9.5 Maximum Conducted Output Power

9.5.1 Test Requirement:

FCC CFR 47 Rule Part 15.407 (a)

Industry Canada RSS-247 [6.2]

9.5.2 Test Method:

Measurements were performed according to the procedures defined in KDBs 789033- General UNII Test Procedures New Rules v01, 662911 D01 Multiple Transmitter Output v02r01, and ANSI C63.10 2013.

Spectrum Analyzer settings:

Average Power:

RBW= 1 MHz
VBW= 3 MHz
Detector = RMS
Trace Mode= Average over 100 traces
Sweep time= Auto
Sweep Point ≥ 2*Span/RBW
Span= large enough to encompass the 26-dB Emission Bandwidth or alternatively the 99% Occupied Bandwidth.
Use the band power measurement function to integrate the power over the 26-dB Emission Bandwidth or 99% Occupied Bandwidth.

9.5.3 Limits:

15.407: The maximum conducted output power shall not exceed the limits given the following table for antennas that do not exceed a directional gain > 6dBi:

Band of Operation (MHz)	15.407 Limit
5150 – 5250	24 dBm
5250 – 5350	24dBm or 11 dBm + 10 log (B)(1)
5470 – 5725	24dBm or 11 dBm + 10 log (B)(1)
5725 – 5825	30 dBm

Note(1): B is the 26-dB Emission bandwidth of signal.

RSS-247: The maximum conducted output power shall not exceed the limits given the following table:

Band of Operation (MHz)	RSS-247 Conducted Output Power Limit	RSS-247 E.I.R.P Limit
5150 – 5250	--	23 dBm or 10 + 10 log (B)(1)
5250 – 5350	24 dBm or 11 + 10 log (B)(1)	30 dBm or 17 + 10 log (B)(1)
5470 – 5725	24 dBm or 11 + 10 log (B)(1)	30 dBm or 17 + 10 log (B)(1)
5725 – 5825	30 dBm	--

Note(1): B is the 99% Occupied Bandwidth of the signal.

9.5.4 Test Results:

Pass

9.5.5 Test Data

9.5.5.1 802.11a Maximum Average Conducted Output Power

Channel No.	Frequency (MHz)	Conducted Power (dBm)	15.407 Limit (dBm)	RSS-247 Limit (dBm)	Result
36	5180	8.34	24	--	Pass
40	5200	8.11	24	--	Pass
48	5240	8.1	24	--	Pass
52	5260	8.01	23.2	23.2	Pass
60	5300	8.27	23.2	23.2	Pass
64	5320	8.15	23.2	23.2	Pass
100	5500	8.27	23.2	23.2	Pass
116	5580	8.02	23.2	23.2	Pass
140	5700	8.38	23.2	23.2	Pass
149	5745	8.29	30	30	Pass
152	5785	8.05	30	30	Pass
165	5825	8.11	30	30	Pass

Channel No.	Frequency (MHz)	Total Power Conducted (dBm)	Antenna Gain	E.I.R.P (dBm)	RSS-247 E.I.R.P Limit (dBm)	Result
36	5180	8.34	1.95	10.29	22.2	Pass
40	5200	8.11	1.95	10.06	22.2	Pass
48	5240	8.1	1.95	10.05	22.2	Pass
52	5260	8.01	1.6	9.61	29.2	Pass
60	5300	8.27	1.6	9.87	29.2	Pass
64	5320	8.15	1.6	9.75	29.2	Pass
100	5500	8.27	0.5	8.77	29.2	Pass
116	5580	8.02	0.5	8.52	29.2	Pass
140	5700	8.38	0.5	8.88	29.2	Pass
149	5745	8.29	1.8	10.09	--	Pass
152	5785	8.05	1.8	9.85	--	Pass
165	5825	8.11	1.8	9.91	--	Pass

Figure 9-59. Maximum Conducted Output Power 802.11a (Ch. 36)

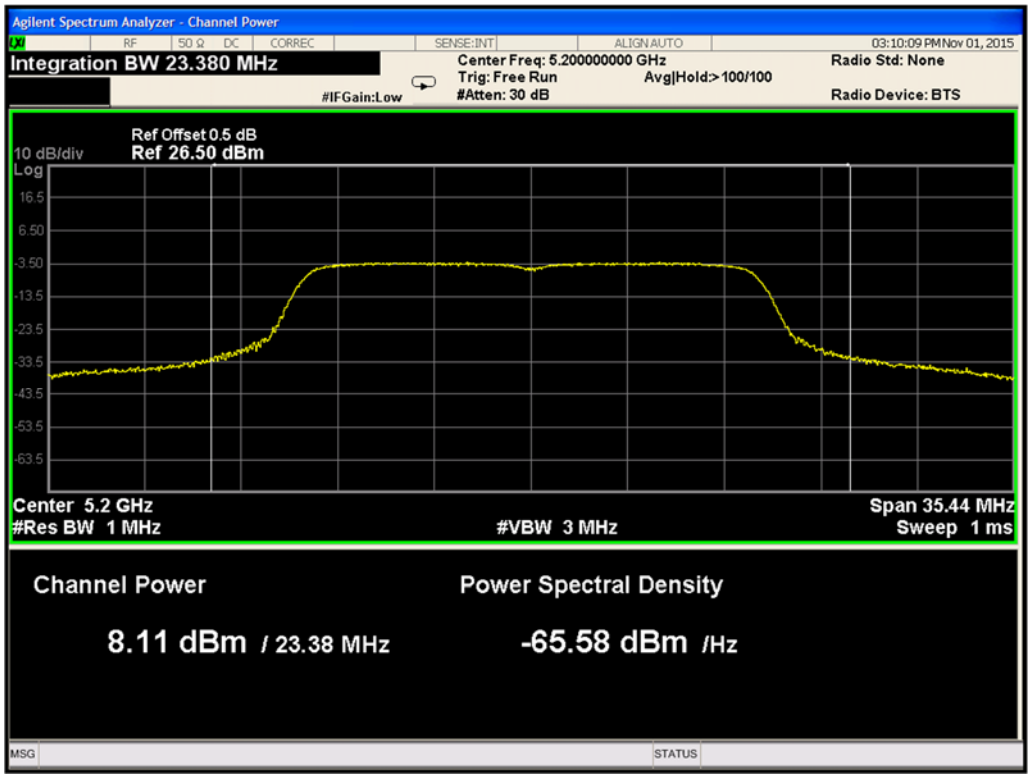

Figure 9-60. Maximum Conducted Output Power 802.11a (Ch. 40)

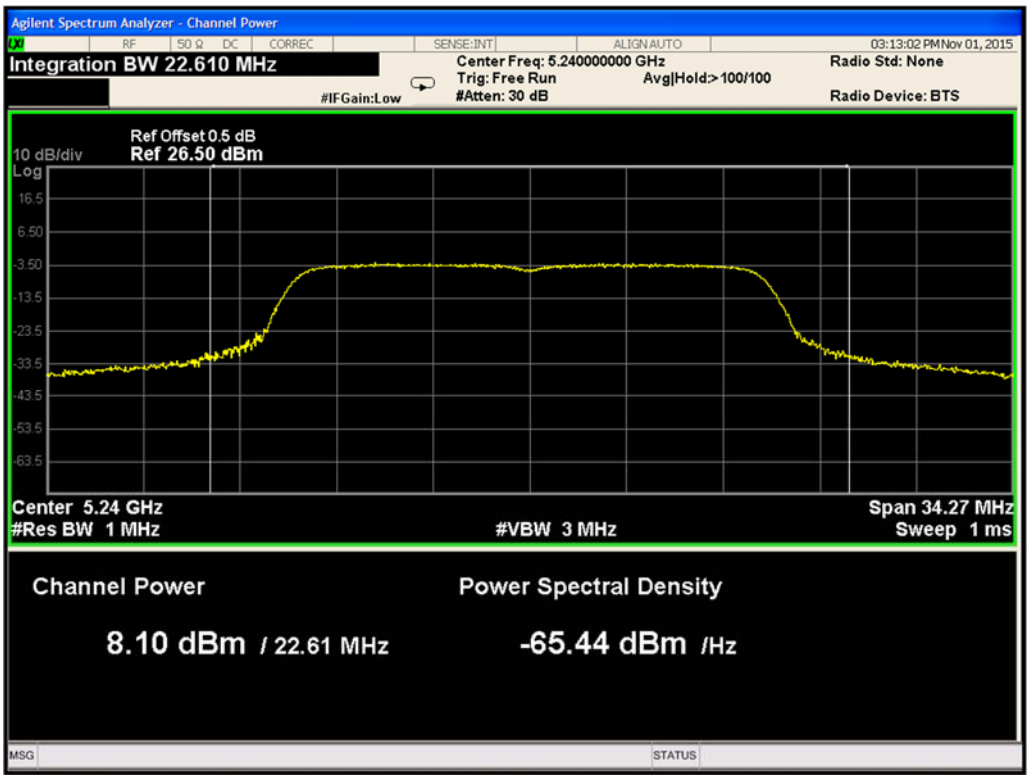

Figure 9-61. Maximum Conducted Output Power 802.11a (Ch. 48)

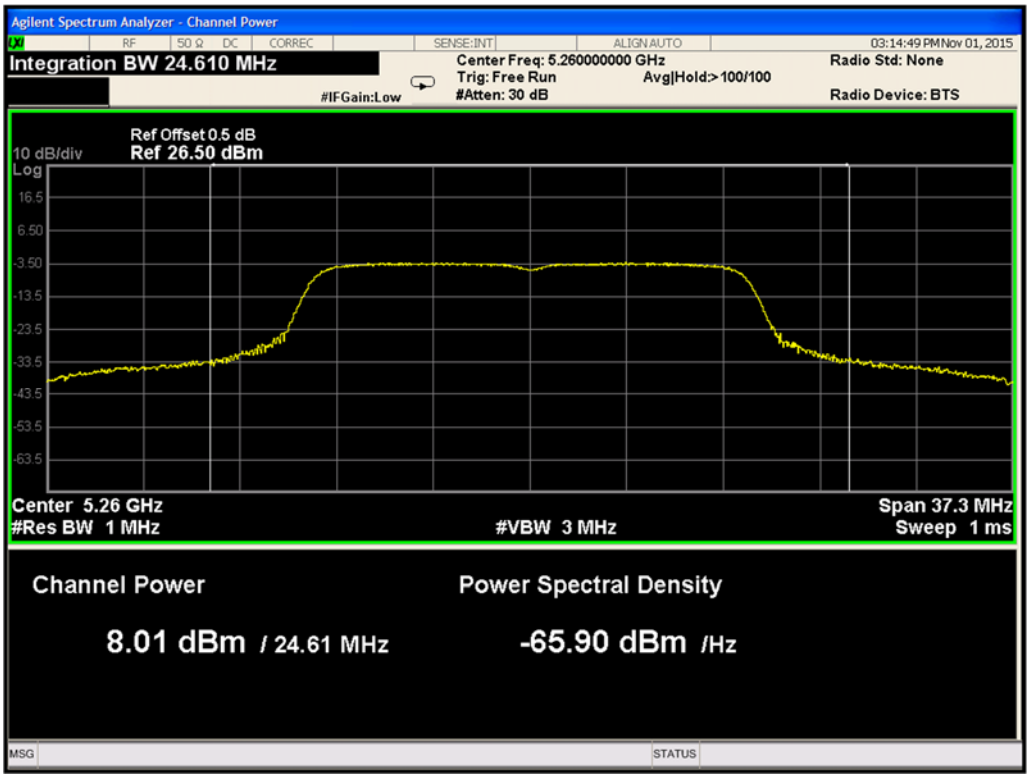

Figure 9-62. Maximum Conducted Output Power 802.11a (Ch. 52)

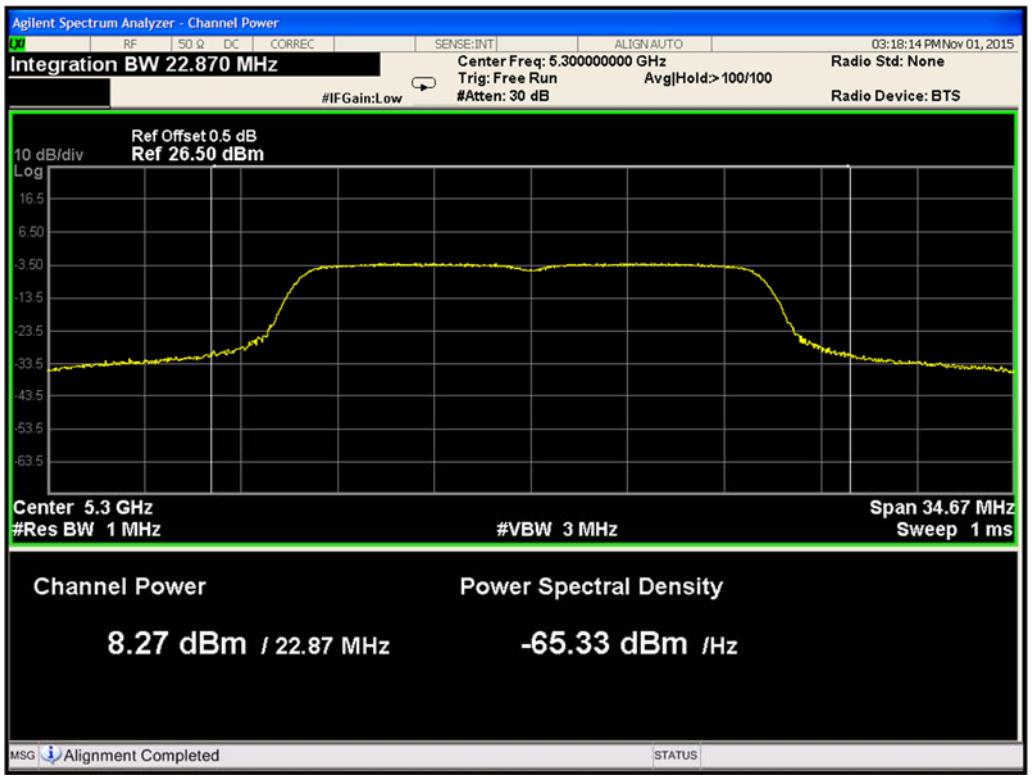

Figure 9-63. Maximum Conducted Output Power 802.11a (Ch. 60)

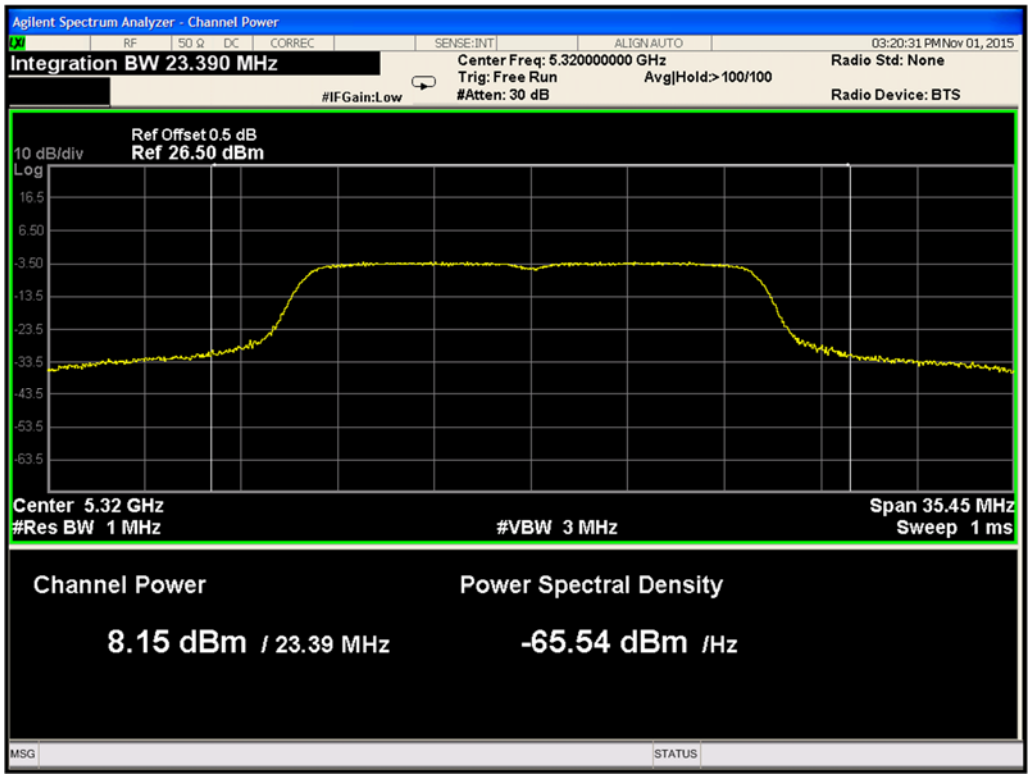

Figure 9-64. Maximum Conducted Output Power 802.11a (Ch. 64)

