

RF TEST REPORT

Test item : Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA
Phone with Bluetooth, WLAN and NFC
Model No. : LG-E975k, E975K, LGE975K, E975k, LGE975k
Order No. : DEMC1210-02190
Date of receipt : 2012-10-16
Test duration : 2012-11-01 ~ 2012-11-16
Date of issue : 2012-11-27
Use of report : Original Grant

Applicant : LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Kyunggi-Do, 449-080, Korea

Test specification : FCC Part 15.407 Subpart E
ANSI C63.10-2009, KDB 789033

Test environment : See appended test report

Test result : Pass Fail

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of Digital EMC Co., Ltd.

Tested by:

Witnessed by:

Reviewed by:



Engineer
Hyun-Su, Son

N/A



Technical Director
Harvey Sung

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1. EUT information

1.1 EUT description

FCC Equipment Class	Unlicensed National Information Infrastructure (UNII)
Product	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC
Model Name	LG-E975k
Add Model Name	E975K, LGE975K, E975k, LGE975k
Equipment serial no.	Identical prototype
Frequency Range	802.11a/n(20MHz) : Band I: 5180 ~ 5240MHz Band II: 5260 ~ 5320MHz Band III: 5500 ~ 5700MHz
	802.11n(40MHz) : Band I: 5190 ~ 5230MHz Band II: 5270 ~ 5310MHz Band III: 5510 ~ 5670MHz
Channels	802.11a/n(20MHz): 4 (Band I) / 4 (Band II) / 8 (Band III) 802.11n(40MHz): 2 (Band I) / 2 (Band II) / 3 (Band III)
Modulation type	802.11a/n : OFDM
Data rate	802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n(20MHz): 6.5, 7.2, 13, 14.4, 19.5, 21.7, 26, 28.9, 39, 43.3, 52, 57.8, 58.5, 65, 72.2 Mbps 802.11n(40MHz): 13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150 Mbps
Antenna Specification	Internal Antenna (1TX / 1RX) / Max. peak gain: -1.19dBi
Power Supply	DC 3.8 V

1.2 Ancillary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
-	-	-	-	-
-	-	-	-	-

2. Information about test items

2.1 Test mode / Channel Information

5GHz Band	Mode	Data Rate
Band I	802.11a	6Mbps
	802.11n(20MHz)	MCS0
	802.11n(40MHz)	MCS0
Band II	802.11a	6Mbps
	802.11n(20MHz)	MCS0
	802.11n(40MHz)	MCS0
Band III	802.11a	6Mbps
	802.11n(20MHz)	MCS0
	802.11n(40MHz)	MCS0

For all test items, the low, middle and high channels of the modes were tested with above worst case data rate.

2.2 Tested Channel Information

5GHz Band	802.11a/n(20MHz)		802.11n(40MHz)	
	Channel	Frequency [MHz]	Channel	Frequency [MHz]
Band I	36	5180	38	5190
	40	5200	-	-
	48	5240	46	5230
Band II	52	5260	54	5270
	60	5300	-	-
	64	5320	62	5310
Band III	100	5500	102	5510
	116	5580	110	5550
	140	5700	134	5670

2.3 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
-	-	-	-	-
-	-	-	-	-

2.4 Tested environment

Temperature	: 23 ~ 24 °C
Relative humidity content	: 45 ~ 54 % R.H.
Details of power supply	: DC 3.8 V

2.5 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing
→ None

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	RSS Section(s)	Parameter	Limit	Test Condition	Status Note 1
I. Transmitter Mode (TX)					
15.407(a)	N/A	26 dB Bandwidth for FCC	N/A	Conducted	C
15.407(a)	RSS-210 [A9.2]	Maximum Conducted Output Power	< 4 + 10log ₁₀ (B) dBm (5150-5250) < 11 + 10log ₁₀ (B) dBm (5250-5350) < 11 + 10log ₁₀ (B) dBm (5470-5725)		C
15.407(a)	RSS-210 [A9.2]	Peak Power Spectral Density	< 4 dBm/MHz (5150-5250) < 11 dBm/MHz (5250-5350) < 11 dBm/MHz (5470-5725)		C
15.407(a)	N/A	Peak Excursion	< 13 dB/MHz maximum difference		C
15.407(g)	N/A	Frequency Stability	N/A		C
-	RSS Gen [4.6.1]	Occupied Bandwidth (99%)	N/A		NA
15.407(b)	RSS-210 [A9.2]	Undesirable Emissions	< -27 dBm/MHz EIRP (5150-5725)	Radiated	C
15.205 15.209 15.407(b)	RSS-Gen [7.2.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		C
15.407(h)	RSS-210 [A9.3]	Dynamic Frequency Selection	See DFS Test Report		C Note3
15.207	RSS-Gen [7.2.4]	AC Conducted Emissions	FCC 15.207	AC Line Conducted	C
15.203	RSS-Gen [7.1.2]	Antenna Requirements	FCC 15.203	-	C

Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable

Note 2: These test items were performed in each axis and the worst case data was reported.

Note 3: Refer to the DFS Test Report.

3.2 Transmitter requirements

3.2.1 26 dB Bandwidth

Test Requirements

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies. The 26dB bandwidth is used to determine the conducted output power limit.

■ TEST CONFIGURATION

Refer to the APPENDIX I.

■ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of **KDB789033**.

1. Set resolution bandwidth (RBW) = approximately 1 % of the EBW.
2. Set the video bandwidth (VBW) > RBW.
3. Detector = **Peak**.
4. Trace mode = **max hold**.

Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

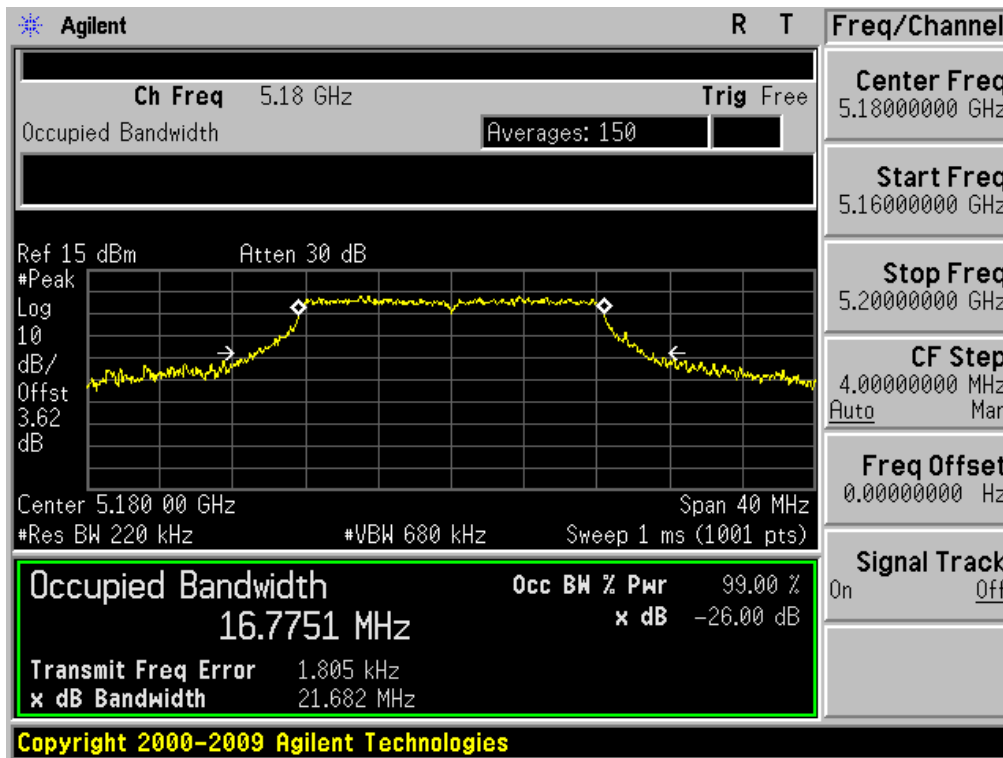
■ TEST RESULTS: **Comply**

Mode	Band	Channel	Frequency [MHz]	Test Result [MHz]
802.11a	Band I	36	5180	21.682
		40	5200	21.346
		48	5240	21.637
	Band II	52	5260	22.040
		60	5300	21.518
		64	5320	21.784
	Band III	100	5500	21.327
		116	5580	21.823
		140	5700	21.771
802.11n (20MHz)	Band I	36	5180	21.959
		40	5200	21.872
		48	5240	21.791
	Band II	52	5260	21.765
		60	5300	21.712
		64	5320	21.504
	Band III	100	5500	21.785
		116	5580	21.977
		140	5700	21.665
802.11n (40MHz)	Band I	38	5190	42.514
		46	5230	42.906
	Band II	54	5270	42.322
		62	5310	42.565
	Band III	102	5510	42.418
		110	5550	42.917
		134	5670	42.626

RESULT PLOTS

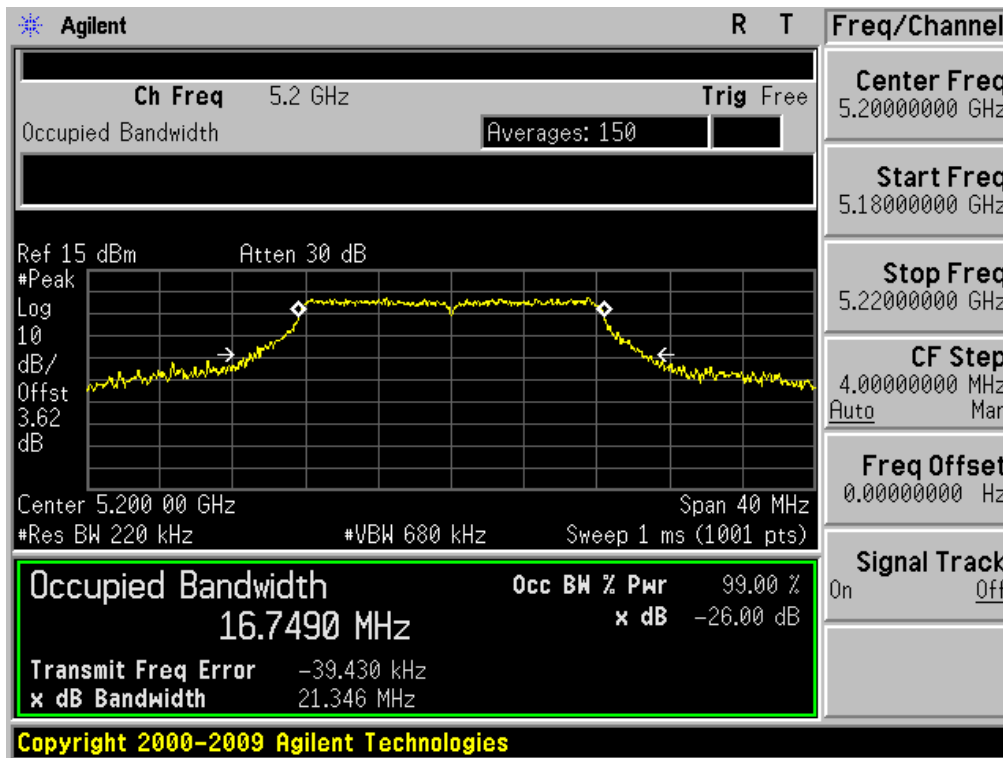
26 dB Bandwidth

Test Mode: 802.11a & Ch.36



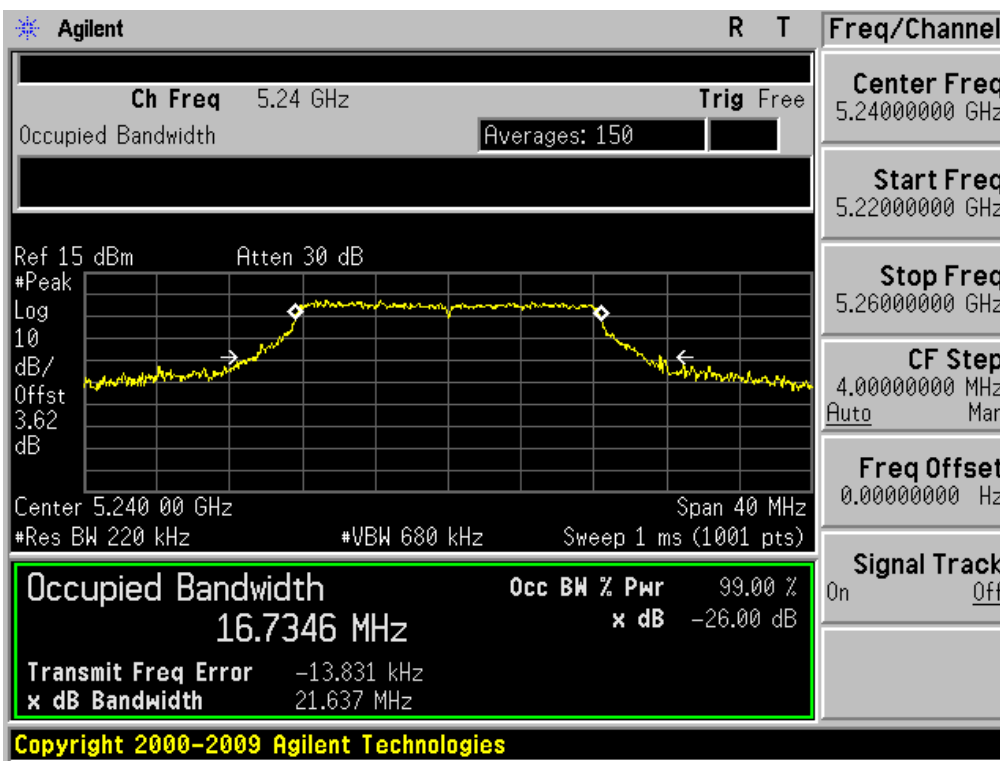
26 dB Bandwidth

Test Mode: 802.11a & Ch.40



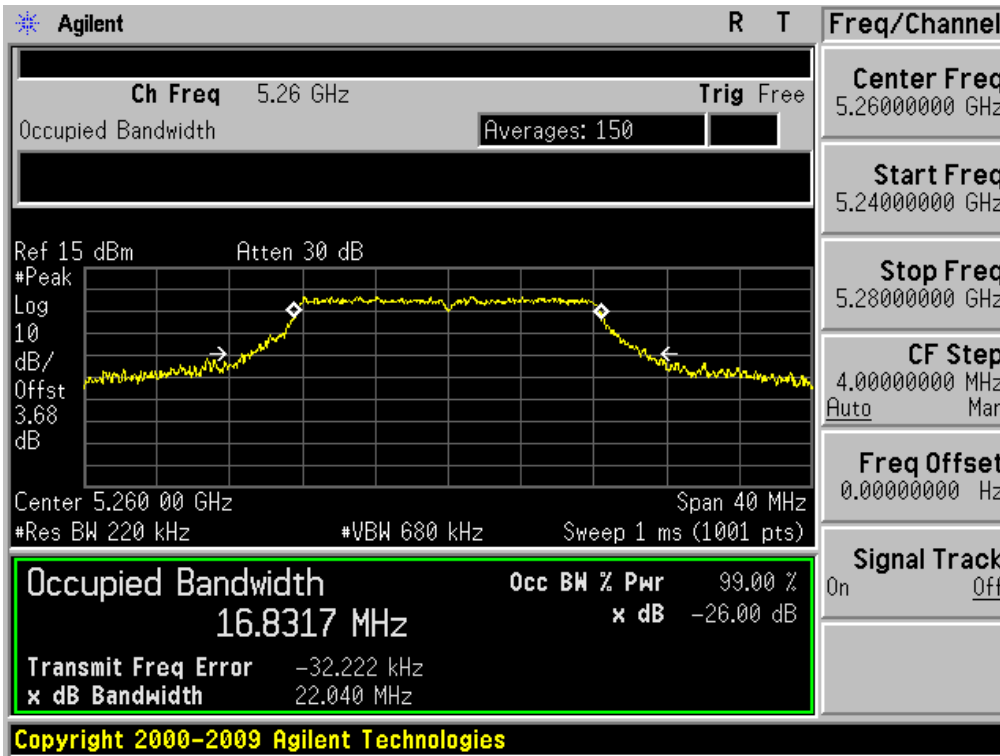
26 dB Bandwidth

Test Mode: 802.11a & Ch.48



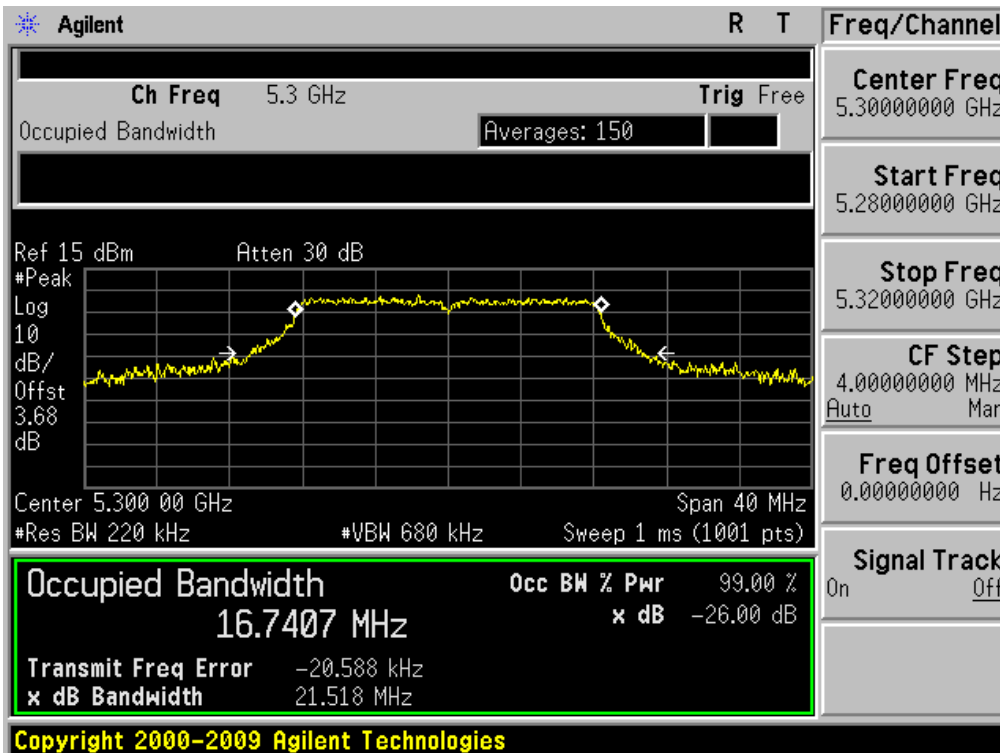
26 dB Bandwidth

Test Mode: 802.11a & Ch.52



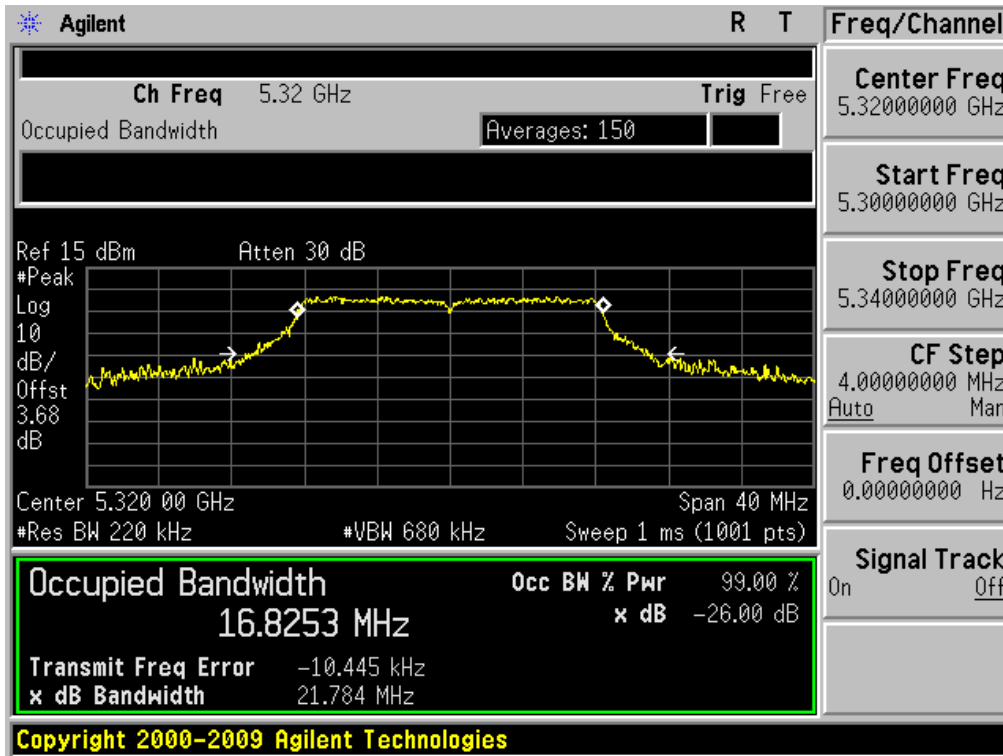
26 dB Bandwidth

Test Mode: 802.11a & Ch.60



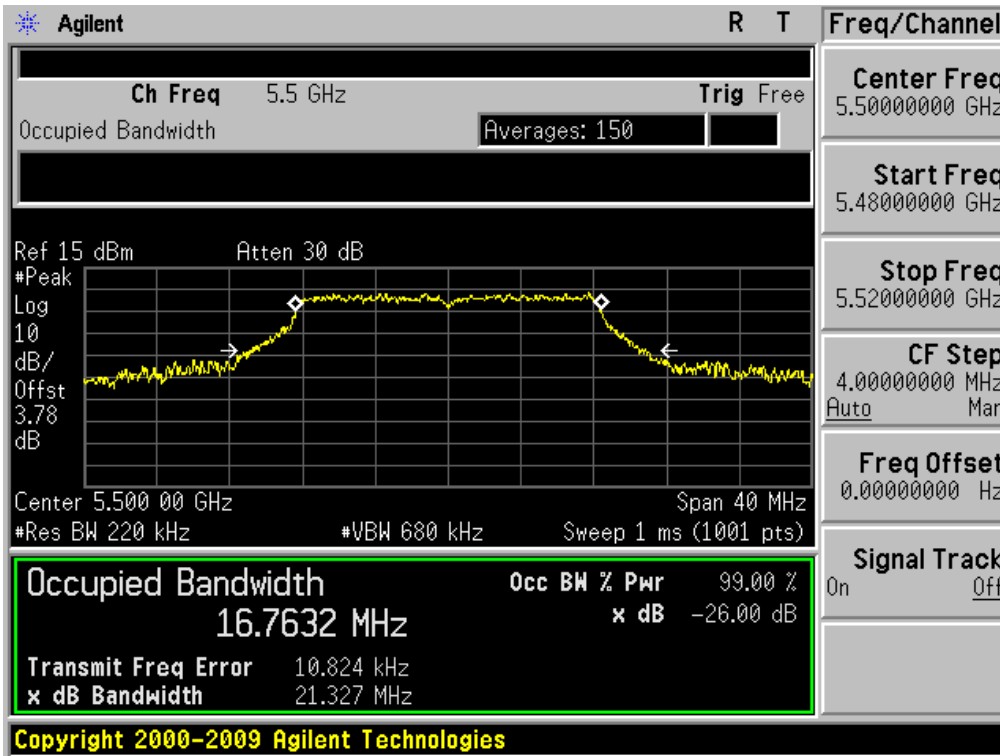
26 dB Bandwidth

Test Mode: 802.11a & Ch.64



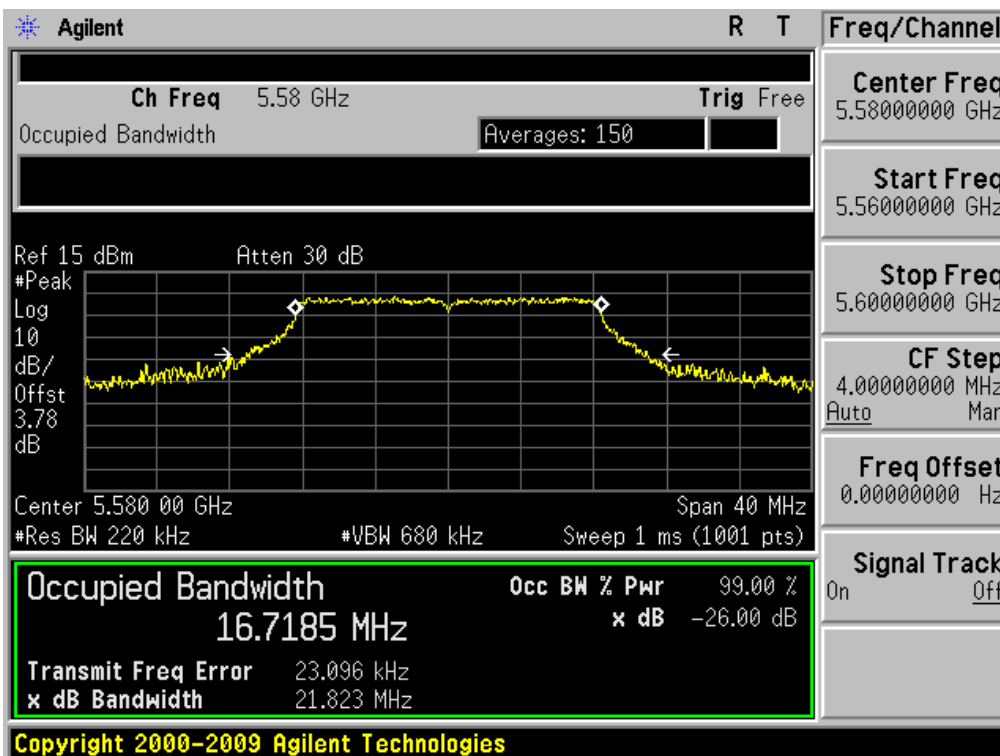
26 dB Bandwidth

Test Mode: 802.11a & Ch.100



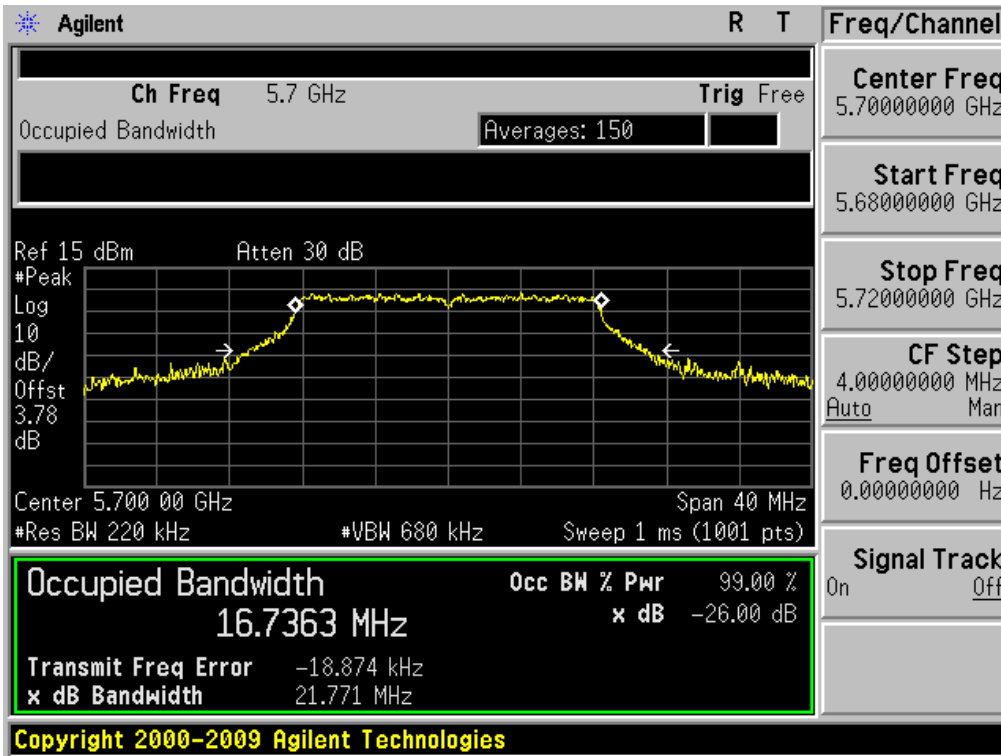
26 dB Bandwidth

Test Mode: 802.11a & Ch.116



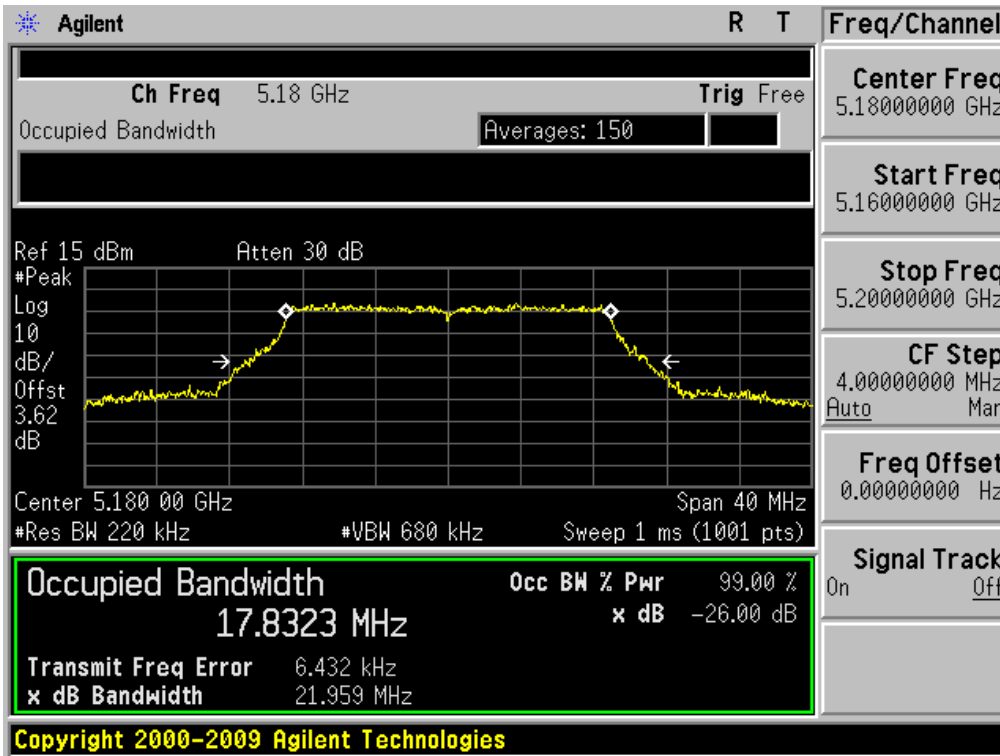
26 dB Bandwidth

Test Mode: 802.11a & Ch.140



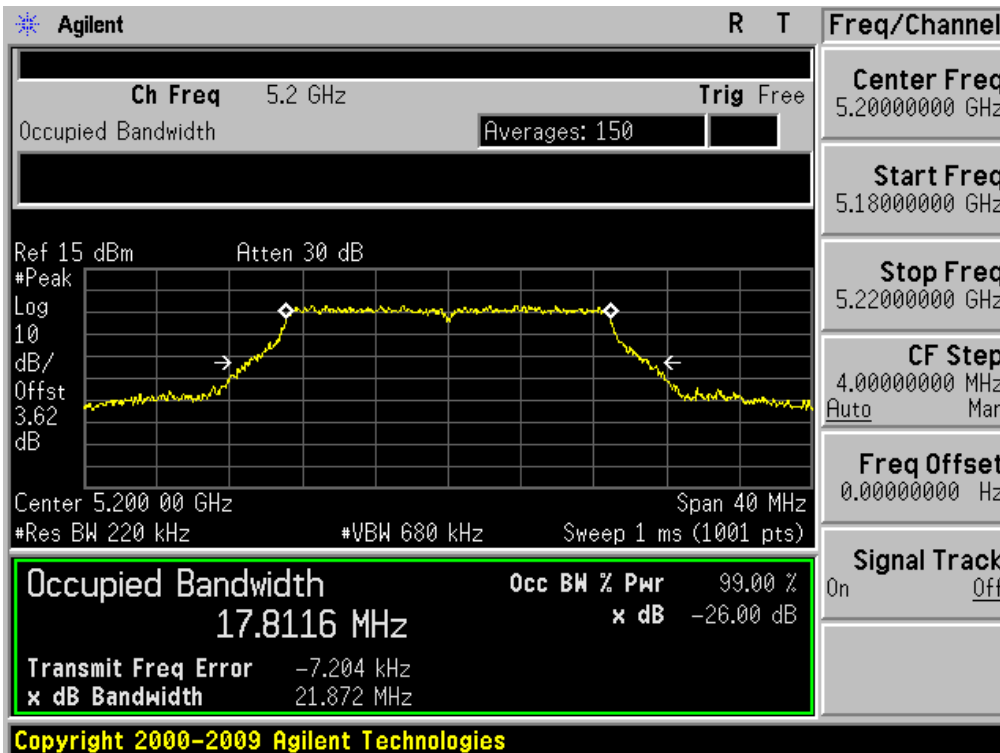
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.36



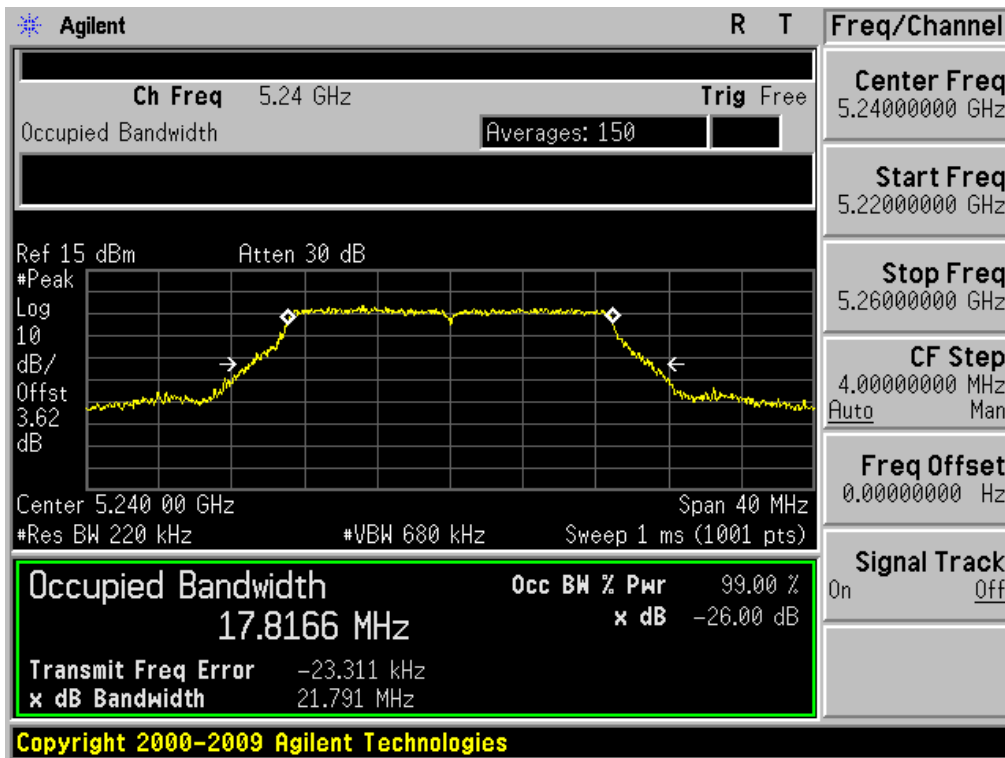
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.40



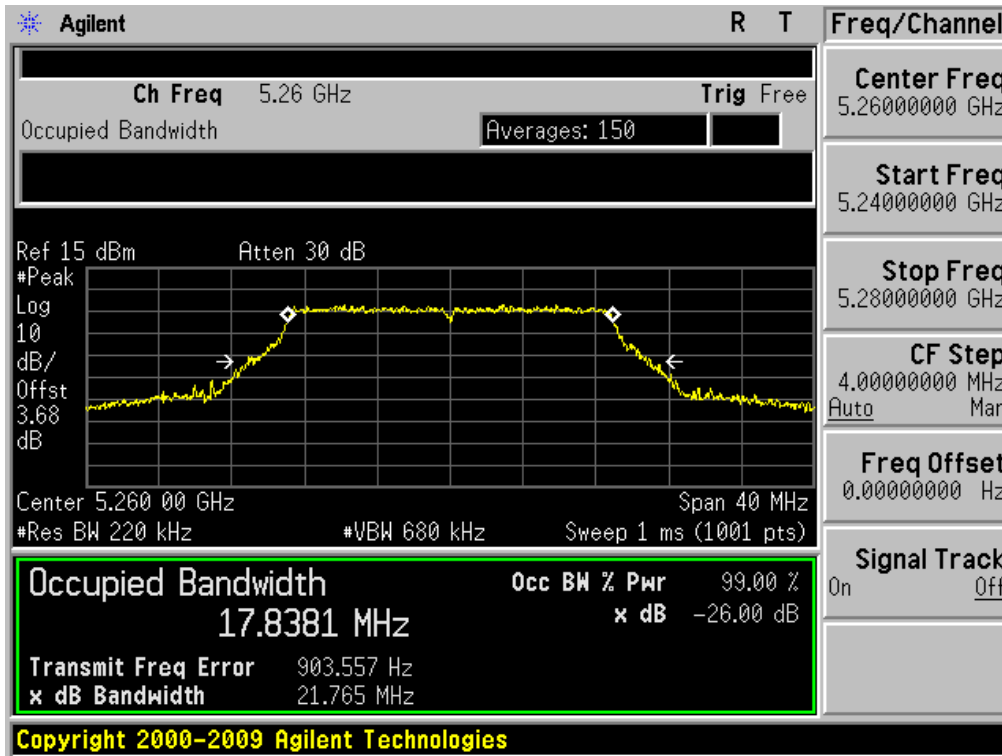
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.48



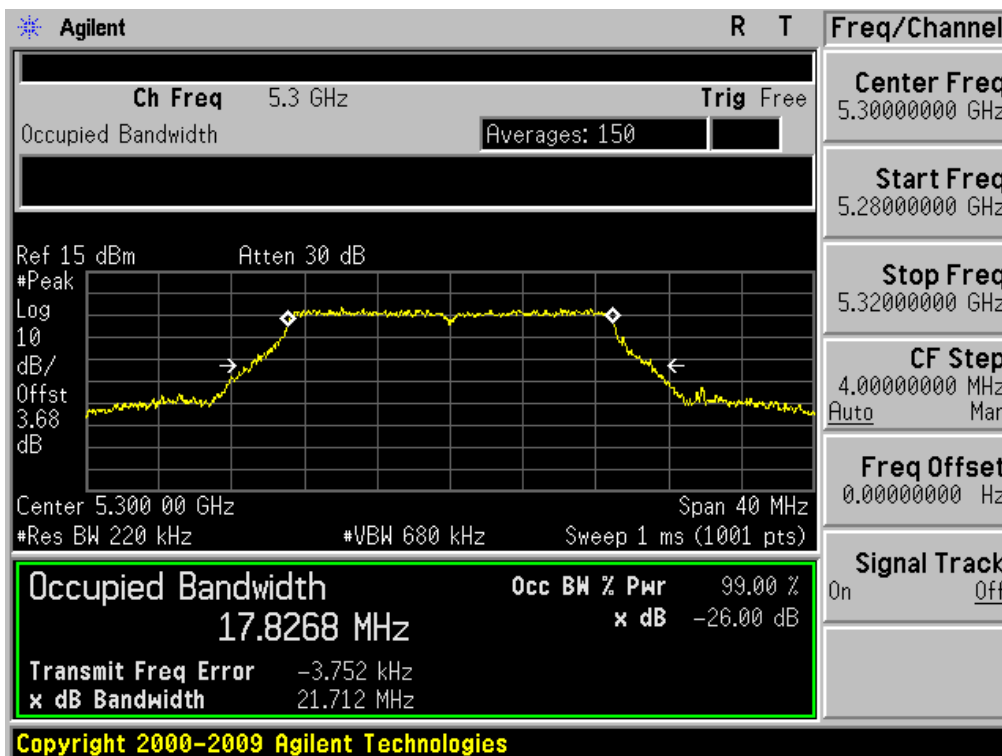
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.52



