GROUP SEFTON TECHNOLOGY

GSM Mobile Phone

Main Model: S-450
Serial Model: N/A

April 24, 2012
Report No.: 12070051-FCC-R3

(This report supersedes NONE)

Modifications made to the product : None

This Test Report is Issued Under the Authority of:		
William Long	Alex Liu	
William Long **Compliance Engineer**	**Alex Liu** **Technical Manager**	

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Test result presented in this test report is applicable to the representative sample only.

RF Test Report
To: FCC Part 15.247: 2012

SIEMIC, INC.
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Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

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Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC, (RCB 208)	RF , Telecom
Hong Kong	OFTA (US002)	RF , Telecom

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CONTENTS

1 EXECUTIVE SUMMARY & EUT INFORMATION

The purpose of this test programme was to demonstrate compliance of the GROUP SEFTON TECHNOLOGY, GSM Mobile Phone and model: S-450 against the current Stipulated Standards. The GSM Mobile Phone has demonstrated compliance with the FCC 15.247: 2012.

EUT Information

EUT Description	:	**GSM Mobile Phone**
Model No	:	**S-450**
Serial No	:	**N/A**
Input Power	:	**Li-ion Rechargeable battery Model: BL-4D Charging Voltage: 3.7 V 1200 mAh Restrictive Voltage: 4.2 V**
Classification Per Stipulated Test Standard	:	**Spread Spectrum System/Device Per FCC 15.247: 2012**

Description of Revision	FCC ID	Model	Revision Number	Report Number	Date of Revision
Original Report	AODZKTXIPROI9	i9	0	12070027-FCC-R3-V1	March 15, 2012
Amended Report	FPOSEFTONS450	S-450	1	12070051-FCC-R3	April 24, 2012

Note: This is the amended report application (12070051-FCC-R3) of the device, the original submission (12070027-FCC-R3-V1) was granted on March 15, 2012. The difference between the original device and the current one was as following the detail information:

The difference of these two models is for different logo and color

All above were explained in the attached Declaration Letter. Based on the letter the difference between them will not affect all test items. In this report we revised the EUT photos, setup photos and FCC ID.

2 TECHNICAL DETAILS

Purpose	**Compliance testing of GSM Mobile Phone with stipulated standard**
Applicant / Client	**GROUP SEFTON TECHNOLOGY CALLE 13 #15-61,BOGOTA,COLOMBIA**
Manufacturer	**SHEN ZHEN ZHIKE COMMUNICATION CO.,LTD 1805, Tower A , Phase I, Tianan High-Tech Plaza, Futian District, Shenzhen China**
Laboratory performing the tests	**SIEMIC Nanjing (China) Laboratories NO.2-1,Longcang Dadao, Yuhua Economic Development Zone, Nanjing, China Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email:info@siemic.com**
Test report reference number	**12070051-FCC-R3**
Date EUT received	**March 01, 2012**
Standard applied	**FCC 15.247: 2012**
Dates of test (from – to)	**March 13 to March 14, 2012**
No of Units :	**#1**
Equipment Category :	**Spread Spectrum System/Device**
Trade Name :	**SEFTON™**
RF Operating Frequency (ies)	**GSM850 TX : 824.2 ~ 848.8 MHz; RX :869.2 ~ 893.8 MHz PCS1900 TX : 1850.2 ~ 1909.8 MHz; RX :1930.2 ~ 1989.8 MHz Bluetooth: 2402 - 2480 MHz WiFi: 2412 – 2462 MHz**
Number of Channels	**300CH (PCS1900) and 125CH (GSM850) Bluetooth: 79CH WiFi: 11 CH**
Modulation	**GSM\PCS: GMSK Bluetooth: GFSK WiFi: DSSS**
FCC ID :	**FPOSEFTONS450**

