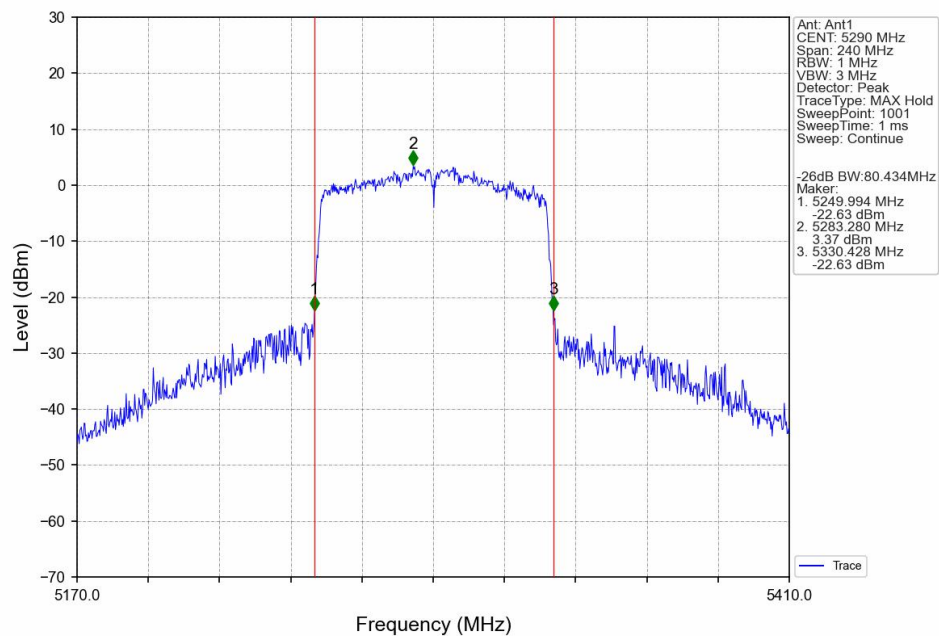


FCC ID: 2BWH8-S26-UITRA

802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant1_NTNV



FCC ID: 2BWH8-S26-UITRA

3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11a	SISO	5260	12.09	<=23.98	Pass
		5300	11.69	<=23.97	Pass
		5320	11.70	<=23.98	Pass
802.11n (HT20)	SISO	5260	12.52	<=23.98	Pass
		5300	11.15	<=23.98	Pass
		5320	11.04	<=23.98	Pass
802.11n (HT40)	SISO	5270	11.23	<=23.98	Pass
		5310	10.26	<=23.98	Pass
802.11ac (VHT20)	SISO	5260	12.63	<=23.98	Pass
		5300	12.19	<=23.98	Pass
		5320	12.01	<=23.98	Pass
802.11ac (VHT40)	SISO	5270	11.42	<=23.98	Pass
		5310	10.47	<=23.98	Pass
802.11ac (VHT80)	SISO	5290	11.37	<=23.98	Pass
Note1: Antenna Gain: Ant1: 0.88dBi;					
Note2: The duty factor is already compensated in the result;					

