

Report No.: ER/2009/60018 Issue Date: Jul. 28, 2010

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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name: SmartBRIDGE

Brand Name: Cadi

Model Name: SMB-800

Model Different: N/A

FCC ID: VPE-SMB800

Report No.: ER/2009/60018

Issue Date: Jul. 28, 2010

FCC Rule Part: §15.247, Cat: DSS

Prepared for: CADI SCIENTIFIC PTE LTD

31 Ubi Road 1, #03-00 Aztech Building, Sin-

gapore 408694

Prepared by: SGS Taiwan Ltd.

Electronics & Communication Laboratory

No. 134, Wu Kung Rd., Wuku Industrial

Zone, Taipei County, Taiwan





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VERIFICATION OF COMPLIANCE

CADI SCIENTIFIC PTE LTD **Applicant:**

31 Ubi Road 1, #03-00 Aztech Building, Singapore 408694

SmartBRIDGE Equipment Under Test:

Brand Name: Cadi

SMB-800 Model No.:

Model Difference: N/A

FCC ID: VPE-SMB800 ER/2009/60018 File Number:

Jun. 11, 2009 ~ Jul. 27, 2010 Date of test:

Date of EUT Received: Jun. 11, 2009

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

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

Test By:	Jason When	Date	Jul. 28, 2010	
Prepared By:	Jason Wu /Asst. Supervisor	Date	Jul. 28, 2010	
Approved By:	Gigi Yeh / Clerk ALW HSieh Arno Hsieh / Asst. Supervisor	Date	Jul. 28, 2010	

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Version

Version No.	Date	Description
00	Jul. 28, 2010	Initial creation of document

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GENERAL INFORMATION

1.1 **Product Description**

General:

Product Name	SmartBRIDGE			
Brand Name	Cadi			
Model Name	SMB-800			
Model Difference	N/A			
Power Supply	12 Vdc re-chargeable battery or 15Vdc by AC/DC power adapter			
Power Supply	Adapter:	Model No.: SNP-A048-M, Brand Name: Skynet Electronic		

FCC 15.249

00 1812 17			
Transmit Power	<94dBuV/m		
Operation Frequency:	919.8MHz and 925MHz		
Channel number:	1 channels		
Modulation Type:	FSK		

WLAN: 802.11 b/g:

Frequency Range:	2412 – 2462 MHz
Channel number:	11 channels
Output Power:	802.11 b: 13.51dBm 802.11 g: 13.89dBm
Modulation Technology:	DSSS, OFDM
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM. 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps
Antenna Designation:	Dipole Antenna, 2dBi.

This report applies for WLAN 802.11b/g.

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Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: <u>VPE-SMB800</u> 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 was 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.

Equipment Modifications

Not available for this EUT intended for grant.

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SYSTEM TEST CONFIGURATION

EUT Configuration 2.1

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 30MHz 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 of ANSI C63.4-2003.

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Configuration of Tested System

Fig. 2-1 AC Power line and Radiated Emission Configuration

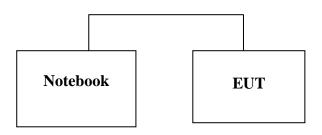


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	Notebook	DELL	E5400	3704625136	N/A	Un-shielded
2.	Testing software	CADI	Terminal	V1.96	N/A	N/A

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SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result	
§15.207(a)	AC Power Line Conducted Emission	Compliant	
§15.247(b) (3),(4)(c)	Peak Output Power	Compliant	
§15.247(a)(2)	6dB Bandwidth	Compliant	
	100 KHz Bandwidth Of	Compliant	
§15.247(d)	Frequency Band Edges		
§15.247(d)	Spurious Emission	Compliant	
§15.247(e)	Peak Power Density	Compliant	
§15.203	Antenna Requirement	Compliant	

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.

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CONDUCTED EMISSION TEST

5.1 **Standard Applicable:**

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

Frequency range		nits (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

- 1. The lower limit shall apply at the transition frequencies
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

5.2 **Measurement Equipment Used:**

3.2 Medsurement Eq	dipinent esec	4.				
Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
EMI Test Receiver	R&S	ESCS30	828985/004	09/15/2009	09/14/2010	
LISN	Rolf-Heine	NNB-2/16Z	99012	02/02/2010	02/01/2011	
LISN	FCC	FCC-LISN-50/250-2 5-2-01	04034	02/02/2010	02/01/2011	
Coaxial Cables	N/A	WK CE Cable	N/A	11/28/2009	11/27/2010	

5.3 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 EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

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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.

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.

Note: Refer to next page for measurement data and plots.

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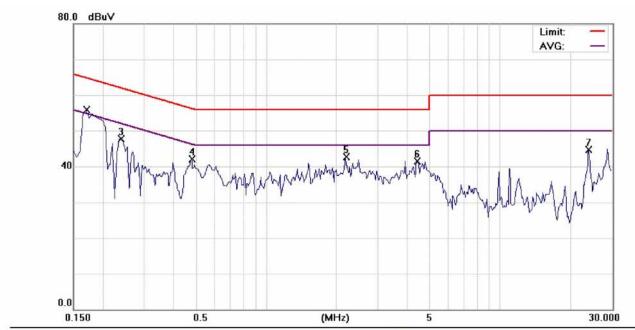


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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	WiFi Mode			Test Date:	Jul. 10, 2010
Temperature:	23 °C	Humidity:	57 %	Test By:	Jason



Site SGS CONDUCTED #1

Limit: CISPR22/11/EN55022 Class B

EUT: Wireless Temperature Monitor

M/N: SMB-800

Note: WLAN Operation

Phase:	L1	remperature	23 (
Power:	AC 120V/60Hz	Humidity:	57 %
Distance		Air Pressure	: hpa

No. M	k. Fre	Reading q. Level	Factor	Measure- ment	Limit	Over		
	MH	z dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.17	00 55.70	0.13	55.83	64.96	-9.13	QP	
2	0.17	00 37.30	0.13	37.43	54.96	-17.53	AVG	
3	0.24	00 47.61	0.12	47.73	62.10	-14.37	peak	
4	0.48	00 42.04	0.12	42.16	56.34	-14.18	peak	
5	2.20	00 42.46	0.16	42.62	56.00	-13.38	peak	
6	4.41	00 41.29	0.21	41.50	56.00	-14.50	peak	
7	24.00	00 44.00	0.68	44.68	60.00	-15.32	peak	

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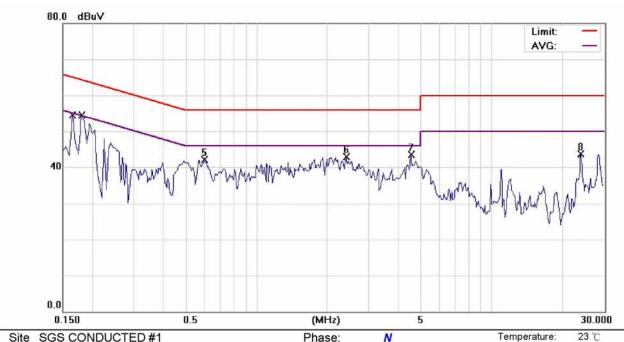


