



CTK Co., Ltd.

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4.3 OUTPUT POWER

Test Procedures

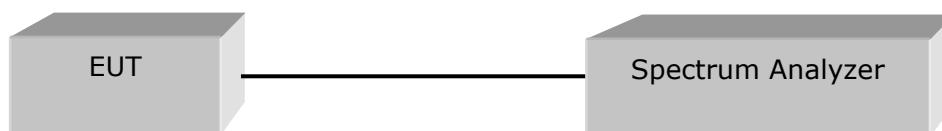
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KDB 789033 – Section E.2.d (Method SA-2, Maximum Conducted Output Power)

KDB 662911 D01, D02 (Multiple Transmitter Output)

ANSI C63.10-2013 – Section 12.3.2.4

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



Test Settings :

Center frequency = the highest, middle and the lowest channels

a) RBW = 1 MHz

b) VBW $\geq 3 \times$ RBW

c) Sweep time = auto

d) Detector = power averaging (rms)

e) Trace mode = Average at least 100

f) Duty cycle factor = $10\log(1/x)$

Test mode	Duty Cycle Factor (dB)
802.11a	0.09 dB
802.11n_HT20	0.10 dB
802.11n_HT40	0.21 dB
802.11ac_VHT20	0.20 dB
802.11ac_VHT40	0.34 dB
802.11ac_VHT80	2.35 dB



Limit

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Band	Limit (dBm)
SISO	802.11a/n/ac	ANT1, ANT2	0.54, 1.58	UNII 1	24.00
				UNII 2A	24.00
			1.69, 3.75	UNII 2C	24.00
				UNII 3	30.00
MIMO (2Tx)	802.11a/n/ac	ANT1 + ANT2	4.09	UNII 1	24.00
				UNII 2A	24.00
			5.79	UNII 2C	24.00
				UNII 3	30.00

Note :
Per KDB 662911, the MIMO directional gain is calculated using the following formula, Where G_N is the gain of the nth antenna and N_{ANT} , the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] \text{ dBi}$$



Test Data

ANT1(SISO)

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	15.27	0.09	15.36	24.00	8.64
	5 200	15.01	0.09	15.10	24.00	8.90
	5 240	15.21	0.09	15.30	24.00	8.70
	5 260	15.70	0.09	15.79	24.00	8.21
	5 300	15.84	0.09	15.93	24.00	8.07
	5 320	16.02	0.09	16.11	24.00	7.89
	5 500	13.87	0.09	13.96	24.00	10.04
	5 600	13.04	0.09	13.13	24.00	10.87
	5 700	13.20	0.09	13.29	24.00	10.71
	5 720	13.05	0.09	13.14	24.00	10.86
	5 745	12.77	0.09	12.86	30.00	17.14
	5 785	12.79	0.09	12.88	30.00	17.12
	5 825	12.31	0.09	12.40	30.00	17.60
802.11n _HT20	5 180	10.31	0.10	10.41	24.00	13.59
	5 200	10.41	0.10	10.51	24.00	13.49
	5 240	10.83	0.10	10.93	24.00	13.07
	5 260	12.18	0.10	12.28	24.00	11.72
	5 300	12.41	0.10	12.51	24.00	11.49
	5 320	12.78	0.10	12.88	24.00	11.12
	5 500	13.53	0.10	13.63	24.00	10.37
	5 600	12.74	0.10	12.84	24.00	11.16
	5 700	11.86	0.10	11.96	24.00	12.04
	5 720	11.48	0.10	11.58	24.00	12.42
	5 745	12.25	0.10	12.35	30.00	17.65
	5 785	12.77	0.10	12.87	30.00	17.13
	5 825	12.32	0.10	12.42	30.00	17.58
802.11ac _VHT20	5 180	11.08	0.20	11.28	24.00	12.72
	5 200	10.99	0.20	11.19	24.00	12.81
	5 240	13.38	0.20	13.58	24.00	10.42
	5 260	13.32	0.20	13.52	24.00	10.48
	5 300	13.63	0.20	13.83	24.00	10.17
	5 320	13.78	0.20	13.98	24.00	10.02
	5 500	12.99	0.20	13.19	24.00	10.81

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	5 600	12.50	0.20	12.70	24.00	11.30
	5 700	12.31	0.20	12.51	24.00	11.49
	5 720	11.99	0.20	12.19	24.00	11.81
	5 745	12.35	0.20	12.55	30.00	17.45
	5 785	12.36	0.20	12.56	30.00	17.44
	5 825	12.02	0.20	12.22	30.00	17.78
802.11n _HT40	5 190	12.99	0.21	13.20	24.00	10.80
	5 230	13.10	0.21	13.31	24.00	10.69
	5 270	14.17	0.21	14.38	24.00	9.62
	5 310	14.00	0.21	14.21	24.00	9.79
	5 510	10.78	0.21	10.99	24.00	13.01
	5 590	11.66	0.21	11.87	24.00	12.13
	5 670	10.71	0.21	10.92	24.00	13.08
	5 710	11.31	0.21	11.52	24.00	12.48
	5 755	11.26	0.21	11.47	30.00	18.53
	5 795	11.45	0.21	11.66	30.00	18.34
802.11ac _VHT40	5 190	12.00	0.34	12.34	24.00	11.66
	5 230	12.44	0.34	12.78	24.00	11.22
	5 270	14.13	0.34	14.47	24.00	9.53
	5 310	14.49	0.34	14.83	24.00	9.17
	5 510	11.29	0.34	11.63	24.00	12.37
	5 590	12.38	0.34	12.72	24.00	11.28
	5 670	11.76	0.34	12.10	24.00	11.90
	5 710	12.63	0.34	12.97	24.00	11.03
	5 755	12.42	0.34	12.76	30.00	17.24
	5 795	12.25	0.34	12.59	30.00	17.41
802.11ac _VHT80	5 210	10.14	2.35	12.49	24.00	11.51
	5 290	10.81	2.35	13.16	24.00	10.84
	5 530	8.49	2.35	10.84	24.00	13.16
	5 610	11.69	2.35	14.04	24.00	9.96
	5 690	11.02	2.35	13.37	24.00	10.63
	5 775	5.57	2.35	7.92	30.00	22.08
Measurement uncertainty		± 1.5 dB				

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ANT2(SISO)

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	15.21	0.09	15.30	24.00	8.70
	5 200	15.31	0.09	15.40	24.00	8.60
	5 240	15.37	0.09	15.46	24.00	8.54
	5 260	15.31	0.09	15.40	24.00	8.60
	5 300	15.39	0.09	15.48	24.00	8.52
	5 320	15.41	0.09	15.50	24.00	8.50
	5 500	15.90	0.09	15.99	24.00	8.01
	5 600	17.10	0.09	17.19	24.00	6.81
	5 700	15.06	0.09	15.15	24.00	8.85
	5 720	17.53	0.09	17.62	24.00	6.38
	5 745	16.94	0.09	17.03	30.00	12.97
	5 785	17.24	0.09	17.33	30.00	12.67
	5 825	16.95	0.09	17.04	30.00	12.96
802.11n _HT20	5 180	12.55	0.10	12.65	24.00	11.35
	5 200	12.54	0.10	12.64	24.00	11.36
	5 240	12.93	0.10	13.03	24.00	10.97
	5 260	13.66	0.10	13.76	24.00	10.24
	5 300	13.85	0.10	13.95	24.00	10.05
	5 320	14.04	0.10	14.14	24.00	9.86
	5 500	15.31	0.10	15.41	24.00	8.59
	5 600	14.64	0.10	14.74	24.00	9.26
	5 700	14.25	0.10	14.35	24.00	9.65
	5 720	15.50	0.10	15.60	24.00	8.40
	5 745	13.84	0.10	13.94	30.00	16.06
	5 785	14.31	0.10	14.41	30.00	15.59
	5 825	13.83	0.10	13.93	30.00	16.07
802.11ac _VHT20	5 180	12.89	0.20	13.09	24.00	10.91
	5 200	13.05	0.20	13.25	24.00	10.75
	5 240	13.22	0.20	13.42	24.00	10.58
	5 260	14.56	0.20	14.76	24.00	9.24
	5 300	14.74	0.20	14.94	24.00	9.06
	5 320	14.90	0.20	15.10	24.00	8.90
	5 500	14.67	0.20	14.87	24.00	9.13
	5 600	14.22	0.20	14.42	24.00	9.58

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	5 700	14.49	0.20	14.69	24.00	9.31
	5 720	14.60	0.20	14.80	24.00	9.20
	5 745	13.23	0.20	13.43	30.00	16.57
	5 785	13.51	0.20	13.71	30.00	16.29
	5 825	13.08	0.20	13.28	30.00	16.72
802.11n _HT40	5 190	15.04	0.21	15.25	24.00	8.75
	5 230	15.15	0.21	15.36	24.00	8.64
	5 270	15.76	0.21	15.97	24.00	8.03
	5 310	15.40	0.21	15.61	24.00	8.39
	5 510	12.66	0.21	12.87	24.00	11.13
	5 590	13.28	0.21	13.49	24.00	10.51
	5 670	12.67	0.21	12.88	24.00	11.12
	5 710	13.62	0.21	13.83	24.00	10.17
	5 755	12.07	0.21	12.28	30.00	17.72
	5 795	12.72	0.21	12.93	30.00	17.07
802.11ac _VHT40	5 190	13.86	0.34	14.20	24.00	9.80
	5 230	13.94	0.34	14.28	24.00	9.72
	5 270	15.01	0.34	15.35	24.00	8.65
	5 310	15.22	0.34	15.56	24.00	8.44
	5 510	13.09	0.34	13.43	24.00	10.57
	5 590	13.74	0.34	14.08	24.00	9.92
	5 670	12.98	0.34	13.32	24.00	10.68
	5 710	14.01	0.34	14.35	24.00	9.65
	5 755	12.50	0.34	12.84	30.00	17.16
	5 795	13.05	0.34	13.39	30.00	16.61
802.11ac _VHT80	5 210	11.99	2.35	14.34	24.00	9.66
	5 290	11.91	2.35	14.26	24.00	9.74
	5 530	9.71	2.35	12.06	24.00	11.94
	5 610	13.35	2.35	15.70	24.00	8.30
	5 690	12.69	2.35	15.04	24.00	8.96
	5 775	11.26	2.35	13.61	30.00	16.39
Measurement uncertainty		± 1.5 dB				

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ANT1 + ANT2(MIMO)

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11n _HT20	5 180	14.58	0.10	14.68	24.00	9.32
	5 200	14.61	0.10	14.71	24.00	9.29
	5 240	15.02	0.10	15.12	24.00	8.88
	5 260	15.99	0.10	16.09	24.00	7.91
	5 300	16.20	0.10	16.30	24.00	7.70
	5 320	16.47	0.10	16.57	24.00	7.43
	5 500	17.52	0.10	17.62	24.00	6.38
	5 600	16.80	0.10	16.90	24.00	7.10
	5 700	16.23	0.10	16.33	24.00	7.67
	5 720	16.95	0.10	17.05	24.00	6.95
	5 745	16.13	0.10	16.23	30.00	13.77
	5 785	16.62	0.10	16.72	30.00	13.28
	5 825	16.15	0.10	16.25	30.00	13.75
802.11ac _VHT20	5 180	15.09	0.20	15.29	24.00	8.71
	5 200	15.15	0.20	15.35	24.00	8.65
	5 240	16.31	0.20	16.51	24.00	7.49
	5 260	16.99	0.20	17.19	24.00	6.81
	5 300	17.23	0.20	17.43	24.00	6.57
	5 320	17.39	0.20	17.59	24.00	6.41
	5 500	16.92	0.20	17.12	24.00	6.88
	5 600	16.45	0.20	16.65	24.00	7.35
	5 700	16.55	0.20	16.75	24.00	7.25
	5 720	16.50	0.20	16.70	24.00	7.30
	5 745	15.82	0.20	16.02	30.00	13.98
	5 785	15.98	0.20	16.18	30.00	13.82
	5 825	15.59	0.20	15.79	30.00	14.21
802.11n _HT40	5 190	17.15	0.21	17.36	24.00	6.64
	5 230	17.26	0.21	17.47	24.00	6.53
	5 270	18.05	0.21	18.26	24.00	5.74
	5 310	17.77	0.21	17.98	24.00	6.02
	5 510	14.83	0.21	15.04	24.00	8.96
	5 590	15.56	0.21	15.77	24.00	8.23
	5 670	14.81	0.21	15.02	24.00	8.98
	5 710	15.63	0.21	15.84	24.00	8.16



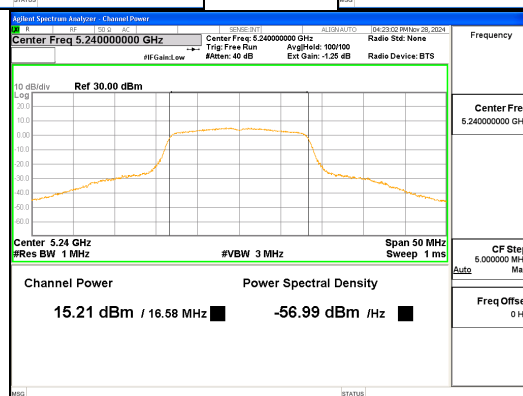
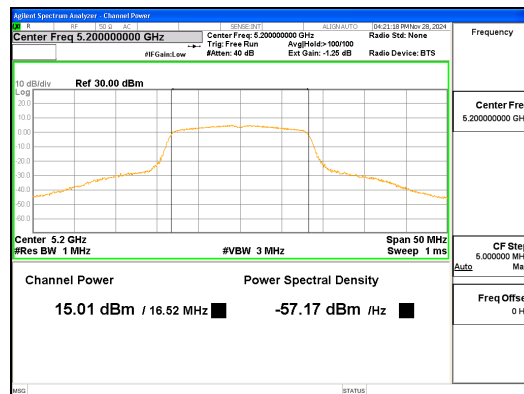
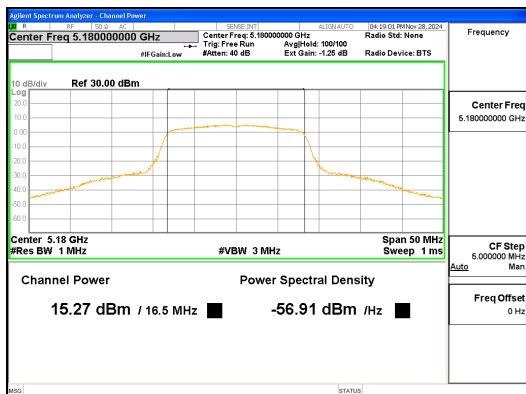
	5 755	14.69	0.21	14.90	30.00	15.10
	5 795	15.14	0.21	15.35	30.00	14.65
802.11ac _VHT40	5 190	16.04	0.34	16.38	24.00	7.62
	5 230	16.26	0.34	16.60	24.00	7.40
	5 270	17.60	0.34	17.94	24.00	6.06
	5 310	17.88	0.34	18.22	24.00	5.78
	5 510	15.29	0.34	15.63	24.00	8.37
	5 590	16.12	0.34	16.46	24.00	7.54
	5 670	15.42	0.34	15.76	24.00	8.24
	5 710	16.38	0.34	16.72	24.00	7.28
	5 755	15.47	0.34	15.81	30.00	14.19
	5 795	15.68	0.34	16.02	30.00	13.98
802.11ac _VHT80	5 210	14.17	2.35	16.52	24.00	7.48
	5 290	14.41	2.35	16.76	24.00	7.24
	5 530	12.15	2.35	14.50	24.00	9.50
	5 610	15.61	2.35	17.96	24.00	6.04
	5 690	14.95	2.35	17.30	24.00	6.70
	5 775	12.30	2.35	14.65	30.00	15.35
Measurement uncertainty		± 1.5 dB				

See next pages for actual measured spectrum plots.

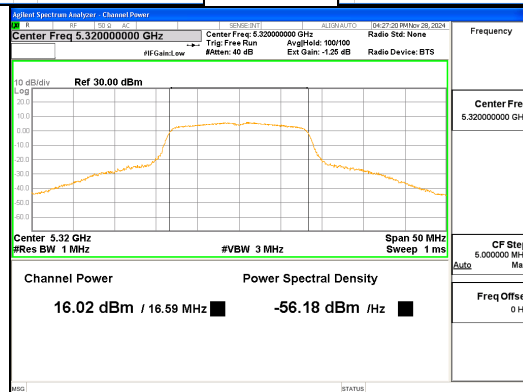
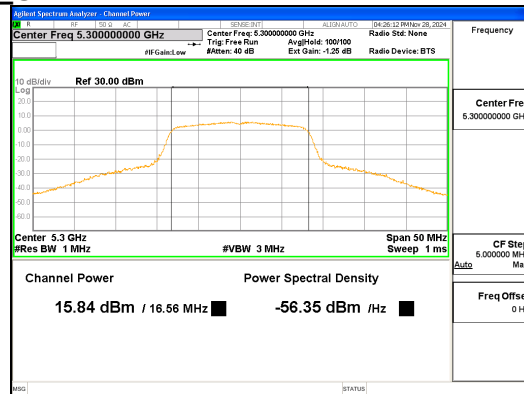
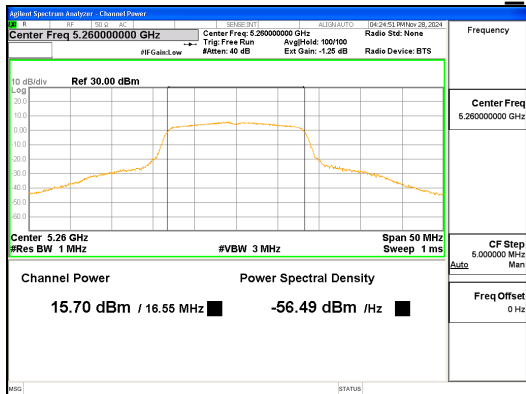


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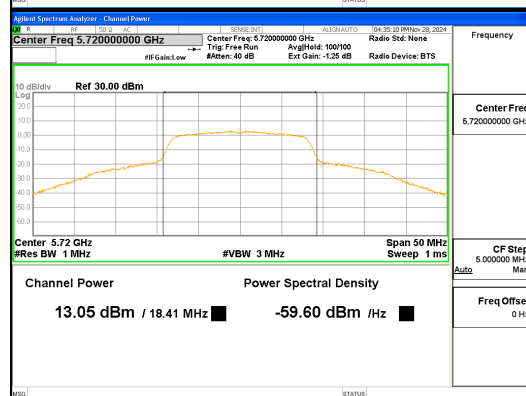
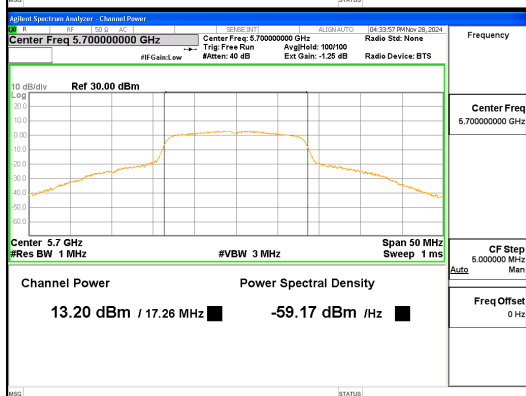
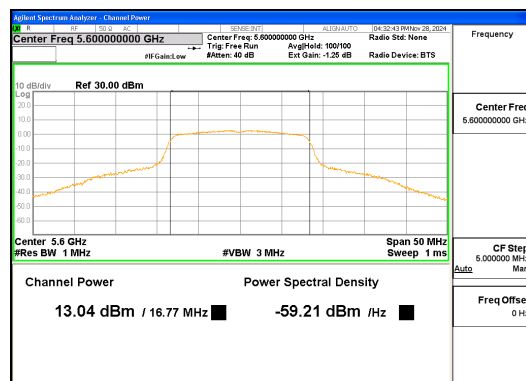
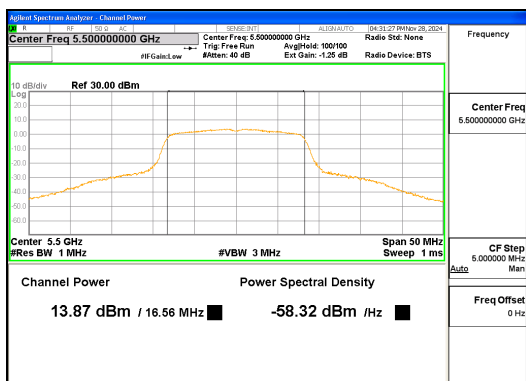


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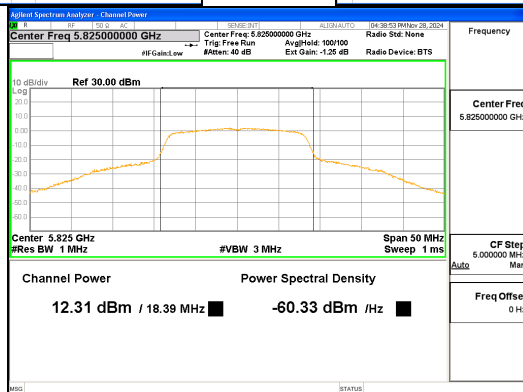
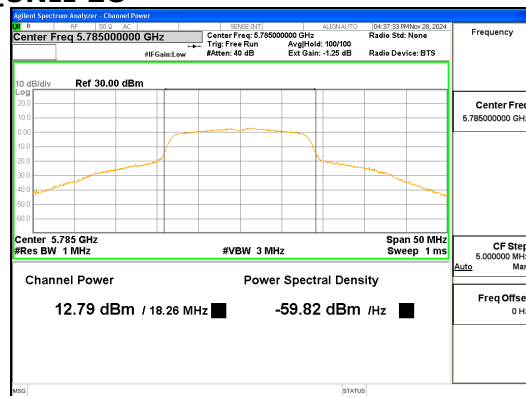
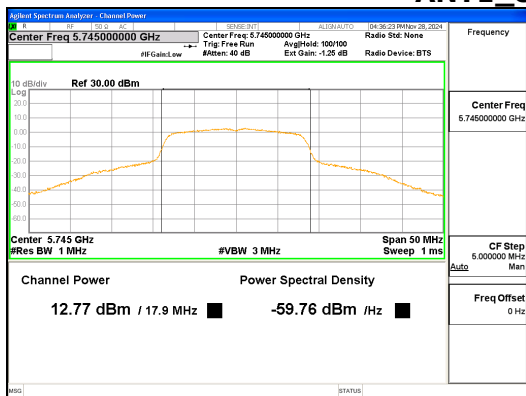


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ANT1_802.11a_UNII 2C

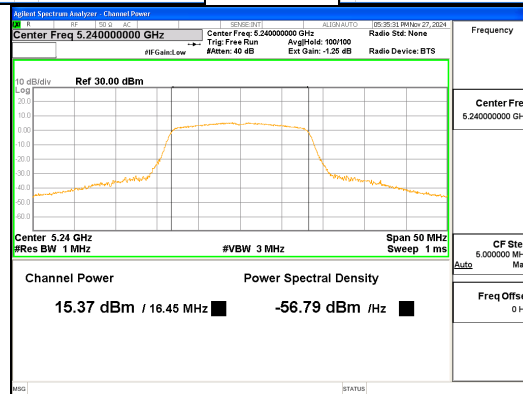
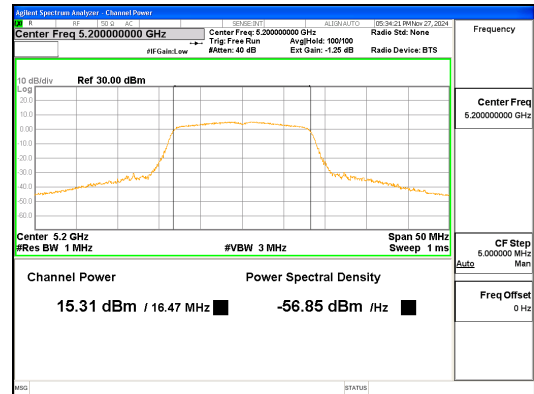
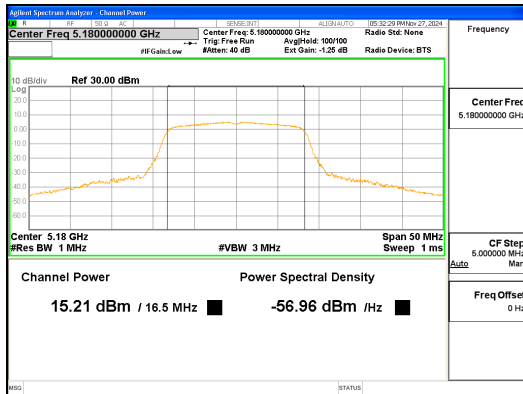


ANT1_802.11a_UNII 3

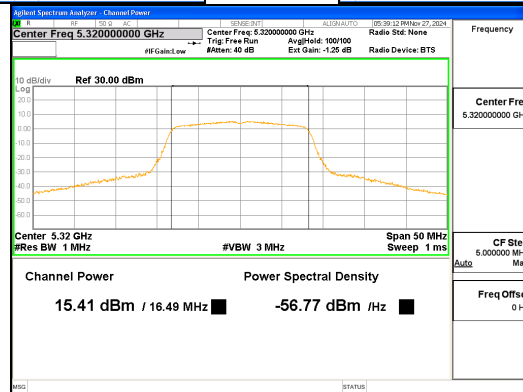
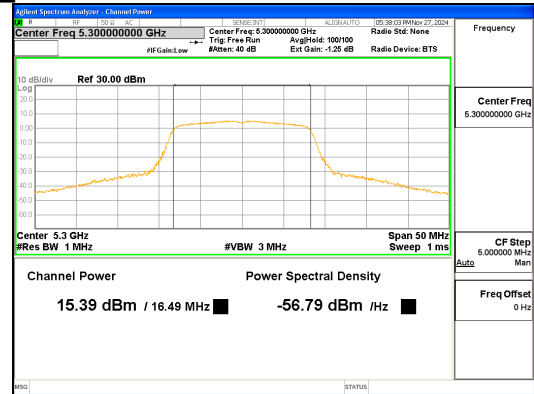
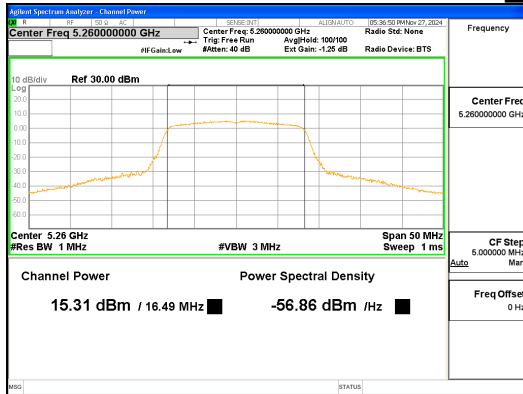


