



Appendix D for SHEM200300156704

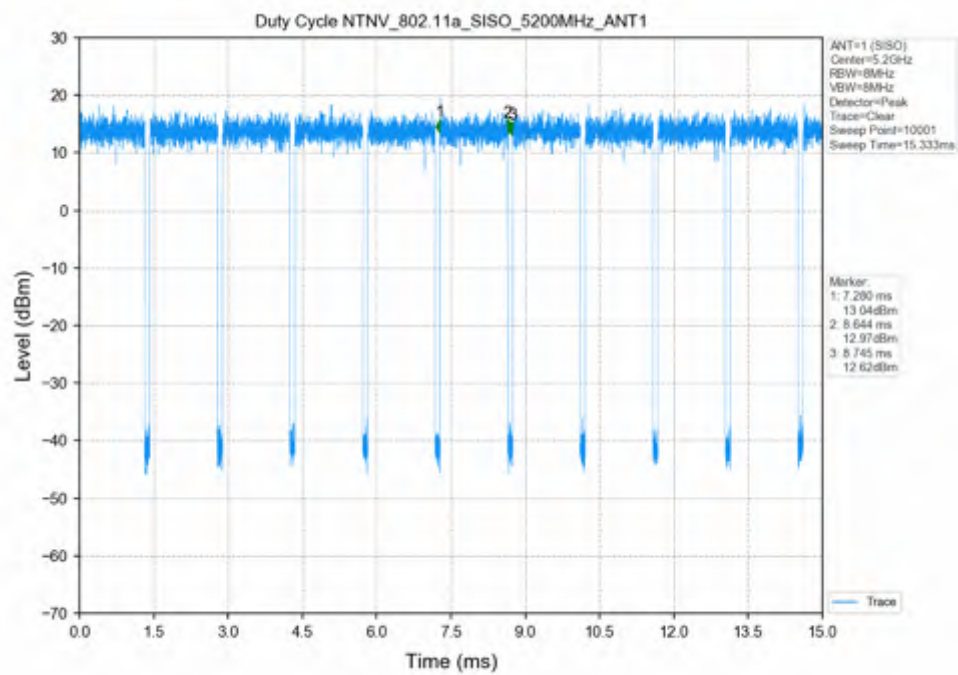
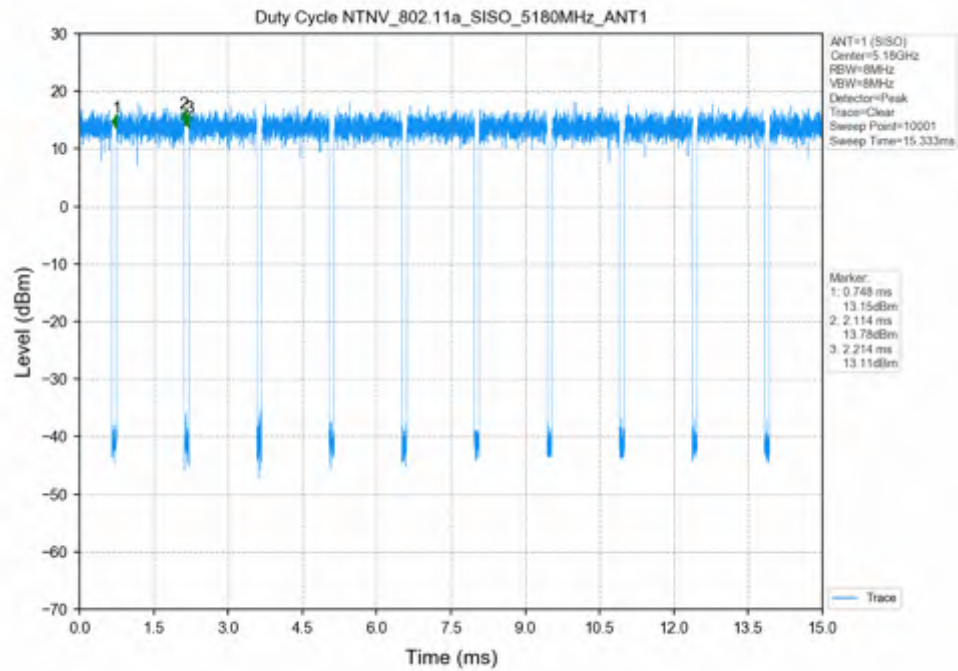
1. Duty Cycle

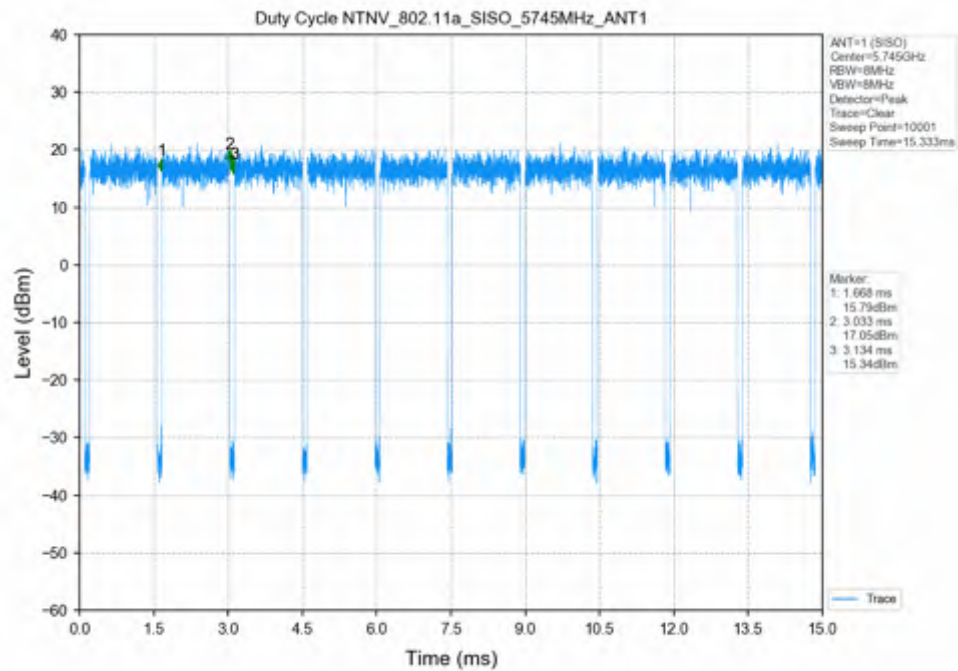
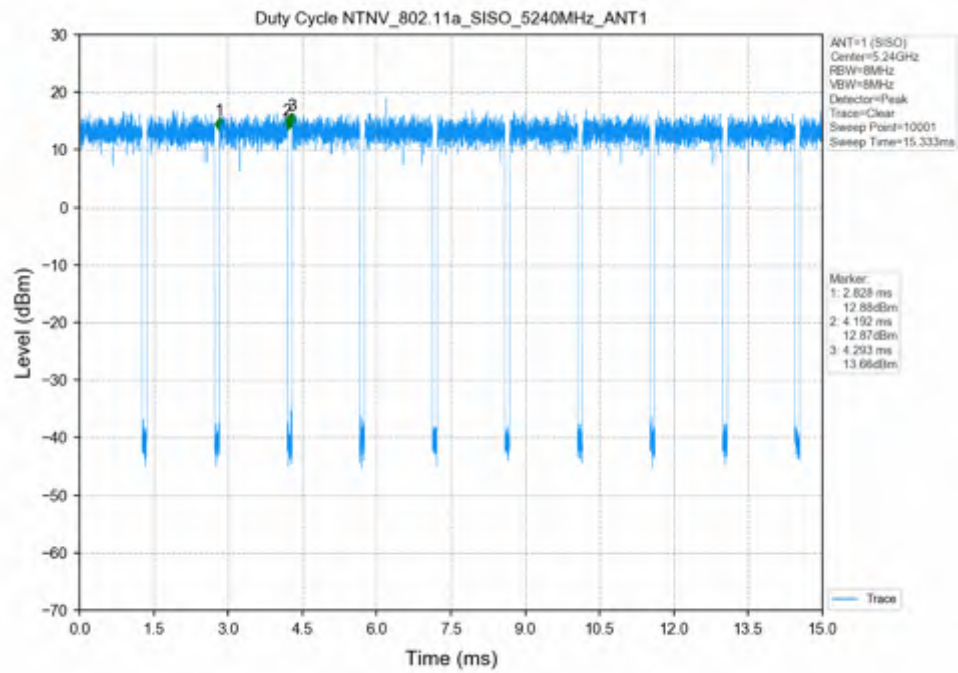
1.1 Test Result

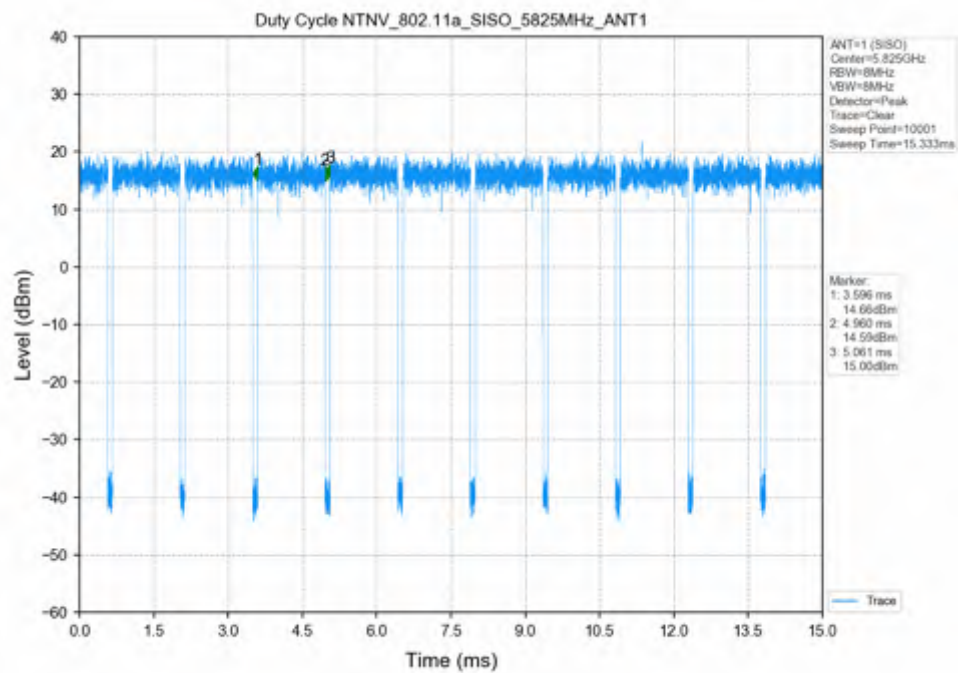
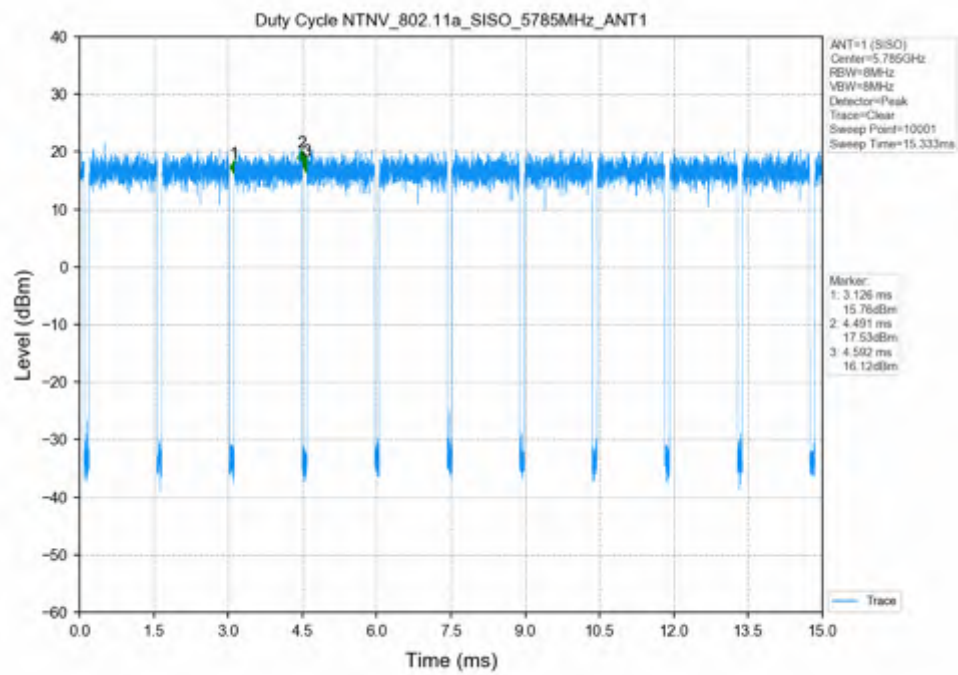
Test Mode	Channel Frequency(MHz)	TX Type	ANT No.	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11a	5180	SISO	1	1.366	1.466	93.18	0.31
	5200	SISO	1	1.364	1.465	93.11	0.31
	5240	SISO	1	1.364	1.465	93.11	0.31
	5745	SISO	1	1.365	1.466	93.11	0.31
	5785	SISO	1	1.365	1.466	93.11	0.31
	5825	SISO	1	1.364	1.465	93.11	0.31
802.11n(HT20)	5180	SISO	1	1.307	1.409	92.76	0.33
	5200	SISO	1	1.307	1.409	92.76	0.33
	5240	SISO	1	1.308	1.410	92.77	0.33
	5745	SISO	1	1.308	1.410	92.77	0.33
	5785	SISO	1	1.308	1.410	92.77	0.33
	5825	SISO	1	1.308	1.410	92.77	0.33
802.11n(HT40)	5190	SISO	1	0.648	0.749	86.52	0.63
	5230	SISO	1	0.648	0.749	86.52	0.63
	5755	SISO	1	0.648	0.749	86.52	0.63
	5795	SISO	1	0.648	0.750	86.40	0.63
	5825	SISO	1	0.648	0.750	86.40	0.63
802.11ac(VHT20)	5180	SISO	1	1.316	1.418	92.81	0.32
	5200	SISO	1	1.316	1.418	92.81	0.32
	5240	SISO	1	1.316	1.418	92.81	0.32
	5745	SISO	1	1.316	1.418	92.81	0.32
	5785	SISO	1	1.315	1.417	92.80	0.32
	5825	SISO	1	1.316	1.418	92.81	0.32
	5825	SISO	1	1.316	1.418	92.81	0.32
802.11ac(VHT40)	5190	SISO	1	0.656	0.758	86.54	0.63
	5230	SISO	1	0.656	0.757	86.66	0.62
	5755	SISO	1	0.656	0.758	86.54	0.63
	5795	SISO	1	0.656	0.758	86.54	0.63
802.11ac(VHT80)	5210	SISO	1	0.326	0.426	76.53	1.16
	5775	SISO	1	0.325	0.425	76.47	1.17

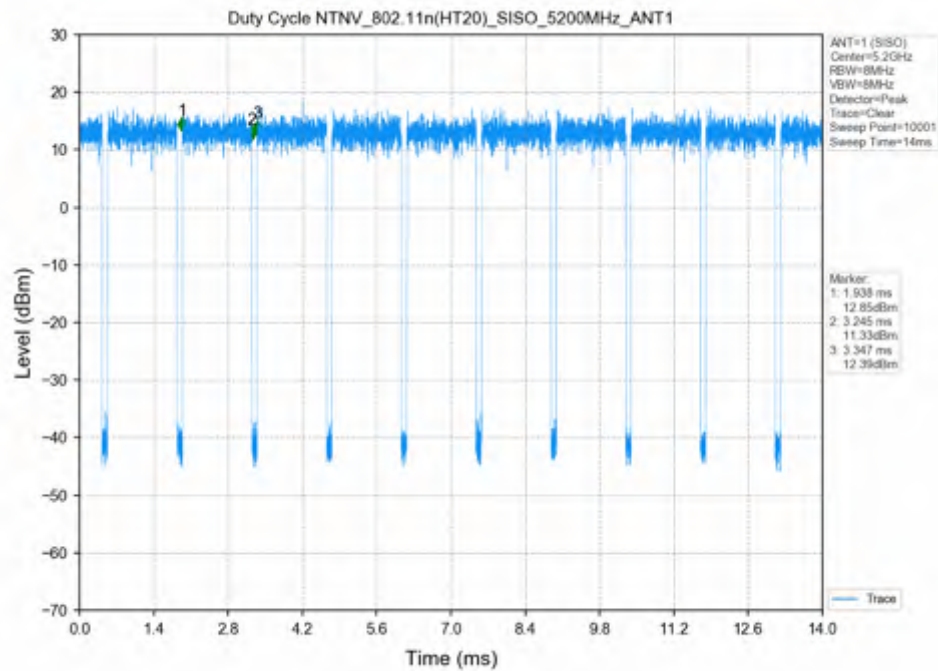
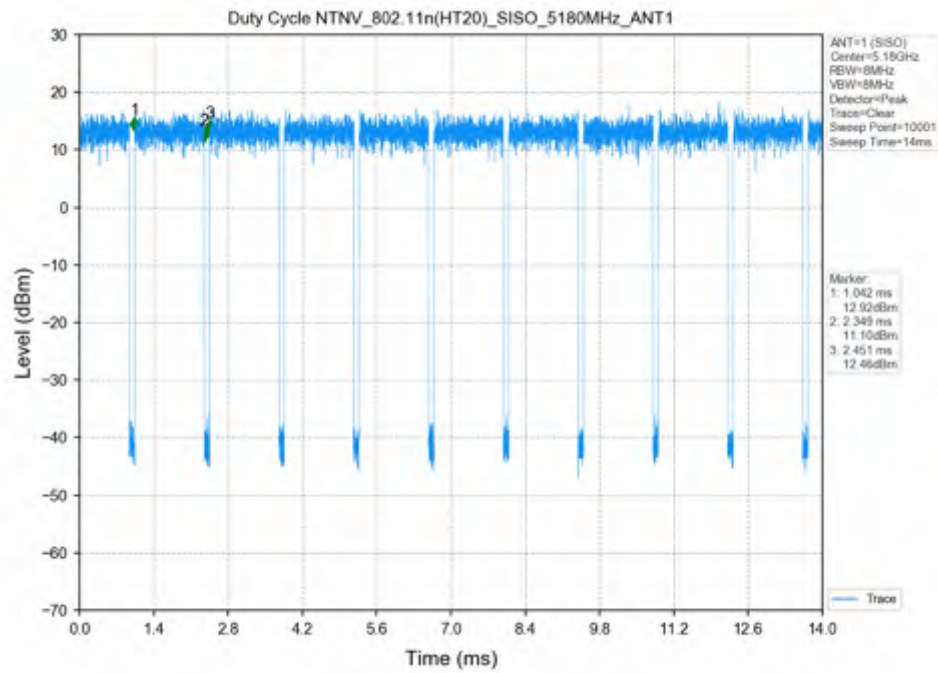


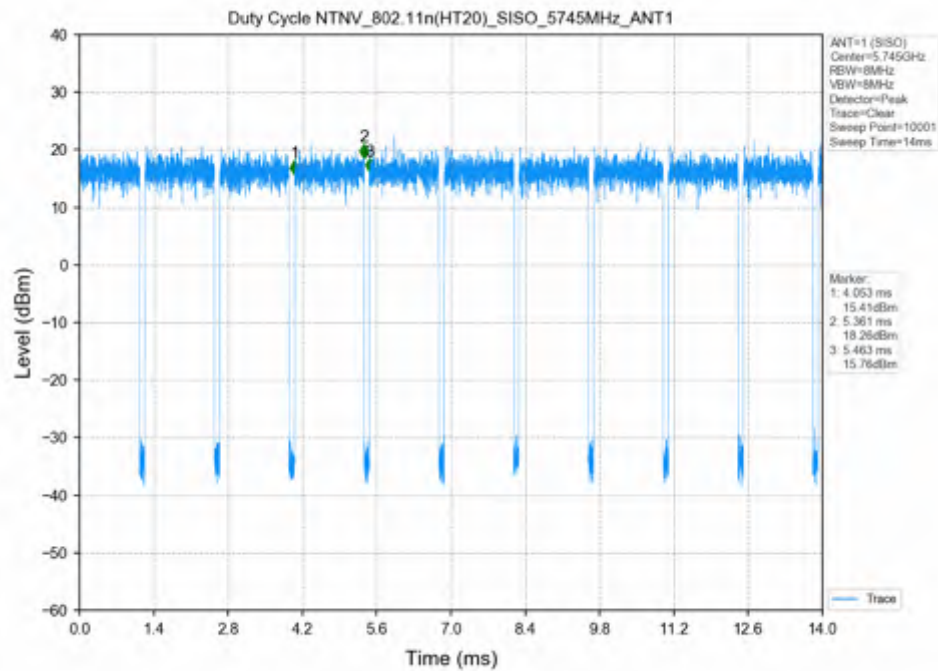
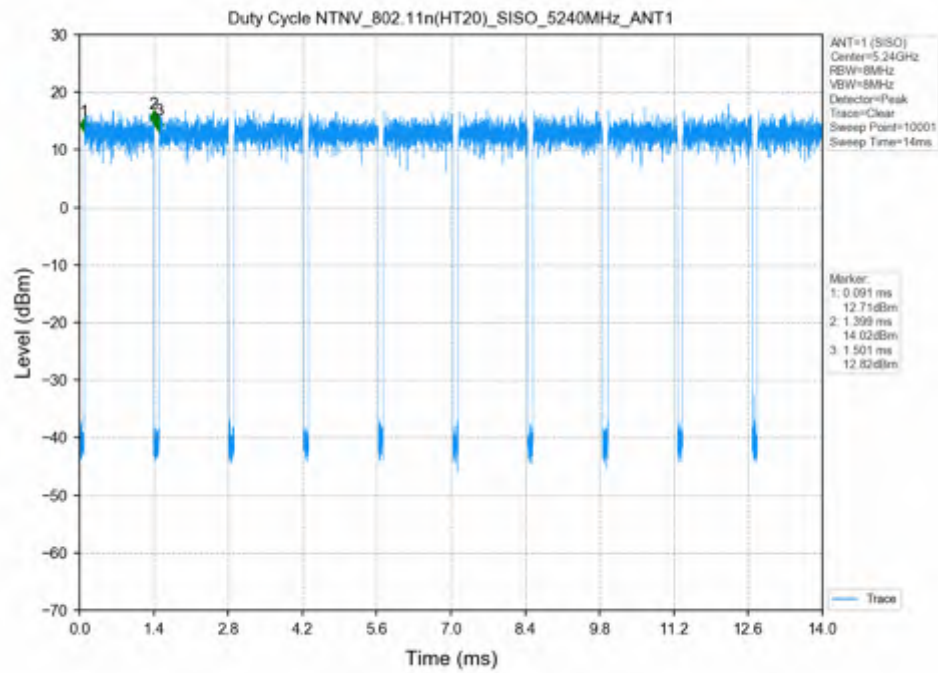
1.2 Test Graph

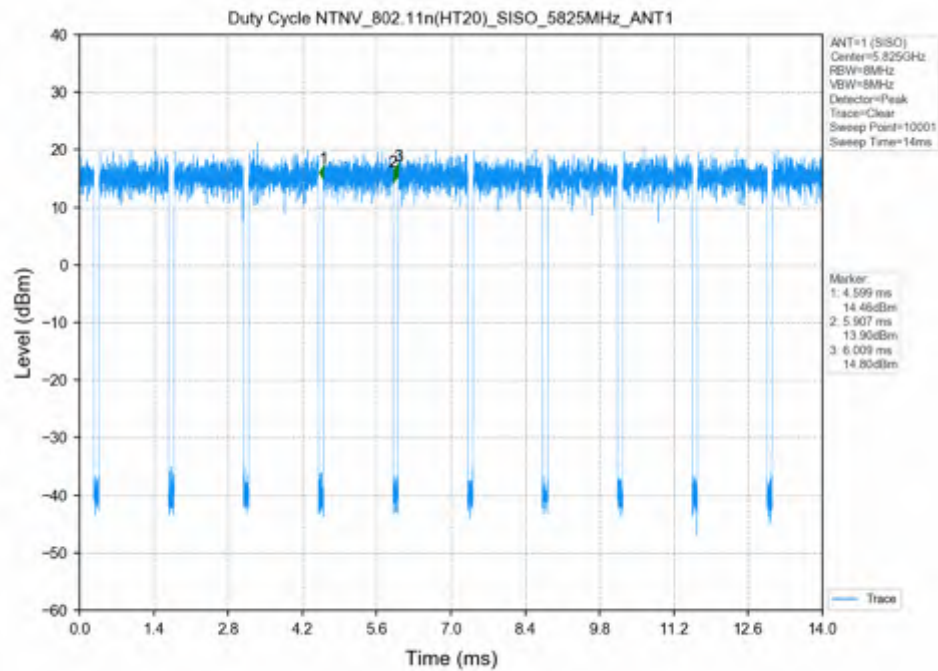
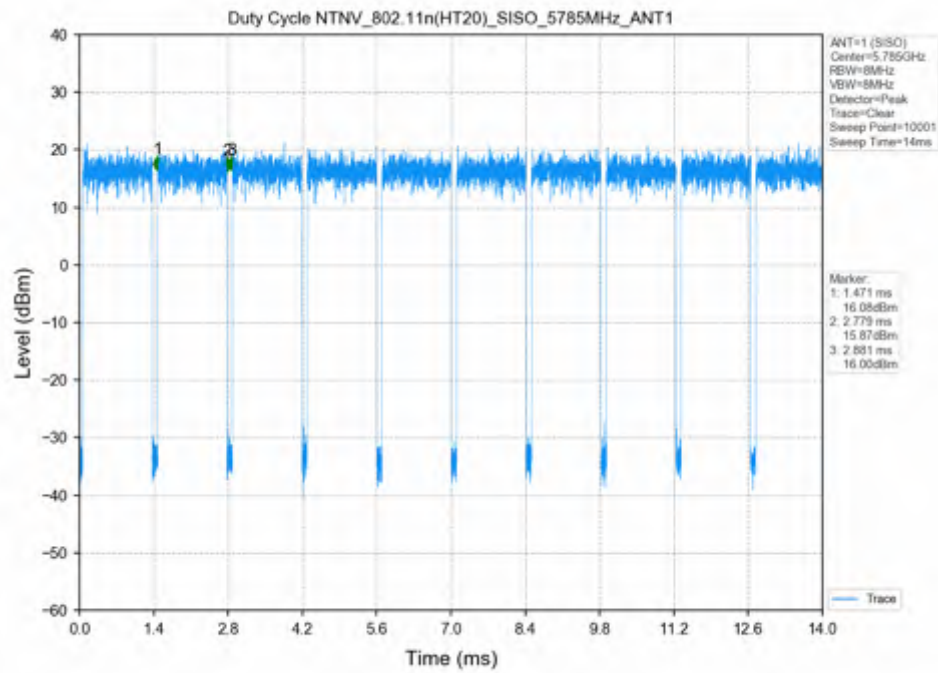


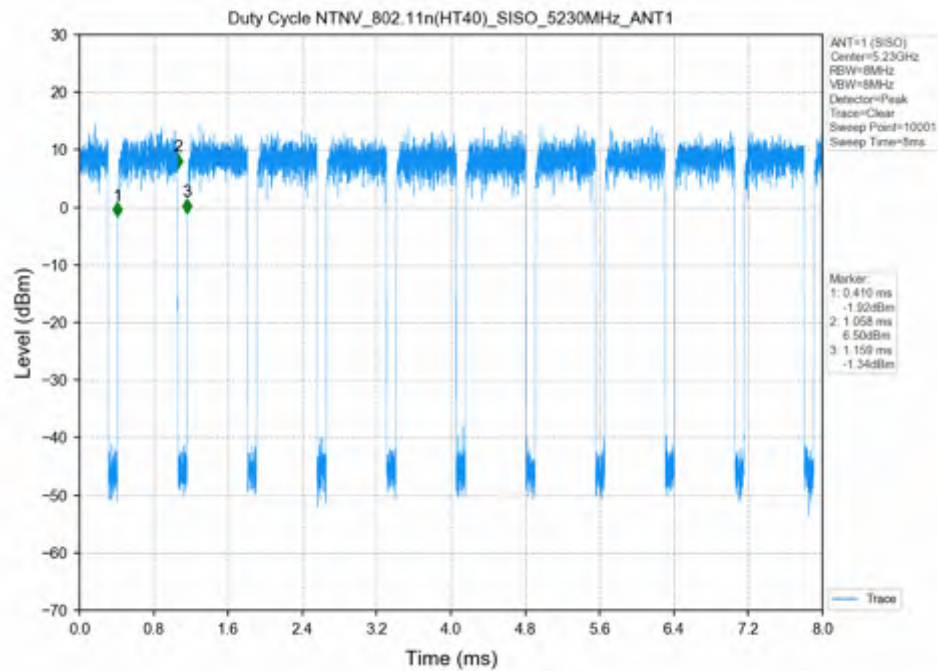
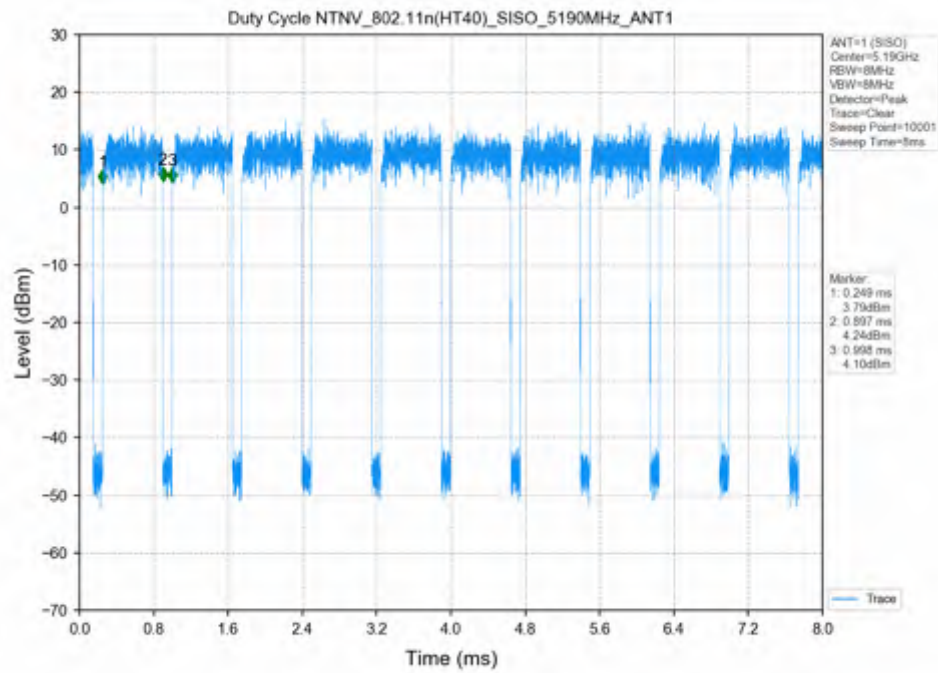


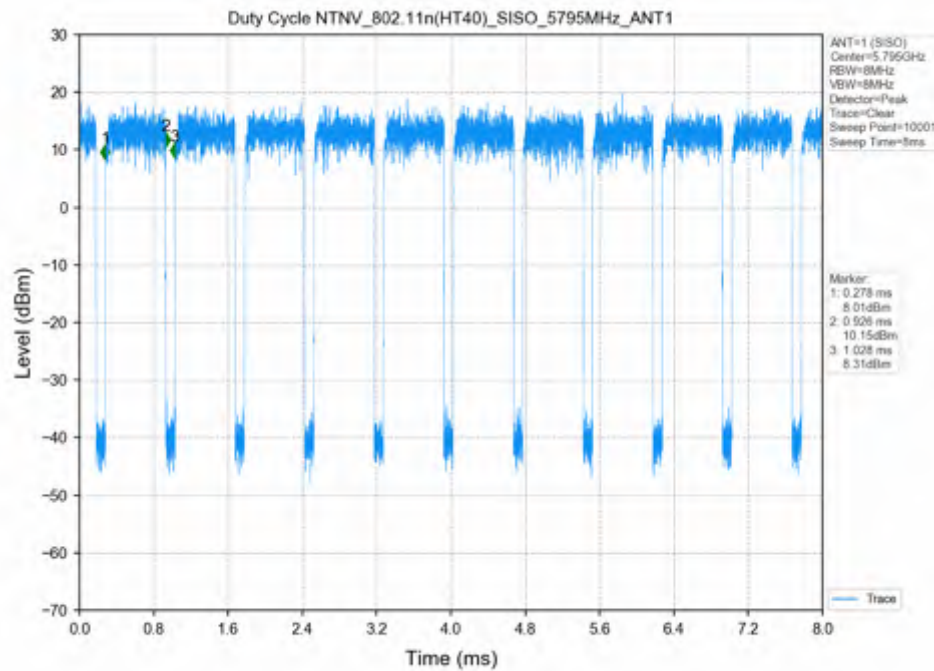
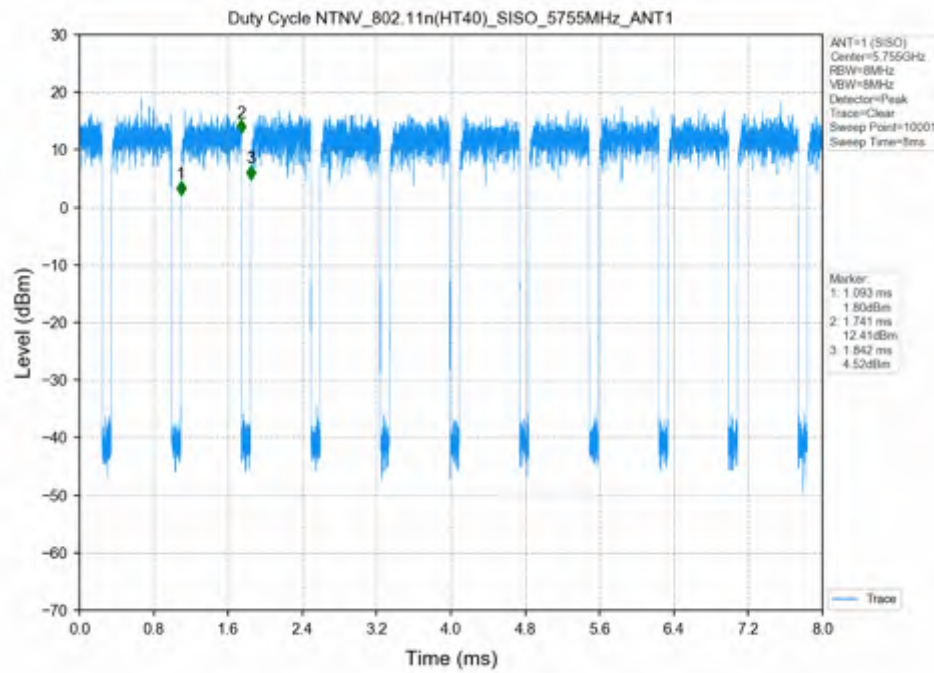


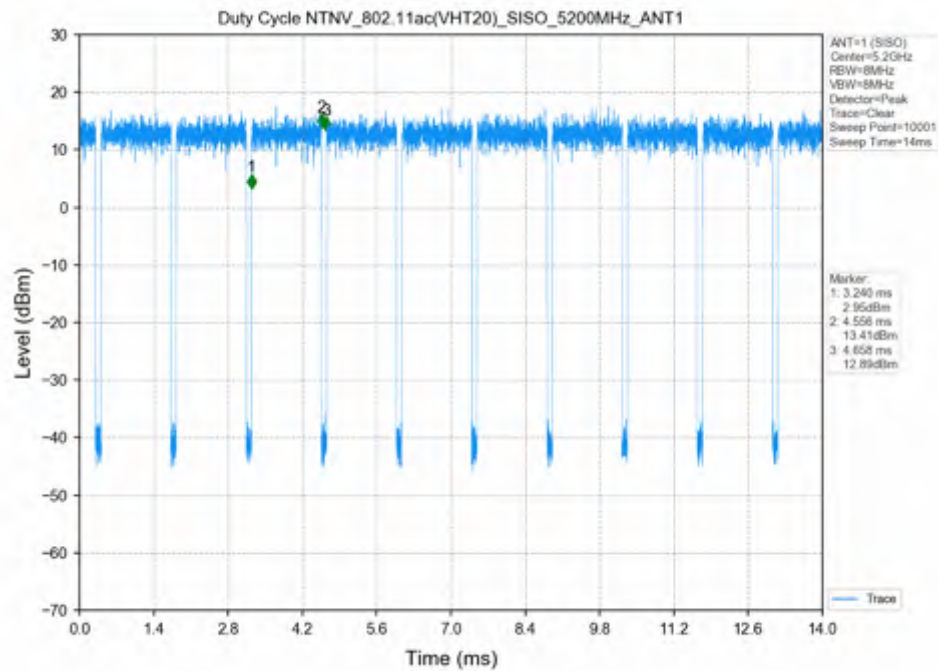
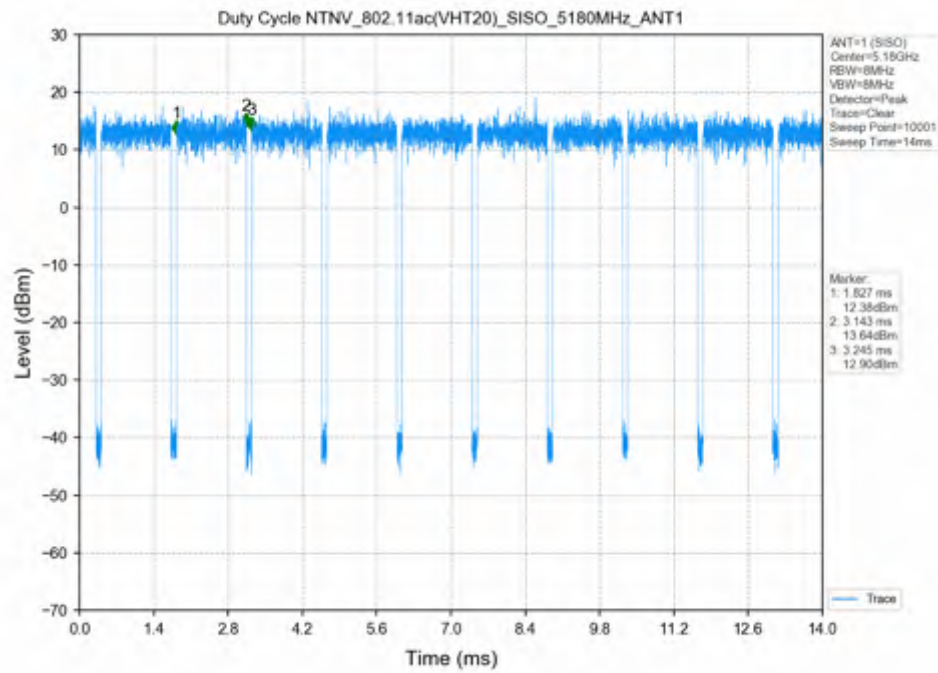


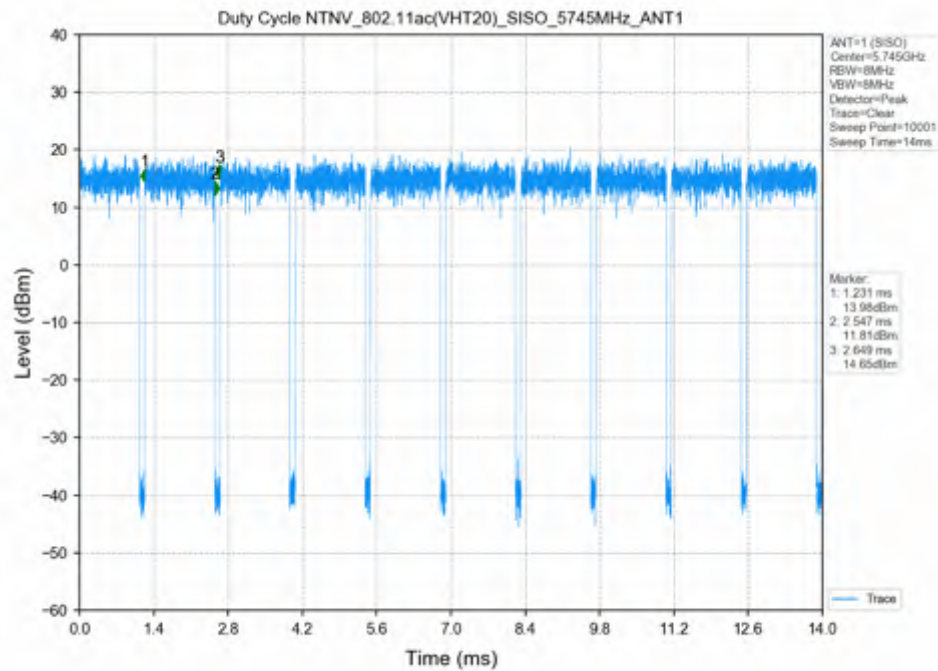
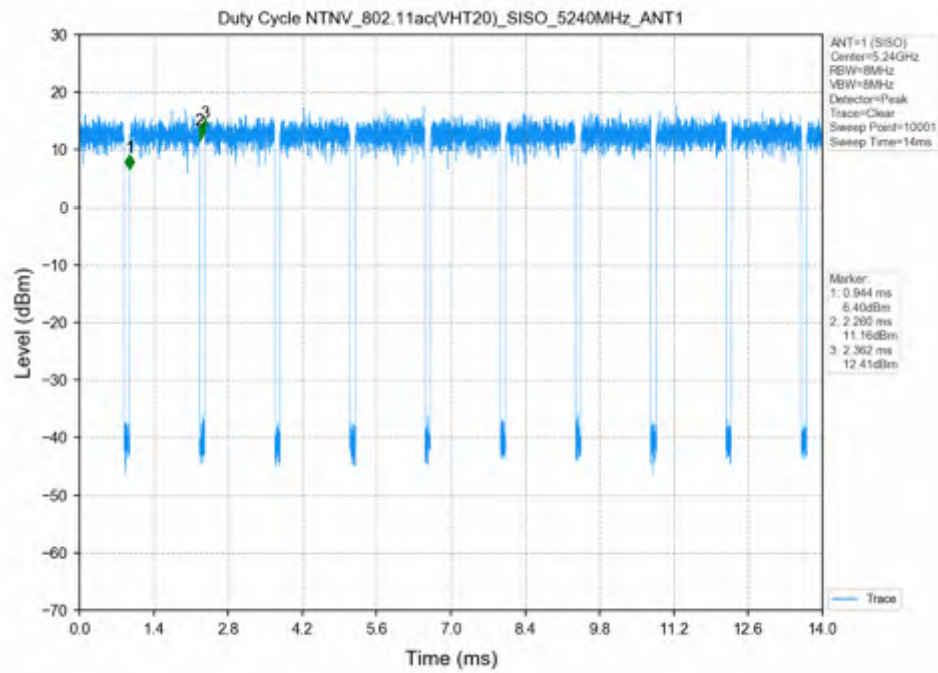


