

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT****INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART E REQUIREMENT  
AND INDUSTRY CANADA RSS 210**

OF

**Product Name:** Vehicle Mount Terminal  
**Brand Name:** Honeywell  
**Marketing Name:** Thor VM2  
**Model No.:** VM2W  
**Model Difference:** N/A  
**IC:** 1693B-VM2W01  
**FCC ID:** KDZVM2W01  
**Report No.:** EH/2012/A0037  
**Issue Date:** Apr. 22, 2013  
**FCC Rule Part:** §15.407  
**IC Rule Part:** RSS-210 issue 8:2010, Annex 9  
**Prepared for:** Honeywell International Inc.,  
Honeywell Scanning and Mobility  
9680 Old Bailes Road, Fort Mill, SC 29707, USA  
SGS Taiwan Ltd.  
Electronics & Communication Laboratory  
**Prepared by:** No.134, Wu Kung Road, New Taipei Industrial  
Park, Wuku District, New Taipei City, Taiwan  
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## VERIFICATION OF COMPLIANCE

**Applicant:** Honeywell International Inc.,  
Honeywell Scanning and Mobility  
9680 Old Bailes Road, Fort Mill, SC 29707, USA

**Product Name:** Vehicle Mount Terminal

**Brand Name:** Honeywell

**Marketing Name:** Thor VM2

**Model No.:** VM2W

**Model Difference:** N/A

**IC:** 1693B-VM2W01

**FCC ID:** KDZVM2W01

**File Number:** EH/2012/A0037

**Date of test:** Oct. 05, 2012 ~ Apr. 18, 2012

**Date of EUT Received:** Oct. 05, 2012

### We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407 and RSS-210 issue 8: 2010 Annex 9.. The test results of this report relate only to the tested sample identified in this report.

**Test By:**

*Marcus Tseng*

**Date:**

Apr. 22, 2013

*Marcus Tseng / Engineer*

**Prepared By:**

*Tiffany Kao*

**Date:**

Apr. 22, 2013

*Tiffany Kao / Clerk*

**Approved By:**

*Jim Chang*

**Date:**

Apr. 22, 2013

*Jim Chang / Supervisor*

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## Version

Version No.	Date	Description
00	Apr. 22, 2013	Initial creation of document

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## 1. GENERAL INFORMATION

General:

Product Name:	Vehicle Mount Terminal	
Marketing Name:	Thor VM2	
Brand Name:	Honeywell	
Model No.:	VM2W	
Model Difference:	N/A	
Hardware Version:	N/A	
Software Version:	N/A	
Power Supply:	10.8Vdc Li-ion battery or 100-240Vdc from AC/DC adapter	
	Battery:	Model No.: OVT310L1R00 Supplier: TOTEX International Limited
	Adapter:	Model No.:GT-81081-6015-T3, Supplier: GlobTek, Inc.

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**WLAN: 802.11 a/b/g/n**

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.) / Average Rated Power(EIRP)	Modulation Technology	Type of Emission
11a	5150-5250	4	11.31 dBm (Avg.) 15.19dBm (EIRP)	OFDM	17M2D1D
	5250-5350	4	12.65 dBm (Avg.) 16.57dBm (EIRP)		17M2D1D
	5470-5725	11	10.27 dBm (Avg.) 15.24 dBm (EIRP)		17M1D1D
11n	HT20 5150-5250	4	Avg. Power: (MIMO Chain 0):9.24dBm (MIMO Chain 1):8.07dBm (MIMO Chain 0+1):11.70dBm  EIRP: (MIMO Chain 0): 13.16dBm (MIMO Chain 1):11.99dBm (MIMO Chain 0+1):15.62dBm	OFDM	17M8D1D
	HT20 5250-5350	4	Avg. Power: (MIMO Chain 0):12.49 dBm (MIMO Chain 1):12.09dBm (MIMO Chain 0+1):15.30dBm  EIRP: (MIMOChain 0): 17.49dBm (MIMO Chain 1): 16.01dBm (MIMO Chain 0+1): 19.22dBm		17M8D1D
	HT20 5470-5725	11	Avg. Power: (MIMO Chain 0):10.08 dBm (MIMO Chain 1):10.01dBm (MIMO Chain 0+1):13.06dBm EIRP (MIMO Chain 0):15.05 dBm (MIMO Chain 1):14.98dBm (MIMO Chain 0+1):18.03 dBm		18M0D1D

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Modulation type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps; 802.11 n_20MHz: 6.5 – 144Mbps 802.11 n_40MHz: 13.5 – 300Mbps

The EUT is compliance with IEEE 802.11 a/b/g/n Standard.

This report applies for frequency bands 5150 MHz– 5250 MHz, 5250MHz-5350MHz and 5470 MHz– 5725 MHz.

The 5G max antenna gain is 3.88dBi for 5.2GHz and 4.85dBi for 5.5GHz which was choosing for Radiated Spurious Emission test.

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### 1.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: KDZVM2W01** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules and **IC: 1693B-VM2W01** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 9. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

### 1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 2009 & DA 02 2138 published on 08, 30, 2002. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with FCC Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices, and Emissions Testing of Transmitters with Multiple Output in the same Band were employed to conduct the mandatory test items for the compliance with FCC 47CFR 15.407 requirements.

### 1.3. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2009. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 & 10 meters) and FCC Registration Number: 94644.

### 1.4. Special Accessories

Not available for this EUT intended for grant.

### 1.5. Equipment Modifications

Not available for this EUT intended for grant.

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## 2. SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

### 2.3. Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 7.3.1 and 13 of ANSI C63.4-2009, conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and Average detector mode.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." Is still within the 3Db illumination BW of the measurement antenna. According to the requirements in Section 8 and 13 and Subclause 8.3.1.2 of ANSI C63.4-2009.

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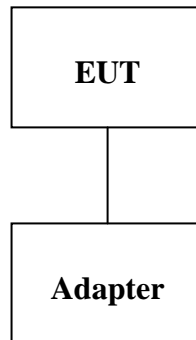
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## 2.4. Configuration of Tested System

**Fig. 2-1 Radiated Emission Configuration**



**Table 2-1 Equipment Used in Tested System**

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	SCU	v3.03.08	N/A	N/A	N/A

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### 3. SUMMARY OF TEST RESULT

FCC and IC Rules	Description Of Test	Result
§15.207 RSS-Gen §7.2.4	AC Power Line Conducted Emission	Compliant
§15.407(a) RSS 210 A9.2 RSS-Gen §4.6.3	26 dB and 99% Emission Bandwidth	Compliant
§15.407(a)	Peak Output Power Measurement	Compliant
RSS 210 A9.2(1)(2)(3)	Average Output Power Measurement(EIRP)	Compliant
§15.407(a) RSS 210 A9.2(1)(2)(3)	Peak Power Spectral Density Measurement	Compliant
15.407(a)(6)	Peak Excursion Measurement	Compliant
§15.407(b) RSS 210 A9.2(1)(2)(3)	Undesirable Emission – Conducted Measurement	Compliant
§15.407(b) RSS 210 A9.3(1)(2)(3)	Undesirable Emission – Radiated Measurement	Compliant
§15.407(c) RSS 210 A9.4(4)	Transmission in case of Absence of Information	Compliant
§15.407(g) RSS 210 A9.5(5)	Frequency Stability	Compliant
§15.407(a)	Antenna Requirement	Compliant
§15.407(d) RSS 210 A9.2(3) RSS 210 A9.3	TPC and DFS Measurement	Compliant
	Maximum Permissible Exposure	Compliant

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#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting mode is programmed. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

a mode:

5150MHz-5250MHz: Channel lowest (5180MHz), Mid (5220MHz) and Highest (5240MHz).

5250MHz-5350MHz: Channel lowest (5260MHz), Mid (5300MHz) and Highest (5320MHz).

5470MHz-5725MHz: Channel lowest (5500MHz), Mid (5580MHz) and Highest (5700MHz) and with 6Mbps data rate are chosen as the test configuration carrying out the all applicable testing.

n HT 20 mode :

5150MHz-5250MHz: Channel lowest (5180MHz), Mid(5220MHz) and Highest(5240MHz).

5250MHz-5350MHz: Channel lowest (5260MHz), Mid(5300MHz) and Highest(5320MHz).

5470MHz-5725MHz: Channel lowest (5500MHz), Mid (52580MHz) and Highest (5700MHz) with 6.5Mbps data rate are chosen as the test configuration carrying out the all applicable testing.

n HT 40 mode :

5150MHz-5250MHz: Channel lowest (5190MHz) and Highest (5230MHz).

5250MHz-5350MHz: Channel lowest (5270MHz) and Highest (5310MHz).

5470MHz-5725MHz: Channel lowest (5510MHz), Mid (5550MHz) and Highest (5670MHz) with 13.5Mbps data rate are chosen as the test configuration carrying out the all applicable testing.

Pre-scanned was done on external antenna: WTS 2450 and antenna R380500314, and antenna R380500314 results higher emission at 5GHz. Therefore, the completed set of measurement was done on antenna: R380500314 to presented on this test report.

The field strength of spurious radiation emission was measured as EUT stand-up position(H mode), EUT with H position is selected to be the test configuration for test items relevant to radiated emission after pre-scanned investigation.

For radiation spurious emission test relevant n\_HT20&HT40, MIMO mode that generates the higher emission is chosen to be tested in comparison with transmission at SISO mode.

*Remark: While conducting average power measurement, duty cycle of each mode (a/n\_ht20/n\_ht40) shall be greater than 98%. All duty cycle is pre-scanned, but verified to be greater than 98%, where a = 98%, n\_HT20&HT40= 98% (SISO), and n\_ht\_20&n\_ht\_40 = 98%,(MIMO) where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.*

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## 5. MEASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SPURIOUS RADIATION

Measurement uncertainty (Polarization : <b>Vertical</b> )	30MHz - 180MHz: 3.37dB
	180MHz -417MHz: 3.19dB
	0.417GHz-1GHz: 3.19dB
	1GHz - 18GHz: 4.04dB
	18GHz - 40GHz: 4.04dB
Measurement uncertainty (Polarization : <b>Horizontal</b> )	30MHz - 167MHz: 4.22dB
	167MHz -500MHz: 3.44dB
	0.5GHz-1GHz: 3.39dB
	1GHz - 18GHz: 4.08dB
	18GHz - 40GHz: 4.08dB

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## 6. AC POWER LINE CONDUCTED EMISSION TEST

### 6.1. Standard Applicable

According to §15.207 and RSS-Gen §7.2.4, frequency range within 150 KHz to 30 MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

### 6.2. EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2009.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The LISN was connected with 120Vac/60Hz power source.

### 6.3. Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

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#### 6.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100759	05/20/2011	05/19/2013
EMI Receiver	R&S	ESCS 30	828985/004	09/23/2012	09/22/2013
LISN	Rolf-Heine	NNB-2/16Z	99012	03/23/2012	03/22/2013
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/23/2012	03/22/2013
Coaxial Cables	N/A	WK CE Cable	N/A	01/05/2012	01/04/2013

#### 6.5. Measurement Result

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

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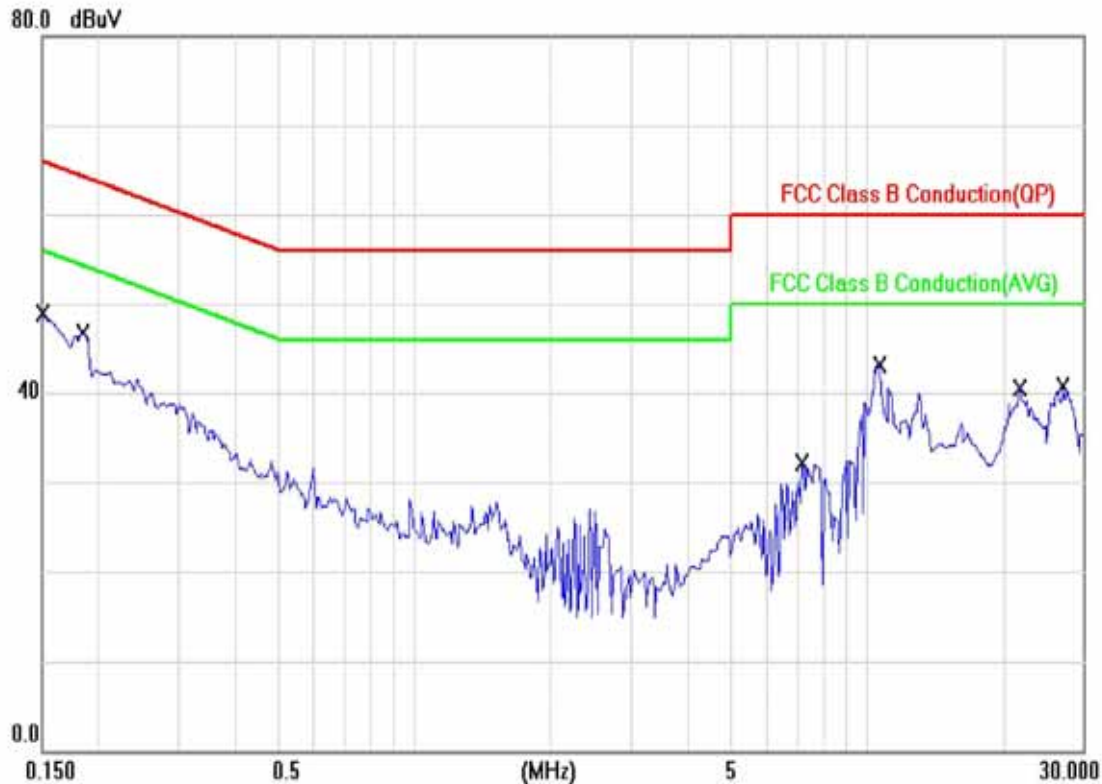
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## AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode			Test Date:	Nov. 24, 2012
Temperature:	26	Humidity:	60 %	Test By:	Marcus



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	48.57	0.25	48.82	66.00	-17.18	QP	
2		0.1852	46.53	0.23	46.76	64.25	-17.49	QP	
3		7.2110	31.73	0.37	32.10	60.00	-27.90	QP	
4	*	10.6327	42.66	0.46	43.12	60.00	-16.88	QP	
5		21.8242	39.59	0.94	40.53	60.00	-19.47	QP	
6		27.1836	39.65	1.14	40.79	60.00	-19.21	QP	

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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	48.13	0.35	48.48	66.00	-17.52	QP	
2		0.1812	46.08	0.33	46.41	64.43	-18.02	QP	
3		0.5977	36.92	0.34	37.26	56.00	-18.74	QP	
4	*	10.6327	42.74	0.48	43.22	60.00	-16.78	QP	
5		21.8242	39.11	0.81	39.92	60.00	-20.08	QP	
6		27.0040	39.15	0.92	40.07	60.00	-19.93	QP	

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## 7. 26dB and 99%EMISSION BANDWIDTH MEASUREMENT

### 7.1 Standard Applicable

According to §15.407(a). No Limit required.

According to RSS 210 A9.2(1), No Limit required

RSS-Gen §4.4.1, the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. 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 since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

### 7.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as 1% of emission BW RBW= 200kHz for a mode, RBW=200kHz for n\_HT20, and RBW=510kHz for n\_HT40, VBW =620KHz for a, n\_HT20, and VBW = 1.5MHz for n\_HT40, Span= 50MHz for a, n\_HT20 ,and Span= 60MHz for n\_HT40 Sweep=auto
4. Set Detector = Peak, and Trace Mode = max hold
5. set Marker at the frequency where -26dB (upper and lower) frequency.
6. Repeat above procedures until all frequency (low, middle, and high) was complete.

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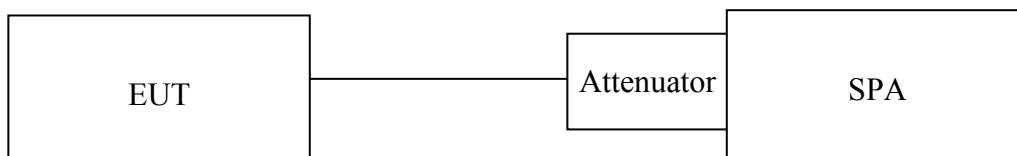
### 7.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Sensor	Anritsu	ML2495A	1005007	02/08/2012	02/07/2014
Power Meter	Anritsu	MA2411B	917032	02/08/2012	02/07/2014
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/17/2012	03/16/2014
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2012	02/27/2013
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2012	01/04/2013
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2012	02/27/2013
Splitter	Agilent	11636B	N/A	02/28/2012	02/27/2013

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2013	04/14/2014
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2013	02/27/2014
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2013	01/04/2014
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2013	02/27/2014
Splitter	Agilent	11636B	N/A	02/28/2013	02/27/2014

*Remark: Please note that the duration to conduct the test took place in the mean time when the calibration for several equipments is due, and therefore extra tables of equipment calibration is constructed to indicate the calibration work is still maintained.*

### 7.4 Test Set-up:



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## 7.5 Measurement Result

### 26dB Bandwidth

802.11a, 5150~5250 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5180	21.18	13.26
5220	21.23	13.27
5240	21.54	13.33

802.11a, 5250~5350 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5260	21.48	13.32
5300	21.25	13.27
5320	21.58	13.34

802.11a, 5470~5725 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5500	21.99	13.42
5580	21.15	13.25
5700	21.96	13.42

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802.11n HT20, 5150~5250 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5180	25.15	14.01
5220	20.01	13.01
5240	25.06	13.99

802.11n HT20, 5250~5350 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5260	25.12	14.00
5300	25.08	13.99
5320	25.15	14.00

802.11n HT20, 5470~5725 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5500	19.95	13.00
5580	22.61	13.54
5700	25.12	14.00

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802.11n HT40, 5150~5250 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5190	38.36	15.84
5230	41.68	16.20

802.11n HT40, 5250~5350 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5270	41.92	16.22
5310	41.95	16.23

802.11n HT40, 5470~5725 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5510	41.90	16.22
5550	44.09	16.44
5670	44.57	16.49

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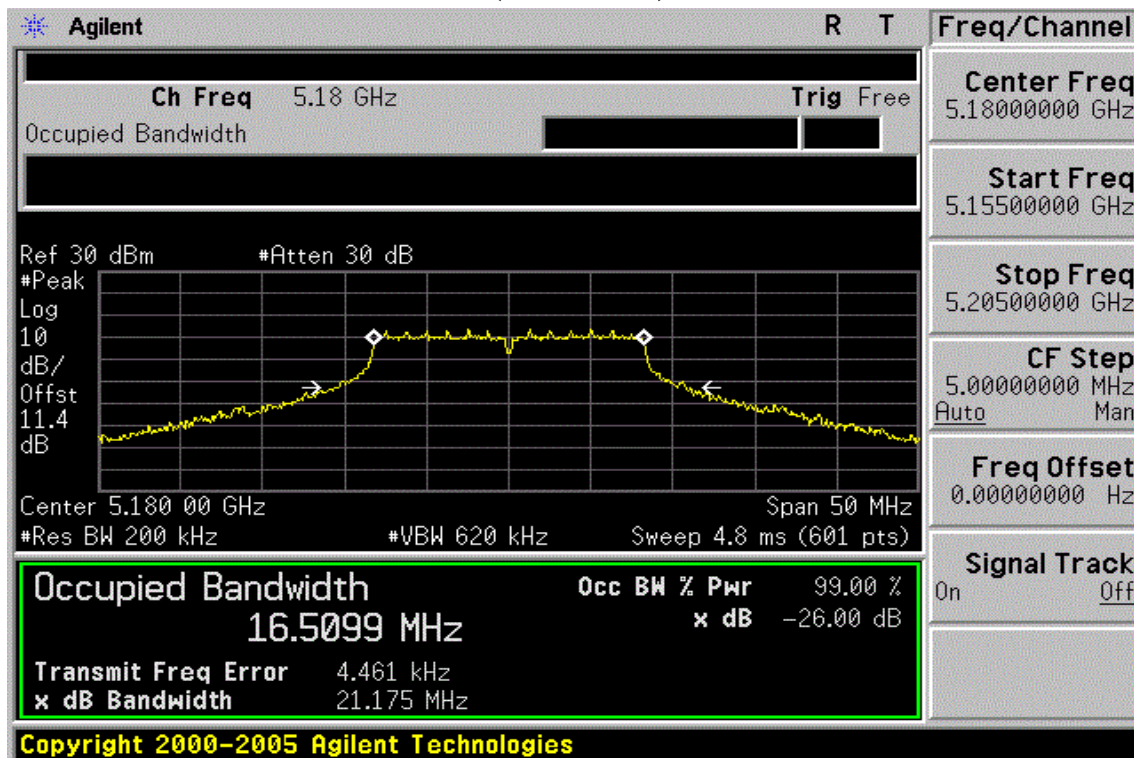
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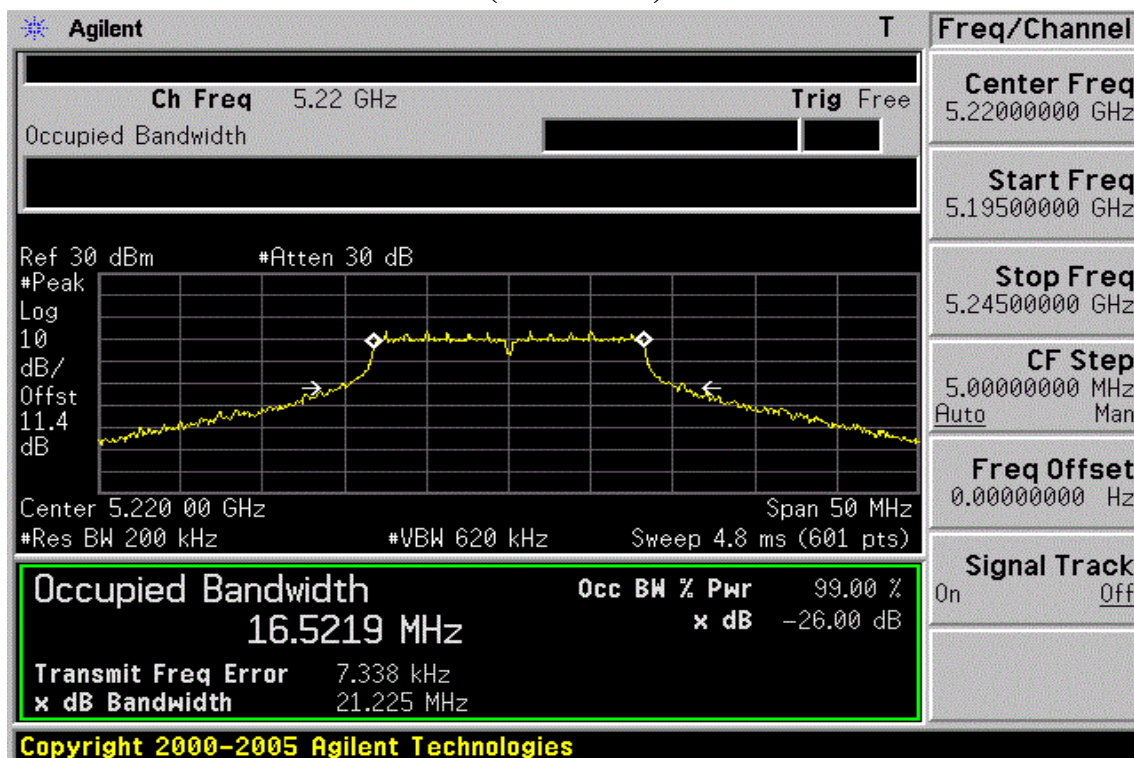
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## 802.11a, 5150~5250 MHz

### 26dB Band Width Test Data CH-Low (5180MHz)



### 26dB Band Width Test Data CH-Mid (5220MHz)



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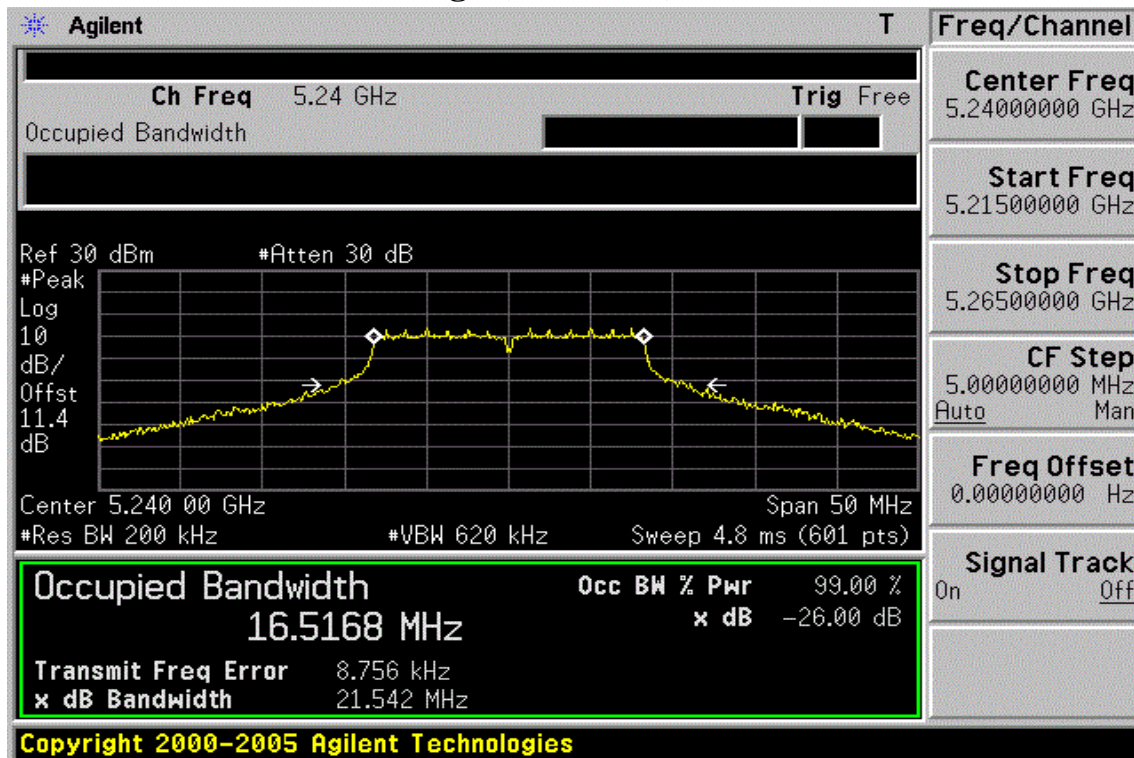
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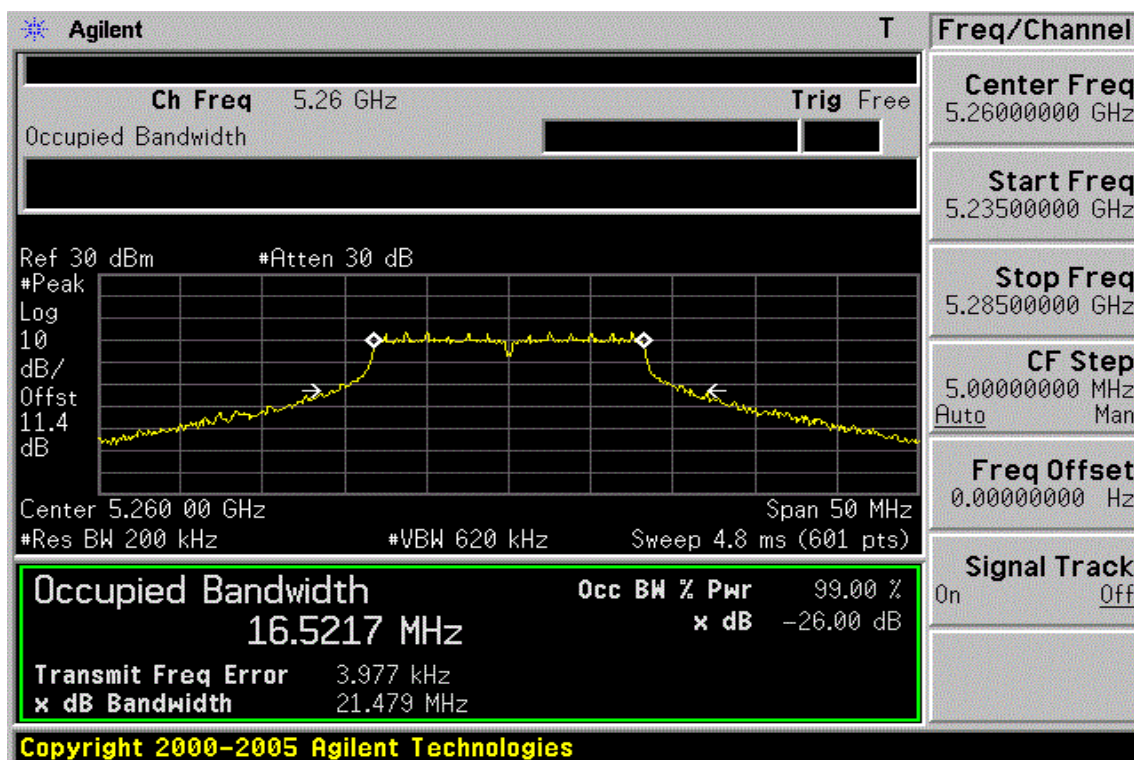
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## 26dB Band Width Test Data CH-High (5240MHz)



## 802.11a, 5250~5350 MHz

## 26dB Band Width Test Data CH-Low (5260MHz)



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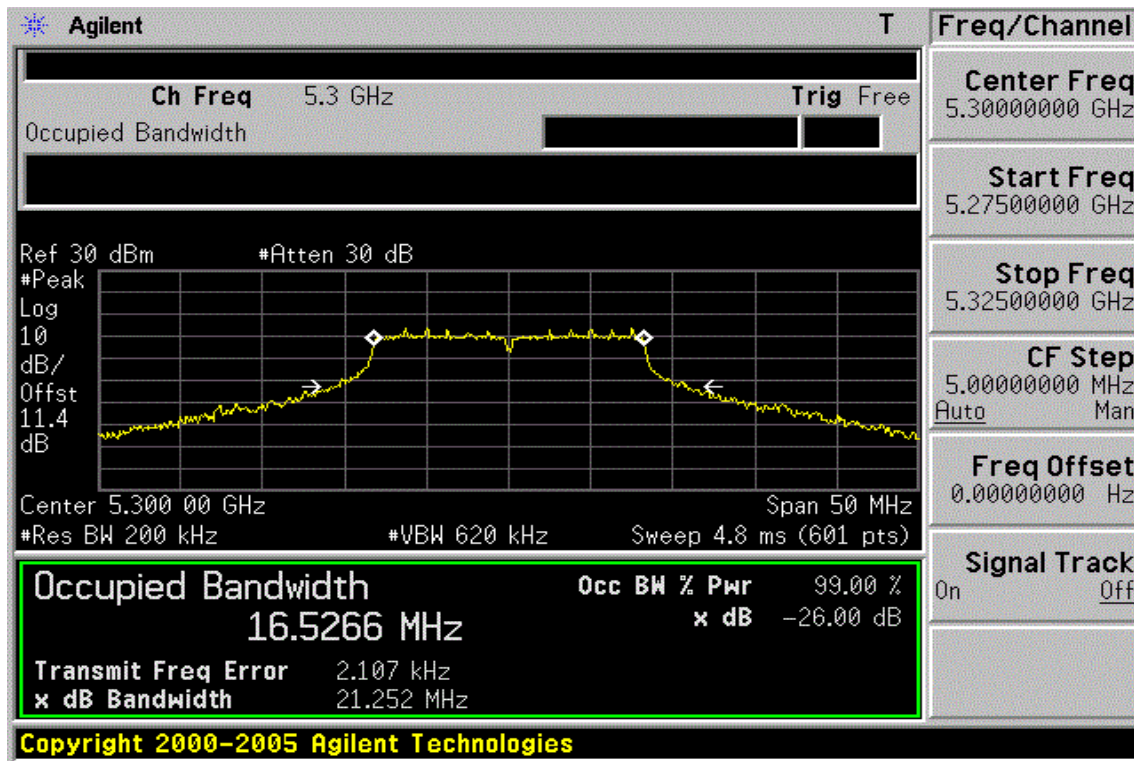
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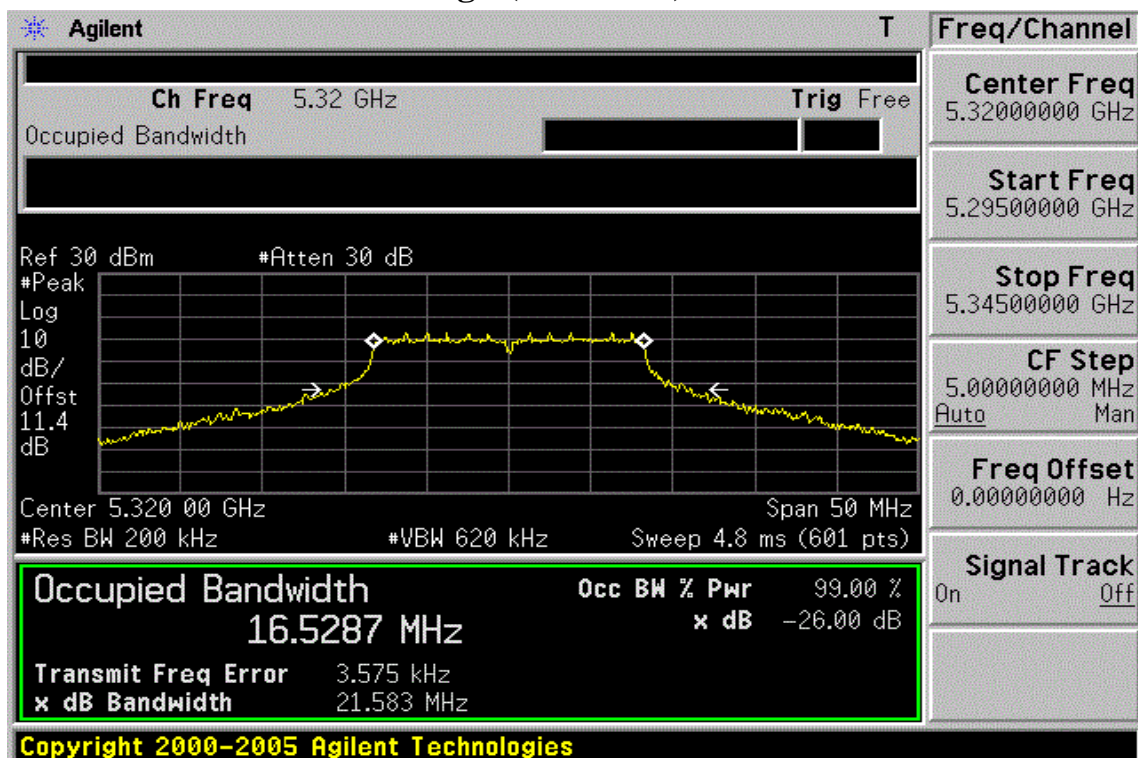
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## 26dB Band Width Test Data CH-Mid (5300MHz)



## 26dB Band Width Test Data CH-High (5320MHz)



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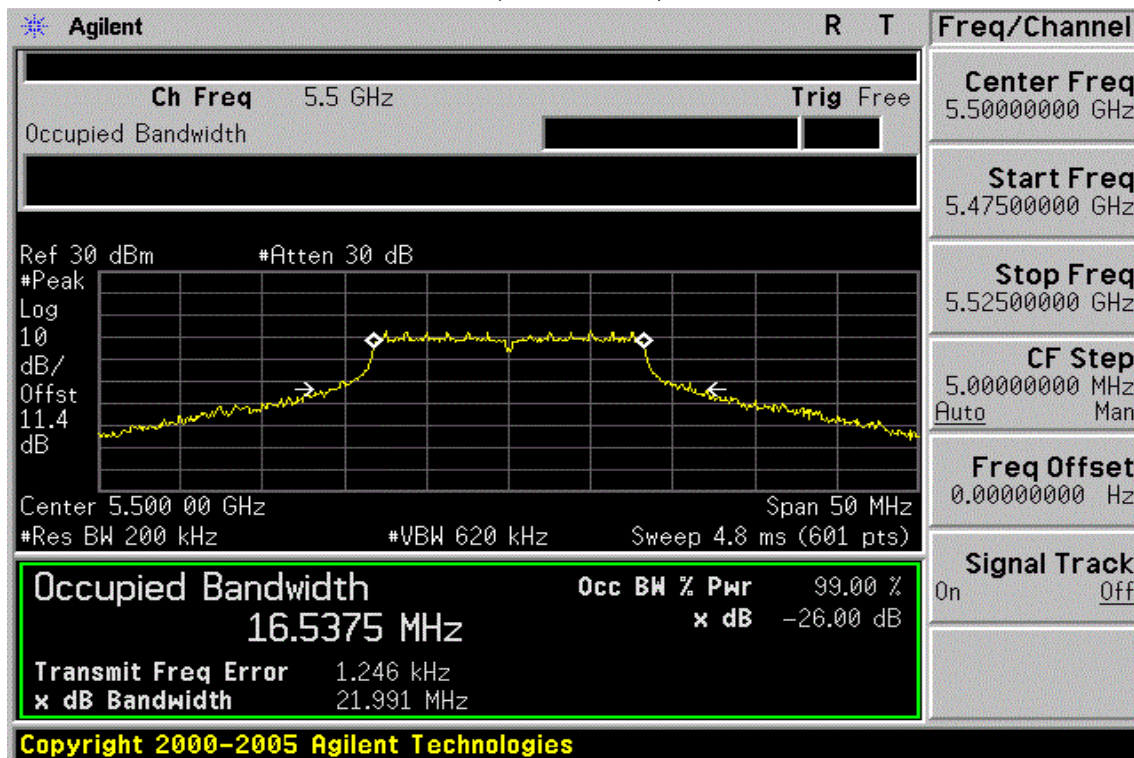
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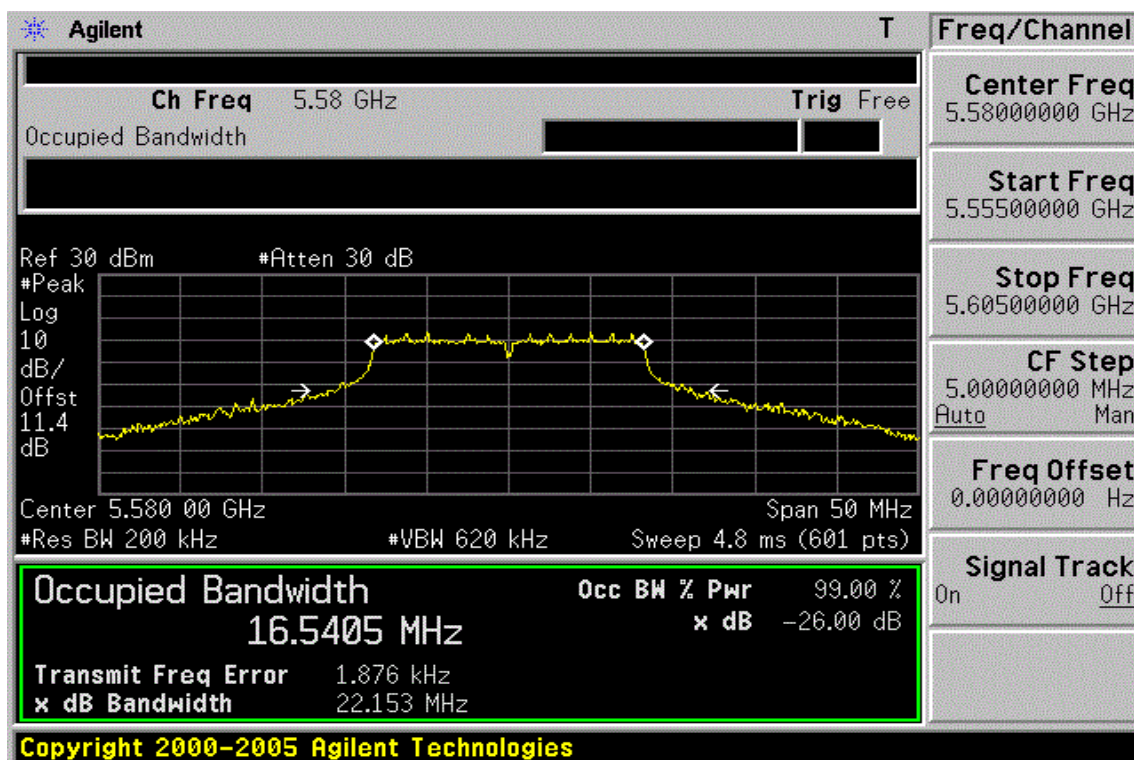
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## 802.11a, 5470~5725 MHz

### 26dB Band Width Test Data CH-Low (5500MHz)



### 26dB Band Width Test Data CH-Mid (5580MHz)



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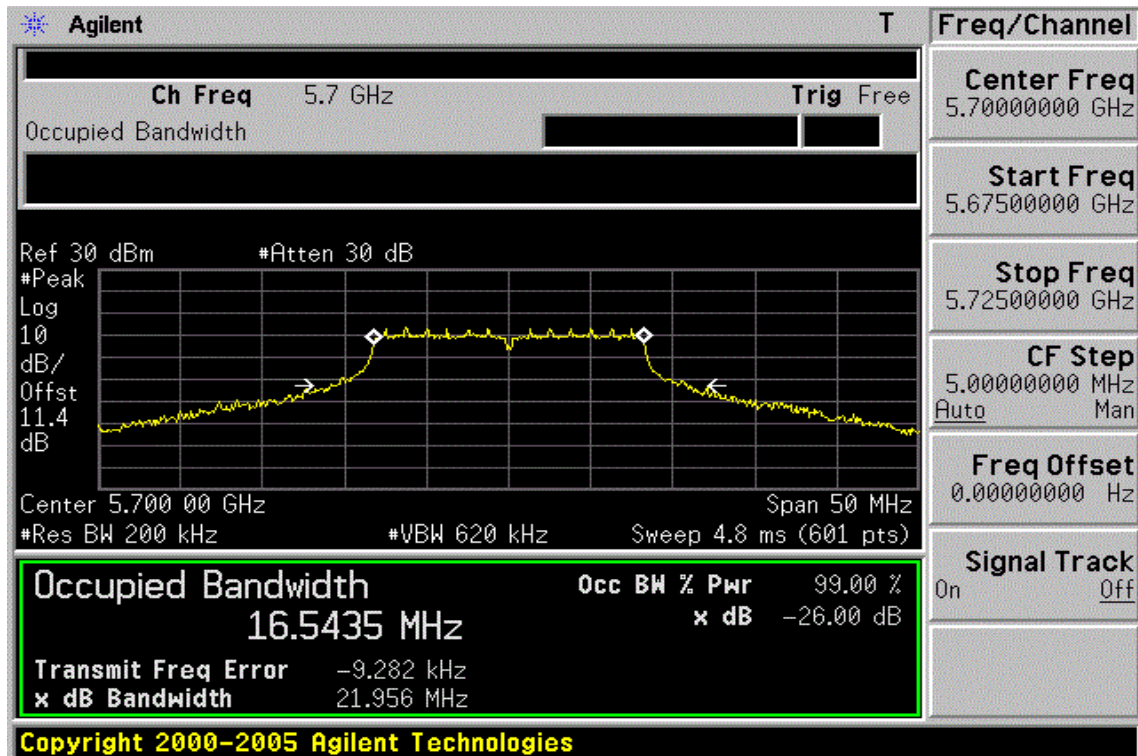
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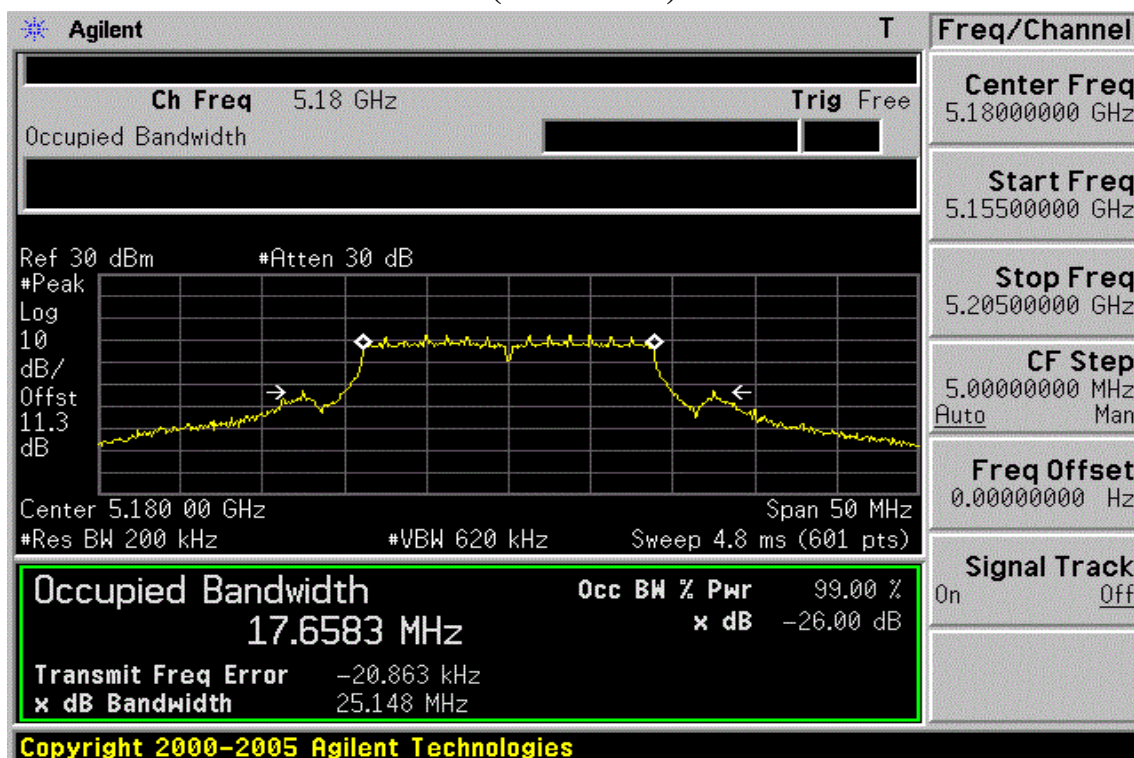


## 26dB Band Width Test Data CH-High (5700MHz)



## 802.11n HT20, 5150~5250 MHz

## 26dB Band Width Test Data CH-Low (5180 MHz)



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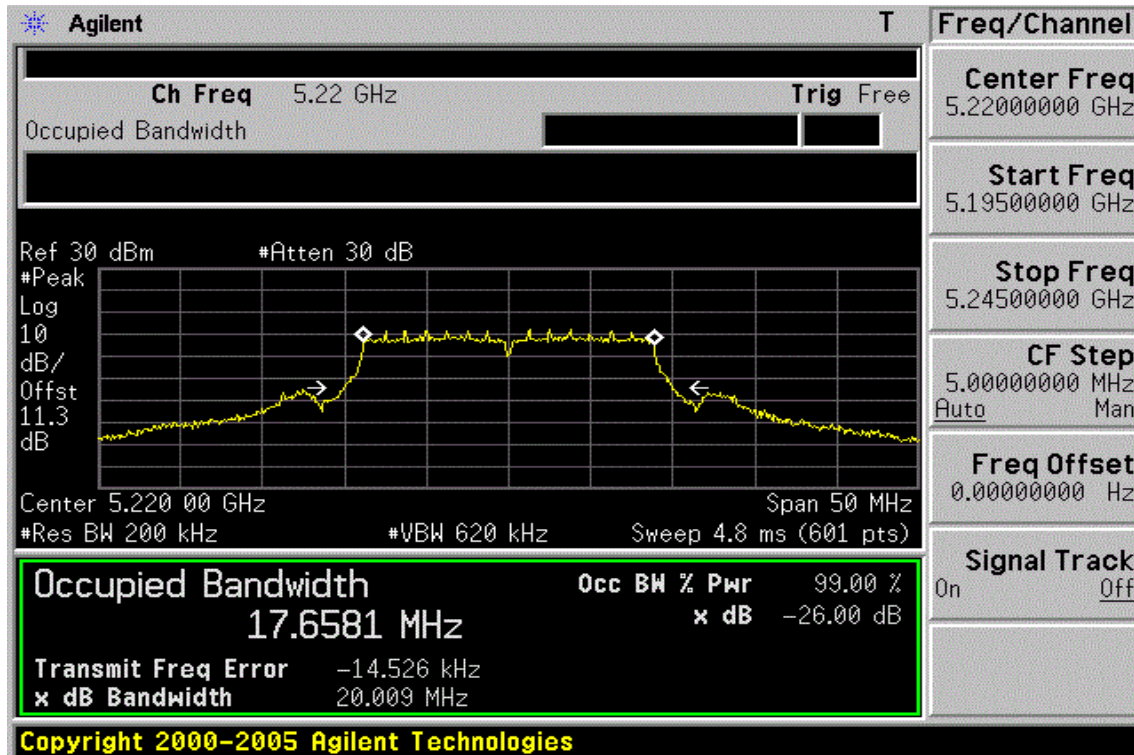
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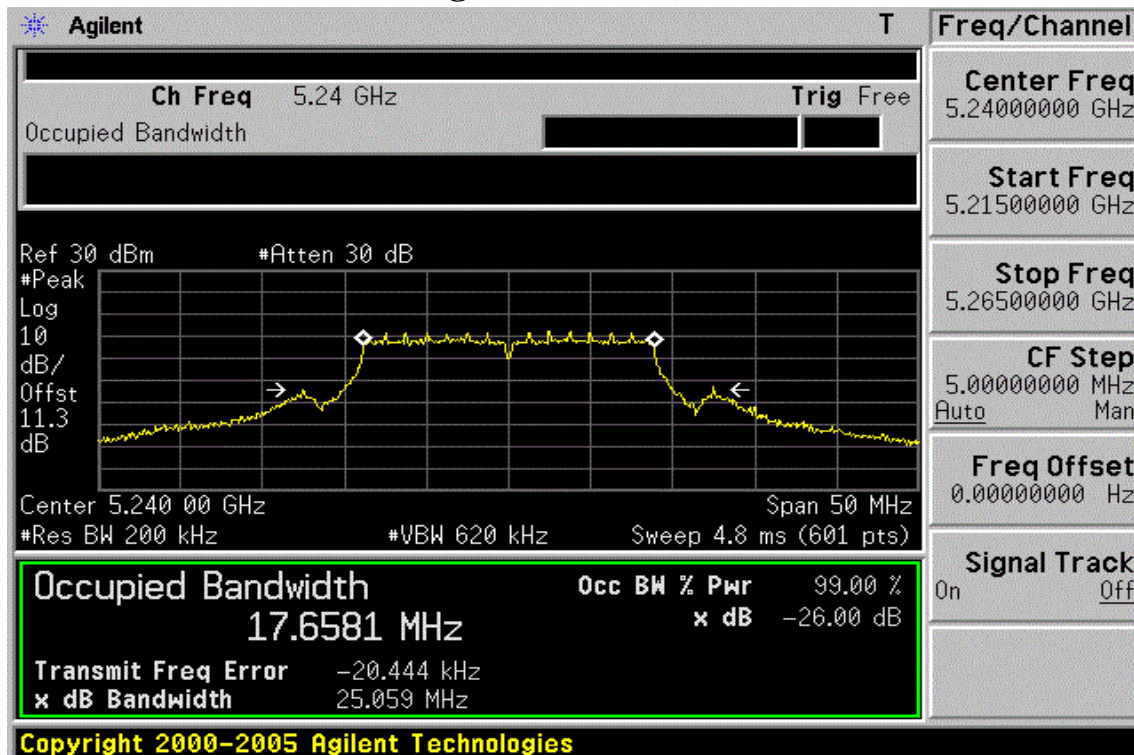
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## 26dB Band Width Test Data CH-Mid (5220 MHz)



## 26dB Band Width Test Data CH-High (5240 MHz)



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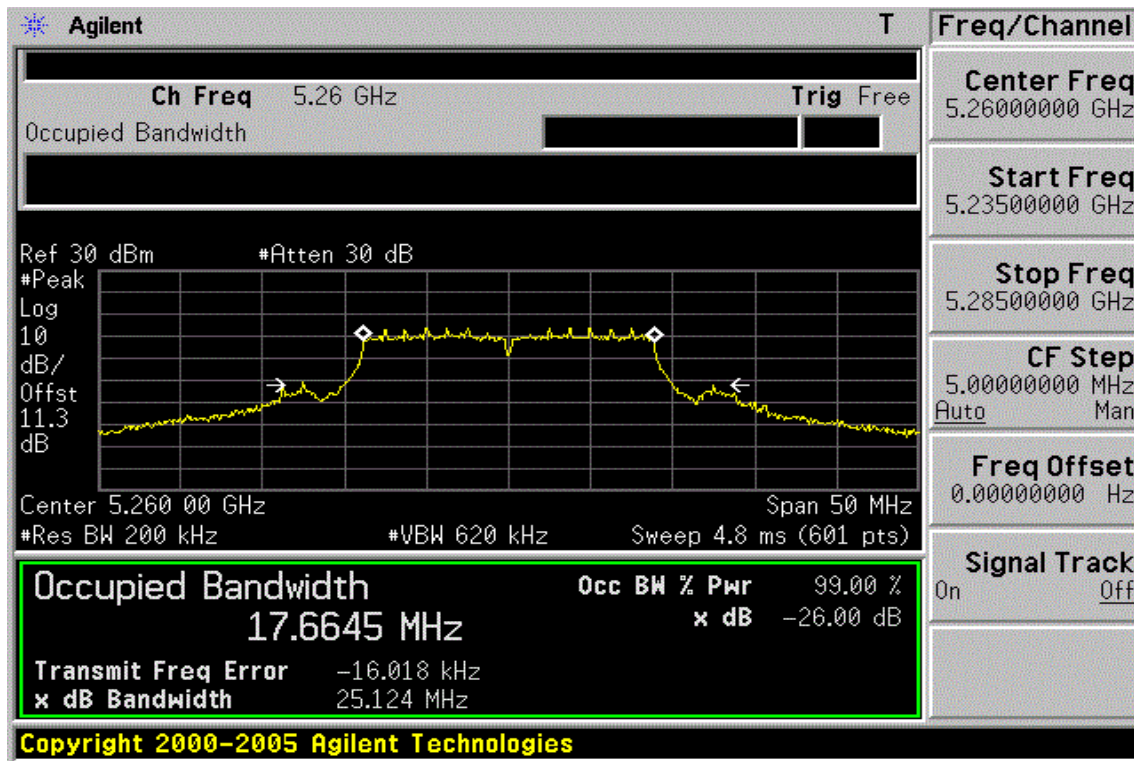
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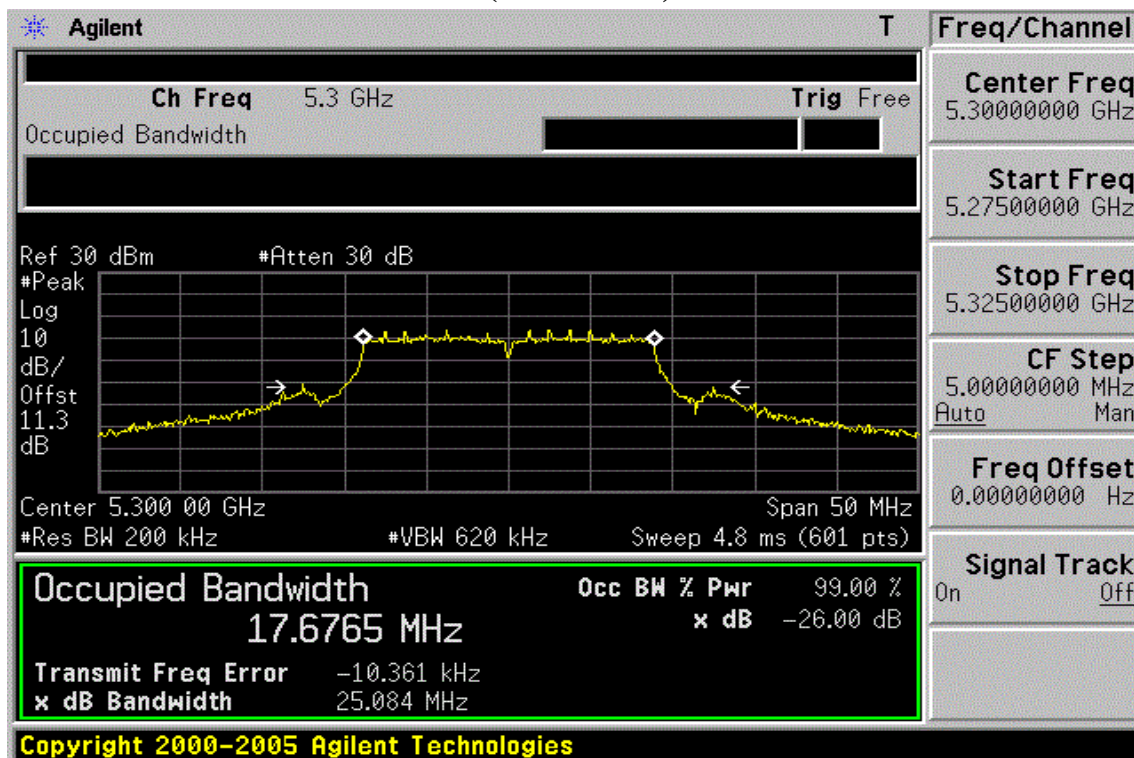


## 802.11n HT20, 5250~5350 MHz

### 26dB Band Width Test Data CH-Low (5260 MHz)



### 26dB Band Width Test Data CH-Mid (5300 MHz)



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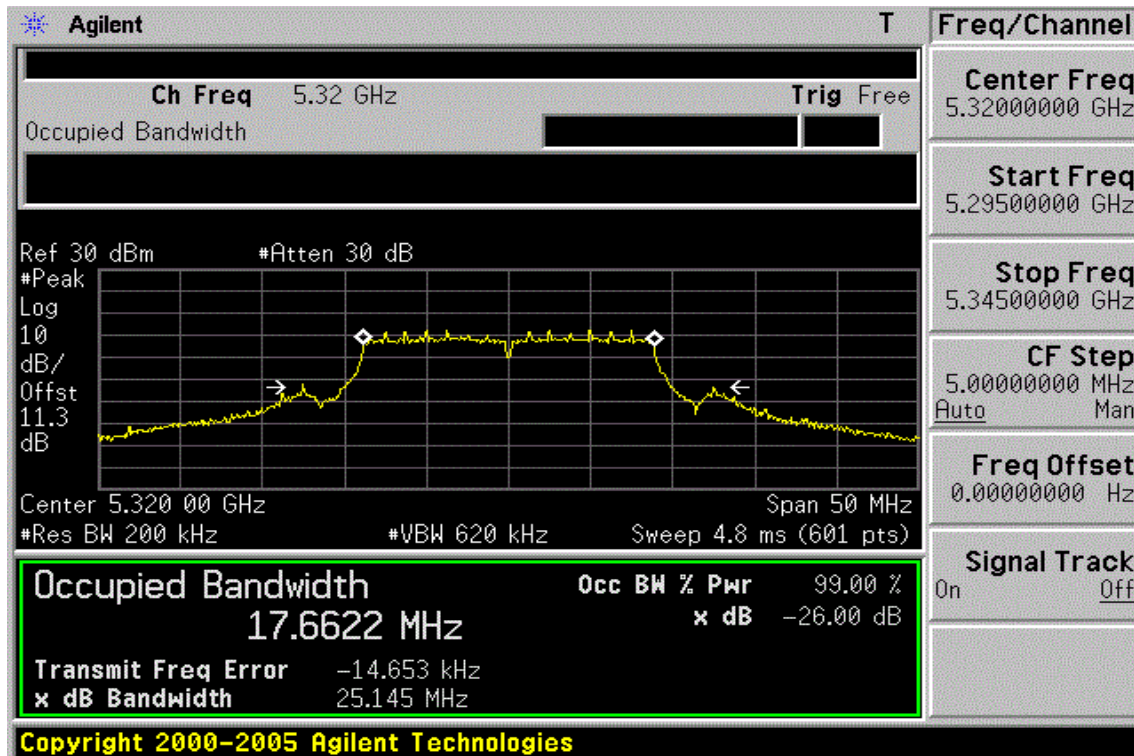
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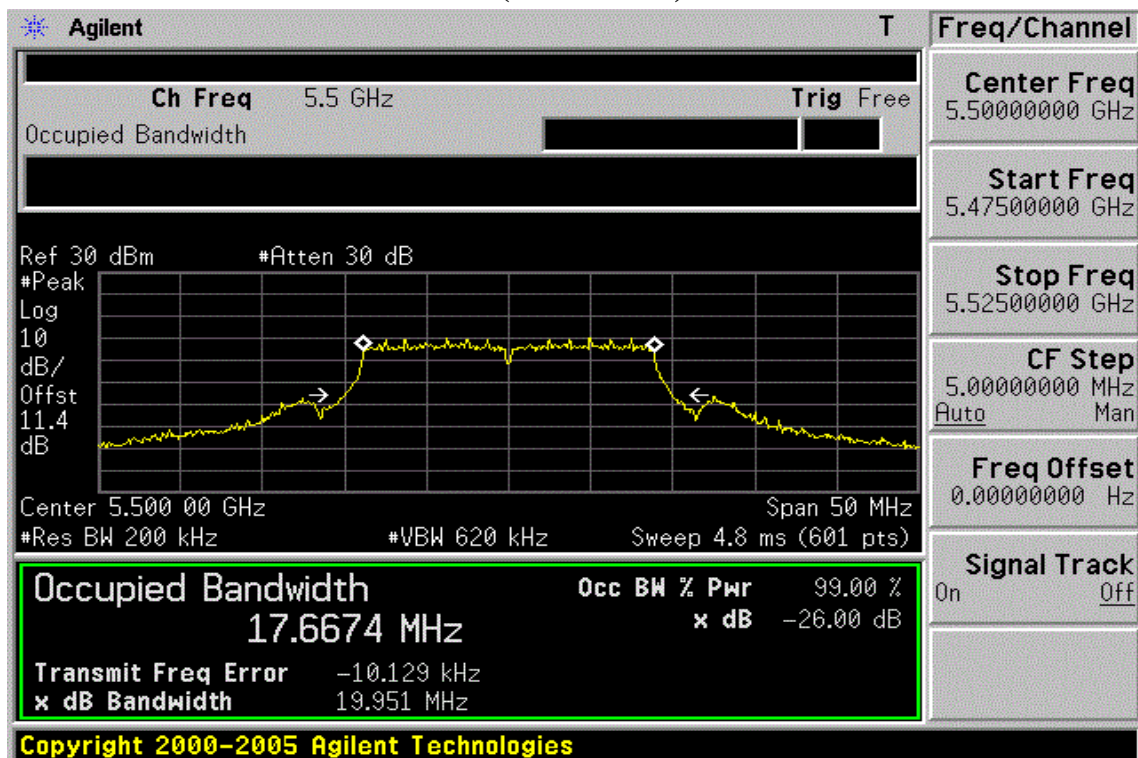


## 26dB Band Width Test Data CH-High (5320 MHz)



## 802.11n HT20, 5470~5725 MHz

## 26dB Band Width Test Data CH-Low (5500 MHz)



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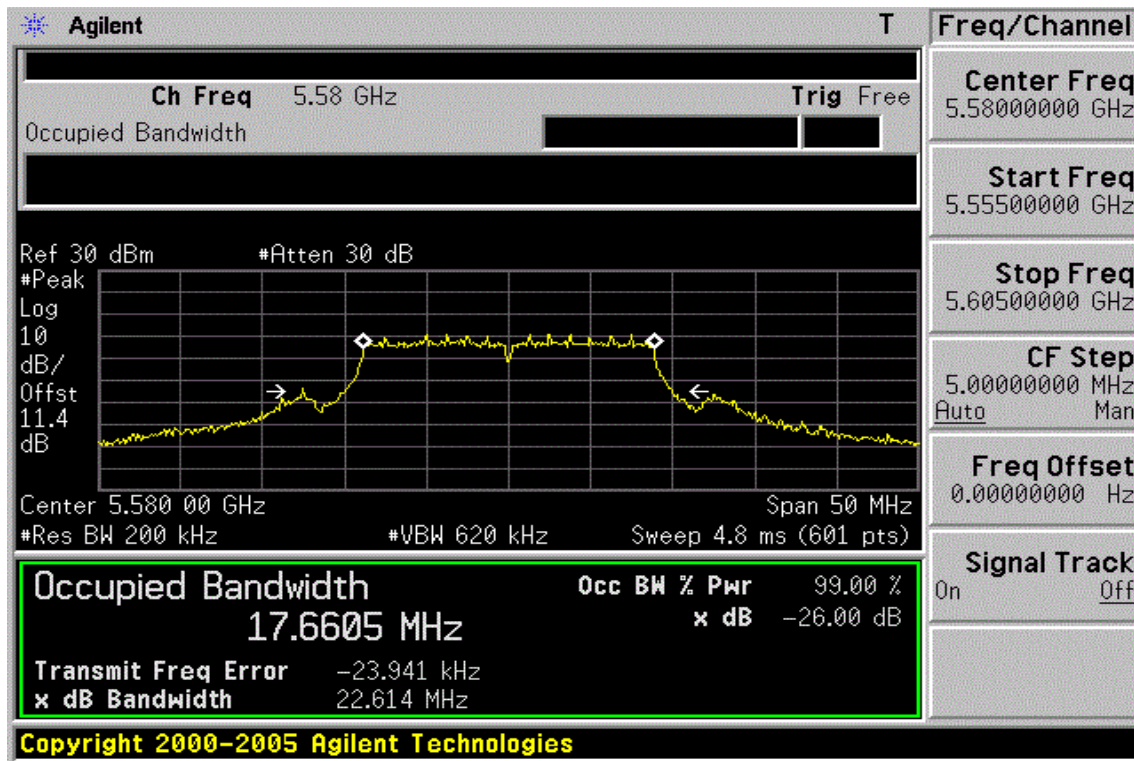
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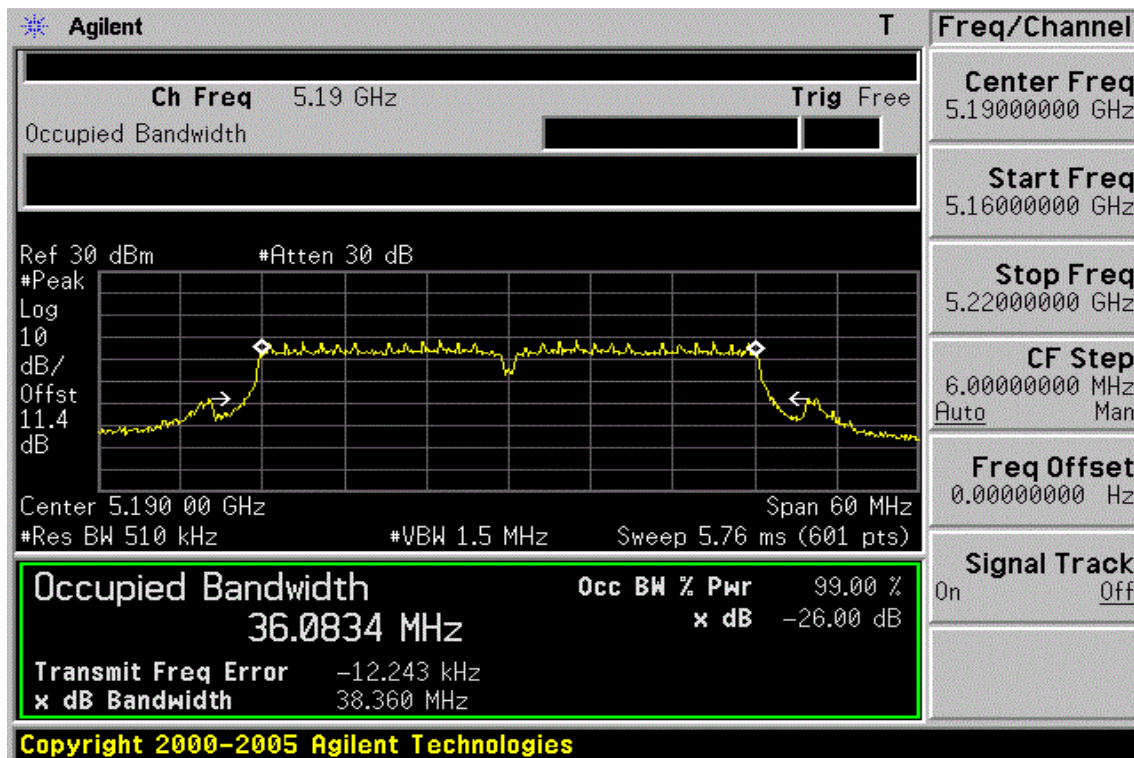
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## 26dB Band Width Test Data CH-Mid (5580 MHz)



## 26dB Band Width Test Data CH-High (5700 MHz)



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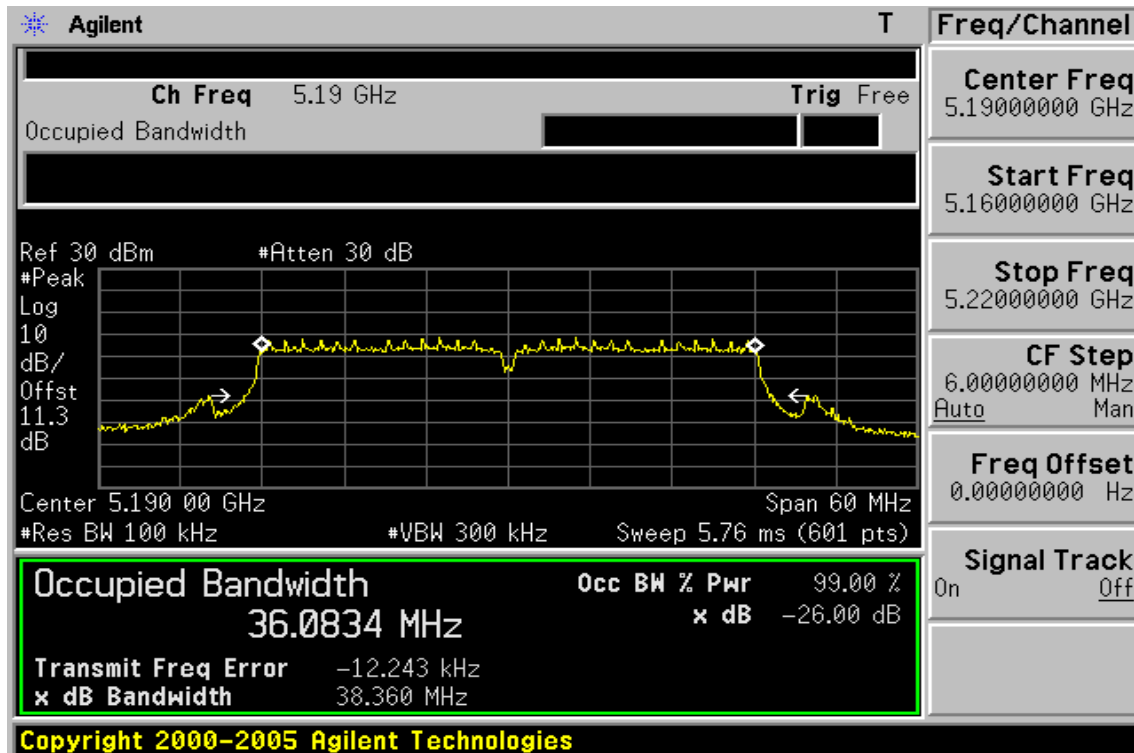
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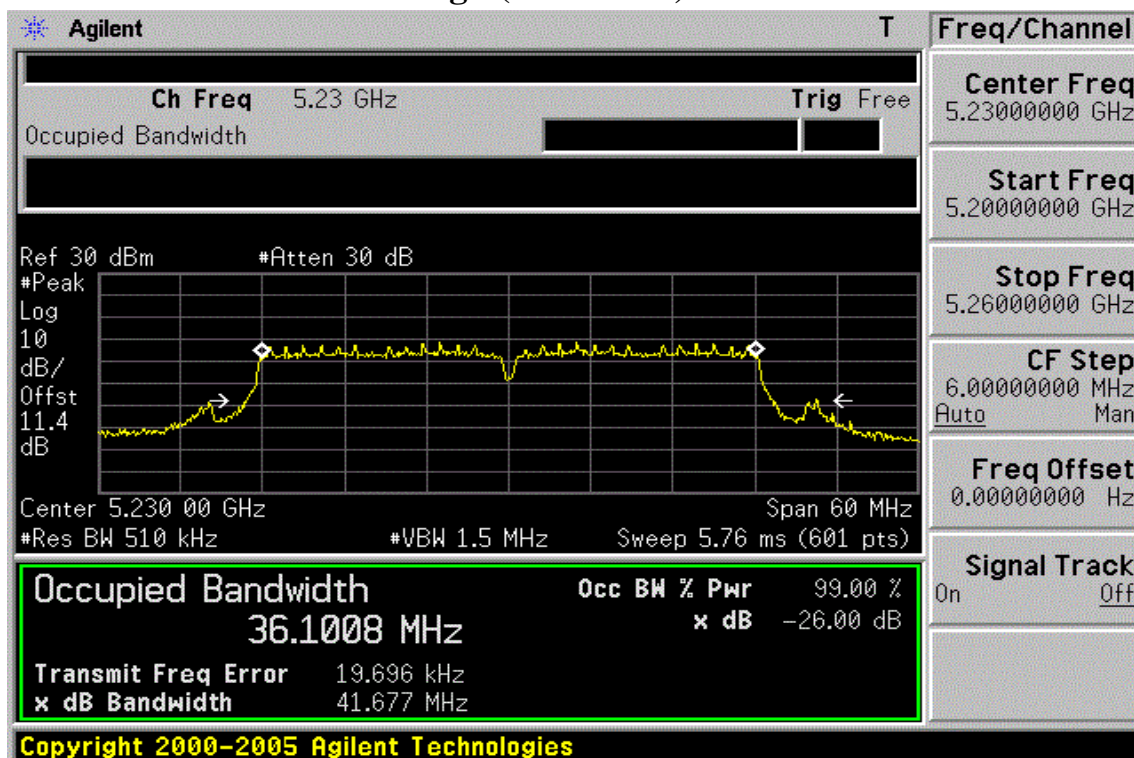


## 802.11n HT40, 5150~5250 MHz

### 26dB Band Width Test Data CH-Low (5190 MHz)



### 26dB Band Width Test Data CH-High (5230 MHz)



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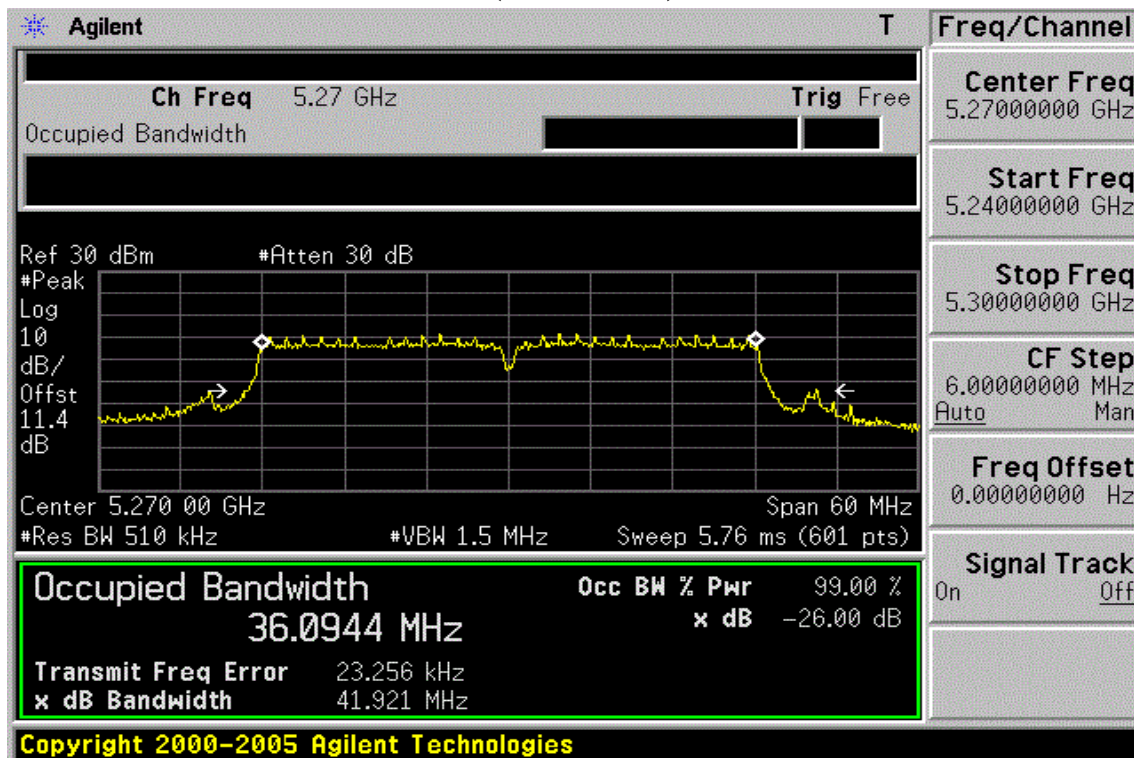
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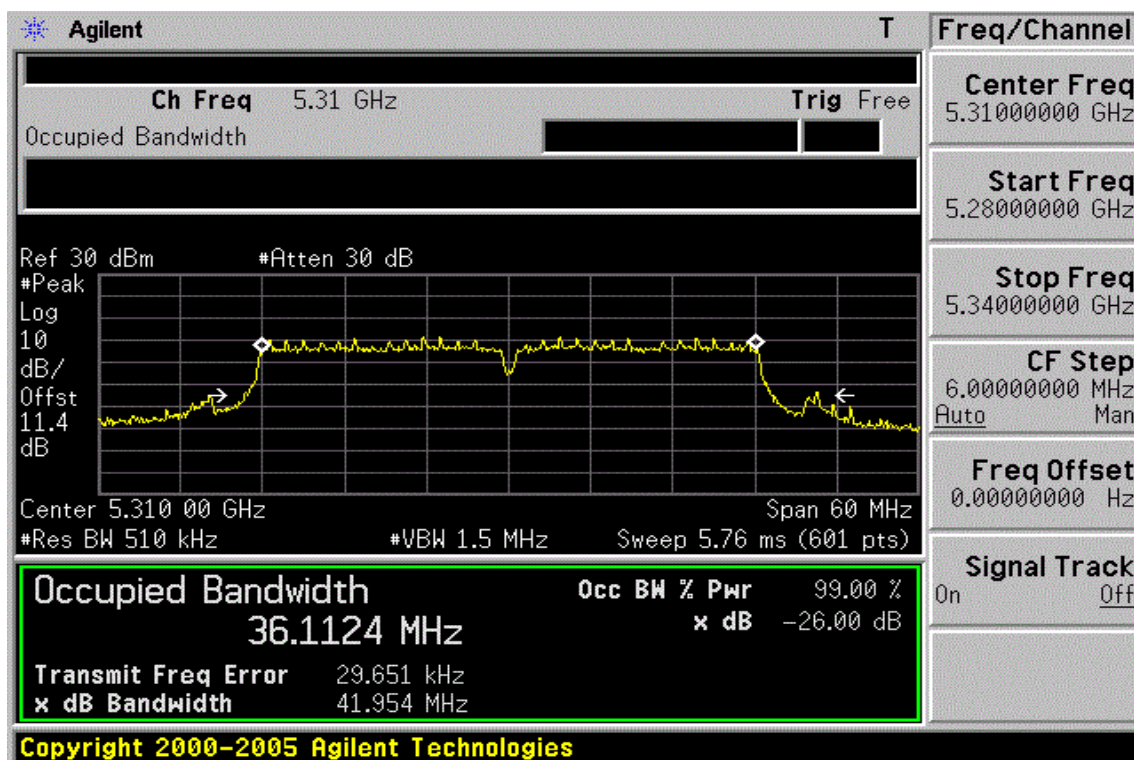
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## 802.11n HT40, 5250~5350 MHz

### 26dB Band Width Test Data CH-Low (5270 MHz)



### 26dB Band Width Test Data CH-High (5310MHz)



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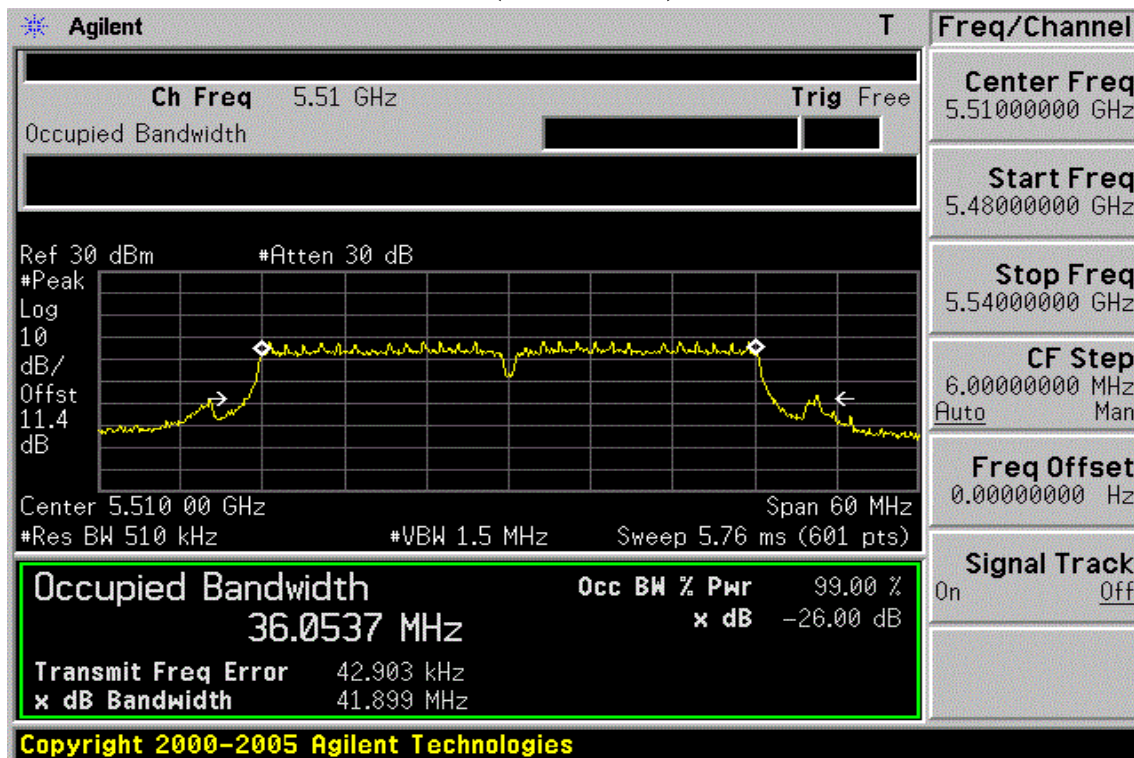
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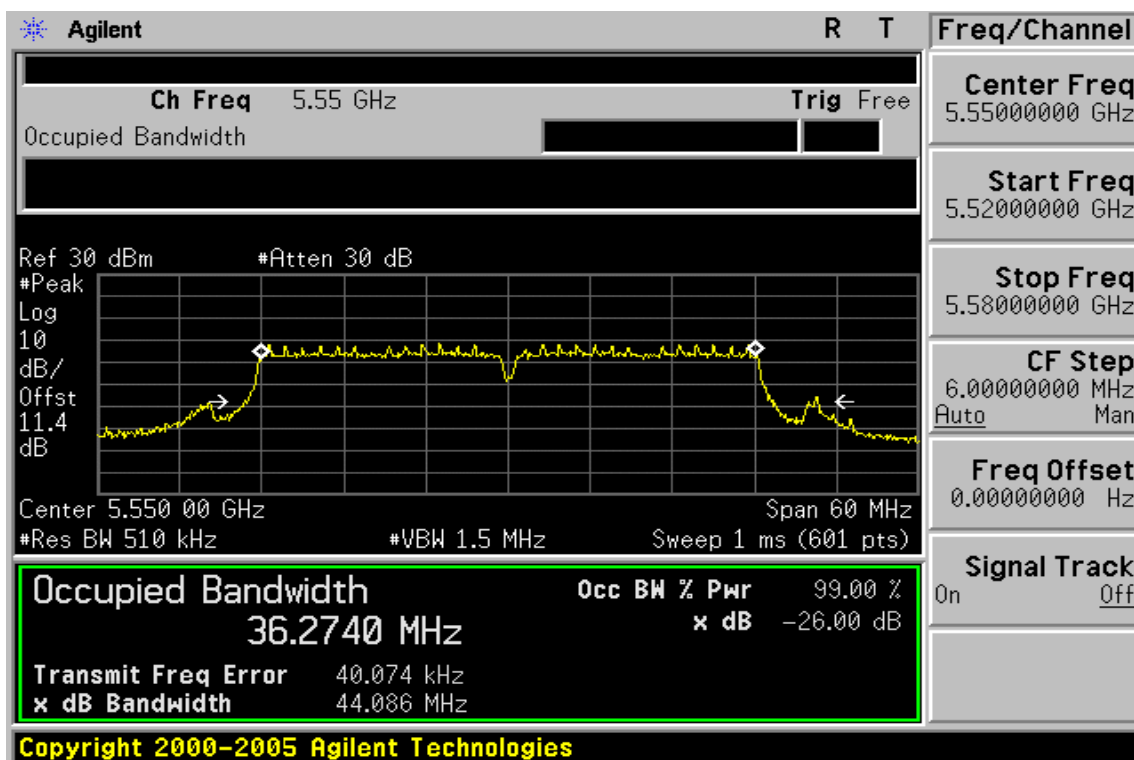
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## 802.11n HT40, 5470~5725 MHz

### 26dB Band Width Test Data CH-Low (5510 MHz)



### 26dB Band Width Test Data CH-Mid (5550 MHz)



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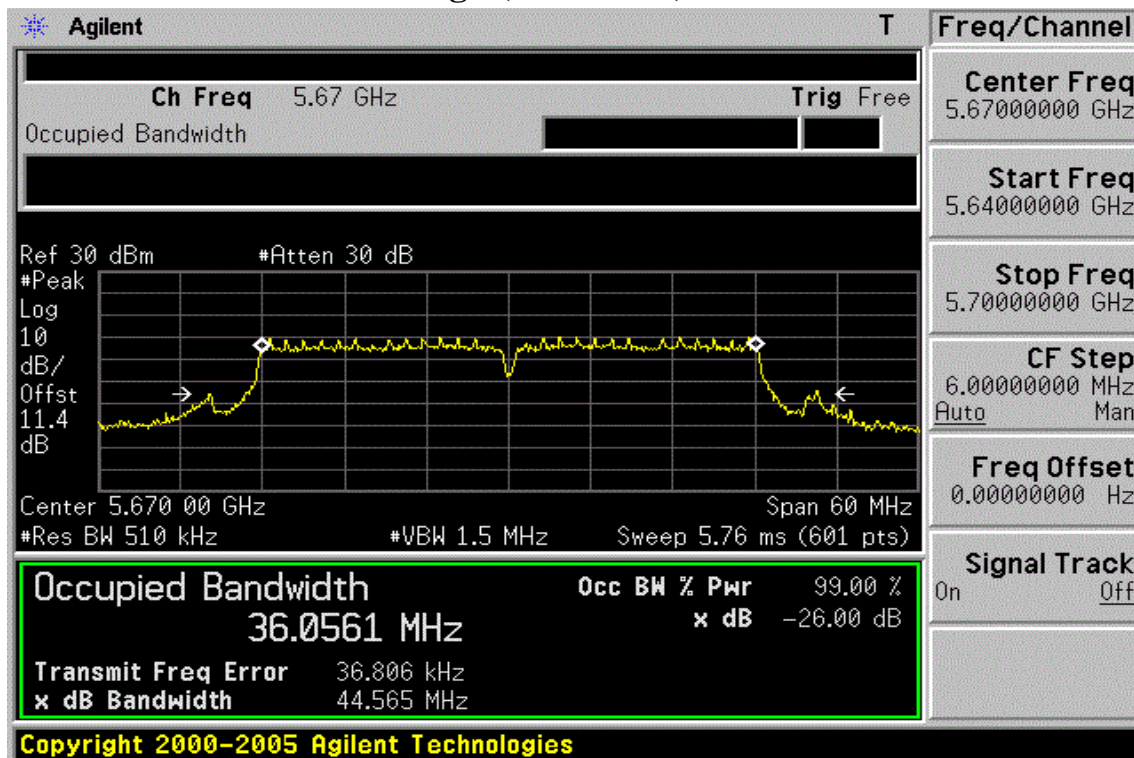
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## 26dB Band Width Test Data CH-High (5670 MHz)



