

Report No.: ER/2010/B0031 **Issue Date: Dec. 07, 2010** 

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# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

**Product Name:** WLAN 11n Micro USB Adapter,1T1R

**Brand Name:** CC&C

**Model Name:** WL6200V1

**Model Different:** N/A

FCC ID: PANWL6200V1

**Report No.:** ER/2010/B0031

**Issue Date:** Dec. 07, 2010

**FCC Rule Part: §15.247** 

**Prepared for:** CC&C Technologies, Inc.

8F, No. 150, Jian Yi Road, Chung Ho City,

Taipei County, Taiwan 235, R. O. C.

Prepared by: SGS Taiwan Ltd.

**Electronics & Communication Laboratory** 

No. 134, Wu Kung Rd., Wuku Industrial

Zone, Taipei County, Taiwan.





Testing Laboratory 0513

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## VERIFICATION OF COMPLIANCE

**Applicant:** CC&C Technologies, Inc.

8F, No. 150, Jian Yi Road, Chung Ho City, Taipei County, Taiwan

235, R. O. C.

**Product Name:** WLAN 11n Micro USB Adapter,1T1R

**Brand Name:** CC&C

FCC ID: PANWL6200V1

Model No.: WL6200V1

**Model Difference:** N/A

**File Number:** ER/2010/B0031

**Date of test:** Nov. 17, 2010 ~ Dec. 07, 2010

**Date of EUT Received:** Nov. 17, 2010

## 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.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Brian	Chang	Date:	Dec. 07, 2010
	Brian Chan	g / Engineer		
Prepared By:	wa	Cow	Date:	Dec. 07, 2010
	Eva Kao / As	st. Supervisor	•	
Approved By:	Almo	Hsieh	Date:	Dec. 07, 2010
	Arno Hsieh / A	Asst. Supervisor		

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## Version

Version No.	Date	Description
00	Dec. 07, 2010	Initial creation of document

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### 1 GENERAL INFORMATION

## 1.1 Product Description

#### General:

Product Name:	WLAN 11n Micro USB Adapter,1T1R
Brand Name:	CC&C
Model Name:	WL6200V1
Model Difference:	N/A
Hardware Version:	289G129403-B0
Software Version:	00-29401-01[F/W,WL-6200-V1-FCC][][0]
Power Supply	5Vdc form USB port

#### WLAN: 802.11 b/g/n

Frequency Range & Channel number:	802.11 b/g/n_20M: 2412 – 2462 MHz 802.11 n_40M: 2422 – 2452 MHz
Rated Power:	802.11 b: 13.38dBm 802.11 g: 13.34dBm 802.11 n_20M: 13.24dBm 802.11 n_40M: 13.22dBm
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transmission Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n: up to 150Mbps
Antenna Designation	Chip Antenna / 0.5dBi

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

This report applies for frequency bands 2412MHz – 2462MHz; 2422MHz – 2452MHz.

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

This submittal(s) (test report) is intended for FCC ID: PANWL6200V1 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules 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). Radiated testing was performed at an antenna to EUT distance 3 meters.

#### **Test Facility** 1.4

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-4.

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

#### 1.5 **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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## 2 SYSTEM TEST CONFIGURATION

## 2.1 EUT Configuration

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

### 2.2 EUT Exercise

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

#### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is 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

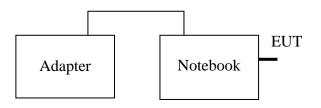


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.
1.	Notebook	HP	ProBook4411s	CNU9316C47

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### 3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emis-	Compliant
	sion	
§15.247(b)	Peak Output Power	Compliant
§15.247(b)	6dB Bandwidth	Compliant
§15.247(c)	100 KHz Bandwidth Of	Compliant
	Frequency Band Edges	
§15.247(c)	Spurious Emission	Compliant
§15.247	Peak Power Density	Compliant
§15.203	Antenna Requirement	Compliant

#### 4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting 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.

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### CONDUCTED EMISSION TEST

## 5.1 Standard Applicable

According to §15.207 frequency range within 150 KHz to 30 MHz shall not exceed the Limit table as below.

Frequency range	Limits 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 DUE.
TYPE		NUMBER	NUMBER	CAL.	
EMI Test Receiver	R&S	ESCS30	828985/004	09/23/2010	09/22/2011
LISN	Rolf-Heine	NNB-2/16Z	99012	02/02/2010	02/01/2011
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	02/02/2010	02/01/2011
Coaxial Cables	N/A	WK CE Cable	N/A	11/28/2010	11/27/2011

#### 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.

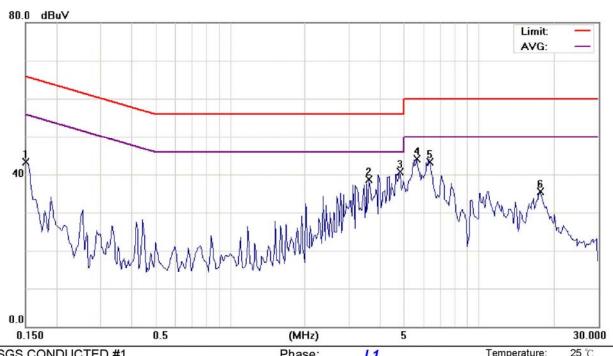


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### AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode			Test Date:	Dec. 02, 2010
Temperature:	25 ℃	Humidity:	62 %	Test By:	Brian



Site SGS CONDUCTED #1

Limit: FCC Class B Conduction(QP)

EUT: WLAN 11n USB Adapter(1T1R)

M/N: WL-6200-V1 Note: Operation mode

r nase.	LI	romporataro.	20 0
Power:	AC 120V/60Hz	Humidity:	62 %
Distance:		Air Pressure:	hpa

No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	42.95	0.45	43.40	66.00	-22.60	peak	
2	3.6200	37.78	0.95	38.73	56.00	-17.27	peak	
3 *	4.8000	39.70	1.00	40.70	56.00	-15.30	peak	
4	5.6400	43.03	1.02	44.05	60.00	-15.95	peak	
5	6.3521	42.32	1.04	43.36	60.00	-16.64	peak	
6	17.6800	34.34	1.22	35.56	60.00	-24.44	peak	

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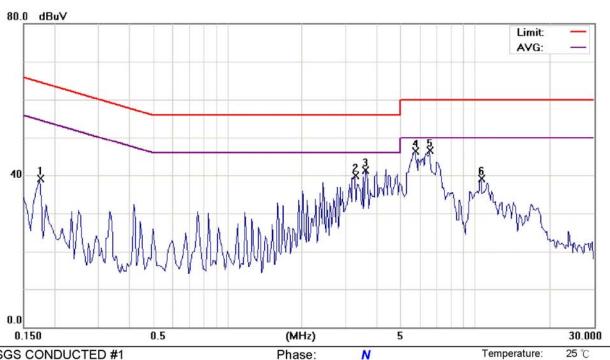
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Humidity:

Air Pressure:

hpa



Power:

Distance:

N AC 120V/60Hz

Site SGS CONDUCTED #1

Limit: FCC Class B Conduction(QP)

EUT: WLAN 11n USB Adapter(1T1R)

M/N: WL-6200-V1 Note: Operation mode

No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1750	38.53	0.48	39.01	64.72	-25.71	peak	
2	3.2800	38.97	0.93	39.90	56.00	-16.10	peak	
3	3.6200	40.38	0.95	41.33	56.00	-14.67	peak	
4	5.7200	45.28	1.03	46.31	60.00	-13.69	peak	
5 *	6.5600	45.37	1.05	46.42	60.00	-13.58	peak	
6	10.6000	37.95	1.14	39.09	60.00	-20.91	peak	

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#### 6 PEAK OUTPUT POWER MEASUREMENT

## 6.1 Standard Applicable

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

- (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 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 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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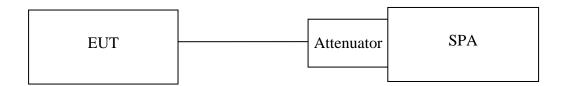
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## 6.2 Test Set-up:



**6.3** Measurement Equipment Used:

ricusurement Equipment Oscu.									
	Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
Power Sensor	Anritsu	MA2411B	917032	01/21/2010	01/20/2012				
Power Meter	Anritsu	ML2495A	1005007	02/17/2010	02/16/2012				
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012				
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/25/2010	01/24/2011				
DC Block	Agilent	BLK-18	155452	07/05/2010	07/04/2011				
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2010	01/04/2011				
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2010	07/04/2011				
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2010	07/04/2011				
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2010	07/04/2011				
Splitter	Agilent	11636B	N/A	07/05/2010	07/04/2011				

#### 6.4 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 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.

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### 6.5 Measurement Result

#### 802.11b Mode

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412	13.24	0.00	13.24	0.02109	1
2437	13.38	0.00	13.38	0.02178	1
2462	13.37	0.00	13.37	0.02173	1

### 802.11g Mode

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412	13.28	0.00	13.28	0.02128	1
2437	13.34	0.00	13.34	0.02158	1
2462	13.22	0.00	13.22	0.02099	1

#### 802.11n\_20M Mode

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412	13.18	0.00	13.18	0.02080	1
2437	13.23	0.00	13.23	0.02104	1
2462	13.24	0.00	13.24	0.02109	1

## 802.11n\_40M Mode

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2422	13.22	0.00	13.22	0.02099	1
2437	13.19	0.00	13.19	0.02084	1
2452	13.13	0.00	13.13	0.02056	1

offset: 0.5dB

Note: Refer to next page for plots.

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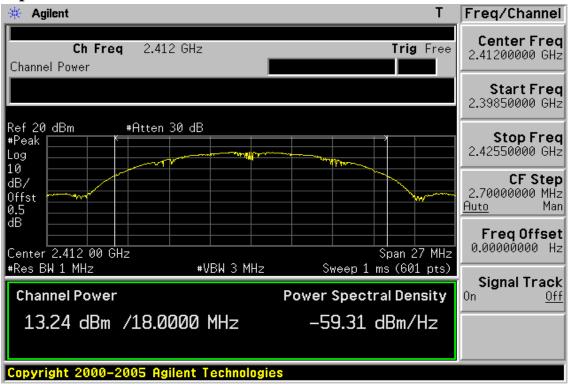
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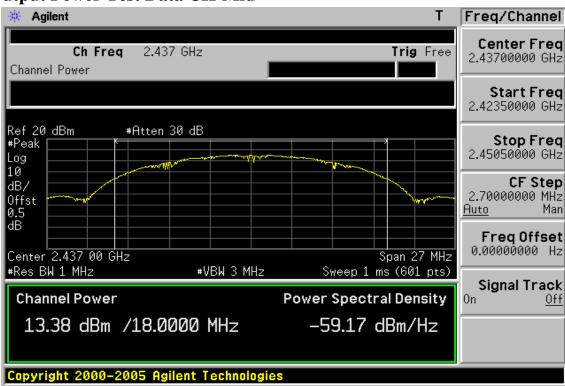
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802.11b Peak Output Power Test Data CH-Low