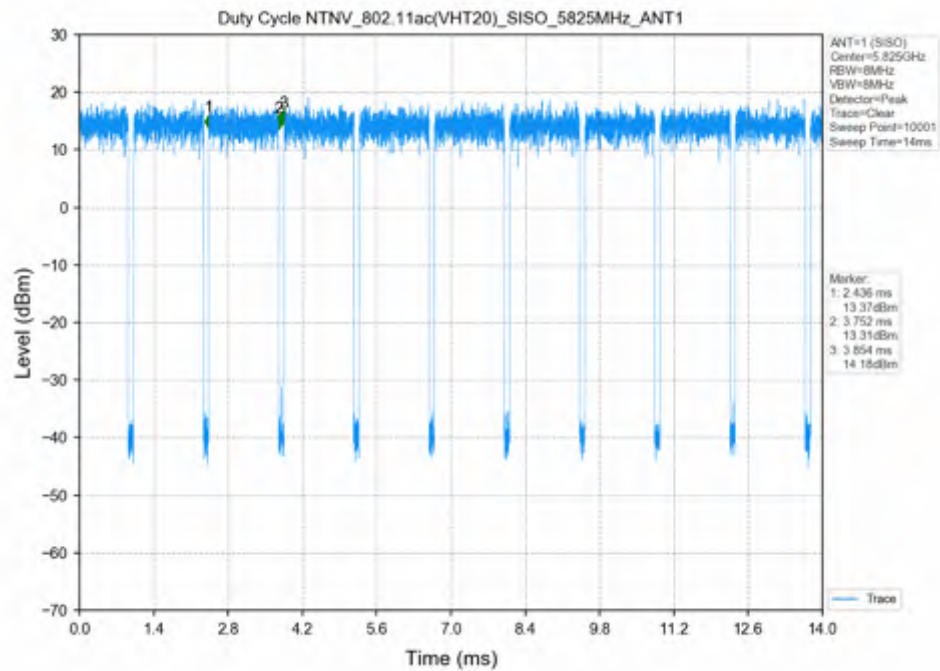
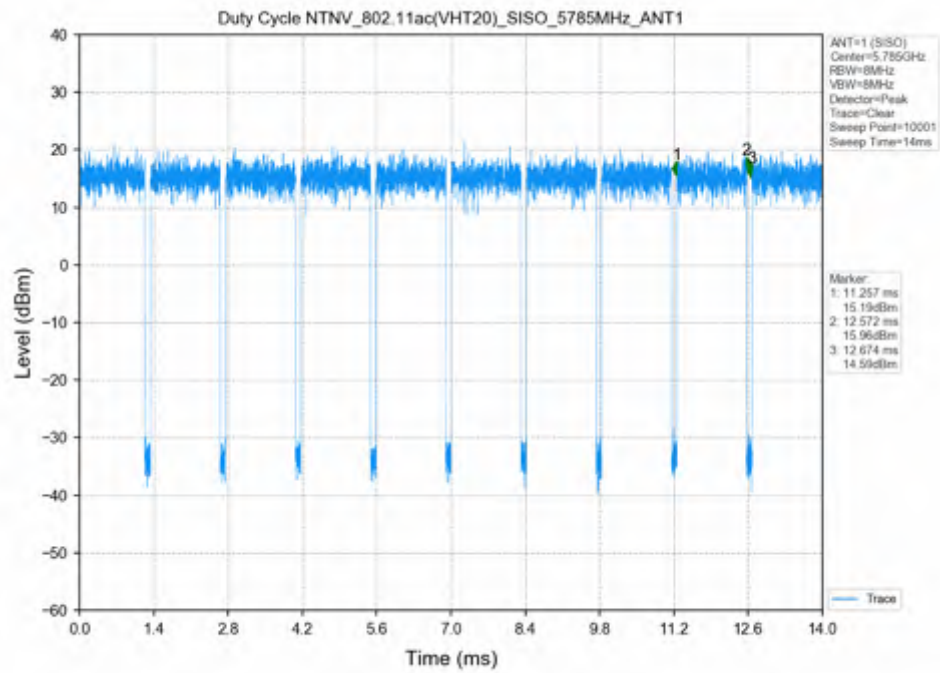


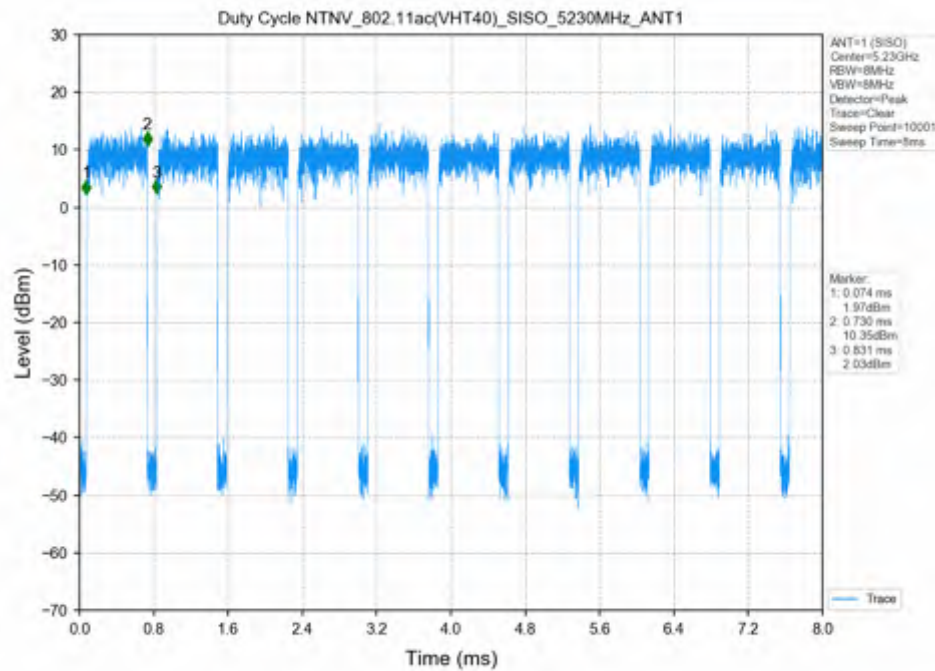
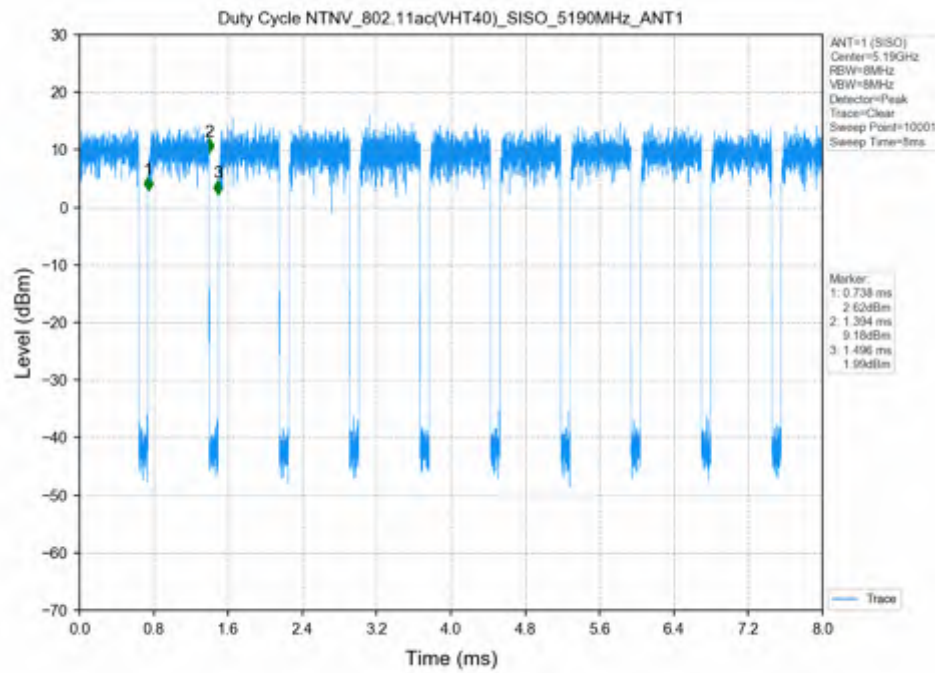


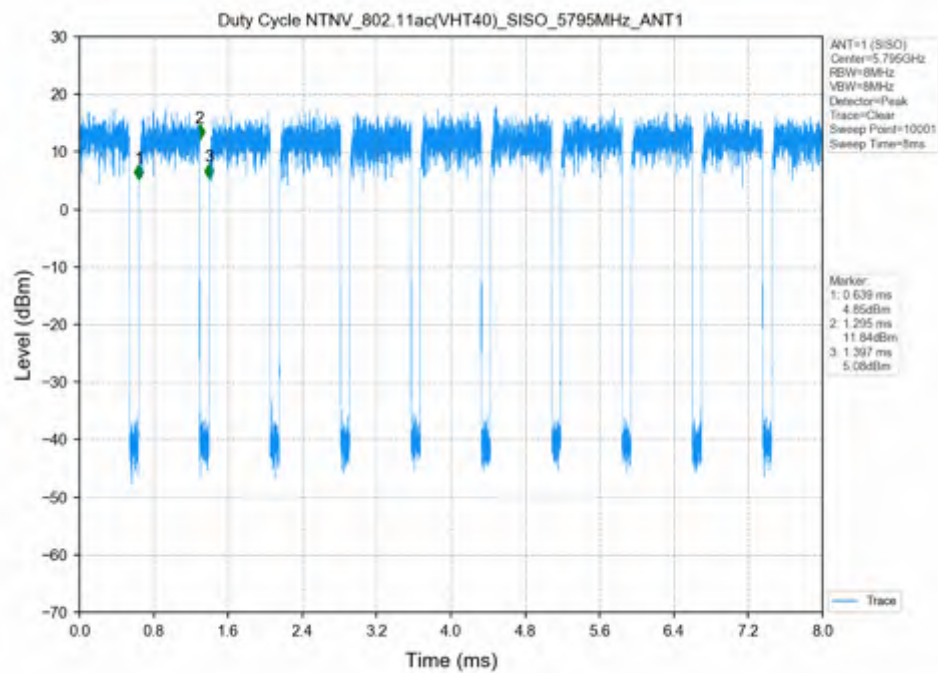
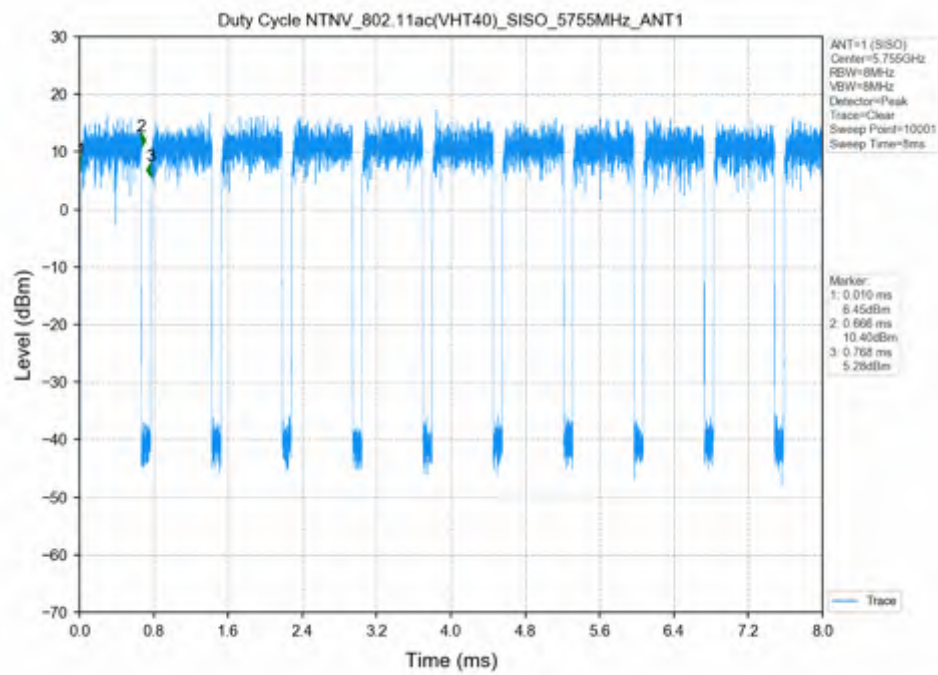


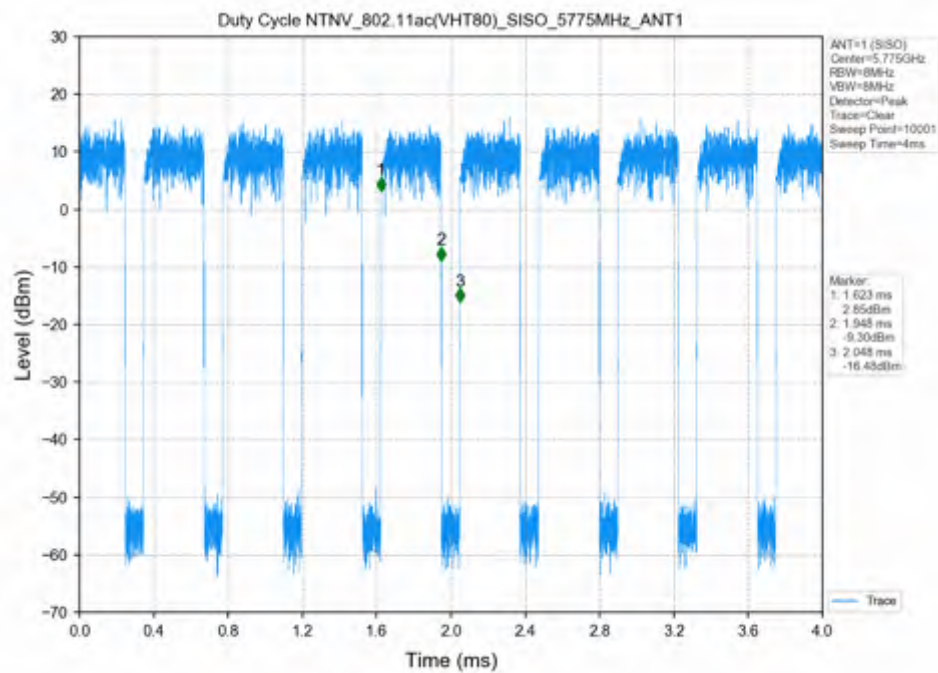
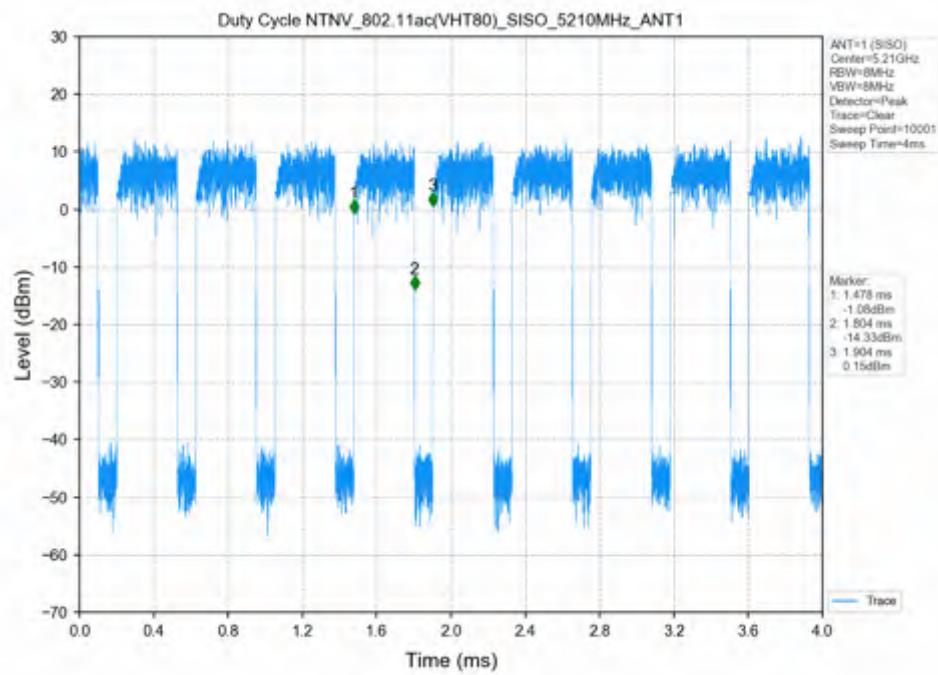














2. Bandwidth

2.1 Test Result

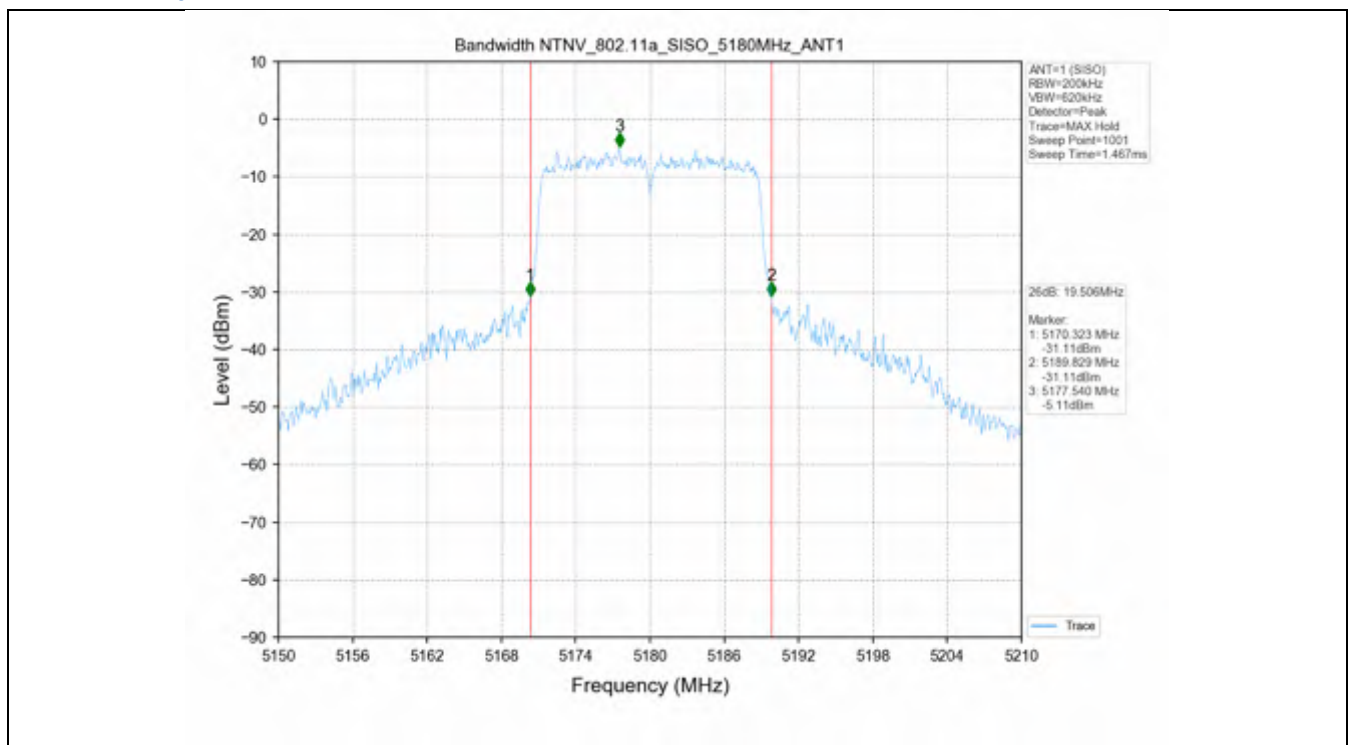
Test Mode	Frequency (MHz)	TX Type	ANT No.	Emission Bandwidth		Verdict
				Test Result (MHz)	Limits (MHz)	
802.11a	5180	SISO	1	19.506	Only for Report Use	PASS
	5200	SISO	1	19.632	Only for Report Use	PASS
	5240	SISO	1	21.259	Only for Report Use	PASS
	5745	SISO	1	17.383	≥0.5	PASS
	5785	SISO	1	17.257	≥0.5	PASS
	5825	SISO	1	16.958	≥0.5	PASS
802.11n(HT20)	5180	SISO	1	21.179	Only for Report Use	PASS
	5200	SISO	1	23.784	Only for Report Use	PASS
	5240	SISO	1	20.185	Only for Report Use	PASS
	5745	SISO	1	17.559	≥0.5	PASS
	5785	SISO	1	17.583	≥0.5	PASS
	5825	SISO	1	17.310	≥0.5	PASS
802.11n(HT40)	5190	SISO	1	42.038	Only for Report Use	PASS
	5230	SISO	1	41.341	Only for Report Use	PASS
	5755	SISO	1	33.968	≥0.5	PASS
	5795	SISO	1	35.274	≥0.5	PASS
802.11ac(VHT20)	5180	SISO	1	20.735	Only for Report Use	PASS
	5200	SISO	1	22.026	Only for Report Use	PASS
	5240	SISO	1	21.978	Only for Report Use	PASS
	5745	SISO	1	15.776	≥0.5	PASS
	5785	SISO	1	16.357	≥0.5	PASS
	5825	SISO	1	16.343	≥0.5	PASS
802.11ac(VHT40)	5190	SISO	1	42.298	Only for Report Use	PASS
	5230	SISO	1	40.901	Only for Report Use	PASS
	5755	SISO	1	35.278	≥0.5	PASS
	5795	SISO	1	35.222	≥0.5	PASS
802.11ac(VHT80)	5210	SISO	1	80.885	Only for Report Use	PASS
	5775	SISO	1	75.055	≥0.5	PASS

Test Mode	Frequency (MHz)	TX Type	ANT No.	99% Occupied Bandwidth	
				Test Result (MHz)	
802.11a	5180	SISO	1	17.638	Only for Report Use
	5200	SISO	1	17.652	Only for Report Use
	5240	SISO	1	17.648	Only for Report Use
	5745	SISO	1	23.767	Only for Report Use
	5785	SISO	1	20.446	Only for Report Use
	5825	SISO	1	18.366	Only for Report Use
802.11n(HT20)	5180	SISO	1	17.616	Only for Report Use
	5200	SISO	1	17.675	Only for Report Use
	5240	SISO	1	17.671	Only for Report Use
	5745	SISO	1	24.590	Only for Report Use
	5785	SISO	1	20.982	Only for Report Use
802.11n(HT40)	5190	SISO	1	36.477	Only for Report Use
	5230	SISO	1	36.456	Only for Report Use
	5755	SISO	1	44.426	Only for Report Use
	5795	SISO	1	38.117	Only for Report Use
802.11ac(VHT20)	5180	SISO	1	16.500	Only for Report Use



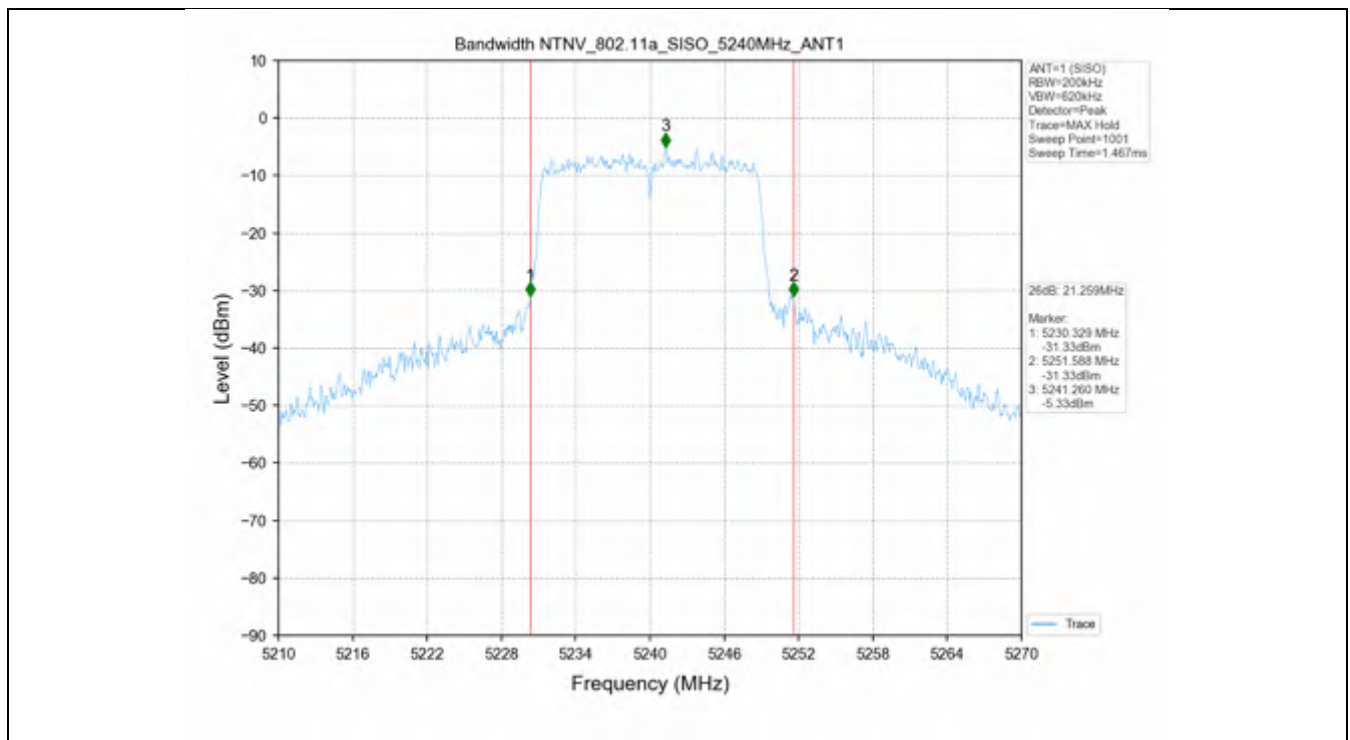
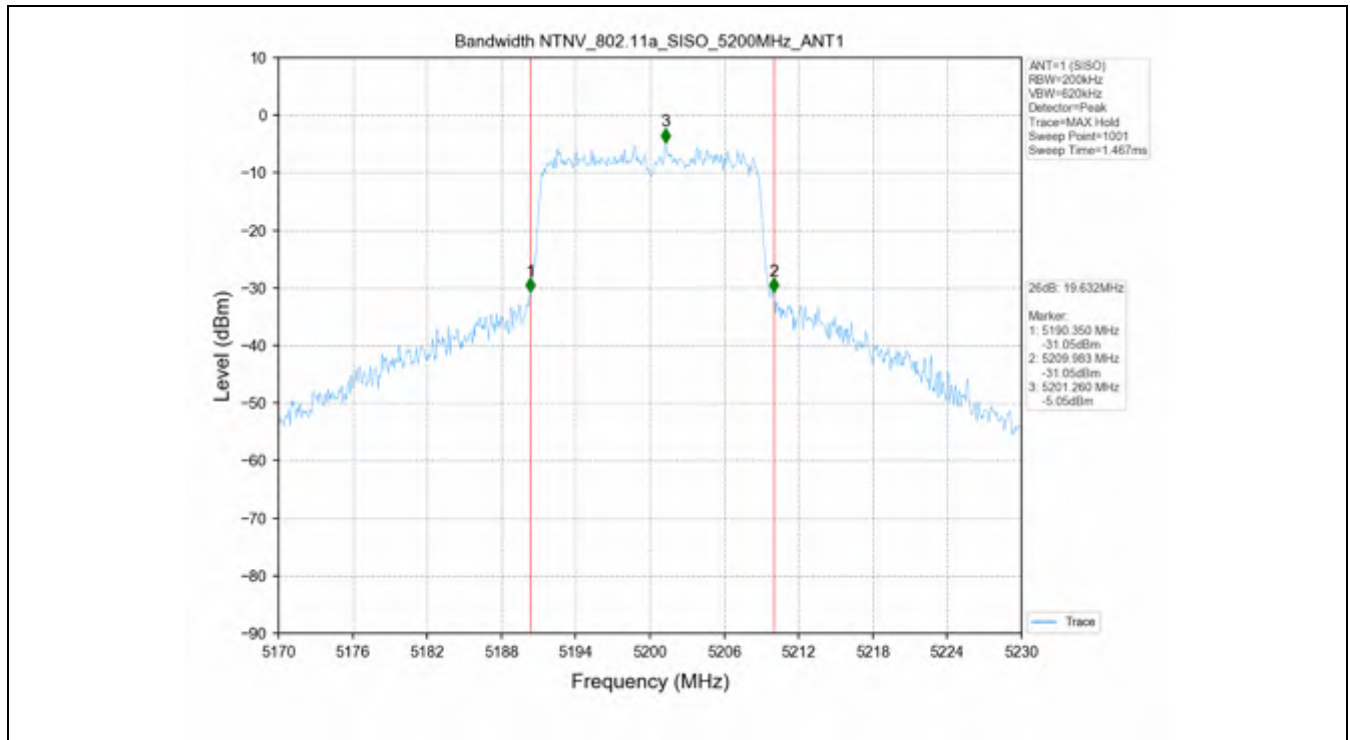
	5200	SISO	1	16.567	Only for Report Use
	5240	SISO	1	16.540	Only for Report Use
	5745	SISO	1	23.433	Only for Report Use
	5785	SISO	1	21.579	Only for Report Use
	5825	SISO	1	17.967	Only for Report Use
802.11ac(VHT40)	5190	SISO	1	36.526	Only for Report Use
	5230	SISO	1	36.406	Only for Report Use
	5755	SISO	1	45.246	Only for Report Use
	5795	SISO	1	38.507	Only for Report Use
802.11ac(VHT80)	5210	SISO	1	74.772	Only for Report Use
	5775	SISO	1	75.848	Only for Report Use

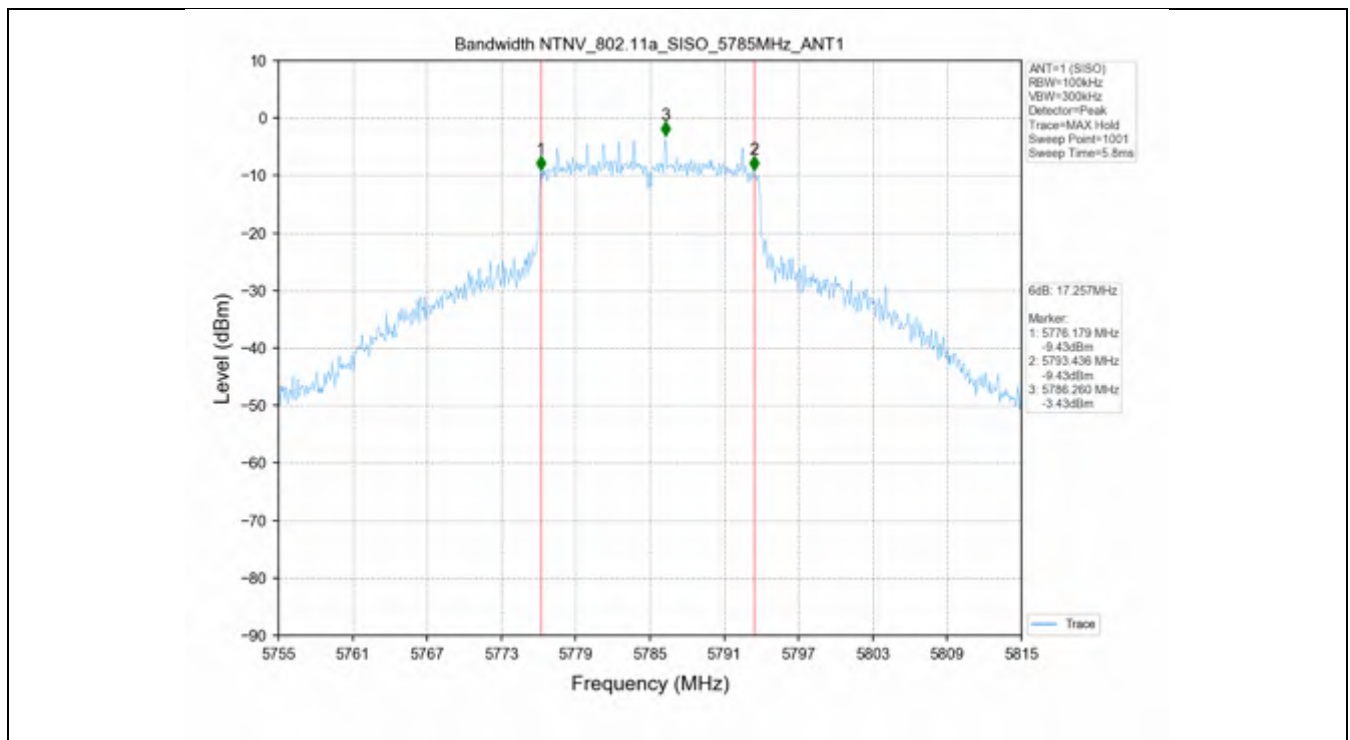
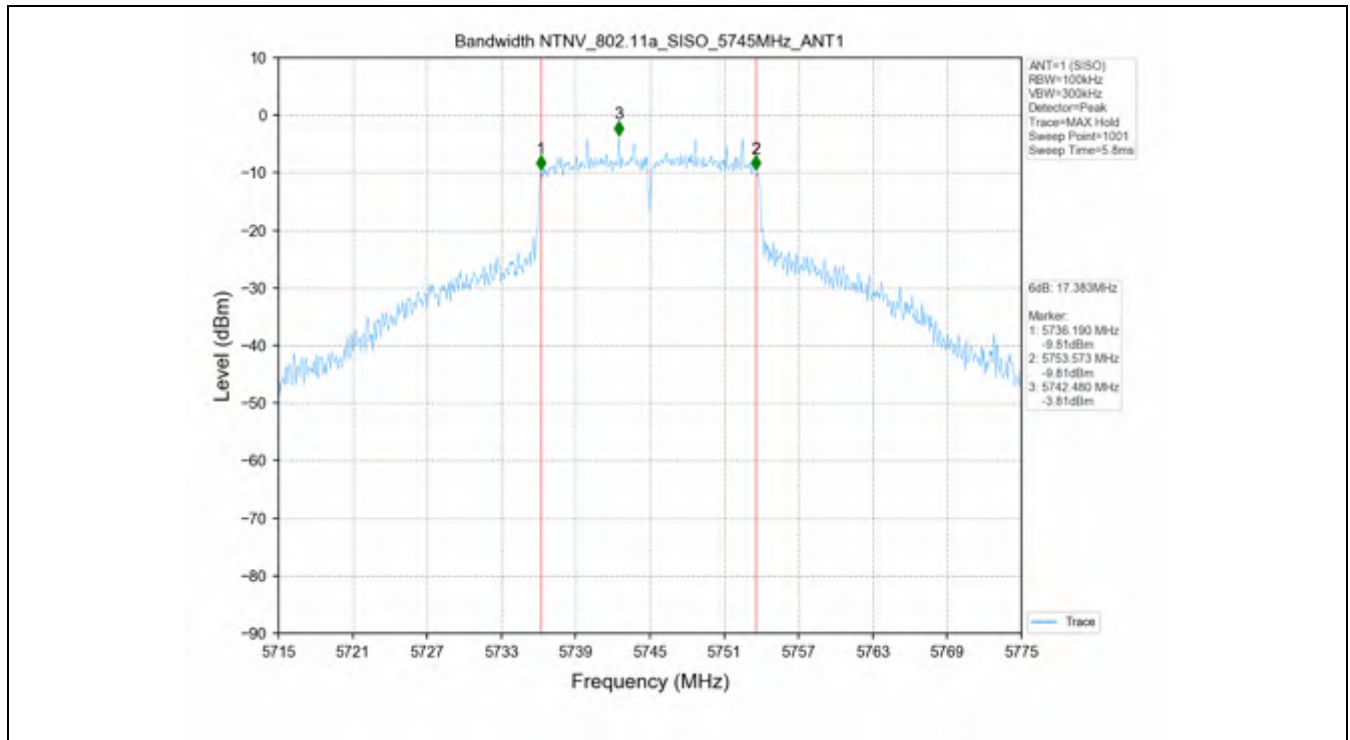
2.2 Test Graph - Emission Bandwidth

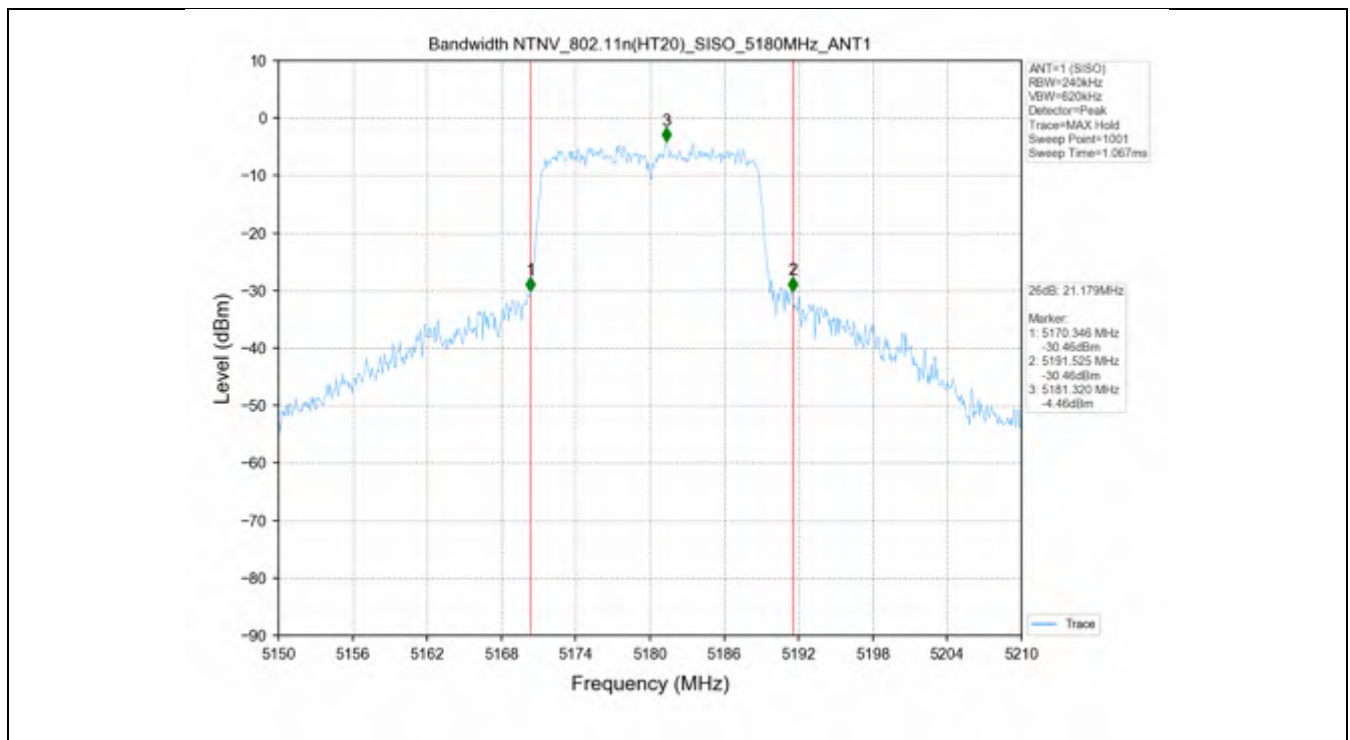
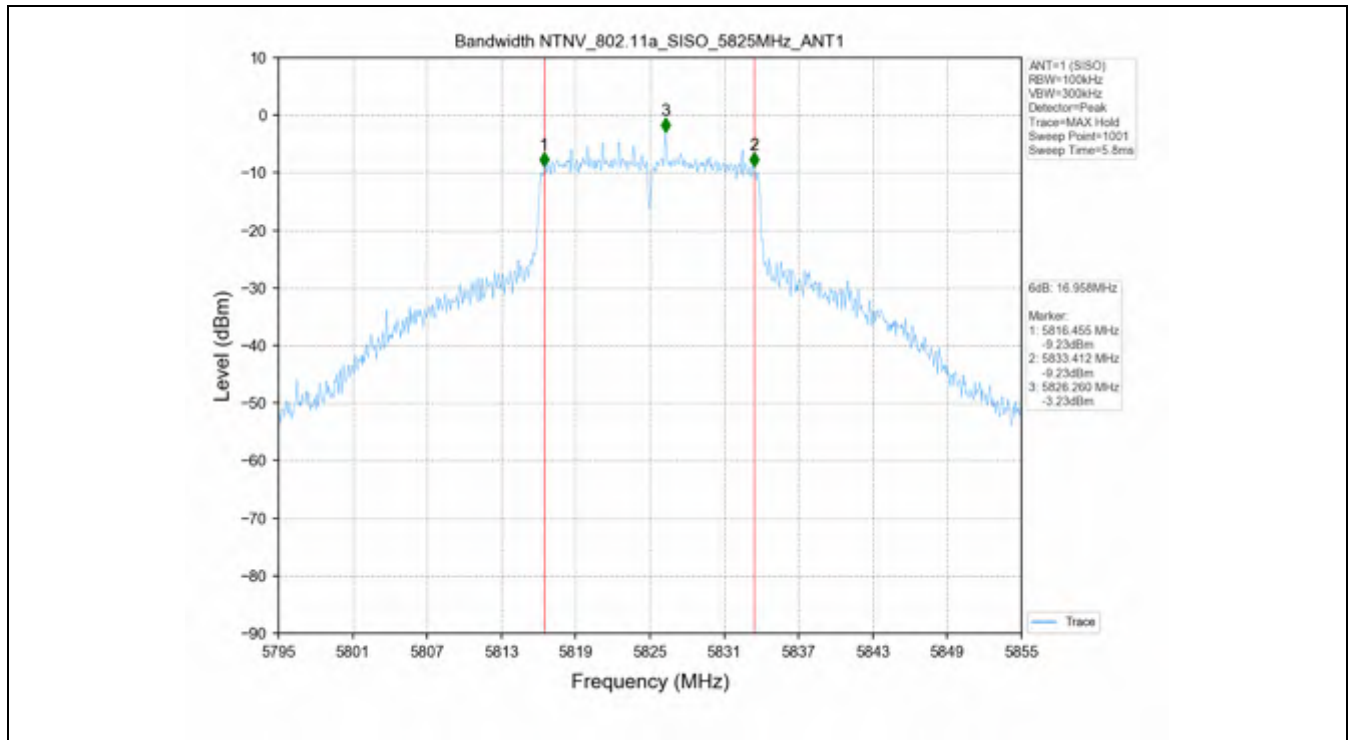


