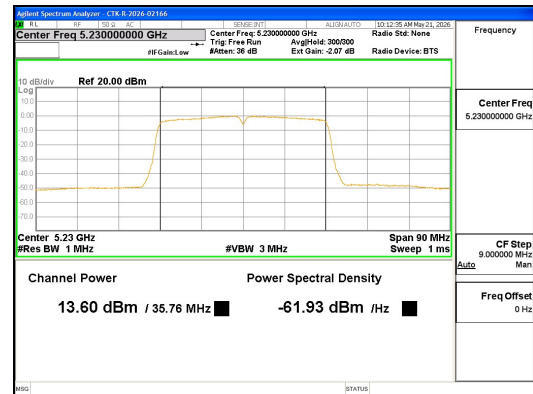
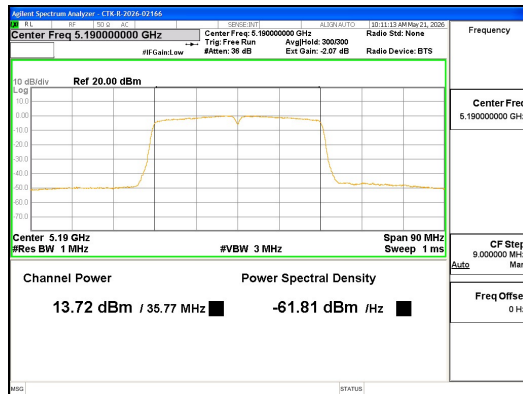




