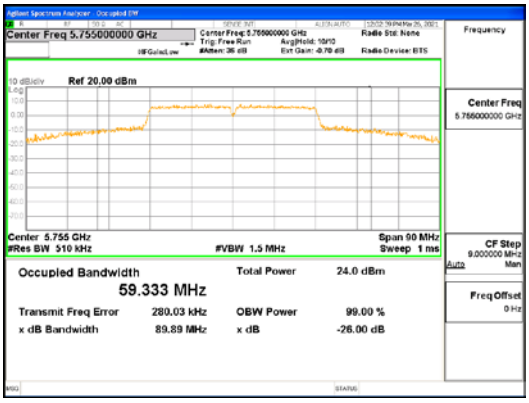
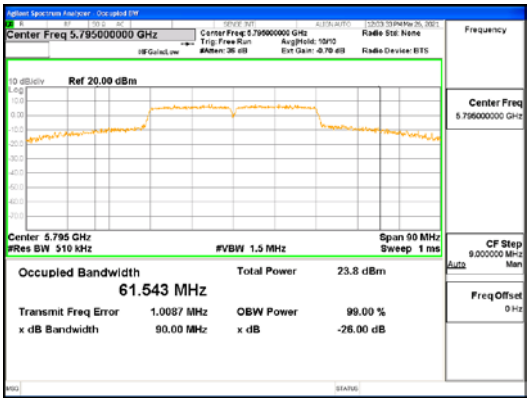
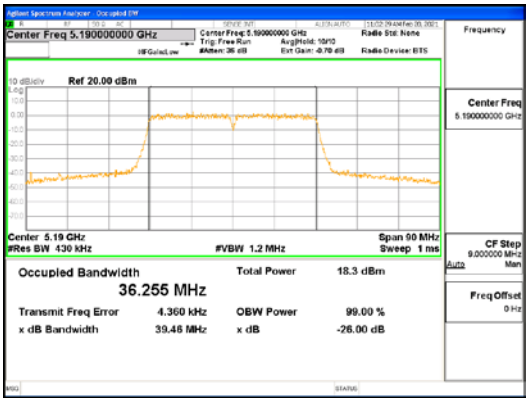
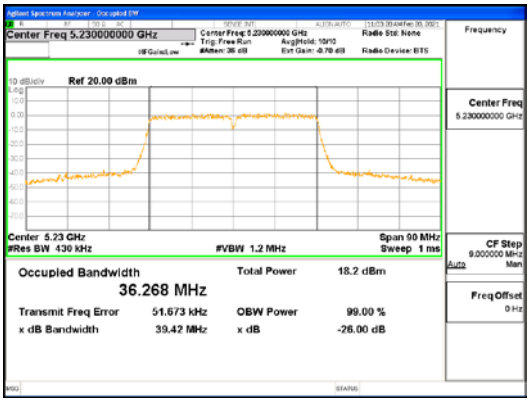




ANT1_802.11ac_VHT40_UNII 3





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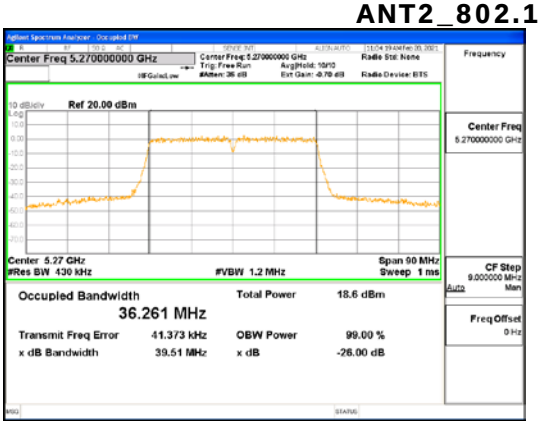

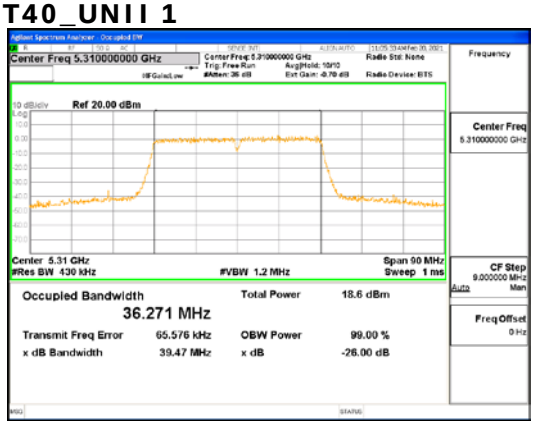

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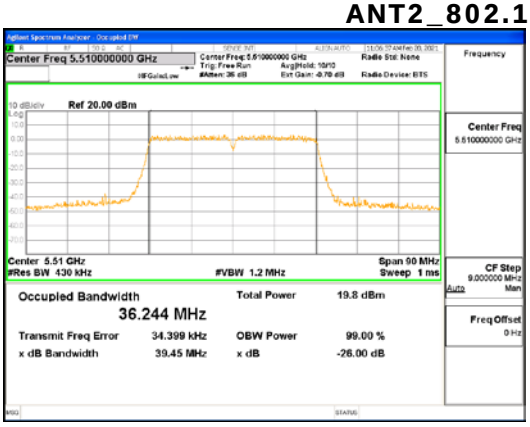

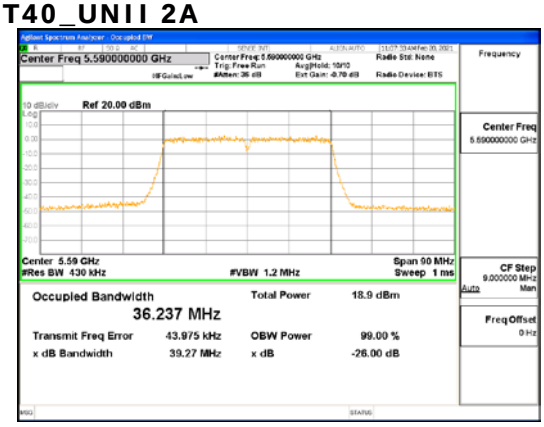

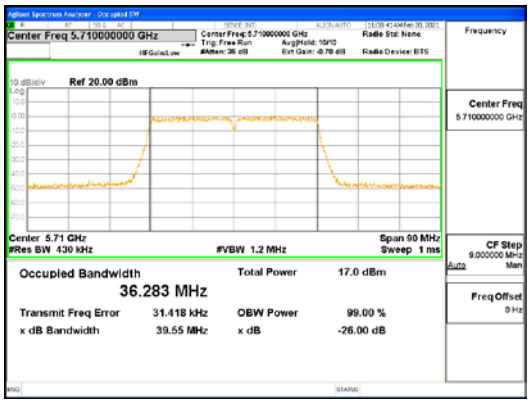

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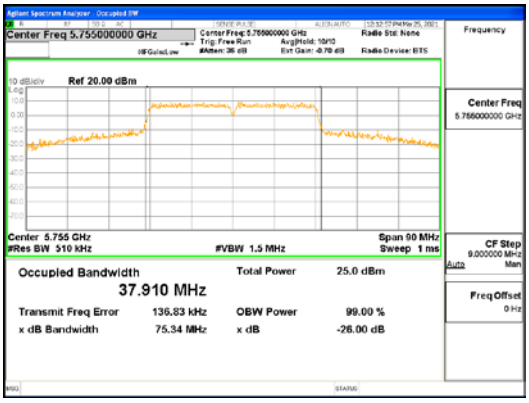

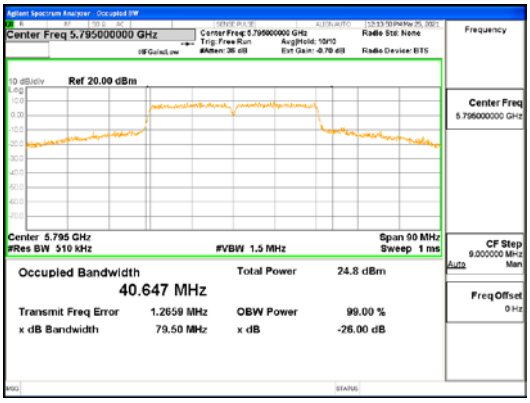

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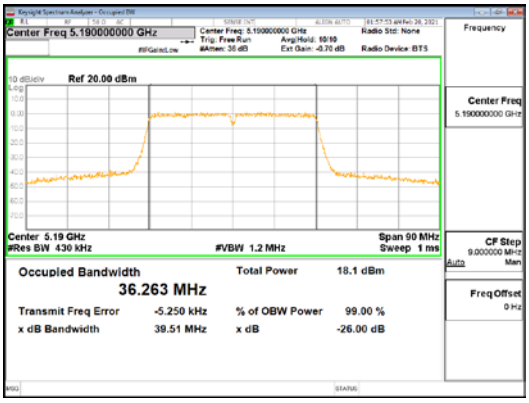

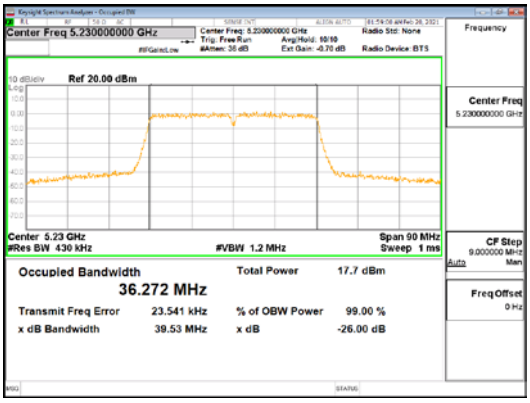

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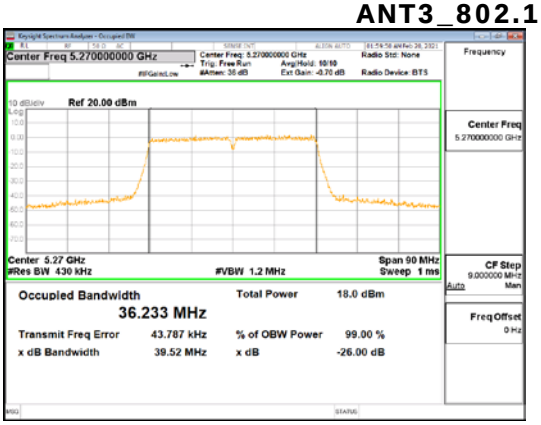
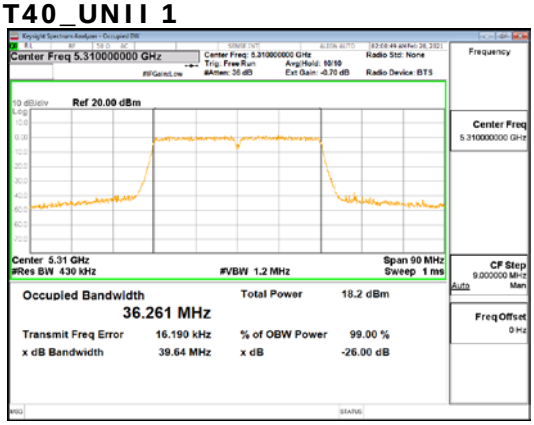
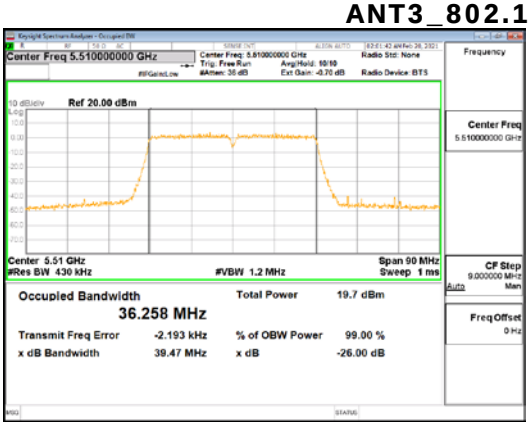
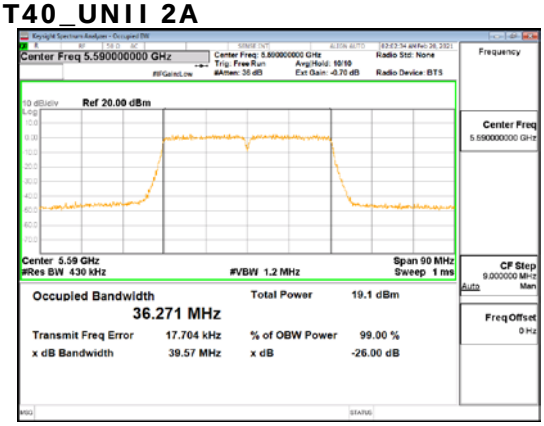
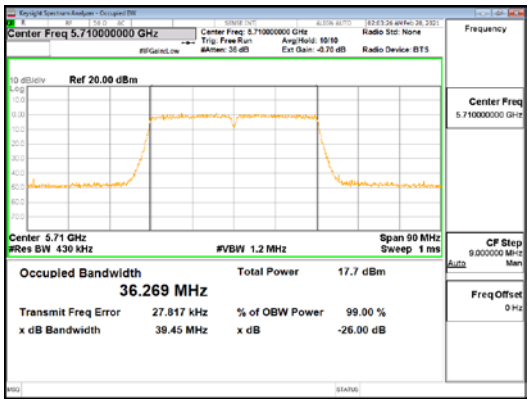




