

Report No.: ER/2009/A0041 **Issue Date: Nov. 27, 2009** 

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# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT AND INDUSTRY CANADA RSS 210

**Product Name:** Wi-Fi Dongle

**Brand Name:** LG

**Model Name: AN-WF100** 

**Model Different:** N/A

FCC ID: **BEJ-WF100** 

IC: 2703H-WF100

**Report No.:** ER/2009/A0041

**Issue Date:** Nov. 27, 2009

**FCC Rule Part: §15.247** 

**IC Rule Part:** RSS-210 issue 7:2007, Annex 8

**Prepared for: LG Electronics USA** 

1000 Sylvan Avenue Englewood Cliffs, Nj

07632

Prepared by: SGS Taiwan Ltd.

> **Electronics & Communication Laboratory** No. 134, Wu Kung Rd., Wuku Industrial

Zone, Taipei County, Taiwan.



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# VERIFICATION OF COMPLIANCE

**Applicant:** LG Electronics USA

1000 Sylvan Avenue Englewood Cliffs, Nj 07632

**Product Name:** Wi-Fi Dongle

**Brand Name:** LG

FCC ID: BEJ-WF100 IC: 2703H-WF100 Model No.: AN-WF100

**Model Difference:** N/A

File Number: ER/2009/A0041

Date of test: Oct. 19, 2009 ~ Nov. 25, 2009

**Date of EUT Received:** Oct. 19, 2009

# 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 (2003) 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 15.247 and IC RSS 210 issue 7: 2007 Annex 8. The test results of this report relate only to the tested sample identified in this report.

Test By:	Jim Chang	Date:	Nov. 27, 2009	
	Jim Chang / Supervisor			
Prepared By:	Gigi yeh	Date:	Nov. 27, 2009	
Approved By:	Gigi Yeh/Clerk	Date:	Nov. 27, 2009	
	Vincent Su / Manager			

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Version No.	Date	Description
00	Nov. 27, 2009	Initial creation of document

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### **GENERAL INFORMATION**

# 1.1 Product Description

#### General:

Product Name:	Wi-Fi Dongle
Brand Name:	LG
Model Name:	AN-WF100
Model Difference:	N/A
Power Supply:	5Vdc form USB port

WLAN: 802.11 a/b/g/n (2TX / 2RX)

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology	Type of Emission
11b/g	2412-2462	11	b: 16.70dBm g: 14.28dBm	DSSS, OFDM	b : 13M1G1D g : 16M5G1D
11	HT20 2412-2462 11		17M6G1D		
11n	HT40 2422-2452	9	n: 13.65 dBm	OFDM	36M1DG1D

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Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology	Type of Emission
	5180-5240	4			16M5G1D
11a	HT20 5180-5240	4	a : 14.03dBm	OFDM	17M6G1D
	HT40 5190-5230	2			36M2G1D
	5745-5825	5		OFDM	17M6G1D
11a	HT20 5745-5825	5	a : 14.29 dBm		17M6G1D
	HT40 5755-5795	2			36M1G1D
Antenna Designation		2.4G: Antenna 1: -0.22dBi / Antenna 2: -0.50 dBi 5G: Antenna 1: 5.53dBi / Antenna 2: 4.18 dBi			
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 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 72.2Mbps 802.11 n_40MHz: 13.5 – 300Mbps			

The 2.4G max antenna gain is -0.22dBi which was choosing for Radiated Spurious Emission test.

The 5G max antenna gain is 5.53dBi which was choosing for Radiated Spurious Emission test.

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

This report applies for frequency bands 2412MHz – 2462MHz; 5725MHz – 5825MHz.

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#### 1.2 **Related Submittal(s) / Grant (s)**

This submittal(s) (test report) is intended for FCC ID: BEJ-WF100 filing to comply with Section 15.247 of the FCC Part 15, Subpart E Rules and IC: 2703H-WF100 filing to comply with Industry Canada RSS-210 issue 7: 2007 Annex 8. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

#### 1.3 **Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and RSS-Gen: 2007.. Radiated testing was performed at an antenna to EUT distance 3 meters.

#### 1.4 **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: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1.

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.

#### 1.5 **Special Accessories**

Not available for this EUT intended for grant.

#### 1.6 **Equipment Modifications**

Not available for this EUT intended for grant.

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#### 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 a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. 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 a placed on as 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 C63.4-2003.

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## **Configuration of Tested System**

Fig. 2-1 Configuration of Tested System



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.
1.	Notebook	IBM	T43	L3LHHN6
2.	WiFi Software	N/A	WLAN eMapi	N/A

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### SUMMARY OF TEST RESULTS

FCC Rules	<b>Description Of Test</b>	Result
§15.207(a)/	AC Power Line Conducted Emis-	Compliant
RSS-Gen §7.2.2	sion	
§15.247(b)/	Peak Output Power	Compliant
§A8.4(2)		
§15.247(b)/	6dB Bandwidth	Compliant
§A8.2		
§15.247(c)/	100 KHz Bandwidth Of	Compliant
§A8.5	Frequency Band Edges	
§15.247(c)/	Spurious Emission	Compliant
§A8.5		
§15.247/,§A8.3(2)	Peak Power Density	Compliant
RSS-Gen §4.4.1	99% Power Bandwidth	Compliant
§15.203/	Antenna Requirement	Compliant
RSS-GEN 7.1.4,		
RSS-210 issue 7,§A8.4		

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#### **DESCRIPTION OF TEST MODES**

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

802.11 b mode: Channel low (2412MHz) · mid (2437MHz) and high (2462MHz) with 1Mbps highest data rate are chosen for full testing.

802.11 g mode: Channel low (2412MHz) · mid (2437MHz) and high (2462MHz) with 6Mbps highest data rate are chosen for full testing.

802.11 n\_20MHz: Lowest (2412MHz), Mid (2437MHz) and high (2462MHz) with 6.5 Mbps highest data rate are chosen for above testing.

802.11 n\_40MHz: Lowest (2422MHz), Mid(2437MHz) and high (2452MHz) with 13.5 Mbps highest data rate are chosen for above testing.

802.11 a mode: Channel low (5725MHz) · mid (5785MHz) and high (5825MHz) with 6Mbps highest data rate are chosen for full testing.

802.11 n\_20MHz: Lowest (5725MHz), Mid (5785MHz) and high (5825MHz) with 6.5 Mbps highest data rate are chosen for above testing.

802.11 n\_40MHz: Lowest (5755MHz), high (5795MHz) with 13.5 Mbps highest data rate are chosen for above testing.

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#### CONDUCTED EMISSION TEST

#### **Standard Applicable 5.1**

According to §15.207 and RSS-Gen §7.2.2, frequency range within 150 KHz to 30 MHz shall not exceed the Limit table as below.

	Limits				
Frequency range	dB(uV)				
MHz	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

# 5.2 EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
- 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.

#### 5.3 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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<sup>1.</sup> The lower limit shall apply at the transition frequencies

<sup>2.</sup> The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.



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## **5.4** Measurement Equipment Used:

Conducted Emission Test Site							
EQUIPMENT MFR MODEL SERIAL LAST CAL DU							
TYPE		NUMBER	NUMBER	CAL.			
EMI Test Receiver	R&S	ESCS30	828985/004	09/16/2009	09/15/2010		
LISN	Rolf-Heine	NNB-2/16Z	99012	02/02/2009	02/01/2010		
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	02/02/2009	02/01/2010		
Coaxial Cables	N/A	WK CE Cable	N/A	10/30/2009	10/29/2010		

#### 5.5 **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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58 %

hpa

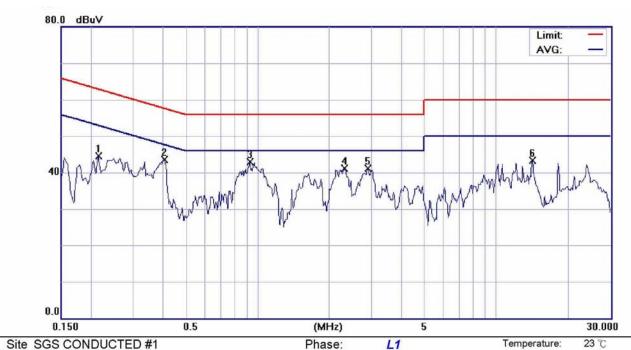
Humidity:

Air Pressure:

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### AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	WLAN Link			Test Date:	Nov. 15, 2009
Temperature:	23 °C	Humidity:	58 %	Test By:	Jim



Site SGS CONDUCTED #1

Limit: CISPR22/11/EN55022 Class B

EUT: Wi-Fi Dongle

M/N: AN-WF100 Note: Operation mode

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1		0.2150	44.37	0.12	44.49	63.01	-18.52	peak		
2		0.4050	43.38	0.08	43.46	57.75	-14.29	peak		
3	*	0.9300	42.90	0.09	42.99	56.00	-13.01	peak		
4		2.3200	40.88	0.13	41.01	56.00	-14.99	peak		
5		2.8900	40.97	0.14	41.11	56.00	-14.89	peak		
6		14.2000	42.99	0.40	43.39	60.00	-16.61	peak		

Power:

Distance:

AC 120V/60Hz

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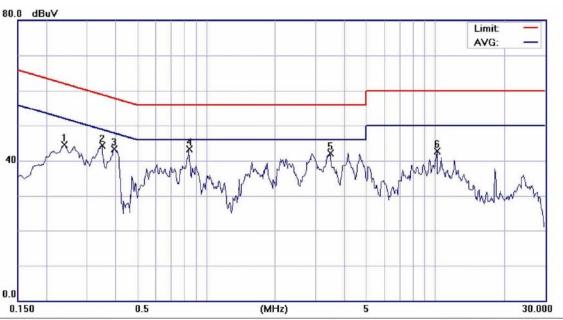
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Site SGS CONDUCTED #1

Limit: CISPR22/11/EN55022 Class B

EUT: Wi-Fi Dongle M/N: AN-WF100 Note: Operation mode

Temperature: 23 °C Phase: Power: AC 120V/60Hz Humidity: Air Pressure: Distance: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1		0.2400	44.46	0.13	44.59	62.10	-17.51	peak		
2		0.3500	44.23	0.12	44.35	58.96	-14.61	peak		
3		0.3950	43.18	0.11	43.29	57.96	-14.67	peak		
4	*	0.8400	43.10	0.11	43.21	56.00	-12.79	peak		
5		3.4800	42.03	0.16	42.19	56.00	-13.81	peak		
6		10.2000	42.23	0.45	42.68	60.00	-17.32	peak		

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#### PEAK OUTPUT POWER MEASUREMENT

## **Standard Applicable**

According to  $\S15.247(a)(2)$ , (b)

5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna

elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The

average must not include any time intervals during which the transmitter is off or is transmitting at a

reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods),

the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and

on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c)

of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted

output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1),

(b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the

antenna exceeds 6 dBi.

- (c) Operation with directional antenna gains greater than 6 dBi.
- (1) Fixed point-to-point operation:
- (i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for

fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for

every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for

fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6

dBi without any corresponding reduction in transmitter conducted output power.

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According to RSS-210 issue 7,§A8.4(2), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, the maximum conducted output power shall not exceed 1 W. For all other frequency hopping systems, the maximum peak conducted output power shall not exceed 0.125 W.

#### 6.2 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 or spectrum. (Channel power function, RBW, VBW = 1MHz,Bandwidth=26dB occupied Bandwidth)
- 3. Record the max. reading.
- 4. Repeat above procedures until all frequency measured were complete.

### **6.3** Measurement Equipment Used:

ote magazen	C1							
Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
TYPE		NUMBER	NUMBER	CAL.				
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010			
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/23/2008	01/22/2010			
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010			
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010			
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010			
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010			
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010			
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010			

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### 6.4 Measurement Result

#### 802.11b

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	16.70	0.00	16.70	0.04699	1
2437.00	16.66	0.00	16.66	0.04634	1
2462.00	16.62	0.00	16.62	0.04592	1

### 802.11g

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	14.17	0.00	14.17	0.02612	1
2437.00	14.16	0.00	14.16	0.02606	1
2462.00	14.28	0.00	14.28	0.02679	1

\*Note: Offset 0.2dB

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#### 802.11n\_20M Chain 0

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	9.66	0.00	9.66	0.00925	1
2437.00	9.20	0.00	9.20	0.00832	1
2462.00	10.65	0.00	10.65	0.01161	1

### 802.11n\_20M Chain 1

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	9.80	0.00	9.80	0.00955	1
2437.00	9.91	0.00	9.91	0.00979	1
2462.00	9.68	0.00	9.68	0.00929	1

### 802.11n 20M Combine, Chain0, Chain1

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	13.56	0.00	13.56	0.02270	1
2437.00	13.57	0.00	13.57	0.02275	1
2462.00	13.65	0.00	13.65	0.02317	1

\*Note: Offset 0.2dB

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#### 802.11n\_40M Chain0

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2422.00	8.21	0.00	8.21	0.00662	1
2437.00	9.18	0.00	9.18	0.00828	1
2452.00	9.45	0.00	9.45	0.00881	1

### 802.11n\_40M Chain1

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2422.00	9.92	0.00	9.92	0.00982	1
2437.00	9.75	0.00	9.75	0.00944	1
2452.00	9.86	0.00	9.86	0.00968	1

### 802.11n\_40M Combine, Chain0, Chain1

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2422.00	13.64	0.00	13.64	0.02312	1
2437.00	13.52	0.00	13.52	0.02249	1
2452.00	13.61	0.00	13.61	0.00296	1

\*Note: Offset 0.2dB

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#### 802.11a

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5745.00	14.09	0.00	14.09	0.02564	1
5785.00	14.29	0.00	14.29	0.02685	1
5825.00	14.19	0.00	14.19	0.02624	1

### 802.11n\_20M Chain 0

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5745.00	9.37	0.00	9.37	0.00865	1
5785.00	9.83	0.00	9.83	0.00962	1
5825.00	10.45	0.00	10.45	0.01109	1

#### 802.11n\_20M Chain 1

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5745.00	10.53	0.00	10.53	0.01130	1
5785.00	10.42	0.00	10.42	0.01102	1
5825.00	10.33	0.00	10.33	0.01079	1

### 802.11n\_20M Combine, Chain0, Chain1

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5745.00	13.60	0.00	13.60	0.02291	1
5785.00	13.61	0.00	13.61	0.02296	1
5825.00	13.54	0.00	13.54	0.02259	1

\*Note: Offset 0.2dB

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#### 802.11n\_40M Chain0

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5755.00	9.84	0.00	9.84	0.00964	1
5795.00	10.87	0.00	10.87	0.01222	1

### 802.11n\_40M Chain1

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5755.00	9.93	0.00	9.93	0.00984	1
5795.00	9.72	0.00	9.72	0.00938	1

### 802.11n\_40M Combine, Chain0, Chain1

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5755.00	13.54	0.00	13.54	0.02259	1
5795.00	13.62	0.00	13.62	0.02301	1

\*Note: Offset 0.2dB

Note: Refer to next page for plots.

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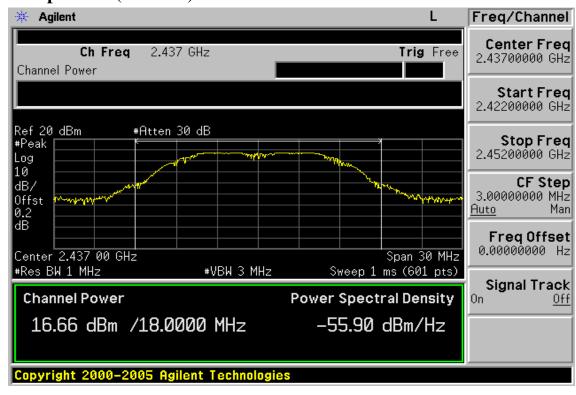
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# 802.11b, 1Mbps

## **Power Output Plot (CH Low)**



# **Power Output Plot (CH Mid)**



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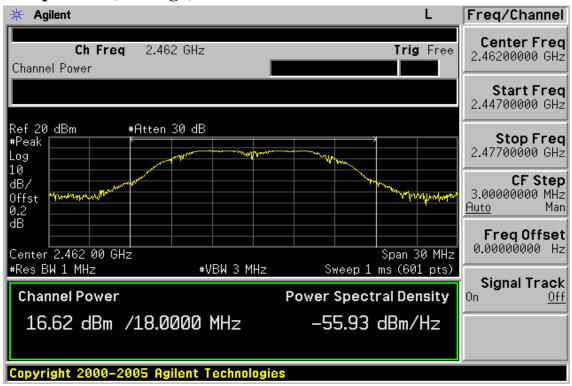
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# **Power Output Plot (CH High)**



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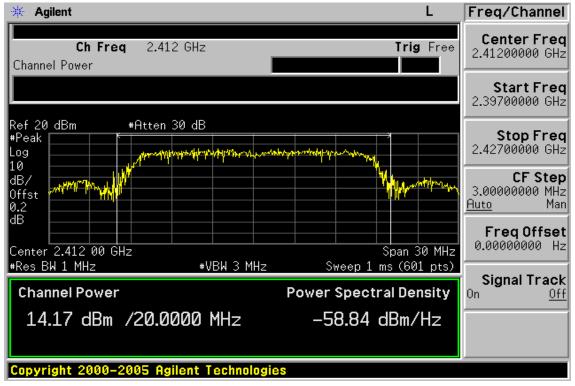


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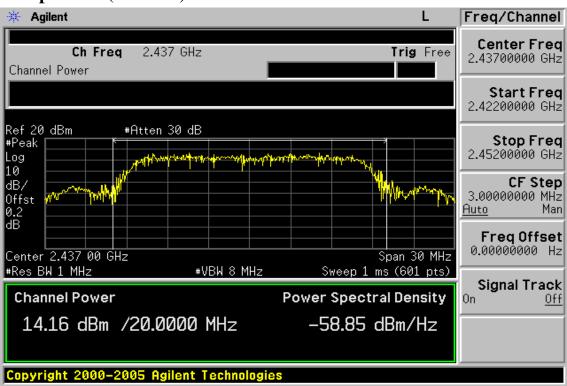
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# 802.11g, 6Mbps

# **Power Output Plot (CH Low)**



# **Power Output Plot (CH Mid)**



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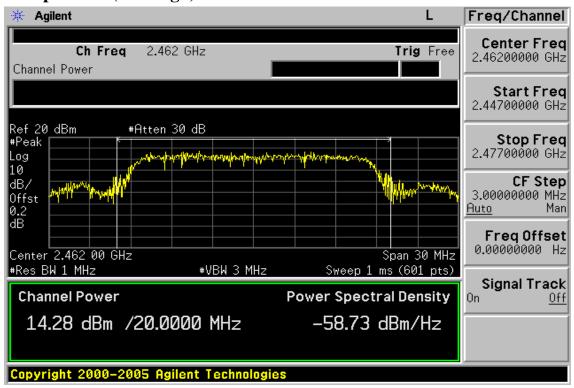
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# **Power Output Plot (CH High)**



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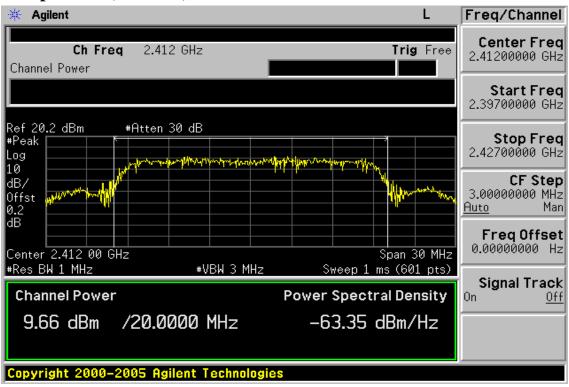
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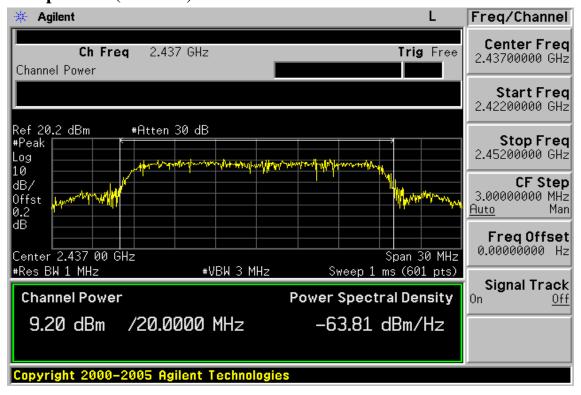
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# 802.11n\_20M, Ch 0, 6.5Mbps **Power Output Plot (CH Low)**



# **Power Output Plot (CH Mid)**



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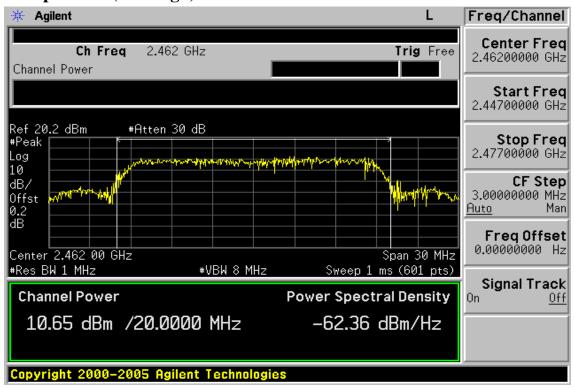
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# **Power Output Plot (CH High)**



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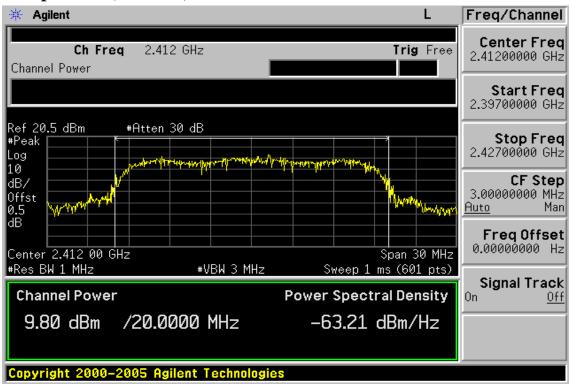
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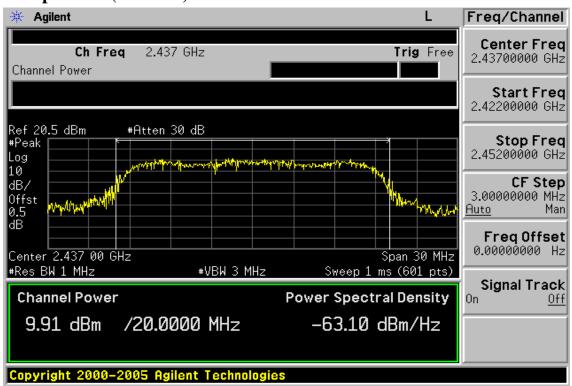
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# 802.11n\_20M, Ch 1, 6.5Mbps **Power Output Plot (CH Low)**



# **Power Output Plot (CH Mid)**



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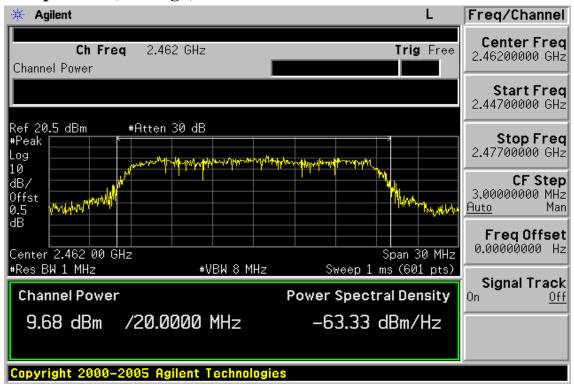
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# **Power Output Plot (CH High)**



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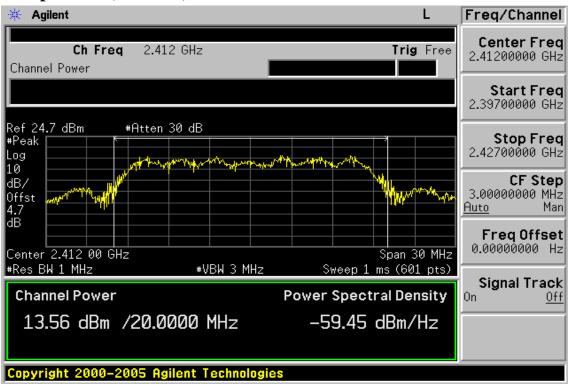
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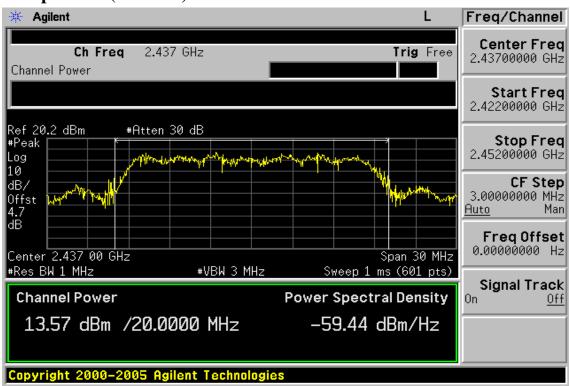
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# 802.11n\_20M, Comp, 6.5Mbps **Power Output Plot (CH Low)**



# **Power Output Plot (CH Mid)**



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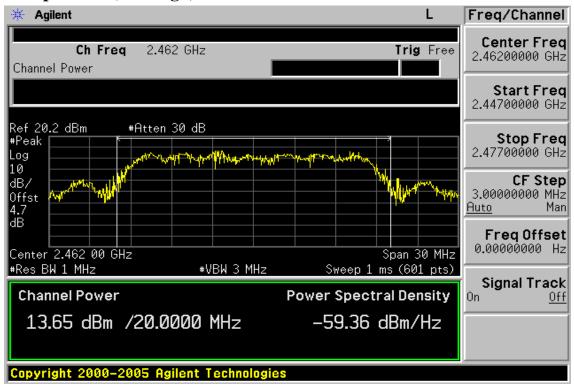
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# **Power Output Plot (CH High)**



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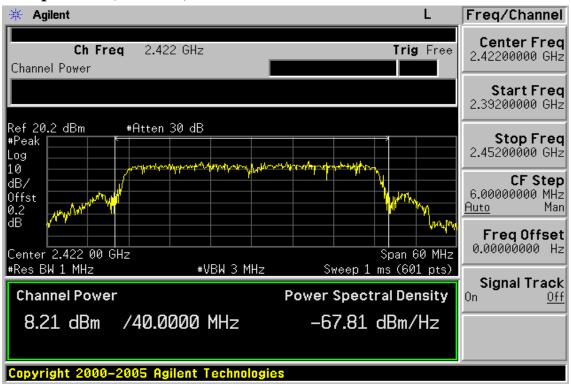
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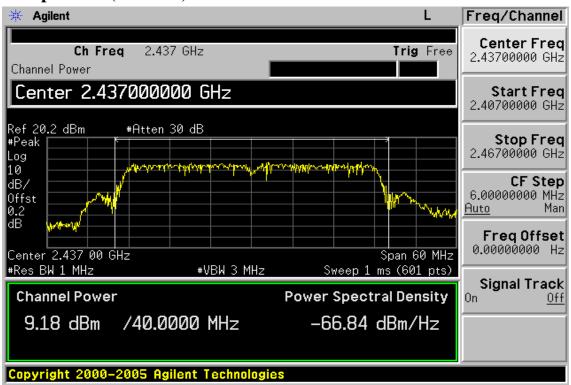
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# 802.11n\_40M, Ch 0, 13.5Mbps **Power Output Plot (CH Low)**



# **Power Output Plot (CH Mid)**



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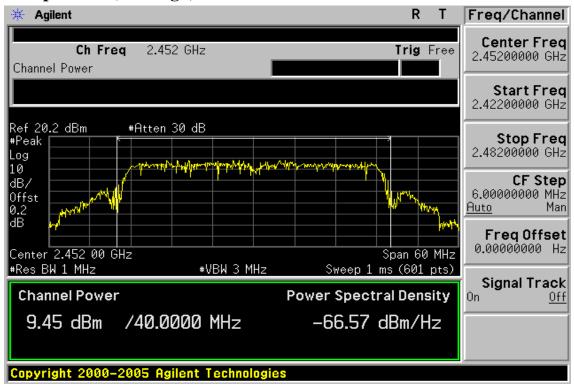
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# **Power Output Plot (CH High)**



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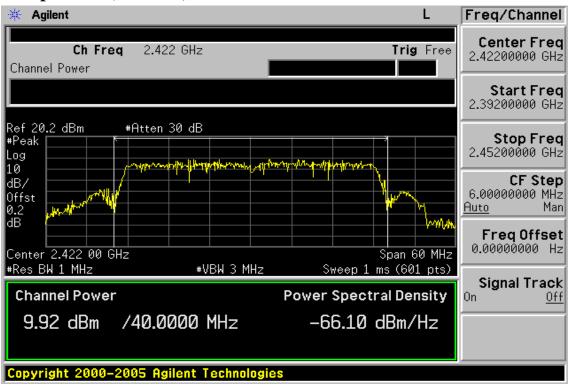
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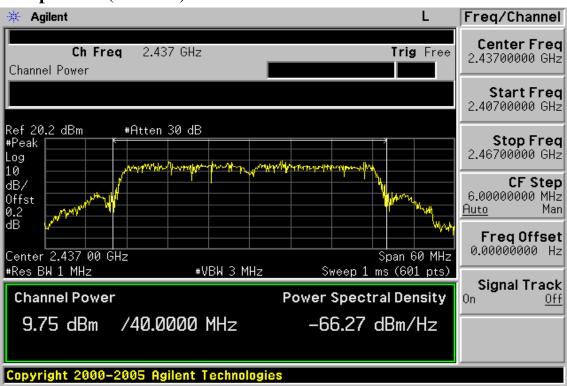
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# 802.11n\_40M, Ch 1, 13.5Mbps **Power Output Plot (CH Low)**



# **Power Output Plot (CH Mid)**



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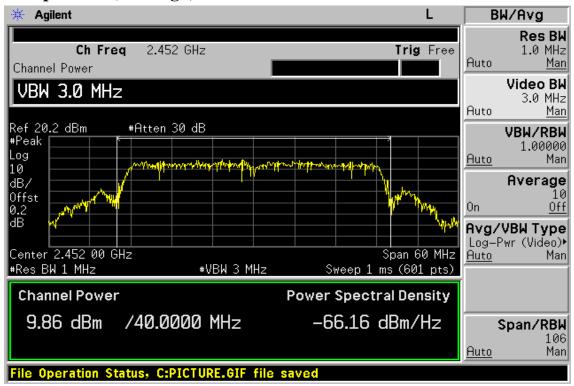
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### **Power Output Plot (CH High)**



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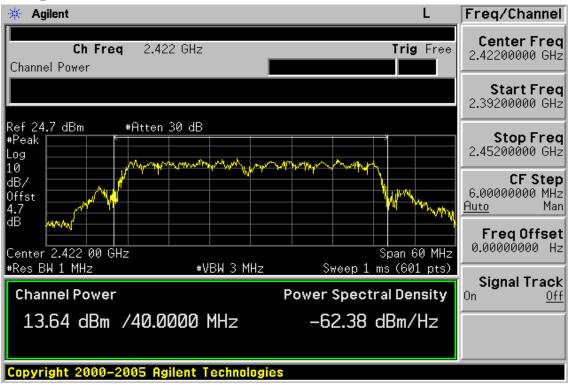
f (886-2) 2298-0488



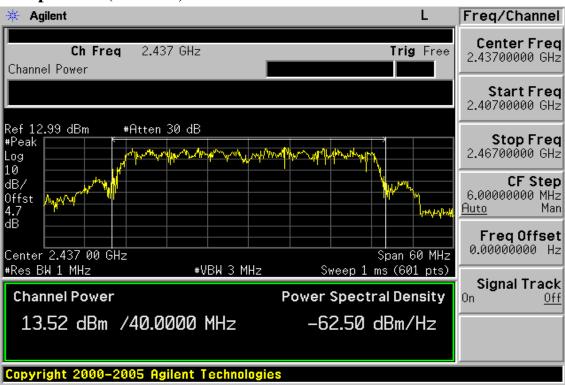
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# 802.11n\_40M, Comp 13.5Mbps **Power Output Plot (CH Low)**



### **Power Output Plot (CH Mid)**



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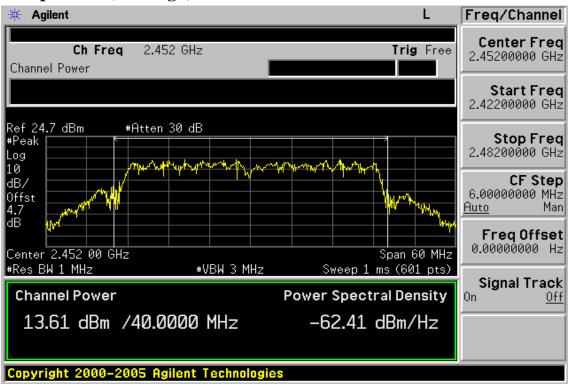
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### **Power Output Plot (CH High)**



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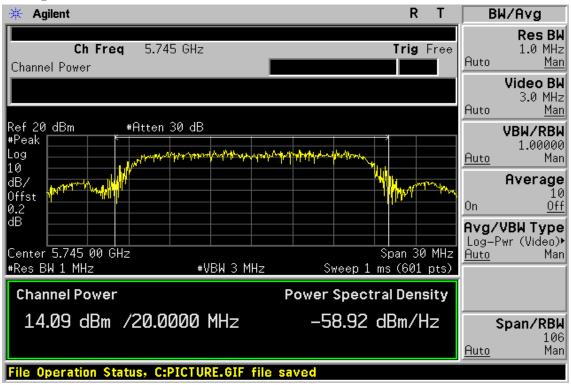


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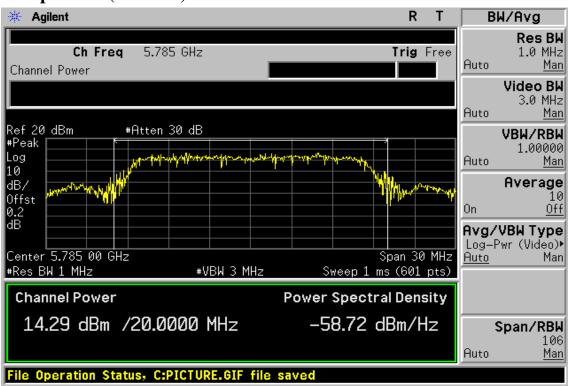
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# 802.11a, 6Mbps

### **Power Output Plot (CH Low)**



### **Power Output Plot (CH Mid)**



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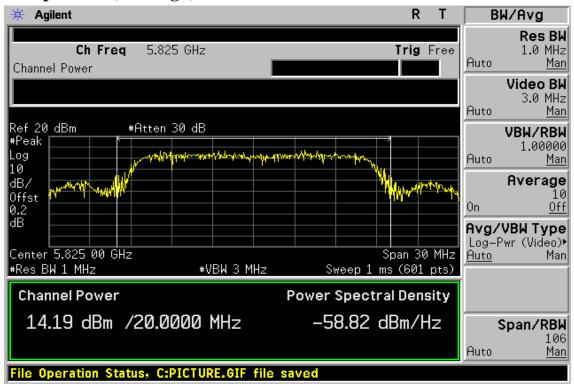
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### **Power Output Plot (CH High)**



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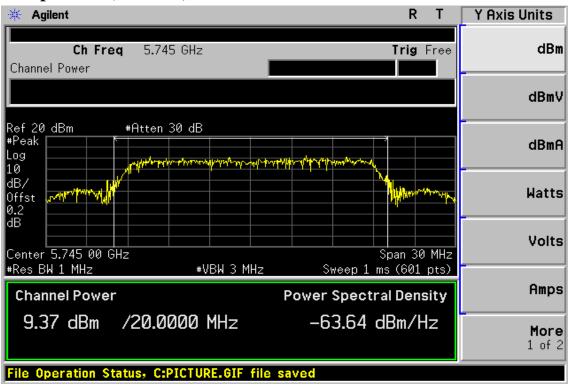
www.sas.com.tw



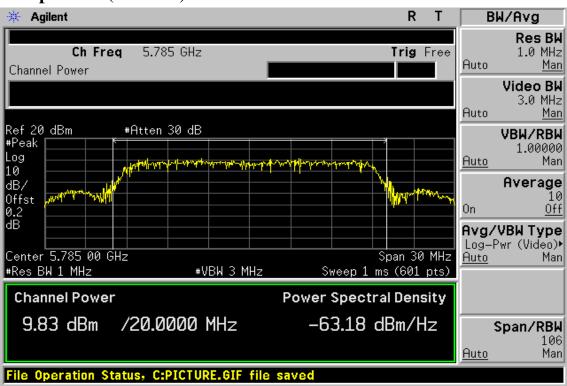
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# 802.11a/n\_20M, Ch 0, 6.5Mbps **Power Output Plot (CH Low)**