FCC ID: 2BWH8-S26-UITRA

4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

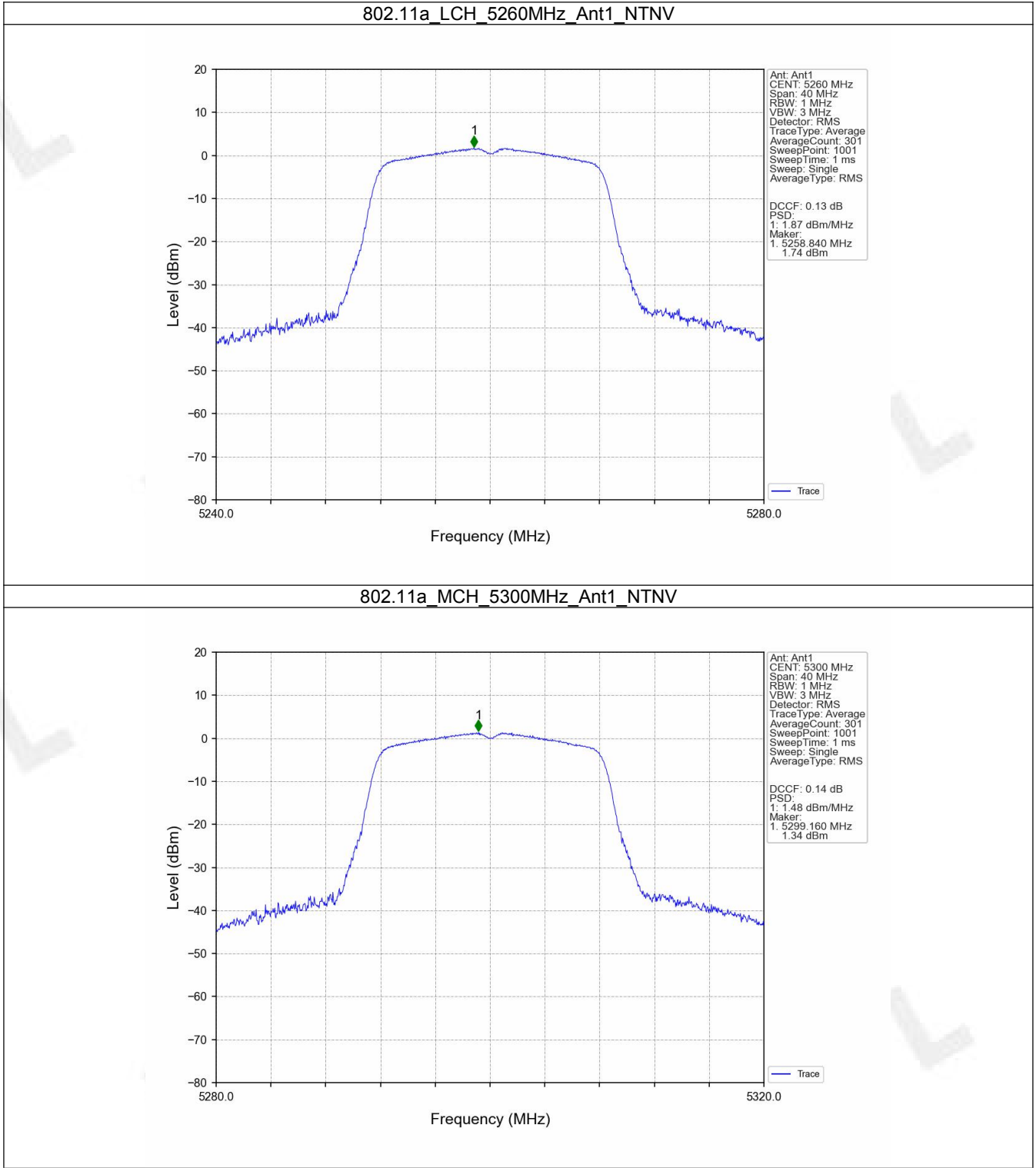
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/MHz)		Verdict
			ANT1	Limit	
802.11a	SISO	5260	1.87	<=11	Pass
		5300	1.48	<=11	Pass
		5320	1.43	<=11	Pass
802.11n (HT20)	SISO	5260	2.21	<=11	Pass
		5300	0.64	<=11	Pass
		5320	0.15	<=11	Pass
802.11n (HT40)	SISO	5270	-2.10	<=11	Pass
		5310	-2.96	<=11	Pass
802.11ac (VHT20)	SISO	5260	2.21	<=11	Pass
		5300	1.94	<=11	Pass
		5320	1.67	<=11	Pass
802.11ac (VHT40)	SISO	5270	-2.04	<=11	Pass
		5310	-2.82	<=11	Pass
802.11ac (VHT80)	SISO	5290	-5.18	<=11	Pass

Note1: Antenna Gain: Ant1: 0.88dBi;