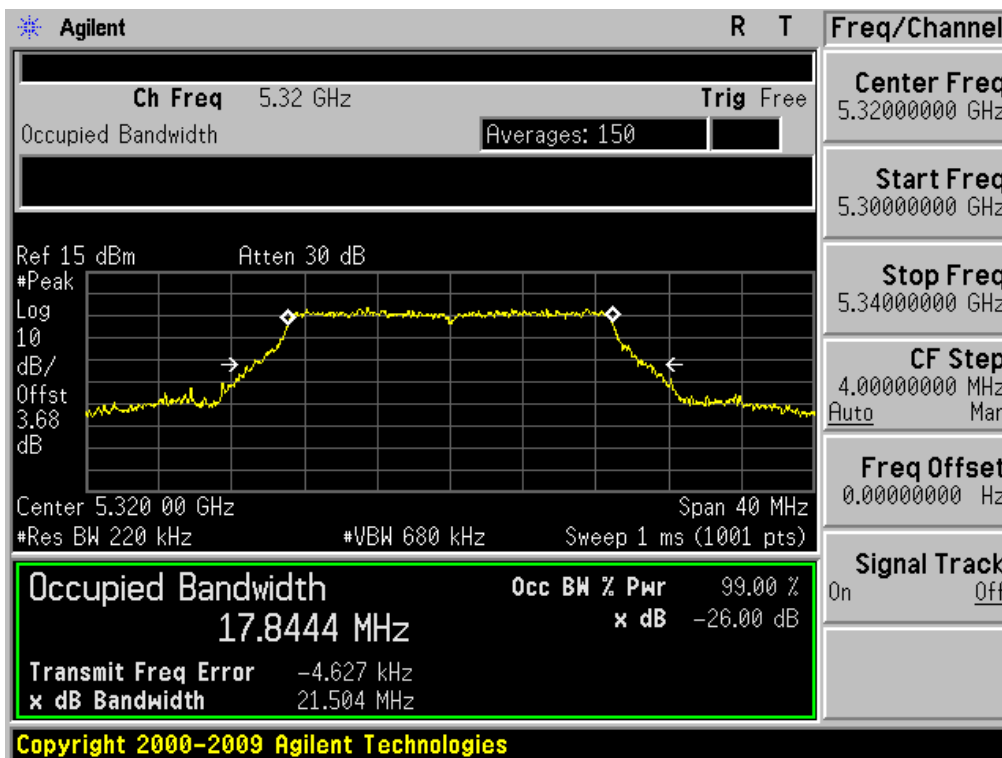
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.60



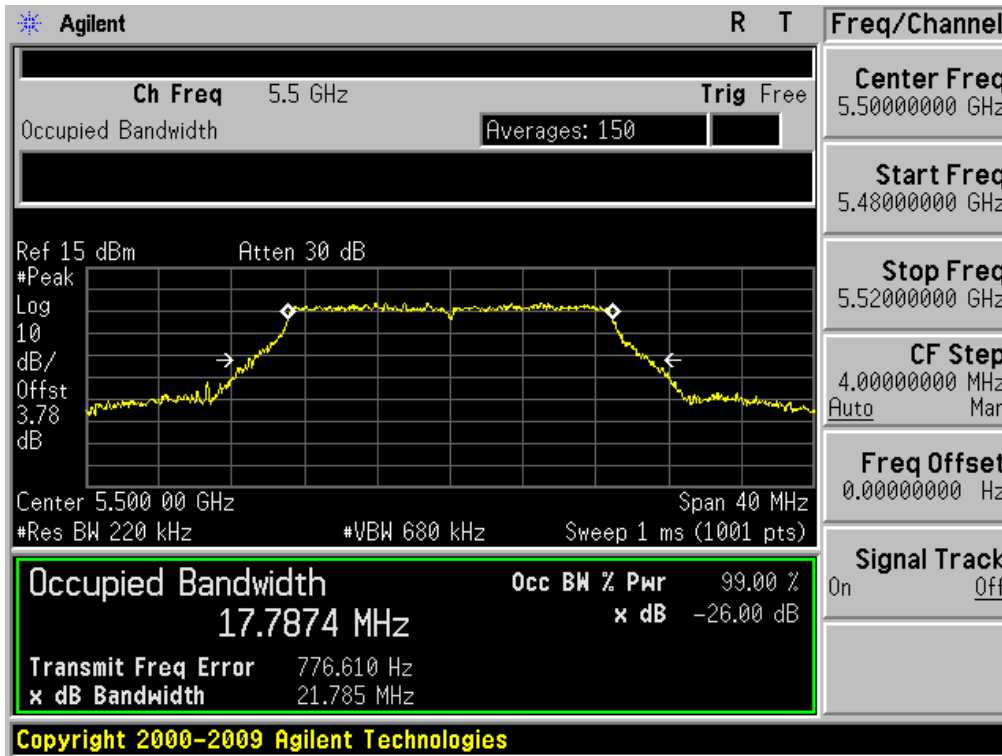
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.64



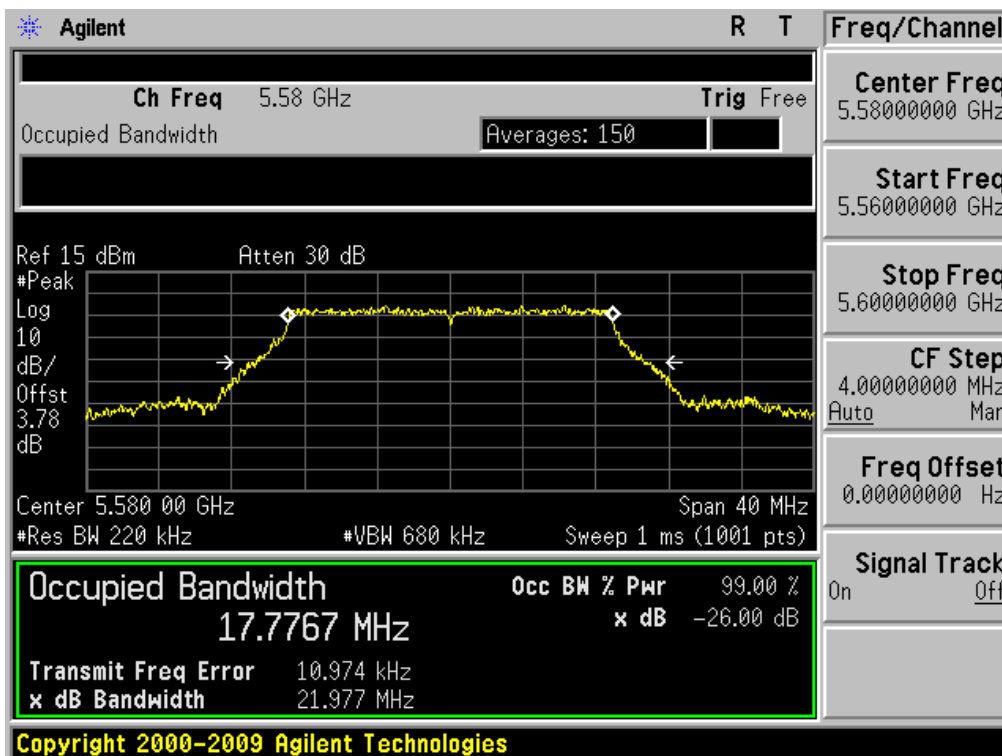
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.100



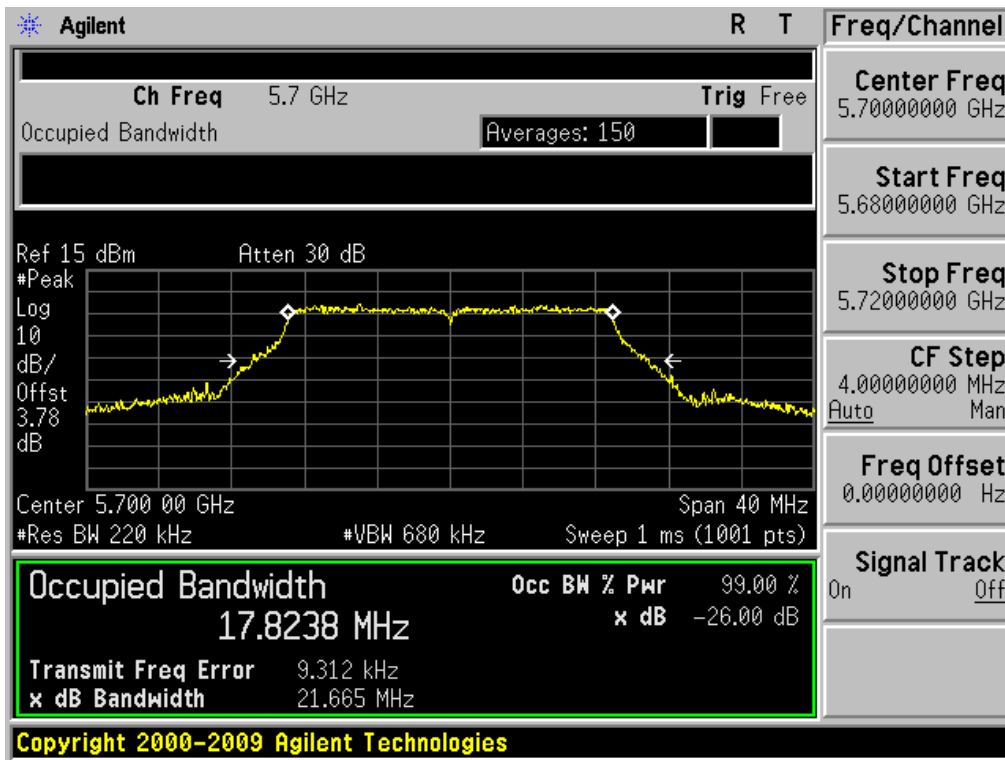
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.116



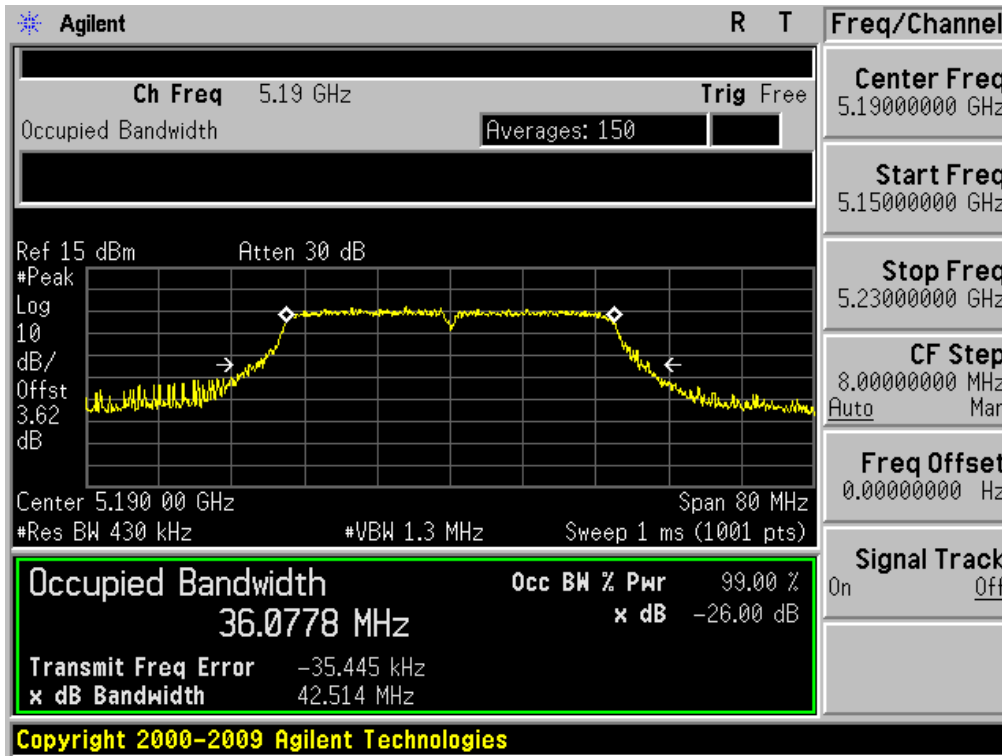
26 dB Bandwidth

Test Mode: 802.11n-HT20 & Ch.140



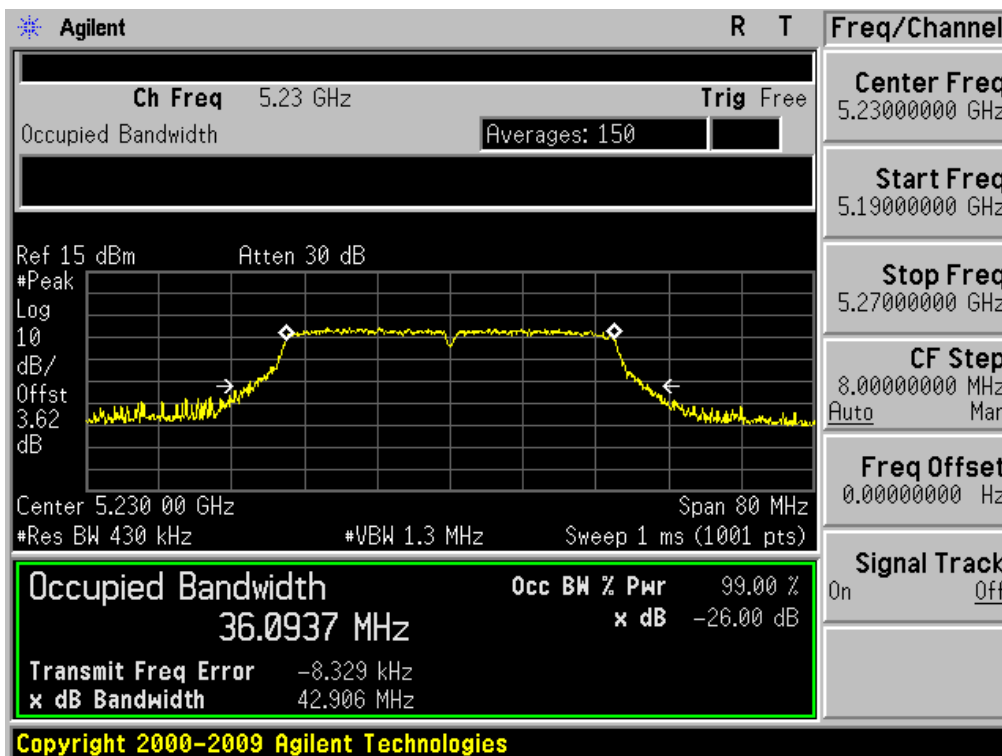
26 dB Bandwidth

Test Mode: 802.11n-HT40 & Ch.38



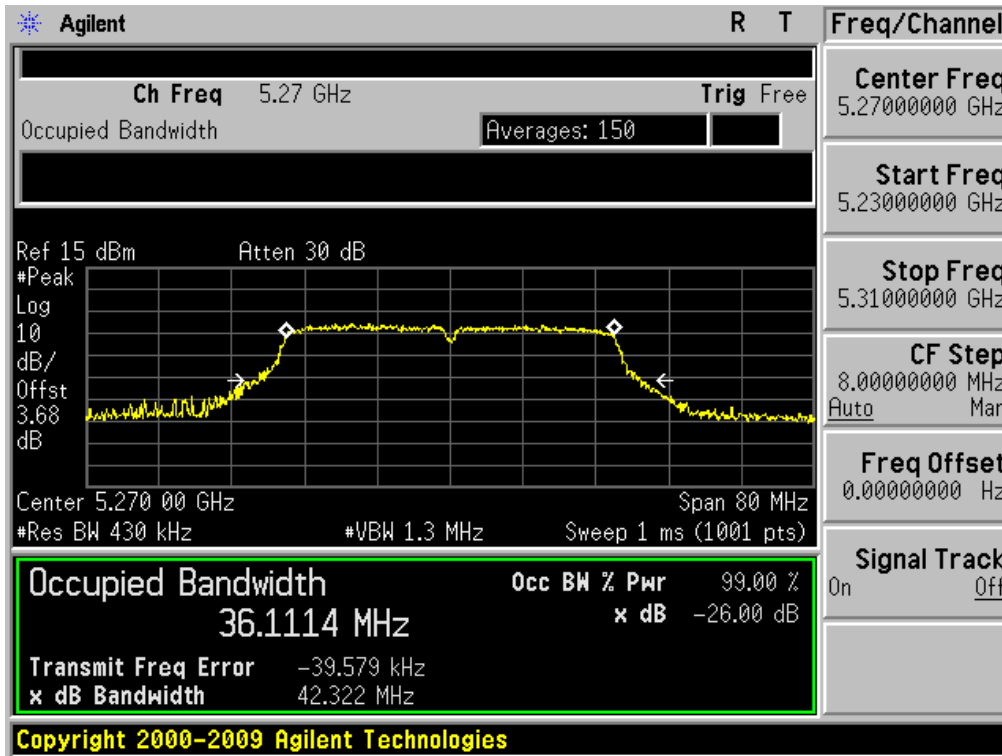
26 dB Bandwidth

Test Mode: 802.11n-HT40 & Ch.46



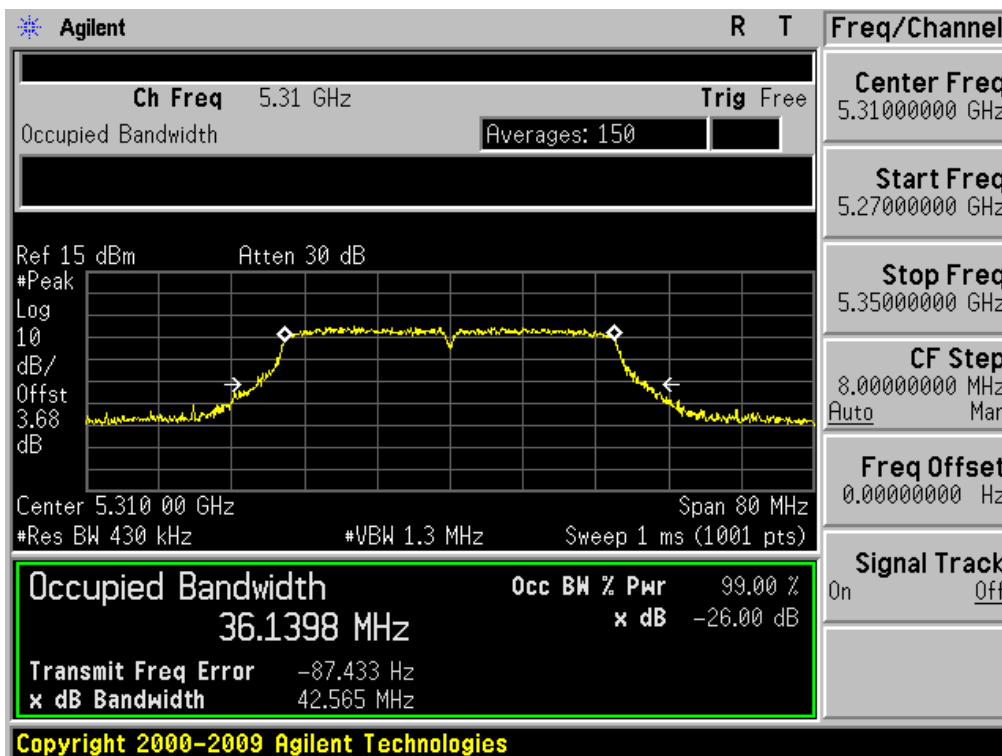
26 dB Bandwidth

Test Mode: 802.11n-HT40 & Ch.54



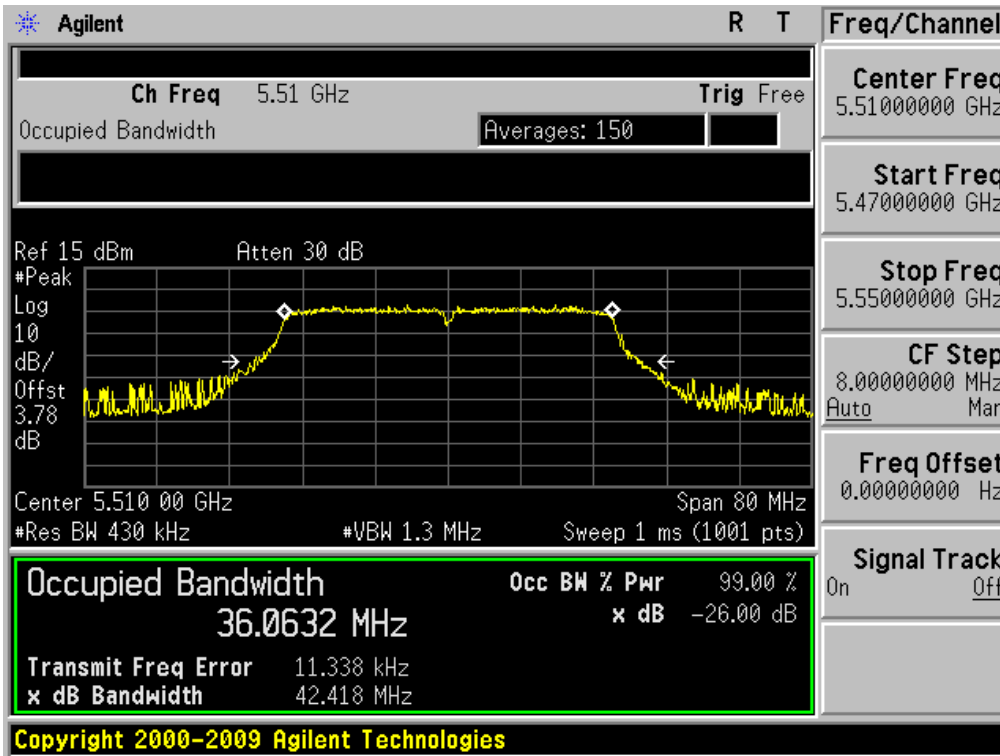
26 dB Bandwidth

Test Mode: 802.11n-HT40 & Ch.62



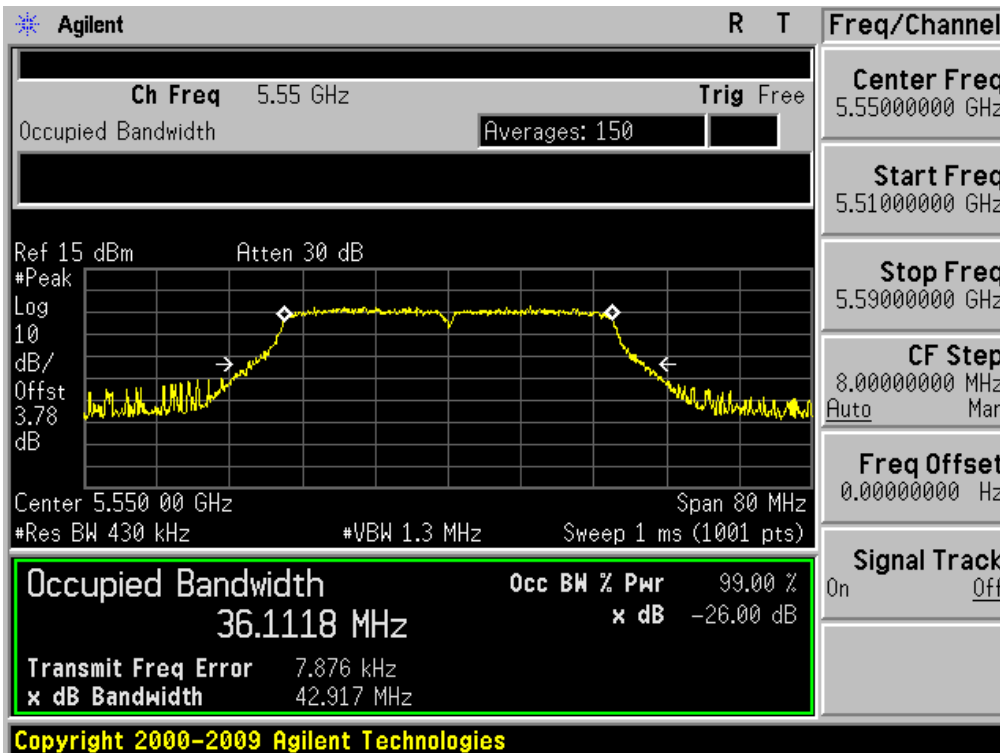
26 dB Bandwidth

Test Mode: 802.11n-HT40 & Ch.102



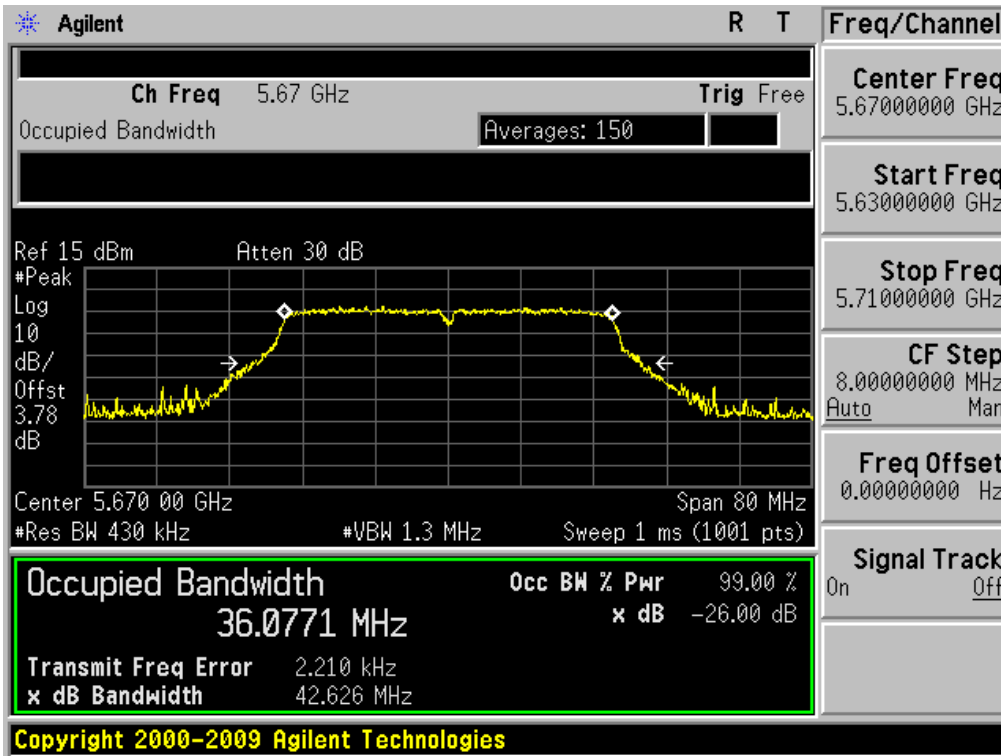
26 dB Bandwidth

Test Mode: 802.11n-HT40 & Ch.110



26 dB Bandwidth

Test Mode: 802.11n-HT40 & Ch.134



3.2.2 Output Power

Test Requirements

- (1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26 dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

- Output power Limit Calculation

Bands	Mode	Power Limit [mW]	Calculated Limit [dBm]	ANT Gain	Determined Limit [dBm]
		Least 26dBC BW [MHz]			
Band I	802.11a	50	16.98	-1.19	16.98
		21.346	17.29		
	802.11n HT20	50	16.98		16.98
		21.791	17.38		
	802.11n HT40	50	16.98		16.98
		42.514	20.28		

Bands	Mode	Power Limit [mW]	Calculation Limit [dBm]	ANT Gain	Determined Limit [dBm]
		Least 26dBC BW [MHz]			
Band II	802.11a	250	23.97	-1.19	23.97
		21.518	24.32		
	802.11n HT20	250	23.97		23.97
		21.504	24.32		
	802.11n HT40	250	23.97		23.97
		42.322	27.26		
Band III	802.11a	250	23.97	-1.19	23.97
		21.327	24.28		
	802.11n HT20	250	23.97		23.97
		21.665	24.35		
	802.11n HT40	250	23.97		23.97
		42.418	27.27		

■ TEST CONFIGURATION

Refer to the APPENDIX I.

■ TEST PROCEDURE:

Maximum Conducted Output Power is measured using Measurement Procedure **Method SA-2 of KDB789033**

1. Set the **RBW = 1 MHz**.
2. Set the **VBW ≥ 3 MHz**.
3. Set **SPAN to encompass the entire EBW** of signal.
4. Detector = **RMS (power averaging)**
5. Sweep time = **auto couple**.
6. **Trace average at least 100 traces in power averaging**.
7. **Compute power by integrating the spectrum across the 26 dB EBW** of the signal using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges.
8. **Add 10 log(1/x), where x is the duty cycle**, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission)

■ TEST RESULTS : **Comply**

Mode	Channel	Frequency [MHz]	Reading [dBm]	Duty Cycle			DCF [dB]	Test Result [dBm]
				On Time[ms]	On+Off Time[ms]	X		
802.11a	36	5180	12.230	2.030	2.130	0.95	0.23	12.460
	40	5200	12.160					12.390
	48	5240	12.150					12.380
	52	5260	12.670	2.030	2.130	0.95	0.23	12.900
	60	5300	12.210					12.440
	64	5320	12.400					12.630
	100	5500	13.100	2.030	2.130	0.95	0.23	13.330
	116	5580	13.780					14.010
140	5700	13.350	13.580					

Mode	Channel	Frequency [MHz]	Reading [dBm]	Duty Cycle			DCF [dB]	Result
				On Time[ms]	On+Off Time[ms]	X		
802.11n (20MHz)	36	5180	8.150	1.890	1.990	0.94	0.27	8.420
	40	5200	8.210					8.480
	48	5240	8.120					8.390
	52	5260	8.000	1.890	1.990	0.94	0.27	8.270
	60	5300	8.250					8.520
	64	5320	8.140					8.410
	100	5500	8.760	1.890	1.990	0.94	0.27	9.030
	116	5580	9.580					9.850
140	5700	8.960	9.230					
802.11n (40MHz)	38	5190	6.790	0.930	0.980	0.94	0.27	7.060
	46	5230	6.540					6.810
	54	5270	6.750	0.930	0.980	0.94	0.27	7.020
	62	5310	6.500					6.770
	102	5510	7.690	0.930	0.980	0.94	0.27	7.960
	110	5550	7.380					7.650
134	5670	7.020	7.290					

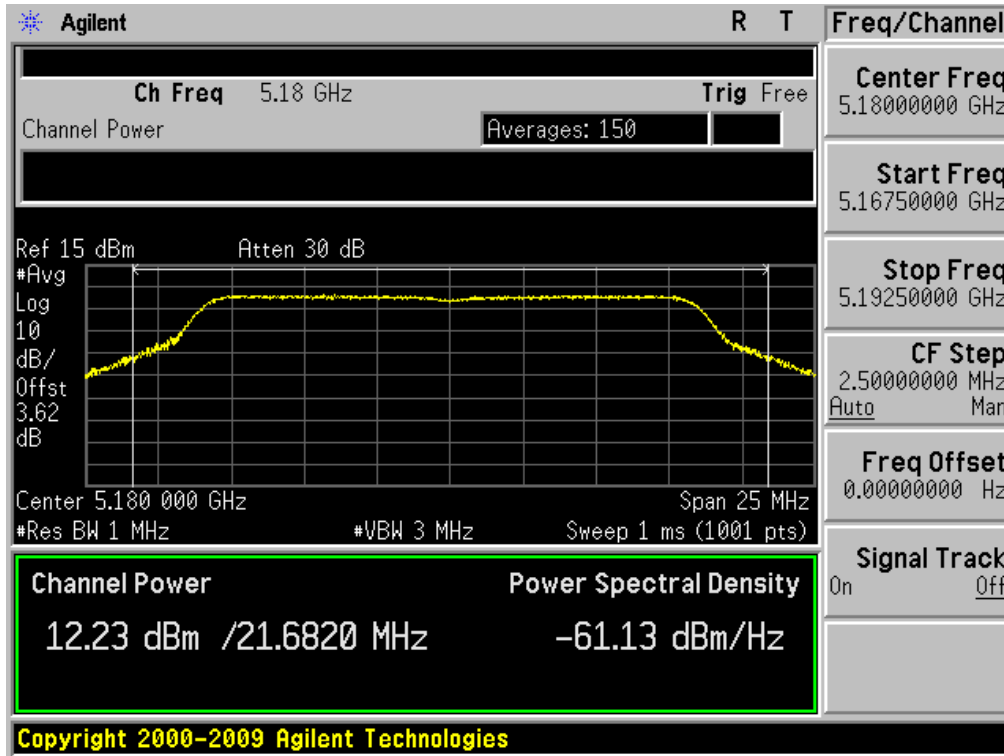
Note 1 : DCF = 10log(1 / X), X = On Time / (On+Off time)