### **Power Output Plot (CH Mid)**



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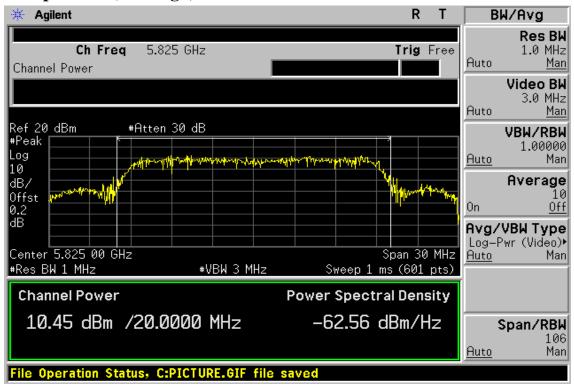
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### **Power Output Plot (CH High)**



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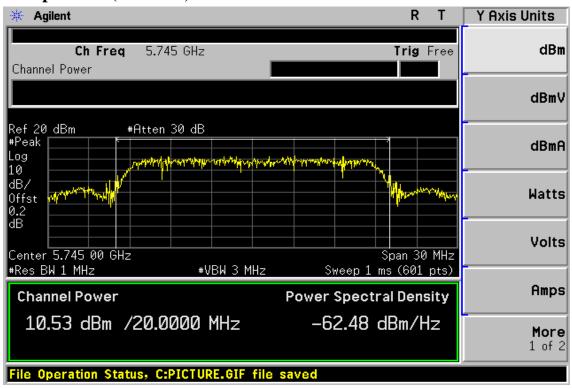
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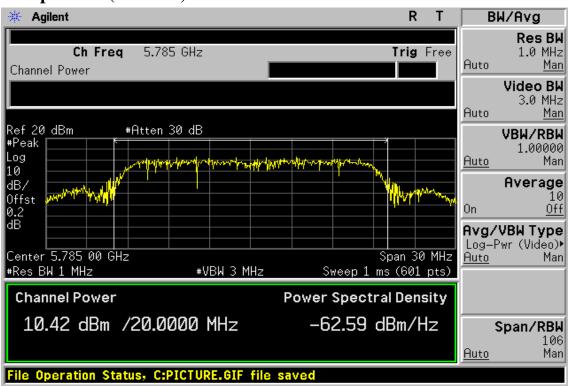
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# 802.11a/n\_20M, Ch 1, 6.5Mbps Power Output Plot (CH Low)



### **Power Output Plot (CH Mid)**



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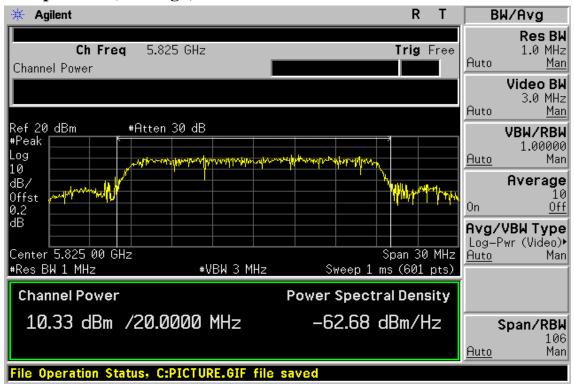
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### **Power Output Plot (CH High)**



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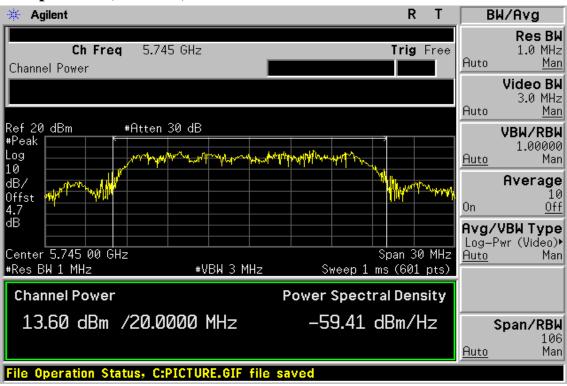
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# 802.11a/n\_20M, Comp, 6.5Mbps **Power Output Plot (CH Low)**



### **Power Output Plot (CH Mid)**



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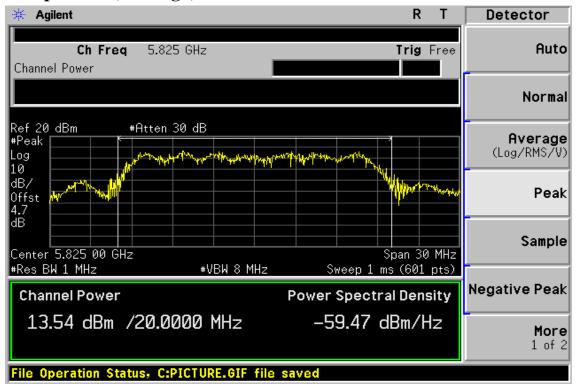
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### **Power Output Plot (CH High)**



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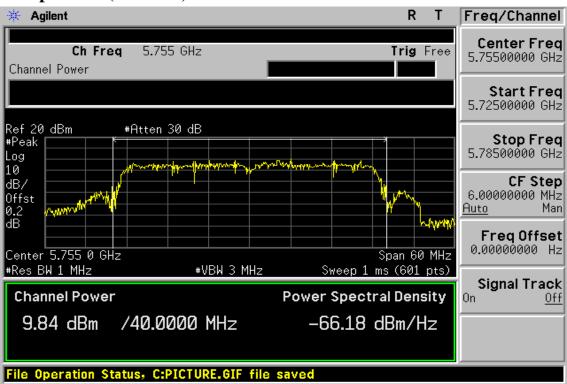
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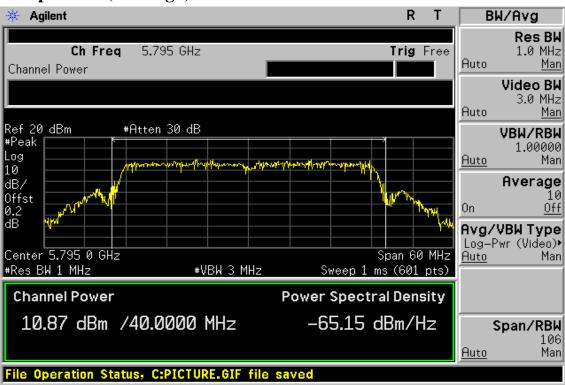
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# 802.11a/n\_40M, Ch 0, 13.5Mbps **Power Output Plot (CH Low)**



## **Power Output Plot (CH High)**



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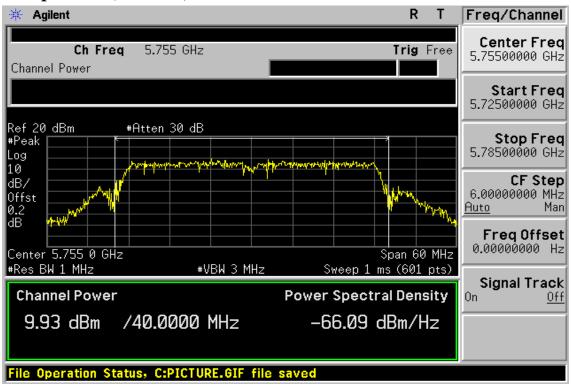
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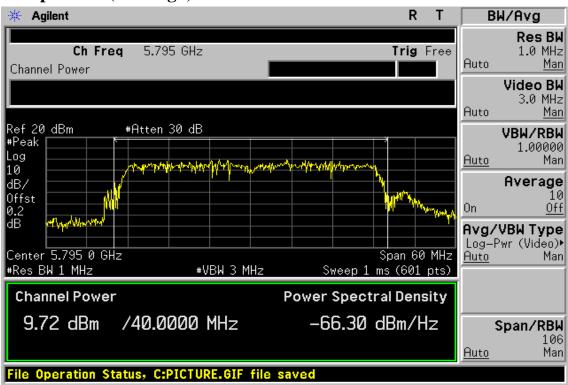
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# 802.11a/n\_40M, Ch 1, 13.5Mbps **Power Output Plot (CH Low)**



## **Power Output Plot (CH High)**



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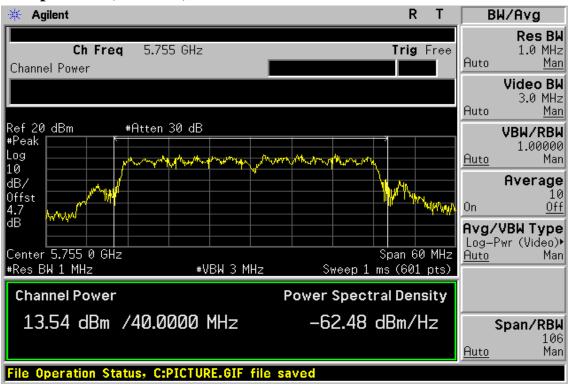
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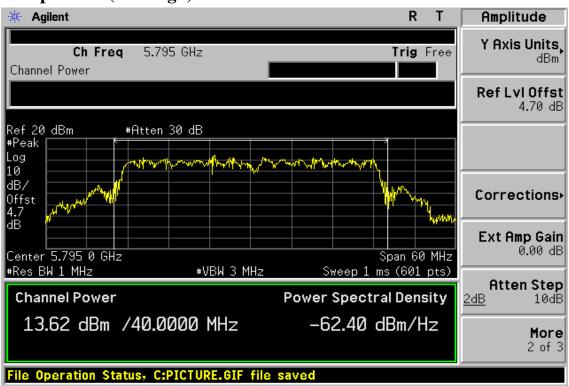
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# 802.11n\_40M, Comp 13.5Mbps **Power Output Plot (CH Low)**



### **Power Output Plot (CH High)**



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#### 6dB Bandwidth

### 7.1 Standard Applicable

According to §15.247(a)(2), Systems using digital modulation techniques may operate in the 902 - 928 MHz,2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

According to RSS 210 issue 7: 2007 Annex 8.2. Systems employing digital modulation techniques (which includes direct sequence) can now be certified under RSS-210 provided they comply with the following requirements: The minimum 6 dB bandwidth shall be at least 500 kHz.

#### 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 3.antenna port to the spectrum analyzer.
- 3.Set the spectrum analyzer as RBW=100KHz, VBW = 3\*RBW, Span= 30M/50MHz, Sweep=auto
- 4. Mark the peak frequency and –6dB (upper and lower) frequency.
- 5. Repeat above procedures until all frequency measured were complete.

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### 7.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2008	01/22/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/12/2010
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2009	01/04/2010
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2009	01/04/2010
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-C P-AR	MAA0512-018	02/05/2008	02/04/2010
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010
DC Power Supply	HP	6038A	2929A-07548	06/27/2009	06/26/2011
DC Power Supply	Topward	3303D	981327	10/26/2009	10/25/2011

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#### 7.4 Measurement Result

#### 802.11b

Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	
2412	10.221	> 500	PASS
2437	10.213	> 500	PASS
2462	10.208	> 500	PASS

#### 802.11g

0021115			
Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	
2412	16.548	> 500	PASS
2437	16.497	> 500	PASS
2462	16.523	> 500	PASS

<sup>\*</sup>Offset 0.2dB

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802.11n\_20M Chain0

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	17.683	> 500	PASS
2437	17.740	> 500	PASS
2462	17.708	> 500	PASS

802.11n 20M Chain1

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	17.697	> 500	PASS
2437	17.715	> 500	PASS
2462	17.726	> 500	PASS

802.11n\_20M Combine, Chain0, Chain1

Frequency (MHz)	Bandwidth	Bandwidth	Result
	(MHz)	(KHz)	Result
2412	16.172	> 500	PASS
2437	16.195	> 500	PASS
2462	16.180	> 500	PASS

offset: 0.2dB

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#### 802.11n\_40M Chain0

Frequency (MHz)	Bandwidth	Bandwidth	Result
	(MHz)	(KHz)	
2422	36.422	> 500	PASS
2437	36.352	> 500	PASS
2452	36.385	> 500	PASS

#### 802.11n\_40M Chain1

Frequency (MHz)	Bandwidth	Bandwidth	Result
	(MHz)	(KHz)	
2422	36.442	> 500	PASS
2437	36.458	> 500	PASS
2452	36.448	> 500	PASS

### 802.11n\_40M Combine, Chain0, Chain1

Frequency (MHz)	Bandwidth	Bandwidth	Result
	(MHz)	(KHz)	
2422	35.931	> 500	PASS
2437	36.104	> 500	PASS
2452	35.904	> 500	PASS

offset: 0.2dB

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#### 802.11a

Frequency	Bandwidth (MHz)	Bandwidth (KHz)	Result
5745	16.497	> 500	PASS
5785	16.545	> 500	PASS
5825	17.724	> 500	PASS

<sup>\*</sup>Offset 0.2dB

#### 802.11a/n\_20M Chain0

Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	
5745	17.681	> 500	PASS
5785	17.691	> 500	PASS
5825	17.696	> 500	PASS

### 802.11a/n\_20M Chain1

Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	
5745	17.275	> 500	PASS
5785	17.673	> 500	PASS
5825	17.687	> 500	PASS

#### 802.11a/n 20M Combine, Chain0, Chain1

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
5745	16.455	> 500	PASS
5785	16.390	> 500	PASS
5825	16.118	> 500	PASS

offset: 0.2dB

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#### 802.11a/n\_40M Chain0

Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	
5755	36.412	> 500	PASS
5795	36.406	> 500	PASS

#### 802.11a/n\_40M Chain1

Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	
5755	36.458	> 500	PASS
5795	36.335	> 500	PASS

### 802.11a/n\_40M Combine, Chain0, Chain1

Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	
5755	35.808	> 500	PASS
5795	35.996	> 500	PASS

offset: 0.2dB

Note: Refer to next page for plots.

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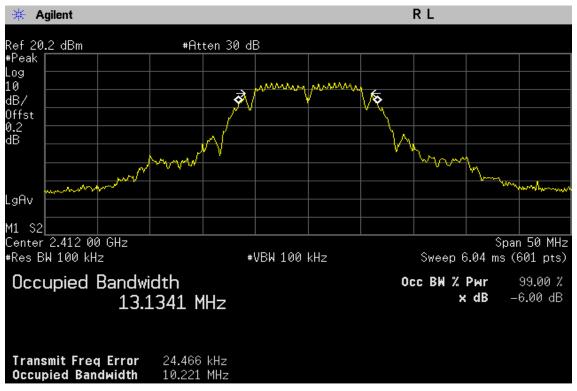
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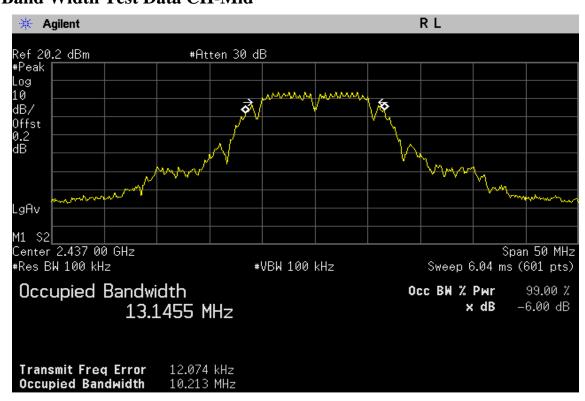
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802.11b 6dB Band Width Test Data CH-Low



#### 6dB Band Width Test Data CH-Mid



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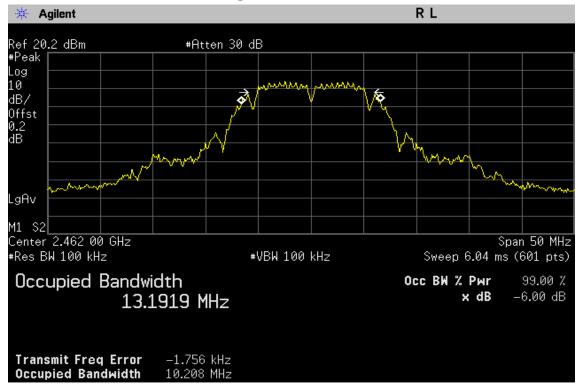
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# 6dB Band Width Test Data CH-High



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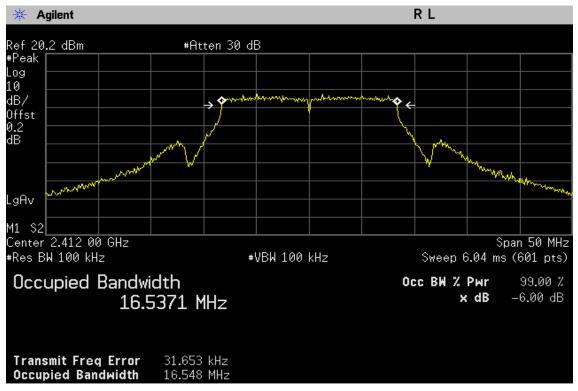
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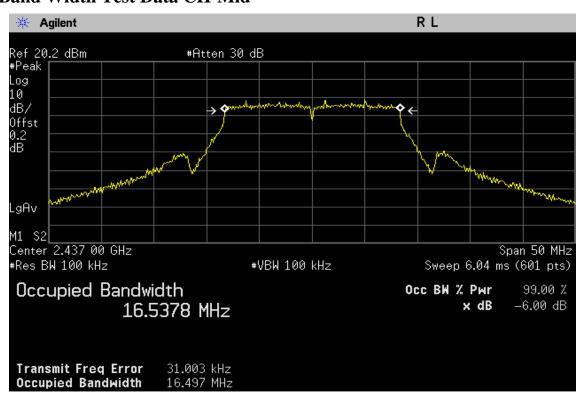
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802.11g 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



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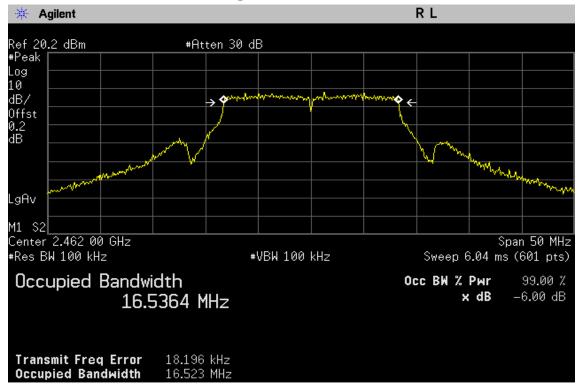
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# 6dB Band Width Test Data CH-High



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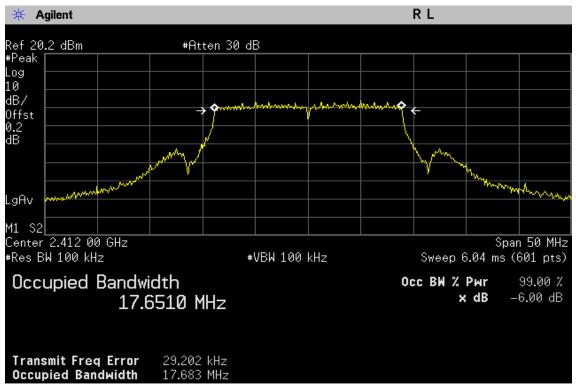
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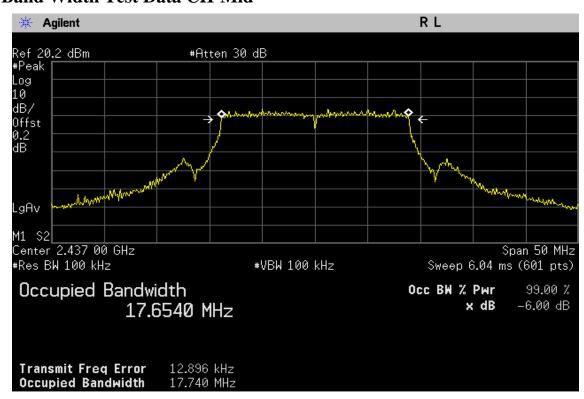
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# 802.11n\_20M, Chain0 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



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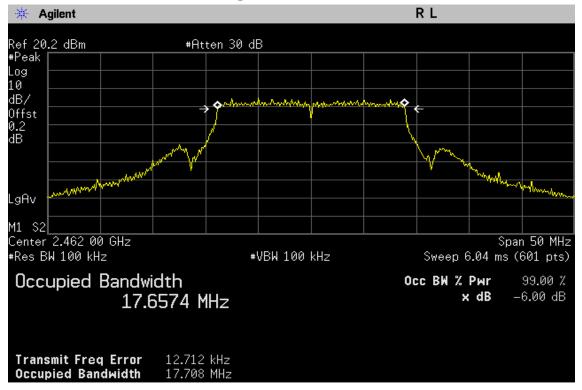
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# 6dB Band Width Test Data CH-High



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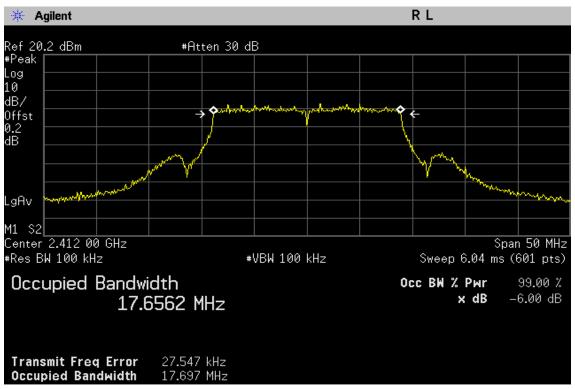
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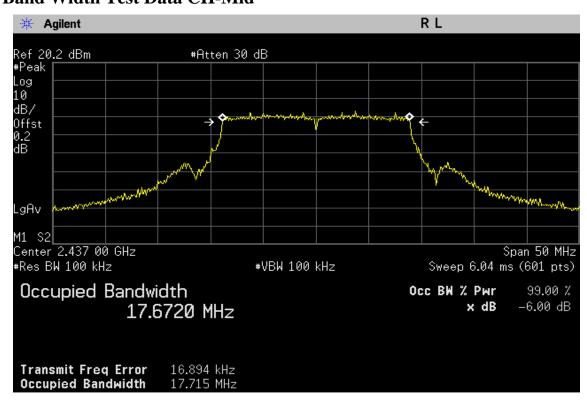
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# 802.11n\_20M, Chain 1 6dB Band Width Test Data CH-Low



#### 6dB Band Width Test Data CH-Mid



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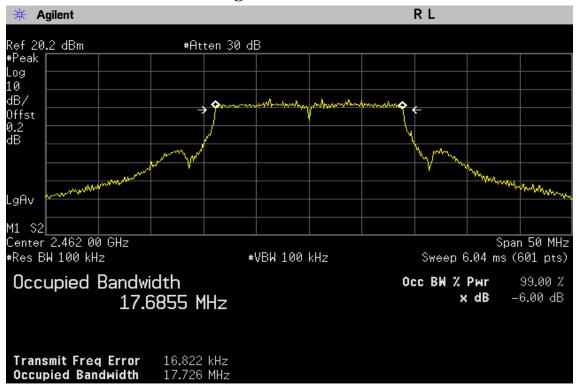
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# 6dB Band Width Test Data CH-High



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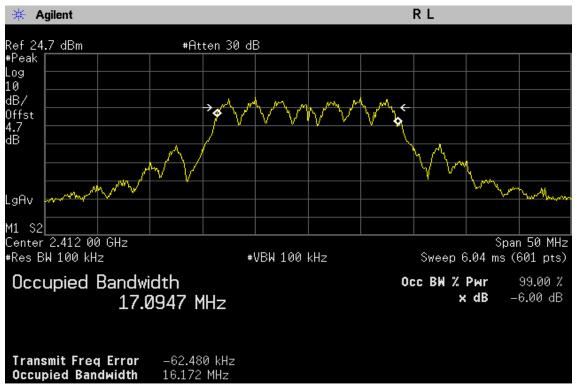
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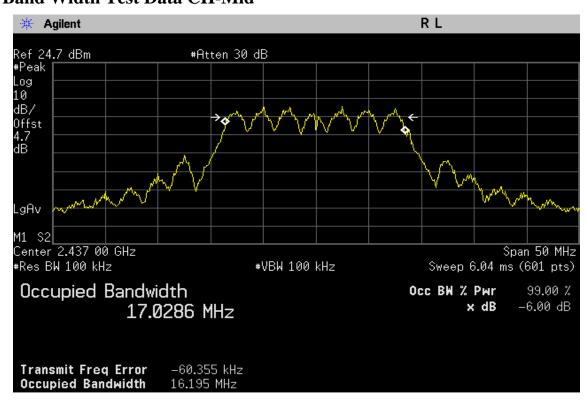
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# 802.11n\_20M, Combine, Chain0, Chain1 6dB Band Width Test Data CH-Low



#### 6dB Band Width Test Data CH-Mid



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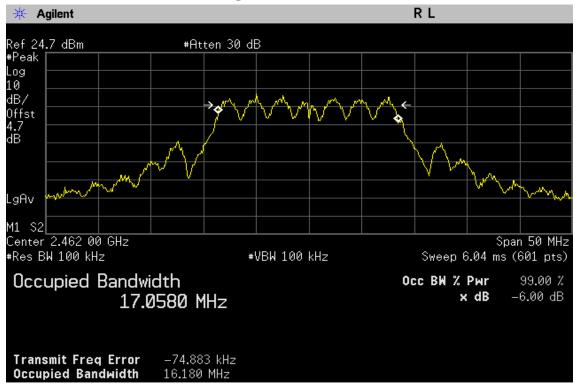
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# 6dB Band Width Test Data CH-High



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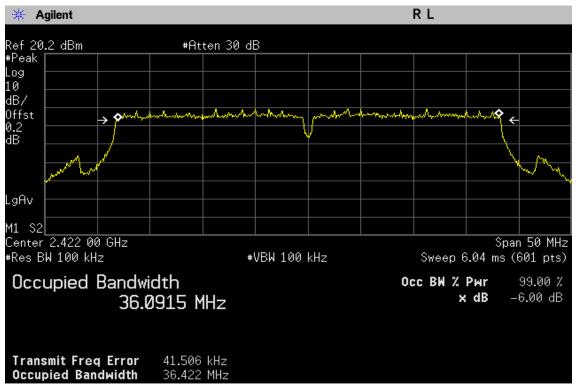
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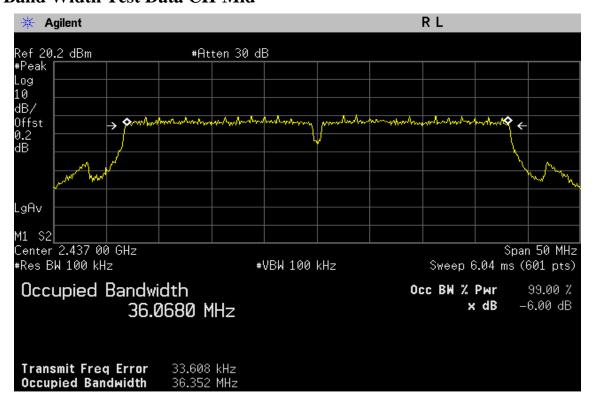
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# 802.11n\_40M, Chain0 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



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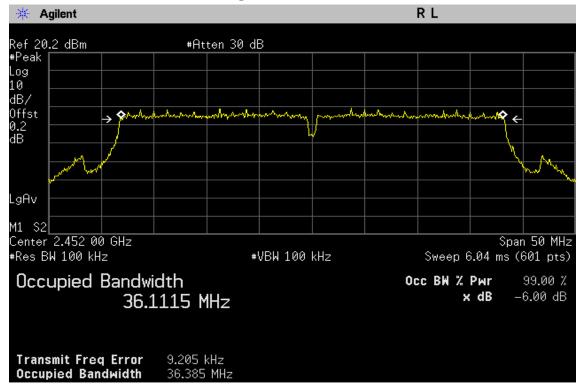
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# 6dB Band Width Test Data CH-High



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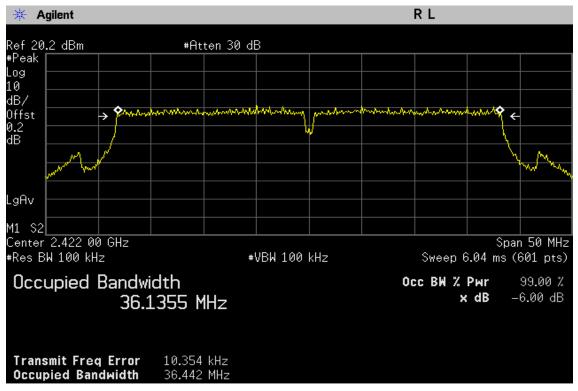
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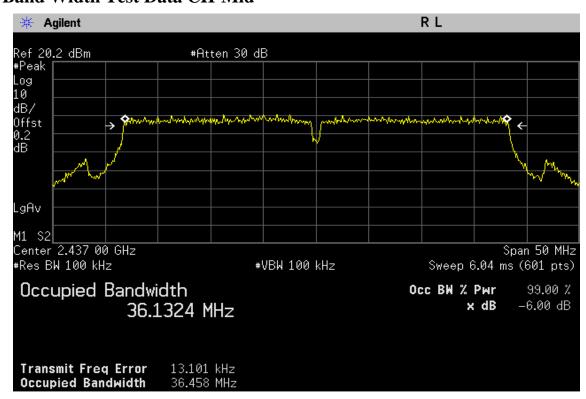
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# 802.11n\_40M, Chain1 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



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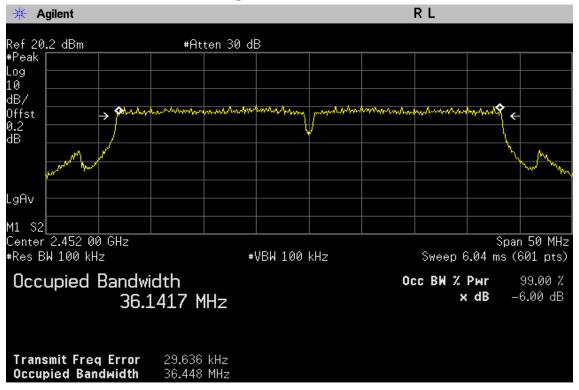
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# 6dB Band Width Test Data CH-High



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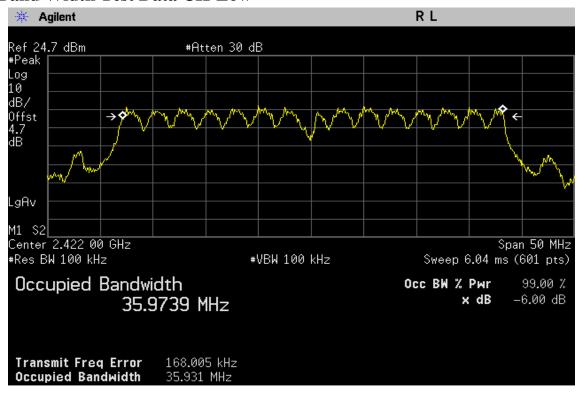
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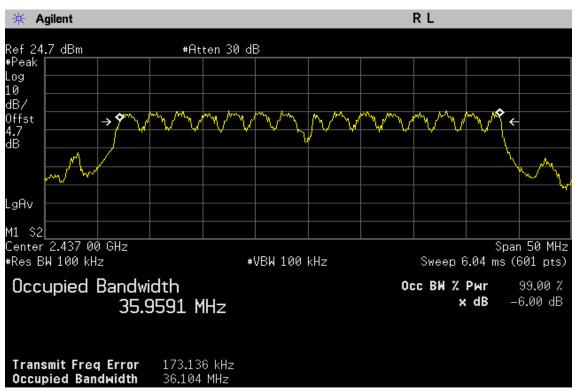
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# 802.11n\_40M, Combine, Chain0, Chain1 6dB Band Width Test Data CH-Low



#### 6dB Band Width Test Data CH-Mid



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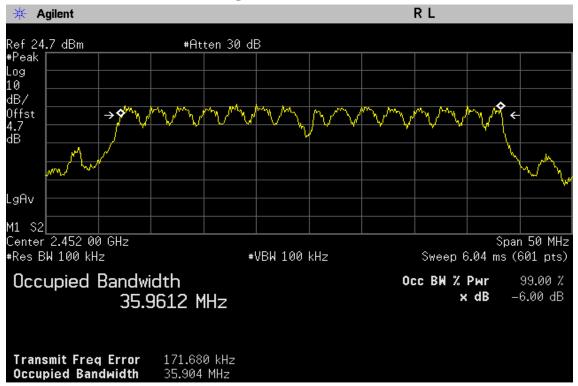
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# 6dB Band Width Test Data CH-High



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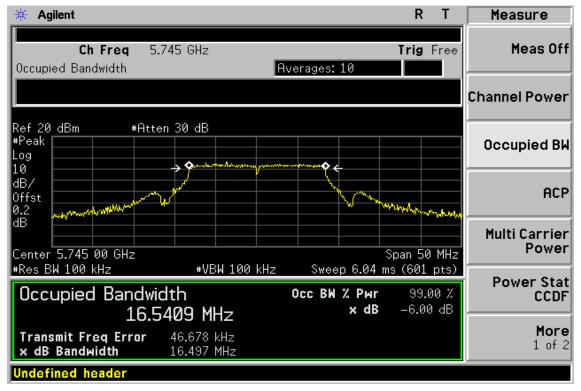


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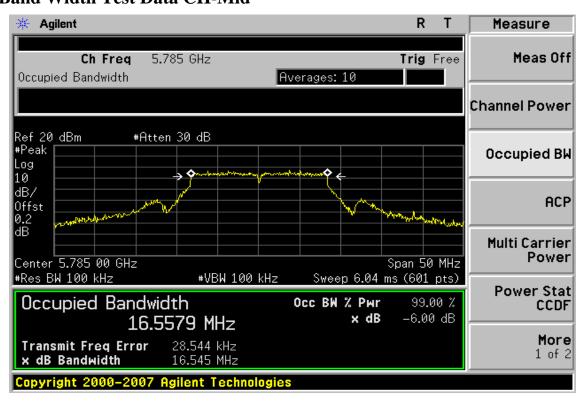
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#### 802.11a

### 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



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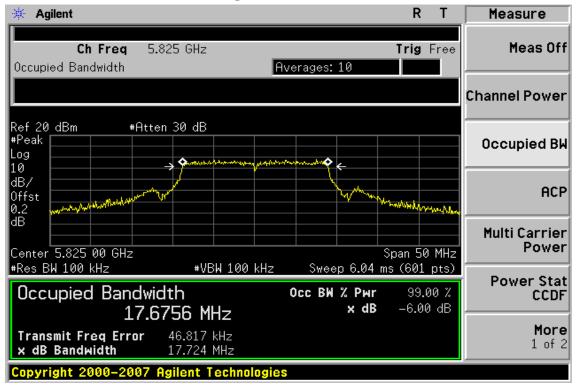
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## 6dB Band Width Test Data CH-High



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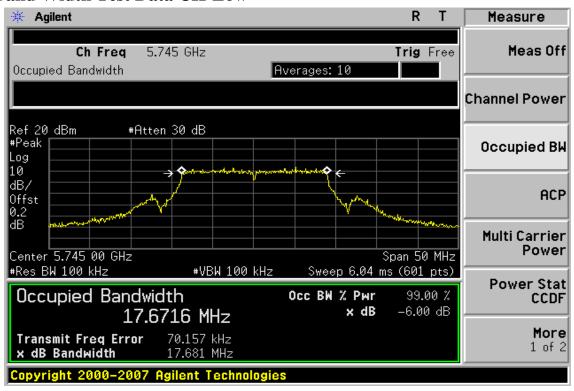
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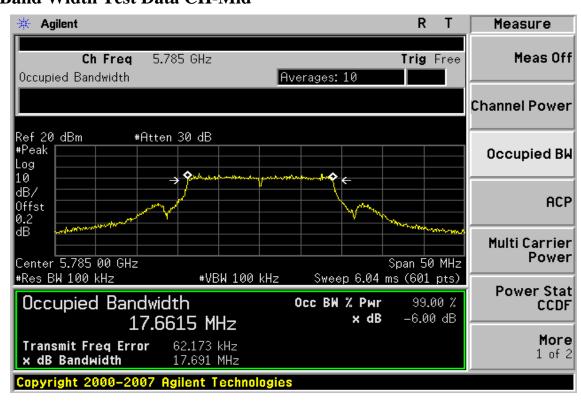
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# 802.11a/n 20M, Chain0 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



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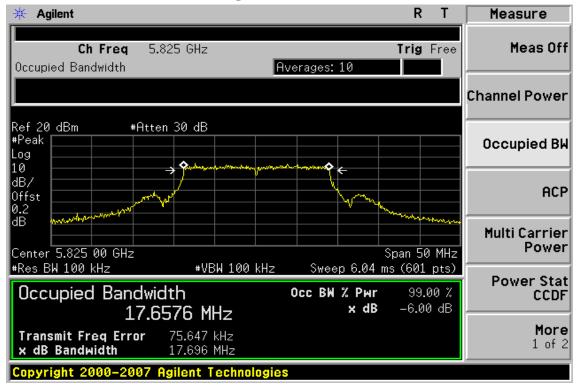
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## 6dB Band Width Test Data CH-High



