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# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

	OF
Product Name:	Wireless Module
Brand Name:	N/A
Model Name:	WMB510
Model Different:	N/A
FCC ID:	W5388D1235000
Report No.:	ER/2008/B0019
Issue Date:	Mar. 05, 2009
FCC Rule Part:	§15.247, Cat: DTS
Prepared for:	HiTi Digital, Inc.
	20F., No. 100, Sec. 2, Roosevelt Rd., Taipei City 100, Taiwan
Prepared by:	SGS Taiwan Ltd.
	<b>Electronics &amp; Communication Laboratory</b>
	No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan
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FCC ID: W5388D1235000

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# **VERIFICATION OF COMPLIANCE**

Applicant:	HiTi Digital, Inc. 20F., No. 100, Sec. 2, Roosevelt Rd., Taipei City 100, Taiwan
Equipment Under Test:	Wireless Module
Brand Name:	N/A
Model No.:	WMB510
Model Difference:	N/A
FCC ID:	W5388D1235000
File Number:	ER/2008/B0019
Date of test:	Nov. 13, 2008 ~ Mar. 04, 2009
Date of EUT Received:	Nov. 13, 2008

## We hereby certify that:

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

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

Test By:	Brian Chang	Date:	Mar. 05, 2009	
	Brian Chang / Engineer			
Prepared By:	Gig: yeh	Date:	Mar. 05, 2009	
- Approved By:	Gigi Yeh / Clerk Timent In Vincent Su / Manager	Date:	Mar. 05, 2009	

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## Version

Version No.	Date	Description
00	Mar. 05, 2009	Initial creation of document

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#### **GENERAL INFORMATION** 1

#### 1.1 **Product Description**

Product Name:	Wireless Module
Brand Name:	N/A
Model Number:	WMB510
Model Difference:	N/A
Power Supply:	5V DC
Hardware Version:	1
Software Version:	0.21

#### WLAN: 802.11 b/g

Frequency Range:	2412 – 2462 MHz
Channel number:	11 channels
Transmit Power:	⊠802.11 b: 11.76 dBm EIRP ⊠802.11 g: 14.44 dBm EIRP
Modulation Technology:	$\square DSSS, \square OFDM$
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM. 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps
Antenna Designation:	Dipole Antenna / 2 dBi
Type of Emission:	16M4D1D

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

This report applies for frequency bands 2412MHz – 2462MHz.

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

This submittal(s) (test report) is intended for **FCC ID:** <u>W5388D1235000</u> filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

## **1.3 Test Methodology**

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

## 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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## 2.4 Configuration of Tested System

## Fig. 2-1 Configuration of Tested System



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

Item Equipment	nt Mfr/Brand	Model/	Series No.	Data Cable	Power Cord	
num	Equipment	Min/Drand	Type No.	beries 140.	Data Cabic	Power Cord
1	Nobebook	IBM	T40	99HCY4	Un-shielding	Shielding
2.	Develop Kit	N/A	N/A	N/A	N/A	N/A
2	Test software	ART	Revision 8.0 build # 31 ART_11n	N/A	N/A	N/A



## **3 SUMMARY OF TEST RESULTS**

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

## **4 DESCRIPTION OF TEST MODES**

The EUT has been tested under operating condition.

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

802.11 b mode: Channel low (2412MHz)  $\backsim$  mid (2437MHz) and high (2462MHz) with 1Mbps

highest data rate are chosen for full testing.

802.11 g mode: Channel low (2412MHz) 
, mid (2437MHz) and high (2462MHz) with 6Mbps

highest data rate are chosen for full testing.

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11b/g WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.



## **5** CONDUCTED EMISSION TEST

## 5.1 Standard Applicable:

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

Frequency range		nits uV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note		

1. The lower limit shall apply at the transition frequencies

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

## 5.2 Measurement Equipment Used:

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

## 5.3 EUT Setup:

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 110Vac/60Hz power source.

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## 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.

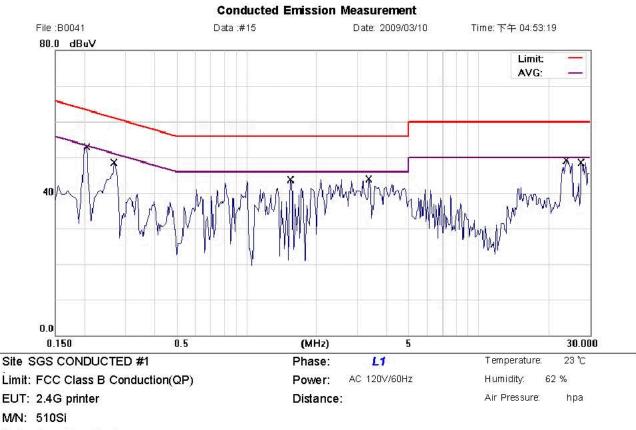
Note: Refer to next page for measurement data and plots.



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## AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	WIFI + Bluetooth	Mode	Test Date:	Mar. 10, 2009	
Temperature:	23	Humidity:	62 %	Test By:	Brian



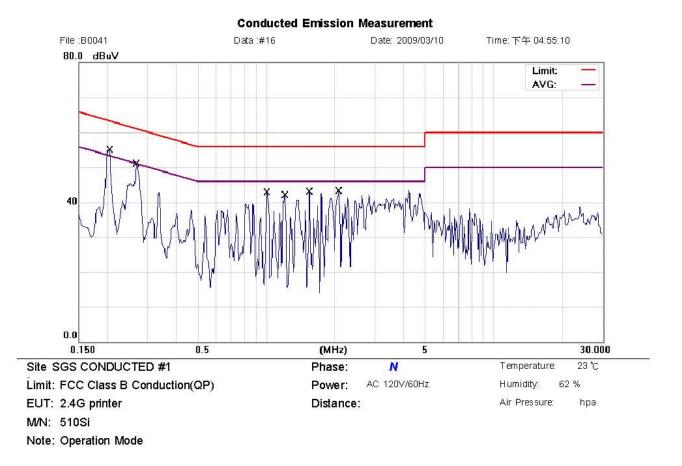
Note: Operation Mode

No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
	MHz	dBu∨	dB	dBu∀	dBu∨	dB	Detector	Comment
1 *	0.2050	52.83	0.12	52.95	63.41	-10.46	QP	
2	0.2700	48.32	0.11	48.43	61.12	-12.69	QP	
3	1.5600	43.63	0.11	43.74	56.00	-12.26	QP	
4	3.3800	43.74	0.14	43.88	56.00	-12.12	QP	
5	23.9800	48.90	0.29	49.19	60.00	-10.81	QP	
6	27.8400	48.15	0.38	48.53	60.00	-11.47	QP	



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No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
		MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector	Comment
1		0.2030	54.70	0.14	54.84	63.49	-8.65	QP	
2	*	0.2030	50.80	0.14	50.94	53.49	-2.55	AVG	
3		0.2700	50.89	0.13	51.02	61.12	-10.10	QP	
4		1.0100	42.81	0.12	42.93	56.00	-13.07	QP	
5		1.2100	42.03	0.13	42.16	56.00	-13.84	QP	
6		1.5600	43.04	0.14	43.18	56.00	-12.82	QP	
7		2.0900	43.18	0.15	43.33	56.00	-12.67	QP	

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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 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 forfixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted output power.

f (886-2) 2298-0488

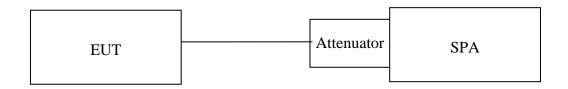


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## 6.2 Measurement Equipment Used:

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010		
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/23/2008	01/22/2010		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	02/13/2009	02/12/2010		
DC Block	Agilent	BLK-18	155452	07/05/2008	07/04/2009		
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2008	07/04/2009		
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2008	07/04/2009		
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2008	07/04/2009		
Splitter	Agilent	11636B	N/A	07/05/2008	07/04/2009		

#### 6.3 Test Set-up:



## 6.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Channel power function, RBW, VBW = 1MHz,Bandwidth=26dB occupied Bandwidth)
- 3. Record the max. reading.
- 4. Repeat above procedures until all frequency measured were complete.