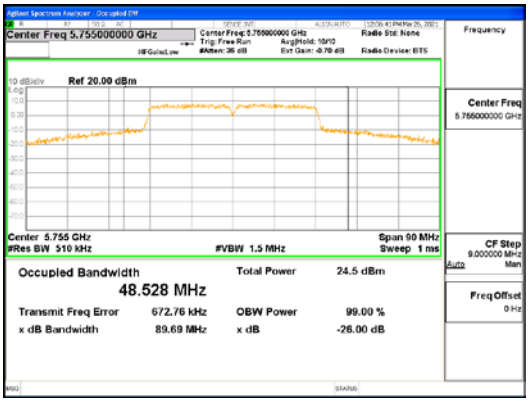
ANT3_802.11ac_VHT40_UNII 2A

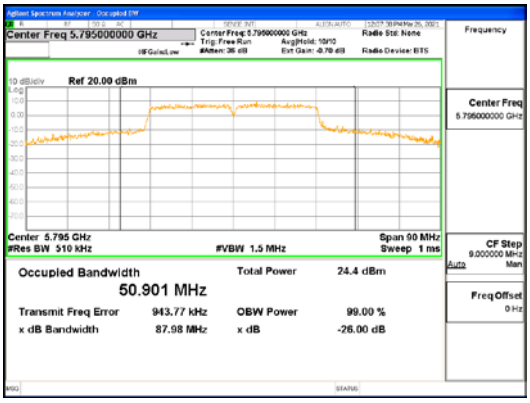






ANT3_802.11ac_VHT40_UNII 2C





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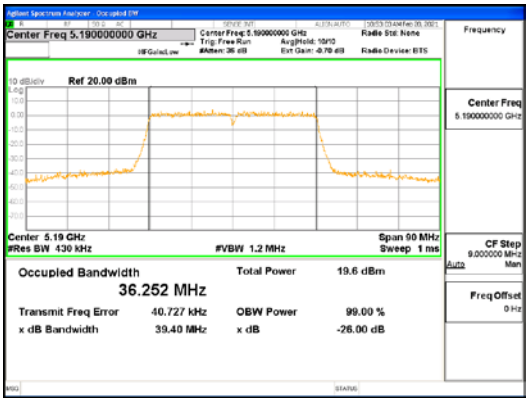

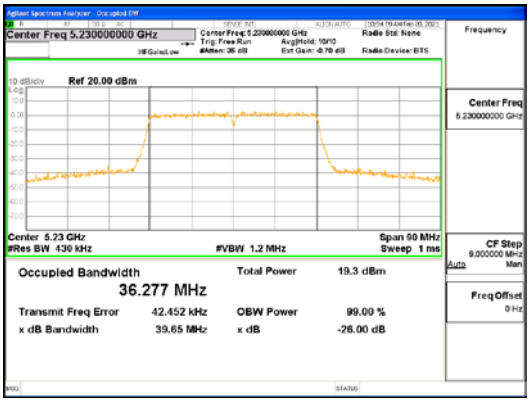

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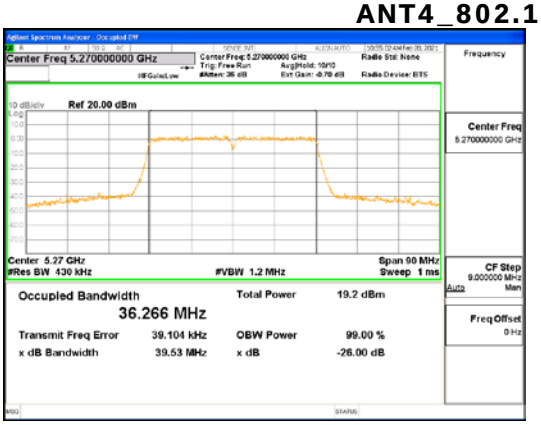
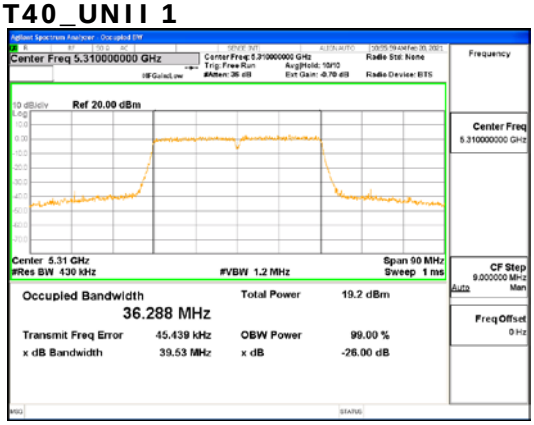
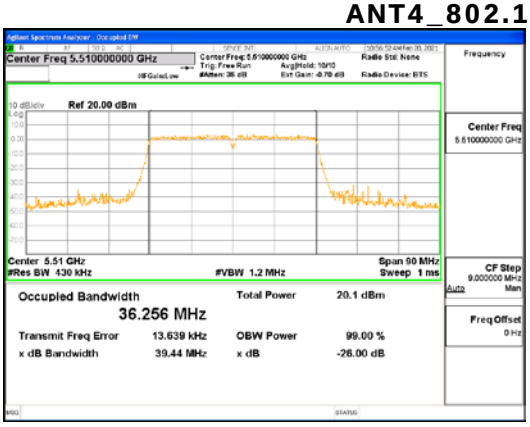
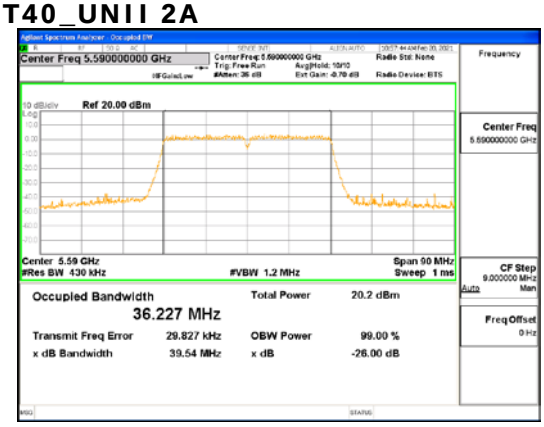
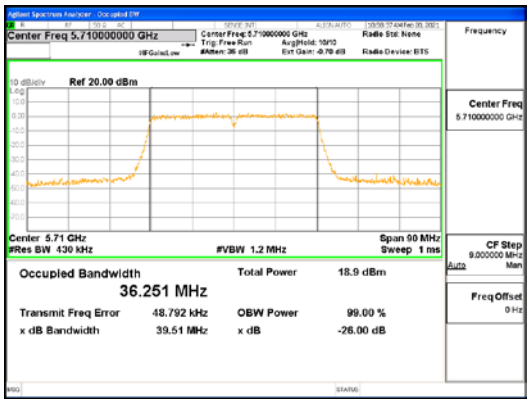




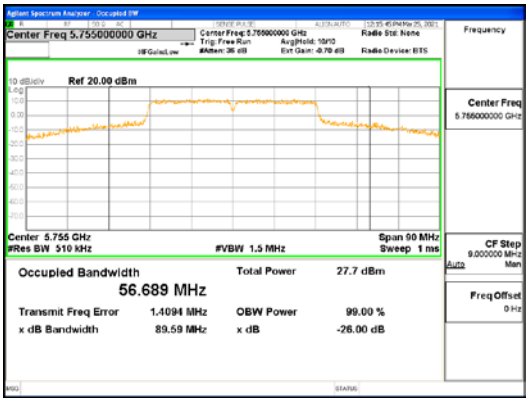
ANT4_802.11ac_VHT40_UNII 2A

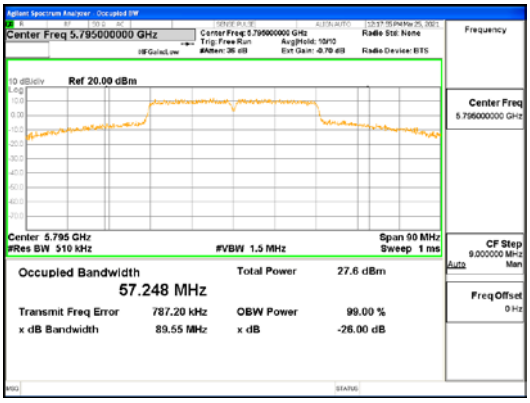






ANT4_802.11ac_VHT40_UNII 2C





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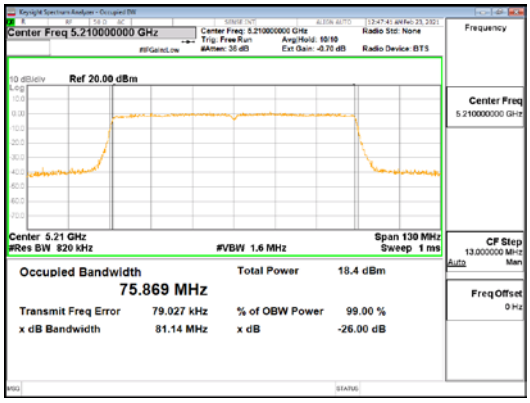

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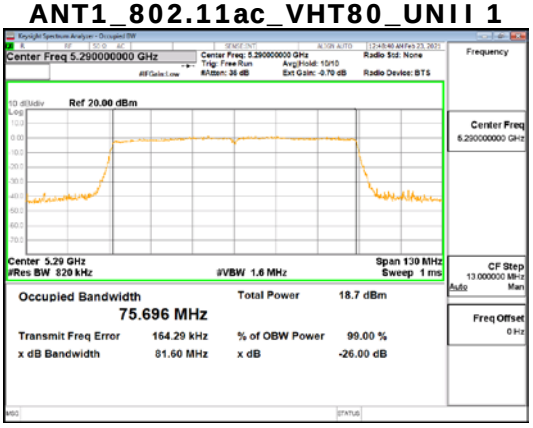

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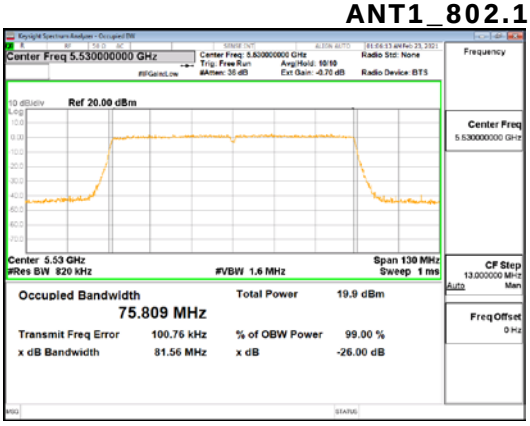
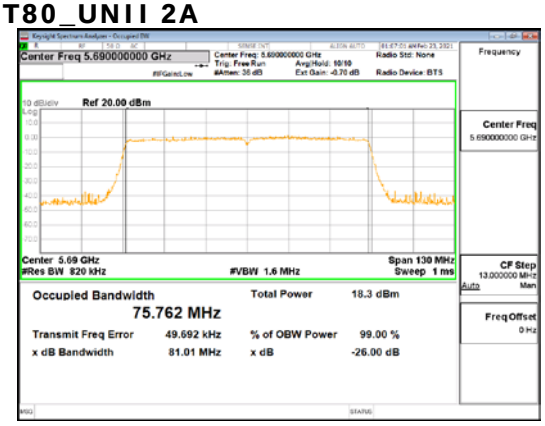
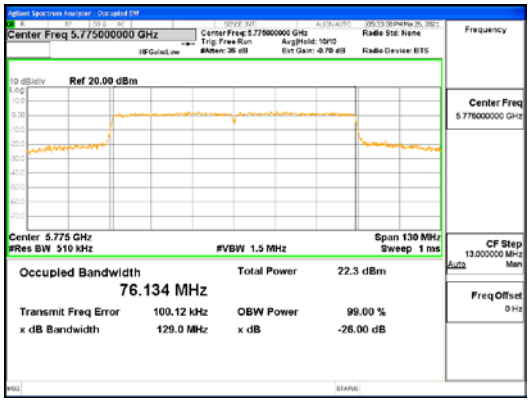
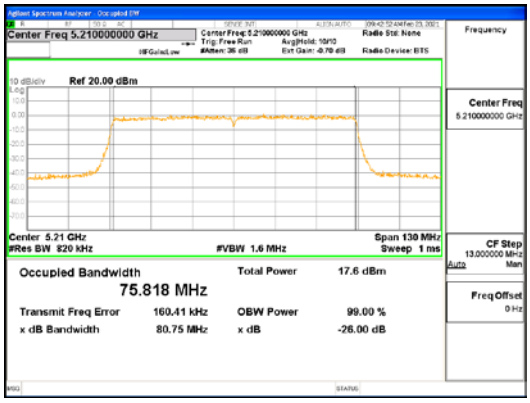