FCC ID: 2BWH8-S26-UITRA

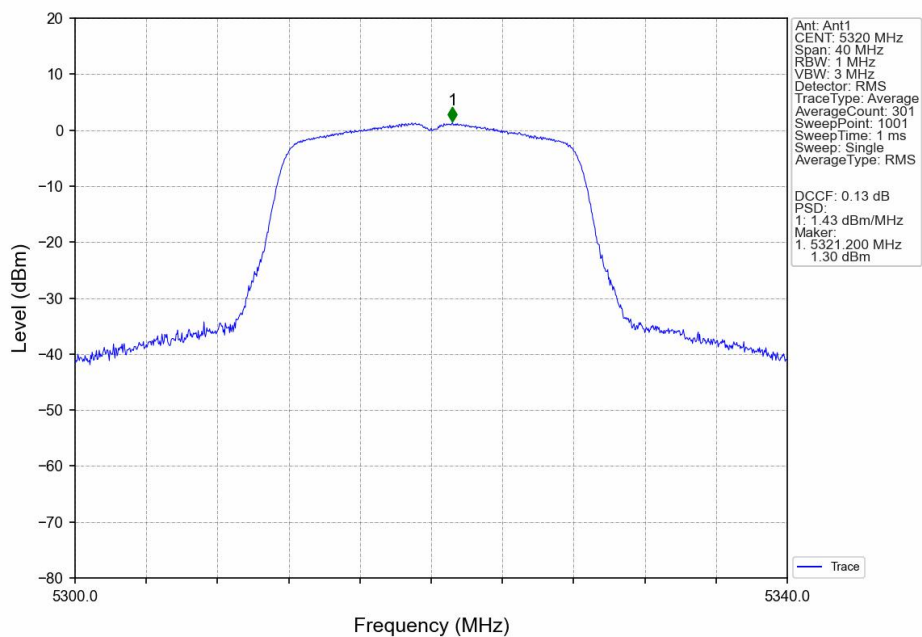
4.2 Test Graph

4.2.1 PSD

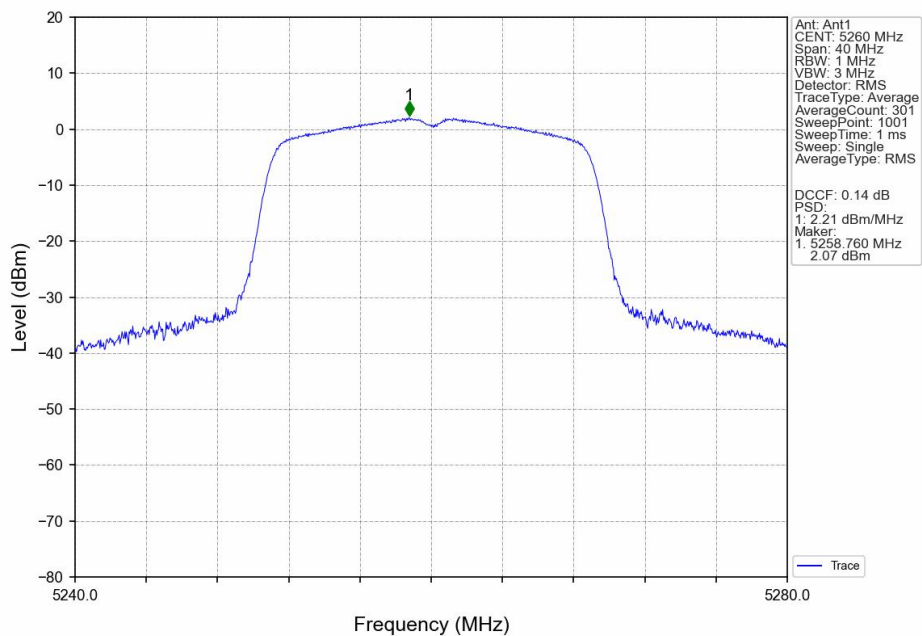


FCC ID: 2BWH8-S26-UITRA

802.11a_HCH_5320MHz_Ant1_NTNV

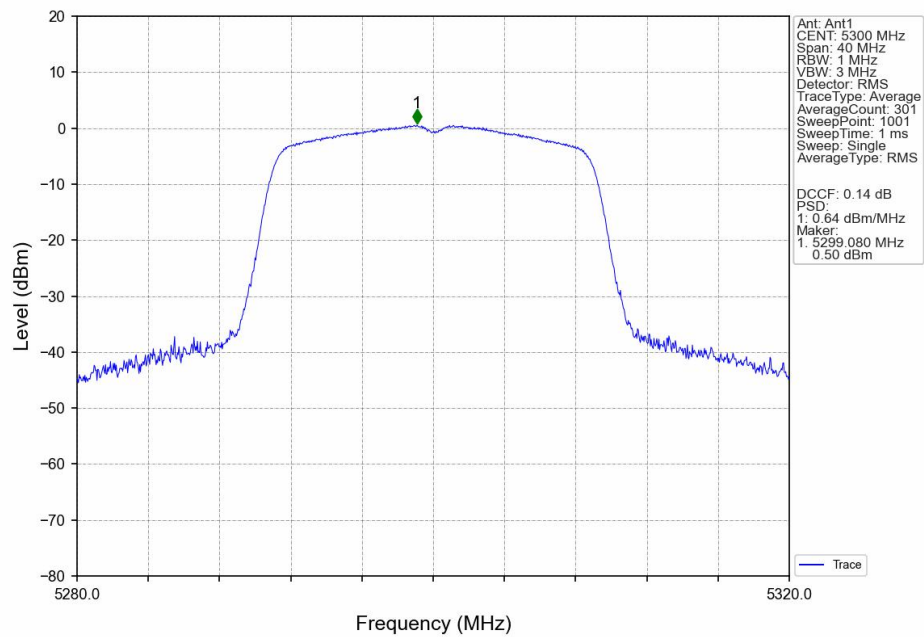


