

Report No.: EH/2009/30031 Issue Date: Jul. 28, 2009

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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

Product Name: POS terminal

Brand Name: ingenico **Model Name: iWP250**

Model Different: N/A

FCC ID: XKBIWP250

IC: 2586D-IWP250

Report No.: EH/2009/30031

Issue Date: Jun. 28, 2009

FCC Rule Part: §15.247

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

Prepared for: INGENICO

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Prepared by: SGS Taiwan Ltd.

Electronics & Communication Laboratory

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VERIFICATION OF COMPLIANCE

Applicant: INGENICO

192, avenue Charles de Gaulle, 92200 Neuilly-sur-Seine, FRANCE

Product Name: POS terminal **Brand Name:** ingenico

FCC ID: XKBIWP250

IC: 2586D-IWP250

Model No.: iWP250 **Model Difference:** N/A

File Number: EH/2009/30031

Date of test: Jul. 17, 2009 ~ Jul. 27, 2009

Date of EUT Received: Mar. 27, 2009

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247 and IC RSS 210 issue 7: 2007 Annex 8.

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

Test By:	Jason We	Date	Jul. 28, 2009	
_	Jason Wu/ Asst. Supervisor			
Prepared By:	Gigi yeh	Date	Jul. 28, 2009	
_	Gigi Yeh / Clerk			
Approved By:	Jim Chang	Date	Jul. 28, 2009	
_	Jim Chang / Supervisor			

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Version

Version No.	Date	Description
00	Jul. 28, 2009	Initial creation of document

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GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	POS terminal		
Brand Name:	ingenico		
Model Name:	iWP250		
Model Difference:	N/A		
Downer Conneller	24Vdc by AC/DC power adapter		
Power Supply	Adapter:	Model: EA11002B, Supplier: EDAC	

GSM / DCS:

	Operation Band	Frequency Range	Rated Power	
Cellular Phone Standards Frequency Range and Power	GSM/EDGE 850, class10	824 MHz– 849MHz	33dBm	
1 7 0	DCS/EDGE 1900, class10	1850MHz – 1910MHz	30dBm	
		DC voltage (V)	DC current (mA)	
	GSM 850, class10	M 850, class10 24Vdc		
Final Amplifier Voltage and Current Information	DCS1900, class10	24Vdc	310	
	DEGE 850	24Vdc	315	
	EDGE 1900	24Vdc	305	
Antenna Designation:	PIFA Antenna / -2.3 dBi.			
Type of Emission	f Emission 300KGXW			
IMEI	354060011204555			

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WI	[.A]	N	١.

Frequency Range:	2412 – 2462 MHz
Channel number:	11 channels
Max. Output Power:	802.11 b: 16.61 dBm (Peak) 802.11 g: 16.54 dBm (Peak)
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:	PIFA Antenna / -3.6dBi.

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

Bluetooth:

Bluetooth Version	□ V1.1 (GFSK) □ V1.2 (GFSK) □ V2.0 (GFSK) □ V2.0 + EDR (GFSK + /4DQPSK + 8DPSK) □ V2.1 + EDR (GFSK + /4DQPSK + 8DPSK)		
Frequency Range	2402 – 2480MHz		
Channel number	79 channels max.		
Rated Power	1.93 dBm (Peak)		
Modulation type	Frequency Hopping Spread Spectrum		
Antenna Designation	PIFA Antenna / -3.9dBi.		

The EUT is compliance with Bluetooth 2.1 Standard.

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RFID:

Operating Frequency	13.56MHz
Transmit Power	< 123dBuV/m at 3m.
Number of Channels	1
Operating Mode	Point-to-Point
Antenna Type	A permanent fixed antenna, which is built-In, designed as an indispensable part of the EUT.
Module Type	ASK

The EUT is compliance with RFID Standard. This test report applies for 802.11b/g WLAN.

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

This submittal(s) (test report) is intended for FCC ID: XKBIWP250 filing to comply with Section 15.247 of the FCC Part 15, Subpart E Rules and IC: 2586D-IWP250 filing to comply with Industry Canada RSS-210 issue 7: 2007 Annex 8. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

1.3 **Test Methodology**

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

1.4 **Test Facility**

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1.

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

1.5 **Special Accessories**

Not available for this EUT intended for grant.

1.6 **Equipment Modifications**

Not available for this EUT intended for grant.

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SYSTEM TEST CONFIGURATION

2.1 **EUT Configuration**

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

2.2 **EUT Exercise**

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

2.3 **Test Procedure**

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 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

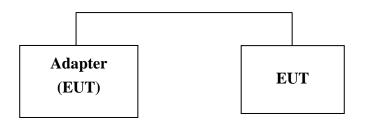


Table 2-1 Equipment Used in Tested System

Item Equipment Mfr/Br		Mfn/Drand	Model/	Series No.	Data Cabla	Power Cord
		WIII/Drailu	Type No.	Series No.	Data Cable	
1.	WiFi Software	N/A	WLAN eMapi	N/A	N/A	N/A
2.	AC Adaptor	EDAC	EA11002B	N/A	N/A	180cm, Un-shielded

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SUMMARY OF TEST RESULTS

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

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

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CONDUCTED EMISSION TEST

5.1. Standard Applicable:

According to §15.207 and RSS-Gen §7.2.2, frequency range within 150KHz to 30MHz 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. Measurement Equipment Used:

AC Power Line Conducted Emission Test Site								
EQUIPMENT	ENT MFR MODEL SERIAL LAST CAL DUE.							
TYPE		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCS30	828985/004	09/15/2008	09/14/2009			
LISN	Rolf-Heine	NNB-2/16Z	99012	02/18/2009	02/17/2010			
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	02/18/2009	02/17/2010			
Coaxial Cables	N/A	WK CE Cable	N/A	10/30/2008	10/29/2009			

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 110Vac/60Hz power source.

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^{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.



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5.4. 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.

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.

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

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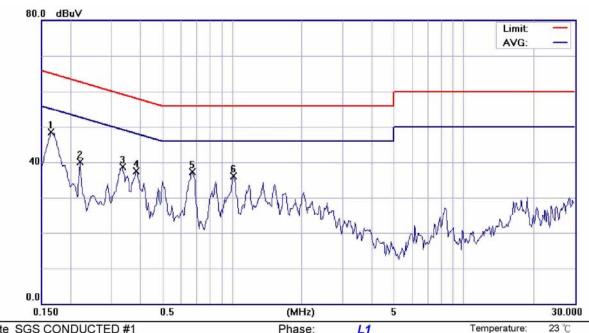


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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	WLAN Link			Test Date:	Jul. 24, 2009
Temperature:	24 °C	Humidity:	60 %	Test By:	Jason



Site SGS CONDUCTED #1

Limit: FCC Class B Conduction(QP)

EUT: POS terminal M/N: M82-250

Note: WLAN Normal Link Mode

Power:	AC 120V/60Hz	Humidity:	60 %
Distance	r.	Air Pressure:	hpa

L1

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1	*	0.1650	48.30	0.16	48.46	65.21	-16.75	peak		
2		0.2200	40.06	0.12	40.18	62.82	-22.64	peak		
3		0.3350	38.67	0.09	38.76	59.33	-20.57	peak		
4		0.3850	37.33	0.08	37.41	58.17	-20.76	peak		
5		0.6700	37.15	0.08	37.23	56.00	-18.77	peak		
6		1.0100	36.06	0.09	36.15	56.00	-19.85	peak		

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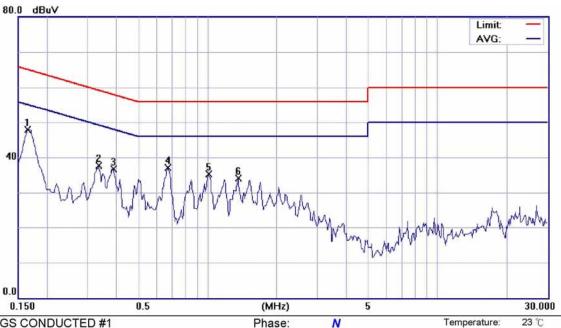
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Humidity:

Air Pressure:

hpa



AC 120V/60Hz

Site SGS CONDUCTED #1

Limit: FCC Class B Conduction(QP)

EUT: POS terminal

M/N: M82-250

Note: WLAN Normal Link Mode

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1	*	0.1650	47.70	0.18	47.88	65.21	-17.33	peak		
2		0.3350	37.52	0.12	37.64	59.33	-21.69	peak		
3		0.3900	36.63	0.11	36.74	58.06	-21.32	peak		
4		0.6700	36.95	0.11	37.06	56.00	-18.94	peak		
5		1.0100	35.11	0.12	35.23	56.00	-20.77	peak		
6		1.3600	33.90	0.13	34.03	56.00	-21.97	peak		