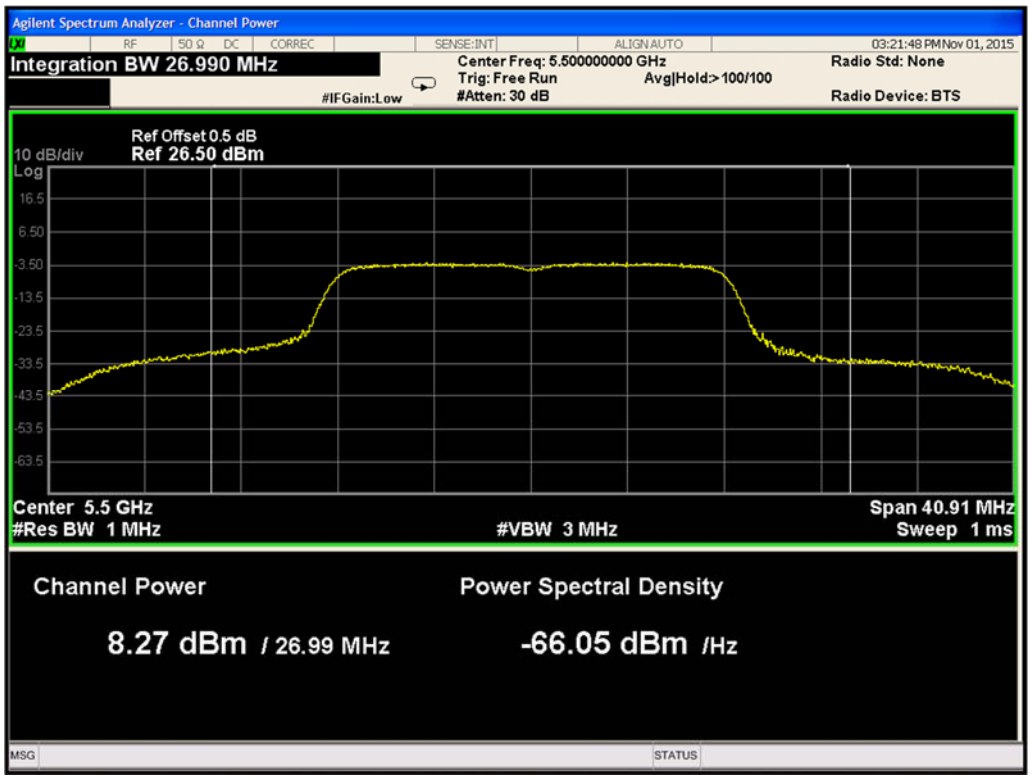

Figure 9-65. Maximum Conducted Output Power 802.11a (Ch. 100)

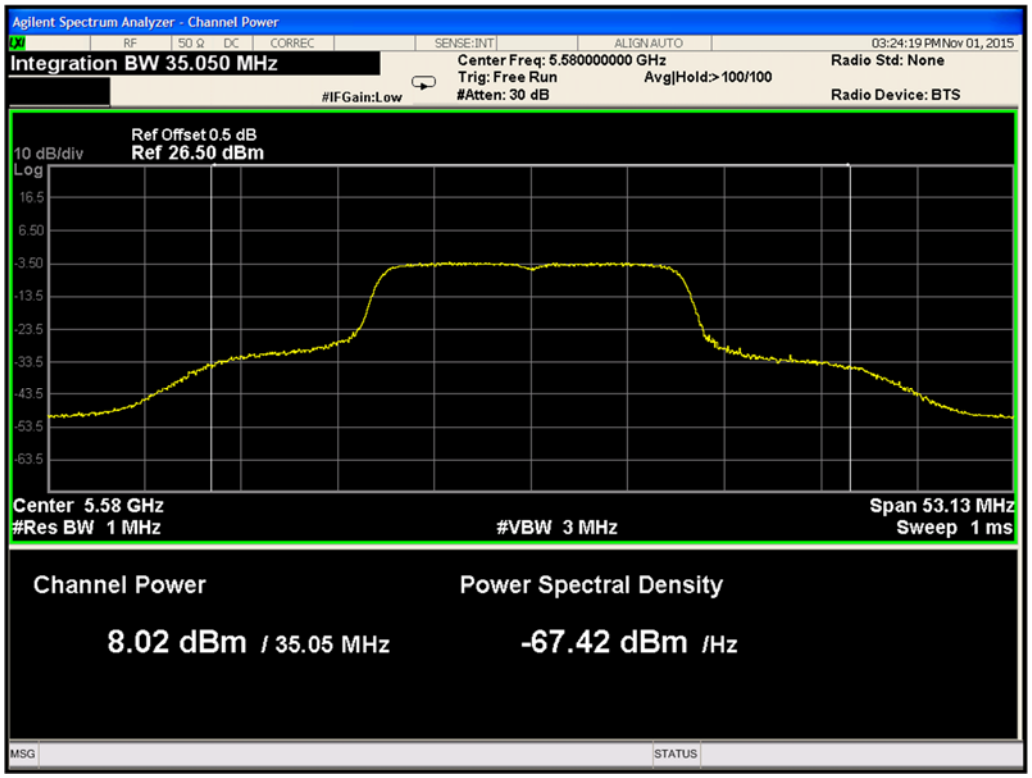

Figure 9-66. Maximum Conducted Output Power 802.11a (Ch. 116)

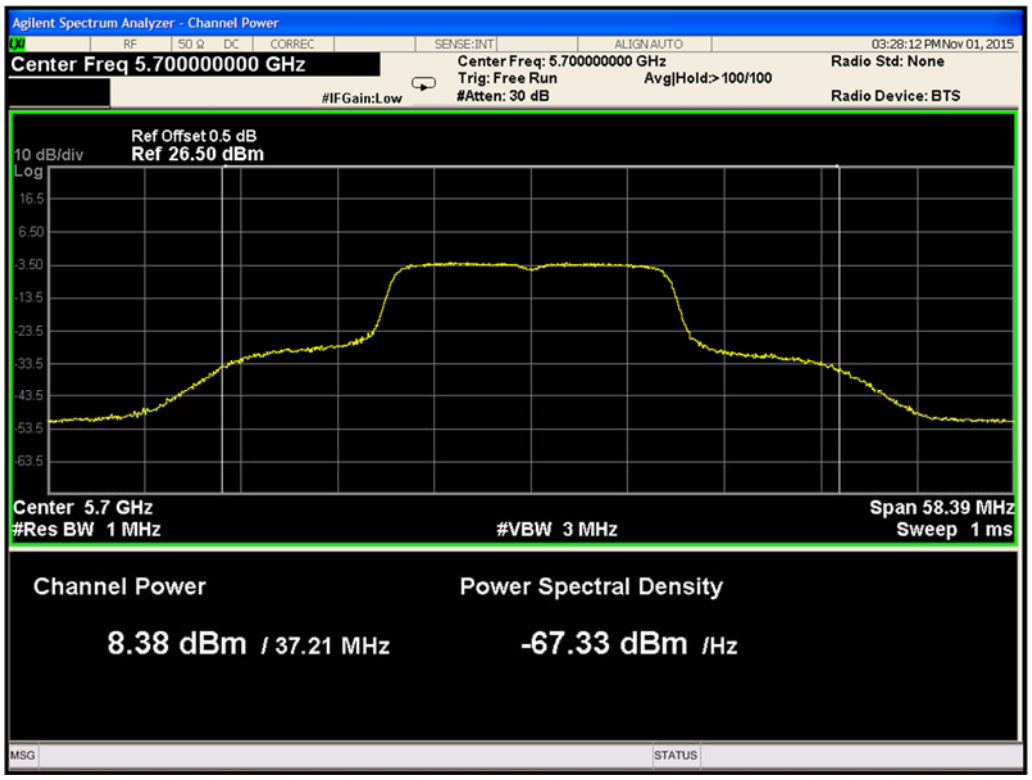

Figure 9-67. Maximum Conducted Output Power 802.11a (Ch. 140)

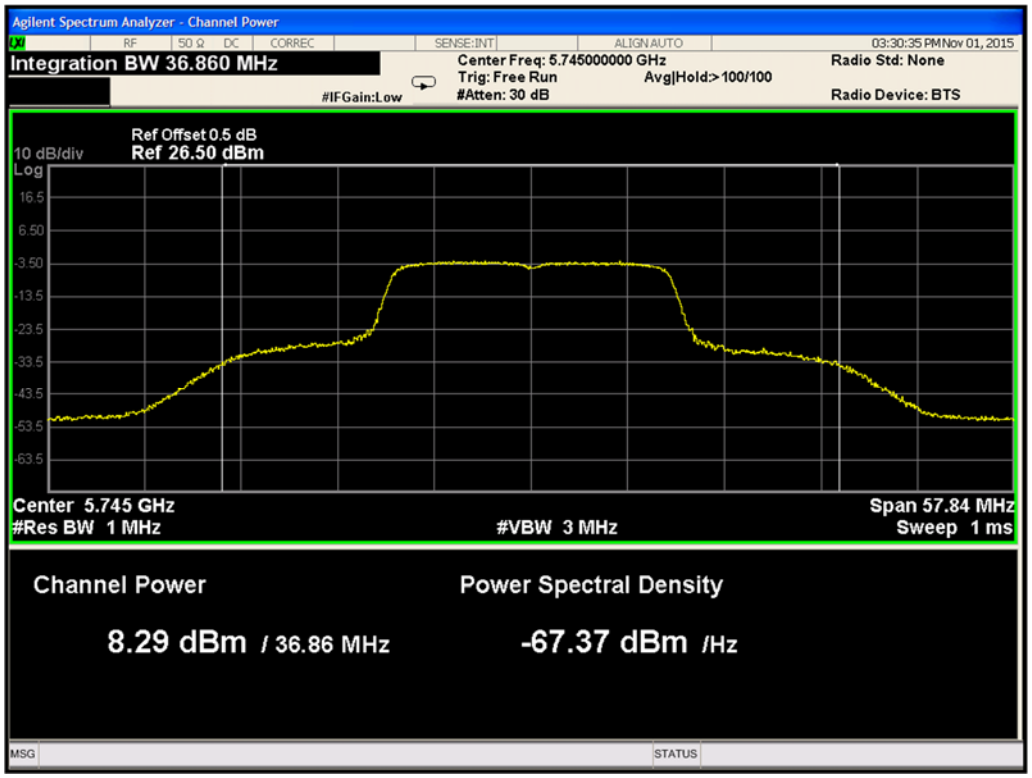

Figure 9-68. Maximum Conducted Output Power 802.11a (Ch. 149)

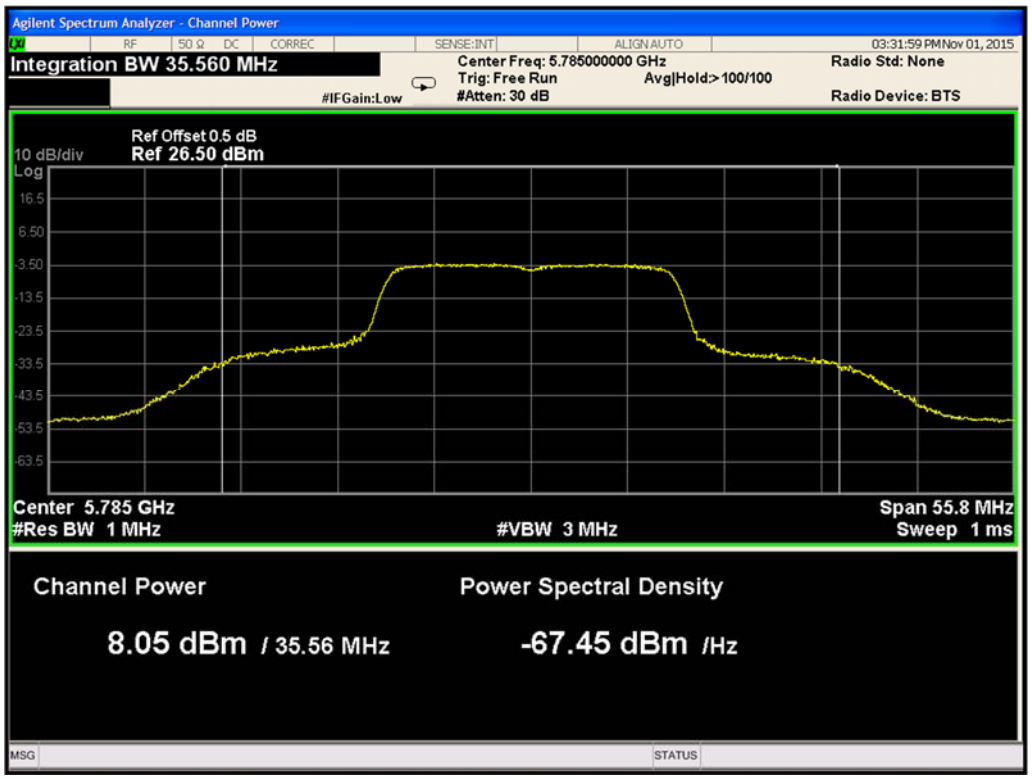

Figure 9-69. Maximum Conducted Output Power 802.11a (Ch. 157)

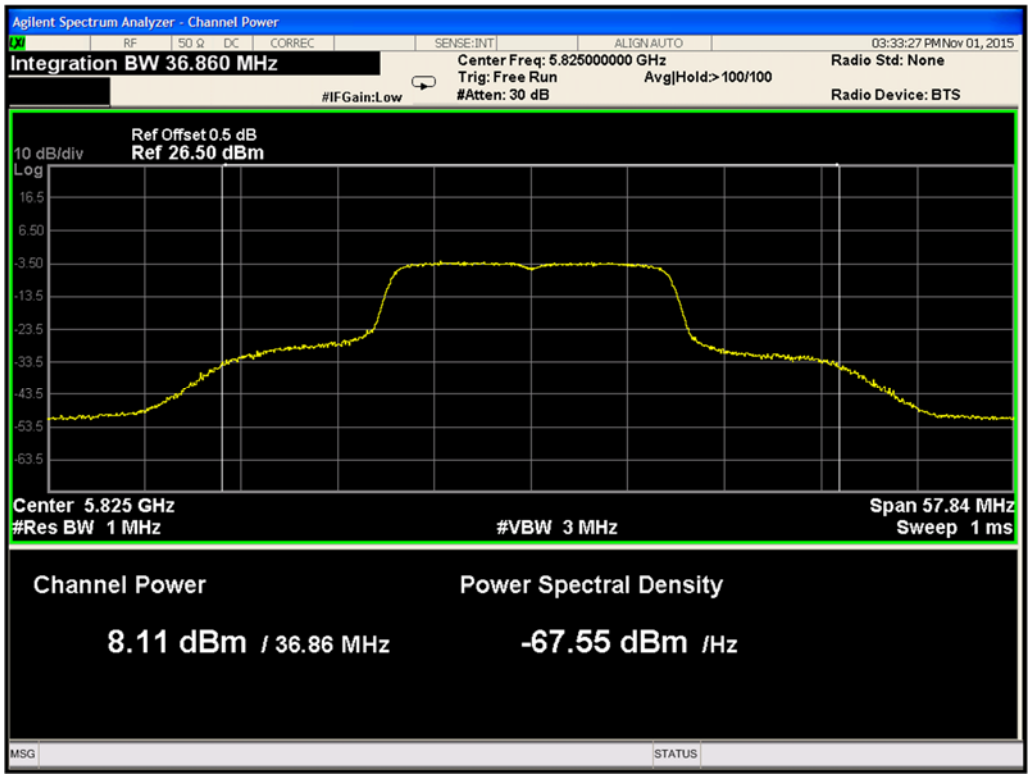

Figure 9-70. Maximum Conducted Output Power 802.11a (Ch. 165)

9.5.5.2 802.11n HT20 Maximum Conducted Output Power

Channel No.	Frequency (MHz)	Maximum Conducted Output Power (dBm)	15.407 Limit (dBm)	RSS-247 Limit (dBm)	Result
36	5180	8.25	24	--	Pass
40	5200	8.17	24	--	Pass
48	5240	8.06	24	--	Pass
52	5260	8.32	24	23.2	Pass
60	5300	8.05	24	23.2	Pass
64	5320	8.38	24	23.2	Pass
100	5500	8.27	24	23.2	Pass
116	5580	8.15	24	23.2	Pass
140	5700	8.23	24	23.2	Pass
149	5745	8.25	30	30	Pass
152	5785	8.27	30	30	Pass
165	5825	8.38	30	30	Pass