802.11n(HT20)_LCH_5260MHz_Ant1_NTNV

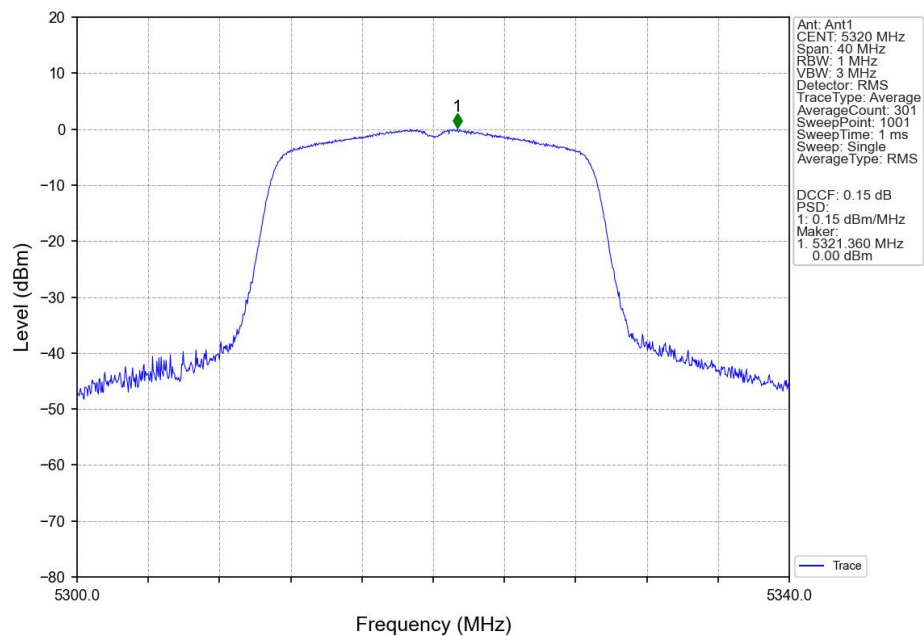


FCC ID: 2BWH8-S26-UITRA

802.11n(HT20)_MCH_5300MHz_Ant1_NTNV

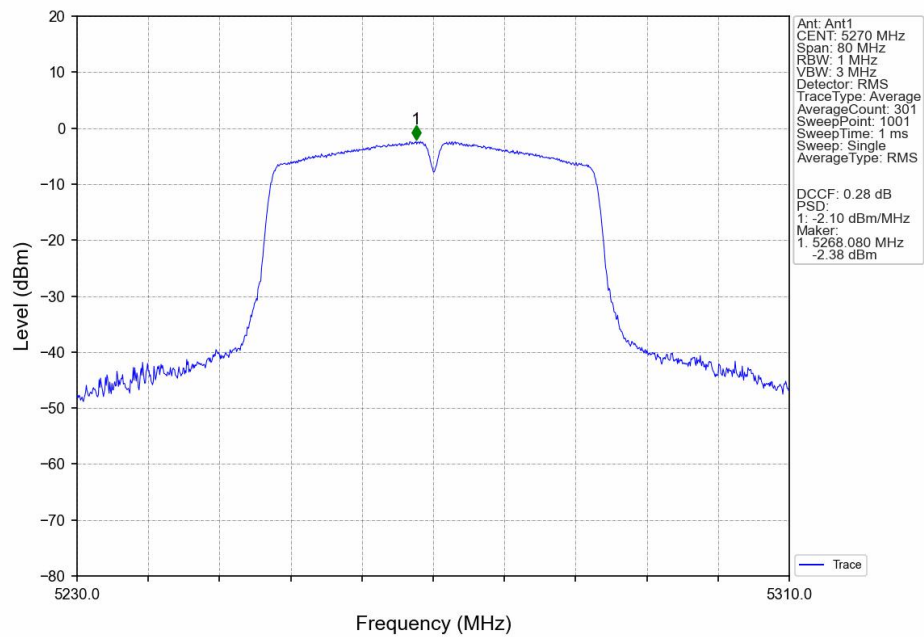


802.11n(HT20)_HCH_5320MHz_Ant1_NTNV

