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LINUDIX

Dates of Tests: February 04 ~ 21, 2008
Test Report S/N: LR500190802B
Test Site : LTA CO., LTD.

CERTIFICATION OF COMPLIANCE

FCC ID. **SRVWMGMR01**

APPLICANT **LINUDIX CO., LTD.**

FCC Classification	**:**	**FCC Part 15 Spread Spectrum Transceiver (DSS)**
Manufacturing Description	**:**	**802.11g Wireless LAN SiP Module**
Manufacturer	**:**	**LINUDIX CO., LTD.**
Model name	**:**	**WM-G-MR-01**
Test Device Serial No.:	**:**	**-**
Rule Part(s)	**:**	**FCC Part 15.247 Subpart C; ANSI C-63.4-2003**
Frequency Range	**:**	**2412MHz ~ 2462MHz**
RF power	**:**	**18.90dBm Peak Conducted (802.11b)**
		18.44dBm Peak Conducted (802.11g)
Data of issue	**:**	**February 22, 2008**

This test report is issued under the authority of:

Dong –Min JUNG, Technical Manager

The test was supervised by:

Kyung-Taek LEE, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.

NVLAP

NVLAP LAB Code.: 200723-0

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1. General information's

1-1 Test Performed

Company name : LTA Co., Ltd.

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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2008-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2009-06-20	EMC accredited Lab.
FCC	U.S.A	610755	2008-03-28	FCC filing
VCCI	JAPAN	R2133, C2307	2008-06-22	VCCI registration
IC	CANADA	IC5799	2008-04-23	IC filing

2. Information's about test item

2-1 Client & Manufacturer

Company name	:	LINUDIX Co.,Ltd.
Address	:	Anyang K-Center 6F, 1591-9, Kwanyang-Dong, Dongan-Gu, Anyang, Gyeonggi, Korea (431-060)
Tel / Fax	:	+82-31-381-4294 / +82-31-381-7684

2-2 Equipment Under Test (EUT)

Trade name	:	802.11g Wireless LAN SiP Module
FCC ID	:	SRVWMGMR01
Model name	:	WM-G-MR-01
Serial number	:	-
Date of receipt	:	February 04, 2008
EUT condition	:	Pre-production, not damaged
Antenna type	:	Monopole Antenna Max. Gain 4.33 dBi
Frequency Range	:	2412MHz ~ 2462MHz (DSSS)
RF output power	:	18.90dBm Peak Conducted (802.11b) 18.44dBm Peak Conducted (802.11g)
Type of Modulation	:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer Rate	:	11/5.5/2/1Mbps for 802.11b 54/48/36/24/18/12/9/6Mbps for 802.11g
Power Source	:	3.3Vdc from host equipment

2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	2412	2437	2462

2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
PC	HP COMPAG dx2200	CNG6500RX9	HP
Monitor	VS11353	E060T0404	View Sonic
Keyboard	SK-8115	641-OEWW	DELL
Mouse	M056U0	520107013	DELL
Print	STYLUS C65	N/A	EPSON
Router	BR-015B SKY	11470Y20P3085	LANSTORY INC
Zig Board	N/A	N/A	LINUDIX

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	> 500kHz	Conducted	C
15.247(b)	Transmitter Peak Output Power	< 1Watt		C
15.247(d)	Transmitter Power Spectral Density	< 8dBm @ 3kHz		C
15.247(d)	Band Edge & Spurious	> 20 dBc		C
15.209	Field Strength of Harmonics	Emission	Radiated	C
15.207	AC Conducted Emissions	Emissions	Conducted	C
15.203	Antenna requirement	-	-	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

→ Antenna Requirement

The LINUDIX Co., Ltd. 'WM-G-MR-01' unit complies with the requirement of §15.203.
The antenna connector of module is the MHF connector.

The sample was tested according to the following specification:
FCC Parts 15.247; ANSI C-63.4-2003

3.2 Technical Characteristics Test (802.11b/g)

3.2.1 6 dB Bandwidth

Procedure:

The bandwidth at 6dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 30 MHz

VBW = 300 kHz (VBW ≥ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data:

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11b	2412	1	10.20	Complies
	2437	6	10.50	Complies
	2462	11	10.28	Complies
802.11g	2412	1	16.58	Complies
	2437	6	16.65	Complies
	2462	11	16.58	Complies

- See next pages for actual measured spectrum plots.

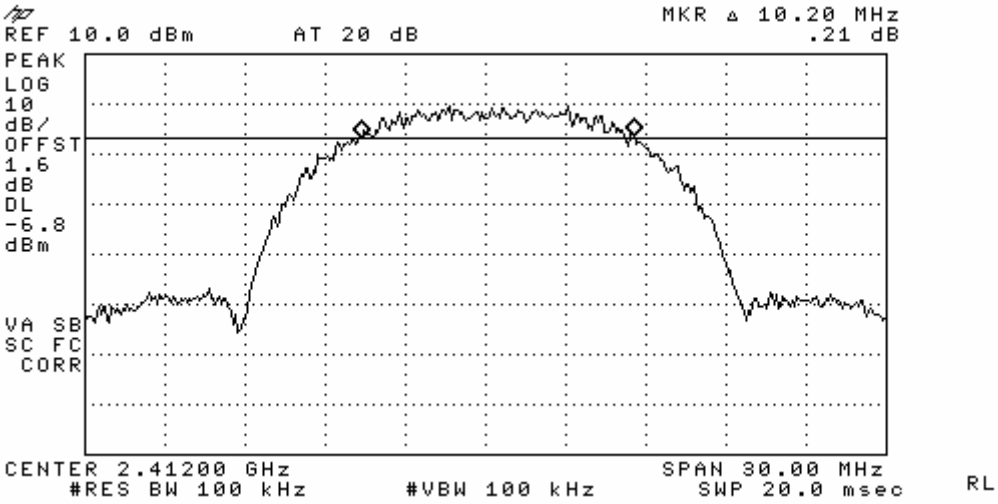
Minimum Standard:

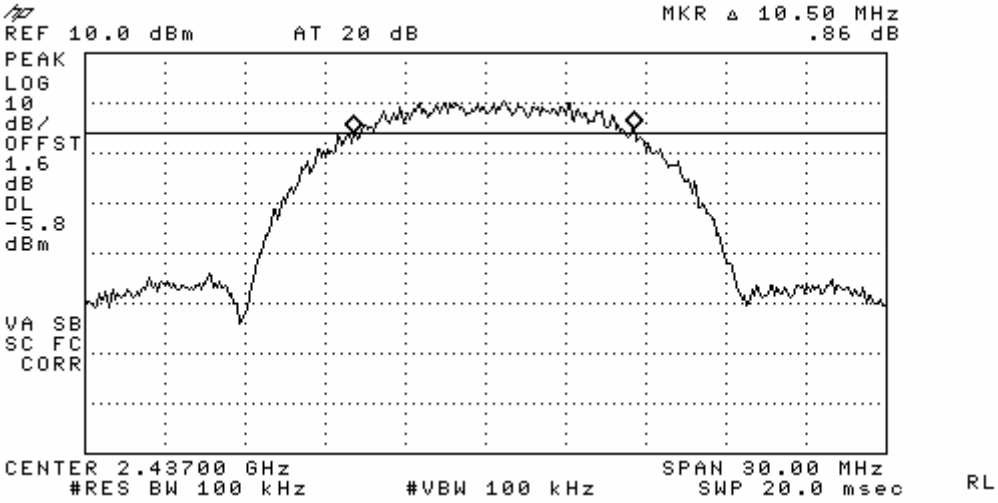
6 dB Bandwidth > 500kHz

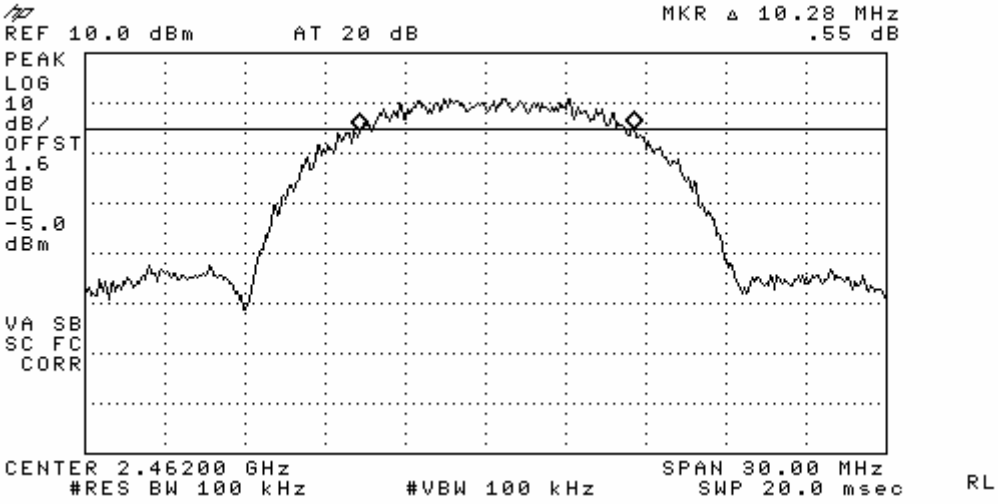
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