Channel No.	Frequency (MHz)	Total Conducted Power (dBm)	Antenna Gain	E.I.R.P (dBm)	RSS-247 E.I.R.P Limit (dBm)	Result
36	5180	8.25	1.95	10.2	23	Pass
40	5200	8.17	1.95	10.12	23	Pass
48	5240	8.06	1.95	10.01	23	Pass
52	5260	8.32	1.6	9.92	29.2	Pass
60	5300	8.05	1.6	9.65	29.2	Pass
64	5320	8.38	1.6	9.98	29.2	Pass
100	5500	8.27	0.5	8.77	29.2	Pass
116	5580	8.15	0.5	8.65	29.2	Pass
140	5700	8.23	0.5	8.73	29.2	Pass
149	5745	8.25	1.8	10.05	--	Pass
152	5785	8.27	1.8	10.07	--	Pass
165	5825	8.38	1.8	10.18	--	Pass

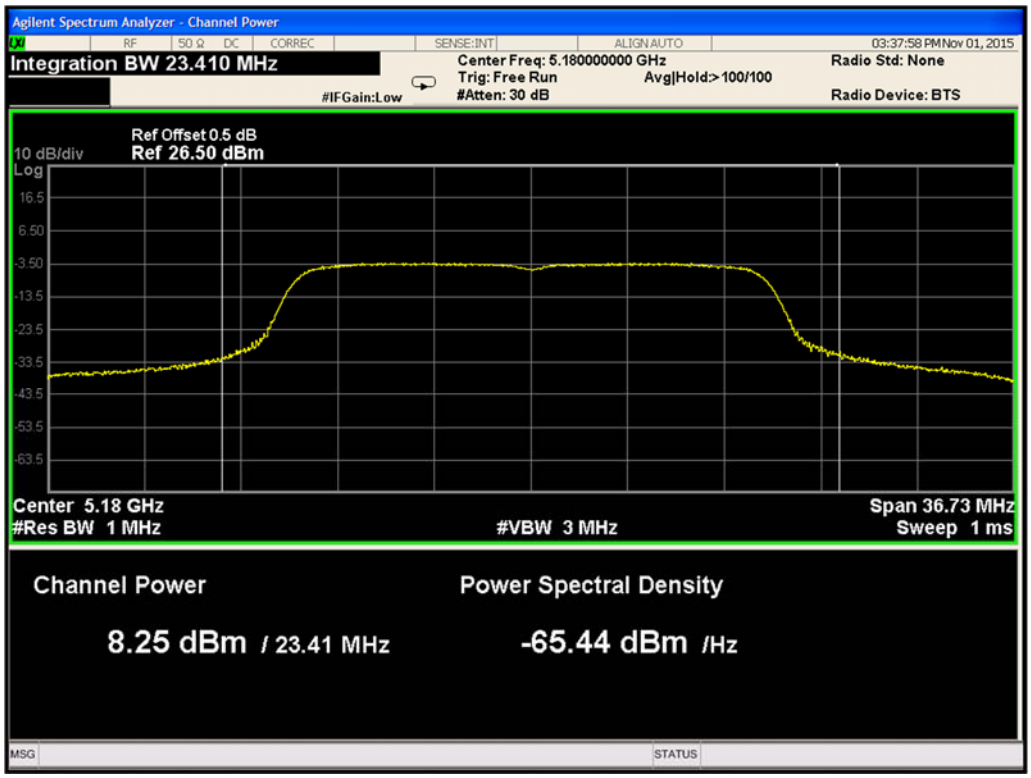

Figure 9-71. Maximum Conducted Output Power 802.11n HT20 (Ch. 36)

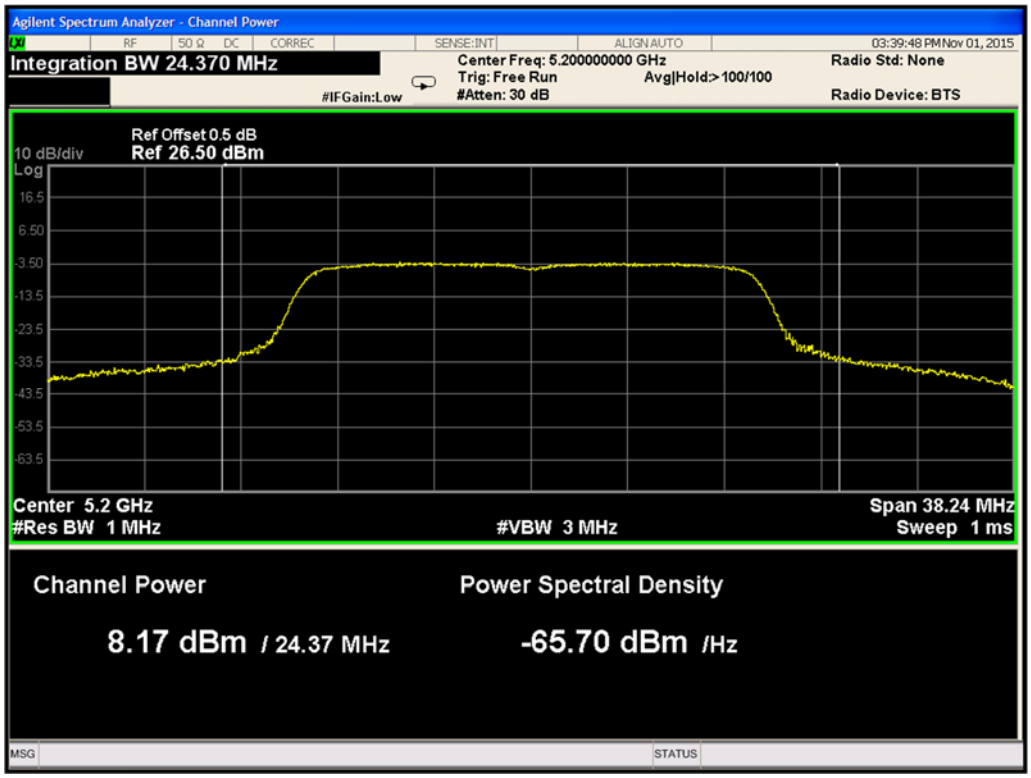

Figure 9-72. Maximum Conducted Output Power 802.11n HT20 (Ch. 40)

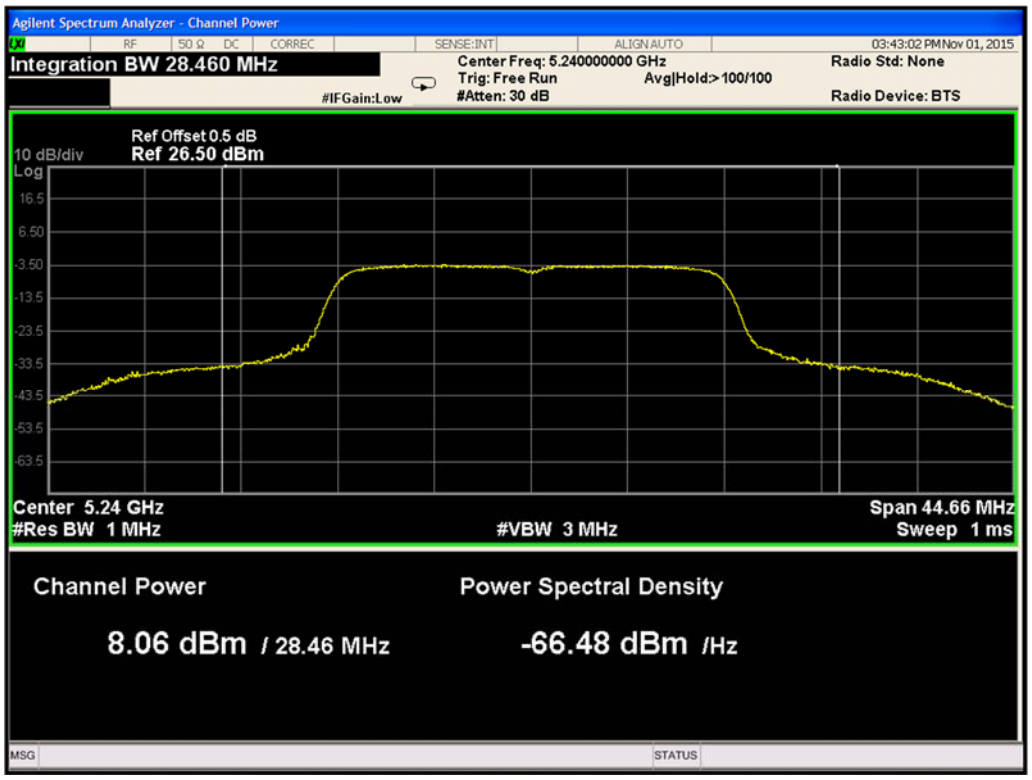

Figure 9-73. Maximum Conducted Output Power 802.11n HT20 (Ch. 48)

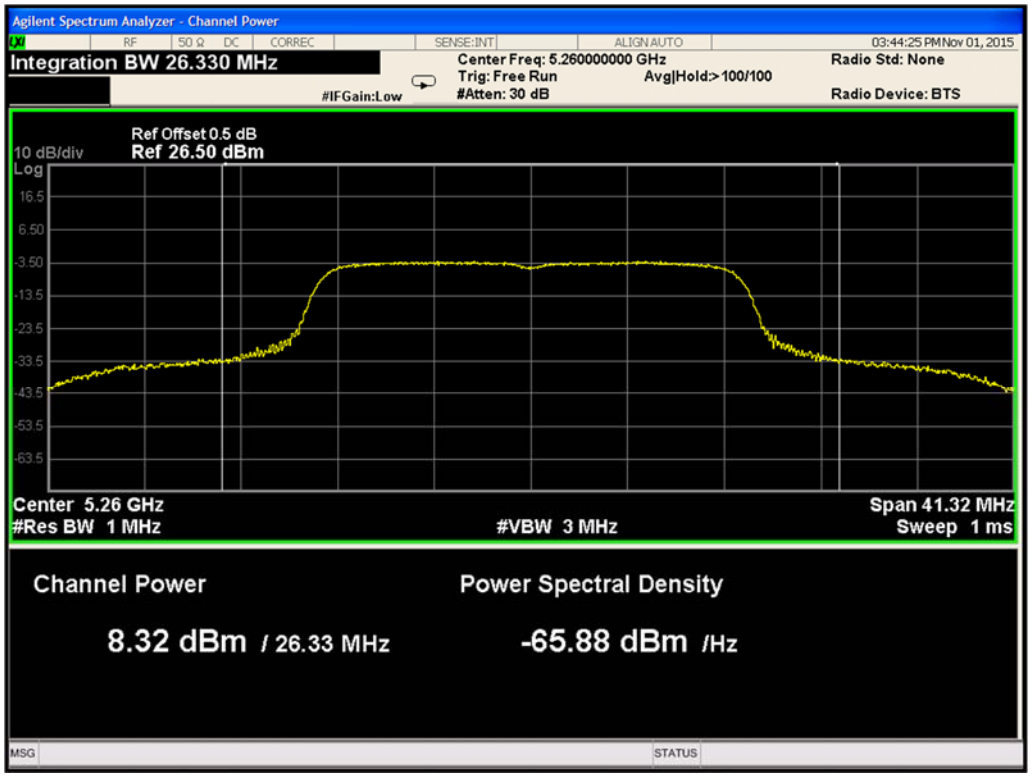

Figure 9-74. Maximum Conducted Output Power 802.11n HT20 (Ch. 52)

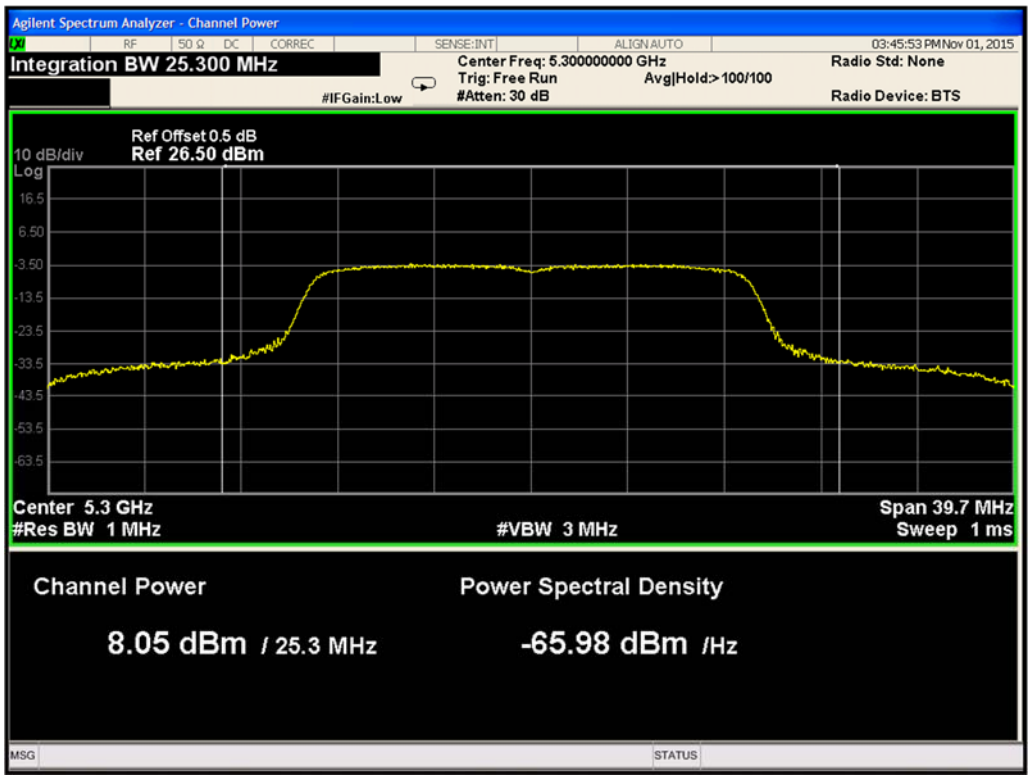

Figure 9-75. Maximum Conducted Output Power 802.11n HT20 (Ch. 60)

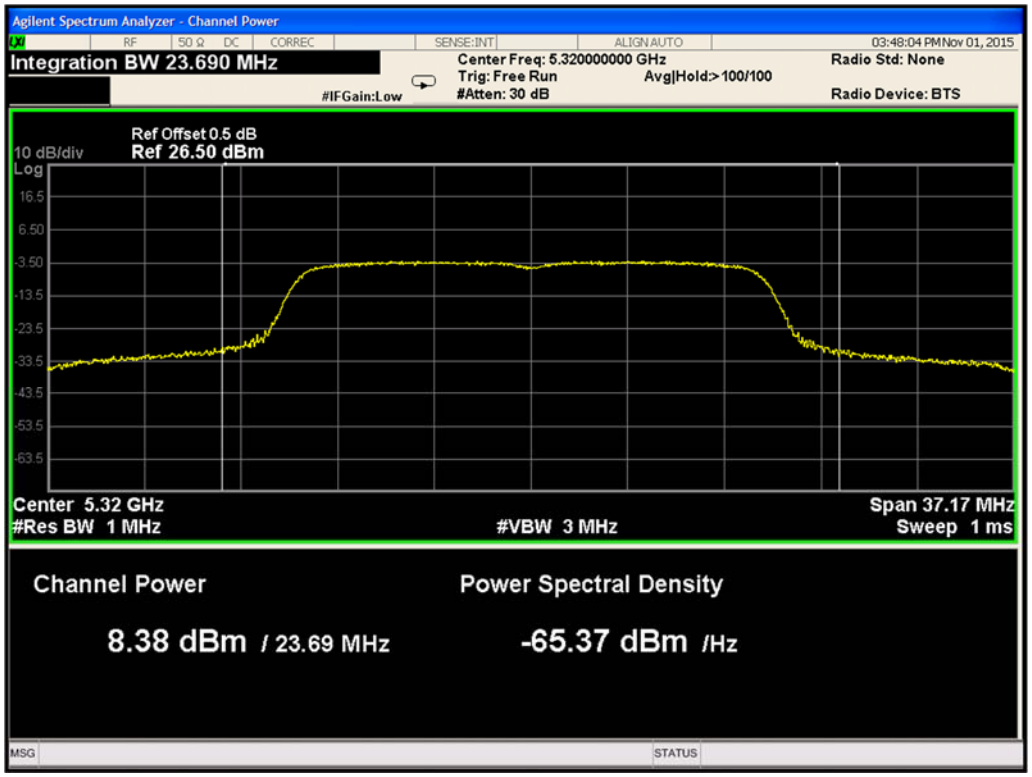

Figure 9-76. Maximum Conducted Output Power 802.11n HT20 (Ch. 64)