ANT1_802.11ac_VHT80_UNII 2C



ANT1_802.11ac_VHT80_UNII 3



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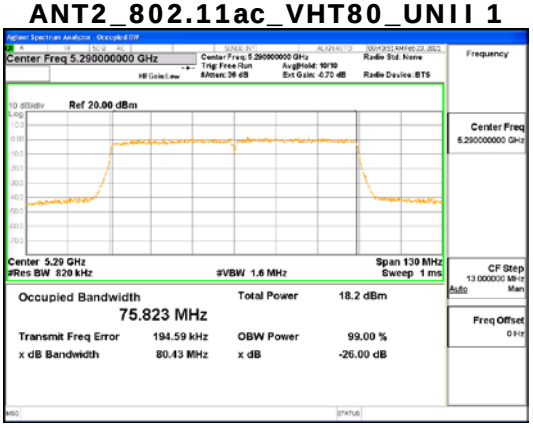
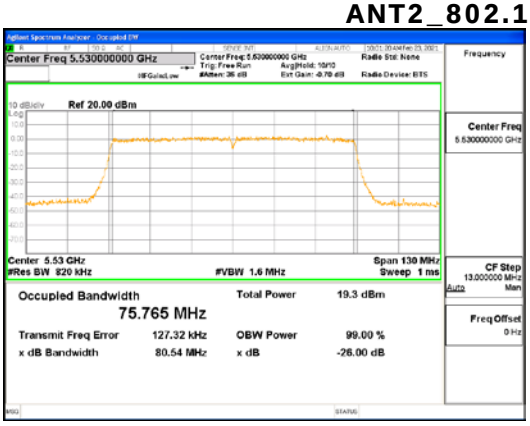
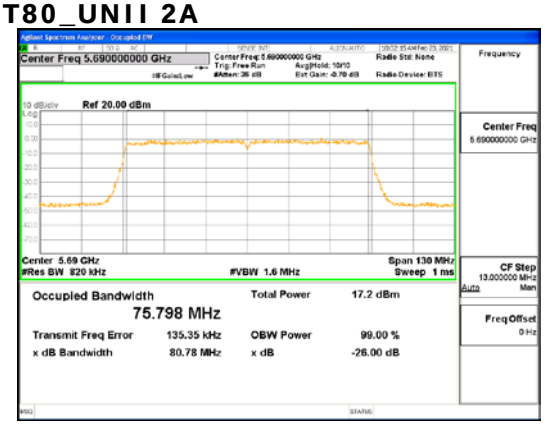
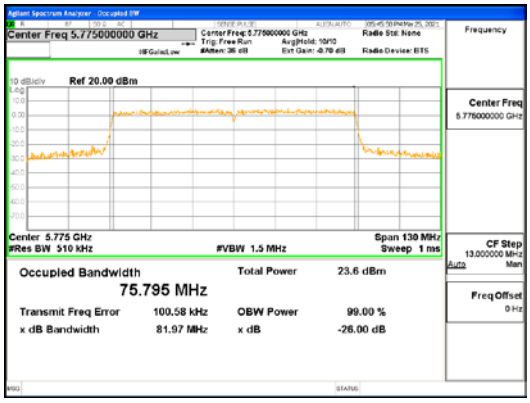


ANT2_802.11ac_VHT80_UNII 2A

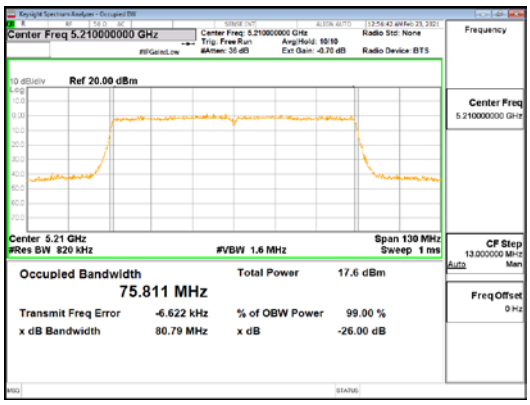




ANT2_802.11ac_VHT80_UNII 2C



ANT2_802.11ac_VHT80_UNII 3



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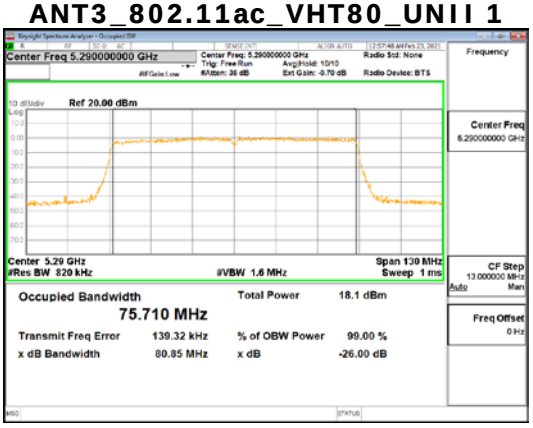

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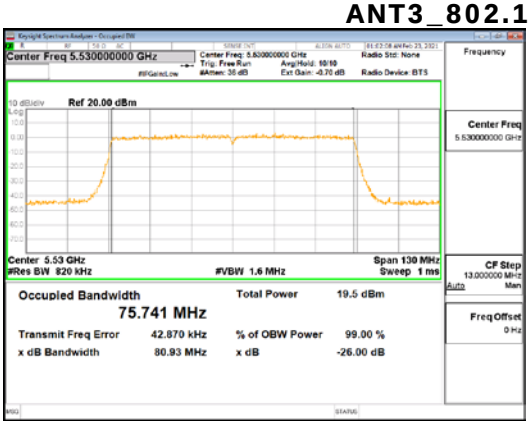

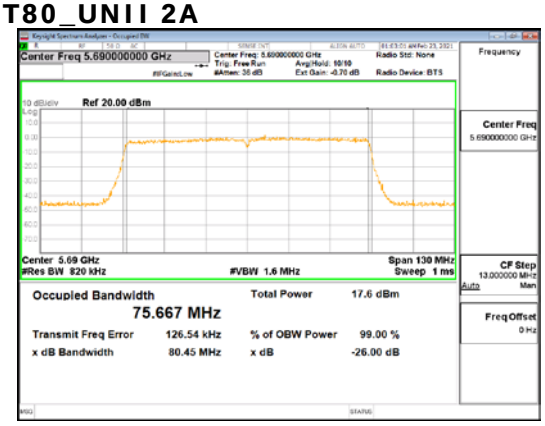

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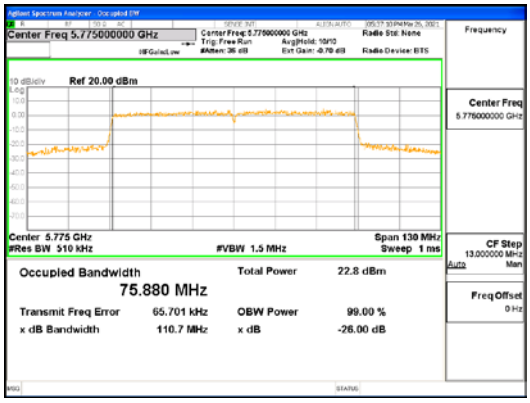
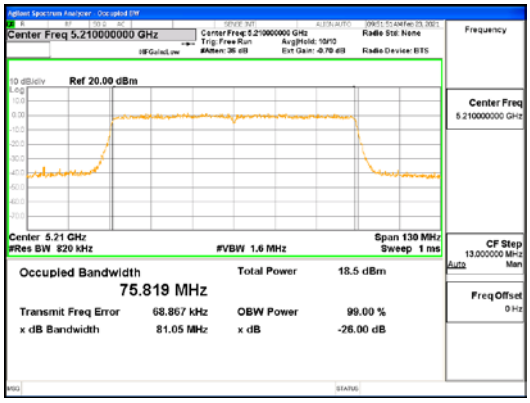


ANT3_802.11ac_VHT80_UNII 3



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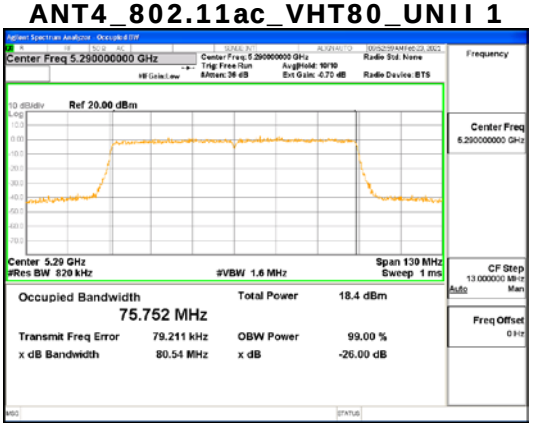
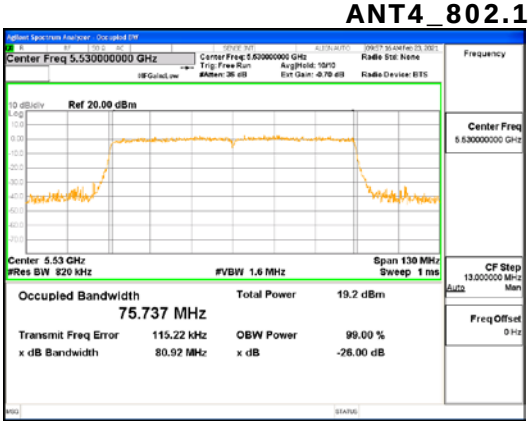
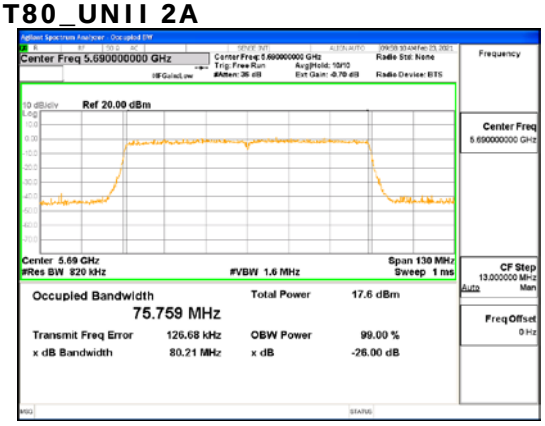
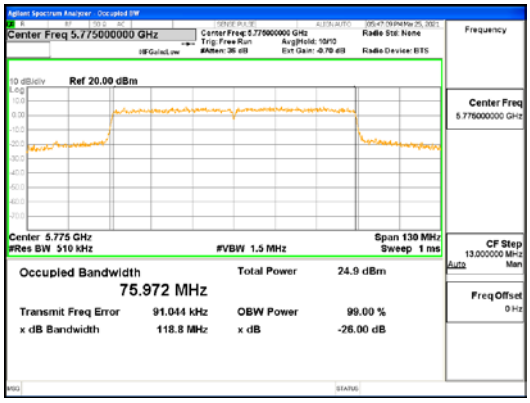


ANT4_802.11ac_VHT80_UNII 2A





ANT4_802.11ac_VHT80_UNII 2C



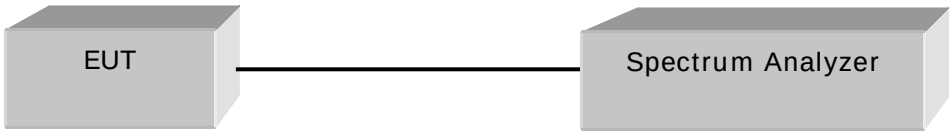
ANT4_802.11ac_VHT80_UNII 3

4.3 OUTPUT POWER

Test Procedures

KDB 789033 – Section E.2.d (Method SA-2, Maximum Conducted Output Power)
KDB 662911 D01, D02 (Multiple Transmitter Output)

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 ≥ 3 x RBW

c) Sweep time = auto

d) Detector = power averaging (rms)

e) Trace mode = Average at least 100

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

Test mode	Duty Cycle Factor (dB)
802.11a	0.21
802.11n_HT20	0.21
802.11n_HT40	0.42
802.11ac_VHT20	0.00
802.11ac_VHT40	0.11
802.11ac_VHT80	0.25

Limit

Operating Mode	ANT Configuration	ANT Gain (dBi)	Mode	Band	Limit (dBm)
SISO	ANT1, ANT3, ANT4	1.9	802.11a/n/ac	UNII 1	24.00
				UNII 2A	24.00
	ANT2	2.0		UNII 2C	24.00
				UNII 3	30.00
MIMO (4Tx)	ANT1 + ANT2 + ANT3 + ANT4	7.95	802.11a/n/ac	UNII 1	22.05
				UNII 2A	22.05
				UNII 2C	22.05
				UNII 3	28.05