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## 6.5 Measurement Result:

Cable loss $= 0$	Peak Power Output						
Frequency		Limit					
(MHz)	1	2	5.5	11	Linnt		
2412	11.22	10.97	10.64	10.25	30 dBm		
2437	11.25	11.01	10.68	10.33	30 dBm		
2462	11.76	11.43	11.25	10.94	30 dBm		

## 802.11g

Cable loss $= 0$		Peak Power Output							
Frequency	Data Rate							Limit	
(MHz)	6	9	12	18	24	36	48	54	Liiiit
2412	14.43	14.36	12.95	12.84	11.85	11.73	10.49	10.41	30 dBm
2437	14.06	13.97	12.57	12.47	11.61	11.38	10.18	10.03	30 dBm
2462	14.44	14.28	12.78	12.55	11.74	11.69	10.35	10.30	30 dBm

Note: Refer to next page for plots.

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



Comment: 1 Date: 21.JAN.2009 19:55:45

## Power Output Plot (CH Mid)



Comment: 1 Date: 21.JAN.2009 20:05:44



Report No.: EH/2008/B0019 Issue Date: Mar. 05, 2009 Page: 19 of 69

## Power Output Plot (CH High)

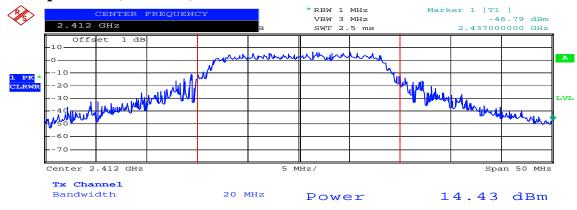


Comment: 1 Date: 21.JAN.2009 20:11:59



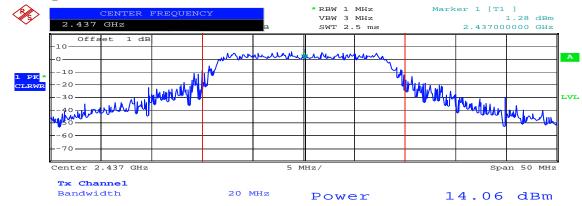
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## 802.11g, 6Mbps Power Output Plot (CH Low)



Comment: 1 Date: 13.JAN.2009 18:58:47

## Power Output Plot (CH Mid)

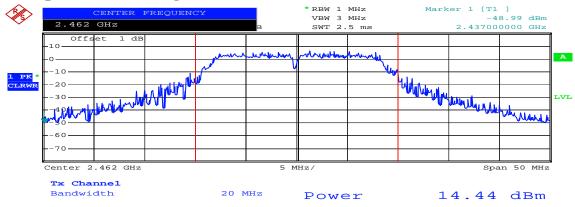


Comment: 1 Date: 13.JAN.2009 19:01:27



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## Power Output Plot (CH High)



Comment: 1 Date: 13.JAN.2009 19:05:03



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#### 6dB Bandwidth 7

#### **Standard Applicable:** 7.1

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

#### **Measurement Equipment Used:** 7.2

Refer to section 6.2 for details.

#### 7.3 **Test Set-up:**

Refer to section 6.3 for details.

#### 7.4 **Measurement Procedure:**

1.Place the EUT on the table and set it in transmitting mode.

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

f (886-2) 2298-0488



## 7.5 Measurement Result:

#### 802.11b

002.110			
Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	12.70	> 500	PASS
2437	13.00	> 500	PASS
2462	12.70	> 500	PASS

## 802.11g

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	16.30	> 500	PASS
2437	16.20	> 500	PASS
2462	16.50	> 500	PASS

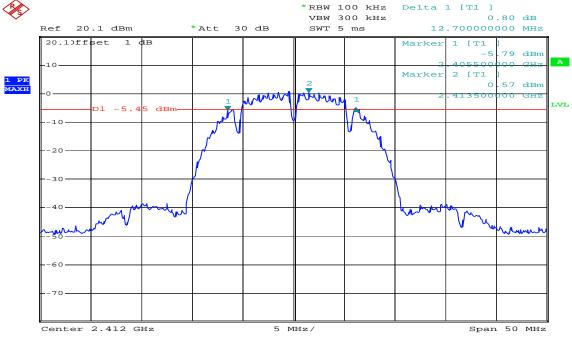
Note: Refer to next page for plots.

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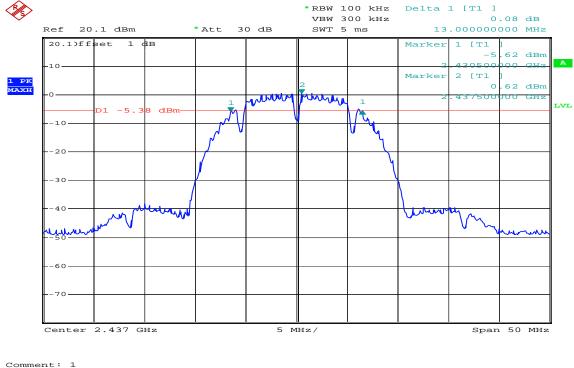
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# 802.11b 6dB Band Width Test Data CH-Low



Comment: 1 Date: 14.JAN.2009 10:23:58

## 6dB Band Width Test Data CH-Mid

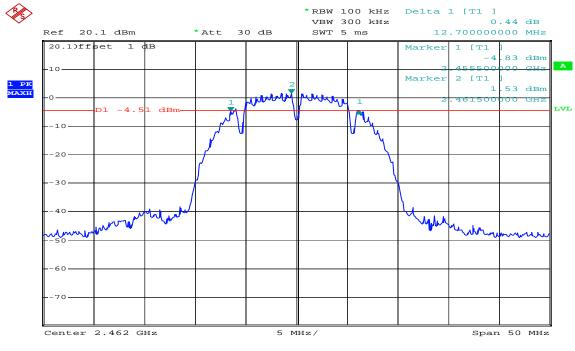


Date: 14.JAN.2009 10:28:58



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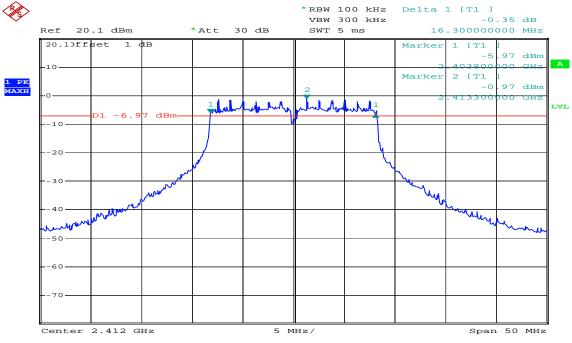


Comment: 1 Date: 14.JAN.2009 10:32:41



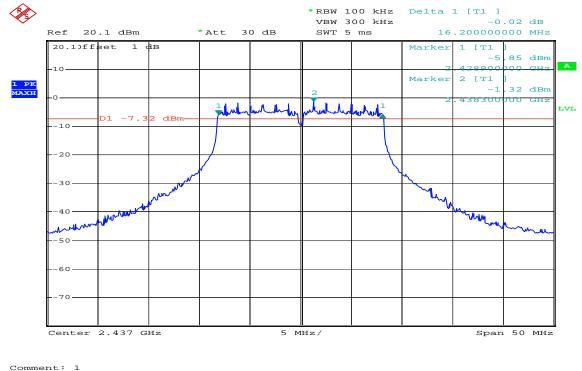
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# 802.11g 6dB Band Width Test Data CH-Low



Comment: 1 Date: 14.JAN.2009 10:36:43

## 6dB Band Width Test Data CH-Mid

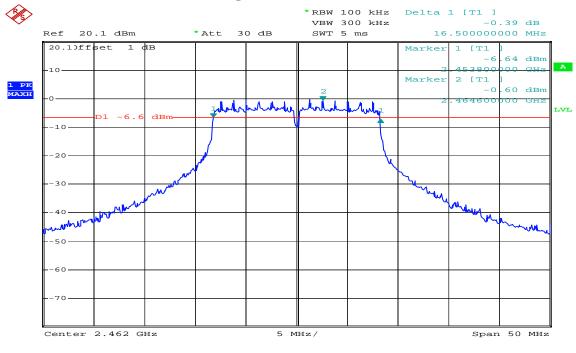


Date: 14.JAN.2009 10:41:45



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Comment: 1 Date: 14.JAN.2009 10:46:34



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## 8 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

## 8.1 Standard Applicable:

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

## 8.2 Measurement Equipment Used:

## 8.2.1 Conducted Emission at antenna port:

Refer to section 6.2 for details.