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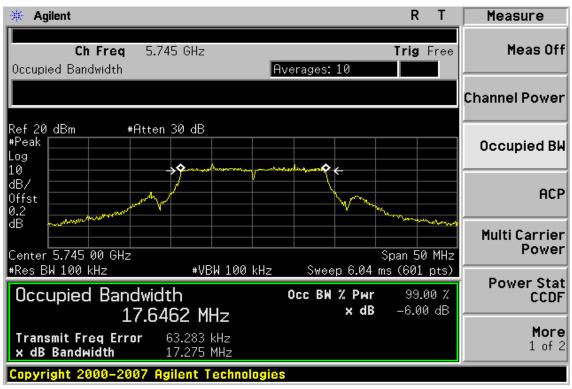
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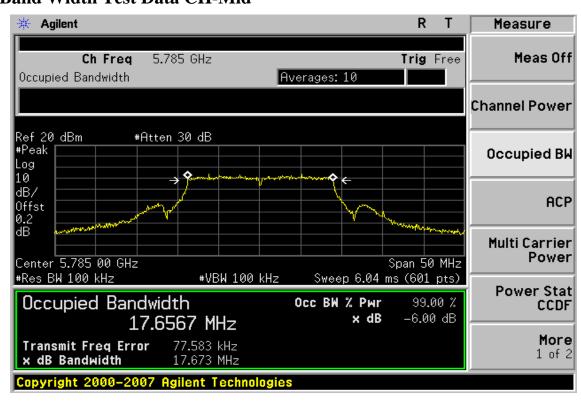
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# 802.11a/n\_20M, Chain 1 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



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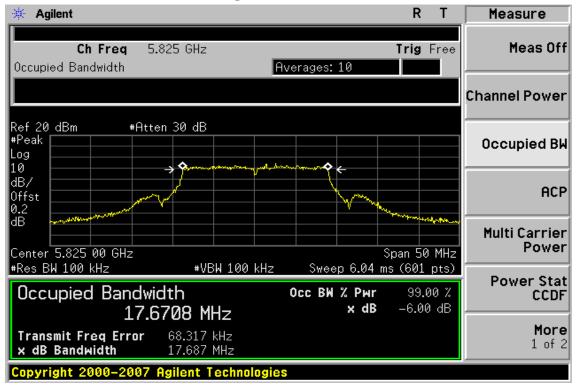
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## 6dB Band Width Test Data CH-High



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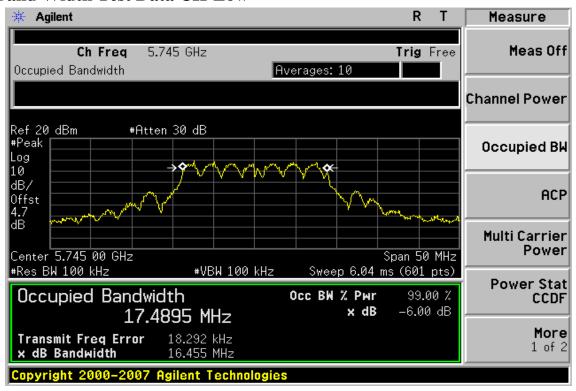
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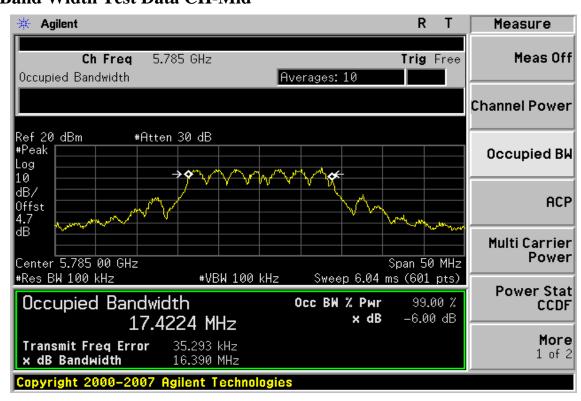
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# 802.11a/n\_20M, Combine, Chain0, Chain1 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



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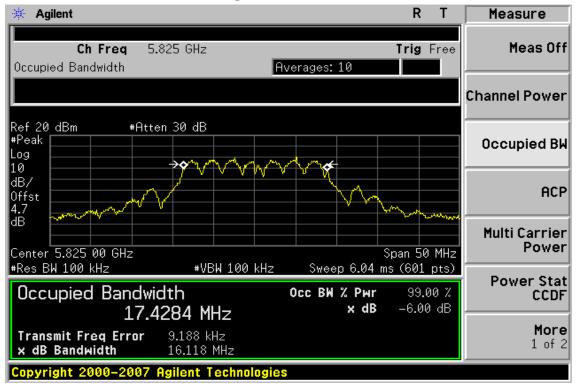
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## 6dB Band Width Test Data CH-High



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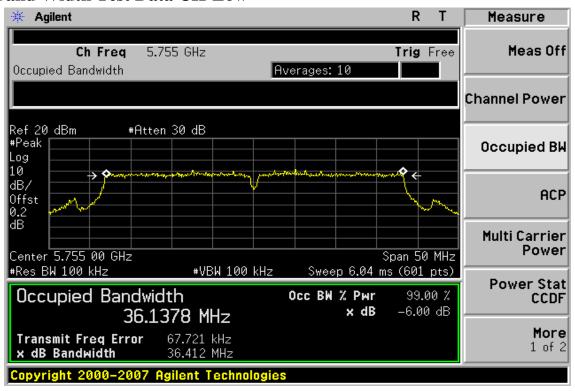
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# 802.11a/n\_40M, Chain0 6dB Band Width Test Data CH-Low



## 6dB Band Width Test Data CH-High



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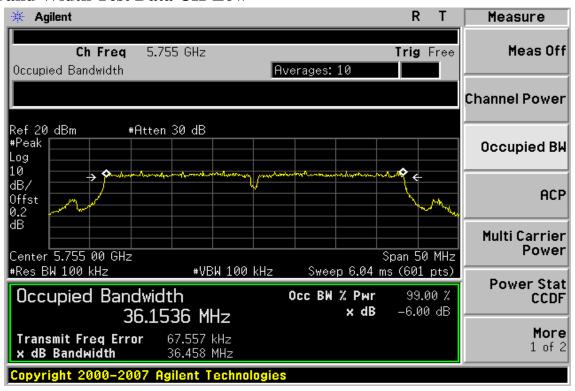
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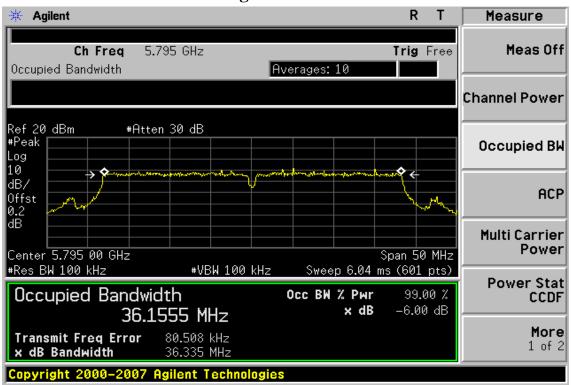
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# 802.11a/n\_40M, Chain 1 6dB Band Width Test Data CH-Low



## 66dB Band Width Test Data CH-High



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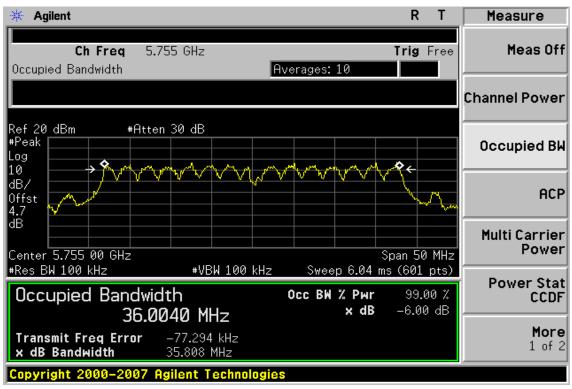
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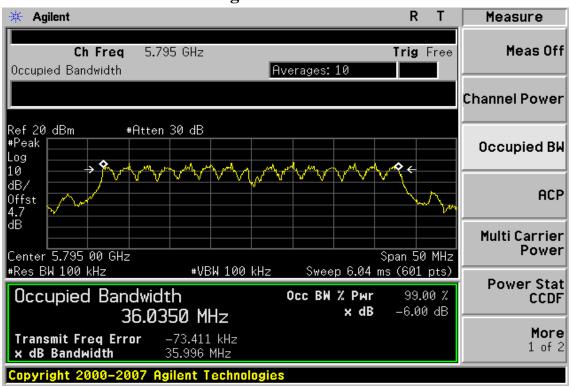
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# 802.11a/n\_40M, Combine, Chain0, Chain1 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-High



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### 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

### 8.1 Standard Applicable

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

According to RSS-210 issue 7,§A8.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

#### 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 spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW=100KHz, VBW=300KHz, Span=25MHz, Sweep = auto
- 5. Mark Peak, 2.390GHz and 2.488GHz and record the max. level.
- 6. Repeat above procedures until all frequency measured were complete.

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## 8.3 Measurement Equipment Used:

	Conducted Emission Test Site											
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.							
TYPE		NUMBER	NUMBER	CAL.								
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010							
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/23/2008	01/22/2010							
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010							
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010							
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010							
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010							
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010							
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010							

### 8.4 Measurement Result

Refer to attach spectrum analyzer data chart.

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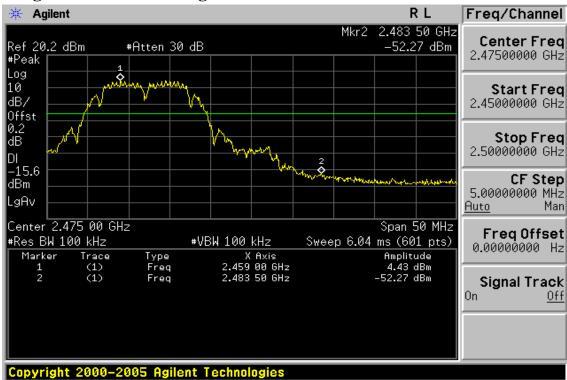
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# 802.11b **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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Radiated Emission: 802.11 b mode

Operation Mode TX CH Low Test Date Nov. 12, 2009

Fundamental Frequency 2412 MHz Test By Jim Tmperature 25  $^{\circ}$ C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBu V/n	<b>a</b> ) ( <b>dB</b> )	
2390.00	53.31	43.19	-1.39	51.92	41.80	74.00	54.00	-12.20	AV
Operation 1			H Low					Nov. 12, 2	.009
Fundament	tal Frequer	ncy 2412	MHz			Test	By	Jim	
Temperatu	re	25 °C				Pol		Hor.	
Humidity		65 %							

		Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
	Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
	(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
,	2390.00	55.23	44.75	-1.39	53.84	43.36	74.00	54.00	-10.64	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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Radiated Emission: 802.11 b mode

Operation Mode TX CH High Test Date Nov. 12, 2009

Fundamental Frequency 2462 MHz Test By Jim Temperature Pol Ver. 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	ıal FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	<b>a</b> ) ( <b>dB</b> )	
2483.50	53.11	44.38	-0.92	52.19	43.46	74.00	54.00	-10.54	AV
Operation 1	Mode	TX C	CH High			Test	Date	Nov. 12, 2	009
Fundament	tal Frequer	ncy 2462	MHz			Test	By	Jim	
Temperatu	re	25 °C				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
2483.50	55.93	46.31	-0.92	55.01	45.39	74.00	54.00	-8.61	ΑV

#### Remark:

- Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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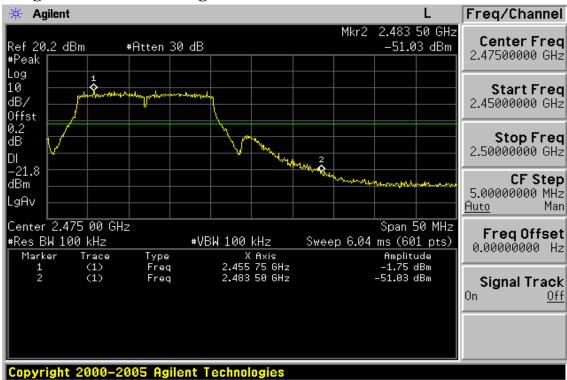
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802.11g **Band Edges Test Data CH-Low** 



## **Band Edges Test Data CH-High**



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Radiated Emission: 802.11 g mode

Operation Mode TX CH Low Test Date Nov. 12, 2009

Fundamental Frequency 2412 MHz Test By Jim **Tmperature** Pol Ver. 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBu V/n	<b>a</b> ) ( <b>dB</b> )	
2390.00	53.71	43.05	-1.39	52.32	41.66	74.00	54.00	-12.34	AV
Operation 1			H Low					Nov. 12, 2	.009
Fundament	tal Frequer	ncy 2412	MHz			Test	By	Jim	
Temperatu	re	25 °C				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2390.00	56.09	45.49	-1.39	54.70	44.10	74.00	54.00	-9.90	AV

#### Remark:

- Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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Radiated Emission: 802.11 g mode

Operation Mode TX CH High Test Date May. 12, 2009

Fundamental Frequency 2462 MHz Test By Sky Temperature 25 °C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	ıal FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBu V/n	n) ( <b>dB</b> )	
2483.50	53.62	42.28	-0.92	52.70	41.36	74.00	54.00	-12.64	AV
Operation 1	Mode	TX C	H High			Test	Date	May. 12, 2	2009
Fundament	tal Frequer	ncy 2462	MHz			Test	By	Sky	
Temperatu	re	25 °C				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	)(dBuV/m)	(dB)	
2483.50	57.67	48.13	-0.92	56.75	47.21	74.00	54.00	-6.79	ΑV

### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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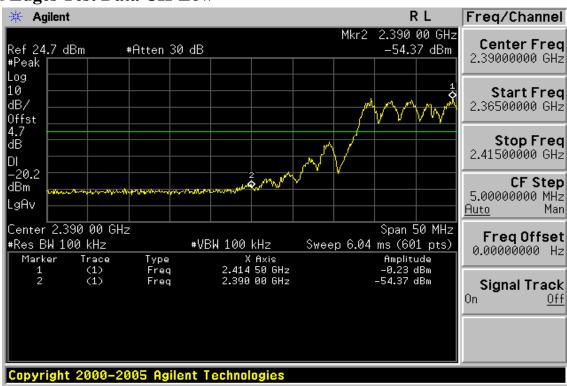
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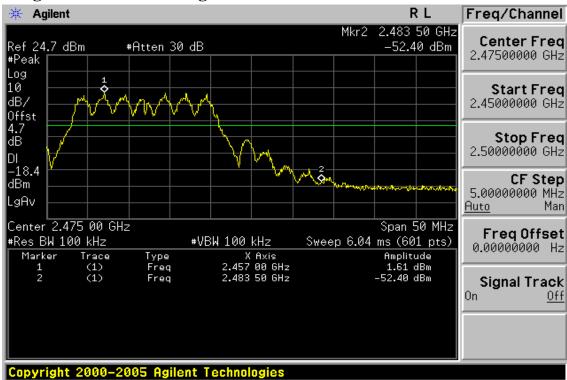
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# 802.11n\_20M, Combine, Chain0, Chain1 **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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### Radiated Emission: 802.11 n\_20M mode, Combine, Chain1, Chain1

Operation Mode TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412 MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	<b>1</b> ) ( <b>dB</b> )	
2390.00	53.38	43.05	-1.39	51.99	41.66	74.00	54.00	-12.34	AV
Operation 1			H Low					Nov. 22, 2	009
Fundament	_	•	MHz			Test	Ву	Jim	
Temperatu	re	25 ℃				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2390.00	54.36	45.71	-1.39	52.97	44.32	74.00	54.00	-9.68	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Emission: 802.11 n 20M mode Combine, Chain0, Chain1

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462 MHz Test By Jim Temperature  $25 \,^{\circ}\text{C}$  Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	ıal FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	( <b>dB</b> )	
2483.50	53.73	43.86	-0.92	52.81	42.94	74.00	54.00	-11.06	ΑV

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462 MHz Test By Jim Temperature 25 °C Pol Hor.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	)(dBuV/m	( <b>dB</b> )	
2483.50	54.77	45.64	-0.92	53.85	44.72	74.00	54.00	-9.28	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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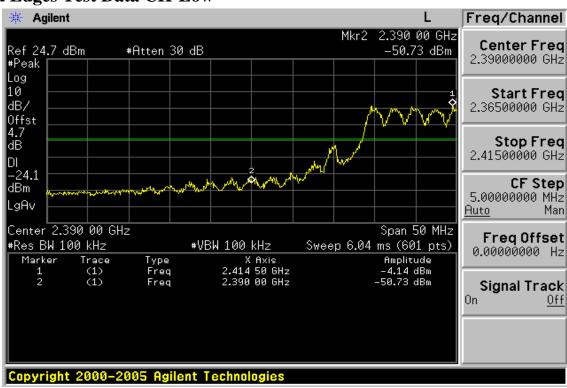
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# 802.11n\_40M, Combine, Chain0, Chain1 **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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### Radiated Emission: 802.11 n 40M mode, Combine, Chain1, Chain1

Operation Mode TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2422 MHz Test By Jim Temperature 25 °C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
2390.00	52.89	41.33	-1.39	51.50	39.94	74.00	54.00	-14.06	ΑV

Operation Mode TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2442 MHz Test By Jim Temperature 25 °C Pol Hor.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m	) <b>(dB)</b>	
2390.00	55.67	46.37	-1.39	54.28	44.98	74.00	54.00	-9.02	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Emission: 802.11 n 40M mode Combine, Chain0, Chain1

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2452 MHz Test By Jim Temperature  $25 \,^{\circ}\text{C}$  Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	ıal FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
2483.50	53.53	43.85	-0.92	52.61	42.93	74.00	54.00	-11.07	ΑV

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2452 MHz Test By Jim Temperature 25 °C Pol Hor.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2483.50	56.99	47.24	-0.92	56.07	46.32	74.00	54.00	-7.68	ΑV
2487.45	60.94	51.41	-0.92	60.02	50.49	74.00	54.00	-3.51	AV

### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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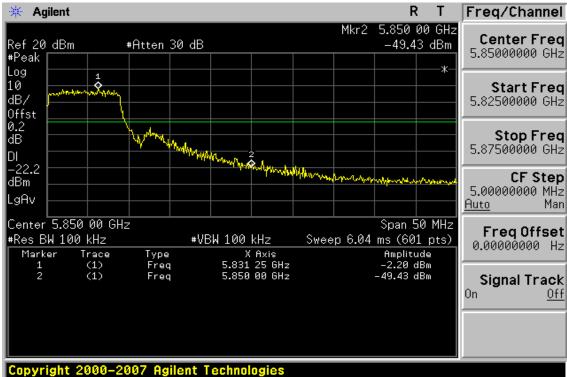
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# 802.11a **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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Radiated Emission: 802.11 a mode

Operation Mode TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5745 MHz Test By Jim Tmperature 25  $^{\circ}$ C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	<b>a</b> ) ( <b>dB</b> )	
5725.00	49.05	39.24	8.03	57.08	47.27	74.00	54.00	-6.73	AV
Operation 1	Mode	TX C	H Low			Test	Date	Nov. 22, 2	009
Fundament	tal Frequer	ncy 5745	MHz			Test	By	Jim	
Temperatu	re	25 °C				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{AV}$		Actu	ıal FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	)(dBuV/m)	(dB)	
5725.00	56.39	44.79	8.03	64.42	52.82	74.00	54.00	-1.18	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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#### Radiated Emission: 802.11 a mode

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 5825 MHz Test By Jim Temperature  $25 \text{ }^{\circ}\text{C}$  Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Acti	ual FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m	) (dBuV/m)	(dBuV/m)	(dBu V/n	<b>a</b> ) ( <b>dB</b> )	
5850.00	48.51	39.72	8.39	56.90	48.11	74.00	54.00	-5.89	AV
Operation 1	Mode	TX C	H High			Test	Date	Nov. 22, 2	009
Fundament	al Frequer	ncy 5825	MHz			Test	By	Jim	
Temperatur	re	25 °C				Pol		Hor.	
Humidity		65 %							

		Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
	Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
	(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
,	5850.00	51.93	42.37	8.39	60.32	50.76	74.00	54.00	-3.24	ΑV
	5851.95	54.82	44.56	8.39	63.21	52.95	74.00	54.00	-1.05	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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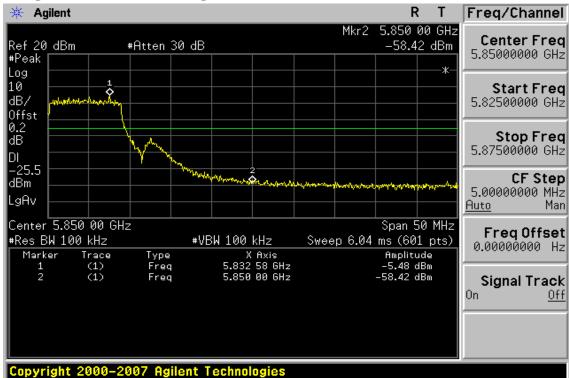
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# 802.11a/n 20M, Chain0 **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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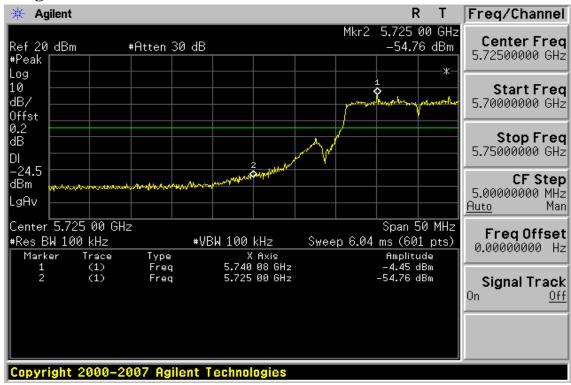
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# 802.11a/n 20M, Chain1 **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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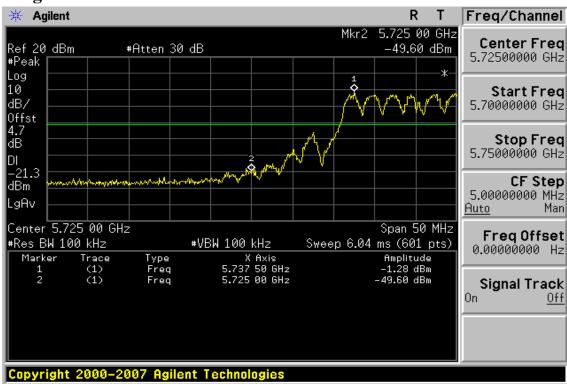
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# 802.11a/n\_20M, Combine, Chain0, Chain1 **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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### Radiated Emission: 802.11a/n\_20M mode, Combine, Chain1, Chain1

Operation Mode TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5745 MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	<b>1</b> ) ( <b>dB</b> )	
5725.00	49.62	41.25	8.03	57.65	49.28	74.00	54.00	-4.72	AV
Operation 1	Mode	TX C	H Low			Test	Date	Nov. 22, 2	009
Fundament	tal Frequer	ncy 5745	MHz			Test	Ву	Jim	
Temperatu	re	25 ℃				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{AV}$		Actu	ıal FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
5725.00	49.52	41.83	8.03	57.55	49.86	74.00	54.00	-4.14	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Emission: 802.11a/n 20M mode Combine, Chain1, Chain1

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 5825 MHz Test By Jim Temperature  $25 \,^{\circ}\text{C}$  Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
5850.00	36.00	38.68	8.39	44.39	47.07	74.00	54.00	-6.93	ΑV

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 5825 MHz Test By Jim Temperature 25 °C Pol Hor.

Humidity 65 %

	Peak	$\mathbf{AV}$		<b>Actual FS</b>		Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
5850.00	49.06	41.29	8.39	57.45	49.68	74.00	54.00	-4.32	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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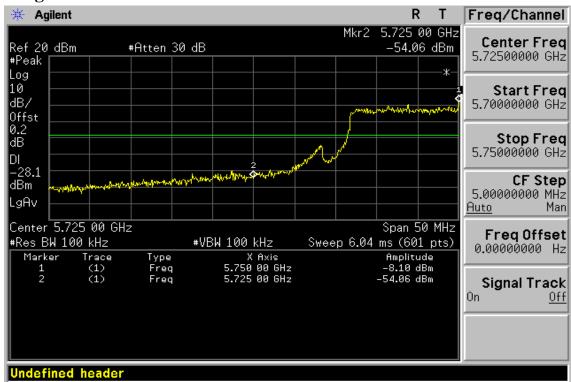
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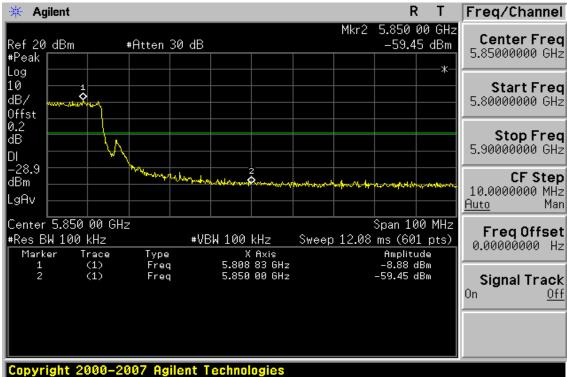
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# 802.11a/n 40M, Chain0 **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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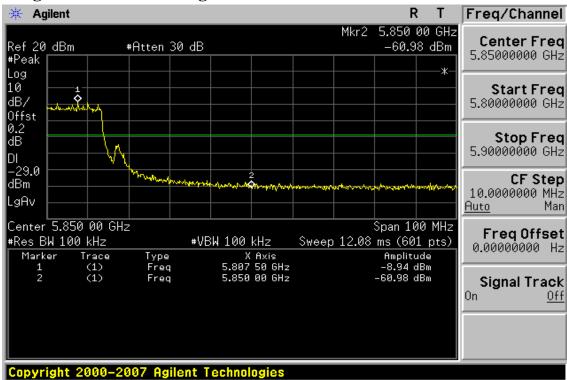
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# 802.11a/n 40M, Chain1 **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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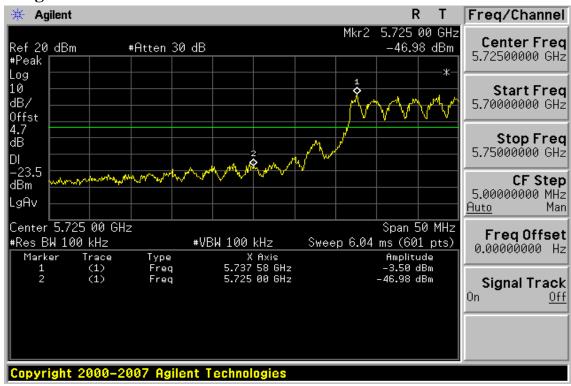
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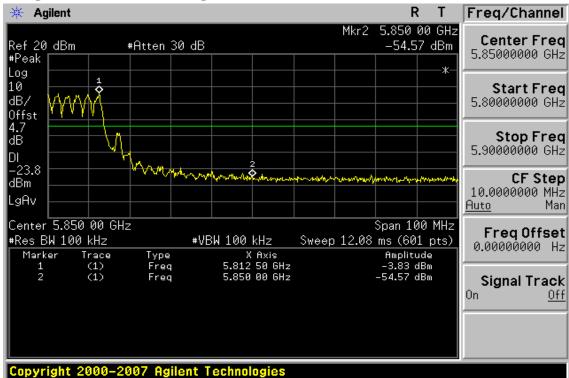
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# 802.11a/n\_40M, Combine, Chain0, Chain1 **Band Edges Test Data CH-Low**



## **Band Edges Test Data CH-High**



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### Radiated Emission: 802.11a/n\_40M mode, Combine, Chain1, Chain1

Operation Mode TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5725 MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	ıal FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
5725.00	49.07	39.44	8.03	57.10	47.47	74.00	54.00	-6.53	ΑV

Operation Mode TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5725 MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Hor.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
5725.00	49.99	41.87	8.03	58.02	49.90	74.00	54.00	-4.10	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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#### Radiated Emission: 802.11 a/n 40M mode Combine, Chain0, Chain1

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency  $5825 \, \text{MHz}$  Test By Jim Temperature  $25 \, ^{\circ}\text{C}$  Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	ıal FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	(dB)	
5850.00	48.54	38.97	8.39	56.93	47.36	74.00	54.00	-6.64	ΑV

Operation Mode TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 5825 MHz Test By Jim Temperature 25 °C Pol Hor.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
5850.00	48.69	39.76	8.39	57.08	48.15	74.00	54.00	-5.85	ΑV

#### Remark:

- (1) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### SPURIOUS RADIATED EMISSION TEST

### 9.1 Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

According to RSS-210 issue 7,§A8.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

## 9.2 EUT Setup

- The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-2003.
- The EUT was put in the front of the test table. The rear of the EUT and peripherals were 2 placed flushed with the rear of the tabletop.
- The spacing between the peripherals was 10 centimeters.
- External I/O cables were draped along the edge of the test table and bundle when necessary.

#### 9.3 Measurement Procedure

- The EUT was placed on a turn table which is 0.8m above ground plane.
- 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.
- When 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.
- Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measured were complete.

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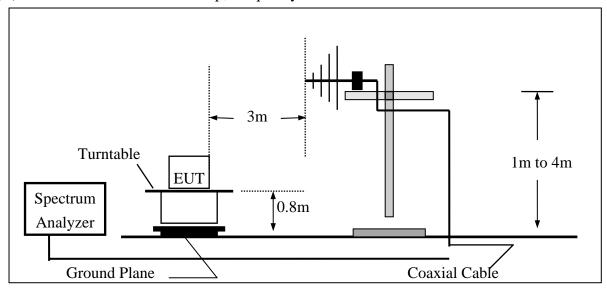


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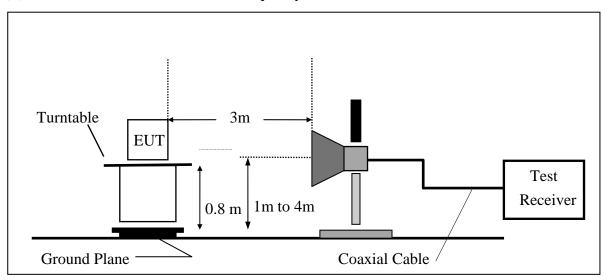
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#### 9.1 **Test SET-UP (Block Diagram of Configuration)**

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



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



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#### 9.2 **Measurement Equipment Used:**

966 Chamber									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010				
Loop antenna	MESSTEC	FLA30	03/10086	07/08/2009	07/07/2011				
Bilog Antenna	SCHWAZBECK	VULB9160	3158	11/29/2007	11/28/2009				
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010				
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009				
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010				
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	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010				
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010				
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010				

#### 9.3 **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	

#### 9.4 **Measurement Result**

Refer to attach tabular data sheets.

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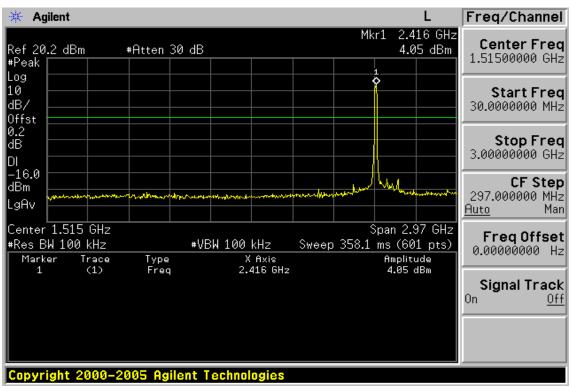
f (886-2) 2298-0488



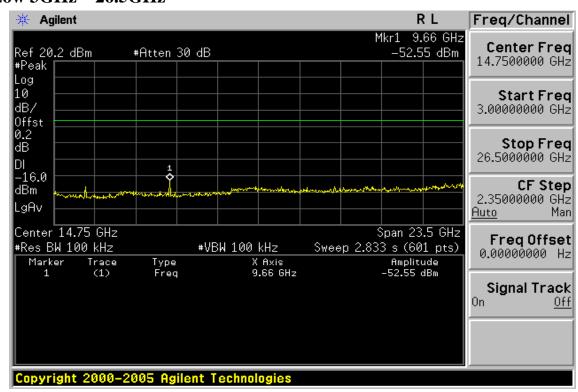
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# **Conducted Spurious Emission Measurement Result (802.11b)** Ch Low 30MHz - 3GHz



#### Ch Low 3GHz – 26.5GHz



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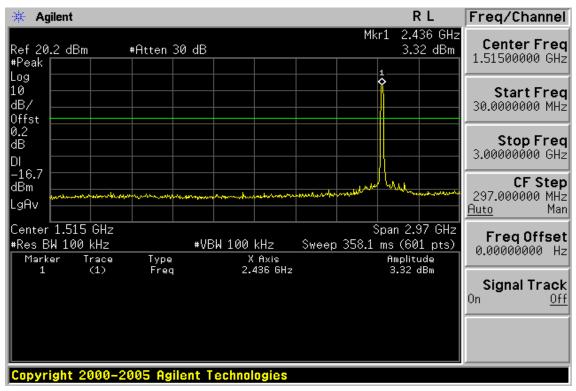
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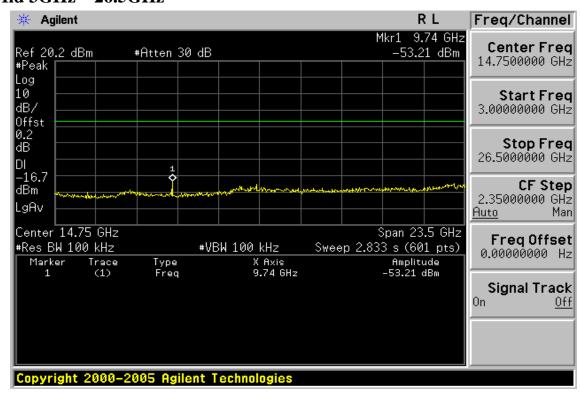
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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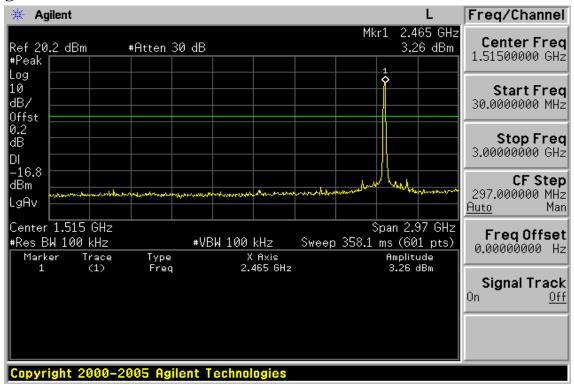
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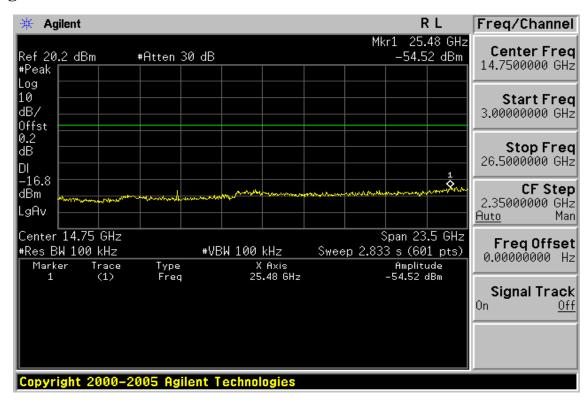
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## Ch High 30MHz - 3GHz



### Ch High 3GHz – 26.5GHz



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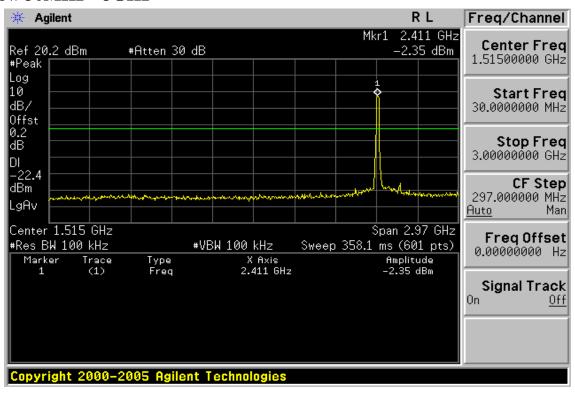
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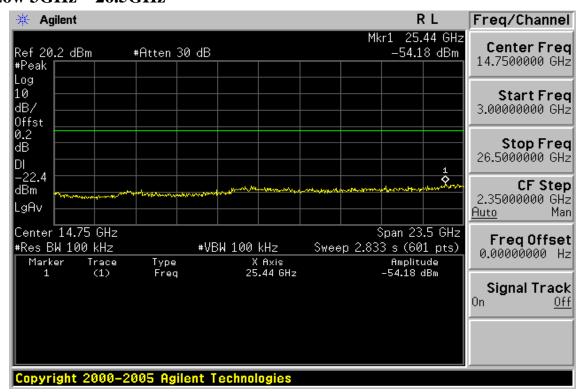
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# Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz – 3GHz