## **Peak Output Power Test Data CH-Mid**



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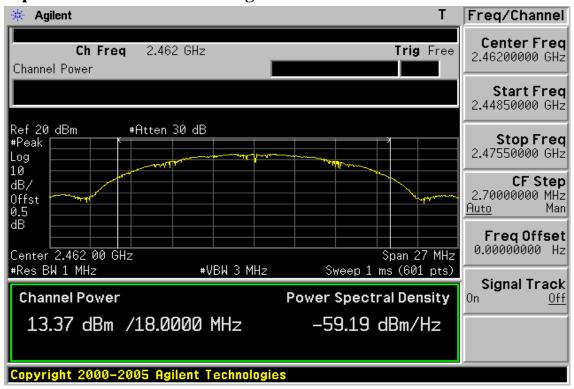
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## **Peak Output Power Test Data CH-High**



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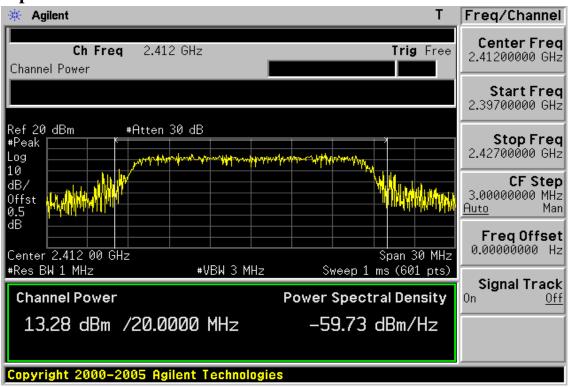
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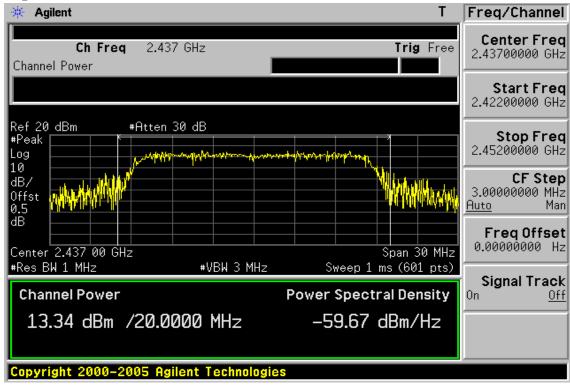
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802.11g Peak Output Power Test Data CH-Low



## **Peak Output Power Test Data CH-Mid**



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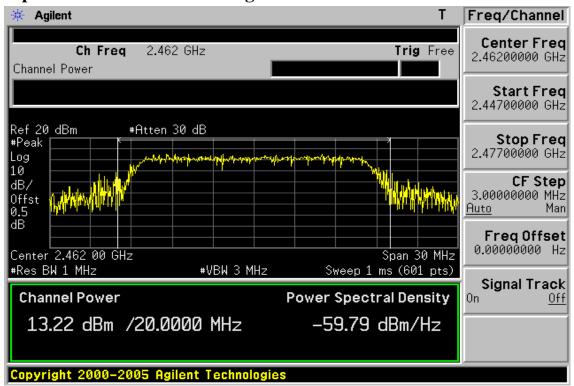
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## **Peak Output Power Test Data CH-High**



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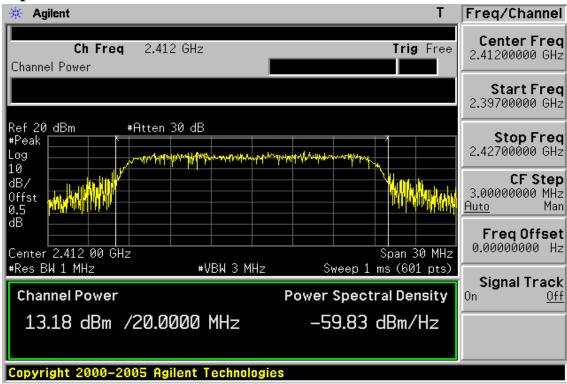


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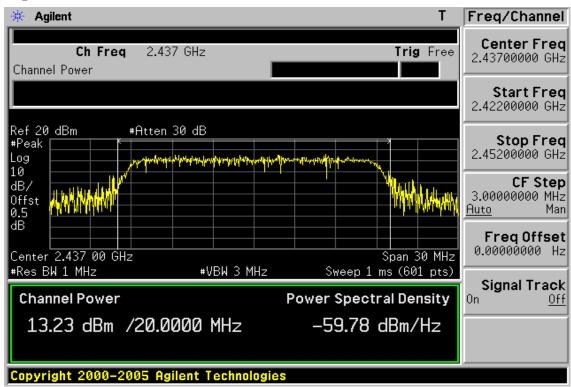
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## 802.11n\_20M

## **Peak Output Power Test Data CH-Low**



## **Peak Output Power Test Data CH-Mid**



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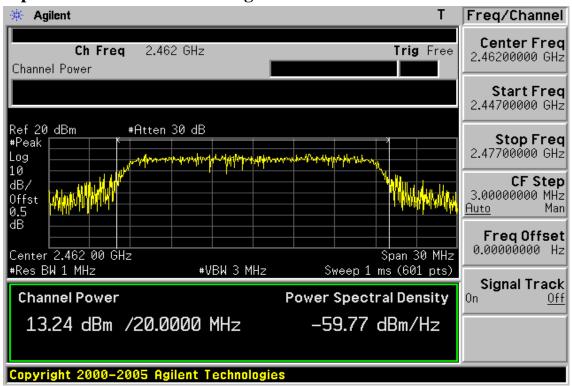
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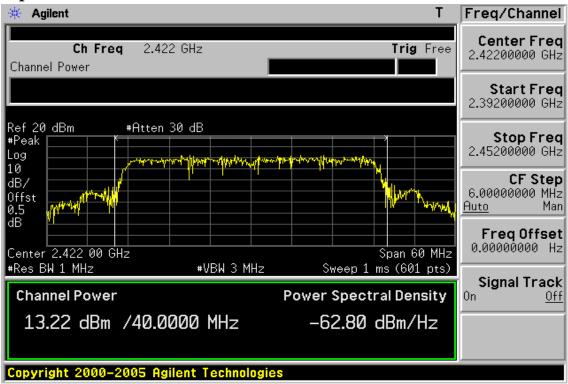


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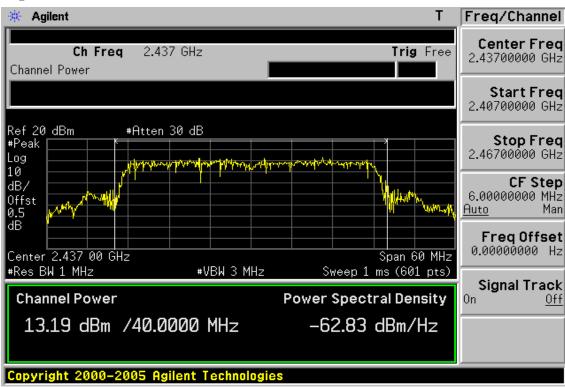
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### 802.11n\_40M

## **Peak Output Power Test Data CH-Low**



## **Peak Output Power Test Data CH-Mid**



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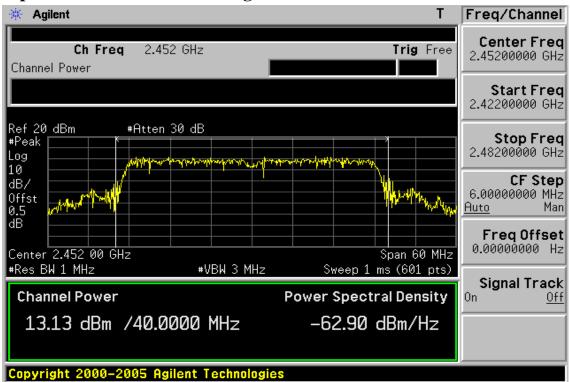
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## **Peak Output Power Test Data CH-High**



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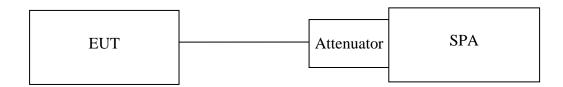
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#### 7 6dB Bandwidth

## 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.

## 7.2 .Test Set-up:



## 7.3 Measurement Equipment Used:

Refer to section 6.3 for details.

#### 7.4 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 3.antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW=100KHz, VBW = 3\*RBW, Span= 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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#### **Measurement Result**

#### 802.11b

Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	Result
2412	16.629	> 500	PASS
2437	16.613	> 500	PASS
2462	16.601	> 500	PASS

#### 802.11b

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	15.200	> 500	PASS
2437	15.241	> 500	PASS
2462	15.217	> 500	PASS

#### 802.11n-20M

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	17.841	> 500	PASS
2437	17.841	> 500	PASS
2462	17.826	> 500	PASS

#### 802.11n-40M

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2422	36.490	> 500	PASS
2437	36.523	> 500	PASS
2452	36.513	> 500	PASS

offset 0.5dB

Note: Refer to next page for plots.

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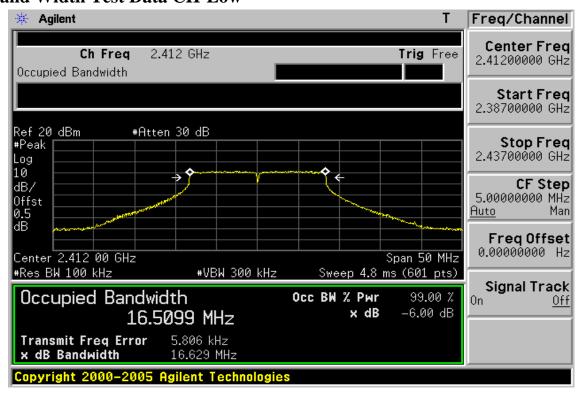
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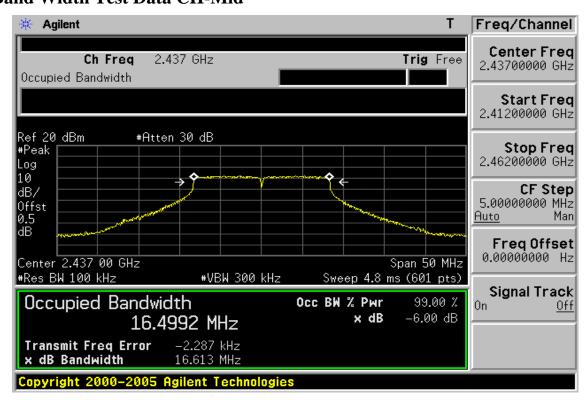
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# 802.11b 6dB Band Width Test Data CH-Low



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



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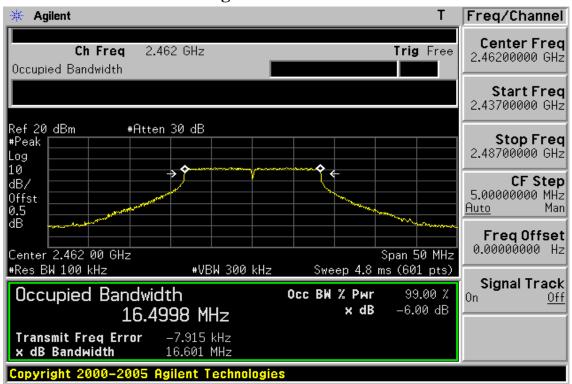
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# 6dB Band Width Test Data CH-High