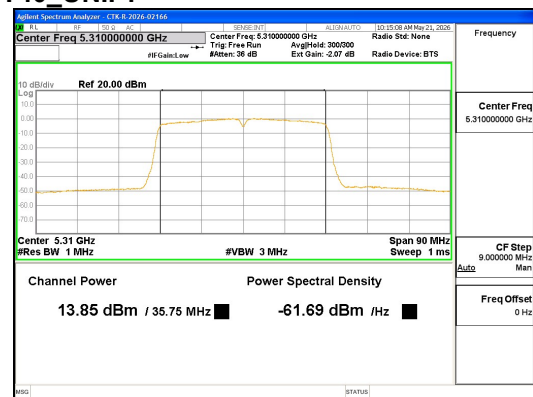
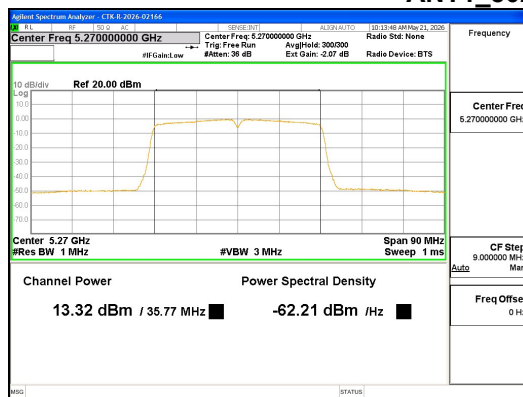
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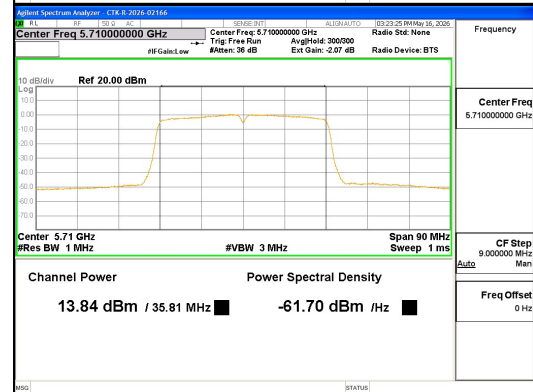
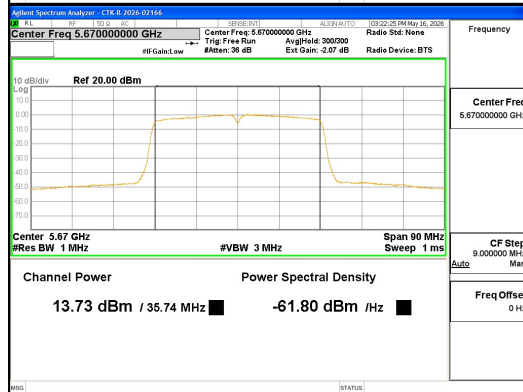
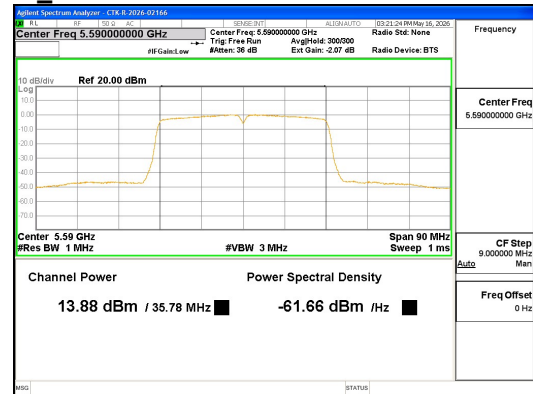
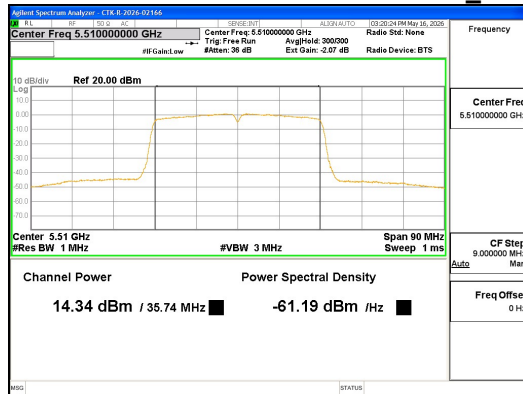
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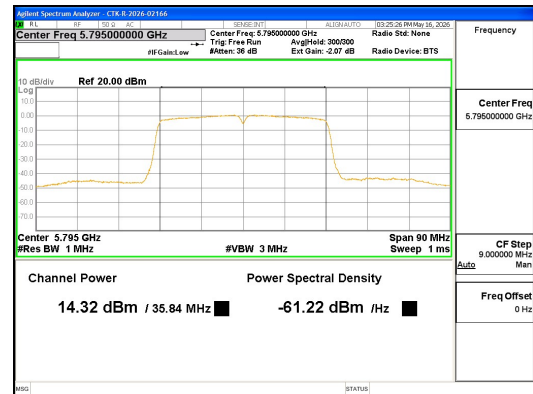
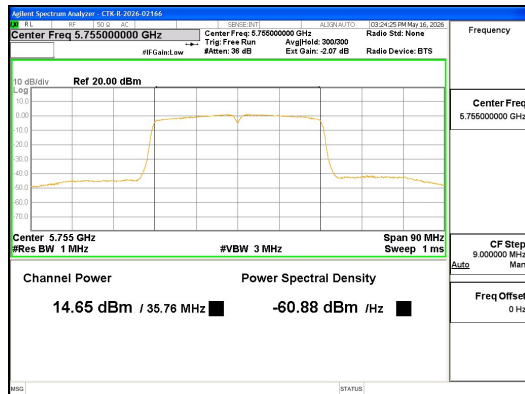
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ANT1_802.11ac_VHT40_UNII 2A