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## 7.6 Measurement Result

### 99% Bandwidth

802.11a, 5150~5250 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log (B) (dB)
5180	17.0603	12.32
5220	17.2159	12.36
5240	17.1413	12.34

802.11a, 5250~5350 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log (B) (dB)
5260	17.2079	12.36
5300	17.1245	12.34
5320	17.0383	12.31

802.11a, 5470~5725 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log (B) (dB)
5500	17.1065	12.33
5580	17.0321	12.31
5700	17.0988	12.33

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802.11n HT20, 5150~5250 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log (B) (dB)
5180	17.8340	12.51
5220	17.8014	12.50
5240	17.8195	12.51

802.11n HT20, 5250~5350 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log 10(B) (dB)
5260	17.8128	12.51
5300	17.8393	12.51
5320	17.8399	12.51

802.11n HT20, 5470~5725 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log (B) (dB)
5500	17.8128	12.51
5580	17.8167	12.51
5700	17.7950	12.50

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802.11n HT40, 5150~5250 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log (B) (dB)
5190	36.2536	15.59
5230	36.3030	15.60

802.11n HT40, 5250~5350 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log (B) (dB)
5270	36.2014	15.59
5310	36.2598	15.59

802.11n HT40, 5470~5725 MHz

Frequency (MHz)	99% Bandwidth (B) (MHz)	10 Log (B) (dB)
5510	36.2119	15.59
5550	36.2639	15.59
5670	36.2605	15.59

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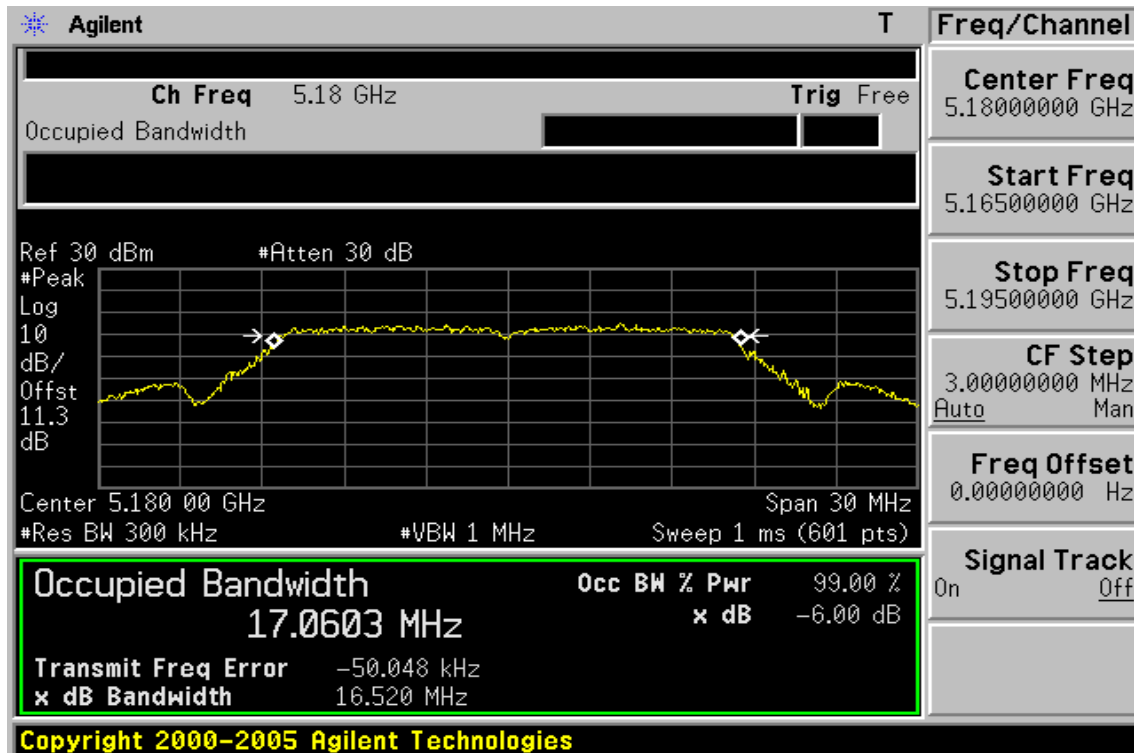
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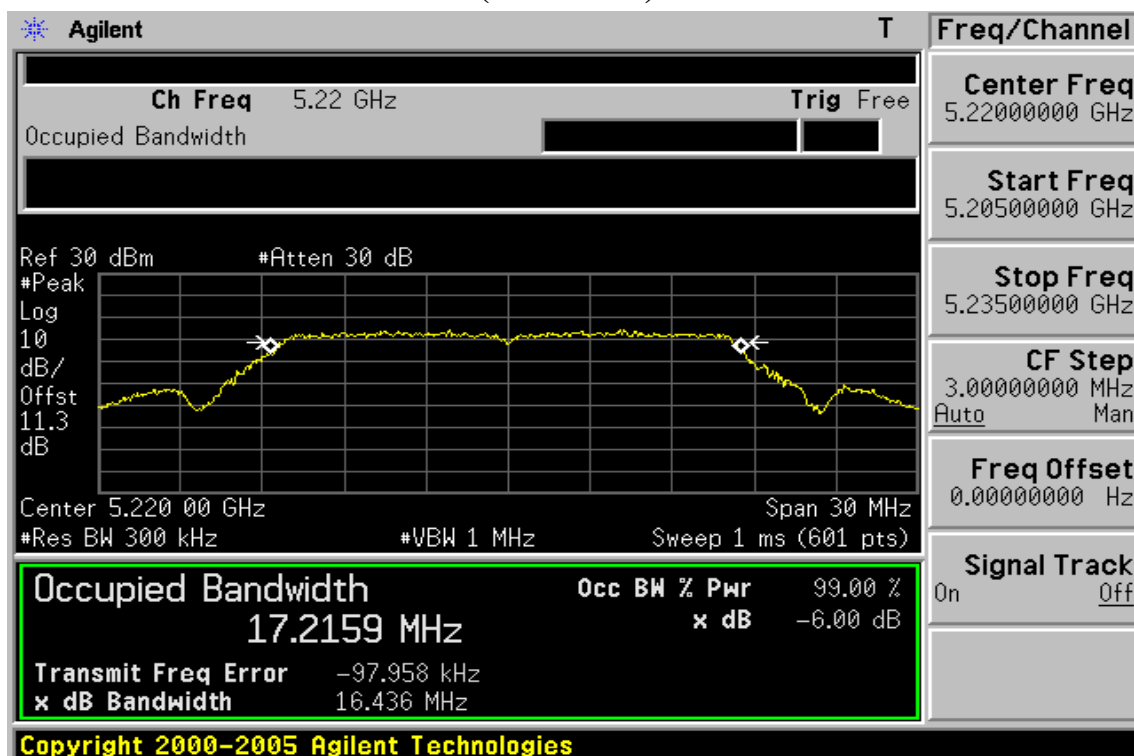
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## 802.11a, 5150~5250 MHz

### 99% Band Width Test Data CH-Low (5180MHz)



### 99% Band Width Test Data CH-Mid (5220MHz)



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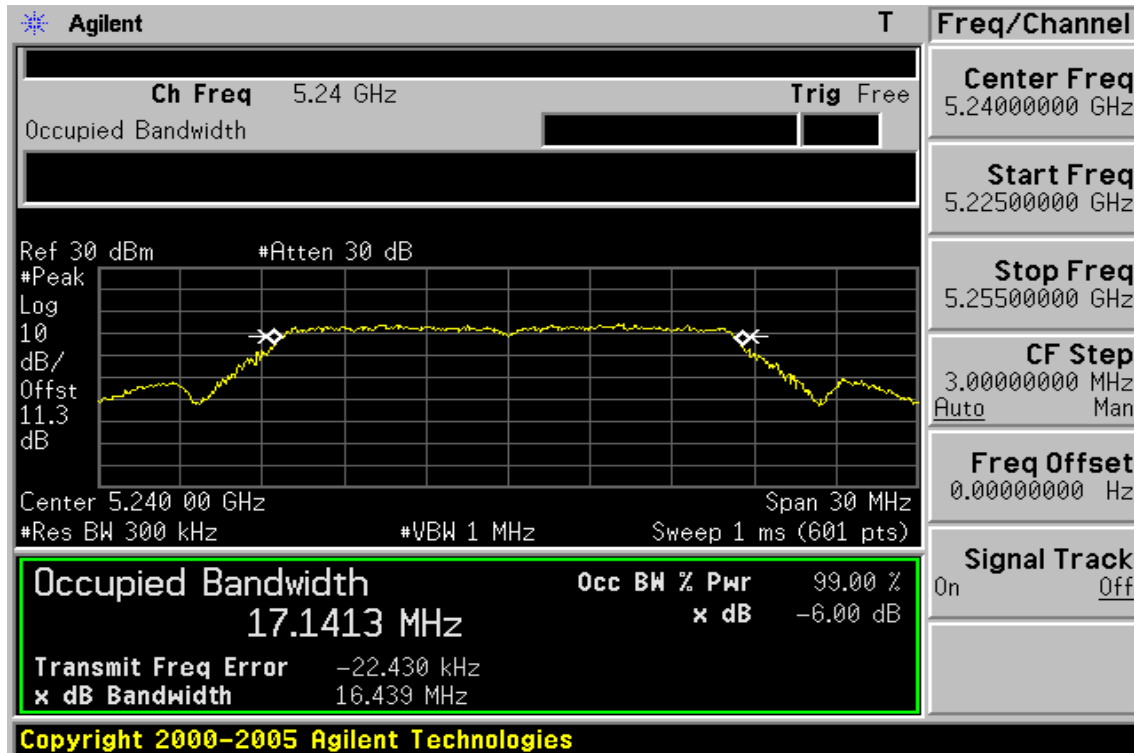
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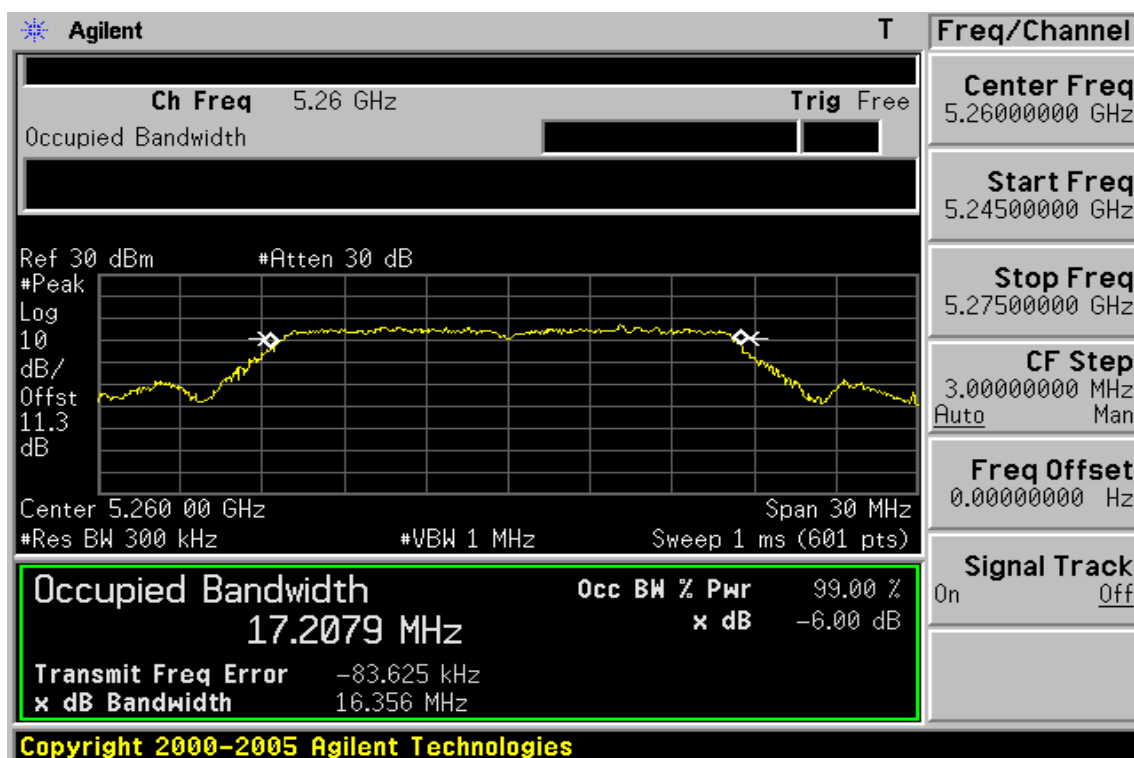
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## 99% Band Width Test Data CH-High (5240MHz)



## 802.11a, 5250~5350 MHz

## 99% Band Width Test Data CH-Low (5260MHz)



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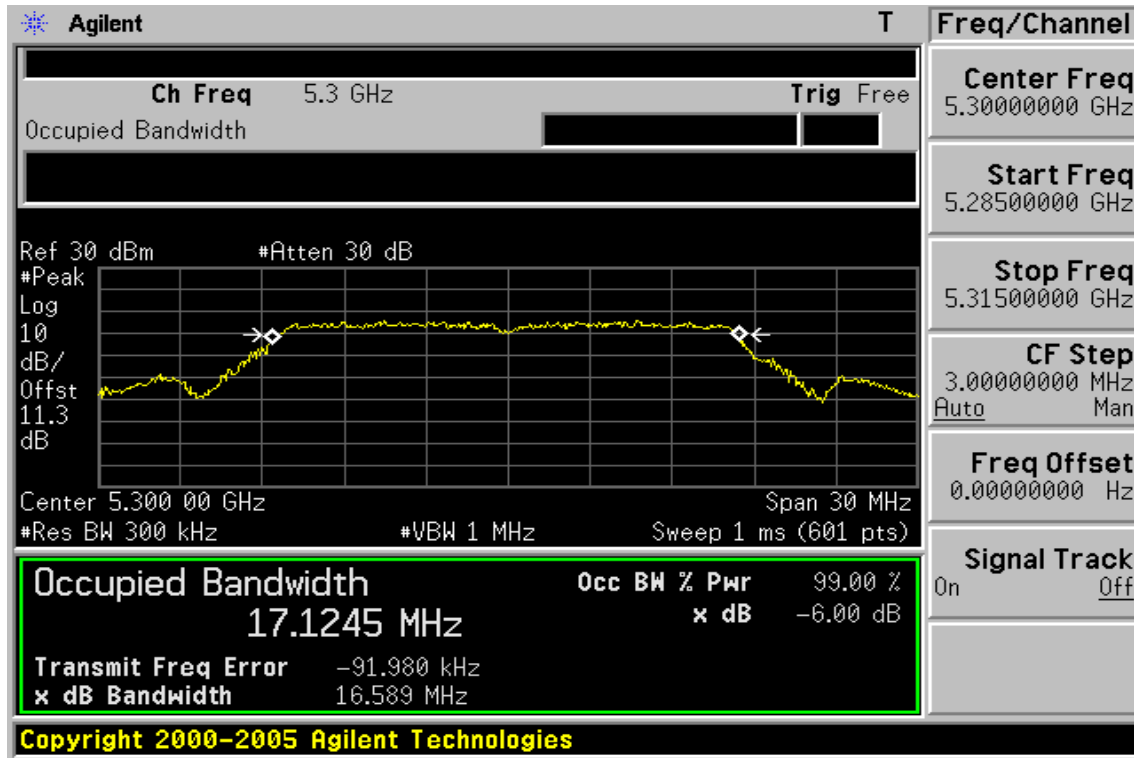
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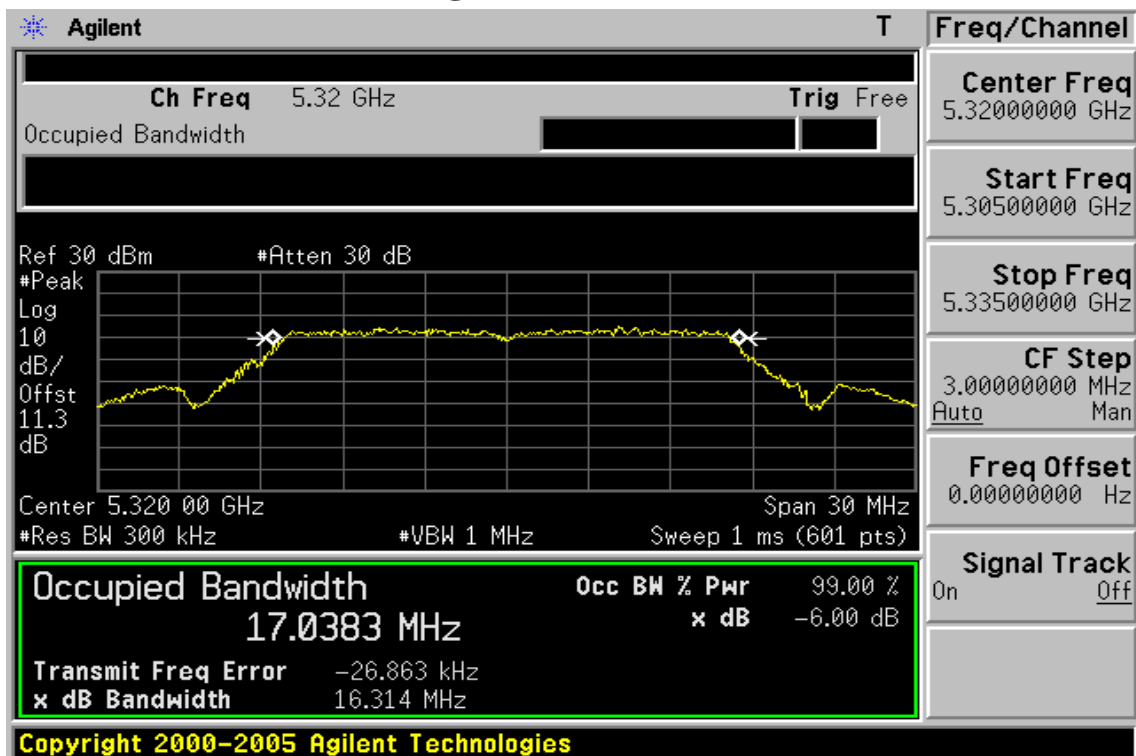
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## 99% Band Width Test Data CH-Mid (5300MHz)



## 99% Band Width Test Data CH-High (5320MHz)



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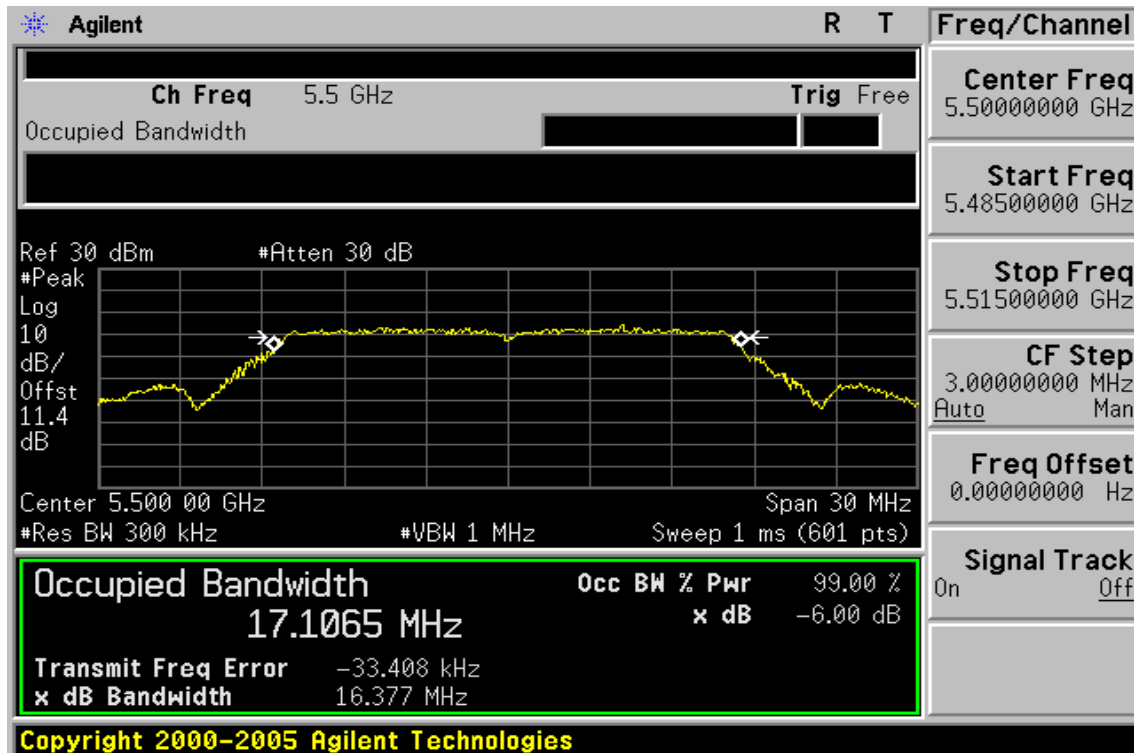
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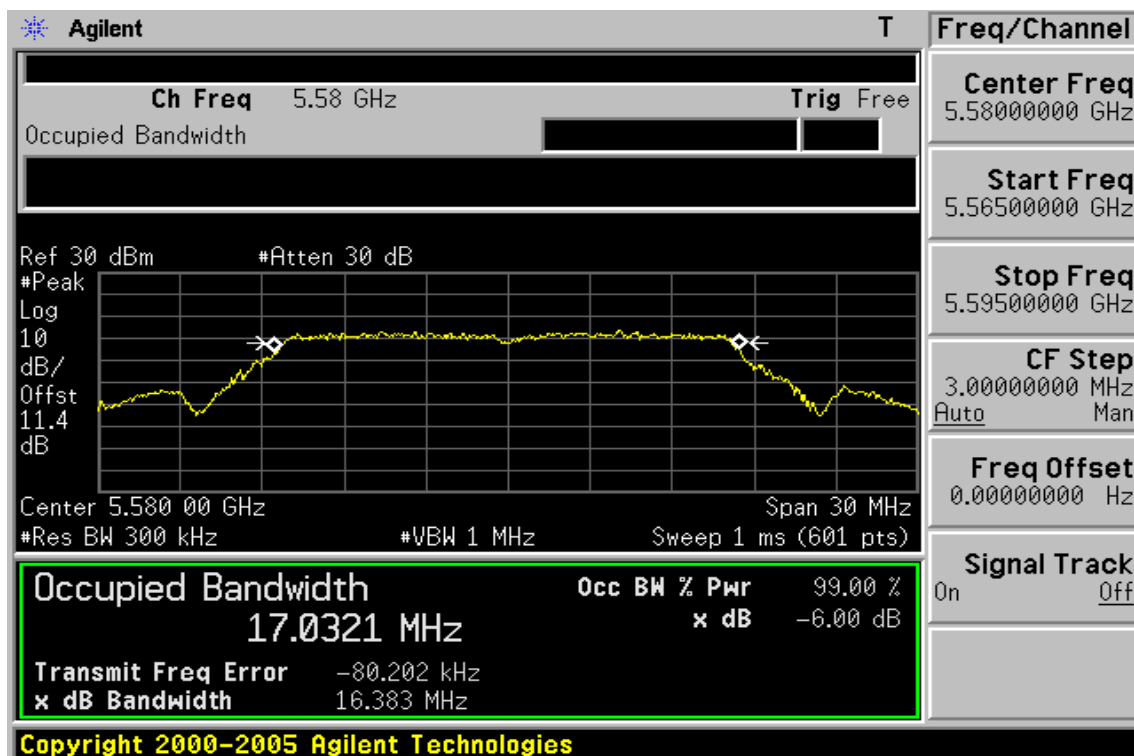
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## 802.11a, 5470~5725 MHz

### 99% Band Width Test Data CH-Low (5500MHz)



### 99% Band Width Test Data CH-Mid (5580MHz)



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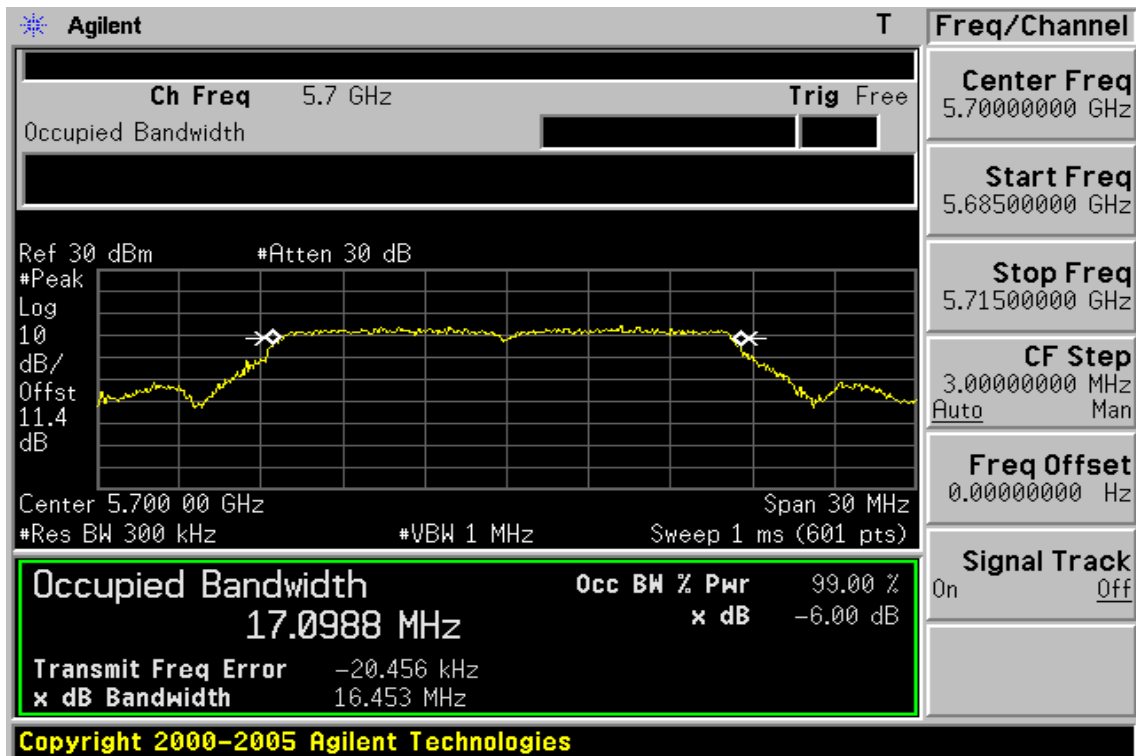
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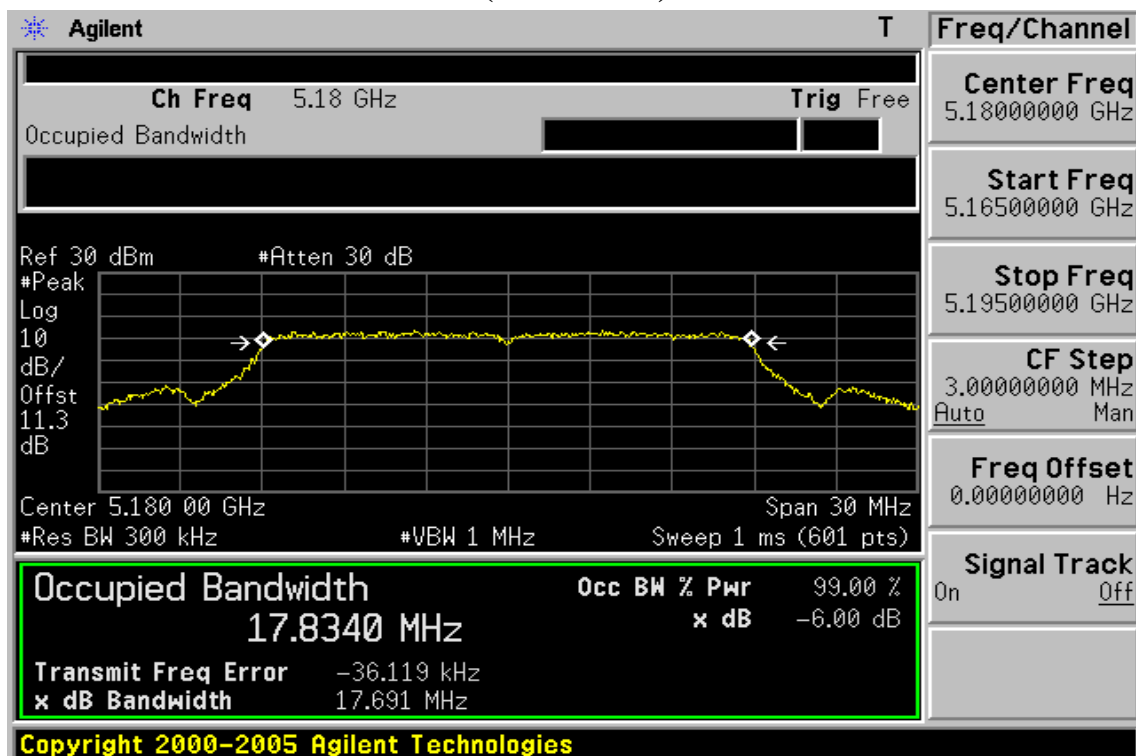
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## 99% Band Width Test Data CH-High (5700MHz)



## 802.11n HT20, 5150~5250 MHz

## 99% Band Width Test Data CH-Low (5180 MHz)



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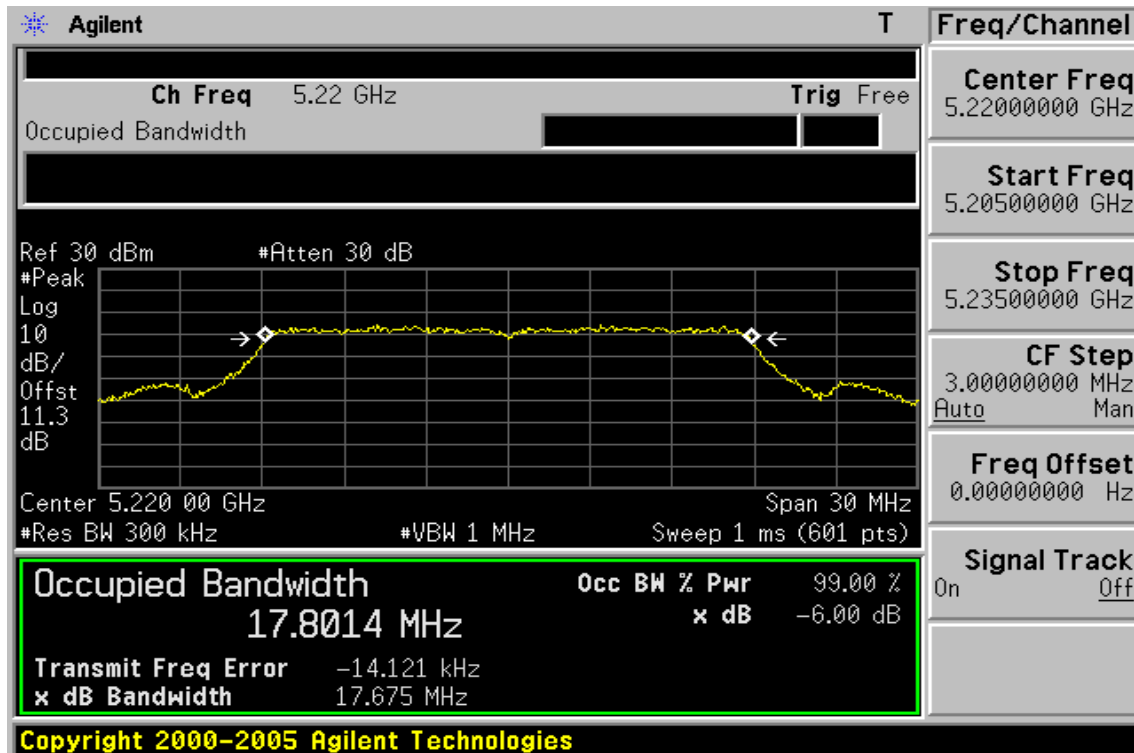
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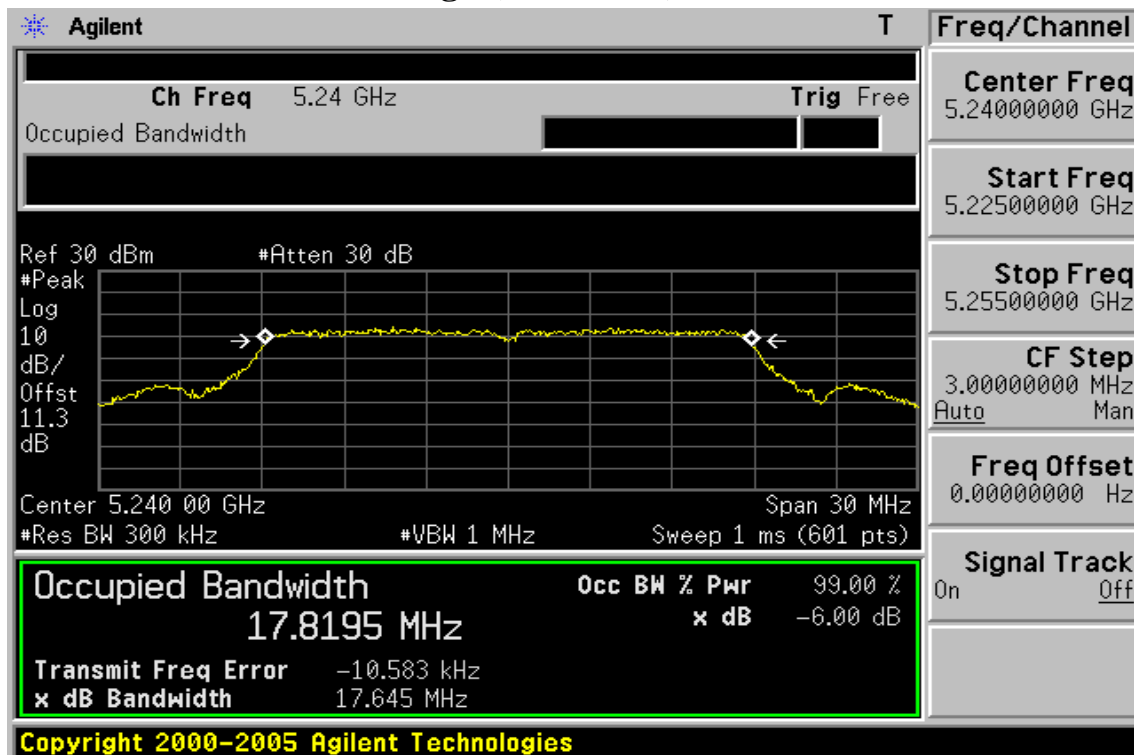
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## 99% Band Width Test Data CH-Mid (5220 MHz)



## 99% Band Width Test Data CH-High (5240 MHz)



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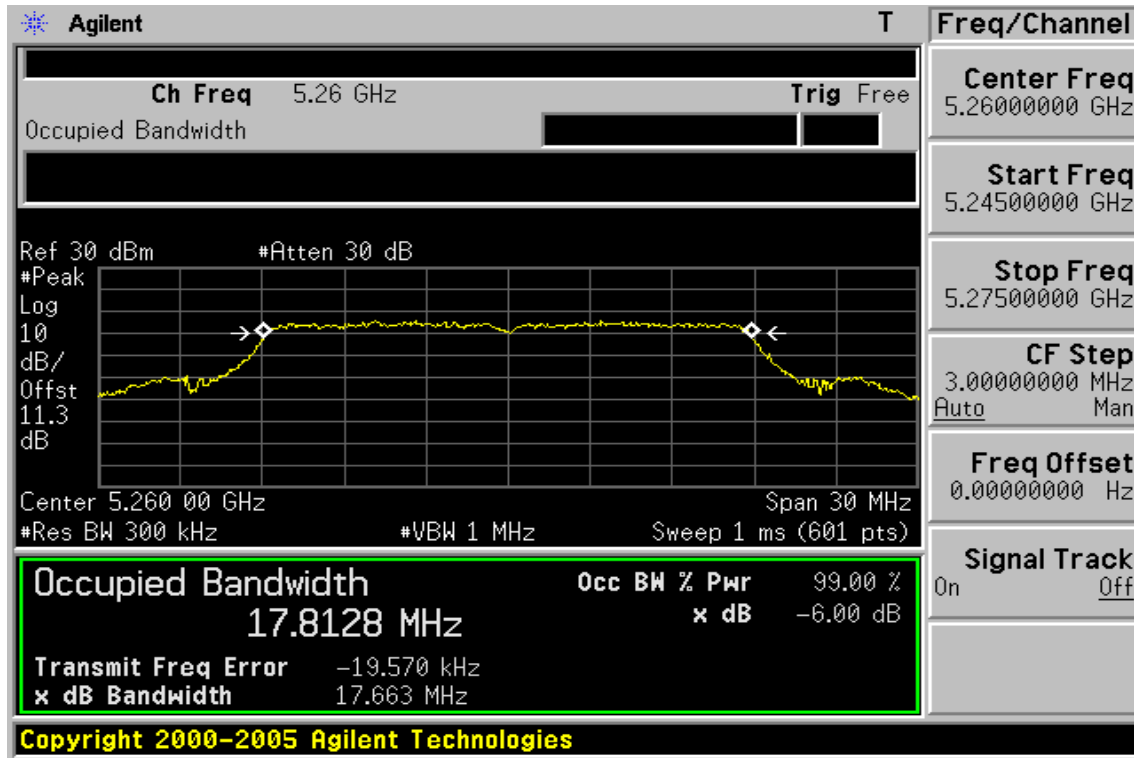
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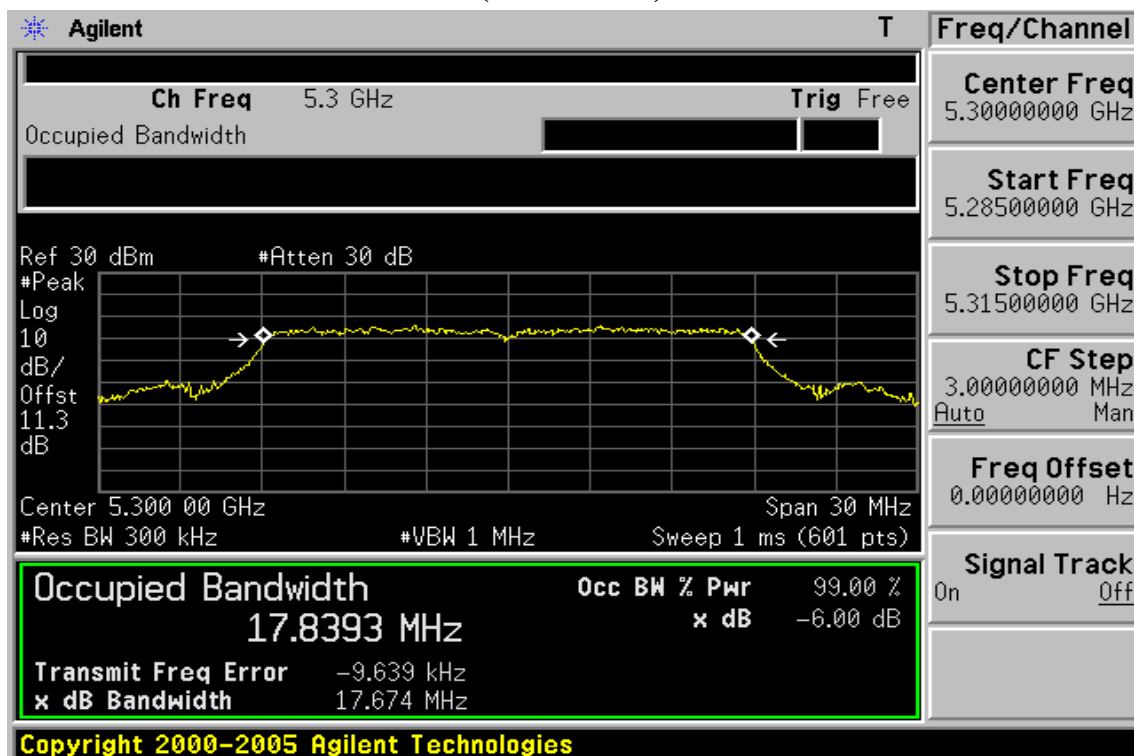


## 802.11n HT20, 5250~5350 MHz

### 99% Band Width Test Data CH-Low (5260 MHz)



### 99% Band Width Test Data CH-Mid (5300 MHz)



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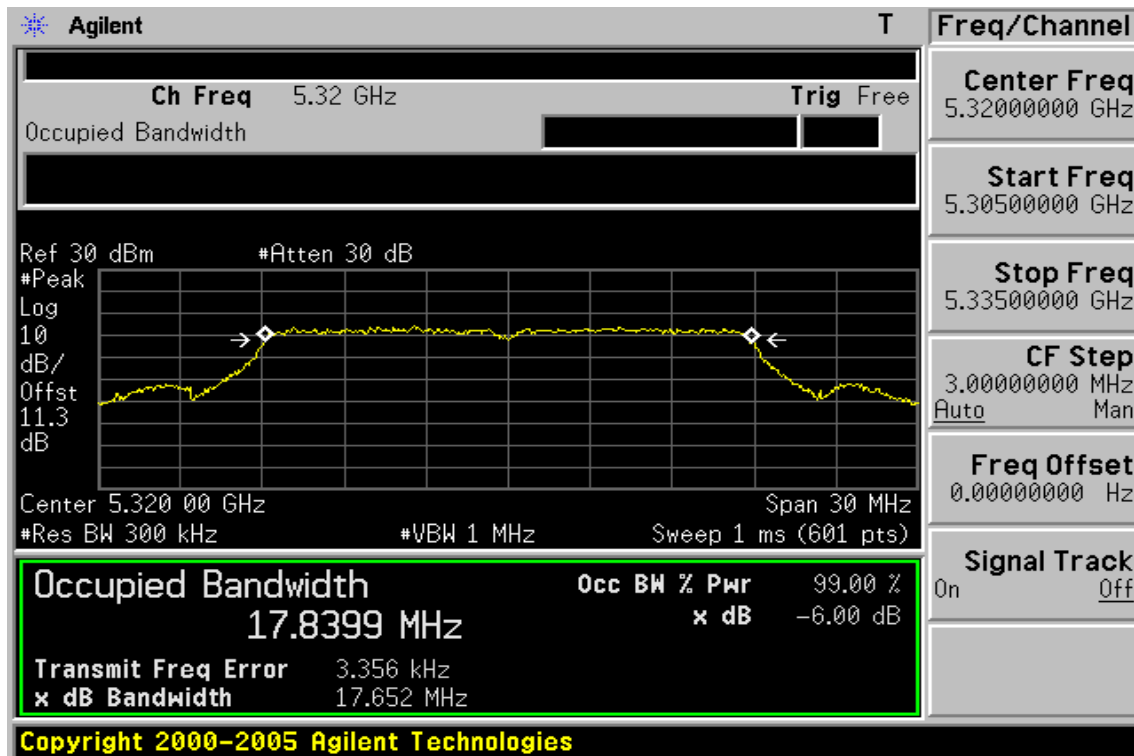
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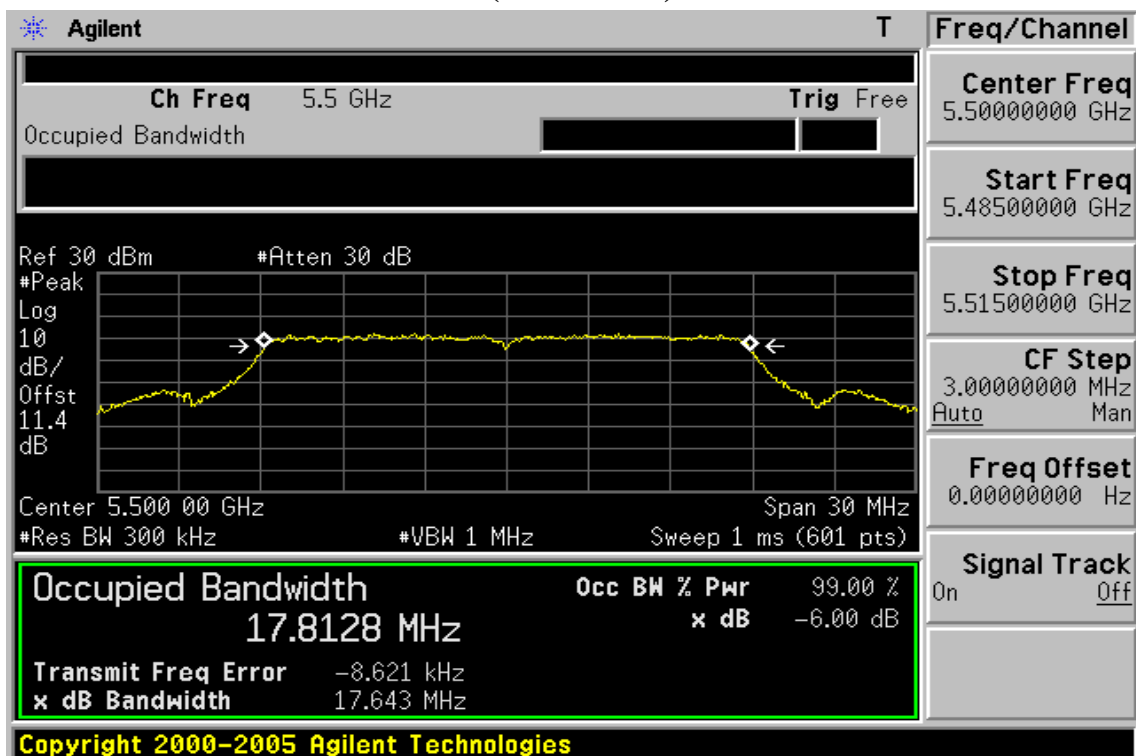


## 99% Band Width Test Data CH-High (5320 MHz)



## 802.11n HT20, 5470~5725 MHz

## 99% Band Width Test Data CH-Low (5500 MHz)



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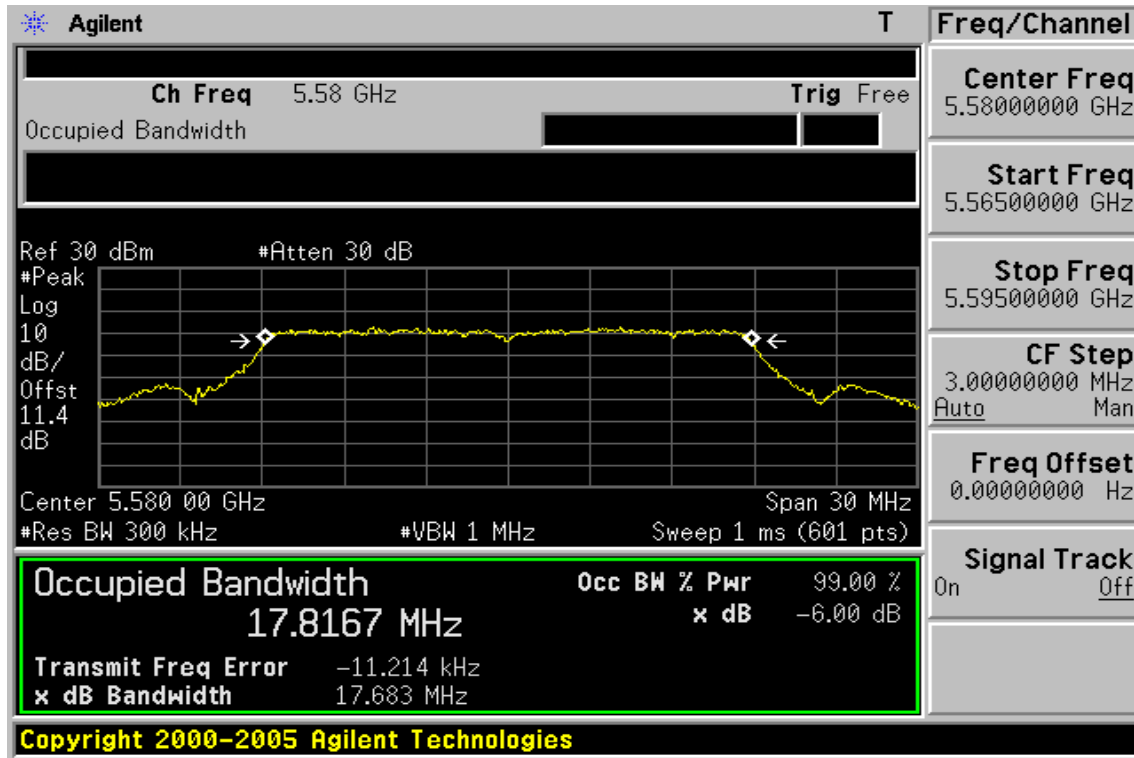
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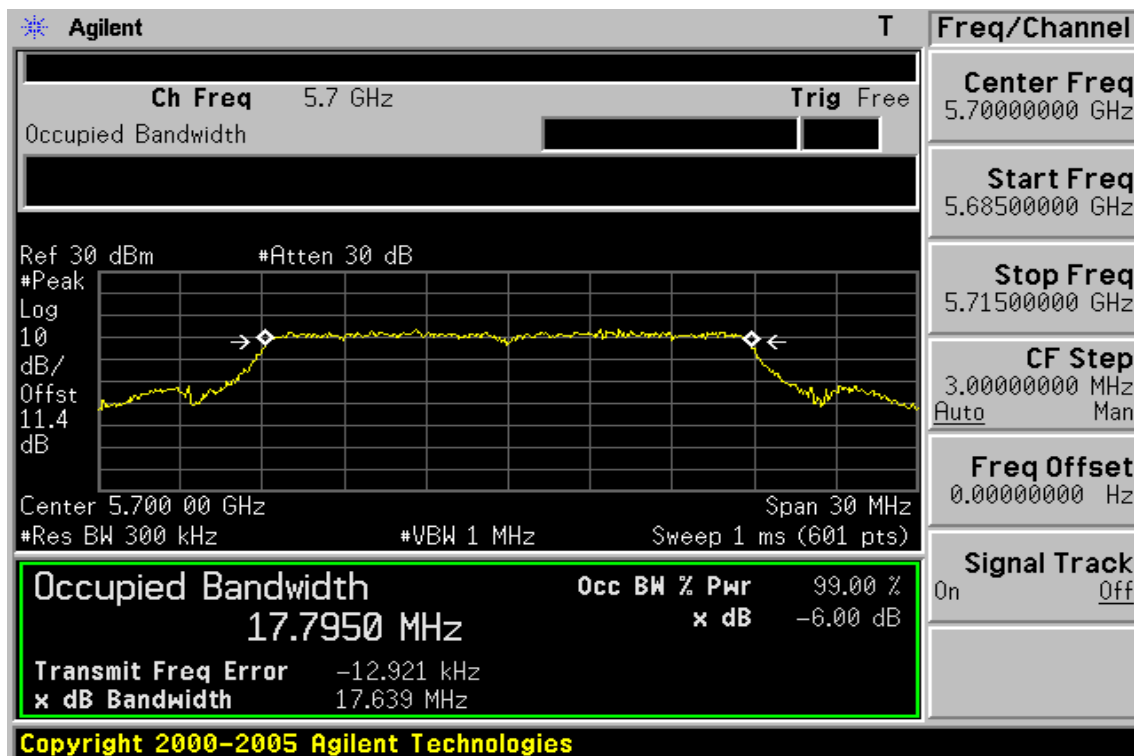
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## 99% Band Width Test Data CH-Mid (5580 MHz)



## 99% Band Width Test Data CH-High (5700 MHz)



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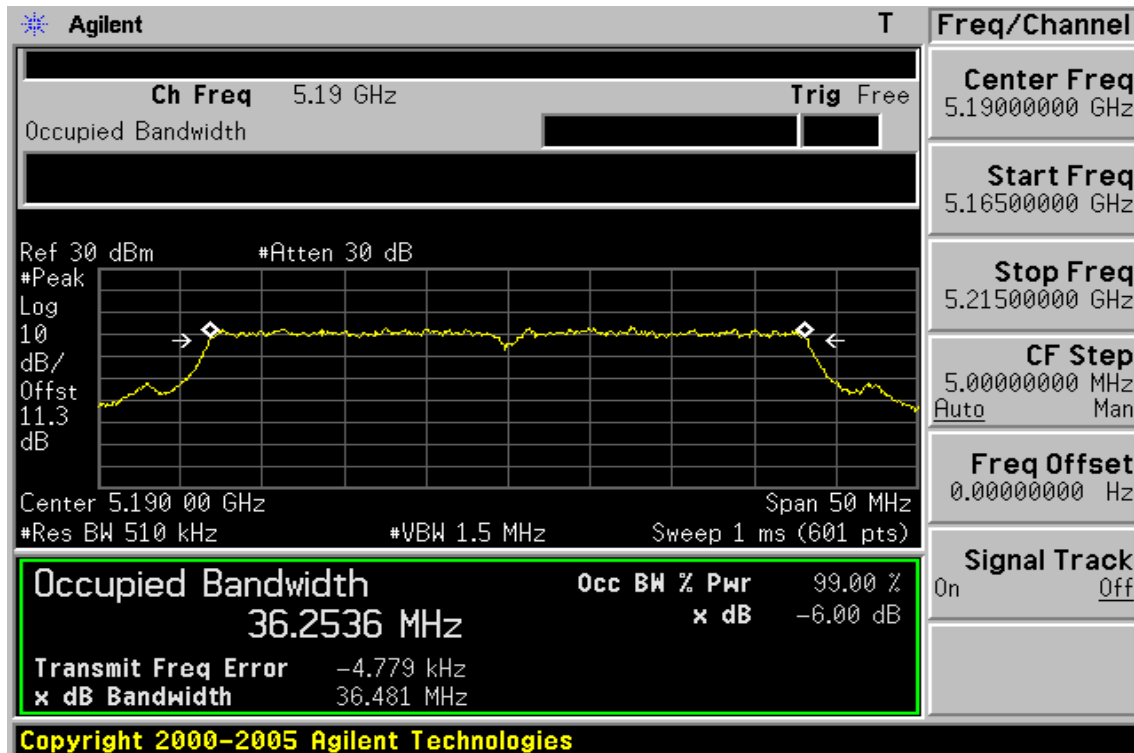
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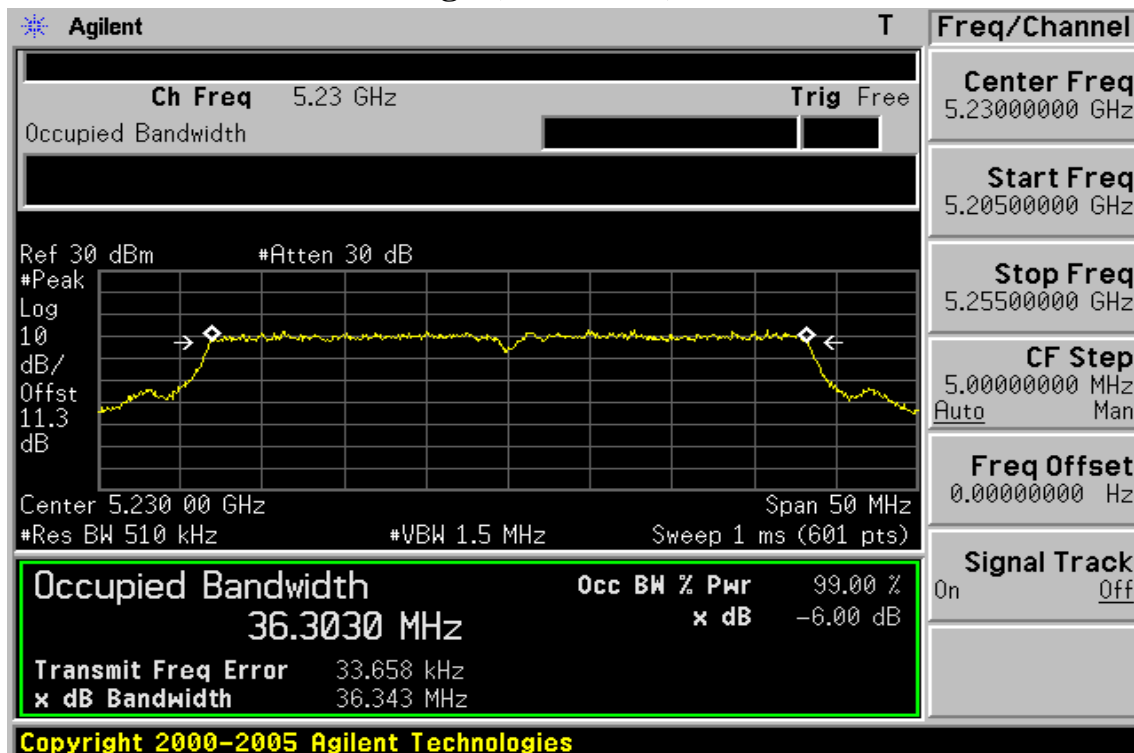
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## 802.11n HT40, 5150~5250 MHz

### 99% Band Width Test Data CH-Low (5190 MHz)



### 99% Band Width Test Data CH-High (5230 MHz)



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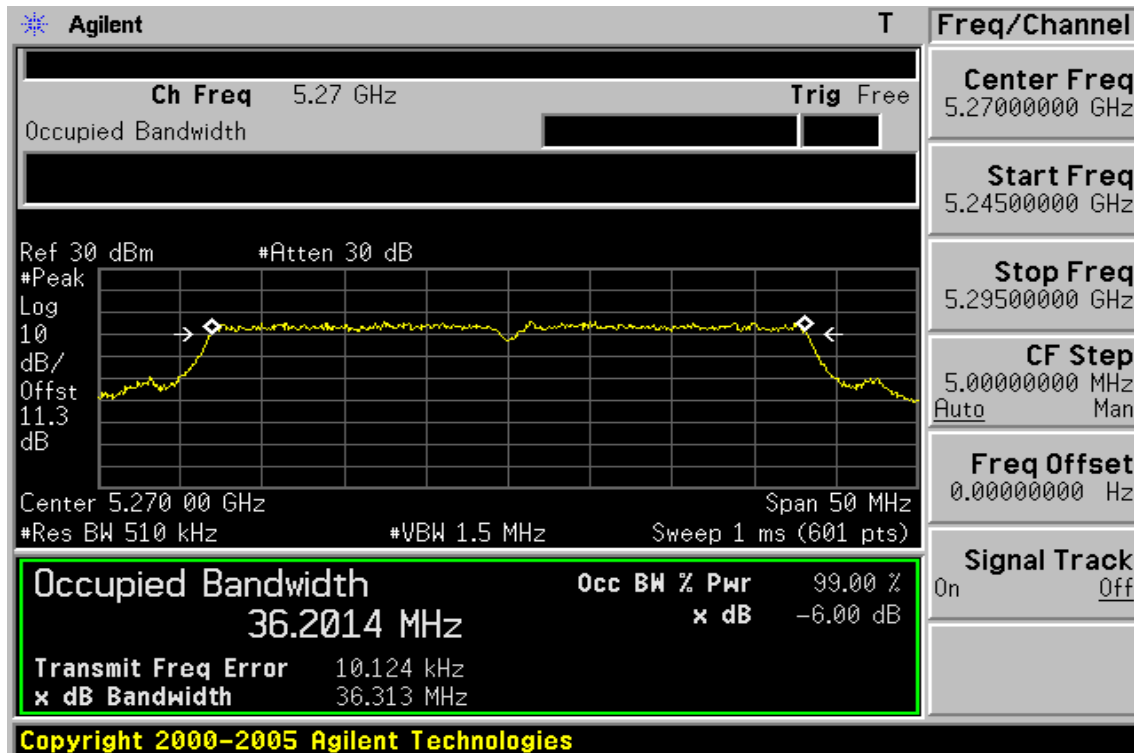
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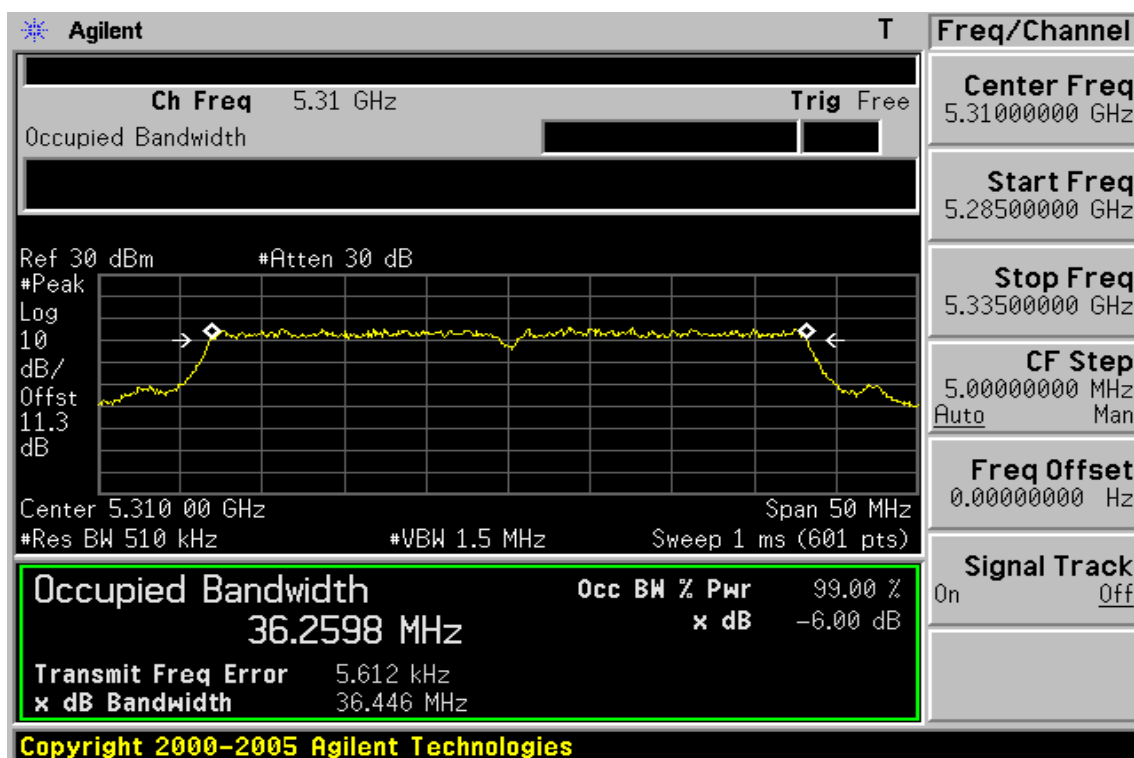
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## 802.11n HT40, 5250~5350 MHz

### 99% Band Width Test Data CH-Low (5270 MHz)



### 99% Band Width Test Data CH-High (5310MHz)



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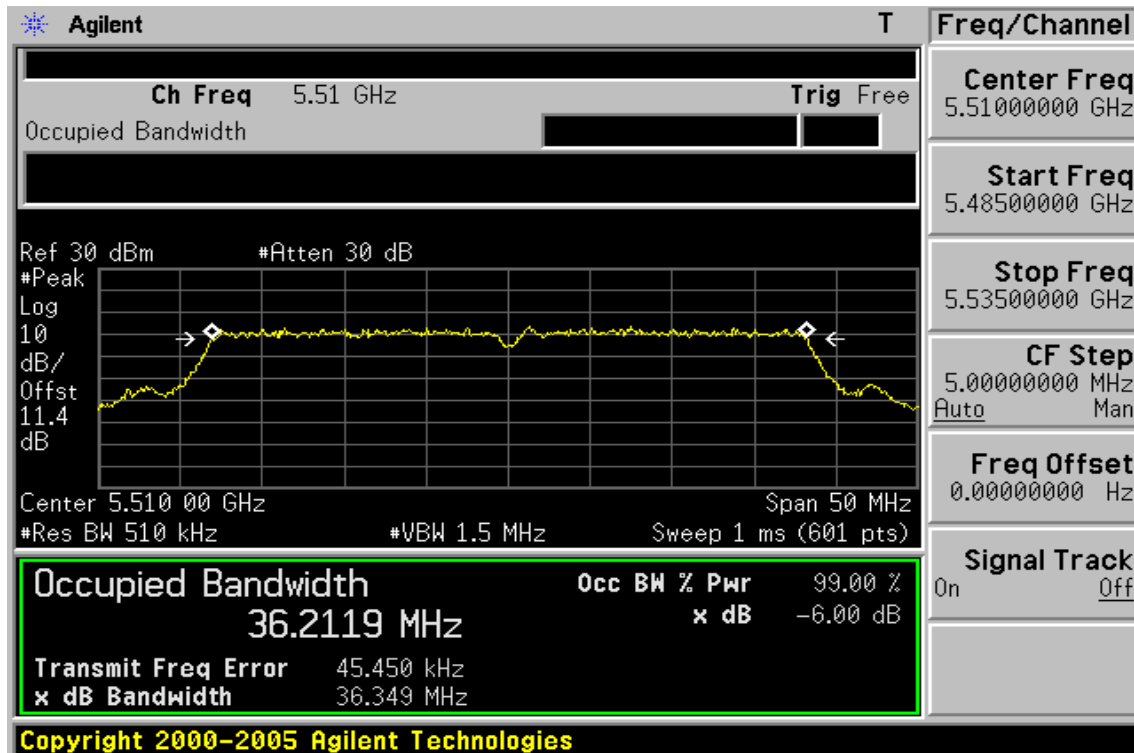
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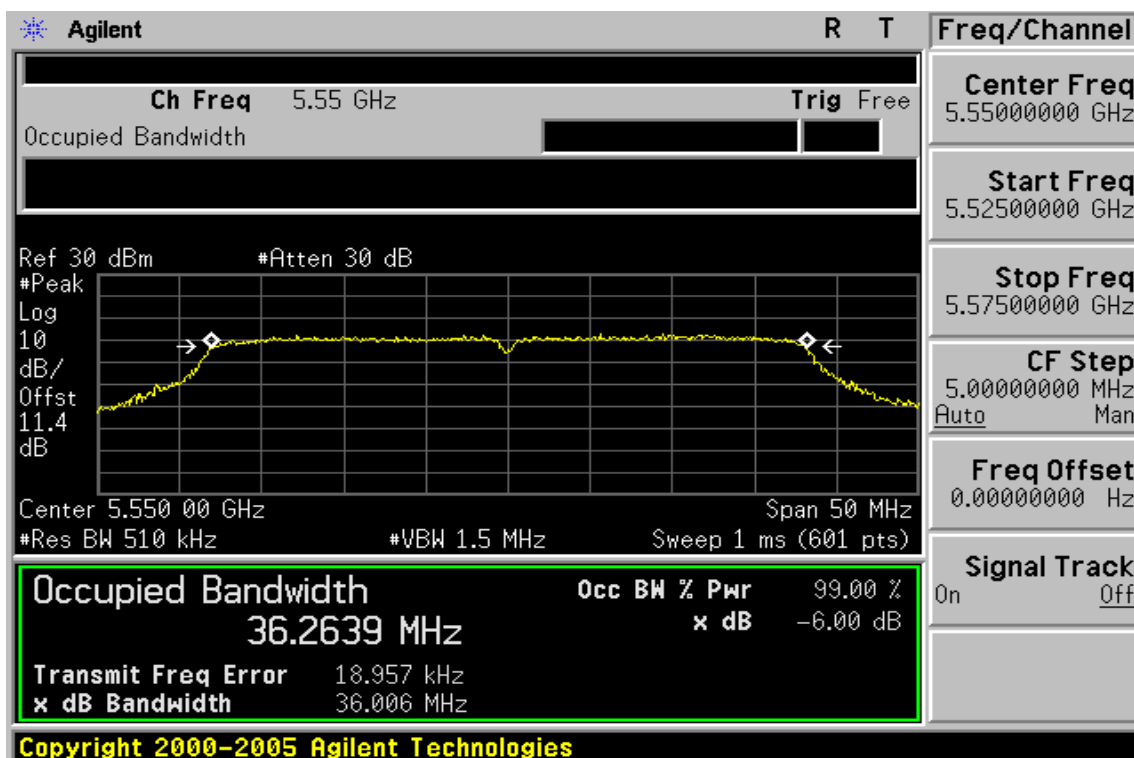
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## 802.11n HT40, 5470~5725 MHz

### 99% Band Width Test Data CH-Low (5510 MHz)



### 99% Band Width Test Data CH-Mid (5550 MHz)



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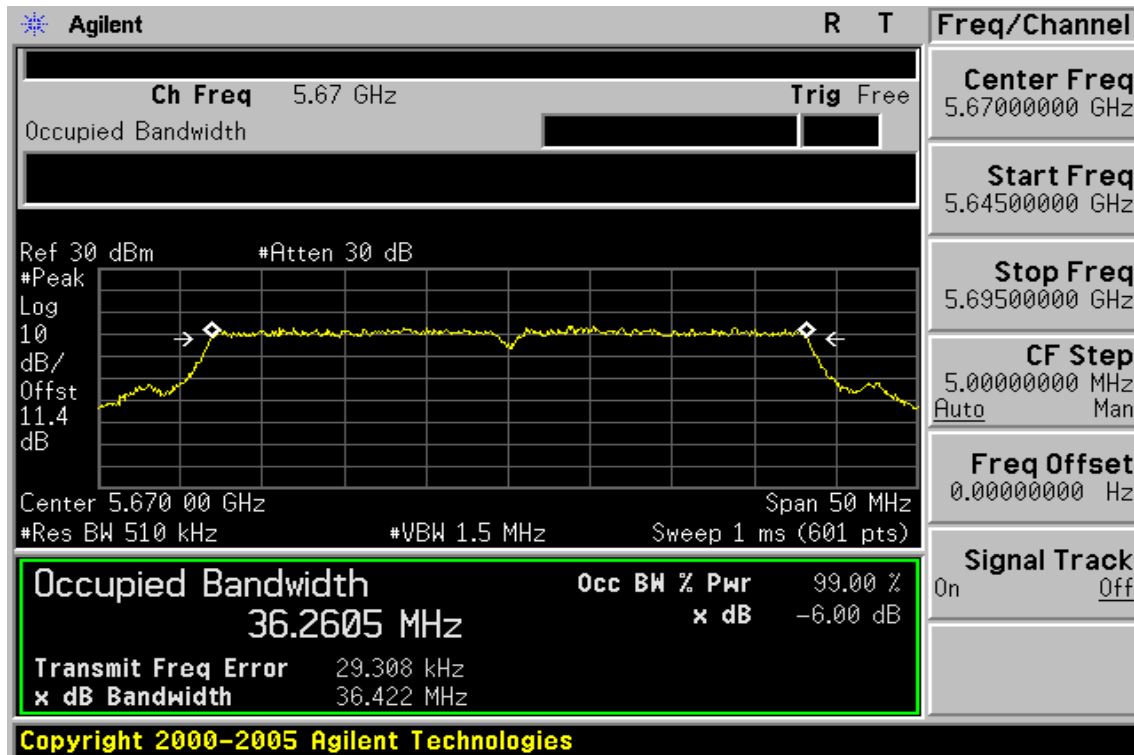
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## 99% Band Width Test Data CH-High (5670 MHz)



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## 8. PEAK OUTPUT POWER MEASUREMENT

### 8.1 Standard Applicable

According to §15.407(a)

1. For the band 5.15-5.25 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 50 mW (17dBm) or  $4 \text{ dBm} + 10 \log B$ .
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 250 mW (24dBm) or  $11 \text{ dBm} + 10 \log B$ .
3. For the band 5.725-5.825 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 1W (30dBm) or  $17 \text{ dBm} + 10 \log B$ .

According to RSS-210 A9.2

1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where  $\theta$  is the angle above the local horizontal plane (of the earth) as shown below:

- (i) -13 dB(W/MHz) for  $0^\circ \leq \theta < 8^\circ$
- (ii)  $-13 - 0.716 (\theta - 8)$  dB(W/MHz) for  $8^\circ \leq \theta < 40^\circ$
- (iii)  $-35.9 - 1.22 (\theta - 40)$  dB(W/MHz) for  $40^\circ \leq \theta \leq 45^\circ$
- (iv) -42 dB(W/MHz) for  $\theta > 45^\circ$

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3. For the band 5725-5825 MHz, the maximum conducted output power shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 17 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or  $23 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Fixed point-to-point systems for this band are permitted to have an e.i.r.p. greater than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain antennas, but not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be permitted to operate at greater than 4 W e.i.r.p, under the same conditions as for point-to-point systems, where B is the 26dB emission bandwidth in MHz.

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

*Note: The antenna gain is greater than 6 dBi in MIMO mode the limit reduce as below:*

*5180-5240 MHz*

*Antenna Gain:  $3.92 \text{ dBi} + 10 \log(2) = 6.93 \text{ dBi}$*

*Limit:  $16.99 \text{ dBm} - (6.93 - 6 \text{ dBi}) = 16.06 \text{ dBm} = 40.36 \text{ mW}$*

*5260-5320 MHz*

*Antenna Gain:  $3.92 \text{ dBi} + 10 \log(2) = 6.93 \text{ dBi}$*

*Limit:  $23.98 \text{ dBm} - (6.93 - 6 \text{ dBi}) = 23.05 \text{ dBm} = 201.84 \text{ mW}$*

*5500-5700 MHz*

*Antenna Gain:  $4.97 \text{ dBi} + 10 \log(2) = 7.98 \text{ dBi}$*

*Limit:  $23.98 \text{ dBm} - (7.98 - 6 \text{ dBi}) = 22 \text{ dBm} = 158.49 \text{ mW}$*

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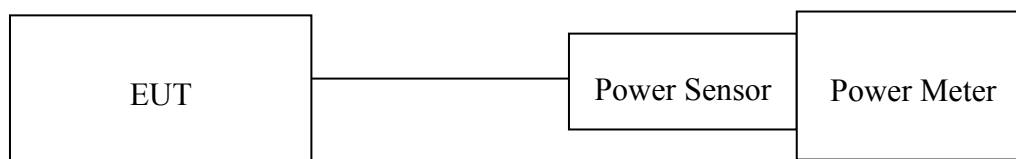
## 8.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
3. Set the offset  $10 \cdot \log(1/x)$  ( $x=0.98$ ), 0.09 approximately.
4. Record the max. reading in average.
5. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.
6. employing step 1 to4 obtaining per-chain basis in MIMO operation, and sum the power in linear to result the output of MIMO operation at frequency of interest (,where MIMO is applicable).

## 8.3 Measurement Equipment Used:

Refer to section 7.3 for details.