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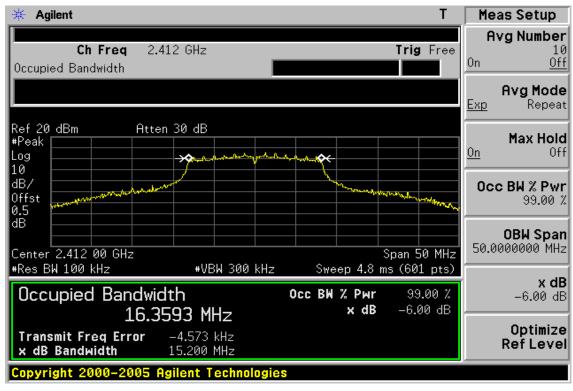
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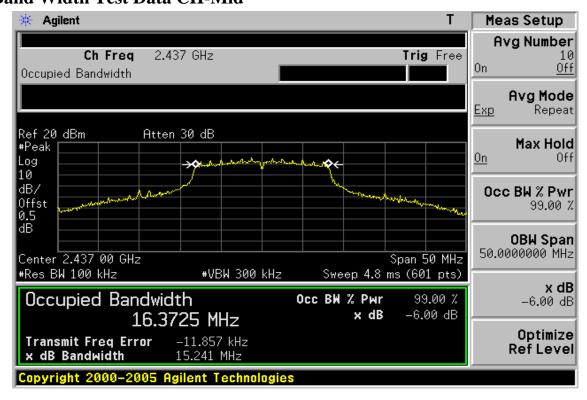
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# 802.11g 6dB Band Width Test Data CH-Low



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



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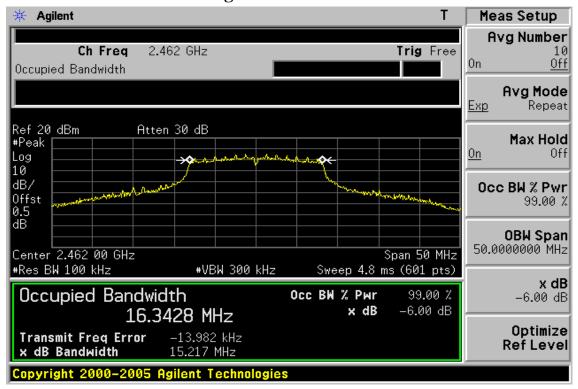
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## 6dB Band Width Test Data CH-High



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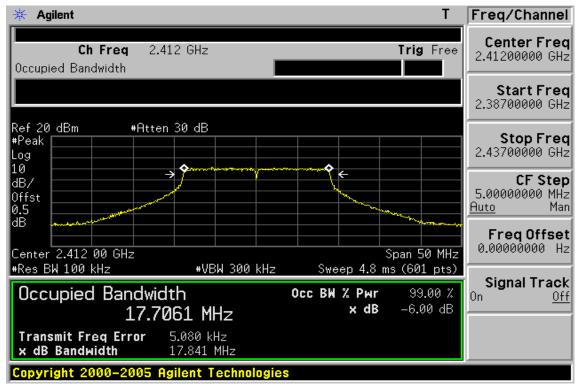


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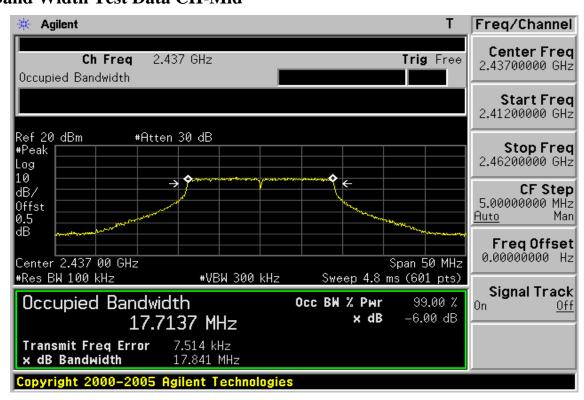
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## 802.11n\_20M

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



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



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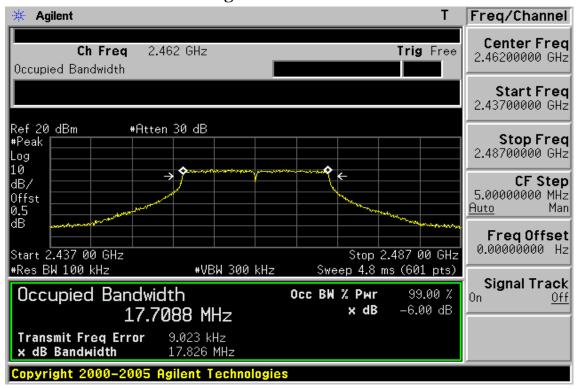
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# 6dB Band Width Test Data CH-High



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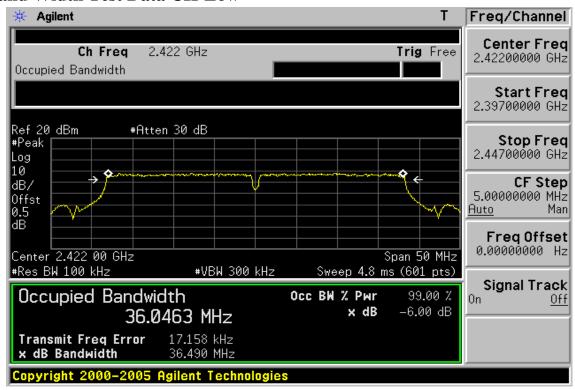


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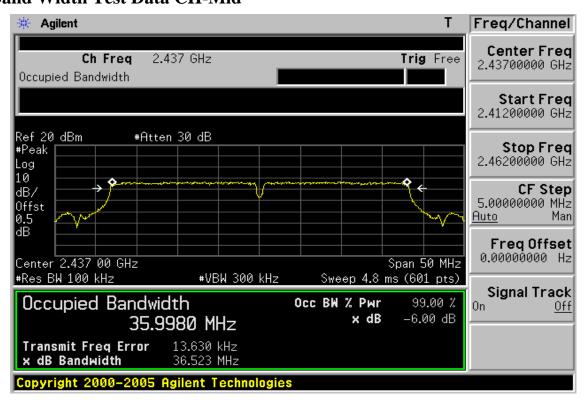
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## 802.11n\_40M

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



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



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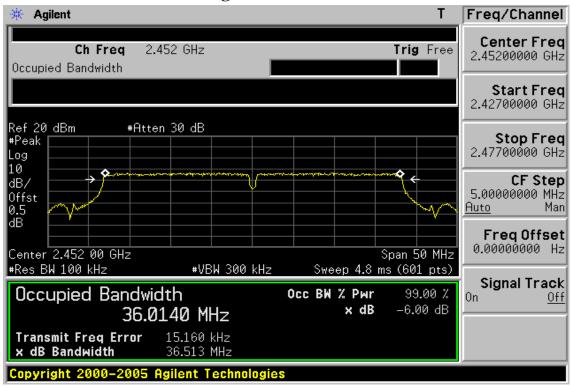
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## 6dB Band Width Test Data CH-High



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## 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).

## **8.2** Measurement Equipment Used:

### **Conducted Emission at antenna port:**

Refer to section 6.3 for details.

#### 8.2.2 **Radiated emission:**

966 Chamber							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2011		
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2010	11/18/2011		
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	03/09/2009	03/08/2011		
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2010	11/27/2011		
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011		
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012		
DC Block	Agilent	BLK-18	155452	07/05/2010	07/04/2011		
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	01/05/2010	01/04/2011		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2011		
3m Site	SGS	966 chamber	N/A	09/06/2010	09/05/2011		

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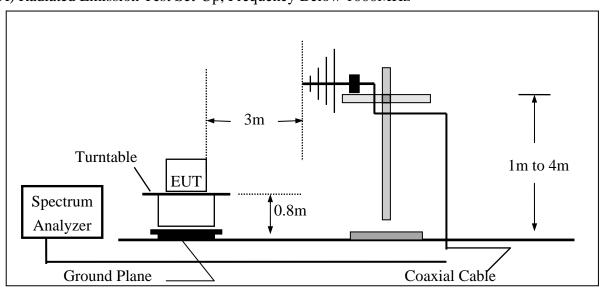
### 8.3 Test SET-UP:

#### **8.3.1** Conducted Emission at antenna port:

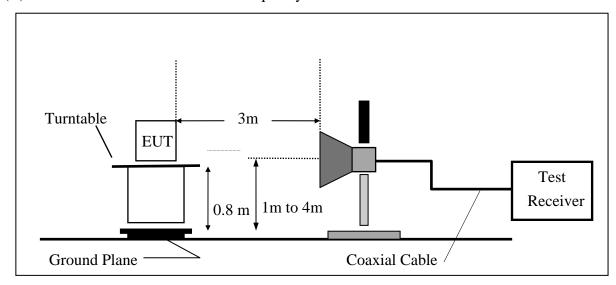
Refer to section 7.2 for details.

#### **8.3.2** Radiated emission:

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



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



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### 8.4 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 center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
- 5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
- 6. Repeat above procedures until all frequency measured were complete.

# 8.5 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	

#### **8.6** Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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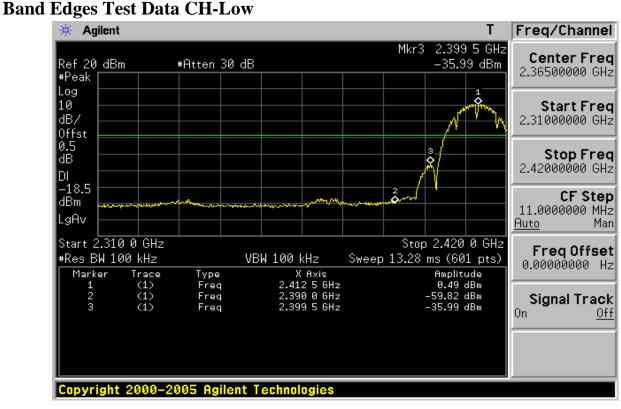
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802.11b



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



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Radiated Emission: 802.11 b mode

Operation Mode TX CH Low Test Date Dec. 01, 2010

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

Humidity 65 %

44.98

	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	(dB)	
2390.00	44.52		-1.39	43.13		74.00	54.00	-10.87	Peak
Operation M	<b>l</b> ode	TX C	H Low			Test	Date	Dec. 01, 2	010
Fundamenta	al Frequenc	cy 2412 l	MHz			Test	By	Brian	
Temperature	e	25 °C				Pol	-	Hor.	
Humidity		65 %							
	Peak	$\mathbf{AV}$		Actu	al FS	Peak	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>n</b> ) ( <b>dB</b> )	

#### Remark:

2390.00

(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.