3 MODIFICATION

NONE

4 TEST SUMMARY

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

Spread Spectrum System/Device

Test Results Summary

FCC Rules	Description of Test	Result
§15.247 (i), §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a),	Conducted Emissions	Compliance
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions & Restricted Bands	Compliance
§15.247 (a)(2)	6 dB Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Output Power	Compliance
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 §15.247 (i) and §2.1093 – RF EXPOSURE

Applicable Standard

According to §15.247 (i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Table 2 – Summary of SAR Evaluation Requirements for a Cell Phone with Multiple Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	Routine evaluation required	SAR not required: Unlicensed only o when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed o when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas o when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – o output ≤ 60/f: SAR not required o output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when o output ≤ 2·P_{Ref} and antenna is ≥ 5.0 cm from other antennas o output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas o output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required o test SAR on highest output channel for each wireless mode and exposure condition o if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	
Jaw, Mouth and Nose	Flat phantom SAR required o when measurement is required in tight regions of SAM and it is not feasible or the results can be questionable due to probe tilt, calibration, positioning and orientation issues o position rectangular and clam-shell phones according to flat phantom procedures and conduct SAR measurements for these specific locations	When simultaneous transmission SAR testing is required, contact the FCC Laboratory for interim guidance.

Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

Two antennas are available for the EUT, (GSM antenna, WiFi/Bluetooth antenna), The distance between WiFi/BT antenna and WWAN antenna is 7cm which is More than 5 cm, and the Max output power of WiFi is 12.97mW <2*Pref (24 mW), Max output power of BT is 0.97mW.So no stand-alone SAR is required for WiFi and BT antenna. According to KDB 648474, no simultaneous SAR measurement is required too.

Note: The WiFi and BT use the same antenna.

Result:

The SAR measurement is exempt.

5.2 §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has 2 antennas, one is a monopole antenna for Bluetooth and WIFI, the gain is 2.0dBi; one is a PIFA antenna for GSM, the gain are 1dBi for GSM and 0.5dBi for PCS which in accordance to section 15.203, please refer to the internal photos.

Result: Compliance.

5.3 §15.207 (a) - CONDUCTED EMISSIONS

Requirement:

Frequency of emissions (MHz)	Conducted limit (dBμV)	
	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.

Procedures:

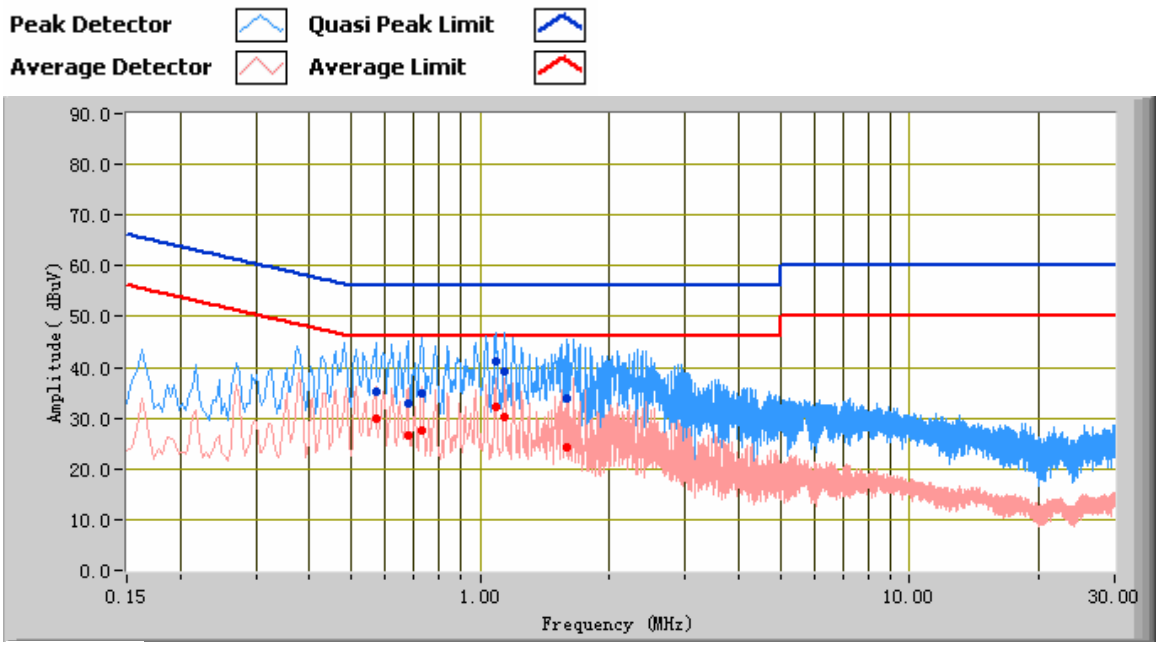
1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR and Average detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is ±3.5dB.
4. Environmental Conditions

