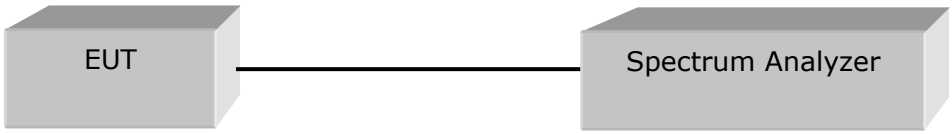
4.2 OUTPUT POWER

Test Procedures

Maximum Conducted Output Power(KDB 789033, Method SA-1, Method SA-2)
Multiple Transmitter Output (KDB 662911 D01, D02)

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	0.11
802.11n_HT20	0.00
802.11n_HT40	0.10
802.11ac_VHT20	0.00
802.11ac_VHT40	0.09
802.11ac_VHT80	0.24
802.11ac_VHT160	0.11

Limit

Operating Mode	Band	Mode	ANT Configuration	ANT Gain (dBi)	Limit (dBm)
SISO	UNII 2A	802.11a/n/ac	ANT0	3.49	24.00
			ANT1	4.53	
			ANT2	3.90	
			ANT3	3.78	
	UNII 2C		ANT0	3.49	
			ANT1	4.53	
			ANT2	3.90	
			ANT3	3.78	
MIMO (2Tx)	UNII 2A	802.11a/n/ac	ANT0 + ANT1	7.04	22.96
	UNII 2C				
MIMO (3Tx)	UNII 2A	802.11a/n/ac	ANT0 + ANT1 + ANT2	8.76	21.24
	UNII 2C				
MIMO (4Tx)	UNII 2A	802.11a/n/ac	ANT0 + ANT1 + ANT2 + ANT3	9.95	20.05
	UNII 2C				

Test Data

ANT0

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 260	10.51	0.11	10.62	24.00	13.38
	5 300	10.24	0.11	10.35	24.00	13.65
	5 320	9.38	0.11	9.49	24.00	14.51
	5 500	7.62	0.11	7.73	24.00	16.27
	5 600	10.36	0.11	10.47	24.00	13.53
	5 720	10.09	0.11	10.20	24.00	13.80
802.11n _HT20	5 260	10.72	0.00	10.72	24.00	13.28
	5 300	10.41	0.00	10.41	24.00	13.59
	5 320	9.71	0.00	9.71	24.00	14.29
	5 500	7.41	0.00	7.41	24.00	16.59
	5 600	10.14	0.00	10.14	24.00	13.86
	5 720	9.85	0.00	9.85	24.00	14.15
802.11ac _VHT20	5 260	10.82	0.00	10.82	24.00	13.18
	5 300	10.56	0.00	10.56	24.00	13.44
	5 320	9.76	0.00	9.76	24.00	14.24
	5 500	7.37	0.00	7.37	24.00	16.63
	5 600	10.06	0.00	10.06	24.00	13.94
	5 720	9.84	0.00	9.84	24.00	14.16
802.11n _HT40	5 270	12.74	0.10	12.84	24.00	11.16
	5 310	12.11	0.10	12.21	24.00	11.79
	5 510	10.24	0.10	10.34	24.00	13.66
	5 590	12.68	0.10	12.78	24.00	11.22
	5 710	12.47	0.10	12.57	24.00	11.43
802.11ac _VHT40	5 270	12.71	0.09	12.80	24.00	11.20
	5 310	12.10	0.09	12.19	24.00	11.81
	5 510	10.26	0.09	10.35	24.00	13.65
	5 590	12.67	0.09	12.76	24.00	11.24
	5 710	12.50	0.09	12.59	24.00	11.41
802.11ac _VHT80	5 290	12.67	0.24	12.91	24.00	11.09
	5 530	10.51	0.24	10.75	24.00	13.25
	5 690	12.28	0.24	12.52	24.00	11.48
Measurement uncertainty		± 1.5 dB				