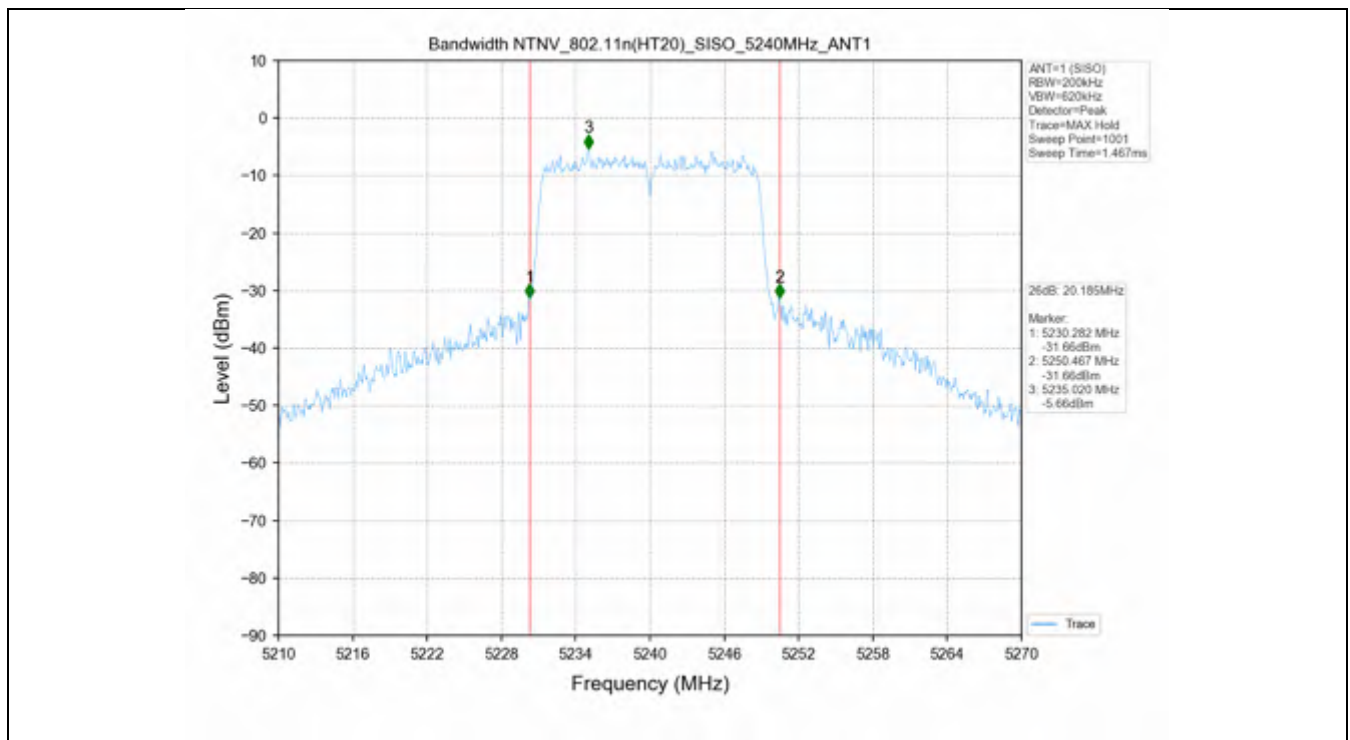
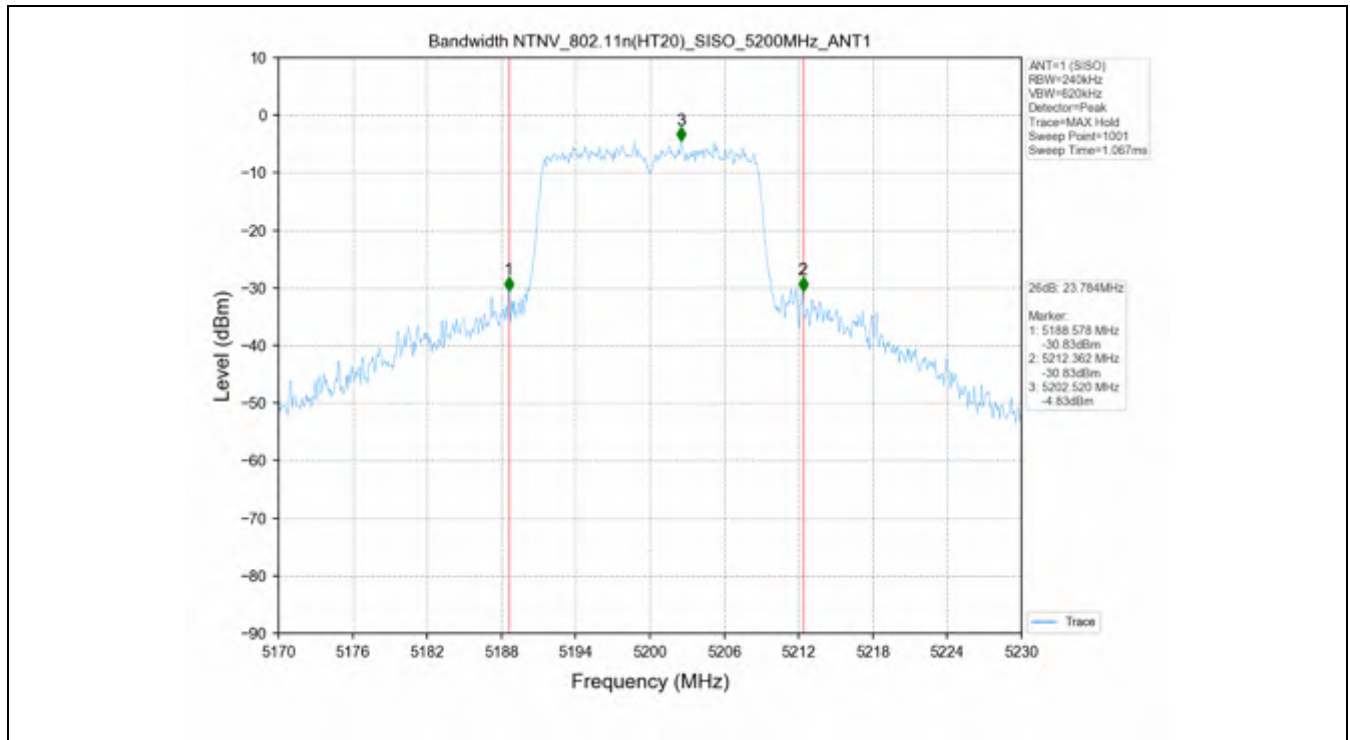


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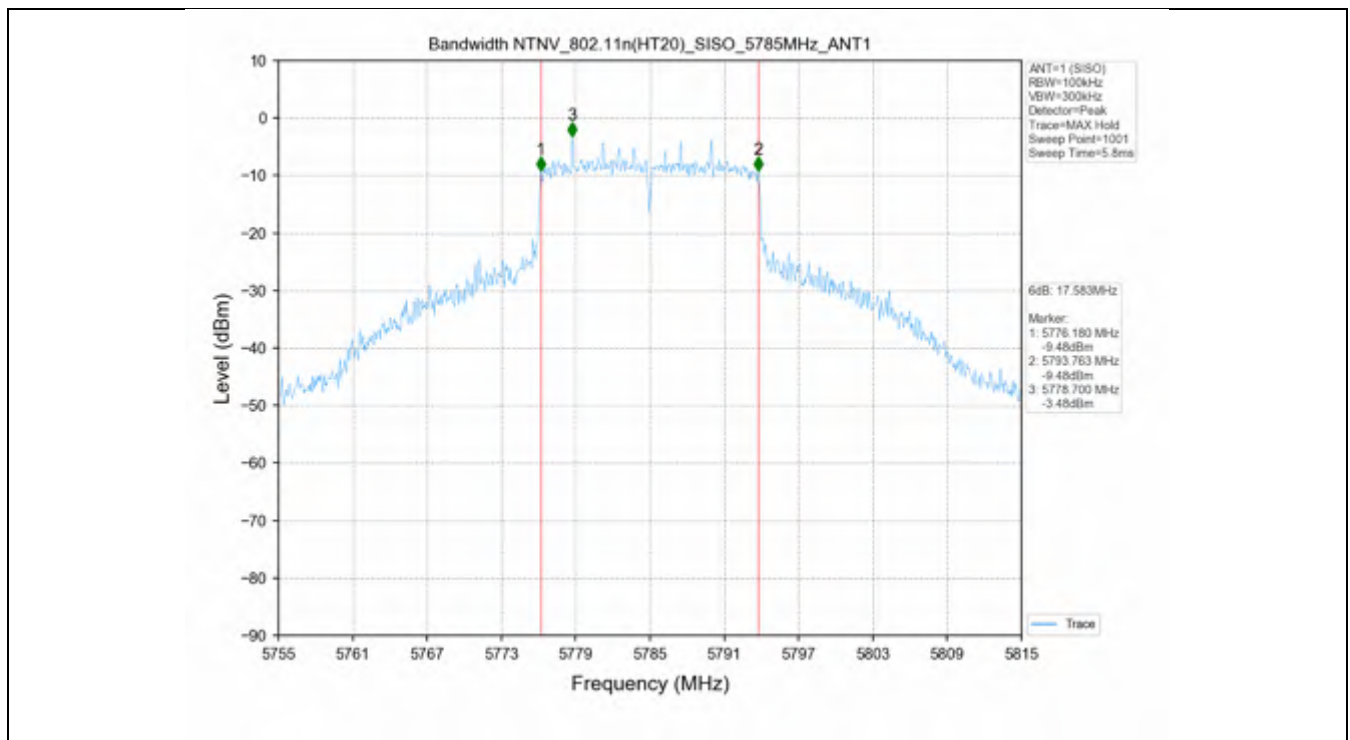
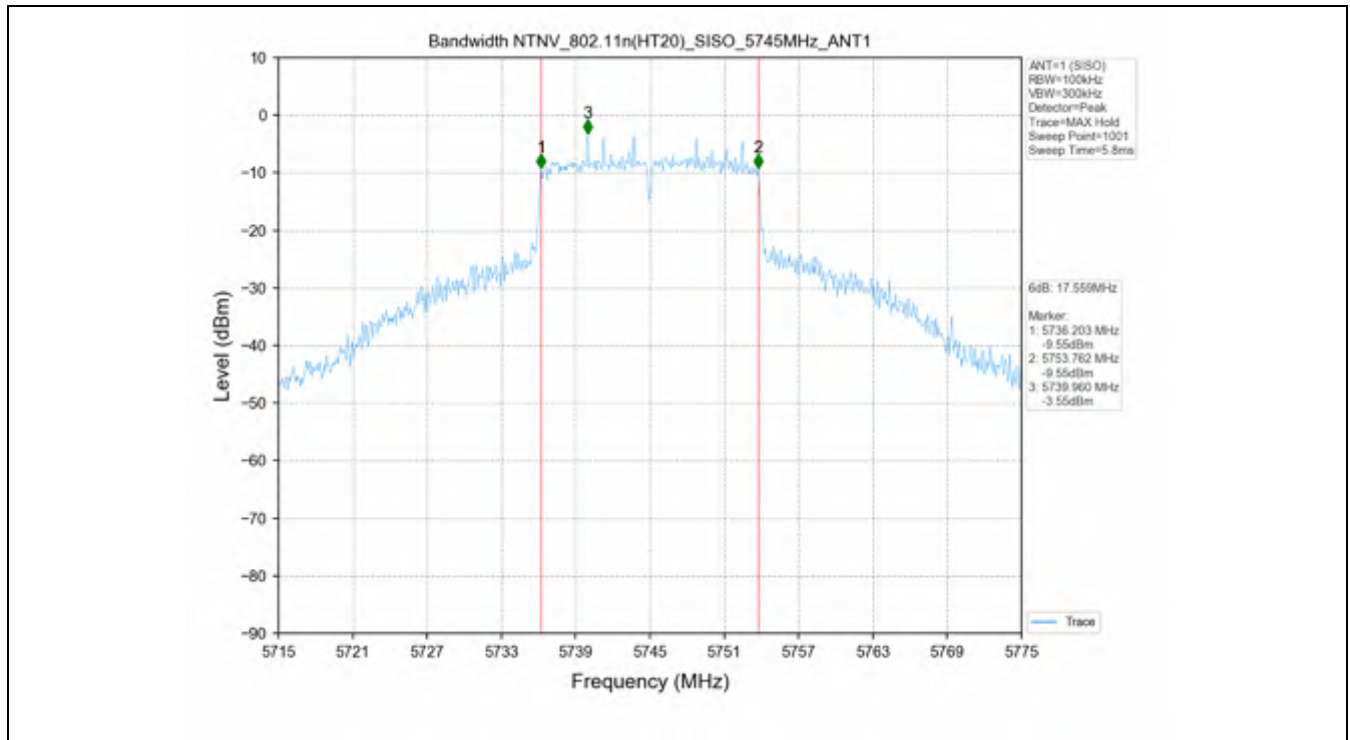






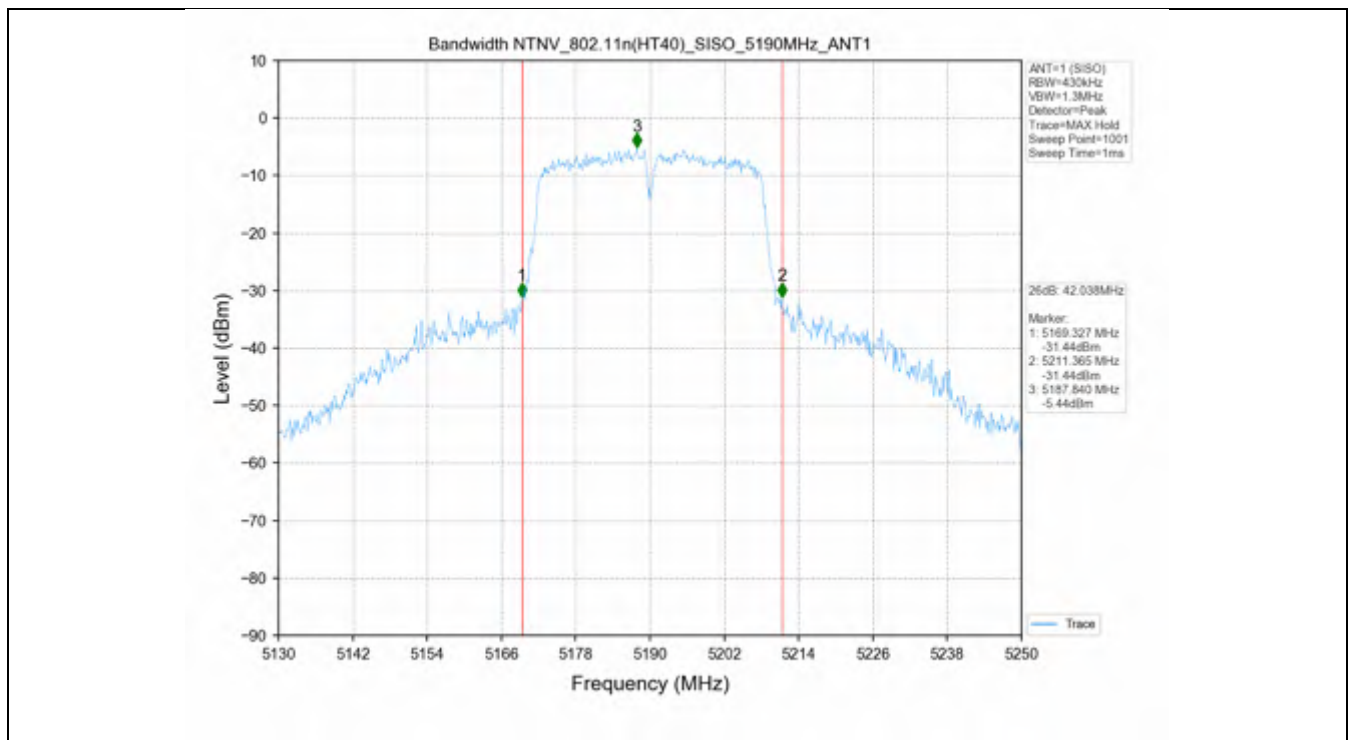
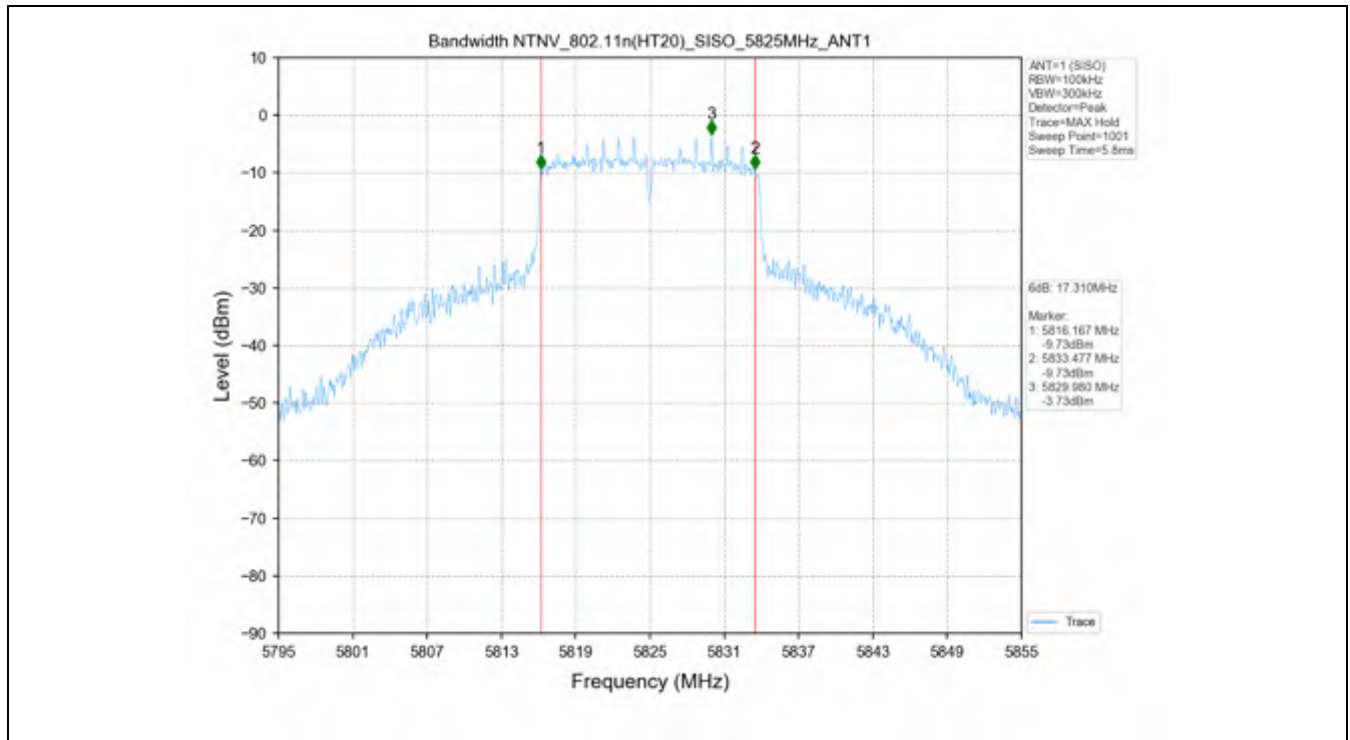


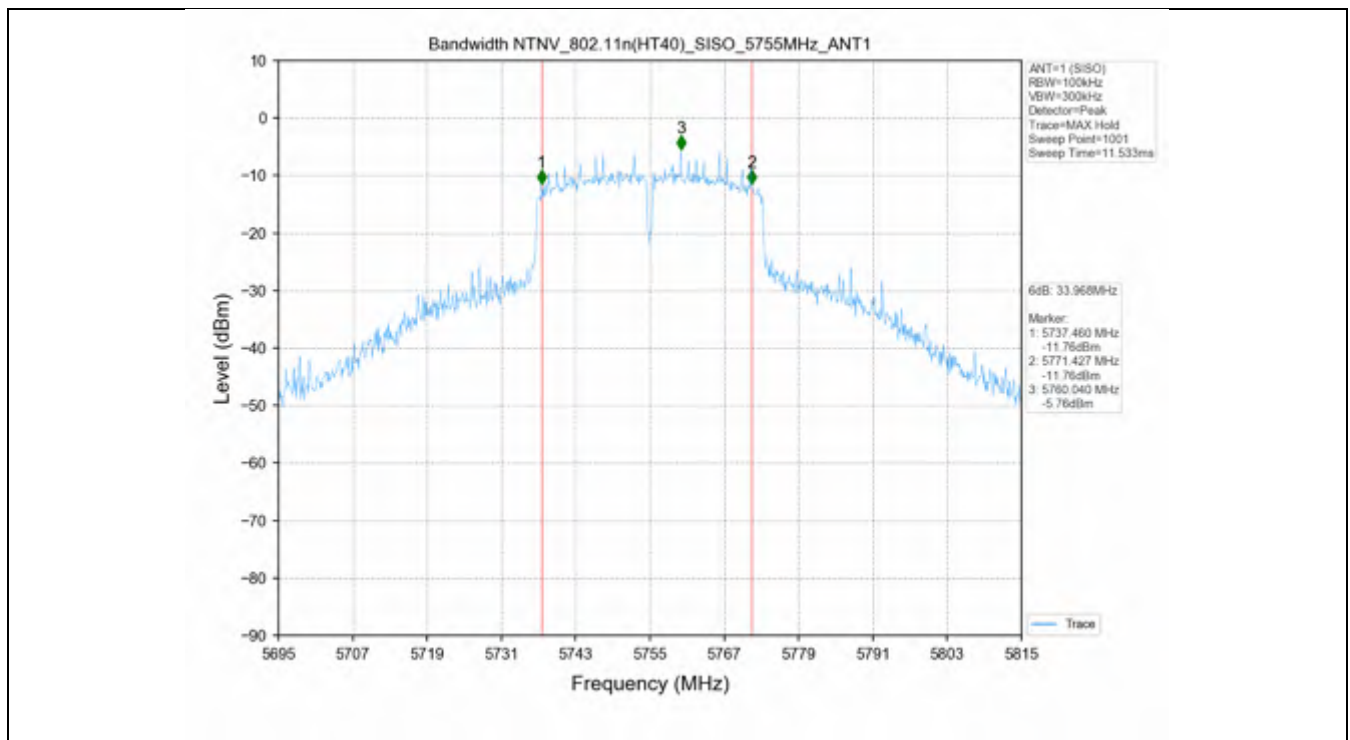
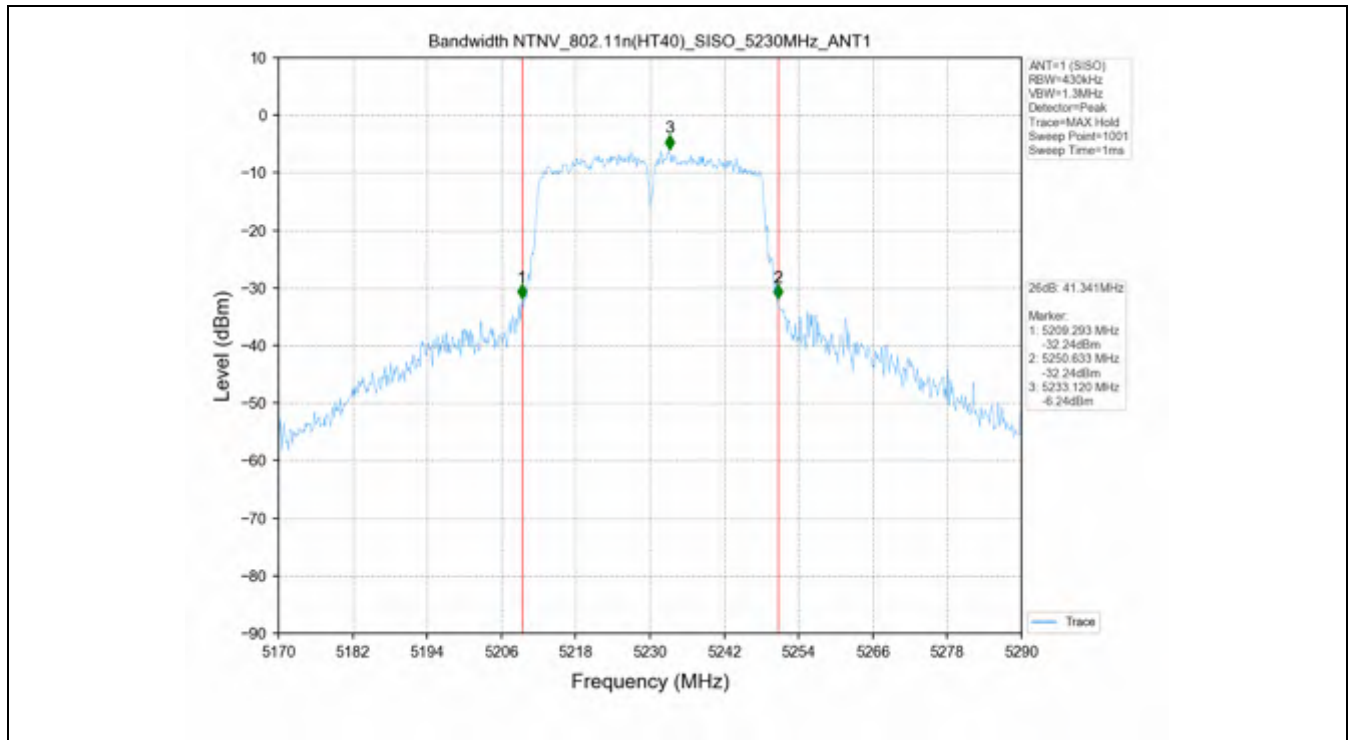
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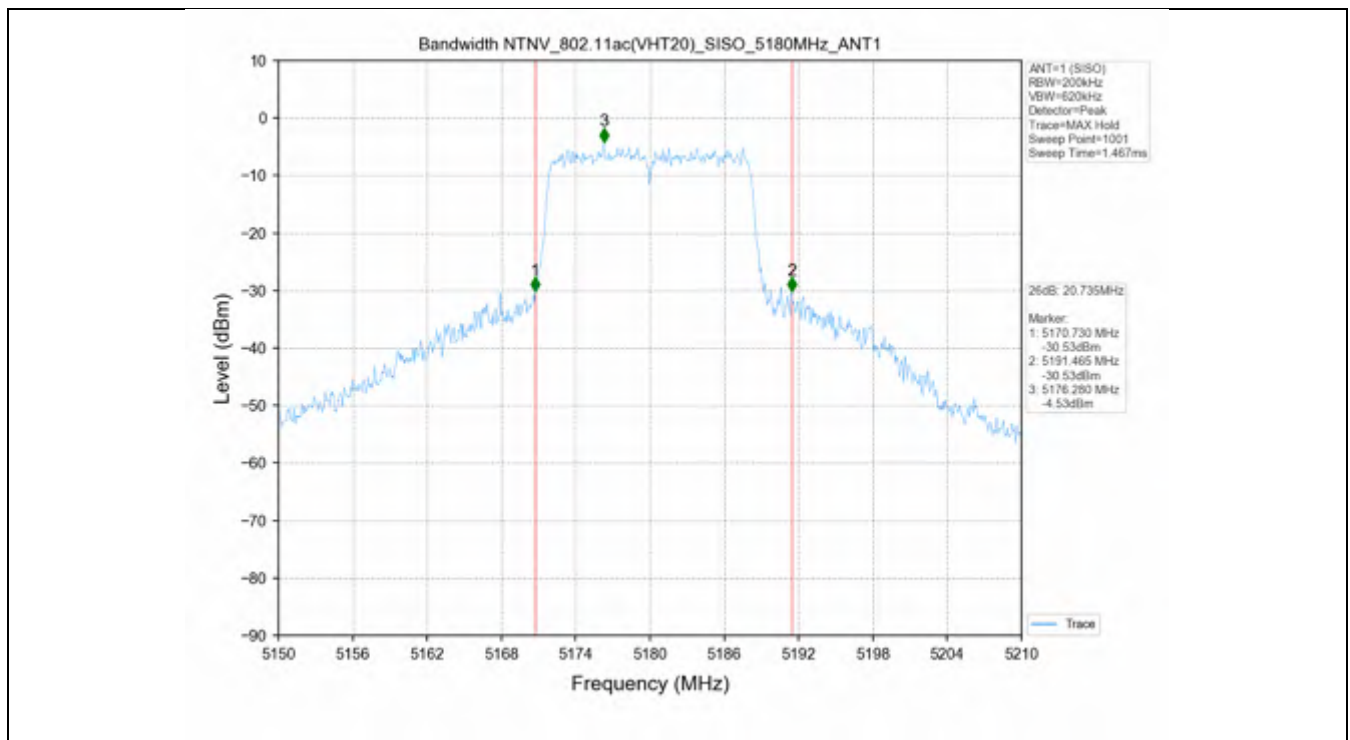
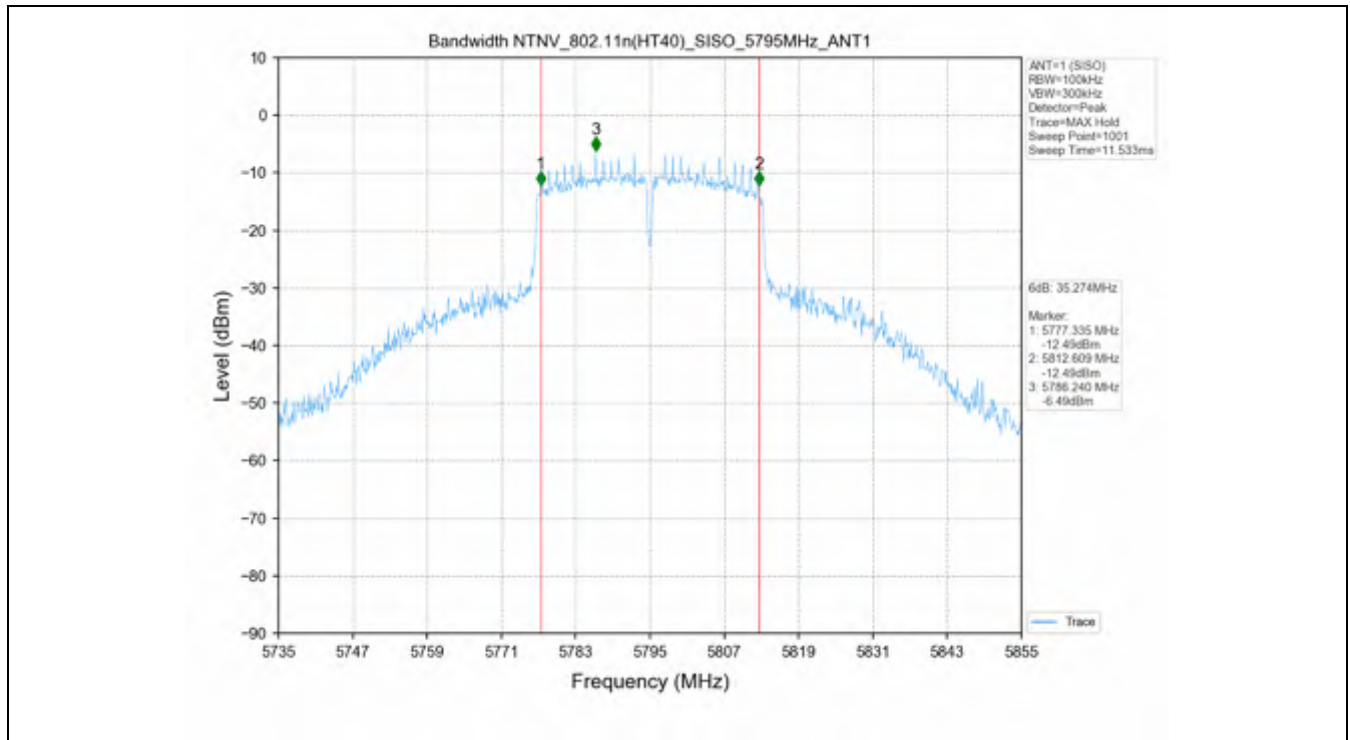
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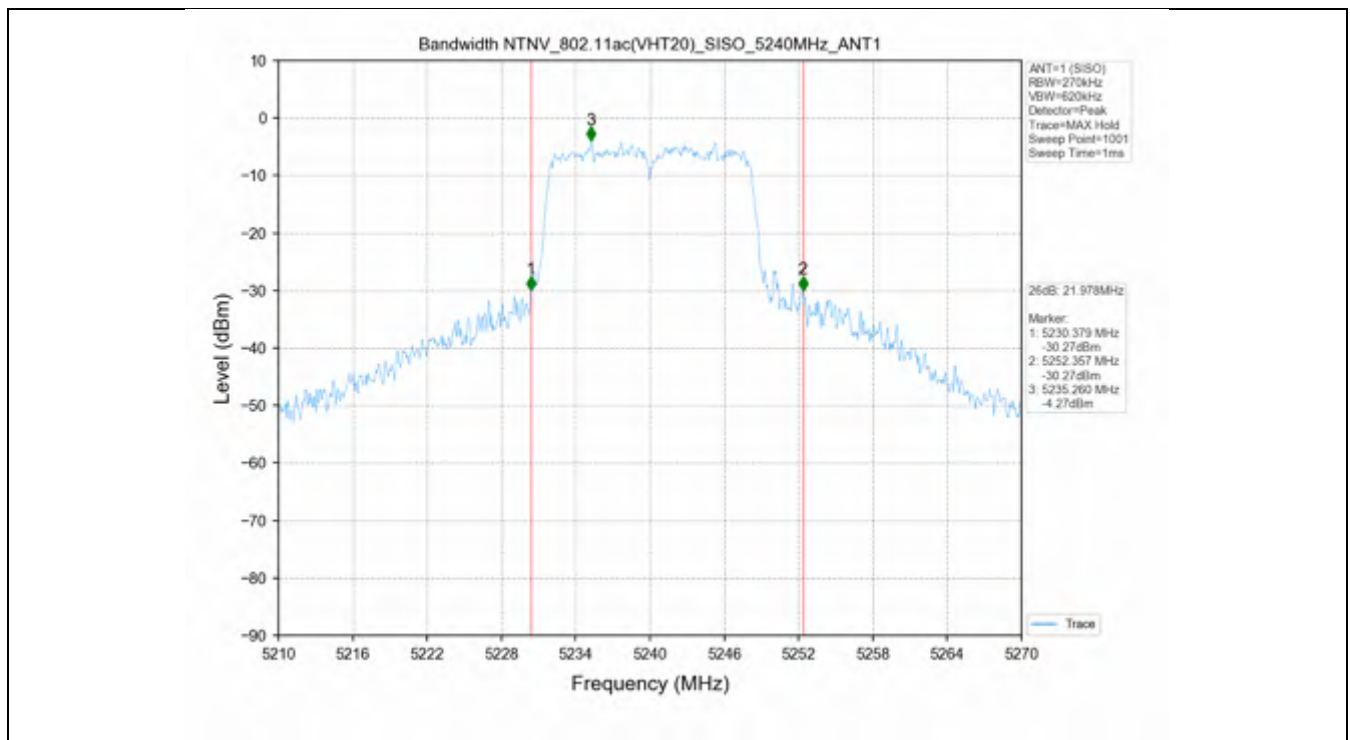
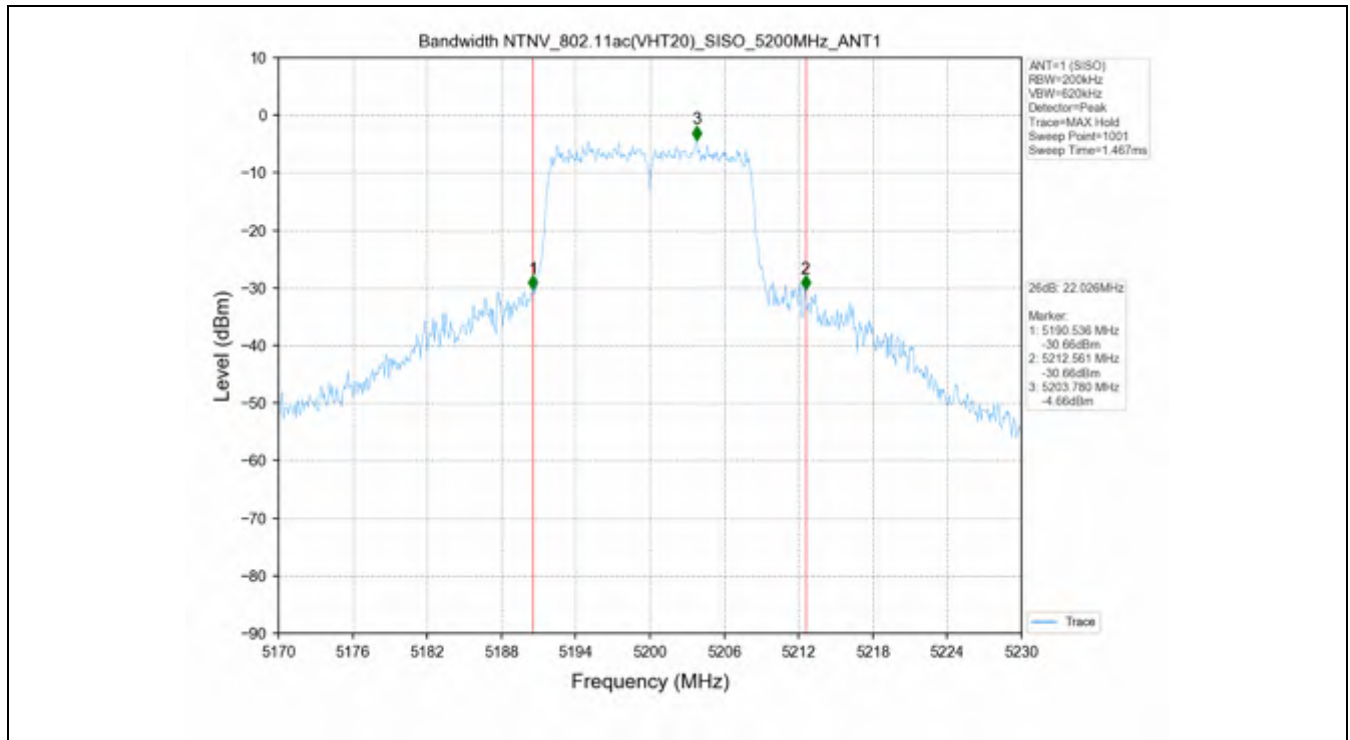






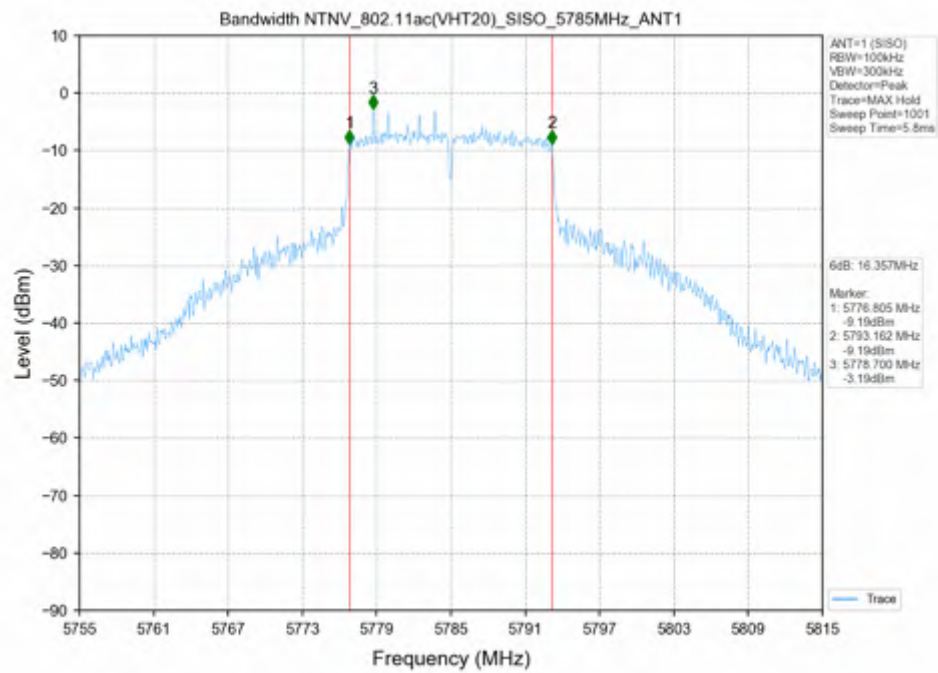
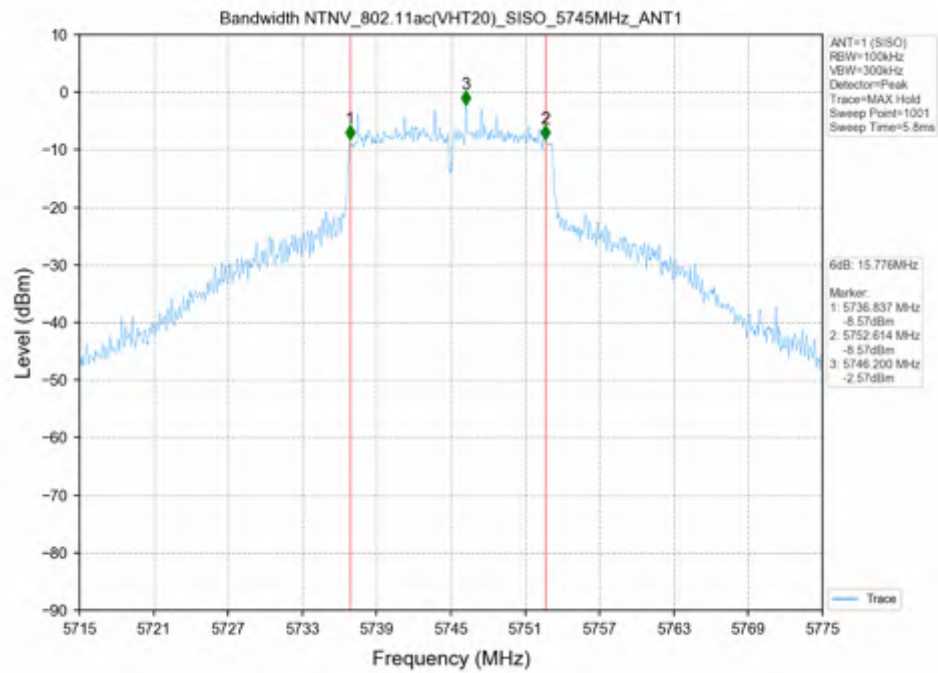
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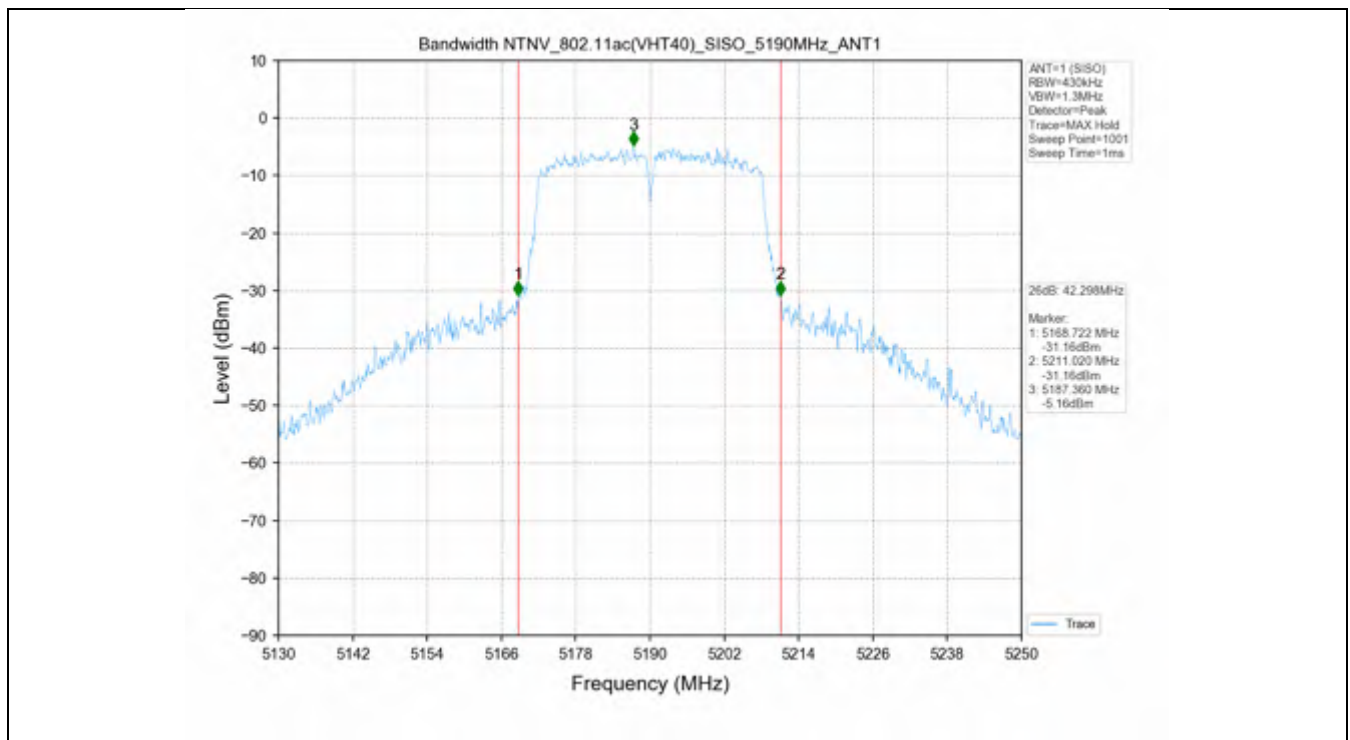
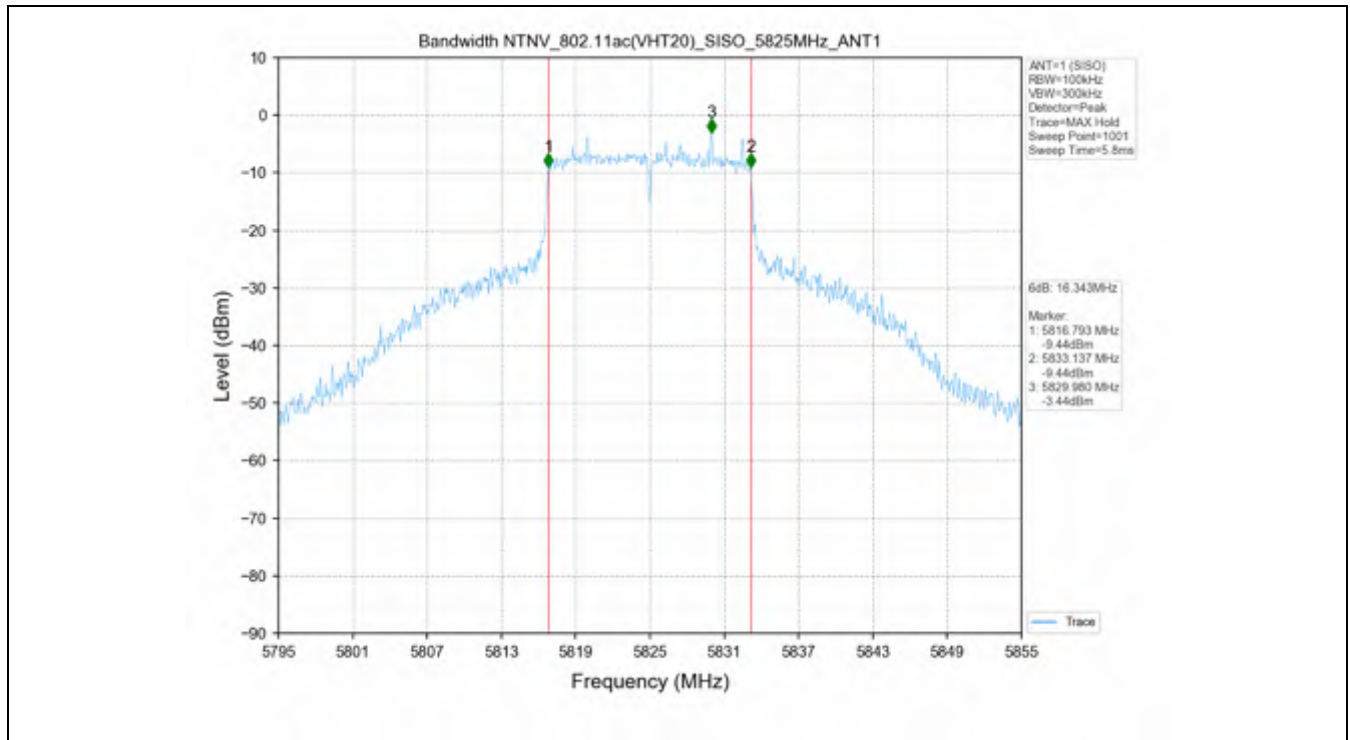


