RF TEST REPORT

Test item	:	PCS GSM/GPRS & Cellular/PCS WCDMA & Cellular CDMA Phone with Bluetooth and WLAN/NFC
Model No.	:	LGL21
Order No.	:	DEMC1208-01659
Date of receipt	:	2012-08-31
Test duration	:	2012-09-03 ~ 2012-09-08
Date of issue	:	2012-09-17
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 C63.4-2003, KDB 789033
Test environment	:	See appended test report
Test result	:	☒ Pass ☐ Fail

Tested by:	Witnessed by:	Reviewed by:
Engineer H.S.Son	N/A	Technical Director Harvey sung

CONTENTS

1. EUT information

1.1 EUT description

FCC Equipment Class	Unlicensed National Information Infrastructure (UNII)
Product	PCS GSM/GPRS & Cellular/PCS WCDMA & Cellular CDMA Phone with Bluetooth and WLAN/NFC
Model Name	LGL21
Add Model Name	N/A
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: 0.41dBi
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
	56	5280	-	-
	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	:	22 ~ 25 °C
Relative humidity content	:	34 ~ 44 % 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		C
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%.

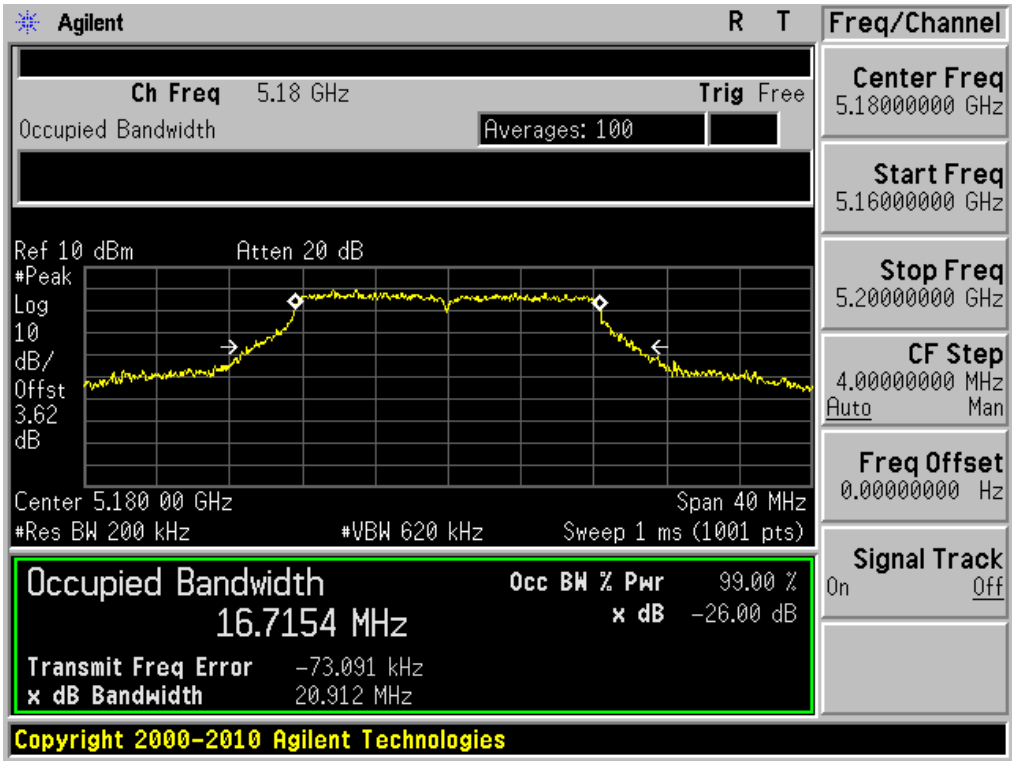
▣ TEST RESULTS: Comply

Mode	Band	Channel	Frequency [MHz]	Test Result [MHz]
802.11a	Band I	36	5180	20.912
		40	5200	21.432
		48	5240	21.746
	Band II	52	5260	21.411
		56	5280	21.531
		64	5320	21.154
	Band III	100	5500	21.914
		116	5580	21.128
		140	5700	21.569
802.11n (20MHz)	Band I	36	5180	21.493
		40	5200	21.867
		48	5240	21.613
	Band II	52	5260	21.566
		56	5280	21.842
		64	5320	21.966
	Band III	100	5500	21.609
		116	5580	21.752
		140	5700	21.248
802.11n (40MHz)	Band I	38	5190	42.835
		46	5230	42.993
	Band II	54	5270	43.011
		62	5310	42.095
	Band III	102	5510	42.028
		110	5550	42.771
		134	5670	42.846

▣ RESULT PLOTS

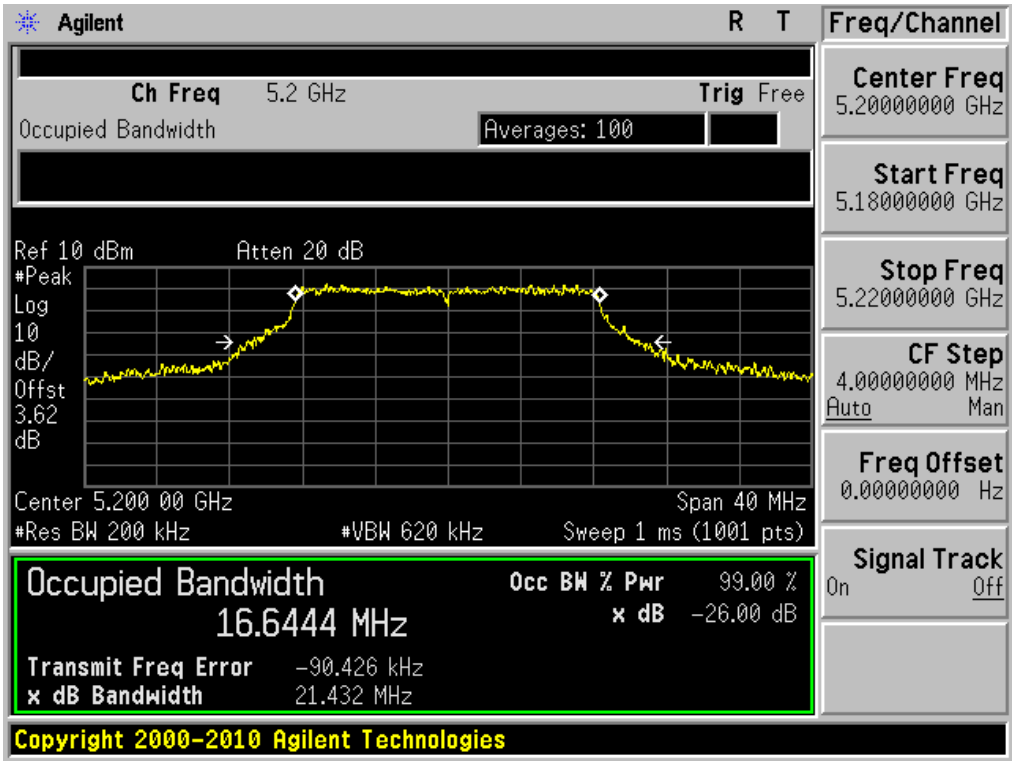
26 dB Bandwidth

Test Mode: 802.11a & Ch.36

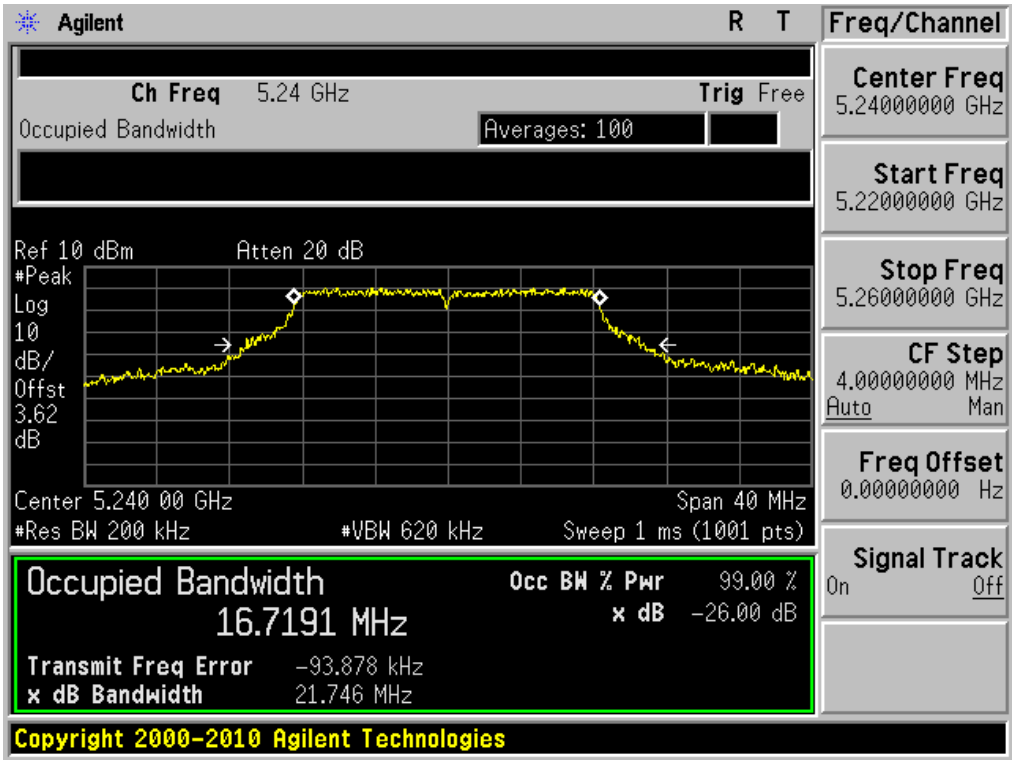


26 dB Bandwidth

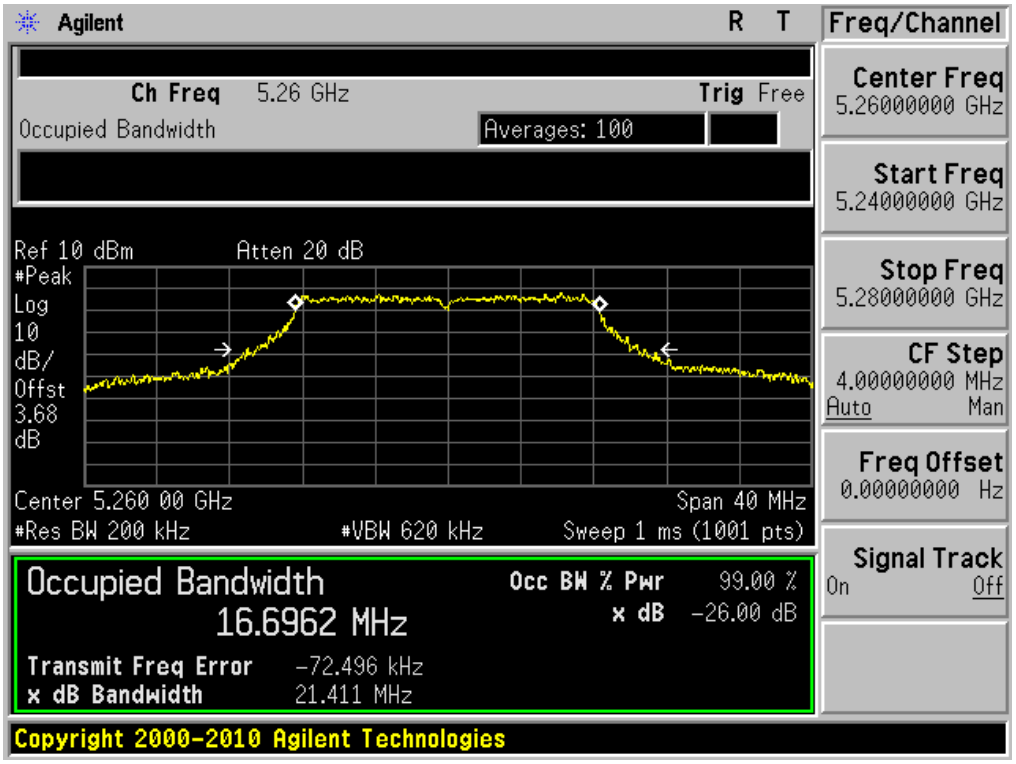
Test Mode: 802.11a & Ch.40



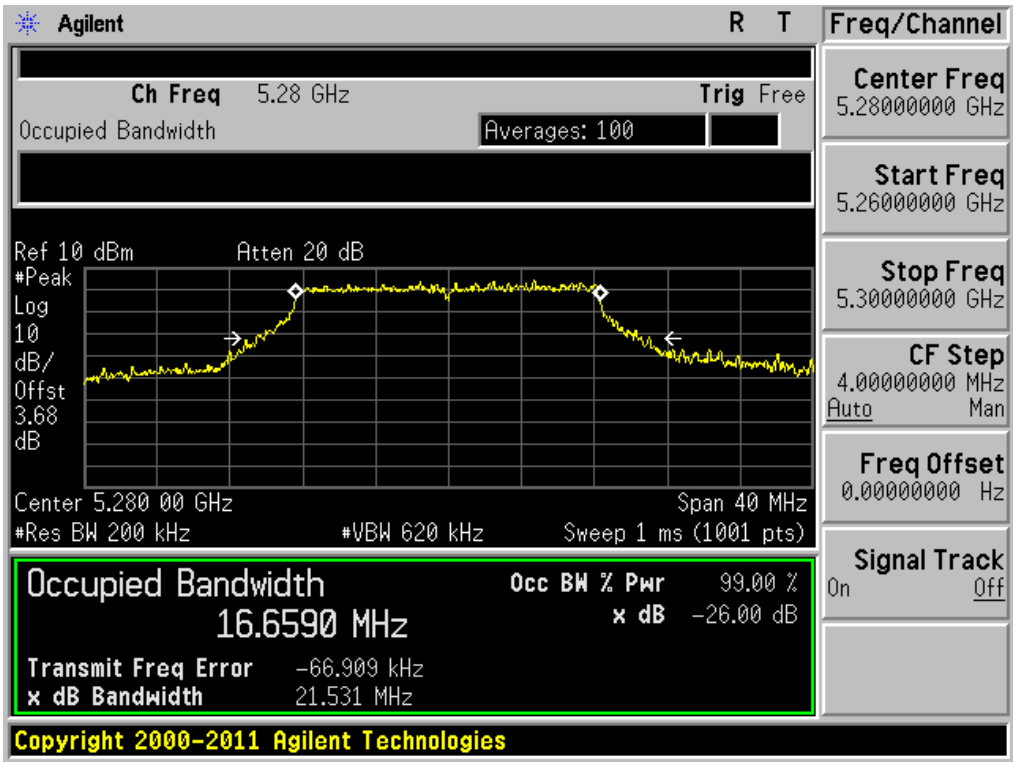
26 dB Bandwidth Test Mode: 802.11a & Ch.48



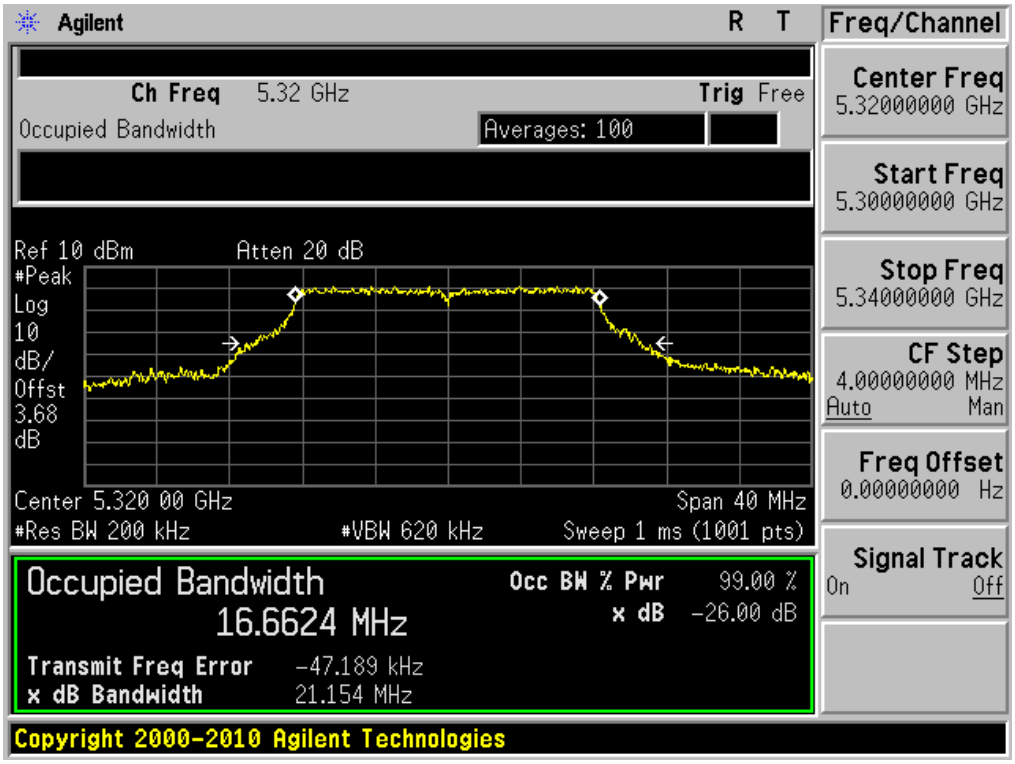
26 dB Bandwidth Test Mode: 802.11a & Ch.52



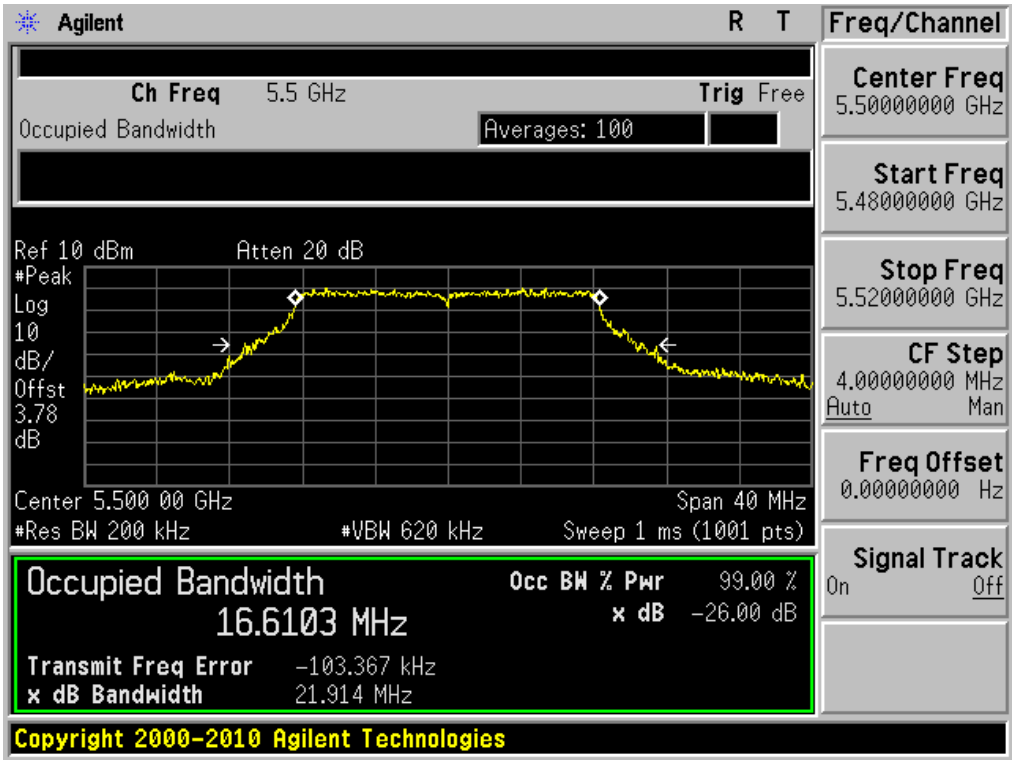
26 dB Bandwidth Test Mode: 802.11a & Ch.56



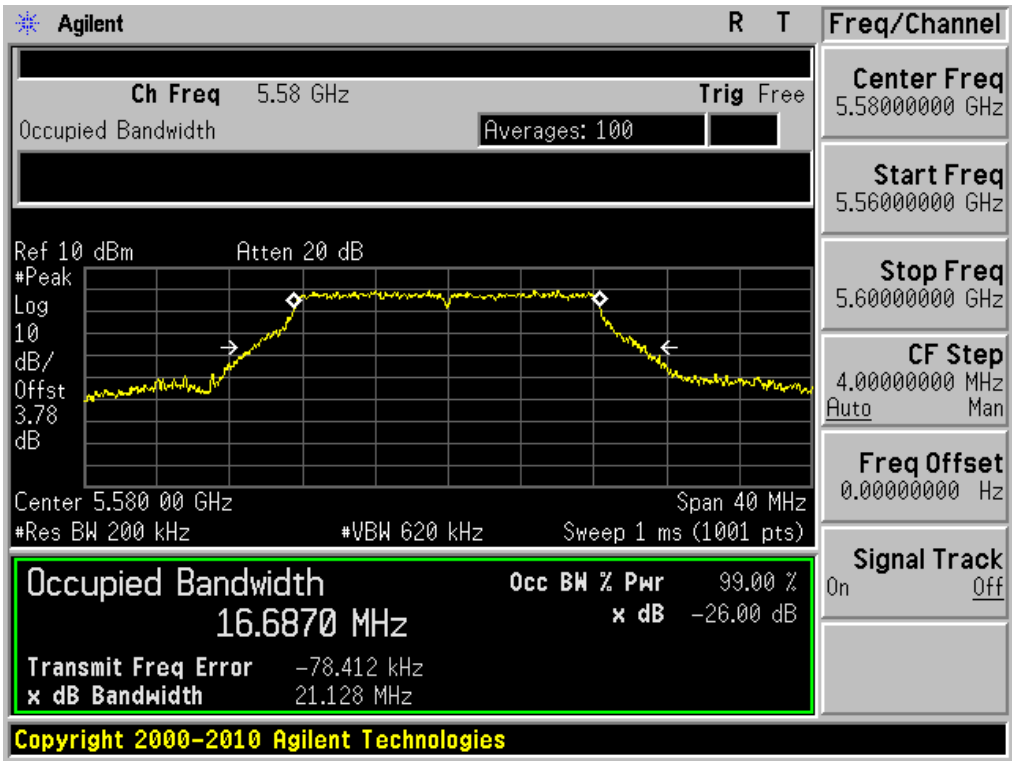
26 dB Bandwidth Test Mode: 802.11a & Ch.64



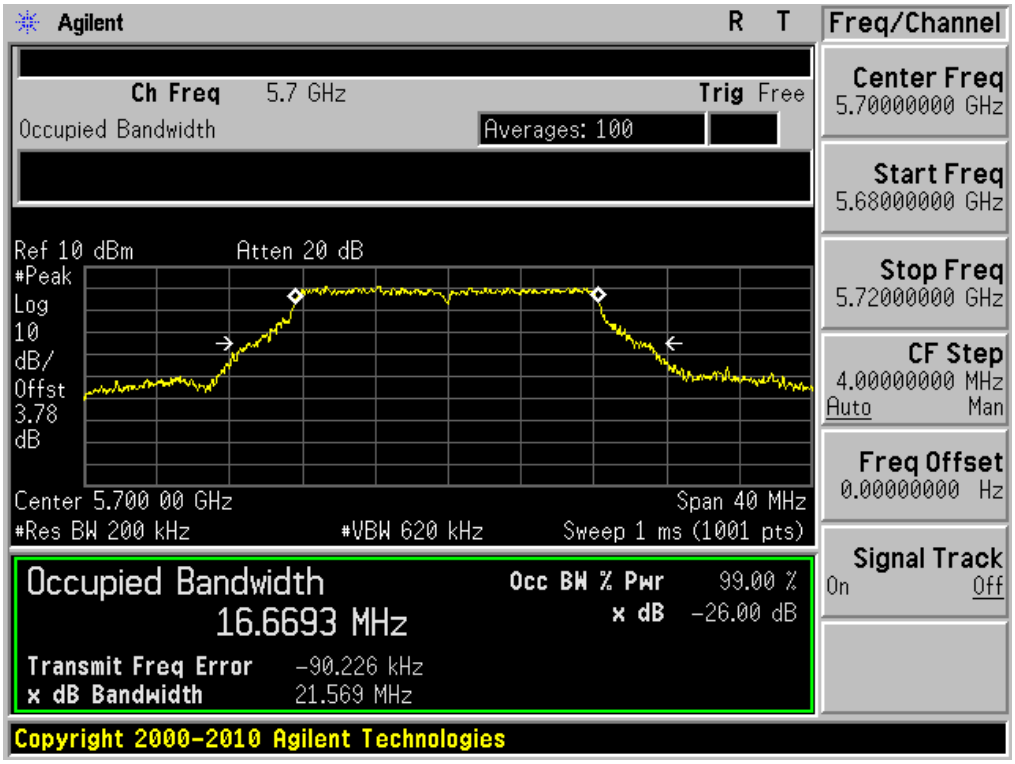
26 dB Bandwidth Test Mode: 802.11a & Ch.100



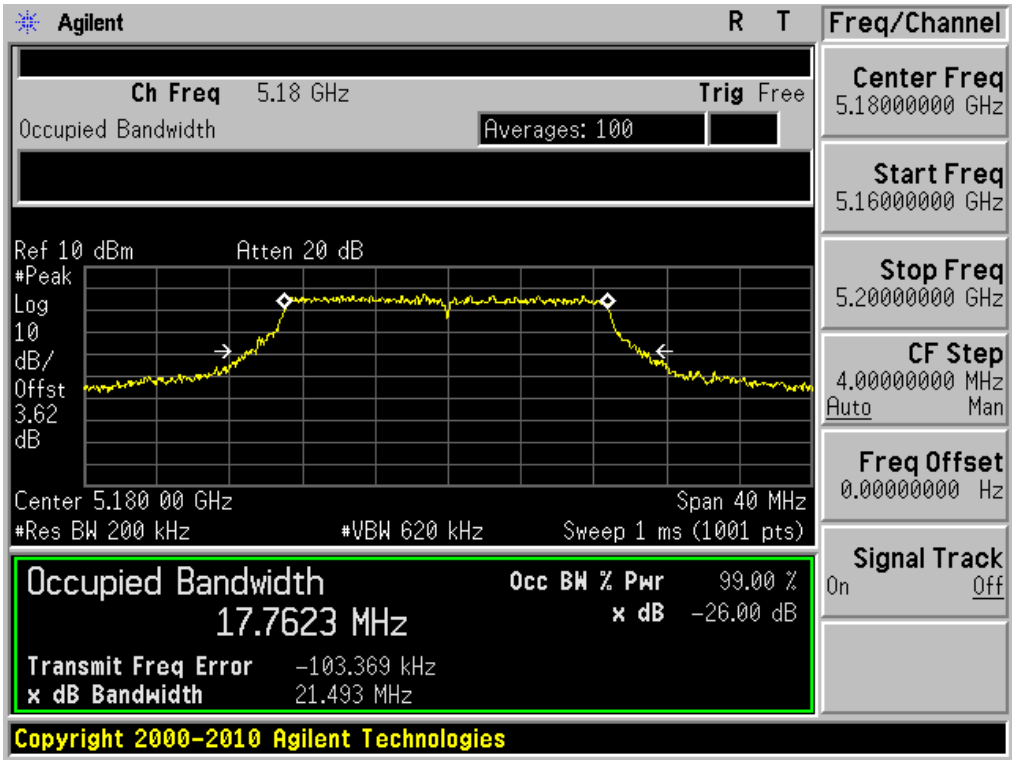
26 dB Bandwidth Test Mode: 802.11a & Ch.116



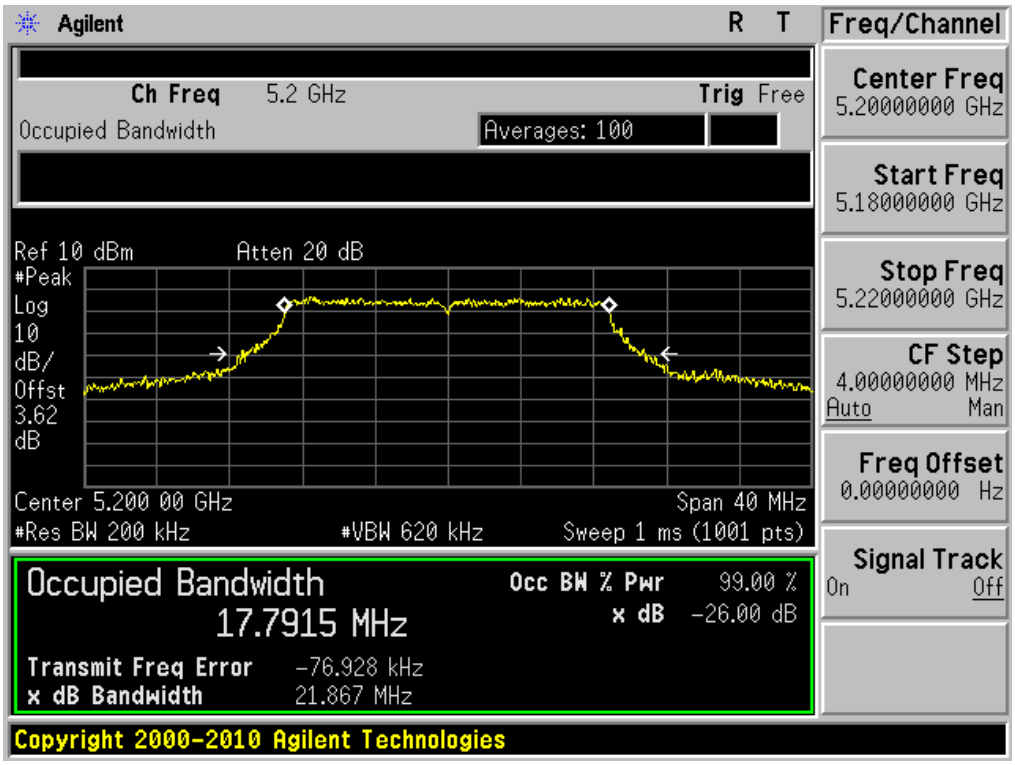
26 dB Bandwidth Test Mode: 802.11a & Ch.140



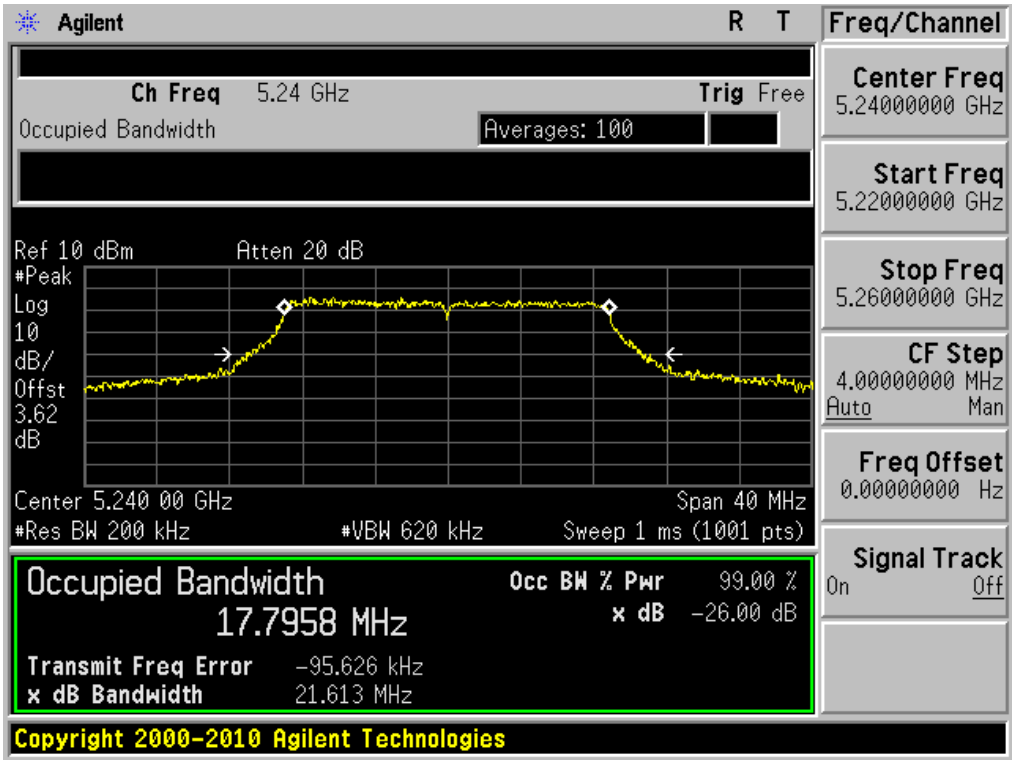
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.36



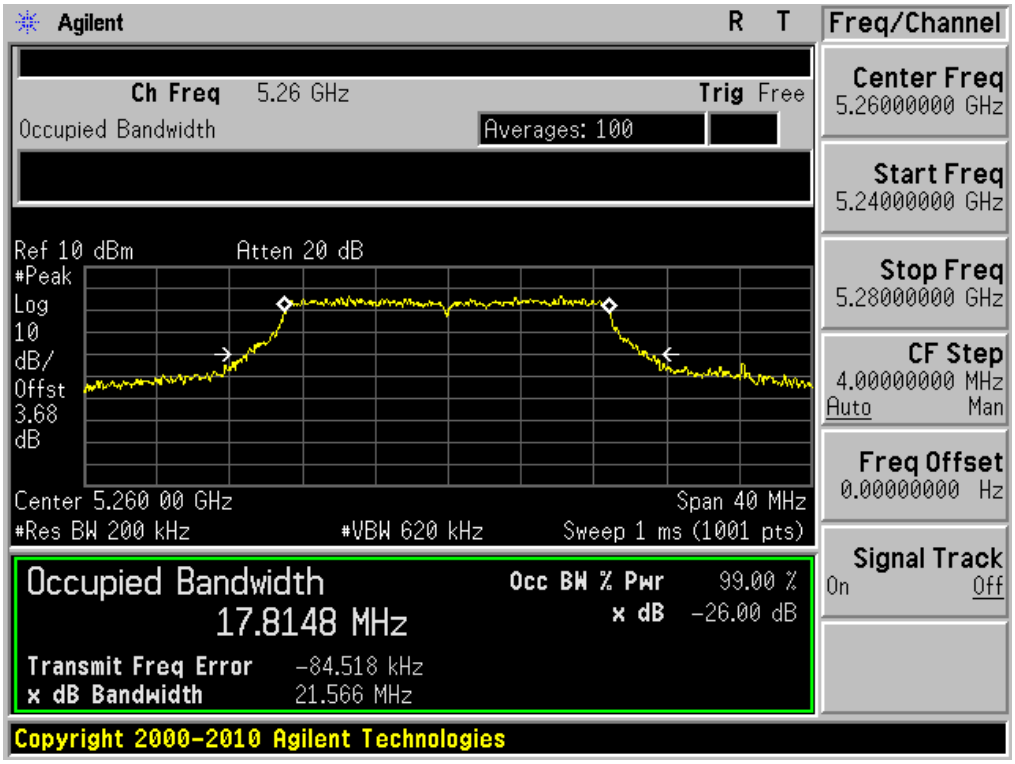
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.40



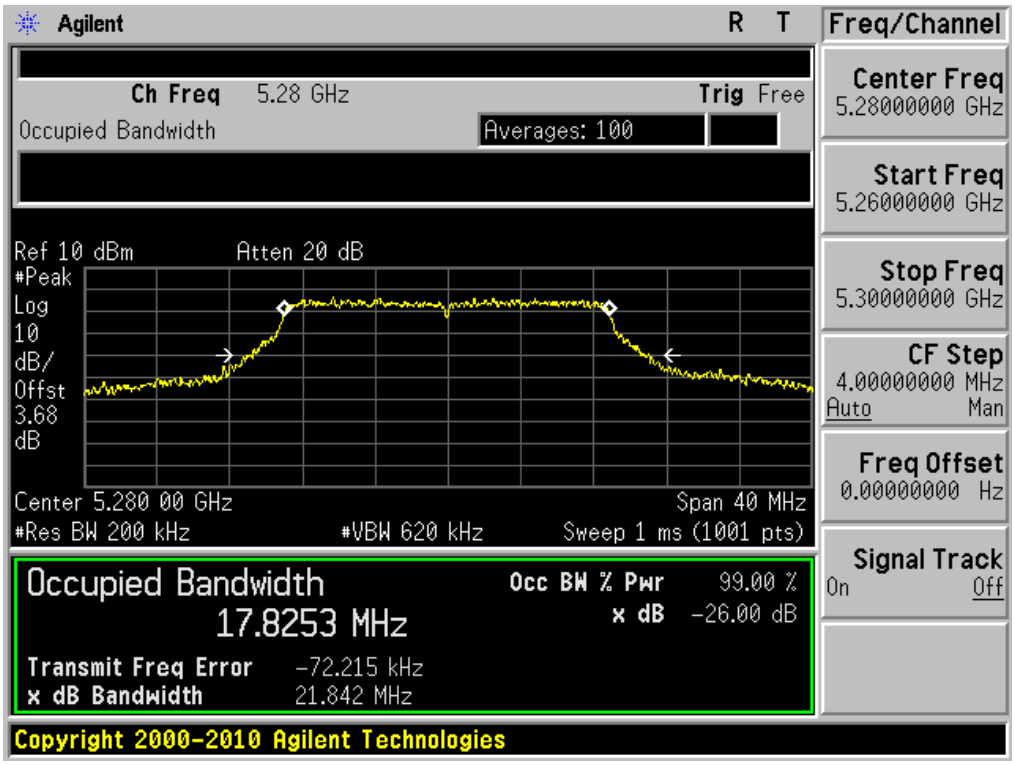
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.48