## 8.4 Test Set-up:



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## 8.5 Measurement Result

### 802.11a

Cable loss = 0		Average Power Output									
CH	Frequency (MHz)	Data Rate								Required Limit	Required Limit
		6	9	12	18	24	36	48	54	FCC	IC
36	5180	<b>11.31</b>	11.08	10.86	10.63	10.41	10.18	9.96	9.74	50mWatt or 4+10log(B) = 17.26dBm	N/A
44	5220	11.11	10.86	10.61	10.36	10.12	9.87	9.62	9.38	50mWatt or 4+10log(B) = 17.27dBm	N/A
48	5240	11.14	10.89	10.64	10.39	10.15	9.90	9.65	9.41	50mWatt or 4+10log(B) = 17.33dBm	N/A
52	5260	<b>12.65</b>	12.39	12.14	11.89	11.64	11.39	11.14	10.89	250mWatt or 11+10log(B) = 24.32dBm	250mWatt or 11+10log(B) = 24.32dBm
60	5300	12.41	12.18	11.95	11.72	11.49	11.26	11.03	10.80	250mWatt or 11+10log(B) = 24.27dBm	250mWatt or 11+10log(B) = 24.27dBm
64	5320	11.22	11.02	10.83	10.64	10.45	10.26	10.07	9.88	250mWatt or 11+10log(B) = 24.34dBm	250mWatt or 11+10log(B) = 24.34dBm
100	5500	8.78	8.70	8.63	8.56	8.49	8.42	8.35	8.28	250mWatt or 11+10log(B) = 24.42dBm	250mWatt or 11+10log(B) = 24.42dBm
116	5580	9.66	9.42	9.18	8.94	8.70	8.46	8.22	7.99	250mWatt or 11+10log(B) = 24.25dBm	250mWatt or 11+10log(B) = 24.25dBm
140	5700	<b>10.27</b>	10.02	9.78	9.54	9.29	9.05	8.81	8.57	250mWatt or 11+10log(B) = 24.42dBm	250mWatt or 11+10log(B) = 24.42dBm

Where, 50mW = 16.99dBm, and 250mW = 23.98dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT20

Cable loss = 0		Average Power Output (CH 0)									
CH	Frequency (MHz)	Data Rate								Required Limit	Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130.0	144.4	FCC	IC
36	5180	8.64	8.35	8.06	7.78	7.49	7.21	6.92	6.64	40.36mWatt or 4+10log(B) = 18.01dBm	N/A
44	5220	8.42	8.09	7.76	7.44	7.11	6.79	6.46	6.14	40.36mWatt or 4+10log(B) = 17.01dBm	N/A
48	5240	9.24	8.81	8.39	7.97	7.55	7.13	6.71	6.29	40.36mWatt or 4+10log(B) = 17.99dBm	N/A
52	5260	12.49	12.17	11.85	11.54	11.22	10.91	10.59	10.28	201.84mWatt or 11+10log(B) = 25.00dBm	201.84mWatt or 11+10log(B) = 25.00dBm
60	5300	12.20	11.90	11.60	11.30	11.01	10.71	10.41	10.12	201.84mWatt or 11+10log(B) = 24.99dBm	201.84mWatt or 11+10log(B) = 24.99dBm
64	5320	12.22	11.88	11.55	11.22	10.89	10.56	10.23	9.90	201.84mWatt or 11+10log(B) = 25.00dBm	201.84mWatt or 11+10log(B) = 25.00dBm
100	5500	9.92	9.36	8.80	8.24	7.68	7.12	6.56	6.01	158.49mWatt or 11+10log(B) = 24.00dBm	158.49mWatt or 11+10log(B) = 24.00dBm
116	5580	9.69	9.31	8.94	8.56	8.19	7.81	7.44	7.07	158.49mWatt or 11+10log(B) = 24.54dBm	158.49mWatt or 11+10log(B) = 24.54dBm
140	5700	10.08	9.70	9.32	8.94	8.57	8.19	7.81	7.44	158.49mWatt or 11+10log(B) = 25.00dBm	158.49mWatt or 11+10log(B) = 25.00dBm

Where, 50mW = 16.99dBm, and 250mW = 23.98dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT20

Cable loss = 0		Average Power Output (CH 1)									
CH	Frequency (MHz)	Data Rate								Required Limit	Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130.0	144.4	FCC	IC
36	5180	<b>8.07</b>	7.83	7.59	7.36	7.12	6.89	6.65	6.42	40.36mWatt or 4+10log(B) = 18.01dBm	N/A
44	5220	7.87	7.57	7.28	6.99	6.69	6.40	6.11	5.82	40.36mWatt or 4+10log(B) = 17.01dBm	N/A
48	5240	8.06	7.77	7.48	7.19	6.90	6.61	6.32	6.03	40.36mWatt or 4+10log(B) = 17.99dBm	N/A
52	5260	<b>12.09</b>	11.79	11.49	11.20	10.90	10.61	10.31	10.02	201.84mWatt or 11+10log(B) = 25.00dBm	201.84mWatt or 11+10log(B) = 25.00dBm
60	5300	11.63	11.37	11.11	10.85	10.60	10.34	10.08	9.83	201.84mWatt or 11+10log(B) = 24.99dBm	201.84mWatt or 11+10log(B) = 24.99dBm
64	5320	11.88	11.56	11.24	10.92	10.60	10.28	9.96	9.64	201.84mWatt or 11+10log(B) = 25.00dBm	201.84mWatt or 11+10log(B) = 25.00dBm
100	5500	9.72	9.10	8.48	7.86	7.24	6.62	6.00	5.39	158.49mWatt or 11+10log(B) = 24.00dBm	158.49mWatt or 11+10log(B) = 24.00dBm
116	5580	9.65	9.24	8.83	8.42	8.01	7.60	7.19	6.78	158.49mWatt or 11+10log(B) = 24.54dBm	158.49mWatt or 11+10log(B) = 24.54dBm
140	5700	<b>10.01</b>	9.59	9.18	8.77	8.35	7.94	7.53	7.12	158.49mWatt or 11+10log(B) = 25.00dBm	158.49mWatt or 11+10log(B) = 25.00dBm

Where, 50mW = 16.99dBm, and 250mW = 23.98dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT20 MIMO operation

Cable loss = 0		Average Power Output (CH 0 + CH 1)									
CH	Frequency (MHz)	Data Rate								Required Limit	Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130.0	144.4	FCC	IC
36	5180	11.37	11.11	10.84	10.59	10.32	10.06	9.80	9.54	40.36mWatt or 4+10log(B) = 18.01dBm	N/A
44	5220	11.16	10.85	10.54	10.23	9.92	9.61	9.30	8.99	40.36mWatt or 4+10log(B) = 17.01dBm	N/A
48	5240	<b>11.70</b>	11.33	10.97	10.61	10.25	9.89	9.53	9.17	40.36mWatt or 4+10log(B) = 17.99dBm	N/A
52	5260	<b>15.30</b>	14.99	14.68	14.38	14.07	13.77	13.46	13.16	201.84mWatt or 11+10log(B) = 25.00dBm	201.84mWatt or 11+10log(B) = 25.00dBm
60	5300	14.93	14.65	14.37	14.09	13.82	13.54	13.26	12.99	201.84mWatt or 11+10log(B) = 24.99dBm	201.84mWatt or 11+10log(B) = 24.99dBm
64	5320	15.06	14.73	14.41	14.08	13.76	13.43	13.11	12.78	201.84mWatt or 11+10log(B) = 25.00dBm	201.84mWatt or 11+10log(B) = 25.00dBm
100	5500	12.83	12.24	11.65	11.06	10.48	9.89	9.30	8.72	158.49mWatt or 11+10log(B) = 24.00dBm	158.49mWatt or 11+10log(B) = 24.00dBm
116	5580	12.68	12.29	11.90	11.50	11.11	10.72	10.33	9.94	158.49mWatt or 11+10log(B) = 24.54dBm	158.49mWatt or 11+10log(B) = 24.54dBm
140	5700	<b>13.06</b>	12.66	12.26	11.87	11.47	11.08	10.68	10.29	158.49mWatt or 11+10log(B) = 25.00dBm	158.49mWatt or 11+10log(B) = 25.00dBm

Where, 50mW = 16.99dBm, and 250mW = 23.98dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT40

Cable loss = 0		Average Power Output (CH 0)									
CH	Frequency (MHz)	Data Rate								Required Limit	Required Limit
		30	60	90	120	180	240	270	300	FCC	IC
38	5190	9.11	8.68	8.26	7.84	7.42	7.00	6.58	6.16	40.36mWatt or 4+10log(B) = 19.84dBm	N/A
46	5230	9.29	8.87	8.46	8.05	7.64	7.23	6.82	6.41	40.36mWatt or 4+10log(B) = 20.20dBm	N/A
54	5270	11.28	10.85	10.42	9.99	9.57	9.14	8.71	8.29	201.84mWatt or 11+10log(B) = 27.22dBm	201.84mWatt or 11+10log(B) = 27.22dBm
62	5310	11.15	10.73	10.32	9.91	9.49	9.08	8.67	8.26	201.84mWatt or 11+10log(B) = 27.23dBm	201.84mWatt or 11+10log(B) = 27.23dBm
102	5510	8.13	7.71	7.29	6.88	6.46	6.05	5.63	5.22	158.49mWatt or 11+10log(B) = 27.22dBm	158.49mWatt or 11+10log(B) = 27.22dBm
118	5550	9.00	8.55	8.10	7.61	7.20	6.84	6.33	5.93	158.49mWatt or 11+10log(B) = 27.44dBm	158.49mWatt or 11+10log(B) = 27.44dBm
134	5670	9.02	8.60	8.18	7.76	7.34	6.92	6.50	6.08	158.49mWatt or 11+10log(B) = 27.49dBm	158.49mWatt or 11+10log(B) = 27.49dBm

Where, 50mW = 16.99dBm, and 250mW = 23.98dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT40

Cable loss = 0		Average Power Output (CH 1)									
CH	Frequency (MHz)	Data Rate								Required Limit	Required Limit
		30	60	90	120	180	240	270	300	FCC	IC
38	5190	<b>7.84</b>	7.57	7.30	7.04	6.77	6.51	6.24	5.98	<b>40.36mWatt or 4+10log(B) = 19.84dBm</b>	N/A
46	5230	7.65	7.44	7.23	7.03	6.82	6.62	6.41	6.21	<b>40.36mWatt or 4+10log(B) = 20.20dBm</b>	N/A
54	5270	<b>10.54</b>	10.19	9.84	9.49	9.15	8.80	8.45	8.11	<b>201.84mWatt or 11+10log(B) = 27.22dBm</b>	<b>201.84mWatt or 11+10log(B) = 27.22dBm</b>
62	5310	10.16	9.85	9.55	9.25	8.95	8.65	8.35	8.05	<b>201.84mWatt or 11+10log(B) = 27.23dBm</b>	<b>201.84mWatt or 11+10log(B) = 27.23dBm</b>
102	5510	7.82	7.42	7.02	6.62	6.22	5.82	5.42	5.03	<b>158.49mWatt or 11+10log(B) = 27.22dBm</b>	<b>158.49mWatt or 11+10log(B) = 27.22dBm</b>
118	5550	7.86	7.58	7.19	6.99	6.60	6.31	6.05	5.65	<b>158.49mWatt or 11+10log(B) = 27.44dBm</b>	<b>158.49mWatt or 11+10log(B) = 27.44dBm</b>
134	5670	<b>8.50</b>	8.11	7.73	7.35	6.96	6.58	6.20	5.82	<b>158.49mWatt or 11+10log(B) = 27.49dBm</b>	<b>158.49mWatt or 11+10log(B) = 27.49dBm</b>

Where, 50mW = 16.99dBm, and 250mW = 23.98dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT40 MIMO operation

Cable loss = 0		Average Power Output (CH 0 + CH 1)									
CH	Frequency (MHz)	Data Rate								Required Limit	Required Limit
		30	60	90	120	180	240	270	300	FCC	IC
38	5190	11.53	11.17	10.82	10.47	10.12	9.77	9.42	9.08	40.36mWatt or 4+10log(B) = 19.84dBm	N/A
46	5230	<b>11.56</b>	11.22	10.90	10.58	10.26	9.95	9.63	9.32	40.36mWatt or 4+10log(B) = 20.20dBm	N/A
54	5270	<b>13.94</b>	13.54	13.15	12.76	12.38	11.98	11.59	11.21	201.84mWatt or 11+10log(B) = 27.22dBm	201.84mWatt or 11+10log(B) = 27.22dBm
62	5310	13.69	13.32	12.96	12.60	12.24	11.88	11.52	11.17	201.84mWatt or 11+10log(B) = 27.23dBm	201.84mWatt or 11+10log(B) = 27.23dBm
102	5510	10.99	10.58	10.17	9.76	9.35	8.95	8.54	8.14	158.49mWatt or 11+10log(B) = 27.22dBm	158.49mWatt or 11+10log(B) = 27.22dBm
118	5550	11.48	11.10	10.68	10.32	9.92	9.59	9.20	8.80	158.49mWatt or 11+10log(B) = 27.44dBm	158.49mWatt or 11+10log(B) = 27.44dBm
134	5670	<b>11.78</b>	11.37	10.97	10.57	10.16	9.76	9.36	8.96	158.49mWatt or 11+10log(B) = 27.49dBm	158.49mWatt or 11+10log(B) = 27.49dBm

Where, 50mW = 16.99dBm, and 250mW = 23.98dBm

Note: Offset 11.4dB for 5GHz

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### 802.11a

Cable loss = 0		Average Power Output (EIRP)								
CH	Frequency (MHz)	Data Rate								Required Limit
		6	9	12	18	24	36	48	54	
36	5180	<b>15.19</b>	14.96	14.74	14.51	14.29	14.06	13.84	13.62	<b>200mWatt or 10+10log(B) = 22.32dBm</b>
44	5220	15.03	14.78	14.53	14.28	14.04	13.79	13.54	13.30	<b>200mWatt or 10+10log(B) = 22.36dBm</b>
48	5240	15.02	14.77	14.52	14.27	14.03	13.78	13.53	13.29	<b>200mWatt or 10+10log(B) = 22.34dBm</b>
52	5260	<b>16.57</b>	16.31	16.06	15.81	15.56	15.31	15.06	14.81	<b>1.0Watt or 17+10log(B) = 29.36dBm</b>
60	5300	16.33	16.10	15.87	15.64	15.41	15.18	14.95	14.72	<b>1.0Watt or 17+10log(B) = 29.34dBm</b>
64	5320	15.14	14.94	14.75	14.56	14.37	14.18	13.99	13.80	<b>1.0Watt or 17+10log(B) = 29.31dBm</b>
100	5500	13.75	13.67	13.60	13.53	13.46	13.39	13.32	13.25	<b>1.0Watt or 17+10log(B) = 29.33dBm</b>
116	5580	14.63	14.39	14.15	13.91	13.67	13.43	13.19	12.96	<b>1.0Watt or 17+10log(B) = 29.31dBm</b>
140	5700	<b>15.24</b>	14.99	14.75	14.51	14.26	14.02	13.78	13.54	<b>1.0Watt or 17+10log(B) = 29.33dBm</b>

Where, 200mW = 23.dBm, and 250mW = 23.98dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT20

Cable loss = 0		Average Power Output ((EIRP) CH 0)								
CH	Frequency (MHz)	Data Rate								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130.0	144.4	
36	5180	12.56	12.27	11.98	11.70	11.41	11.13	10.84	10.56	200mWatt or 10+10log(B) = 22.51dBm
44	5220	12.34	12.01	11.68	11.36	11.03	10.71	10.38	10.06	200mWatt or 10+10log(B) = 22.50dBm
48	5240	<b>13.16</b>	12.73	12.31	11.89	11.47	11.05	10.63	10.21	200mWatt or 10+10log(B) = 22.51dBm
52	5260	<b>16.41</b>	16.09	15.77	15.46	15.14	14.83	14.51	14.20	1.0Watt or 17+10log(B) = 29.51dBm
60	5300	16.12	15.82	15.52	15.22	14.93	14.63	14.33	14.04	1.0Watt or 17+10log(B) = 29.51dBm
64	5320	16.14	15.80	15.47	15.14	14.81	14.48	14.15	13.82	1.0Watt or 17+10log(B) = 29.51dBm
100	5500	14.89	14.33	13.77	13.21	12.65	12.09	11.53	10.98	1.0Watt or 17+10log(B) = 29.51dBm
116	5580	14.66	14.28	13.91	13.53	13.16	12.78	12.41	12.04	1.0Watt or 17+10log(B) = 29.51dBm
140	5700	<b>15.05</b>	14.67	14.29	13.91	13.54	13.16	12.78	12.41	1.0Watt or 17+10log(B) = 29.50dBm

Where, 200mW = 23dBm, and 1.0W = 30dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT20

Cable loss = 0		Average Power Output (EIRP) (CH 1)								
CH	Frequency (MHz)	Data Rate								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130.0	144.4	
36	5180	<b>11.99</b>	11.75	11.51	11.28	11.04	10.81	10.57	10.34	<b>200mWatt or 10+10log(B) = 22.51dBm</b>
44	5220	11.79	11.49	11.20	10.91	10.61	10.32	10.03	9.74	<b>200mWatt or 10+10log(B) = 22.50dBm</b>
48	5240	11.98	11.69	11.40	11.11	10.82	10.53	10.24	9.95	<b>200mWatt or 10+10log(B) = 22.51dBm</b>
52	5260	<b>16.01</b>	15.71	15.41	15.12	14.82	14.53	14.23	13.94	<b>1.0Watt or 17+10log(B) = 29.51dBm</b>
60	5300	15.55	15.29	15.03	14.77	14.52	14.26	14.00	13.75	<b>1.0Watt or 17+10log(B) = 29.51dBm</b>
64	5320	15.80	15.48	15.16	14.84	14.52	14.20	13.88	13.56	<b>1.0Watt or 17+10log(B) = 29.51dBm</b>
100	5500	14.69	14.07	13.45	12.83	12.21	11.59	10.97	10.36	<b>1.0Watt or 17+10log(B) = 29.51dBm</b>
116	5580	14.62	14.21	13.80	13.39	12.98	12.57	12.16	11.75	<b>1.0Watt or 17+10log(B) = 29.51dBm</b>
140	5700	<b>14.98</b>	14.56	14.15	13.74	13.32	12.91	12.50	12.09	<b>1.0Watt or 17+10log(B) = 29.50dBm</b>

Where, 200mW = 23dBm, and 1.0W = 30dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT20 MIMO operation

Cable loss = 0		Average Power Output (EIRP) (CH 0 + CH 1)								
CH	Frequency (MHz)	Data Rate								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130.0	144.4	
36	5180	15.29	15.03	14.76	14.51	14.24	13.98	13.72	13.46	200mWatt or 10+10log(B) = 22.51dBm
44	5220	15.08	14.77	14.46	14.15	13.84	13.53	13.22	12.91	200mWatt or 10+10log(B) = 22.50dBm
48	5240	<b>15.62</b>	15.25	14.89	14.53	14.17	13.81	13.45	13.09	200mWatt or 10+10log(B) = 22.51dBm
52	5260	<b>19.22</b>	18.91	18.60	18.30	17.99	17.69	17.38	17.08	1.0Watt or 17+10log(B) = 29.51dBm
60	5300	18.85	18.57	18.29	18.01	17.74	17.46	17.18	16.91	1.0Watt or 17+10log(B) = 29.51dBm
64	5320	18.98	18.65	18.33	18.00	17.68	17.35	17.03	16.70	1.0Watt or 17+10log(B) = 29.51dBm
100	5500	17.80	17.21	16.62	16.03	15.45	14.86	14.27	13.69	1.0Watt or 17+10log(B) = 29.51dBm
116	5580	17.65	17.26	16.87	16.47	16.08	15.69	15.30	14.91	1.0Watt or 17+10log(B) = 29.51dBm
140	5700	<b>18.03</b>	17.63	17.23	16.84	16.44	16.05	15.65	15.26	1.0Watt or 17+10log(B) = 29.50dBm

Where, 200mW = 23dBm, and 1.0W = 30dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT40

Cable loss = 0		Average Power Output (EIRP) (CH 0)								
CH	Frequency (MHz)	Data Rate								Required Limit
		30	60	90	120	180	240	270	300	
38	5190	13.03	12.60	12.18	11.76	11.34	10.92	10.50	10.08	200mWatt or $10+10\log(B) = 25.59\text{dBm}$
46	5230	<b>13.21</b>	12.79	12.38	11.97	11.56	11.15	10.74	10.33	200mWatt or $10+10\log(B) = 25.60\text{dBm}$
54	5270	<b>15.20</b>	14.77	14.34	13.91	13.49	13.06	12.63	12.21	1.0Watt or $17+10\log(B) = 32.59\text{dBm}$
62	5310	15.07	14.65	14.24	13.83	13.41	13.00	12.59	12.18	1.0Watt or $17+10\log(B) = 32.59\text{dBm}$
102	5510	13.10	12.68	12.26	11.85	11.43	11.02	10.60	10.19	1.0Watt or $17+10\log(B) = 32.59\text{dBm}$
118	5550	13.97	13.52	13.07	12.58	12.17	11.81	11.30	10.90	1.0Watt or $17+10\log(B) = 32.59\text{dBm}$
134	5670	<b>13.99</b>	13.57	13.15	12.73	12.31	11.89	11.47	11.05	1.0Watt or $17+10\log(B) = 32.59\text{dBm}$

Where, 200mW = 23dBm, and 1.0W = 30dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT40

Cable loss = 0		Average Power Output (EIRP) (CH 1)								
CH	Frequency (MHz)	Data Rate								Required Limit
		30	60	90	120	180	240	270	300	
38	5190	<b>11.76</b>	11.49	11.22	10.96	10.69	10.43	10.16	9.90	<b>200mWatt or 10+10log(B) = 25.59dBm</b>
46	5230	11.57	11.36	11.15	10.95	10.74	10.54	10.33	10.13	<b>200mWatt or 10+10log(B) = 25.60dBm</b>
54	5270	<b>14.46</b>	14.11	13.76	13.41	13.07	12.72	12.37	12.03	<b>1.0Watt or 17+10log(B) = 32.59dBm</b>
62	5310	14.08	13.77	13.47	13.17	12.87	12.57	12.27	11.97	<b>1.0Watt or 17+10log(B) = 32.59dBm</b>
102	5510	12.79	12.39	11.99	11.59	11.19	10.79	10.39	10.00	<b>1.0Watt or 17+10log(B) = 32.59dBm</b>
118	5550	12.83	12.55	12.16	11.96	11.57	11.28	11.02	10.62	<b>1.0Watt or 17+10log(B) = 32.59dBm</b>
134	5670	<b>13.47</b>	13.08	12.70	12.32	11.93	11.55	11.17	10.79	<b>1.0Watt or 17+10log(B) = 32.59dBm</b>

Where, 200mW = 23dBm, and 250mW = 30dBm

Note: Offset 11.4dB for 5GHz

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### 802.11n HT40 MIMO operation

Cable loss = 0		Average Power Output (EIRP) (CH 0 + CH 1)								
CH	Frequency (MHz)	Data Rate								Required Limit
		30	60	90	120	180	240	270	300	
38	5190	15.45	15.09	14.74	14.39	14.04	13.69	13.34	13.00	200mWatt or 10+10log(B) = 25.59dBm
46	5230	15.48	15.14	14.82	14.50	14.18	13.87	13.55	13.24	200mWatt or 10+10log(B) = 25.60dBm
54	5270	17.86	17.46	17.07	16.68	16.30	15.90	15.51	15.13	1.0Watt or 17+10log(B) = 32.59dBm
62	5310	17.61	17.24	16.88	16.52	16.16	15.80	15.44	15.09	1.0Watt or 17+10log(B) = 32.59dBm
102	5510	15.96	15.55	15.14	14.73	14.32	13.92	13.51	13.11	1.0Watt or 17+10log(B) = 32.59dBm
118	5550	16.45	16.07	15.65	15.29	14.89	14.56	14.17	13.77	1.0Watt or 17+10log(B) = 32.59dBm
134	5670	16.75	16.34	15.94	15.54	15.13	14.73	14.33	13.93	1.0Watt or 17+10log(B) = 32.59dBm

Where, 200mW = 23dBm, and 1.0W = 30dBm

Note: Offset 11.4dB for 5GHz

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## 9. PEAK POWER SPECTRAL DENSITY

### 9.1 Standard Applicable

According to §15.407(a)

1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band.
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.
3. For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

*Note: The antenna gain is greater than 6 dBi in MIMO mode the limit reduce as below:*

*5180-5240 MHz,*

*Antenna Gain:  $3.92 \text{ dBi} + 10 \log (2) = 6.93 \text{ dBi}$*

*Limit:  $4 \text{ dBm} - (6.93 - 6 \text{ dBi}) = 3.07 \text{ dBm}$*

*5260-5320 MHz,*

*Antenna Gain:  $3.92 \text{ dBi} + 10 \log (2) = 6.93 \text{ dBi}$*

*Limit:  $11 \text{ dB} - (6.93 - 6 \text{ dBi}) = 10.07 \text{ dBm}$*

*5500-5700 MHz,*

*Antenna Gain:  $4.97 \text{ dBi} + 10 \log (2) = 7.98 \text{ dBi}$*

*Limit:  $11 \text{ dB} - (7.98 - 6 \text{ dBi}) = 9.02 \text{ dBm}$*

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According to RSS-210 A9.2

1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or

$17 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where  $\theta$  is the angle above the local horizontal plane (of the earth) as shown below:

- (i) -13 dB(W/MHz) for  $0^\circ \leq \theta < 8^\circ$
- (ii)  $-13 - 0.716 (\theta - 8)$  dB(W/MHz) for  $8^\circ \leq \theta < 40^\circ$
- (iii)  $-35.9 - 1.22 (\theta - 40)$  dB(W/MHz) for  $40^\circ \leq \theta \leq 45^\circ$
- (iv) -42 dB(W/MHz) for  $\theta > 45^\circ$

3. For the band 5725-5825 MHz, the maximum conducted output power shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 17 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or  $23 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Fixed point-to-point systems for this band are permitted to have an e.i.r.p. greater than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain antennas, but not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be permitted to operate at greater than 4 W e.i.r.p., under the same conditions as for point-to-point systems.

B is the 99% emission bandwidth in MHz.

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## 9.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
3. Set RBW=1MHz, VBW=3MHz, Span=50MHz/80MHz (Base Mode), where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging.
4. User the cursor on spectrum to peak search the highest level of trace.
5. Record the max. Reading.
6. For MIMO mode, add the appropriate offset.
7. Repeat above procedures until all frequency measured were complete.

## 9.3 Measurement Equipment Used:

Refer to section 7.3 for details.

*Remark: as per KDB 662291, MIMO mode is accomplished by the addition of  $10 \log(N)$ , where  $N=2$  as the simultaneous emission of PSD*

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## 9.4 Measurement Result

802.11a, 5150~5250 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5180	-2.54	3.07	-5.61
5220	-4.64	3.07	-7.71
5240	-3.69	3.07	-6.76

802.11a, 5250~5350 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5260	-2.54	10.07	-12.61
5300	-2.33	10.07	-12.40
5320	-4.91	10.07	-14.98

802.11a, 5470~5725 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5500	-3.67	9.02	-12.69
5580	-6.18	9.02	-15.20
5700	-4.34	9.02	-13.36

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802.11n HT20, 5150~5250 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5180	-6.55	3.07	-9.62
5220	-4.51	3.07	-7.58
5240	-3.98	3.07	-7.05

802.11n HT20, 5250~5350 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5260	-3.74	10.07	-13.81
5300	-1.11	10.07	-11.18
5320	-1.24	10.07	-11.31

802.11n HT20, 5470~5725 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5500	-5.03	9.02	-14.05
5580	-4.48	9.02	-13.50
5700	-3.18	9.02	-12.20

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802.11n HT40, 5150~5250 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5190	-10.51	3.07	-13.58
5230	-8.25	3.07	-11.32

802.11n HT40, 5250~5350 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5270	-10.34	10.07	-20.41
5310	-10.21	10.07	-20.28

802.11n HT40, 5470~5725 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5510	-12.23	9.02	-21.25
5550	-14.29	9.02	-23.31
5670	-11.72	9.02	-20.74

*Note: Offset 11.4dB for 5GHz*

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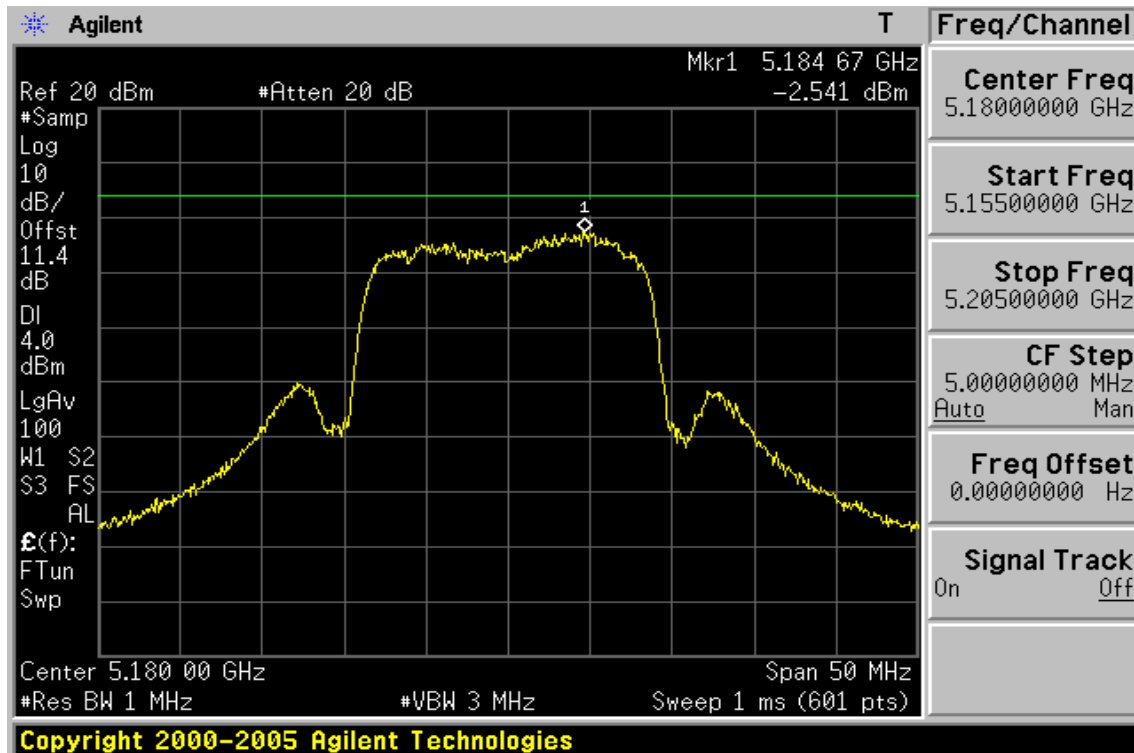
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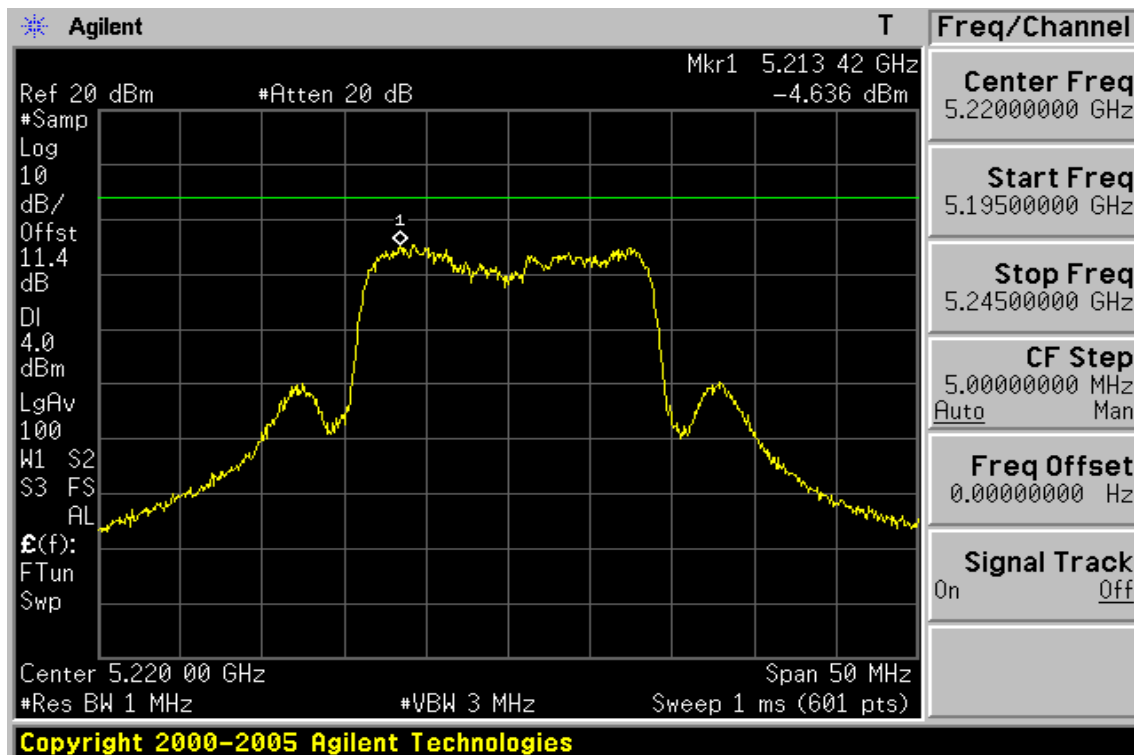
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## 802.11a, 5150~5250 MHz

### Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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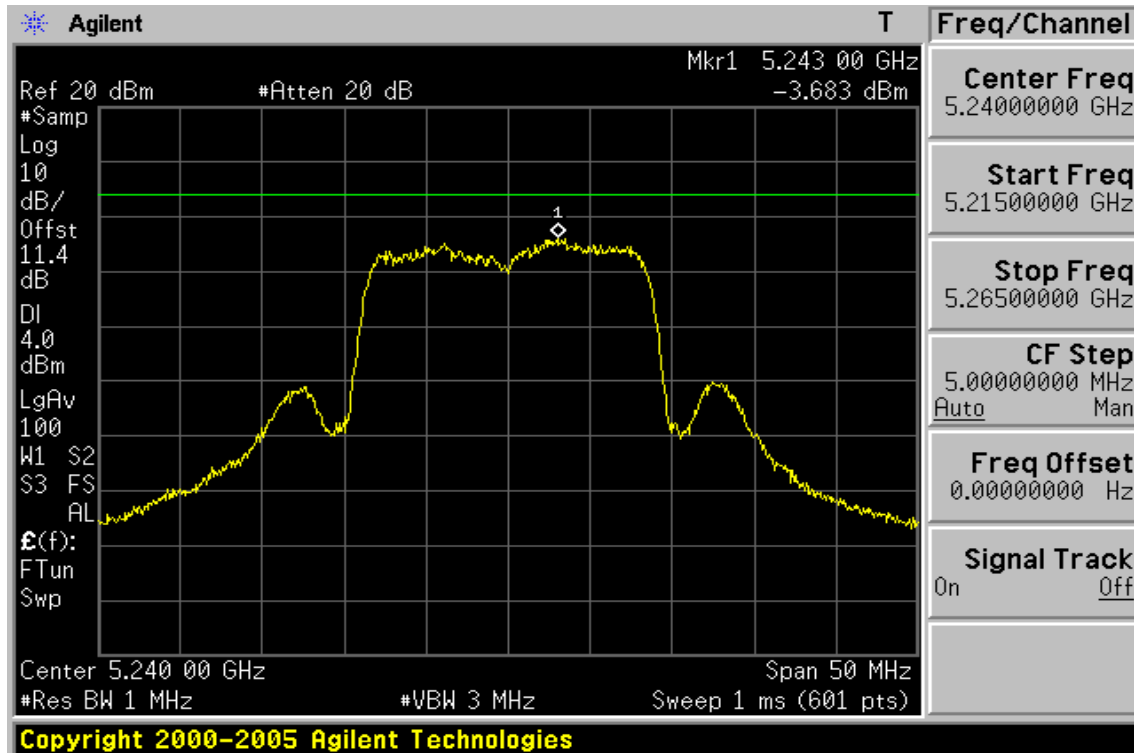
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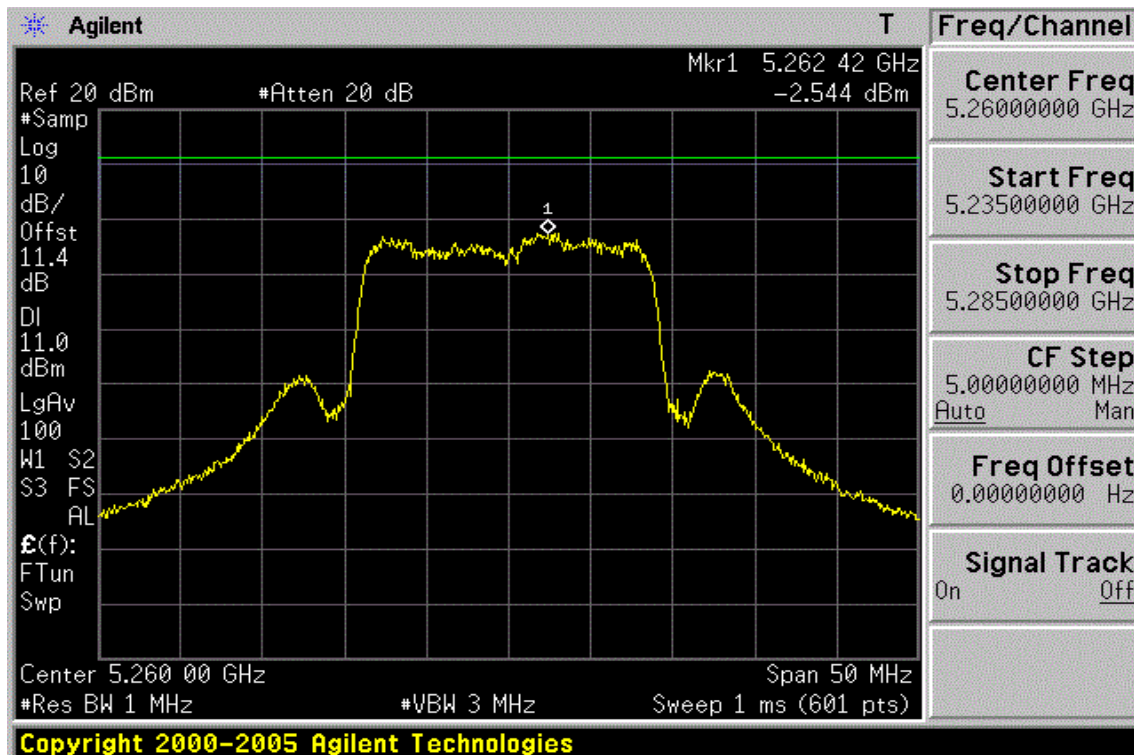


## Peak Power Spectral Density Data Plot (CH High 5240 MHz)



## 802.11a, 5250~5350 MHz

## Peak Power Spectral Density Data Plot (CH Low 5260 MHz)



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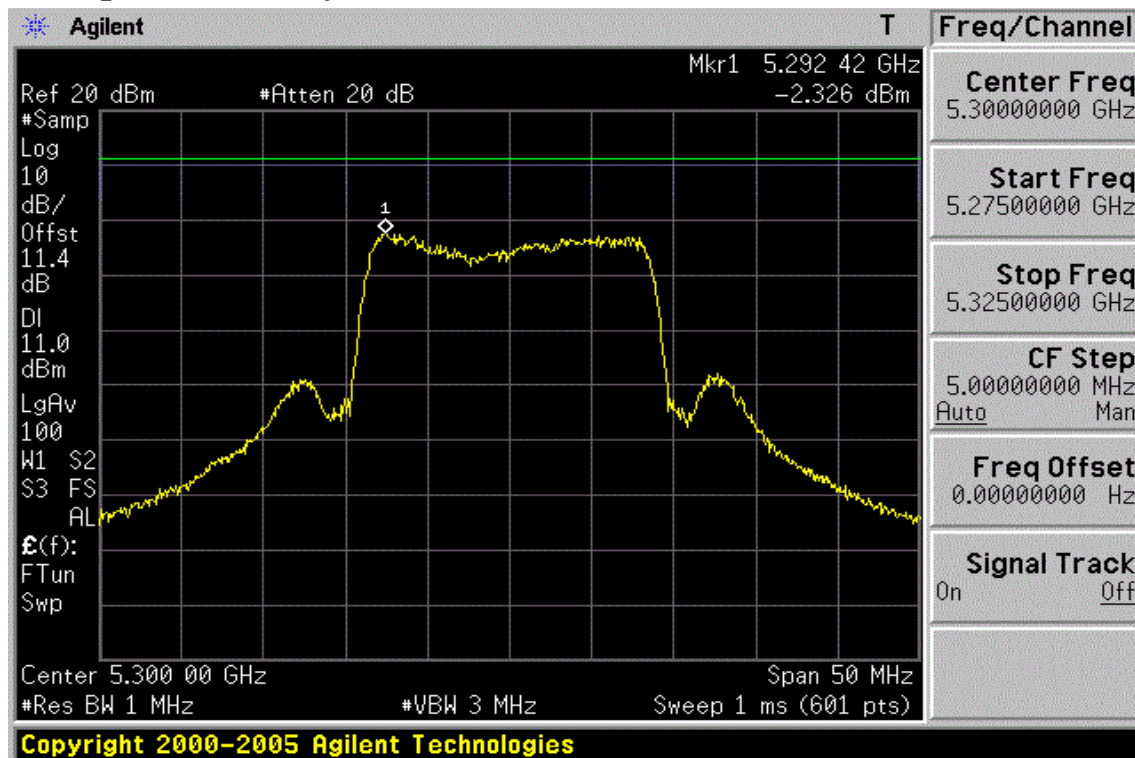
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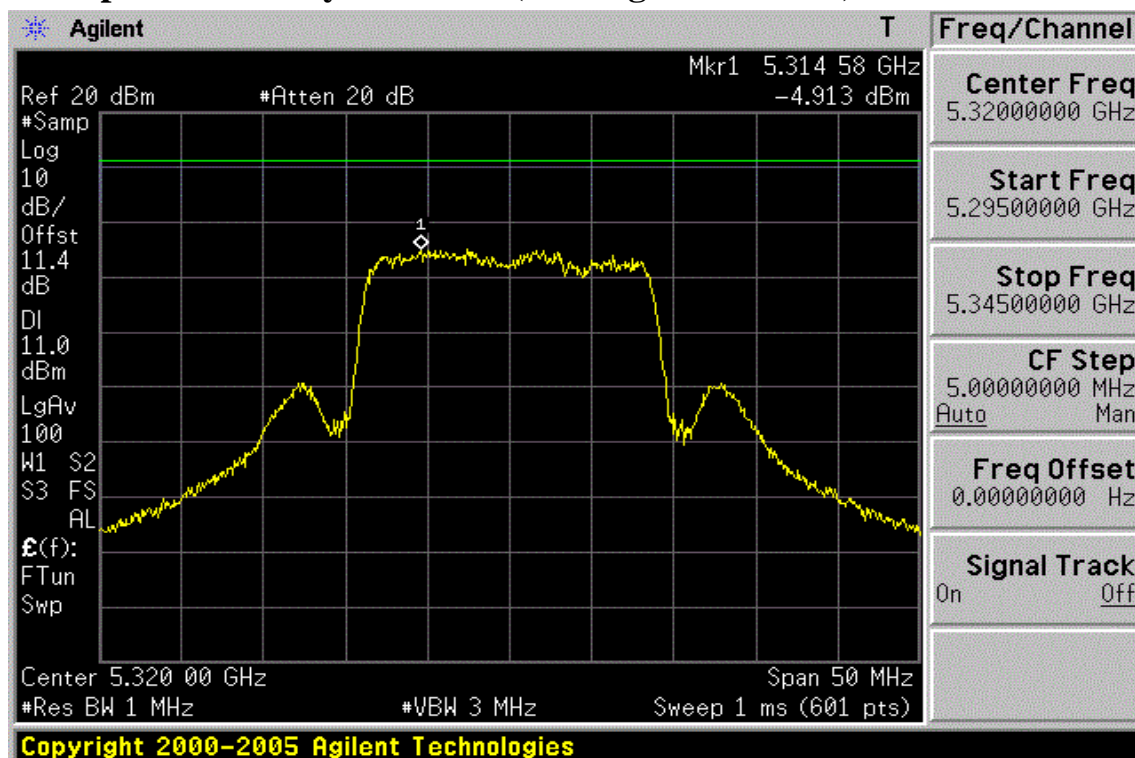
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## Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



## Peak Power Spectral Density Data Plot (CH High 5320 MHz)



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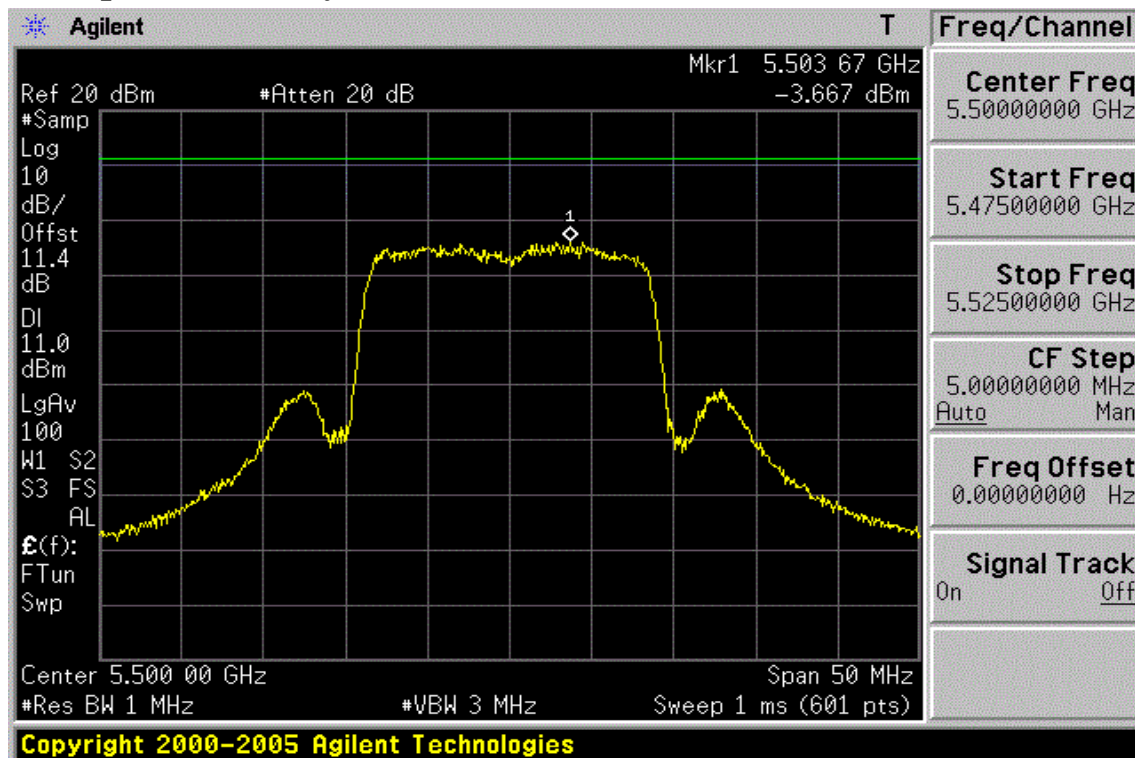
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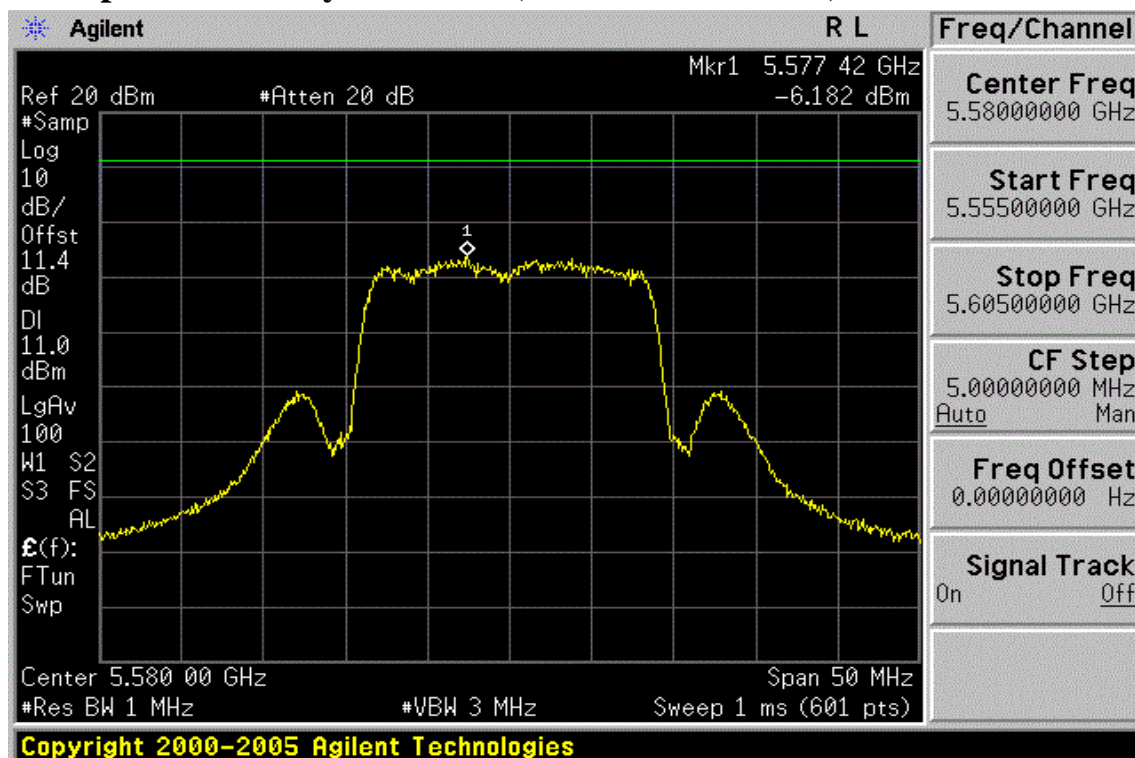
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## 802.11a, 5470~5725 MHz

### Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5580 MHz)



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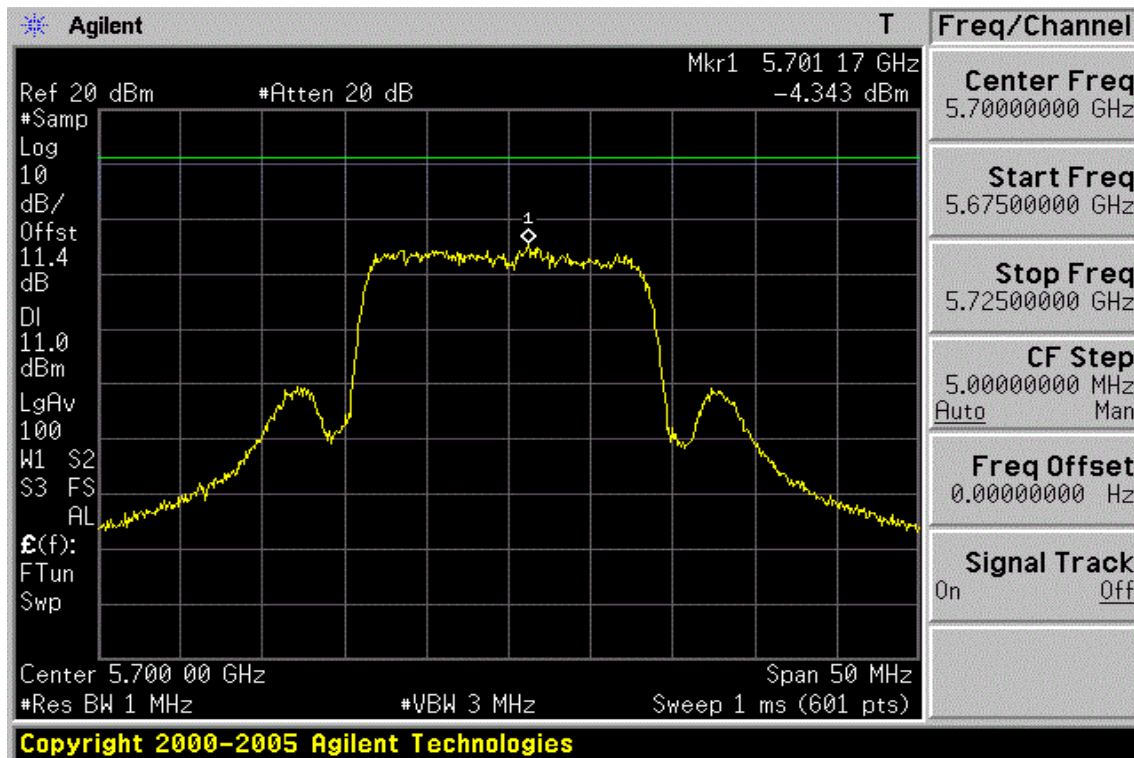
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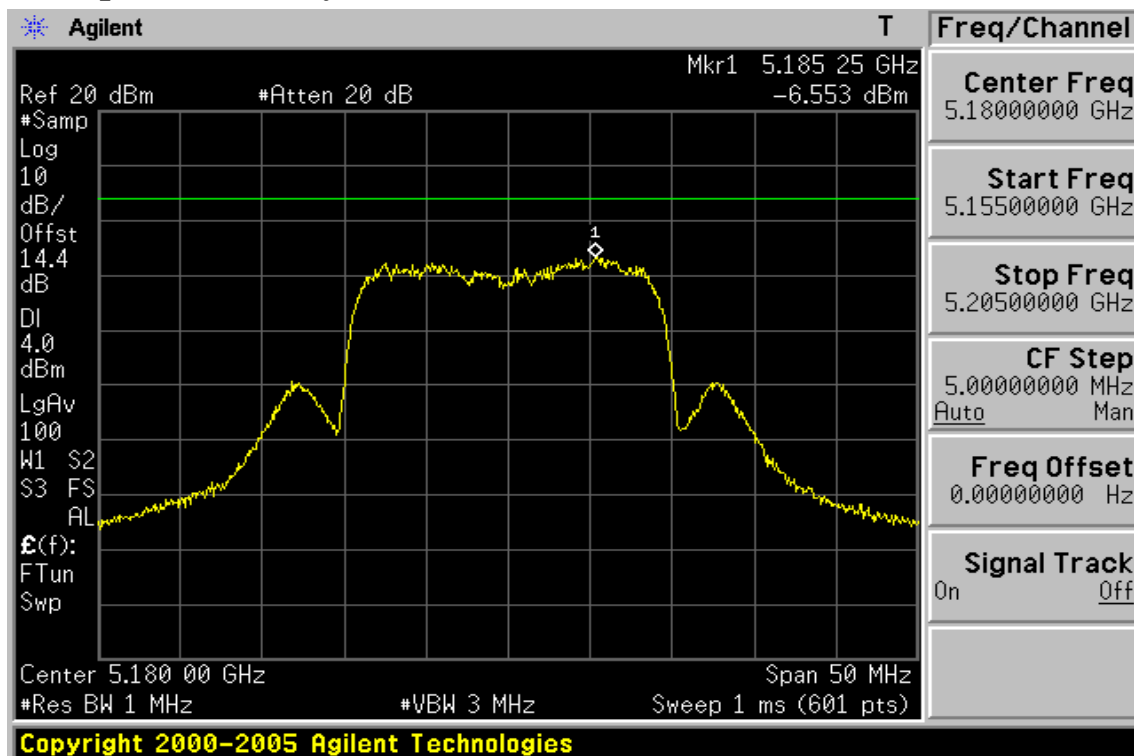


## Peak Power Spectral Density Data Plot (CH High 5700 MHz)



## 802.11n HT20, 5150~5250 MHz

## Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



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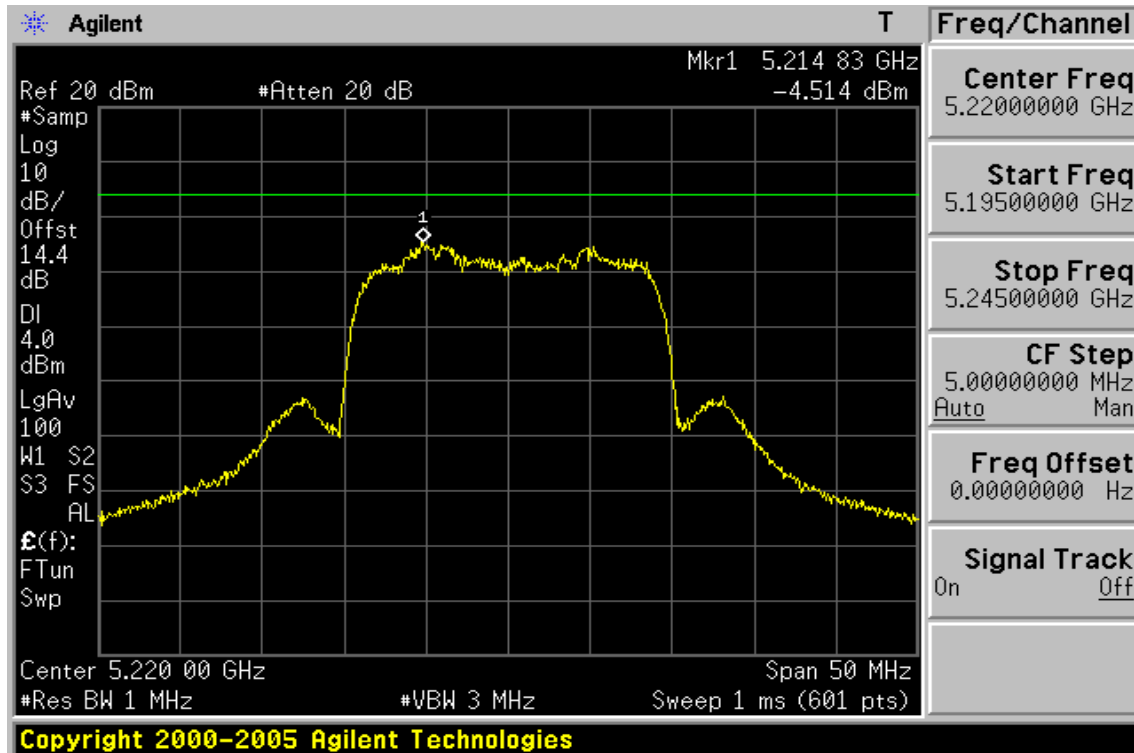
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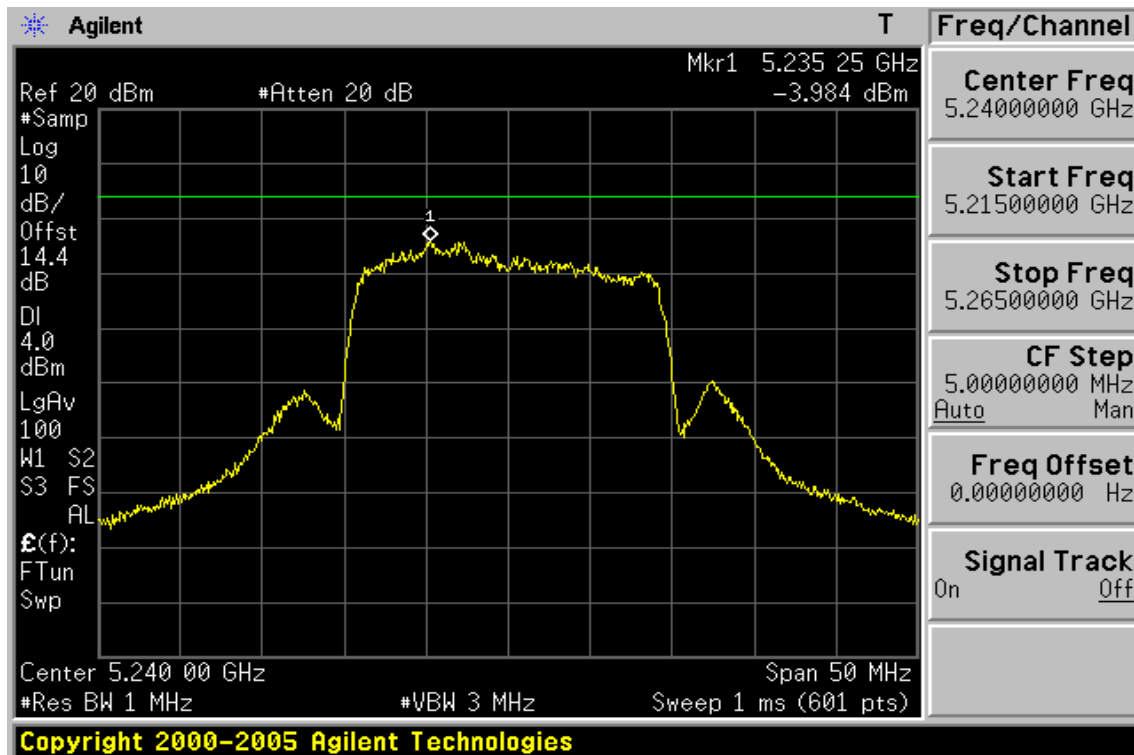
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## Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



## Peak Power Spectral Density Data Plot (CH High 5240 MHz)



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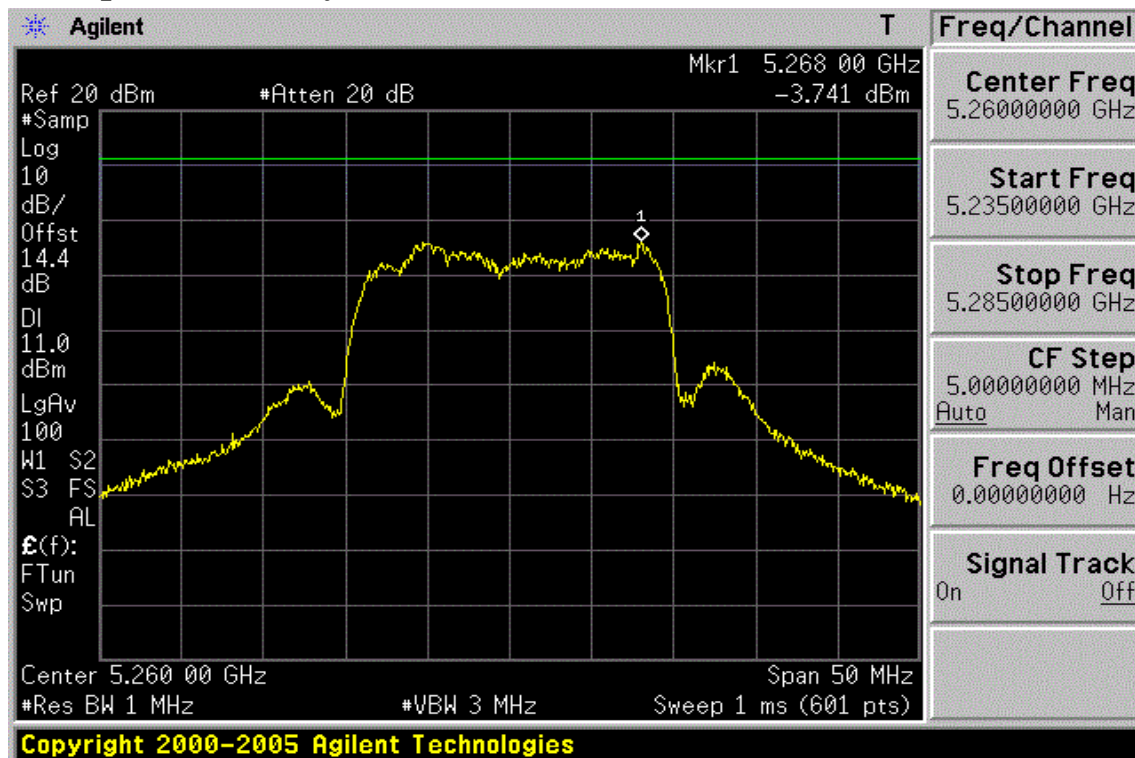
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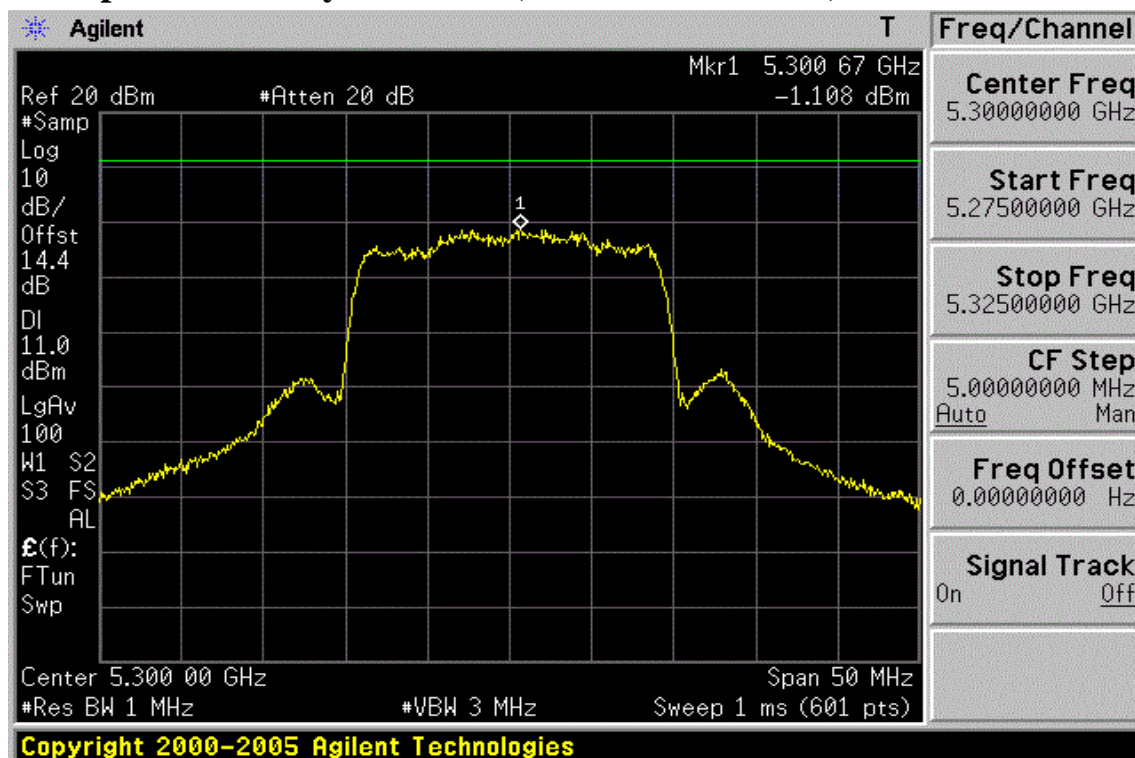


## 802.11n HT20, 5250~5350 MHz

### Peak Power Spectral Density Data Plot (CH Low 5260MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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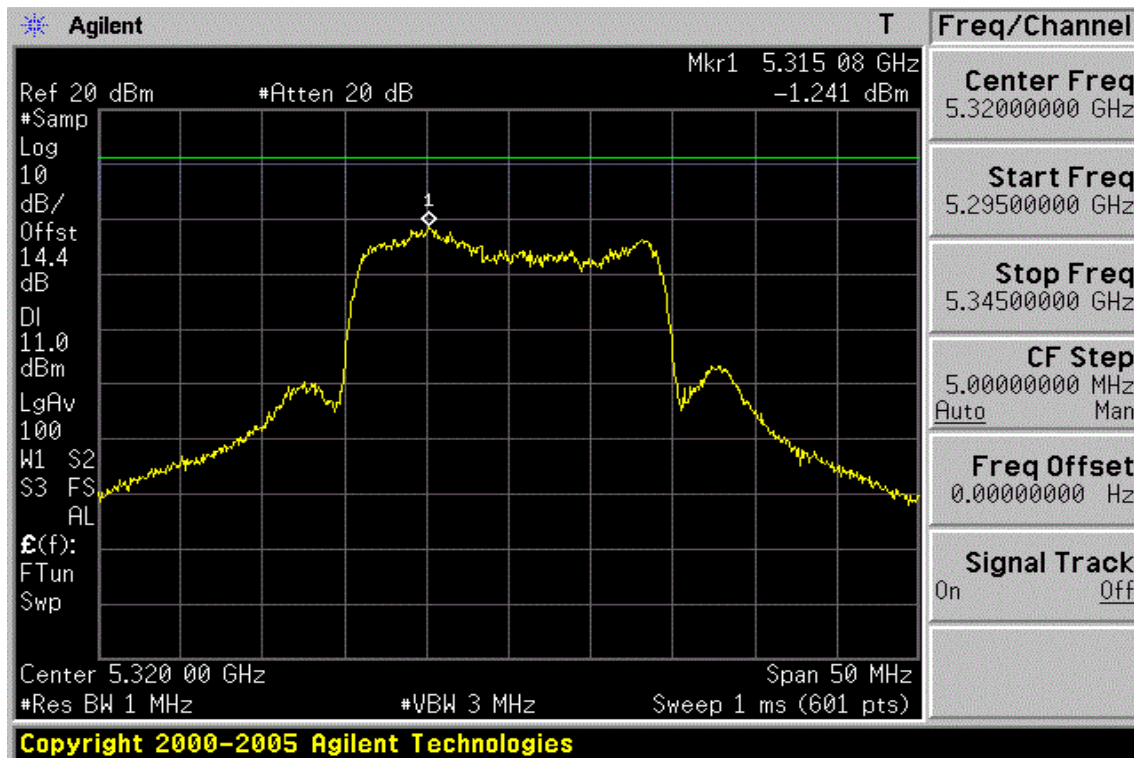
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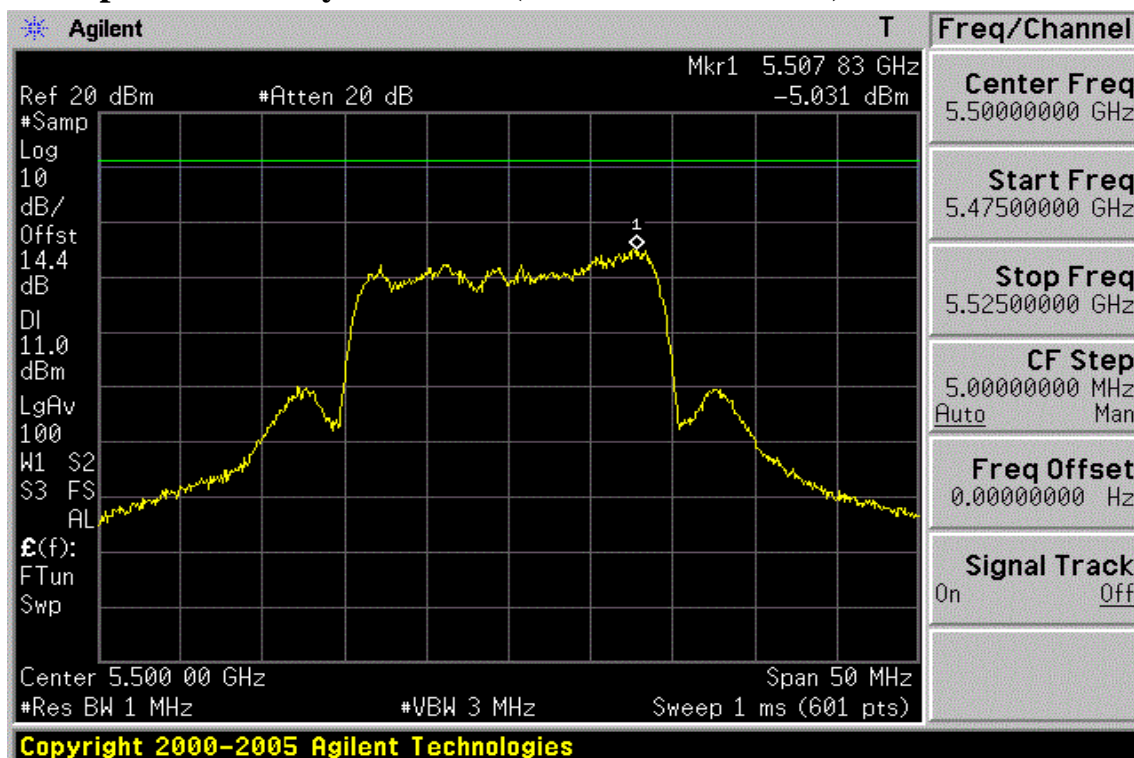
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## Peak Power Spectral Density Data Plot (CH High 5320 MHz)



## 802.11n HT20, 5470~5725 MHz

## Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



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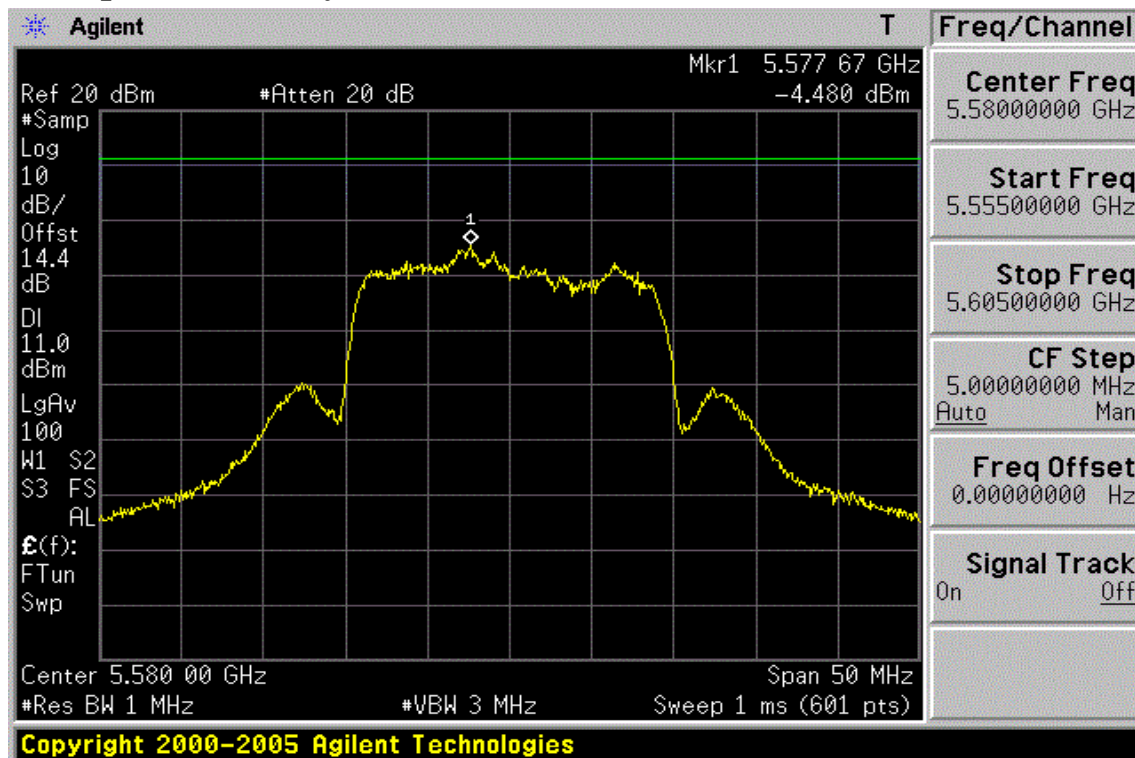
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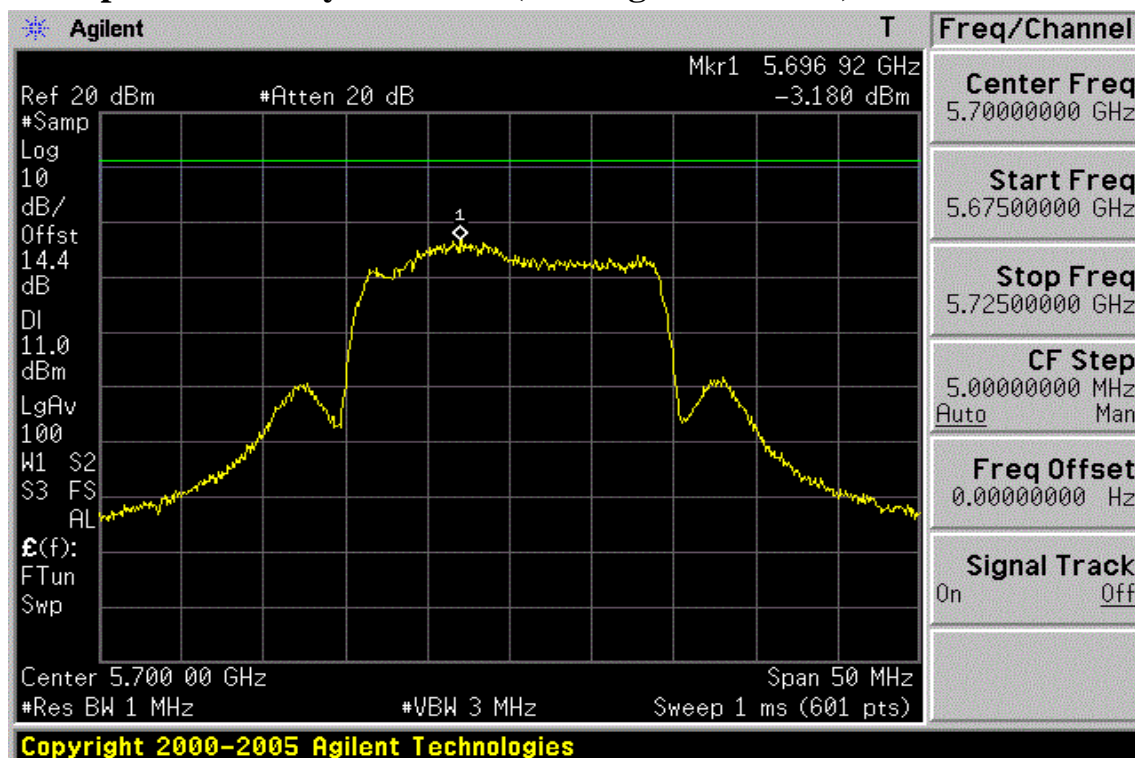
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## Peak Power Spectral Density Data Plot (CH Mid 5580MHz)



## Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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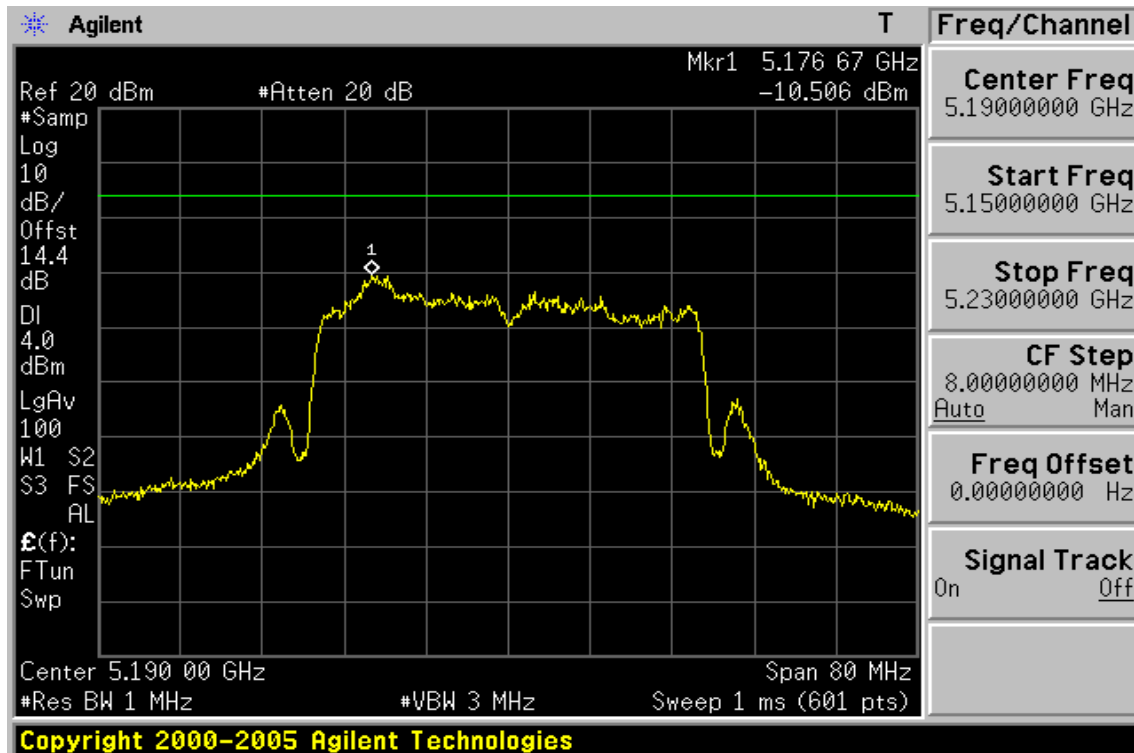
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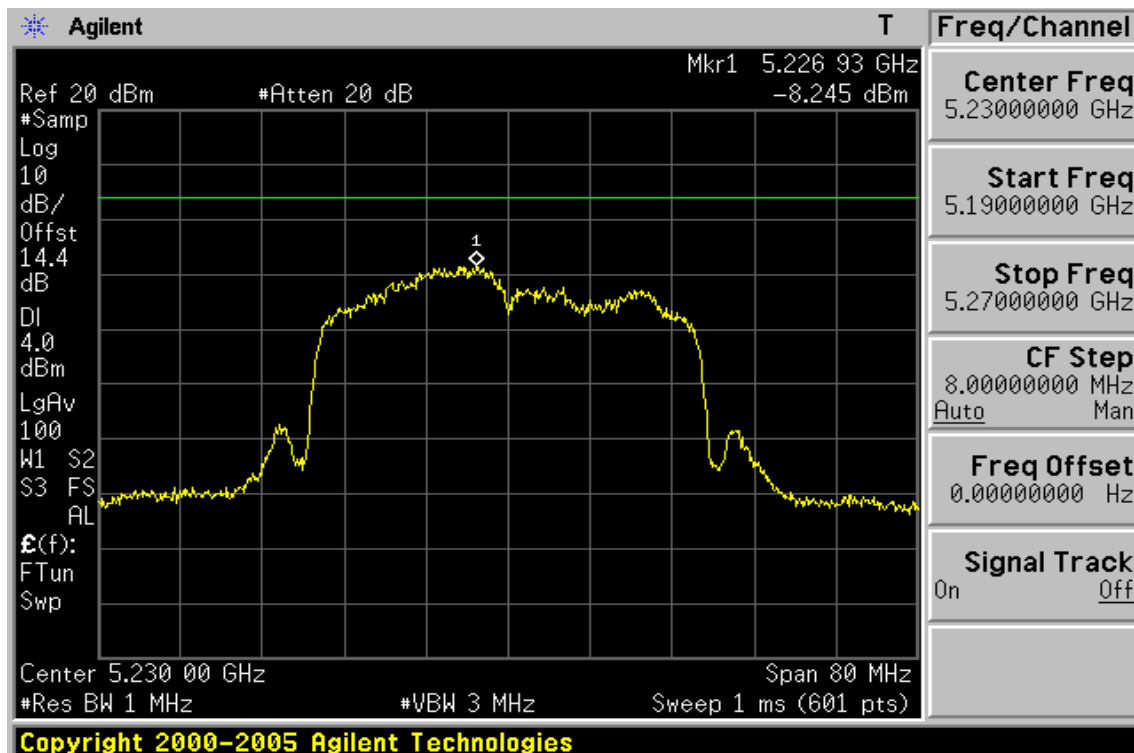


## 802.11n HT40, 5150~5250 MHz

### Peak Power Spectral Density Data Plot (CH Low 5190 MHz)



### Peak Power Spectral Density Data Plot (CH High 5230 MHz)



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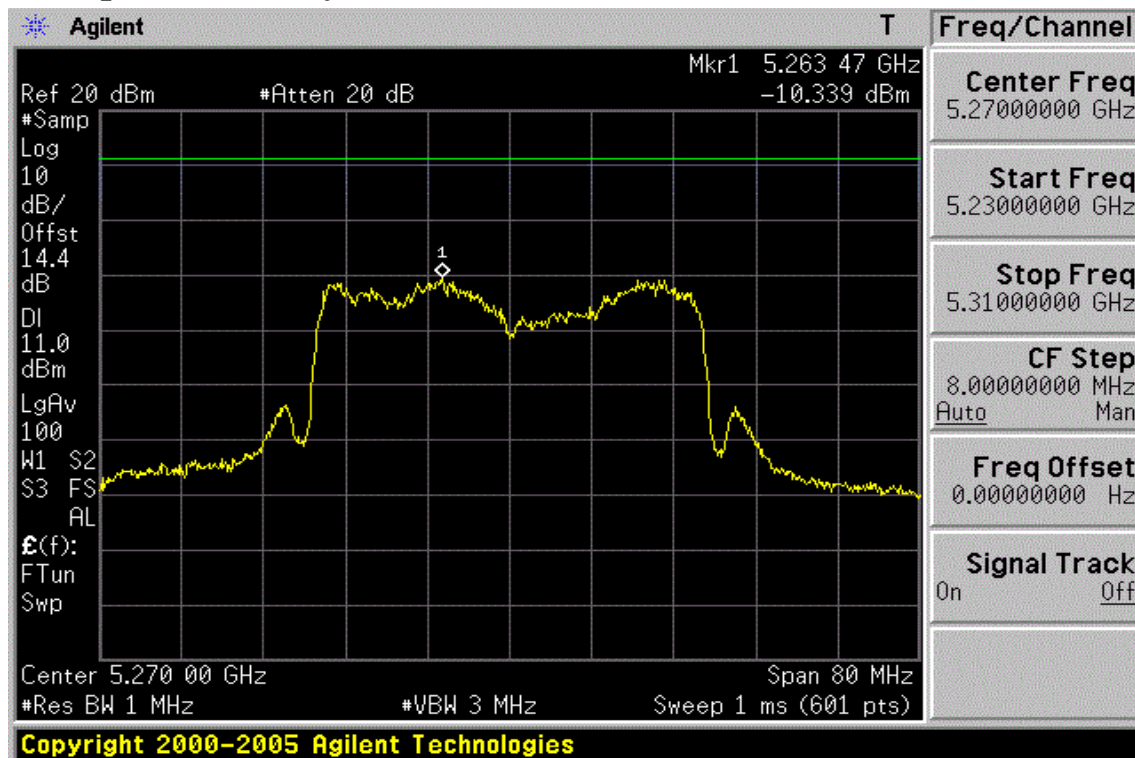
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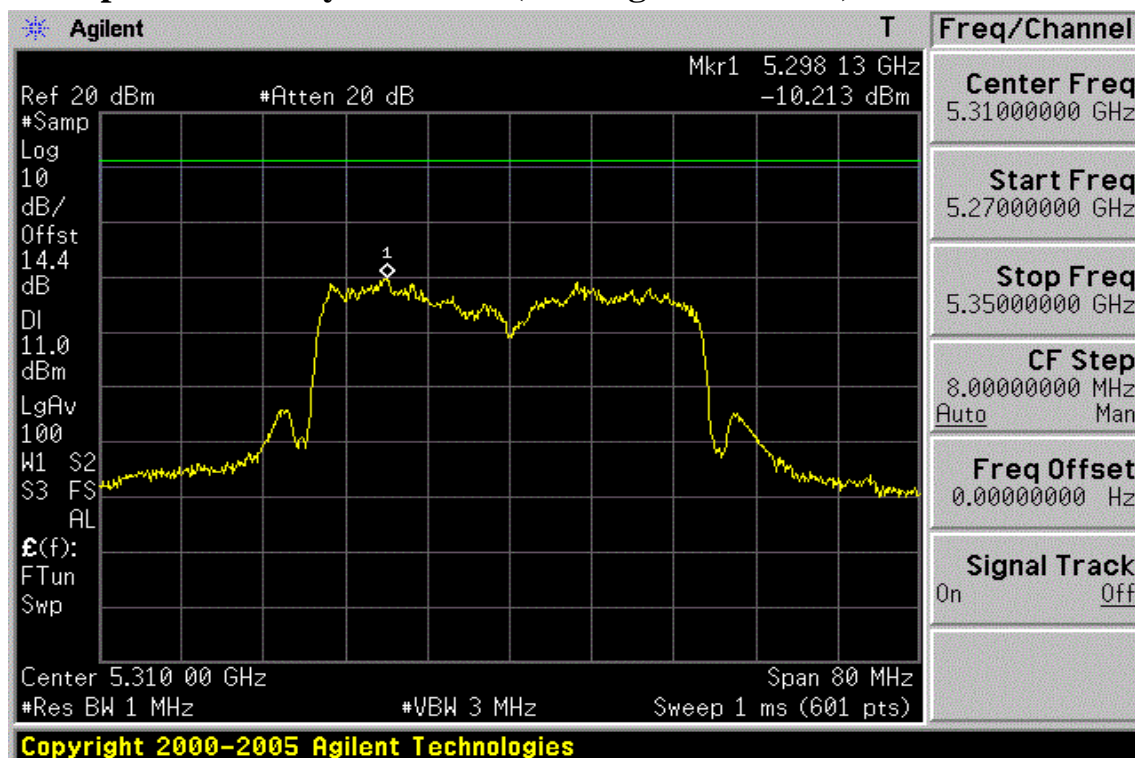
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## 802.11n HT40, 5250~5350 MHz

### Peak Power Spectral Density Data Plot (CH Low 5270 MHz)



### Peak Power Spectral Density Data Plot (CH High 5310 MHz)



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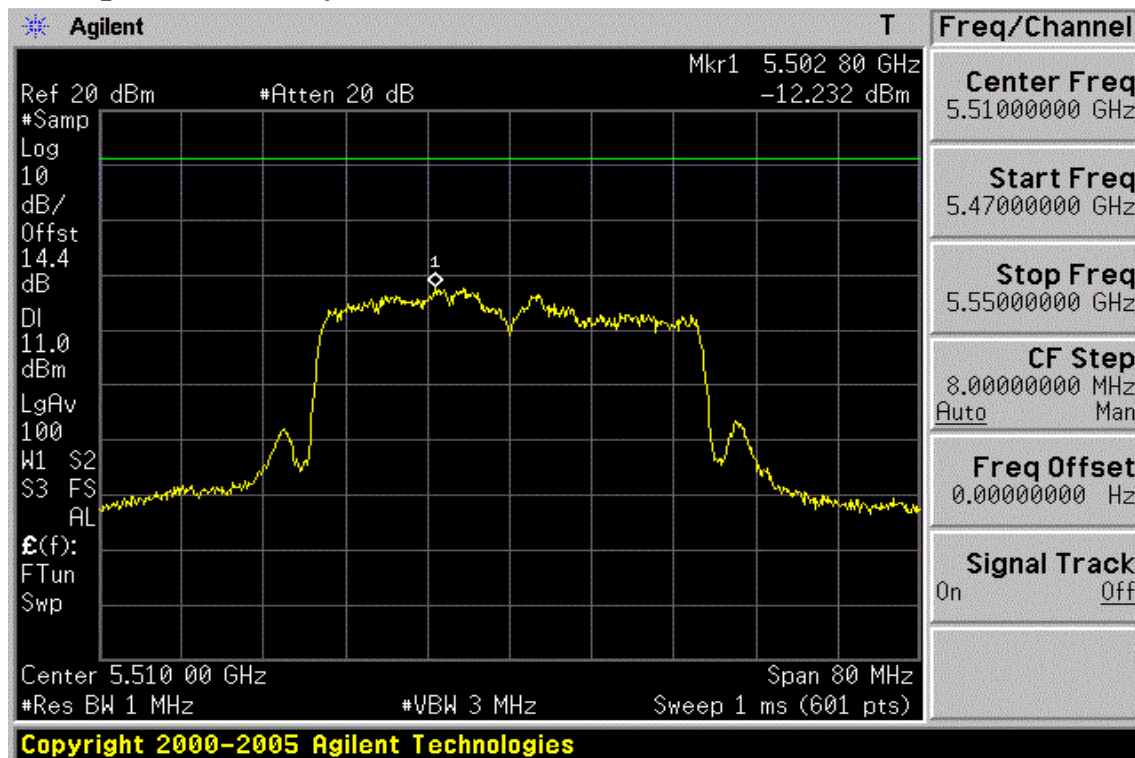
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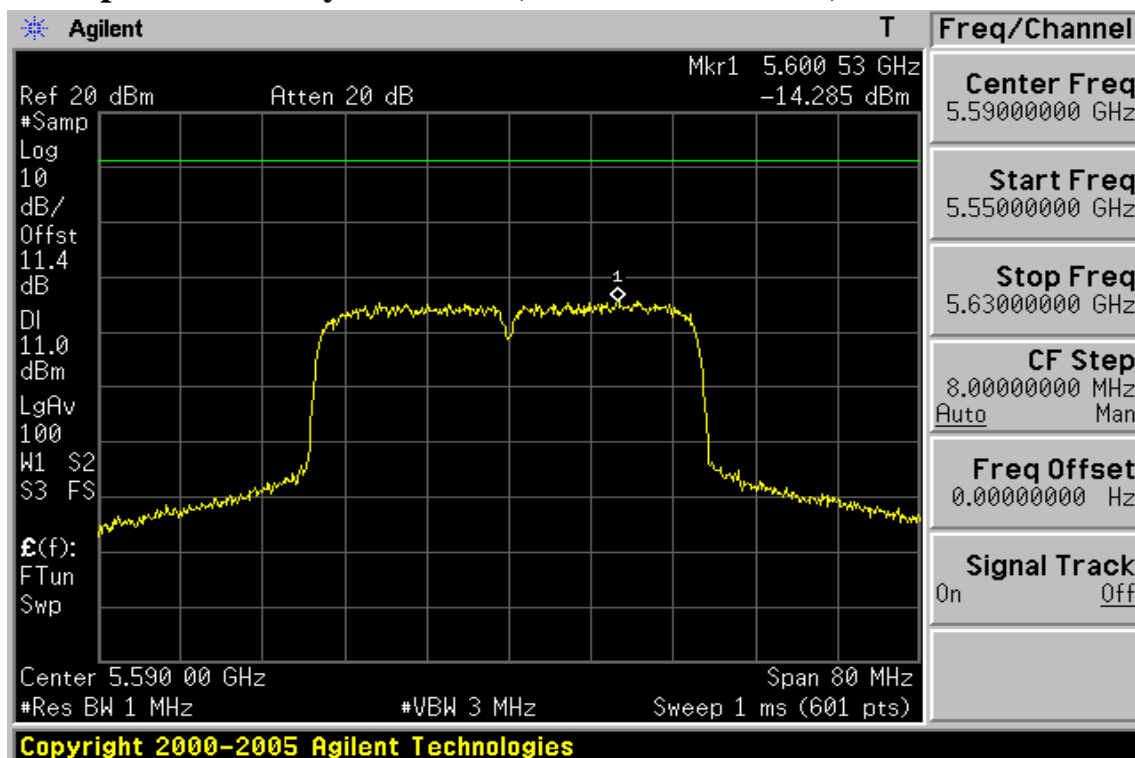
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## 802.11n HT40, 5470~5725 MHz

### Peak Power Spectral Density Data Plot (CH Low 5510 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5550 MHz)



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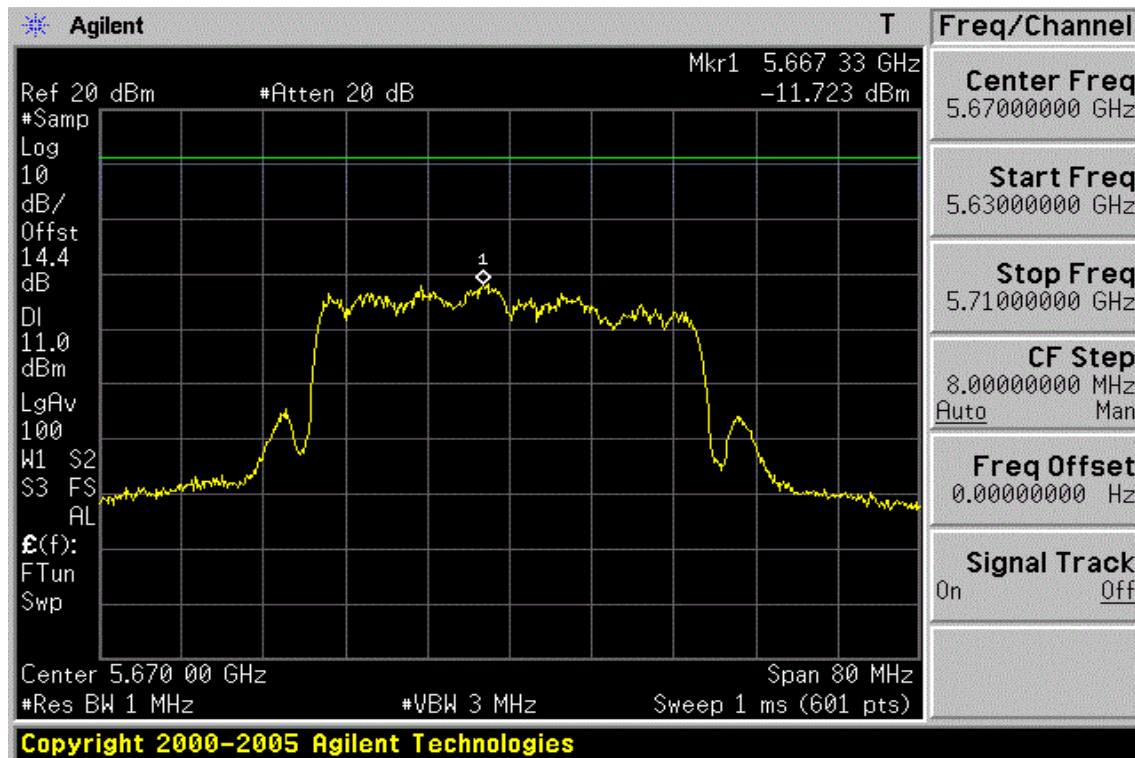
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## Peak Power Spectral Density Data Plot (CH High 5670 MHz)



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## 10. PEAK EXCURSION MEASUREMENT

### 10.1 Standard Applicable

15.407(a)(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### 10.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
3. Trace A, Set RBW=1MHz, VBW = 3MHz, Span = 26dBc, Max. hold.
4. Trace B, Set RBW=1MHz, VBW = 30KHz, Span = 26dBc, Max. hold..
5. For MIMO mode, set offset =  $10 * \log(N)$  on Trace B
6. Delta Mark trace A center frequency and trace B center frequency.
7. Repeat above procedures until all frequency measured were complete.

### 10.3 Measurement Equipment Used:

Refer to section 7.3 for details.

*Remark: as per KDB 662291, MIMO mode is accomplished by the addition of  $10 \log(N)$ , where  $N = 2$  as the simultaneous emission of Peak Excursion.*

### 10.4 Test Set-up:

Refer to section 7.4 for details.