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ANT2_802.11a_UNII 1

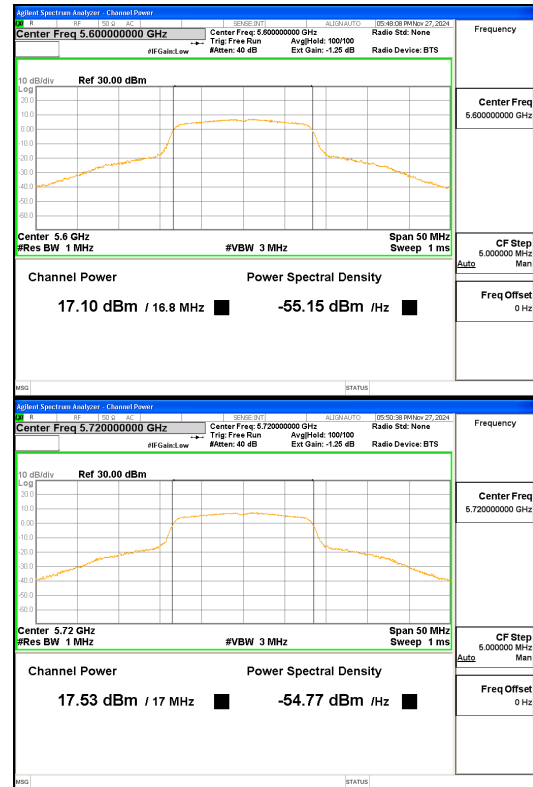
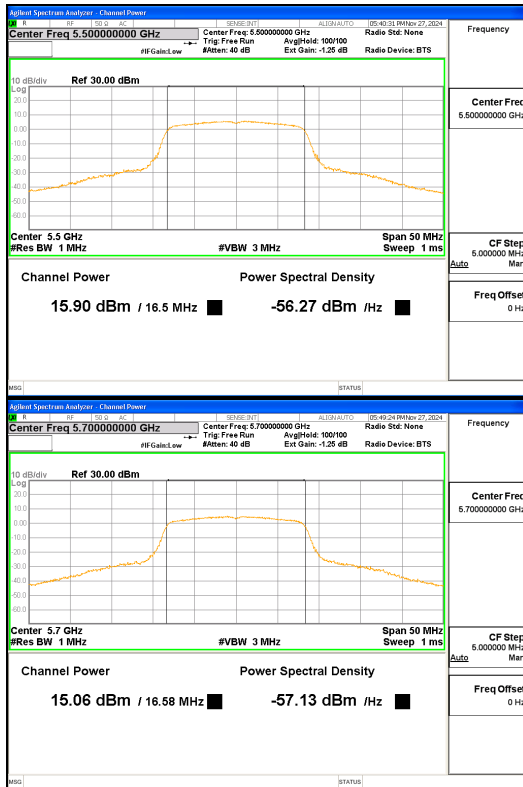


ANT2_802.11a_UNII 2A

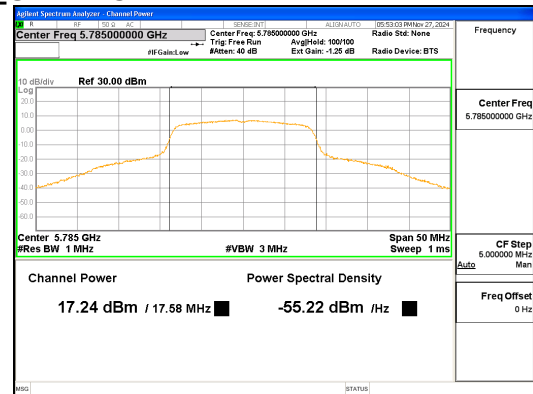
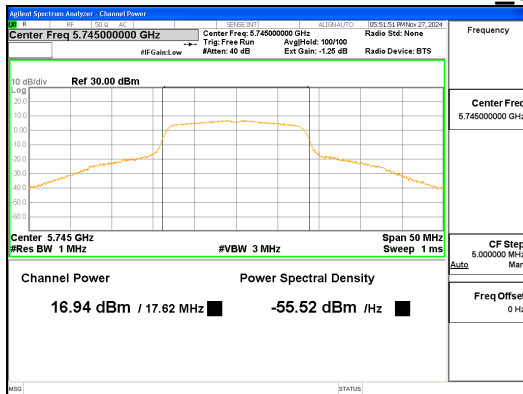


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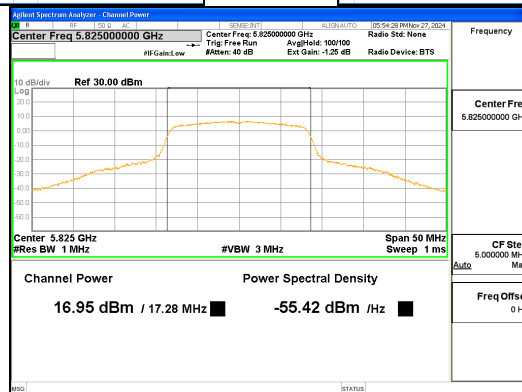
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ANT2_802.11a_UNII 2C



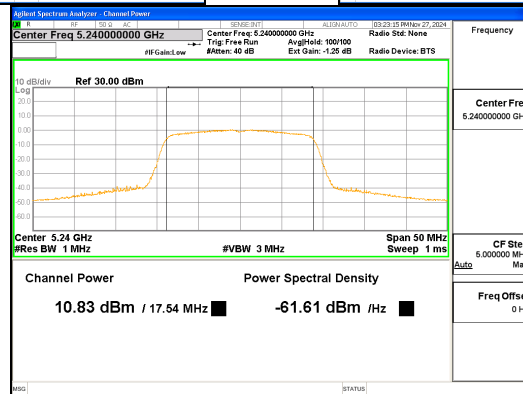
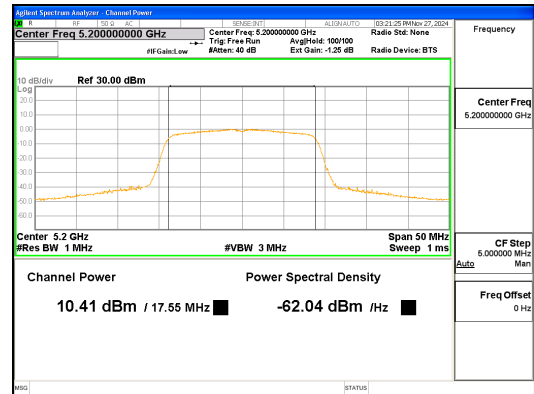
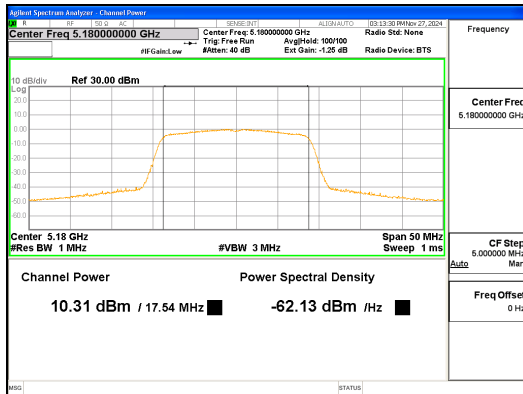
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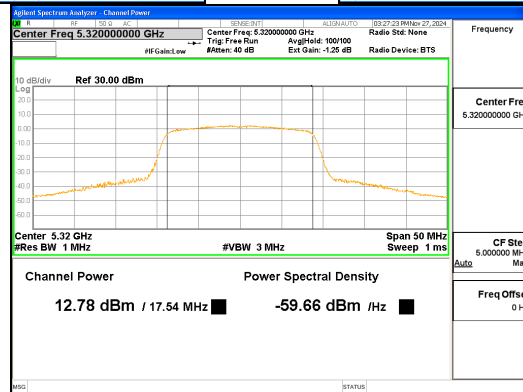
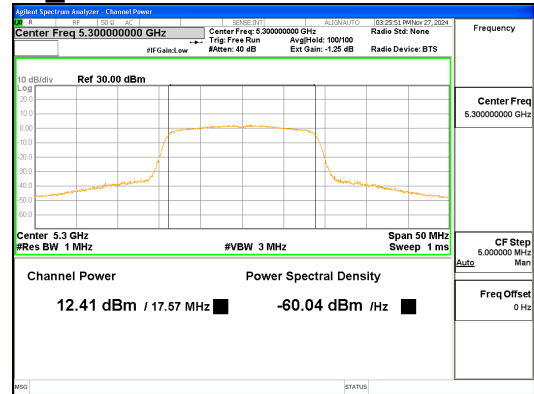
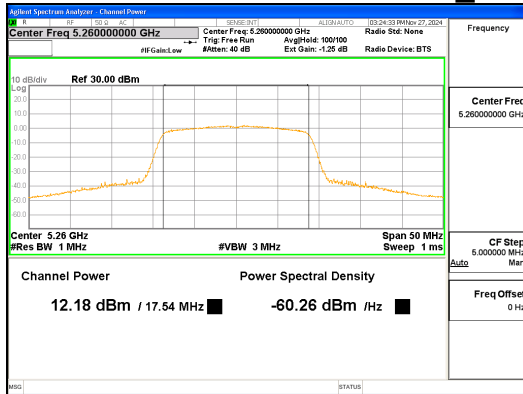


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ANT1_802.11n_HT20_UNII 1

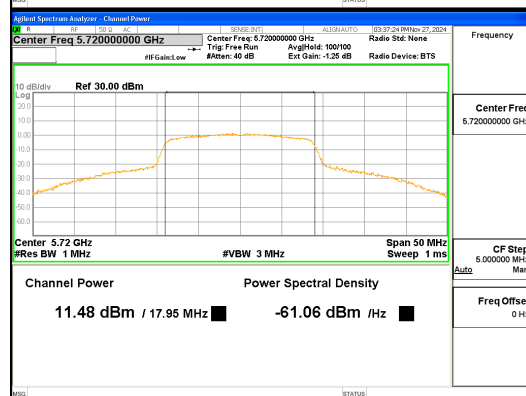
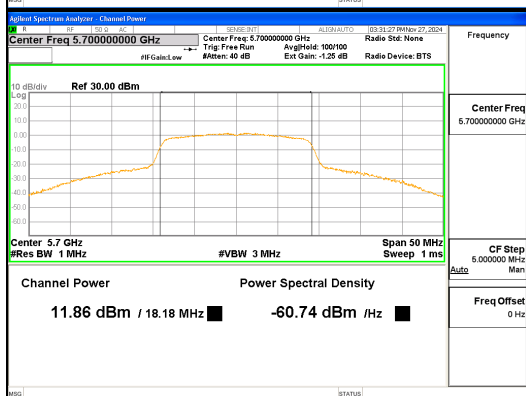
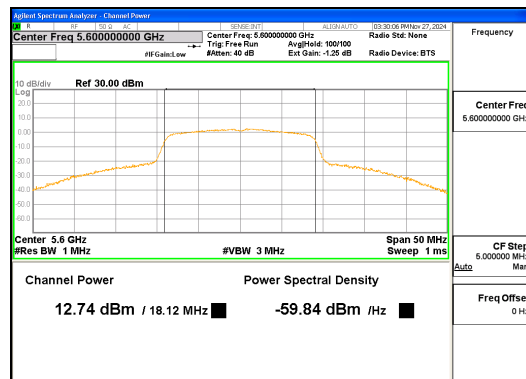
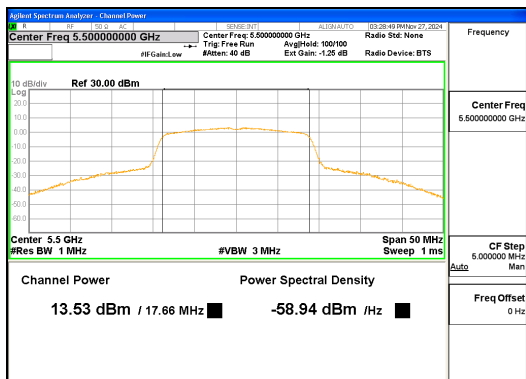


ANT1_802.11n_HT20_UNII 2A

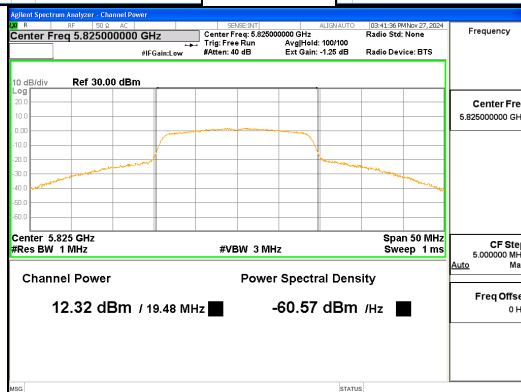
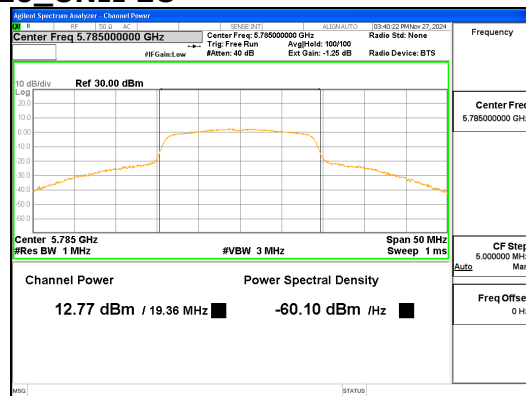
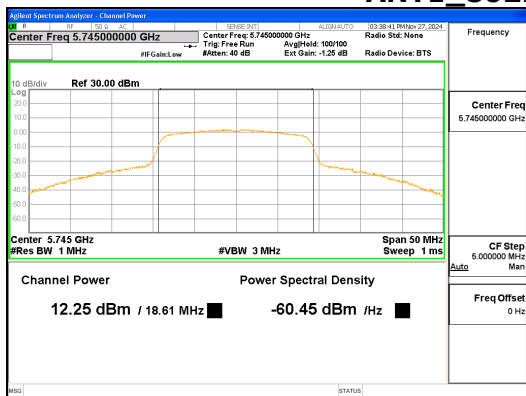


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ANT1_802.11n_HT20_UNII 2C

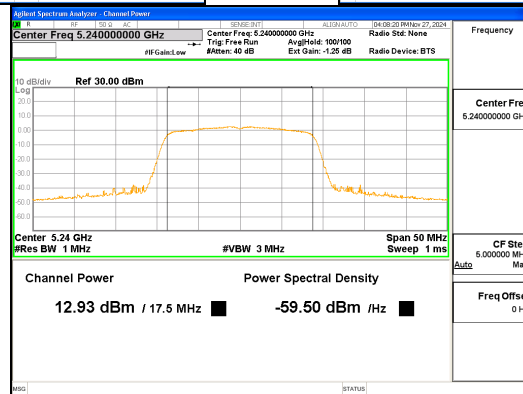
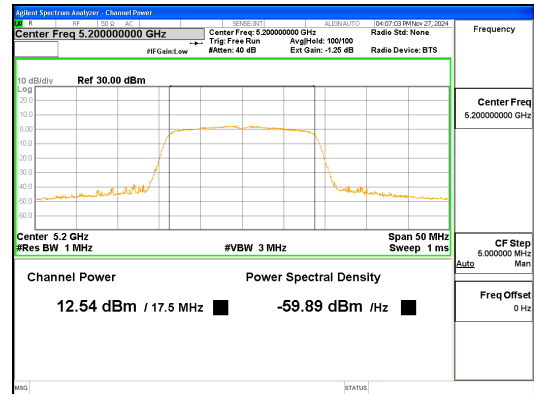
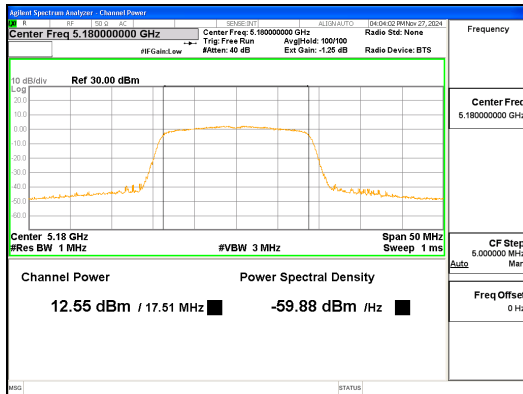


ANT1_802.11n_HT20_UNII 3

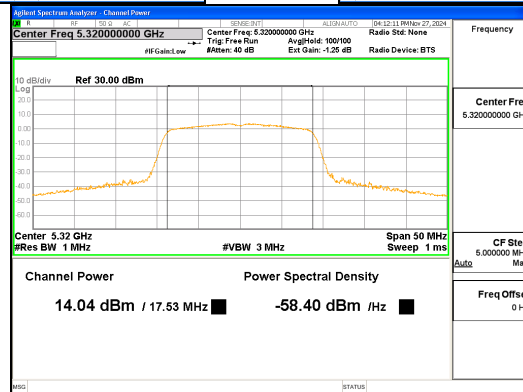
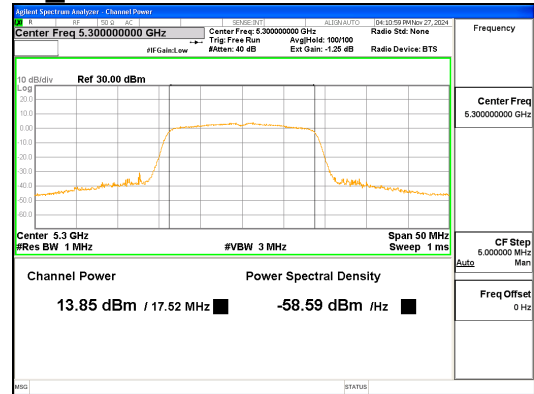
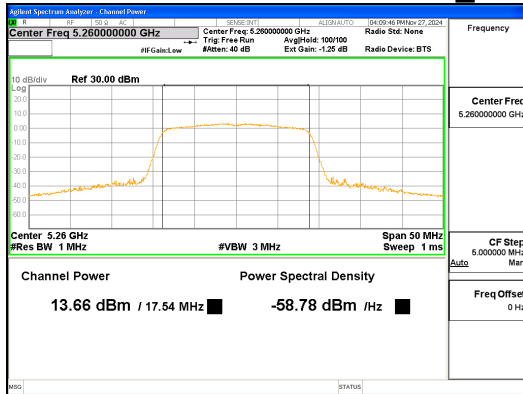


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ANT2_802.11n_HT20_UNII 1

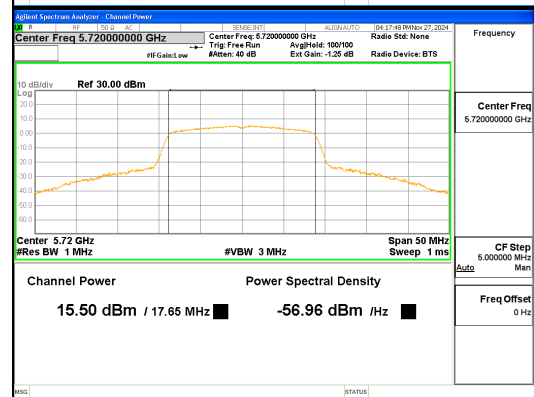
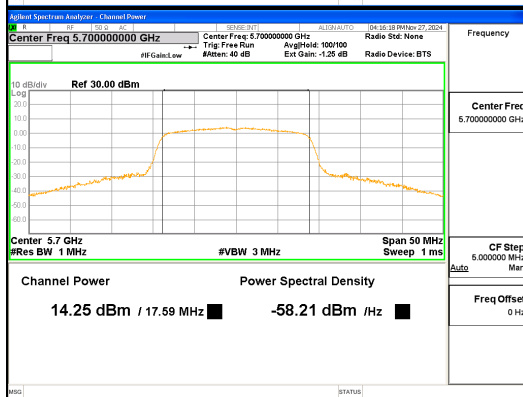
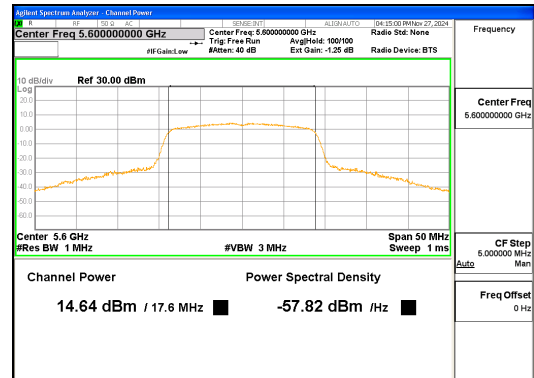
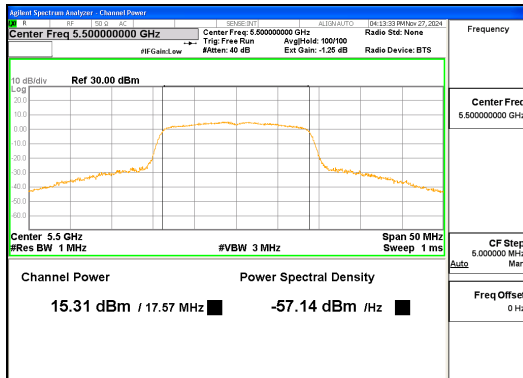


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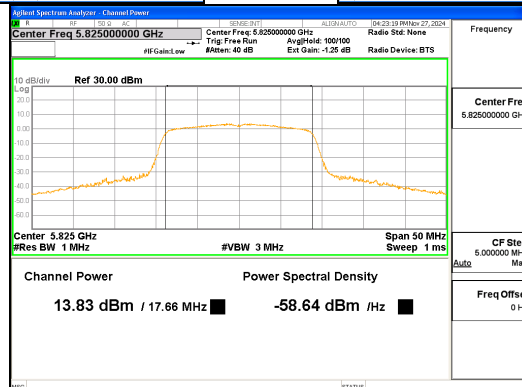
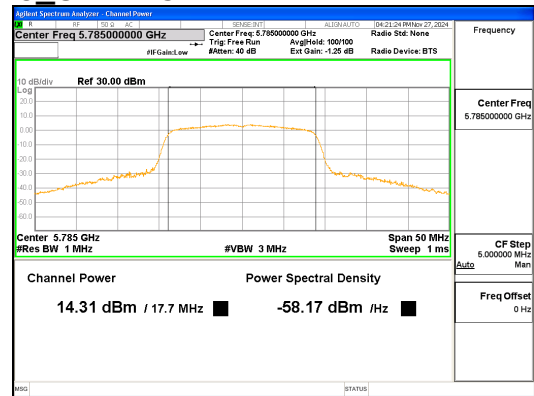
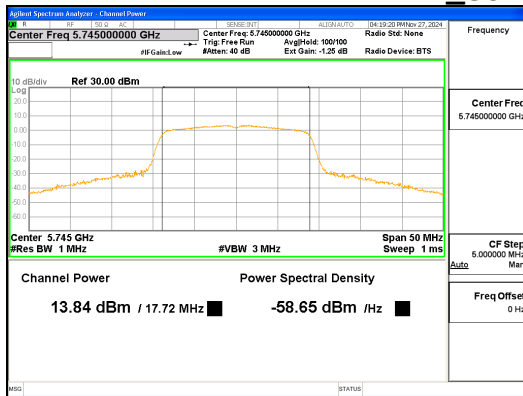


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ANT2_802.11n_HT20_UNII 2C

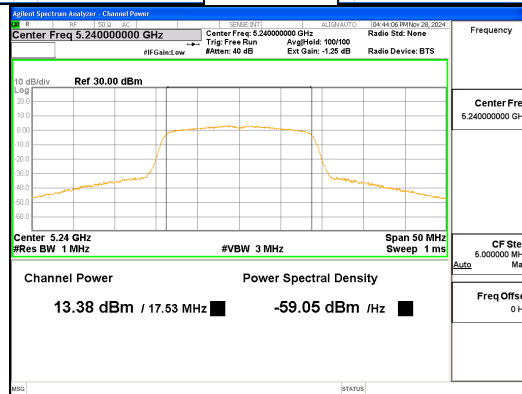
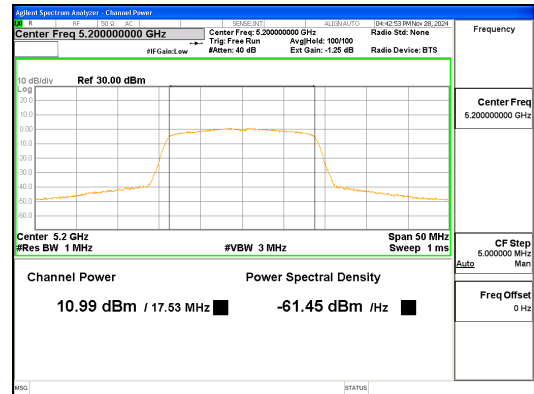
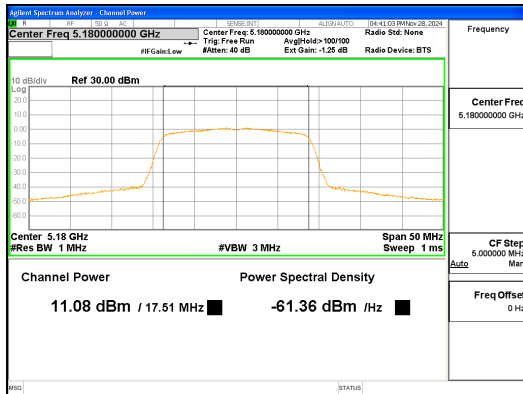