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Humidity: Air Pressure:

hpa



Site SGS CONDUCTED #1

Limit: CISPR22/11/EN55022 Class B

EUT: Wireless Temperature Monitor

M/N: SMB-800

Note: WLAN Operation

No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1650	52.80	0.14	52.94	65.21	-12.27	QP	
2	0.1650	33.50	0.14	33.64	55.21	-21.57	AVG	
3 *	0.1800	55.40	0.14	55.54	64.49	-8.95	QP	
4	0.1800	34.90	0.14	35.04	54.49	-19.45	AVG	
5	0.6000	41.96	0.12	42.08	56.00	-13.92	peak	
6	2.4100	42.73	0.17	42.90	56.00	-13.10	peak	
7	4.5300	43.33	0.21	43.54	56.00	-12.46	peak	
8	24.0000	43.16	0.52	43.68	60.00	-16.32	peak	

Power:

Distance:

AC 120V/60Hz

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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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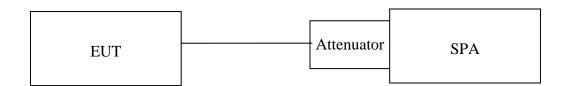
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Measurement Equipment Used:

Wedstrement Equipment escu.												
	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							

6.3 **Test Set-up:**



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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Measurement Result:

802.11b

	Cable loss = 0		;			
СН	CH Frequency (MHz)		Required Limit			
CII	Trequency (WIII2)	1	2	5.5	11	Required Limit
1	2412	13.51	13.43	13.31	13.29	1 Watt = 30 dBm
6	2437	13.03	13.01	12.96	12.90	1 Watt = 30 dBm
11	2462	12.86	12.83	12.79	12.76	1 Watt = 30 dBm

802.11g

Cal	ole loss = 0		Peak Power Output							
СН	Frequency				Data	Rate				Required Limit
	(MHz)	6	9	12	18	24	36	48	54	Required Limit
1	2412	13.57	13.51	13.46	13.42	13.38	13.32	13.28	13.26	1 Watt = 30 dBm
6	2437	13.70	13.64	13.61	13.58	13.55	13.50	13.46	13.39	1 Watt = 30 dBm
11	2462	13.89	13.83	13.79	13.76	13.74	13.69	13.66	13.62	1 Watt = 30 dBm

*Note: Offset: 0.5dB

Note: Refer to next page for plots.

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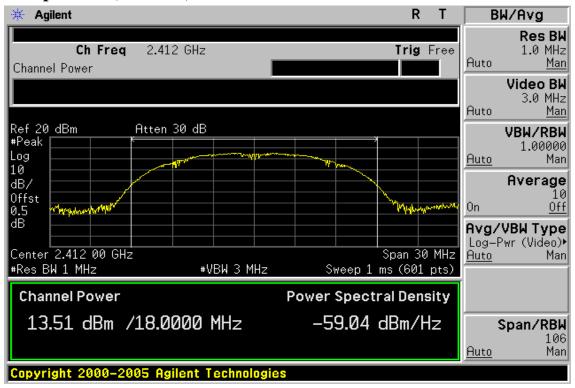
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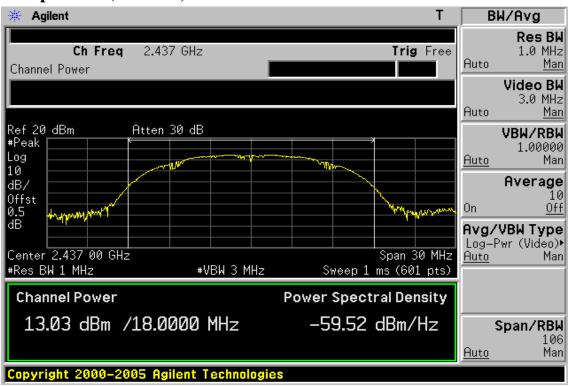
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802.11b, 1Mbps **Power Output Plot (CH Low)**



Power Output Plot (CH Mid)



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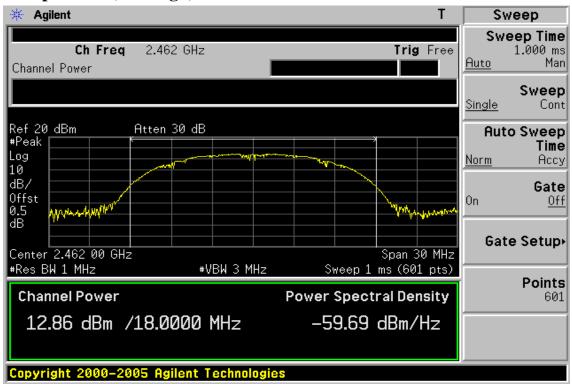
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Power Output Plot (CH High)



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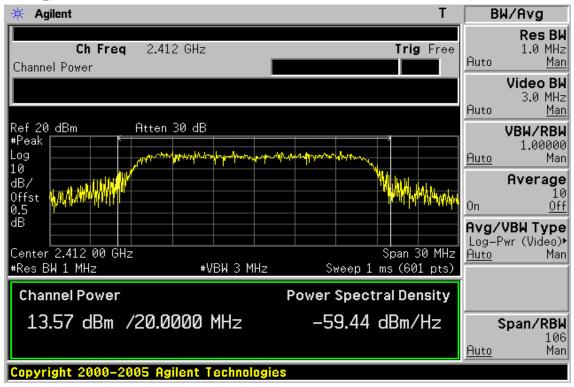
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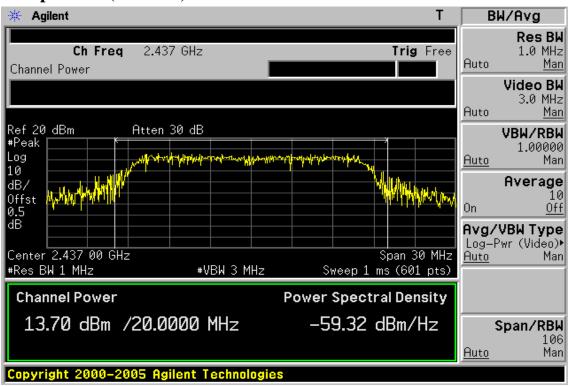
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802.11g, 6Mbps **Power Output Plot (CH Low)**



Power Output Plot (CH Mid)



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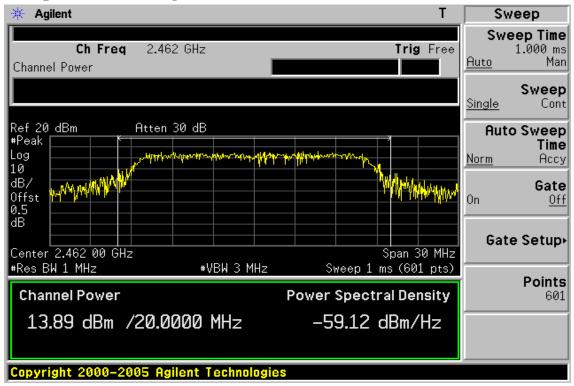
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Power Output Plot (CH High)



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6dB Bandwidth

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.

Measurement Equipment Used:

Refer to section 6.2 for details.

7.3 **Test Set-up:**

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= 30M/50MHz, Sweep=auto
- 4. Mark the peak frequency and –6dB (upper and lower) frequency.
- 5. Repeat above procedures until all frequency measured were complete.

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7.5 **Measurement Result:**

802.11b

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	10.029	> 500	PASS
2437	10.012	> 500	PASS
2462	10.024	> 500	PASS

^{*}Offset 0.6 dB

802.11g

002.11g			
Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	16.593	> 500	PASS
2437	16.600	> 500	PASS
2462	16.601	> 500	PASS

^{*}Offset:0.5 dB

Note: Refer to next page for plots.