ANT1

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 260	9.42	0.11	9.53	24.00	14.47
	5 300	10.01	0.11	10.12	24.00	13.88
	5 320	9.82	0.11	9.93	24.00	14.07
	5 500	7.05	0.11	7.16	24.00	16.84
	5 600	8.96	0.11	9.07	24.00	14.93
	5 720	9.96	0.11	10.07	24.00	13.93
802.11n _HT20	5 260	10.44	0.00	10.44	24.00	13.56
	5 300	10.94	0.00	10.94	24.00	13.06
	5 320	10.73	0.00	10.73	24.00	13.27
	5 500	7.24	0.00	7.24	24.00	16.76
	5 600	9.22	0.00	9.22	24.00	14.78
	5 720	10.19	0.00	10.19	24.00	13.81
802.11ac _VHT20	5 260	10.46	0.00	10.46	24.00	13.54
	5 300	10.97	0.00	10.97	24.00	13.03
	5 320	10.74	0.00	10.74	24.00	13.26
	5 500	7.24	0.00	7.24	24.00	16.76
	5 600	9.24	0.00	9.24	24.00	14.76
	5 720	10.18	0.00	10.18	24.00	13.82
802.11n _HT40	5 270	11.94	0.10	12.04	24.00	11.96
	5 310	12.21	0.10	12.31	24.00	11.69
	5 510	9.65	0.10	9.75	24.00	14.25
	5 590	11.17	0.10	11.27	24.00	12.73
	5 710	12.28	0.10	12.38	24.00	11.62
802.11ac _VHT40	5 270	11.94	0.09	12.03	24.00	11.97
	5 310	12.20	0.09	12.29	24.00	11.71
	5 510	9.68	0.09	9.77	24.00	14.23
	5 590	11.16	0.09	11.25	24.00	12.75
	5 710	12.33	0.09	12.42	24.00	11.58
802.11ac _VHT80	5 290	12.29	0.24	12.53	24.00	11.47
	5 530	8.35	0.24	8.59	24.00	15.41
	5 690	11.00	0.24	11.24	24.00	12.76
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	5 260	10.24	0.11	10.35	24.00	13.65
	5 300	10.97	0.11	11.08	24.00	12.92
	5 320	10.60	0.11	10.71	24.00	13.29
	5 500	7.71	0.11	7.82	24.00	16.18
	5 600	9.57	0.11	9.68	24.00	14.32
	5 720	10.51	0.11	10.62	24.00	13.38
802.11n _HT20	5 260	10.59	0.00	10.59	24.00	13.41
	5 300	11.29	0.00	11.29	24.00	12.71
	5 320	10.98	0.00	10.98	24.00	13.02
	5 500	7.86	0.00	7.86	24.00	16.14
	5 600	9.82	0.00	9.82	24.00	14.18
	5 720	10.84	0.00	10.84	24.00	13.16
802.11ac _VHT20	5 260	10.61	0.00	10.61	24.00	13.39
	5 300	11.35	0.00	11.35	24.00	12.65
	5 320	11.02	0.00	11.02	24.00	12.98
	5 500	7.82	0.00	7.82	24.00	16.18
	5 600	9.89	0.00	9.89	24.00	14.11
	5 720	10.82	0.00	10.82	24.00	13.18
802.11n _HT40	5 270	12.19	0.10	12.29	24.00	11.71
	5 310	12.73	0.10	12.83	24.00	11.17
	5 510	9.65	0.10	9.75	24.00	14.25
	5 590	11.15	0.10	11.25	24.00	12.75
	5 710	12.45	0.10	12.55	24.00	11.45
802.11ac _VHT40	5 270	12.19	0.09	12.28	24.00	11.72
	5 310	12.70	0.09	12.79	24.00	11.21
	5 510	9.63	0.09	9.72	24.00	14.28
	5 590	11.12	0.09	11.21	24.00	12.79
	5 710	12.51	0.09	12.60	24.00	11.40
802.11ac _VHT80	5 290	12.53	0.24	12.77	24.00	11.23
	5 530	10.07	0.24	10.31	24.00	13.69
	5 690	12.56	0.24	12.80	24.00	11.20
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	5 260	10.21	0.11	10.32	24.00	13.68
	5 300	10.00	0.11	10.11	24.00	13.89
	5 320	9.15	0.11	9.26	24.00	14.74
	5 500	8.01	0.11	8.12	24.00	15.88
	5 600	10.69	0.11	10.80	24.00	13.20
	5 720	10.28	0.11	10.39	24.00	13.61
802.11n _HT20	5 260	11.16	0.00	11.16	24.00	12.84
	5 300	10.82	0.00	10.82	24.00	13.18
	5 320	9.97	0.00	9.97	24.00	14.03
	5 500	8.25	0.00	8.25	24.00	15.75
	5 600	10.87	0.00	10.87	24.00	13.13
	5 720	10.52	0.00	10.52	24.00	13.48
802.11ac _VHT20	5 260	11.09	0.00	11.09	24.00	12.91
	5 300	10.84	0.00	10.84	24.00	13.16
	5 320	9.95	0.00	9.95	24.00	14.05
	5 500	8.25	0.00	8.25	24.00	15.75
	5 600	10.90	0.00	10.90	24.00	13.10
	5 720	10.54	0.00	10.54	24.00	13.46
802.11n _HT40	5 270	12.52	0.10	12.62	24.00	11.38
	5 310	11.92	0.10	12.02	24.00	11.98
	5 510	10.71	0.10	10.81	24.00	13.19
	5 590	13.02	0.10	13.12	24.00	10.88
	5 710	12.63	0.10	12.73	24.00	11.27
802.11ac _VHT40	5 270	12.48	0.09	12.57	24.00	11.43
	5 310	11.86	0.09	11.95	24.00	12.05
	5 510	10.69	0.09	10.78	24.00	13.22
	5 590	12.95	0.09	13.04	24.00	10.96
	5 710	12.59	0.09	12.68	24.00	11.32
802.11ac _VHT80	5 290	12.42	0.24	12.66	24.00	11.34
	5 530	11.40	0.24	11.64	24.00	12.36
	5 690	12.88	0.24	13.12	24.00	10.88
Measurement uncertainty		± 1.5 dB				