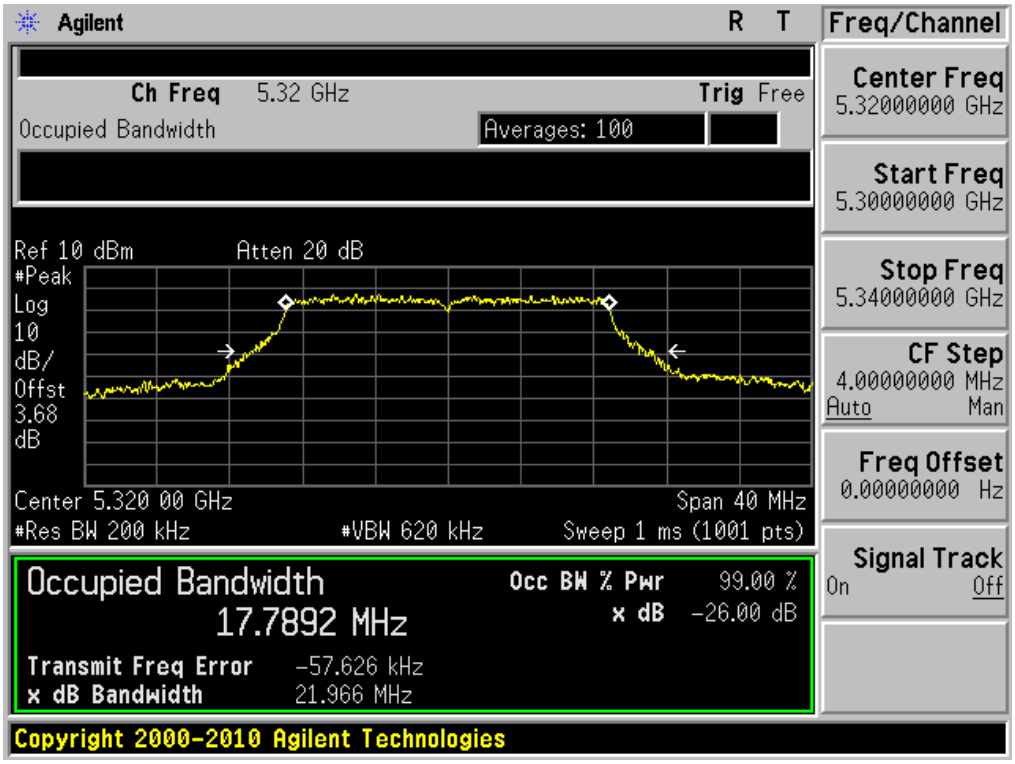
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.52



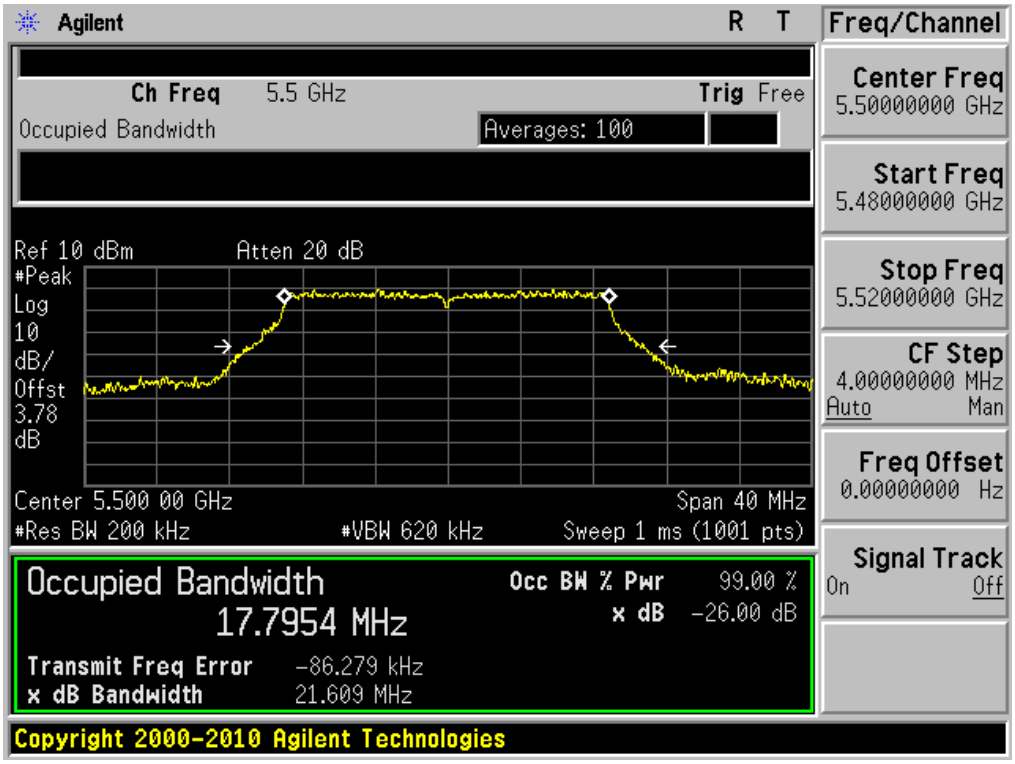
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.56



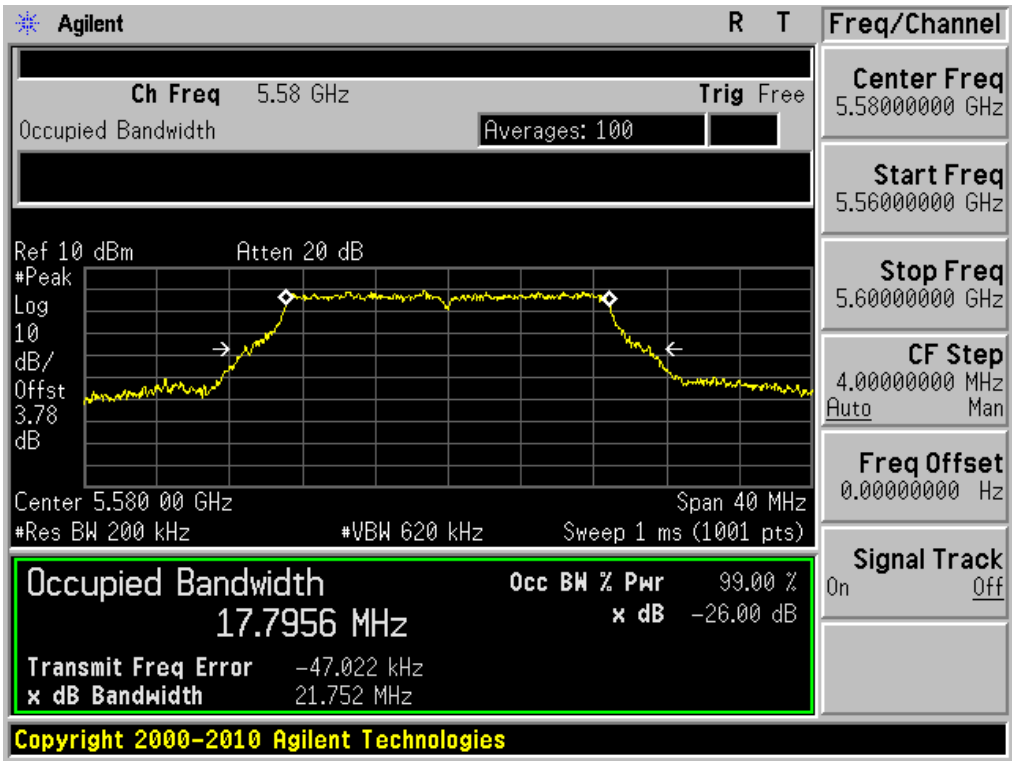
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.64



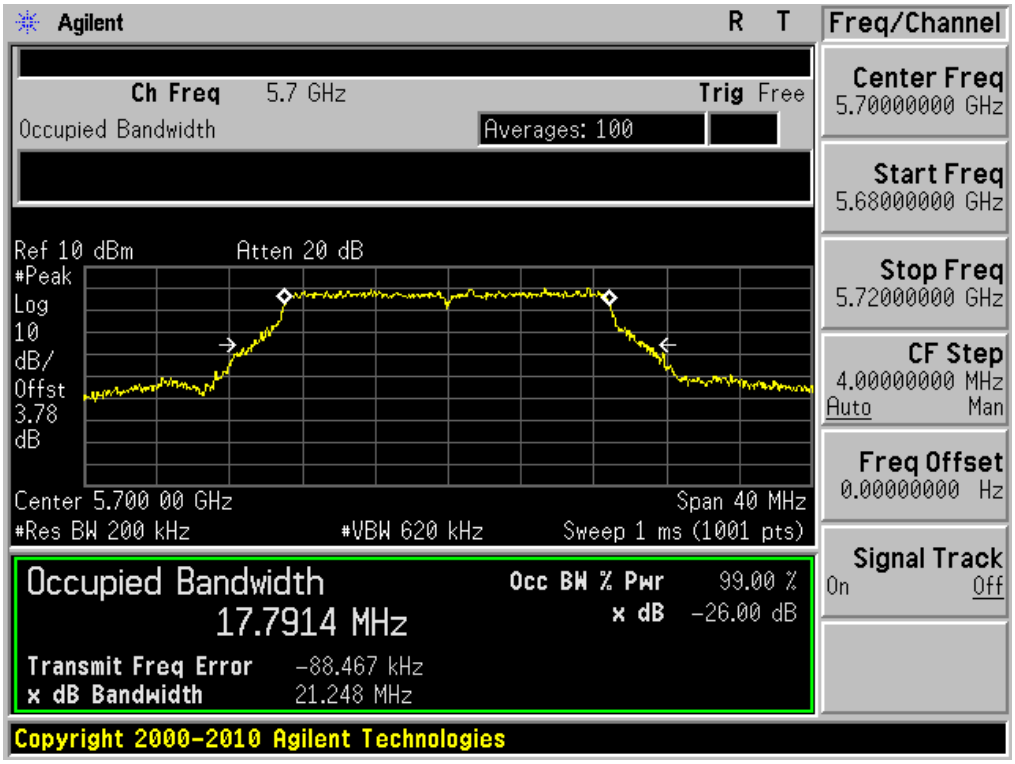
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.100



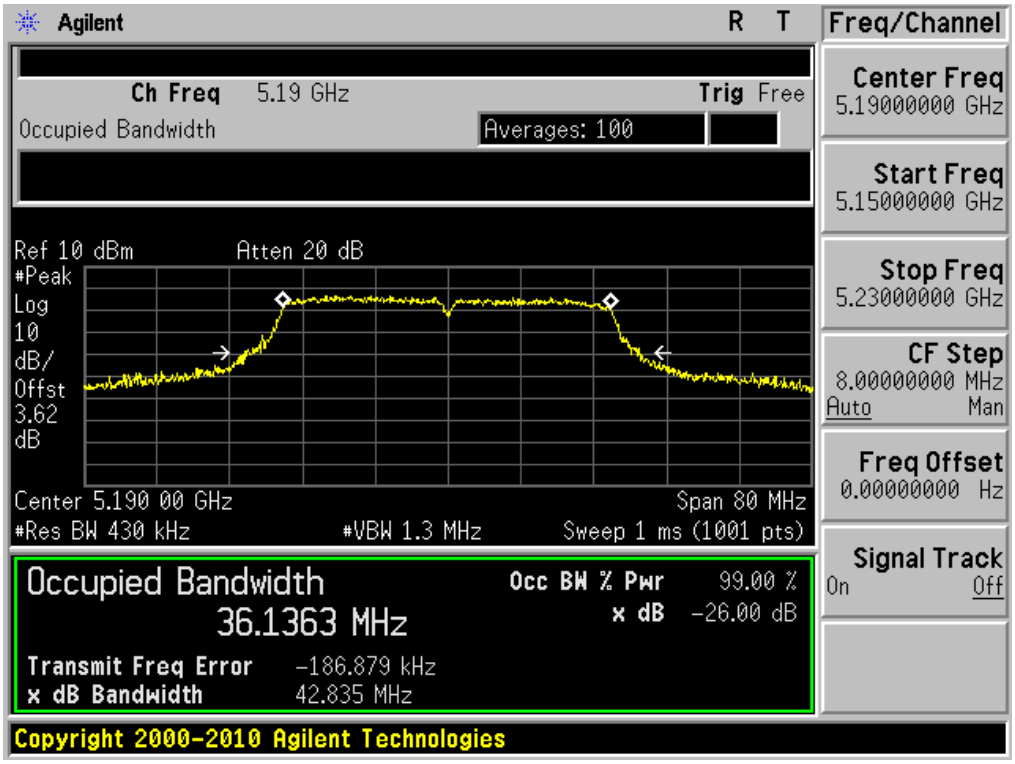
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.116



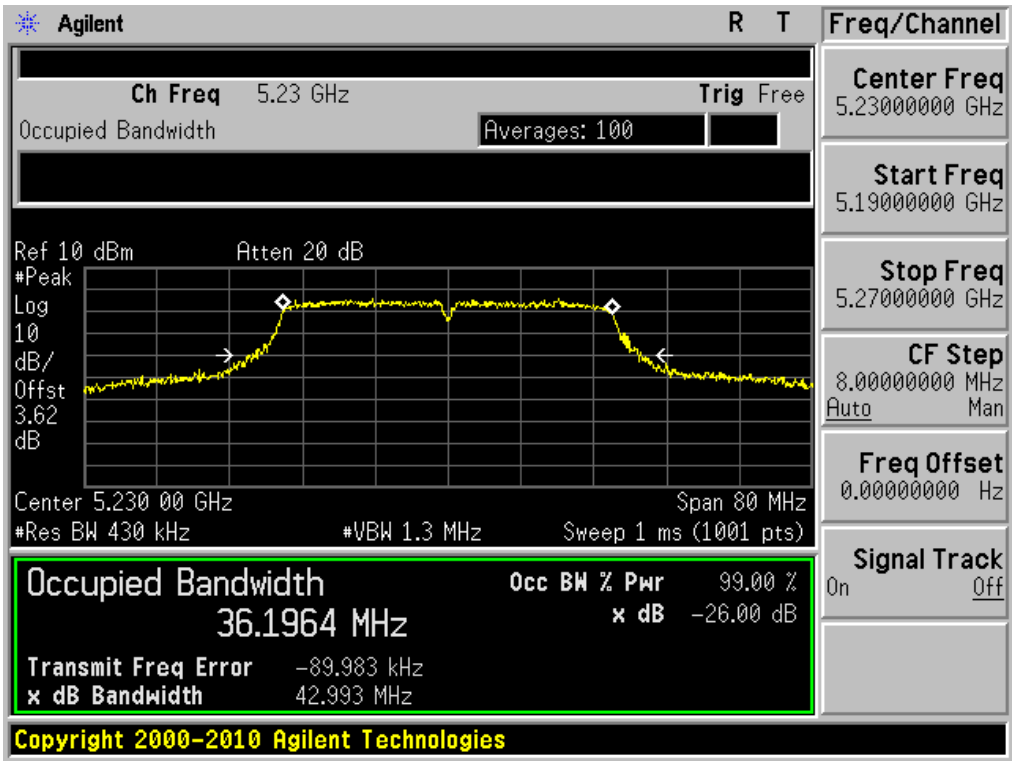
26 dB Bandwidth Test Mode: 802.11n-HT20 & Ch.140



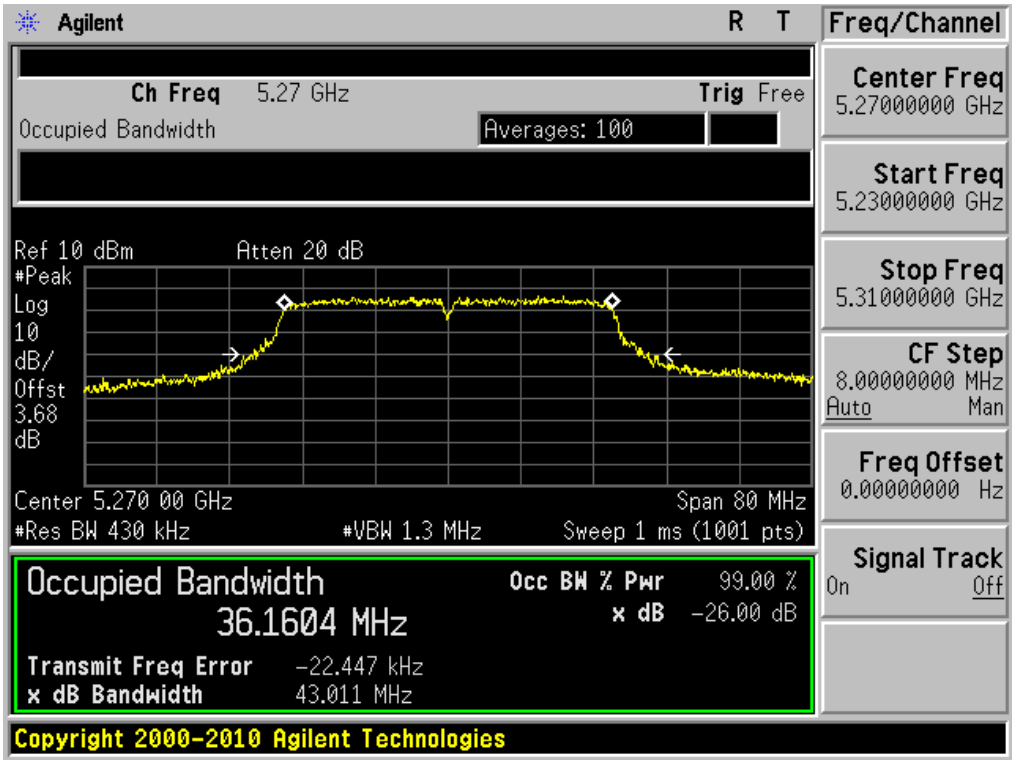
26 dB Bandwidth Test Mode: 802.11n-HT40 & Ch.38



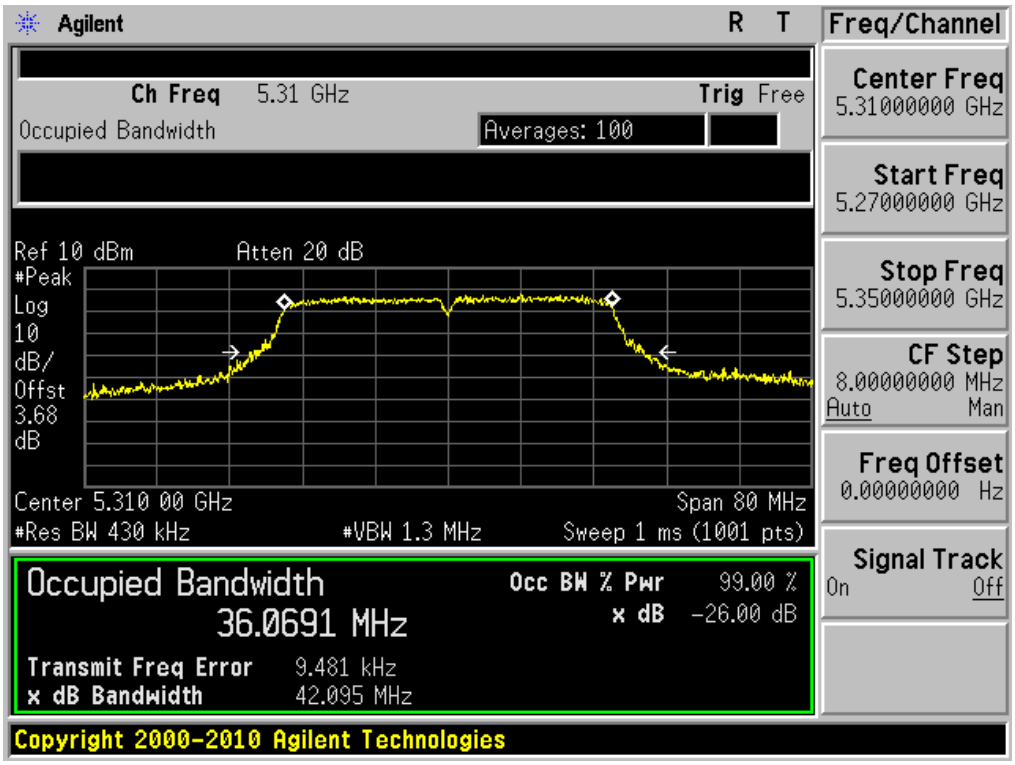
26 dB Bandwidth Test Mode: 802.11n-HT40 & Ch.46



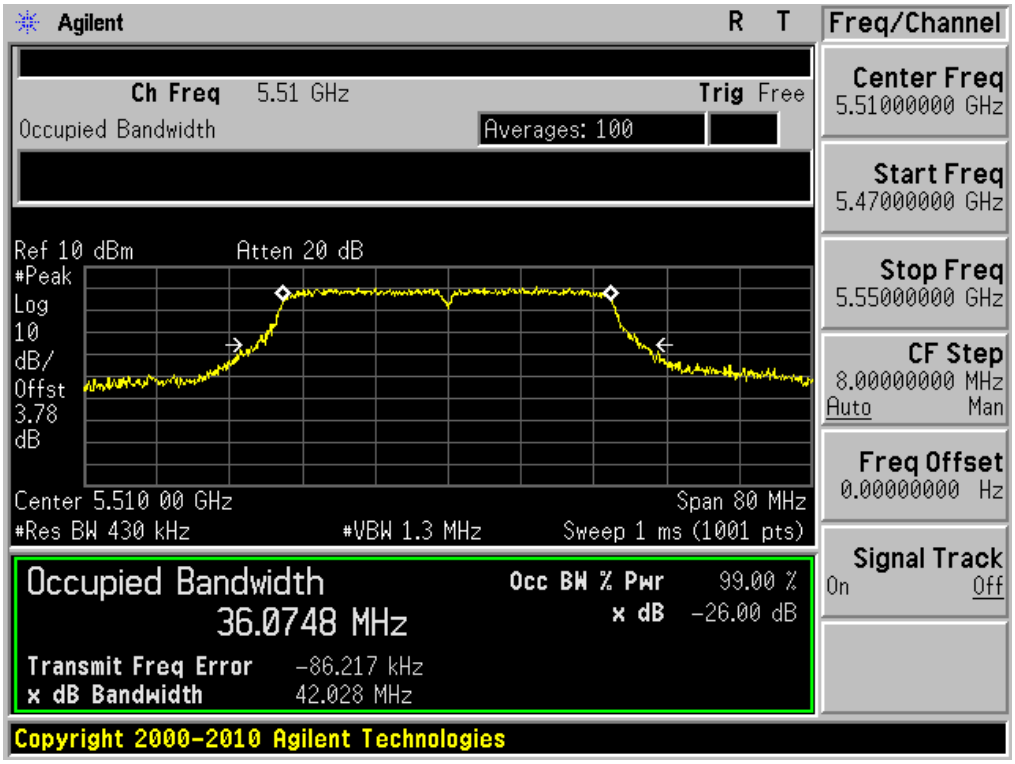
26 dB Bandwidth Test Mode: 802.11n-HT40 & Ch.54



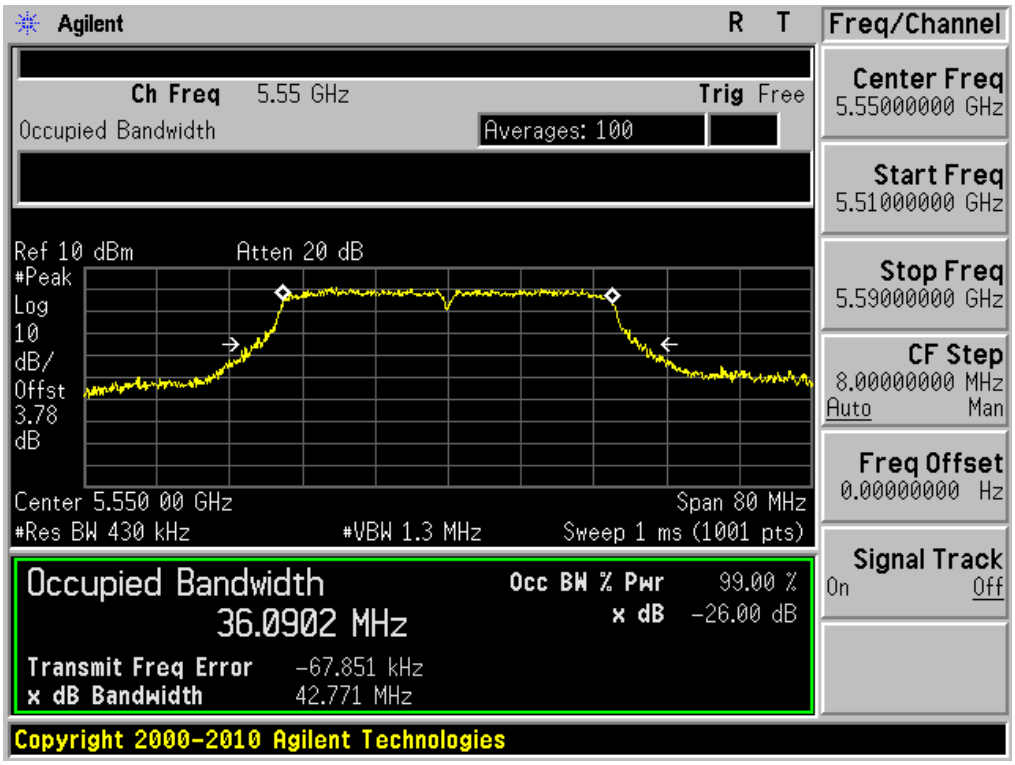
26 dB Bandwidth Test Mode: 802.11n-HT40 & Ch.62



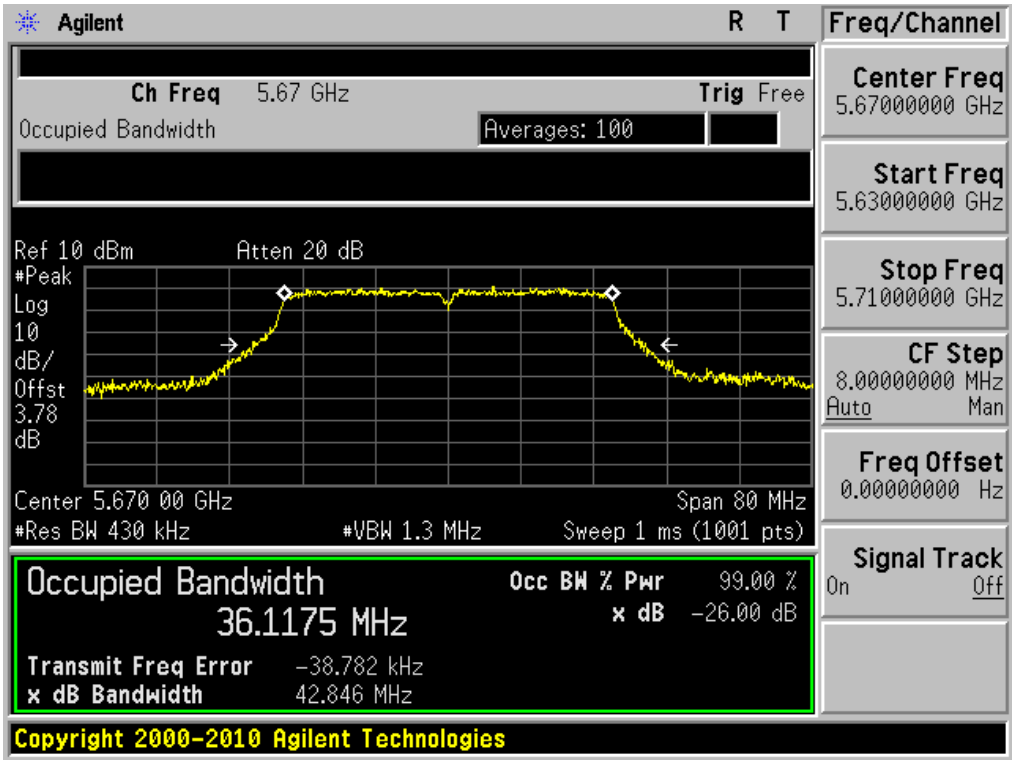
26 dB Bandwidth Test Mode: 802.11n-HT40 & Ch.102



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] / Least 26dBC BW [MHz]	Calculated Limit [dBm]	ANT Gain	Determined Limit [dBm]
Band I	802.11a	50	**16.98**	-6.008	16.98
		20.912	17.20		
	802.11n HT20	50	**16.98**		16.98
		21.493	17.32		
	802.11n HT40	50	**16.98**		16.98
		42.835	20.31		

Bands	Mode	Power Limit [mW] / Least 26dBC BW [MHz]	Calculation Limit [dBm]	ANT Gain	Determined Limit [dBm]
Band II	802.11a	250	**23.97**	-3.587	23.97
		21.154	24.25		
	802.11n HT20	250	**23.97**		23.97
		21.566	24.33		
	802.11n HT40	250	**23.97**		23.97
		42.095	27.24		
Band III	802.11a	250	**23.97**	0.410	23.97
		21.128	24.24		
	802.11n HT20	250	**23.97**		23.97
		21.248	24.27		
	802.11n HT40	250	**23.97**		23.97
		42.028	27.23		

▣ 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**

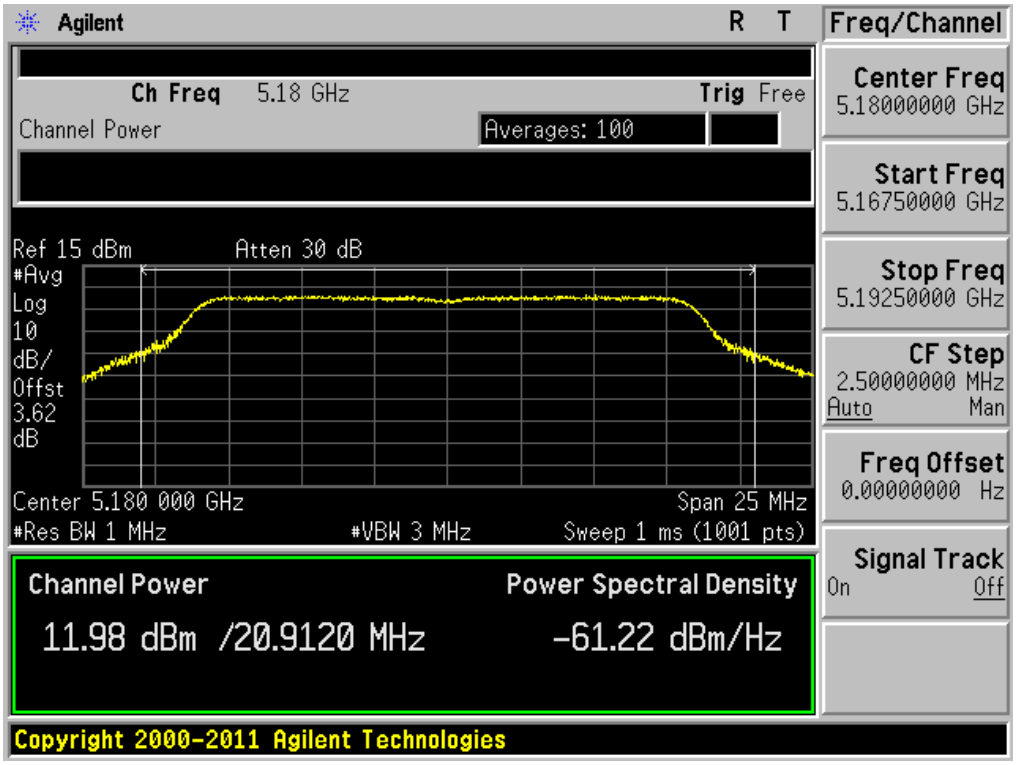
Mode	Channel	Frequency [MHz]	Reading [dBm]	Duty Cycle			DCF [dB]	Test Result [dBm]
				On Time[ms]	On+Off Time[ms]	X		
802.11a	36	5180	11.980	2.03	2.13	0.95	0.23	12.210
	40	5200	12.240					12.470
	48	5240	11.780					12.010
	52	5260	12.040	2.03	2.13	0.95	0.23	12.270
	56	5280	11.610					11.840
	64	5320	12.240					12.470
	100	5500	11.850	2.03	2.13	0.95	0.23	12.080
	116	5580	12.080					12.310
	140	5700	11.520					11.750

Mode	Channel	Frequency [MHz]	Reading [dBm]	Duty Cycle			DCF [dB]	Result
				On Time[ms]	On+Off Time[ms]	X		
802.11n (20MHz)	36	5180	11.81	1.89	1.99	0.94	0.27	12.08
	40	5200	11.64					11.91
	48	5240	11.59					11.86
	52	5260	11.71	1.89	1.99	0.94	0.27	11.98
	56	5280	11.81					12.08
	64	5320	11.74					12.01
	100	5500	11.63	1.89	1.99	0.94	0.27	11.90
	116	5580	11.26					11.53
	140	5700	11.40					11.67
802.11n (40MHz)	38	5190	12.18	0.93	0.98	0.94	0.27	12.45
	46	5230	12.38					12.65
	54	5270	12.30	0.93	0.98	0.94	0.27	12.57
	62	5310	12.34					12.61
	102	5510	12.21	0.93	0.98	0.94	0.27	12.48
	110	5550	12.14					12.41
	134	5670	11.76					12.03

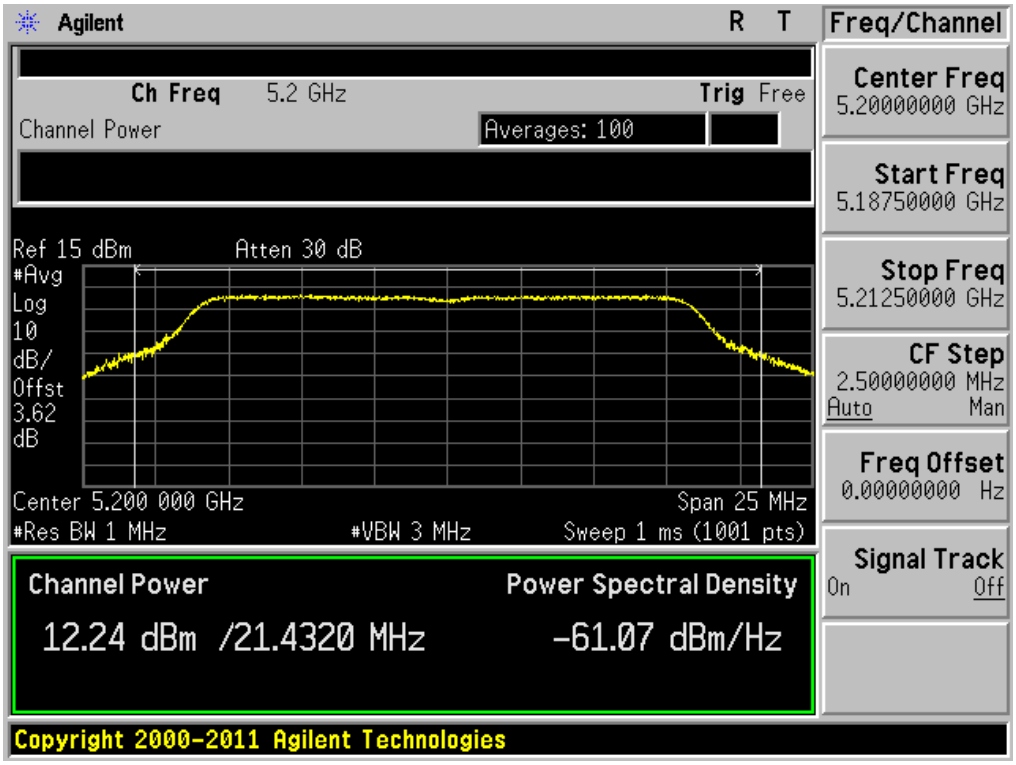
Note 1 : DCF = 10log(1 / X), X = On Time / (On + Off time)
Note 2 : Test Result = Measurement Data + DCF

