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# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

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

<b>.</b>	OF				
Product Name:	Notebook				
Brand Name:	lenovo				
Model Name of Host	IdeaPad S10-3t				
Model No. of WLAN	AR5B95				
Modular:	AK3D75				
<b>Model Different:</b>	N/A				
FCC ID:	HFS-AR5B95				
IC:	1787B-AR5B95				
Report No.:	ER/2009/A0008				
Issue Date:	Nov. 19, 2009				
FCC Rule Part:	§15.247 / DSS				
IC Rule Part:	RSS-210 issue 7:2007, Annex 8				
Prepared for:	Quanta Computer INC.				
	No.188,Wen Hua 2nd Road,Kuei Shan				
	Hsiang,Tao Yuan Hsien,Taiwan				
Prepared by:	SGS Taiwan Ltd.				
	Electronics & Communication Laboratory				
	No. 134, Wu Kung Rd., Wuku Industrial Zone,				
	Taipei County, Taiwan.				



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Report No.: ER/2009/A0008 Issue Date: Nov. 19, 2009 Page: 2 of 79

# **VERIFICATION OF COMPLIANCE**

Applicant:	Quanta Computer INC. No.188,Wen Hua 2nd Road,Kuei Shan Hsiang,Tao Yuan Hsien,Taiwan
Product Name:	Notebook
Brand Name:	lenovo
FCC ID:	HFS-AR5B95
IC:	1787B-AR5B95
Model Name of Host:	IdeaPad S10-3t
Model No. of WLAN Modular:	AR5B95
Model Difference:	N/A
File Number:	ER/2009/A0008
Date of test:	Oct. 23, 2009 ~ Nov. 13, 2009
Date of EUT Received:	Oct. 23, 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 When	Date:	Nov.19, 2009
Prepared By:	Jason Wu/Asst. Supervisor Mark Churg	Date:	Nov. 19, 2009
Approved By:	Mark Chung /Project Engineer	Date:	Nov. 19, 2009

Vincent Su / Manager

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# Version

Version No.	Date	Description
00	Nov. 19, 2009	Initial creation of document

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#### **GENERAL INFORMATION** 1

#### **Product Description** 1.1

Notebook General Information:

Notebook Applicant	Quanta Computer INC. No.188,Wen Hua 2nd Road,Kuei Shan Hsiang,Tao Yuan Hsien,Taiwan		
Product name:	Notebook		
Brand Name:	lenovo		
Model Name:	IdeaPad S1	0-3t	
Model Difference:	N/A		
Display size:	10"		
Collocated Transmitters:	WWAN, WLAN		
WWAN FCC ID:	VV7-MBMF3607GW1		
WWAN IC ID:	287AG-MBMF3607GW1		
WLAN FCC ID:	HFS-AR5B95		
WLAN IC ID:	1787B-AR5B95		
Hardware Version	SIT		
Software Version	SIT		
	7.4 Vdc Li-lio battery or 20Vdc from AC/DC power adapter		
Power Supply:	Battery: Model: 2UF103450-2-T0520, Supplier: Sanyo		
	Adapter: Model: ADP-40NH B, Supplier: lenovo		

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

Modular report:	Compliance Certification Services Inc. Report No: 81029005
Brand Name:	Quanta Computer Inc
Model Name:	AR5B95
WLAN module FCC ID:	HFS-AR5B95
WLAN module IC ID:	1787B-AR5B95
Frequency Range & Channel number:	802.11 b/g: 2412 – 2462 MHz, 11 channels 802.11 n_20MHz: 2412 – 2462 MHz, 11 channels 802.11 n_40MHz: 2422 – 2452 MHz, 9 channels
Rated Power:	802.11 b: 21.13 dBm 802.11 g: 25.21 dBm 802.11 n_20MHz: 25.28 dBm 802.11 n_40MHz: 21.95 dBm
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transmission Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 - 130Mbps 802.11 n_40MHz: 13.5 - 270Mbps
Antenna Designation:	Main: PIFA Antenna / Gain: 1.40dBi Aux: PIFA Antenna / -0.4dBi
Type of Emission	15M9G7D(802.11b); 17M3G7D(802.11g) 18M3G7D(802.11n_20M); 36M5G7D(802.11n_40M)
Class II Permissive change:	Adding an IdeaPad S10-3t series laptop.

This test report applies for 802.11b/g/n WLAN.

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

This submittal(s) (test report) is intended for FCC ID: HFS-AR5B95 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules and IC: 1787B-AR5B95 filing to comply with Industry Canada RSS-210 issue 7: 2007 Annex 8.

#### 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

#### 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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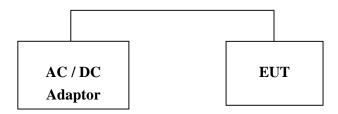
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#### 2.4 **Configuration of Tested System**

### Fig. 2-1 AC Power line Emission Configuration



# Fig. 2-2 Radiated Emission Configuration



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

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Avt Software	Atheros	Build #7 ART_11n	Revision 0.9	N/A	N/A

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# **3 SUMMARY OF TEST RESULTS**

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

# **4 DESCRIPTION OF TEST MODES**

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

802.11 b mode: Channel low (2412MHz)  $\cdot$  mid (2437MHz) and high (2462MHz) with 1Mbps data rate are chosen for above testing.

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

802.11 n mode(20M): Channel low (2412MHz)  $\cdot$  mid (2437MHz) and high (2462MHz) with 6.5 Mbps data rate are chosen for above testing.

802.11 n mode(40M): Channel low (2422MHz)  $\cdot$  mid (2437MHz) and high (2452MHz) with13.5 Mbps data rate are chosen for above testing.

The power of channel at each available mode is tuned to corresponding parameter under engineering mode of Avt Software in order for its band edge to comply with FCC regulation. The setting to tune up the power at each respective channel is set as follows:

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802.11 b mode: Channel low - 15.5 \ mid -16 and high -16 802.11 g mode: Channel low -13 x mid -13 and high -14 802.11 n mode(20M): Channel low -11 \ mid -11 and high -11.5 802.11 n mode(40M): Channel low - 9 \cdot mid -9 and high -9.5

Note: Upon the date the applicant's product is market, the power setting to control the power emission will be set in the above setting list, and will no longer be changed at User's discretion.

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# **5** 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 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.

	AC Power Line Conducted Emission Test Site										
EQUIPMENT	MFR	MFR MODEL		LAST	CAL DUE.						
ТҮРЕ		NUMBER	NUMBER	CAL.							
EMI Test Receiver	R&S	ESCS30	828985/004	09/15/2008	09/14/2009						
LISN	Rolf-Heine	NNB-2/16Z	99012	02/18/2008	02/17/2009						
LISN	FCC	FCC-LISN-50/250-2 5-2-01	04034	02/18/2008	02/17/2009						
Coaxial Cables	N/A	WK CE Cable	N/A	10/30/2007	10/29/2008						

### 5.2. Measurement Equipment Used:

# 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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#### 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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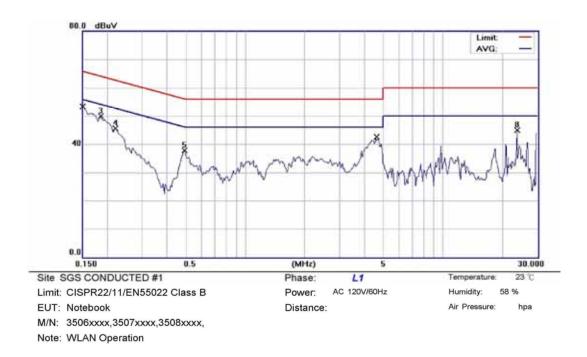
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Operation Mode:	Normal Operatio	n		Test Date:	Nov. 13, 2009					
Temperature:	23	Humidity:	58%	Test By:	Jason					