## 8.2.2 Radiated emission:

966 Chamber							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	R&S	FSP 40	100034	02/22/2009	02/21/2010		
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2008	11/14/2009		
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-320	03/14/2008	03/13/2009		
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		

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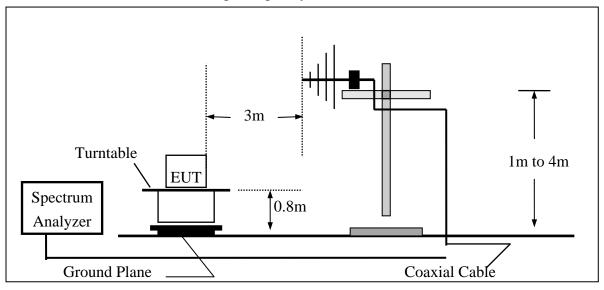
## 8.3 Test SET-UP:

## 8.3.1 Conducted Emission at antenna port:

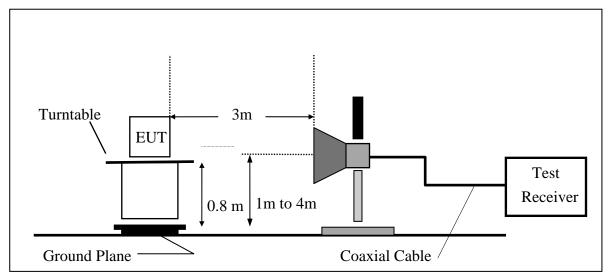
Refer to section 6.3 for details.

## 8.3.2 Radiated emission:

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



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





## 8.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
- 5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
- 6. Repeat above procedures until all frequency measured were complete.

## 8.5 Field Strength Calculation:

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

## FS = RA + AF + CL - AG

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

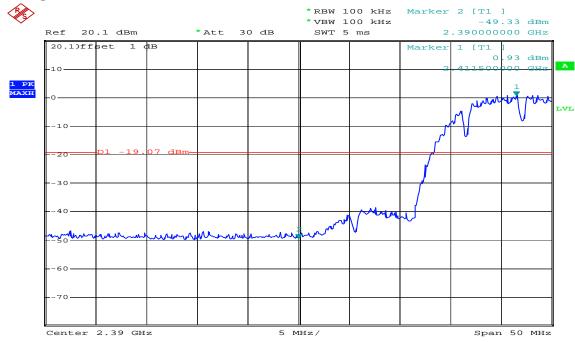
## 8.6 Measurement Result:

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



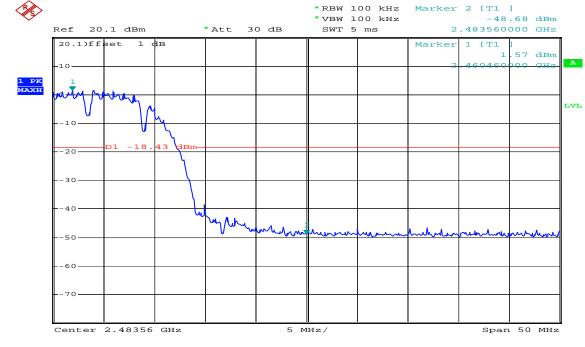
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# 802.11b Band Edges Test Data CH-Low



Comment: 1 Date: 14.JAN.2009 11:07:37

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



Comment: 1 Date: 14.JAN.2009 11:10:29



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## Radiated Emission: 802.11 b mode

Operation Mode	TX CH Low	Test Date	Jan. 22, 2009
Fundamental Frequency	2412 MHz	Test By	Brian
Tmperature	25	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq. (MHz)	Reading (dBuV)	Reading (dBuV)			AV (dBuV/m)	Limit (dBuV/m)	Limit dBuV/r	0	Remark
$(\mathbf{WIIIZ})$	(uDuv)	(uDuv)	CF (UD)		(uDu v/m)			n, (uD)	
2390.00	53.50		-10.76	42.74		74.00	54.00	-11.26	Peak
Operation	Mode	TX C	H Low			Test	Date	Jan. 22, 20	09
Fundamen	tal Frequei	ncy 2412	MHz			Test	By	Brian	
Temperatu	re	25				Pol	•	Hor.	
Humidity		65 %							
	Peak	AV		Actu	al FS	Peak	AV		

	Peak	AV		Actu	al FS	Peak	AV		
Freq. (MHz)	0	0		Peak				Margin (dB)	Remark
$(\mathbf{WHZ})$	(UDUV)	(ubuv)	CF (UD)	(dBuV/m)		)( <b>ubuv</b> /III)		( <b>UD</b> )	
2390.00	44.33		-10.76	33.57		74.00	54.00	-20.43	Peak

#### Remark:

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



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## Radiated Emission: 802.11 b mode

Operation Mode	TX CH High	Test Date	Jan. 22, 2009
Fundamental Frequency	2462 MHz	Test By	Brian
Temperature	25	Pol	Ver.
Humidity	65 %		

			Actu	al FS	Peak	AV		
0	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dB uV/m)	Limit (dBuV/n	0	Remark
7.93		-10.46	47.47		74.00	54.00	-6.53	Peak
1.93		-10.46	51.47		74.00	54.00	-2.53	Peak
Operation ModeTX CH HighFundamental Frequency2462 MHzTemperature25Humidity65 %						By	Brian	09
	<b>BuV</b> ) 7.93 1.93 de	BuV)         (dBuV)           7.93            1.93            de         TX C           Frequency         2462	7.93        -10.46         1.93        -10.46         de       TX CH High         Frequency       2462 MHz         25	BuV)         (dBuV)         CF(dB)         (dBuV/m)           7.93          -10.46         47.47           1.93          -10.46         51.47           de         TX CH High           Frequency         2462 MHz           25	BuV)         (dBuV)         CF(dB)         (dBuV/m)         (dBuV/m)           7.93          -10.46         47.47            1.93          -10.46         51.47            de         TX CH High         Frequency         2462 MHz         25	BuV)         (dBuV)         CF (dB)         (dBuV/m)         (dBuV/m)         (dBuV/m)           7.93          -10.46         47.47          74.00           1.93          -10.46         51.47          74.00           de         TX CH High         Test         Test           Frequency         2462 MHz         Test         Pol	BuV)         (dBuV)         CF(dB)         (dBuV/m)         (dB	BuV)         (dBuV)         CF (dB)         (dBuV/m)         (dBuV/m)         (dBuV/m)         (dB)           7.93          -10.46         47.47          74.00         54.00         -6.53           1.93          -10.46         51.47          74.00         54.00         -2.53           de         TX CH High         Test Date         Jan. 22, 20         Test By         Brian           Frequency         2462 MHz         25         Hor.         Test By         Brian

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Lim it	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	) (dB uV/m)	(dBuV/m	( <b>dB</b> )	
2483.56	49.44		-10.46	38.98		74.00	54.00	-15.02	Peak
2487.41	48.75		-10.46	38.29		74.00	54.00	-15.71	Peak