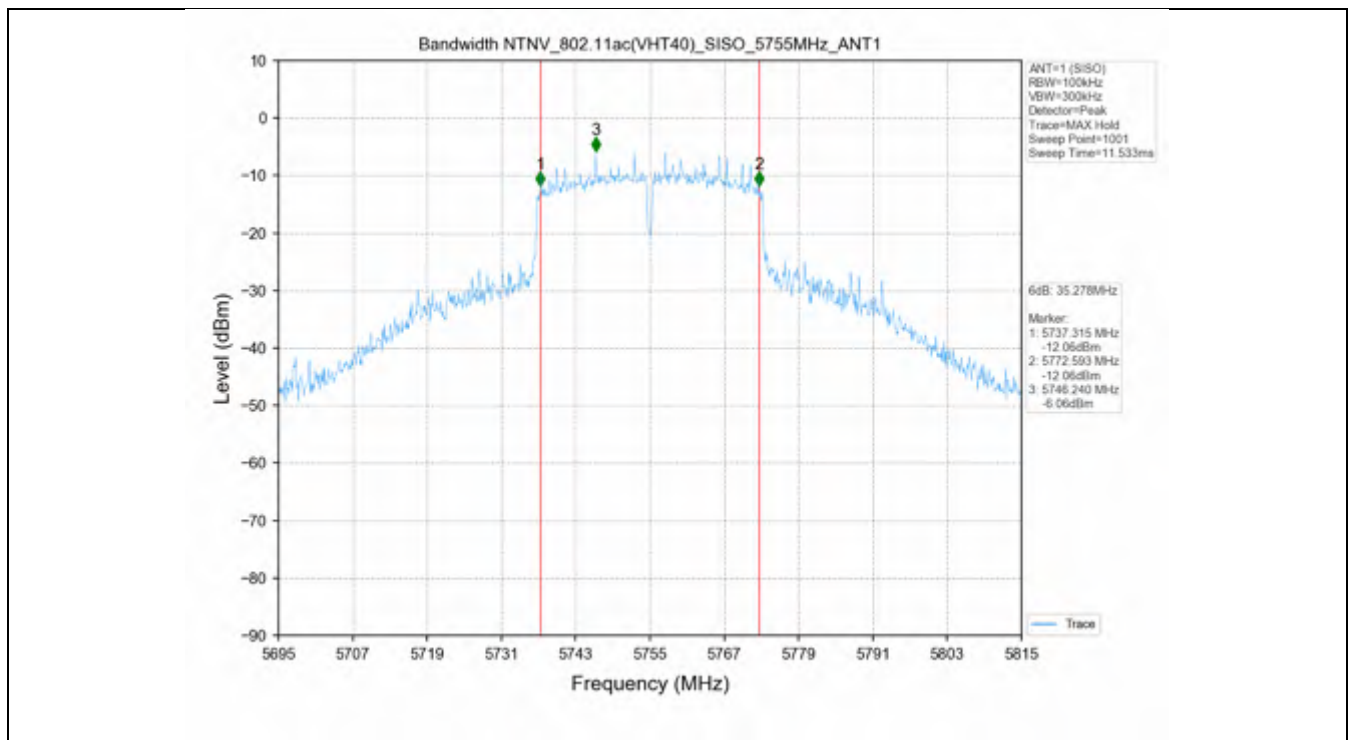
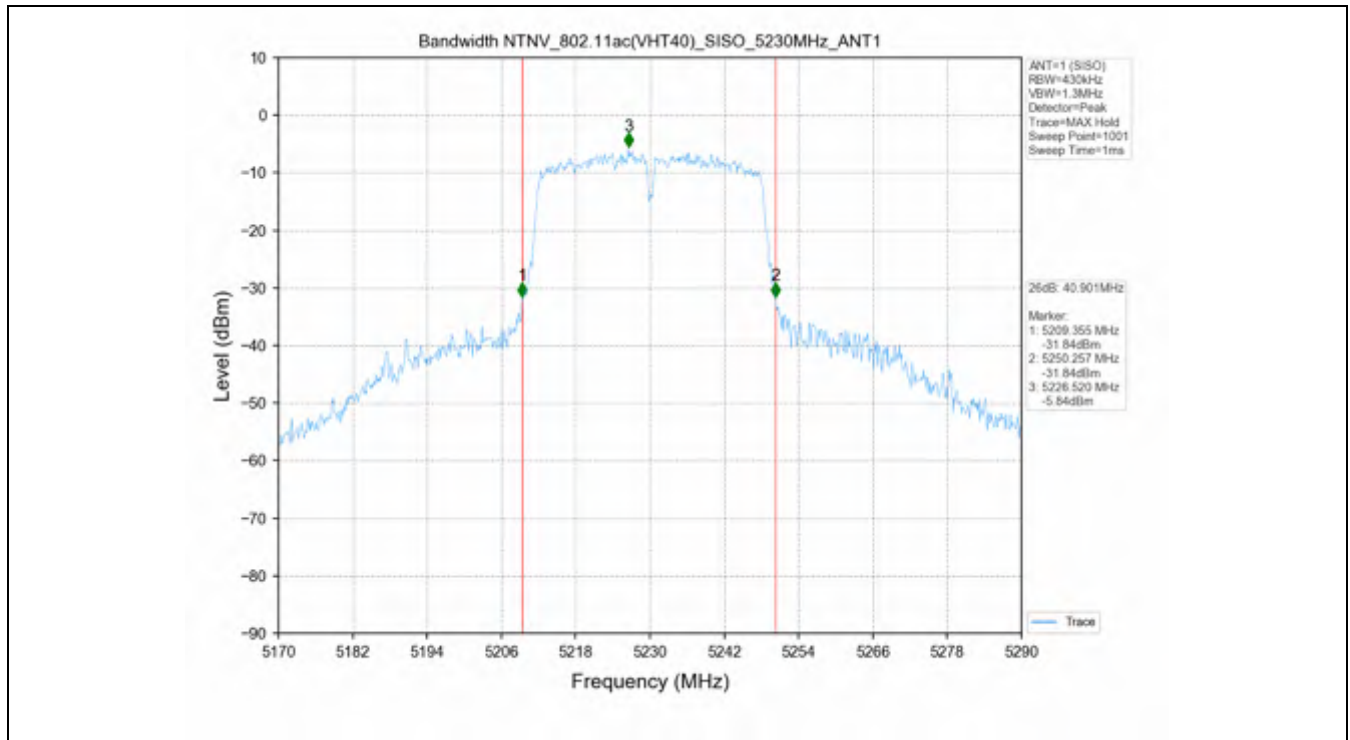
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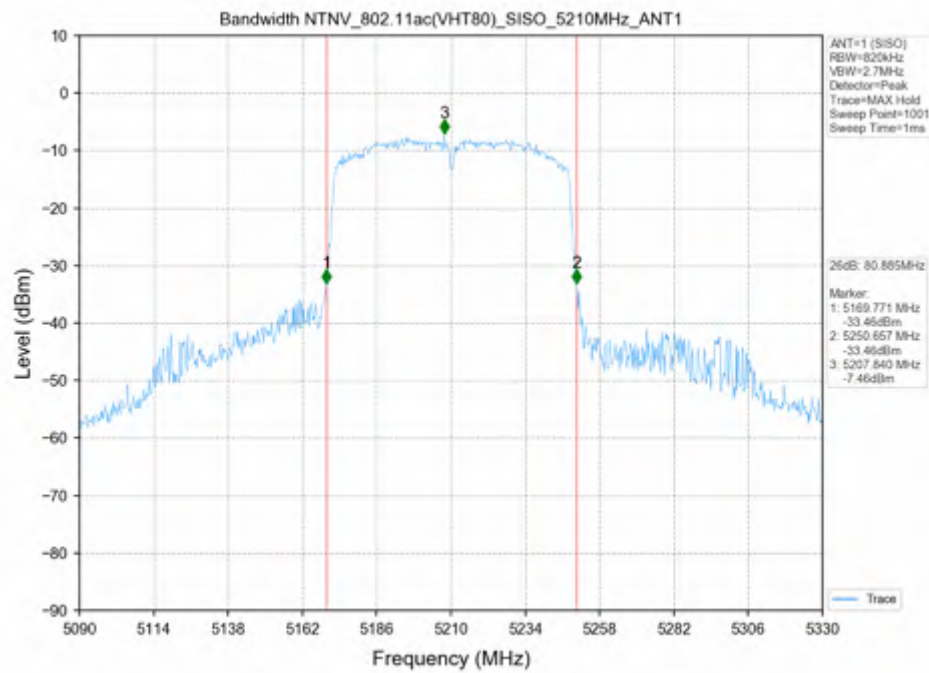
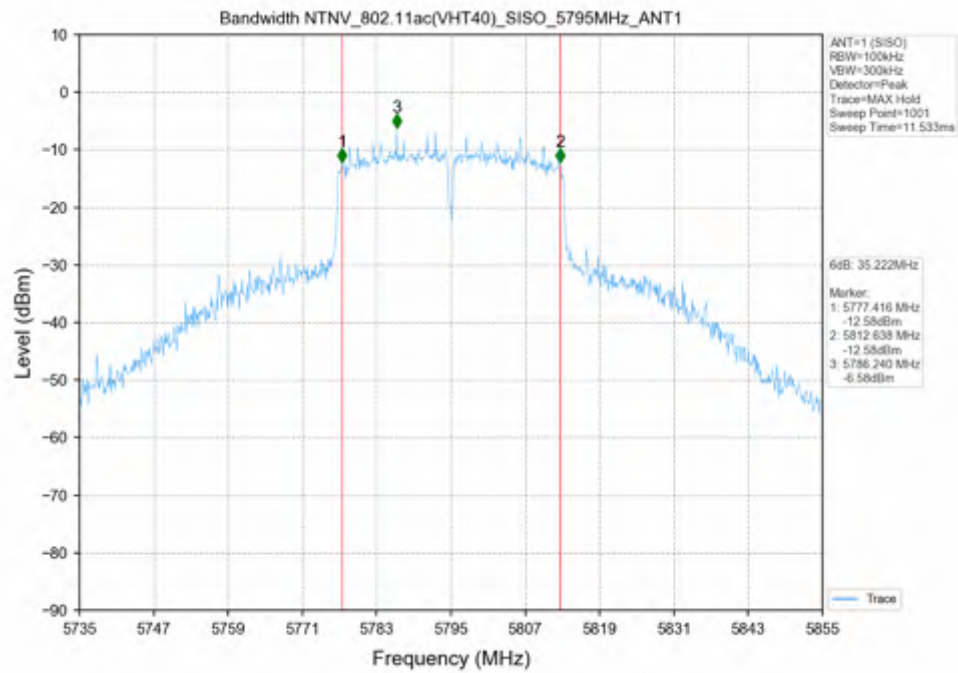


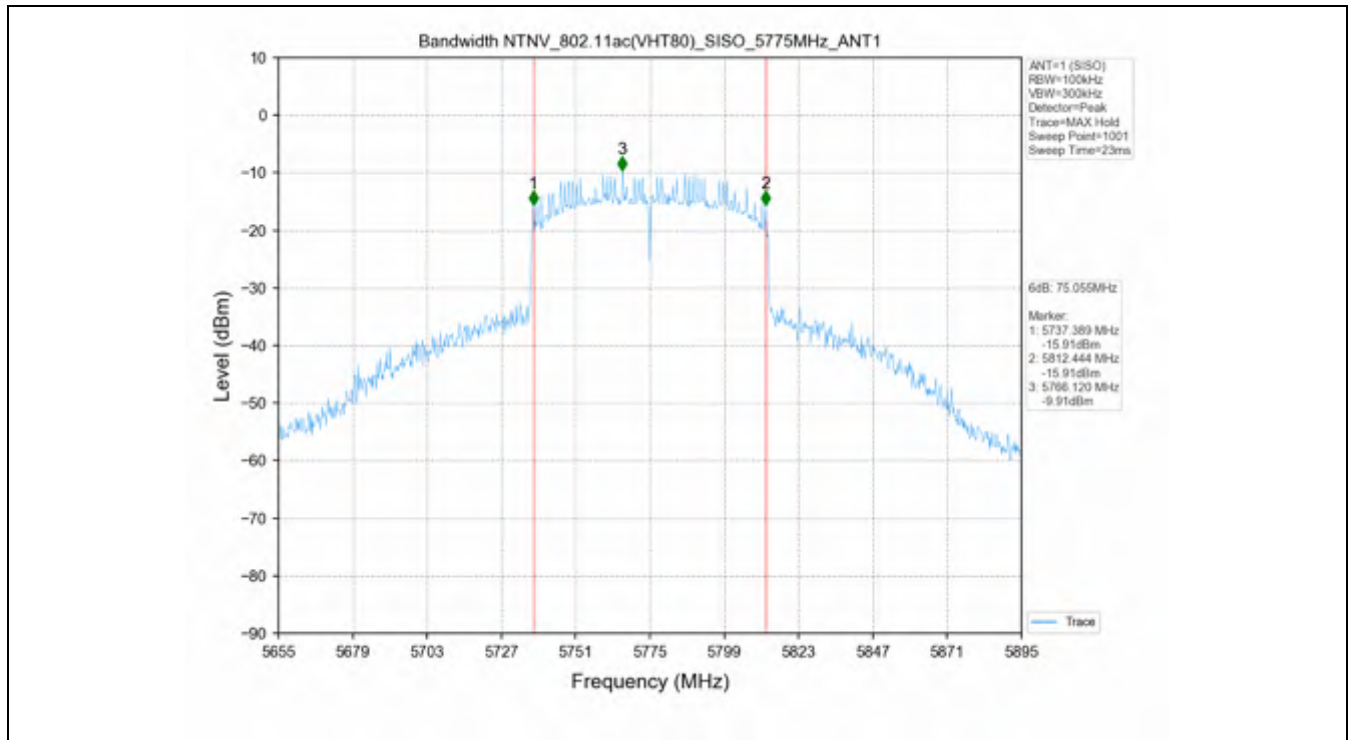


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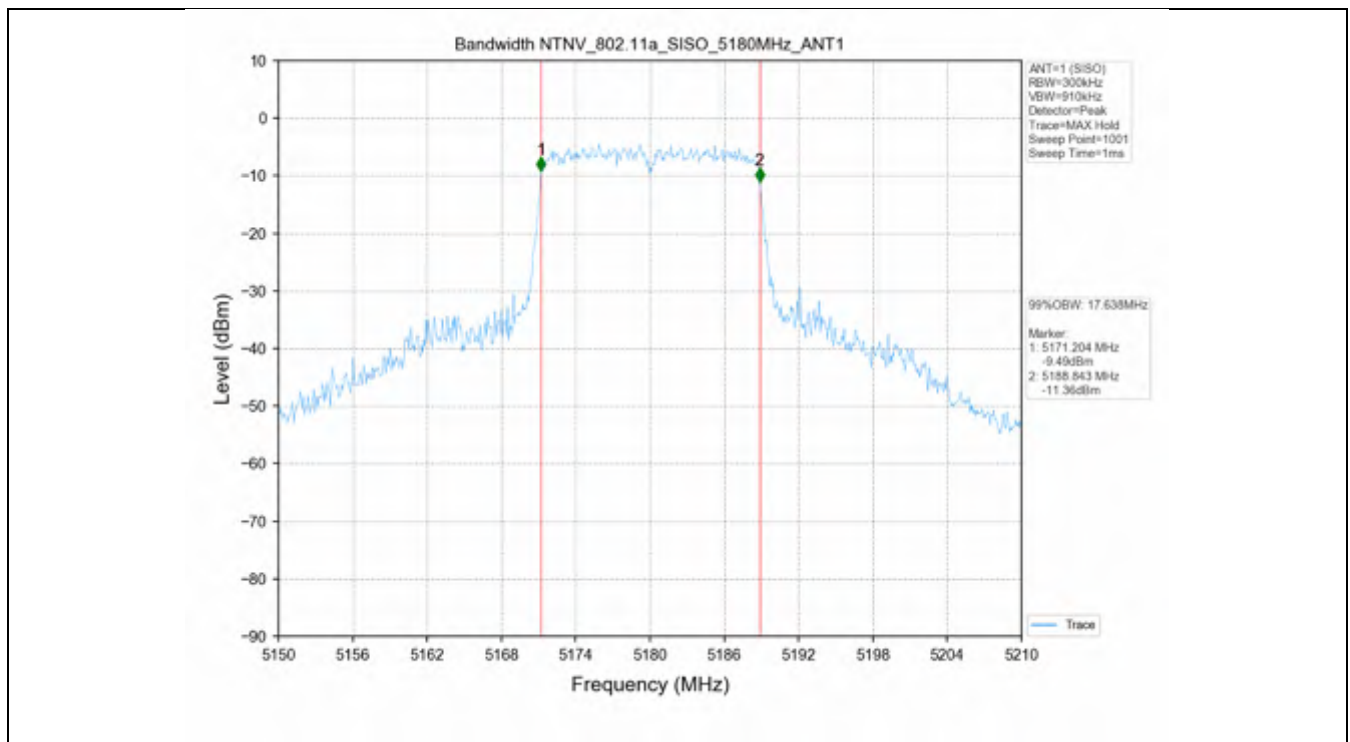


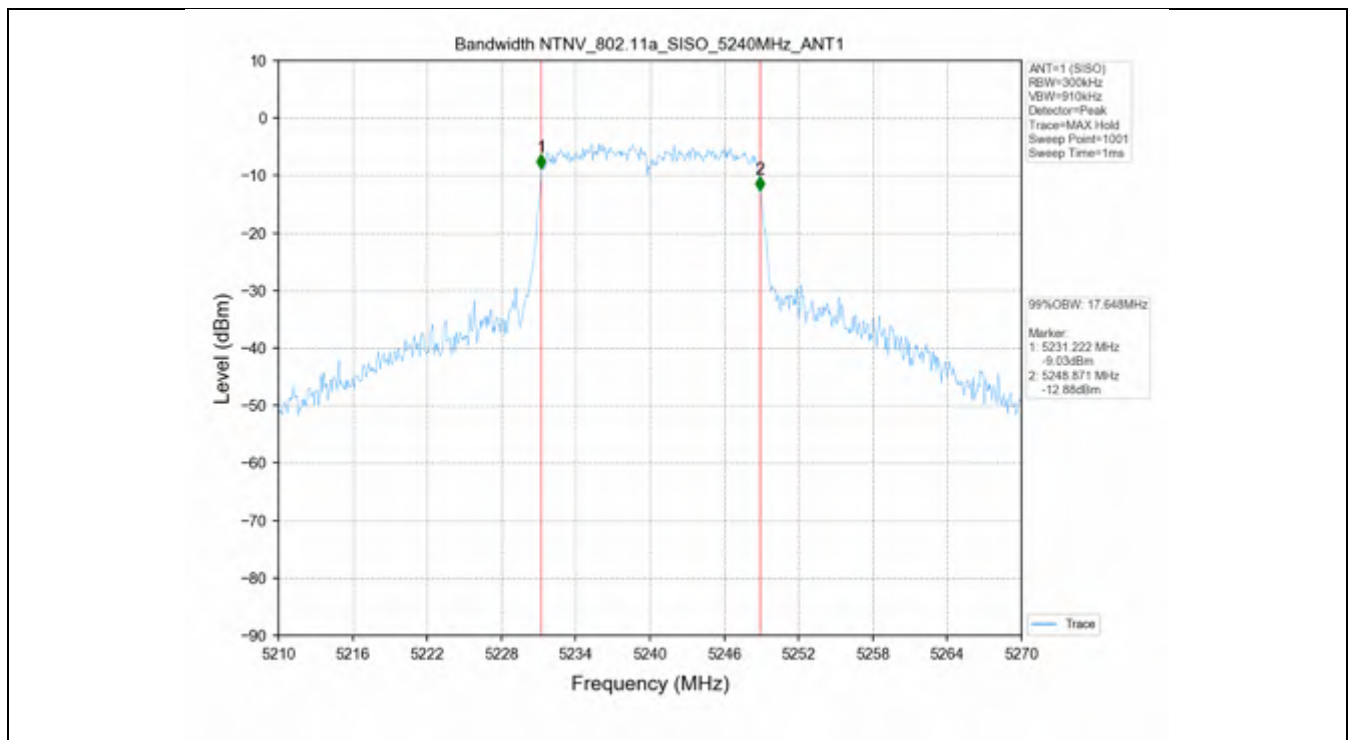
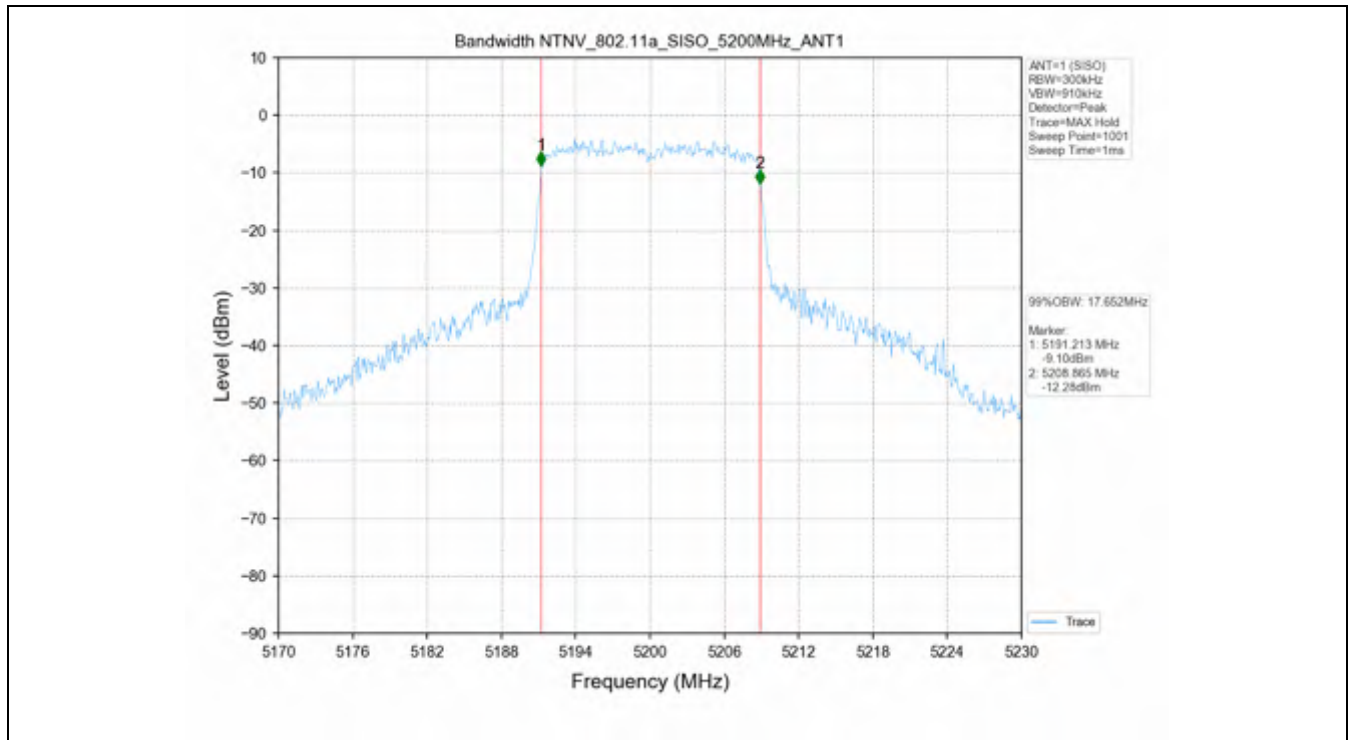


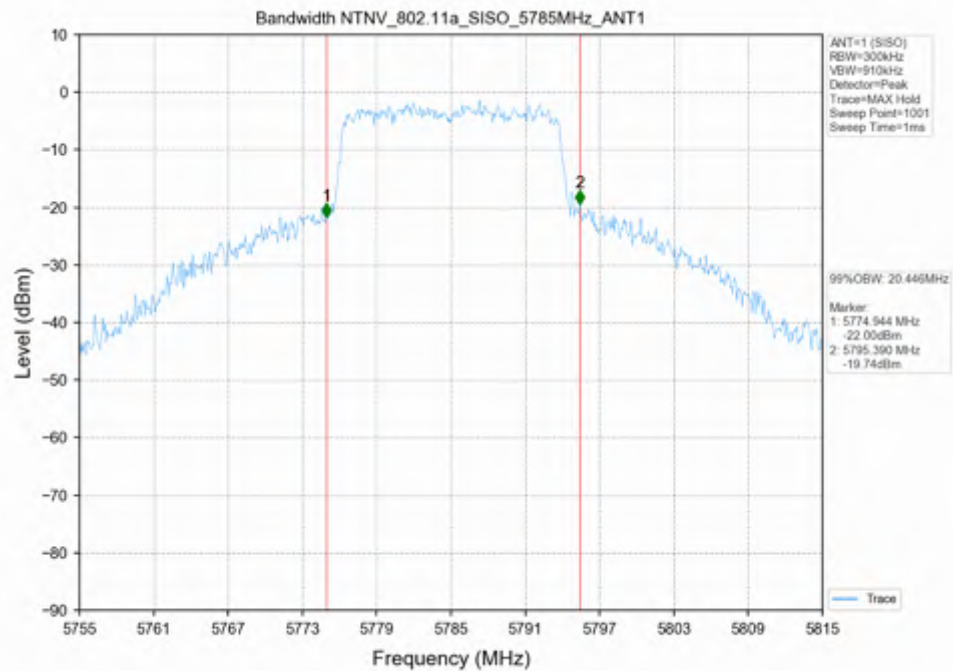
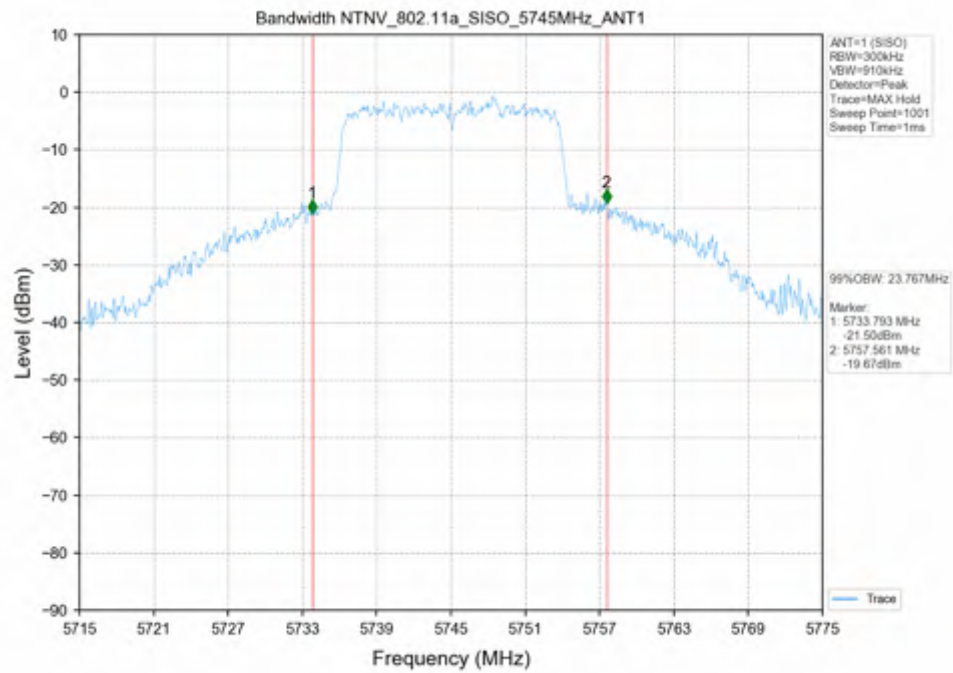


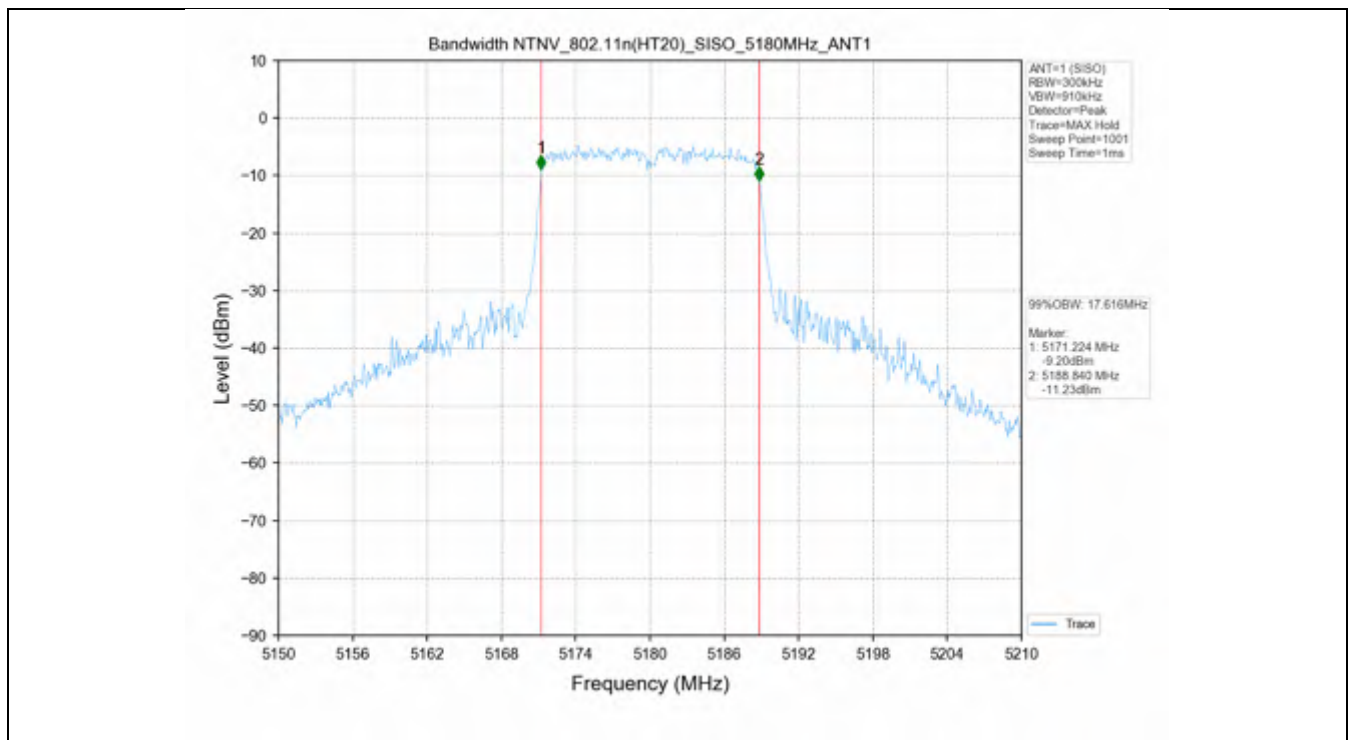
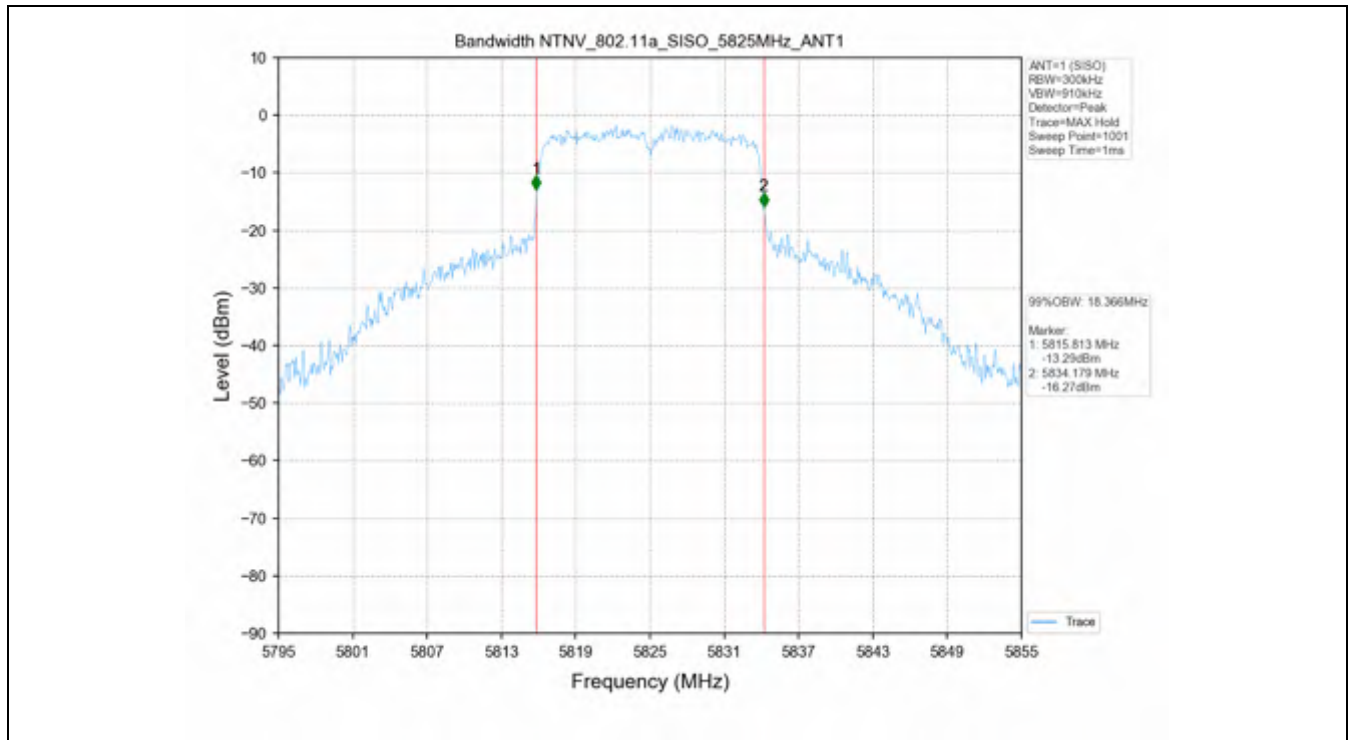


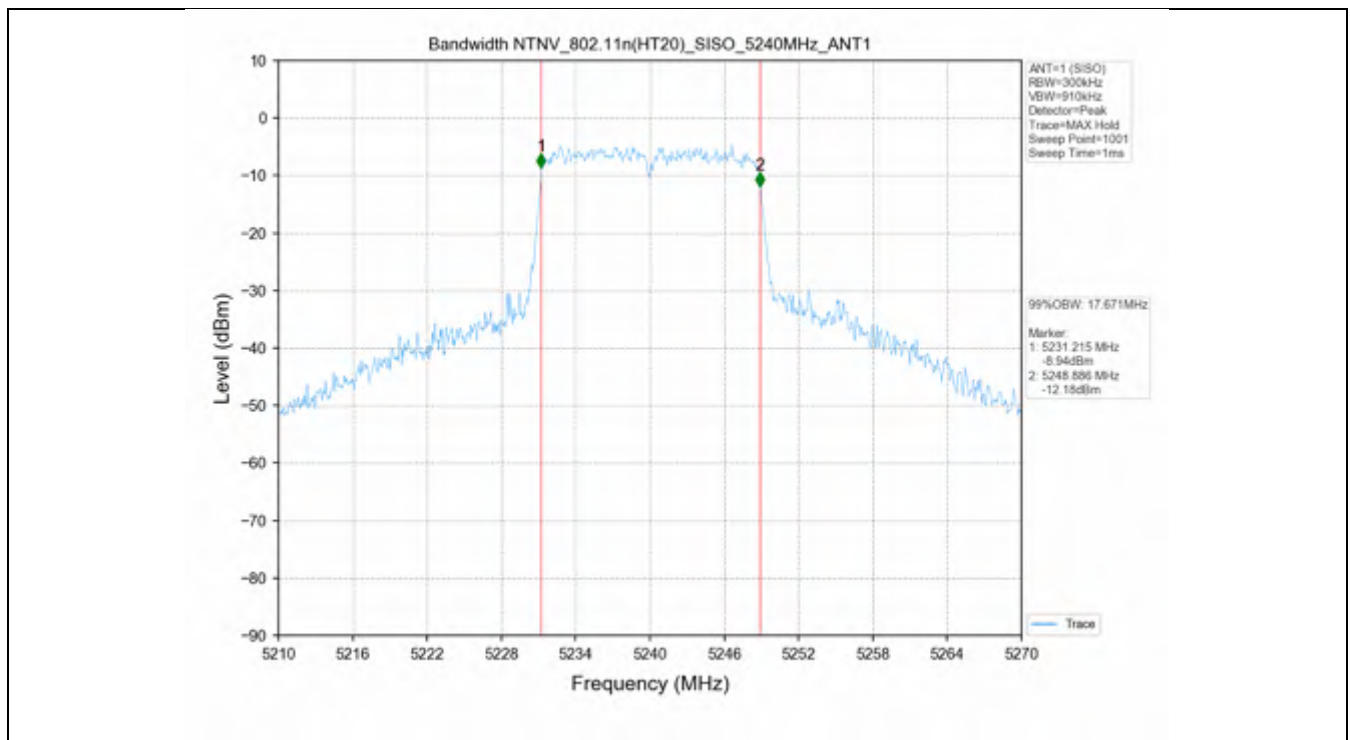
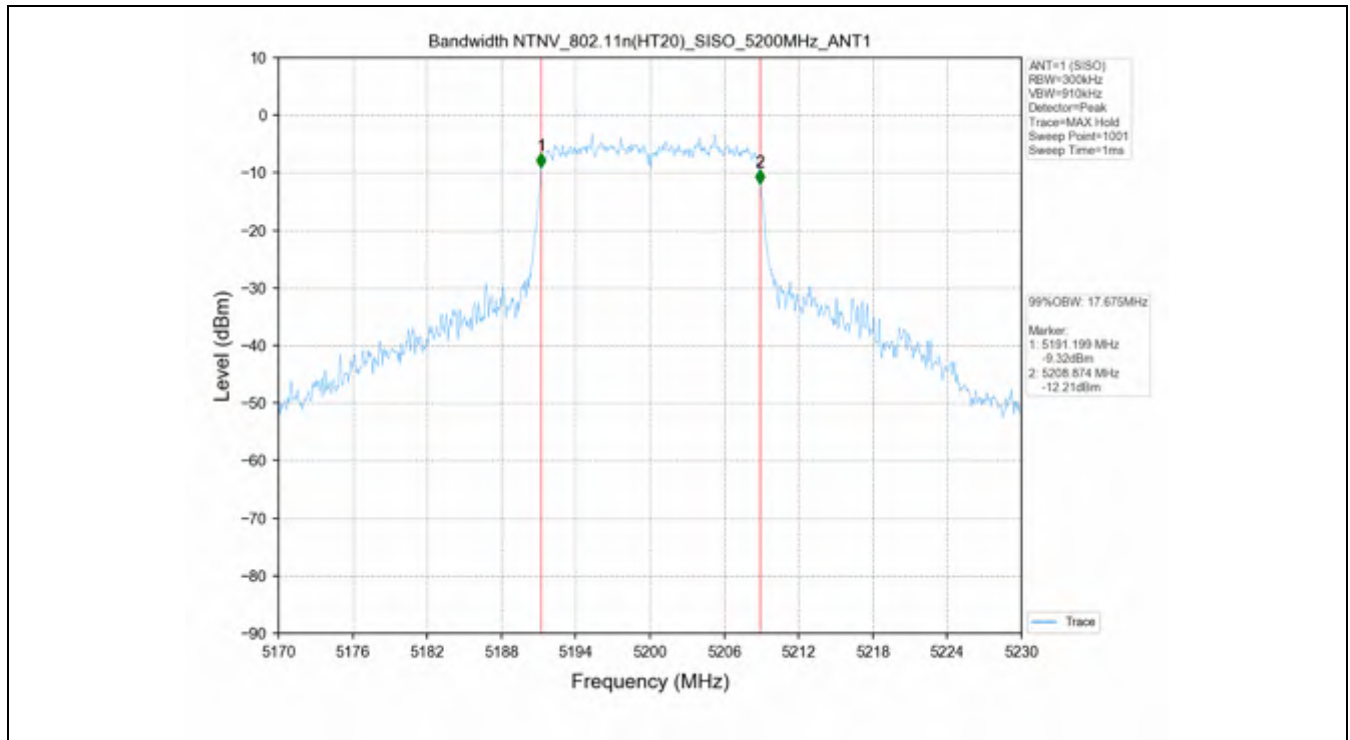
2.3 Test Graph - 99% Occupied Bandwidth