ANT1_802.11ac_VHT40_UNII 2C



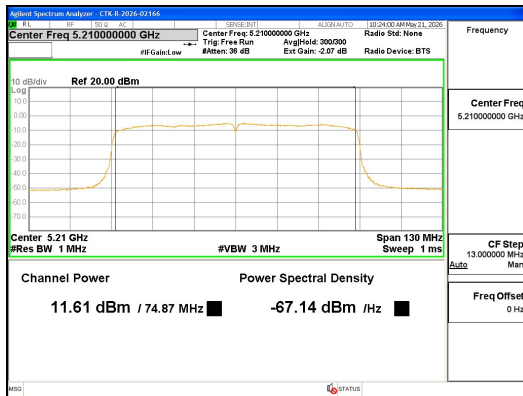
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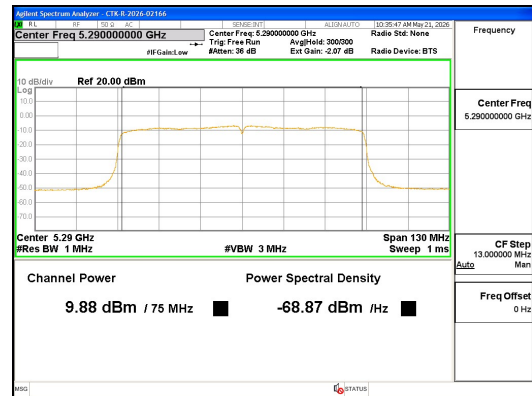
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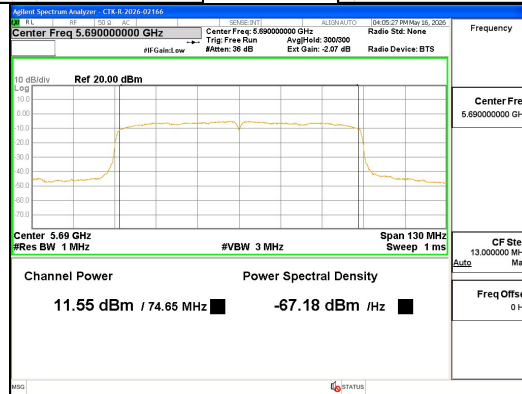
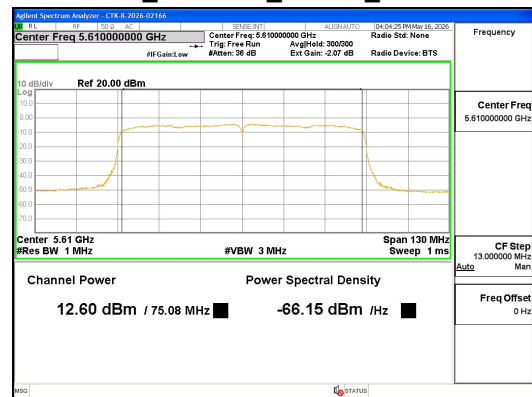
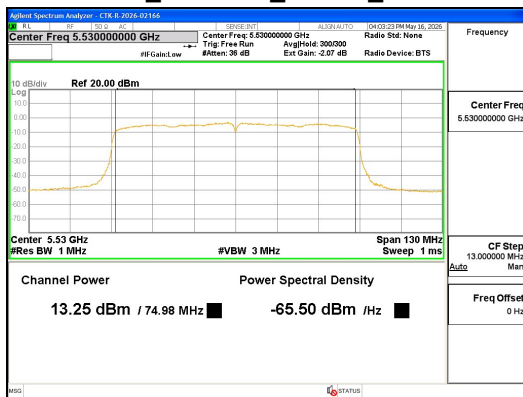
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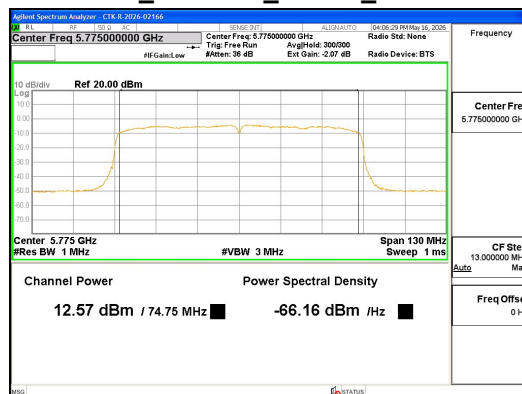
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ANT0_802.11ac_VHT80_UNII 2A