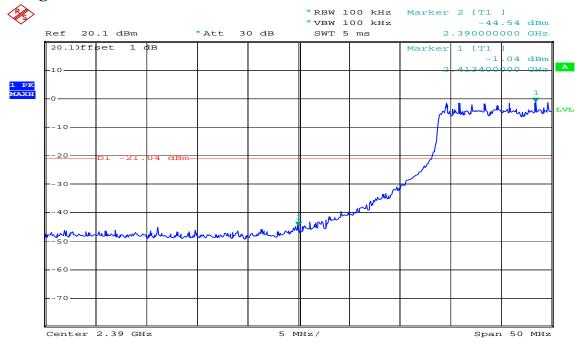
## Remark:

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



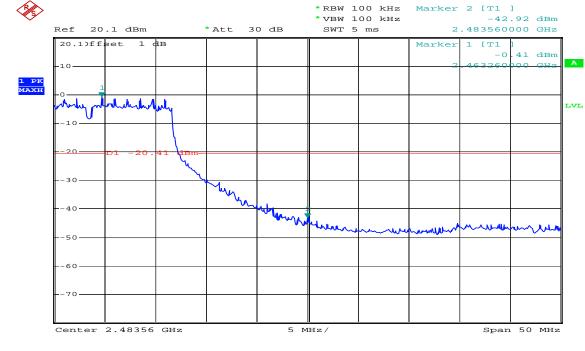
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# 802.11g Band Edges Test Data CH-Low



Comment: 1 Date: 14.JAN.2009 11:15:24

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



Comment: 1 Date: 14.JAN.2009 11:13:38



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## Radiated Emission: 802.11 g mode

Operation Mode	TX CH Low	Test Date	Jan. 22, 2009
Fundamental Frequency	2412 MHz	Test By	Brian
Tmperature	25	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq. (MHz)	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)(	Limit dBuV/n	0	Remark
2390.00	61.43	(ubu v )	-10.76	50.67	(uDu (/ III) 	74.00	54.00	-3.33	Peak
Operation Fundamen Temperatu	tal Frequer	ncy 2412 25	H Low MHz			Test Test Pol	By	Jan. 22, 20 Brian Hor.	09
Humidity	Peak	65 % AV		Actu	al FS	Peak	AV		

	геак	AV		Actu	ai r S	г еак	AV		
Freq. (MHz)	0	0		Peak (dBuV/m)			Limit (dBuV/m)	0	Remark
2390.00	52.67		-10.76	41.91		74.00	54.00	-12.09	Peak

#### Remark:

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



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## Radiated Emission: 802.11 g mode

Operation Mode	TX CH High	Test Date	Jan. 22, 2009
Fundamental Frequency	2462 MHz	Test By	Brian
Temperature	25	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	0	Reading		Peak	AV	Limit	Limit	0	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dB uV/m)	(dBuV/m	<b>)</b> ( <b>dB</b> )	
2483.56	59.37		-10.46	48.91		74.00	54.00	-5.09	Peak
2483.91	60.67		-10.46	50.21		74.00	54.00	-3.79	Peak
2485.01	60.81		-10.46	50.35		74.00	54.00	-3.65	Peak
Operation Fundamen Temperatu	tal Frequer		H High MHz			Test Test Pol	By 1	Jan. 22, 20 Brian Hor.	09
Humidity		65 %							
	Peak	AV		Actu	al FS	Peak	AV		

	геак	Αv		Actu	агэ	геак	AV		
Freq.	0	0		Peak			Limit	0	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m	(dB)	
2483.56	52.04		-10.46	41.58		74.00	54.00	-12.42	Peak

## Remark:

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

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# 9 SPURIOUS RADIATED EMISSION TEST

# 9.1 Standard Applicable

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

## 9.2 Measurement Equipment Used:

## 9.2.1 Conducted Emission at antenna port:

Refer to section 6.2 for details.

## 9.2.2 Radiated emission:

Refer to section 7.2 for details.

## 9.3 Test SET-UP:

# 9.3.1 Conducted Emission at antenna port:

Refer to section 6.3 for details.

## 9.3.2 Radiated emission:

Refer to section 7.3 for details.

#### 9.4 Measurement Procedure:

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



# 9.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

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

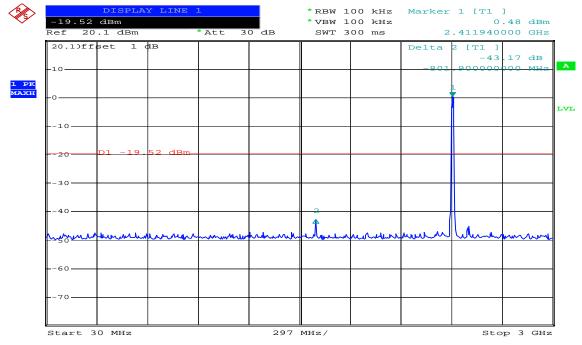
## 9.6 Measurement Result:

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



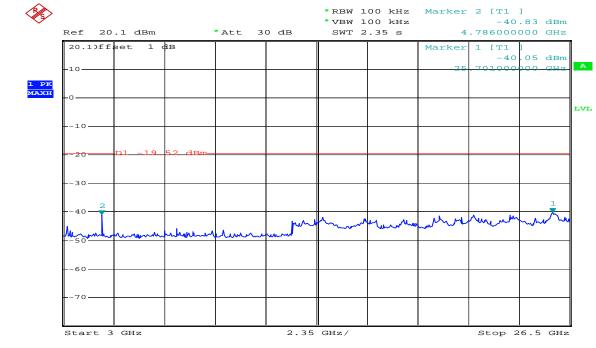
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# Conducted Spurious Emission Measurement Result (802.11b) Ch Low 30MHz – 3GHz



Comment: 1 Date: 14.JAN.2009 11:31:02

# Ch Low 3GHz – 26.5GHz

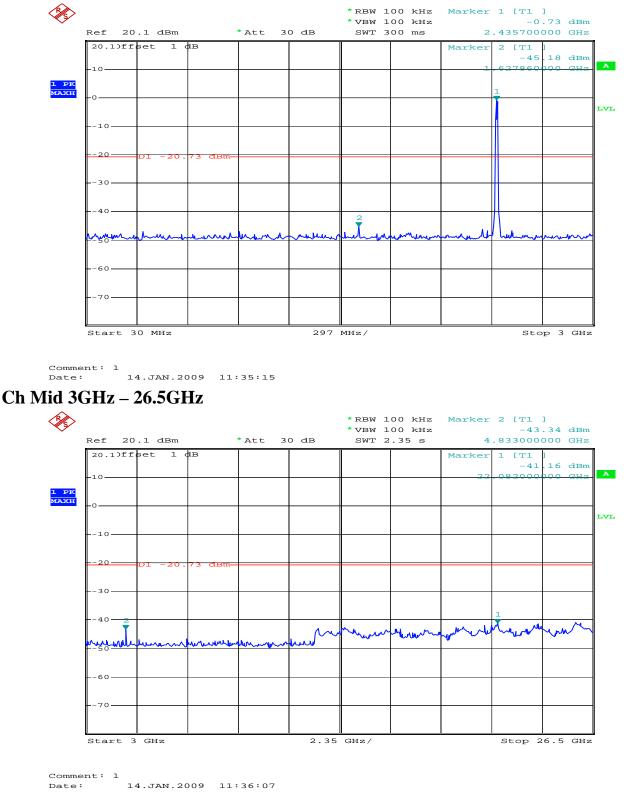


Comment: 1 Date: 14.JAN.2009 11:32:49



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# Ch Mid 30MHz – 3GHz

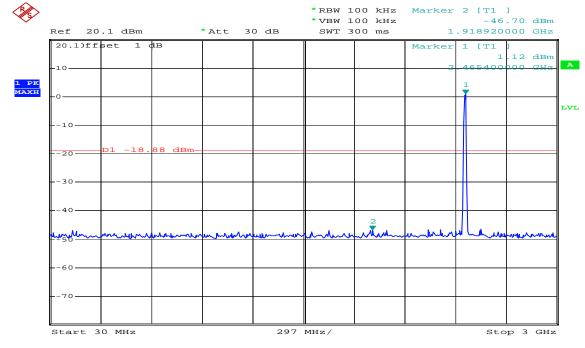


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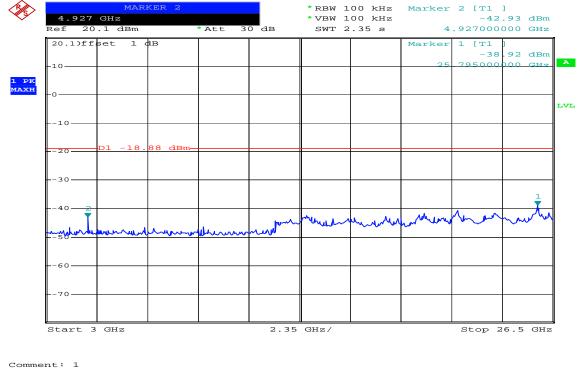
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# Ch High 30MHz – 3GHz