Test Data

ANT1

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	11.91	0.21	12.12	24.00	11.88
	5 200	11.84	0.21	12.05	24.00	11.95
	5 240	11.53	0.21	11.74	24.00	12.26
	5 260	11.53	0.21	11.74	24.00	12.26
	5 300	11.92	0.21	12.13	24.00	11.87
	5 320	11.78	0.21	11.99	24.00	12.01
	5 500	11.90	0.21	12.11	24.00	11.89
	5 600	11.04	0.21	11.25	24.00	12.75
	5 720	9.72	0.21	9.93	24.00	14.07
	5 745	19.58	0.21	19.79	30.00	10.21
	5 785	19.20	0.21	19.41	30.00	10.59
	5 825	19.95	0.21	20.16	30.00	9.84
802.11n _HT20	5 180	12.01	0.21	12.22	24.00	11.78
	5 200	11.74	0.21	11.95	24.00	12.05
	5 240	11.54	0.21	11.75	24.00	12.25
	5 260	11.62	0.21	11.83	24.00	12.17
	5 300	11.95	0.21	12.16	24.00	11.84
	5 320	11.87	0.21	12.08	24.00	11.92
	5 500	11.91	0.21	12.12	24.00	11.88
	5 600	11.18	0.21	11.39	24.00	12.61
	5 720	11.33	0.21	11.54	24.00	12.46
	5 745	19.44	0.21	19.65	30.00	10.35
	5 785	18.98	0.21	19.19	30.00	10.81
	5 825	19.69	0.21	19.90	30.00	10.10
802.11ac _VHT20	5 180	12.04	0.00	12.04	24.00	11.96
	5 200	11.83	0.00	11.83	24.00	12.17
	5 240	11.59	0.00	11.59	24.00	12.41
	5 260	11.85	0.00	11.85	24.00	12.15
	5 300	12.00	0.00	12.00	24.00	12.00
	5 320	11.89	0.00	11.89	24.00	12.11
	5 500	12.02	0.00	12.02	24.00	11.98
	5 600	11.26	0.00	11.26	24.00	12.74
	5 720	9.82	0.00	9.82	24.00	14.18

	5 745	19.69	0.00	19.69	30.00	10.31
	5 785	19.26	0.00	19.26	30.00	10.74
	5 825	19.94	0.00	19.94	30.00	10.06
802.11n _HT40	5 190	12.56	0.42	12.98	24.00	11.02
	5 230	12.26	0.42	12.68	24.00	11.32
	5 270	12.68	0.42	13.10	24.00	10.90
	5 310	12.55	0.42	12.97	24.00	11.03
	5 510	14.19	0.42	14.61	24.00	9.39
	5 590	13.57	0.42	13.99	24.00	10.01
	5 710	12.06	0.42	12.48	24.00	11.52
	5 755	18.11	0.42	18.53	30.00	11.47
	5 795	17.79	0.42	18.21	30.00	11.79
802.11ac _VHT40	5 190	12.86	0.11	12.97	24.00	11.03
	5 230	12.42	0.11	12.53	24.00	11.47
	5 270	12.88	0.11	12.99	24.00	11.01
	5 310	12.98	0.11	13.09	24.00	10.91
	5 510	14.45	0.11	14.56	24.00	9.44
	5 590	13.77	0.11	13.88	24.00	10.12
	5 710	12.45	0.11	12.56	24.00	11.44
	5 755	17.78	0.11	17.89	30.00	12.11
	5 795	17.62	0.11	17.73	30.00	12.27
802.11ac _VHT80	5 210	12.76	0.25	13.01	24.00	10.99
	5 290	13.09	0.25	13.34	24.00	10.66
	5 530	14.43	0.25	14.68	24.00	9.32
	5 690	12.67	0.25	12.92	24.00	11.08
	5 775	16.23	0.25	16.48	30.00	13.52
Measurement uncertainty	± 1.5 dB					

ANT2

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	10.69	0.21	10.90	24.00	13.10
	5 200	10.47	0.21	10.68	24.00	13.32
	5 240	10.56	0.21	10.77	24.00	13.23
	5 260	10.68	0.21	10.89	24.00	13.11
	5 300	10.76	0.21	10.97	24.00	13.03
	5 320	11.11	0.21	11.32	24.00	12.68
	5 500	10.49	0.21	10.70	24.00	13.30
	5 600	9.31	0.21	9.52	24.00	14.48
	5 720	7.63	0.21	7.84	24.00	16.16
	5 745	18.60	0.21	18.81	30.00	11.19
	5 785	18.04	0.21	18.25	30.00	11.75
	5 825	17.65	0.21	17.86	30.00	12.14
802.11n _HT20	5 180	10.76	0.21	10.97	24.00	13.03
	5 200	10.60	0.21	10.81	24.00	13.19
	5 240	10.79	0.21	11.00	24.00	13.00
	5 260	10.93	0.21	11.14	24.00	12.86
	5 300	10.83	0.21	11.04	24.00	12.96
	5 320	11.22	0.21	11.43	24.00	12.57
	5 500	10.59	0.21	10.80	24.00	13.20
	5 600	9.57	0.21	9.78	24.00	14.22
	5 720	9.57	0.21	9.78	24.00	14.22
	5 745	18.33	0.21	18.54	30.00	11.46
	5 785	17.98	0.21	18.19	30.00	11.81
	5 825	17.45	0.21	17.66	30.00	12.34
802.11ac _VHT20	5 180	10.93	0.00	10.93	24.00	13.07
	5 200	10.62	0.00	10.62	24.00	13.38
	5 240	10.78	0.00	10.78	24.00	13.22
	5 260	10.93	0.00	10.93	24.00	13.07
	5 300	10.88	0.00	10.88	24.00	13.12
	5 320	11.27	0.00	11.27	24.00	12.73
	5 500	10.63	0.00	10.63	24.00	13.37
	5 600	9.33	0.00	9.33	24.00	14.67
	5 720	7.86	0.00	7.86	24.00	16.14
	5 745	18.44	0.00	18.44	30.00	11.56

	5 785	18.13	0.00	18.13	30.00	11.87
	5 825	17.58	0.00	17.58	30.00	12.42
802.11n _HT40	5 190	10.88	0.42	11.30	24.00	12.70
	5 230	10.98	0.42	11.40	24.00	12.60
	5 270	11.20	0.42	11.62	24.00	12.38
	5 310	11.37	0.42	11.79	24.00	12.21
	5 510	12.55	0.42	12.97	24.00	11.03
	5 590	11.63	0.42	12.05	24.00	11.95
	5 710	9.87	0.42	10.29	24.00	13.71
	5 755	19.10	0.42	19.52	30.00	10.48
	5 795	19.18	0.42	19.60	30.00	10.40
802.11ac _VHT40	5 190	11.66	0.11	11.77	24.00	12.23
	5 230	11.60	0.11	11.71	24.00	12.29
	5 270	11.83	0.11	11.94	24.00	12.06
	5 310	12.06	0.11	12.17	24.00	11.83
	5 510	13.07	0.11	13.18	24.00	10.82
	5 590	12.29	0.11	12.40	24.00	11.60
	5 710	10.35	0.11	10.46	24.00	13.54
	5 755	18.23	0.11	18.34	30.00	11.66
	5 795	18.15	0.11	18.26	30.00	11.74
802.11ac _VHT80	5 210	11.22	0.25	11.47	24.00	12.53
	5 290	11.73	0.25	11.98	24.00	12.02
	5 530	12.90	0.25	13.15	24.00	10.85
	5 690	10.86	0.25	11.11	24.00	12.89
	5 775	16.81	0.25	17.06	30.00	12.94
Measurement uncertainty		± 1.5 dB				

ANT3

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	10.49	0.21	10.70	24.00	13.30
	5 200	10.42	0.21	10.63	24.00	13.37
	5 240	10.15	0.21	10.36	24.00	13.64
	5 260	10.26	0.21	10.47	24.00	13.53
	5 300	10.72	0.21	10.93	24.00	13.07
	5 320	10.54	0.21	10.75	24.00	13.25
	5 500	10.72	0.21	10.93	24.00	13.07
	5 600	9.78	0.21	9.99	24.00	14.01
	5 720	8.60	0.21	8.81	24.00	15.19
	5 745	18.94	0.21	19.15	30.00	10.85
	5 785	18.57	0.21	18.78	30.00	11.22
	5 825	19.26	0.21	19.47	30.00	10.53
802.11n _HT20	5 180	10.59	0.21	10.80	24.00	13.20
	5 200	10.45	0.21	10.66	24.00	13.34
	5 240	10.21	0.21	10.42	24.00	13.58
	5 260	10.25	0.21	10.46	24.00	13.54
	5 300	10.69	0.21	10.90	24.00	13.10
	5 320	10.59	0.21	10.80	24.00	13.20
	5 500	10.71	0.21	10.92	24.00	13.08
	5 600	9.94	0.21	10.15	24.00	13.85
	5 720	8.53	0.21	8.74	24.00	15.26
	5 745	18.82	0.21	19.03	30.00	10.97
	5 785	18.58	0.21	18.79	30.00	11.21
	5 825	19.25	0.21	19.46	30.00	10.54
802.11ac _VHT20	5 180	10.69	0.00	10.69	24.00	13.31
	5 200	10.49	0.00	10.49	24.00	13.51
	5 240	10.26	0.00	10.26	24.00	13.74
	5 260	10.36	0.00	10.36	24.00	13.64
	5 300	10.79	0.00	10.79	24.00	13.21
	5 320	10.61	0.00	10.61	24.00	13.39
	5 500	10.88	0.00	10.88	24.00	13.12
	5 600	9.83	0.00	9.83	24.00	14.17
	5 720	8.34	0.00	8.34	24.00	15.66
	5 745	18.42	0.00	18.42	30.00	11.58

	5 785	18.11	0.00	18.11	30.00	11.89
	5 825	18.33	0.00	18.33	30.00	11.67
802.11n _HT40	5 190	11.03	0.42	11.45	24.00	12.55
	5 230	10.80	0.42	11.22	24.00	12.78
	5 270	11.19	0.42	11.61	24.00	12.39
	5 310	11.25	0.42	11.67	24.00	12.33
	5 510	12.62	0.42	13.04	24.00	10.96
	5 590	12.06	0.42	12.48	24.00	11.52
	5 710	10.81	0.42	11.23	24.00	12.77
	5 755	18.31	0.42	18.73	30.00	11.27
	5 795	18.34	0.42	18.76	30.00	11.24
802.11ac _VHT40	5 190	11.55	0.11	11.66	24.00	12.34
	5 230	11.15	0.11	11.26	24.00	12.74
	5 270	11.56	0.11	11.67	24.00	12.33
	5 310	11.53	0.11	11.64	24.00	12.36
	5 510	13.06	0.11	13.17	24.00	10.83
	5 590	12.51	0.11	12.62	24.00	11.38
	5 710	11.21	0.11	11.32	24.00	12.68
	5 755	18.06	0.11	18.17	30.00	11.83
	5 795	17.99	0.11	18.10	30.00	11.90
802.11ac _VHT80	5 210	11.41	0.25	11.66	24.00	12.34
	5 290	11.97	0.25	12.22	24.00	11.78
	5 530	13.28	0.25	13.53	24.00	10.47
	5 690	11.33	0.25	11.58	24.00	12.42
	5 775	16.28	0.25	16.53	30.00	13.47
Measurement uncertainty		± 1.5 dB				

ANT4

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	12.06	0.21	12.27	24.00	11.73
	5 200	11.76	0.21	11.97	24.00	12.03
	5 240	11.66	0.21	11.87	24.00	12.13
	5 260	11.75	0.21	11.96	24.00	12.04
	5 300	11.36	0.21	11.57	24.00	12.43
	5 320	11.75	0.21	11.96	24.00	12.04
	5 500	10.85	0.21	11.06	24.00	12.94
	5 600	10.84	0.21	11.05	24.00	12.95
	5 720	9.61	0.21	9.82	24.00	14.18
	5 745	20.99	0.21	21.20	30.00	8.80
	5 785	20.20	0.21	20.41	30.00	9.59
	5 825	19.83	0.21	20.04	30.00	9.96
802.11n _HT20	5 180	12.12	0.21	12.33	24.00	11.67
	5 200	11.78	0.21	11.99	24.00	12.01
	5 240	11.78	0.21	11.99	24.00	12.01
	5 260	11.83	0.21	12.04	24.00	11.96
	5 300	11.52	0.21	11.73	24.00	12.27
	5 320	12.05	0.21	12.26	24.00	11.74
	5 500	10.86	0.21	11.07	24.00	12.93
	5 600	11.07	0.21	11.28	24.00	12.72
	5 720	9.79	0.21	10.00	24.00	14.00
	5 745	20.42	0.21	20.63	30.00	9.37
	5 785	19.81	0.21	20.02	30.00	9.98
	5 825	19.15	0.21	19.36	30.00	10.64
802.11ac _VHT20	5 180	12.25	0.00	12.25	24.00	11.75
	5 200	11.87	0.00	11.87	24.00	12.13
	5 240	11.96	0.00	11.96	24.00	12.04
	5 260	11.88	0.00	11.88	24.00	12.12
	5 300	11.67	0.00	11.67	24.00	12.33
	5 320	12.01	0.00	12.01	24.00	11.99
	5 500	10.94	0.00	10.94	24.00	13.06
	5 600	11.04	0.00	11.04	24.00	12.96
	5 720	9.80	0.00	9.80	24.00	14.20
	5 745	20.91	0.00	20.91	30.00	9.09