▣ Measurement Data PLOTS

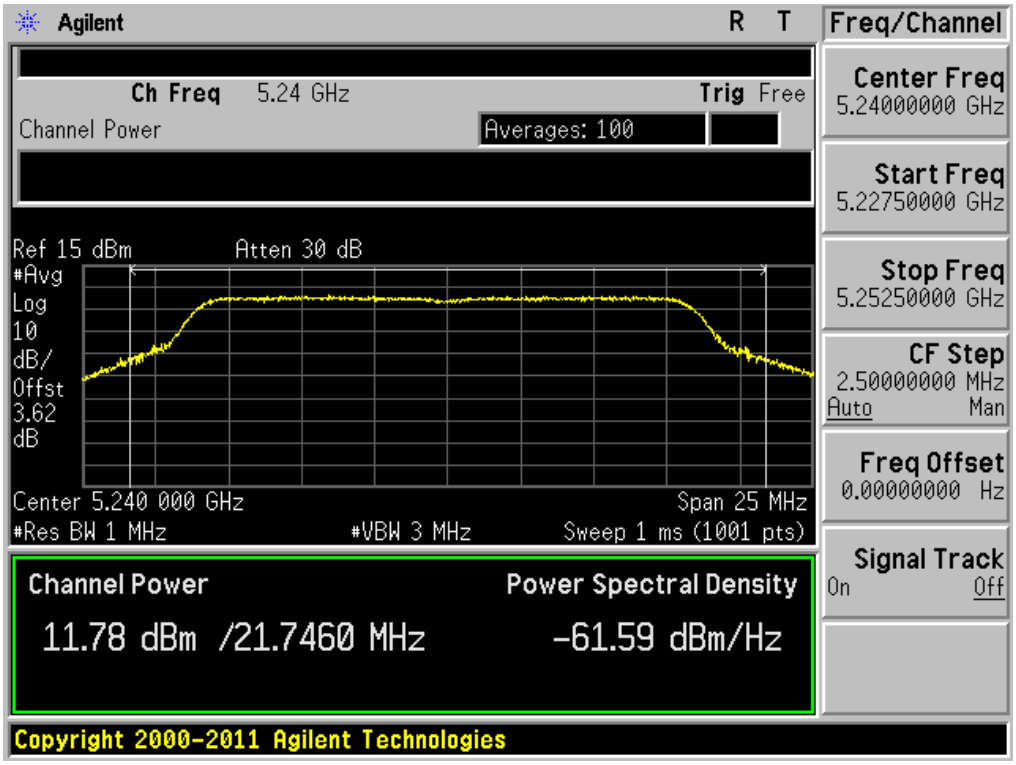
Output Power Test Mode: 802.11a & Ch.36



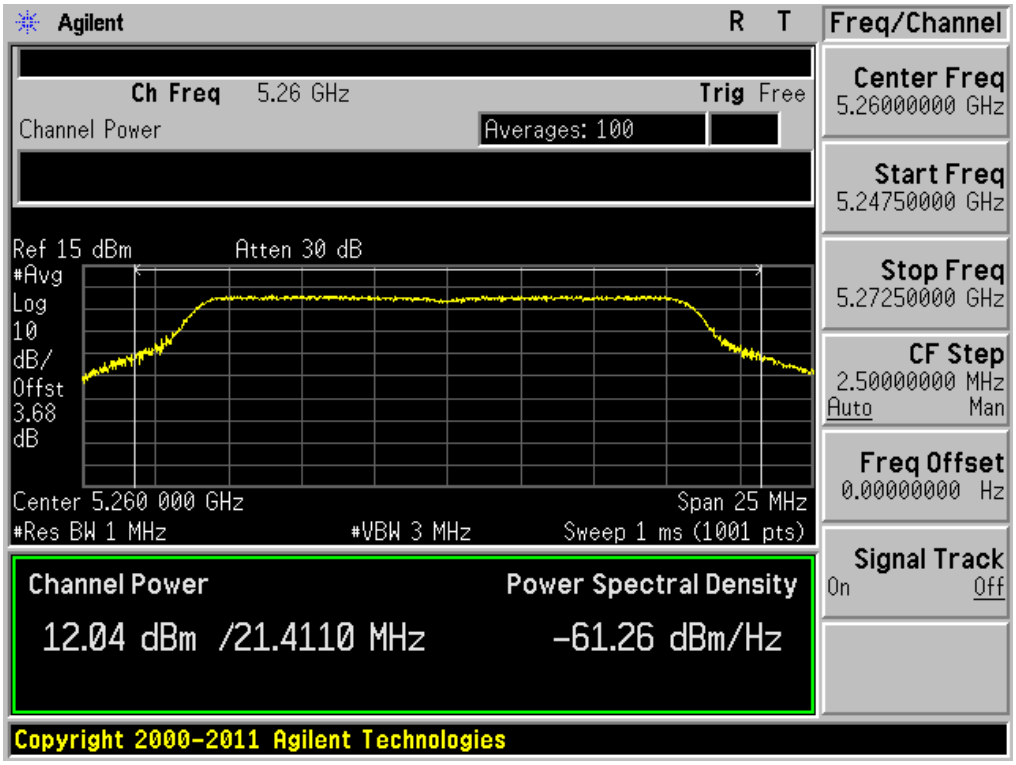
Output Power Test Mode: 802.11a & Ch.40



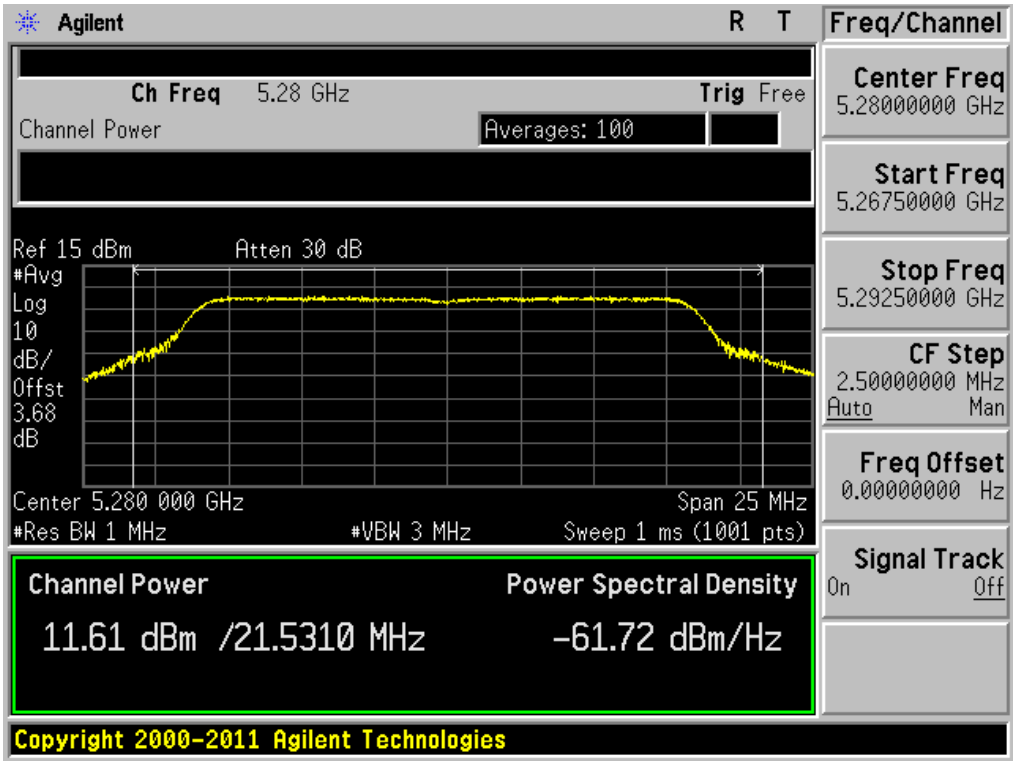
Output Power Test Mode: 802.11a & Ch.48



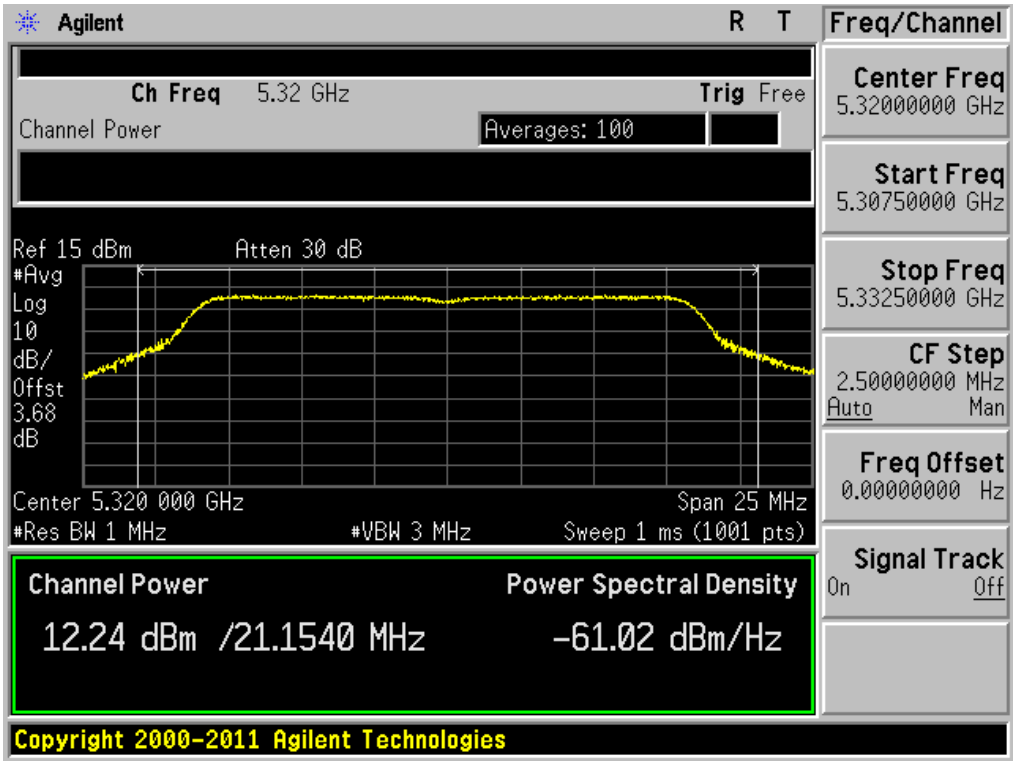
Output Power Test Mode: 802.11a & Ch.52



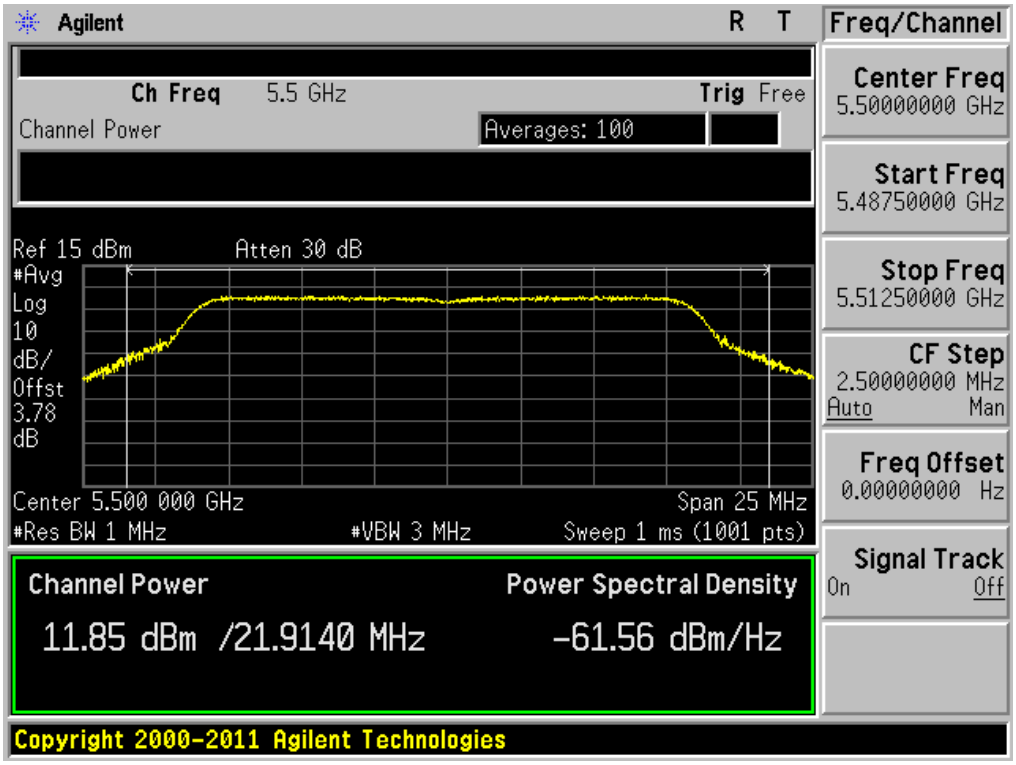
Output Power Test Mode: 802.11a & Ch.56



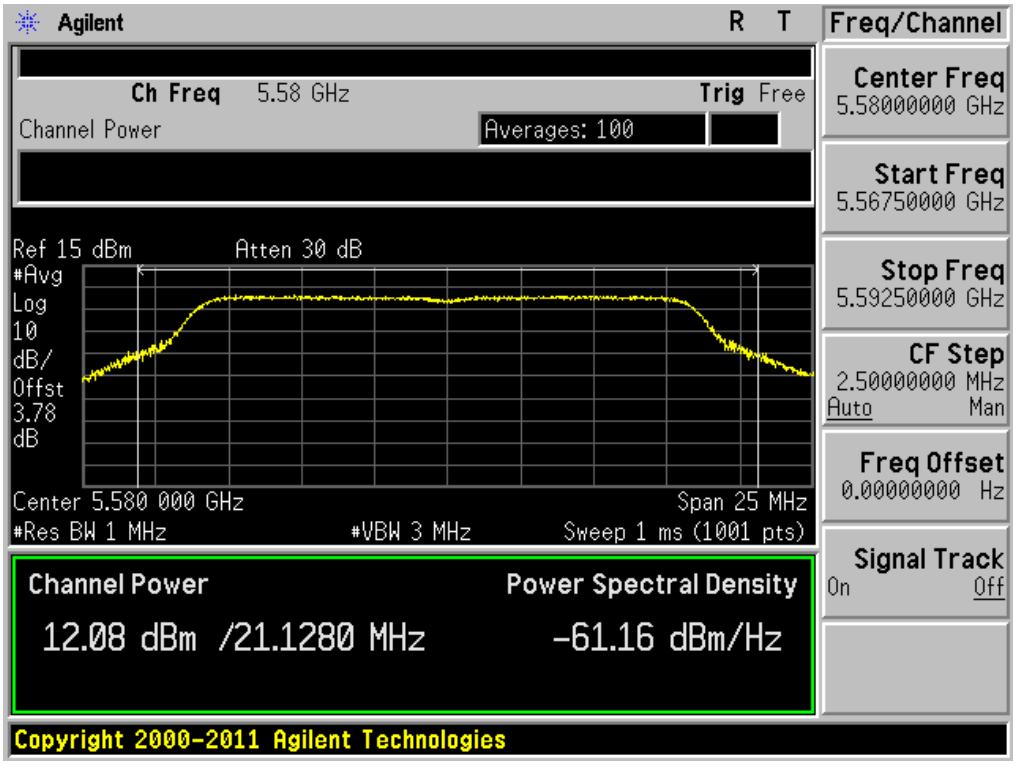
Output Power Test Mode: 802.11a & Ch.64



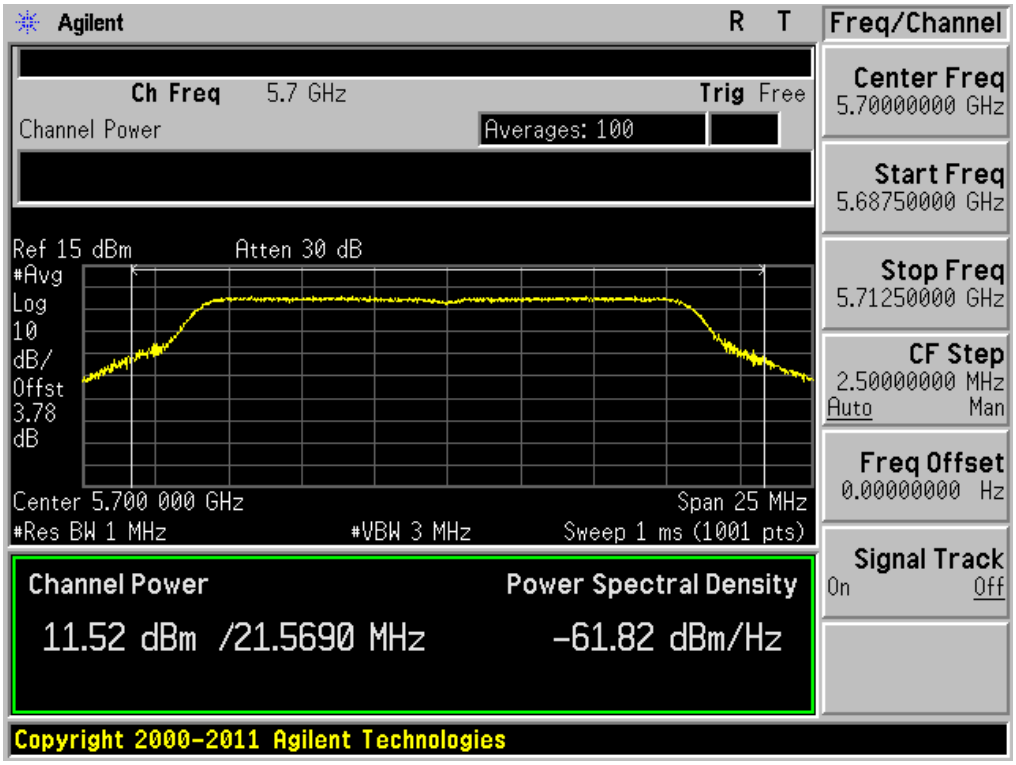
Output Power Test Mode: 802.11a & Ch.100



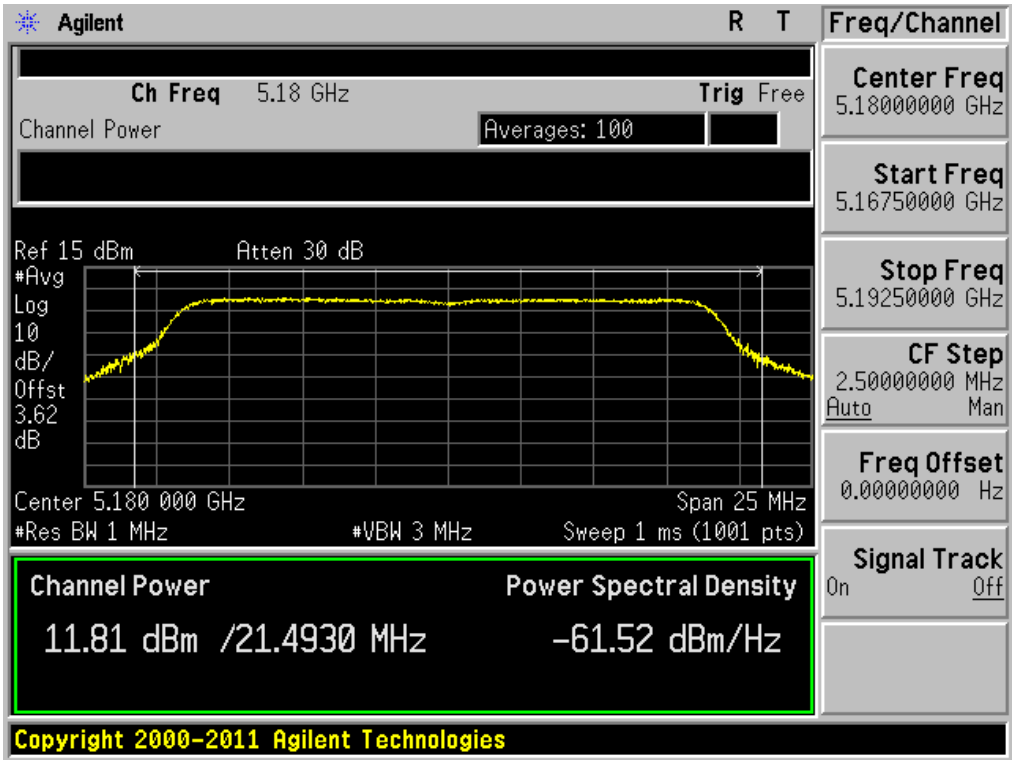
Output Power Test Mode: 802.11a & Ch.116



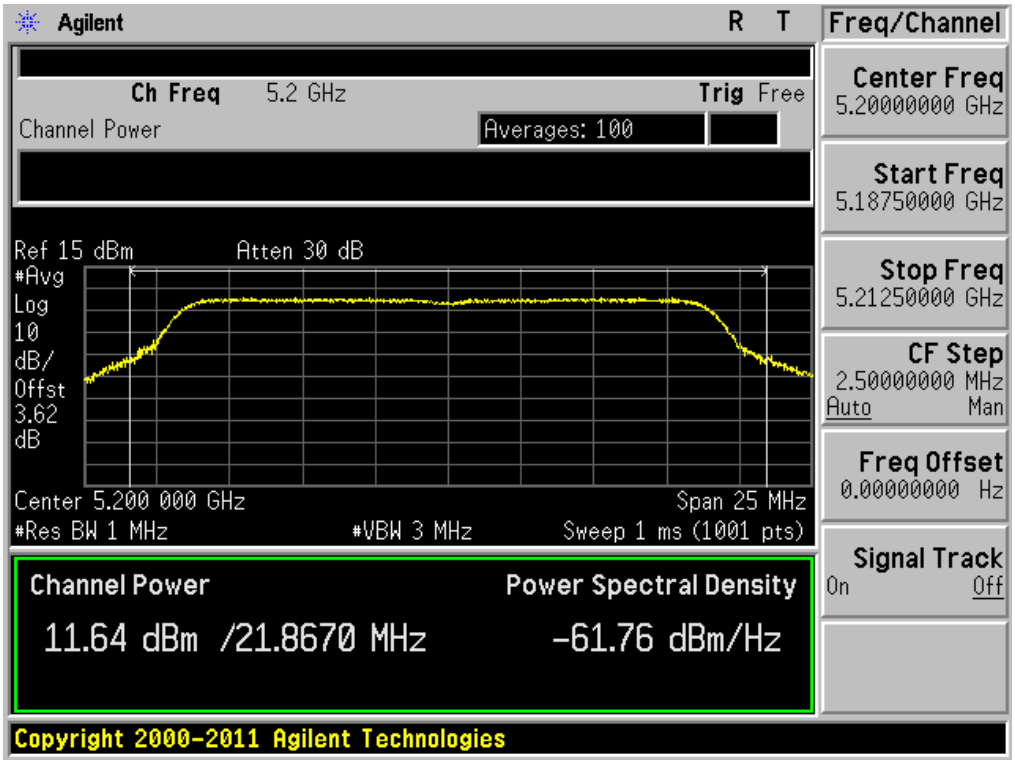
Output Power Test Mode: 802.11a & Ch.140



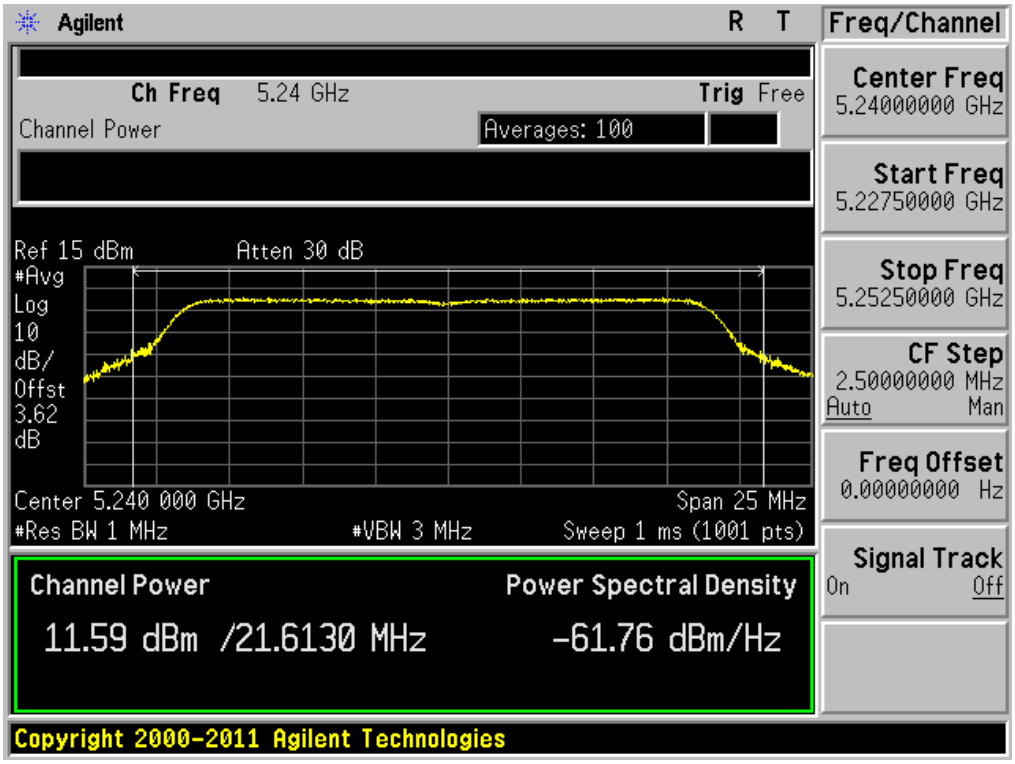
Output Power Test Mode: 802.11n HT20 & Ch.36



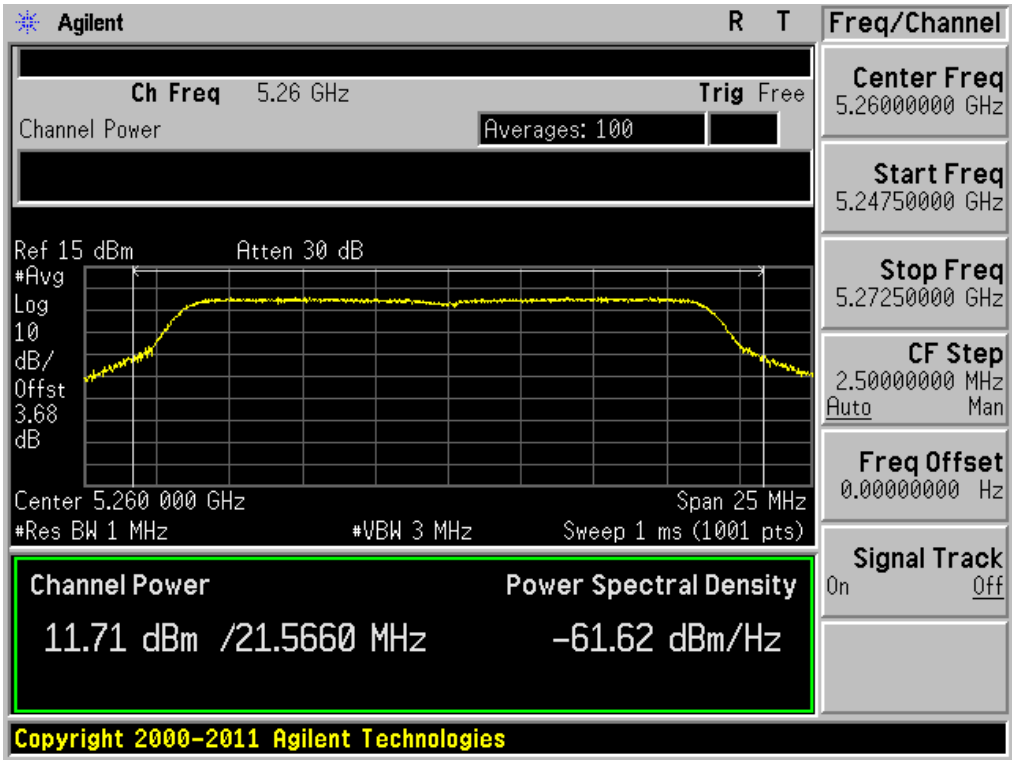
Output Power Test Mode: 802.11n HT20 & Ch.40



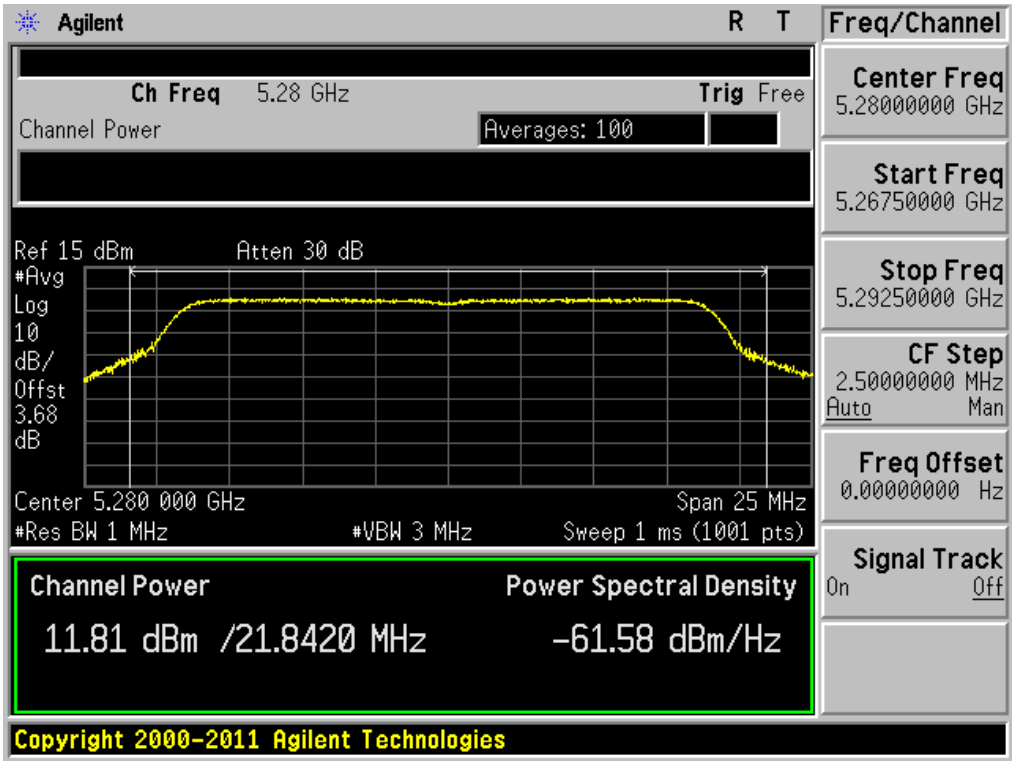
Output Power Test Mode: 802.11n HT20 & Ch.48



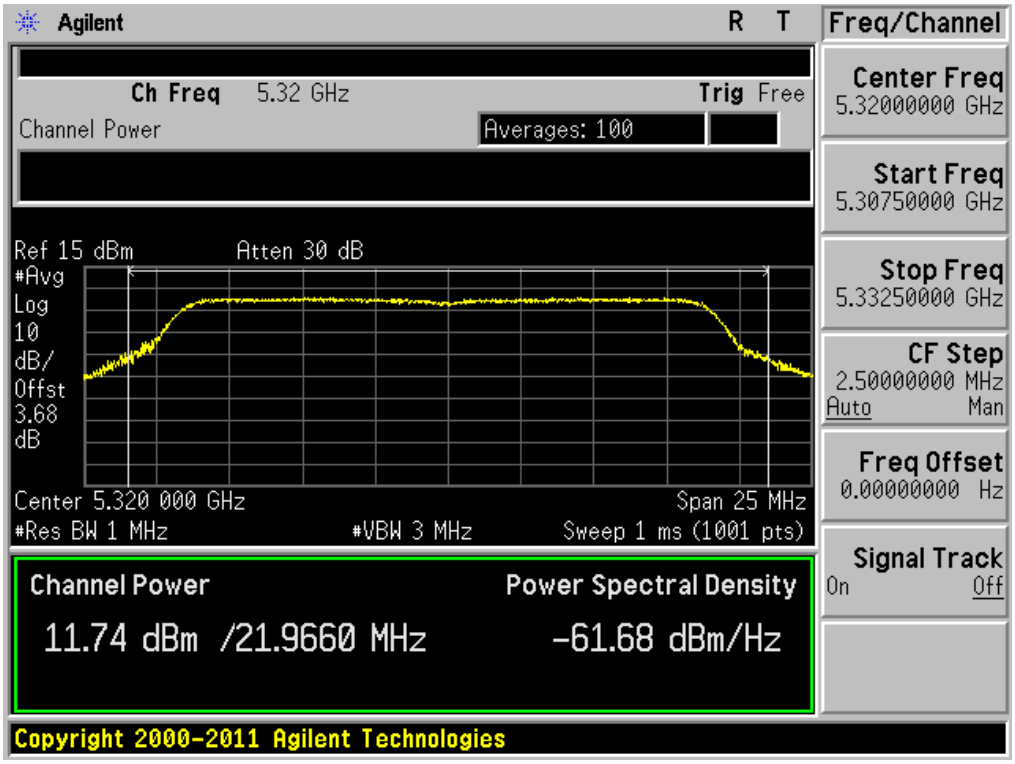
Output Power Test Mode: 802.11n HT20 & Ch.52



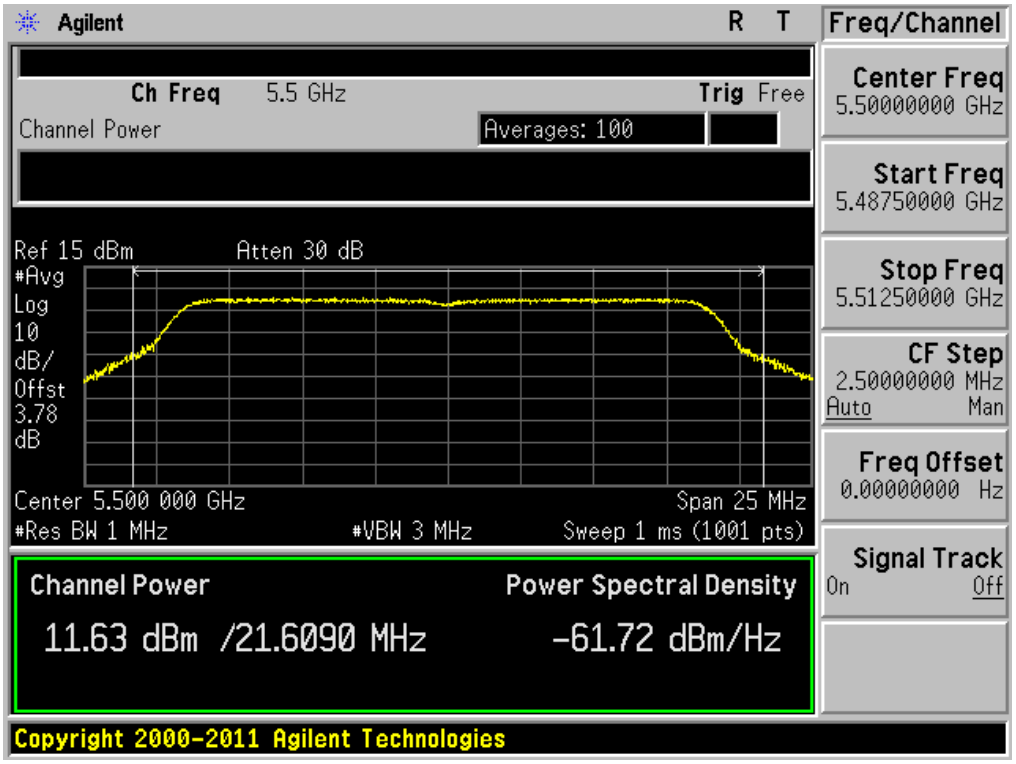
Output Power Test Mode: 802.11n HT20 & Ch.56



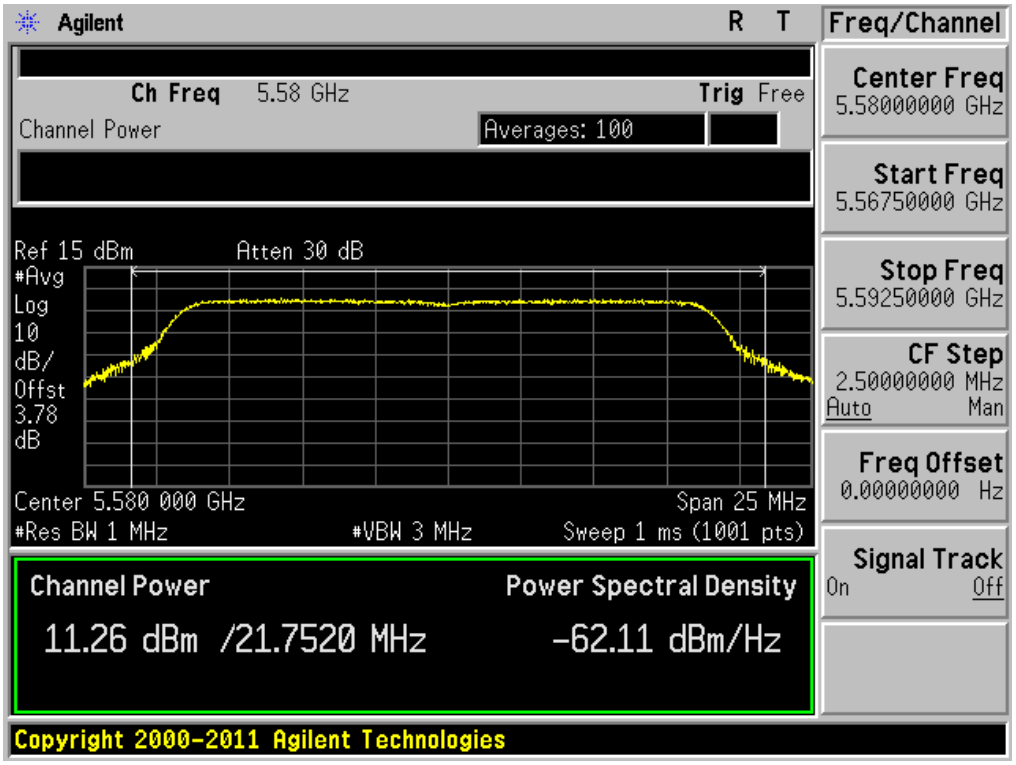
Output Power Test Mode: 802.11n HT20 & Ch.64



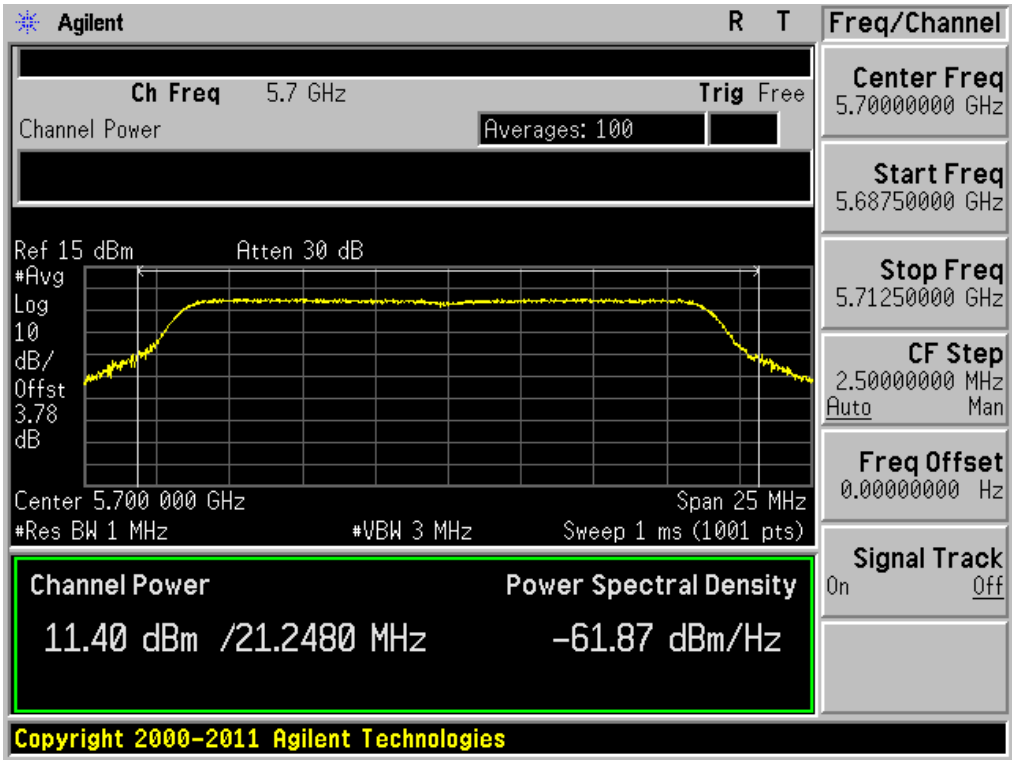
Output Power Test Mode: 802.11n HT20 & Ch.100



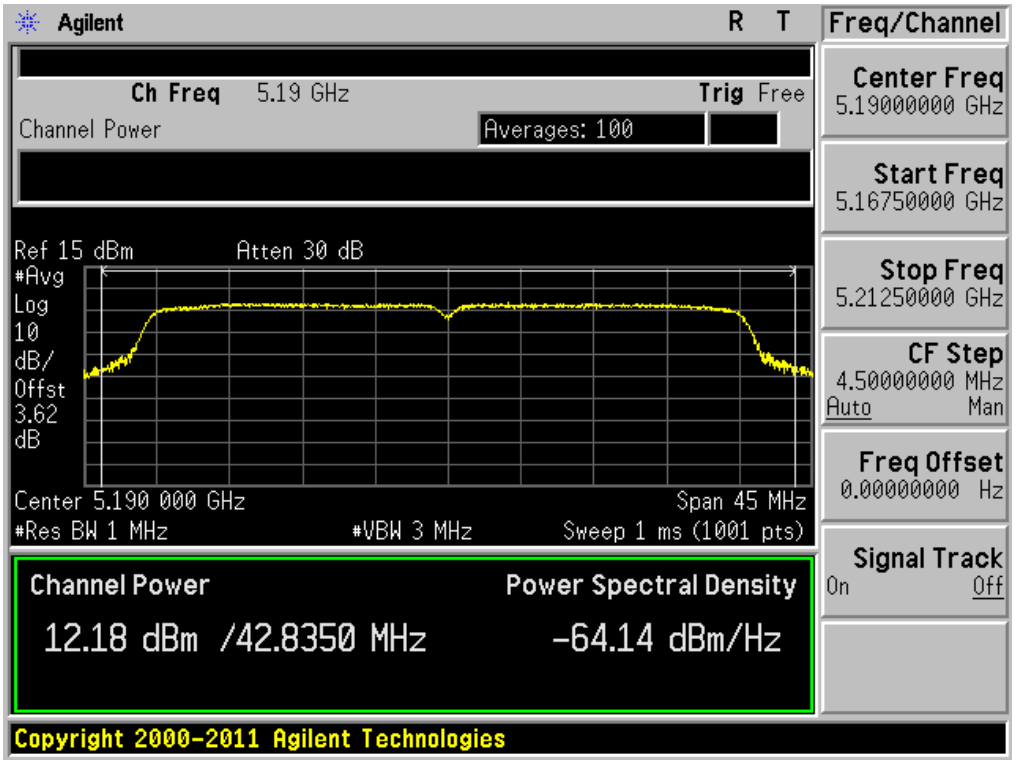
Output Power Test Mode: 802.11n HT20 & Ch.116