### AC POWER LINE CONDUCTED EMISSION TEST DATA



No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1505	48.45	0.17	48.62	65.97	-17.35	QP	
2		0.1505	32.34	0.17	32.51	55.97	-23.46	AVG	
3	*	0.1850	49.75	0.14	49.89	64.26	-14.37	peak	
4		0.2200	45.44	0.12	45.56	62.82	-17.26	peak	
5		0.4900	37.61	0.07	37.68	56.17	-18.49	peak	
6		4.6090	36.19	0.16	36.35	56.00	-19.65	QP	
7		4.6090	26.75	0.16	26.91	46.00	-19.09	AVG	
8		23.8600	44.53	0.29	44.82	60.00	-15.18	peak	

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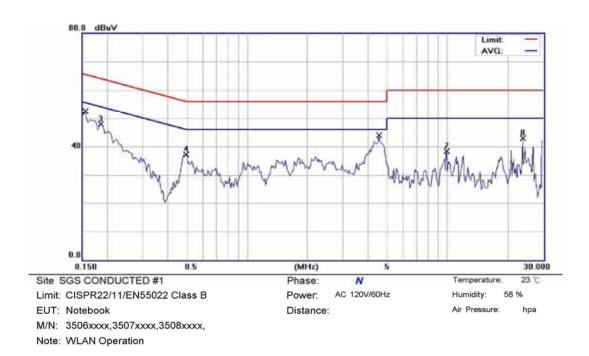
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Operation Mode:	Normal Operation			Test Date:	Nov. 13, 2009
Temperature:	23	Humidity:	58%	Test By:	Jason



No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1547	47.07	0.19	47.26	65.74	-18.48	QP	
2		0.1547	31.09	0.19	31.28	55.74	-24.46	AVG	
3	*	0.1850	47.67	0.16	47.83	64.26	-16.43	peak	
4		0.4950	36.92	0.10	37.02	56.08	-19.06	peak	
5		4.5495	36.33	0.18	36.51	56.00	-19.49	QP	
6		4.5495	27.37	0.18	27.55	46.00	-18.45	AVG	
7		9.9000	37.83	0.44	38.27	60.00	-21.73	peak	
8		23.8600	42.67	0.29	42.96	60.00	-17.04	peak	

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## 6 PEAK OUTPUT POWER MEASUREMENT

#### 6.1 Standard Applicable:

According to §15.247(a)(2), (b)

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

5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode. (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

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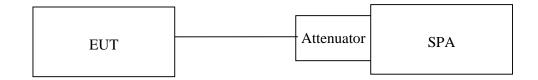
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According to RSS-210 issue 7,§A8.4(2), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, the maximum conducted output power shall not exceed 1 W. For all other frequency hopping systems, the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

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					

# 6.2 Measurement Equipment Used:

### 6.3 .Test Set-up:



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#### **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 =1, VBW = 3MHz, Bandwidth=26dB **Emission Bandwidth**)
- 3. Peak power is then measured using internal channel power integration function of SPA.
- 4. Power is integrated over a bandwidth greater than or equal to 26dBc bandwidth
- 5. Record the max. reading.
- 6. Repeat above procedures until all frequency measured was completed.

Note: occupied bandwidth can be referenced to modular report: 81029005

#### 6.5 Measurement Result:

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	17.52	0.00	17.52	0.05649	1
2437.00	17.68	0.00	17.68	0.05861	1
2462.00	17.52	0.00	17.52	0.05649	1

#### 802.11g

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	15.59	0.00	15.59	0.03622	1
2437.00	15.87	0.00	15.87	0.03864	1
2462.00	15.98	0.00	15.98	0.03963	1

Cable loss = 0\*Note: Offset 0.5dB

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#### 802.11n\_20M

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	13.63	0.00	13.63	0.02307	1
2437.00	13.89	0.00	13.89	0.02449	1
2462.00	13.96	0.00	13.96	0.02489	1

802.11\_40M

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2422.00	11.92	0.00	11.92	0.01556	1
2437.00	11.84	0.00	11.84	0.01528	1
2452.00	11.96	0.00	11.96	0.01570	1

Cable loss = 0 \*Note: Offset 0.5dB

Note: Refer to next page for plots.

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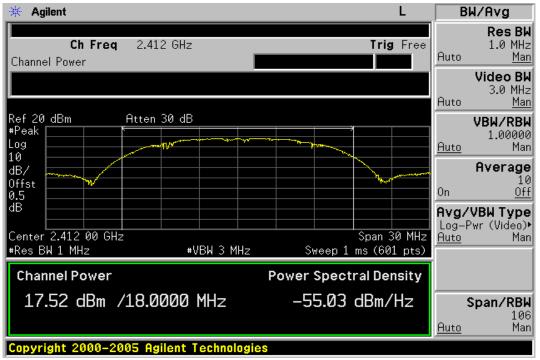
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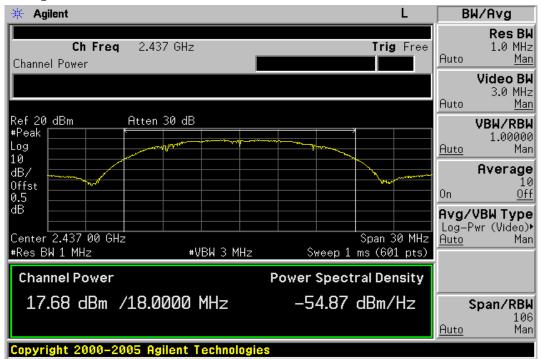


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# 802.11b, 1Mbps Power Output Plot (CH Low)



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



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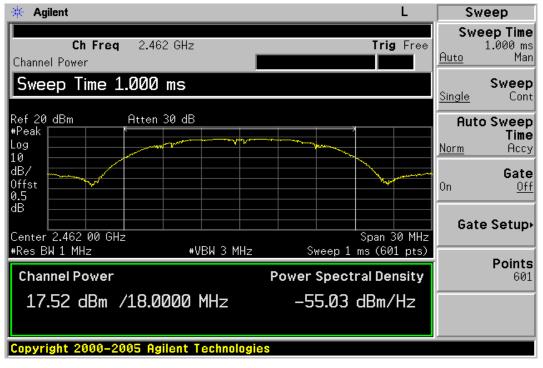
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# **Power Output Plot (CH High)**



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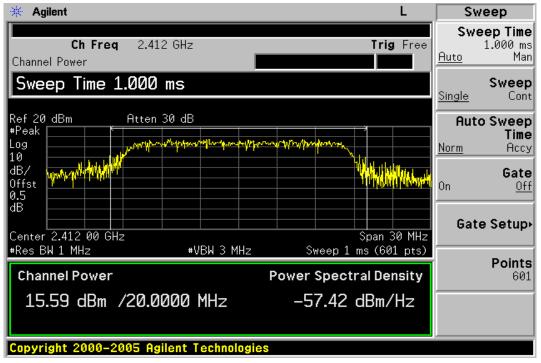
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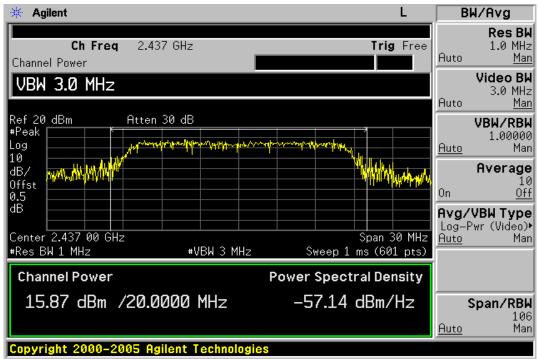