Note 2 : Test Result = Measurement Data + DCF

Measurement Data PLOTS

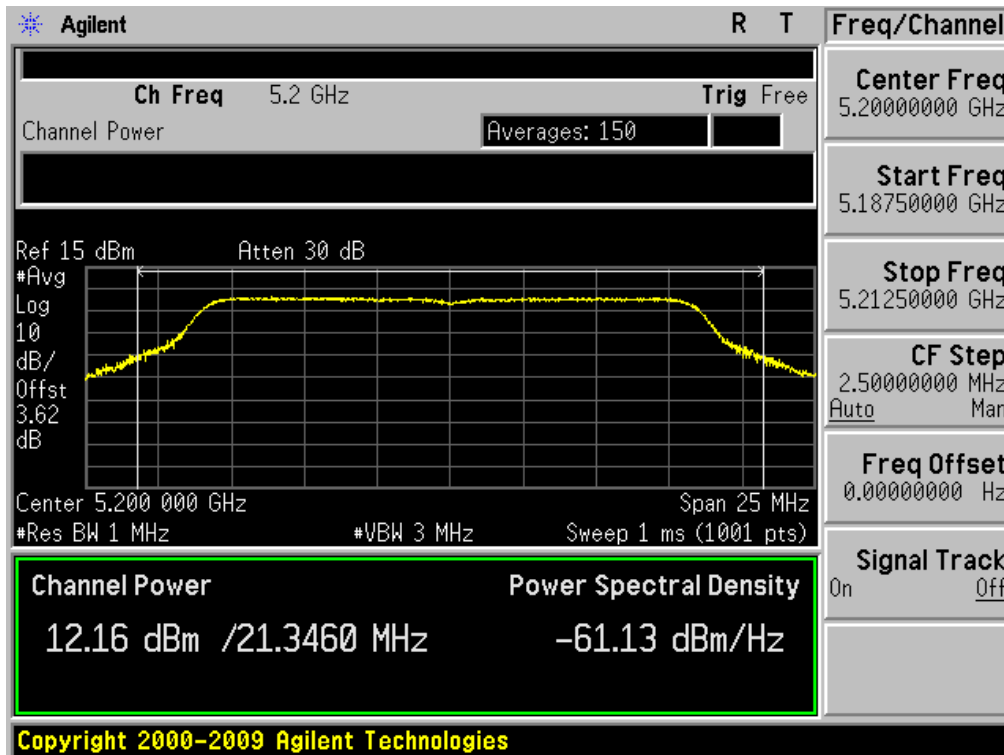
Output Power

Test Mode: 802.11a & Ch.36



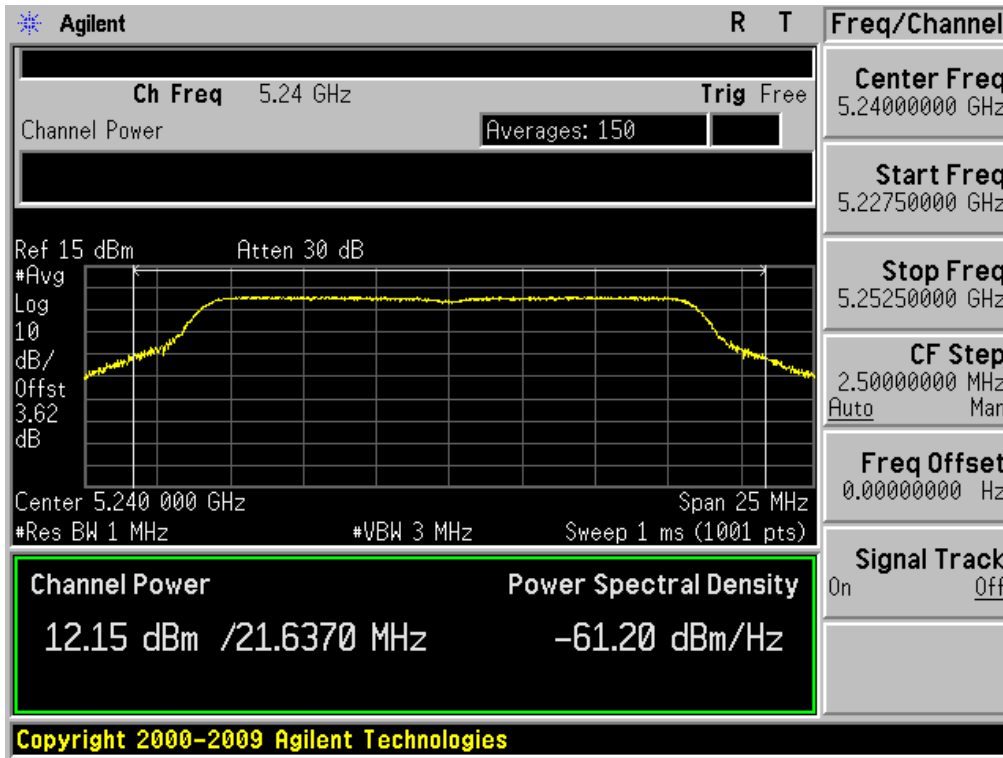
Output Power

Test Mode: 802.11a & Ch.40



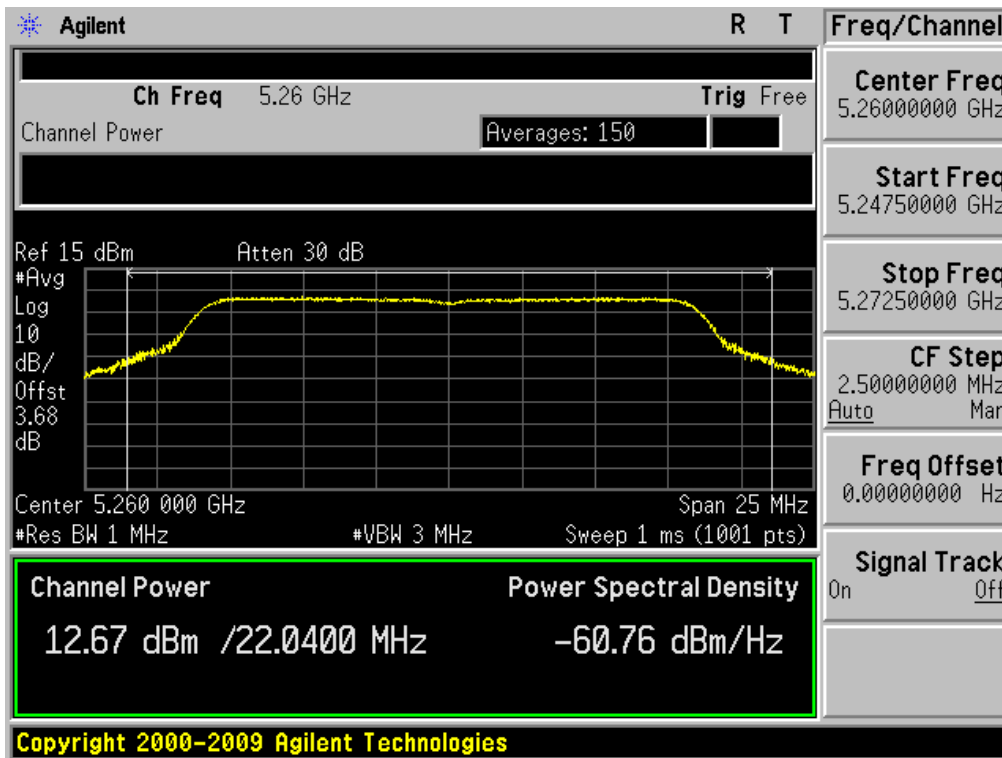
Output Power

Test Mode: 802.11a & Ch.48



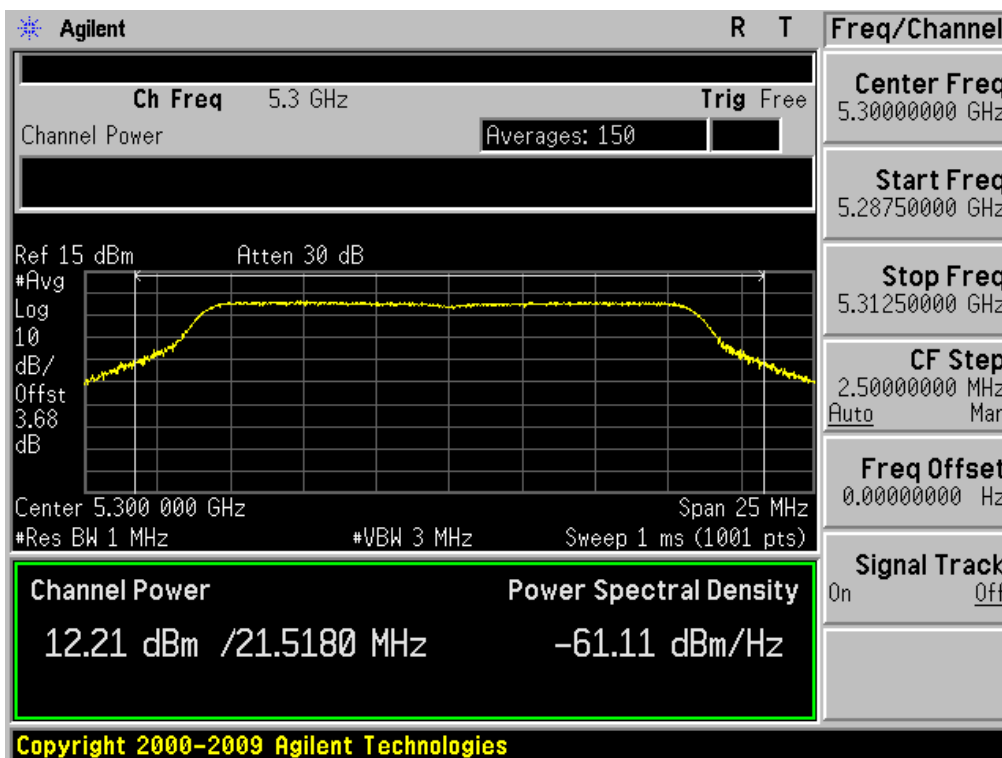
Output Power

Test Mode: 802.11a & Ch.52



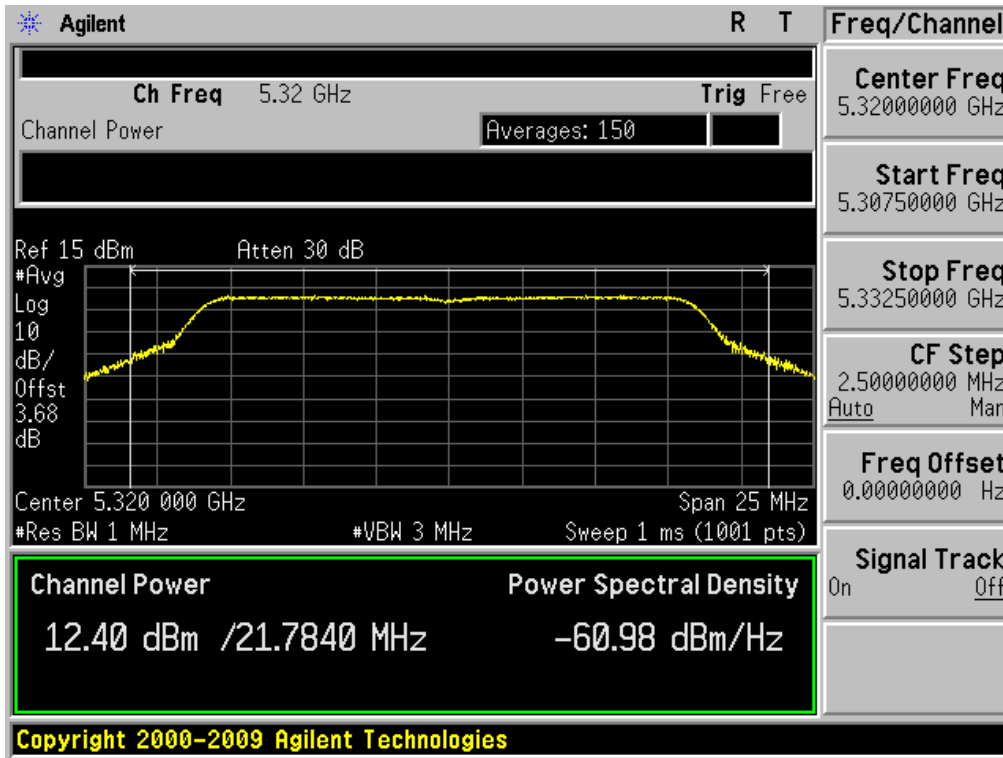
Output Power

Test Mode: 802.11a & Ch.60



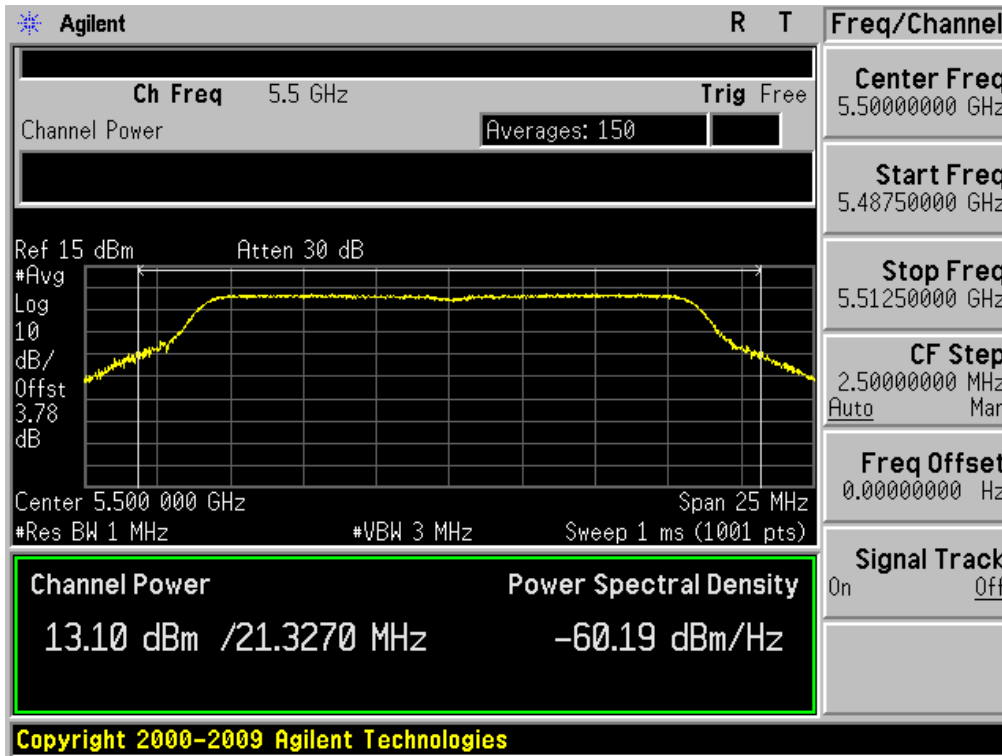
Output Power

Test Mode: 802.11a & Ch.64



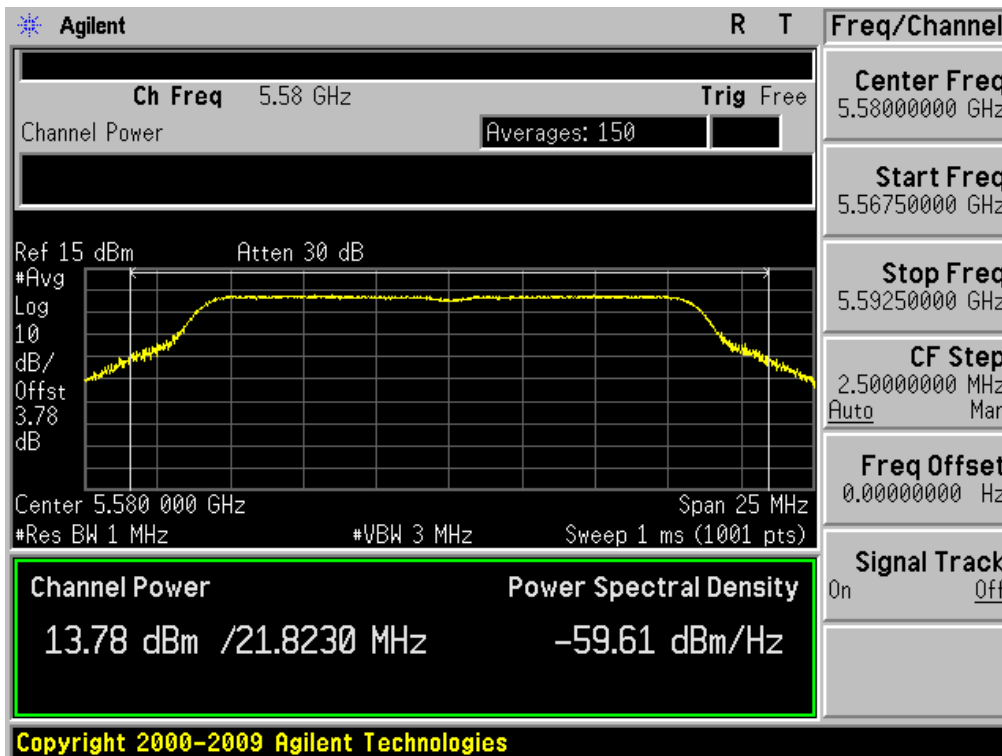
Output Power

Test Mode: 802.11a & Ch.100



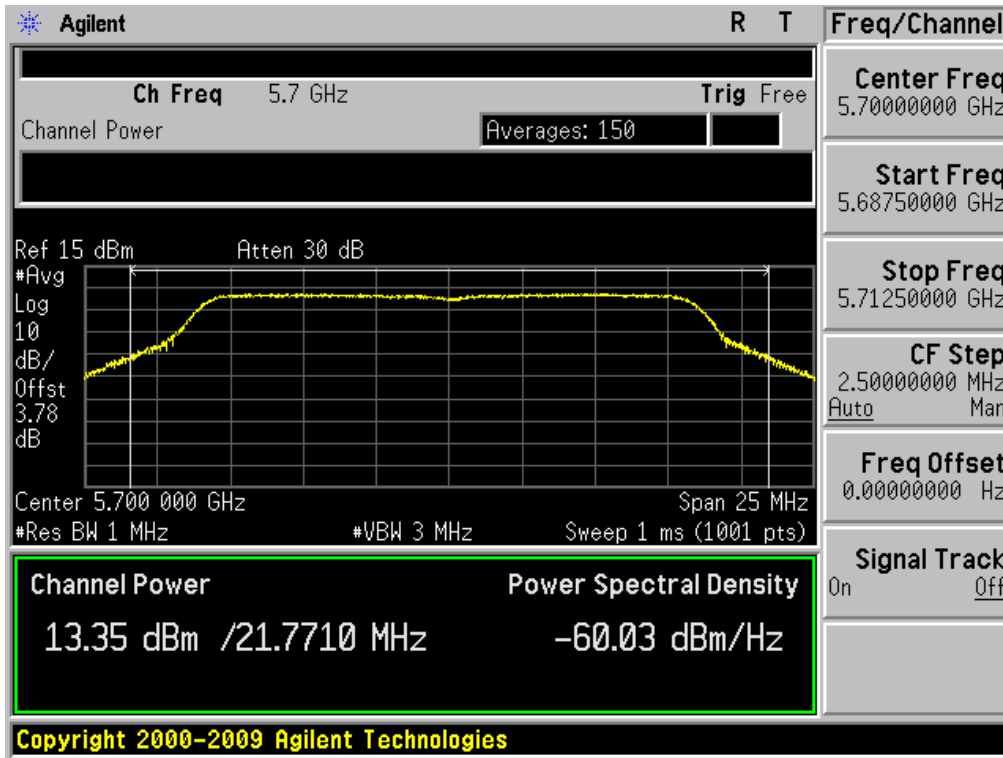
Output Power

Test Mode: 802.11a & Ch.116



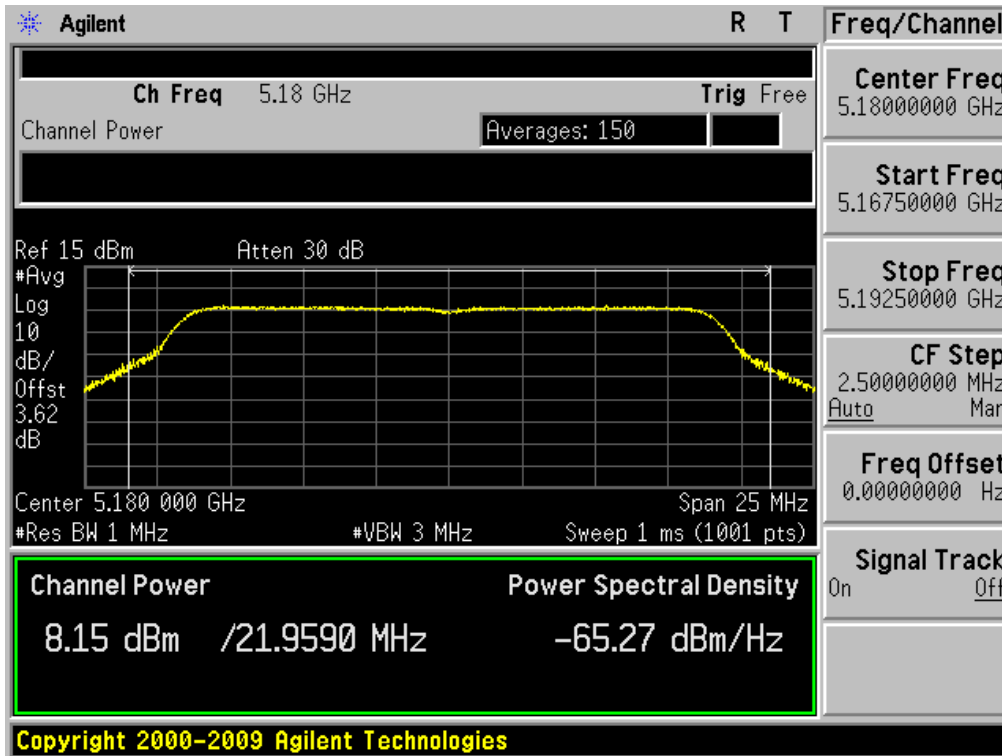
Output Power

Test Mode: 802.11a & Ch.140



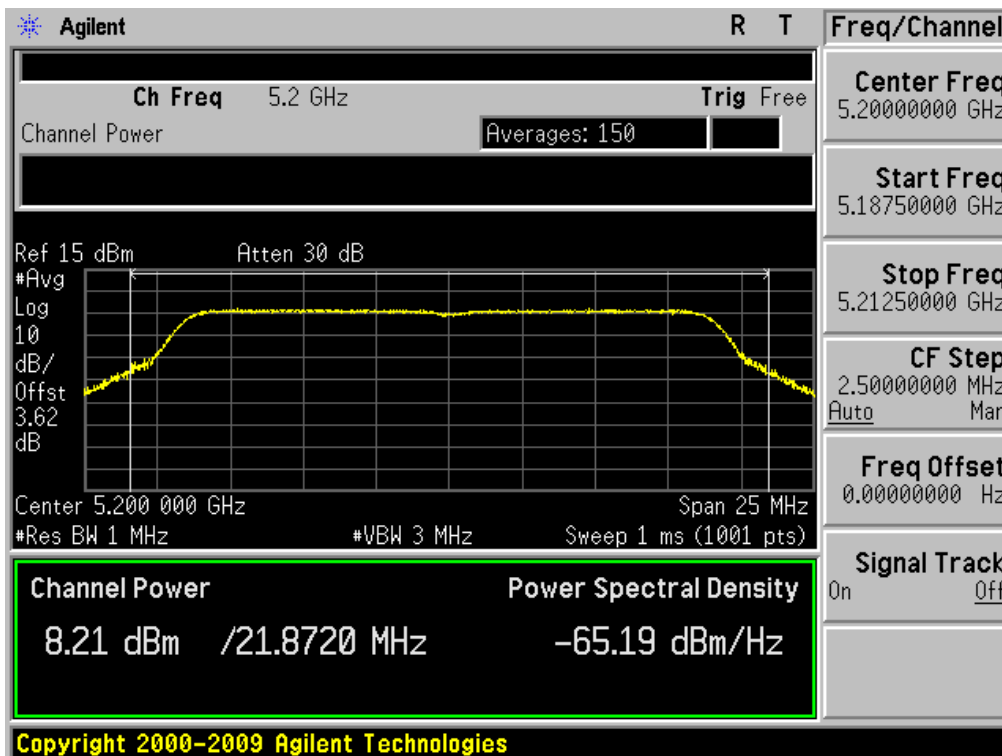
Output Power

Test Mode: 802.11n HT20 & Ch.36



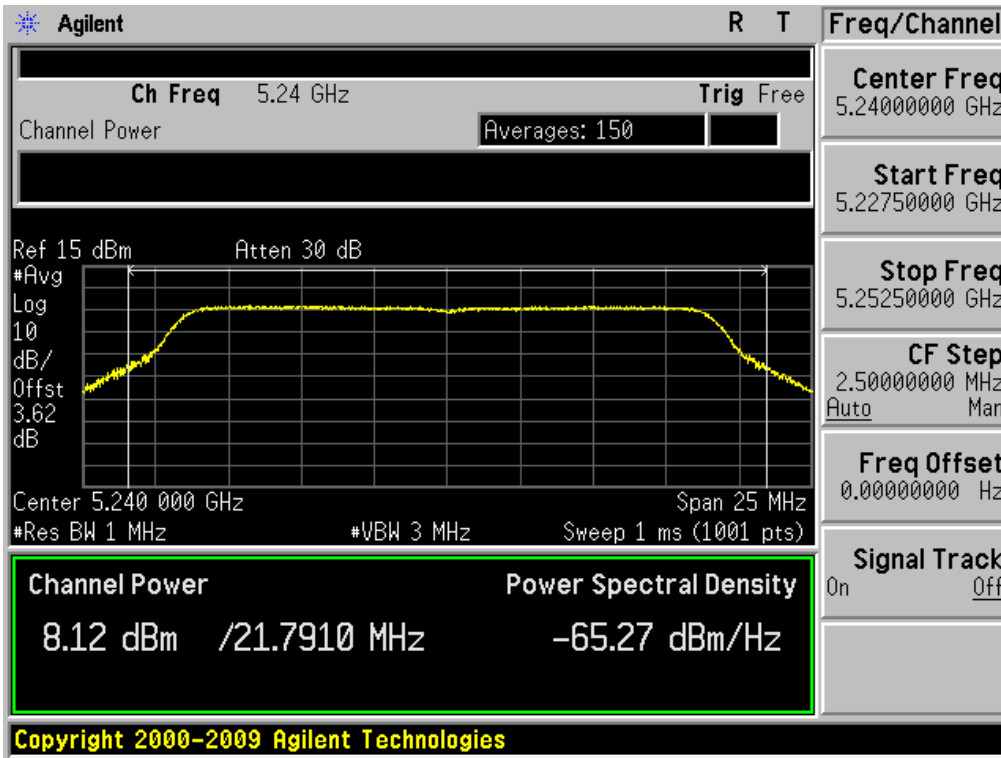
Output Power

Test Mode: 802.11n HT20 & Ch.40



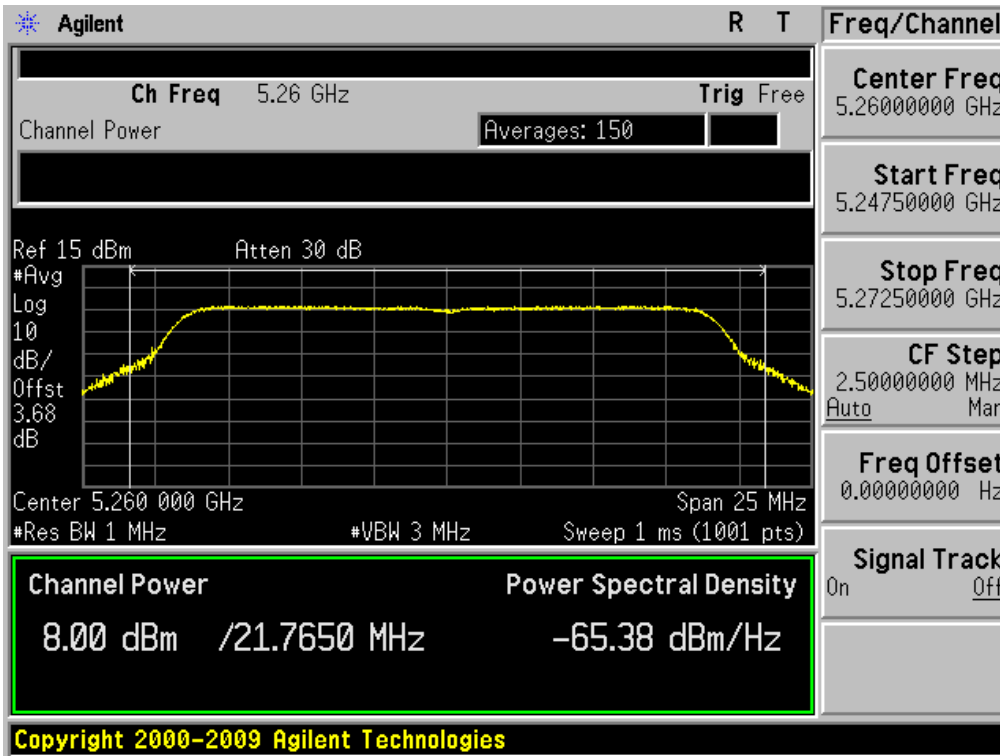
Output Power

Test Mode: 802.11n HT20 & Ch.48



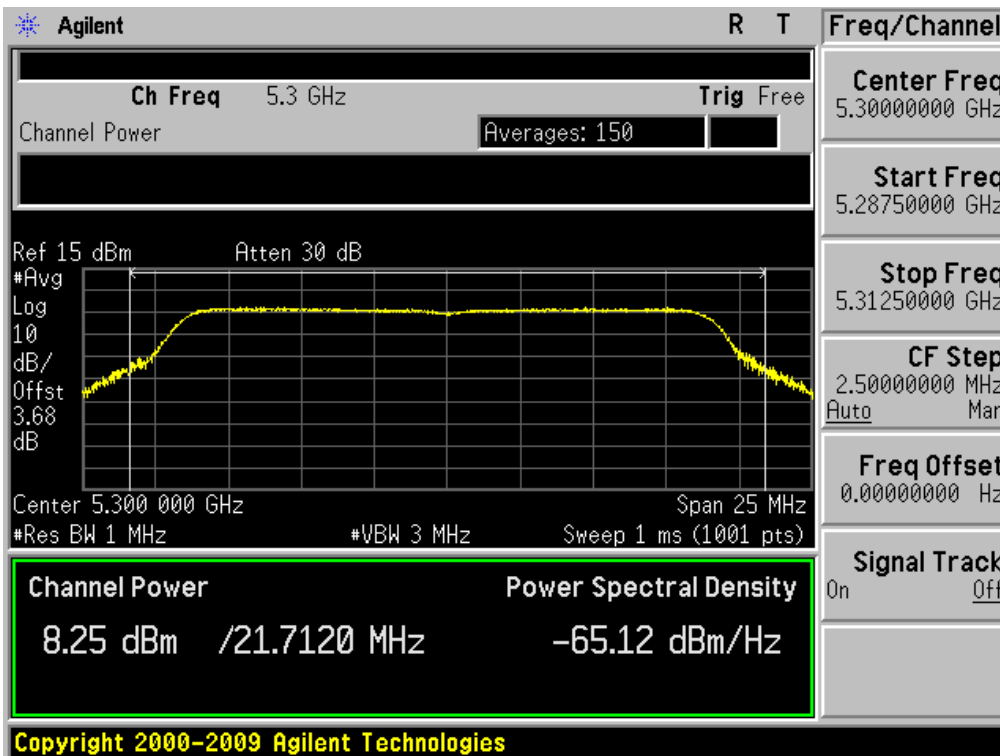
Output Power

Test Mode: 802.11n HT20 & Ch.52



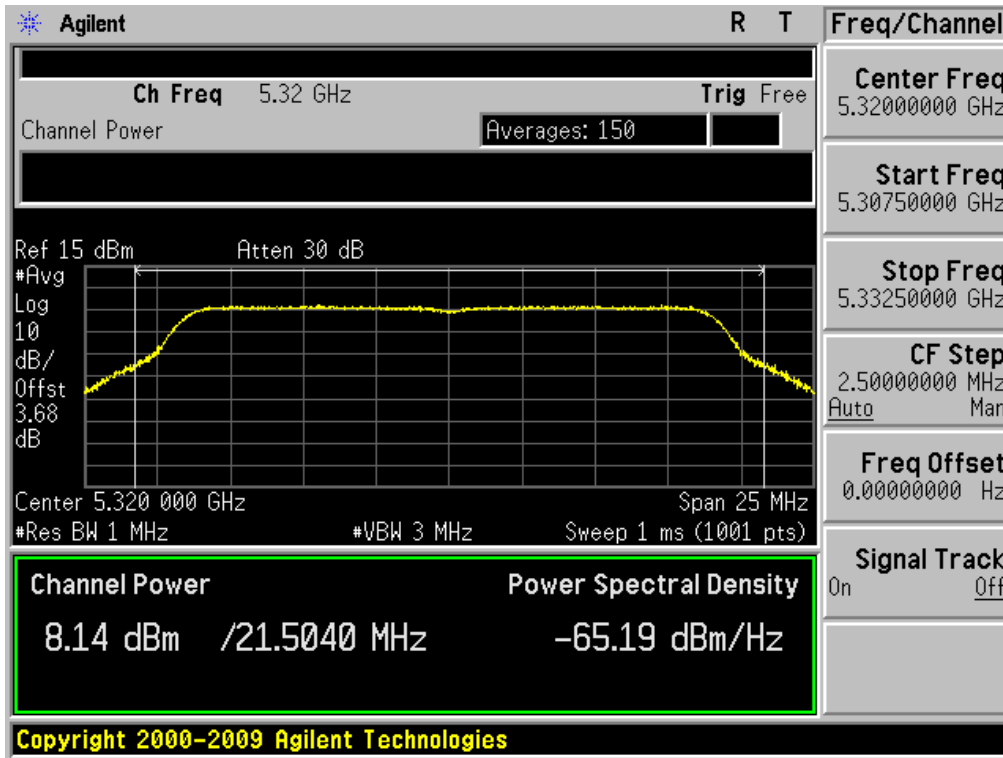
Output Power

Test Mode: 802.11n HT20 & Ch.60



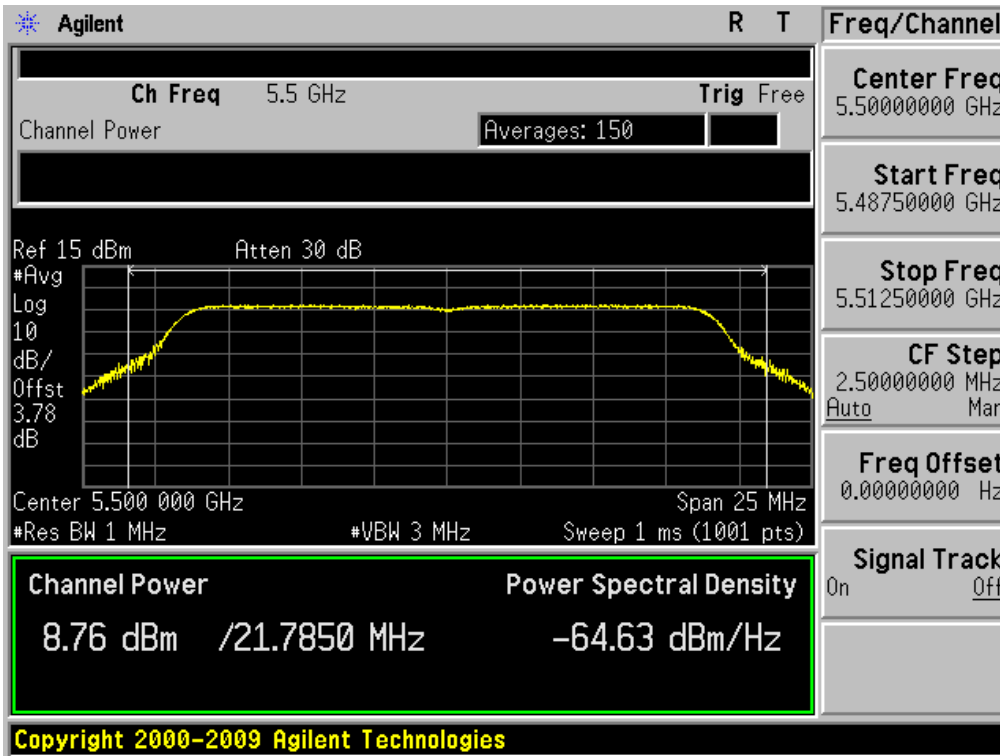
Output Power

Test Mode: 802.11n HT20 & Ch.64



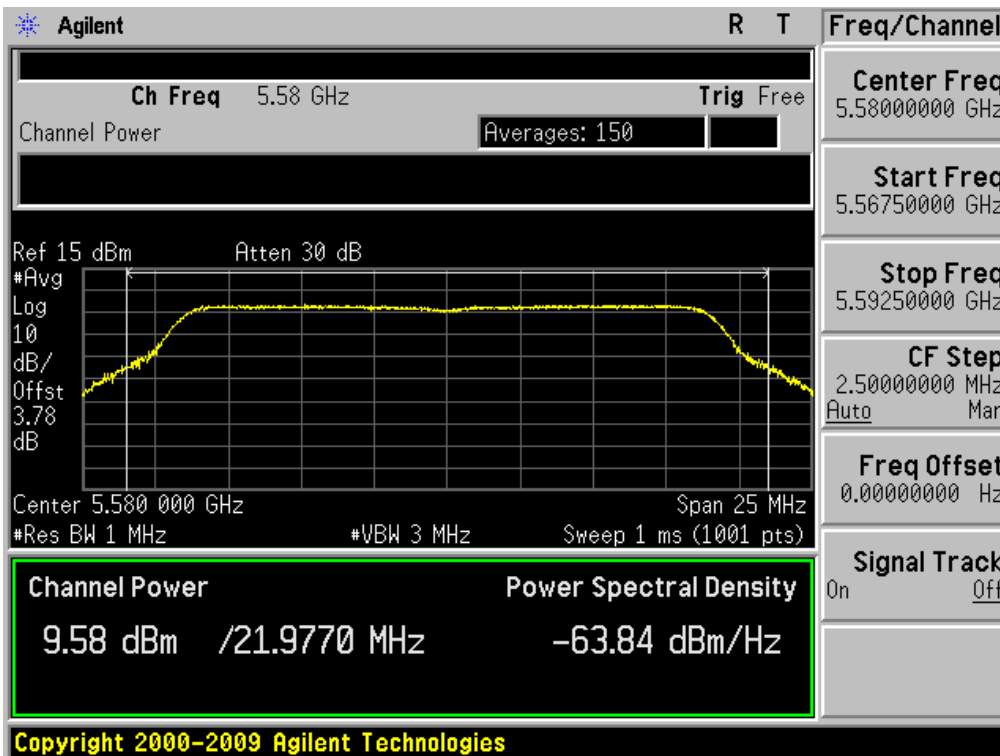
Output Power

Test Mode: 802.11n HT20 & Ch.100



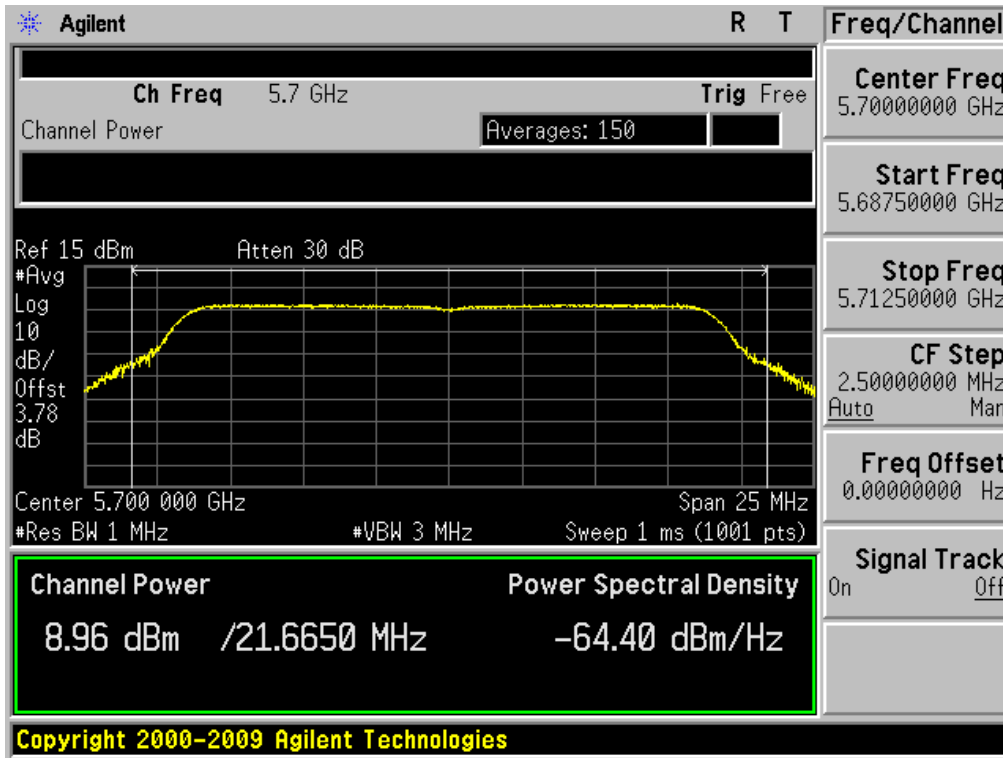
Output Power

Test Mode: 802.11n HT20 & Ch.116



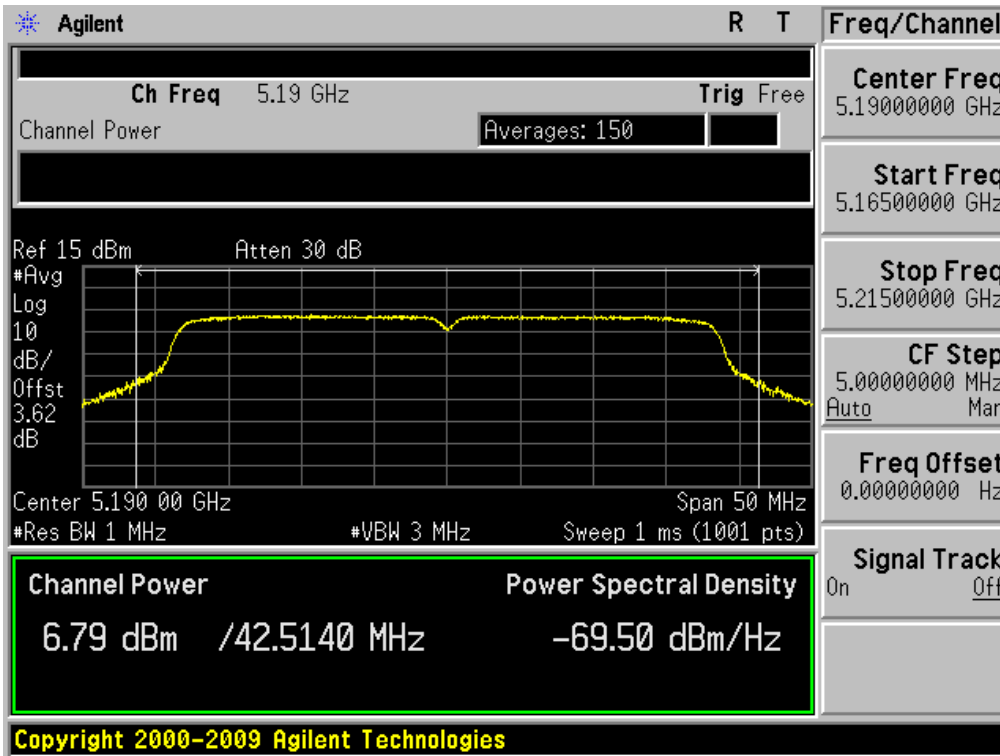
Output Power

Test Mode: 802.11n HT20 & Ch.140



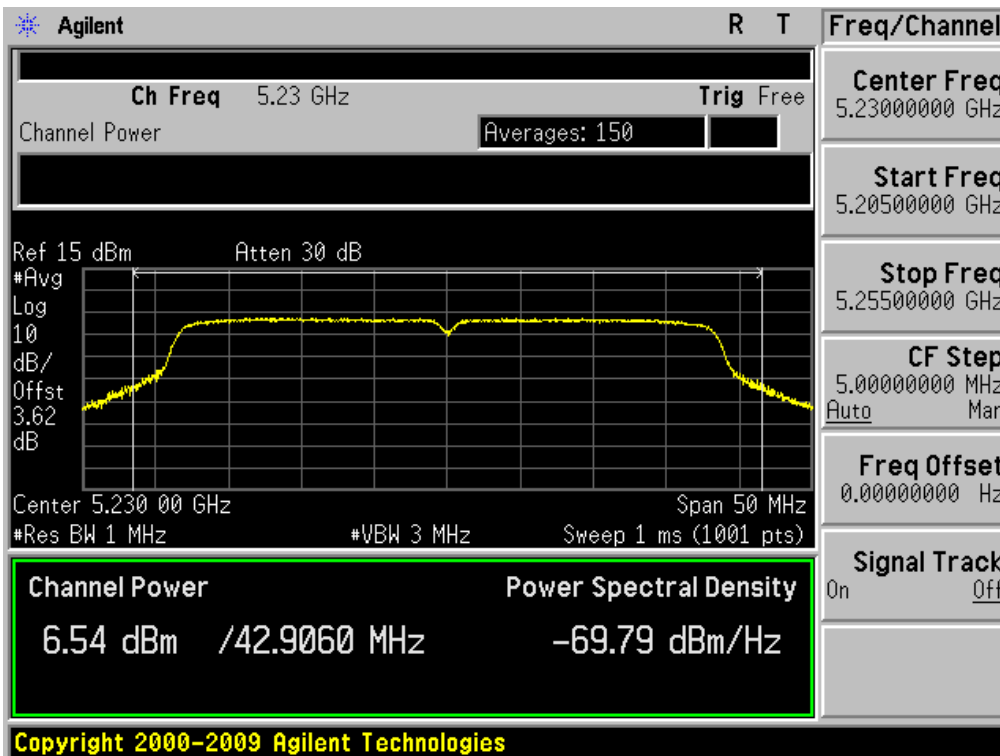
Output Power

Test Mode: 802.11n HT40 & Ch.38



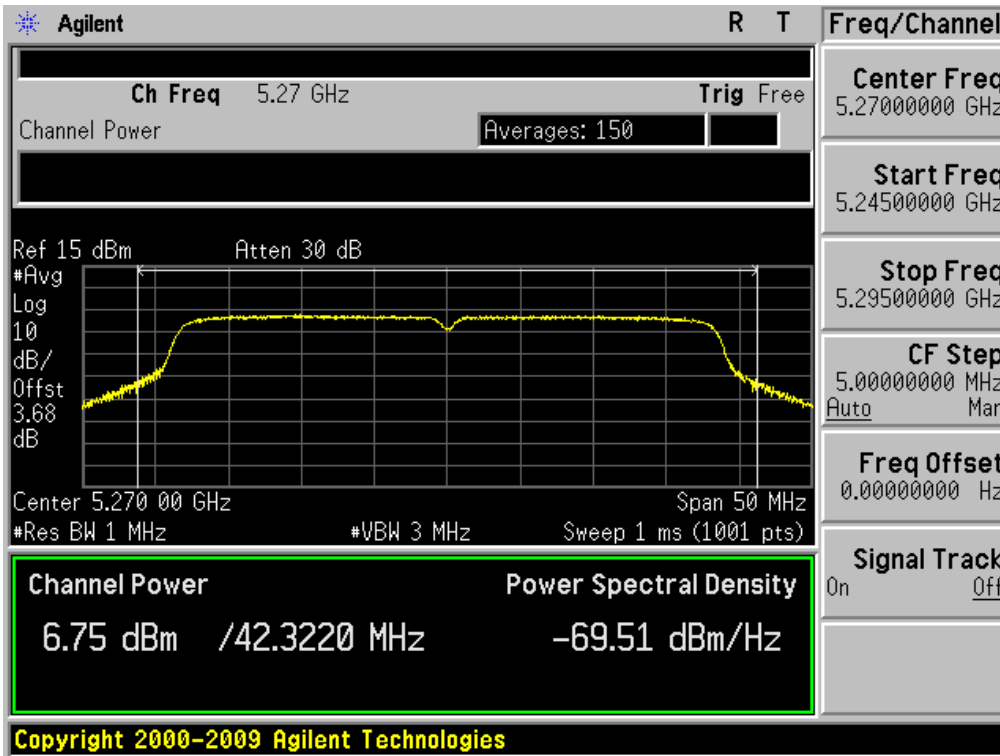
Output Power

Test Mode: 802.11n HT40 & Ch.46



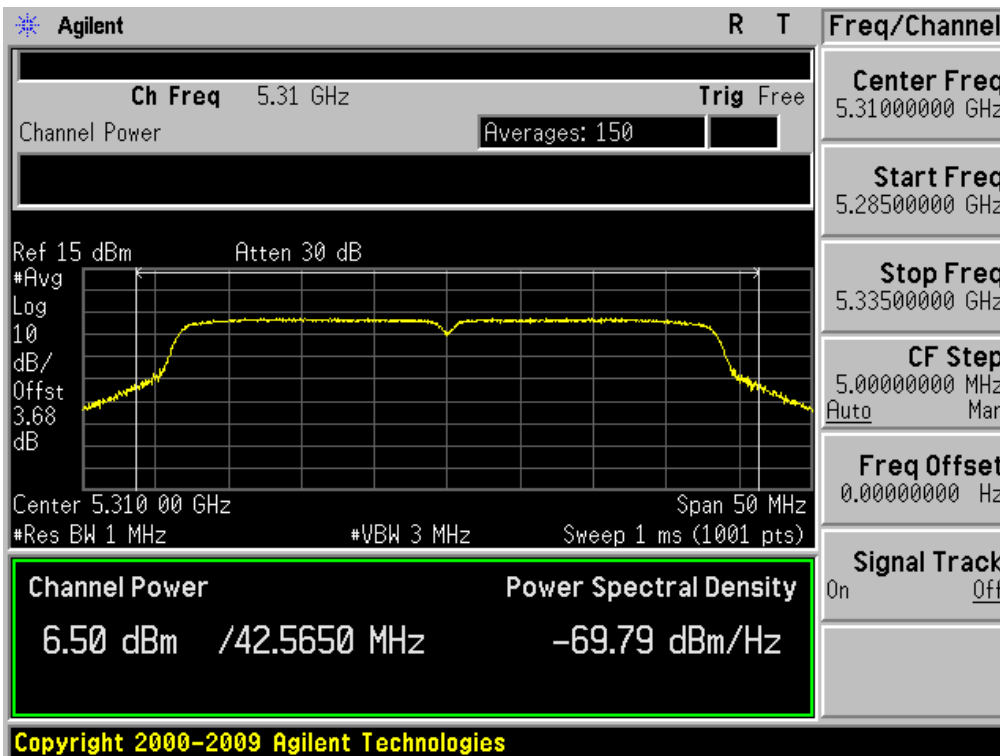
Output Power

Test Mode: 802.11n HT40 & Ch.54



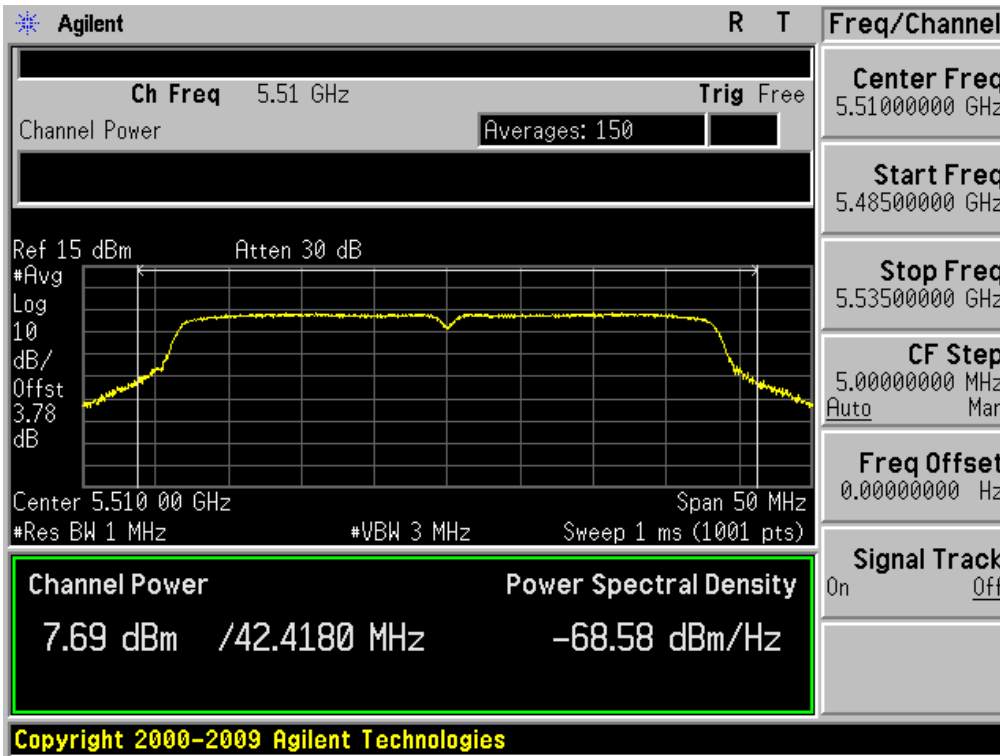
Output Power

Test Mode: 802.11n HT40 & Ch.62



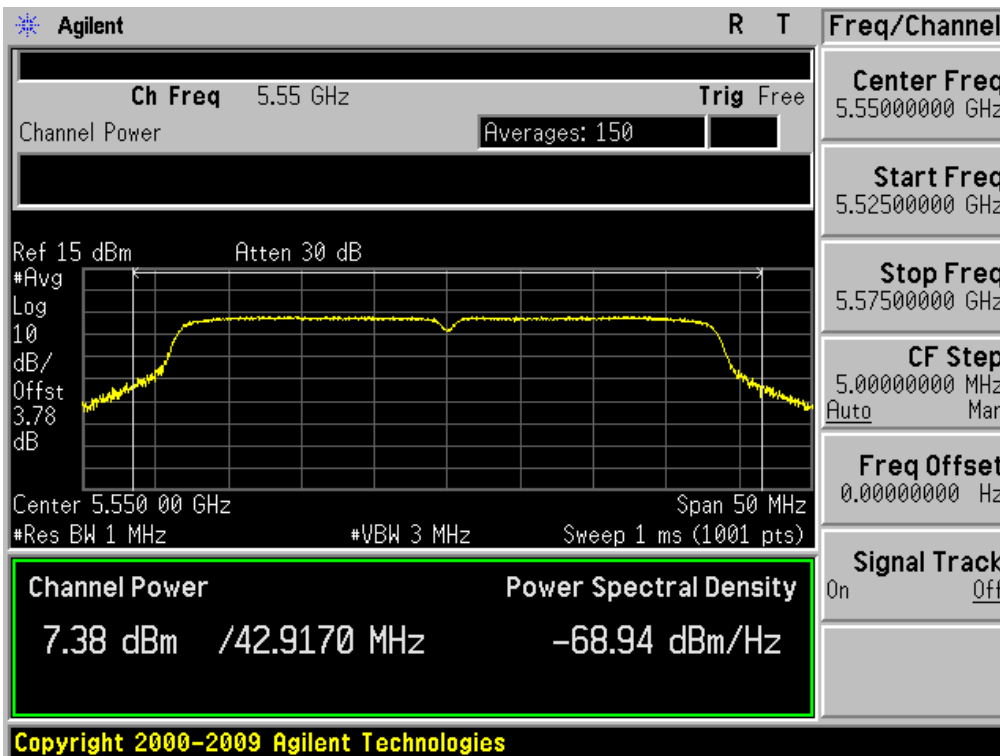
Output Power

Test Mode: 802.11n HT40 & Ch.102



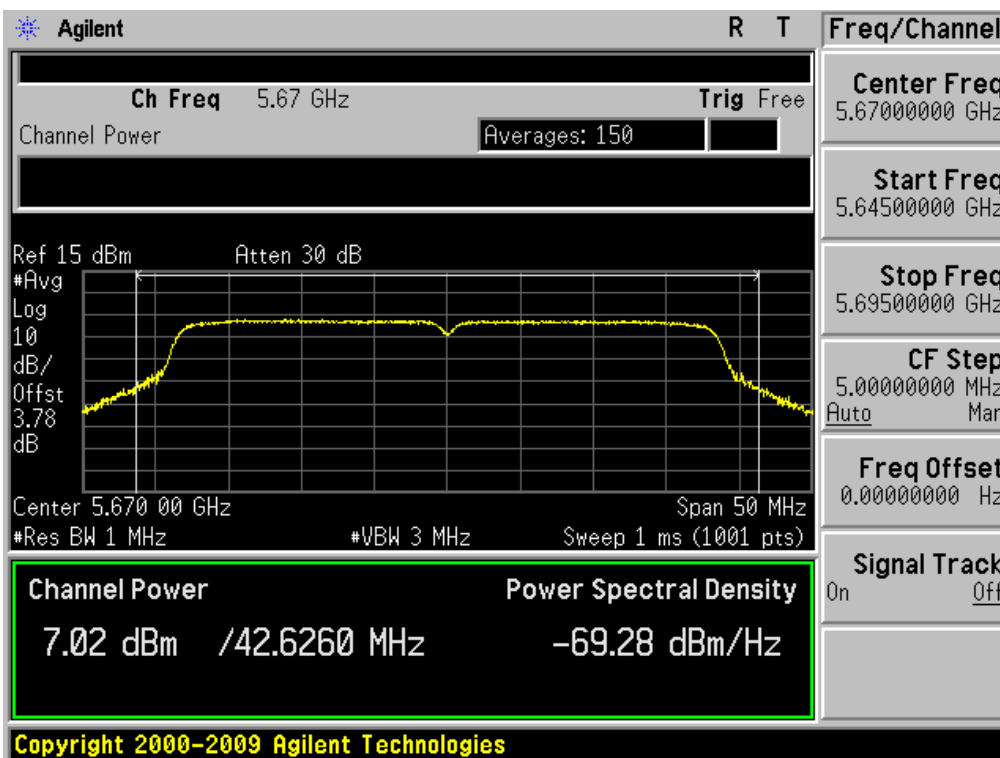
Output Power

Test Mode: 802.11n HT40 & Ch.110



Output Power

Test Mode: 802.11n HT40 & Ch.134



3.2.3 Peak Power Spectral Density

Test requirements

- (1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1MHz band.
- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

- Peak Power Spectral Density Limit Calculation

Band	Limit [dBm]	ANT Gain [dBi]	Determined Limit [dBm]
Band I	4	-1.19	4
Band II	11	-1.19	11
Band III	11	-1.19	11

■ TEST CONFIGURATION

Refer to the APPENDIX I.

■ TEST PROCEDURE

Peak Power Spectral Density is measured using Measurement Procedure of **KDB789033**