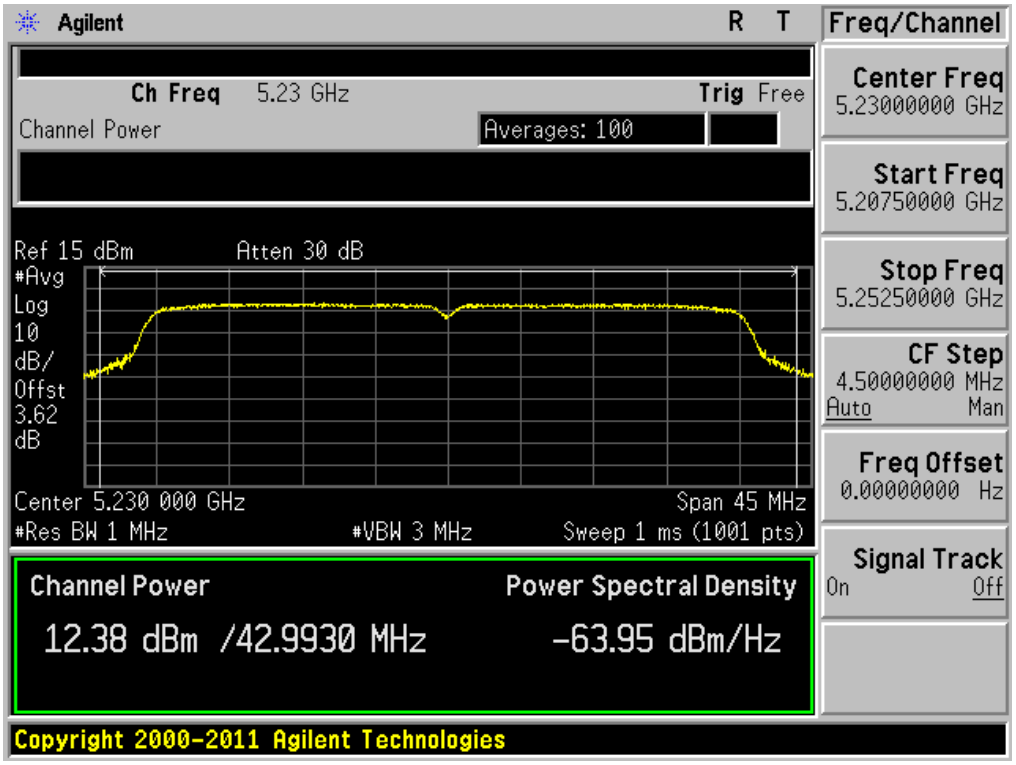
Output Power Test Mode: 802.11n HT20 & Ch.140



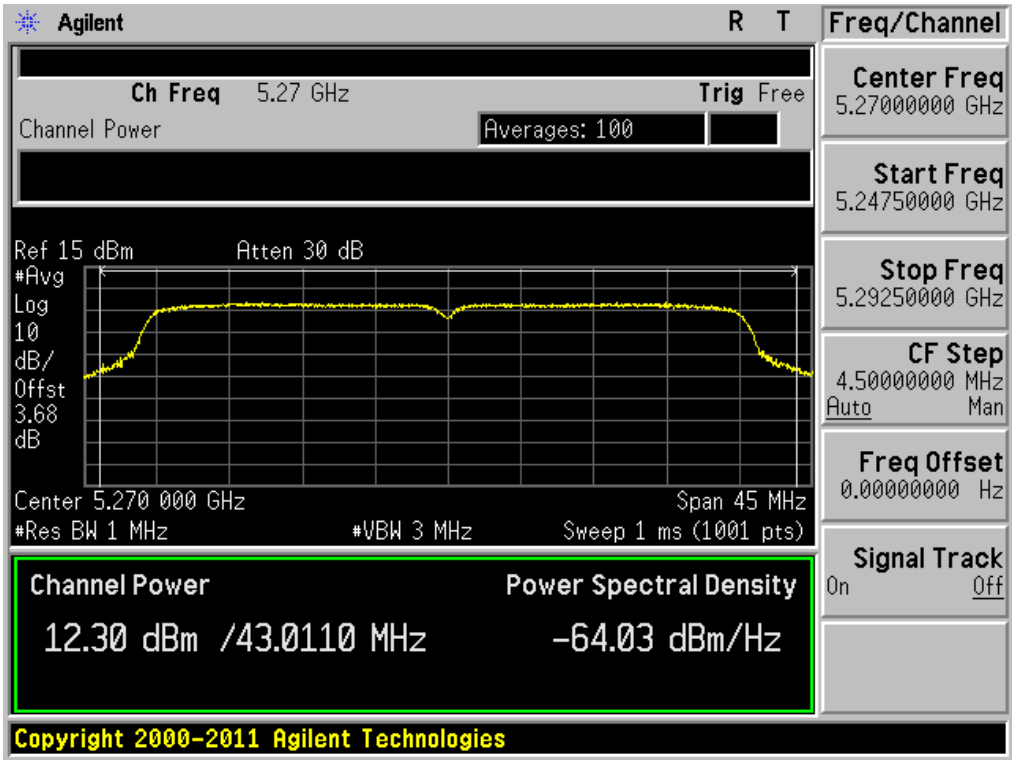
Output Power Test Mode: 802.11n HT40 & Ch.38



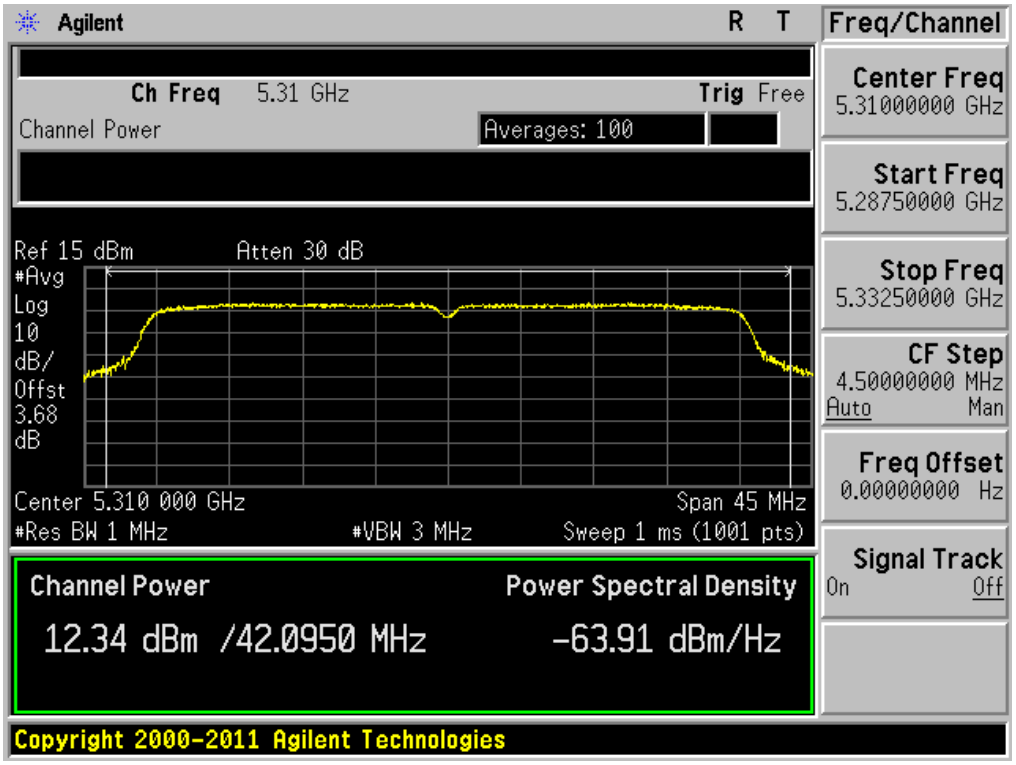
Output Power Test Mode: 802.11n HT40 & Ch.46



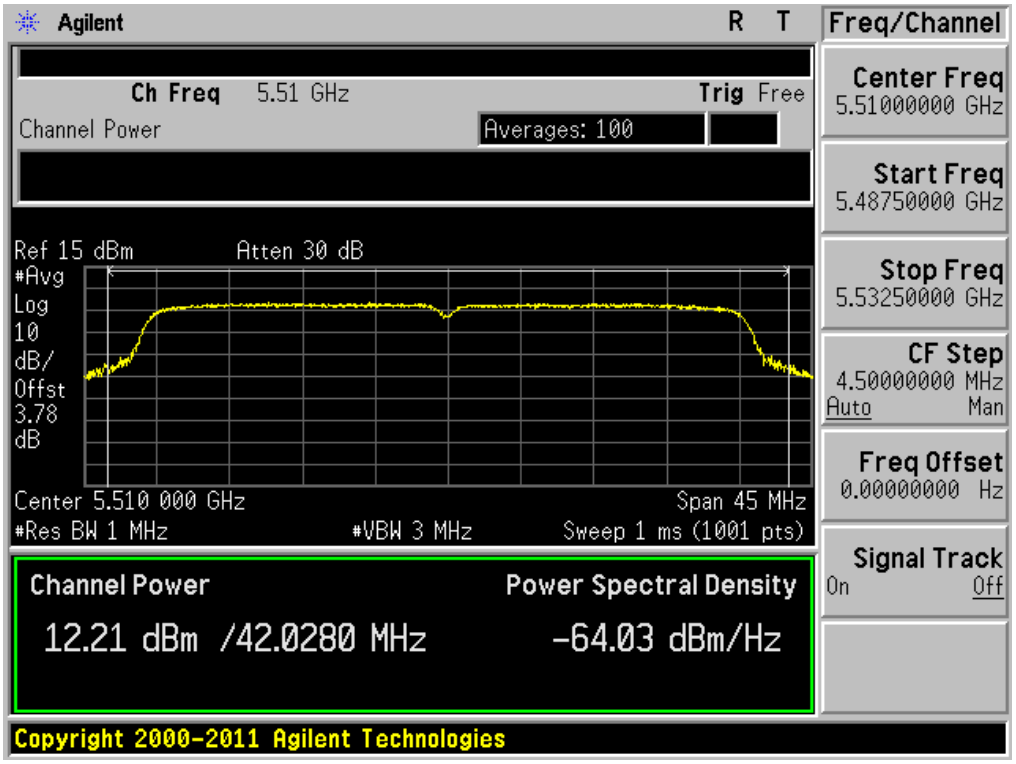
Output Power Test Mode: 802.11n HT40 & Ch.54



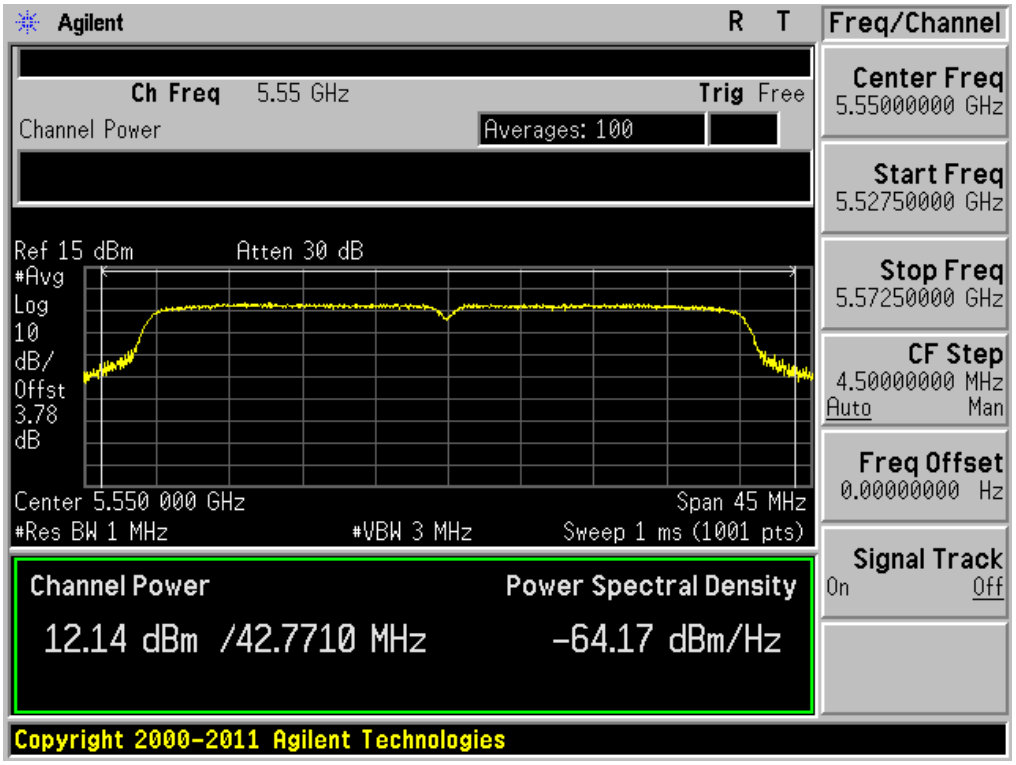
Output Power Test Mode: 802.11n HT40 & Ch.62



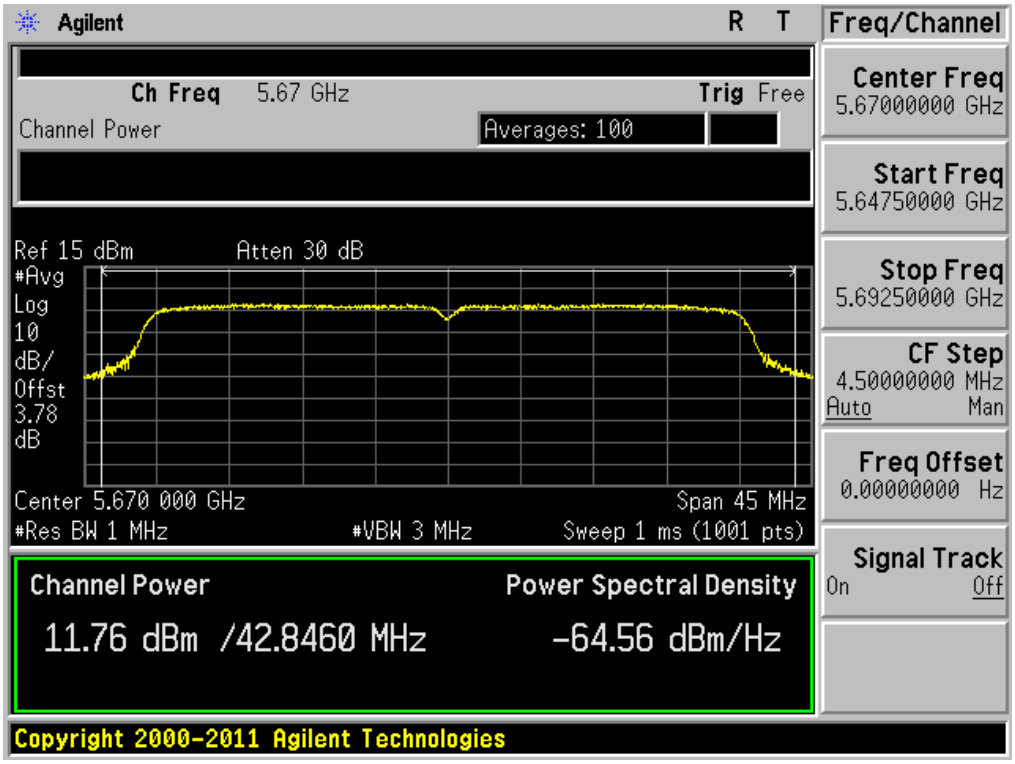
Output Power Test Mode: 802.11n HT40 & Ch.102



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**	**-6.008**	**4**
Band II	**11**	**-3.587**	**11**
Band III	**11**	**0.410**	**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**

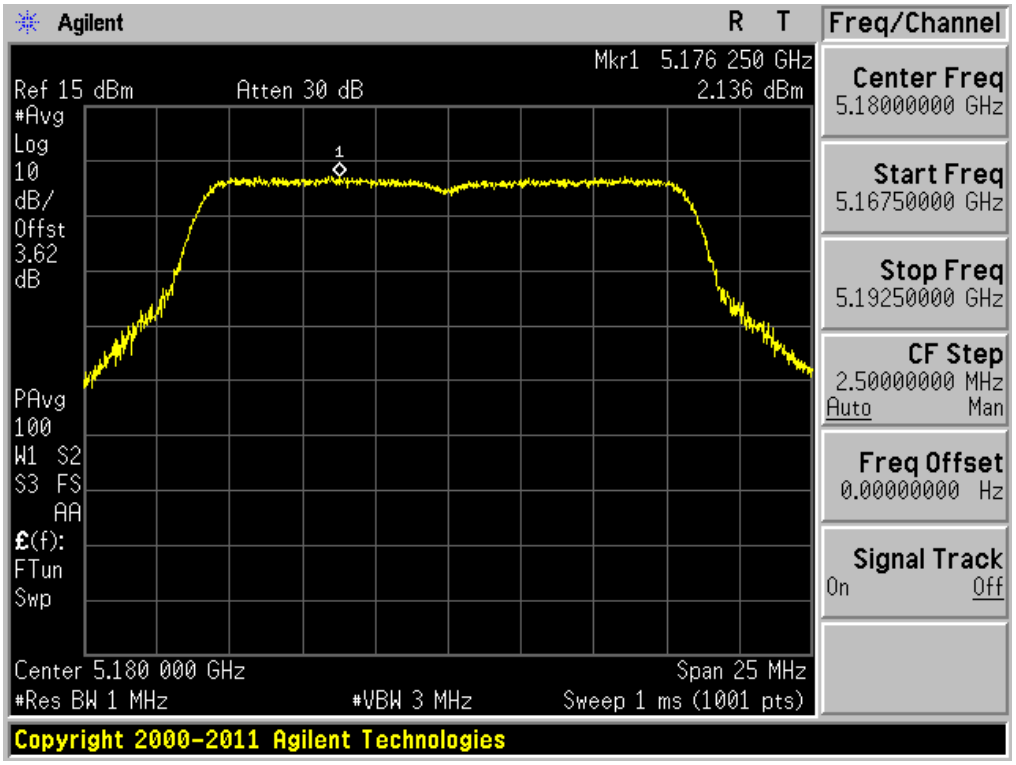
Mode	Channel	Frequency [MHz]	Reading [dBm]	Duty Cycle			DCF [dB]	Test Result [dBm]
				On Time[ms]	On+Off Time[ms]	X		
802.11a	36	5180	2.136	2.03	2.13	0.95	0.23	2.366
	40	5200	1.831					2.061
	48	5240	1.663					1.893
	52	5260	2.315	2.03	2.13	0.95	0.23	2.545
	56	5280	2.201					2.431
	64	5320	1.577					1.807
	100	5500	1.722	2.03	2.13	0.95	0.23	1.952
	116	5580	0.943					1.173
	140	5700	0.583					0.813

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	0.590	1.89	1.99	0.94	0.27	0.860
	40	5200	0.337					0.607
	48	5240	0.132					0.402
	52	5260	0.389	1.89	1.99	0.94	0.27	0.659
	56	5280	0.265					0.535
	64	5320	0.098					0.368
	100	5500	0.249	1.89	1.99	0.94	0.27	0.519
	116	5580	-0.296					-0.026
	140	5700	-0.919					-0.649
802.11n (40MHz)	38	5190	-1.479	0.93	0.98	0.94	0.27	-1.209
	46	5230	-2.046					-1.776
	54	5270	-1.853	0.93	0.98	0.94	0.27	-1.583
	62	5310	-1.749					-1.479
	102	5510	-2.028	0.93	0.98	0.94	0.27	-1.758
	110	5550	-2.374					-2.104
	134	5670	-2.419					-2.149

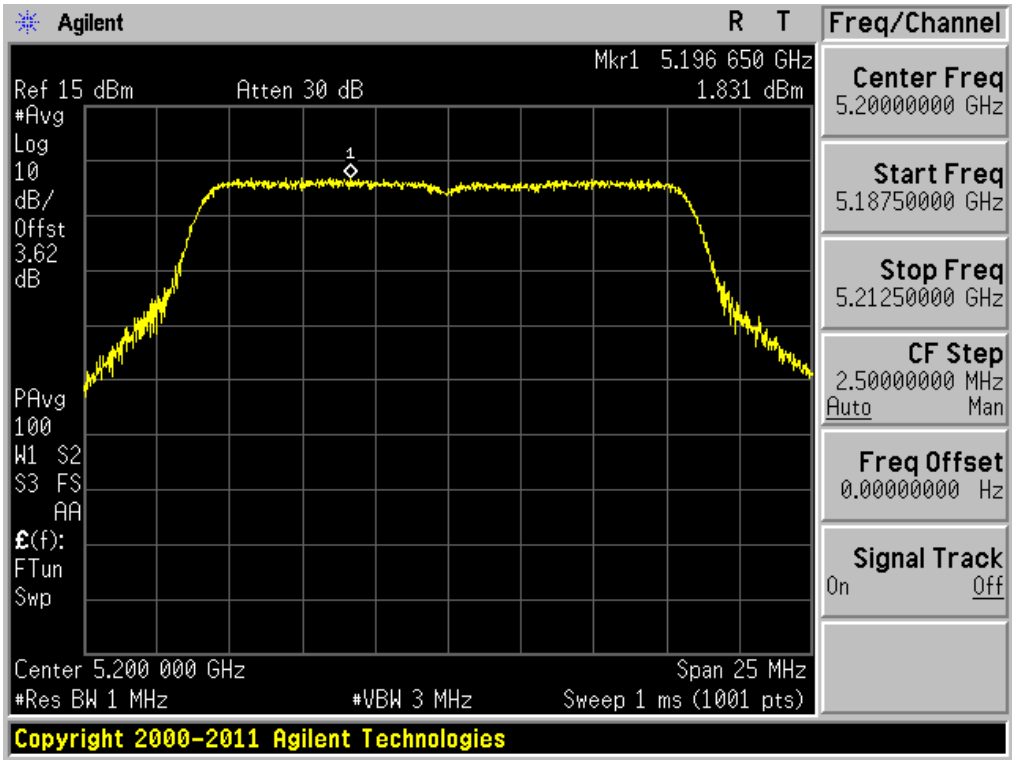
Note 1 : DCF = 10log(1 / X), X = On Time / (On+Off time)
Note 2 : Test Result = Measurement Data + DCF

▣ Measurement Data PLOTS

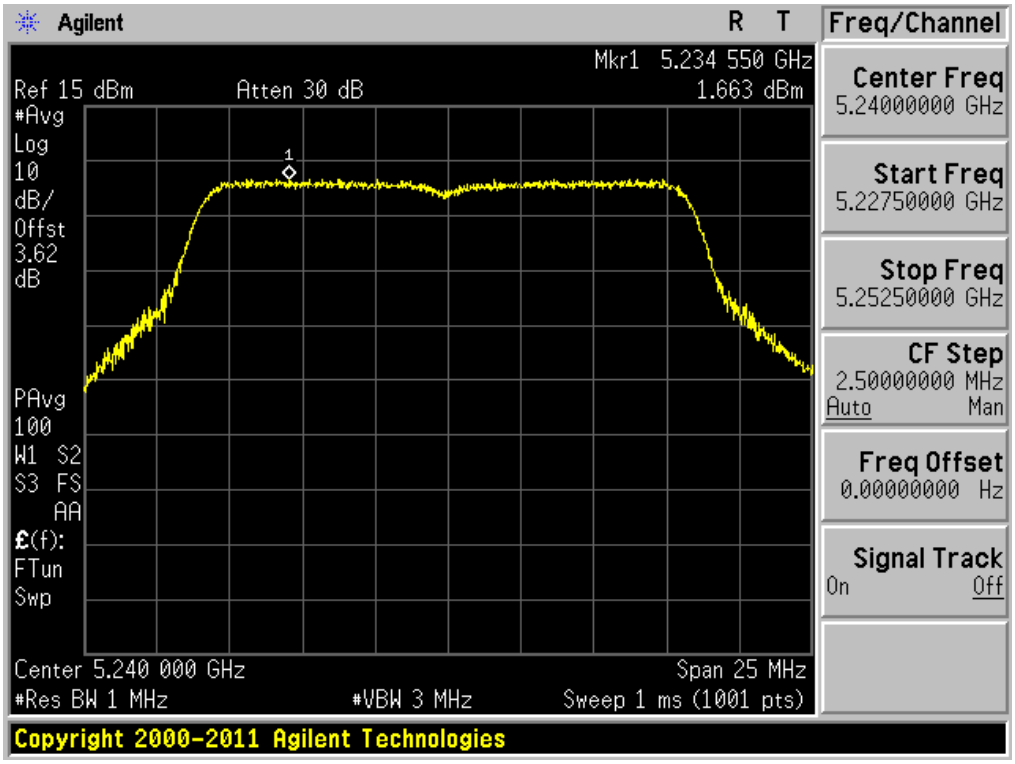
Peak Power Spectral Density Test Mode: 802.11a & Ch.36



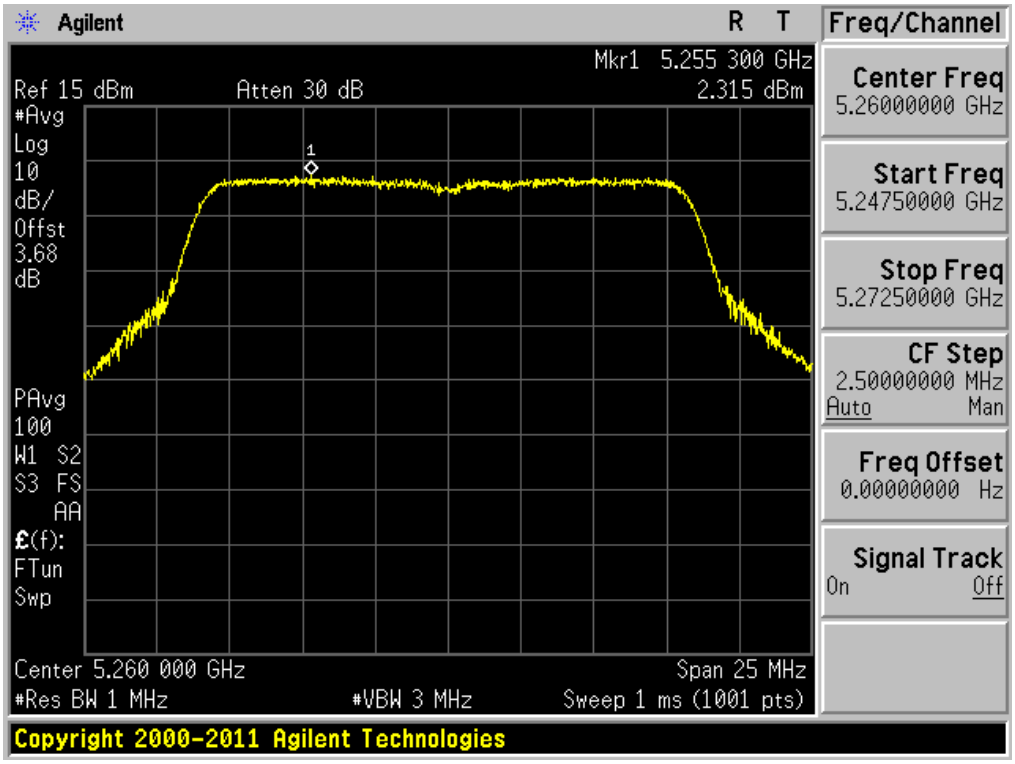
Peak Power Spectral Density Test Mode: 802.11a & Ch.40



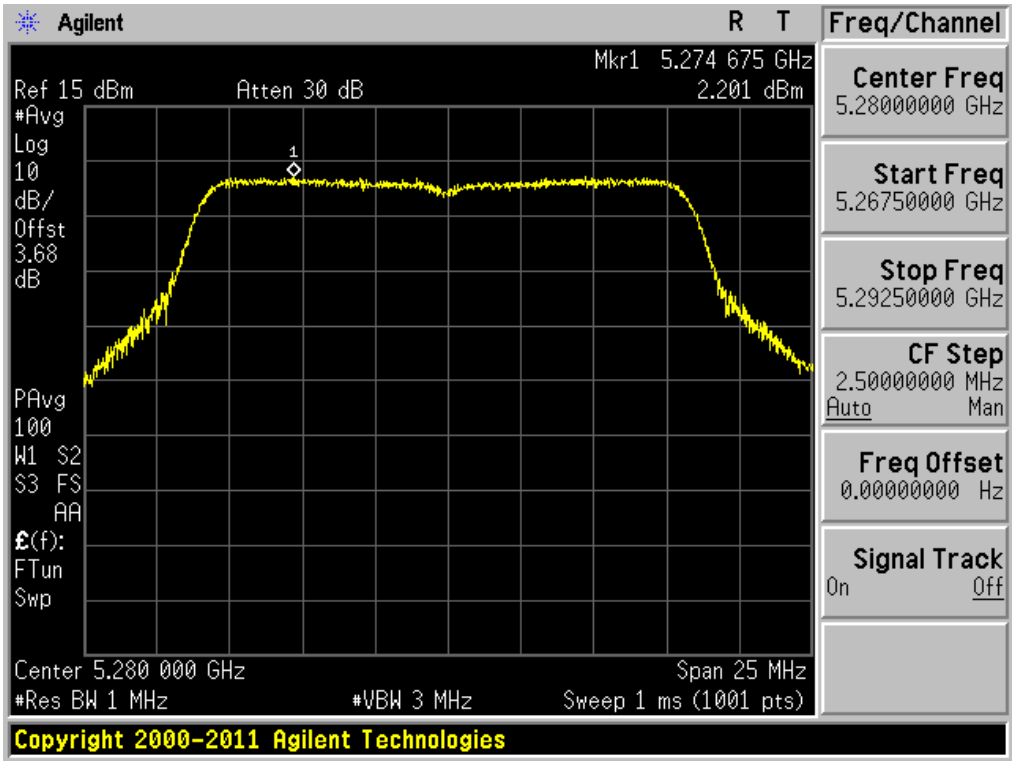
Peak Power Spectral Density Test Mode: 802.11a & Ch.48



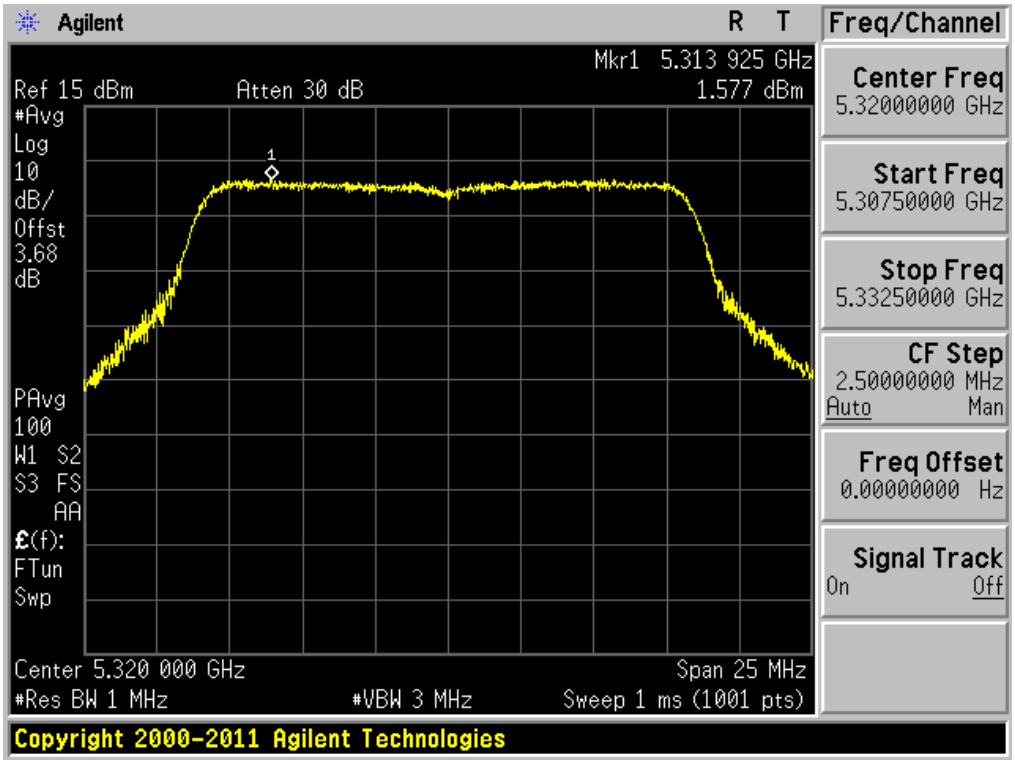
Peak Power Spectral Density Test Mode: 802.11a & Ch.52



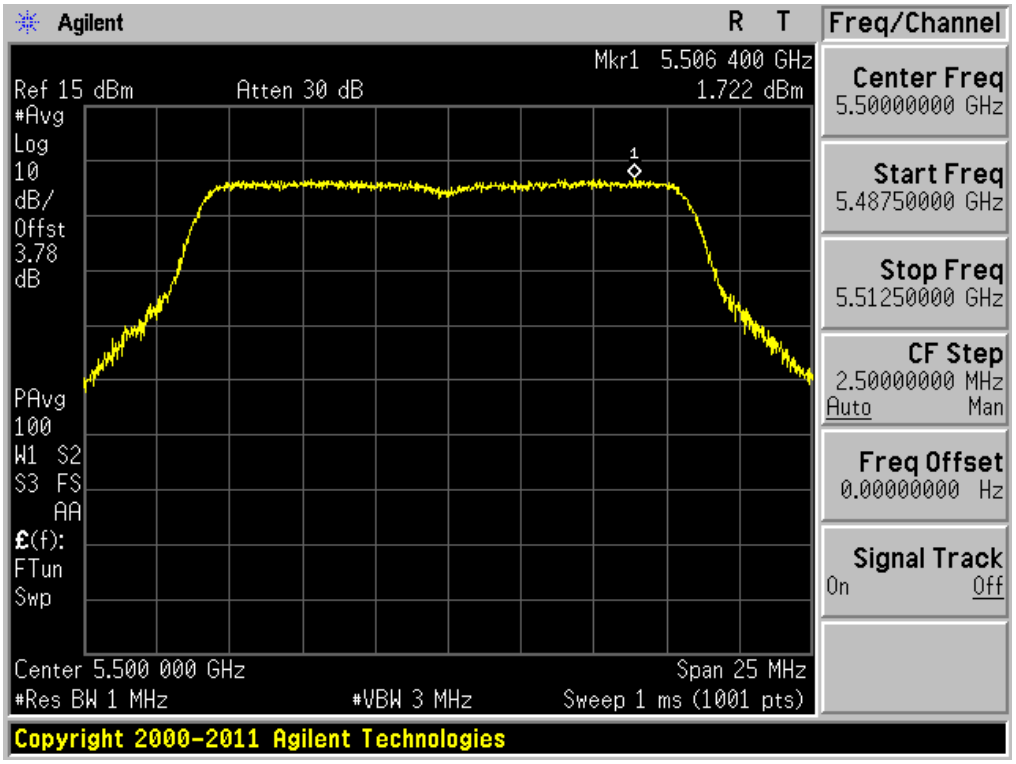
Peak Power Spectral Density Test Mode: 802.11a & Ch.56



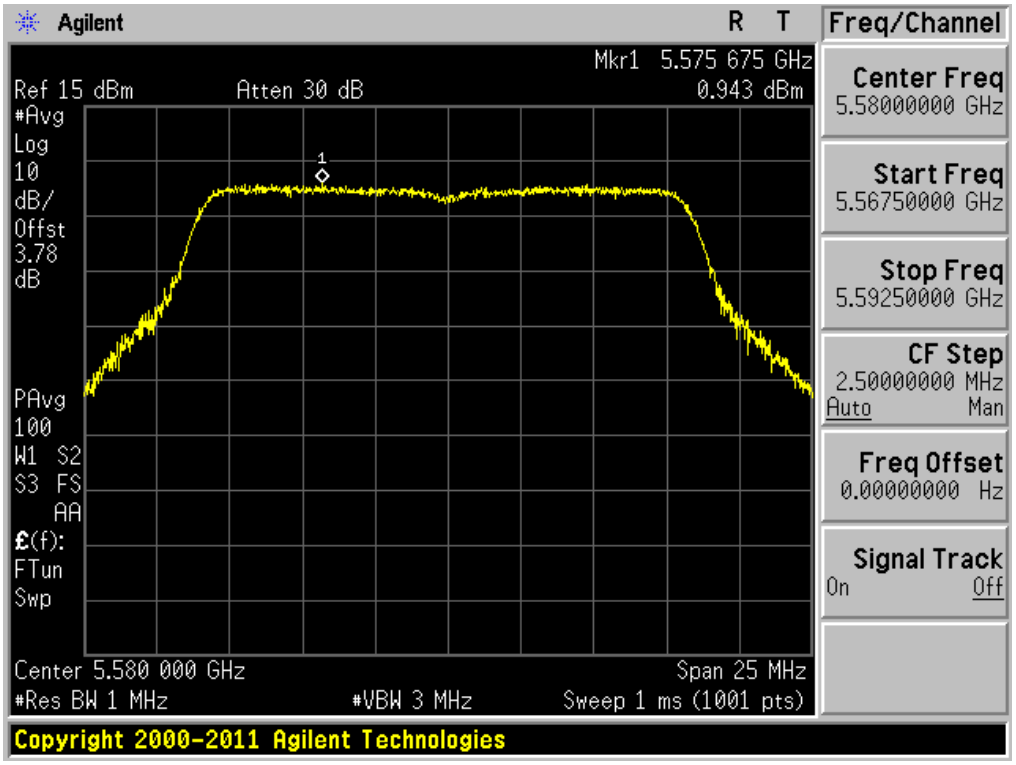
Peak Power Spectral Density Test Mode: 802.11a & Ch.64