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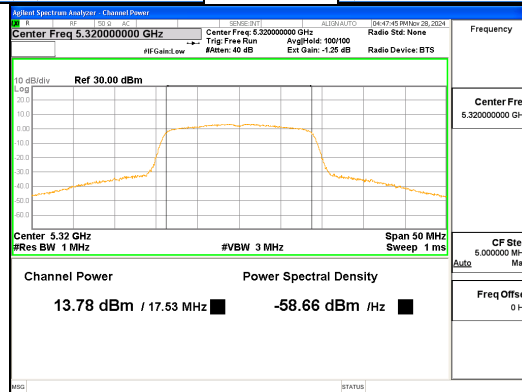
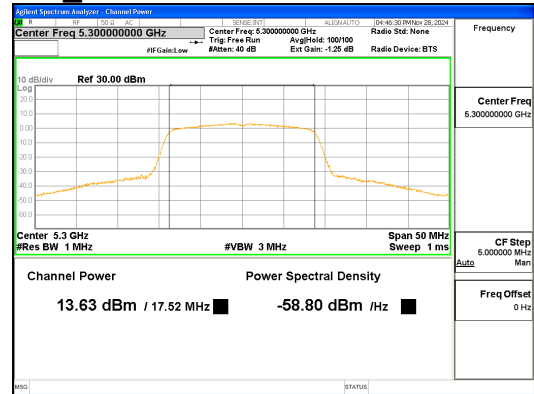
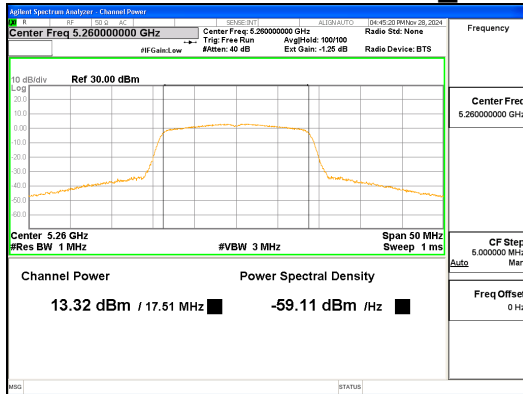


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ANT1_802.11ac_VHT20_UNII 1

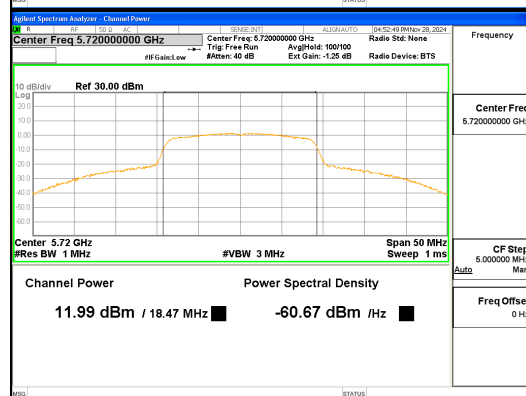
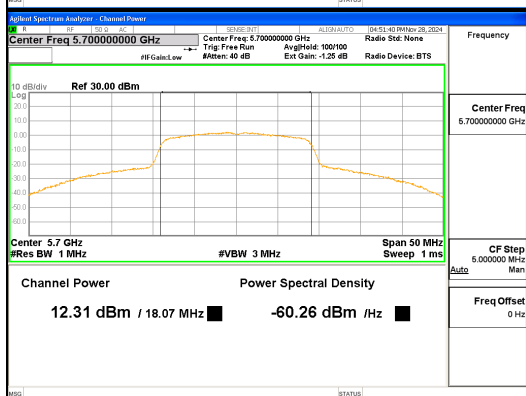
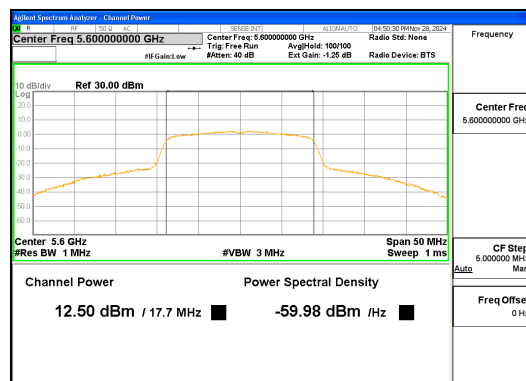
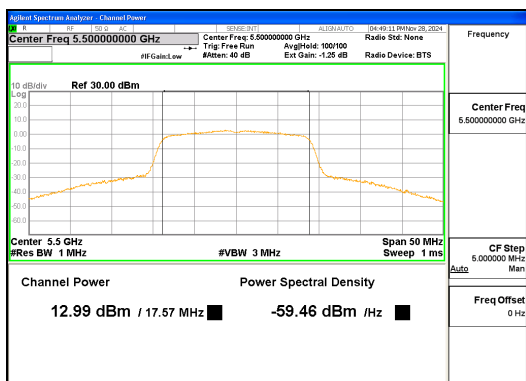


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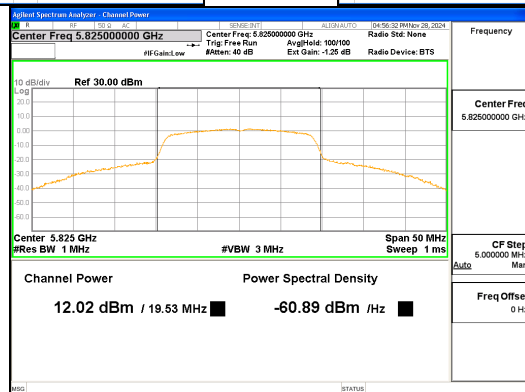
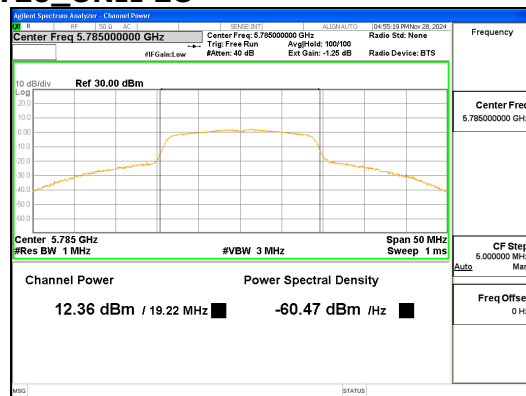
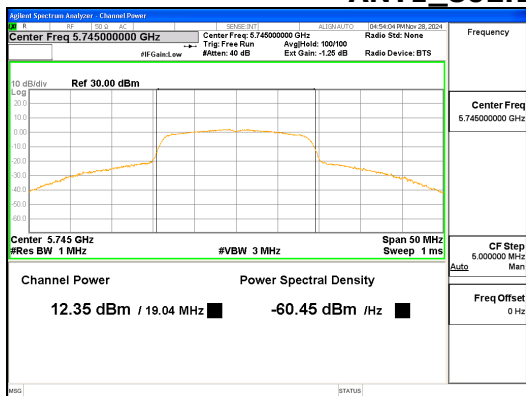


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ANT1_802.11ac_VHT20_UNII 2C

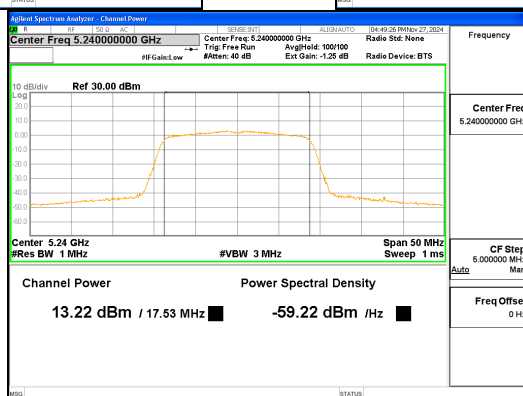
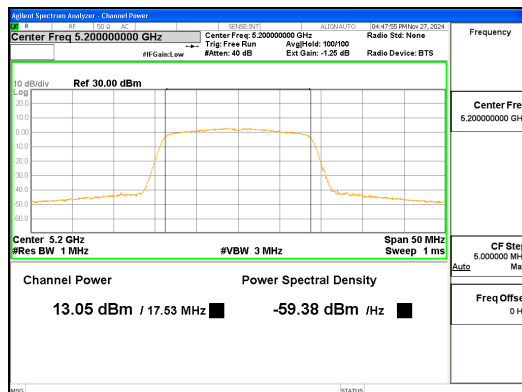
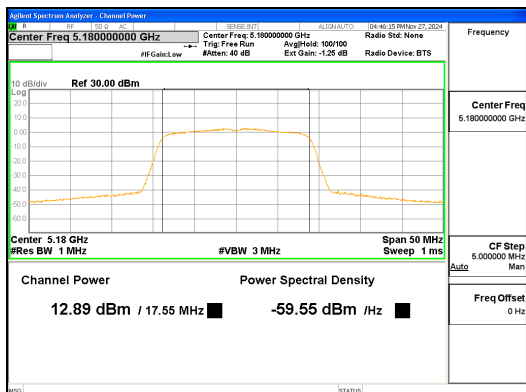


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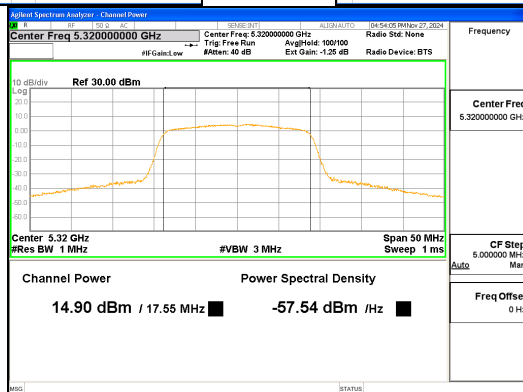
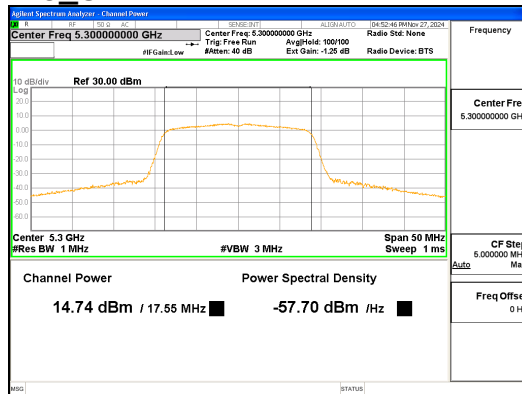
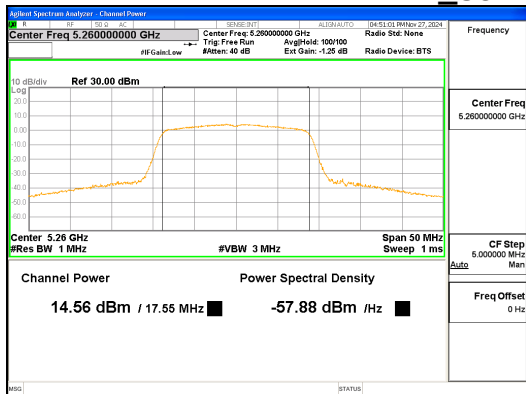


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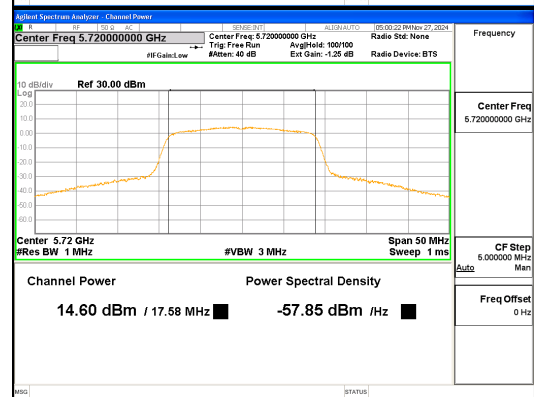
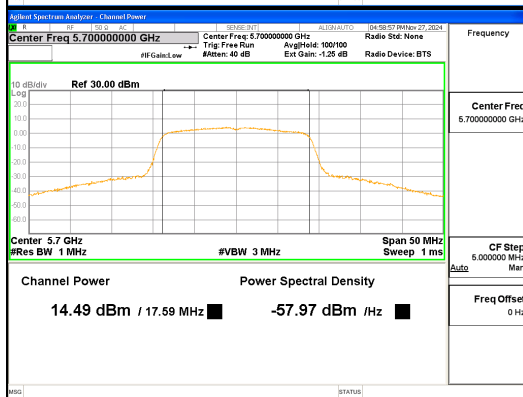
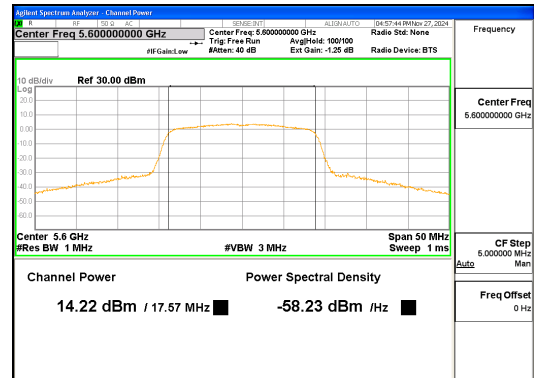
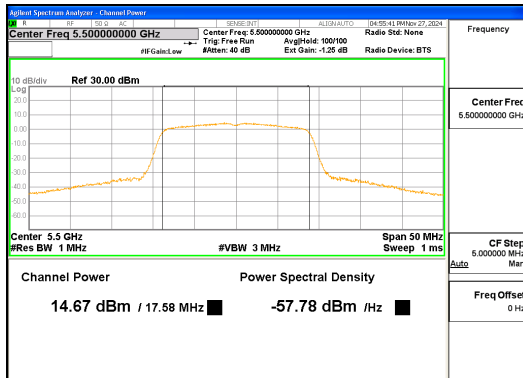


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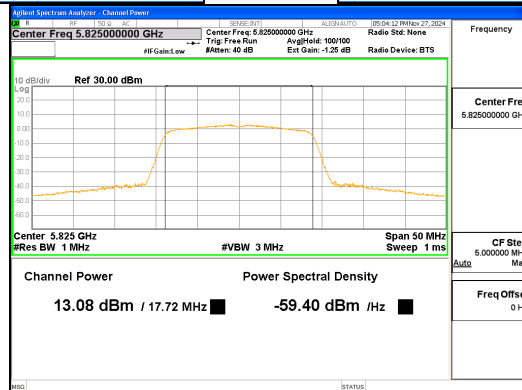
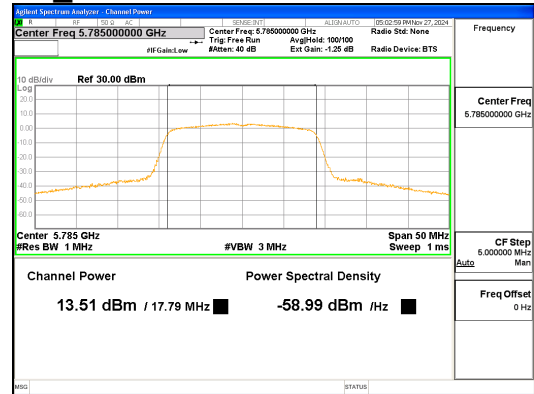
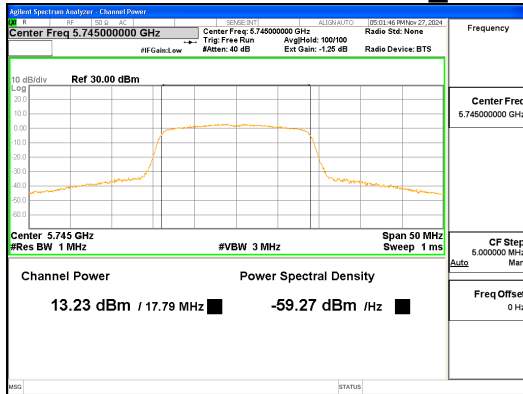


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ANT2_802.11ac_VHT20_UNII 2C

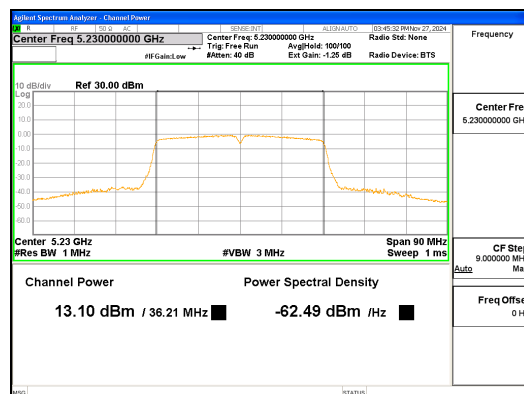
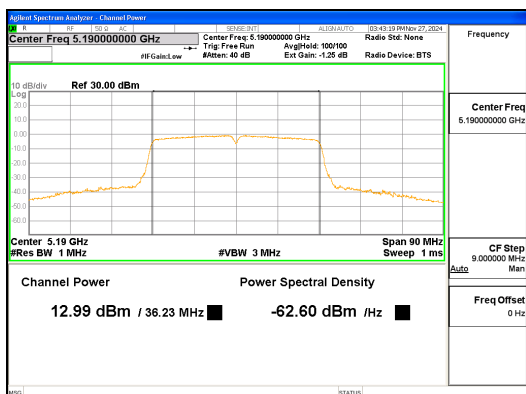


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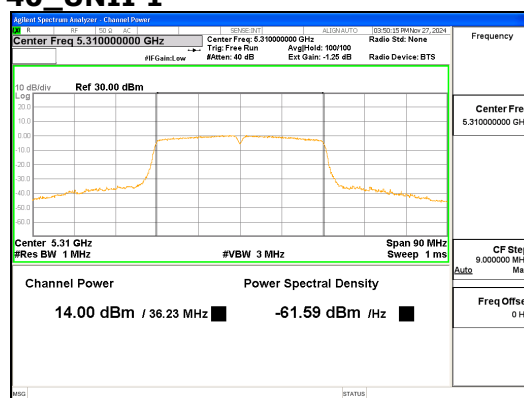
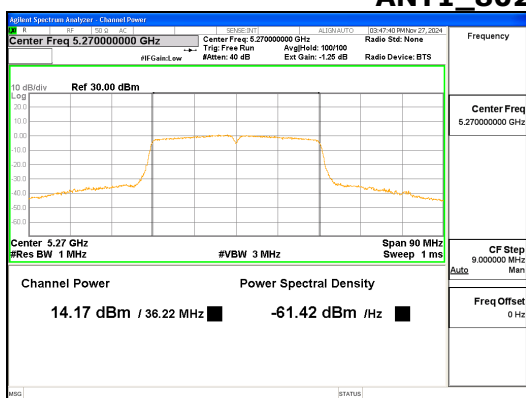


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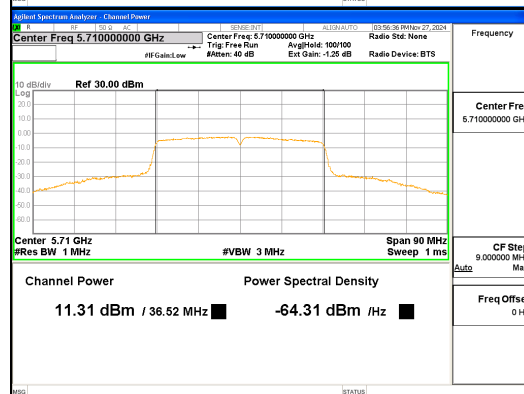
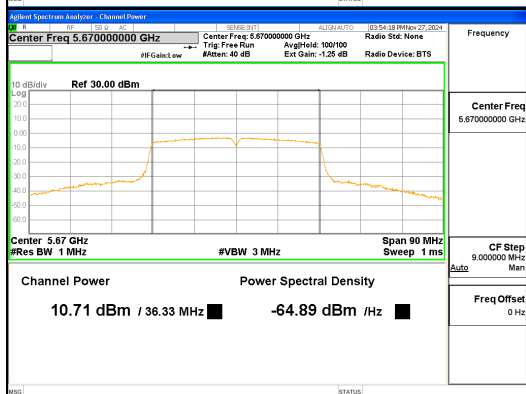
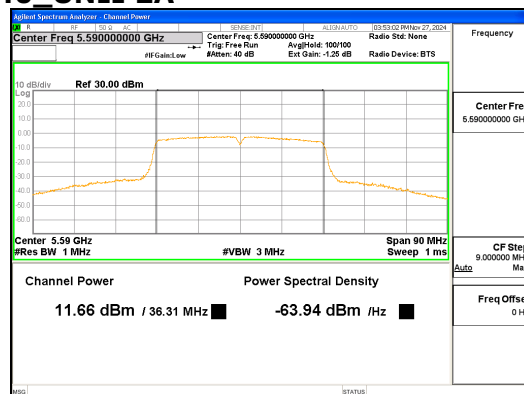
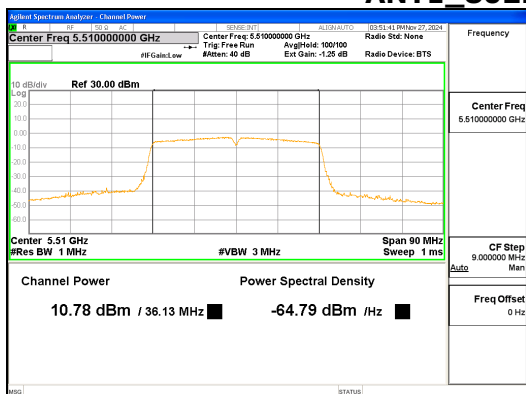
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ANT1_802.11n_HT40_UNII 1



ANT1_802.11n_HT40_UNII 2A



ANT1_802.11n_HT40_UNII 2C



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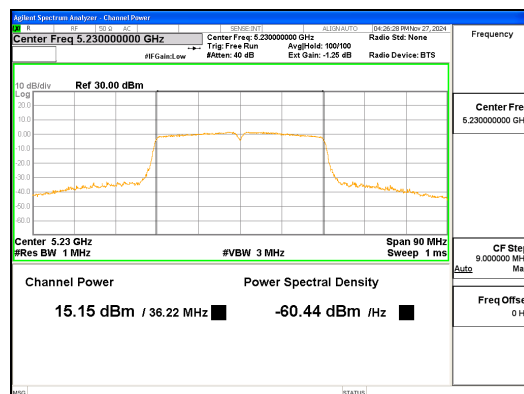
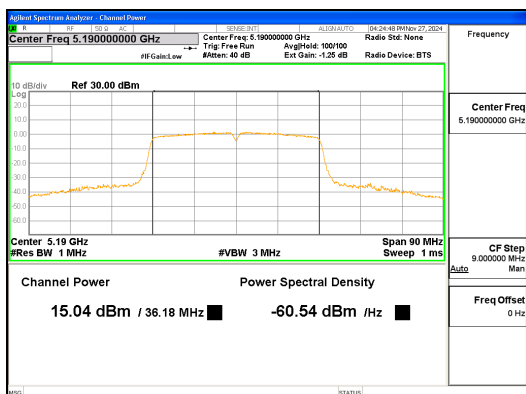


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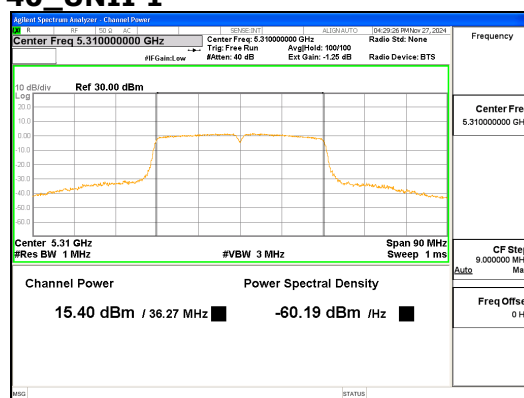
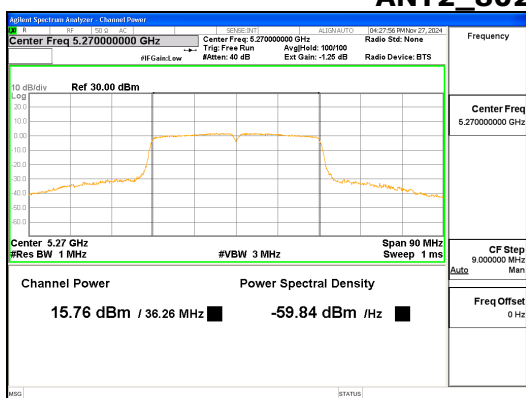