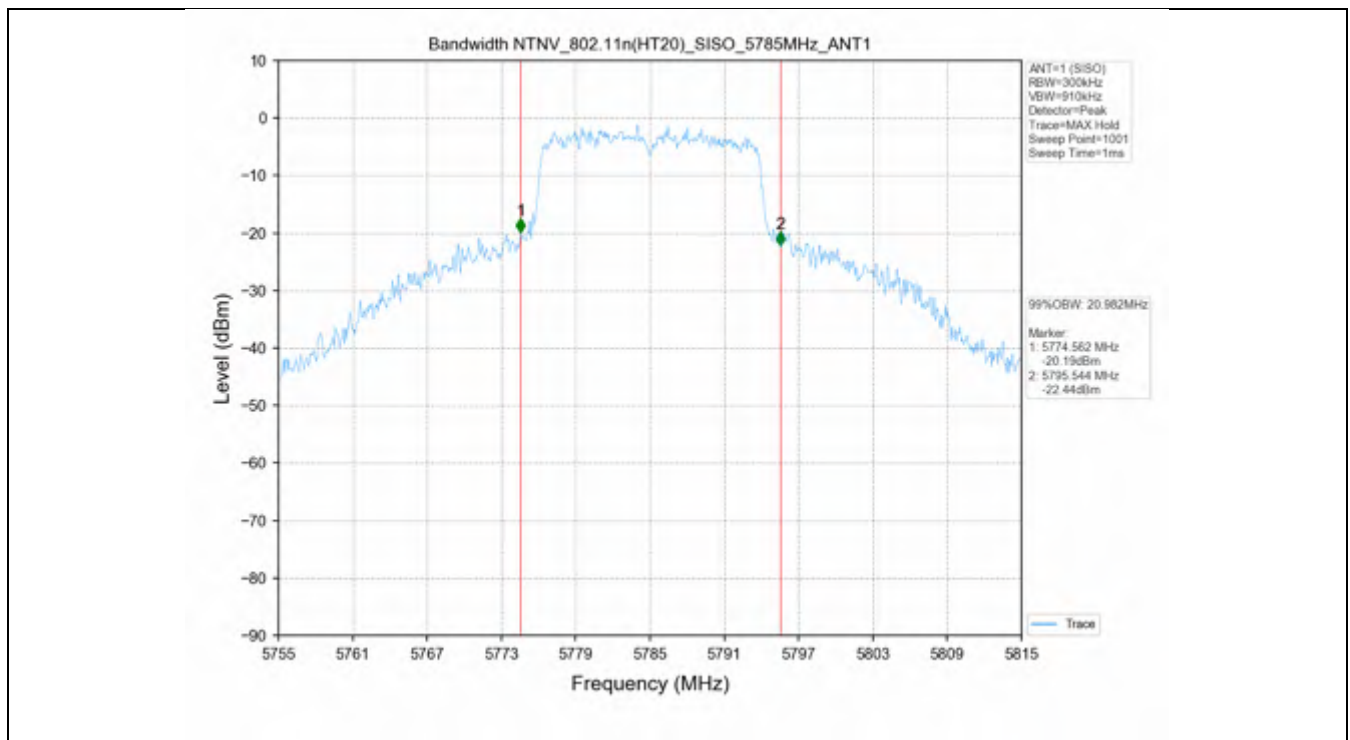
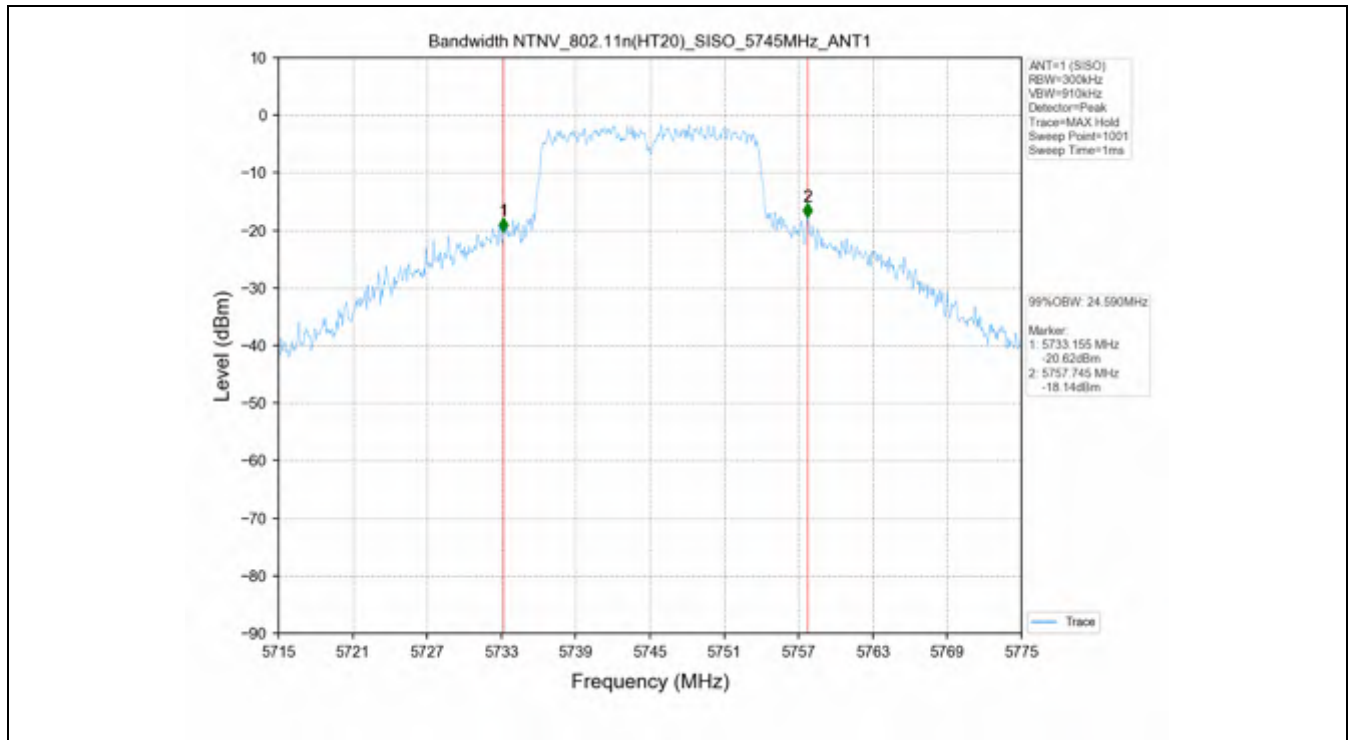






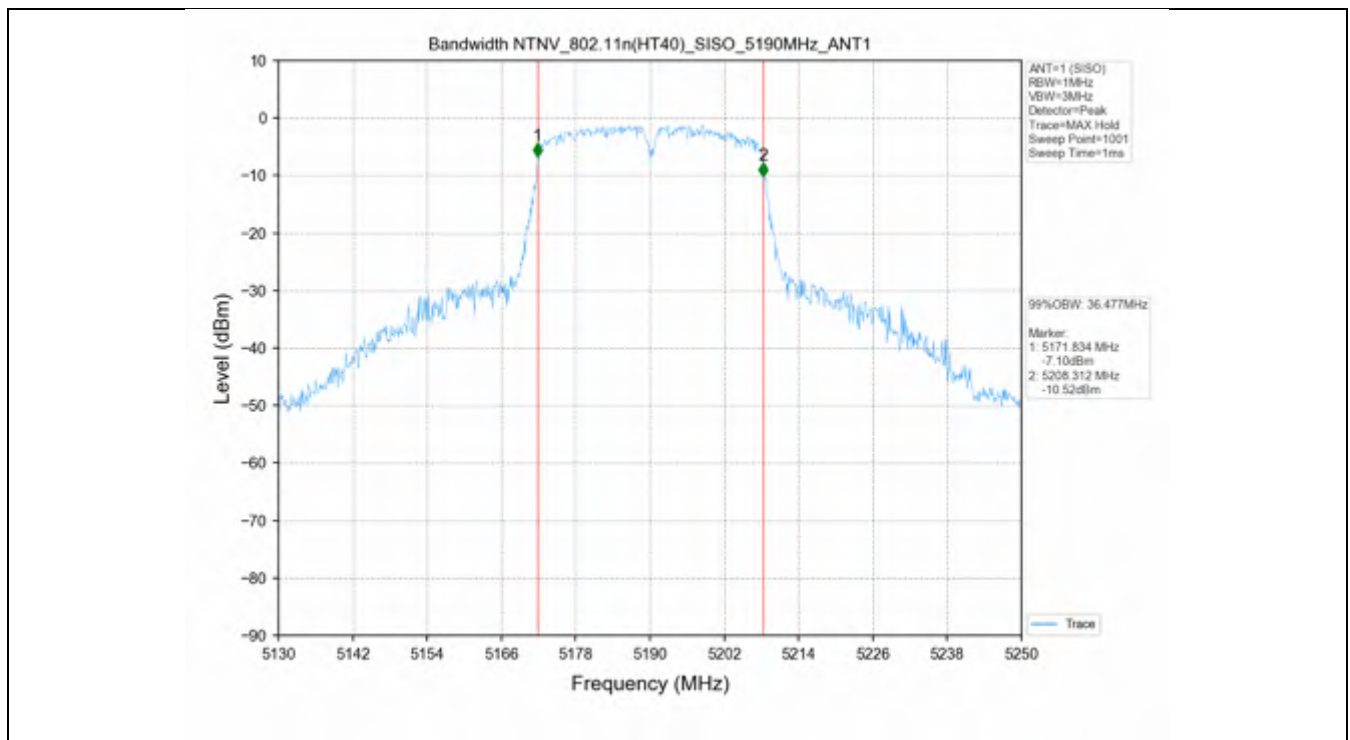
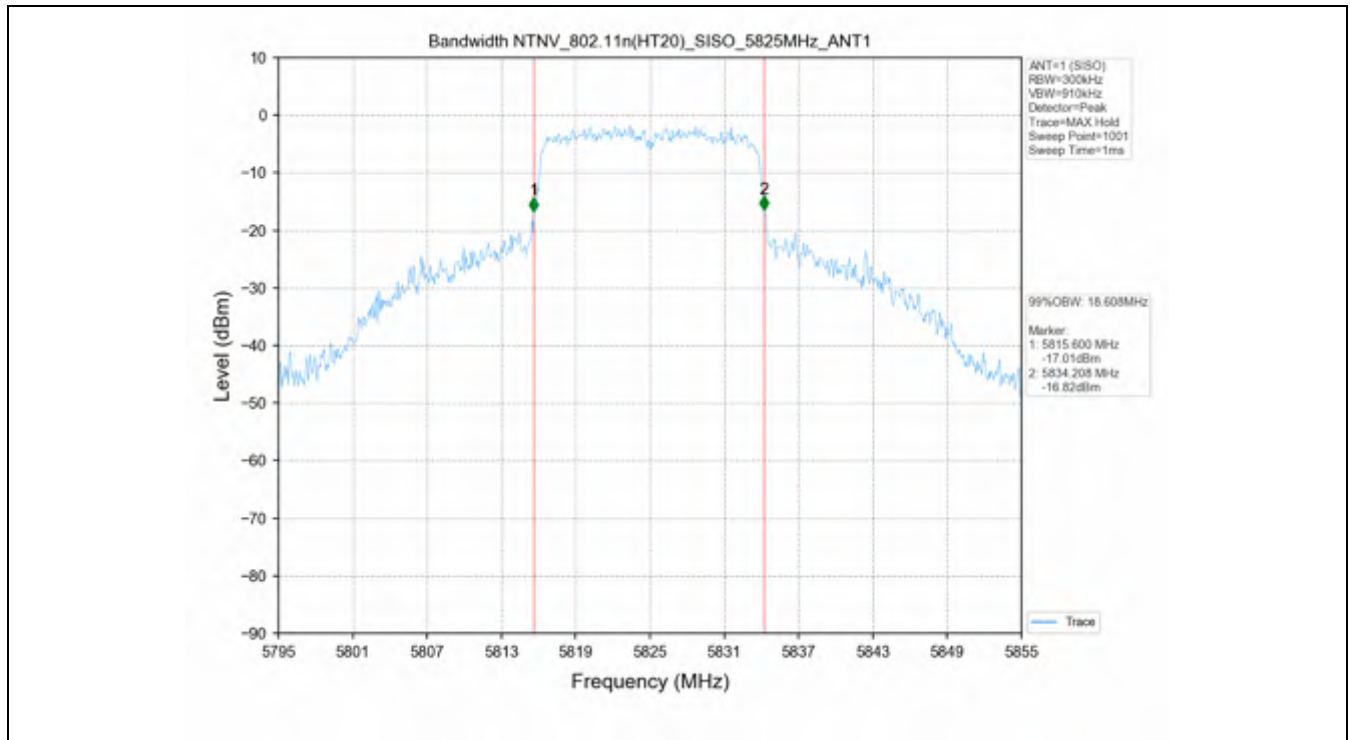


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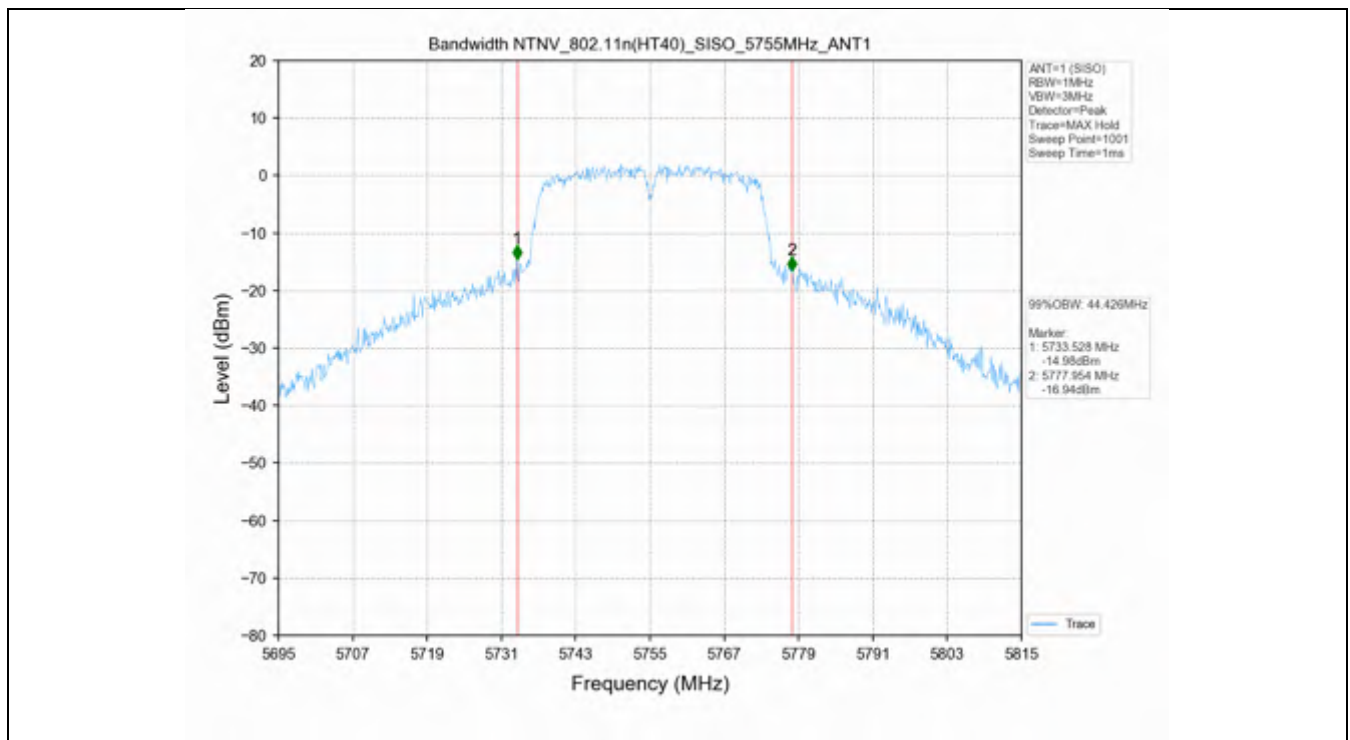
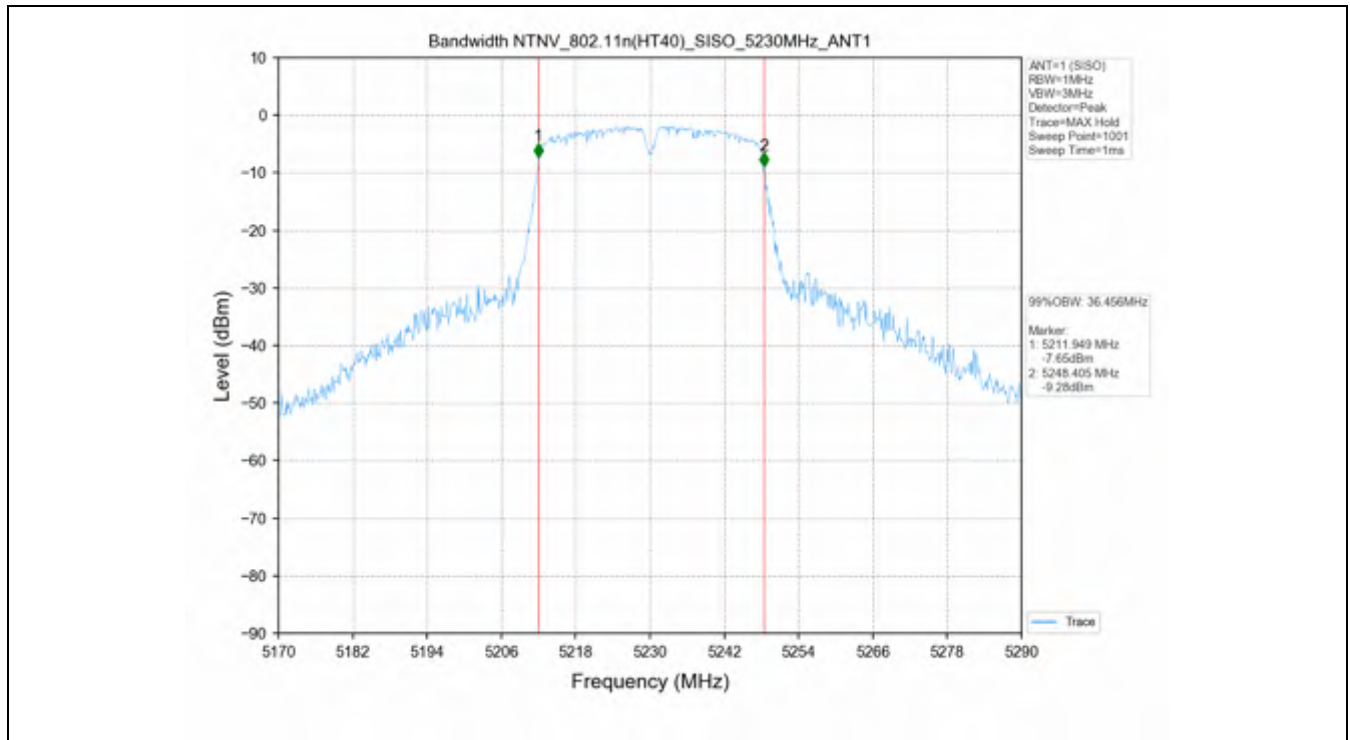


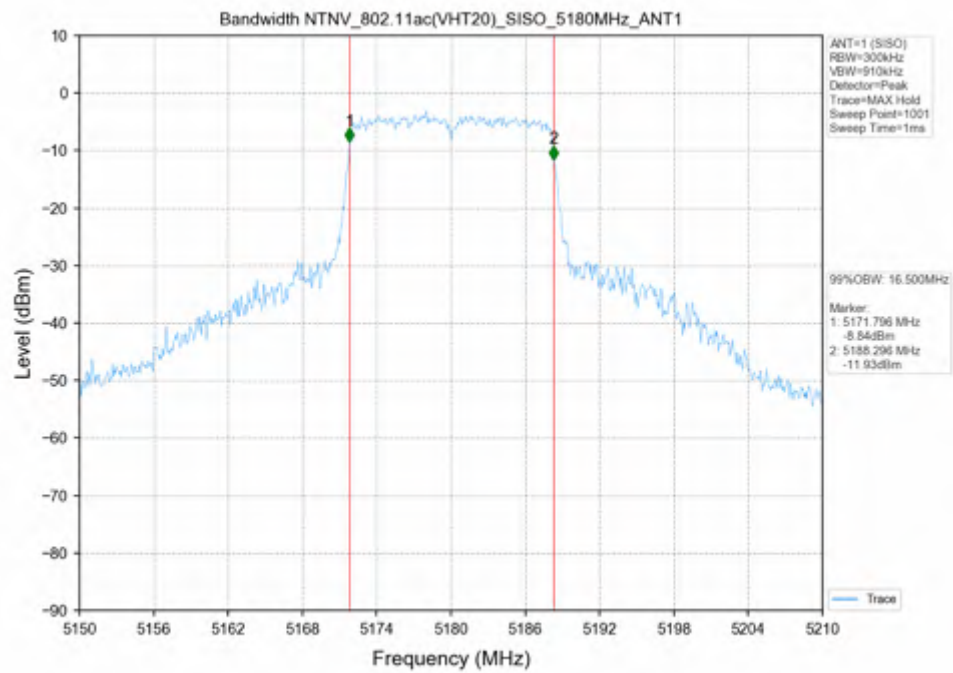
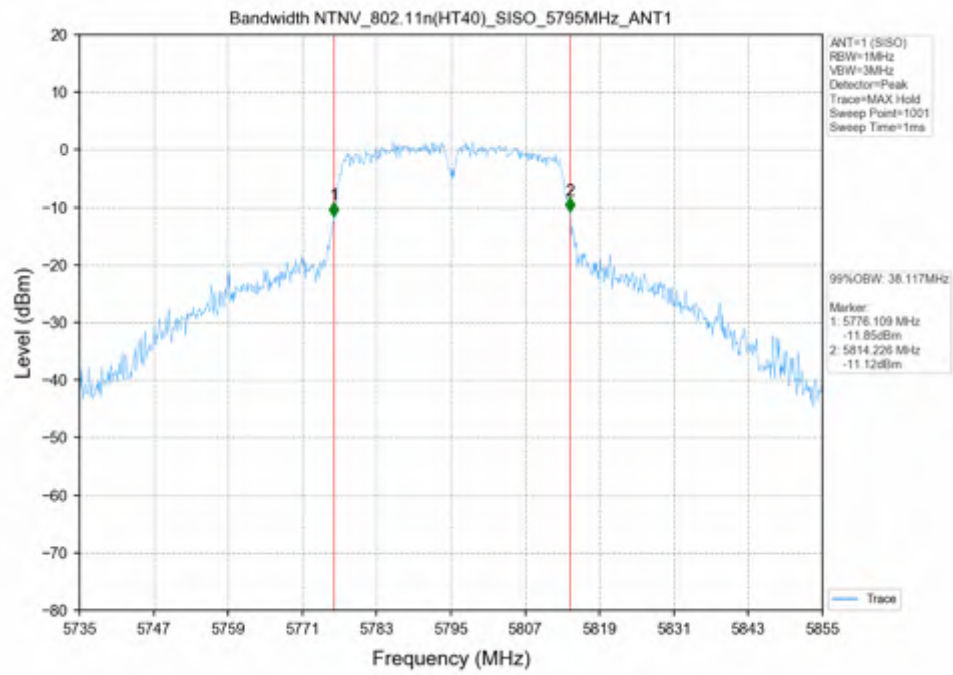
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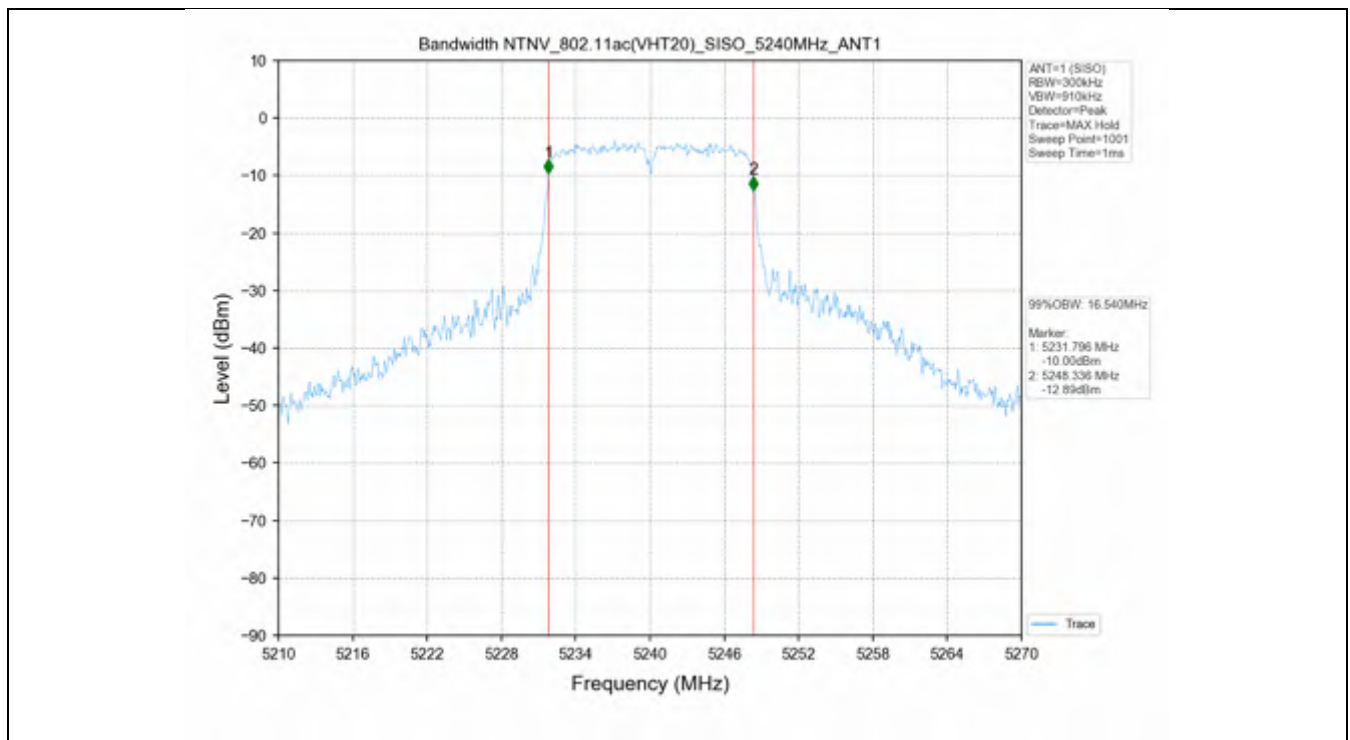
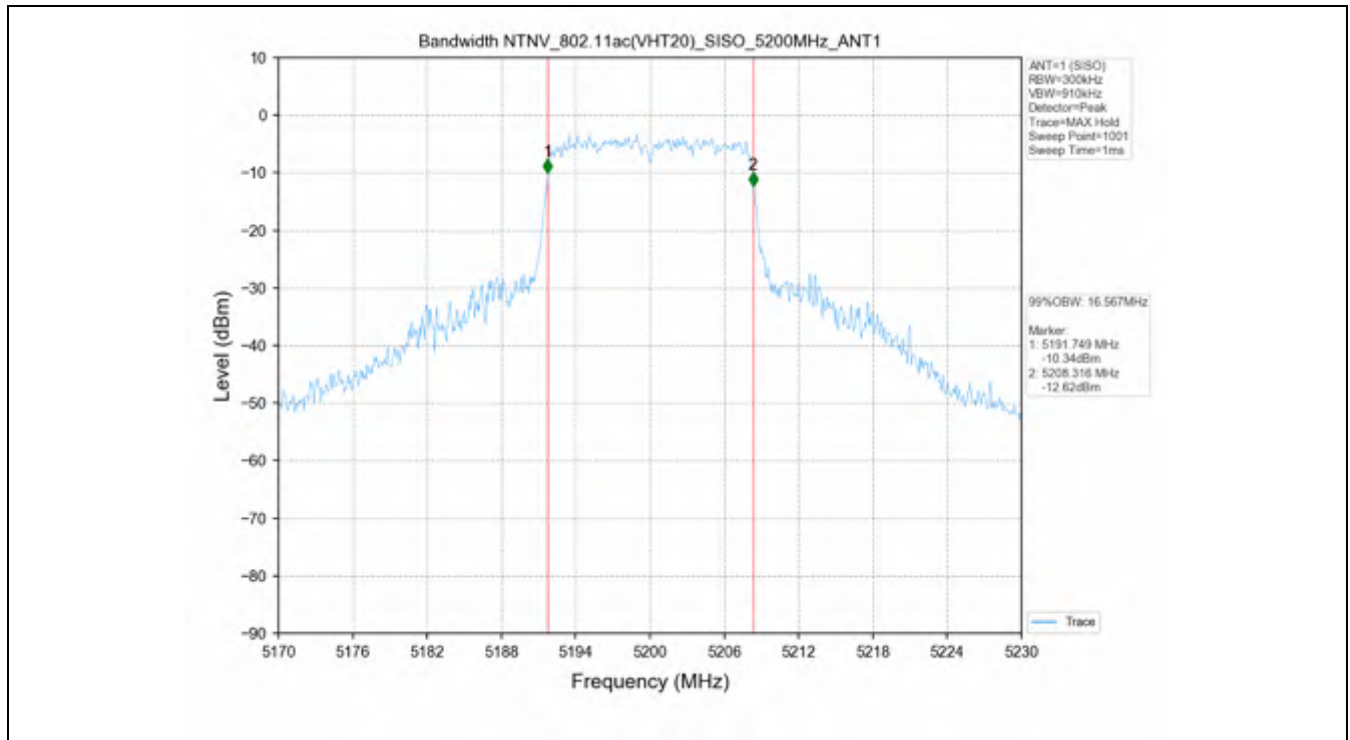


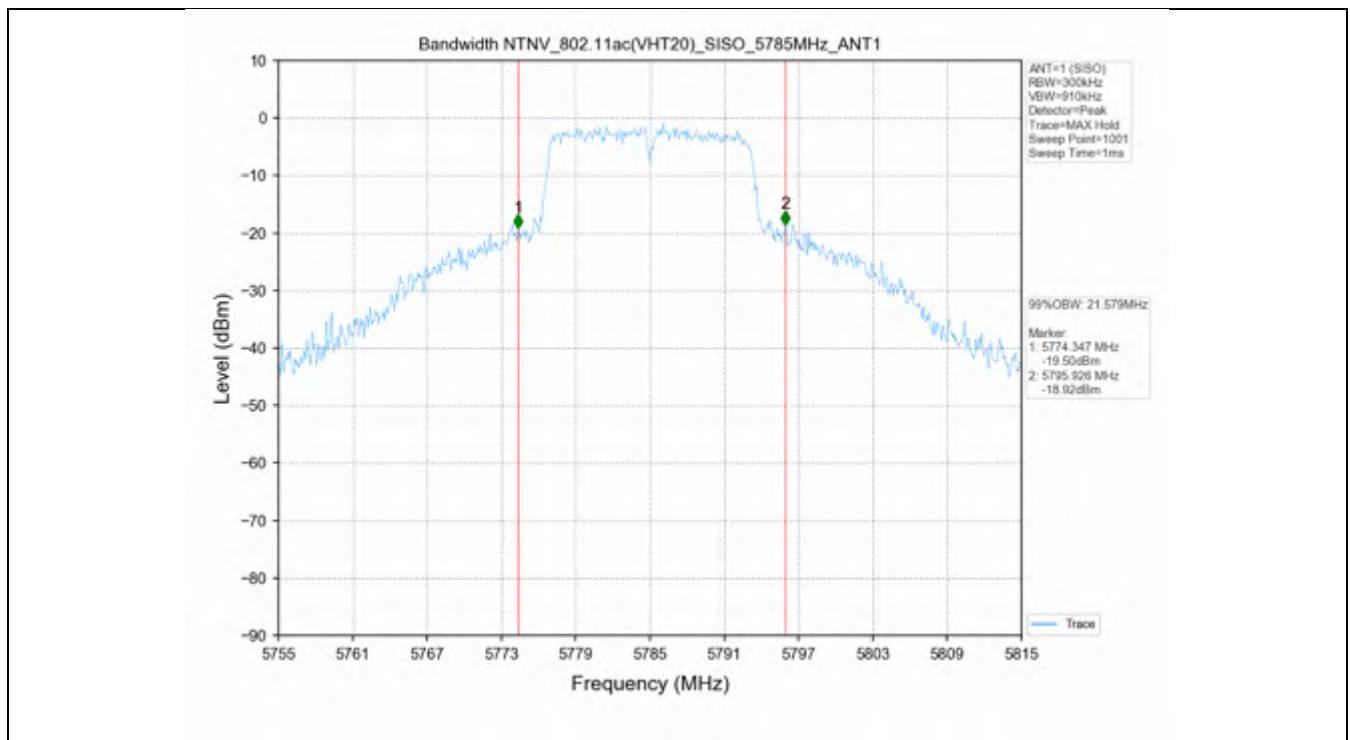
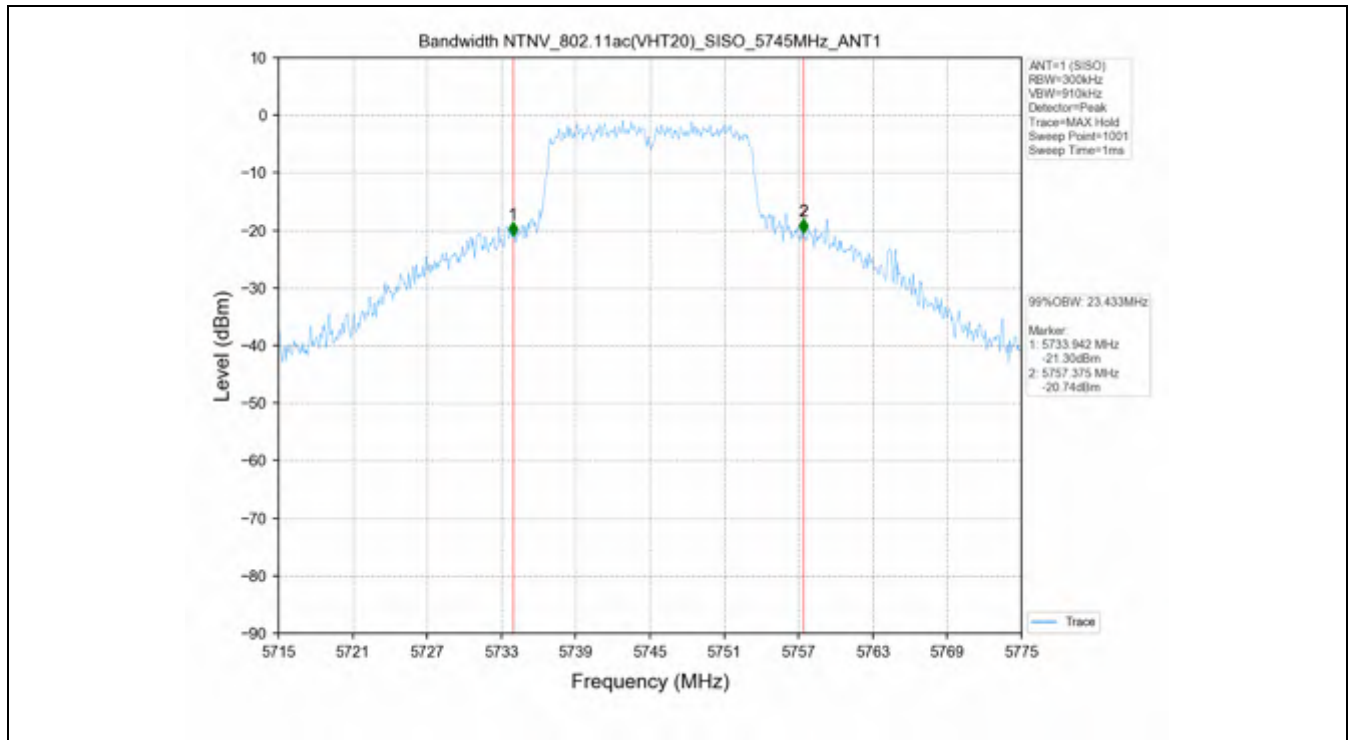


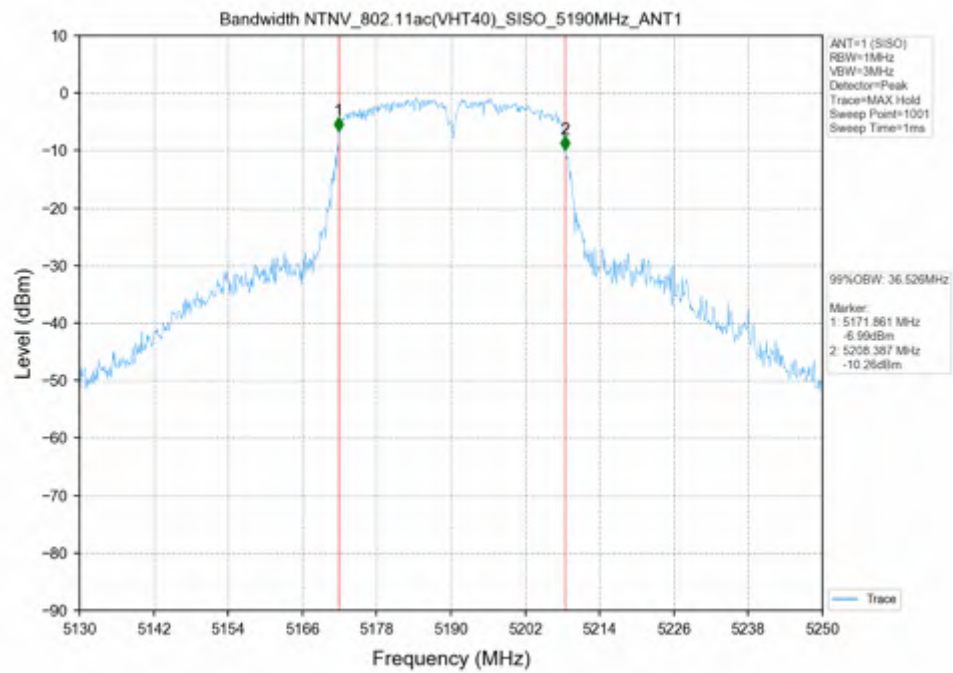
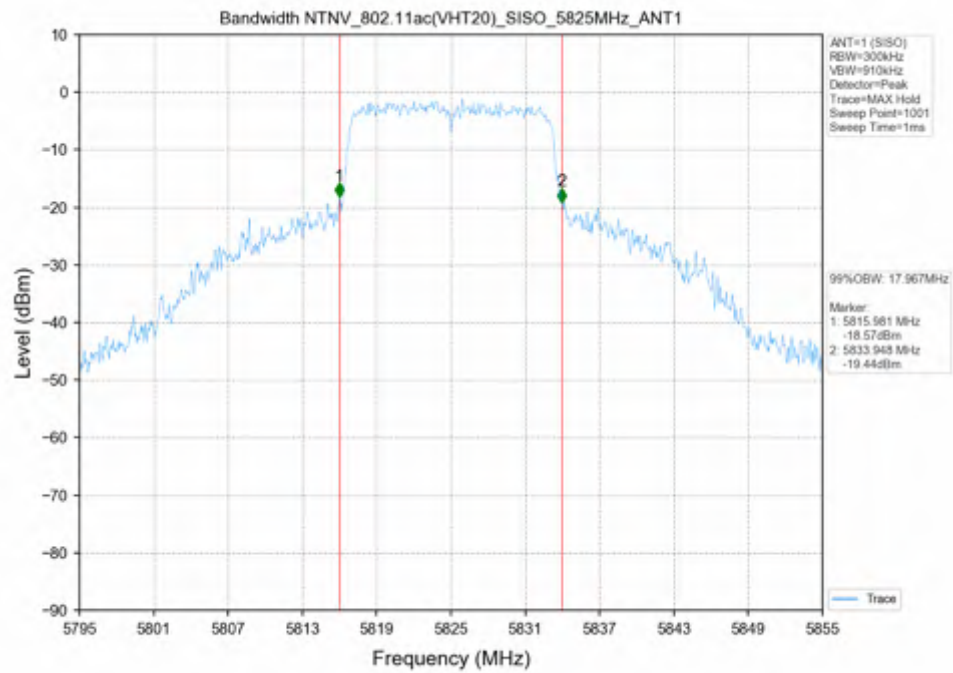
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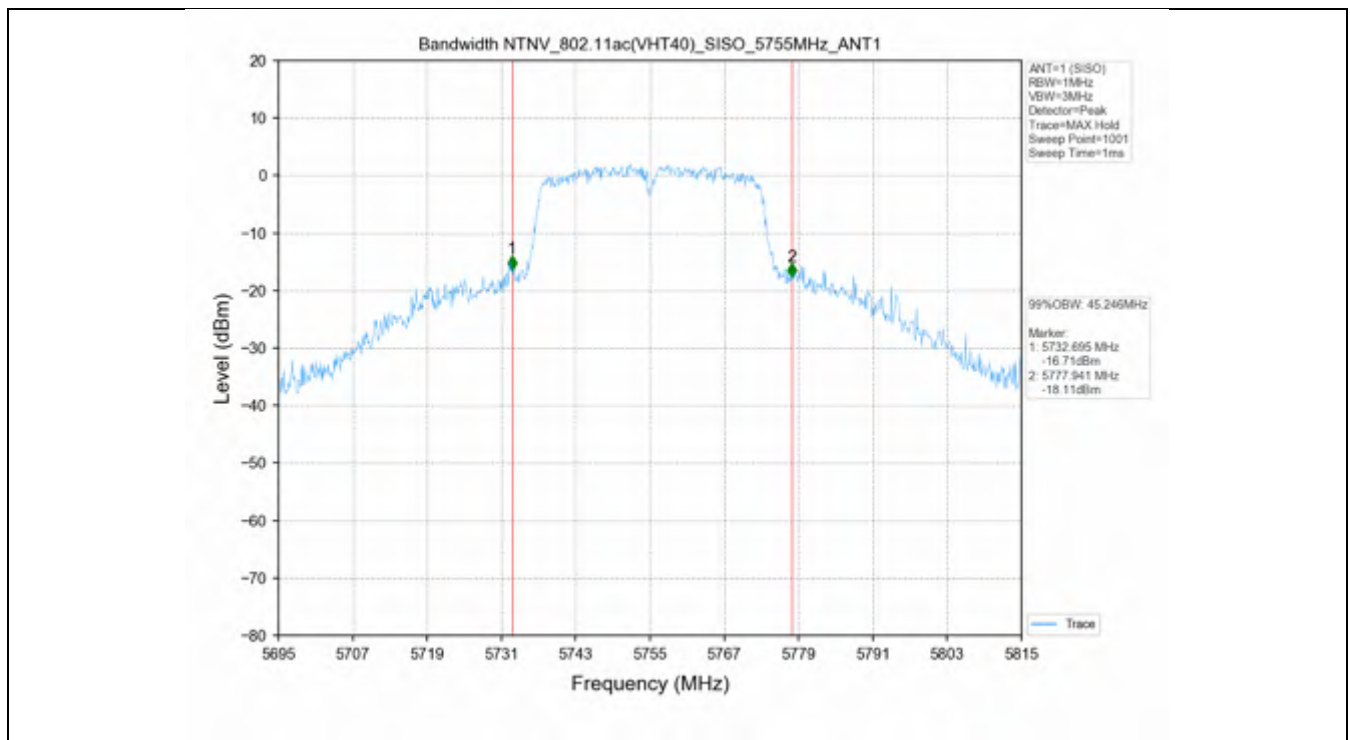
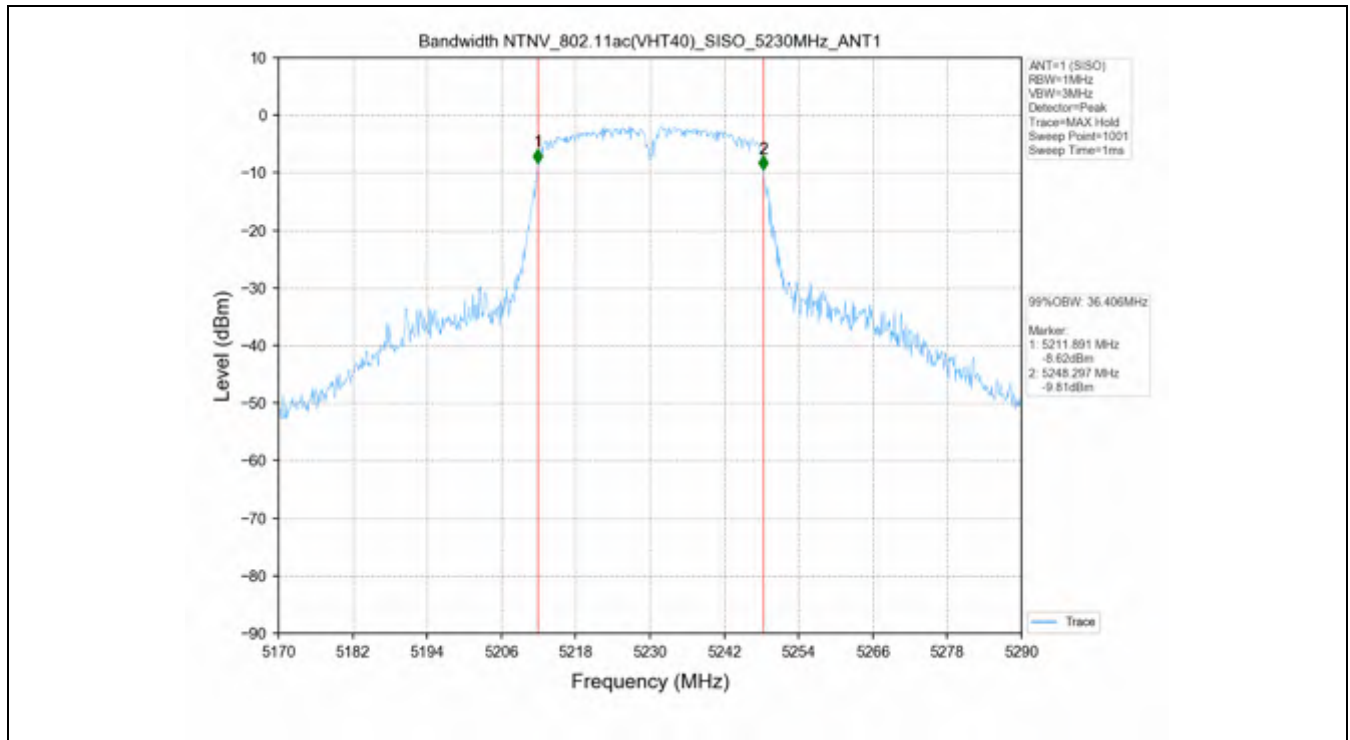