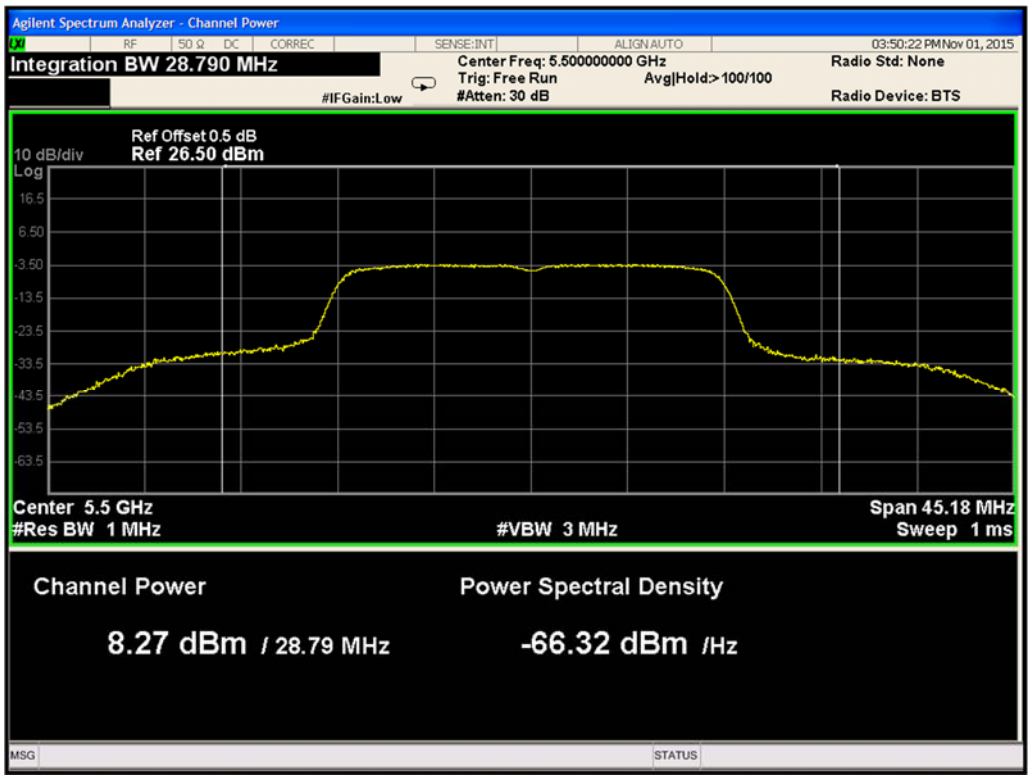

Figure 9-77. Maximum Conducted Output Power 802.11n HT20 (Ch. 100)

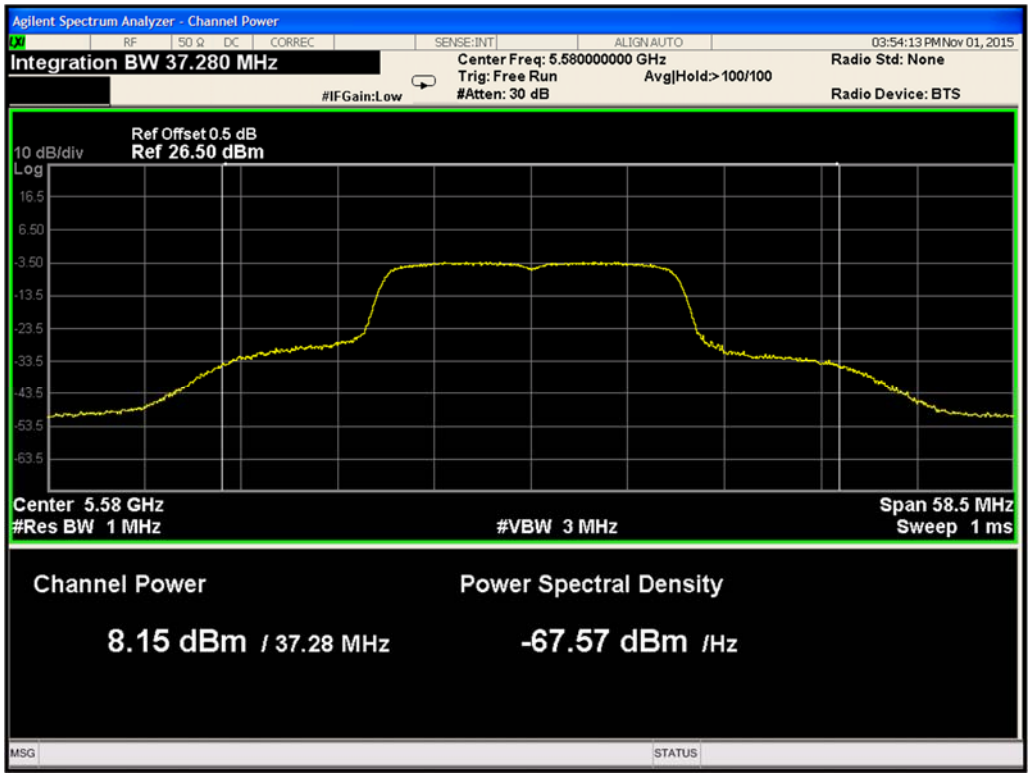

Figure 9-78. Maximum Conducted Output Power 802.11n HT20 (Ch. 116)

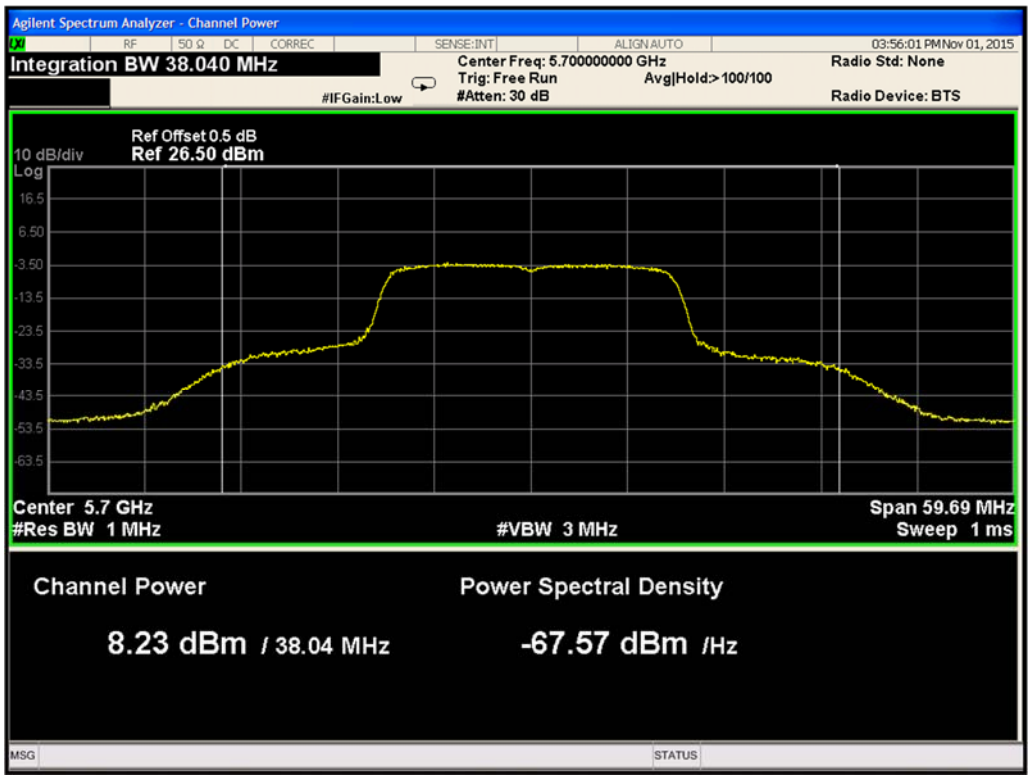

Figure 9-79. Maximum Conducted Output Power 802.11n HT20 (Ch. 140)

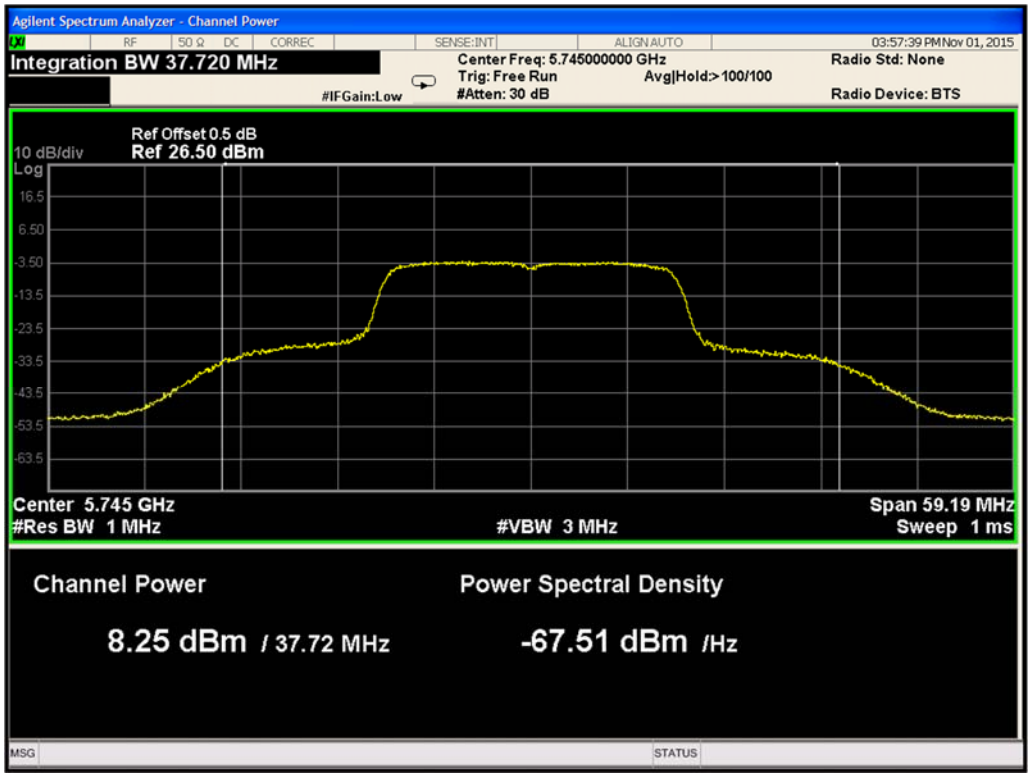

Figure 9-80. Maximum Conducted Output Power 802.11n HT20 (Ch. 149)

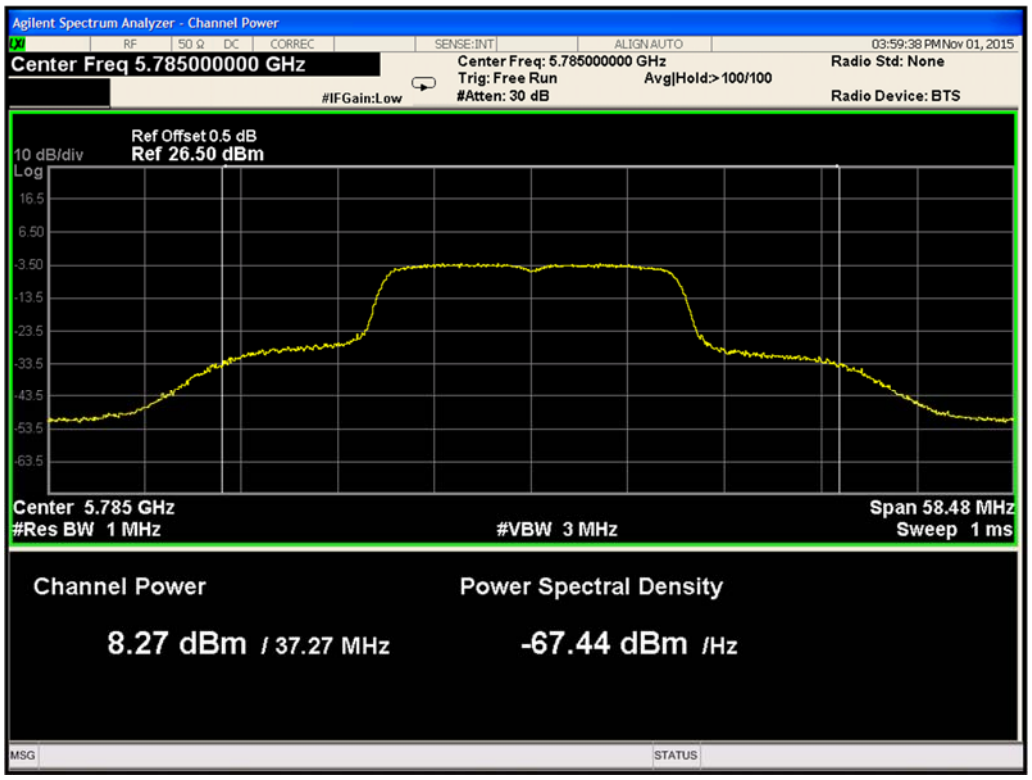

Figure 9-81. Maximum Conducted Output Power 802.11n HT20 (Ch. 157)

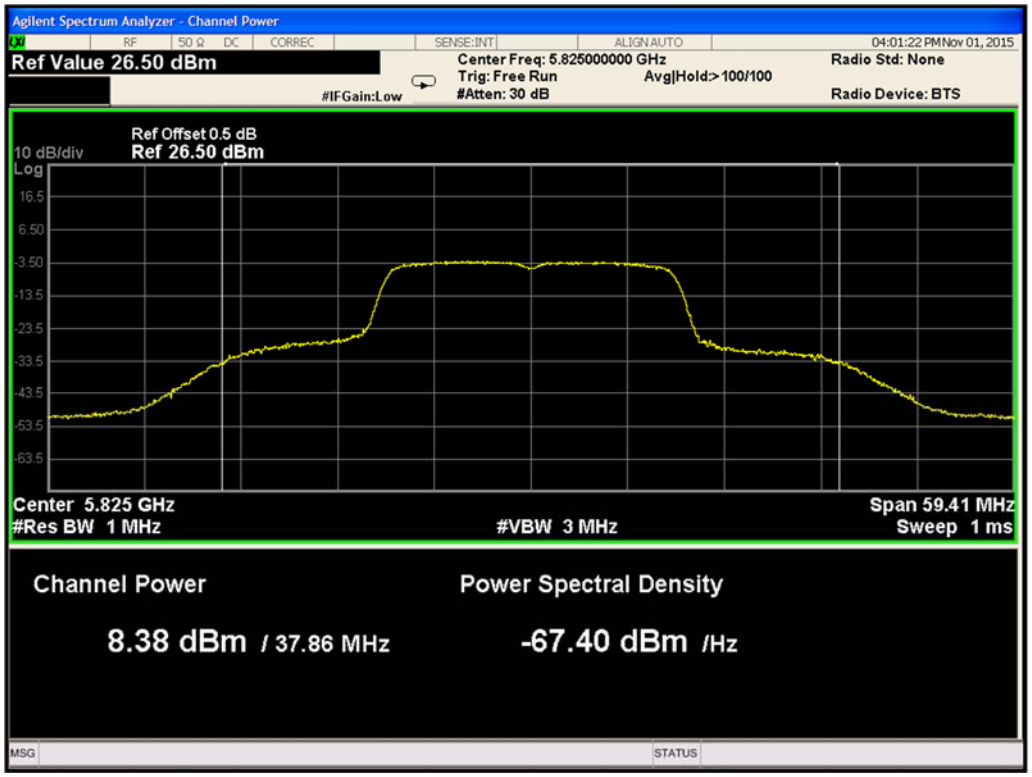

Figure 9-82. Maximum Conducted Output Power 802.11n HT20 (Ch. 165)

9.6 Maximum Power Spectral Density

9.6.1 Test Requirement:

FCC CFR 47 Rule Part 15.407 (a)

Industry Canada RSS-247 [6.2]

9.6.2 Test Method:

Measurements were performed according to the procedures defined in KDBs 789033 D02-General UNII Test Procedures New Rules v01, 662911 D01 Multiple Transmitter Output v02r01, and ANSI C63.10 (2013) American National Standard of Procedure for Compliance Testing of Unlicensed Wireless Devices.