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# 802.11g, 6Mbps Power Output Plot (CH Low)



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



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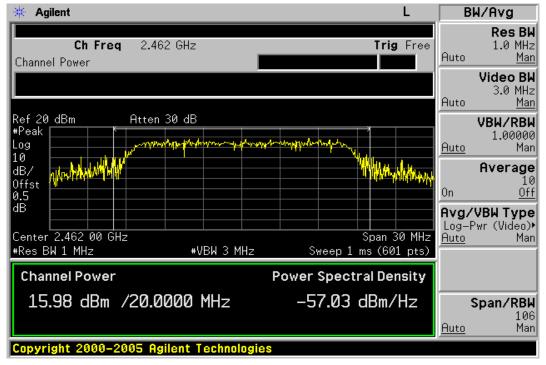
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# **Power Output Plot (CH High)**



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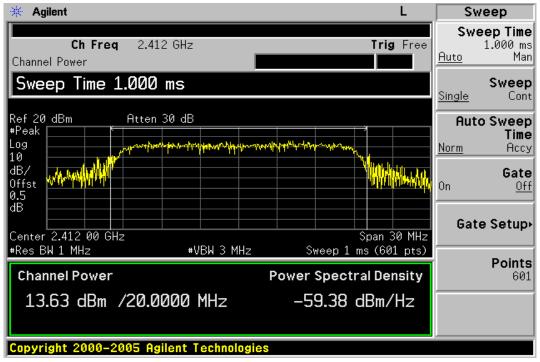
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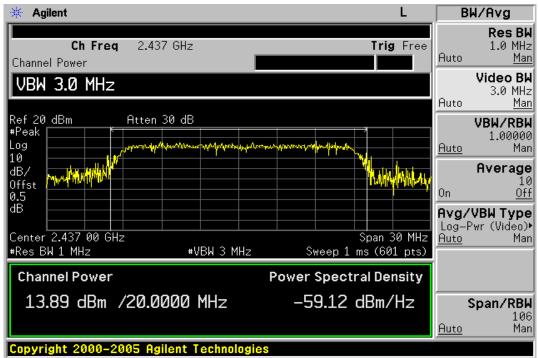


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# 802.11n\_20M 6.5Mbs Power Output Plot (CH Low)



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



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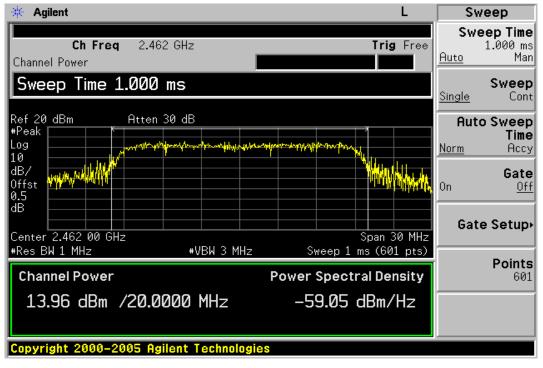
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# **Power Output Plot (CH High)**



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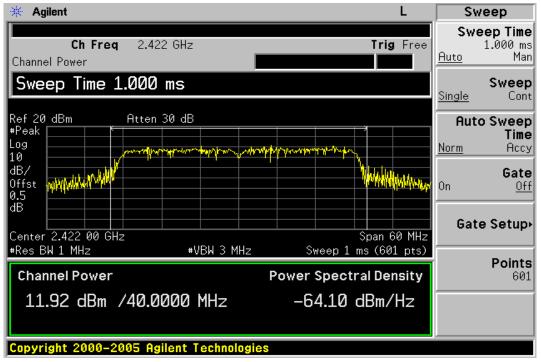
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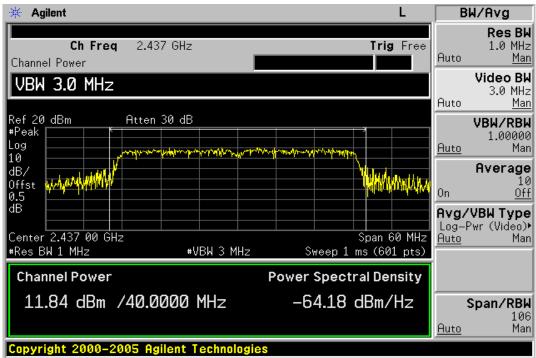


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# 802.11g\_40M 13.5Mbs Power Output Plot (CH Low)



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



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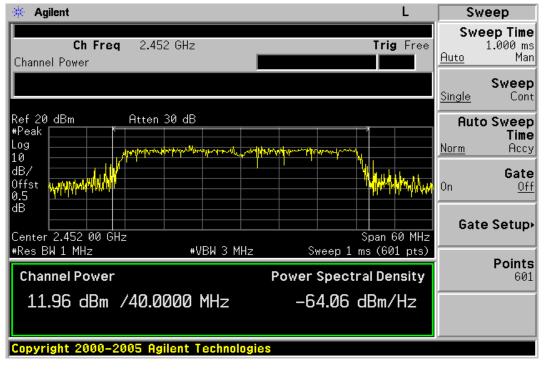
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 No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. / 台閣統因工業區石工路134號

 台灣檢驗科技股份有限公司
 t (886-2) 2299-3279
 f (886-2) 2298-0488
 www.sgs.com.tw



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



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# 7 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

# 7.1 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 in15.209(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.

# 7.2 Measurement Equipment Used:

### 7.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

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#### 7.2.2. Radiated emission:

	966 Chamber										
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.						
TYPE		NUMBER	NUMBER	CAL.							
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010						
Loop antenna	MESSTEC	FLA30	03/10086	07/08/2009	07/07/2011						
Bilog Antenna	SCHWAZBECK	VULB9160	3158	11/29/2007	11/28/2009						
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010						
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009						
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010						
Turn Table	HD	DT420	N/A	N.C.R	N.C.R						
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R						
Controller	HD	HD100	N/A	N.C.R	N.C.R						
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010						
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010						
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010						

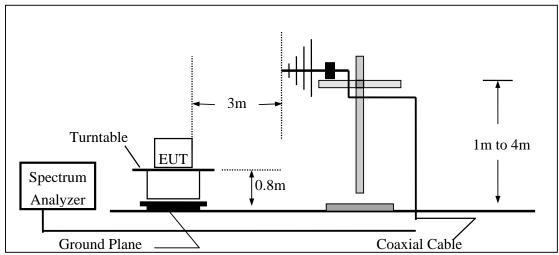
# 7.3 Test SET-UP:

### 7.3.1 Conducted Emission at antenna port:

Refer to section 6.3 for details.

### 7.3.2 Radiated emission:

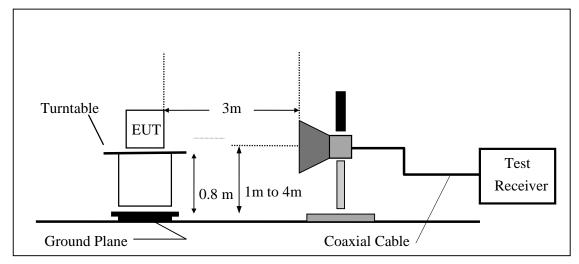
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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### 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 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.