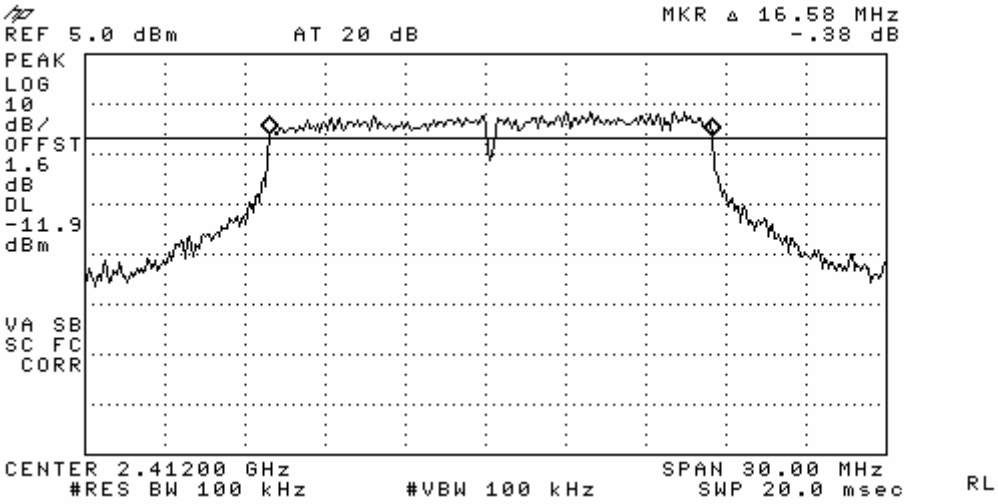
802.11b

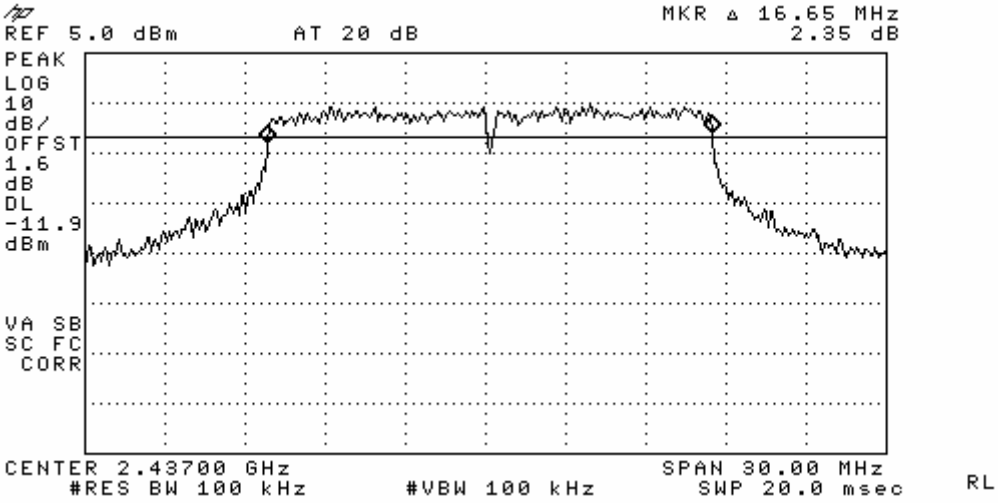


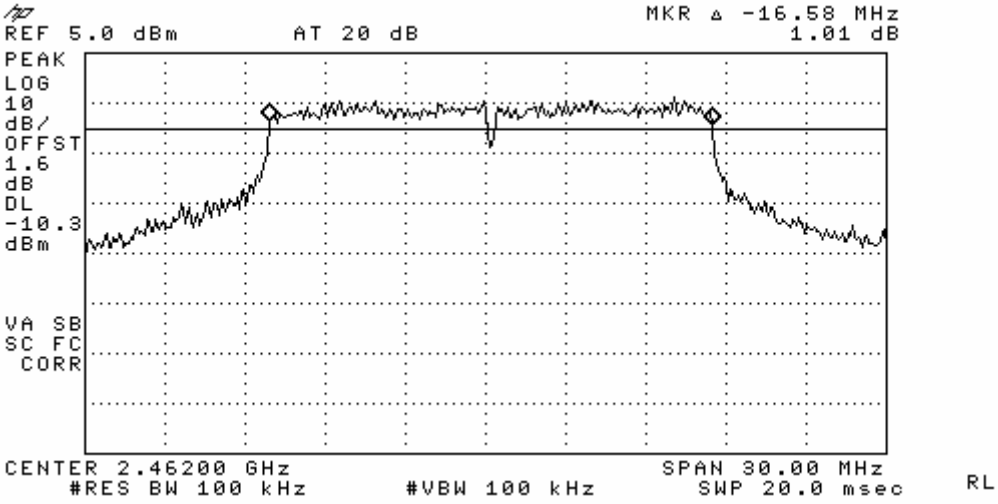




802.11g







3.2.2 Peak Output Power Measurement

Procedure:

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 1MHz Span = auto

VBW = 3MHz (VBW ≥ RBW) Sweep = auto

Detector function = peak

Measurement Data:

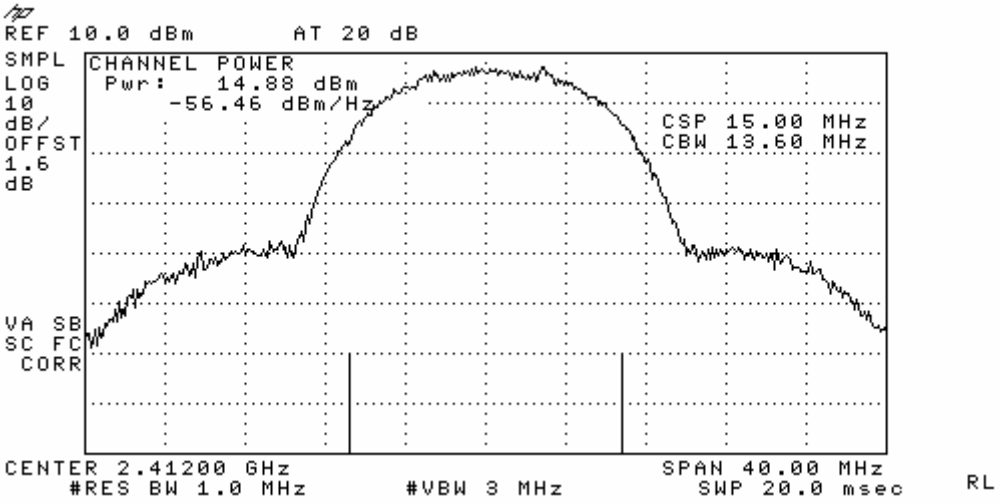
Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Data (dBm)	Result
802.11b	2412	1	14.88	Complies
	2437	6	14.74	Complies
	2462	11	14.91	Complies
802.11g	2412	1	13.02	Complies
	2437	6	13.15	Complies
	2462	11	13.11	Complies

- See next pages for actual measured spectrum plots.

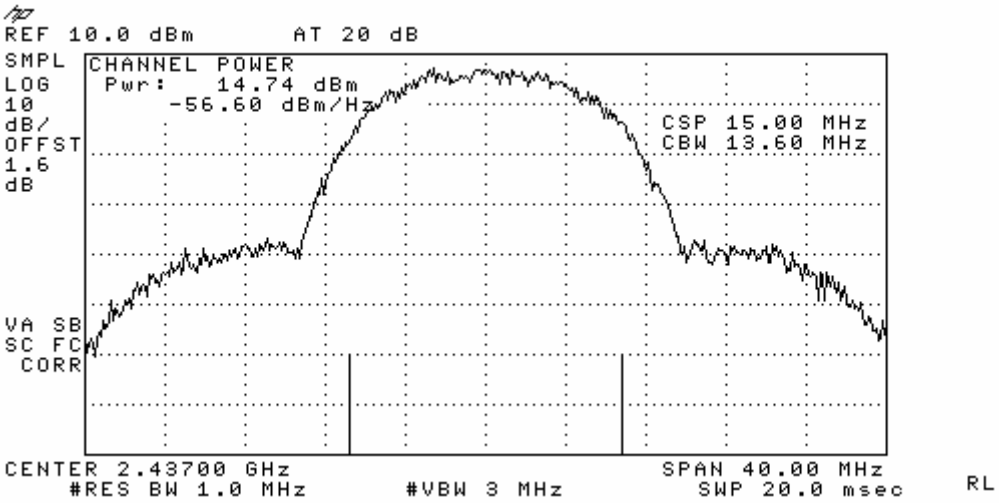
Minimum Standard:

Peak output power	< 1W

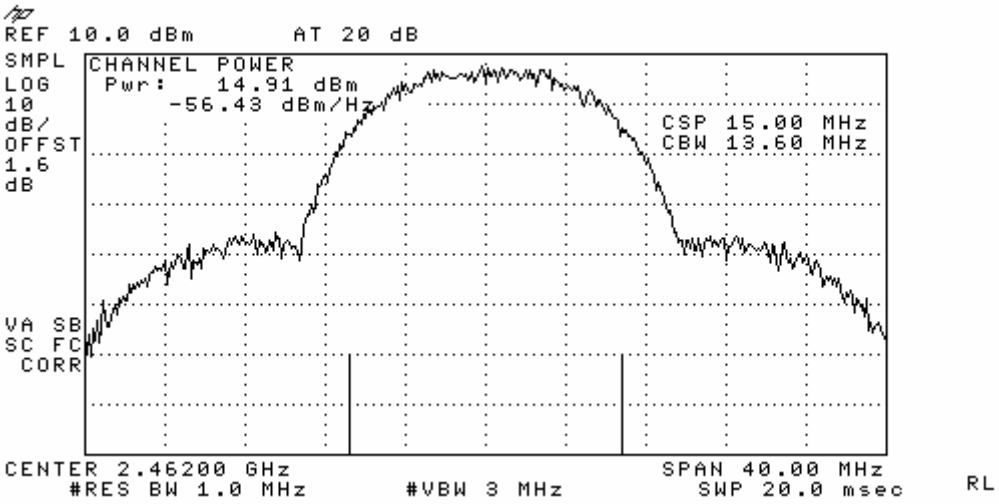
Measurement Data: **CH 1**



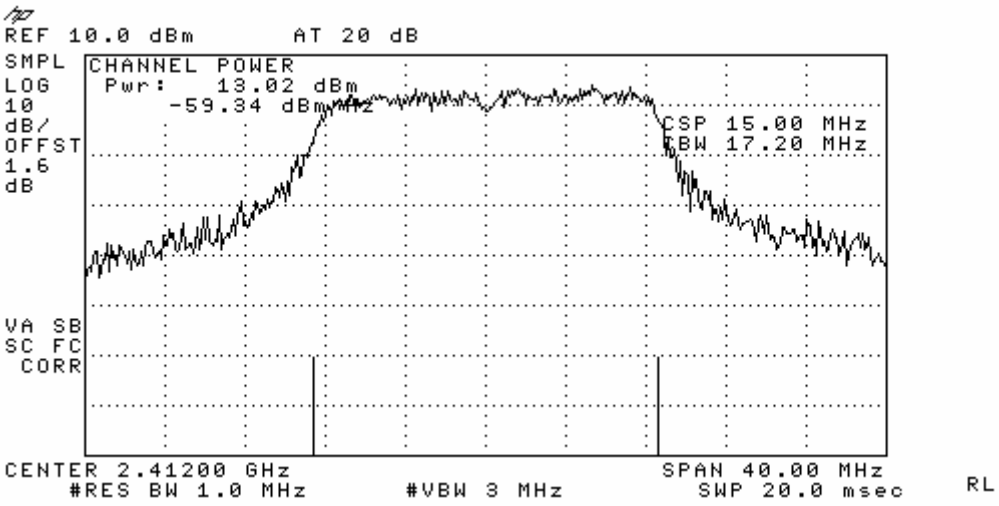
CH 6



CH 11



Measurement Data: **CH 1**



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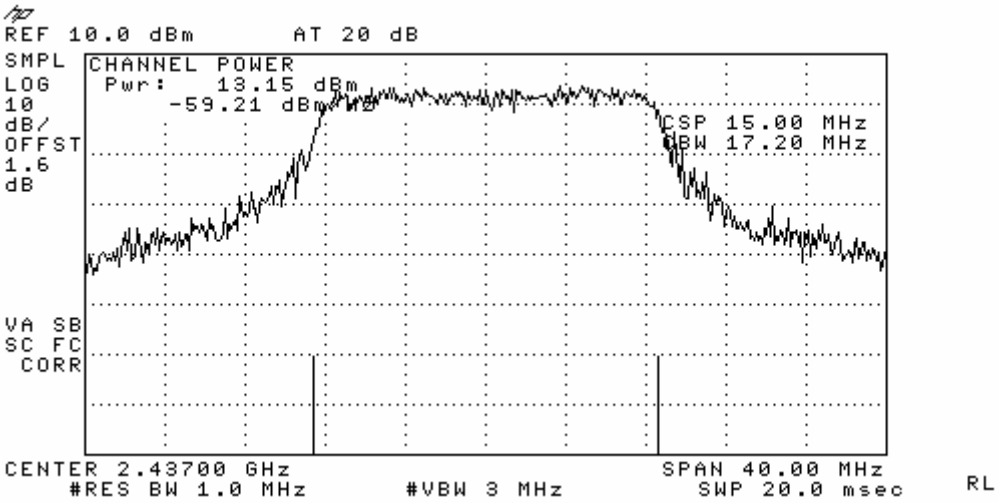