Spectrum Analyzer settings:
RBW= 1 MHz
VBW= 3 MHz
Detector = RMS
Trace Mode= Average over 100 traces
Sweep time= Auto
Sweep Point ≥ 2*Span/RBW
Span= large enough to encompass the 26-dB Emission Bandwidth or alternatively the 99% Occupied Bandwidth. Use the peak marker function to identify the Maximum Power Spectral Density

9.6.3 Limits:

15.407: The Maximum Power Spectral Density shall not exceed the limits given in the following table for antennas that do not exceed a directional gain > 6dBi:

Band of Operation (MHz)	15.407 Limits
5150 – 5250	11dBm/MHz
5250 – 5350	11dBm/MHz
5470 – 5725	11dBm/MHz
5725 – 5825	30dBm/500kHz

RSS-247: The power spectral density shall not exceed the limit given in the following table.

Band of Operation (MHz)	RSS-247 Limits
5150 – 5250	10dBm/MHz EIRP
5250 – 5350	11dBm/MHz
5470 – 5725	11dBm/MHz
5725 – 5825	30dBm/500kHz

9.6.4 Test Results:

Pass

9.6.5 Test Data:

9.6.5.1 802.11a Maximum Power Spectral Density

Channel No.	Frequency (MHz)	Total PSD (dBm/MHz)	15.407 Limit (dBm/MHz)	RSS-247 Limit (dBm/MHz)	Result
36	5180	-3.316	11	-	Pass
40	5220	-2.802	11	-	Pass
48	5240	-2.845	11	-	Pass
52	5260	-3.234	11	11	Pass
60	5300	-3.147	11	11	Pass
64	5320	-3.177	11	11	Pass
100	5500	-3.066	11	11	Pass
116	5580	-2.990	11	11	Pass
140	5700	-2.515	11	11	Pass

Channel No.	Frequency (MHz)	Total PSD (dBm/500kHz)	15.407 Limit (dBm/500kHz)	RSS-247 Limit (dBm/500kHz)	Result
149	5745	-6.745	30	30	Pass
157	5785	-7.217	30	30	Pass
165	5825	-6.964	30	30	Pass

Channel No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Antenna Gain (dBi	EIRP PSD (dBm/MHz)	RSS-247 EIRP Limit (dBm/MHz)	Result
36	5180	-3.316	1.95	-1.37	10	Pass
40	5220	-2.802	1.95	-0.85	10	Pass
48	5240	-2.845	1.95	-0.90	10	Pass

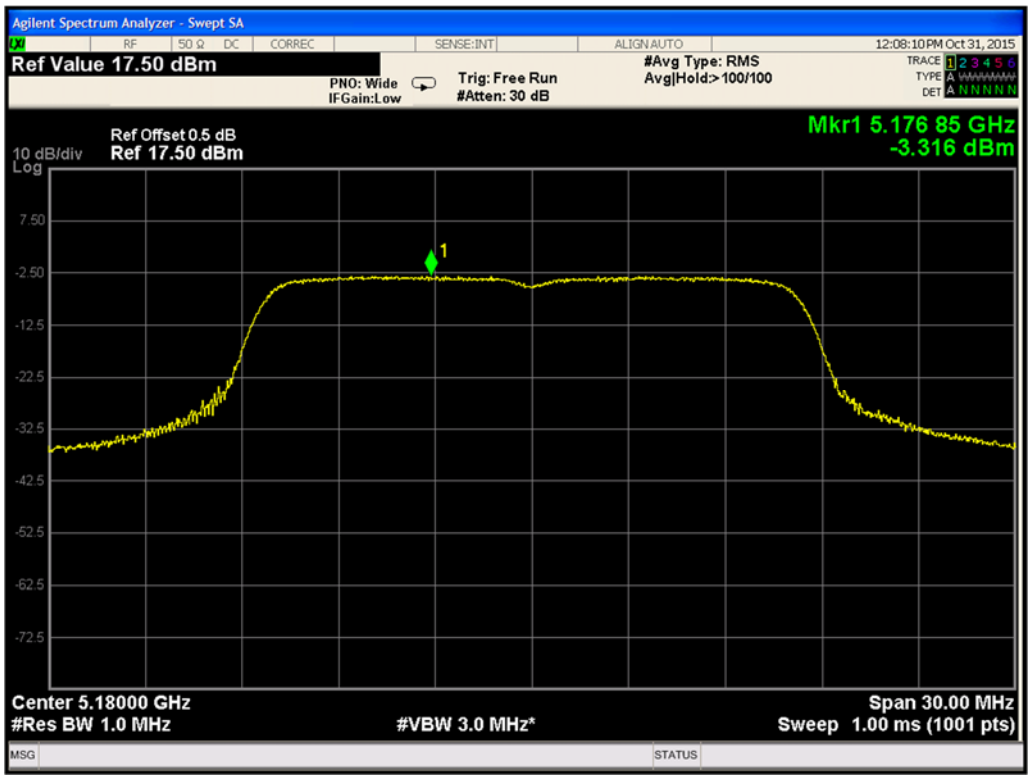

Figure 9-83. Maximum Power Spectral Density 802.11a (Ch. 36)

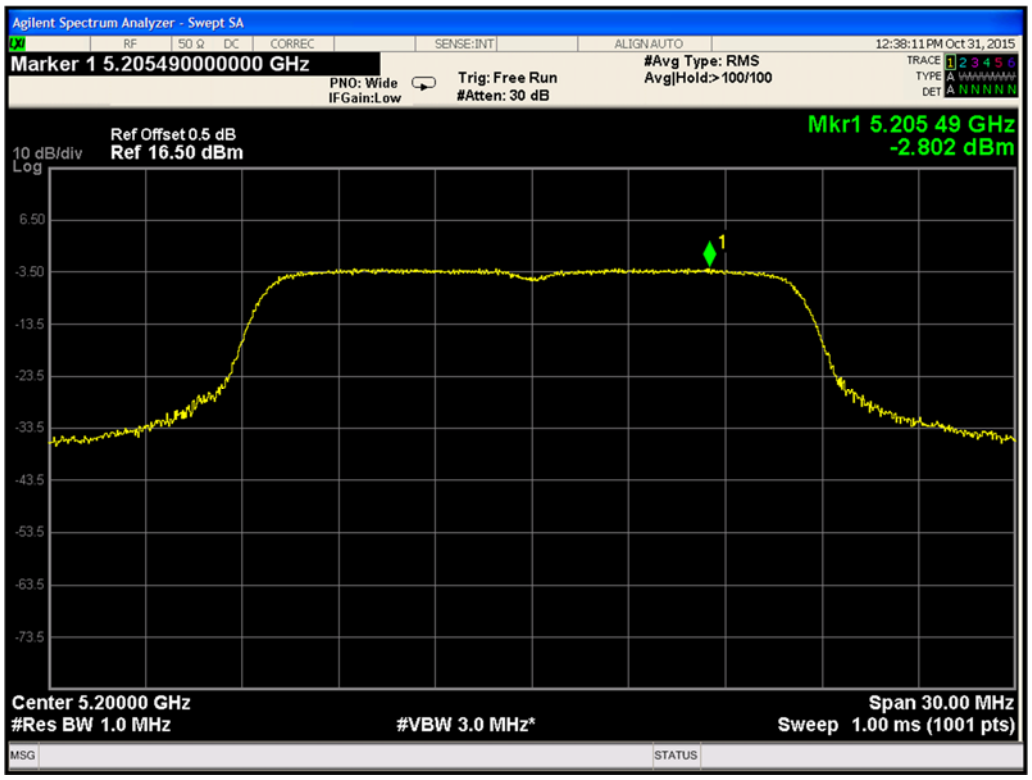

Figure 9-84. Maximum Power Spectral Density 802.11a (Ch. 40)

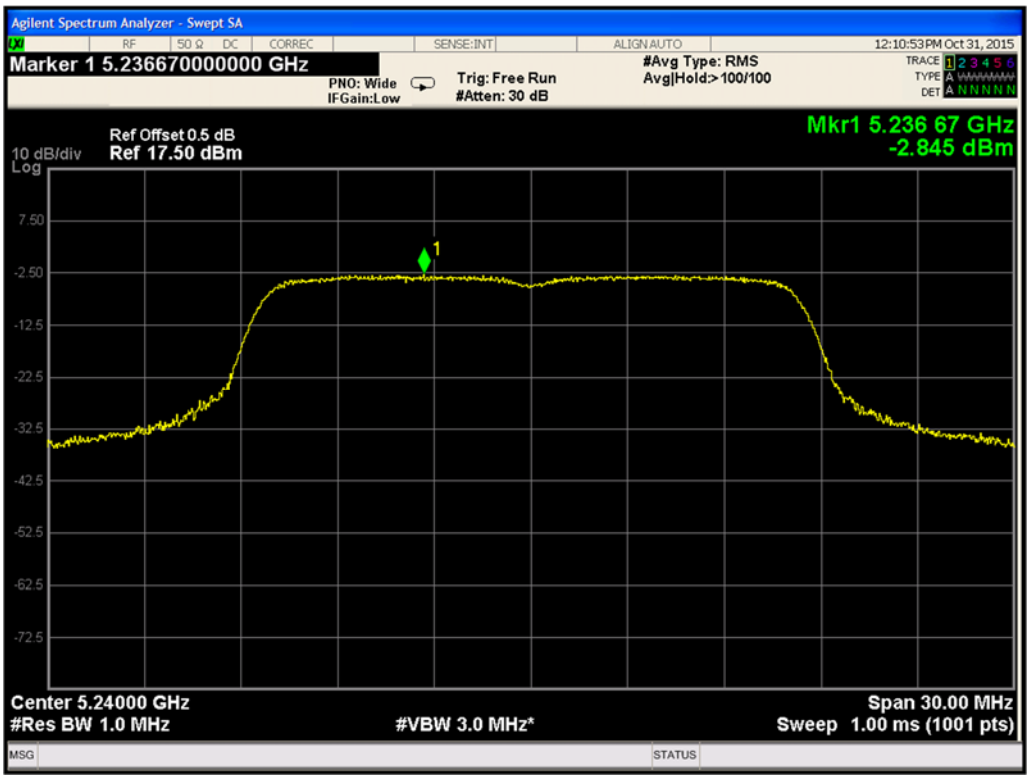

Figure 9-85. Maximum Power Spectral Density 802.11a (Ch. 48)

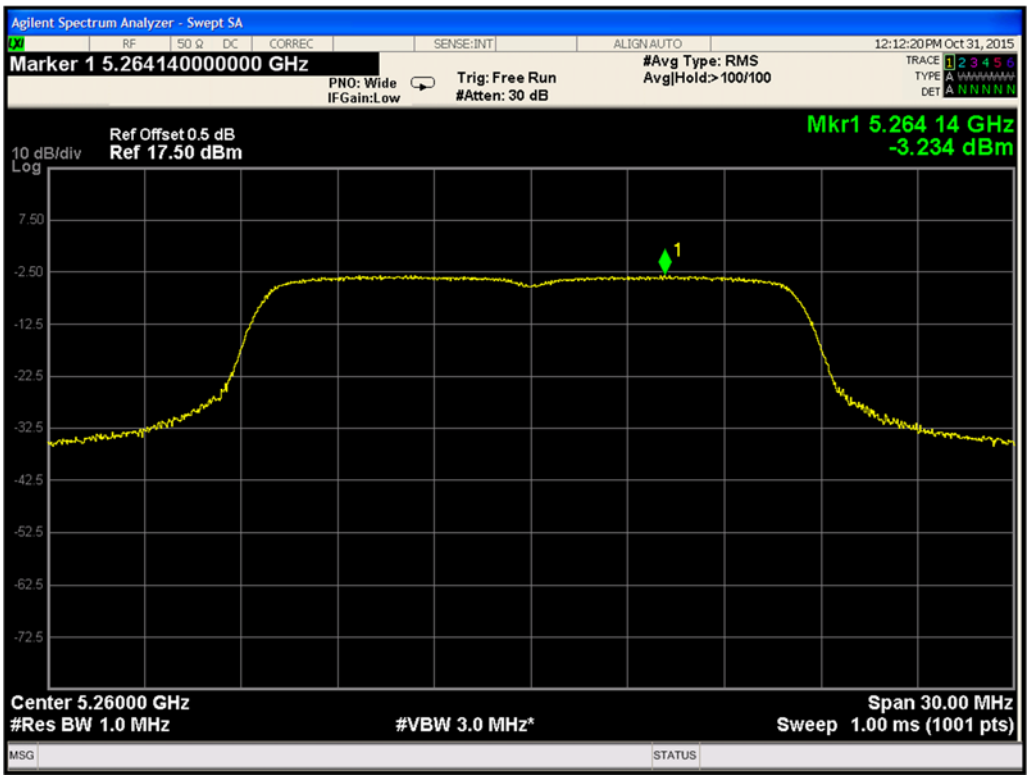

Figure 9-86. Maximum Power Spectral Density 802.11a (Ch. 52)

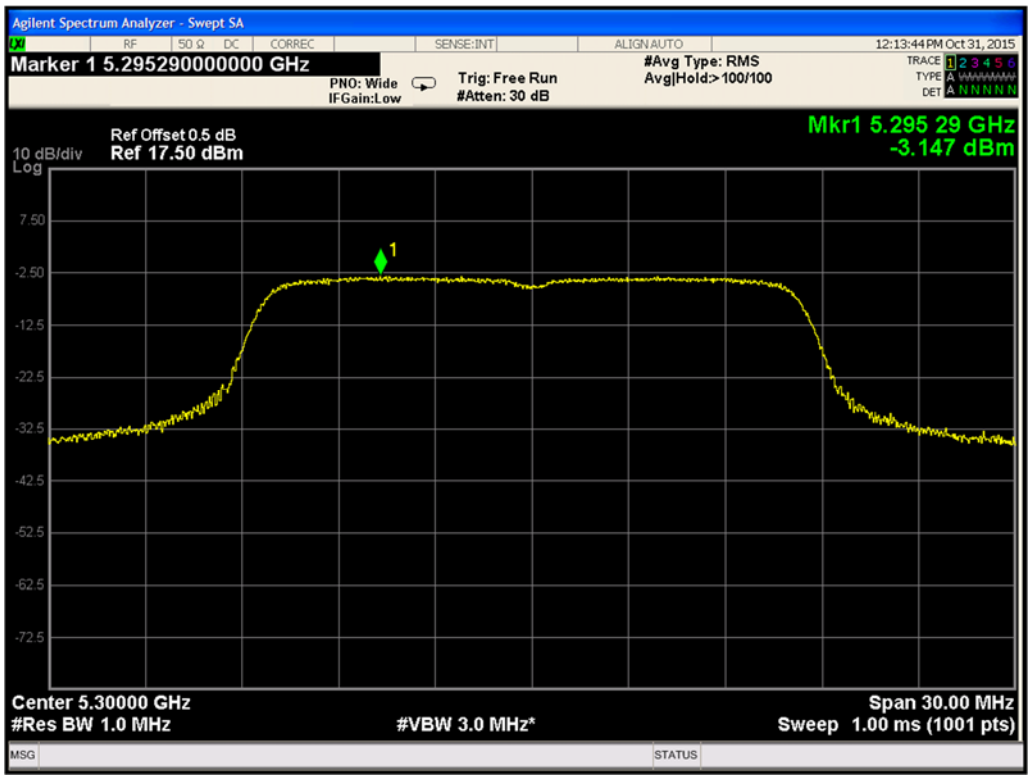

Figure 9-87. Maximum Power Spectral Density 802.11a (Ch. 60)

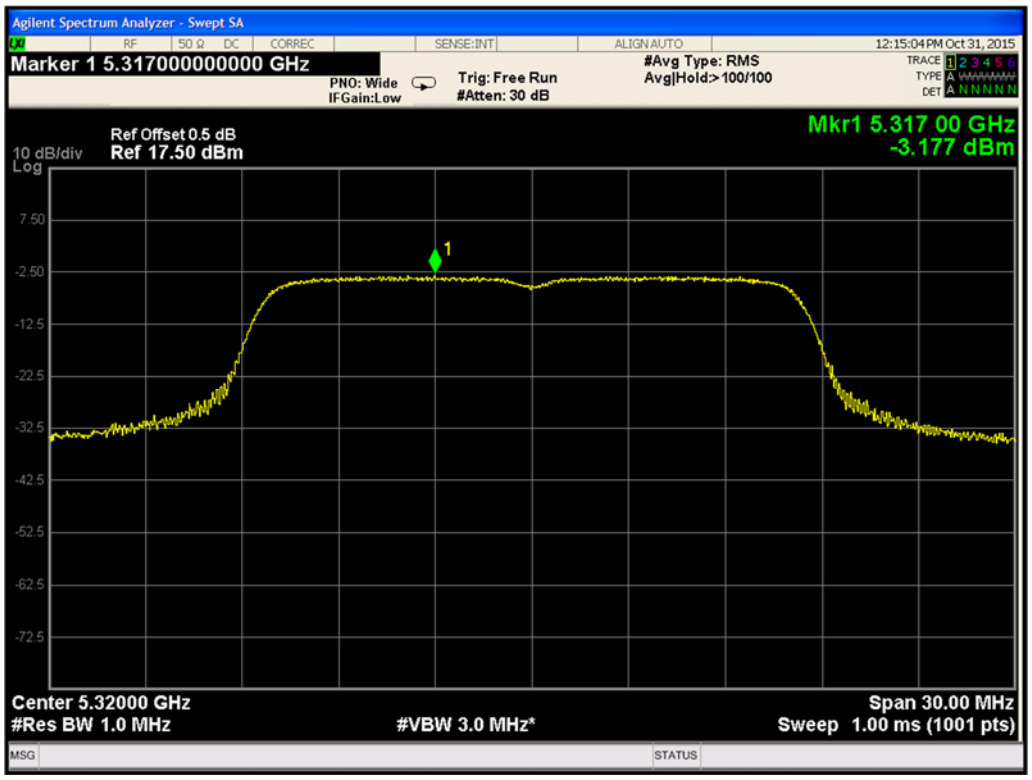

Figure 9-88. Maximum Power Spectral Density 802.11a (Ch. 64)