ANT0_802.11ac_VHT80_UNII 2C



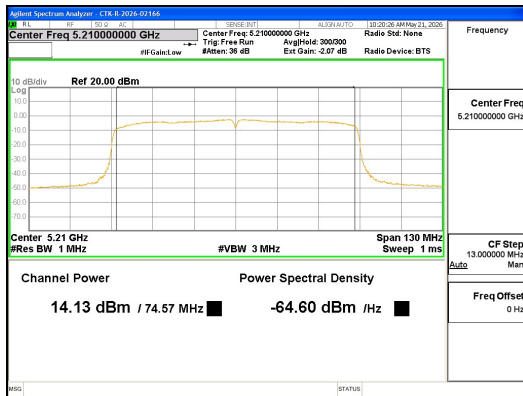
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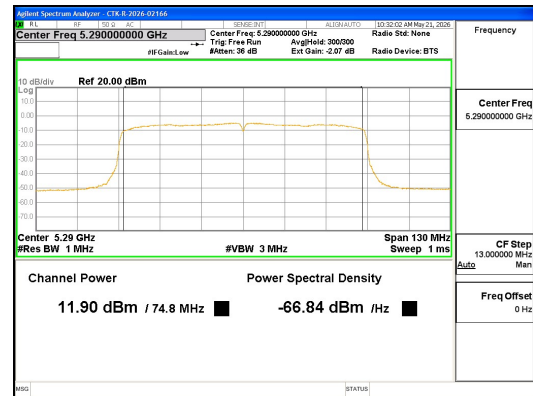
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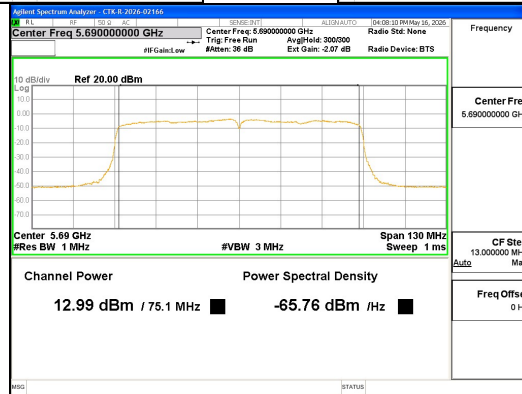
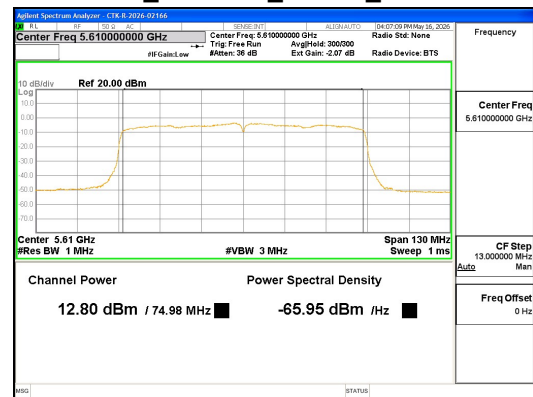
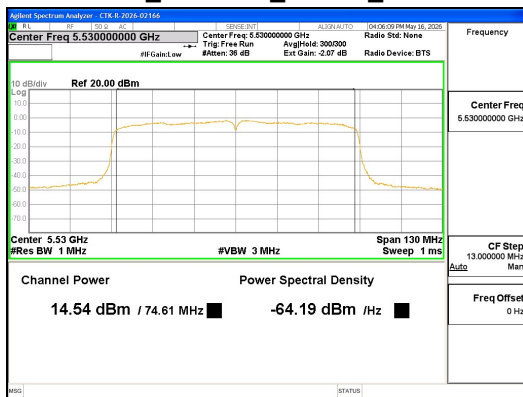
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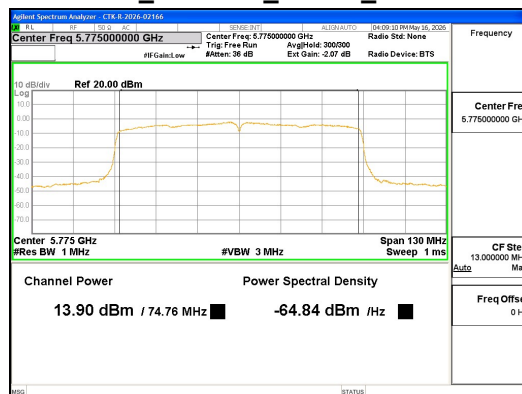
ANT1_802.11ac_VHT80_UNII 1



ANT1_802.11ac_VHT80_UNII 2A



ANT1_802.11ac_VHT80_UNII 2C



ANT1_802.11ac_VHT80_UNII 3

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4.4 Transmitter Power Spectral Density

Test Procedures

KDB 789033 – Section F (Method SA-2, Maximum Power Spectral Density)
KDB 662911 D01, D02 (Multiple Transmitter Output)
ANSI C63.10-2020 – Section 12.6

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	0.09
802.11n_HT40	0.19
802.11ac_VHT20	0.09
802.11ac_VHT40	0.19
802.11ac_VHT80	0.37

Limit :

Operating Mode	Mode	ANT Configuration	ANT Gain [dBi]	Band	Limit [dBm]
SISO	802.11a/n/ac	ANT0, ANT1	0.85, 0.69	UNII 1	11.00
				UNII 2A	11.00
			1.39, 0.87	UNII 2C	11.00
				UNII 3	30.00
MIMO (2Tx)	802.11n/ac	ANT0 + ANT1	3.78	UNII 1	11.00
				UNII 2A	11.00
			4.14	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.