- 1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section C)3) for measuring maximum conducted output power using a spectrum analyzer: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...". (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
- 2) Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
- 3) Make the following adjustments to the peak value of the spectrum, if applicable:
 - a) **If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.**
 - b) If Method SA-3 Alternative was used and the linear mode was used in step C)3)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
- 4) The result is the PPSD.

■ TEST RESULT : **Comply**

Mode	Channel	Frequency [MHz]	Reading [dBm]	Duty Cycle			DCF [dB]	Test Result [dBm]
				On Time[ms]	On+Off Time[ms]	X		
802.11a	36	5180	1.755	2.030	2.130	0.95	0.23	1.985
	40	5200	1.814					2.044
	48	5240	1.481					1.711
	52	5260	1.371	2.030	2.130	0.95	0.23	1.601
	60	5300	1.358					1.588
	64	5320	0.667					0.897
	100	5500	1.769	2.030	2.130	0.95	0.23	1.999
	116	5580	2.754					2.984
140	5700	2.494	2.724					

Mode	Channel	Frequency [MHz]	Reading [dBm]	Duty Cycle			DCF [dB]	Test Result [dBm]
				On Time[ms]	On+Off Time[ms]	X		
802.11n (20MHz)	36	5180	-3.127	1.890	1.990	0.94	0.27	-2.857
	40	5200	-3.265					-2.995
	48	5240	-3.421					-3.151
	52	5260	-3.480	1.890	1.990	0.94	0.27	-3.210
	60	5300	-3.356					-3.086
	64	5320	-3.473					-3.203
	100	5500	-2.759	1.890	1.990	0.94	0.27	-2.489
	116	5580	-2.200					-1.930
140	5700	-2.607	-2.337					
802.11n (40MHz)	38	5190	-7.509	0.930	0.980	0.94	0.27	-7.239
	46	5230	-7.906					-7.636
	54	5270	-7.876	0.930	0.980	0.94	0.27	-7.606
	62	5310	-7.488					-7.218
	102	5510	-6.788	0.930	0.980	0.94	0.27	-6.518
	110	5550	-6.696					-6.426
	134	5670	-6.985					-6.715

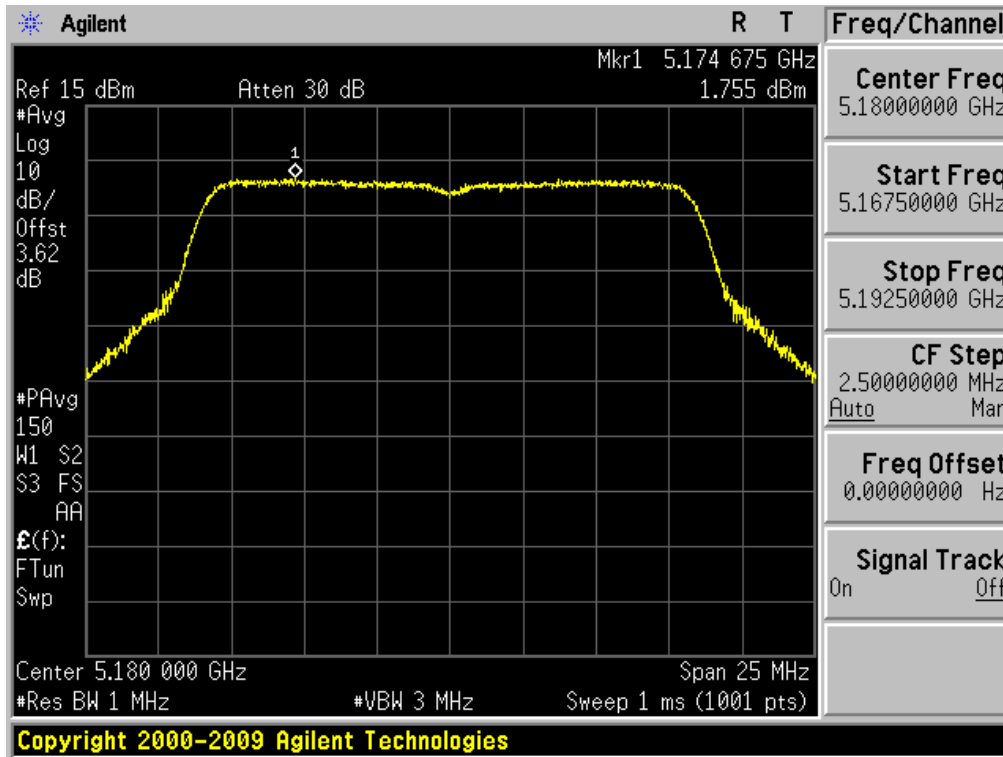
Note 1 : DCF = 10log(1 / X), X = On Time / (On+Off time)

Note 2 : Test Result = Measurement Data + DCF

Measurement Data PLOTS

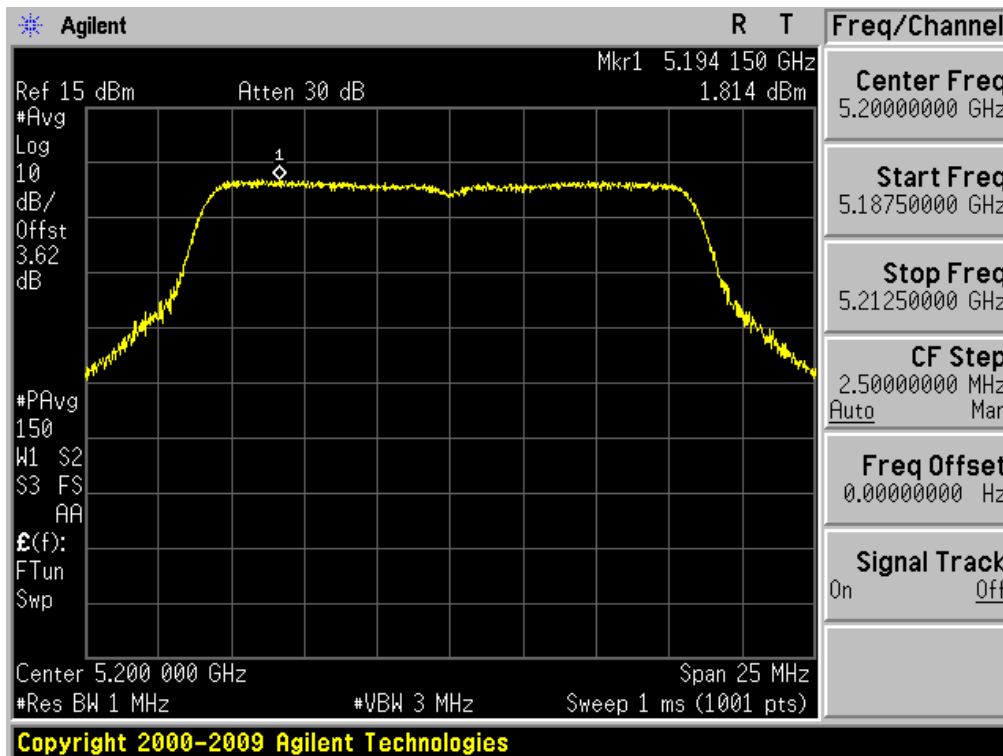
Peak Power Spectral Density

Test Mode: 802.11a & Ch.36



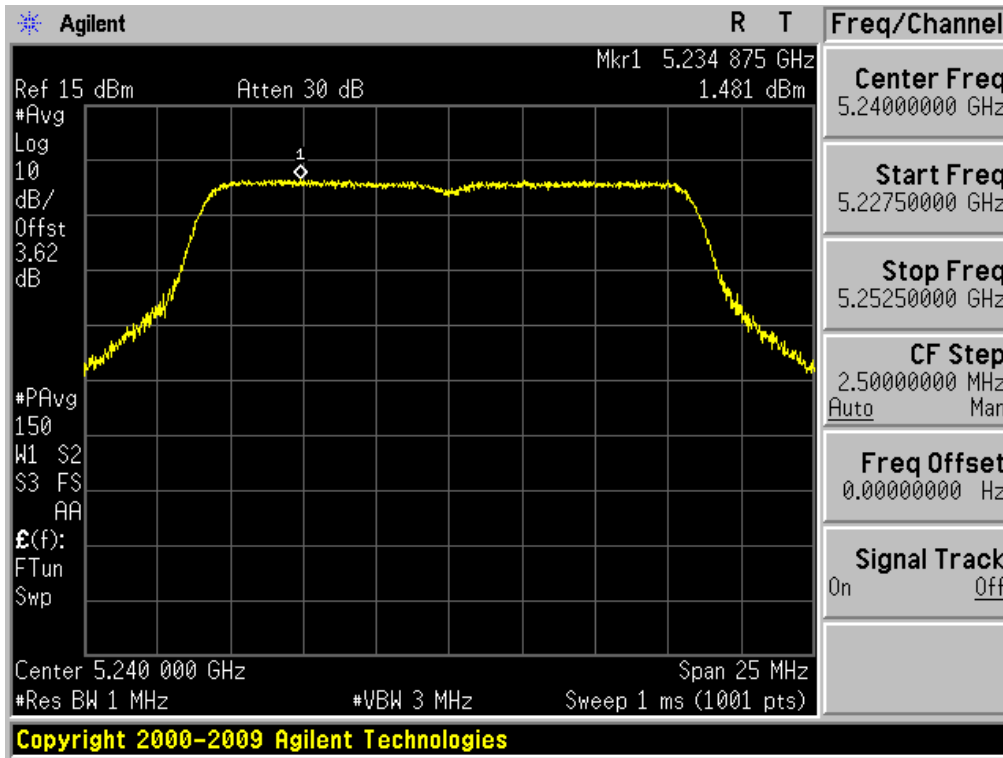
Peak Power Spectral Density

Test Mode: 802.11a & Ch.40



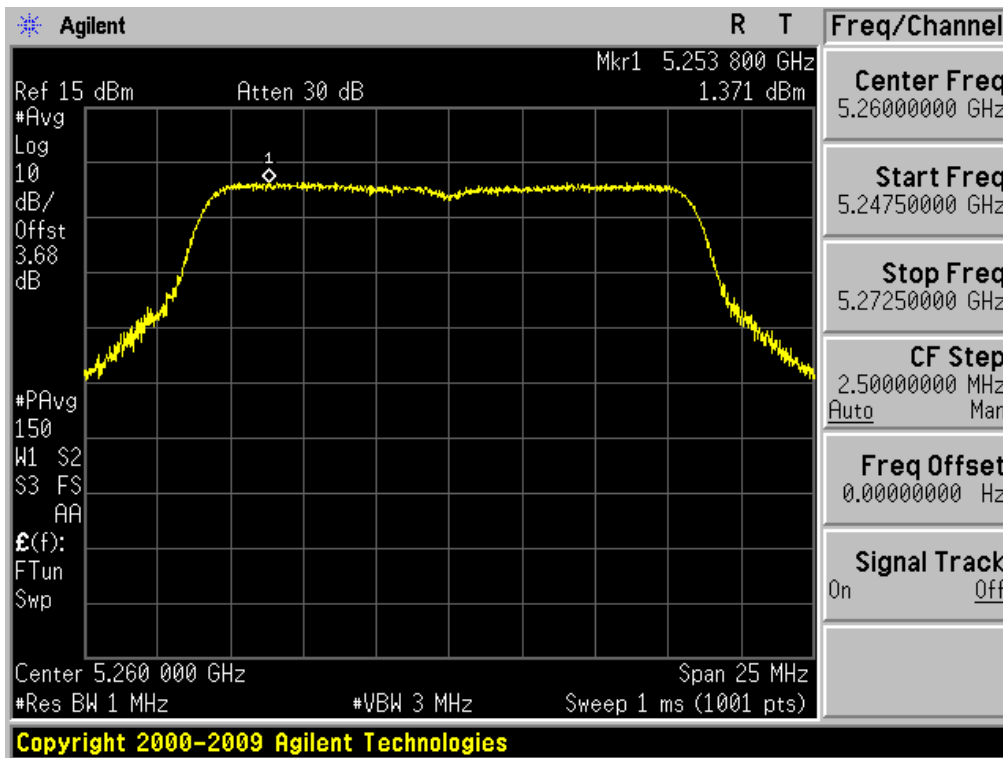
Peak Power Spectral Density

Test Mode: 802.11a & Ch.48



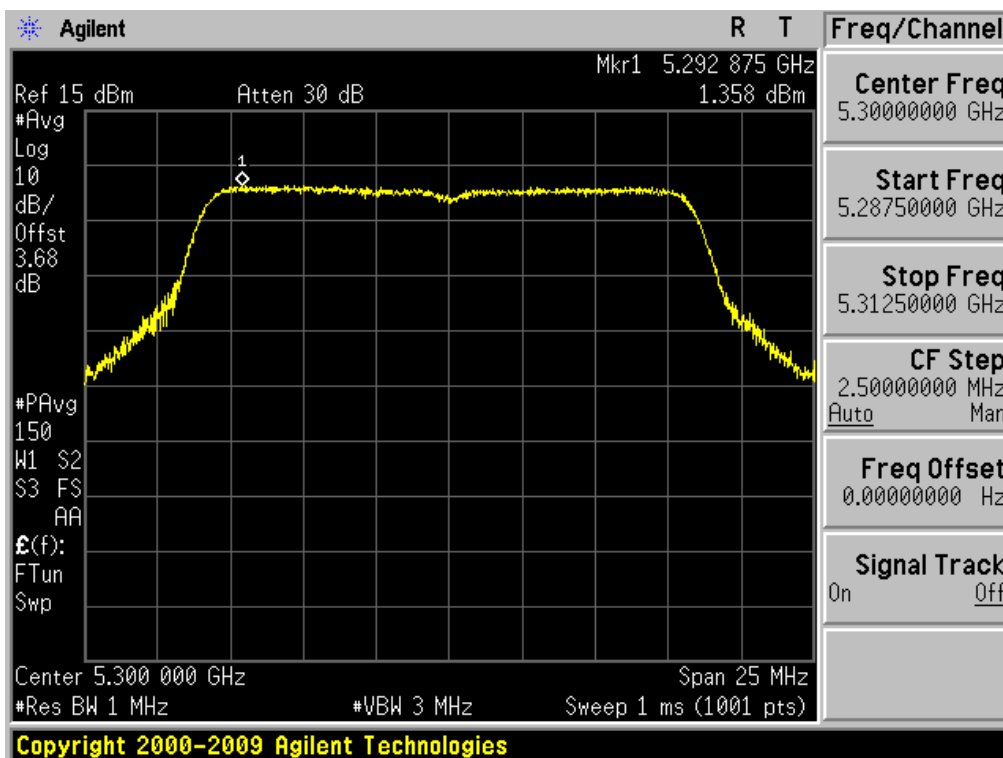
Peak Power Spectral Density

Test Mode: 802.11a & Ch.52



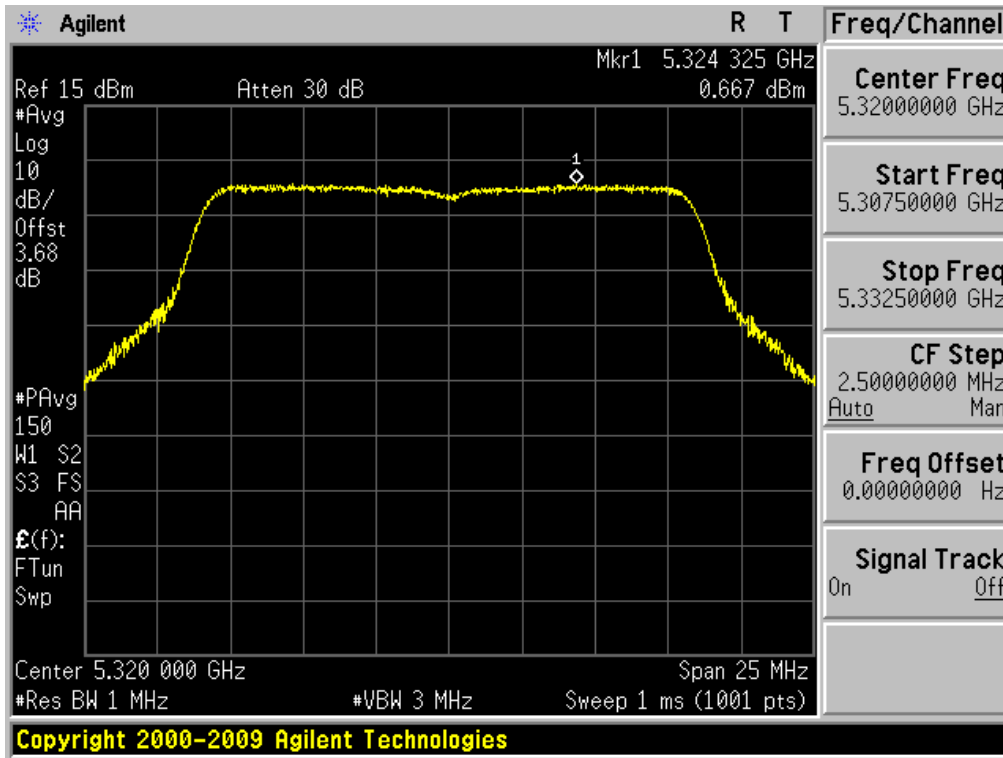
Peak Power Spectral Density

Test Mode: 802.11a & Ch.60



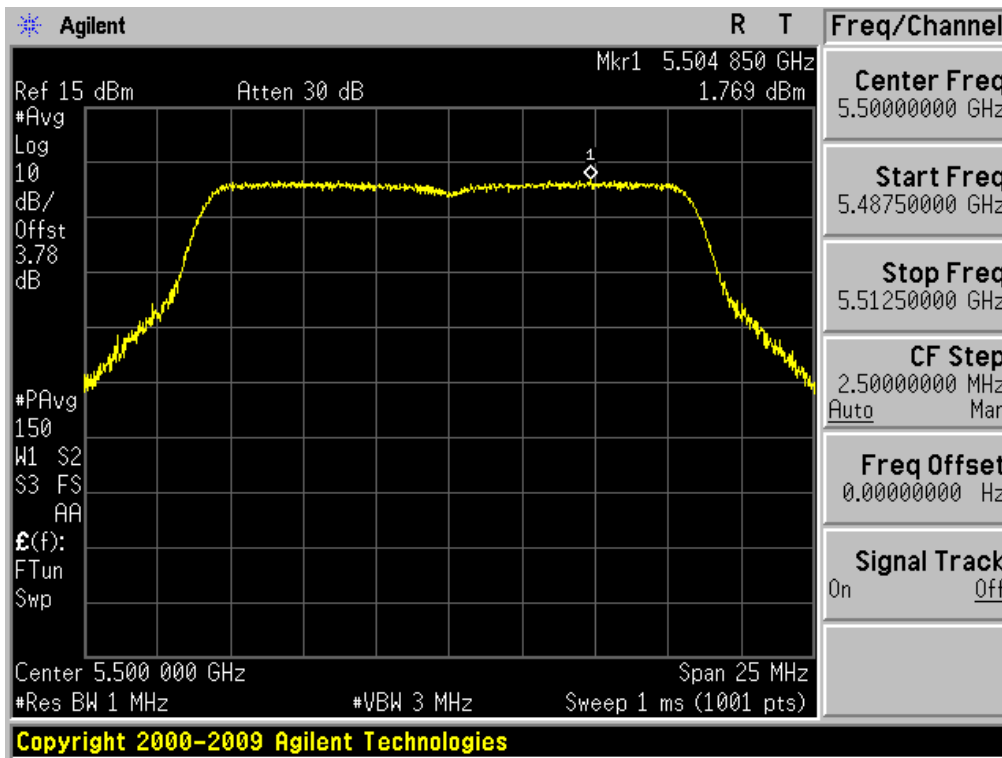
Peak Power Spectral Density

Test Mode: 802.11a & Ch.64



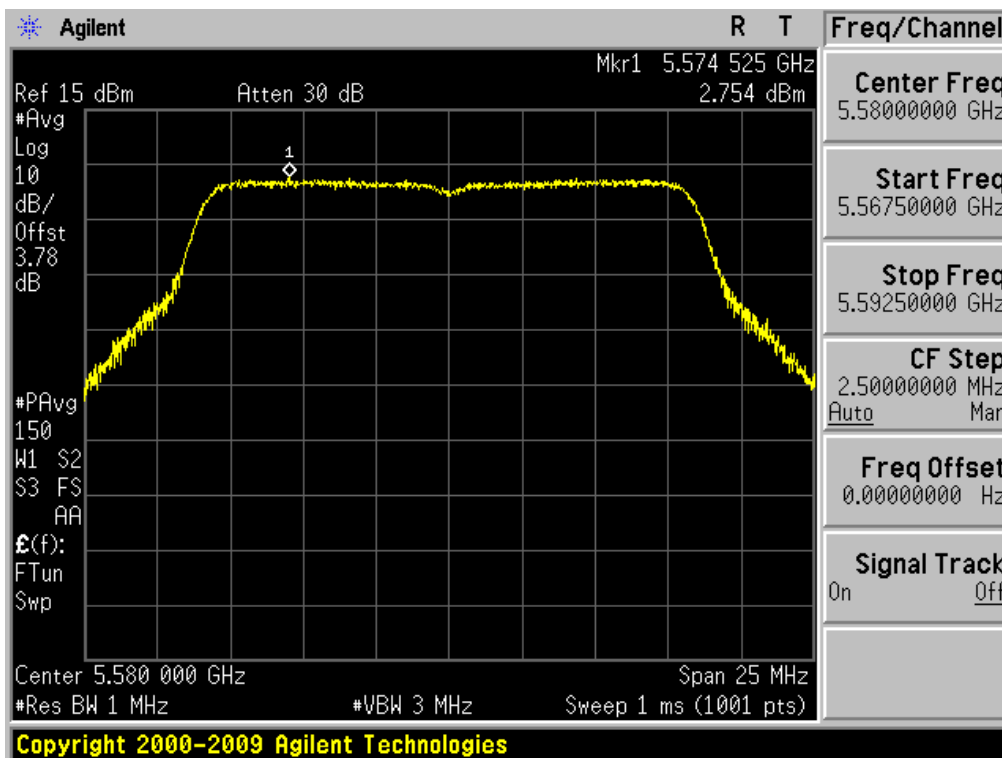
Peak Power Spectral Density

Test Mode: 802.11a & Ch.100



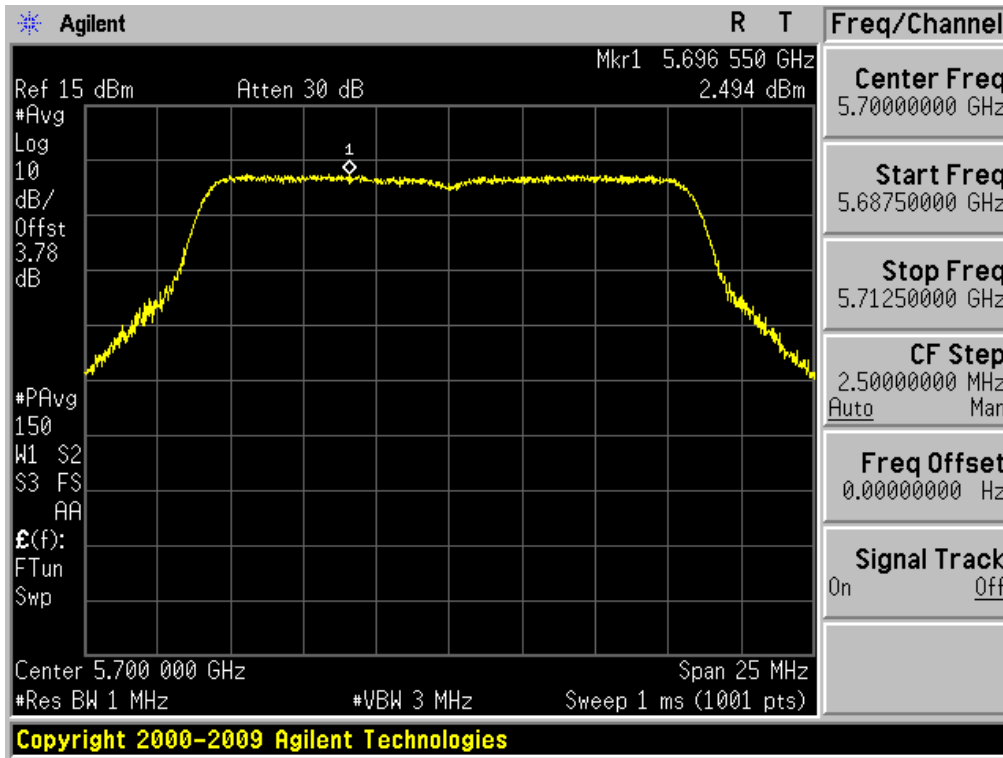
Peak Power Spectral Density

Test Mode: 802.11a & Ch.116



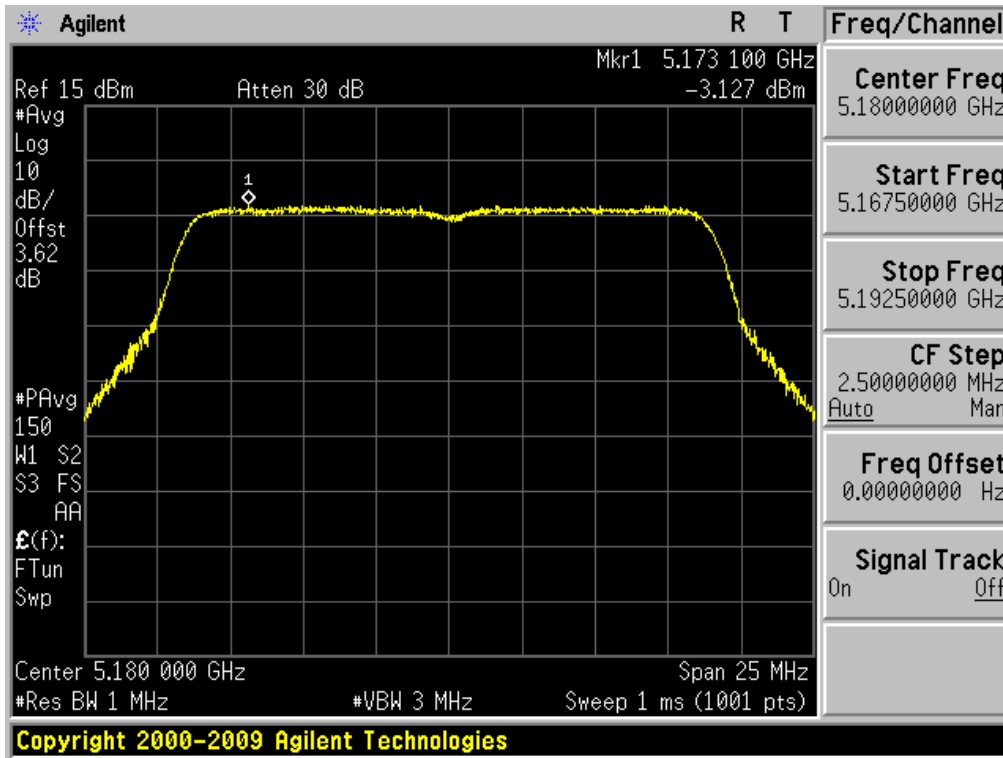
Peak Power Spectral Density

Test Mode: 802.11a & Ch.140



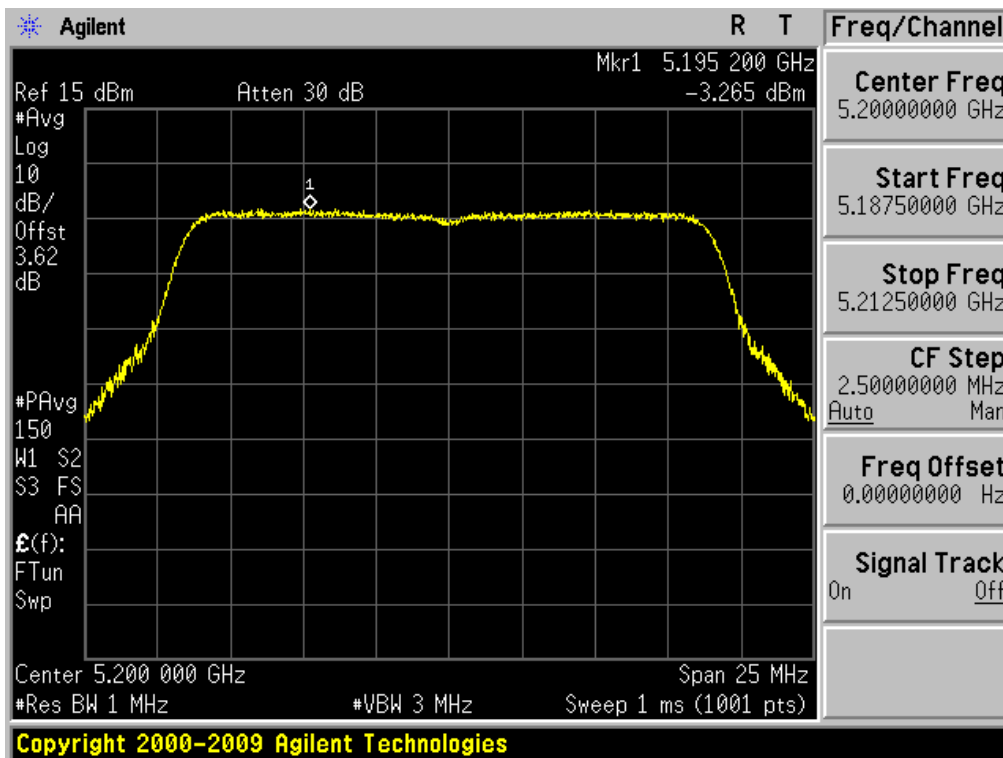
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.36