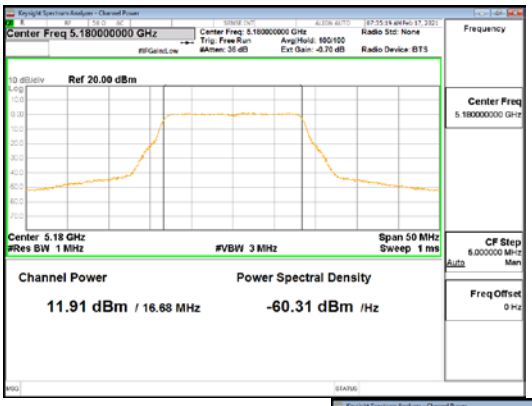
	5 785	20.24	0.00	20.24	30.00	9.76
	5 825	19.57	0.00	19.57	30.00	10.43
802.11n _HT40	5 190	12.78	0.42	13.20	24.00	10.80
	5 230	12.53	0.42	12.95	24.00	11.05
	5 270	12.48	0.42	12.90	24.00	11.10
	5 310	12.41	0.42	12.83	24.00	11.17
	5 510	13.48	0.42	13.90	24.00	10.10
	5 590	13.22	0.42	13.64	24.00	10.36
	5 710	12.15	0.42	12.57	24.00	11.43
	5 755	20.82	0.42	21.24	30.00	8.76
	5 795	20.48	0.42	20.90	30.00	9.10
802.11ac _VHT40	5 190	13.06	0.11	13.17	24.00	10.83
	5 230	12.84	0.11	12.95	24.00	11.05
	5 270	12.78	0.11	12.89	24.00	11.11
	5 310	12.82	0.11	12.93	24.00	11.07
	5 510	13.66	0.11	13.77	24.00	10.23
	5 590	13.68	0.11	13.79	24.00	10.21
	5 710	12.46	0.11	12.57	24.00	11.43
	5 755	21.20	0.11	21.31	30.00	8.69
	5 795	20.94	0.11	21.05	30.00	8.95
802.11ac _VHT80	5 210	12.36	0.25	12.61	24.00	11.39
	5 290	12.15	0.25	12.40	24.00	11.60
	5 530	12.98	0.25	13.23	24.00	10.77
	5 690	11.28	0.25	11.53	24.00	12.47
	5 775	18.43	0.25	18.68	30.00	11.32
Measurement uncertainty		± 1.5 dB				

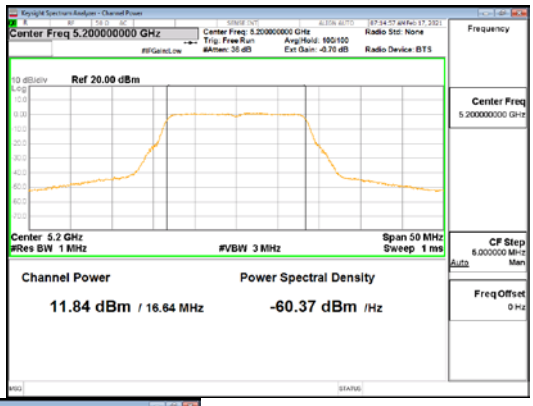
ANT1 + ANT2 + ANT3 + ANT4

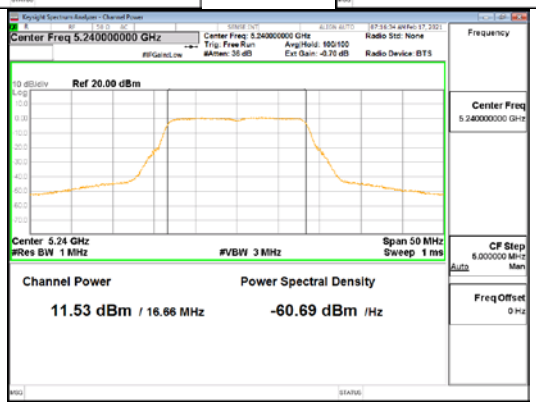
Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	17.36	0.21	17.57	22.05	4.48
	5 200	17.20	0.21	17.41	22.05	4.64
	5 240	17.04	0.21	17.25	22.05	4.80
	5 260	17.12	0.21	17.33	22.05	4.72
	5 300	17.24	0.21	17.45	22.05	4.60
	5 320	17.35	0.21	17.56	22.05	4.49
	5 500	17.05	0.21	17.26	22.05	4.79
	5 600	16.32	0.21	16.53	22.05	5.52
	5 720	14.99	0.21	15.20	22.05	6.85
	5 745	25.65	0.21	25.86	28.05	2.19
	5 785	25.10	0.21	25.31	28.05	2.74
	5 825	25.28	0.21	25.49	28.05	2.56
802.11n _HT20	5 180	17.45	0.21	17.66	22.05	4.39
	5 200	17.21	0.21	17.42	22.05	4.63
	5 240	17.14	0.21	17.35	22.05	4.70
	5 260	17.22	0.21	17.43	22.05	4.62
	5 300	17.30	0.21	17.51	22.05	4.54
	5 320	17.49	0.21	17.70	22.05	4.35
	5 500	17.07	0.21	17.28	22.05	4.77
	5 600	16.52	0.21	16.73	22.05	5.32
	5 720	15.94	0.21	16.15	22.05	5.90
	5 745	25.34	0.21	25.55	28.05	2.50
	5 785	24.91	0.21	25.12	28.05	2.93
	5 825	24.98	0.21	25.19	28.05	2.86
802.11ac _VHT20	5 180	17.55	0.00	17.55	22.05	4.50
	5 200	17.27	0.00	17.27	22.05	4.78
	5 240	17.22	0.00	17.22	22.05	4.83
	5 260	17.32	0.00	17.32	22.05	4.73
	5 300	17.39	0.00	17.39	22.05	4.66
	5 320	17.50	0.00	17.50	22.05	4.55
	5 500	17.17	0.00	17.17	22.05	4.88
	5 600	16.46	0.00	16.46	22.05	5.59
	5 720	15.06	0.00	15.06	22.05	6.99
	5 745	25.51	0.00	25.51	28.05	2.54

	5 785	25.05	0.00	25.05	28.05	3.00
	5 825	24.98	0.00	24.98	28.05	3.07
802.11n _HT40	5 190	17.92	0.42	18.34	22.05	3.71
	5 230	17.73	0.42	18.15	22.05	3.90
	5 270	17.96	0.42	18.38	22.05	3.67
	5 310	17.96	0.42	18.38	22.05	3.67
	5 510	19.28	0.42	19.70	22.05	2.35
	5 590	18.71	0.42	19.13	22.05	2.92
	5 710	17.34	0.42	17.76	22.05	4.29
	5 755	25.24	0.42	25.66	28.05	2.39
	5 795	25.09	0.42	25.51	28.05	2.54
802.11ac _VHT40	5 190	18.36	0.11	18.47	22.05	3.58
	5 230	18.07	0.11	18.18	22.05	3.87
	5 270	18.32	0.11	18.43	22.05	3.62
	5 310	18.41	0.11	18.52	22.05	3.53
	5 510	19.62	0.11	19.73	22.05	2.32
	5 590	19.13	0.11	19.24	22.05	2.81
	5 710	17.73	0.11	17.84	22.05	4.21
	5 755	25.08	0.11	25.19	28.05	2.86
	5 795	24.92	0.11	25.03	28.05	3.02
802.11ac _VHT80	5 210	18.01	0.25	18.26	22.05	3.79
	5 290	18.29	0.25	18.54	22.05	3.51
	5 530	19.46	0.25	19.71	22.05	2.34
	5 690	17.61	0.25	17.86	22.05	4.19
	5 775	23.06	0.25	23.31	28.05	4.74
Measurement uncertainty		± 1.5 dB				

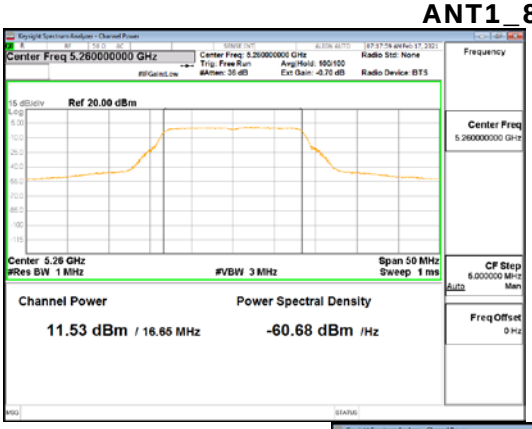
See next pages for actual measured spectrum plots.