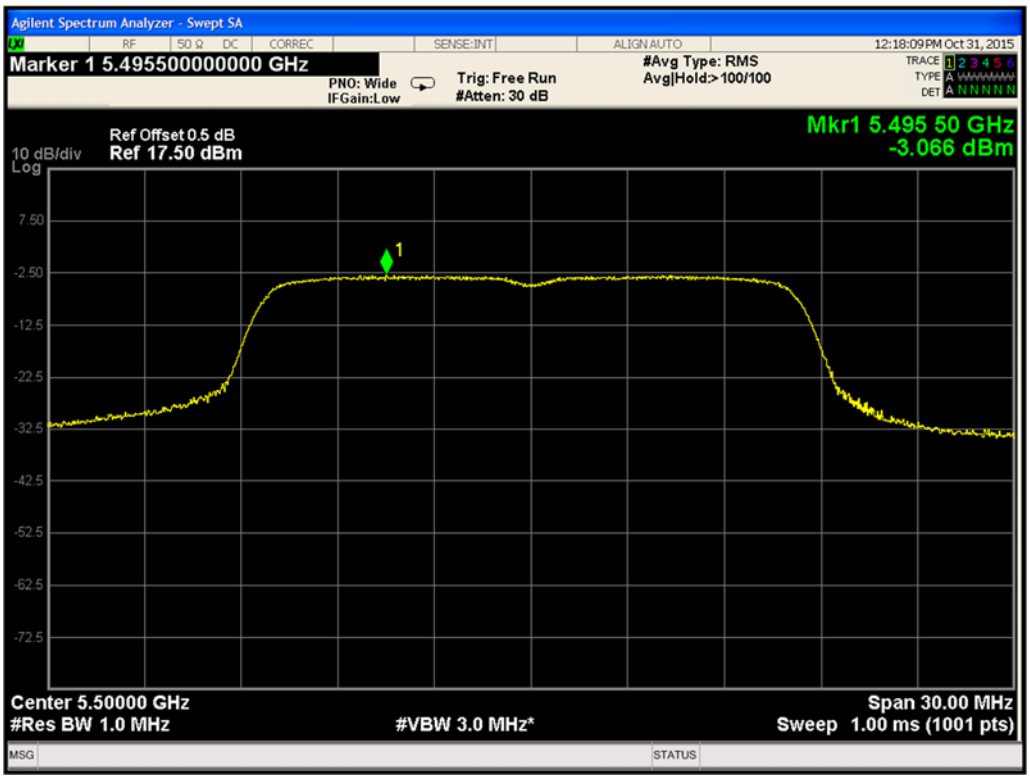

Figure 9-89. Maximum Power Spectral Density 802.11a (Ch. 100)

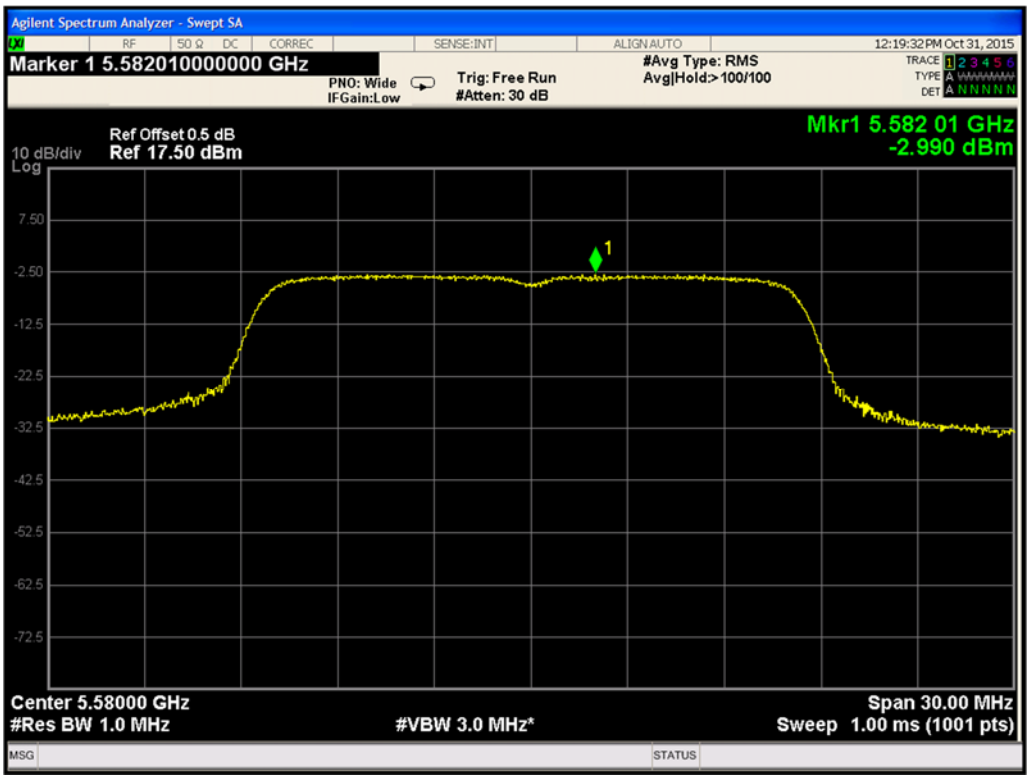

Figure 9-90. Maximum Power Spectral Density 802.11a (Ch. 116)

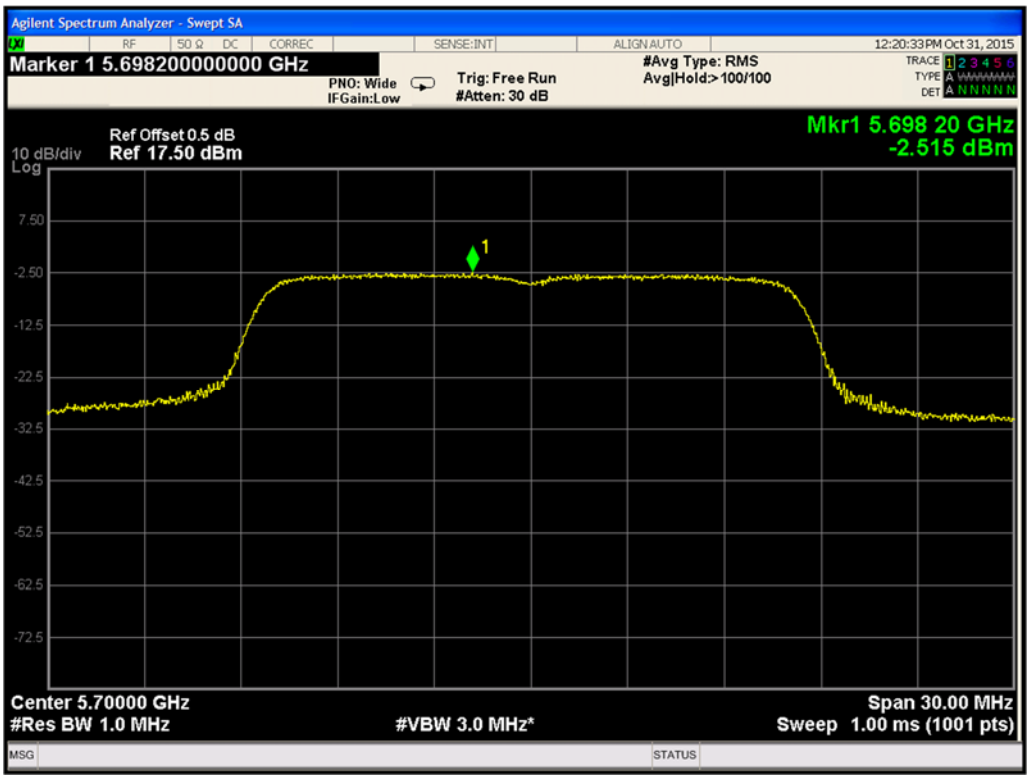

Figure 9-91. Maximum Power Spectral Density 802.11a (Ch. 140)

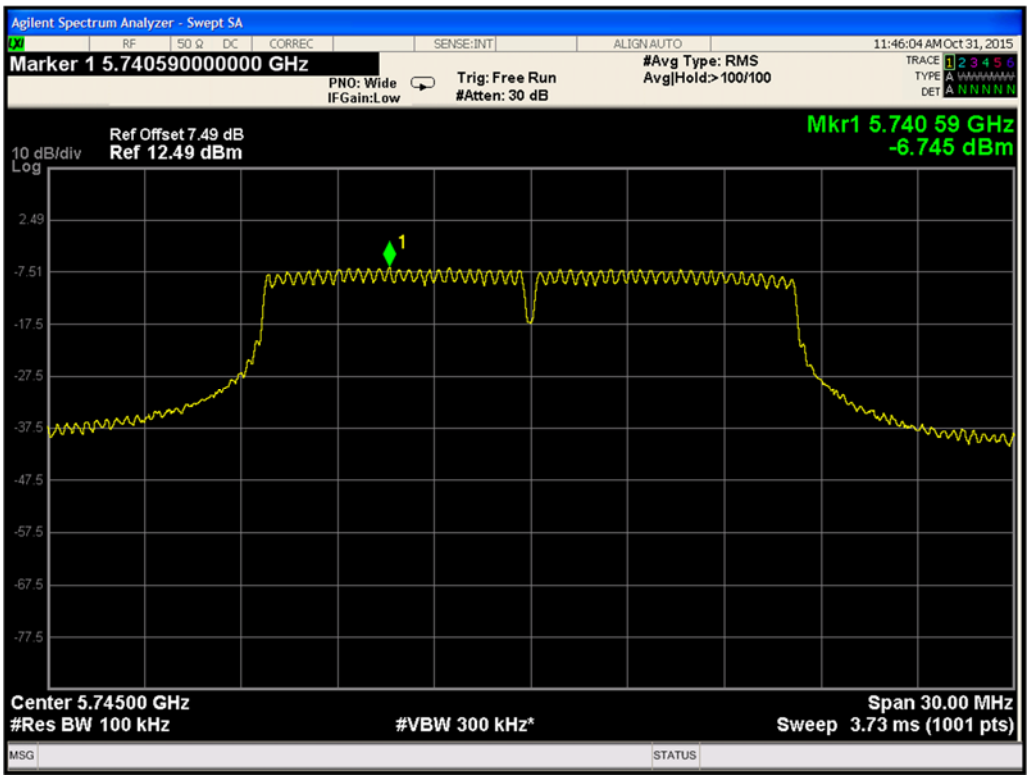

Figure 9-92. Maximum Power Spectral Density 802.11a (Ch. 149)

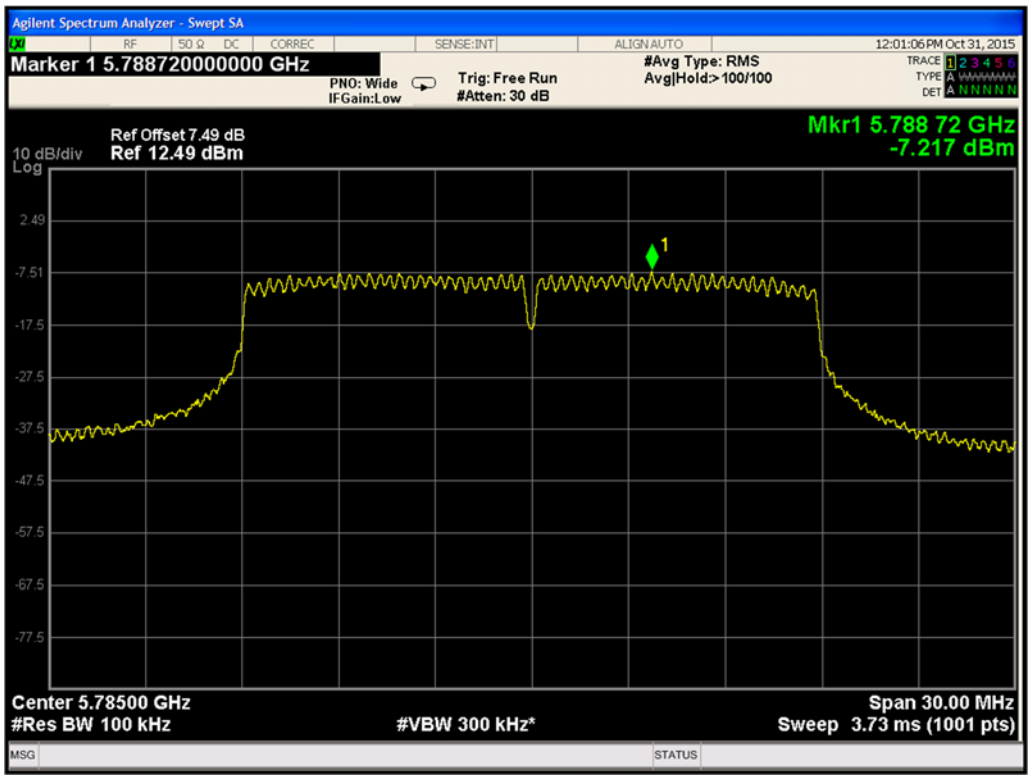

Figure 9-93. Maximum Power Spectral Density 802.11a (Ch. 157)

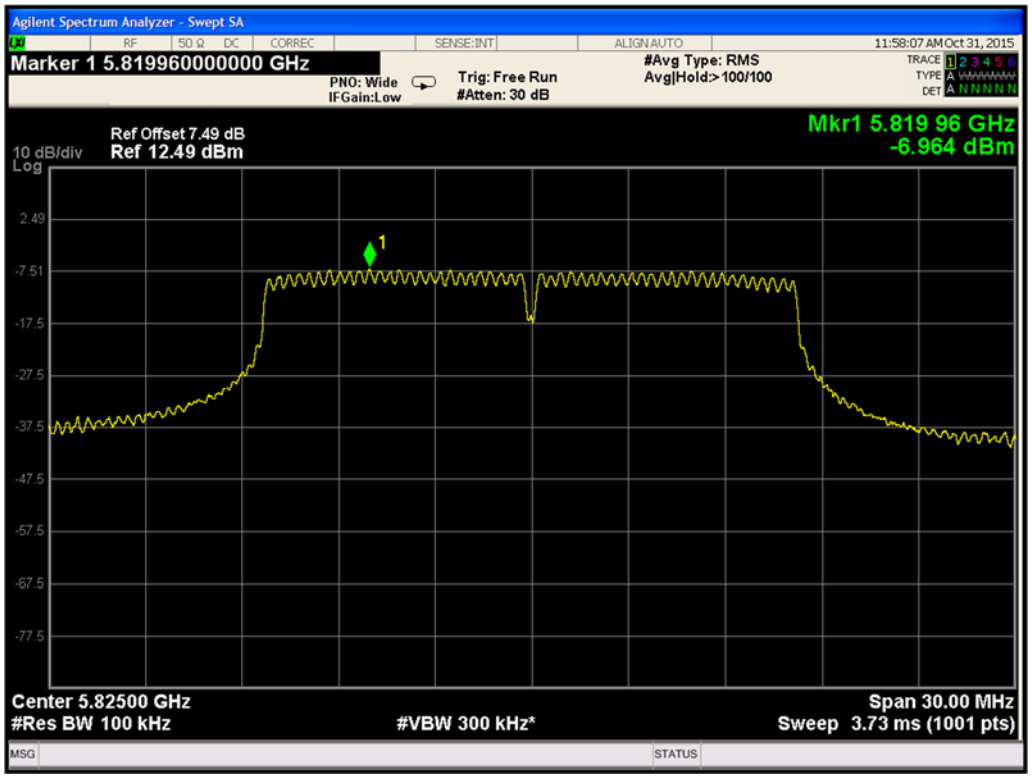

Figure 9-94. Maximum Power Spectral Density 802.11a (Ch. 165)