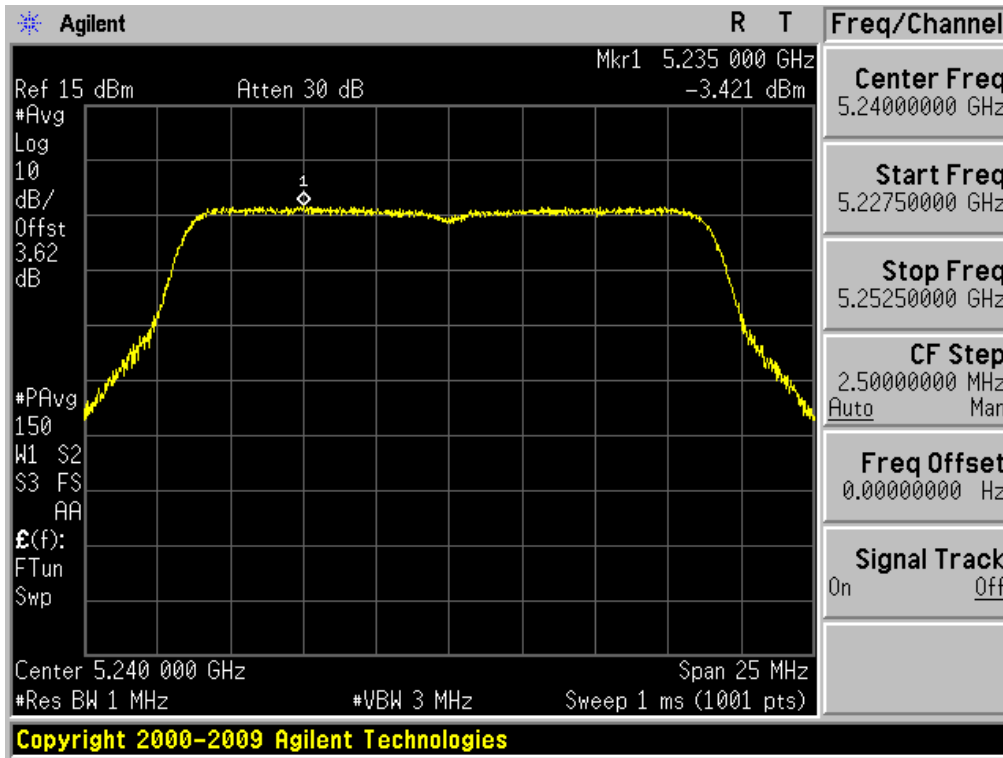
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.40



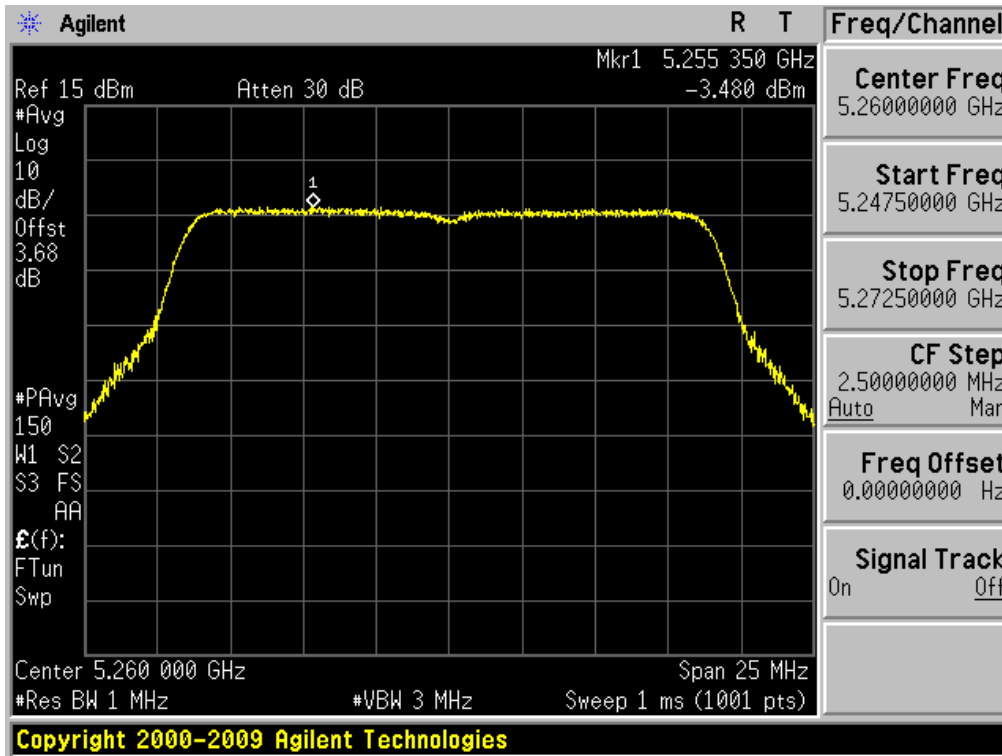
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.48



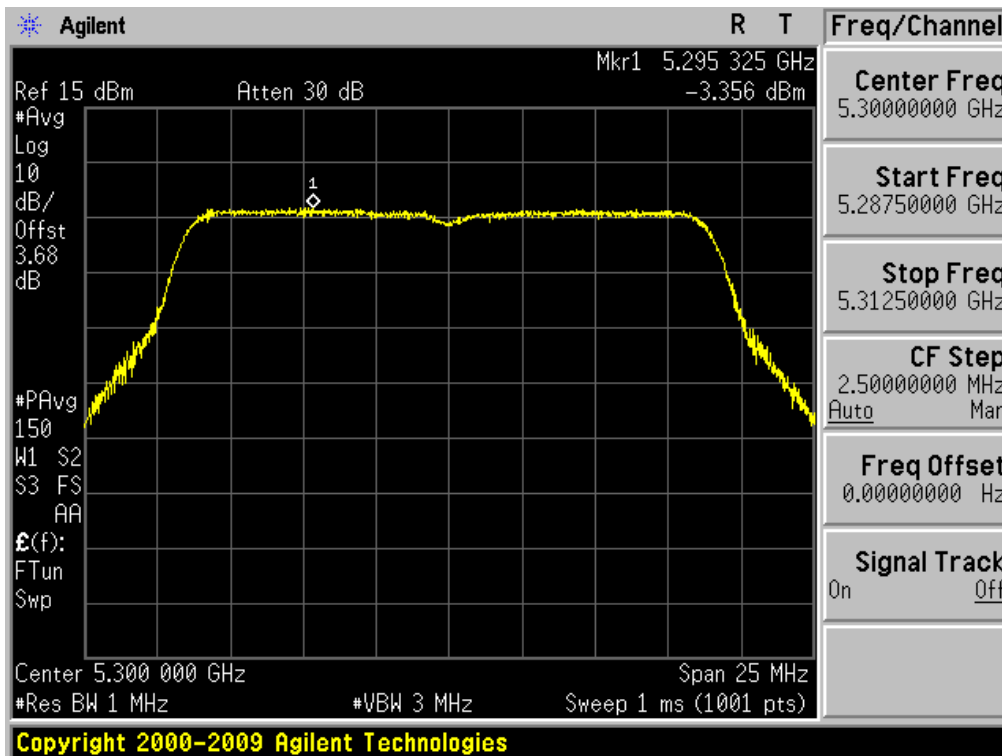
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.52



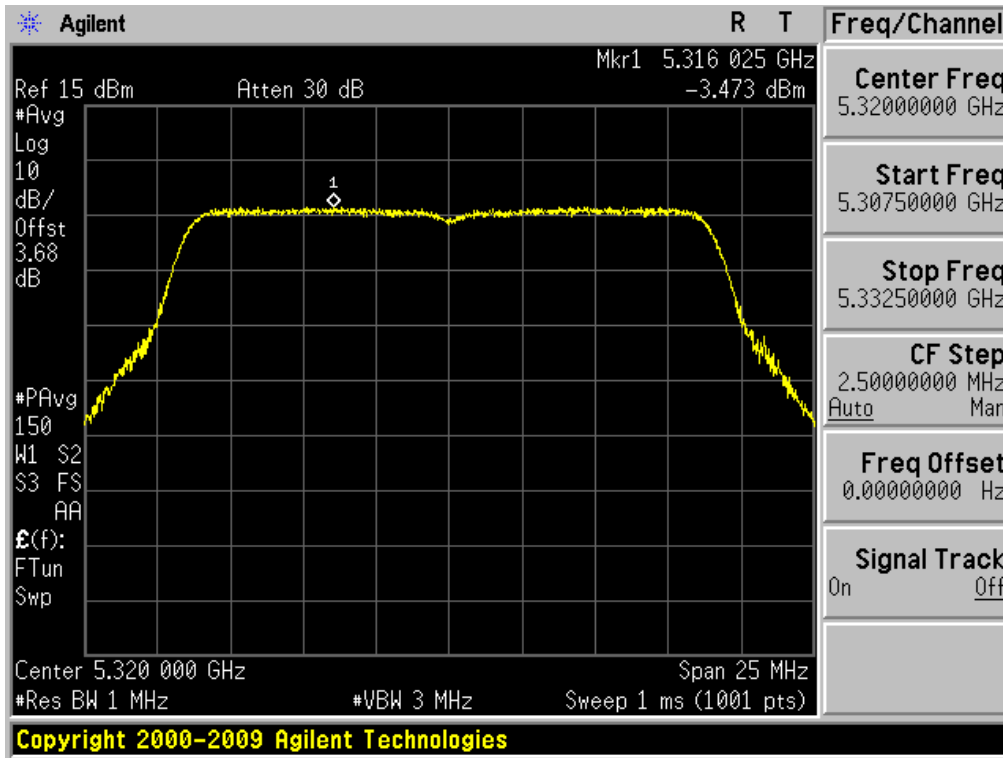
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.60



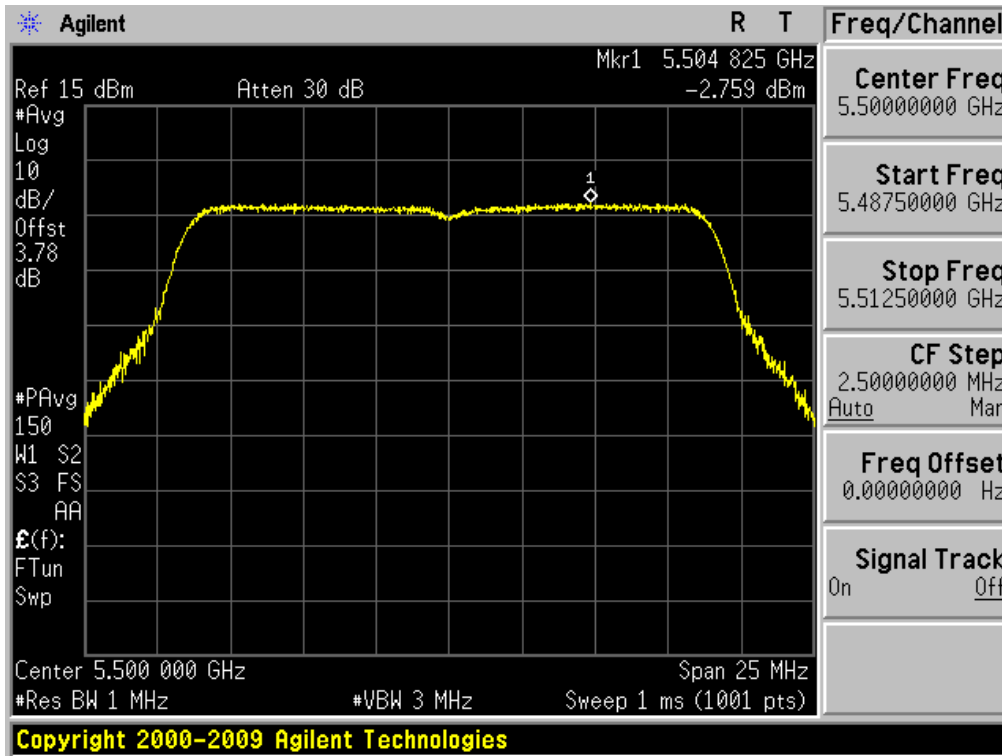
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.64



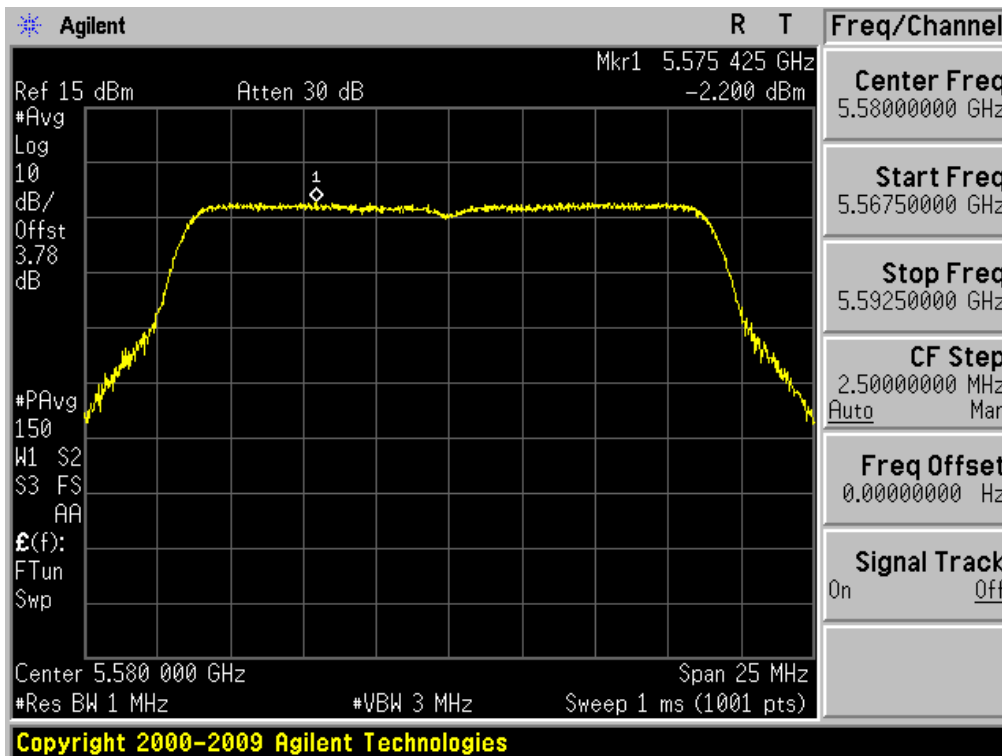
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.100



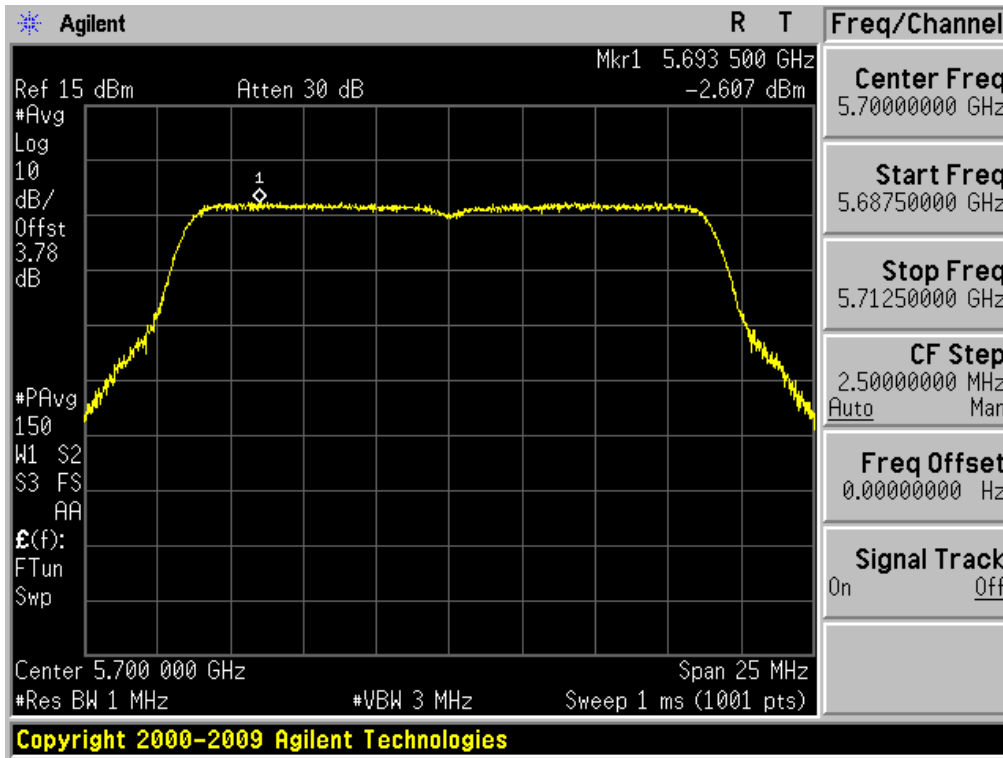
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.116



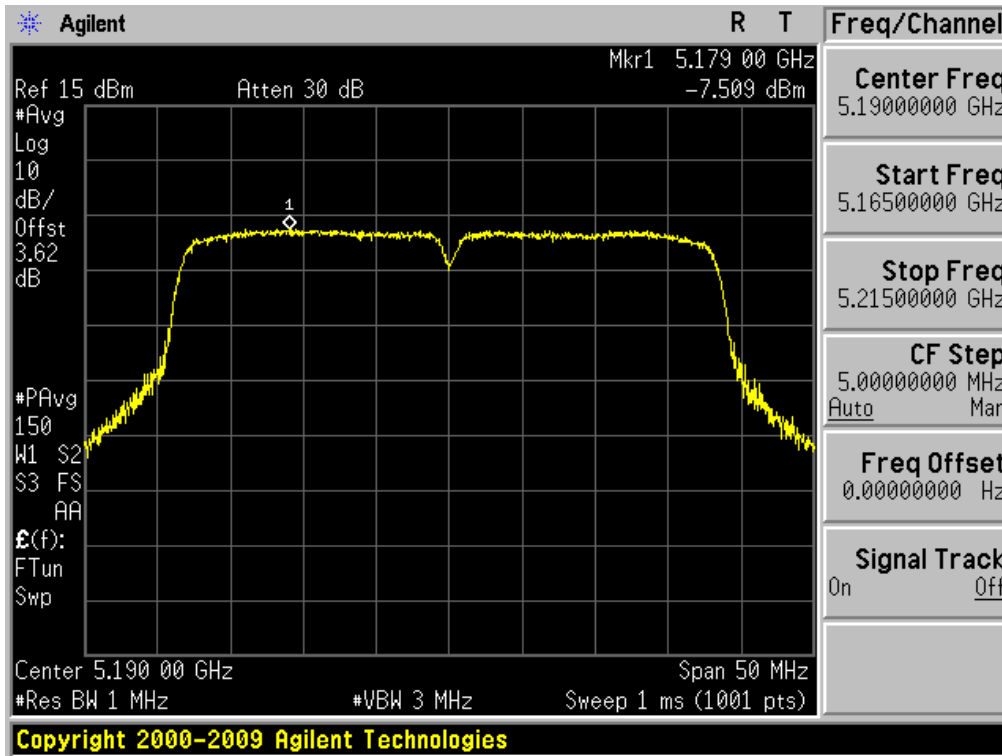
Peak Power Spectral Density

Test Mode: 802.11n HT20 & Ch.140



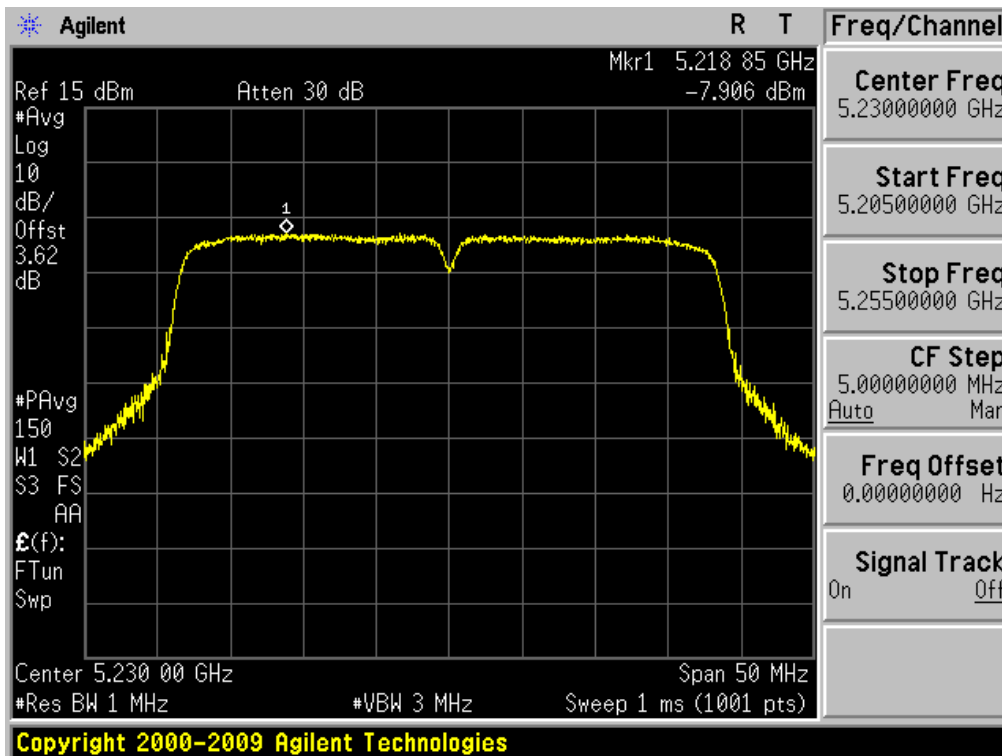
Peak Power Spectral Density

Test Mode: 802.11n HT40 & Ch.38



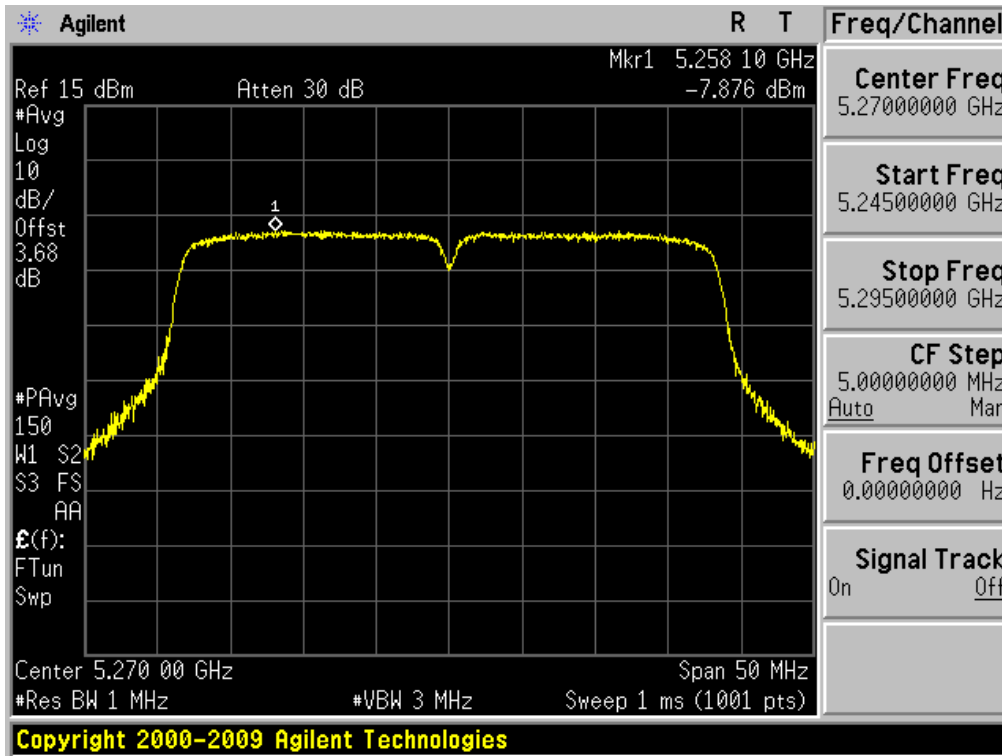
Peak Power Spectral Density

Test Mode: 802.11n HT40 & Ch.46



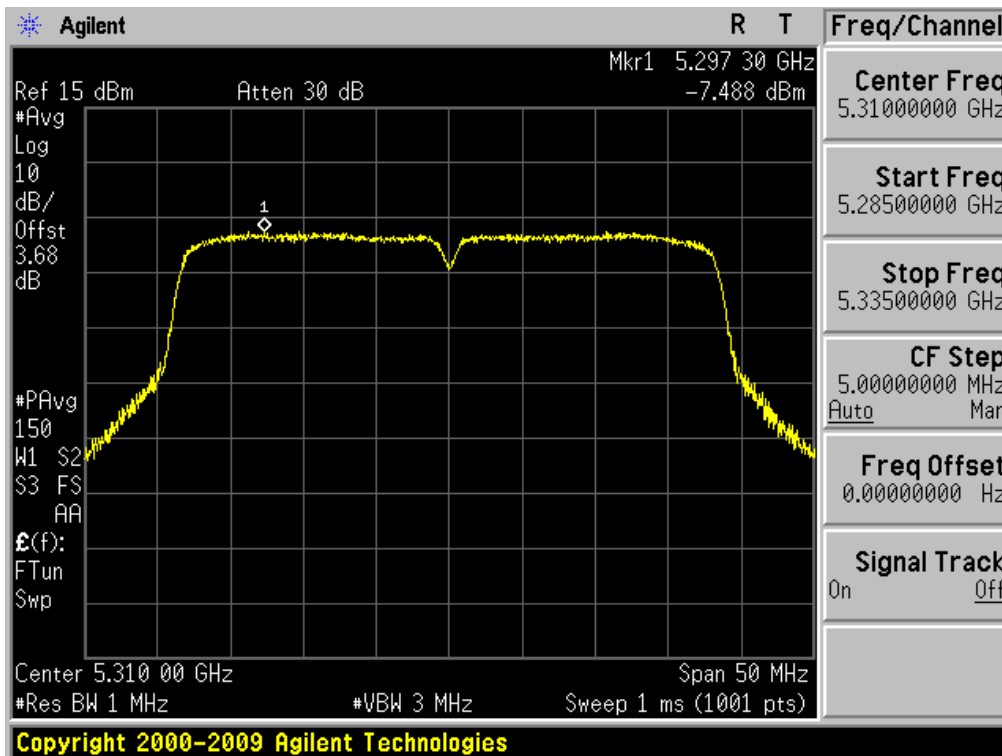
Peak Power Spectral Density

Test Mode: 802.11n HT40 & Ch.54



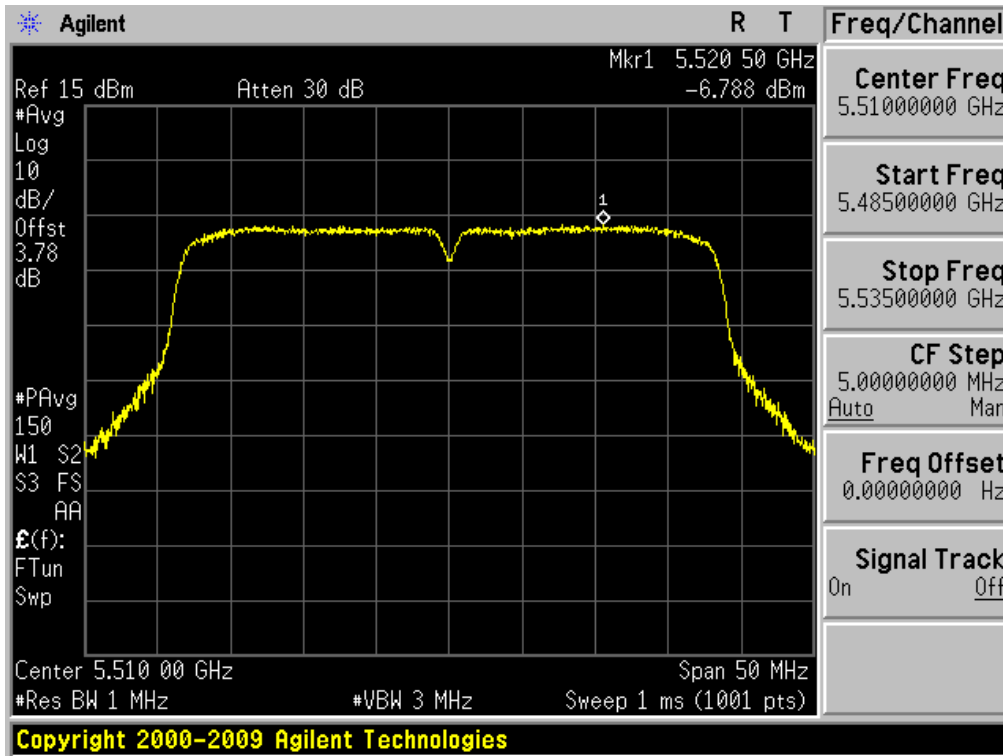
Peak Power Spectral Density

Test Mode: 802.11n HT40 & Ch.62



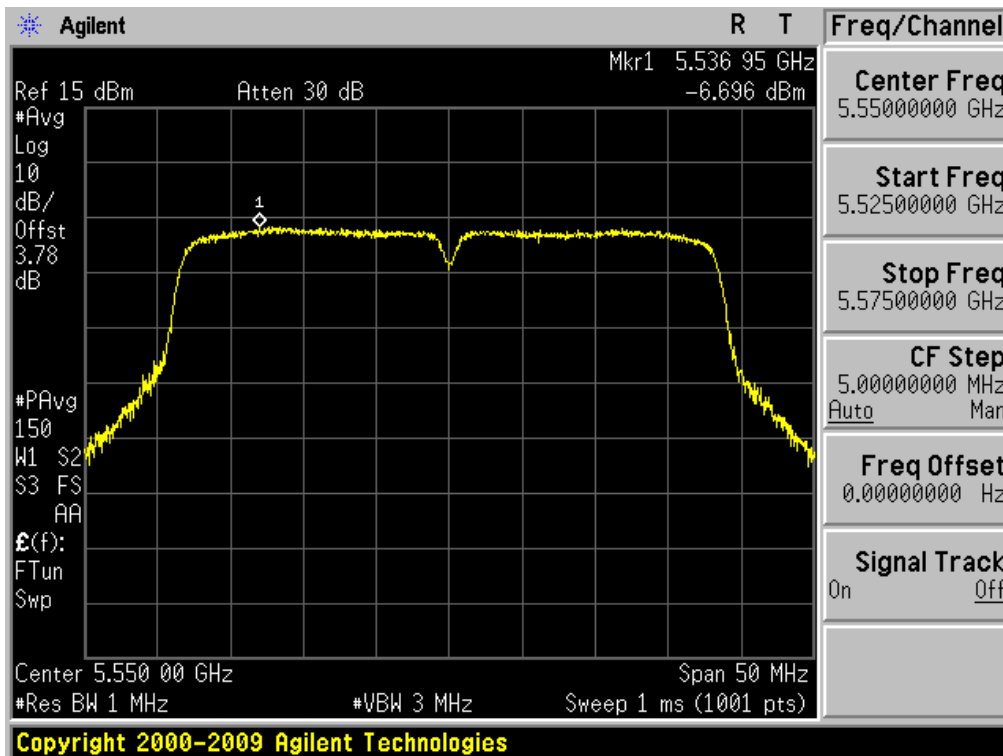
Peak Power Spectral Density

Test Mode: 802.11n HT40 & Ch.102



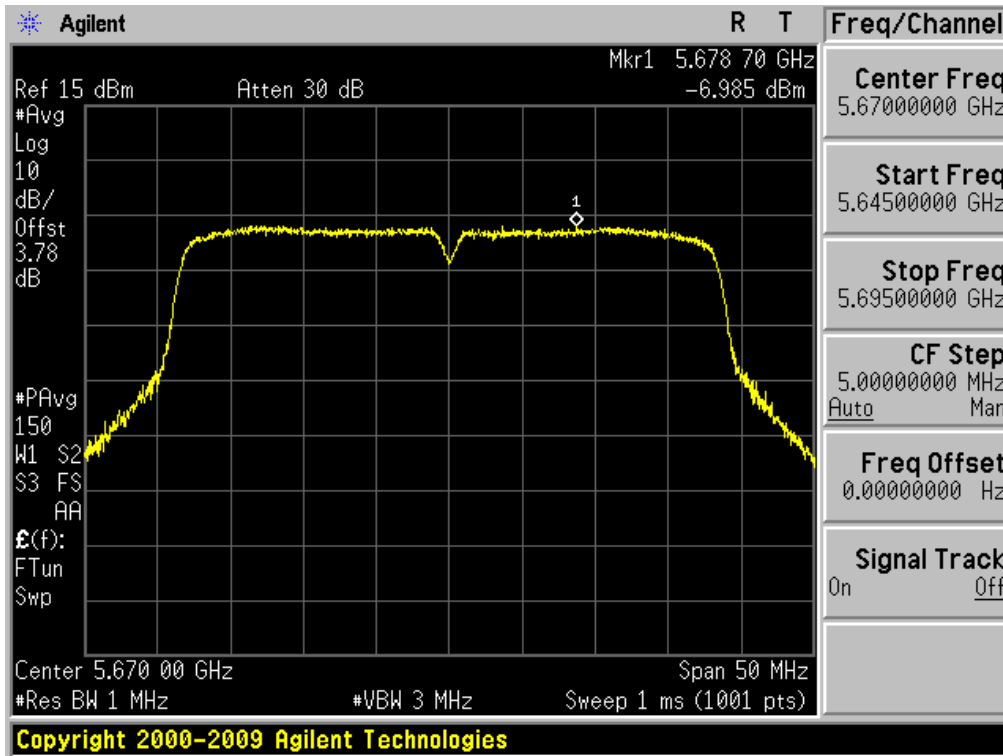
Peak Power Spectral Density

Test Mode: 802.11n HT40 & Ch.110



Peak Power Spectral Density

Test Mode: 802.11n HT40 & Ch.134



3.2.4 Peak Excursion Ratio

Test requirements

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed **13 dB/MHz**.

■ TEST CONFIGURATION

Refer to the APPENDIX I.