ANT0+ANT1

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 260	13.01	0.11	13.12	22.96	9.84
	5 300	13.14	0.11	13.25	22.96	9.71
	5 320	12.62	0.11	12.73	22.96	10.23
	5 500	10.35	0.11	10.46	22.96	12.50
	5 600	12.73	0.11	12.84	22.96	10.12
	5 720	13.04	0.11	13.15	22.96	9.81
802.11n _HT20	5 260	13.59	0.00	13.59	22.96	9.37
	5 300	13.69	0.00	13.69	22.96	9.27
	5 320	13.26	0.00	13.26	22.96	9.70
	5 500	10.34	0.00	10.34	22.96	12.62
	5 600	12.71	0.00	12.71	22.96	10.25
	5 720	13.03	0.00	13.03	22.96	9.93
802.11ac _VHT20	5 260	13.65	0.00	13.65	22.96	9.31
	5 300	13.78	0.00	13.78	22.96	9.18
	5 320	13.29	0.00	13.29	22.96	9.67
	5 500	10.32	0.00	10.32	22.96	12.64
	5 600	12.68	0.00	12.68	22.96	10.28
	5 720	13.02	0.00	13.02	22.96	9.94
802.11n _HT40	5 270	15.37	0.10	15.47	22.96	7.49
	5 310	15.17	0.10	15.27	22.96	7.69
	5 510	12.97	0.10	13.07	22.96	9.89
	5 590	15.00	0.10	15.10	22.96	7.86
	5 710	15.39	0.10	15.49	22.96	7.47
802.11ac _VHT40	5 270	15.35	0.09	15.44	22.96	7.52
	5 310	15.16	0.09	15.25	22.96	7.71
	5 510	12.99	0.09	13.08	22.96	9.88
	5 590	14.99	0.09	15.08	22.96	7.88
	5 710	15.43	0.09	15.52	22.96	7.44
802.11ac _VHT80	5 290	15.49	0.24	15.73	22.96	7.23
	5 530	12.57	0.24	12.81	22.96	10.15
	5 690	14.70	0.24	14.94	22.96	8.02
Measurement uncertainty		± 1.5 dB				