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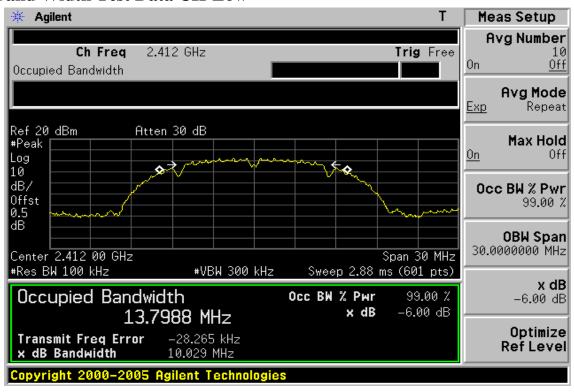
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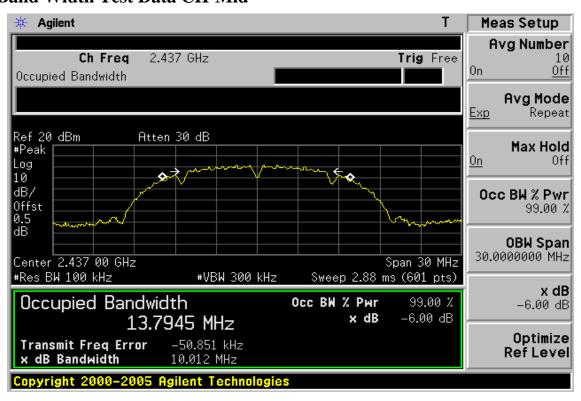
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802.11b 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



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6dB Band Width Test Data CH-High



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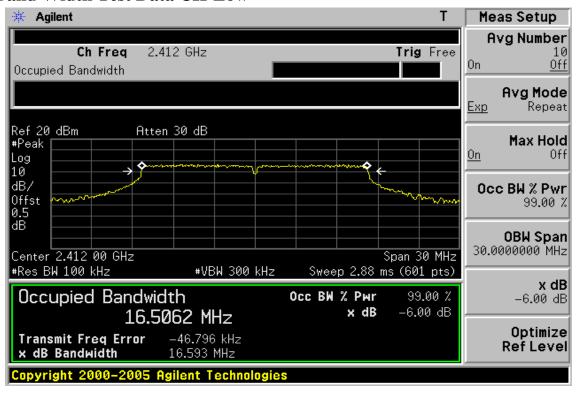
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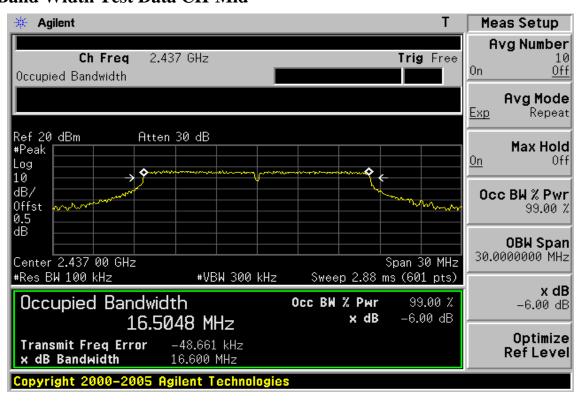
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802.11g 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



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6dB Band Width Test Data CH-High



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100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

Standard Applicable: 8.1

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:**

8.2.1 **Conducted Emission at antenna port:**

Refer to section 6.2 for details.

8.2.2 Radiated emission:

	90	66 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	11/19/2009	11/18/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	03/09/2009	03/08/2011
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2009	11/28/2010
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011
Radio Communication Analyzer	R & S	CMU200	111787	10/31/2008	10/30/2010
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	11/08/2009	11/09/2010

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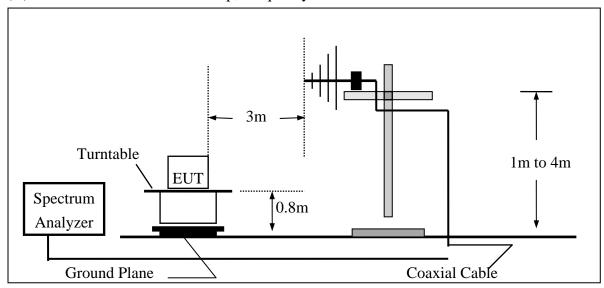
Test SET-UP: 8.3

8.3.1 **Conducted Emission at antenna port:**

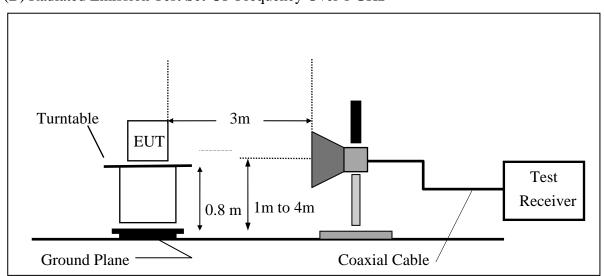
Refer to section 6.3 for details.

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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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	

Measurement Result:

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

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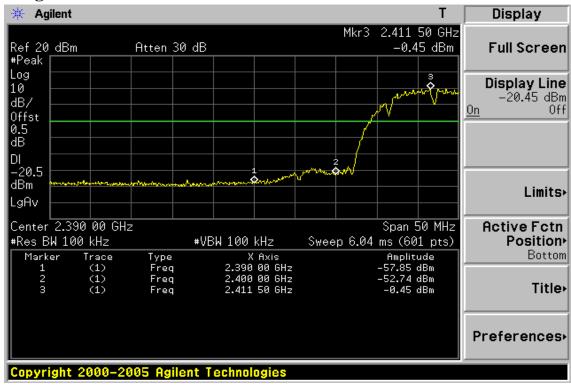
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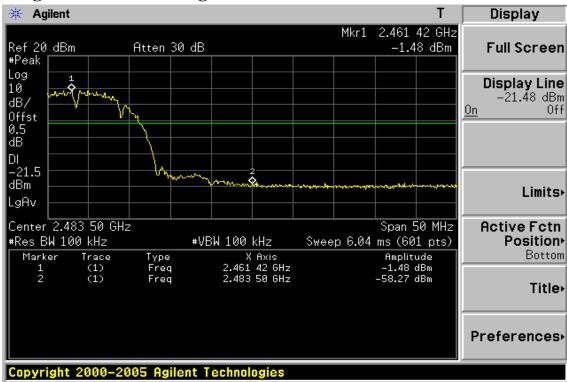
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802.11b **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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Radiated Emission: 802.11 b mode

Operation Mode TX CH Low **Test Date** Jul. 05, 2010

Fundamental Frequency 2412 MHz Test By Jason **Tmperature** Pol Ver. 25

Humidity 65 %

62.81

51.26

-10.76

	Peak	\mathbf{AV}		Actu	ıal FS	Peak	\mathbf{AV}		
Freq.	Reading	O		Peak	AV	Limit	Limit	_	Remark
(MHz)	(dBuV)	(aBuv)	CF(aB)	(aBuv/m) (d Bu V/m)	(aBuv/m)	(a Bu v/n	n) (dB)	
2390.00	64.63	53.96	-10.76	53.87	43.20	74.00	54.00	-10.80	AV
Operation Fundamen Temperatu Humidity	tal Frequer	_	H Low MHz			Test Test Pol	Ву	Jul. 05, 20 Jason Hor.	10
Hammanty		05 70							
	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) (d Bu V/m)	(dBuV/m)	(d Bu V/n	n) (dB)	

Remark:

2390.00

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.