■ TEST PROCEDURE

Peak Excursion Ratio is measured using Measurement Procedure of **KDB789033**

- 1) Compliance with the peak excursion requirement of Section 15.407(a)(6) shall be demonstrated by confirming that the ratio of the maximum of the peak-max-hold spectrum to the maximum of the average spectrum for continuous transmission does not exceed 13 dB. (Earlier procedures that required computing the ratio of the two spectra at each frequency across the emission bandwidth can lead to unintended failures at band edges and will no longer be required.)
- 2) Set the spectrum analyzer span to view the entire emission bandwidth.
- 3) Find the maximum of the peak-max-hold spectrum.
 - a) Set **RBW = 1 MHz**.
 - b) **VBW ≥ 3 MHz**.
 - c) **Detector = peak**.
 - d) **Trace mode = max-hold**.
 - e) Allow the sweeps to continue until the trace stabilizes.
 - f) Use the peak search function to find the peak of the spectrum.
- 4) **Use the procedure found under E) to measure the PPSD.**
- 5) Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

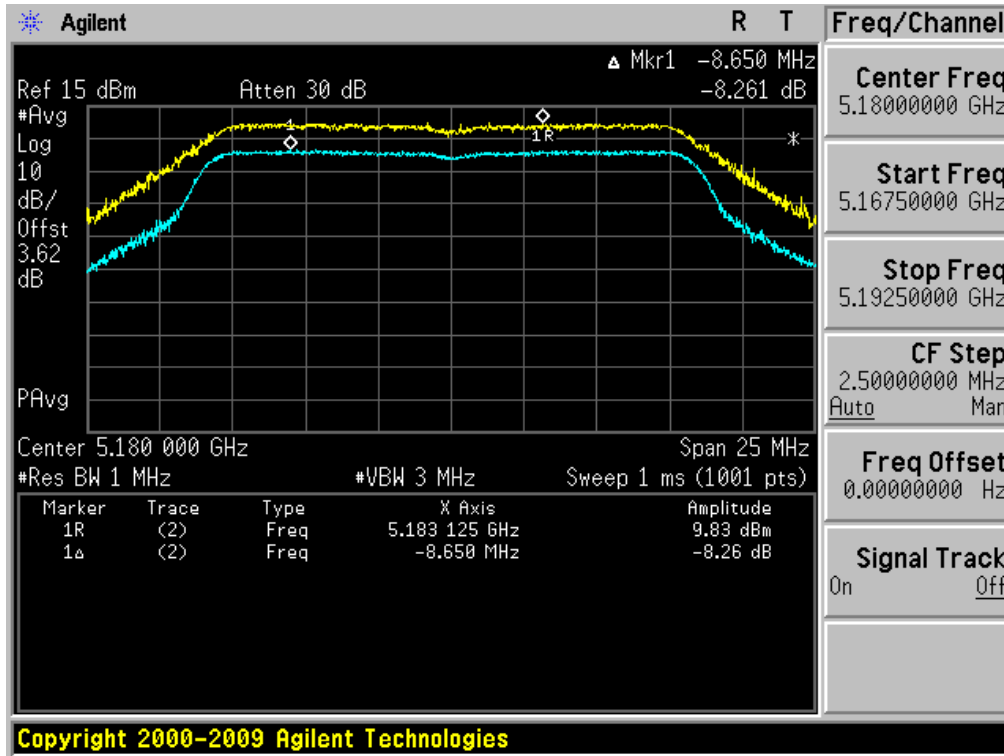
■ TEST RESULT : **Comply**

Mode	Band	Channel	Frequency [MHz]	Test Result [dB/MHz]	Limit [dB/MHz]
802.11a	Band I	36	5180	8.261	13.000
		40	5200	8.769	
		48	5240	8.043	
	Band II	52	5260	8.618	
		60	5300	7.801	
		64	5320	8.309	
	Band III	100	5500	8.470	
		116	5580	8.753	
		140	5700	8.728	
802.11n (20MHz)	Band I	36	5180	9.009	
		40	5200	8.702	
		48	5240	8.293	
	Band II	52	5260	8.225	
		60	5300	9.232	
		64	5320	8.495	
	Band III	100	5500	8.781	
		116	5580	8.717	
		140	5700	9.356	
802.11n (40MHz)	Band I	38	5190	8.728	
		46	5230	8.119	
	Band II	54	5270	8.831	
		62	5310	8.757	
	Band III	102	5510	9.041	
		110	5550	8.403	
		134	5670	8.215	

Measurement Data PLOTS

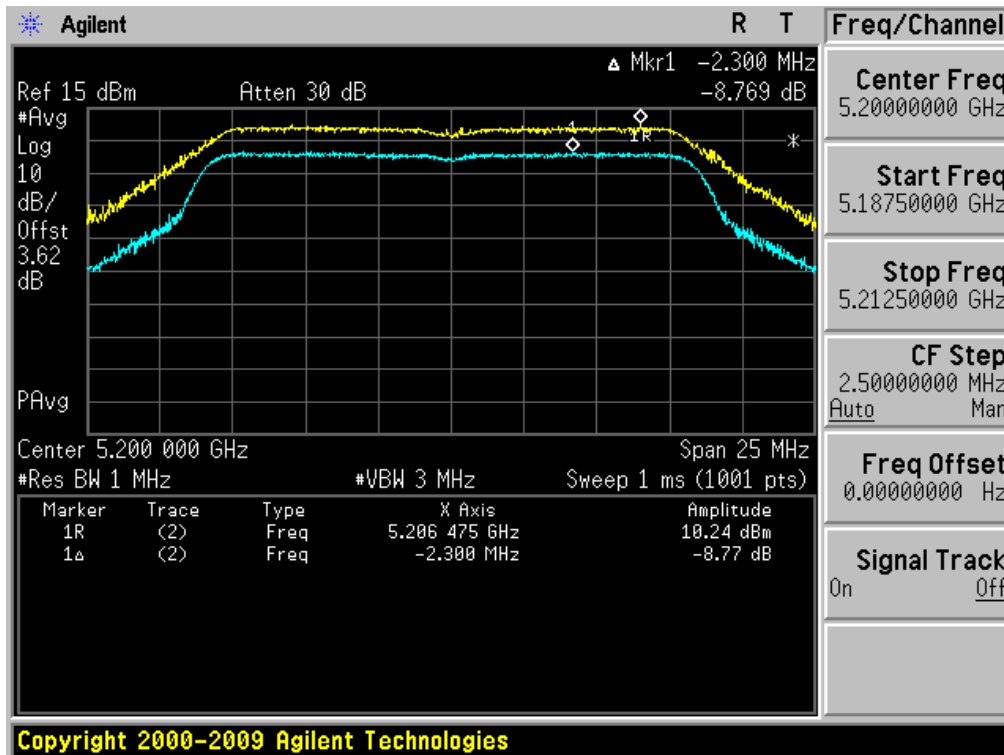
Peak Excursion Ratio

Test Mode: 802.11a & Ch.36



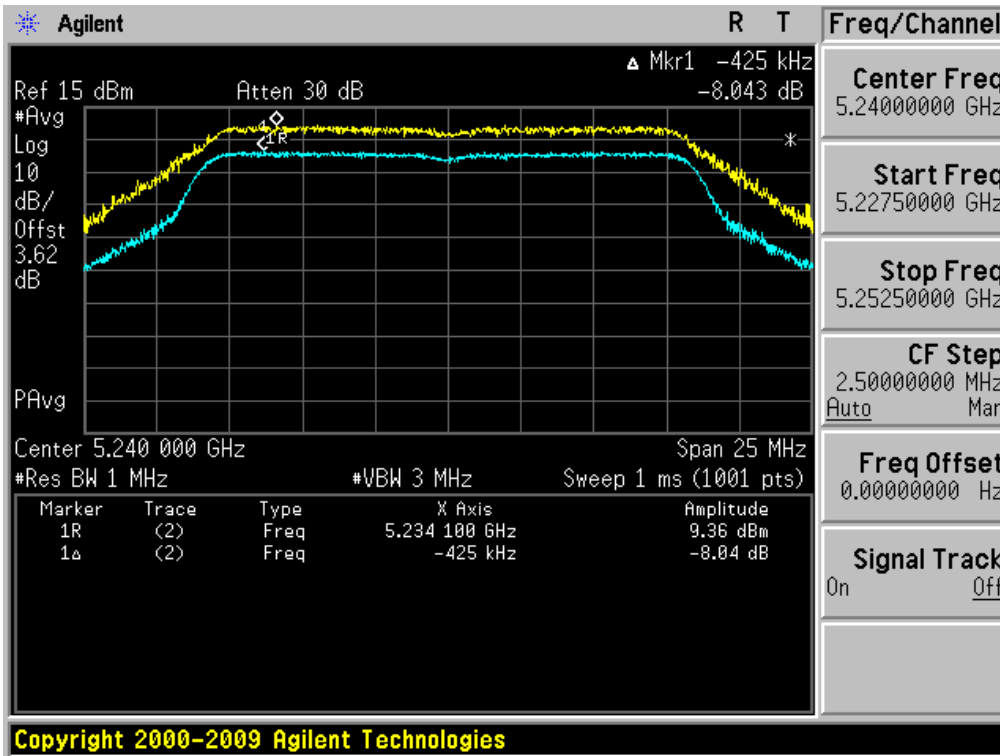
Peak Excursion Ratio

Test Mode: 802.11a & Ch.40



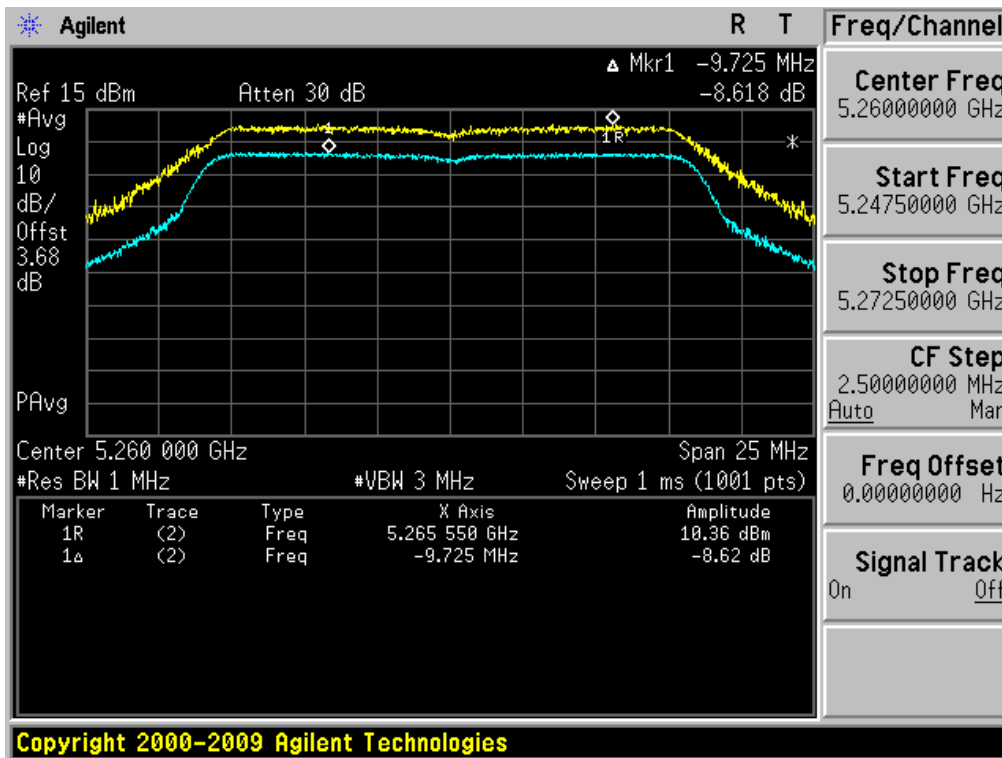
Peak Excursion Ratio

Test Mode: 802.11a & Ch.48



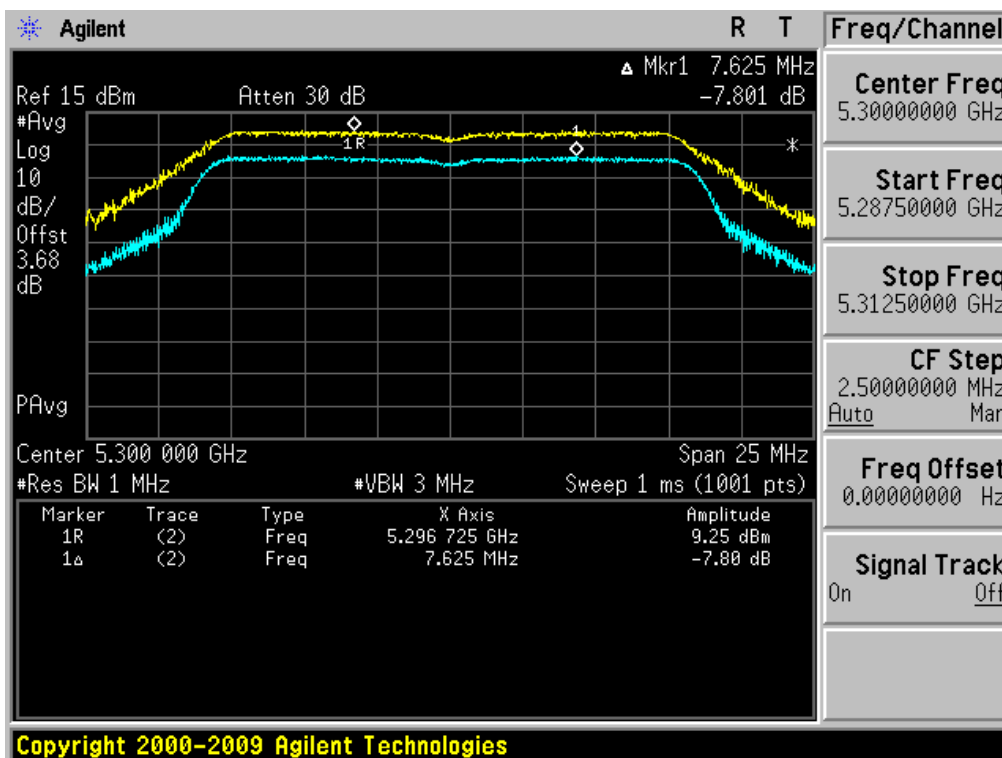
Peak Excursion Ratio

Test Mode: 802.11a & Ch.52



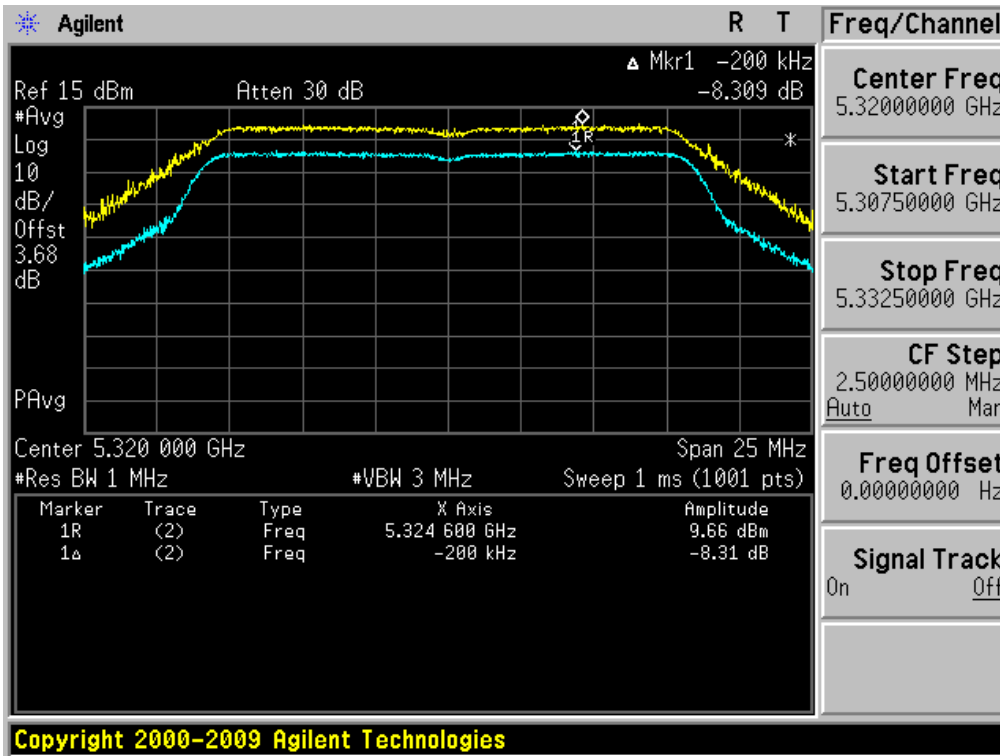
Peak Excursion Ratio

Test Mode: 802.11a & Ch.60



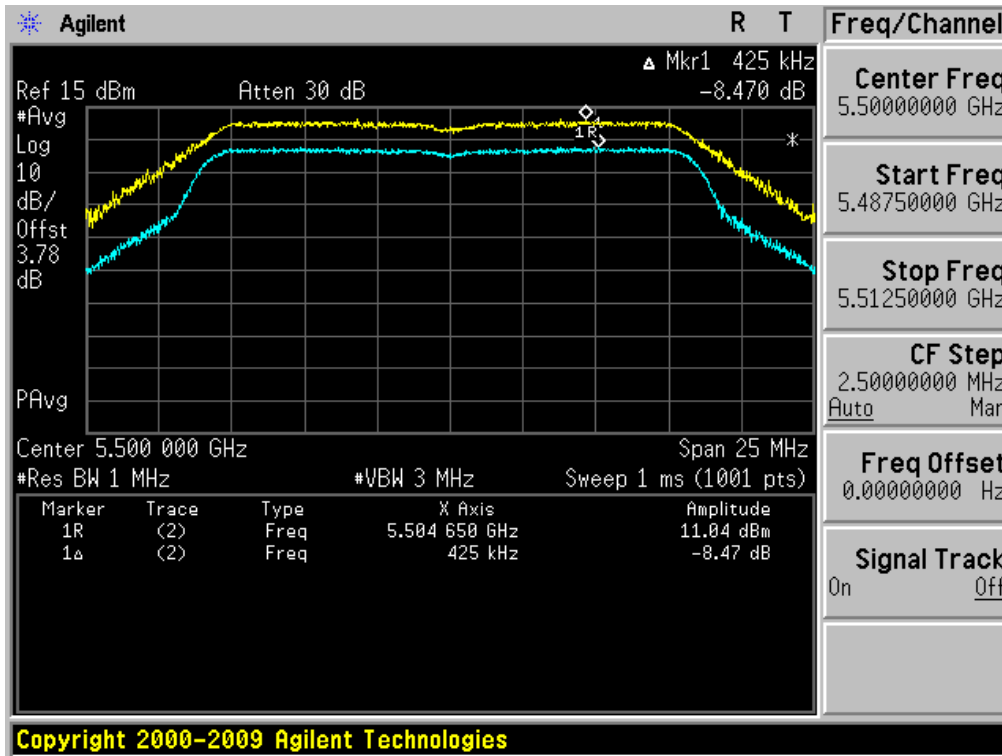
Peak Excursion Ratio

Test Mode: 802.11a & Ch.64



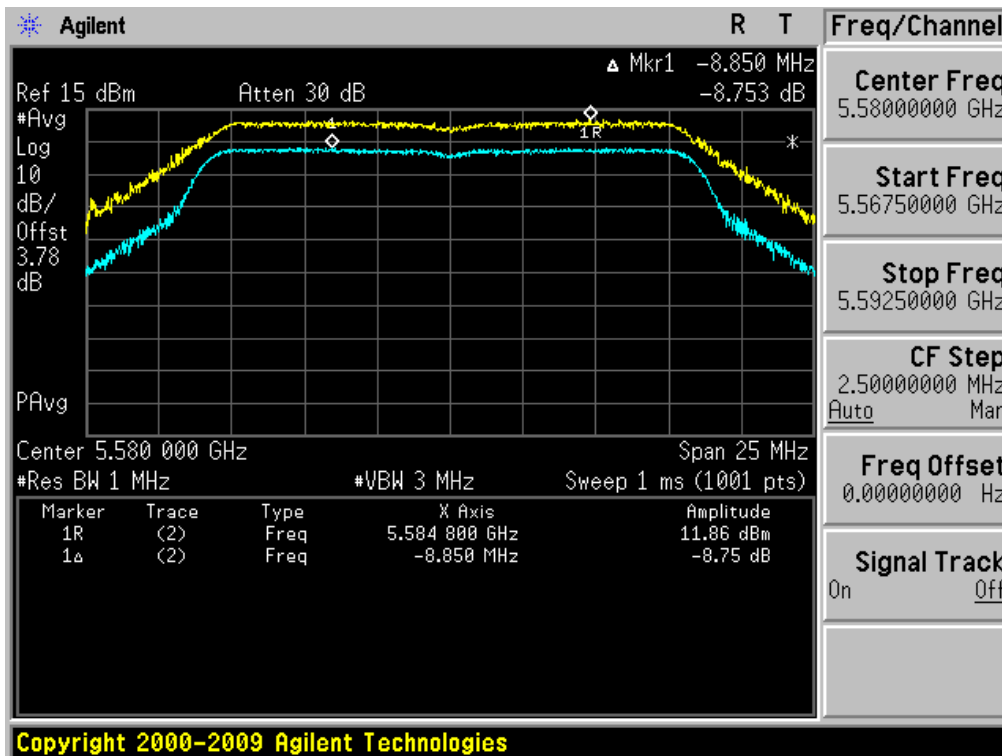
Peak Excursion Ratio

Test Mode: 802.11a & Ch.100



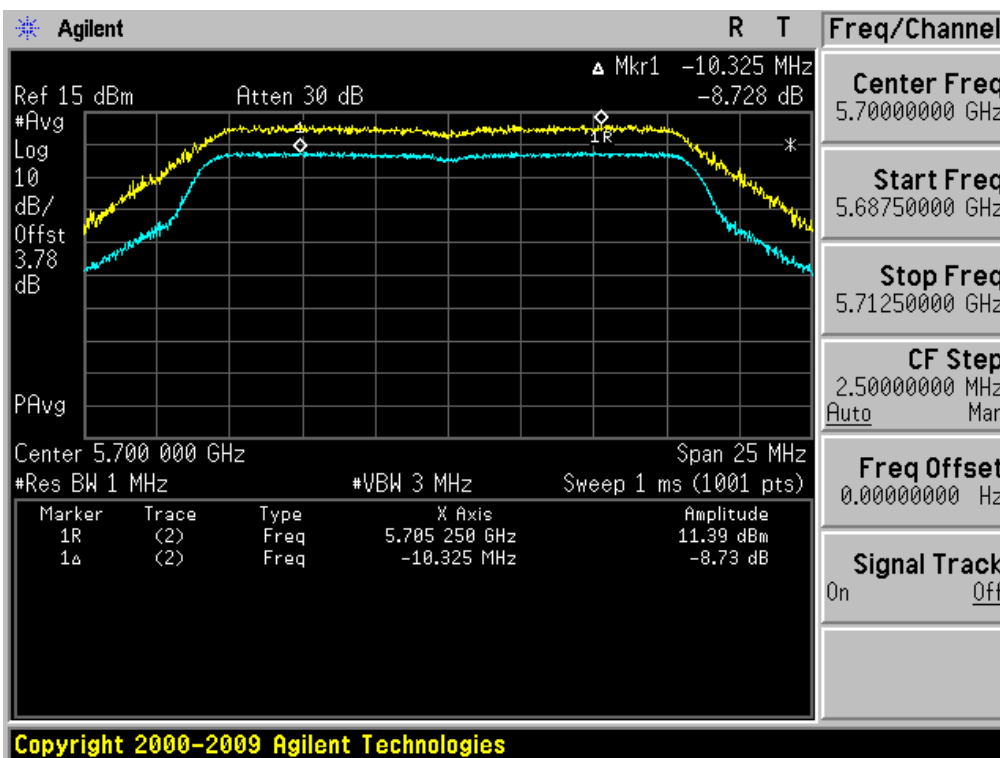
Peak Excursion Ratio

Test Mode: 802.11a & Ch.116



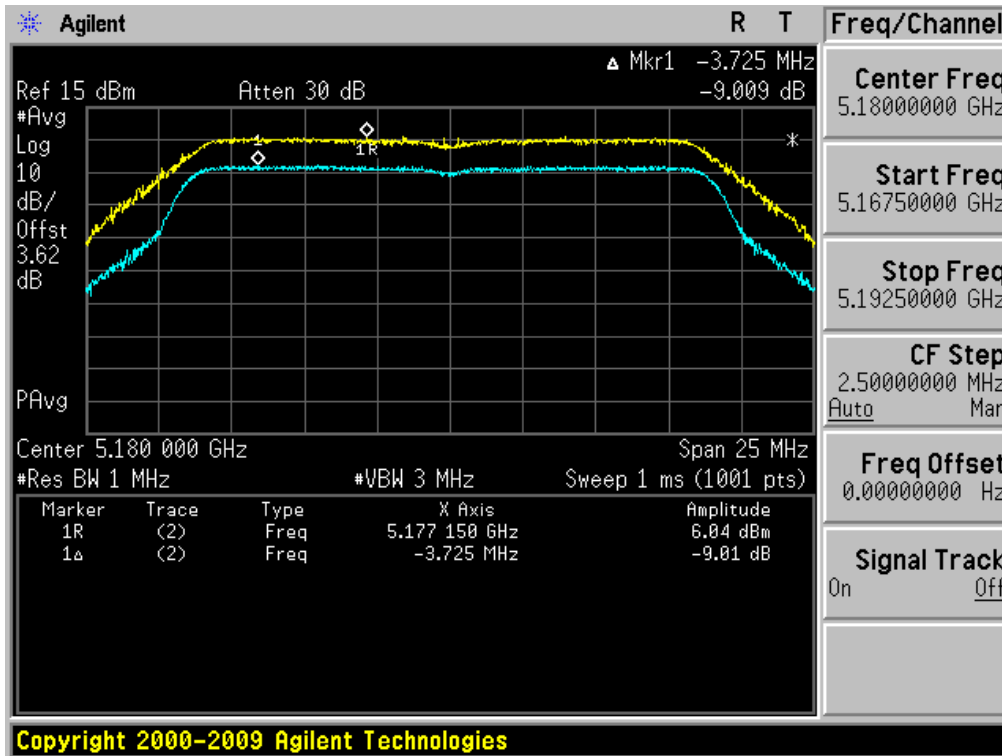
Peak Excursion Ratio

Test Mode: 802.11a & Ch.140



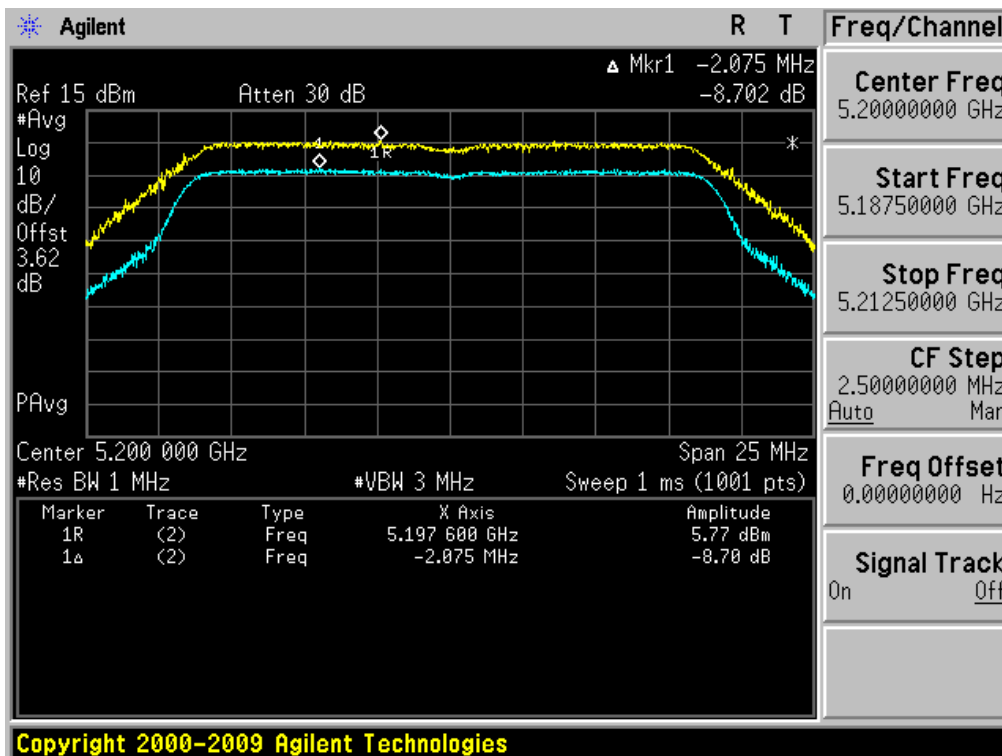
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.36



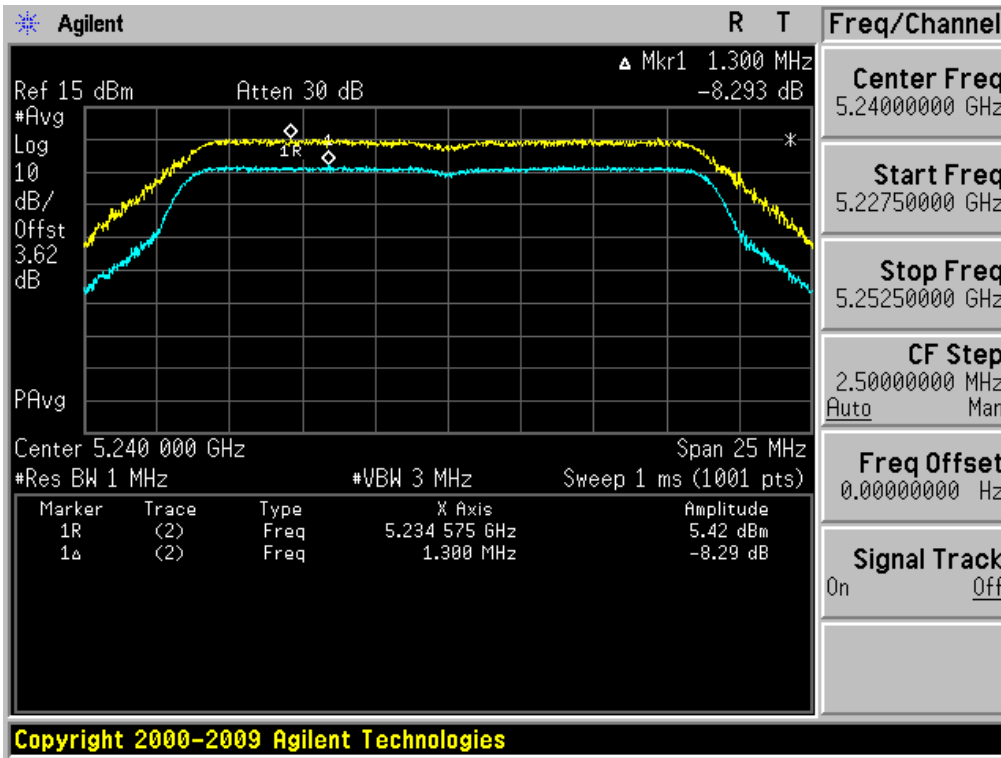
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.40



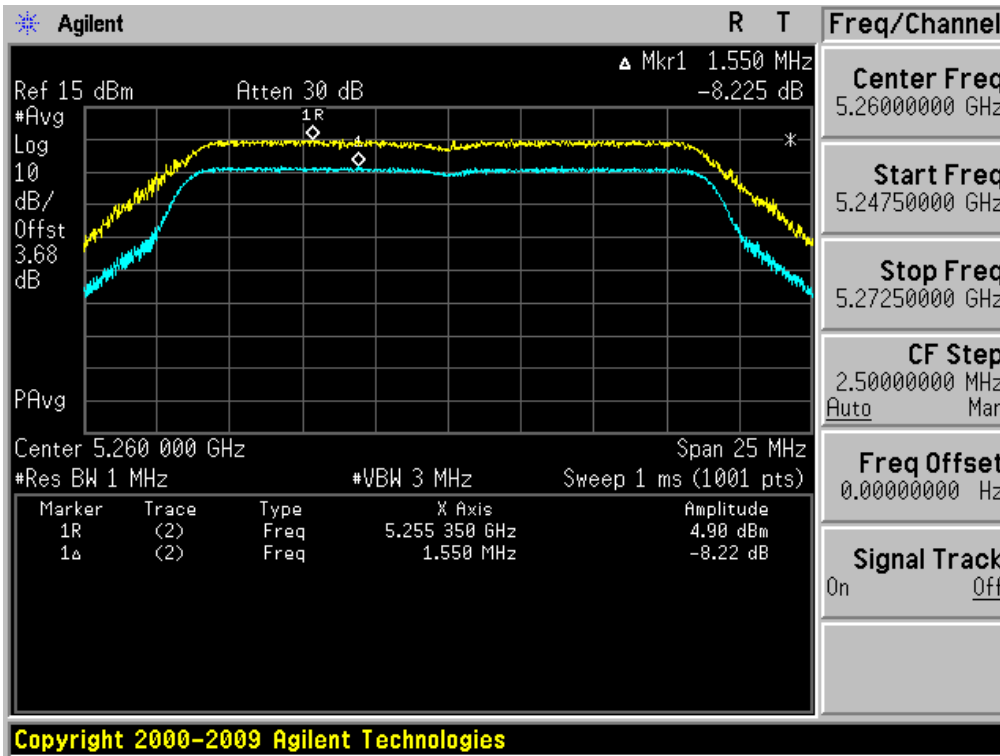
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.48



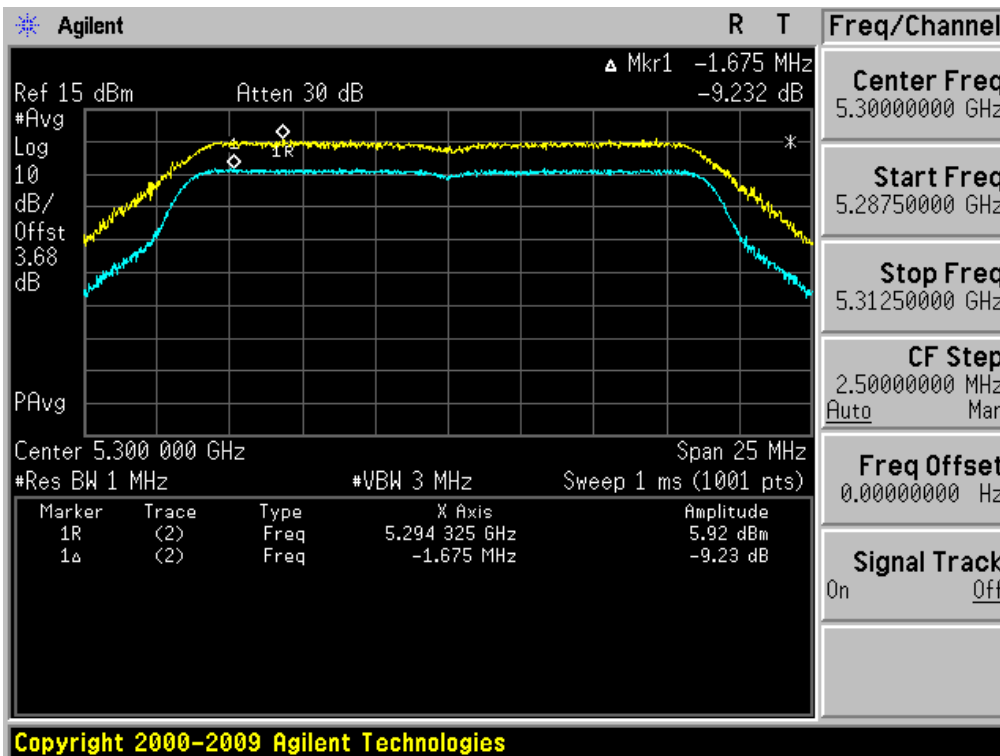
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.52



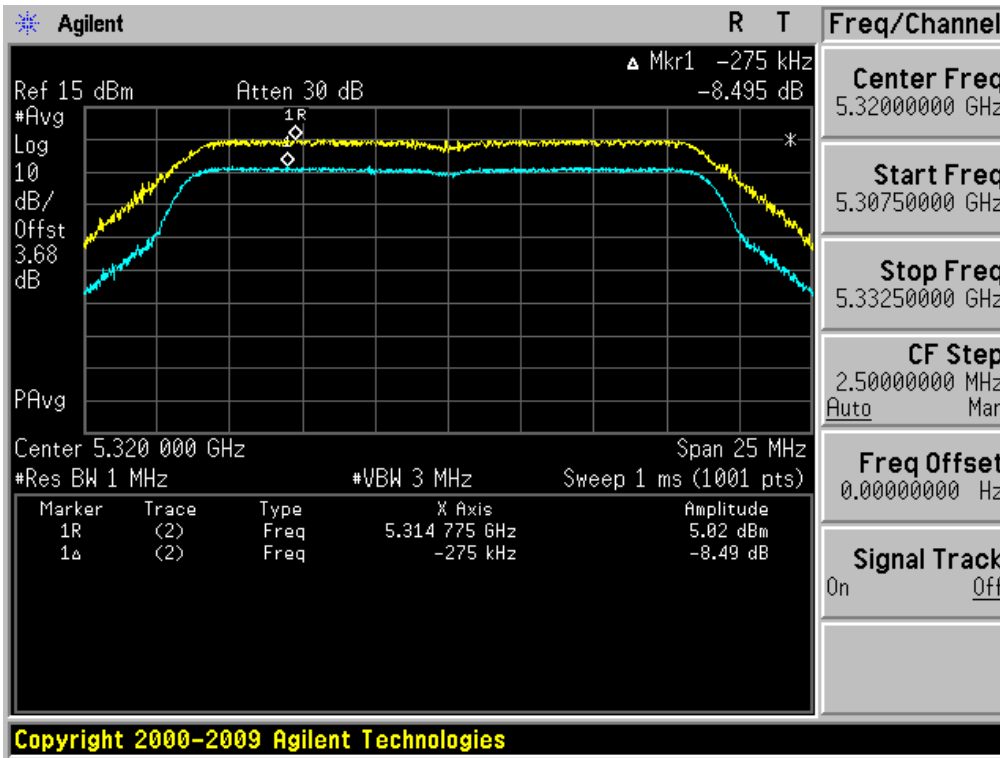
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.60



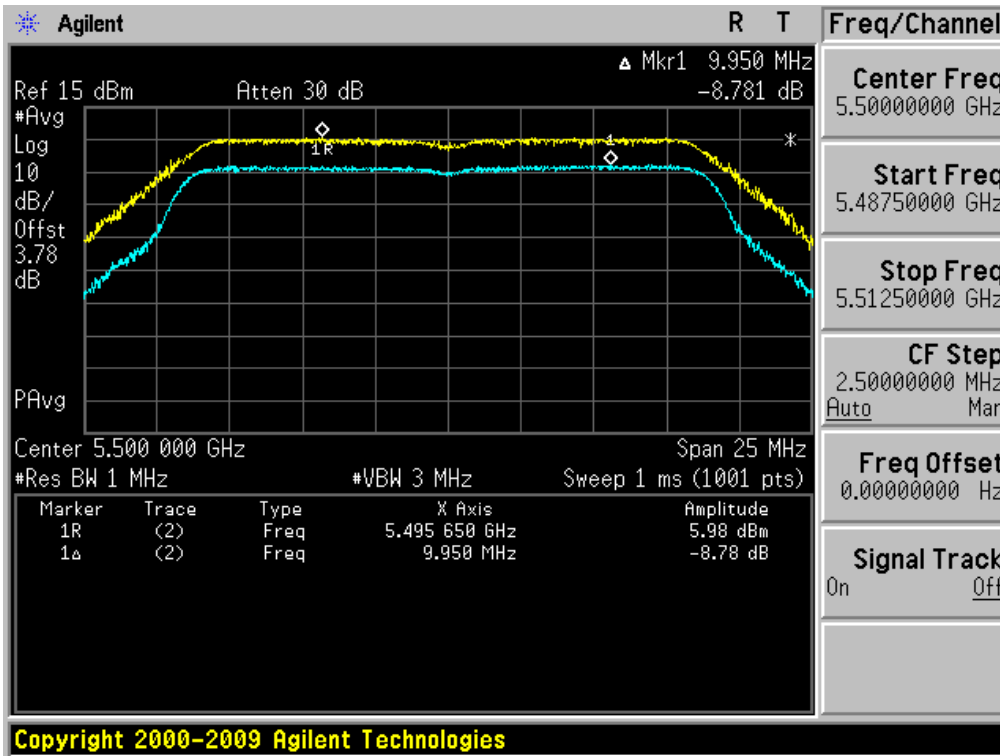
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.64



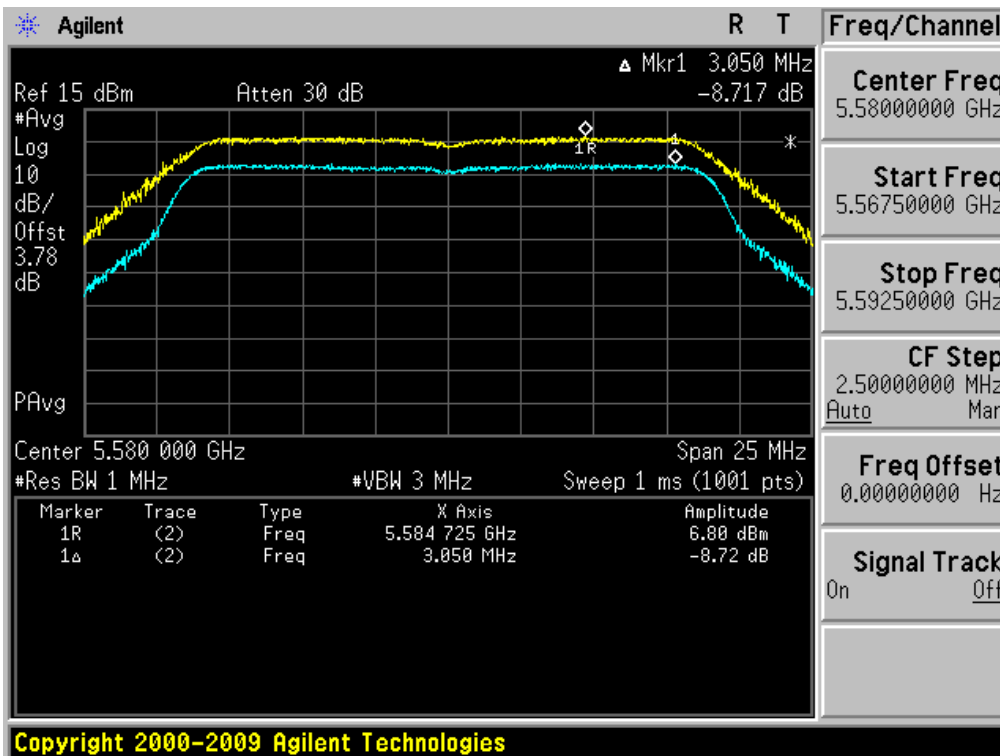
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.100