# 7.5 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:

### $\mathbf{FS} = \mathbf{RA} + \mathbf{AF} + \mathbf{CL} - \mathbf{AG}$

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

### 7.6 Measurement Result:

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

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2.11 b mode
TX CH Low
2412 MHz
25 °C
65 %

Test Date	Nov. 13, 2009
Test By	Jason
Pol	Ver.

	P ea k	AV		Actu	al FS	Peak	AV		
Freq.	Reading	R ea din g		Peak	AV	Limit	Limit	0	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2390.00	48.70	•••	-1.39	47.31		74.00	54.00	-6.69	Peak
2400.00	53.16		-1.36	51.80		74.00	54.00	-2.20	Peak
Operation	Operation Mode TX CH Low					Test	Date	Nov. 13, 2	009
Fundament	tal Frequer	ncy 2412	MHz			Test	By	Jason	
Temperatu	re	25				Pol	•	Hor.	
Humidity		65 %							
	Peak	AV		A ctu	al FS	Pea k	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)(	dBuV/n	n) ( <b>dB</b> )	
2390.00	48.74		-1.39	47.35		74.00	54.00	-6.65	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 ms.
  - (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 Fundamental Frequency	TX CH High 2462 MHz	Test Date Test By	Nov. 13, 2009 Jason
Temperature	25	Pol	Ver.
Humidity	65 %		

	<b>P</b> eak	AV		A ctu a	l FS	Pea k	AV		
F req.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m) (	(dBuV/m)	(dBuV/m)(	dBuV/n	n) ( <b>dB</b> )	
2483.56	49.33		-0.92	48.41		74.00	54.00	-5.59	Peak
Operation Mode TX CH High						Test	Date	Nov. 13, 2	009
Fundamen	tal Frequer	ncy 2462	MHz			Test	By	Jason	
Temperatu	re	25				Pol		Hor.	
Humidity		65 %							
	Peak	AV		Actu	al FS	Peak	AV		
F req.	Reading	Reading	Ant/CL	P ea k	AV	Limit	Limi	t Margi	n Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	) (dBuV/m	) (dBuV	'm) (dB)	
2483.56	49.34		-0.92	48.42		74.00	54.00	-5.58	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 columno
- (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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#### Radiated Emission: 802.11 g mode

Operation Mode	TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412 MHz	Test By	Jason
Tmperature Humidity	25 °C 65 %	Pol	Ver.

	P eak	AV		A ctu	al FS	Pea k	AV		
Freq. (MHz)	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit ) (dBuV/m)	Limit (dBuV/n		Remark
2390.00	51.06		-1.39	49.67		74.00	54.00	-4.33	Peak
Operation	Mode	TX C	H Low			Test	Date	Nov. 13, 2009	
Fundamen	tal Frequei	ncy 2412	MHz			Test	By	Jason	
Temperatu	re	25 °C				Pol	•	Hor.	
Humidity		65 %							
	Peak	AV		A ctu	al FS	Pea k	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	) (dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2388.20	54.40	42.35	-1.39	53.01	40.96	74.00	54.00	-13.04	Avg
2390.00	53.71	43.74	-1.39	52.32	42.35	74.00	54.00	-11.65	Avg

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.
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- (3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
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#### Radiated Emission: 802.11 g mode

T	TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462 MHz	Test By	Jason
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	P ea k	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	) (dBuV/m)(	dBuV/n	n) ( <b>dB</b> )	
2483.56	57.12	45.11	-0.92	56.20	44.19	74.00	54.00	-9.81	Avg
2484.66	57.47	44.65	-0.92	56.55	43.73	74.00	54.00	-10.27	Avg
Operation Mode TX CH High Fundamental Frequency 2462 MHz							Nov. 13, 2	009	
Fundament	-	2				Test	2	Jason	
Temperatu	re	25 ℃				Pol		Hor.	
Humidity		65 %							
	Peak	AV		A ctu	al FS	<b>Pea</b> k	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	) (dBuV/m)(	dBuV/n	n) ( <b>dB</b> )	
2483.56	61.65	49.74	-0.92	60.73	48.82	74.00	54.00	-5.18	Avg
2485.41	60.59	47.42	-0.92	59.67	46.50	74.00	54.00	-7.50	Avg
2487.76	60.57	45.44	-0.86	59.71	44.58	74.00	54.00	-9.42	Avg

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 ms.
- (4) Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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#### Radiated Emission: 802.11 n 20M mode

Operation Mode	TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412 MHz	Test By	Jason
Tmperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		A ctu	al FS	Pea k	AV		
Freq.	0	Reading		Peak	AV	Limit	Limit	0	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	) (dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2390.00	50.38		-1.39	48.99		74.00	54.00	-5.01	Peak
Operation 2	Mode	TX C	H Low			Test	Date	Nov. 13, 2	009
Fundament	tal Frequei	ncy 2412	MHz			Test	By	Jason	
Temperatu	re	25 °C				Pol		Hor.	
Humidity		65 %							
	Peak	AV		A ctu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)		(dBuV/m)	(dBuV/m)	) (dBuV/m)	(dBuV/n	0	
2389.70	54.65	42.95	-1.39	53.26	41.56	74.00	54.00	-12.44	Avg
2390.00	53.19	42.63	-1.39	51.80	41.24	74.00	54.00	-12.76	Avg

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.
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- (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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### Radiated Emission: 802.11 n 20M mode

Operation Mode	TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462 MHz	Test By	Jason
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		A ctu	al FS	Pea k	AV		
Freq.	U	Reading		Peak	AV	Limit	Limit	0	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	$(\mathbf{d}\mathbf{B}\mathbf{u}\mathbf{V}/\mathbf{m})$	(dBuV/m)	) (dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2483.56	55.50	43.83	-0.92	54.58	42.91	74.00	54.00	-11.09	Avg
Operation	Mode	TX C	H High			Test	Date	Nov. 13, 2	009
Fundament	tal Frequei	ncy 2462	MHz			Test	By	Jason	
Temperatu	re	25 °C				Pol	-	Hor.	
Humidity		65 %							
	Peak	AV		A ctu	al FS	Pea k	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	) (dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2483.56	59.67	47.37	-0.92	58.75	46.45	74.00	54.00	-7.55	Avg
2484.76	60.17	46.19	-0.92	59.25	45.27	74.00	54.00	-8.73	Avg

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.
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- (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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### Radiated Emission: 802.11 n 40M mode

Operation Mode	TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2422 MHz	Test By	Jason
Tmperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		A ctu	al FS	<b>Pea k</b>	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2390.00	54.06	43.85	-1.39	52.67	42.46	74.00	54.00	-11.54	Avg
Operation 2	Mode	TX C	H Low			Test	Date	Nov. 13, 2	009
Fundament	tal Frequei	ncy 2412	MHz			Test	By	Jason	
Temperatu	re	25 °C				Pol	•	Hor.	
Humidity		65 %							
	P ea k	AV		Actu	al FS	Peak	AV		
Freq.	Reading	R ea ding	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2382.45	54.90	44.96	-1.46	53.44	43.50	74.00	54.00	-10.50	Avg

Remark :

2389.45

59.88

46.67

-1.40

(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.