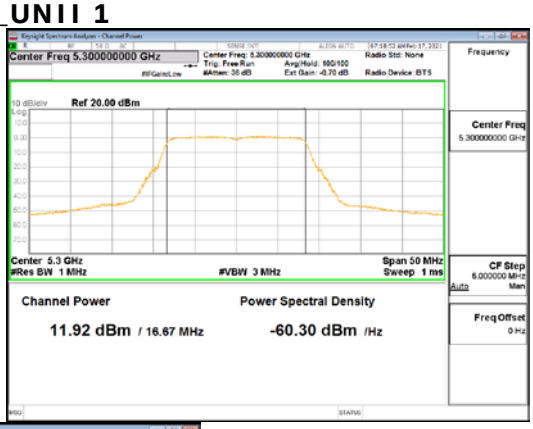


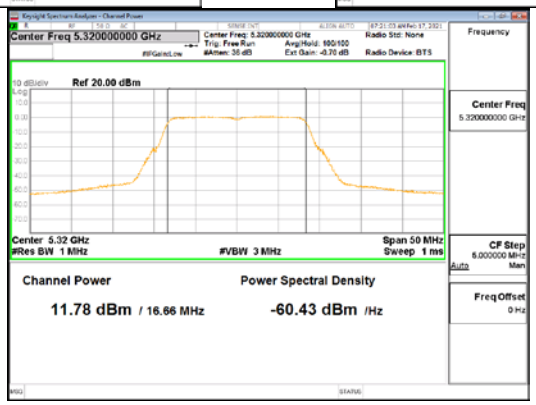




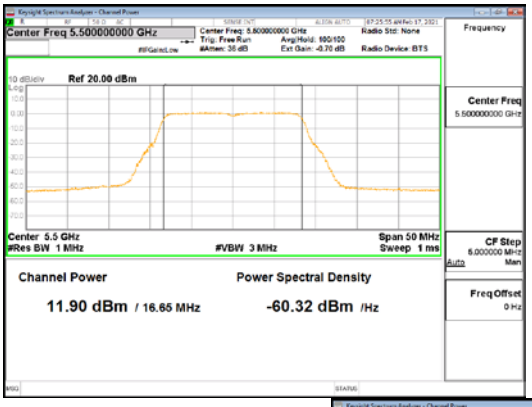
ANT1_802.11a_UNII 1

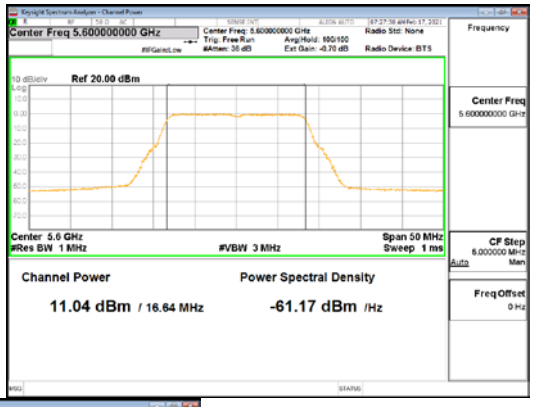


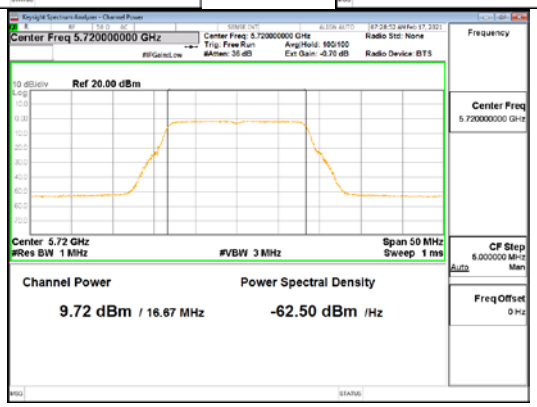




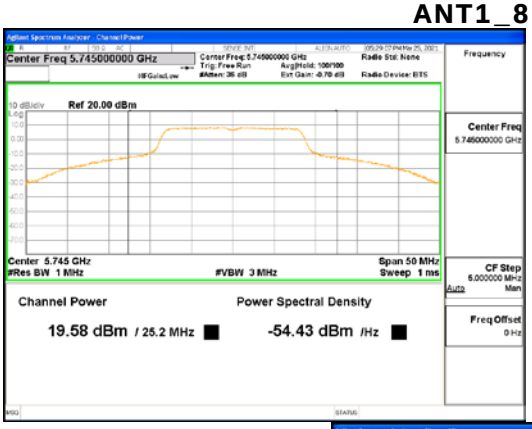
ANT1_802.11a_UNII 2A

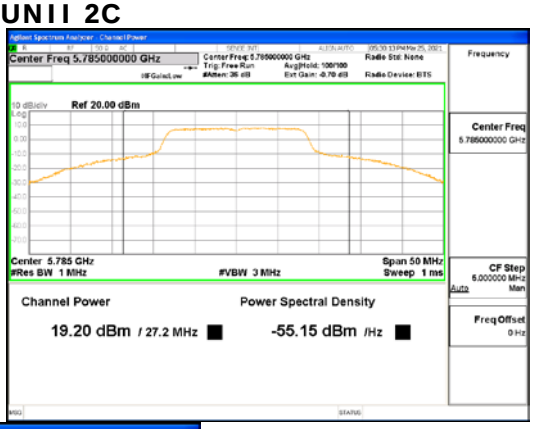




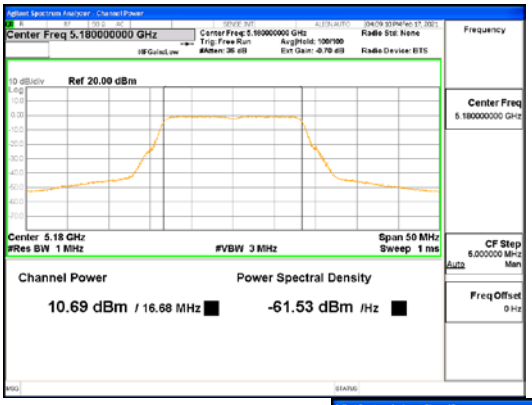


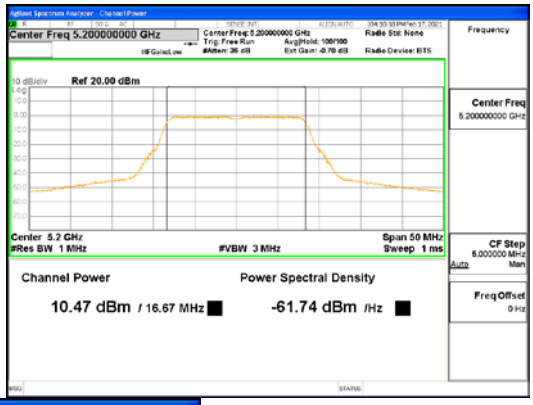
ANT1_802.11a_UNII 2C





ANT1_802.11a_UNII 3





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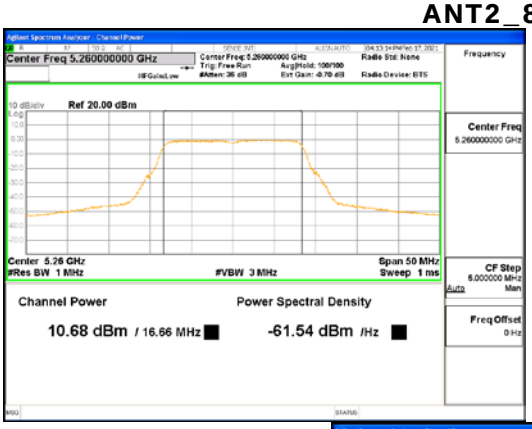
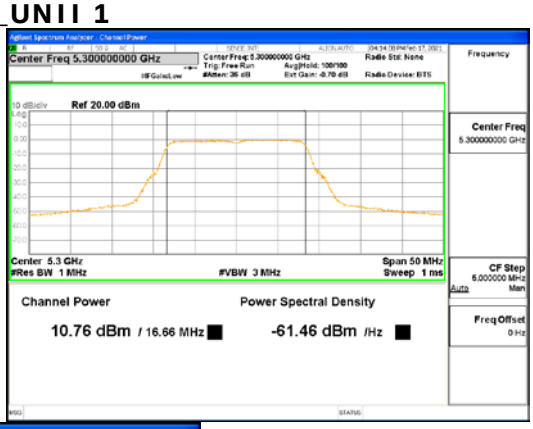
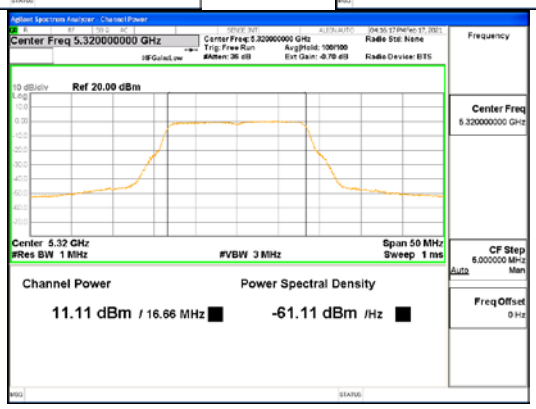
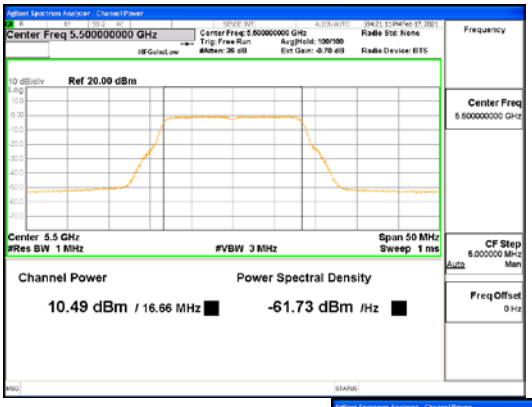
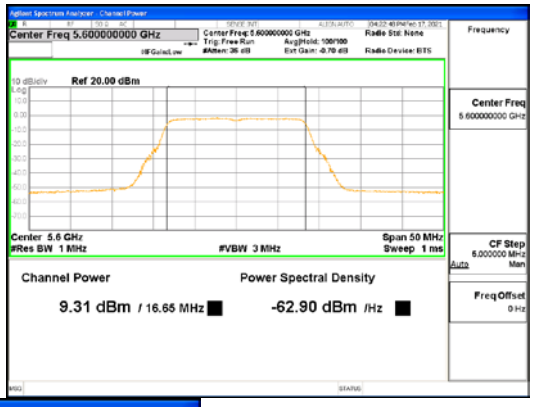






ANT2_802.11a_UNII 2A





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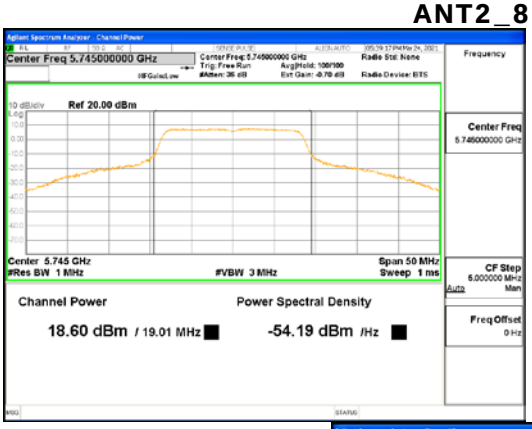

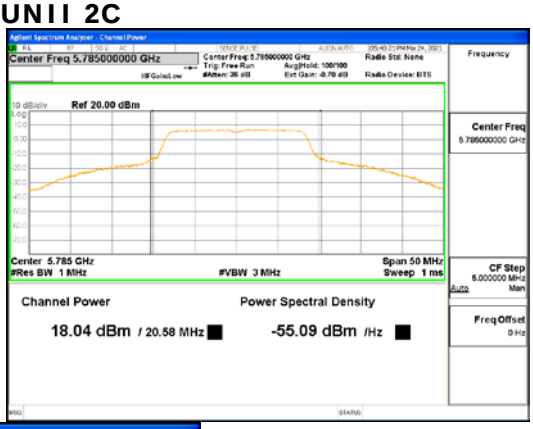

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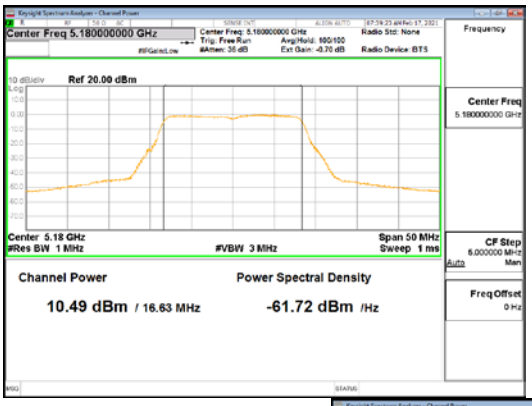

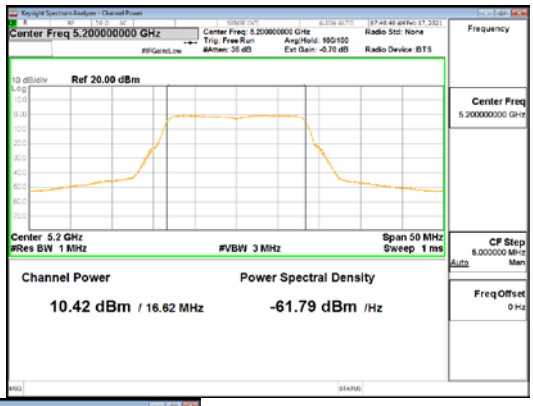

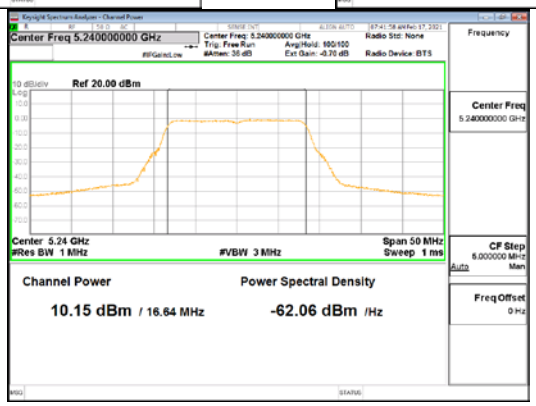

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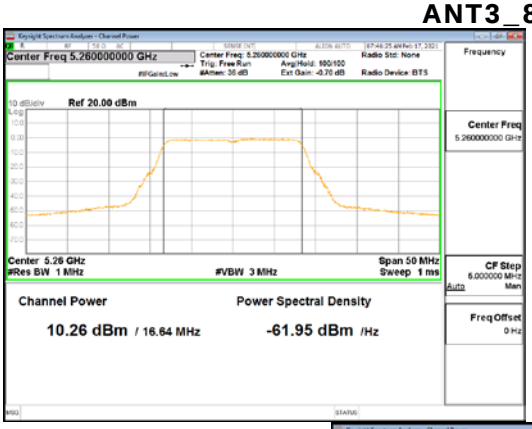
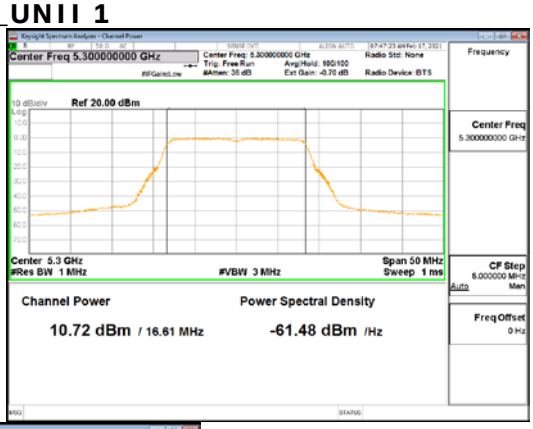
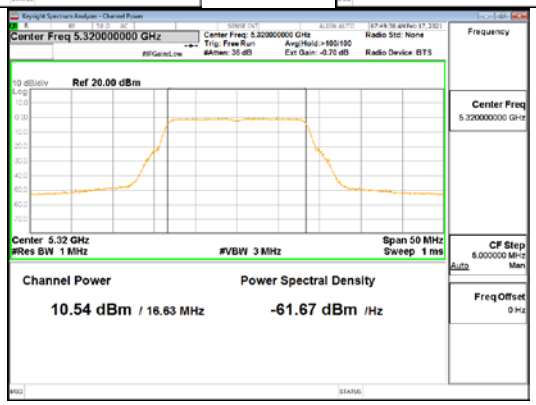
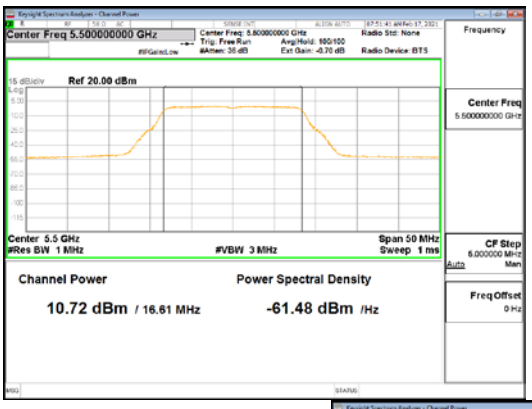
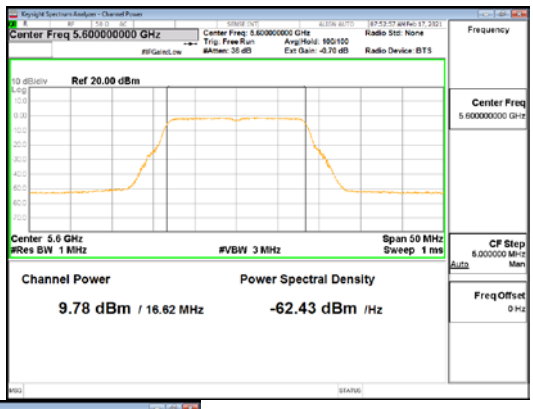