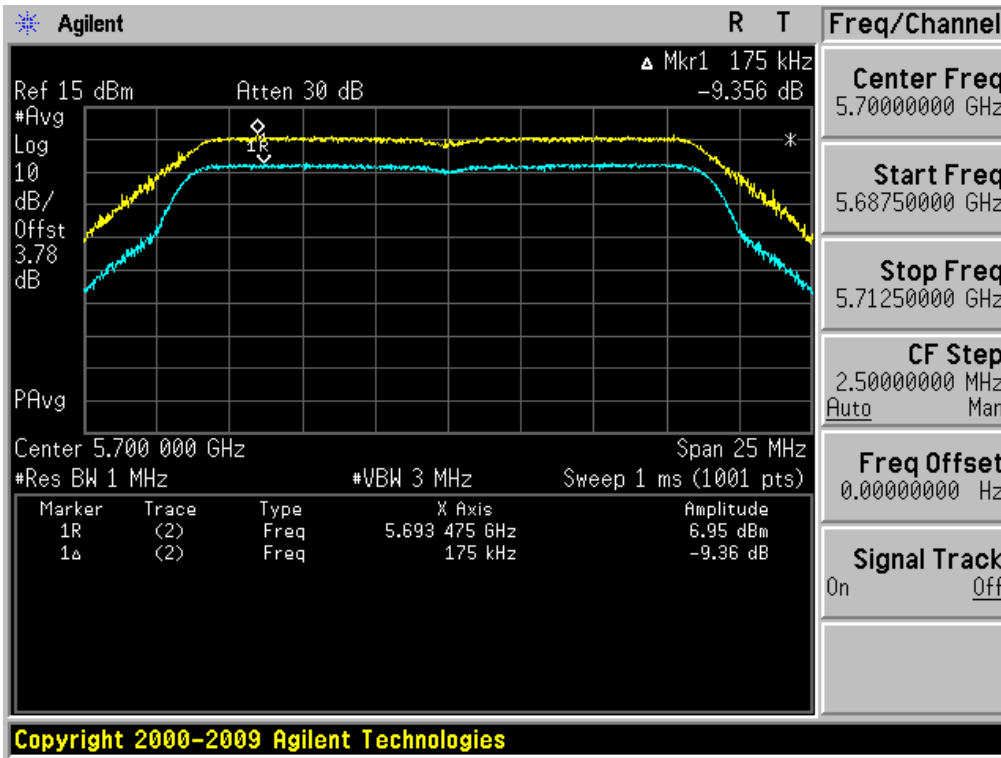
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.116



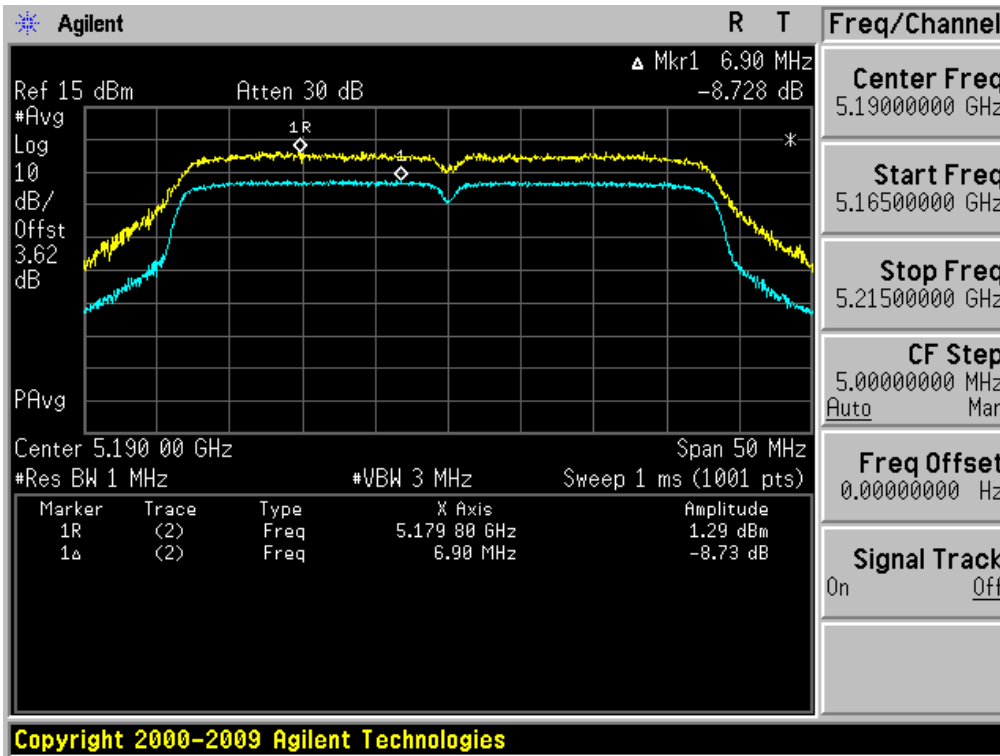
Peak Excursion Ratio

Test Mode: 802.11n HT20 & Ch.140



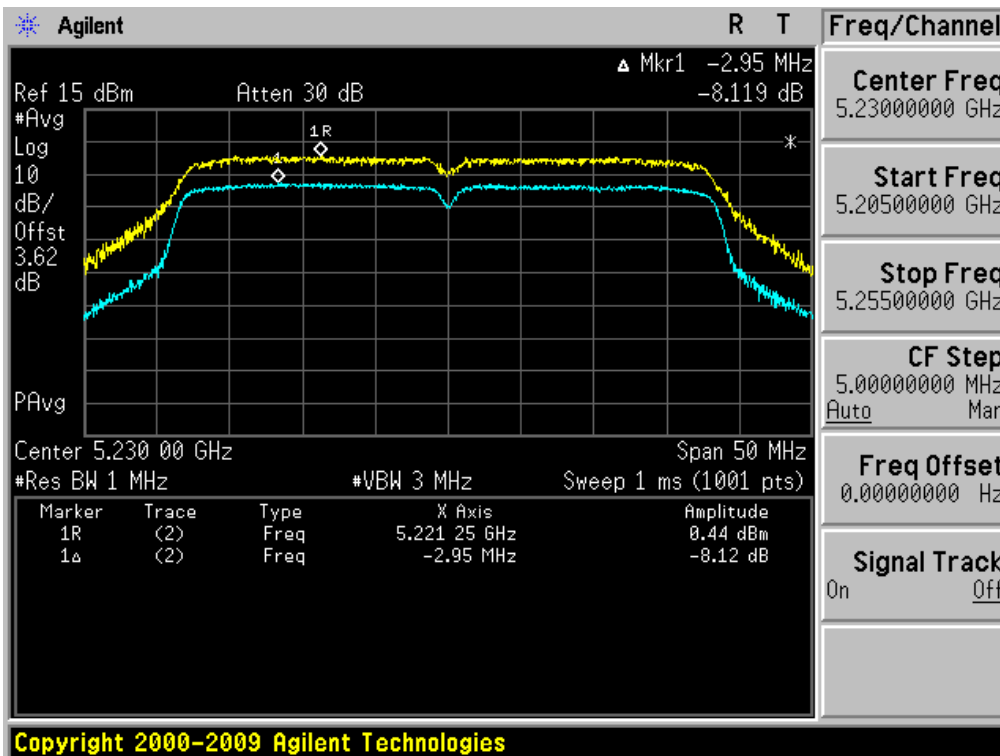
Peak Excursion Ratio

Test Mode: 802.11n HT40 & Ch.38



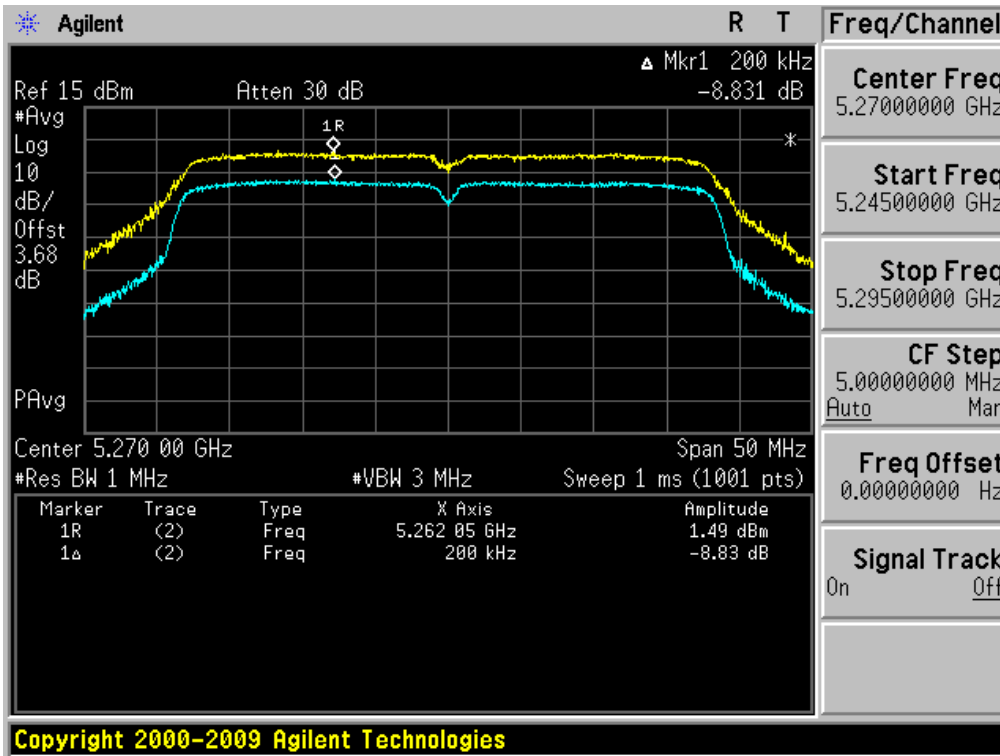
Peak Excursion Ratio

Test Mode: 802.11n HT40 & Ch.46



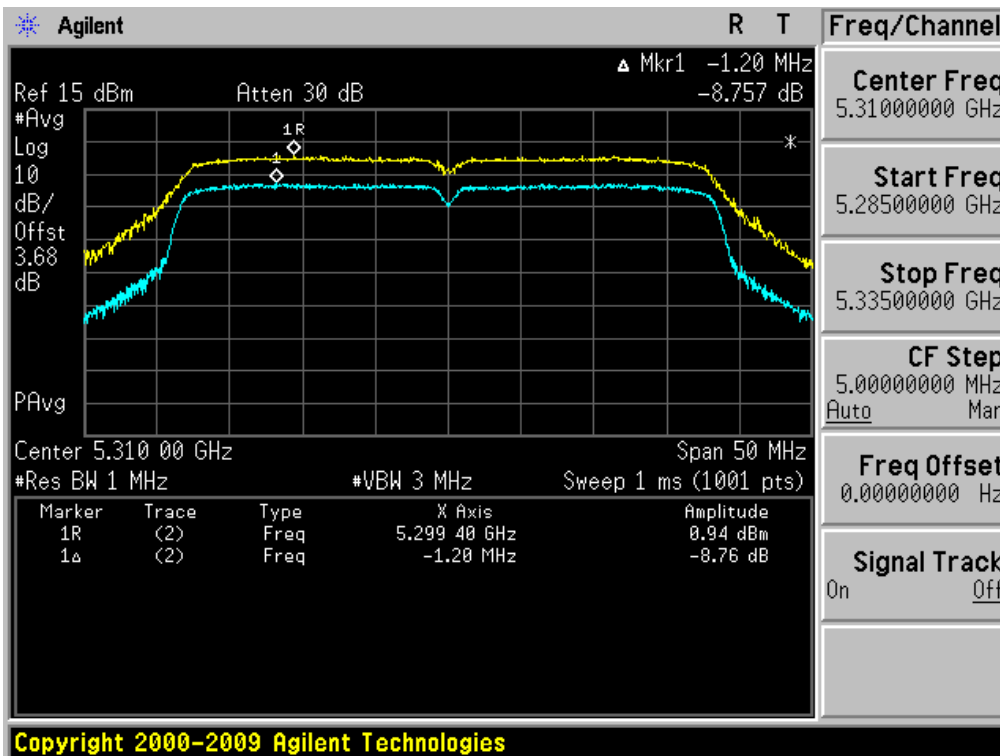
Peak Excursion Ratio

Test Mode: 802.11n HT40 & Ch.54



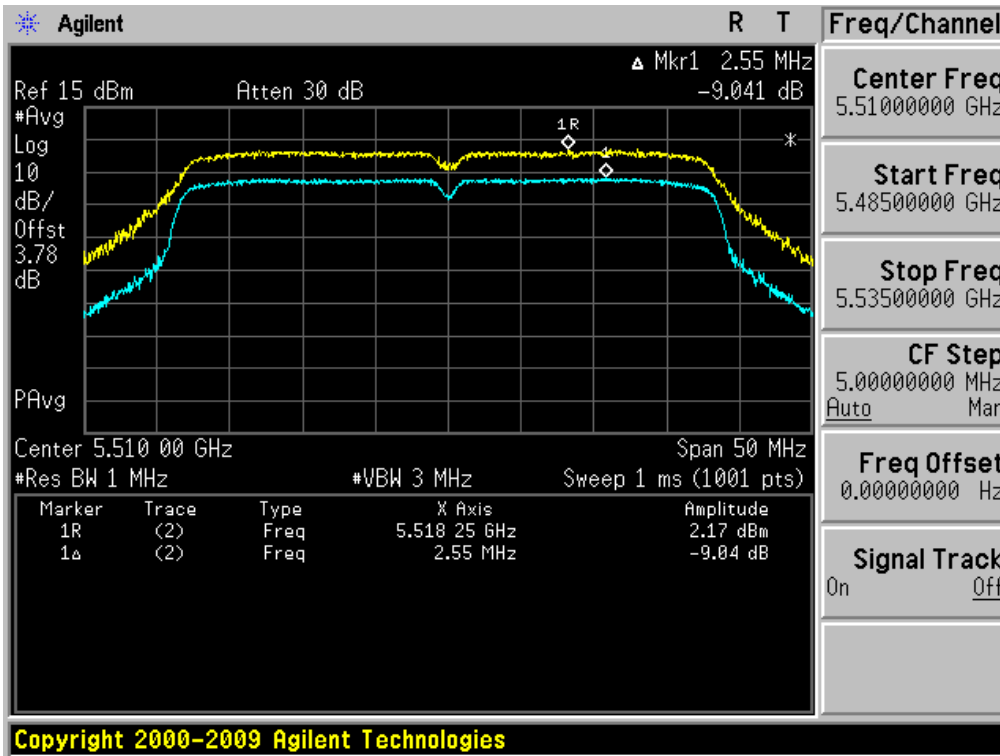
Peak Excursion Ratio

Test Mode: 802.11n HT40 & Ch.62



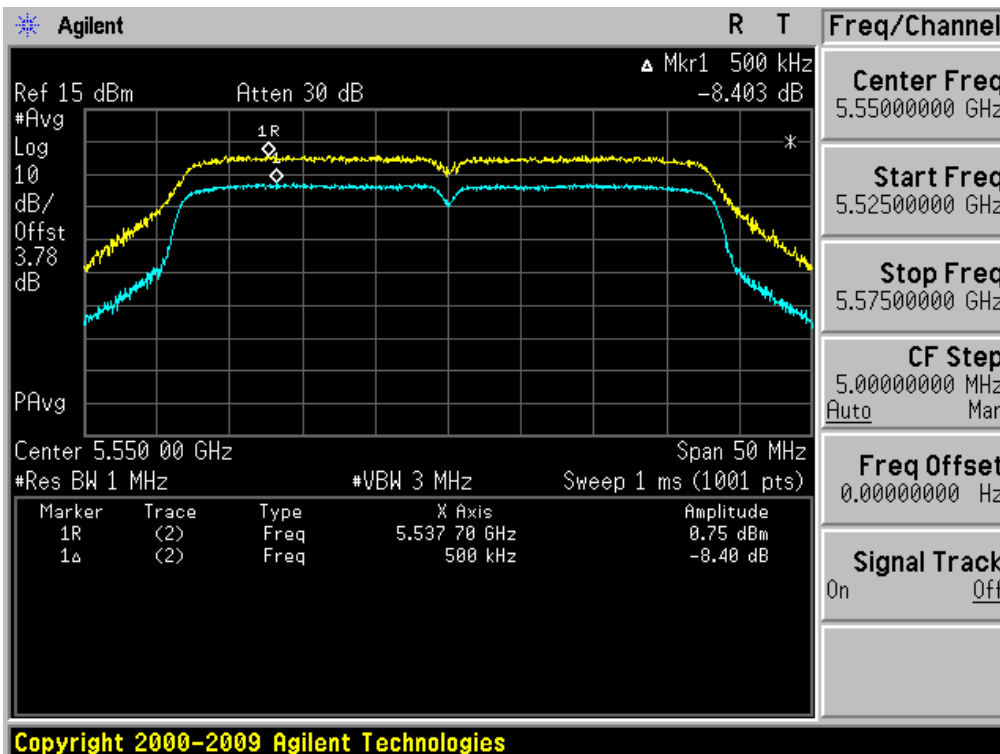
Peak Excursion Ratio

Test Mode: 802.11n HT40 & Ch.102



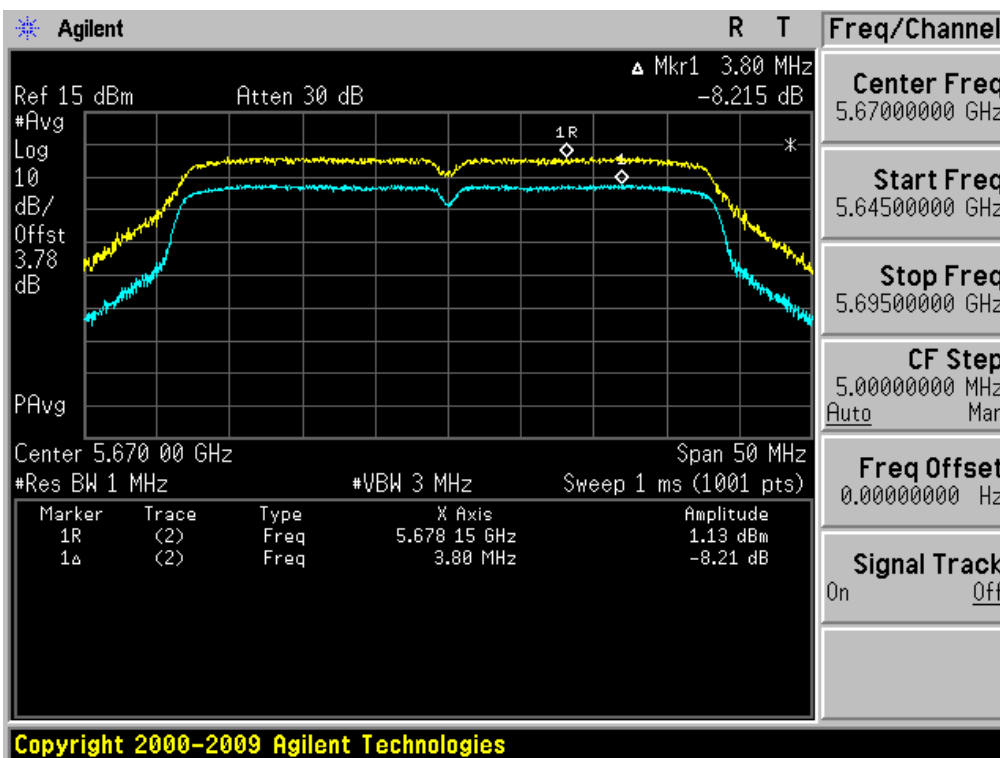
Peak Excursion Ratio

Test Mode: 802.11n HT40 & Ch.110



Peak Excursion Ratio

Test Mode: 802.11n HT40 & Ch.134



3.2.5 Frequency Stability

Test requirements

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

■ TEST PROCEDURE

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10°C intervals and the unit was allowed to stabilize at each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

■ TEST RESULT : **Comply**

- Measurement Data:

OPERATING FREQUENCY : 5,200,000,000 Hz
 CHANNEL : 40
 REFERENCE VOLTAGE : 3.800 V DC

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQ (Hz)	Deviation (%)
100%	3.800	+25(Ref)	5,199,988,548	-0.000220
100%		-30	5,200,027,402	0.000527
100%		-20	5,200,023,242	0.000447
100%		-10	5,200,011,785	0.000227
100%		0	5,200,003,786	0.000073
100%		+10	5,199,996,781	-0.000062
100%		+20	5,199,995,602	-0.000085
100%		+30	5,199,987,402	-0.000242
100%		+40	5,199,985,241	-0.000284
100%		+50	5,199,981,202	-0.000362
100%		+60	5,199,984,206	-0.000304
85%		3.230	+25	5,199,988,741
115%	4.370	+25	5,199,993,403	-0.000127
BATT.ENDPOINT	3.200	+25	5,199,992,441	-0.000145

- Minimum Standard: The emission is maintained within the band of the operation.

- Measurement Data:

OPERATING FREQUENCY : 5,300,000,000 Hz
 CHANNEL : 60
 REFERENCE VOLTAGE : 3.800 V DC

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQ (Hz)	Deviation (%)
100%	3.800	+25(Ref)	5,299,982,455	-0.000331
100%		-30	5,300,019,778	0.000373
100%		-20	5,300,011,224	0.000212
100%		-10	5,300,004,249	0.000080
100%		0	5,299,998,627	-0.000026
100%		+10	5,299,989,984	-0.000189
100%		+20	5,299,983,473	-0.000312
100%		+30	5,299,973,742	-0.000495
100%		+40	5,299,968,258	-0.000599
100%		+50	5,299,965,304	-0.000655
100%		+60	5,299,962,484	-0.000708
85%		3.230	+25	5,299,978,249
115%	4.370	+25	5,299,977,203	-0.000430
BATT.ENDPOINT	3.200	+25	5,299,978,452	-0.000407

- Minimum Standard: The emission is maintained within the band of the operation.

- Measurement Data:

OPERATING FREQUENCY : 5,580,000,000 Hz
 CHANNEL : 116
 REFERENCE VOLTAGE : 3.800 V DC

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQ (Hz)	Deviation (%)
100%	3.800	+25(Ref)	5,579,987,753	-0.000219
100%		-30	5,580,024,559	0.000440
100%		-20	5,580,017,245	0.000309
100%		-10	5,580,010,338	0.000185
100%		0	5,580,005,394	0.000097
100%		+10	5,579,999,584	-0.000007
100%		+20	5,579,993,485	-0.000117
100%		+30	5,579,985,892	-0.000253
100%		+40	5,579,977,234	-0.000408
100%		+50	5,579,974,393	-0.000459
100%		+60	5,579,975,895	-0.000432
85%		3.230	+25	5,579,987,553
115%	4.370	+25	5,579,987,340	-0.000227
BATT.ENDPOINT	3.200	+25	5,579,987,430	-0.000225

- Minimum Standard: The emission is maintained within the band of the operation.

3.2.6 Radiated Spurious Emission Measurements

■ TEST PROCEDURE

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in semi anechoic chamber. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine the worst-case orientation for maximum emissions.

Radiated spurious emission measured using following Measurement Procedure of **KDB789033**

● Measurements Below 1000MHz

- a) Follow the requirements in section G)3), "General Requirements for Unwanted Emissions Measurements"
- b) Compliance shall be demonstrated using **CISPR quasi-peak detection**; however, **peak detection** is permitted as an alternative to quasi-peak detection.

G)3), General Requirements for Unwanted Emissions Measurements. The following requirements apply to all unwanted emissions measurements, both in and outside of the restricted bands:

a) EUT Duty Cycle

- (1) The EUT shall be configured or modified to **transmit continuously** except as stated in (ii), below. The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (**to no lower than 98 percent**) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.
- (2) If **continuous transmission (or at least 98 percent duty cycle) cannot be achieved** due to hardware limitations of the EUT (e.g., overheating), the following additions to the measurement and reporting procedures are required:
 - The EUT shall be configured to operate at the maximum achievable duty cycle.
 - Measure the duty cycle, x, of the transmitter output signal.
 - Adjustments to measurement procedures (e.g., increasing test time and number of traces averaged) shall be performed as described in the procedures below.
 - The test report shall include the following additional information:
 - The reason for the duty cycle limitation.
 - The duty cycle achieved for testing and the associated transmit duration and interval between transmissions.
 - The sweep time and the amount of time used for trace stabilization during max-hold measurements for peak emission measurements.
- (3) **Reduction of the measured emission amplitude levels to account for operational duty factor is not permitted. Compliance is based on emission levels occurring during transmission - not on an average across on and off times of the transmitter.**

● Measurements Above 1000MHz (Peak)

- a) Follow the requirements in section G)3), "General Requirements for Unwanted Emissions Measurements".
- b) Peak emission levels are measured by setting the analyzer as follows:
 - (1) **RBW = 1 MHz.**
 - (2) **VBW ≥ 3 MHz.**
 - (3) **Detector = Peak.**
 - (4) Sweep time = auto.
 - (5) Trace mode = max hold.
 - (6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

● Measurements Above 1000MHz (Method AD)

- (1) **RBW = 1 MHz.**
- (2) **VBW ≥ 3 MHz.**
- (3) **Detector = RMS**, if $\text{span}/(\# \text{ of points in sweep}) \leq \text{RBW}/2$. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, the detector mode shall be set to peak.
- (4) Averaging type = power (i.e., RMS)
 - As an alternative, the detector and averaging type may be set for linear voltage averaging. Some analyzers require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
- (5) Sweep time = auto.
- (6) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, the number of traces shall be increased by a factor of $1/x$, where x is the duty cycle. For example, with 50 percent duty cycle, at least 200 traces should be averaged.
- (7) If tests are performed with the EUT transmitting at a duty cycle less than 98 percent, a correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
 - If power averaging (RMS) mode was used in step (iv) above, the correction factor is $10 \log(1/x)$, where x is the duty cycle. For example, if the transmit duty cycle was 50 percent, then 3 dB must be added to the measured emission levels.
 - **If linear voltage averaging mode was used in step (iv) above, the correction factor is $20 \log(1/x)$, where x is the duty cycle.** For example, if the transmit duty cycle was 50 percent, then 6 dB must be added to the measured emission levels.

■ **Minimum Standard:**

▪ **FCC Part 15.209(a) and (b)**

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

▪ **FCC Part 15.205 (a):** Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	3600 ~ 4400	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	4.5 ~ 5.15	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	5.35 ~ 5.46	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	7.25 ~ 7.75	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	8.025 ~ 8.5	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.0 ~ 9.2	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	9.3 ~ 9.5	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	10.6 ~ 12.7	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900	13.25 ~ 13.4	
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240			
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

▪ **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

▪ **FCC Part 15.407 (b):** Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the **5.15-5.25 GHz band**: all emissions outside of the **5.15-5.35 GHz band** shall not exceed an **EIRP of -27 dBm/MHz**.
- (2) For transmitters operating in the **5.25-5.35 GHz band**: all emissions outside of the **5.15-5.35 GHz band** shall not exceed an **EIRP of -27 dBm/MHz**. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
- (3) For transmitters operating in the **5.47-5.725 GHz band**: all emissions outside of the **5.47-5.725 GHz band** shall not exceed an **EIRP of -27 dBm/MHz**.
- (4) For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.
- (5) The above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions **below 1 GHz** must comply with the general field strength limits set forth in **Section 15.209**. Further, any U-NII devices using an **AC power line** are required to comply also with the conducted limits set forth in **Section 15.207**.

■ Measurement Data:

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5180MHz(Ch. 36)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5149.80	H	Y	PK	49.01	3.08	-	-	52.09	74.00	21.91
5149.86	H	Y	AV	39.79	3.08	0.46	-	43.33	54.00	10.67
10359.93	H	Y	PK	48.32	11.39	-	-6.02	53.69	68.20	14.51
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5200MHz(Ch. 40)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10399.95	H	Y	PK	48.03	11.98	-	-6.02	53.99	68.20	14.21
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5240MHz(Ch. 48)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10480.20	H	Y	PK	46.95	12.36	-	-6.02	53.29	68.20	14.91
-	-	-	-	-	-	-	-	-	-	-

Note.

- This test item was performed in each axis and the worst case data were reported.
- Sample Calculation.
 Margin = Limit – Result
 Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
 T.F = AF + CL – AG
 DUTY Correction Factor : 0.46 dB = 20*log(1/0.95) for Method AD.
- Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

■ Measurement Data:

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5260MHz(Ch. 52)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10519.91	H	Y	PK	47.27	12.08	-	-6.02	53.33	68.20	14.87
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5300MHz(Ch. 60)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10600.04	H	Y	PK	48.23	12.21	-	-6.02	54.42	74.00	19.58
10600.03	H	Y	AV	39.66	12.21	0.46	-6.02	46.31	54.00	7.69

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5320MHz(Ch. 64)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5352.47	H	Y	PK	50.72	3.61	-	-	54.33	74.00	19.67
5352.27	H	Y	AV	40.71	3.61	0.46	-	44.78	54.00	9.22
10639.69	H	Y	PK	49.21	12.53	-	-6.02	55.72	74.00	18.28
10639.91	H	Y	AV	40.28	12.53	0.46	-6.02	47.25	54.00	6.75
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

- This test item was performed in each axis and the worst case data were reported.
- Sample Calculation.
 Margin = Limit – Result
 Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
 T.F = AF + CL – AG
 DUTY Correction Factor : 0.46 dB = 20*log(1/0.95) for Method AD.
- Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

■ Measurement Data:

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5500MHz(Ch. 100)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5453.05	H	Y	PK	50.99	3.4	-	-	54.39	74.00	19.61
5453.37	H	Y	AV	40.36	3.4	0.46	-	44.22	54.00	9.78
5469.16	H	Y	PK	50.52	3.47	N/A	-	53.99	68.20	14.21
10999.88	H	Y	PK	48.55	12.92	N/A	-6.02	55.45	74.00	18.55
10999.84	H	Y	AV	39.21	12.92	0.46	-6.02	46.57	54.00	7.43

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5580MHz(Ch. 116)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11160.00	H	Y	PK	48.68	14.65	-	-6.02	57.31	74.00	16.69
11159.94	H	Y	AV	40.86	14.65	0.46	-6.02	49.95	54.00	4.05

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11a & 5700MHz(Ch. 140)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5725.59	H	Y	PK	50.28	3.80	-	-	54.08	68.20	14.12
11399.96	H	Z	PK	48.32	14.65	-	-6.02	56.95	74.00	17.05
11399.95	H	Z	AV	39.67	14.65	0.46	-6.02	48.76	54.00	5.24

Note.

- This test item was performed in each axis and the worst case data were reported.
- Sample Calculation.
Margin = Limit – Result
Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
T.F = AF + CL – AG
DUTY Correction Factor : 0.46 dB = 20*log(1/0.95) for Method AD.
- Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

■ Measurement Data:

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5180MHz(Ch. 36)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5149.57	H	Y	PK	48.81	3.08	-	-	51.89	74.00	22.11
5149.73	H	Y	AV	39.24	3.08	0.54	-	42.86	54.00	11.14
10359.93	H	Y	PK	47.9	11.39	-	-6.02	53.27	68.20	14.93
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5200MHz(Ch. 40)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10399.99	H	Y	PK	48.01	11.98	-	-6.02	53.97	68.20	14.23
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5240MHz(Ch. 48)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10480.03	H	Y	PK	47.01	12.36	N/A	-6.02	53.35	68.20	14.85
-	-	-	-	-	-	-	-	-	-	-

Note.

- This test item was performed in each axis and the worst case data were reported.
- Sample Calculation.
Margin = Limit – Result
Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
T.F = AF + CL – AG
DUTY Correction Factor : 0.54 dB = 20*log(1/0.94) for Method AD.
- Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

■ Measurement Data:

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5260MHz(Ch. 52)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBUV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)
10519.78	H	Y	PK	47.35	12.08	-	-6.02	53.41	68.20	14.79
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5300MHz(Ch. 60)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBUV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)
10600.18	H	Y	PK	48.28	12.21	-	-6.02	54.47	74.00	19.53
10600.03	H	Y	AV	39.77	12.21	0.54	-6.02	46.50	54.00	7.50

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5320MHz(Ch. 64)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBUV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)
5352.70	H	Y	PK	50.35	3.61	-	-	53.96	74.00	20.04
5352.64	H	Y	AV	40.41	3.61	0.54	-	44.56	54.00	9.44
10639.91	H	Y	PK	48.79	12.53	-	-6.02	55.30	74.00	18.70
10640.15	H	Y	AV	39.76	12.53	0.54	-6.02	46.81	54.00	7.19
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

- This test item was performed in each axis and the worst case data were reported.
- Sample Calculation.
 Margin = Limit – Result
 Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
 T.F = AF + CL – AG
 DUTY Correction Factor : 0.54 dB = 20*log(1/0.94) for Method AD.
- Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

■ Measurement Data:

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5500MHz(Ch. 100)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5457.79	H	Y	PK	49.41	3.4	-	-	52.81	74.00	21.19
5457.91	H	Y	AV	40.24	3.4	0.54	-	44.18	54.00	9.82
5469.07	H	Y	PK	50.68	3.47	-	-	54.15	68.20	14.05
11000.14	H	Y	PK	47.86	12.92	-	-6.02	54.76	74.00	19.24
10999.95	H	Y	AV	39.67	12.92	0.54	-6.02	47.11	54.00	6.89

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5580MHz(Ch. 116)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11159.70	H	Y	PK	47.08	14.65	-	-6.02	55.71	74.00	18.29
11160.00	H	Y	AV	37.92	14.65	0.54	-6.02	47.09	54.00	6.91

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT20 & 5700MHz(Ch. 140)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5725.97	H	Z	PK	49.97	3.8	-	-	53.77	68.20	14.43
11399.93	H	Z	PK	47.93	14.65	-	-6.02	56.56	74.00	17.44
11400.03	H	Z	AV	40.26	14.65	0.54	-6.02	49.43	54.00	4.57

Note.

- This test item was performed in each axis and the worst case data were reported.
- Sample Calculation.
Margin = Limit – Result
Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
T.F = AF + CL – AG
DUTY Correction Factor : 0.54 dB = 20*log(1/0.94) for Method AD.
- Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

■ **Measurement Data:**

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT40 & 5190MHz(Ch. 38)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBUV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)
5149.68	H	Y	PK	49.38	3.08	-	-	52.46	74.00	21.54
5149.83	H	Y	AV	39.71	3.08	0.54	-	43.33	54.00	10.67
10379.92	H	Y	PK	48.53	11.52	N/A	-6.02	54.03	68.20	14.17

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT40 & 5230MHz(Ch. 46)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBUV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)
10459.48	H	Y	PK	47.59	12.03	-	-6.02	53.60	68.20	14.60
-	-	-	-	-	-	-	-	-	-	-

Note.

1. This test item was performed in each axis and the worst case data were reported.
2. Sample Calculation.
 Margin = Limit – Result
 Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
 T.F = AF + CL – AG
 DUTY Correction Factor : 0.54 dB = 20*log(1/0.94) for Method AD.
3. Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

■ Measurement Data:

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT40 & 5270MHz(Ch. 54)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10540.13	H	Y	PK	46.92	12.16	-	-6.02	53.06	68.20	15.14
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT40 & 5310MHz(Ch. 62)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5352.44	H	Z	PK	50.47	3.61	-	-	54.08	74.00	19.92
5352.57	H	Z	AV	40.27	3.61	0.54	-	44.42	54.00	9.58
10620.04	H	Y	PK	47.92	12.63	-	-6.02	54.53	74.00	19.47
10619.98	H	Y	AV	39.15	12.63	0.54	-6.02	46.30	54.00	7.70

Note.

- This test item was performed in each axis and the worst case data were reported.
- Sample Calculation.
 Margin = Limit – Result
 Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
 T.F = AF + CL – AG
 DUTY Correction Factor : 0.54 dB = 20*log(1/0.94) for Method AD.
- Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

■ Measurement Data:

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT40 & 5510MHz(Ch. 102)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5459.10	H	Y	PK	50.47	3.4	-	-	53.87	74.00	20.13
5458.99	H	Y	AV	40.18	3.4	0.54	-	44.12	74.00	29.88
5469.72	H	Y	PK	50.52	3.47	-	-	53.99	68.20	14.21
11019.97	H	Y	PK	47.73	12.78	-	-6.02	54.49	74.00	19.51
11019.90	H	Y	AV	39.21	12.78	0.54	-6.02	46.51	54.00	7.49

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT40 & 5550MHz(Ch. 110)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11099.94	H	Y	PK	47.82	13.12	-	-6.02	54.92	74.00	19.08
11099.88	H	Y	AV	39.61	13.12	0.54	-6.02	47.25	54.00	6.75

30MHz ~ 40GHz Radiated Spurious Emissions: 802.11n HT40 & 5670MHz(Ch. 134)

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector	Reading (dBuV)	T.F (dB/m)	DUTY Correction Factor (dB)	Distance Correction Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
5725.08	H	Y	PK	51.50	3.8	-	-	55.30	68.20	12.90
11340.03	H	Z	PK	48.65	14.46	-	-6.02	57.09	74.00	16.91
11339.93	H	Z	AV	41.49	14.46	0.54	-6.02	50.47	54.00	3.53

Note.

- This test item was performed in each axis and the worst case data were reported.
- Sample Calculation.
Margin = Limit – Result
Result = Reading + T.F + DUTY Correction Factor + Distance Correction Factor
T.F = AF + CL – AG
DUTY Correction Factor : 0.54 dB = 20*log(1/0.94) for Method AD.
- Measurement Distance above 10 GHz = 1.5m. So Distance Correction Factor : -6.02dB = 20*log(1.5m/3m)

3.2.7 AC Conducted Emissions

■ **TEST PROCEDURE :**

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. Emissions closest to the limit are measured in the quasi-peak mode (QP) and average mode (AV) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

■ **Measurement Data: Comply**

Note 1: See next pages for actual measured spectrum plots and data.