40.50

74.00

54.00

-13.50

AV

52.05

- Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (3) Spectrum Peak Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz-40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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Radiated Emission: 802.11 b mode

Operation Mode TX CH High Test Date Jul. 05, 2010

Fundamental Frequency 2462 MHz Test By Jason Temperature Pol Ver. 25

65 % Humidity

62.72

50.23

-10.46

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.		U	Ant./CL		\mathbf{AV}	Limit	Limit	O	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)) (d Bu V/m)	(dBuV/m)	(d Bu V/n	n) (dB)	
2483.56	63.67	53.41	-10.46	53.21	42.95	74.00	54.00	-11.05	AV
Operation Mode TX CH High						Test	Date	Jul. 05, 20	10
Fundamen	tal Frequer	ncy 2462	MHz			Test	Ву	Jason	
Temperatu	re	25				Pol		Hor.	
Humidity		65 %							
	Peak	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)) (d Bu V/m)	(dBuV/m)	(d Bu V/n	n) (dB)	

Remark:

2483.56

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.

39.77

74.00

54.00

-14.23

ΑV

52.26

- 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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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 Jul. 05, 2010

Fundamental Frequency 2412 MHz Test By Jason **Tmperature** Pol Ver. 25

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)	(d BuV/m)	(dBu V/m	(dB)	
2390.00	65.01	54.35	-10.76	54.25	43.59	74.00	54.00	-10.41	AV
Operation Mode TX CH Low						Te	st Date	Jul. 05, 2	2010
Fundamental Frequency 2412 MHz						Te	st By	Jason	
Temperatu	re	25				Po	1	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)) (d Bu V/m)	(dBuV/m)(d Bu V/m)	(dB)	
2390.00	62.23		-10.76	51.47		74.00	54.00	-2.53	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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Radiated Emission: 802.11 g mode

Operation Mode TX CH High Test Date Jul. 05, 2010

2462 MHz Fundamental Frequency Test By Jason Temperature Pol Ver. 25

65 % Humidity

63.82

52.21

-10.46

	Peak	\mathbf{AV}		Actual FS		Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)) (d Bu V/m)	(dBuV/m)	(d Bu V/n	n) (dB)	
2483.50	64.72	53.70	-10.46	54.26	43.24	74.00	54.00	-10.76	AV
Operation Mode TX CH High					Test	Date	Jul. 05, 20	10	
Fundamental Frequency 2462 MHz				Test By Jason				Jason	
Temperature 25				Pol		Hor.			
Humidity		65 %							
	Peak	\mathbf{AV}		Actual FS		Peak	\mathbf{AV}		
Freq. (MHz)	Reading (dBuV)	Reading (dBuV)			AV) (d Bu V/m)	Limit (dBuV/m)	Limi t (d Bu V/n	O	Remark

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.

41.75

74.00

54.00

-12.25

AV

53.36

- 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.
- 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

Standard Applicable 9.1

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 6.2 for details.

9.2.2 Radiated emission:

Refer to section 7.2 for details.

9.3 **Test SET-UP:**

9.3.1 Conducted Emission at antenna port:

Refer to section 6.3 for details.

9.3.2 Radiated emission:

Refer to section 7.3 for details.

Measurement Procedure:

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. 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.

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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	

Measurement Result:

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

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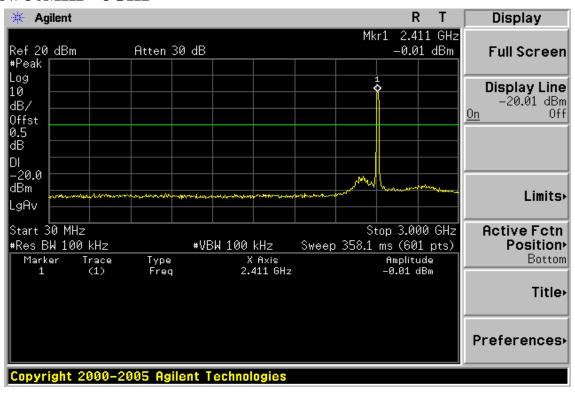
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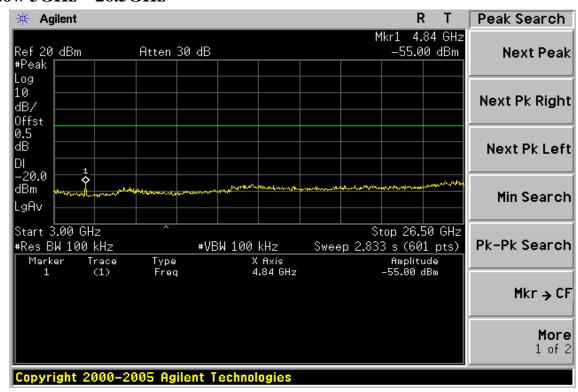
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Conducted Spurious Emission Measurement Result (802.11b) Ch Low 30MHz - 3GHz



Ch Low 3GHz – 26.5GHz



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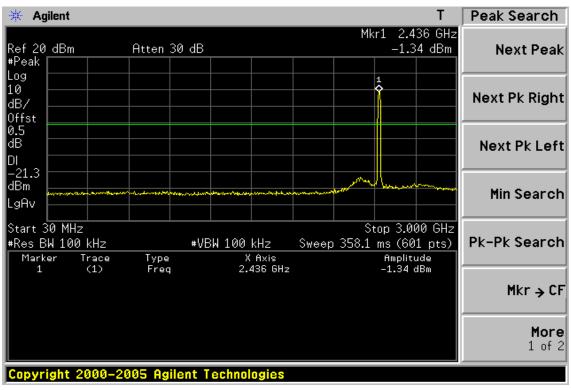
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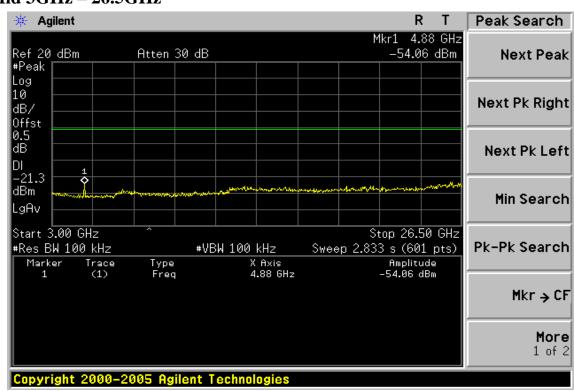
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Ch Mid 30MHz - 3GHz



Ch Mid 3GHz – 26.5GHz



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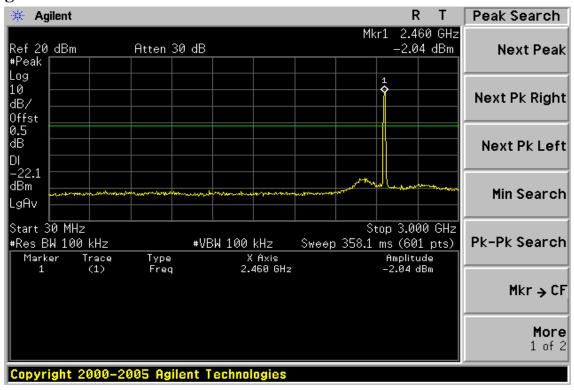
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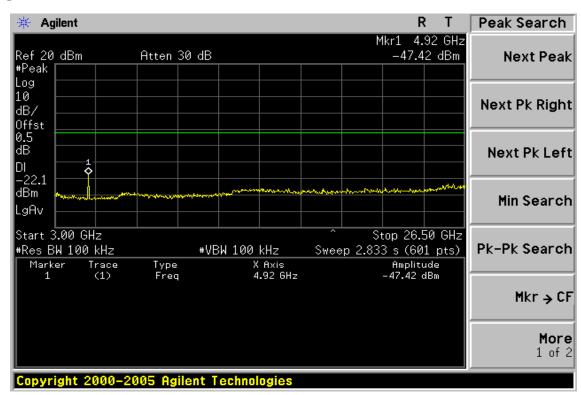
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Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