9.6.5.2 802.11n HT20 Maximum Power Spectral Density

Channel No.	Frequency (MHz)	Total PSD (dBm/MHz)	15.407 Limit (dBm/MHz)	RSS-247 Limit (dBm/MHz)	Result
36	5180	-2.999	11	-	Pass
40	5220	-3.545	11	-	Pass
48	5240	-3.030	11	-	Pass
52	5260	-3.167	11	11	Pass
60	5300	-2.820	11	11	Pass
64	5320	-3.361	11	11	Pass
100	5500	-2.387	11	11	Pass
116	5580	-2.566	11	11	Pass
140	5700	-3.160	11	11	Pass

Channel No.	Frequency (MHz)	Total PSD (dBm/500kHz)	15.407 Limit (dBm/500kHz)	RSS-247 Limit (dBm/500kHz)	Result
149	5745	-7.320	30	30	Pass
157	5785	-7.217	30	30	Pass
165	5825	-7.144	30	30	Pass

Channel No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Antenna Gain (dBi	EIRP PSD (dBm/MHz)	RSS-247 EIRP Limit (dBm/MHz)	Result
36	5180	-2.999	1.95	-1.05	10	Pass
40	5220	-3.545	1.95	-1.60	10	Pass
48	5240	-3.030	1.95	-1.08	10	Pass

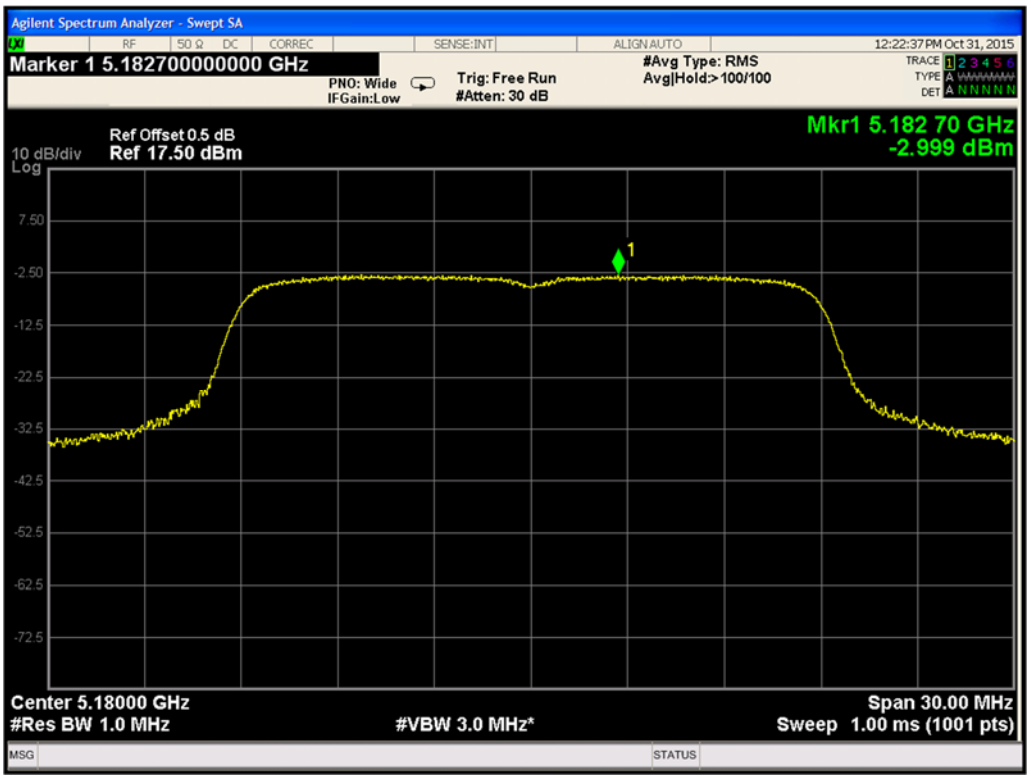

Figure 9-95. Maximum Power Spectral Density 802.11n HT20 (Ch. 36)

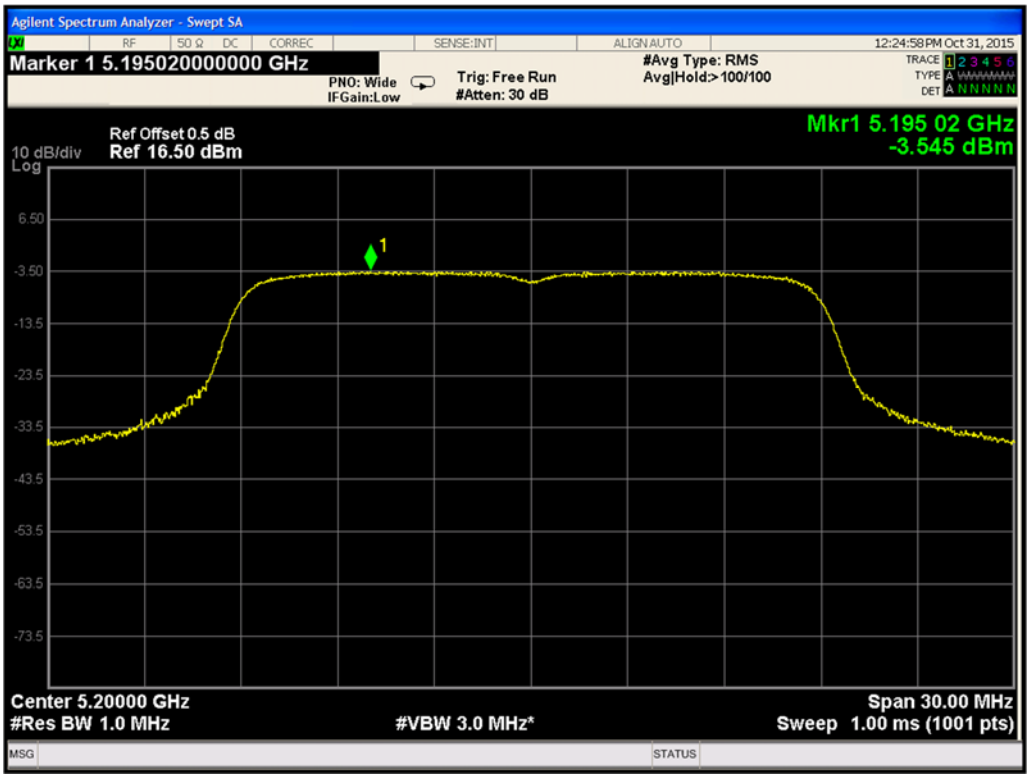

Figure 9-96. Maximum Power Spectral Density 802.11n HT20 (Ch. 40)

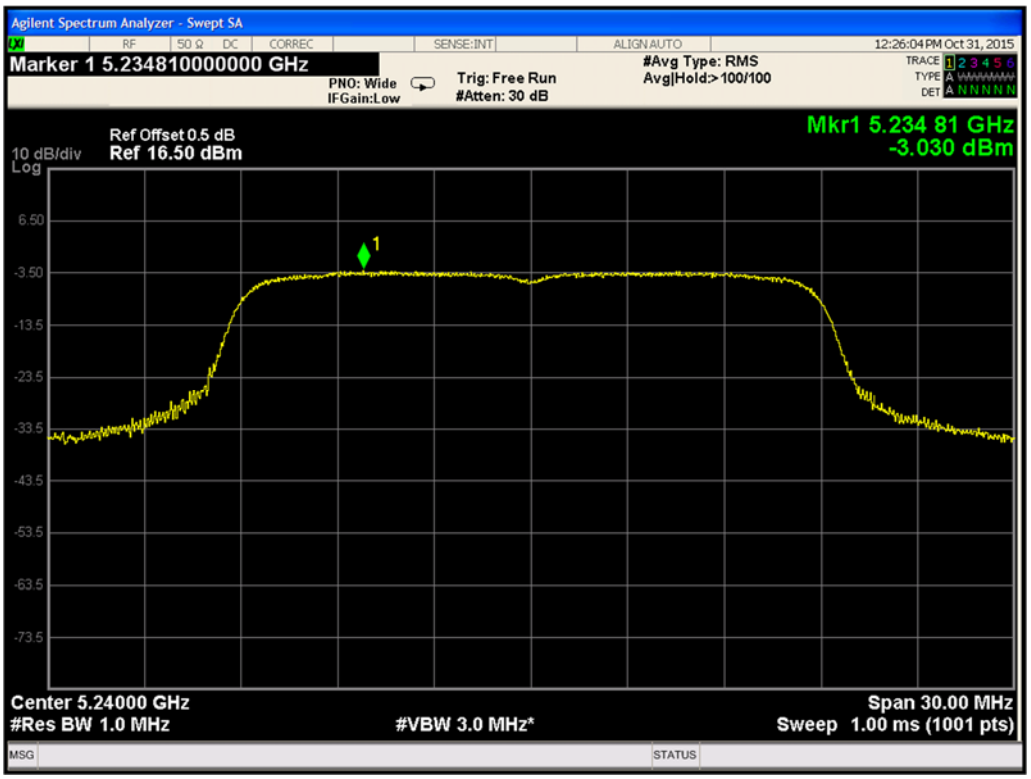

Figure 9-97. Maximum Power Spectral Density 802.11n HT20 (Ch. 48)

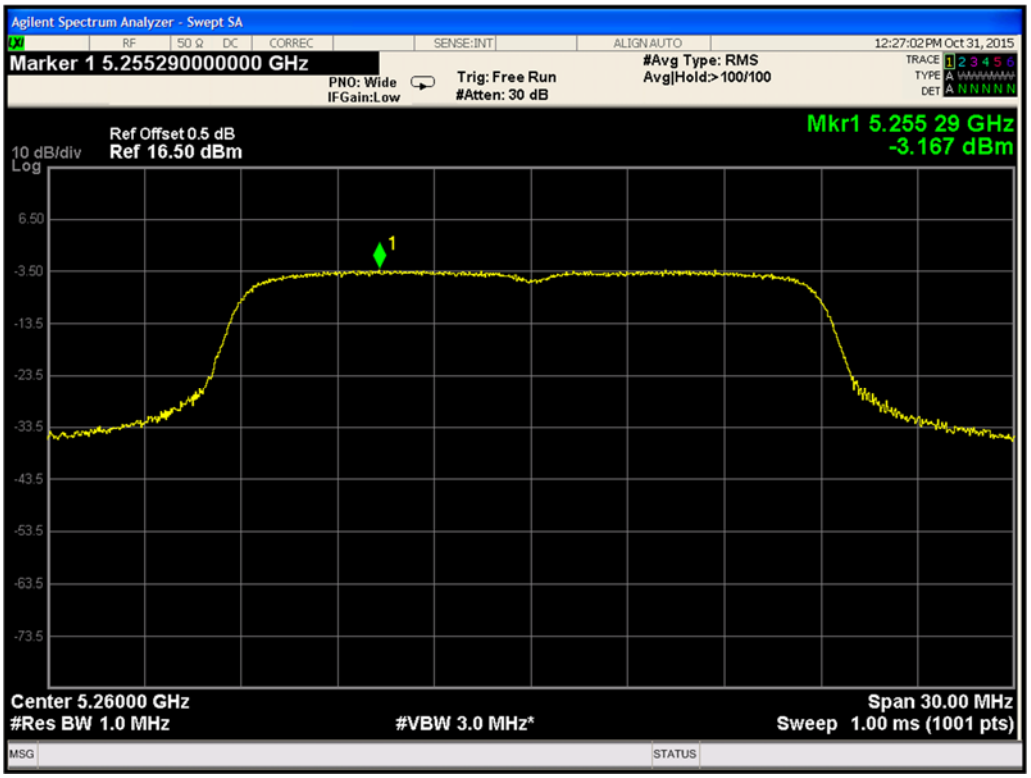

Figure 9-98. Maximum Power Spectral Density 802.11n HT20 (Ch. 52)

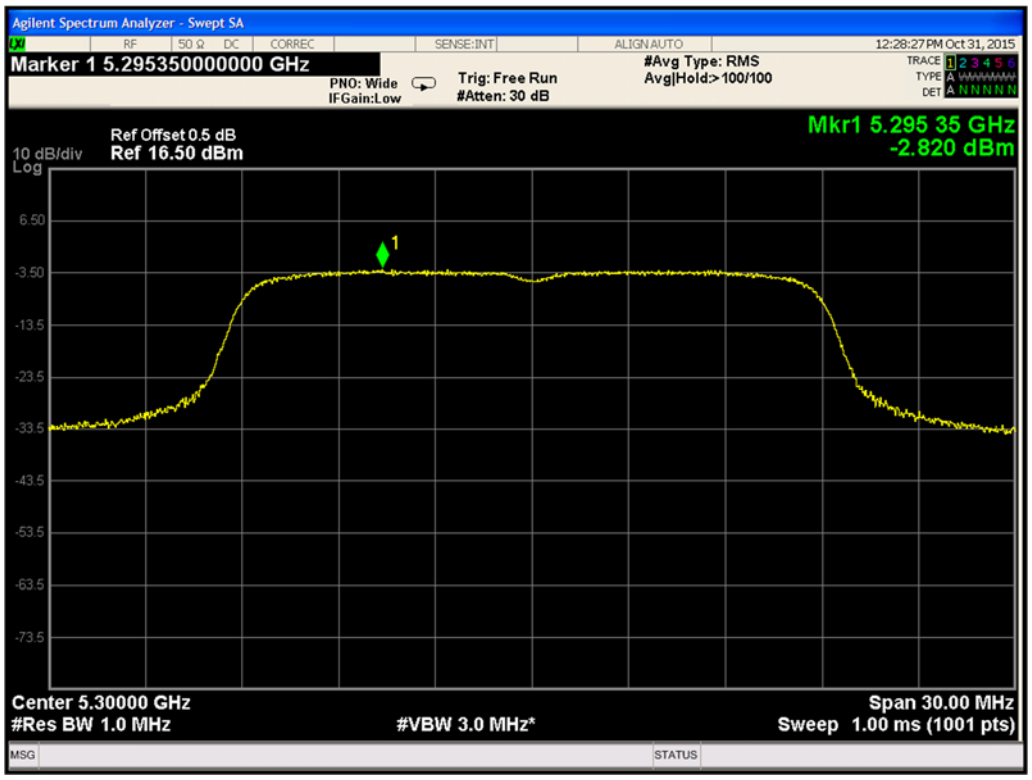

Figure 9-99. Maximum Power Spectral Density 802.11n HT20 (Ch. 60)

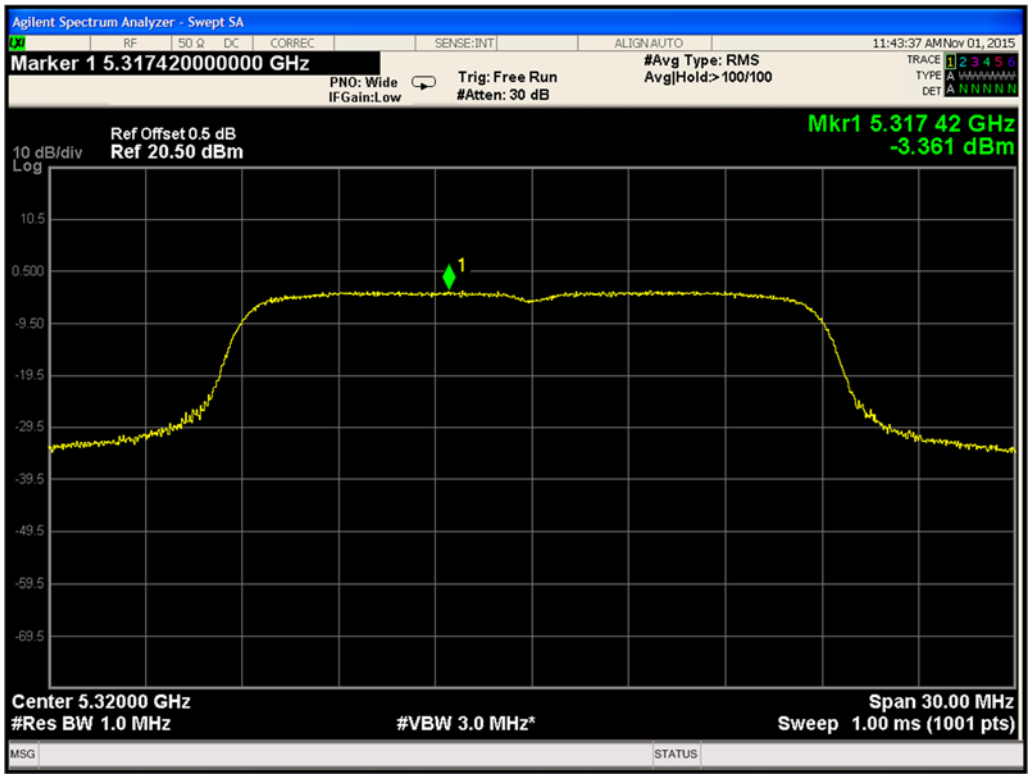

Figure 9-100. Maximum Power Spectral Density 802.11n HT20 (Ch. 64)