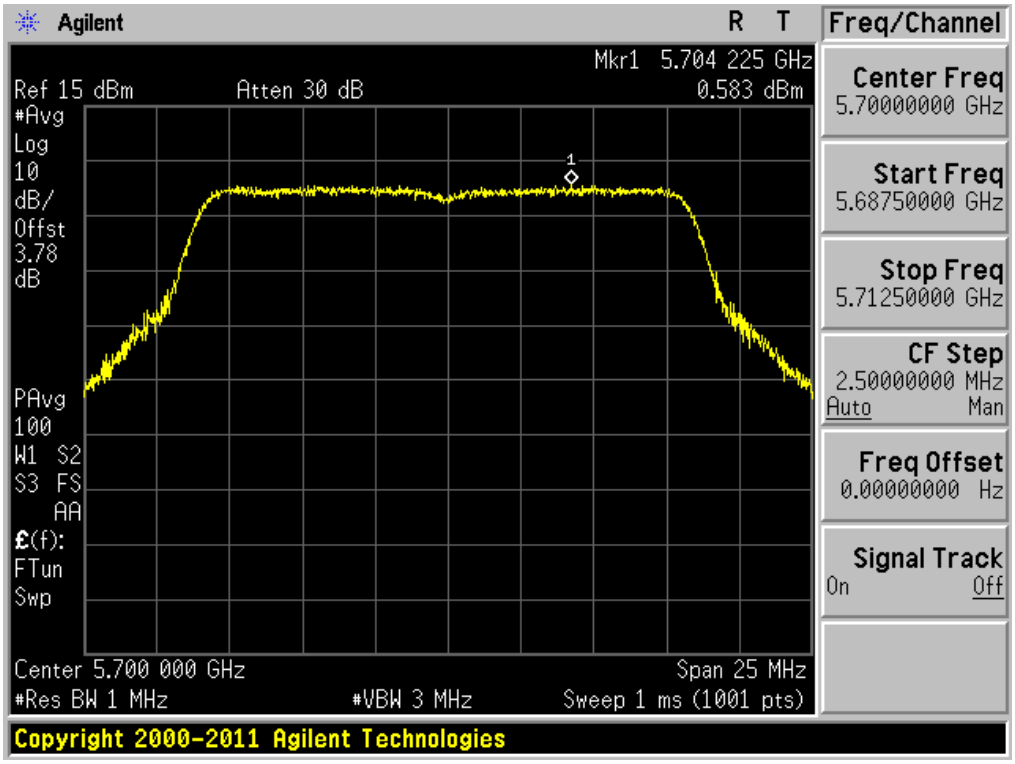
Peak Power Spectral Density Test Mode: 802.11a & Ch.100



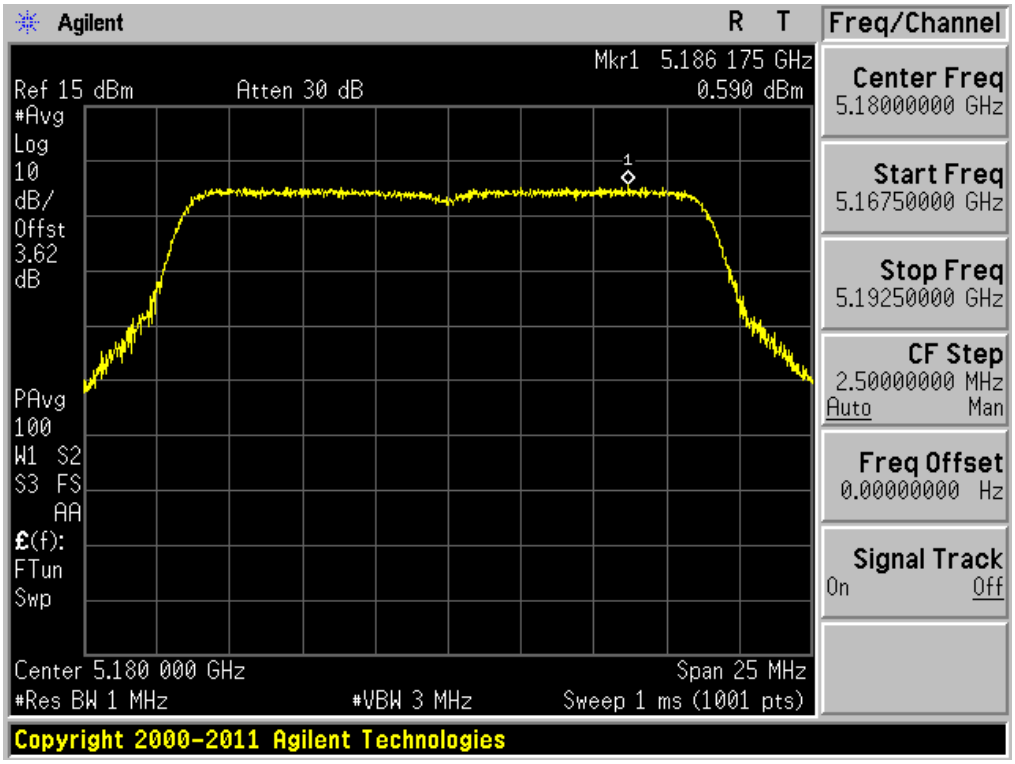
Peak Power Spectral Density Test Mode: 802.11a & Ch.116



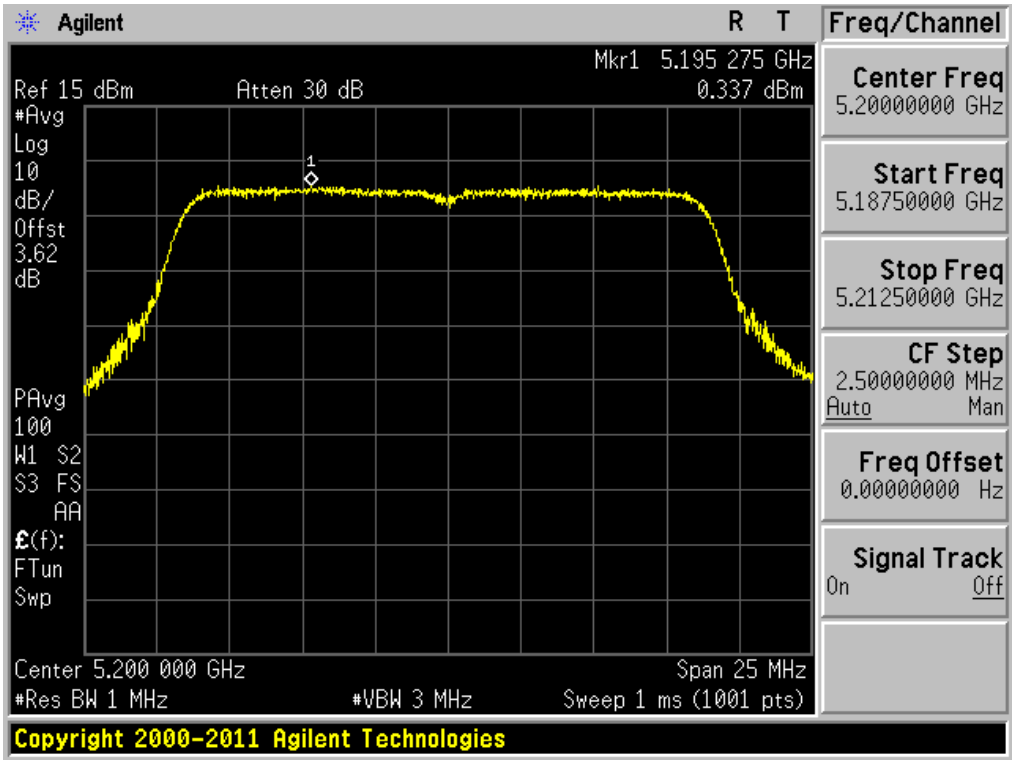
Peak Power Spectral Density Test Mode: 802.11a & Ch.140



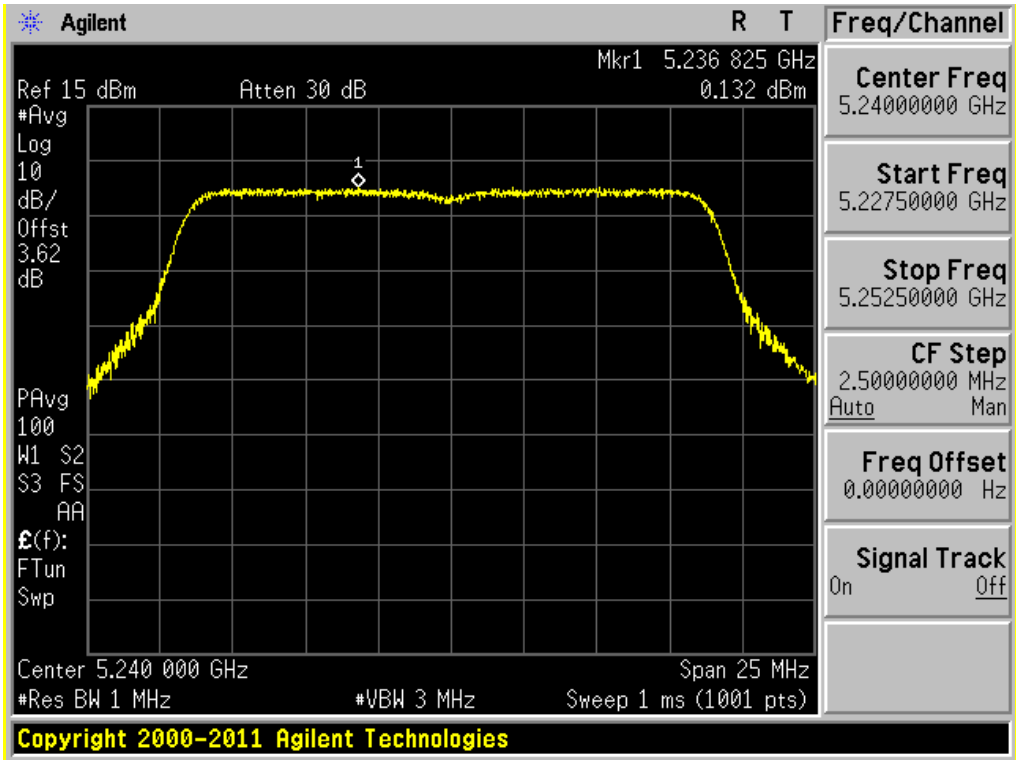
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.36



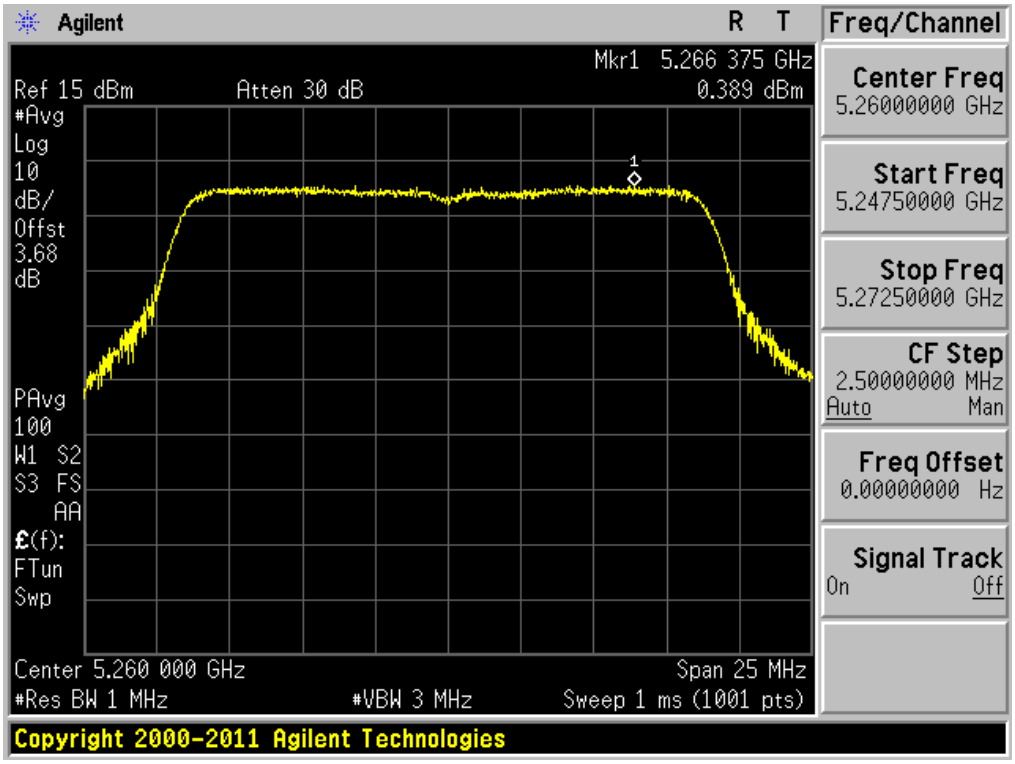
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.40



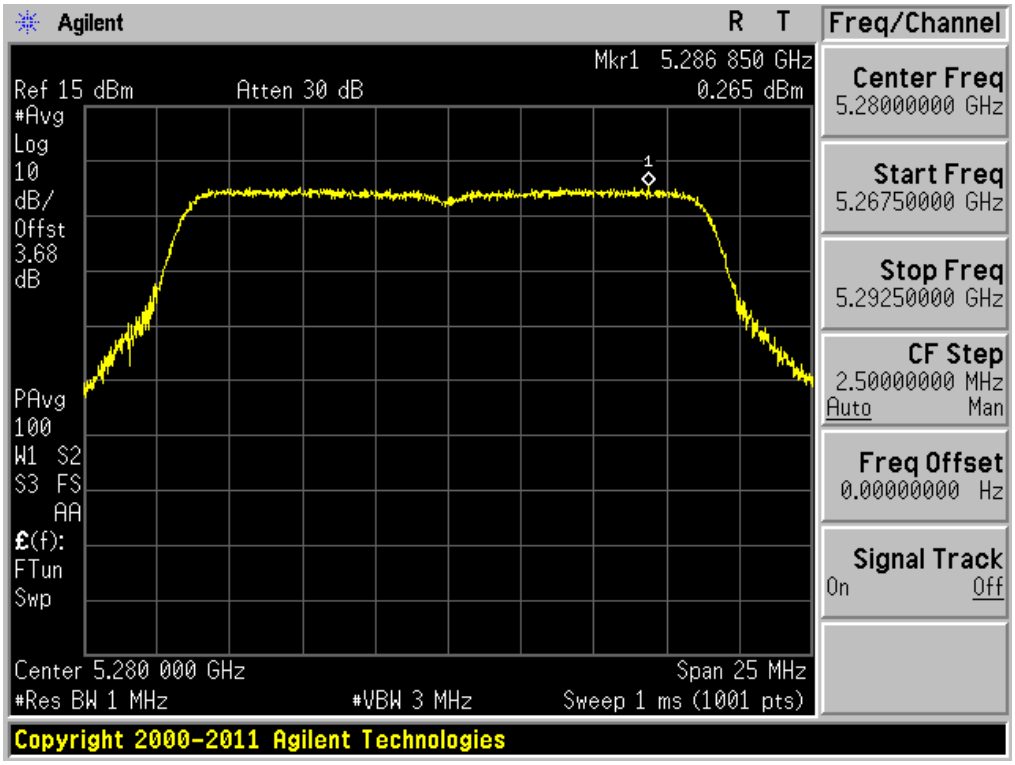
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.48



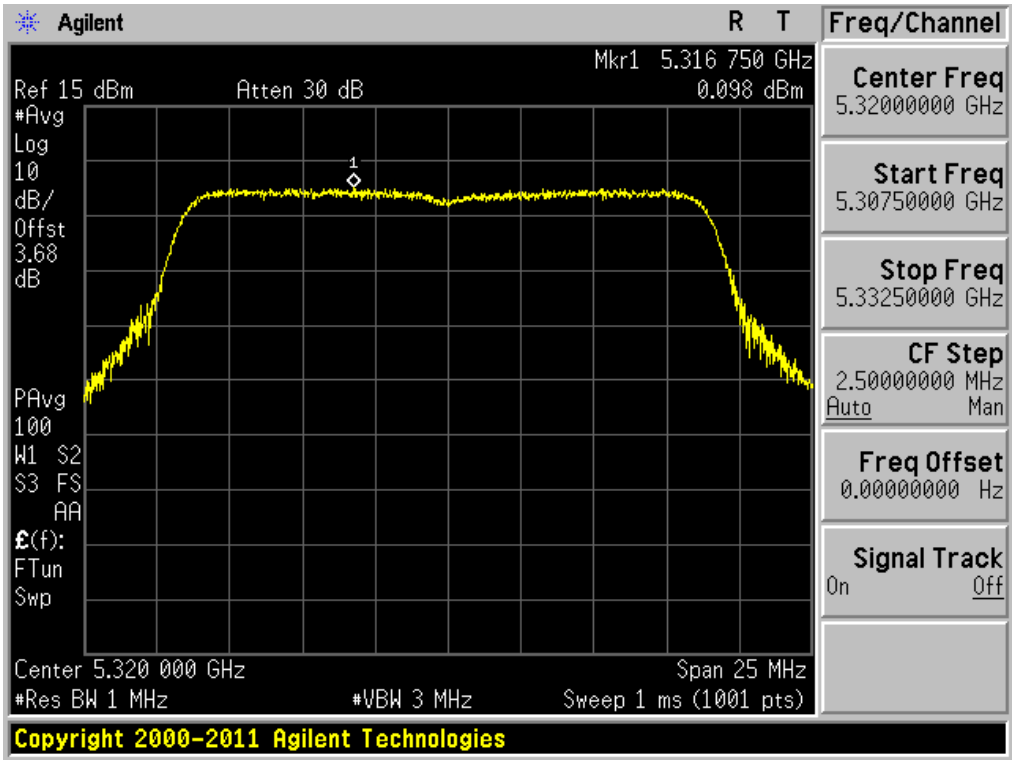
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.52



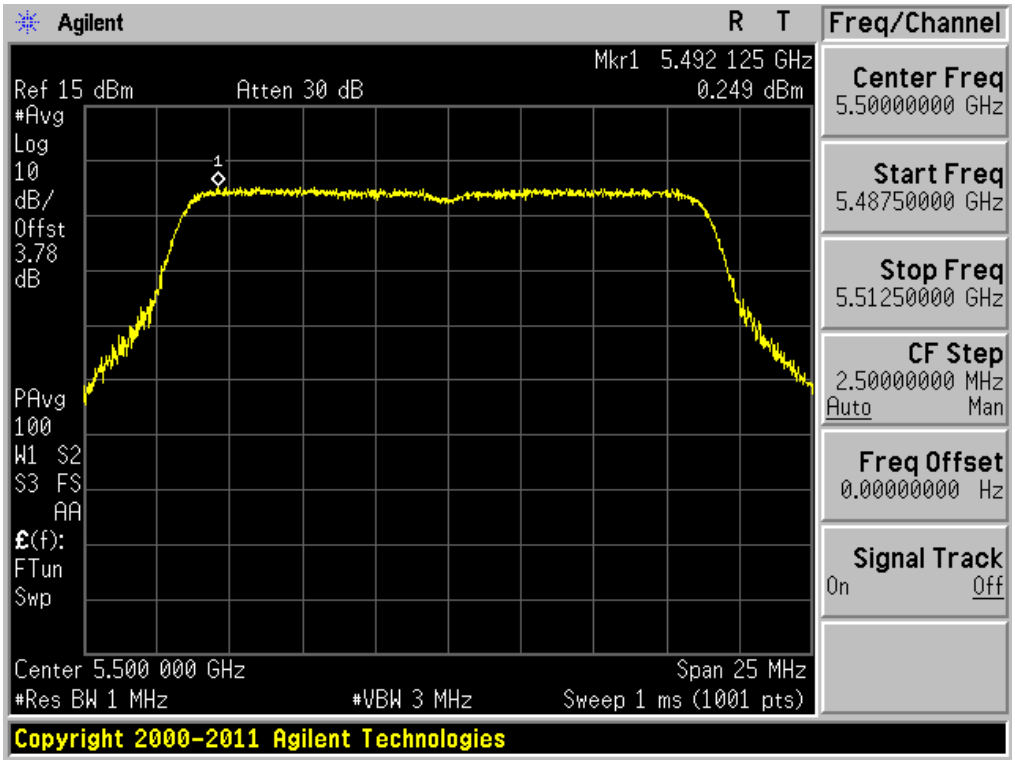
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.56



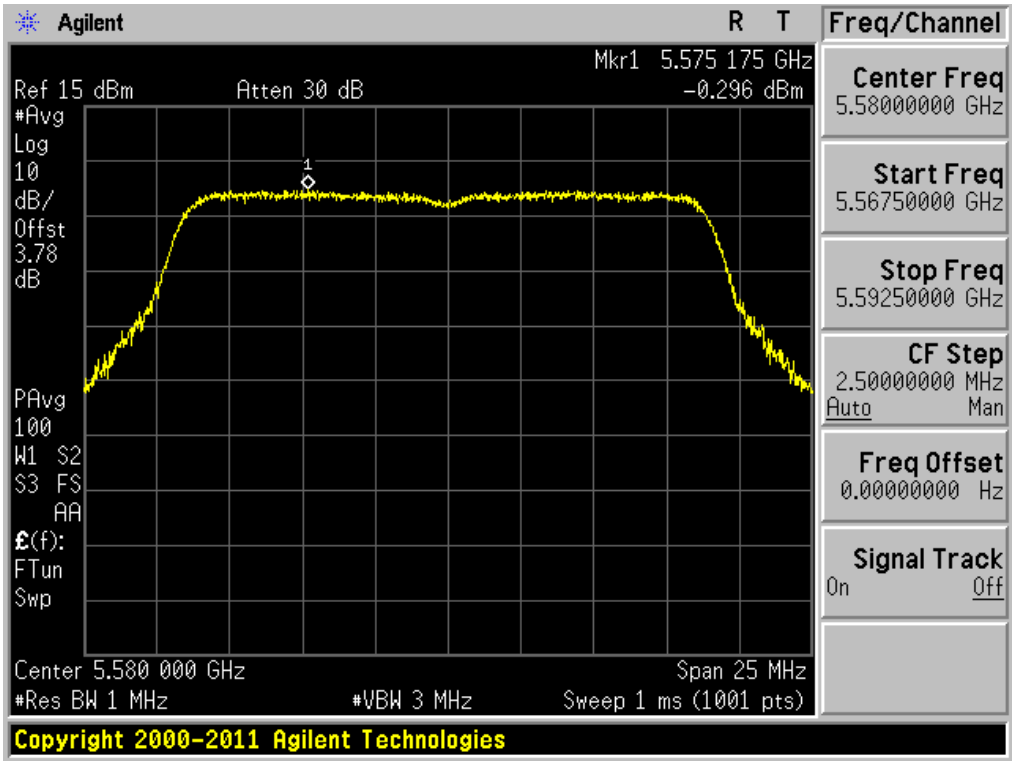
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.64



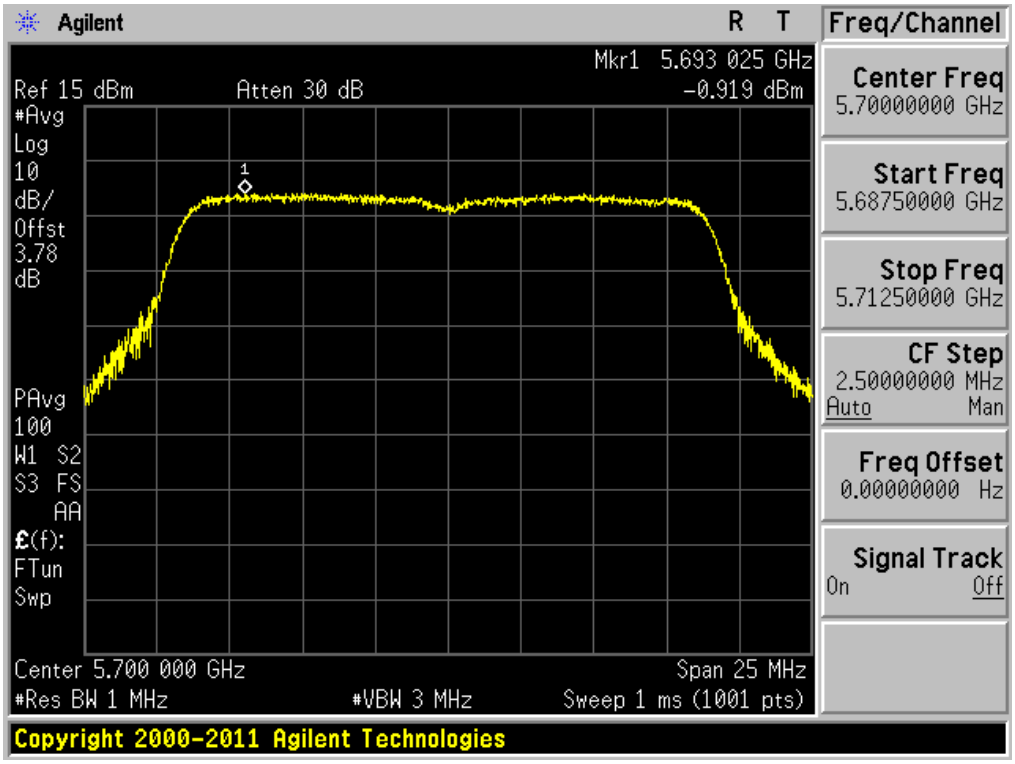
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.100



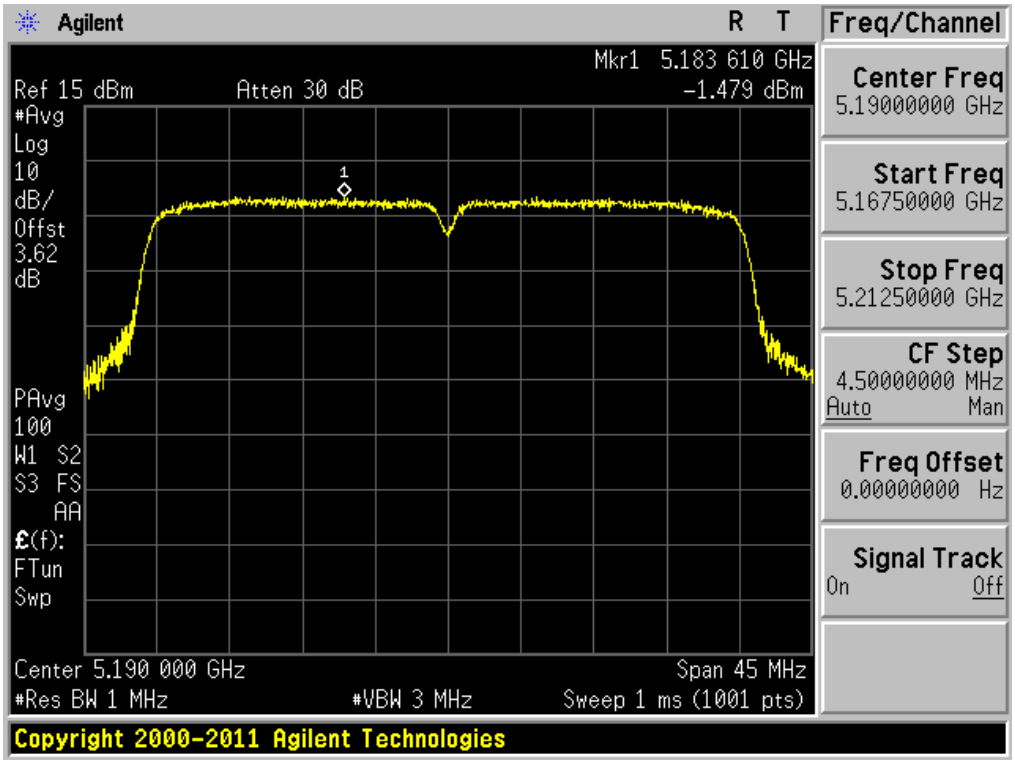
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.116



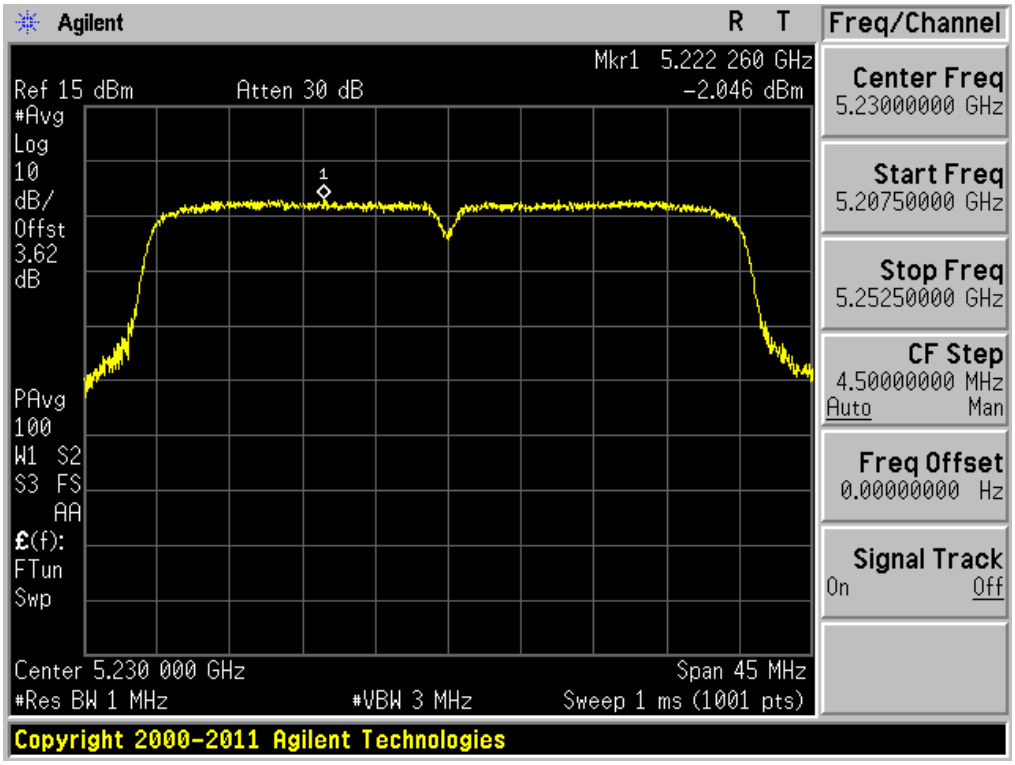
Peak Power Spectral Density Test Mode: 802.11n HT20 & Ch.140



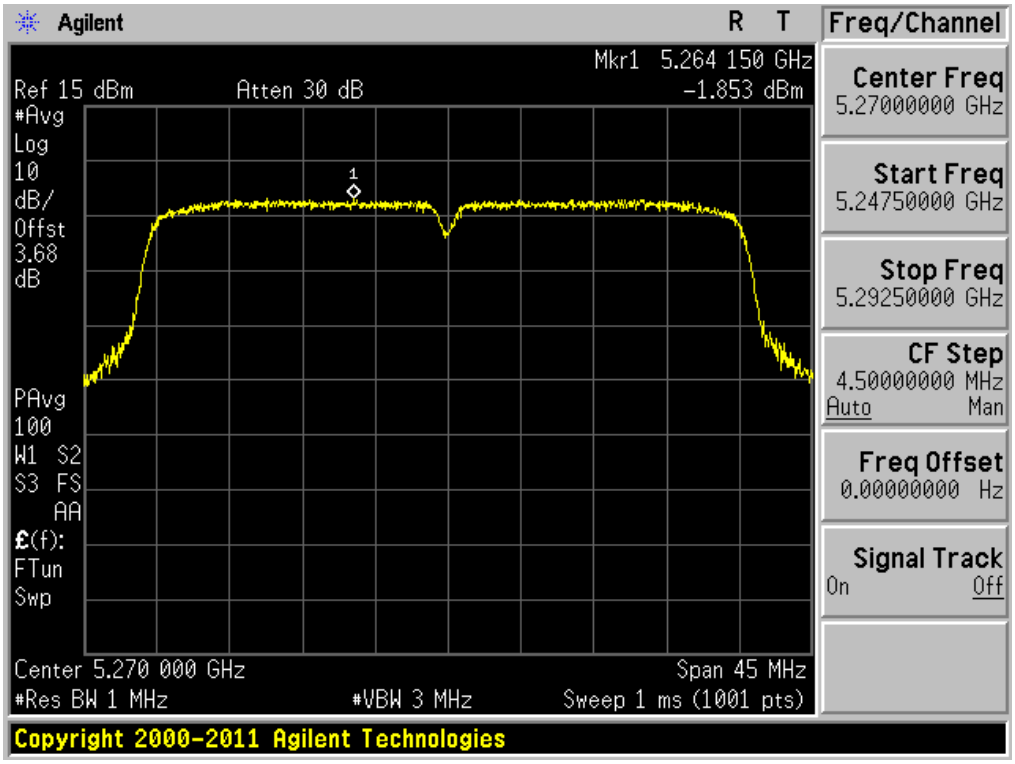
Peak Power Spectral Density Test Mode: 802.11n HT40 & Ch.38



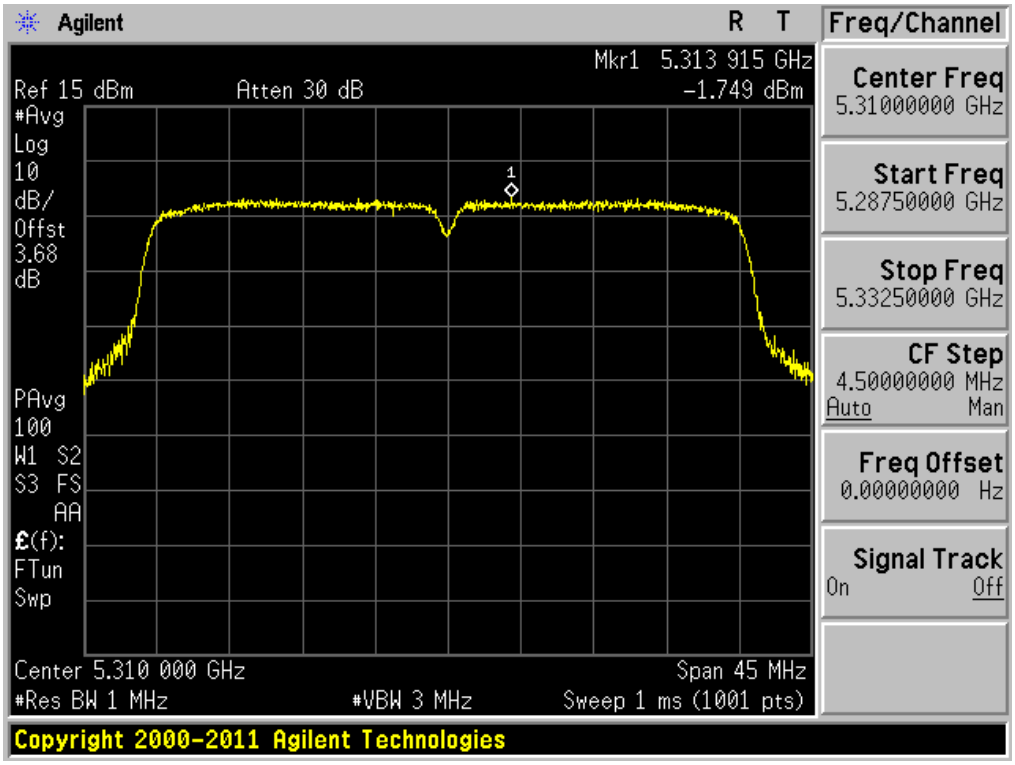
Peak Power Spectral Density Test Mode: 802.11n HT40 & Ch.46



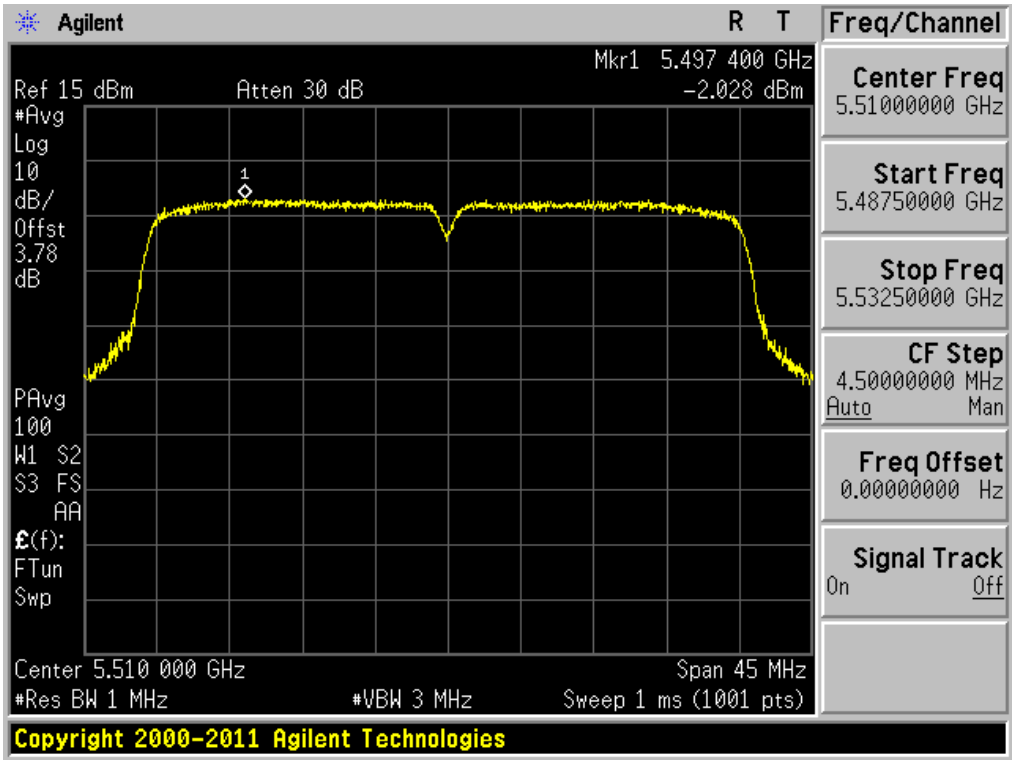
Peak Power Spectral Density Test Mode: 802.11n HT40 & Ch.54



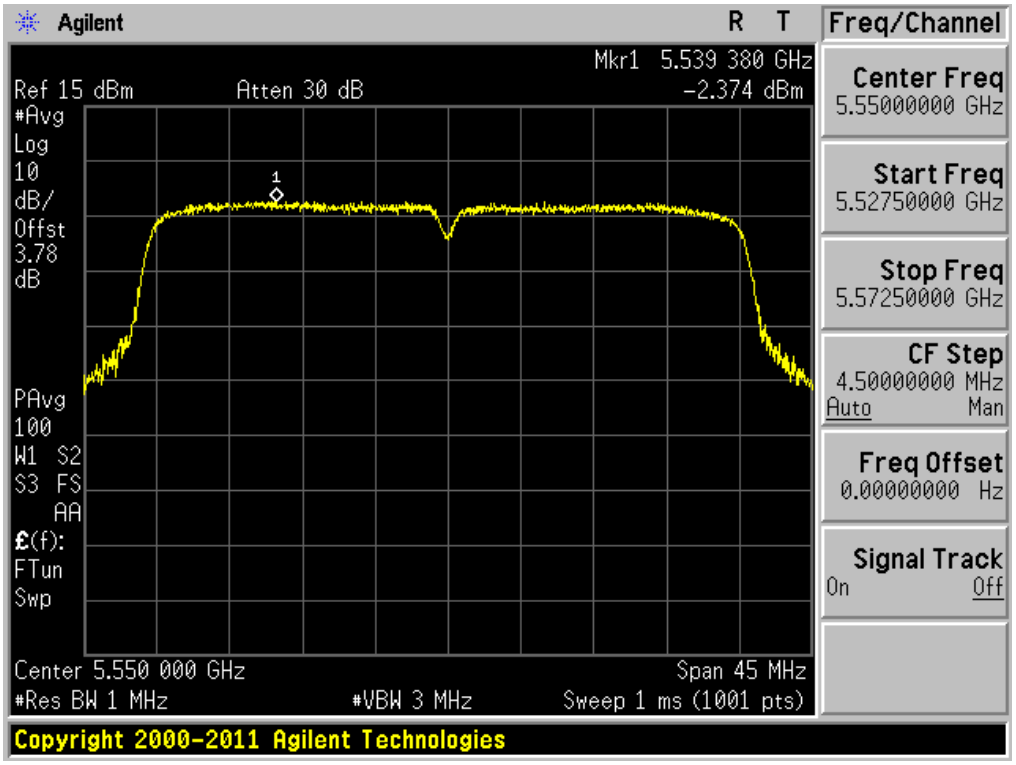
Peak Power Spectral Density Test Mode: 802.11n HT40 & Ch.62



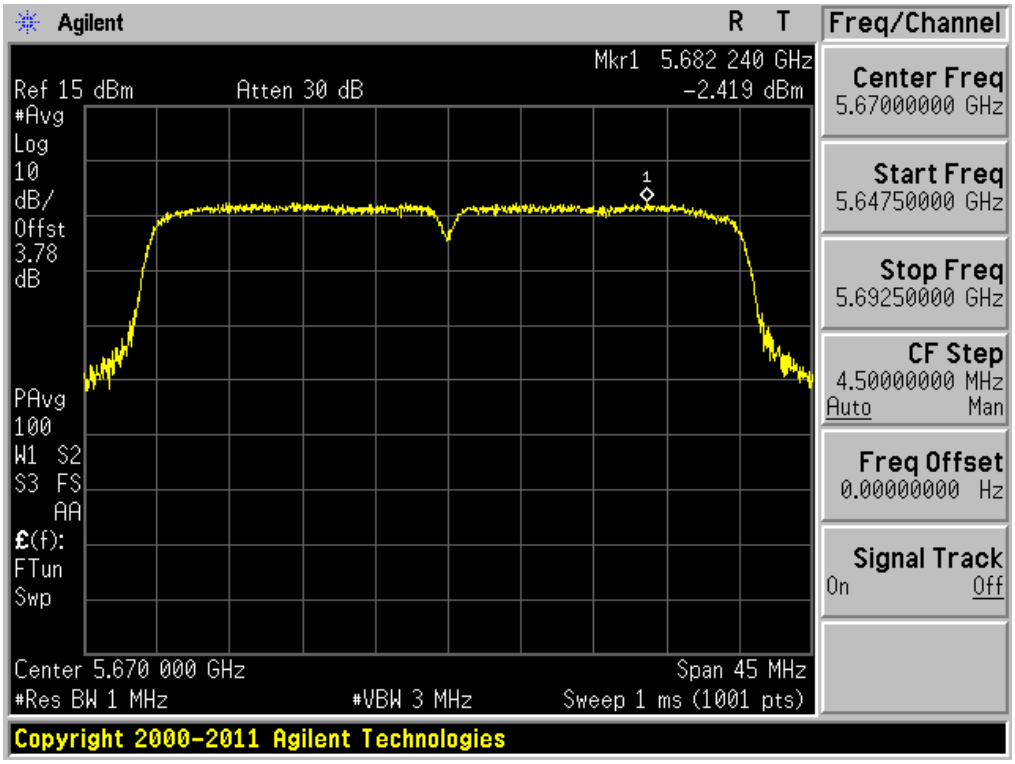
Peak Power Spectral Density Test Mode: 802.11n HT40 & Ch.102



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/MH**z.