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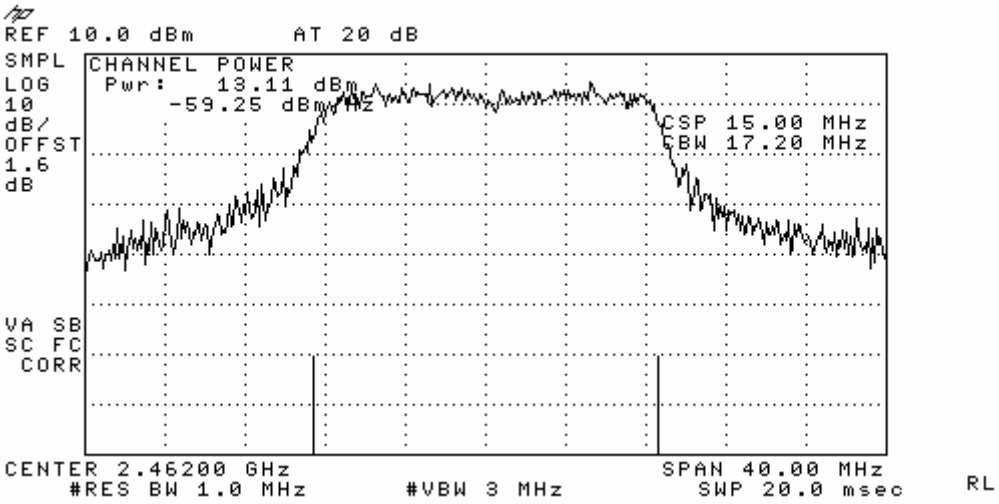


3.2.3 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 3 kHz — Span = 300 kHz

VBW = 10 kHz — Sweep = 1000 sec

Detector function = peak — Trace = max hold

Measurement Data:

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-15.28	Complies
	2437	6	-15.02	Complies
	2462	11	-14.17	Complies
802.11b	2412	1	-17.30	Complies
	2437	6	-17.95	Complies
	2462	11	-17.89	Complies

- See next pages for actual measured spectrum plots.

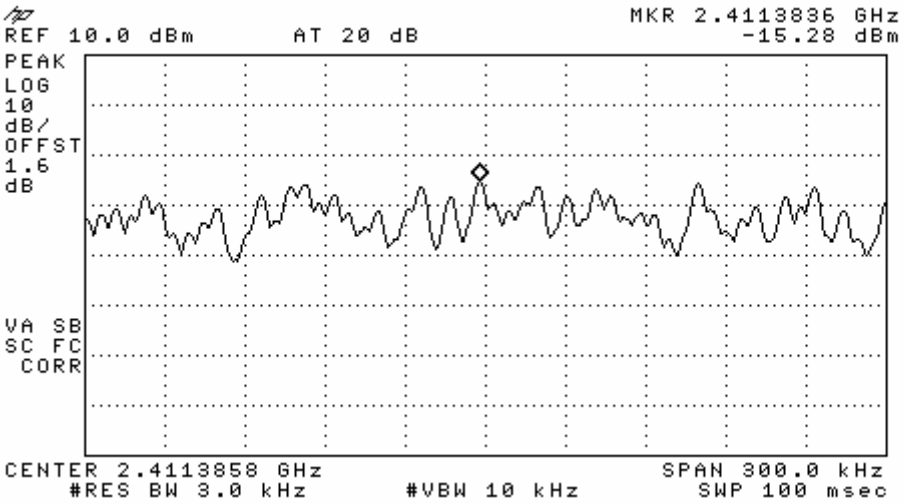
Minimum Standard:

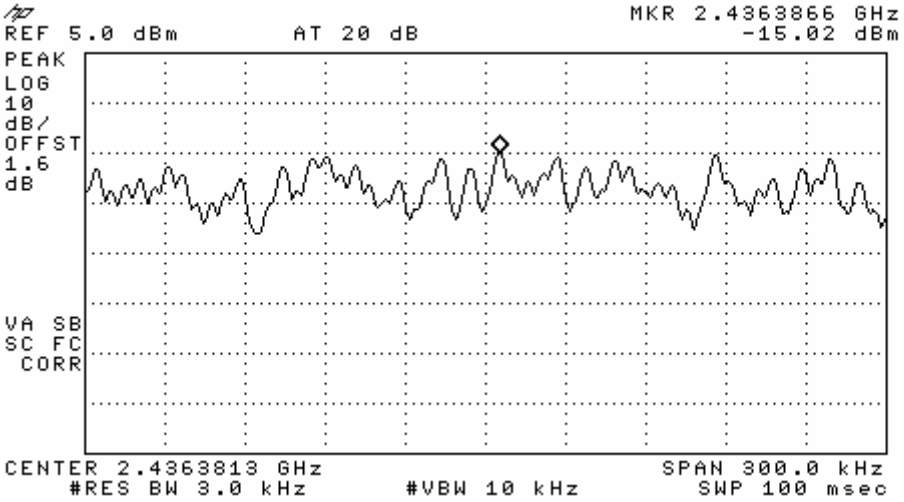
Power Spectral Density	< 8dBm @ 3kHz BW

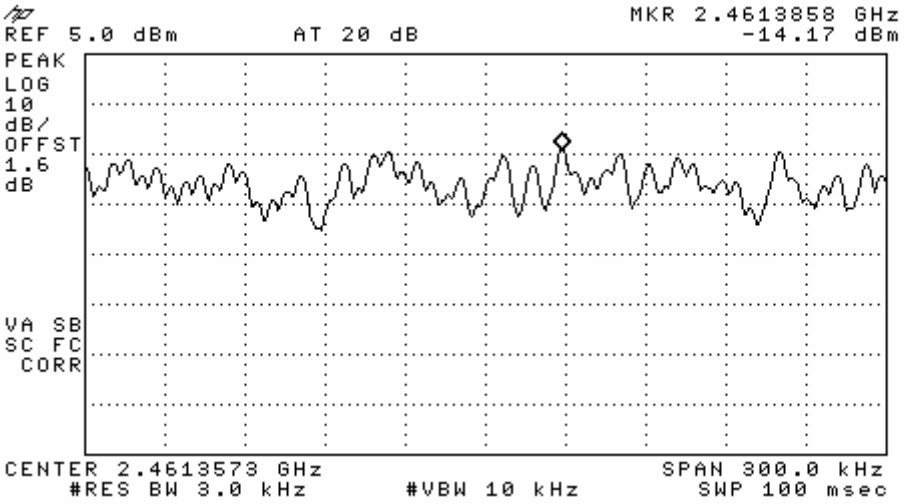
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