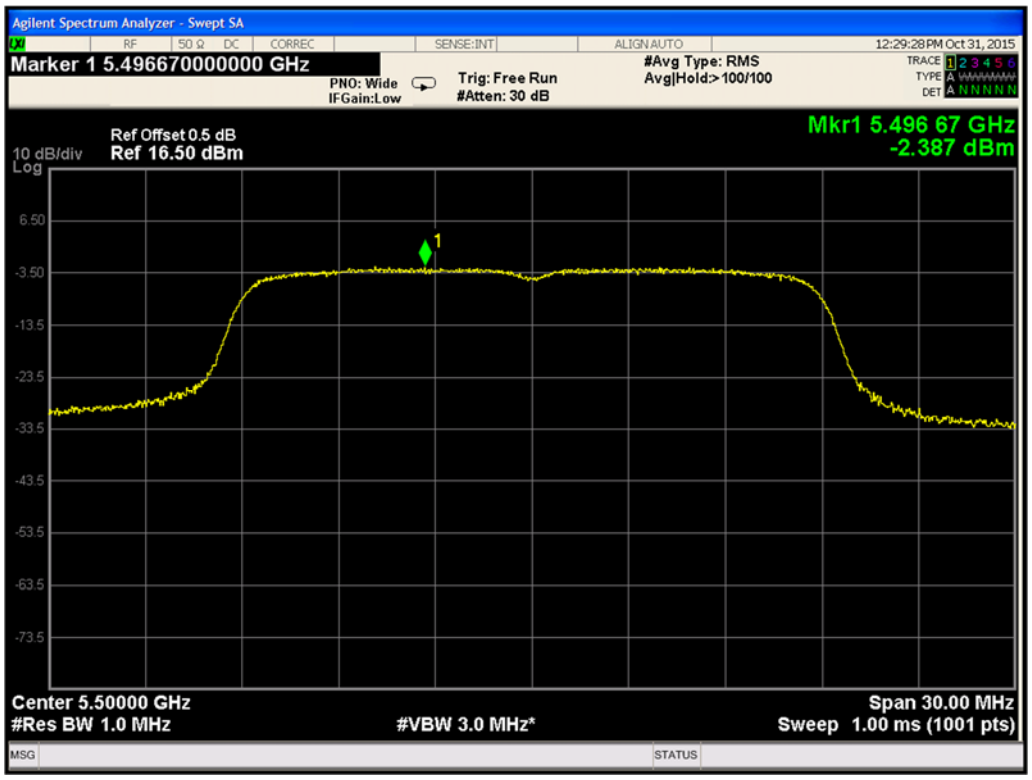

Figure 9-101. Maximum Power Spectral Density 802.11n HT20 (Ch. 100)

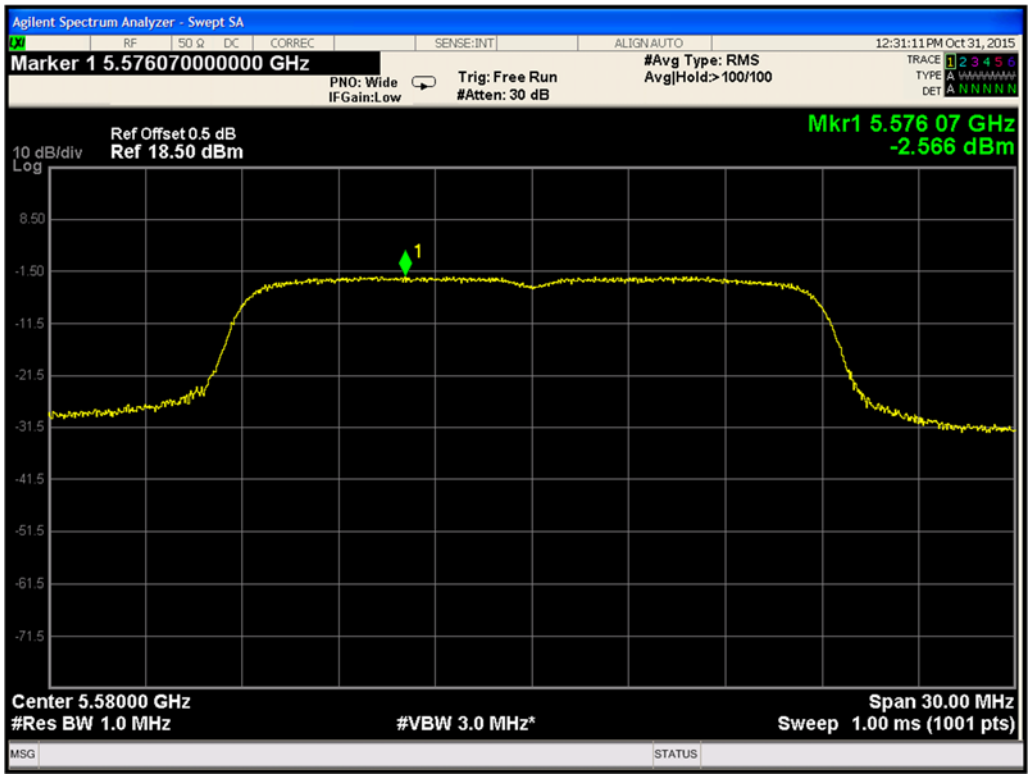

Figure 9-102. Maximum Power Spectral Density 802.11n HT20 (Ch. 116)

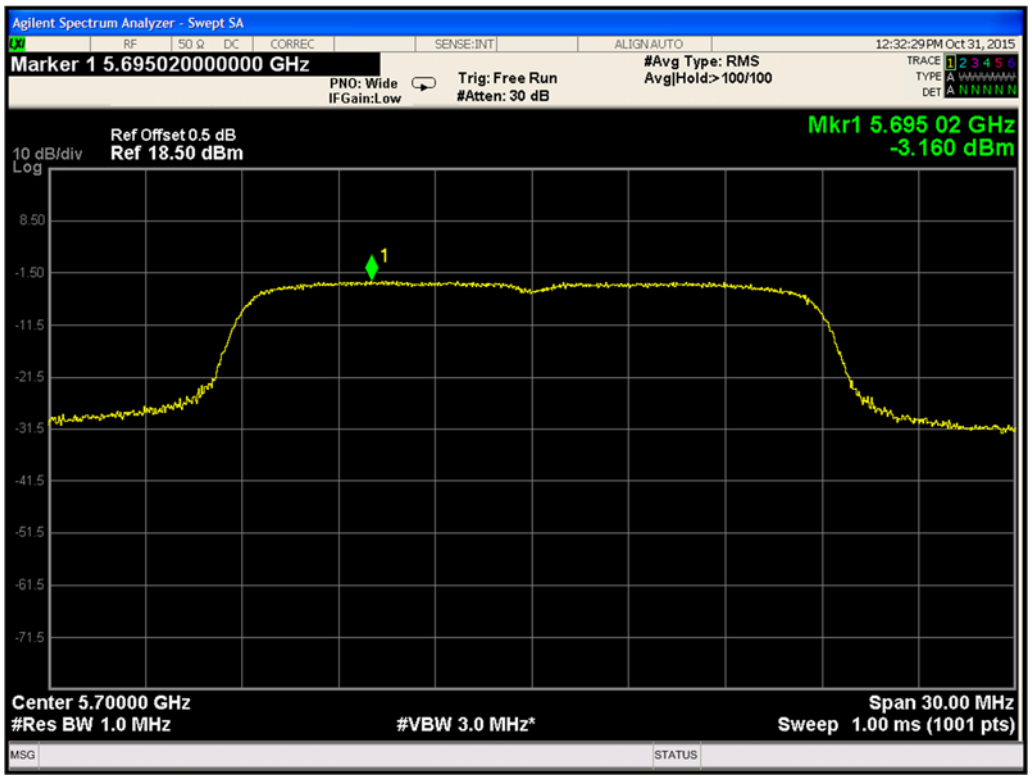

Figure 9-103. Maximum Power Spectral Density 802.11n HT20 (Ch. 140)

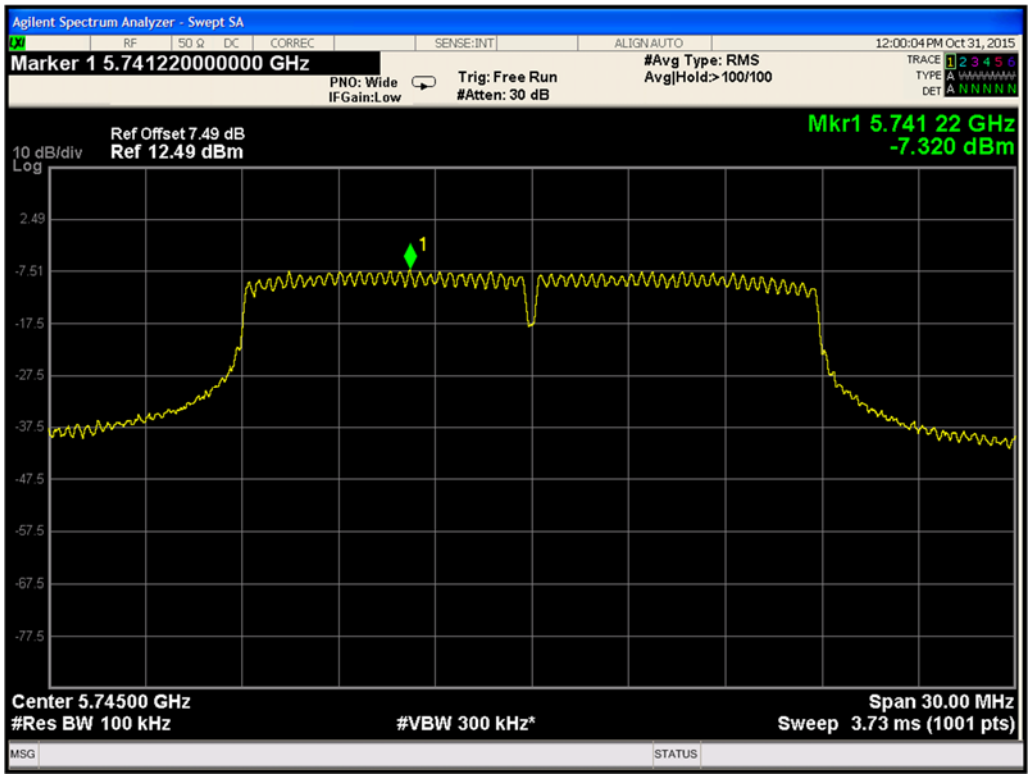

Figure 9-104. Maximum Power Spectral Density 802.1n HT20 (Ch. 149)

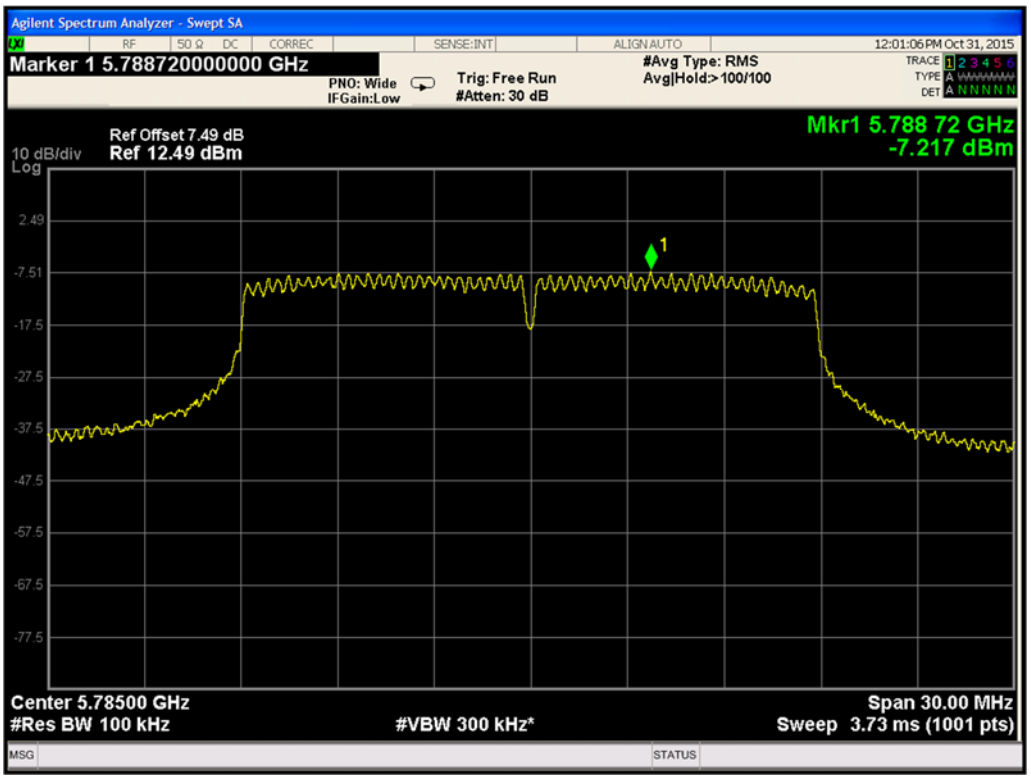

Figure 9-105. Maximum Power Spectral Density 802.11n HT20 (Ch. 157)

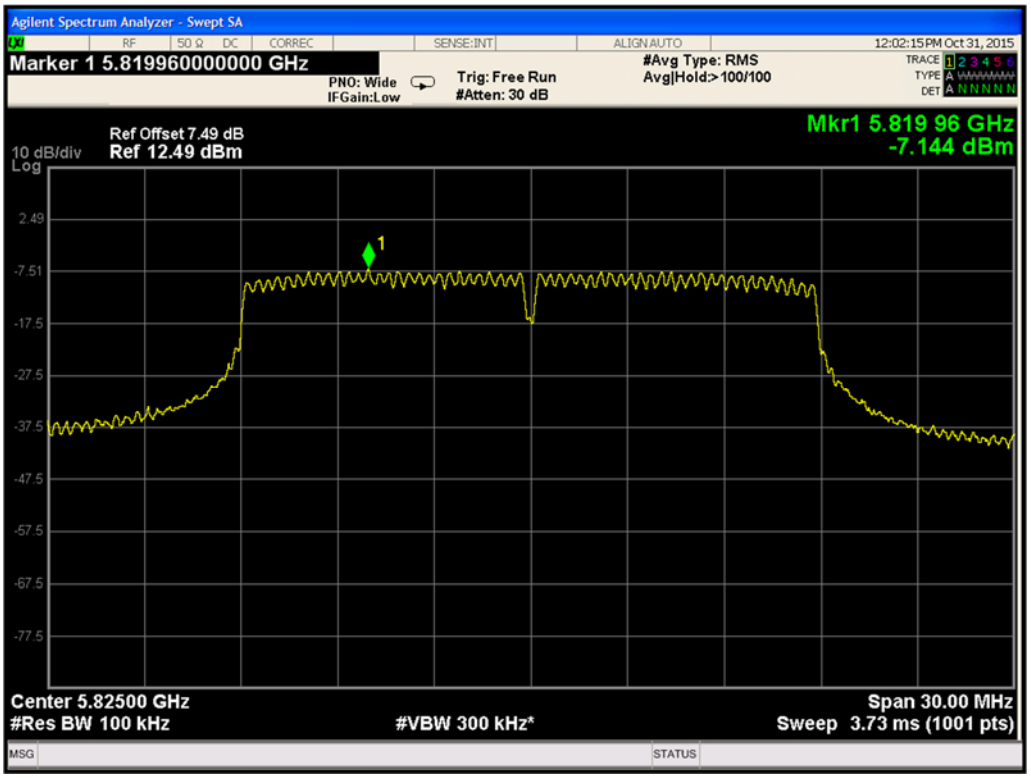

Figure 9-106. Maximum Power Spectral Density 802.11n HT20 (Ch. 165)