74.00

54.00

-10.41

Peak

43.59

- (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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-1.39

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Radiated Emission: 802.11 b mode

Operation Mode TX CH High Test Date Dec. 01, 2010

Fundamental Frequency 2462 MHz Test By Brian 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/n	( <b>dB</b> )	
2483.50	43.93		-0.92	43.01		74.00	54.00	-10.99	Peak
Operation N	/lode	TX C	H High			Tes	t Date	Dec. 01, 2	010
Fundamenta	al Frequenc	cy 2462 l	MHz			Tes	t By	Brian	
Temperatur	e	25 °C				Pol	•	Hor.	
Humidity		65 %							
	Peak	$\mathbf{AV}$		Actua	ıl FS	Peak	$\mathbf{AV}$		

	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	45.02		-0.92	44.10		74.00	54.00	-9.90	Peak

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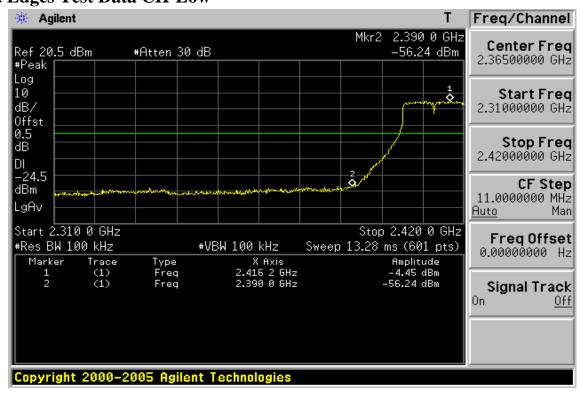
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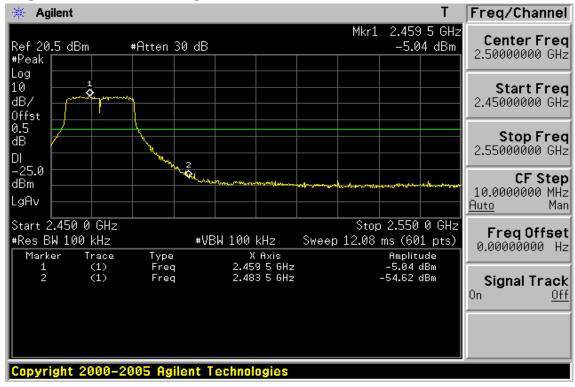
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802.11g Band Edges Test Data CH-Low



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



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Radiated Emission: 802.11 g mode

Operation Mode TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2412 MHz Test By Brian Tmperature 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)	(dBuV/m	( <b>dB</b> )	
2390.00	44.67		-1.39	43.28		74.00	54.00	-10.72	Peak
Operation	Mode	TX C	H Low			Test	t Date	Dec. 01, 2	010
Fundamen	tal Frequen	cy 2412]	MHz			Test	t By	Brian	
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	( <b>dB</b> )	
2390.00	44.34		-1.39	42.95		74.00	54.00	-11.05	Peak

#### 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 g mode

Dec. 01, 2010 Operation Mode TX CH High Test Date

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

Humidity 65 %

43.86

	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	n) ( <b>dB</b> )	
2483.50	43.72		-0.92	42.80		74.00	54.00	-11.20	Peak
Operation N	Mode	TX C	H High			Tes	t Date	Dec. 01, 2	010
Fundamenta	al Frequen	cy 2462	MHz			Tes	t By	Brian	
Temperatur	re	25 °C				Pol		Hor.	
Humidity		65 %							
	Peak	$\mathbf{AV}$		Actua	l FS	Peak	$\mathbf{AV}$		
Freq.	Reading 1	Reading A	nt./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin 1	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m) (	(dBuV/m)	(dBuV/m)(	dBuV/m	( <b>dB</b> )	

#### Remark:

2483.50

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.

74.00

54.00

-11.06

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Peak

42.94

- (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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-0.92

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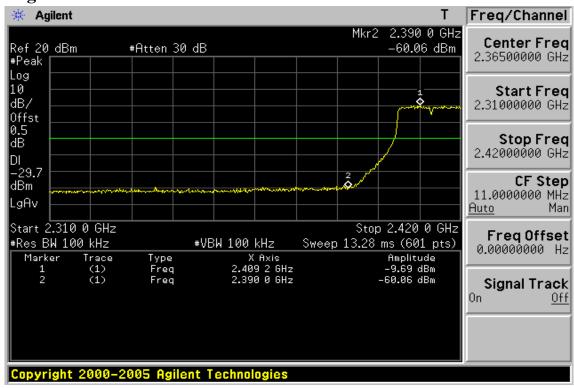


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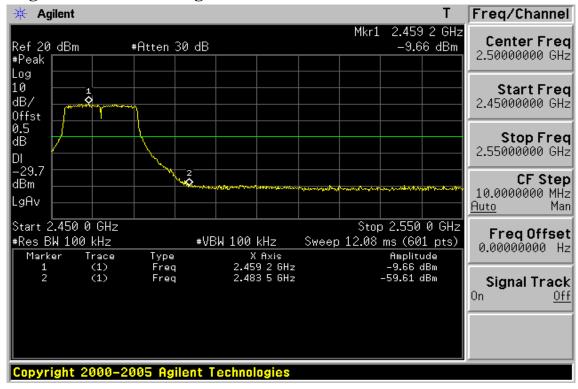
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### 802.11n\_20M

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



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



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Radiated Emission: 802.11n\_20M mode

Operation Mode TX CH Low Test Date Dec. 01, 2010

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

Humidity 65 %

		Peak	$\mathbf{AV}$		Actu	al FS	Peak	$\mathbf{AV}$		
F	re q.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(M	(1Hz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	( <b>dB</b> )	
239	90.00	44.16		-1.39	42.77		74.00	54.00	-11.23	Peak
Opera	ation N	/Iode	TX Cl	H Low			Test	Date	Dec. 01, 2	010
Funda	amenta	al Frequenc	ey 2412 I	MHz			Test	By	Brian	
Temp	eratur	e	25 ℃				Pol		Hor.	
Humi	idity		65 %							
		Peak	$\mathbf{AV}$		Actu	al FS	Peak	AV		
F	req.	Reading	Reading	Ant./CL	Peak	$\mathbf{AV}$	Limit	Limit	Margin	Remark
(N	(IHz	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)(	(dBuV/n	(dB)	
239	90.00	43.87		-1.39	42.48		74.00	54.00	-11.52	Peak

#### 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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Member of SGS Group

Radiated Emission: 802.11n 20M mode

Dec. 01, 2010 Operation Mode TX CH High Test Date

Fundamental Frequency 2462 MHz Test By Brian **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	( <b>dB</b> )	
2483.50	45.02		-0.92	44.10		74.00	54.00	-9.90	Peak
Operation N	/Iode	TX C	H High			Tes	t Date	Dec. 01, 2	010
Fundamenta	al Frequen	cy 2462 l	MHz			Tes	t By	Brian	
Temperatur	e	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	)( <b>dBuV/m</b> )	(dB)	
2483.50									

#### 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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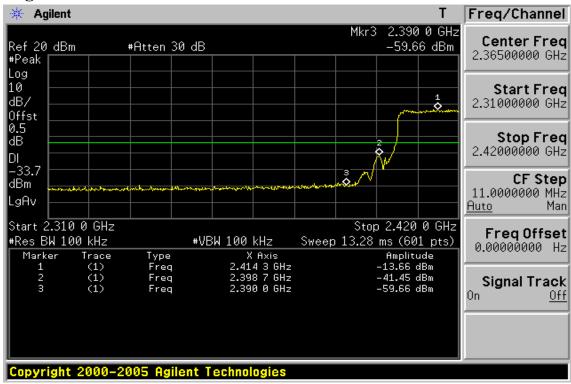


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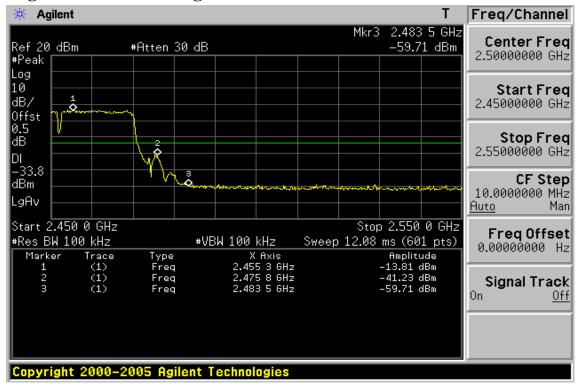
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# 802.11n\_40M

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



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



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### Radiated Emission: 802.11n\_40M mode

Operation Mode TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2422 MHz Test By Brian 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/n	(dB)		
2390.00	44.41		-1.39	43.02		74.00	54.00	-10.98	Peak	v
Operation 1	Mode	TX C	H Low			Te	st Date	Dec. 01, 2	2010	
Fundament	tal Frequer	ncy 2422	MHz			Tes	st By	Brian		
Temperatu	re	25 ℃				Pol	1	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	45.22	51.88	-10.66	34.56	41.22	74.00	54.00	-12.78	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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Radiated Emission: 802.11n 40M mode

Operation Mode Dec. 01, 2010 TX CH High Test Date

Fundamental Frequency 2452 MHz Test By Brian **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	( <b>dB</b> )	
2483.50	44.93		-0.92	44.01		74.00	54.00	-9.99	Peak
Operation I	Mode	TX C	H High			Tes	t Date	Dec. 01, 2	.010
Fundament	tal Frequenc	ey 2452]	MHz			Tes	t By	Brian	
Temperatur	re	25 °C				Pol		Hor.	
Humidity		65 %							
(MHz) 2483.50 Operation In Fundament Temperature	(dBuV) 44.93 Mode tal Frequence	(dBuV) TX Cl cy 2452 l 25 °C	•0.92 H High	(dBuV/m)		(dBuV/m) 74.00 Tes Tes	6( <b>dBuV/m</b> 54.00 t Date t By	-9.99 Dec. 01, 2 Brian	Peal

	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	44.06		-0.92	43.14		74.00	54.00	-10.86	Peak

#### 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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#### 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.

# 9.2 Measurement Equipment Used:

#### 9.2.1. Conducted Emission at antenna port:

Refer to section 6.3 for details.

#### 9.2.2. Radiated emission:

Refer to section 8.2 for details.

#### 9.3 Test SET-UP:

### 9.3.1. Conducted Emission at antenna port:

Refer to section 7.3 for details.

#### 9.3.2. Radiated emission:

Refer to section 8.3 for details.

### 9.4 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 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.

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#### 9.5 Measurement Procedure

- The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3 EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- When measurement procedures for electric field radiated emissions above 1 GHz the EUT 4 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.
- 5 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.
- 7 Repeat above procedures until all frequency measured were complete.

# 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	

#### 9.7 **Measurement Result**

Refer to attach tabular data sheets.