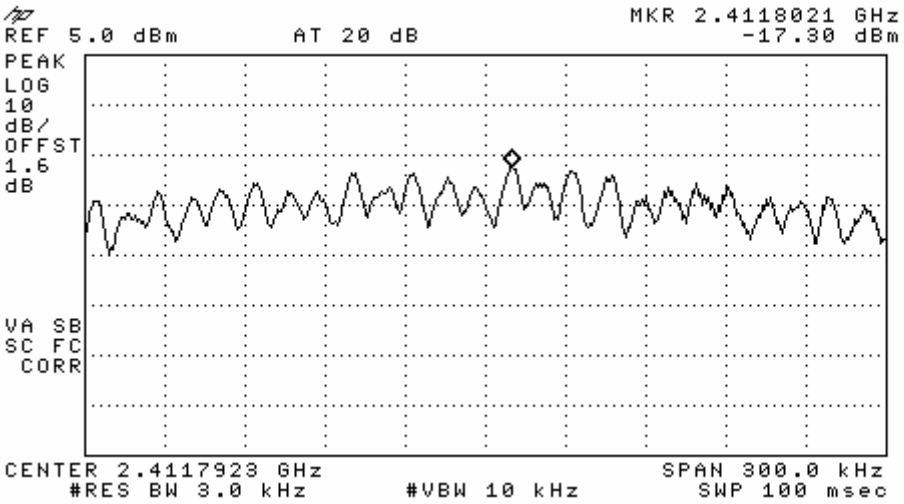
802.11b Power Density Measurement

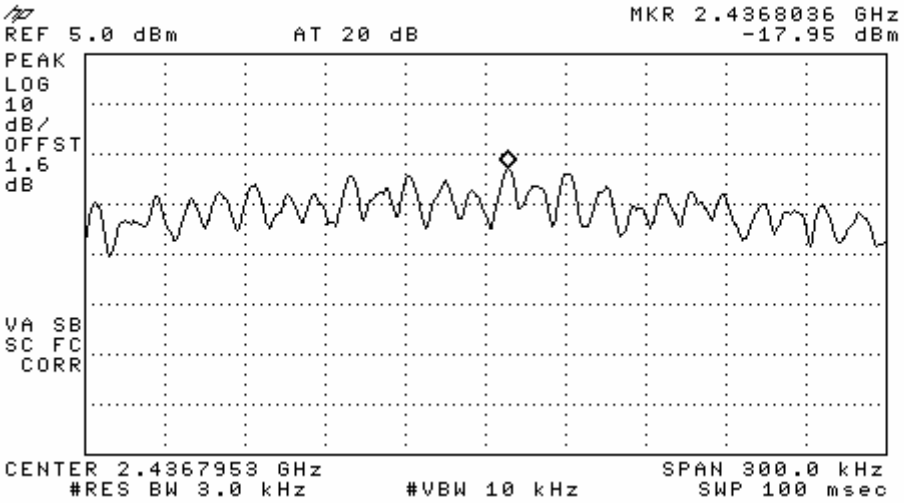


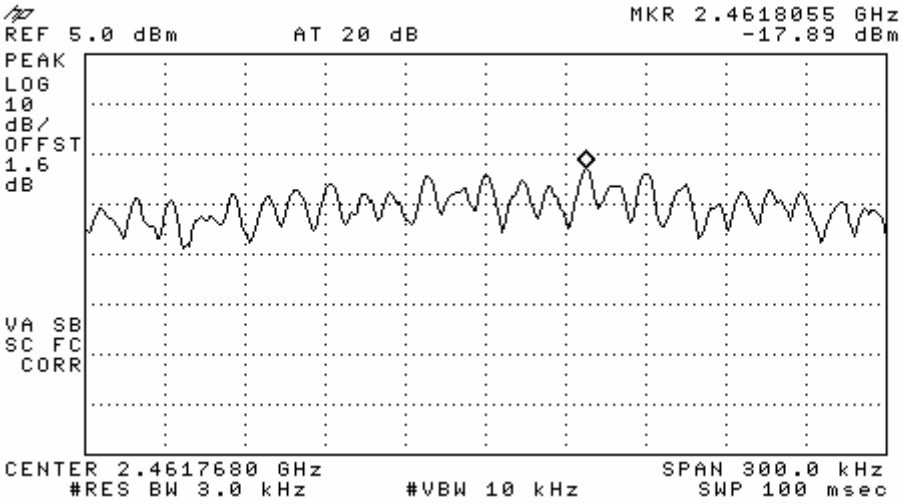




802.11g Power Density Measurement







3.2.4 Band - edge & Spurious

Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz VBW = 100 kHz

Span = 40 MHz Detector function = peak

Trace = max hold Sweep = auto

Radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

The spectrum analyzer is set to:

Center frequency = the highest, the lowest channels

PEAK: RBW = VBW = 1MHz, Sweep=Auto

Average: RBW = 1MHz, VBW=10Hz, Sweep=Auto

Measurement Distance: 3m

Polarization: Horizontal / Vertical

Measurement Data: Complies

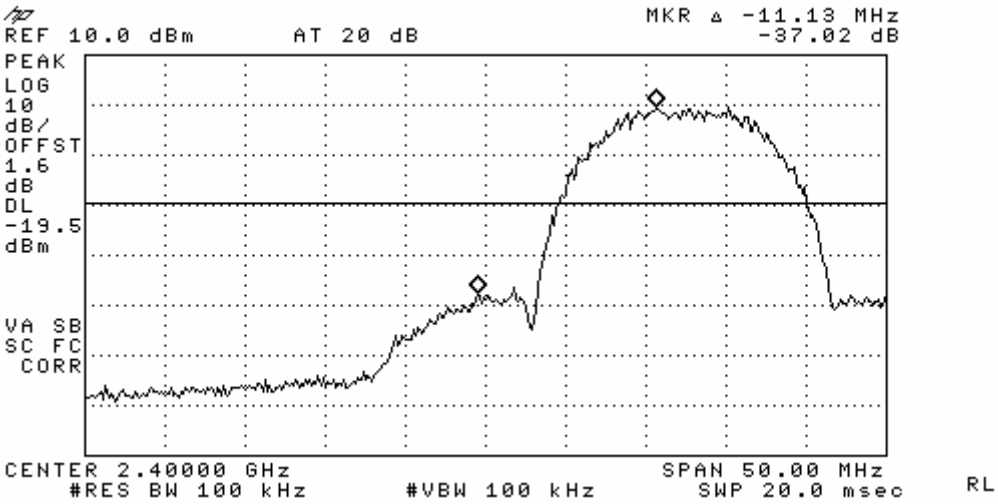
- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

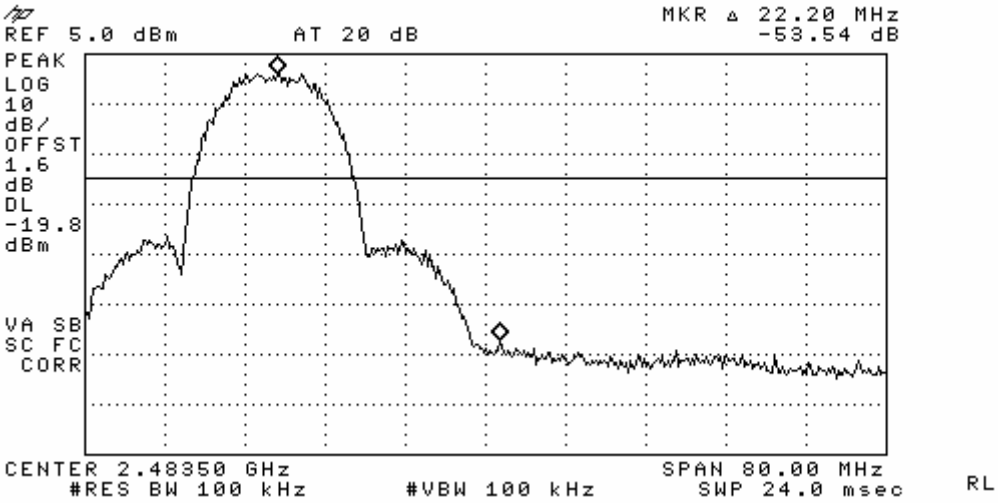
Minimum Standard:	> 20 dBc

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

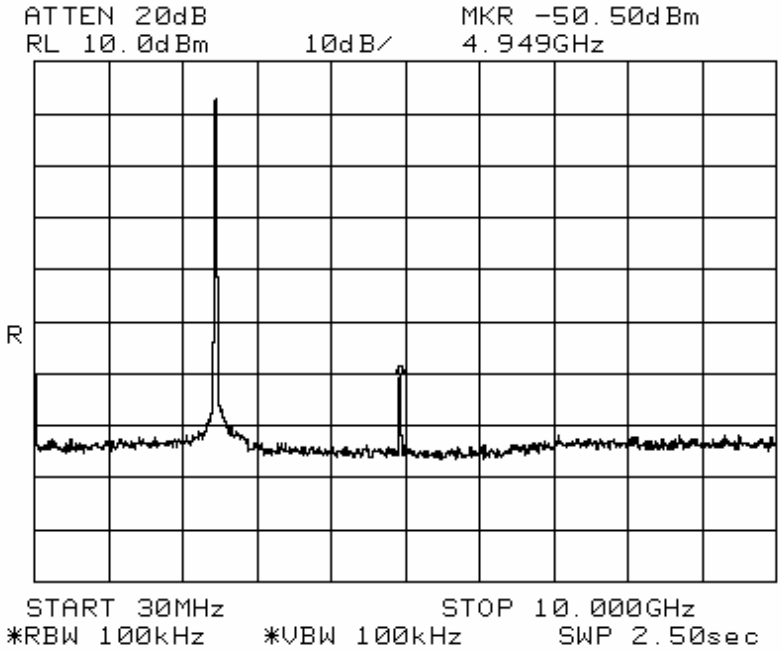
802.11b Band–edge : Conducted Measurements

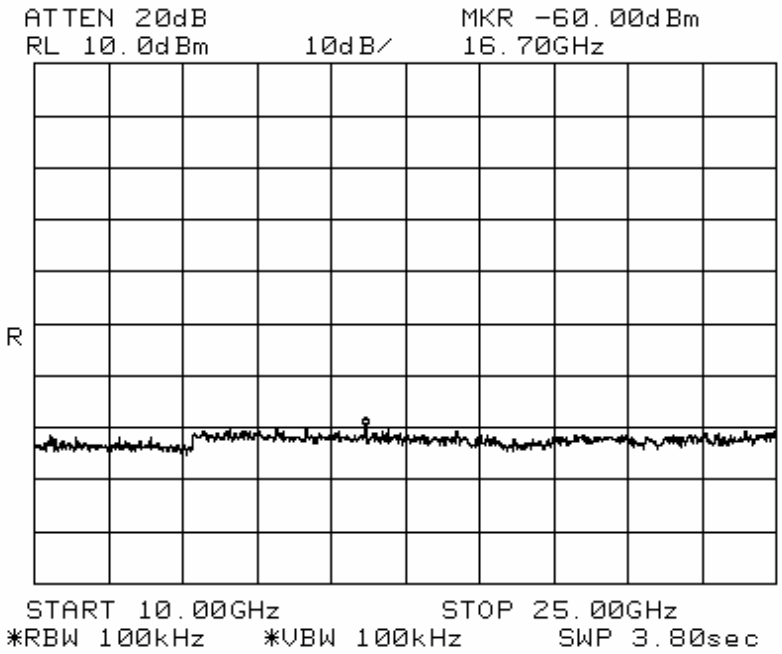




802.11b - Low channel

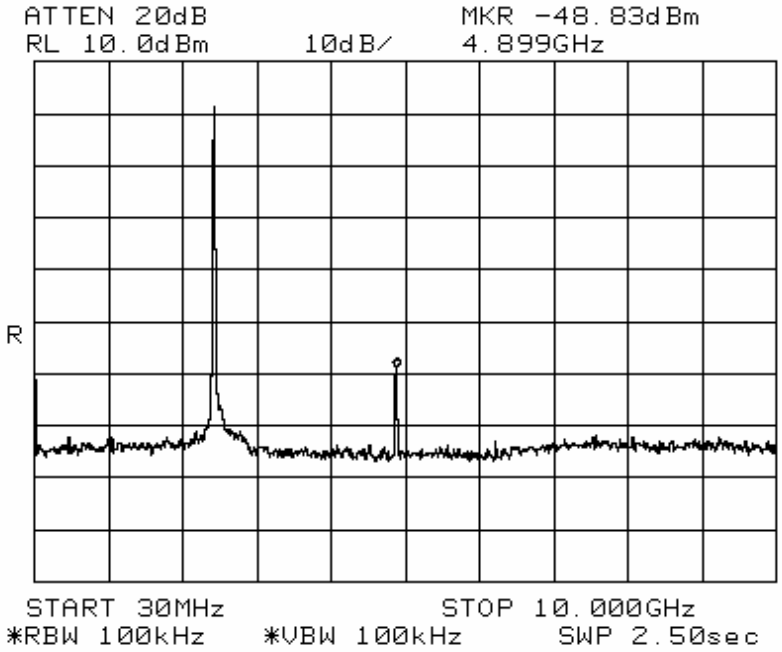
Frequency Range = 30 MHz ~ 10th harmonic.