▣ **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.

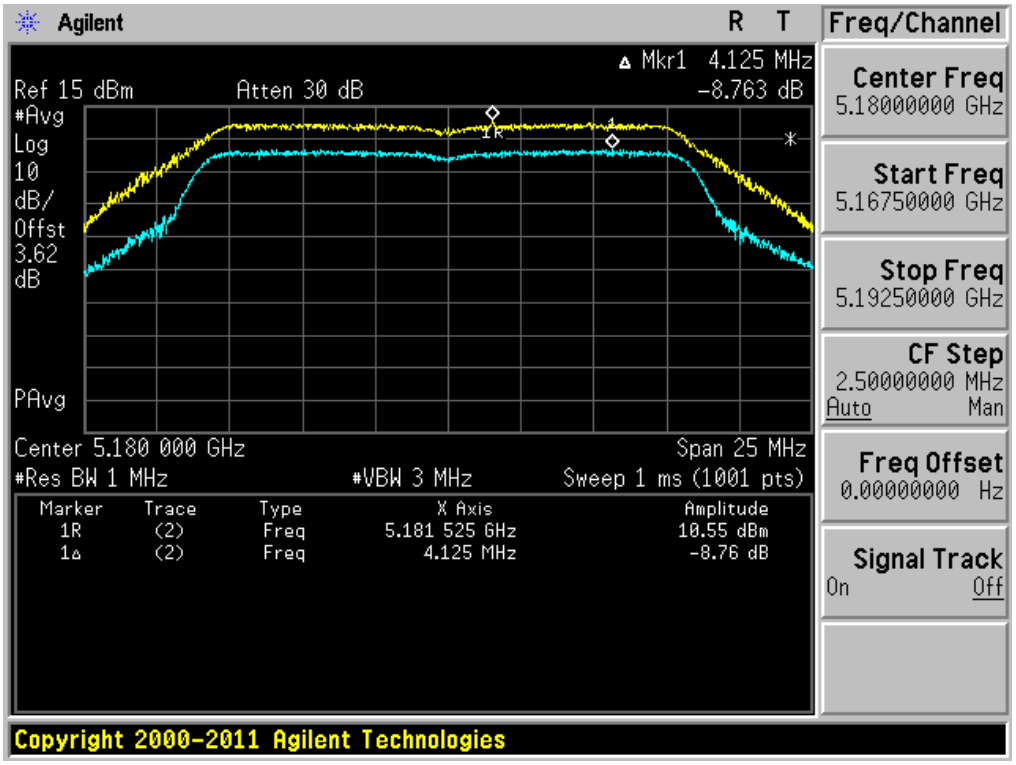
▣ **TEST RESULT : Comply**

Mode	Band	Channel	Frequency [MHz]	Test Result [dB/MHz]	Limit [dB/MHz]
802.11a	Band I	36	5180	8.763	13.000
		40	5200	8.396	
		48	5240	7.961	
	Band II	52	5260	8.645	
		56	5280	7.930	
		64	5320	7.378	
	Band III	100	5500	7.766	
		116	5580	8.497	
		140	5700	8.209	
802.11n (20MHz)	Band I	36	5180	8.895	
		40	5200	8.954	
		48	5240	8.977	
	Band II	52	5260	7.779	
		56	5280	7.843	
		64	5320	8.188	
	Band III	100	5500	8.335	
		116	5580	8.244	
		140	5700	8.207	
802.11n (40MHz)	Band I	38	5190	8.182	
		46	5230	8.395	
	Band II	54	5270	8.434	
		62	5310	7.957	
	Band III	102	5510	8.695	
		110	5550	9.161	
		134	5670	7.879	

▣ Measurement Data PLOTS

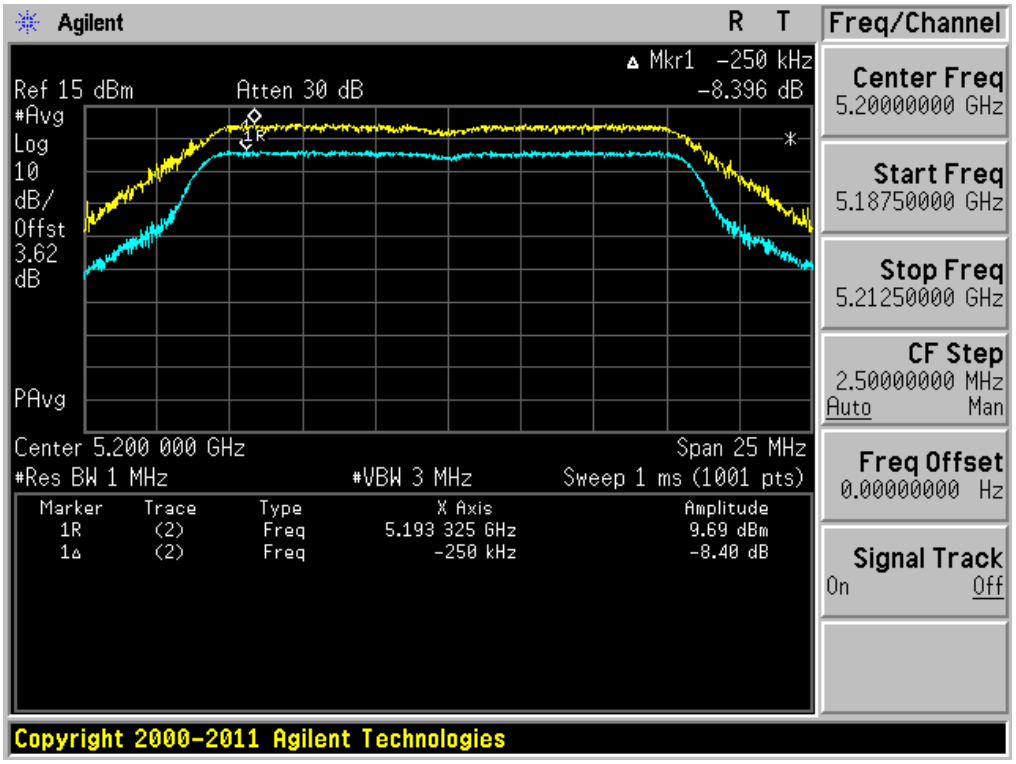
Peak Excursion Ratio

Test Mode: 802.11a & Ch.36

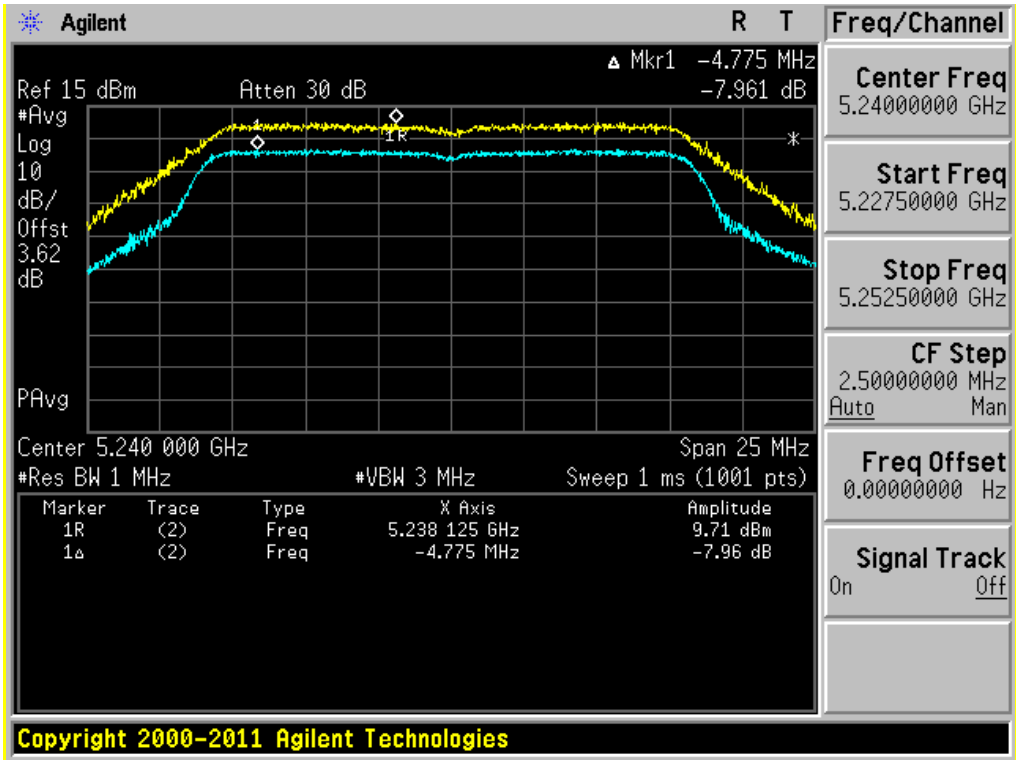


Peak Excursion Ratio

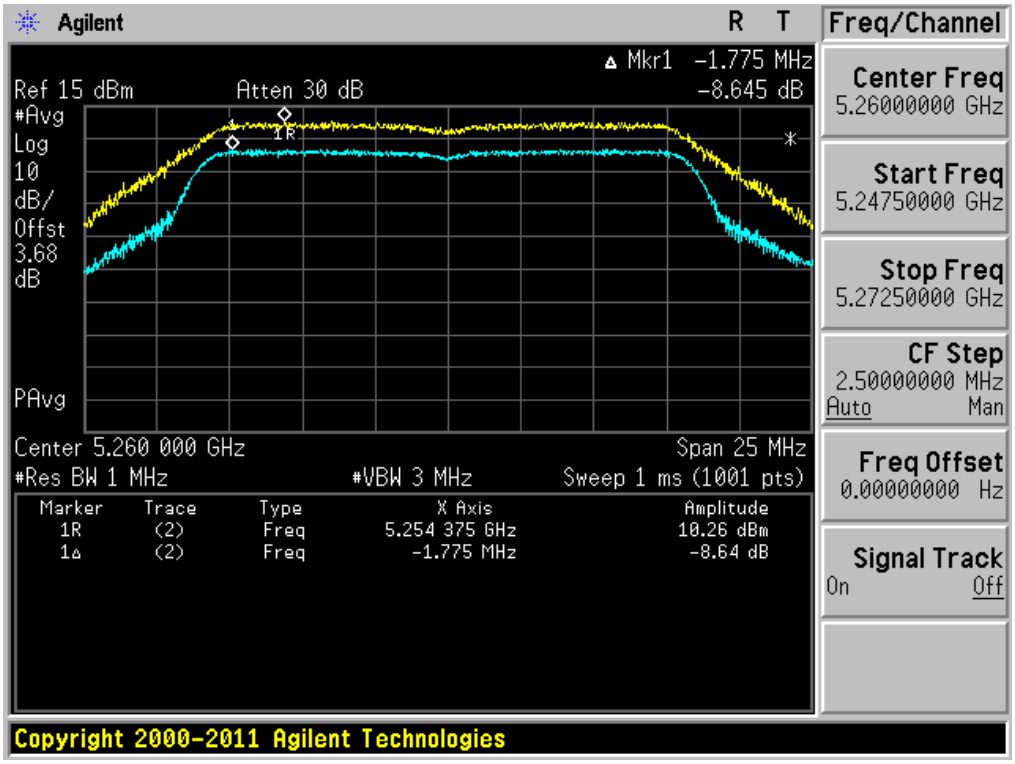
Test Mode: 802.11a & Ch.40



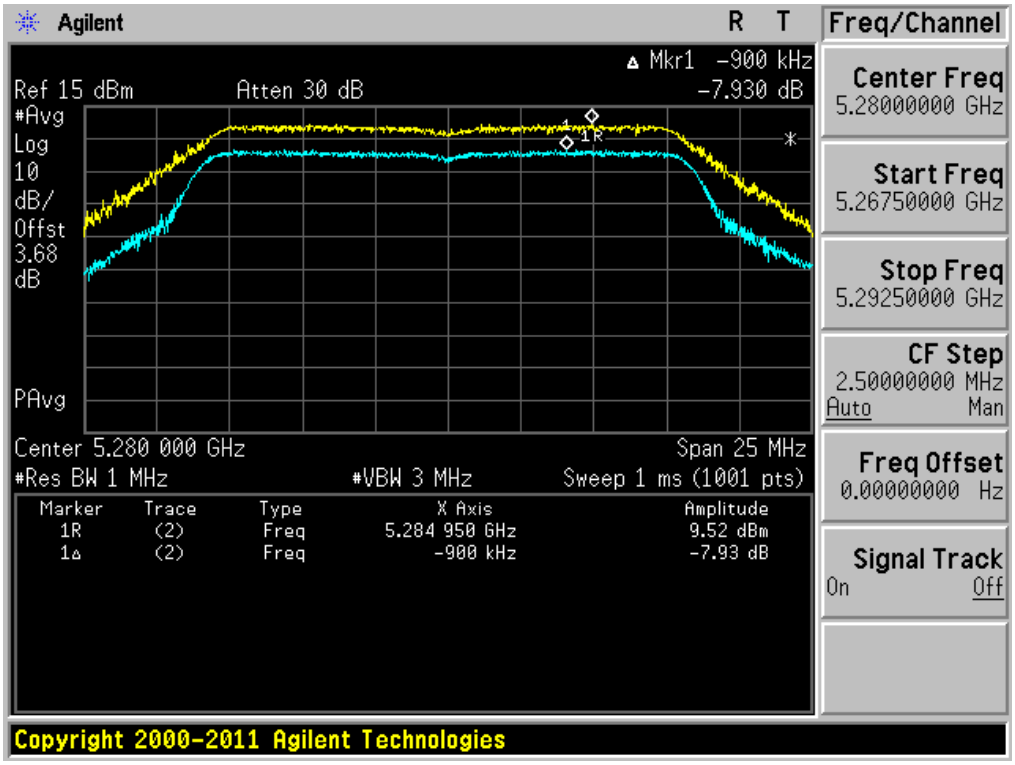
Peak Excursion Ratio Test Mode: 802.11a & Ch.48



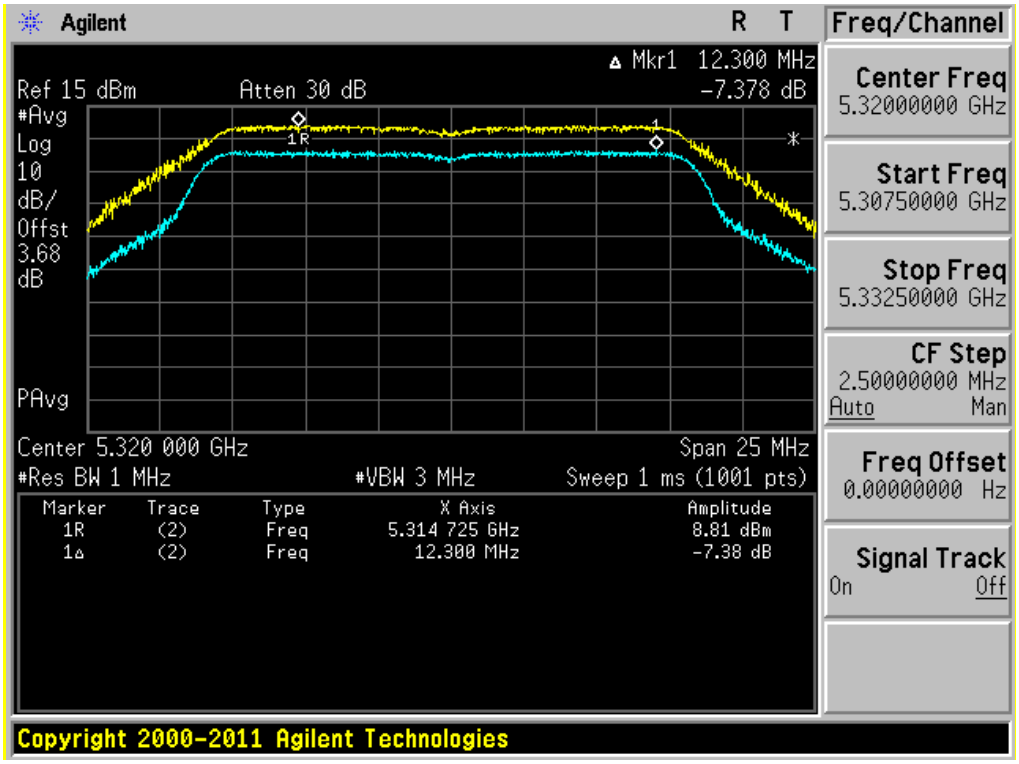
Peak Excursion Ratio Test Mode: 802.11a & Ch.52



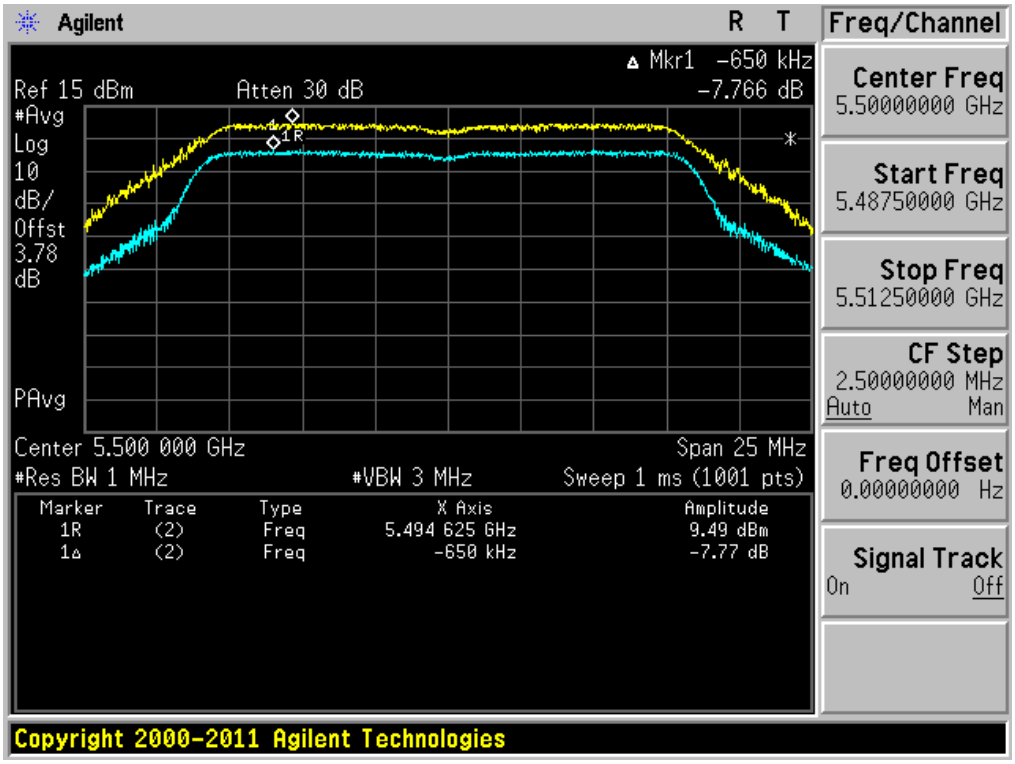
Peak Excursion Ratio Test Mode: 802.11a & Ch.56



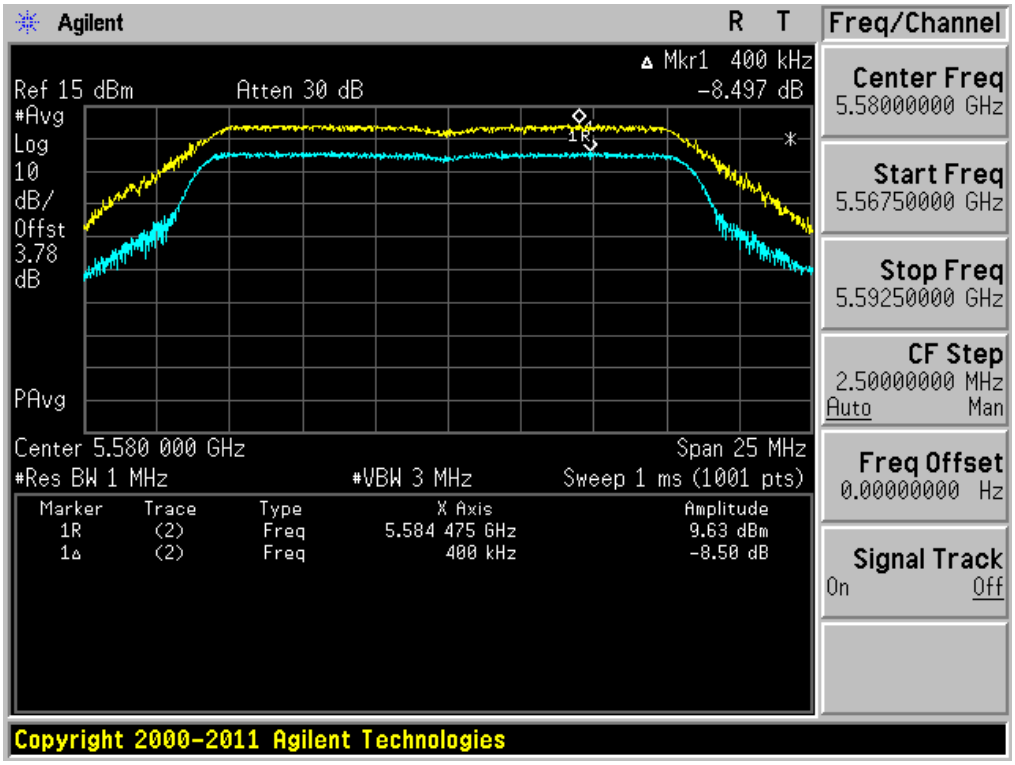
Peak Excursion Ratio Test Mode: 802.11a & Ch.64



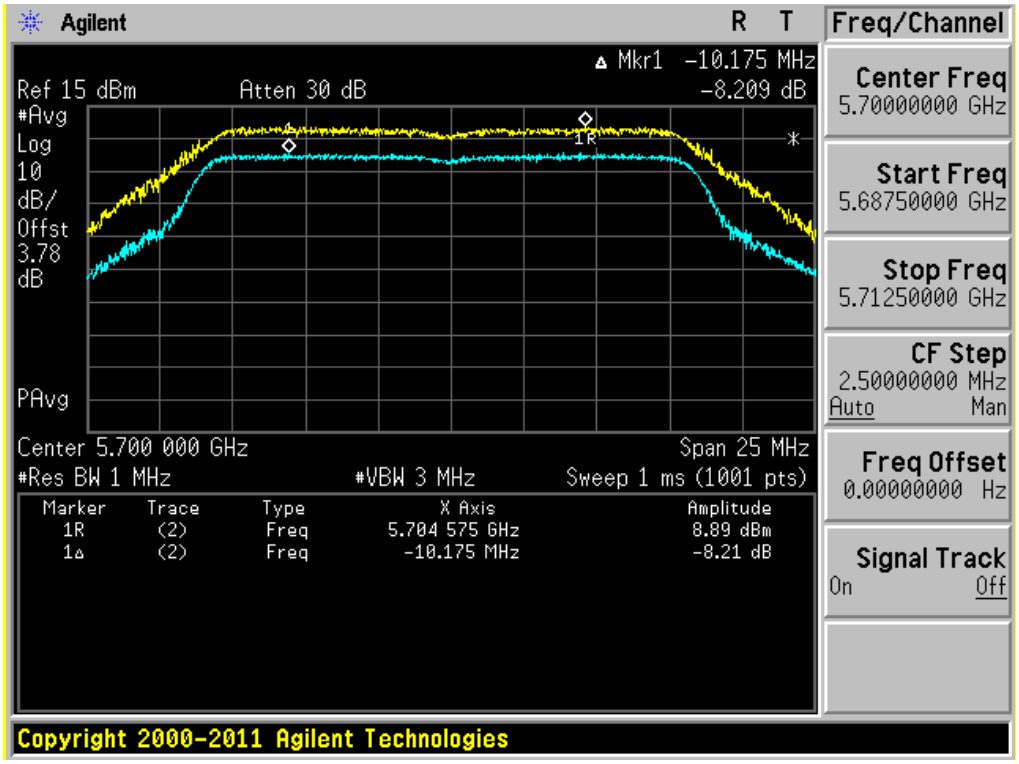
Peak Excursion Ratio Test Mode: 802.11a & Ch.100



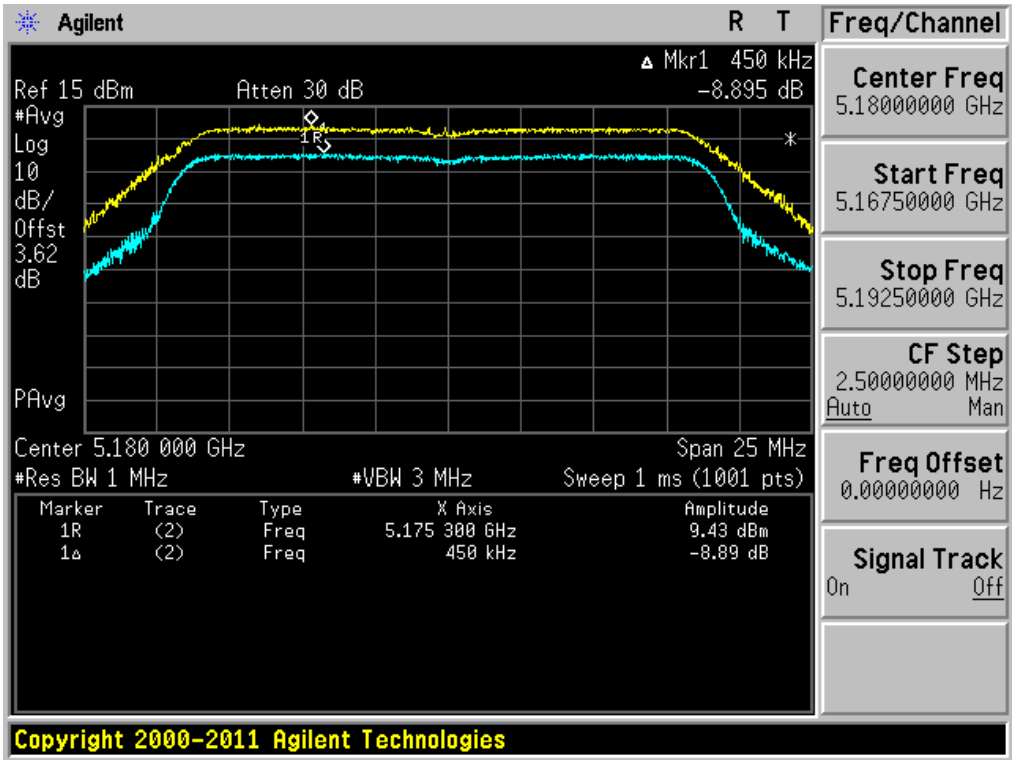
Peak Excursion Ratio Test Mode: 802.11a & Ch.116



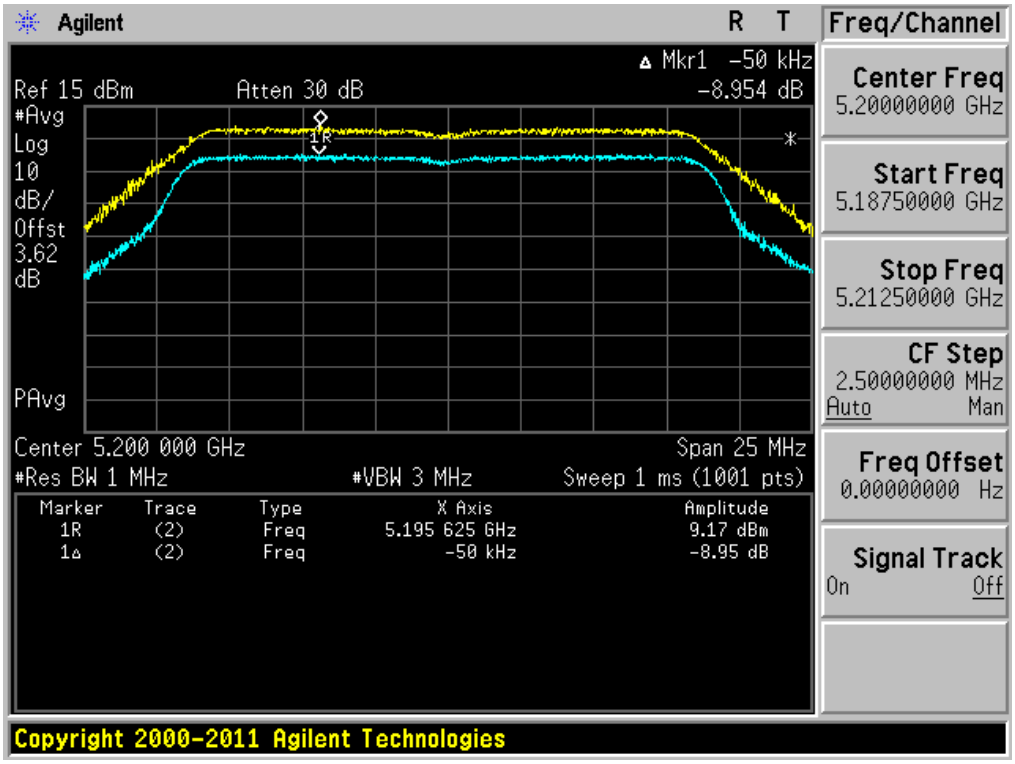
Peak Excursion Ratio Test Mode: 802.11a & Ch.140



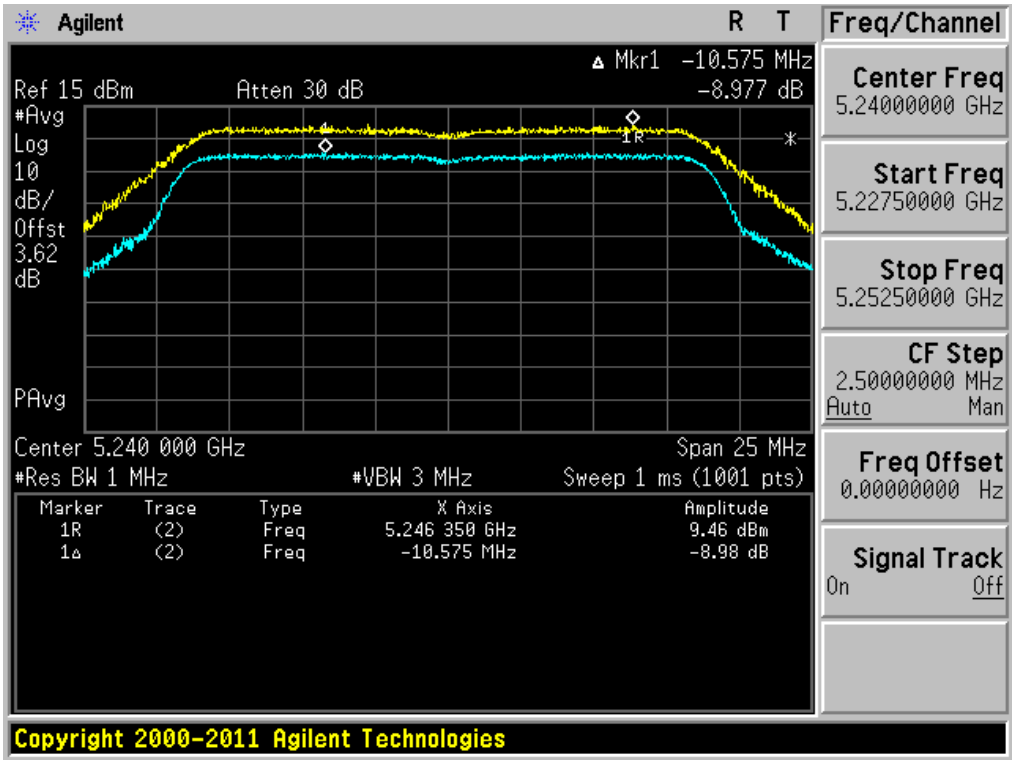
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.36



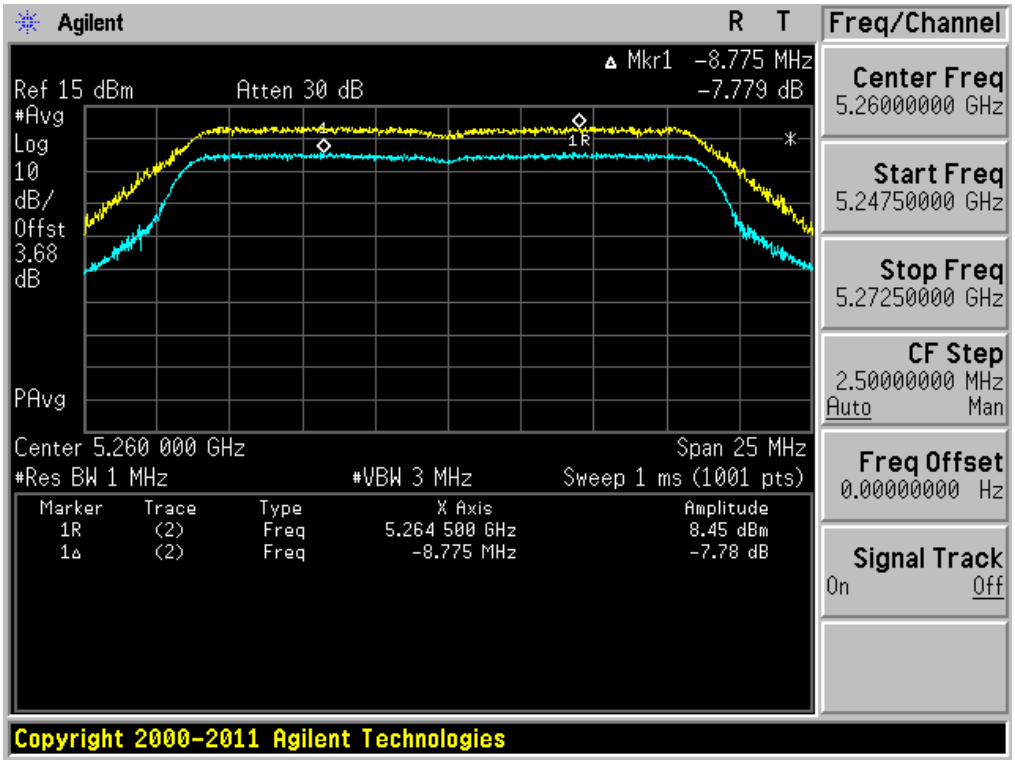
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.40