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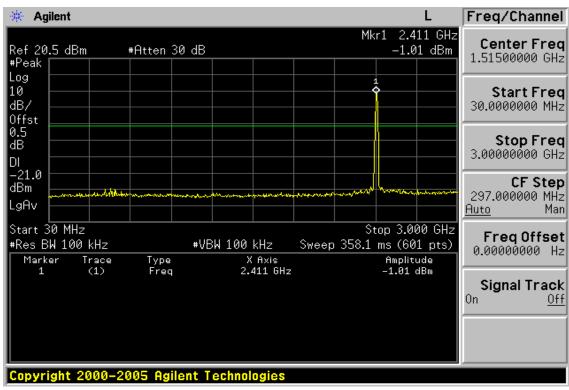
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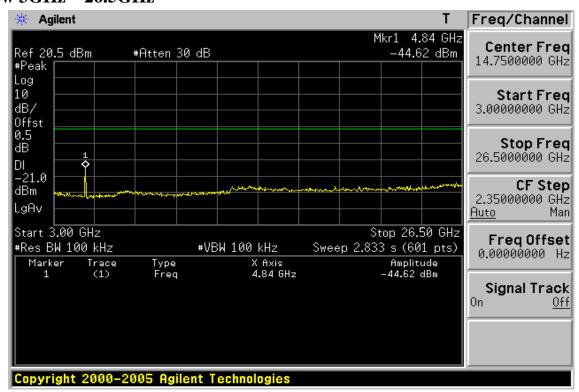
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# Conducted Spurious Emission Measurement Result (802.11b) Ch Low 30MHz – 3GHz



#### Ch Low 3GHz – 26.5GHz



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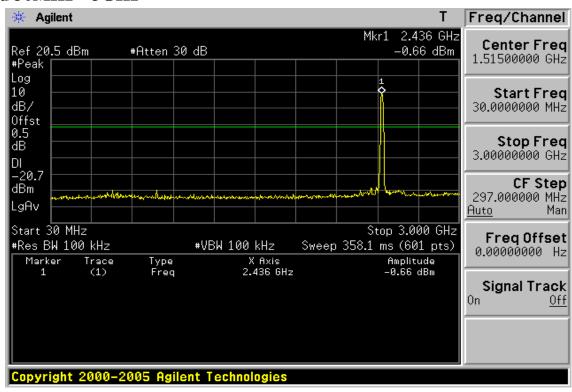
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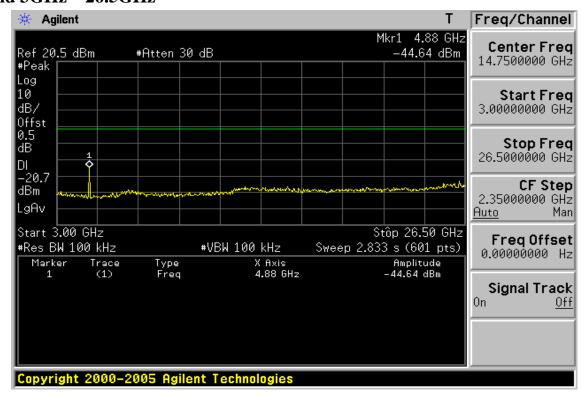
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#### Ch Mid 30MHz – 3GHz



#### Ch Mid 3GHz – 26.5GHz



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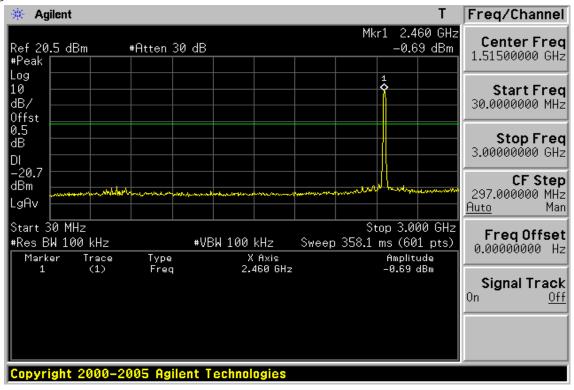
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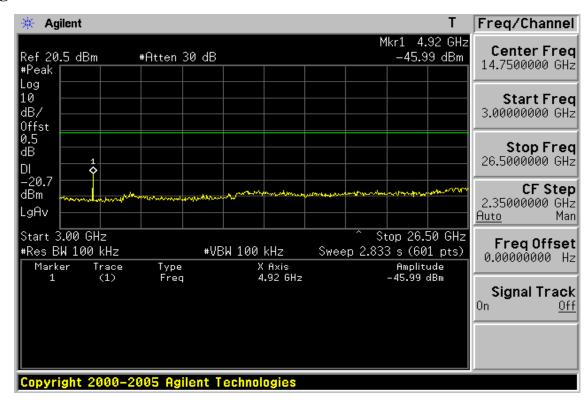
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# Ch High 30MHz - 3GHz



# Ch High 3GHz – 26.5GHz



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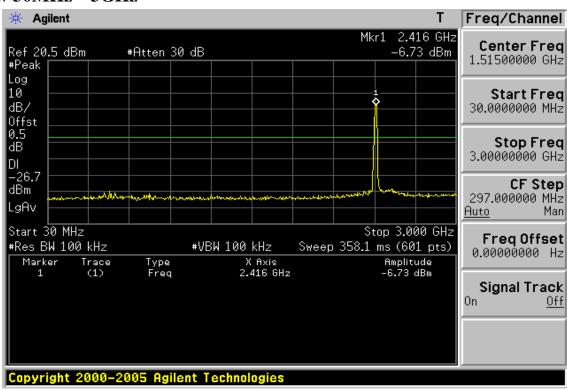
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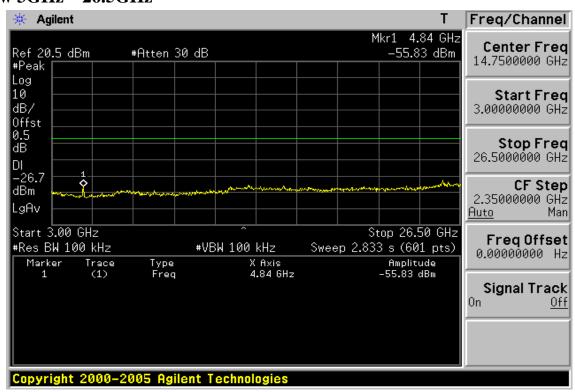
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# Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz – 3GHz



#### Ch Low 3GHz – 26.5GHz



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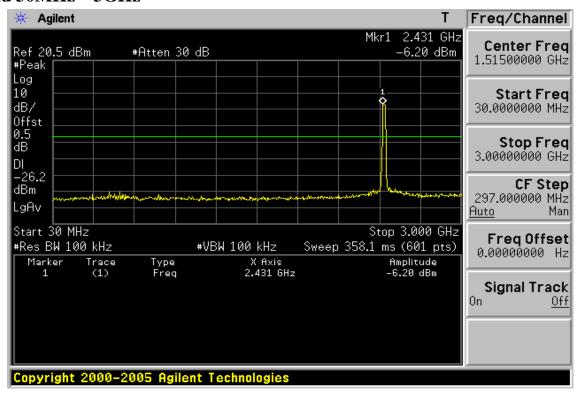
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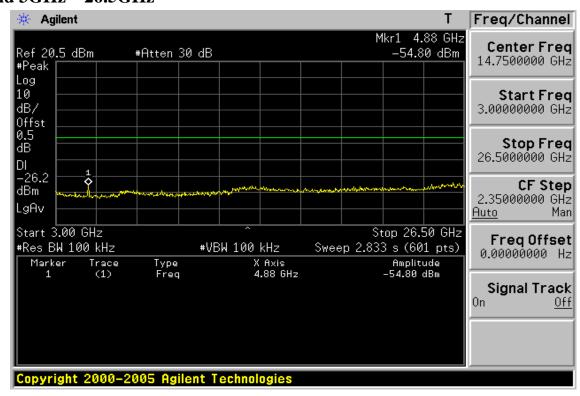
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#### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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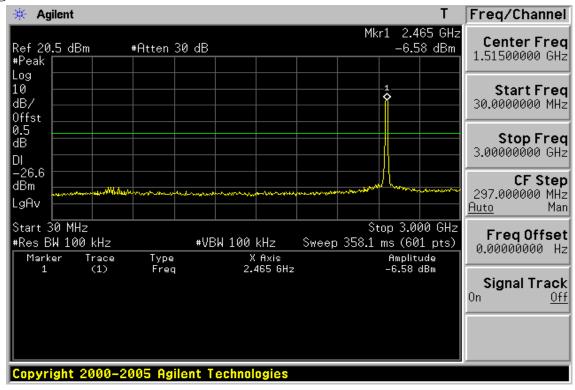
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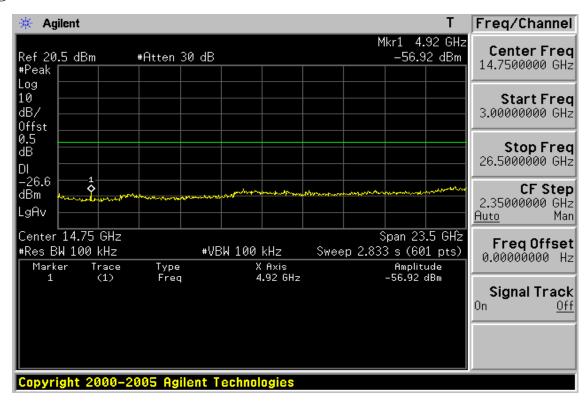
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# Ch High 30MHz - 3GHz



# Ch High 3GHz – 26.5GHz



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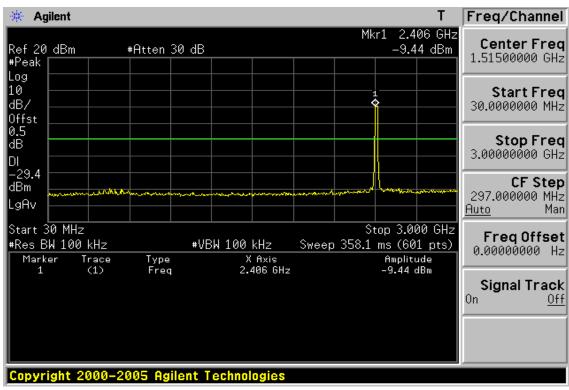
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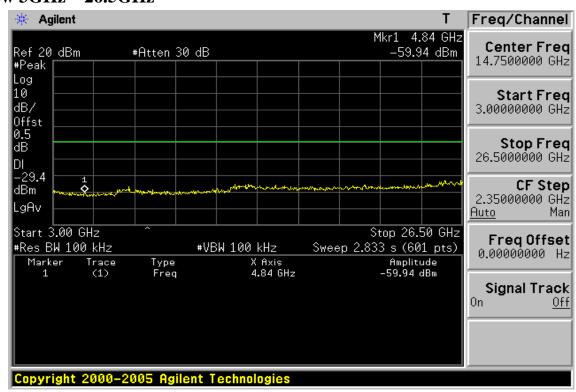
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# Conducted Spurious Emission Measurement Result (802.11n\_20M) Ch Low 30MHz – 3GHz



#### Ch Low 3GHz – 26.5GHz



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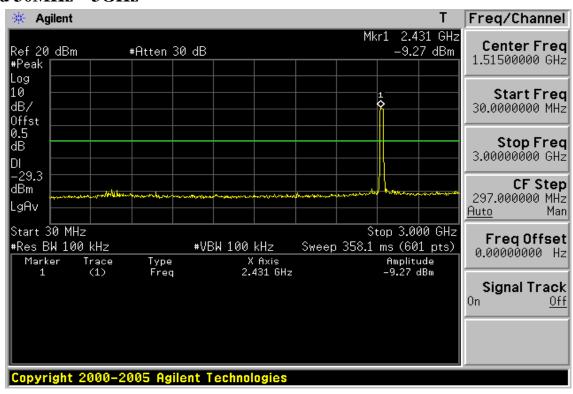
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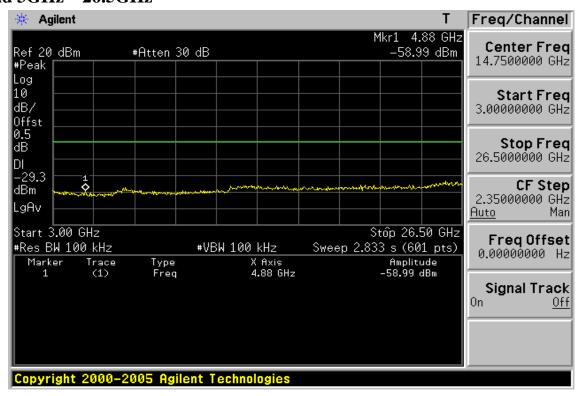
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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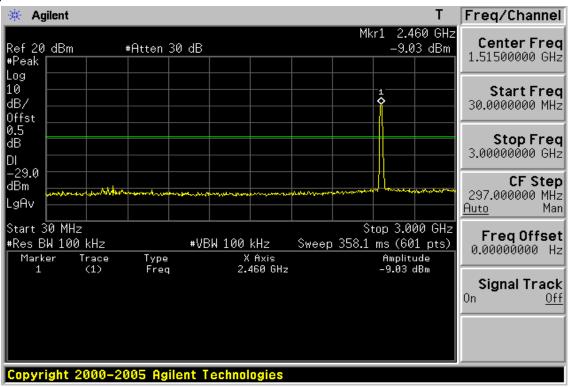
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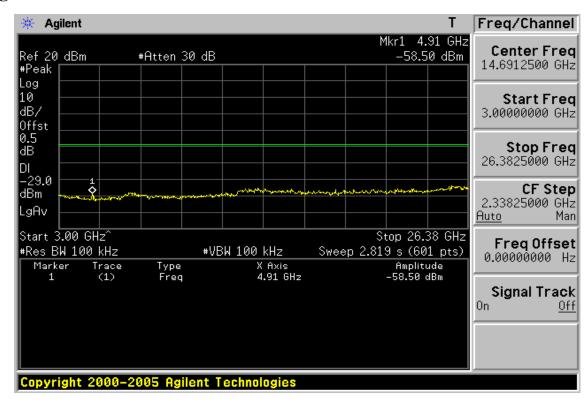
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# Ch High 30MHz - 3GHz