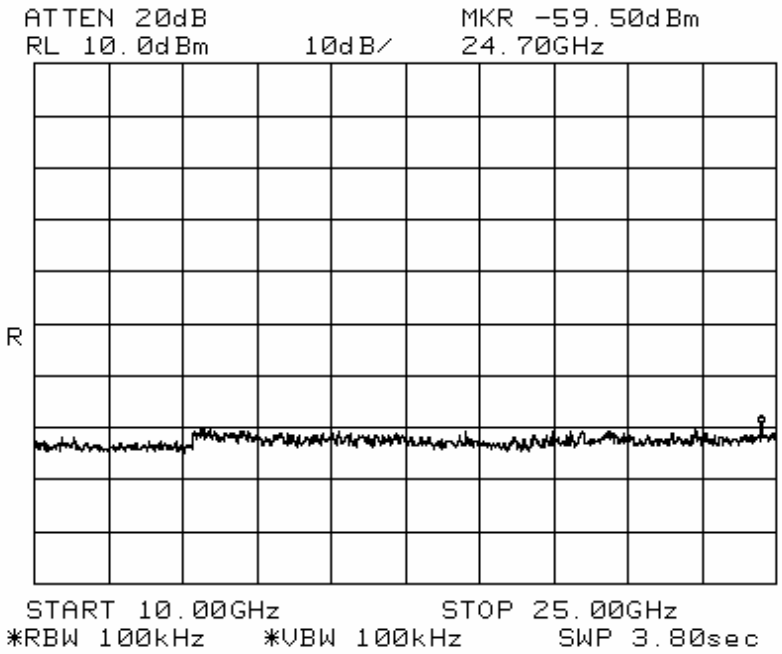




802.11b - Mid channel

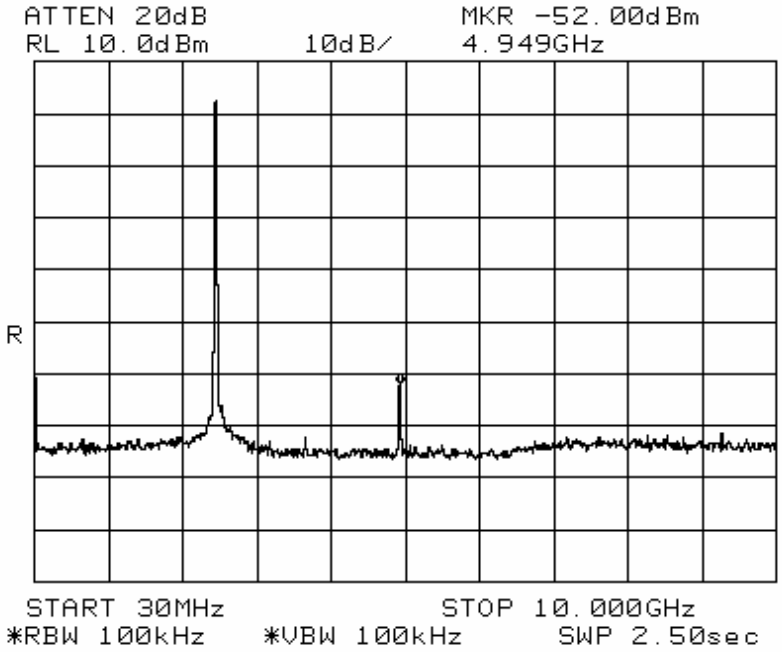
Frequency Range = 30 MHz ~ 10th harmonic.

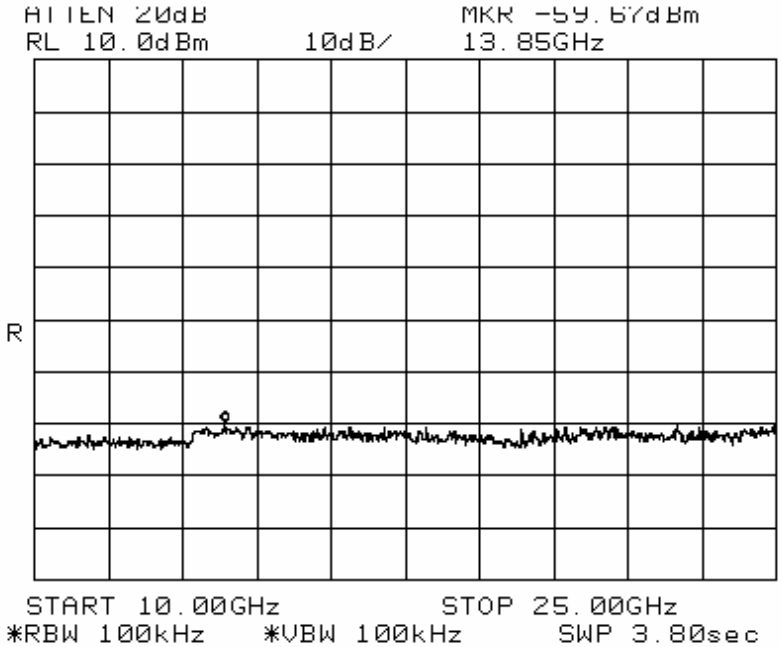




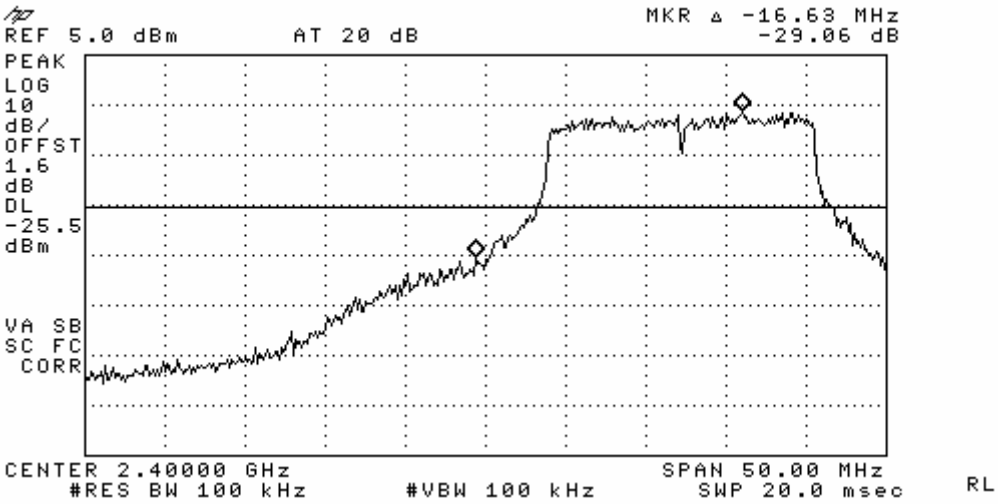
802.11b – High channel

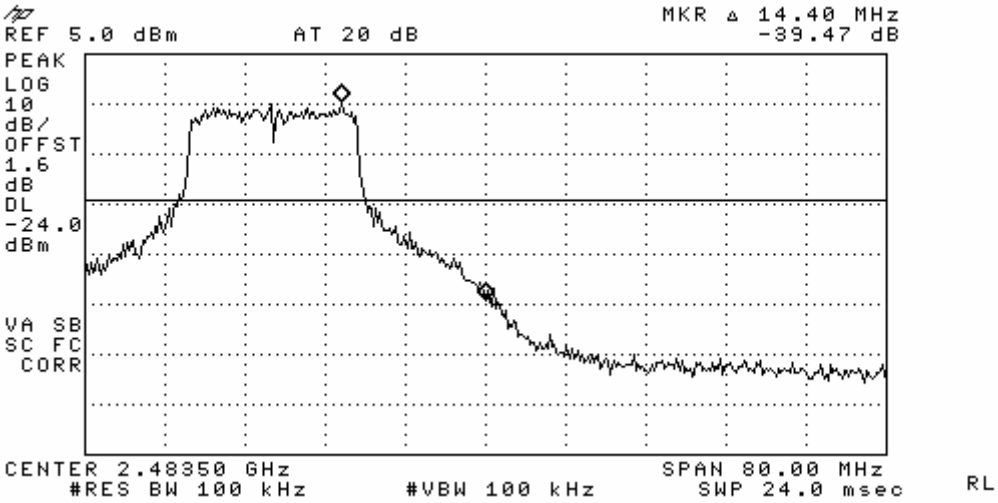
Frequency Range = 30 MHz ~ 10th harmonic.





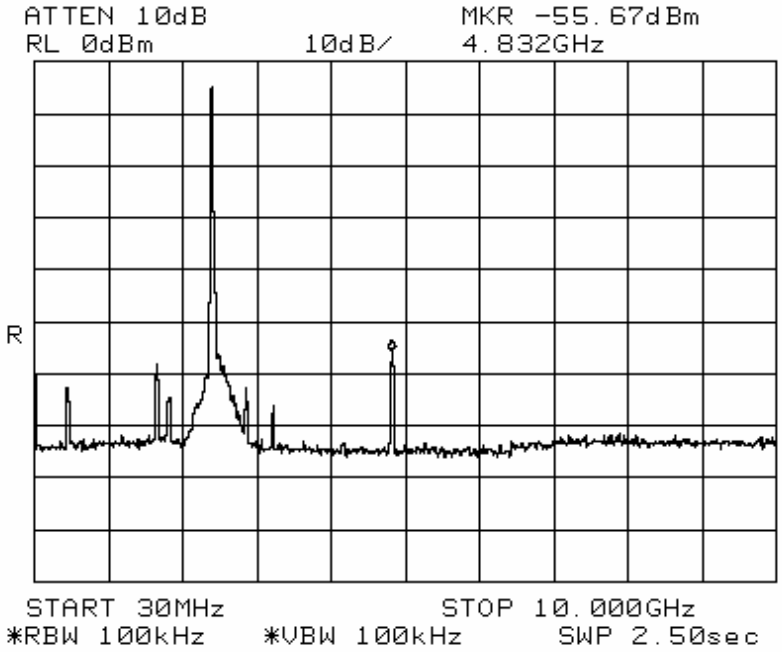
802.11g Band–edge : Conducted Measurements