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_{N_{ANT}}/20})^2 / N_{ANT}] \text{ dBi}$$

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**Test Data :
ANT0 (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	5.19	0.09	5.28	11.00	5.72
	5 200	4.86	0.09	4.95	11.00	6.05
	5 240	4.53	0.09	4.62	11.00	6.38
	5 260	2.76	0.09	2.85	11.00	8.15
	5 300	2.89	0.09	2.98	11.00	8.02
	5 320	2.65	0.09	2.74	11.00	8.26
	5 500	6.11	0.09	6.20	11.00	4.80
	5 600	5.44	0.09	5.53	11.00	5.47
	5 700	4.09	0.09	4.18	11.00	6.82
	5 720	3.96	0.09	4.05	11.00	6.95
	5 745	2.20	0.09	2.29	30.00	27.71
	5 785	1.90	0.09	1.99	30.00	28.01
	5 825	2.28	0.09	2.37	30.00	27.63
802.11n _HT20	5 180	0.36	0.09	0.45	11.00	10.55
	5 200	0.55	0.09	0.64	11.00	10.36
	5 240	-0.14	0.09	-0.05	11.00	11.05
	5 260	3.75	0.09	3.84	11.00	7.16
	5 300	3.86	0.09	3.95	11.00	7.05
	5 320	3.65	0.09	3.74	11.00	7.26
	5 500	5.38	0.09	5.47	11.00	5.53
	5 600	4.94	0.09	5.03	11.00	5.97
	5 700	4.19	0.09	4.28	11.00	6.72
	5 720	3.25	0.09	3.34	11.00	7.66
	5 745	1.86	0.09	1.95	30.00	28.05
	5 785	1.41	0.09	1.50	30.00	28.50
	5 825	1.97	0.09	2.06	30.00	27.94
802.11ac _VHT20	5 180	0.59	0.09	0.68	11.00	10.32
	5 200	0.51	0.09	0.60	11.00	10.40
	5 240	0.20	0.09	0.29	11.00	10.71
	5 260	2.60	0.09	2.69	11.00	8.31
	5 300	2.25	0.09	2.34	11.00	8.66
	5 320	1.79	0.09	1.88	11.00	9.12
	5 500	3.72	0.09	3.81	11.00	7.19
	5 600	2.90	0.09	2.99	11.00	8.01
	5 700	1.96	0.09	2.05	11.00	8.95
	5 720	1.83	0.09	1.92	11.00	9.08
	5 745	0.37	0.09	0.46	30.00	29.54
	5 785	-0.29	0.09	-0.20	30.00	30.20
	5 825	0.32	0.09	0.41	30.00	29.59
802.11n _HT40	5 190	-2.46	0.19	-2.27	11.00	13.27
	5 230	-3.26	0.19	-3.07	11.00	14.07
	5 270	-2.74	0.19	-2.55	11.00	13.55
	5 310	-2.54	0.19	-2.35	11.00	13.35
	5 510	-0.82	0.19	-0.63	11.00	11.63
	5 590	-1.78	0.19	-1.59	11.00	12.59
	5 670	-2.79	0.19	-2.60	11.00	13.60
	5 710	-1.77	0.19	-1.58	11.00	12.58
	5 755	-1.61	0.19	-1.42	30.00	31.42
	5 795	-2.27	0.19	-2.08	30.00	32.08