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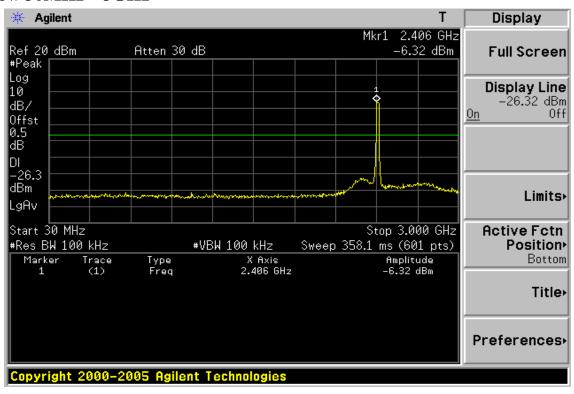
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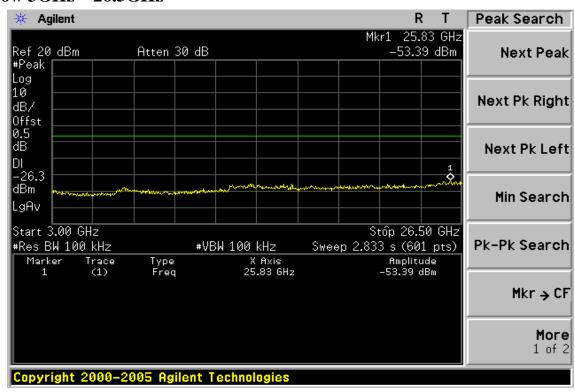
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Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz - 3GHz



Ch Low 3GHz – 26.5GHz



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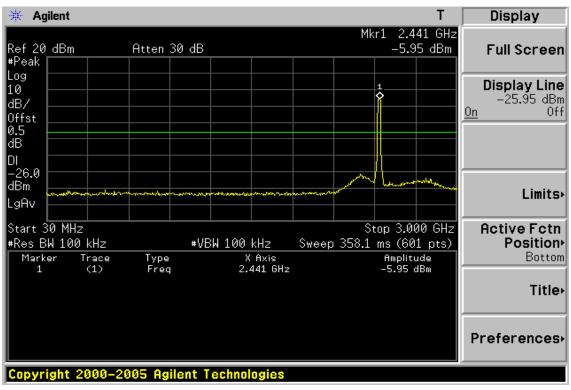
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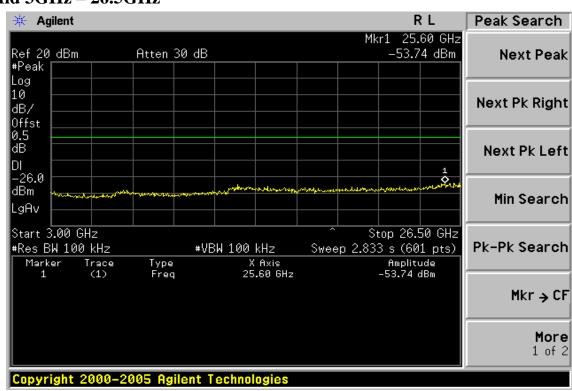
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Ch Mid 30MHz - 3GHz



Ch Mid 3GHz – 26.5GHz



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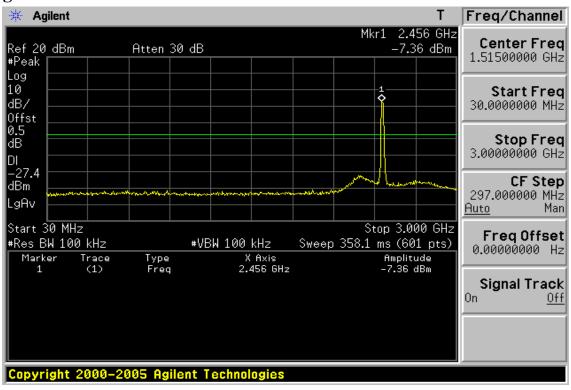
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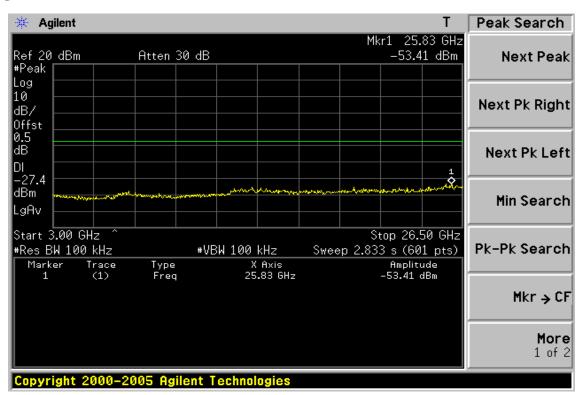
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Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



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

Operation Mode 802.11b TX CH Low **Test Date** Jul. 05, 2010

Fundamental Frequency 2412MHz Test By Jason Temperature Pol Ver./Hor 25

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)
77.53	V	Peak	59.72	-30.53	29.19	40.00	-10.81
140.58	V	Peak	62.18	-27.44	34.74	43.50	-8.76
240.49	V	Peak	61.02	-29.89	31.13	46.00	-14.87
720.64	V	Peak	52.13	-20.96	31.17	46.00	-14.83
814.73	V	Peak	53.92	-20.00	33.92	46.00	-12.08
911.73	V	Peak	48.98	-18.85	30.13	46.00	-15.87
128.94	Н	Peak	54.62	-28.27	26.35	43.50	-17.15
240.49	Н	Peak	66.28	-29.89	36.39	46.00	-9.61
288.99	Н	Peak	66.55	-28.76	37.79	46.00	-8.21
552.83	Н	Peak	53.62	-23.68	29.94	46.00	-16.06
720.64	Н	Peak	56.50	-20.96	35.54	46.00	-10.46
814.73	Н	Peak	55.94	-20.00	35.94	46.00	-10.06

Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz_o
- 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** Jul. 05, 2010

Fundamental Frequency 2437MHz Test By Jason Temperature Pol Ver./Hor 25

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)
77.53	V	Peak	59.50	-30.53	28.97	40.00	-11.03
140.58	V	Peak	62.30	-27.44	34.86	43.50	-8.64
240.49	V	Peak	60.86	-29.89	30.97	46.00	-15.03
720.64	V	Peak	51.91	-20.96	30.95	46.00	-15.05
814.73	V	Peak	54.18	-20.00	34.18	46.00	-11.82
911.73	V	Peak	48.95	-18.85	30.10	46.00	-15.90
140.58	Н	Peak	53.69	-27.44	26.25	43.50	-17.25
240.49	Н	Peak	66.21	-29.89	36.32	46.00	-9.68
288.99	Н	Peak	66.71	-28.76	37.95	46.00	-8.05
415.09	Н	Peak	53.36	-25.69	27.67	46.00	-18.33
720.64	Н	Peak	56.05	-20.96	35.09	46.00	-10.91
814.73	Н	Peak	55.66	-20.00	35.66	46.00	-10.34

Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz_o
- 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** Jul. 05, 2010