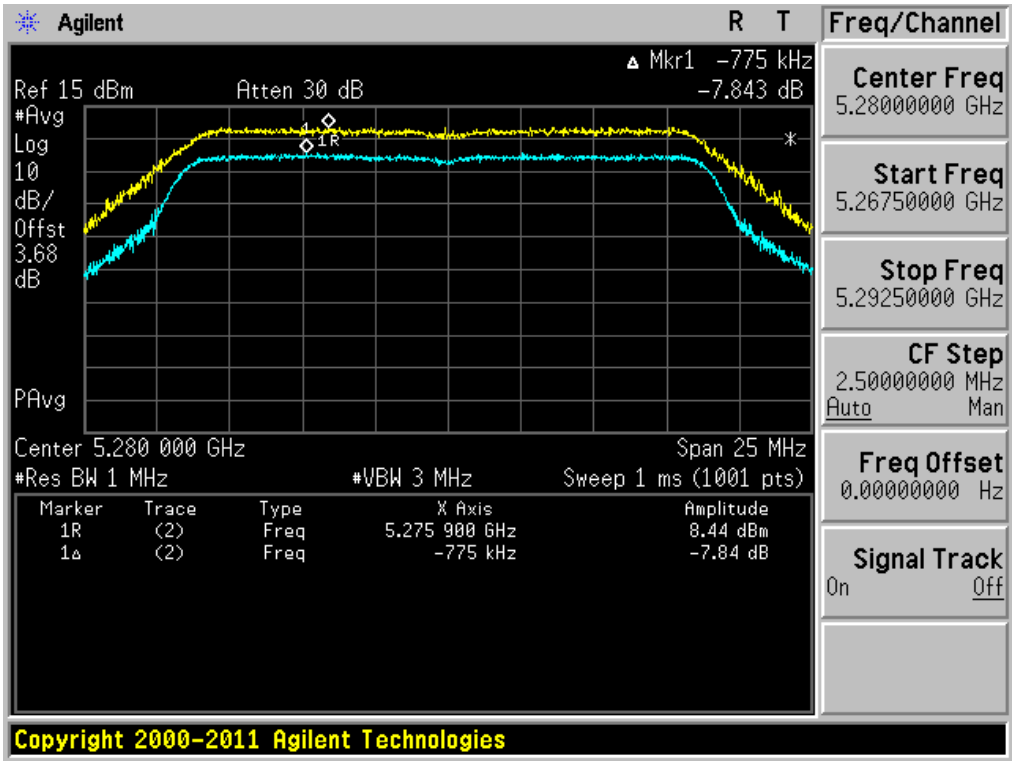
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.48



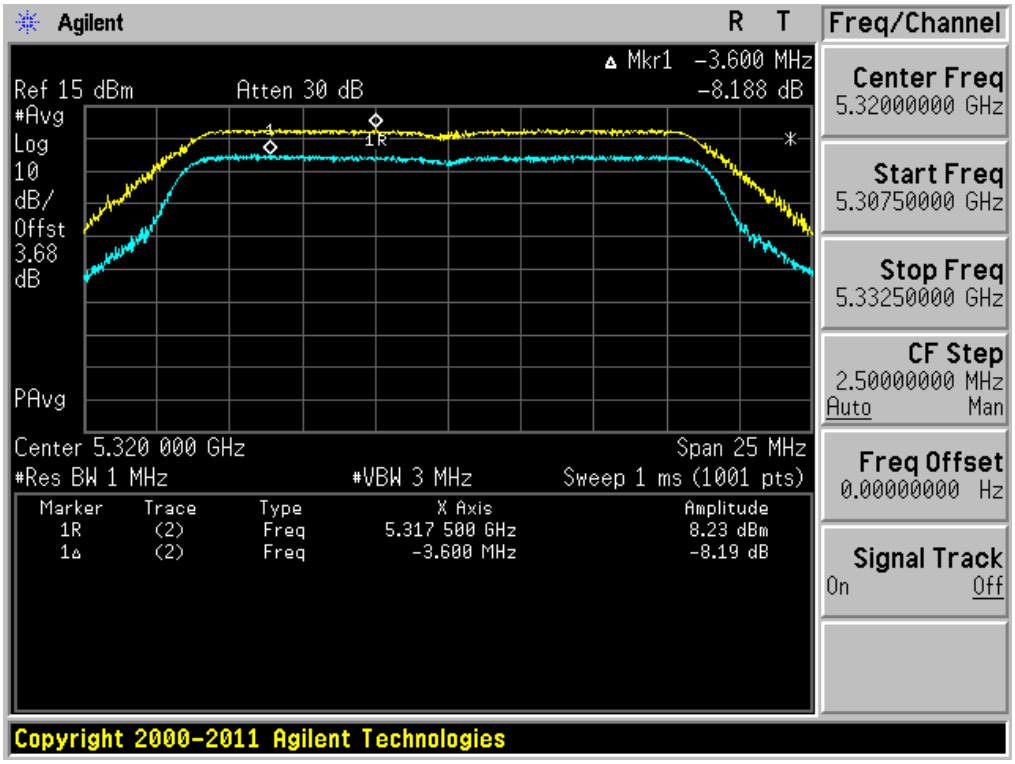
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.52



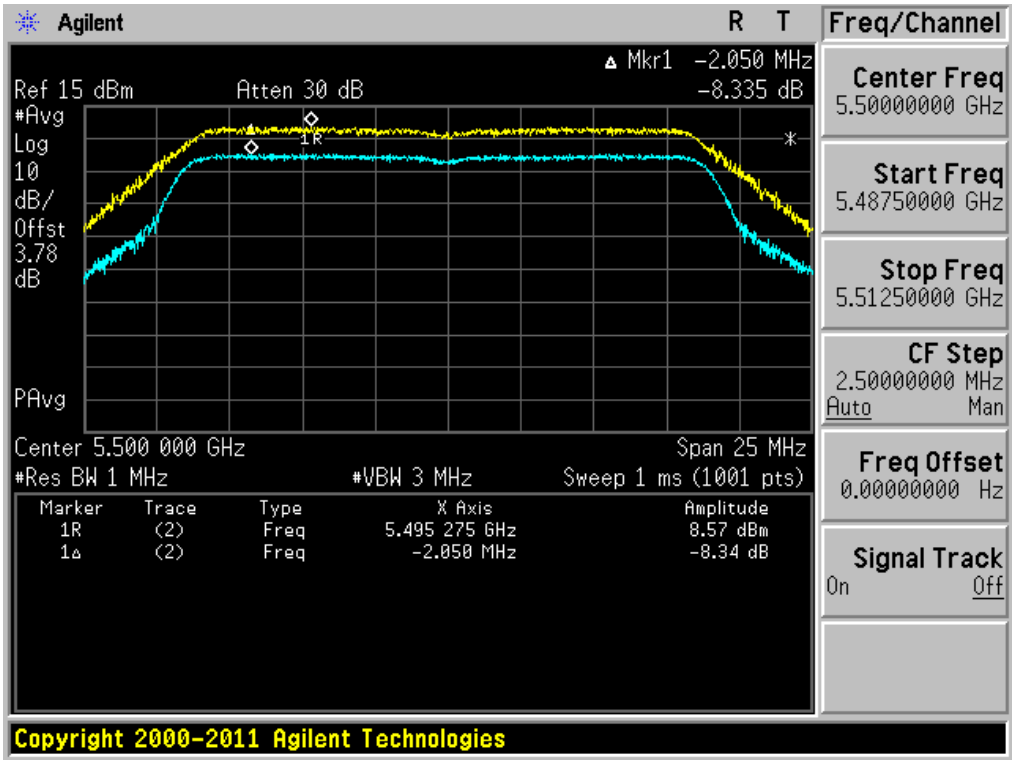
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.56



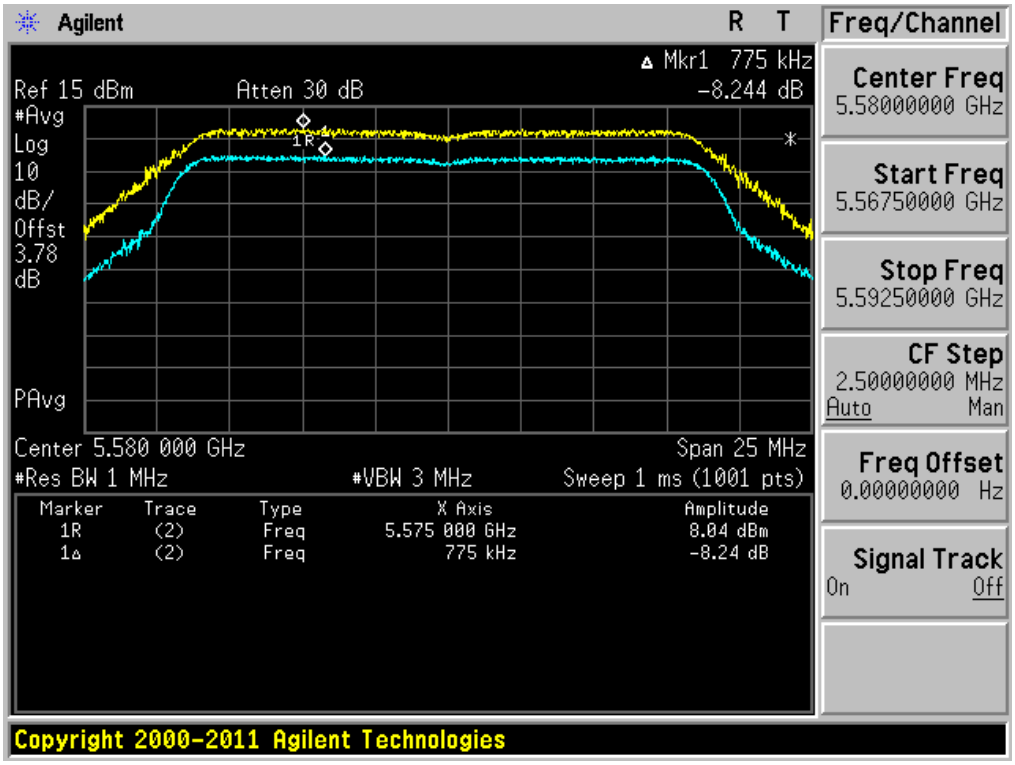
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.64



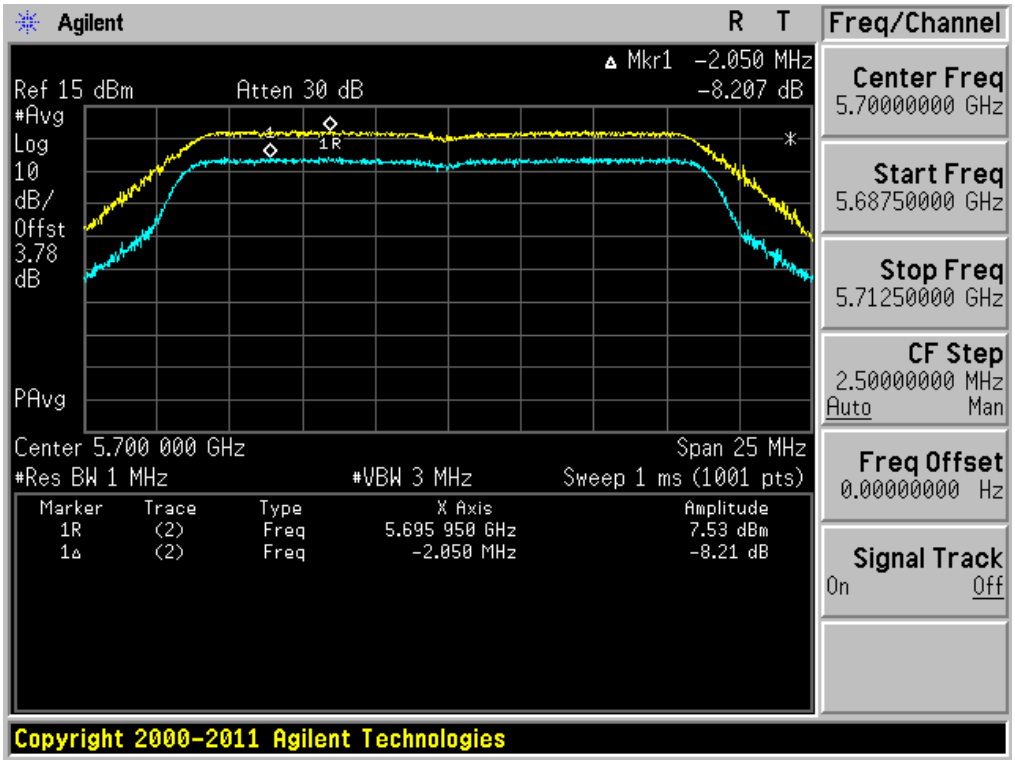
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.100



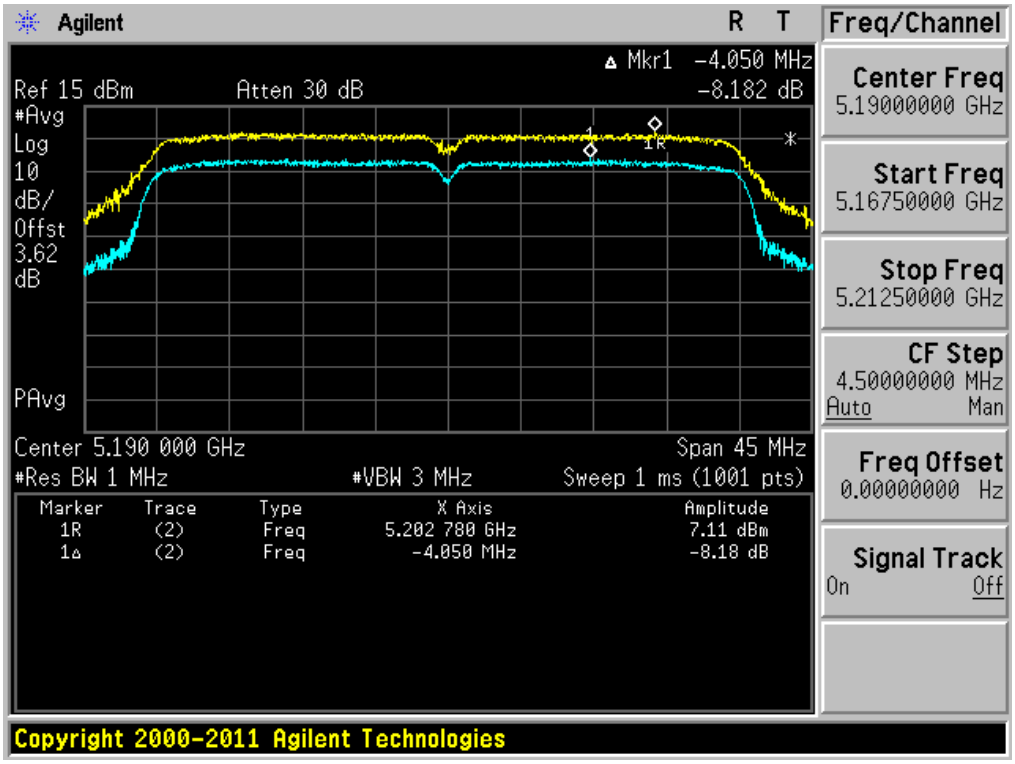
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.116



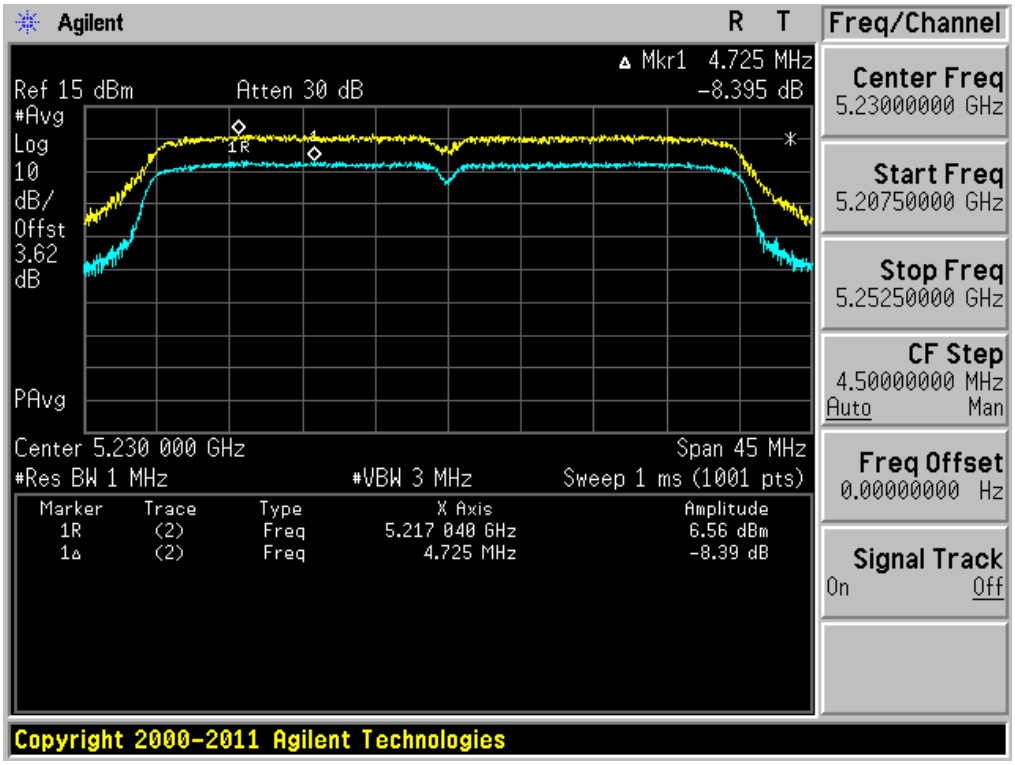
Peak Excursion Ratio Test Mode: 802.11n HT20 & Ch.140



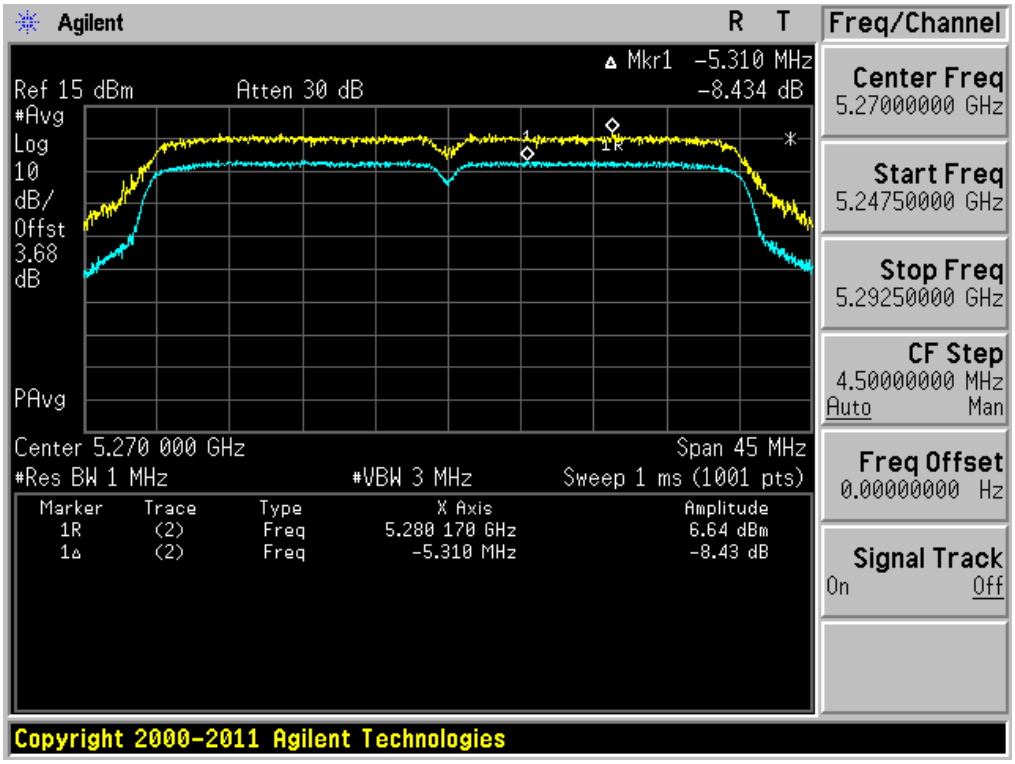
Peak Excursion Ratio Test Mode: 802.11n HT40 & Ch.38



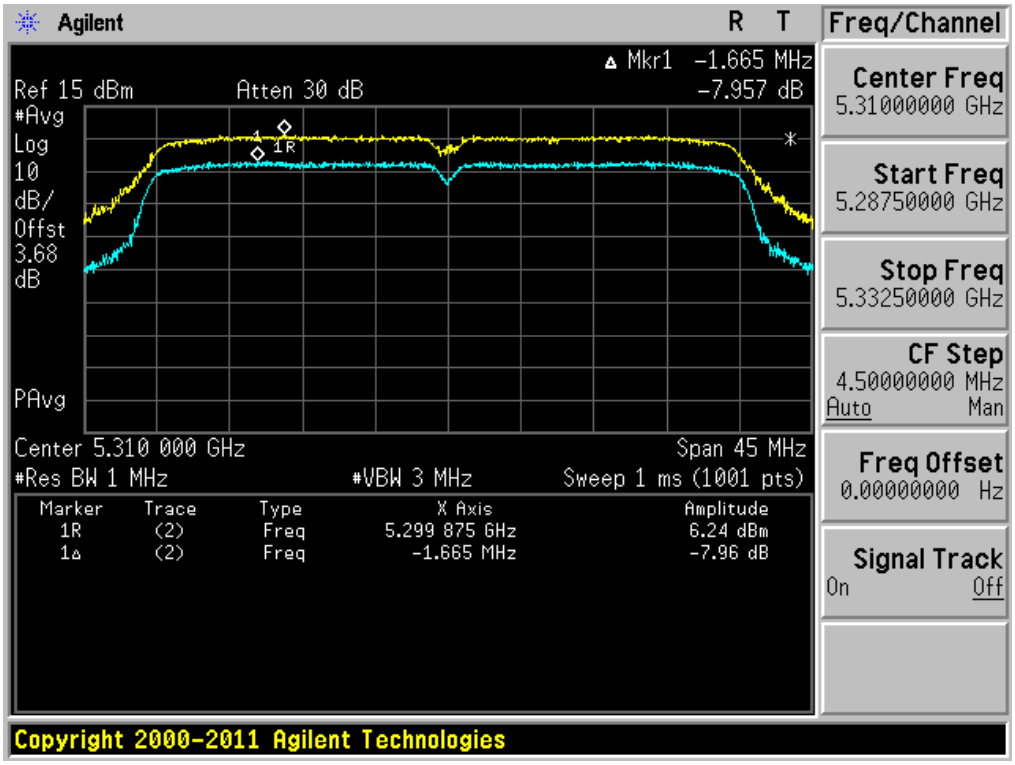
Peak Excursion Ratio Test Mode: 802.11n HT40 & Ch.46



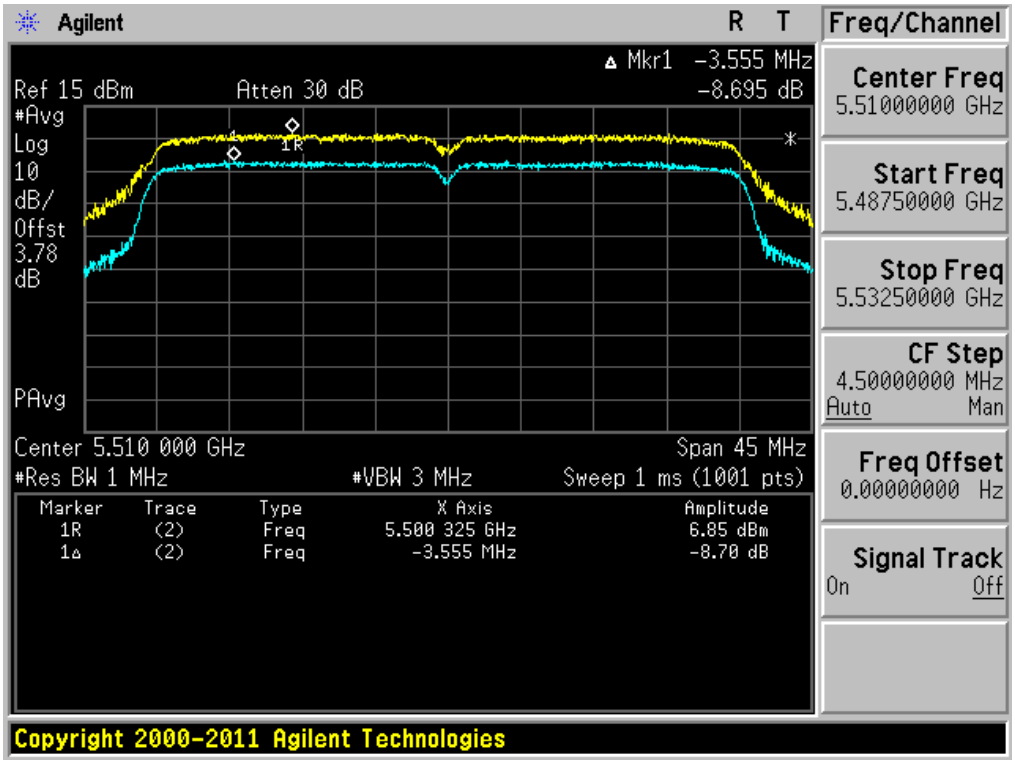
Peak Excursion Ratio Test Mode: 802.11n HT40 & Ch.54



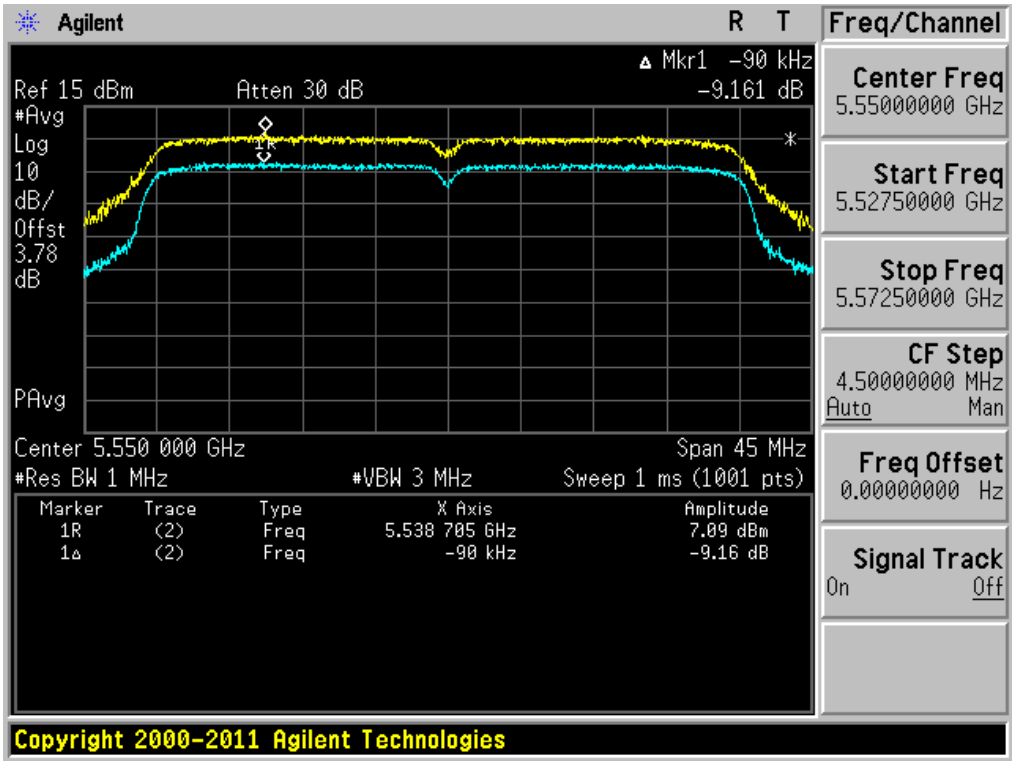
Peak Excursion Ratio Test Mode: 802.11n HT40 & Ch.62



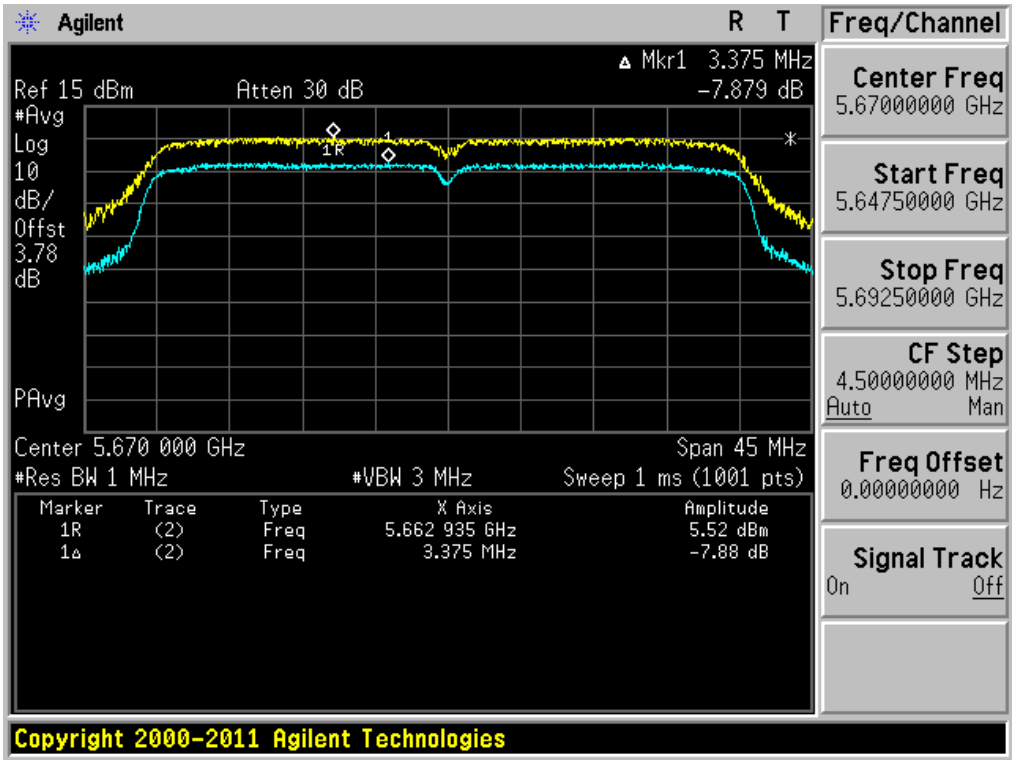
Peak Excursion Ratio Test Mode: 802.11n HT40 & Ch.102



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℃ and +50℃. The temperature was incremented by 10℃ 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 : 5,180,000,000 Hz
CHANNEL : 36
REFERENCE VOLTAGE : 3.800 V DC

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation (%)
100%	3.800	+25(Ref)	5,179,918,071	-0.001582
100%		-30	5,179,935,289	-0.001249
100%		-20	5,179,942,840	-0.001103
100%		-10	5,179,957,093	-0.000828
100%		0	5,179,933,289	-0.001288
100%		+10	5,179,920,844	-0.001528
100%		+20	5,179,918,482	-0.001574
100%		+30	5,179,926,836	-0.001412
100%		+40	5,179,921,228	-0.001521
100%		+50	5,179,917,788	-0.001587
100%		+60	5,179,910,686	-0.001724
85%	3.230	+25	5,179,918,892	-0.001566
115%	4.370	+25	5,179,917,983	-0.001583
BATT.ENDPOINT	3.200	+25	5,179,918,984	-0.001564

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

- Measurement Data:

OPERATING FREQUENCY : 5,260,000,000 Hz
CHANNEL : 52
REFERENCE VOLTAGE : 3.800 V DC

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation (%)
100%	3.800	+25(Ref)	5,259,915,128	-0.001614
100%		-30	5,259,937,255	-0.001193
100%		-20	5,259,946,292	-0.001021
100%		-10	5,259,959,153	-0.000777
100%		0	5,259,937,290	-0.001192
100%		+10	5,259,922,873	-0.001466
100%		+20	5,259,915,302	-0.001610
100%		+30	5,259,929,322	-0.001344
100%		+40	5,259,924,761	-0.001430
100%		+50	5,259,915,337	-0.001610
100%		+60	5,259,912,899	-0.001656
85%	3.230	+25	5,259,915,202	-0.001612
115%	4.370	+25	5,259,915,011	-0.001616
BATT.ENDPOINT	3.200	+25	5,259,915,267	-0.001611

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

- Measurement Data:

OPERATING FREQUENCY : 5,500,000,000 Hz
CHANNEL : 100
REFERENCE VOLTAGE : 3.800 V DC

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation (%)
100%	3.800	+25(Ref)	5,499,912,149	-0.001597
100%		-30	5,499,938,242	-0.001123
100%		-20	5,499,949,078	-0.000926
100%		-10	5,499,959,463	-0.000737
100%		0	5,499,938,275	-0.001122
100%		+10	5,499,923,471	-0.001391
100%		+20	5,499,912,253	-0.001595
100%		+30	5,499,926,388	-0.001338
100%		+40	5,499,921,948	-0.001419
100%		+50	5,499,910,452	-0.001628
100%		+60	5,499,909,872	-0.001639
85%	3.230	+25	5,499,912,298	-0.001595
115%	4.370	+25	5,499,912,032	-0.001599
BATT.ENDPOINT	3.200	+25	5,499,912,363	-0.001593

- 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 span/(# of points in sweep) ≤ 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)
5149.340	V	Z	PK	64.23	3.08	-	-	67.31	74.00	6.69
5149.470	V	Z	AV	43.27	3.08	0.45	-	46.80	54.00	7.20
10359.760	V	X	PK	44.81	11.39	-	-	56.20	68.20	12.00

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)
10399.854	V	X	PK	43.53	11.98	-	-	55.51	68.20	12.69
-	-	-	-	-	-	-	-	-	-	-

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)
10479.800	V	X	PK	42.49	12.36	-	-	54.85	68.20	13.35
-	-	-	-	-	-	-	-	-	-	-

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 : 0.45 dB = 20*log(1/0.95) for Method AD.
3. Measurement Distance above 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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)
10519.582	V	X	PK	41.59	12.08	-	-	53.67	68.20	14.53
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: *802.11a & 5280MHz(Ch. 56)*

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)
10560.058	V	X	PK	43.90	12.21	-	-	56.11	68.20	12.09
-	-	-	-	-	-	-	-	-	-	-

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)
5350.010	V	Z	PK	48.98	3.61	-	-	52.59	74.00	21.41
5350.000	V	Z	AV	38.18	3.61	0.45	-	42.24	54.00	11.76
10639.930	V	X	PK	46.83	12.53	-	-	59.36	74.00	14.64
10639.840	V	X	AV	39.22	12.53	0.45	-	52.20	54.00	1.80

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 : 0.45 dB = 20*log(1/0.95) for Method AD.
3. Measurement Distance above 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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)
5459.810	V	Z	PK	45.15	3.40	-	-	48.55	74.00	25.45
5459.920	V	Z	AV	34.32	3.40	0.45	-	38.17	54.00	15.83
5469.710	V	Z	PK	55.22	3.47	-	-	58.69	68.20	9.51
10999.660	V	X	PK	44.05	12.92	-	-	56.97	74.00	17.03
10999.685	V	X	AV	35.99	12.92	0.45	-	49.36	54.00	4.64

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)
11160.265	V	X	PK	43.89	14.65	-	-	58.54	74.00	15.46
11159.845	V	X	AV	35.29	14.65	0.45	-	50.39	54.00	3.61

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)
5725.090	V	Z	PK	57.04	3.80	-	-	60.84	68.20	7.36
11399.675	V	X	PK	44.17	14.65	-	-	58.82	74.00	15.18
11399.815	V	X	AV	34.16	14.65	0.45	-	49.26	54.00	4.74

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 : 0.45 dB = 20*log(1/0.95) for Method AD.
3. Measurement Distance above 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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)
5149.320	V	Z	PK	53.62	3.08	-	-	56.70	74.00	17.30
5149.470	V	Z	AV	39.72	3.08	0.54	-	43.34	54.00	10.66
10359.590	V	X	PK	45.33	11.39	-	-	56.72	68.20	11.48

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)
10399.978	V	X	PK	44.19	11.98	-	-	56.17	68.20	12.03
-	-	-	-	-	-	-	-	-	-	-

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)
10479.798	V	X	PK	43.65	12.36	-	-	56.01	68.20	12.19
-	-	-	-	-	-	-	-	-	-	-

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.
4. Measurement Distance above 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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)
10519.956	V	X	PK	43.60	12.08	-	-	55.68	68.20	12.52
-	-	-	-	-	-	-	-	-	-	-

30MHz ~ 40GHz Radiated Spurious Emissions: *802.11n HT20 & 5280MHz(Ch. 56)*

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)
10559.836	V	X	PK	45.72	12.21	-	-	57.93	68.20	10.27
-	-	-	-	-	-	-	-	-	-	-

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)
5350.620	V	Z	PK	48.29	3.61	-	-	51.90	74.00	22.10
5351.610	V	Z	AV	38.22	3.61	0.54	-	42.37	54.00	11.63
10639.955	V	X	PK	45.92	12.53	-	-	58.45	74.00	15.55
10639.745	V	X	AV	38.47	12.53	0.54	-	51.54	54.00	2.46

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 : 0.45 dB = 20*log(1/0.95) for Method AD.
3. Measurement Distance above 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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)
5459.880	V	Z	PK	48.82	3.40	-	-	52.22	74.00	21.78
5459.820	V	Z	AV	38.03	3.40	0.54	-	41.97	54.00	12.03
5469.820	V	Z	PK	58.91	3.47	-	-	62.38	68.20	5.82
10999.415	V	X	PK	44.42	12.92	-	-	57.34	74.00	16.66
10999.900	V	X	AV	36.09	12.92	0.54	-	49.55	54.00	4.45

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)
11159.925	V	X	PK	42.83	14.65	-	-	57.48	74.00	16.52
11159.740	V	X	AV	33.84	14.65	0.54	-	49.03	54.00	4.97

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)
5725.500	V	Z	PK	55.29	3.80	-	-	59.09	68.20	9.11
11400.105	V	X	PK	46.17	14.65	-	-	60.82	74.00	13.18
11399.825	V	X	AV	33.67	14.65	0.54	-	48.86	54.00	5.14

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.
5. Measurement Distance above 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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)
5149.920	V	Z	PK	64.25	3.08	-	-	67.33	74.00	6.67
5149.840	V	Z	AV	44.63	3.08	0.54	-	48.25	54.00	5.75
10379.978	V	X	PK	45.23	11.52	-	-	56.75	68.20	11.45

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)
10459.818	V	X	PK	43.16	12.03	-	-	55.19	68.20	13.01
-	-	-	-	-	-	-	-	-	-	-

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.
6. Measurement Distance above 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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)
10539.826	V	X	PK	45.38	12.16	-	-	57.54	68.20	10.66
-	-	-	-	-	-	-	-	-	-	-

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)
5350.600	V	Z	PK	59.37	3.61	-	-	62.98	74.00	11.02
5350.530	V	Z	AV	42.29	3.61	0.54	-	46.44	54.00	7.56
10619.736	V	X	PK	44.73	12.63	-	-	57.36	74.00	16.64
10619.724	V	X	AV	37.24	12.63	0.54	-	50.41	54.00	3.59

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.
7. Measurement Distance above 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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)
5457.850	V	Z	PK	53.99	3.40	-	-	57.39	74.00	16.61
5459.590	V	Z	AV	39.82	3.40	0.54	-	43.76	54.00	10.24
5469.800	V	Z	PK	58.61	3.47	-	-	62.08	68.20	6.12
11020.175	V	X	PK	42.92	12.78	-	-	55.70	74.00	18.30
11019.830	V	X	AV	34.43	12.78	0.54	-	47.75	54.00	6.25

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)
11100.230	V	X	PK	41.33	13.12	-	-	54.45	74.00	19.55
11100.347	V	X	AV	33.30	13.12	0.54	-	46.96	54.00	7.04

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)
5725.020	V	Z	PK	47.55	3.80	-	-	51.35	68.20	16.85
11340.247	V	X	PK	42.34	14.46	-	-	56.80	74.00	17.20
11340.420	V	X	AV	31.56	14.46	0.54	-	46.56	54.00	7.44

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 15 GHz = 1.0 m. So Distance Correction Factor : -9.54dB = 20*log(1.0m/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.