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Test Mode	Frequency [MHz]	Measured Power Density [dBm]	Duty Cycle Factor [dB]	Result Power Density [dBm]	Limit [dBm]	Margin [dB]
802.11ac_VHT40	5 190	-2.14	0.19	-1.95	11.00	12.95
	5 230	-2.78	0.19	-2.59	11.00	13.59
	5 270	-2.76	0.19	-2.57	11.00	13.57
	5 310	-2.50	0.19	-2.31	11.00	13.31
	5 510	0.64	0.19	0.83	11.00	10.17
	5 590	-0.15	0.19	0.04	11.00	10.96
	5 670	-2.29	0.19	-2.10	11.00	13.10
	5 710	-1.26	0.19	-1.07	11.00	12.07
	5 755	-2.81	0.19	-2.62	30.00	32.62
	5 795	-3.44	0.19	-3.25	30.00	33.25
802.11ac_VHT80	5 210	-5.34	0.37	-4.97	11.00	15.97
	5 290	-6.76	0.37	-6.39	11.00	17.39
	5 530	-3.46	0.37	-3.09	11.00	14.09
	5 610	-4.39	0.37	-4.02	11.00	15.02
	5 690	-5.13	0.37	-4.76	11.00	15.76
	5 775	-6.43	0.37	-6.06	30.00	36.06

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ANT1 (SISO)

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	2.07	0.09	2.16	11.00	8.84
	5 200	2.30	0.09	2.39	11.00	8.61
	5 240	1.22	0.09	1.31	11.00	9.69
	5 260	5.03	0.09	5.12	11.00	5.88
	5 300	5.45	0.09	5.54	11.00	5.46
	5 320	5.38	0.09	5.47	11.00	5.53
	5 500	5.31	0.09	5.40	11.00	5.60
	5 600	3.71	0.09	3.80	11.00	7.20
	5 700	4.40	0.09	4.49	11.00	6.51
	5 720	3.47	0.09	3.56	11.00	7.44
	5 745	2.67	0.09	2.76	30.00	27.24
	5 785	1.68	0.09	1.77	30.00	28.23
	5 825	2.28	0.09	2.37	30.00	27.63
802.11ac _VHT20	5 180	1.96	0.09	2.05	11.00	8.95
	5 200	2.11	0.09	2.20	11.00	8.80
	5 240	1.21	0.09	1.30	11.00	9.70
	5 260	3.77	0.09	3.86	11.00	7.14
	5 300	4.25	0.09	4.34	11.00	6.66
	5 320	3.97	0.09	4.06	11.00	6.94
	5 500	3.82	0.09	3.91	11.00	7.09
	5 600	2.52	0.09	2.61	11.00	8.39
	5 700	3.31	0.09	3.40	11.00	7.60
	5 720	1.42	0.09	1.51	11.00	9.49
	5 745	0.89	0.09	0.98	30.00	29.02
	5 785	0.66	0.09	0.75	30.00	29.25
	5 825	0.96	0.09	1.05	30.00	28.95
802.11n _HT40	5 190	-0.02	0.19	0.17	11.00	10.83
	5 230	-0.23	0.19	-0.04	11.00	11.04
	5 270	-0.40	0.19	-0.21	11.00	11.21
	5 310	-0.22	0.19	-0.03	11.00	11.03
	5 510	-0.21	0.19	-0.02	11.00	11.02
	5 590	-0.79	0.19	-0.60	11.00	11.60
	5 670	-1.00	0.19	-0.81	11.00	11.81
	5 710	-0.87	0.19	-0.68	11.00	11.68
	5 755	-0.77	0.19	-0.58	30.00	30.58
	5 795	-1.06	0.19	-0.87	30.00	30.87

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Test Mode	Frequency [MHz]	Measured Power Density [dBm]	Duty Cycle Factor [dB]	Result Power Density [dBm]	Limit [dBm]	Margin [dB]
802.11ac_VHT40	5 190	-0.27	0.19	-0.08	11.00	11.08
	5 230	-0.09	0.19	0.10	11.00	10.90
	5 270	-0.41	0.19	-0.22	11.00	11.22
	5 310	0.04	0.19	0.23	11.00	10.77
	5 510	0.59	0.19	0.78	11.00	10.22
	5 590	0.16	0.19	0.35	11.00	10.65
	5 670	0.02	0.19	0.21	11.00	10.79
	5 710	0.13	0.19	0.32	11.00	10.68
	5 755	-1.90	0.19	-1.71	30.00	31.71
	5 795	-2.19	0.19	-2.00	30.00	32.00
802.11ac_VHT80	5 210	-2.56	0.37	-2.19	11.00	13.19
	5 290	-5.20	0.37	-4.83	11.00	15.83
	5 530	-1.65	0.37	-1.28	11.00	12.28
	5 610	-3.34	0.37	-2.97	11.00	13.97
	5 690	-3.85	0.37	-3.48	11.00	14.48
	5 775	-5.27	0.37	-4.90	30.00	34.90