Fundamental Frequency 2462MHz Test By Jason Temperature Pol Ver./Hor 25

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)
140.58	V	Peak	62.60	-27.44	35.16	43.50	-8.34
240.49	V	Peak	60.97	-29.89	31.08	46.00	-14.92
288.99	V	Peak	55.76	-28.76	27.00	46.00	-19.00
720.64	V	Peak	53.20	-20.96	32.24	46.00	-13.76
814.73	V	Peak	53.86	-20.00	33.86	46.00	-12.14
911.73	V	Peak	48.74	-18.85	29.89	46.00	-16.11
140.58	Н	Peak	54.17	-27.44	26.73	43.50	-16.77
240.49	Н	Peak	65.86	-29.89	35.97	46.00	-10.03
288.99	Н	Peak	66.80	-28.76	38.04	46.00	-7.96
415.09	Н	Peak	53.32	-25.69	27.63	46.00	-18.37
720.64	Н	Peak	55.95	-20.96	34.99	46.00	-11.01
814.73	Н	Peak	55.72	-20.00	35.72	46.00	-10.28

Remark:

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

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

Operation Mode 802.11g TX CH Low **Test Date** Jul. 05, 2010

Fundamental Frequency 2412MHz Test By Jason Temperature Pol Ver./Hor 25

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)
140.58	V	Peak	62.48	-27.44	35.04	43.50	-8.46
240.49	V	Peak	61.55	-29.89	31.66	46.00	-14.34
288.99	V	Peak	55.34	-28.76	26.58	46.00	-19.42
720.64	V	Peak	51.98	-20.96	31.02	46.00	-14.98
814.73	V	Peak	55.03	-20.00	35.03	46.00	-10.97
911.73	V	Peak	48.15	-18.85	29.30	46.00	-16.70
143.49	Н	Peak	53.93	-27.31	26.62	43.50	-16.88
240.49	Н	Peak	66.01	-29.89	36.12	46.00	-9.88
288.99	Н	Peak	66.40	-28.76	37.64	46.00	-8.36
415.09	Н	Peak	53.47	-25.69	27.78	46.00	-18.22
720.64	Н	Peak	55.85	-20.96	34.89	46.00	-11.11
814.73	Н	Peak	55.91	-20.00	35.91	46.00	-10.09

Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz_o
- 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** Jul. 05, 2010

Fundamental Frequency 2437MHz Test By Jason Temperature Pol Ver./Hor 25

65 % Humidity

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
140.58	V	Peak	62.45	-27.44	35.01	43.50	-8.49
240.49	V	Peak	60.58	-29.89	30.69	46.00	-15.31
288.99	V	Peak	55.68	-28.76	26.92	46.00	-19.08
720.64	V	Peak	52.17	-20.96	31.21	46.00	-14.79
814.73	V	Peak	54.58	-20.00	34.58	46.00	-11.42
911.73	V	Peak	49.14	-18.85	30.29	46.00	-15.71
143.49	Н	Peak	53.68	-27.31	26.37	43.50	-17.13
240.49	Н	Peak	65.92	-29.89	36.03	46.00	-9.97
288.99	Н	Peak	66.44	-28.76	37.68	46.00	-8.32
417.03	Н	Peak	53.57	-25.64	27.93	46.00	-18.07
720.64	Н	Peak	55.71	-20.96	34.75	46.00	-11.25
814.73	Н	Peak	55.42	-20.00	35.42	46.00	-10.58

Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz_o
- 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** Jul. 05, 2010

Fundamental Frequency 2462MHz Test By Jason Temperature Pol Ver./Hor 25

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)
140.58	V	Peak	62.44	-27.44	35.00	43.50	-8.50
240.49	V	Peak	60.96	-29.89	31.07	46.00	-14.93
288.99	V	Peak	55.53	-28.76	26.77	46.00	-19.23
720.64	V	Peak	52.23	-20.96	31.27	46.00	-14.73
814.73	V	Peak	53.85	-20.00	33.85	46.00	-12.15
911.73	V	Peak	48.85	-18.85	30.00	46.00	-16.00
143.49	Н	Peak	54.01	-27.31	26.70	43.50	-16.80
240.49	Н	Peak	65.97	-29.89	36.08	46.00	-9.92
288.99	Н	Peak	66.75	-28.76	37.99	46.00	-8.01
415.09	Н	Peak	52.53	-25.69	26.84	46.00	-19.16
720.64	Н	Peak	56.32	-20.96	35.36	46.00	-10.64
814.73	Н	Peak	55.72	-20.00	35.72	46.00	-10.28

Remark:

- 1 Measuring frequencies from 30 MHz to the 1GHz_o
- 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** Jul. 05, 2010

Fundamental Frequency 2412MHz Test By Jason Temperature Pol Ver. 25

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)	
1188.5	46.57		-15.61	30.96		74.00	54.00	-23.04	Peak
1598.0	46.95		-13.95	33.00		74.00	54.00	-21.00	Peak
4824.0	50.35		-6.01	44.34		74.00	54.00	-9.66	Peak
5985.5	44.02		-3.52	40.50		74.00	54.00	-13.50	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) (802.11b)

Operation Mode 802.11b TX CH Low **Test Date** Jul. 05, 2010

Fundamental Frequency 2412MHz Test By Jason Temperature Pol Hor 25

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)	
1110.5	46.87		-15.90	30.97		74.00	54.00	-23.03	Peak
3333.5	44.00		-10.26	33.74		74.00	54.00	-20.26	Peak
4824.0	46.37		-6.01	40.36		74.00	54.00	-13.64	Peak
6388.5	43.15		-1.69	41.46		74.00	54.00	-12.54	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) (802.11b)

Operation Mode 802.11b TX CH Mid **Test Date** Jul. 05, 2010

Fundamental Frequency 2437MHz Test By Jason Temperature Pol Ver 25

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)	
1500.5	46.95		-14.37	32.58		74.00	54.00	-21.42	Peak
1598.0	47.12		-13.95	33.17		74.00	54.00	-20.83	Peak
4874.0	54.93		-5.97	48.96		74.00	54.00	-5.04	Peak
6486.0	44.31		-1.27	43.04		74.00	54.00	-10.96	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) (802.11b)

Operation Mode 802.11b TX CH Mid **Test Date** Jul. 05, 2010

Fundamental Frequency 2437MHz Test By Jason Temperature Pol Hor 25

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)	
1188.5	47.79		-15.61	32.18		74.00	54.00	-21.82	Peak
4874.0	48.60		-5.97	42.63		74.00	54.00	-11.37	Peak
6453.5	42.59		-1.40	41.19		74.00	54.00	-12.81	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 High **Test Date** Jul. 05, 2010

Fundamental Frequency 2462MHz Test By Jason Temperature Pol Ver 25

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)	
1188.5	46.80		-15.61	31.19		74.00	54.00	-22.81	Peak
1500.5	47.79		-14.37	33.42		74.00	54.00	-20.58	Peak
1598.0	47.30		-13.95	33.35		74.00	54.00	-20.65	Peak
3710.5	44.04		-8.82	35.22		74.00	54.00	-18.78	Peak
4924.0	57.31		-5.91	51.40		74.00	54.00	-2.60	Peak
5985.5	44.90		-3.52	41.38		74.00	54.00	-12.62	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.