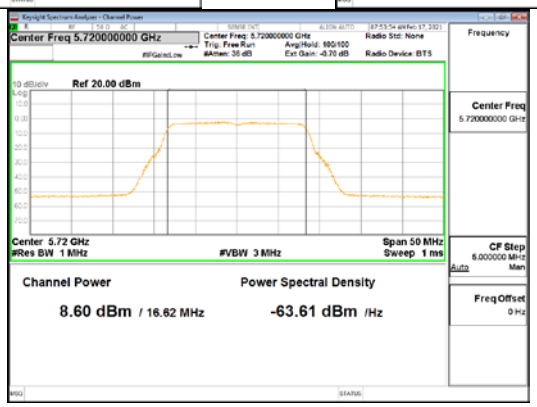




ANT3_802.11a_UNII 2A







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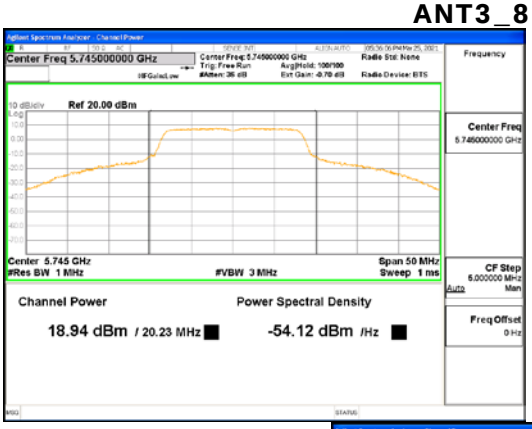

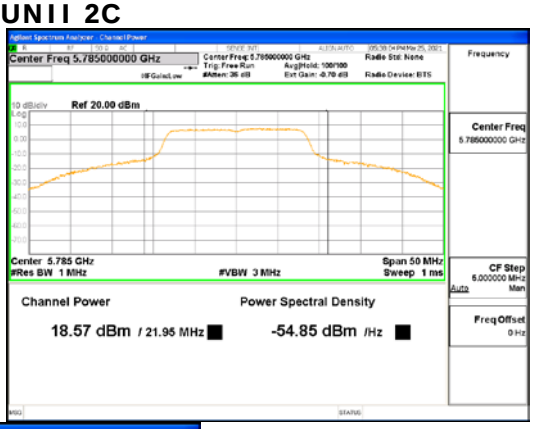

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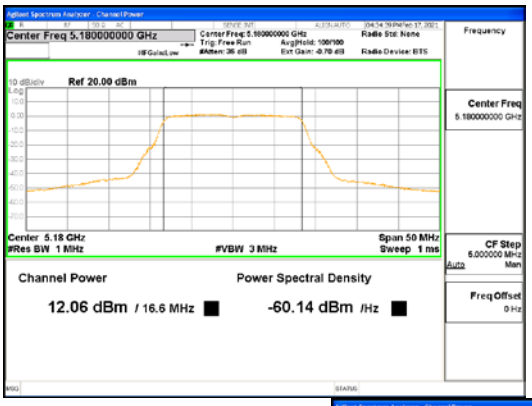

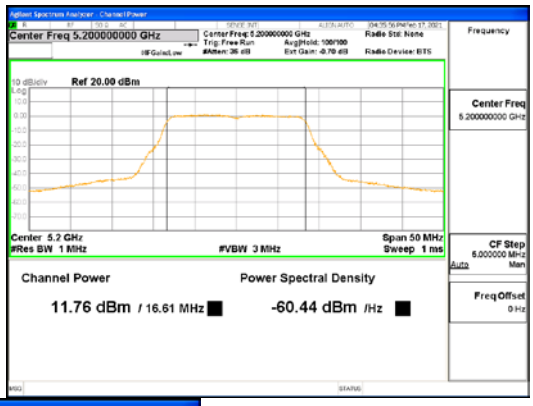

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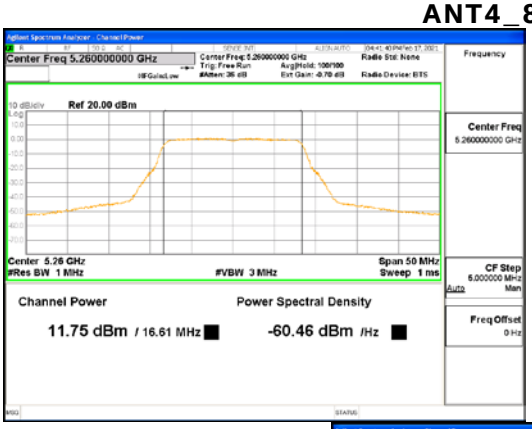
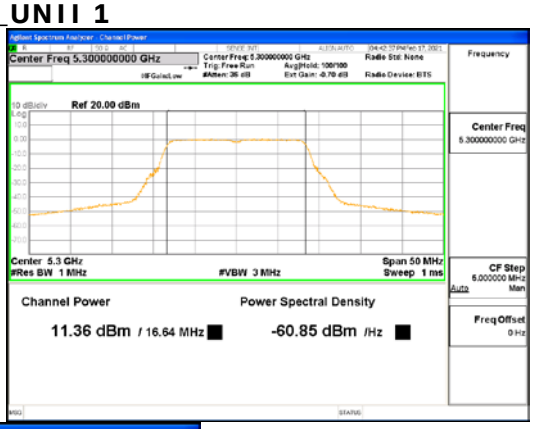
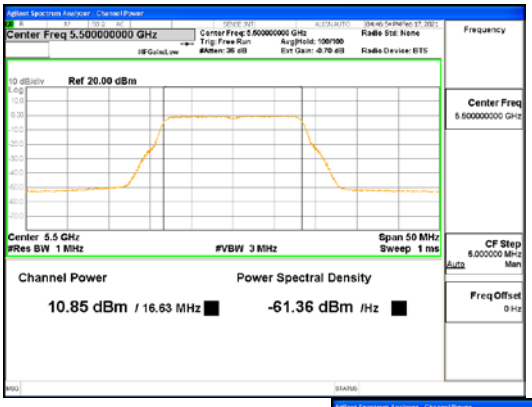
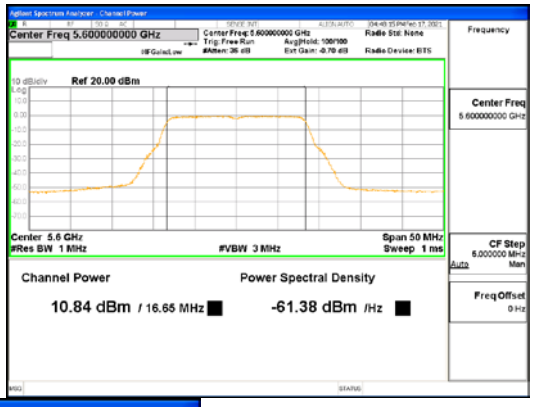




ANT4_802.11a_UNII 2A





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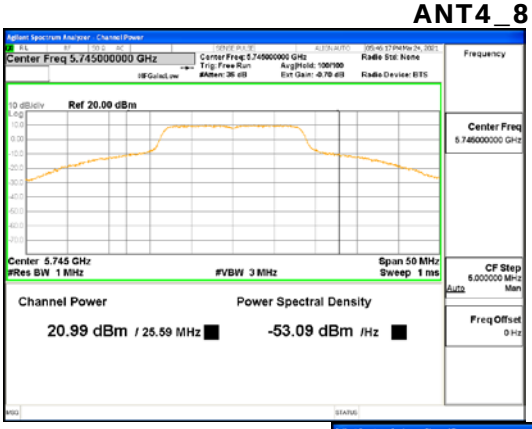
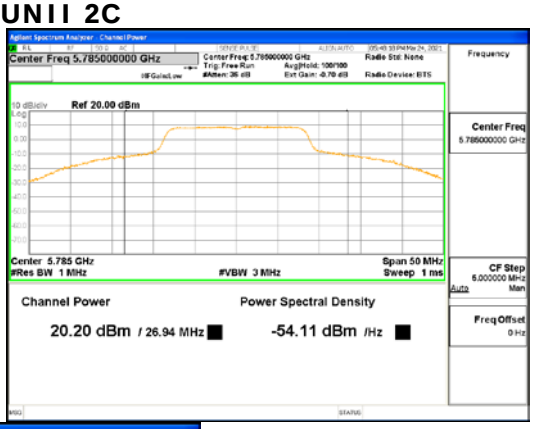
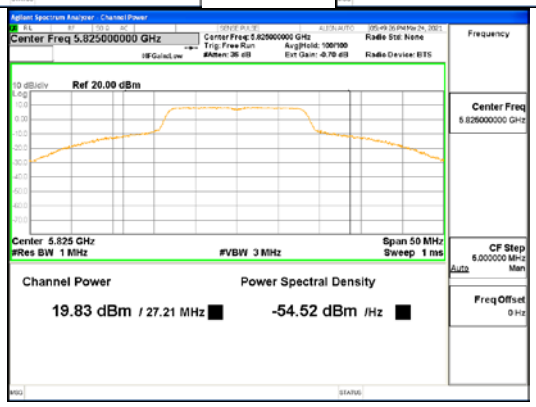
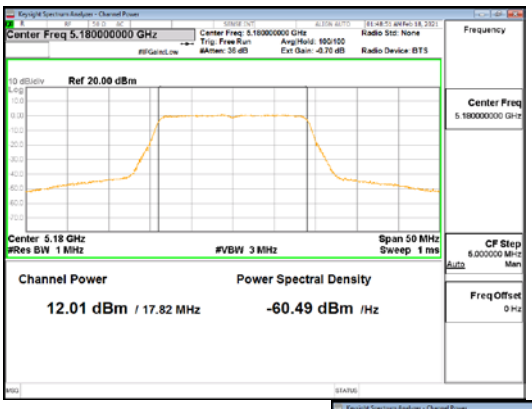
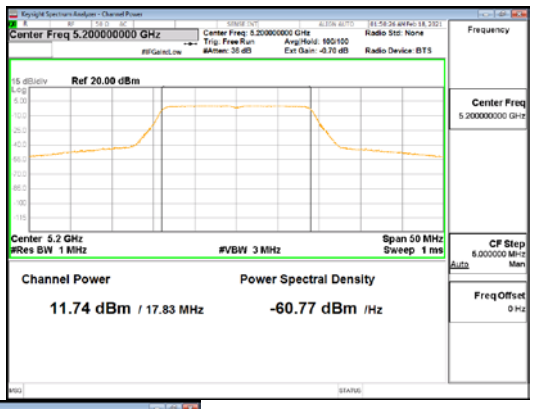