Power:

Distance:

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PEAK OUTPUT POWER MEASUREMENT

6.1 Standard Applicable:

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

5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the

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

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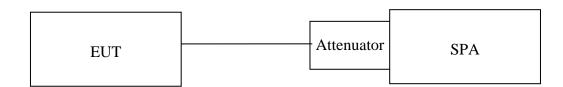
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According to RSS-210 issue 7,§A8.4(2), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, the maximum conducted output power shall not exceed 1 W. For all other frequency hopping systems, the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

6.2 Measurement Equipment Used:

1 1								
Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
ТҮРЕ		NUMBER	NUMBER	CAL.				
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010			
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2009	07/03/2010			
Spectrum Analyzer	R&S	FSP 40	100034	02/22/2009	02/21/2010			
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010			
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010			

6.3 .Test Set-up:



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

		Peak Power Output					
СН	Frequency		Required				
CH	(MHz)	1	2	5.5	11	Limit	
1	2412	16.24	16.20	16.14	16.05	30 dBm	
6	2437	16.61	16.55	16.49	16.41	30 dBm	
11	2462	16.05	16.00	15.91	15.86	30 dBm	

802.11g

	Peak Power Output									
CII	Frequency	Data Data						Required		
СН	(MHz)	6	9	12	18	24	36	48	54	Limit
1	2412	16.46	16.44	16.41	16.35	16.29	16.24	16.15	16.10	30 dBm
6	2437	16.54	16.50	16.45	16.41	16.38	16.34	16.28	16.21	30 dBm
11	2462	16.29	16.22	16.17	16.14	16.11	16.06	16.03	15.97	30 dBm

Cable loss = 0*Note: Offset 1dB

Note: Refer to next page for plots.

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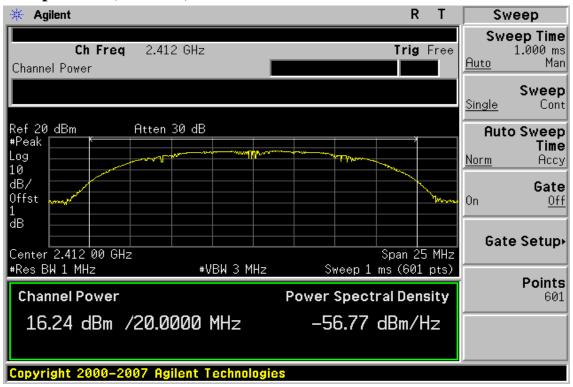


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802.11b, 1Mbps

Power Output Plot (CH Low)



Power Output Plot (CH Mid)



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Power Output Plot (CH High)



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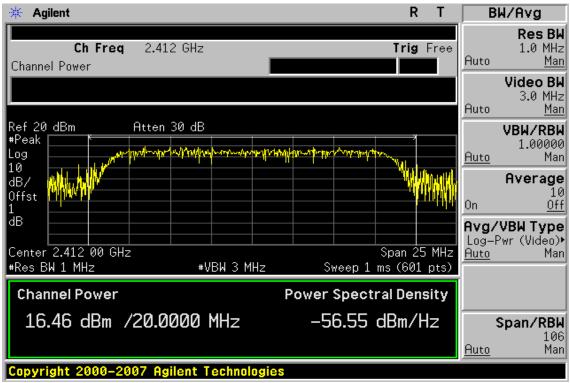


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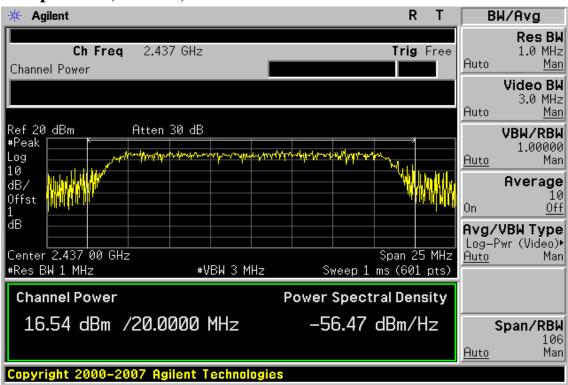
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802.11g, 6Mbps

Power Output Plot (CH Low)



Power Output Plot (CH Mid)



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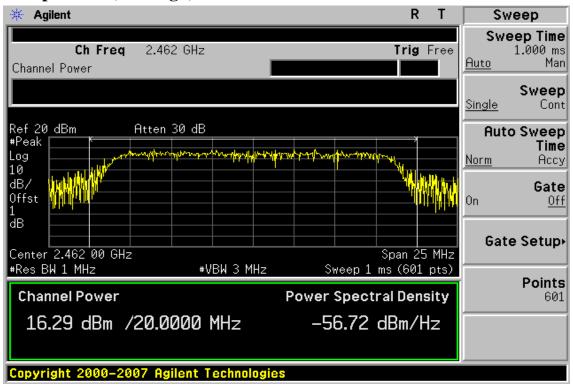
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Power Output Plot (CH High)



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6dB Bandwidth

7.1 Standard Applicable:

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

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

7.2 Measurement 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

002:110			
СН	Bandwidth (MHz)	Bandwidth (KHz)	Result
Lower	12.589	> 500	PASS
Mid	12.584	> 500	PASS
Higher	12.626	> 500	PASS

^{*}Offset 1dB

802.11g

0020115			
СН	Bandwidth (MHz)	Bandwidth (KHz)	Result
Lower	16.453	> 500	PASS
Mid	16.425	> 500	PASS
Higher	16.460	> 500	PASS

^{*}Offset 1dB

Note: Refer to next page for plots.

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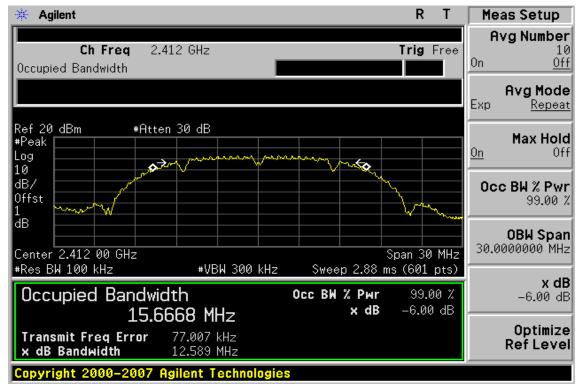


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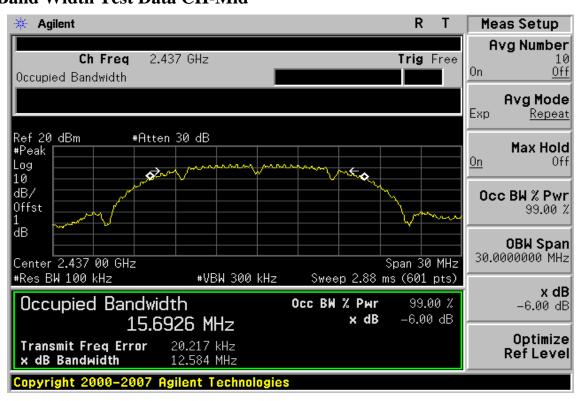
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802.11b

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



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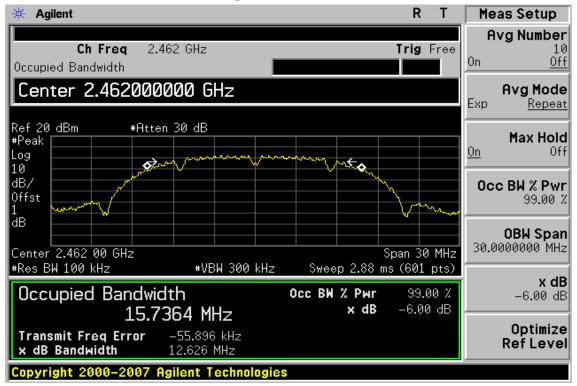
f (886-2) 2298-0488



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6dB Band Width Test Data CH-High



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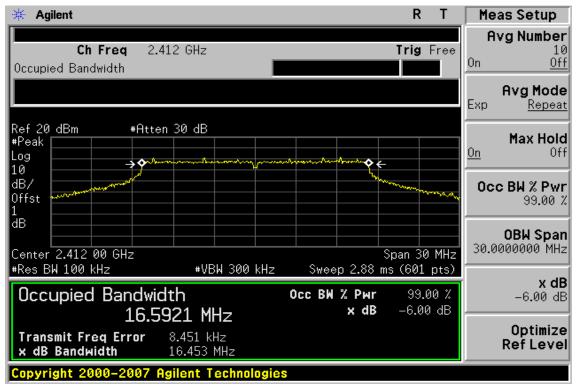