# Ch High 3GHz – 26.5GHz



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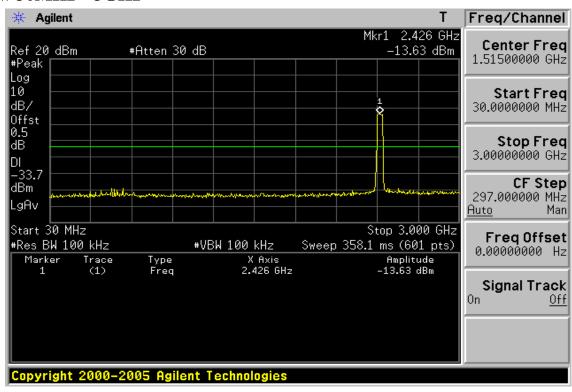
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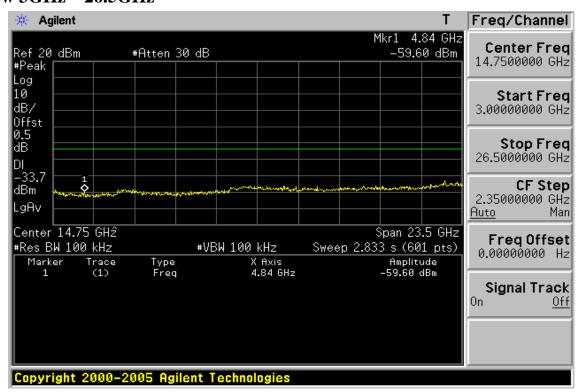
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# Conducted Spurious Emission Measurement Result (802.11n\_40M) Ch Low 30MHz – 3GHz



#### Ch Low 3GHz - 26.5GHz



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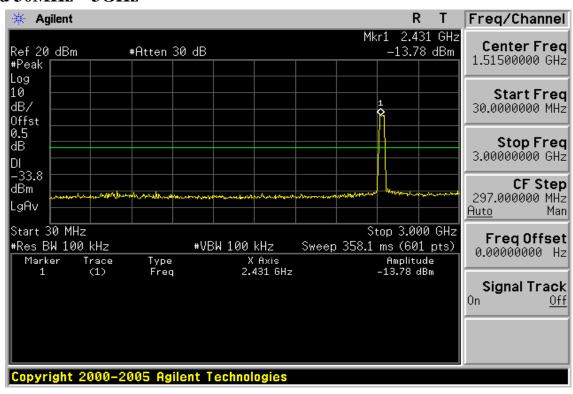
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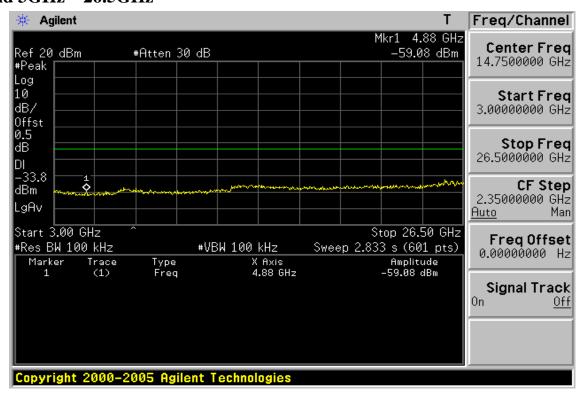
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### Ch Mid 30MHz - 3GHz



#### Ch Mid 3GHz – 26.5GHz



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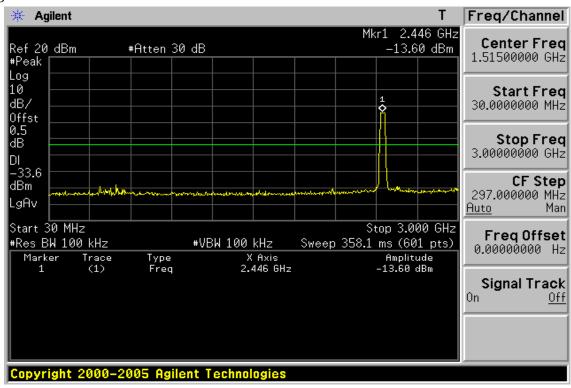
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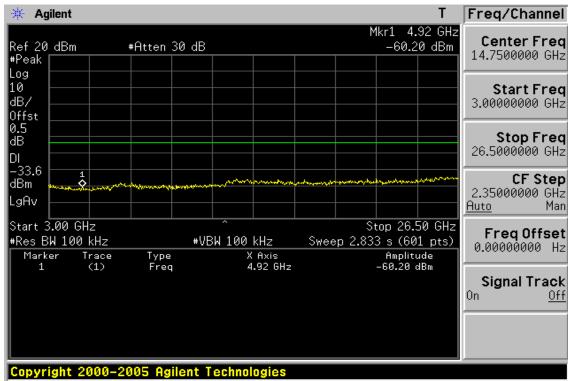
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# Ch High 30MHz - 3GHz



# Ch High 3GHz – 26.5GHz



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

Operation Mode 802.11b TX CH Low Test Date Dec. 01, 2010

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

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)
31.94	V	Peak	51.01	-14.82	36.19	40.00	-3.81
93.05	V	Peak	54.76	-17.35	37.41	43.50	-6.09
241.46	V	Peak	51.64	-14.09	37.55	46.00	-8.45
260.86	V	Peak	47.07	-13.63	33.44	46.00	-12.56
454.86	V	Peak	43.74	-8.61	35.13	46.00	-10.87
623.64	V	Peak	36.05	-5.51	30.54	46.00	-15.46
73.65	H	Peak	51.76	-16.76	35.00	40.00	-5.00
233.70	H	Peak	47.25	-14.34	32.91	46.00	-13.09
260.86	H	Peak	45.33	-13.63	31.70	46.00	-14.30
299.66	Н	Peak	43.69	-13.13	30.56	46.00	-15.44

#### 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 Dec. 01, 2010

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

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)
31.94	V	Peak	50.41	-14.82	35.59	40.00	-4.41
93.05	V	Peak	54.91	-17.35	37.56	43.50	-5.94
233.70	V	Peak	50.96	-14.34	36.62	46.00	-9.38
241.46	V	Peak	51.15	-14.09	37.06	46.00	-8.94
260.86	V	Peak	47.16	-13.63	33.53	46.00	-12.47
458.74	V	Peak	43.07	-8.61	34.46	46.00	-11.54
73.65	Н	Peak	52.01	-16.79	35.22	40.00	-4.78
241.46	Н	Peak	47.76	-14.09	33.67	46.00	-12.33
458.74	Н	Peak	39.47	-8.61	30.86	46.00	-15.14
914.64	Н	Peak	34.43	-1.04	33.39	46.00	-12.61

### 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 Dec. 01, 2010

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

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)
31.94	V	Peak	51.27	-14.82	36.45	40.00	-3.55
93.05	V	Peak	54.86	-17.35	37.51	43.50	-5.99
241.46	V	Peak	51.67	-14.09	37.58	46.00	-8.42
264.74	V	Peak	47.58	-13.59	33.99	46.00	-12.01
454.86	V	Peak	44.30	-8.61	35.69	46.00	-10.31
623.64	V	Peak	35.96	-5.51	30.45	46.00	-15.55
73.65	Н	Peak	52.52	-16.79	35.73	40.00	-4.27
233.70	Н	Peak	49.96	-14.34	35.62	46.00	-10.38
262.80	H	Peak	45.38	-13.61	31.77	46.00	-14.23
299.66	Н	Peak	44.86	-13.13	31.73	46.00	-14.27
458.74	Н	Peak	40.43	-8.61	31.82	46.00	-14.18

#### 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.

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

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

Operation Mode 802.11g TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2412MHz Test By Brian **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)
31.94	V	Peak	51.51	-14.82	36.69	40.00	-3.31
93.05	V	Peak	54.18	-17.35	36.83	43.50	-6.67
241.46	V	Peak	51.42	-14.09	37.33	46.00	-8.67
260.86	V	Peak	47.22	-13.63	33.59	46.00	-12.41
458.74	V	Peak	42.87	-8.61	34.26	46.00	-11.74
73.65	Н	Peak	51.39	-16.79	34.60	40.00	-5.40
241.46	H	Peak	47.28	-14.09	33.19	46.00	-12.81
260.86	Н	Peak	45.44	-13.63	31.81	46.00	-14.19
367.56	H	Peak	41.46	-11.14	30.32	46.00	-15.68
458.74	H	Peak	39.15	-8.61	30.54	46.00	-15.46

#### 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 Dec. 01, 2010

Fundamental Frequency 2437MHz Test By Brian **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)
31.94	V	Peak	50.29	-14.82	35.47	40.00	-4.53
93.05	V	Peak	54.92	-17.35	37.57	43.50	-5.93
233.70	V	Peak	52.86	-14.34	38.52	46.00	-7.48
260.86	V	Peak	46.66	-13.63	33.03	46.00	-12.97
458.74	V	Peak	43.28	-8.61	34.67	46.00	-11.33
623.64	V	Peak	35.97	-5.51	30.46	46.00	-15.54
73.65	H	Peak	52.58	-16.79	35.79	40.00	-4.21
233.70	H	Peak	47.07	-14.34	32.73	46.00	-13.27
260.86	H	Peak	44.81	-13.63	31.18	46.00	-14.82
458.74	H	Peak	39.55	-8.61	30.94	46.00	-15.06

#### 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 Dec. 01, 2010

Fundamental Frequency 2462MHz Test By Brian 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)
30.97	V	Peak	51.31	-14.90	36.41	40.00	-3.59
93.05	V	Peak	54.61	-17.35	37.26	43.50	-6.24
241.46	V	Peak	51.77	-14.09	37.68	46.00	-8.32
260.86	V	Peak	47.42	-13.63	33.79	46.00	-12.21
390.84	V	Peak	41.41	-10.31	31.10	46.00	-14.90
454.86	V	Peak	43.73	-8.61	35.12	46.00	-10.88
73.65	H	Peak	52.30	-16.79	35.51	40.00	-4.49
233.70	H	Peak	47.87	-14.34	33.53	46.00	-12.47
301.60	Н	Peak	45.45	-13.09	32.36	46.00	-13.64