45.27

74.00

54.00

-8.73

Avg

58.48

- (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 columno
- (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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### Radiated Emission: 802.11 n 40M mode

Operation Mode	TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2452 MHz	Test By	Jason
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al F S	Peak	AV		
Freq.	Reading	Reading	Ant./CL	P ea k	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
2483.56	50.85		-0.92	49.93		74.00	54.00	-4.07	Peak
Operation Mode TX CH High Test Date Nov. 13, 2009								)9	
Fundament	tal Frequer	ncy 2452	MHz			Test 1	By Jas	son	
Temperatu	re	25 °C				Pol	Ho	or.	
Humidity		65 %							
Peak AV Actual FS Peak AV									
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit I	Margin <b>R</b>	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m) (	dBuV/m) (	dBuV/m)(d	lBuV/m)	( <b>dB</b> )	

(11112)	(uDu V)	(ubu v)	CI (ub)	(uDu V/III)	(uDu V/III)	(uDu / m	(uDu V/III	) (ub)	
2483.56	55.80	44.12	-0.92	54.88	43.20	74.00	54.00	-10.80	Avg
2484.76	59.24	43.45	-0.92	58.32	42.53	74.00	54.00	-11.47	Avg
2489.41	56.35	43.58	-0.86	55.49	42.72	74.00	54.00	-11.28	Avg

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 ms.
- (4) Spectrum AV Setting: 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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# 8 SPURIOUS RADIATED EMISSION TEST

# 8.1 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.

# 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:

Refer to section 7.2.2 for details.

# 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:

Refer to section 7.3 for details.

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 t (886-2) 2299-3279
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# **8.4 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.

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

Operation Mode	802.11b TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
V	Peak	46.59	-14.97	31.62	40.00	-8.38
V	Peak	46.72	-17.38	29.34	43.50	-14.16
V	Peak	49.58	-13.64	35.94	46.00	-10.06
V	Peak	47.76	-12.47	35.29	46.00	-10.71
V	Peak	53.10	-11.73	41.37	46.00	-4.63
V	Peak	39.87	-4.95	34.92	46.00	-11.08
Н	Peak	44.33	-13.84	30.49	40.00	-9.51
Н	Peak	42.37	-16.27	26.10	40.00	-13.90
Н	Peak	48.98	-12.47	36.51	46.00	-9.49
Н	Peak	53.25	-11.73	41.52	46.00	-4.48
Н	Peak	39.01	-4.95	34.06	46.00	-11.94
	H/V V V V V V H H H H	Ant.Pol.ModeH/V(PK/QP)VPeakVPeakVPeakVPeakVPeakVPeakHPeakHPeakHPeakHPeakHPeakHPeakHPeakHPeakHPeakHPeakHPeak	Ant.Pol.         Mode         Reading           H/V         (PK/QP)         (dBuV)           V         Peak         46.59           V         Peak         46.72           V         Peak         49.58           V         Peak         47.76           V         Peak         53.10           V         Peak         39.87           H         Peak         42.37           H         Peak         48.98           H         Peak         53.25	Ant.Pol.         Mode         Reading         Factor           H/V         (PK/QP)         (dBuV)         (dB)           V         Peak         46.59         -14.97           V         Peak         46.72         -17.38           V         Peak         49.58         -13.64           V         Peak         47.76         -12.47           V         Peak         53.10         -11.73           V         Peak         39.87         -4.95           H         Peak         42.37         -16.27           H         Peak         48.98         -12.47           H         Peak         53.10         -11.73           V         Peak         39.87         -4.95           H         Peak         44.33         -13.84           H         Peak         48.98         -12.47           H         Peak         48.98         -12.47           H         Peak         44.33         -13.84           H         Peak         48.98         -12.47           H         Peak         53.25         -11.73	Ant.Pol.ModeReadingFactorActual FSH/V(PK/QP)(dBuV)(dB)(dBuV/m)VPeak46.59-14.9731.62VPeak46.72-17.3829.34VPeak49.58-13.6435.94VPeak47.76-12.4735.29VPeak53.10-11.7341.37VPeak39.87-4.9534.92HPeak44.33-13.8430.49HPeak42.37-16.2726.10HPeak48.98-12.4736.51HPeak53.25-11.7341.52	Ant.Pol.ModeReadingFactorActual FSLimit3mH/V(PK/QP)(dBuV)(dB)(dBuV/m)(dBuV/m)VPeak46.59-14.9731.6240.00VPeak46.72-17.3829.3443.50VPeak49.58-13.6435.9446.00VPeak47.76-12.4735.2946.00VPeak53.10-11.7341.3746.00VPeak39.87-4.9534.9246.00HPeak44.33-13.8430.4940.00HPeak48.98-12.4736.5146.00HPeak48.98-12.4736.5146.00HPeak53.25-11.7341.5246.00

Remark:

- (1) Measuring frequencies from 30 MHz to the 1GHz<sub>o</sub>
- (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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 f (886-2) 2298-0488
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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b)

Operation Mode	802.11b TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
67.83	V	Peak	44.67	-15.60	29.07	40.00	-10.93
256.98	V	Peak	48.17	-13.67	34.50	46.00	-11.50
322.94	V	Peak	49.05	-12.47	36.58	46.00	-9.42
352.04	V	Peak	53.44	-11.73	41.71	46.00	-4.29
604.24	V	Peak	39.24	-5.92	33.32	46.00	-12.68
703.18	V	Peak	40.49	-4.95	35.54	46.00	-10.46
39.70	Н	Peak	44.38	-13.73	30.65	40.00	-9.35
70.74	Н	Peak	42.87	-16.27	26.60	40.00	-13.40
322.94	Н	Peak	48.55	-12.47	36.08	46.00	-9.92
352.04	Н	Peak	54.02	-11.73	42.29	46.00	-3.71
703.18	Н	Peak	38.23	-4.95	33.28	46.00	-12.72

Remark :

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

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

Operation Mode	802.11b TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
_	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	67.83	V	Peak	44.54	-15.60	28.94	40.00	-11.06
	143.49	V	Peak	50.25	-13.42	36.83	43.50	-6.67
	256.98	V	Peak	48.43	-13.67	34.76	46.00	-11.24
	322.94	V	Peak	48.37	-12.47	35.90	46.00	-10.10
	352.04	V	Peak	53.41	-11.73	41.68	46.00	-4.32
	703.18	V	Peak	39.66	-4.95	34.71	46.00	-11.29
	38.73	Н	Peak	44.23	-13.84	30.39	40.00	-9.61
	198.78	Н	Peak	42.56	-15.56	27.00	43.50	-16.50
	256.98	Н	Peak	43.96	-13.67	30.29	46.00	-15.71
	322.94	Н	Peak	48.96	-12.47	36.49	46.00	-9.51
	352.04	Н	Peak	51.86	-11.73	40.13	46.00	-5.87
	703.18	Н	Peak	37.53	-4.95	32.58	46.00	-13.42

#### Remark :

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

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

Operation Mode	802.11g TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
_	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	67.83	V	Peak	44.45	-15.60	28.85	40.00	-11.15
	104.69	V	Peak	45.55	-16.63	28.92	43.50	-14.58
	259.89	V	Peak	47.40	-13.64	33.76	46.00	-12.24
	322.94	V	Peak	47.22	-12.47	34.75	46.00	-11.25
	352.04	V	Peak	52.06	-11.73	40.33	46.00	-5.67
	706.09	V	Peak	38.88	-4.91	33.97	46.00	-12.03
	38.73	Н	Peak	44.11	-13.84	30.27	40.00	-9.73
	70.74	Н	Peak	42.68	-16.27	26.41	40.00	-13.59
	259.89	Н	Peak	44.53	-13.64	30.89	46.00	-15.11
	322.94	Н	Peak	48.43	-12.47	35.96	46.00	-10.04
	352.04	Н	Peak	51.66	-11.73	39.93	46.00	-6.07
	703.18	Н	Peak	37.89	-4.95	32.94	46.00	-13.06