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 (above 1GHz) (802.11b)

Operation Mode 802.11b TX CH High **Test Date** Jul. 05, 2010

Fundamental Frequency 2462MHz Test By Jason Temperature Pol Hor 25

65 % Humidity

	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)	
1110.5	47.07		-15.90	31.17		74.00	54.00	-22.83	Peak
1273.0	45.47		-15.16	30.31		74.00	54.00	-23.69	Peak
1968.5	44.17		-12.82	31.35		74.00	54.00	-22.65	Peak
3678.0	43.82		-8.95	34.87		74.00	54.00	-19.13	Peak
4924.0	49.76		-5.91	43.85		74.00	54.00	-10.15	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)

Operation Mode 802.11g TX CH Low **Test Date** Jul. 05, 2010

Fundamental Frequency 2412MHz Test By Jason Temperature Pol Ver. 25

65 % Humidity

	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)	
1500.5	48.11		-14.37	33.74		74.00	54.00	-20.26	Peak
1598.0	47.28		-13.95	33.33		74.00	54.00	-20.67	Peak
4824.0	44.70		-6.01	38.69		74.00	54.00	-15.31	Peak
4861.0	46.52		-5.97	40.55		74.00	54.00	-13.45	Peak
6486.0	43.77		-1.27	42.50		74.00	54.00	-11.50	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 Low **Test Date** Jul. 05, 2010

Fundamental Frequency 2412MHz Test By Jason Temperature Pol Hor 25

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)	
1091.0	46.67		-15.90	30.77		74.00	54.00	-23.23	Peak
1598.0	44.94		-13.95	30.99		74.00	54.00	-23.01	Peak
4824.0	42.36		-5.98	36.38		74.00	54.00	-17.62	Peak
6083.0	42.95		-3.00	39.95		74.00	54.00	-14.05	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** Jul. 05, 2010

Fundamental Frequency 2437MHz Test By Jason Temperature Pol Ver 25

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)	
1500.5	47.22		-14.37	32.85		74.00	54.00	-21.15	Peak
2800.5	50.64		-10.37	40.27		74.00	54.00	-13.73	Peak
4490.5	45.89		-6.94	38.95		74.00	54.00	-15.05	Peak
4874.0	51.16		-5.93	45.23		74.00	54.00	-8.77	Peak
6421.0	45.22		-1.52	43.70		74.00	54.00	-10.30	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 Mid **Test Date** Jul. 05, 2010

Fundamental Frequency 2437MHz Test By Jason Temperature Pol Hor 25

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)	
1091.0	46.56		-15.90	30.66		74.00	54.00	-23.34	Peak
1286.0	45.59		-15.04	30.55		74.00	54.00	-23.45	Peak
2735.5	45.61		-10.42	35.19		74.00	54.00	-18.81	Peak
4874.0	44.64		-5.93	38.71		74.00	54.00	-15.29	Peak
6193.5	43.04		-2.49	40.55		74.00	54.00	-13.45	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** Jul. 05, 2010

Fundamental Frequency 2462MHz Test By Jason Temperature Pol Ver 25

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)	
1500.5	48.46		-14.37	34.09		74.00	54.00	-19.91	Peak
2813.5	51.93		-10.35	41.58		74.00	54.00	-12.42	Peak
4924.0	58.17		-5.94	52.23		74.00	54.00	-1.77	Peak
6486.0	44.74		-1.27	43.47		74.00	54.00	-10.53	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)

Operation Mode 802.11g TX CH High **Test Date** Jul. 05, 2010

Fundamental Frequency 2462MHz Test By Jason Temperature Pol Hor 25

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)	
1180.5	47.32		-15.61	31.71		74.00	54.00	-22.29	Peak
3678.0	43.67		-8.95	34.72		74.00	54.00	-19.28	Peak
4924.0	49.09		-5.94	43.15		74.00	54.00	-10.85	Peak
6778.5	42.68		0.54	43.22		74.00	54.00	-10.78	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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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 = 300KHz, 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

Frequency	RF Power Density	Cable loss	RF Power Density	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
2412	-18.85	0.00	-18.85	8
2437	-19.83	0.00	-19.83	8
2462	-20.36	0.00	-20.36	8

^{*}Offset 0.5 dB

802.11g

	RF Power Density	Cable loss	RF Power Density	Maximum Limit
MHz	Reading (dBm)	(dB)	Level (dBm)	(dBm)
2412	-20.64	0.00	-20.64	8
2437	-21.45	0.00	-21.45	8
2462	-21.05	0.00	-21.05	8

^{*}Offset 0.5 dB

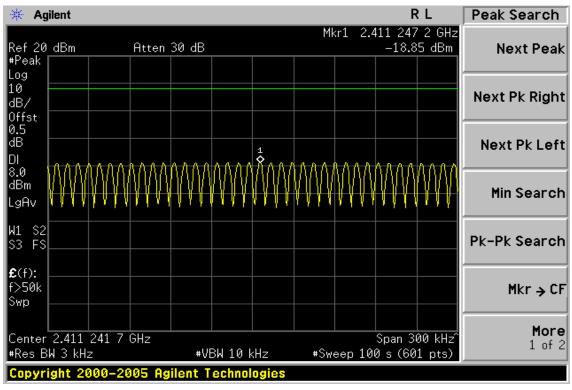
Note: Refer to next page for plots.



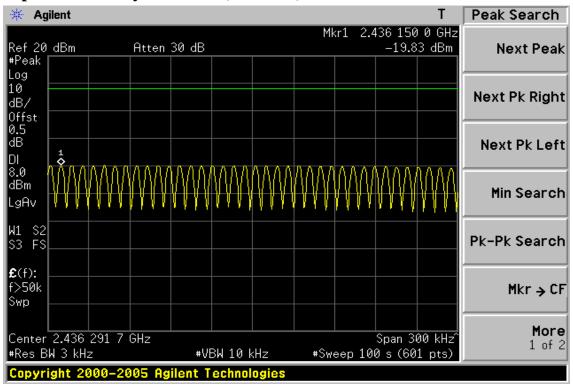
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802.11b **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)



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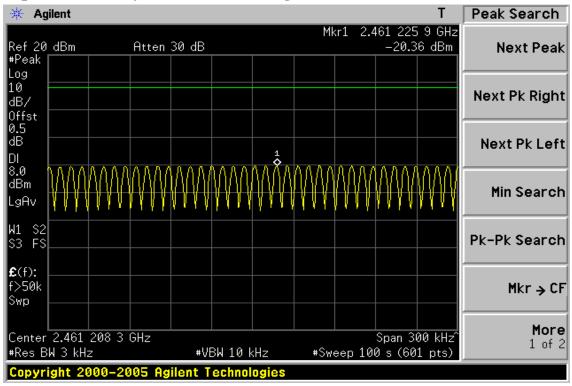
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Power Spectral Density Test Plot (CH-High)



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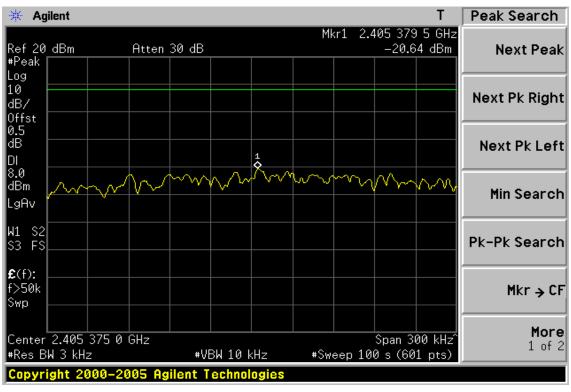
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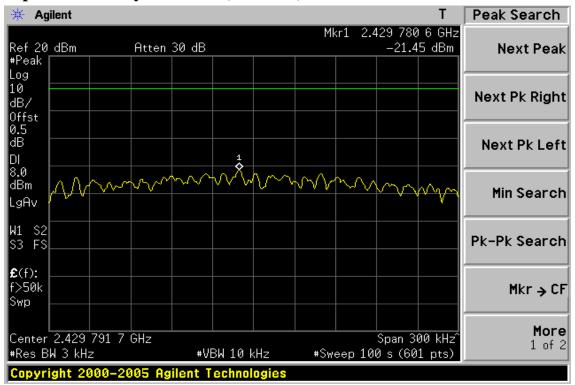
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802.11g **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)