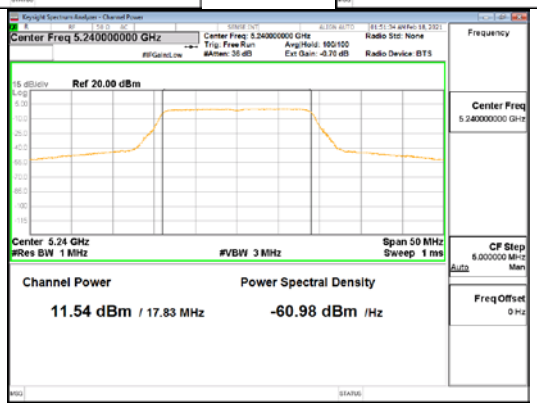




ANT4_802.11a_UNII 3







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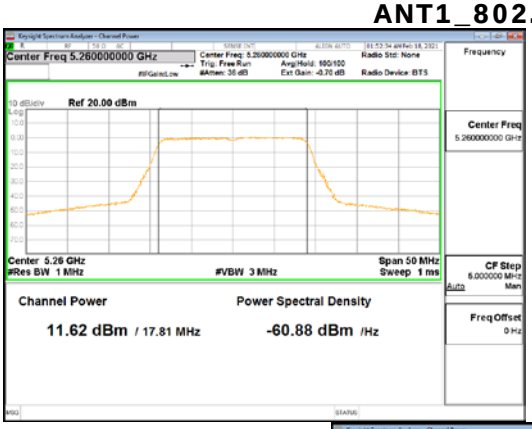
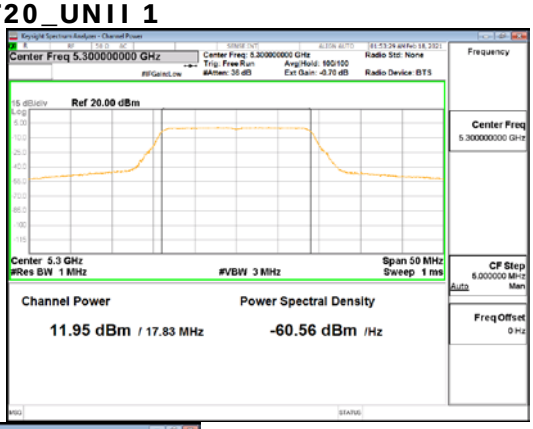
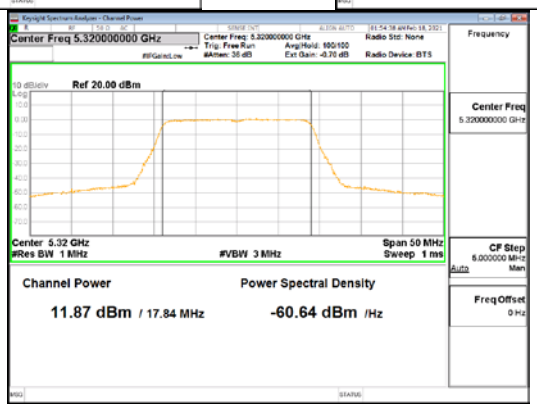
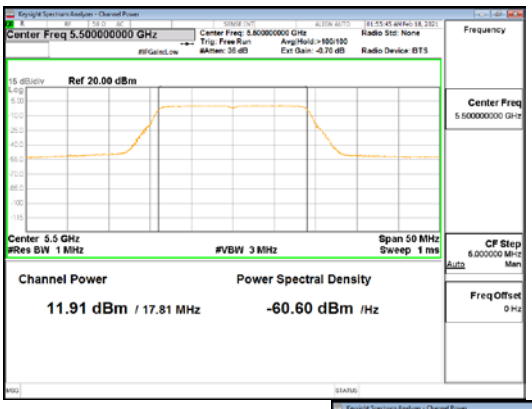
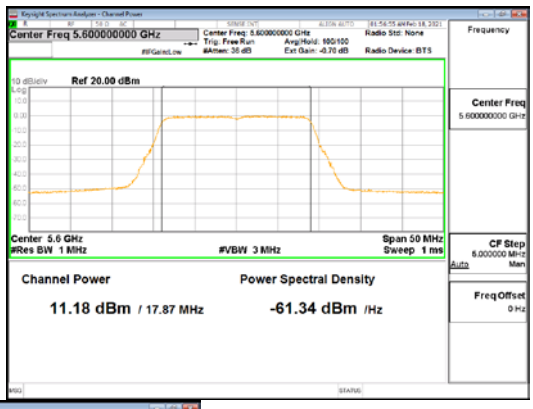


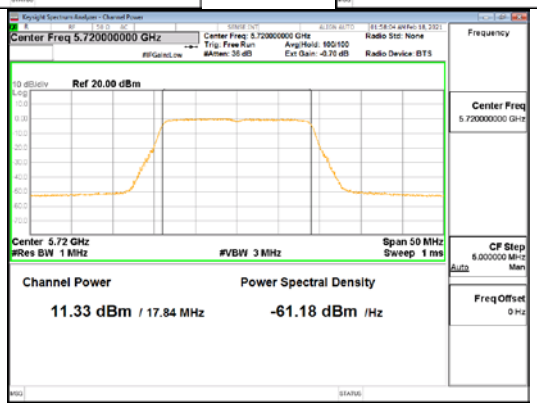




ANT1_802.11n_HT20_UNII 2A







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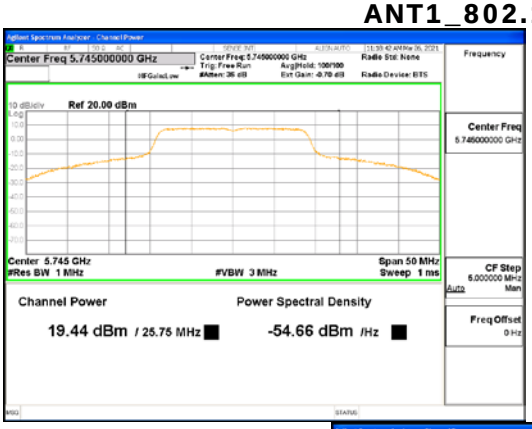
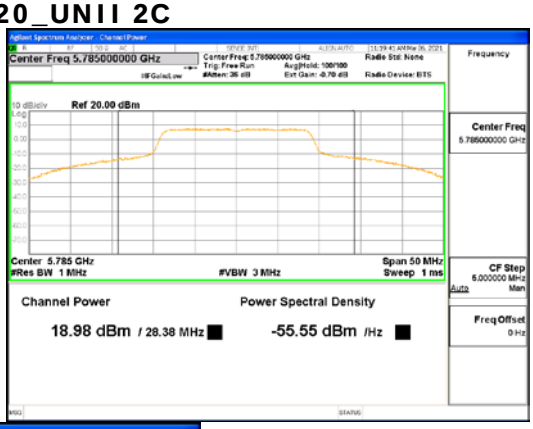
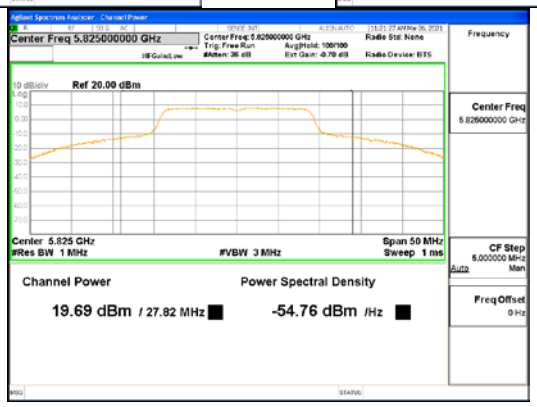
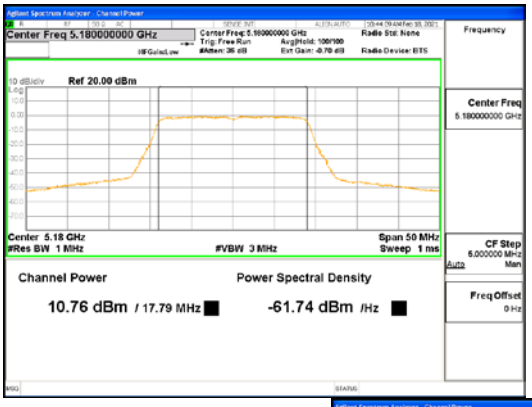
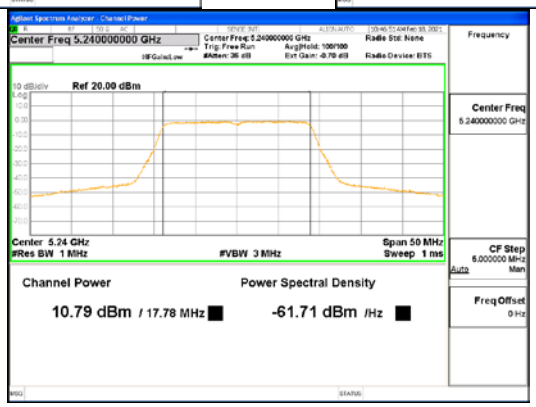






ANT1_802.11n_HT20_UNII 3





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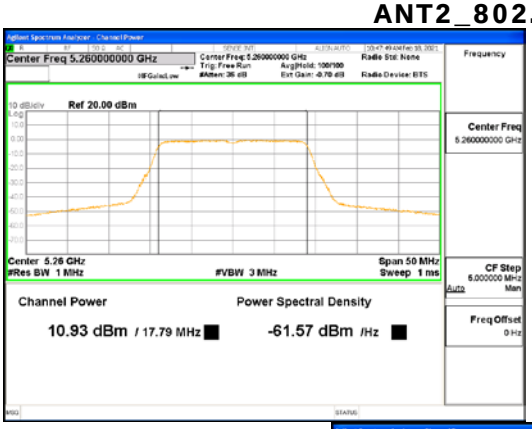
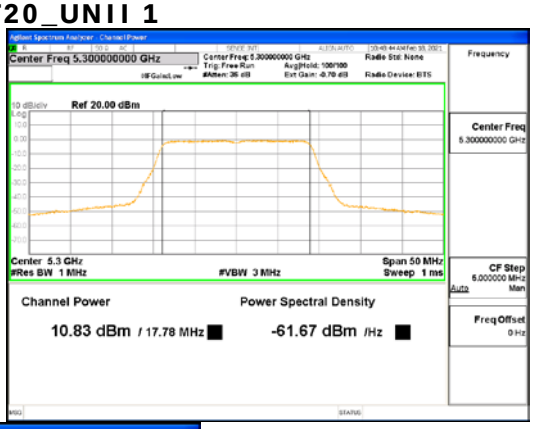
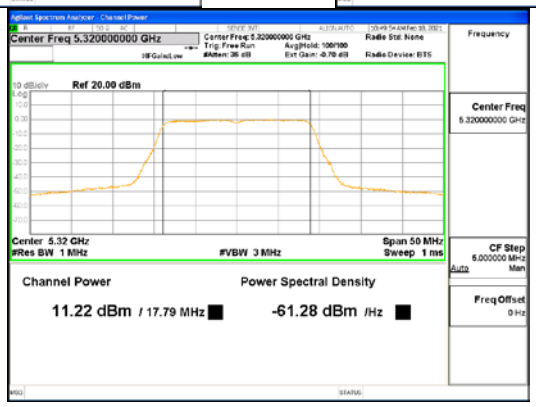
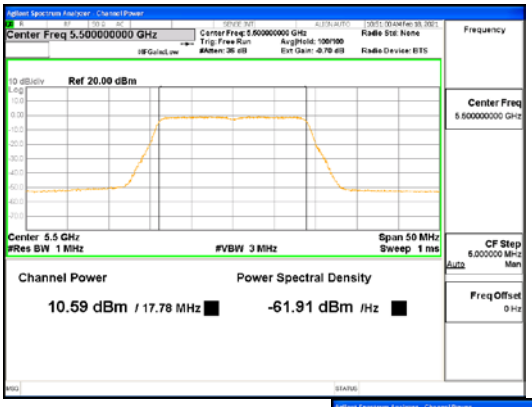
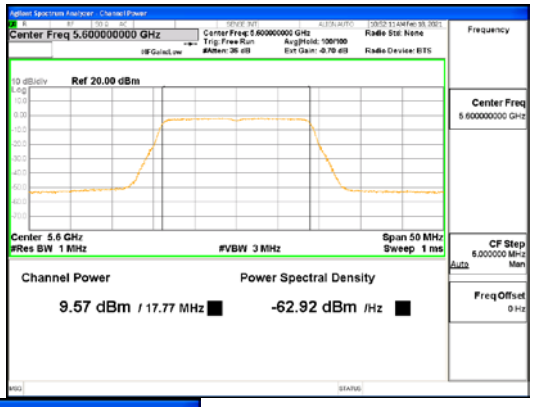




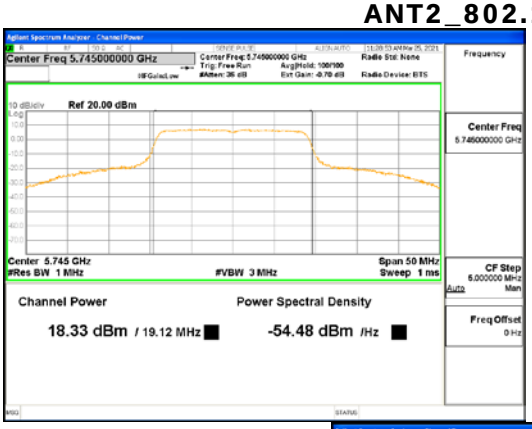


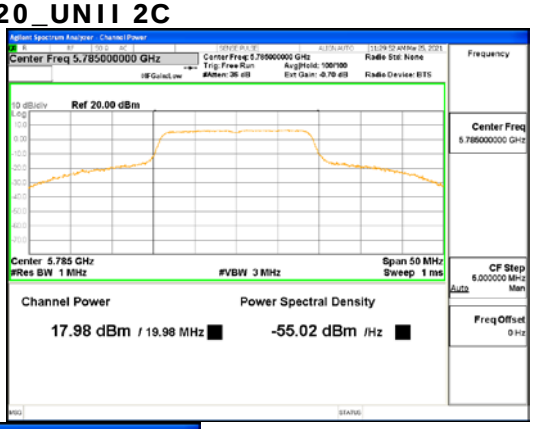
ANT2_802.11n_HT20_UNII 2A

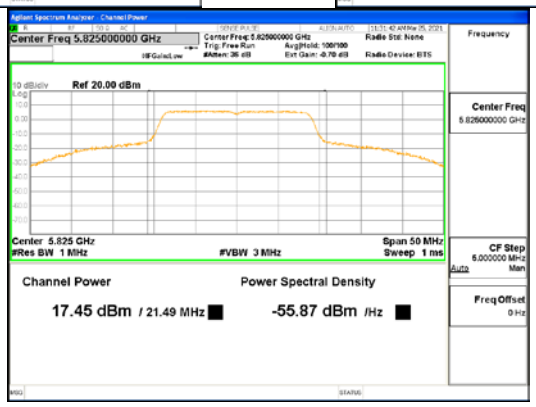




ANT2_802.11n_HT20_UNII 2C







ANT2_802.11n_HT20_UNII 3