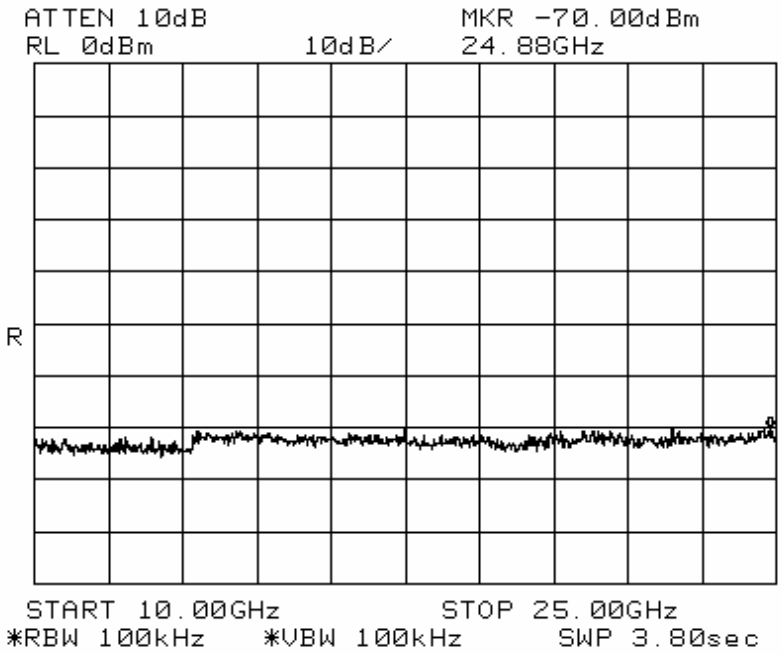




802.11g - Low channel

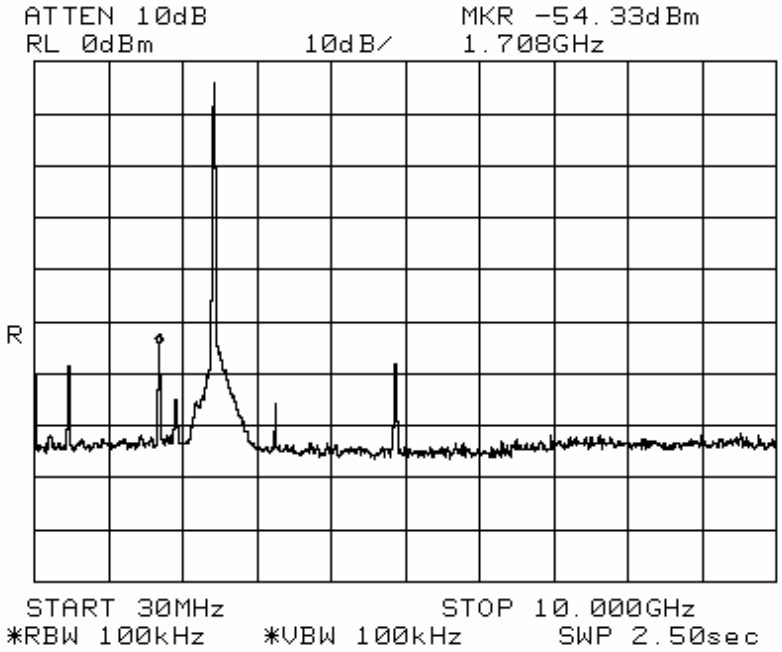
Frequency Range = 30 MHz ~ 10th harmonic.

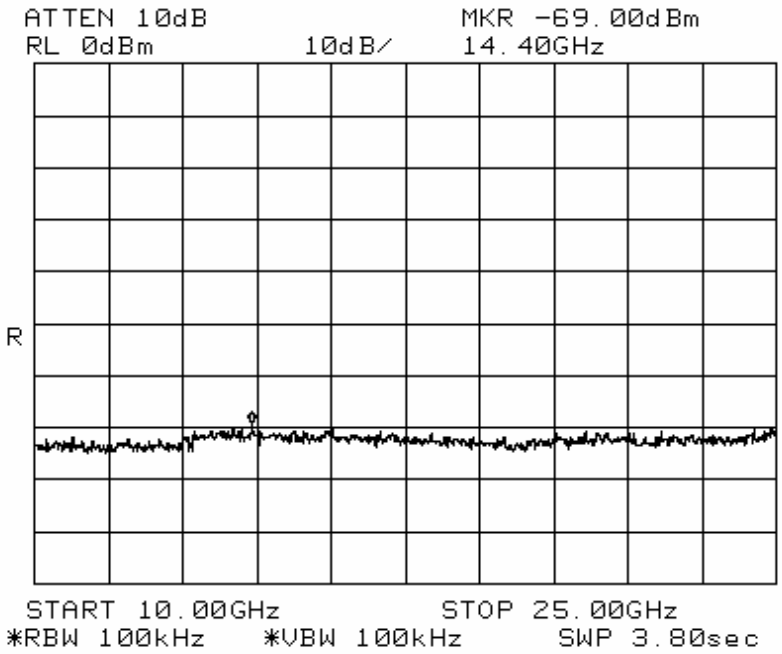




802.11g - Mid channel

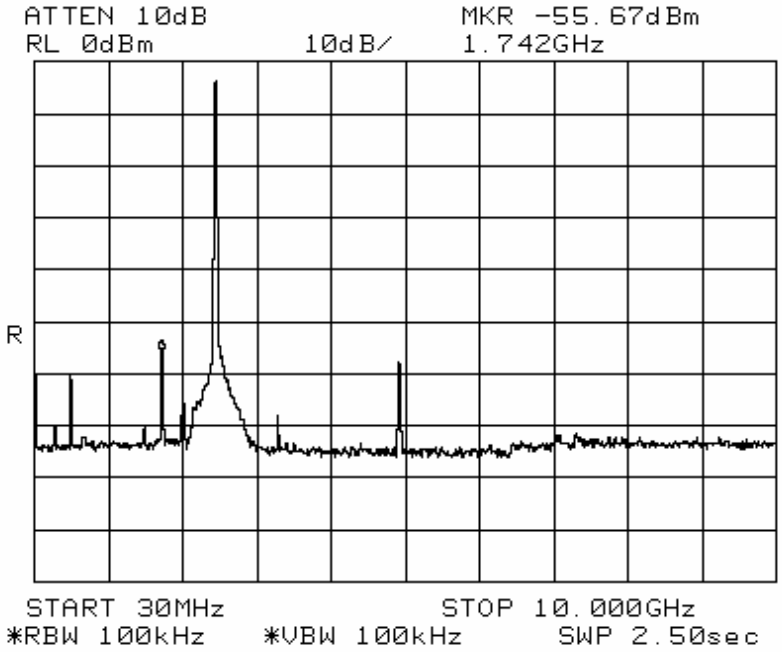
Frequency Range = 30 MHz ~ 10th harmonic.

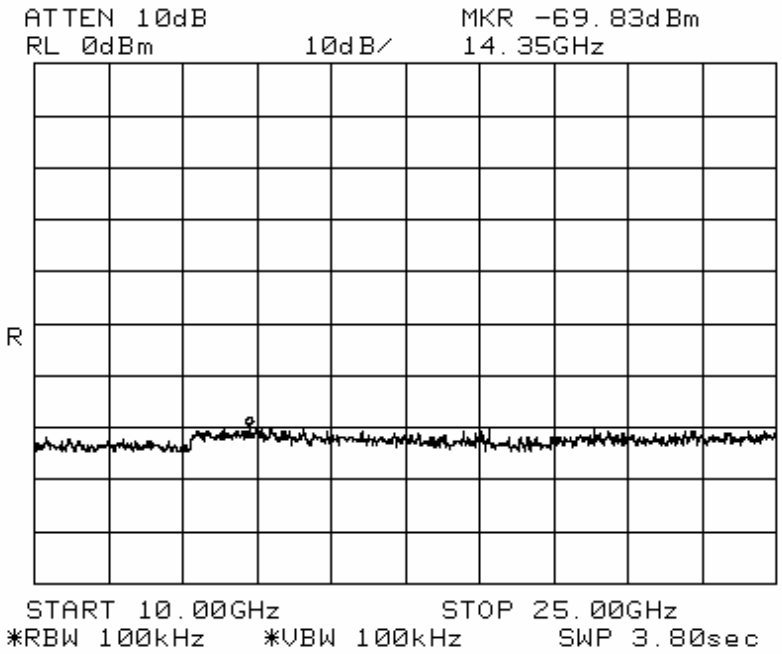




802.11g – High channel

Frequency Range = 30 MHz ~ 10th harmonic.





3.2.5 Field Strength of Harmonics

Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10th harmonic.

RBW = 100 kHz (30MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz Detector function = peak

Trace = max hold Sweep = auto

Measurement Data: Complies

- See next pages for actual measured data.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

802.11b Measurement Data:

Peak mode

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**
4823.6	56.56	4874	52.04	4923.9	54.44
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

No other emissions were detected at a level greater than 20dB below limit.

Average mode

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**
4823.6	51.46	4874	46.44	4923.9	48.44
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

No other emissions were detected at a level greater than 20dB below limit.

802.11g Measurement Data:

Peak mode

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**
4823	63.5	4873	60.43	4924	61.63
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

No other emissions were detected at a level greater than 20dB below limit.

Average mode

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**
4823	51.47	4873	46.6	4924	49.33
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

No other emissions were detected at a level greater than 20dB below limit.

Radiated Emissions –WLAN 802.11b

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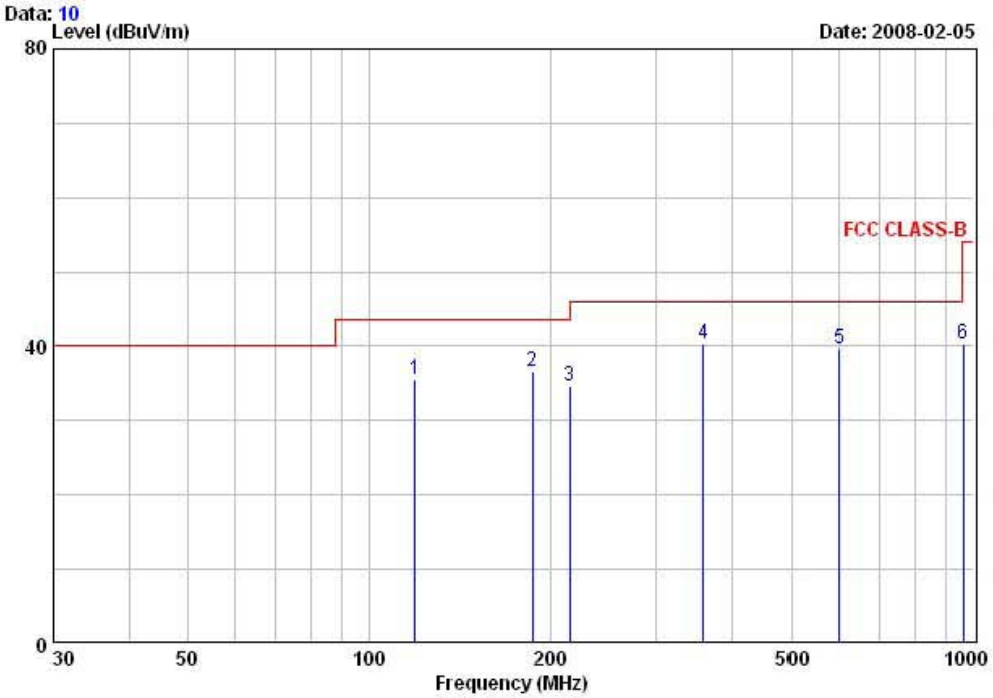
EUT/Model No.: CF module TEST MODE: wireless 802.11b mode