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## 10.5 Test Results:

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	6.71	13.00	-6.29
Mid	5220	6.49	13.00	-6.51
High	5240	6.58	13.00	-6.42

802.11a, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	6.91	13.00	-6.09
Mid	5300	6.88	13.00	-6.12
High	5320	6.49	13.00	-6.51

802.11a, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	7.32	13.00	-5.68
Mid	5580	6.71	13.00	-6.29
High	5700	6.87	13.00	-6.13

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802.11n HT20, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	7.44	13.00	-5.56
Mid	5220	7.82	13.00	-5.18
High	5240	7.86	13.00	-5.14

802.11n HT20, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	7.15	13.00	-5.85
Mid	5300	8.20	13.00	-4.80
High	5320	8.51	13.00	-4.49

802.11n HT20, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	8.37	13.00	-4.63
Mid	5580	7.70	13.00	-5.30
High	5700	8.00	13.00	-5.00

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802.11n HT40, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	7.33	13.00	-5.67
High	5230	8.09	13.00	-4.91

802.11n HT40, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	8.47	13.00	-4.53
High	5310	8.14	13.00	-4.86

802.11n HT40, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	8.69	13.00	-4.31
Mid	5550	8.47	13.00	-4.53
High	5670	8.15	13.00	-4.85

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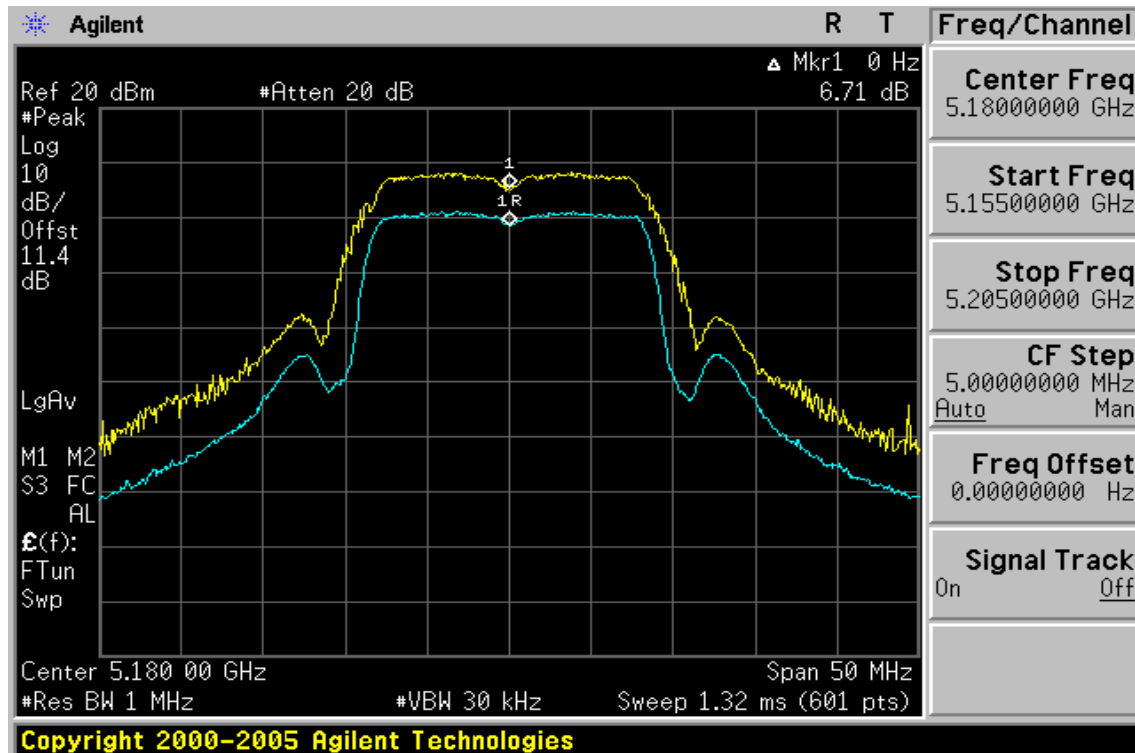
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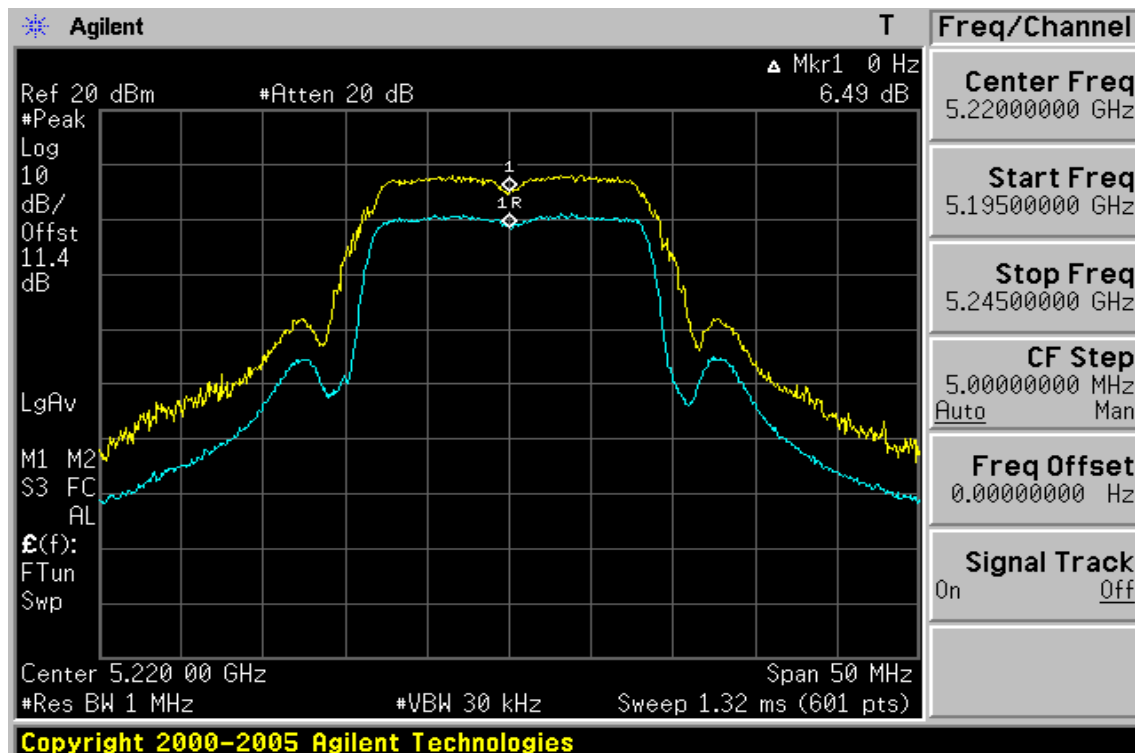
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## 802.11a, 5150~5250 MHz

### Peak Excursion Data Plot (CH Low 5180 MHz)



### Peak Excursion Data Plot (CH Mid 5220 MHz)



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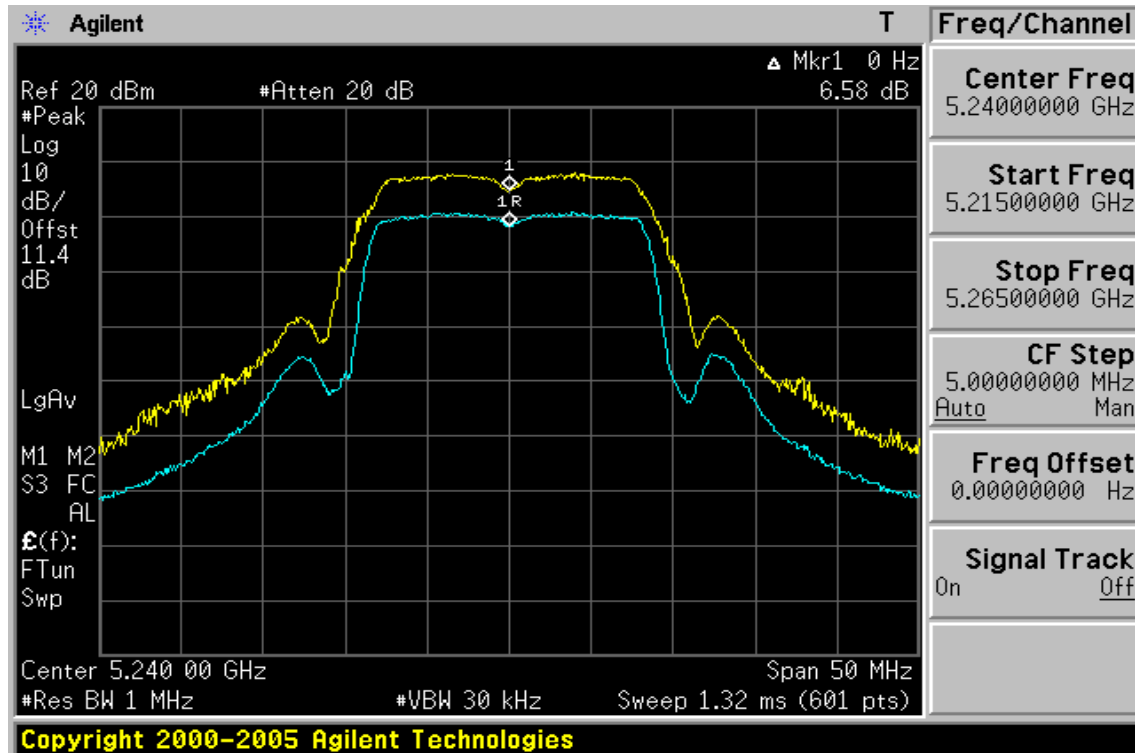
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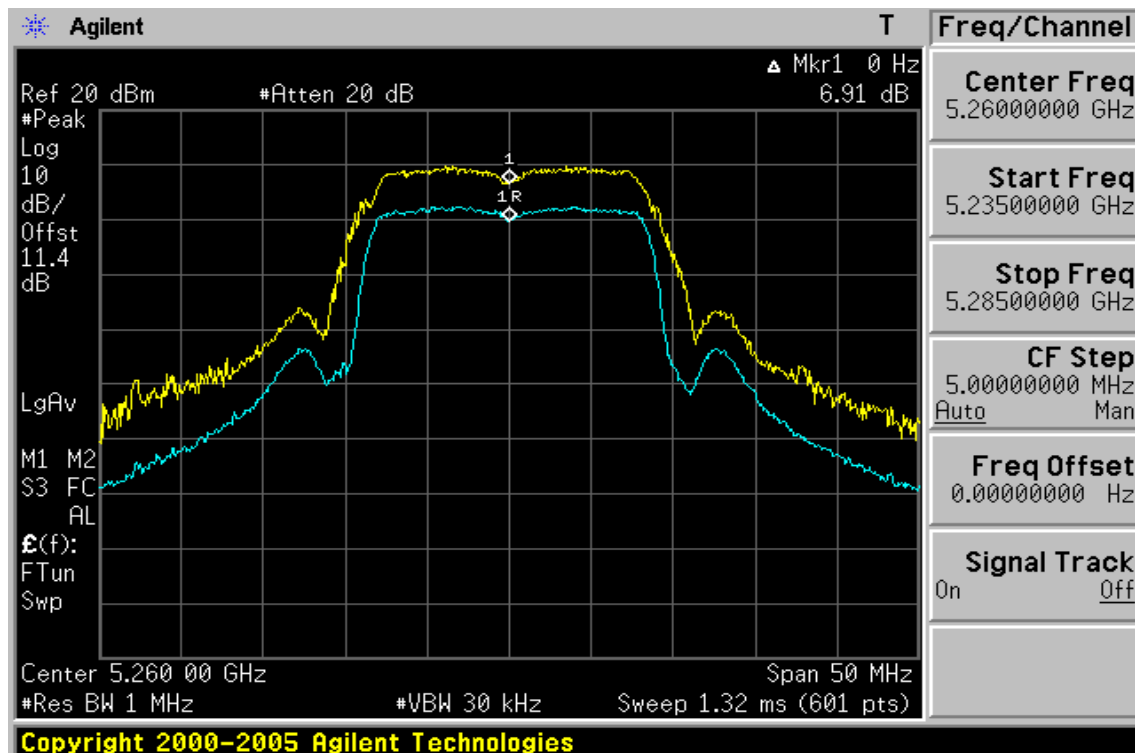


## Peak Excursion Data Plot (CH High 5240 MHz)



## 802.11a, 5250~5350 MHz

## Peak Excursion Data Plot (CH Low 5260 MHz)



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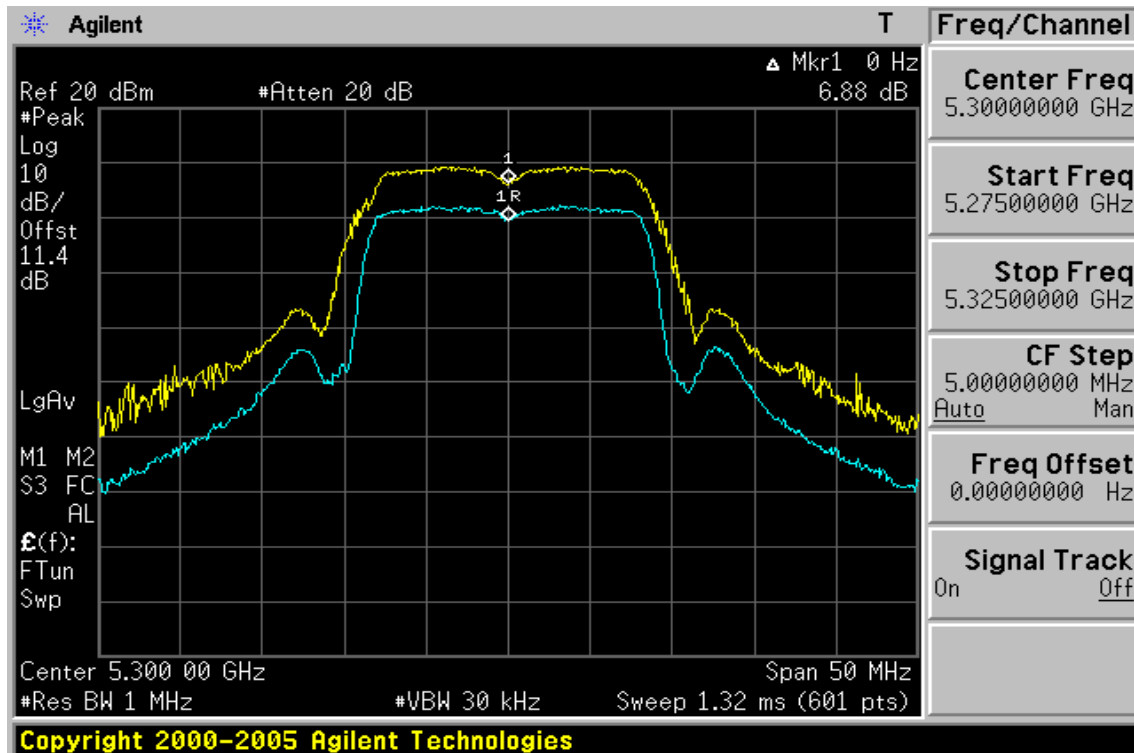
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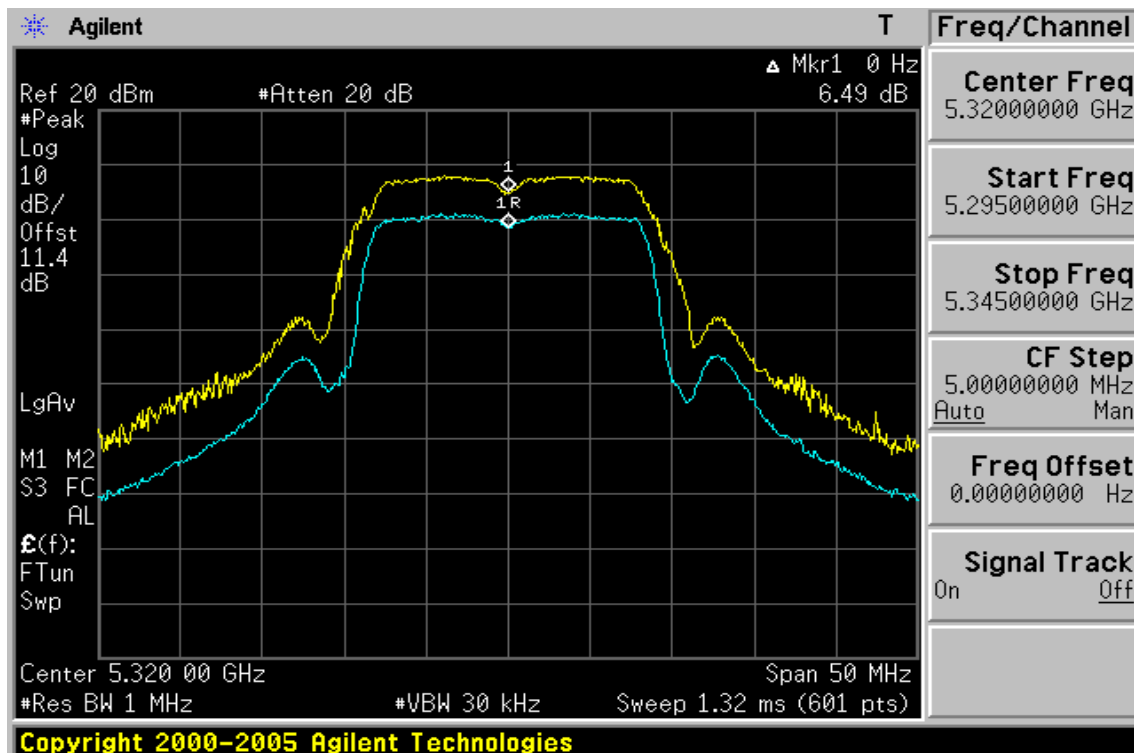
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## Peak Excursion Data Plot (CH Mid 5300 MHz)



## Peak Excursion Data Plot (CH High 5320 MHz)



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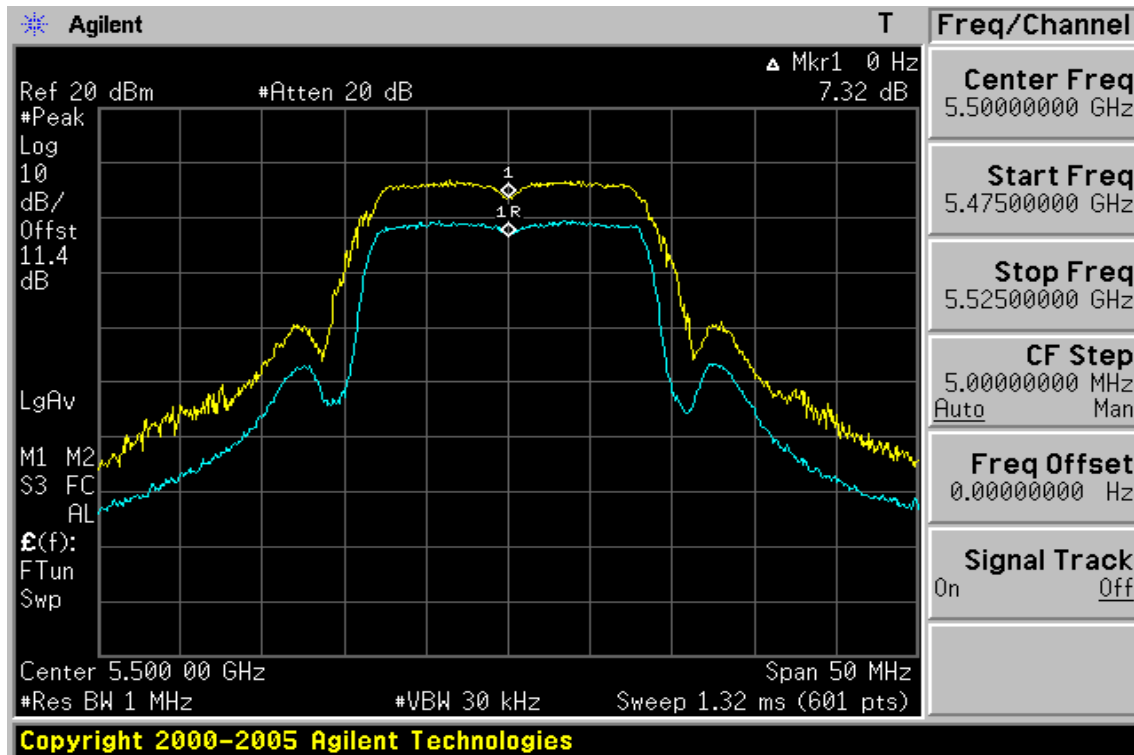
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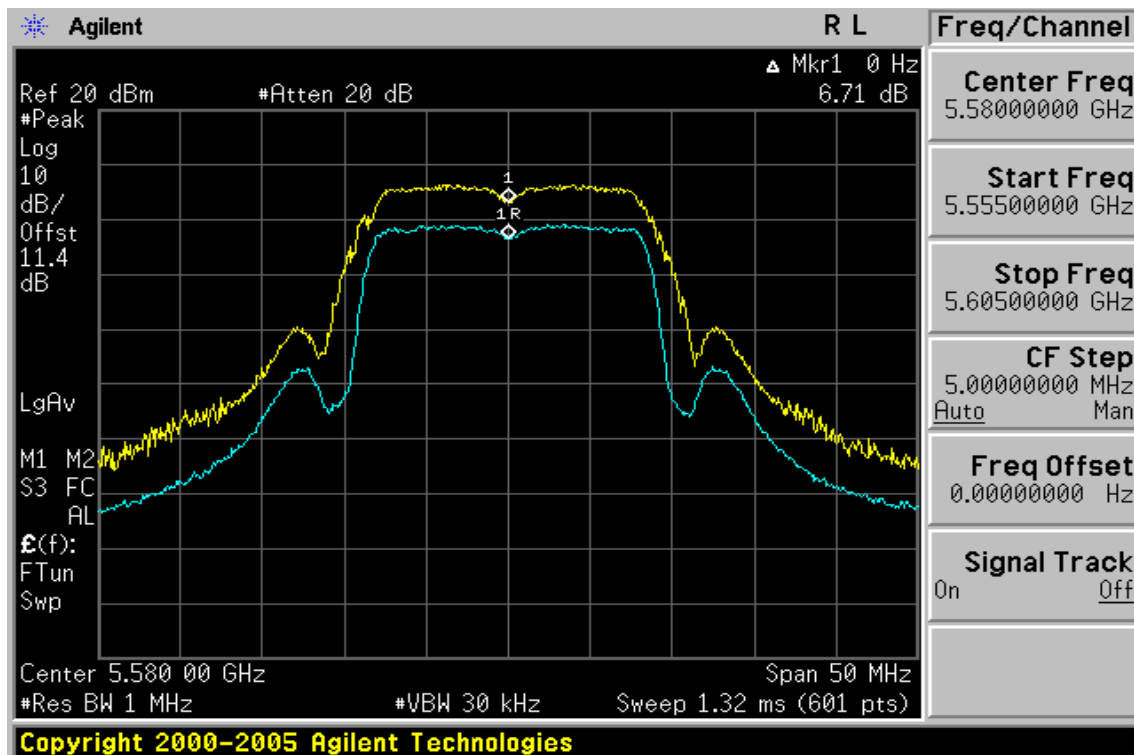
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## 802.11a, 5470~5725 MHz

### Peak Excursion Data Plot (CH Low 5500 MHz)



### Peak Excursion Data Plot (CH Mid 5580 MHz)



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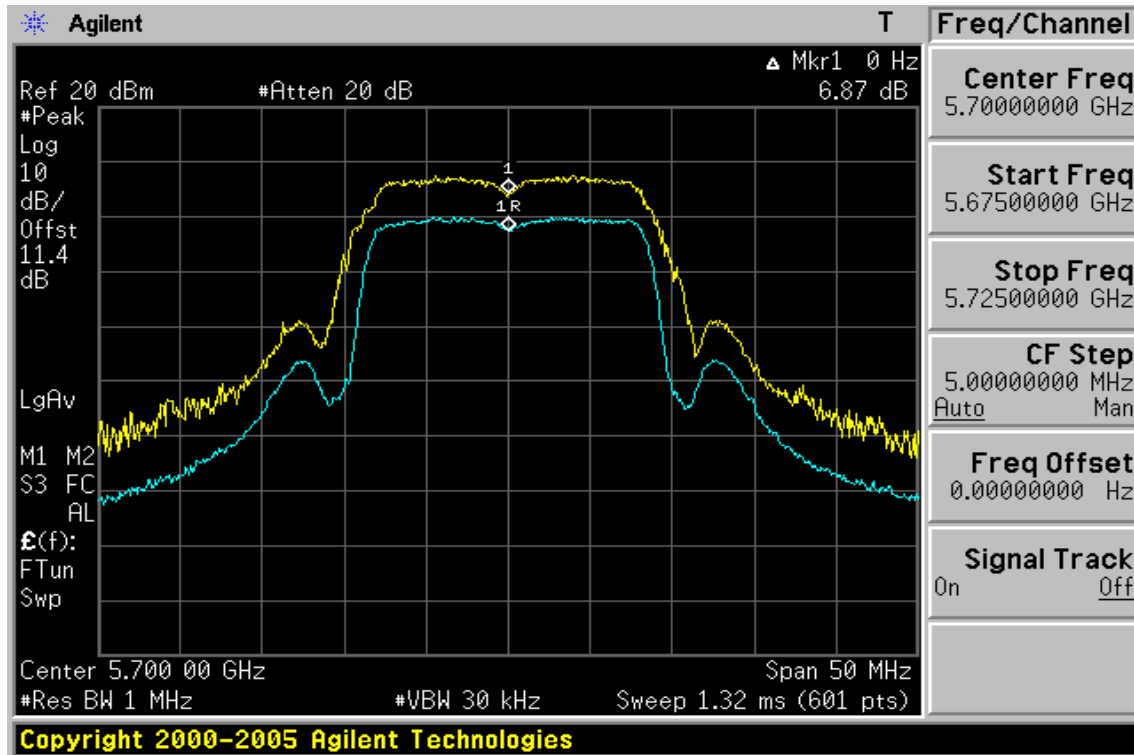
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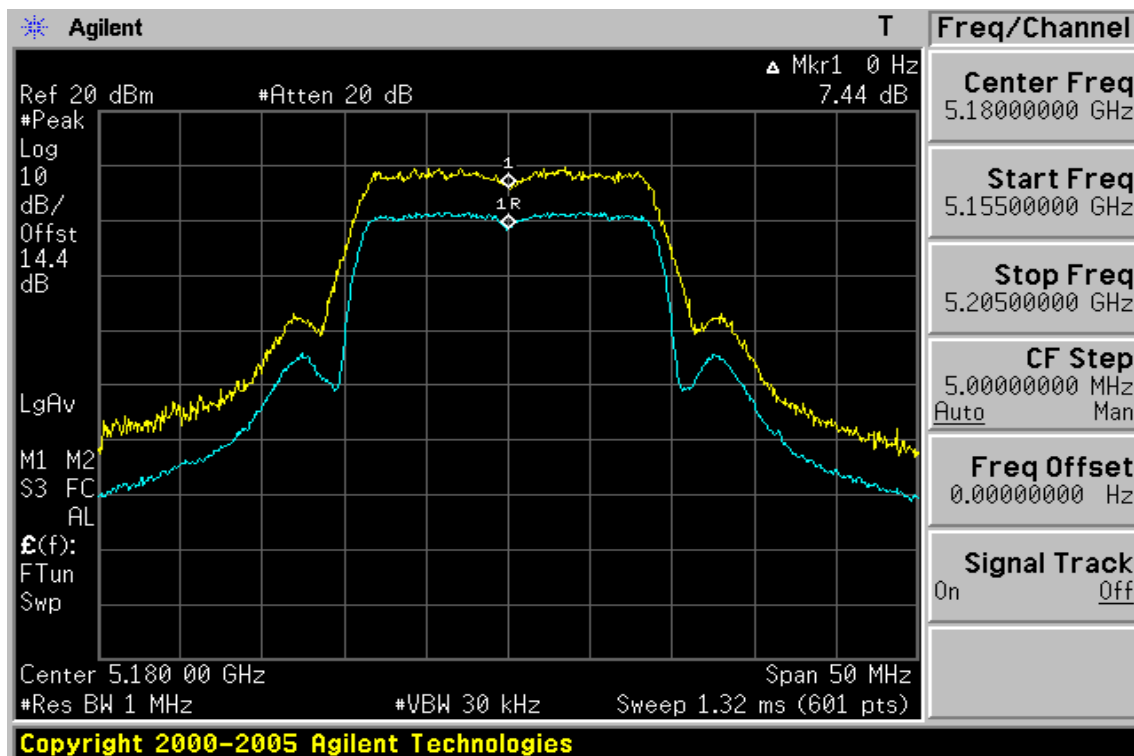
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## Peak Excursion Data Plot (CH High 5700 MHz)



## 802.11n HT20, 5150~5250 MHz

## Peak Excursion Data Plot (CH Low 5180 MHz)



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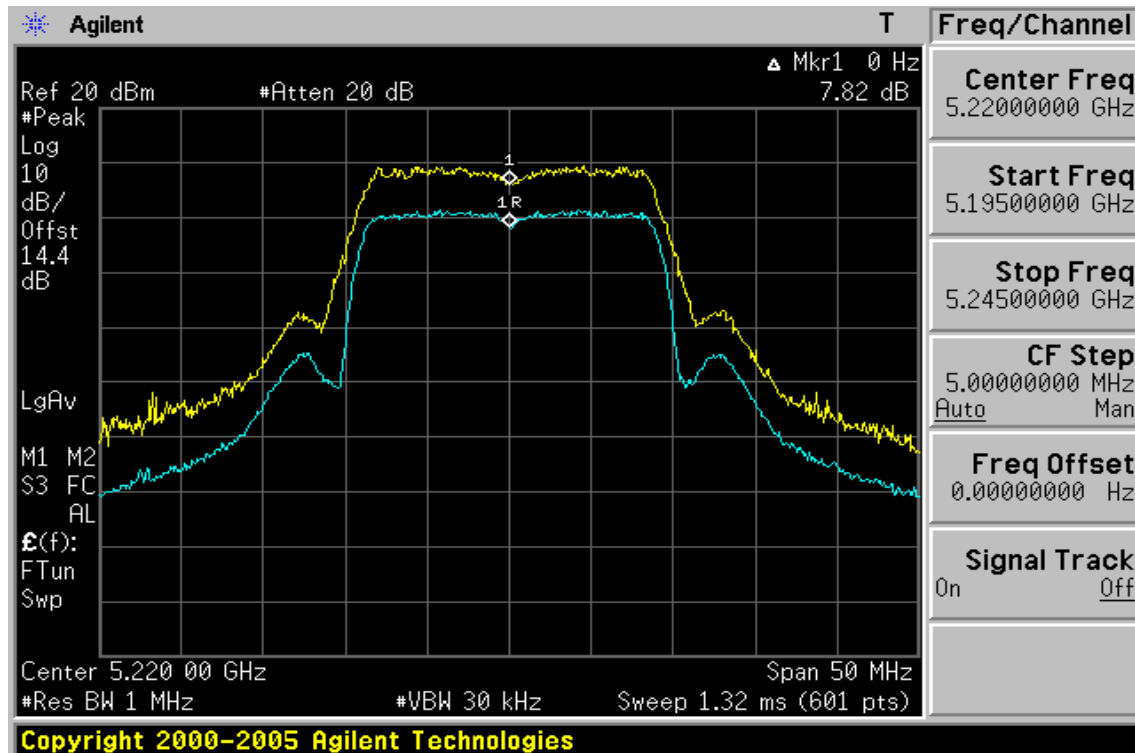
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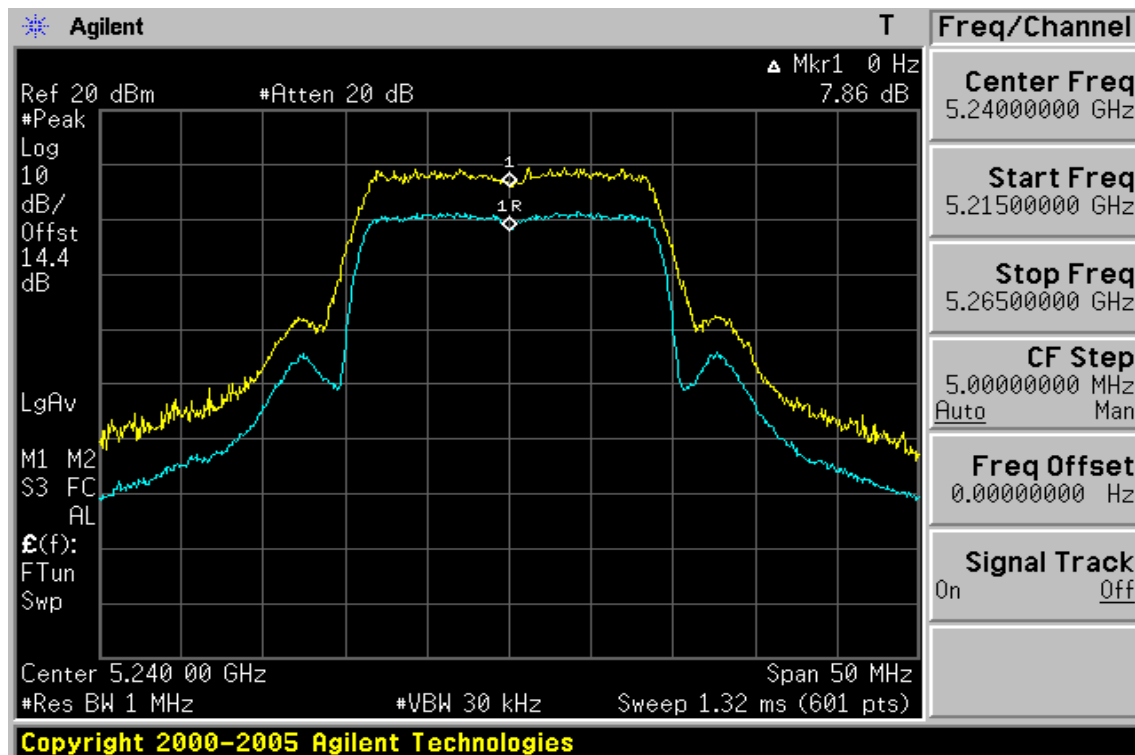
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## Peak Excursion Data Plot (CH Mid 5220 MHz)



## Peak Excursion Data Plot (CH High 5240 MHz)



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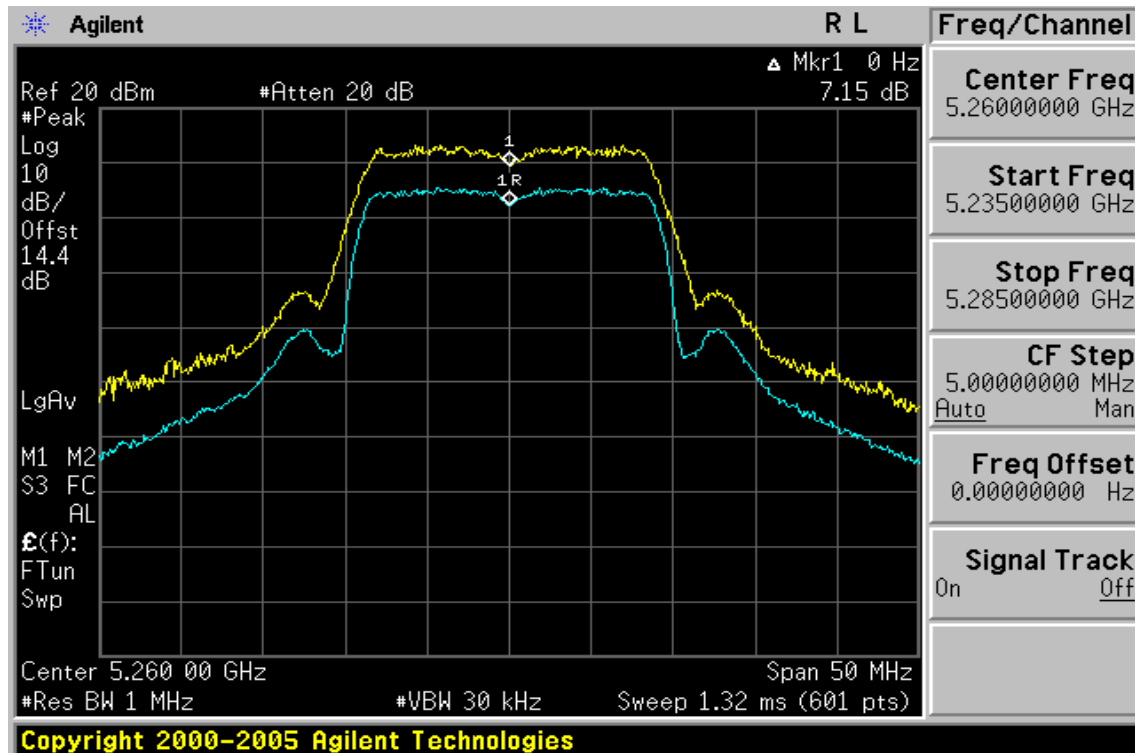
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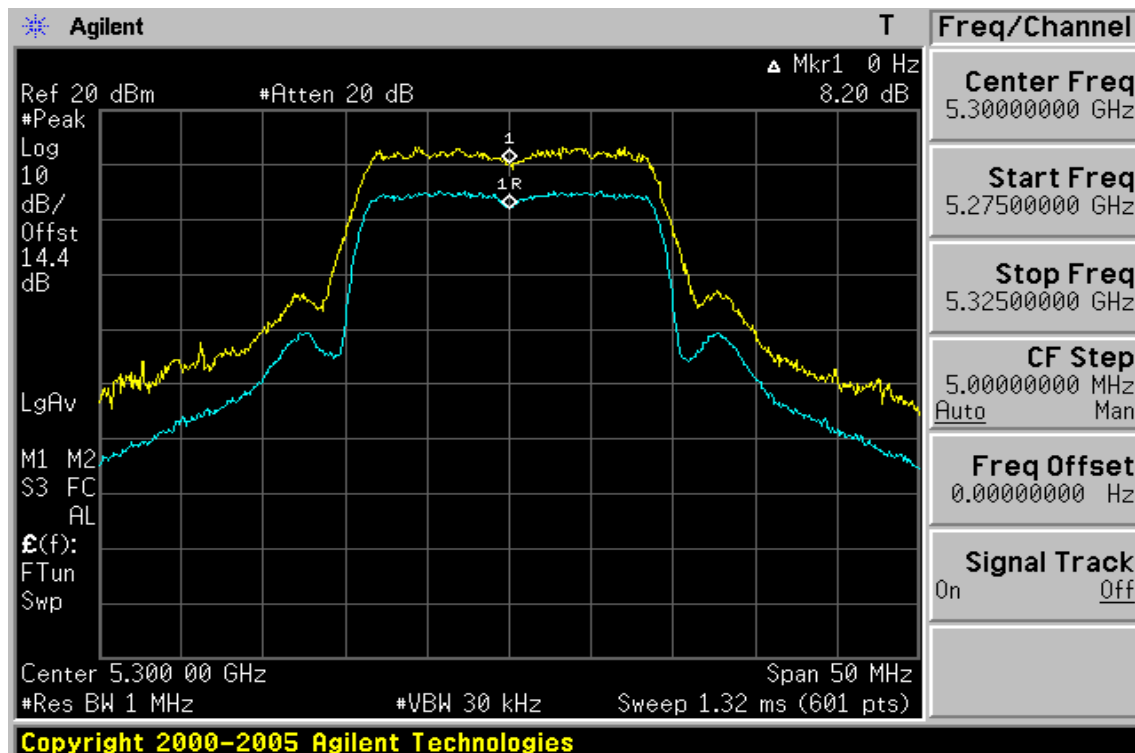
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## 802.11n HT20, 5250~5350 MHz

### Peak Excursion Data Plot (CH Low 5260MHz)



### Peak Excursion Data Plot (CH Mid 5300MHz)



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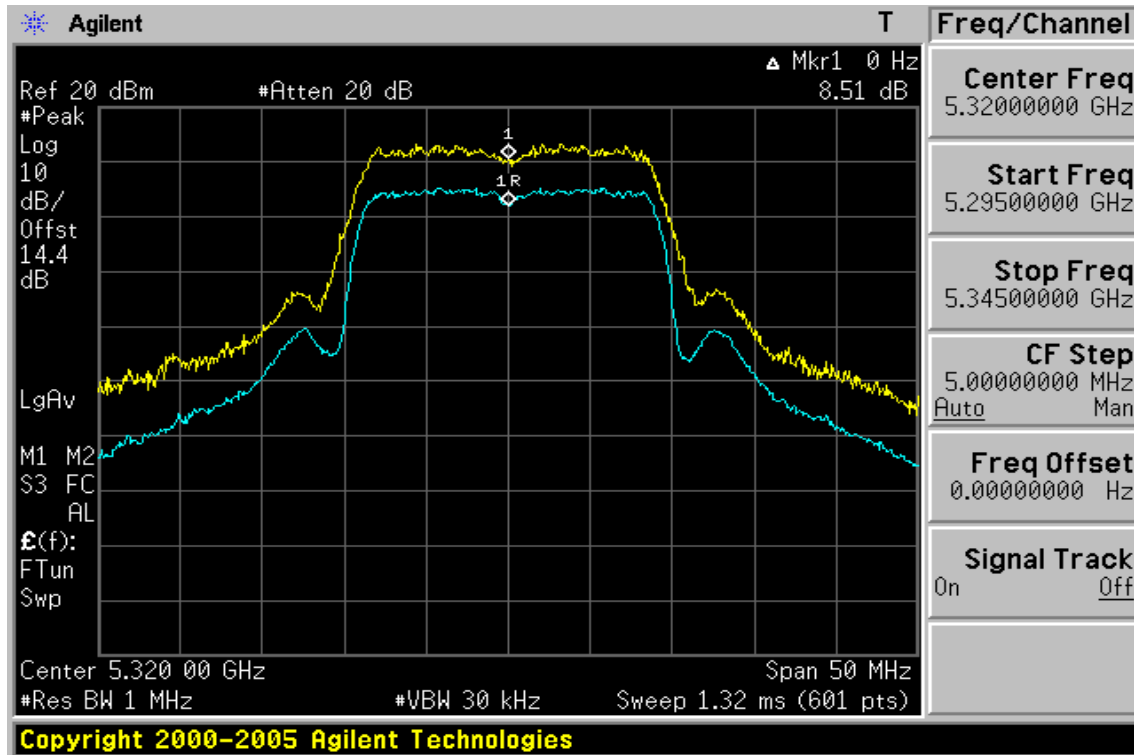
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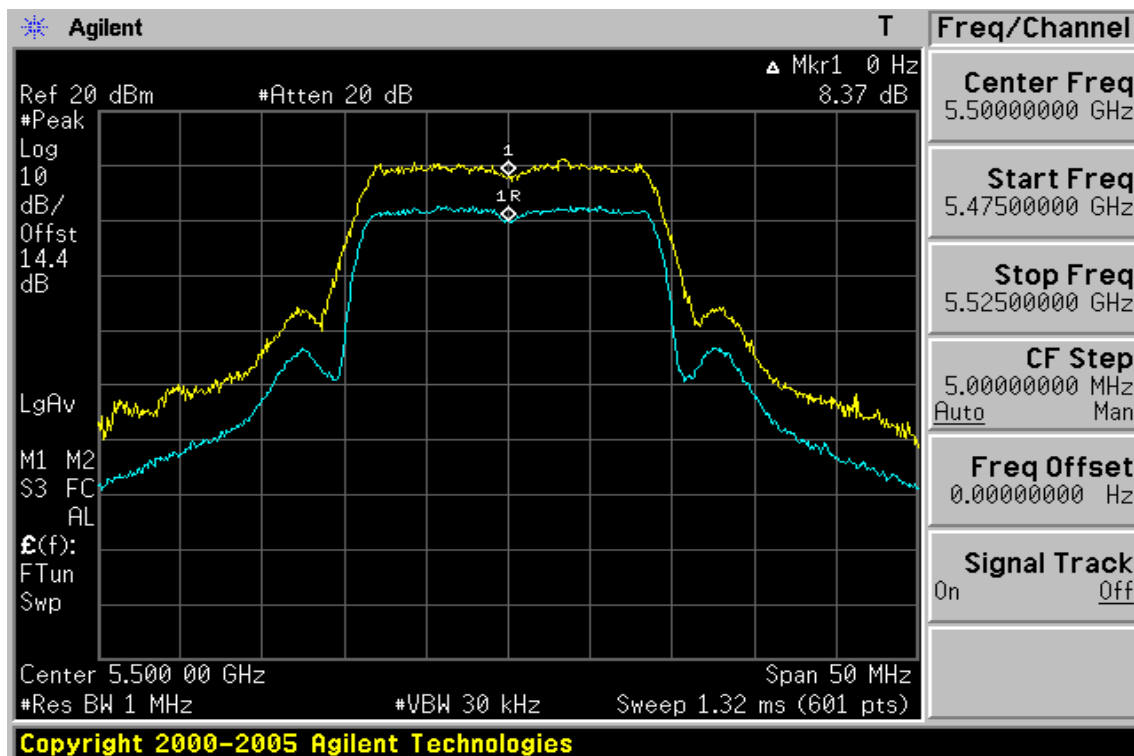


## Peak Excursion Data Plot (CH High 5320MHz)



## 802.11n HT20, 5470~5725 MHz

## Peak Excursion Data Plot (CH Low 5500 MHz)



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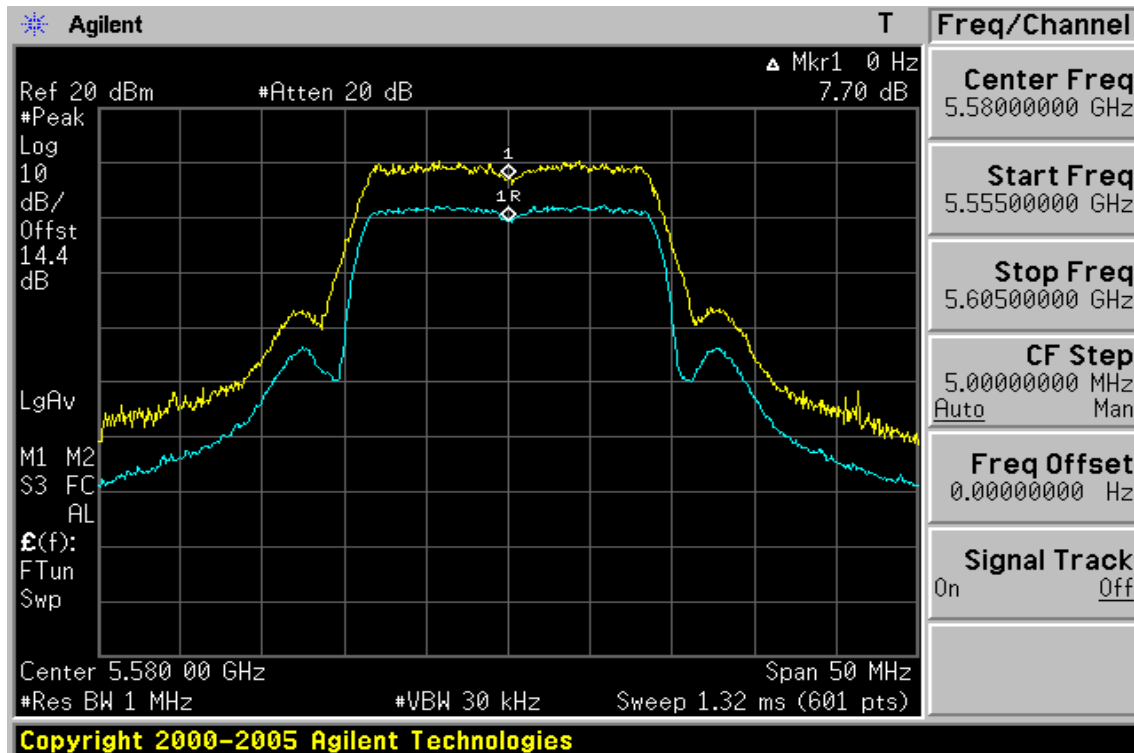
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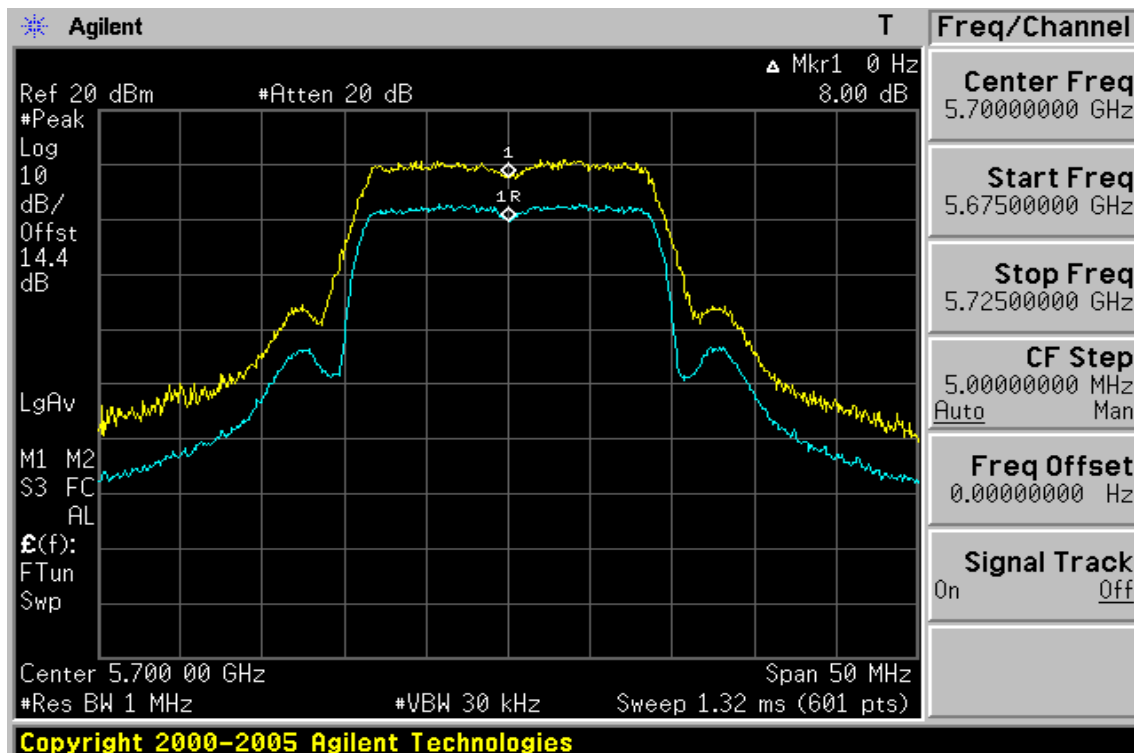
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## Peak Excursion Data Plot (CH Mid 5580 MHz)



## Peak Excursion Data Plot (CH High 5700 MHz)



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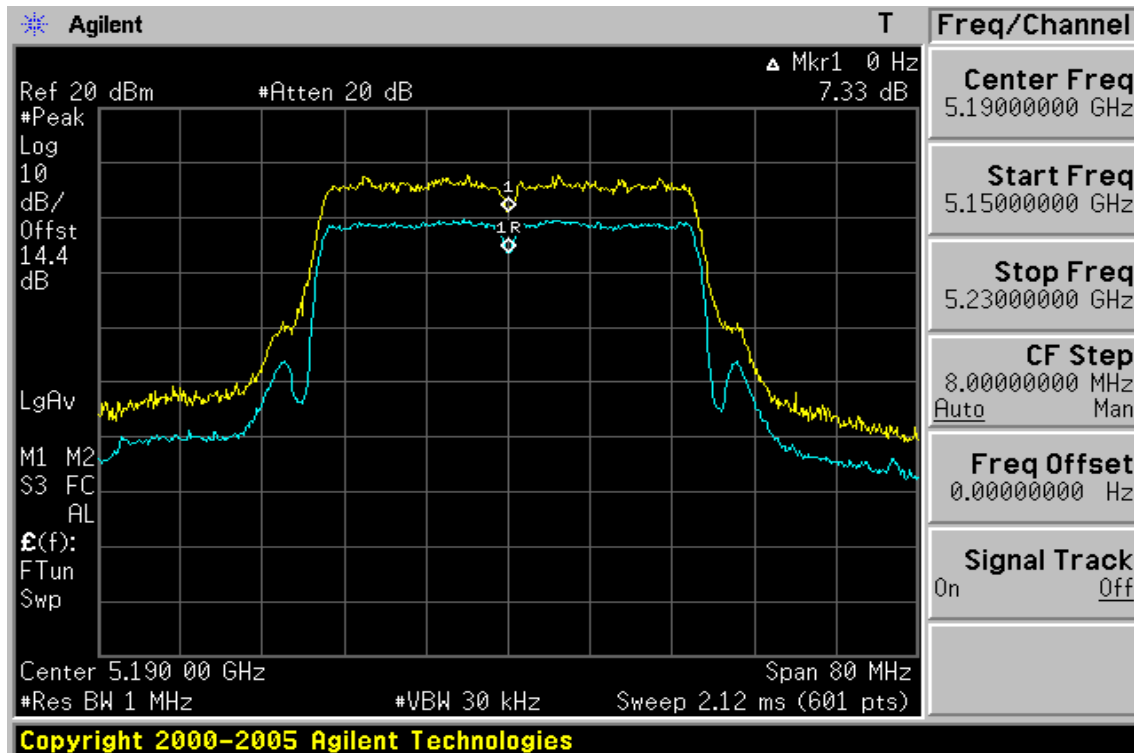
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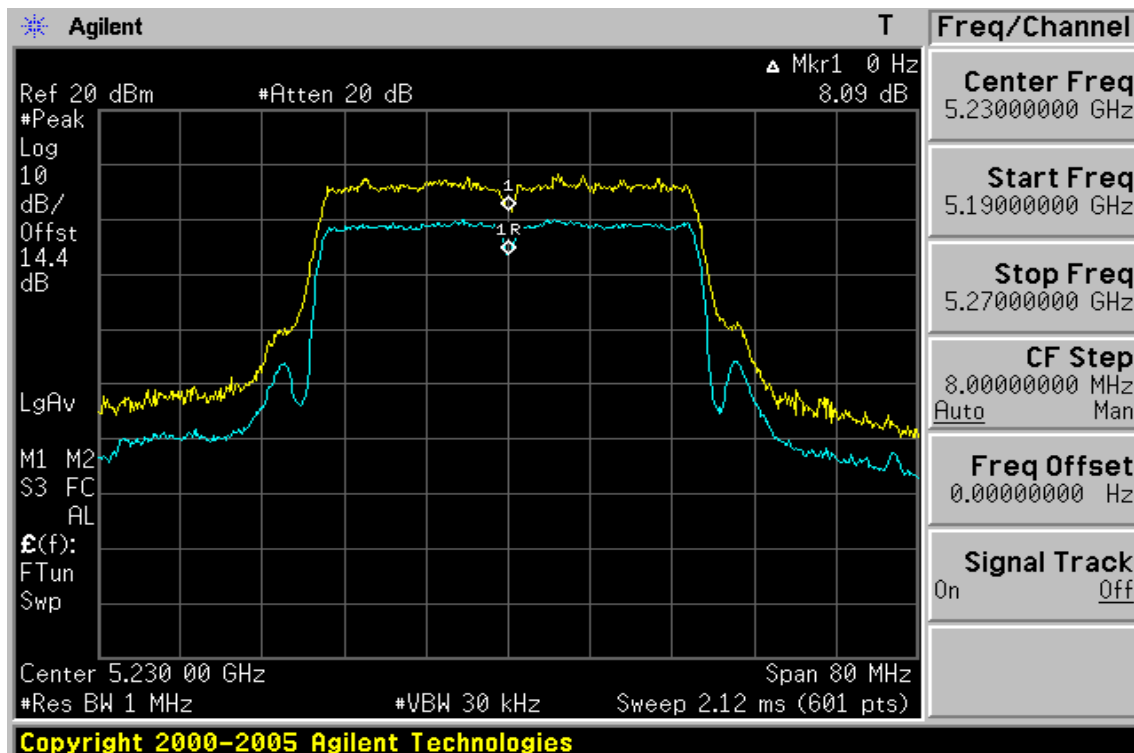
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## 802.11n HT40, 5150~5250 MHz

### Peak Excursion Data Plot (CH Low 5190 MHz)



### Peak Excursion Data Plot (CH High 5230 MHz)



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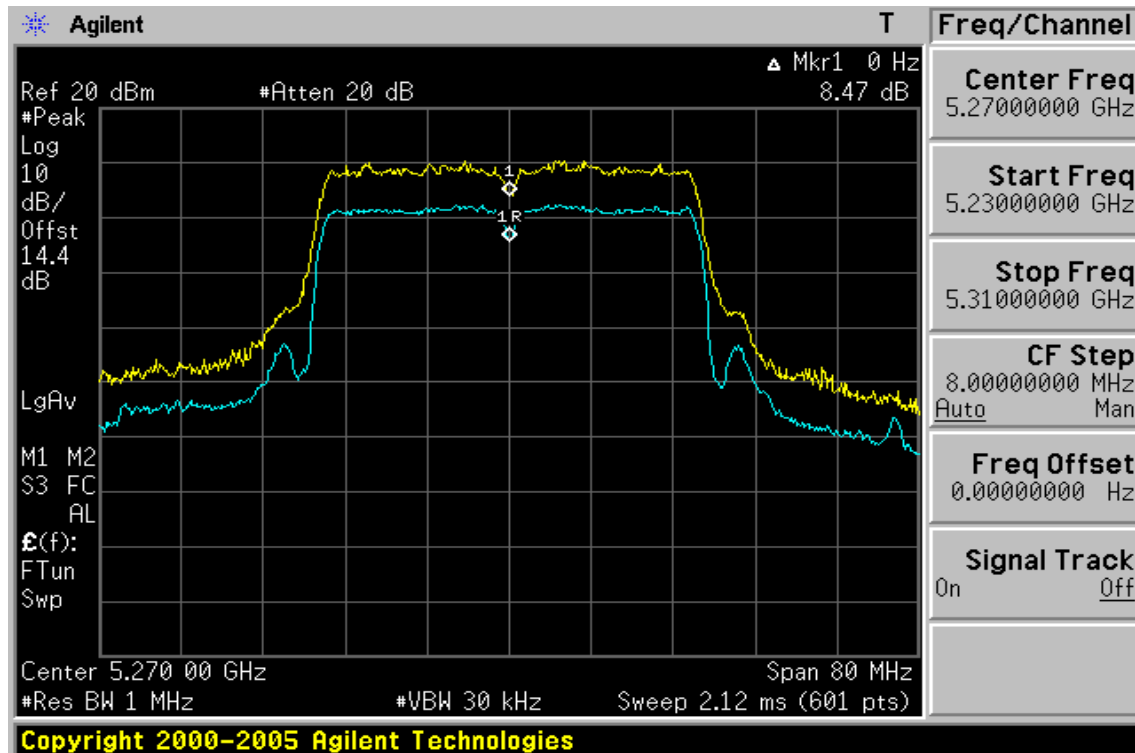
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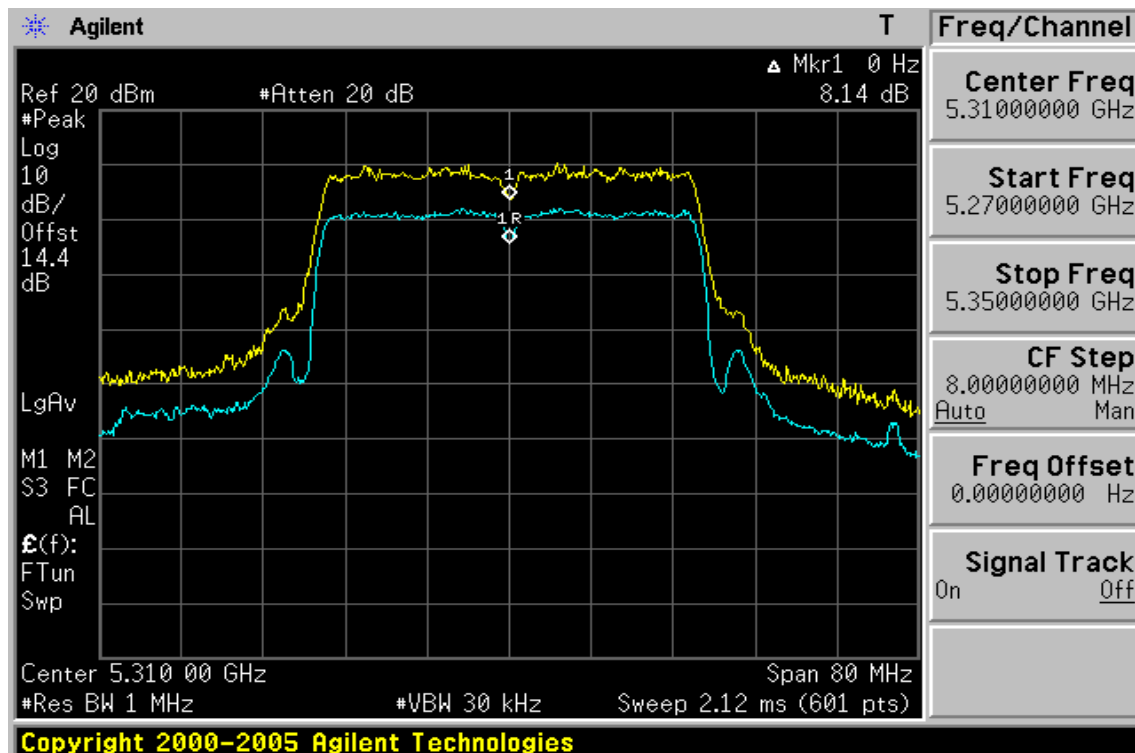
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## 802.11n HT20, 5250~5350 MHz

### Peak Excursion Data Plot (CH Low 5270 MHz)



### Peak Excursion Data Plot (CH High 5310MHz)



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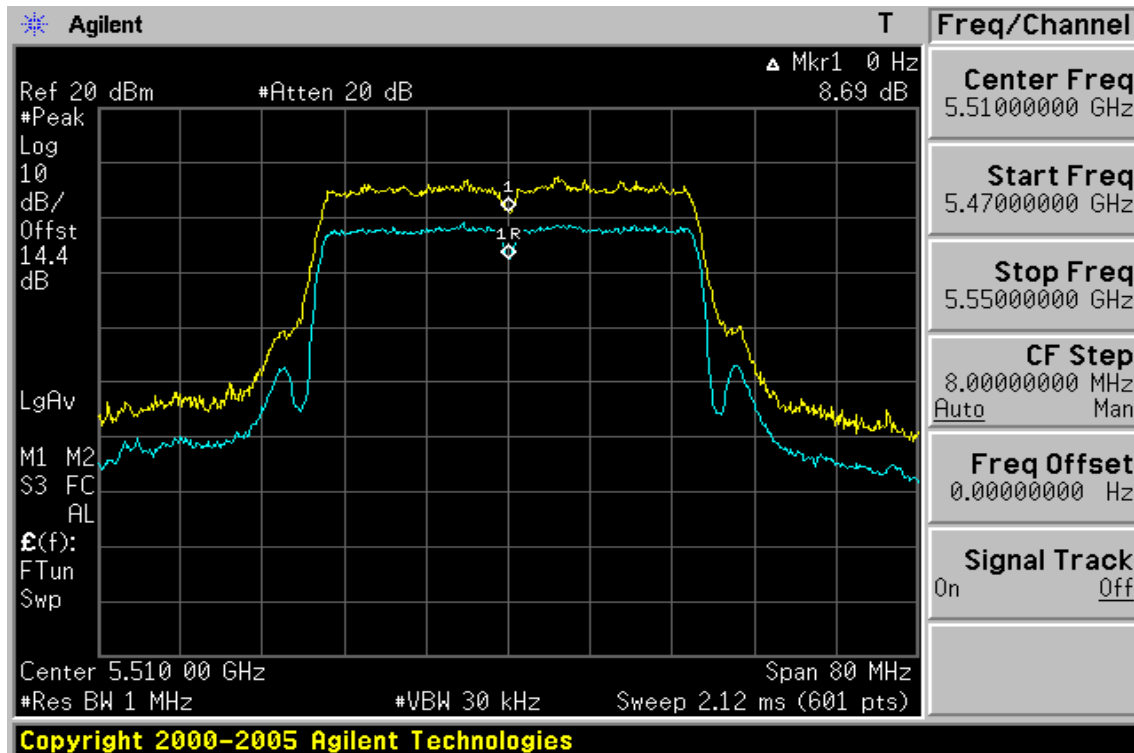
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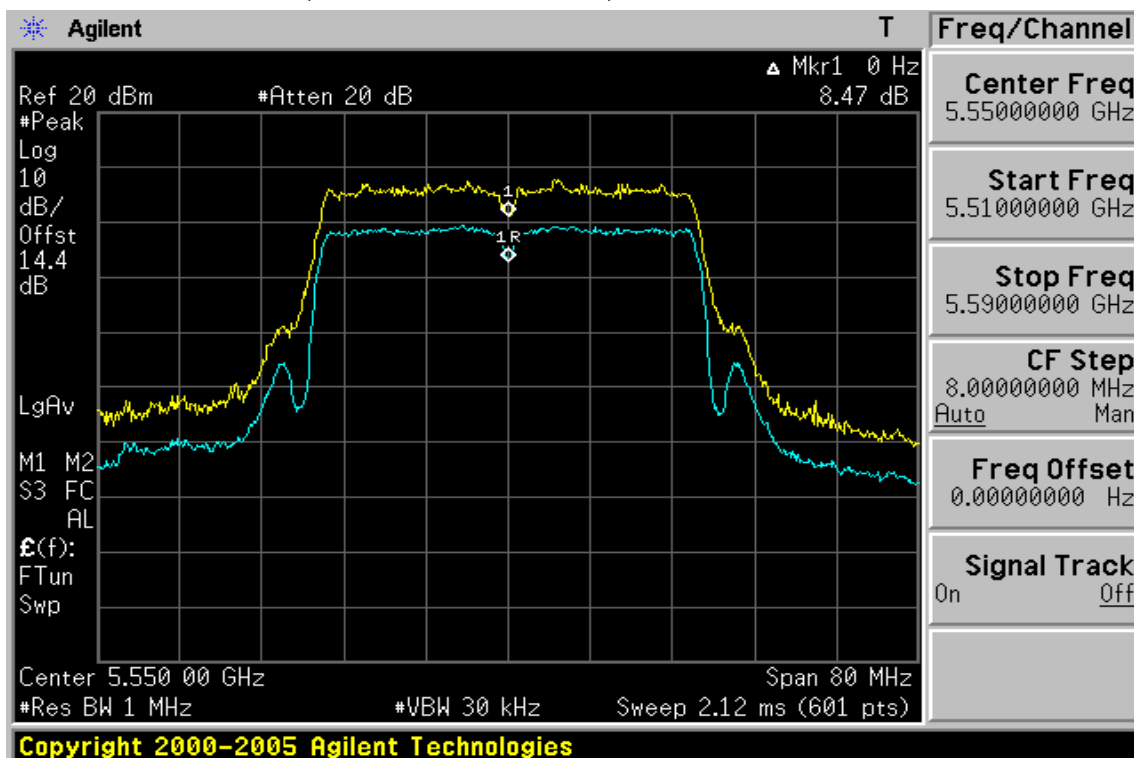
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## 802.11n HT20, 5470~5725 MHz

### Peak Excursion Data Plot (CH Low 5510MHz)



### Peak Excursion Data Plot (CH Mid 5550MHz)



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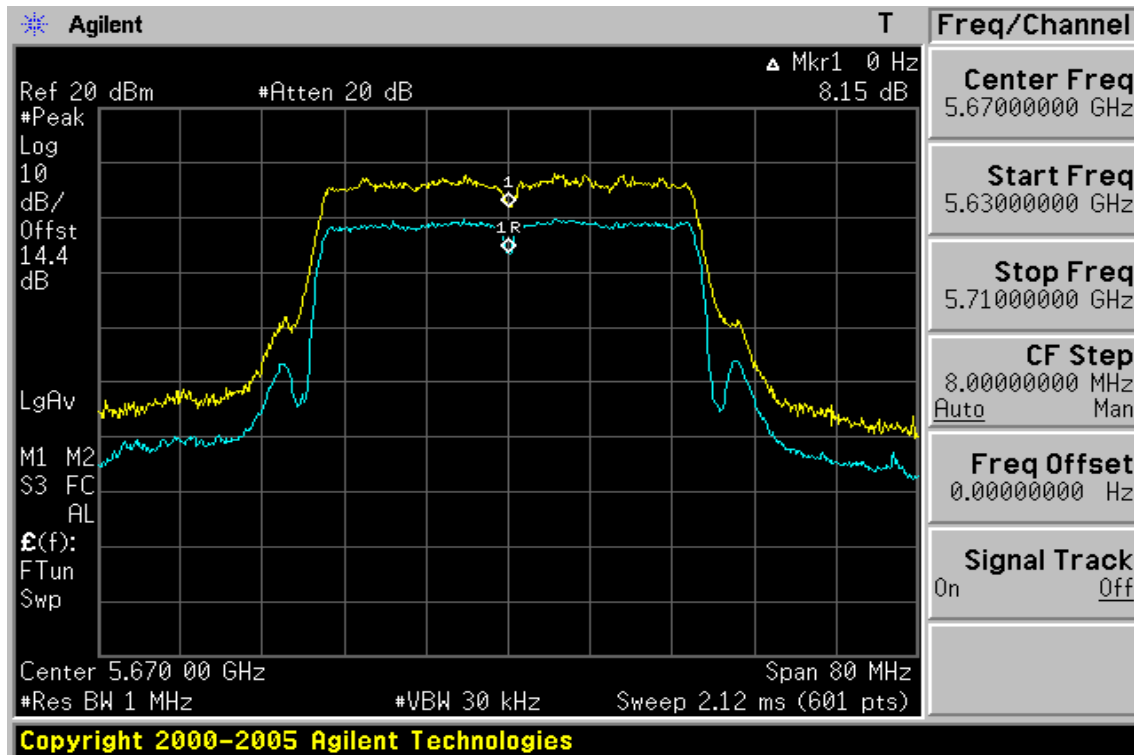
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## Peak Excursion Data Plot (CH High 5670 MHz)



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## 11. UNDESIRABLE EMISSION - CONDUCTED MEASUREMENT

### 11.1 Standard Applicable

According to §15.407(b),

(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.
- (7) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

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**According to RSS-210 A9.2**

- (1) For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
- (2) For transmitters operating in the band 5250-5350 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Devices operating in the band 5250-5350 MHz that generate emissions in the band 5150-5250 MHz shall not exceed an out-of-band emission limit of -27 dBm/MHz e.i.r.p. in the band 5150-5250 MHz in order to operate indoor/outdoor, or alternatively shall comply with the spectral power density for operation within the band 5150-5250 MHz and shall be labelled “for indoor use only”.
- (3) For transmitters operating in the band 5470-5725 MHz, all emissions outside that band shall not exceed -27 dBm/MHz e.i.r.p.

For transmitters operating in the band 5725-5825 MHz, all emissions within the frequency range from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p. For frequencies more than 10 MHz above or below the band edges, emissions shall not exceed -27 dBm/MHz.

**11.2 Measurement Procedure**

1. Measure the proper duty cycle to determine what approach is going to be used.
2. Place the EUT on the table and set it in transmitting mode.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
4. Set Spectrum RBW=1MHz, VBW = 1MHz for peak measurement and 10Hz for average measurement.
5. Set Spectrum at lower/upper band edge and the restricted band adjacent to the lower/upper edge of the authorized band, with the transmitter set to the lowest/highest channel.
6. Set Spectrum over the 30MHz to 40GHz range with the transmitter set to the lowest, middle, and highest channels.

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**Conducted Emission:**

1. Measure the proper duty cycle to determine what approach is going to be used:
2. To connect Antenna Port of EUT to Spectrum.
3. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
4. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 3G, 3G to 6G, 6G to 13G, 13G to 18G, 18G to 26.5G and 26.5G to 40GHz
5. Via Software, combine 6 spans of frequency range into one plot

RF measurements of the transmitter output employing measurement of conducted method were made at the band edges and the adjacent restricted bands.

Also, conducted RF measurements of the transmitter output over the 30 MHz to 40 GHz band were made in order to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

**11.3 Measurement Equipment Used:**

Refer to section 7.3 for details.

**11.4 Measurement Result:**

Refer to next page for plots.

*Remark: as per KDB 662291, MIMO mode is accomplished by the addition of  $10 \log(N)$ , where  $N=2$  as the simultaneous emission of spurious emission, and bandedge for conducted compliance test items.*

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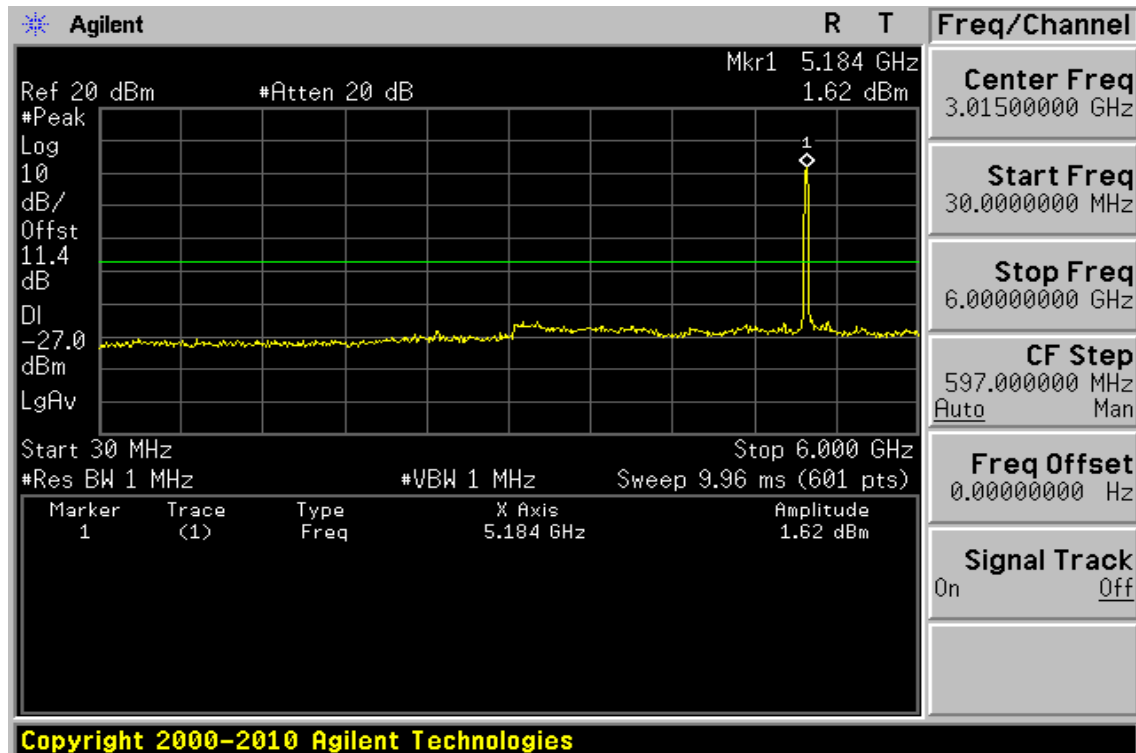
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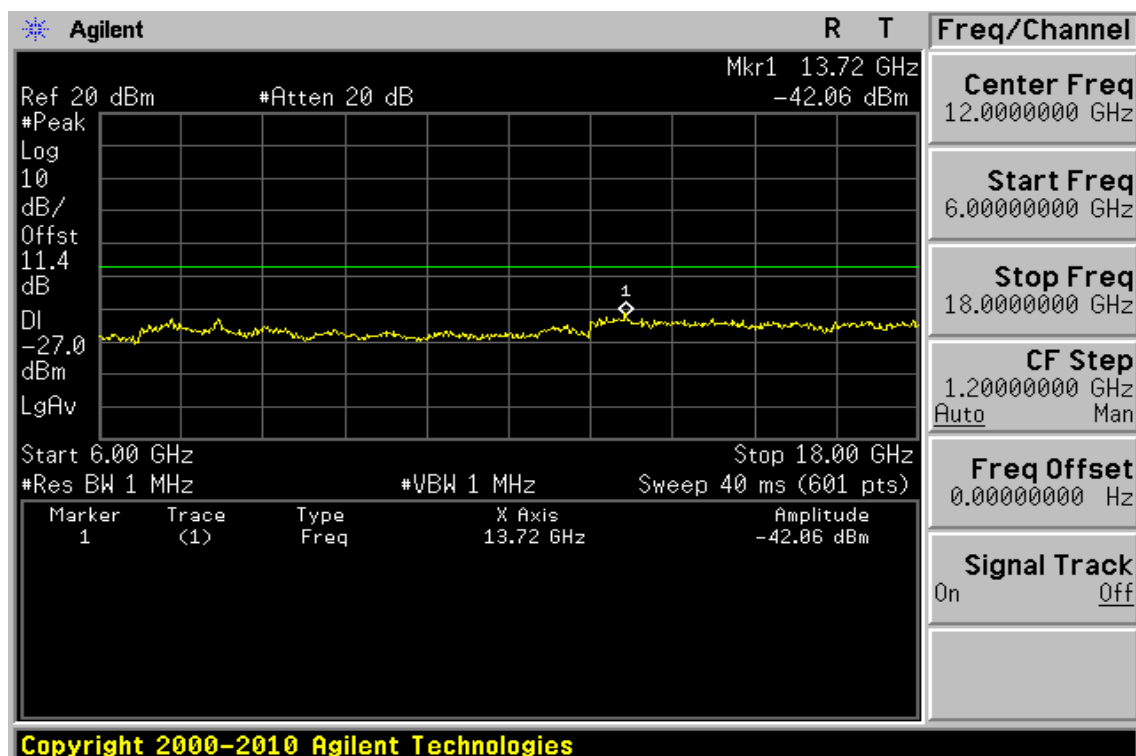
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802.11a, 5150~5250 MHz

Ch Low 30MHz – 6GHz (5180 MHz)



Ch Low 6GHz – 18GHz



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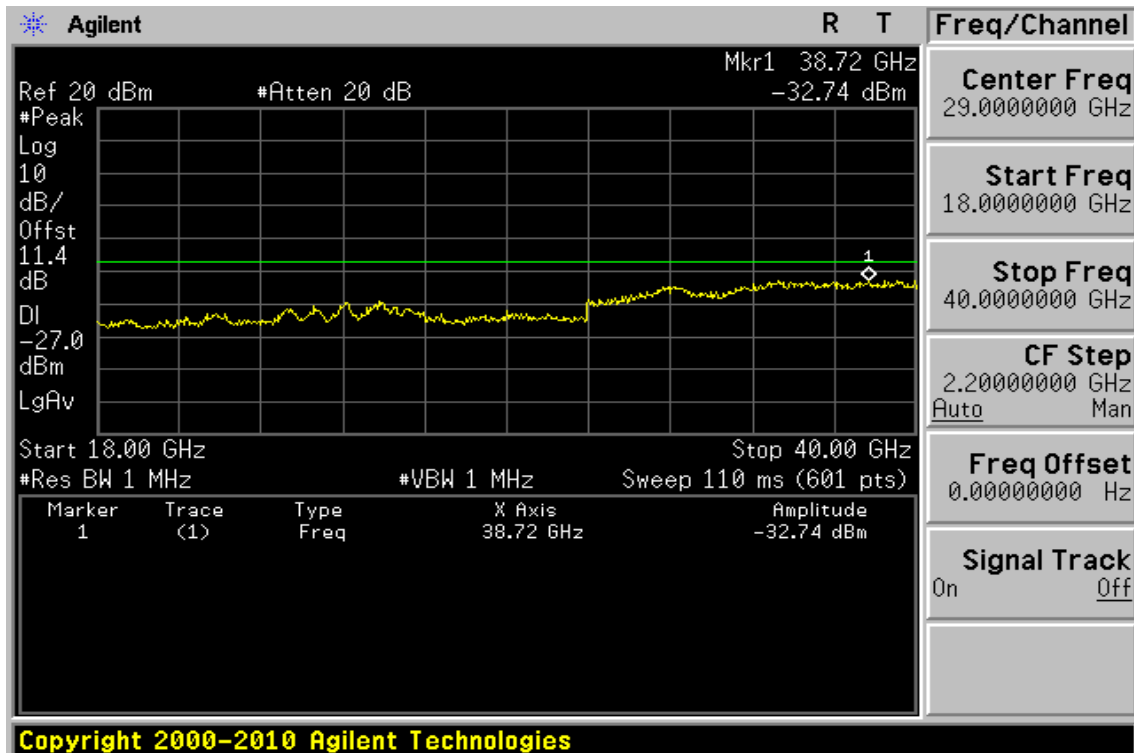
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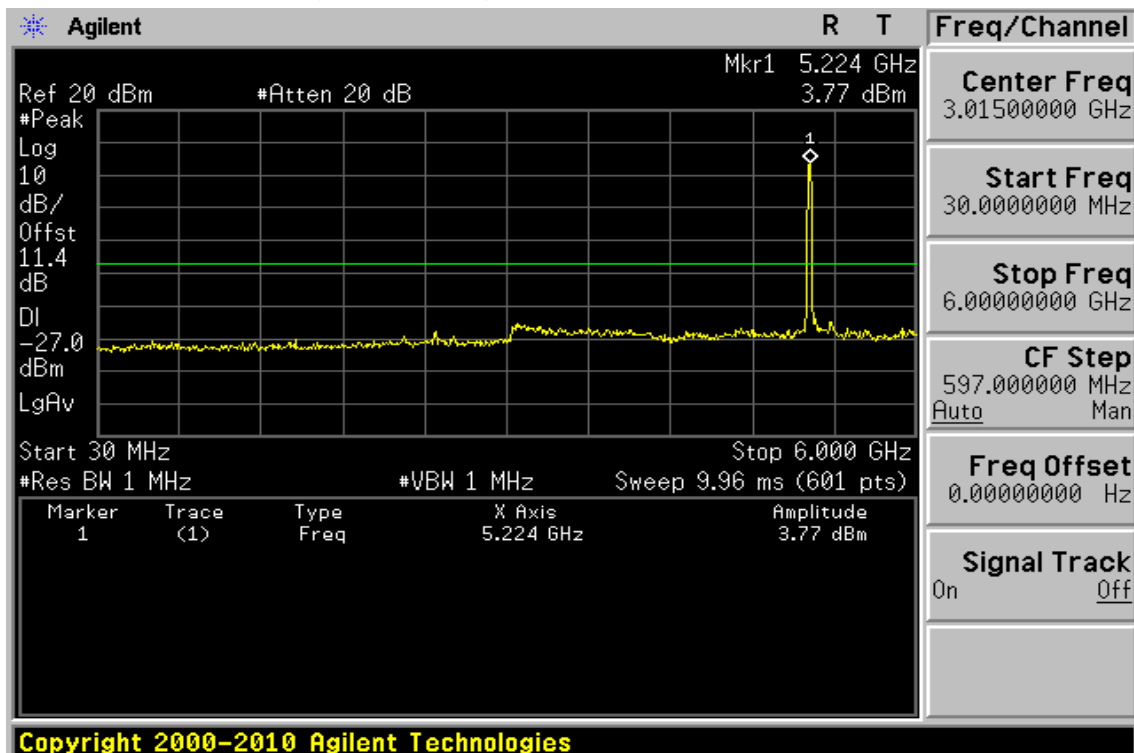
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## Ch Low 18GHz – 40GHz



## Ch Mid 30MHz – 6GHz (5220 MHz)



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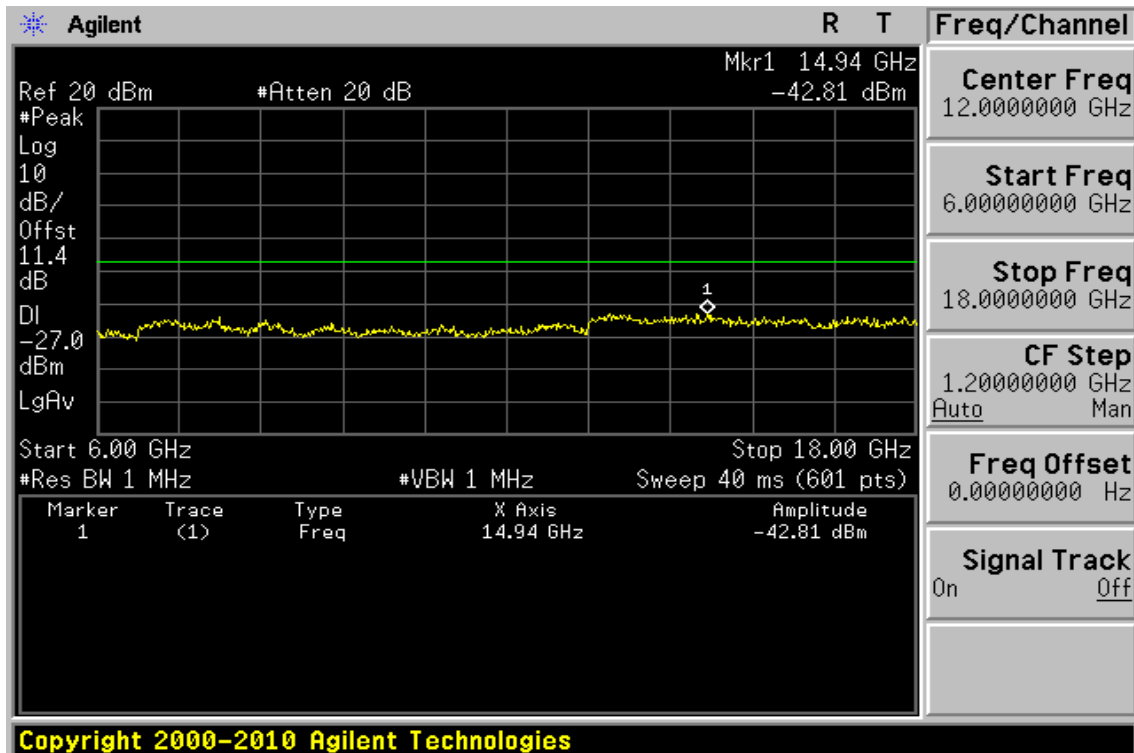
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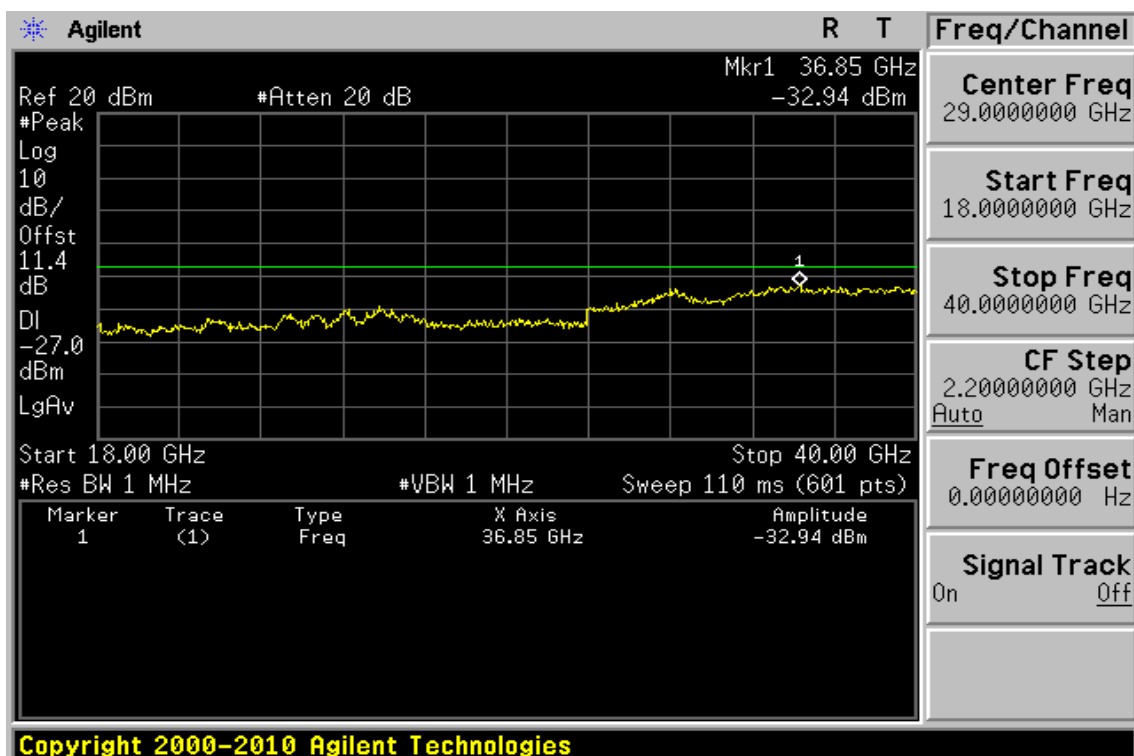
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## Ch Mid 6GHz – 18GHz



## Ch Mid 18GHz – 40GHz



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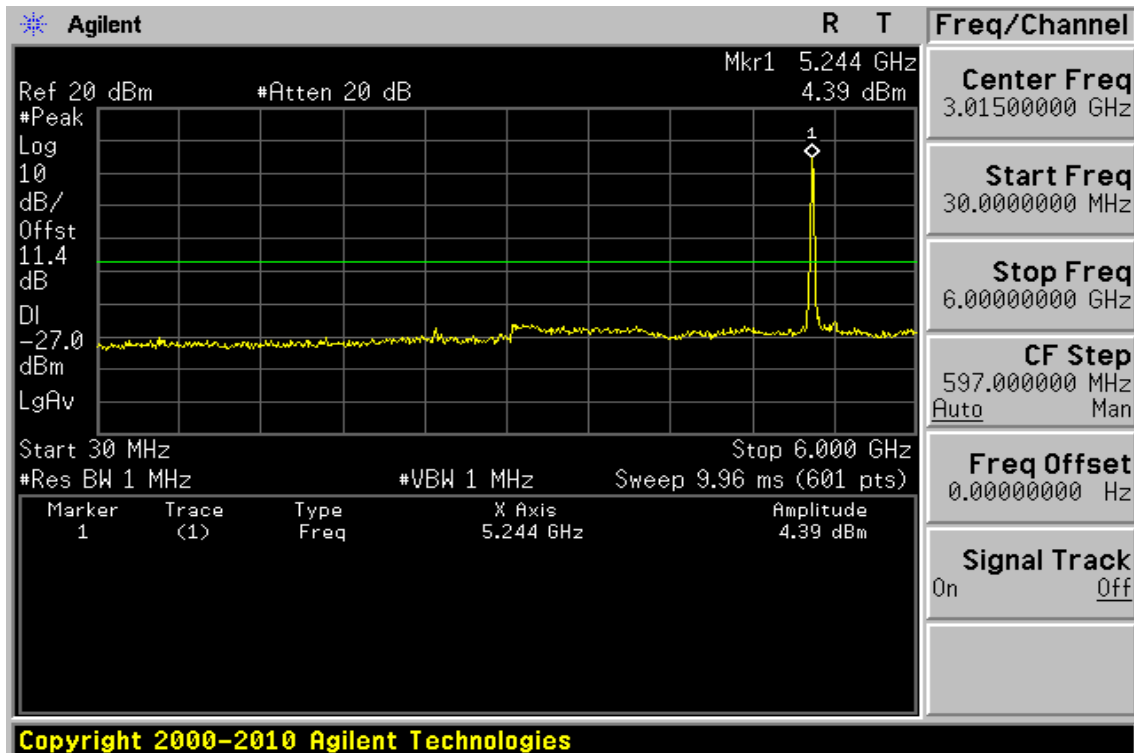
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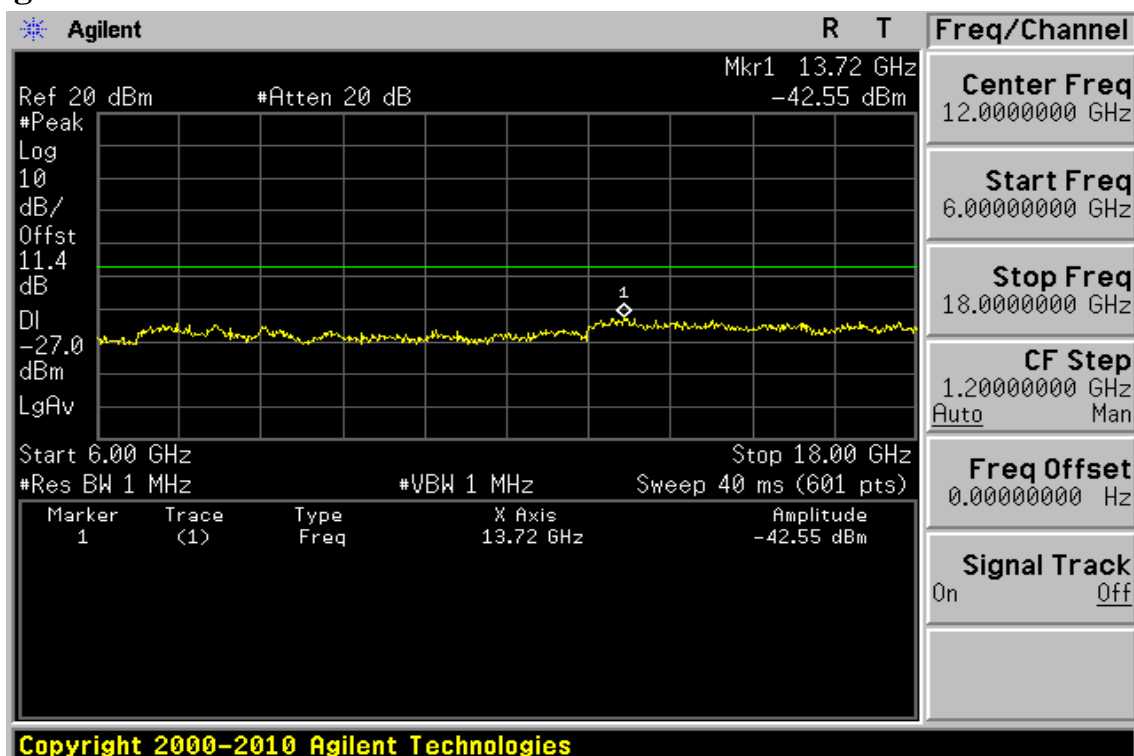
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## Ch High 30MHz – 6GHz (5240 MHz)



## Ch High 6GHz – 18GHz



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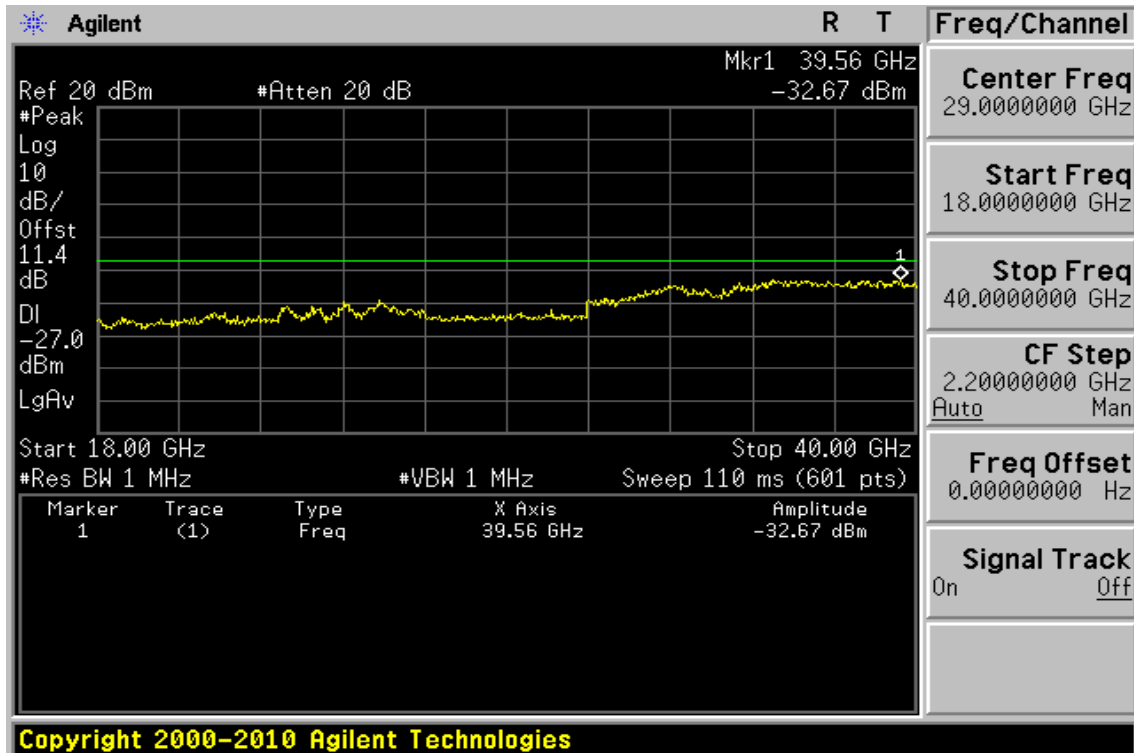
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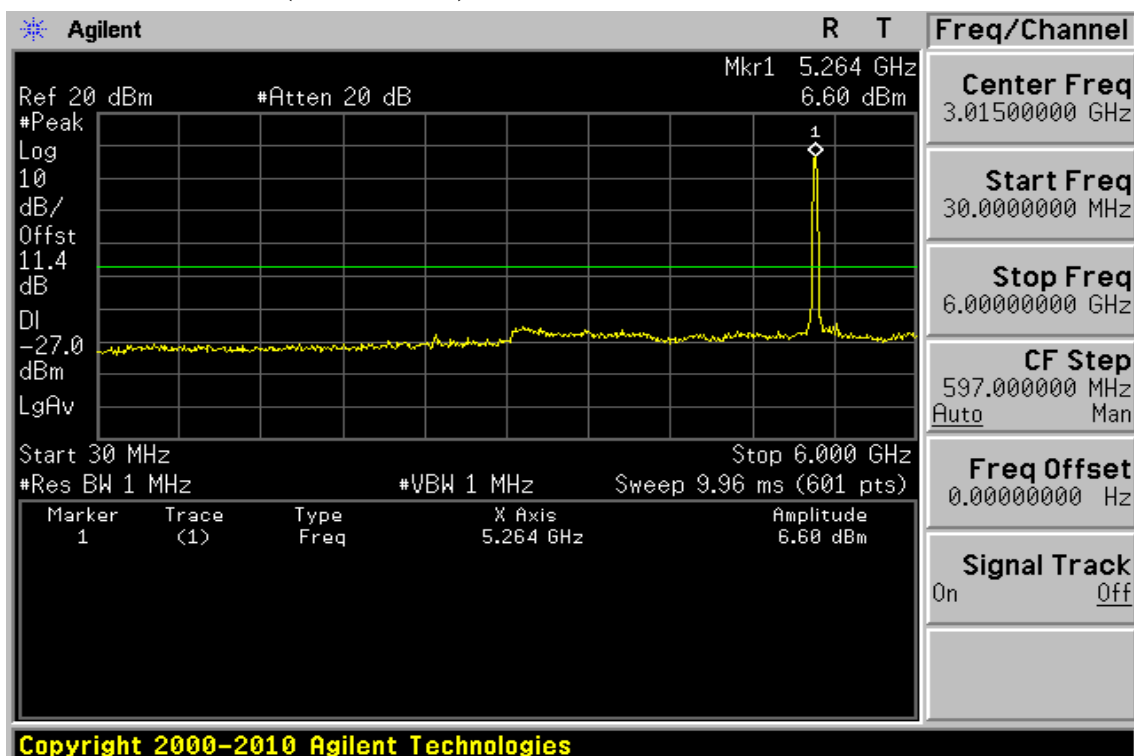
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## Ch High 18GHz – 40GHz



## 802.11a, 5250~5350 MHz

## Ch Low 30MHz – 6GHz (5260 MHz)



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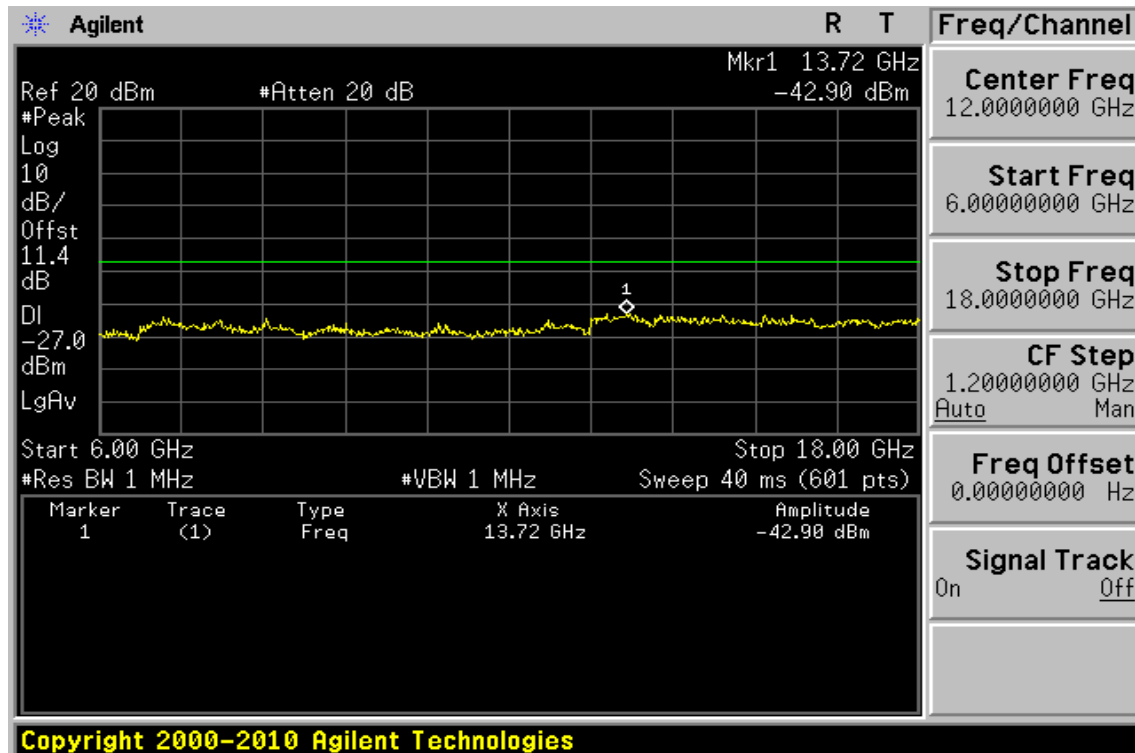
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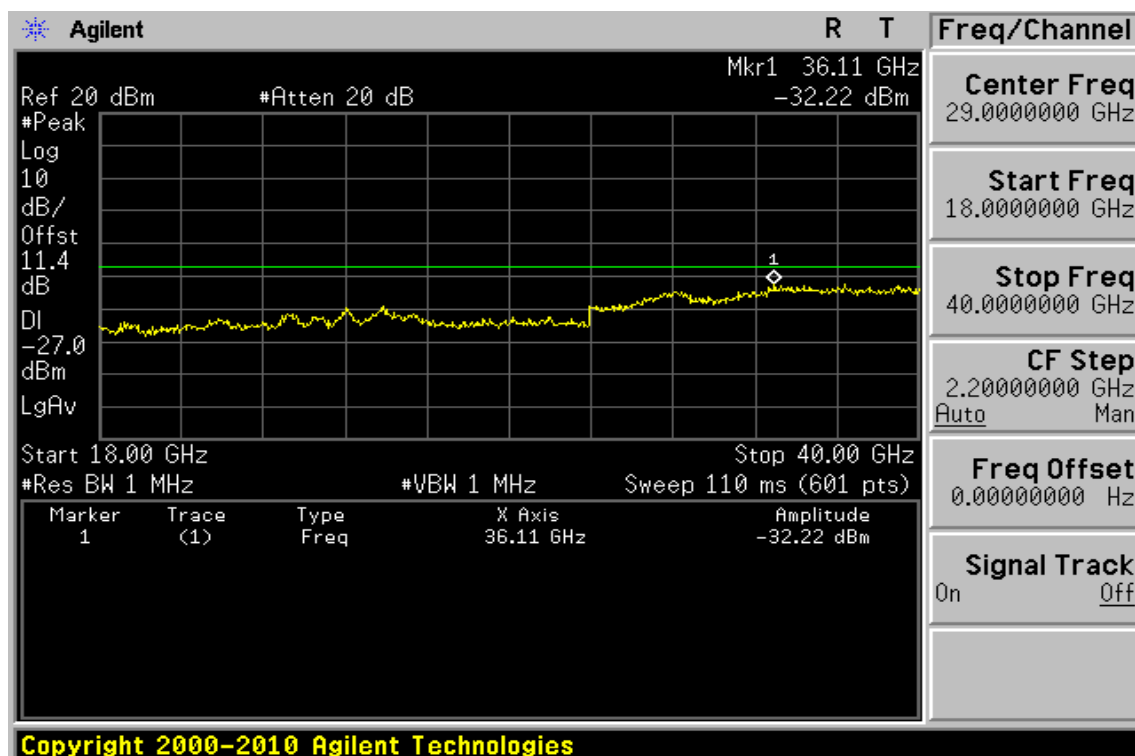
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## Ch Low 6GHz – 18GHz



## Ch Low 18GHz – 40GHz



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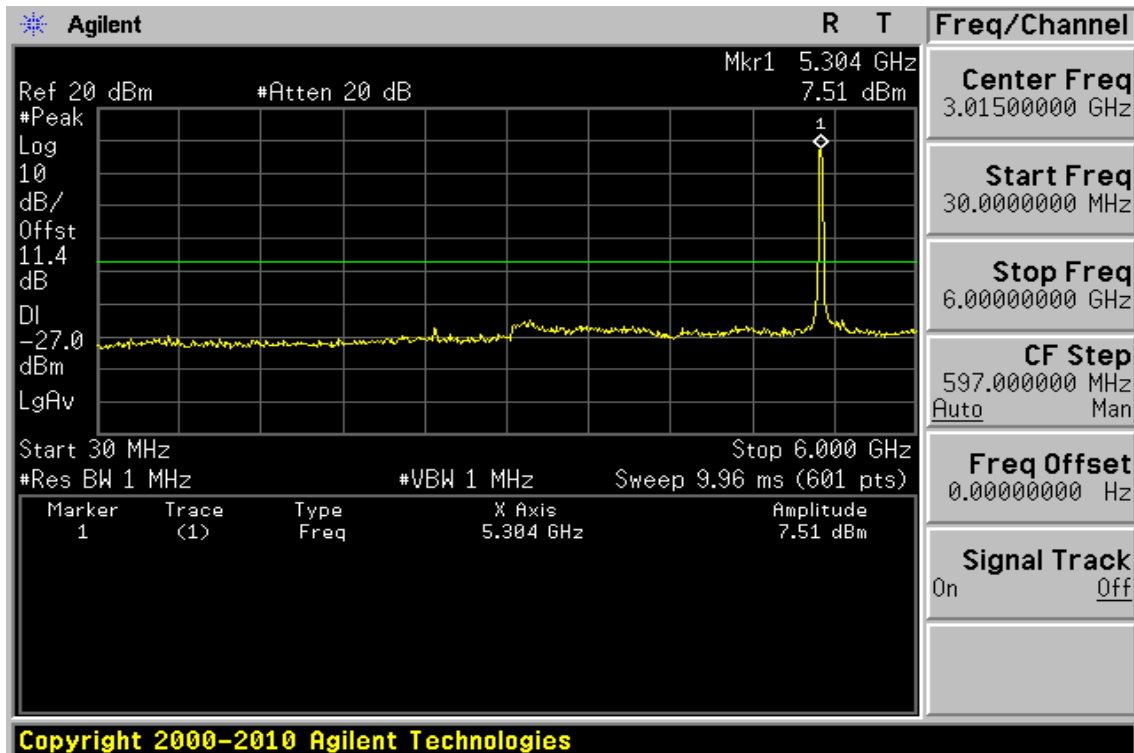
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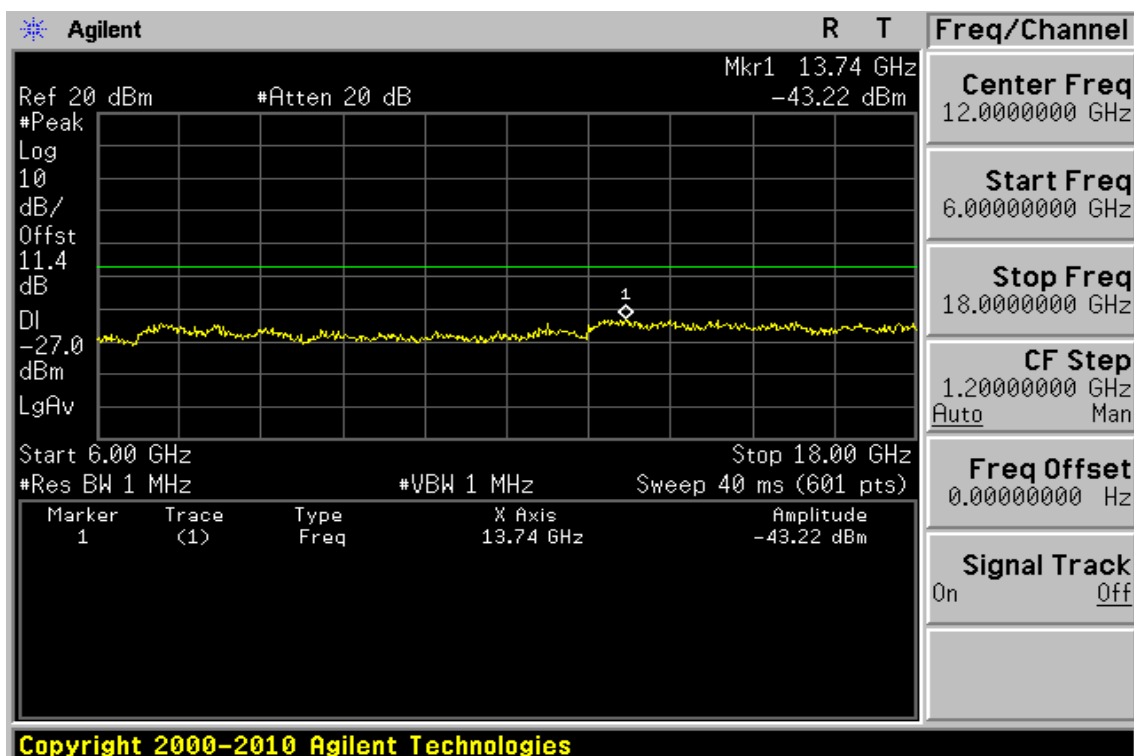
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## Ch Mid 30MHz – 6GHz (5300 MHz)



## Ch Mid 6GHz – 18GHz



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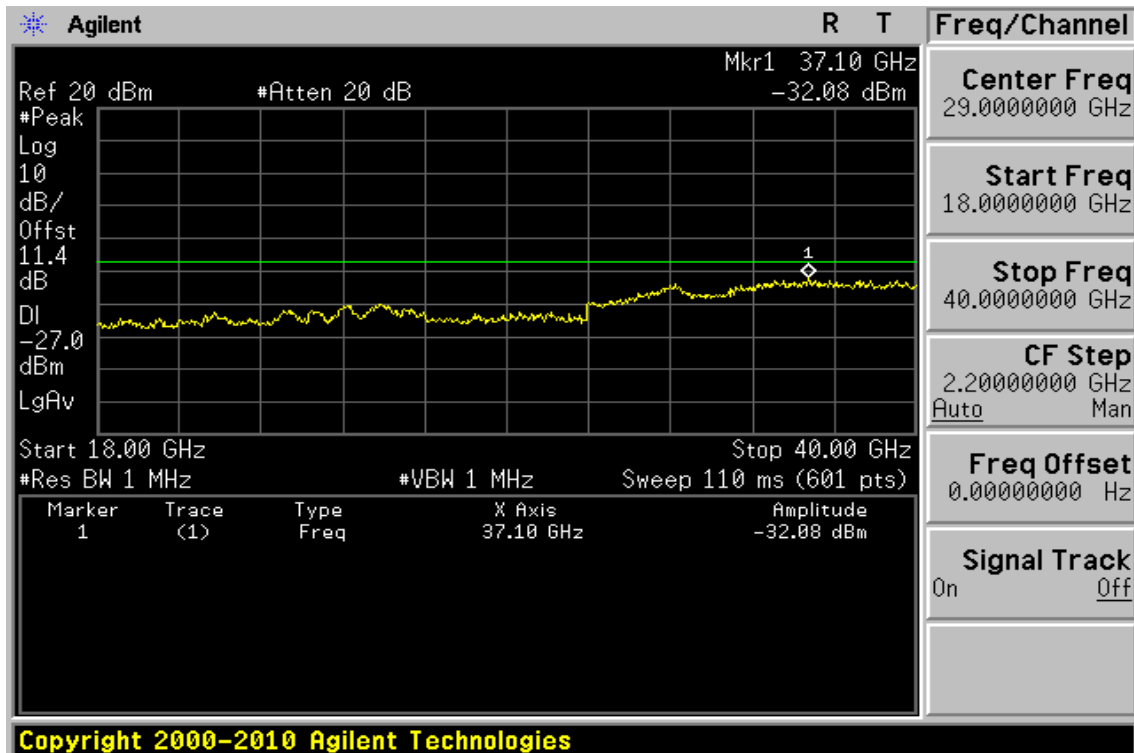
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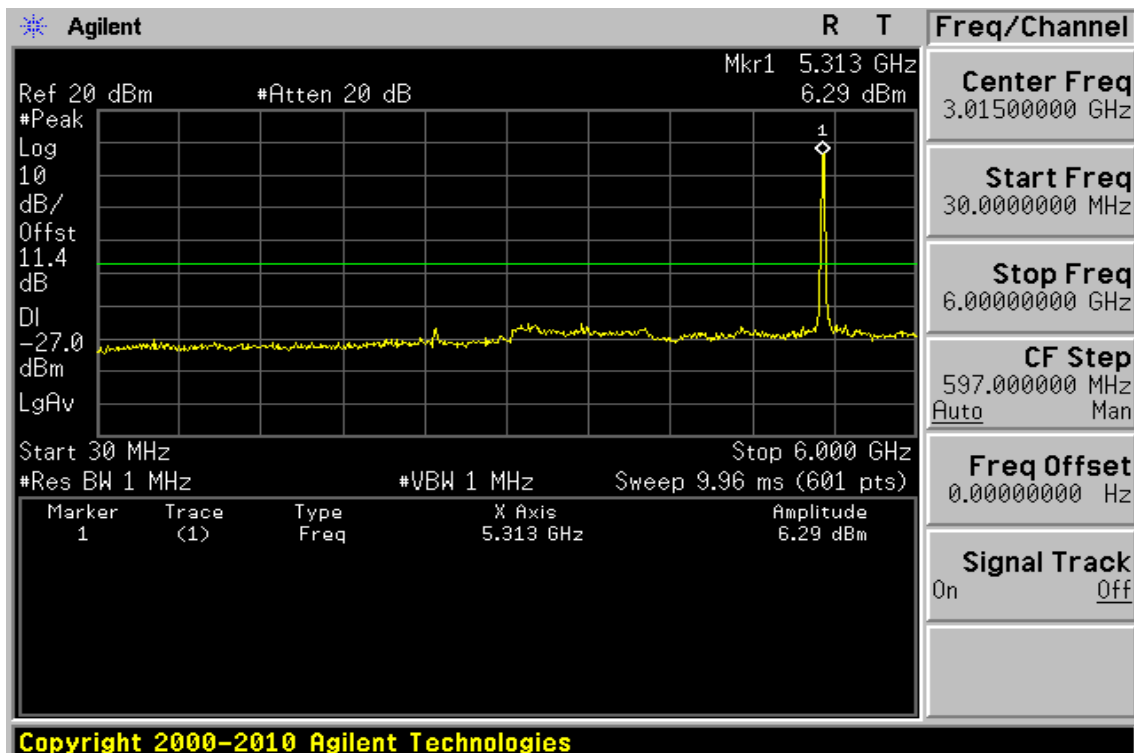
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## Ch Mid 18GHz – 40GHz



## Ch High 30MHz – 6GHz (5320 MHz)



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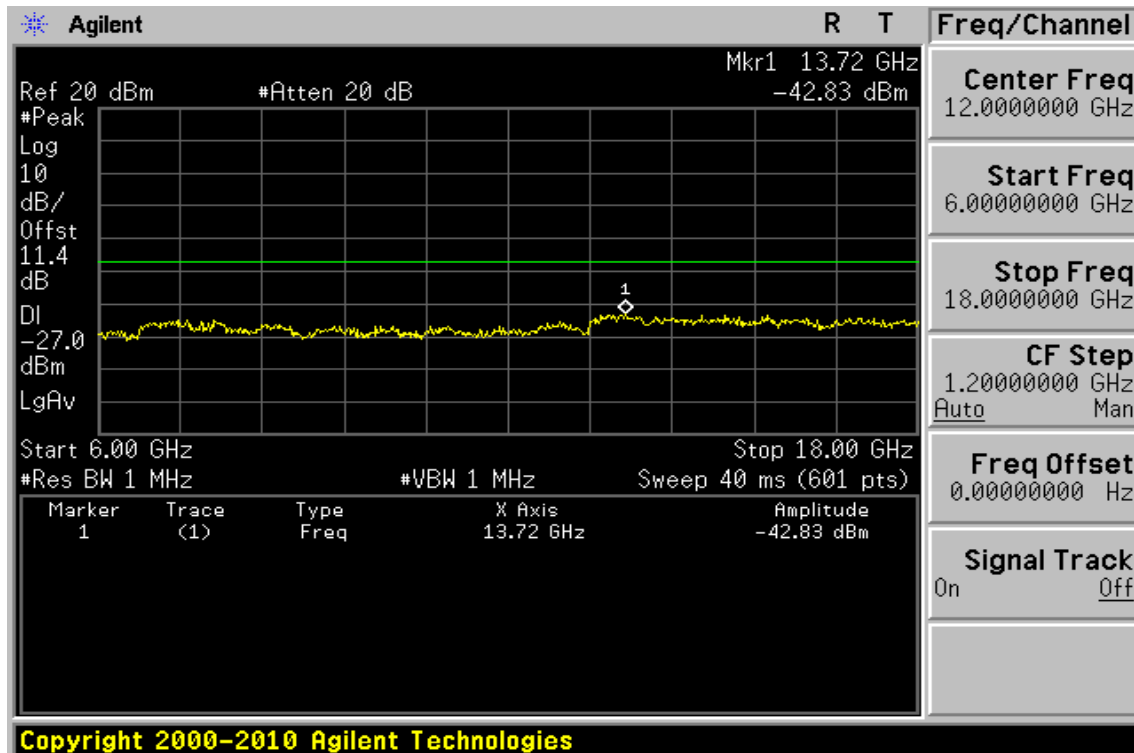
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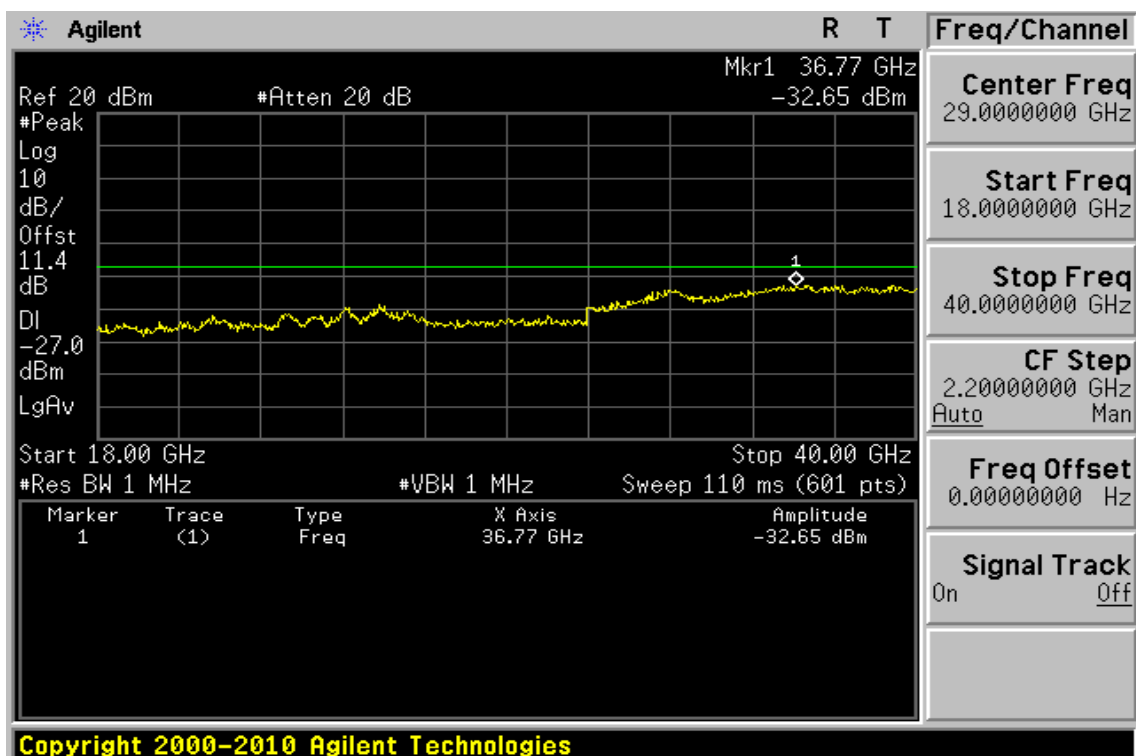
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## Ch High 6GHz – 18GHz



## Ch High 18GHz – 40GHz



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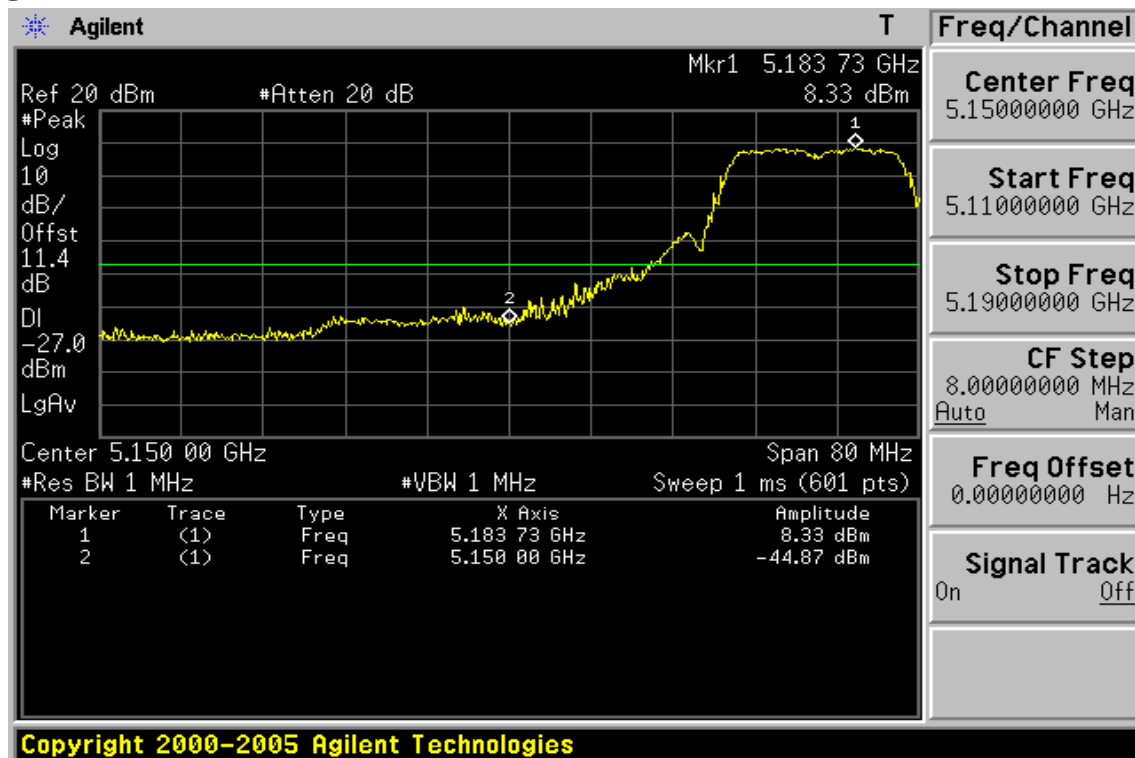
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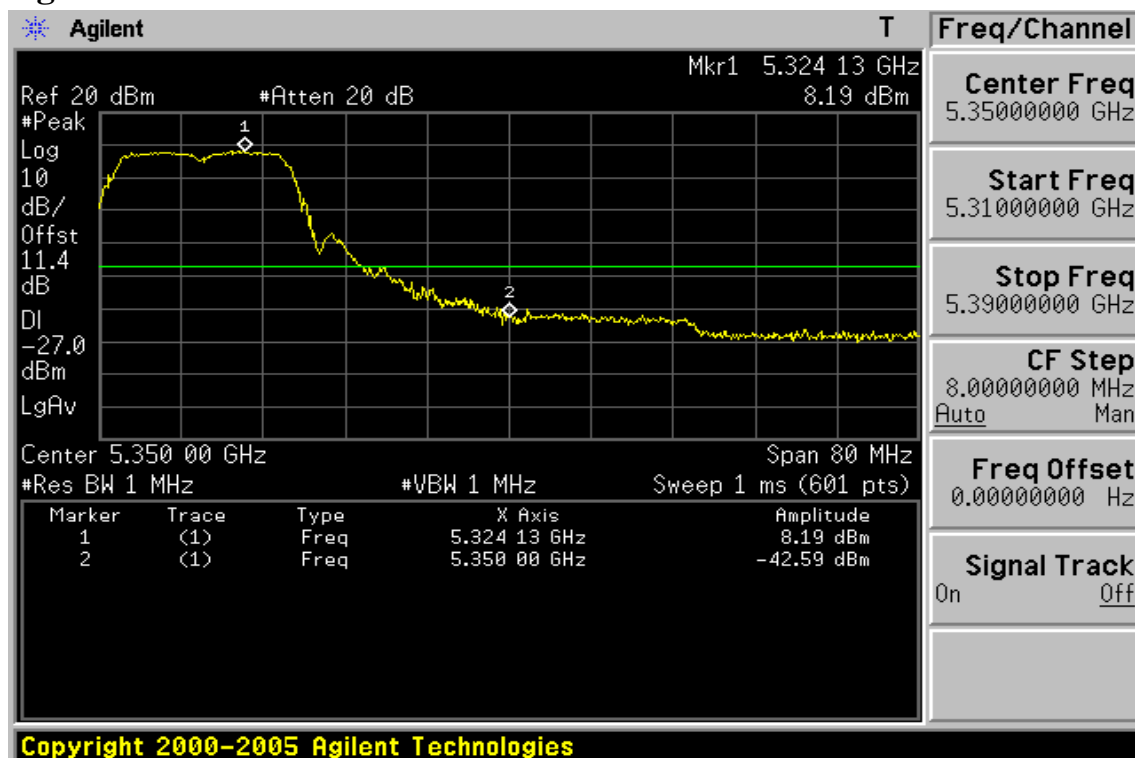
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## 802.11a, 5150~5350 MHz

### Band Edges Test Data CH 5150



### Band Edges Test Data CH 5350



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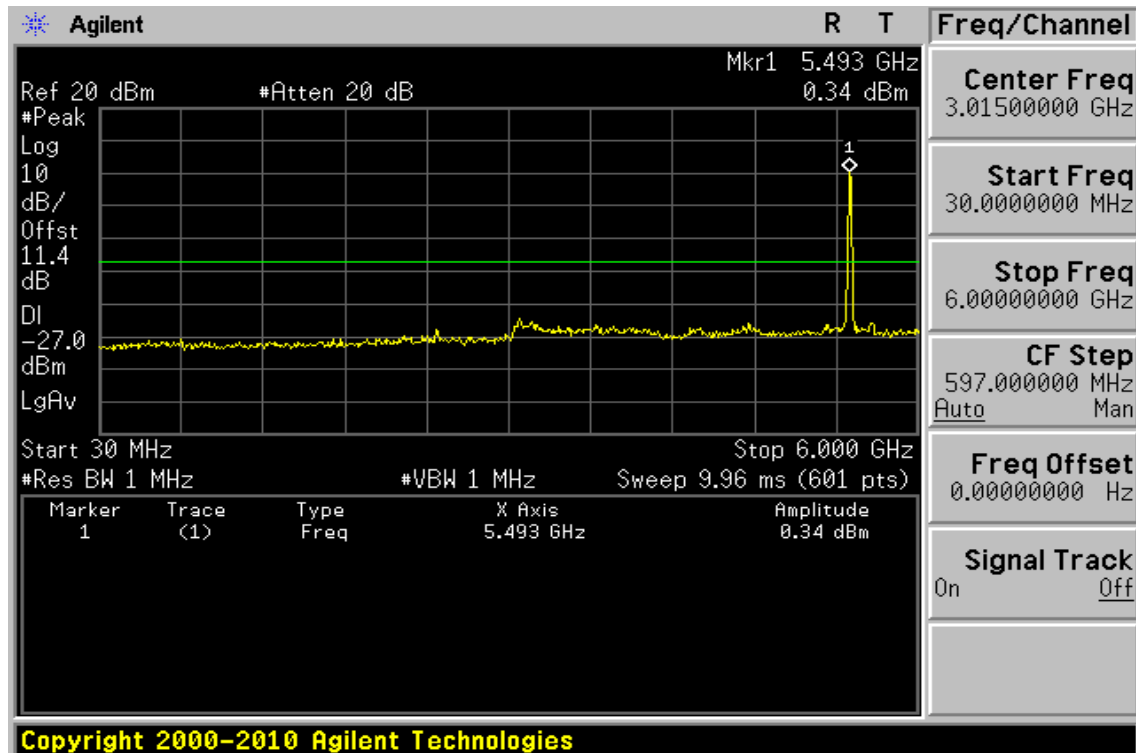
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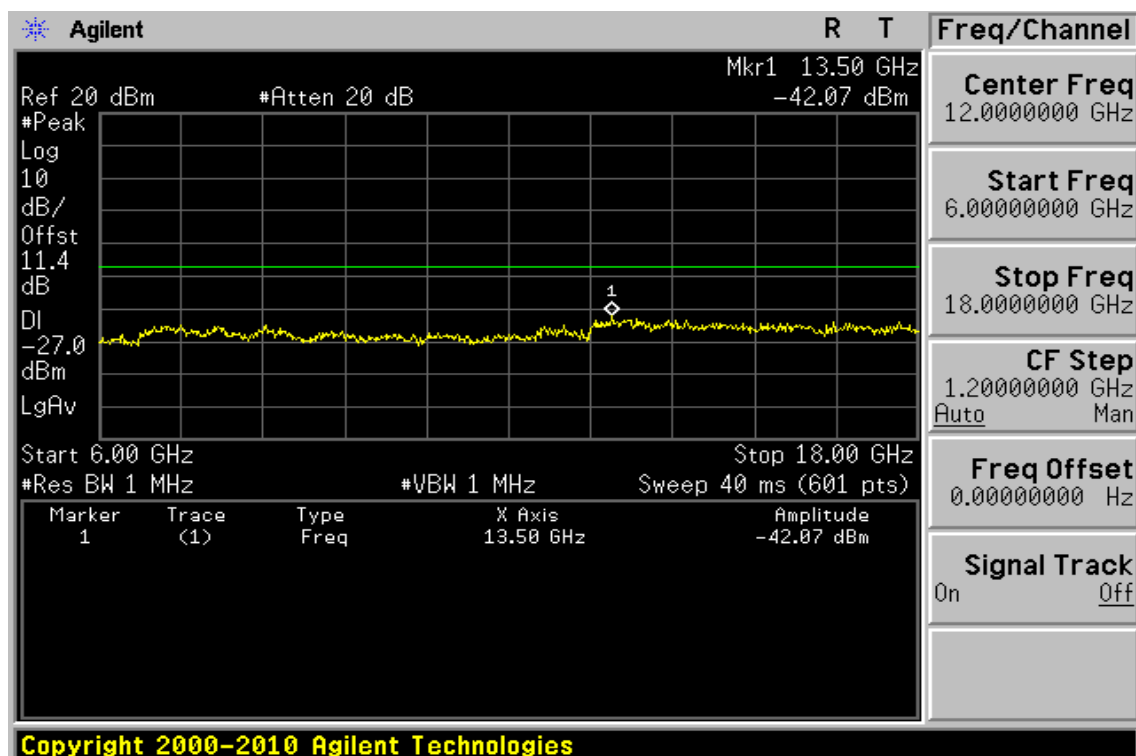
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802.11a, 5470~5725 MHz

Ch Low 30MHz – 6GHz (5500 MHz)



Ch Low 6GHz – 18GHz



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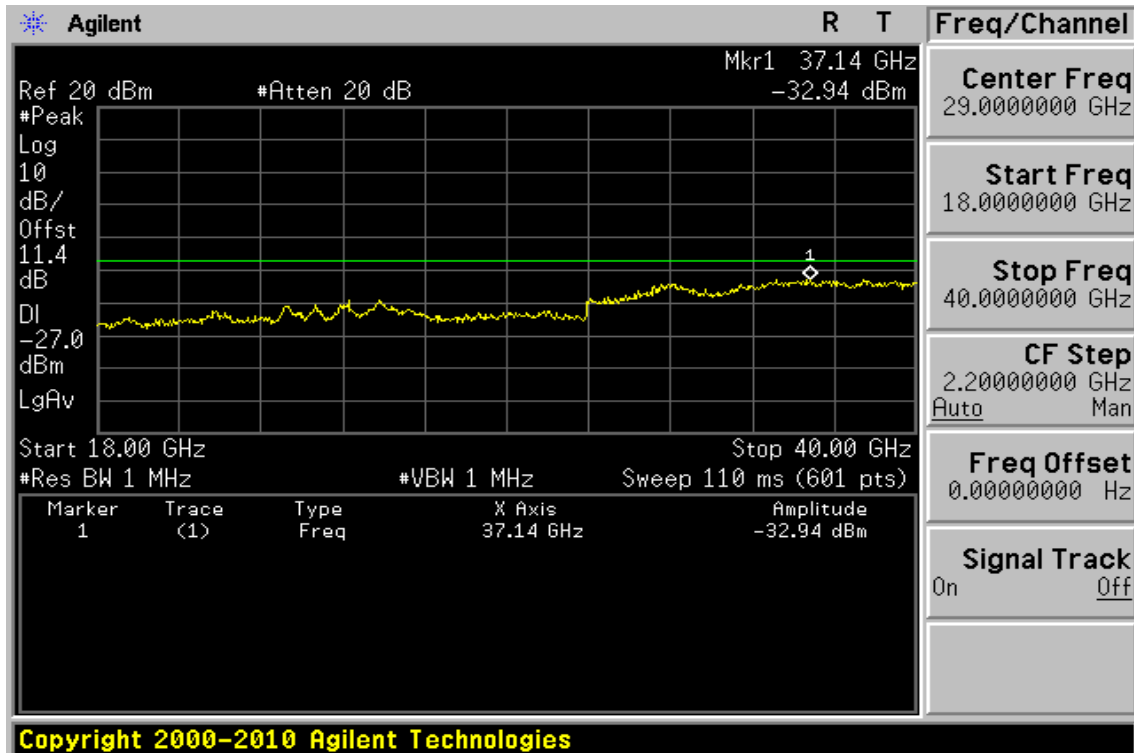
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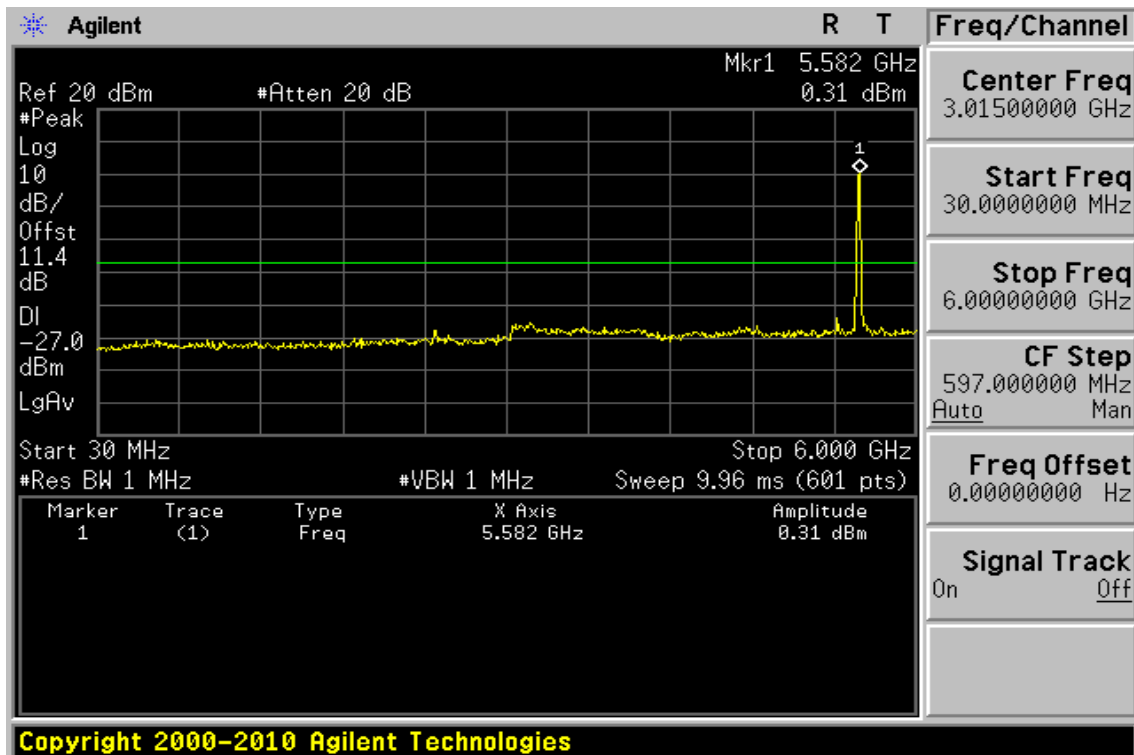
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## Ch Low 18GHz – 40GHz



## Ch Mid 30MHz – 6GHz (5580 MHz)



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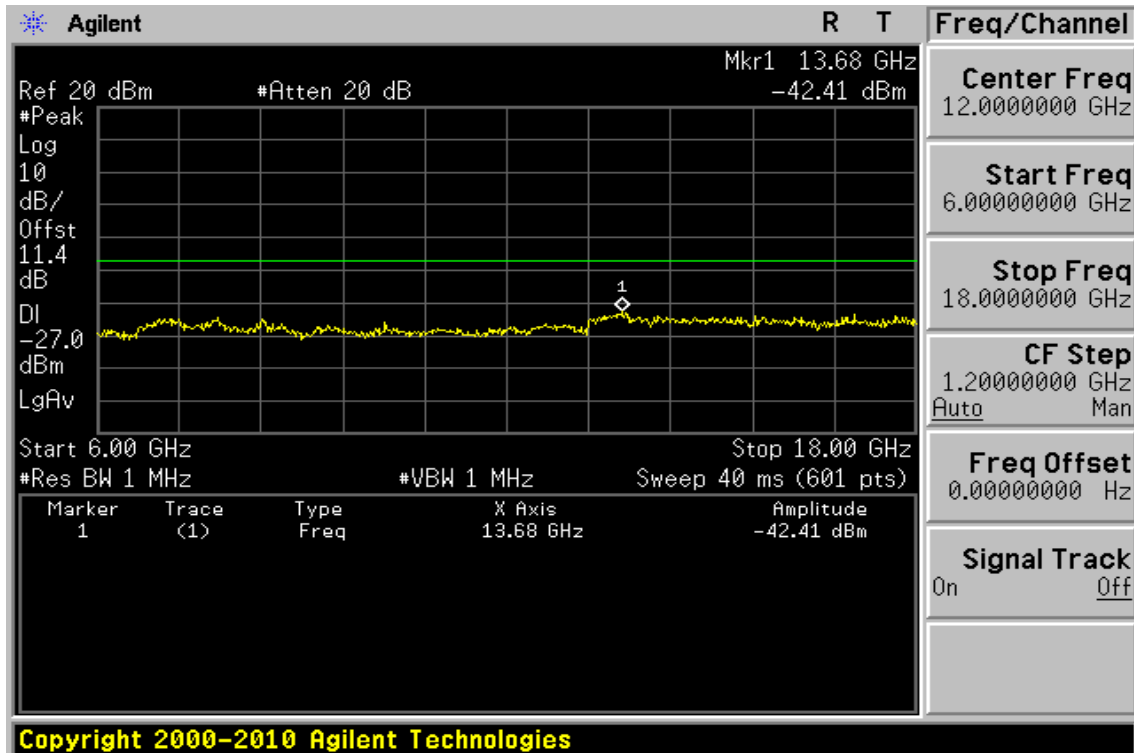
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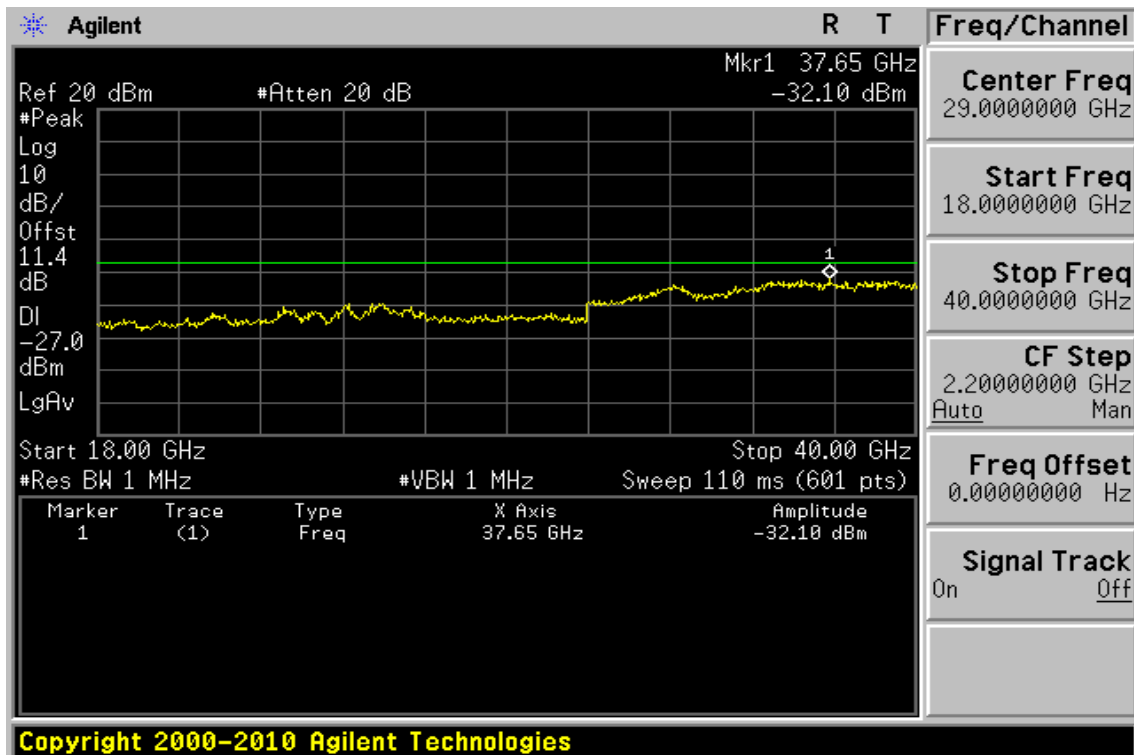
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## Ch Mid 6GHz – 18GHz



## Ch Mid 18GHz – 40GHz



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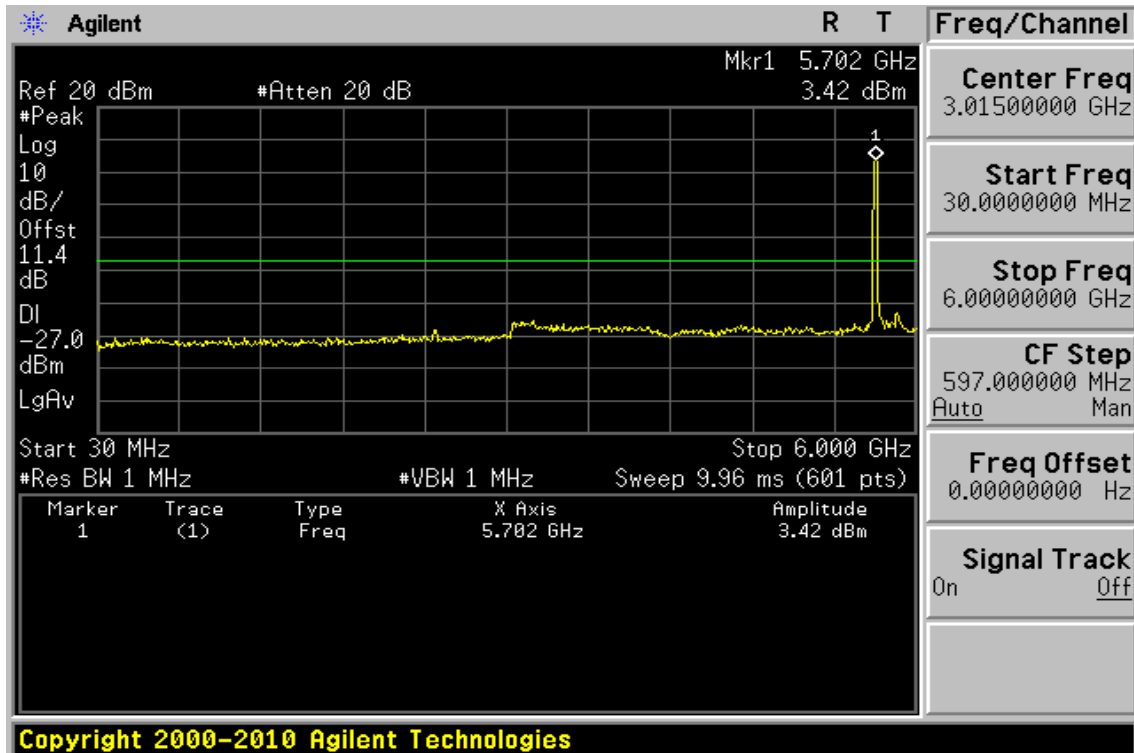
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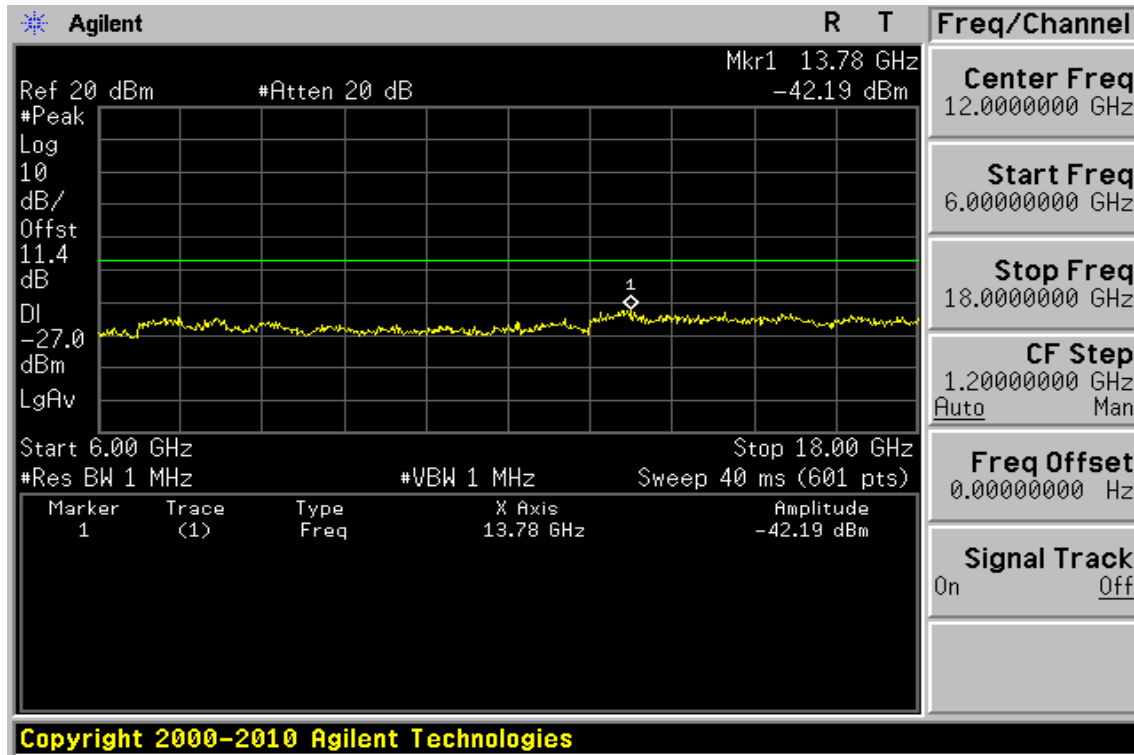
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## Ch High 30MHz – 6GHz (5700 MHz)



## Ch High 6GHz – 18GHz



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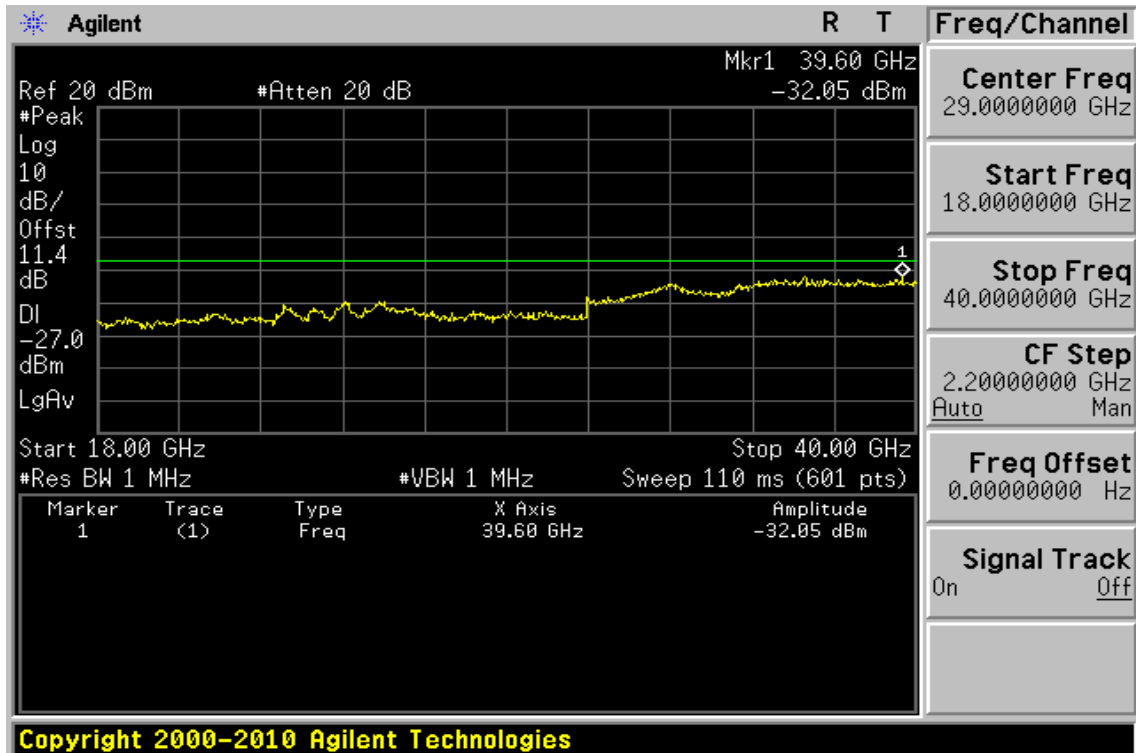
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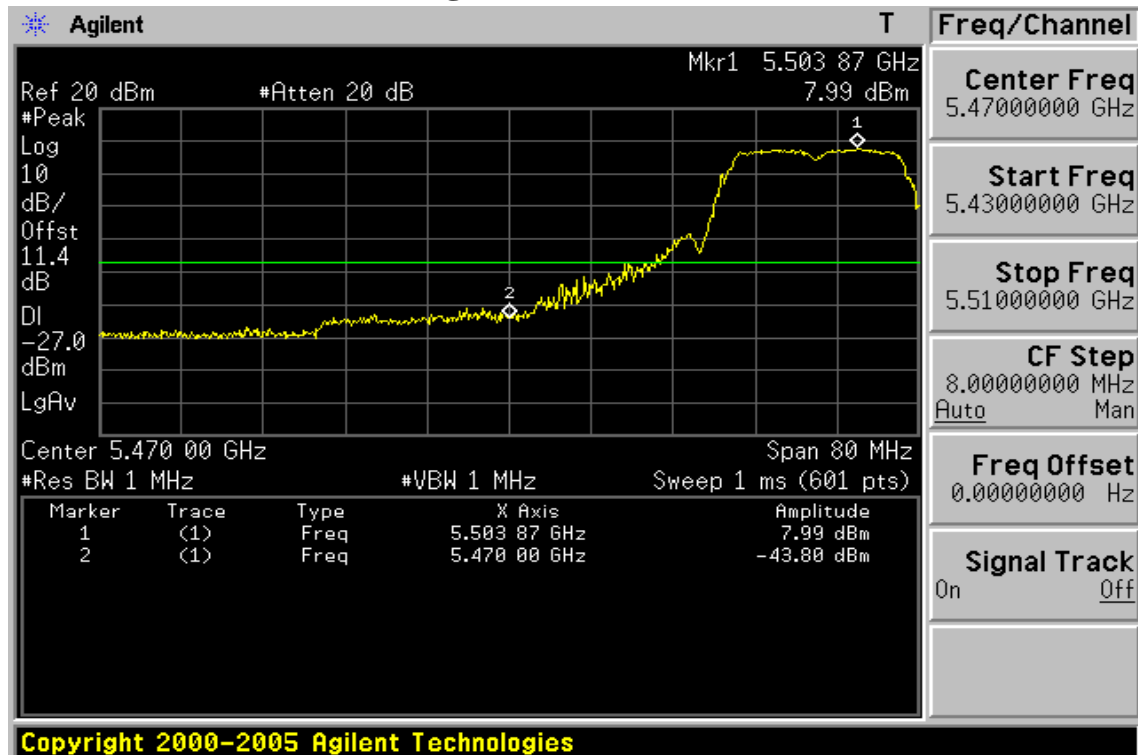
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## Ch High 18GHz – 40GHz



## 802.11a, 5470~5725 MHz Band Edges Test Data CH 5500



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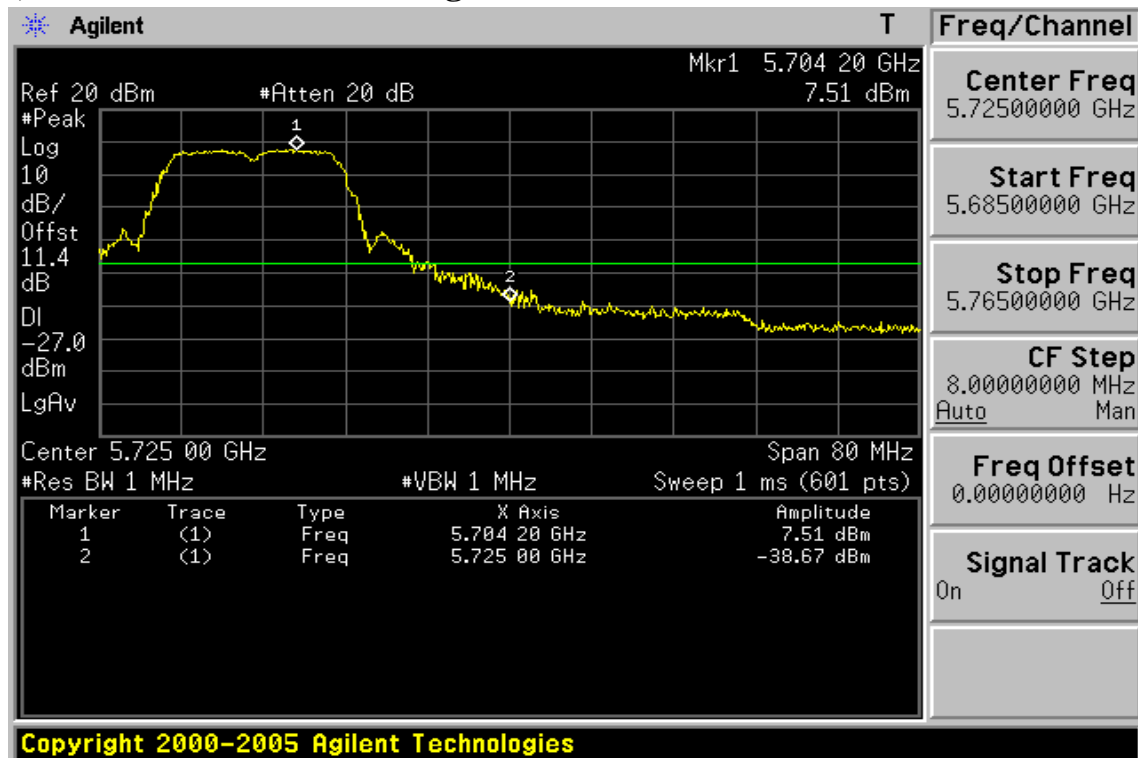
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## 802.11a, 5470~5725 MHz Band Edges Test Data CH 5700



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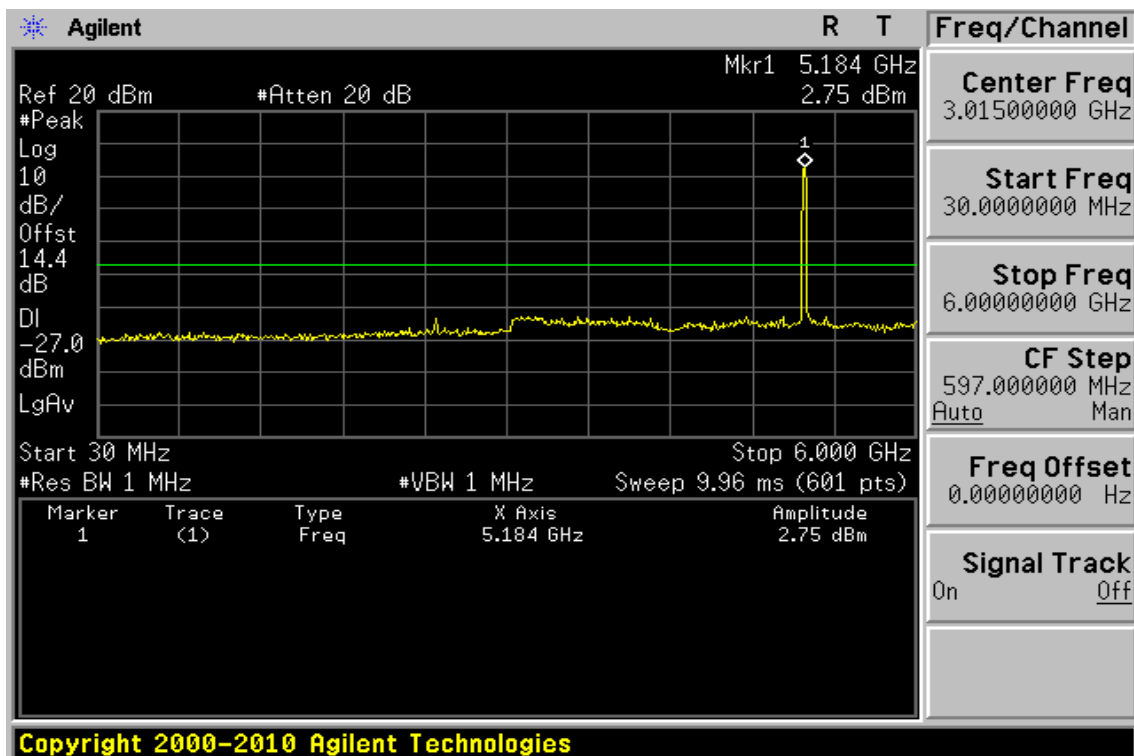
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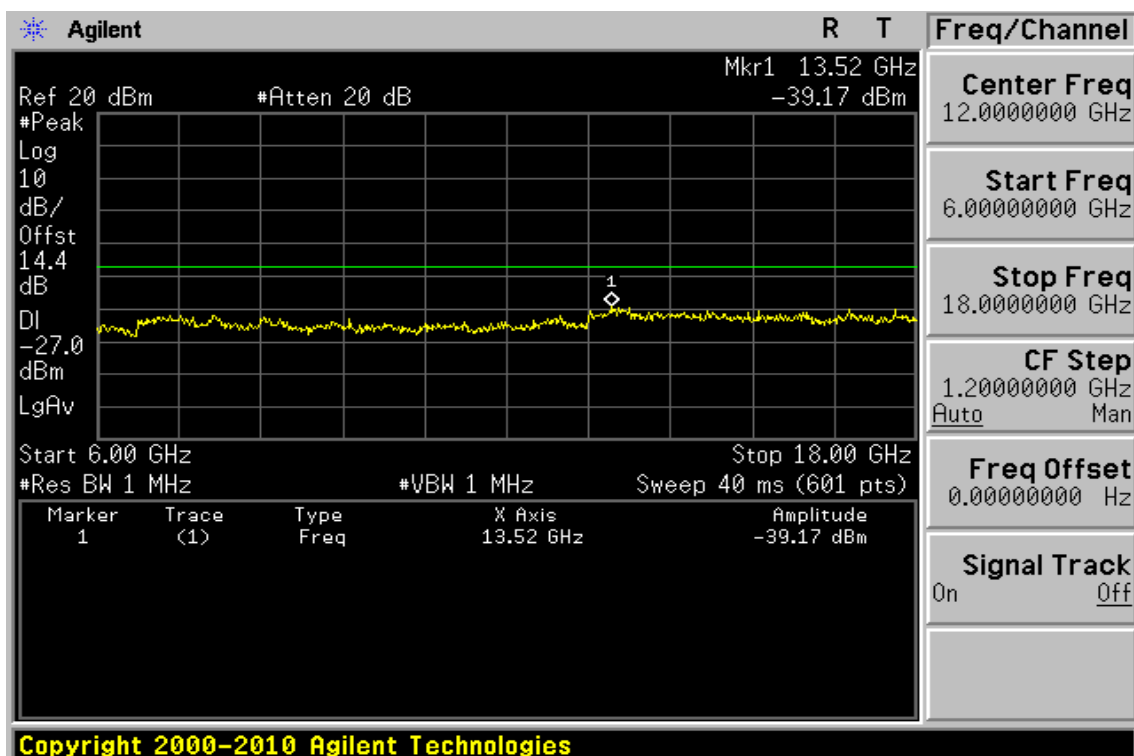
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## 802.11n HT20, 5150~5250 MHz Ch Low 30MHz – 6GHz (5180 MHz)



## Ch Low 6GHz – 18GHz



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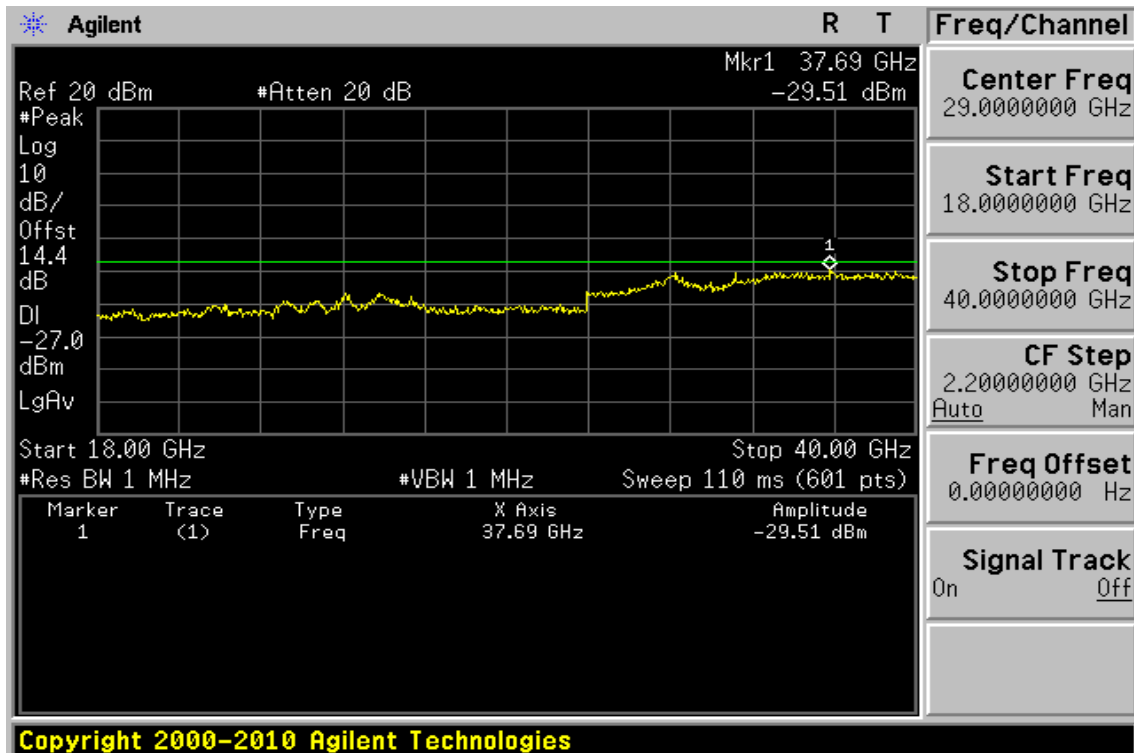
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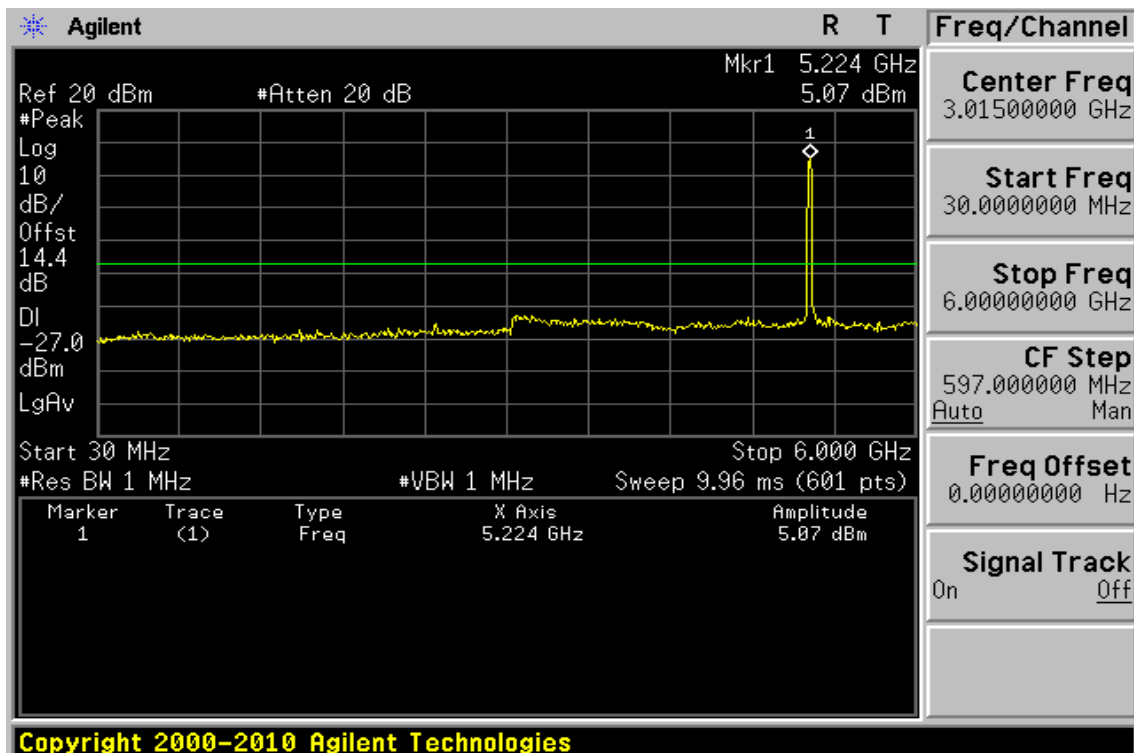
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## Ch Low 18GHz – 40GHz



## Ch Mid 30MHz – 6GHz (5220 MHz)



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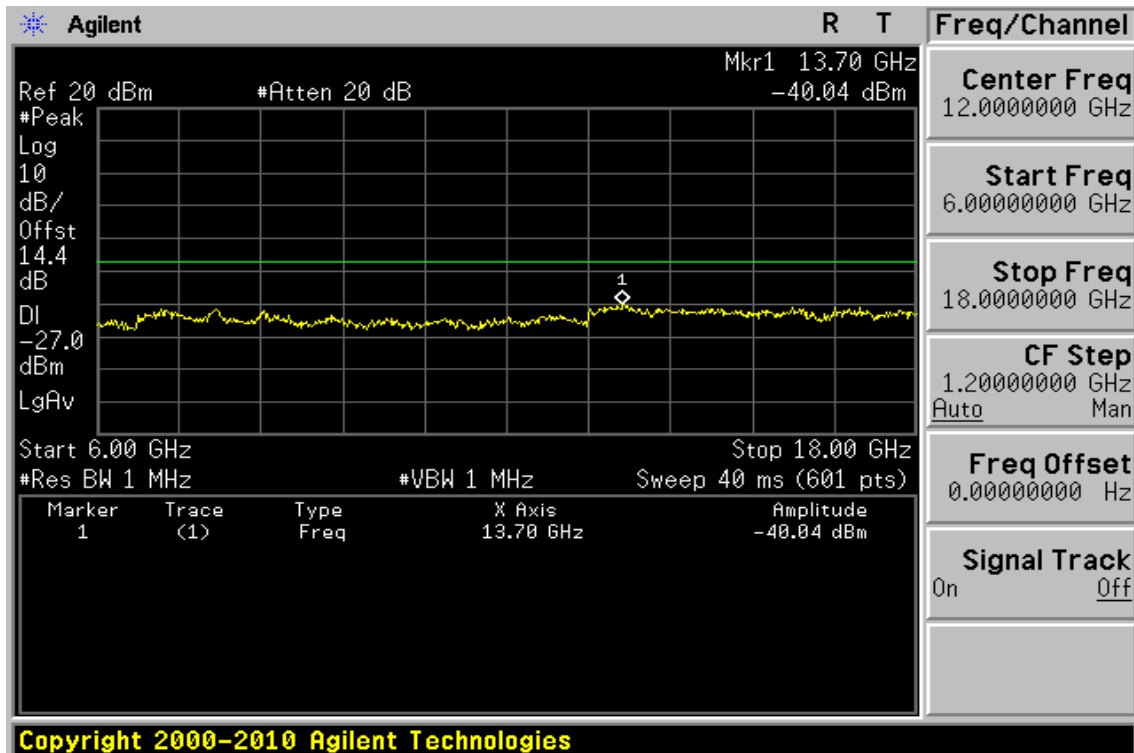
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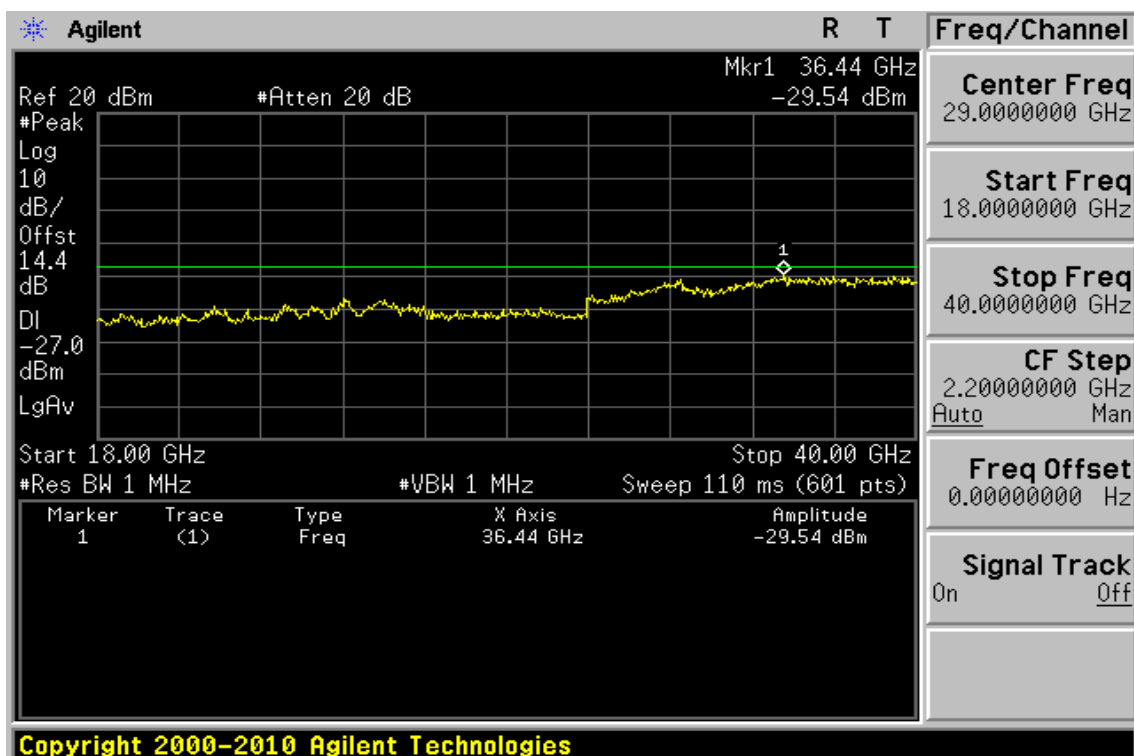
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## Ch Mid 6GHz – 18GHz



## Ch Mid 18GHz – 40GHz



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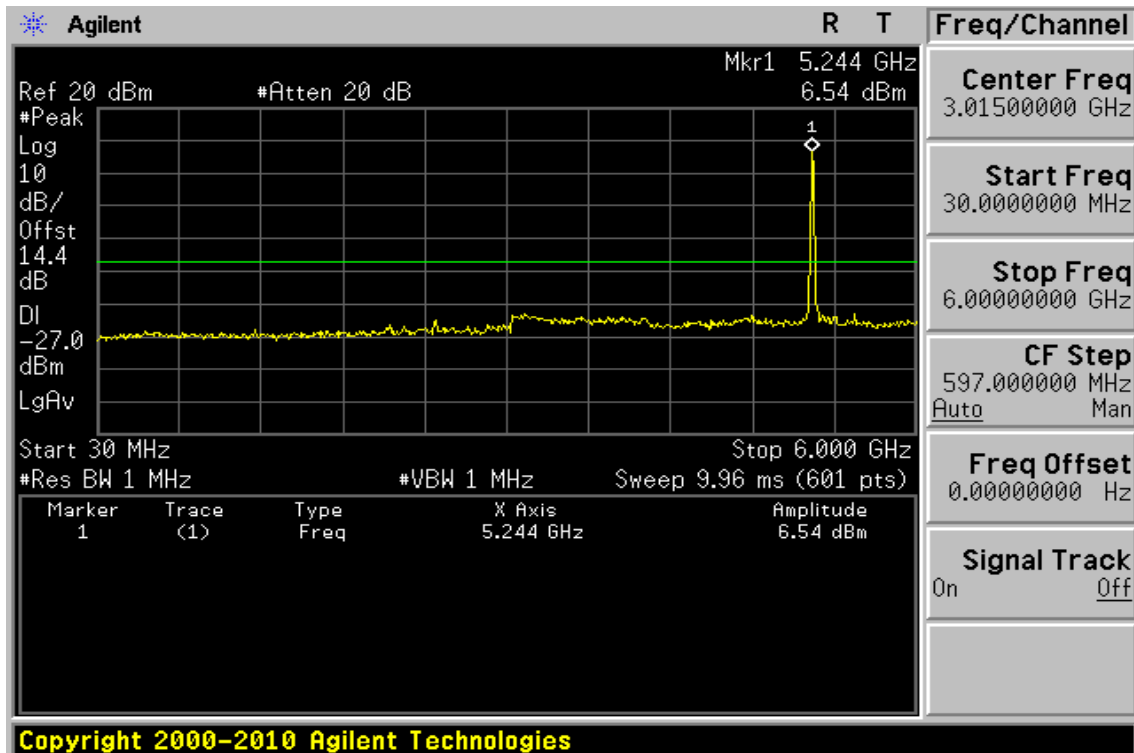
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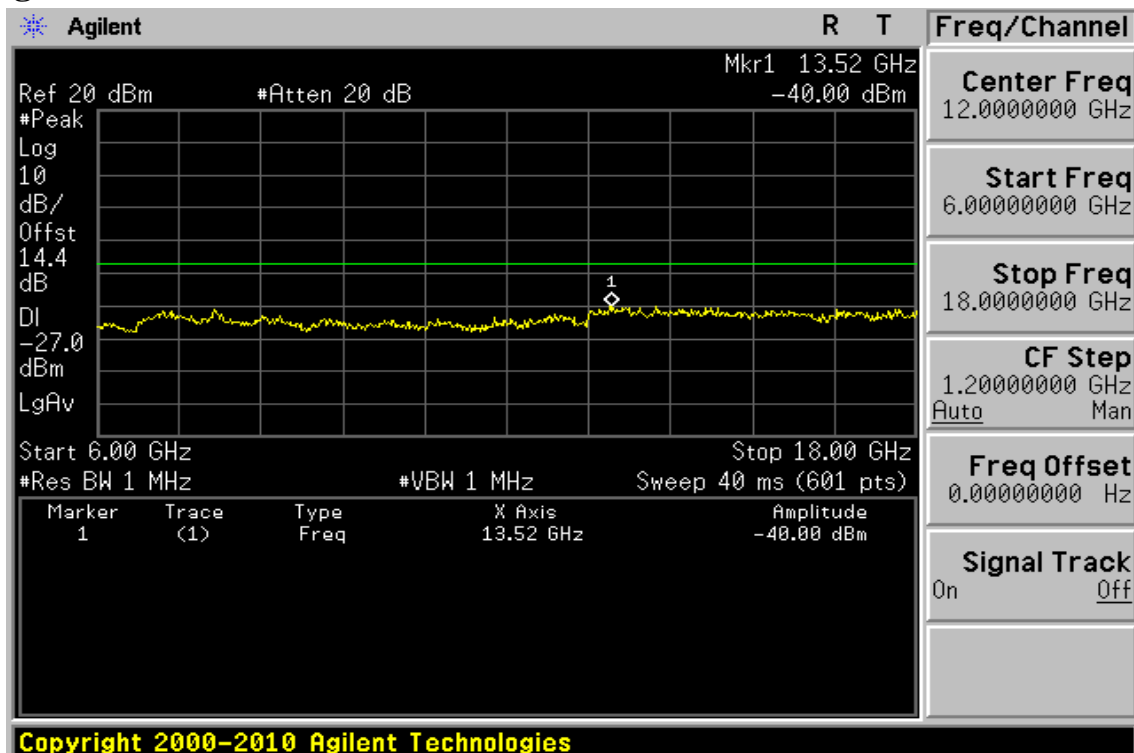
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## Ch High 30MHz – 6GHz (5240 MHz)



## Ch High 6GHz – 18GHz



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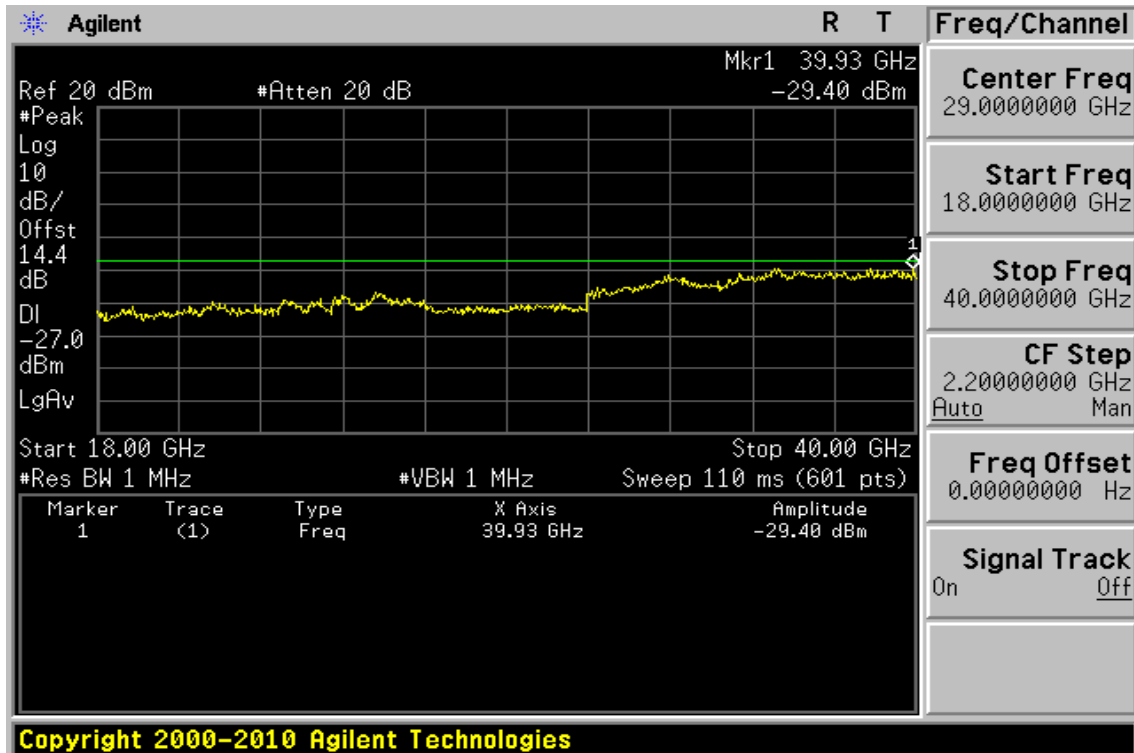
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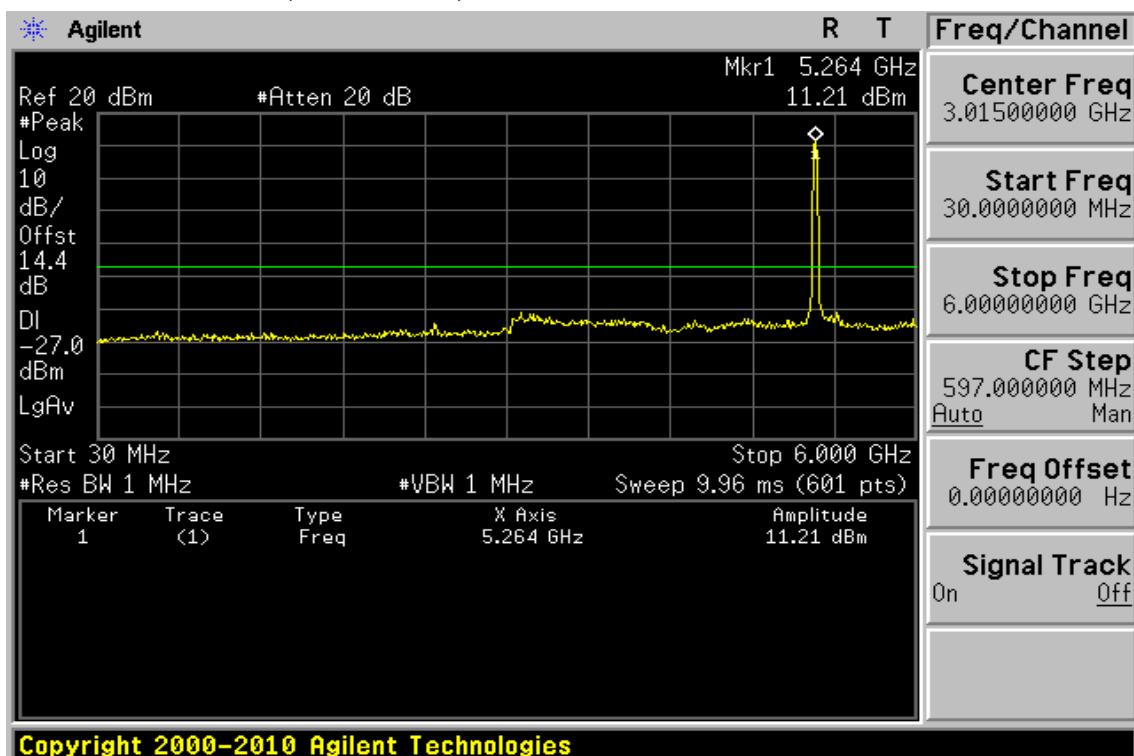


## Ch High 18GHz – 40GHz



## 802.11n HT20, 5250~5350 MHz

## Ch Low 30MHz – 6GHz (5260 MHz)



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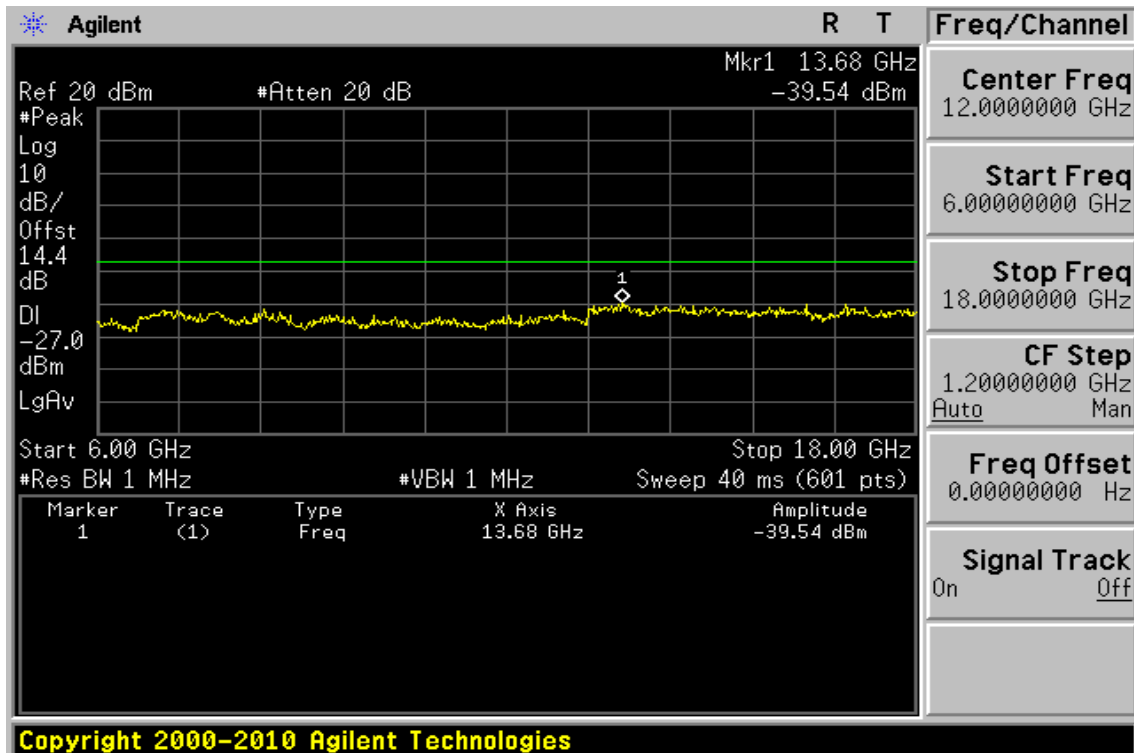
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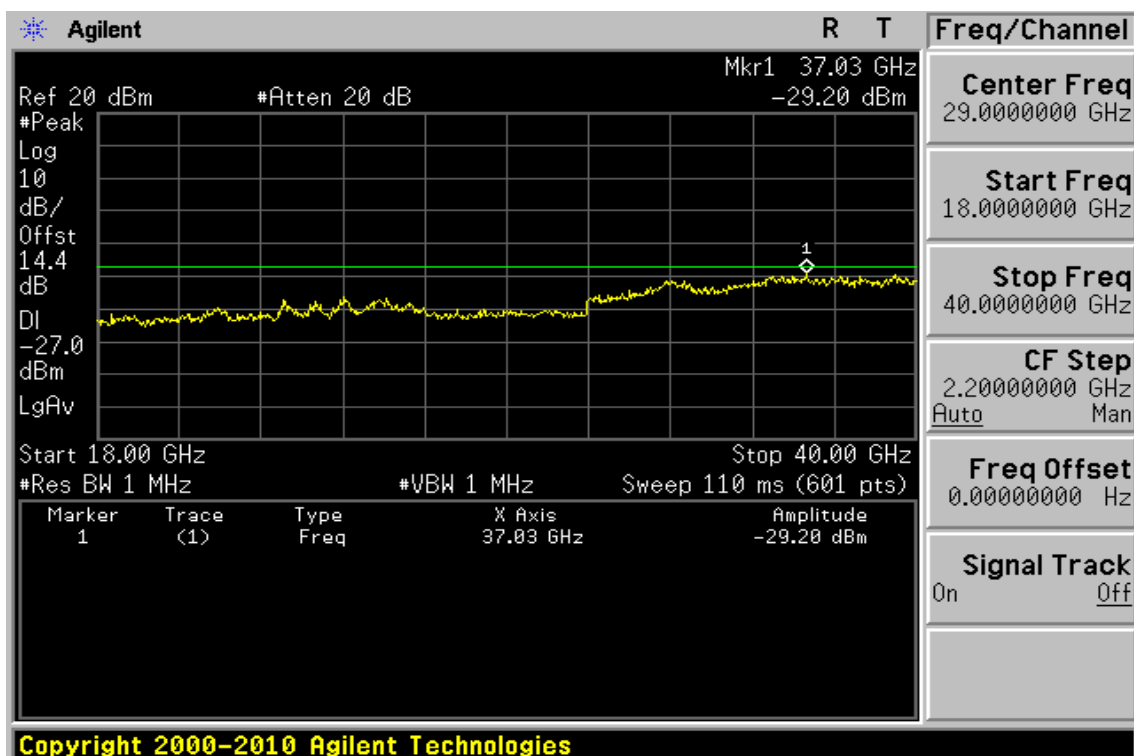
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## Ch Low 6GHz – 18GHz



## Ch Low 18GHz – 40GHz



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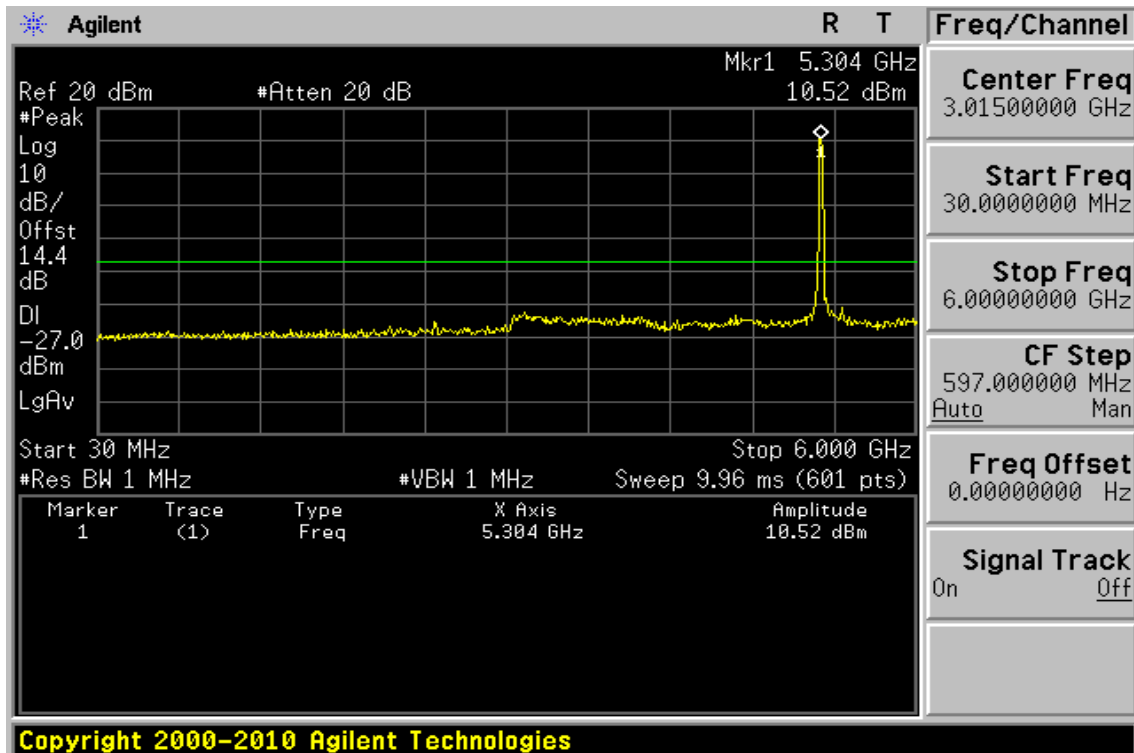
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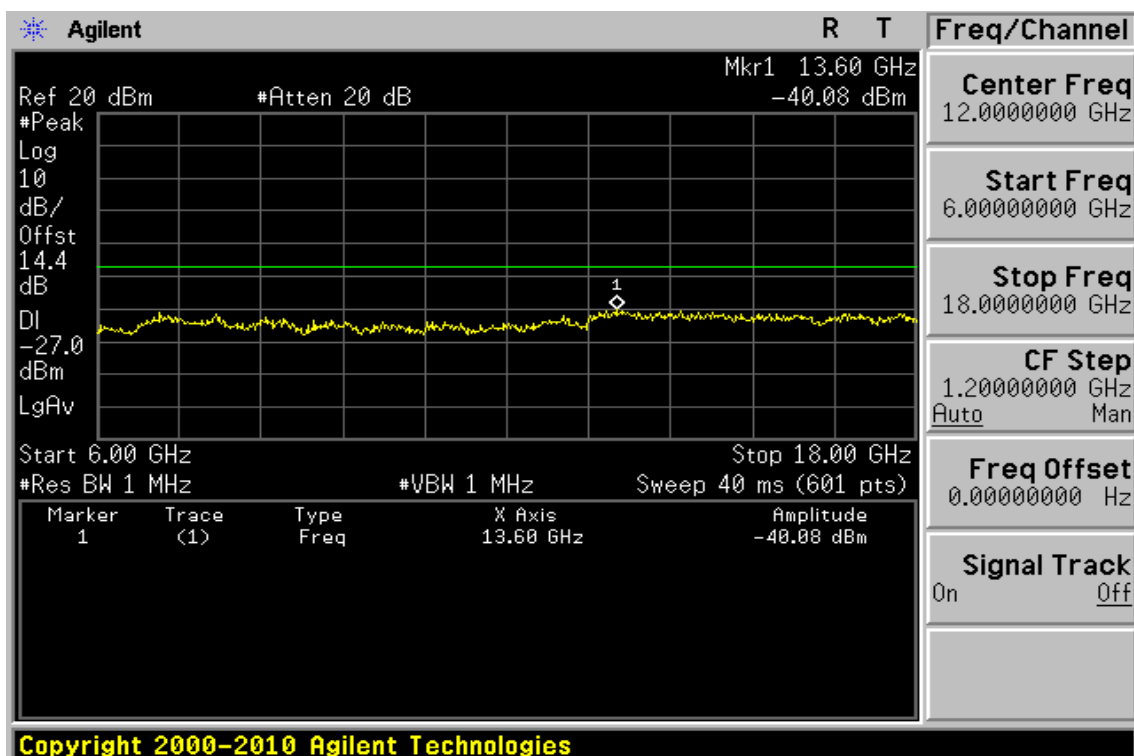
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## Ch Mid 30MHz – 6GHz (5300 MHz)



## Ch Mid 6GHz – 18GHz



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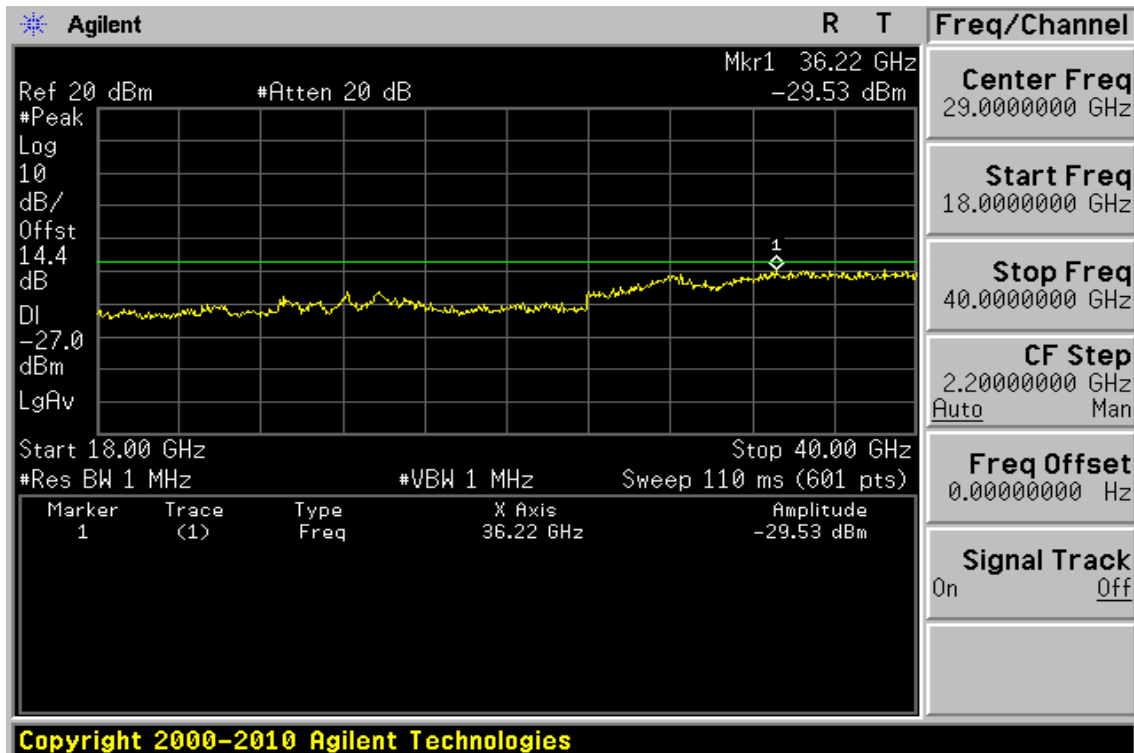
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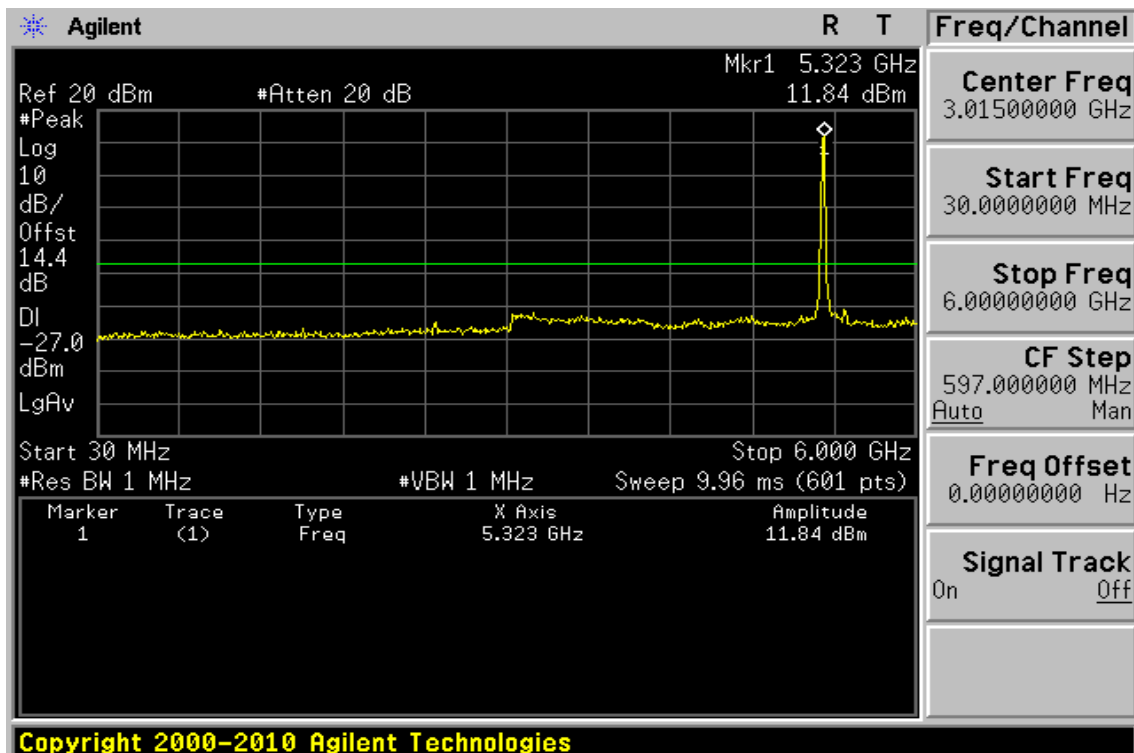
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## Ch Mid 18GHz – 40GHz



## Ch High 30MHz – 6GHz (5320 MHz)



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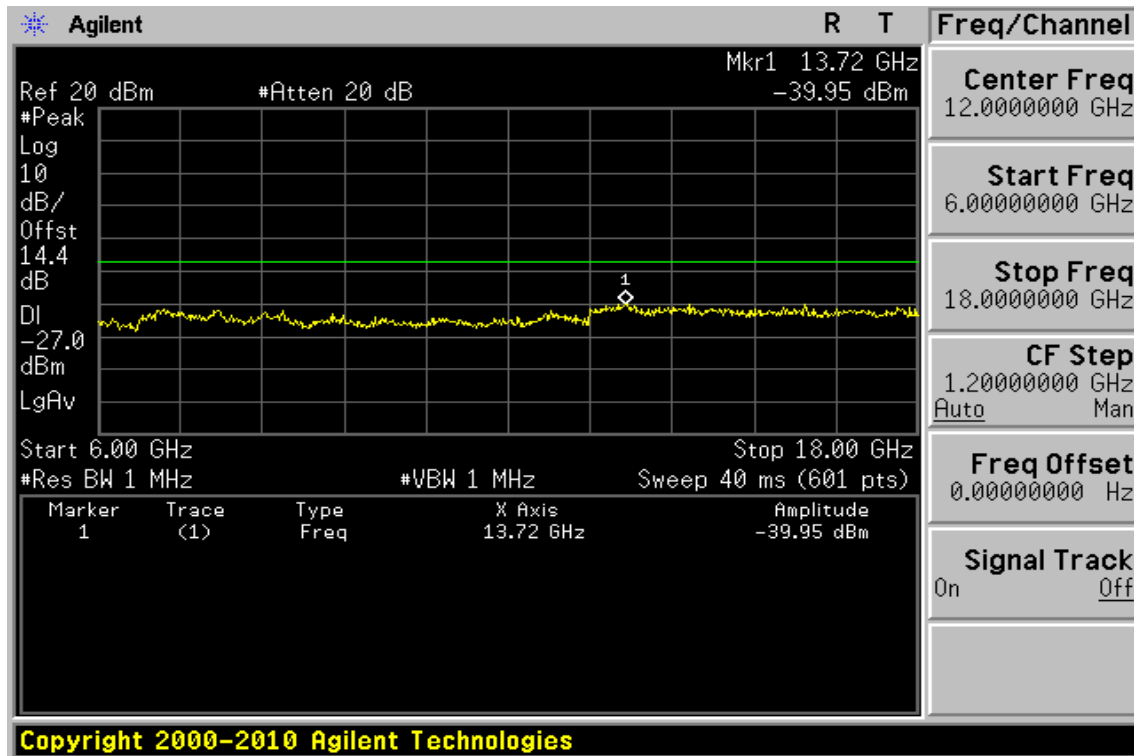
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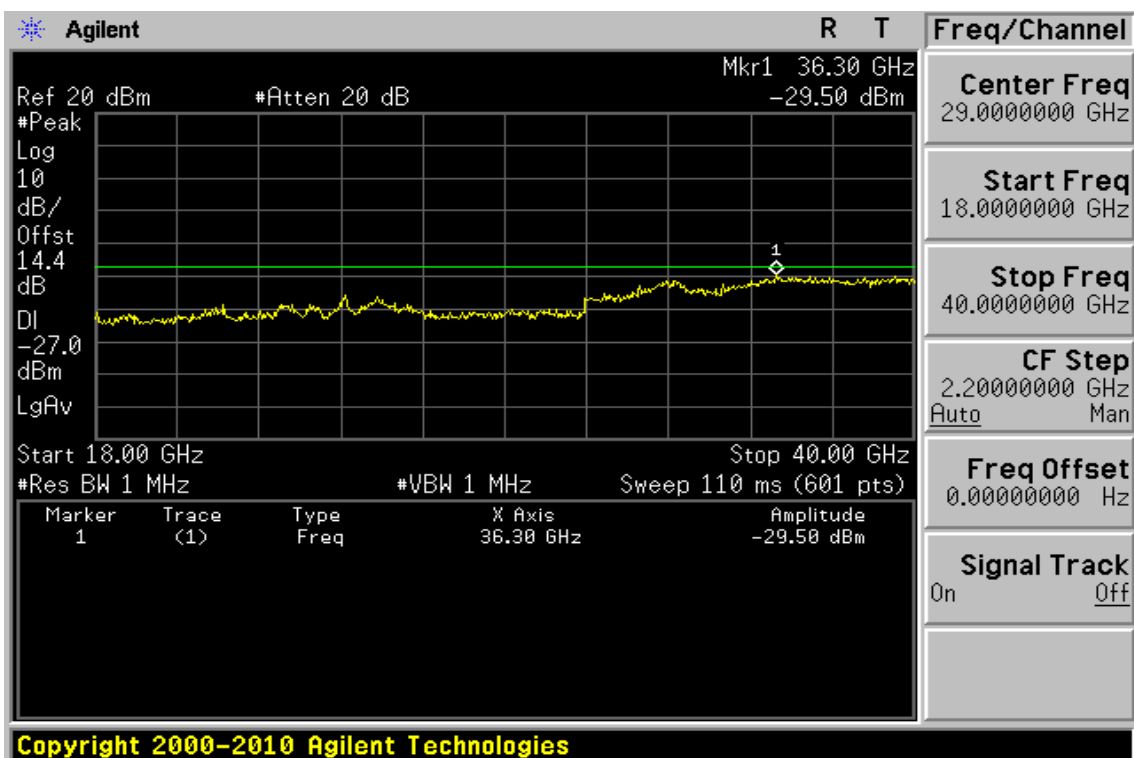
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## Ch High 6GHz – 18GHz



## Ch High 18GHz – 40GHz



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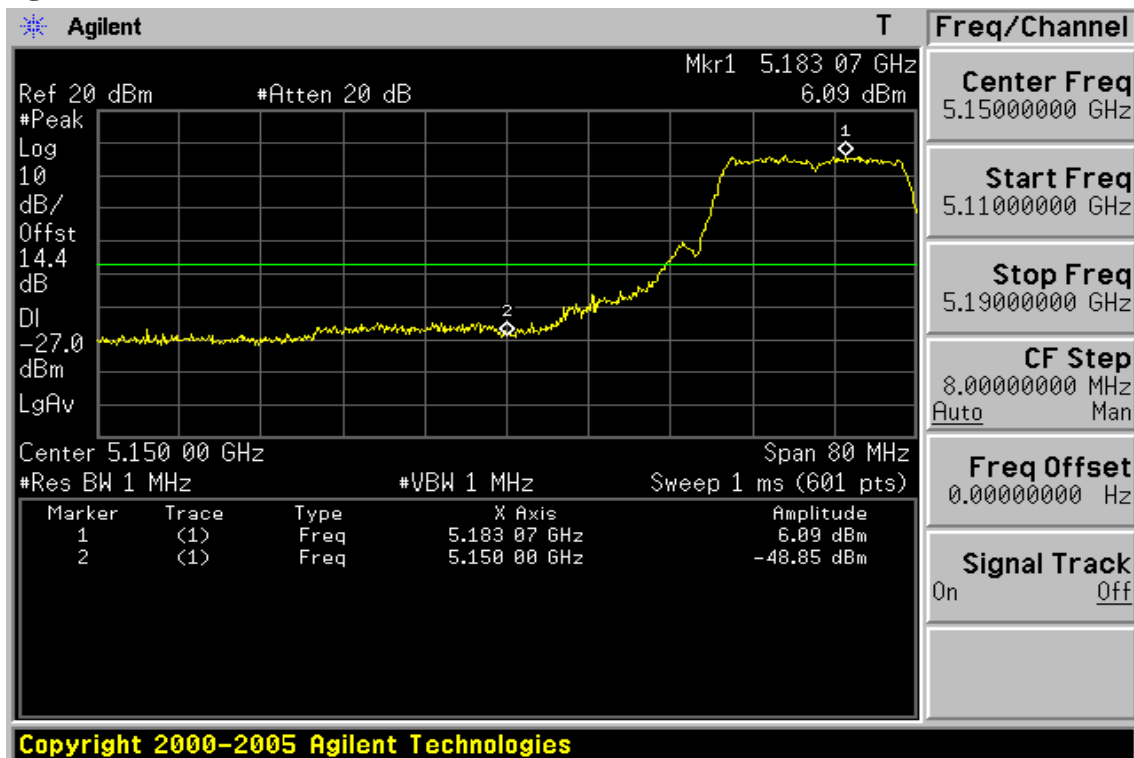
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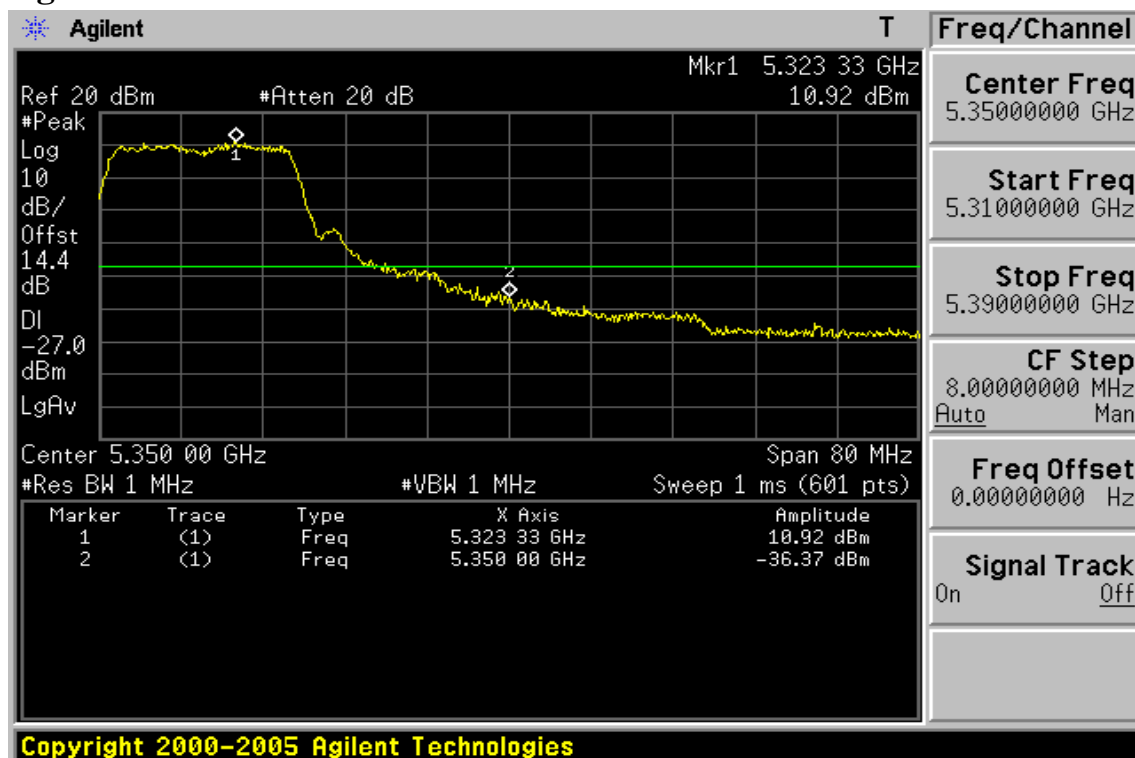
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## 802.11n HT20, 5150~5350 MHz Band Edges Test Data CH 5150



## Band Edges Test Data CH 5350



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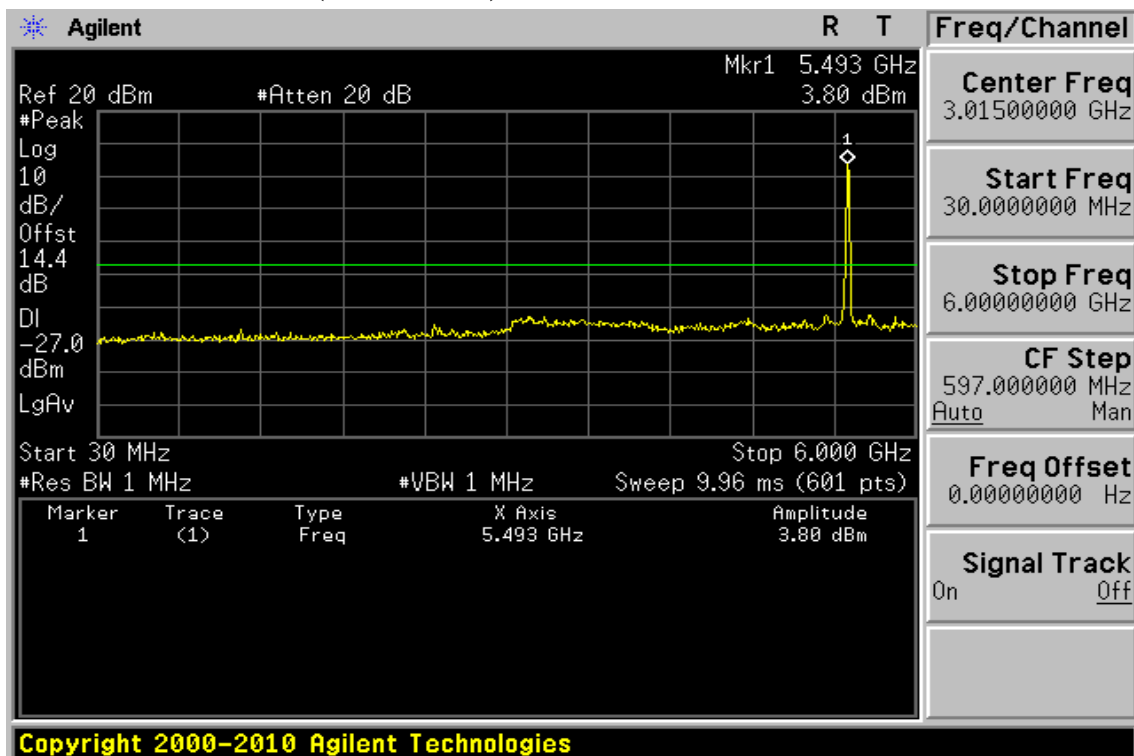
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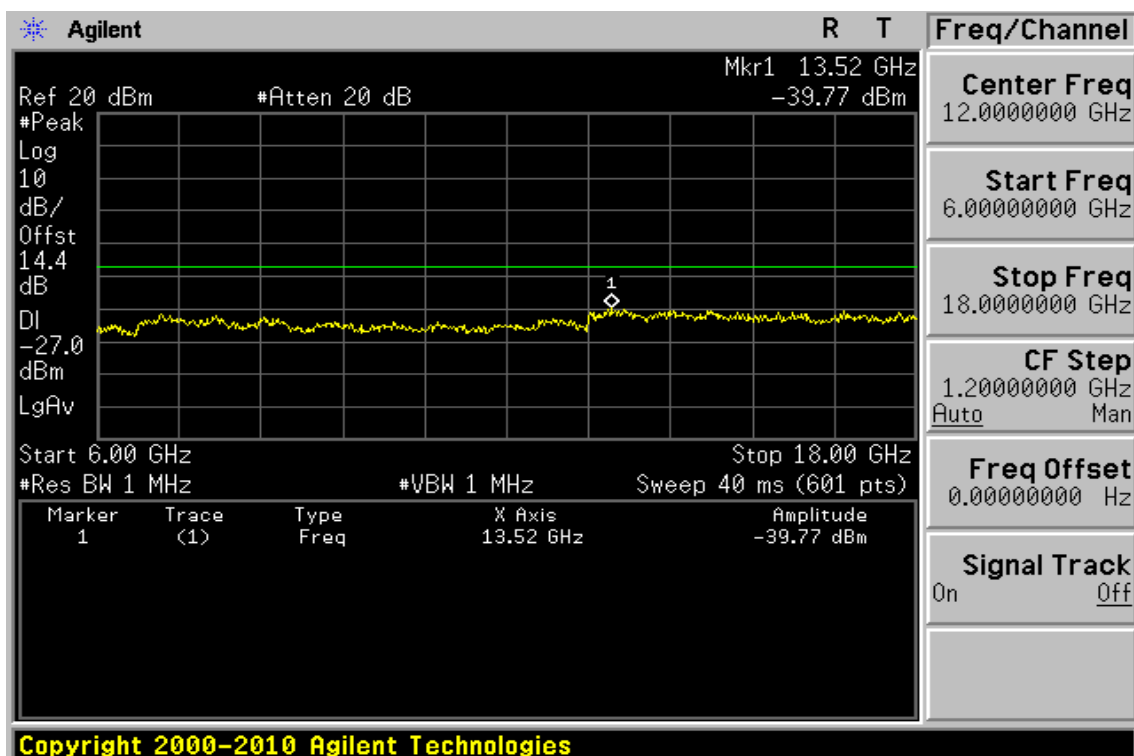
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## 802.11n HT20, 5470~5725 MHz Ch Low 30MHz – 6GHz (5500 MHz)



## Ch Low 6GHz – 18GHz



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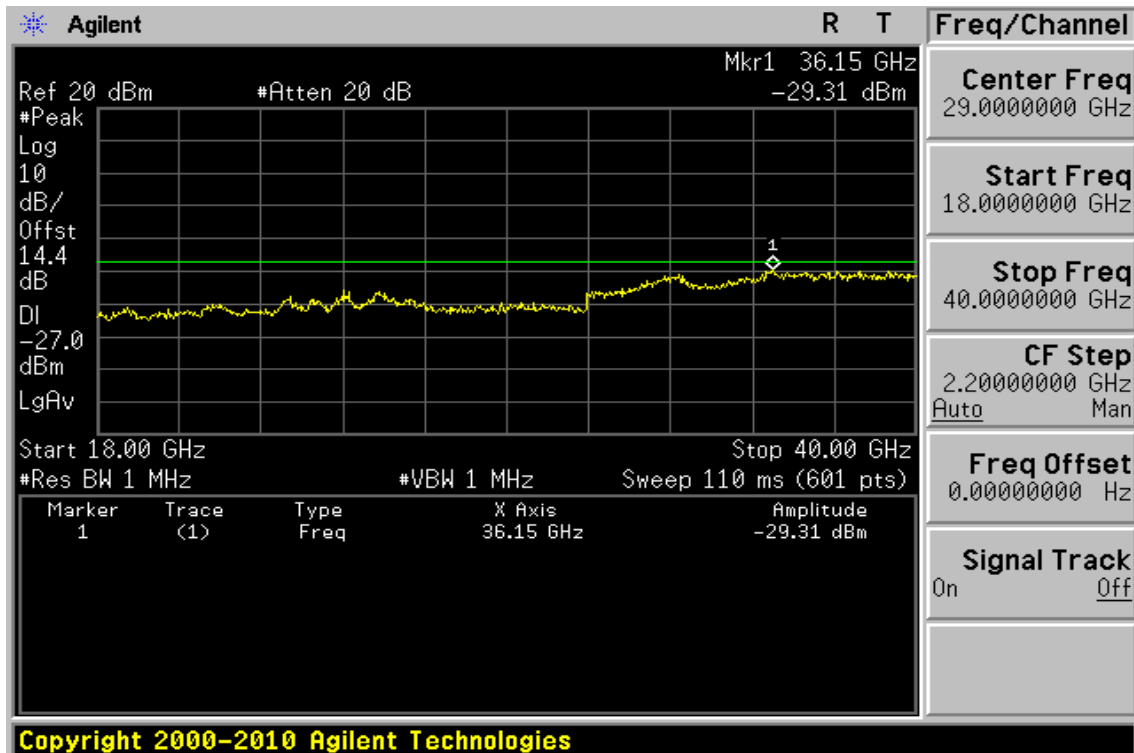
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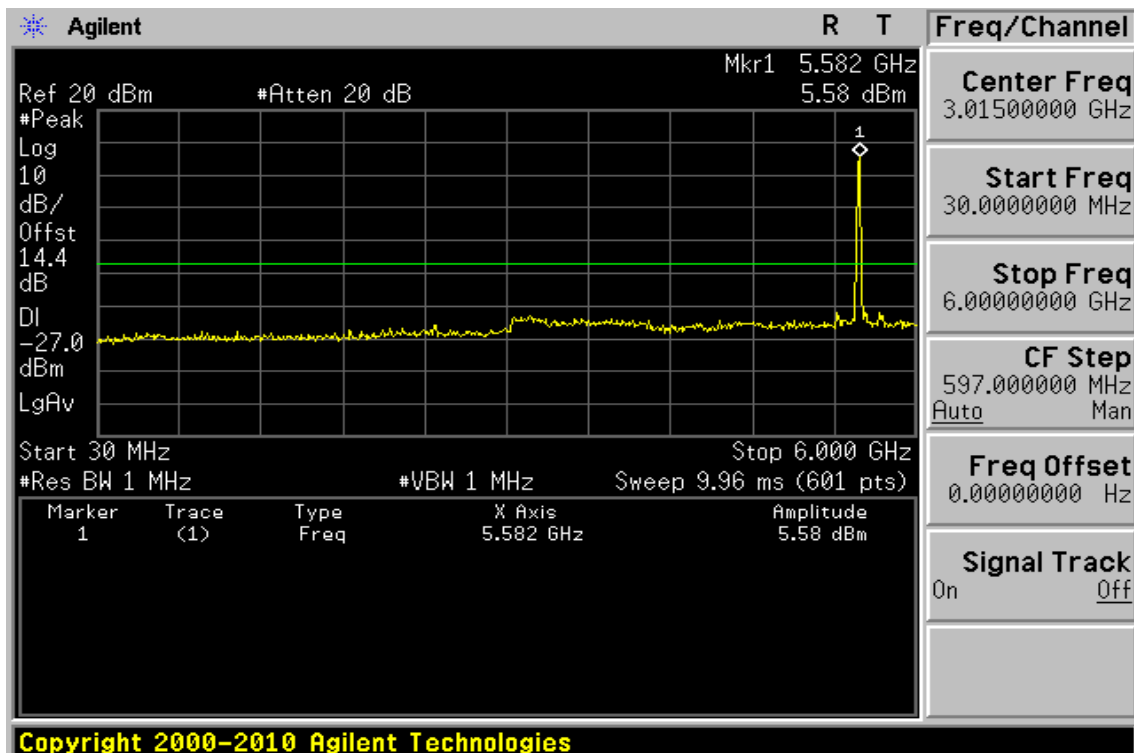
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## Ch Low 18GHz – 40GHz



## Ch Mid 30MHz – 6GHz (5580 MHz)



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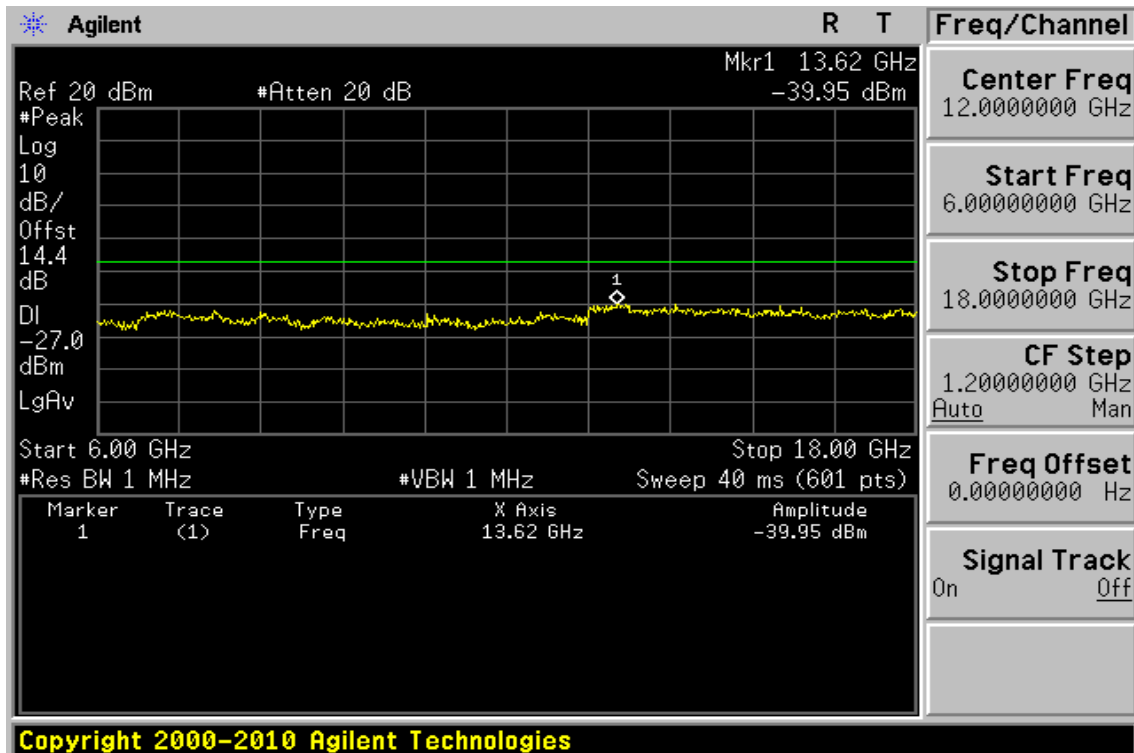
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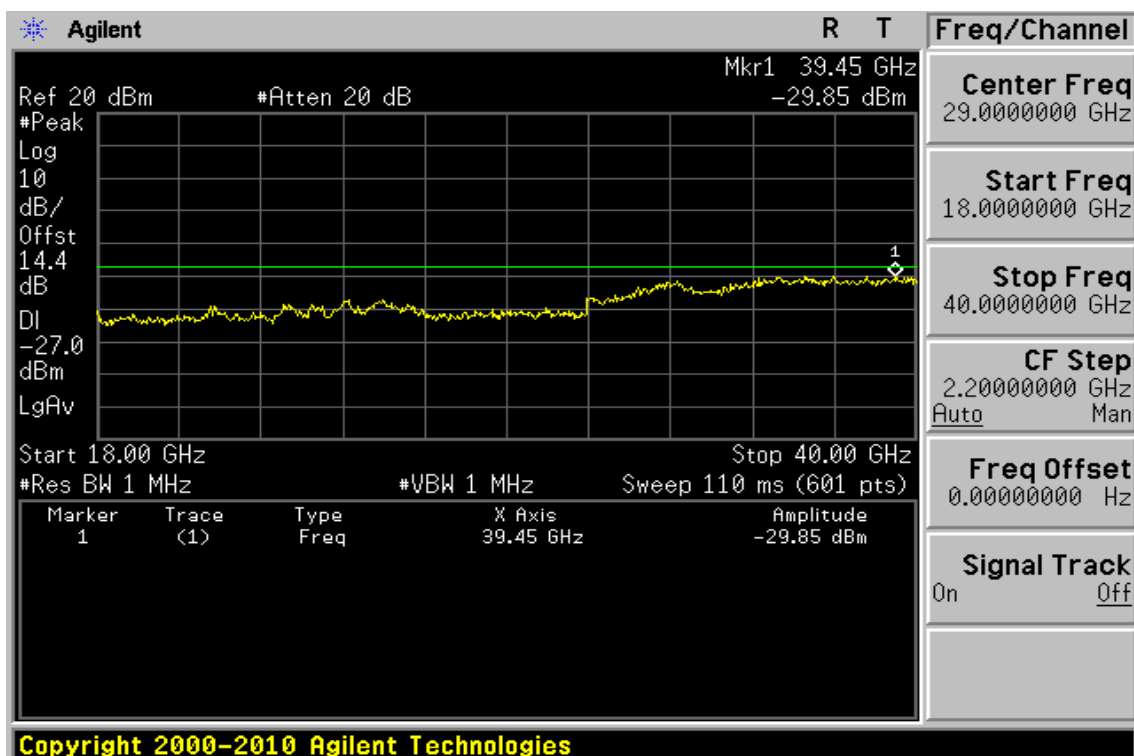
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## Ch Mid 6GHz – 18GHz



## Ch Mid 18GHz – 40GHz



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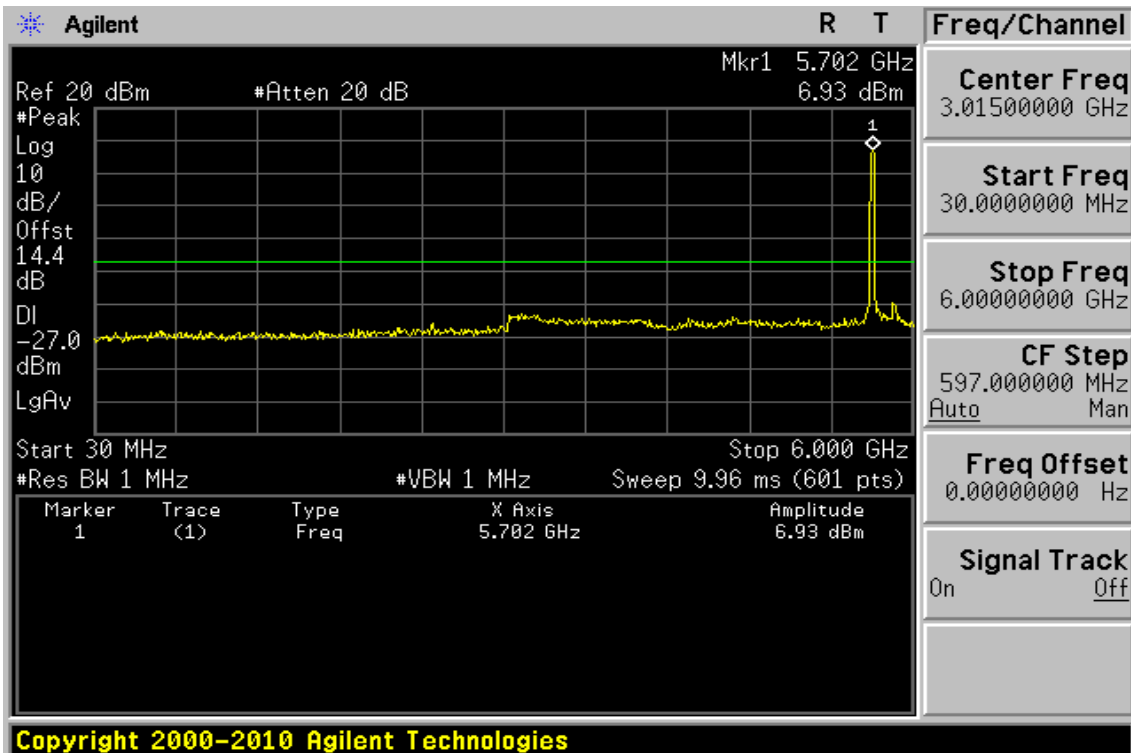
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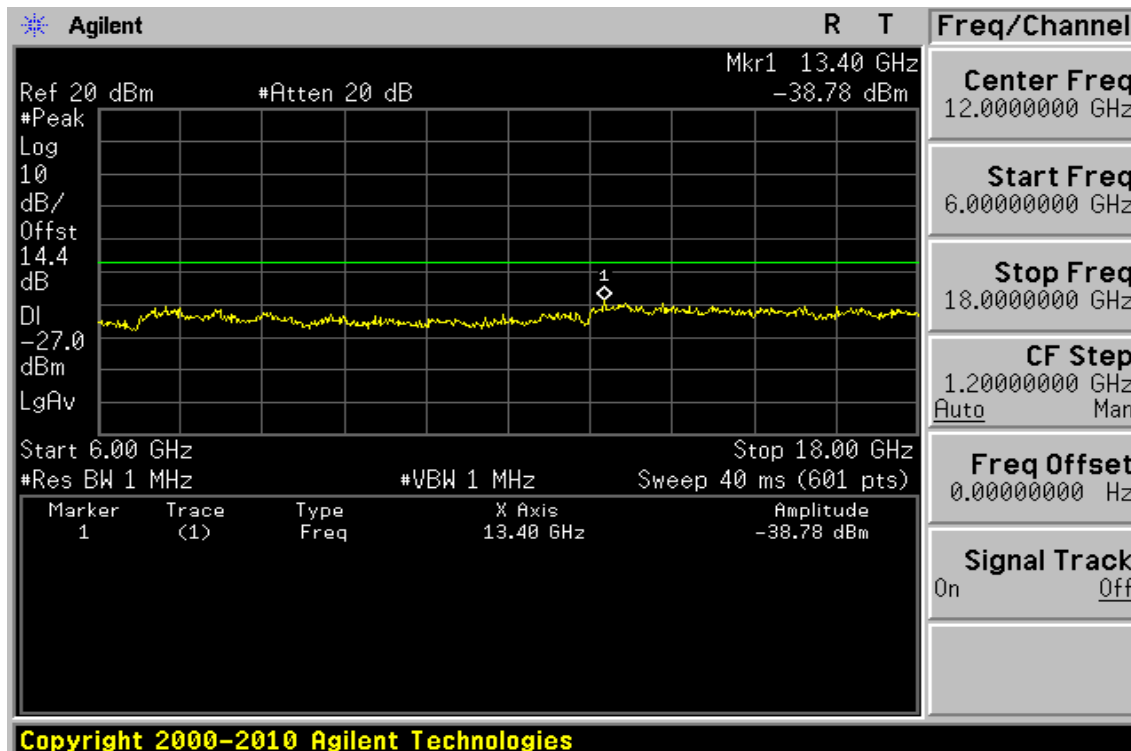
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## Ch High 30MHz – 6GHz (5700 MHz)



## Ch High 6GHz – 18GHz



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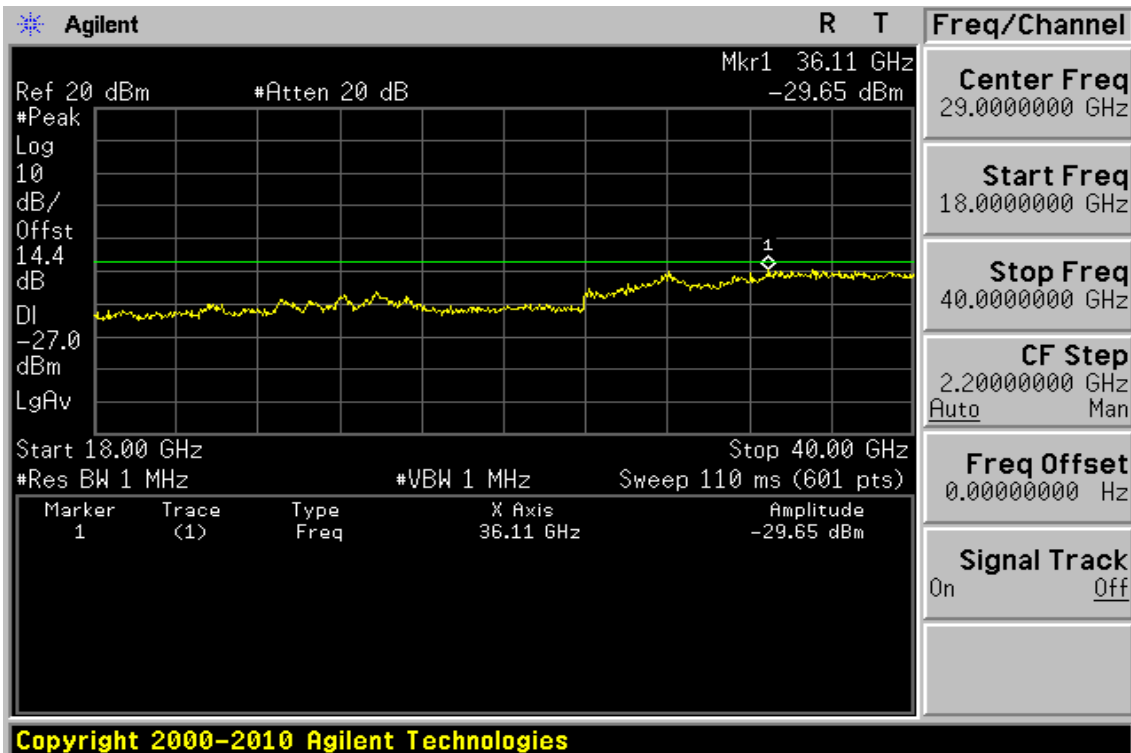
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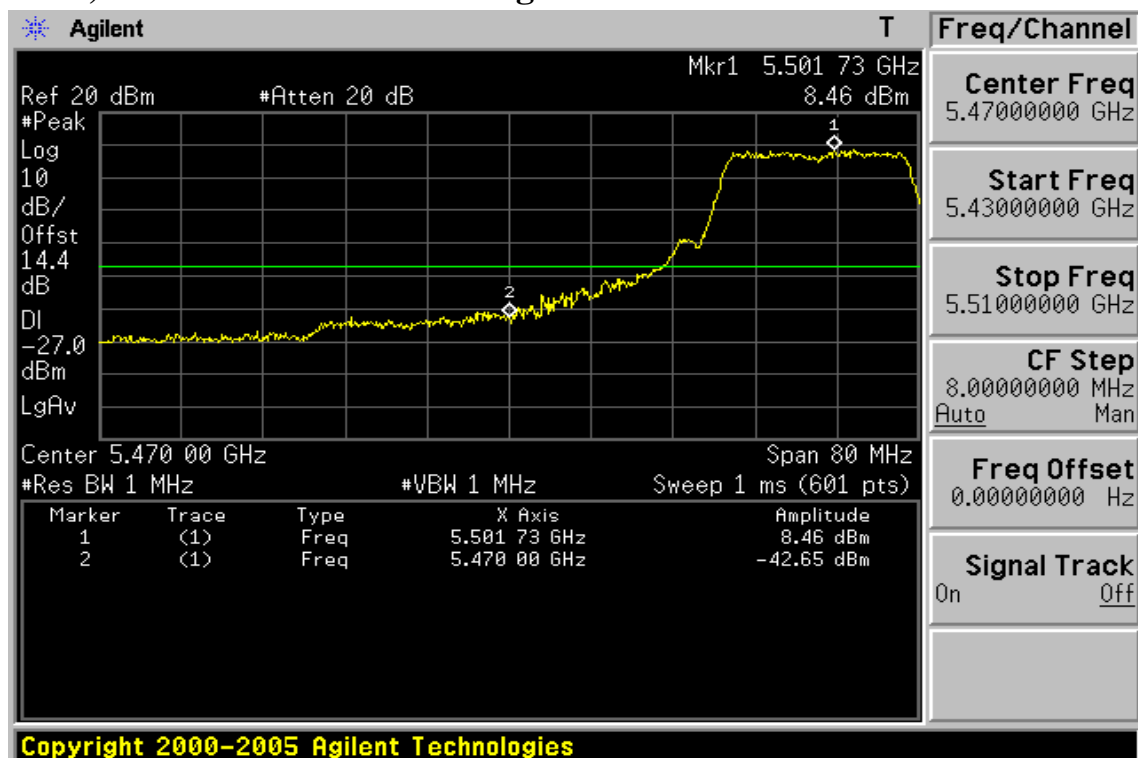
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## Ch High 18GHz – 40GHz



## 802.11n HT20, 5470~5725 MHz Band Edges Test Data CH 5500



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## 802.11n HT20, 5470~5725 MHz Band Edges Test Data CH 5700



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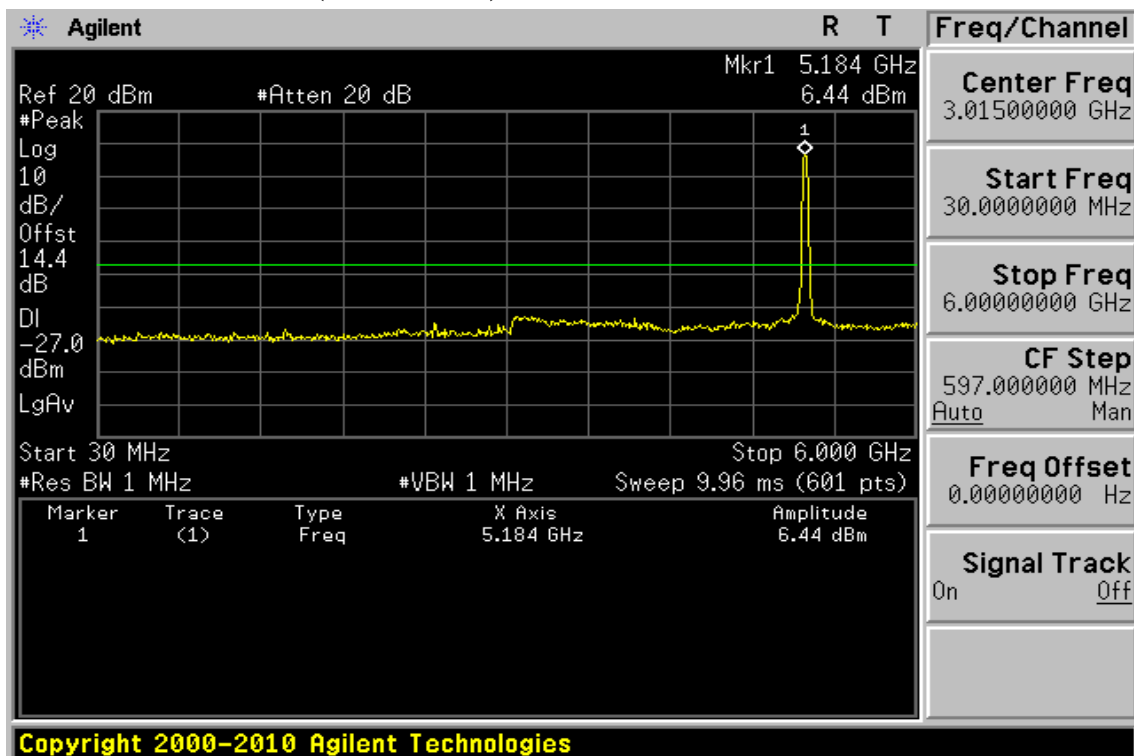
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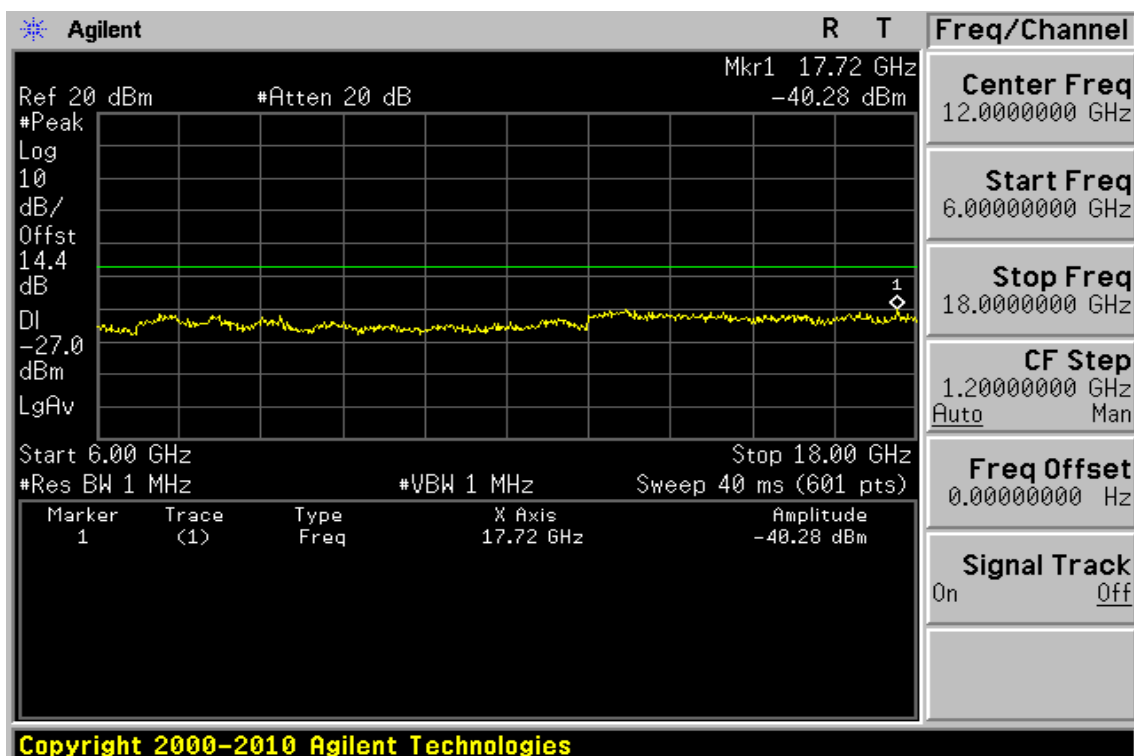
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## 802.11n HT40, 5150~5250 MHz Ch Low 30MHz – 6GHz (5190 MHz)



## Ch Low 6GHz – 18GHz



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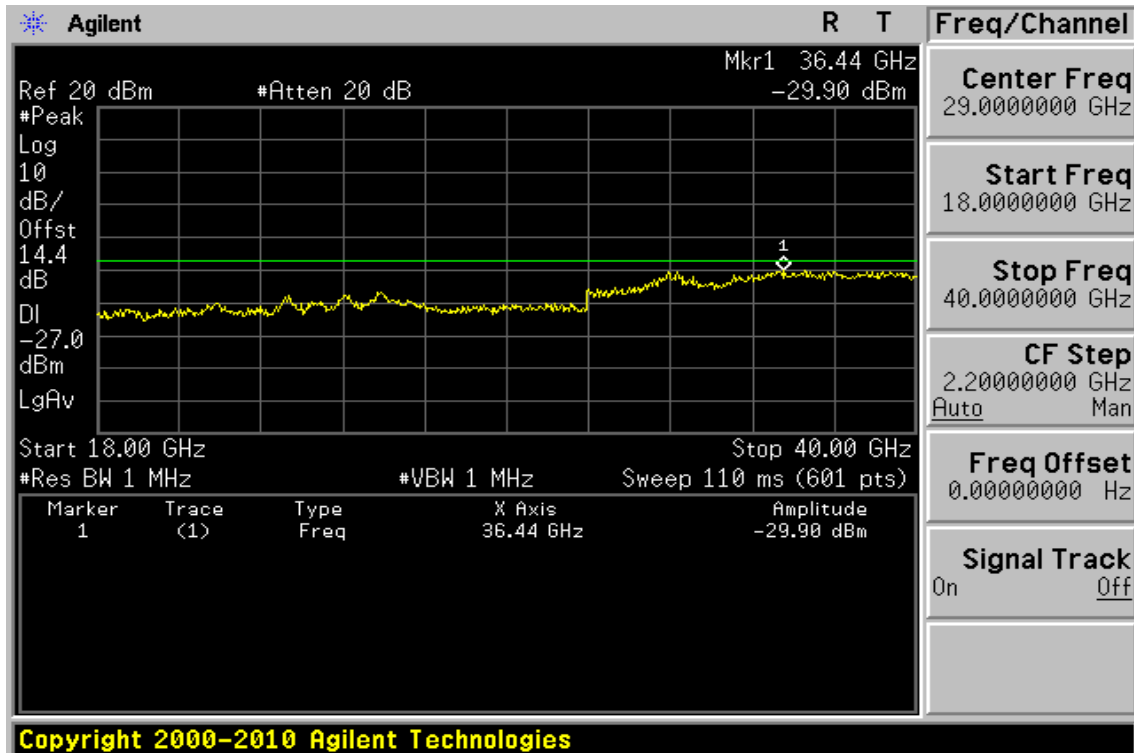
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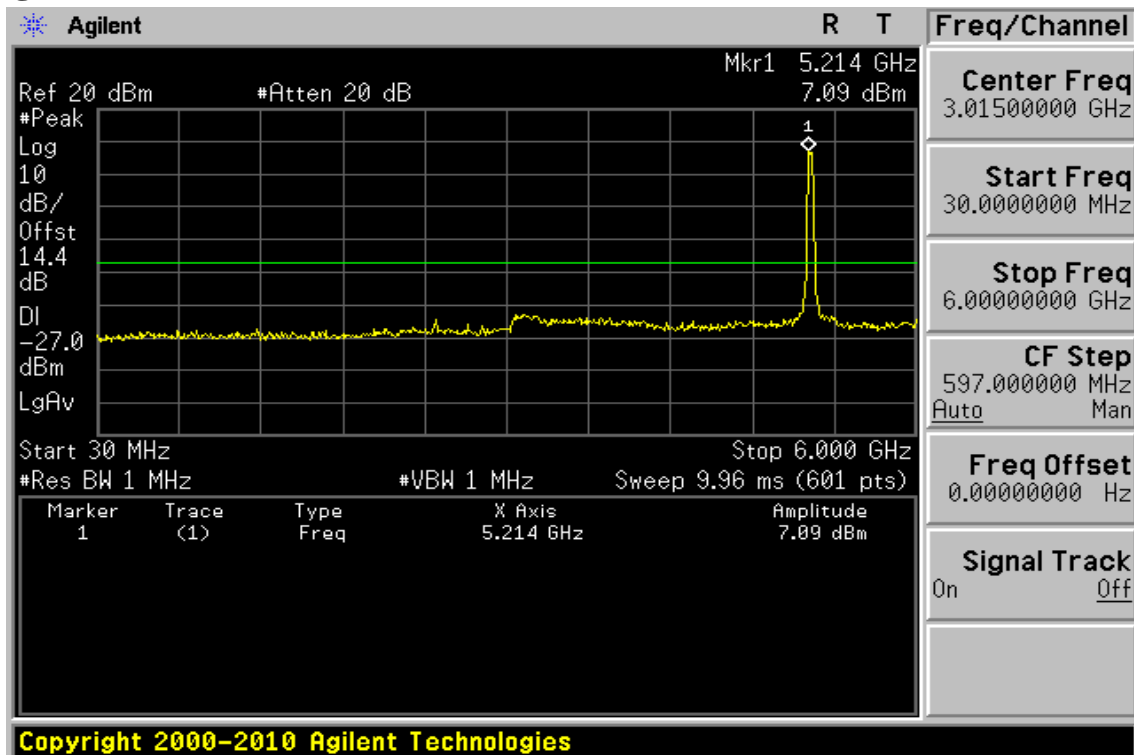
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## Ch Low 18GHz – 40GHz



## Ch High 30MHz – 6GHz (5230 MHz)



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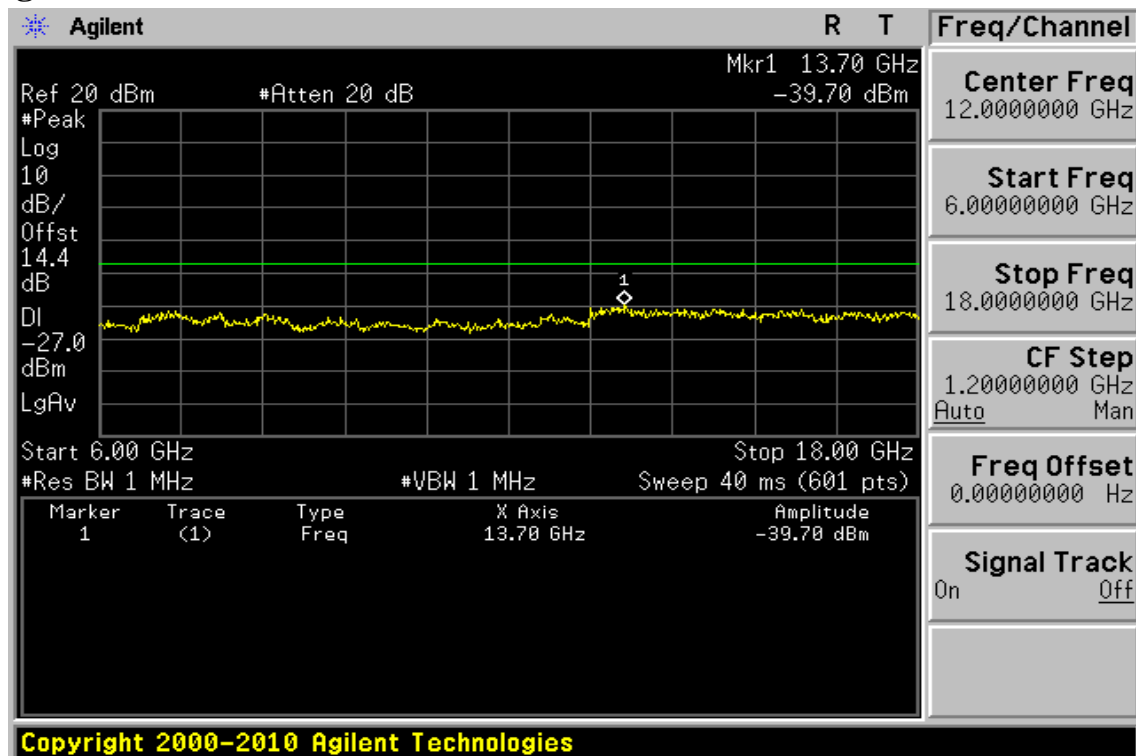
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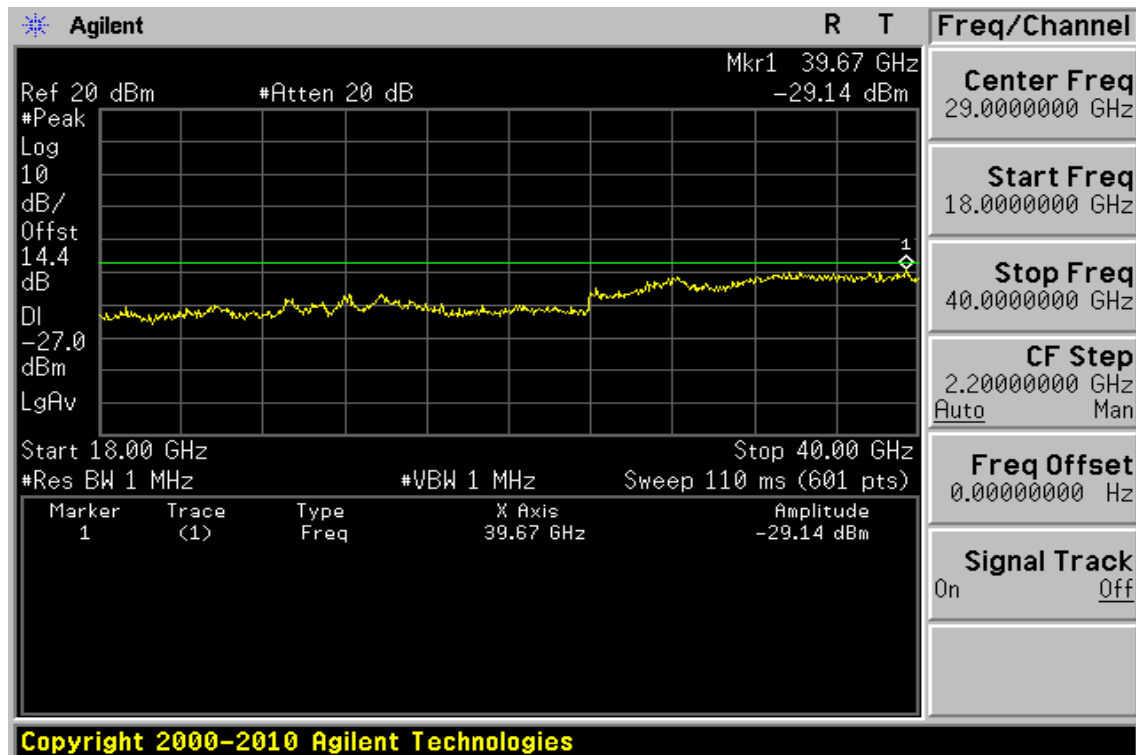
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## Ch High 6GHz – 18GHz



## Ch High 18GHz – 40GHz



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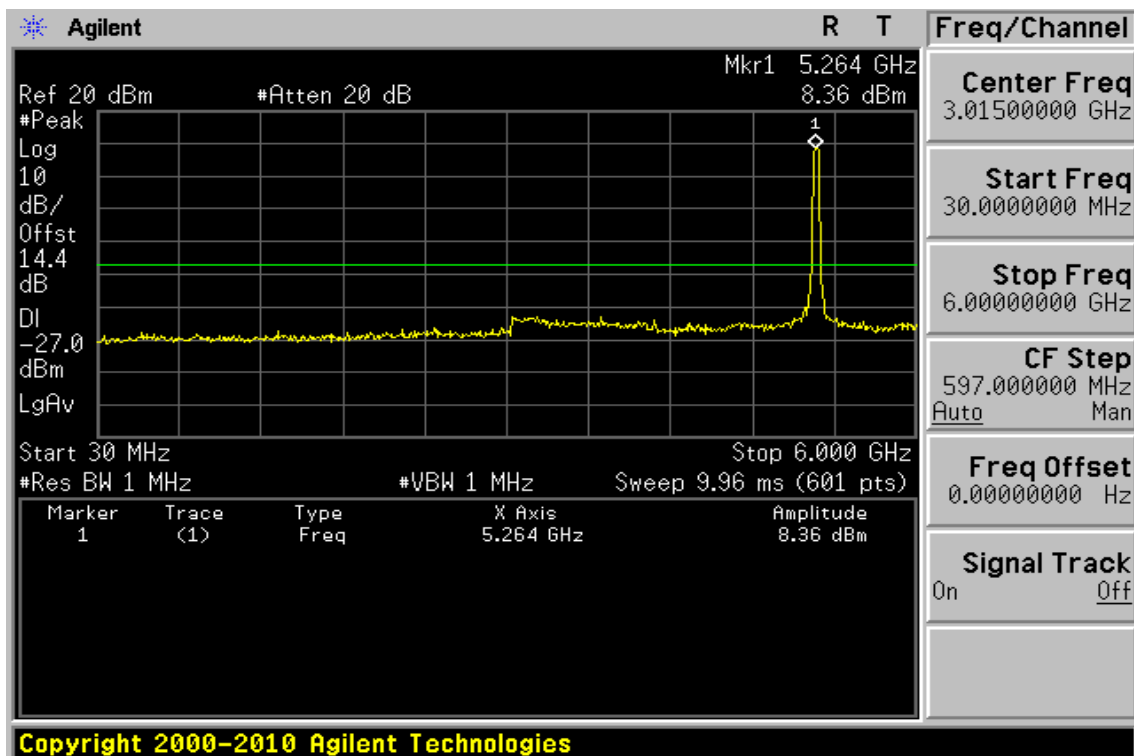
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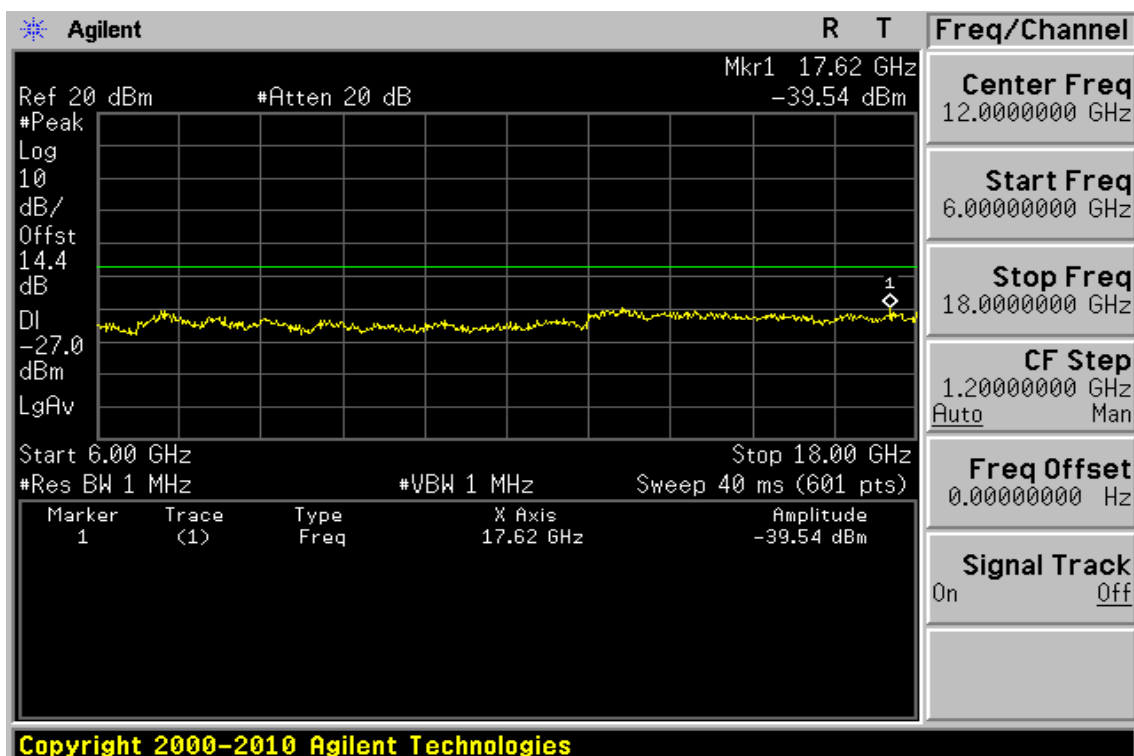
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## 802.11n HT40, 5250~5350 MHz Ch Low 30MHz – 6GHz (5270 MHz)



## Ch Low 6GHz – 18GHz



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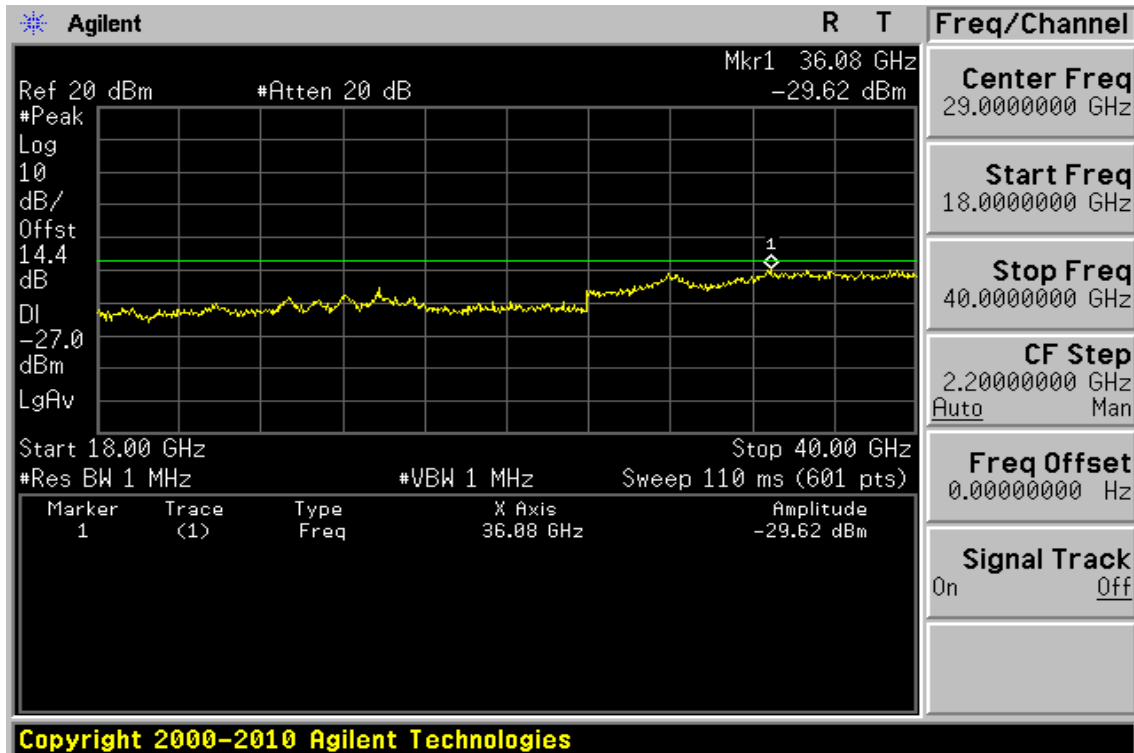
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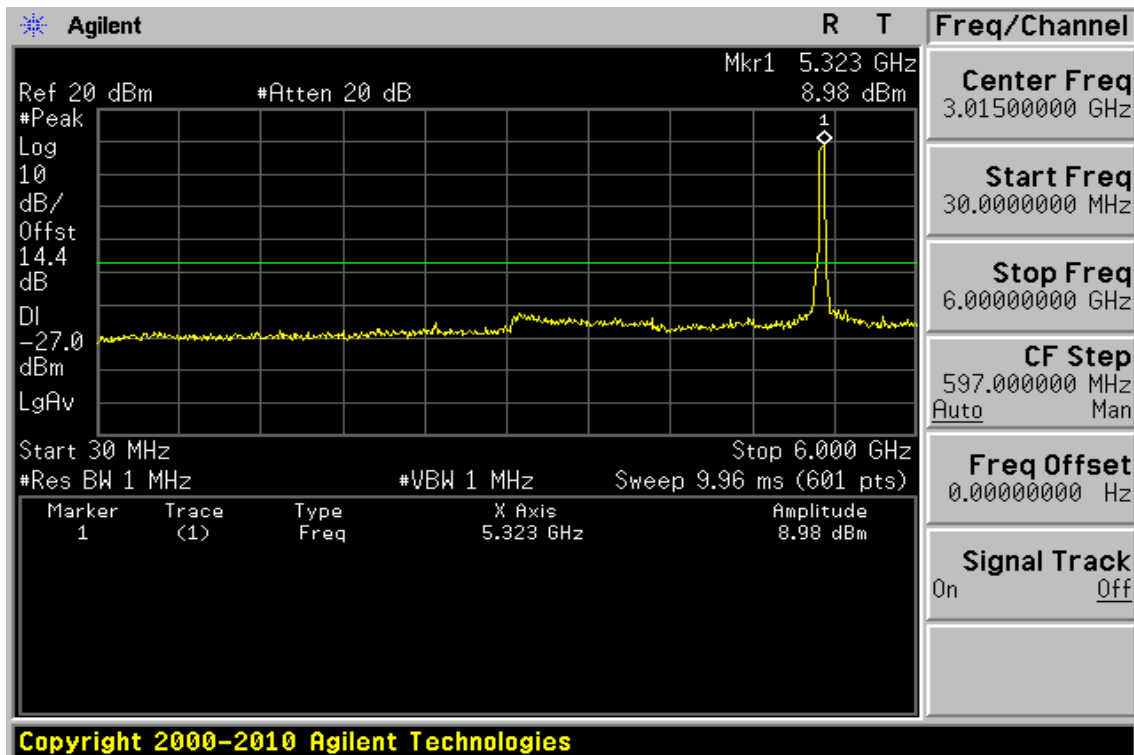
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## Ch Low 18GHz – 40GHz



## Ch High 30MHz – 6GHz (5310 MHz)



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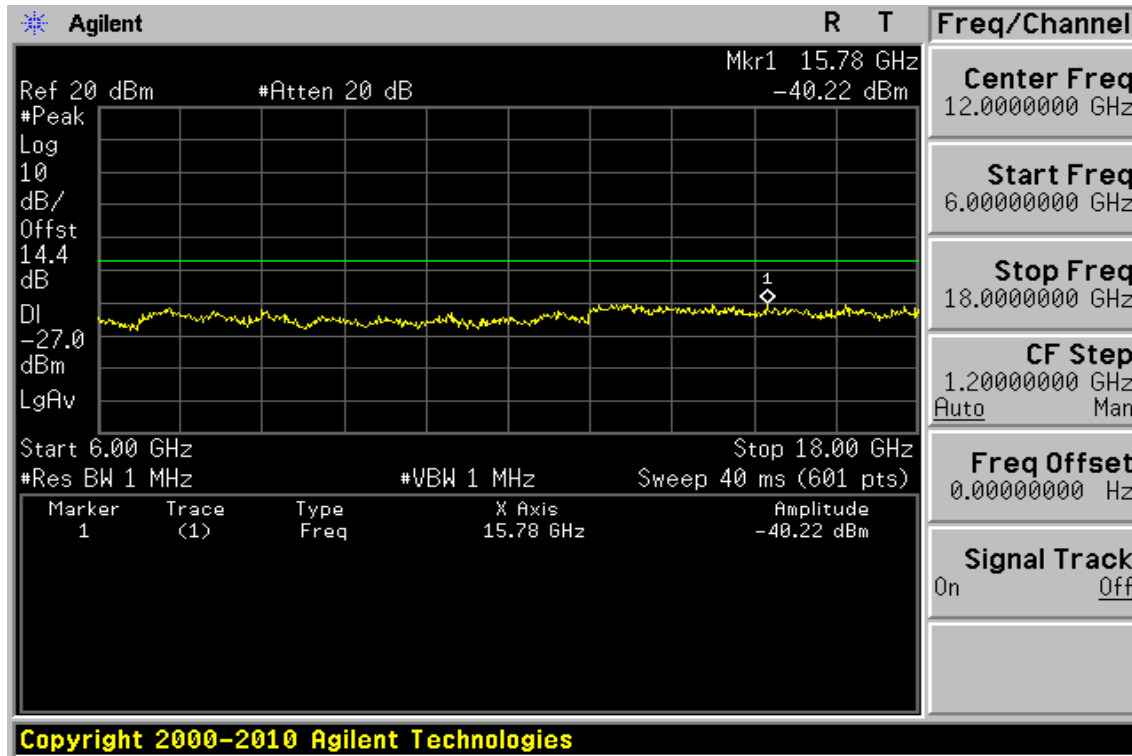
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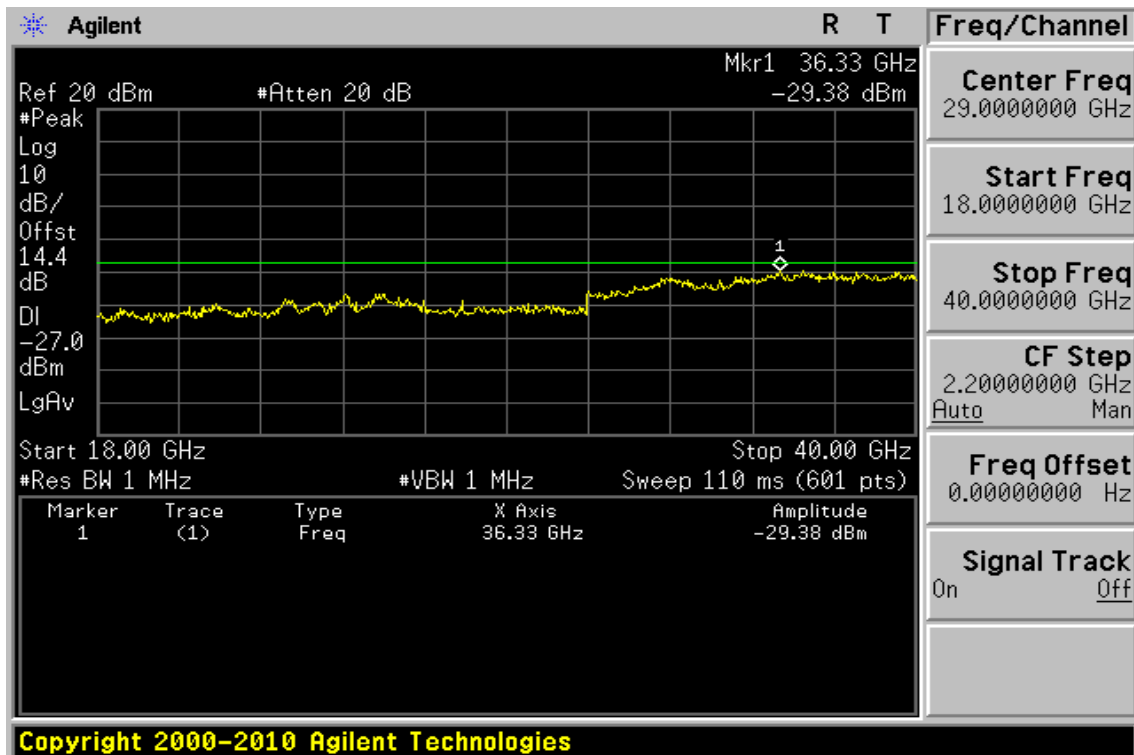
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## Ch High 6GHz – 18GHz



## Ch High 18GHz – 40GHz



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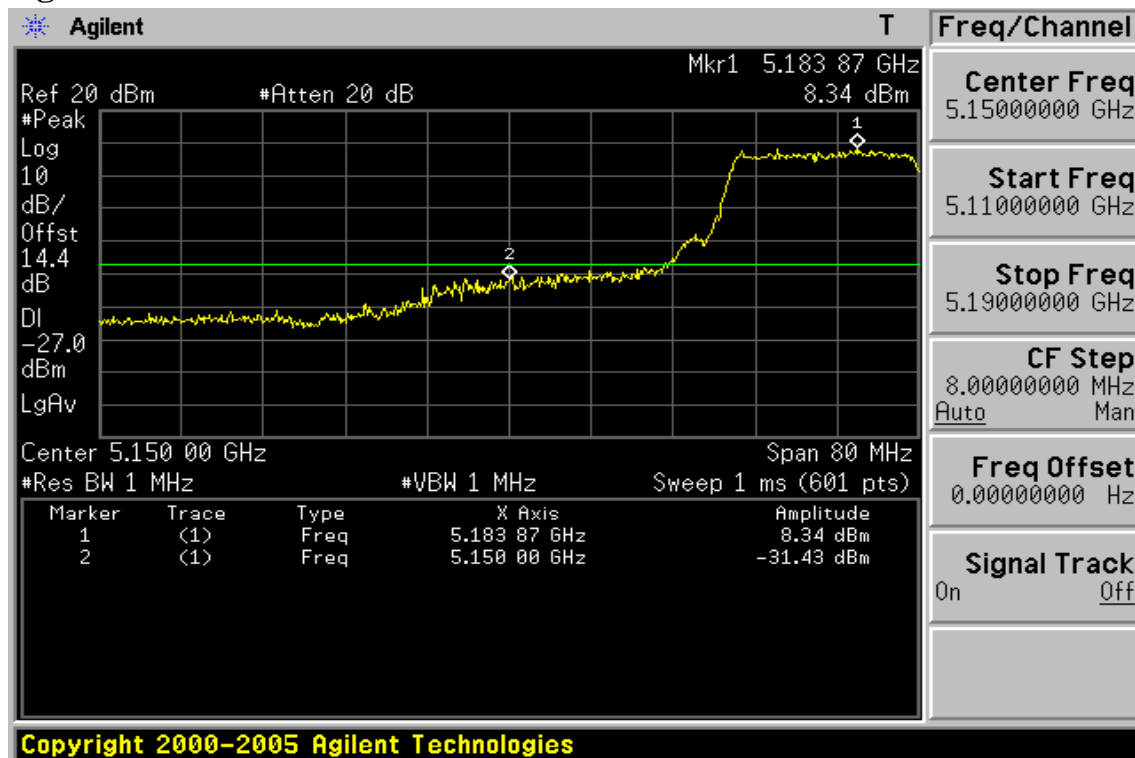
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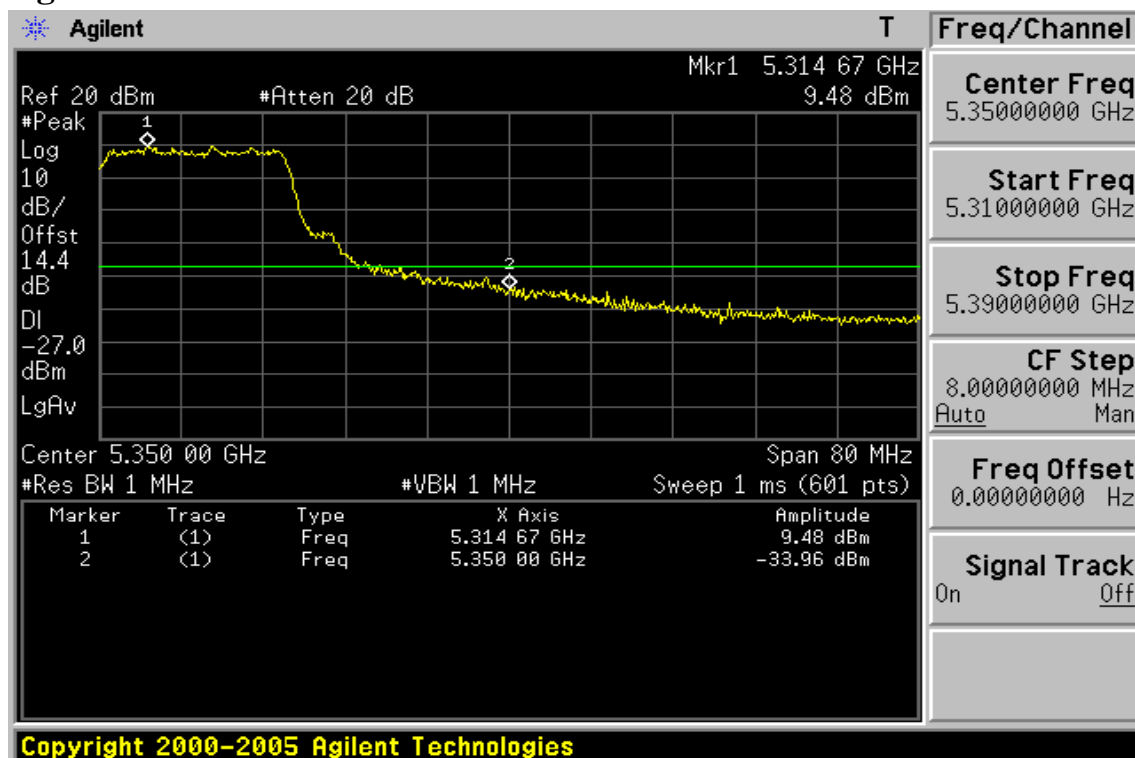
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## 802.11n HT40, 5150~5350 MHz Band Edges Test Data CH 5150



## Band Edges Test Data CH 5350



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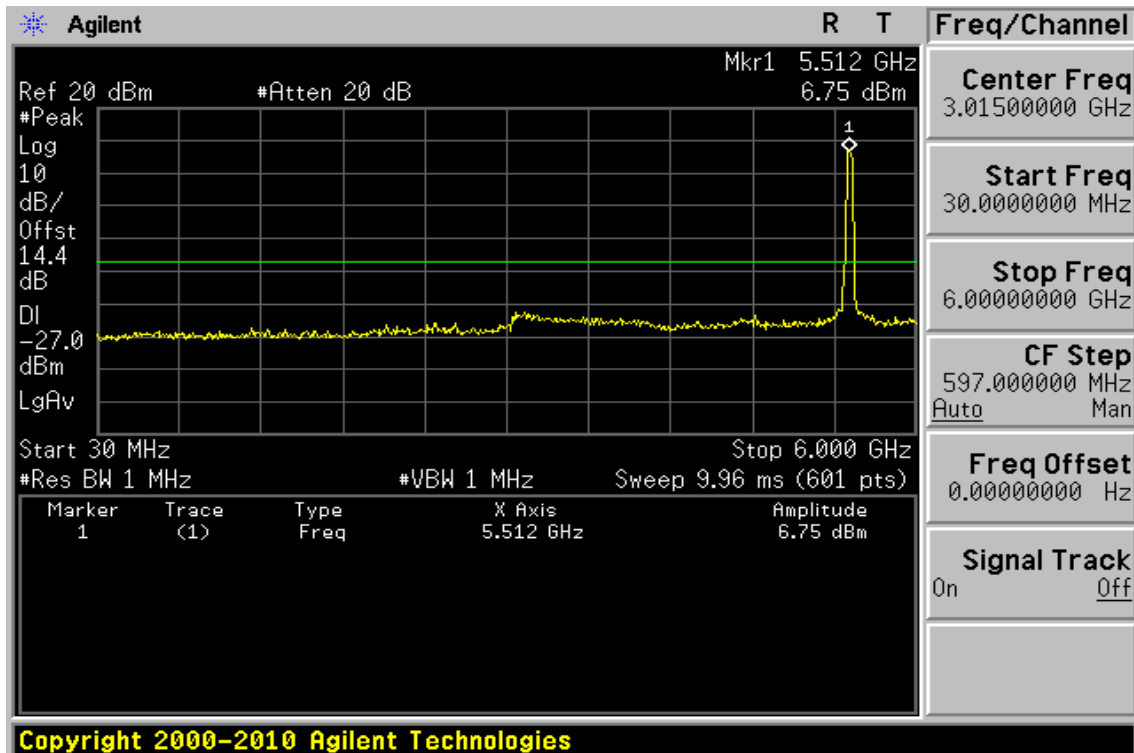
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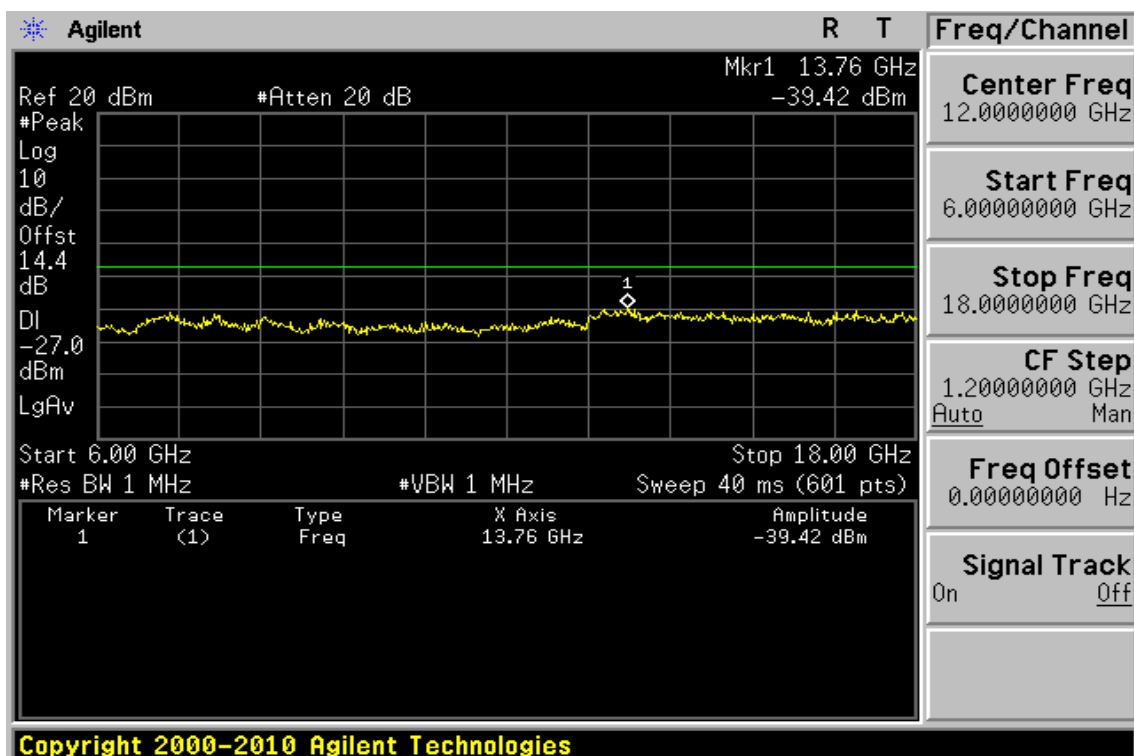
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## 802.11n HT40, 5470~5725 MHz Ch Low 30MHz – 6GHz (5510 MHz)



## Ch Low 6GHz – 18GHz



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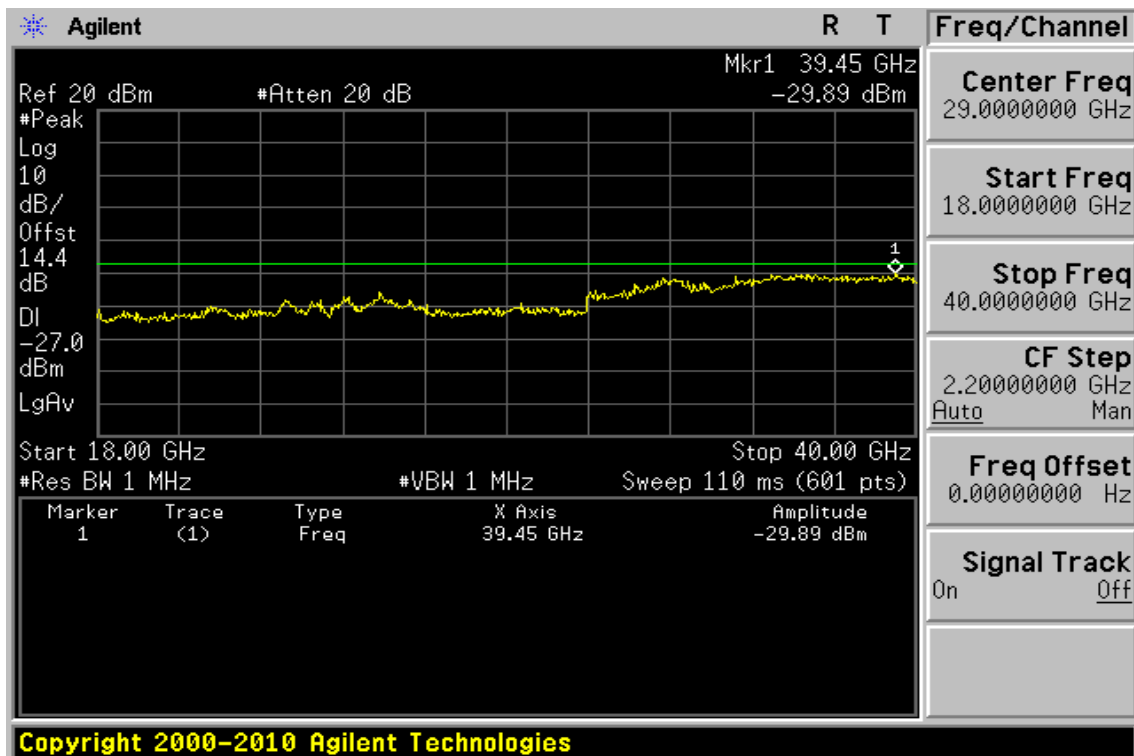
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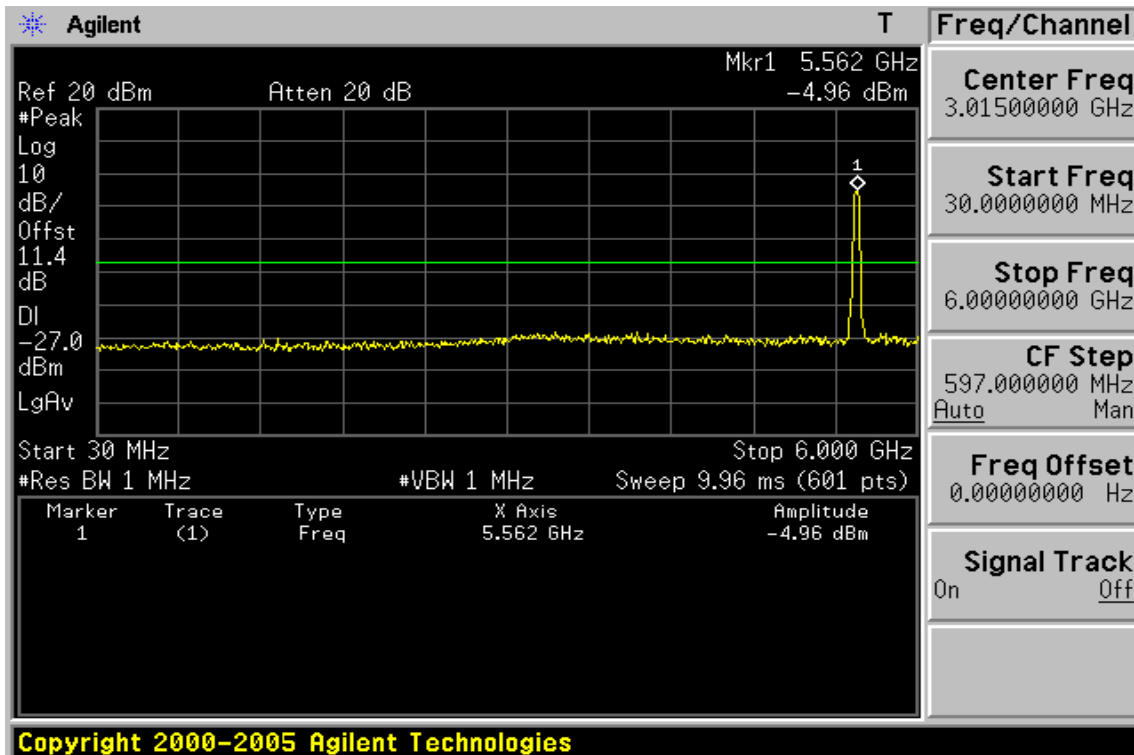
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## Ch Low 18GHz – 40GHz



## Ch Mid 30MHz – 6GHz (5550 MHz)



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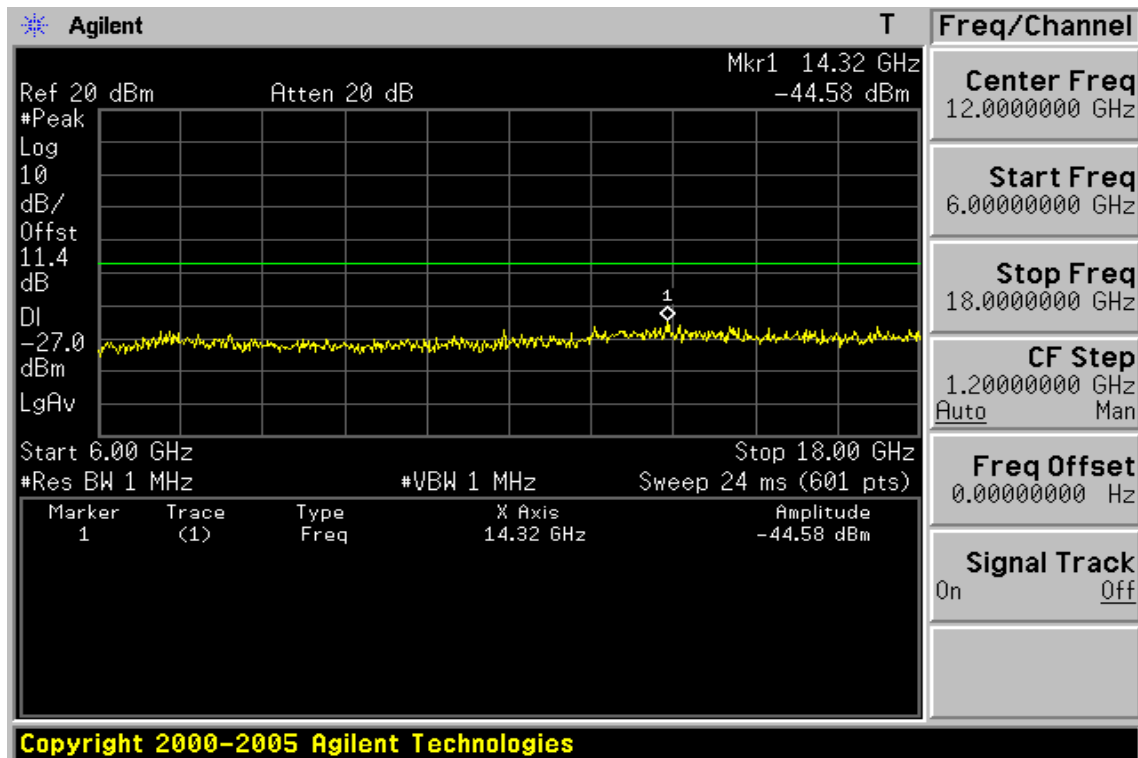
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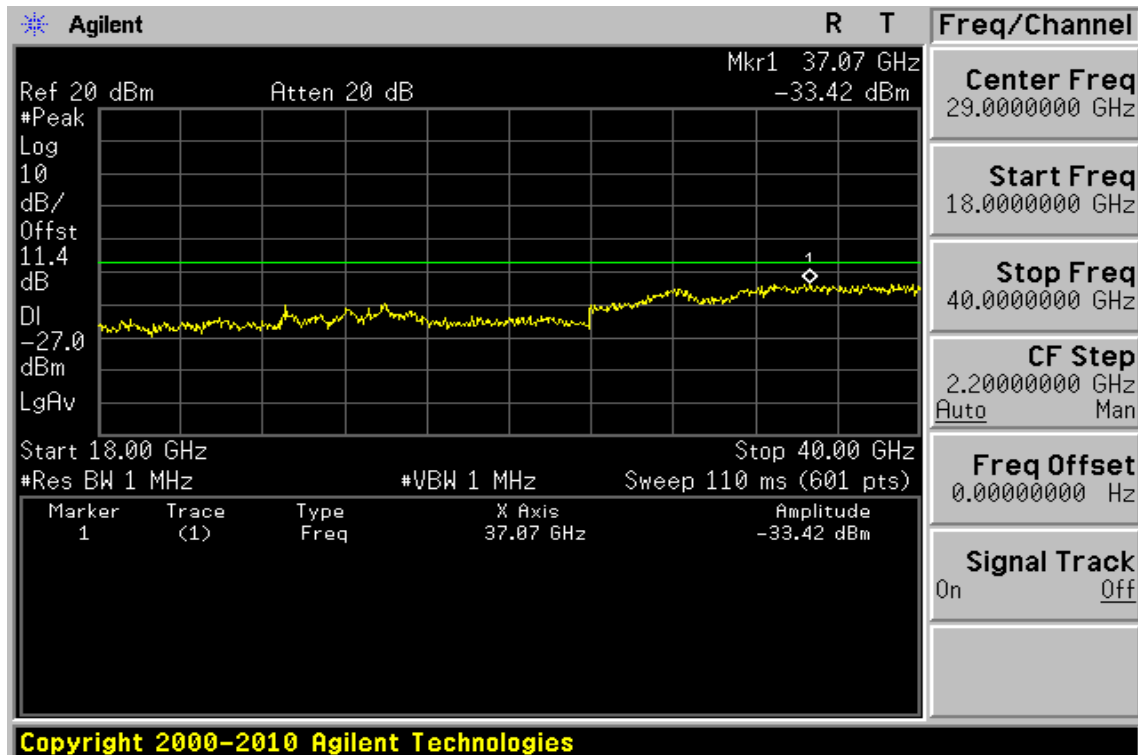
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## Ch Mid 6GHz – 18GHz



## Ch Mid 18GHz – 40GHz



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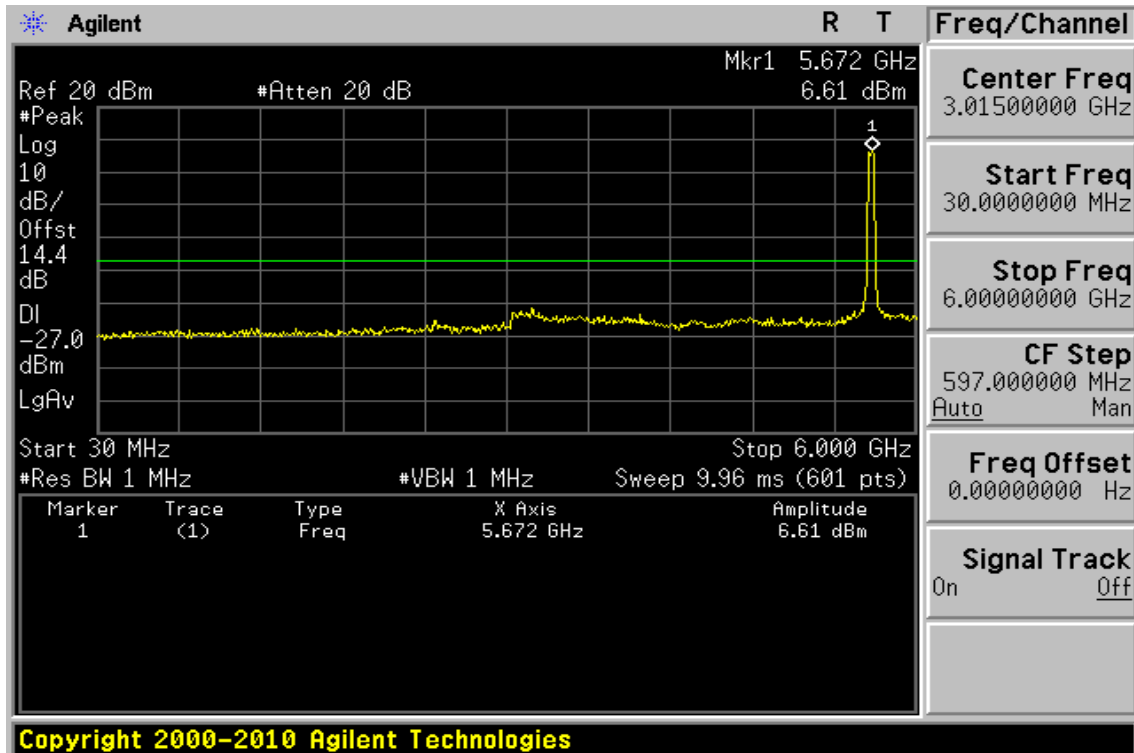
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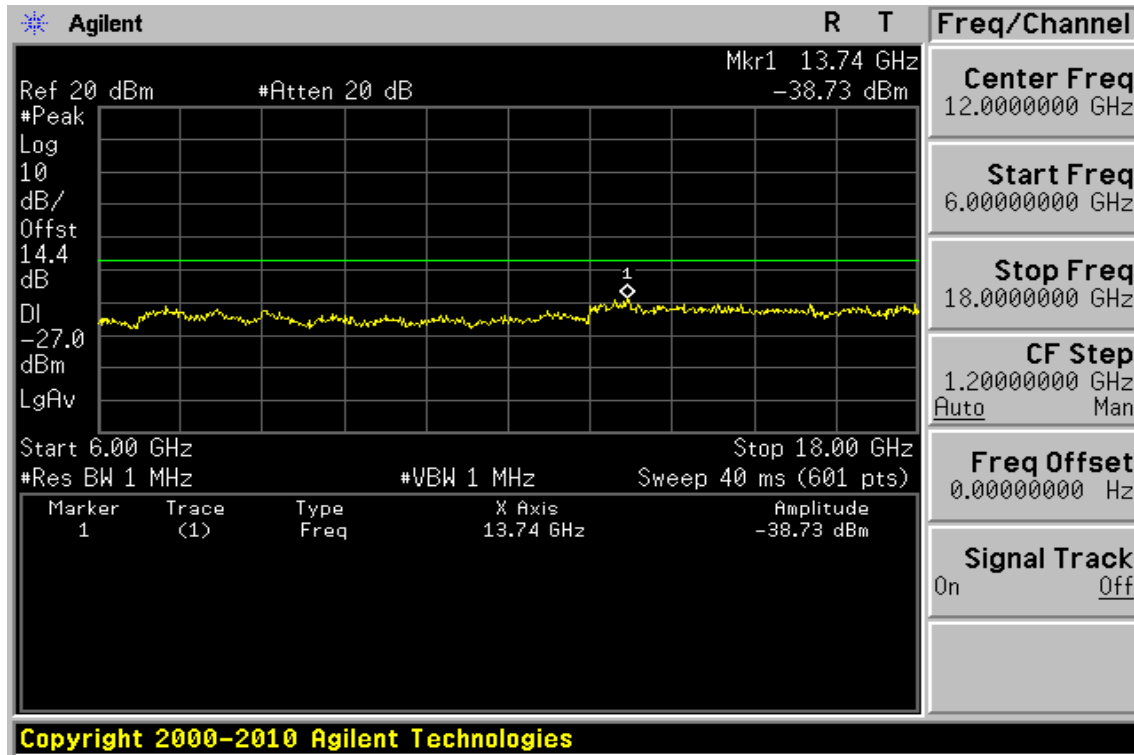
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## Ch High 30MHz – 6GHz (5670 MHz)



## Ch High 6GHz – 18GHz



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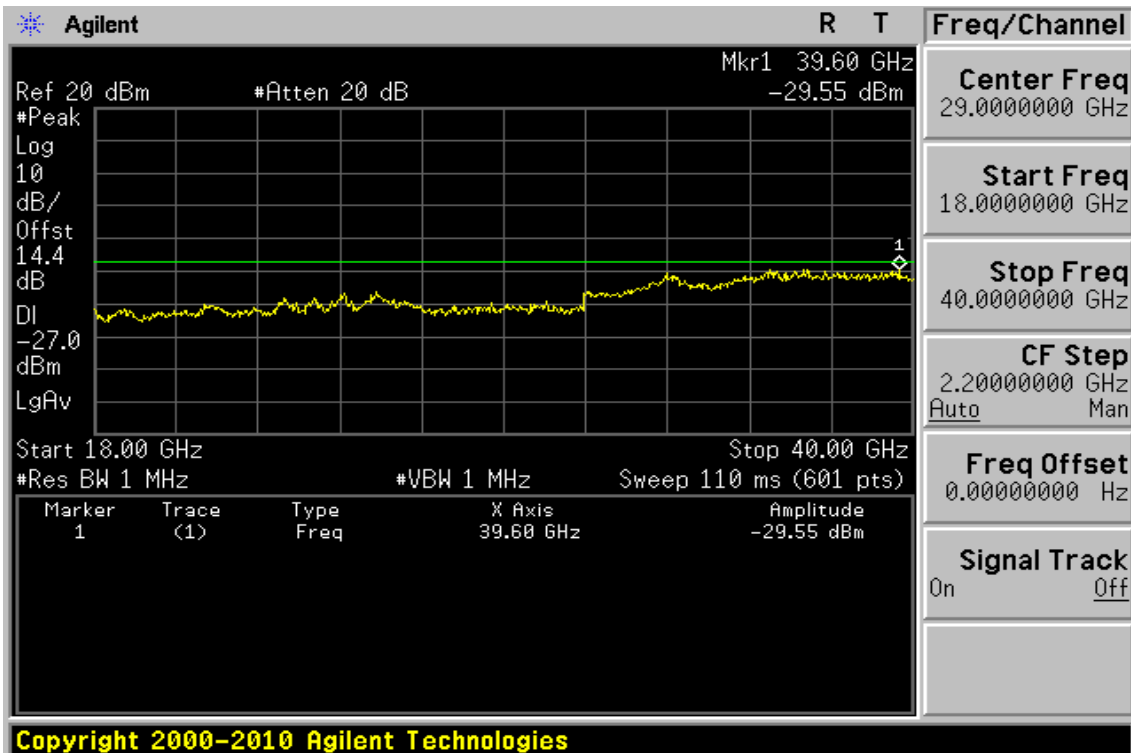
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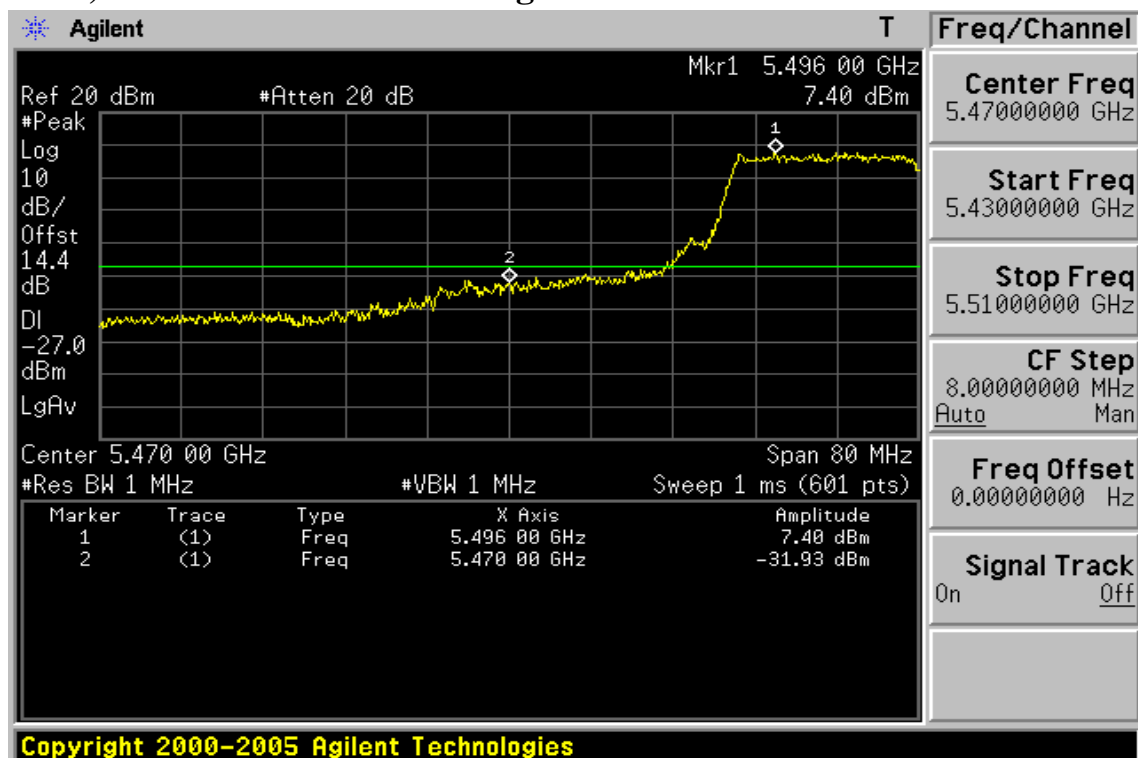
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## Ch High 18GHz – 40GHz



## 802.11n HT40, 5470~5725 MHz Band Edges Test Data CH 5510



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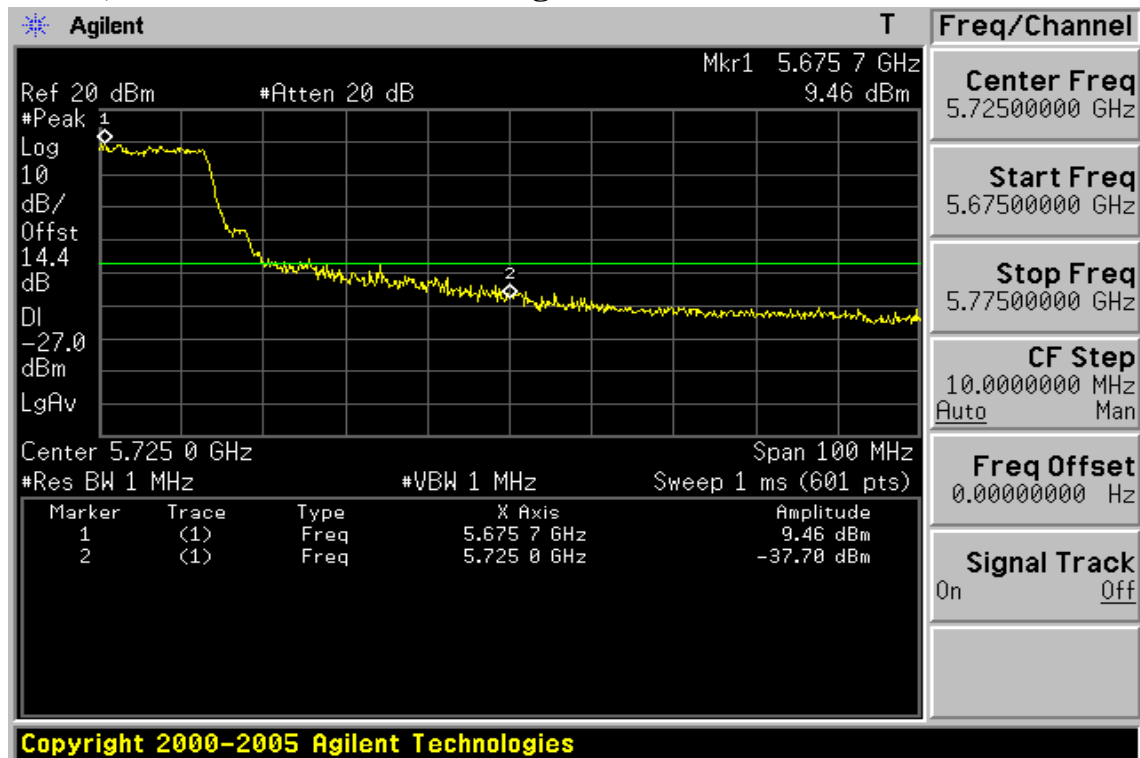
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## 802.11n HT40, 5470~5725 MHz Band Edges Test Data CH 5670



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## 12. UNDESIRABLE EMISSION - RADICTED MEASUREMENT

### 12.1 Standard Applicable

According to §15.407(b),

(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) For MIMO operation, appropriate offset (10 log (N)) on the spectrum is adjusted on “per chain basis to result MIMO measurement.
- (7) 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.
- (8) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (9) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

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## §15.205- RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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## §15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

### FCC PART 15.209

MEASURING DISTANCE OF 3 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

### According to RSS-Gen section 4.9 Transmitter Unwanted Emissions

The measurement method shall be described in the test report. When the applicable unwanted emissions limits are defined in relative terms, the same parameter, peak power or average power, used for the transmitter output power measurement, shall be used for unwanted emission measurements.

In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given in (a) and (b):

(a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency, as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value need not be reported.

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When limits are expressed in absolute terms, compliance with the emission limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth for emissions below 1000 MHz. As an alternative to CISPR quasi-peak measurement, compliance with the emission limits can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth. Above 1000 MHz, compliance with the emission limits shall be demonstrated using an average detector with a minimum resolution bandwidth of 1 MHz

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**According to RSS-Gen section 7.2.2 Emissions Falling Within Restricted Frequency Bands**

Restricted bands, identified in Table 1, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following restrictions apply:

- (a) fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 1;
- (b) unwanted emissions falling into restricted bands of Table 1 shall comply with the limits specified in RSS-Gen;
- (c) unwanted emissions not falling within restricted frequency bands shall either comply with the limits specified in the applicable RSS, or with those specified in RSS-Gen.

**Table 1: Frequency Range of Operation**

Frequency Range over which the device operates	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	Centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre and 1 near low end

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**Table 3: Restricted Frequency Bands** (Note)

MHz	MHz	GHz
0.090-0.110	240-285	9.0-9.2
2.1735-2.1905	322-335.4	9.3-9.5
3.020-3.026	399.9-410	10.6-12.7
4.125-4.128	608-614	13.25-13.4
4.17725-4.17775	960-1427	14.47-14.5
4.20725-4.20775	1435-1626.5	15.35-16.2
5.677-5.683	1645.5-1646.5	17.7-21.4
6.215-6.218	1660-1710	22.01-23.12
6.26775-6.26825	1718.8-1722.2	23.6-24.0
6.31175-6.31225	2200-2300	31.2-31.8
8.291-8.294	2310-2390	36.43-36.5
8.362-8.366	2655-2900	Above 38.6
8.37625-8.38675	3260-3267	
8.41425-8.41475	3332-3339	
12.29-12.293	3345.8-3358	
12.51975-12.52025	3500-4400	
12.57675-12.57725	4500-5150	
13.36-13.41	5350-5460	
16.42-16.423	7250-7750	
16.69475-16.69525	8025-8500	
16.80425-16.80475		
25.5-25.67		
37.5-38.25		
73-74.6		
74.8-75.2		
108-138		
156.52475-156.52525		
156.7-156.9		

**Note:** Certain frequency bands listed in Table 1 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300- series RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.

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## 12.2 EUT Setup

1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-2009.
2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 120Vac/60Hz power source.

## 12.3 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

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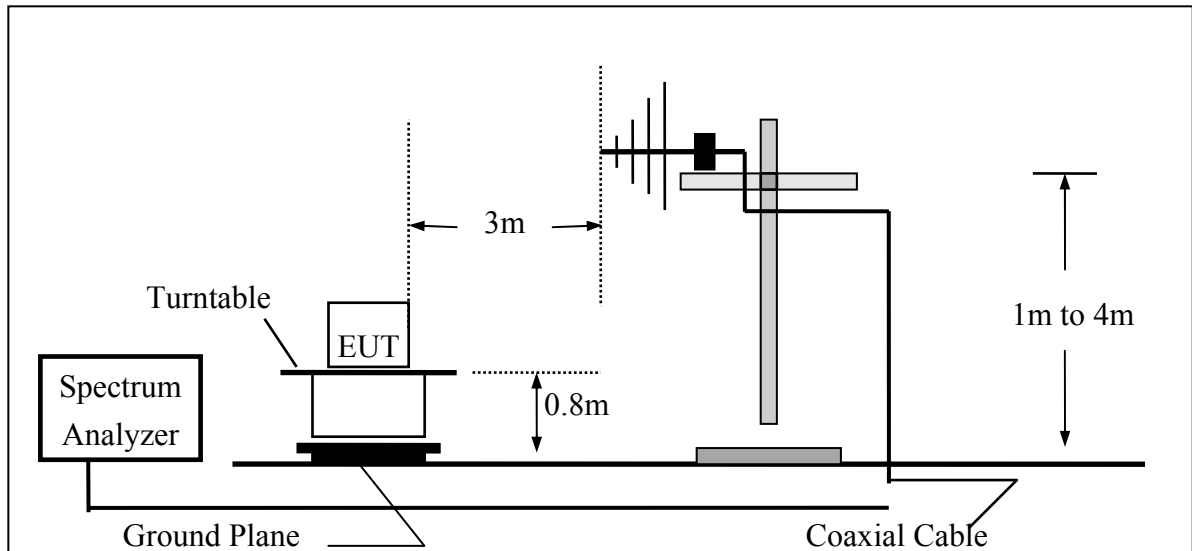
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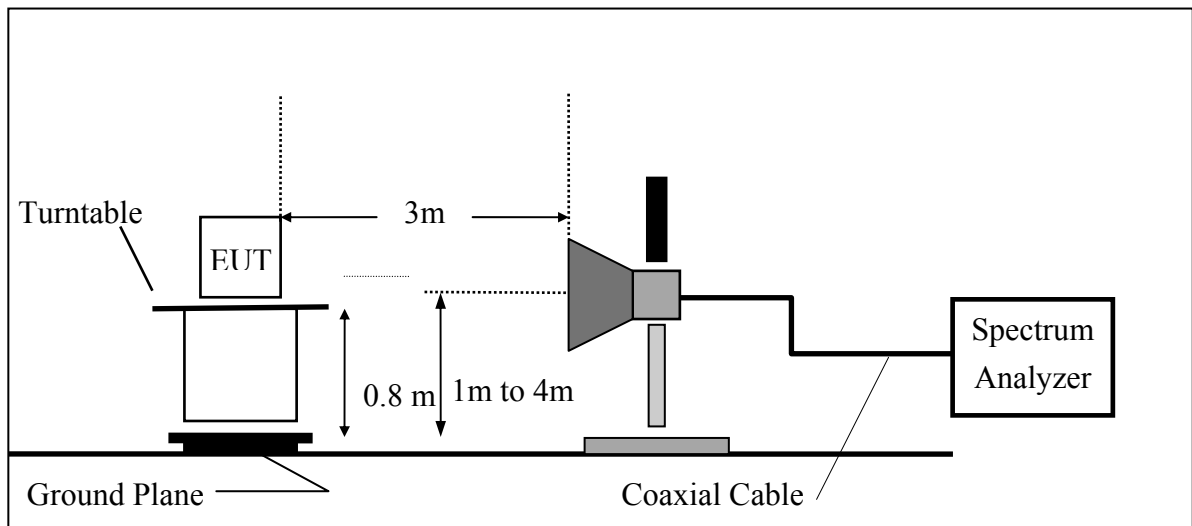
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## 12.4 Test SET-UP (Block Diagram of Configuration)

### (A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



### (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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## 12.5 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESC17	100759	05/20/2011	05/19/2013
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	02/15/2011	02/14/2013
Spectrum Analyzer	R&S	FSV-30	101398	10/18/2011	10/17/2013
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/10/2012	01/09/2014
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2011	05/18/2013
Horn Antenna	Schwarzbeck	BBHA9170	185	07/11/2011	07/10/2013
RF amplifier	Miteq	AMF-6F-2600 400-40-8P	971576	12/28/2011	12/27/2012
Pre-Amplifier	Agilent	8447D	2944A07676	01/04/2012	01/03/2013
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/04/2012	01/03/2013
5150-5350 Band Reject Filter	Micro-Tronics	BRM50703	1	01/04/2012	01/03/2013
5470-5725 Band Reject Filter	Micro-Tronics	BRM50704	1	01/04/2012	01/03/2013
5725-5875 Band Reject Filter	Micro-Tronics	BRM50705	1	01/04/2012	01/03/2013
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	02/28/2012	02/27/2013
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	02/28/2012	02/27/2013
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2012	02/27/2013
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_Rx	9	01/04/2012	01/03/2013
3m Site NSA	SGS	966 chamber	N/A	07/15/2012	07/14/2013

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966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2013	04/14/2014
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	02/06/2013	02/07/2014
RF amplifier	Miteq	AMF-6F-2600 400-40-8P	971576	12/28/2012	12/27/2013
Pre-Amplifier	Agilent	8447D	2944A07676	01/04/2013	01/03/2014
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/04/2013	01/03/2014
5150-5350 Band Reject Filter	Micro-Tronics	BRM50703	1	01/04/2013	01/03/2014
5470-5725 Band Reject Filter	Micro-Tronics	BRM50704	1	01/04/2013	01/03/2014
5725-5875 Band Reject Filter	Micro-Tronics	BRM50705	1	01/04/2013	01/03/2014
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	02/28/2013	02/27/2014
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	02/28/2013	02/27/2014
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2013	02/27/2014
Low Loss Cable	Huber Suhner	966_Rx	9	01/04/2013	01/03/2014

*Remark: Please note that the duration to conduct the test took place in the mean time when the calibration for several equipments is due, and therefore extra tables of equipment calibration is constructed to indicate the calibration work is still maintained.*

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## 12.6 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

## 12.7 Measurement Result

fer to attach tabular data sheets.

### NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

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**Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz (Internal Antenna)**

Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	48.91	-13.85	35.06	40.00	-4.94
153.19	S	Peak	44.01	-12.32	31.69	43.50	-11.81
270.56	S	Peak	43.44	-13.34	30.10	46.00	-15.90
364.65	S	Peak	38.29	-11.50	26.79	46.00	-19.21
672.14	S	Peak	34.38	-6.16	28.22	46.00	-17.78
966.05	S	Peak	32.05	-2.03	30.02	54.00	-23.98
10360.00	H	Peak	18.23	15.14	33.37	74.00	-40.63
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
185.20	S	Peak	49.23	-15.10	34.13	43.50	-9.37
273.47	S	Peak	45.36	-13.25	32.11	46.00	-13.89
366.59	S	Peak	43.04	-11.48	31.56	46.00	-14.44
696.39	S	Peak	35.62	-5.79	29.83	46.00	-16.17
934.04	S	Peak	33.36	-2.25	31.11	46.00	-14.89
966.05	S	Peak	32.34	-2.03	30.31	54.00	-23.69
10360.00	H	Peak	18.62	15.17	33.79	74.00	-40.21
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5220 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	49.61	-13.85	35.76	40.00	-4.24
152.22	S	Peak	44.81	-12.32	32.49	43.50	-11.01
272.50	S	Peak	43.46	-13.28	30.18	46.00	-15.82
366.59	S	Peak	37.99	-11.48	26.51	46.00	-19.49
798.24	S	Peak	34.67	-4.22	30.45	46.00	-15.55
995.15	S	Peak	31.35	-1.87	29.48	54.00	-24.52
10440.00	H	Peak	19.66	14.92	34.58	74.00	-39.42
15660.00	H	---					
20880.00	H	---					
26100.00	H	---					
31320.00	H	---					
36540.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5220 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
185.20	S	Peak	48.19	-15.10	33.09	43.50	-10.41
273.47	S	Peak	44.93	-13.25	31.68	46.00	-14.32
364.65	S	Peak	42.62	-11.50	31.12	46.00	-14.88
577.08	S	Peak	38.81	-8.05	30.76	46.00	-15.24
799.21	S	Peak	36.37	-4.21	32.16	46.00	-13.84
962.17	S	Peak	31.82	-2.05	29.77	54.00	-24.23
10440.00	H	Peak	18.96	15.00	33.96	74.00	-40.04
15660.00	H	---					
20880.00	H	---					
26100.00	H	---					
31320.00	H	---					
36540.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5240 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
46.49	S	Peak	48.55	-13.80	34.75	40.00	-5.25
154.16	S	Peak	43.95	-12.30	31.65	43.50	-11.85
270.56	S	Peak	43.34	-13.34	30.00	46.00	-16.00
566.41	S	Peak	36.61	-8.25	28.36	46.00	-17.64
696.39	S	Peak	35.00	-5.79	29.21	46.00	-16.79
966.05	S	Peak	31.69	-2.03	29.66	54.00	-24.34
10480.00	H	Peak	18.70	14.83	33.53	74.00	-40.47
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5240 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	47.35	-14.78	32.57	43.50	-10.93
273.47	S	Peak	46.23	-13.25	32.98	46.00	-13.02
364.65	S	Peak	43.34	-11.50	31.84	46.00	-14.16
577.08	S	Peak	38.19	-8.05	30.14	46.00	-15.86
766.23	S	Peak	34.92	-4.69	30.23	46.00	-15.77
799.21	S	Peak	36.72	-4.21	32.51	46.00	-13.49
10480.00	H	Peak	18.67	14.92	33.59	74.00	-40.41
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-06
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.74	7.37	47.11	54.00	-6.89
5150.00	E	Peak	51.83	7.37	59.20	74.00	-14.80

Operation Band	:802.11a	Test Date	:2012-11-06
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.59	7.47	47.06	54.00	-6.94
5150.00	E	Peak	49.66	7.47	57.13	74.00	-16.87

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# **Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz (Internal Antenna)**

Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	46.22	-13.86	32.36	40.00	-7.64
95.96	S	Peak	50.64	-17.13	33.51	43.50	-9.99
157.07	S	Peak	40.63	-12.29	28.34	43.50	-15.16
577.08	S	Peak	39.91	-8.05	31.86	46.00	-14.14
966.05	S	Peak	35.07	-2.03	33.04	54.00	-20.96
995.15	S	Peak	40.21	-1.87	38.34	54.00	-15.66
10360.00	H	Peak	18.27	15.14	33.41	74.00	-40.59
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.47	-13.20	30.27	43.50	-13.23
288.02	S	Peak	43.91	-12.86	31.05	46.00	-14.95
335.55	S	Peak	39.85	-11.86	27.99	46.00	-18.01
398.60	S	Peak	39.22	-11.07	28.15	46.00	-17.85
577.08	S	Peak	37.36	-8.05	29.31	46.00	-16.69
995.15	S	Peak	35.07	-1.87	33.20	54.00	-20.80
10360.00	H	Peak	19.04	15.17	34.21	74.00	-39.79
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5220 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	46.04	-13.86	32.18	40.00	-7.82
95.96	S	Peak	50.57	-17.13	33.44	43.50	-10.06
158.04	S	Peak	40.86	-12.30	28.56	43.50	-14.94
577.08	S	Peak	40.17	-8.05	32.12	46.00	-13.88
966.05	S	Peak	35.54	-2.03	33.51	54.00	-20.49
995.15	S	Peak	39.61	-1.87	37.74	54.00	-16.26
10440.00	H	Peak	18.34	14.92	33.26	74.00	-40.74
15660.00	H	---					
20880.00	H	---					
26100.00	H	---					
31320.00	H	---					
36540.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5220 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	45.88	-13.13	32.75	43.50	-10.75
288.02	S	Peak	43.76	-12.86	30.90	46.00	-15.10
398.60	S	Peak	39.57	-11.07	28.50	46.00	-17.50
577.08	S	Peak	37.74	-8.05	29.69	46.00	-16.31
933.07	S	Peak	34.20	-2.26	31.94	46.00	-14.06
995.15	S	Peak	34.97	-1.87	33.10	54.00	-20.90
10440.00	H	Peak	17.94	15.00	32.94	74.00	-41.06
15660.00	H	---					
20880.00	H	---					
26100.00	H	---					
31320.00	H	---					
36540.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5240 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
37.76	S	Peak	46.77	-13.72	33.05	40.00	-6.95
95.96	S	Peak	50.16	-17.13	33.03	43.50	-10.47
159.01	S	Peak	39.79	-12.28	27.51	43.50	-15.99
577.08	S	Peak	39.35	-8.05	31.30	46.00	-14.70
966.05	S	Peak	35.38	-2.03	33.35	54.00	-20.65
995.15	S	Peak	39.50	-1.87	37.63	54.00	-16.37
10480.00	H	Peak	17.91	14.83	32.74	74.00	-41.26
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5240 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	44.80	-13.13	31.67	43.50	-11.83
288.02	S	Peak	43.64	-12.86	30.78	46.00	-15.22
335.55	S	Peak	40.50	-11.86	28.64	46.00	-17.36
577.08	S	Peak	37.63	-8.05	29.58	46.00	-16.42
966.05	S	Peak	33.63	-2.03	31.60	54.00	-22.40
995.15	S	Peak	36.73	-1.87	34.86	54.00	-19.14
10480.00	H	Peak	18.81	14.92	33.73	74.00	-40.27
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-09
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.44	7.37	46.81	54.00	-7.19
5150.00	E	Peak	50.24	7.37	57.61	74.00	-16.39

Operation Band	:802.11n20M	Test Date	:2012-11-09
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.64	7.47	47.11	54.00	-6.89
5150.00	E	Peak	52.57	7.47	60.04	74.00	-13.96

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# **Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz (Internal Antenna)**

Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	44.08	-13.59	30.49	40.00	-9.51
95.96	S	Peak	50.95	-17.13	33.82	43.50	-9.68
157.07	S	Peak	40.37	-12.29	28.08	43.50	-15.42
577.08	S	Peak	40.09	-8.05	32.04	46.00	-13.96
966.05	S	Peak	35.47	-2.03	33.44	54.00	-20.56
995.15	S	Peak	40.37	-1.87	38.50	54.00	-15.50
10380.00	H	Peak	18.17	15.15	33.32	74.00	-40.68
15570.00	H	---					
20760.00	H	---					
25950.00	H	---					
31140.00	H	---					
36330.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	46.34	-13.13	33.21	43.50	-10.29
239.52	S	Peak	42.06	-14.21	27.85	46.00	-18.15
288.02	S	Peak	43.82	-12.86	30.96	46.00	-15.04
335.55	S	Peak	40.23	-11.86	28.37	46.00	-17.63
577.08	S	Peak	37.95	-8.05	29.90	46.00	-16.10
995.15	S	Peak	35.83	-1.87	33.96	54.00	-20.04
10380.00	H	Peak	19.07	15.20	34.27	74.00	-39.73
15570.00	H	---					
20760.00	H	---					
25950.00	H	---					
31140.00	H	---					
36330.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5230 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
37.76	S	Peak	46.51	-13.72	32.79	40.00	-7.21
95.96	S	Peak	51.06	-17.13	33.93	43.50	-9.57
158.04	S	Peak	40.75	-12.30	28.45	43.50	-15.05
577.08	S	Peak	40.08	-8.05	32.03	46.00	-13.97
962.17	S	Peak	35.09	-2.05	33.04	54.00	-20.96
995.15	S	Peak	38.88	-1.87	37.01	54.00	-16.99
10460.00	H	Peak	18.28	14.88	33.16	74.00	-40.84
15690.00	H	---					
20920.00	H	---					
26150.00	H	---					
31380.00	H	---					
36610.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5230 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	43.78	-13.13	30.65	43.50	-12.85
288.02	S	Peak	43.71	-12.86	30.85	46.00	-15.15
398.60	S	Peak	39.54	-11.07	28.47	46.00	-17.53
577.08	S	Peak	38.04	-8.05	29.99	46.00	-16.01
966.05	S	Peak	33.84	-2.03	31.81	54.00	-22.19
995.15	S	Peak	35.46	-1.87	33.59	54.00	-20.41
10460.00	H	Peak	18.17	14.96	33.13	74.00	-40.87
15690.00	H	---					
20920.00	H	---					
26150.00	H	---					
31380.00	H	---					
36610.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-06
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	41.74	7.37	49.11	54.00	-4.89
5150.00	E	Peak	52.74	7.37	60.11	74.00	-13.89

Operation Band	:802.11n40M	Test Date	:2012-11-09
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	43.56	7.47	51.03	54.00	-2.97
5150.00	E	Peak	55.71	7.47	63.18	74.00	-10.82

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# **Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz (Internal Antenna)**

Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5260 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	47.61	-13.59	34.02	40.00	-5.98
95.96	S	Peak	50.26	-17.13	33.13	43.50	-10.37
189.08	S	Peak	45.17	-15.53	29.64	43.50	-13.86
577.08	S	Peak	39.74	-8.05	31.69	46.00	-14.31
966.05	S	Peak	35.39	-2.03	33.36	54.00	-20.64
995.15	S	Peak	39.41	-1.87	37.54	54.00	-16.46
10520.00	H	Peak	19.02	14.69	33.71	74.00	-40.29
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5260 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	44.08	-13.13	30.95	43.50	-12.55
288.02	S	Peak	43.54	-12.86	30.68	46.00	-15.32
335.55	S	Peak	39.86	-11.86	28.00	46.00	-18.00
577.08	S	Peak	37.40	-8.05	29.35	46.00	-16.65
962.17	S	Peak	34.46	-2.05	32.41	54.00	-21.59
995.15	S	Peak	34.76	-1.87	32.89	54.00	-21.11
10520.00	H	Peak	18.55	14.78	33.33	74.00	-40.67
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5300 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	43.72	-13.59	30.13	40.00	-9.87
95.96	S	Peak	50.61	-17.13	33.48	43.50	-10.02
155.13	S	Peak	41.50	-12.30	29.20	43.50	-14.30
292.87	S	Peak	39.51	-12.74	26.77	46.00	-19.23
577.08	S	Peak	39.90	-8.05	31.85	46.00	-14.15
995.15	S	Peak	39.77	-1.87	37.90	54.00	-16.10
10600.00	H	Peak	17.75	15.33	33.08	74.00	-40.92
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5300 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.80	-13.20	30.60	43.50	-12.90
288.02	S	Peak	44.23	-12.86	31.37	46.00	-14.63
399.57	S	Peak	39.03	-11.06	27.97	46.00	-18.03
577.08	S	Peak	38.41	-8.05	30.36	46.00	-15.64
966.05	S	Peak	34.23	-2.03	32.20	54.00	-21.80
995.15	S	Peak	35.50	-1.87	33.63	54.00	-20.37
10600.00	H	Peak	17.87	15.35	33.22	74.00	-40.78
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	45.82	-13.86	31.96	40.00	-8.04
95.96	S	Peak	50.06	-17.13	32.93	43.50	-10.57
158.04	S	Peak	39.61	-12.30	27.31	43.50	-16.19
577.08	S	Peak	39.79	-8.05	31.74	46.00	-14.26
962.17	S	Peak	35.79	-2.05	33.74	54.00	-20.26
995.15	S	Peak	39.55	-1.87	37.68	54.00	-16.32
10640.00	H	Peak	18.24	15.72	33.96	74.00	-40.04
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	43.94	-13.13	30.81	43.50	-12.69
288.02	S	Peak	43.47	-12.86	30.61	46.00	-15.39
399.57	S	Peak	39.40	-11.06	28.34	46.00	-17.66
577.08	S	Peak	37.71	-8.05	29.66	46.00	-16.34
966.05	S	Peak	33.97	-2.03	31.94	54.00	-22.06
995.15	S	Peak	35.65	-1.87	33.78	54.00	-20.22
10640.00	H	Peak	17.96	15.71	33.67	74.00	-40.33
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-06
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	40.66	8.02	48.68	54.00	-5.32
5350.00	E	Peak	50.82	8.02	58.84	74.00	-15.16

Operation Band	:802.11a	Test Date	:2012-11-06
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	40.35	8.32	48.67	54.00	-5.33
5350.00	E	Peak	51.72	8.32	60.04	74.00	-13.96

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# **Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz (Internal Antenna)**

Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5260 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	47.73	-13.86	33.87	40.00	-6.13
95.96	S	Peak	50.49	-17.13	33.36	43.50	-10.14
155.13	S	Peak	43.97	-12.30	31.67	43.50	-11.83
577.08	S	Peak	39.69	-8.05	31.64	46.00	-14.36
962.17	S	Peak	34.66	-2.05	32.61	54.00	-21.39
995.15	S	Peak	38.95	-1.87	37.08	54.00	-16.92
10520.00	H	Peak	18.33	14.69	33.02	74.00	-40.98
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5260 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
142.52	S	Peak	44.81	-12.89	31.92	43.50	-11.58
272.50	S	Peak	44.82	-13.28	31.54	46.00	-14.46
399.57	S	Peak	38.76	-11.06	27.70	46.00	-18.30
577.08	S	Peak	37.96	-8.05	29.91	46.00	-16.09
966.05	S	Peak	34.23	-2.03	32.20	54.00	-21.80
995.15	S	Peak	36.78	-1.87	34.91	54.00	-19.09
10520.00	H	Peak	18.26	14.78	33.04	74.00	-40.96
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5300 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	45.92	-13.86	32.06	40.00	-7.94
95.96	S	Peak	49.76	-17.13	32.63	43.50	-10.87
191.99	S	Peak	43.68	-15.76	27.92	43.50	-15.58
577.08	S	Peak	40.17	-8.05	32.12	46.00	-13.88
966.05	S	Peak	34.76	-2.03	32.73	54.00	-21.27
995.15	S	Peak	39.59	-1.87	37.72	54.00	-16.28
10600.00	H	Peak	17.67	15.33	33.00	74.00	-41.00
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5300 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	44.79	-13.20	31.59	43.50	-11.91
288.02	S	Peak	44.13	-12.86	31.27	46.00	-14.73
398.60	S	Peak	39.66	-11.07	28.59	46.00	-17.41
577.08	S	Peak	37.41	-8.05	29.36	46.00	-16.64
966.05	S	Peak	33.64	-2.03	31.61	54.00	-22.39
995.15	S	Peak	34.78	-1.87	32.91	54.00	-21.09
10600.00	H	Peak	17.13	15.35	32.48	74.00	-41.52
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	45.82	-13.59	32.23	40.00	-7.77
95.96	S	Peak	51.00	-17.13	33.87	43.50	-9.63
158.04	S	Peak	40.42	-12.30	28.12	43.50	-15.38
577.08	S	Peak	39.57	-8.05	31.52	46.00	-14.48
966.05	S	Peak	35.07	-2.03	33.04	54.00	-20.96
995.15	S	Peak	38.71	-1.87	36.84	54.00	-17.16
10640.00	H	Peak	17.19	15.72	32.91	74.00	-41.09
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
140.58	S	Peak	46.15	-13.04	33.11	43.50	-10.39
198.78	S	Peak	45.20	-16.05	29.15	43.50	-14.35
288.02	S	Peak	44.10	-12.86	31.24	46.00	-14.76
398.60	S	Peak	39.48	-11.07	28.41	46.00	-17.59
577.08	S	Peak	37.44	-8.05	29.39	46.00	-16.61
995.15	S	Peak	35.60	-1.87	33.73	54.00	-20.27
10640.00	H	Peak	17.66	15.71	33.37	74.00	-40.63
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-06
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	41.25	8.02	49.27	54.00	-4.73
5350.00	E	Peak	52.21	8.02	60.23	74.00	-13.77

Operation Band	:802.11n20M	Test Date	:2012-11-06
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	43.86	8.32	52.18	54.00	-1.82
5350.00	E	Peak	60.65	8.32	68.97	74.00	-5.03

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**Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz (Internal Antenna)**

Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5270 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	44.47	-13.86	30.61	40.00	-9.39
95.96	S	Peak	50.14	-17.13	33.01	43.50	-10.49
158.04	S	Peak	40.22	-12.30	27.92	43.50	-15.58
296.75	S	Peak	39.01	-12.64	26.37	46.00	-19.63
577.08	S	Peak	39.53	-8.05	31.48	46.00	-14.52
966.05	S	Peak	34.46	-2.03	32.43	54.00	-21.57
10540.00	H	Peak	18.39	14.83	33.22	74.00	-40.78
15810.00	H	---					
21080.00	H	---					
26350.00	H	---					
31620.00	H	---					
36890.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5270 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.74	-13.20	30.54	43.50	-12.96
288.02	S	Peak	43.83	-12.86	30.97	46.00	-15.03
398.60	S	Peak	39.30	-11.07	28.23	46.00	-17.77
577.08	S	Peak	37.41	-8.05	29.36	46.00	-16.64
962.17	S	Peak	34.36	-2.05	32.31	54.00	-21.69
995.15	S	Peak	35.72	-1.87	33.85	54.00	-20.15
10540.00	H	Peak	18.34	14.90	33.24	74.00	-40.76
15810.00	H	---					
21080.00	H	---					
26350.00	H	---					
31620.00	H	---					
36890.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5310 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	44.59	-13.86	30.73	40.00	-9.27
95.96	S	Peak	50.90	-17.13	33.77	43.50	-9.73
155.13	S	Peak	41.24	-12.30	28.94	43.50	-14.56
577.08	S	Peak	39.95	-8.05	31.90	46.00	-14.10
966.05	S	Peak	36.04	-2.03	34.01	54.00	-19.99
995.15	S	Peak	40.06	-1.87	38.19	54.00	-15.81
10620.00	H	Peak	17.52	15.50	33.02	74.00	-40.98
15930.00	H	---					
21240.00	H	---					
26550.00	H	---					
31860.00	H	---					
37170.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5310 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.40	-13.20	30.20	43.50	-13.30
288.02	S	Peak	43.64	-12.86	30.78	46.00	-15.22
399.57	S	Peak	39.38	-11.06	28.32	46.00	-17.68
577.08	S	Peak	37.83	-8.05	29.78	46.00	-16.22
962.17	S	Peak	34.96	-2.05	32.91	54.00	-21.09
995.15	S	Peak	35.56	-1.87	33.69	54.00	-20.31
10620.00	H	Peak	17.88	15.51	33.39	74.00	-40.61
15930.00	H	---					
21240.00	H	---					
26550.00	H	---					
31860.00	H	---					
37170.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-06
Fundamental Frequency	:5310 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	43.50	8.02	51.52	54.00	-2.48
5350.00	E	Peak	54.93	8.02	62.95	74.00	-11.05

Operation Band	:802.11n40M	Test Date	:2012-11-09
Fundamental Frequency	:5310 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	44.05	8.32	52.37	54.00	-1.63
5350.00	E	Peak	56.36	8.32	64.68	74.00	-9.32

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# **Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz (Internal Antenna)**

Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	44.58	-13.86	30.72	40.00	-9.28
95.96	S	Peak	50.33	-17.13	33.20	43.50	-10.30
157.07	S	Peak	40.42	-12.29	28.13	43.50	-15.37
577.08	S	Peak	40.54	-8.05	32.49	46.00	-13.51
966.05	S	Peak	35.51	-2.03	33.48	54.00	-20.52
995.15	S	Peak	38.20	-1.87	36.33	54.00	-17.67
11000.00	H	Peak	18.13	16.54	34.67	74.00	-39.33
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.58	-13.20	30.38	43.50	-13.12
288.02	S	Peak	43.96	-12.86	31.10	46.00	-14.90
398.60	S	Peak	39.47	-11.07	28.40	46.00	-17.60
577.08	S	Peak	37.73	-8.05	29.68	46.00	-16.32
966.05	S	Peak	34.72	-2.03	32.69	54.00	-21.31
995.15	S	Peak	34.99	-1.87	33.12	54.00	-20.88
11000.00	H	Peak	18.01	16.44	34.45	74.00	-39.55
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5580 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
37.76	S	Peak	43.76	-13.72	30.04	40.00	-9.96
95.96	S	Peak	50.21	-17.13	33.08	43.50	-10.42
183.26	S	Peak	45.26	-14.89	30.37	43.50	-13.13
577.08	S	Peak	40.10	-8.05	32.05	46.00	-13.95
966.05	S	Peak	34.62	-2.03	32.59	54.00	-21.41
995.15	S	Peak	39.21	-1.87	37.34	54.00	-16.66
11160.00	H	Peak	18.16	16.93	35.09	74.00	-38.91
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5580 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	44.63	-13.13	31.50	43.50	-12.00
175.50	S	Peak	41.90	-13.90	28.00	43.50	-15.50
288.02	S	Peak	43.71	-12.86	30.85	46.00	-15.15
399.57	S	Peak	39.41	-11.06	28.35	46.00	-17.65
577.08	S	Peak	38.56	-8.05	30.51	46.00	-15.49
995.15	S	Peak	35.67	-1.87	33.80	54.00	-20.20
11160.00	H	Peak	17.46	16.70	34.16	74.00	-39.84
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
37.76	S	Peak	43.82	-13.72	30.10	40.00	-9.90
95.96	S	Peak	50.41	-17.13	33.28	43.50	-10.22
152.22	S	Peak	41.52	-12.32	29.20	43.50	-14.30
577.08	S	Peak	40.14	-8.05	32.09	46.00	-13.91
966.05	S	Peak	34.51	-2.03	32.48	54.00	-21.52
995.15	S	Peak	40.05	-1.87	38.18	54.00	-15.82
11400.00	H	Peak	18.14	17.30	35.44	74.00	-38.56
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-1
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	43.59	-13.13	30.46	43.50	-13.04
288.02	S	Peak	43.79	-12.86	30.93	46.00	-15.07
398.60	S	Peak	39.59	-11.07	28.52	46.00	-17.48
577.08	S	Peak	37.62	-8.05	29.57	46.00	-16.43
966.05	S	Peak	33.74	-2.03	31.71	54.00	-22.29
995.15	S	Peak	34.77	-1.87	32.90	54.00	-21.10
11400.00	H	Peak	18.27	17.06	35.33	74.00	-38.67
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-11-06
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	41.34	7.77	49.11	54.00	-4.89
5460.00	E	Peak	51.10	7.77	58.87	74.00	-15.13

Operation Band	:802.11a	Test Date	:2012-11-06
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	40.49	8.07	48.56	54.00	-5.44
5460.00	E	Peak	50.79	8.07	58.86	74.00	-15.14

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**Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz (Internal Antenna)**

Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	47.88	-13.86	34.02	40.00	-5.98
95.96	S	Peak	50.10	-17.13	32.97	43.50	-10.53
178.41	S	Peak	45.27	-14.31	30.96	43.50	-12.54
577.08	S	Peak	39.51	-8.05	31.46	46.00	-14.54
966.05	S	Peak	36.25	-2.03	34.22	54.00	-19.78
995.15	S	Peak	39.44	-1.87	37.57	54.00	-16.43
11000.00	H	Peak	18.43	16.54	34.97	74.00	-39.03
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
139.61	S	Peak	44.58	-13.13	31.45	43.50	-12.05
288.02	S	Peak	43.69	-12.86	30.83	46.00	-15.17
335.55	S	Peak	40.25	-11.86	28.39	46.00	-17.61
577.08	S	Peak	37.50	-8.05	29.45	46.00	-16.55
966.05	S	Peak	34.30	-2.03	32.27	54.00	-21.73
995.15	S	Peak	35.14	-1.87	33.27	54.00	-20.73
11000.00	H	Peak	17.94	16.44	34.38	74.00	-39.62
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5580 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	44.19	-13.86	30.33	40.00	-9.67
95.96	S	Peak	50.92	-17.13	33.79	43.50	-9.71
157.07	S	Peak	41.15	-12.29	28.86	43.50	-14.64
577.08	S	Peak	39.74	-8.05	31.69	46.00	-14.31
966.05	S	Peak	34.76	-2.03	32.73	54.00	-21.27
995.15	S	Peak	38.91	-1.87	37.04	54.00	-16.96
11160.00	H	Peak	17.49	16.93	34.42	74.00	-39.58
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5580 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.35	-13.20	30.15	43.50	-13.35
288.02	S	Peak	43.99	-12.86	31.13	46.00	-14.87
398.60	S	Peak	39.84	-11.07	28.77	46.00	-17.23
577.08	S	Peak	37.54	-8.05	29.49	46.00	-16.51
962.17	S	Peak	34.39	-2.05	32.34	54.00	-21.66
995.15	S	Peak	35.30	-1.87	33.43	54.00	-20.57
11160.00	H	Peak	17.56	16.70	34.26	74.00	-39.74
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	45.55	-13.86	31.69	40.00	-8.31
95.96	S	Peak	50.21	-17.13	33.08	43.50	-10.42
180.35	S	Peak	45.17	-14.58	30.59	43.50	-12.91
577.08	S	Peak	39.99	-8.05	31.94	46.00	-14.06
962.17	S	Peak	35.78	-2.05	33.73	54.00	-20.27
995.15	S	Peak	39.83	-1.87	37.96	54.00	-16.04
11400.00	H	Peak	18.51	17.30	35.81	74.00	-38.19
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-1
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.13	-13.20	29.93	43.50	-13.57
288.02	S	Peak	43.77	-12.86	30.91	46.00	-15.09
335.55	S	Peak	40.97	-11.86	29.11	46.00	-16.89
398.60	S	Peak	39.50	-11.07	28.43	46.00	-17.57
577.08	S	Peak	37.81	-8.05	29.76	46.00	-16.24
995.15	S	Peak	35.97	-1.87	34.10	54.00	-19.90
11400.00	H	Peak	18.32	17.06	35.38	74.00	-38.62
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-11-06
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	41.30	7.77	49.07	54.00	-4.93
5460.00	E	Peak	50.89	7.77	58.66	74.00	-15.34

Operation Band	:802.11n20M	Test Date	:2012-11-06
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	42.32	8.07	50.39	54.00	-3.61
5460.00	E	Peak	52.26	8.07	60.33	74.00	-13.67

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# **Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz (Internal Antenna)**

Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
37.76	S	Peak	45.28	-13.72	31.56	40.00	-8.44
95.96	S	Peak	50.19	-17.13	33.06	43.50	-10.44
159.01	S	Peak	40.29	-12.28	28.01	43.50	-15.49
577.08	S	Peak	40.03	-8.05	31.98	46.00	-14.02
966.05	S	Peak	34.43	-2.03	32.40	54.00	-21.60
995.15	S	Peak	38.92	-1.87	37.05	54.00	-16.95
11020.00	H	Peak	18.91	16.58	35.49	74.00	-38.51
16530.00	H	---					
22040.00	H	---					
27550.00	H	---					
33060.00	H	---					
38570.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	44.27	-13.20	31.07	43.50	-12.43
288.02	S	Peak	43.95	-12.86	31.09	46.00	-14.91
398.60	S	Peak	39.30	-11.07	28.23	46.00	-17.77
577.08	S	Peak	37.70	-8.05	29.65	46.00	-16.35
966.05	S	Peak	33.93	-2.03	31.90	54.00	-22.10
995.15	S	Peak	34.78	-1.87	32.91	54.00	-21.09
11020.00	H	Peak	18.49	16.46	34.95	74.00	-39.05
16530.00	H	---					
22040.00	H	---					
27550.00	H	---					
33060.00	H	---					
38570.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2013-04-18
Fundamental Frequency	:5550 MHz	Temp./Humi.	:25.deg_C/60RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
37.82	S	Peak	43.89	-13.79	30.10	40.00	-9.90
95.96	S	Peak	50.33	-17.13	33.20	43.50	-10.30
157.07	S	Peak	45.17	-14.58	30.59	43.50	-12.91
577.08	S	Peak	40.54	-8.05	32.49	46.00	-13.51
672.57	S	Peak	35.57	-6.24	29.33	46.00	-16.67
995.16	S	Peak	38.25	-1.87	36.38	54.00	-17.62
11100.00	H	Peak	18.23	16.78	35.01	74.00	-38.99
16650.00	H	---					
22200.00	H	---					
27750.00	H	---					
33300.00	H	---					
38850.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2013-04-18
Fundamental Frequency	:5550 MHz	Temp./Humi.	:25.deg_C/60RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.58	-13.20	30.38	43.50	-13.12
288.35	S	Peak	43.45	-12.59	30.86	46.00	-15.14
398.60	S	Peak	39.47	-11.07	28.40	46.00	-17.60
577.08	S	Peak	37.73	-8.05	29.68	46.00	-16.32
598.57	S	Peak	37.81	-8.05	29.76	46.00	-16.24
995.16	S	Peak	34.99	-1.87	33.12	54.00	-20.88
11100.00	H	Peak	18.01	16.44	34.45	74.00	-39.55
16650.00	H	---					
22200.00	H	---					
27750.00	H	---					
33300.00	H	---					
38850.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5670 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	44.56	-13.86	30.70	40.00	-9.30
95.96	S	Peak	51.10	-17.13	33.97	43.50	-9.53
186.17	S	Peak	47.67	-15.22	32.45	43.50	-11.05
577.08	S	Peak	39.71	-8.05	31.66	46.00	-14.34
966.05	S	Peak	34.63	-2.03	32.60	54.00	-21.40
995.15	S	Peak	38.81	-1.87	36.94	54.00	-17.06
11340.00	H	Peak	17.58	17.24	34.82	74.00	-39.18
17010.00	H	---					
22680.00	H	---					
28350.00	H	---					
34020.00	H	---					
39690.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-1
Fundamental Frequency	:5670 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
138.64	S	Peak	43.61	-13.20	30.41	43.50	-13.09
288.02	S	Peak	44.05	-12.86	31.19	46.00	-14.81
398.60	S	Peak	39.23	-11.07	28.16	46.00	-17.84
577.08	S	Peak	37.92	-8.05	29.87	46.00	-16.13
966.05	S	Peak	34.61	-2.03	32.58	54.00	-21.42
995.15	S	Peak	35.86	-1.87	33.99	54.00	-20.01
11340.00	H	Peak	18.17	16.98	35.15	74.00	-38.85
17010.00	H	---					
22680.00	H	---					
28350.00	H	---					
34020.00	H	---					
39690.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-11-06
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	41.21	7.77	48.98	54.00	-5.02
5460.00	E	Peak	52.56	7.77	60.33	74.00	-13.67

Operation Band	:802.11n40M	Test Date	:2012-11-06
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.1deg_C/59RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	41.63	8.07	49.70	54.00	-4.30
5460.00	E	Peak	51.54	8.07	59.61	74.00	-14.39

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## Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

### (External Antenna (MIMO))

Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	48.91	-13.85	35.06	40.00	-4.94
153.19	S	Peak	44.01	-12.32	31.69	43.50	-11.81
270.56	S	Peak	43.44	-13.34	30.10	46.00	-15.90
364.65	S	Peak	38.29	-11.50	26.79	46.00	-19.21
672.14	S	Peak	34.38	-6.16	28.22	46.00	-17.78
966.05	S	Peak	32.05	-2.03	30.02	54.00	-23.98
10360.00	H	Peak	18.23	15.14	33.37	74.00	-40.63
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
185.20	S	Peak	49.23	-15.10	34.13	43.50	-9.37
273.47	S	Peak	45.36	-13.25	32.11	46.00	-13.89
366.59	S	Peak	43.04	-11.48	31.56	46.00	-14.44
696.39	S	Peak	35.62	-5.79	29.83	46.00	-16.17
934.04	S	Peak	33.36	-2.25	31.11	46.00	-14.89
966.05	S	Peak	32.34	-2.03	30.31	54.00	-23.69
10360.00	H	Peak	18.62	15.17	33.79	74.00	-40.21
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5220 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	49.61	-13.85	35.76	40.00	-4.24
152.22	S	Peak	44.81	-12.32	32.49	43.50	-11.01
272.50	S	Peak	43.46	-13.28	30.18	46.00	-15.82
366.59	S	Peak	37.99	-11.48	26.51	46.00	-19.49
798.24	S	Peak	34.67	-4.22	30.45	46.00	-15.55
995.15	S	Peak	31.35	-1.87	29.48	54.00	-24.52
10440.00	H	Peak	19.66	14.92	34.58	74.00	-39.42
15660.00	H	---					
20880.00	H	---					
26100.00	H	---					
31320.00	H	---					
36540.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5220 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
185.20	S	Peak	48.19	-15.10	33.09	43.50	-10.41
273.47	S	Peak	44.93	-13.25	31.68	46.00	-14.32
364.65	S	Peak	42.62	-11.50	31.12	46.00	-14.88
577.08	S	Peak	38.81	-8.05	30.76	46.00	-15.24
799.21	S	Peak	36.37	-4.21	32.16	46.00	-13.84
962.17	S	Peak	31.82	-2.05	29.77	54.00	-24.23
10440.00	H	Peak	18.96	15.00	33.96	74.00	-40.04
15660.00	H	---					
20880.00	H	---					
26100.00	H	---					
31320.00	H	---					
36540.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5240 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
46.49	S	Peak	48.55	-13.80	34.75	40.00	-5.25
154.16	S	Peak	43.95	-12.30	31.65	43.50	-11.85
270.56	S	Peak	43.34	-13.34	30.00	46.00	-16.00
566.41	S	Peak	36.61	-8.25	28.36	46.00	-17.64
696.39	S	Peak	35.00	-5.79	29.21	46.00	-16.79
966.05	S	Peak	31.69	-2.03	29.66	54.00	-24.34
10480.00	H	Peak	18.70	14.83	33.53	74.00	-40.47
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5240 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	47.35	-14.78	32.57	43.50	-10.93
273.47	S	Peak	46.23	-13.25	32.98	46.00	-13.02
364.65	S	Peak	43.34	-11.50	31.84	46.00	-14.16
577.08	S	Peak	38.19	-8.05	30.14	46.00	-15.86
766.23	S	Peak	34.92	-4.69	30.23	46.00	-15.77
799.21	S	Peak	36.72	-4.21	32.51	46.00	-13.49
10480.00	H	Peak	18.67	14.92	33.59	74.00	-40.41
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band :802.11a (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5180 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.94	7.37	47.31	54.00	-6.69
5150.00	E	Peak	51.58	7.37	58.95	74.00	-15.05

Operation Band :802.11a (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5180 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.13	7.47	46.60	54.00	-7.40
5150.00	E	Peak	51.12	7.47	58.59	74.00	-15.41

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## Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

### (External Antenna (MIMO))

Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	48.00	-13.85	34.15	40.00	-5.85
154.16	S	Peak	41.59	-12.30	29.29	43.50	-14.21
288.02	S	Peak	35.80	-12.86	22.94	46.00	-23.06
577.08	S	Peak	37.59	-8.05	29.54	46.00	-16.46
672.14	S	Peak	34.87	-6.16	28.71	46.00	-17.29
966.05	S	Peak	31.22	-2.03	29.19	54.00	-24.81
10360.00	H	Peak	18.22	15.14	33.36	74.00	-40.64
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	42.90	-14.78	28.12	43.50	-15.38
240.49	S	Peak	43.15	-14.19	28.96	46.00	-17.04
366.59	S	Peak	43.54	-11.48	32.06	46.00	-13.94
577.08	S	Peak	39.19	-8.05	31.14	46.00	-14.86
766.23	S	Peak	35.24	-4.69	30.55	46.00	-15.45
934.04	S	Peak	33.37	-2.25	31.12	46.00	-14.88
10360.00	H	Peak	18.96	15.17	34.13	74.00	-39.87
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5220 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	47.73	-13.85	33.88	40.00	-6.12
154.16	S	Peak	41.51	-12.30	29.21	43.50	-14.29
366.59	S	Peak	38.14	-11.48	26.66	46.00	-19.34
577.08	S	Peak	37.17	-8.05	29.12	46.00	-16.88
800.18	S	Peak	33.20	-4.19	29.01	46.00	-16.99
995.15	S	Peak	31.31	-1.87	29.44	54.00	-24.56
10440.00	H	Peak	19.16	14.92	34.08	74.00	-39.92
15660.00	H	---					
20880.00	H	---					
26100.00	H	---					
31320.00	H	---					
36540.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5220 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	42.28	-14.78	27.50	43.50	-16.00
239.52	S	Peak	42.54	-14.21	28.33	46.00	-17.67
288.02	S	Peak	43.23	-12.86	30.37	46.00	-15.63
366.59	S	Peak	43.02	-11.48	31.54	46.00	-14.46
799.21	S	Peak	37.20	-4.21	32.99	46.00	-13.01
934.04	S	Peak	32.44	-2.25	30.19	46.00	-15.81
10440.00	H	Peak	19.10	15.00	34.10	74.00	-39.90
15660.00	H	---					
20880.00	H	---					
26100.00	H	---					
31320.00	H	---					
36540.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5240 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	47.19	-13.85	33.34	40.00	-6.66
153.19	S	Peak	41.08	-12.32	28.76	43.50	-14.74
366.59	S	Peak	37.98	-11.48	26.50	46.00	-19.50
577.08	S	Peak	37.34	-8.05	29.29	46.00	-16.71
763.32	S	Peak	33.06	-4.74	28.32	46.00	-17.68
966.05	S	Peak	31.77	-2.03	29.74	54.00	-24.26
10480.00	H	Peak	18.14	14.83	32.97	74.00	-41.03
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5240 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	42.39	-14.78	27.61	43.50	-15.89
288.02	S	Peak	43.39	-12.86	30.53	46.00	-15.47
364.65	S	Peak	43.08	-11.50	31.58	46.00	-14.42
577.08	S	Peak	39.32	-8.05	31.27	46.00	-14.73
699.30	S	Peak	36.47	-5.76	30.71	46.00	-15.29
797.27	S	Peak	36.71	-4.24	32.47	46.00	-13.53
10480.00	H	Peak	18.56	14.92	33.48	74.00	-40.52
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band :802.11n20M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5180 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.94	7.37	47.31	54.00	-6.69
5150.00	E	Peak	52.51	7.37	59.88	74.00	-14.12

Operation Band :802.11n20M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5180 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.53	7.47	47.00	54.00	-7.00
5150.00	E	Peak	51.88	7.47	59.35	74.00	-14.65

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# **Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz (Internal Antenna)**

Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	47.16	-13.85	33.31	40.00	-6.69
153.19	S	Peak	39.35	-12.32	27.03	43.50	-16.47
366.59	S	Peak	38.28	-11.48	26.80	46.00	-19.20
577.08	S	Peak	36.91	-8.05	28.86	46.00	-17.14
766.23	S	Peak	32.24	-4.69	27.55	46.00	-18.45
966.05	S	Peak	32.49	-2.03	30.46	54.00	-23.54
10380.00	H	Peak	18.66	15.15	33.81	74.00	-40.19
15570.00	H	---					
20760.00	H	---					
25950.00	H	---					
31140.00	H	---					
36330.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
240.49	S	Peak	43.32	-14.19	29.13	46.00	-16.87
288.02	S	Peak	43.19	-12.86	30.33	46.00	-15.67
364.65	S	Peak	42.97	-11.50	31.47	46.00	-14.53
633.34	S	Peak	35.01	-6.89	28.12	46.00	-17.88
800.18	S	Peak	35.19	-4.19	31.00	46.00	-15.00
934.04	S	Peak	32.17	-2.25	29.92	46.00	-16.08
10380.00	H	Peak	18.40	15.20	33.60	74.00	-40.40
15570.00	H	---					
20760.00	H	---					
25950.00	H	---					
31140.00	H	---					
36330.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5230 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	47.12	-13.85	33.27	40.00	-6.73
154.16	S	Peak	38.66	-12.30	26.36	43.50	-17.14
288.02	S	Peak	35.58	-12.86	22.72	46.00	-23.28
366.59	S	Peak	37.74	-11.48	26.26	46.00	-19.74
672.14	S	Peak	33.42	-6.16	27.26	46.00	-18.74
966.05	S	Peak	31.28	-2.03	29.25	54.00	-24.75
10460.00	H	Peak	18.95	14.88	33.83	74.00	-40.17
15690.00	H	---					
20920.00	H	---					
26150.00	H	---					
31380.00	H	---					
36610.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5230 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
239.52	S	Peak	43.55	-14.21	29.34	46.00	-16.66
366.59	S	Peak	42.33	-11.48	30.85	46.00	-15.15
431.58	S	Peak	33.80	-10.40	23.40	46.00	-22.60
699.30	S	Peak	34.10	-5.76	28.34	46.00	-17.66
799.21	S	Peak	35.24	-4.21	31.03	46.00	-14.97
934.04	S	Peak	33.95	-2.25	31.70	46.00	-14.30
10460.00	H	Peak	18.58	14.96	33.54	74.00	-40.46
15690.00	H	---					
20920.00	H	---					
26150.00	H	---					
31380.00	H	---					
36610.00	H	---					

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Operation Band	:802.11n40M (MIMO)	Test Date	:2012-11-09
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	41.60	7.37	48.97	54.00	-5.03
5150.00	E	Peak	53.46	7.37	60.83	74.00	-13.17

Operation Band	:802.11n40M (MIMO)	Test Date	:2012-11-09
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	39.44	7.47	46.91	54.00	-7.09
5150.00	E	Peak	51.95	7.47	59.42	74.00	-14.58

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**Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz (Internal Antenna)**

Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5260 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	49.26	-13.85	35.41	40.00	-4.59
153.19	S	Peak	44.80	-12.32	32.48	43.50	-11.02
274.44	S	Peak	42.61	-13.21	29.40	46.00	-16.60
577.08	S	Peak	36.87	-8.05	28.82	46.00	-17.18
766.23	S	Peak	32.33	-4.69	27.64	46.00	-18.36
995.15	S	Peak	32.23	-1.87	30.36	54.00	-23.64
10520.00	H	Peak	18.71	14.69	33.40	74.00	-40.60
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5260 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
183.26	S	Peak	47.86	-14.89	32.97	43.50	-10.53
273.47	S	Peak	46.85	-13.25	33.60	46.00	-12.40
366.59	S	Peak	43.32	-11.48	31.84	46.00	-14.16
577.08	S	Peak	39.53	-8.05	31.48	46.00	-14.52
799.21	S	Peak	38.91	-4.21	34.70	46.00	-11.30
966.05	S	Peak	31.29	-2.03	29.26	54.00	-24.74
10520.00	H	Peak	17.95	14.78	32.73	74.00	-41.27
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5300 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	49.04	-13.85	35.19	40.00	-4.81
153.19	S	Peak	45.50	-12.32	33.18	43.50	-10.32
271.53	S	Peak	43.21	-13.32	29.89	46.00	-16.11
577.08	S	Peak	37.00	-8.05	28.95	46.00	-17.05
696.39	S	Peak	33.93	-5.79	28.14	46.00	-17.86
966.05	S	Peak	31.34	-2.03	29.31	54.00	-24.69
10600.00	H	Peak	17.93	15.33	33.26	74.00	-40.74
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5300 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
183.26	S	Peak	47.76	-14.89	32.87	43.50	-10.63
272.50	S	Peak	47.41	-13.28	34.13	46.00	-11.87
366.59	S	Peak	43.48	-11.48	32.00	46.00	-14.00
699.30	S	Peak	35.18	-5.76	29.42	46.00	-16.58
796.30	S	Peak	36.17	-4.24	31.93	46.00	-14.07
962.17	S	Peak	32.09	-2.05	30.04	54.00	-23.96
10600.00	H	Peak	17.66	15.35	33.01	74.00	-40.99
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	49.27	-13.85	35.42	40.00	-4.58
152.22	S	Peak	45.44	-12.32	33.12	43.50	-10.38
271.53	S	Peak	43.68	-13.32	30.36	46.00	-15.64
566.41	S	Peak	36.08	-8.25	27.83	46.00	-18.17
796.30	S	Peak	33.37	-4.24	29.13	46.00	-16.87
995.15	S	Peak	32.30	-1.87	30.43	54.00	-23.57
10640.00	H	Peak	18.68	15.72	34.40	74.00	-39.60
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	48.23	-14.78	33.45	43.50	-10.05
273.47	S	Peak	47.76	-13.25	34.51	46.00	-11.49
366.59	S	Peak	42.81	-11.48	31.33	46.00	-14.67
699.30	S	Peak	35.97	-5.76	30.21	46.00	-15.79
799.21	S	Peak	37.26	-4.21	33.05	46.00	-12.95
934.04	S	Peak	31.62	-2.25	29.37	46.00	-16.63
10640.00	H	Peak	17.83	15.71	33.54	74.00	-40.46
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11a (MIMO)	Test Date	:2012-11-09
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	41.20	8.02	49.22	54.00	-4.78
5350.00	E	Peak	50.98	8.02	59.00	74.00	-15.00

Operation Band	:802.11a (MIMO)	Test Date	:2012-11-09
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	39.88	8.32	48.20	54.00	-5.80
5350.00	E	Peak	50.98	8.32	59.30	74.00	-14.70

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**Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz****(External Antenna (MIMO))**

Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5260 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	46.82	-13.85	32.97	40.00	-7.03
153.19	S	Peak	40.66	-12.32	28.34	43.50	-15.16
366.59	S	Peak	37.93	-11.48	26.45	46.00	-19.55
577.08	S	Peak	37.27	-8.05	29.22	46.00	-16.78
672.14	S	Peak	34.99	-6.16	28.83	46.00	-17.17
797.27	S	Peak	34.54	-4.24	30.30	46.00	-15.70
10520.00	H	Peak	18.58	14.69	33.27	74.00	-40.73
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5260 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	43.18	-14.78	28.40	43.50	-15.10
288.02	S	Peak	43.54	-12.86	30.68	46.00	-15.32
366.59	S	Peak	43.87	-11.48	32.39	46.00	-13.61
577.08	S	Peak	39.16	-8.05	31.11	46.00	-14.89
796.30	S	Peak	36.41	-4.24	32.17	46.00	-13.83
934.04	S	Peak	31.91	-2.25	29.66	46.00	-16.34
10520.00	H	Peak	18.65	14.78	33.43	74.00	-40.57
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5300 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	46.87	-13.85	33.02	40.00	-6.98
95.96	S	Peak	46.39	-17.13	29.26	43.50	-14.24
366.59	S	Peak	37.78	-11.48	26.30	46.00	-19.70
577.08	S	Peak	37.38	-8.05	29.33	46.00	-16.67
795.33	S	Peak	32.59	-4.26	28.33	46.00	-17.67
962.17	S	Peak	30.96	-2.05	28.91	54.00	-25.09
10600.00	H	Peak	19.14	15.33	34.47	74.00	-39.53
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5300 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	43.13	-14.78	28.35	43.50	-15.15
288.02	S	Peak	43.58	-12.86	30.72	46.00	-15.28
366.59	S	Peak	43.11	-11.48	31.63	46.00	-14.37
577.08	S	Peak	39.65	-8.05	31.60	46.00	-14.40
672.14	S	Peak	36.44	-6.16	30.28	46.00	-15.72
897.18	S	Peak	33.20	-2.87	30.33	46.00	-15.67
10600.00	H	Peak	19.15	15.35	34.50	74.00	-39.50
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	47.24	-13.85	33.39	40.00	-6.61
95.96	S	Peak	46.44	-17.13	29.31	43.50	-14.19
366.59	S	Peak	37.90	-11.48	26.42	46.00	-19.58
564.47	S	Peak	37.10	-8.28	28.82	46.00	-17.18
799.21	S	Peak	32.03	-4.21	27.82	46.00	-18.18
995.15	S	Peak	31.14	-1.87	29.27	54.00	-24.73
10640.00	H	Peak	17.71	15.72	33.43	74.00	-40.57
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	42.45	-14.78	27.67	43.50	-15.83
288.02	S	Peak	43.44	-12.86	30.58	46.00	-15.42
366.59	S	Peak	43.21	-11.48	31.73	46.00	-14.27
577.08	S	Peak	38.57	-8.05	30.52	46.00	-15.48
766.23	S	Peak	35.24	-4.69	30.55	46.00	-15.45
897.18	S	Peak	32.45	-2.87	29.58	46.00	-16.42
10640.00	H	Peak	19.28	15.71	34.99	74.00	-39.01
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band :802.11n20M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5320 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	41.65	8.02	49.67	54.00	-4.33
5350.00	E	Peak	53.98	8.02	62.00	74.00	-12.00

Operation Band :802.11n20M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5320 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	39.88	8.32	48.20	54.00	-5.80
5350.00	E	Peak	52.07	8.32	60.39	74.00	-13.61

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## Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz

### (External Antenna (MIMO))

Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5270 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
47.46	S	Peak	47.37	-13.85	33.52	40.00	-6.48
154.16	S	Peak	39.00	-12.30	26.70	43.50	-16.80
366.59	S	Peak	38.11	-11.48	26.63	46.00	-19.37
577.08	S	Peak	37.11	-8.05	29.06	46.00	-16.94
796.30	S	Peak	35.67	-4.24	31.43	46.00	-14.57
995.15	S	Peak	31.43	-1.87	29.56	54.00	-24.44
10540.00	H	Peak	18.56	14.83	33.39	74.00	-40.61
15810.00	H	---					
21080.00	H	---					
26350.00	H	---					
31620.00	H	---					
36890.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5270 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
239.52	S	Peak	43.66	-14.21	29.45	46.00	-16.55
288.02	S	Peak	43.00	-12.86	30.14	46.00	-15.86
364.65	S	Peak	42.98	-11.50	31.48	46.00	-14.52
577.08	S	Peak	37.95	-8.05	29.90	46.00	-16.10
799.21	S	Peak	38.71	-4.21	34.50	46.00	-11.50
962.17	S	Peak	31.94	-2.05	29.89	54.00	-24.11
10540.00	H	Peak	18.47	14.90	33.37	74.00	-40.63
15810.00	H	---					
21080.00	H	---					
26350.00	H	---					
31620.00	H	---					
36890.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5310 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	47.39	-13.85	33.54	40.00	-6.46
95.96	S	Peak	45.42	-17.13	28.29	43.50	-15.21
366.59	S	Peak	38.43	-11.48	26.95	46.00	-19.05
577.08	S	Peak	37.35	-8.05	29.30	46.00	-16.70
798.24	S	Peak	31.63	-4.22	27.41	46.00	-18.59
995.15	S	Peak	31.33	-1.87	29.46	54.00	-24.54
10620.00	H	Peak	17.59	15.50	33.09	74.00	-40.91
15930.00	H	---					
21240.00	H	---					
26550.00	H	---					
31860.00	H	---					
37170.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5310 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	40.61	-14.78	25.83	43.50	-17.67
288.02	S	Peak	43.18	-12.86	30.32	46.00	-15.68
366.59	S	Peak	42.58	-11.48	31.10	46.00	-14.90
577.08	S	Peak	38.02	-8.05	29.97	46.00	-16.03
799.21	S	Peak	38.93	-4.21	34.72	46.00	-11.28
962.17	S	Peak	31.64	-2.05	29.59	54.00	-24.41
10620.00	H	Peak	17.53	15.51	33.04	74.00	-40.96
15930.00	H	---					
21240.00	H	---					
26550.00	H	---					
31860.00	H	---					
37170.00	H	---					

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Operation Band :802.11n40M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5310 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	43.15	8.02	51.17	54.00	-2.83
5350.00	E	Peak	55.39	8.02	63.41	74.00	-10.59

Operation Band :802.11n40M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5310 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	40.21	8.32	48.53	54.00	-5.47
5350.00	E	Peak	51.91	8.32	60.23	74.00	-13.77

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## Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

### (External Antenna (MIMO))

Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
47.46	S	Peak	48.02	-13.85	34.17	40.00	-5.83
152.22	S	Peak	43.72	-12.32	31.40	43.50	-12.10
271.53	S	Peak	42.39	-13.32	29.07	46.00	-16.93
577.08	S	Peak	37.30	-8.05	29.25	46.00	-16.75
797.27	S	Peak	34.70	-4.24	30.46	46.00	-15.54
966.05	S	Peak	32.04	-2.03	30.01	54.00	-23.99
11000.00	H	Peak	18.63	16.54	35.17	74.00	-38.83
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
182.29	S	Peak	46.79	-14.78	32.01	43.50	-11.49
364.65	S	Peak	42.74	-11.50	31.24	46.00	-14.76
577.08	S	Peak	38.87	-8.05	30.82	46.00	-15.18
796.30	S	Peak	36.04	-4.24	31.80	46.00	-14.20
934.04	S	Peak	33.88	-2.25	31.63	46.00	-14.37
995.15	S	Peak	29.88	-1.87	28.01	54.00	-25.99
11000.00	H	Peak	18.12	16.44	34.56	74.00	-39.44
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5580 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	48.55	-13.85	34.70	40.00	-5.30
152.22	S	Peak	43.30	-12.32	30.98	43.50	-12.52
366.59	S	Peak	37.92	-11.48	26.44	46.00	-19.56
566.41	S	Peak	35.77	-8.25	27.52	46.00	-18.48
672.14	S	Peak	33.94	-6.16	27.78	46.00	-18.22
995.15	S	Peak	32.03	-1.87	30.16	54.00	-23.84
11160.00	H	Peak	18.06	16.93	34.99	74.00	-39.01
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5580 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
184.23	S	Peak	44.98	-15.00	29.98	43.50	-13.52
288.02	S	Peak	43.86	-12.86	31.00	46.00	-15.00
364.65	S	Peak	43.46	-11.50	31.96	46.00	-14.04
577.08	S	Peak	39.39	-8.05	31.34	46.00	-14.66
797.27	S	Peak	37.97	-4.24	33.73	46.00	-12.27
934.04	S	Peak	32.51	-2.25	30.26	46.00	-15.74
11160.00	H	Peak	18.69	16.70	35.39	74.00	-38.61
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	48.74	-13.85	34.89	40.00	-5.11
155.13	S	Peak	42.17	-12.30	29.87	43.50	-13.63
366.59	S	Peak	38.09	-11.48	26.61	46.00	-19.39
564.47	S	Peak	35.39	-8.28	27.11	46.00	-18.89
763.32	S	Peak	32.60	-4.74	27.86	46.00	-18.14
966.05	S	Peak	30.76	-2.03	28.73	54.00	-25.27
11400.00	H	Peak	18.62	17.30	35.92	74.00	-38.08
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11a	Test Date	:2012-10-27
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
183.26	S	Peak	42.75	-14.89	27.86	43.50	-15.64
288.02	S	Peak	43.18	-12.86	30.32	46.00	-15.68
366.59	S	Peak	43.89	-11.48	32.41	46.00	-13.59
577.08	S	Peak	38.97	-8.05	30.92	46.00	-15.08
697.36	S	Peak	36.31	-5.78	30.53	46.00	-15.47
796.30	S	Peak	35.21	-4.24	30.97	46.00	-15.03
11400.00	H	Peak	18.59	17.06	35.65	74.00	-38.35
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11a (MIMO)	Test Date	:2012-11-09
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	40.66	7.77	48.43	54.00	-5.57
5460.00	E	Peak	53.24	7.77	61.01	74.00	-12.99

Operation Band	:802.11a (MIMO)	Test Date	:2012-11-09
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX BANDEDGE	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	39.79	8.07	47.86	54.00	-6.14
5460.00	E	Peak	52.74	8.07	60.81	74.00	-13.19

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## Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

### (External Antenna (MIMO))

Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV			dBμV/m	dBμV/m	
47.46	S	Peak	47.09	-13.85	33.24	40.00	-6.76
152.22	S	Peak	38.89	-12.32	26.57	43.50	-16.93
366.59	S	Peak	38.28	-11.48	26.80	46.00	-19.20
577.08	S	Peak	37.33	-8.05	29.28	46.00	-16.72
699.30	S	Peak	33.39	-5.76	27.63	46.00	-18.37
966.05	S	Peak	31.83	-2.03	29.80	54.00	-24.20
11000.00	H	Peak	17.53	16.54	34.07	74.00	-39.93
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
240.49	S	Peak	42.41	-14.19	28.22	46.00	-17.78
366.59	S	Peak	42.92	-11.48	31.44	46.00	-14.56
577.08	S	Peak	37.66	-8.05	29.61	46.00	-16.39
699.30	S	Peak	35.23	-5.76	29.47	46.00	-16.53
766.23	S	Peak	35.50	-4.69	30.81	46.00	-15.19
897.18	S	Peak	33.59	-2.87	30.72	46.00	-15.28
11000.00	H	Peak	18.38	16.44	34.82	74.00	-39.18
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5580 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	47.00	-13.85	33.15	40.00	-6.85
154.16	S	Peak	39.15	-12.30	26.85	43.50	-16.65
366.59	S	Peak	37.96	-11.48	26.48	46.00	-19.52
577.08	S	Peak	37.58	-8.05	29.53	46.00	-16.47
796.30	S	Peak	31.90	-4.24	27.66	46.00	-18.34
995.15	S	Peak	32.39	-1.87	30.52	54.00	-23.48
11160.00	H	Peak	18.54	16.93	35.47	74.00	-38.53
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5580 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
239.52	S	Peak	42.58	-14.21	28.37	46.00	-17.63
288.02	S	Peak	43.23	-12.86	30.37	46.00	-15.63
366.59	S	Peak	42.61	-11.48	31.13	46.00	-14.87
577.08	S	Peak	37.80	-8.05	29.75	46.00	-16.25
763.32	S	Peak	34.25	-4.74	29.51	46.00	-16.49
962.17	S	Peak	32.16	-2.05	30.11	54.00	-23.89
11160.00	H	Peak	17.64	16.70	34.34	74.00	-39.66
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
47.46	S	Peak	46.94	-13.85	33.09	40.00	-6.91
95.96	S	Peak	46.04	-17.13	28.91	43.50	-14.59
191.99	S	Peak	41.88	-15.76	26.12	43.50	-17.38
366.59	S	Peak	38.32	-11.48	26.84	46.00	-19.16
577.08	S	Peak	36.91	-8.05	28.86	46.00	-17.14
995.15	S	Peak	31.53	-1.87	29.66	54.00	-24.34
11400.00	H	Peak	18.93	17.30	36.23	74.00	-37.77
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11n20M	Test Date	:2012-10-27
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
239.52	S	Peak	42.73	-14.21	28.52	46.00	-17.48
288.02	S	Peak	43.31	-12.86	30.45	46.00	-15.55
364.65	S	Peak	42.58	-11.50	31.08	46.00	-14.92
577.08	S	Peak	37.59	-8.05	29.54	46.00	-16.46
696.39	S	Peak	34.81	-5.79	29.02	46.00	-16.98
934.04	S	Peak	32.91	-2.25	30.66	46.00	-15.34
11400.00	H	Peak	18.04	17.06	35.10	74.00	-38.90
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band :802.11n20M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5500 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	41.31	7.77	49.08	54.00	-4.92
5460.00	E	Peak	54.06	7.77	61.83	74.00	-12.17

Operation Band :802.11n20M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5500 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	39.49	8.07	47.56	54.00	-6.44
5460.00	E	Peak	52.47	8.07	60.54	74.00	-13.46

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## Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

### (External Antenna (MIMO))

Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
31.94	S	Peak	49.21	-14.30	34.91	40.00	-5.09
95.96	S	Peak	45.66	-17.13	28.53	43.50	-14.97
364.65	S	Peak	38.22	-11.50	26.72	46.00	-19.28
577.08	S	Peak	37.92	-8.05	29.87	46.00	-16.13
766.23	S	Peak	33.11	-4.69	28.42	46.00	-17.58
995.15	S	Peak	31.69	-1.87	29.82	54.00	-24.18
11020.00	H	Peak	17.90	16.58	34.48	74.00	-39.52
16530.00	H	---					
22040.00	H	---					
27550.00	H	---					
33060.00	H	---					
38570.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
239.52	S	Peak	42.48	-14.21	28.27	46.00	-17.73
288.02	S	Peak	43.36	-12.86	30.50	46.00	-15.50
366.59	S	Peak	43.41	-11.48	31.93	46.00	-14.07
577.08	S	Peak	37.37	-8.05	29.32	46.00	-16.68
796.30	S	Peak	36.47	-4.24	32.23	46.00	-13.77
962.17	S	Peak	31.82	-2.05	29.77	54.00	-24.23
11020.00	H	Peak	17.72	16.46	34.18	74.00	-39.82
16530.00	H	---					
22040.00	H	---					
27550.00	H	---					
33060.00	H	---					
38570.00	H	---					

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Operation Band	: 802.11n40M	Test Date	:2013-04-18
Fundamental Frequency	:5550 MHz	Temp./Humi.	:25.deg_C/60RH
Operation Mode	:TX LOW	Engineer	:Aken
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
49.22	S	Peak	48.02	-13.85	34.17	40.00	-5.83
155.87	S	Peak	43.72	-12.32	31.40	43.50	-12.10
272.85	S	Peak	42.39	-13.32	29.07	46.00	-16.93
578.12	S	Peak	37.30	-8.05	29.25	46.00	-16.75
799.77	S	Peak	34.70	-4.24	30.46	46.00	-15.54
966.08	S	Peak	32.04	-2.03	30.01	54.00	-23.99
11100.00	H	Peak	18.53	16.48	34.91	74.00	-39.09
16650.00	H	---					
22200.00	H	---					
27750.00	H	---					
33300.00	H	---					
38850.00	H	---					

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Operation Band	: 802.11n40M	Test Date	:2013-04-18
Fundamental Frequency	:5550 MHz	Temp./Humi.	:25.deg_C/60RH
Operation Mode	:TX LOW	Engineer	:Aken
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
185.54	S	Peak	45.47	-14.19	31.28	46.00	-14.72
366.23	S	Peak	42.92	-11.48	31.44	46.00	-14.56
578.11	S	Peak	37.66	-8.05	29.61	46.00	-16.39
798.50	S	Peak	36.45	-4.24	32.21	46.00	-13.79
936.00	S	Peak	33.88	-2.25	31.63	46.00	-14.37
994.23	S	Peak	29.88	-1.87	28.01	54.00	-25.99
11100.00	H	Peak	18.23	16.38	34.61	74.00	-39.39
16650.00	H	---					
22200.00	H	---					
27750.00	H	---					
33300.00	H	---					
38850.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5670 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
46.49	S	Peak	48.20	-13.80	34.40	40.00	-5.60
95.96	S	Peak	46.50	-17.13	29.37	43.50	-14.13
366.59	S	Peak	38.85	-11.48	27.37	46.00	-18.63
577.08	S	Peak	37.22	-8.05	29.17	46.00	-16.83
696.39	S	Peak	34.05	-5.79	28.26	46.00	-17.74
966.05	S	Peak	31.91	-2.03	29.88	54.00	-24.12
11340.00	H	Peak	18.25	17.24	35.49	74.00	-38.51
17010.00	H	---					
22680.00	H	---					
28350.00	H	---					
34020.00	H	---					
39690.00	H	---					

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Operation Band	:802.11n40M	Test Date	:2012-10-27
Fundamental Frequency	:5670 MHz	Temp./Humi.	:25.1deg_C/64RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
240.49	S	Peak	42.27	-14.19	28.08	46.00	-17.92
288.02	S	Peak	43.22	-12.86	30.36	46.00	-15.64
366.59	S	Peak	42.72	-11.48	31.24	46.00	-14.76
577.08	S	Peak	37.33	-8.05	29.28	46.00	-16.72
696.39	S	Peak	35.32	-5.79	29.53	46.00	-16.47
934.04	S	Peak	31.64	-2.25	29.39	46.00	-16.61
11340.00	H	Peak	17.88	16.98	34.86	74.00	-39.14
17010.00	H	---					
22680.00	H	---					
28350.00	H	---					
34020.00	H	---					
39690.00	H	---					

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Operation Band :802.11n40M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5510 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	41.16	7.77	48.93	54.00	-5.07
5460.00	E	Peak	52.70	7.77	60.47	74.00	-13.53

Operation Band :802.11n40M (MIMO) Test Date :2012-11-09  
Fundamental Frequency :5510 MHz Temp./Humi. :25.1deg\_C/64RH  
Operation Mode :TX BANDEDGE Engineer :Marcus  
EUT Pol. :H Plan Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	39.82	8.07	47.89	54.00	-6.11
5460.00	E	Peak	52.16	8.07	60.23	74.00	-13.77

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## 13. TRANSMISSION IN THE ABSENCE OF DATA

### 13.1 Standard Applicable

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

According to RSS-210 A9.4(4)

The device shall automatically discontinue transmission in case of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

### 13.2 Result:

No non-compliance noted:

Refer to the theory of operation.

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## 14. FREQUENCY STABILITY

### 14.1 Standard Applicable

According to §15.407 (g) 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.

According to A9.5

(5) The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.

### 14.2 Result:

Refer to next page for plots.

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Operation Mode	802.11 a	Test Date	2012,12,2
Temperature	:25	Test By	Marcus
Humidity	:62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	Frequency (MHz)
25 °C	AC 110V	36	5180.0000	5,179.965000	0.0350
		44	5220.0000	5,219.970000	0.0300
		48	5240.0000	5,239.980000	0.0200
		52	5260.0000	5,259.985000	0.0150
		60	5300.0000	5,299.970000	0.0300
		64	5320.0000	5,319.980000	0.0200
		100	5500.0000	5,499.980000	0.0200
		116	5580.0000	5,579.980000	0.0200
		140	5700.0000	5,699.985000	0.0150
55 °C	AC 110V	36	5180.0000	5,179.965000	0.0350
		44	5220.0000	5,219.975000	0.0250
		48	5240.0000	5,239.985000	0.0150
		52	5260.0000	5,259.985000	0.0150
		60	5300.0000	5,299.970000	0.0300
		64	5320.0000	5,319.980000	0.0200
		100	5500.0000	5,499.975000	0.0250
		116	5580.0000	5,579.980000	0.0200
		140	5700.0000	5,699.985000	0.0150
-20 °C	AC 110V	36	5180.0000	5,179.970000	0.0300
		44	5220.0000	5,219.975000	0.0250
		48	5240.0000	5,239.985000	0.0150
		52	5260.0000	5,259.985000	0.0150
		60	5300.0000	5,299.975000	0.0250
		64	5320.0000	5,319.985000	0.0150
		100	5500.0000	5,499.980000	0.0200
		116	5580.0000	5,579.985000	0.0150
		140	5700.0000	5,699.980000	0.0200

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Operation Mode	802.11n_HT20	Test Date	2012,12,3
Temperature	:25	Test By	Marcus
Humidity	:62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	Frequency (MHz)
25 °C	AC 110V	36	5180.0000	5,180.000000	0.0000
		44	5220.0000	5,220.015000	-0.0150
		48	5240.0000	5,240.010000	-0.0100
		52	5260.0000	5,260.015000	-0.0150
		60	5300.0000	5,300.020000	-0.0200
		64	5320.0000	5,320.030000	-0.0300
		100	5500.0000	5,500.035000	-0.0350
		116	5580.0000	5,580.035000	-0.0350
		140	5700.0000	5,700.035000	-0.0350
55 °C	AC 110V	36	5180.0000	5,180.000000	0.0000
		44	5220.0000	5,220.015000	-0.0150
		48	5240.0000	5,240.010000	-0.0100
		52	5260.0000	5,260.015000	-0.0150
		60	5300.0000	5,300.020000	-0.0200
		64	5320.0000	5,320.030000	-0.0300
		100	5500.0000	5,500.030000	-0.0300
		116	5580.0000	5,580.035000	-0.0350
		140	5700.0000	5,700.035000	-0.0350
-20 °C	AC 110V	36	5180.0000	5,180.000000	0.0000
		44	5220.0000	5,220.010000	-0.0100
		48	5240.0000	5,240.010000	-0.0100
		52	5260.0000	5,260.015000	-0.0150
		60	5300.0000	5,300.020000	-0.0200
		64	5320.0000	5,320.030000	-0.0300
		100	5500.0000	5,500.035000	-0.0350
		116	5580.0000	5,580.030000	-0.0300
		140	5700.0000	5,700.035000	-0.0350

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Operation Mode	802.11 n_HT40	Test Date	2012,12,3
Temperature	:25	Test By	Marcus
Humidity	:62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	Frequency (MHz)
25 °C	AC 110V	38	5190.0000	5,190.030000	-0.0300
		46	5230.0000	5,230.030000	-0.0300
		54	5270.0000	5,270.030000	-0.0300
		62	5310.0000	5,310.030000	-0.0300
		102	5510.0000	5,510.030000	-0.0300
		118	5550.0000	5,550.030000	-0.0300
		134	5670.0000	5,670.030000	-0.0300
55 °C	AC 110V	38	5190.0000	5,190.030000	-0.0300
		46	5230.0000	5,230.030000	-0.0300
		54	5270.0000	5,270.030000	-0.0300
		62	5310.0000	5,310.035000	-0.0350
		102	5510.0000	5,510.030000	-0.0300
		118	5550.0000	5,550.030000	-0.0300
		134	5670.0000	5,670.035000	-0.0350
-20 °C	AC 110V	38	5190.0000	5,190.035000	-0.0350
		46	5230.0000	5,230.030000	-0.0300
		54	5270.0000	5,270.030000	-0.0300
		62	5310.0000	5,310.030000	-0.0300
		102	5510.0000	5,510.035000	-0.0350
		118	5550.0000	5,550.030000	-0.0300
		134	5670.0000	5,670.030000	-0.0300

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## 15. ANTENNA REQUIREMENT

### 15.1 Standard Applicable

According to §15.203, Antenna requirement.

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 of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

### 15.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 5.0dBi and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna specifications for details.

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## 16. TPC and DFS MEASUREMENT

### 16.1 TPC: Standard Applicable

According to §15.407(h)(1), Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

According to RSS 210 A9.2(3), The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

**16.1.1. Result:** N/A, The output power is less than 500mW.

### 16.2 DFS: Standard Applicable

According to §15.407(h)(2), Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection.

According to RSS 210 A9.3), Note: For the band 5600-5650 MHz, no operation is permitted.

Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600-5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band.

Devices operating in the bands 5250-5350 MHz, 5470-5600 MHz and 5650-5725 MHz band shall comply with the following.

(a) Devices shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems (see Note below). The minimum DFS radar signal detection threshold is -62 dBm for devices with a maximum e.i.r.p. less than 200 mW, and -64 dBm for devices with a maximum e.i.r.p. of 200 mW to 1 W. The detection threshold power is the received power, averaged over a 1-microsecond reference to a 0 dBi antenna. The DFS process shall provide a uniform spreading of the load over all the available channels.

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Note: Test procedures for demonstrating compliance with the DFS radar detection requirements set out in this section are being evaluated by Industry Canada. As an interim measure, the Department will, until further notice, accept utilization of the DFS test procedures published by the U.S. Federal Communications Commission (FCC)3 to demonstrate compliance with the requirements of this section.

(b) Operational requirements: the requirement for channel availability check time applies in the master operational mode. The requirement for channel move time applies in both the master and slave operational modes.

(i) In-service monitoring: an LE-LAN device should be able to monitor the operating channel to check that a co-channel radar has not moved or started operation within range of the LE-LAN device. During in-service monitoring, the LE-LAN radar detection function continuously searches for radar signals between normal LE-LAN transmissions.

(ii) Channel availability check time: the device shall check if there is a radar system already operating on the channel before it initiates a transmission on a channel and when it moves to a channel. The device may start using the channel if no radar signal with a power level greater than the interference threshold value specified in A9.3 (a) above is detected within 60 seconds.

(iii) Channel move time: after a radar's signal is detected, the device shall cease all transmissions on the operating channel within 10 seconds. Transmission during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. Intermittent management and control signals may also be sent during the remaining time to facilitate vacating the operating channel.

(iv) Channel closing time: the maximum channel closing time is 260 ms.

(v) Non-occupancy period: a channel that has been flagged as containing a radar signal, either by a channel availability check or in-service monitoring, is subject to a 30-minute non-occupancy period where the channel cannot be used by the LE-LAN device. The non-occupancy period starts from the time that the radar signal is detected.

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### 16.2.1.Limit

**Table 1:Applicability of DFS requirements prior to use of a channel**

Requirement	Operational Mode		
	Master	Client(without radar detection)	Client(with radar detection)
Non-occupancy Period	Yes	Yes	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spareading	Yes	Not required	Not required

**Table 2:Applicability of DFS requirements during normal operation**

Requirement	Operational Mode		
	Master	Client(without radar detection)	Client(with radar detection)
Cannel Closing Transmis- sion time	Yes	Yes	Yes
Channel Move time	Yes	Yes	Yes

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**Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring**

Maximum Transmit Power	Value (see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
<p>Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna</p> <p>Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.</p>	

**Table 4: DFS Response requirement values**

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	Minimum 80% of the 99% power bandwidth See Note 3.
<p>Note 1: The instant that the <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> begins is as follows:</p> <ul style="list-style-type: none"> <li>For the Short pulse radar Test Signals this instant is the end of the <i>Burst</i>.</li> <li>For the Frequency Hopping radar Test Signal, this instant is the end of the last radar <i>Burst</i> generated.</li> <li>For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.</li> </ul> <p>Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate <i>Channel</i> changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.</p> <p>Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.</p>	

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**Table 5: Radar Test Waveforms**

**Short Pulse Radar**

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

**Long Pulse Radar**

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

**Frequency Hopping Radar**

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	.333	300	70%	30

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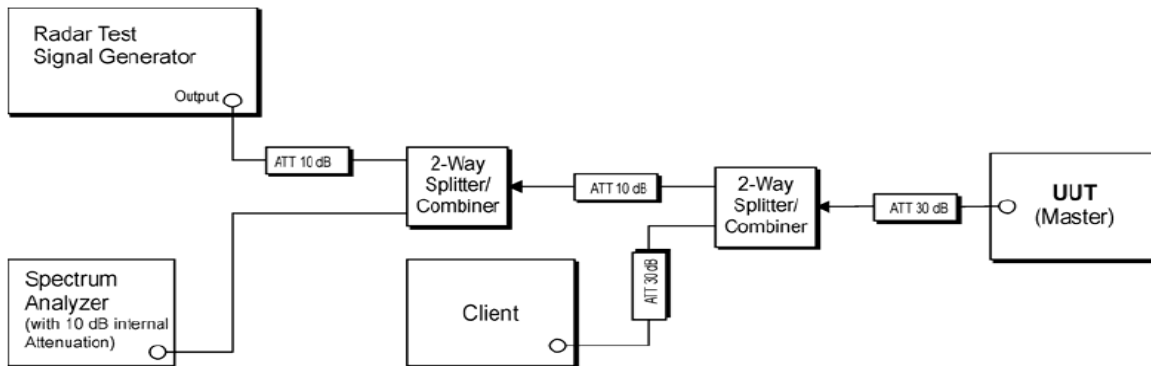
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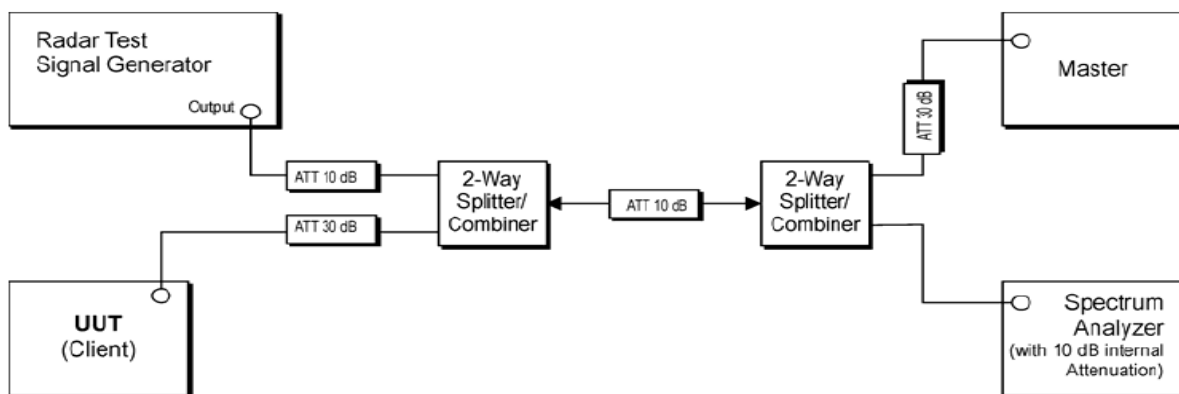


## 16.2.2. Test Setup

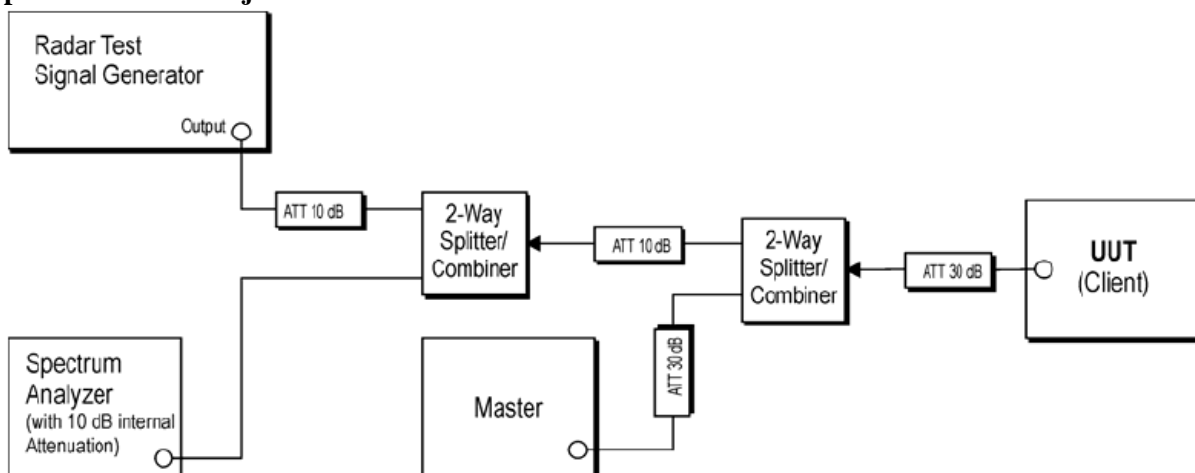
### Setup for Master with injection at the Master



### Setup for Client with injection at the Master



### Setup for Client with injection at the Client



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### 16.2.3. Test Equipment Used:

Refer to section 7.3 for details.

### 16.2.4. Description of EUT :

EUT operates over the 5250-5350MHz and 5470-5725MHz ranges and EUT is a slave device (client equipment) w/o radar detection and DFS capability. EUT has a gain of 5dBi in the 5GHz Band.

The EUT utilizes the 802.11a architecture, with a nominal channel bandwidth of 20MHz  
WLAN traffic is generated by streaming the mpeg file from the master to slave in full monitor video mode using the media player.

The rated output power of the master unit is >23dBm(EIRP).therefore the required interference threshold level is -64dBm.after correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is  $-64+6=-58$ , and the master device as employed for the applicable DFS test is CISCO router whose FCC ID= LDK102061

### 16.2.5. Test results

Refer to next page for plots.

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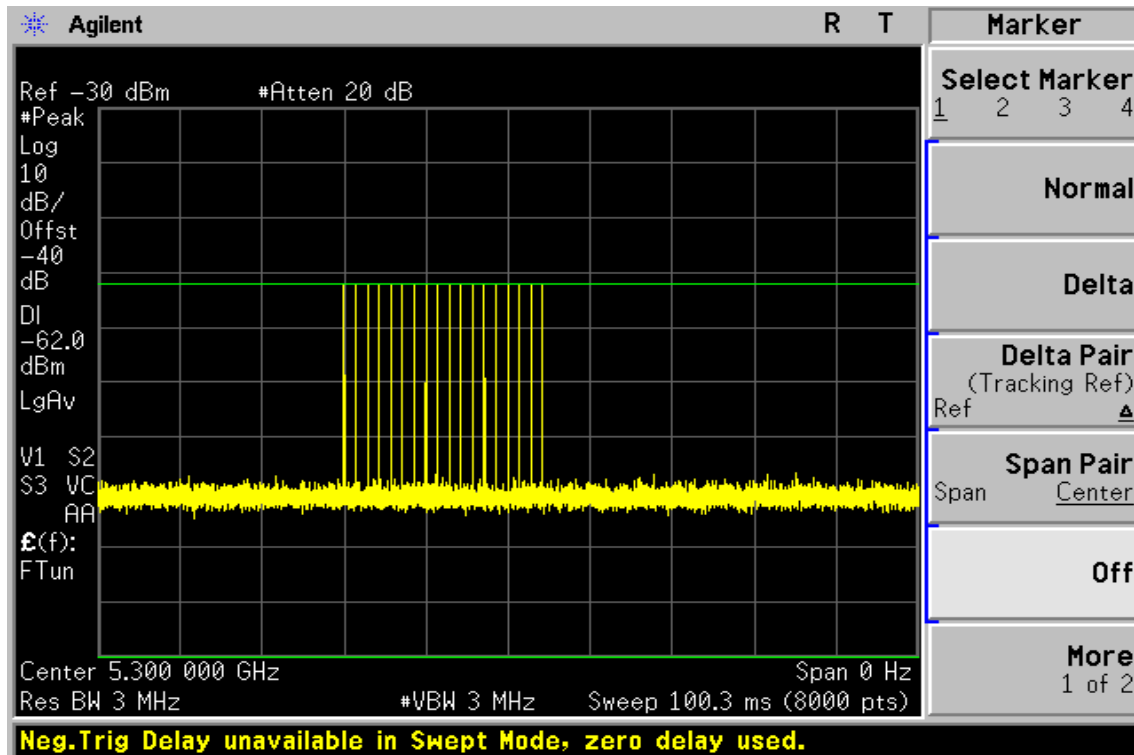
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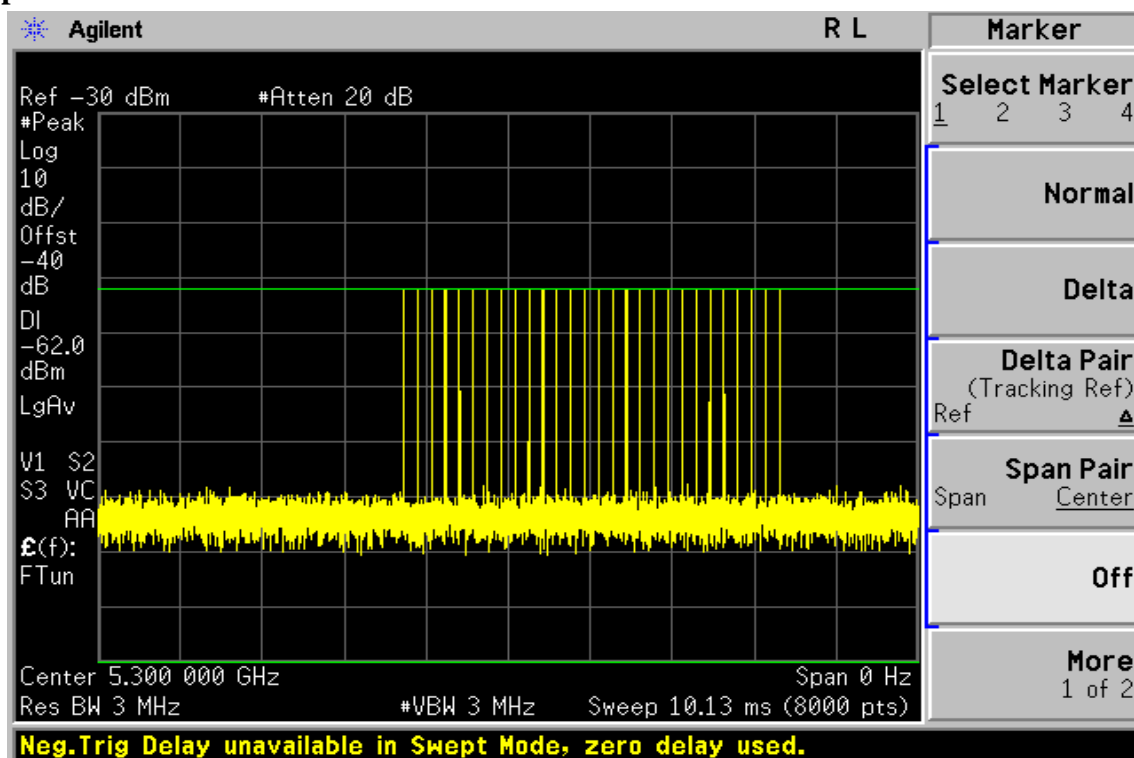
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## Calibration plots for each of the required radar waveforms

### Radar type 1



### Radar type 2



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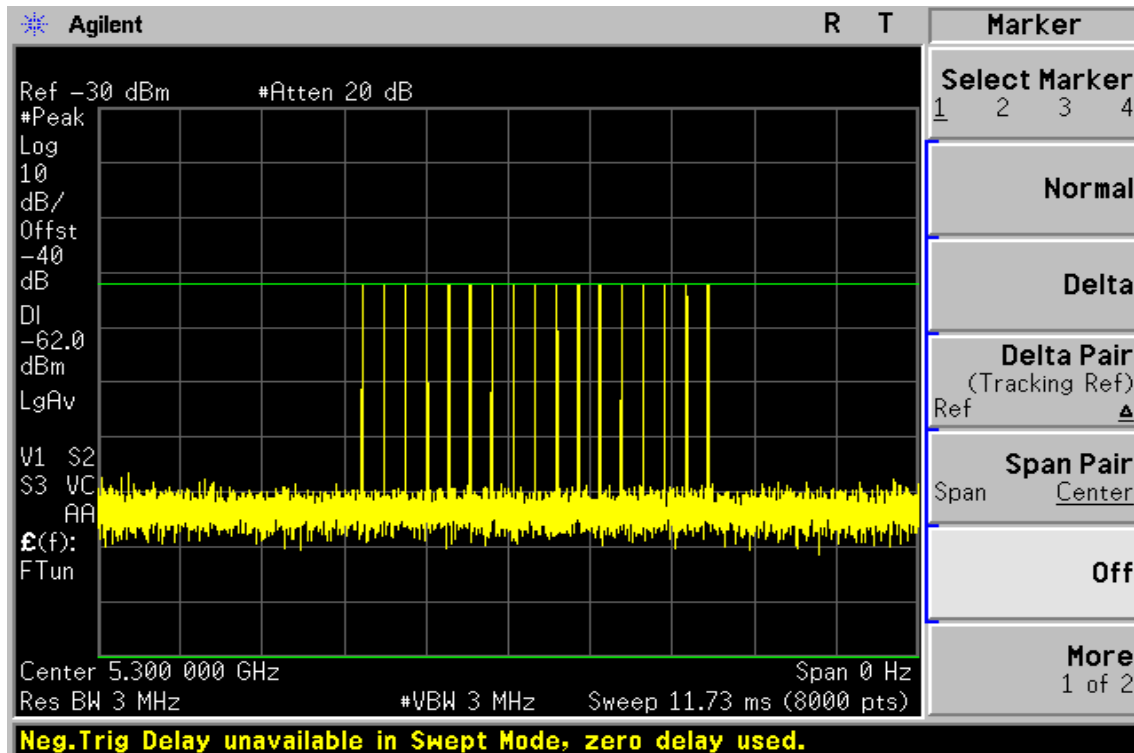
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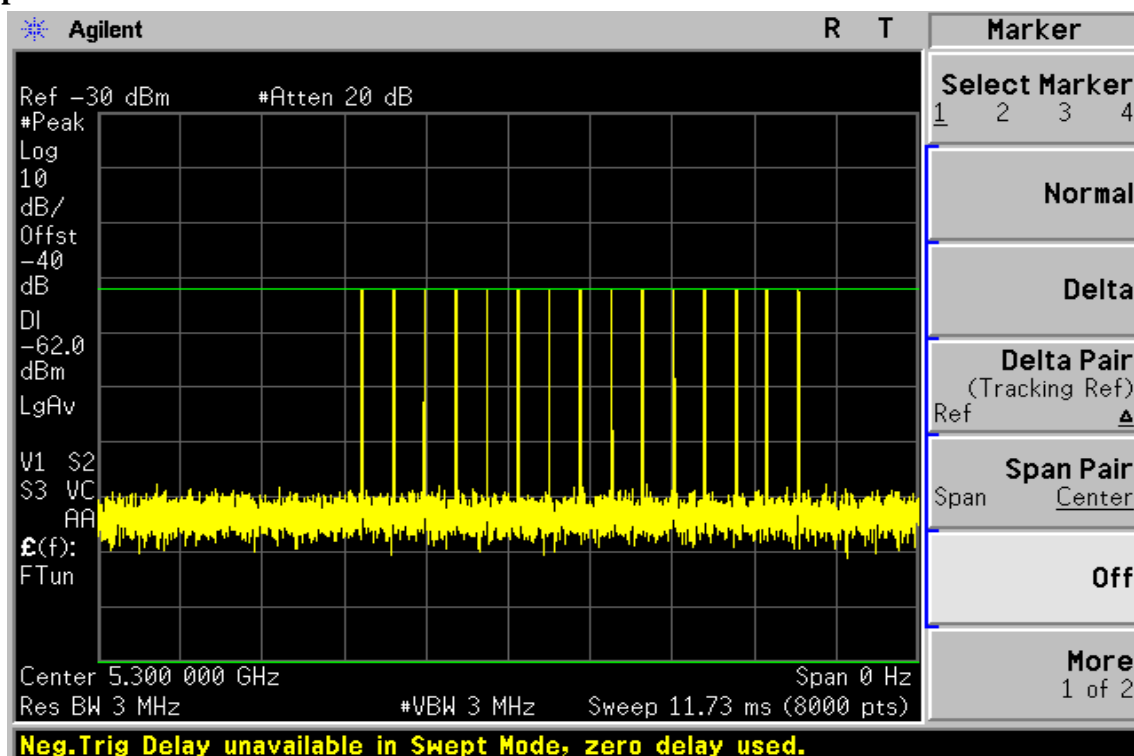
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## Radar type 3



## Radar type 4



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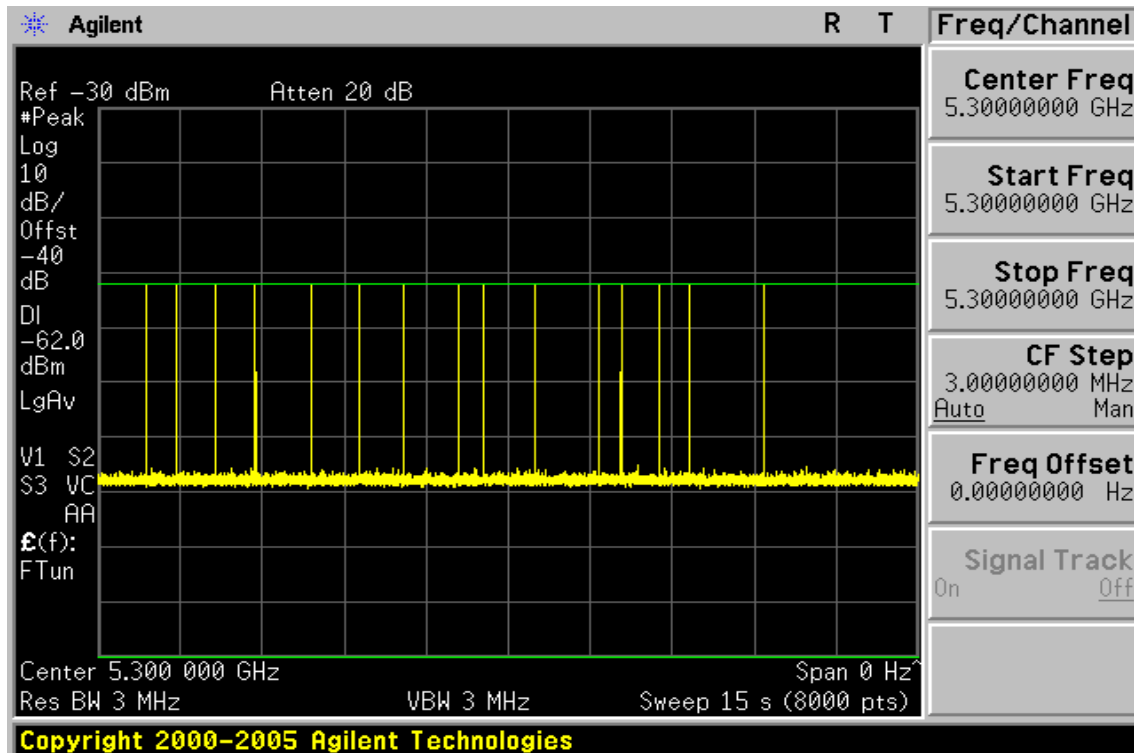
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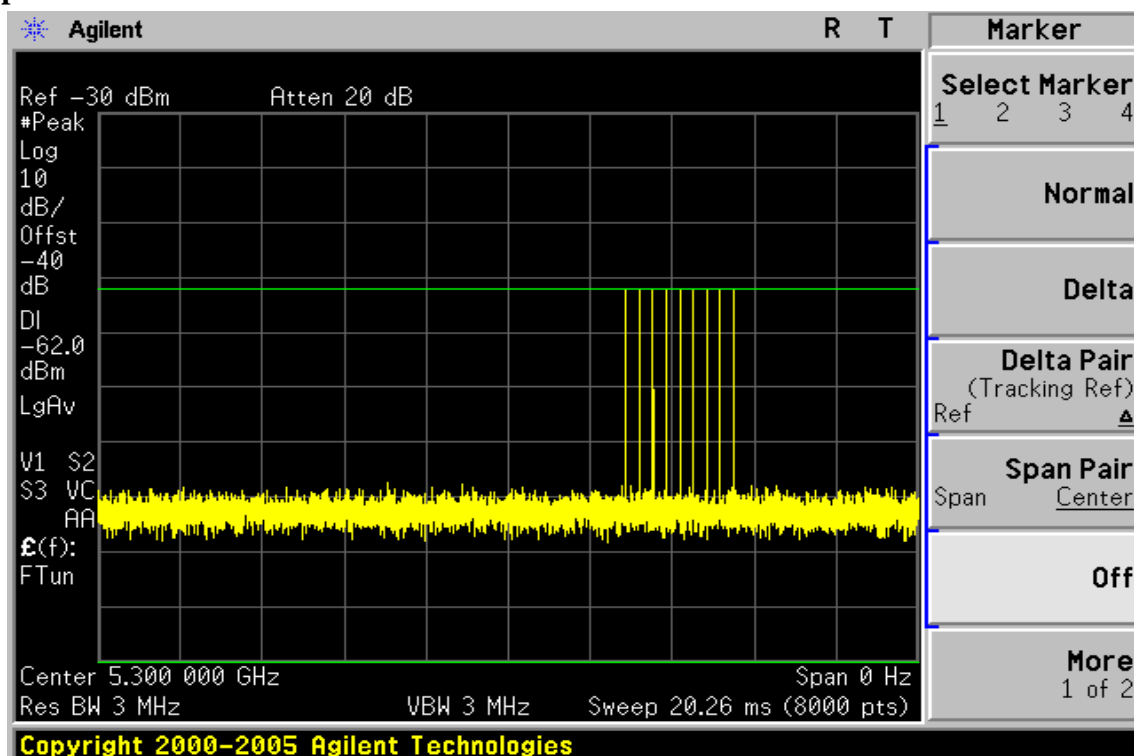
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## Radar type 5



## Radar type 6



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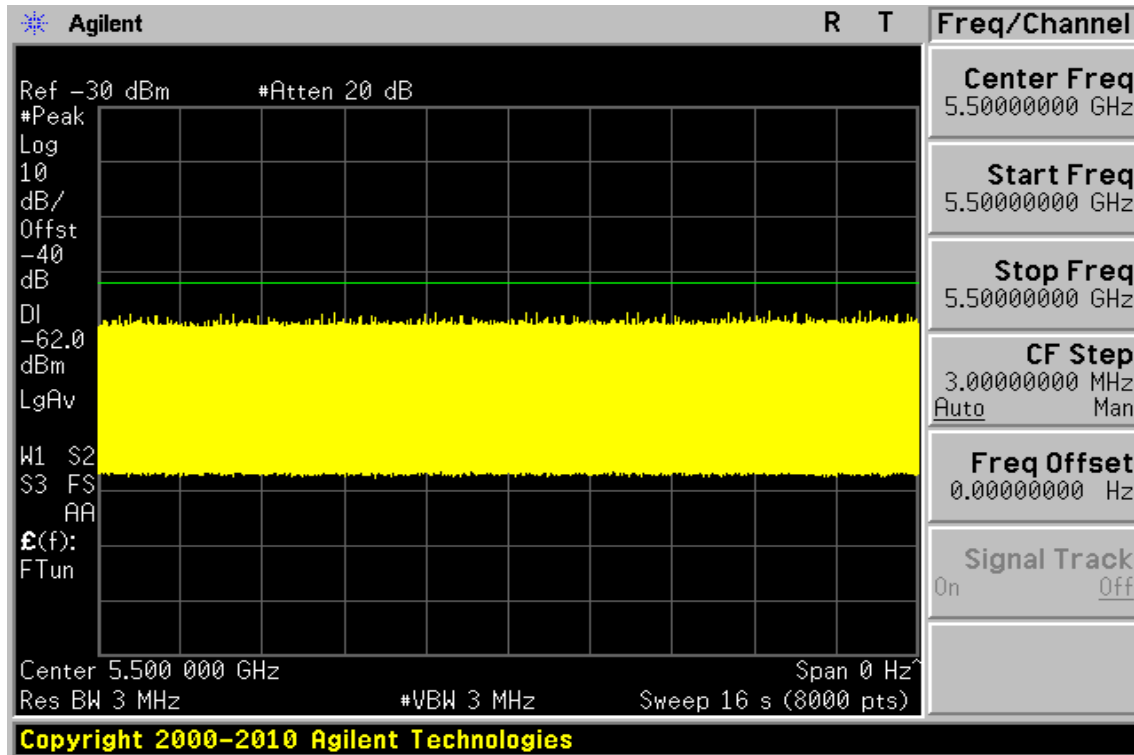
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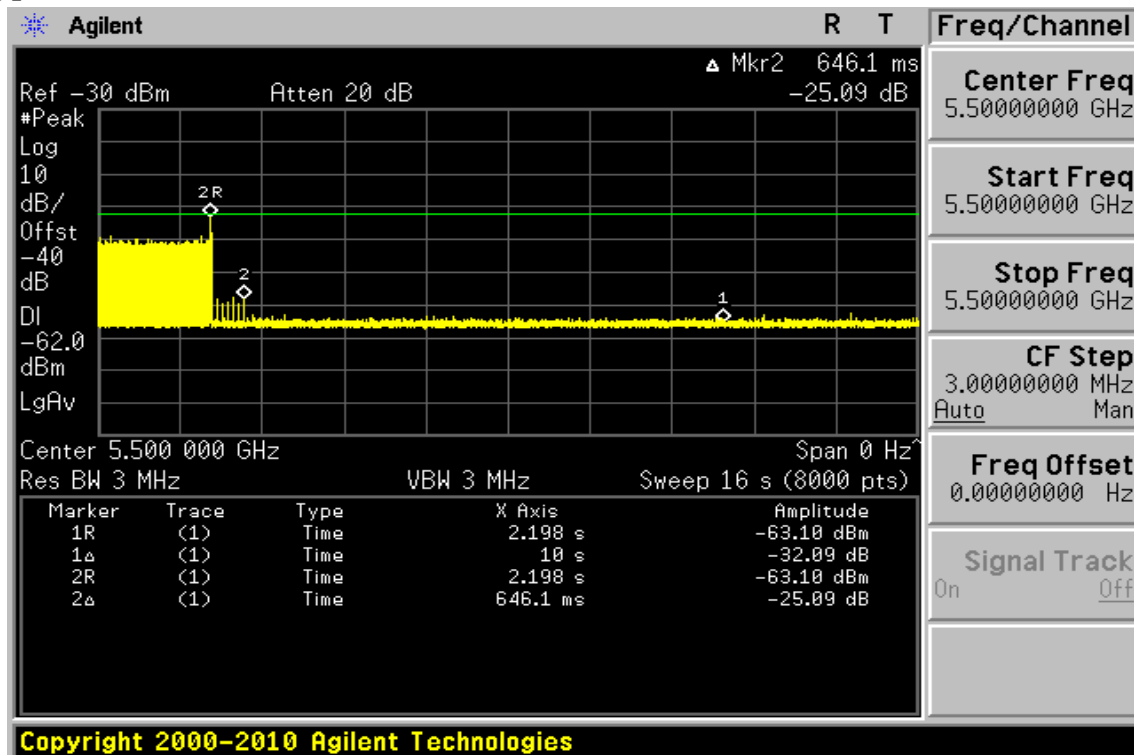
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## WLAN traffic



## Radar Type 1 Channel Move Time



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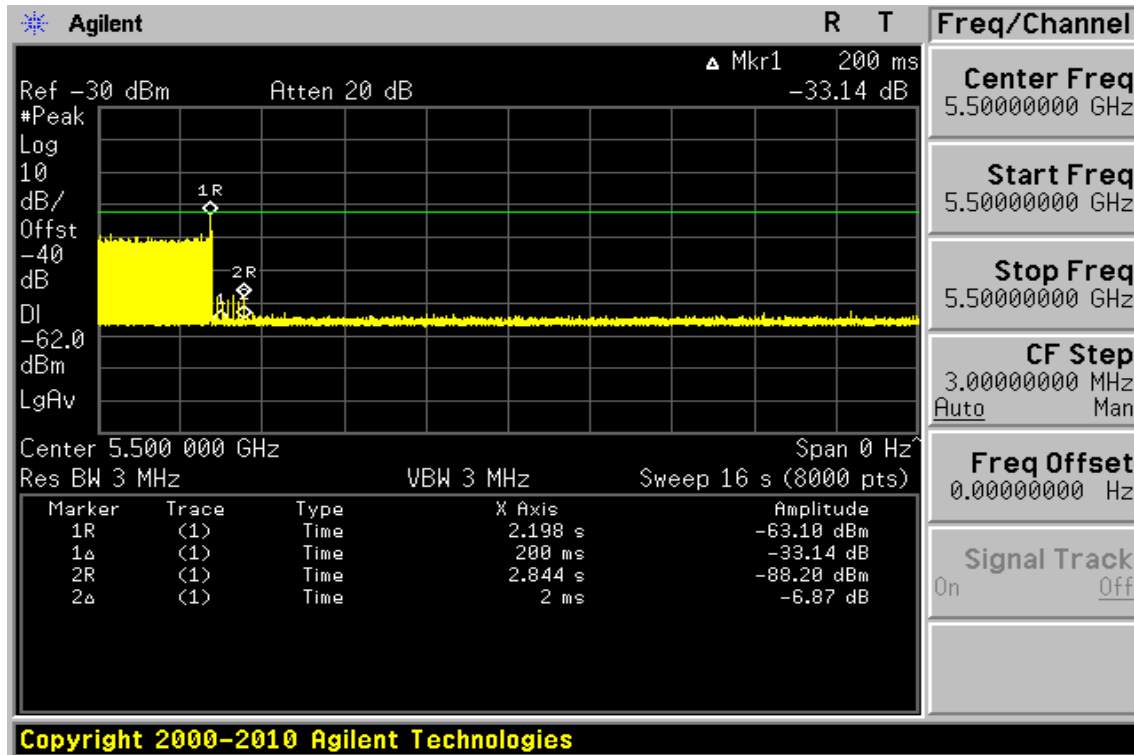
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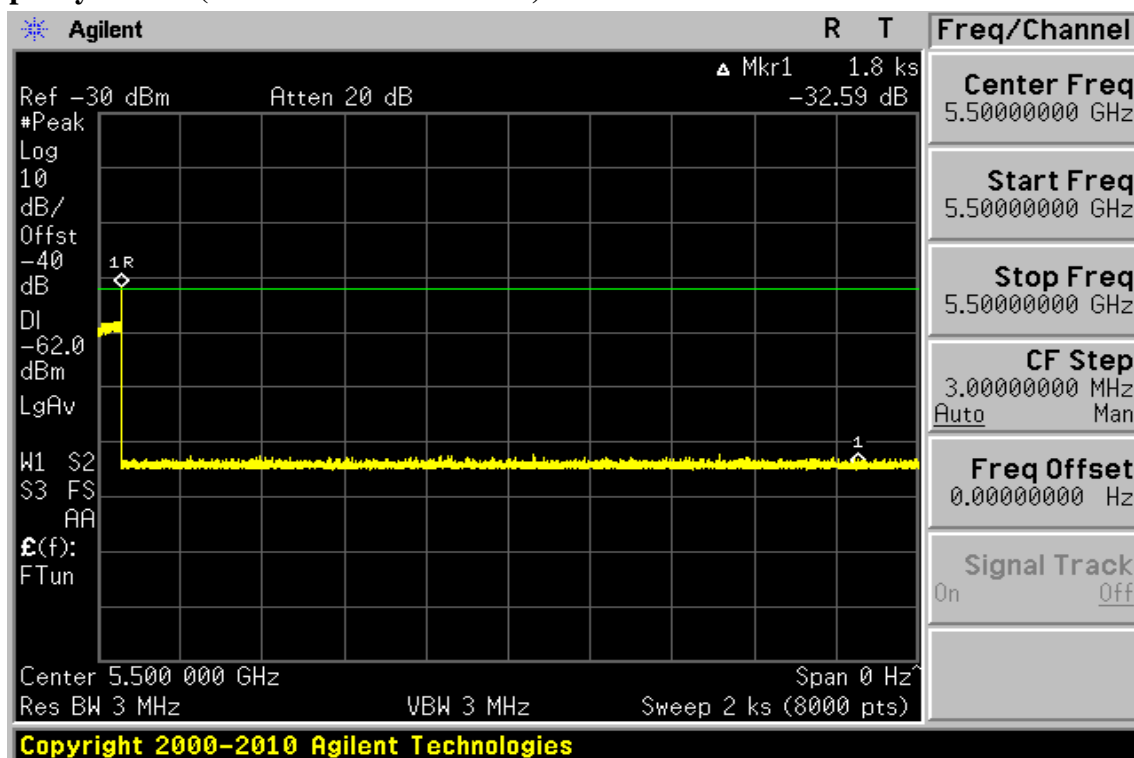
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## Radar Type 1 Channel Closing Transmission Time



$$2\text{ms} * 6 = 12\text{ ms}$$

## Non-occupancy Period (without radar detection)



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## 17. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### 17.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

\* = Plane-wave equipment power density

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## 17.2 Maximum Permissible Exposure (MPE) Evaluation

### Internal Antenna

#### 802.11a 5150~5250 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5180.00	11.31	11.31	0.01352	1
5220.00	11.11	11.11	0.01291	1
5240.00	11.14	11.14	0.01300	1

### MPE Prediction (802.11a 5150~5250)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	11.31	(dBm)
Maximum peak output power at antenna input terminal:	13.52072563	(mW)
Duty cycle:	100	(%)
Maximum Pav :	13.52072563	(mW)
Antenna gain (typical):	3.92	(dBi)
Maximum antenna gain:	2.466039337	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0066367	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.00664 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5180MHz.

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**802.11a 5250~5350 Power Table**

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5260.00	<b>12.65</b>	12.65	0.01840	1
5300.00	12.41	12.41	0.01742	1
5320.00	11.22	11.22	0.01324	1

**MPE Prediction (802.11a 5250~5350)**

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<b>12.65</b>	(dBm)
Maximum peak output power at antenna input terminal:	18.40772001	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	18.40772001	(mW)
Antenna gain (typical):	<b>3.92</b>	(dBi)
Maximum antenna gain:	2.466039337	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5260</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0090355	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.00903 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5260MHz.

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### 802.11a 5470~5725 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5500.00	8.78	8.78	0.00755	1
5580.00	9.66	9.66	0.00925	1
5700.00	<b>10.27</b>	10.27	0.01064	1

### MPE Prediction (802.11a 5470~5725)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	10.27	(dBm)
Maximum peak output power at antenna input terminal:	10.64143018	(mW)
Duty cycle:	100	(%)
Maximum Pav :	10.64143018	(mW)
Antenna gain (typical):	4.97	(dBi)
Maximum antenna gain:	3.140508694	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5700	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0066520	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.00665 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5700MHz.

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**802.11n HT20 MIMO operation (CH 0 + CH 1) Power Table**

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5180.00	11.37	11.37	0.01371	1
5220.00	11.16	11.16	0.01306	1
5240.00	<b>11.70</b>	11.70	0.01479	1

**MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 5150~5250)**

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	11.70	(dBm)
Maximum peak output power at antenna input terminal:	14.79108388	(mW)
Duty cycle:	100	(%)
Maximum Pav :	14.79108388	(mW)
Antenna gain (typical):	6.93	(dBi)
Maximum antenna gain:	4.93173804	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5240	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0145195	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.01452 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5240MHz.

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**802.11n HT20 MIMO operation (CH 0 + CH 1) Power Table**

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5260.00	<b>15.30</b>	15.30	0.03388	1
5300.00	14.93	14.93	0.03112	1
5320.00	15.06	15.06	0.03206	1

**MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 5250~5350)**

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<b>15.3</b>	(dBm)
Maximum peak output power at antenna input terminal:	33.88441561	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	33.88441561	(mW)
Antenna gain (typical):	<b>6.93</b>	(dBi)
Maximum antenna gain:	4.93173804	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5260</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0332622	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.03326 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5260MHz.

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### 802.11n HT20 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5500.00	12.83	12.83	0.01919	1
5580.00	12.68	12.68	0.01854	1
5700.00	<b>13.06</b>	13.06	0.02023	1

### MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 5470~5725)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	13.06	(dBm)
Maximum peak output power at antenna input terminal:	20.23019179	(mW)
Duty cycle:	100	(%)
Maximum Pav :	20.23019179	(mW)
Antenna gain (typical):	7.98	(dBi)
Maximum antenna gain:	6.280583588	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5700	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0252901	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.02529 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5700MHz.

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### 802.11n HT40 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5190.00	11.53	11.53	0.01422	1
5230.00	<b>11.56</b>	11.56	0.01432	1

### MPE Prediction (802.11n HT40 MIMO operation (CH 0 + CH 1) 5150~5250)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<b>11.56</b>	(dBm)
Maximum peak output power at antenna input terminal:	14.32187899	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	14.32187899	(mW)
Antenna gain (typical):	<b>6.93</b>	(dBi)
Maximum antenna gain:	4.93173804	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5230</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0140589	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.01429 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5230MHz.

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### 802.11n HT40 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5270.00	<b>13.94</b>	15.30	0.02477	1
5310.00	13.69	14.93	0.02339	1

### MPE Prediction (802.11n HT40 MIMO operation (CH 0 + CH 1) 5250~5350)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<b>13.94</b>	(dBm)
Maximum peak output power at antenna input terminal:	24.77422058	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	24.77422058	(mW)
Antenna gain (typical):	<b>6.93</b>	(dBi)
Maximum antenna gain:	4.93173804	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5270</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0243193	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.02432 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5270MHz.

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### 802.11n HT40 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5510.00	10.99	10.99	0.01256	1
5550.00	11.48	11.48	0.01406	1
5670.00	<b>11.78</b>	11.78	0.01507	1

### MPE Prediction (802.11n HT40 MIMO operation (CH 0 + CH 1) 5470~5725)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	11.78	(dBm)
Maximum peak output power at antenna input terminal:	15.06607066	(mW)
Duty cycle:	100	(%)
Maximum Pav :	15.06607066	(mW)
Antenna gain (typical):	7.98	(dBi)
Maximum antenna gain:	6.280583588	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5670	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0188343	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.01883 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5670MHz.

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## External Antenna

### 802.11a 5150~5250 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5180.00	<b>11.31</b>	11.31	0.01352	1
5220.00	11.11	11.11	0.01291	1
5240.00	11.14	11.14	0.01300	1

### MPE Prediction (802.11a 5150~5250)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<b>11.31</b>	(dBm)
Maximum peak output power at antenna input terminal:	13.52072563	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	13.52072563	(mW)
Antenna gain (typical):	<b>3.88</b>	(dBi)
Maximum antenna gain:	2.443430553	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5180</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0065758	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.00658mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5180MHz.

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### 802.11a 5250~5350 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5260.00	12.65	12.65	0.01840	1
5300.00	12.41	12.41	0.01742	1
5320.00	11.22	11.22	0.01324	1

### MPE Prediction (802.11a 5250~5350)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	12.65	(dBm)
Maximum peak output power at antenna input terminal:	18.40772001	(mW)
Duty cycle:	100	(%)
Maximum Pav :	18.40772001	(mW)
Antenna gain (typical):	3.88	(dBi)
Maximum antenna gain:	2.443430553	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5260	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0089526	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.00895mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5260MHz.

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### 802.11a 5470~5725 Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5500.00	8.78	8.78	0.00755	1
5580.00	9.66	9.66	0.00925	1
5700.00	<b>10.27</b>	10.27	0.01064	1

### MPE Prediction (802.11a 5470~5725)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	10.27	(dBm)
Maximum peak output power at antenna input terminal:	10.64143018	(mW)
Duty cycle:	100	(%)
Maximum Pav :	10.64143018	(mW)
Antenna gain (typical):	4.85	(dBi)
Maximum antenna gain:	3.054921113	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5700	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0064707	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.00647mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5700MHz.

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### 802.11n HT20 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5180.00	11.37	11.37	0.01371	1
5220.00	11.16	11.16	0.01306	1
5240.00	<b>11.70</b>	11.70	0.01479	1

### MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 5150~5250)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	11.70	(dBm)
Maximum peak output power at antenna input terminal:	14.79108388	(mW)
Duty cycle:	100	(%)
Maximum Pav :	14.79108388	(mW)
Antenna gain (typical):	6.89	(dBi)
Maximum antenna gain:	4.886523593	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5240	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0143863	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.01439 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5240MHz.

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**802.11n HT20 MIMO operation (CH 0 + CH 1) Power Table**

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5260.00	<b>15.30</b>	15.30	0.03388	1
5300.00	14.93	14.93	0.03112	1
5320.00	15.06	15.06	0.03206	1

**MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 5250~5350)**

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<b>15.3</b>	(dBm)
Maximum peak output power at antenna input terminal:	33.88441561	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	33.88441561	(mW)
Antenna gain (typical):	<b>6.89</b>	(dBi)
Maximum antenna gain:	4.886523593	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5260</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0329572	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.03296 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5260MHz.

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### 802.11n HT20 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5500.00	12.83	12.83	0.01919	1
5580.00	12.68	12.68	0.01854	1
5700.00	<b>13.06</b>	13.06	0.02023	1

### MPE Prediction (802.11n HT20 MIMO operation (CH 0 + CH 1) 5470~5725)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	13.06	(dBm)
Maximum peak output power at antenna input terminal:	20.23019179	(mW)
Duty cycle:	100	(%)
Maximum Pav :	20.23019179	(mW)
Antenna gain (typical):	7.86	(dBi)
Maximum antenna gain:	6.109420249	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5700	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0246009	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.02460 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5700MHz.

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### 802.11n HT40 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5190.00	11.53	11.53	0.01422	1
5230.00	<b>11.56</b>	11.56	0.01432	1

### MPE Prediction (802.11n HT40 MIMO operation (CH 0 + CH 1) 5150~5250)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<b>11.56</b>	(dBm)
Maximum peak output power at antenna input terminal:	14.32187899	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	14.32187899	(mW)
Antenna gain (typical):	<b>6.89</b>	(dBi)
Maximum antenna gain:	4.886523593	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	<b>5230</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0139300	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.01393 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5230MHz.

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### 802.11n HT40 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5270.00	13.94	15.30	0.02477	1
5310.00	13.69	14.93	0.02339	1

### MPE Prediction (802.11n HT40 MIMO operation (CH 0 + CH 1) 5250~5350)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	13.94	(dBm)
Maximum peak output power at antenna input terminal:	24.77422058	(mW)
Duty cycle:	100	(%)
Maximum Pav :	24.77422058	(mW)
Antenna gain (typical):	6.89	(dBi)
Maximum antenna gain:	4.886523593	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5270	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0240963	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.02410 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5270MHz.

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### 802.11n HT40 MIMO operation (CH 0 + CH 1) Power Table

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5510.00	10.99	10.99	0.01256	1
5550.00	11.48	11.48	0.01406	1
5670.00	<b>11.78</b>	11.78	0.01507	1

### MPE Prediction (802.11n HT40 MIMO operation (CH 0 + CH 1) 5470~5725)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	11.78	(dBm)
Maximum peak output power at antenna input terminal:	15.06607066	(mW)
Duty cycle:	100	(%)
Maximum Pav :	15.06607066	(mW)
Antenna gain (typical):	7.86	(dBi)
Maximum antenna gain:	6.109420249	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5670	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.0183211	(mW/cm <sup>2</sup> )

### Measurement Result

The predicted power density level at 20 cm is 0.01832 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5670MHz.

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