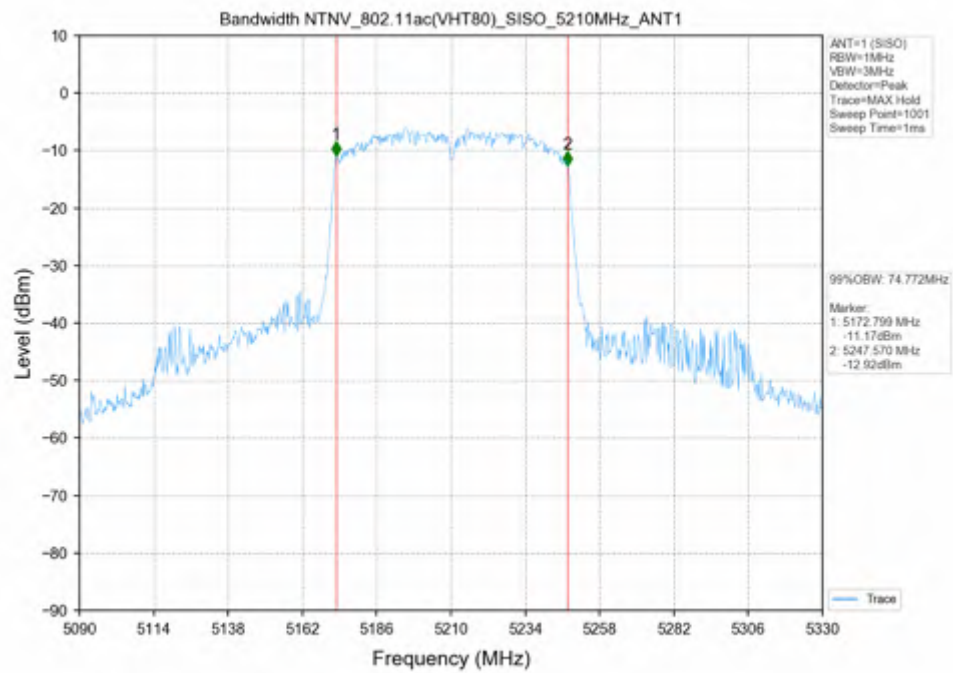
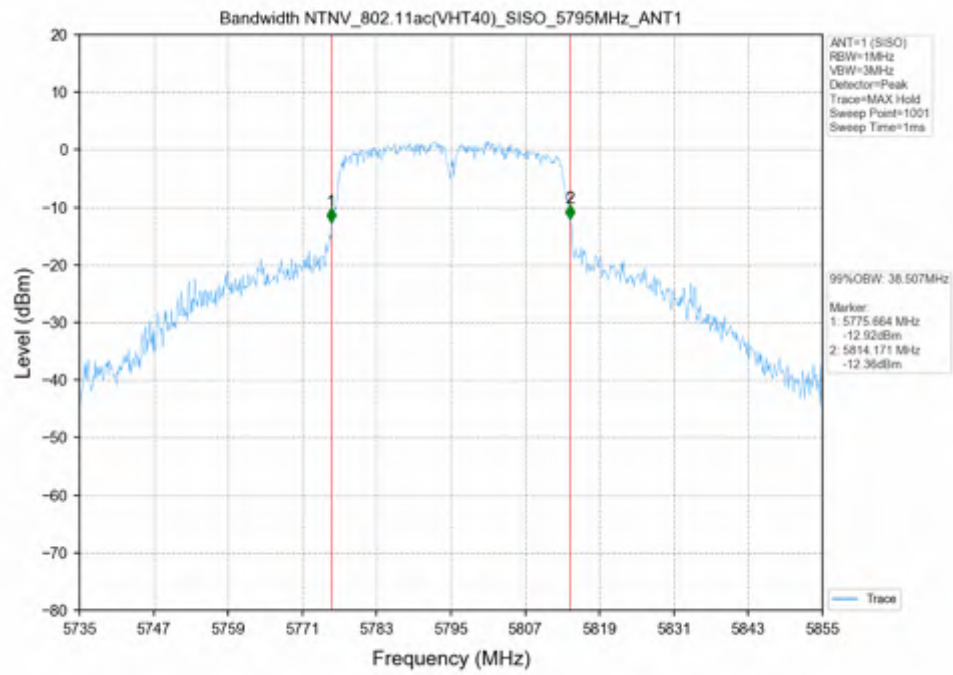


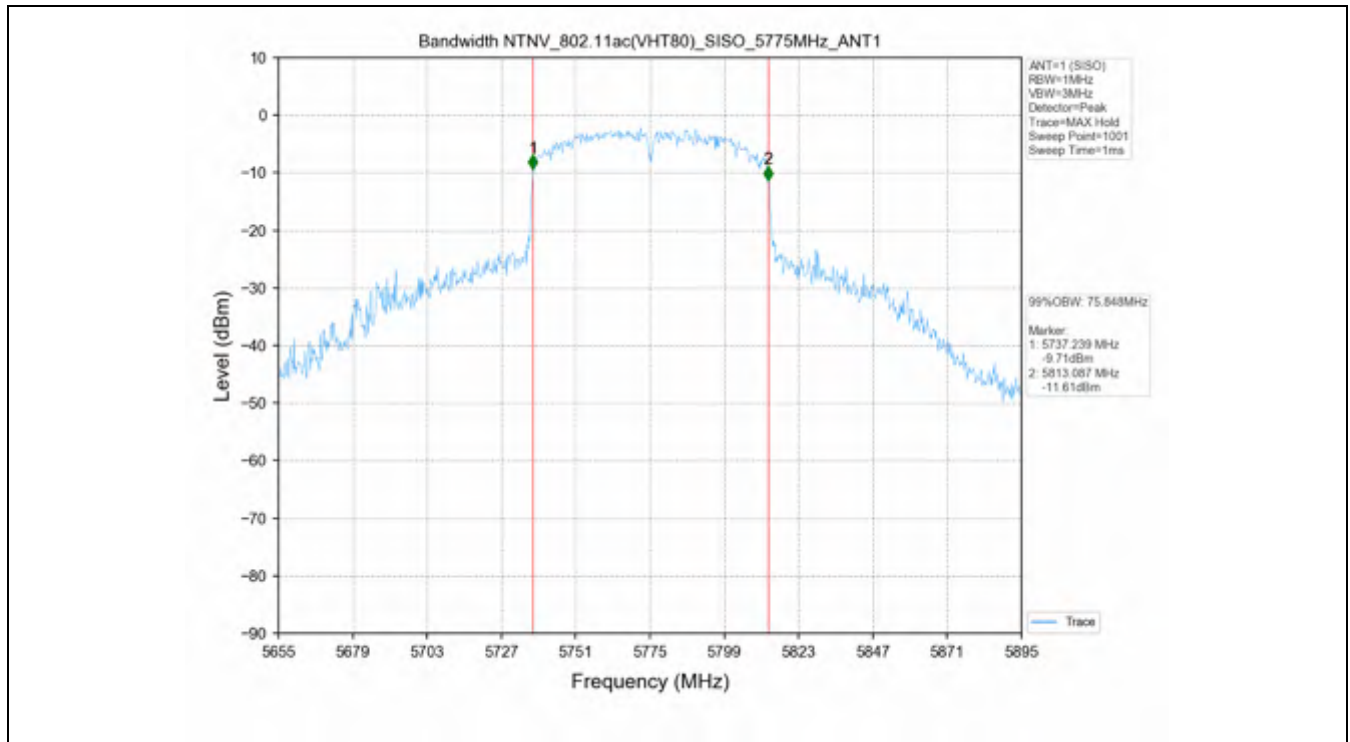












3. Maximum Conducted Output Power

3.1 Test Result

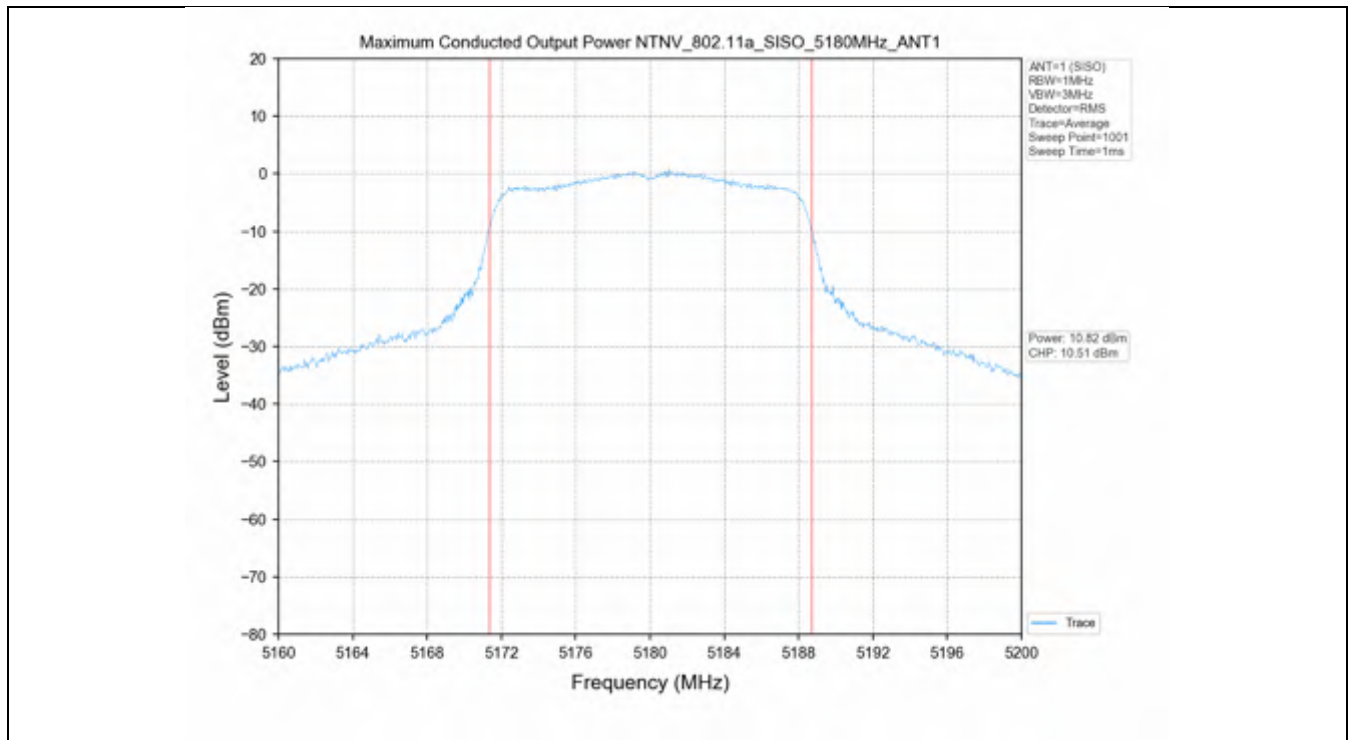
Test Mode	Frequency (MHz)	Tx Type	Measured Output Power (dBm)	Limits (dBm)	Verdict
			Ant 1		
802.11a	5180	SISO	10.82	≤24	PASS
	5200	SISO	11.10	≤24	PASS
	5240	SISO	10.64	≤24	PASS
	5745	SISO	13.79	≤30	PASS
	5785	SISO	13.89	≤30	PASS
	5825	SISO	13.40	≤30	PASS
802.11ac	5180	SISO	12.33	≤24	PASS
	5190	SISO	12.94	≤24	PASS
	5200	SISO	12.63	≤24	PASS
	5210	SISO	12.70	≤24	PASS
	5230	SISO	12.31	≤24	PASS
	5240	SISO	12.15	≤24	PASS
	5745	SISO	14.35	≤30	PASS
	5755	SISO	14.77	≤30	PASS
	5775	SISO	15.85	≤30	PASS
	5785	SISO	14.39	≤30	PASS
	5795	SISO	15.28	≤30	PASS
	5825	SISO	13.98	≤30	PASS
802.11n	5180	SISO	12.15	≤24	PASS
	5190	SISO	13.71	≤24	PASS
	5200	SISO	12.47	≤24	PASS

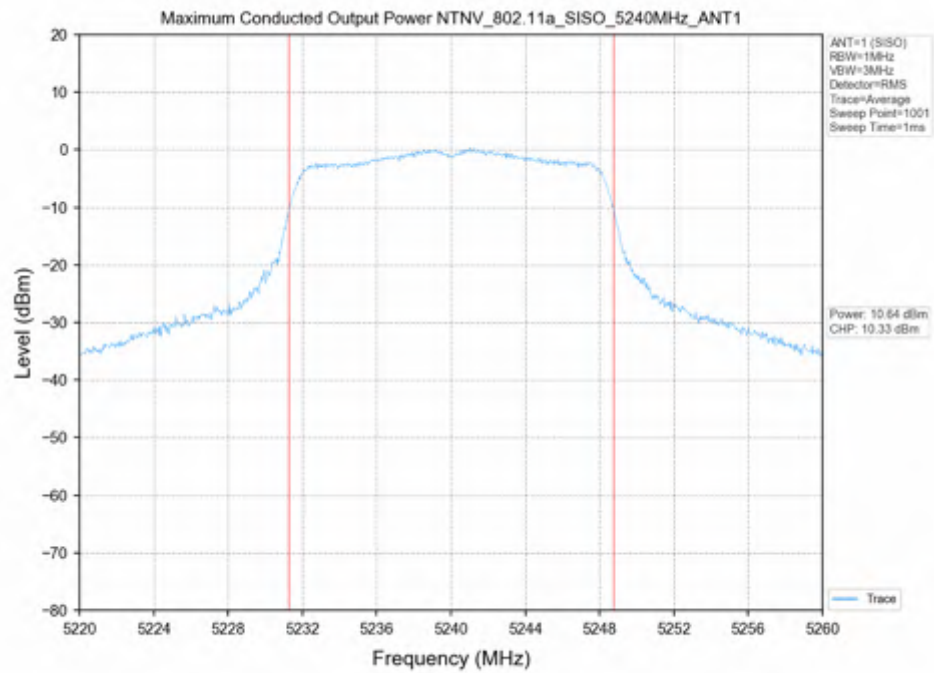
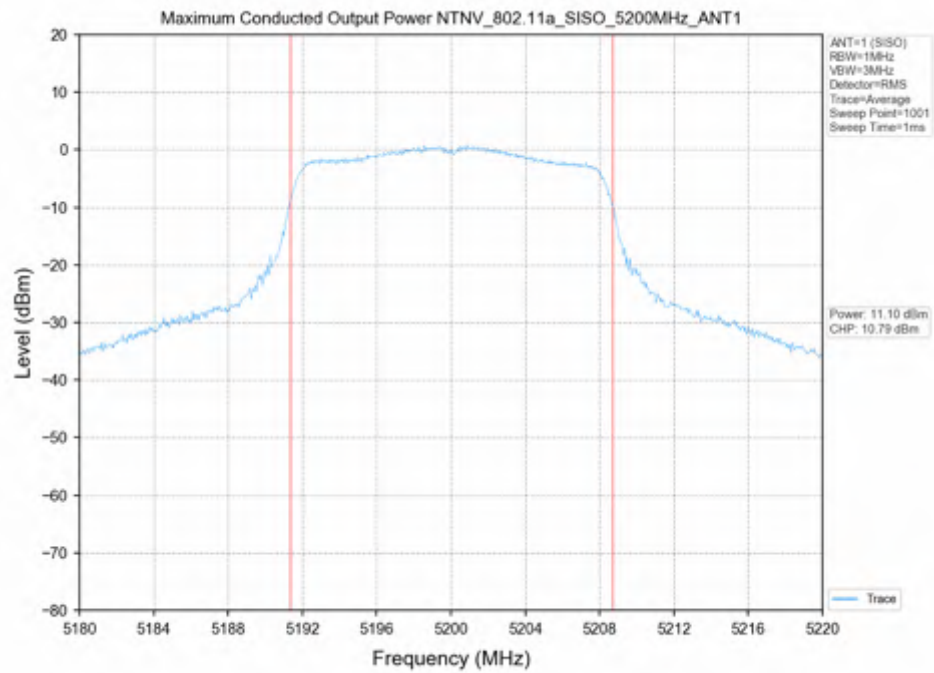


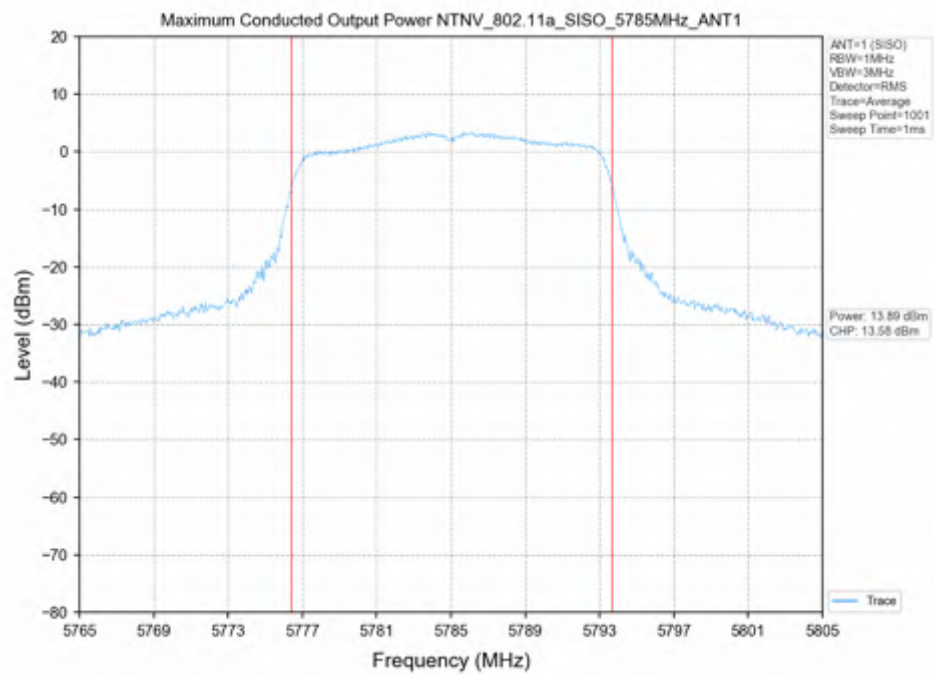
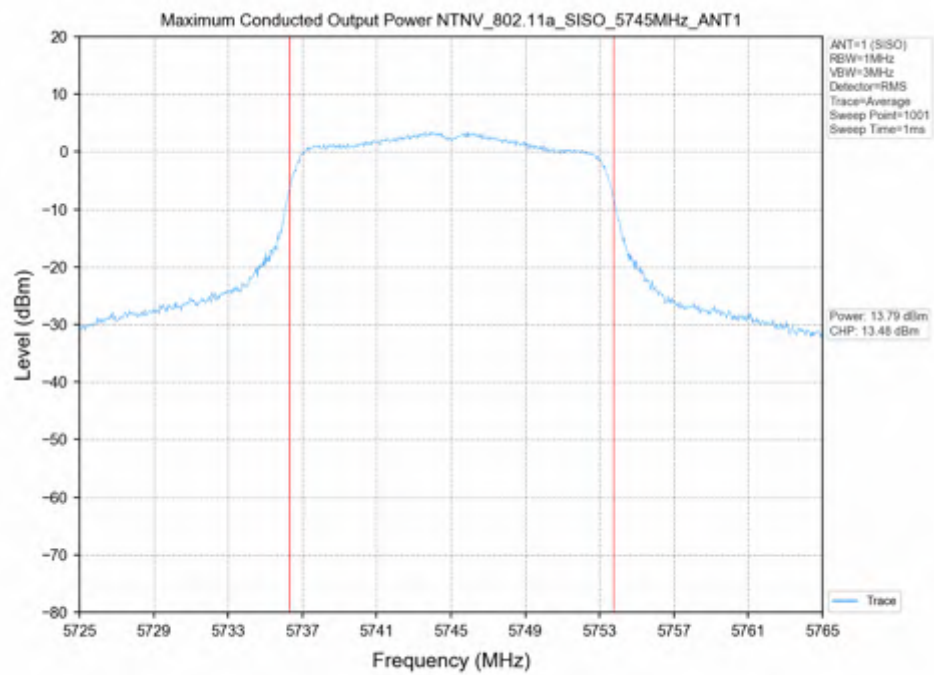
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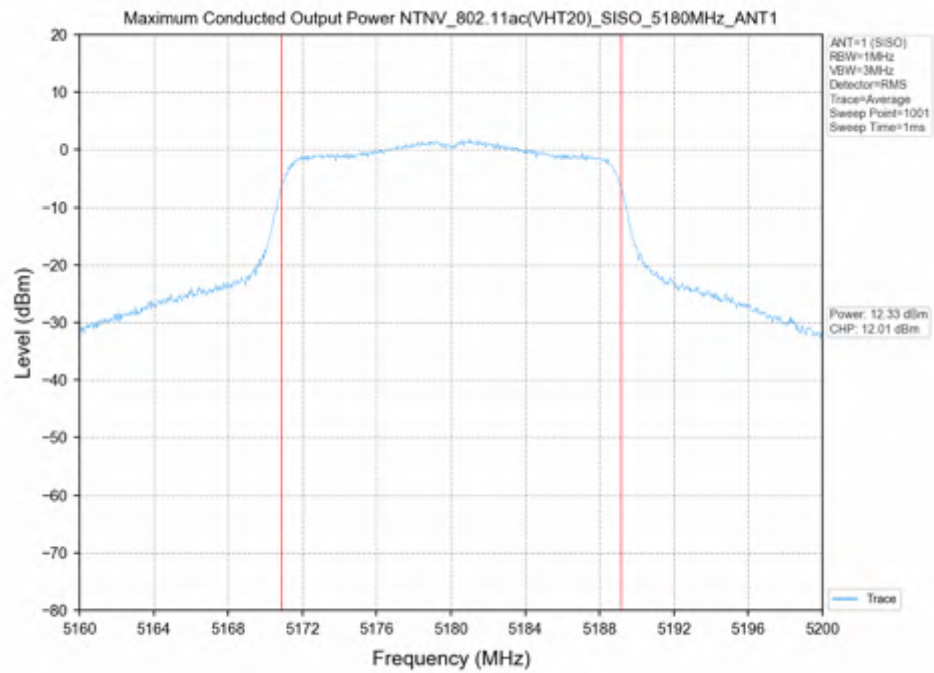
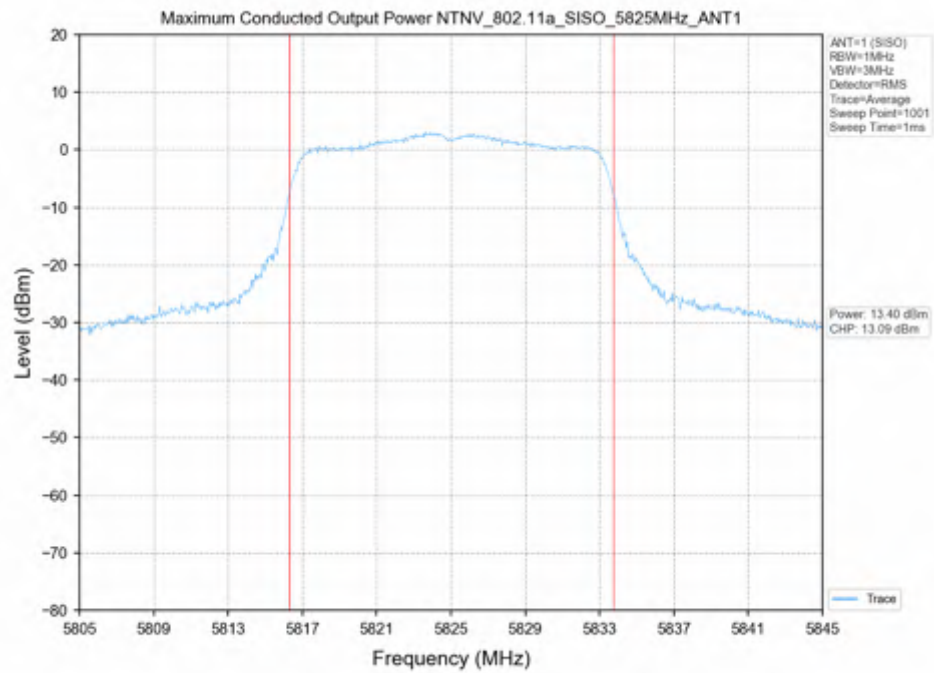
	5230	SISO	13.89	≤ 24	PASS
	5240	SISO	12.00	≤ 24	PASS
	5745	SISO	14.24	≤ 30	PASS
	5755	SISO	15.28	≤ 30	PASS
	5785	SISO	14.49	≤ 30	PASS
	5795	SISO	15.67	≤ 30	PASS
	5825	SISO	14.00	≤ 30	PASS

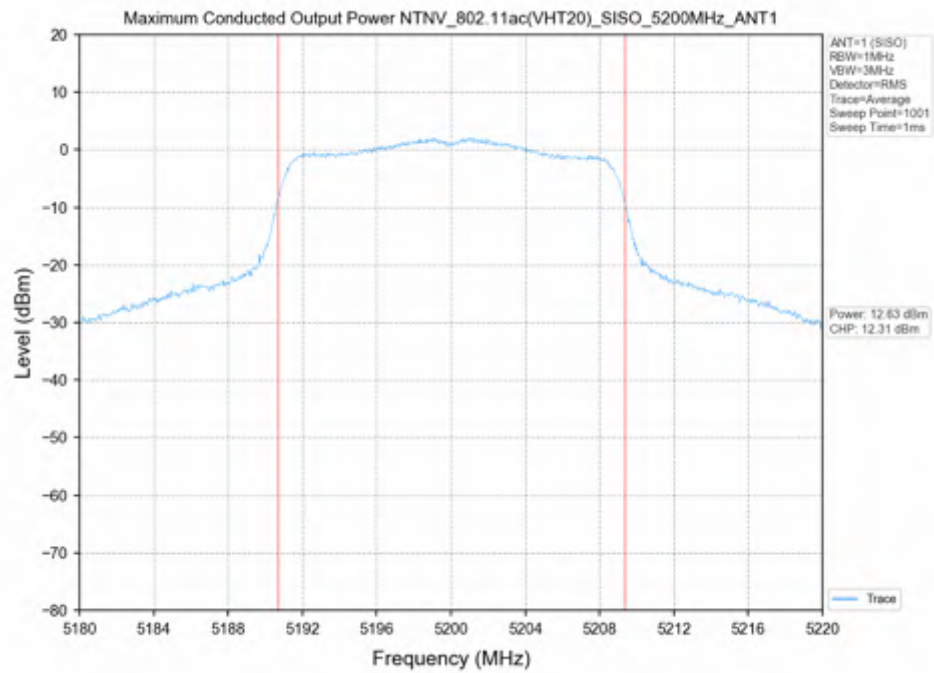
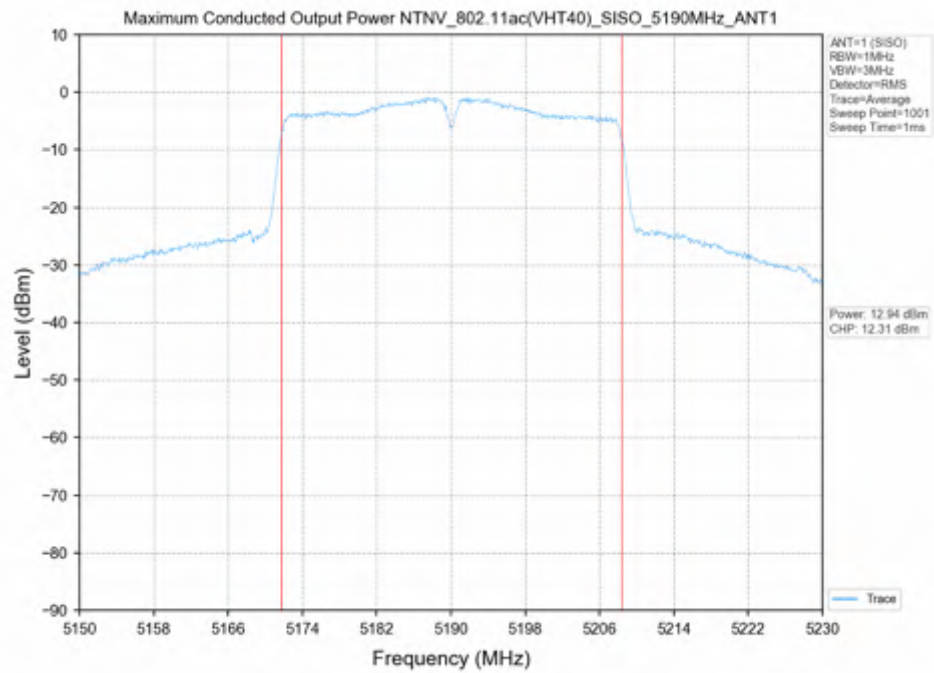
3.2 Test Graph

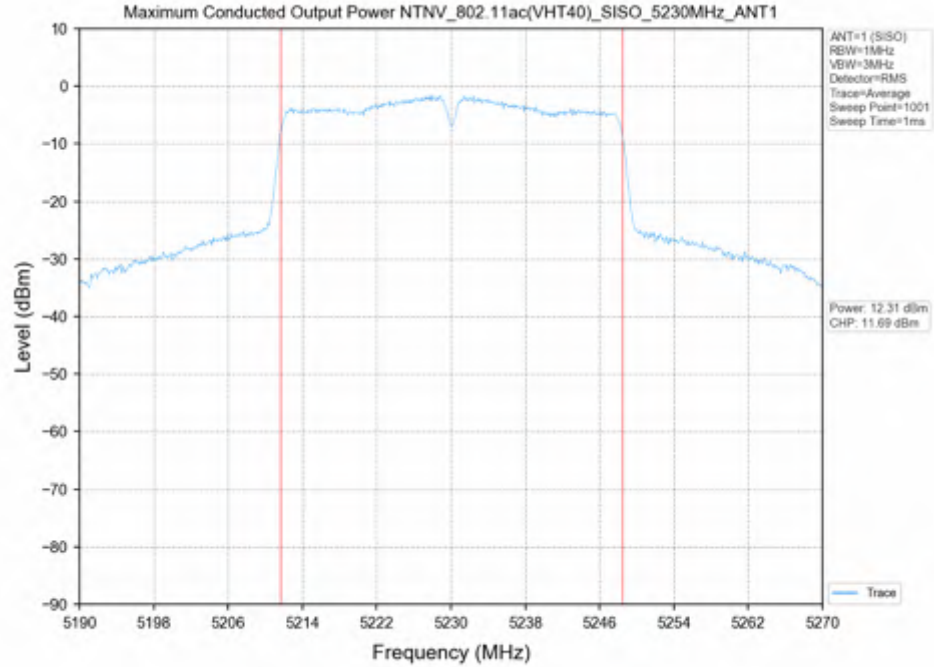
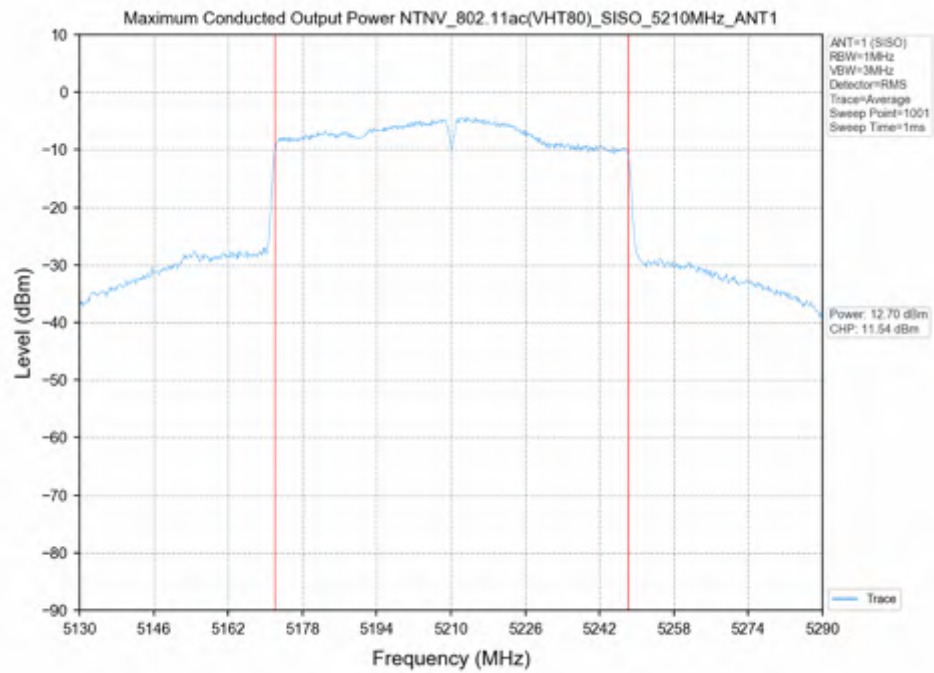


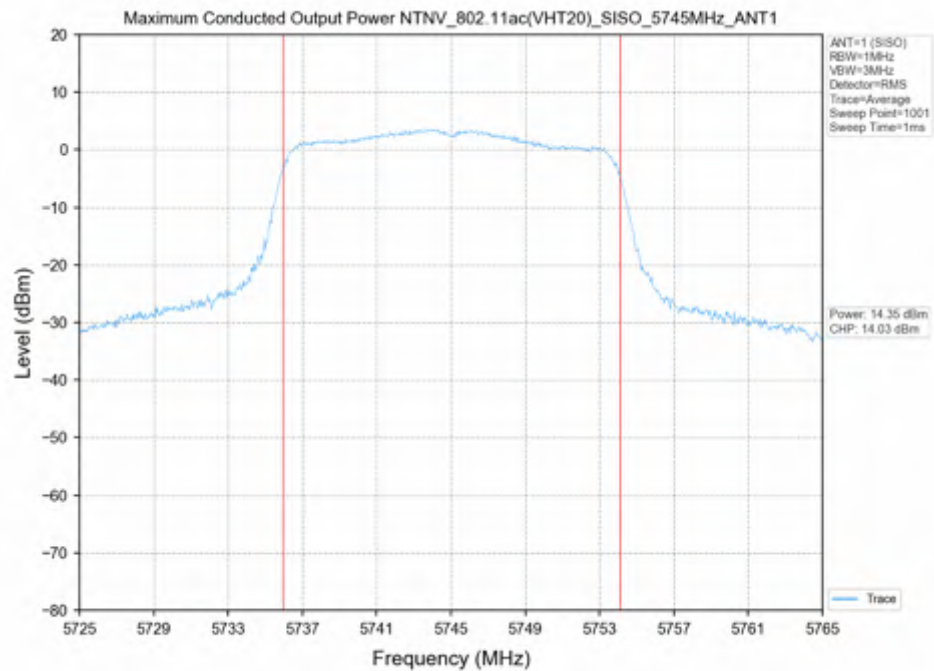
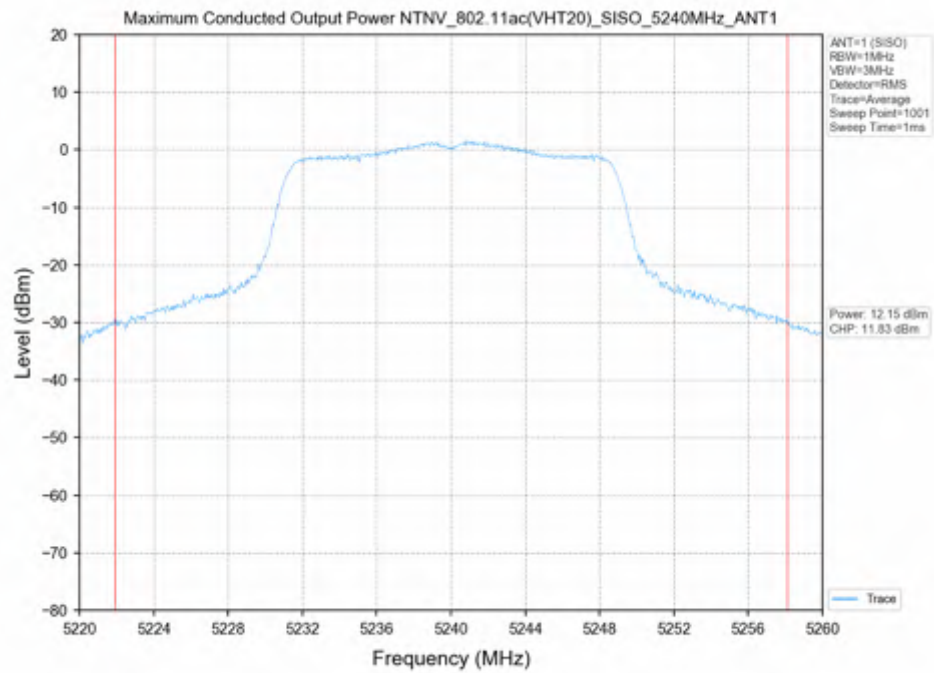


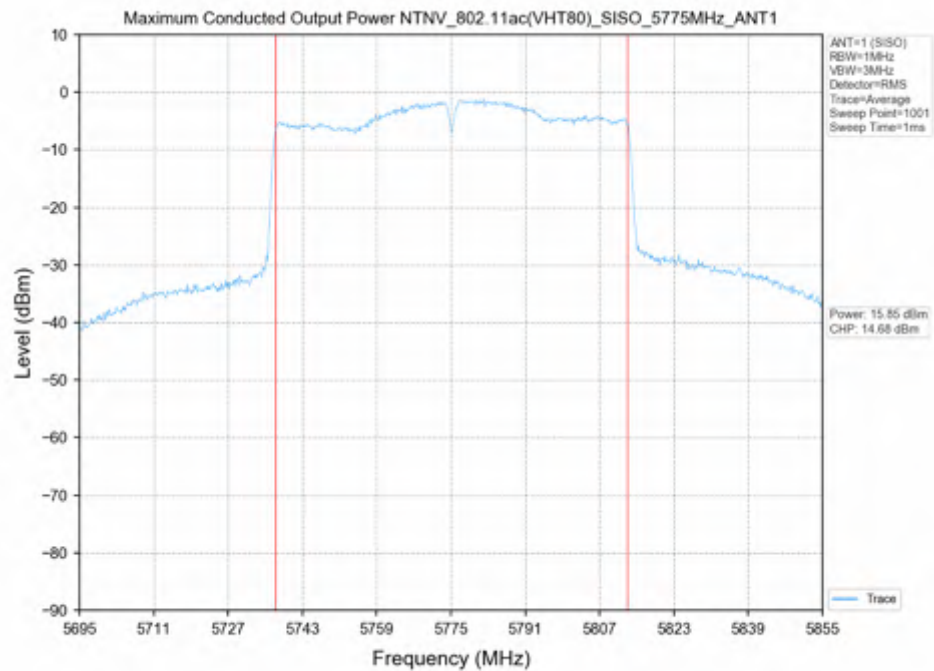
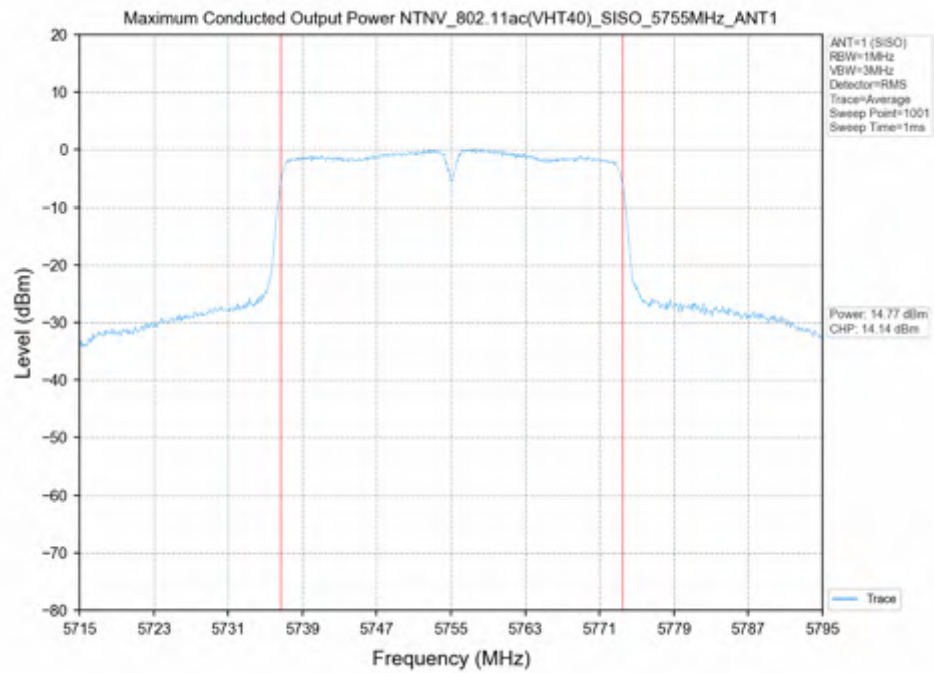


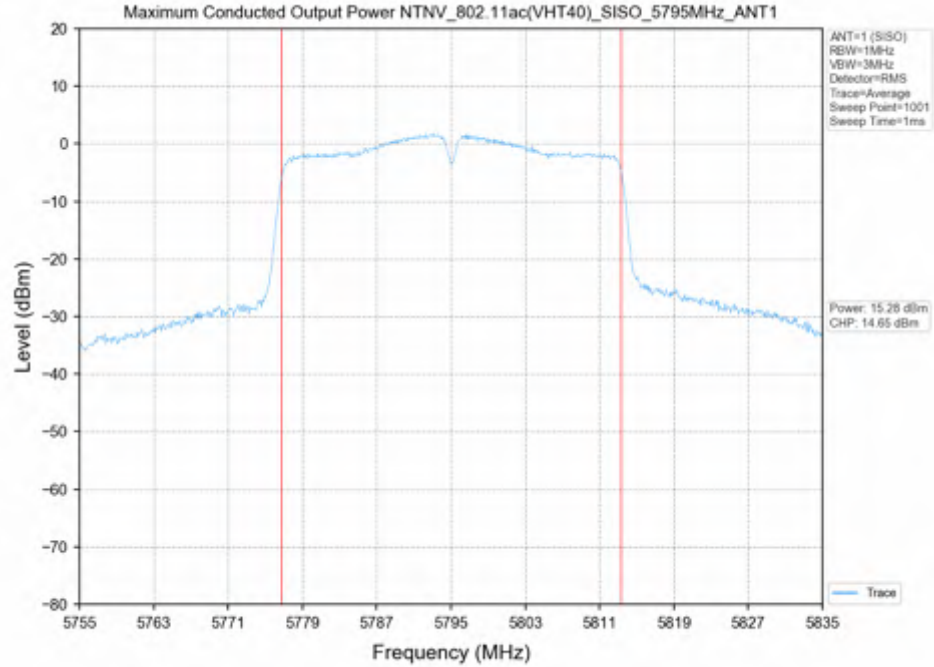
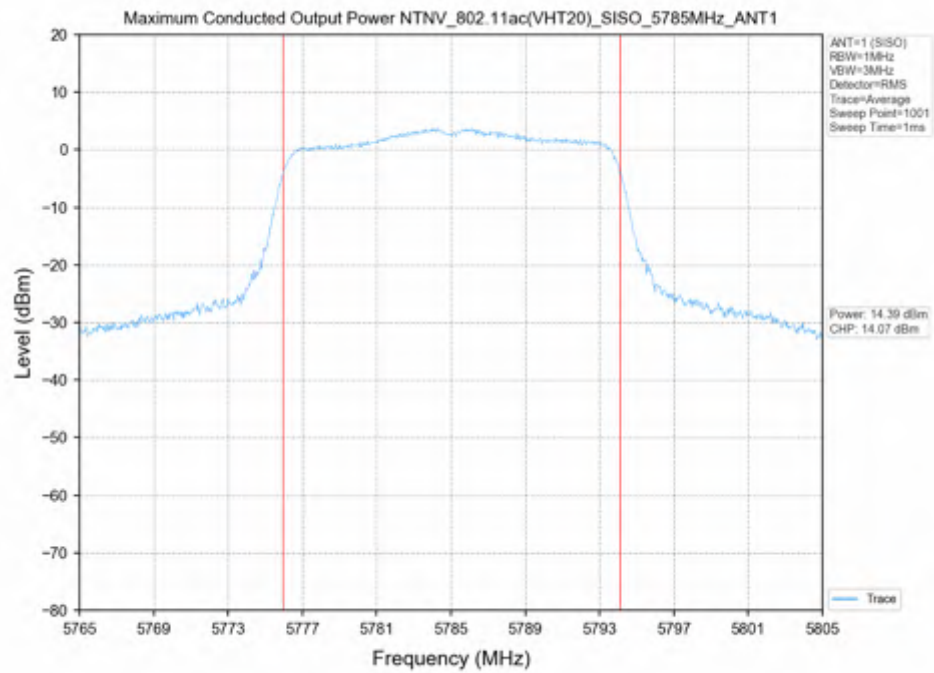