■ **Minimum Standard: FCC Part 15.207(a)/EN 55022**

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

AC Line Conducted Emissions (Graph)

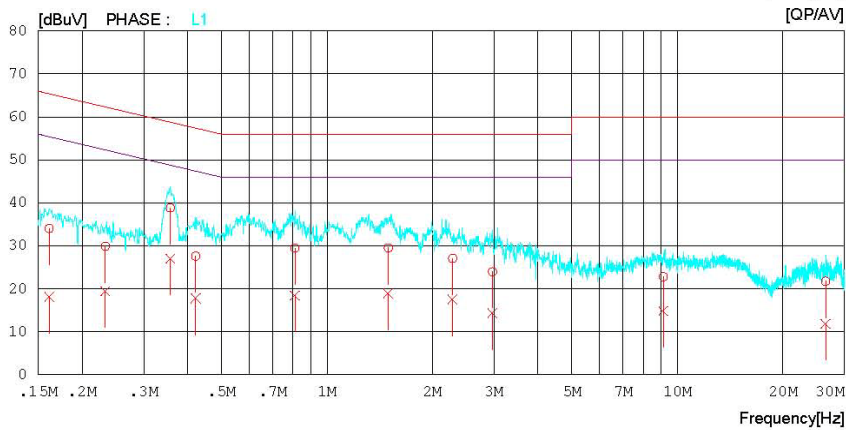
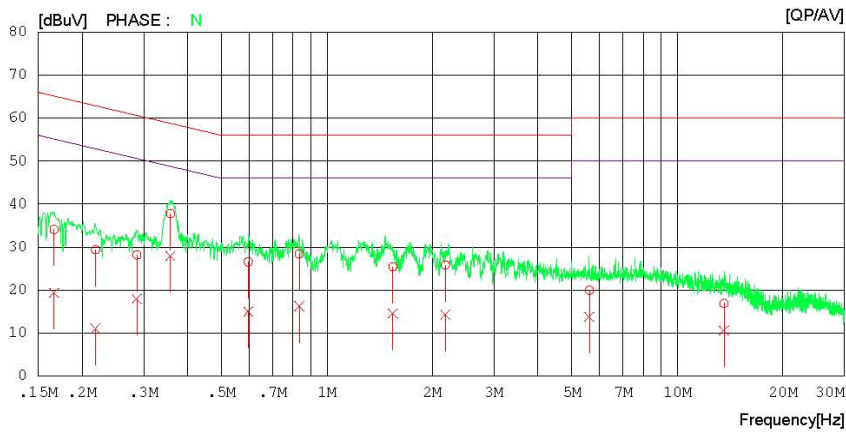
Test Mode: 802.11a_5.1G



Results of Conducted Emission

Digital EMC
Date : 2012-11-15

Model No.	: LG-E975k	Reference No.	:
Type	:	Power Supply	: 120 V 60 Hz
Serial No.	: Identical prototype	Temp/Humi.	: 23 °C 45 % R.H.
Test Condition	: WLAN	Operator	: H.S SON
Memo	: 5.1GHz		
LIMIT	: CISPR22_B QP		
	: CISPR22_B AV		



AC Line Conducted Emissions (Data List)

Test Mode: 802.11a_5.1G

Results of Conducted Emission

Digital EMC
Date : 2012-11-15

Model No. : LG-E975k
Type :
Serial No. : Identical prototype
Test Condition : WLAN
Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 23 °C 45 % R.H.
Operator : H.S SON
Memo : 5.1GHz

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16650	34.0	19.2	0.1	34.1	19.3	65.1	55.1	31.0	35.8	N
2	0.21875	29.2	10.9	0.1	29.3	11.0	62.9	52.9	33.6	41.9	N
3	0.28713	28.0	17.8	0.1	28.1	17.9	60.6	50.6	32.5	32.7	N
4	0.35769	37.6	27.8	0.1	37.7	27.9	58.8	48.8	21.1	20.9	N
5	0.59671	26.4	14.9	0.1	26.5	15.0	56.0	46.0	29.5	31.0	N
6	0.83375	28.3	16.1	0.1	28.4	16.2	56.0	46.0	27.6	29.8	N
7	1.54200	25.3	14.4	0.1	25.4	14.5	56.0	46.0	30.6	31.5	N
8	2.17950	25.7	14.2	0.1	25.8	14.3	56.0	46.0	30.2	31.7	N
9	5.61250	19.7	13.5	0.2	19.9	13.7	60.0	50.0	40.1	36.3	N
10	13.59000	16.6	10.2	0.3	16.9	10.5	60.0	50.0	43.1	39.5	N
11	0.16118	34.0	18.0	0.1	34.1	18.1	65.4	55.4	31.3	37.3	L1
12	0.23303	29.8	19.3	0.1	29.9	19.4	62.3	52.3	32.4	32.9	L1
13	0.35745	38.7	26.9	0.1	38.8	27.0	58.8	48.8	20.0	21.8	L1
14	0.42219	27.5	17.7	0.1	27.6	17.8	57.4	47.4	29.8	29.6	L1
15	0.81030	29.3	18.3	0.1	29.4	18.4	56.0	46.0	26.6	27.6	L1
16	1.49700	29.4	18.9	0.1	29.5	19.0	56.0	46.0	26.5	27.0	L1
17	2.28500	27.0	17.4	0.1	27.1	17.5	56.0	46.0	28.9	28.5	L1
18	2.96850	23.9	14.2	0.1	24.0	14.3	56.0	46.0	32.0	31.7	L1
19	9.12800	22.5	14.6	0.3	22.8	14.9	60.0	50.0	37.2	35.1	L1
20	26.49750	21.3	11.3	0.5	21.8	11.8	60.0	50.0	38.2	38.2	L1

AC Line Conducted Emissions (Graph)

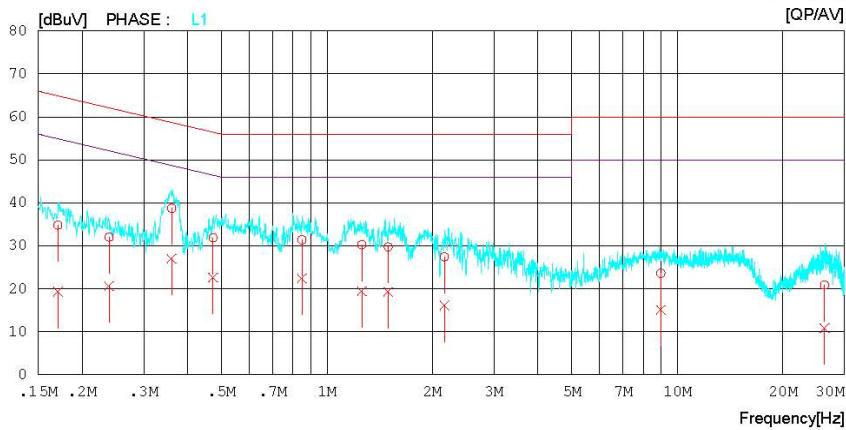
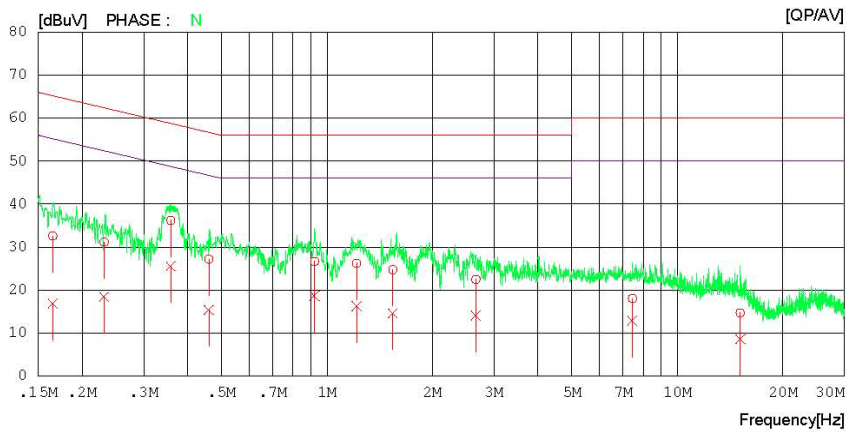
Test Mode: 802.11a_5.3G



Results of Conducted Emission

Digital EMC
 Date : 2012-11-15

Model No.	: LG-E975k	Reference No.	:
Type	:	Power Supply	: 120 V 60 Hz
Serial No.	: Identical prototype	Temp/Humi.	: 23 °C 45 % R.H.
Test Condition	: WLAN	Operator	: H.S SON
Memo	: 5.3GHz		
LIMIT	: CISPR22_B QP		
	: CISPR22_B AV		



AC Line Conducted Emissions (Data List)

Test Mode: 802.11a_5.3G

Results of Conducted Emission

Digital EMC
Date : 2012-11-15

Model No. : LG-E975k
Type :
Serial No. : Identical prototype
Test Condition : WLAN
Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 23 °C 45 % R.H.
Operator : H.S SON

Memo : 5.3GHz

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16508	32.4	16.8	0.1	32.5	16.9	65.2	55.2	32.7	38.3	N
2	0.23138	31.0	18.3	0.1	31.1	18.4	62.4	52.4	31.3	34.0	N
3	0.35865	36.1	25.4	0.1	36.2	25.5	58.8	48.8	22.6	23.3	N
4	0.46020	27.1	15.2	0.1	27.2	15.3	56.7	46.7	29.5	31.4	N
5	0.92258	26.5	18.5	0.1	26.6	18.6	56.0	46.0	29.4	27.4	N
6	1.21550	26.1	16.2	0.1	26.2	16.3	56.0	46.0	29.8	29.7	N
7	1.54100	24.6	14.4	0.1	24.7	14.5	56.0	46.0	31.3	31.5	N
8	2.66100	22.3	13.9	0.1	22.4	14.0	56.0	46.0	33.6	32.0	N
9	7.44250	17.8	12.6	0.2	18.0	12.8	60.0	50.0	42.0	37.2	N
10	15.11500	14.4	8.2	0.3	14.7	8.5	60.0	50.0	45.3	41.5	N
11	0.17066	34.7	19.3	0.1	34.8	19.4	64.9	54.9	30.1	35.5	L1
12	0.23898	31.9	20.5	0.1	32.0	20.6	62.1	52.1	30.1	31.5	L1
13	0.36059	38.6	27.0	0.1	38.7	27.1	58.7	48.7	20.0	21.6	L1
14	0.47296	31.8	22.5	0.1	31.9	22.6	56.5	46.5	24.6	23.9	L1
15	0.84883	31.3	22.4	0.1	31.4	22.5	56.0	46.0	24.6	23.5	L1
16	1.25800	30.2	19.3	0.1	30.3	19.4	56.0	46.0	25.7	26.6	L1
17	1.49600	29.7	19.2	0.1	29.8	19.3	56.0	46.0	26.2	26.7	L1
18	2.16450	27.3	16.0	0.1	27.4	16.1	56.0	46.0	28.6	29.9	L1
19	8.97700	23.3	14.8	0.3	23.6	15.1	60.0	50.0	36.4	34.9	L1
20	26.30300	20.4	10.4	0.5	20.9	10.9	60.0	50.0	39.1	39.1	L1

AC Line Conducted Emissions (Graph)

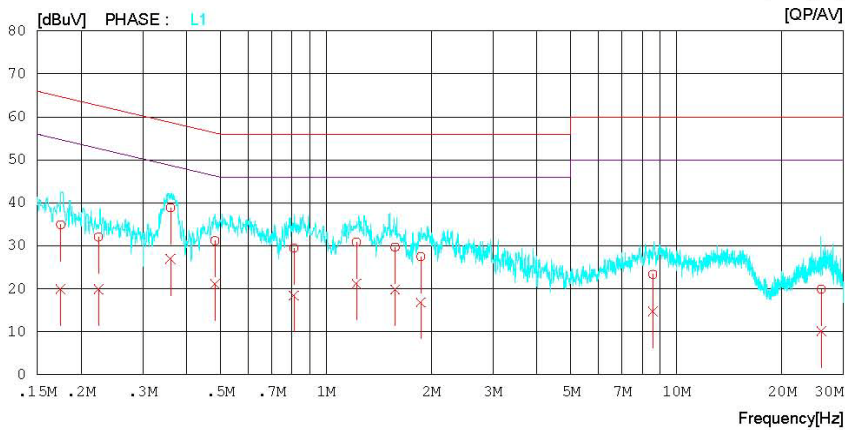
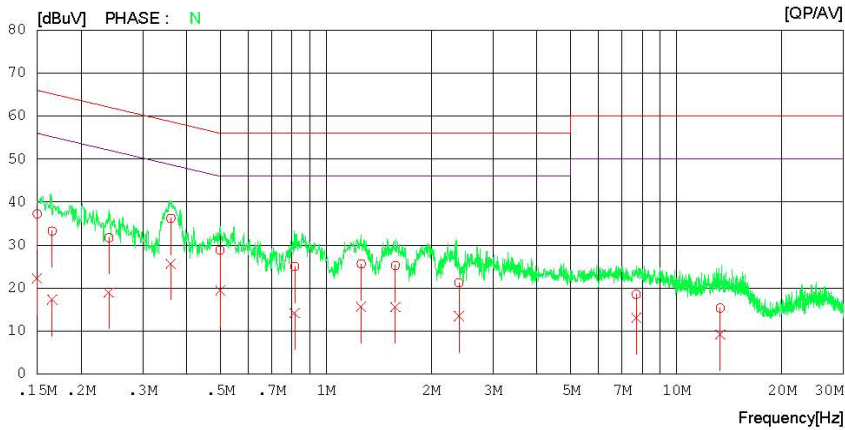
Test Mode: 802.11a_5.5G



Results of Conducted Emission

Digital EMC
Date : 2012-11-15

Model No.	: LG-E975k	Reference No.	:
Type	:	Power Supply	: 120 V 60 Hz
Serial No.	: Identical prototype	Temp/Humi.	: 23 °C 45 % R.H.
Test Condition	: WLAN	Operator	: H.S SON
Memo	: 5.5GHz		
LIMIT	: CISPR22_B QP CISPR22_B AV		



AC Line Conducted Emissions (Data List)

Test Mode: 802.11a_5.5G

Results of Conducted Emission

Digital EMC
Date : 2012-11-15

Model No. : LG-E975k
Type :
Serial No. : Identical prototype
Test Condition : WLAN
Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 23 °C 45 % R.H.
Operator : H.S SON
Memo : 5.5GHz
LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15000	37.2	22.1	0.1	37.3	22.2	66.0	56.0	28.7	33.8	N
2	0.16558	33.1	17.2	0.1	33.2	17.3	65.2	55.2	32.0	37.9	N
3	0.24025	31.6	18.9	0.1	31.7	19.0	62.1	52.1	30.4	33.1	N
4	0.36091	36.1	25.6	0.1	36.2	25.7	58.7	48.7	22.5	23.0	N
5	0.49915	28.7	19.3	0.1	28.8	19.4	56.0	46.0	27.2	26.6	N
6	0.81539	24.9	14.1	0.1	25.0	14.2	56.0	46.0	31.0	31.8	N
7	1.26100	25.5	15.5	0.1	25.6	15.6	56.0	46.0	30.4	30.4	N
8	1.57700	25.1	15.4	0.1	25.2	15.5	56.0	46.0	30.8	30.5	N
9	2.39800	21.1	13.4	0.1	21.2	13.5	56.0	46.0	34.8	32.5	N
10	7.68600	18.3	12.9	0.2	18.5	13.1	60.0	50.0	41.5	36.9	N
11	13.33700	15.0	8.9	0.3	15.3	9.2	60.0	50.0	44.7	40.8	N
12	0.17495	34.8	19.9	0.1	34.9	20.0	64.7	54.7	29.8	34.7	L1
13	0.22438	31.9	19.8	0.1	32.0	19.9	62.7	52.7	30.7	32.8	L1
14	0.36013	38.8	26.9	0.1	38.9	27.0	58.7	48.7	19.8	21.7	L1
15	0.48231	31.1	21.1	0.1	31.2	21.2	56.3	46.3	25.1	25.1	L1
16	0.81063	29.4	18.3	0.1	29.5	18.4	56.0	46.0	26.5	27.6	L1
17	1.22250	30.8	21.1	0.1	30.9	21.2	56.0	46.0	25.1	24.8	L1
18	1.57500	29.6	19.7	0.1	29.7	19.8	56.0	46.0	26.3	26.2	L1
19	1.86700	27.4	16.7	0.1	27.5	16.8	56.0	46.0	28.5	29.2	L1
20	8.56550	23.1	14.4	0.3	23.4	14.7	60.0	50.0	36.6	35.3	L1
21	25.93350	19.4	9.7	0.5	19.9	10.2	60.0	50.0	40.1	39.8	L1

3.2.8 Antenna Requirements

■ **Procedure:**

Describe how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.

■ **Conclusion: Comply**

The internal antenna is attached on the main PCB using the special spring tension. (Refer to Internal Photo file.)

■ **Minimum Standard:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions.

3.2.9 Occupied Bandwidth

■ **TEST Requirements**

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured

■ **TEST CONFIGURATION**

■ **TEST PROCEDURE :**

The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual

■ **TEST RESULT : N/A**

Minimum Standard : N/A

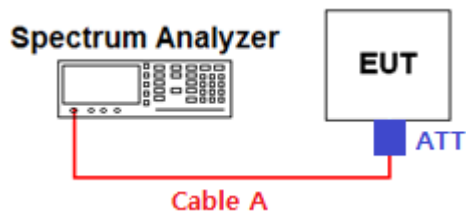
■ **RESULT PLOT : N/A**

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent	E4440A	12/09/18	13/09/18	MY45304199
Spectrum Analyzer	Agilent	E4440A	12/01/03	13/01/03	MY44033778
Spectrum Analyzer	Rohde Schwarz	FSQ26	12/01/09	13/01/09	200445
Harmonic Mixer	OML	M28HWD	12/02/06	13/02/06	Ka100224-1
Digital Multimeter	H.P	34401A	12/03/05	13/03/05	3146A13475, US36122178
Spectrum Analyzer	Agilent	N9020A	12/01/09	13/01/09	MY49100833
Signal Generator	Rohde Schwarz	SMR20	12/03/05	13/03/05	101251
Vector Signal Generator	Rohde Schwarz	SMJ100A	12/01/09	13/01/09	100148
Thermo hygrometer	BODYCOM	BJ5478	12/01/13	13/01/13	090205-2
DC Power Supply	HP	6622A	12/03/05	13/03/05	3448A03760
High-Pass Filter	Wainwright	WHKX8.5	12/09/17	13/09/17	1
BILOG ANTENNA	SCHAFFNER	CBL6112D	10/12/21	12/12/21	2737
HORN ANT	ETS	3115	12/02/20	14/02/20	6419
HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	154
Attenuator (10dB)	WEINSCHTEL	23-10-34	12/09/17	13/09/17	BP4386
Amplifier (22dB)	H.P	8447E	12/01/09	13/01/09	2945A02865
Amplifier (30dB)	Agilent	8449B	12/03/05	13/03/05	3008A01590
EMI TEST RECEIVER	R&S	ESU	12/03/05	13/03/05	100014
EMI TEST RECEIVER	R&S	ESCI	12/03/06	13/03/06	100364
CVCF	NF Electronic	4420	12/03/06	13/03/06	304935/337980
ARTIFICIAL MAINS NETWORK	R&S	ESH2-Z5	12/09/18	13/09/18	828739/006
RFI/Field intensity Meter	KYORITSU	KNM-2402	12/07/02	13/07/02	4N-170-3
TEMP & HUMIDITY Chamber	SJ SCIENCE	TEMI850-10	12/03/06	13/03/06	S7400LE267 1226

APPENDIX I Conducted Test set up Diagram & Path loss Information

▪ Conducted Measurement



Path loss value information

Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)
5180	3.56	5260	3.54	5500	3.62
5190	3.55	5270	3.62	5510	3.66
5200	3.57	5300	3.68	5550	3.71
5230	3.61	5310	3.66	5580	3.78
5240	3.62	5320	3.65	5670	3.74
				5700	3.59

Note. 1: The path loss from EUT to Spectrum analyzer was measured and used for test.
Path loss (=S/A's offset value) = Cable A + ATT (Attenuator, Applied only when it was used externally)

Note. 2: The worst case path loss was used as below.

BAND1 : 3.62dB, BAND2 : 3.68dB, Band3 : 3.78dB

APPENDIX II

Duty cycle plots

TEST PROCEDURE

Duty Cycle [$X = \text{On Time} / (\text{On} + \text{Off time})$] is measured using Measurement Procedure of KDB789033

1. Set the center frequency of the spectrum analyzer to the center frequency of the transmission.
2. Set RBW \geq EBW if possible; otherwise, set RBW to the largest available value.
3. Set VBW \geq RBW.
4. Set detector = peak.
5. Note : The zero-span measurement method shall not be used unless both **RBW and VBW are $> 50/T$** , where T is defined in section B)1)a), and **the number of sweep points across duration T exceeds 100**. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \leq 16.7$ microseconds.)

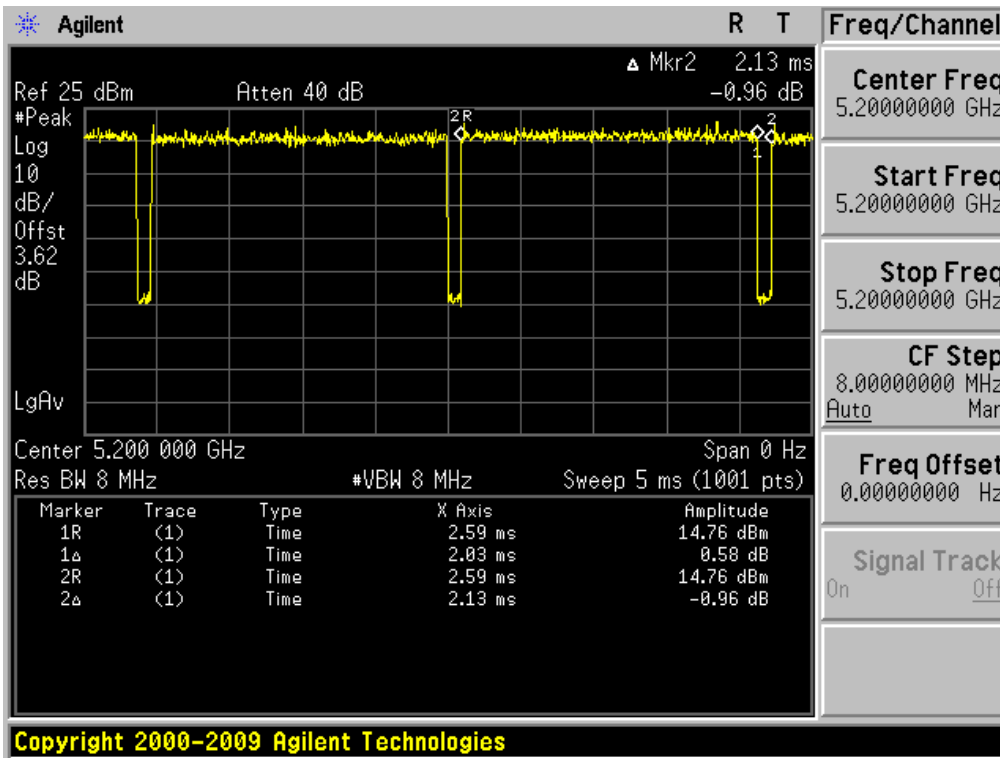
- Summary of Duty Cycle Calculation Table

Mode	Channel	Frequency [MHz]	Maximum Achievable Duty Cycle ($x = \text{On} / (\text{On} + \text{Off})$)		
			On Time [ms]	(On+Off) Time [ms]	x
802.11a	36	5180	2.030	2.130	0.95
	40	5200			
	48	5240			
	52	5260	2.030	2.130	0.95
	60	5300			
	64	5320			
	100	5500	2.030	2.130	0.95
	116	5580			
140	5700				
802.11n (20MHz)	36	5180	1.890	1.990	0.94
	40	5200			
	48	5240			
	52	5260	1.890	1.990	0.94
	60	5300			
	64	5320			
	100	5500	1.890	1.990	0.94
	116	5580			
140	5700				
802.11n (40MHz)	38	5190	0.930	0.980	0.94
	46	5230			
	54	5270	0.930	0.980	0.94
	62	5310			
	102	5510	0.930	0.980	0.94
	110	5550			
134	5670				

- Description for duty cycle plot data on next pages : $1 \Delta = \text{On Time}$, $2 \Delta = (\text{On} + \text{Off}) \text{ Time}$ So $\text{Off Time} = 2 \Delta - 1 \Delta$
- T : The minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
($T = \text{On time}$ of the above table since the EUT operates with above fixed Duty Cycle and it is the minimum On time)
For Duty Cycle with zero span method, both RBW/VBW $> 50/T$
(For example, this case $\text{RBW/VBW (8 MHz)} > 50/0.00093 = 53.8 \text{ KHz}$)
- The reason for the Duty Cycle Limitation : The test S/W provided by the applicant supports transmission with above maximum fixed duty cycle.
- The number of sweeps were increased by factor of $1/x$ until the trace stabilizes for Peak Measurement
The number of average traces were increased by factor of $1/x$ for Method AD

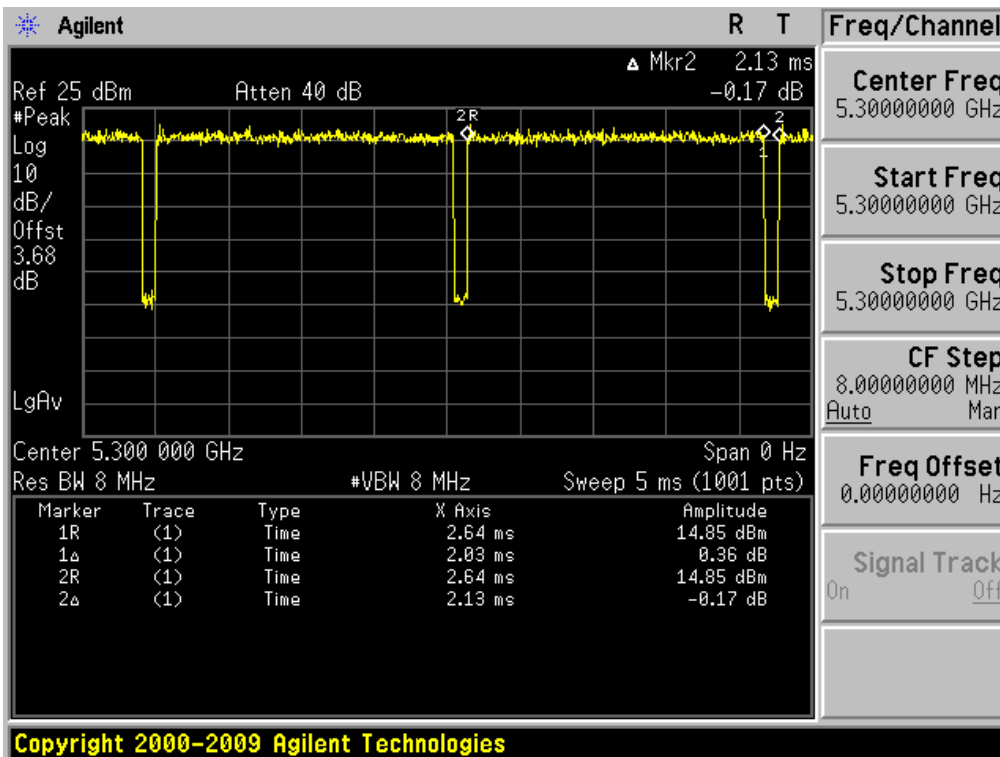
Duty Cycle

Test Mode: 802.11a & Ch.40



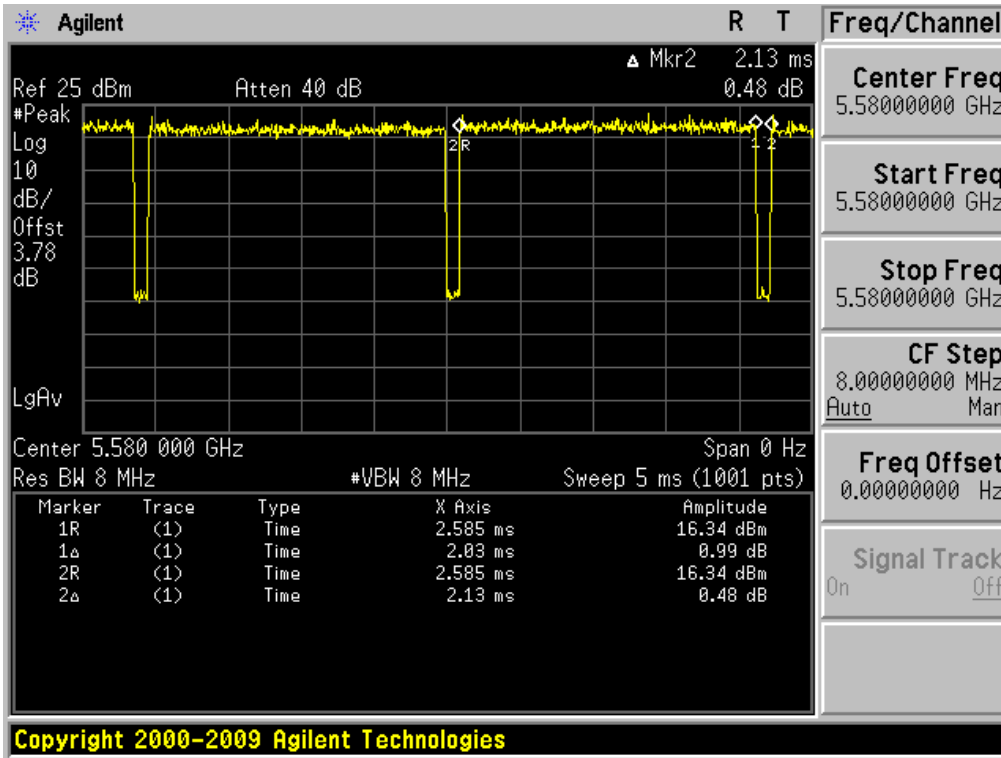
Duty Cycle

Test Mode: 802.11a & Ch.60



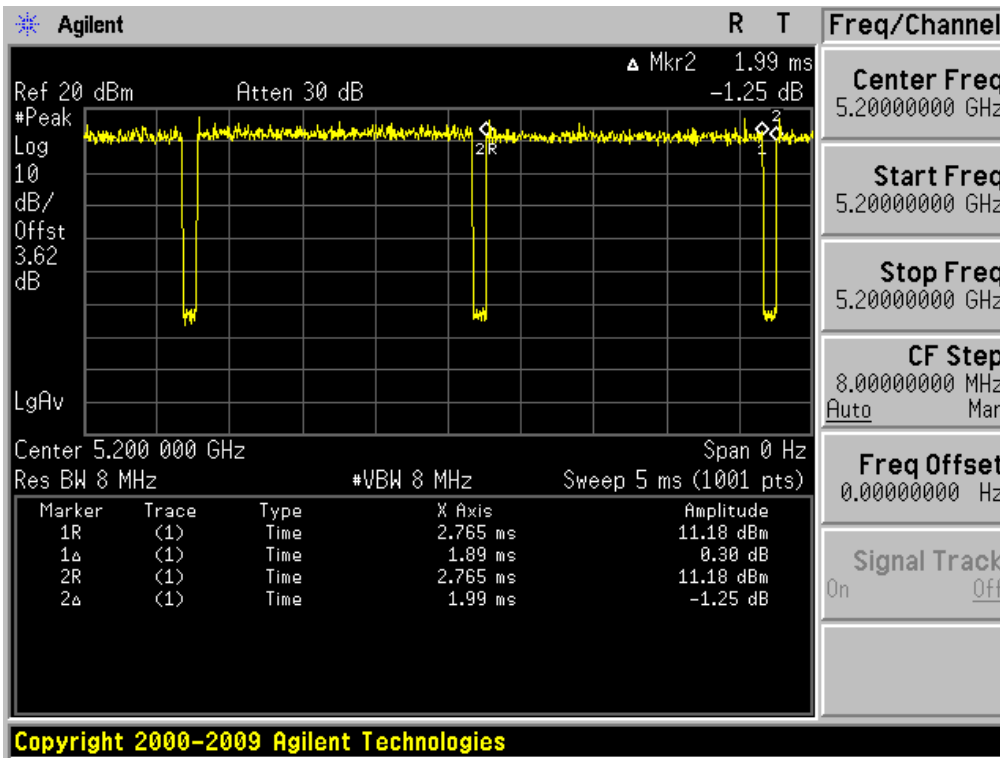
Duty Cycle

Test Mode: 802.11a & Ch.116



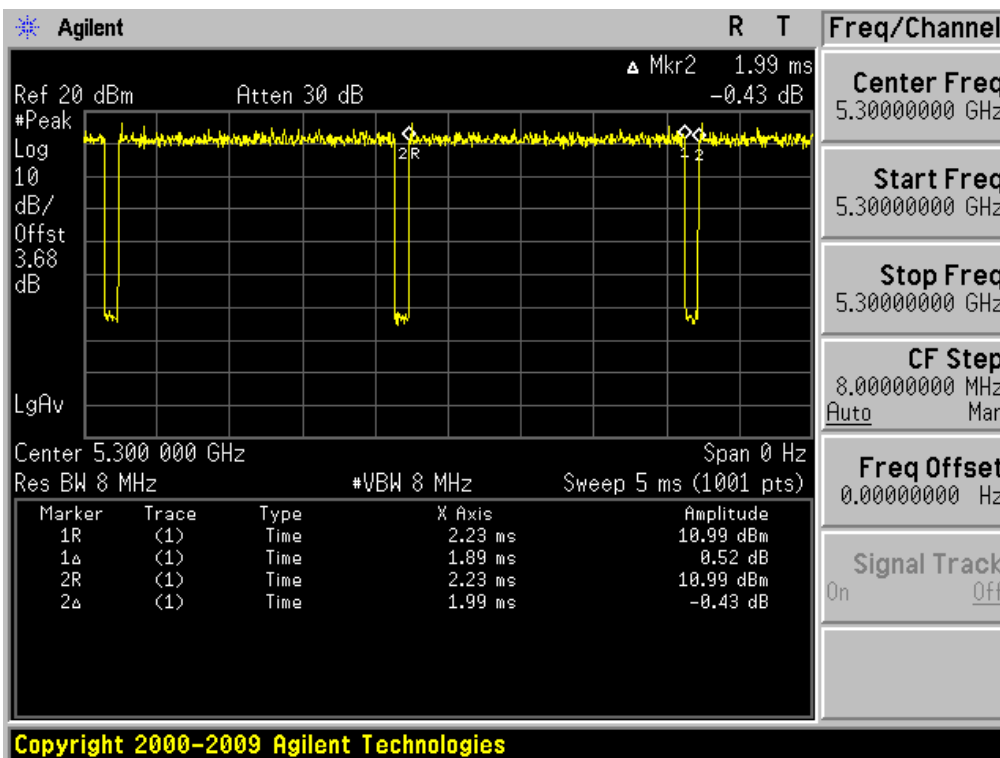
Duty Cycle

Test Mode: 802.11n(HT20) & Ch.40



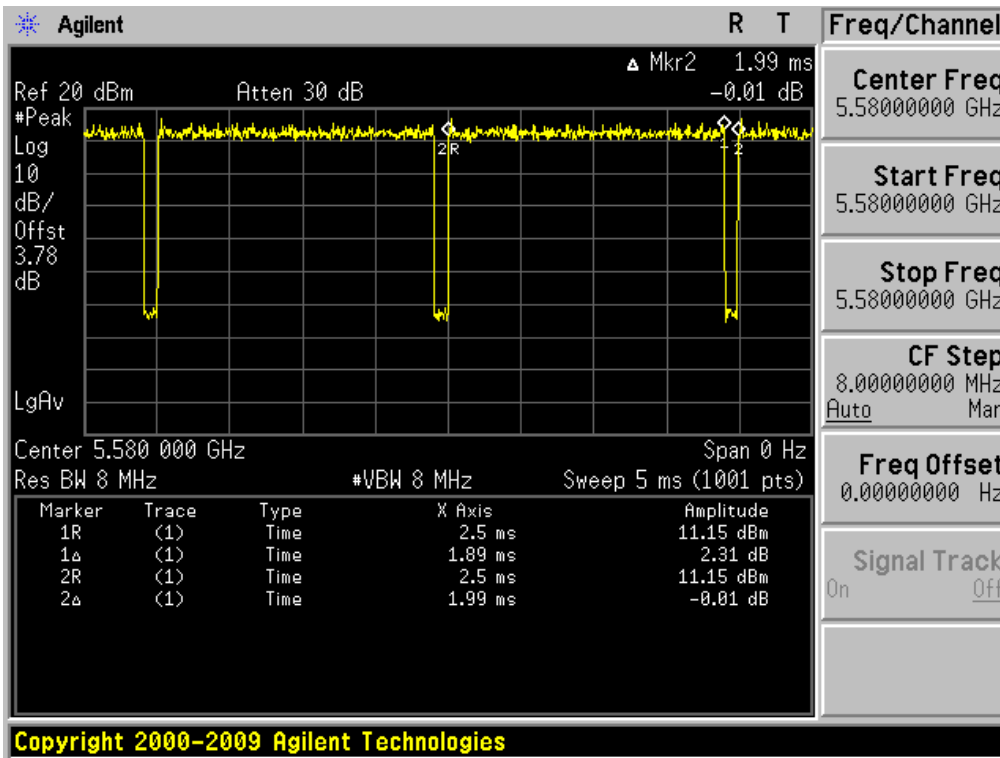
Duty Cycle

Test Mode: 802.11n(HT20) & Ch.60



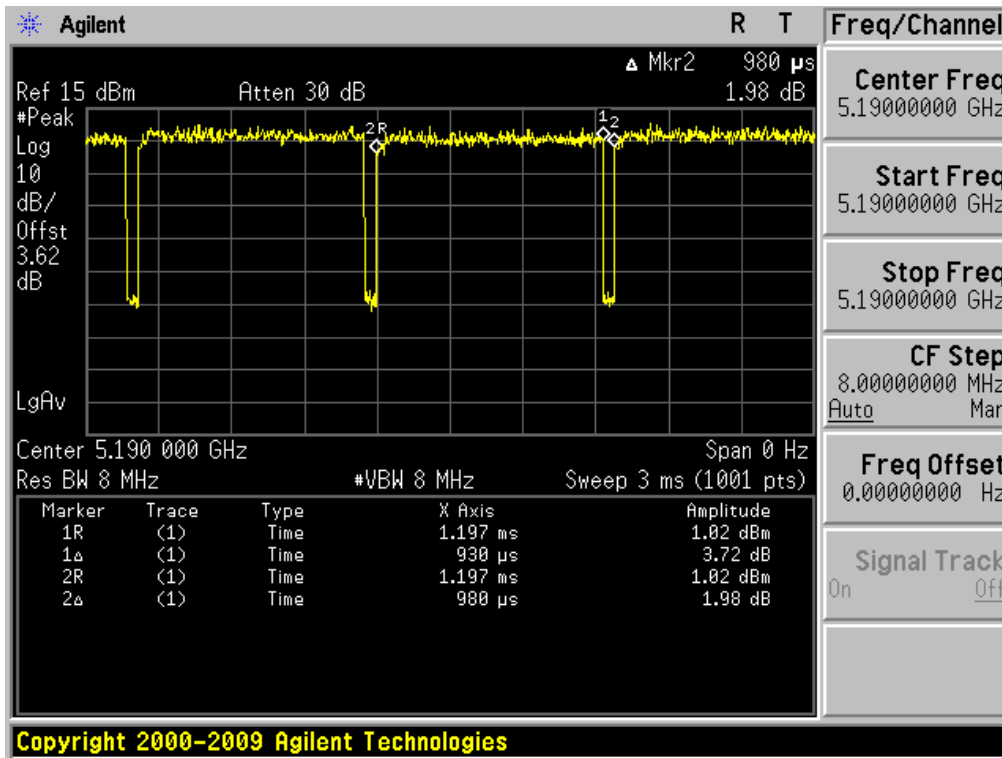
Duty Cycle

Test Mode: 802.11n(HT20) & Ch.116



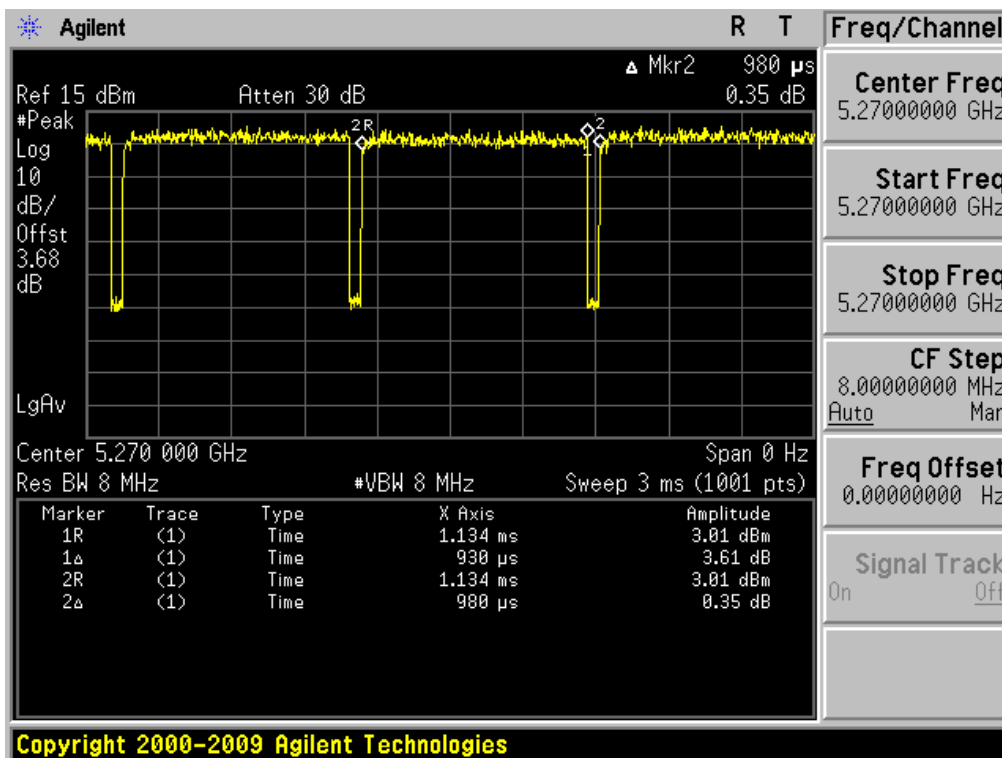
Duty Cycle

Test Mode: 802.11n(HT40) & Ch.46



Duty Cycle

Test Mode: 802.11n(HT40) & Ch.62



Duty Cycle

Test Mode: 802.11n(HT40) & Ch.110