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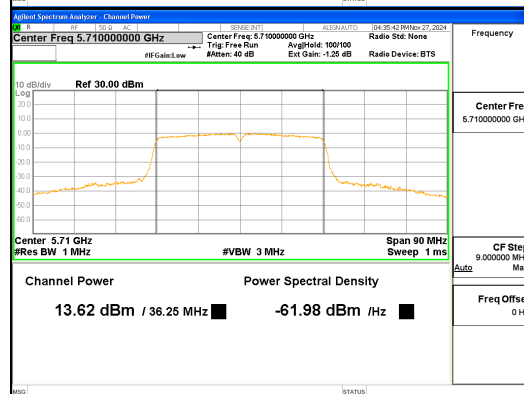
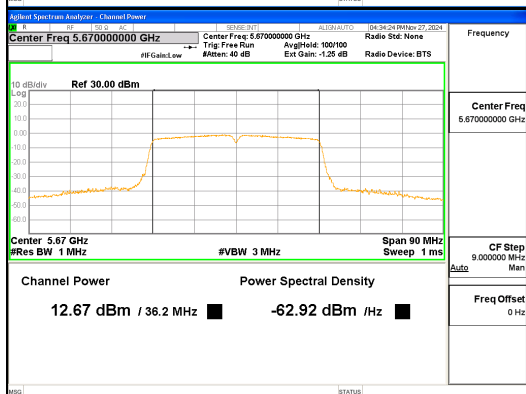
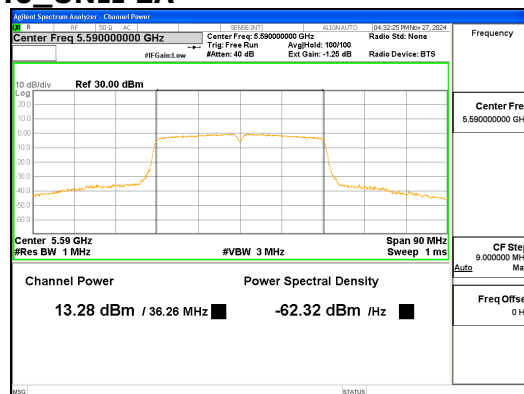
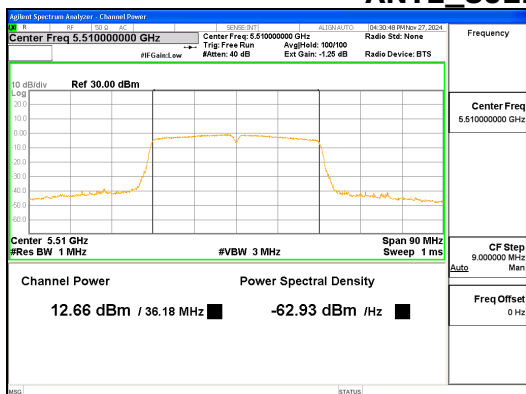
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ANT2_802.11n_HT40_UNII 1



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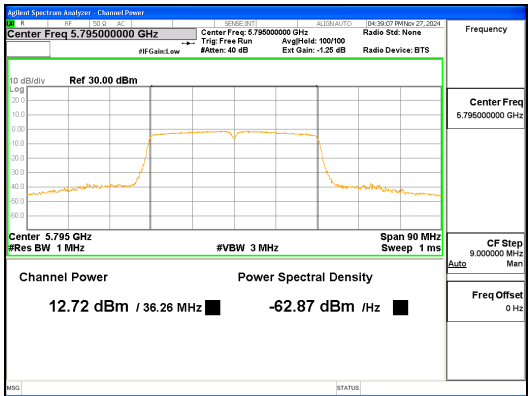
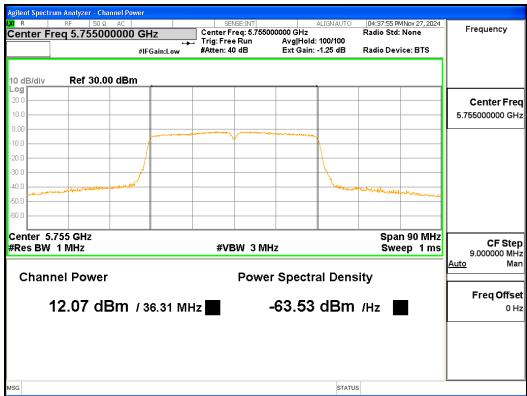


ANT2_802.11n_HT40_UNII 2C



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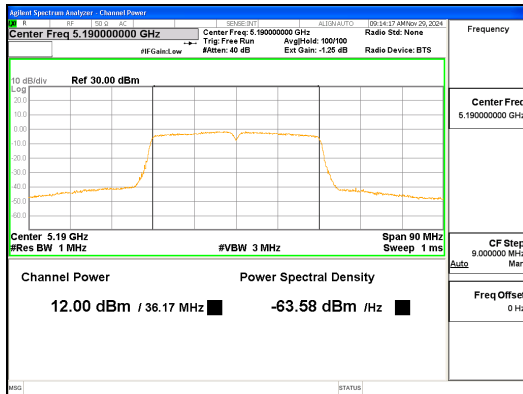


ANT2_802.11n_HT40_UNII 3

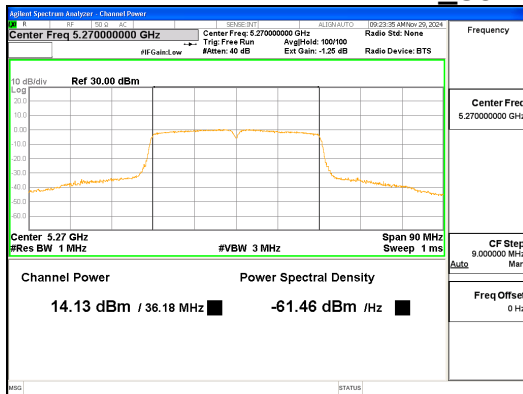
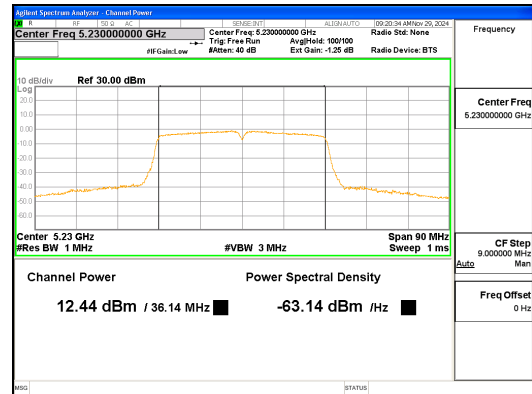


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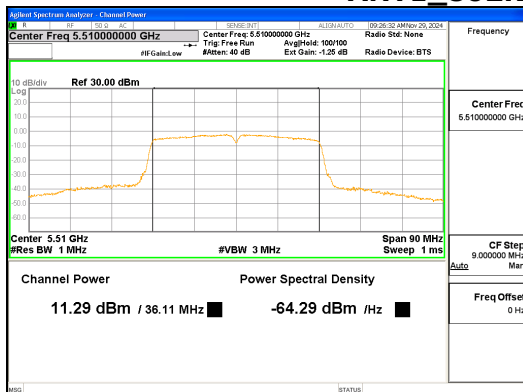
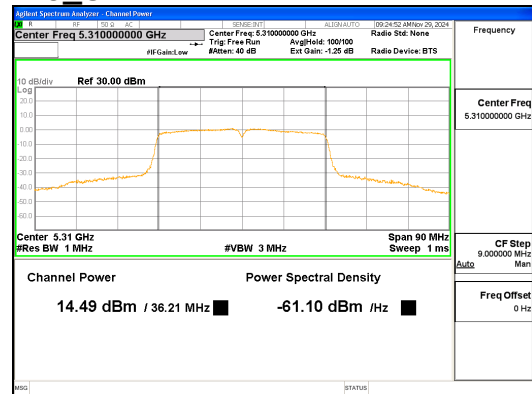
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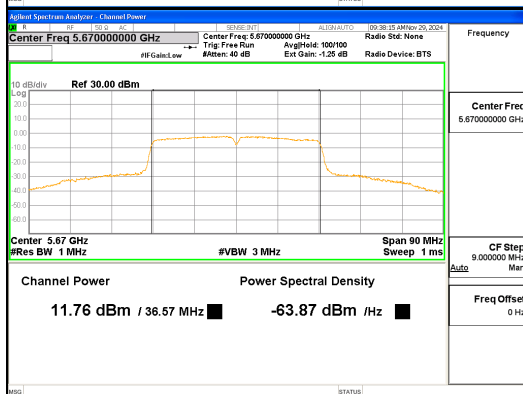
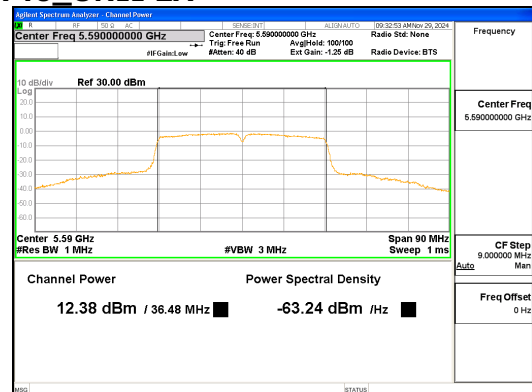
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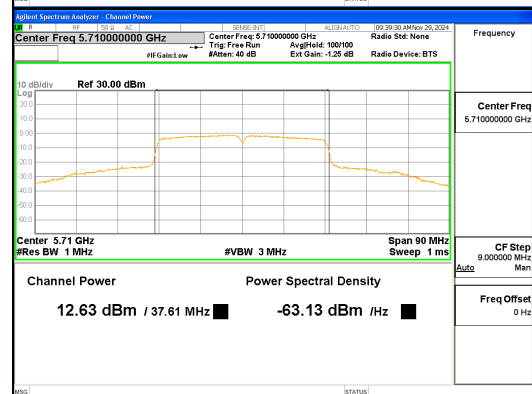
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ANT1_802.11ac_VHT40_UNII 2C



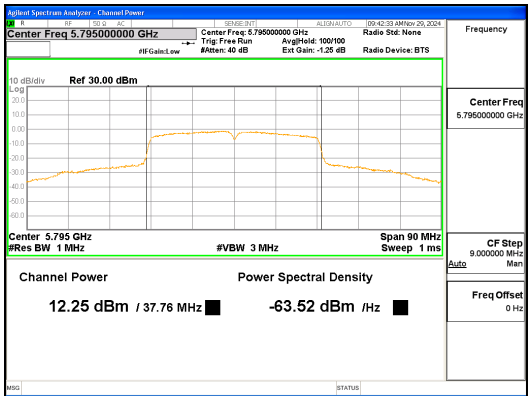
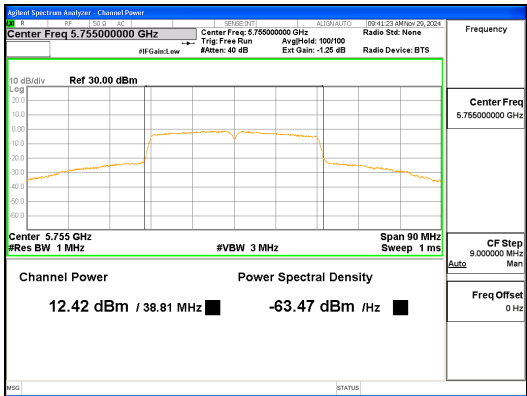
ANT1_802.11ac_VHT40_UNII 2C





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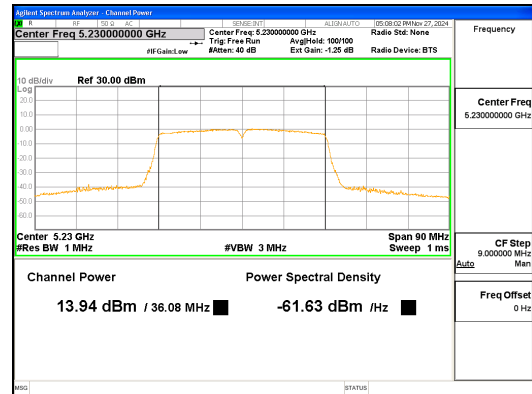
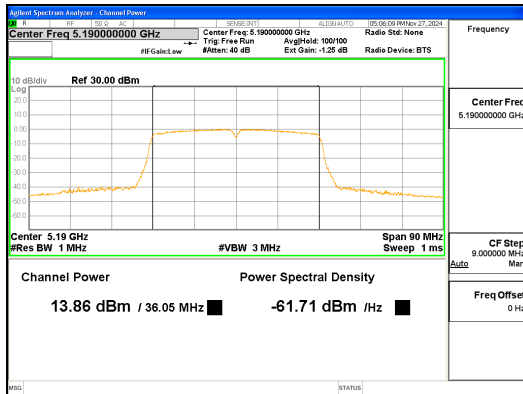


ANT1_802.11ac_VHT40_UNII 3

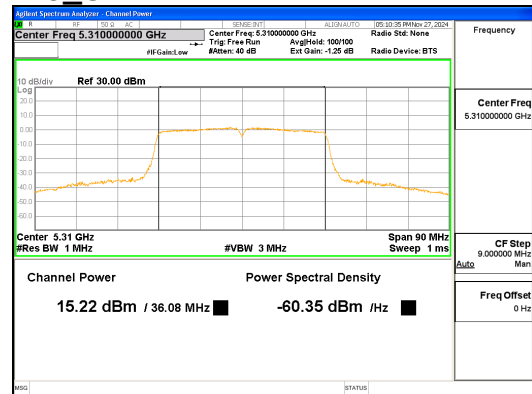
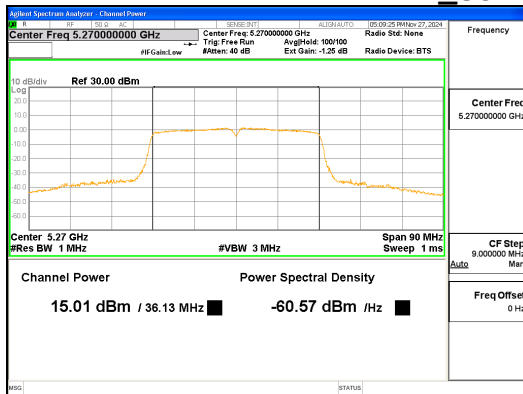


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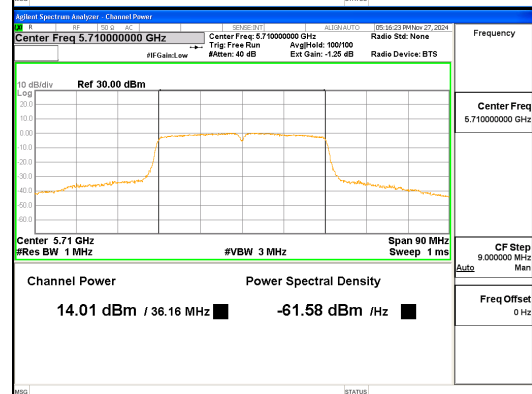
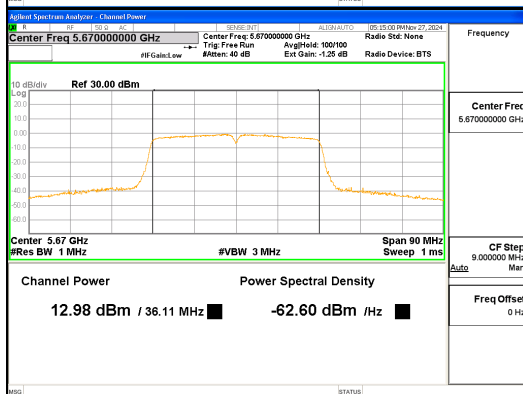
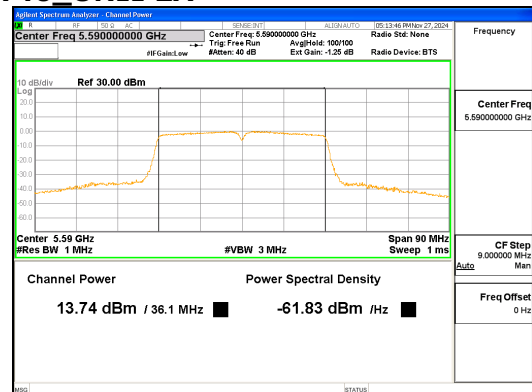
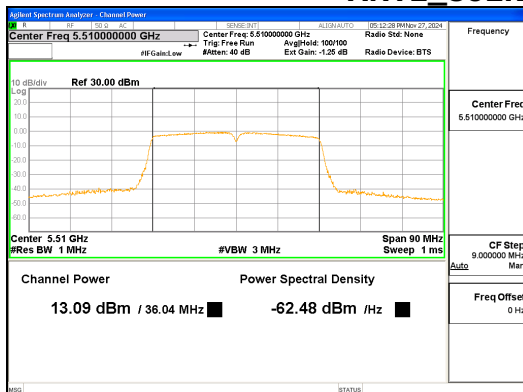
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ANT2_802.11ac_VHT40_UNII 1



ANT2_802.11ac_VHT40_UNII 2A

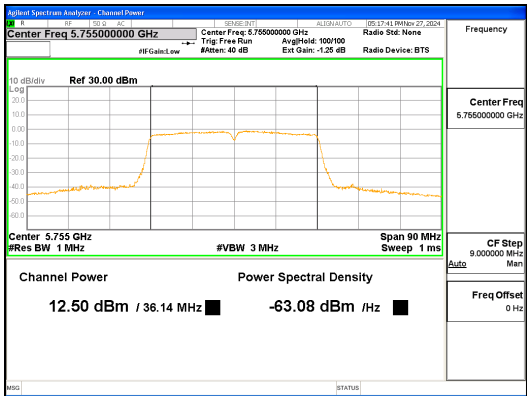


ANT2_802.11ac_VHT40_UNII 2C



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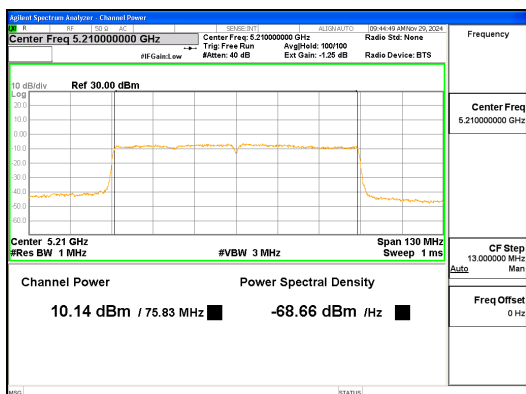


ANT2_802.11ac_VHT40_UNII 3

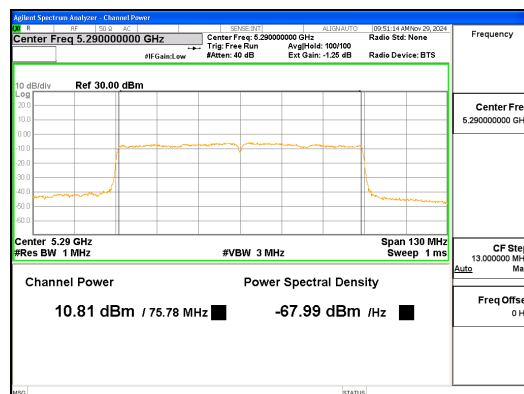


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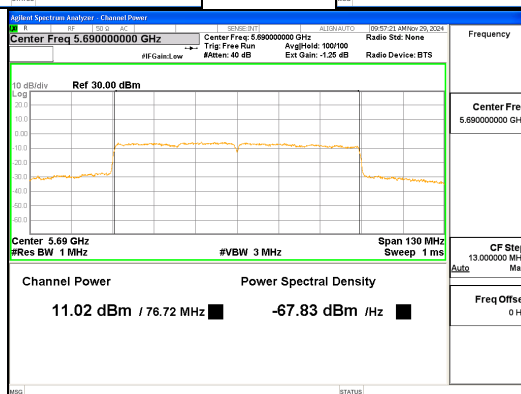
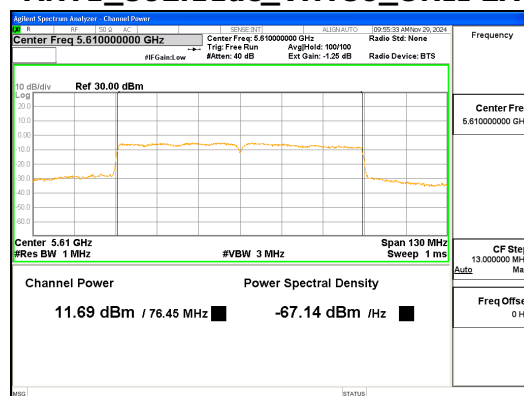
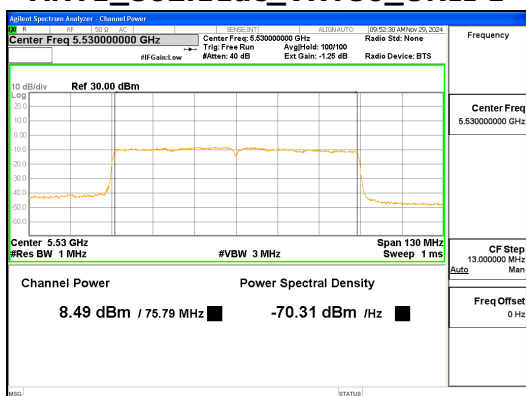
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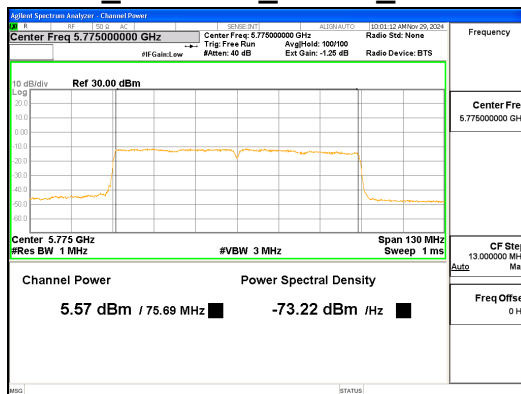
ANT1_802.11ac_VHT80_UNII 1



ANT1_802.11ac_VHT80_UNII 2A



ANT1_802.11ac_VHT80_UNII 2C

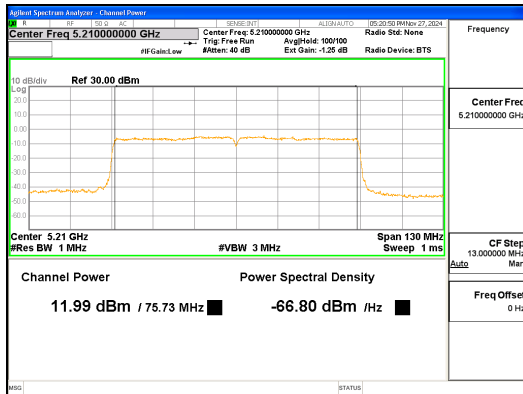


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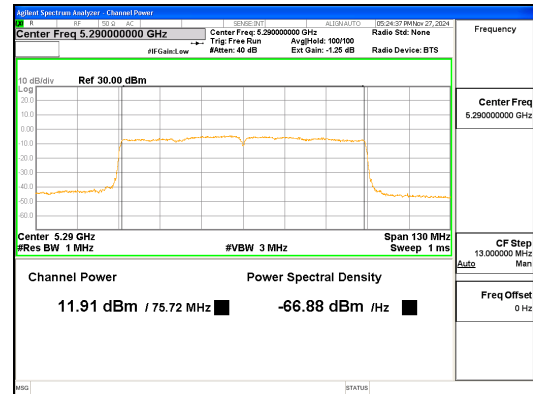


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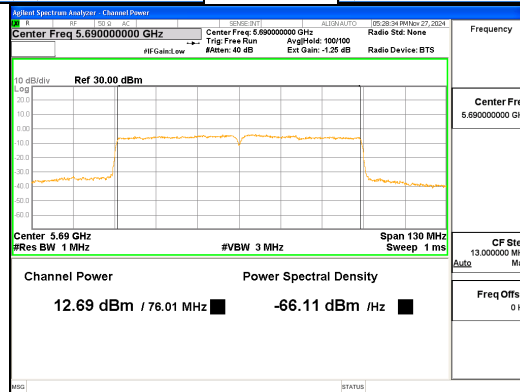
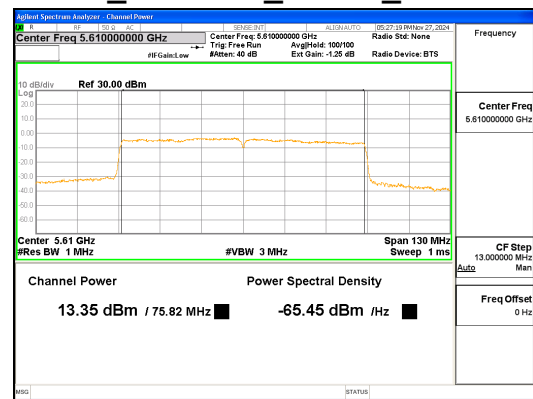
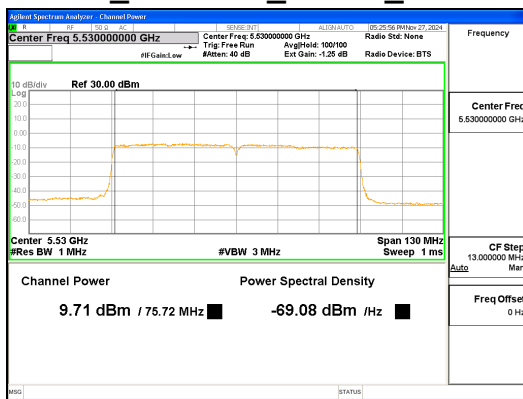
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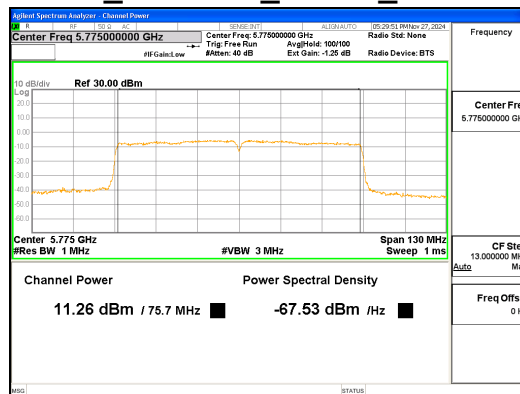
ANT2_802.11ac_VHT80_UNII 1



ANT2_802.11ac_VHT80_UNII 2A



ANT2_802.11ac_VHT80_UNII 2C



ANT2_802.11ac_VHT80_UNII 3

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4.4 Power Spectral Density

Test Procedures

KDB 789033 – Section F (Method SA-2, Maximum Power Spectral Density)

KDB 662911 D01, D02 (Multiple Transmitter Output)

ANSI C63.10-2013 – Section 12.5

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Test Settings :

Center frequency = the highest, middle and the lowest channels

- a) RBW = 1 MHz, 500 KHz (UNII 3)
- b) VBW = 3 MHz, 1.5 MHz (UNII 3)
- c) Sweep time = auto
- d) Detector = power averaging (rms)
- e) Trace mode = Average at least 100
- f) Duty cycle factor = $10\log(1/x)$