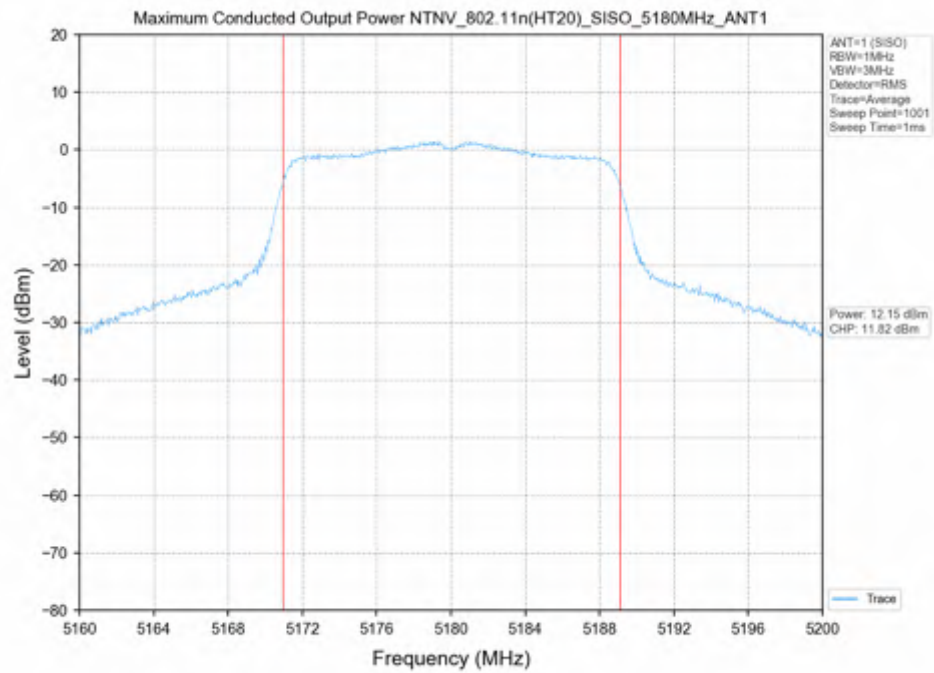
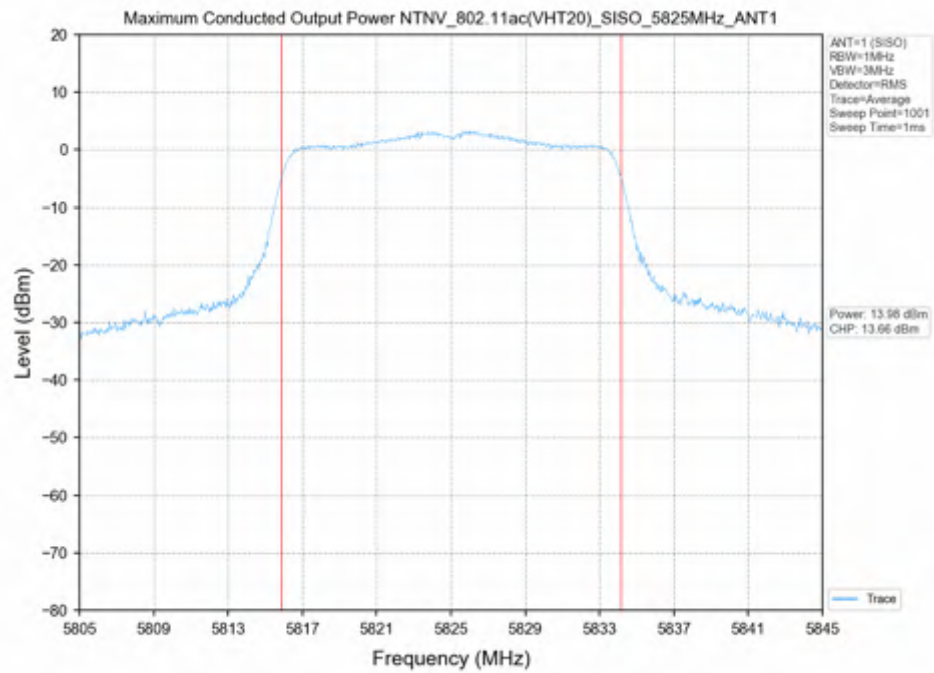


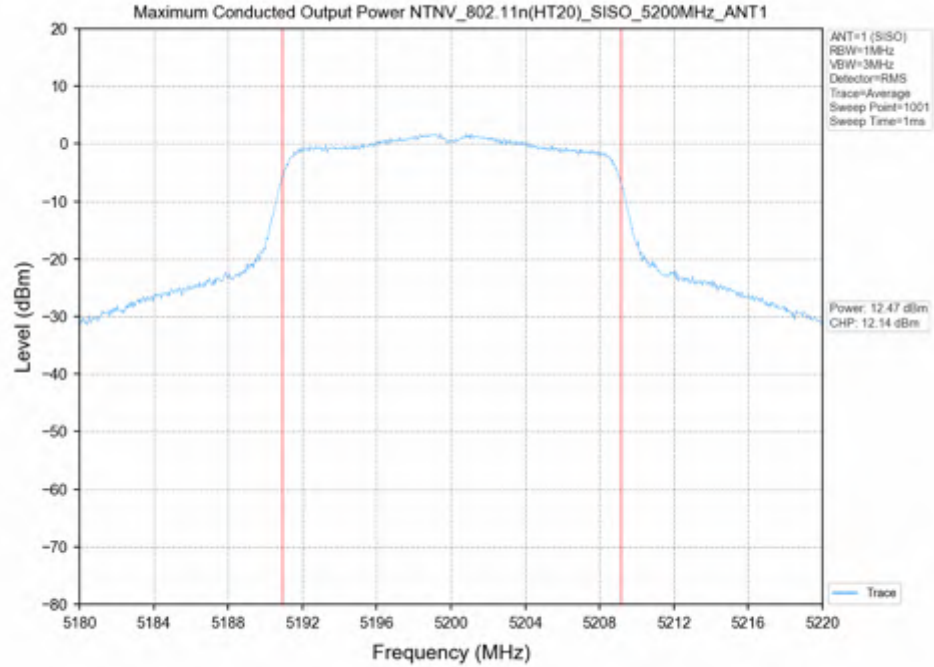
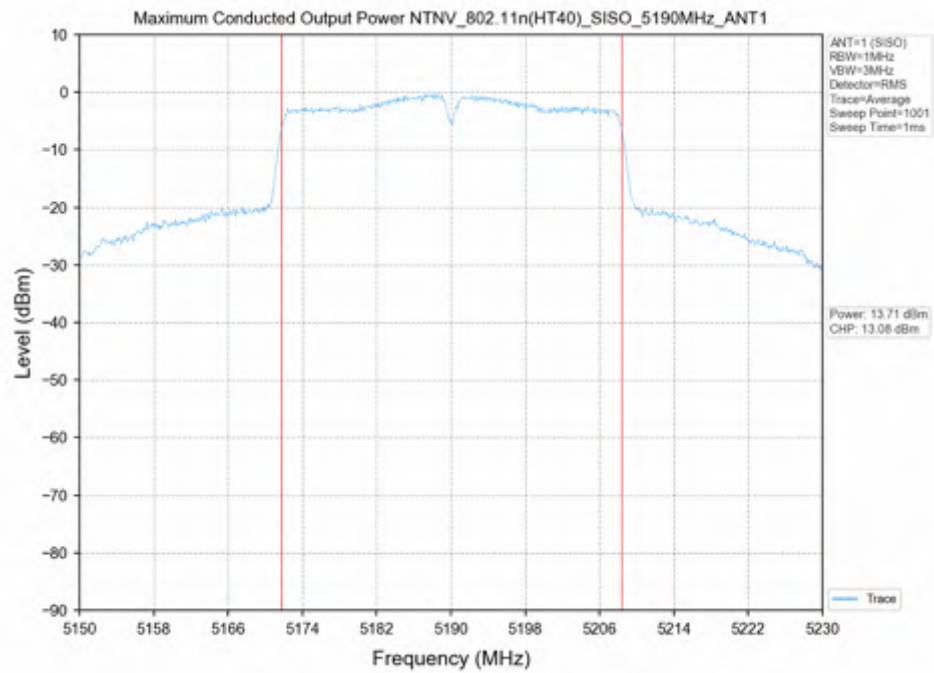


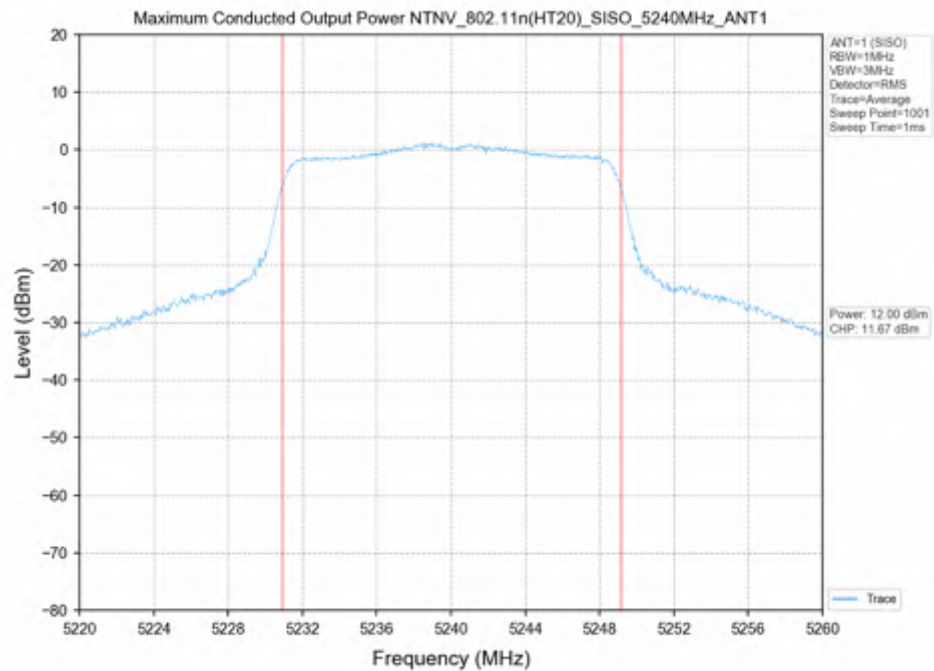
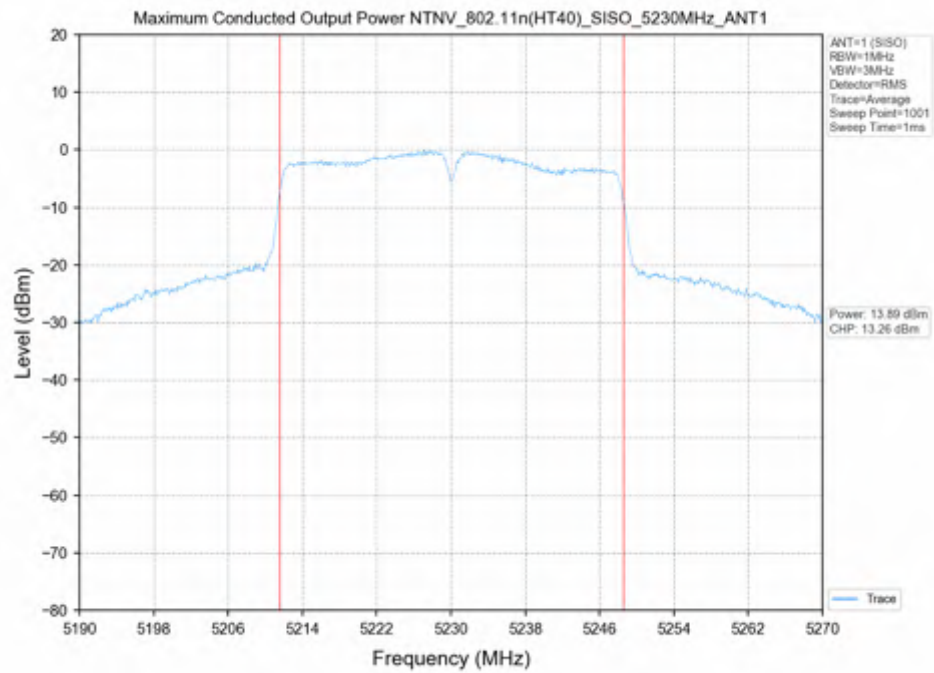


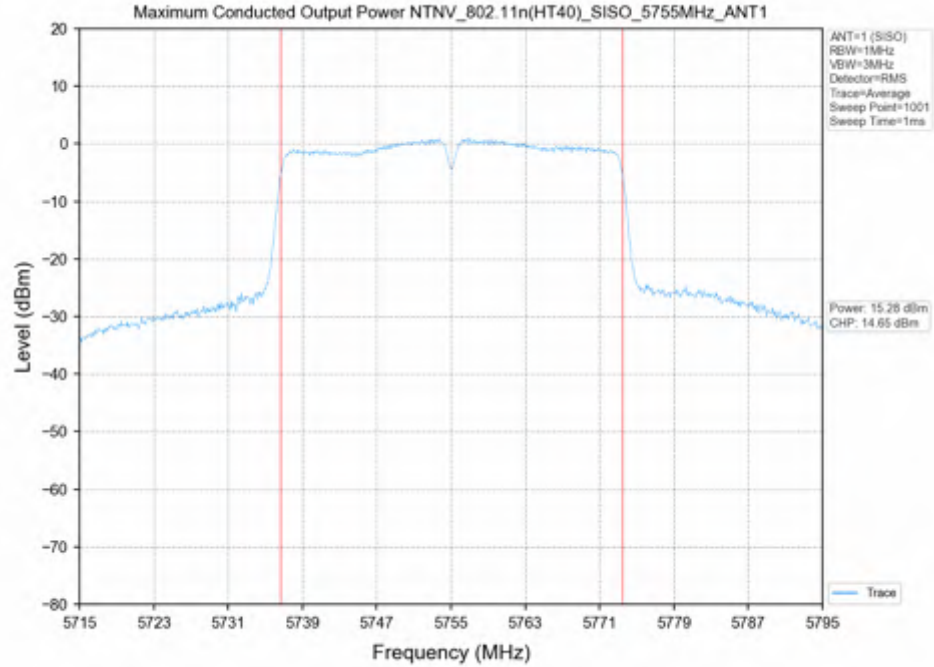
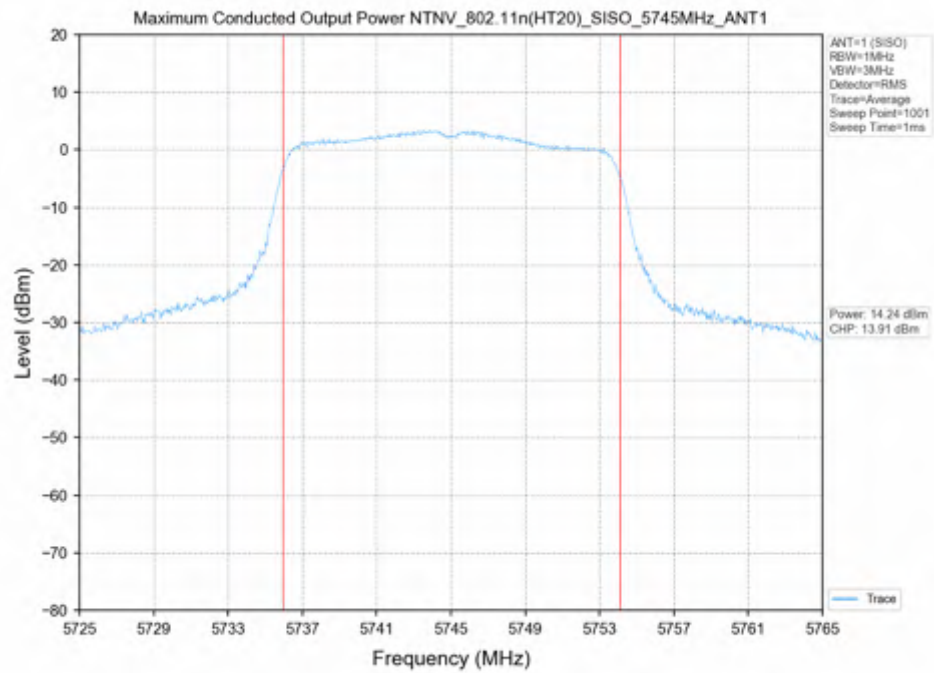


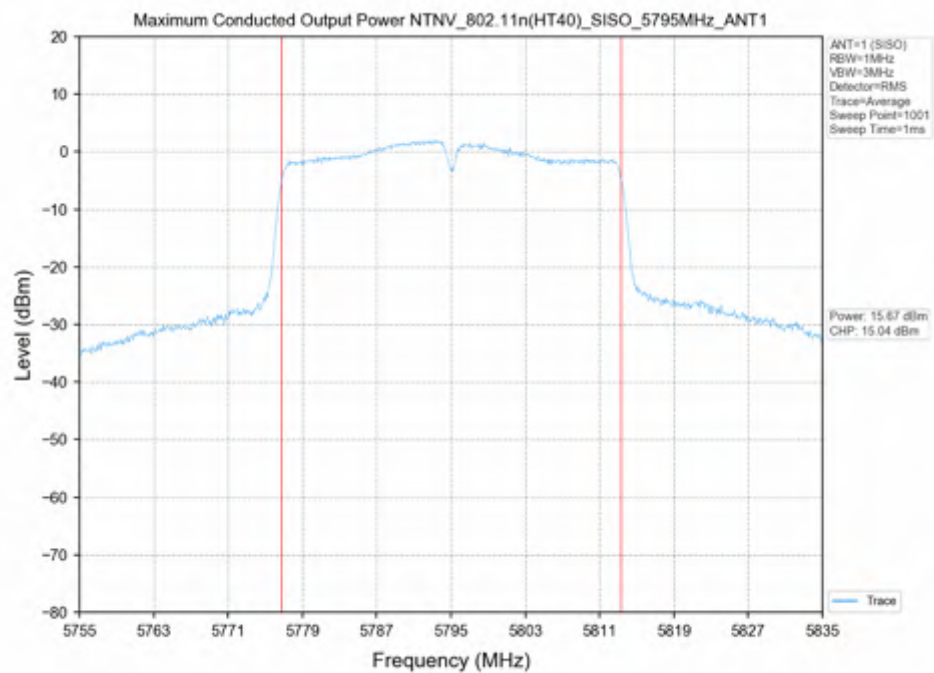
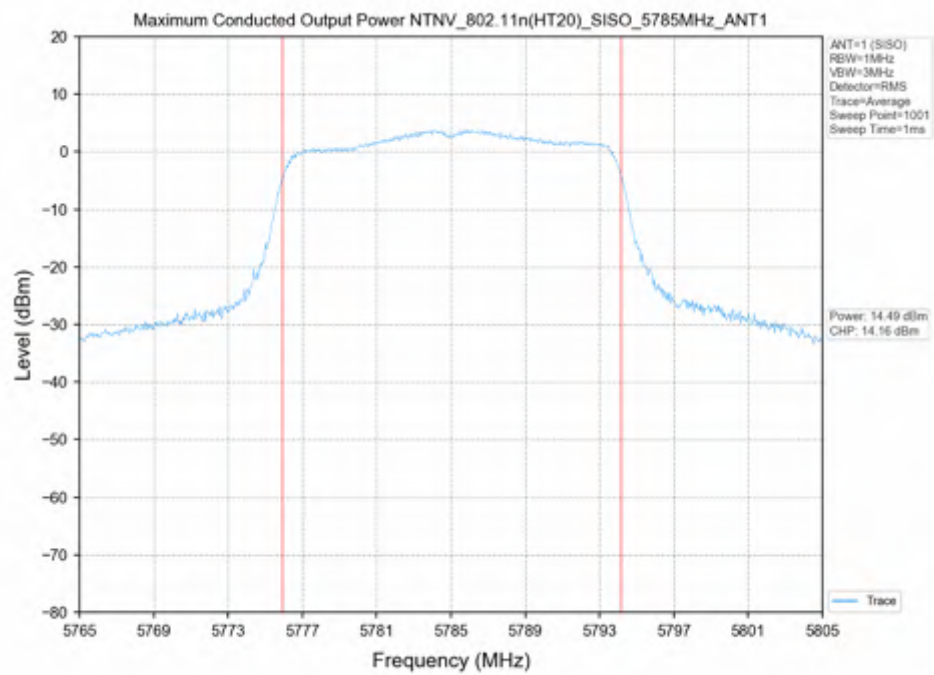


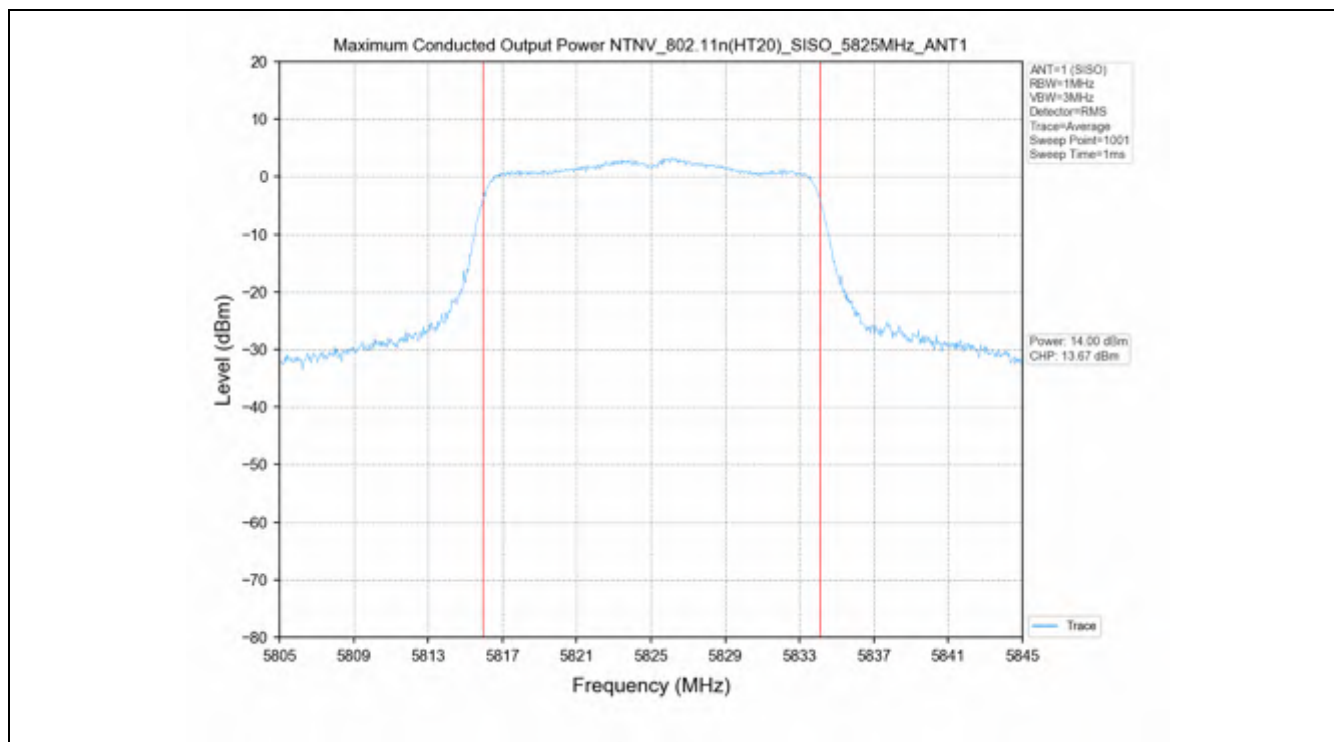












4. Maximum Power Spectral Density (PSD)

4.1 Test Result

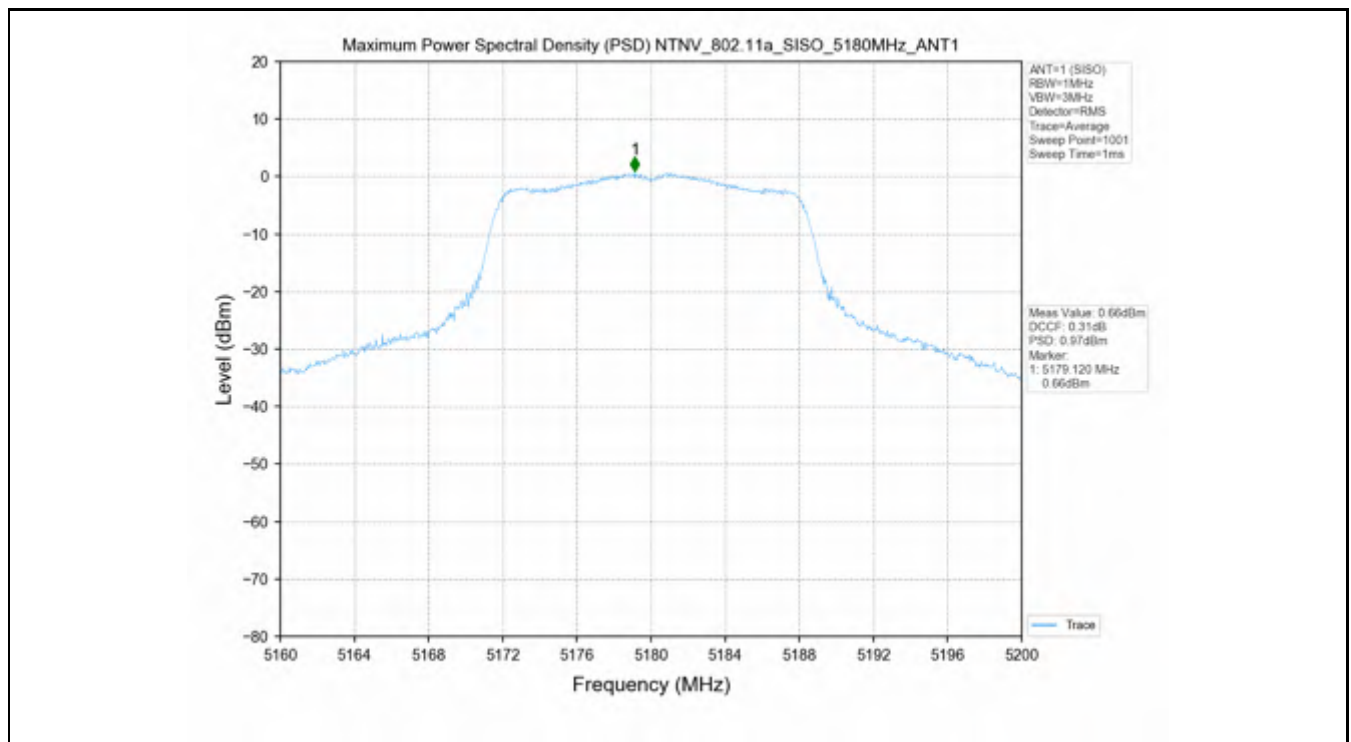
Test Mode	Frequency (MHz)	Tx Type	Maximum Power Spectral Density (dBm/MHz)	Limits (dBm/MHz)	Verdict
			Ant 1		
802.11a	5180	SISO	0.97	≤11	PASS
	5200	SISO	1.46	≤11	PASS
	5240	SISO	0.89	≤11	PASS
802.11n(HT20)	5180	SISO	2.02	≤11	PASS
	5200	SISO	2.29	≤11	PASS
	5240	SISO	1.83	≤11	PASS
802.11n(HT40)	5190	SISO	1.02	≤11	PASS
	5230	SISO	0.51	≤11	PASS
802.11ac(VHT20)	5180	SISO	2.17	≤11	PASS
	5200	SISO	2.68	≤11	PASS
	5240	SISO	1.79	≤11	PASS
802.11ac(VHT40)	5190	SISO	-0.19	≤11	PASS
	5230	SISO	-1.30	≤11	PASS
802.11ac(VHT80)	5210	SISO	-2.88	≤11	PASS

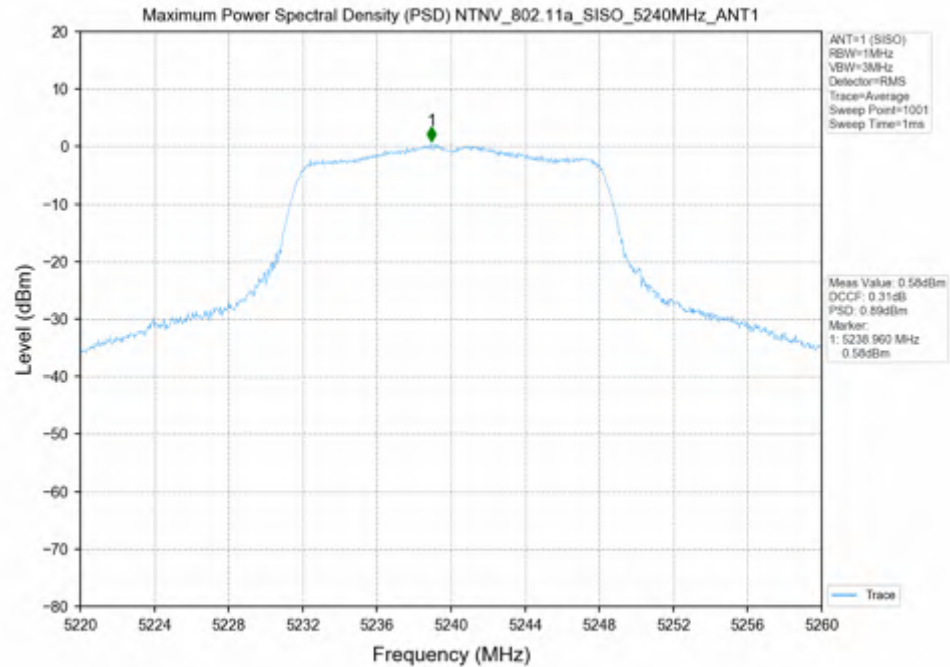
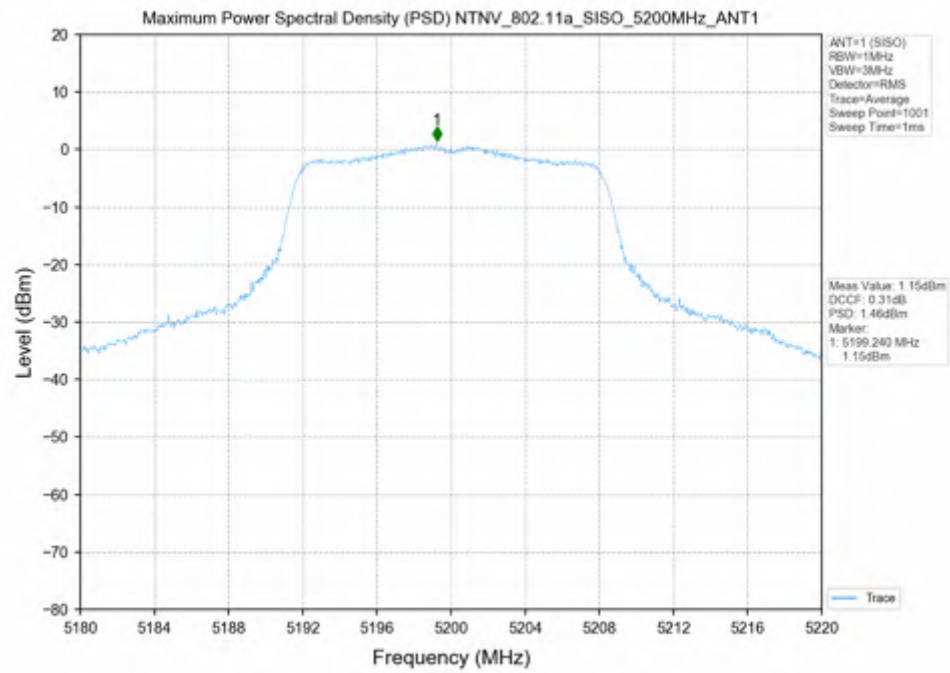
Test Mode	Frequency (MHz)	Tx Type	Maximum Power Spectral Density (dBm/500kHz)	Limits (dBm/500kHz)	Verdict
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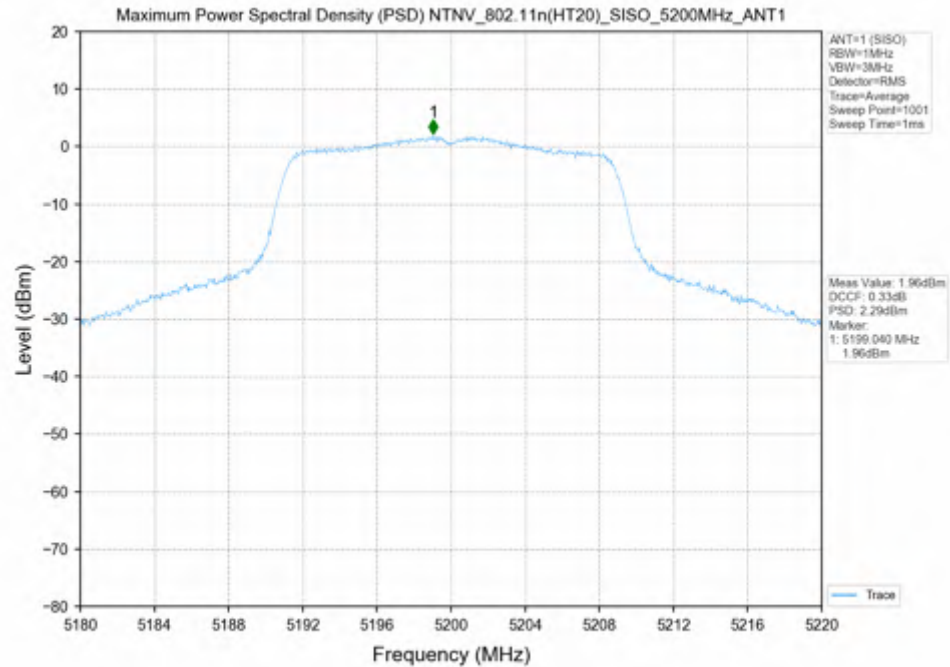
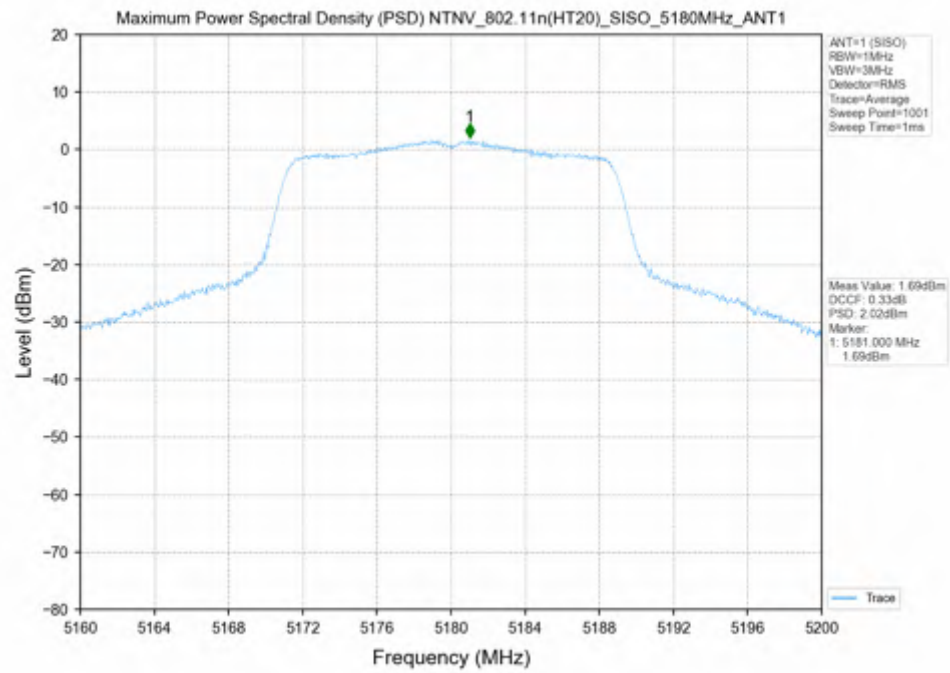


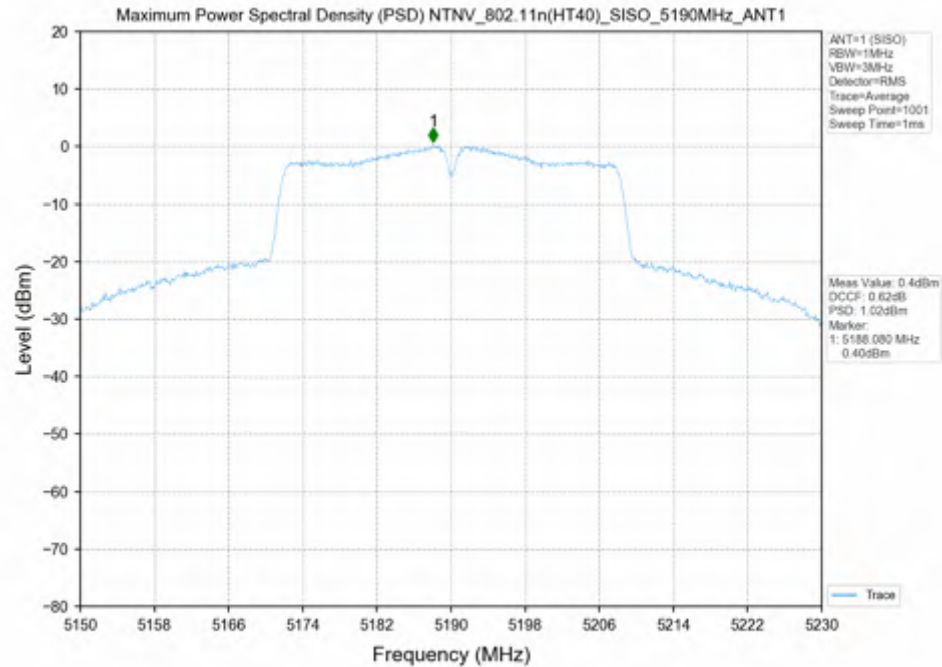
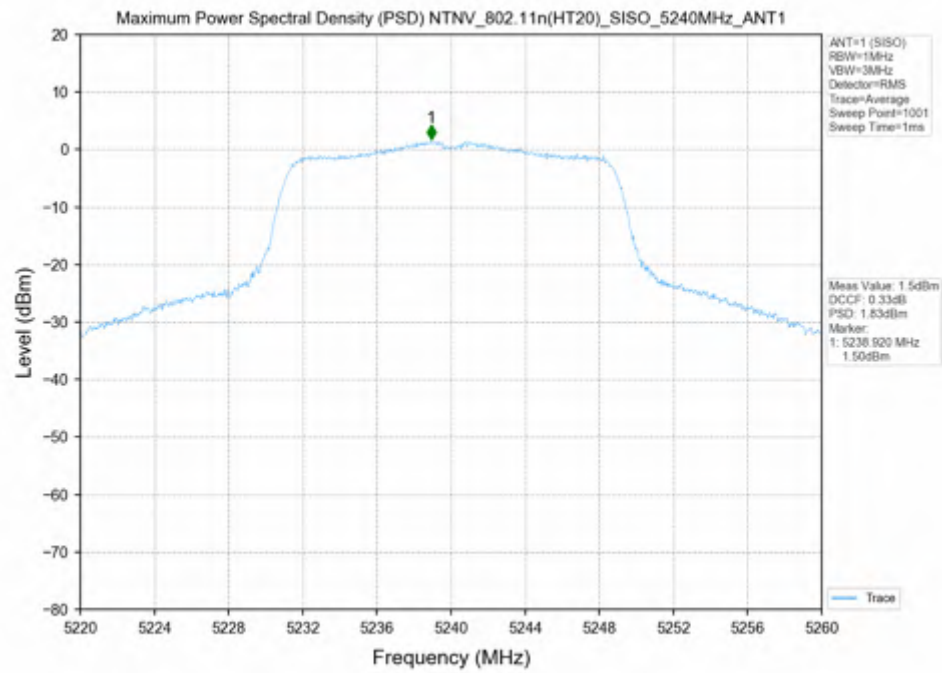
			Ant 1		
802.11a	5745	SISO	0.89	≤30	PASS
	5785	SISO	1.52	≤30	PASS
	5825	SISO	0.77	≤30	PASS
802.11n(HT20)	5745	SISO	1.54	≤30	PASS
	5785	SISO	1.36	≤30	PASS
	5825	SISO	1.06	≤30	PASS
802.11n(HT40)	5755	SISO	-1.28	≤30	PASS
	5795	SISO	-0.48	≤30	PASS
802.11ac(VHT20)	5745	SISO	1.47	≤30	PASS
	5785	SISO	1.54	≤30	PASS
	5825	SISO	0.90	≤30	PASS
802.11ac(VHT40)	5755	SISO	-1.46	≤30	PASS
	5795	SISO	-0.38	≤30	PASS
802.11ac(VHT80)	5775	SISO	-3.56	≤30	PASS

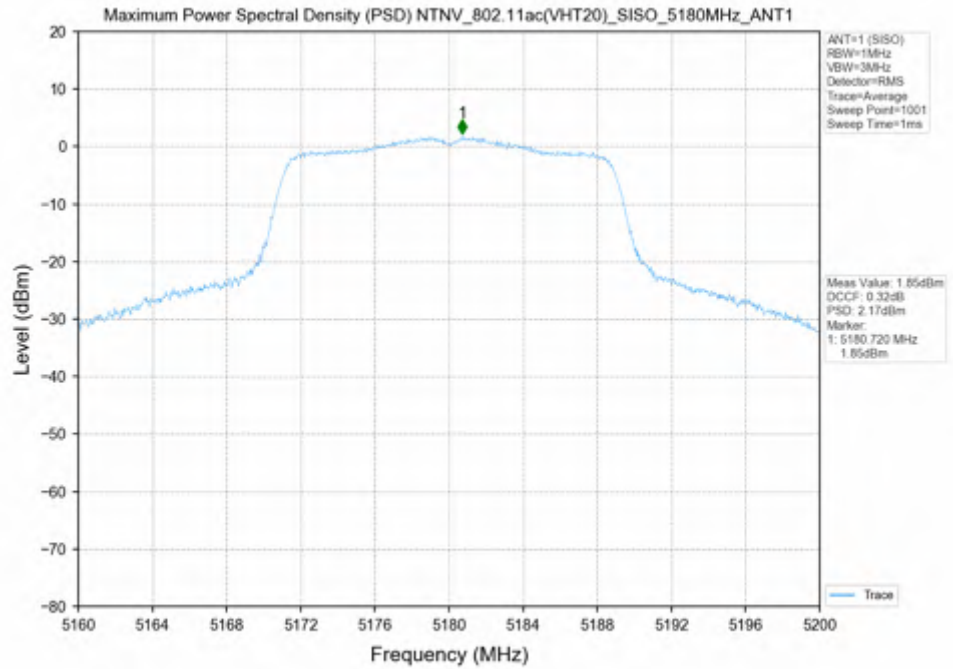
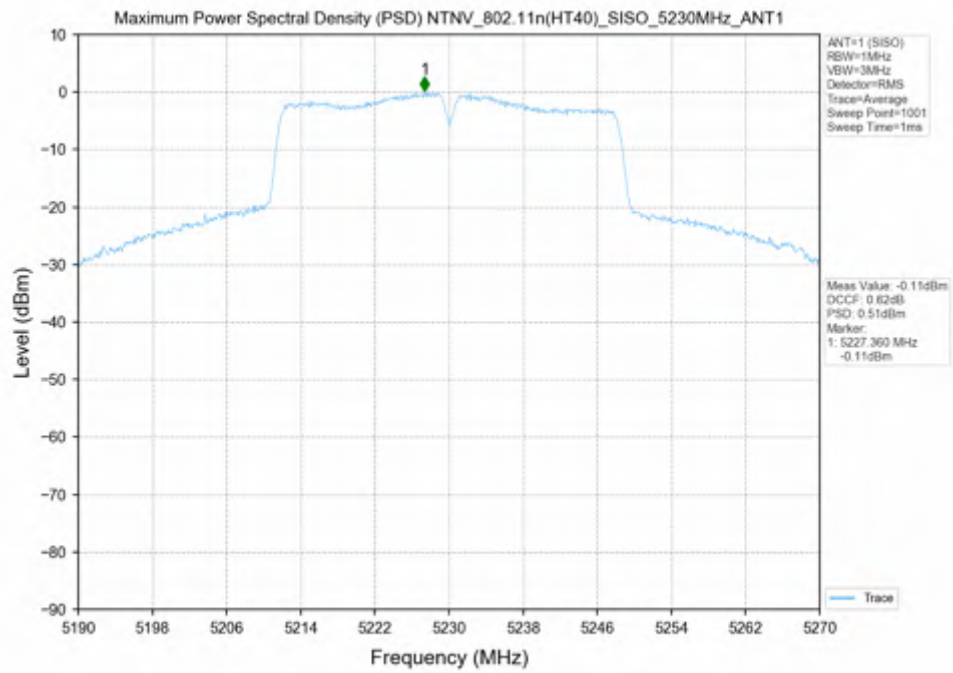
4.2 Test Graph