#### Ch Low 3GHz – 26.5GHz



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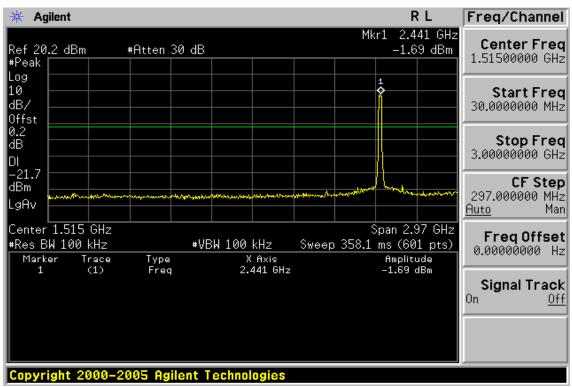
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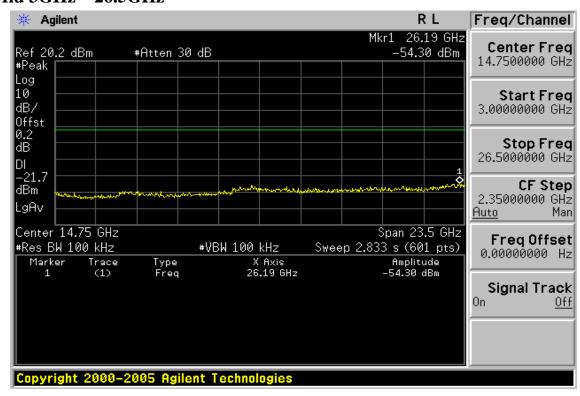
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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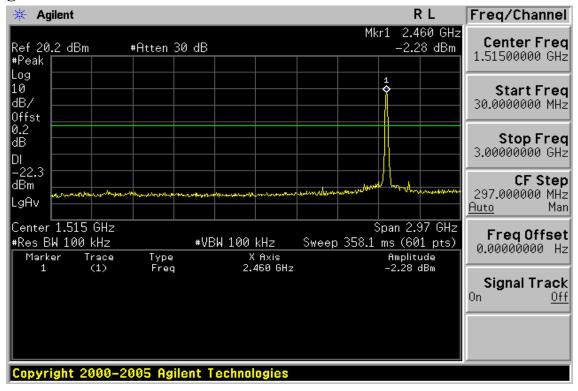
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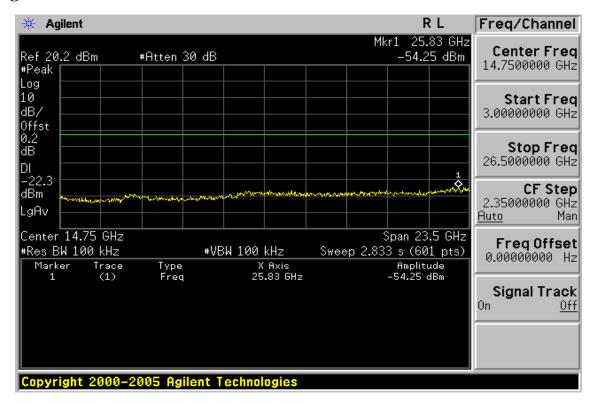
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## Ch High 30MHz - 3GHz



### Ch High 3GHz – 26.5GHz



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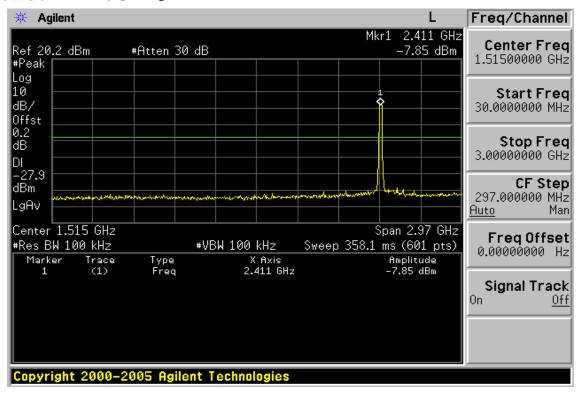
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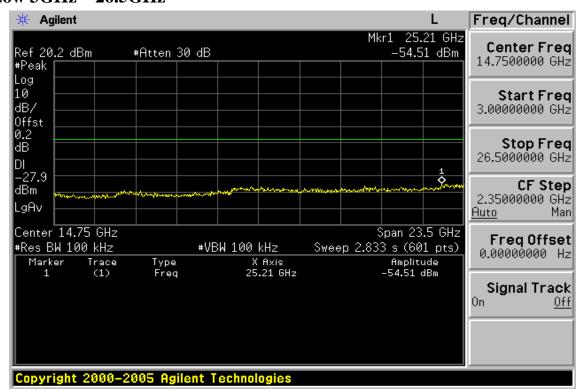
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# Conducted Spurious Emission Measurement Result (802.11n\_20M), Chain0 Ch Low 30MHz – 3GHz C



#### Ch Low 3GHz – 26.5GHz



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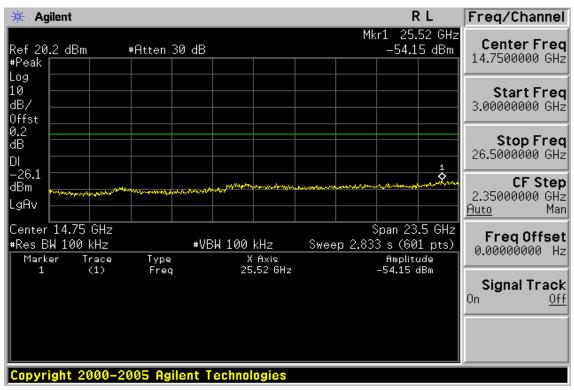
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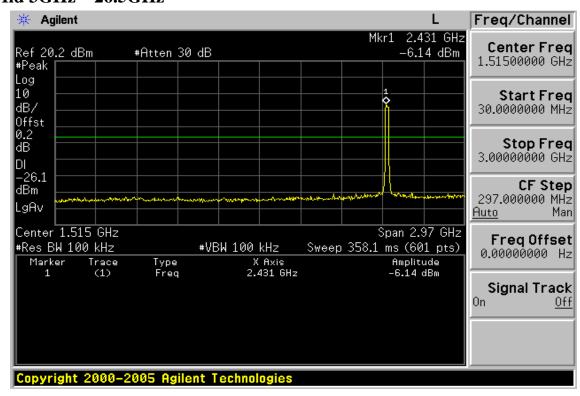
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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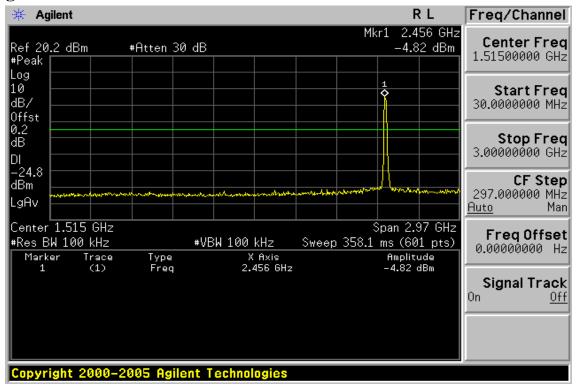
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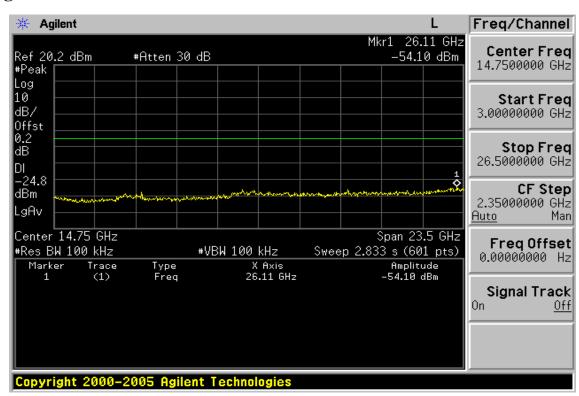
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## Ch High 30MHz - 3GHz



### Ch High 3GHz – 26.5GHz



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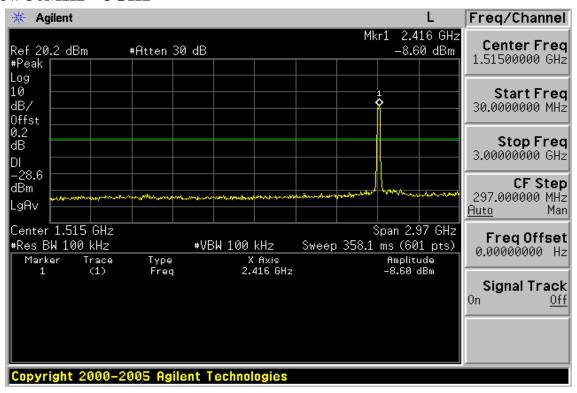
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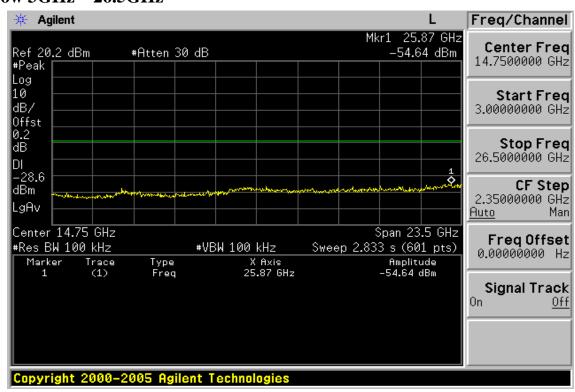
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# Conducted Spurious Emission Measurement Result (802.11n\_20M), Chain1 Ch Low 30MHz - 3GHz



#### Ch Low 3GHz – 26.5GHz



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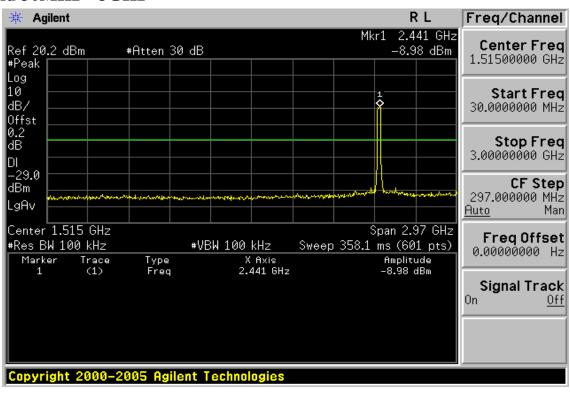
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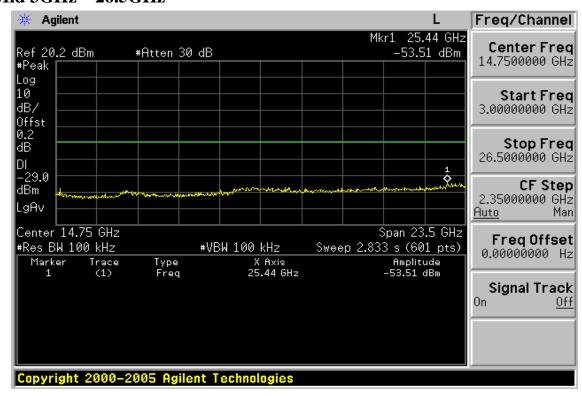
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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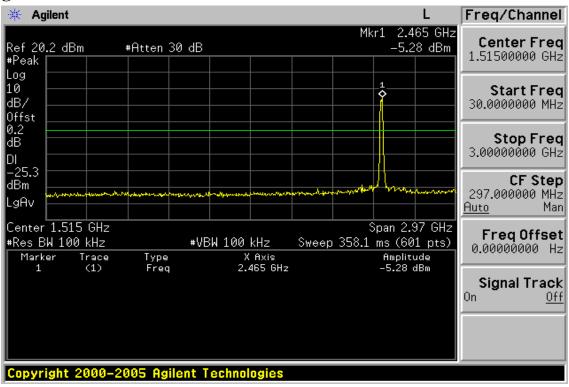
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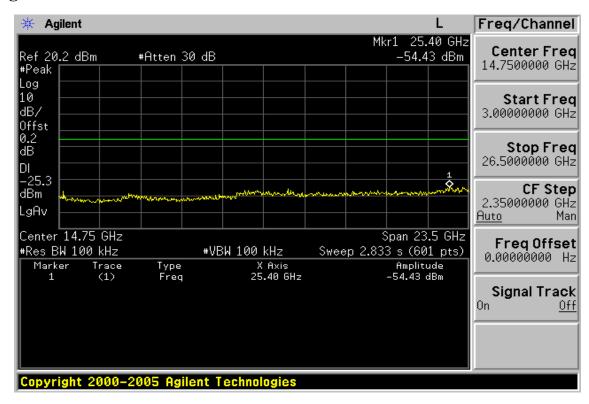
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## Ch High 30MHz - 3GHz



### Ch High 3GHz – 26.5GHz



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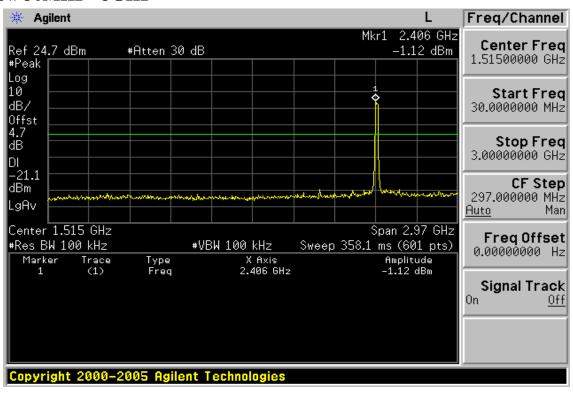
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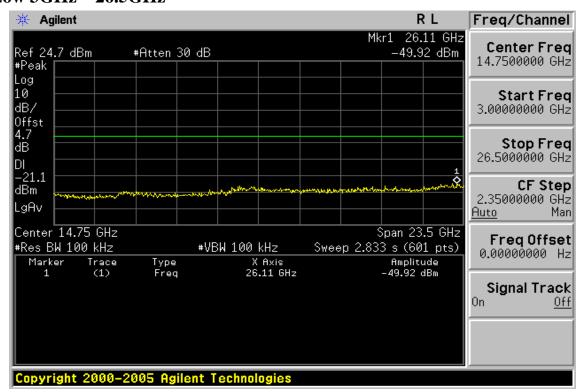
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# Conducted Spurious Emission Measurement Result (802.11n\_20M), Combine Ch Low 30MHz - 3GHz



#### Ch Low 3GHz – 26.5GHz



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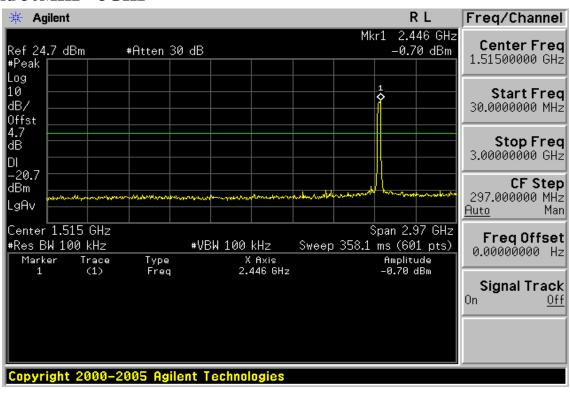
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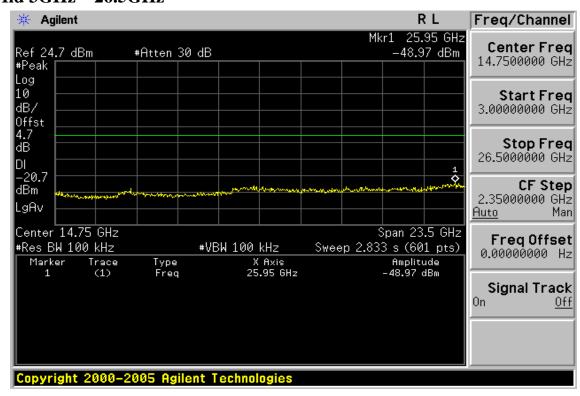
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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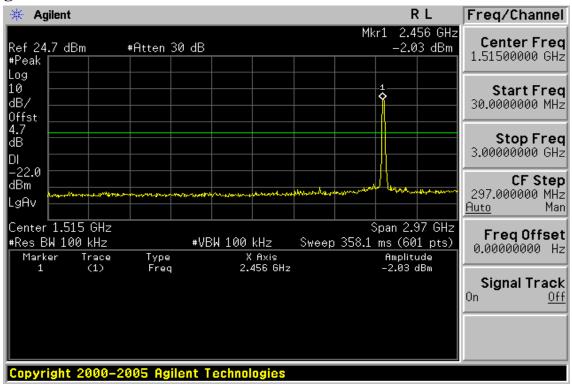
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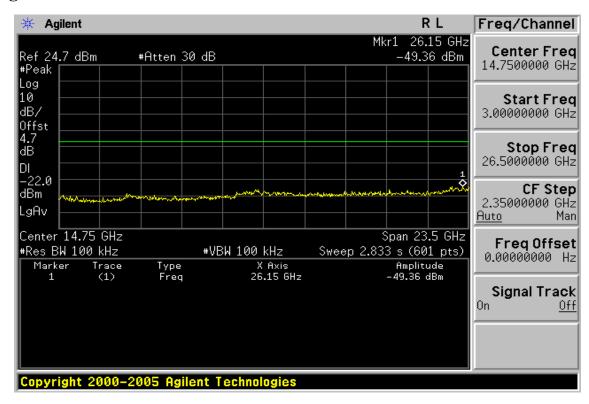
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## Ch High 30MHz - 3GHz



### Ch High 3GHz – 26.5GHz



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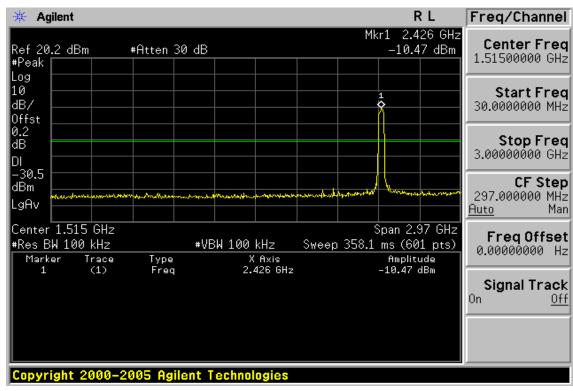
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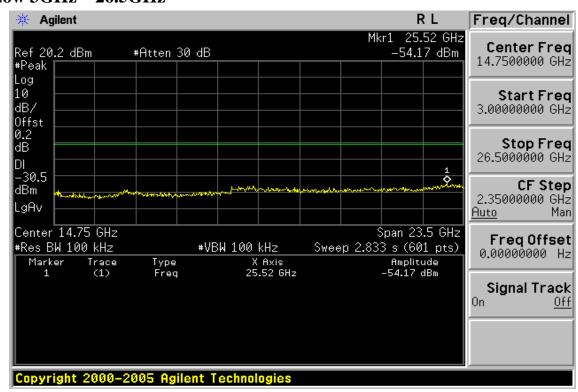
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# Conducted Spurious Emission Measurement Result (802.11n\_40M), Chain0 Ch Low 30MHz - 3GHz



#### Ch Low 3GHz – 26.5GHz



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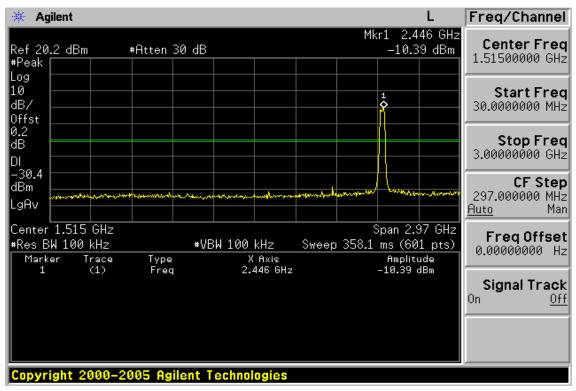
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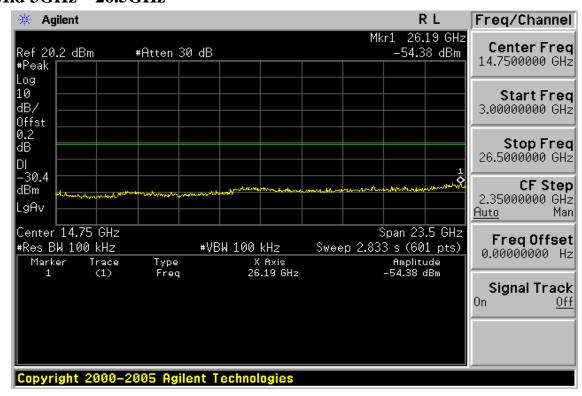
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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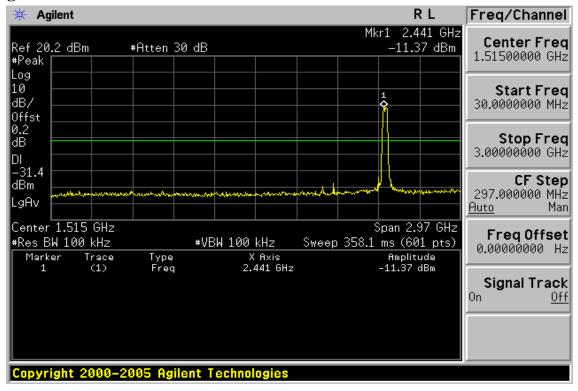
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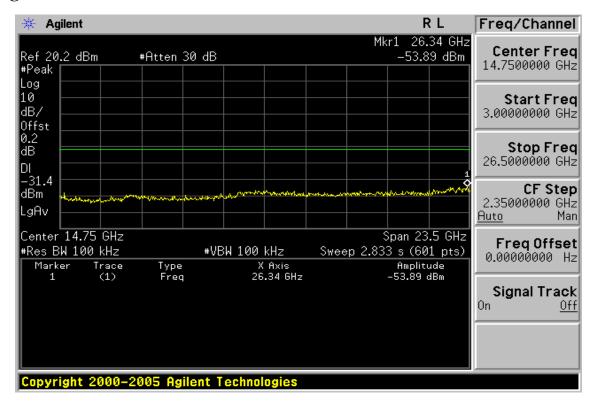
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## Ch High 30MHz - 3GHz



### Ch High 3GHz – 26.5GHz



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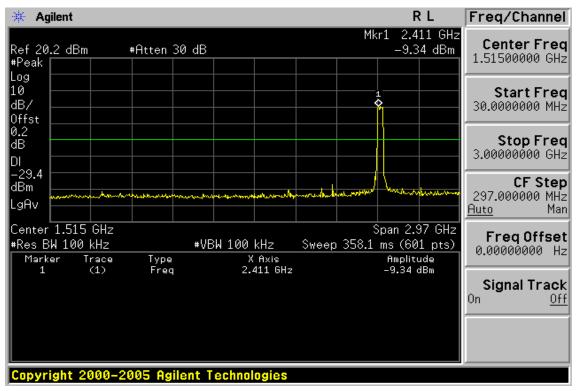
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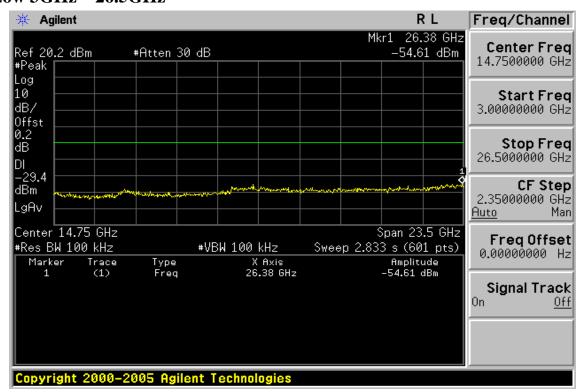
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# Conducted Spurious Emission Measurement Result (802.11n\_40M), Chain1 Ch Low 30MHz - 3GHz



#### Ch Low 3GHz – 26.5GHz



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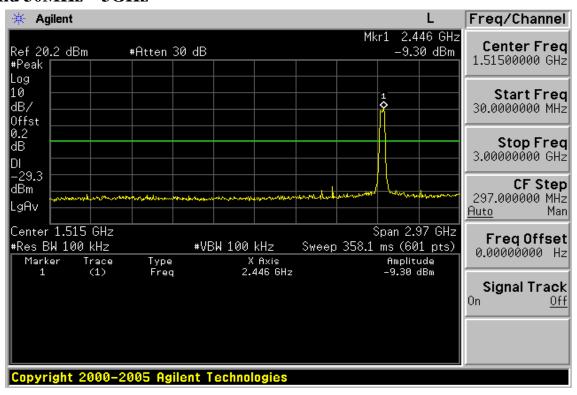
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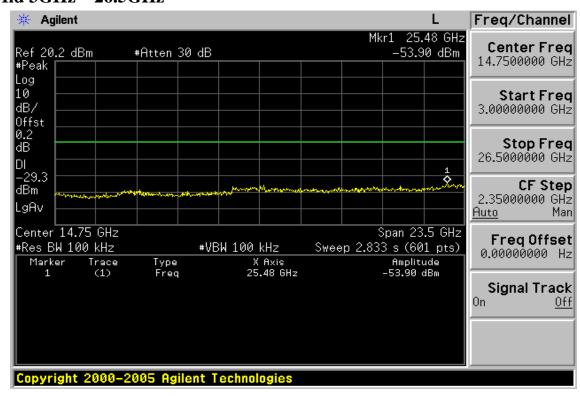
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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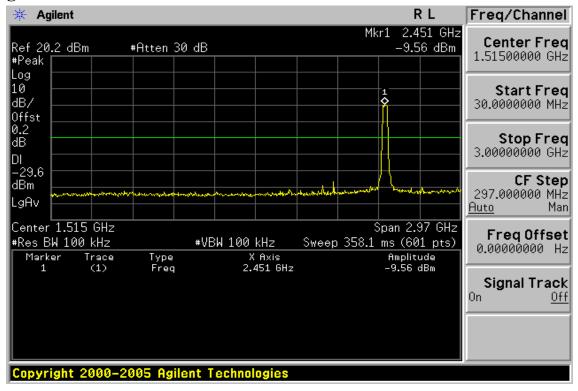
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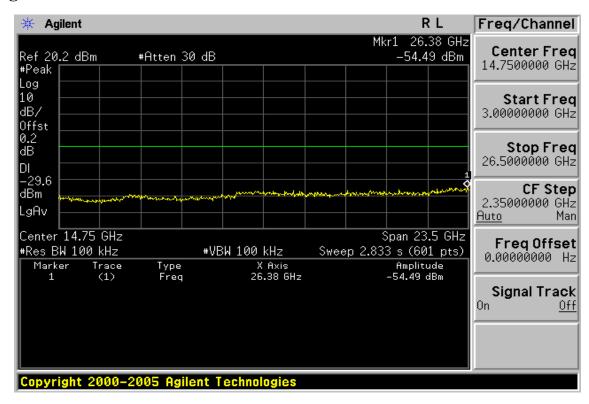
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## Ch High 30MHz - 3GHz



### Ch High 3GHz – 26.5GHz



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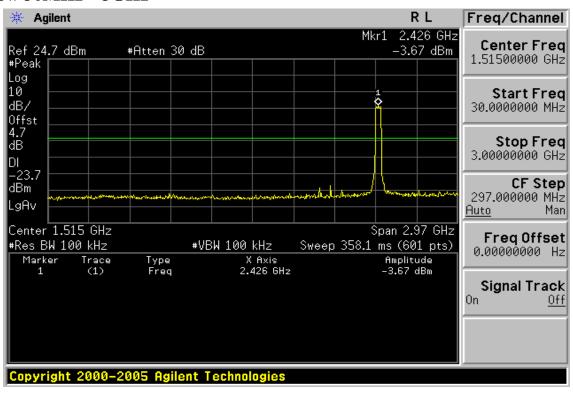
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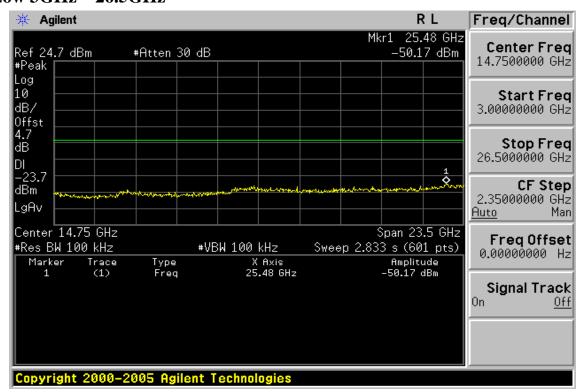
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# Conducted Spurious Emission Measurement Result (802.11n\_40M), Combine Ch Low 30MHz - 3GHz



#### Ch Low 3GHz – 26.5GHz



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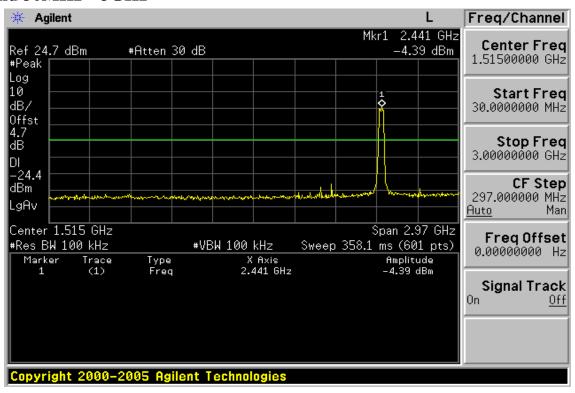
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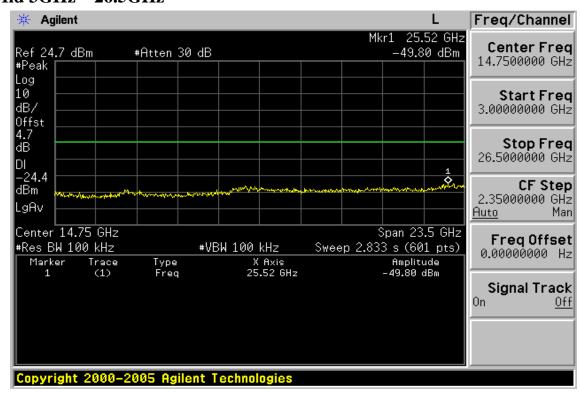
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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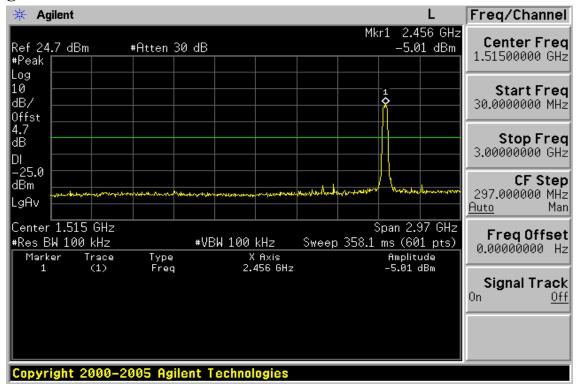
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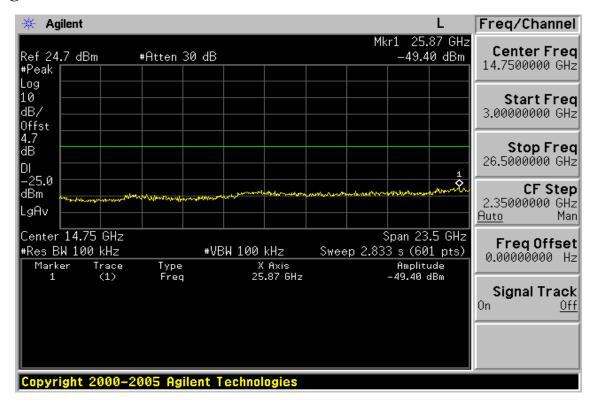
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## Ch High 30MHz - 3GHz



### Ch High 3GHz – 26.5GHz



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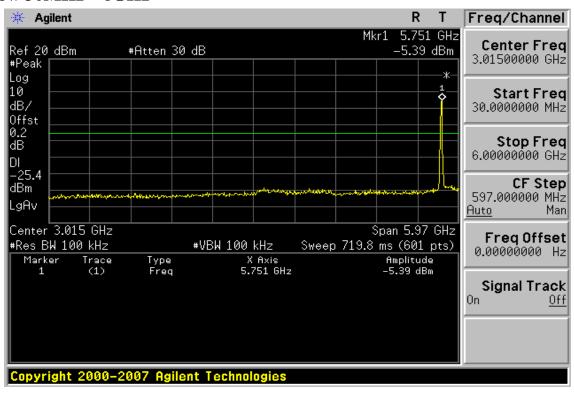
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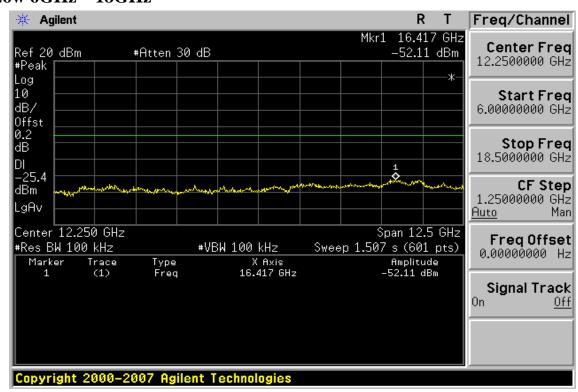
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# **Conducted Spurious Emission Measurement Result (802.11a)** Ch Low 30MHz - 6GHz



#### Ch Low 6GHz - 18GHz



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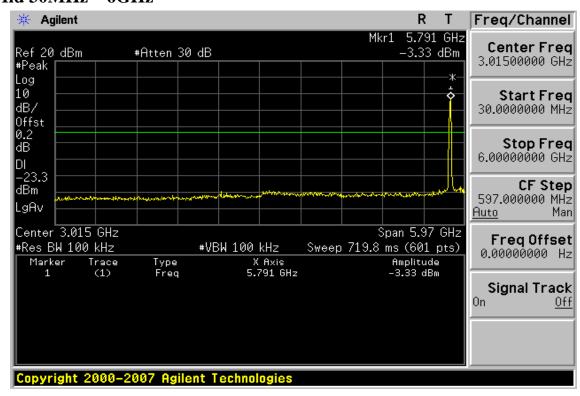
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### Ch Low 18GHz - 40GHz



#### Ch Mid 30MHz – 6GHz



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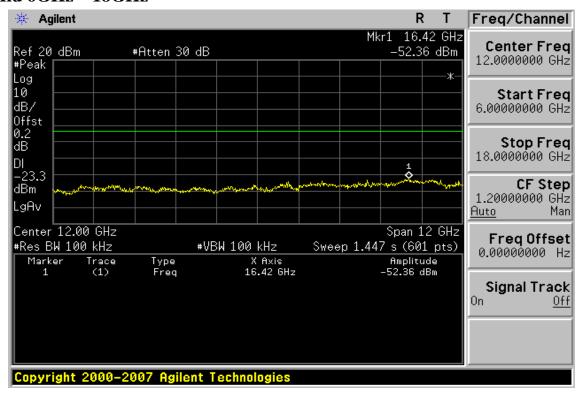
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### Ch Mid 6GHz - 18GHz



#### Ch Mid 18GHz – 40GHz



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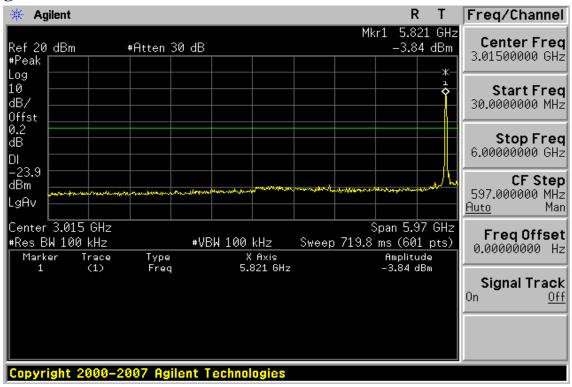
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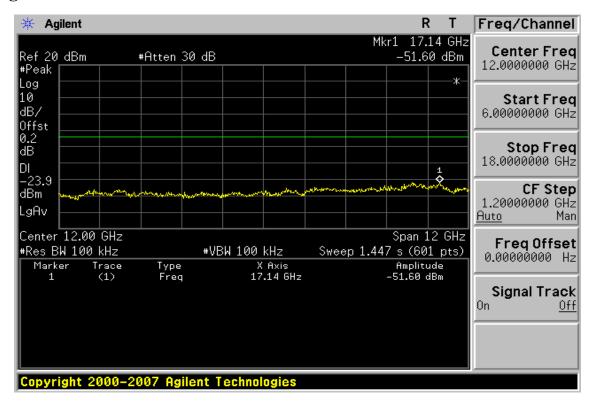
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## Ch High 30MHz - 6GHz