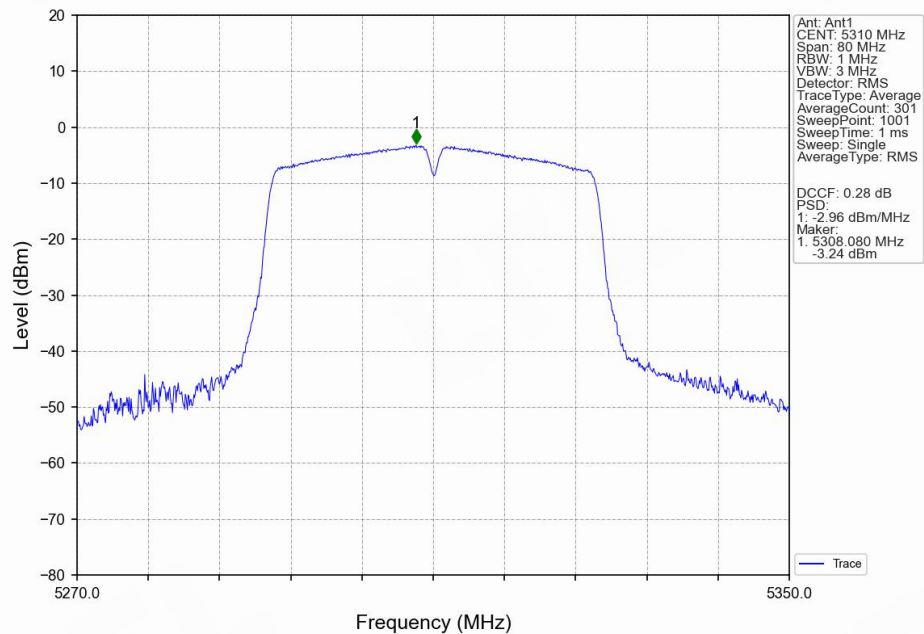


FCC ID: 2BWH8-S26-UITRA

802.11n(HT40)_LCH_5270MHz_Ant1_NTNV

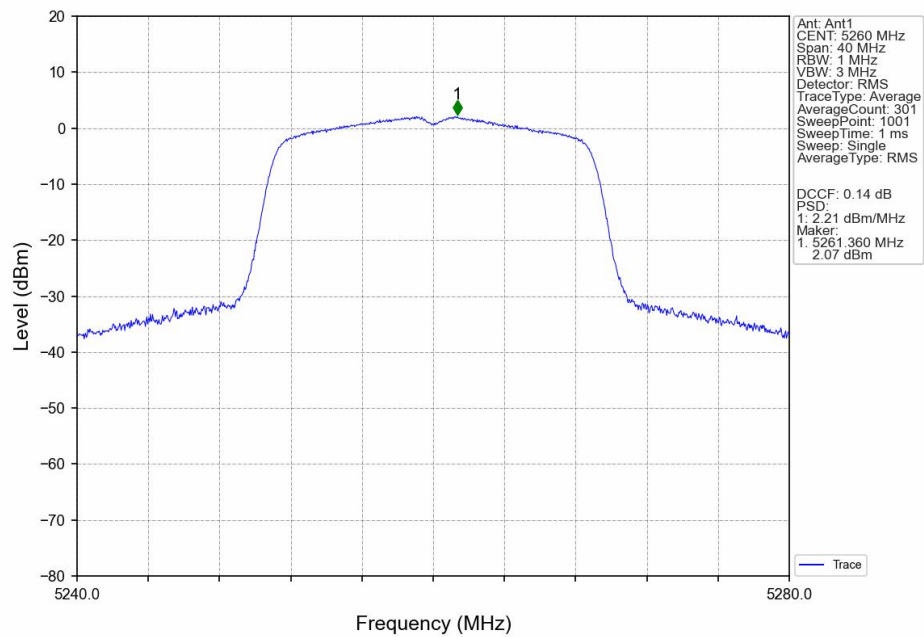


802.11n(HT40)_HCH_5310MHz_Ant1_NTNV

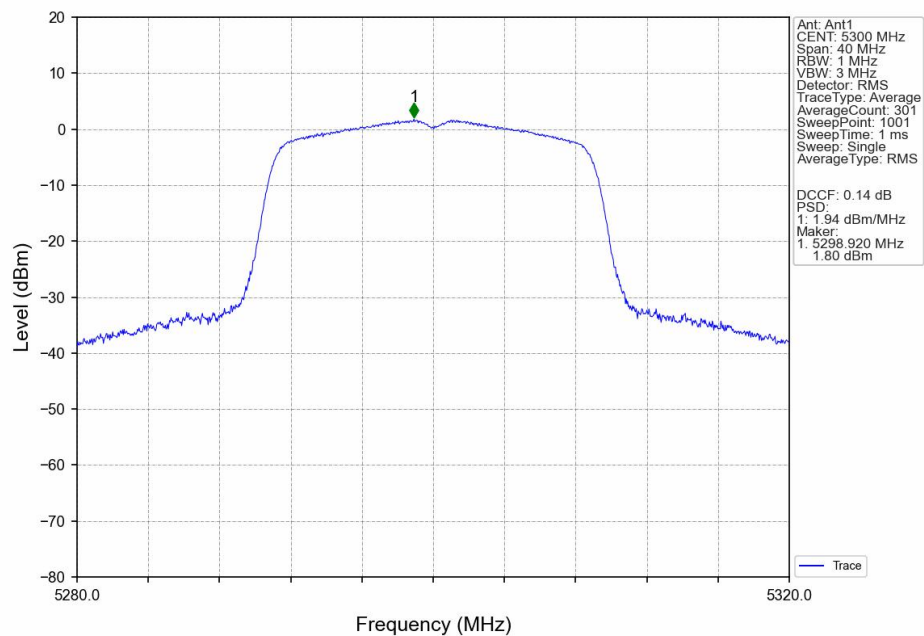


FCC ID: 2BWH8-S26-UITRA

802.11ac(VHT20)_LCH_5260MHz_Ant1_NTNV

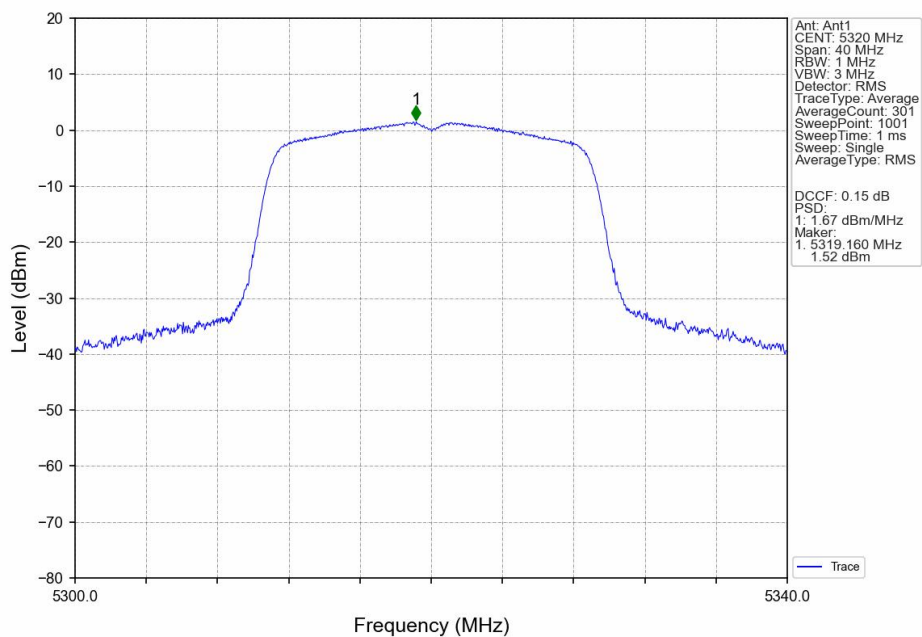


802.11ac(VHT20)_MCH_5300MHz_Ant1_NTNV

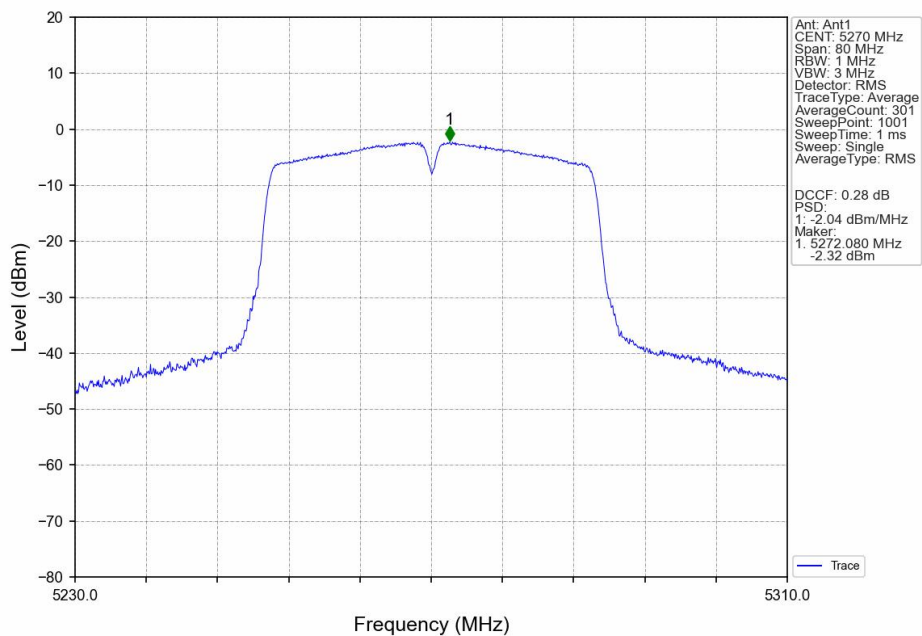


FCC ID: 2BWH8-S26-UITRA

802.11ac(VHT20)_HCH_5320MHz_Ant1_NTNV

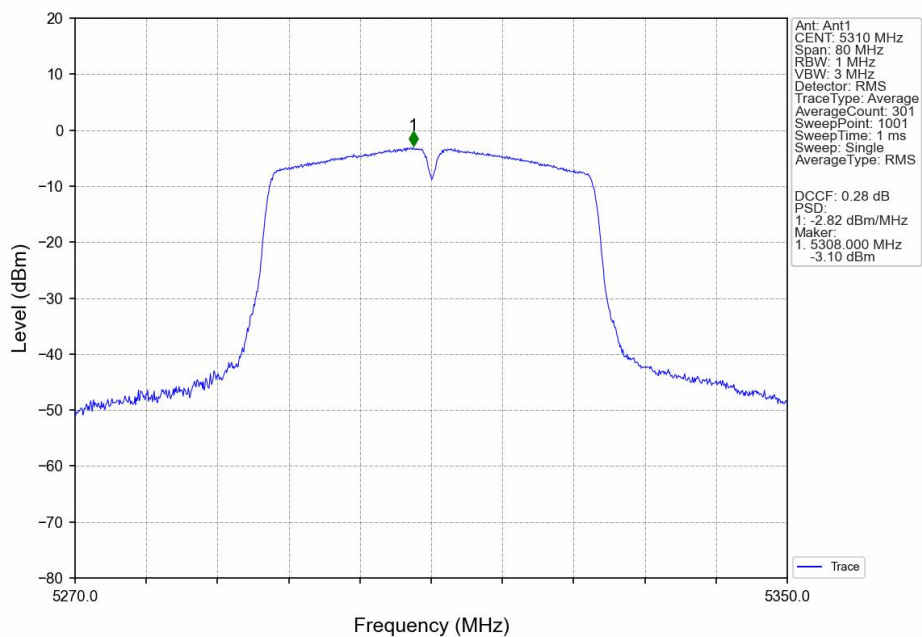


802.11ac(VHT40)_LCH_5270MHz_Ant1_NTNV

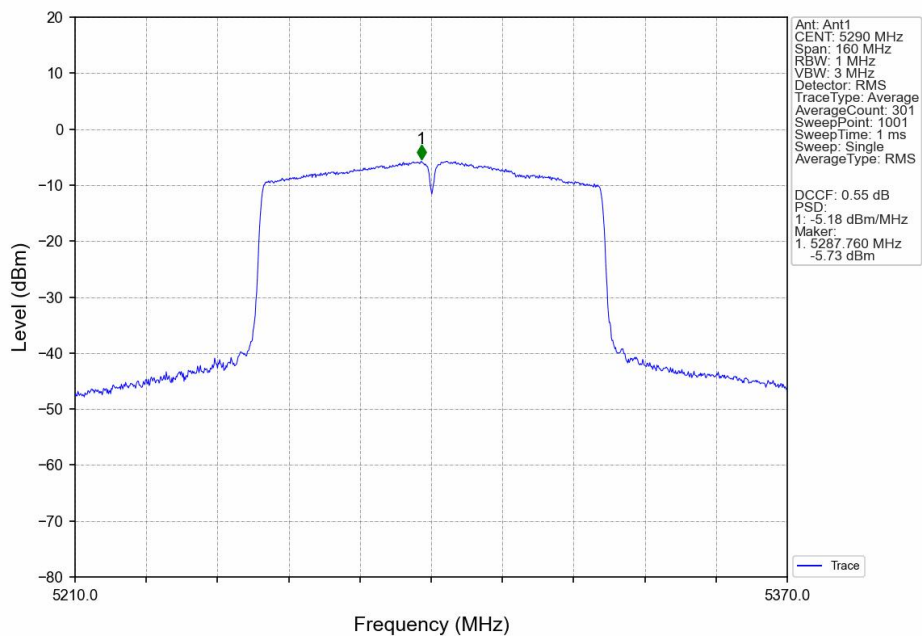


FCC ID: 2BWH8-S26-UITRA

802.11ac(VHT40)_HCH_5310MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5290MHz_Ant1_NTNV



FCC ID: 2BWH8-S26-UITRA

5. Frequency Stability

5.1 Test Result

5.1.1 Ant1

Mode	TX Type	Frequency (MHz)	Temperature (°C)	Ant1		Limit (MHz)	Verdict
				Voltage	Measured Frequency (MHz)		
Carrier Wave	SISO	5260	20	LV	5259.988	5250 to 5350	Pass
				NV	5259.987	5250 to 5350	Pass
				HV	5259.987	5250 to 5350	Pass
			-30	NV	5259.987	5250 to 5350	Pass
			-20	NV	5259.987	5250 to 5350	Pass
			-10	NV	5259.986	5250 to 5350	Pass
			0	NV	5259.986	5250 to 5350	Pass
			10	NV	5259.986	5250 to 5350	Pass
			30	NV	5259.986	5250 to 5350	Pass
			40	NV	5259.986	5250 to 5350	Pass
			50	NV	5259.986	5250 to 5350	Pass
		5300	20	LV	5299.985	5250 to 5350	Pass
				NV	5299.986	5250 to 5350	Pass
				HV	5299.985	5250 to 5350	Pass
			-30	NV	5299.985	5250 to 5350	Pass
			-20	NV	5299.985	5250 to 5350	Pass
			-10	NV	5299.985	5250 to 5350	Pass
			0	NV	5299.985	5250 to 5350	Pass
			10	NV	5299.985	5250 to 5350	Pass
			30	NV	5299.985	5250 to 5350	Pass
			40	NV	5299.985	5250 to 5350	Pass
			50	NV	5299.985	5250 to 5350	Pass
		5320	20	LV	5319.987	5250 to 5350	Pass
				NV	5319.987	5250 to 5350	Pass
				HV	5319.986	5250 to 5350	Pass
			-30	NV	5319.986	5250 to 5350	Pass
			-20	NV	5319.986	5250 to 5350	Pass
			-10	NV	5319.986	5250 to 5350	Pass
			0	NV	5319.986	5250 to 5350	Pass
			10	NV	5319.985	5250 to 5350	Pass
			30	NV	5319.985	5250 to 5350	Pass
			40	NV	5319.985	5250 to 5350	Pass
			50	NV	5319.985	5250 to 5350	Pass
		5270	20	LV	5269.989	5250 to 5350	Pass
				NV	5269.988	5250 to 5350	Pass
				HV	5269.988	5250 to 5350	Pass
			-30	NV	5269.987	5250 to 5350	Pass
			-20	NV	5269.987	5250 to 5350	Pass
			-10	NV	5269.987	5250 to 5350	Pass
			0	NV	5269.987	5250 to 5350	Pass
			10	NV	5269.986	5250 to 5350	Pass
			30	NV	5269.986	5250 to 5350	Pass
			40	NV	5269.986	5250 to 5350	Pass
			50	NV	5269.986	5250 to 5350	Pass
		5310	20	LV	5309.987	5250 to 5350	Pass
				NV	5309.987	5250 to 5350	Pass
				HV	5309.986	5250 to 5350	Pass

FCC ID: 2BWH8-S26-UITRA

			-30	NV	5309.986	5250 to 5350	Pass
			-20	NV	5309.986	5250 to 5350	Pass
			-10	NV	5309.986	5250 to 5350	Pass
			0	NV	5309.986	5250 to 5350	Pass
			10	NV	5309.986	5250 to 5350	Pass
			30	NV	5309.986	5250 to 5350	Pass
			40	NV	5309.985	5250 to 5350	Pass
			50	NV	5309.985	5250 to 5350	Pass
		5290	20	LV	5289.993	5250 to 5350	Pass
				NV	5289.992	5250 to 5350	Pass
				HV	5289.990	5250 to 5350	Pass
			-30	NV	5289.990	5250 to 5350	Pass
			-20	NV	5289.989	5250 to 5350	Pass
			-10	NV	5289.989	5250 to 5350	Pass
			0	NV	5289.988	5250 to 5350	Pass
			10	NV	5289.987	5250 to 5350	Pass
			30	NV	5289.987	5250 to 5350	Pass
			40	NV	5289.987	5250 to 5350	Pass
			50	NV	5289.987	5250 to 5350	Pass