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ANT0 + ANT1 (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	4.31	0.09	4.40	11.00	6.60
	5 200	4.52	0.09	4.61	11.00	6.39
	5 240	3.60	0.09	3.69	11.00	7.31
	5 260	7.45	0.09	7.54	11.00	3.46
	5 300	7.74	0.09	7.83	11.00	3.17
	5 320	7.61	0.09	7.70	11.00	3.30
	5 500	8.36	0.09	8.45	11.00	2.55
	5 600	7.38	0.09	7.47	11.00	3.53
	5 700	7.31	0.09	7.40	11.00	3.60
	5 720	6.37	0.09	6.46	11.00	4.54
	5 745	5.29	0.09	5.38	30.00	24.62
	5 785	4.56	0.09	4.65	30.00	25.35
	5 825	5.14	0.09	5.23	30.00	24.77
	5 825	5.14	0.09	5.23	30.00	24.77
802.11ac _VHT20	5 180	4.34	0.09	4.43	11.00	6.57
	5 200	4.39	0.09	4.48	11.00	6.52
	5 240	3.74	0.09	3.83	11.00	7.17
	5 260	6.23	0.09	6.32	11.00	4.68
	5 300	6.37	0.09	6.46	11.00	4.54
	5 320	6.03	0.09	6.12	11.00	4.88
	5 500	6.78	0.09	6.87	11.00	4.13
	5 600	5.72	0.09	5.81	11.00	5.19
	5 700	5.70	0.09	5.79	11.00	5.21
	5 720	4.64	0.09	4.73	11.00	6.27
	5 745	3.65	0.09	3.74	30.00	26.26
	5 785	3.22	0.09	3.31	30.00	26.69
	5 825	3.66	0.09	3.75	30.00	26.25
	5 825	3.66	0.09	3.75	30.00	26.25
802.11n _HT40	5 190	1.94	0.19	2.13	11.00	8.87
	5 230	1.52	0.19	1.71	11.00	9.29
	5 270	1.60	0.19	1.79	11.00	9.21
	5 310	1.78	0.19	1.97	11.00	9.03
	5 510	2.51	0.19	2.70	11.00	8.30
	5 590	1.75	0.19	1.94	11.00	9.06
	5 670	1.21	0.19	1.40	11.00	9.60
	5 710	1.71	0.19	1.90	11.00	9.10
	5 755	1.84	0.19	2.03	30.00	27.97
	5 795	1.39	0.19	1.58	30.00	28.42
802.11ac _VHT40	5 190	1.91	0.19	2.10	11.00	8.90
	5 230	1.78	0.19	1.97	11.00	9.03
	5 270	1.58	0.19	1.77	11.00	9.23
	5 310	1.96	0.19	2.15	11.00	8.85
	5 510	3.63	0.19	3.82	11.00	7.18
	5 590	3.02	0.19	3.21	11.00	7.79
	5 670	2.03	0.19	2.22	11.00	8.78
	5 710	2.50	0.19	2.69	11.00	8.31
	5 755	0.68	0.19	0.87	30.00	29.13
	5 795	0.24	0.19	0.43	30.00	29.57

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Test Mode	Frequency [MHz]	Measured Power Density [dBm]	Duty Cycle Factor [dB]	Result Power Density [dBm]	Limit [dBm]	Margin [dB]
802.11ac_VHT80	5 210	-0.72	0.37	-0.35	11.00	11.35
	5 290	-2.90	0.37	-2.53	11.00	13.53
	5 530	0.55	0.37	0.92	11.00	10.08
	5 610	-0.82	0.37	-0.45	11.00	11.45
	5 690	-1.43	0.37	-1.06	11.00	12.06
	5 775	-2.80	0.37	-2.43	30.00	32.43