### Ch High 6GHz – 18GHz



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## Ch High 18GHz – 40GHz



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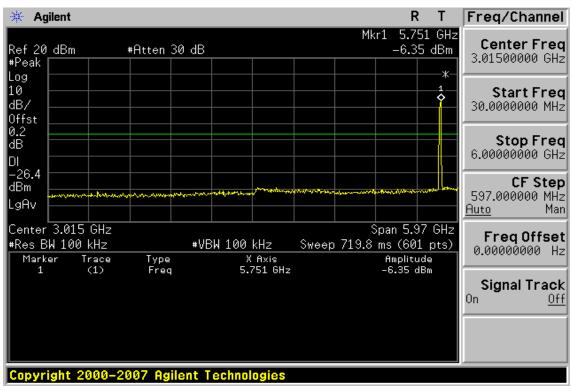
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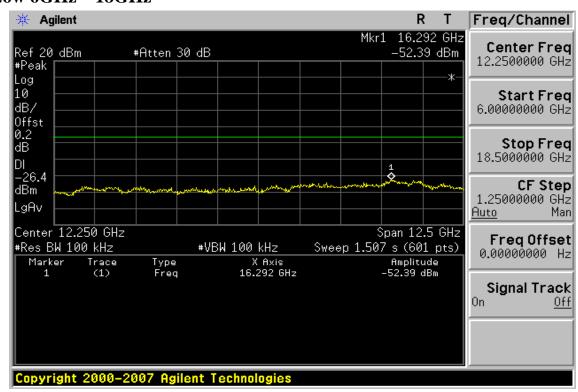
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# Conducted Spurious Emission Measurement Result (802.11a/n\_20M), Chain0 Ch Low 30MHz - 6GHz



#### Ch Low 6GHz - 18GHz



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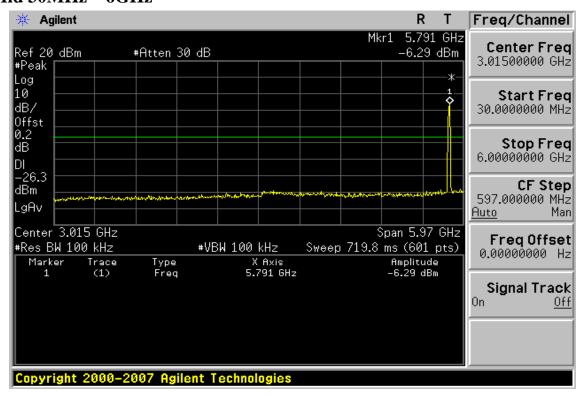
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### Ch Low 18GHz - 40GHz



### Ch Mid 30MHz – 6GHz



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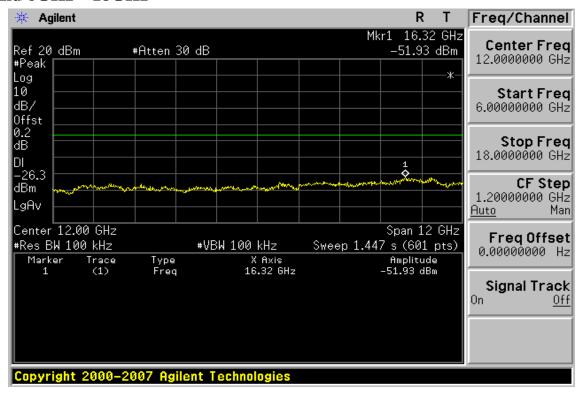
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### Ch Mid 6GHz - 18GHz



### Ch Mid 18GHz – 40GHz



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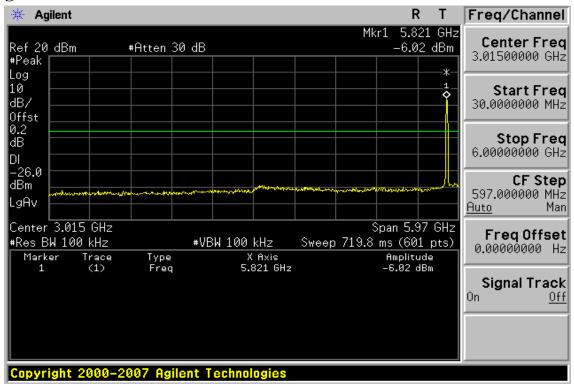
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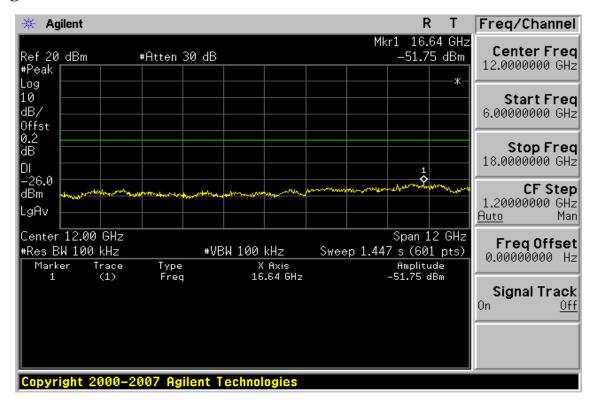
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## Ch High 30MHz - 6GHz



## Ch High 6GHz – 18GHz



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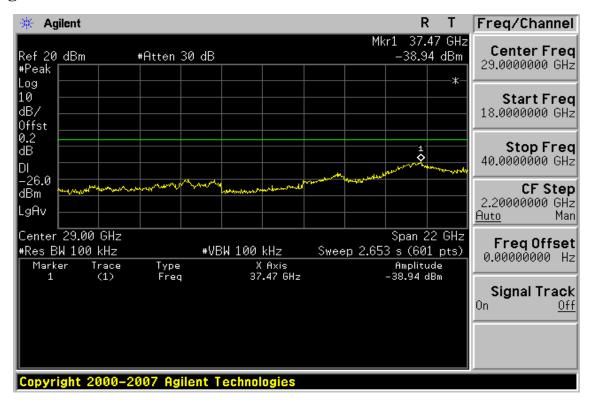
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# Ch High 18GHz – 40GHz



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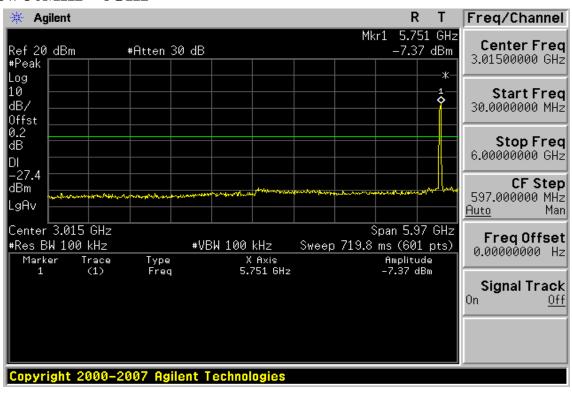
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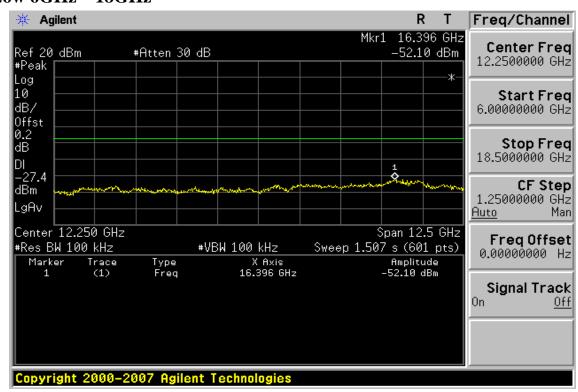
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# Conducted Spurious Emission Measurement Result (802.11a/n\_20M), Chain1 Ch Low 30MHz - 6GHz



### Ch Low 6GHz - 18GHz



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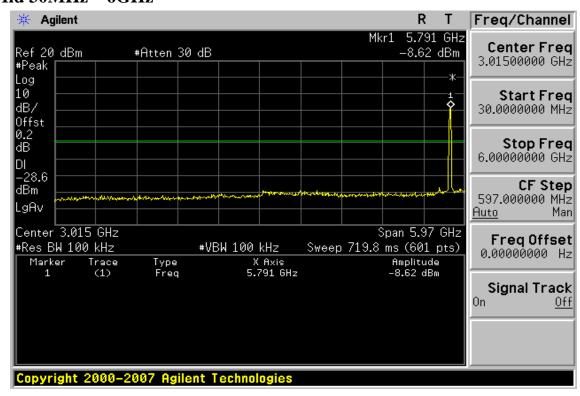
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### Ch Low 18GHz - 40GHz



### Ch Mid 30MHz – 6GHz



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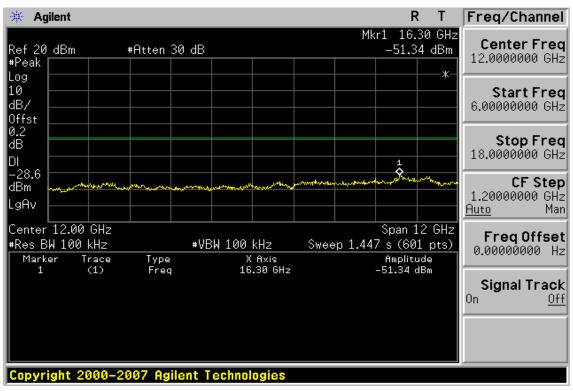
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### Ch Mid 6 GHz – 18GHz



### Ch Mid 18 GHz – 40GHz



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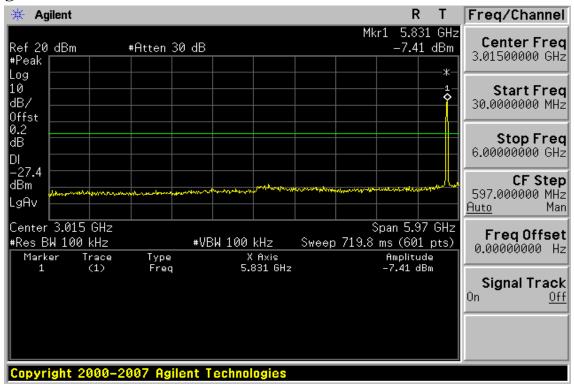
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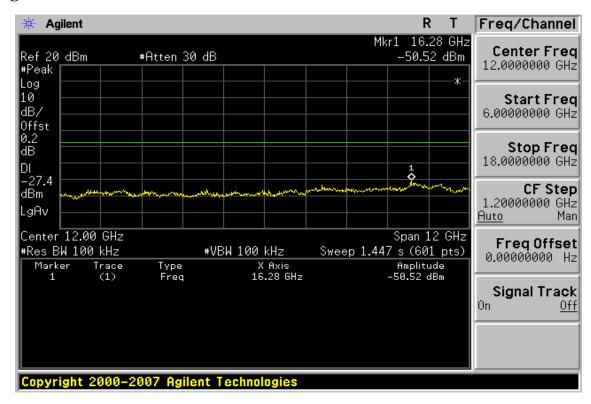
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## Ch High 30MHz - 6GHz



## Ch High 6GHz – 18GHz



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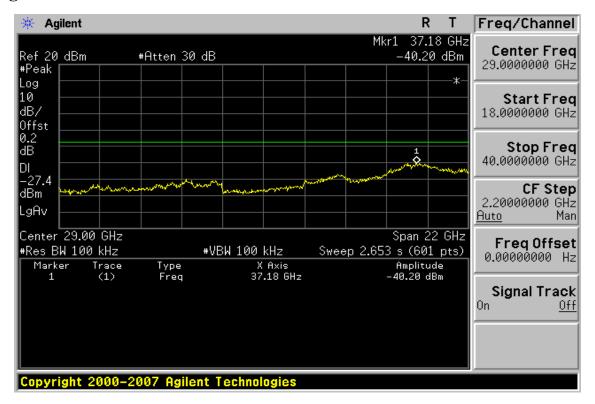
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## Ch High 6GHz – 40GHz



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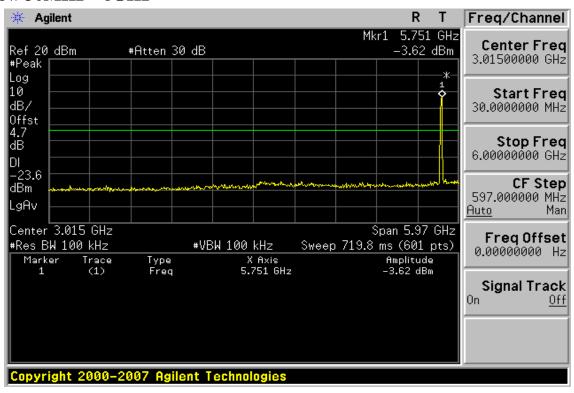
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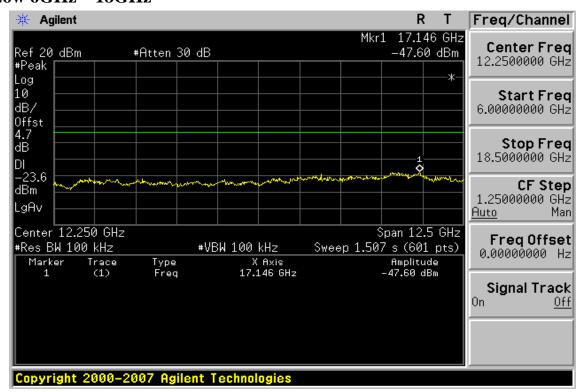
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# Conducted Spurious Emission Measurement Result (802.11a/n\_20M), Combine Ch Low 30MHz - 6GHz



### Ch Low 6GHz - 18GHz



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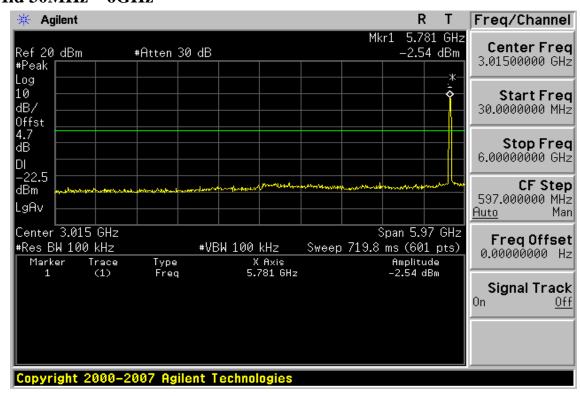
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### Ch Low 18GHz - 40GHz



### Ch Mid 30MHz – 6GHz



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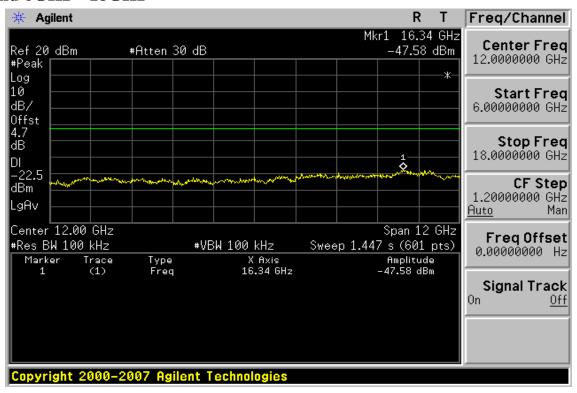
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### Ch Mid 6GHz - 18GHz



### Ch Mid 18GHz – 40GHz



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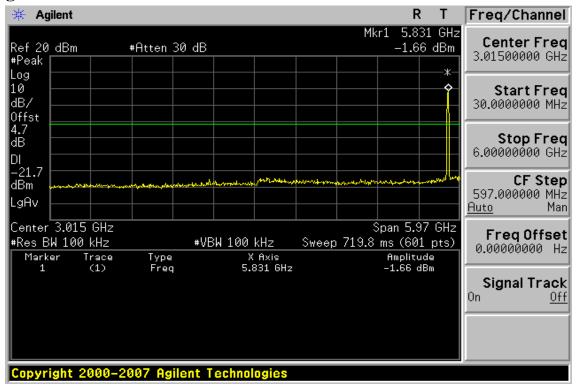
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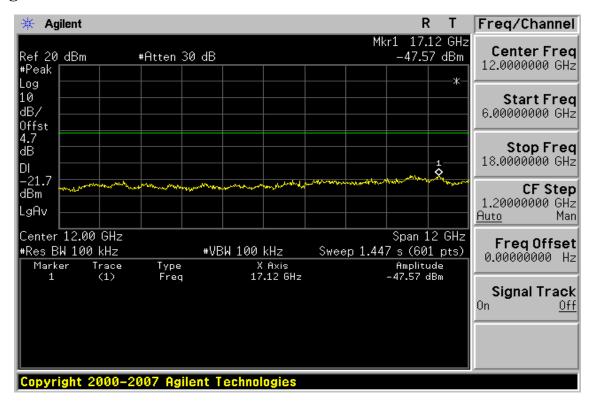
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## Ch High 30MHz - 3GHz



## Ch High 6GHz – 18GHz



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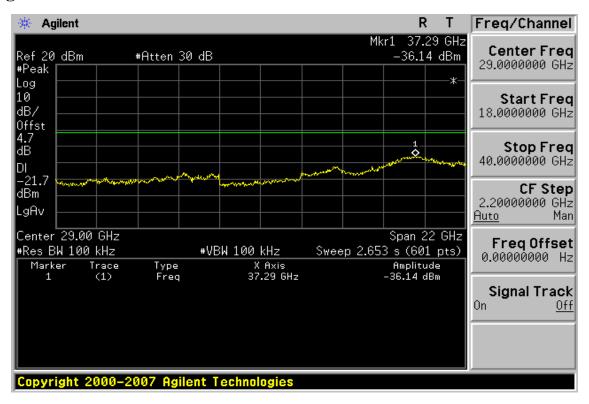
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## Ch High 18GHz – 40GHz



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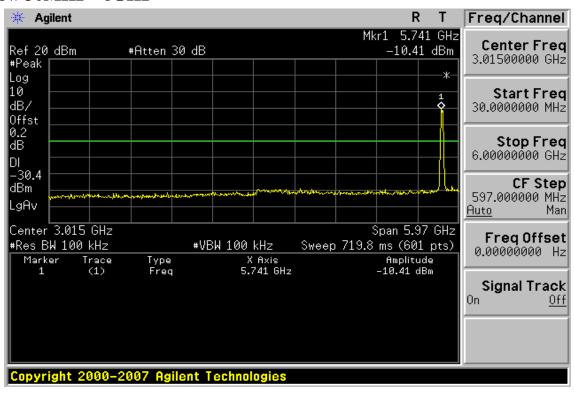
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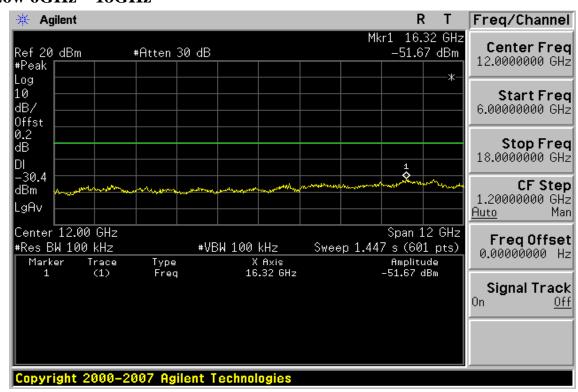
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# Conducted Spurious Emission Measurement Result (802.11a/n\_40M), Chain0 Ch Low 30MHz - 6GHz



### Ch Low 6GHz - 18GHz



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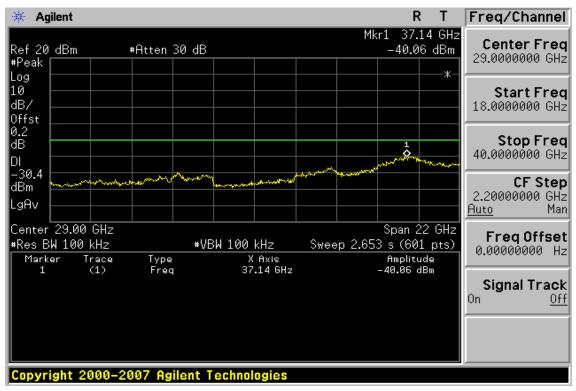
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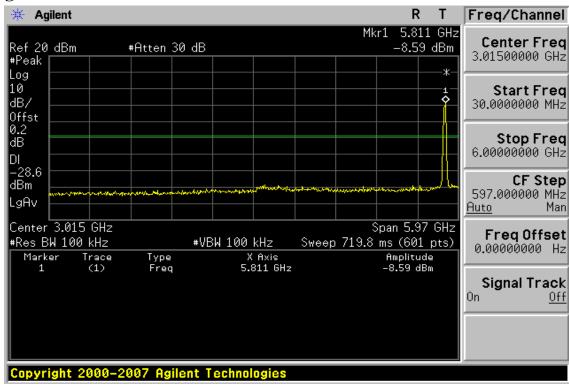
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### Ch Low 18GHz - 40GHz



## Ch High 30MHz – 6GHz



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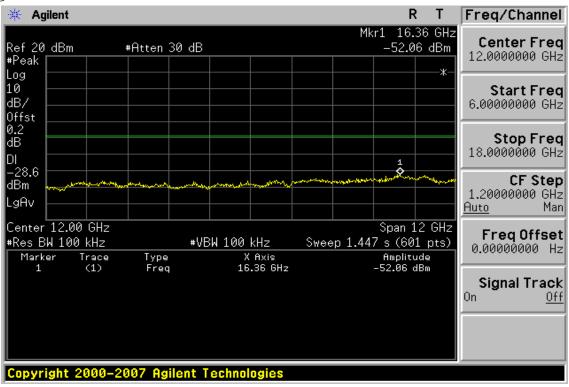
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## Ch High 6GHz - 18GHz



## Ch High 18GHz – 40GHz



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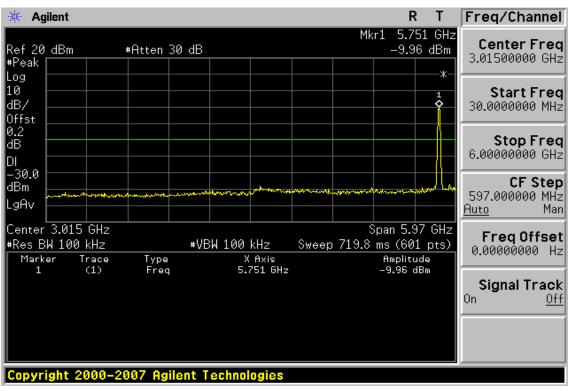
台灣檢驗科技股份有限公司 **t** (886-2) 2299-3279 f (886-2) 2298-0488



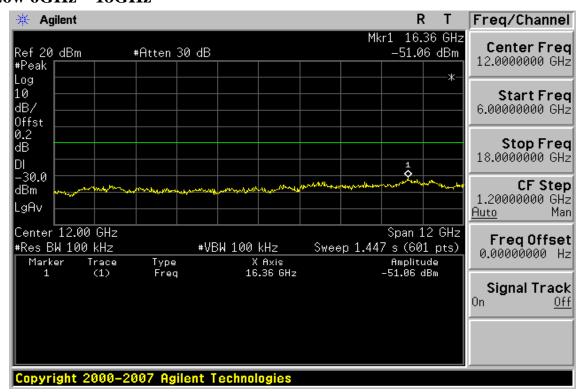
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# Conducted Spurious Emission Measurement Result (802.11a/n\_40M), Chain1 Ch Low 30MHz - 6GHz



### Ch Low 6GHz - 18GHz



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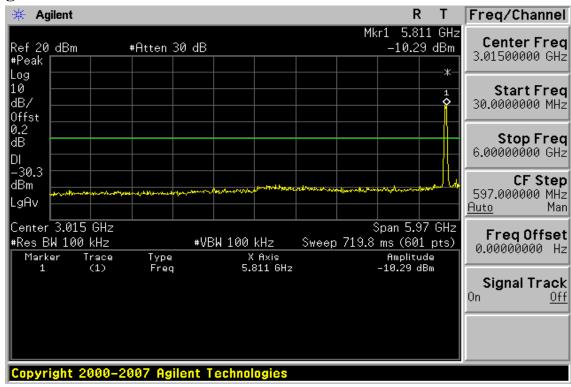
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### Ch Low 18GHz - 40GHz



## Ch High 30MHz – 6GHz



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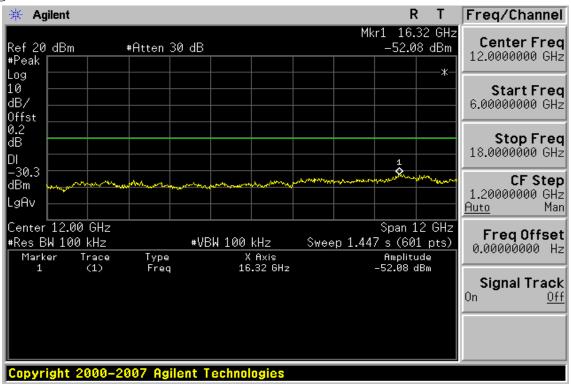
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## Ch High 6GHz - 18GHz



## Ch High 18GHz – 40GHz



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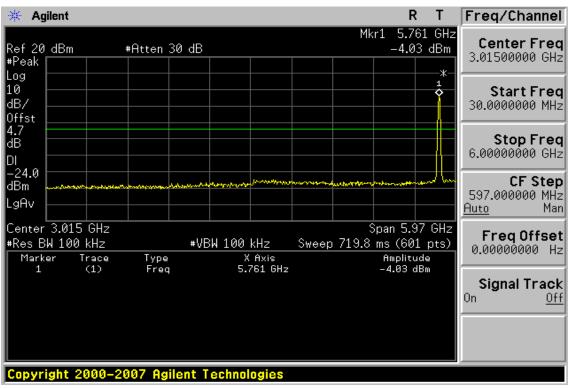
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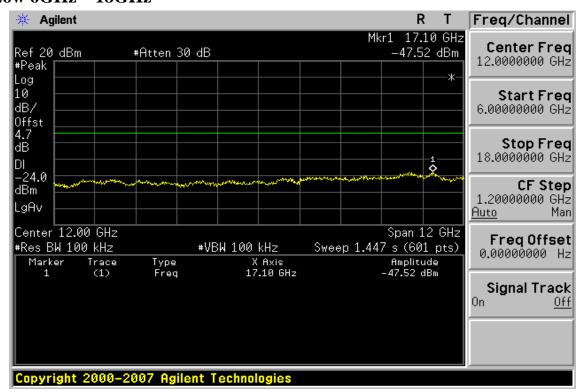
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# Conducted Spurious Emission Measurement Result (802.11a/n\_40M), Combine Ch Low 30MHz - 6GHz



### Ch Low 6GHz - 18GHz



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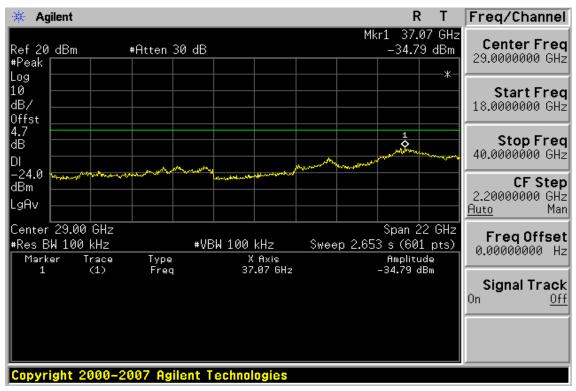
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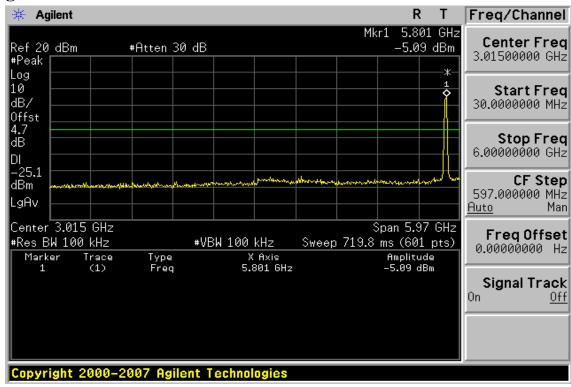
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### Ch Low 18GHz - 40GHz



## Ch High 30MHz – 6GHz



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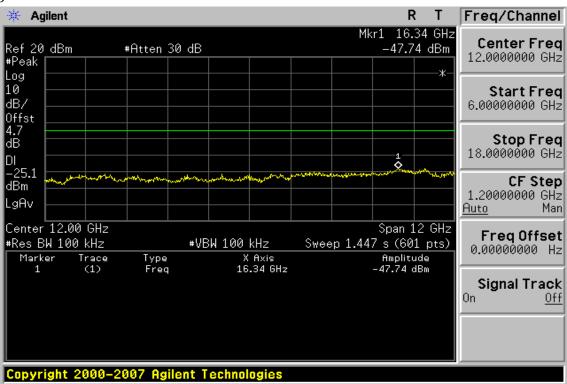
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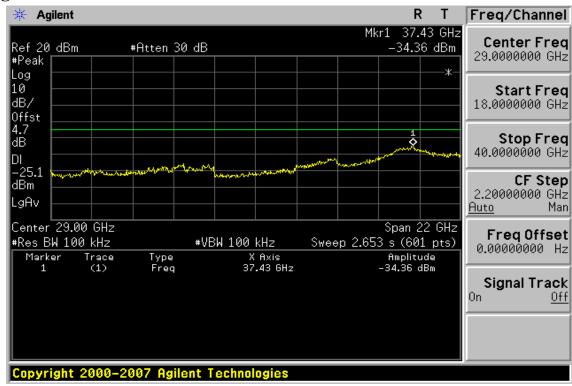
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## Ch High 6GHz - 18GHz



## Ch High 18GHz – 40GHz



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## Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b)

Operation Mode 802.11b TX CH Low Test Date Nov. 12, 2009

Fundamental Frequency 2412MHz Test By Jim Pol Ver./Hor **Temperature** 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.45	-14.36	36.09	40.00	-3.91
62.98	V	Peak	44.62	-14.85	29.77	40.00	-10.23
75.59	V	Peak	45.17	-17.13	28.04	40.00	-11.96
90.14	V	Peak	44.51	-17.62	26.89	43.50	-16.61
101.78	V	Peak	43.98	-16.87	27.11	43.50	-16.39
851.59	V	Peak	32.27	-1.96	30.31	46.00	-15.69
38.73	Н	Peak	47.27	-13.84	33.43	40.00	-6.57
255.04	Н	Peak	54.05	-13.69	40.36	46.00	-5.64
290.93	Н	Peak	53.72	-13.21	40.51	46.00	-5.49
324.88	Н	Peak	48.76	-12.43	36.33	46.00	-9.67
344.28	Н	Peak	47.79	-11.92	35.87	46.00	-10.13
601.33	Н	Peak	46.01	-5.98	40.03	46.00	-5.97

### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz •
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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## Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b)

Operation Mode 802.11b TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.43	-14.36	36.07	40.00	-3.93
64.92	V	Peak	43.51	-14.83	28.68	40.00	-11.32
75.59	V	Peak	45.57	-17.13	28.44	40.00	-11.56
90.14	V	Peak	45.46	-17.62	27.84	43.50	-15.66
101.78	V	Peak	44.03	-16.87	27.16	43.50	-16.34
654.68	V	Peak	33.51	-4.97	28.54	46.00	-17.46
38.73	Н	Peak	46.75	-13.84	32.91	40.00	-7.09
240.49	Н	Peak	53.19	-14.11	39.08	46.00	-6.92
284.14	Н	Peak	56.22	-13.28	42.94	46.00	-3.06
315.18	Н	Peak	53.16	-12.66	40.50	46.00	-5.50
344.28	Н	Peak	48.51	-11.92	36.59	46.00	-9.41
591.54	Н	Peak	45.62	-6.18	39.44	46.00	-6.56

### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz •
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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## Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b)

Operation Mode 802.11b TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	<b>Actual FS</b>	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.76	-14.36	36.40	40.00	-3.60
62.98	V	Peak	44.18	-14.85	29.33	40.00	-10.67
75.59	V	Peak	44.91	-17.13	27.78	40.00	-12.22
90.14	V	Peak	44.09	-17.62	26.47	43.50	-17.03
104.69	V	Peak	43.81	-16.63	27.18	43.50	-16.32
829.28	V	Peak	32.47	-2.43	30.04	46.00	-15.96
38.73	Н	Peak	41.73	-13.84	27.89	40.00	-12.11
225.94	Н	Peak	45.21	-14.61	30.60	46.00	-15.40
240.49	Н	Peak	46.29	-14.11	32.18	46.00	-13.82
284.14	Н	Peak	53.51	-13.28	40.23	46.00	-5.77
315.18	Н	Peak	44.61	-12.66	31.95	46.00	-14.05
644.98	Н	Peak	40.84	-5.10	35.74	46.00	-10.26

### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz •
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11g)

Operation Mode 802.11g TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
38.73	V	Peak	49.44	-13.84	35.60	40.00	-4.40
62.98	V	Peak	42.68	-14.85	27.83	40.00	-12.17
75.59	V	Peak	44.65	-17.13	27.52	40.00	-12.48
90.14	V	Peak	44.93	-17.62	27.31	43.50	-16.19
104.69	V	Peak	43.07	-16.63	26.44	43.50	-17.06
783.69	V	Peak	32.83	-3.41	29.42	46.00	-16.58
38.73	Н	Peak	44.46	-13.84	30.62	40.00	-9.38
240.49	Н	Peak	52.16	-14.11	38.05	46.00	-7.95
255.04	Н	Peak	53.67	-13.69	39.98	46.00	-6.02
286.08	Н	Peak	54.98	-16.26	38.72	46.00	-7.28
315.18	Н	Peak	52.49	-12.66	39.83	46.00	-6.17
606.18	Н	Peak	42.80	-5.88	36.92	46.00	-9.08

### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz •
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11g)

Operation Mode 802.11g TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.30	-14.36	35.94	40.00	-4.06
64.92	V	Peak	43.58	-14.83	28.75	40.00	-11.25
75.59	V	Peak	45.51	-17.13	28.38	40.00	-11.62
90.14	V	Peak	45.15	-17.62	27.53	43.50	-15.97
104.69	V	Peak	43.24	-16.63	26.61	43.50	-16.89
877.78	V	Peak	32.30	-25.24	-1.49	46.00	-47.49
38.73	Н	Peak	41.83	-13.84	27.99	40.00	-12.01
240.49	Н	Peak	48.02	-14.11	33.91	46.00	-12.09
284.14	Н	Peak	53.72	-13.28	40.44	46.00	-5.56
315.18	Н	Peak	51.41	-12.66	38.75	46.00	-7.25
654.68	Н	Peak	39.97	-4.97	35.00	46.00	-11.00
960.23	Н	Peak	37.03	-0.94	36.09	54.00	-17.91

### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz •
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11g)

Operation Mode 802.11g TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim
Temperature 25 °C Pol Ver./Hor

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	49.92	-14.36	35.56	40.00	-4.44
64.92	V	Peak	43.67	-14.83	28.84	40.00	-11.16
75.59	V	Peak	45.73	-17.13	28.60	40.00	-11.40
90.14	V	Peak	44.99	-17.62	27.37	43.50	-16.13
104.69	V	Peak	42.84	-16.63	26.21	43.50	-17.29
657.59	V	Peak	33.32	-4.98	28.34	46.00	-17.66
40.67	Н	Peak	40.50	-13.74	26.76	40.00	-13.24
240.49	Н	Peak	50.50	-14.11	36.39	46.00	-9.61
286.08	Н	Peak	55.05	-13.26	41.79	46.00	-4.21
315.18	Н	Peak	46.00	-12.66	33.34	46.00	-12.66
334.58	Н	Peak	44.65	-12.12	32.53	46.00	-13.47
649.83	Н	Peak	38.96	-4.95	34.01	46.00	-11.99

### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz  $\circ$
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n\_20M) Combine mode

Nov. 22, 2009 Operation Mode 802.11n\_20M TX CH Low Test Date

Fundamental Frequency 2412MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
38.73	V	Peak	50.11	-13.84	36.27	40.00	-3.73
62.98	V	Peak	44.26	-14.85	29.41	40.00	-10.59
75.59	V	Peak	45.37	-17.13	28.24	40.00	-11.76
90.14	V	Peak	44.12	-17.62	26.50	43.50	-17.00
104.69	V	Peak	42.83	-16.63	26.20	43.50	-17.30
866.14	V	Peak	33.49	-1.65	31.84	46.00	-14.16
38.73	Н	Peak	46.54	-13.84	32.70	40.00	-7.30
240.49	Н	Peak	53.48	-14.11	39.37	46.00	-6.63
269.59	Н	Peak	50.00	-13.55	36.45	46.00	-9.55
281.23	Н	Peak	51.54	-13.31	38.23	46.00	-7.77
315.18	Н	Peak	53.37	-12.66	40.71	46.00	-5.29
644.98	Н	Peak	45.87	-5.10	40.77	46.00	-5.23

### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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## Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n\_20M) Combine mode