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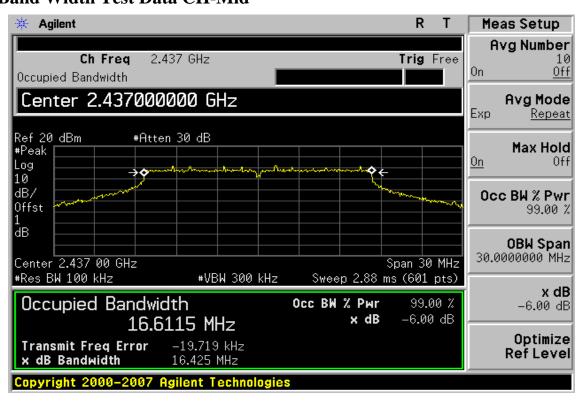
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802.11g

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



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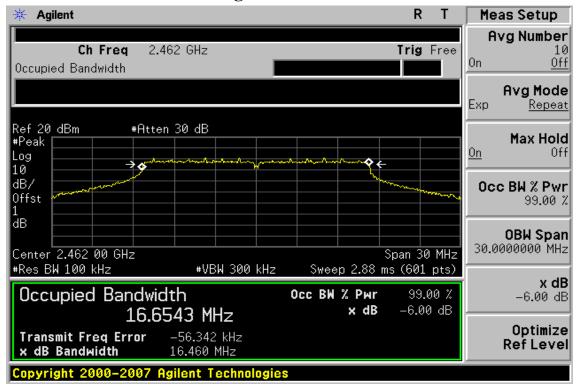
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6dB Band Width Test Data CH-High



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100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

8.1 Standard Applicable:

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

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

8.2 Measurement Equipment Used:

8.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

8.2.2. Radiated emission:

	Conducted Emission Test Site									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.					
TYPE		NUMBER	NUMBER	CAL.						
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010					
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2009	07/03/2010					
Spectrum Analyzer	R&S	FSP 40	100034	02/22/2009	02/21/2010					
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010					
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010					

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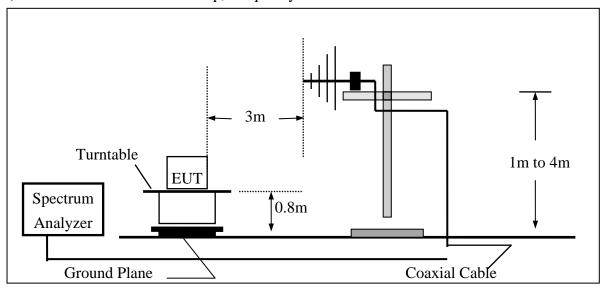
8.3 Test SET-UP:

8.3.1 Conducted Emission at antenna port:

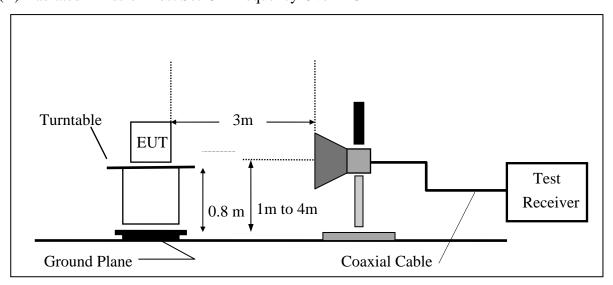
Refer to section 6.3 for details.

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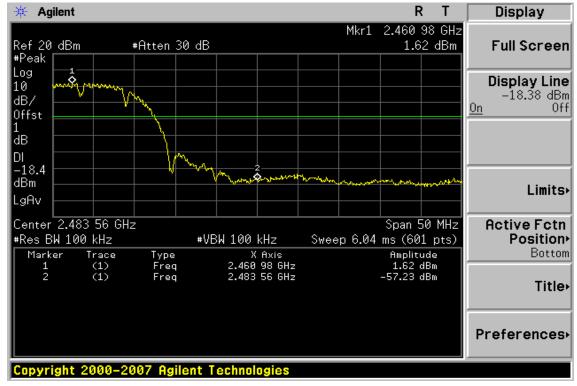
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802.11b **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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Radiated Emission: 802.11 b mode

TX CH Low Test Date Jul. 24, 2009 Operation Mode

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

Humidity 65 %

	Peak	\mathbf{AV}		Actu	ıal FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)) (dBuV/m)	(dBuV/m)	(dBu V/n	1) (dB)	
2390.00	35.74		-1.39	34.35		74.00	54.00	-19.65	Peak
Operation 1	Mode	TX C	H Low			Test	Date	Jul. 24, 20	09
Fundament	tal Frequer	ncy 2412	MHz			Test	By	Jason	
Temperatu	re	25				Pol		Hor.	
Humidity		65 %							

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m	(dB)	
2390.00	37.79		-1.39	36.40		74.00	54.00	-17.60	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_o
- (3) Spectrum Peak Setting: 1GHz-26GHz, RBW=1MHz, VBW=3MHz, Sweep time=200
- (4) Spectrum AV Setting: 1GHz-26GHz, RBW=1MHz, VBW=10Hz, Sweep time=200 ms.

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Radiated Emission: 802.11 b mode

Operation Mode TX CH High Jul. 24, 2009 Test Date

Fundamental Frequency 2462 MHz Test By Jason Pol Ver. Temperature 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)	
2483.56	37.38		-0.92	36.46		74.00	54.00	-17.54	Peak

Operation Mode TX CH High Test Date Jul. 24, 2009

Fundamental Frequency 2462 MHz 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)	
2483.56	40.60		-0.92	39.68		74.00	54.00	-14.32	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_o
- (3) Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200
- (4) Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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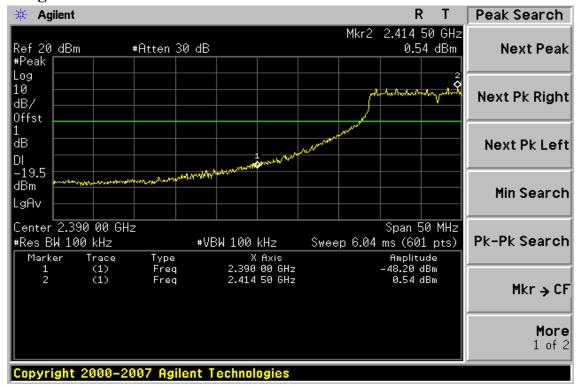
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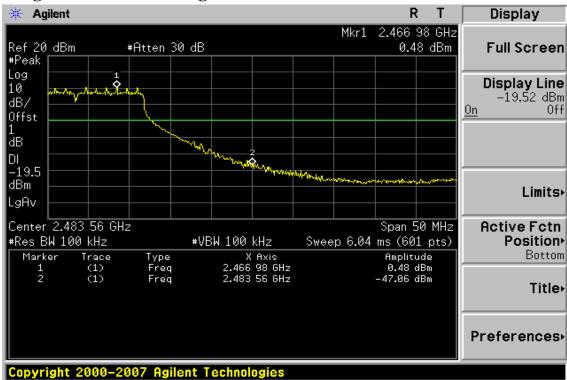
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802.11g **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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Radiated Emission: 802.11 g mode

Operation Mode TX CH Low Test Date Jul. 24, 2009

Fundamental Frequency 2412 MHz Test By Jason **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)	(dBu V/n	a) (dB)	
2390.00	41.20		-1.39	39.81		74.00	54.00	-14.19	Peak
Operation :	Mode	TX C	H Low			Test	t Date	Jul. 24, 20	09
Fundament	tal Frequer	ncy 2412	MHz			Test	t By	Jason	
Temperatu	re	25 ℃				Pol		Hor.	
Humidity		65 %							

		Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Fre	eq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MI	Hz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m	(dB)	
2390	0.00	43.89		-1.39	42.50		74.00	54.00	-11.50	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-26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200
- (4) Spectrum AV Setting: 1GHz-26GHz, RBW=1MHz, VBW=10Hz, Sweep time=200 ms.

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Radiated Emission: 802.11 g mode

Operation Mode TX CH High Jul. 24, 2009 Test Date

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

Humidity 65 %

	Peak	\mathbf{AV}		Actu	ıal FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBu V/n	1) (dB)	
2483.56	42.20		-0.92	41.28		74.00	54.00	-12.72	Peak
Operation 1	Mode	TX C	H High			Test	Date	Jul. 24, 20	09
Fundament	tal Frequer	ncy 2462	MHz			Test	By	Jason	
Temperatu	re	25 ℃				Pol		Hor.	
Humidity		65 %							

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2483.56	46.94		-0.92	46.02		74.00	54.00	-7.98	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_o
- (3) Spectrum Peak Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (4) Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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SPURIOUS RADIATED EMISSION TEST

9.1 Standard Applicable

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

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

9.2 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.

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9.4 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.

9.5 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	

9.6 Measurement Result:

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

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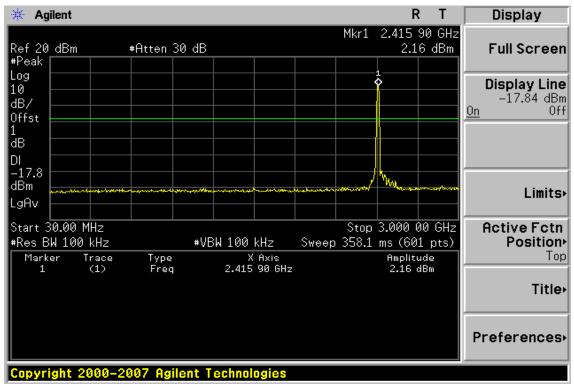
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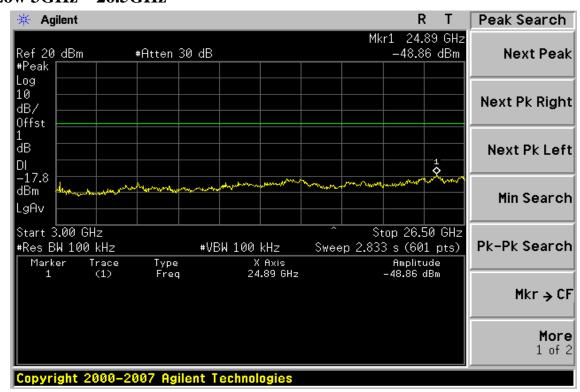
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Conducted Spurious Emission Measurement Result (802.11b) Ch Low 30MHz - 3GHz



Ch Low 3GHz - 26.5GHz



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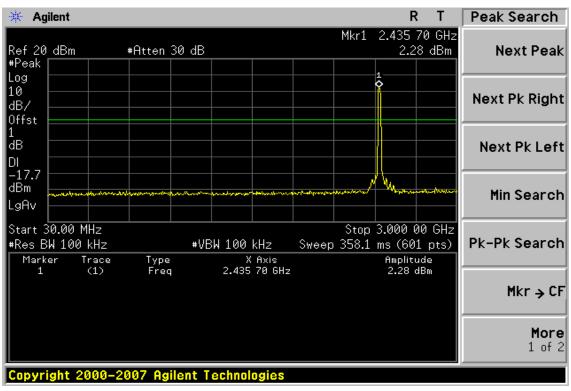
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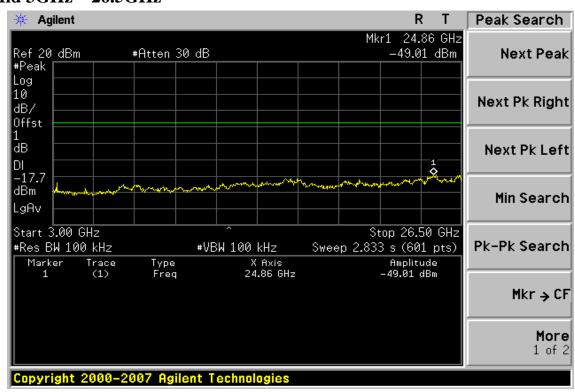
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Ch Mid 30MHz – 3GHz



Ch Mid 3GHz – 26.5GHz



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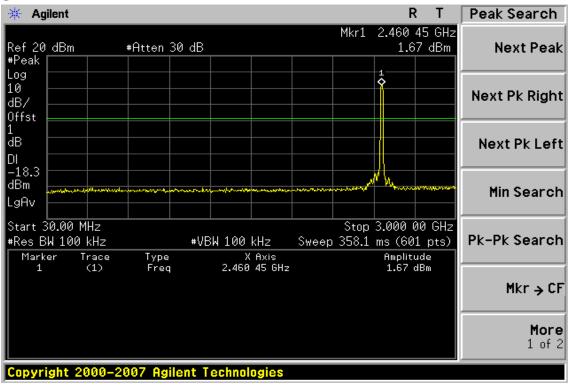
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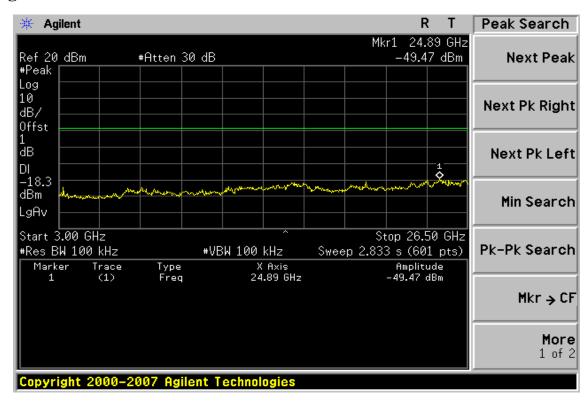
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Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



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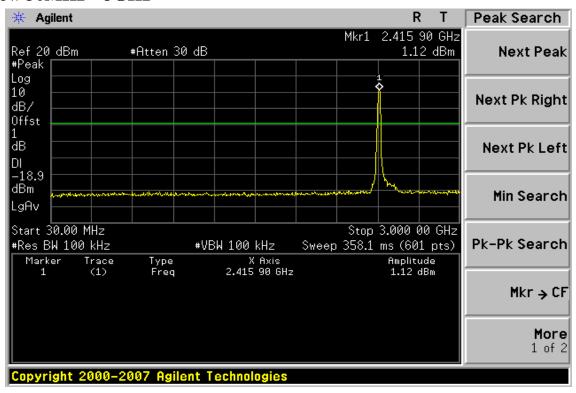
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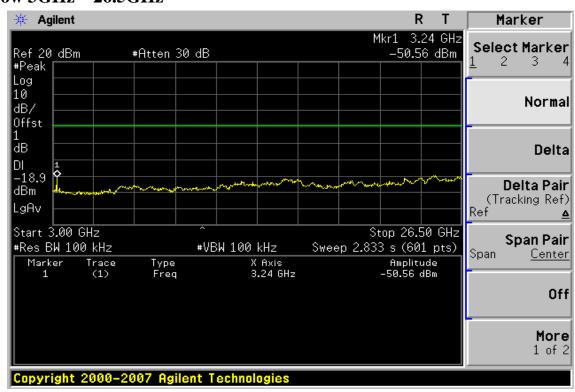
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Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz - 3GHz



Ch Low 3GHz - 26.5GHz



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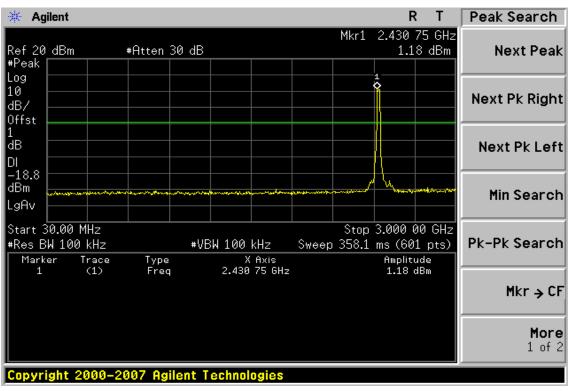
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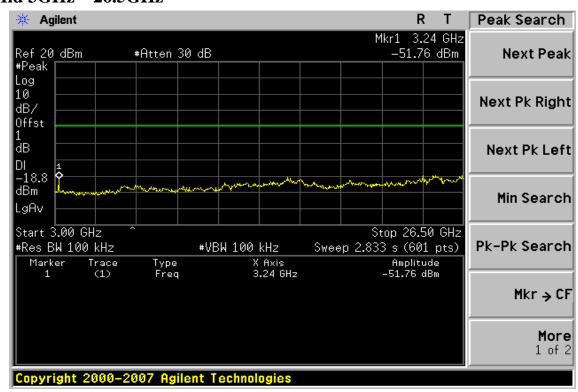
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Ch Mid 30MHz – 3GHz



Ch Mid 3GHz – 26.5GHz



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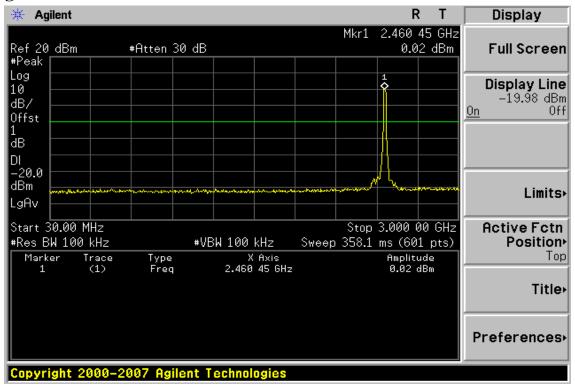
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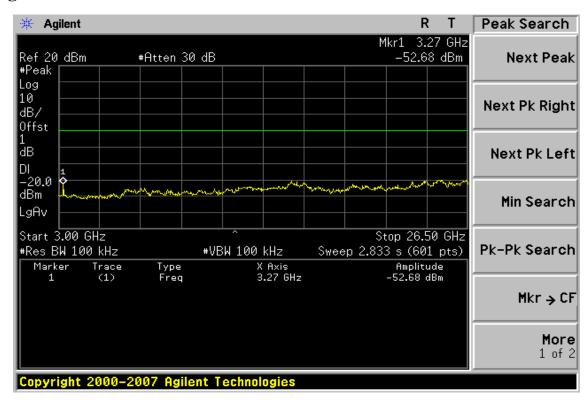
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Ch High 30MHz – 3GHz



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. 24, 2009

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

Humidity 60 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
90.14	V	Peak	48.61	-17.62	30.99	43.50	-12.51
119.24	V	Peak	50.03	-15.32	34.71	43.50	-8.79
177.44	V	Peak	46.67	-14.38	32.29	43.50	-11.21
216.24	V	Peak	49.03	-15.05	33.98	46.00	-12.02
353.98	V	Peak	40.88	-11.67	29.21	46.00	-16.79
565.44	V	Peak	40.81	-7.15	33.66	46.00	-12.34
58.13	Н	Peak	45.95	-14.66	31.29	40.00	-8.71
119.24	Н	Peak	50.40	-15.32	35.08	43.50	-8.42
216.24	Н	Peak	46.91	-15.05	31.86	46.00	-14.14
255.04	Н	Peak	49.23	-13.69	35.54	46.00	-10.46
412.18	Н	Peak	43.10	-9.59	33.51	46.00	-12.49
565.44	Н	Peak	40.28	-7.15	33.13	46.00	-12.87

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. 24, 2009

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

Humidity 60 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
119.24	V	Peak	49.97	-15.32	34.65	43.50	-8.85
177.44	V	Peak	46.29	-14.38	31.91	43.50	-11.59
216.24	V	Peak	46.72	-15.05	31.67	46.00	-14.33
256.98	V	Peak	48.31	-13.67	34.64	46.00	-11.36
293.84	V	Peak	44.11	-13.19	30.92	46.00	-15.08
412.18	V	Peak	42.78	-9.59	33.19	46.00	-12.81
58.13	Н	Peak	47.09	-14.66	32.43	40.00	-7.57
119.24	Н	Peak	50.65	-15.32	35.33	43.50	-8.17
255.04	Н	Peak	47.91	-13.69	34.22	46.00	-11.78
412.18	Н	Peak	42.06	-9.59	32.47	46.00	-13.53
450.98	Н	Peak	40.87	-8.61	32.26	46.00	-13.74
565.44	Н	Peak	38.42	-7.15	31.27	46.00	-14.73

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. 24, 2009

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

Humidity 60 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
30.00	V	Peak	49.09	-14.97	34.12	40.00	-5.88
119.24	V	Peak	49.97	-15.32	34.65	43.50	-8.85
177.44	V	Peak	49.43	-14.38	35.05	43.50	-8.45
216.24	V	Peak	47.93	-15.05	32.88	46.00	-13.12
255.04	V	Peak	47.01	-13.69	33.32	46.00	-12.68
412.18	V	Peak	41.61	-9.59	32.02	46.00	-13.98
58.13	Н	Peak	45.53	-14.66	30.87	40.00	-9.13
119.24	Н	Peak	49.90	-15.32	34.58	43.50	-8.92
216.24	Н	Peak	46.73	-15.05	31.68	46.00	-14.32
255.04	Н	Peak	48.60	-13.69	34.91	46.00	-11.09
412.18	Н	Peak	43.60	-9.59	34.01	46.00	-11.99
450.98	H	Peak	40.67	-8.61	32.06	46.00	-13.94

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. 24, 2009

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

Humidity 60 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
119.24	V	Peak	52.01	-15.32	36.69	43.50	-6.81
216.24	V	Peak	45.90	-15.05	30.85	46.00	-15.15
255.04	V	Peak	46.11	-13.69	32.42	46.00	-13.58
353.98	V	Peak	41.80	-11.67	30.13	46.00	-15.87
449.04	V	Peak	39.04	-8.61	30.43	46.00	-15.57
664.38	V	Peak	34.68	-5.01	29.67	46.00	-16.33
38.73	Н	Peak	45.04	-13.84	31.20	40.00	-8.80
119.24	Н	Peak	53.63	-15.32	38.31	43.50	-5.19
216.24	Н	Peak	47.80	-15.05	32.75	46.00	-13.25
255.04	Н	Peak	48.32	-13.69	34.63	46.00	-11.37
383.08	Н	Peak	45.12	-10.57	34.55	46.00	-11.45
444.19	Н	Peak	43.81	-8.70	35.11	46.00	-10.89

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)

802.11g TX CH Mid Operation Mode Test Date Jul. 24, 2009

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

Humidity 60 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
119.24	V	Peak	51.55	-15.32	36.23	43.50	-7.27
177.44	V	Peak	45.45	-14.38	31.07	43.50	-12.43
216.24	V	Peak	47.17	-15.05	32.12	46.00	-13.88
255.04	V	Peak	46.24	-13.69	32.55	46.00	-13.45
383.08	V	Peak	40.63	-10.57	30.06	46.00	-15.94
601.33	V	Peak	36.25	5.98	42.23	46.00	-3.77
58.13	Н	Peak	46.41	-14.66	31.75	40.00	-8.25
119.24	Н	Peak	53.64	-15.32	38.32	43.50	-5.18
216.24	Н	Peak	47.50	-15.05	32.45	46.00	-13.55
255.04	Н	Peak	49.30	-13.69	35.61	46.00	-10.39
373.38	Н	Peak	42.47	-10.95	31.52	46.00	-14.48
444.19	Н	Peak	43.53	-8.70	34.83	46.00	-11.17

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. 24, 2009

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

Humidity 60 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
119.24	V	Peak	52.83	-15.32	37.51	43.50	-5.99
177.44	V	Peak	45.46	-14.38	31.08	43.50	-12.42
255.04	V	Peak	46.92	-13.69	33.23	46.00	-12.77
444.19	V	Peak	39.58	-8.70	30.88	46.00	-15.12
601.33	V	Peak	37.09	-5.98	31.11	46.00	-14.89
664.38	V	Peak	35.46	-5.01	30.45	46.00	-15.55
38.73	Н	Peak	45.61	-13.84	31.77	40.00	-8.23
119.24	Н	Peak	53.40	-15.32	38.08	43.50	-5.42
255.04	Н	Peak	50.07	-13.69	36.38	46.00	-9.62
444.19	Н	Peak	44.48	-8.70	35.78	46.00	-10.22
601.33	Н	Peak	37.67	-5.98	31.69	46.00	-14.31
664.38	Н	Peak	36.78	-5.01	31.77	46.00	-14.23

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. 24, 2009

Fundamental Frequency 2412MHz Test By Jason Pol Ver. Temperature 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3073.5	37.00		0.65	37.65		74.00	54.00	-16.35	Peak
4815.5	40.28		6.02	46.30		74.00	54.00	-7.70	Peak
4824.0						74.00	54.00		
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental
- (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
- 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. 24, 2009

Fundamental Frequency 2412MHz Test By Jason Pol Temperature Hor 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2963.0	37.03		0.29	37.32		74.00	54.00	-16.68	Peak
3366.0	36.15		1.64	37.79		74.00	54.00	-16.21	Peak
4824.0	37.07		6.02	43.09		74.00	54.00	-10.91	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental
- (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
- 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. 24, 2009

Fundamental Frequency 2437MHz Test By Jason Pol Ver Temperature 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3125.5	36.93		0.81	37.74		74.00	54.00	-16.26	Peak
4555.5	35.91		5.44	41.35		74.00	54.00	-12.65	Peak
4874.0	33.87		6.17	40.04		74.00	54.00	-13.96	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 scanned from 1GHz to the 10th harmonic of highest fundamental
- (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
- 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. 24, 2009

Fundamental Frequency 2437MHz Test By Jason Pol Temperature Hor 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3528.5	35.93		2.16	38.09		74.00	54.00	-15.91	Peak
4874.0	33.97		6.17	40.14		74.00	54.00	-13.86	Peak
5855.5	35.17		8.42	43.59		74.00	54.00	-10.41	Peak
6570.5	35.86		10.12	45.98		74.00	54.00	-8.02	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 scanned from 1GHz to the 10th harmonic of highest fundamental frequency
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column
- (4) Spectrum Peak Setting: 1GHz- 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 High Test Date Jul. 24, 2009

Fundamental Frequency 2462MHz Test By Jason Pol Ver Temperature 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1448.5	38.39		-6.14	32.25		74.00	54.00	-21.75	Peak
4924.0	36.16		6.28	42.44		74.00	54.00	-11.56	Peak
5836.0	34.94		8.33	43.27		74.00	54.00	-10.73	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental
- (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
- 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. 24, 2009

Fundamental Frequency 2462MHz Test By Jason Pol Temperature Hor 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2280.5	36.56		-2.00	34.56		74.00	54.00	-19.44	Peak
3775.5	36.00		2.94	38.94		74.00	54.00	-15.06	Peak
4924.0	33.91		6.28	40.19		74.00	54.00	-13.81	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental
- (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
- 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. 24, 2009

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

Humidity 60 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2651.0	37.14		-0.45	36.69		74.00	54.00	-17.31	Peak
3723.5	36.77		2.78	39.55		74.00	54.00	-14.45	Peak
4824.0	34.08		6.05	40.13		74.00	54.00	-13.87	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

Remark:

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

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

Operation Mode 802.11g TX CH Low Test Date Jul. 24, 2009

Fundamental Frequency 2412MHz Test By Jason Pol Temperature Hor 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3223.0	37.44		1.15	38.59		74.00	54.00	-15.41	Peak
4373.5	35.79		4.88	40.67		74.00	54.00	-13.33	Peak
4824.0	33.72		6.05	39.77		74.00	54.00	-14.23	Peak
5303.0	34.97		7.07	42.04		74.00	54.00	-11.96	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		
14472.0						74.00	54.00		
16884.0						74.00	54.00		
19296.0						74.00	54.00		
21708.0						74.00	54.00		
24120.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (4) Spectrum Peak Setting: 1GHz- 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. 24, 2009

Fundamental Frequency 2437MHz Test By Jason Pol Ver Temperature 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3203.5	36.88		1.07	37.95		74.00	54.00	-16.05	Peak
4295.5	35.42		4.65	40.07		74.00	54.00	-13.93	Peak
4874.0	34.29		6.15	40.44		74.00	54.00	-13.56	Peak
6115.5	34.84		9.03	43.87		74.00	54.00	-10.13	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency.
- (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. 24, 2009

Fundamental Frequency 2437MHz Test By Jason Pol Temperature Hor 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1448.5	37.60		-6.14	31.46		74.00	54.00	-22.54	Peak
4620.5	35.40		-5.59	29.81		74.00	54.00	-24.19	Peak
4874.0	33.18		6.17	39.35		74.00	54.00	-14.65	Peak
5576.0	35.29		7.63	42.92		74.00	54.00	-11.08	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency.
- (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. 24, 2009

Fundamental Frequency 2462MHz Test By Jason Pol Ver Temperature 23

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1338.0	39.25		-6.62	32.63		74.00	54.00	-21.37	Peak
3106.0	36.47		0.77	37.24		74.00	54.00	-16.76	Peak
4924.0	34.06		6.28	40.34		74.00	54.00	-13.66	Peak
6031.0	34.99		8.90	43.89		74.00	54.00	-10.11	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency.
- (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. 24, 2009

Fundamental Frequency 2462MHz Test By Jason 23 °C Pol Temperature Hor

Humidity 54 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3353.0	36.63		1.59	38.22		74.00	54.00	-15.78	Peak
3821.0	35.16		3.08	38.24		74.00	54.00	-15.76	Peak
4924.0	33.81		6.28	40.09		74.00	54.00	-13.91	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

Remark:

- (1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency.
- (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
- Spectrum AV Setting: 1GHz-26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode 802.11b RX CH Low **Test Date** Jul. 24, 2009

Fundamental Frequency 2412MHz Test By Jason Pol Ver./Hor Temperature 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)
72.68	V	Peak	47.82	-16.62	31.20	40.00	-8.80
119.24	V	Peak	49.98	-15.32	34.66	43.50	-8.84
177.44	V	Peak	47.34	-14.38	32.96	43.50	-10.54
216.24	V	Peak	46.86	-15.05	31.81	46.00	-14.19
255.04	V	Peak	45.17	-13.69	31.48	46.00	-14.52
383.08	V	Peak	42.28	-10.57	31.71	46.00	-14.29
58.13	Н	Peak	46.28	-14.66	31.62	40.00	-8.38
119.24	Н	Peak	50.17	-15.32	34.85	43.50	-8.65
177.44	Н	Peak	44.15	-14.38	29.77	43.50	-13.73
216.24	Н	Peak	45.68	-15.05	30.63	46.00	-15.37
255.04	Н	Peak	48.61	-13.68	34.93	46.00	-11.07
450.98	Н	Peak	41.78	-8.61	33.17	46.00	-12.83

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)

Operation Mode 802.11b RX CH Mid **Test Date** Jul. 24, 2009

Fundamental Frequency 2437MHz Test By Jason Pol Ver./Hor **Temperature** 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)
72.68	V	Peak	46.81	-16.62	30.19	40.00	-9.81
119.24	V	Peak	49.67	-15.32	34.35	43.50	-9.15
177.44	V	Peak	46.64	-14.38	32.26	43.50	-11.24
216.24	V	Peak	46.56	-15.05	31.51	46.00	-14.49
255.04	V	Peak	44.86	-13.69	31.17	46.00	-14.83
412.18	V	Peak	44.20	-9.59	34.61	46.00	-11.39
58.13	Н	Peak	46.42	-14.66	31.76	40.00	-8.24
119.24	Н	Peak	49.44	-15.32	34.12	43.50	-9.38
177.44	Н	Peak	44.69	-14.38	30.31	43.50	-13.19
255.04	Н	Peak	49.26	-13.69	35.57	46.00	-10.43
412.18	Н	Peak	45.87	-9.59	36.28	46.00	-9.72
664.38	H	Peak	37.50	-5.01	32.49	46.00	-13.51

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)

Operation Mode 802.11b RX CH High **Test Date** Jul. 24, 2009

Fundamental Frequency 2462MHz Test By Jason Pol Ver./Hor **Temperature** 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)
72.68	V	Peak	46.83	-16.62	30.21	40.00	-9.79
119.24	V	Peak	49.88	-15.32	34.56	43.50	-8.94
177.44	V	Peak	45.50	-14.38	31.12	43.50	-12.38
255.04	V	Peak	45.91	-13.69	32.22	46.00	-13.78
383.08	V	Peak	40.20	-10.57	29.63	46.00	-16.37
565.44	V	Peak	36.59	-7.15	29.44	46.00	-16.56
58.13	Н	Peak	47.47	-14.66	32.81	40.00	-7.19
119.24	Н	Peak	50.52	-15.32	35.20	43.50	-8.30
216.24	Н	Peak	45.51	-15.05	30.46	46.00	-15.54
255.04	Н	Peak	49.09	-13.69	35.40	46.00	-10.60
412.18	Н	Peak	42.60	-9.59	33.01	46.00	-12.99
565.44	H	Peak	36.73	-7.15	29.58	46.00	-16.42

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)

Operation Mode 802.11g RX CH Low **Test Date** Jul. 24, 2009

Fundamental Frequency 2412MHz Test By Jason Pol Ver./Hor **Temperature** 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)
72.68	V	Peak	47.82	-16.62	31.20	40.00	-8.80
119.24	V	Peak	49.98	-15.32	34.66	43.50	-8.84
177.44	V	Peak	47.34	-14.38	32.96	43.50	-10.54
216.24	V	Peak	46.86	-15.05	31.81	46.00	-14.19
255.04	V	Peak	45.17	-13.69	31.48	46.00	-14.52
383.08	V	Peak	42.28	-10.57	31.71	46.00	-14.29
58.13	Н	Peak	46.28	-14.66	31.62	40.00	-8.38
119.24	Н	Peak	50.17	-15.32	34.85	43.50	-8.65
177.44	Н	Peak	44.50	-14.38	30.12	43.50	-13.38
216.24	Н	Peak	45.68	-15.05	30.63	46.00	-15.37
255.04	Н	Peak	48.61	-13.69	34.92	46.00	-11.08
450.98	Н	Peak	41.78	-8.61	33.17	46.00	-12.83

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)

Operation Mode 802.11g RX CH Mid **Test Date** Jul. 24, 2009

Fundamental Frequency 2437MHz Test By Jason Pol Ver./Hor **Temperature** 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)
72.68	V	Peak	46.81	-16.62	30.19	40.00	-9.81
119.24	V	Peak	49.67	-15.32	34.35	43.50	-9.15
177.44	V	Peak	46.64	-14.38	32.26	43.50	-11.24
216.24	V	Peak	46.56	-15.05	31.51	46.00	-14.49
255.04	V	Peak	44.86	-13.69	31.17	46.00	-14.83
412.18	V	Peak	44.20	-9.59	34.61	46.00	-11.39
58.13	Н	Peak	46.42	-14.66	31.76	40.00	-8.24
119.24	Н	Peak	49.44	-15.32	34.12	43.50	-9.38
177.44	Н	Peak	44.69	-14.38	30.31	43.50	-13.19
255.04	Н	Peak	49.26	-13.69	35.57	46.00	-10.43
412.18	Н	Peak	45.87	-9.59	36.28	46.00	-9.72
664.38	H	Peak	37.50	-5.01	32.49	46.00	-13.51

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)

Operation Mode 802.11g RX CH High **Test Date** Jul. 24, 2009

Fundamental Frequency 2462MHz Test By Jason Pol Ver./Hor **Temperature** 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)
72.68	V	Peak	46.83	-16.62	30.21	40.00	-9.79
119.24	V	Peak	49.88	-15.32	34.56	43.50	-8.94
177.44	V	Peak	45.50	-14.38	31.12	43.50	-12.38
255.04	V	Peak	45.91	-13.69	32.22	46.00	-13.78
383.08	V	Peak	40.20	-10.57	29.63	46.00	-16.37
565.44	V	Peak	36.59	-7.15	29.44	46.00	-16.56
58.13	Н	Peak	47.47	-14.66	32.81	40.00	-7.19
119.24	Н	Peak	50.52	-15.32	35.20	43.50	-8.30
216.24	Н	Peak	45.51	-15.05	30.46	46.00	-15.54
255.04	Н	Peak	49.09	-13.69	35.40	46.00	-10.60
412.18	Н	Peak	42.60	-9.59	33.01	46.00	-12.99
565.44	Н	Peak	36.73	-7.15	29.58	46.00	-16.42

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)

Operation Mode 802.11b RX CH Low Test Date Jul. 24, 2009

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

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3073.5	37.00		0.65	37.65		74.00	54.00	-16.35	Peak
4824.0	40.28		6.02	46.30		74.00	54.00	-7.70	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11b RX CH Low Jul. 24, 2009 **Test Date**

Fundamental Frequency 2412 MHz Test By Jason Pol Temperature Hor 25

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2963.0	37.03		0.29	37.32		74.00	54.00	-16.68	Peak
3366.0	36.15		1.64	37.79		74.00	54.00	-16.21	Peak
4824.0	37.07		6.02	43.09		74.00	54.00	-10.91	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11b RX CH Mid **Test Date** Jul. 24, 2009

Fundamental Frequency 2437 MHz Test By Jason Pol Ver Temperature 25

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3125.5	36.93		0.81	37.74		74.00	54.00	-16.26	Peak
4555.5	35.91		5.44	41.35		74.00	54.00	-12.65	Peak
4874.0	33.87		6.17	40.04		74.00	54.00	-13.96	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11b RX CH Mid Jul. 24, 2009 **Test Date**

Fundamental Frequency 2437 MHz Test By Jason Pol Temperature Hor 25

Humidity 65%

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3528.5	35.93		2.16	38.09		74.00	54.00	-15.91	Peak
4874.0	33.97		6.17	40.14		74.00	54.00	-13.86	Peak
5855.5	33.15		8.42	41.57		74.00	54.00	-12.43	Peak
6570.5	35.86		10.12	45.98		74.00	54.00	-8.02	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						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_o
- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW= 3MHz, VBW= 1MHz, Sweep time= 200
- (5) Spectrum AV Setting: 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11b RX CH High **Test Date** Jul. 24, 2009

Fundamental Frequency 2462 MHz Test By Jason Pol Ver Temperature 25

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1448.5	44.81		-6.14	38.67		74.00	54.00	-15.33	Peak
4926.0	36.16		6.28	42.44		74.00	54.00	-11.56	Peak
5836.0	34.94		8.33	43.27		74.00	54.00	-10.73	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11b RX CH High Jul. 24, 2009 **Test Date**

Fundamental Frequency 2462 MHz Test By Jason Pol Temperature Hor 25

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2280.5	36.56		-2.00	34.56		74.00	54.00	-19.44	Peak
3775.5	36.00		2.94	38.94		74.00	54.00	-15.06	Peak
4924.0	33.91		6.28	40.19		74.00	54.00	-13.81	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11g RX CH Low **Test Date** Jul. 24, 2009

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

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2813.5	36.58		-0.05	36.53		74.00	54.00	-17.47	Peak
4068.0	35.32		3.89	39.21		74.00	54.00	-14.79	Peak
4824.0						74.00	54.00		
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		

Remark:

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

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Report No.: EH/2009/30031 **Issue Date: Jul. 28, 2009**

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11g RX CH Low Jul. 24, 2009 **Test Date**

Fundamental Frequency 2412 MHz Test By Jason Pol Temperature Hor 25

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
3528.5	35.97		2.16	38.13		74.00	54.00	-15.87	Peak
4824.0						74.00	54.00		
5465.5	34.80		7.43	42.23		74.00	54.00	-11.77	Peak
7236.0						74.00	54.00		
9648.0						74.00	54.00		
12060.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11g RX CH Mid **Test Date** Jul. 24, 2009

Fundamental Frequency 2437 MHz Test By Jason Pol Ver Temperature 25

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2410.5	36.40		-1.30	35.10		74.00	54.00	-18.90	Peak
4081.0	35.25		3.94	39.19		74.00	54.00	-14.81	Peak
4874.0						74.00	54.00		
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11g RX CH Mid Jul. 24, 2009 **Test Date**

Fundamental Frequency 2437 MHz Test By Jason Pol Temperature Hor 25

Humidity 65%

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2215.5	36.23		-2.26	33.97		74.00	54.00	-20.03	Peak
4763.5	34.18		5.90	40.08		74.00	54.00	-13.92	Peak
4874.0						74.00	54.00		
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11g RX CH High **Test Date** Jul. 24, 2009

Fundamental Frequency 2462 MHz Test By Jason Pol Ver Temperature 25

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2703.0	36.90		-0.33	36.57		74.00	54.00	-17.43	Peak
4924.0						74.00	54.00		
5023.5	34.96		6.50	41.46		74.00	54.00	-12.54	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		

Remark:

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

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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode 802.11g RX CH High Jul. 24, 2009 **Test Date**

Fundamental Frequency 2462 MHz Test By Jason Pol Temperature Hor 25

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1728.0	37.60		-4.79	32.81		74.00	54.00	-21.19	Peak
3093.0	36.34		0.72	37.06		74.00	54.00	-16.94	Peak
4924.0						74.00	54.00		
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		

Remark:

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency_o
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
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- (4) Spectrum Peak Setting: 1GHz-40GHz, RBW= 3MHz, VBW= 1MHz, Sweep time= 200
- (5) Spectrum AV Setting: 1GHz-40GHz, 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.

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

10.2 Measurement 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.

Measurement Result: 10.5

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802.11b

CH	RF Power Density	Cable loss	RF Power Density	Maximum Limit
	Reading (dBm)	(dB)	Level (dBm)	(dBm)
Low	-11.62	0.00	-11.62	8
Mid	-11.01	0.00	-11.01	8
High	-10.45	0.00	-10.45	8

802.11g

CH	RF Power Density	Cable loss	RF Power Density	Maximum Limit
	Reading (dBm)	(dB)	Level (dBm)	(dBm)
Low	-13.61	0.00	-13.61	8
Mid	-13.19	0.00	-13.19	8
High	-12.91	0.00	-12.91	8

Note: offset 1dB

Note: Refer to next page for plots.

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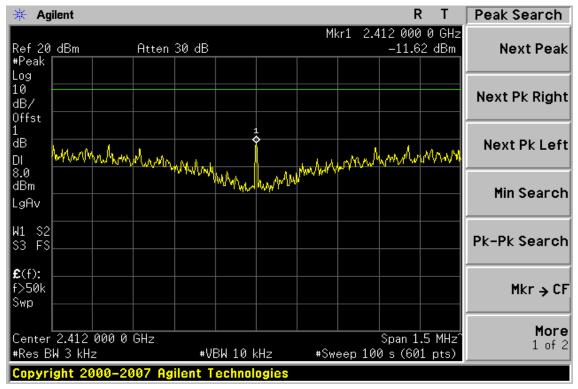
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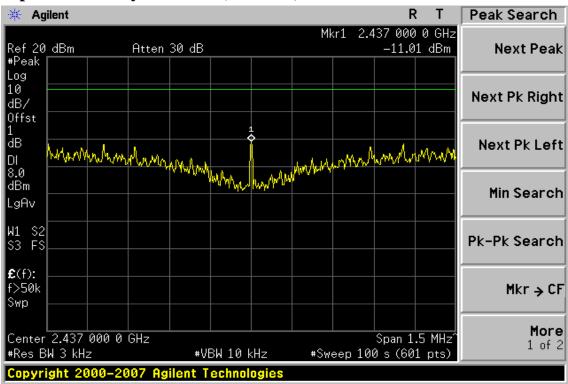
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802.11b **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)



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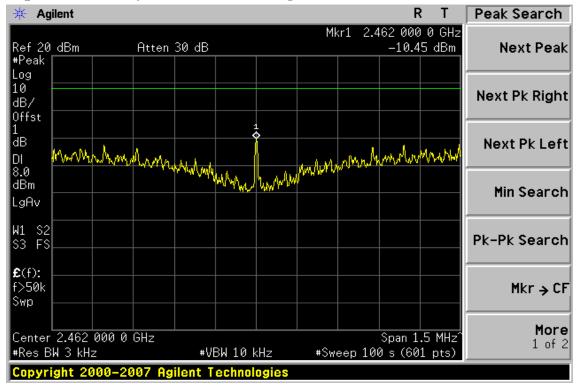
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Power Spectral Density Test Plot (CH-High)



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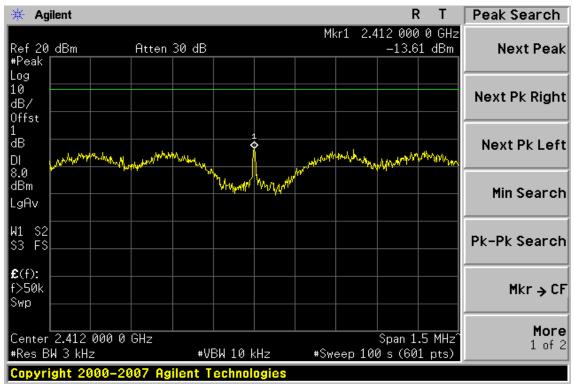
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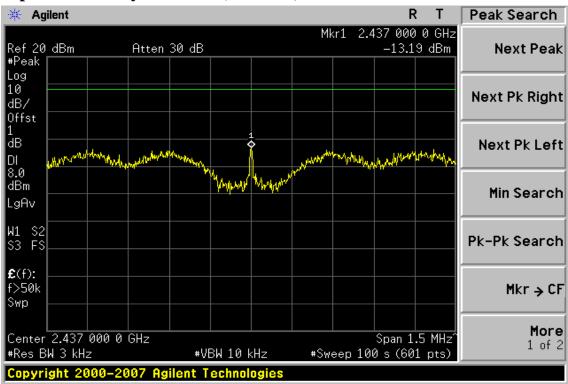
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802.11g **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)



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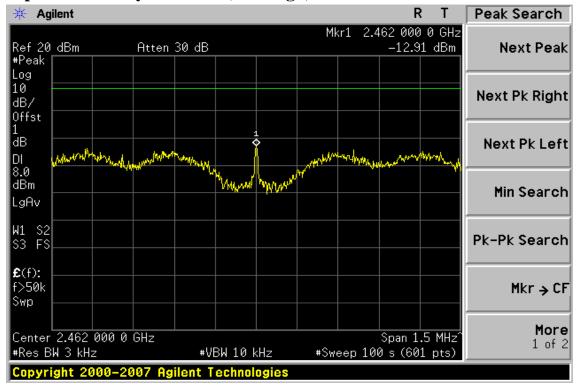
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Power Spectral Density Test Plot (CH-High)



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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

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

proper antenna is employed so that the limits in this Part are not exceeded.

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

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using

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the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

11.2. Antenna Connected Construction:

The directional gains of antenna used for transmitting is -3.6 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

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12 99% Bandwidth Measurement

12.1. Standard Applicable:

RSS-Gen §4.4.1, the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

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

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

12.2. Measurement Equipment Used:

Refer to section 6.2 for details.

12.3. Test Set-up:

Refer to section 6.3 for details.

12.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW=1% of the approximate emission bandwidth, VBW = 3 times RBW, Span= approximately 20dB below the peak level. Sweep=auto
- 4. Turn on the 99% bandwidth function, max reading...
- 5. Repeat above procedures until all frequency measured were complete.

12.5. Measurement Result:

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802.11b

Frequency	Bandwidth
MHz	(MHz)
2412	15.64
2437	15.69
2462	15.69

802.11g

Frequency	Bandwidth
MHz	(MHz)
2412	16.60
2437	16.60
2462	16.65

Note: Refer to next page for plots.

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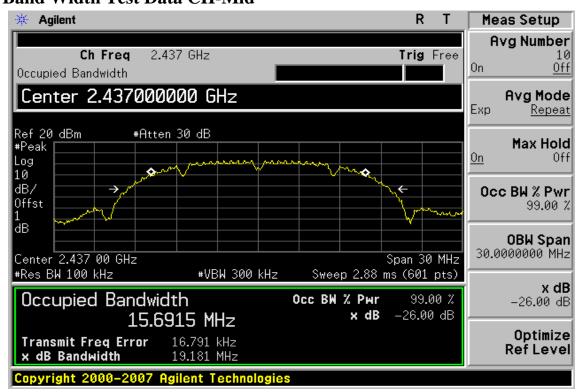
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802.11b

99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



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99% Band Width Test Data CH-High



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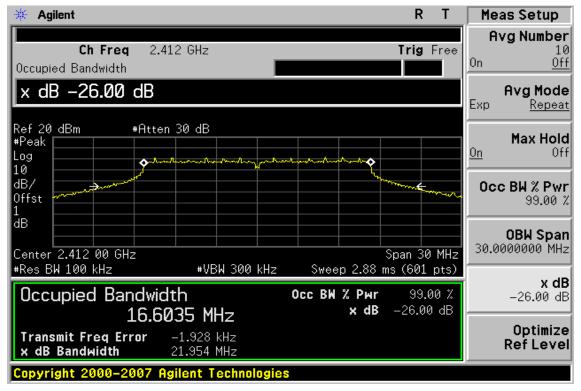


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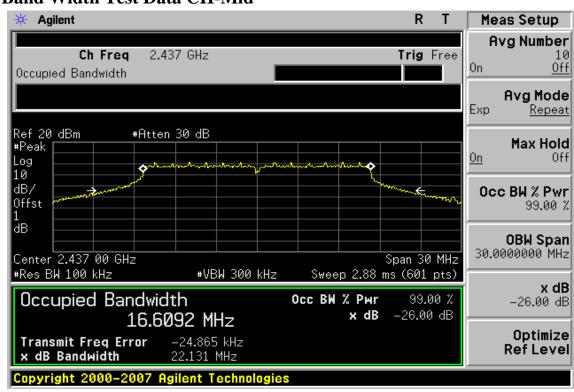
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802.11g

99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



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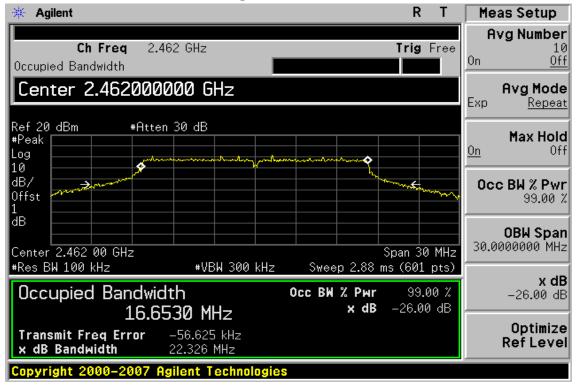
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99% Band Width Test Data CH-High



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