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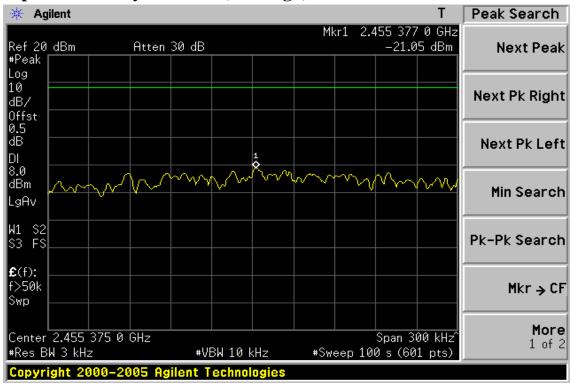
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Power Spectral Density Test Plot (CH-High)



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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 2 dBi, 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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APPENDIX 1 PHOTOGRAPHS OF SET UP

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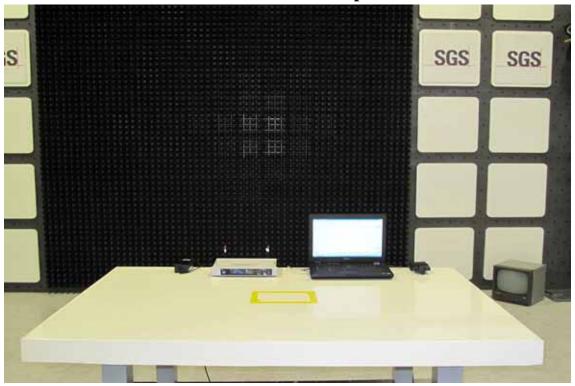
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Radiated Emission Set up Photo





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Conducted Emission Set up Photo





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APPENDIX 2 PHOTOGRAPHS OF EUT

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All View of EUT



Front View of EUT



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Back View of EUT



Side View of EUT – 1



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Side View of EUT – 2



Side View of EUT - 3



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Side View of EUT - 4



Adapter-1



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Open View of EUT - 1



Open View of EUT - 2



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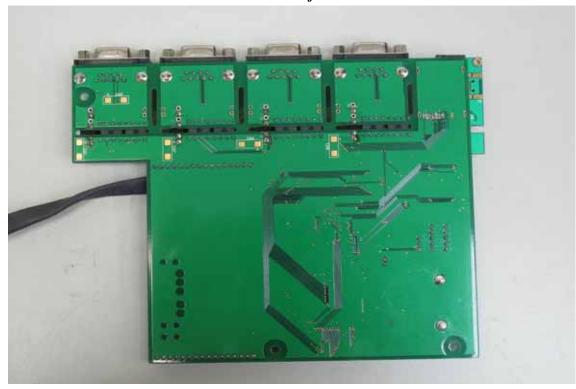
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Internal View of EUT – 1



Internal View of EUT - 2



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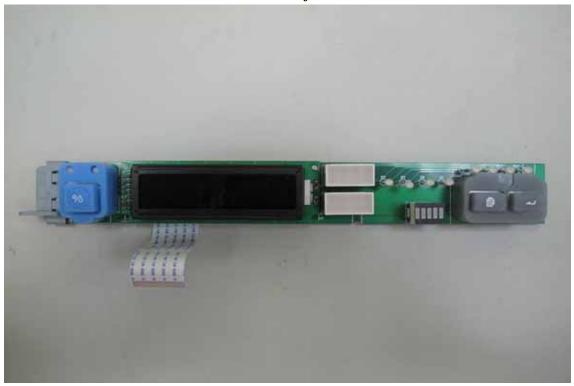
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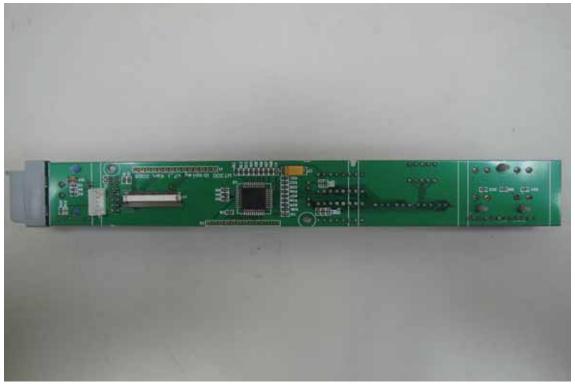
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Internal View of EUT - 3



Internal View of EUT - 4



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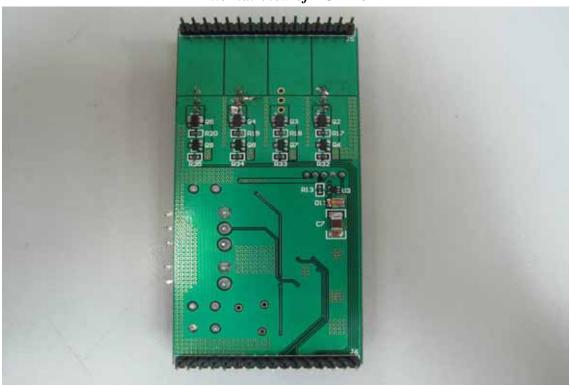
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Internal View of EUT – 5



Internal View of EUT - 6



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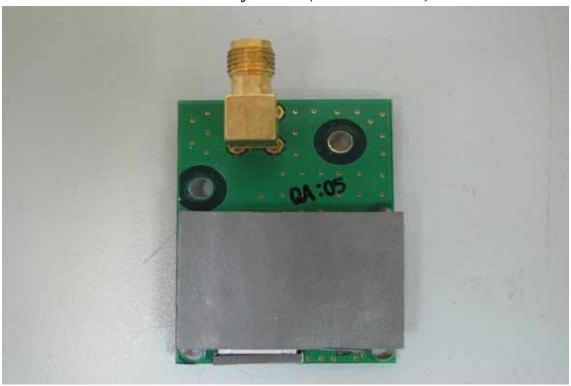
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Internal View of EUT – 7



Internal View of EUT – 8(Wireless Module)



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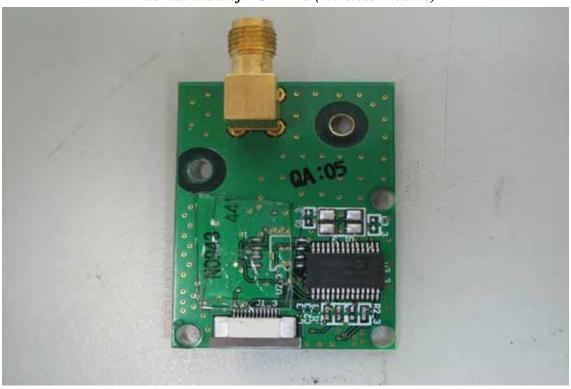
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Internal View of EUT – 9(Wireless Module)



Internal View of EUT – 10 (Wireless Module)



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Internal View of EUT – 11(WLAN Module)



Internal View of EUT – 12(WLAN Module)



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Internal View of EUT – 13(WLAN Module)



Internal View of EUT – 14 (WLAN Module)



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