Comment: 1 Date: 14.JAN.2009 11:39:27

# Ch High 3GHz – 26.5GHz

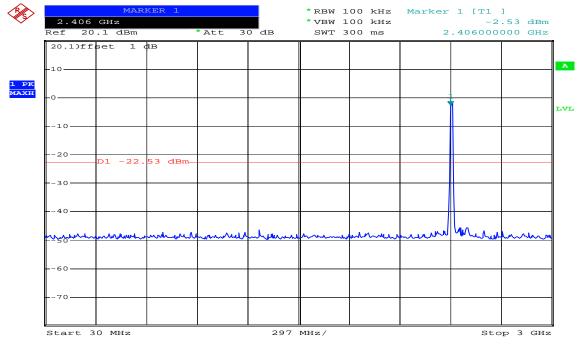


Date: 14.JAN.2009 11:40:33



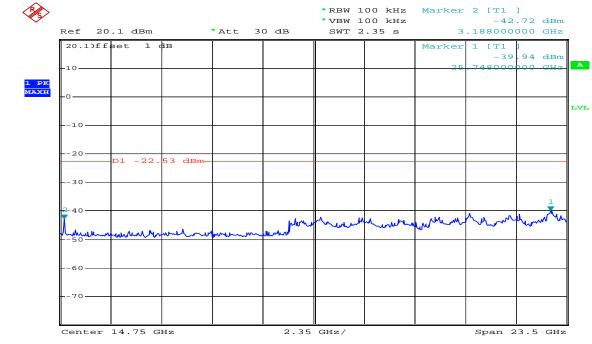
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# Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz – 3GHz





# Ch Low 3GHz – 26.5GHz

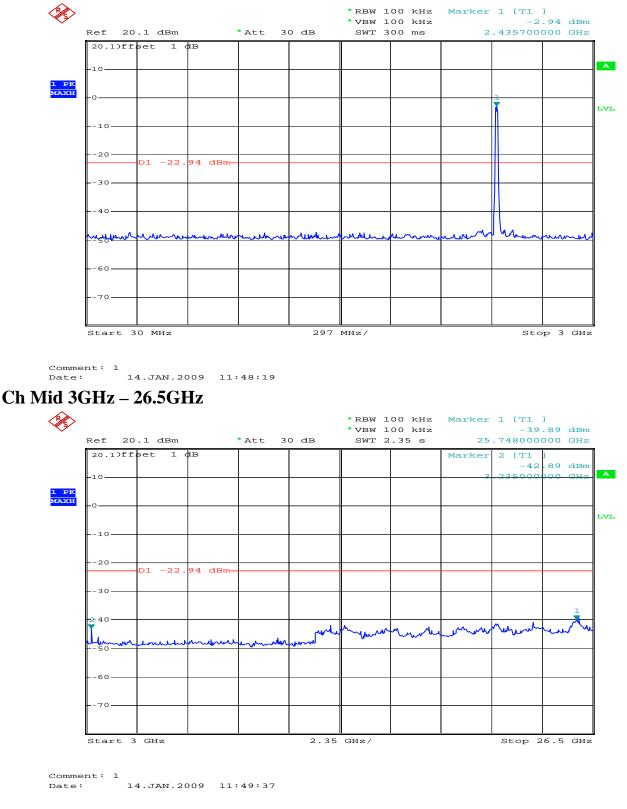


Comment: 1 Date: 14.JAN.2009 11:46:11



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# Ch Mid 30MHz – 3GHz



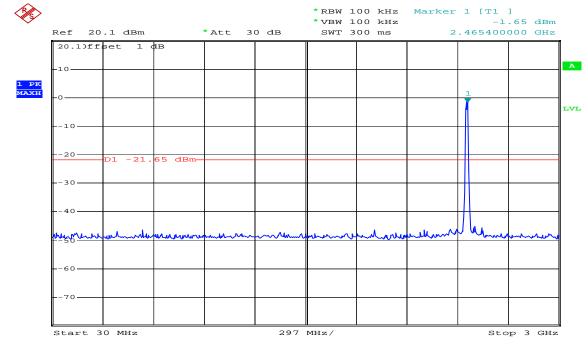
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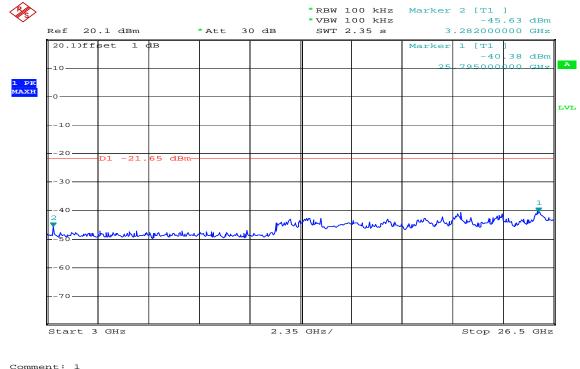
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# Ch High 30MHz – 3GHz



Comment: 1 Date: 14.JAN.2009 11:52:53

# Ch High 3GHz – 26.5GHz



Date: 14.JAN.2009 11:53:44



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

Operation Mode	802.11b TX CH Low	Test Date	Jan. 22, 2009
Fundamental Frequency	2412MHz	Test By	Brian
Temperature	25	Pol	Ver./Hor
Humidity	65 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
135.73	V	Peak	64.86	-27.87	36.99	43.50	-6.51
261.83	V	Peak	61.95	-29.61	32.34	46.00	-13.66
458.74	V	Peak	58.74	-24.91	33.83	46.00	-12.17
647.89	V	Peak	57.15	-21.93	35.22	46.00	-10.78
730.34	V	Peak	57.15	-20.89	36.26	46.00	-9.74
783.69	V	Peak	56.37	-20.30	36.07	46.00	-9.93
135.73	Н	Peak	64.86	-27.87	36.99	43.50	-6.51
261.83	Н	Peak	61.95	-29.61	32.34	46.00	-13.66
458.74	Н	Peak	58.74	-24.91	33.83	46.00	-12.17
647.89	Н	Peak	57.15	-21.93	35.22	46.00	-10.78
730.34	Н	Peak	56.52	-20.89	35.63	46.00	-10.37
783.69	Н	Peak	56.37	-20.30	36.07	46.00	-9.93

- 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 Mid	Test Date	Jan. 22, 2009
Fundamental Frequency	2437MHz	Test By	Brian
Temperature	25	Pol	Ver./Hor
Humidity	65 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
 (MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
135.73	V	Peak	68.99	-27.87	41.12	43.50	-2.38
148.34	V	Peak	66.81	-27.10	39.71	43.50	-3.79
216.24	V	Peak	71.45	-30.90	40.55	46.00	-5.45
230.79	V	Peak	68.84	-29.35	39.49	46.00	-6.51
269.59	V	Peak	65.35	-29.35	36.00	46.00	-10.00
783.69	V	Peak	59.59	-20.30	39.29	46.00	-6.71
135.73	Н	Peak	62.13	-27.87	34.26	43.50	-9.24
162.89	Н	Peak	57.38	-27.18	30.20	43.50	-13.30
269.59	Н	Peak	60.92	-29.35	31.57	46.00	-14.43
458.74	Н	Peak	59.33	-24.91	34.42	46.00	-11.58
640.13	Н	Peak	56.55	-22.16	34.39	46.00	-11.61
674.08	Н	Peak	54.31	-21.52	32.79	46.00	-13.21