ANT0+ANT1+ANT2

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 260	14.85	0.11	14.96	21.24	6.28
	5 300	15.20	0.11	15.31	21.24	5.93
	5 320	14.73	0.11	14.84	21.24	6.40
	5 500	12.24	0.11	12.35	21.24	8.89
	5 600	14.44	0.11	14.55	21.24	6.69
	5 720	14.96	0.11	15.07	21.24	6.17
802.11n _HT20	5 260	15.36	0.00	15.36	21.24	5.88
	5 300	15.67	0.00	15.67	21.24	5.57
	5 320	15.28	0.00	15.28	21.24	5.96
	5 500	12.28	0.00	12.28	21.24	8.96
	5 600	14.51	0.00	14.51	21.24	6.73
	5 720	15.08	0.00	15.08	21.24	6.16
802.11ac _VHT20	5 260	15.40	0.00	15.40	21.24	5.84
	5 300	15.74	0.00	15.74	21.24	5.50
	5 320	15.31	0.00	15.31	21.24	5.93
	5 500	12.26	0.00	12.26	21.24	8.98
	5 600	14.52	0.00	14.52	21.24	6.72
	5 720	15.07	0.00	15.07	21.24	6.17
802.11n _HT40	5 270	17.07	0.10	17.17	21.24	4.07
	5 310	17.13	0.10	17.23	21.24	4.01
	5 510	14.63	0.10	14.73	21.24	6.51
	5 590	16.50	0.10	16.60	21.24	4.64
	5 710	17.17	0.10	17.27	21.24	3.97
802.11ac _VHT40	5 270	17.06	0.09	17.15	21.24	4.09
	5 310	17.11	0.09	17.20	21.24	4.04
	5 510	14.64	0.09	14.73	21.24	6.51
	5 590	16.48	0.09	16.57	21.24	4.67
	5 710	17.22	0.09	17.31	21.24	3.93
802.11ac _VHT80	5 290	17.27	0.24	17.51	21.24	3.73
	5 530	14.51	0.24	14.75	21.24	6.49
	5 690	16.77	0.24	17.01	21.24	4.23
Measurement uncertainty		± 1.5 dB				

ANT0+ANT1+ANT2+ANT3

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 260	16.13	0.11	16.24	20.05	3.81
	5 300	16.34	0.11	16.45	20.05	3.60
	5 320	15.79	0.11	15.90	20.05	4.15
	5 500	13.63	0.11	13.74	20.05	6.31
	5 600	15.97	0.11	16.08	20.05	3.97
	5 720	16.24	0.11	16.35	20.05	3.70
802.11n _HT20	5 260	16.76	0.00	16.76	20.05	3.29
	5 300	16.90	0.00	16.90	20.05	3.15
	5 320	16.40	0.00	16.40	20.05	3.65
	5 500	13.73	0.00	13.73	20.05	6.32
	5 600	16.07	0.00	16.07	20.05	3.98
	5 720	16.39	0.00	16.39	20.05	3.66
802.11ac _VHT20	5 260	16.77	0.00	16.77	20.05	3.28
	5 300	16.96	0.00	16.96	20.05	3.09
	5 320	16.42	0.00	16.42	20.05	3.63
	5 500	13.71	0.00	13.71	20.05	6.34
	5 600	16.08	0.00	16.08	20.05	3.97
	5 720	16.38	0.00	16.38	20.05	3.67
802.11n _HT40	5 270	18.38	0.10	18.48	20.05	1.57
	5 310	18.27	0.10	18.37	20.05	1.68
	5 510	16.11	0.10	16.21	20.05	3.84
	5 590	18.11	0.10	18.21	20.05	1.84
	5 710	18.48	0.10	18.58	20.05	1.47
802.11ac _VHT40	5 270	18.36	0.09	18.45	20.05	1.60
	5 310	18.25	0.09	18.34	20.05	1.71
	5 510	16.11	0.09	16.20	20.05	3.85
	5 590	18.08	0.09	18.17	20.05	1.88
	5 710	18.50	0.09	18.59	20.05	1.46
802.11ac _VHT80	5 290	18.5	0.24	18.74	20.05	1.31
	5 530	16.24	0.24	16.48	20.05	3.57
	5 690	18.26	0.24	18.50	20.05	1.55
Measurement uncertainty		± 1.5 dB				

ANT0 + ANT2_1TX

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11ac _VHT160	5 250	15.38	0.11	15.49	22.96	7.47
	5 570	14.42	0.11	14.53	22.96	8.43
Measurement uncertainty		± 1.5 dB				

ANT1 + ANT3_1TX

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11ac _VHT160	5 250	15.38	0.11	15.49	22.96	7.47
	5 570	14.45	0.11	14.56	22.96	8.40
Measurement uncertainty		± 1.5 dB				

ANT0 + ANT1 + ANT2 + ANT3_2TX

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11ac _VHT160	5 250	18.39	0.11	18.50	20.05	1.55
	5 570	17.45	0.11	17.56	20.05	2.49
Measurement uncertainty		± 1.5 dB				

See next pages for actual measured spectrum plots.

ANT0_802.11a_UNII 2A

ANT0_802.11a_UNII 2C

ANT1_802.11a_UNII 2A

ANT1_802.11a_UNII 2C

ANT2_802.11a_UNII 2A

ANT2_802.11a_UNII 2C

ANT3_802.11a_UNII 2A

ANT3_802.11a_UNII 2C

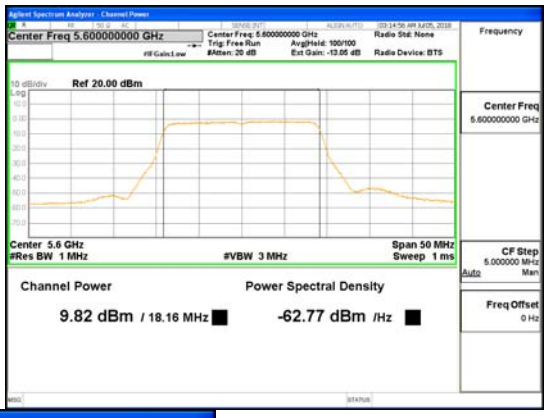
ANT0_802.11n_HT20_UNII 2A

ANT0_802.11n_HT20_UNII 2C

ANT1_802.11n_HT20_UNII 2A

ANT1_802.11n_HT20_UNII 2C

ANT2_802.11n_HT20_UNII 2A



ANT2_802.11n_HT20_UNII 2C

ANT3_802.11n_HT20_UNII 2A

ANT3_802.11n_HT20_UNII 2C

ANT0_802.11ac_VHT20_UNII 2A

ANT0_802.11ac_VHT20_UNII 2C

ANT1_802.11ac_VHT20_UNII 2A

ANT1_802.11ac_VHT20_UNII 2C

ANT2_802.11ac_VHT20_UNII 2A

ANT2_802.11ac_VHT20_UNII 2C

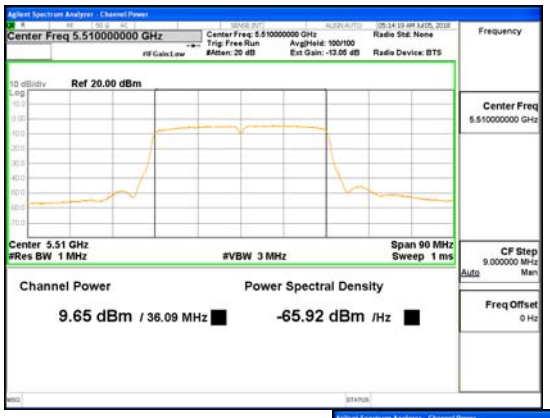
ANT3_802.11ac_VHT20_UNII 2A

ANT3_802.11ac_VHT20_UNII 2C

ANT0_802.11n_HT40_UNII 2A

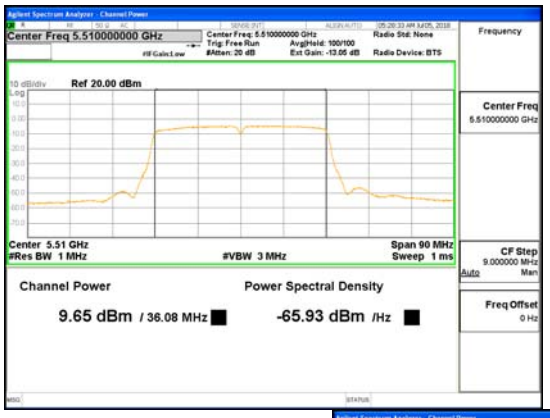
ANT0_802.11n_HT40_UNII 2C

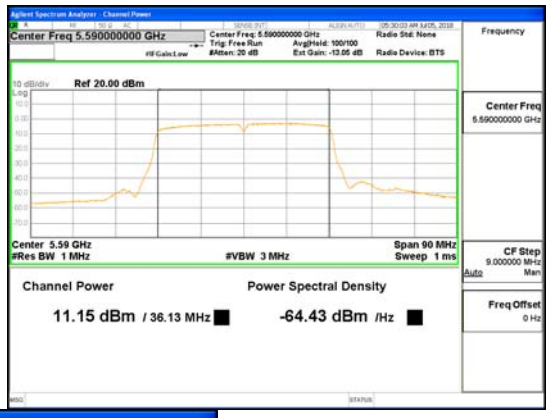
ANT1_802.11n_HT40_UNII 2A



ANT1_802.11n_HT40_UNII 2C

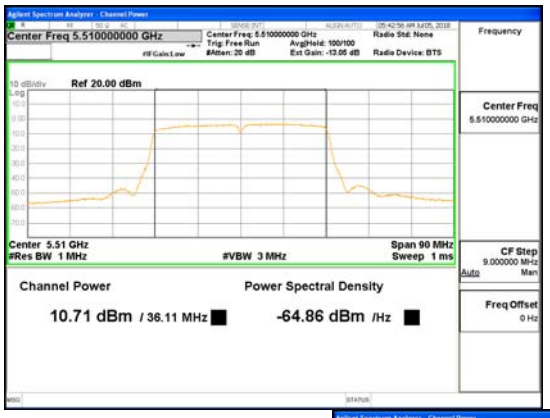
ANT2_802.11n_HT40_UNII 2A





ANT2_802.11n_HT40_UNII 2C

ANT3_802.11n_HT40_UNII 2A

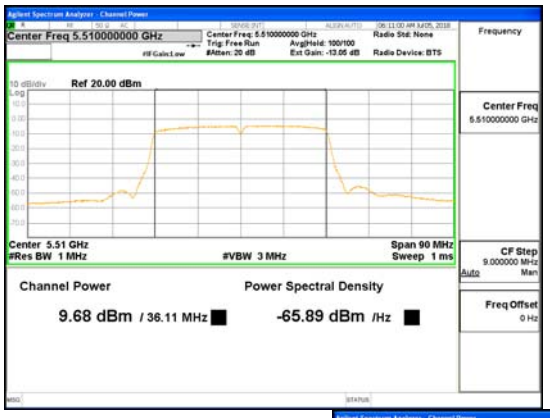


ANT3_802.11n_HT40_UNII 2C

ANT0_802.11ac_VHT40_UNII 2A

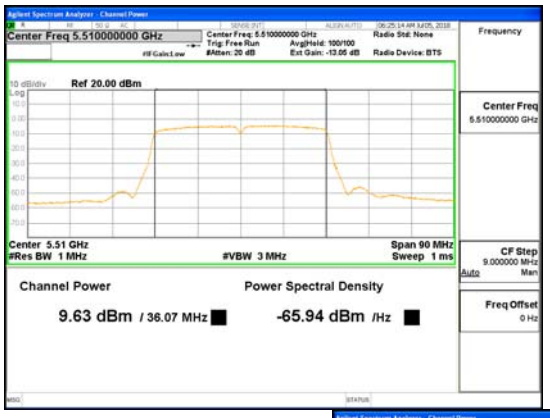
ANT0_802.11ac_VHT40_UNII 2C

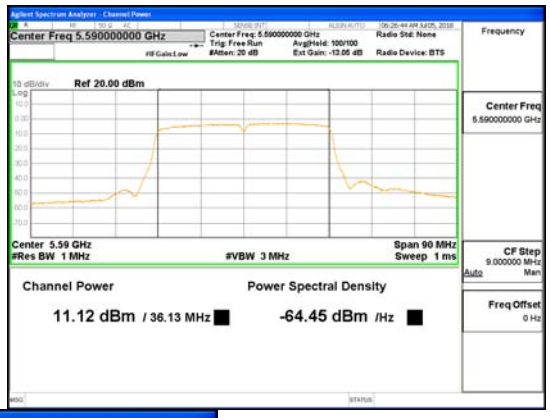
ANT1_802.11ac_VHT40_UNII 2A



ANT1_802.11ac_VHT40_UNII 2C

ANT2_802.11ac_VHT40_UNII 2A





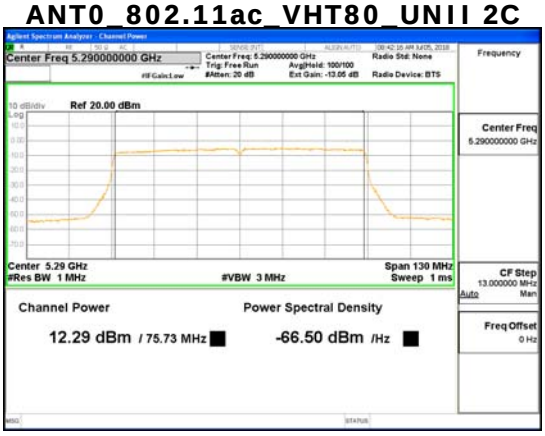
ANT2_802.11ac_VHT40_UNII 2C

ANT3_802.11ac_VHT40_UNII 2A

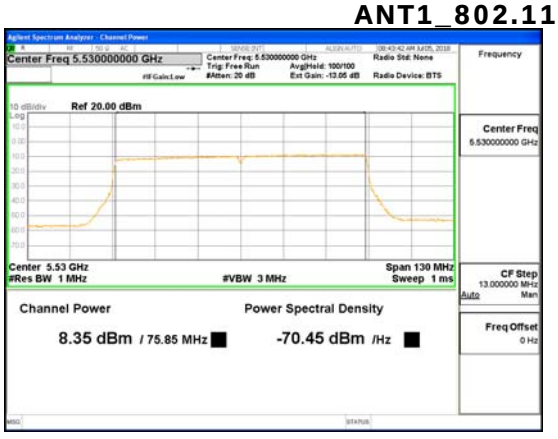
ANT3_802.11ac_VHT40_UNII 2C

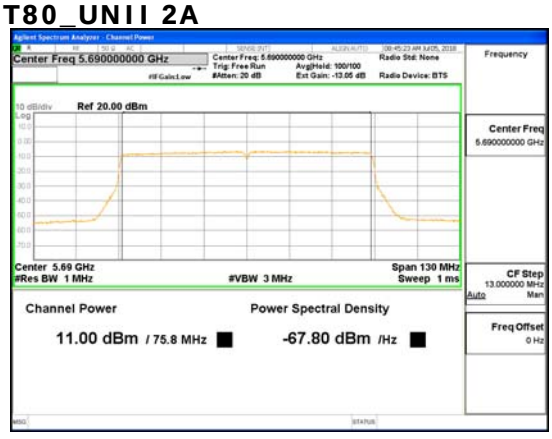
ANT0_802.11ac_VHT80_UNII 2A

ANT0_802.11ac_VHT80_UNII 2C



ANT1_802.11ac_VHT80_UNII 2A

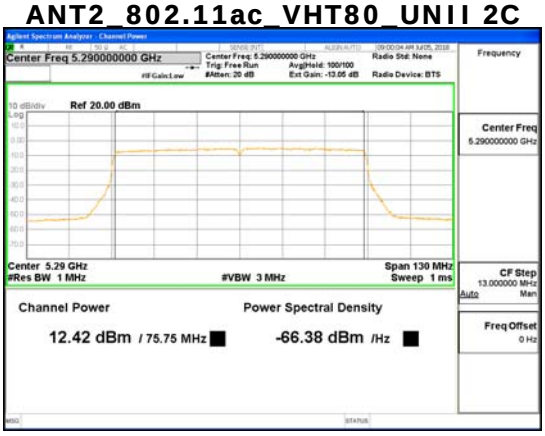




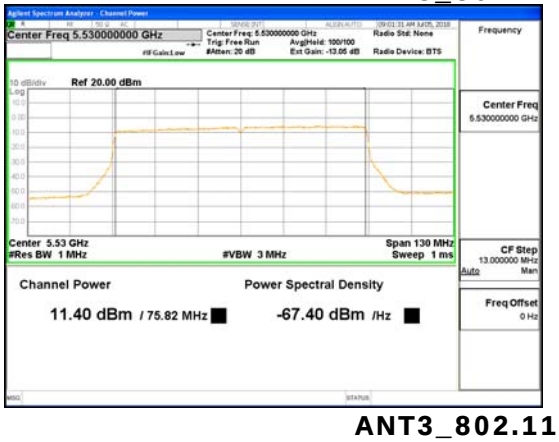
ANT1_802.11ac_VHT80_UNII 2C

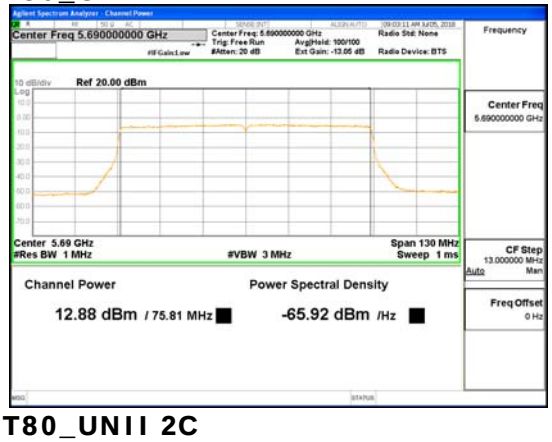
ANT2_802.11ac_VHT80_UNII 2A

ANT2_802.11ac_VHT80_UNII 2C



ANT3_802.11ac_VHT80_UNII 2A

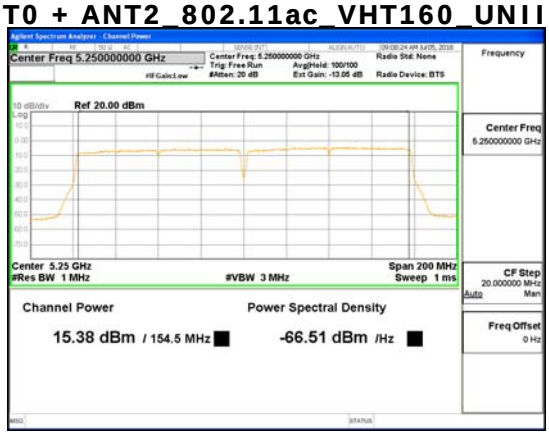




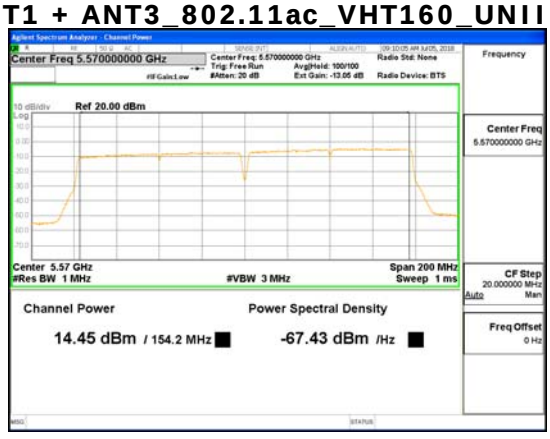
ANT3_802.11ac_VHT80_UNII 2C

ANT0 + ANT2_802.11ac_VHT160_UNII 2A

ANT0 + ANT2_802.11ac_VHT160_UNII 2C



ANT1 + ANT3_802.11ac_VHT160_UNII 2A



ANT1+ ANT3_802.11ac_VHT160_UNII 2C