Test mode	Duty Cycle Factor (dB)
802.11a	0.09
802.11n_HT20	0.10
802.11n_HT40	0.21
802.11ac_VHT20	0.20
802.11ac_VHT40	0.34
802.11ac_VHT80	2.35



Limit

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Band	Limit (dBm)
SISO	802.11a/n/ac	ANT1, ANT2	0.54, 1.58	UNII 1	11.00
				UNII 2A	11.00
			1.69, 3.75	UNII 2C	11.00
				UNII 3	30.00
MIMO (2Tx)	802.11n/ac	ANT1 + ANT2	4.09	UNII 1	11.00
				UNII 2A	11.00
			5.79	UNII 2C	11.00
				UNII 3	30.00

Note :
Per KDB 662911, the MIMO directional gain is calculated using the following formula, Where G_N is the gain of the nth antenna and N_{ANT} , the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] \text{ dBi}$$



Test Data

ANT1 (SISO)

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Duty cycle Factor (dB)	Result Power Density (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	5.16	0.09	5.25	11.00	5.75
	5 200	5.02	0.09	5.11	11.00	5.89
	5 240	4.97	0.09	5.06	11.00	5.94
	5 260	5.76	0.09	5.85	11.00	5.15
	5 300	5.72	0.09	5.81	11.00	5.19
	5 320	5.86	0.09	5.95	11.00	5.05
	5 500	3.72	0.09	3.81	11.00	7.19
	5 600	3.11	0.09	3.20	11.00	7.80
	5 700	3.42	0.09	3.51	11.00	7.49
	5 720	2.98	0.09	3.07	11.00	7.93
	5 745	0.04	0.09	0.13	30.00	29.87
	5 785	-0.12	0.09	-0.03	30.00	30.03
	5 825	-0.46	0.09	-0.37	30.00	30.37
802.11n_HT20	5 180	0.13	0.10	0.23	11.00	10.77
	5 200	0.11	0.10	0.21	11.00	10.79
	5 240	0.57	0.10	0.67	11.00	10.33
	5 260	2.07	0.10	2.17	11.00	8.83
	5 300	2.32	0.10	2.42	11.00	8.58
	5 320	2.37	0.10	2.47	11.00	8.53
	5 500	3.19	0.10	3.29	11.00	7.71
	5 600	2.50	0.10	2.60	11.00	8.40
	5 700	1.51	0.10	1.61	11.00	9.39
	5 720	2.24	0.10	2.34	11.00	8.66
	5 745	-0.13	0.10	-0.03	30.00	30.03
	5 785	0.01	0.10	0.11	30.00	29.89
	5 825	-0.74	0.10	-0.64	30.00	30.64
802.11ac_VHT20	5 180	0.89	0.20	1.09	11.00	9.91
	5 200	0.82	0.20	1.02	11.00	9.98
	5 240	2.23	0.20	2.43	11.00	8.57
	5 260	2.91	0.20	3.11	11.00	7.89
	5 300	3.43	0.20	3.63	11.00	7.37
	5 320	3.47	0.20	3.67	11.00	7.33
	5 500	2.77	0.20	2.97	11.00	8.03

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	5 600	2.04	0.20	2.24	11.00	8.76
	5 700	1.98	0.20	2.18	11.00	8.82
	5 720	1.69	0.20	1.89	11.00	9.11
	5 745	-1.04	0.20	-0.84	30.00	30.84
	5 785	-0.78	0.20	-0.58	30.00	30.58
	5 825	-1.01	0.20	-0.81	30.00	30.81
802.11n _HT40	5 190	-0.73	0.21	-0.52	11.00	11.52
	5 230	-0.58	0.21	-0.37	11.00	11.37
	5 270	0.70	0.21	0.91	11.00	10.09
	5 310	0.45	0.21	0.66	11.00	10.34
	5 510	-2.85	0.21	-2.64	11.00	13.64
	5 590	-2.22	0.21	-2.01	11.00	13.01
	5 670	-2.76	0.21	-2.55	11.00	13.55
	5 710	-2.17	0.21	-1.96	11.00	12.96
	5 755	-5.28	0.21	-5.07	30.00	35.07
	5 795	-4.72	0.21	-4.51	30.00	34.51
802.11ac _VHT40	5 190	-1.43	0.34	-1.09	11.00	12.09
	5 230	-1.40	0.34	-1.06	11.00	12.06
	5 270	0.82	0.34	1.16	11.00	9.84
	5 310	1.15	0.34	1.49	11.00	9.51
	5 510	-2.32	0.34	-1.98	11.00	12.98
	5 590	-0.91	0.34	-0.57	11.00	11.57
	5 670	-1.87	0.34	-1.53	11.00	12.53
	5 710	-0.77	0.34	-0.43	11.00	11.43
	5 755	-4.03	0.34	-3.69	30.00	33.69
	5 795	-3.80	0.34	-3.46	30.00	33.46
802.11ac _VHT80	5 210	-5.99	2.35	-3.64	11.00	14.64
	5 290	-5.86	2.35	-3.51	11.00	14.51
	5 530	-8.58	2.35	-6.23	11.00	17.23
	5 610	-5.16	2.35	-2.81	11.00	13.81
	5 690	-5.69	2.35	-3.34	11.00	14.34
	5 775	-13.46	2.35	-11.11	30.00	41.11
Measurement uncertainty		± 1.5 dB				

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ANT2 (SISO)

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Duty cycle Factor (dB)	Result Power Density (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	5.29	0.09	5.38	11.00	5.62
	5 200	5.18	0.09	5.27	11.00	5.73
	5 240	5.49	0.09	5.58	11.00	5.42
	5 260	5.23	0.09	5.32	11.00	5.68
	5 300	5.12	0.09	5.21	11.00	5.79
	5 320	5.24	0.09	5.33	11.00	5.67
	5 500	5.77	0.09	5.86	11.00	5.14
	5 600	7.03	0.09	7.12	11.00	3.88
	5 700	4.87	0.09	4.96	11.00	6.04
	5 720	7.64	0.09	7.73	11.00	3.27
	5 745	4.53	0.09	4.62	30.00	25.38
	5 785	4.40	0.09	4.49	30.00	25.51
	5 825	4.17	0.09	4.26	30.00	25.74
802.11n _HT20	5 180	2.36	0.10	2.46	11.00	8.54
	5 200	2.46	0.10	2.56	11.00	8.44
	5 240	2.73	0.10	2.83	11.00	8.17
	5 260	3.38	0.10	3.48	11.00	7.52
	5 300	3.57	0.10	3.67	11.00	7.33
	5 320	3.89	0.10	3.99	11.00	7.01
	5 500	5.21	0.10	5.31	11.00	5.69
	5 600	4.64	0.10	4.74	11.00	6.26
	5 700	3.95	0.10	4.05	11.00	6.95
	5 720	5.23	0.10	5.33	11.00	5.67
	5 745	0.95	0.10	1.05	30.00	28.95
	5 785	1.24	0.10	1.34	30.00	28.66
	5 825	0.93	0.10	1.03	30.00	28.97
802.11ac _VHT20	5 180	2.66	0.20	2.86	11.00	8.14
	5 200	2.70	0.20	2.90	11.00	8.10
	5 240	2.88	0.20	3.08	11.00	7.92
	5 260	4.33	0.20	4.53	11.00	6.47
	5 300	4.19	0.20	4.39	11.00	6.61
	5 320	4.67	0.20	4.87	11.00	6.13
	5 500	4.59	0.20	4.79	11.00	6.21
	5 600	4.22	0.20	4.42	11.00	6.58

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	5 700	4.34	0.20	4.54	11.00	6.46
	5 720	4.63	0.20	4.83	11.00	6.17
	5 745	0.54	0.20	0.74	30.00	29.26
	5 785	0.57	0.20	0.77	30.00	29.23
	5 825	0.09	0.20	0.29	30.00	29.71
802.11n _HT40	5 190	1.57	0.21	1.78	11.00	9.22
	5 230	1.63	0.21	1.84	11.00	9.16
	5 270	2.11	0.21	2.32	11.00	8.68
	5 310	2.03	0.21	2.24	11.00	8.76
	5 510	-0.78	0.21	-0.57	11.00	11.57
	5 590	-0.45	0.21	-0.24	11.00	11.24
	5 670	-0.97	0.21	-0.76	11.00	11.76
	5 710	0.05	0.21	0.26	11.00	10.74
	5 755	-4.28	0.21	-4.07	30.00	34.07
	5 795	-3.59	0.21	-3.38	30.00	33.38
802.11ac _VHT40	5 190	0.37	0.34	0.71	11.00	10.29
	5 230	0.52	0.34	0.86	11.00	10.14
	5 270	1.41	0.34	1.75	11.00	9.25
	5 310	1.66	0.34	2.00	11.00	9.00
	5 510	-0.43	0.34	-0.09	11.00	11.09
	5 590	0.09	0.34	0.43	11.00	10.57
	5 670	-0.46	0.34	-0.12	11.00	11.12
	5 710	0.36	0.34	0.70	11.00	10.30
	5 755	-3.82	0.34	-3.48	30.00	33.48
	5 795	-3.49	0.34	-3.15	30.00	33.15
802.11ac _VHT80	5 210	-4.86	2.35	-2.51	11.00	13.51
	5 290	-4.63	2.35	-2.28	11.00	13.28
	5 530	-7.23	2.35	-4.88	11.00	15.88
	5 610	-3.31	2.35	-0.96	11.00	11.96
	5 690	-3.87	2.35	-1.52	11.00	12.52
	5 775	-7.88	2.35	-5.53	30.00	35.53
Measurement uncertainty		± 1.5 dB				



ANT1 + ANT2(MIMO)

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Duty cycle Factor (dB)	Result Power Density (dBm)	Limit (dBm)	Margin (dB)
802.11n _HT20	5 180	4.40	0.10	4.50	11.00	6.50
	5 200	4.45	0.10	4.55	11.00	6.45
	5 240	4.79	0.10	4.89	11.00	6.11
	5 260	5.78	0.10	5.88	11.00	5.12
	5 300	6.00	0.10	6.10	11.00	4.90
	5 320	6.21	0.10	6.31	11.00	4.69
	5 500	7.33	0.10	7.43	11.00	3.57
	5 600	6.71	0.10	6.81	11.00	4.19
	5 700	5.91	0.10	6.01	11.00	4.99
	5 720	7.00	0.10	7.10	11.00	3.90
	5 745	3.45	0.10	3.55	30.00	26.45
	5 785	3.68	0.10	3.78	30.00	26.22
	5 825	3.19	0.10	3.29	30.00	26.71
802.11ac _VHT20	5 180	4.87	0.20	5.07	11.00	5.93
	5 200	4.87	0.20	5.07	11.00	5.93
	5 240	5.58	0.20	5.78	11.00	5.22
	5 260	6.69	0.20	6.89	11.00	4.11
	5 300	6.84	0.20	7.04	11.00	3.96
	5 320	7.12	0.20	7.32	11.00	3.68
	5 500	6.78	0.20	6.98	11.00	4.02
	5 600	6.28	0.20	6.48	11.00	4.52
	5 700	6.33	0.20	6.53	11.00	4.47
	5 720	6.41	0.20	6.61	11.00	4.39
	5 745	2.83	0.20	3.03	30.00	26.97
	5 785	2.96	0.20	3.16	30.00	26.84
	5 825	2.59	0.20	2.79	30.00	27.21
802.11n _HT40	5 190	3.58	0.21	3.79	11.00	7.21
	5 230	3.67	0.21	3.88	11.00	7.12
	5 270	4.47	0.21	4.68	11.00	6.32
	5 310	4.32	0.21	4.53	11.00	6.47
	5 510	1.32	0.21	1.53	11.00	9.47
	5 590	1.76	0.21	1.97	11.00	9.03
	5 670	1.24	0.21	1.45	11.00	9.55
	5 710	2.09	0.21	2.30	11.00	8.70



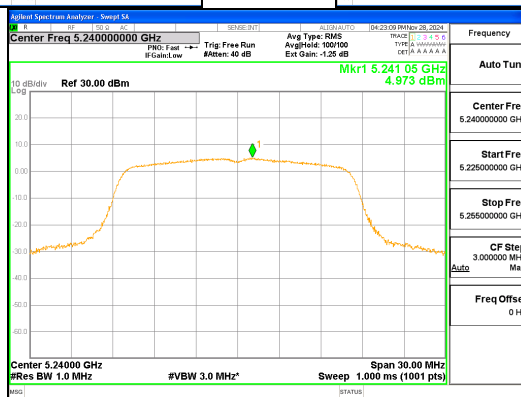
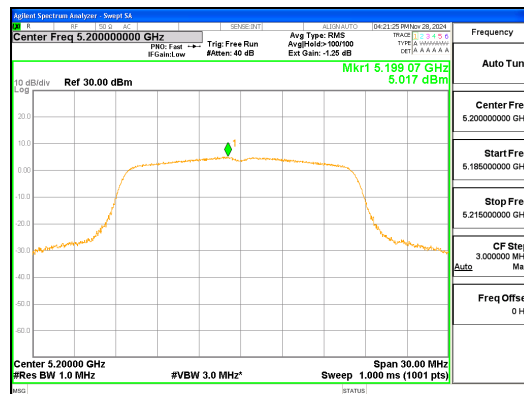
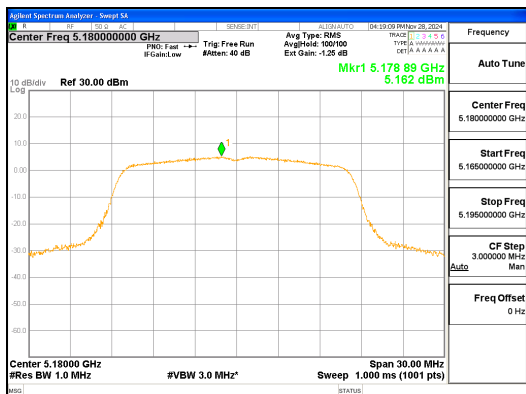
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	5 795	-1.11	0.21	-0.90	30.00	30.90
802.11ac _VHT40	5 190	2.57	0.21	2.78	11.00	8.22
	5 230	2.68	0.21	2.89	11.00	8.11
	5 270	4.14	0.21	4.35	11.00	6.65
	5 310	4.42	0.21	4.63	11.00	6.37
	5 510	1.74	0.21	1.95	11.00	9.05
	5 590	2.63	0.21	2.84	11.00	8.16
	5 670	1.90	0.21	2.11	11.00	8.89
	5 710	2.84	0.21	3.05	11.00	7.95
	5 755	-0.91	0.21	-0.70	30.00	30.70
	5 795	-0.63	0.21	-0.42	30.00	30.42
802.11ac _VHT80	5 210	-2.38	2.35	-0.03	11.00	11.03
	5 290	-2.19	2.35	0.16	11.00	10.84
	5 530	-4.84	2.35	-2.49	11.00	13.49
	5 610	-1.13	2.35	1.22	11.00	9.78
	5 690	-1.68	2.35	0.67	11.00	10.33
	5 775	-6.82	2.35	-4.47	30.00	34.47
Measurement uncertainty		± 1.5 dB				

See next pages for actual measured spectrum plots.

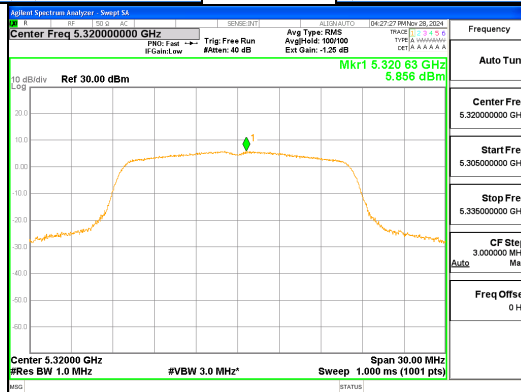
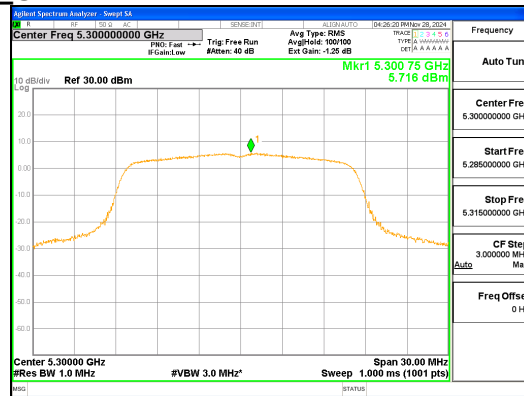
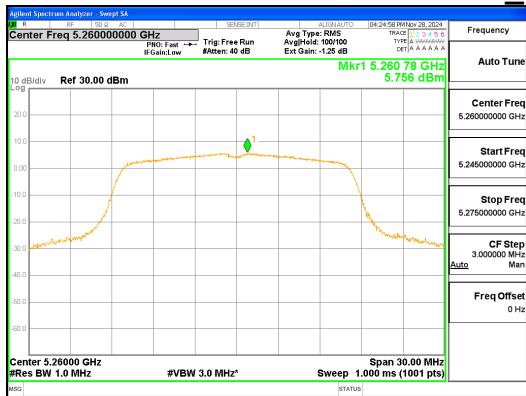


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ANT1_802.11a_UNII 1

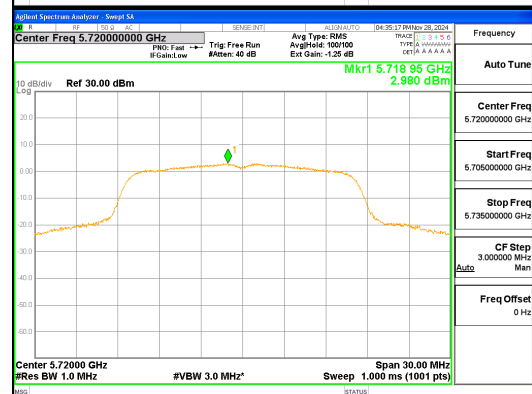
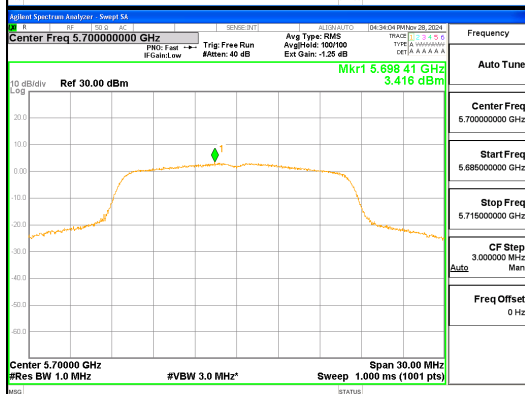
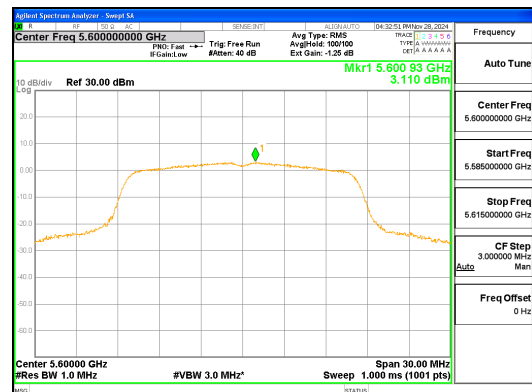
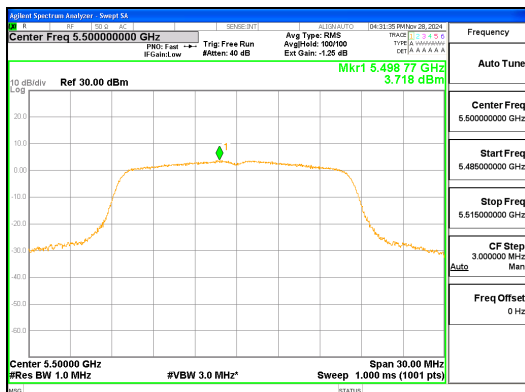


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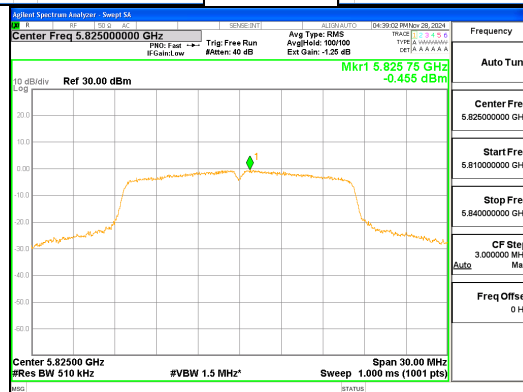
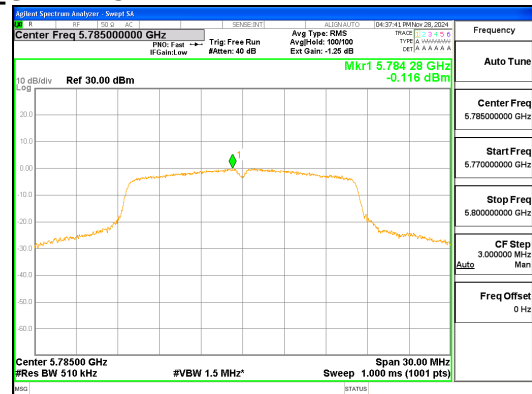
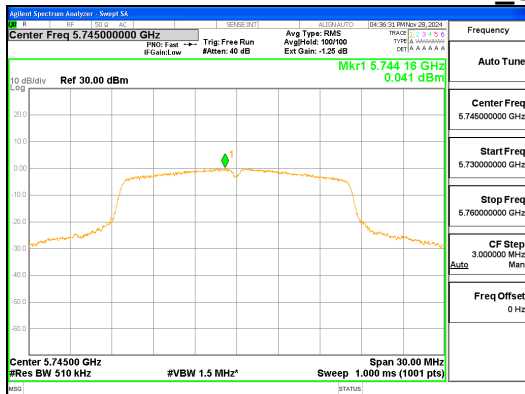


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ANT1_802.11a_UNII 2C

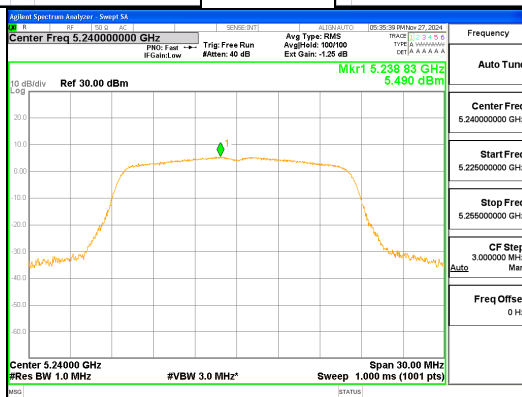
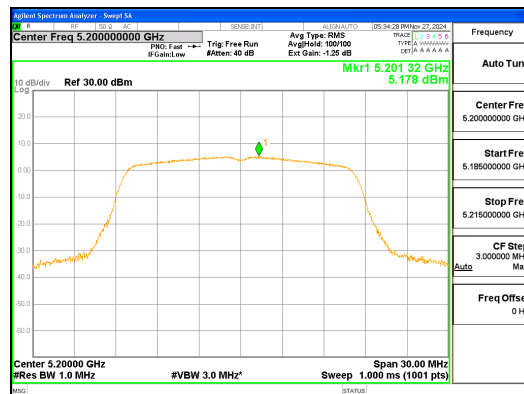
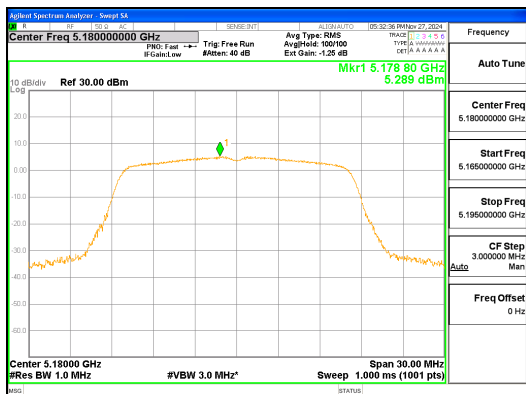


ANT1_802.11a_UNII 3

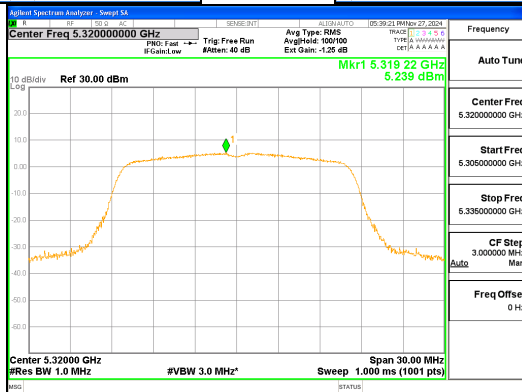
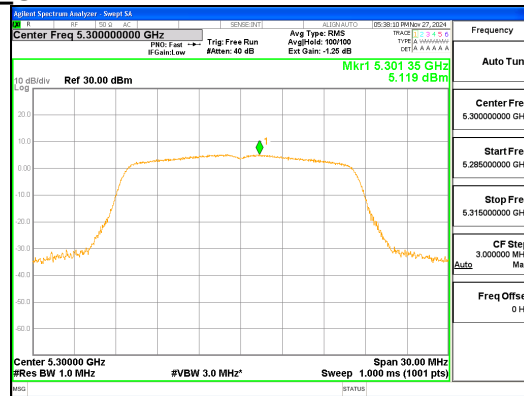
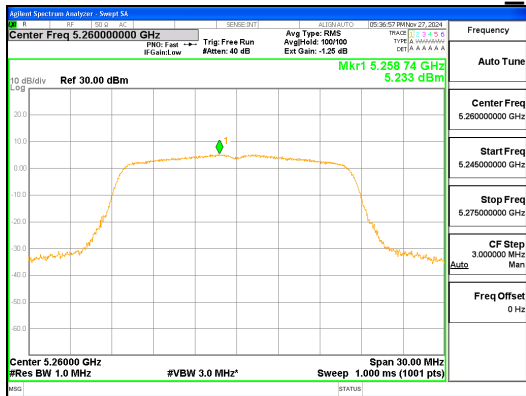