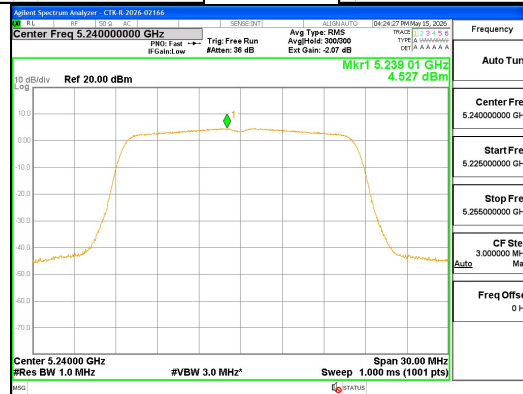
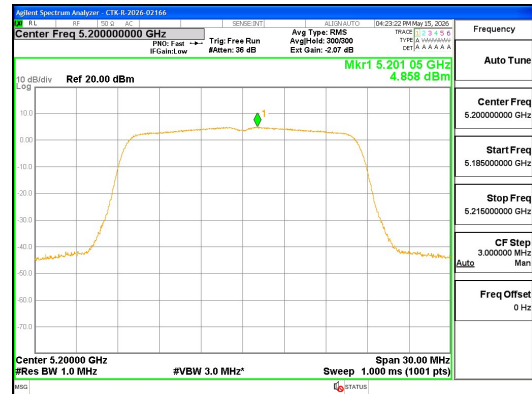
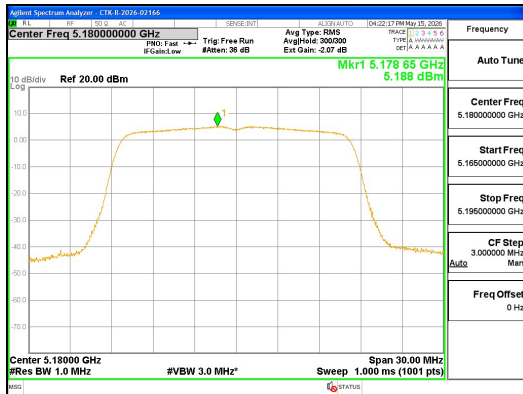
See next pages for actual measured spectrum plots.



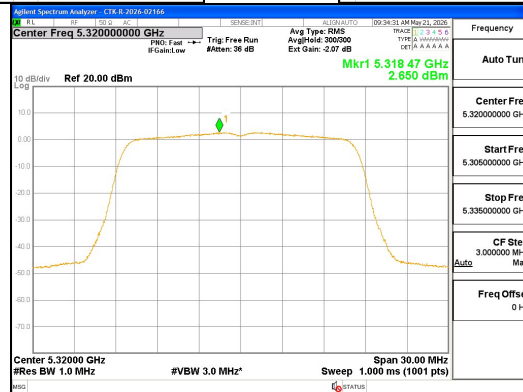
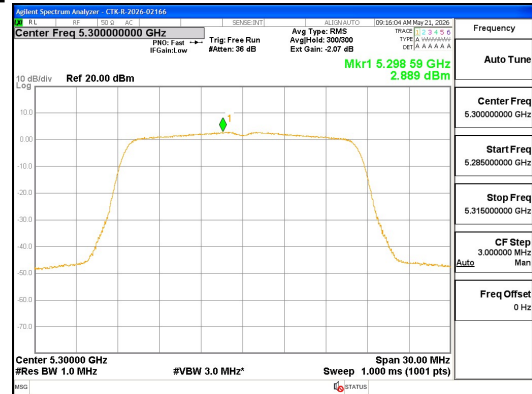
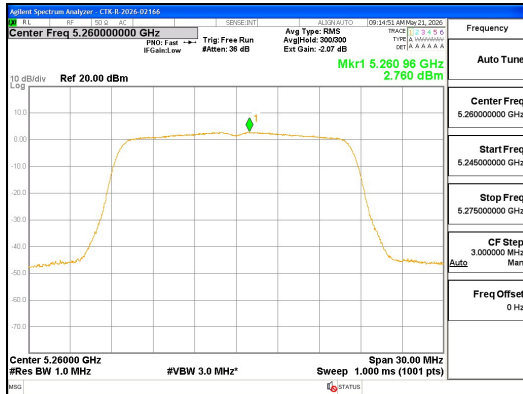
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