Remark:

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

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

Operation Mode	802.11g TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
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)	( <b>dB</b> )
	67.83	V	Peak	44.76	-15.60	29.16	40.00	-10.84
	198.78	V	Peak	45.41	-15.56	29.85	43.50	-13.65
	259.89	V	Peak	49.18	-13.64	35.54	46.00	-10.46
	322.94	V	Peak	48.34	-12.47	35.87	46.00	-10.13
	352.04	V	Peak	54.10	-11.73	42.37	46.00	-3.63
	703.18	V	Peak	39.30	-4.95	34.35	46.00	-11.65
	41.64	Н	Peak	43.79	-13.76	30.03	40.00	-9.97
	70.74	Н	Peak	43.10	-16.27	26.83	40.00	-13.17
	259.89	Н	Peak	44.71	-13.64	31.07	46.00	-14.93
	322.94	Н	Peak	43.85	-12.47	31.38	46.00	-14.62
	352.04	Н	Peak	49.85	-11.73	38.12	46.00	-7.88

#### Remark :

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

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

Operation Mode	802.11g TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
67.83	V	Peak	44.24	-15.60	28.64	40.00	-11.36
198.78	V	Peak	44.14	-15.56	28.58	43.50	-14.92
259.89	V	Peak	47.32	-13.64	33.68	46.00	-12.32
322.94	V	Peak	47.37	-12.47	34.90	46.00	-11.10
352.04	V	Peak	54.14	-11.73	42.41	46.00	-3.59
703.18	V	Peak	39.41	-4.95	34.46	46.00	-11.54
39.70	Н	Peak	43.95	-13.73	30.22	40.00	-9.78
259.89	Н	Peak	42.52	-13.64	28.88	46.00	-17.12
322.94	Н	Peak	47.73	-12.47	35.26	46.00	-10.74
352.04	Н	Peak	53.64	-11.73	41.91	46.00	-4.09
706.09	Н	Peak	37.54	-4.91	32.63	46.00	-13.37

Remark :

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

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n 20M)

Operation Mode	802.11n_20M TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
-	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	67.83	V	Peak	44.23	-15.60	28.63	40.00	-11.37
	191.99	V	Peak	45.06	-15.23	29.83	43.50	-13.67
	259.89	V	Peak	49.31	-13.64	35.67	46.00	-10.33
	322.94	V	Peak	47.81	-12.47	35.34	46.00	-10.66
	352.04	V	Peak	53.84	-11.73	42.11	46.00	-3.89
	706.09	V	Peak	39.87	-4.91	34.96	46.00	-11.04
	41.64	Н	Peak	43.95	-13.76	30.19	40.00	-9.81
	70.74	Н	Peak	42.80	-16.27	26.53	40.00	-13.47
	322.94	Н	Peak	47.85	-12.47	35.38	46.00	-10.62
	352.04	Н	Peak	51.33	-11.73	39.60	46.00	-6.40
	703.18	Н	Peak	37.60	-4.95	32.65	46.00	-13.35

#### Remark :

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

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n 20M)

Operation Mode	802.11n_20M TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
-	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	67.83	V	Peak	44.63	-15.60	29.03	40.00	-10.97
	104.69	V	Peak	45.30	-16.63	28.67	43.50	-14.83
	191.99	V	Peak	44.05	-15.23	28.82	43.50	-14.68
	259.89	V	Peak	49.02	-13.64	35.38	46.00	-10.62
	322.94	V	Peak	48.22	-12.47	35.75	46.00	-10.25
	352.04	V	Peak	54.65	-11.73	42.92	46.00	-3.08
	39.70	Н	Peak	43.69	-13.73	29.96	40.00	-10.04
	70.74	Н	Peak	42.70	-16.27	26.43	40.00	-13.57
	322.94	Н	Peak	47.13	-12.47	34.66	46.00	-11.34
	352.04	Н	Peak	52.79	-11.73	41.06	46.00	-4.94
	703.18	Н	Peak	38.49	-4.95	33.54	46.00	-12.46

#### Remark :

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

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n 20M)

Operation Mode	802.11n_20M TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
_	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	67.83	V	Peak	44.87	-15.60	29.27	40.00	-10.73
	191.99	V	Peak	44.09	-15.23	28.86	43.50	-14.64
	259.89	V	Peak	48.94	-13.64	35.30	46.00	-10.70
	322.94	V	Peak	48.93	-12.47	36.46	46.00	-9.54
	352.04	V	Peak	52.63	-11.73	40.90	46.00	-5.10
	604.24	V	Peak	37.56	-5.92	31.64	46.00	-14.36
	39.70	Н	Peak	43.45	-13.73	29.72	40.00	-10.28
	70.74	Н	Peak	43.04	-16.27	26.77	40.00	-13.23
	259.89	Н	Peak	45.15	-13.64	31.51	46.00	-14.49
	322.94	Н	Peak	47.97	-12.47	35.50	46.00	-10.50
	352.04	Н	Peak	52.71	-11.73	40.98	46.00	-5.02
	703.18	Н	Peak	38.23	-4.95	33.28	46.00	-12.72

#### Remark :

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

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n 40M)

Operation Mode	802.11n_40M TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2422MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Mar- gin
_	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	41.64	V	Peak	43.57	-13.76	29.81	40.00	-10.19
	198.78	V	Peak	43.38	-15.56	27.82	43.50	-15.68
	259.89	V	Peak	44.45	-13.64	30.81	46.00	-15.19
	322.94	V	Peak	47.33	-12.47	34.86	46.00	-11.14
	352.04	V	Peak	52.53	-11.73	40.80	46.00	-5.20
	703.18	V	Peak	38.43	-4.95	33.48	46.00	-12.52
	41.64	Н	Peak	43.52	-13.76	29.76	40.00	-10.24
	70.70	Н	Peak	42.02	-16.27	25.75	40.00	-14.25
	259.89	Н	Peak	41.89	-13.64	28.25	46.00	-17.75
	322.94	Н	Peak	47.92	-12.47	35.45	46.00	-10.55
	352.04	Н	Peak	52.59	-11.73	40.86	46.00	-5.14
	703.18	Н	Peak	38.91	-4.95	33.96	46.00	-12.04

Remark :

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

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n 40M)

Operation Mode	802.11n_40M TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

	Freq.	Ant.Pol. Detect		Reading Factor		Actual FS	Limit3m	Safe Mar- gin
-	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	67.83	V	Peak	44.40	-15.60	28.80	40.00	-11.20
	198.78	V	Peak	44.36	-15.56	28.80	43.50	-14.70
	259.89	V	Peak	47.74	-13.64	34.10	46.00	-11.90
	322.94	V	Peak	46.66	-12.47	34.19	46.00	-11.81
	352.04	V	Peak	51.56	-11.73	39.83	46.00	-6.17
	604.24	V	Peak	37.42	-5.92	31.50	46.00	-14.50
	41.64	Н	Peak	43.49	-13.76	29.73	40.00	-10.27
	191.99	Н	Peak	40.50	-15.23	25.27	43.50	-18.23
	259.89	Н	Peak	40.60	-13.64	26.96	46.00	-19.04
	322.94	Н	Peak	43.84	-12.47	31.37	46.00	-14.63
	352.04	Н	Peak	52.26	-11.73	40.53	46.00	-5.47

#### Remark :

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

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### Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n 40M)

Operation Mode	802.11g TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	25	Pol	Ver./Hor
Humidity	60 %		

	Freq.	Ant.Pol.	Detector Mode	Reading	Reading Factor		Limit3m	Safe Mar- gin
_	(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
	65.89	V	Peak	42.63	-15.09	27.54	40.00	-12.46
	116.33	V	Peak	46.60	-15.72	30.88	43.50	-12.62
	191.99	V	Peak	41.58	-15.23	26.35	43.50	-17.15
	259.89	V	Peak	47.56	-13.64	33.92	46.00	-12.08
	322.94	V	Peak	46.01	-12.47	33.54	46.00	-12.46
	352.04	V Peak		51.13	-11.73	39.40	46.00	-6.60
	41.64	Н	Peak	43.14	-13.76	29.38	40.00	-10.62
	70.74	Н	Peak	40.87	-16.27	24.60	40.00	-15.40
	259.89	Н	Peak	42.33	-13.64	28.69	46.00	-17.31
	322.94	Н	Peak	46.30	-12.47	33.83	46.00	-12.17
	352.04	Н	Peak	53.33	-11.73	41.60	46.00	-4.40
	706.09	Н	Peak	36.78	-4.91	31.87	46.00	-14.13

#### Remark :

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

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

Operation Mode	802.11b TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	23	Pol	Ver.
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	40.58		-7.74	32.84		74.00	54.00	-21.16	Peak
1403.0	36.14		-6.34	29.80		74.00	54.00	-24.20	Peak
1663.0	36.41		-5.11	31.30		74.00	54.00	-22.70	Peak
1988.0	36.20		-3.47	32.73		74.00	54.00	-21.27	Peak
3203.5	35.16		1.07	36.23		74.00	54.00	-17.77	Peak
4824.0	30.50		6.05	36.55		74.00	54.00	-17.45	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11b TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1045.5	38.17		-7.91	30.26		74.00	54.00	-23.74	Peak
1663.0	37.04		-5.11	31.93		74.00	54.00	-22.07	Peak
3203.5	35.36		1.07	36.43		74.00	54.00	-17.57	Peak
4824.0	29.89		6.05	35.94		74.00	54.00	-18.06	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11b TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	23	Pol	Ver
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	40.23		-7.74	32.49		74.00	54.00	-21.51	Peak
1403.0	38.15		-6.34	31.81		74.00	54.00	-22.19	Peak
1988.0	36.02		-3.47	32.55		74.00	54.00	-21.45	Peak
2976.0	34.63		0.32	34.95		74.00	54.00	-19.05	Peak
4874.0	31.28		6.15	37.43		74.00	54.00	-16.57	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies 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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 台灣檢驗科技股份有限公司
 t (886-2) 2299-3279
 f (886-2) 2298-0488
 www.sas.com.tw



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

Operation Mode	802.11b TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1058.5	37.67		-7.91	29.76		74.00	54.00	-24.24	Peak
2943.5	34.01		0.24	34.25		74.00	54.00	-19.75	Peak
4874.0	29.48		6.17	35.65		74.00	54.00	-18.35	Peak
5771.0	30.72		8.18	38.90		74.00	54.00	-15.10	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11b TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	23	Pol	Ver
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1000.0	40.86		-7.74	33.12		74.00	54.00	-20.88	Peak
1403.0	36.56		-6.34	30.22		74.00	54.00	-23.78	Peak
1663.0	36.05		-5.11	30.94		74.00	54.00	-23.06	Peak
1998.0	36.31		-3.47	32.84		74.00	54.00	-21.16	Peak
3288.0	33.72		1.36	35.08		74.00	54.00	-18.92	Peak
4924.0	33.47		6.28	39.75		74.00	54.00	-14.25	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11b TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1058.5	37.13		-7.91	29.22		74.00	54.00	-24.78	Peak
3288.0	34.73		1.36	36.09		74.00	54.00	-17.91	Peak
4924.0	31.87		6.28	38.15		74.00	54.00	-15.85	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11g TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	25	Pol	Ver.
Humidity	60 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1000.0	40.37		-7.74	32.63		74.00	54.00	-21.37	Peak
1988.0	36.68		-3.47	33.21		74.00	54.00	-20.79	Peak
3203.5	36.52		1.07	37.59		74.00	54.00	-16.41	Peak
4824.0	29.95		6.05	36.00		74.00	54.00	-18.00	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11g TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1045.5	37.37		-7.91	29.46		74.00	54.00	-24.54	Peak
3203.5	38.16		1.07	39.23		74.00	54.00	-14.77	Peak
4824.0	30.04		6.05	36.09		74.00	54.00	-17.91	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 frequency.
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- (4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 t (886-2) 2299-3279
 f (886-2) 2298-0488
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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode	802.11g TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	23	Pol	Ver
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	40.67		-7.74	32.93		74.00	54.00	-21.07	Peak
1403.0	36.44		-6.34	30.10		74.00	54.00	-23.90	Peak
1663.0	36.93		-5.11	31.82		74.00	54.00	-22.18	Peak
3255.5	35.67		1.23	36.90		74.00	54.00	-17.10	Peak
4874.0	30.47		6.17	36.64		74.00	54.00	-17.36	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 f (886-2) 2298-0488
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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode	802.11g TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1058.5	37.43		-7.91	29.52		74.00	54.00	-24.48	Peak
3225.5	35.77		1.23	37.00		74.00	54.00	-17.00	Peak
4874.0	29.99		6.17	36.16		74.00	54.00	-17.84	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 台灣檢驗科技股份有限公司
 t (886-2) 2299-3279
 f (886-2) 2298-0488
 www.sas.com.tw



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

Operation Mode	802.11g TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	23	Pol	Ver
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	39.94		-7.74	32.20		74.00	54.00	-21.80	Peak
1403.0	37.67		-6.34	31.33		74.00	54.00	-22.67	Peak
1988.0	38.13		-3.47	34.66		74.00	54.00	-19.34	Peak
3288.0	38.54		1.36	39.90		74.00	54.00	-14.10	Peak
4924.0	29.68		6.28	35.96		74.00	54.00	-18.04	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11g TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1045.0	37.77		-7.91	29.86		74.00	54.00	-24.14	Peak
3288.0	36.98		1.36	38.34		74.00	54.00	-15.66	Peak
4924.0	29.53		6.28	35.81		74.00	54.00	-18.19	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 台灣檢驗科技股份有限公司
 t (886-2) 2299-3279
 f (886-2) 2298-0488
 www.sas.com.tw



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

Operation Mode	802.11n_20M TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	25	Pol	Ver.
Humidity	60 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	39.59		-7.74	31.85		74.00	54.00	-22.15	Peak
1403.0	35.60		-6.34	29.26		74.00	54.00	-24.74	Peak
1663.0	35.32		-5.11	30.21		74.00	54.00	-23.79	Peak
1988.0	37.39		-3.47	33.92		74.00	54.00	-20.08	Peak
3203.5	37.01		1.07	38.08		74.00	54.00	-15.92	Peak
4824.0	30.21		6.05	36.26		74.00	54.00	-17.74	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11n_20M TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2412MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1045.5	37.96		-7.91	30.05		74.00	54.00	-23.95	Peak
3203.5	37.75		1.07	38.82		74.00	54.00	-15.18	Peak
4824.0	30.03		6.05	36.08		74.00	54.00	-17.92	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 台灣檢驗科技股份有限公司
 t (886-2) 2299-3279
 f (886-2) 2298-0488
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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_20M)

Operation Mode	802.11n_20M TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	23	Pol	Ver
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	40.32		-7.74	32.58		74.00	54.00	-21.42	Peak
1403.0	37.32		-6.34	30.98		74.00	54.00	-23.02	Peak
1663.0	36.60		-5.11	31.49		74.00	54.00	-22.51	Peak
1998.0	37.90		-3.47	34.43		75.00	54.00	-19.57	Peak
3236.0	35.91		1.20	37.11		76.00	54.00	-16.89	Peak
4874.0	30.08		6.17	36.25		74.00	54.00	-17.75	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11n_20M TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1058.5	38.06		-7.91	30.15		74.00	54.00	-23.85	Peak
3236.0	34.94		1.20	36.14		74.00	54.00	-17.86	Peak
4874.0	29.76		6.17	35.93		74.00	54.00	-18.07	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 t (886-2) 2299-3279
 f (886-2) 2298-0488
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### Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n\_20M)

Operation Mode	802.11n_20M TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	23	Pol	Ver
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	41.40		-7.74	33.66		74.00	54.00	-20.34	Peak
1318.5	39.78		-6.72	33.06		74.00	54.00	-20.94	Peak
1988.0	37.11		-3.47	33.64		74.00	54.00	-20.36	Peak
3288.0	35.67		1.36	37.03		75.00	54.00	-16.97	Peak
4924.0	29.79		6.29	36.08		76.00	54.00	-17.92	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies 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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11n_20M TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2462MHz	Test By	Jason
Temperature	23 °C	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1058.5	37.43		-7.91	29.52		74.00	54.00	-24.48	Peak
3288.0	35.76		1.36	37.12		74.00	54.00	-16.88	Peak
4003.0	32.71		3.70	36.41		75.00	54.00	-17.59	Peak
6291.0	30.95		9.37	40.32		77.00	54.00	-13.68	Peak
4924.0	30.06		6.28	36.34		76.00	54.00	-17.66	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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 SGS Taiwan Ltd.
 No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. / 台欄統历股工業显在工路134號

 台灣檢驗科技股份有限公司
 t (886-2) 2299-3279
 f (886-2) 2298-0488
 www.sas.com.tw



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

Operation Mode	802.11n_40M TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2422MHz	Test By	Jason
Temperature	25	Pol	Ver.
Humidity	60 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	39.16		-7.74	31.42		74.00	54.00	-22.58	Peak
1403.0	37.28		-6.34	30.94		74.00	54.00	-23.06	Peak
1760.5	37.00		-4.61	32.39		74.00	54.00	-21.61	Peak
1988.0	37.27		-3.47	33.80		74.00	54.00	-20.20	Peak
3203.5	37.31		1.07	38.38		75.00	54.00	-15.62	Peak
4824.0	29.99		6.05	36.04		76.00	54.00	-17.96	Peak
7266.0						74.00	54.00		
9688.0						74.00	54.00		
12110.0						74.00	54.00		
14532.0						74.00	54.00		
16954.0						74.00	54.00		
19376.0						74.00	54.00		
21798.0						74.00	54.00		

#### 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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11n_40M TX CH Low	Test Date	Nov. 13, 2009
Fundamental Frequency	2422MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1058.5	35.83		-7.91	27.92		74.00	54.00	-26.08	Peak
3203.5	37.85		1.07	38.92		75.00	54.00	-15.08	Peak
4844.0	29.65		6.05	35.70		74.00	54.00	-18.30	Peak
7266.0						74.00	54.00		
9688.0						74.00	54.00		
12110.0						74.00	54.00		
14532.0						74.00	54.00		
16954.0						74.00	54.00		
19376.0						74.00	54.00		
21798.0						74.00	54.00		
24220.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies 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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. / 台閣統證理書五丁路134號

 台灣檢驗科技股份有限公司
 t (886-2) 2299-3279
 f (886-2) 2298-0488
 www.sgs.com.tw



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

Operation Mode	802.11n_40M TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	23	Pol	Ver
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	41.21		-7.74	33.47		74.00	54.00	-20.53	Peak
1403.0	36.93		-6.34	30.59		74.00	54.00	-23.41	Peak
1663.0	38.59		-5.11	33.48		74.00	54.00	-20.52	Peak
1998.0	38.21		-3.47	34.74		74.00	54.00	-19.26	Peak
3236.0	37.30		1.20	38.50		75.00	54.00	-15.50	Peak
4874.0	30.18		6.17	36.35		74.00	54.00	-17.65	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		

#### 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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11n_40M TX CH Mid	Test Date	Nov. 13, 2009
Fundamental Frequency	2437MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1045.5	37.94		-7.91	30.03		74.00	54.00	-23.97	Peak
3236.0	35.76		1.20	36.96		74.00	54.00	-17.04	Peak
4874.0	30.22		6.17	36.39		74.00	54.00	-17.61	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies 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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11n_40M TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2452MHz	Test By	Jason
Temperature	23	Pol	Ver
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	40.81		-7.74	33.07		74.00	54.00	-20.93	Peak
1403.0	36.18		-6.34	29.84		74.00	54.00	-24.16	Peak
1663.0	36.39		-5.11	31.28		74.00	54.00	-22.72	Peak
1988.0	35.53		-3.47	32.06		74.00	54.00	-21.94	Peak
3268.0	34.68		1.30	35.98		75.00	54.00	-18.02	Peak
4904.0	29.87		6.24	36.11		74.00	54.00	-17.89	Peak
7356.0						74.00	54.00		
9808.0						74.00	54.00		
12260.0						74.00	54.00		
14712.0						74.00	54.00		
17164.0						74.00	54.00		
19616.0						74.00	54.00		
22068.0						74.00	54.00		
24520.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies 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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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

Operation Mode	802.11n_40M TX CH High	Test Date	Nov. 13, 2009
Fundamental Frequency	2452MHz	Test By	Jason
Temperature	23	Pol	Hor
Humidity	54 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1000.0	37.53		-7.91	29.62		74.00	54.00	-24.38	Peak
3268.5	35.82		1.30	37.12		74.00	54.00	-16.88	Peak
4904.0	29.60		6.24	35.84		74.00	54.00	-18.16	Peak
7356.0						74.00	54.00		
9808.0						74.00	54.00		
12260.0						74.00	54.00		
14712.0						74.00	54.00		
17164.0						74.00	54.00		
19616.0						74.00	54.00		
22068.0						74.00	54.00		
24520.0						74.00	54.00		

#### Remark:

- (1) Measuring frequencies 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 ms.
- (5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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 No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. / 台閣統因工業區石工路134號

 台灣檢驗科技股份有限公司
 t (886-2) 2299-3279
 f (886-2) 2298-0488
 www.sas.com.tw



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# 9. ANTENNA REQUIREMENT

#### 9.1. **Standard Applicable:**

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be

replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some

field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the

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

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

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

#### 9.2. **Antenna Connected Construction:**

The directional gains of antenna used for transmitting is TX1, -1.40dBi, TX2, -0.4dBi and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

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