Nov. 22, 2009 Operation Mode 802.11n\_20M TX CH Mid Test Date

Fundamental Frequency 2437MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	<b>Actual FS</b>	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
38.73	V	Peak	50.26	-13.84	36.42	40.00	-3.58
58.13	V	Peak	43.71	-14.66	29.05	40.00	-10.95
75.59	V	Peak	45.19	-17.13	28.06	40.00	-11.94
90.14	V	Peak	44.31	-17.62	26.69	43.50	-16.81
104.69	V	Peak	43.66	-16.63	27.03	43.50	-16.47
797.27	V	Peak	32.44	-3.11	-1.49	46.00	-47.49
38.73	Н	Peak	42.02	-13.84	28.18	40.00	-11.82
242.43	Н	Peak	47.07	-14.06	33.01	46.00	-12.99
255.04	Н	Peak	49.77	-13.69	36.08	46.00	-9.92
284.14	Н	Peak	55.22	-13.28	41.94	46.00	-4.06
315.18	Н	Peak	49.11	-12.66	36.45	46.00	-9.55
591.63	Н	Peak	41.75	-6.30	35.45	46.00	-10.55

### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n\_20M) Combine mode

Nov. 22, 2009 Operation Mode 802.11n\_20M TX CH High Test Date

Fundamental Frequency 2462MHz Test By Jim Pol Ver./Hor Temperature 25 °C

65 % Humidity

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
38.73	V	Peak	50.37	-13.84	36.53	40.00	-3.47
58.13	V	Peak	43.34	-14.66	28.68	40.00	-11.32
75.59	V	Peak	45.09	-17.13	27.96	40.00	-12.04
90.14	V	Peak	44.41	-17.62	26.79	43.50	-16.71
104.69	V	Peak	43.12	-16.63	26.49	43.50	-17.01
654.68	V	Peak	34.14	-4.97	29.17	46.00	-16.83
38.73	Н	Peak	43.81	-13.84	29.97	40.00	-10.03
255.04	Н	Peak	51.52	-13.69	37.83	46.00	-8.17
286.08	Н	Peak	55.43	-13.26	42.17	46.00	-3.83
305.48	Н	Peak	48.63	-12.89	35.74	46.00	-10.26
315.18	Н	Peak	48.32	-12.66	35.66	46.00	-10.34
657.59	Н	Peak	41.34	-4.98	36.36	46.00	-9.64

### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n\_40M) Combine mode

Nov. 22, 2009 Operation Mode 802.11n\_40M TX CH Low Test Date

Fundamental Frequency 2422MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
38.73	V	Peak	49.47	-13.84	35.63	40.00	-4.37
58.13	V	Peak	42.58	-14.66	27.92	40.00	-12.08
75.59	V	Peak	44.51	-17.13	27.38	40.00	-12.62
90.14	V	Peak	43.80	-17.62	26.18	43.50	-17.32
104.69	V	Peak	42.60	-16.63	25.97	43.50	-17.53
678.93	V	Peak	32.27	-4.98	27.29	46.00	-18.71
38.73	Н	Peak	45.80	-13.84	31.96	40.00	-8.04
255.04	Н	Peak	52.07	-13.69	38.38	46.00	-7.62
284.14	Н	Peak	55.73	-13.28	42.45	46.00	-3.55
290.93	Н	Peak	53.07	-13.21	39.86	46.00	-6.14
315.18	Н	Peak	53.10	-12.66	40.44	46.00	-5.56
615.88	Н	Peak	44.69	-5.70	38.99	46.00	-7.01

### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n\_40M) Combine mode

Nov. 22, 2009 Operation Mode 802.11n\_40M TX CH Mid Test Date

Fundamental Frequency 2437MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.02	-14.36	35.66	40.00	-4.34
62.98	V	Peak	42.95	-14.85	28.10	40.00	-11.90
75.59	V	Peak	44.98	-17.13	27.85	40.00	-12.15
80.44	V	Peak	44.92	-17.84	27.08	40.00	-12.92
104.69	V	Peak	42.66	-16.63	26.03	43.50	-17.47
866.14	V	Peak	32.98	-1.65	-1.49	46.00	-47.49
36.79	Н	Peak	41.40	-14.36	27.04	40.00	-12.96
241.46	Н	Peak	46.22	-14.09	32.13	46.00	-13.87
284.14	Н	Peak	54.17	-13.28	40.89	46.00	-5.11
305.48	Н	Peak	45.00	-12.89	32.11	46.00	-13.89
643.04	Н	Peak	38.19	-5.14	33.05	46.00	-12.95
960.23	Н	Peak	31.68	-0.94	30.74	54.00	-23.26

### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n\_40M) Combine mode

Nov. 22, 2009 Operation Mode 802.11n\_40M TX CH High Test Date

Fundamental Frequency 2452MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	49.53	-14.36	35.17	40.00	-4.83
62.98	V	Peak	42.97	-14.85	28.12	40.00	-11.88
75.59	V	Peak	43.89	-17.13	26.76	40.00	-13.24
90.14	V	Peak	44.56	-17.62	26.94	43.50	-16.56
104.69	V	Peak	42.86	-16.63	26.23	43.50	-17.27
824.43	V	Peak	32.10	-2.52	29.58	46.00	-16.42
38.73	Н	Peak	43.41	-13.84	29.57	40.00	-10.43
240.49	Н	Peak	50.46	-14.11	36.35	46.00	-9.65
255.04	Н	Peak	51.20	-13.69	37.51	46.00	-8.49
284.14	Н	Peak	54.49	-13.28	41.21	46.00	-4.79
315.18	Н	Peak	47.62	-12.66	34.96	46.00	-11.04
615.88	Н	Peak	42.38	-5.70	36.68	46.00	-9.32

### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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## Radiated Spurious Emission Measurement Result (below 1GHz) (802.11a)

Operation Mode 802.11a TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5745MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.85	-14.36	36.49	40.00	-3.51
64.92	V	Peak	45.22	-14.83	30.39	40.00	-9.61
90.14	V	Peak	46.69	-17.62	29.07	43.50	-14.43
250.19	V	Peak	46.00	-13.74	32.26	46.00	-13.74
293.84	V	Peak	50.23	-13.19	37.04	46.00	-8.96
533.43	V	Peak	38.91	-7.96	30.95	46.00	-15.05
38.73	Н	Peak	45.54	-13.84	31.70	40.00	-8.30
67.83	Н	Peak	42.01	-15.60	26.41	40.00	-13.59
218.18	Н	Peak	44.64	-14.99	29.65	46.00	-16.35
252.13	Н	Peak	43.24	-13.72	29.52	46.00	-16.48
288.99	Н	Peak	48.77	-13.23	35.54	46.00	-10.46
363.68	Н	Peak	39.75	-11.27	28.48	46.00	-17.52

### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz •
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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# Radiated Spurious Emission Measurement Result (below 1GHz) (802.11a)

Operation Mode 802.11a TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 5785MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.02	-14.36	35.66	40.00	-4.34
64.92	V	Peak	45.21	-14.83	30.38	40.00	-9.62
90.14	V	Peak	46.22	-17.62	28.60	43.50	-14.90
101.78	V	Peak	44.63	-16.87	27.76	43.50	-15.74
255.04	V	Peak	43.31	-13.69	29.62	46.00	-16.38
293.84	V	Peak	50.22	-13.19	37.03	46.00	-8.97
38.73	Н	Peak	45.97	-13.84	32.13	40.00	-7.87
218.18	Н	Peak	44.43	-14.99	29.44	46.00	-16.56
255.04	Н	Peak	44.10	-13.69	30.41	46.00	-15.59
293.84	Н	Peak	48.34	-13.19	35.15	46.00	-10.85
358.83	Н	Peak	39.13	-11.43	27.70	46.00	-18.30
596.48	Н	Peak	35.87	-6.12	29.75	46.00	-16.25

#### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz •
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11a)

Operation Mode 802.11a TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 5825MHz Test By Jim
Temperature 25 °C Pol Ver./Hor

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	51.26	-14.36	36.90	40.00	-3.10
62.98	V	Peak	46.07	-14.85	31.22	40.00	-8.78
90.14	V	Peak	46.37	-17.62	28.75	43.50	-14.75
218.18	V	Peak	45.69	-14.99	30.70	46.00	-15.30
290.93	V	Peak	49.72	-13.21	36.51	46.00	-9.49
798.24	V	Peak	34.27	-3.08	31.19	46.00	-14.81
38.73	Н	Peak	45.77	-13.84	31.93	40.00	-8.07
70.74	Н	Peak	43.35	-16.27	27.08	40.00	-12.92
218.18	Н	Peak	44.37	-14.99	29.38	46.00	-16.62
256.98	Н	Peak	43.98	-13.67	30.31	46.00	-15.69
290.93	Н	Peak	48.88	-13.21	35.67	46.00	-10.33

#### Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz •
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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Test Date

### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH Low

Fundamental Frequency 5745MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.57	-14.36	36.21	40.00	-3.79
62.98	V	Peak	45.94	-14.85	31.09	40.00	-8.91
96.93	V	Peak	45.89	-17.16	28.73	43.50	-14.77
290.93	V	Peak	48.82	-13.21	35.61	46.00	-10.39
358.83	V	Peak	40.84	-11.43	29.41	46.00	-16.59
664.38	V	Peak	34.77	-5.01	29.76	46.00	-16.24
38.73	Н	Peak	46.33	-13.84	32.49	40.00	-7.51
70.74	Н	Peak	43.43	-16.27	27.16	40.00	-12.84
255.04	Н	Peak	44.61	-13.69	30.92	46.00	-15.08
286.08	Н	Peak	48.25	-13.26	34.99	46.00	-11.01
293.84	Н	Peak	48.16	-13.19	34.97	46.00	-11.03
366.59	Н	Peak	40.18	-11.17	29.01	46.00	-16.99

#### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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Test Date

# Radiated Spurious Emission Measurement Result (below 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH Mid

Fundamental Frequency 5785MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	51.14	-14.36	36.78	40.00	-3.22
62.98	V	Peak	45.51	-14.85	30.66	40.00	-9.34
89.17	V	Peak	44.91	-17.70	27.21	43.50	-16.29
290.93	V	Peak	50.57	-13.21	37.36	46.00	-8.64
596.48	V	Peak	39.07	-6.12	32.95	46.00	-13.05
667.29	V	Peak	35.05	-5.02	30.03	46.00	-15.97
38.73	Н	Peak	46.18	-13.84	32.34	40.00	-7.66
67.83	Н	Peak	42.90	-15.60	27.30	40.00	-12.70
218.18	Н	Peak	44.99	-14.99	30.00	46.00	-16.00
255.04	Н	Peak	44.28	-13.69	30.59	46.00	-15.41
290.93	Н	Peak	51.38	-13.21	38.17	46.00	-7.83
358.83	Н	Peak	41.47	-11.43	30.04	46.00	-15.96

#### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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Test Date

# Radiated Spurious Emission Measurement Result (below 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH High

Fundamental Frequency 5825MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
38.73	V	Peak	47.77	-13.84	33.93	40.00	-6.07
64.92	V	Peak	45.21	-14.83	30.38	40.00	-9.62
250.19	V	Peak	45.54	-13.74	31.80	46.00	-14.20
290.93	V	Peak	49.49	-13.21	36.28	46.00	-9.72
356.89	V	Peak	39.98	-11.49	28.49	46.00	-17.51
533.43	V	Peak	37.98	-7.96	30.02	46.00	-15.98
38.73	Н	Peak	46.08	-13.84	32.24	40.00	-7.76
70.74	Н	Peak	43.12	-16.27	26.85	40.00	-13.15
145.43	Н	Peak	40.50	-13.14	27.36	43.50	-16.14
218.18	Н	Peak	46.58	-14.99	31.59	46.00	-14.41
290.93	Н	Peak	48.88	-13.21	35.67	46.00	-10.33
436.43	Н	Peak	36.07	-8.88	27.19	46.00	-18.81

#### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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Jim

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Test Date

Test By

### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11a/n 40M) Combine mode

Operation Mode 802.11a/n\_40M TX CH Low

Fundamental Frequency 5755MHz

Temperature 25 °C Pol Ver./Hor

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.06	-14.36	35.70	40.00	-4.30
66.86	V	Peak	45.60	-15.34	30.26	40.00	-9.74
90.14	V	Peak	46.97	-17.62	29.35	43.50	-14.15
255.04	V	Peak	44.82	-13.69	31.13	46.00	-14.87
290.93	V	Peak	50.41	-13.21	37.20	46.00	-8.80
531.49	V	Peak	36.71	-7.99	28.72	46.00	-17.28
38.73	Н	Peak	45.68	-13.84	31.84	40.00	-8.16
70.74	Н	Peak	42.37	-16.27	26.10	40.00	-13.90
213.33	Н	Peak	43.22	-15.16	28.06	43.50	-15.44
250.19	Н	Peak	41.76	-13.74	28.02	46.00	-17.98
290.93	Н	Peak	47.28	-13.21	34.07	46.00	-11.93
358.83	Н	Peak	39.69	-11.43	28.26	46.00	-17.74

#### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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Test Date

# Radiated Spurious Emission Measurement Result (below 1GHz) (802.11a/n 40M) Combine mode

Operation Mode 802.11a/n\_40M TX CH High

Fundamental Frequency 5795MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.08	-14.36	35.72	40.00	-4.28
67.83	V	Peak	45.35	-15.60	29.75	40.00	-10.25
96.93	V	Peak	45.61	-17.16	28.45	43.50	-15.05
256.98	V	Peak	42.86	-13.67	29.19	46.00	-16.81
290.93	V	Peak	49.50	-13.21	36.29	46.00	-9.71
533.43	V	Peak	36.99	-7.96	29.03	46.00	-16.97
38.73	Н	Peak	45.47	-13.84	31.63	40.00	-8.37
70.74	Н	Peak	42.27	-16.27	26.00	40.00	-14.00
218.18	Н	Peak	43.95	-14.99	28.96	46.00	-17.04
250.19	Н	Peak	43.00	-13.74	29.26	46.00	-16.74
293.84	Н	Peak	48.54	-13.19	35.35	46.00	-10.65
366.59	Н	Peak	38.39	-11.17	27.22	46.00	-18.78

#### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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#### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode 802.11b TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412MHz Test By Jim Pol Ver. Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4824.0	36.69		6.02	42.71		74.00	54.00	-11.29	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- Spectrum AV Setting: 1GHz-40GHz, RBW=1MHz, VBW=10Hz, Sweep time=200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode 802.11b TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4824.0	40.79		6.02	46.81		74.00	54.00	-7.19	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency  $\circ$
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column  $\circ$
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode 802.11b TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4874.0	35.32		6.15	41.47		74.00	54.00	-12.53	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode 802.11b TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4874.0	39.95		6.15	46.10		74.00	54.00	-7.90	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency  $\circ$
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column  $\circ$
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode 802.11b TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4924.0	35.44		6.28	41.72		74.00	54.00	-12.28	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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#### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode 802.11b TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim Pol Hor Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	_
4924.0	38.95		6.28	45.23		74.00	54.00	-8.77	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode 802.11g TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412MHz Test By Jim Pol Ver. Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4824.0	34.01		6.05	40.06		74.00	54.00	-13.94	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode 802.11g TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412MHz Test By Jim Pol Hor Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4824.0	34.55		6.05	40.60		74.00	54.00	-13.40	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode 802.11g TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	-
4874.0	33.52		6.17	39.69		74.00	54.00	-14.31	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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#### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode 802.11g TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Hor Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4874.0	34.30		6.17	40.47		74.00	54.00	-13.53	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode 802.11g TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4924.0	34.51		6.28	40.79		74.00	54.00	-13.21	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode 802.11g TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim Pol Hor Temperature 25 °C

Humidity 65 %

Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	-
33.43		6.28	39.71		74.00	54.00	-14.29	Peak
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
	Reading (dBuV)  33.43	Reading (dBuV)         Reading (dBuV)           33.43	Reading (dBuV)         Reading (dBuV)         Ant./CL (dBuV)           33.43          6.28   <	Reading (dBuV)         Ant./CL (dBuV/m)           33.43          6.28         39.71 <td>Reading (dBuV)Ant./CL CF(dB)Peak (dBuV/m)AV33.436.2839.71        </td> <td>Reading (dBuV)         Ant./CL (dBuV)         Peak (dBuV)m (dBuV/m)         Limit (dBuV/m) (dBuV/m)           33.43          6.28         39.71          74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00</td> <td>Reading (dBuV)         Ant./CL (dBuV)         Peak (dBuV)m (dBuV)m (dBuV)m (dBuV)m         Limit (dBuV)m (dBuV)m (dBuV)m         Limit (dBuV)m (dBuV)m         Limit (dBuV)m (dBuV)m         Avon (dBuV)m         Limit (dBuV)m         54.00</td> <td>Reading (dBuV)         Ant./CL (dBuV)         Peak (dBuV)         AV (dBuV)         Limit (dBuV)         Limit (dBuV)         Margin (dBuV)           33.43          6.28         39.71          74.00         54.00         -14.29             74.00         54.00              74.00         54.00              74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00        </td>	Reading (dBuV)Ant./CL CF(dB)Peak (dBuV/m)AV33.436.2839.71        	Reading (dBuV)         Ant./CL (dBuV)         Peak (dBuV)m (dBuV/m)         Limit (dBuV/m) (dBuV/m)           33.43          6.28         39.71          74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00             74.00         74.00	Reading (dBuV)         Ant./CL (dBuV)         Peak (dBuV)m (dBuV)m (dBuV)m (dBuV)m         Limit (dBuV)m (dBuV)m (dBuV)m         Limit (dBuV)m (dBuV)m         Limit (dBuV)m (dBuV)m         Avon (dBuV)m         Limit (dBuV)m         54.00	Reading (dBuV)         Ant./CL (dBuV)         Peak (dBuV)         AV (dBuV)         Limit (dBuV)         Limit (dBuV)         Margin (dBuV)           33.43          6.28         39.71          74.00         54.00         -14.29             74.00         54.00              74.00         54.00              74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00             74.00         54.00

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_20M) Combine mode

Operation Mode 802.11n\_20M TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412MHz Test By Jim Pol Ver. Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4824.0	34.02		6.10	40.12		74.00	54.00	-13.88	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_20M) Combine mode

Operation Mode 802.11n\_20M TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412MHz Test By Jim Pol Temperature 25 °C Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4824.0	34.54		6.10	40.64		74.00	54.00	-13.36	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_20M) Combine mode

Operation Mode 802.11n\_20M TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4874.0	33.27		6.17	39.44		74.00	54.00	-14.56	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_20M) Combine mode

Operation Mode 802.11n\_20M TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4874.0	33.98		6.17	40.15		74.00	54.00	-13.85	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_20M) Combine mode

Operation Mode 802.11n\_20M TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4924.0	33.37		6.24	39.61		74.00	54.00	-14.39	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_20M) Combine mode

Operation Mode 802.11n\_20M TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim Pol Temperature 25 °C Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4924.0	33.40		6.24	39.64		74.00	54.00	-14.36	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_40M) Combine mode

Operation Mode 802.11n\_40M TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2422MHz Test By Jim Pol Ver. Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4844.0	34.43		6.05	40.48		74.00	54.00	-13.52	Peak
7266.0						74.00	54.00		
9688.0						74.00	54.00		
12110.0						74.00	54.00		
14532.0						74.00	54.00		
16954.0						74.00	54.00		
19376.0						74.00	54.00		
21798.0						74.00	54.00		
24220.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_40M) Combine mode

Operation Mode 802.11n\_40M TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2422MHz Test By Jim Pol Temperature 25 °C Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4844.0	34.18		6.05	40.23		74.00	54.00	-13.77	Peak
7266.0						74.00	54.00		
9688.0						74.00	54.00		
12110.0						74.00	54.00		
14532.0						74.00	54.00		
16954.0						74.00	54.00		
19376.0						74.00	54.00		
21798.0						74.00	54.00		
24220.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_40M) Combine mode

Operation Mode 802.11n\_40M TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4874.0	34.48		6.17	40.65		74.00	54.00	-13.35	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_40M) Combine mode

Operation Mode 802.11n\_40M TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Temperature 25 °C Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4874.0	33.52		6.17	39.69		74.00	54.00	-14.31	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_40M) Combine mode

Operation Mode 802.11n\_40M TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2452MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4904.0	33.34		6.28	39.62		74.00	54.00	-14.38	Peak
7356.0						74.00	54.00		
9808.0						74.00	54.00		
12260.0						74.00	54.00		
14712.0						74.00	54.00		
17164.0						74.00	54.00		
19616.0						74.00	54.00		
22068.0						74.00	54.00		
24520.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_40M) Combine mode

Operation Mode 802.11n\_40M TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2452MHz Test By Jim Temperature 25 °C Pol Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4904.0	33.25		6.28	39.53		74.00	54.00	-14.47	Peak
7356.0						74.00	54.00		
9808.0						74.00	54.00		
12260.0						74.00	54.00		
14712.0						74.00	54.00		
17164.0						74.00	54.00		
19616.0						74.00	54.00		
22068.0						74.00	54.00		
24520.0						74.00	54.00		

#### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a)

Operation Mode 802.11a TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5745MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1595.0	47.76		-5.48	42.28		74.00	54.00	-11.72	Peak
11490.0	23.78		19.19	42.97		74.00	54.00	-11.03	Peak
17235.0						74.00	54.00		
22980.0						74.00	54.00		
28725.0						74.00	54.00		
34470.0						74.00	54.00		
40215.0						74.00	54.00		
45960.0						74.00	54.00		
51705.0						74.00	54.00		
57450.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency  $\circ$
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column  $\circ$
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a)

Operation Mode 802.11a TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5745MHz Test By Jim Pol Hor Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	_
1435.0	48.80		-6.22	42.58		74.00	54.00	-11.42	Peak
11490.0	23.72		19.19	42.91		74.00	54.00	-11.09	Peak
17235.0						74.00	54.00		
22980.0						74.00	54.00		
28725.0						74.00	54.00		
34470.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a)

Operation Mode 802.11a TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 5785MHz Test By Jim Pol Ver Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	_
1245.0	49.24		-7.04	42.20		74.00	54.00	-11.80	Peak
11570.0	22.78		19.20	41.98		74.00	54.00	-12.02	Peak
17355.0						74.00	54.00		
23140.0						74.00	54.00		
28925.0						74.00	54.00		
34710.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a)

Operation Mode 802.11a TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 5785MHz Test By Jim Pol Hor Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	_
1435.0	54.20		-6.22	47.98		74.00	54.00	-6.02	Peak
11570.0	23.06		13.06	36.12		74.00	54.00	-17.88	Peak
17355.0						74.00	54.00		
23140.0						74.00	54.00		
28925.0						74.00	54.00		
34710.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a)

Operation Mode 802.11a TX CH High Test Date Nov. 22, 2009

Fundamental Frequency  $5825 \mathrm{MHz}$  Test By Jim Temperature  $25~^{\circ}\mathrm{C}$  Pol Ver

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	-
1595.0	45.95		-5.48	40.47		74.00	54.00	-13.53	Peak
11650.0	23.07		19.27	42.34		74.00	54.00	-11.66	Peak
17475.0						74.00	54.00		
23300.0						74.00	54.00		
29125.0						74.00	54.00		
34950.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency  $\circ$
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column  $\circ$
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a)

Operation Mode 802.11a TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 5825MHz Test By Jim Pol Hor Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	ī
1435.0	48.47		-6.22	42.25		74.00	54.00	-11.75	Peak
11650.0	23.24		19.27	42.51		74.00	54.00	-11.49	Peak
17475.0						74.00	54.00		
23300.0						74.00	54.00		
29125.0						74.00	54.00		
34950.0						74.00	54.00		

## Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- (5) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5745MHz Test By Jim Pol Ver. Temperature 25 °C

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1245.0	47.09		-7.04	40.05		74.00	54.00	-13.95	Peak
11490.0	24.12		19.19	43.31		74.00	54.00	-10.69	Peak
17235.0						74.00	54.00		
22980.0						74.00	54.00		
28725.0						74.00	54.00		
34470.0						74.00	54.00		
40215.0						74.00	54.00		
45960.0						74.00	54.00		
51705.0						74.00	54.00		
57450.0						74.00	54.00		

## Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5745MHz Test By Jim Pol Temperature 25 °C Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1435.0	50.91		-6.22	44.69		74.00	54.00	-9.31	Peak
11490.0	24.24		19.19	43.43		74.00	54.00	-10.57	Peak
17235.0						74.00	54.00		
22980.0						74.00	54.00		
28725.0						74.00	54.00		
34470.0						74.00	54.00		
40215.0						74.00	54.00		
45960.0						74.00	54.00		
51705.0						74.00	54.00		
57450.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 5785MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Ver

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1435.0	46.73		-6.22	40.51		74.00	54.00	-13.49	Peak
11570.0	23.50		19.20	42.70		74.00	54.00	-11.30	Peak
17355.0						74.00	54.00		
23140.0						74.00	54.00		
28925.0						74.00	54.00		
34710.0						74.00	54.00		
40495.0						74.00	54.00		
46280.0						74.00	54.00		
52065.0						74.00	54.00		
57850.0						74.00	54.00		

## Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 5785MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1435.0	48.80		-6.22	42.58		74.00	54.00	-11.42	Peak
11570.0	23.41		13.06	36.47		74.00	54.00	-17.53	Peak
17355.0						74.00	54.00		
23140.0						74.00	54.00		
28925.0						74.00	54.00		
34710.0						74.00	54.00		
40495.0						74.00	54.00		
46280.0						74.00	54.00		
52065.0						74.00	54.00		
57850.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH High Test Date Nov. 22, 2009

Fundamental Frequency  $5825 \mathrm{MHz}$  Test By Jim Temperature  $25~^{\circ}\mathrm{C}$  Pol Ver

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1245.0	51.55		-7.04	44.51		74.00	54.00	-9.49	Peak
11650.0	23.38		19.27	42.65		74.00	54.00	-11.35	Peak
17475.0						74.00	54.00		
23300.0						74.00	54.00		
29125.0						74.00	54.00		
34950.0						74.00	54.00		
40775.0						74.00	54.00		
46600.0						74.00	54.00		
52425.0						74.00	54.00		
58250.0						74.00	54.00		

## Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 20M) Combine mode

Operation Mode 802.11a/n\_20M TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 5825MHz Test By Jim Pol Temperature 25 °C Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1435.0	48.85		-6.22	42.63		74.00	54.00	-11.37	Peak
11650.0	24.13		19.27	43.40		74.00	54.00	-10.60	Peak
17475.0						74.00	54.00		
23300.0						74.00	54.00		
29125.0						74.00	54.00		
34950.0						74.00	54.00		
40775.0						74.00	54.00		
46600.0						74.00	54.00		
52425.0						74.00	54.00		
58250.0						74.00	54.00		

## Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 40M) Combine mode

Operation Mode 802.11a/n\_40M TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 5755 MHz Temperature 5755 MHz Temperature 25  $^{\circ}$ C Pol Ver.

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1245.0	50.02		-6.22	43.80		74.00	54.00	-10.20	Peak
11510.0	23.07		19.16	42.23		74.00	54.00	-11.77	Peak
17265.0						74.00	54.00		
23020.0						74.00	54.00		
28775.0						74.00	54.00		
34530.0						74.00	54.00		
40285.0						74.00	54.00		
46040.0						74.00	54.00		
51795.0						74.00	54.00		
57550.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 40M) Combine mode

Operation Mode 802.11a/n\_40M TX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2422MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1435.0	51.43		-6.22	45.21		74.00	54.00	-8.79	Peak
11510.0	23.79		19.16	42.95		74.00	54.00	-11.05	Peak
17265.0						74.00	54.00		
23020.0						74.00	54.00		
28775.0						74.00	54.00		
34530.0						74.00	54.00		
40285.0						74.00	54.00		
46040.0						74.00	54.00		
51795.0						74.00	54.00		
57550.0						74.00	54.00		

## Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 40M) Combine mode

Operation Mode 802.11a/n\_40M TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 5795MHz Test By Jim Temperature 25  $^{\circ}$ C Pol Ver

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1435.0	47.65		-6.22	41.43		74.00	54.00	-12.57	Peak
5590.0	23.03		19.19	42.22		74.00	54.00	-11.78	Peak
8385.0						74.00	54.00		
11180.0						74.00	54.00		
13975.0						74.00	54.00		
16770.0						74.00	54.00		
19565.0						74.00	54.00		
22360.0						74.00	54.00		
25155.0						74.00	54.00		
27950.0						74.00	54.00		

## Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11a/n 40M) Combine mode

Operation Mode 802.11a/n\_40M TX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2452 MHz Test By Jim Temperature  $25 \,^{\circ}\text{C}$  Pol Hor

Humidity 65 %

	Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1435.0	52.00		-6.22	45.78		74.00	54.00	-8.22	Peak
5590.0	23.47		19.19	42.66		74.00	54.00	-11.34	Peak
8385.0						74.00	54.00		
11180.0						74.00	54.00		
13975.0						74.00	54.00		
16770.0						74.00	54.00		
19565.0						74.00	54.00		
22360.0						74.00	54.00		
25155.0						74.00	54.00		
27950.0						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (below 1GHz) (802.11g) (worst case)

Nov. 22, 2009 Operation Mode 802.11g RX CH Low Test Date

Fundamental Frequency 2412MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	49.77	-14.36	35.41	40.00	-4.59
62.98	V	Peak	42.87	-14.85	28.02	40.00	-11.98
75.59	V	Peak	43.72	-17.13	26.59	40.00	-13.41
90.14	V	Peak	44.48	-17.62	26.86	43.50	-16.64
104.69	V	Peak	42.56	-16.63	25.93	43.50	-17.57
875.84	V	Peak	31.88	-1.51	30.37	46.00	-15.63
38.73	Н	Peak	46.03	-13.84	32.19	40.00	-7.81
58.13	Н	Peak	39.69	-14.66	25.03	40.00	-14.97
65.89	Н	Peak	37.80	-15.09	22.71	40.00	-17.29
242.43	Н	Peak	45.42	-14.06	31.36	46.00	-14.64
611.03	Н	Peak	39.60	-5.79	33.81	46.00	-12.19
644.98	Н	Peak	39.69	-5.10	34.59	46.00	-11.41

### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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# Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b) (worst case)

Operation Mode 802.11g RX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	50.43	-14.36	36.07	40.00	-3.93
63.95	V	Peak	42.43	-14.89	27.54	40.00	-12.46
75.59	V	Peak	43.93	-17.13	26.80	40.00	-13.20
90.14	V	Peak	45.37	-17.62	27.75	43.50	-15.75
104.69	V	Peak	42.52	-16.63	25.89	43.50	-17.61
798.24	V	Peak	32.61	-3.08	29.53	46.00	-16.47
38.73	Н	Peak	45.73	-13.84	31.89	40.00	-8.11
58.13	Н	Peak	39.91	-14.66	25.25	40.00	-14.75
75.59	Н	Peak	40.59	-17.13	23.46	40.00	-16.54
245.34	Н	Peak	45.24	-13.98	31.26	46.00	-14.74
599.39	Н	Peak	39.29	-6.03	33.26	46.00	-12.74
644.98	Н	Peak	38.95	-5.10	33.85	46.00	-12.15

### Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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# Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b) (worst case)

Operation Mode 802.11g RX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim Pol Ver./Hor Temperature 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36.79	V	Peak	49.99	-14.36	35.63	40.00	-4.37
62.98	V	Peak	42.71	-14.85	27.86	40.00	-12.14
75.59	V	Peak	43.95	-17.13	26.82	40.00	-13.18
90.14	V	Peak	44.42	-17.62	26.80	43.50	-16.70
104.69	V	Peak	42.25	-16.63	25.62	43.50	-17.88
906.88	V	Peak	31.58	-1.07	30.51	46.00	-15.49
38.73	Н	Peak	45.43	-13.84	31.59	40.00	-8.41
58.13	Н	Peak	39.84	-14.66	25.18	40.00	-14.82
75.59	Н	Peak	41.87	-17.13	24.74	40.00	-15.26
245.34	Н	Peak	45.28	-13.98	31.30	46.00	-14.70
575.14	Н	Peak	37.83	-6.83	31.00	46.00	-15.00
643.04	Н	Peak	39.97	-5.14	34.83	46.00	-11.17

## Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz •
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b) (worst case)

Operation Mode 802.11b RX CH Low Test Date Nov. 22, 2009

Fundamental Frequency 2412MHz Test By Jim

Pol Ver. / Hor Temperature 25 °C

Humidity 65 %

		Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Ant.Pol.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4824.0	V	34.60		6.05	40.65		74.00	54.00	-13.35	Peak
7236.0	V						74.00	54.00		
9648.0	V						74.00	54.00		
12060.0	V						74.00	54.00		
4824.0	Н	34.67		6.05	40.72		74.00	54.00	-13.28	Peak
7236.0	Н						74.00	54.00		
9648.0	Н						74.00	54.00		
12060.0	Н						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b) (worst case)

Operation Mode 802.11b RX CH Mid Test Date Nov. 22, 2009

Fundamental Frequency 2437MHz Test By Jim

Pol Ver. / Hor. Temperature 25 °C

Humidity 65 %

		Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Ant.Pol.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4874.0	V	34.58		6.17	40.75		74.00	54.00	-13.25	Peak
7311.0	V						74.00	54.00		
9748.0	V						74.00	54.00		
12185.0	V						74.00	54.00		
4874.0	H	33.86		6.17	40.03		74.00	54.00	-13.97	Peak
7311.0	Н						74.00	54.00		
9748.0	Н						74.00	54.00		
12185.0	Н						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200 ms.
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b) (worst case)

Operation Mode 802.11b RX CH High Test Date Nov. 22, 2009

Fundamental Frequency 2462MHz Test By Jim

Pol Ver. / Hor. Temperature 25 °C

Humidity 65 %

		Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
Freq.	Ant.Pol.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4924.0	V	33.46		6.28	39.74		74.00	54.00	-14.26	Peak
7386.0	V						74.00	54.00		
9848.0	V						74.00	54.00		
12310.0	V						74.00	54.00		
4924.0	Н	34.00		6.28	40.28		74.00	54.00	-13.72	Peak
7386.0	Н						74.00	54.00		
9848.0	Н						74.00	54.00		
12310.0	Н						74.00	54.00		

### Remark:

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# 10 Peak Power Spectral Density

# **Standard Applicable**

According to §15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

According to RSS-210 issue 7, §A8.2(2) and §A8.3(2), The transmitter power spectral density (into the antenna) shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0 second duration.

#### 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 the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW = 3KHz, VBW = 10KHz, Span = 1.5MHz, Sweep=100s
- 4. Record the max. reading.
- 5. Repeat above procedures until all frequency measured were complete.

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#### **Measurement Equipment Used:** 10.3

100 Medsarement Equipment Osca.								
Conducted Emission Test Site								
<b>EQUIPMENT</b>	MFR	MODEL	SERIAL	LAST	CAL DUE.			
TYPE		NUMBER	NUMBER	CAL.				
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010			
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/23/2008	01/22/2010			
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010			
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010			
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010			
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010			
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010			
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010			

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#### 10.4 **Measurement Result**

# 802.11b

Frequency	<b>RF Power Density</b>	Cable loss	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
2412	-8.69	0.00	-8.69	8
2437	-9.03	0.00	-9.03	8
2462	-9.40	0.00	-9.40	8

### 802.11g

Frequency	RF Power Density	Cable loss	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
2412	-13.72	0.00	-13.72	8
2437	-13.60	0.00	-13.60	8
2462	-14.26	0.00	-14.26	8

\*Offset: 0.2dB

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# 802.11n\_20M Chain 0

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-18.44	0.00	-18.44	8
2437	-18.62	0.00	-18.62	8
2462	-16.11	0.00	-16.11	8

# 802.11n\_20M Chain 1

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-17.04	0.00	-17.04	8
2437	-16.95	0.00	-16.95	8
2462	-17.92	0.00	-17.92	8

# 802.11n\_20M Combine Chain 0, Chain 1

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-9.86	0.00	-9.86	8
2437	-13.21	0.00	-13.21	8
2462	-11.73	0.00	-11.73	8

\*Offset: 0.2dB

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# 802.11n\_40M Chain 0

Frequency	<b>RF Power Density</b>	Cable loss	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
2422	-24.12	0.00	-24.12	8
2437	-22.93	0.00	-22.93	8
2452	-21.75	0.00	-21.75	8

# 802.11n\_40M Chain 1

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2422	-20.45	0.00	-20.45	8
2437	-21.14	0.00	-21.14	8
2452	-21.00	0.00	-21.00	8

# 8802.11n 40M Combine Chain 0, Chain 1

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2422	-14.94	0.00	-14.94	8
2437	-15.53	0.00	-15.53	8
2452	-15.16	0.00	-15.16	8

\*Offset: 0.2dB

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### 802.11a

Frequency	<b>RF Power Density</b>	Cable loss	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
5745	-15.28	0.00	-15.28	8
5785	-14.32	0.00	-14.32	8
5825	-13.99	0.00	-13.99	8

\*Offset: 0.2dB

# 802.11n\_20M Chain 0

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
5745	-18.84	0.00	-18.84	8
5785	-17.54	0.00	-17.54	8
5825	-17.76	0.00	-17.76	8

# 802.11n\_20M Chain 1

Frequency	<b>RF Power Density</b>	Cable loss	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
5745	-16.86	0.00	-16.86	8
5785	-17.32	0.00	-17.32	8
5825	-17.61	0.00	-17.61	8

# 802.11n\_20M Combine Chain 0, Chain 1

Frequency	<b>RF Power Density</b>	Cable loss	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
5745	-12.18	0.00	-12.18	8
5785	-11.25	0.00	-11.25	8
5825	-11.71	0.00	-11.71	8

\*Offset: 0.2dB

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# 802.11n\_40M Chain 0

Frequency	<b>RF Power Density</b>	Cable loss	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
5755	-22.18	0.00	-22.18	8
5795	-19.68	0.00	-19.68	8

# 802.11n\_40M Chain 1

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
5755	-20.37	0.00	-20.37	8
5795	-20.61	0.00	-20.61	8

# 8802.11n\_40M Combine Chain 0, Chain 1

Frequency	<b>RF Power Density</b>	Cable loss	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
5755	-15.29	0.00	-15.29	8
5795	-15.23	0.00	-15.23	8

\*Offset: 0.2dB

Note: Refer to next page for plots.