- 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	Jan. 22, 2009
Fundamental Frequency	2462MHz	Test By	Brian
Temperature	25	Pol	Ver./Hor
Humidity	65 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
135.73	V	Peak	67.98	-27.87	40.11	43.50	-3.39
216.24	V	Peak	72.46	-30.90	41.56	46.00	-4.44
269.59	V	Peak	65.59	-29.35	36.24	46.00	-9.76
484.93	V	Peak	61.14	-24.86	36.28	46.00	-9.72
674.08	V	Peak	56.64	-21.52	35.12	46.00	-10.88
783.69	V	Peak	57.22	-20.30	36.92	46.00	-9.08
135.73	Н	Peak	63.19	-27.87	35.32	43.50	-8.18
216.24	Н	Peak	62.91	-30.90	32.01	46.00	-13.99
269.59	Н	Peak	60.92	-29.35	31.57	46.00	-14.43
458.74	Н	Peak	57.62	-24.91	32.71	46.00	-13.29
749.74	Н	Peak	56.22	-20.66	35.56	46.00	-10.44
783.69	Н	Peak	55.78	-20.30	35.48	46.00	-10.52

- 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	Jan. 22, 2009
Fundamental Frequency	2412MHz	Test By	Brian
Temperature	25	Pol	Ver./Hor
Humidity	65 %		

F	req.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(N	(Hz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
13	35.73	V	Peak	69.18	-27.87	41.31	43.50	-2.19
16	52.89	V	Peak	62.90	-27.18	35.72	43.50	-7.78
21	6.24	V	Peak	68.89	-30.90	37.99	46.00	-8.01
26	59.59	V	Peak	64.98	-29.35	35.63	46.00	-10.37
48	34.93	V	Peak	61.65	-24.86	36.79	46.00	-9.21
78	33.69	V	Peak	58.78	-20.30	38.48	46.00	-7.52
13	35.73	Н	Peak	62.37	-27.87	34.50	43.50	-9.00
21	6.24	Н	Peak	62.42	-30.90	31.52	46.00	-14.48
26	51.83	Н	Peak	61.52	-29.61	31.91	46.00	-14.09
45	58.74	Н	Peak	58.93	-24.91	34.02	46.00	-11.98
67	74.08	Н	Peak	55.56	-21.52	34.04	46.00	-11.96
78	33.69	Н	Peak	56.32	-20.30	36.02	46.00	-9.98

- 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	Jan. 22, 2009
Fundamental Frequency	2437MHz	Test By	Brian
Temperature	25	Pol	Ver./Hor
Humidity	65 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
 (MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
135.73	V	Peak	68.63	-27.87	40.76	43.50	-2.74
148.34	V	Peak	65.86	-27.10	38.76	43.50	-4.74
216.24	V	Peak	70.39	-30.90	39.49	46.00	-6.51
242.43	V	Peak	67.35	-29.87	37.48	46.00	-8.52
783.69	V	Peak	56.79	-20.30	36.49	46.00	-9.51
837.04	V	Peak	54.07	-19.80	34.27	46.00	-11.73
135.73	Н	Peak	62.57	-27.87	34.70	43.50	-8.80
216.24	Н	Peak	64.66	-30.90	33.76	46.00	-12.24
261.83	Н	Peak	61.41	-29.61	31.80	46.00	-14.20
458.74	Н	Peak	59.19	-24.91	34.28	46.00	-11.72
730.34	Н	Peak	54.05	-20.89	33.16	46.00	-12.84
783.69	Н	Peak	57.76	-20.30	37.46	46.00	-8.54

- 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	Jan. 22, 2009
Fundamental Frequency	2462MHz	Test By	Brian
Temperature	25	Pol	Ver./Hor
Humidity	65 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
 (MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
135.73	V	Peak	68.63	-27.87	40.76	43.50	-2.74
148.34	V	Peak	65.73	-27.10	38.63	43.50	-4.87
216.24	V	Peak	71.93	-30.90	41.03	46.00	-4.97
250.19	V	Peak	65.86	-29.87	35.99	46.00	-10.01
518.88	V	Peak	58.83	-24.33	34.50	46.00	-11.50
783.69	V	Peak	55.76	-20.30	35.46	46.00	-10.54
135.73	Н	Peak	62.62	-27.87	34.75	43.50	-8.75
216.24	Н	Peak	63.73	-30.90	32.83	46.00	-13.17
261.83	Н	Peak	60.87	-29.61	31.26	46.00	-14.74
458.74	Н	Peak	58.56	-24.91	33.65	46.00	-12.35
730.34	Н	Peak	55.91	-20.89	35.02	46.00	-10.98
783.69	Н	Peak	56.31	-20.30	36.01	46.00	-9.99

- 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	Jan. 22, 2009
Fundamental Frequency	2412MHz	Test By	Brian
Temperature	25	Pol	Ver.
Humidity	65 %		

		Peak	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/m)	( <b>dB</b> )	
	3203.5	54.16		-10.39	43.77		74.00	54.00	-10.23	Peak
	4824.0	60.88	58.72	-6.01	54.87	52.71	74.00	54.00	-1.29	AV
	7236.0						74.00	54.00		
	9648.0						74.00	54.00		
	12060.0						74.00	54.00		
	14472.0						74.00	54.00		
	16884.0						74.00	54.00		
	19296.0						74.00	54.00		
	21708.0						74.00	54.00		
	24120.0						74.00	54.00		

#### Remark:

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



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

Operation Mode	802.11b TX CH Low	Test Date	Jan. 22, 2009
Fundamental Frequency	2412MHz	Test By	Brian
Temperature	25	Pol	Hor
Humidity	65 %		

		Peak	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/m)	( <b>dB</b> )	
_	3203.5	46.86		-10.39	36.47		74.00	54.00	-17.53	Peak
	4824.0	49.20		-6.01	43.19		74.00	54.00	-10.81	Peak
	7236.0						74.00	54.00		
	9648.0						74.00	54.00		
	12060.0						74.00	54.00		
	14472.0						74.00	54.00		
	16884.0						74.00	54.00		
	19296.0						74.00	54.00		
	21708.0						74.00	54.00		
	24120.0						74.00	54.00		

#### Remark:

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



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

Operation Mode	802.11b TX CH Mid	Test Date	Jan. 22, 2009
Fundamental Frequency	2437MHz	Test By	Brian
Temperature	25	Pol	Ver
Humidity	65 %		