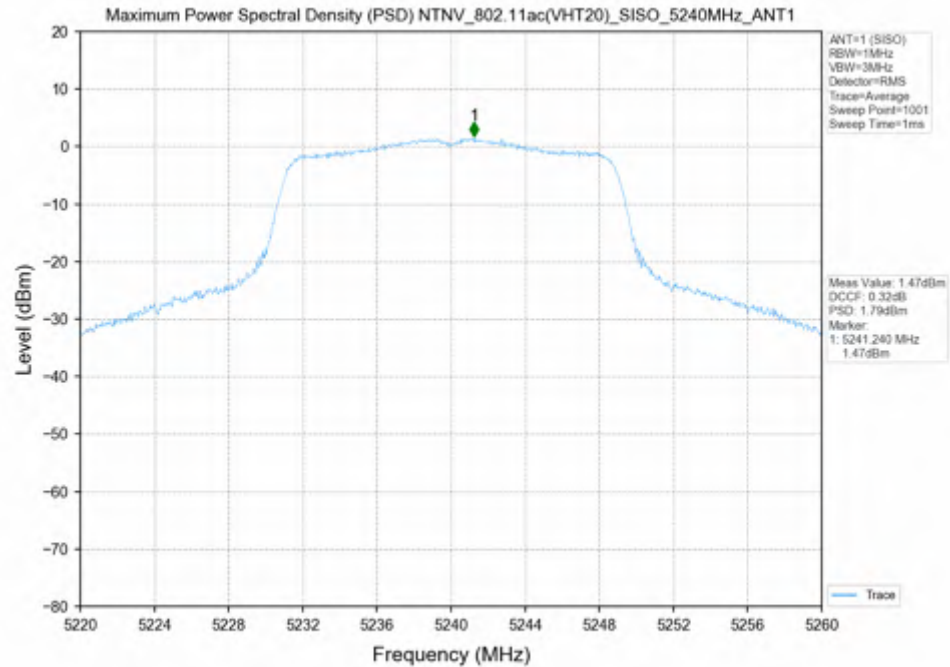
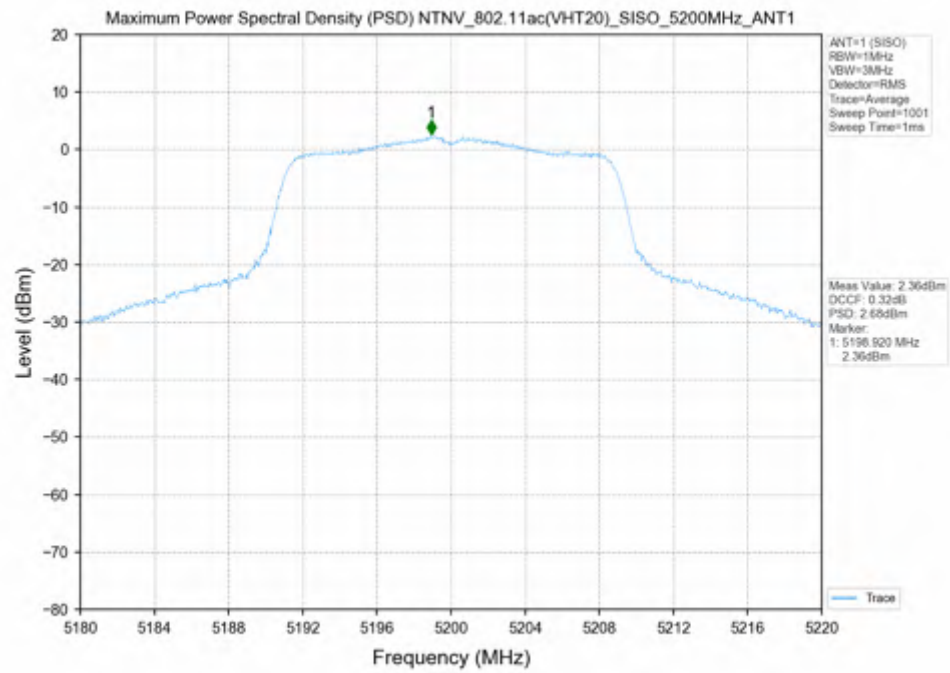


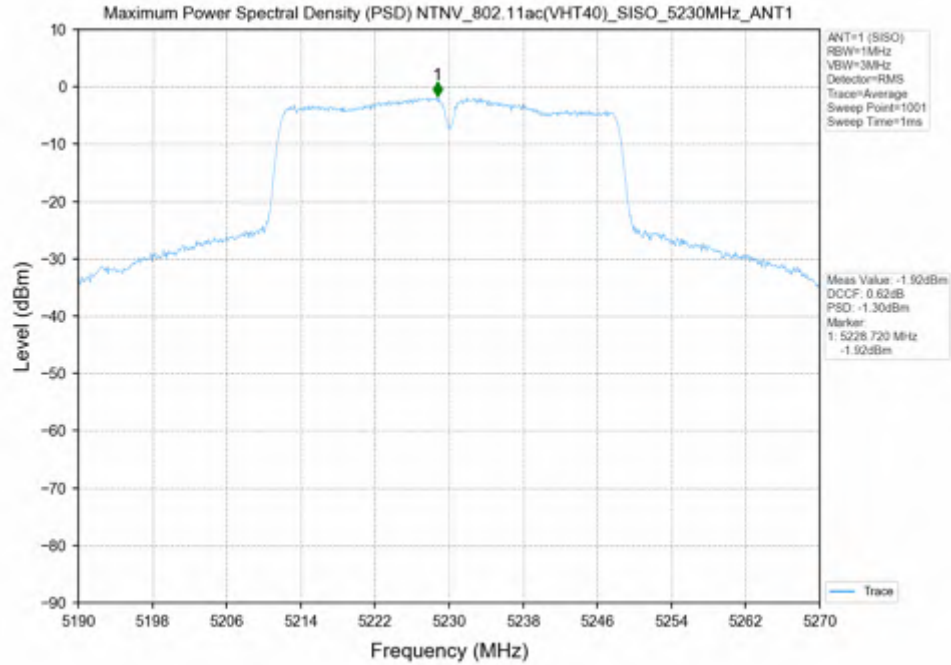
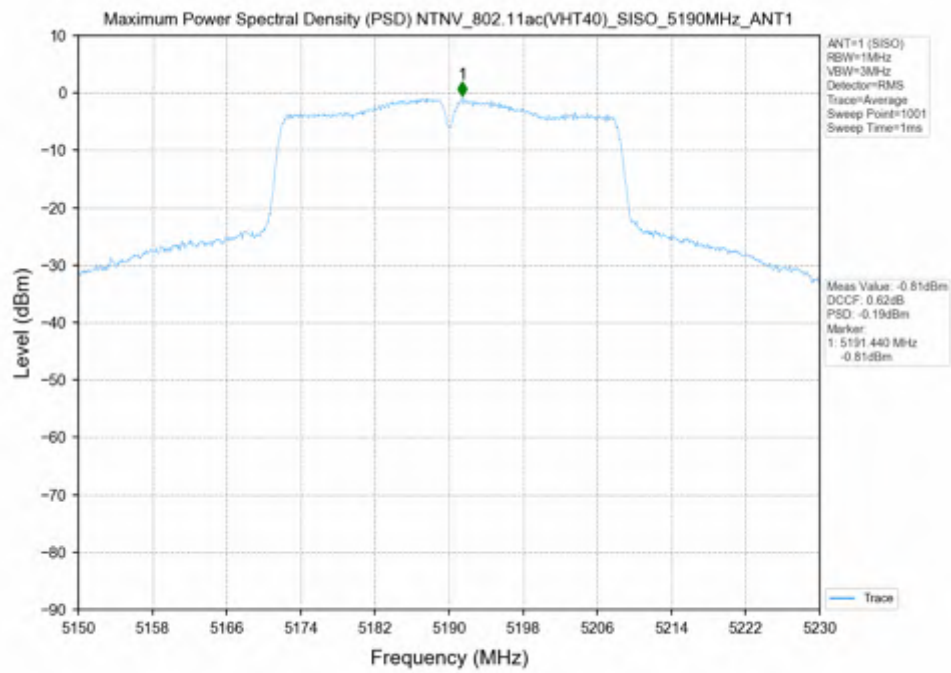


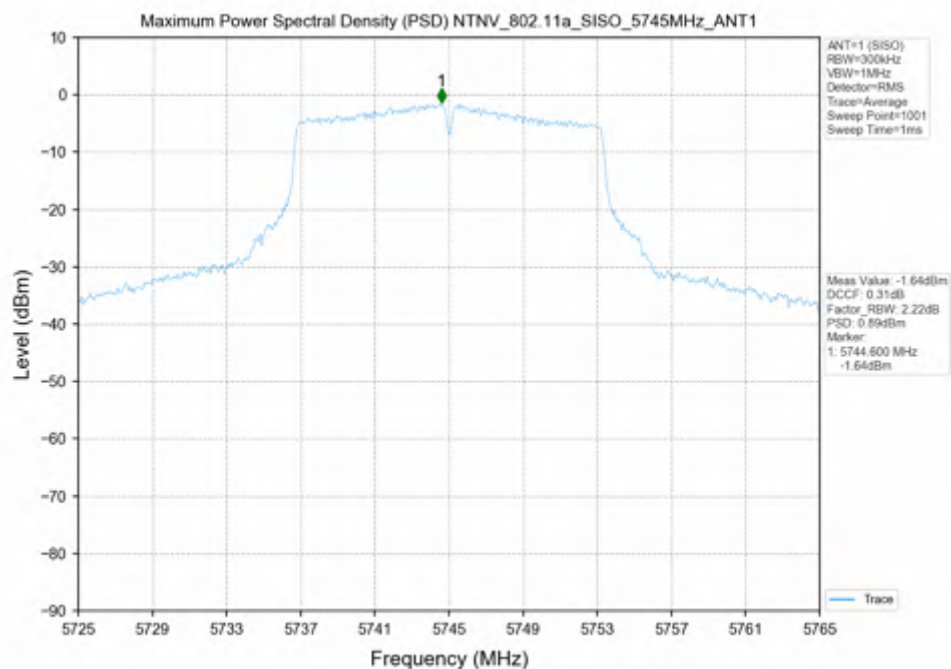
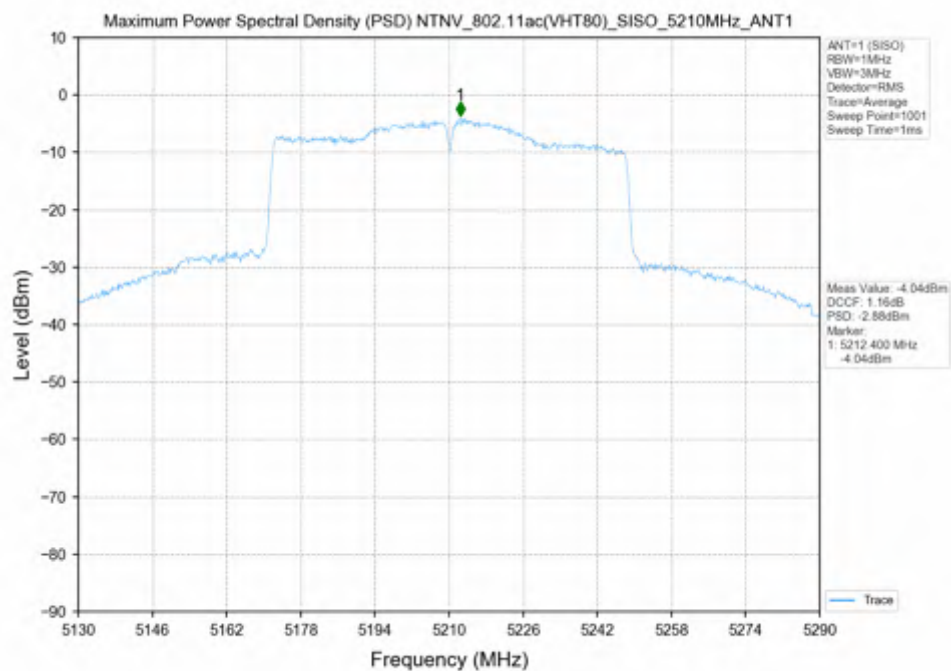


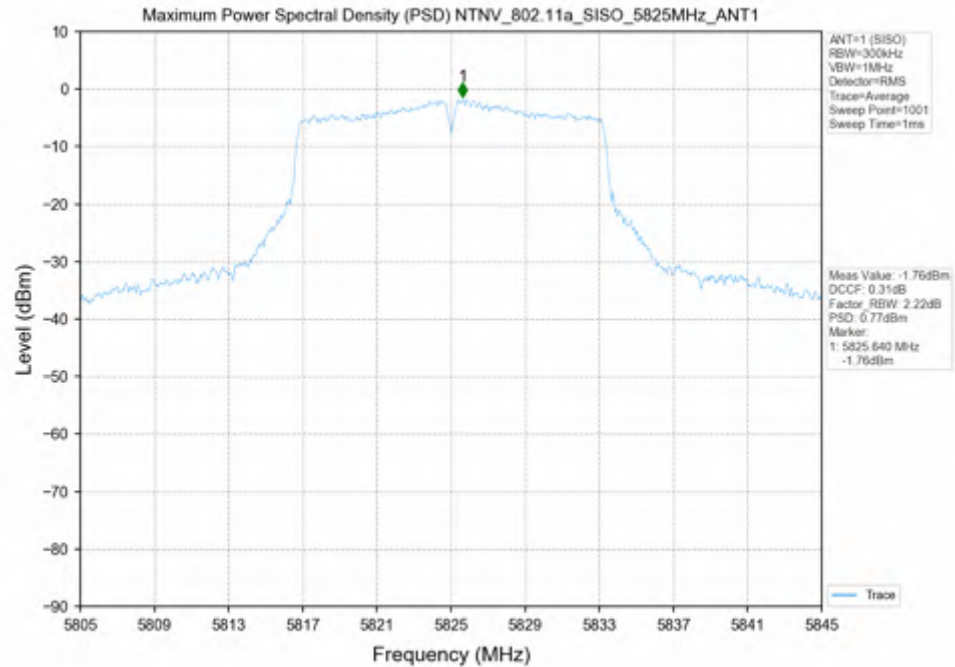
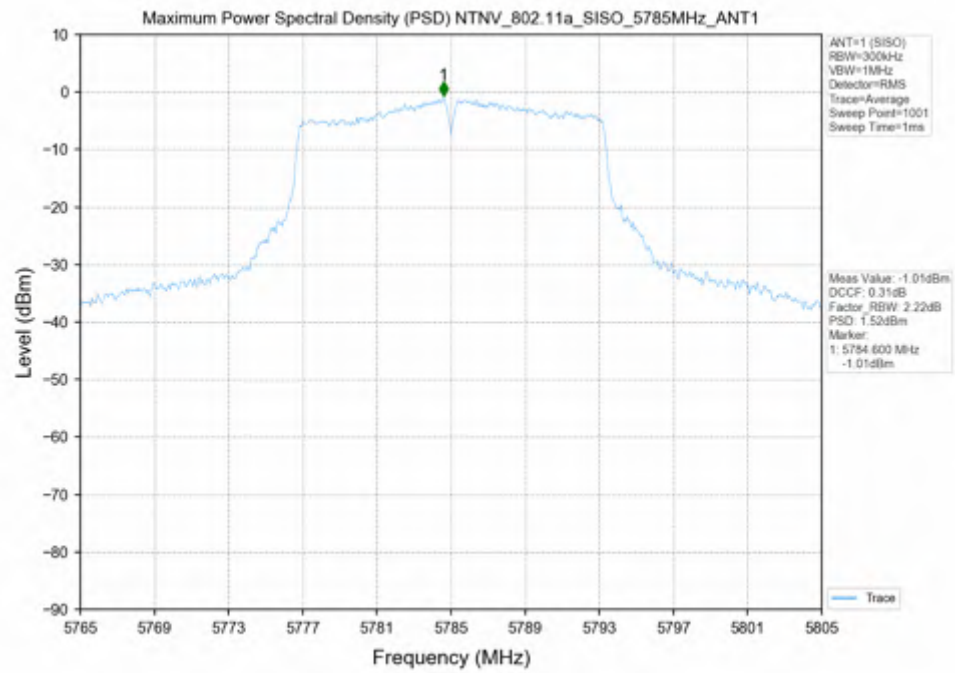


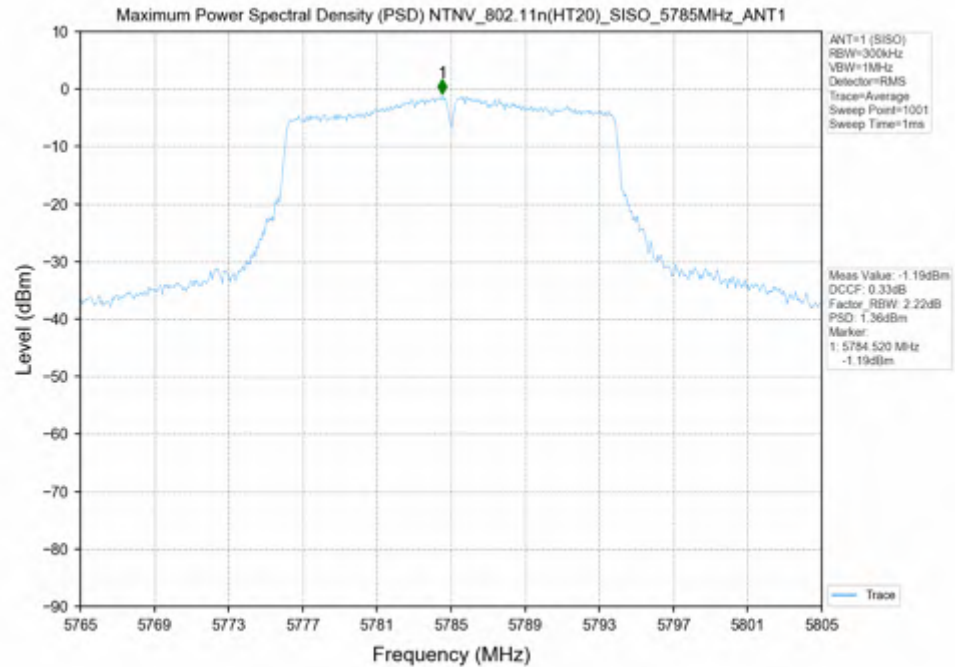
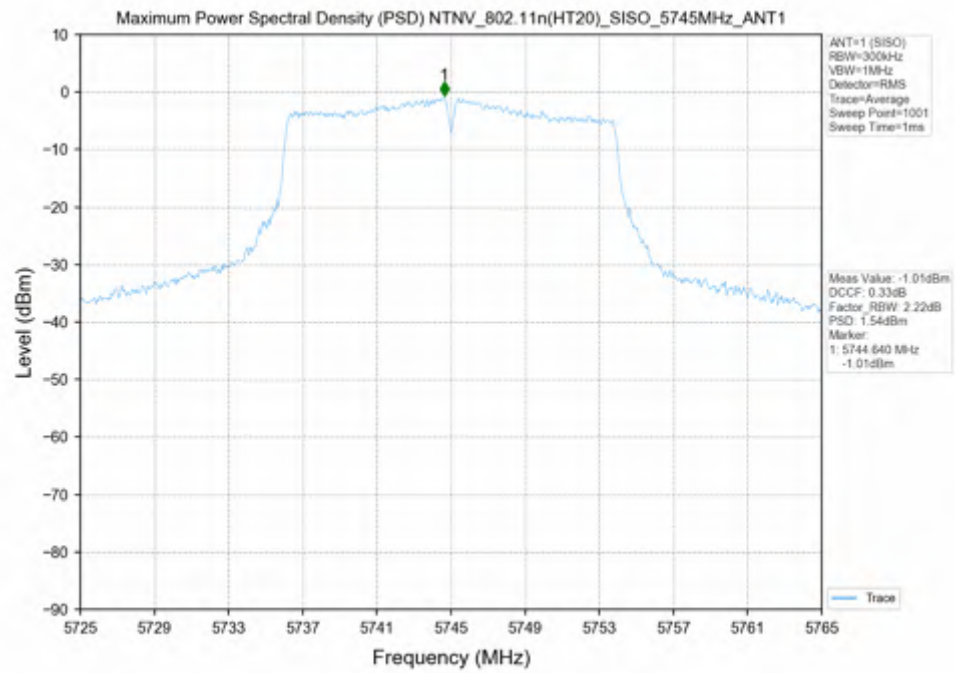


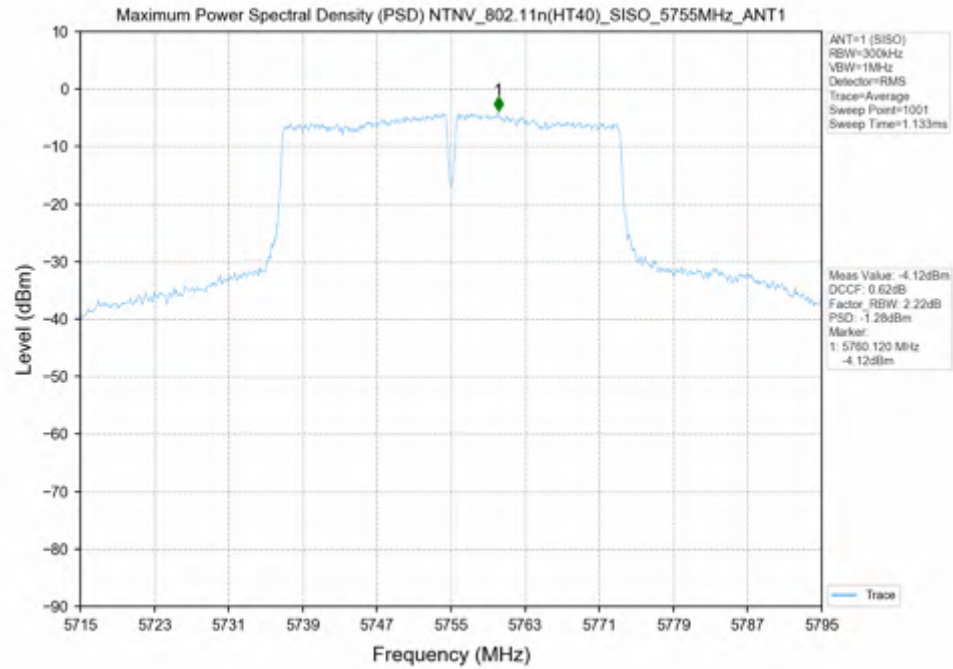
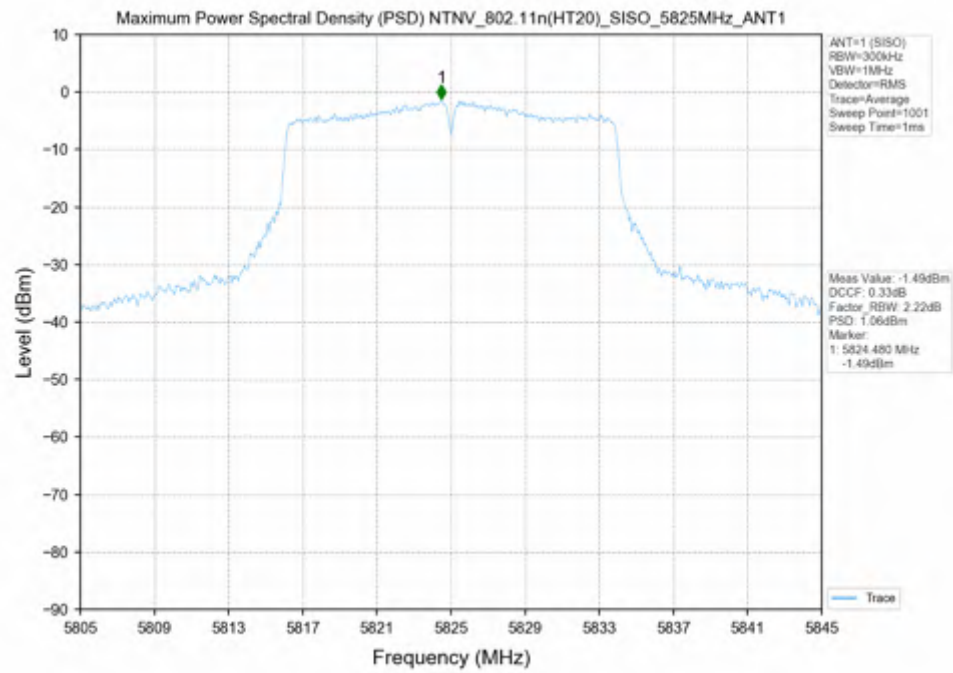


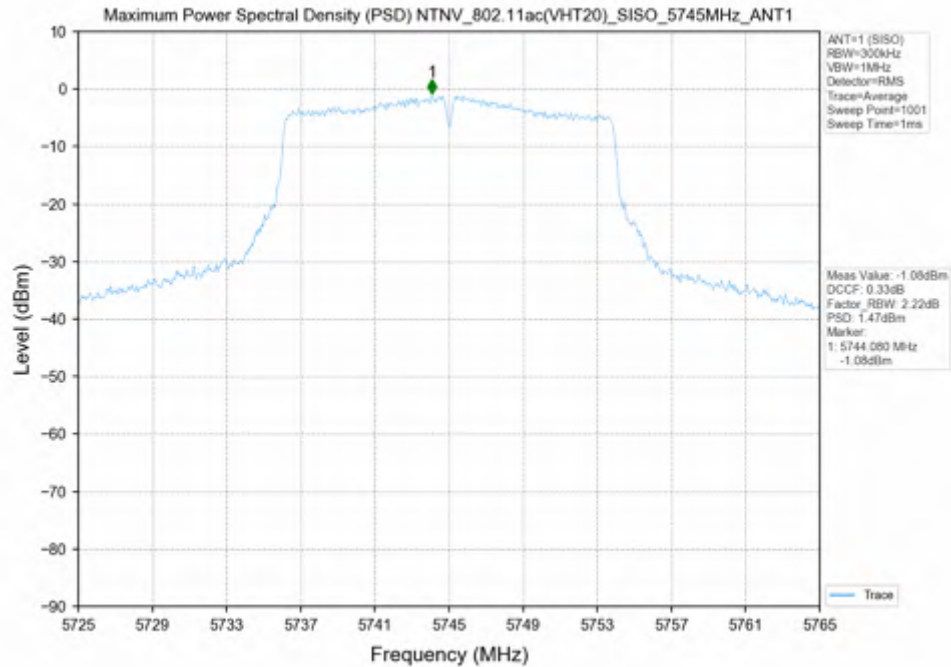
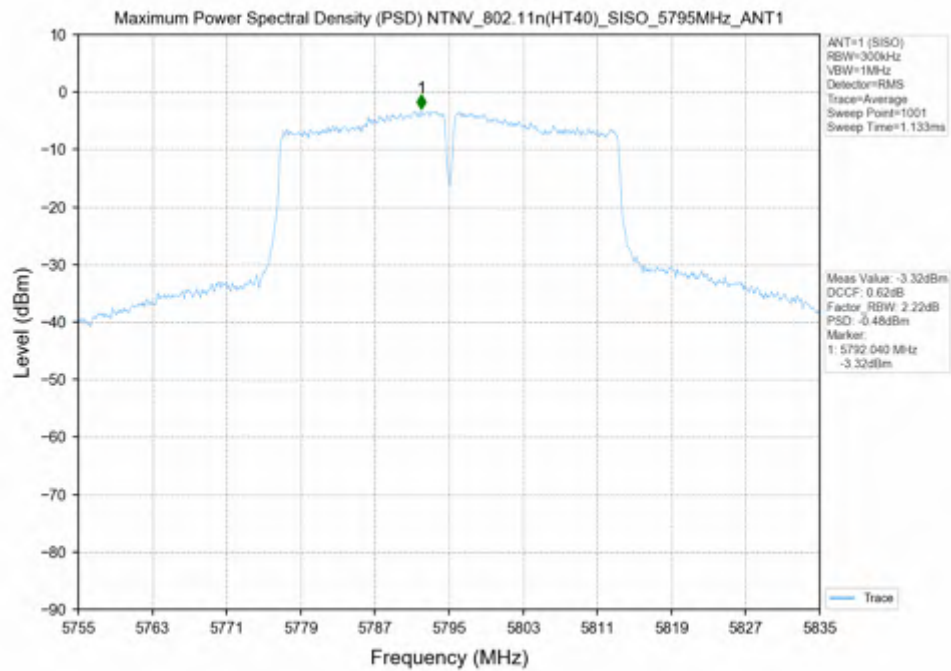


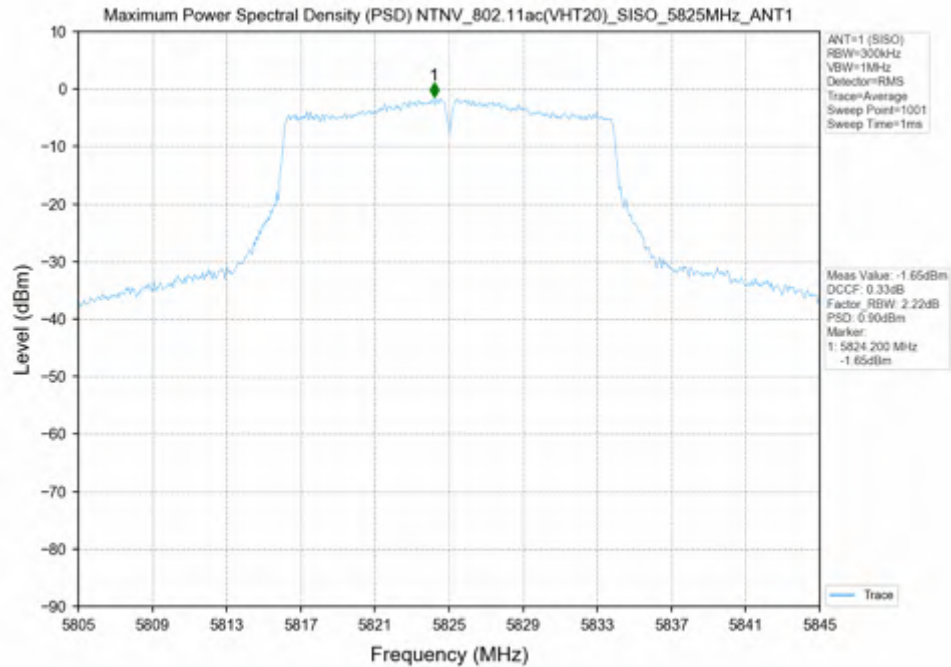
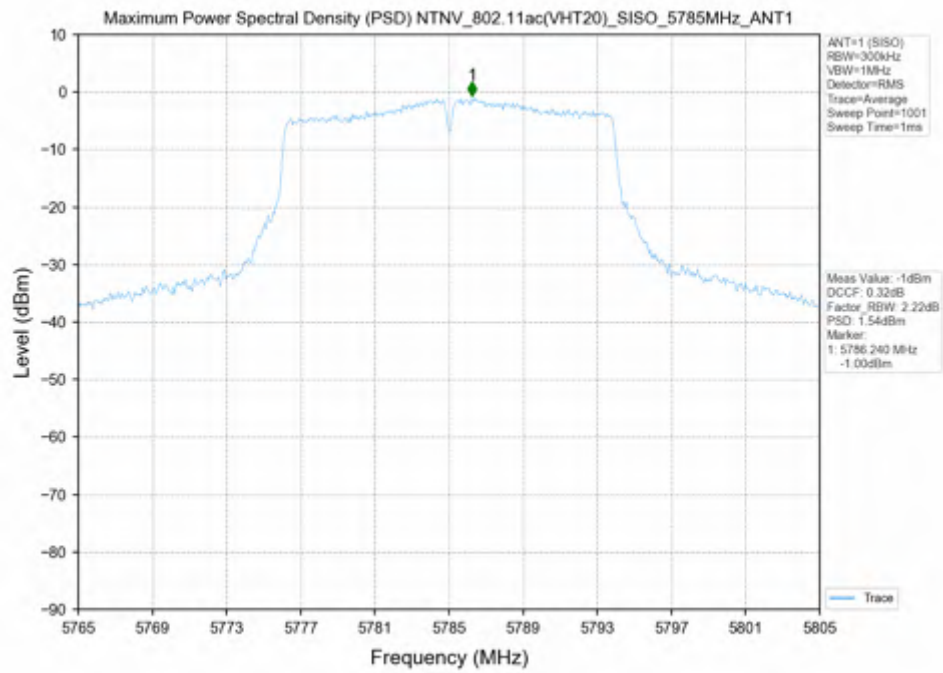


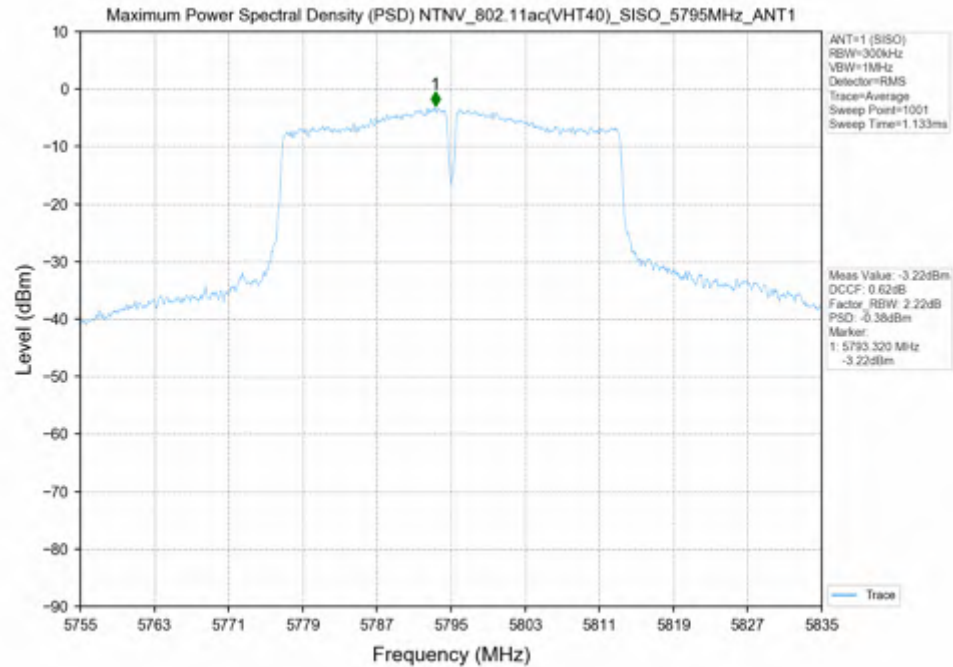
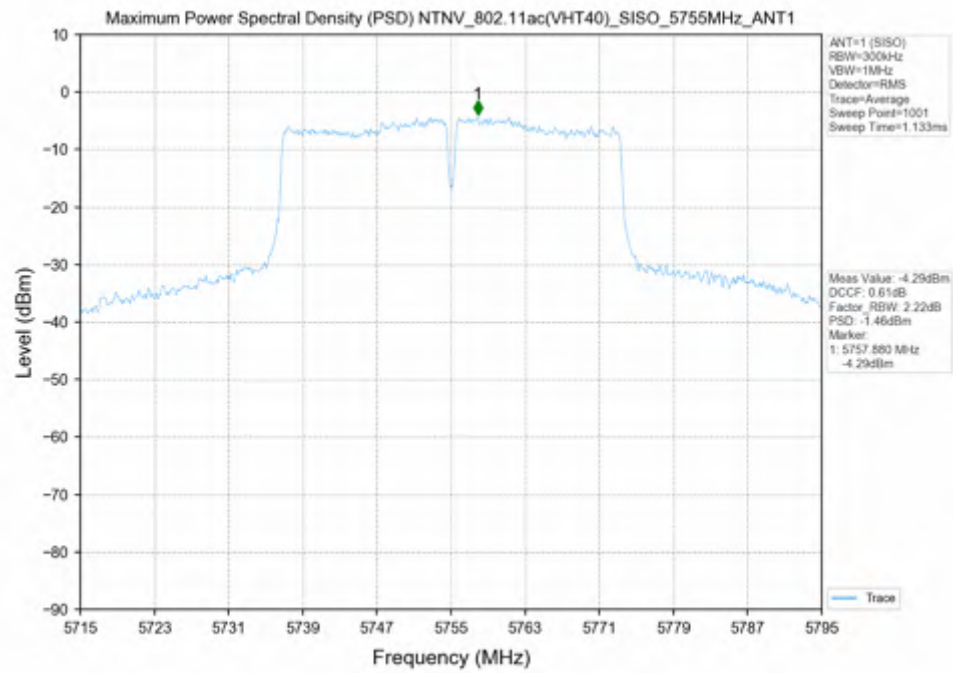


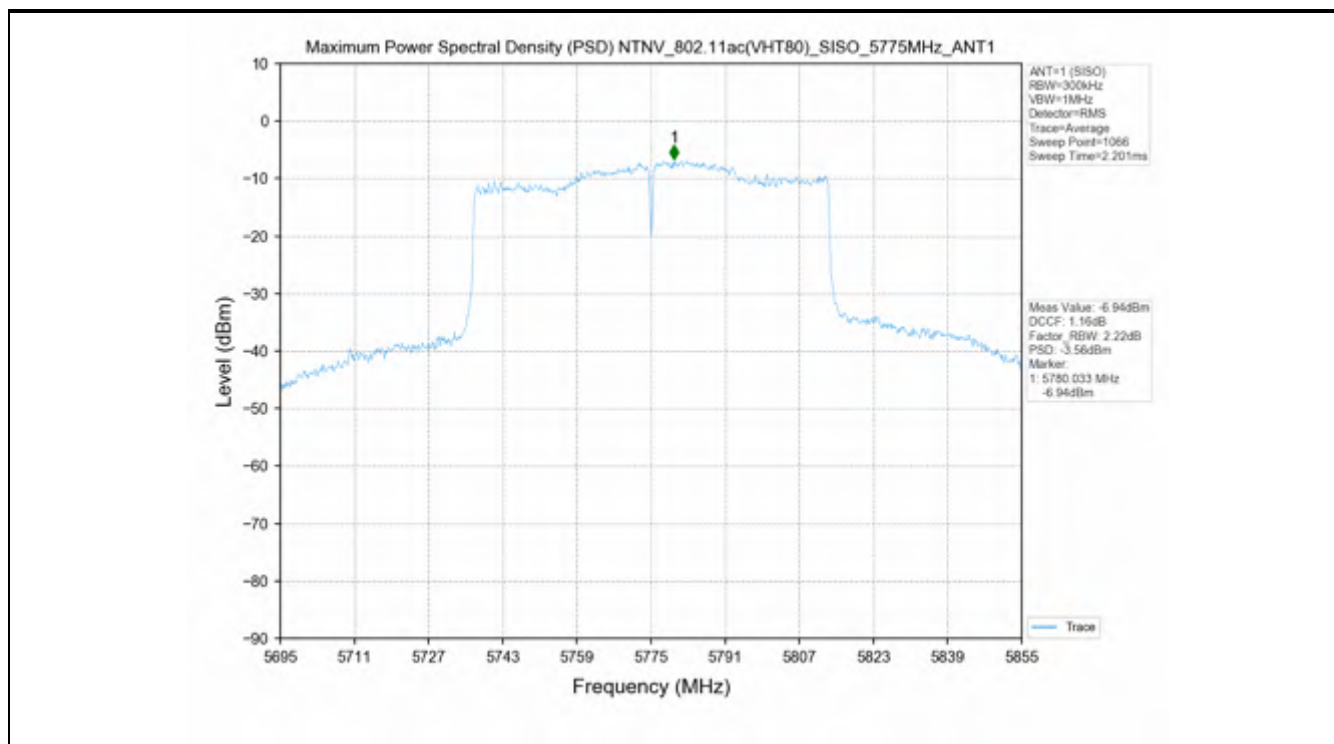












5. Frequency Stability

5.1 Test Result

Band	Test Conditions		Operation Frequency (MHz)	Test Frequency (MHz)	Freq. Dev. (MHz)	Limit (GHz)	Result
	Volt (V AC)	Temp (°C)		ANT1	ANT1		
Band U-NII 1	Normal(120)	Extreme(0)	5180	5180.0356	0.0356	5.150-5.250	Pass
		Extreme(+10)		5180.0322	0.0322		Pass
		Extreme(+20)		5180.0308	0.0308		Pass
		Extreme(+30)		5180.0288	0.0288		Pass
		Extreme(+40)		5180.0397	0.0397		Pass
	Extreme(108)	Norma(+20)		5180.0222	0.0222		Pass
	Extreme(132)			5180.0378	0.0378		Pass
		Extreme(0)	5240	5240.0327	0.0327		Pass
		Extreme(+10)		5240.0322	0.0322		Pass
		Extreme(+20)		5240.0385	0.0385		Pass
		Extreme(+30)		5240.0477	0.0477		Pass
		Extreme(+40)		5240.0229	0.0229		Pass
	Extreme(108)	Norma(20)		5240.0415	0.0415		Pass
	Extreme(132)			5240.0378	0.0378		Pass



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Band	Test Conditions		Operation Frequency (MHz)	Test Frequency (MHz)	Freq. Dev. (MHz)	Limit (GHz)	Result
	Volt (V AC)	Temp (°C)		ANT1	ANT1		
Band U-NII 3	Normal(120)	Extreme(0)	5745	5745.0317	0.0317	5.725-5.850	Pass
		Extreme(+10)		5745.0245	0.0245		Pass
		Extreme(+20)		5745.0167	0.0167		Pass
		Extreme(+30)		5745.0283	0.0283		Pass
		Extreme(+40)		5745.0429	0.0429		Pass
	Extreme(108)	Norma(+20)		5745.0397	0.0397		Pass
	Extreme(132)			5745.0462	0.0462		Pass
		Extreme(0)	5825	5825.0237	0.0237		Pass
		Extreme(+10)		5825.0197	0.0197		Pass
		Extreme(+20)		5825.0235	0.0235		Pass
		Extreme(+30)		5825.0349	0.0349		Pass
		Extreme(+40)		5825.0357	0.0357		Pass
	Extreme(108)	Norma(20)		5825.0426	0.0426		Pass
	Extreme(132)			5825.0155	0.0155		Pass

Remark: Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested