802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-34: Peak Power Spectral Density SISO Secondary, 802.11b, Channel 1, 1 Mbps

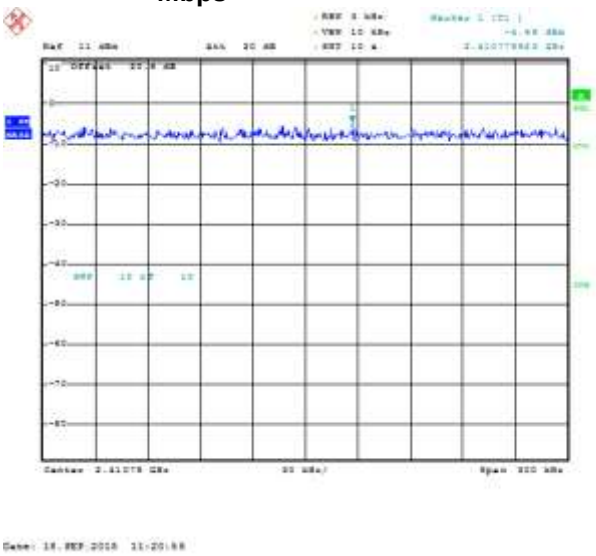


Figure 6-35: Peak Power Spectral Density SISO Secondary, 802.11b, Channel 6, 1 Mbps

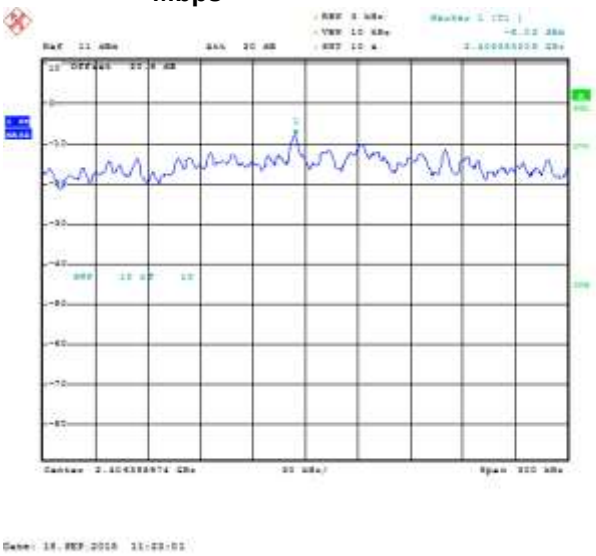
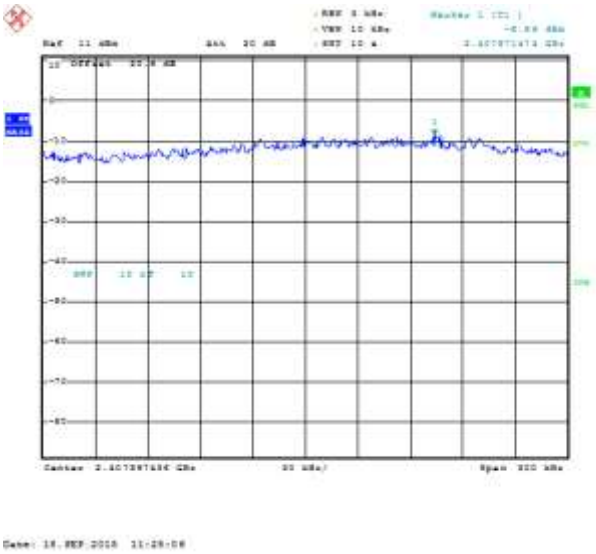


Figure 6-36: Peak Power Spectral Density SISO Secondary, 802.11b, Channel 11, 1 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-37: Peak Power Spectral Density SISO Secondary, 802.11g, Channel 1, 6 Mbps

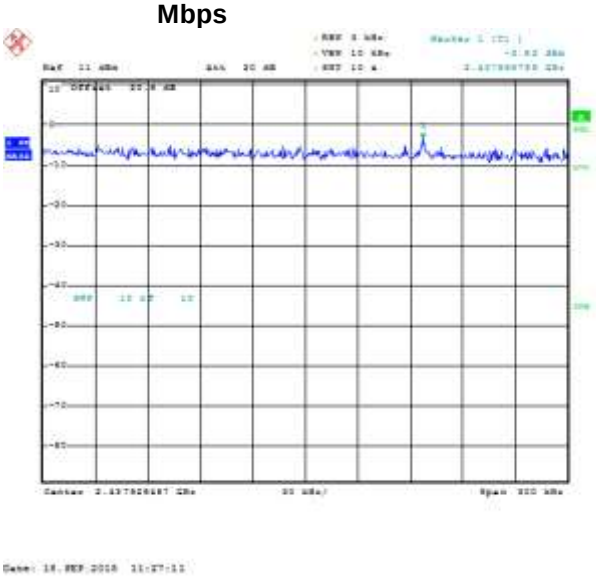


Figure 6-38: Peak Power Spectral Density SISO Secondary, 802.11g, Channel 6, 6 Mbps

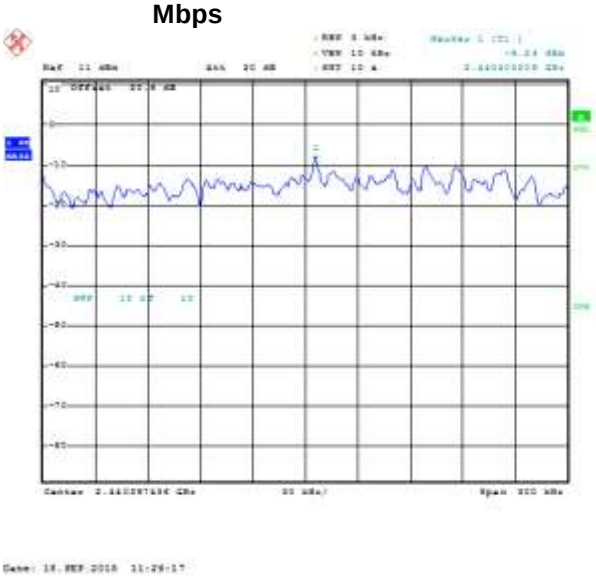
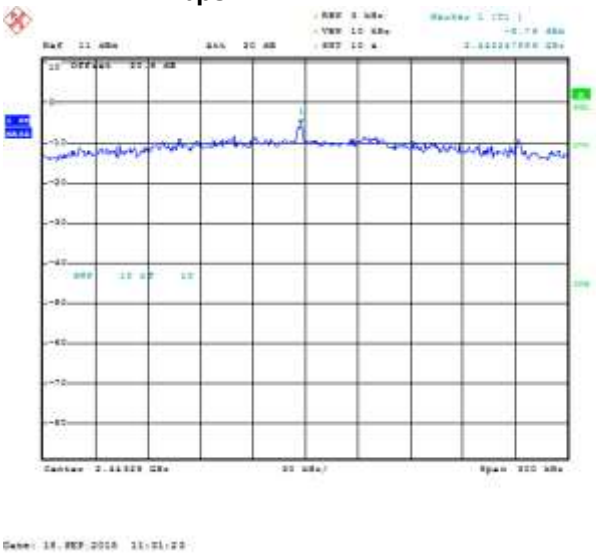


Figure 6-39: Peak Power Spectral Density SISO Secondary, 802.11g, Channel 11, 6 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-40: Peak Power Spectral Density SISO Secondary, 802.11n, Channel 1, MCS 0

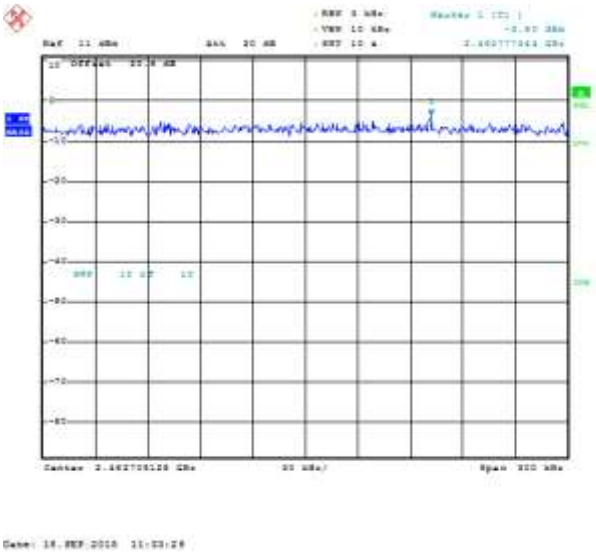


Figure 6-41: Peak Power Spectral Density SISO Secondary, 802.11n, Channel 6, MCS 0

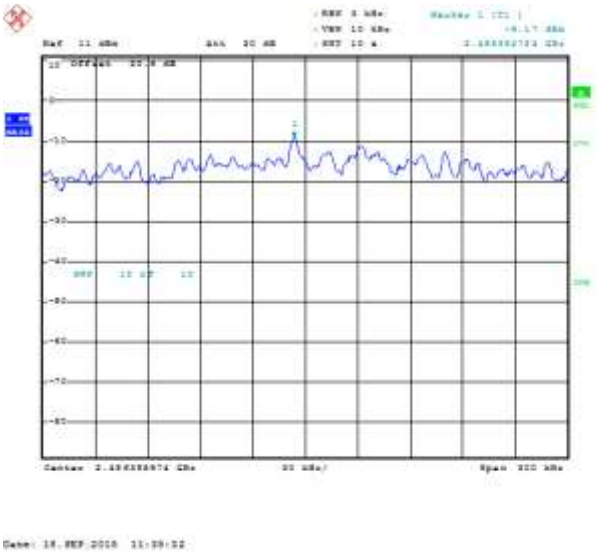
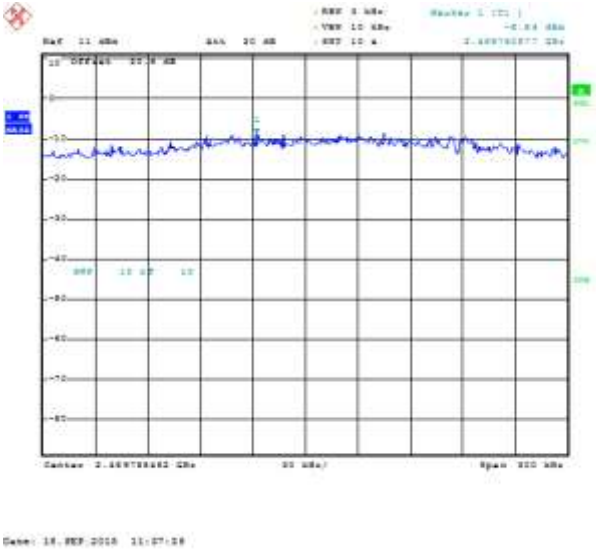


Figure 6-42: Peak Power Spectral Density SISO Secondary, 802.11n, Channel 11, MCS 0



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-43: Peak Power Spectral Density MIMO Primary, 802.11b, Channel 1, 1 Mbps

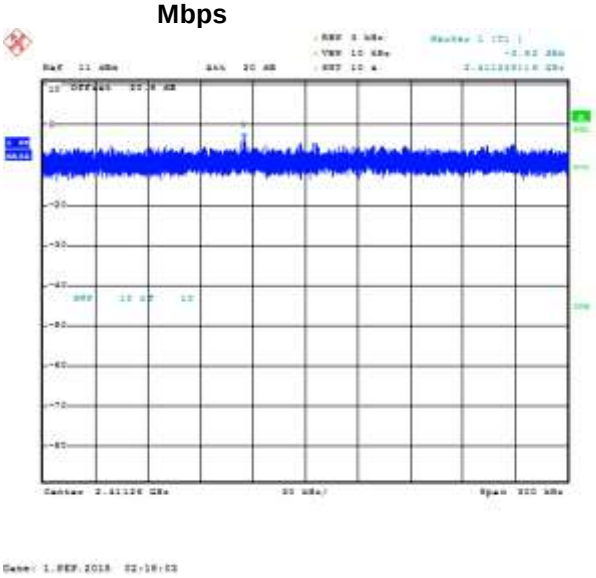


Figure 6-44: Peak Power Spectral Density MIMO Primary, 802.11b, Channel 6, 1 Mbps

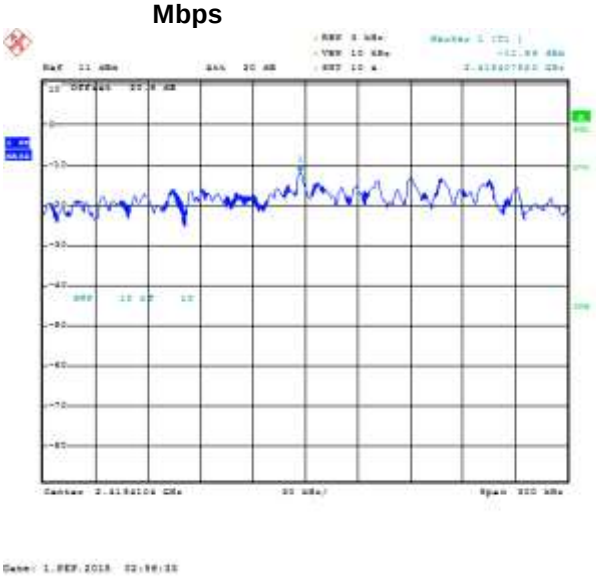
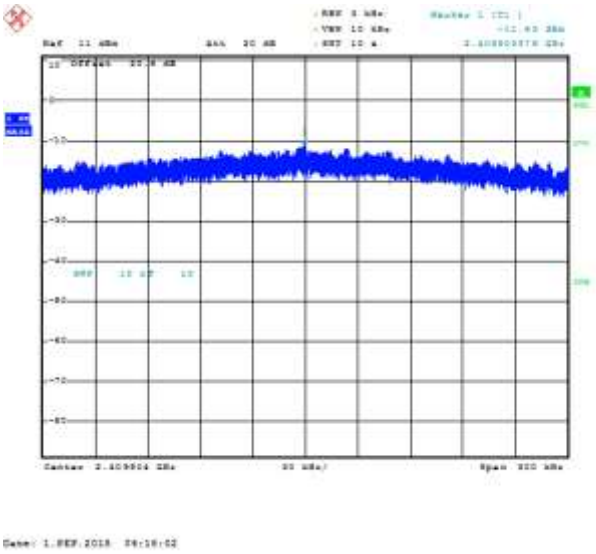


Figure 6-45: Peak Power Spectral Density MIMO Primary, 802.11b, Channel 11, 1 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-46: Peak Power Spectral Density MIMO Primary, 802.11g, Channel 1, 6 Mbps

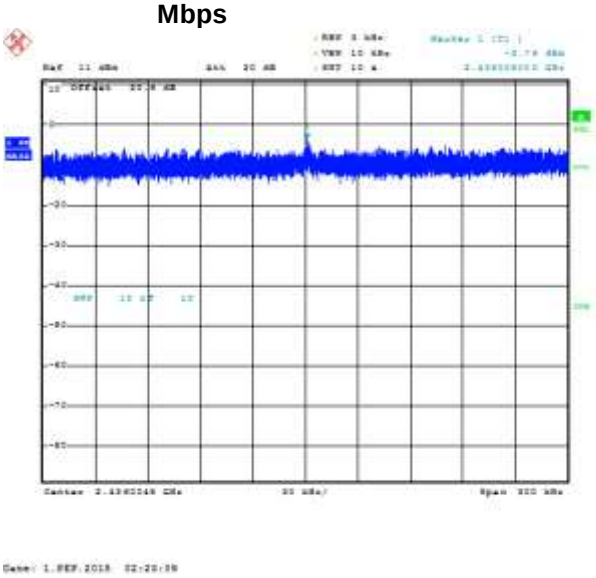


Figure 6-47: Peak Power Spectral Density MIMO Primary, 802.11g, Channel 6, 6 Mbps

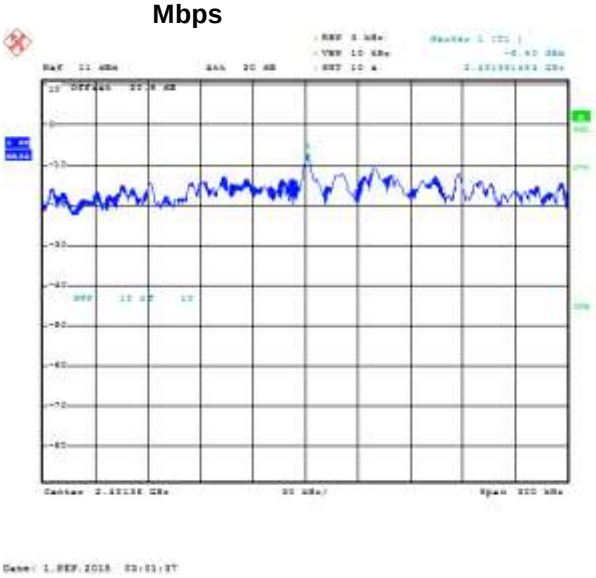
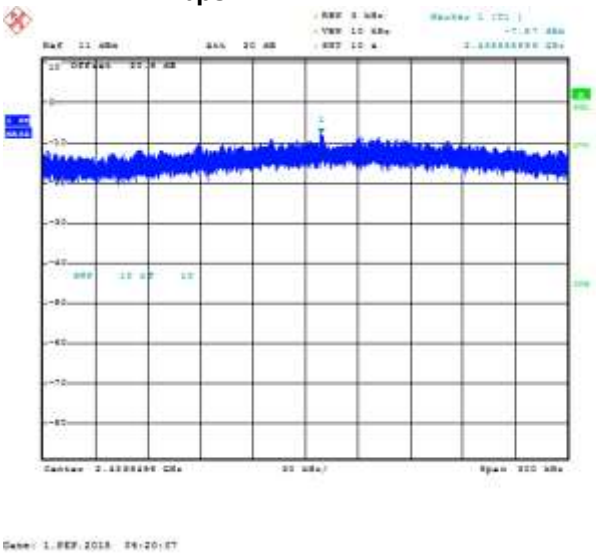


Figure 6-48: Peak Power Spectral Density MIMO Primary, 802.11g, Channel 11, 6 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-49: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 1, MCS 0

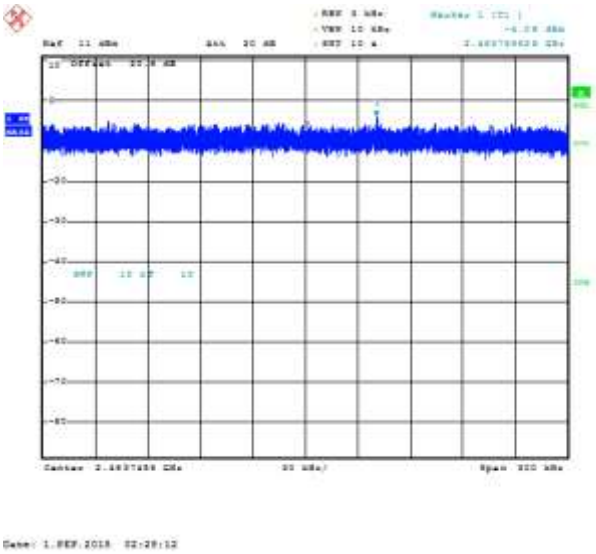


Figure 6-50: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 6, MCS 0

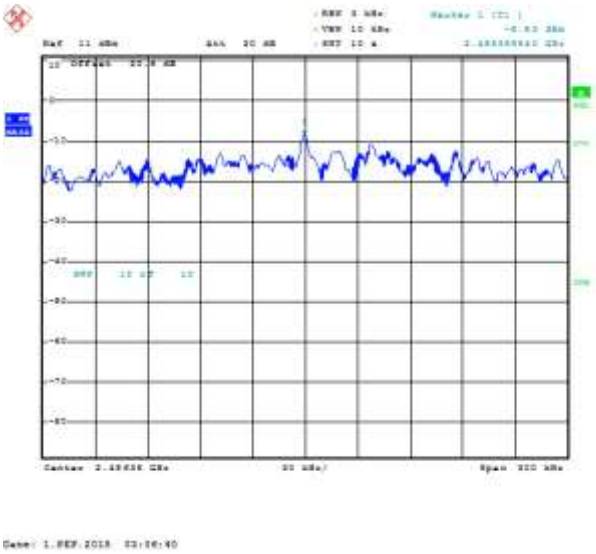
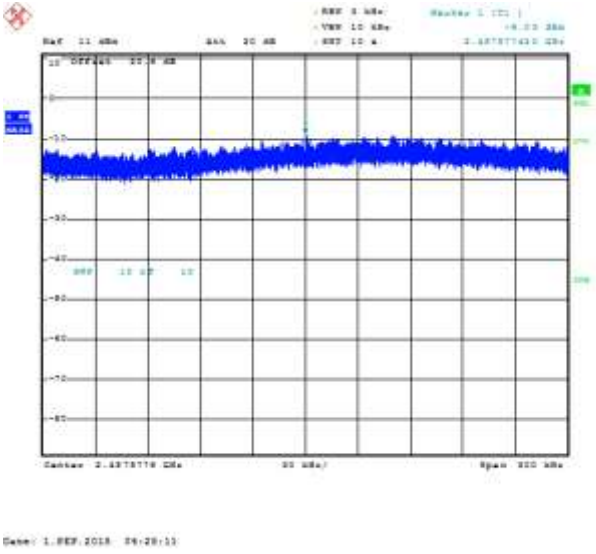


Figure 6-51: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 11, MCS 0



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-52: Peak Power Spectral Density MIMO Secondary, 802.11b, Channel 1, 1 Mbps

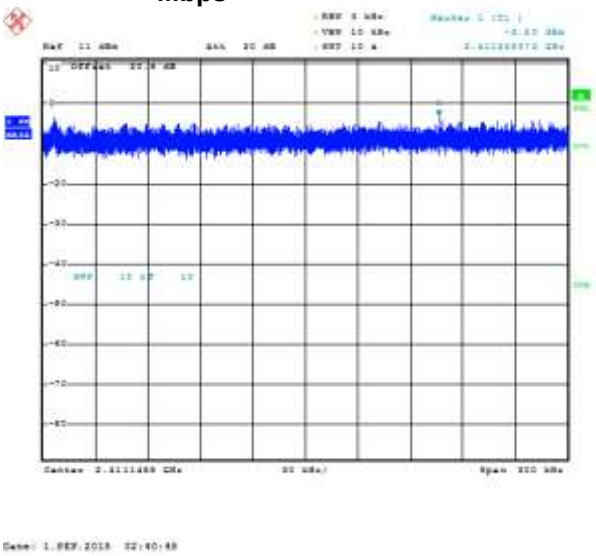


Figure 6-53: Peak Power Spectral Density MIMO Secondary, 802.11b, Channel 6, 1 Mbps

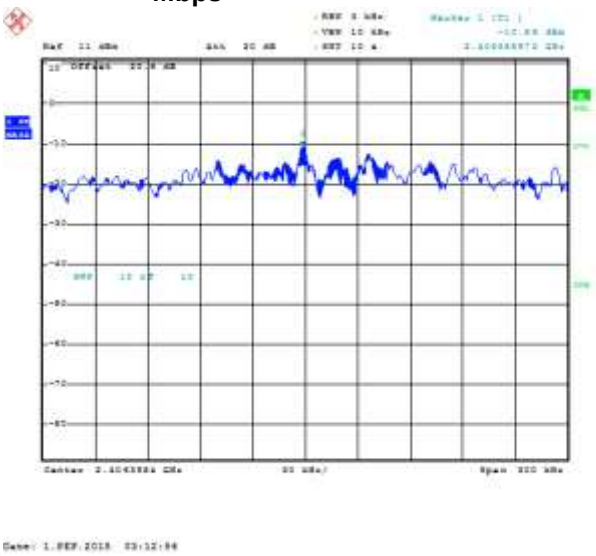
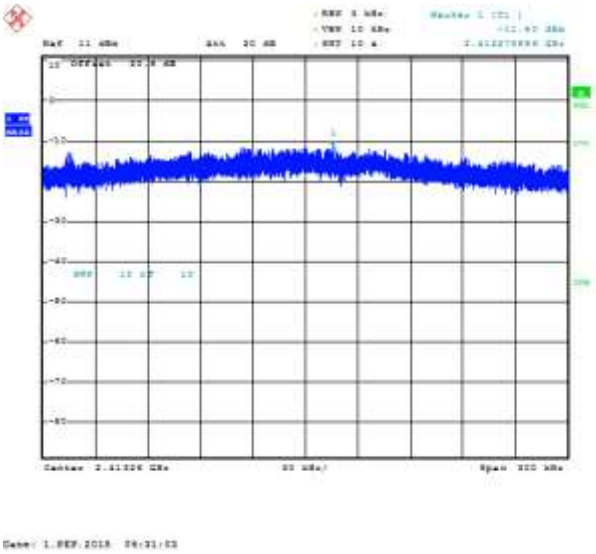


Figure 6-54: Peak Power Spectral Density MIMO Secondary, 802.11b, Channel 11, 1 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-55: Peak Power Spectral Density MIMO Secondary, 802.11g, Channel 1, 6 Mbps

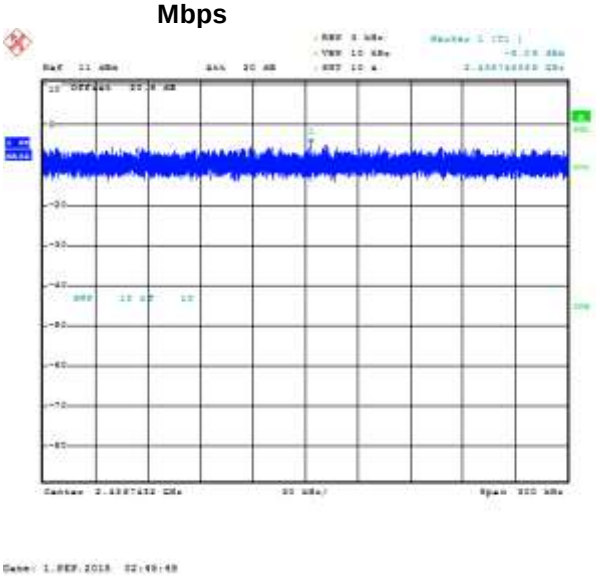


Figure 6-56: Peak Power Spectral Density MIMO Secondary, 802.11g, Channel 6, 6 Mbps

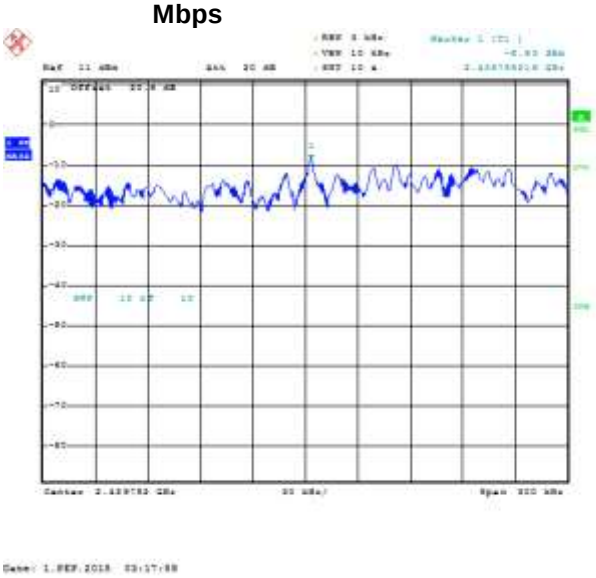
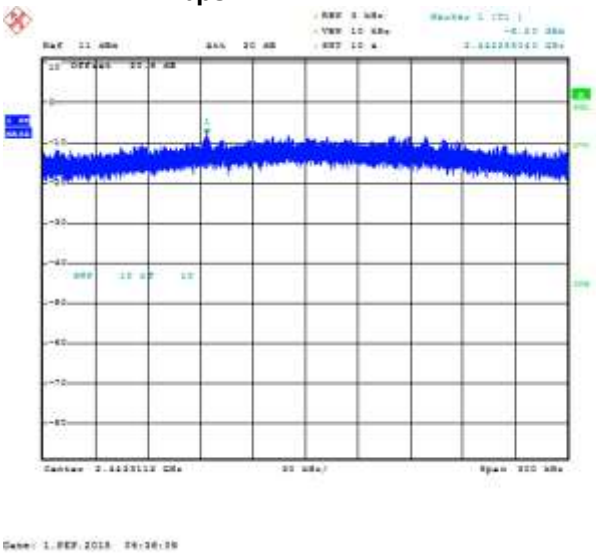


Figure 6-57: Peak Power Spectral Density MIMO Secondary, 802.11g, Channel 11, 6 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-58: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 1, MCS 0

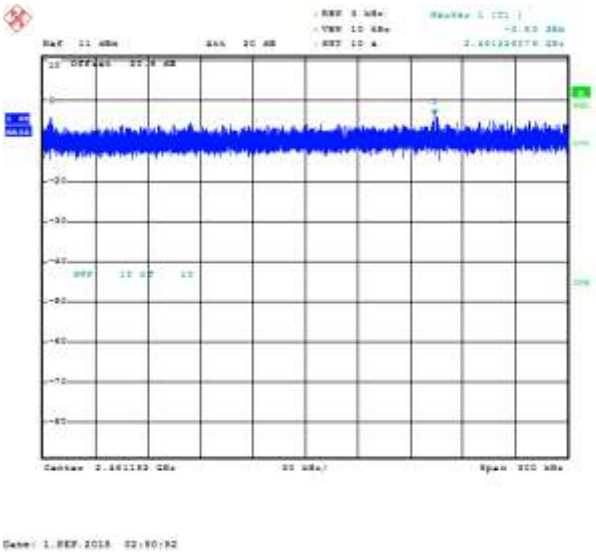


Figure 6-59: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 6, MCS 0

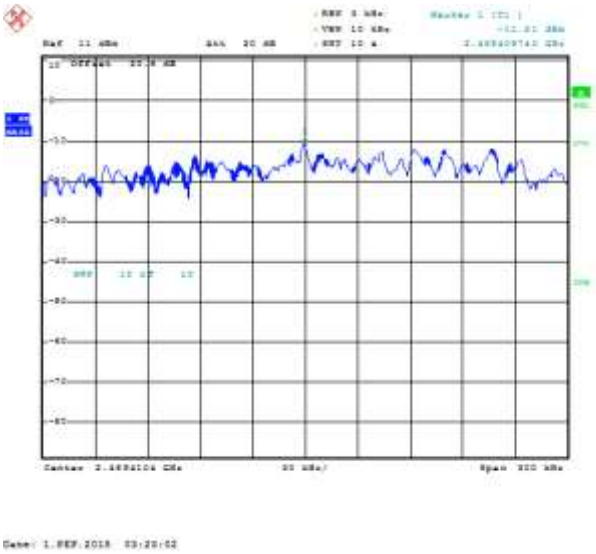
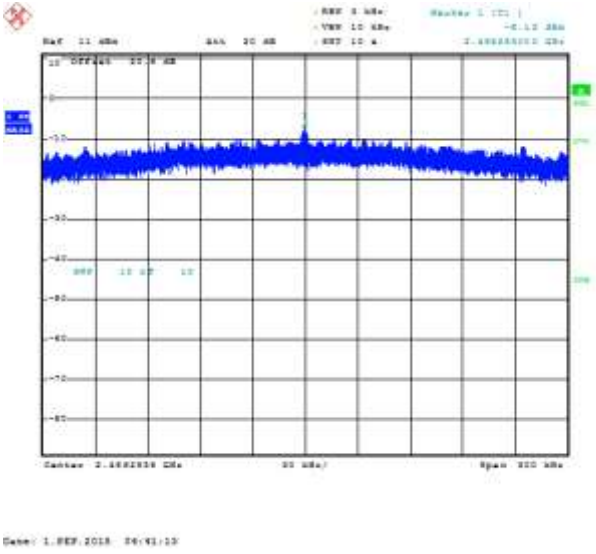


Figure 6-60: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 11, MCS 0



802.11b/g/n RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-247. Channels 1, 6 and 11 were measured at 1 Mbps for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 for 802.11n mode. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 18.4 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

Primary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
1	1 Mbps	16.33	-27.67	-44.00	-20
	6 Mbps	16.20	-21.41	-37.61	-20
	MCS 0	15.99	-18.85	-34.84	-20
6	1 Mbps	16.85	-26.70	-43.55	-20
	6 Mbps	16.66	-16.69	-33.35	-20
	MCS 0	16.56	-17.04	-33.60	-20
11	1 Mbps	17.08	-26.96	-44.04	-20
	6 Mbps	16.74	-22.18	-38.92	-20
	MCS 0	16.70	-16.06	-32.76	-20

Secondary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
1	1 Mbps	17.01	-24.92	-41.93	-20
	6 Mbps	16.41	-17.42	-33.83	-20
	MCS 0	16.18	-19.94	-36.12	-20
6	1 Mbps	17.04	-36.17	-53.21	-20
	6 Mbps	16.55	-19.39	-35.94	-20
	MCS 0	16.30	-18.73	-35.03	-20
11	1 Mbps	16.79	-26.96	-43.75	-20
	6 Mbps	16.14	-22.28	-38.42	-20
	MCS 0	16.08	-18.66	-34.74	-20

802.11b/g/n RF Conducted Emission Test Results cont'd

Sum

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
1	1 Mbps	19.87	-23.07	-42.94	-20
	6 Mbps	16.67	-15.96	-32.63	-20
	MCS 0	16.69	-16.35	-33.04	-20
6	1 Mbps	20.09	-26.24	-46.33	-20
	6 Mbps	19.64	-14.82	-34.46	-20
	MCS 0	19.56	-14.79	-34.35	-20
11	1 Mbps	20.05	-23.95	-44.00	-20
	6 Mbps	18.69	-19.22	-37.91	-20
	MCS 0	18.47	-14.16	-32.63	-20

See figures 6-61 to 6-78 for the plots of the spurious RF conducted emissions for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 each for 802.11n mode.

802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-61: Spurious Conducted RF Emissions
Primary, 802.11b, Channel 1, 1 Mbps

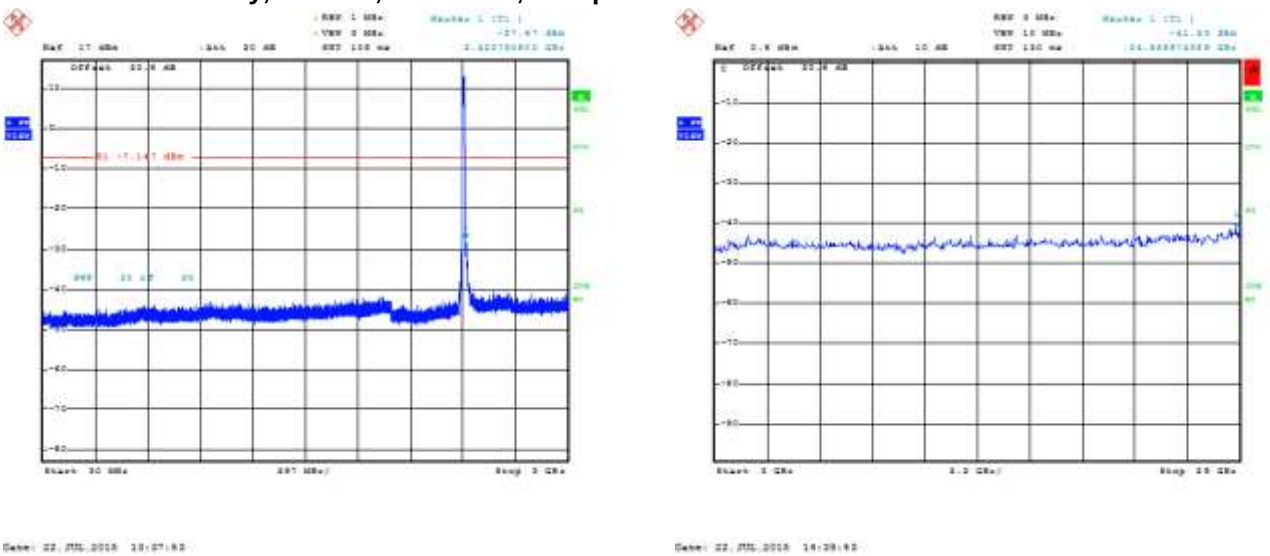
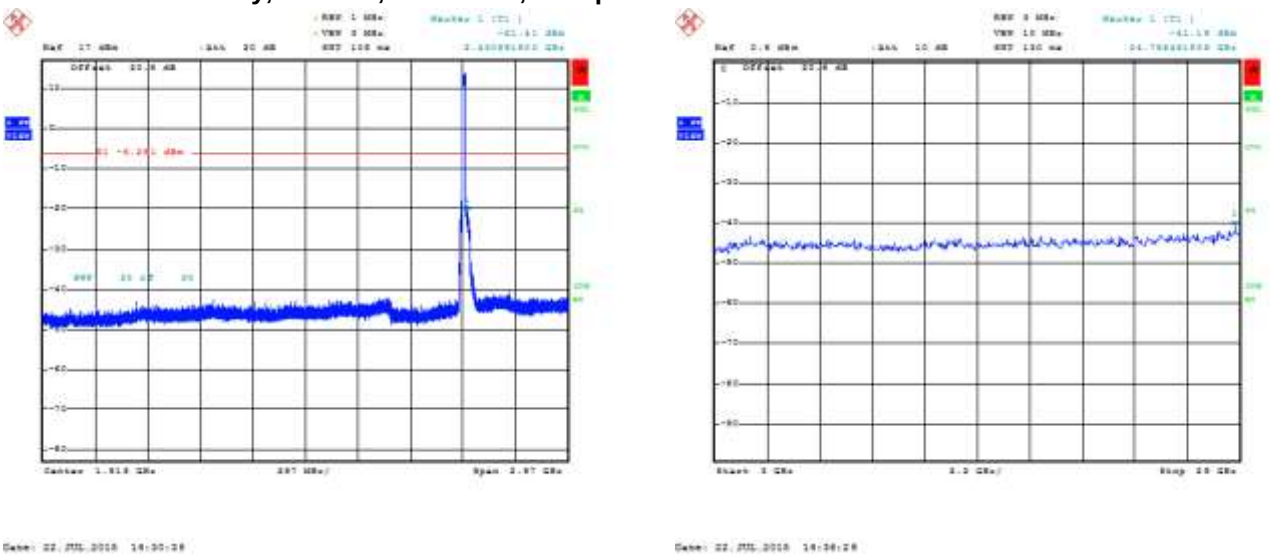


Figure 6-62 : Spurious Conducted RF Emissions
Primary, 802.11b, Channel 6, 1 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-63: Spurious Conducted RF Emissions
Primary, 802.11b, Channel 11, 1 Mbps

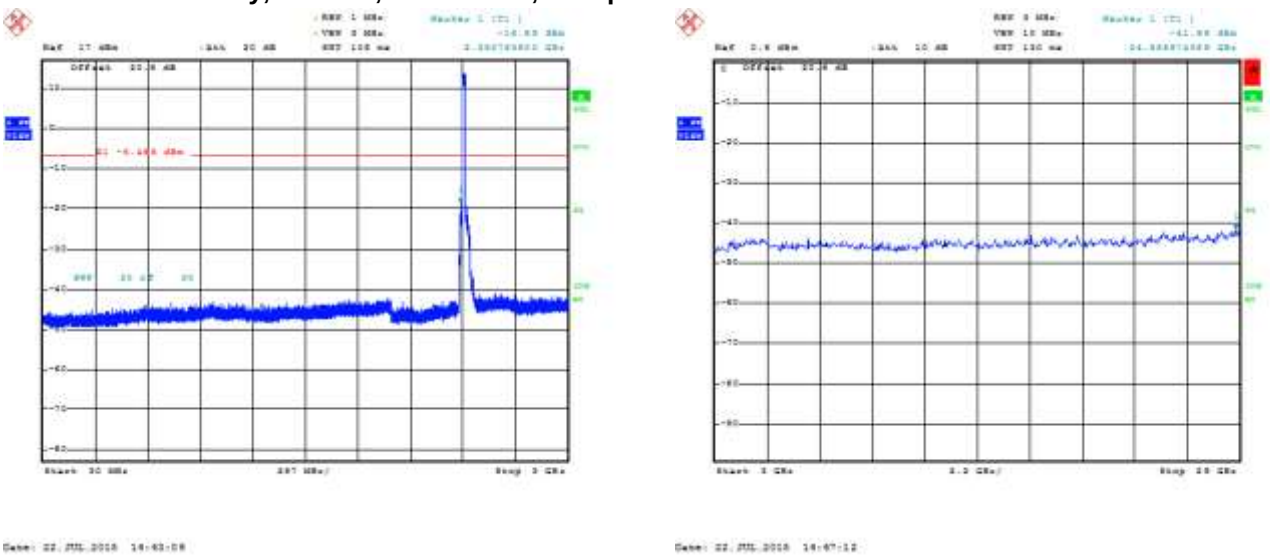
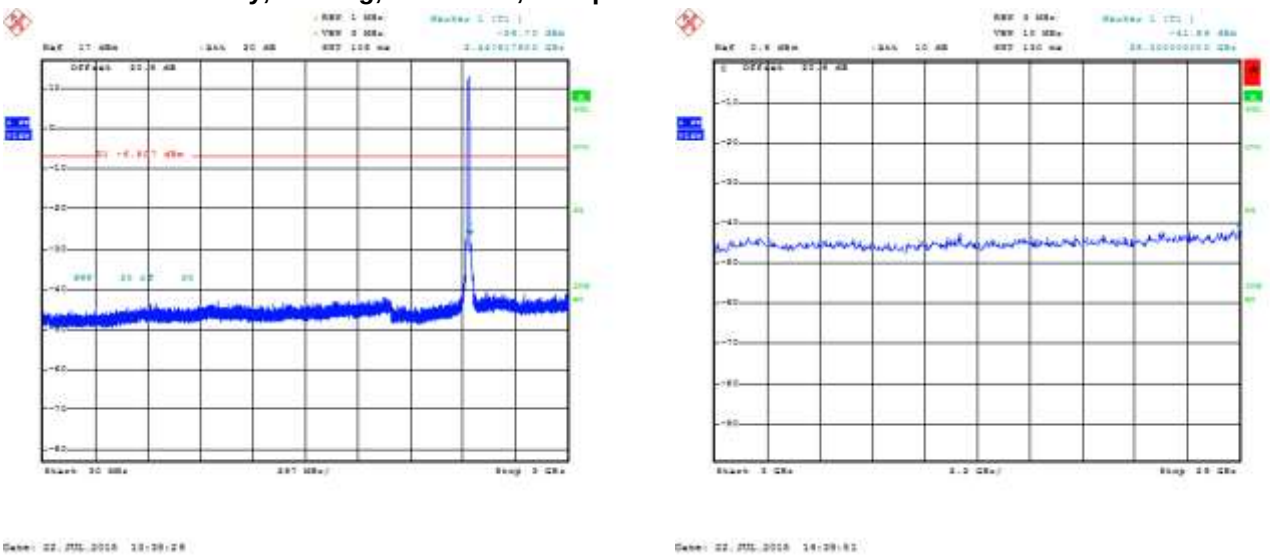


Figure 6-64: Spurious Conducted RF Emissions
Primary, 802.11g, Channel 1, 6 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-65: Spurious Conducted RF Emissions Primary, 802.11g, Channel 6, 6 Mbps

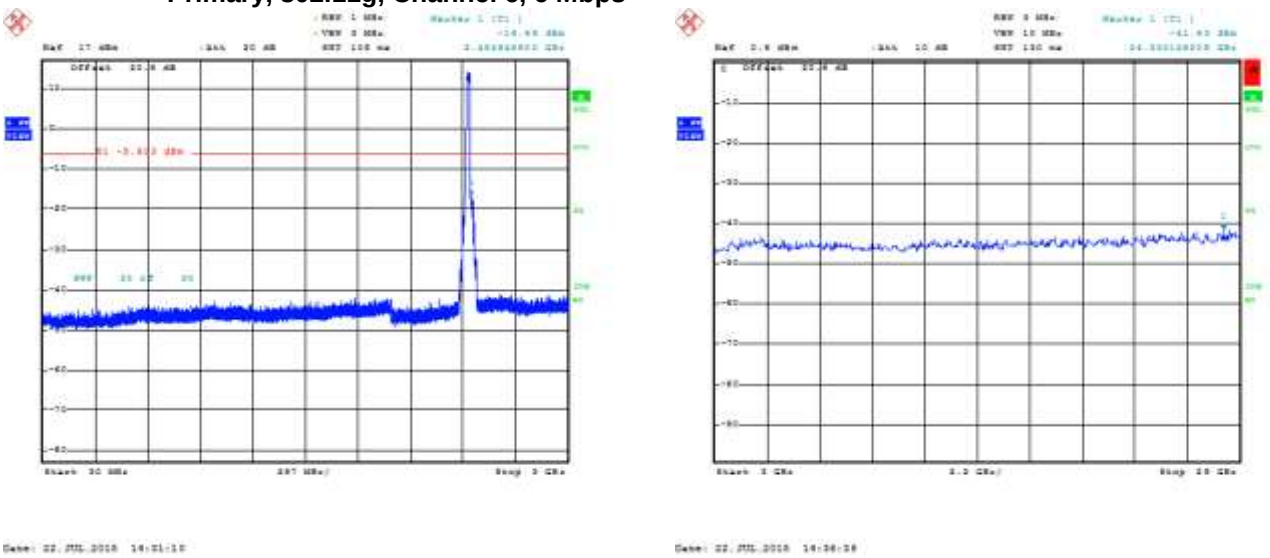
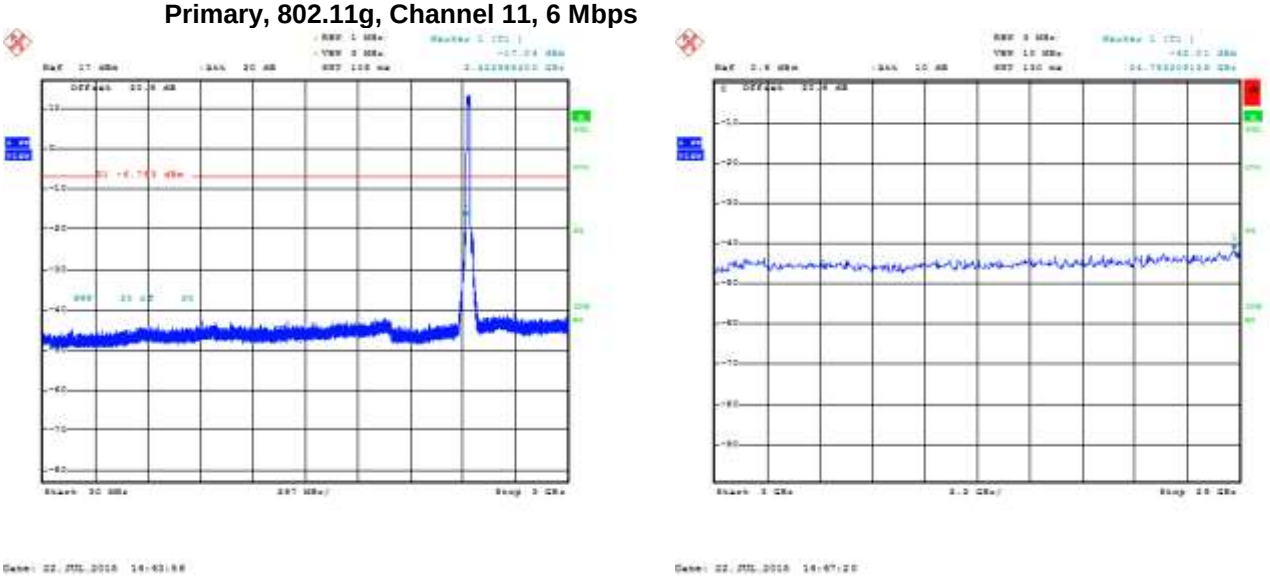


Figure 6-66: Spurious Conducted RF Emissions Primary, 802.11g, Channel 11, 6 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-67: Spurious Conducted RF Emissions Primary, 802.11n, Channel 1, MCS 0

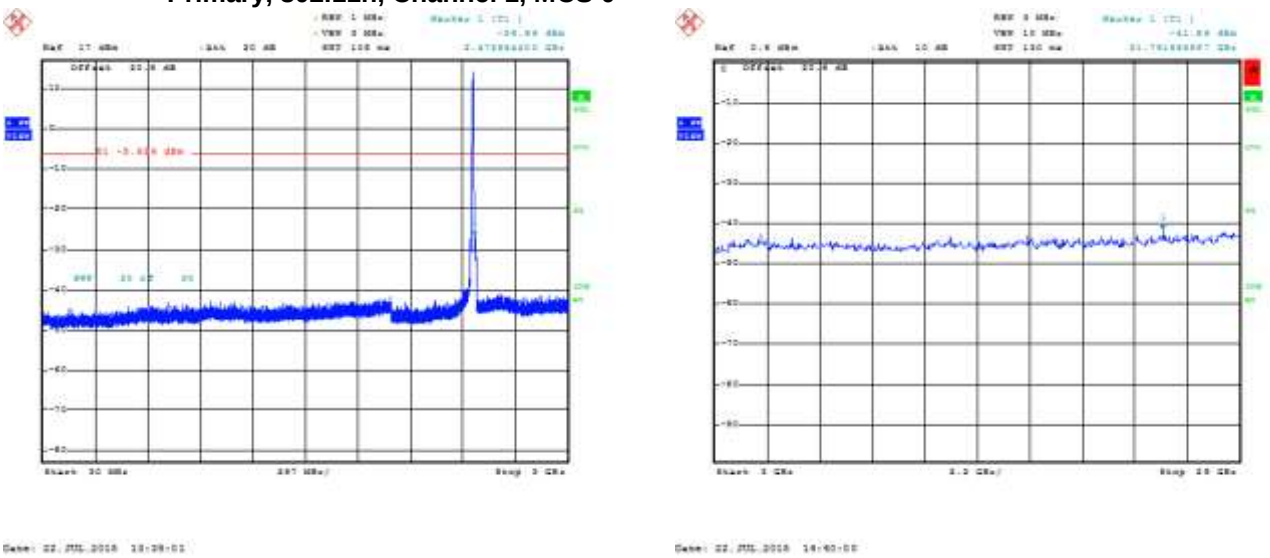
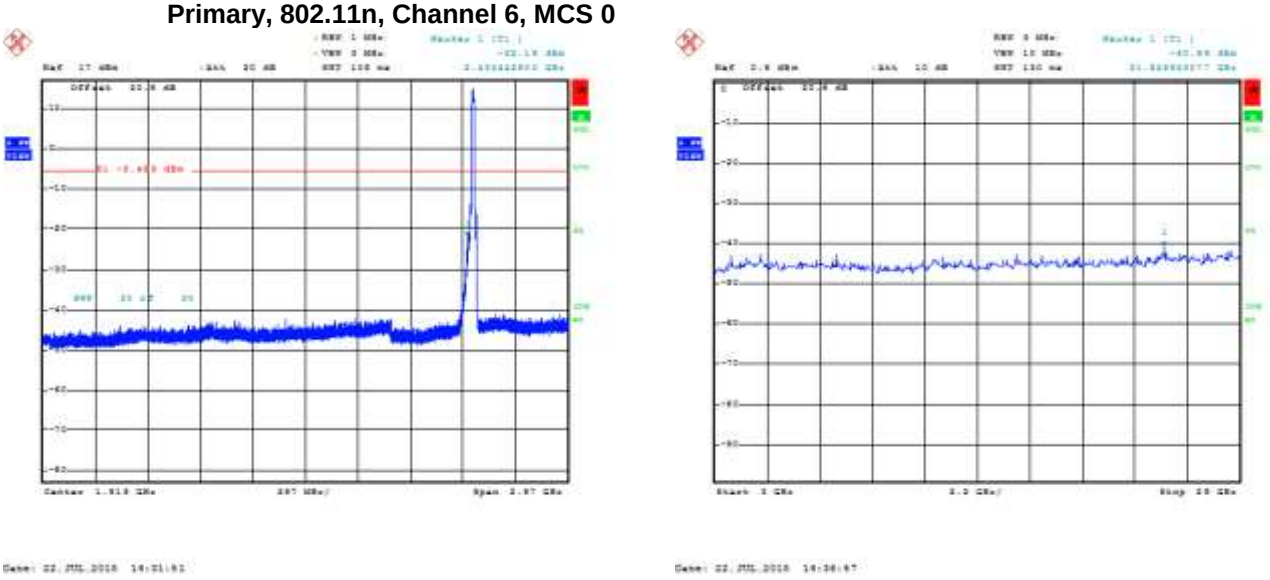
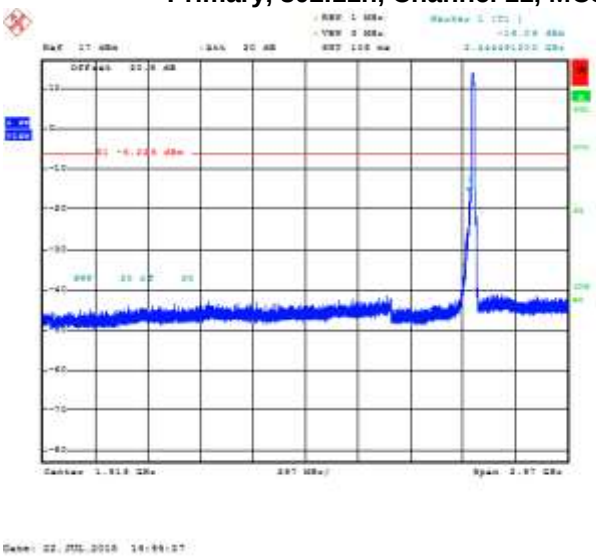


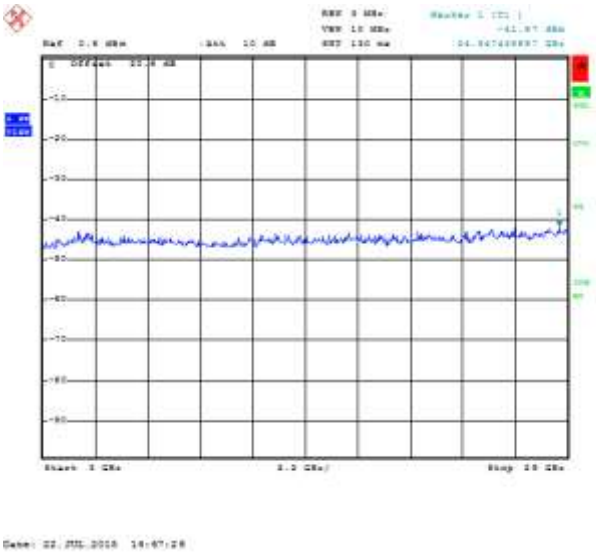
Figure 6-68: Spurious Conducted RF Emissions Primary, 802.11n, Channel 6, MCS 0



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-69: Spurious Conducted RF Emissions
Primary, 802.11n, Channel 11, MCS 0





802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-70: Spurious Conducted RF Emissions
Secondary, 802.11b, Channel 1, 1 Mbps

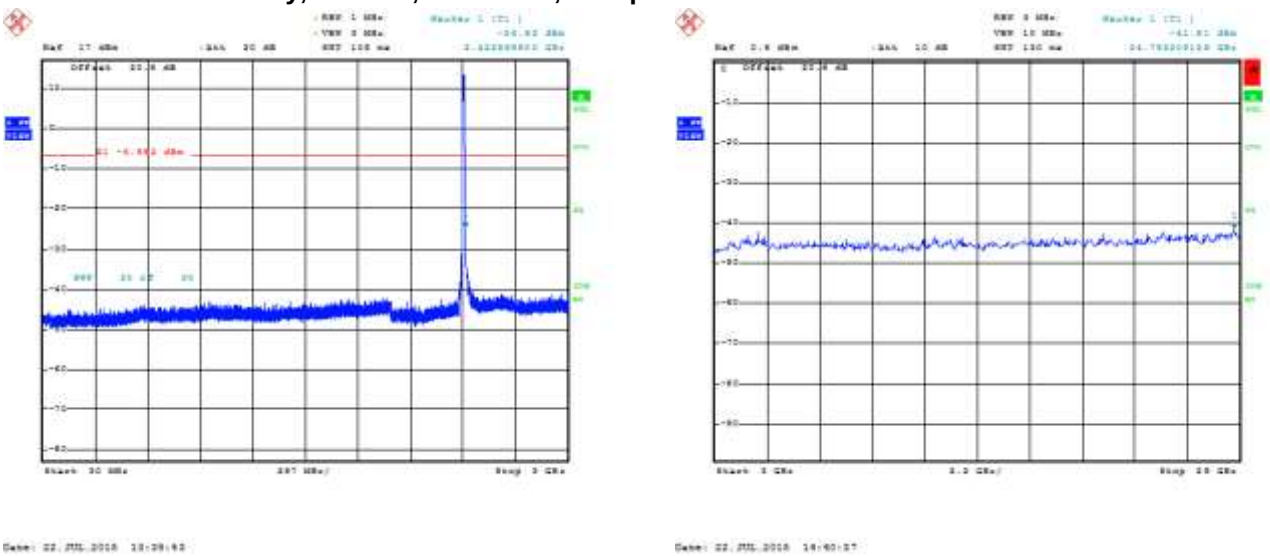
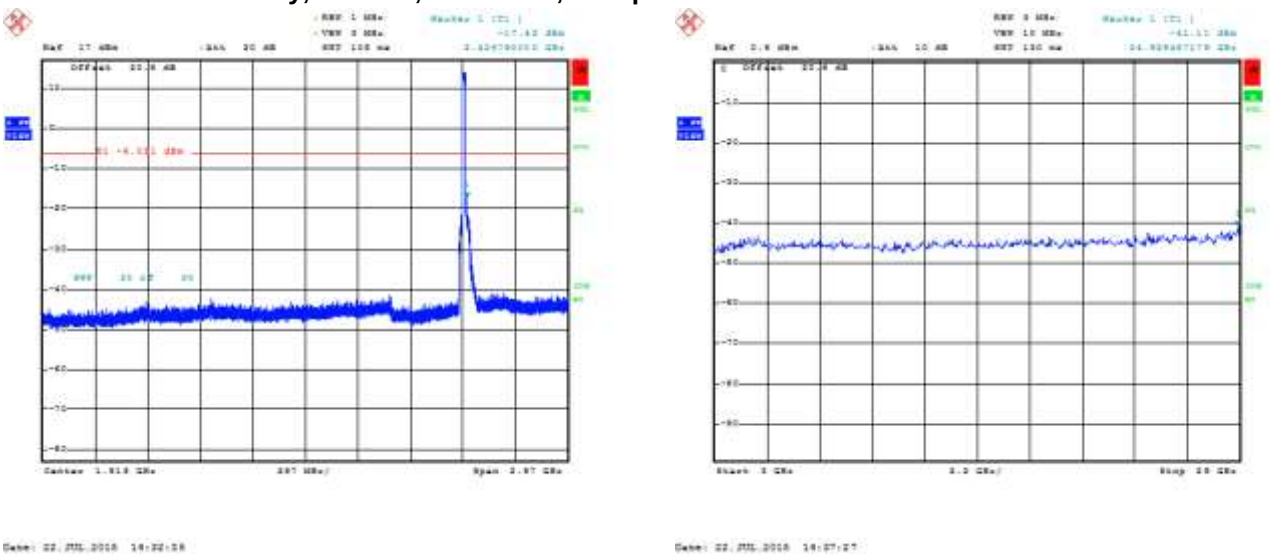


Figure 6-71 : Spurious Conducted RF Emissions
Secondary, 802.11b, Channel 6, 1 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-72: Spurious Conducted RF Emissions
Secondary, 802.11b, Channel 11, 1 Mbps

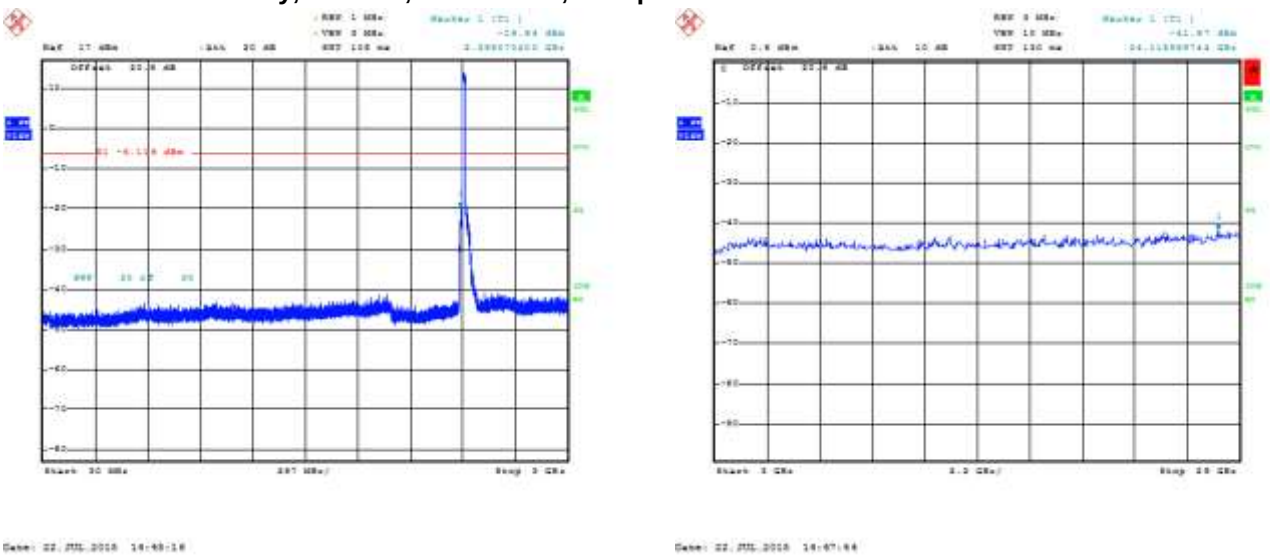
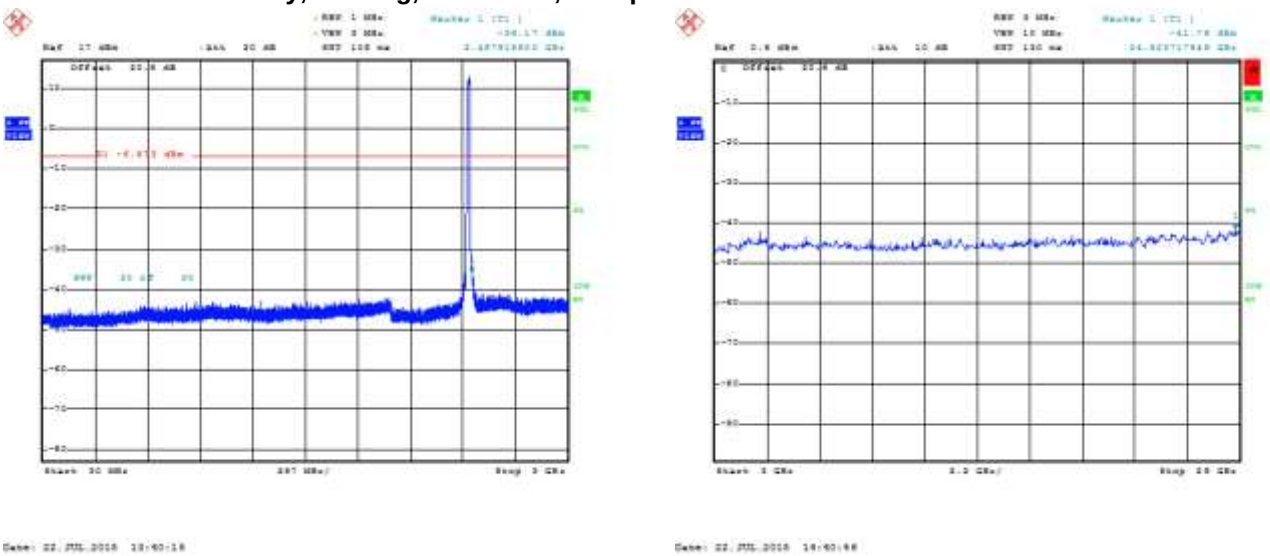


Figure 6-73: Spurious Conducted RF Emissions
Secondary, 802.11g, Channel 1, 6 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-74: Spurious Conducted RF Emissions
Secondary, 802.11g, Channel 6, 6 Mbps

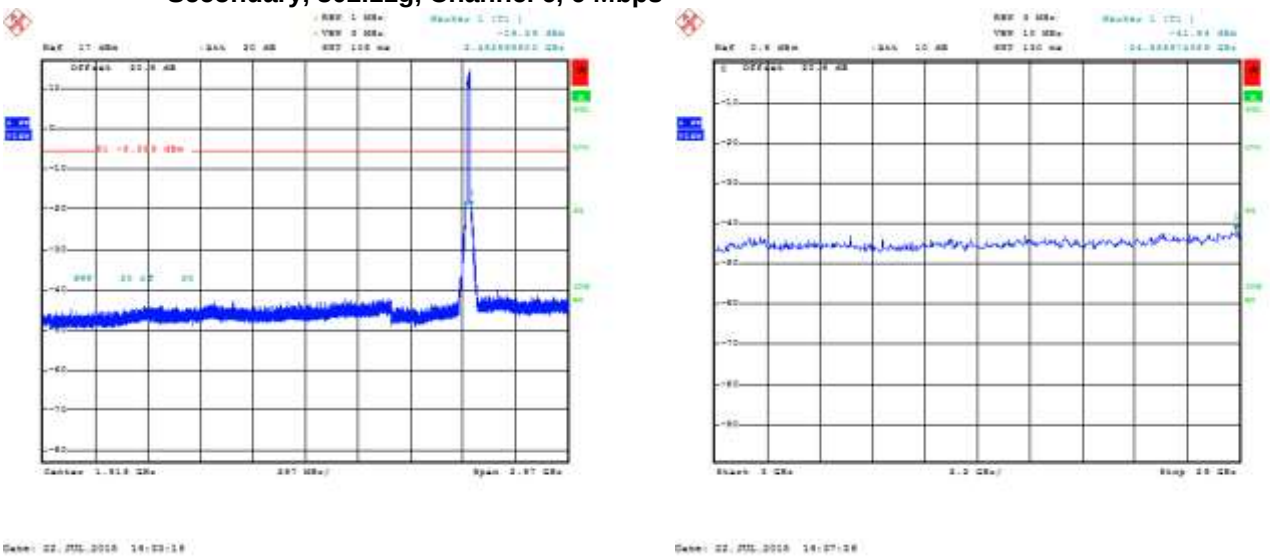
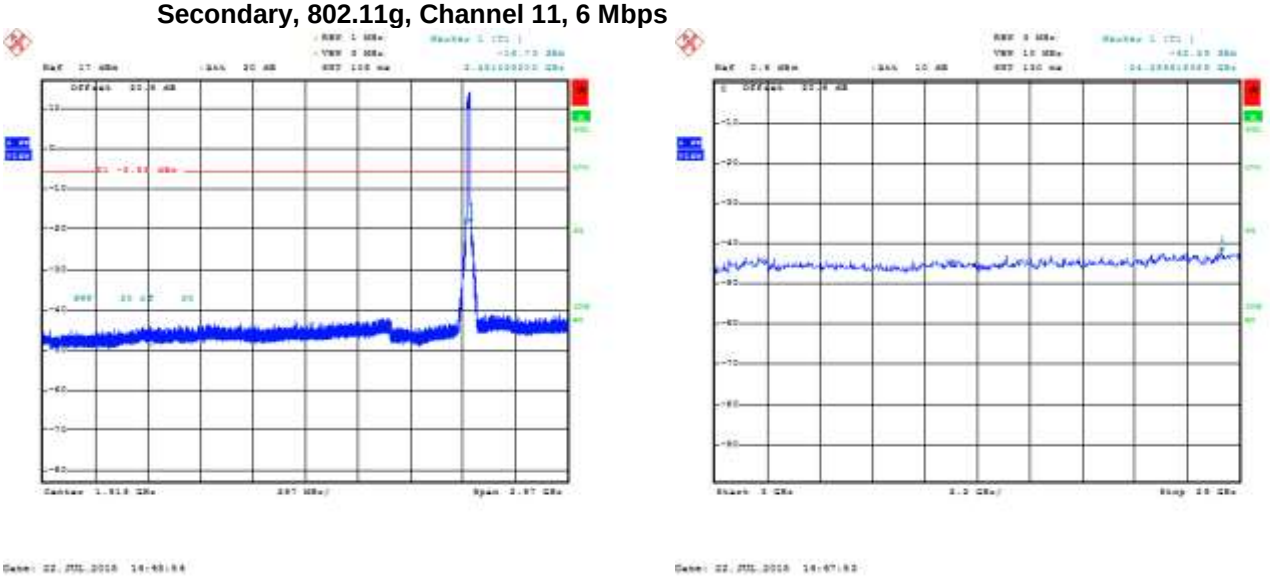


Figure 6-75: Spurious Conducted RF Emissions
Secondary, 802.11g, Channel 11, 6 Mbps



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-76: Spurious Conducted RF Emissions
Secondary, 802.11n, Channel 1, MCS 0

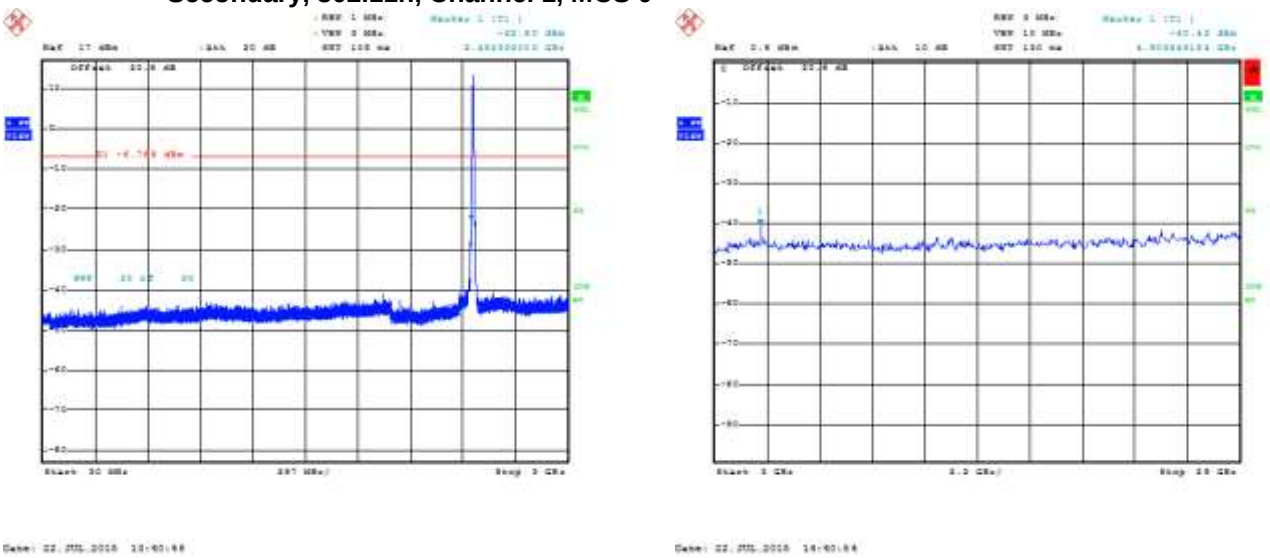
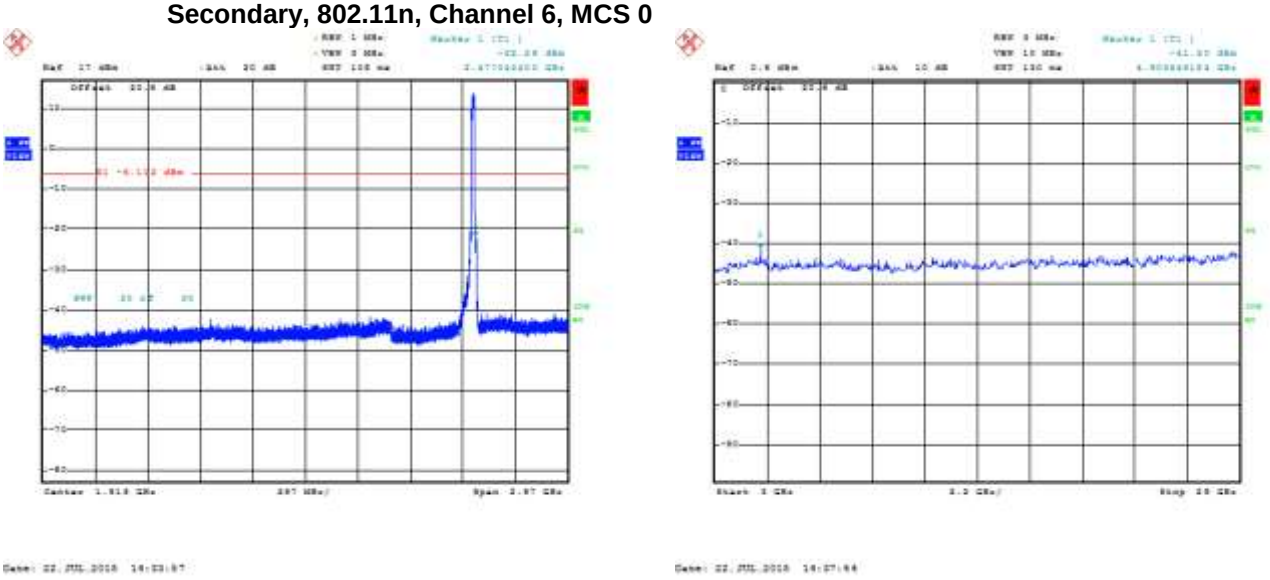
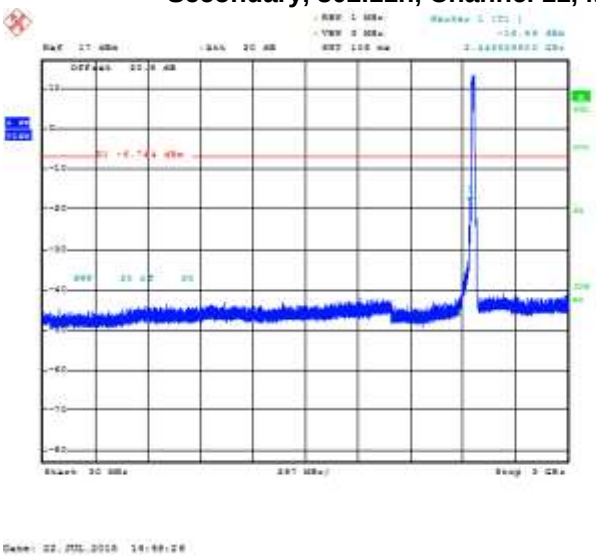


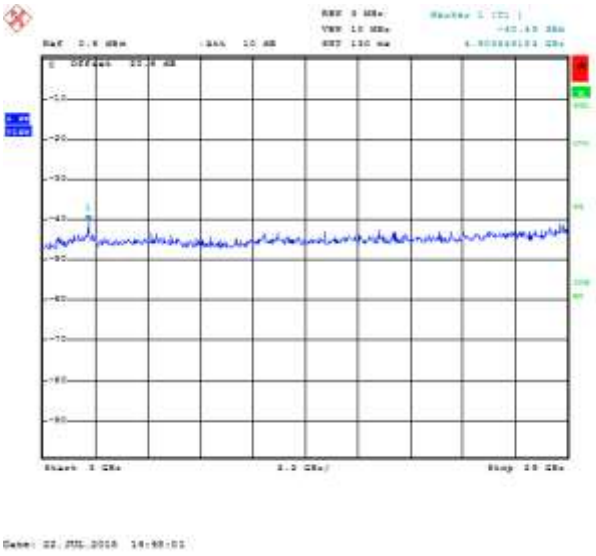
Figure 6-77: Spurious Conducted RF Emissions
Secondary, 802.11n, Channel 6, MCS 0



802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 6-78: Spurious Conducted RF Emissions
Secondary, 802.11n, Channel 11, MCS 0

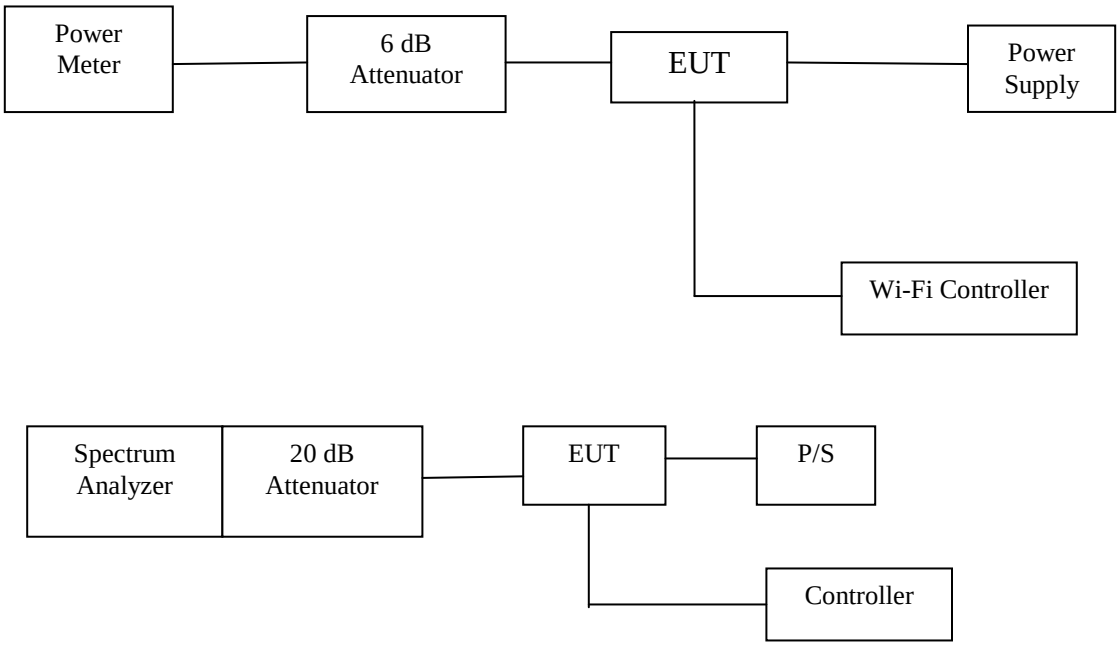




APPENDIX 7 – 802.11a/n CONDUCTED EMISSIONS TEST DATA/PLOTS

802.11a/n RF Conducted Emission Test Results

Test Setup Diagram



A reference offset of 8.9 dB was applied to the spectrum analyzer and 7.4 dB to the Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: August 20, and September 28, 2015
The measurements were performed by Landon Martin.

The environmental test conditions were: Temperature: 23.6 ºC
Relative Humidity: 62.90 %

802.11a RF Conducted Emission Test Results cont'd

6 dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a) (2) and RSS-247. Channels 36, 48, 64, 100, 140, and 165 were measured at 6 Mbps each for 802.11a mode.

Channel	Data Rate	Limit (kHz)	Measured Level Primary Antenna (MHz)	Measured Level Secondary Antenna (MHz)
36	6 Mbps	≥ 500	16.38	**16.42**
48	6 Mbps	≥ 500	16.40	16.26
64	6 Mbps	≥ 500	16.26	16.40
100	6 Mbps	≥ 500	16.36	16.38
140	6 Mbps	≥ 500	16.38	16.12
165	6 Mbps	≥ 500	16.38	16.22

See figures 7-1 to 7-12 for the plots of the 6 dB bandwidth measurements for Channel 36, 48, 64, 100, 140, and 165 at 6 Mbps each for 802.11a mode

802.11n RF Conducted Emission Test Results

6 dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a) (2) and RSS-247. Channels 36, 64, 140, 100 and 165 were measured at MCS 0 each for 802.11n mode.

20 MHz Bandwidth

Channel	Data Rate	Limit (kHz)	Measured Level Primary Antenna (MHz)	Measured Level Secondary Antenna (MHz)
36	MCS0	≥ 500	17.60	**17.62**
64	MCS0	≥ 500	17.42	**17.62**
100	MCS0	≥ 500	**17.62**	17.50
140	MCS0	≥ 500	17.60	17.60
165	MCS0	≥ 500	17.60	**17.62**

40 MHz Bandwidth

Channel	Data Rate	Limit (kHz)	Measured Level Primary Antenna (MHz)	Measured Level Secondary Antenna (MHz)
36	MCS0	≥ 500	**36.40**	**36.40**
64	MCS0	≥ 500	36.32	36.20
100	MCS0	≥ 500	36.32	36.20
140	MCS0	≥ 500	36.28	36.32
161	MCS0	≥ 500	36.04	36.40

See figures 7-13 to 7-32 for the plots of the 6 dB bandwidth measurements for Channel 36, 64, 140, 100 and 161 at MCS 0 each for 802.11n mode.

802.11a RF Conducted Emission Test Results cont'd

Figure 7-1: 6 dB Bandwidth
Primary, 802.11a, Channel 36, 6 Mbps

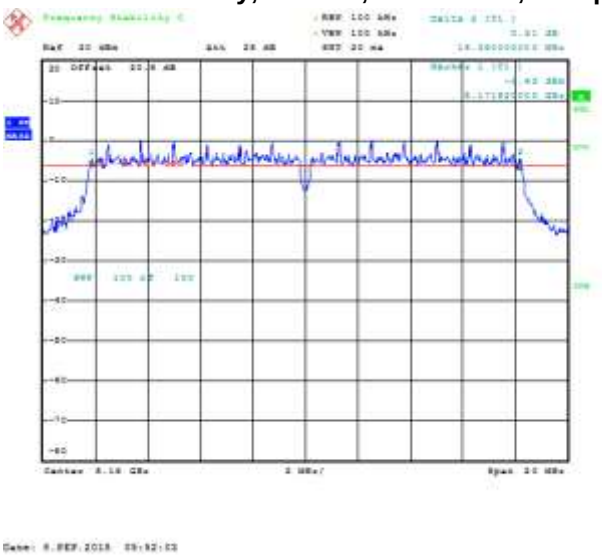


Figure 7-2: 6 dB Bandwidth
Primary, 802.11a, Channel 48, 6 Mbps

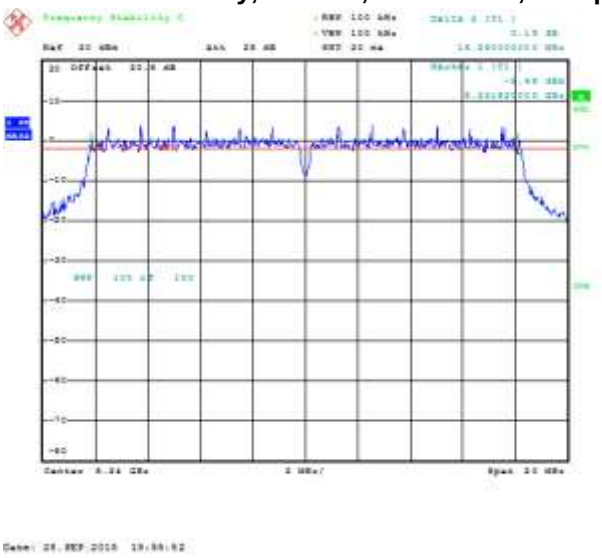


Figure 7-3: 6 dB Bandwidth
Primary, 802.11a, Channel 64, 6 Mbps

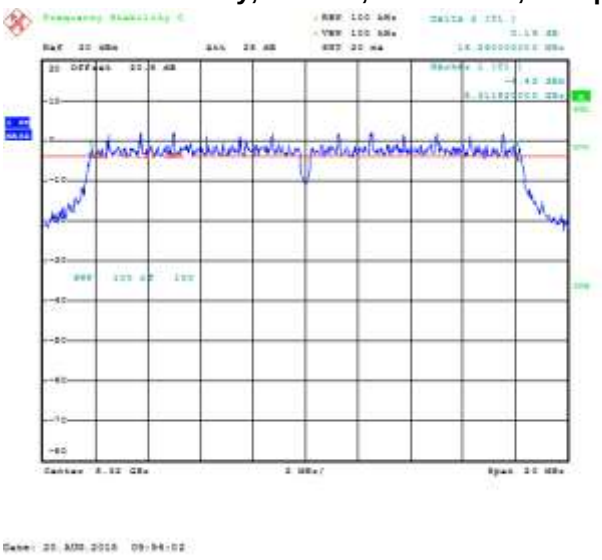
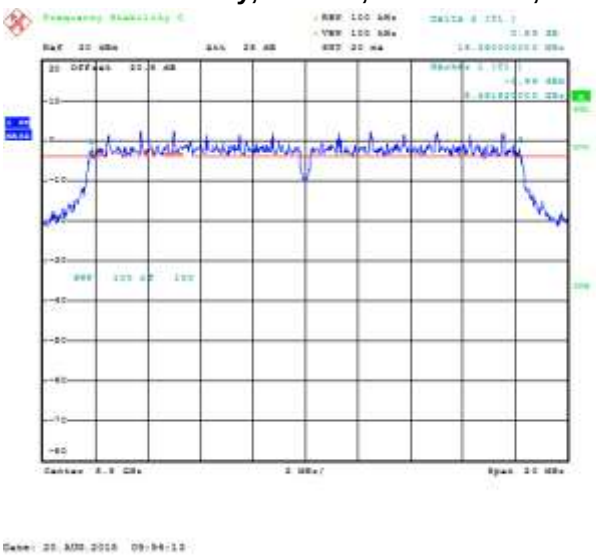


Figure 7-4: 6 dB Bandwidth
Primary, 802.11a, Channel 100, 6 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 7-5: 6 dB Bandwidth
Primary, 802.11a, Channel 140, 6 Mbps

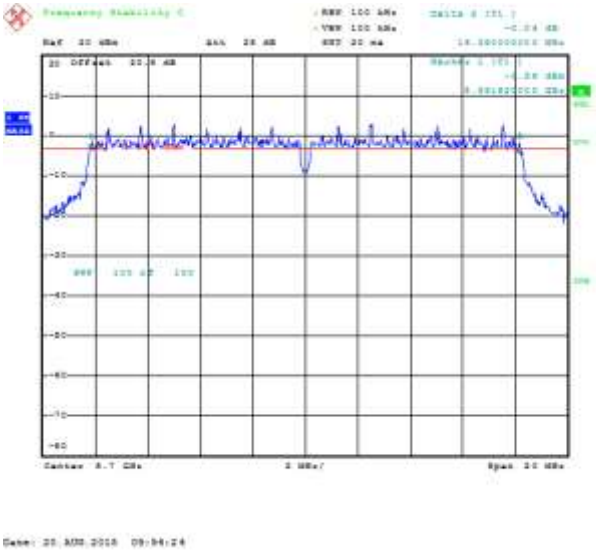


Figure 7-6: 6 dB Bandwidth
Primary, 802.11a, Channel 165, 6 Mbps

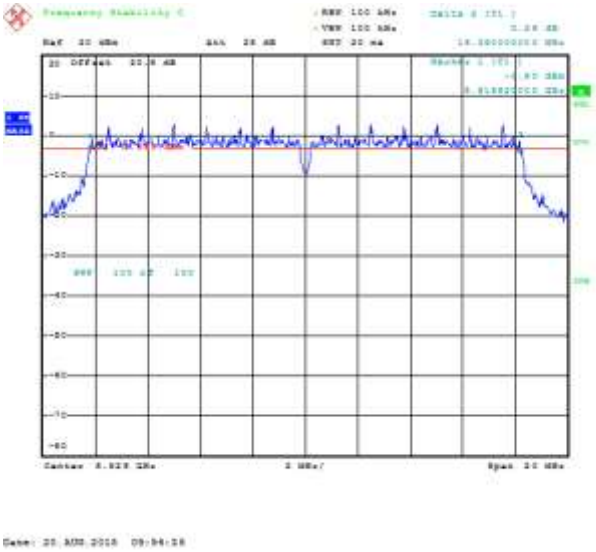


Figure 7-7: 6 dB Bandwidth
Secondary, 802.11a, Channel 36, 6 Mbps

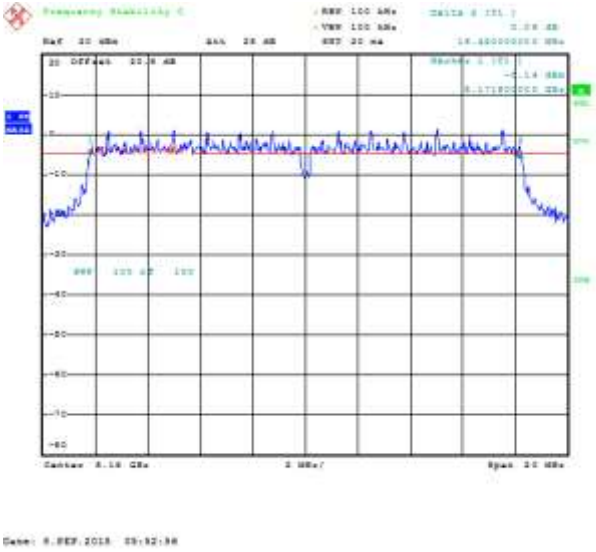
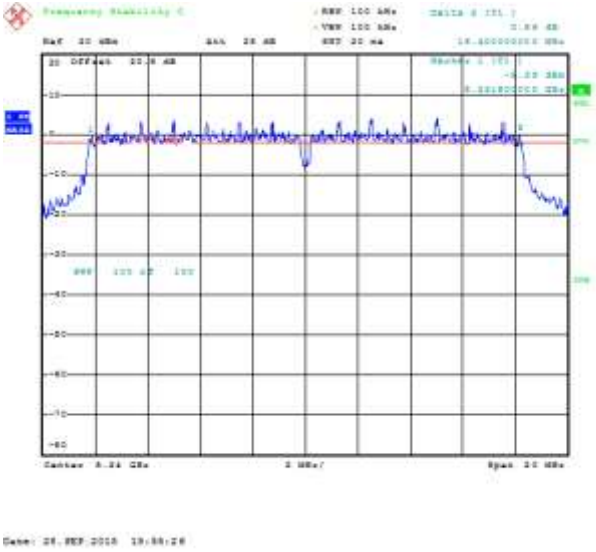


Figure 7-8: 6 dB Bandwidth
Secondary, 802.11a, Channel 48, 6 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 7-9: 6 dB Bandwidth

Secondary, 802.11a, Channel 64, 6 Mbps

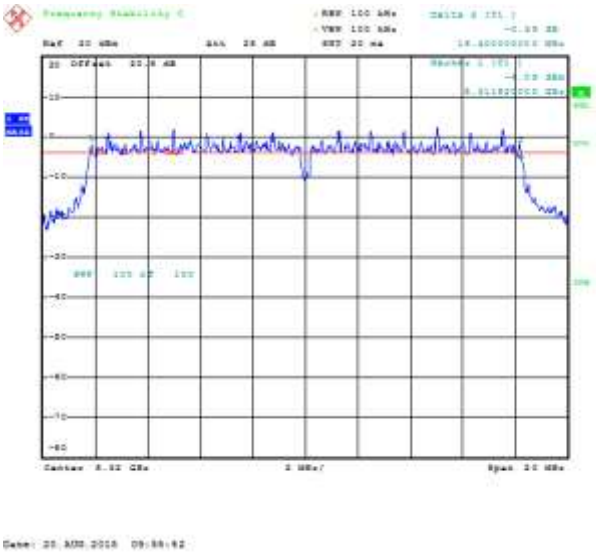


Figure 7-10: 6 dB Bandwidth

Secondary, 802.11a, Channel 100, 6 Mbps

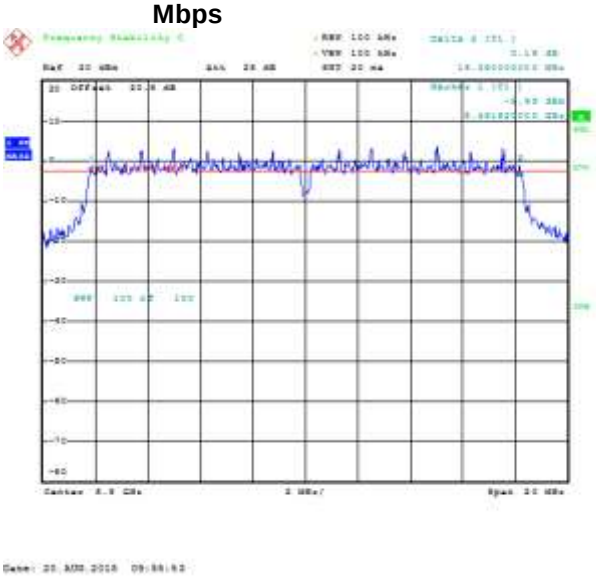


Figure 7-11: 6 dB Bandwidth

Secondary, 802.11a, Channel 140, 6 Mbps

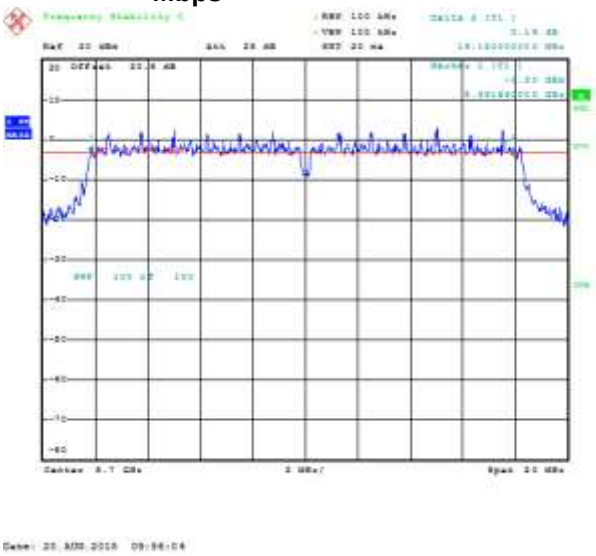
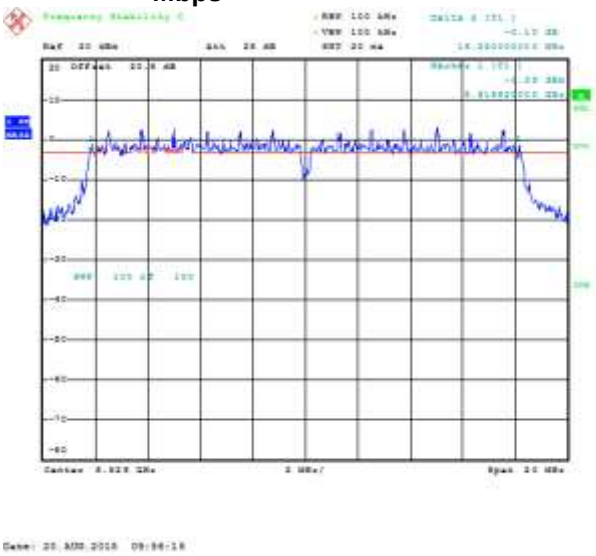


Figure 7-12: 6 dB Bandwidth

Secondary, 802.11a, Channel 165, 6 Mbps



802.11n RF Conducted Emission Test Results cont'd

20 MHz Bandwidth

Figure 7-13: 6 dB Bandwidth
Primary, 802.11n, Channel 36, MCS 0

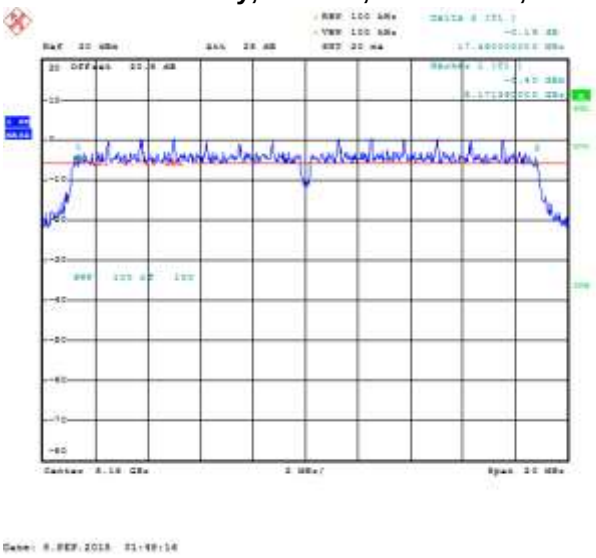
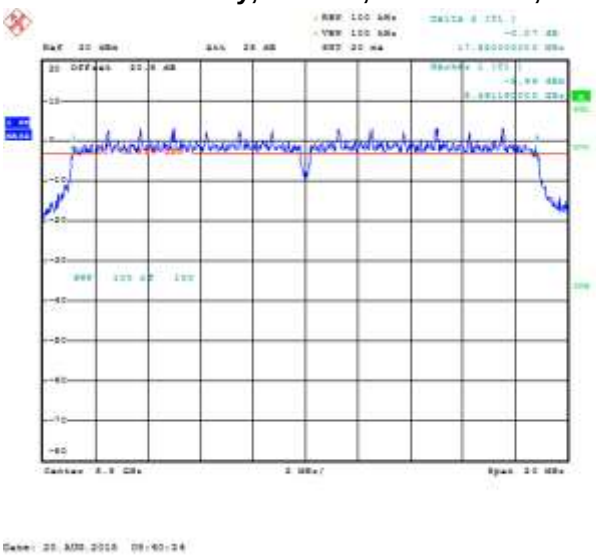


Figure 7-14: 6 dB Bandwidth
Primary, 802.11n, Channel 64, MCS 0

Figure 7-15: 6 dB Bandwidth
Primary, 802.11n, Channel 100, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-16: 6 dB Bandwidth
Primary, 802.11n, Channel 140, MCS 0

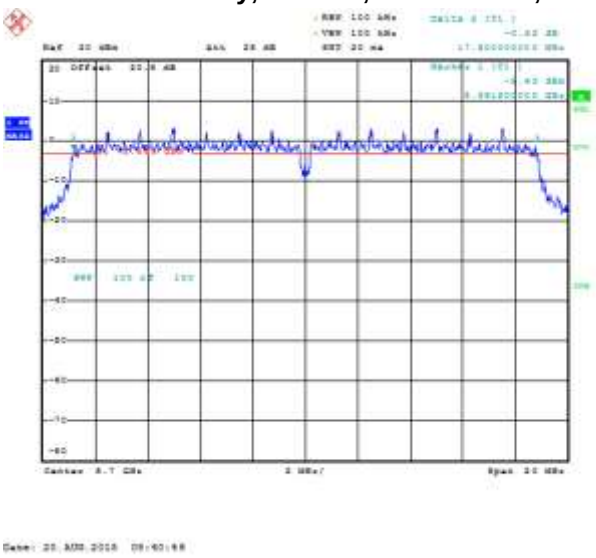
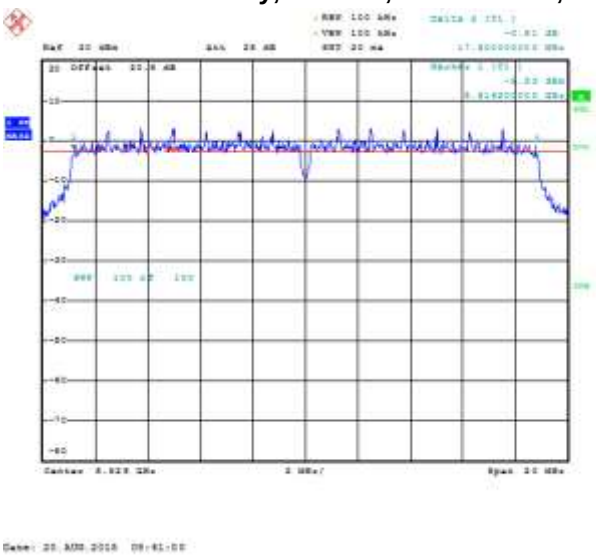


Figure 7-17: 6 dB Bandwidth
Primary, 802.11n, Channel 165, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-18: 6 dB Bandwidth

Secondary, 802.11n, Channel 36, MCS 0

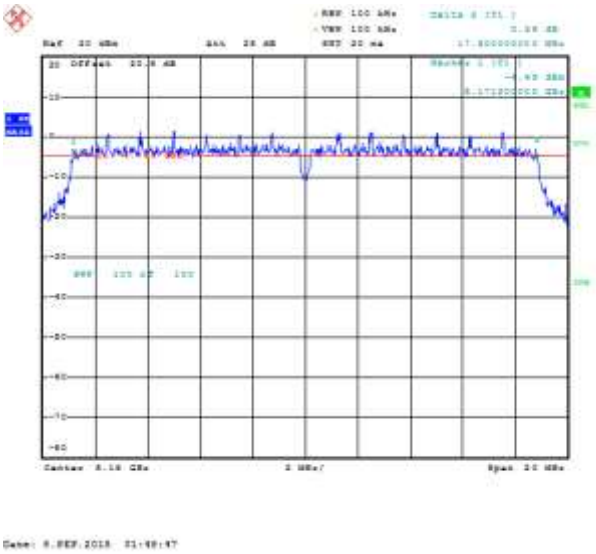


Figure 7-19: 6 dB Bandwidth

Secondary, 802.11n, Channel 64, MCS 0

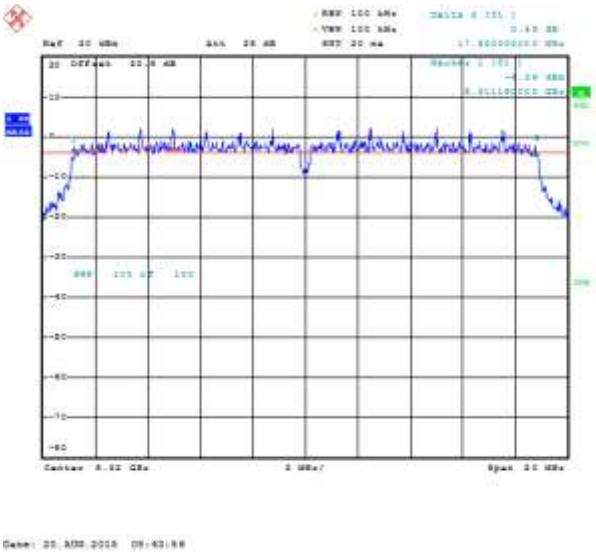


Figure 7-20: 6 dB Bandwidth

Secondary, 802.11n, Channel 100, MCS 0

802.11n RF Conducted Emission Test Results cont'd

Figure 7-21: 6 dB Bandwidth

Secondary, 802.11n, Channel 140, MCS 0

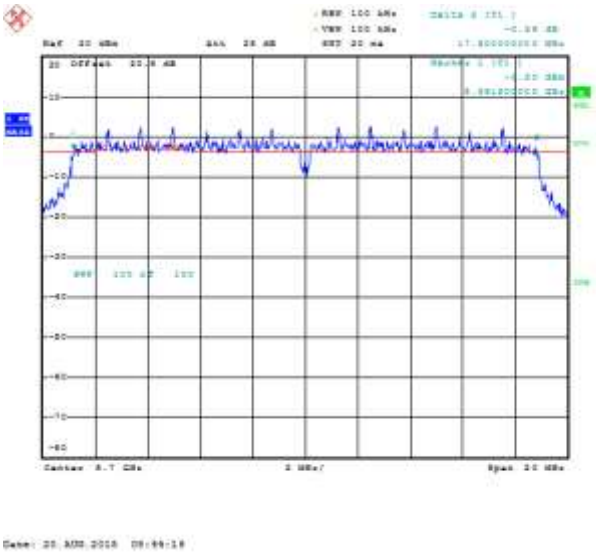
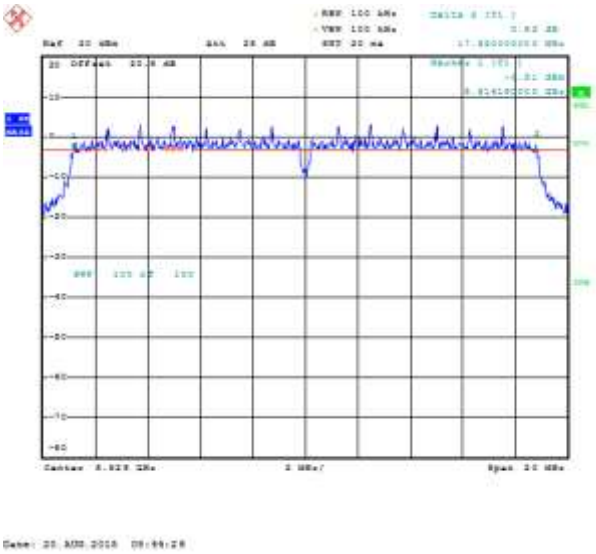


Figure 7-22: 6 dB Bandwidth

Secondary, 802.11n, Channel 165, MCS 0



802.11n RF Conducted Emission Test Results cont'd

40 MHz Bandwidth

Figure 7-23: 6 dB Bandwidth
Primary, 802.11n, Channel 36, MCS 0

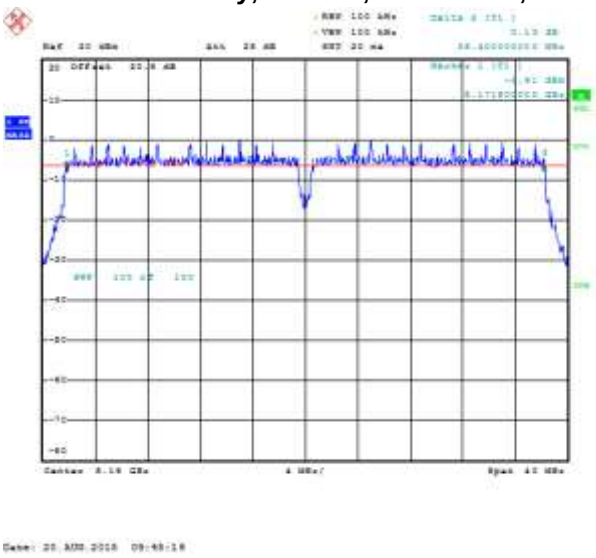


Figure 7-24: 6 dB Bandwidth
Primary, 802.11n, Channel 64, MCS 0

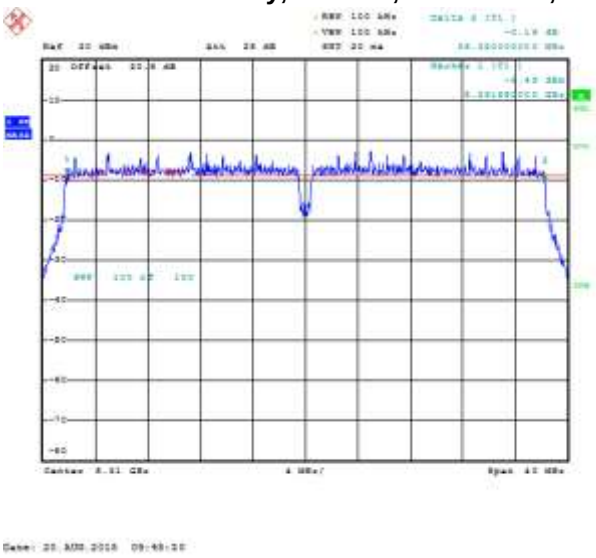
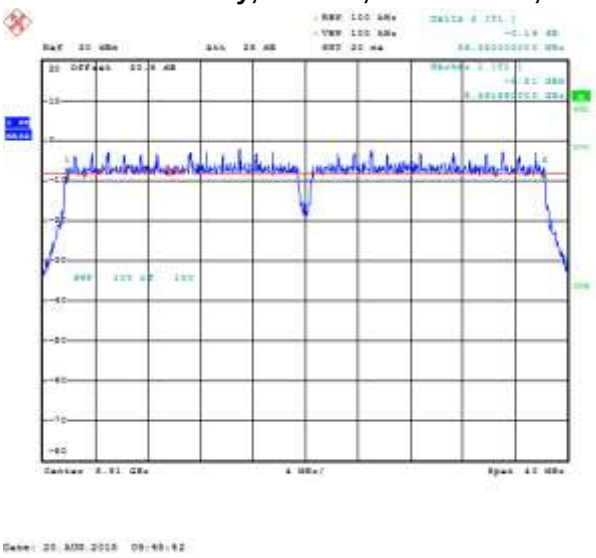


Figure 7-25: 6 dB Bandwidth
Primary, 802.11n, Channel 100, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-26: 6 dB Bandwidth
Primary, 802.11n, Channel 140, MCS 0

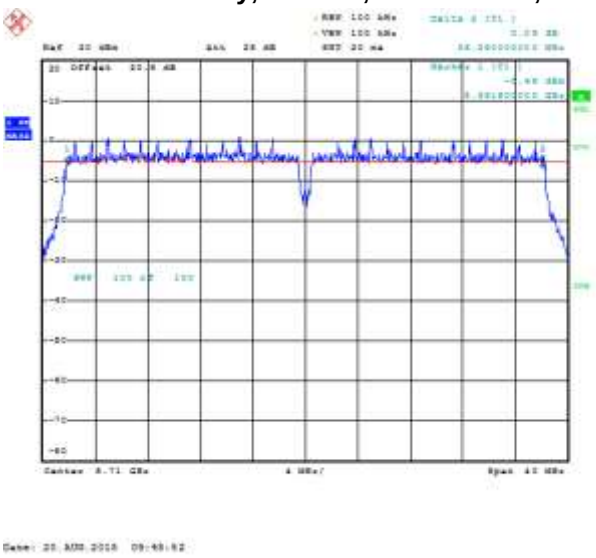
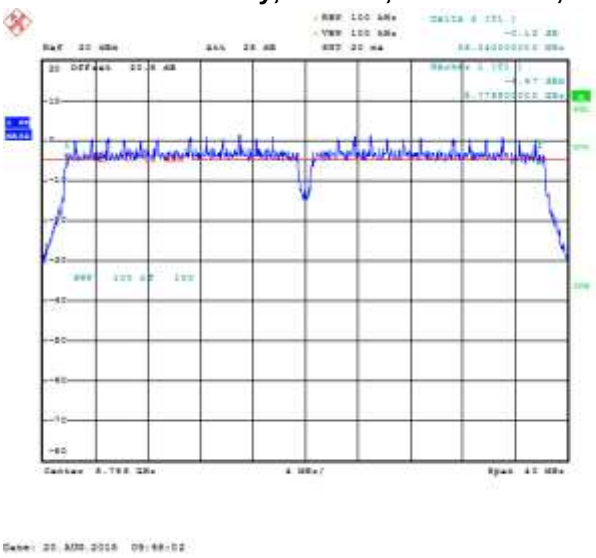


Figure 7-27: 6 dB Bandwidth
Primary, 802.11n, Channel 161, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-28: 6 dB Bandwidth

Secondary, 802.11n, Channel 36, MCS 0

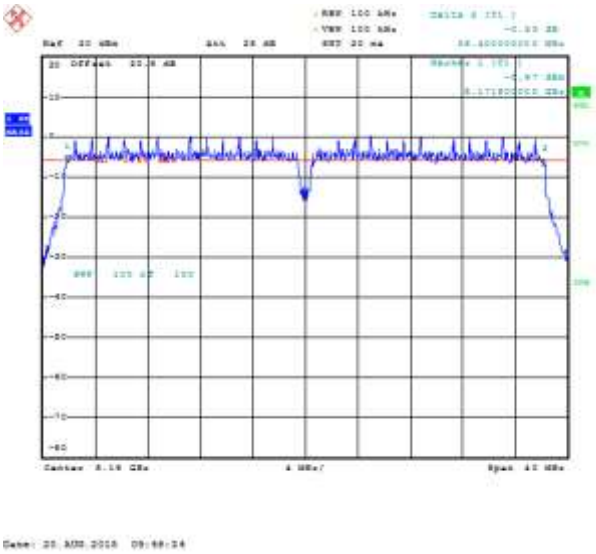


Figure 7-29: 6 dB Bandwidth

Secondary, 802.11n, Channel 64, MCS 0

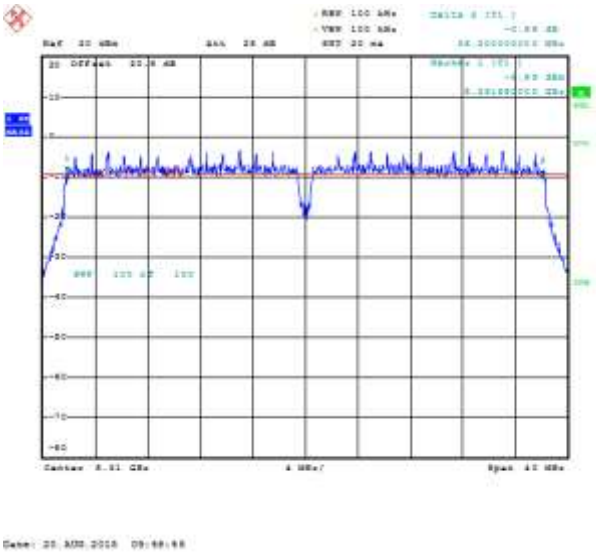
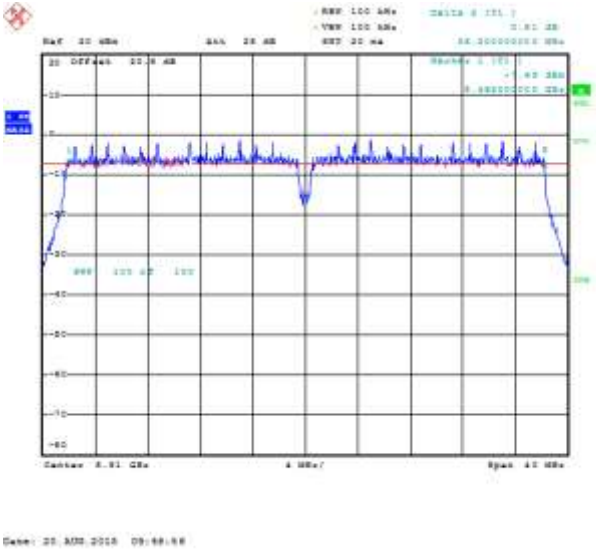


Figure 7-30: 6 dB Bandwidth

Secondary, 802.11n, Channel 100, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-31: 6 dB Bandwidth

Secondary, 802.11n, Channel 140, MCS 0

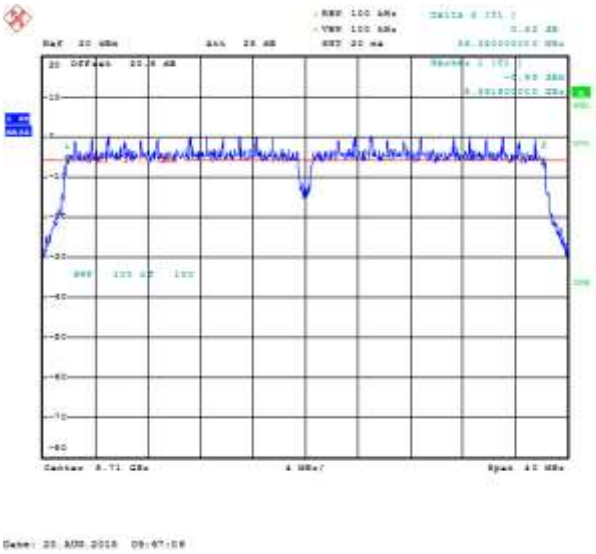
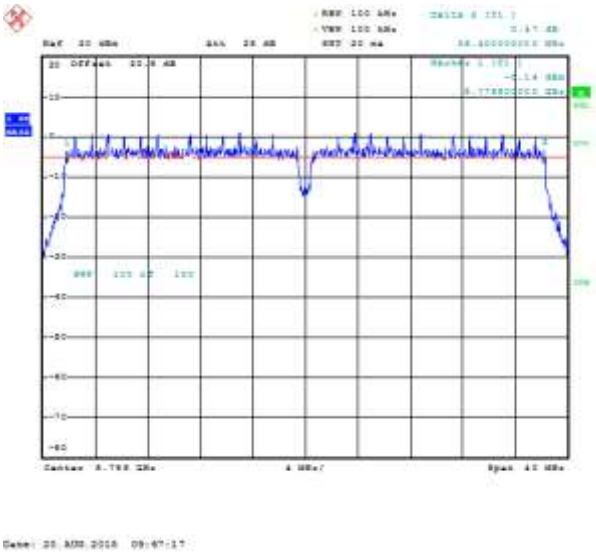


Figure 7-32: 6 dB Bandwidth

Secondary, 802.11n, Channel 161, MCS 0



802.11a RF Conducted Emission Test Results cont'd

Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.407 and RSS-247. Channels 36, 48, 64, 100, 140 and 165 were measured for 802.11a mode using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 8.9 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

SISO Primary Antenna

Channel	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	6 Mbps	< 250.0	12.32	17.06
48	6 Mbps	< 250.0	15.20	33.11
64	6 Mbps	< 250.0	13.93	24.72
100	6 Mbps	< 250.0	14.37	27.35
140	6 Mbps	< 250.0	14.66	29.24
165	6 Mbps	< 1000	14.70	29.51

SISO Secondary Antenna

Channel	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	6 Mbps	< 250.0	13.36	21.68
48	6 Mbps	< 250.0	15.50	35.48
64	6 Mbps	< 250.0	13.62	23.01
100	6 Mbps	< 250.0	14.75	29.85
140	6 Mbps	< 250.0	13.73	23.60
165	6 Mbps	< 1000	14.26	26.67

802.11a RF Conducted Emission Test Results cont'd

2TX//CDD Primary Antenna

Channel	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	6 Mbps	< 250.0	12.32	17.06
48	6 Mbps	< 250.0	15.50	35.48
64	6 Mbps	< 250.0	13.97	24.95
100	6 Mbps	< 250.0	15.05	31.99
140	6 Mbps	< 250.0	13.82	24.10
165	6 Mbps	< 1000	14.41	27.61

2TX//CDD Secondary Antenna

Channel	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	6 Mbps	< 250.0	13.35	21.63
48	6 Mbps	< 250.0	15.15	32.73
64	6 Mbps	< 250.0	14.13	25.88
100	6 Mbps	< 250.0	14.54	28.44
140	6 Mbps	< 250.0	15.01	31.70
165	6 Mbps	< 1000	14.81	30.27

2TX/CDD Sum

Channel	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	6 Mbps	< 250.0	15.88	38.69
48	6 Mbps	< 250.0	**18.34**	**68.22**
64	6 Mbps	< 250.0	17.06	50.83
100	6 Mbps	< 250.0	17.81	60.43
140	6 Mbps	< 250.0	17.47	55.79
165	6 Mbps	< 1000	17.62	57.87

802.11n RF Conducted Emission Test Results

Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 100, 140 and 165 were measured for 802.11n mode using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 8.9 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

20 MHz Bandwidth

SISO Primary Antenna

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	12.01	15.89
64	MCS0	< 250.0	14.17	26.12
100	MCS0	< 250.0	14.65	29.17
140	MCS0	< 250.0	14.61	28.91
165	MCS0	< 1000	14.73	29.72

SISO Secondary Antenna

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	13.16	20.70
64	MCS0	< 250.0	13.77	23.82
100	MCS0	< 250.0	15.11	32.43
140	MCS0	< 250.0	13.86	24.32
165	MCS0	< 1000	14.11	25.76

802.11n RF Conducted Emission Test Results cont'd

MIMO Primary Antenna

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	15.02	31.77
64	MCS0	< 250.0	14.07	25.53
100	MCS0	< 250.0	14.48	28.05
140	MCS0	< 250.0	14.89	30.83
165	MCS0	< 1000	14.55	28.51

MIMO Secondary Antenna

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	15.89	38.82
64	MCS0	< 250.0	13.75	23.71
100	MCS0	< 250.0	14.90	30.90
140	MCS0	< 250.0	13.72	23.55
165	MCS0	< 1000	14.27	26.73

MIMO Sum

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	**18.49**	**70.58**
64	MCS0	< 250.0	16.92	49.24
100	MCS0	< 250.0	17.71	58.96
140	MCS0	< 250.0	17.35	54.38
165	MCS0	< 1000	17.42	55.24

802.11n RF Conducted Emission Test Results cont'd

40 MHz Bandwidth

SISO Primary Antenna

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	13.65	23.17
64	MCS0	< 250.0	10.76	11.91
100	MCS0	< 250.0	11.90	15.49
140	MCS0	< 250.0	14.78	30.06
165	MCS0	< 1000	15.04	31.92

SISO Secondary Antenna

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	14.50	28.18
64	MCS0	< 250.0	10.64	11.59
100	MCS0	< 250.0	12.32	17.06
140	MCS0	< 250.0	13.99	25.06
165	MCS0	< 1000	14.65	29.17

802.11n RF Conducted Emission Test Results cont'd

MIMO Primary Antenna

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	11.51	14.16
64	MCS0	< 250.0	10.67	11.67
100	MCS0	< 250.0	11.73	14.89
140	MCS0	< 250.0	14.20	26.30
165	MCS0	< 1000	14.84	30.48

MIMO Secondary Antenna

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	10.62	11.53
64	MCS0	< 250.0	10.75	11.89
100	MCS0	< 250.0	11.26	13.37
140	MCS0	< 250.0	15.08	32.21
165	MCS0	< 1000	15.40	34.67

MIMO Sum

Channel	Data Rate	Class 2 Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	MCS0	< 250.0	14.10	25.69
64	MCS0	< 250.0	13.72	23.55
100	MCS0	< 250.0	14.51	28.26
140	MCS0	< 250.0	17.67	58.51
165	MCS0	< 1000	**18.14**	**65.15**

802.11a RF Conducted Emission Test Results cont'd

Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 100, 140, 149, and 165 were measured at 6 Mbps each for 802.11a mode.

Primary Antenna

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	6 Mbps	< -20	-42.21	-22.21
64	6 Mbps	< -20	-43.11	-23.11
100	6 Mbps	< -20	-43.05	-23.05
140	6 Mbps	< -20	-42.92	-22.92
149	6 Mbps	< -20	-42.88	-22.88
165	6 Mbps	< -20	-41.21	-21.21

Secondary Antenna

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	6 Mbps	< -20	-42.88	-22.88
64	6 Mbps	< -20	-43.80	-23.80
100	6 Mbps	< -20	-44.08	-24.08
140	6 Mbps	< -20	-43.04	-23.04
149	6 Mbps	< -20	-38.60	-18.60
165	6 Mbps	< -20	-36.34	-16.34

See figures 7-32 to 7-43 for the plots of the band edge compliance measurements for Channel 36, 64, 100, 140, 149 and 165 at 6 Mbps each for 802.11a mode.

802.11n RF Conducted Emission Test Results

Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 100, 140, 149 and 165 were measured at MCS 0each for 802.11n mode.

20 MHz bandwidth

Primary Antenna

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	6 Mbps	< -20	-40.03	-20.03
64	6 Mbps	< -20	-43.97	-23.97
100	6 Mbps	< -20	-44.20	-24.20
140	6 Mbps	< -20	-43.23	-23.23
149	6 Mbps	< -20	-42.86	-22.86
165	6 Mbps	< -20	-42.30	-22.30

Secondary Antenna

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	6 Mbps	< -20	-42.17	-22.17
64	6 Mbps	< -20	-43.33	-23.33
100	6 Mbps	< -20	-44.42	-24.42
140	6 Mbps	< -20	-41.49	-21.49
149	6 Mbps	< -20	-40.18	-20.18
165	6 Mbps	< -20	-35.51	-15.51

802.11n RF Conducted Emission Test Results

40 MHz bandwidth

Primary Antenna

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	6 Mbps	< -20	-37.69	-17.69
64	6 Mbps	< -20	-38.54	-18.54
100	6 Mbps	< -20	-36.35	-16.35
140	6 Mbps	< -20	-26.18	-6.18
149	6 Mbps	< -20	-30.15	-10.15

Secondary Antenna

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	6 Mbps	< -20	-37.69	-17.69
64	6 Mbps	< -20	-38.54	-18.54
100	6 Mbps	< -20	-36.35	-16.35
140	6 Mbps	< -20	-26.18	-6.18
149	6 Mbps	< -20	-30.15	-10.15

See figures 7-44 to 7-65 for the plots of the band edge compliance measurements for Channel 36, 64, 100, 140, 149, and 165 at MCS 0 each for 802.11n mode.

802.11a RF Conducted Emission Test Results cont'd

Figure 7-32: Band Edge Compliance
Primary, 802.11a, Channel 36, 6 Mbps

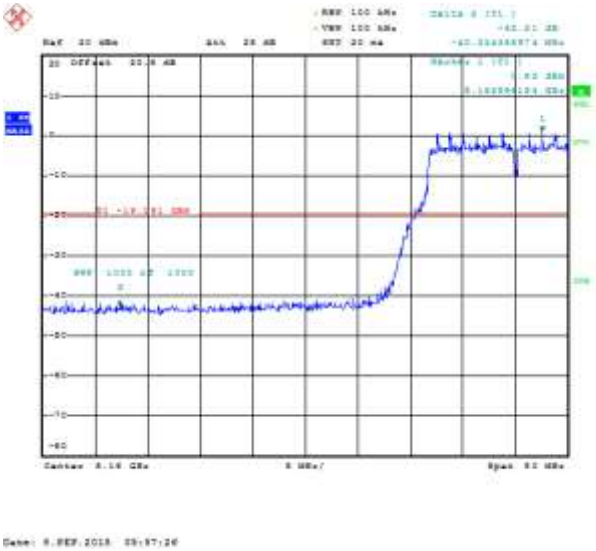


Figure 7-33: Band Edge Compliance
Primary, 802.11a, Channel 64, 6 Mbps

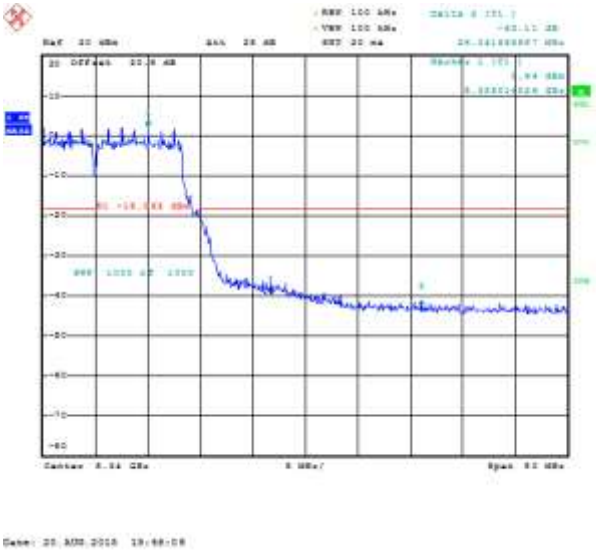


Figure 7-34: Band Edge Compliance
Primary, 802.11a, Channel 100, 6 Mbps

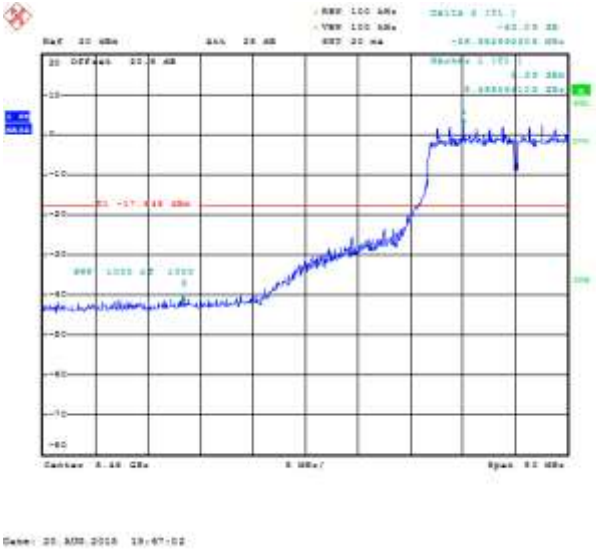
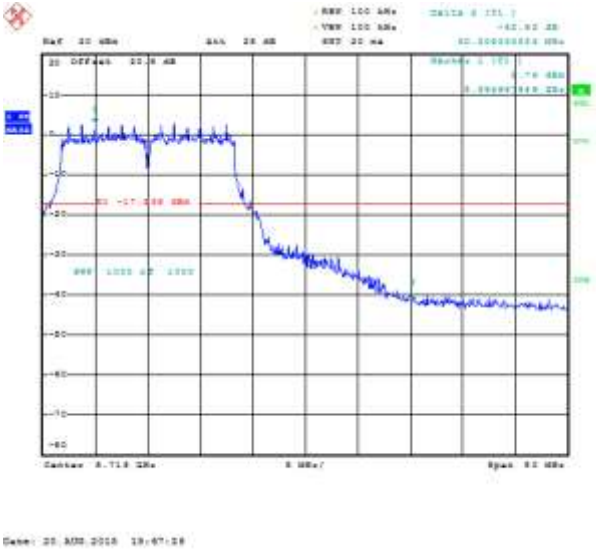


Figure 7-35: Band Edge Compliance
Primary, 802.11a, Channel 140, 6 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 7-36: Band Edge Compliance
Primary, 802.11a, Channel 149, 6 Mbps

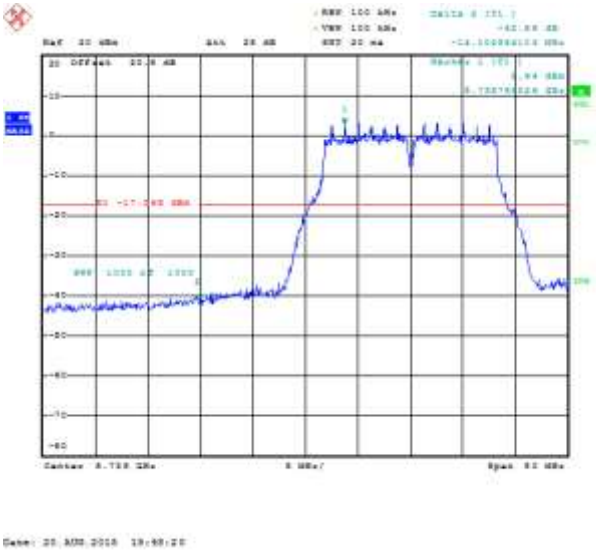


Figure 7-37: Band Edge Compliance
Primary, 802.11a, Channel 165, 6 Mbps

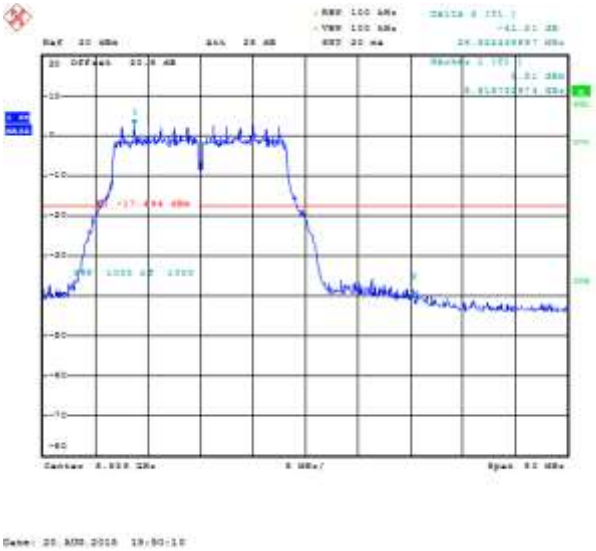


Figure 7-38: Band Edge Compliance
Secondary, 802.11a, Channel 36, 6 Mbps

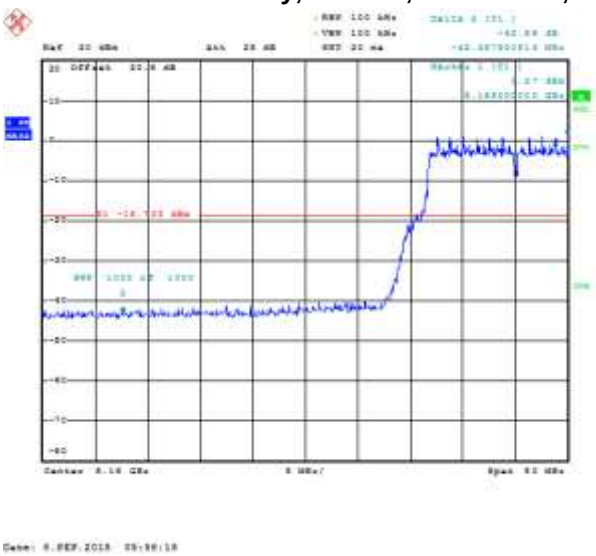
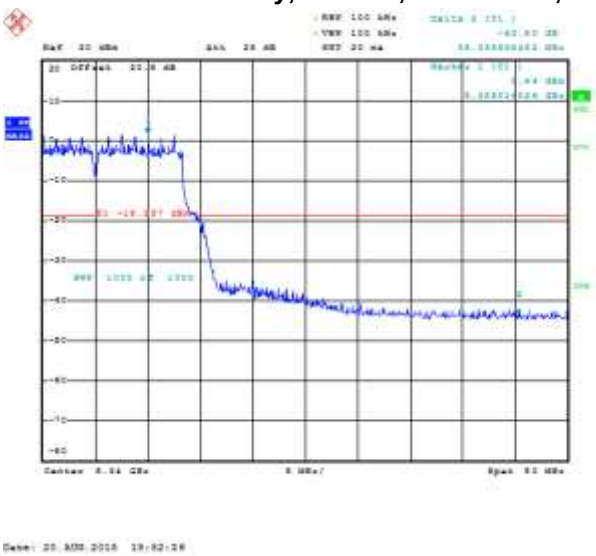


Figure 7-39: Band Edge Compliance
Secondary, 802.11a, Channel 64, 6 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 7-40: Band Edge Compliance Secondary, 802.11a, Channel 100, 6 Mbps

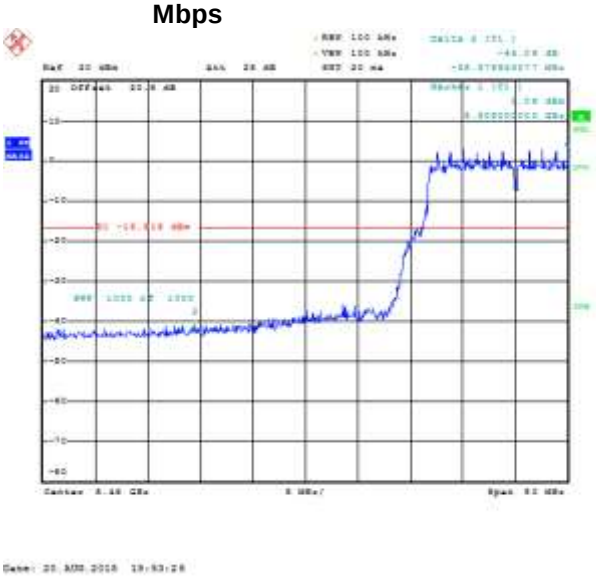


Figure 7-41: Band Edge Compliance Secondary, 802.11a, Channel 140, 6 Mbps

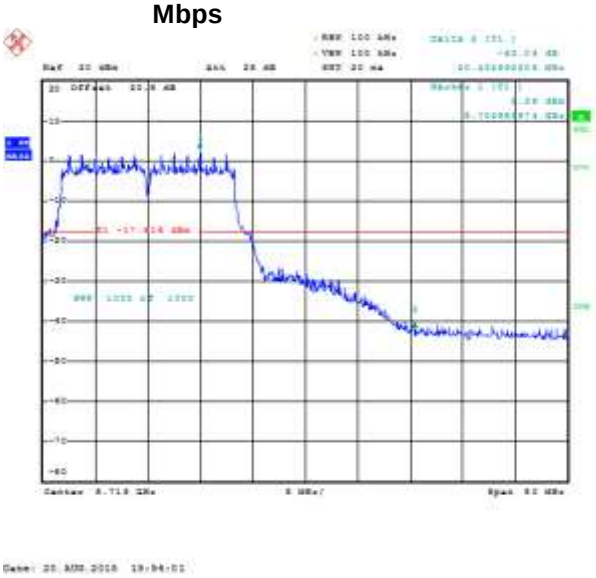


Figure 7-42: Band Edge Compliance Secondary, 802.11a, Channel 149, 6 Mbps

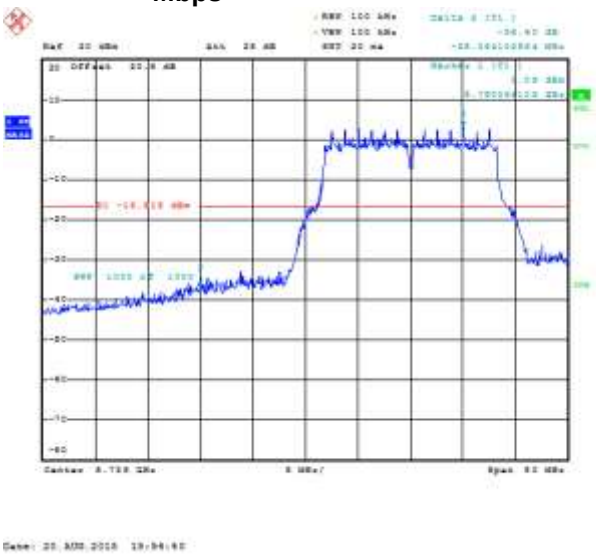
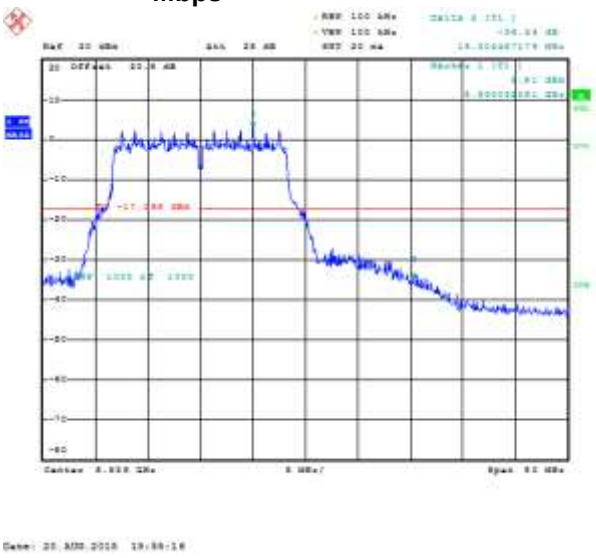


Figure 7-43: Band Edge Compliance Secondary, 802.11a, Channel 165, 6 Mbps



802.11n RF Conducted Emission Test Results

20 MHz Bandwidth

Figure 7-44: Band Edge Compliance
Primary, 802.11n, Channel 36, 6 Mbps

Figure 7-45: Band Edge Compliance
Primary, 802.11n, Channel 64, 6 Mbps

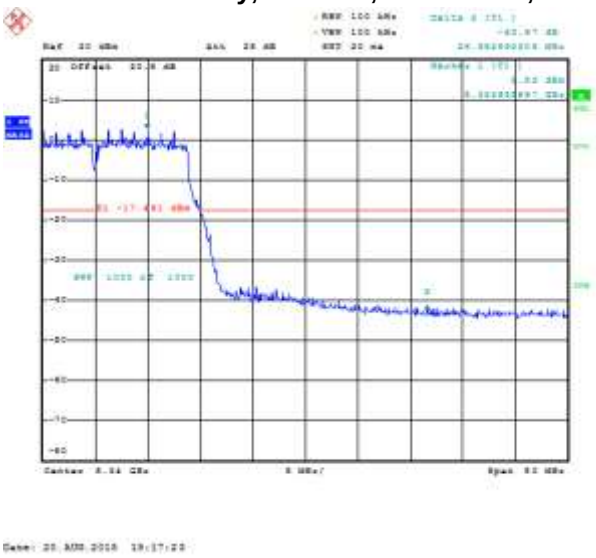


Figure 7-46: Band Edge Compliance
Primary, 802.11n, Channel 100, 6 Mbps

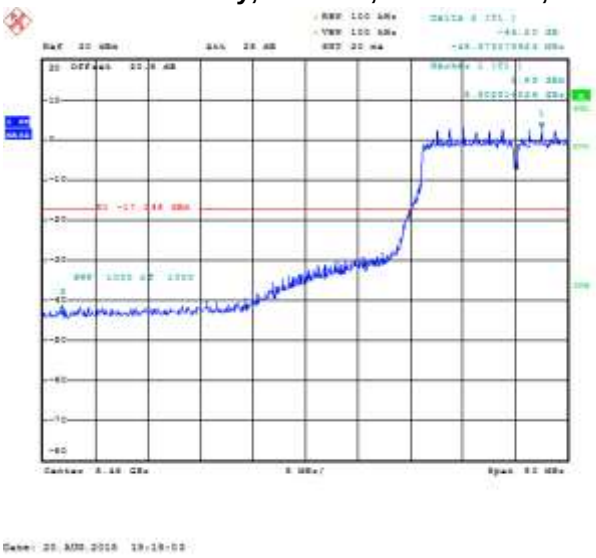
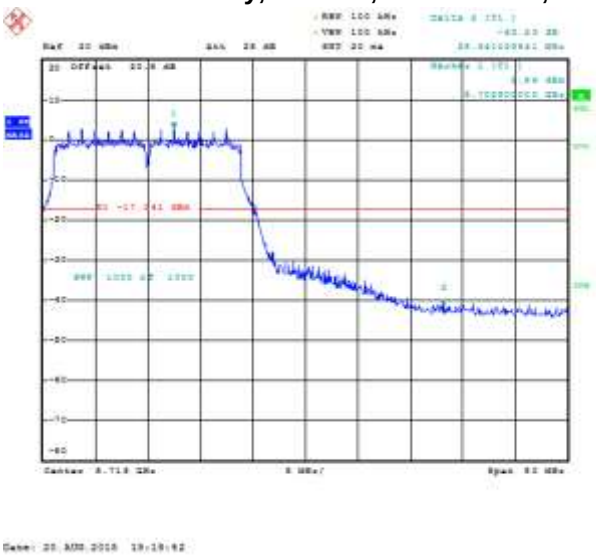


Figure 7-47: Band Edge Compliance
Primary, 802.11n, Channel 140, 6 Mbps



802.11n RF Conducted Emission Test Results cont'd

Figure 7-48: Band Edge Compliance
Primary, 802.11n, Channel 149, 6 Mbps

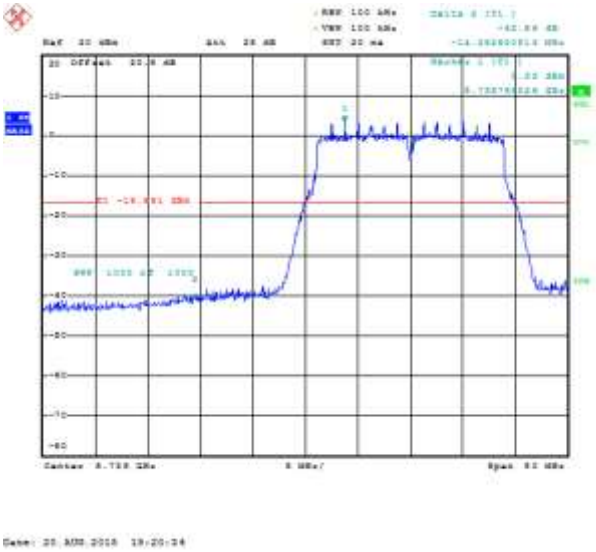


Figure 7-49: Band Edge Compliance
Primary, 802.11n, Channel 165, 6 Mbps

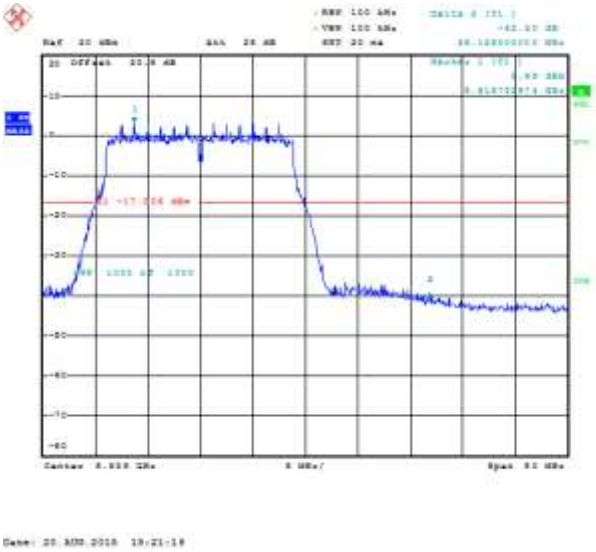


Figure 7-50: Band Edge Compliance
Secondary, 802.11n, Channel 36, 6 Mbps

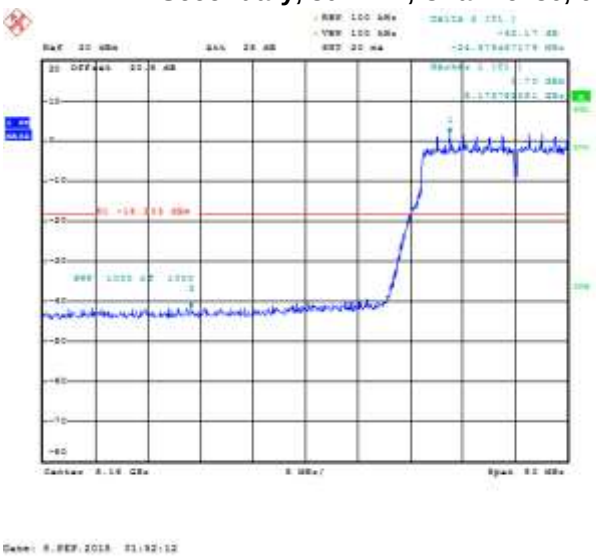
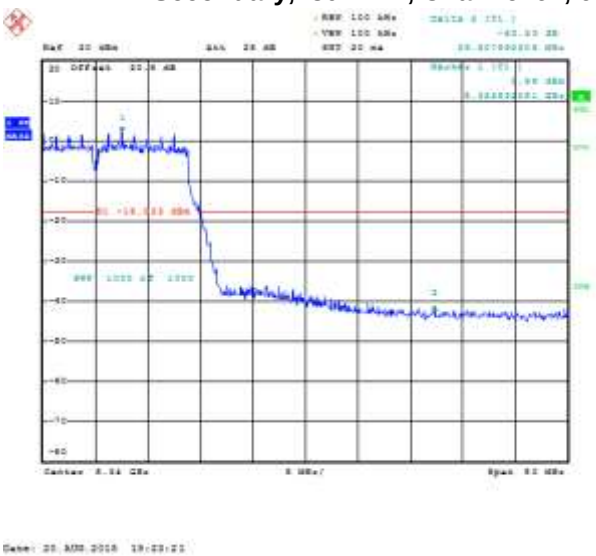


Figure 7-51: Band Edge Compliance
Secondary, 802.11n, Channel 64, 6 Mbps



802.11n RF Conducted Emission Test Results cont'd

Figure 7-52: Band Edge Compliance Secondary, 802.11n, Channel 100, 6 Mbps

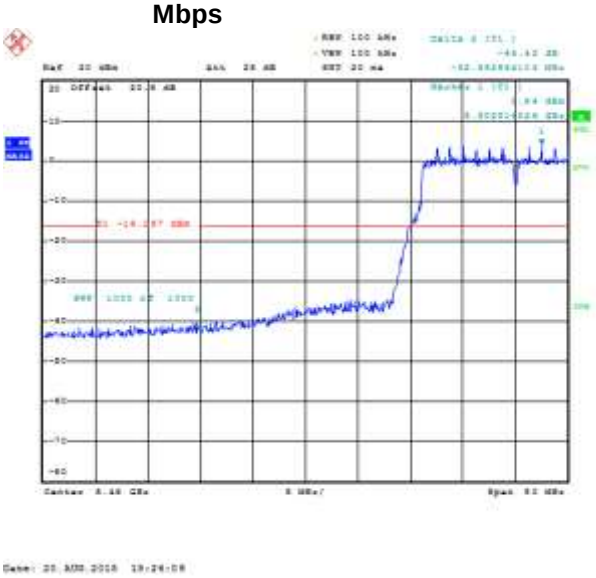


Figure 7-53: Band Edge Compliance Secondary, 802.11n, Channel 140, 6 Mbps

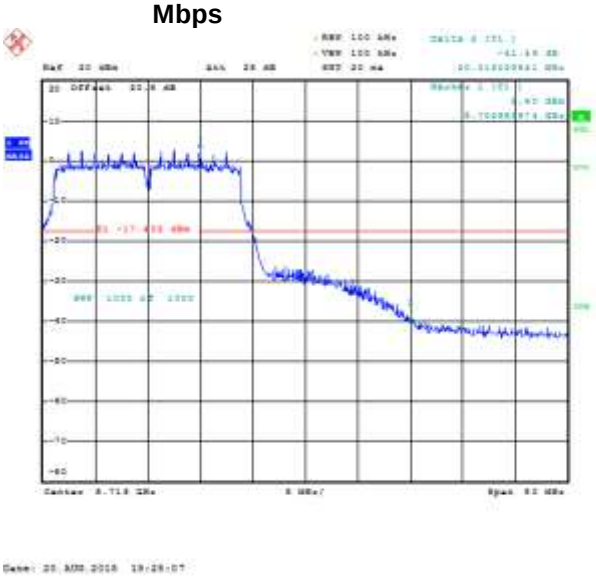


Figure 7-54: Band Edge Compliance Secondary, 802.11n, Channel 149, 6 Mbps

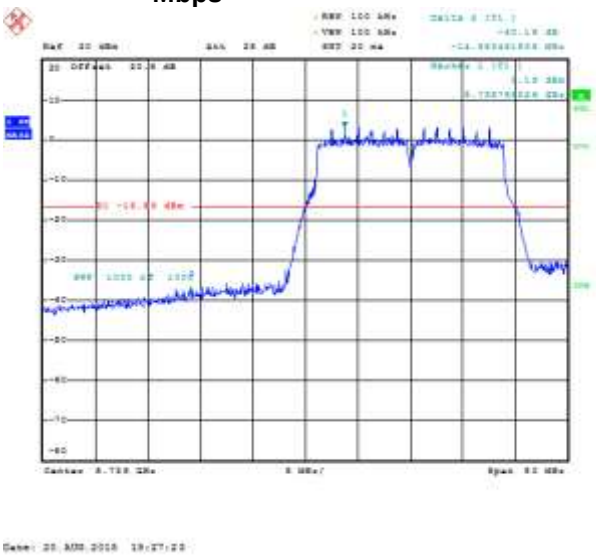
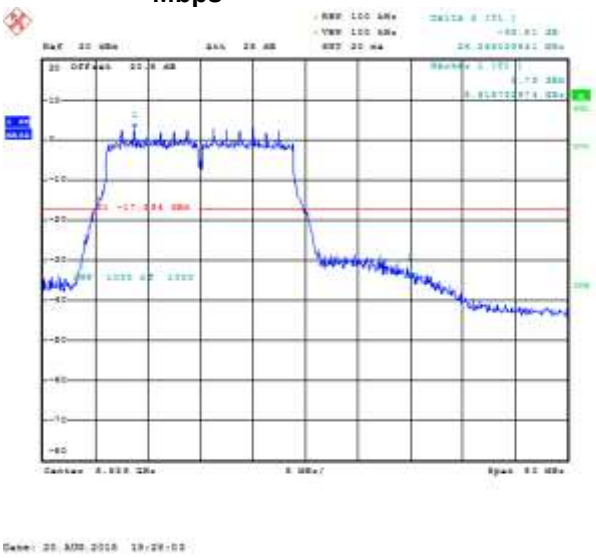


Figure 7-55: Band Edge Compliance Secondary, 802.11n, Channel 165, 6 Mbps



802.11n RF Conducted Emission Test Results cont'd

40 MHz Bandwidth

Figure 7-56: Band Edge Compliance
Primary, 802.11n, Channel 36, 6 Mbps

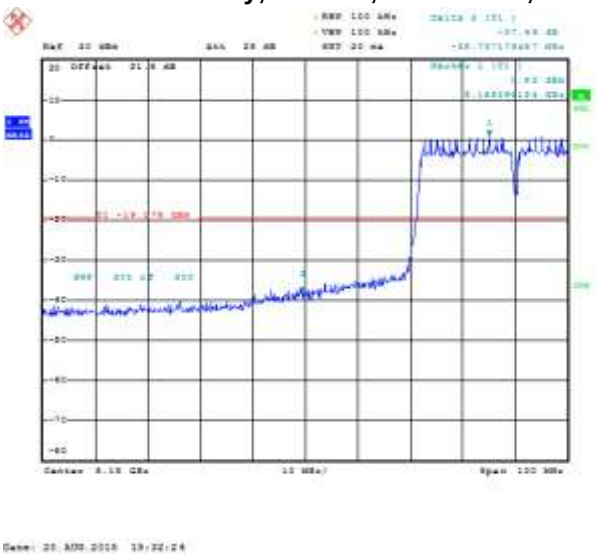


Figure 7-57: Band Edge Compliance
Primary, 802.11n, Channel 64, 6 Mbps

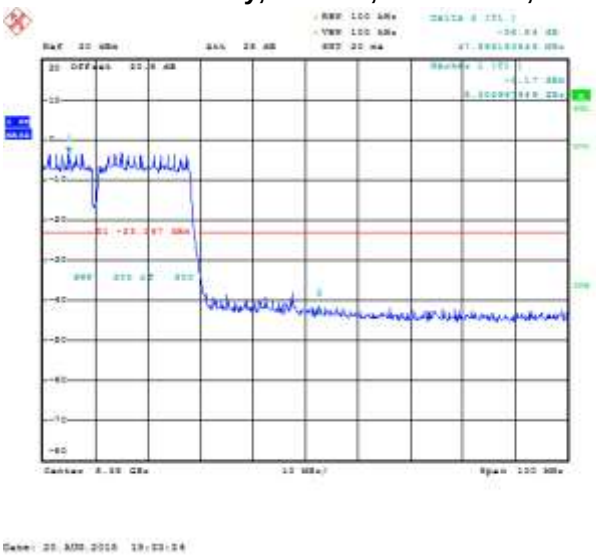


Figure 7-58: Band Edge Compliance
Primary, 802.11n, Channel 100, 6 Mbps

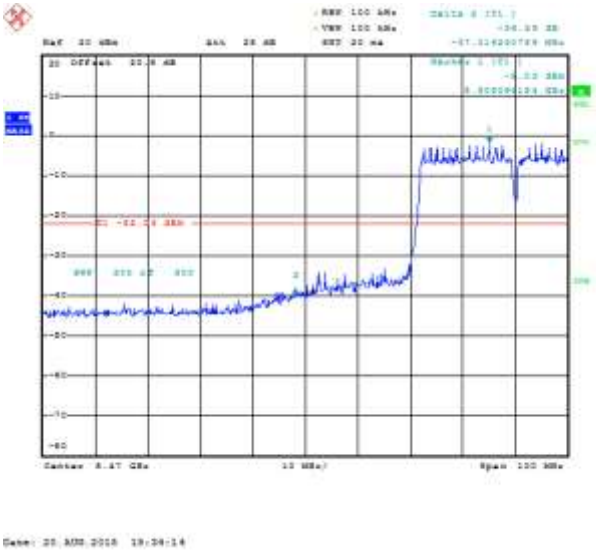
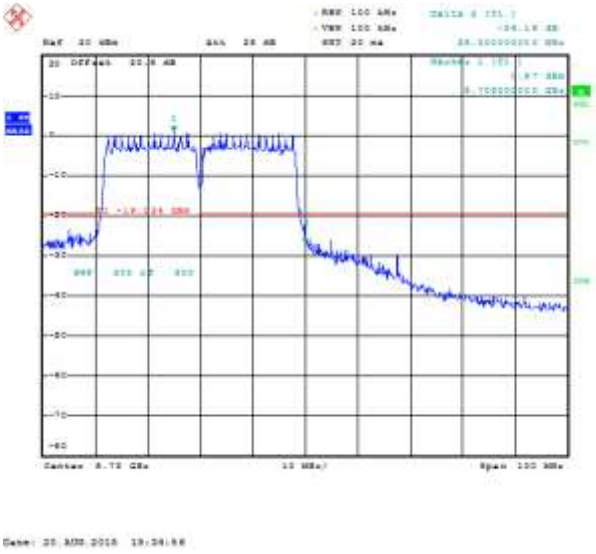


Figure 7-59: Band Edge Compliance
Primary, 802.11n, Channel 140, 6 Mbps



802.11n RF Conducted Emission Test Results cont'd

Figure 7-60: Band Edge Compliance
Primary, 802.11n, Channel 149, 6 Mbps

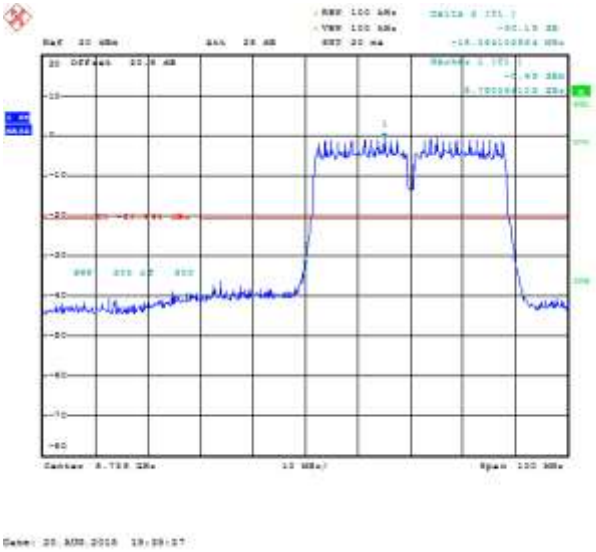


Figure 7-61: Band Edge Compliance
Secondary, 802.11n, Channel 36, 6 Mbps

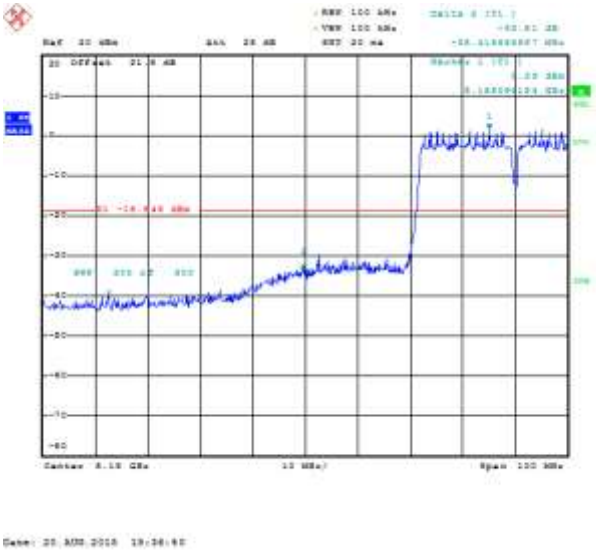


Figure 7-62: Band Edge Compliance
Secondary, 802.11n, Channel 64, 6 Mbps

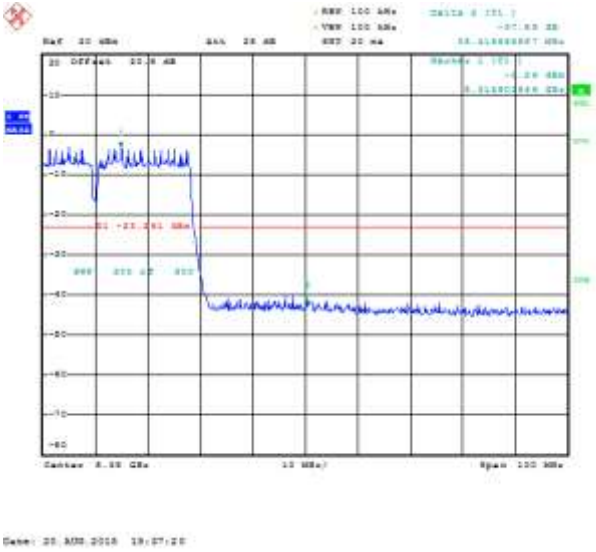
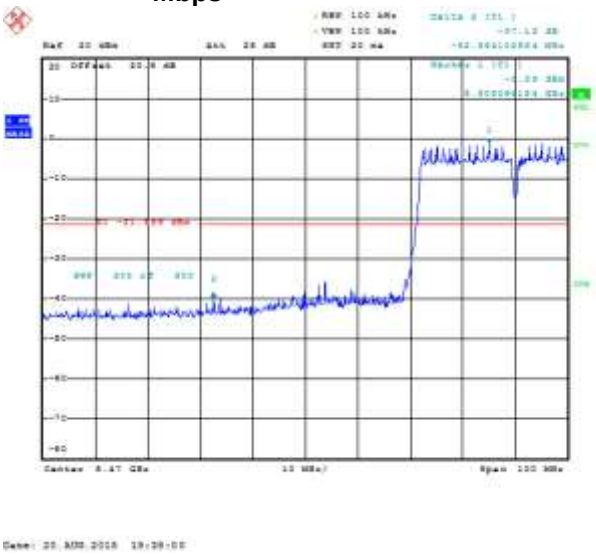


Figure 7-63: Band Edge Compliance
Secondary, 802.11n, Channel 100, 6 Mbps



802.11n RF Conducted Emission Test Results cont'd

Figure 7-64: Band Edge Compliance Secondary, 802.11n, Channel 140, 6 Mbps

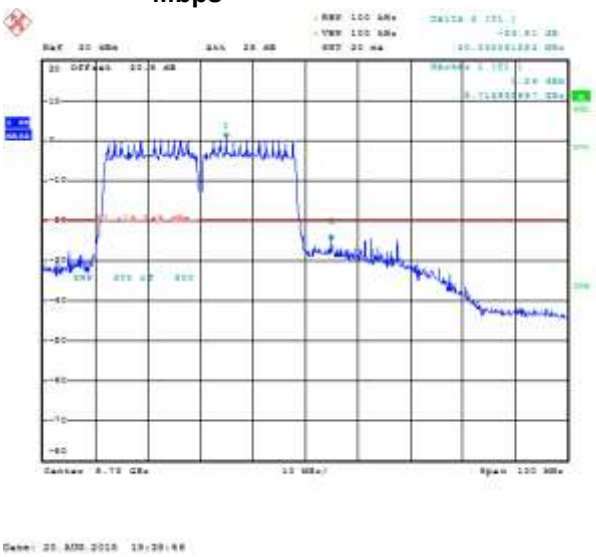
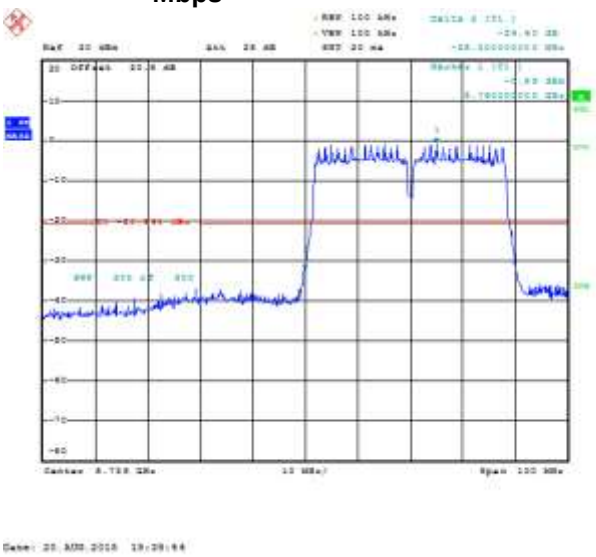


Figure 7-65: Band Edge Compliance Secondary, 802.11n, Channel 149, 6 Mbps



802.11a RF Conducted Emission Test Results cont'd

Peak Power Spectral Density

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.407 and RSS-247. Channels 36, 48, 64, 100, 140 and 165 were measured at 6 Mbps each for 802.11a mode.

SISO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	6 Mbps	< 11.00	-0.81	-11.81
48	6 Mbps	< 11.00	3.83	-7.17
64	6 Mbps	< 11.00	2.91	-8.09
100	6 Mbps	< 11.00	2.21	-8.79
140	6 Mbps	< 11.00	1.69	-9.31
165	6 Mbps	< 33.00	2.06	-30.94

SISO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	6 Mbps	< 11.00	0.39	-10.61
48	6 Mbps	< 11.00	3.70	-7.30
64	6 Mbps	< 11.00	2.34	-8.66
100	6 Mbps	< 11.00	2.58	-8.42
140	6 Mbps	< 11.00	1.83	-9.17
165	6 Mbps	< 33.00	2.50	-30.5

2TX/CDD Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	6 Mbps	< 11.00	0.84	-10.16
48	6 Mbps	< 11.00	4.10	-6.90
64	6 Mbps	< 11.00	2.54	-8.46
100	6 Mbps	< 11.00	3.67	-7.33
140	6 Mbps	< 11.00	3.86	-7.14
165	6 Mbps	< 33.00	3.55	-29.45

802.11a RF Conducted Emission Test Results cont'd

2TX/CDD Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	6 Mbps	< 11.00	-1.18	-12.18
48	6 Mbps	< 11.00	4.06	-6.94
64	6 Mbps	< 11.00	2.91	-8.09
100	6 Mbps	< 11.00	3.83	-7.17
140	6 Mbps	< 11.00	2.69	-8.31
165	6 Mbps	< 33.00	3.29	-29.71

2TX/CDD Combined

Channel	Data Rate	Limit (dBm/MHz)	Combined Peak (dBm/MHz)	Margin (dB)
36	6 Mbps	< 11.00	2.86	-8.14
48	6 Mbps	< 11.00	6.96	-4.04
64	6 Mbps	< 11.00	5.67	-5.33
100	6 Mbps	< 11.00	6.62	-4.38
140	6 Mbps	< 11.00	6.21	-10.79
165	6 Mbps	< 33.00	6.34	-10.66

See figures 7-66 to 7-89 for the plots of the peak power spectral density for Channel 36, 48, 64, 100, 140, and 165 at 6 Mbps each for 802.11a mode.

802.11n RF Conducted Emission Test Results

Peak Power Spectral Density

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.407 and RSS-247. Channels 36, 64 100 and 140 were measured at MCS 0 each for 802.11n mode.

20 MHz Bandwidth

SISO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	0.54	-10.46
64	MCS0	< 11.00	2.70	-8.3
100	MCS0	< 11.00	3.06	-7.94
140	MCS0	< 11.00	3.07	-7.93

SISO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	0.92	-10.08
64	MCS0	< 11.00	1.89	-9.11
100	MCS0	< 11.00	3.54	-7.46
140	MCS0	< 11.00	2.44	-8.56

MIMO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	-2.25	-13.25
64	MCS0	< 11.00	2.46	-8.54
100	MCS0	< 11.00	2.96	-8.04
140	MCS0	< 11.00	3.25	-7.75

802.11n RF Conducted Emission Test Results cont'd

MIMO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	-1.00	-12.00
64	MCS0	< 11.00	2.27	-8.73
100	MCS0	< 11.00	3.52	-7.48
140	MCS0	< 11.00	2.34	-8.66

MIMO Combined

Channel	Data Rate	Limit (dBm/MHz)	Combined Peak (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	1.43	-9.72
64	MCS0	< 11.00	5.38	-5.75
100	MCS0	< 11.00	6.26	-4.88
140	MCS0	< 11.00	5.83	-5.32

40 MHz Bandwidth

SISO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	-0.93	-11.93
64	MCS0	< 11.00	-3.44	-14.44
100	MCS0	< 11.00	-2.85	-13.85
140	MCS0	< 11.00	0.14	-10.86

SISO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	-0.78	-11.78
64	MCS0	< 11.00	-4.27	-15.27
100	MCS0	< 11.00	-2.31	-13.31
140	MCS0	< 11.00	-0.29	-11.29

802.11n RF Conducted Emission Test Results cont'd

MIMO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	-3.61	-14.61
64	MCS0	< 11.00	-3.44	-14.44
100	MCS0	< 11.00	-2.73	-13.73
140	MCS0	< 11.00	0.88	-10.12

MIMO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	-2.73	-13.73
64	MCS0	< 11.00	-3.46	-14.46
100	MCS0	< 11.00	-2.39	-13.39
140	MCS0	< 11.00	0.20	-10.80

MIMO Combined

Channel	Data Rate	Limit (dBm/MHz)	Combined Peak (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	-0.28	-11.28
64	MCS0	< 11.00	-0.48	-11.48
100	MCS0	< 11.00	0.31	-10.69
140	MCS0	< 11.00	3.40	-7.60

See figures 7-90 to 7-121 for the plots of the peak power spectral density for Channel 36, 64 and 165 at MCS 0 each for 802.11n mode.

802.11a RF Conducted Emission Test Results cont'd

Figure 7-66: Peak Power Spectral Density SISO Primary, 802.11a, Channel 36, 6 Mbps

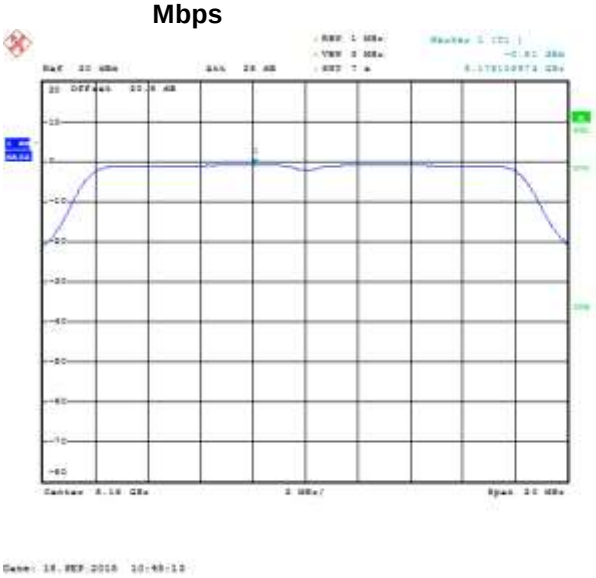


Figure 7-67: Peak Power Spectral Density SISO Primary, 802.11a, Channel 48, 6 Mbps

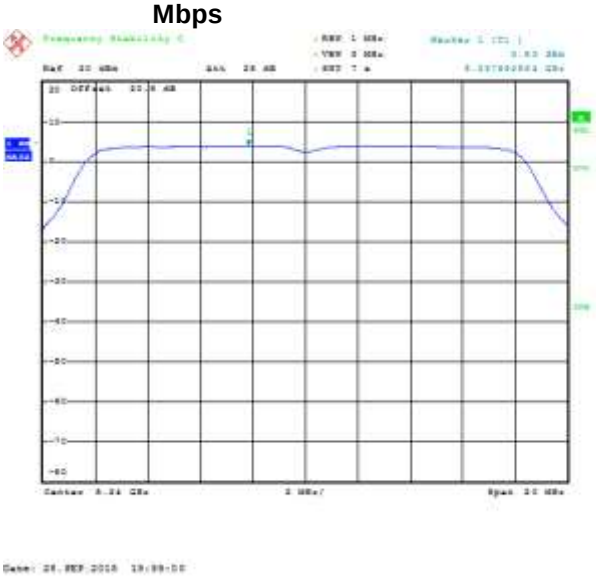


Figure 7-68: Peak Power Spectral Density SISO Primary, 802.11a, Channel 64, 6 Mbps

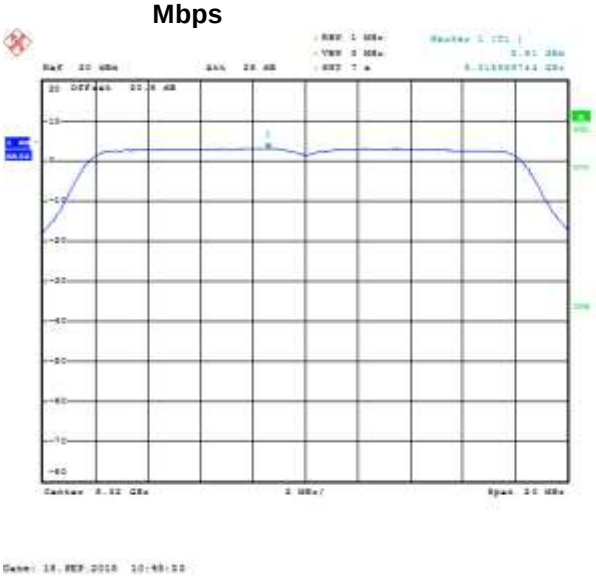
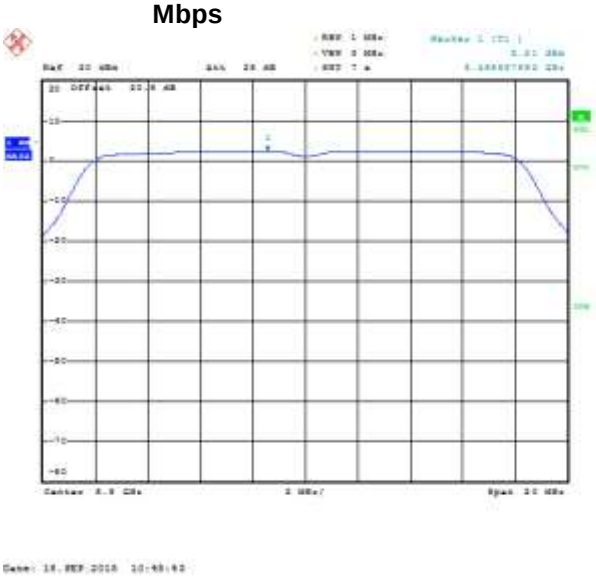


Figure 7-69: Peak Power Spectral Density SISO Primary, 802.11a, Channel 100, 6 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 7-70: Peak Power Spectral Density SISO Primary, 802.11a, Channel 140, 6 Mbps

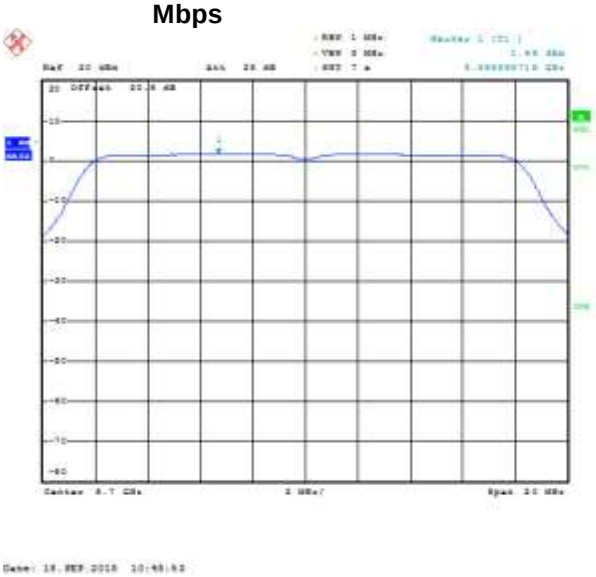


Figure 7-71: Peak Power Spectral Density SISO Primary, 802.11a, Channel 165, 6 Mbps

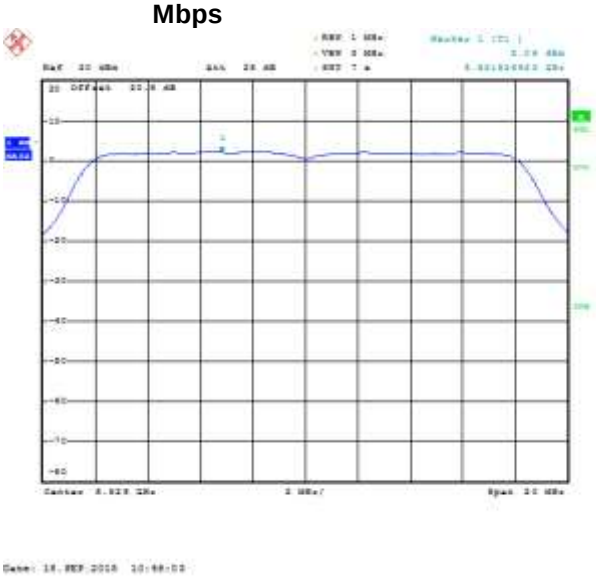


Figure 7-72: Peak Power Spectral Density SISO Secondary, 802.11a, Channel 36, 6 Mbps

Figure 7-73: Peak Power Spectral Density SISO Secondary, 802.11a, Channel 48, 6 Mbps

802.11a RF Conducted Emission Test Results cont'd

Figure 7-74: Peak Power Spectral Density SISO Secondary, 802.11a, Channel 64, 6 Mbps

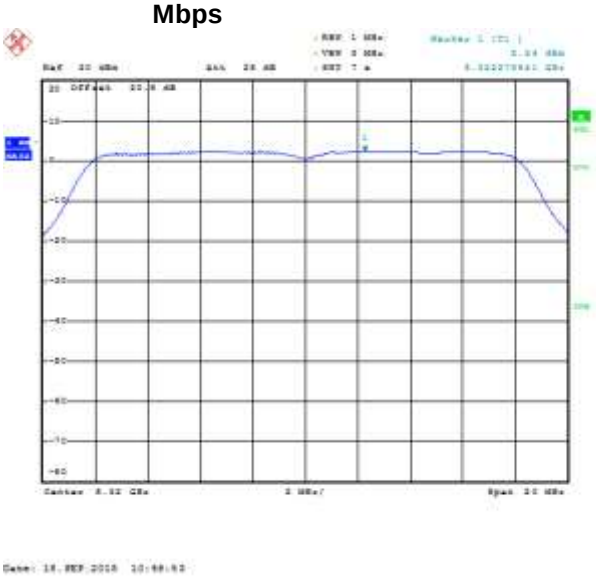


Figure 7-75: Peak Power Spectral Density SISO Secondary, 802.11a, Channel 100, 6 Mbps

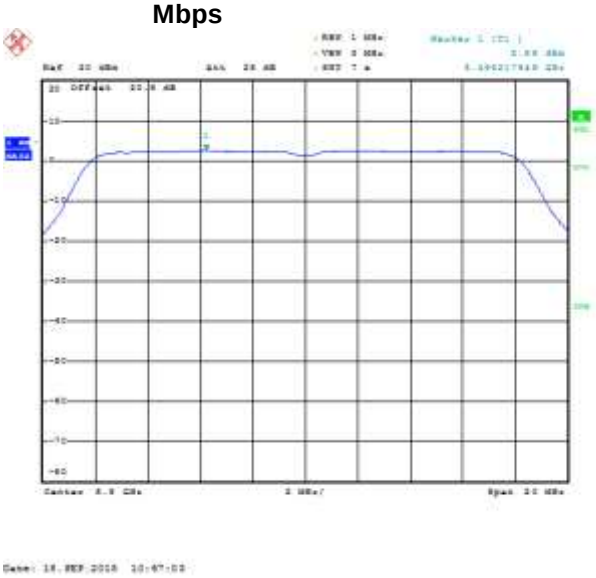


Figure 7-76: Peak Power Spectral Density SISO Secondary, 802.11a, Channel 140, 6 Mbps

Figure 7-77: Peak Power Spectral Density SISO Secondary, 802.11a, Channel 165, 6 Mbps

802.11a RF Conducted Emission Test Results cont'd

Figure 7-78: Peak Power Spectral Density MIMO Primary, 802.11a, Channel 36, 6 Mbps

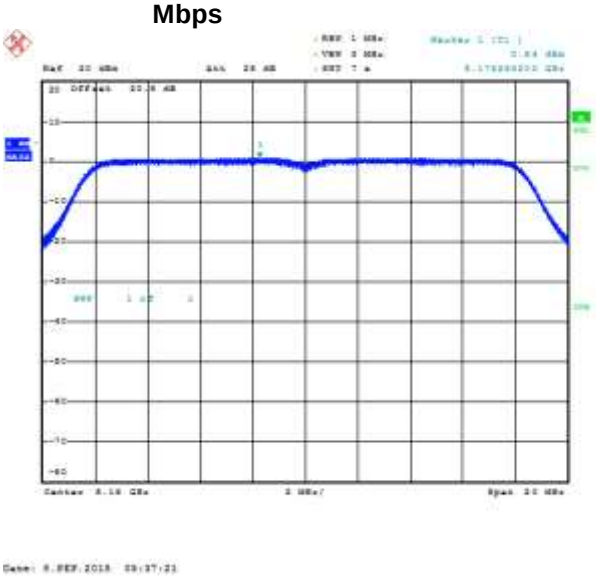


Figure 7-79: Peak Power Spectral Density MIMO Primary, 802.11a, Channel 48, 6 Mbps

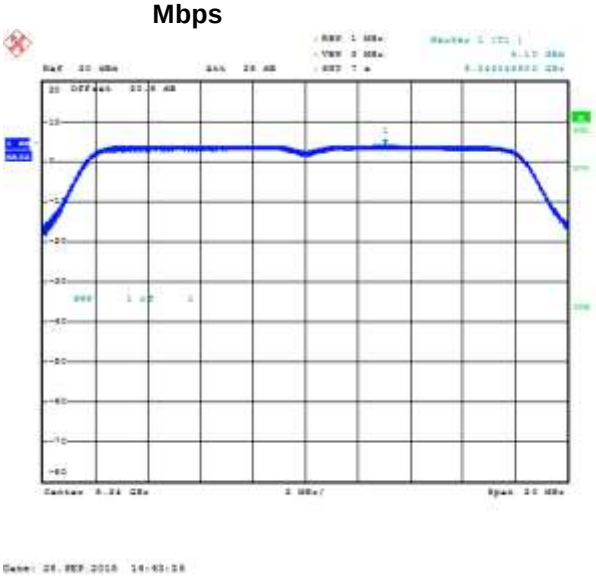


Figure 7-80: Peak Power Spectral Density MIMO Primary, 802.11a, Channel 64, 6 Mbps

Figure 7-81: Peak Power Spectral Density MIMO Primary, 802.11a, Channel 100, 6 Mbps

802.11a RF Conducted Emission Test Results cont'd

Figure 7-82: Peak Power Spectral Density MIMO Primary, 802.11a, Channel 140, 6 Mbps

Figure 7-83: Peak Power Spectral Density MIMO Primary, 802.11a, Channel 165, 6 Mbps

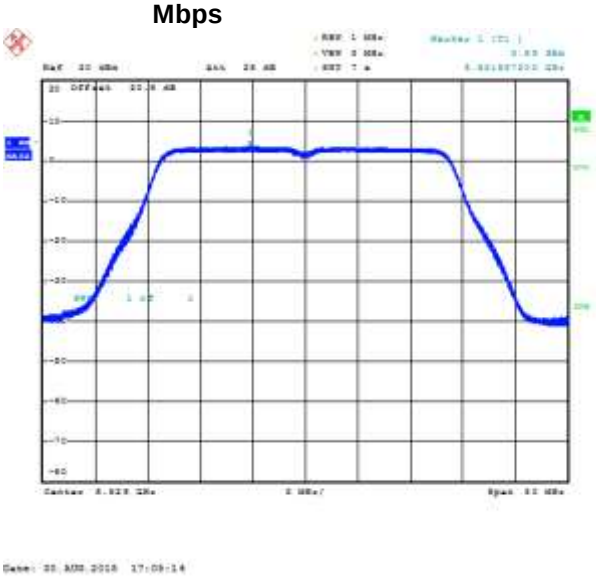


Figure 7-84: Peak Power Spectral Density MIMO Secondary, 802.11a, Channel 36, 6 Mbps

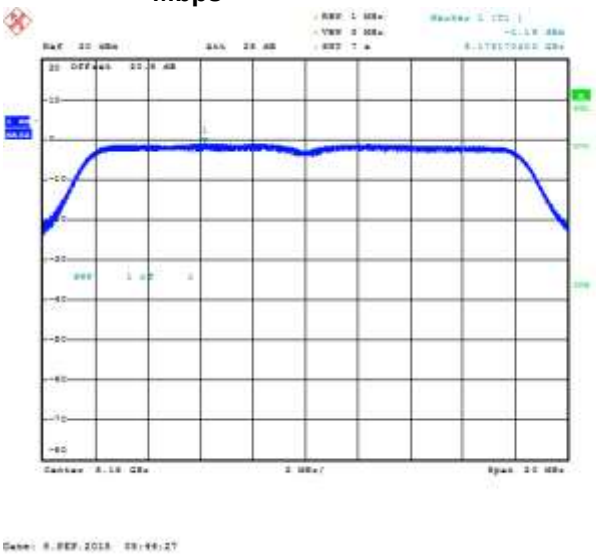
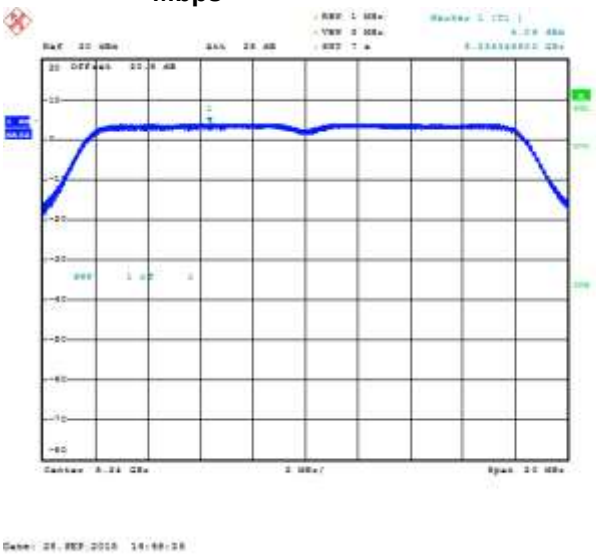


Figure 7-85: Peak Power Spectral Density MIMO Secondary, 802.11a, Channel 48, 6 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 7-86: Peak Power Spectral Density MIMO Secondary, 802.11a, Channel 64, 6 Mbps

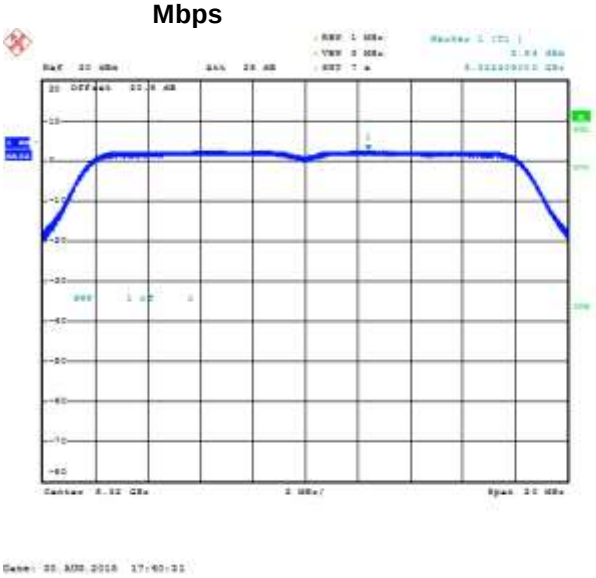


Figure 7-87: Peak Power Spectral Density MIMO Secondary, 802.11a, Channel 100, 6 Mbps

Figure 7-88: Peak Power Spectral Density MIMO Secondary, 802.11a, Channel 140, 6 Mbps

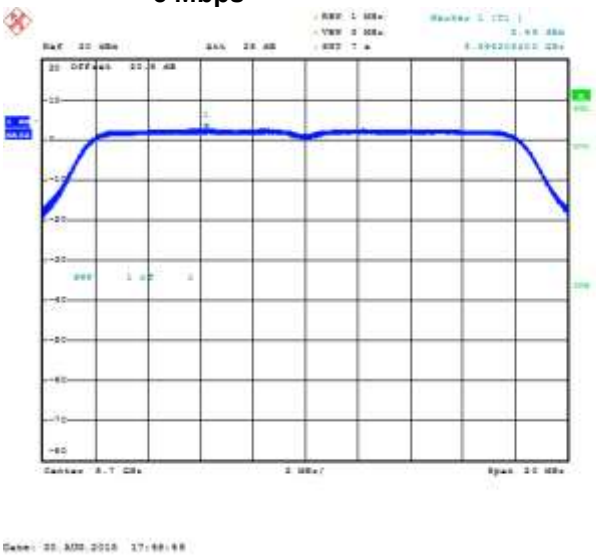
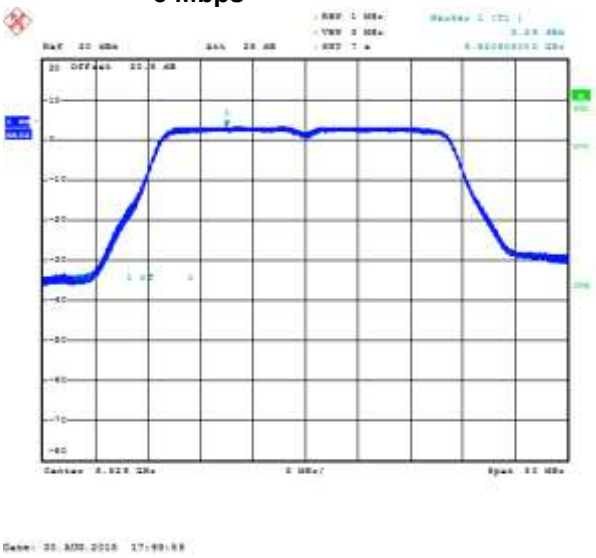


Figure 7-89: Peak Power Spectral Density MIMO Secondary, 802.11a, Channel 165, 6 Mbps



802.11n RF Conducted Emission Test Results

20 MHz bandwidth

Figure 7-90: Peak Power Spectral Density SISO Primary, 802.11n, Channel 36, MCS 0

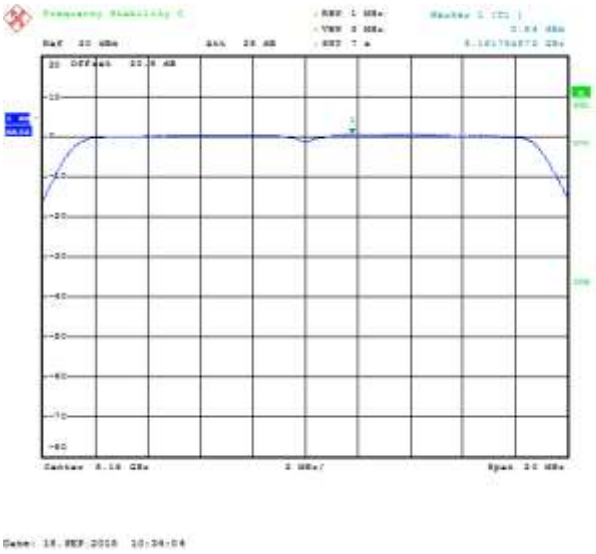


Figure 7-91: Peak Power Spectral Density SISO Primary, 802.11n, Channel 64, MCS 0

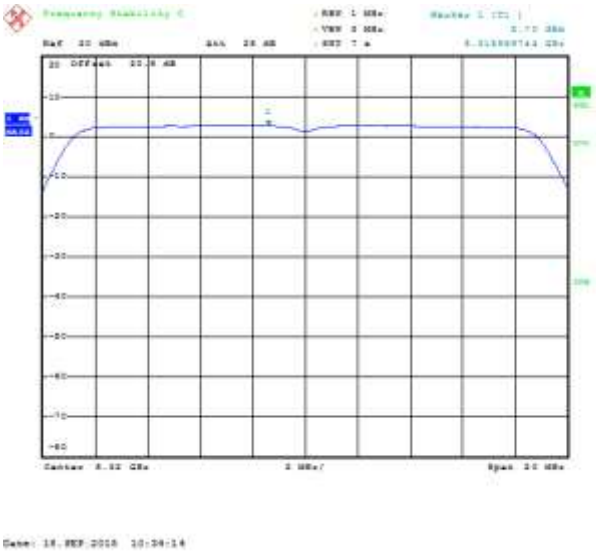


Figure 7-92: Peak Power Spectral Density SISO Primary, 802.11n, Channel 100, MCS 0

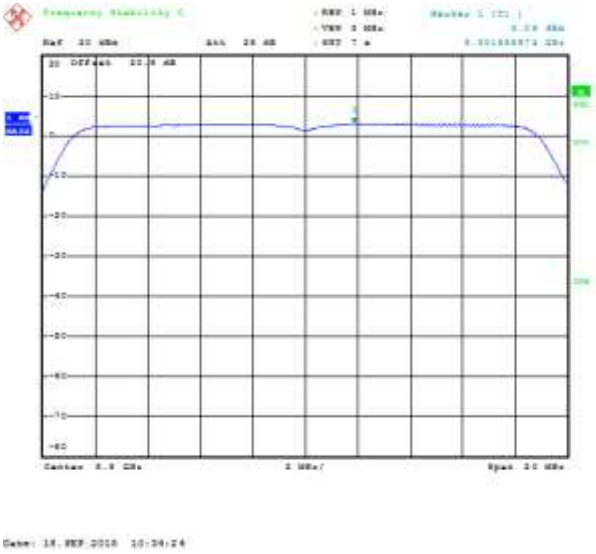
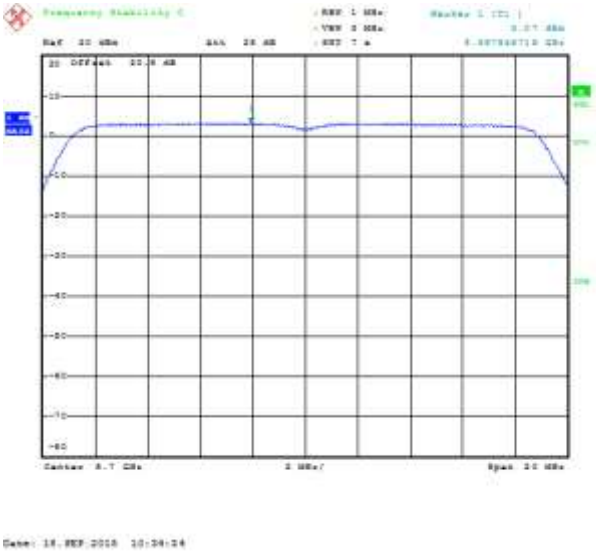


Figure 7-93: Peak Power Spectral Density SISO Primary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results

Figure 7-94: Peak Power Spectral Density SISO Secondary, 802.11n, Channel 36, MCS 0

Figure 7-95: Peak Power Spectral Density SISO Secondary, 802.11n, Channel 48, MCS 0

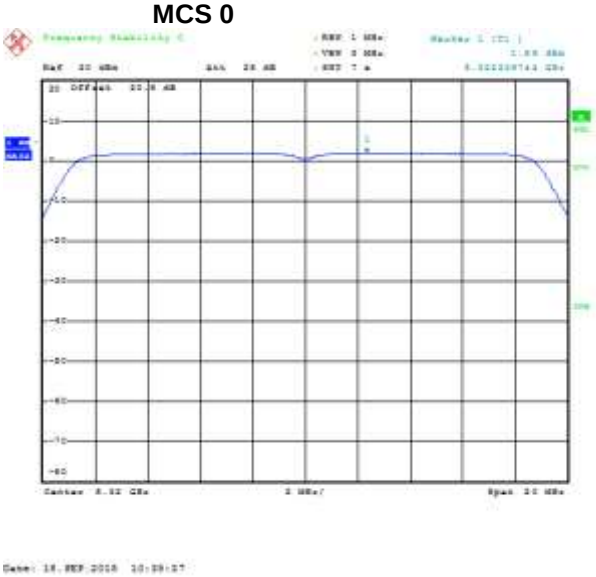


Figure 7-96: Peak Power Spectral Density SISO Secondary, 802.11n, Channel 100, MCS 0

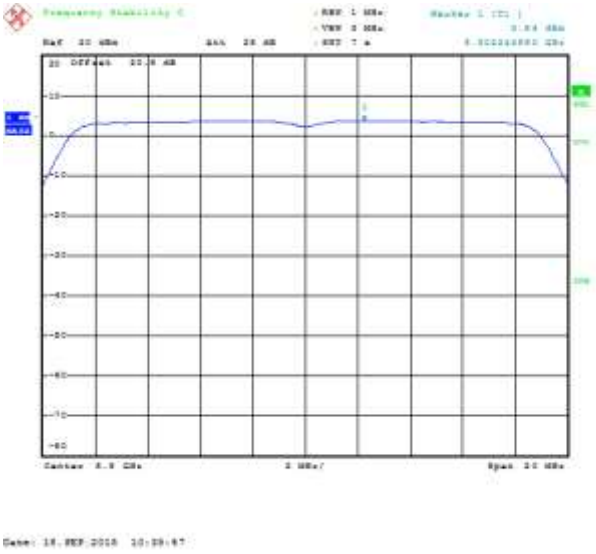
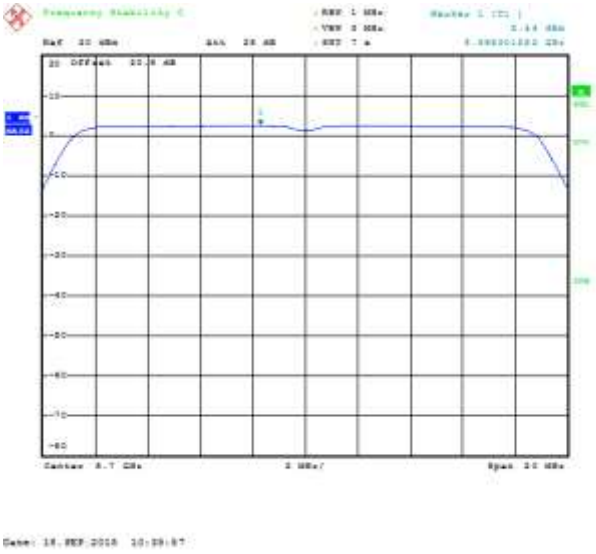


Figure 7-97: Peak Power Spectral Density SISO Secondary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results

20 MHz bandwidth

Figure 7-98: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 36, MCS 0

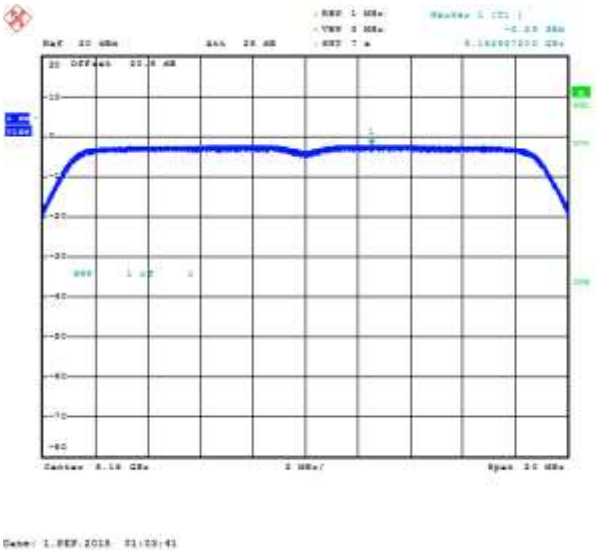


Figure 7-99: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 64, MCS 0

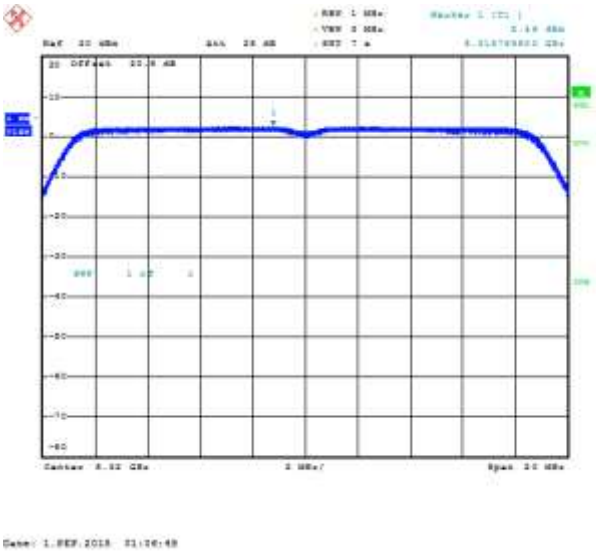


Figure 7-100: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 100, MCS 0

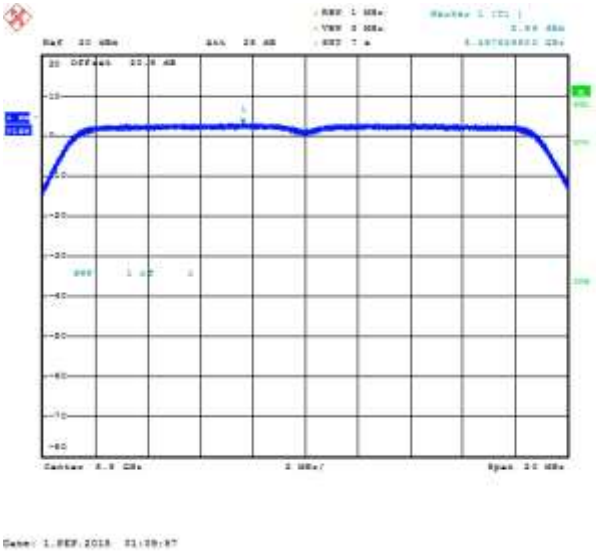
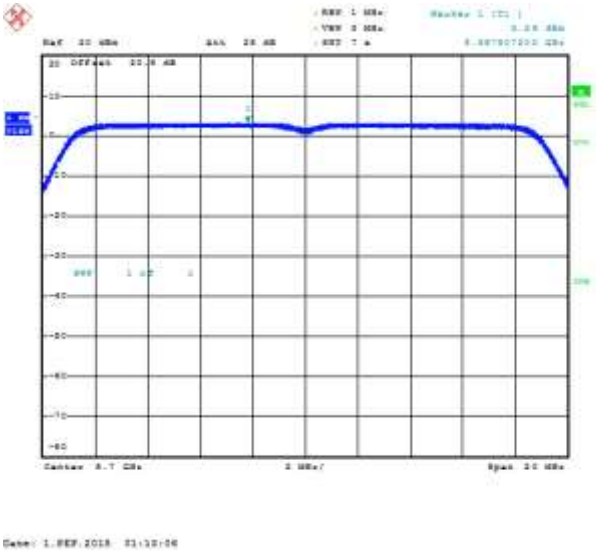


Figure 7-101: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results

Figure 7-102: Peak Power Spectral Density MIMO Secpmdaru, 802.11n, Channel 36, MCS 0

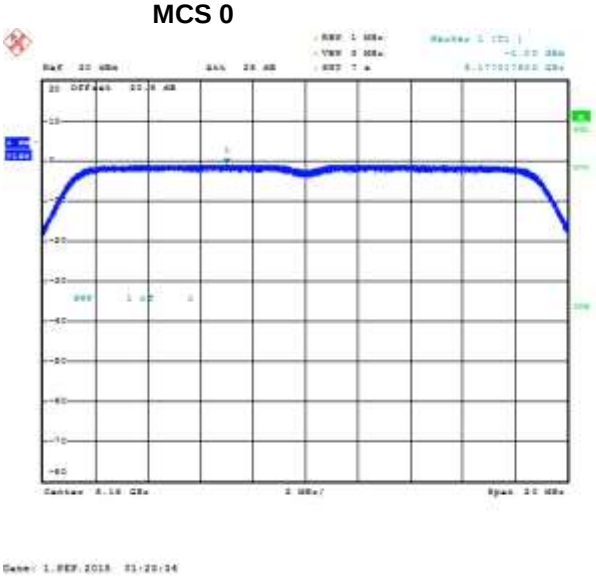


Figure 7-103: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 64, MCS 0

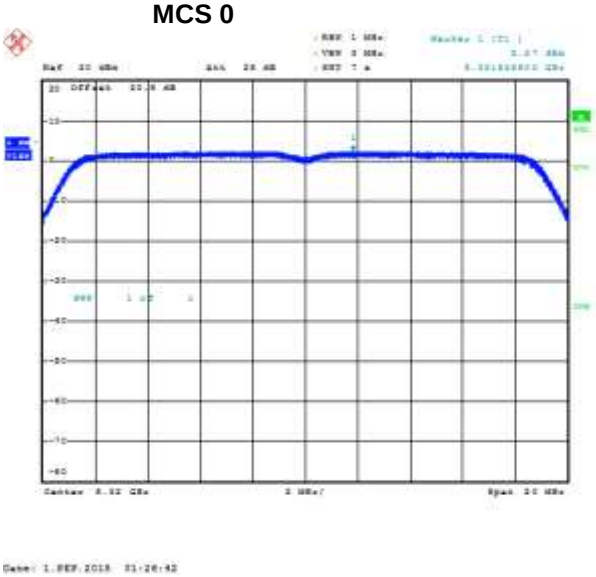


Figure 7-104: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 100, MCS 0

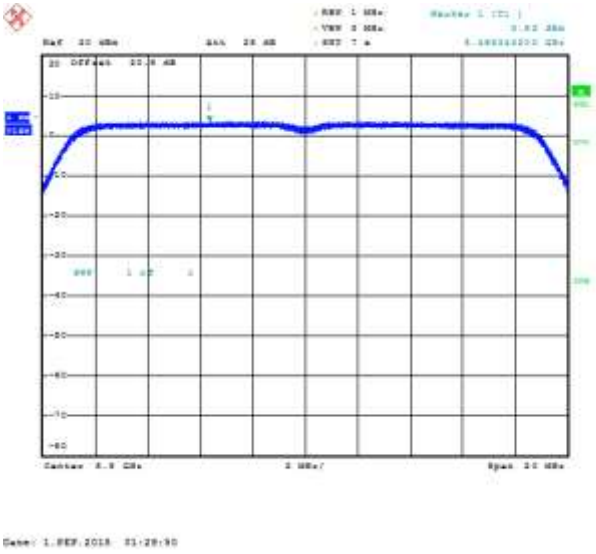
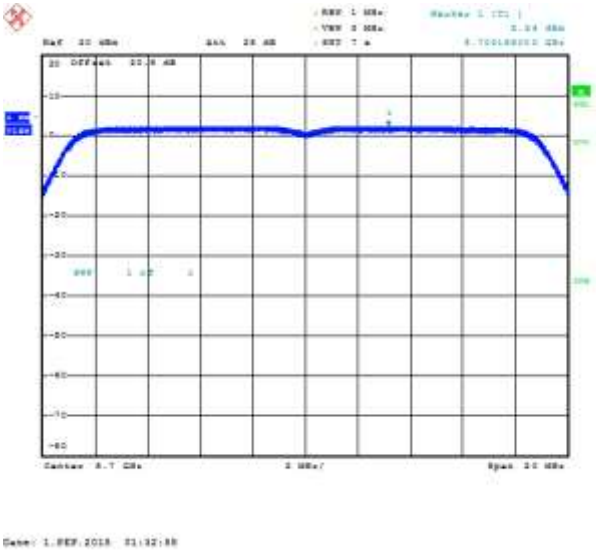


Figure 7-105: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results

40 MHz bandwidth

Figure 7-106: Peak Power Spectral Density SISO Primary, 802.11n, Channel 36, MCS 0

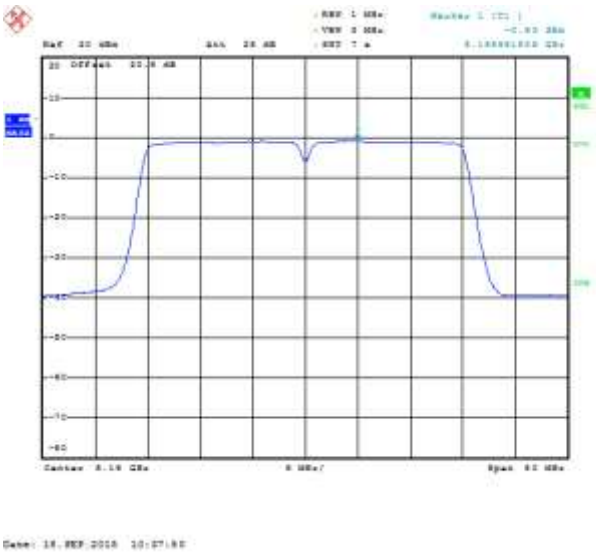


Figure 7-107: Peak Power Spectral Density SISO Primary, 802.11n, Channel 64, MCS 0

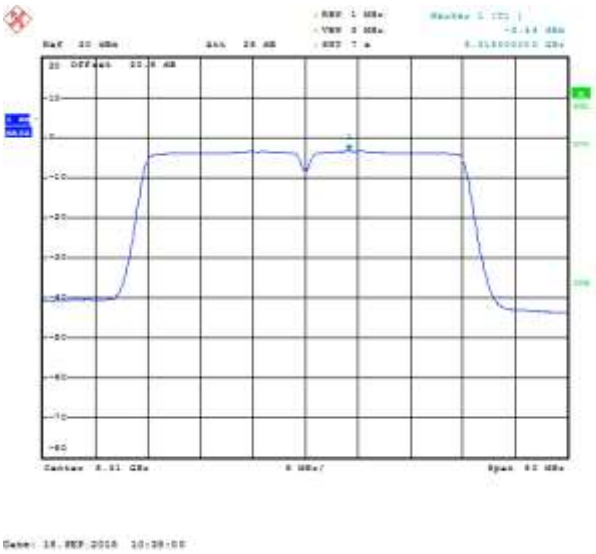
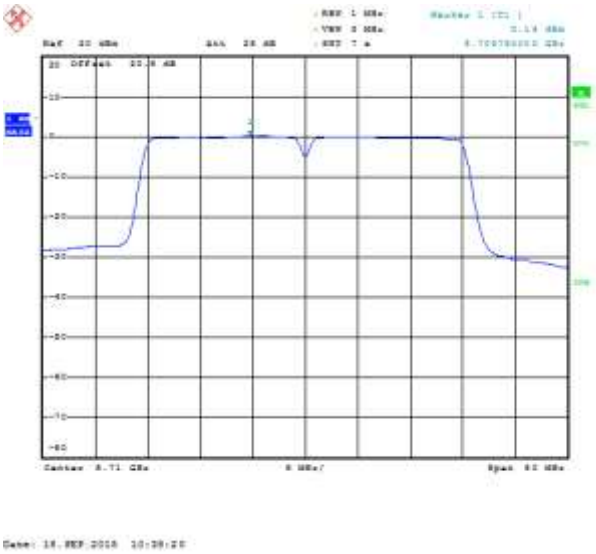


Figure 7-108: Peak Power Spectral Density SISO Primary, 802.11n, Channel 100, MCS 0

Figure 7-109: Peak Power Spectral Density SISO Primary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results

Figure 7-110: Peak Power Spectral Density
SISO Secondary, 802.11n, Channel 36, MCS 0

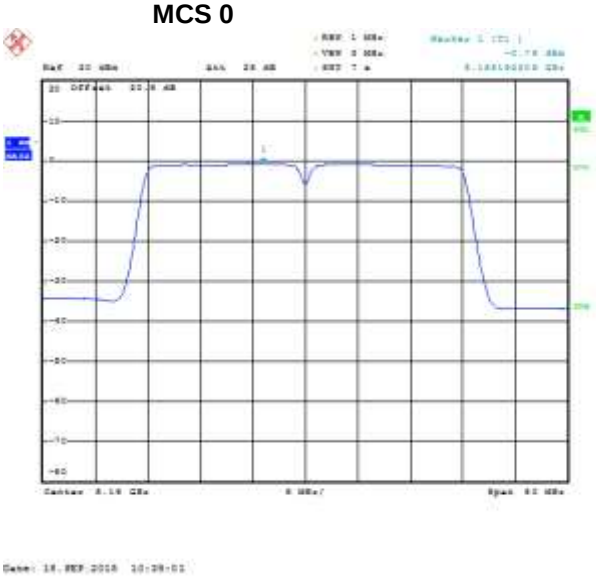


Figure 7-111: Peak Power Spectral Density
SISO Secondary, 802.11n, Channel 64, MCS 0

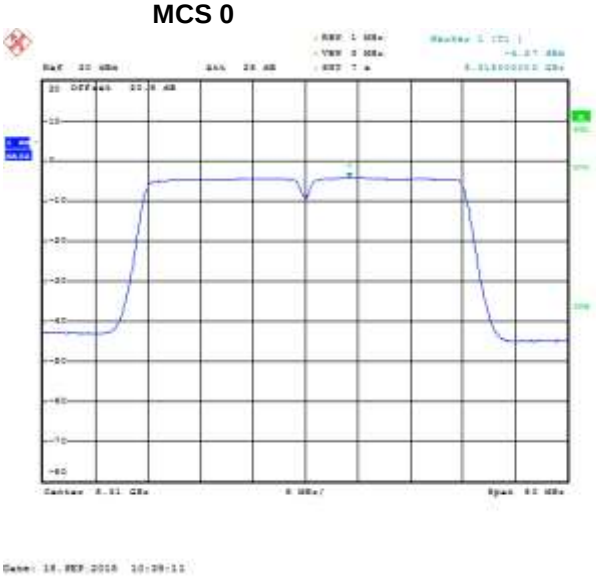


Figure 7-112: Peak Power Spectral Density
SISO Secondary, 802.11n, Channel 100, MCS 0

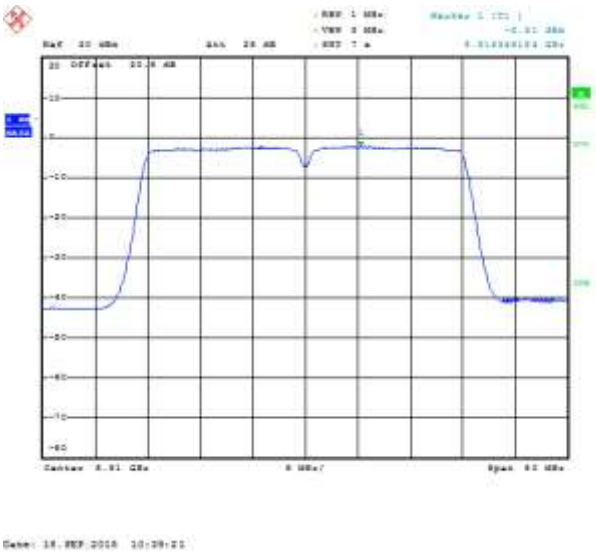


Figure 7-113: Peak Power Spectral Density
SISO Secondary, 802.11n, Channel 140, MCS 0

802.11n RF Conducted Emission Test Results

40 MHz bandwidth

Figure 7-114: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 36, MCS 0

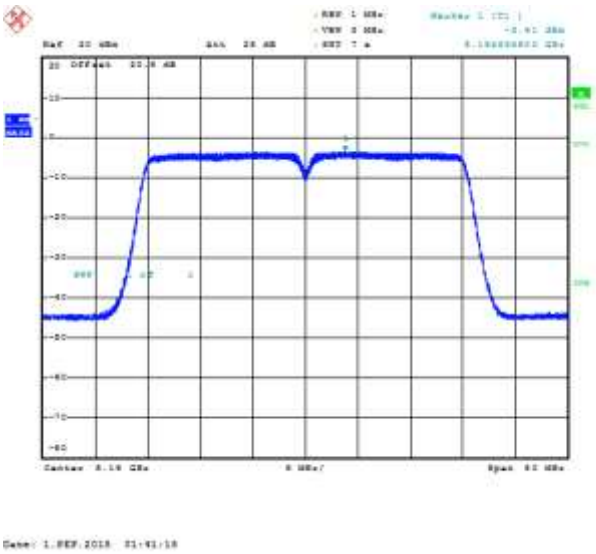


Figure 7-115: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 64, MCS 0

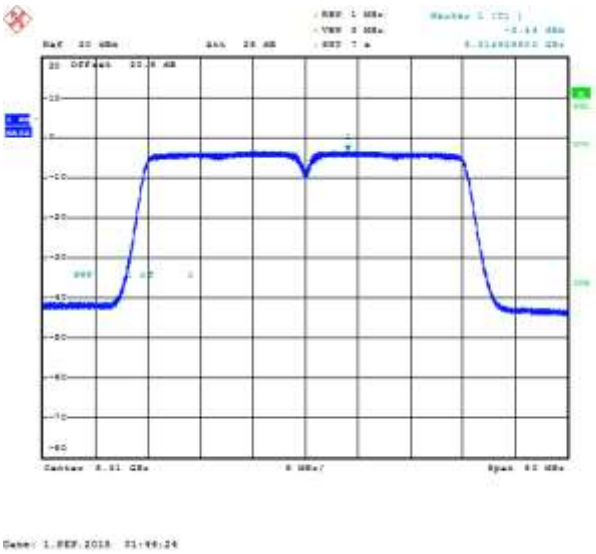


Figure 7-116: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 100, MCS 0

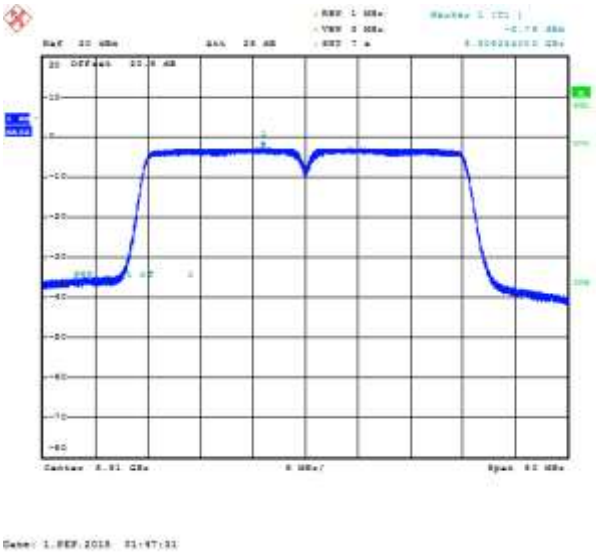
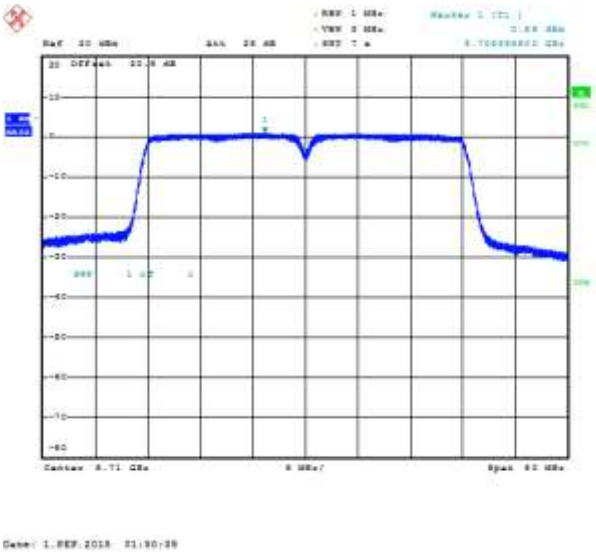


Figure 7-117: Peak Power Spectral Density MIMO Primary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results

Figure 7-118: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 36, MCS 0

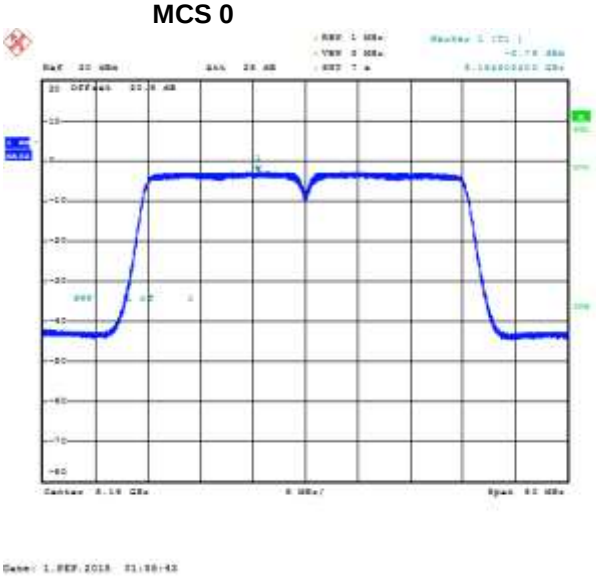


Figure 7-119: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 64, MCS 0

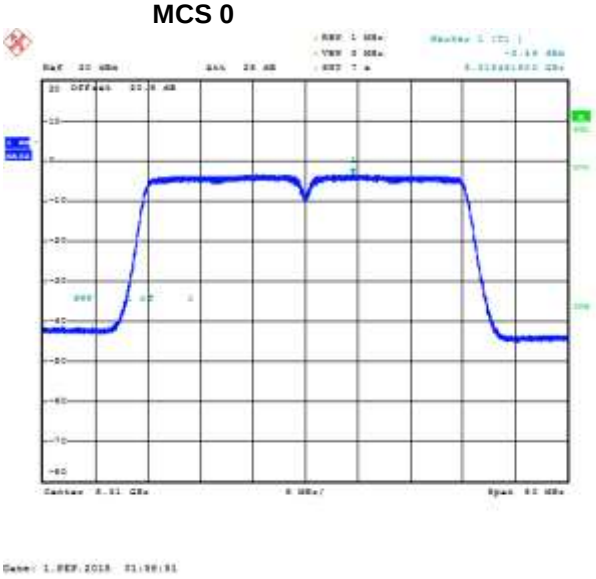


Figure 7-120: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 100, MCS 0

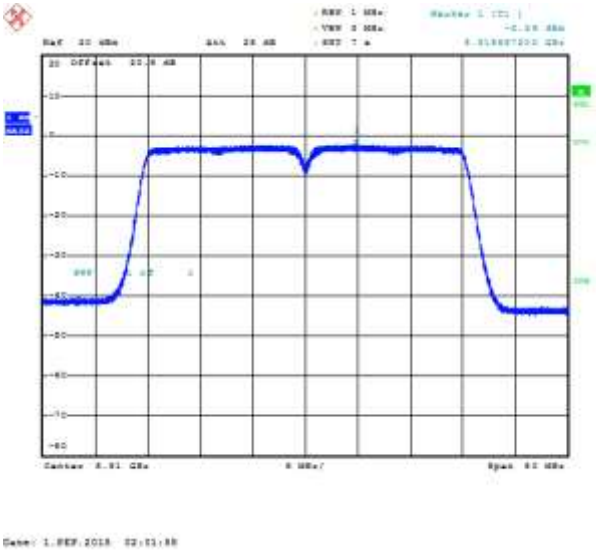
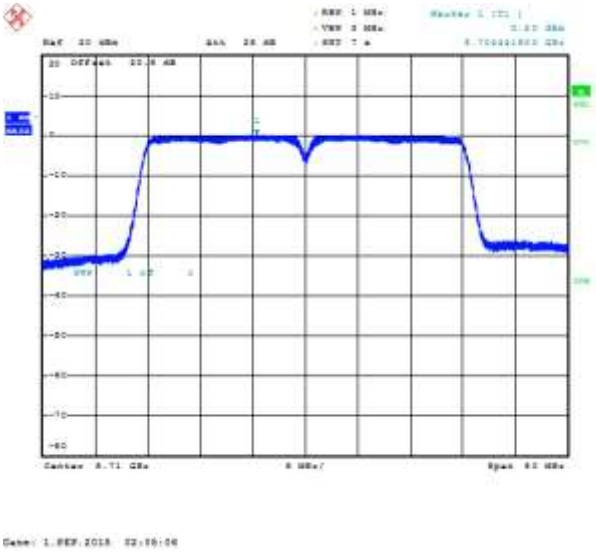


Figure 7-121: Peak Power Spectral Density MIMO Secondary, 802.11n, Channel 140, MCS 0



802.11a RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 100 and 140 were measured at MCS 0 each for 802.11a mode. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 29.0 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

Primary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	12.32	-43.01	-55.33	-20
64	MCS0	12.74	-44.75	-57.49	-20
100	MCS0	13.93	-45.34	-59.27	-20
140	MCS0	14.37	-46.48	-60.85	-20

Secondary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	13.36	-46.38	-59.74	-20
64	MCS0	12.78	-38.87	-51.65	-20
100	MCS0	13.62	-43.68	-57.30	-20
140	MCS0	14.75	-46.52	-61.27	-20

Sum

Channel	Data Rate	Carrier Level (dBm)	Combined Peak (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	15.88	-41.37	-57.24	-20
64	MCS0	15.77	-37.87	-53.64	-20
100	MCS0	17.06	-41.42	-58.48	-20
140	MCS0	17.81	-43.49	-61.30	-20

802.11a RF Conducted Emission Test Results cont'd

See figures 7-122 to 7-137 for the plots of the spurious RF conducted emissions for Channel 36, 64, 100 and 140 at MCS 0 each for 802.11a mode.

802.11a RF Conducted Emission Test Results cont'd

Figure 7-122: Spurious RF Conducted Emissions Primary, 802.11a, Channel 36, MCS 0

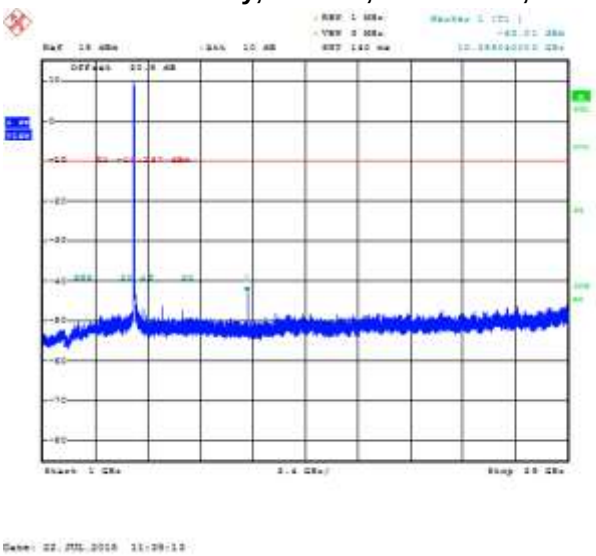


Figure 7-123: Spurious RF Conducted Emissions Primary, 802.11a, Channel 36, MCS 0

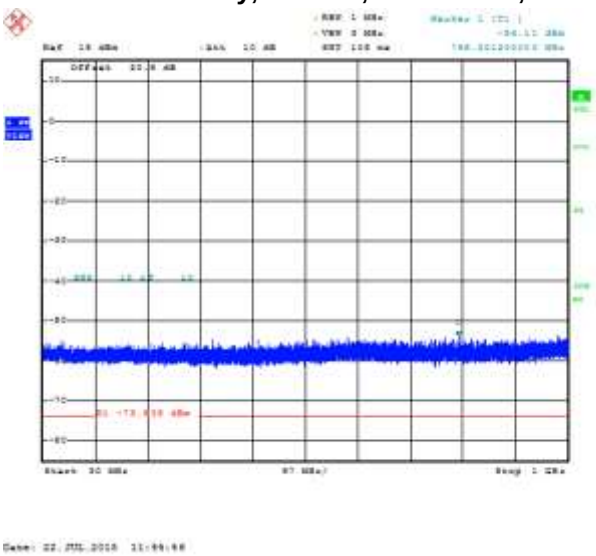


Figure 7-124: Spurious RF Conducted Emissions Primary, 802.11a, Channel 64, MCS 0

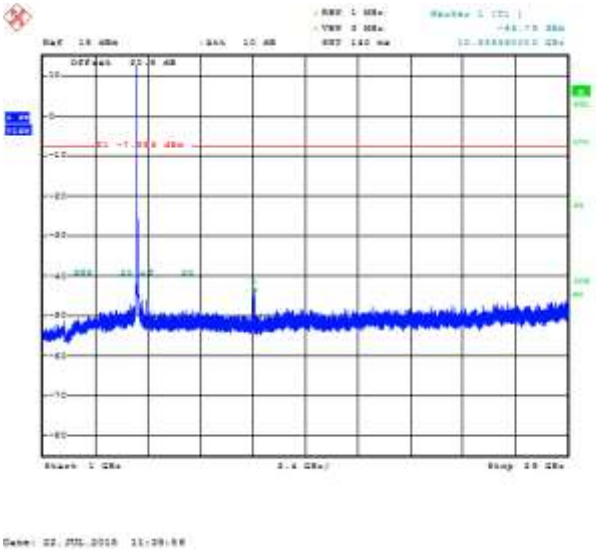
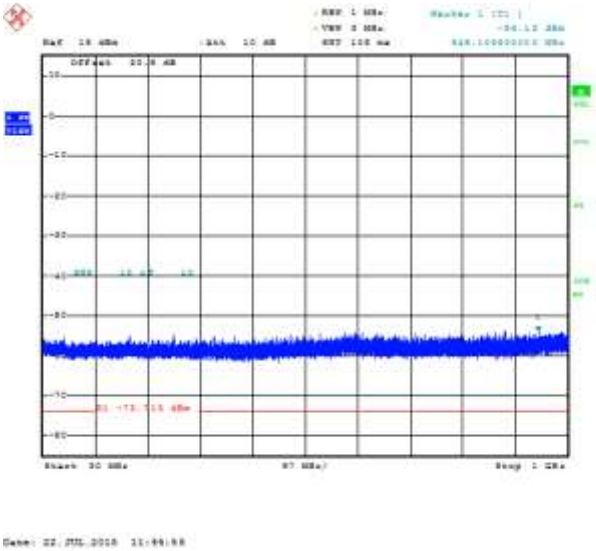


Figure 7-125: Spurious RF Conducted Emissions Primary, 802.11a, Channel 64, MCS 0



802.11a RF Conducted Emission Test Results cont'd

Figure 7-126: Spurious RF Conducted Emissions Primary, 802.11a, Channel 100, MCS 0

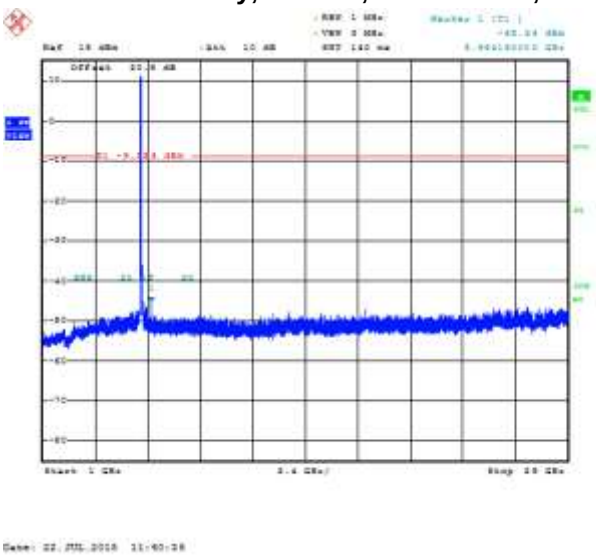


Figure 7-127: Spurious RF Conducted Emissions Primary, 802.11a, Channel 100, MCS 0

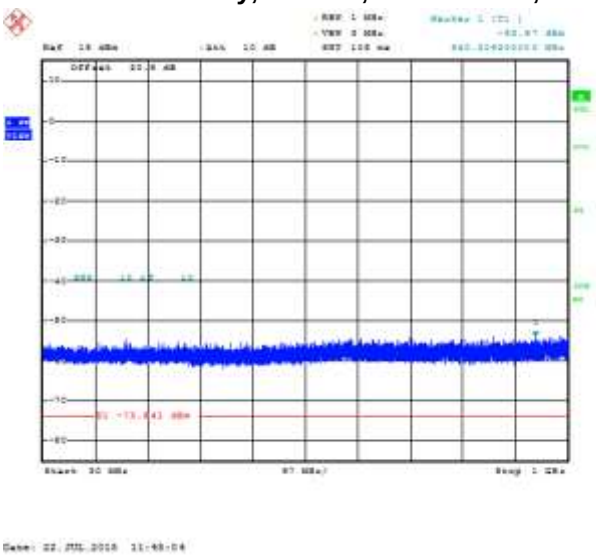


Figure 7-128: Spurious RF Conducted Emissions Primary, 802.11a, Channel 140, MCS 0

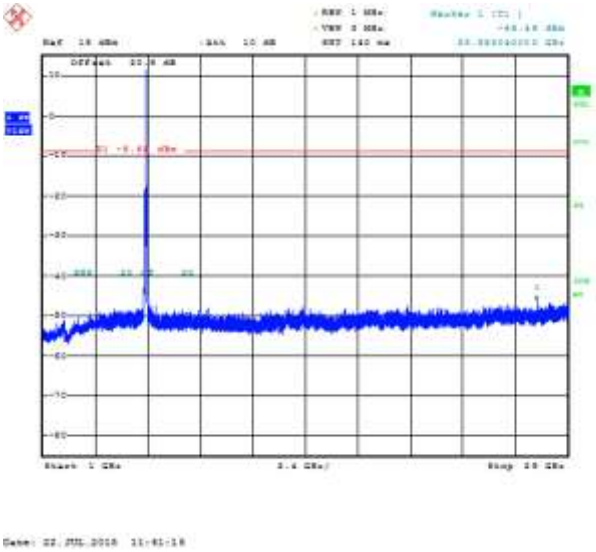
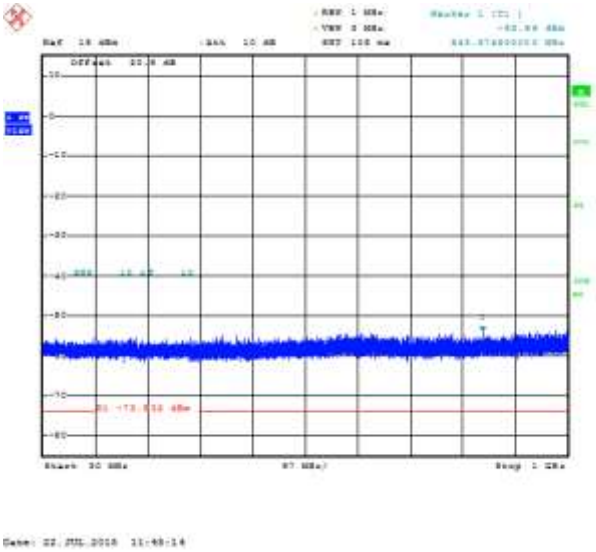


Figure 7-129: Spurious RF Conducted Emissions Primary, 802.11a, Channel 140, MCS 0



802.11a RF Conducted Emission Test Results cont'd

Figure 7-130: Spurious RF Conducted Emissions Secondary, 802.11a, Channel 36, MCS 0

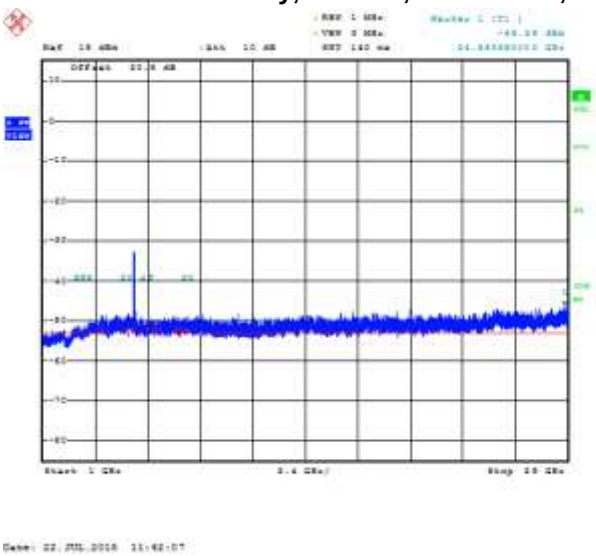


Figure 7-131: Spurious RF Conducted Emissions Secondary, 802.11a, Channel 36, MCS 0

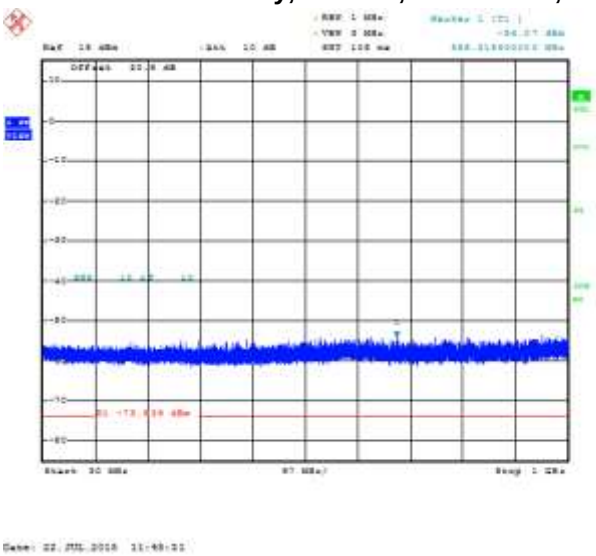


Figure 7-132: Spurious RF Conducted Emissions Secondary, 802.11a, Channel 64, MCS 0

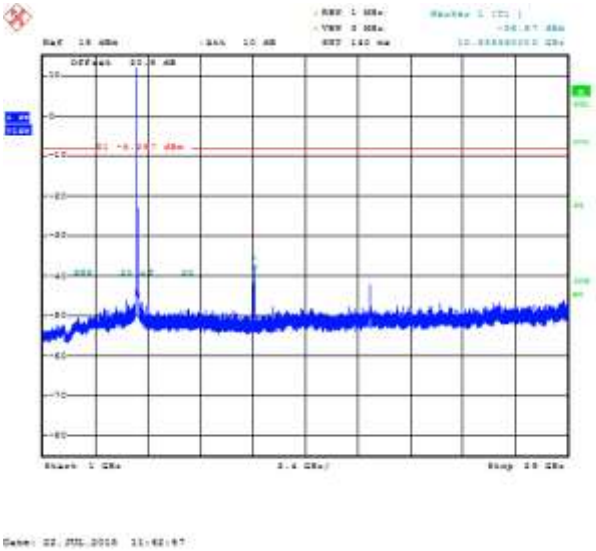
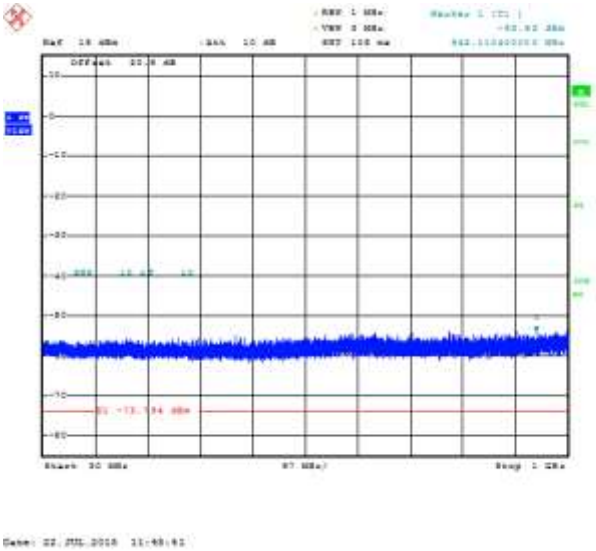


Figure 7-133: Spurious RF Conducted Emissions Secondary, 802.11a, Channel 64, MCS 0



802.11a RF Conducted Emission Test Results cont'd

Figure 7-134: Spurious RF Conducted Emissions Secondary, 802.11a, Channel 100, MCS 0

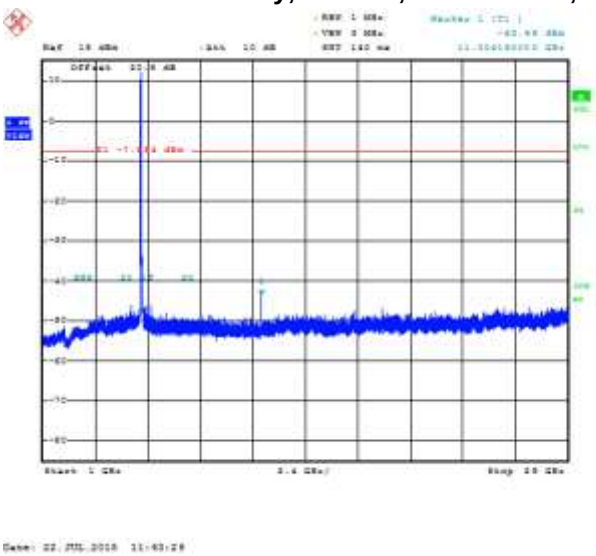


Figure 7-135: Spurious RF Conducted Emissions Secondary, 802.11a, Channel 100, MCS 0

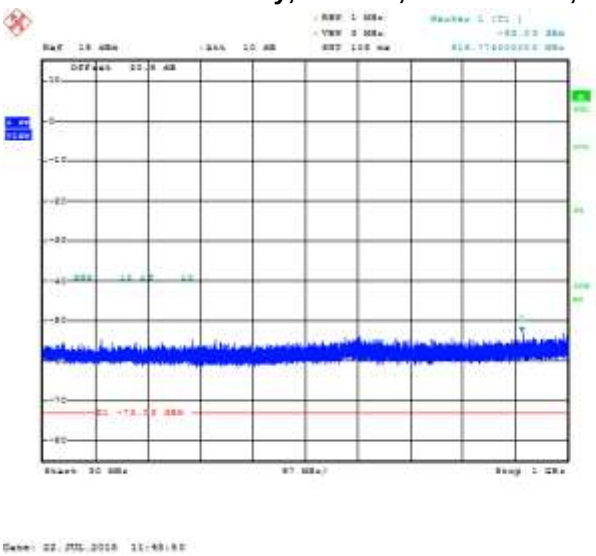


Figure 7-136: Spurious RF Conducted Emissions Secondary, 802.11a, Channel 140, MCS 0

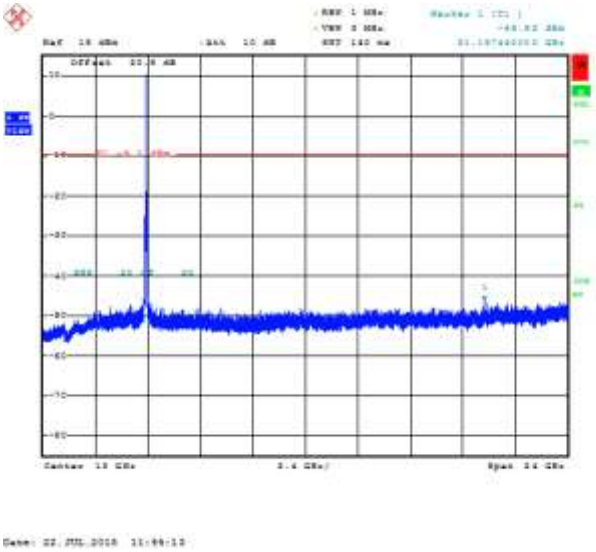
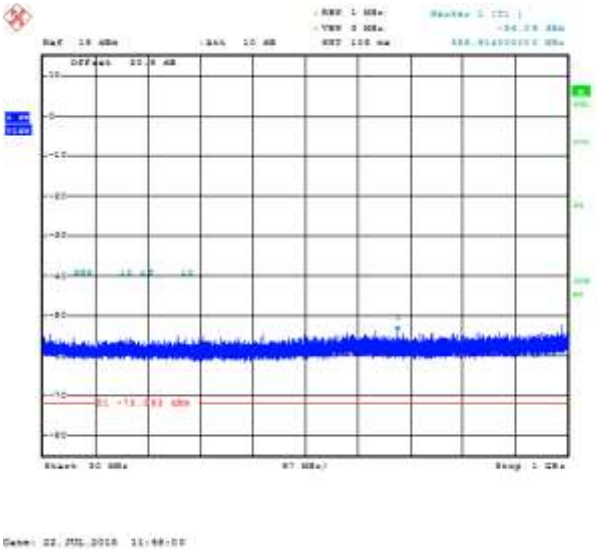


Figure 7-137: Spurious RF Conducted Emissions Secondary, 802.11a, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 100 and 140 were measured at MCS0 Mbps each for 802.11n mode. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 29.0 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

20 MHZ Bandwidth

Primary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	12.01	-45.53	-57.54	-20
64	MCS0	14.17	-45.11	-59.28	-20
100	MCS0	14.65	-45.53	-60.18	-20
140	MCS0	14.61	-46.52	-61.13	-20

Secondary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	13.16	-46.97	-60.13	-20
64	MCS0	13.77	-44.47	-58.24	-20
100	MCS0	15.11	-46.86	-61.97	-20
140	MCS0	13.86	-47.53	-61.39	-20

802.11n RF Conducted Emission Test Results cont'd

Sum

Channel	Data Rate	Carrier Level (dBm)	Combined Peak (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	18.49	-43.18	-61.67	-20
64	MCS0	16.92	-41.77	-58.69	-20
100	MCS0	17.71	-43.13	-60.84	-20
140	MCS0	17.35	-43.99	-61.34	-20

40 MHZ Bandwidth

Primary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	13.65	-42.48	-56.13	-20
64	MCS0	10.76	-42.79	-53.55	-20
100	MCS0	11.90	-42.59	-54.49	-20
140	MCS0	11.90	-46.47	-58.37	-20

Secondary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	14.50	-44.75	-59.25	-20
64	MCS0	10.64	-44.94	-55.58	-20
100	MCS0	12.32	-44.66	-56.98	-20
140	MCS0	13.99	-48.11	-62.10	-20

802.11n RF Conducted Emission Test Results cont'd

Sum

Channel	Data Rate	Carrier Level (dBm)	Combined Peak (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	14.10	-40.46	-54.56	-20
64	MCS0	13.72	-40.72	-54.44	-20
100	MCS0	14.51	-40.49	-55.00	-20
140	MCS0	17.67	-44.20	-61.88	-20

See figures 7-138 to 7-169 for the plots of the spurious RF conducted emissions for Channel 36, 64, 100 and 140 at MCS0 Mbps each for 802.11n mode.

802.11n RF Conducted Emission Test Results cont'd

20 MHz Bandwidth

Figure 7-138: Spurious RF Conducted Emissions Primary, 802.11n, Channel 36, MCS 0

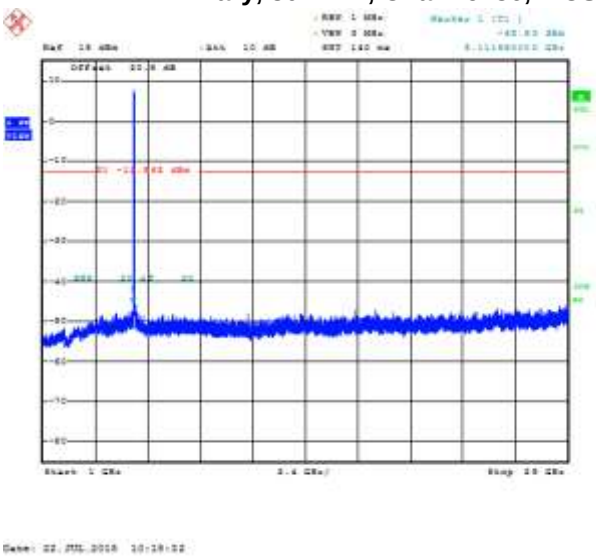


Figure 7-139: Spurious RF Conducted Emissions Primary, 802.11n, Channel 36, MCS 0

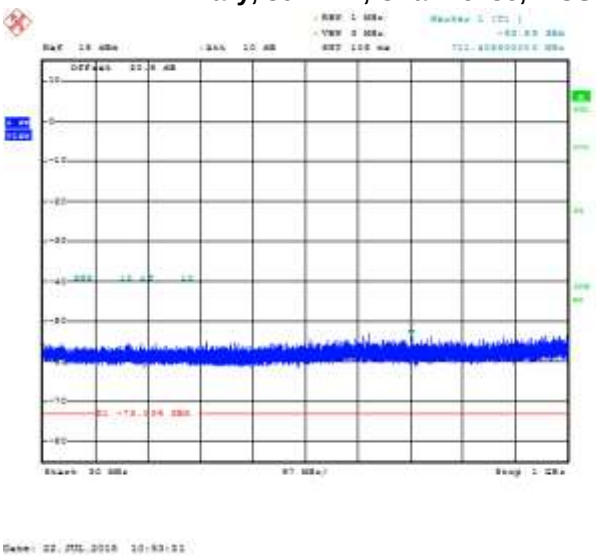


Figure 7-140: Spurious RF Conducted Emissions Primary, 802.11n, Channel 64, MCS 0

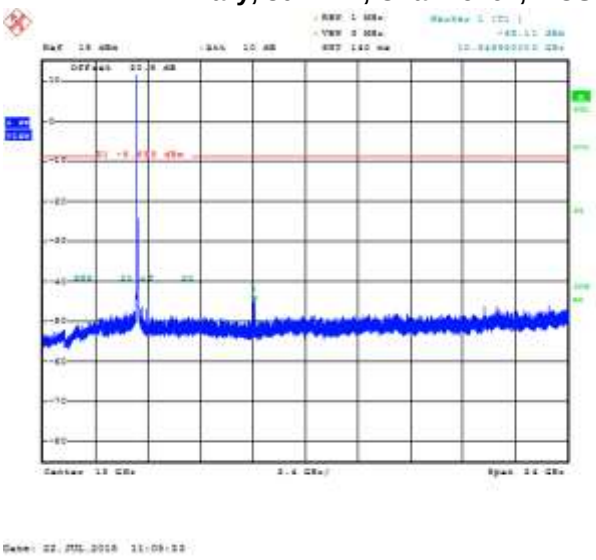
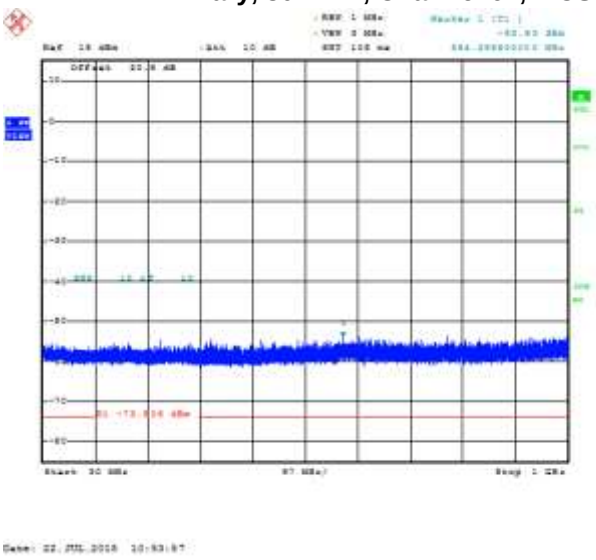


Figure 7-141: Spurious RF Conducted Emissions Primary, 802.11n, Channel 64, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-142: Spurious RF Conducted Emissions Primary, 802.11n, Channel 100, MCS 0

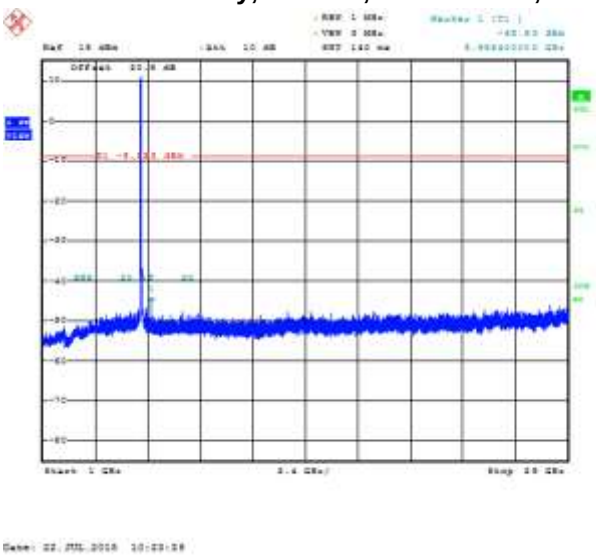


Figure 7-143: Spurious RF Conducted Emissions Primary, 802.11n, Channel 100, MCS 0

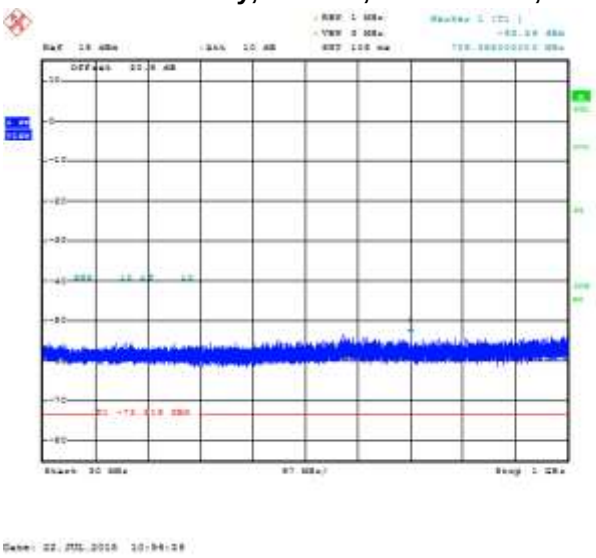


Figure 7-144: Spurious RF Conducted Emissions Primary, 802.11n, Channel 140, MCS 0

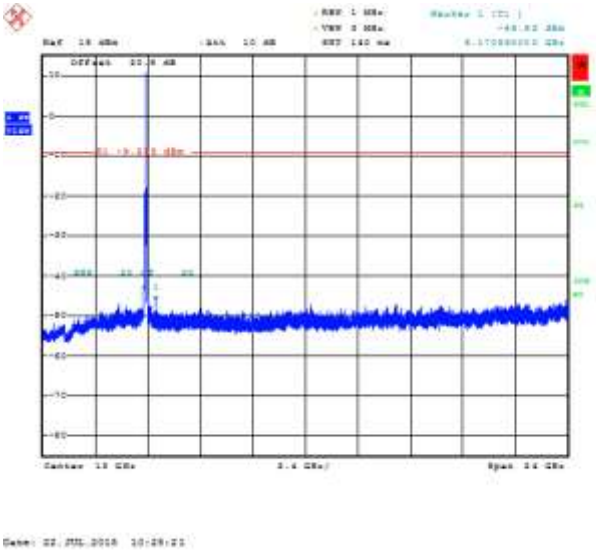
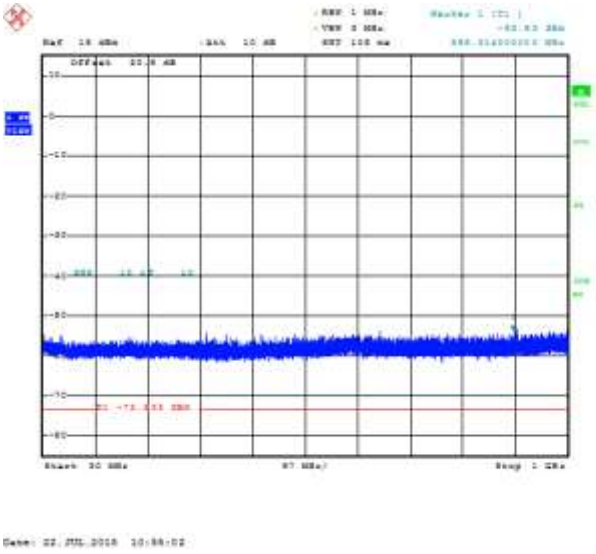


Figure 7-145: Spurious RF Conducted Emissions Primary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-146: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 36, MCS 0

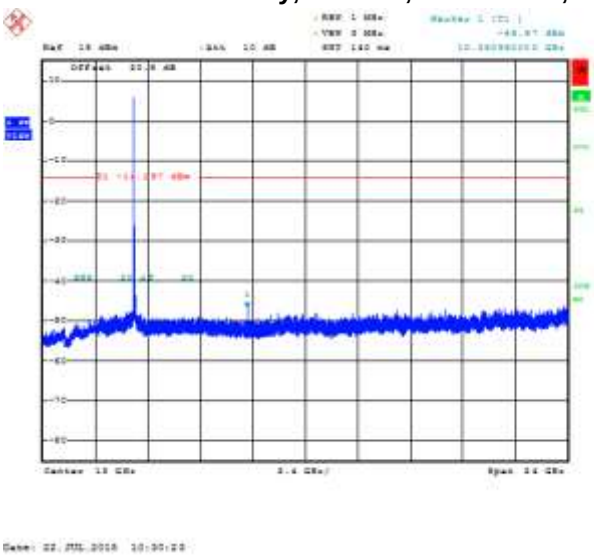


Figure 7-147: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 36, MCS 0

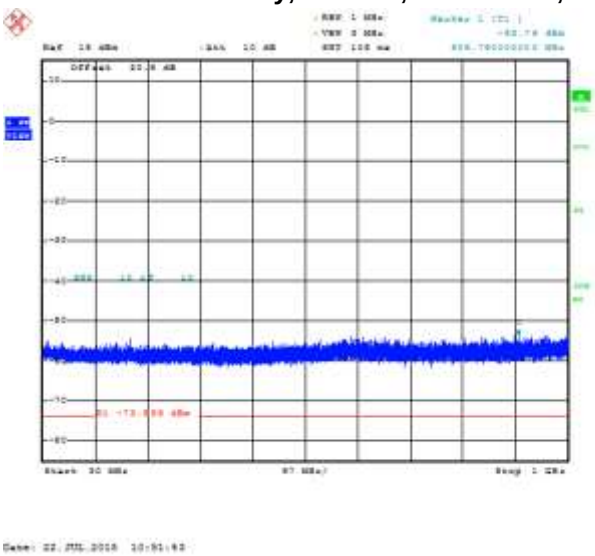


Figure 7-148: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 64, MCS 0

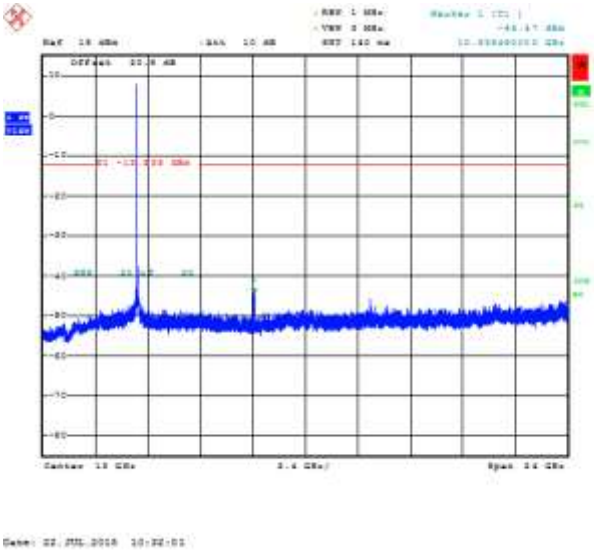
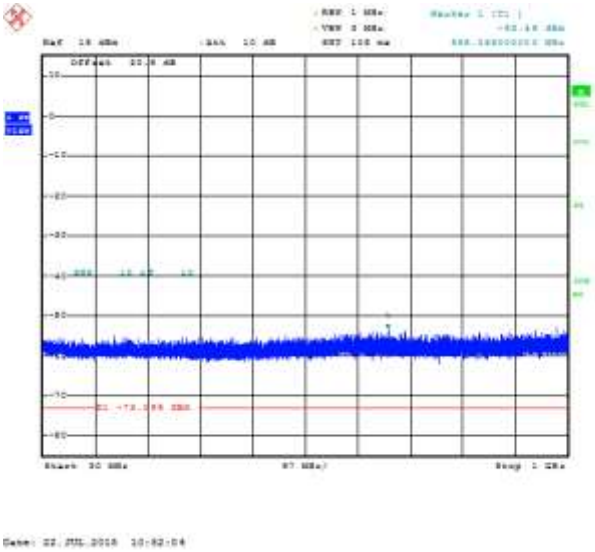


Figure 7-149: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 64, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-150: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 100, MCS 0

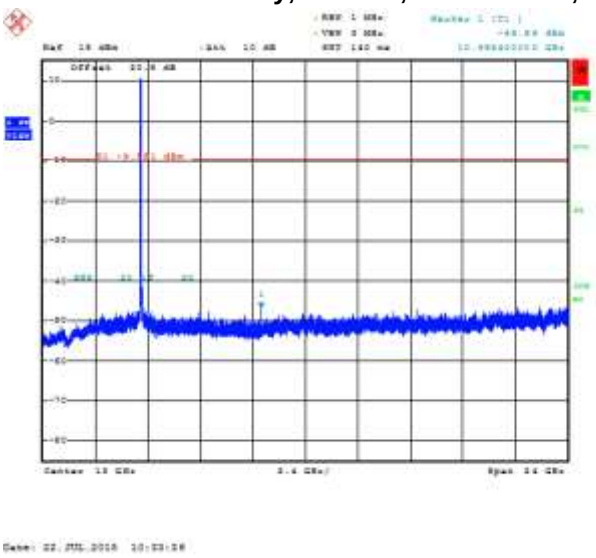


Figure 7-151: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 100, MCS 0

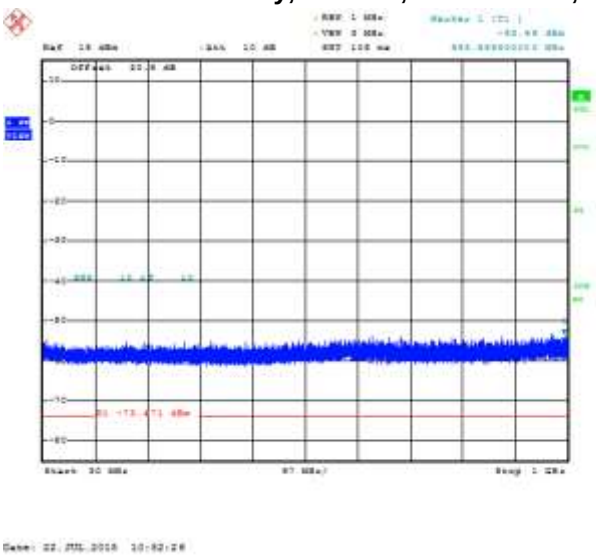


Figure 7-152: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 140, MCS 0

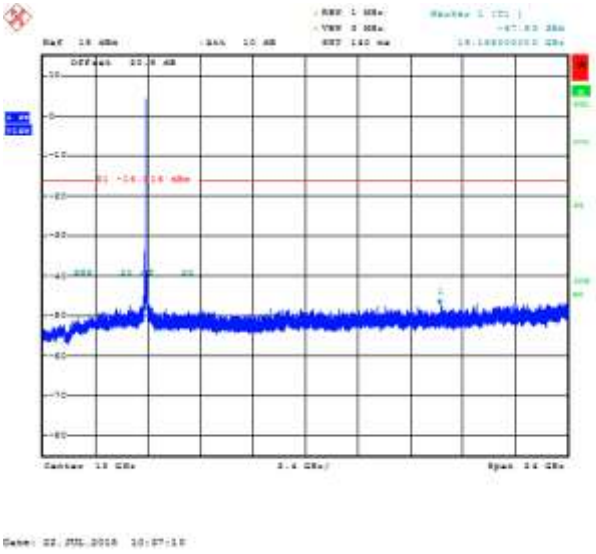
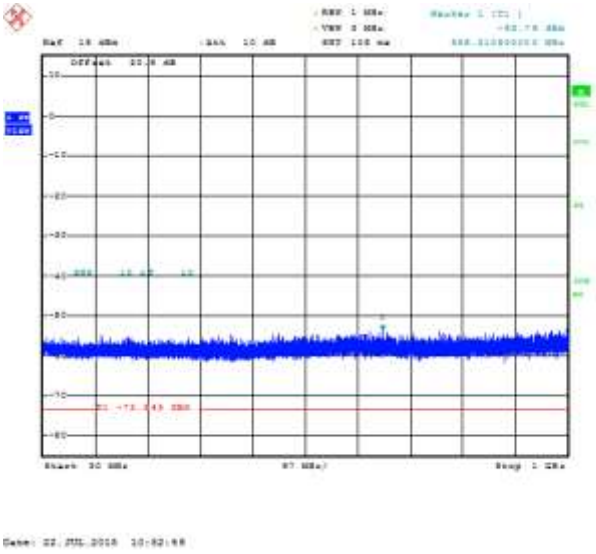


Figure 7-153: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results cont'd

40 MHz Bandwidth

Figure 7-154: Spurious RF Conducted Emissions Primary, 802.11n, Channel 36, MCS 0

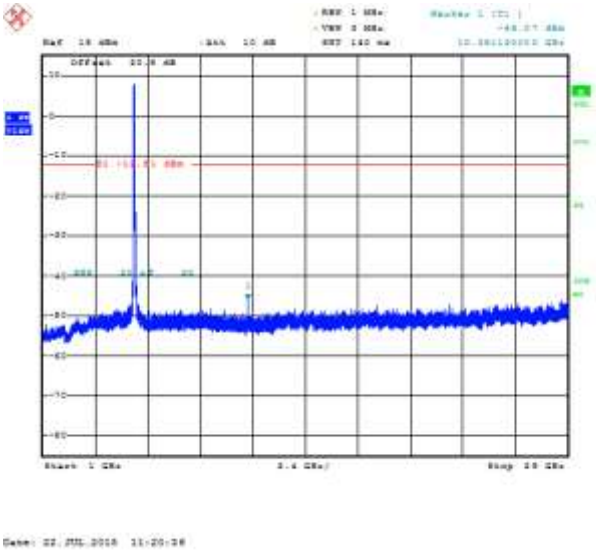


Figure 7-155: Spurious RF Conducted Emissions Primary, 802.11n, Channel 36, MCS 0

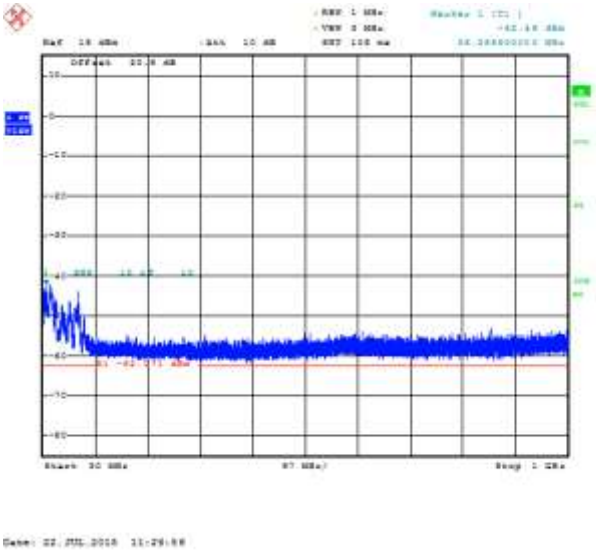


Figure 7-156: Spurious RF Conducted Emissions Primary, 802.11n, Channel 64, MCS 0

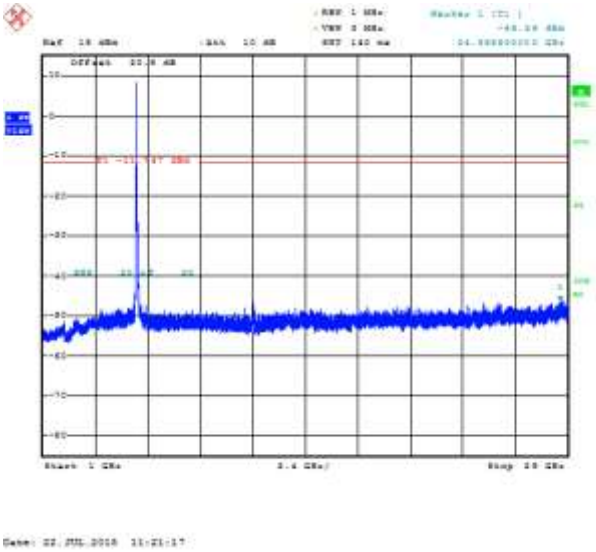
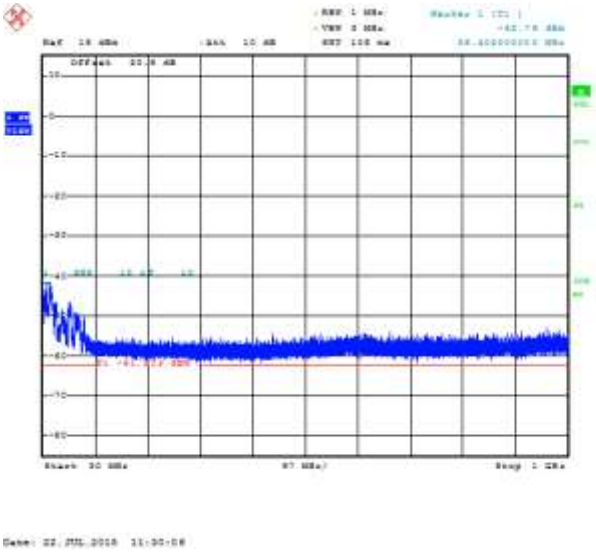


Figure 7-157: Spurious RF Conducted Emissions Primary, 802.11n, Channel 64, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-158: Spurious RF Conducted Emissions Primary, 802.11n, Channel 100, MCS 0

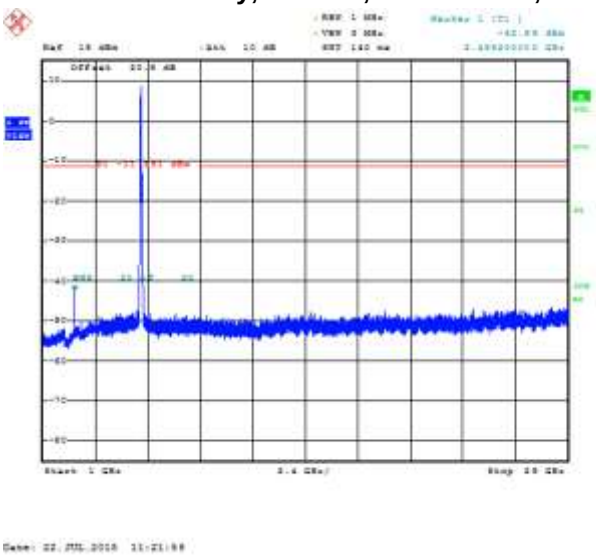


Figure 7-159 Spurious RF Conducted Emissions Primary, 802.11n, Channel 100, MCS 0

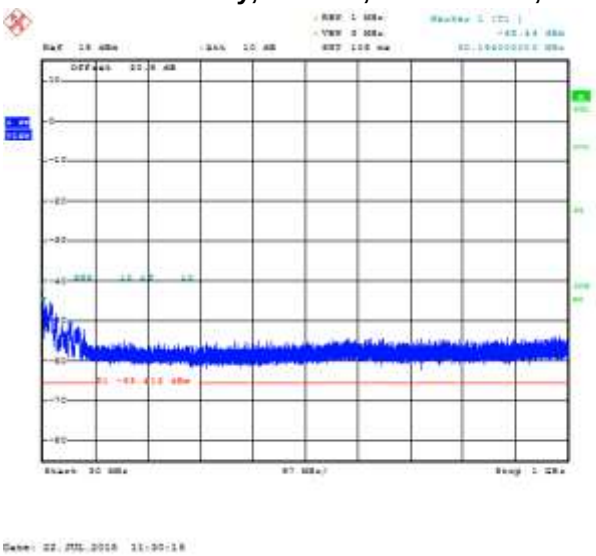


Figure 7-160: Spurious RF Conducted Emissions Primary, 802.11n, Channel 140, MCS 0

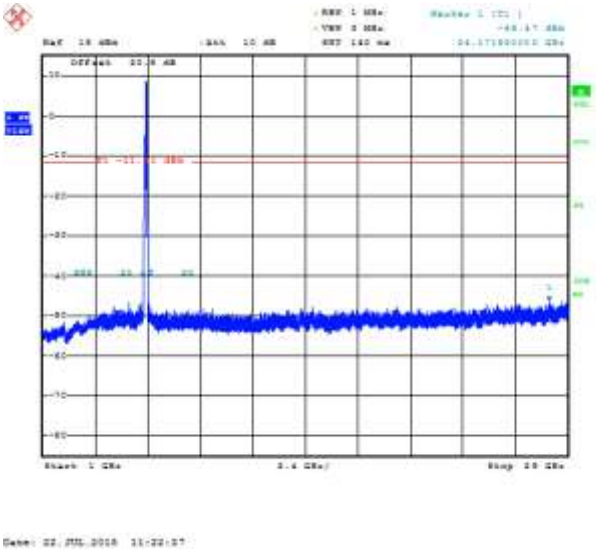
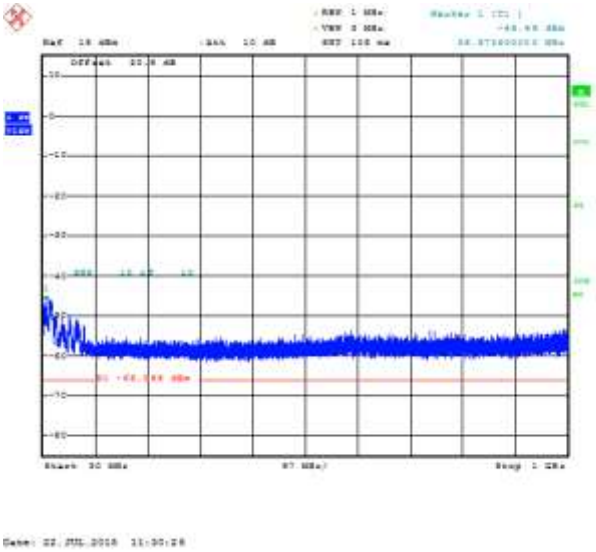


Figure 7-161: Spurious RF Conducted Emissions Primary, 802.11n, Channel 140, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-162: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 36, MCS 0

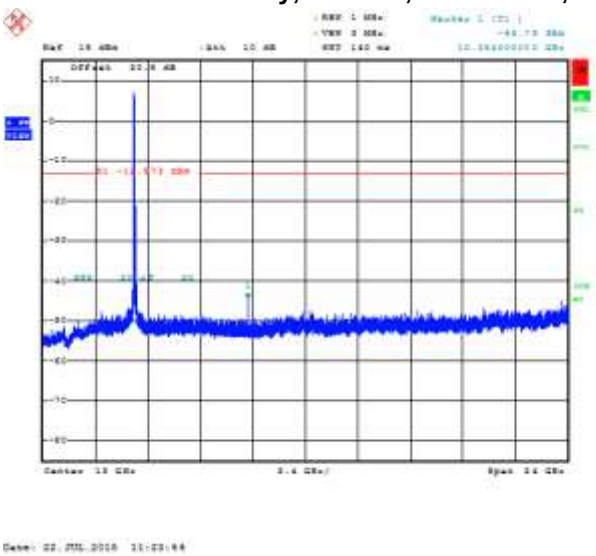


Figure 7-163: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 36, MCS 0

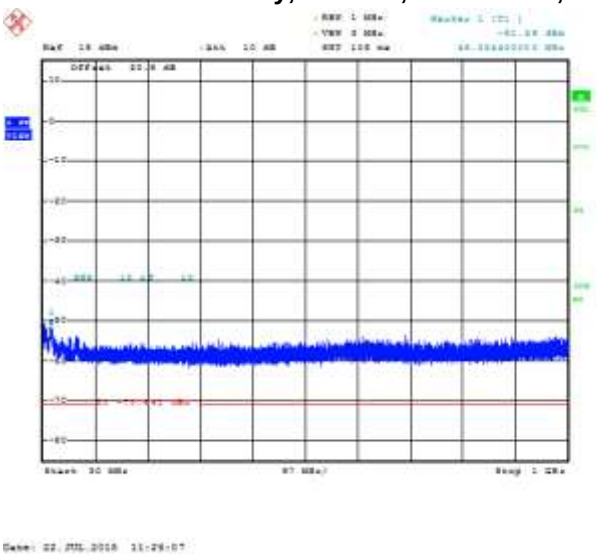


Figure 7-164: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 64, MCS 0

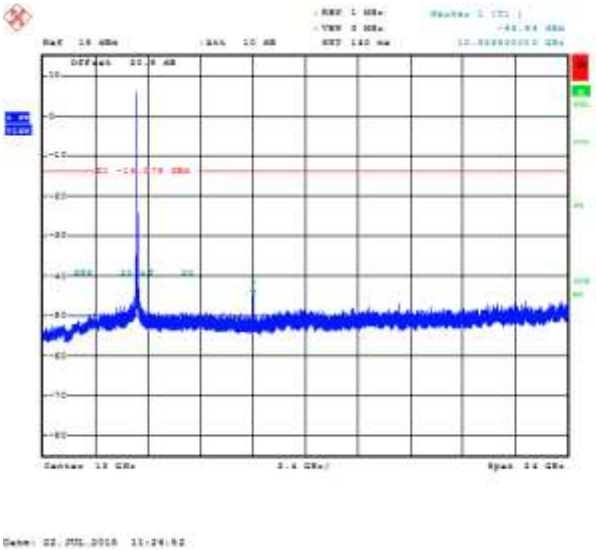
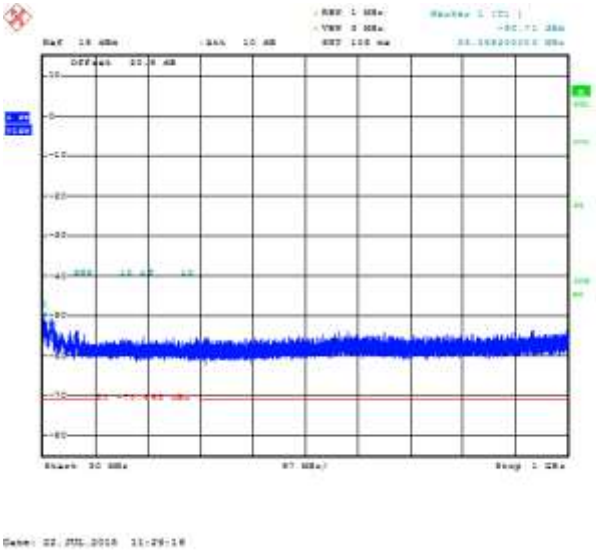


Figure 7-165: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 64, MCS 0



802.11n RF Conducted Emission Test Results cont'd

Figure 7-166: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 100, MCS 0

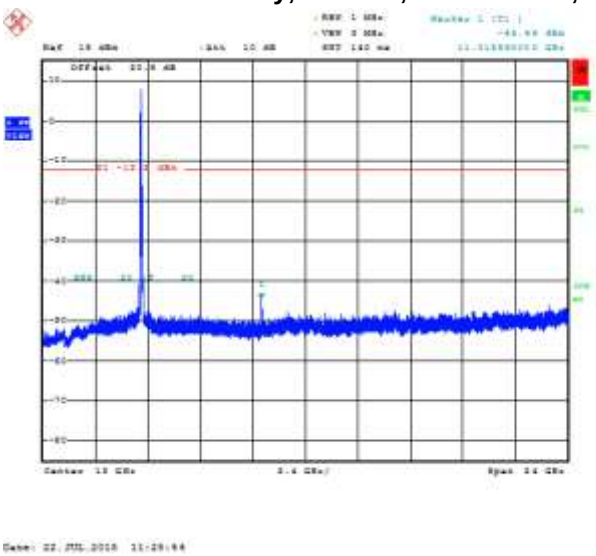


Figure 7-167: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 100, MCS 0

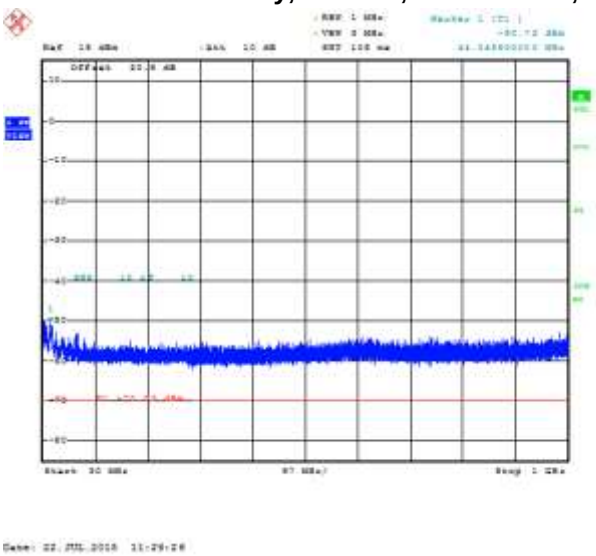


Figure 7-168: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 140, MCS 0

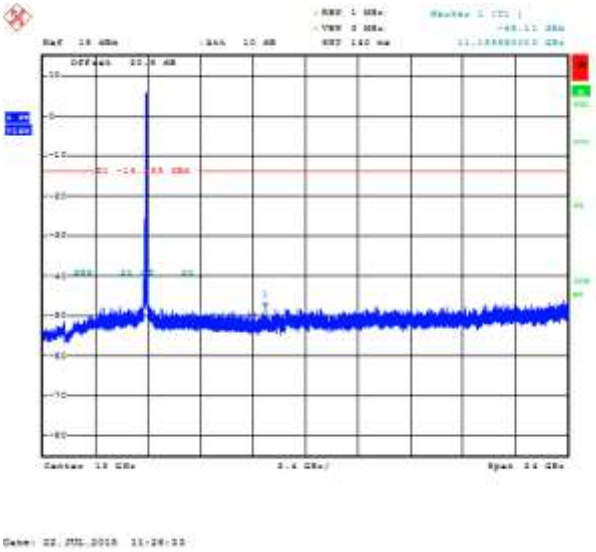
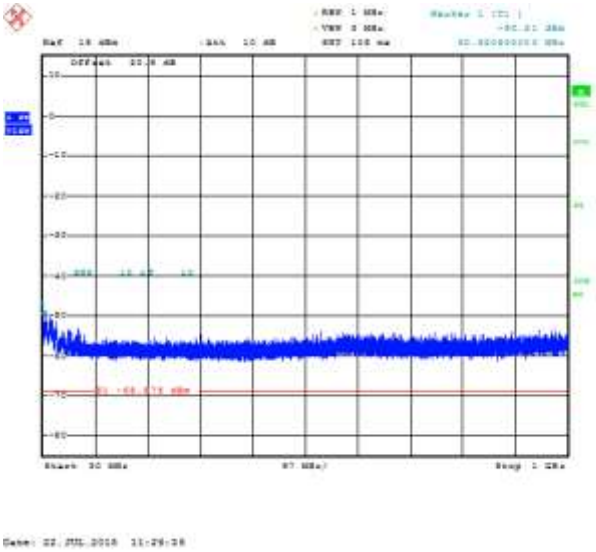


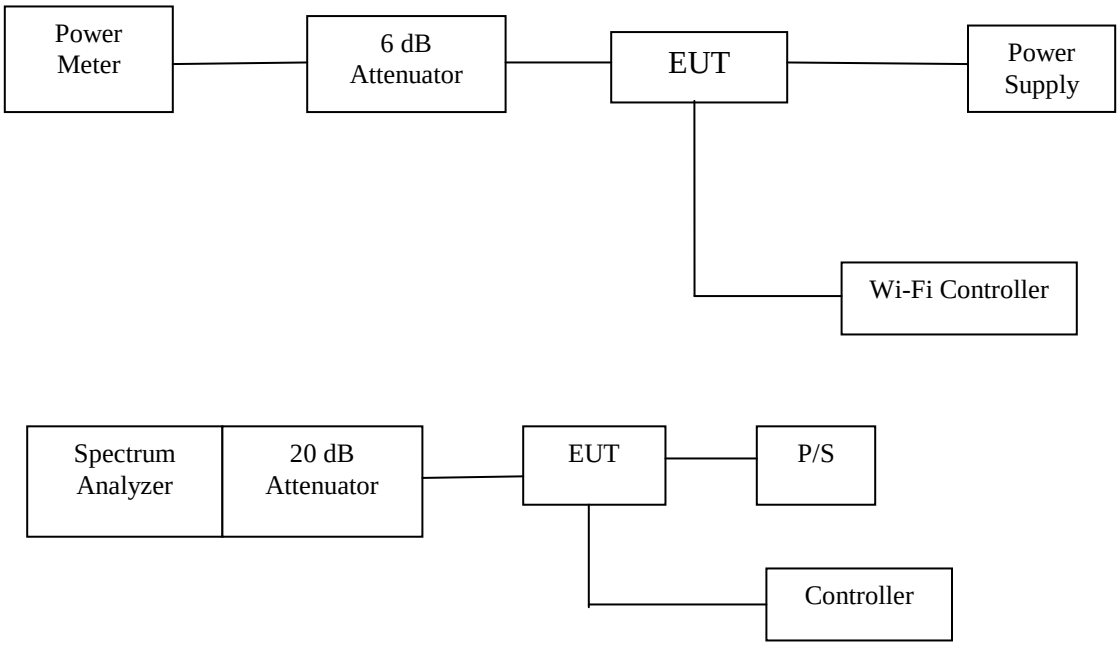
Figure 7-169: Spurious RF Conducted Emissions Secondary, 802.11n, Channel 140, MCS 0



APPENDIX 8 – 802.11ac CONDUCTED EMISSIONS TEST DATA/PLOTS

802.11ac RF Conducted Emission Test Results

Test Setup Diagram



A reference offset of 8.9 dB was applied to the spectrum analyzer and 7.4 dB to the Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: July 22, August 20, 24, and 30, 2015
The measurements were performed by Landon Martin.

The environmental test conditions were:	Temperature:	26.4 ºC
	Relative Humidity:	48.2 %

802.11ac RF Conducted Emission Test Results cont'd

6 dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a) (2) and RSS-247. For bandwidth 20 MHz, channels 36, 64, 100, 140 and 149 were measured at MCS 0 each; for bandwidth 40 MHz, channels 36, 64, 100 and 149 were measured at MCS 0 each; for bandwidth 80 MHz, channels 36, 64, 100, 140 and 149 were measured at MCS 0 each.

20MHz Bandwidth

Primary Antenna

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
36	MCS0	≥ 500	17.46
64	MCS0	≥ 500	**17.62**
100	MCS0	≥ 500	17.38
140	MCS0	≥ 500	17.60
149	MCS0	≥ 500	17.52

Secondary Antenna

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
36	MCS0	≥ 500	**17.62**
64	MCS0	≥ 500	**17.62**
100	MCS0	≥ 500	17.60
140	MCS0	≥ 500	17.52
149	MCS0	≥ 500	17.52

See figures 8-1 to 8-10 for the plots of the 6 dB bandwidth measurements for Channel 36, 64, 100, 140 and 149 at MCS0 Mbps each for 802.11ac mode

802.11ac RF Conducted Emission Test Results cont'd

40MHz Bandwidth

Primary Antenna

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
36	MCS0	≥ 500	36.36
64	MCS0	≥ 500	36.20
100	MCS0	≥ 500	**36.40**
140	MCS0	≥ 500	**36.40**
149	MCS0	≥ 500	**36.40**

Secondary Antenna

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
36	MCS0	≥ 500	36.16
64	MCS0	≥ 500	36.20
100	MCS0	≥ 500	**36.40**
140	MCS0	≥ 500	**36.40**
149	MCS0	≥ 500	**36.40**

See figures 8-11 to 8-20 for the plots of the 6 dB bandwidth measurements for Channel 36, 64, 100, 140 and 149 at MCS 0 each for 802.11ac mode.

802.11ac RF Conducted Emission Test Results cont'd

80MHz Bandwidth

Primary Antenna

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
36	MCS0	≥ 500	76.32
64	MCS0	≥ 500	76.16
100	MCS0	≥ 500	76.08
140	MCS0	≥ 500	76.08
149	MCS0	≥ 500	**76.40**

Secondary Antenna

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
36	MCS0	≥ 500	76.08
64	MCS0	≥ 500	76.08
100	MCS0	≥ 500	76.08
140	MCS0	≥ 500	**76.40**
149	MCS0	≥ 500	76.32

See figures 8-21 to 8-30 for the plots of the 6 dB bandwidth measurements for Channel 36, 64, 100, 140 and 149 at MCS 0 each for 802.11n mode.

802.11ac RF Conducted Emission Test Results cont'd
20 MHz Bandwidth

Figure 8-1: 6 dB Bandwidth
Primary, 802.11ac, Channel 36, MCS0 Mbps

Figure 8-2: 6 dB Bandwidth
Primary, 802.11ac, Channel 64, MCS0 Mbps

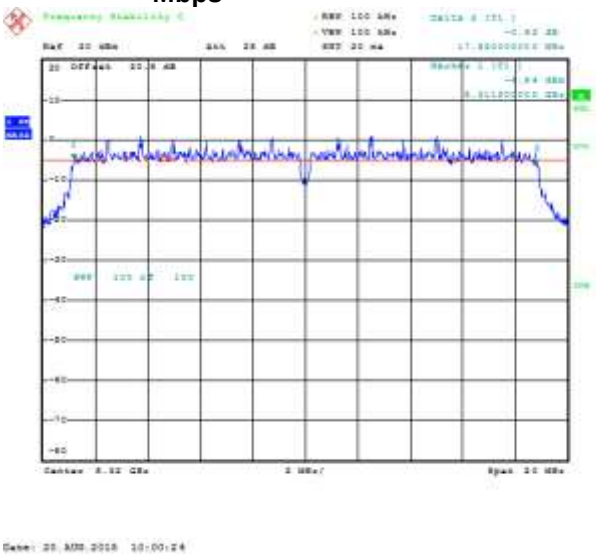


Figure 8-3: 6 dB Bandwidth
Primary, 802.11ac, Channel 100, 6 Mbps

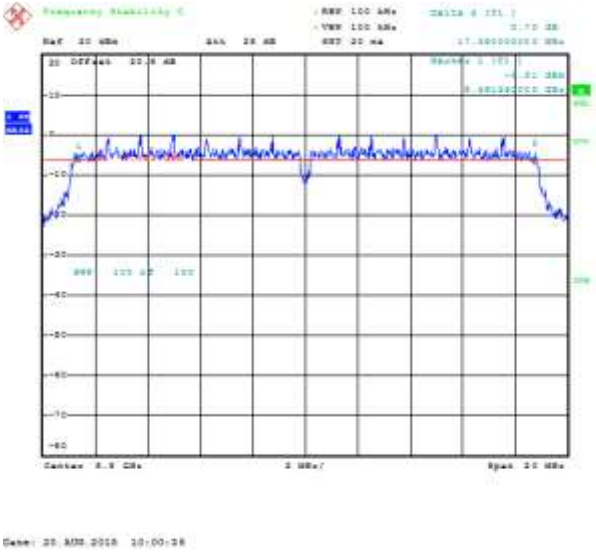
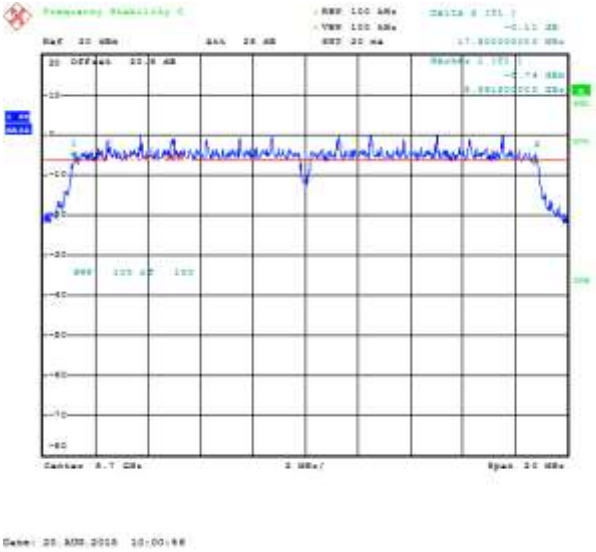


Figure 8-4: 6 dB Bandwidth
Primary, 802.11ac, Channel 140, 6 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-5: 6 dB Bandwidth
Primary, 802.11ac, Channel 149, MCS0 Mbps

Figure 8-6: 6 dB Bandwidth
Secondary, 802.11ac, Channel 36, MCS0 Mbps

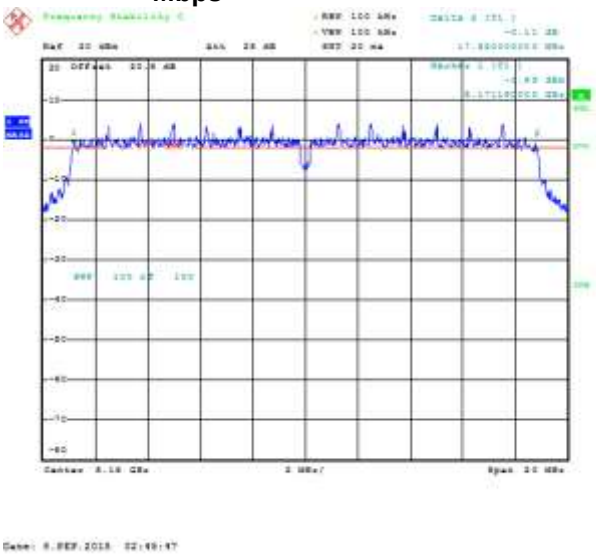


Figure 8-7: 6 dB Bandwidth
Secondary, 802.11ac, Channel 64, 6 Mbps

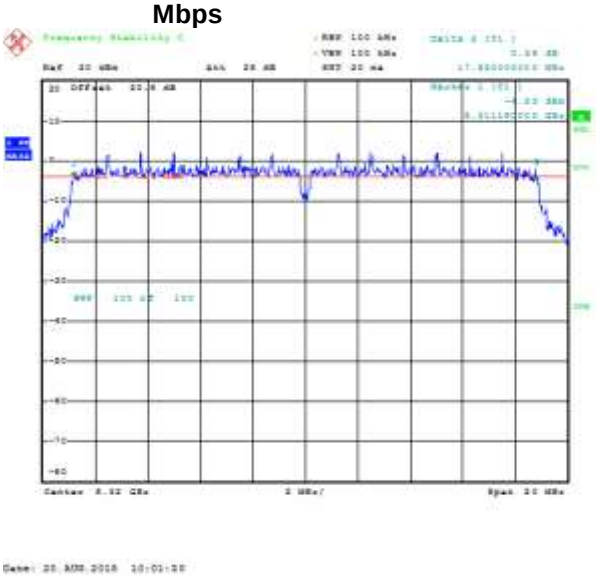
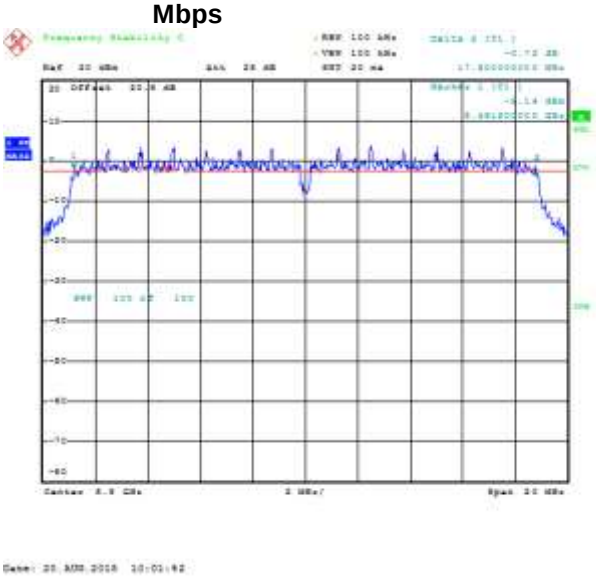


Figure 8-8: 6 dB Bandwidth
Secondary, 802.11ac, Channel 100, 6 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-9: 6 dB Bandwidth Secondary, 802.11ac, Channel 140, MCS0 Mbps

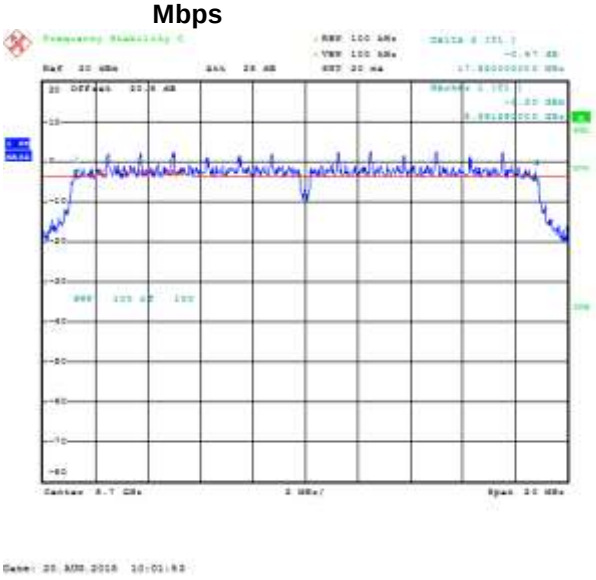
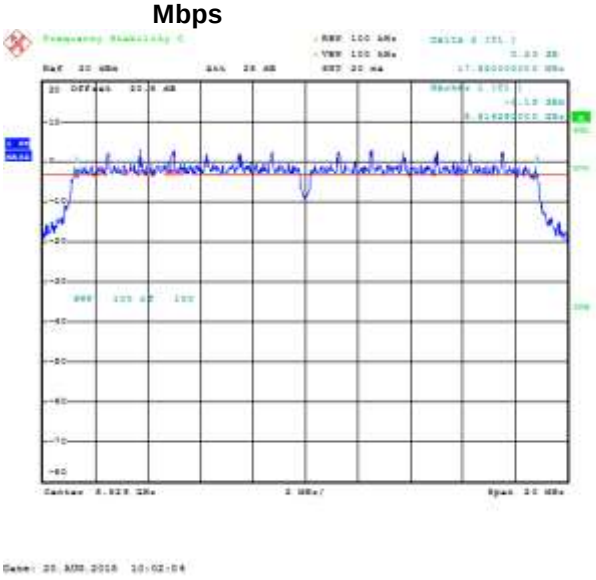


Figure 8-10: 6 dB Bandwidth Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd
40 MHz Bandwidth

Figure 8-11: 6 dB Bandwidth
Primary, 802.11ac, Channel 36, MCS0 Mbps

Figure 8-12: 6 dB Bandwidth
Primary, 802.11ac, Channel 64, MCS0 Mbps

Figure 8-13: 6 dB Bandwidth
Primary, 802.11ac, Channel 100, 6 Mbps

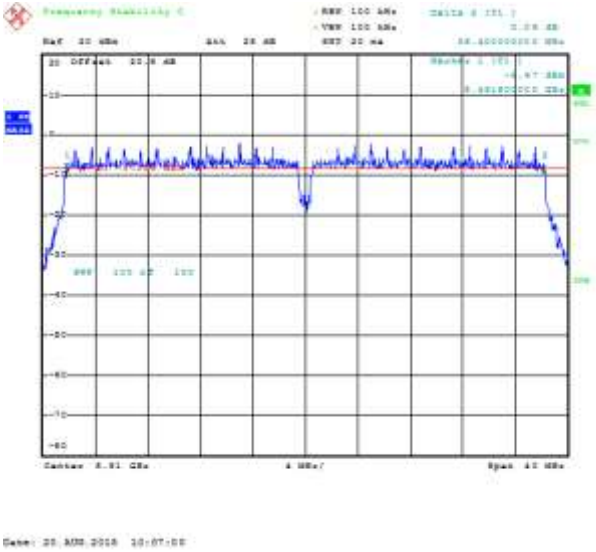
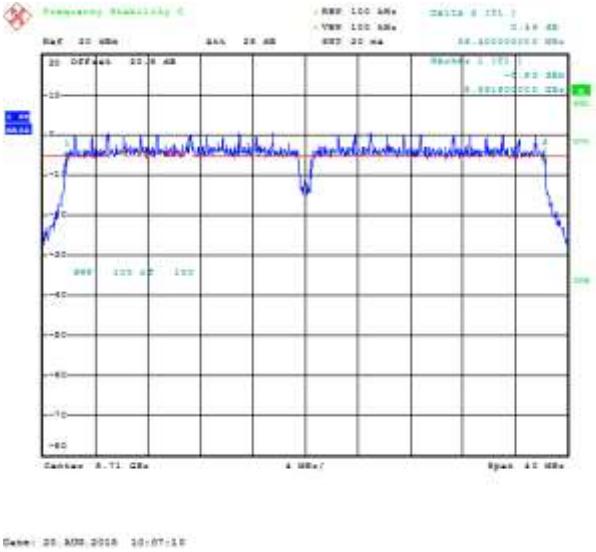


Figure 8-14: 6 dB Bandwidth
Primary, 802.11ac, Channel 140, 6 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-15: 6 dB Bandwidth
Primary, 802.11ac, Channel 149, MCS0 Mbps

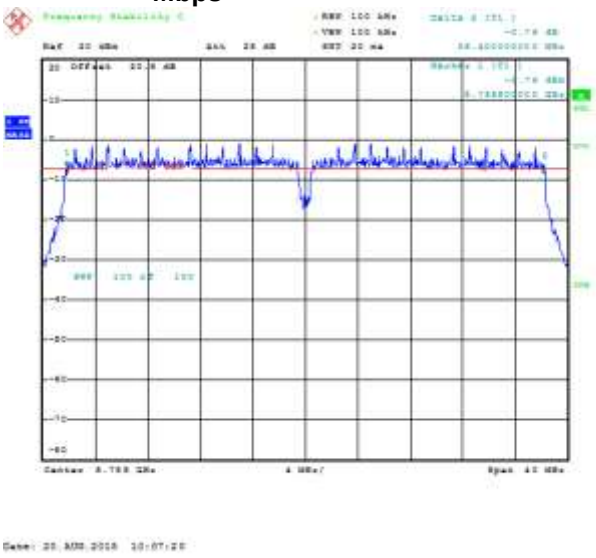


Figure 8-16: 6 dB Bandwidth
Secondary, 802.11ac, Channel 36, MCS0 Mbps

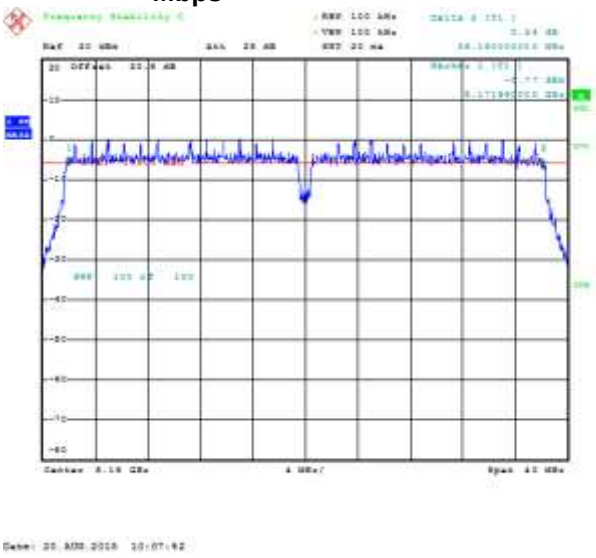


Figure 8-17: 6 dB Bandwidth
Secondary, 802.11ac, Channel 64, 6 Mbps

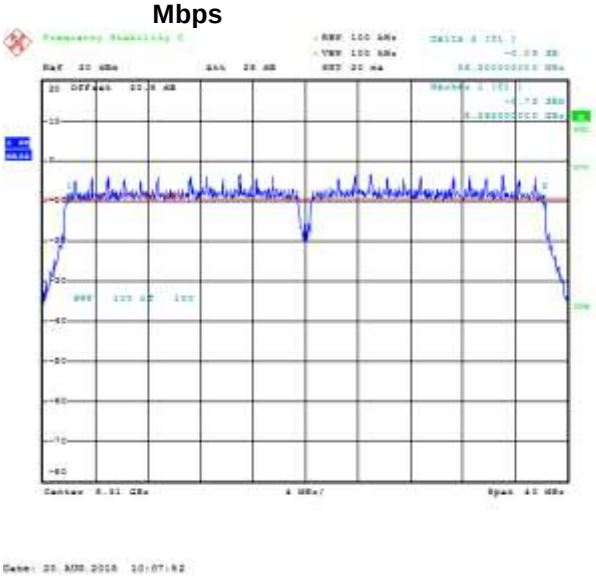
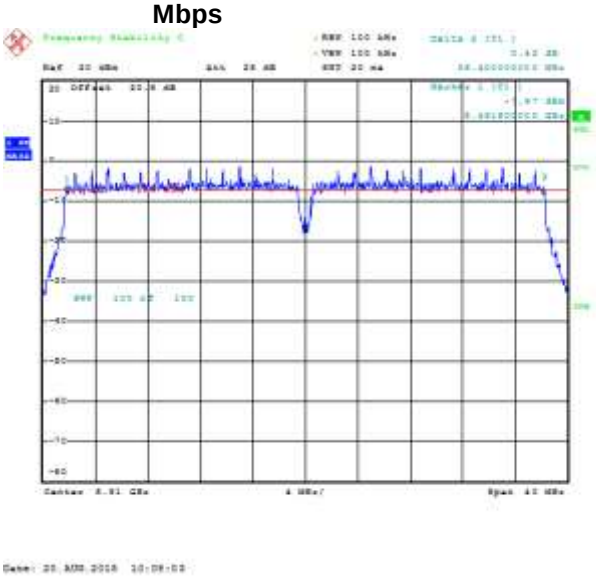


Figure 8-18: 6 dB Bandwidth
Secondary, 802.11ac, Channel 100, 6 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-19: 6 dB Bandwidth Secondary, 802.11ac, Channel 140, MCS0 Mbps

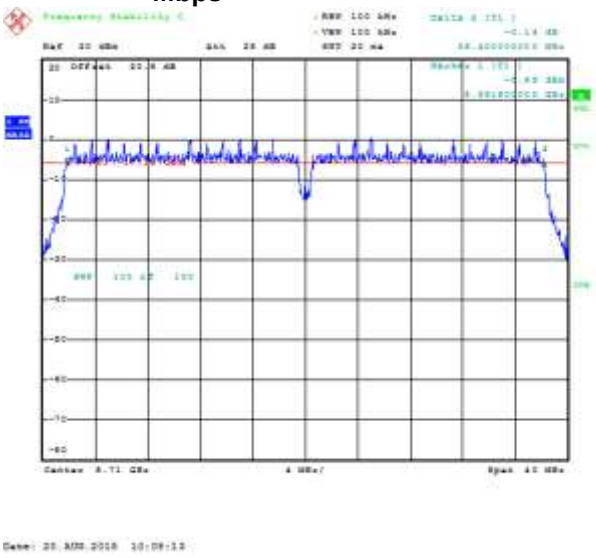
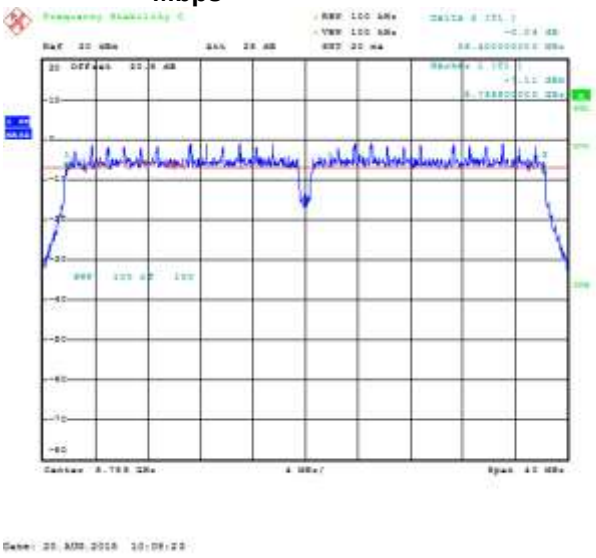


Figure 8-20: 6 dB Bandwidth Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd
80 MHz Bandwidth

Figure 8-21: 6 dB Bandwidth
Primary, 802.11ac, Channel 36, MCS0 Mbps

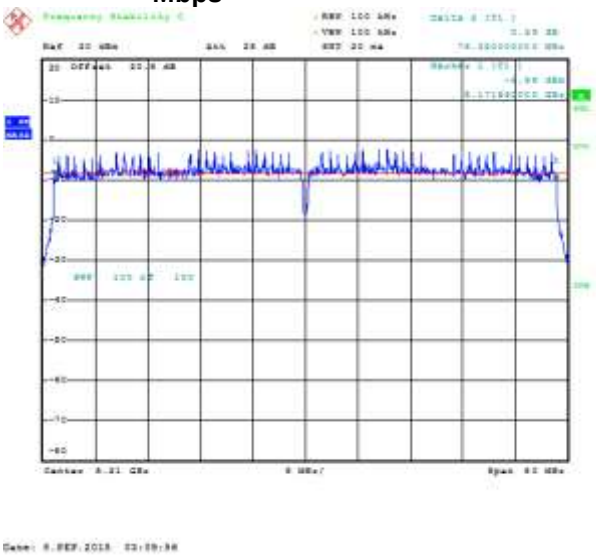


Figure 8-22: 6 dB Bandwidth
Primary, 802.11ac, Channel 64, MCS0 Mbps

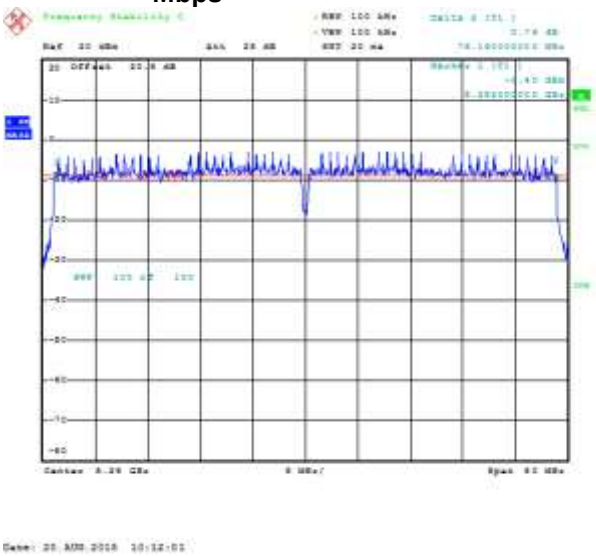


Figure 8-23: 6 dB Bandwidth
Primary, 802.11ac, Channel 100, 6 Mbps

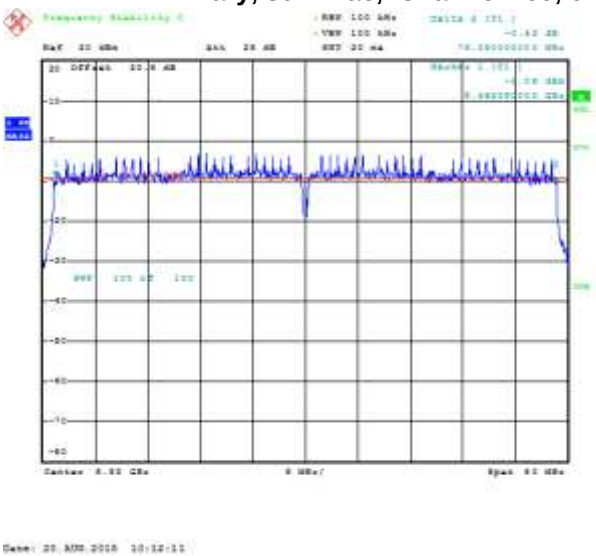
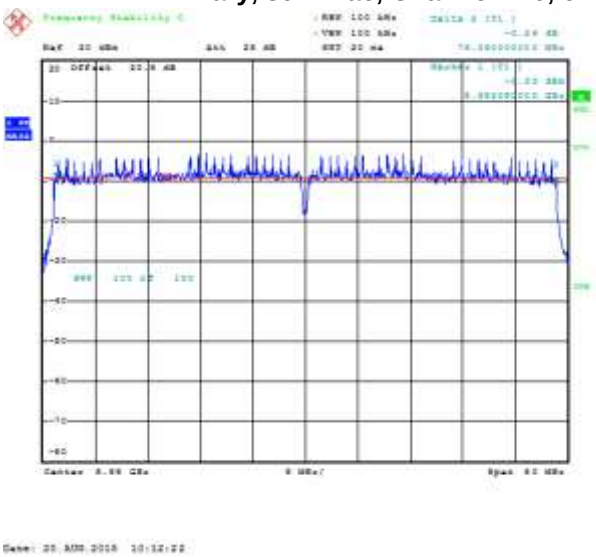


Figure 8-24: 6 dB Bandwidth
Primary, 802.11ac, Channel 140, 6 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-25: 6 dB Bandwidth
Primary, 802.11ac, Channel 149, MCS0 Mbps

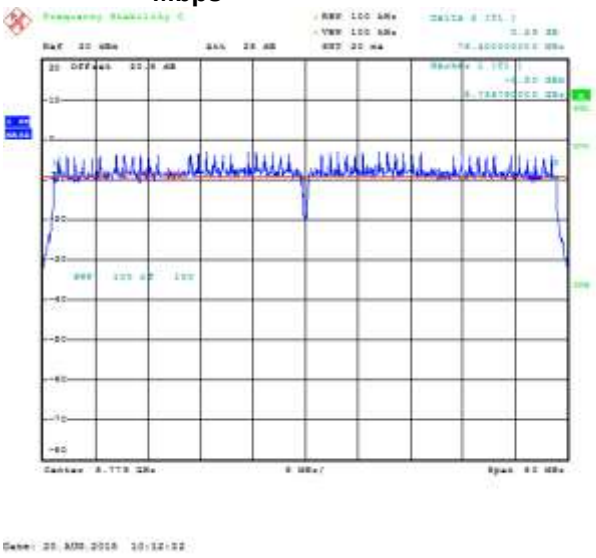


Figure 8-26: 6 dB Bandwidth
Secondary, 802.11ac, Channel 36, MCS0 Mbps

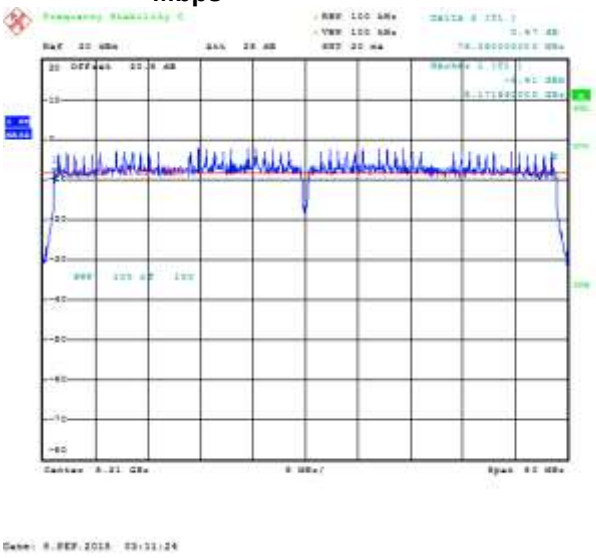


Figure 8-27: 6 dB Bandwidth
Secondary, 802.11ac, Channel 64, 6 Mbps

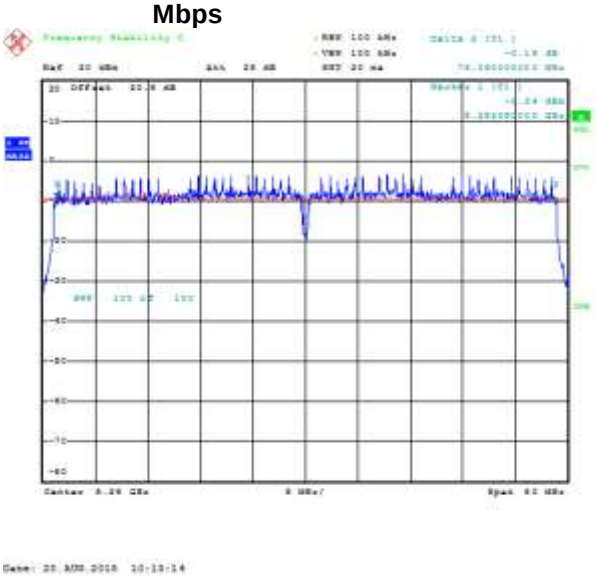
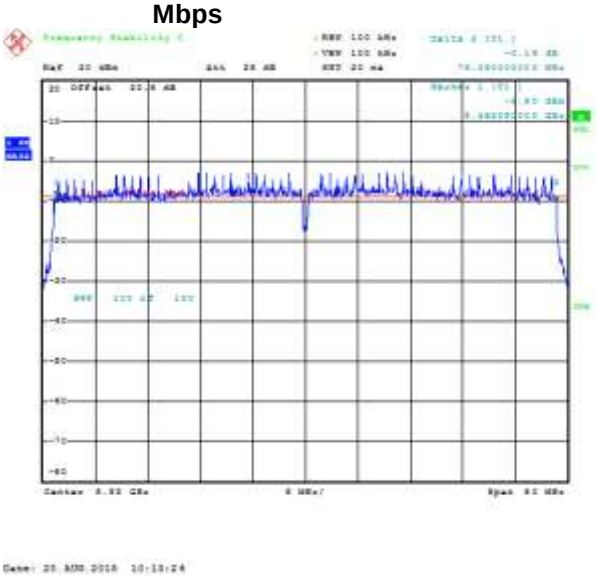


Figure 8-28: 6 dB Bandwidth
Secondary, 802.11ac, Channel 100, 6 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-29: 6 dB Bandwidth Secondary, 802.11ac, Channel 140, MCS0 Mbps

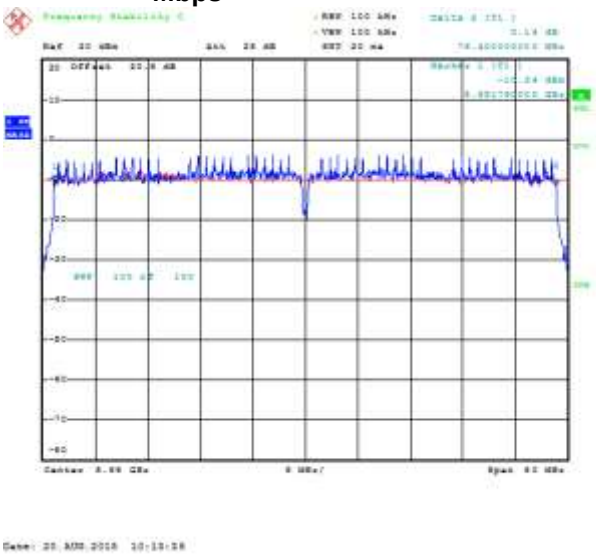
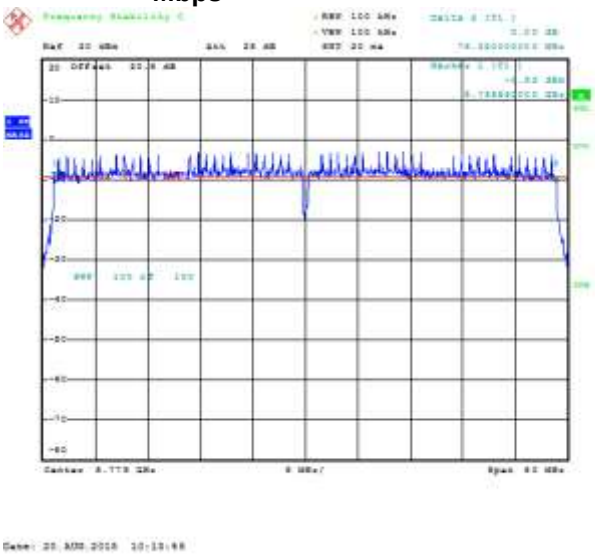


Figure 8-30: 6 dB Bandwidth Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 100, 140 and 165 were measured for 802.11ac mode, bandwidth 20MHz, using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 8.9 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

20 MHz Bandwidth

SISO Primary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	14.73	29.72
64	20	MCS0	< 250.0	12.29	16.94
100	20	MCS0	< 250.0	17.59	57.41
140	20	MCS0	< 250.0	17.45	55.59
149	20	MCS0	< 1000	15.10	32.36

SISO Secondary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	15.91	38.99
64	20	MCS0	< 250.0	14.04	25.35
100	20	MCS0	< 250.0	15.30	33.88
140	20	MCS0	< 250.0	13.86	24.32
149	20	MCS0	< 1000	14.62	28.97

MIMO Primary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	15.01	31.70
64	20	MCS0	< 250.0	13.90	24.55
100	20	MCS0	< 250.0	14.96	31.33
140	20	MCS0	< 250.0	13.71	23.50
149	20	MCS0	< 1000	14.75	29.85

802.11ac RF Conducted Emission Test Results cont'd

MIMO Secondary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	15.80	38.02
64	20	MCS0	< 250.0	13.60	22.91
100	20	MCS0	< 250.0	13.71	23.50
140	20	MCS0	< 250.0	14.52	28.31
149	20	MCS0	< 1000	15.21	33.19

MIMO Sum

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	**18.43**	**69.71**
64	20	MCS0	< 250.0	16.76	47.46
100	20	MCS0	< 250.0	17.39	54.83
140	20	MCS0	< 250.0	17.14	51.81
149	20	MCS0	< 1000	18.00	63.04

802.11ac RF Conducted Emission Test Results

Channels 36, 64, 100, 140 and 165 were measured for 802.11ac mode, bandwidth 40MHz, using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 8.9 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

40 MHz Bandwidth

SISO Primary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	12.18	16.52
64	20	MCS0	< 250.0	10.81	12.05
100	20	MCS0	< 250.0	11.87	15.38
140	20	MCS0	< 250.0	14.68	29.38
149	20	MCS0	< 1000	13.24	21.09

SISO Secondary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	14.65	29.17
64	20	MCS0	< 250.0	10.81	12.05
100	20	MCS0	< 250.0	12.35	17.18
140	20	MCS0	< 250.0	14.21	26.36
149	20	MCS0	< 1000	13.11	20.46

MIMO Primary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	11.60	14.45
64	20	MCS0	< 250.0	10.76	11.91
100	20	MCS0	< 250.0	11.71	14.83
140	20	MCS0	< 250.0	14.20	26.30
149	20	MCS0	< 1000	13.09	20.37

802.11ac RF Conducted Emission Test Results cont'd

MIMO Secondary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	10.73	11.83
64	20	MCS0	< 250.0	10.87	12.22
100	20	MCS0	< 250.0	11.25	13.34
140	20	MCS0	< 250.0	15.22	33.27
149	20	MCS0	< 1000	13.47	22.23

MIMO Sum

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	14.20	26.28
64	20	MCS0	< 250.0	13.83	24.13
100	20	MCS0	< 250.0	14.50	28.16
140	20	MCS0	< 250.0	**17.75**	**59.57**
149	20	MCS0	< 1000	16.29	42.60

802.11ac RF Conducted Emission Test Results

Channels 36, 64, 100, 140 and 165 were measured for 802.11ac mode, bandwidth 80MHz, using an Agilent power meter; model N1911A with model N1921A power sensor. A reference offset of 8.9 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

80 MHz Bandwidth

SISO Primary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	13.14	20.61
64	20	MCS0	< 250.0	13.07	20.28
100	20	MCS0	< 250.0	12.79	19.01
140	20	MCS0	< 250.0	12.63	18.32
149	20	MCS0	< 1000	12.94	19.68

SISO Secondary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	13.69	23.39
64	20	MCS0	< 250.0	12.30	16.98
100	20	MCS0	< 250.0	12.72	18.71
140	20	MCS0	< 250.0	11.32	13.55
149	20	MCS0	< 1000	12.19	16.56

MIMO Primary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	13.68	23.33
64	20	MCS0	< 250.0	10.50	11.22
100	20	MCS0	< 250.0	11.65	14.62
140	20	MCS0	< 250.0	12.22	16.67
149	20	MCS0	< 1000	12.43	17.50

802.11ac RF Conducted Emission Test Results cont'd

MIMO Secondary Antenna

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	14.12	25.82
64	20	MCS0	< 250.0	10.98	12.53
100	20	MCS0	< 250.0	11.24	13.30
140	20	MCS0	< 250.0	13.08	20.32
149	20	MCS0	< 1000	12.83	19.19

MIMO Sum

Channel	BW(MHz)	Data Rate	Power Limit (mW)	Measured Level (dBm)	Measured Level (mW)
36	20	MCS0	< 250.0	**16.92**	**49.16**
64	20	MCS0	< 250.0	13.76	23.75
100	20	MCS0	< 250.0	14.46	27.93
140	20	MCS0	< 250.0	15.68	37.00
149	20	MCS0	< 1000	15.64	36.69

802.11ac RF Conducted Emission Test Results cont'd

Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 100, 140, 149, and 165 were measured at MCS 0 Mbps each for bandwidth 20MHz, 802.11ac mode.

20MHz Bandwidth

SISO Primary Antenna

Channel	Bandwidt(MHz)	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	20	MCS0	< -20	-44.18	-24.18
64	20	MCS0	< -20	-48.86	-28.86
100	20	MCS0	< -20	-49.75	-29.75
140	20	MCS0	< -20	-49.13	-29.13
149	20	MCS0	< -20	-43.28	-23.28
165	20	MCS0	< -20	-45.43	-25.43

SISO Secondary Antenna

Channel	Bandwidt(MHz)	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	20	MCS0	< -20	-44.16	-24.16
64	20	MCS0	< -20	-49.63	-29.63
100	20	MCS0	< -20	-47.81	-27.81
140	20	MCS0	< -20	-43.94	-23.94
149	20	MCS0	< -20	-41.38	-21.38
165	20	MCS0	< -20	-35.15	-15.15

See figures 8-31 to 8-42 for the plots of the band edge compliance measurements for Channel 36, 64, 100, 149 and 165 at MCS0 Mbps each for 802.11ac mode.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-31: Band Edge Compliance Primary, 802.11ac, Channel 36, MCS0 Mbps

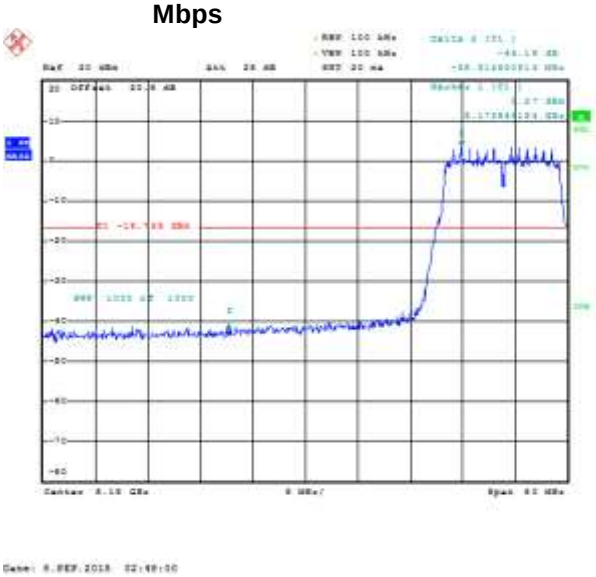


Figure 8-32: Band Edge Compliance Primary, 802.11ac, Channel 64, MCS0 Mbps

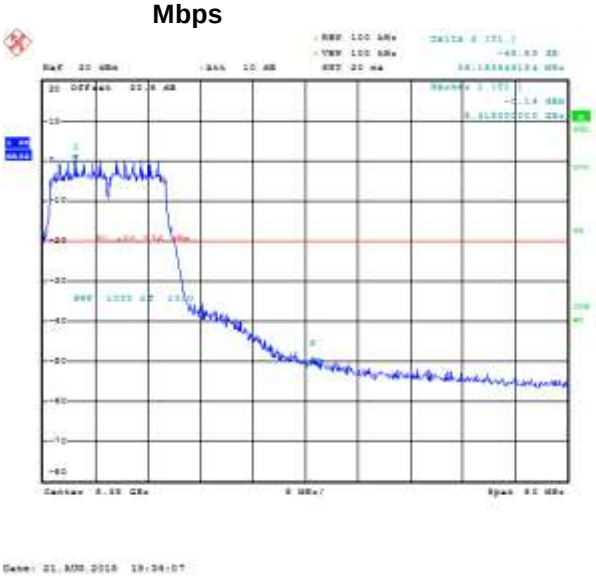
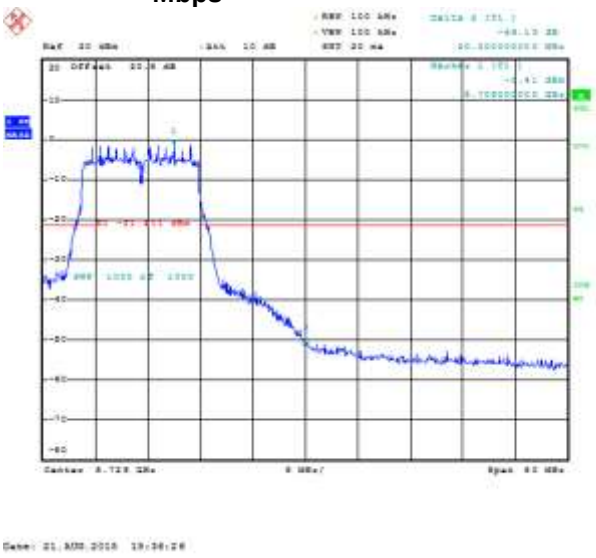


Figure 8-33: Band Edge Compliance Primary, 802.11ac, Channel 100, MCS0 Mbps

Figure 8-34: Band Edge Compliance Primary, 802.11ac, Channel 140, MCS0 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 8-35: Band Edge Compliance Primary, 802.11ac, Channel 149, MCS0 Mbps

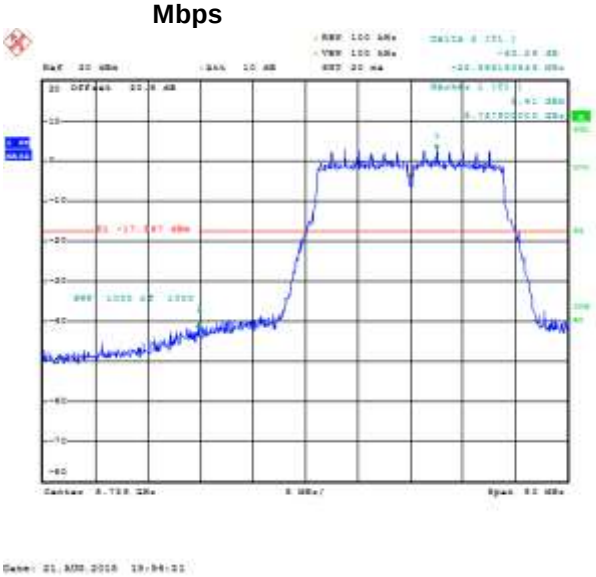


Figure 8-36: Band Edge Compliance Primary, 802.11ac, Channel 165, MCS0 Mbps

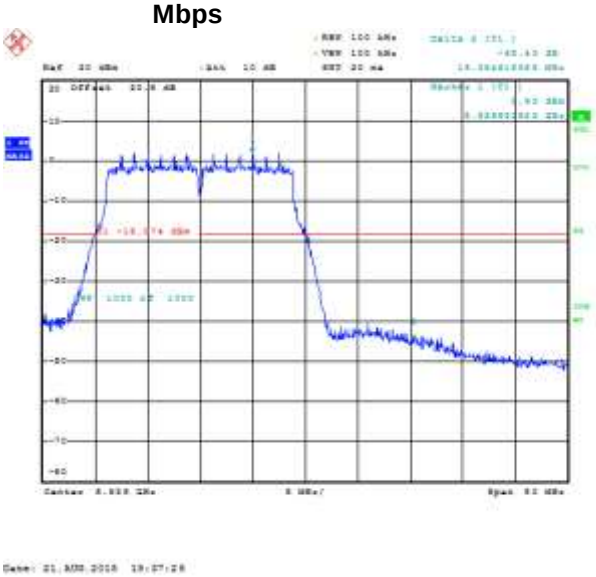


Figure 8-37: Band Edge Compliance Secondary, 802.11ac, Channel 36, MCS0 Mbps

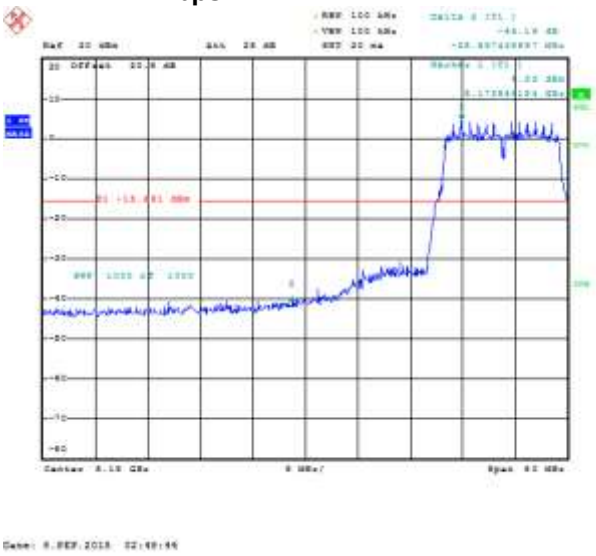
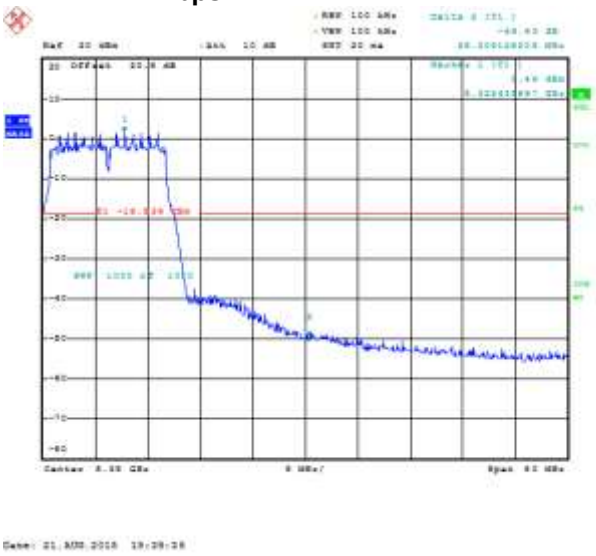


Figure 8-38: Band Edge Compliance Secondary, 802.11ac, Channel 64, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-39: Band Edge Compliance Secondary, 802.11ac, Channel 100, MCS0 Mbps

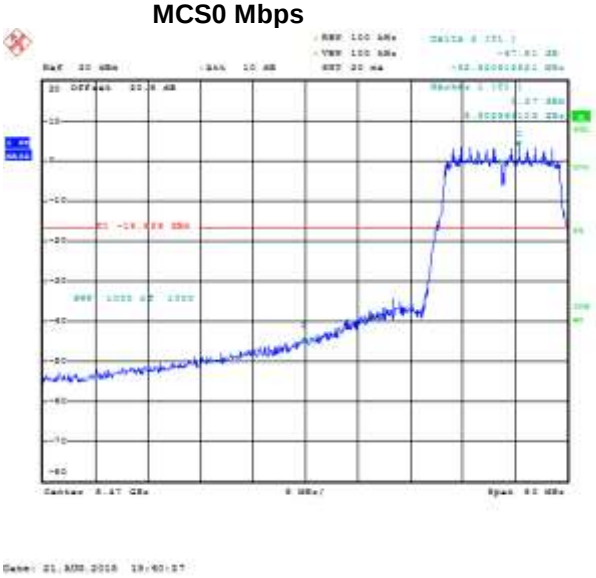


Figure 8-40: Band Edge Compliance Secondary, 802.11ac, Channel 140, MCS0 Mbps

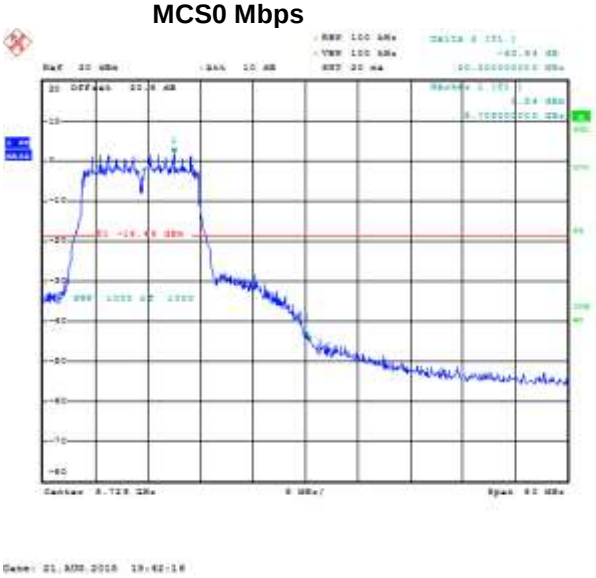


Figure 8-41: Band Edge Compliance Secondary, 802.11ac, Channel 149, MCS0 Mbps

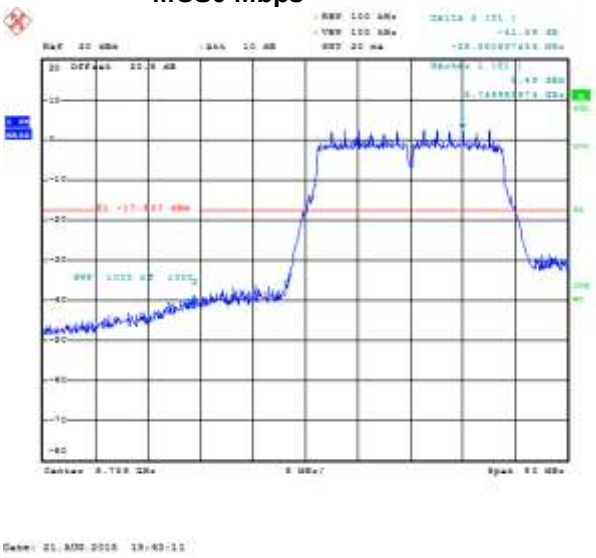
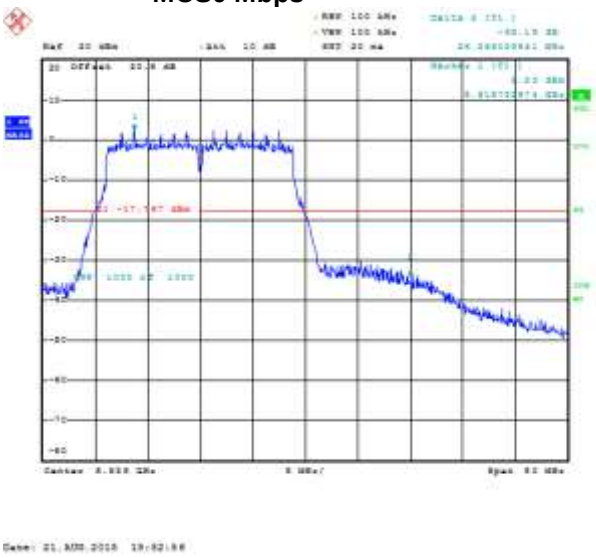


Figure 8-42: Band Edge Compliance Secondary, 802.11ac, Channel 165, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Channels 36, 64, 100, 140, and 149 were measured at MCS0 mode each for bandwidth 40MHz, 802.11ac mode.

40MHz Bandwidth

SISO Primary Antenna

Channel	Bandwidt(MHz)	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	40	MCS0	< -20	-43.33	-23.33
64	40	MCS0	< -20	-40.37	-20.37
100	40	MCS0	< -20	-35.49	-15.49
140	40	MCS0	< -20	-26.37	-6.37
149	40	MCS0	< -20	-40.12	-20.12

SISO Secondary Antenna

Channel	Bandwidt(MHz)	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	40	MCS0	< -20	-35.18	-15.18
64	40	MCS0	< -20	-42.22	-22.22
100	40	MCS0	< -20	-39.60	-19.60
140	40	MCS0	< -20	-23.43	-3.43
149	40	MCS0	< -20	-38.35	-18.35

See figures 8-43 to 8-52 for the plots of the band edge compliance measurements for Channel 36, 64, 100, 140, and 149 at MCS0 Mbps each for 802.11ac mode.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-43: Band Edge Compliance Primary, 802.11ac, Channel 36, MCS0 Mbps

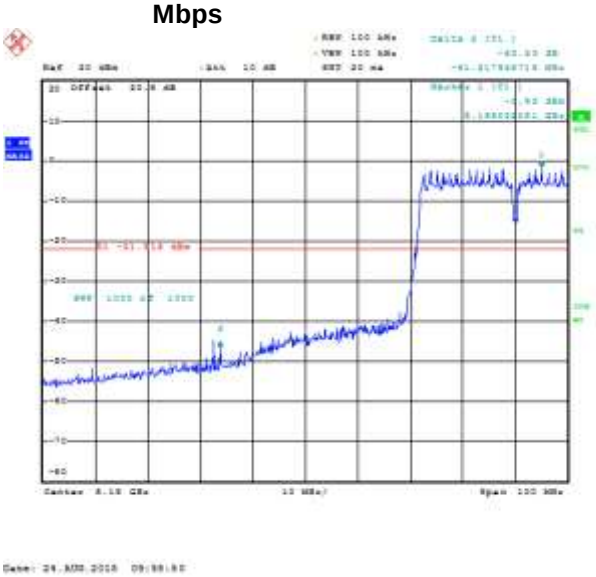


Figure 8-44: Band Edge Compliance Primary, 802.11ac, Channel 64, MCS0 Mbps

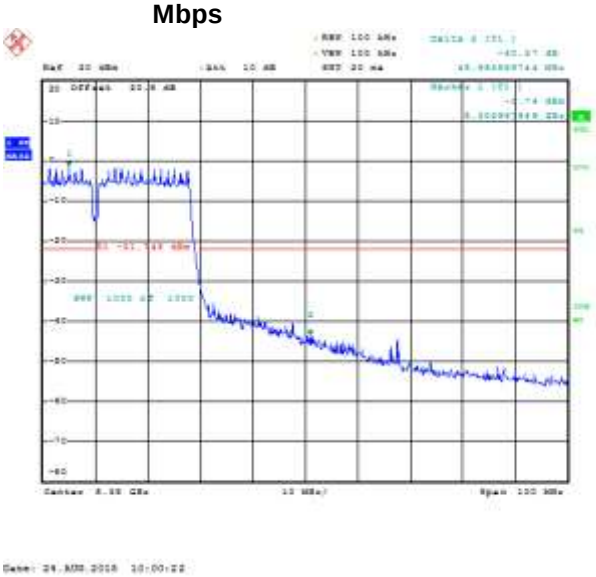


Figure 8-45: Band Edge Compliance Primary, 802.11ac, Channel 100, MCS0 Mbps

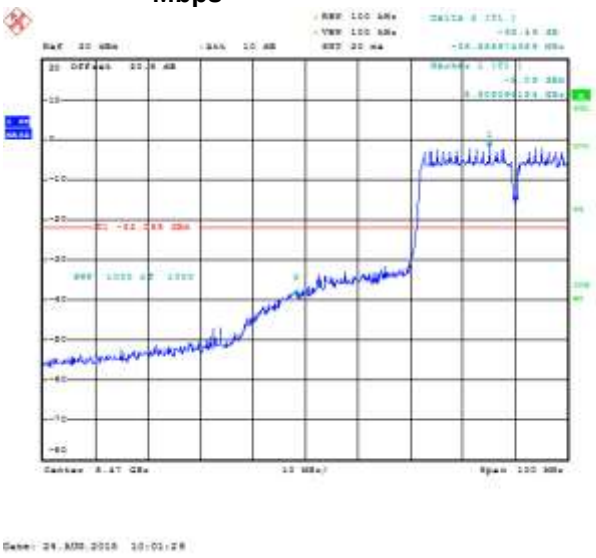
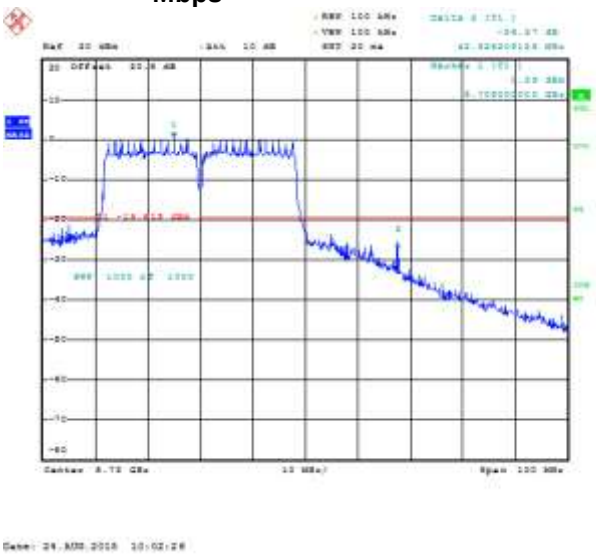


Figure 8-46: Band Edge Compliance Primary, 802.11ac, Channel 140, MCS0 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 8-47: Band Edge Compliance Primary, 802.11ac, Channel 149, MCS0 Mbps

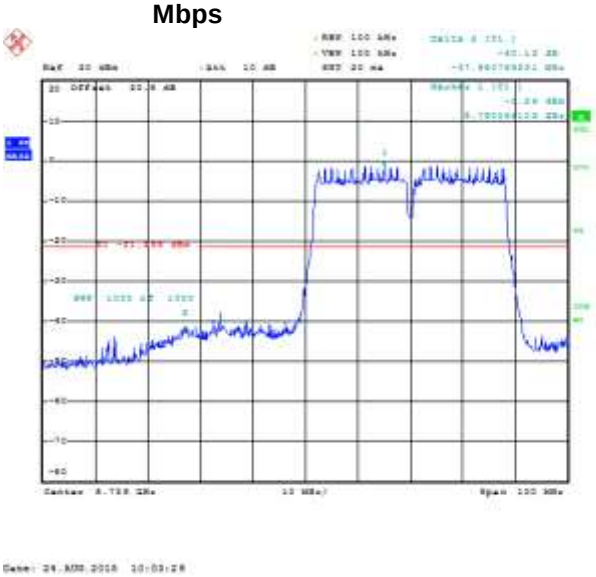


Figure 8-48: Band Edge Compliance Secondary, 802.11ac, Channel 36, MCS0 Mbps

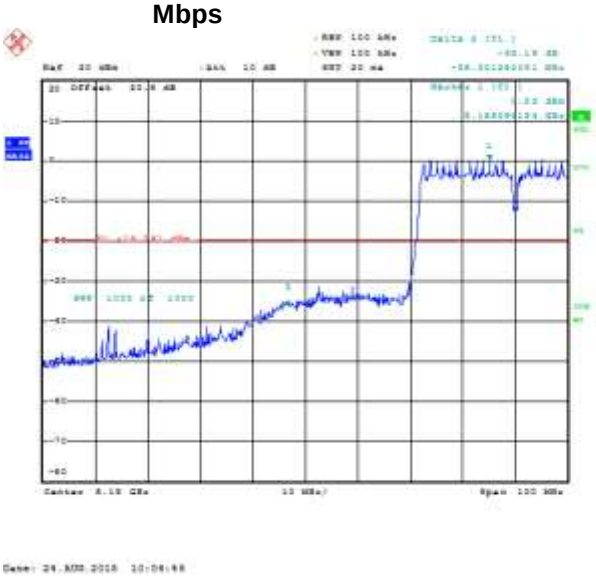


Figure 8-49: Band Edge Compliance Secondary, 802.11ac, Channel 64, MCS0 Mbps

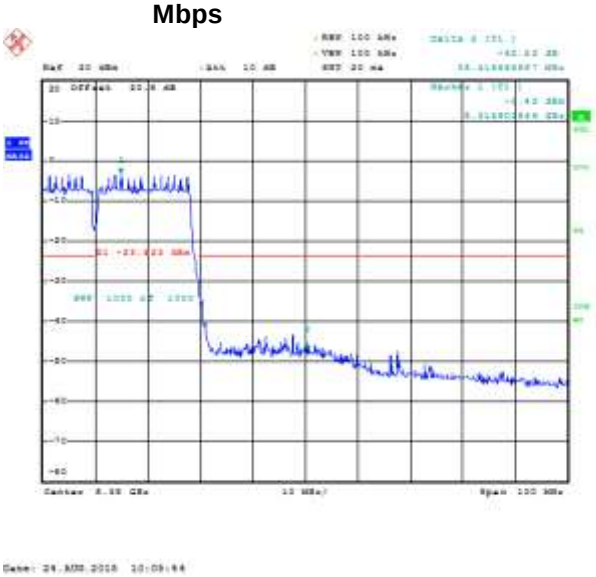
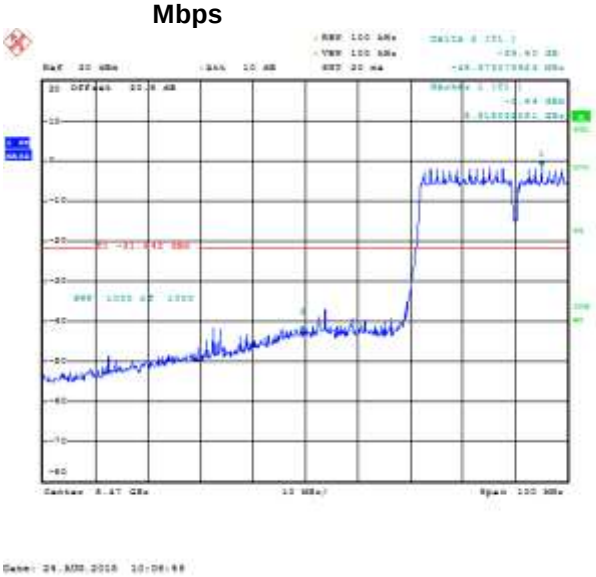


Figure 8-50: Band Edge Compliance Secondary, 802.11ac, Channel 100, MCS0 Mbps



802.11a RF Conducted Emission Test Results cont'd

Figure 8-51: Band Edge Compliance Secondary, 802.11ac, Channel 140, MCS0 Mbps

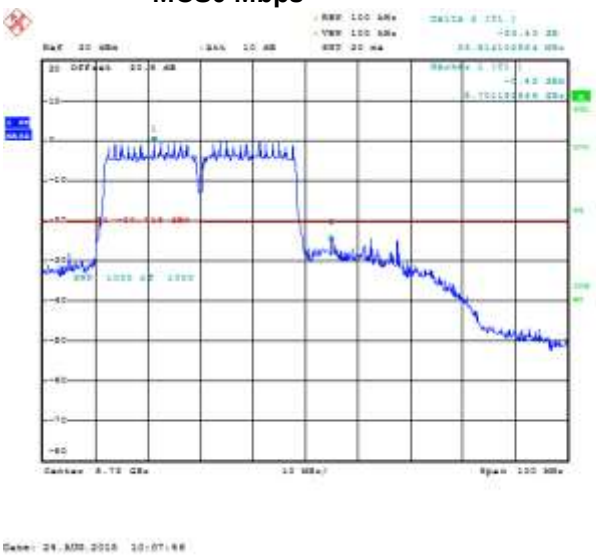
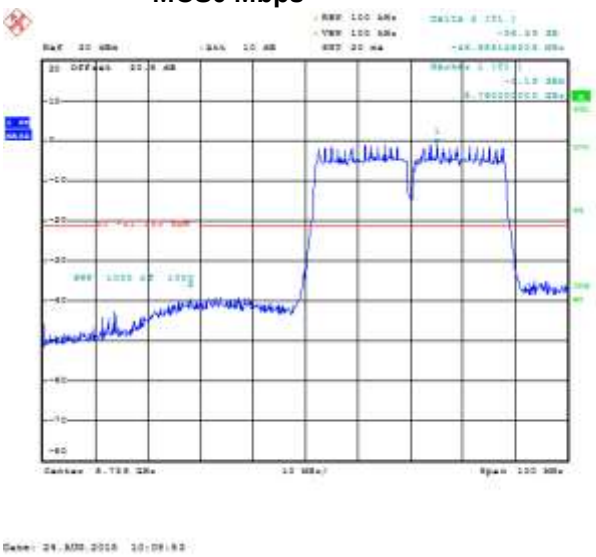


Figure 8-52: Band Edge Compliance Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Channels 36, 64, 100, 140, and 149 were measured at MCS0 Mbps each for bandwidth 80MHz, 802.11ac mode.

80MHz Bandwidth

SISO Primary Antenna

Channel	Bandwidt(MHz)	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	80	MCS0	< -20	-35.19	-15.19
64	80	MCS0	< -20	-36.34	-16.34
100	80	MCS0	< -20	-33.34	-13.34
140	80	MCS0	< -20	-26.24	-6.24
149	80	MCS0	< -20	-37.75	-17.75

SISO Secondary Antenna

Channel	Bandwidt(MHz)	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dB)
36	80	MCS0	< -20	-31.22	-11.22
64	80	MCS0	< -20	-36.10	-16.10
100	80	MCS0	< -20	-36.16	-16.16
140	80	MCS0	< -20	-27.95	-7.95
149	80	MCS0	< -20	-33.74	-13.74

See figures 8-53 to 8-62 for the plots of the band edge compliance measurements for Channel 36, 64, 100, 140, and 149 at MCS0 Mbps each for 802.11ac mode.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-53: Band Edge Compliance Primary, 802.11ac, Channel 36, MCS0 Mbps

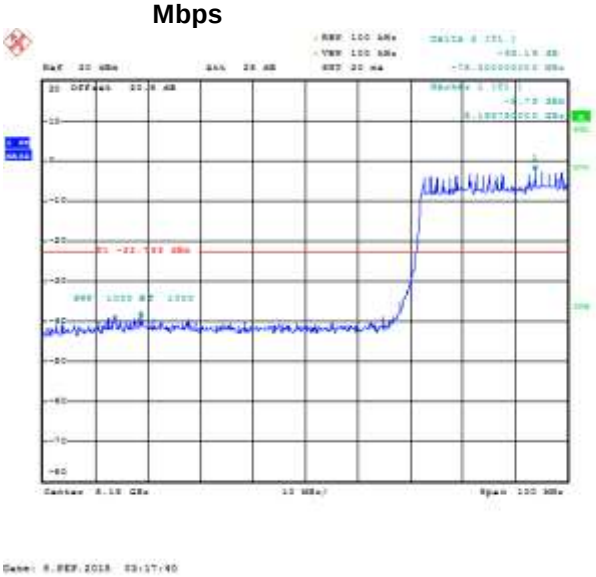


Figure 8-54: Band Edge Compliance Primary, 802.11ac, Channel 64, MCS0 Mbps

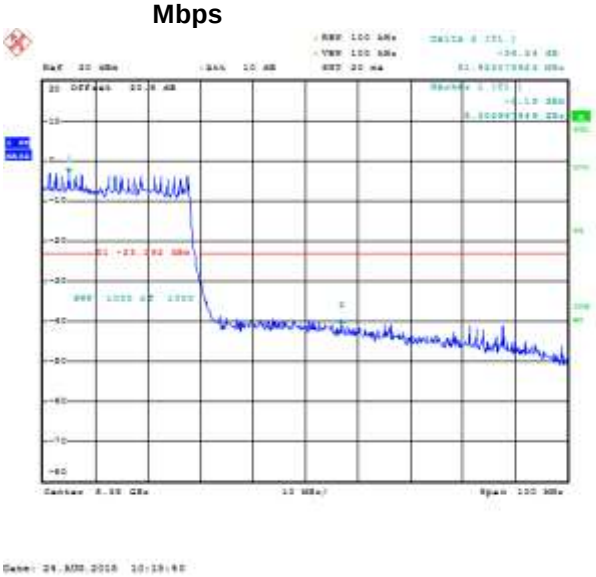


Figure 8-55: Band Edge Compliance Primary, 802.11ac, Channel 100, MCS0 Mbps

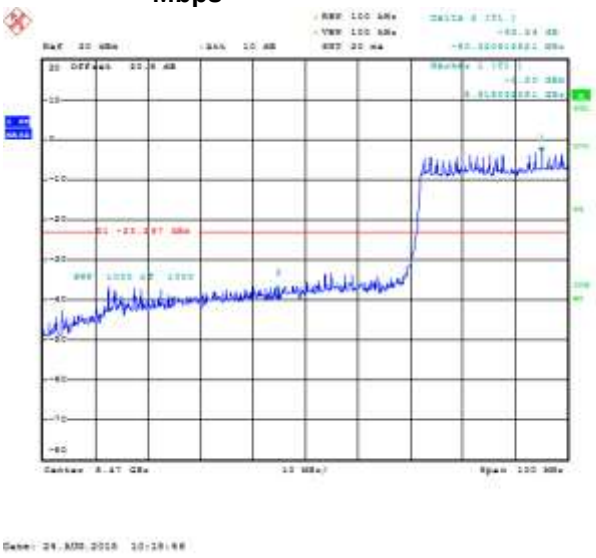
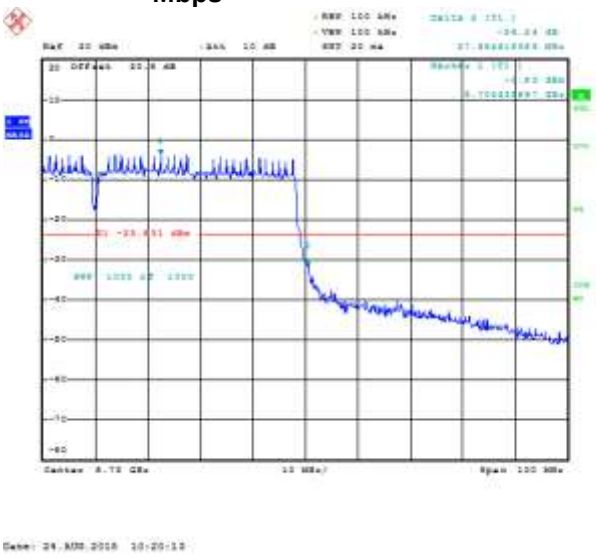


Figure 8-56: Band Edge Compliance Primary, 802.11ac, Channel 140, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-57: Band Edge Compliance Primary, 802.11ac, Channel 149, MCS0 Mbps

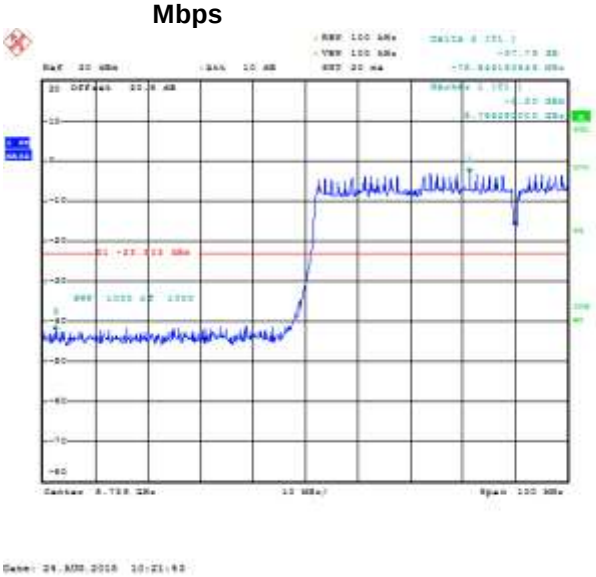


Figure 8-58: Band Edge Compliance Secondary, 802.11ac, Channel 36, MCS0 Mbps

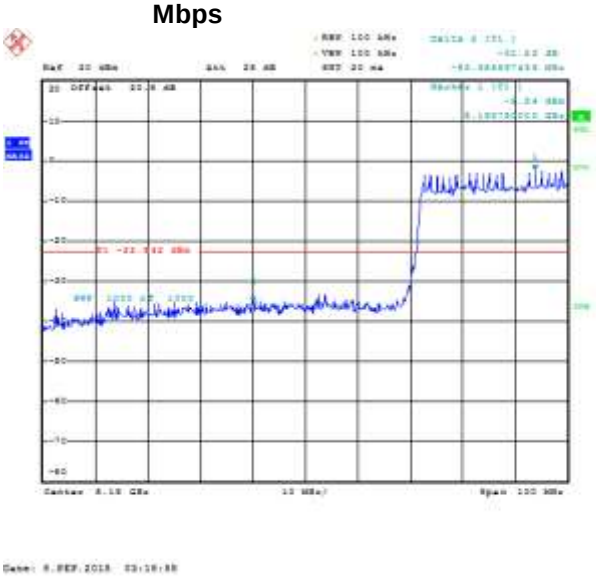


Figure 8-59: Band Edge Compliance Secondary, 802.11ac, Channel 64, MCS0 Mbps

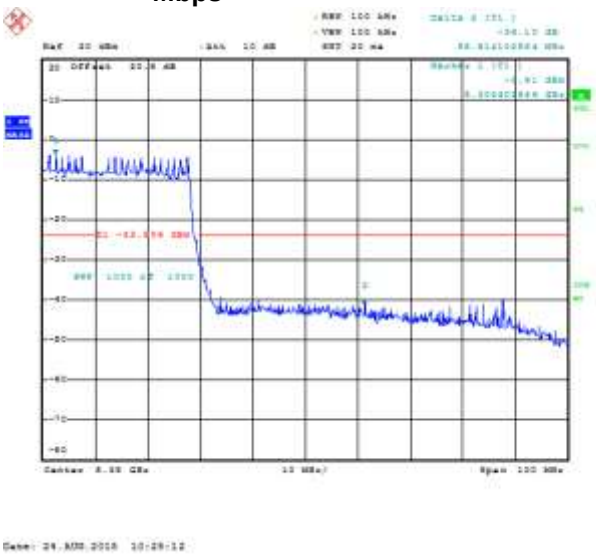
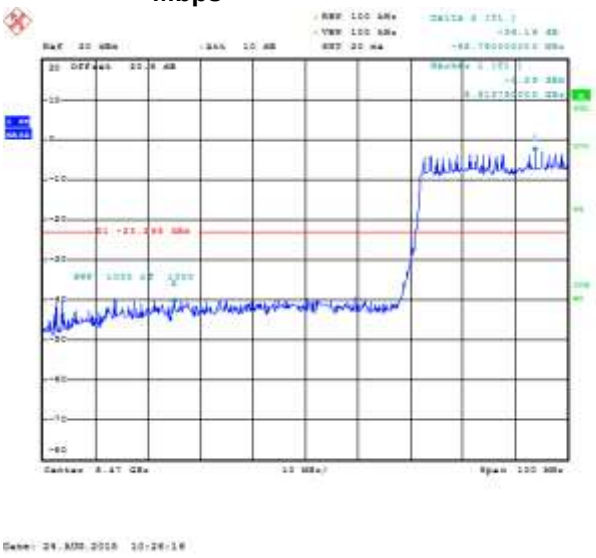


Figure 8-60: Band Edge Compliance Secondary, 802.11ac, Channel 100, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-61: Band Edge Compliance Secondary, 802.11ac, Channel 140, MCS0 Mbps

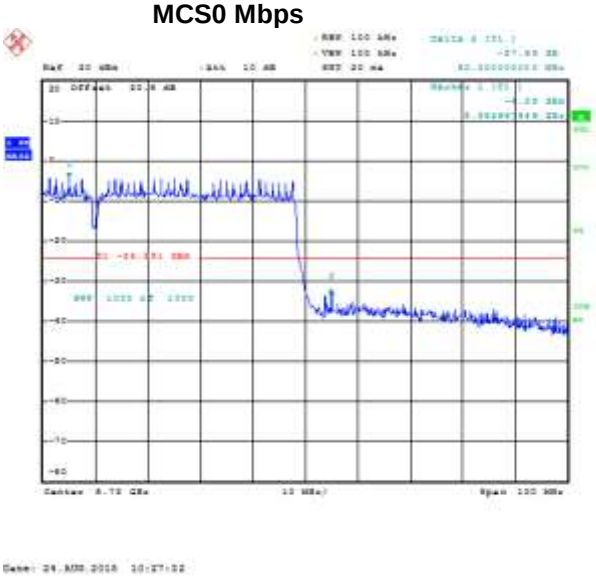
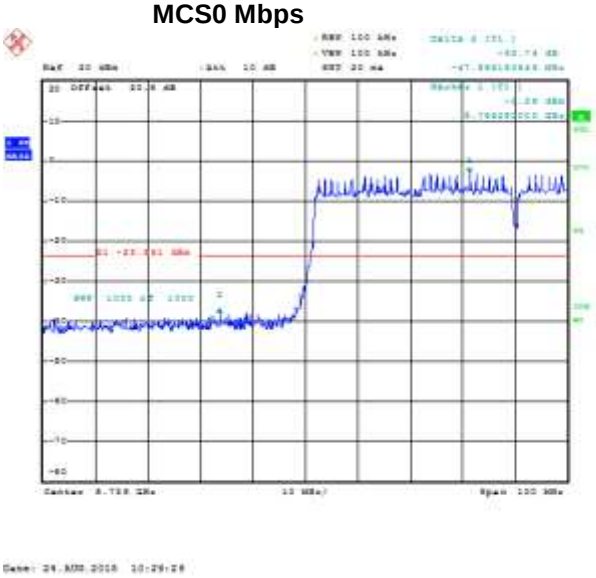


Figure 8-62: Band Edge Compliance Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Peak Power Spectral Density

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 140 and 149 were measured at MCS0 Mbps each for 802.11ac mode, bandwidth 20MHz.

Bandwidth 20 MHz

SISO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	2.89	-8.11
64	MCS0	< 11.00	3.25	-7.75
140	MCS0	< 11.00	2.52	-8.48
149	MCS0	< 33.00	2.94	-30.06

SISO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	3.26	-7.74
64	MCS0	< 11.00	2.63	-8.37
140	MCS0	< 11.00	2.19	-8.81
149	MCS0	< 33.00	2.96	-30.04

MIMO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dB)	Margin (dB)
36	MCS0	< 11.00	3.00	-8.00
64	MCS0	< 11.00	2.60	-8.40
140	MCS0	< 11.00	3.29	-7.71
149	MCS0	< 33.00	3.60	-29.40

802.11ac RF Conducted Emission Test Results cont'd

MIMO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dB)	Margin (dB)
36	MCS0	< 11.00	3.90	-7.10
64	MCS0	< 11.00	2.43	-8.57
140	MCS0	< 11.00	2.29	-8.71
149	MCS0	< 33.00	3.44	-29.56

MIMO Combined

Channel	Data Rate	Limit (dBm/MHz)	Combined Peak (dBm/MHz)	Margin (dB)
36	MCS0	< 11.00	6.38	-4.62
64	MCS0	< 11.00	5.41	-5.59
140	MCS0	< 11.00	5.73	-5.27
149	MCS0	< 33.00	6.41	-26.59

See figures 8-63 to 8-78 for the plots of the peak power spectral density for Channel 36, 64, 140 and 149 at MCS0 Mbps each for 802.11ac mode, 20MHz bandwidth.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-63: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 36, MCS0 Mbps

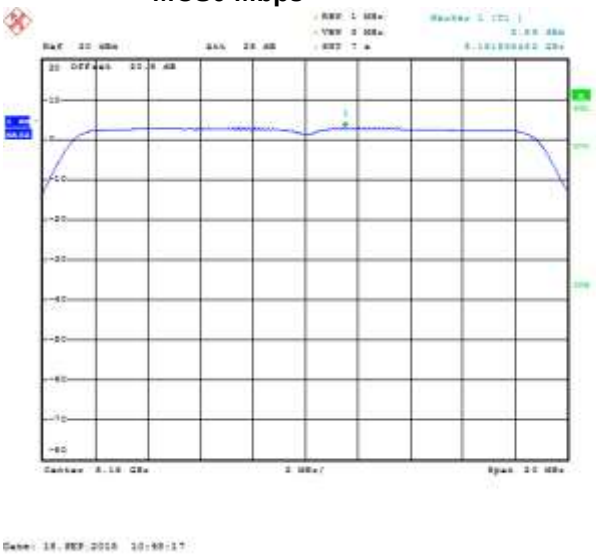


Figure 8-64: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 64, MCS0 Mbps

Figure 8-65: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 140, MCS0 Mbps

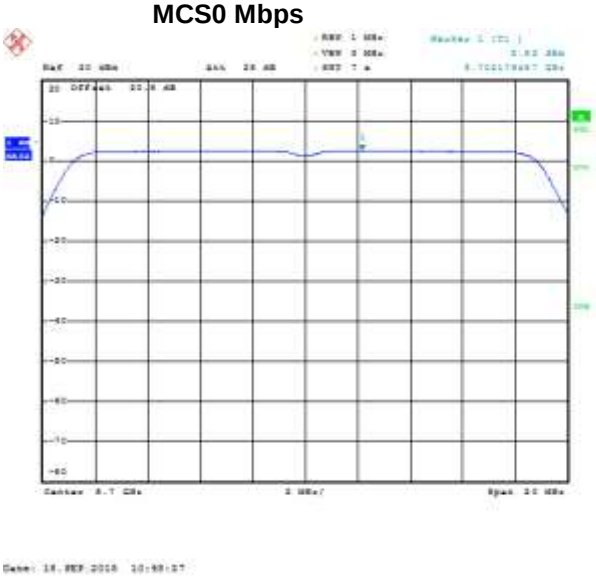
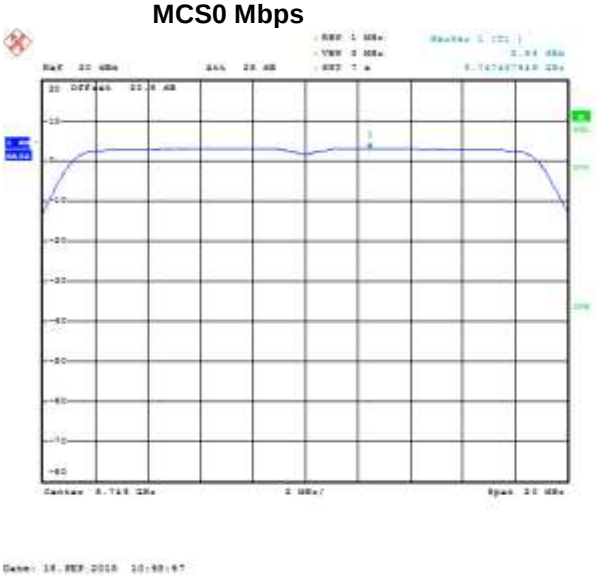


Figure 8-66: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-67: Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 36, MCS0 Mbps

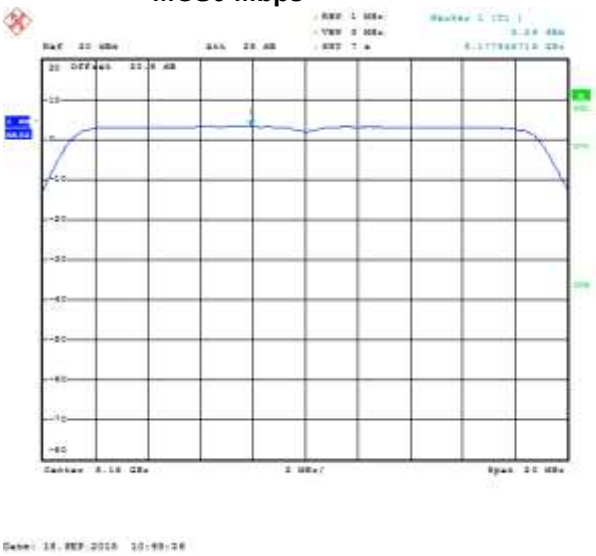


Figure 8-68: Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 64, MCS0 Mbps

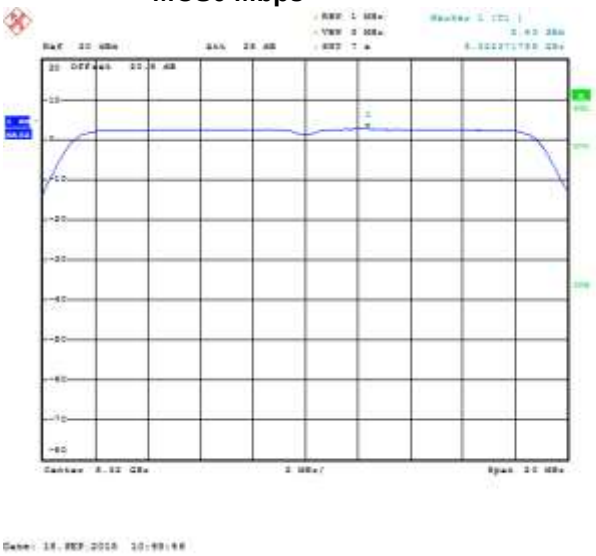


Figure 8-69: Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 140, MCS0 Mbps

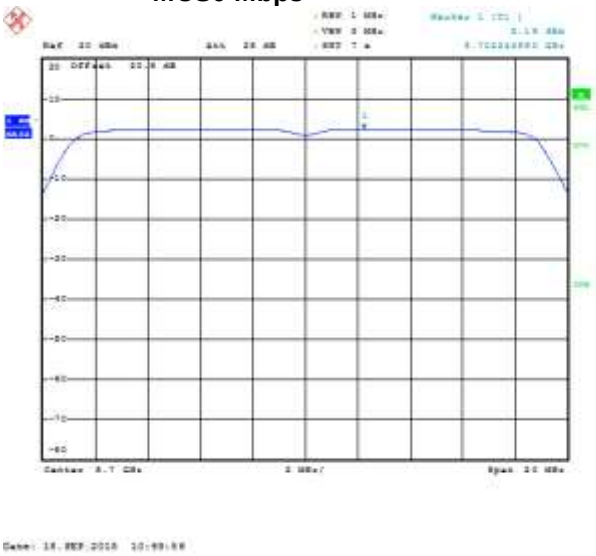
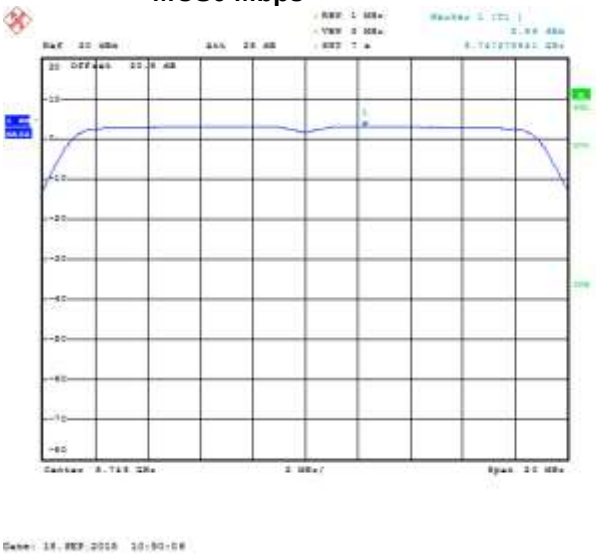


Figure 8-70: Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-71: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 36, MCS0 Mbps

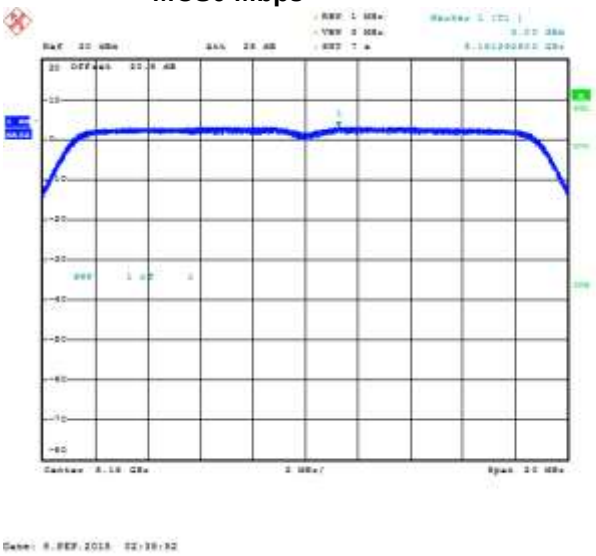


Figure 8-72: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 64, MCS0 Mbps

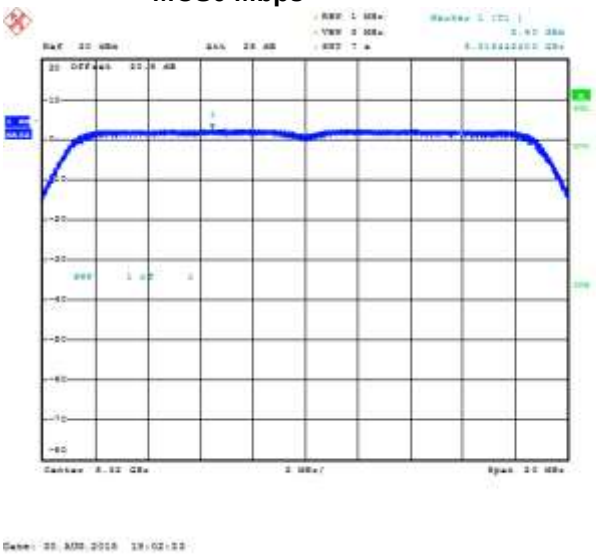


Figure 8-73: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 140, MCS0 Mbps

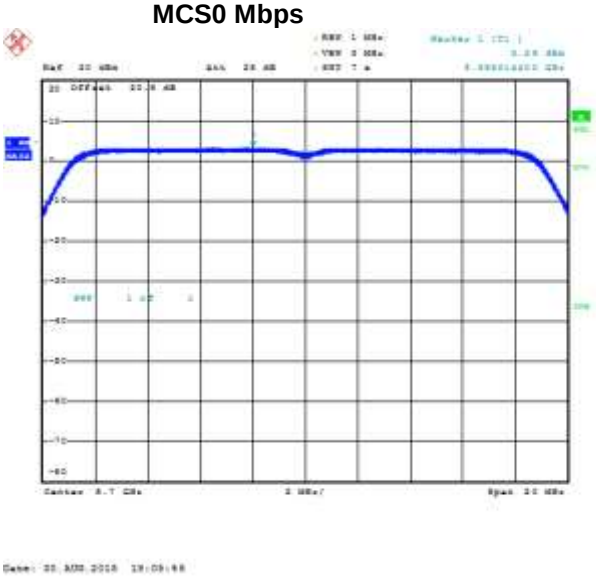
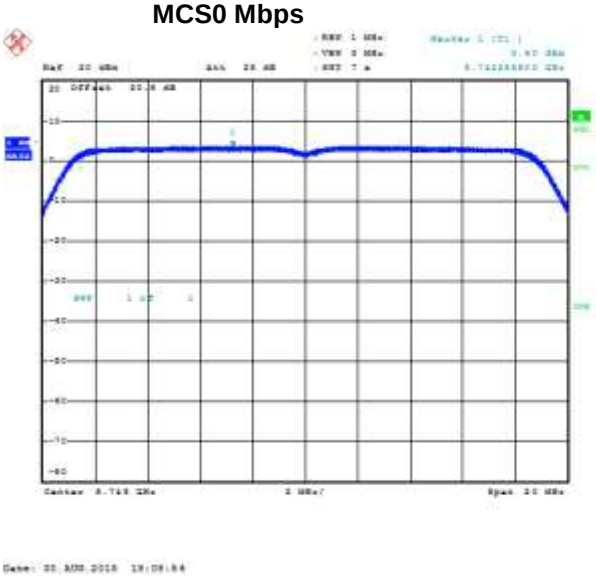


Figure 8-74: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-75: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 36, MCS0 Mbps

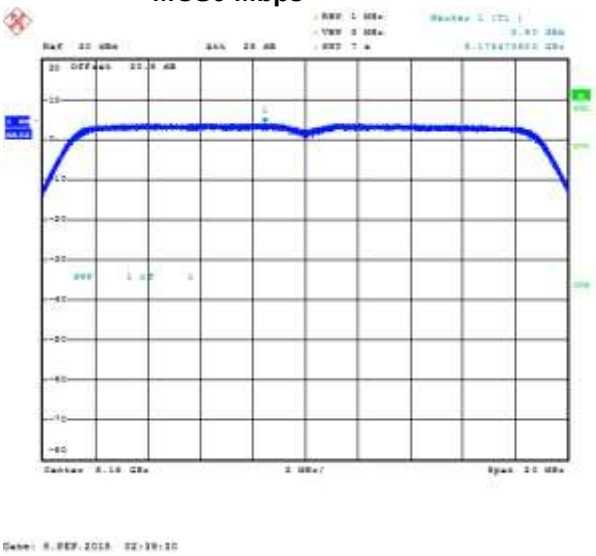


Figure 8-76: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 64, MCS0 Mbps

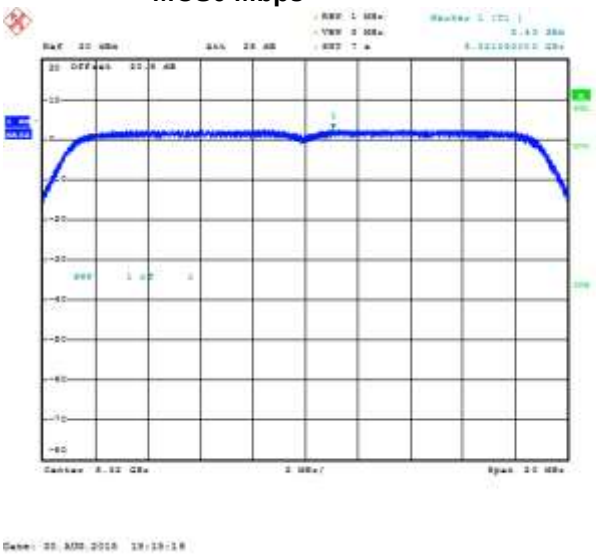


Figure 8-77: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 140, MCS0 Mbps

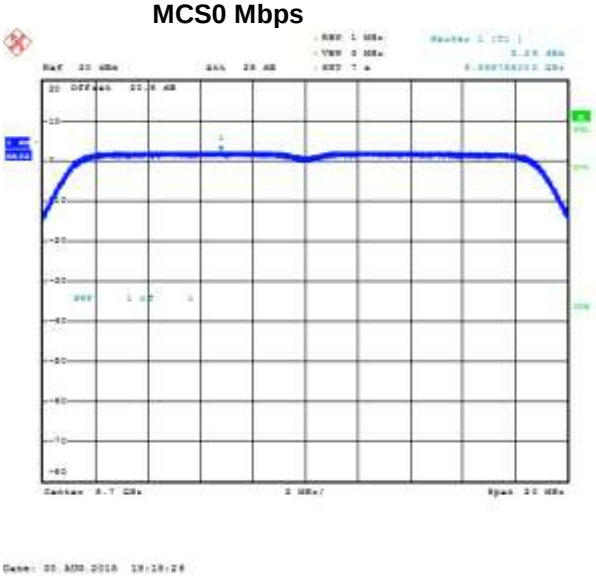
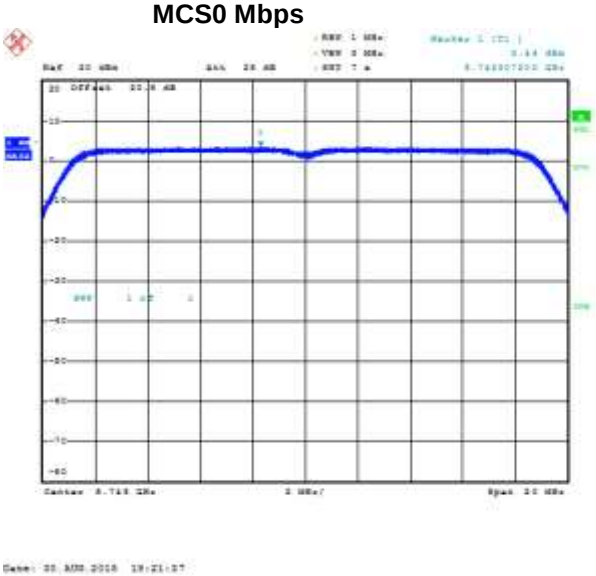


Figure 8-78: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Channels 38, 62, 142 and 151 were measured at MCS0 Mbps each for 802.11ac mode, bandwidth 40MHz.

Bandwidth 40MHz

SISO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
38	MCS0	< 11.00	0.19	-10.81
62	MCS0	< 11.00	1.10	-9.9
142	MCS0	< 11.00	0.06	-10.94
151	MCS0	< 33.00	0.65	-32.35

SISO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
38	MCS0	< 11.00	0.93	-10.07
62	MCS0	< 11.00	0.29	-10.71
142	MCS0	< 11.00	0.05	-10.95
151	MCS0	< 33.00	1.06	-31.94

MIMO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
38	MCS0	< 11.00	-3.51	-14.51
62	MCS0	< 11.00	-3.35	-14.35
142	MCS0	< 11.00	-1.23	-12.23
151	MCS0	< 33.00	-0.74	-33.74

MIMO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
38	MCS0	< 11.00	-3.68	-14.68
62	MCS0	< 11.00	-3.39	-14.39
142	MCS0	< 11.00	0.58	-10.42
151	MCS0	< 33.00	-0.56	-33.56

802.11ac RF Conducted Emission Test Results cont'd

MIMO Combined

Channel	Data Rate	Limit (dBm/MHz)	Combined Peak (dBm/MHz)	Margin (dB)
38	MCS0	< 11.00	-0.69	-11.69
62	MCS0	< 11.00	-0.47	-11.47
142	MCS0	< 11.00	3.88	-7.12
151	MCS0	< 33.00	2.21	-30.79

See figures 8-79 to 8-94 for the plots of the peak power spectral density for channel 38, 62, 142 and 151 at MCS0 Mbps each for 802.11ac mode, 40MHz bandwidth.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-79: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 38, MCS0 Mbps

Figure 8-80: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 62, MCS0 Mbps

Figure 8-81: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 142, MCS0 Mbps

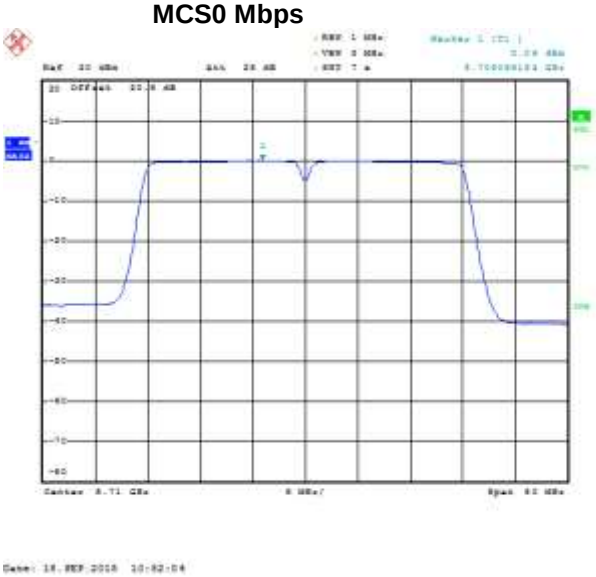
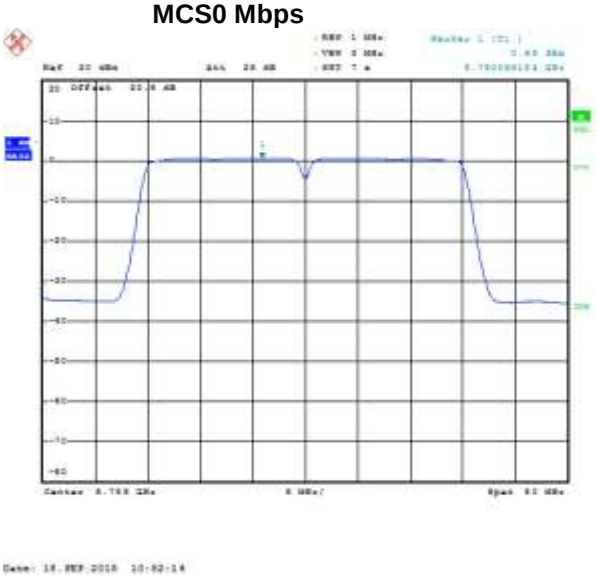


Figure 8-82: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 151, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-83: Peak Power Spectral Density SISO Secondary, 802.11ac, Channel 38, MCS0 Mbps

Figure 8-84: Peak Power Spectral Density SISO Secondary, 802.11ac, Channel 62, MCS0 Mbps

Figure 8-85: Peak Power Spectral Density SISO Secondary, 802.11ac, Channel 142, MCS0 Mbps

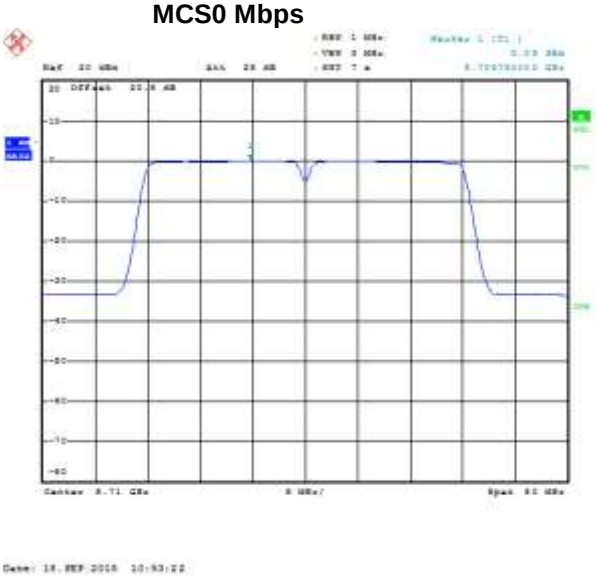
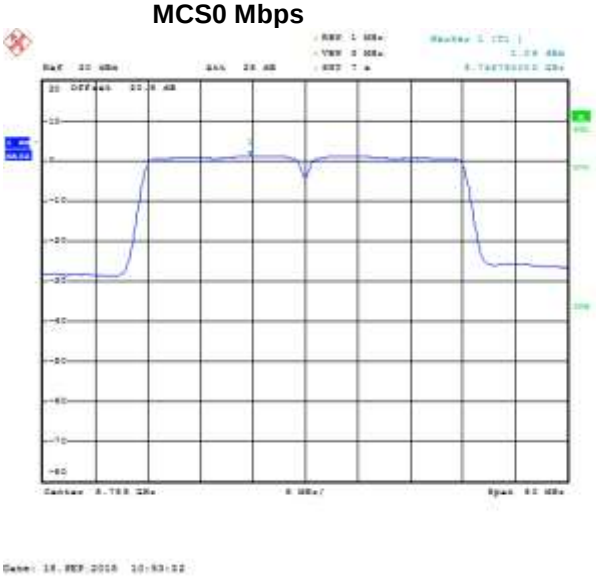


Figure 8-86: Peak Power Spectral Density SISO Secondary, 802.11ac, Channel 151, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-87: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 38, MCS0 Mbps

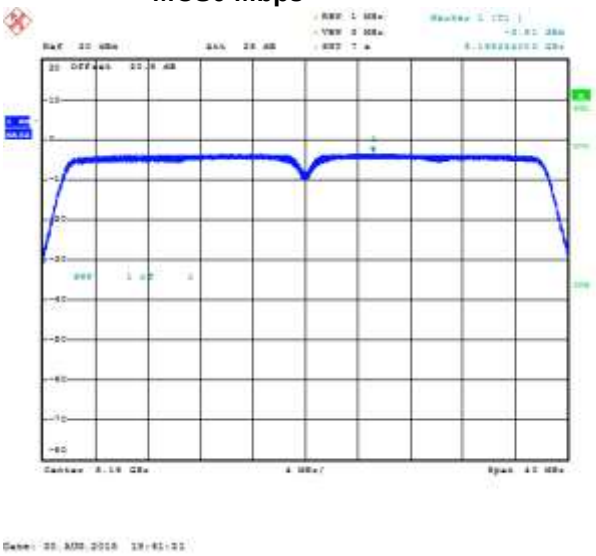


Figure 8-88: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 62, MCS0 Mbps

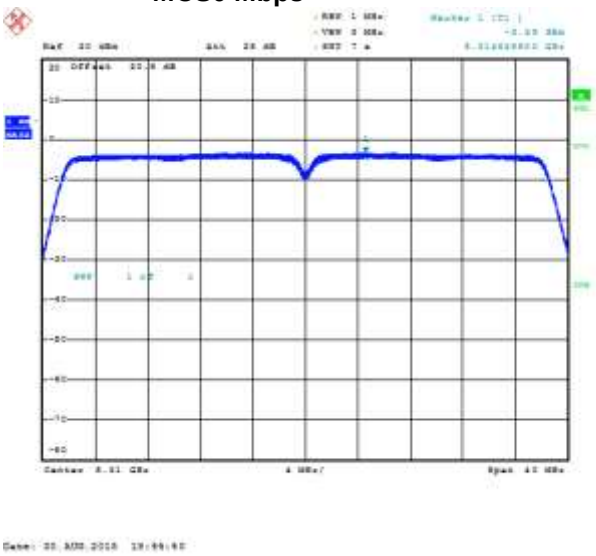


Figure 8-89: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 142, MCS0 Mbps

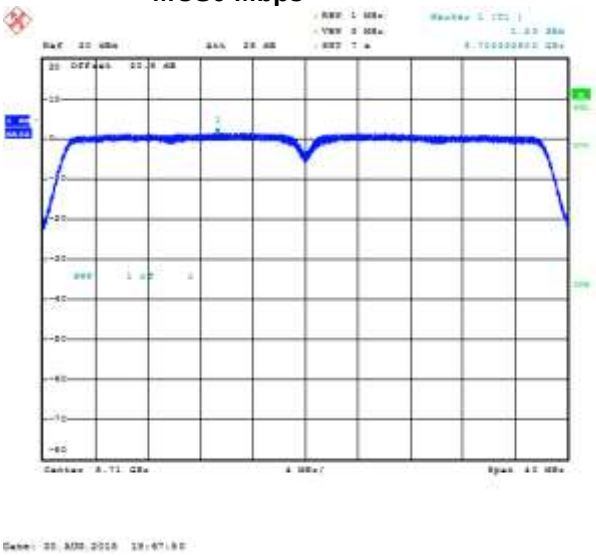
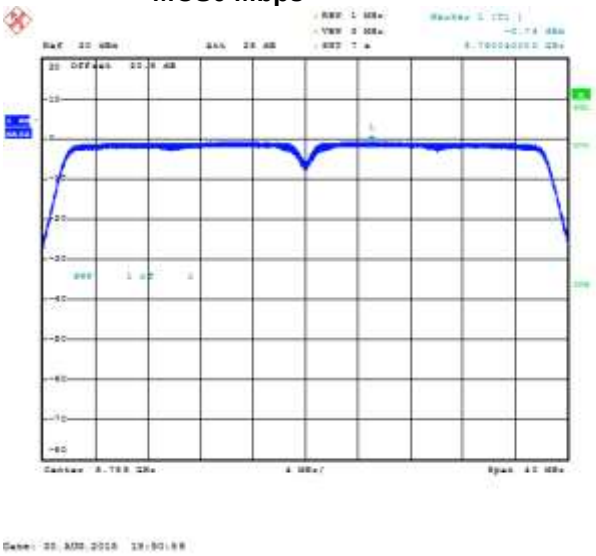


Figure 8-90: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 151, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-91: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 38, MCS0 Mbps

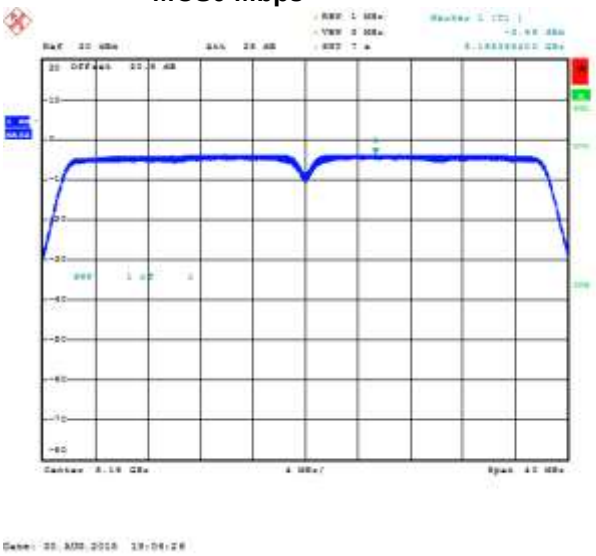


Figure 8-92: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 62, MCS0 Mbps

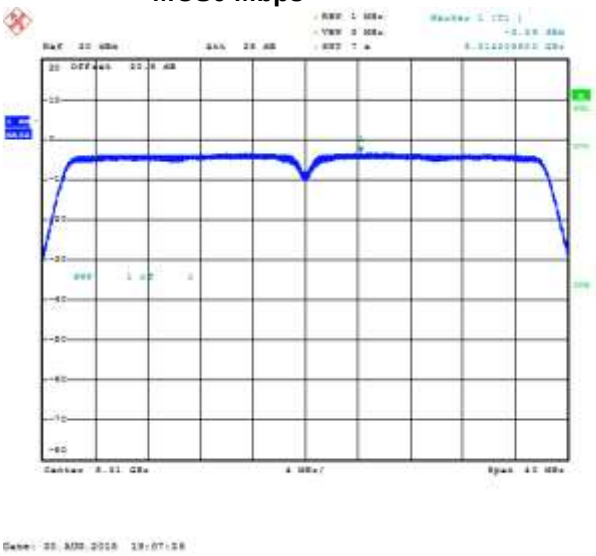


Figure 8-93: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 142, MCS0 Mbps

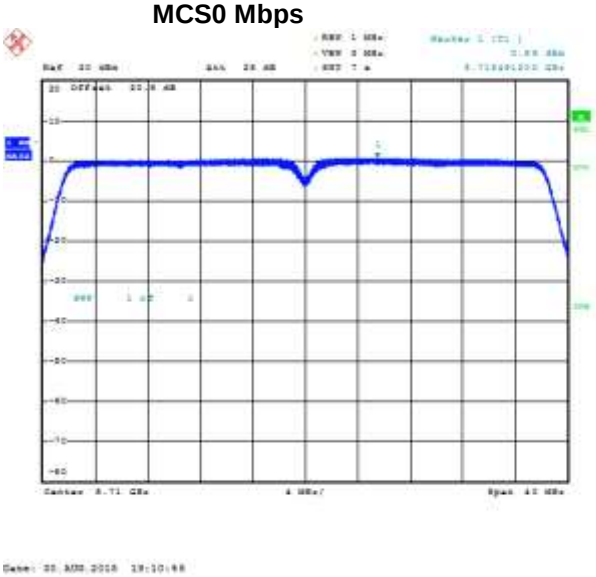
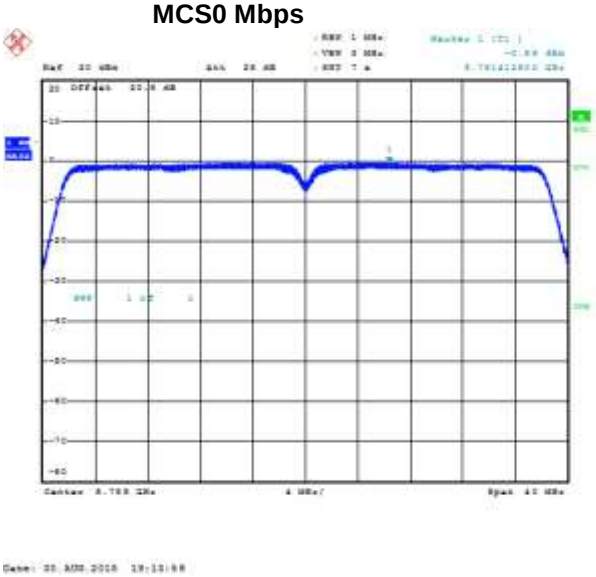


Figure 8-94: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 151, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Channels 42, 58, 138 and 155 were measured at MCS0 Mbps each for 802.11ac mode, bandwidth 80MHz.

Bandwidth 80 MHz

SISO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
42	MCS0	< 11.00	-6.41	-17.41
58	MCS0	< 11.00	-5.78	-16.78
106	MCS0	< 11.00	-6.51	-17.51
138	MCS0	< 11.00	-6.12	-17.12
155	MCS0	< 33.00	-5.41	-38.41

SISO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dBm/MHz)	Margin (dB)
42	MCS0	< 11.00	-4.23	-15.23
58	MCS0	< 11.00	-5.02	-16.02
106	MCS0	< 11.00	-4.05	-15.05
138	MCS0	< 11.00	-4.86	-15.86
155	MCS0	< 33.00	-4.01	-37.01

MIMO Primary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dB/MHz)	Margin (dB)
42	MCS0	< 11.00	-2.80	-13.80
58	MCS0	< 11.00	-5.90	-16.90
106	MCS0	< 11.00	-5.00	-16.00
138	MCS0	< 11.00	-3.18	-14.18
155	MCS0	< 33.00	-3.73	-36.73

802.11ac RF Conducted Emission Test Results cont'd

MIMO Secondary Antenna

Channel	Data Rate	Limit (dBm/MHz)	Measured Level (dB/MHz)	Margin (dB)
42	MCS0	< 11.00	-2.91	-13.91
58	MCS0	< 11.00	-6.05	-17.05
106	MCS0	< 11.00	-4.63	-15.63
138	MCS0	< 11.00	-3.92	-14.92
155	MCS0	< 33.00	-3.64	-36.64

MIMO Combined

Channel	Data Rate	Limit (dBm/MHz)	Combined Peak (dBm/MHz)	Margin (dB)
42	MCS0	< 11.00	0.06	-10.94
58	MCS0	< 11.00	-3.13	-14.13
106	MCS0	< 11.00	-2.00	-13.00
138	MCS0	< 11.00	-0.98	-11.98
155	MCS0	< 33.00	-0.78	-33.78

See figures 8-95 to 8-114 for the plots of the peak power spectral density for channel 42, 58, 138 and 155 at MCS0 Mbps each for 802.11ac mode, 80MHz bandwidth.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-95: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 42, MCS0 Mbps

Figure 8-96: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 58, MCS0 Mbps

Figure 8-97: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 106, MCS0 Mbps

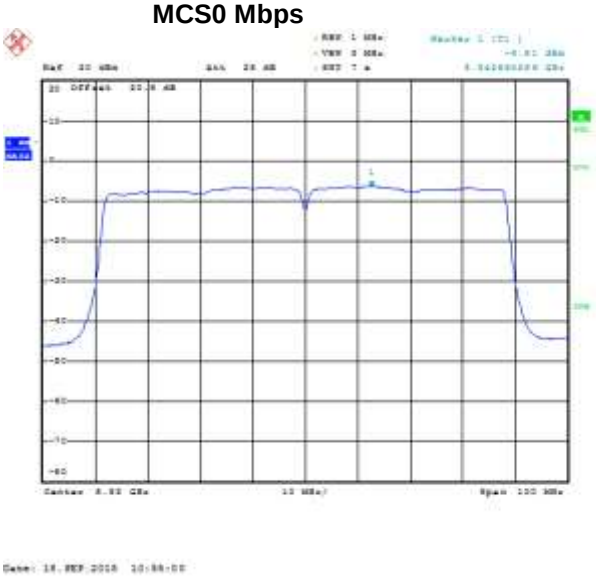
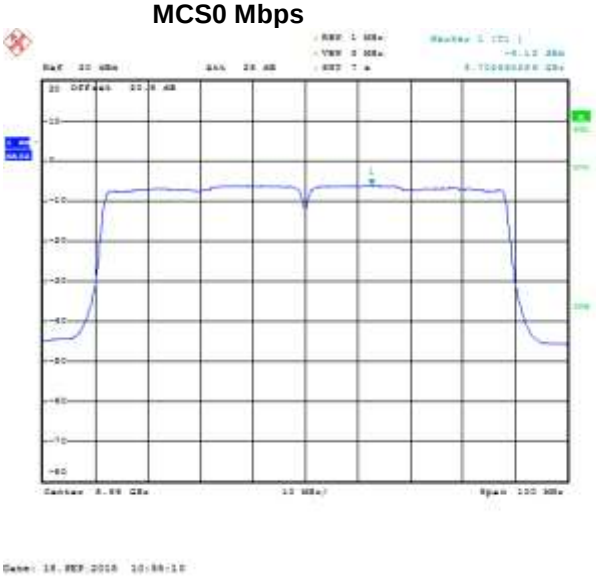
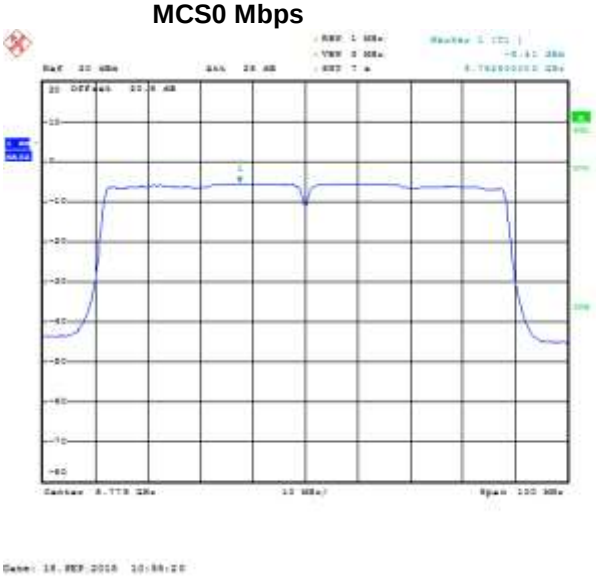


Figure 8-98: Peak Power Spectral Density SISO Primary, 802.11ac, Channel 138, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-99: Peak Power Spectral Density
SISO Primary, 802.11ac, Channel 155, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-100 Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 42, MCS0 Mbps

Figure 8-101: Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 58, MCS0 Mbps

Figure 8-102: Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 106, MCS0 Mbps

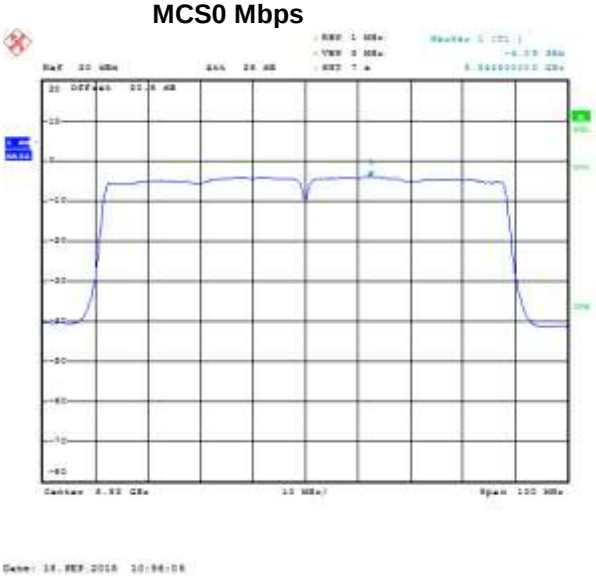
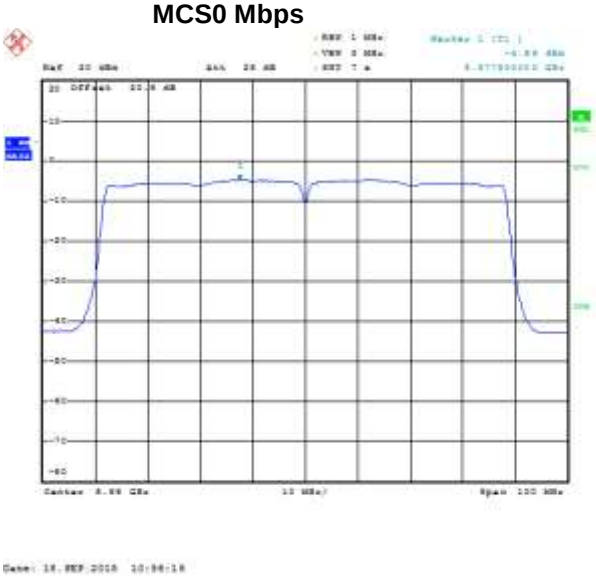
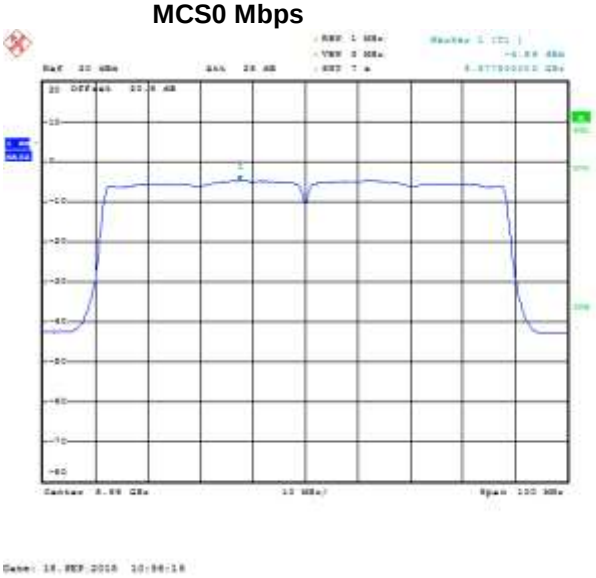


Figure 8-103: Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 138, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-104: Peak Power Spectral Density
SISO Secondary, 802.11ac, Channel 155, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-105: Peak Power Spectral Density MIMO Primary, 802.11ac, Channel 42, MCS0 Mbps

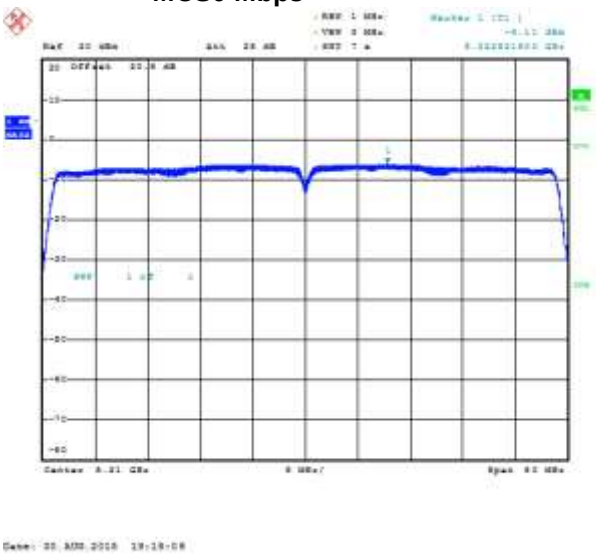


Figure 8-106: Peak Power Spectral Density MIMO Primary, 802.11ac, Channel 58, MCS0 Mbps

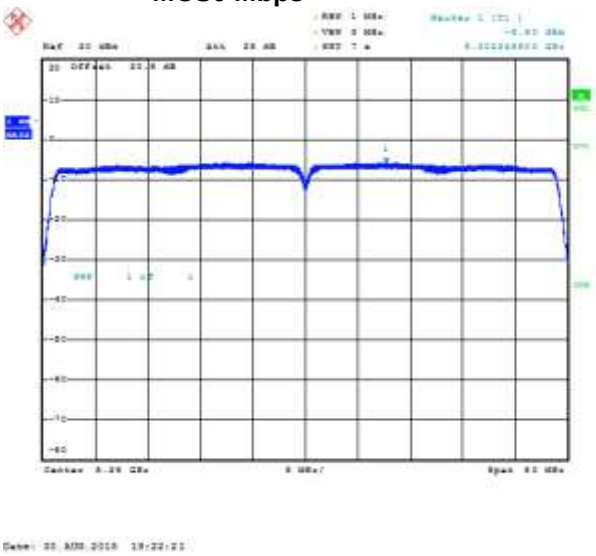


Figure 8-107: Peak Power Spectral Density MIMO Primary, 802.11ac, Channel 106, MCS0 Mbps

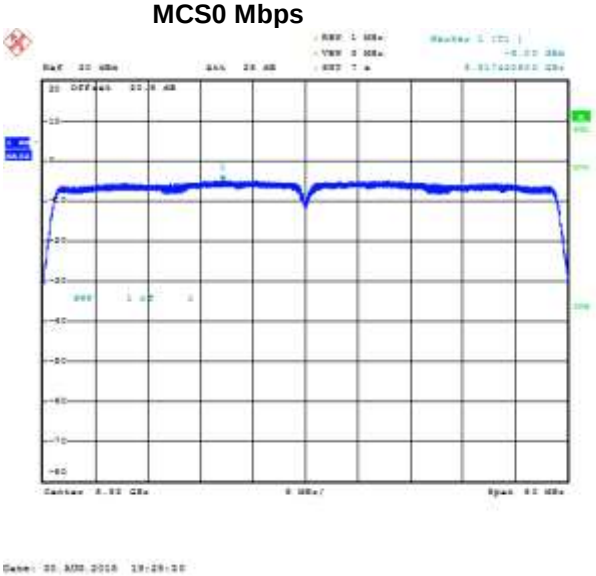
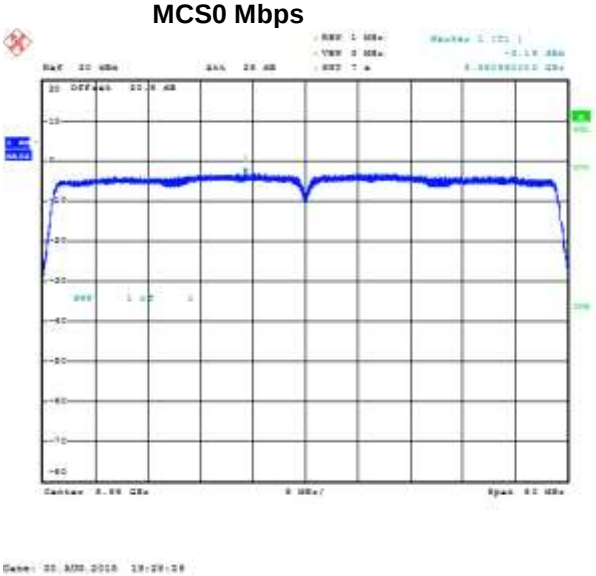
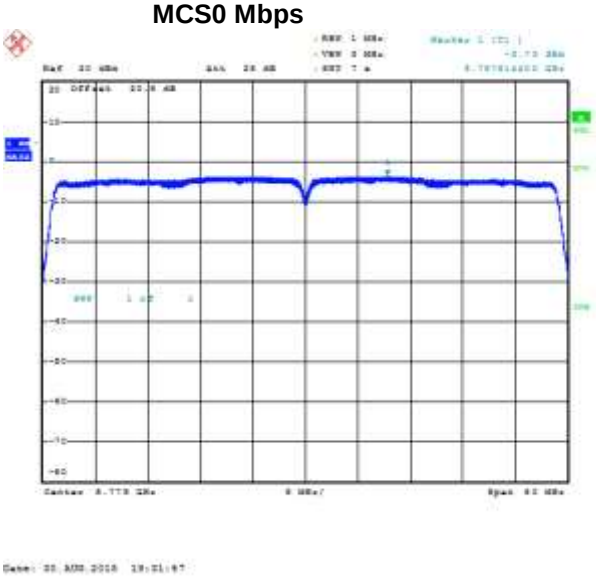


Figure 8-108: Peak Power Spectral Density MIMO Primary, 802.11ac, Channel 138, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-109: Peak Power Spectral Density
MIMO Primary, 802.11ac, Channel 155, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-110: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 42, MCS0 Mbps

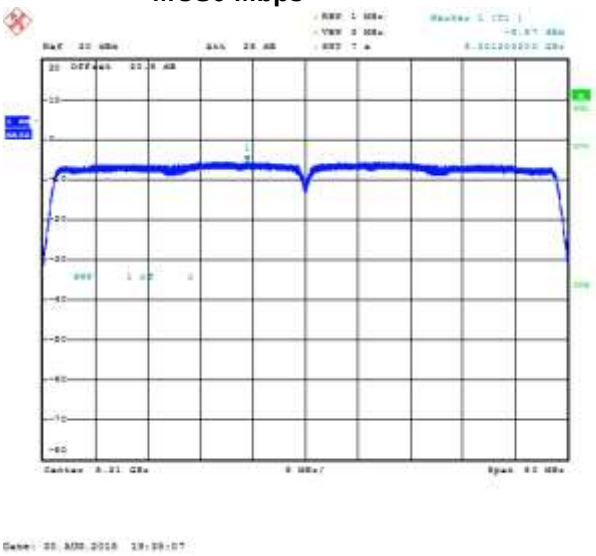


Figure 8-111: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 58, MCS0 Mbps

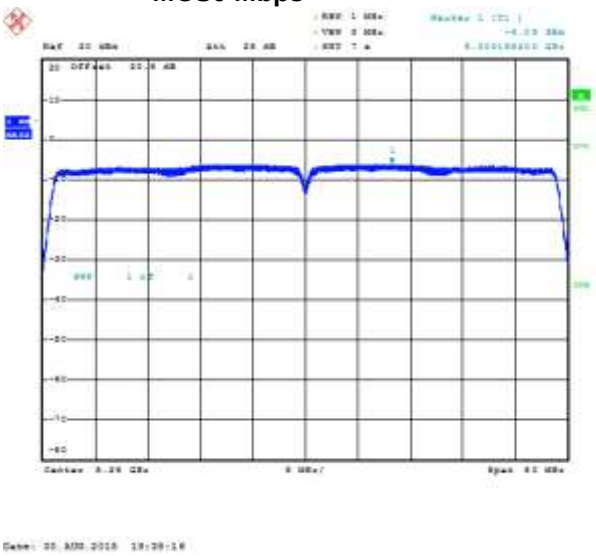


Figure 8-112: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 106, MCS0 Mbps

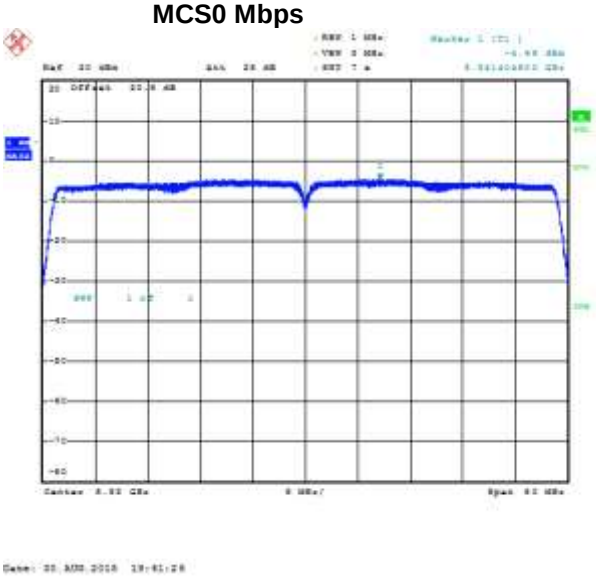
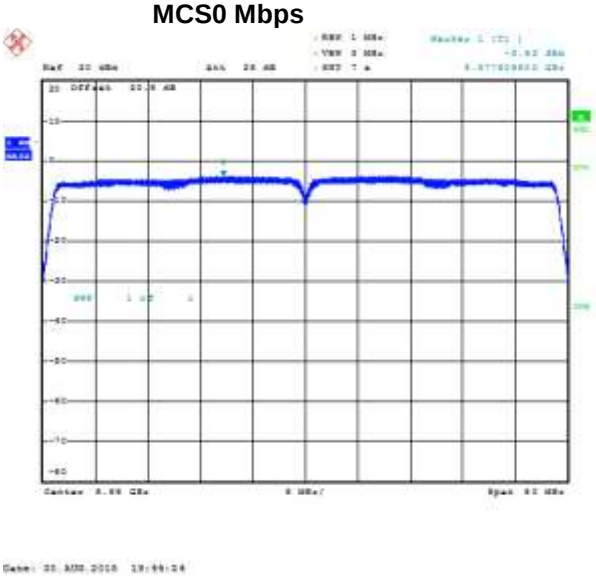
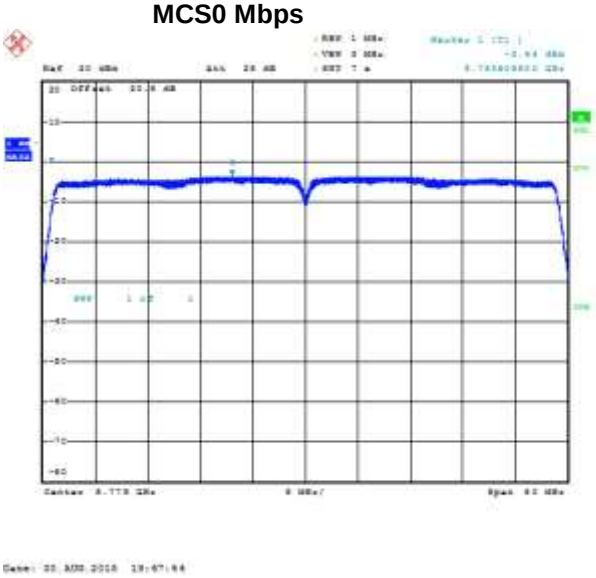


Figure 8-113: Peak Power Spectral Density MIMO Secondary, 802.11ac, Channel 138, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-114: Peak Power Spectral Density
MIMO Secondary, 802.11ac, Channel 155, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.407 and RSS-247. Channels 36, 64, 140 and 149 were measured at MCS0 Mbps each for 802.11ac mode, 20MHz bandwidth. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 29.0 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

20 MHz Bandwidth

Primary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	14.73	-46.54	-61.27	-20
64	MCS0	12.29	-44.72	-57.01	-20
140	MCS0	17.45	-46.42	-63.87	-20
149	MCS0	15.10	-45.25	-60.35	-20

Secondary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	15.91	-43.95	-59.86	-20
64	MCS0	14.04	-42.35	-56.39	-20
140	MCS0	13.86	-45.11	-58.97	-20
149	MCS0	14.62	-45.63	-60.25	-20

Sum

Channel	Data Rate	Carrier Level (dBm)	Combined Peak (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	18.43	-42.04	-60.48	-20
64	MCS0	16.76	-40.36	-57.13	-20
140	MCS0	17.14	-42.71	-59.85	-20
149	MCS0	18.00	-42.43	-60.42	-20

See figures 8-115 to 8-130 for the plots of the spurious RF conducted emissions for Channel 36, 64, 140 and 149 at MCS0 Mbps each for 802.11ac mode.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-115: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 36, MCS0 Mbps

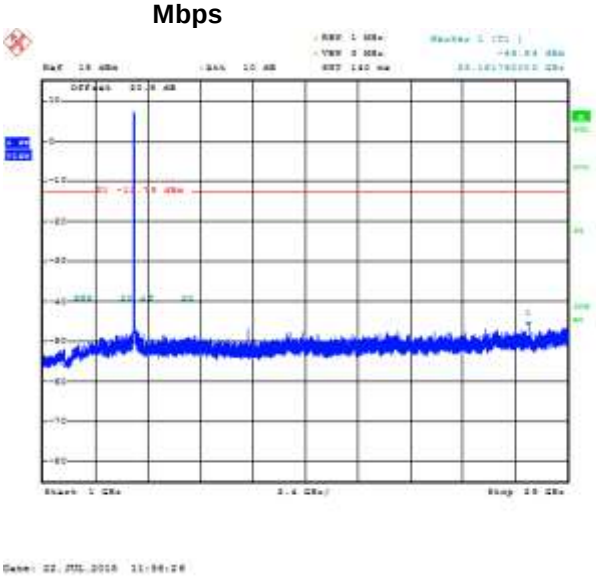


Figure 8-116: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 36, MCS0 Mbps

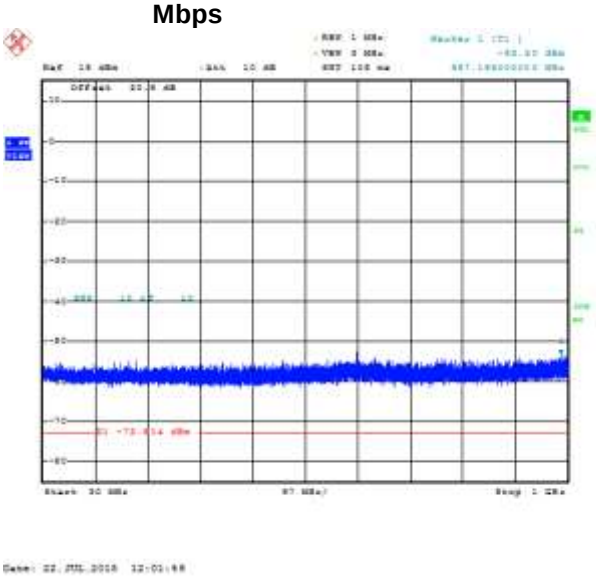


Figure 8-117: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 64, MCS0 Mbps

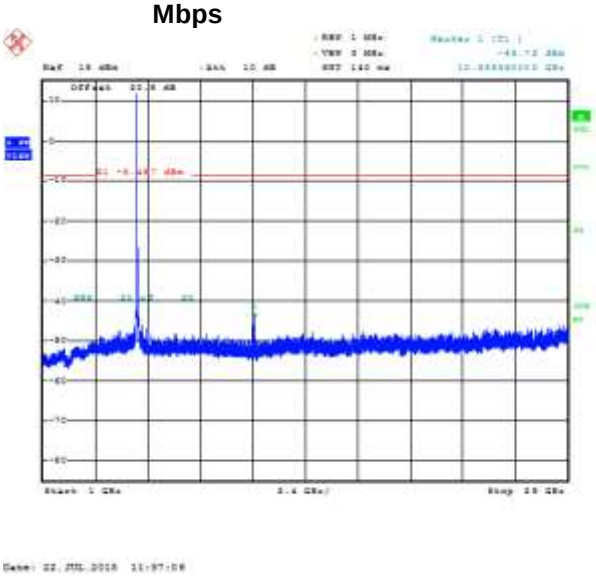
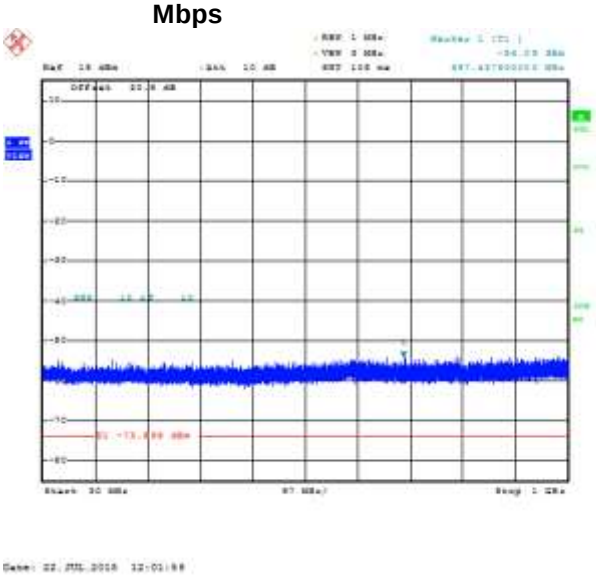


Figure 8-118: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 64, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-119: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 140, MCS0 Mbps

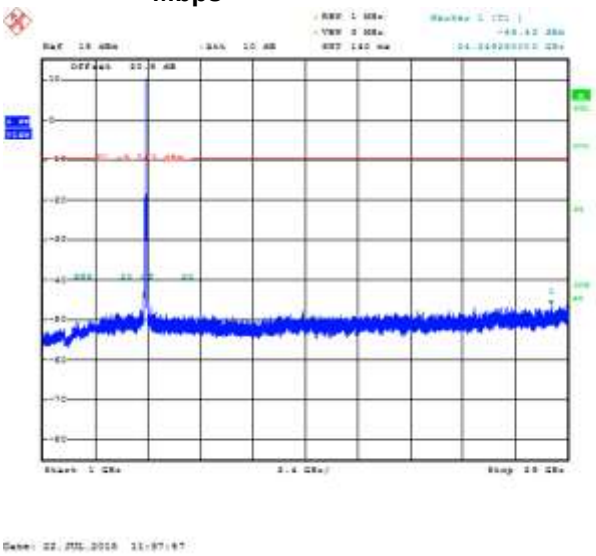


Figure 8-120: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 140, MCS0 Mbps

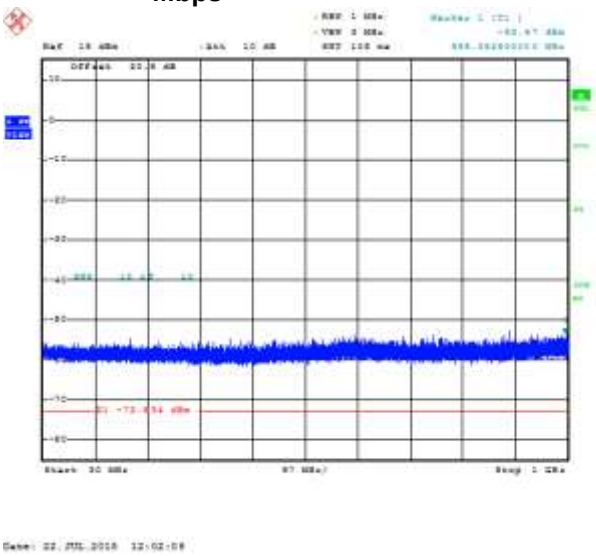


Figure 8-121: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 149, MCS0 Mbps

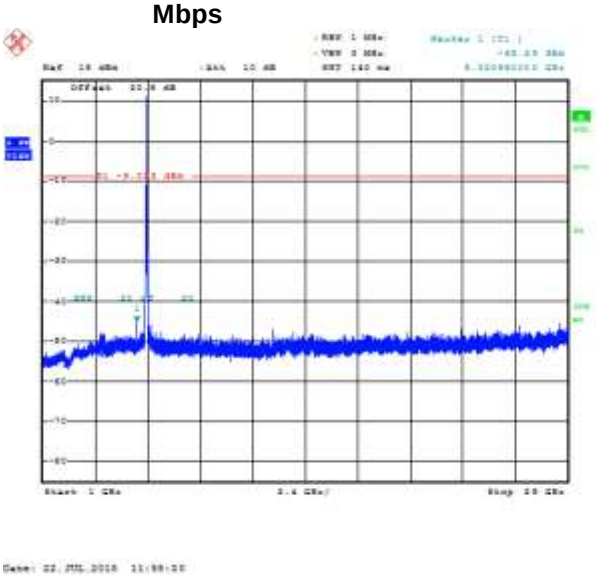
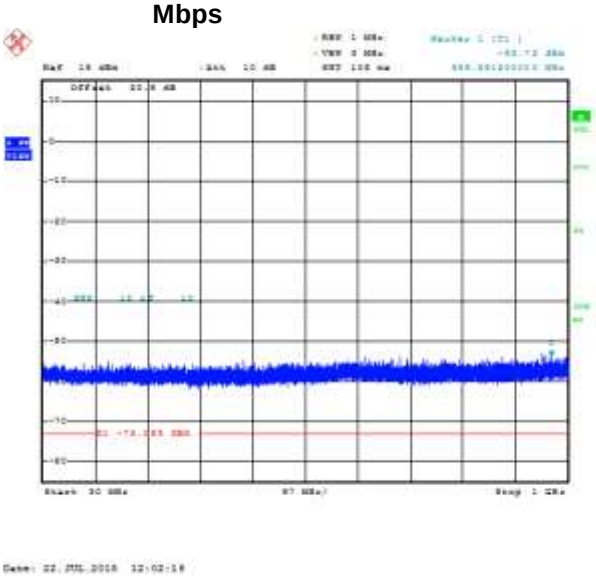


Figure 8-122: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-123: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 36, MCS0 Mbps

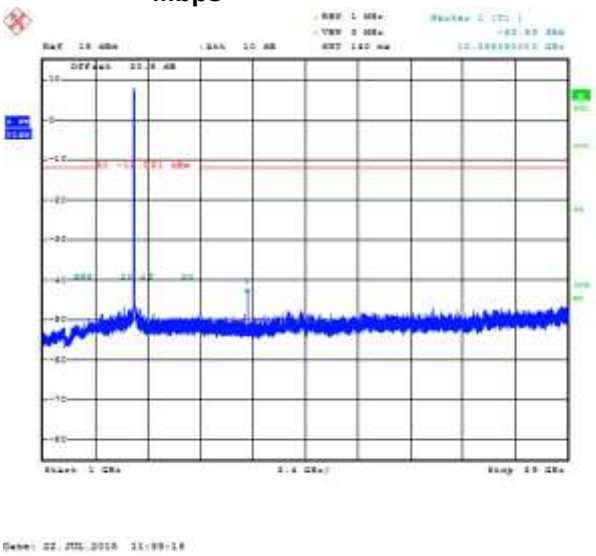


Figure 8-124: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 36, MCS0 Mbps

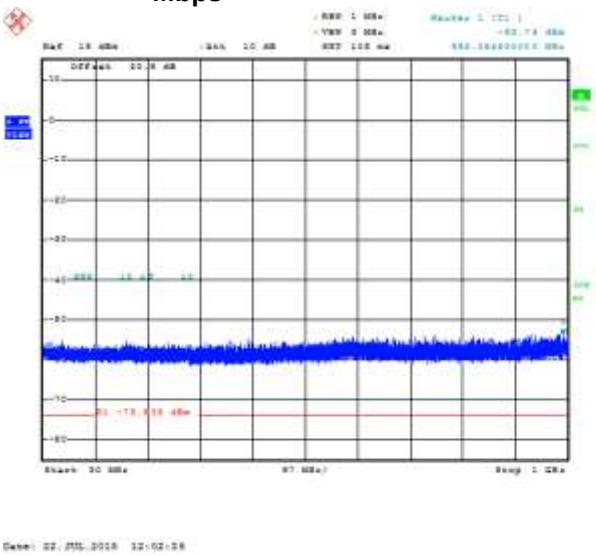


Figure 8-125: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 64, MCS0 Mbps

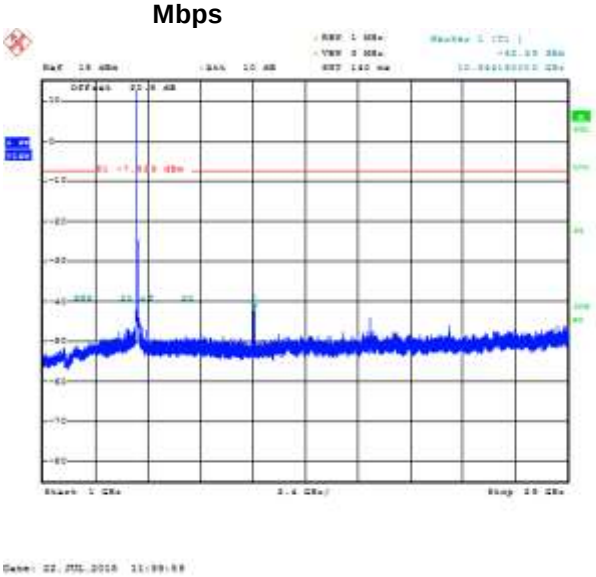
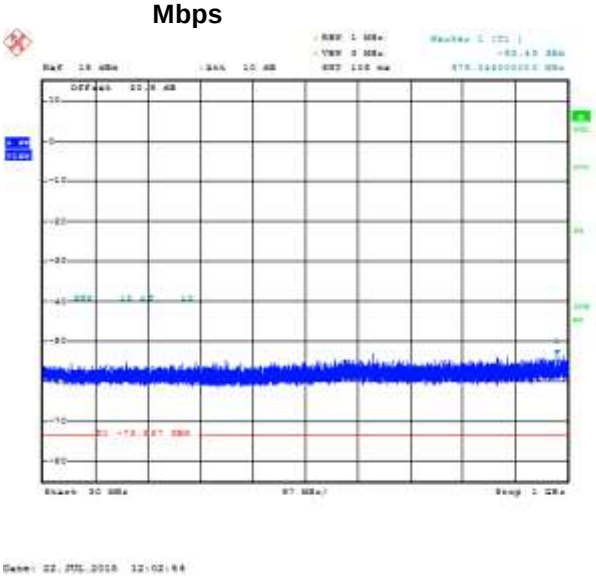


Figure 8-126: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 64, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-127: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 140, MCS0 Mbps

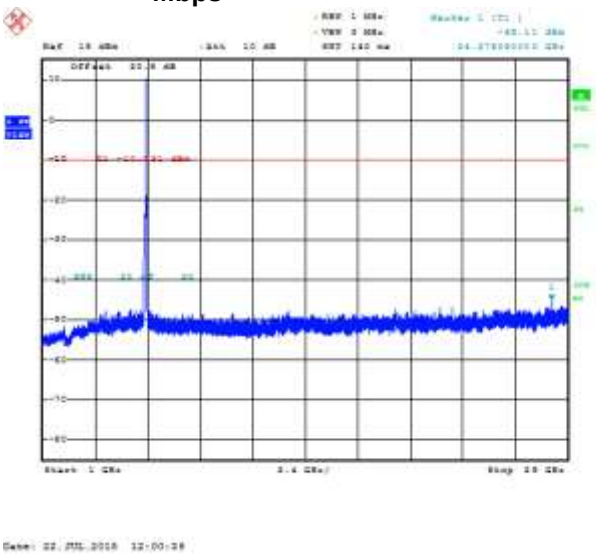


Figure 8-128: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 140, MCS0 Mbps

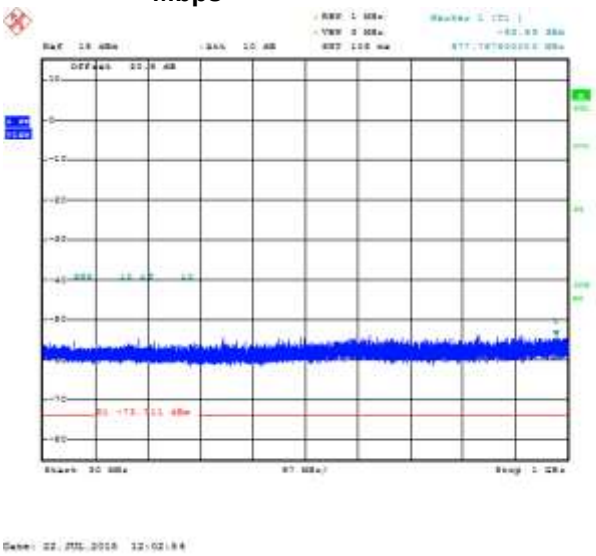


Figure 8-129: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 149, MCS0 Mbps

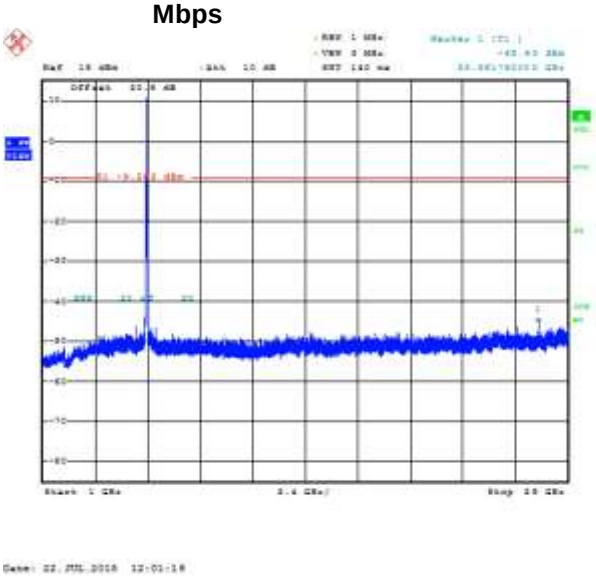
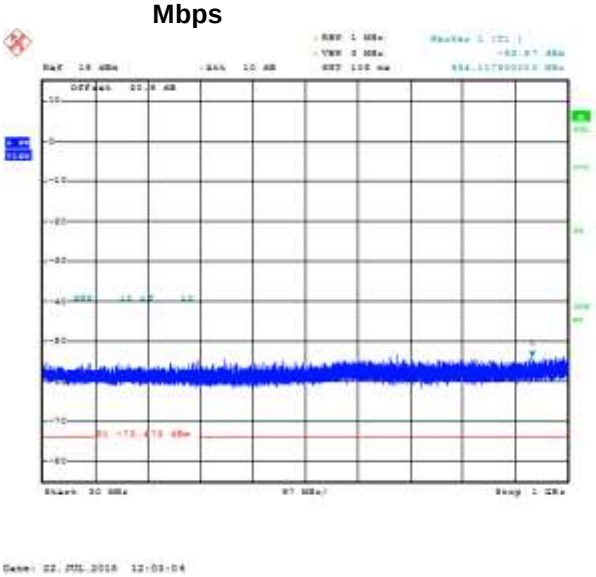


Figure 8-130: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Channels 36, 64, 140 and 149 were measured at MCS0 Mbps each for 802.11ac mode, 40MHz bandwidth. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 29.0 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

40 MHz Bandwidth

Primary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	12.18	-44.45	-56.63	-20
64	MCS0	10.81	-45.43	-56.24	-20
140	MCS0	14.68	-46.18	-60.86	-20
149	MCS0	13.24	-45.22	-58.46	-20

Secondary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	14.65	-42.28	-56.93	-20
64	MCS0	10.81	-44.25	-55.06	-20
140	MCS0	14.21	-45.91	-60.12	-20
149	MCS0	13.11	-46.64	-59.75	-20

Sum

Channel	Data Rate	Carrier Level (dBm)	Combined Peak (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	14.20	-40.22	-54.42	-20
64	MCS0	13.83	-41.79	-55.62	-20
140	MCS0	17.75	-43.03	-60.78	-20
149	MCS0	16.29	-42.86	-59.16	-20

See figures 8-131 to 8-146 for the plots of the spurious RF conducted emissions for Channel 36, 64, 140 and 149 at MCS0 Mbps each for 802.11ac mode, bandwidth 40MHz.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-131: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 36, MCS0 Mbps

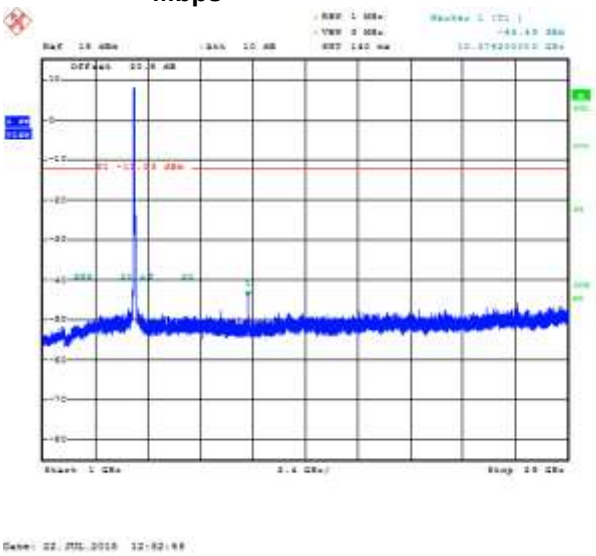


Figure 8-132: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 36, MCS0 Mbps

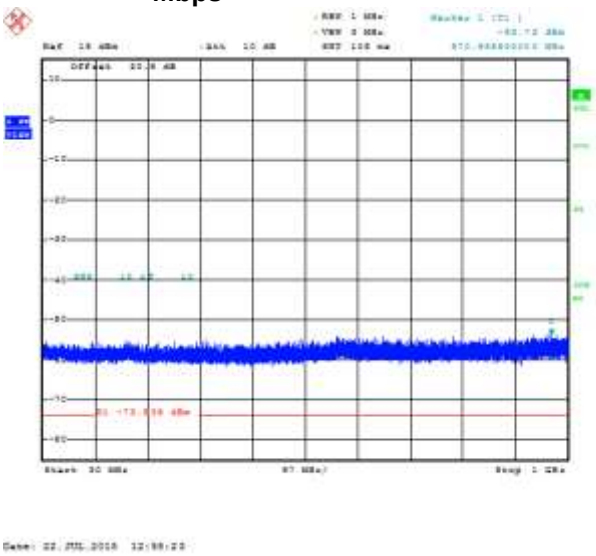


Figure 8-133: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 64, MCS0 Mbps

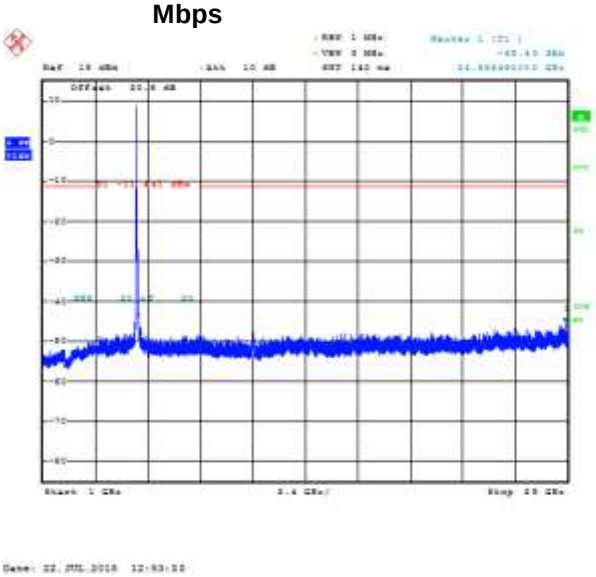
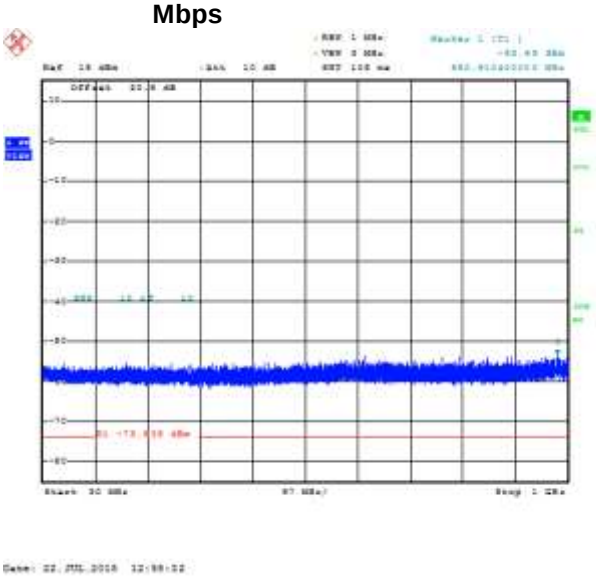


Figure 8-134: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 64, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-135: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 140, MCS0 Mbps

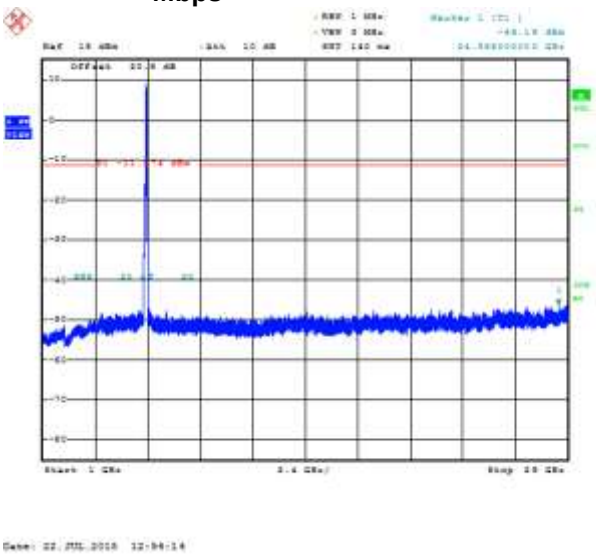


Figure 8-136: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 140, MCS0 Mbps

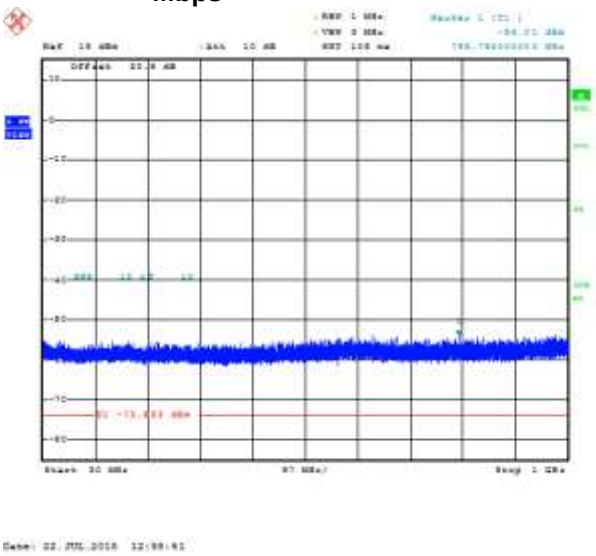


Figure 8-137: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 149, MCS0 Mbps

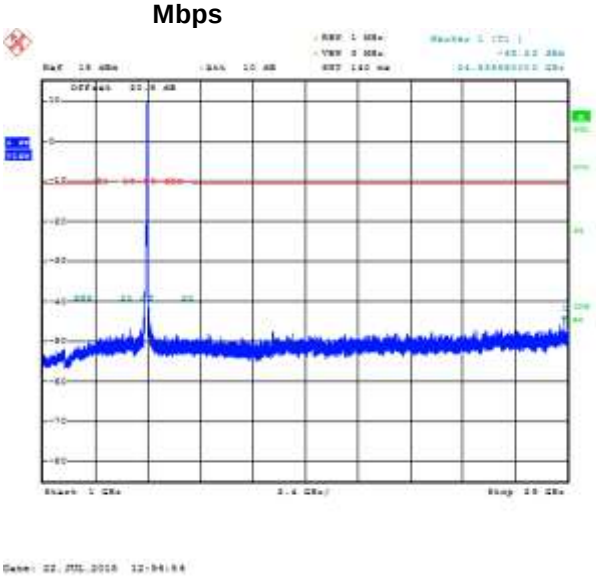
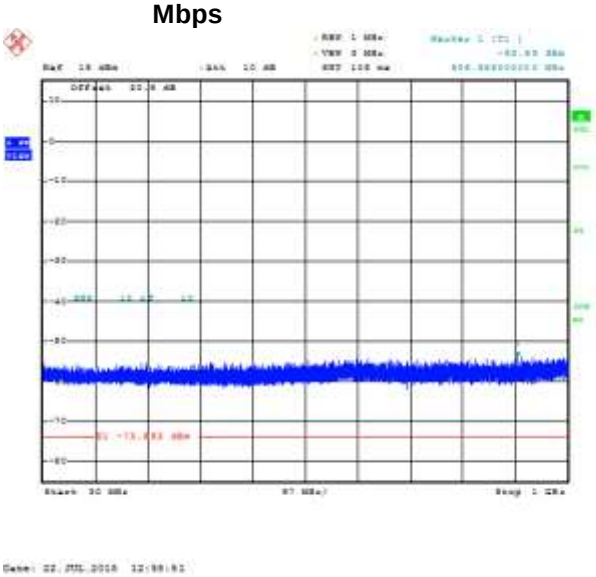


Figure 8-138: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-139: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 36, MCS0 Mbps

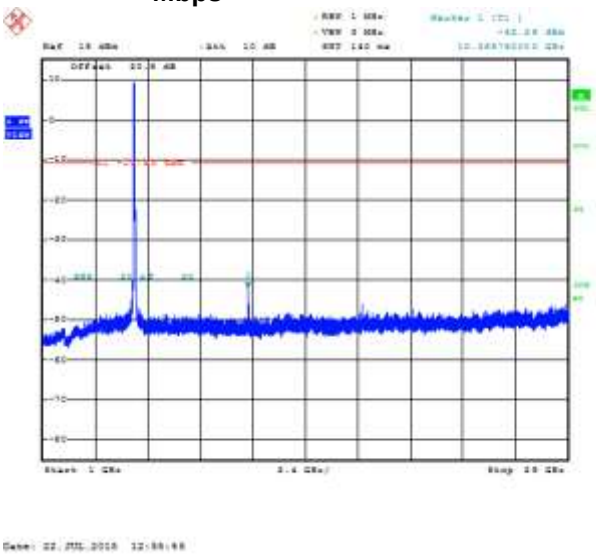


Figure 8-140: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 36, MCS0 Mbps

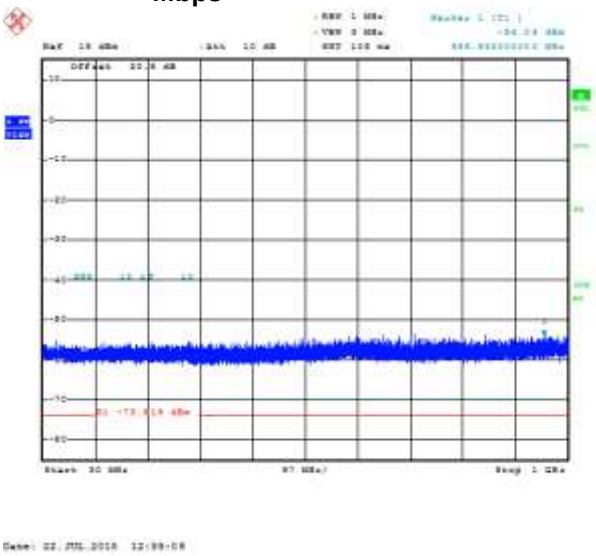


Figure 8-141: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 60, MCS0 Mbps

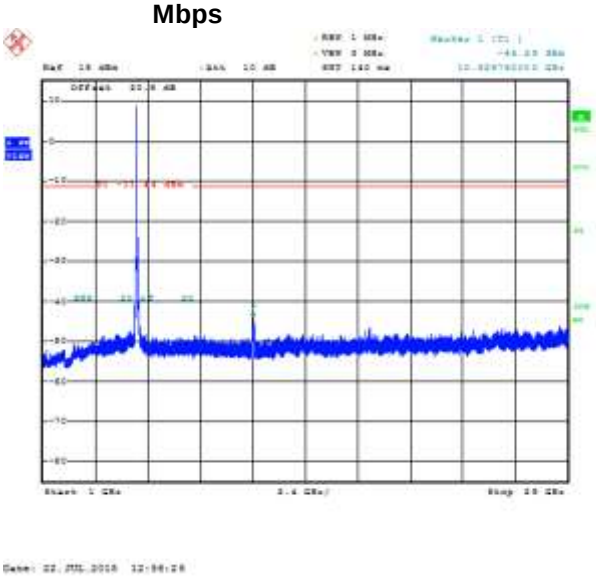
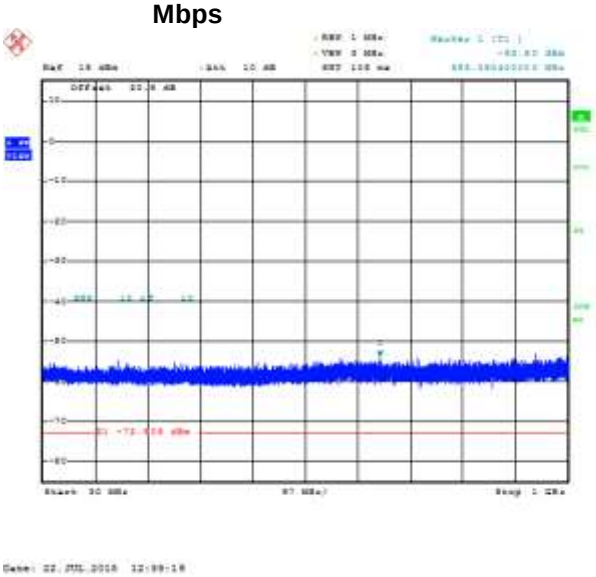


Figure 8-142: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 60, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-143: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 140, MCS0 Mbps

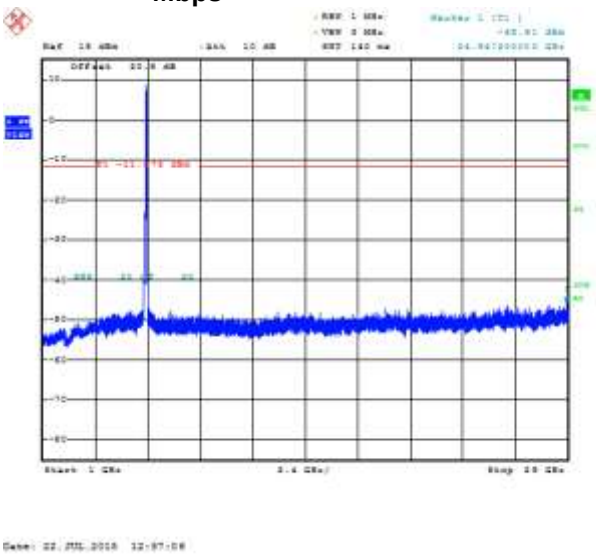


Figure 8-144: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 140, MCS0 Mbps

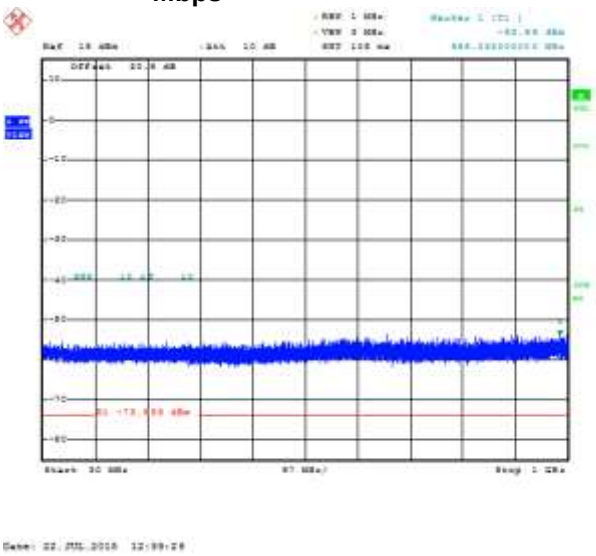


Figure 8-145: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 149, MCS0 Mbps

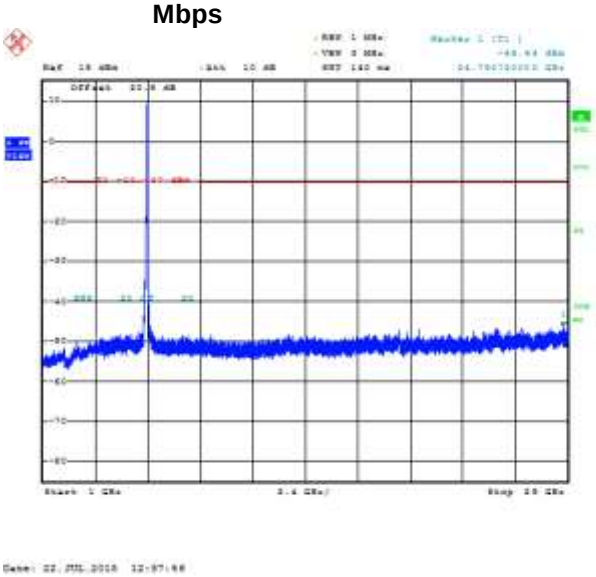
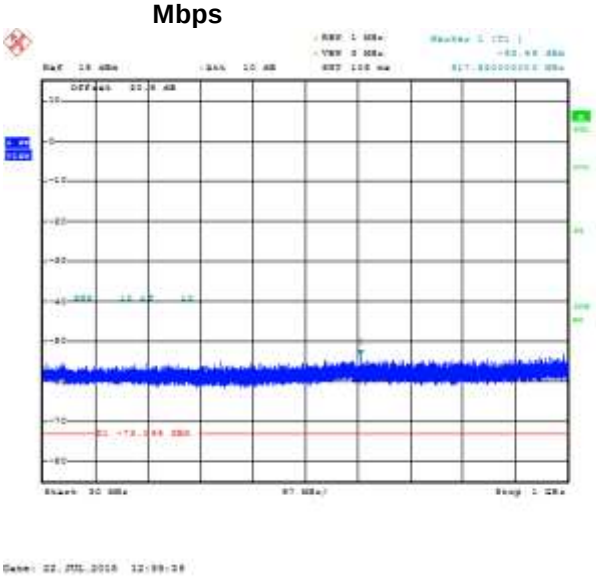


Figure 8-146: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Channels 36, 64, 140 and 149 were measured at MCS0 Mbps each for 802.11ac mode, 80MHz bandwidth. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 29.0 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

80 MHz Bandwidth

Primary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	13.14	-45.79	-58.93	-20
64	MCS0	13.07	-46.23	-59.30	-20
140	MCS0	12.63	-46.57	-59.20	-20
149	MCS0	12.94	-46.23	-59.17	-20

Secondary Antenna

Channel	Data Rate	Carrier Level (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	13.69	-45.97	-59.66	-20
64	MCS0	12.30	-45.57	-57.87	-20
140	MCS0	11.32	-46.26	-57.58	-20
149	MCS0	12.19	-46.37	-58.56	-20

Sum

Channel	Data Rate	Carrier Level (dBm)	Combined Peak (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
36	MCS0	16.92	-42.87	-59.78	-20
64	MCS0	13.76	-42.88	-56.63	-20
140	MCS0	15.68	-43.40	-59.08	-20
149	MCS0	15.64	-43.29	-58.93	-20

See figures 8-147 to 8-162 for the plots of the spurious RF conducted emissions for Channel 36, 64, 140 and 149 at MCS0 Mbps each for 802.11ac mode, bandwidth 80MHz.

802.11ac RF Conducted Emission Test Results cont'd

Figure 8-147: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 36, MCS0 Mbps

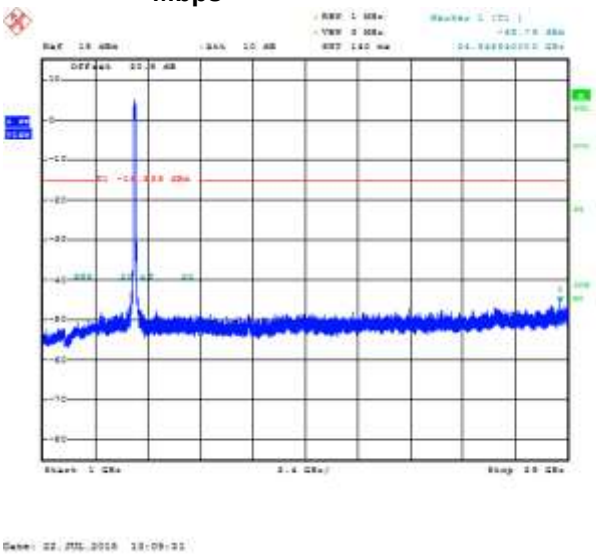


Figure 8-148: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 36, MCS0 Mbps

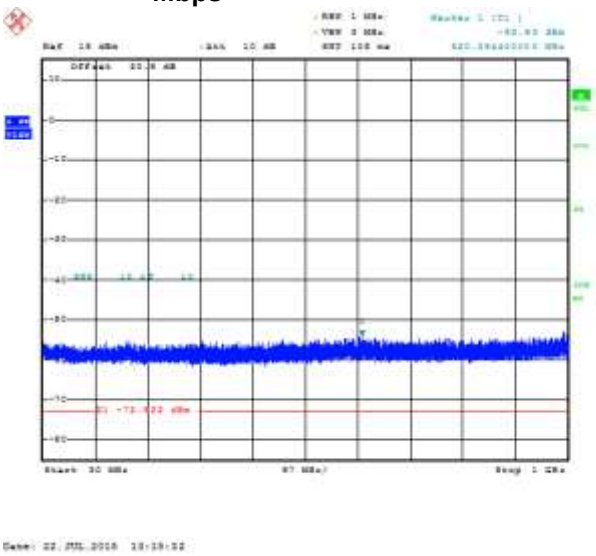


Figure 8-149: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 64, MCS0 Mbps

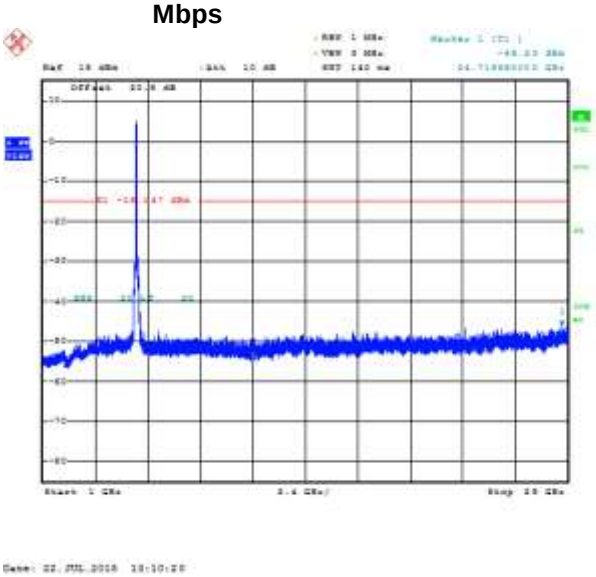
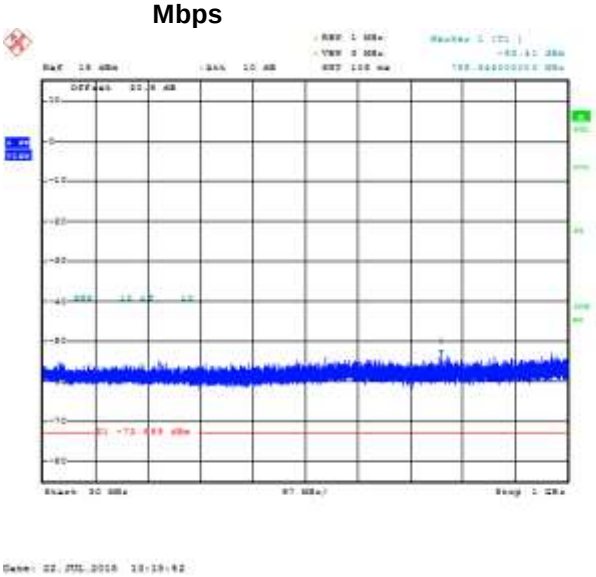


Figure 8-150: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 64, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-151: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 140, MCS0 Mbps

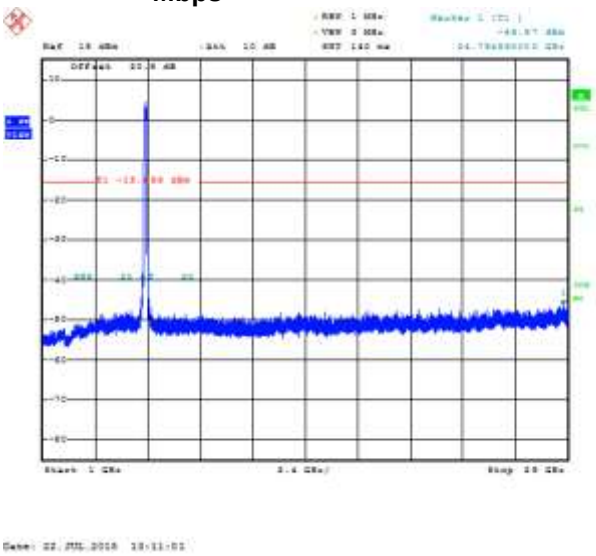


Figure 8-152: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 140, MCS0 Mbps

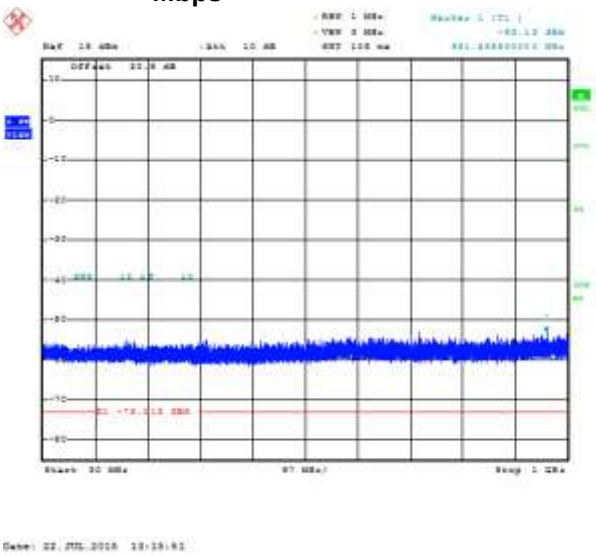


Figure 8-153 Spurious RF Conducted Emissions Primary, 802.11ac, Channel 149, MCS0 Mbps

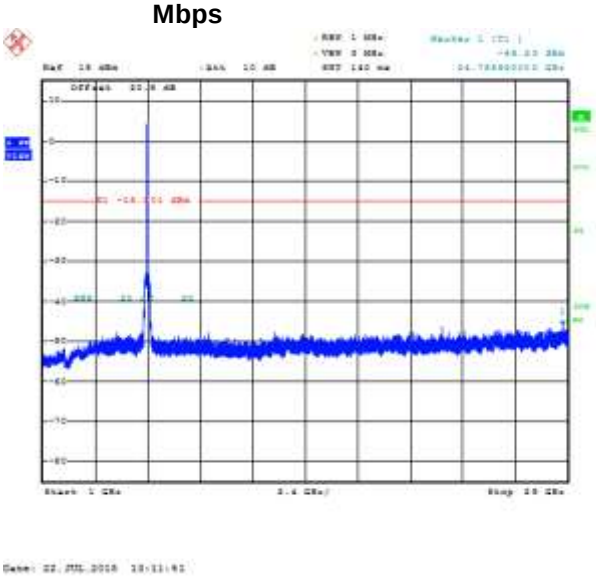
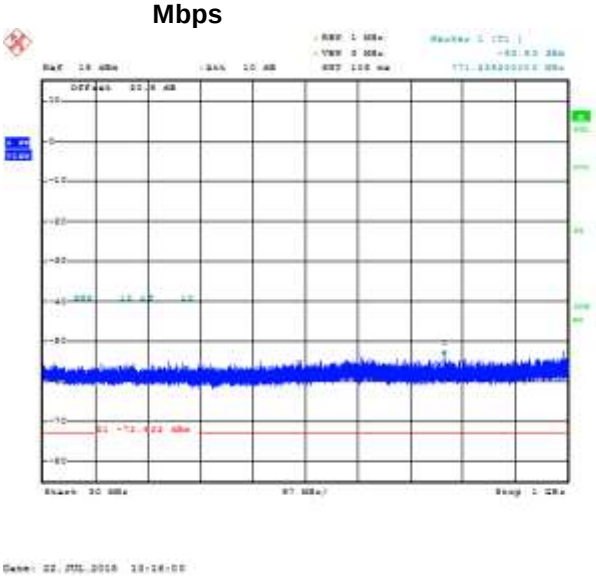


Figure 8-154: Spurious RF Conducted Emissions Primary, 802.11ac, Channel 149, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-155: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 36, MCS0 Mbps

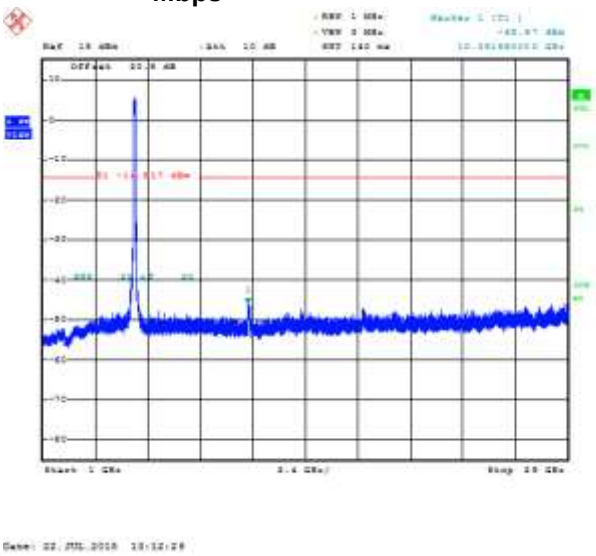


Figure 8-156: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 36, MCS0 Mbps

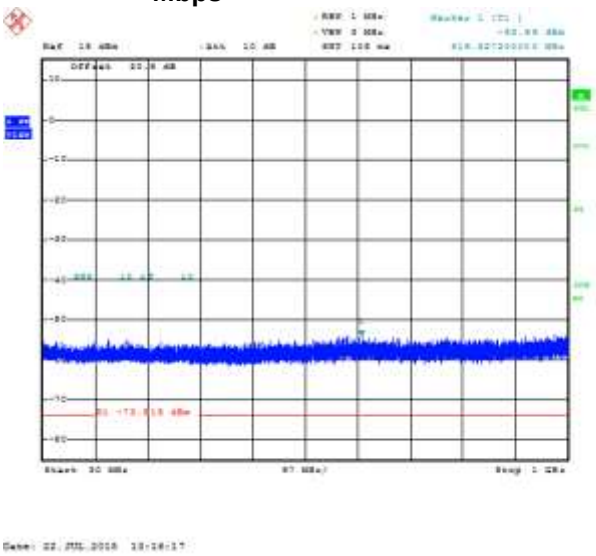


Figure 8-157: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 64, MCS0 Mbps

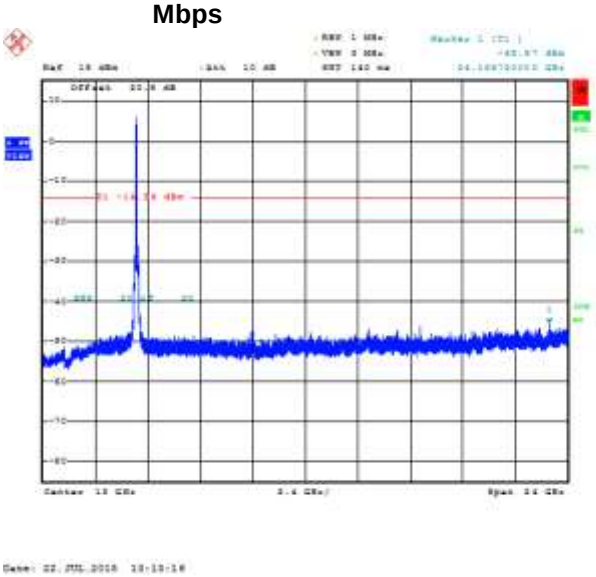
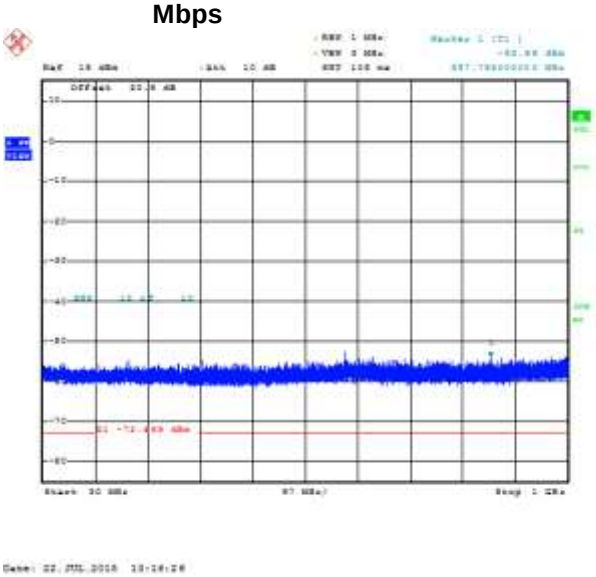


Figure 8-158: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 64, MCS0 Mbps



802.11ac RF Conducted Emission Test Results cont'd

Figure 8-159: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 140, MCS0 Mbps

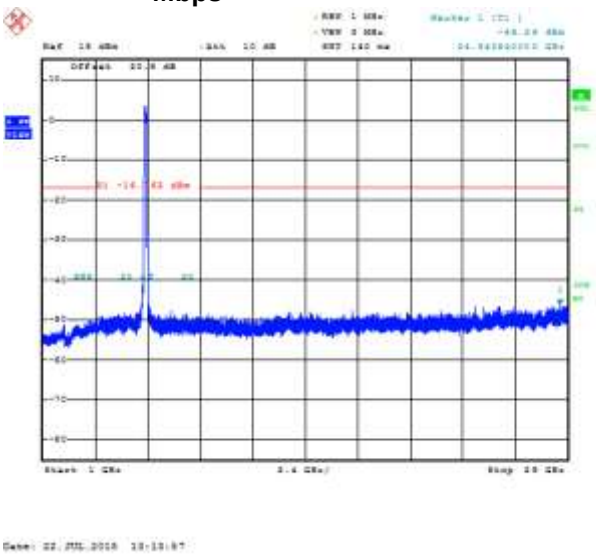


Figure 8-160: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 140, MCS0 Mbps

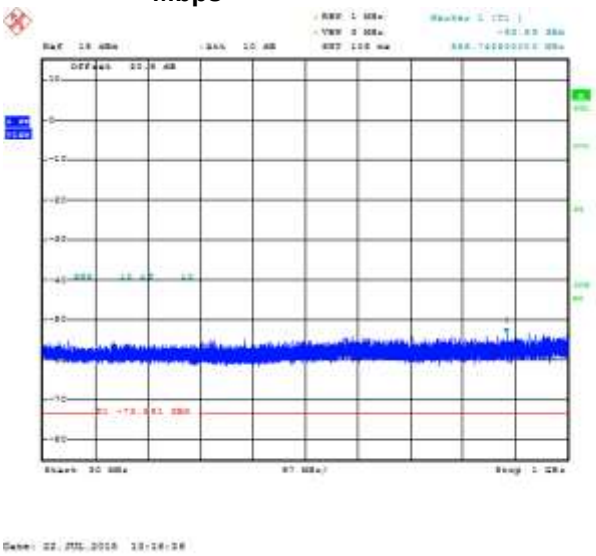


Figure 8-161: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 149, MCS0 Mbps

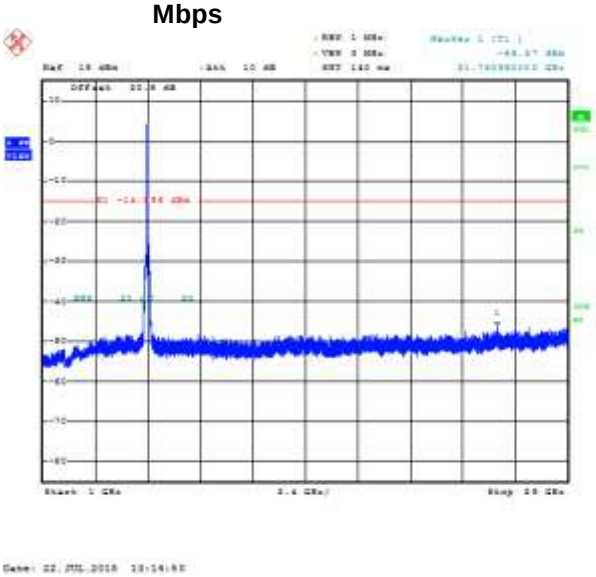
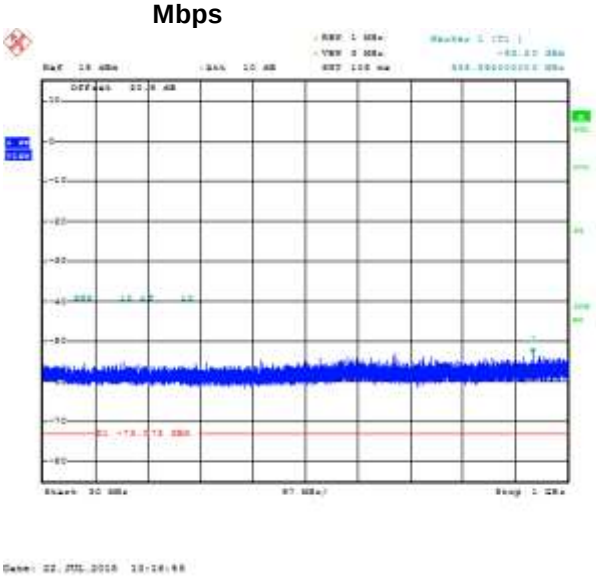


Figure 8-162: Spurious RF Conducted Emissions Secondary, 802.11ac, Channel 149, MCS0 Mbps



APPENDIX 9 – NEAR FIELD COMMUNICATIONS TEST DATA/PLOTS

Near Field Communications (NFC) Test Results

Radiated Emissions

Date of Test: August 24, 2015

Measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 26.2 ºC
Relative Humidity: 31.5 %

The test distance was 3.0 meters with a EUT height of 1.5 meters, and sweep frequency of 9 kHz to 1 GHz.

The BlackBerry® smartphone was in vertical position.

The frequency sweep measurements were performed in Near Field Communications Tx mode at 13.56 MHz

Frequency (MHz)	Reading (QP) (dBµV/m)	Correction Factor (dB)	Corrected Reading (QP) (dBµV/m)	Limit (dBµV/m)	Test Margin (dB)
13.57	56.00	16.67	56	124.00	-68

All other emissions had a test margin of greater than 25.0 dB

Near Field Communications (NFC) Test Results

Occupied Bandwidth

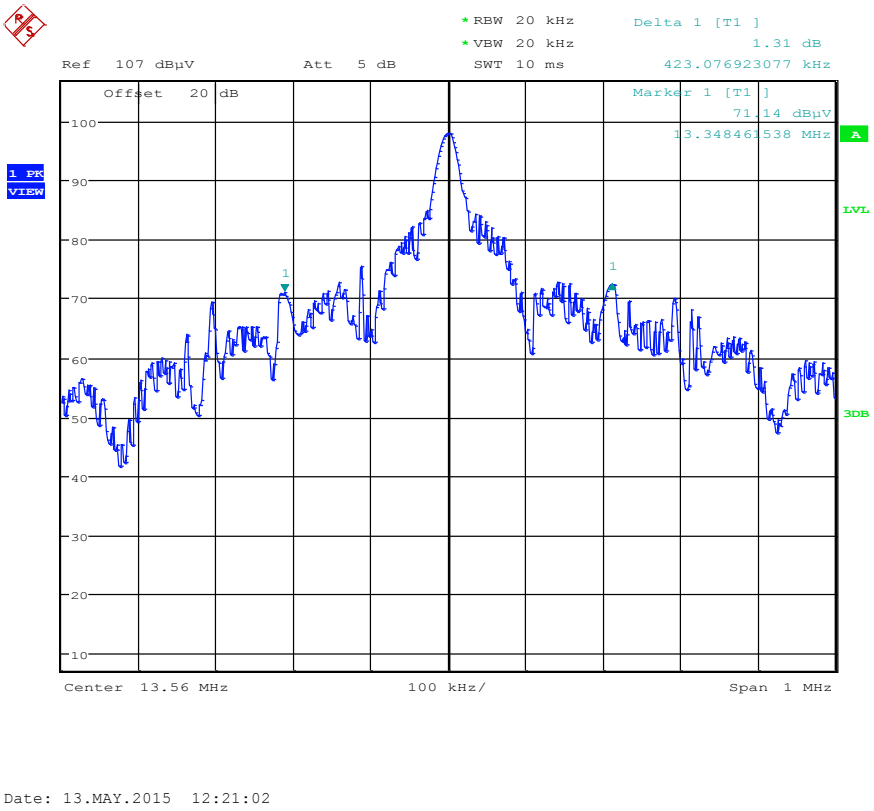
Date of test: September 2, 2015
The measurements were performed by Kevin Guo.

The environmental test conditions were:

Temperature:	25.2 ºC
Relative Humidity:	41.5 %

Operation mode (TX ON)	Occupied Bandwidth (kHz)
NFC, modulated	491.99

Figure 9-1: Occupied Bandwidth, NFC TX Frequency = 13.56 MHz



Near Field Communications (NFC) Test Results cont'd

Frequency Stability

The measurements were performed by Kevin Guo.

The environmental test conditions were: Temperature: 25.2 ºC
Relative Humidity: 41.5 %

Test Temperature (Celsius)	Nominal Freq. (MHz)	Measured Freq. (MHz)	Input Voltage (Volts)	Max Freq Error (Hz)	% Deviation (Limit .01%)	PPM
-20	13.56	13.560005	3.6	0.000005	50	0.00004
-20	13.56	13.559993	3.8	-0.000007	-70	-0.00005
-20	13.56	13.560003	4.35	0.000003	30	0.00002
-10	13.56	13.559950	3.6	-0.000050	-499	-0.00037
-10	13.56	13.559974	3.8	-0.000027	-265	-0.00020
-10	13.56	13.559969	4.35	-0.000031	-310	-0.00023
0	13.56	13.559961	3.6	-0.000039	-390	-0.00029
0	13.56	13.559989	3.8	-0.000011	-110	-0.00008
0	13.56	13.560030	4.35	0.000030	300	0.00022
10	13.56	13.559974	3.6	-0.000026	-257	-0.00019
10	13.56	13.559977	3.8	-0.000023	-231	-0.00017
10	13.56	13.559973	4.35	-0.000027	-274	-0.00020
20	13.56	13.560022	3.6	0.000022	220	0.00016
20	13.56	13.560022	3.8	0.000022	220	0.00016
20	13.56	13.560008	4.35	0.000008	80	0.00006

Near Field Communications (NFC) Test Results cont'd

Frequency Stability cont'd

Test Temperature (Celsius)	Nominal Freq. (MHz)	Measured Freq. (MHz)	Input Voltage (Volts)	Max Freq Error (Hz)	% Deviation (Limit .01%)	PPM
30	13.56	13.560000	3.6	0.000000	0	0.00000
30	13.56	13.560014	3.8	0.000014	140	0.00010
30	13.56	13.559949	4.35	-0.000051	-510	-0.00038
40	13.56	13.559963	3.6	-0.000037	-367	-0.00027
40	13.56	13.559965	3.8	-0.000035	-351	-0.00026
40	13.56	13.559921	4.35	-0.000079	-790	-0.00058
50	13.56	13.559952	3.6	-0.000048	-478	-0.00035
50	13.56	13.559953	3.8	-0.000047	-473	-0.00035
50	13.56	13.559967	4.35	-0.000033	-326	-0.00024
60	13.56	13.559954	3.6	-0.000046	-465	-0.00034
60	13.56	13.559960	3.8	-0.000040	-404	-0.00030
60	13.56	13.559963	4.35	-0.000037	-371	-0.00027