Peak	AV		Actu	al FS	Peak	AV		
Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
55.36		-10.40	44.96		74.00	54.00	-9.04	Peak
60.81	59.07	-5.97	54.84	53.10	74.00	54.00	-0.90	AV
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
					74.00	54.00		
	Reading         (dBuV)         55.36         60.81 </td <td>Reading         Reading           (dBuv)         (dBuv)           55.36            60.81         59.07            59.07   </td> <td>ReadingReadingAnt./Cla(dBuv)(dBuv)CF(dBuv)55.3610.4060.8159.07-5.975.97<!--</td--><td>ReadingAnt./CLPeak(dBuV)CF(dB)(dBuV/n)55.3610.4044.9660.8159.07-5.9754.845.9754.84</td><td>ReadingAnt./CLPeakAV(dBuV)(dBuV)(dBuV)(dBuV)55.3610.4044.9660.8159.07-5.9754.8453.105.9754.8453.10<td>ReadingReadingAnt./ClPeakAVLimit(dBuv)CF(dB)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0060.8159.07-5.9754.8453.1074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.00<!--</td--><td>ReadingReadingAnt./ClPeakAVLimitLimit(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3674.0054.0060.8159.07-5.9754.8453.10074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.00<td>ReadingReadingAnt/CLPeakAVLimitLimitMargin(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0054.00-9.0460.8159.07-5.9754.8453.1074.0054.00-0.9074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.00<t< td=""></t<></td></td></td></td></td>	Reading         Reading           (dBuv)         (dBuv)           55.36            60.81         59.07            59.07	ReadingReadingAnt./Cla(dBuv)(dBuv)CF(dBuv)55.3610.4060.8159.07-5.975.97 </td <td>ReadingAnt./CLPeak(dBuV)CF(dB)(dBuV/n)55.3610.4044.9660.8159.07-5.9754.845.9754.84</td> <td>ReadingAnt./CLPeakAV(dBuV)(dBuV)(dBuV)(dBuV)55.3610.4044.9660.8159.07-5.9754.8453.105.9754.8453.10<td>ReadingReadingAnt./ClPeakAVLimit(dBuv)CF(dB)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0060.8159.07-5.9754.8453.1074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.00<!--</td--><td>ReadingReadingAnt./ClPeakAVLimitLimit(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3674.0054.0060.8159.07-5.9754.8453.10074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.00<td>ReadingReadingAnt/CLPeakAVLimitLimitMargin(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0054.00-9.0460.8159.07-5.9754.8453.1074.0054.00-0.9074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.00<t< td=""></t<></td></td></td></td>	ReadingAnt./CLPeak(dBuV)CF(dB)(dBuV/n)55.3610.4044.9660.8159.07-5.9754.845.9754.84	ReadingAnt./CLPeakAV(dBuV)(dBuV)(dBuV)(dBuV)55.3610.4044.9660.8159.07-5.9754.8453.105.9754.8453.10 <td>ReadingReadingAnt./ClPeakAVLimit(dBuv)CF(dB)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0060.8159.07-5.9754.8453.1074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.00<!--</td--><td>ReadingReadingAnt./ClPeakAVLimitLimit(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3674.0054.0060.8159.07-5.9754.8453.10074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.00<td>ReadingReadingAnt/CLPeakAVLimitLimitMargin(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0054.00-9.0460.8159.07-5.9754.8453.1074.0054.00-0.9074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.00<t< td=""></t<></td></td></td>	ReadingReadingAnt./ClPeakAVLimit(dBuv)CF(dB)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0060.8159.07-5.9754.8453.1074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.0074.00 </td <td>ReadingReadingAnt./ClPeakAVLimitLimit(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3674.0054.0060.8159.07-5.9754.8453.10074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.00<td>ReadingReadingAnt/CLPeakAVLimitLimitMargin(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0054.00-9.0460.8159.07-5.9754.8453.1074.0054.00-0.9074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.00<t< td=""></t<></td></td>	ReadingReadingAnt./ClPeakAVLimitLimit(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3674.0054.0060.8159.07-5.9754.8453.10074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.0054.00 <td>ReadingReadingAnt/CLPeakAVLimitLimitMargin(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0054.00-9.0460.8159.07-5.9754.8453.1074.0054.00-0.9074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.00<t< td=""></t<></td>	ReadingReadingAnt/CLPeakAVLimitLimitMargin(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)(dBuv)55.3610.4044.9674.0054.00-9.0460.8159.07-5.9754.8453.1074.0054.00-0.9074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.0074.0054.00 <t< td=""></t<>

#### Remark:

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



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

Operation Mode	802.11b TX CH Mid	Test Date	Jan. 22, 2009
Fundamental Frequency	2437MHz	Test By	Brian
Temperature	25	Pol	Hor
Humidity	65 %		

	Peak	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/m)	( <b>dB</b> )	
3236.0	46.00		-10.40	35.60		74.00	54.00	-18.40	Peak
4874.0	50.14		-5.97	44.17		74.00	54.00	-9.83	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		
24370.0						74.00	54.00		

#### Remark:

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



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

Operation Mode	802.11b TX CH High	Test Date	Jan. 22, 2009
Fundamental Frequency	2462MHz	Test By	Brian
Temperature	25	Pol	Ver
Humidity	65 %		

		Peak	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/m)	( <b>dB</b> )	
_	3288.0	57.08		-10.37	46.71		74.00	54.00	-7.29	Peak
	4924.0	59.78	58.41	-5.91	53.87	52.50	74.00	54.00	-1.50	AV
	7386.0						74.00	54.00		
	9848.0						74.00	54.00		
	12310.0						74.00	54.00		
	14772.0						74.00	54.00		
	17234.0						74.00	54.00		
	19696.0						74.00	54.00		
	22158.0						74.00	54.00		
	24620.0						74.00	54.00		

#### Remark:

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

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

Operation Mode	802.11b TX CH High	Test Date	Jan. 22, 2009
Fundamental Frequency	2462MHz	Test By	Brian
Temperature	25	Pol	Hor
Humidity	65 %		

	Peak	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/m)	( <b>dB</b> )	
3288.0	48.41		-10.37	38.04		74.00	54.00	-15.96	Peak
4924.0	47.92		-5.91	42.01		74.00	54.00	-11.99	Peak
7386.0						74.00	54.00		
9848.0						74.00	54.00		
12310.0						74.00	54.00		
14772.0						74.00	54.00		
17234.0						74.00	54.00		
19696.0						74.00	54.00		
22158.0						74.00	54.00		
24620.0						74.00	54.00		

#### Remark:

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

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

Operation Mode	802.11g TX CH Low	Test Date	Jan. 22, 2009
Fundamental Frequency	2412MHz	Test By	Brian
Temperature	25	Pol	Ver.
Humidity	65 %		

		Peak	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/m)	( <b>dB</b> )	
_	3288.0	64.02	63.13	-10.39	53.63	52.74	74.00	54.00	-1.26	AV
	4824.0	54.04		-6.01	48.03		74.00	54.00	-5.97	Peak
	7236.0						74.00	54.00		
	9648.0						74.00	54.00		
	12060.0						74.00	54.00		
	14472.0						74.00	54.00		
	16884.0						74.00	54.00		
	19296.0						74.00	54.00		
	21708.0						74.00	54.00		
	24120.0						74.00	54.00		

#### Remark:

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



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

Operation Mode	802.11g TX CH Low	Test Date	Jan. 22, 2009
Fundamental Frequency	2412MHz	Test By	Brian
Temperature	25	Pol	Hor
Humidity	65 %		

		Peak	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/m)	( <b>dB</b> )	
	3288.0	56.46		-10.39	46.07		74.00	54.00	-7.93	Peak
	4824.0	45.76		-6.01	39.75		74.00	54.00	-14.25	Peak
	7236.0						74.00	54.00		
	9648.0						74.00	54.00		
	12060.0						74.00	54.00		
	14472.0						74.00	54.00		
	16884.0						74.00	54.00		
	19296.0						74.00	54.00		
	21708.0						74.00	54.00		
	24120.0						74.00	54.00		

#### Remark:

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



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

Operation Mode	802.11g TX CH Mid	Test Date	Jan. 22, 2009
Fundamental Frequency	2437MHz	Test By	Brian
Temperature	25	Pol	Ver
Humidity	65 %		

	Peak	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/m)	( <b>dB</b> )	
3236.0	65.00	63.95	-10.41	54.59	53.54	74.00	54.00	-0.46	AV
4874.0	50.86		-5.97	44.89		74.00	54.00	-9.11	Peak
7311.0						74.00	54.00		
9748.0						74.00	54.00		
12185.0						74.00	54.00		
14622.0						74.00	54.00		
17059.0						74.00	54.00		
19496.0						74.00	54.00		
21933.0						74.00	54.00		
24370.0						74.00	54.00		

#### Remark:

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

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

Operation Mode	802.11g TX CH Mid	Test Date	Jan. 22, 2009
Fundamental Frequency	2437MHz	Test By	Brian
Temperature	25	Pol	Hor
Humidity	65 %		