### 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\_20M)

Operation Mode 802.11n\_20M TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2412MHz Test By Brian
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)
31.94	V	Peak	50.88	-14.82	36.06	40.00	-3.94
93.05	V	Peak	54.87	-17.35	37.52	43.50	-5.98
241.46	V	Peak	52.14	-14.09	38.05	46.00	-7.95
454.86	V	Peak	44.18	-8.61	35.57	46.00	-10.43
701.24	V	Peak	35.84	-4.97	30.87	46.00	-15.13
73.65	Н	Peak	53.14	-16.79	36.35	40.00	-3.65
233.70	Н	Peak	47.96	-14.34	33.62	46.00	-12.38
262.80	Н	Peak	45.43	-13.61	31.82	46.00	-14.18
299.66	Н	Peak	44.23	-13.13	31.10	46.00	-14.90
454.86	H	Peak	39.23	-8.61	30.62	46.00	-15.38

### 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)

Operation Mode 802.11n\_20M TX CH Mid Test Date Dec. 01, 2010

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

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)
31.94	V	Peak	51.42	-14.82	36.60	40.00	-3.40
93.05	V	Peak	54.41	-17.35	37.06	43.50	-6.44
241.46	V	Peak	51.56	-14.09	37.47	46.00	-8.53
267.65	V	Peak	47.07	-13.57	33.50	46.00	-12.50
454.86	V	Peak	43.70	-8.61	35.09	46.00	-10.91
623.64	V	Peak	35.71	-5.51	30.20	46.00	-15.80
73.65	Н	Peak	52.32	-16.79	35.53	40.00	-4.47
241.46	Н	Peak	46.39	-14.09	32.30	46.00	-13.70
260.86	Н	Peak	44.62	-13.63	30.99	46.00	-15.01
454.86	Н	Peak	38.87	-8.61	30.26	46.00	-15.74

#### 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.

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

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

Operation Mode 802.11n\_20M TX CH High Dec. 01, 2010 Test Date

Fundamental Frequency 2462MHz Test By Brian 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)
31.94	V	Peak	50.12	-14.82	35.30	40.00	-4.70
93.05	V	Peak	54.89	-17.35	37.54	43.50	-5.96
241.46	V	Peak	51.75	-14.09	37.66	46.00	-8.34
264.74	V	Peak	48.03	-13.59	34.44	46.00	-11.56
454.86	V	Peak	43.66	-8.61	35.05	46.00	-10.95
623.64	V	Peak	36.30	-5.51	30.79	46.00	-15.21
73.65	H	Peak	51.90	-16.79	35.11	40.00	-4.89
241.46	H	Peak	46.63	-14.09	32.54	46.00	-13.46
260.86	Н	Peak	45.19	-13.63	31.56	46.00	-14.44

### 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)

Operation Mode 802.11n\_20M TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2422MHz Test By Brian
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)
31.94	V	Peak	51.91	-14.82	37.09	40.00	-2.91
93.05	V	Peak	55.29	-17.35	37.94	43.50	-5.56
241.46	V	Peak	51.99	-14.09	37.90	46.00	-8.10
264.74	V	Peak	47.58	-13.59	33.99	46.00	-12.01
458.74	V	Peak	43.49	-8.61	34.88	46.00	-11.12
623.64	V	Peak	35.89	-5.51	30.38	46.00	-15.62
73.65	Н	Peak	51.52	-16.79	34.73	40.00	-5.27
233.70	Н	Peak	48.87	-14.34	34.53	46.00	-11.47
260.86	Н	Peak	44.31	-13.63	30.68	46.00	-15.32
367.56	Н	Peak	41.99	-11.14	30.85	46.00	-15.15
458.74	Н	Peak	38.81	-8.61	30.20	46.00	-15.80
784.66	Н	Peak	34.31	-3.39	30.92	46.00	-15.08

### 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) (802.11n\_40M)

802.11n\_20M TX CH Mid Dec. 01, 2010 Operation Mode Test Date

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

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)
31.94	V	Peak	51.14	-14.82	36.32	40.00	-3.68
93.05	V	Peak	54.95	-17.35	37.60	43.50	-5.90
241.46	V	Peak	51.20	-14.09	37.11	46.00	-8.89
264.74	V	Peak	46.88	-13.59	33.29	46.00	-12.71
458.74	V	Peak	42.88	-8.61	34.27	46.00	-11.73
623.64	V	Peak	35.76	-5.51	30.25	46.00	-15.75
73.65	H	Peak	52.64	-16.79	35.85	40.00	-4.15
216.24	H	Peak	45.68	-15.05	30.63	46.00	-15.37
241.46	H	Peak	47.05	-14.09	32.96	46.00	-13.04
458.74	Н	Peak	39.59	-8.61	30.98	46.00	-15.02

### 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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Member of SGS Group

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

Operation Mode 802.11n\_20M TX CH High Dec. 01, 2010 Test Date

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

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)
31.94	V	Peak	52.26	-14.82	37.44	40.00	-2.56
93.05	V	Peak	54.72	-17.35	37.37	43.50	-6.13
241.46	V	Peak	51.85	-14.09	37.76	46.00	-8.24
264.74	V	Peak	48.48	-13.59	34.89	46.00	-11.11
454.86	V	Peak	43.11	-8.61	34.50	46.00	-11.50
623.64	V	Peak	36.34	-5.51	30.83	46.00	-15.17
73.65	H	Peak	51.84	-16.79	35.05	40.00	-4.95
233.70	H	Peak	50.16	-14.34	35.82	46.00	-10.18
262.80	H	Peak	44.27	-13.61	30.66	46.00	-15.34
454.86	H	Peak	39.15	-8.61	30.54	46.00	-15.46

### 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 Dec. 01, 2010

Fundamental Frequency 2412MHz Test By Brian 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)	
4824.0	38.06		6.05	44.11		74.00	54.00	-9.89	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 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)

Operation Mode 802.11b TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2412MHz Test By Brian 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)	
4824.0	41.19		6.05	47.24		74.00	54.00	-6.76	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 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)

Operation Mode 802.11b TX CH Mid Test Date Dec. 01, 2010

Fundamental Frequency 2437MHz Test By Brian 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)	
4874.0	36.36		8.07	44.43		74.00	54.00	-9.57	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) (802.11b)

Operation Mode 802.11b TX CH Mid Test Date Dec. 01, 2010

Fundamental Frequency 2437MHz Test By Brian 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)	
4874.0	42.66		8.07	50.73		74.00	54.00	-3.27	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) (802.11b)

802.11b TX CH High Operation Mode Test Date Dec. 01, 2010

Fundamental Frequency 2462MHz Test By Brian 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)	
4924.0	37.70		8.12	45.82		74.00	54.00	-8.18	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) (802.11b)

802.11b TX CH High Operation Mode Test Date Dec. 01, 2010

Fundamental Frequency 2462MHz Test By Brian 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)	
4924.0	43.44		8.12	51.56		74.00	54.00	-2.44	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) (802.11g)

802.11g TX CH Low Operation Mode Test Date Dec. 01, 2010

Fundamental Frequency 2412MHz Test By Brian 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)	
4824.0	34.69		6.05	40.74		74.00	54.00	-13.26	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) (802.11g)

802.11g TX CH Low Operation Mode Test Date Dec. 01, 2010

Fundamental Frequency 2412MHz Test By Brian 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)	
4824.0	33.93		6.05	39.98		74.00	54.00	-14.02	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) (802.11g)

Operation Mode 802.11g TX CH Mid Test Date Dec. 01, 2010

Fundamental Frequency 2437MHz Test By Brian 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)	
4874.0	34.32		8.07	42.39		74.00	54.00	-11.61	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) (802.11g)

802.11g TX CH Mid Operation Mode Test Date Dec. 01, 2010

Fundamental Frequency 2437MHz Test By Brian 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)	
4874.0	34.67		8.07	42.74		74.00	54.00	-11.26	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) (802.11g)

Operation Mode 802.11g TX CH High Test Date Dec. 01, 2010

Fundamental Frequency 2462MHz Test By Brian 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)	
4924.0	32.40		8.12	40.52		74.00	54.00	-13.48	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 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) (802.11g)

Operation Mode 802.11g TX CH High Test Date Dec. 01, 2010

Fundamental Frequency 2462MHz Test By Brian 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)	
4924.0	34.96		8.12	43.08		74.00	54.00	-10.92	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 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)

Operation Mode 802.11n\_20M TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2412MHz Test By Brian 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)	
2963.0	38.67		0.29	38.96		74.00	54.00	-15.04	Peak
4824.0	32.56		6.05	38.61		74.00	54.00	-15.39	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 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)

802.11n\_20M TX CH Low Dec. 01, 2010 Operation Mode Test Date

Fundamental Frequency 2412MHz Test By Brian 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)	
1260.0	38.66		-6.97	31.69		74.00	54.00	-22.31	Peak
4824.0	34.13		6.05	40.18		74.00	54.00	-13.82	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)

Operation Mode 802.11n\_20M TX CH Mid Test Date Dec. 01, 2010

Fundamental Frequency 2437MHz Test By Brian 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)	
4874.0	33.47		8.07	41.54		74.00	54.00	-12.46	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)

Operation Mode 802.11n\_20M TX CH Mid Test Date Dec. 01, 2010

Fundamental Frequency 2437 MHz Test By Brian 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)	
4874.0	33.91		8.07	41.98		74.00	54.00	-12.02	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)

Operation Mode 802.11n\_20M TX CH High Test Date Dec. 01, 2010

Fundamental Frequency 2462 MHz Test By Brian 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)	
4924.0	33.72		8.12	41.84		74.00	54.00	-12.16	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 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)

Operation Mode 802.11n\_20M TX CH High Test Date Dec. 01, 2010

Fundamental Frequency 2462 MHz Test By Brian 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)	
4924.0	32.72		8.12	40.84		74.00	54.00	-13.16	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 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\_40M)

Operation Mode 802.11n\_40M TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2422 MHz Test By Brian 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)	
4844.0	32.58		6.05	38.63		74.00	54.00	-15.37	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 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\_40M)

Operation Mode 802.11n\_40M TX CH Low Test Date Dec. 01, 2010

Fundamental Frequency 2422MHz Test By Brian 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)	
4844.0	33.33		6.05	39.38		74.00	54.00	-14.62	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 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\_40M)

Operation Mode 802.11n\_40M TX CH Mid Test Date Dec. 01, 2010

Fundamental Frequency 2437MHz Test By Brian 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)	
4874.0	33.28		8.07	41.35		74.00	54.00	-12.65	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\_40M)

802.11n\_40M TX CH Mid Dec. 01, 2010 Operation Mode Test Date

Fundamental Frequency 2437MHz Test By Brian 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)	
4874.0	33.25		8.07	41.32		74.00	54.00	-12.68	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)

Operation Mode 802.11n\_40M TX CH High Test Date Dec. 01, 2010

Fundamental Frequency  $2452 \mathrm{MHz}$  Test By Brian 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)	
4904.0	33.18		8.12	41.30		74.00	54.00	-12.70	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) (802.11n\_40M)

Operation Mode 802.11n\_40M TX CH High Test Date Dec. 01, 2010

Fundamental Frequency  $2452 \mathrm{MHz}$  Test By Brian Temperature  $25~^{\circ}\mathrm{C}$  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	33.62		8.12	41.74		74.00	54.00	-12.26	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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## 10 Peak Power Spectral Density

## 10.1 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.

### **10.2 Measurement Equipment Used:**

Refer to section 6.2 for details.