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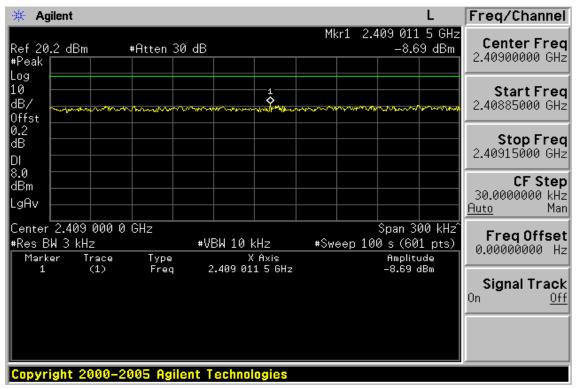
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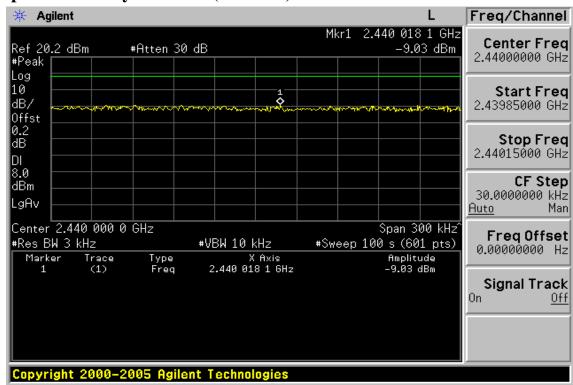
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802.11b **Power Spectral Density Test Plot (CH-Low)** 



# Poer Spectral Density Test Plot (CH-Mid)



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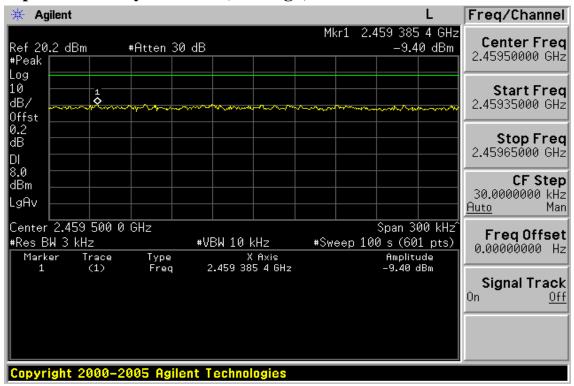
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# **Power Spectral Density Test Plot (CH-High)**



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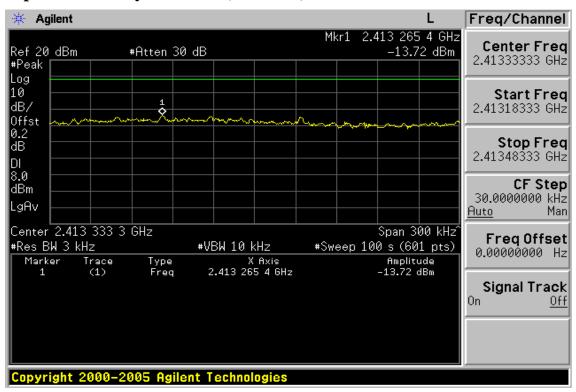
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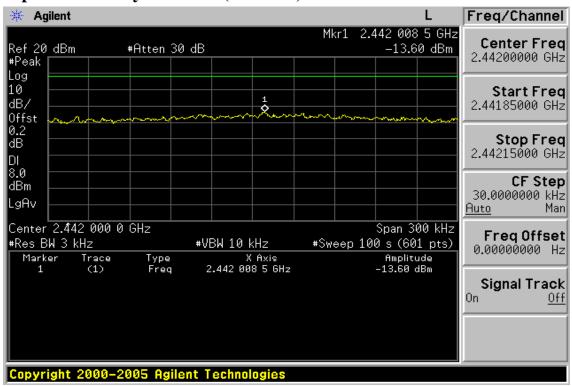
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802.11g Power Spectral Density Test Plot (CH-Low)



# **Power Spectral Density Test Plot (CH-Mid)**



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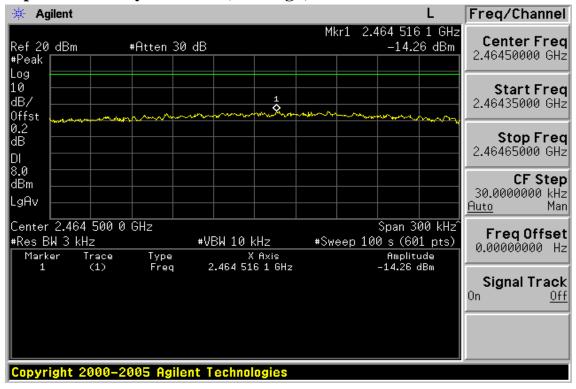
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# **Power Spectral Density Test Plot (CH-High)**



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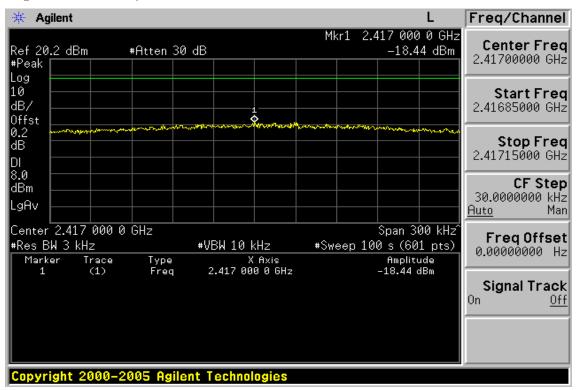


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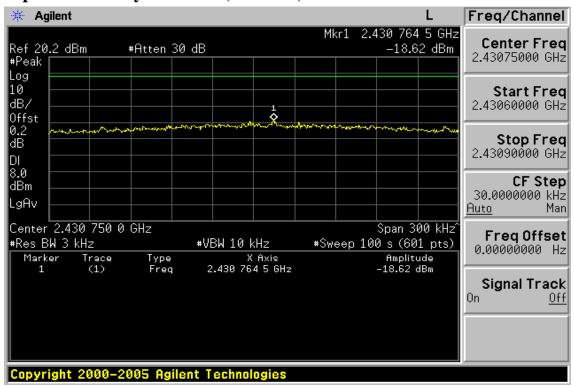
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# 802.11n\_20M, Chain 0

# **Power Spectral Density Test Plot (CH-Low)**



# **Power Spectral Density Test Plot (CH-Mid)**



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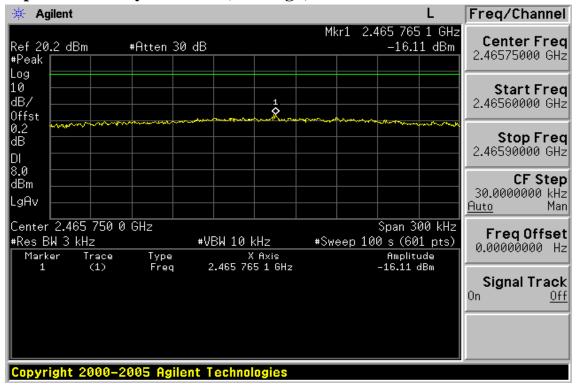
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# **Power Spectral Density Test Plot (CH-High)**



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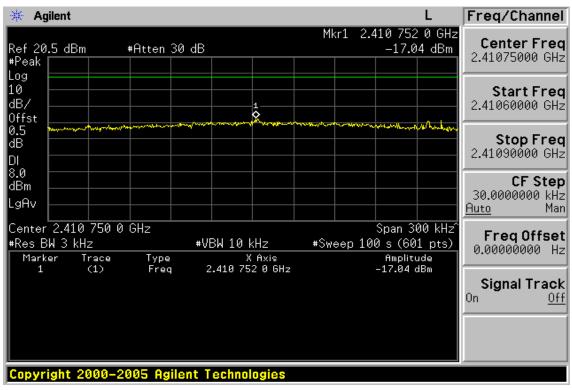
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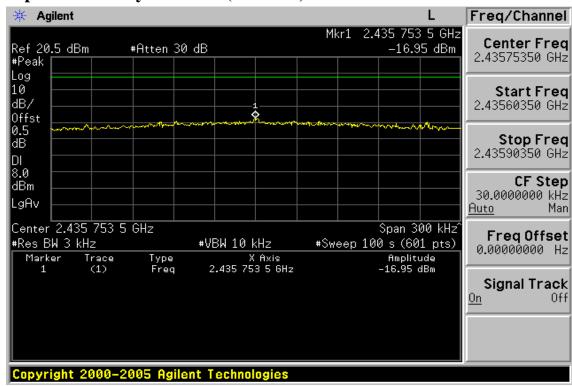
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# 802.11n\_20M, Chain 1 Power Spectral Density Test Plot (CH-Low)



# **Power Spectral Density Test Plot (CH-Mid)**



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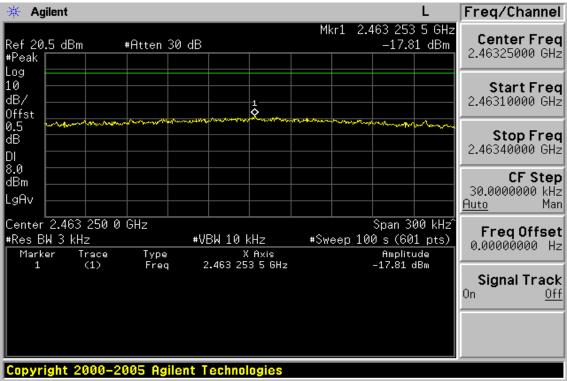
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# Power Spectral Density Test Plot (CH-High)



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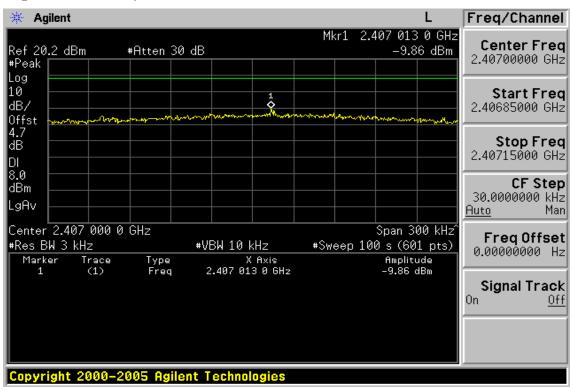
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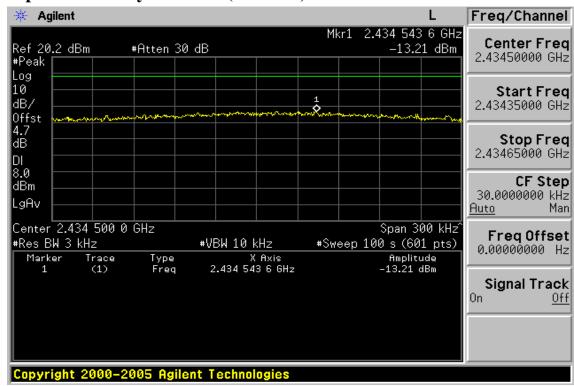
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# 802.11n\_20M, Combine Chain 0, Chain 1 **Power Spectral Density Test Plot (CH-Low)**



# **Power Spectral Density Test Plot (CH-Mid)**



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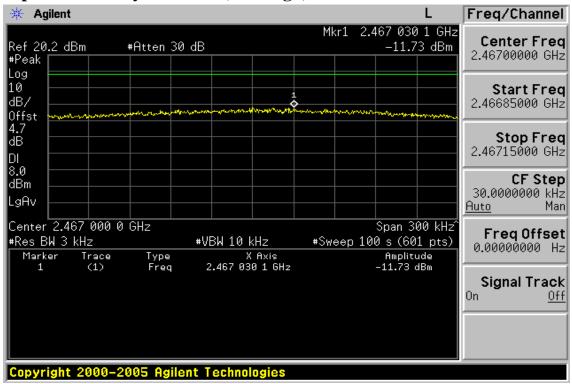
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# **Power Spectral Density Test Plot (CH-High)**



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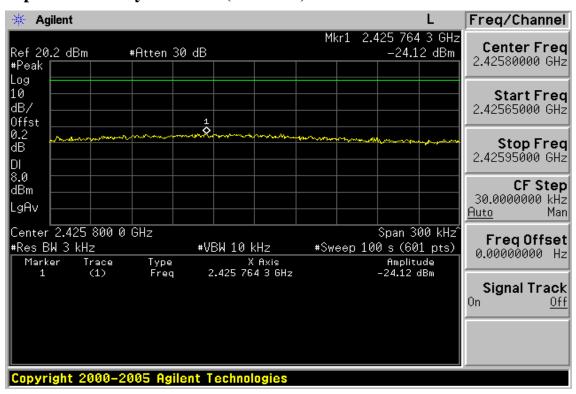
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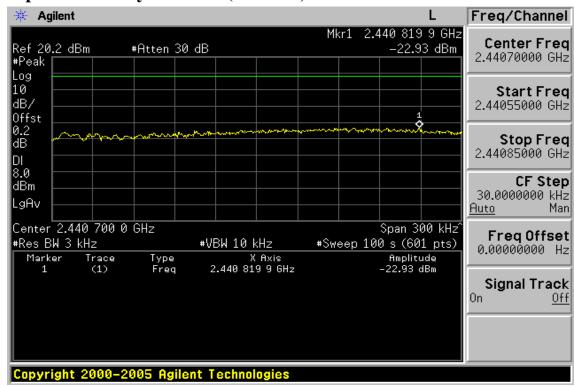
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# 802.11n\_40M, Chain 0 Power Spectral Density Test Plot (CH-Low)



# **Power Spectral Density Test Plot (CH-Mid)**



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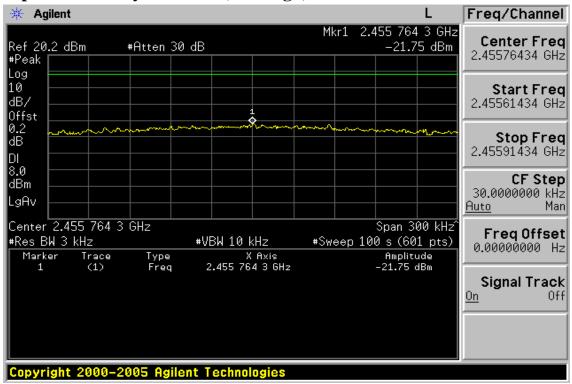
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# **Power Spectral Density Test Plot (CH-High)**



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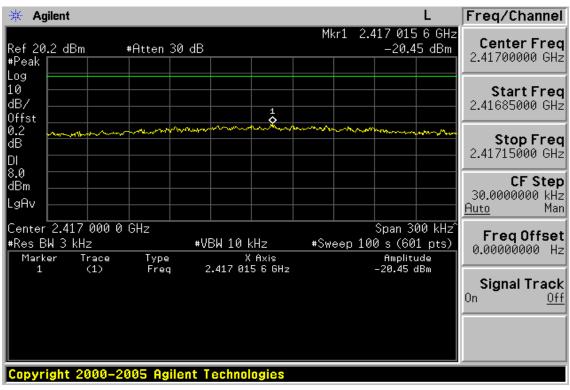
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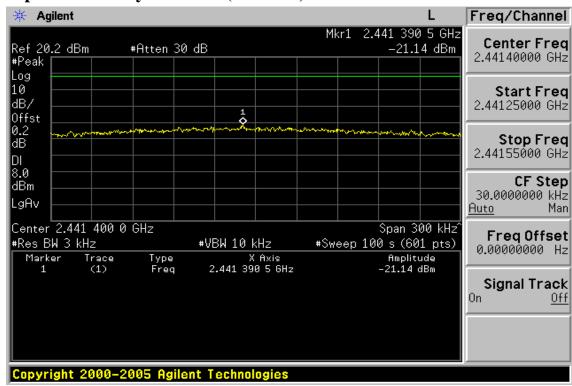
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# 802.11n\_40M, Chain 1 Power Spectral Density Test Plot (CH-Low)



## **Power Spectral Density Test Plot (CH-Mid)**



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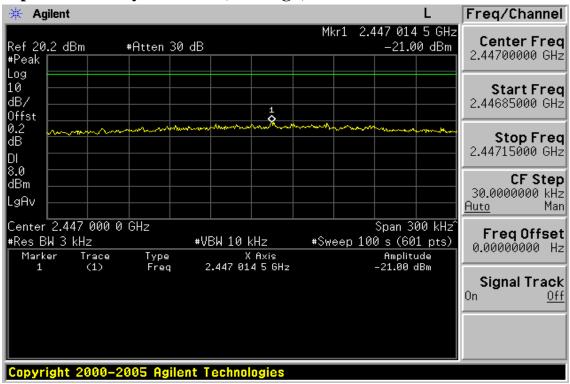
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# **Power Spectral Density Test Plot (CH-High)**



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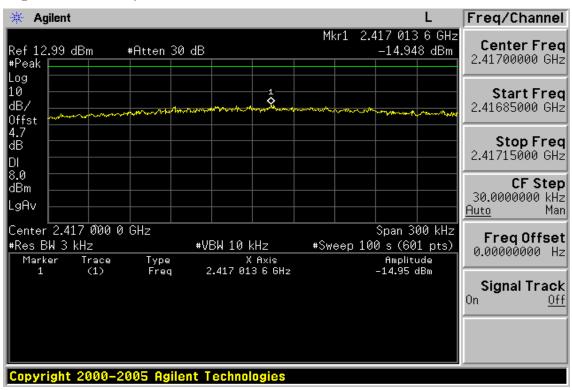
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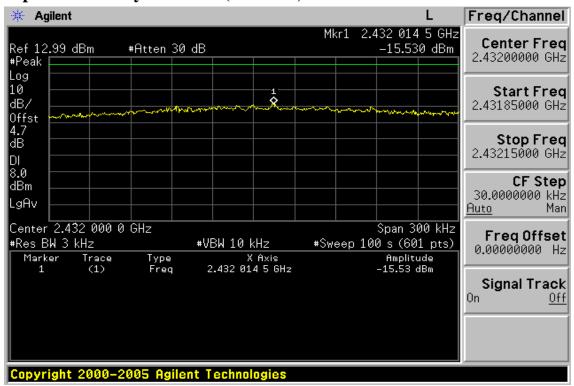
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# 802.11n\_40M, Combine Chain 0, Chain 1 Power Spectral Density Test Plot (CH-Low)



## **Power Spectral Density Test Plot (CH-Mid)**



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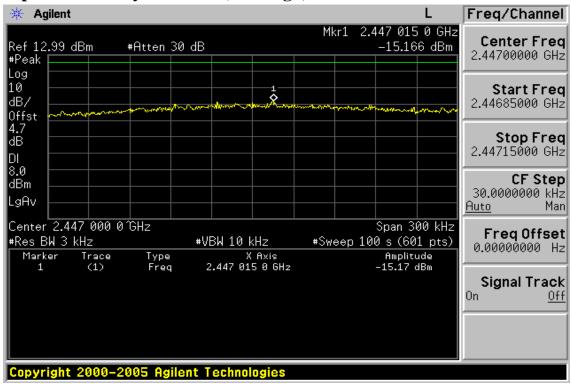
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# **Power Spectral Density Test Plot (CH-High)**



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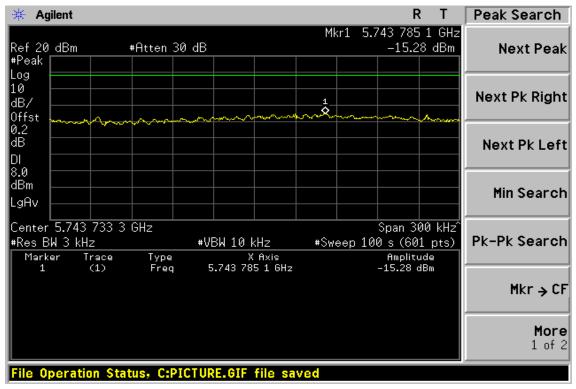
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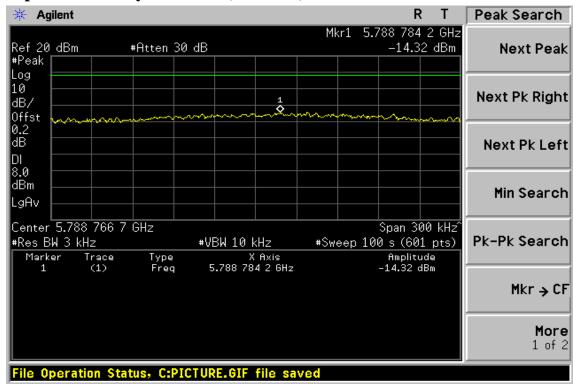
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802.11a **Power Spectral Density Test Plot (CH-Low)** 



## **Power Spectral Density Test Plot (CH-Mid)**



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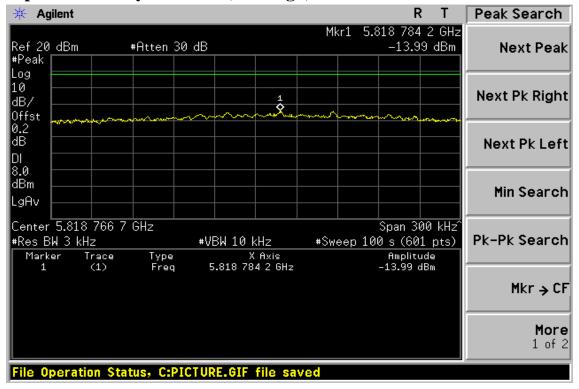
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# **Power Spectral Density Test Plot (CH-High)**



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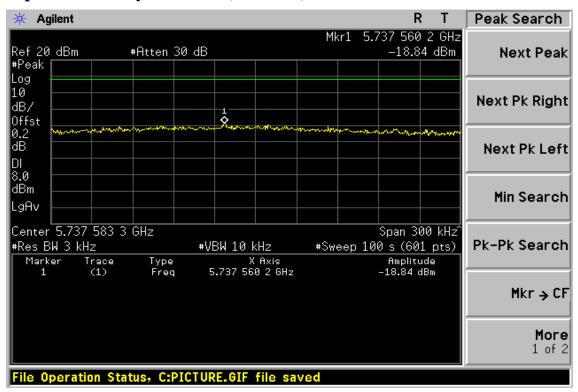


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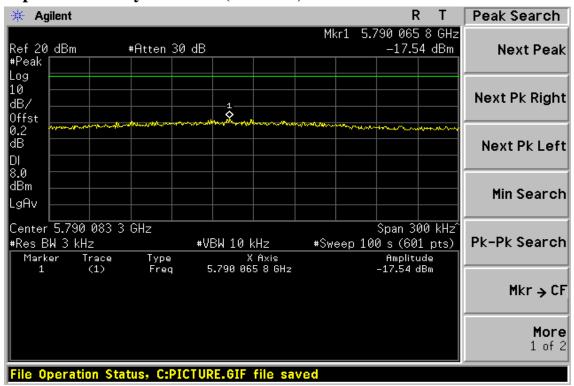
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## 802.11a/n\_20M, Chain 0

### **Power Spectral Density Test Plot (CH-Low)**



## **Power Spectral Density Test Plot (CH-Mid)**



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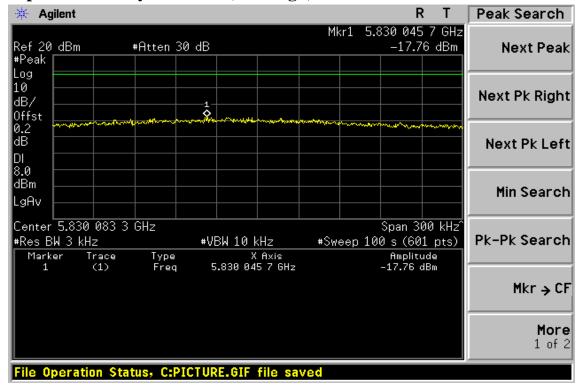
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# **Power Spectral Density Test Plot (CH-High)**



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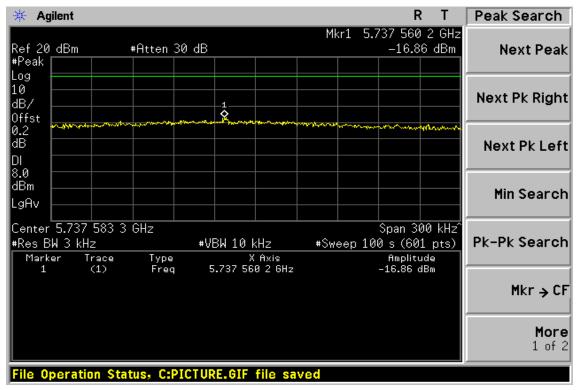
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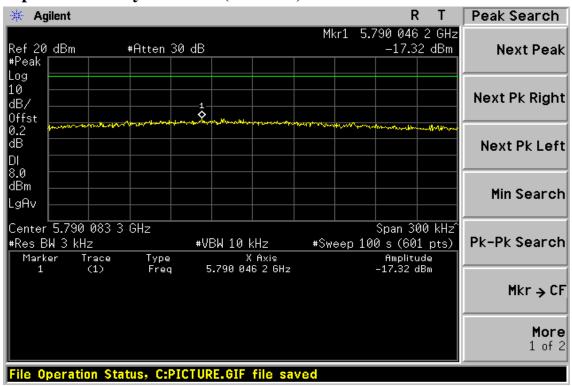
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# 802.11a/n\_20M, Chain 1 **Power Spectral Density Test Plot (CH-Low)**



## **Power Spectral Density Test Plot (CH-Mid)**



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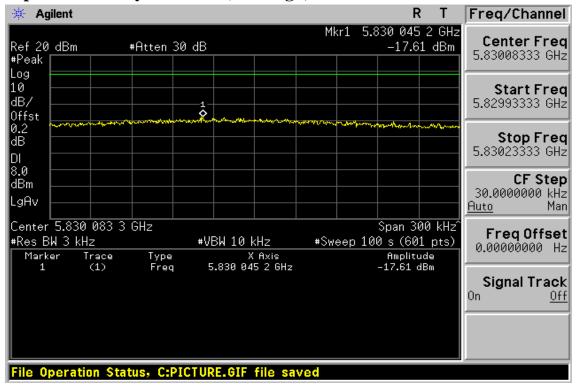
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# **Power Spectral Density Test Plot (CH-High)**



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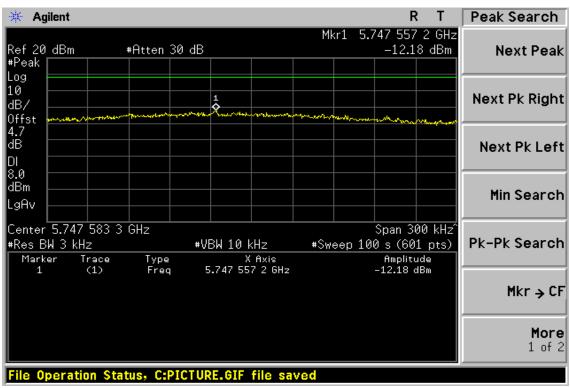
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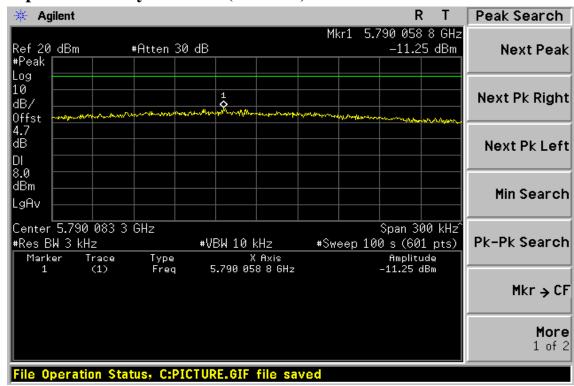
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# 802.11a/n\_20M, Combine Chain 0, Chain 1 **Power Spectral Density Test Plot (CH-Low)**



## **Power Spectral Density Test Plot (CH-Mid)**



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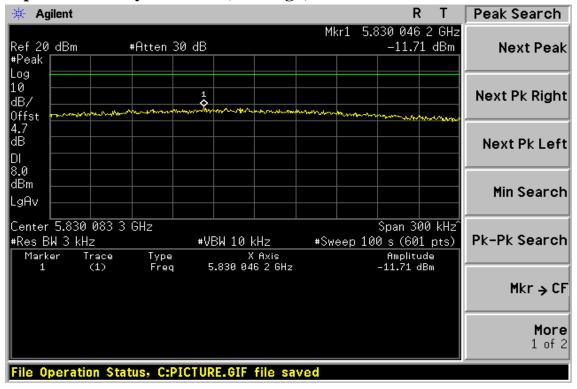
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# **Power Spectral Density Test Plot (CH-High)**



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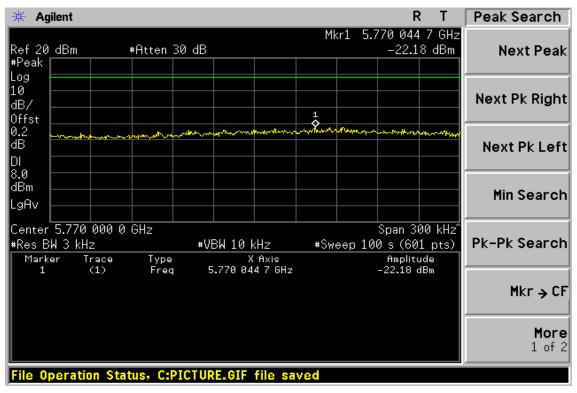


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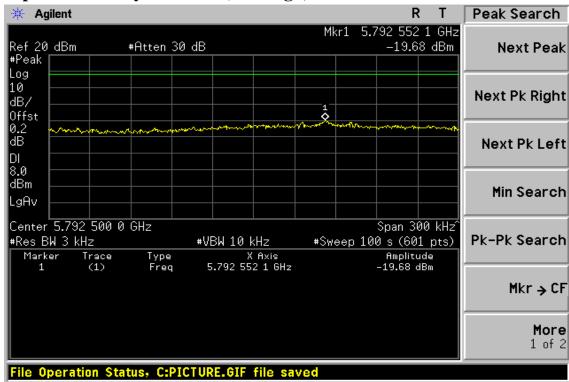
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# 802.11a/n\_40M, Chain 0

## **Power Spectral Density Test Plot (CH-Low)**



# **Power Spectral Density Test Plot (CH-High)**



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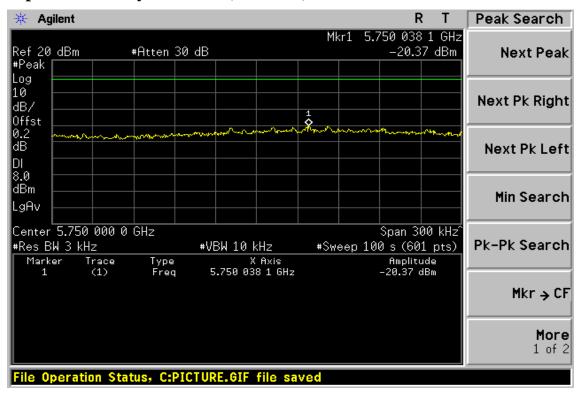
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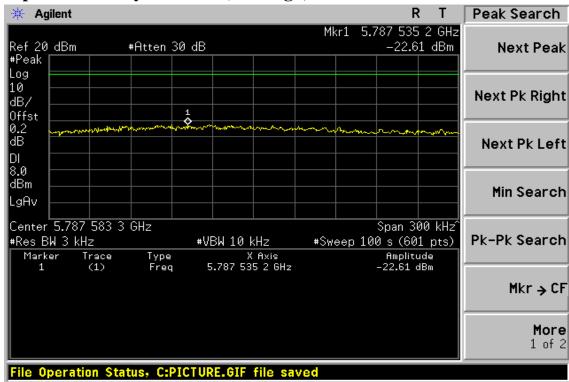
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# 802.11a/n\_40M, Chain 1 Power Spectral Density Test Plot (CH-Low)



# **Power Spectral Density Test Plot (CH-High)**



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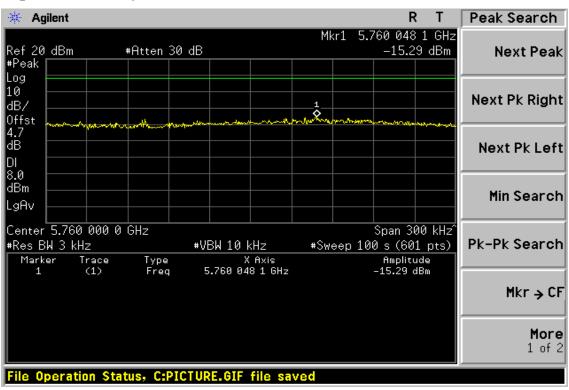
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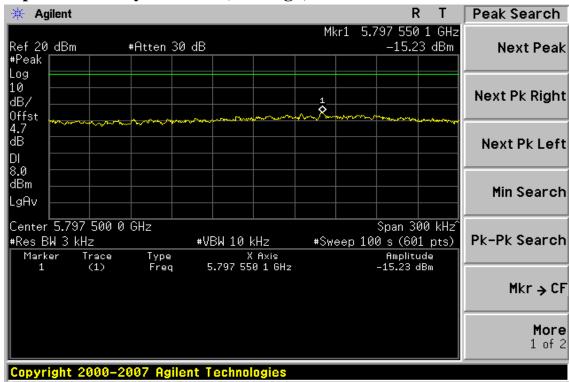
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# 802.11a/n\_40M, Combine Chain 0, Chain 1 **Power Spectral Density Test Plot (CH-Low)**



# **Power Spectral Density Test Plot (CH-High)**



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#### 11 99% Bandwidth Measurement

#### **Standard Applicable** 11.1

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.

The span between the two recorded frequencies is the occupied bandwidth.

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#### 11.2 **Measurement Equipment Used:**

Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/23/2008	01/22/2010
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010

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#### 11.3 **Test Set-up:**

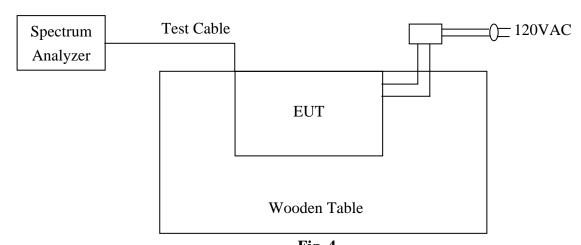


Fig. 4

Fig. 4: Measurement setup for testing on Antenna connector

#### 11.4 **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 RBW=1% of the approximate emission bandwidth, VBW = 3 times RBW, Span= approximately 20dB below the peak level. Sweep=auto
- Turn on the 99% bandwidth function, max reading... 4.
- 5. Repeat above procedures until all frequency measured were complete.

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#### 11.5 **Measurement Result**

#### 802.11b

Frequency MHz	99%Bandwidth (MHz)
2412	13.1341
2437	13.1455
2462	13.1919

#### 802.11b

Frequency MHz	99%Bandwidth (MHz)
2412	16.5371
2437	16.5378
2462	16.5364

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#### 802.11n\_20M, Chain 0

Frequency MHz	99%Bandwidth (MHz)
2412	17.6510
2437	17.6540
2462	17.6574

#### 802.11n\_20M, Chain 1

Frequency MHz	99%Bandwidth (MHz)
2412	17.6562
2437	17.6720
2462	17.6855

#### 802.11n 20M, Combine Chain 0, Chain 1

Frequency	99%Bandwidth	
MHz	(MHz)	
2412	17.0947	
2437	17.0286	
2462	17.0580	

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## 802.11n\_40M, Chain 0

Frequency MHz	99%Bandwidth (MHz)
2422	36.0915
2437	36.0680
2452	36.1115

#### 802.11n\_40M, Chain 1

Frequency MHz	99%Bandwidth (MHz)
2422	36.1355
2437	36.1324
2452	36.1417

#### 802.11n 40M, Combine Chain 0, Chain 1

Frequency	99%Bandwidth	
MHz	(MHz)	
2422	35.9739	
2437	35.9591	
2452	35.9612	

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#### 802.11a

Frequency	99%Bandwidth
MHz	(MHz)
5745	16.5409
5785	16.5579
5825	17.6756

#### 802.11a/n\_20M, Chain 0

Frequency MHz	99%Bandwidth (MHz)
5745	17.6716
5785	17.6615
5825	17.6576

#### 802.11a/n 20M, Chain 1

Frequency	99%Bandwidth
MHz	(MHz)
5745	17.6462
5785	17.6567
5825	17.6708

#### 802.11a/n\_20M, Combine Chain 0, Chain 1

Frequency MHz	99%Bandwidth (MHz)
5745	17.4895
5785	17.4224
5825	17.4284

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#### 802.11a/n\_40M, Chain 0

Frequency MHz	99%Bandwidth (MHz)
5745	36.1378
5795	36.1471

#### 802.11a/n 40M, Chain 1

Frequency MHz	99%Bandwidth (MHz)
5745	36.1536
5795	36.1555

#### 802.11a/n\_40M, Combine Chain 0, Chain 1

Frequency MHz	99%Bandwidth (MHz)
5745	36.0040
5795	36.0350

Note: Refer to next page for plots.

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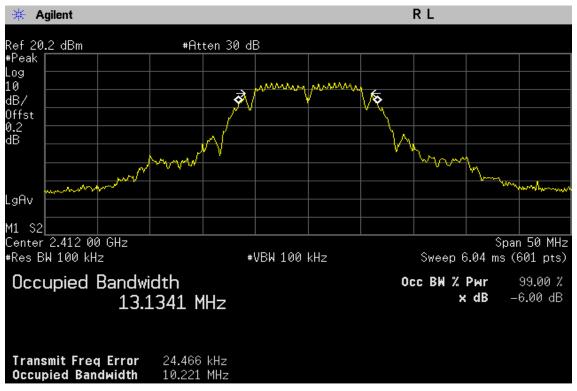
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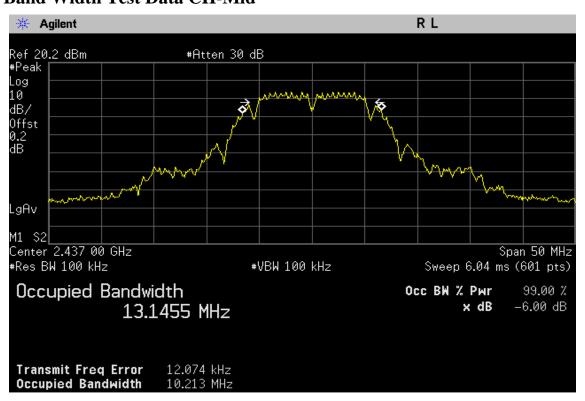
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802.11b 99% Band Width Test Data CH-Low



#### 99% Band Width Test Data CH-Mid



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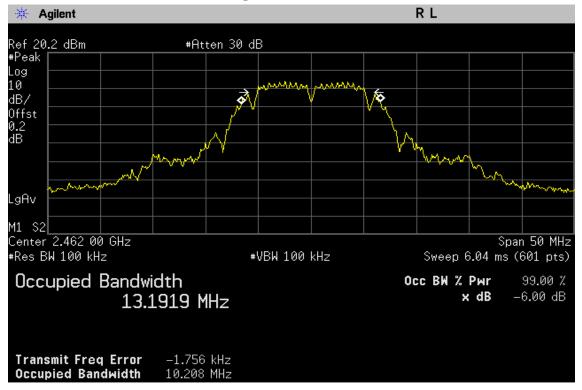
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# 99% Band Width Test Data CH-High



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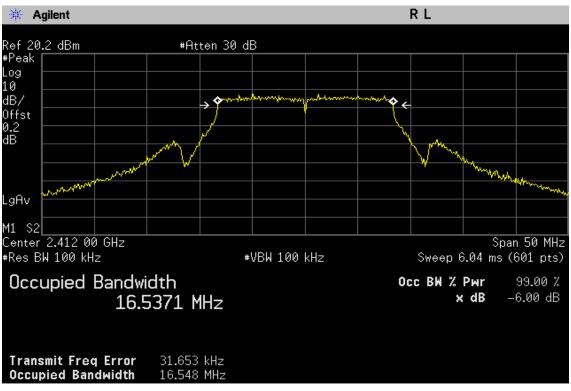
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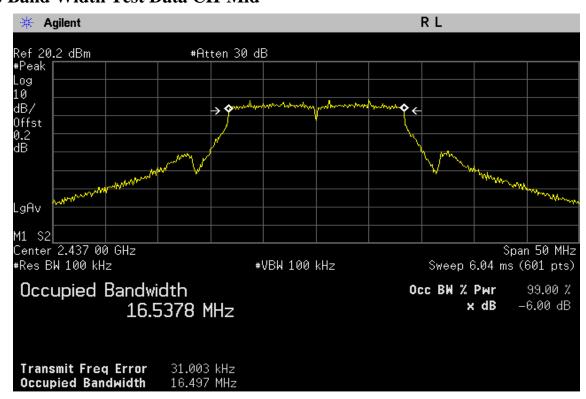
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802.11g 99%Band Width Test Data CH-Low



#### 99% Band Width Test Data CH-Mid



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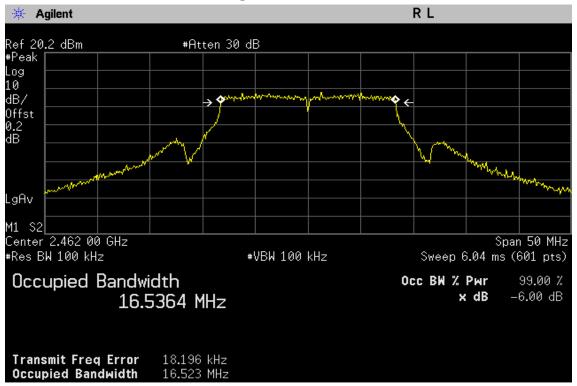
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# 99% Band Width Test Data CH-High



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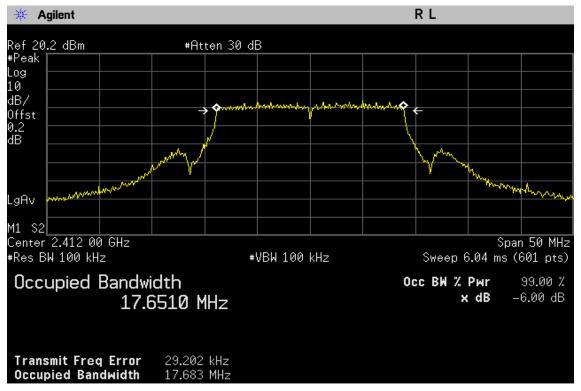


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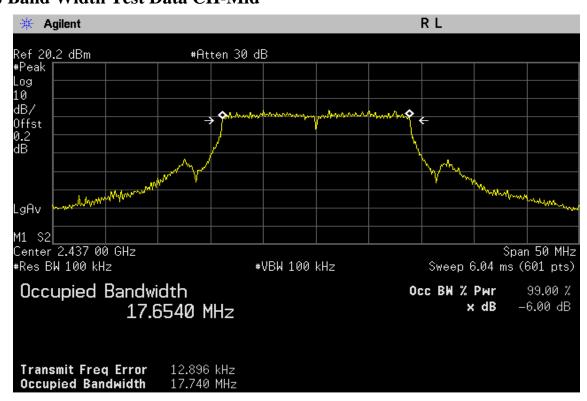
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# 802.11n\_20M, Chain0

#### 99% Band Width Test Data CH-Low



#### 99% Band Width Test Data CH-Mid



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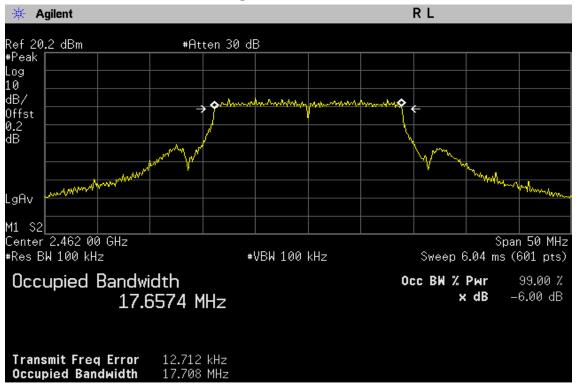
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# 99% Band Width Test Data CH-High



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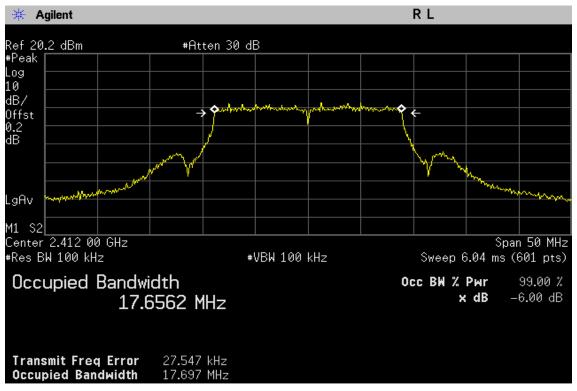
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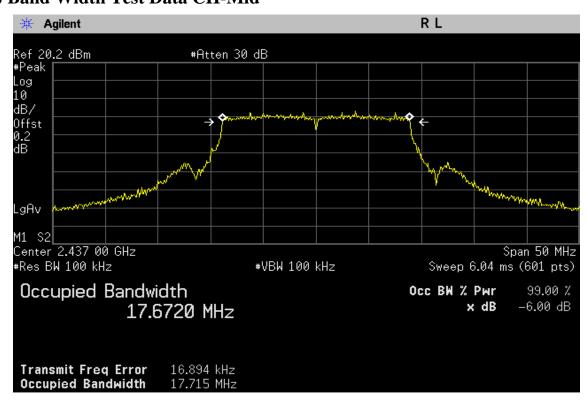
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# 802.11n\_20M, Chain 1 99% Band Width Test Data CH-Low



#### 99% Band Width Test Data CH-Mid



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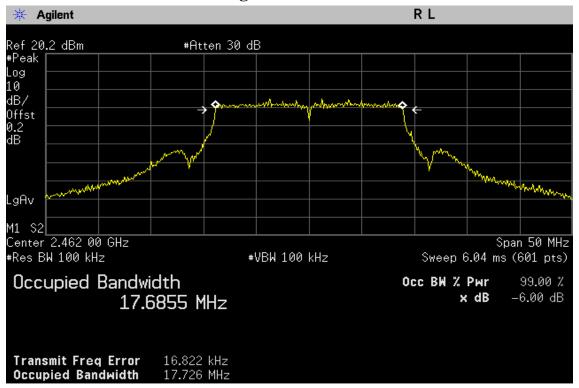
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# 99% Band Width Test Data CH-High



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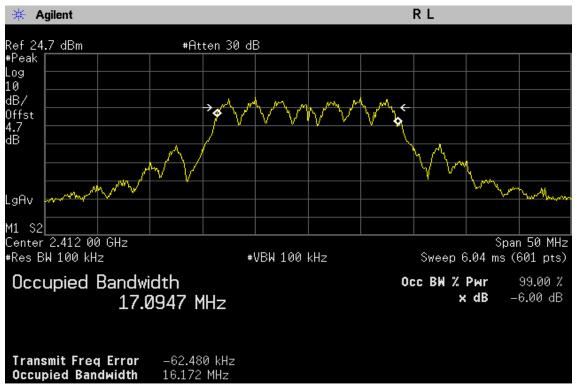
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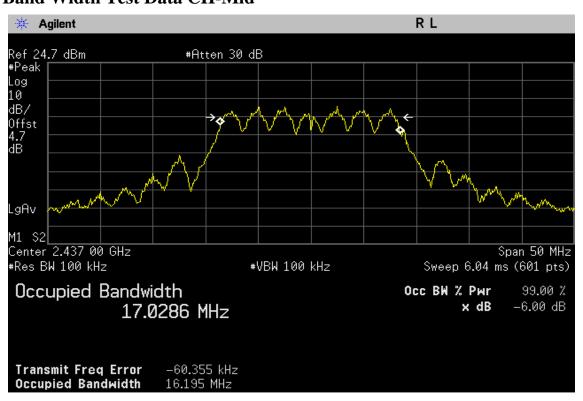
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# 802.11n\_20M, Combine, Chain0, Chain1 99% Band Width Test Data CH-Low



#### 99% Band Width Test Data CH-Mid



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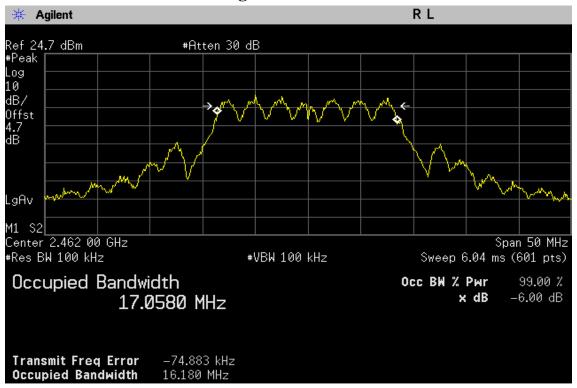
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# 99% Band Width Test Data CH-High



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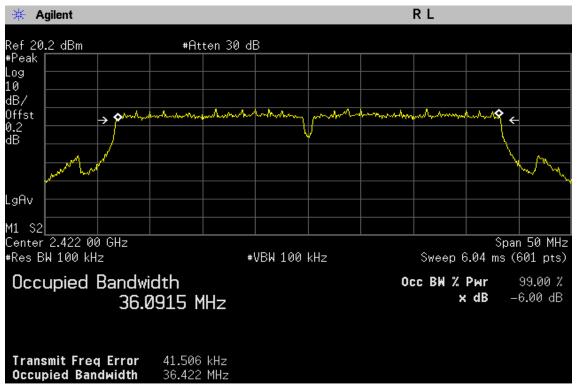
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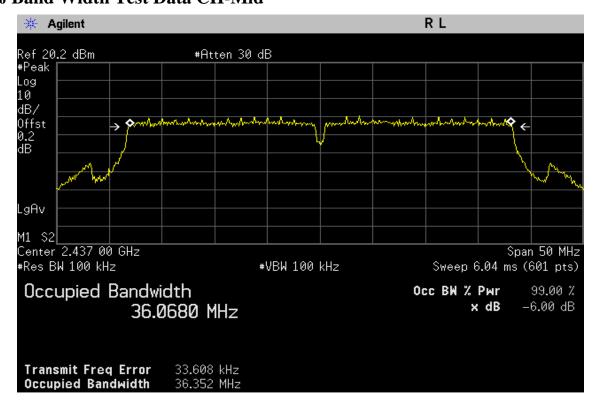
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# 802.11n\_40M, Chain0 99% Band Width Test Data CH-Low



#### 99% Band Width Test Data CH-Mid



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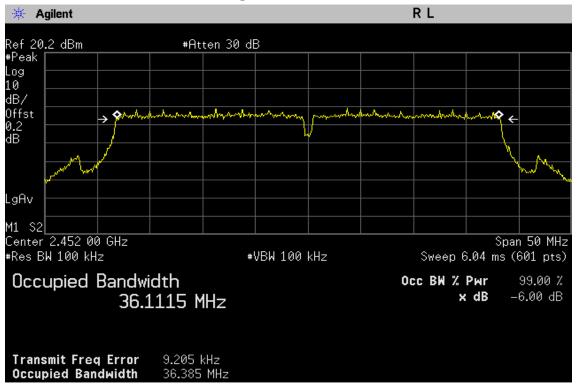
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# 99% Band Width Test Data CH-High



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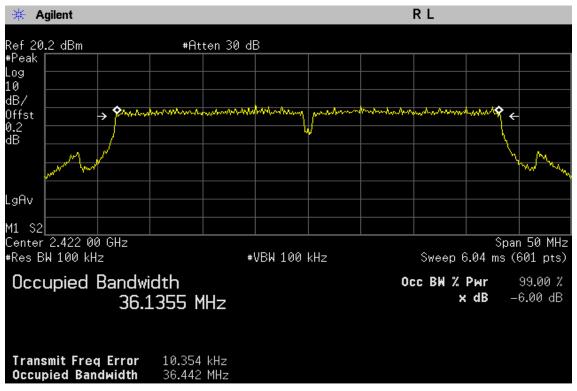
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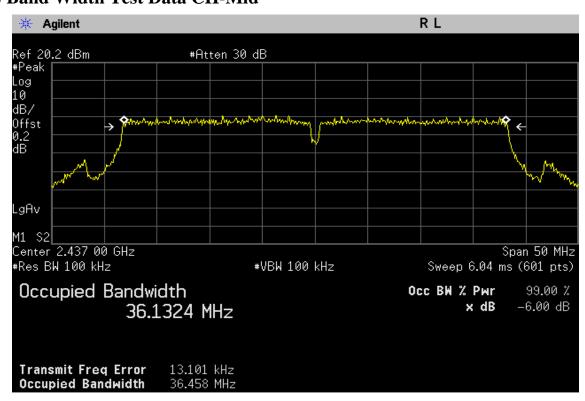
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# 802.11n\_40M, Chain1 99% Band Width Test Data CH-Low



#### 99% Band Width Test Data CH-Mid



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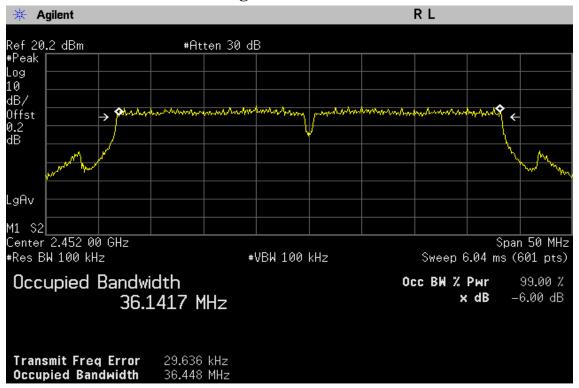
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# 99% Band Width Test Data CH-High



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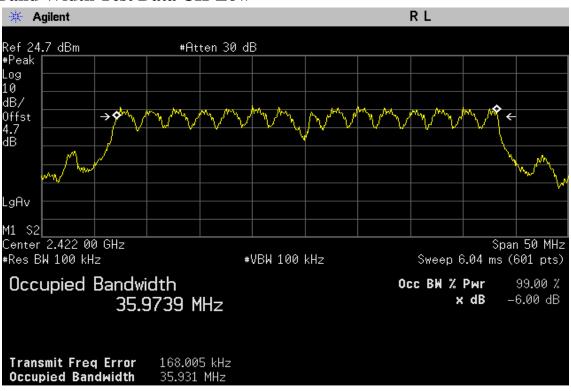
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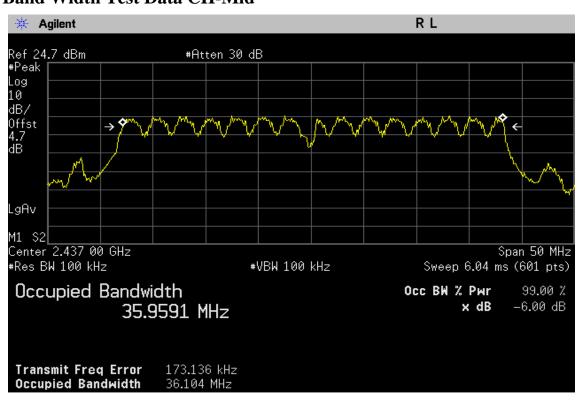
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## 802.11n\_40M, Combine, Chain0, Chain1 99% Band Width Test Data CH-Low



### 99% Band Width Test Data CH-Mid



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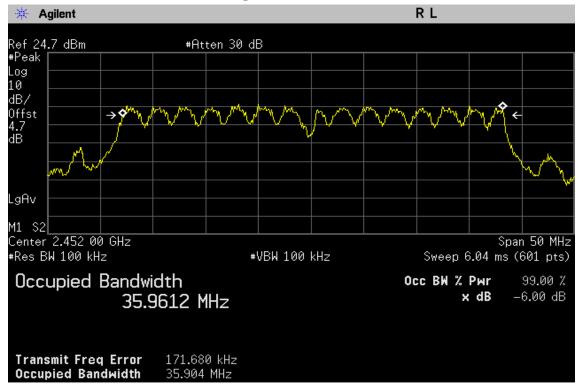
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## 99% Band Width Test Data CH-High



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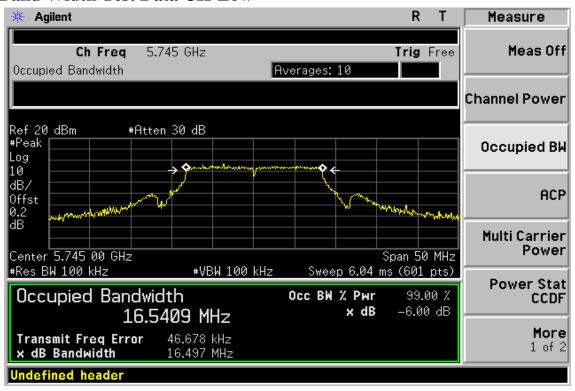


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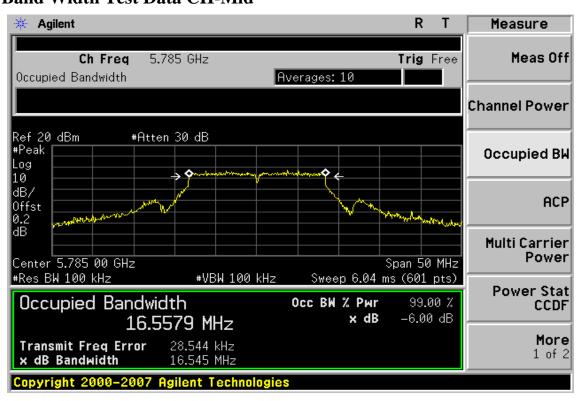
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802.11a

### 99% Band Width Test Data CH-Low



## 99% Band Width Test Data CH-Mid



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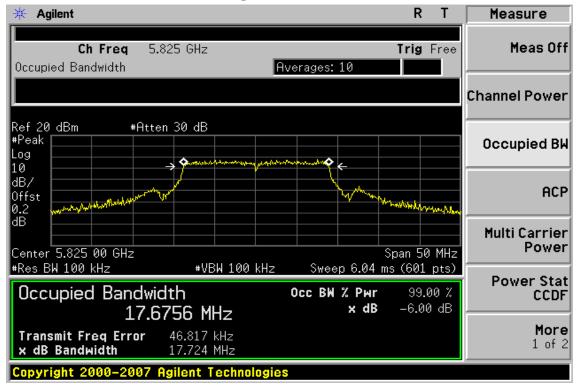
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## 99% Band Width Test Data CH-High



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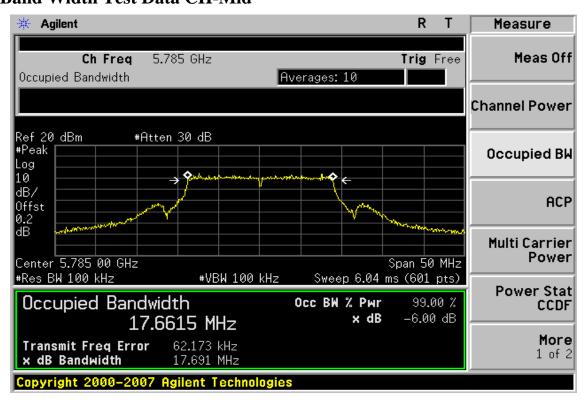
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## 802.11a/n 20M, Chain0 99% Band Width Test Data CH-Low



### 99%Band Width Test Data CH-Mid



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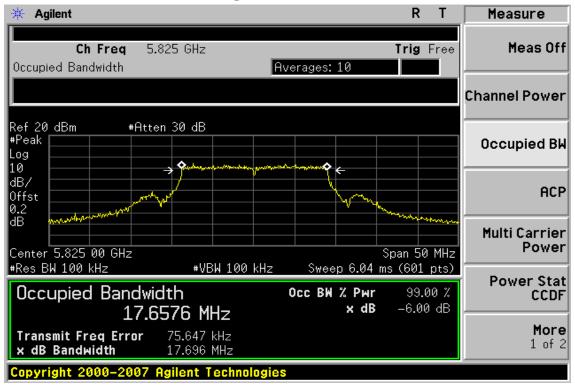
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## 99%Band Width Test Data CH-High



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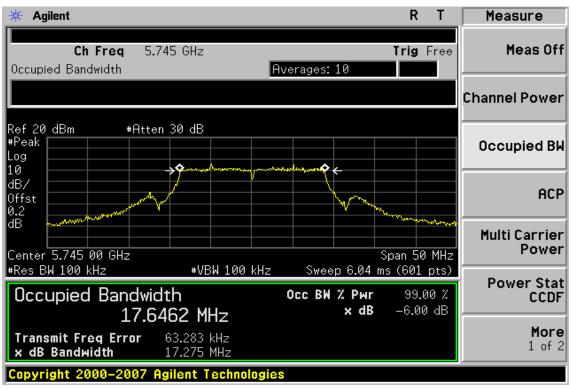
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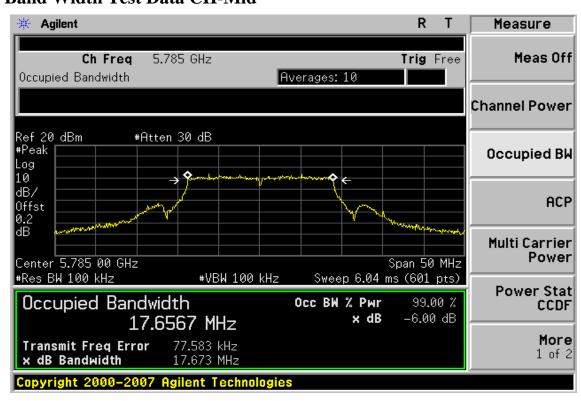
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## 802.11a/n\_20M, ,Chain 1 99% Band Width Test Data CH-Low



## 99% Band Width Test Data CH-Mid



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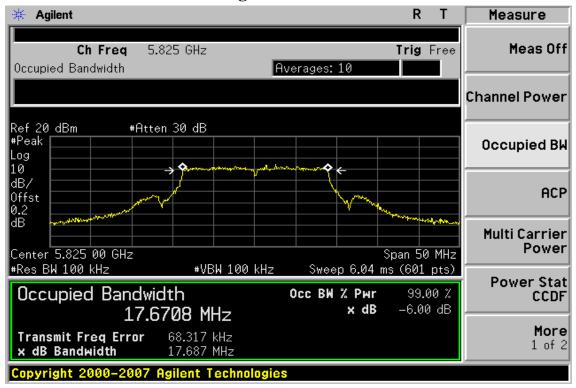
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## 99% Band Width Test Data CH-High



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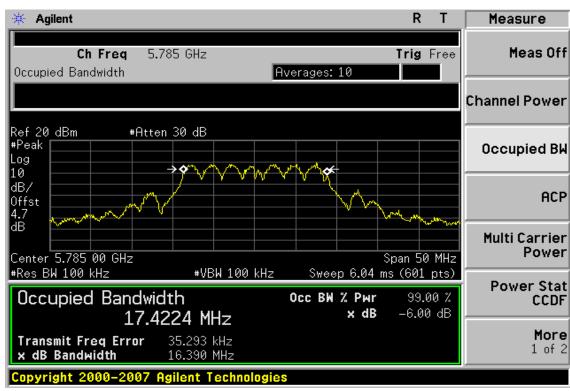
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## 802.11a/n\_20M, Combine, Chain0, Chain1 99% Band Width Test Data CH-Low



### 99% Band Width Test Data CH-Mid



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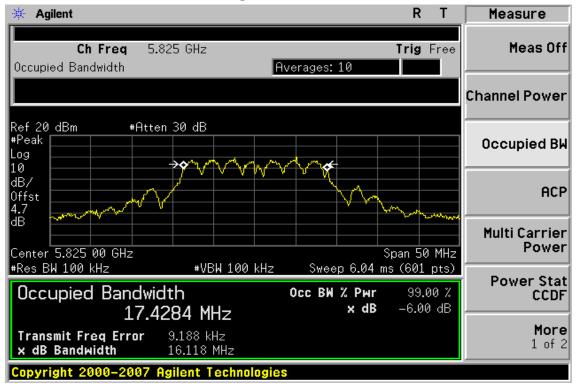
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## 99% Band Width Test Data CH-High



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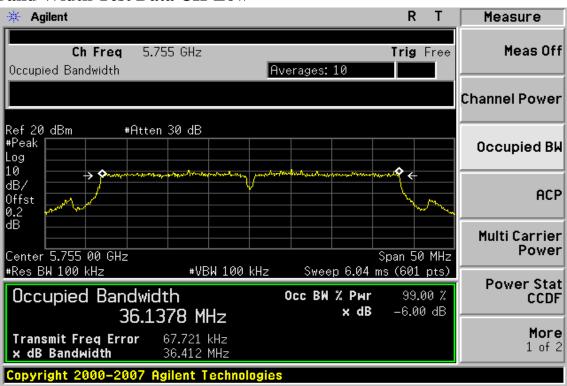
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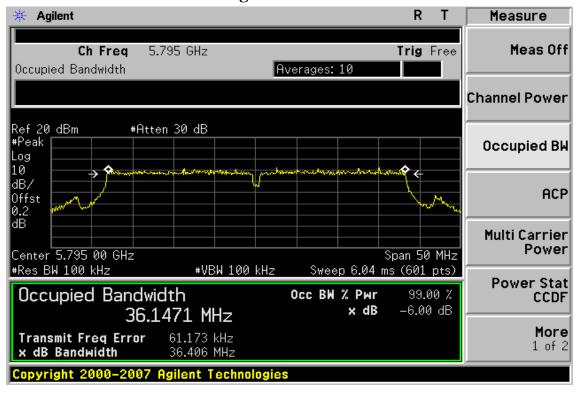
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## 802.11a/n 40M, Chain0 99% Band Width Test Data CH-Low



## 99% Band Width Test Data CH-High



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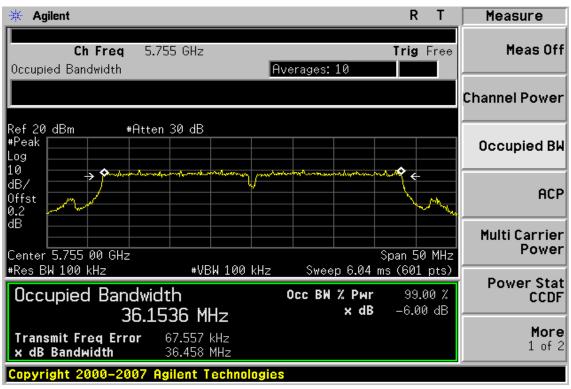
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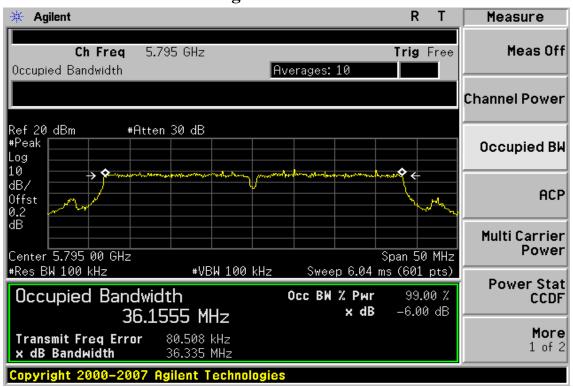
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## 802.11a/n 40M, Chain 1 99% Band Width Test Data CH-Low



## 99%Band Width Test Data CH-High



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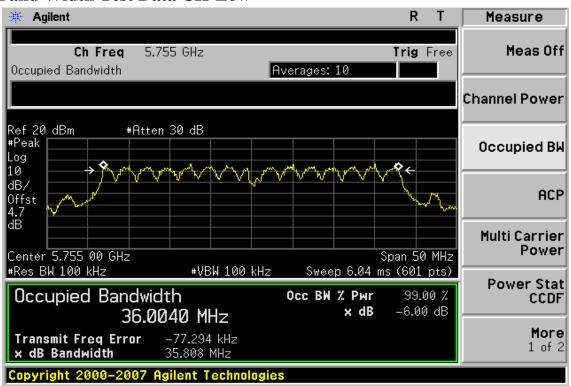
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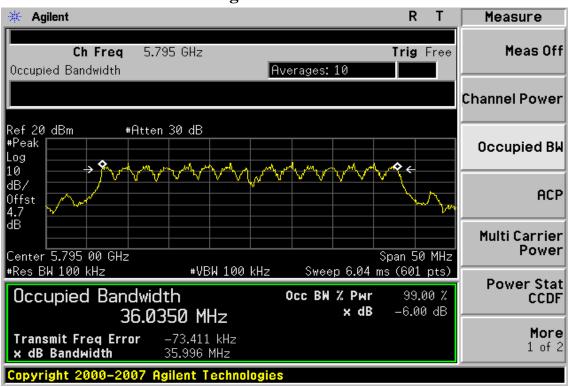
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## 802.11a/n\_40M, Combine, Chain0, Chain1 99% Band Width Test Data CH-Low



## 99%Band Width Test Data CH-High



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## 12 ANTENNA REQUIREMENT

## 12.1. 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.

According to RSS-GEN 7.1.4, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

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#### 12.2. Antenna Connected Construction

The directional gins of antenna used for transmitting is -0.22dBi for 2.4GHz, 5.53dBi for 5GHz, and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec.for details.

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## 13 Maximum Permissible Exposure (MPE)

## 13.1 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	Electric Field	Magnetic Field	Power Density	Averaging Time		
(MHz)	Strength (V/m)	Strength (A/m)	$(mW/cm^2)$	(minute)		
	Limits for General Population/Uncontrolled Exposure					
0.3-1.34	614	1.63	*(100)	30		
1.34-30	824/f	2.19/f	$*(180/f^2)$	30		
30-300	27.5	0.073	0.2	30		
300-1500	/	/	F/1500	30		
1500-15000	/	/	1.0	30		

F = frequency in MHz

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<sup>\* =</sup> Plane-wave equipment power density



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## 13.2 Maximum Permissible Exposure (MPE) Evaluation

#### 802.11b Power Table

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	16.70	0.00	16.70	0.04699	1
2437.00	16.66	0.00	16.66	0.04634	1
2462.00	16.62	0.00	16.62	0.04592	1

#### MPE Prediction (802.11b)

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:	16.7	(dBm)
Maximum peak output power at antenna input terminal:	46.77351413	(mW)
Duty cycle:	100	(%)
Maximum Pav :	46.77351413	(mW)
Antenna gain (typical):	-0.22	(dBi)
Maximum antenna gain:	0.950604794	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0088501	(mW/cm^2)

#### **Measurement Result**

The predicted power density level at 20 cm is 0.00885 mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2412MHz.

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#### 802.11g Power Table

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	14.17	0.00	14.17	0.02612	1
2437.00	14.16	0.00	14.16	0.02606	1
2462.00	14.28	0.00	14.28	0.02679	1

### MPE Prediction (802.11g)

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:	14.28	(dBm)
Maximum peak output power at antenna input terminal:	26.79168325	(mW)
Duty cycle:	100	(%)
Maximum Pav :	26.79168325	(mW)
Antenna gain (typical):	-0.22	(dBi)
Maximum antenna gain:	0.950604794	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2462	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0050693	(mW/cm^2)

### **Measurement Result**

The predicted power density level at 20 cm is 0.00507 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 2462.

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#### 802.11n\_20M Power Table (Worse case)

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	13.56	0.00	13.56	0.02270	1
2437.00	13.57	0.00	13.57	0.02275	1
2462.00	13.65	0.00	13.65	0.02317	1

### MPE Prediction (802.11n\_20M)

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:	13.65	(dBm)
Maximum peak output power at antenna input terminal:	23.1739465	(mW)
Duty cycle:	100	(%)
Maximum Pav :	23.1739465	(mW)
Antenna gain (typical):	-0.22	(dBi)
Maximum antenna gain:	0.950604794	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2462	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0043848	(mW/cm^2)

### **Measurement Result**

The predicted power density level at 20 cm is 0.00439 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 2462.

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#### 802.11a Power Table

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5745.00	14.09	0.00	14.09	0.02564	1
5785.00	14.29	0.00	14.29	0.02685	1
5825.00	14.19	0.00	14.19	0.02624	1

### MPE Prediction (802.11a)

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:	14.29	(dBm)
Maximum peak output power at antenna input terminal:	26.85344446	(mW)
Duty cycle:	100	(%)
Maximum Pav :	26.85344446	(mW)
Antenna gain (typical):	5.53	(dBi)
Maximum antenna gain:	3.572728382	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5785	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0190964	(mW/cm^2)

### **Measurement Result**

The predicted power density level at 20 cm is 0.01910 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 5785.

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### 802.11a/n\_40M Power Table

(Worse case)

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
5755.00	13.54	0.00	13.54	0.02259	1
5795.00	13.62	0.00	13.62	0.02201	1

#### MPE Prediction (802.11n\_40M)

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:	13.62	(dBm)
Maximum peak output power at antenna input terminal:	23.01441817	(mW)
Duty cycle:	100	(%)
Maximum Pav :	23.01441817	(mW)
Antenna gain (typical):	5.53	(dBi)
Maximum antenna gain:	3.572728382	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5795	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0163663	(mW/cm^2)

#### **Measurement Result**

The predicted power density level at 20 cm is 0.01637 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 5795.

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