		Peak	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/m)	( <b>dB</b> )	
	3236.0	55.88		-10.40	45.48		74.00	54.00	-8.52	Peak
	4874.0	44.42		-5.93	38.49		74.00	54.00	-15.51	Peak
	7311.0						74.00	54.00		
	9748.0						74.00	54.00		
	12185.0						74.00	54.00		
	14622.0						74.00	54.00		
	17059.0						74.00	54.00		
	19496.0						74.00	54.00		
	21933.0						74.00	54.00		
	24370.0						74.00	54.00		

#### Remark:

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



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

Operation Mode	802.11g TX CH High	Test Date	Jan. 22, 2009
Fundamental Frequency	2462MHz	Test By	Brian
Temperature	25	Pol	Ver
Humidity	65 %		

		Peak	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/m)	( <b>dB</b> )	
	3288.0	64.13	63.87	-10.37	53.76	53.50	74.00	54.00	-0.50	AV
	4924.0	49.70		-5.94	43.76		74.00	54.00	-10.24	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:

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

Operation Mode	802.11g TX CH High	Test Date	Jan. 22, 2009
Fundamental Frequency	2462MHz	Test By	Brian
Temperature	25	Pol	Hor
Humidity	65 %		

		Peak	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/m)	( <b>dB</b> )	
_	3288.0	55.49		-10.37	45.12		74.00	54.00	-8.88	Peak
	4924.0	44.20		-5.91	38.29		74.00	54.00	-15.71	Peak
	7386.0						74.00	54.00		
	9848.0						74.00	54.00		
	12310.0						74.00	54.00		
	14772.0						74.00	54.00		
	17234.0						74.00	54.00		
	19696.0						74.00	54.00		
	22158.0						74.00	54.00		
	24620.0						74.00	54.00		

#### Remark:

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

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# **10 Peak Power Spectral Density**

#### **10.1 Standard Applicable:**

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

## 10.2 Measurement Equipment Used:

Refer to section 6.2 for details.

## 10.3 Test Set-up:

Refer to section 6.3 for details.

#### **10.4 Measurement Procedure:**

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW = 3KHz, VBW = 10KHz, Span = 1.5MHz, Sweep=100s
- 4. Record the max. reading.
- 5. Repeat above procedures until all frequency measured were complete.



# **10.5 Measurement Result:**

802.11b

СН	<b>RF</b> Power Density	Cable loss RF Power Density		Maximum Limit			
	Reading (dBm)	(dB)	Level (dBm)	(dBm)			
Low	-16.99	0.00	-16.99	8			
Mid	-15.90	0.00	-15.90	8			
High	-15.56	0.00	-15.56	8			

802.11g

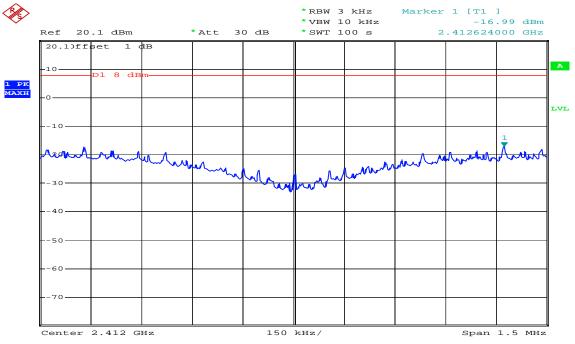
СН	<b>RF</b> Power Density	Cable loss	<b>RF</b> Power Density	Maximum Limit
	Reading (dBm)	(dB)	Level (dBm)	(dBm)
Low	-16.78	0.00	-16.78	8
Mid	-15.84	0.00	-15.84	8
High	-10.63	0.00	-10.63	8

Note: Refer to next page for plots.



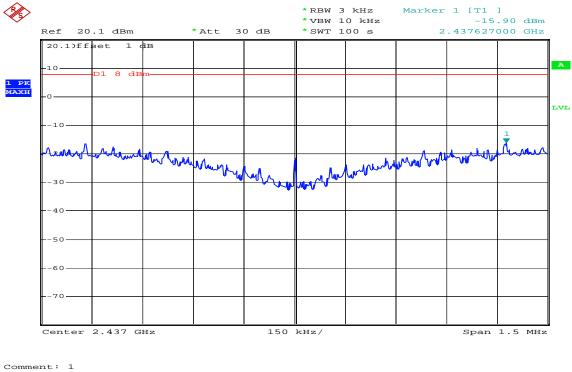
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# 802.11b Power Spectral Density Test Plot (CH-Low)



Comment: 1 Date: 3.FEB.2009 10:20:46

# Power Spectral Density Test Plot (CH-Mid)



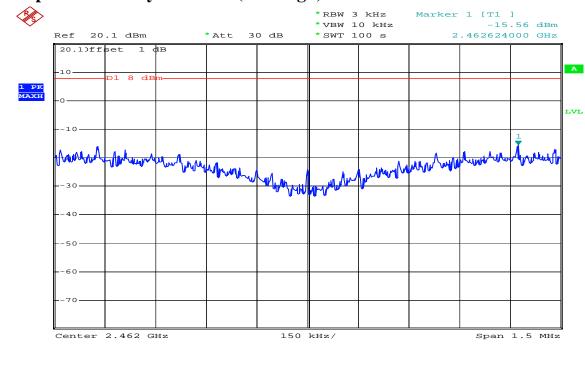
Date: 3.FEB.2009 10:26:54

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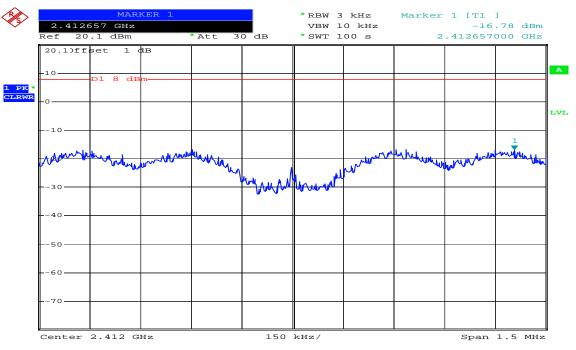
# **Power Spectral Density Test Plot (CH-High)**

Comment: 1 Date: 3.FEB.2009 10:31:13



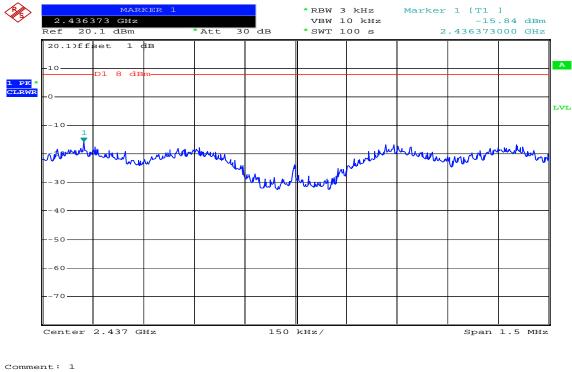
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# 802.11g Power Spectral Density Test Plot (CH-Low)



Comment: 1 Date: 13.JAN.2009 20:02:43

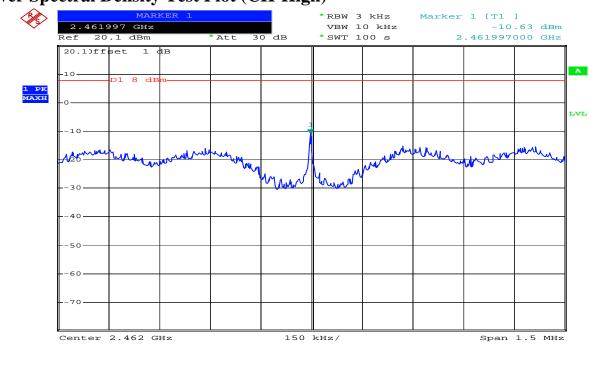
# Power Spectral Density Test Plot (CH-Mid)



Date: 13.JAN.2009 20:08:01



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

Comment: 1 Date: 13.JAN.2009 20:19:00



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# **11 ANTENNA REQUIREMENT**

#### **11.1 Standard Applicable:**

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

#### **11.2 Antenna Connected Construction:**

The directional gins of antenna used for transmitting is 2dBi, and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec.for details.

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