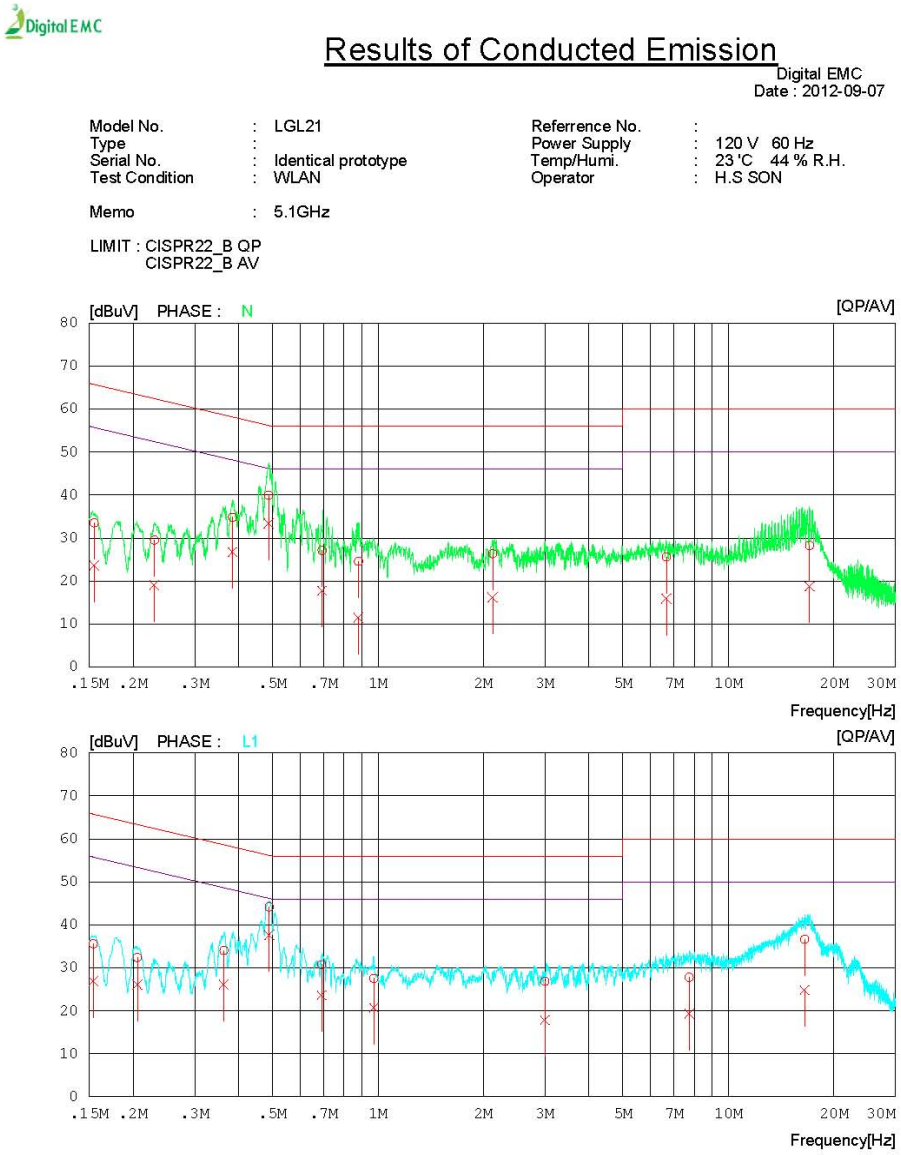
▣ **Minimum Standard: FCC Part 15.207(a)/EN 55022**

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 Band



AC Line Conducted Emissions (Data List)

Test Mode: 802.11a_5.1G Band

Results of Conducted Emission

Digital EMC
Date : 2012-09-07

Model No.	: LGL21	Referrence No.	:
Type	:	Power Supply	: 120 V 60 Hz
Serial No.	: Identical prototype	Temp/Humi.	: 23 'C 44 % R.H.
Test Condition	: WLAN	Operator	: H.S SON

Memo : 5.1GHz

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15498	33.2	23.3	0.3	33.5	23.6	65.7	55.7	32.2	32.1	N
2	0.23024	29.3	18.9	0.2	29.5	19.1	62.4	52.4	32.9	33.3	N
3	0.38470	34.5	26.5	0.3	34.8	26.8	58.2	48.2	23.4	21.4	N
4	0.48764	39.8	33.2	0.2	40.0	33.4	56.2	46.2	16.2	12.8	N
5	0.69261	26.9	17.6	0.2	27.1	17.8	56.0	46.0	28.9	28.2	N
6	0.87978	24.3	11.2	0.3	24.6	11.5	56.0	46.0	31.4	34.5	N
7	2.12450	26.0	15.9	0.3	26.3	16.2	56.0	46.0	29.7	29.8	N
8	6.65500	25.1	15.4	0.5	25.6	15.9	60.0	50.0	34.4	34.1	N
9	17.04300	27.2	17.6	1.1	28.3	18.7	60.0	50.0	31.7	31.3	N
10	0.15420	35.3	26.6	0.3	35.6	26.9	65.8	55.8	30.2	28.9	L1
11	0.20586	32.2	25.9	0.2	32.4	26.1	63.4	53.4	31.0	27.3	L1
12	0.36350	33.8	25.8	0.3	34.1	26.1	58.6	48.6	24.5	22.5	L1
13	0.48938	44.0	37.4	0.2	44.2	37.6	56.2	46.2	12.0	8.6	L1
14	0.69131	30.6	23.4	0.2	30.8	23.6	56.0	46.0	25.2	22.4	L1
15	0.97429	27.2	20.4	0.3	27.5	20.7	56.0	46.0	28.5	25.3	L1
16	2.99750	26.6	17.6	0.3	26.9	17.9	56.0	46.0	29.1	28.1	L1
17	7.73550	27.3	18.8	0.5	27.8	19.3	60.0	50.0	32.2	30.7	L1
18	16.51250	35.6	23.8	1.0	36.6	24.8	60.0	50.0	23.4	25.2	L1

AC Line Conducted Emissions (Graph)

Test Mode: 802.11a_5.3G Band

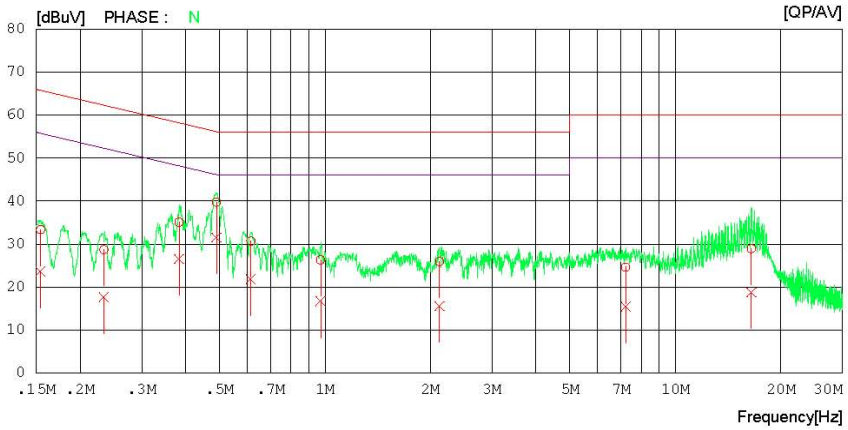
Digital EMC

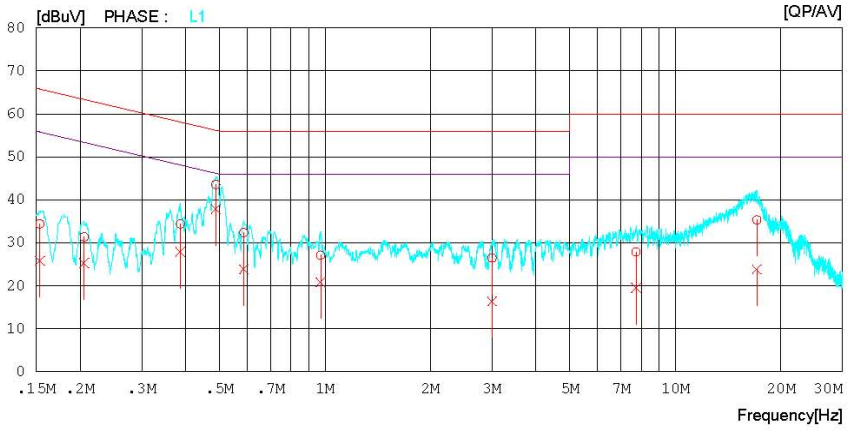
Results of Conducted Emission

Digital EMC
Date : 2012-09-07

Model No.	:	LGL21	Referrence No.	:	
Type	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 44 % 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 Band

Results of Conducted Emission

Digital EMC
Date : 2012-09-07

Model No.	: LGL21	Referrence No.	:
Type	:	Power Supply	: 120 V 60 Hz
Serial No.	: Identical prototype	Temp/Humi.	: 23 'C 44 % R.H.
Test Condition	: WLAN	Operator	: H.S SON

Memo : 5.3GHz

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15435	33.1	23.4	0.3	33.4	23.7	65.8	55.8	32.4	32.1	N
2	0.23413	28.5	17.5	0.2	28.7	17.7	62.3	52.3	33.6	34.6	N
3	0.38348	34.8	26.2	0.3	35.1	26.5	58.2	48.2	23.1	21.7	N
4	0.49020	39.5	31.3	0.2	39.7	31.5	56.2	46.2	16.5	14.7	N
5	0.61440	30.5	21.6	0.2	30.7	21.8	56.0	46.0	25.3	24.2	N
6	0.97161	26.0	16.4	0.3	26.3	16.7	56.0	46.0	29.7	29.3	N
7	2.12400	25.6	15.2	0.3	25.9	15.5	56.0	46.0	30.1	30.5	N
8	7.21250	24.1	15.0	0.5	24.6	15.5	60.0	50.0	35.4	34.5	N
9	16.47400	27.9	17.7	1.0	28.9	18.7	60.0	50.0	31.1	31.3	N
10	0.15371	34.1	25.6	0.3	34.4	25.9	65.8	55.8	31.4	29.9	L1
11	0.20564	31.2	25.1	0.2	31.4	25.3	63.4	53.4	32.0	28.1	L1
12	0.38676	34.1	27.7	0.3	34.4	28.0	58.1	48.1	23.7	20.1	L1
13	0.48819	43.4	37.6	0.2	43.6	37.8	56.2	46.2	12.6	8.4	L1
14	0.58680	32.2	23.7	0.2	32.4	23.9	56.0	46.0	23.6	22.1	L1
15	0.97181	26.9	20.5	0.3	27.2	20.8	56.0	46.0	28.8	25.2	L1
16	3.00000	26.1	16.0	0.4	26.5	16.4	56.0	46.0	29.5	29.6	L1
17	7.72500	27.4	19.0	0.5	27.9	19.5	60.0	50.0	32.1	30.5	L1
18	17.08800	34.3	22.7	1.1	35.4	23.8	60.0	50.0	24.6	26.2	L1

AC Line Conducted Emissions (Graph)

Test Mode: 802.11a_5.5G Band

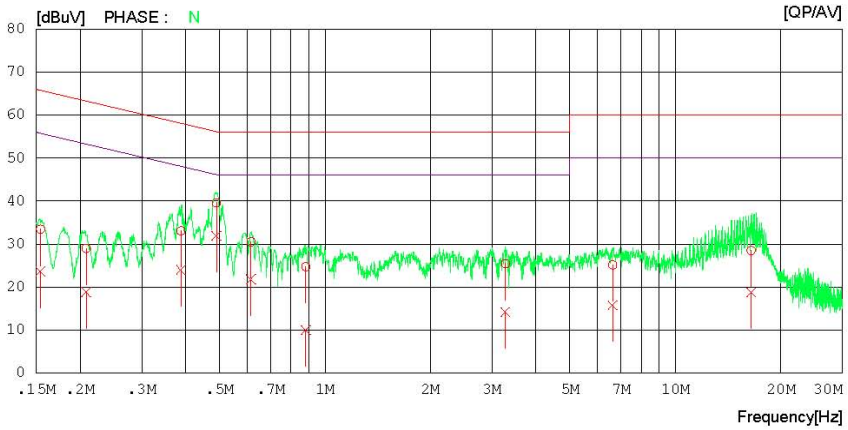
Digital EMC

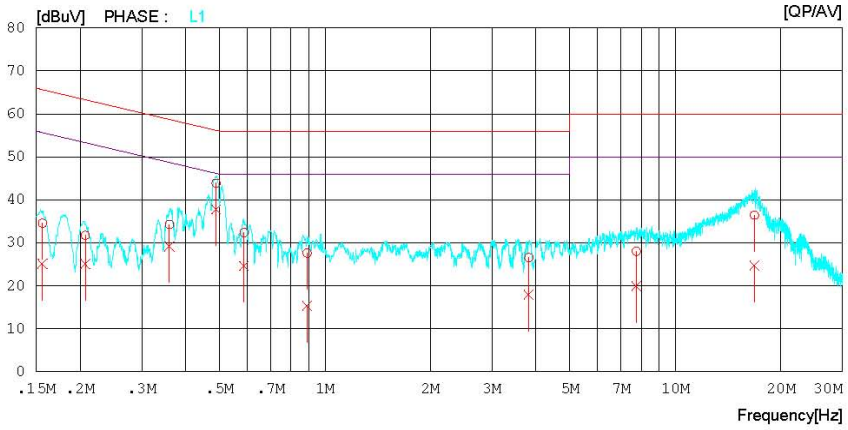
Results of Conducted Emission

Digital EMC
Date : 2012-09-07

Model No.	:	LGL21	Referrence No.	:	
Type	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 44 % 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 Band

Results of Conducted Emission

Digital EMC
Date : 2012-09-07

Model No.	: LGL21	Referrence No.	:
Type	:	Power Supply	: 120 V 60 Hz
Serial No.	: Identical prototype	Temp/Humi.	: 23 'C 44 % R.H.
Test Condition	: WLAN	Operator	: H.S SON

Memo : 5.5GHz

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15435	33.1	23.3	0.3	33.4	23.6	65.8	55.8	32.4	32.2	N
2	0.20816	28.8	18.6	0.2	29.0	18.8	63.3	53.3	34.3	34.5	N
3	0.38826	32.7	23.7	0.3	33.0	24.0	58.1	48.1	25.1	24.1	N
4	0.48984	39.4	31.7	0.2	39.6	31.9	56.2	46.2	16.6	14.3	N
5	0.61535	30.3	21.6	0.2	30.5	21.8	56.0	46.0	25.5	24.2	N
6	0.88181	24.4	9.7	0.3	24.7	10.0	56.0	46.0	31.3	36.0	N
7	3.27400	25.0	13.8	0.4	25.4	14.2	56.0	46.0	30.6	31.8	N
8	6.62750	24.6	15.3	0.5	25.1	15.8	60.0	50.0	34.9	34.2	N
9	16.46200	27.5	17.7	1.0	28.5	18.7	60.0	50.0	31.5	31.3	N
10	0.15633	34.3	24.8	0.3	34.6	25.1	65.7	55.7	31.1	30.6	L1
11	0.20705	31.6	24.9	0.2	31.8	25.1	63.3	53.3	31.5	28.2	L1
12	0.35990	34.0	28.9	0.3	34.3	29.2	58.7	48.7	24.4	19.5	L1
13	0.48890	43.7	37.6	0.2	43.9	37.8	56.2	46.2	12.3	8.4	L1
14	0.58744	32.2	24.4	0.2	32.4	24.6	56.0	46.0	23.6	21.4	L1
15	0.88965	27.3	15.1	0.3	27.6	15.4	56.0	46.0	28.4	30.6	L1
16	3.81550	26.2	17.6	0.4	26.6	18.0	56.0	46.0	29.4	28.0	L1
17	7.74350	27.5	19.4	0.5	28.0	19.9	60.0	50.0	32.0	30.1	L1
18	16.82150	35.4	23.7	1.0	36.4	24.7	60.0	50.0	23.6	25.3	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 of this E.U.T is uniquely attached on the main PCB using specially spring contactors.

▣ **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/T**

Minimum Standard : N/A

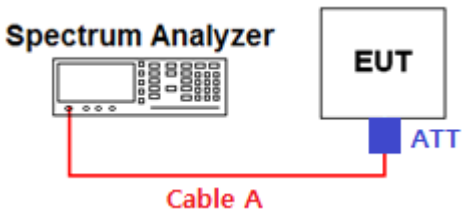
▣ **RESULT PLOT : N/T**

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	11/09/30	12/09/30	MY45304199
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	11/09/19	12/09/19	1
BILOG ANTENNA	SCHAFFNER	CBL6112D	10/12/21	12/12/21	2737
HORN ANT	ETS	3115	12/02/20	13/02/20	6419
HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	154
Attenuator (3dB)	WEINSCHEL	56-3	11/09/30	12/09/30	Y2342
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
RFI/Field intensity Meter	KYORITSU	KNM-2402	12/07/02	13/07/02	4N-170-3
Spectrum Analyzer	H/P	8591E	12/03/05	13/03/05	3649A05889
CVCF	NF	4420	11/09/15	12/09/15	3049354420023
LISN	R&S	ESH2-Z5	11/09/30	12/09/30	8287391006

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)
5.180 ~ 5.240	3.62	5.500 ~ 5.700	3.78
5.260 ~ 5.320	3.68	-	-

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)

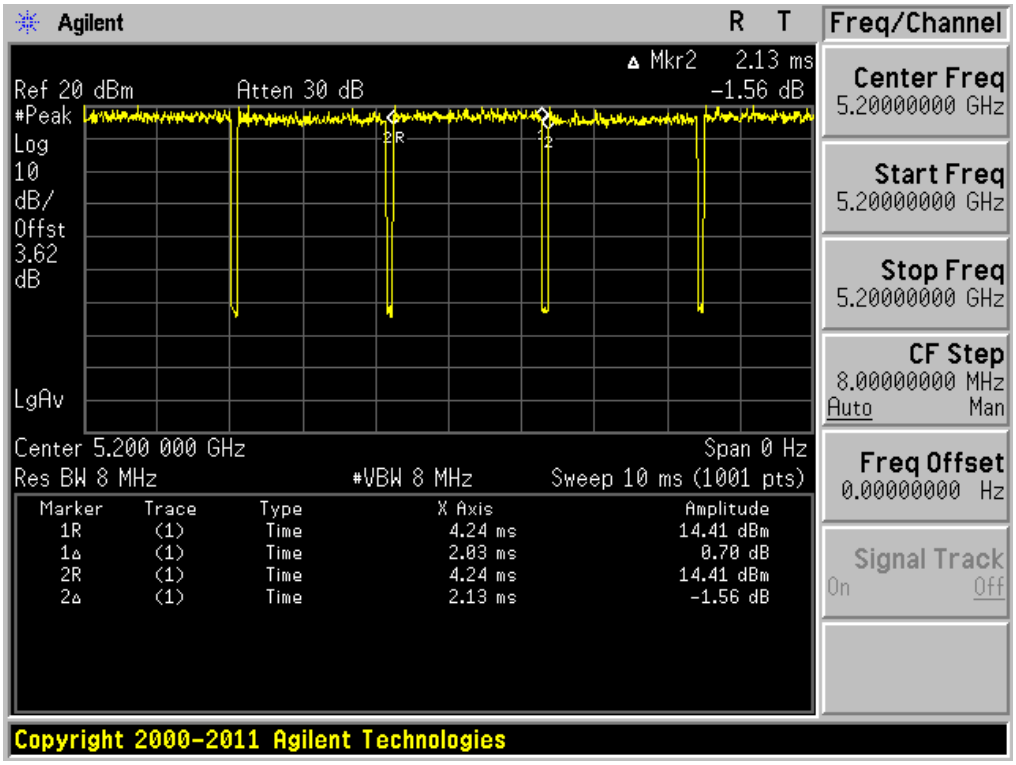
APPENDIX II
Duty cycle plots

▣ TEST PROCEDURE

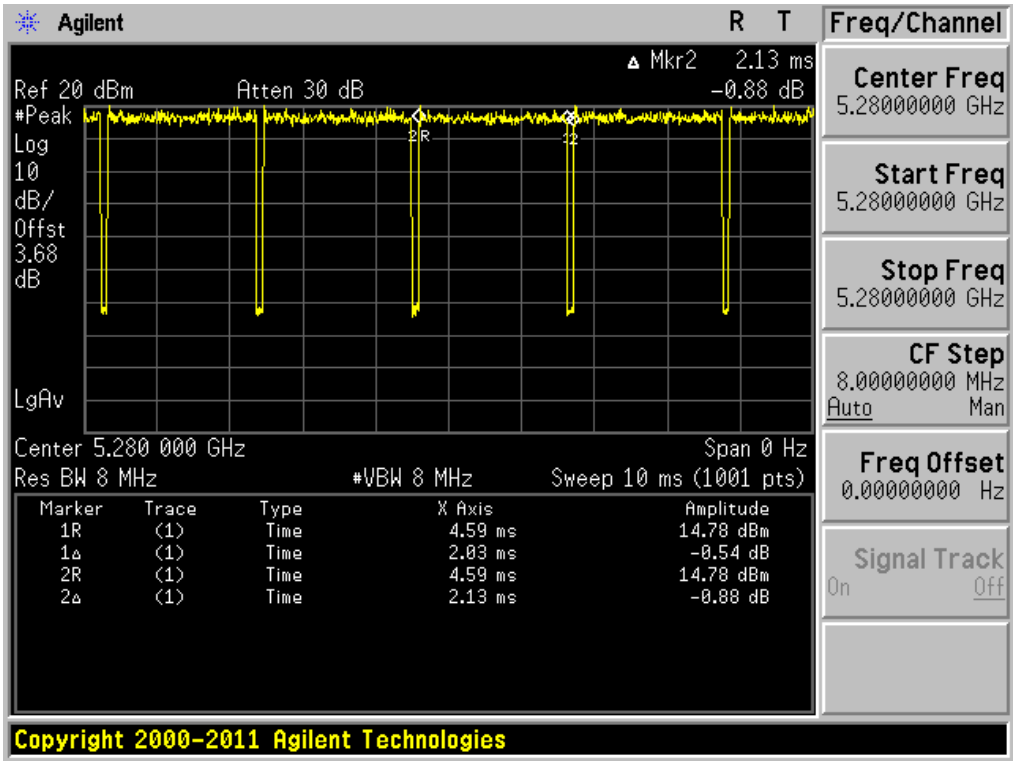
Duty Cycle [X = On Time / (On + Off time)] is measured using Measurement Procedure **of KDB789033**

1. Set the center frequency of the spectrum analyzer to the center frequency of the transmission.
2. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value.
3. Set VBW ≥ 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* ≤ 16.7 microseconds.)

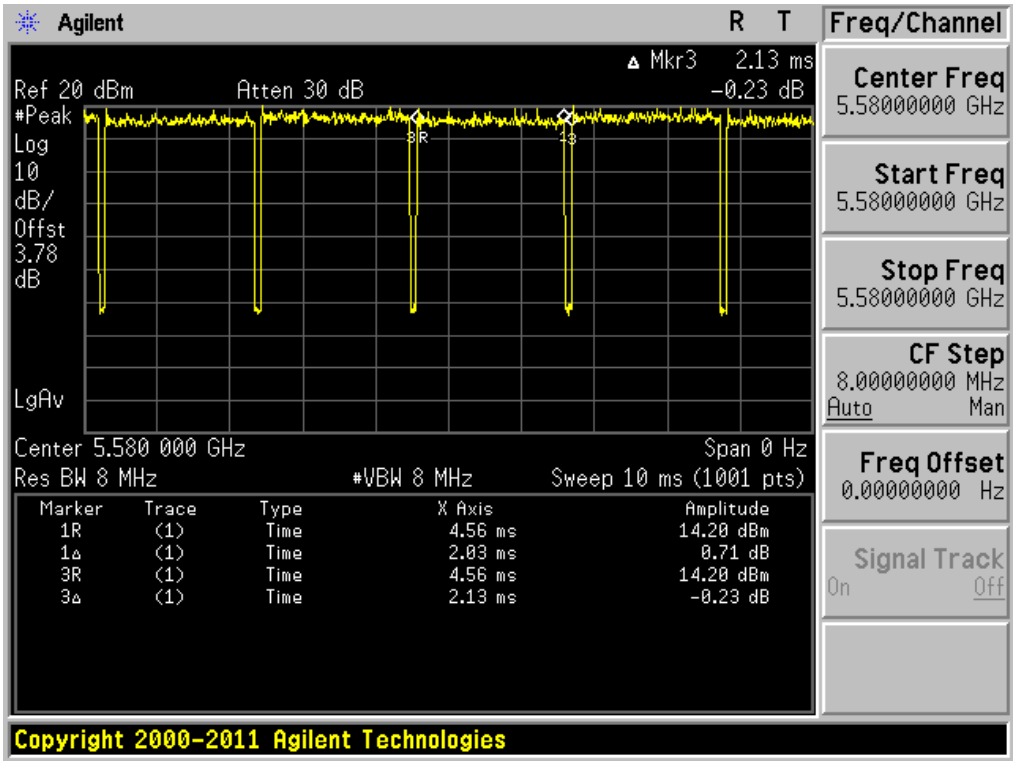
Duty Cycle Test Mode: 802.11a & Ch.40



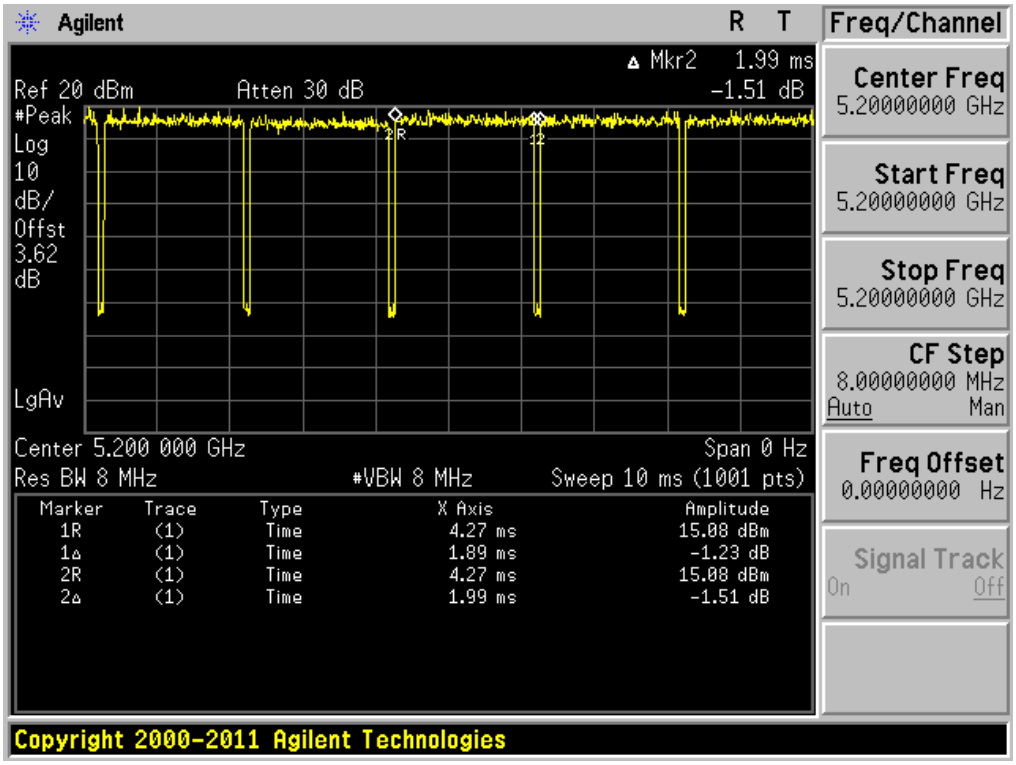
Duty Cycle Test Mode: 802.11a & Ch.56



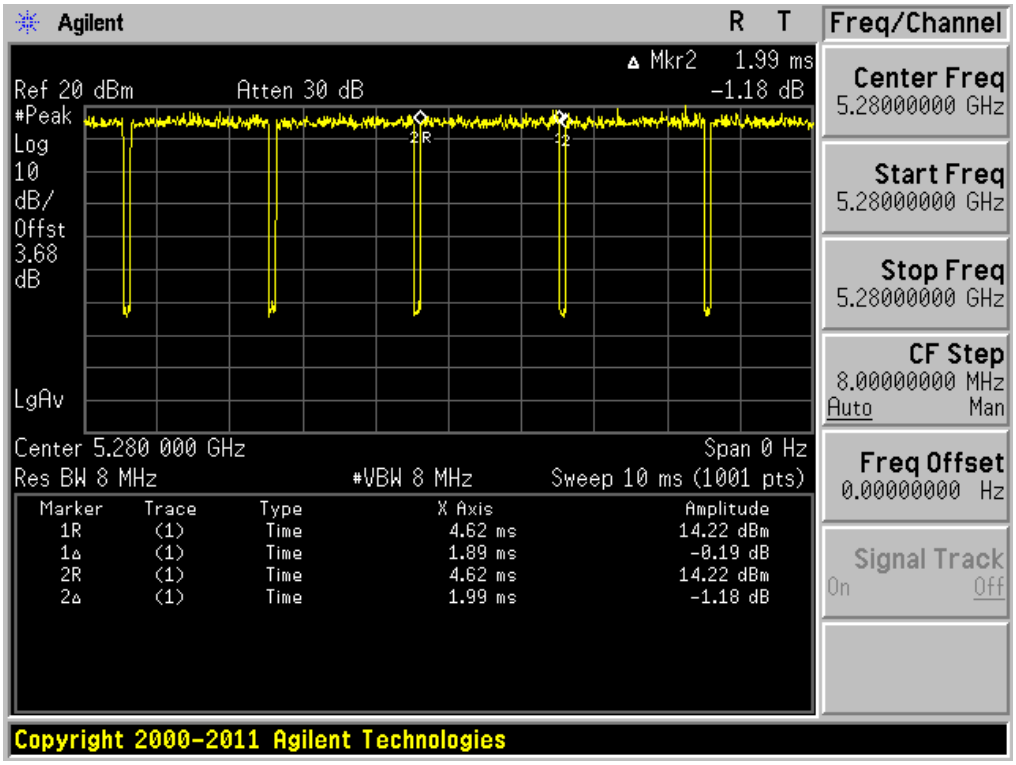
Duty Cycle Test Mode: 802.11a & Ch.116



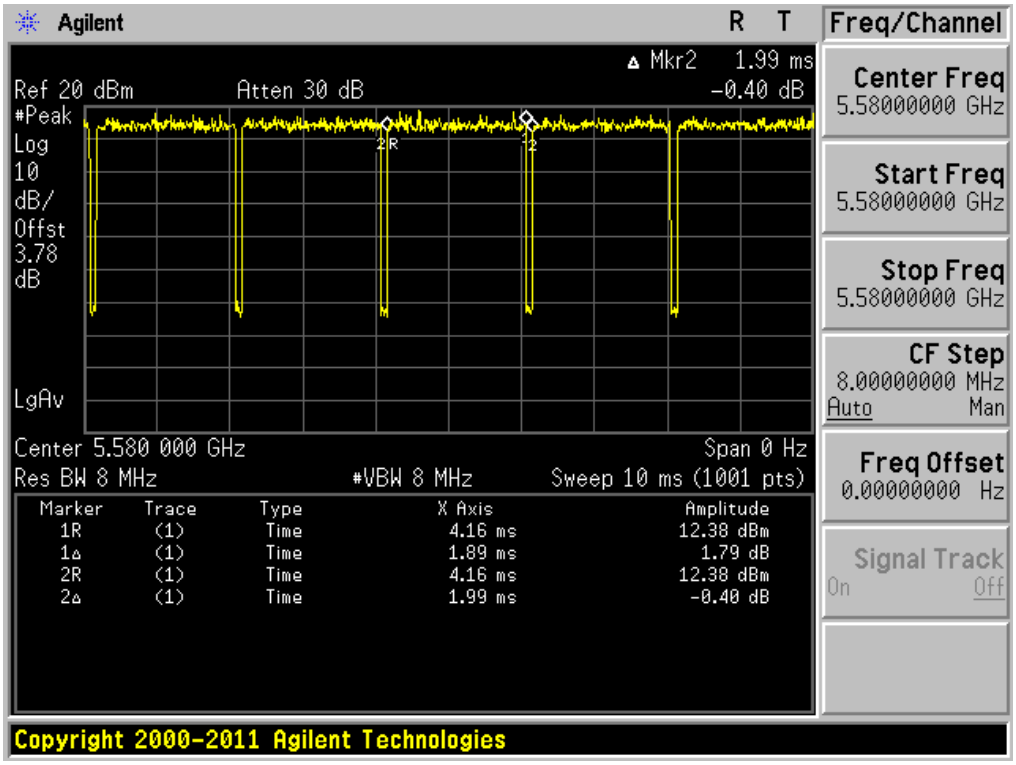
Duty Cycle Test Mode: 802.11n(HT20) & Ch.40



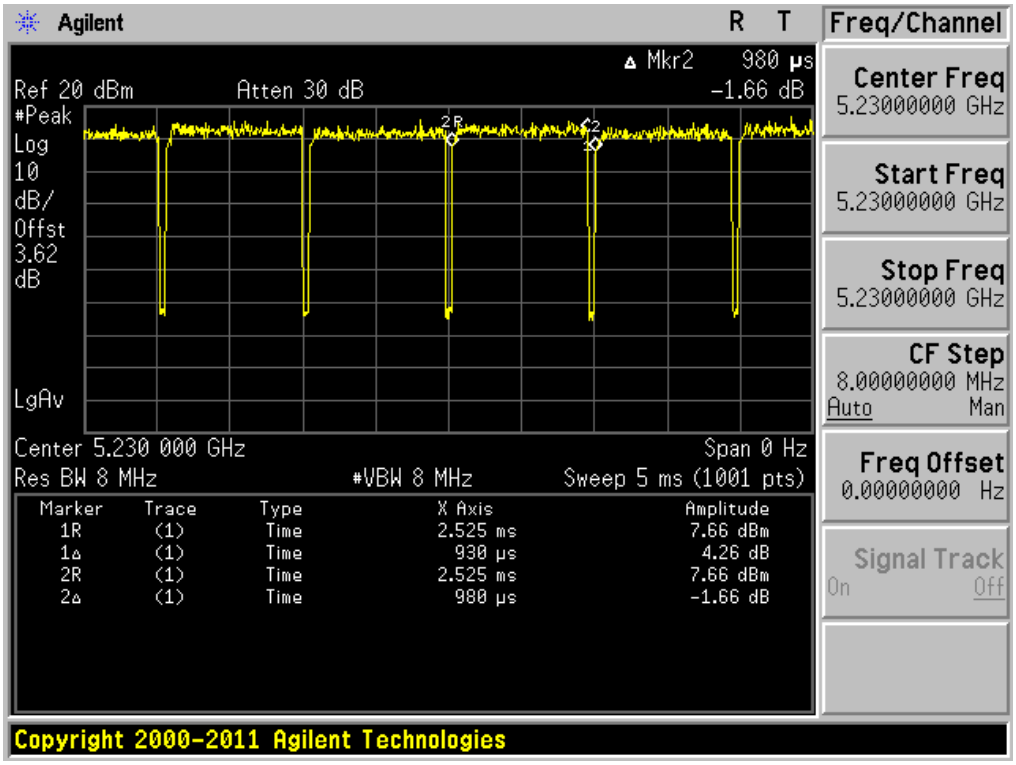
Duty Cycle Test Mode: 802.11n(HT20) & Ch.56



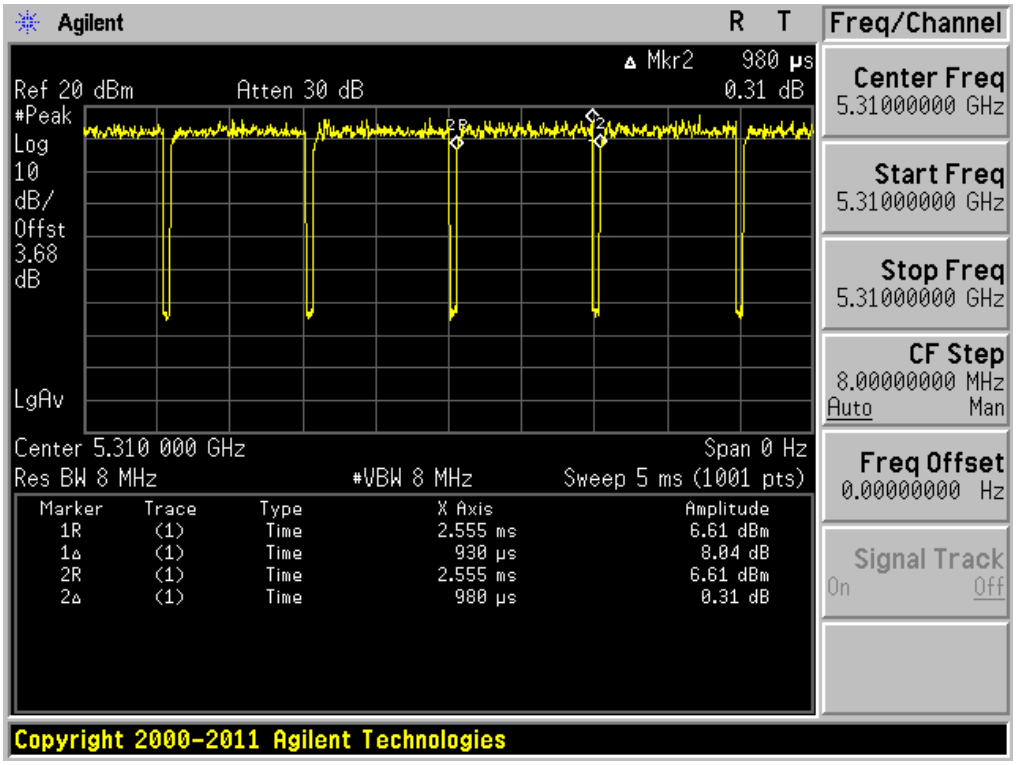
Duty Cycle Test Mode: 802.11n(HT20) & Ch.116



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