Temp Humi : 0 / 20 Tested by: B.S.KIM



	Freq	Reading	C.F	Result QK	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
1	119.38	48.20	-12.63	35.57	43.50	7.93	100	105	VERTICAL
2	187.12	48.90	-12.29	36.61	43.50	6.89	100	184	VERTICAL
3	215.47	47.50	-12.73	34.77	43.50	8.73	171	229	HORIZONTAL
4	358.27	48.70	-8.32	40.38	46.00	5.62	152	221	VERTICAL
5	599.57	42.50	-2.85	39.65	46.00	6.35	100	118	VERTICAL
6	963.35	36.50	3.78	40.28	54.00	13.72	100	322	VERTICAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emissions –WLAN 802.11g

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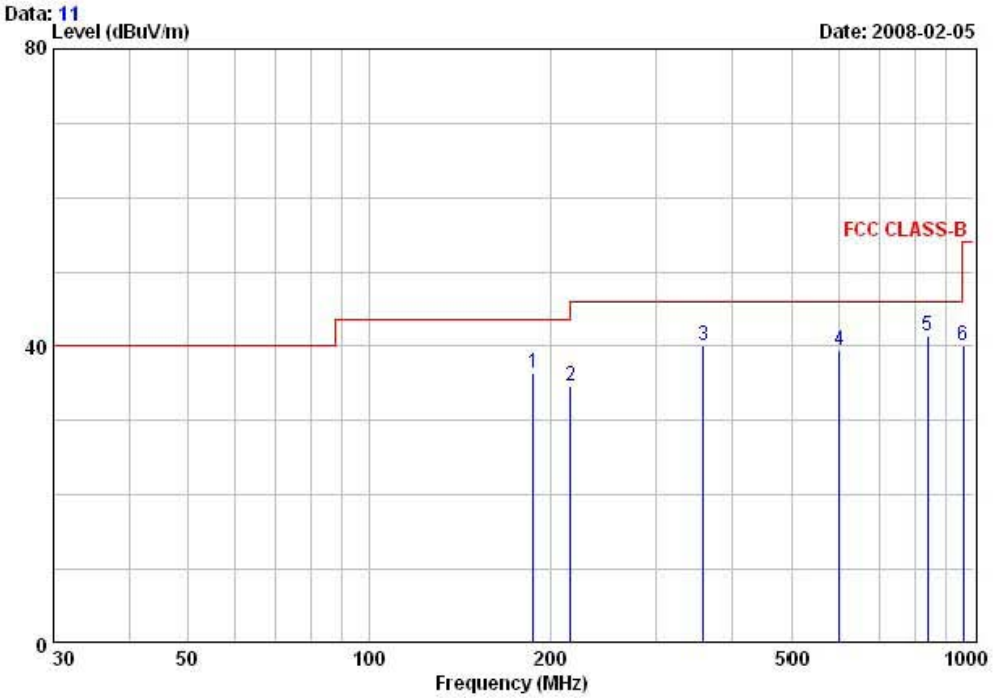
EUT/Model No.: CF module TEST MODE: wireless 802.11g mode

Temp Humi : 0 / 20 Tested by: B.S.KIM



	Freq	Reading	C.F	Result QK	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
1	187.53	48.80	-12.33	36.47	43.50	7.03	125	288	VERTICAL
2	215.79	47.30	-12.72	34.58	43.50	8.92	252	32	HORIZONTAL
3	358.93	48.50	-8.31	40.19	46.00	5.81	100	275	VERTICAL
4	599.47	42.30	-2.86	39.44	46.00	6.56	100	312	VERTICAL
5	839.93	40.10	1.24	41.34	46.00	4.66	299	237	HORIZONTAL
6	963.24	36.40	3.78	40.18	54.00	13.82	100	51	VERTICAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

3.2.6 Radiated Band-Edge – Restricted Bands

Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10th harmonic.

RBW = 100 kHz (30MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz Detector function = peak / average

Trace = max hold Sweep = auto

Measurement Data: Complies

- See next pages for actual measured data.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

802.11b Measurement Data:

Ch	Tx Freq (MHz)	Detect Mode	Restricted Band Edge Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2412	Peak	2390	56.33	74	
1	2412	Average	2390	44.71	54	
11	2462	Peak	2483.5	63.54	74	
11	2462	Average	2483.5	51.19	54	

802.11g Measurement Data:

Ch	Tx Freq (MHz)	Detect Mode	Restricted Band Edge Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2412	Peak	2390	66.11	74	
1	2412	Average	2390	48.08	54	
11	2462	Peak	2483.5	66.67	74	
11	2462	Average	2483.5	49.13	54	

3.2.7 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data: Complies

- See next pages for actual measured spectrum plots.
- No emissions were detected at a level greater than 10dB below limit.

Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range	quasi-peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

AC Conducted Emissions –WLAN 802.11b -Line

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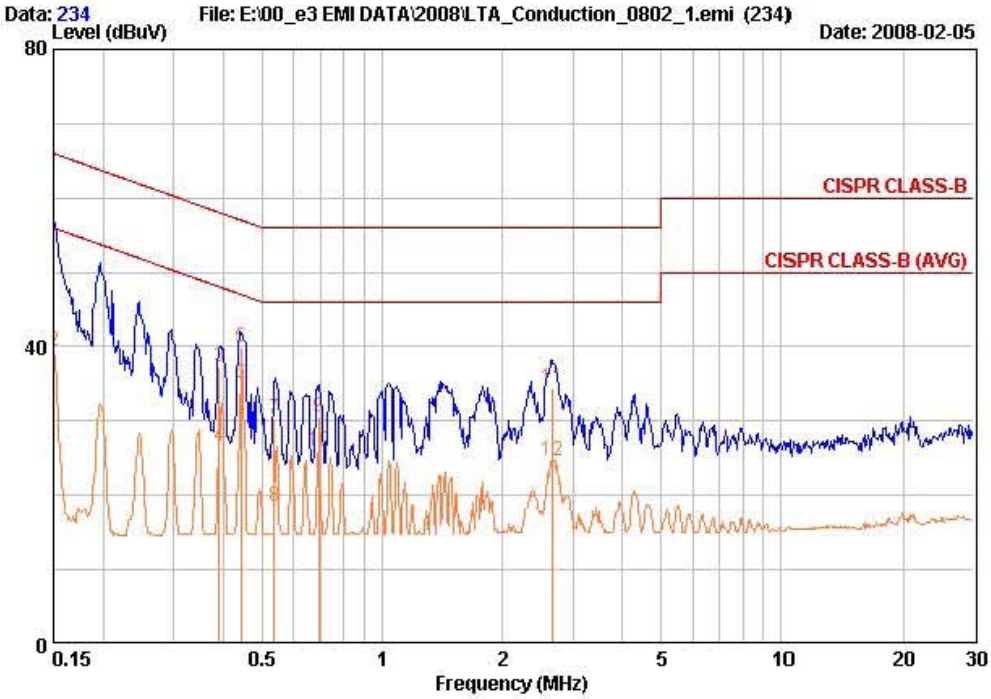
EUT / Model No.	: CF module	Phase	: LINE
Test Mode	: wireless 802.11b mode	Test Power	: 120 / 60
Temp./Humi.	: 24 / 23	Test Engineer	: B.S.KIM



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.150	54.60	38.80	0.59	55.19	39.39	66.00	56.00	10.81	16.61
0.390	36.80	26.30	0.38	37.18	26.68	58.06	48.06	20.89	21.39
0.443	39.50	34.70	0.35	39.85	35.05	57.01	47.01	17.16	11.96
0.535	30.00	18.30	0.29	30.29	18.59	56.00	46.00	25.71	27.41
0.693	30.30	25.70	0.30	30.60	26.00	56.00	46.00	25.40	20.00
2.666	33.80	24.00	0.59	34.39	24.59	56.00	46.00	21.61	21.41

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions – WLAN 802.11b - Neutral

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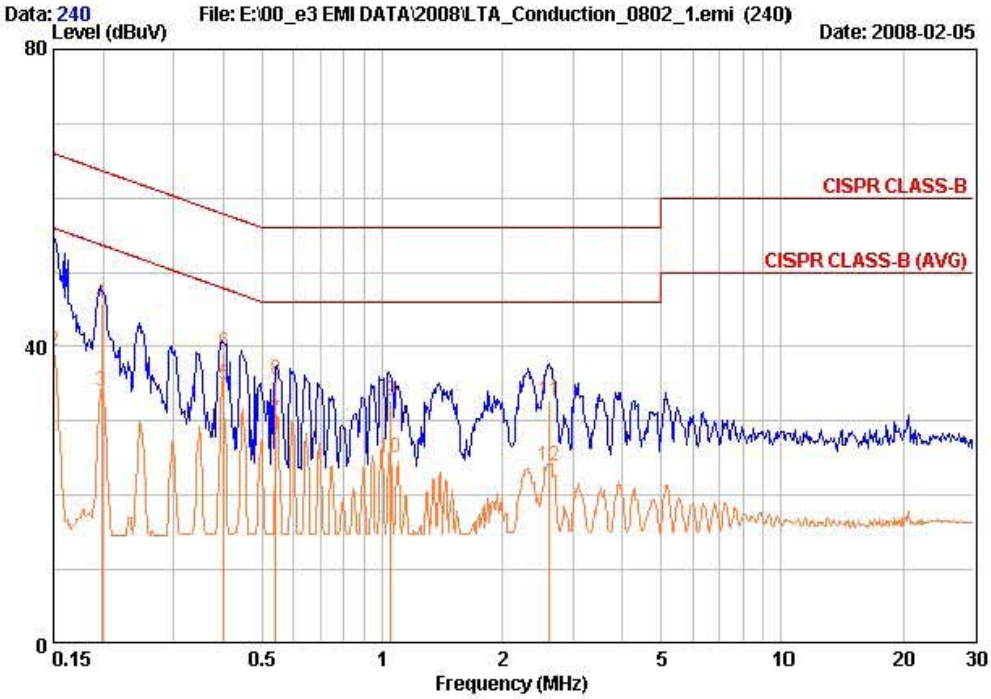
EUT / Model No.	: CF module	Phase	: NEUTRAL
Test Mode	: wireless 802.11b mode	Test Power	: 120 / 60
Temp./Humi.	: 24 / 23	Test Engineer	: B.S.KIM