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ANT2_802.11a_UNII 1

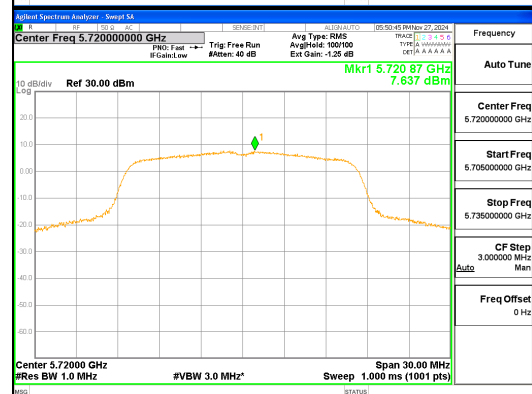
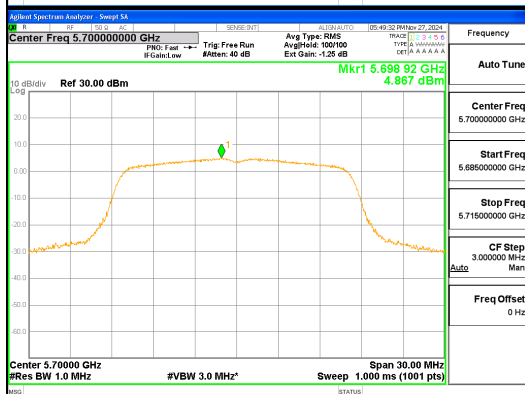
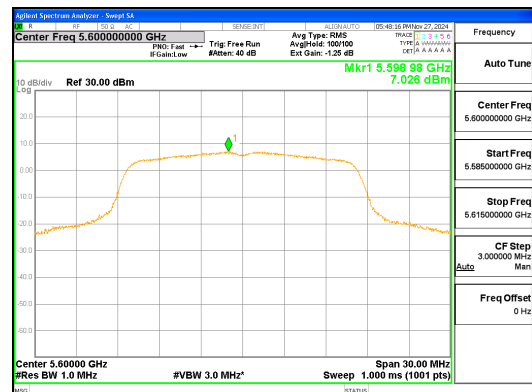
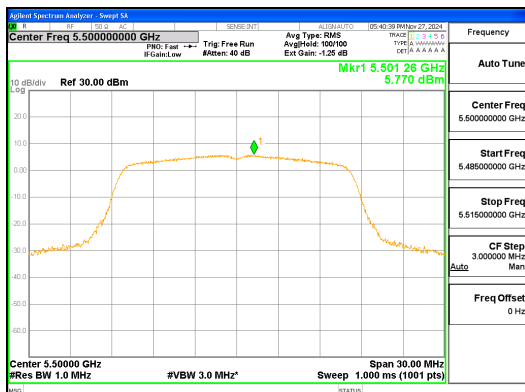


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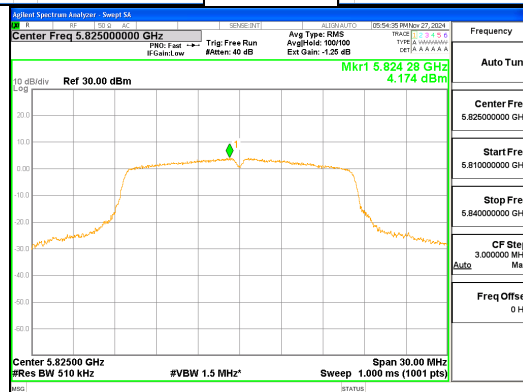
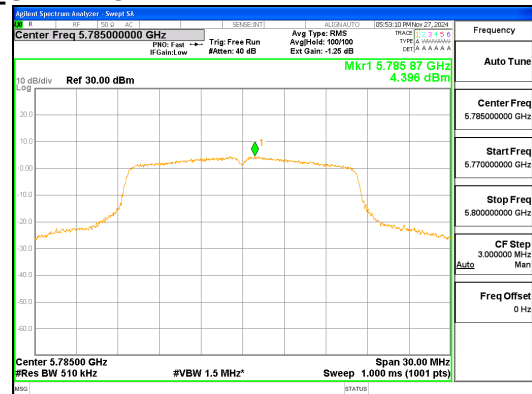
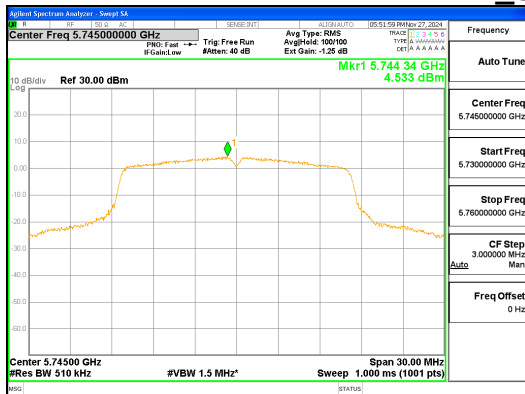


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ANT2_802.11a_UNII 2C

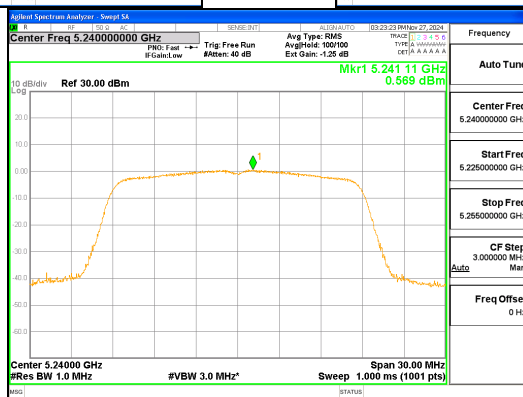
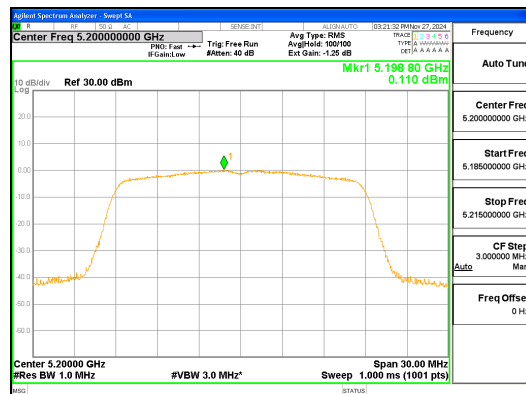
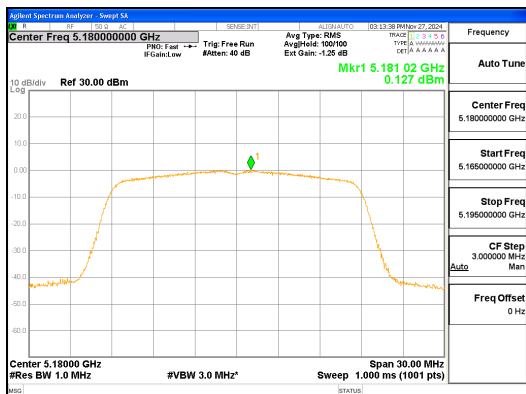


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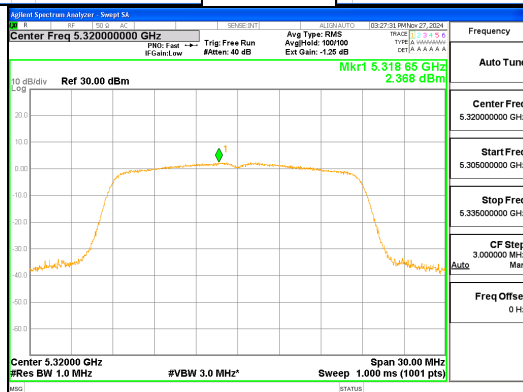
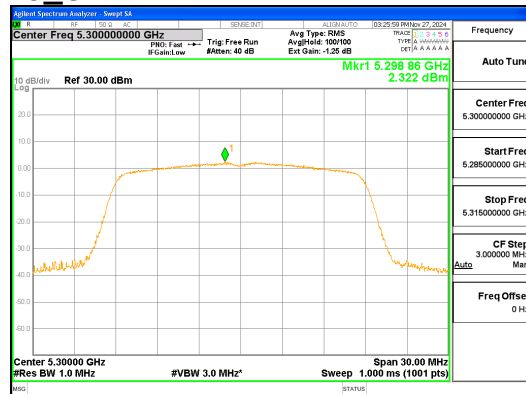
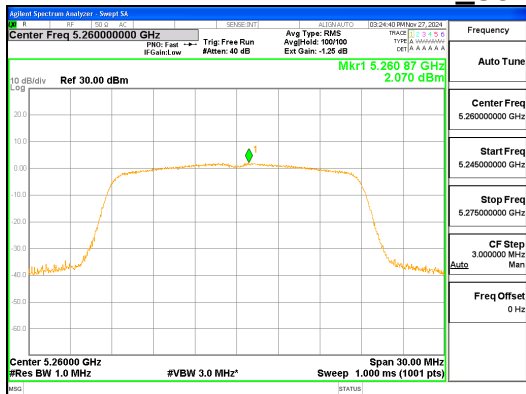


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ANT1_802.11n_HT20_UNII 1

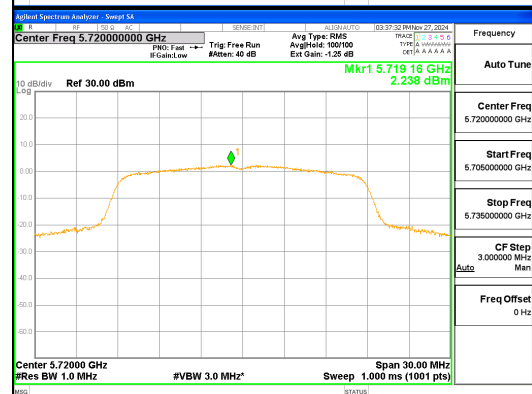
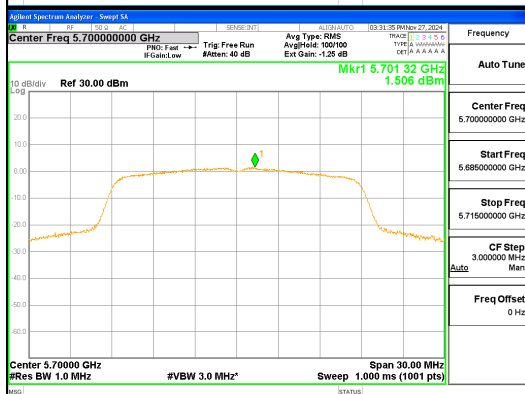
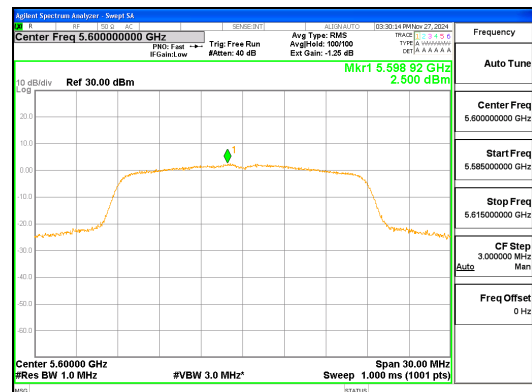
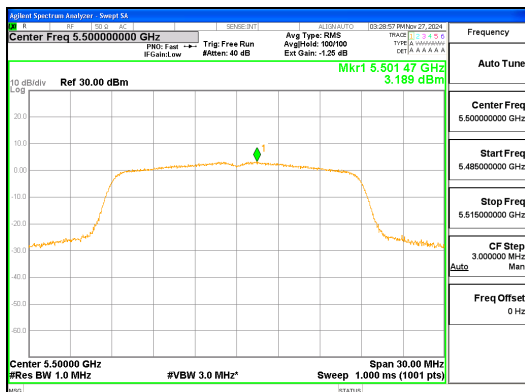


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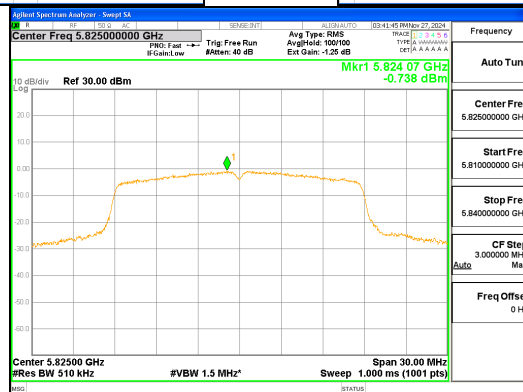
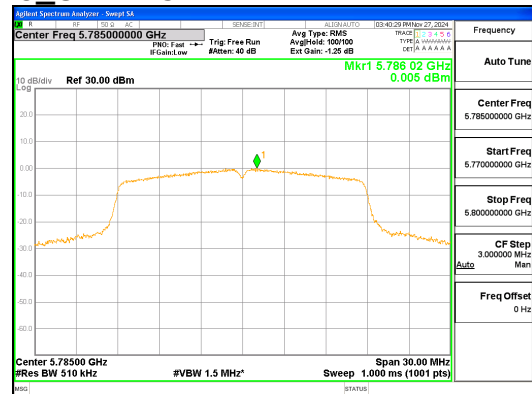
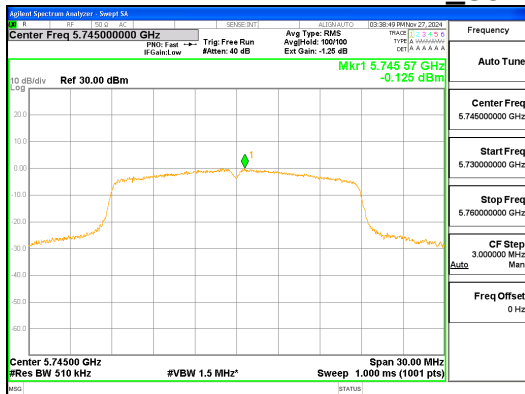


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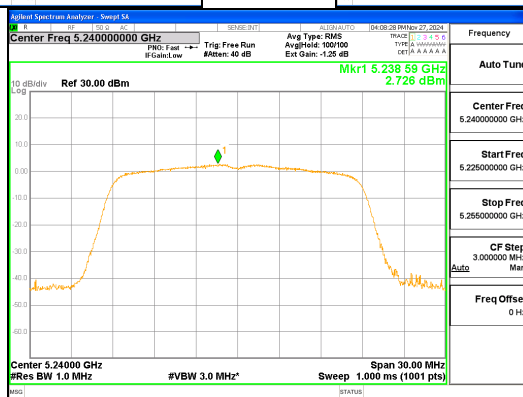
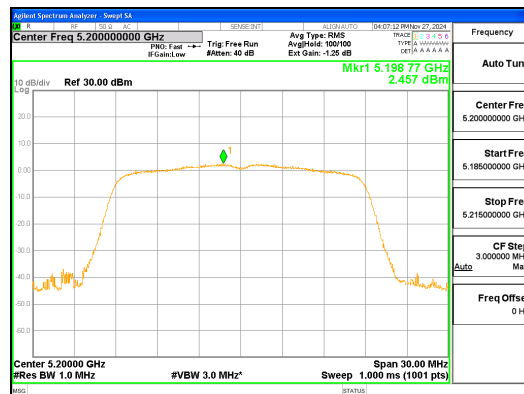
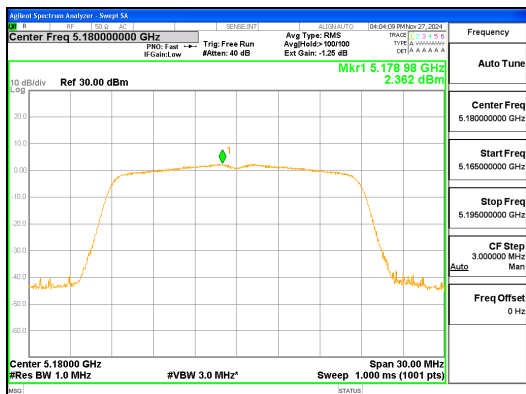


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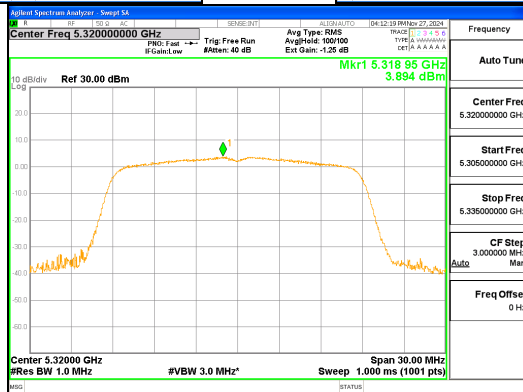
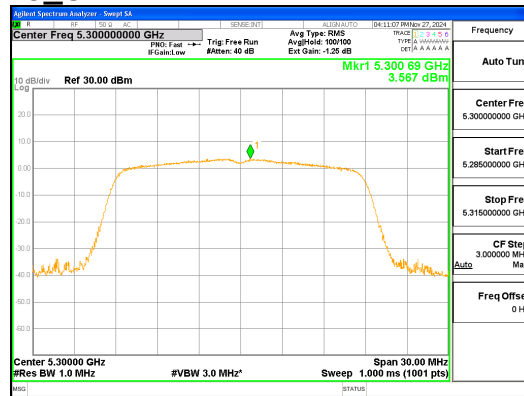
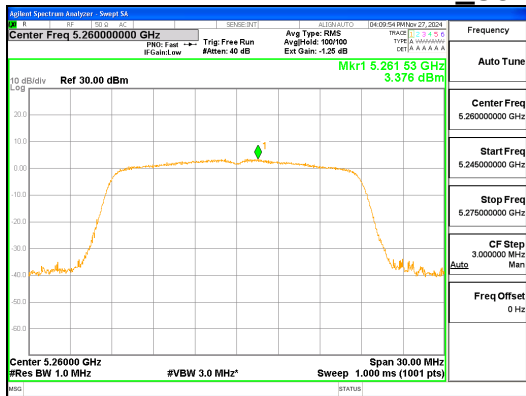


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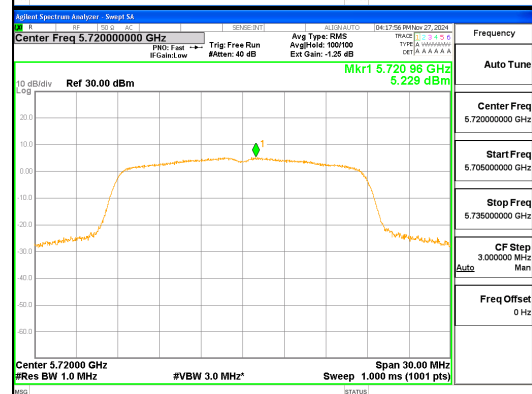
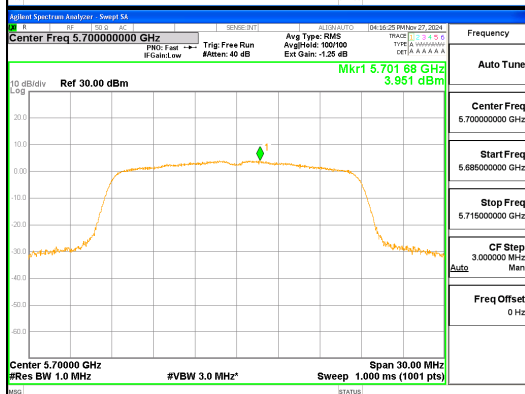
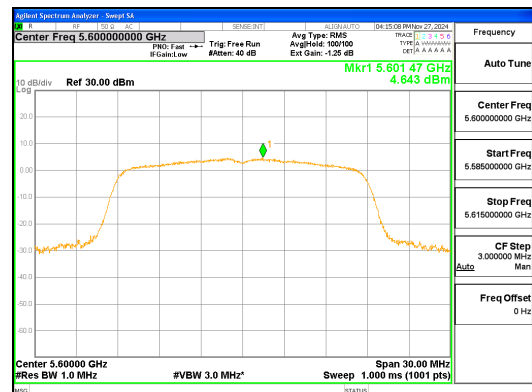
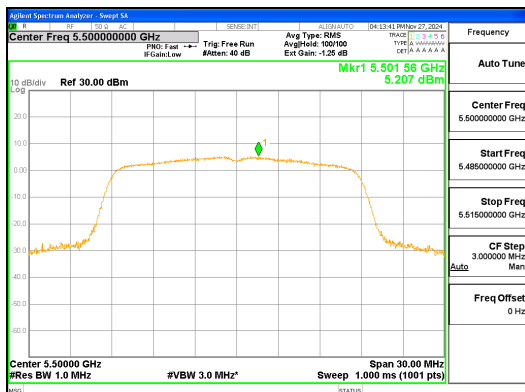


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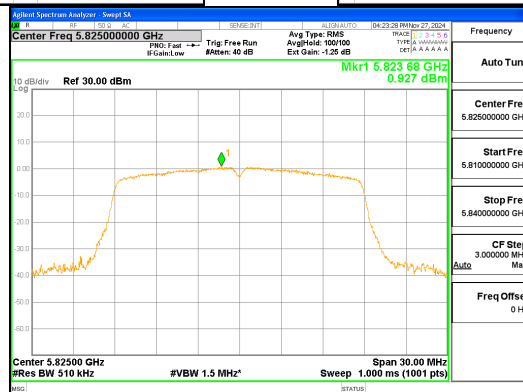
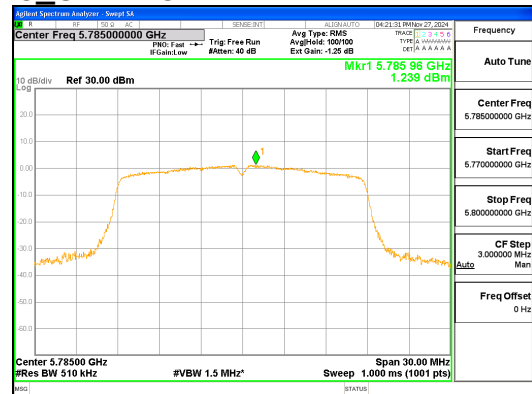
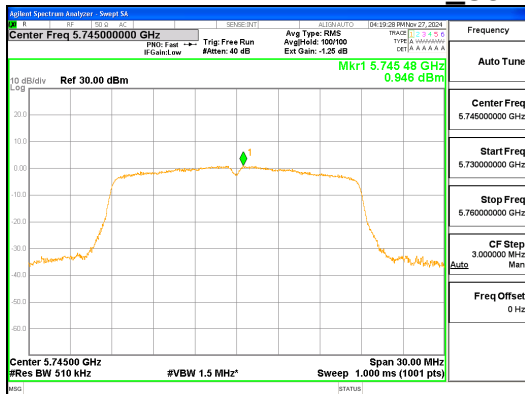


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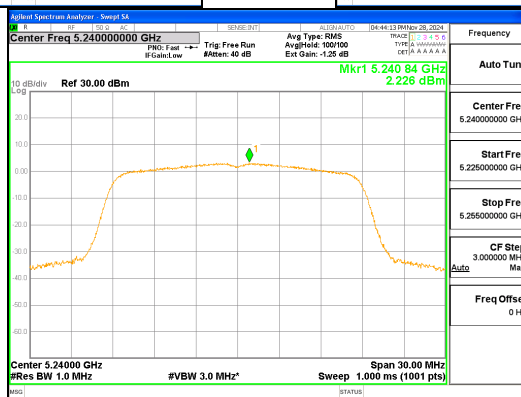
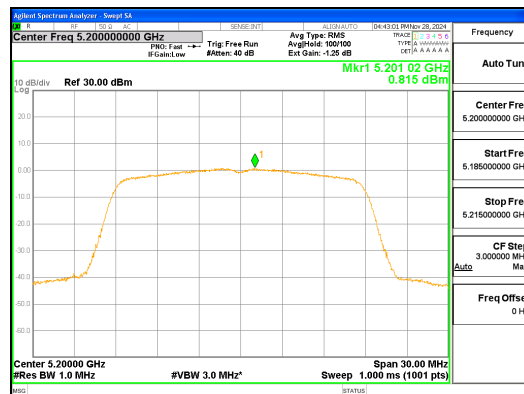
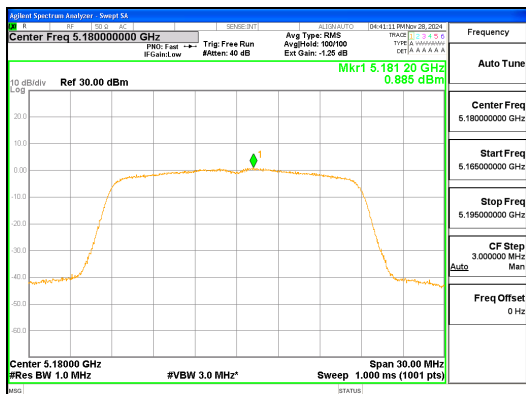


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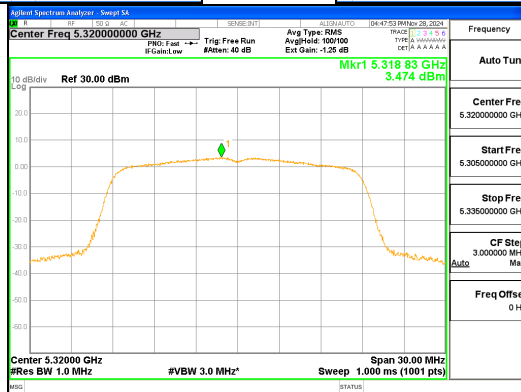
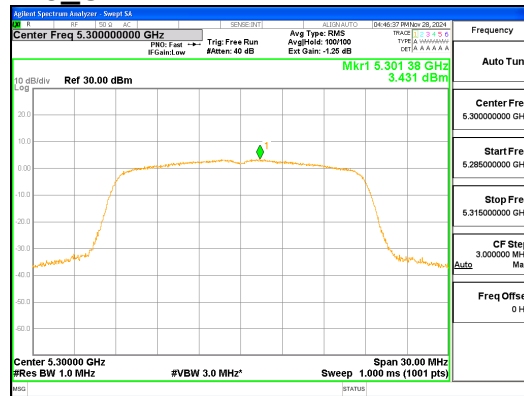
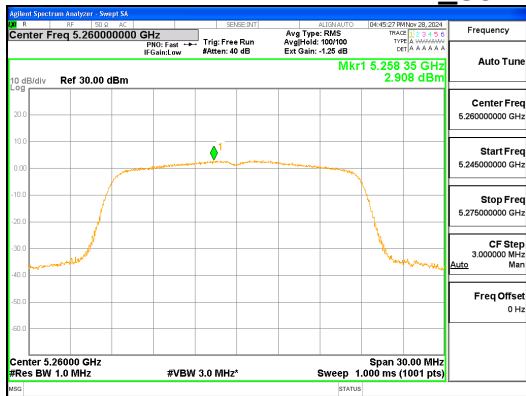


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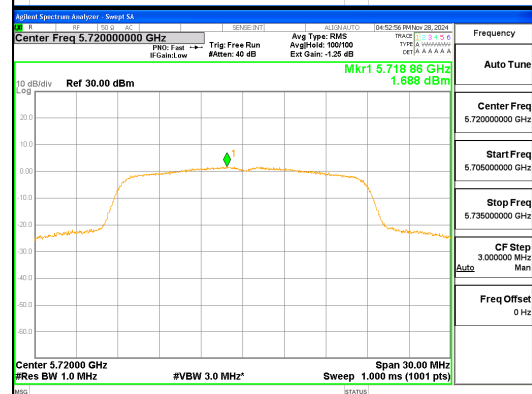
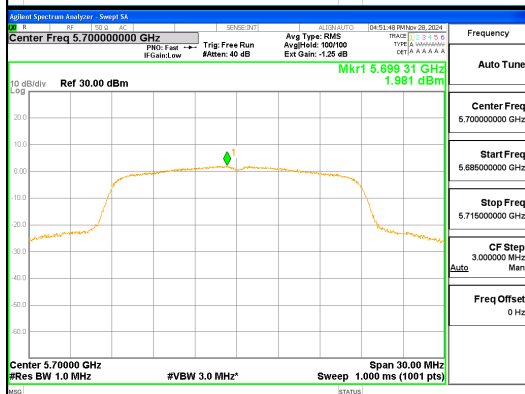
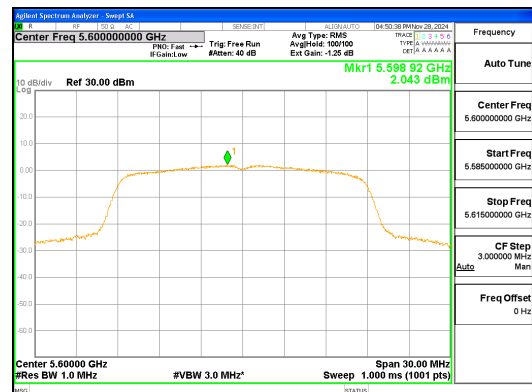
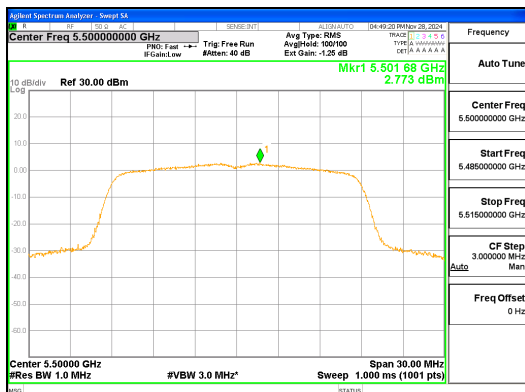


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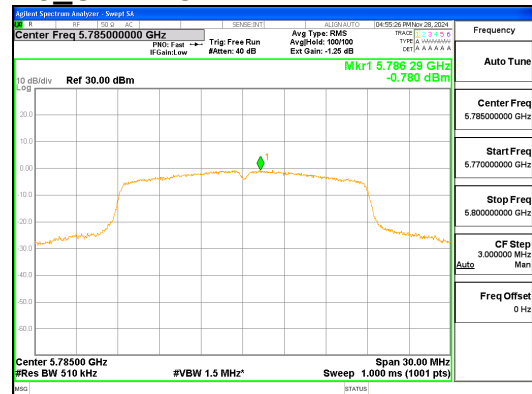
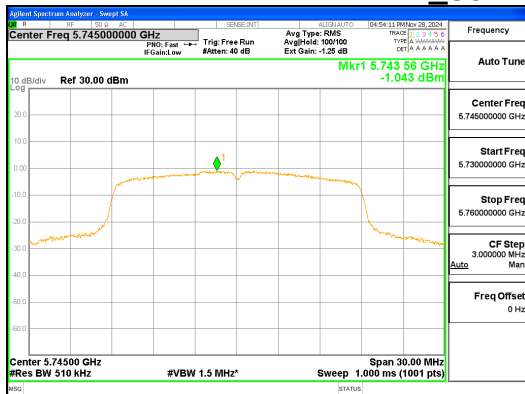


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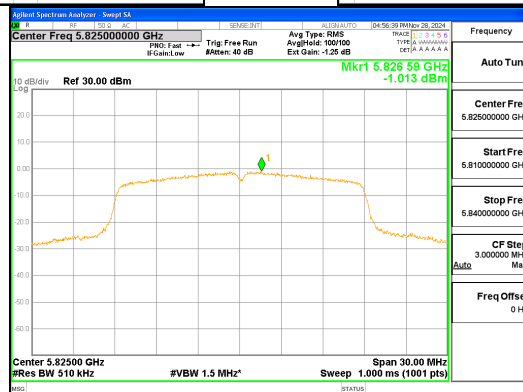
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ANT1_802.11ac_VHT20_UNII 2C



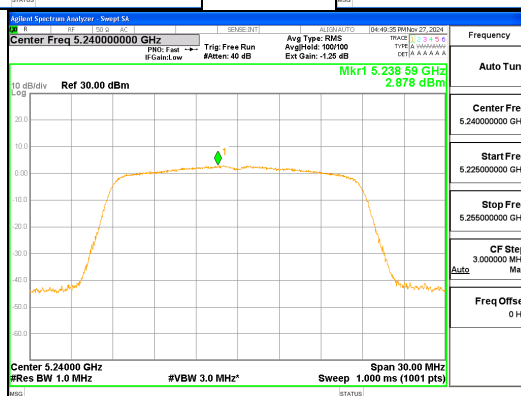
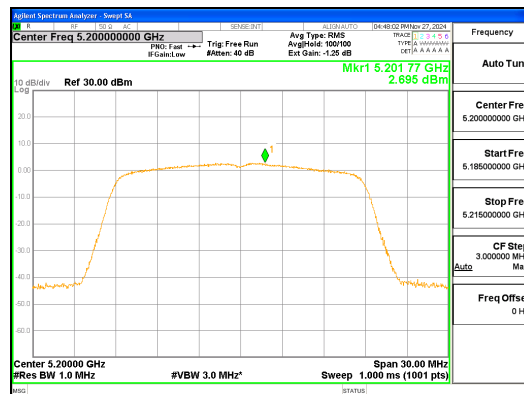
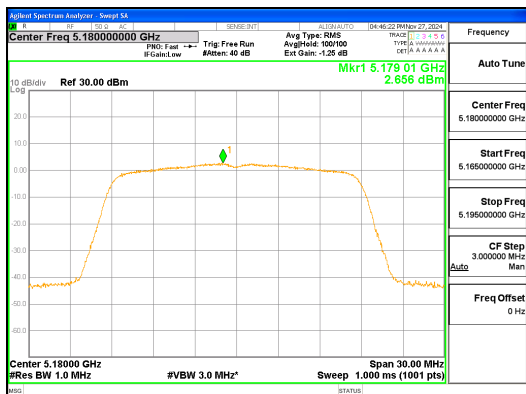
ANT1_802.11ac_VHT20_UNII 3



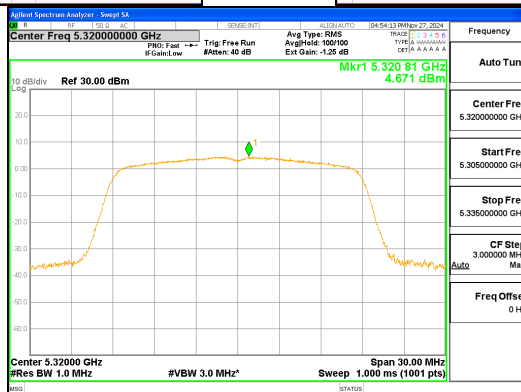
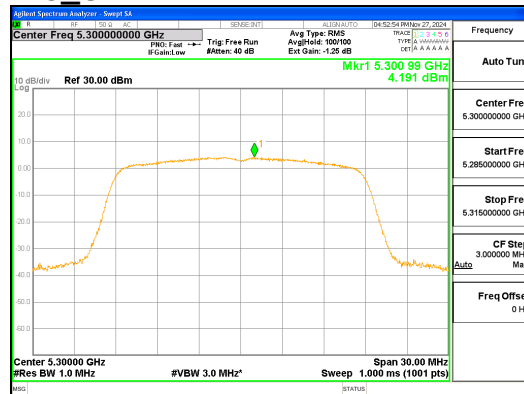
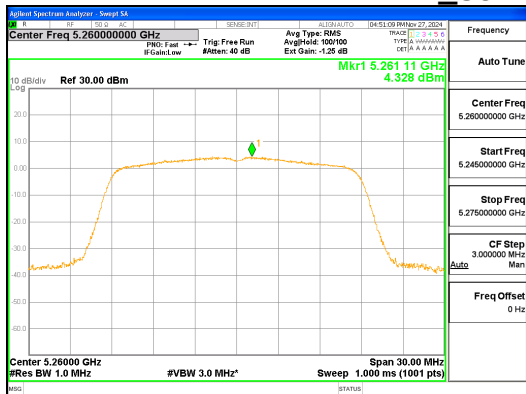


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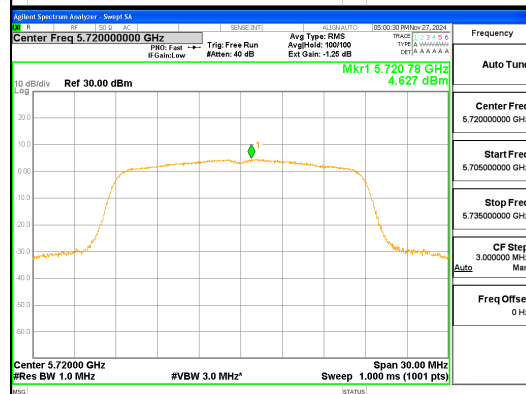
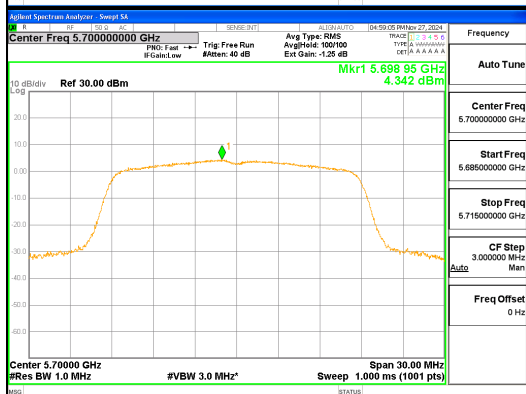
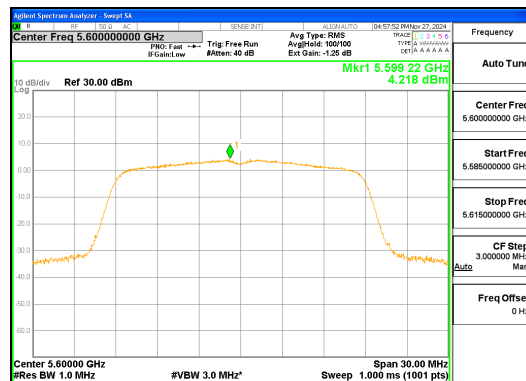
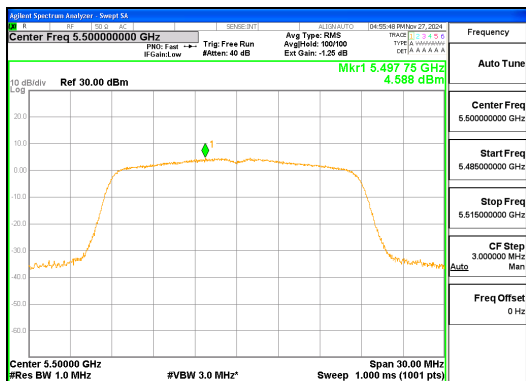


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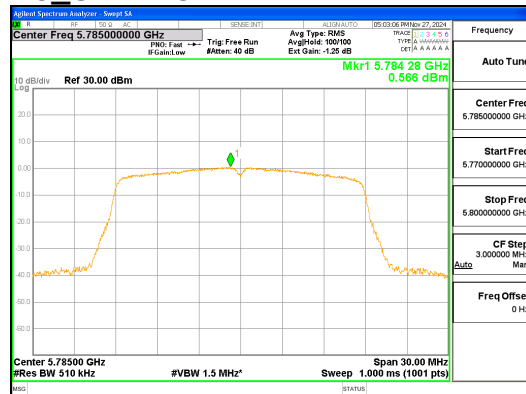
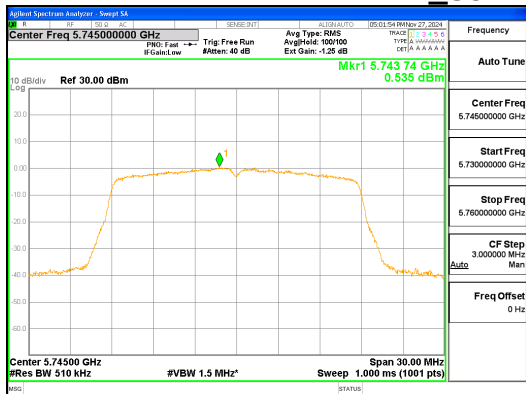


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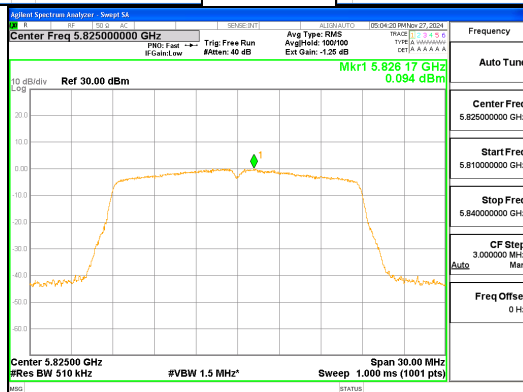
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ANT2_802.11ac_VHT20_UNII 2C



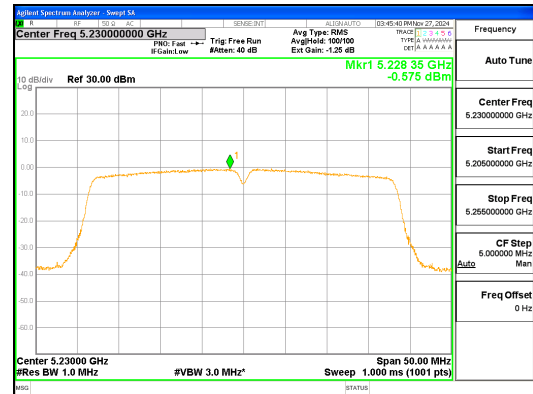
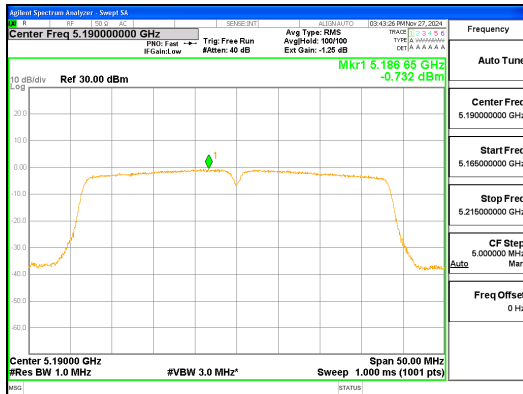
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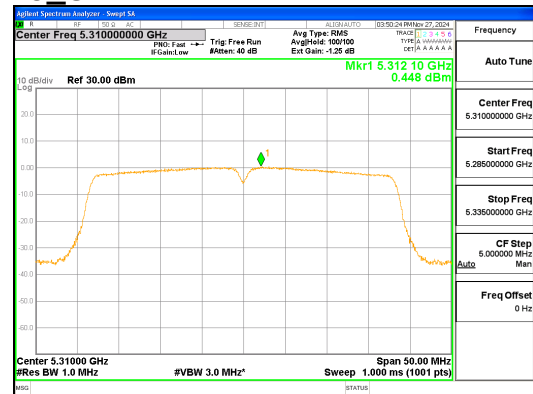
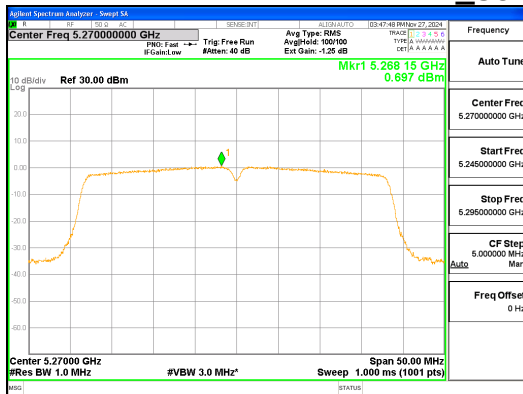


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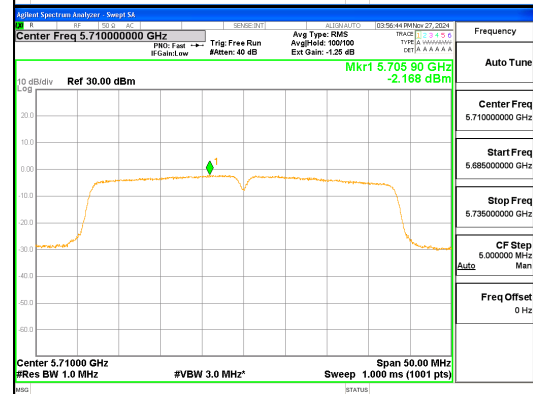
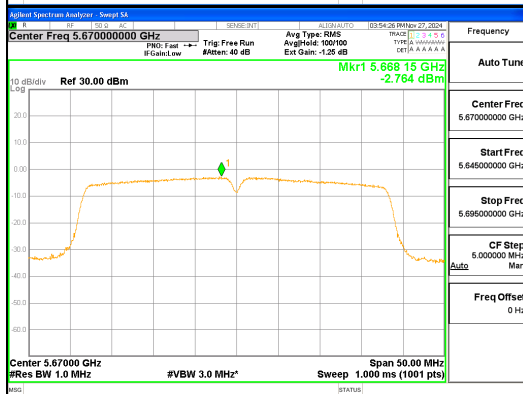
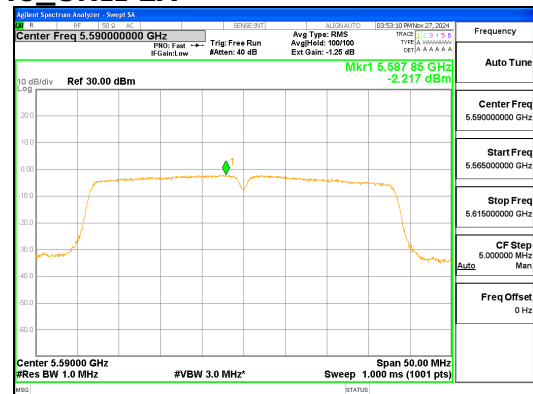
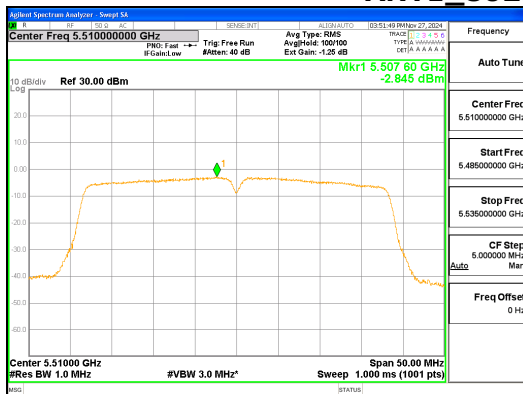
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ANT1_802.11n_HT40_UNII 1



ANT1_802.11n_HT40_UNII 2A

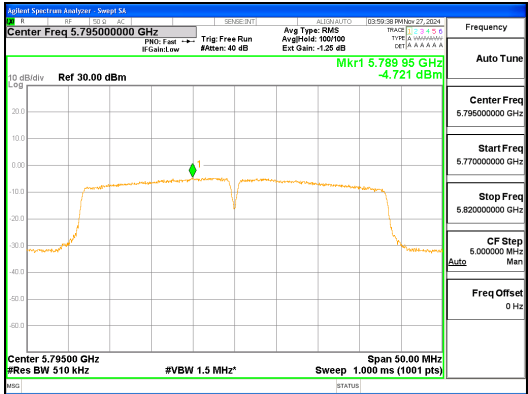
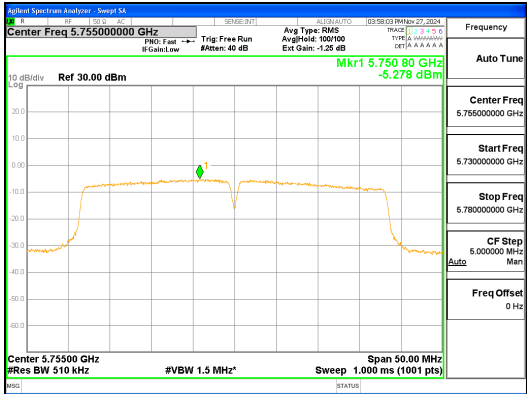


ANT1_802.11n_HT40_UNII 2C



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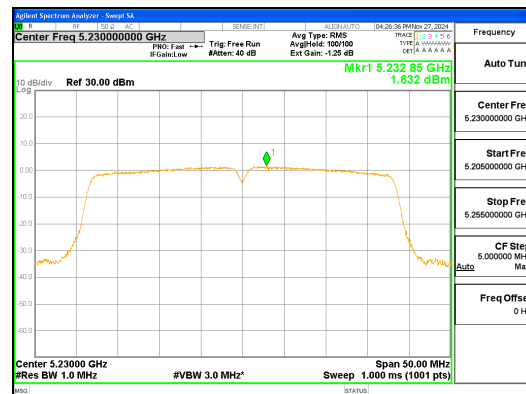
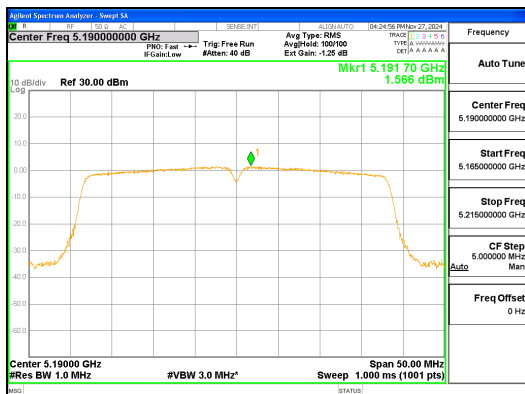


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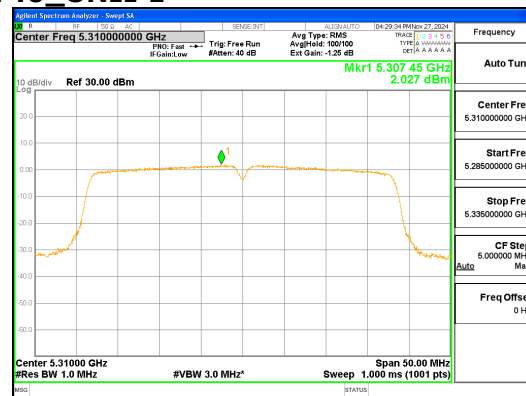
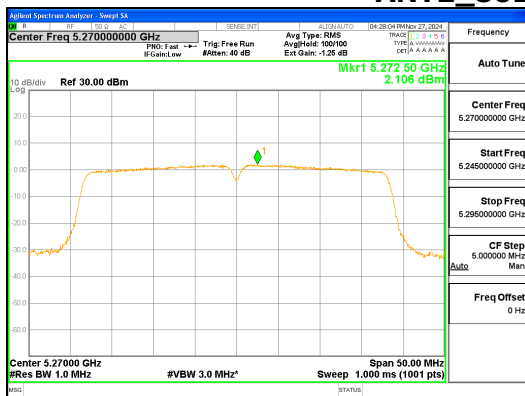