### 10.3 Test Set-up:

Refer to section 6.3 for details.

### **10.4 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 = 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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### 10.5 Measurement Result

### 802.11b Mode

Frequency	RF Power Density	Cable loss	RF Power Density	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
2412	-15.07	0.00	-15.07	8
2437	-14.92	0.00	-14.92	8
2462	-15.00	0.00	-15.00	8

### 802.11g Mode

002:115 111000				
Frequency	RF Power Density	Cable loss	RF Power Density	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
2412	-23.69	0.00	-23.69	8
2437	-23.28	0.00	-23.28	8
2462	-23.89	0.00	-23.89	8

### 802.11n-20M Mode

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-25.12	0.00	-25.12	8
2437	-24.86	0.00	-24.86	8
2462	-24.58	0.00	-24.58	8

### 802.11n-40M Mode

Frequency	RF Power Density	Cable loss	RF Power Density	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
2422	-27.72	0.00	-27.72	8
2437	-27.59	0.00	-27.59	8
2452	-28.55	0.00	-28.55	8

### offset 0.5dB

Note: Refer to next page for plots.

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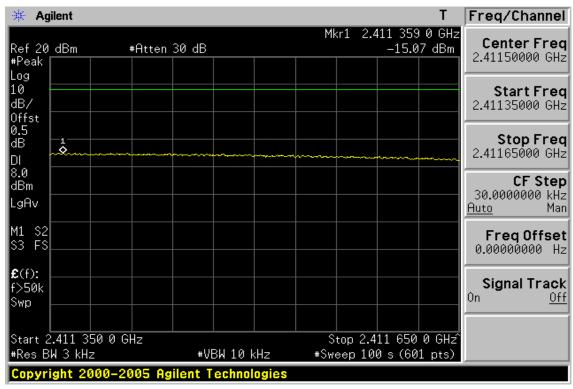
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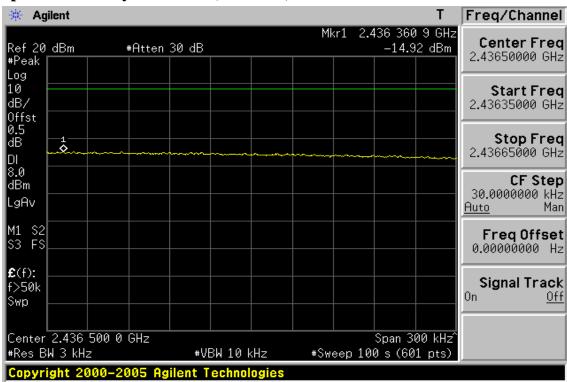
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802.11b Power Spectral Density Test Plot (CH-Low)



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



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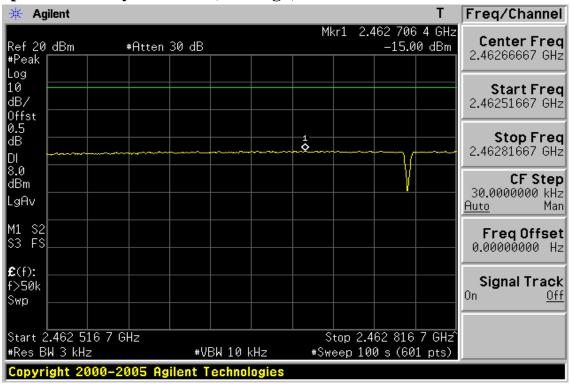
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# Power Spectral Density Test Plot (CH-High)



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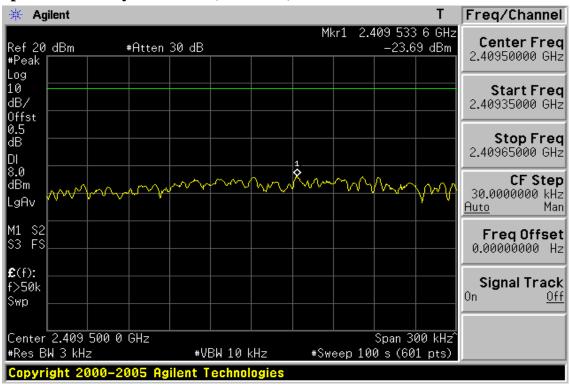
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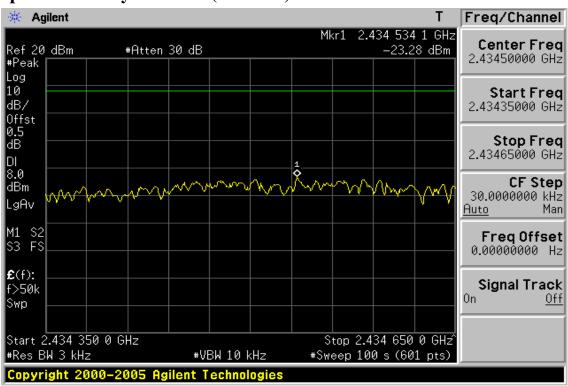
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802.11g Power Spectral Density Test Plot (CH-Low)



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



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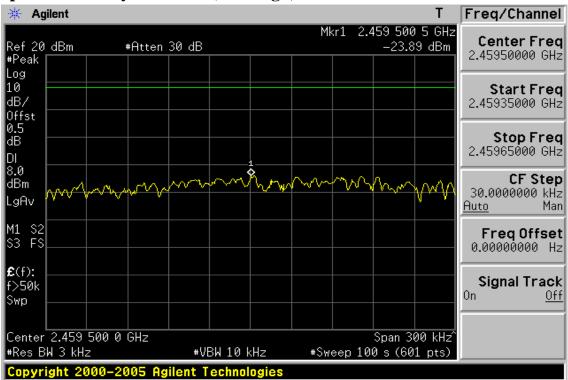
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## **Power Spectral Density Test Plot (CH-High)**



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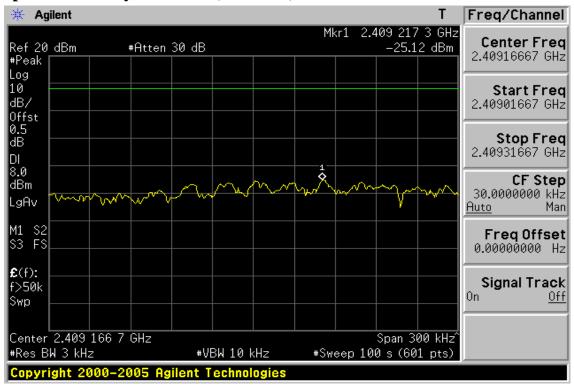


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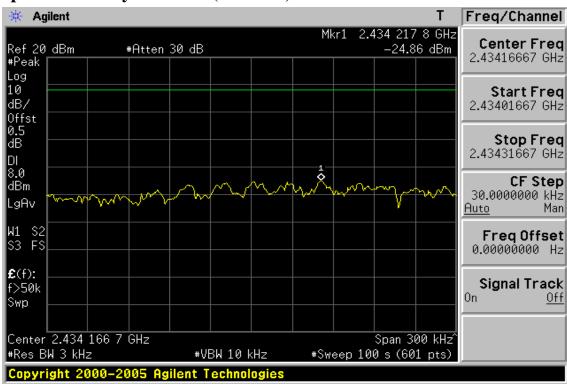
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### 802.11n\_20M

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



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



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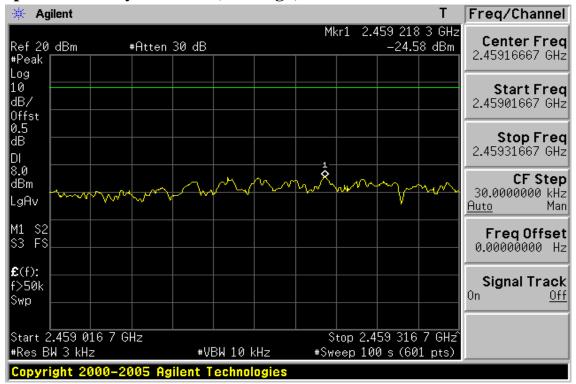
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## **Power Spectral Density Test Plot (CH-High)**



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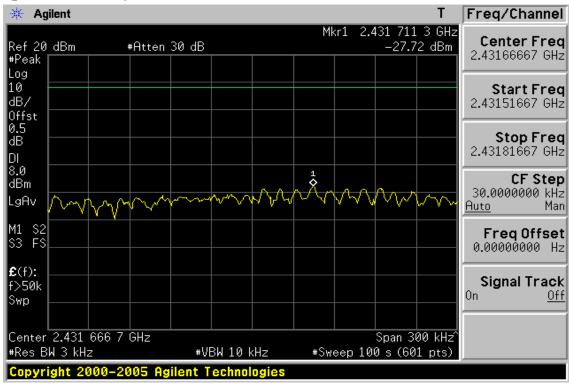


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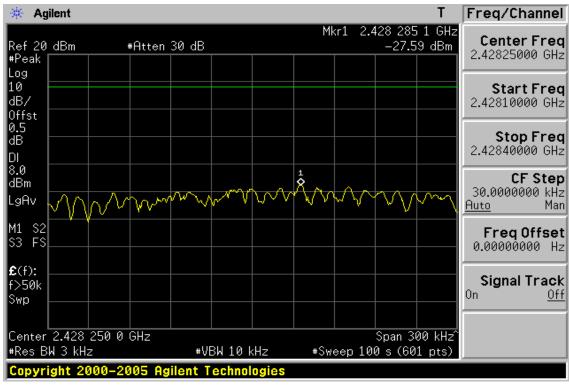
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### 802.11n\_40M

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



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



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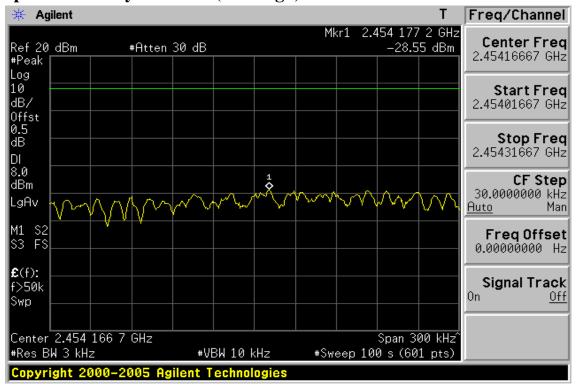
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## Power Spectral Density Test Plot (CH-High)



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# 11 ANTENNA REQUIREMENT

### 11.1 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.

#### 11.2 Antenna Connected Construction

The directional gins of antenna used for transmitting is 0.5dBi, 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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## 12 RF EXPOSURE

### 12.1 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 Portable device.

### 12.2 Measurement Result:

This is a portable device and the Max peak output power is 13.38dBm (0.02178 W) lower than low threshold 60/fGHz mW (24.48mW), d<2.5cm in general population category;

The SAR measurement is not necessary.

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