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.150	52.40	38.80	0.59	52.99	39.39	66.00	56.00	13.01	16.61
0.198	45.60	33.80	0.20	45.80	34.00	63.69	53.69	17.90	19.70
0.401	38.80	34.60	0.39	39.19	34.99	57.83	47.83	18.65	12.85
0.541	35.30	29.80	0.29	35.59	30.09	56.00	46.00	20.41	15.91
1.051	32.40	24.80	0.32	32.72	25.12	56.00	46.00	23.28	20.88
2.620	32.10	23.30	0.58	32.68	23.88	56.00	46.00	23.32	22.12

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions – WLAN 802.11g - Line

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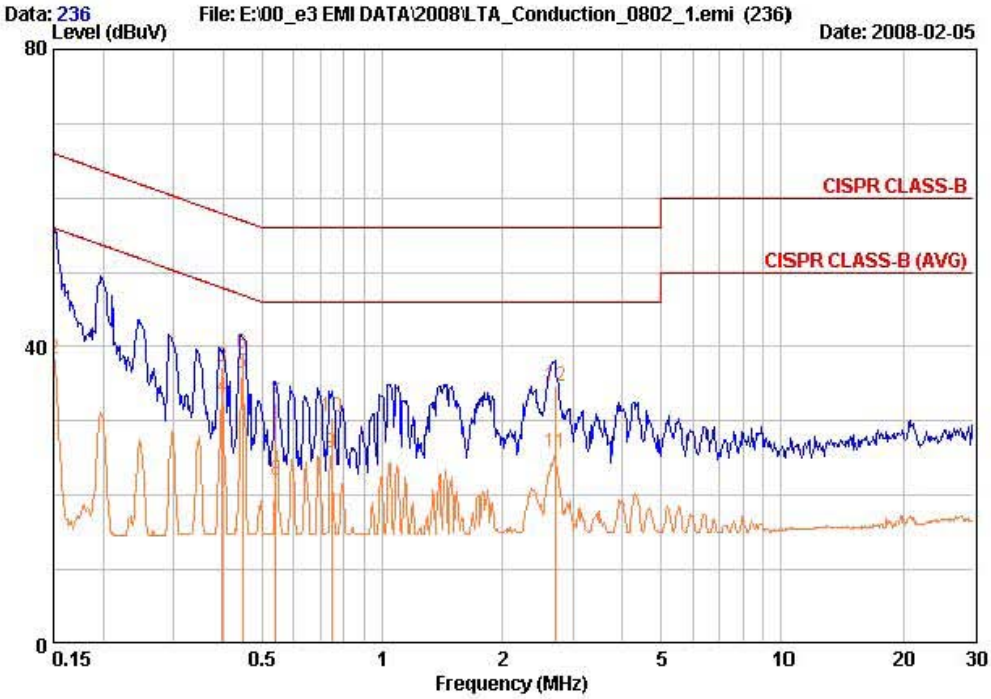
EUT / Model No.	: CF module	Phase	: LINE
Test Mode	: wireless 802.11g mode	Test Power	: 120 / 60
Temp./Humi.	: 24 / 23	Test Engineer	: B.S.KIM



Freq (MHz)	RD QP (dBuV)	RD AV (dBuV)	C.F (dB)	Result QP (dBuV)	Result AV (dBuV)	Limit QP (dBuV)	Limit AV (dBuV)	Margin QP (dB)	Margin AV (dB)
0.150	53.50	37.80	0.59	54.09	38.39	66.00	56.00	11.91	17.61
0.398	36.80	32.80	0.38	37.18	33.18	57.90	47.90	20.71	14.71
0.446	38.60	36.00	0.34	38.94	36.34	56.95	46.95	18.01	10.61
0.540	32.10	21.80	0.29	32.39	22.09	56.00	46.00	23.61	23.91
0.747	30.20	25.40	0.35	30.55	25.75	56.00	46.00	25.45	20.25
2.705	34.00	25.10	0.60	34.60	25.70	56.00	46.00	21.40	20.30

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions – WLAN 802.11g - Neutral

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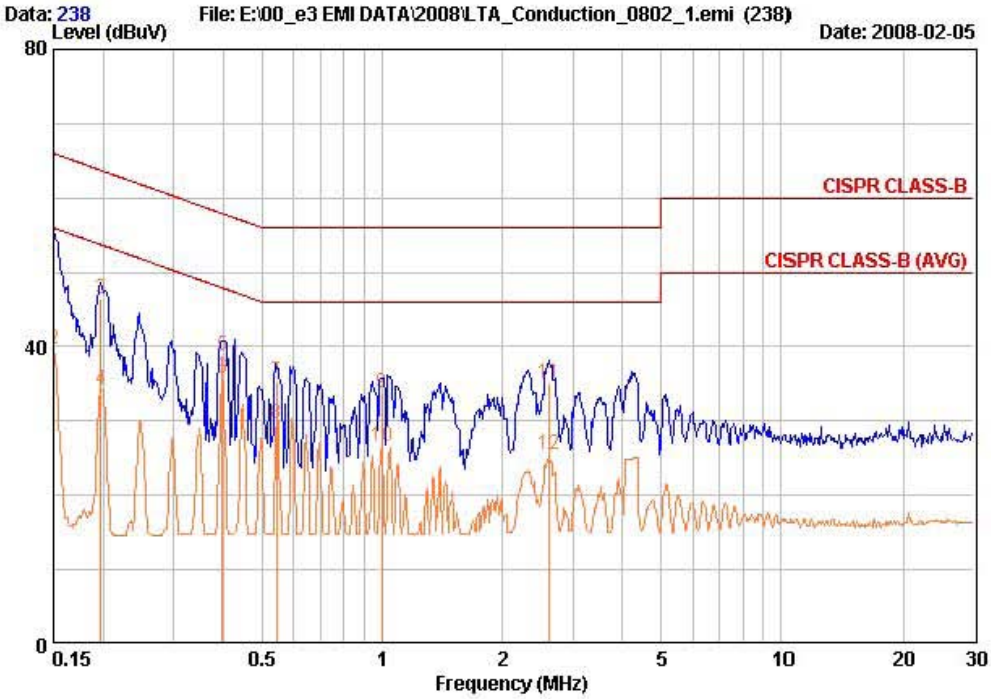
EUT / Model No.	: CF module	Phase	: NEUTRAL
Test Mode	: wireless 802.11g mode	Test Power	: 120 / 60
Temp./Humi.	: 24 / 23	Test Engineer	: B.S.KIM



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.150	53.00	39.10	0.59	53.59	39.69	66.00	56.00	12.41	16.31
0.197	46.20	34.00	0.20	46.40	34.20	63.74	53.74	17.33	19.53
0.398	38.50	35.30	0.38	38.88	35.68	57.90	47.90	19.01	12.21
0.543	35.00	29.30	0.29	35.29	29.59	56.00	46.00	20.71	16.41
0.998	33.40	26.30	0.31	33.71	26.61	56.00	46.00	22.29	19.39
2.609	34.60	25.00	0.58	35.18	25.58	56.00	46.00	20.82	20.42

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

APPENDIX 1

Maximum Permissible Exposure Calculations

** MPE Calculations **

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

EIRP = P + G EIRP = 14.91 dBm + 4.33dBi EIRP = 19.24 dBm	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)

Power density at the specific separation:

$S = PG/(4R^2\pi)$ $S = (30.97 * 2.71) / (4 * 202 * \pi)$ $S = 0.0167$ mW/cm^2	Where, S = Maximum power density (mW/cm^2) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm^2 .
The power density at 20cm does not exceed the 1 mW/cm^2 limit. Therefore, the exposure condition is compliant with FCC rules.

Estimated safe separation:

$R = \sqrt{(PG / 4\pi)}$ $R = \sqrt{(30.97 * 2.71 / 4\pi)}$ R = 2.59Cm	Where, P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$G = Log^{-1}$ (dB antenna gain / 10)
$G = Log^{-1}$ (4.33/ 10)
G = 2.71

APPENDIX 2

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	8594E	3649A03649	HP	Apr-08
2	Signal Generator	8648C	3623A02597	HP	Apr-08
3	Attenuator (3dB)	8491A	37822	HP	Oct-08
4	Attenuator (10dB)	8491A	63196	HP	Oct-08
5	EMI Test Receiver	ESVD	843748/001	R&S	Aug-08
6	LISN	KNW-407	8-1430-1	Kyoritsu	Jan-09
7	Two-Line V-Network	ESH3-Z5	893045/017	R&S	Oct-08
8	RF Amplifier	8447D	2949A02670	HP	Jan-09
9	RF Amplifier	8447D	2439A09058	HP	Oct-08
10	RF Amplifier	8449B	3008A02126	HP	Apr-09
11	Test Receiver	ESHS10	828404009	R&S	Aug-08
12	TRILOG Antenna	VULB 9160	9160-3212	SCHWARZBECK	Jul-08
13	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Apr-09
14	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Apr-09
15	Horn Antenna	3115	00055005	ETS LINDGREN	Mar-09
16	Dipole Antenna	VHA9103	2116	Schwarzbeck	Nov-07
17	Dipole Antenna	VHA9103	2117	Schwarzbeck	Nov-07
18	Dipole Antenna	UHA9105	2261	Schwarzbeck	Nov-07
19	Dipole Antenna	UHA9105	2262	Schwarzbeck	Nov-07
20	Spectrum Analyzer	8591E	3649A05888	HP	Oct-08
21	Spectrum Analyzer	8563E	3425A02505	HP	Apr-08
22	Hygro-Thermograph	THB-36	0041557-01	ISUZU	May-08
23	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	Jun-08
24	RF Switch	MP59B	6200414971	ANRITSU	Jun-08
25	RF Switch	MP59B	6200438565	ANRITSU	Jun-08
26	Power Divider	11636A	6243	HP	Oct-08
27	DC Power Supply	6622A	3448A03079	HP	Oct-08
28	Attenuator (30dB)	11636A	6243	HP	Oct-08
29	Frequency Counter	5342A	2826A12411	HP	Apr-08
30	Power Meter	EPM-441A	GB32481702	HP	Apr-08
31	Power Sensor	8481A	2702A64048	HP	Apr-08
32	Audio Analyzer	8903B	3729A18901	HP	Oct-08
33	Modulation Analyzer	8901B	3749A05878	HP	Oct-08
34	TEMP & HUMIDITY Chamber	YJ-500	L05022	JinYoung Tech	Oct-08
35	LOOP-ANTENNA	FMZB 1516	151602/94	SCHWARZBECK	Mar-09