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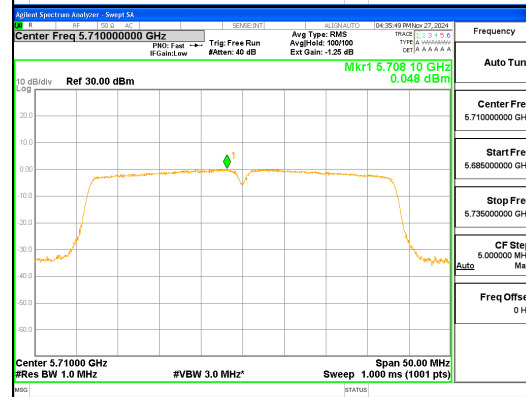
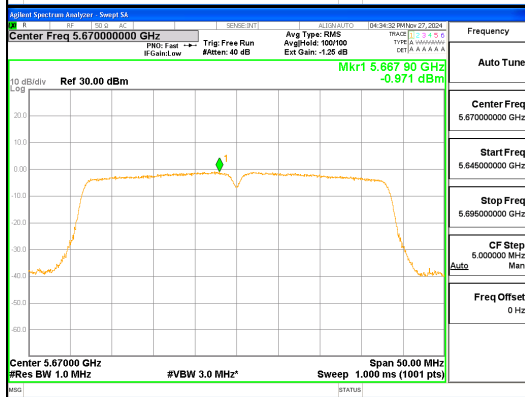
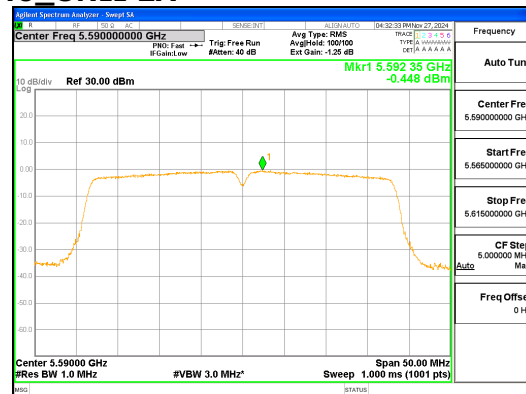
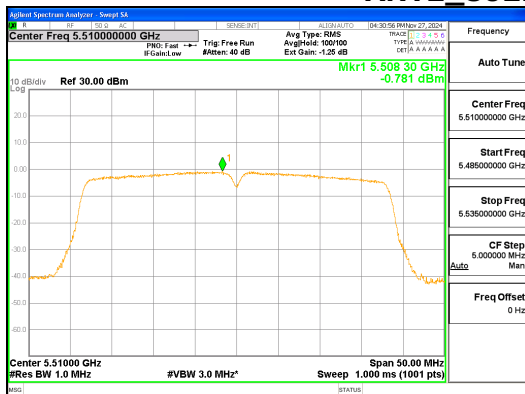
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ANT2_802.11n_HT40_UNII 1



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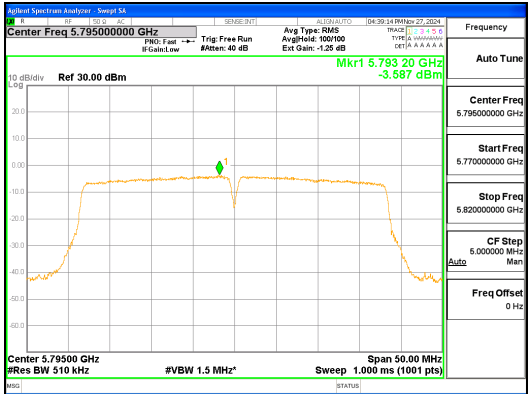
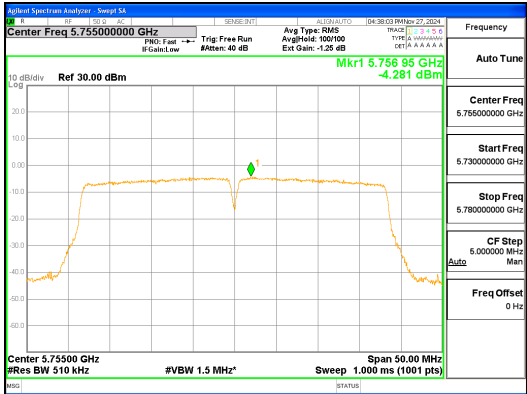


ANT2_802.11n_HT40_UNII 2C



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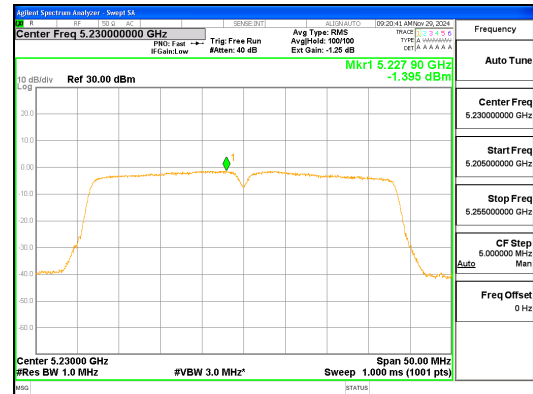
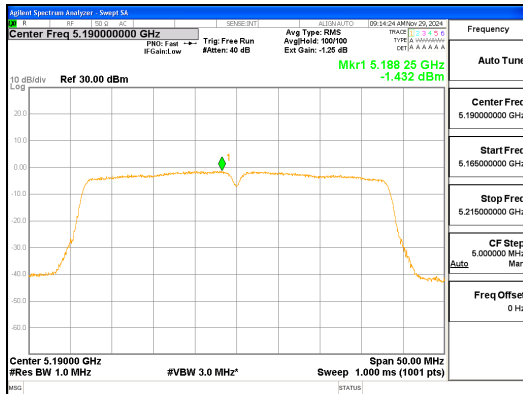


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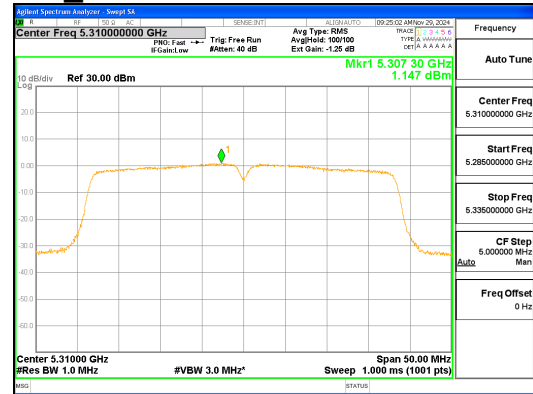
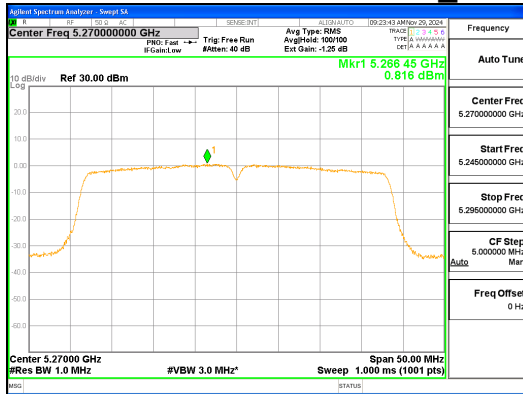


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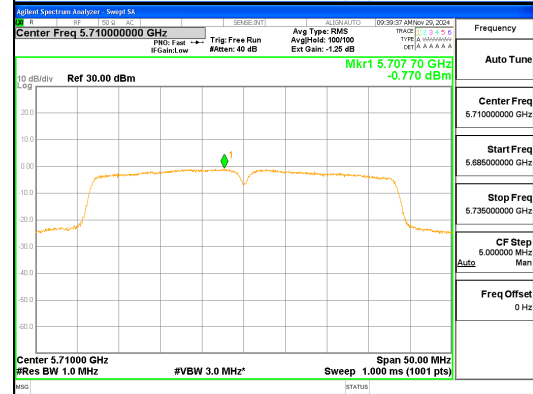
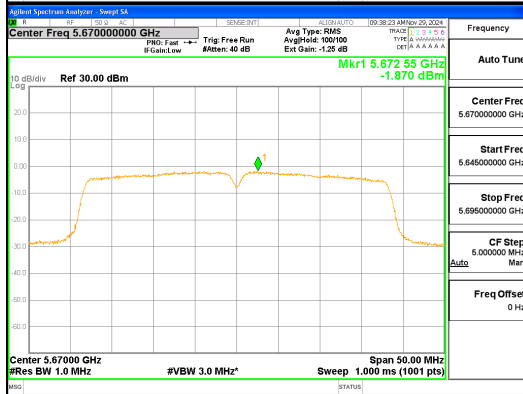
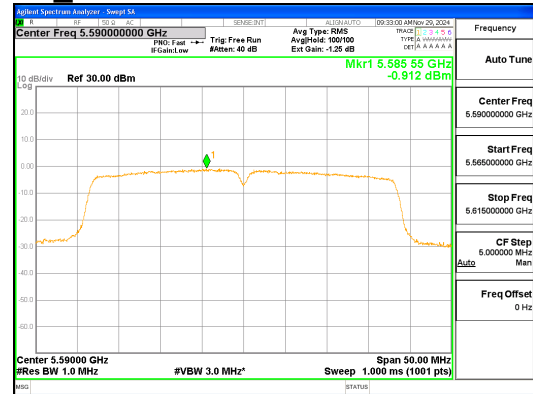
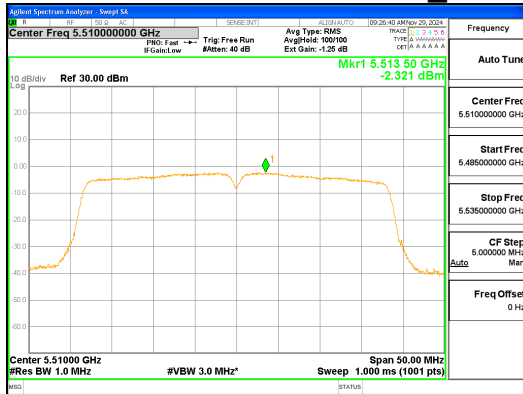
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ANT1_802.11ac_VHT40_UNII 1



ANT1_802.11ac_VHT40_UNII 2A

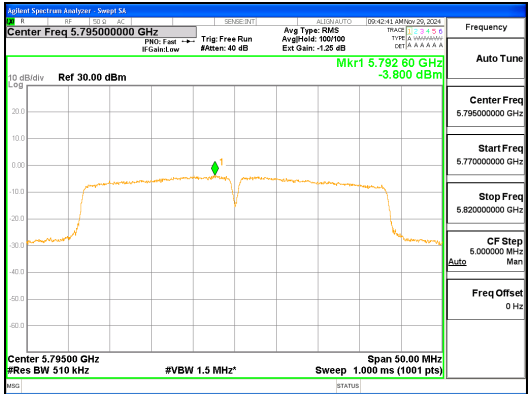
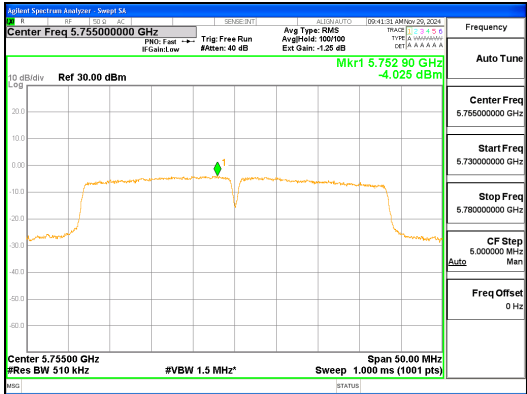


ANT1_802.11ac_VHT40_UNII 2C



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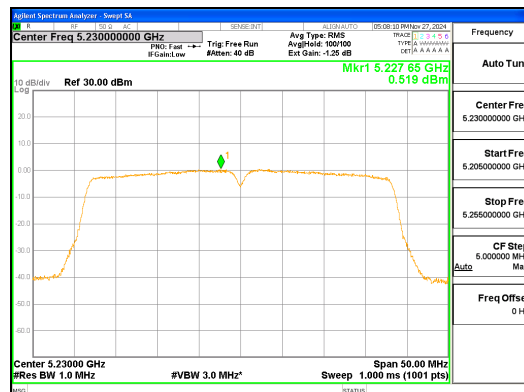
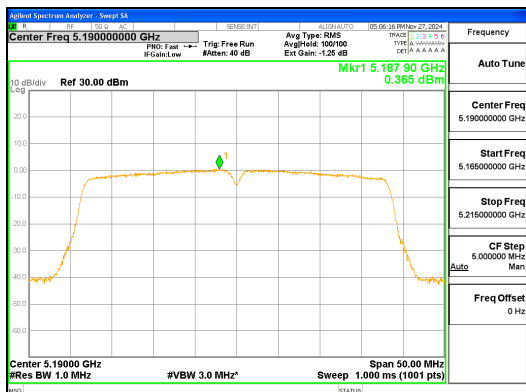


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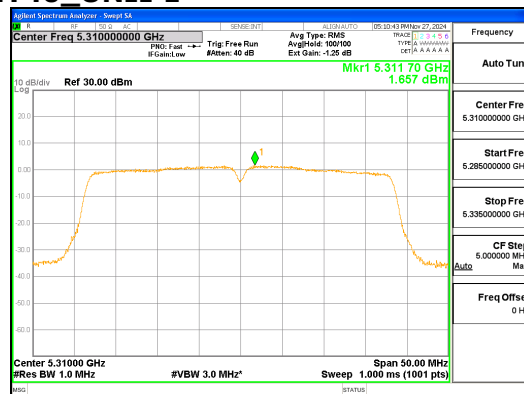
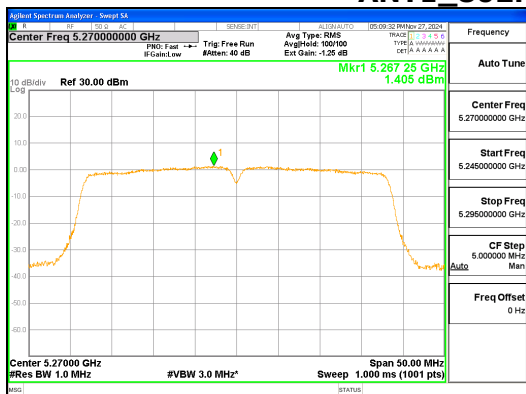


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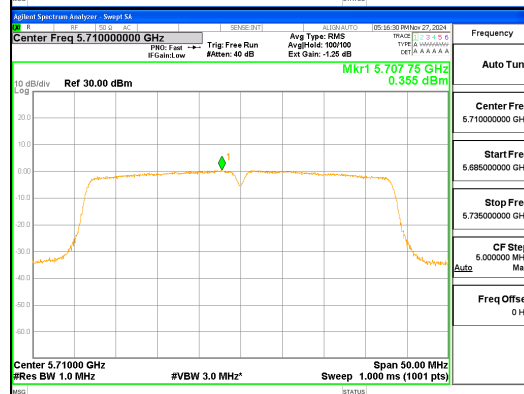
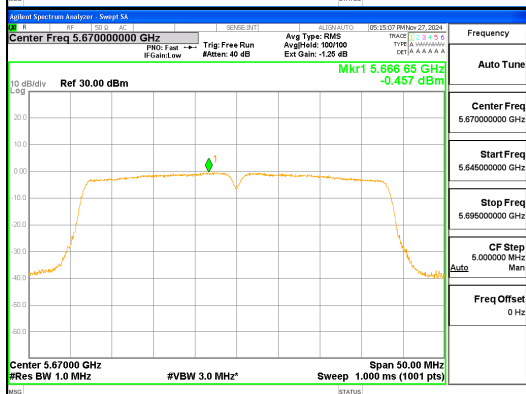
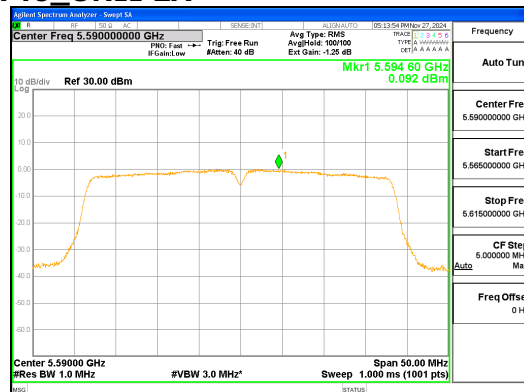
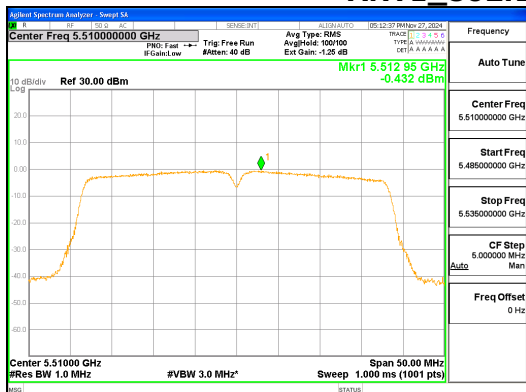
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ANT1_802.11ac_VHT40_UNII 1



ANT1_802.11ac_VHT40_UNII 2A

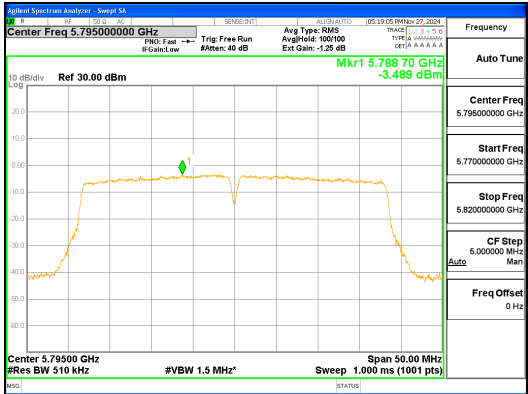
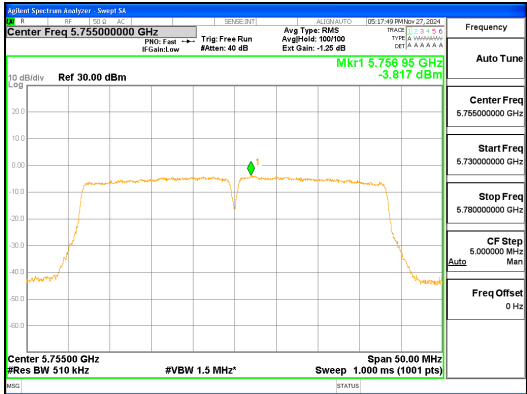


ANT1_802.11ac_VHT40_UNII 2C



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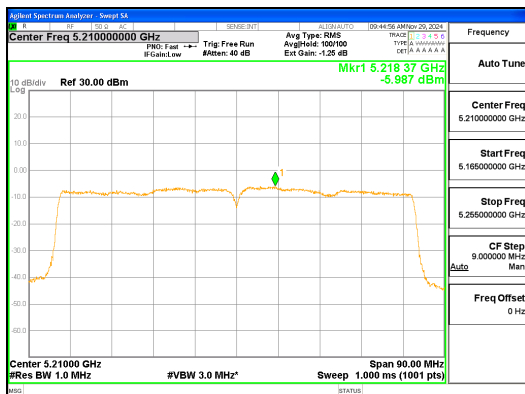


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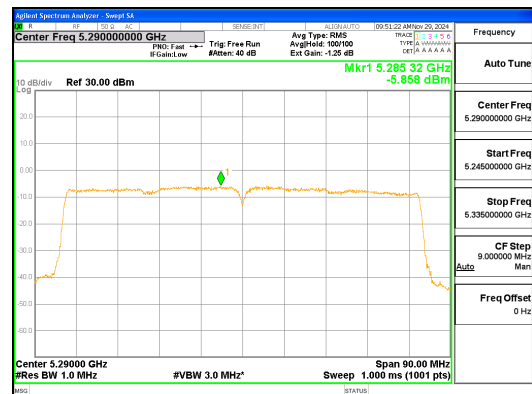


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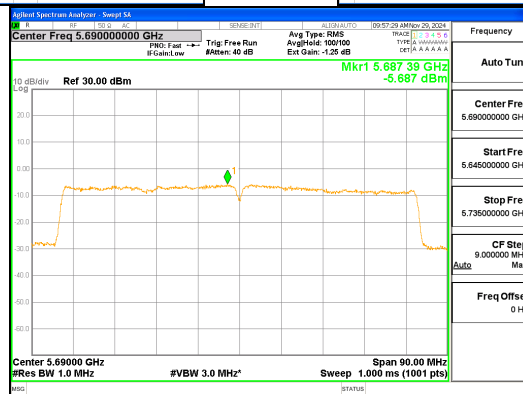
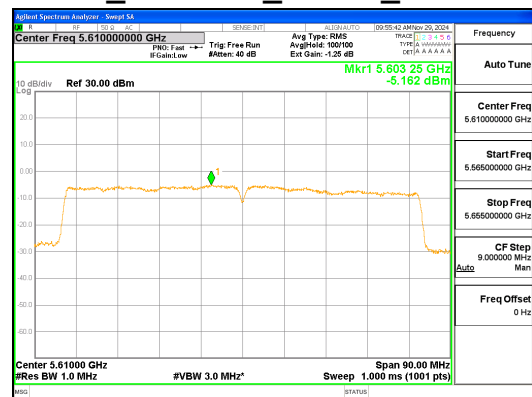
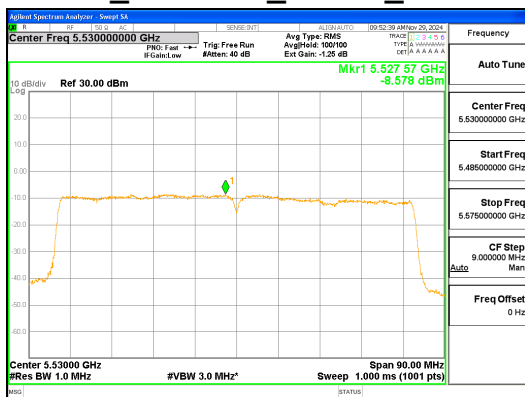
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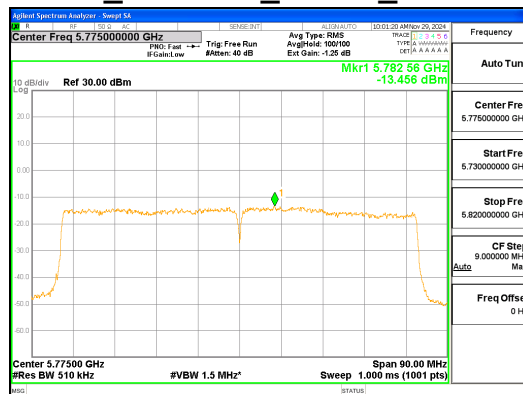
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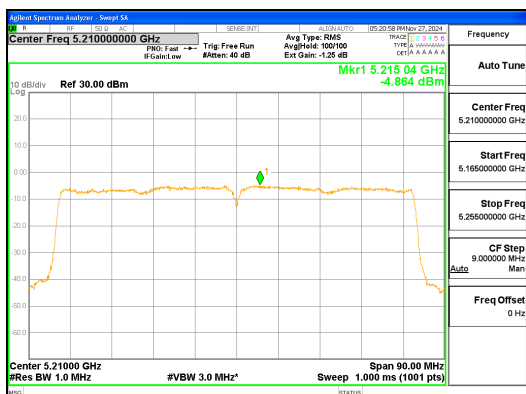


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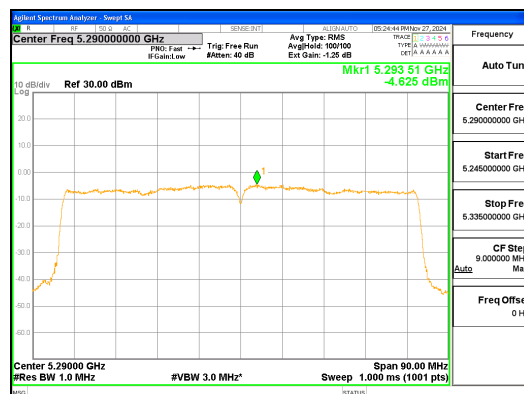


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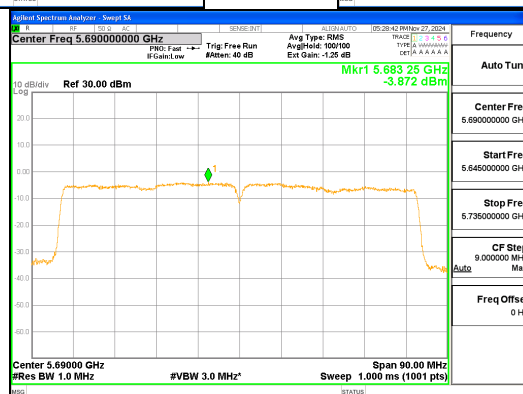
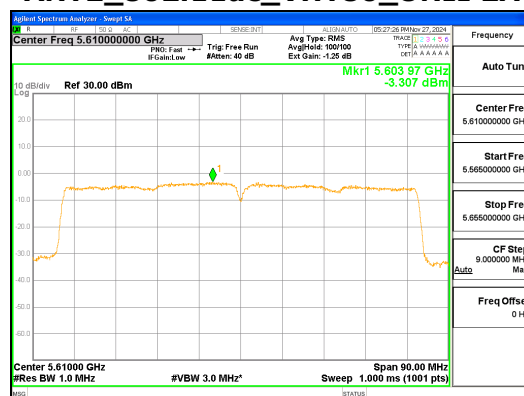
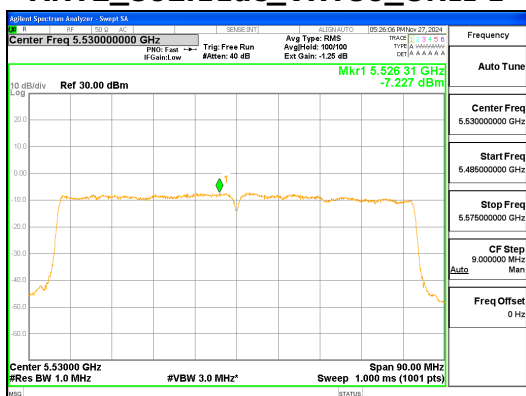
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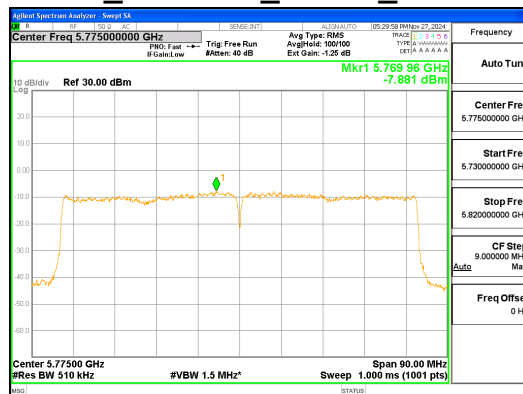
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ANT2_802.11ac_VHT80_UNII 2A



ANT2_802.11ac_VHT80_UNII 2C



ANT2_802.11ac_VHT80_UNII 3