Temperature	22°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

5. Test date : March 13, 2012
   Tested By : William Long

Test Mode:	Transmitting

Mode: 802.11b

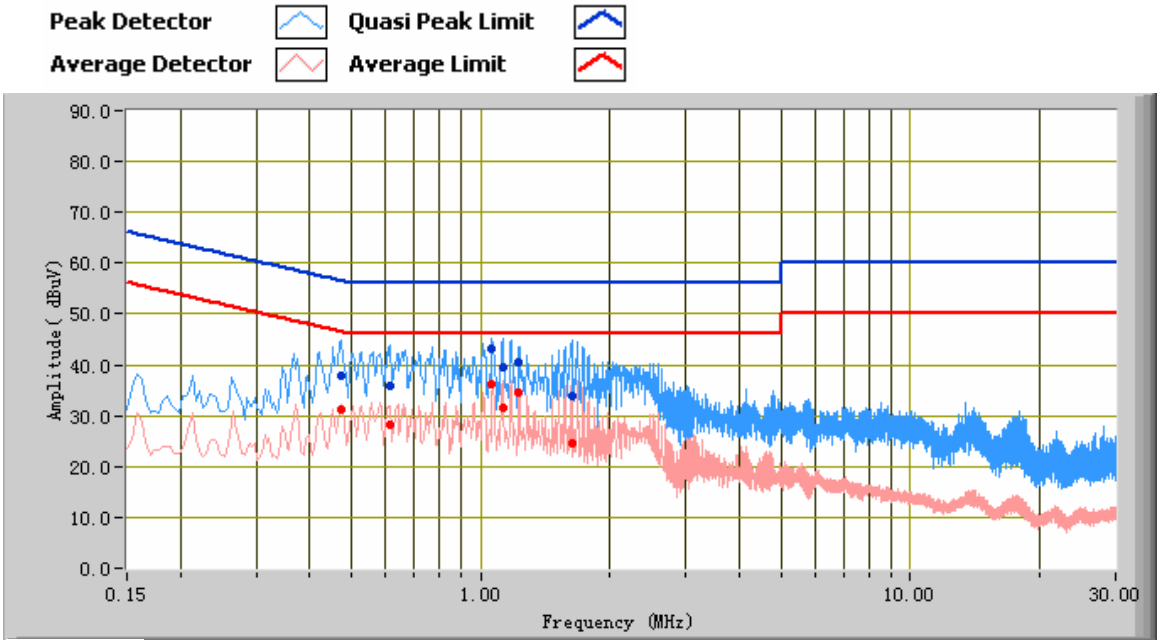


Test Data

Line

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
1.08	41.22	56.00	-14.78	32.12	46.00	-13.88	10.16
1.14	39.10	56.00	-16.90	30.15	46.00	-15.85	10.17
0.73	34.98	56.00	-21.02	27.47	46.00	-18.53	10.13
1.59	33.78	56.00	-22.22	24.23	46.00	-21.77	10.18
0.68	32.75	56.00	-23.25	26.62	46.00	-19.38	10.13
0.57	35.14	56.00	-20.86	29.82	46.00	-16.18	10.15

Test Mode:	Transmitting



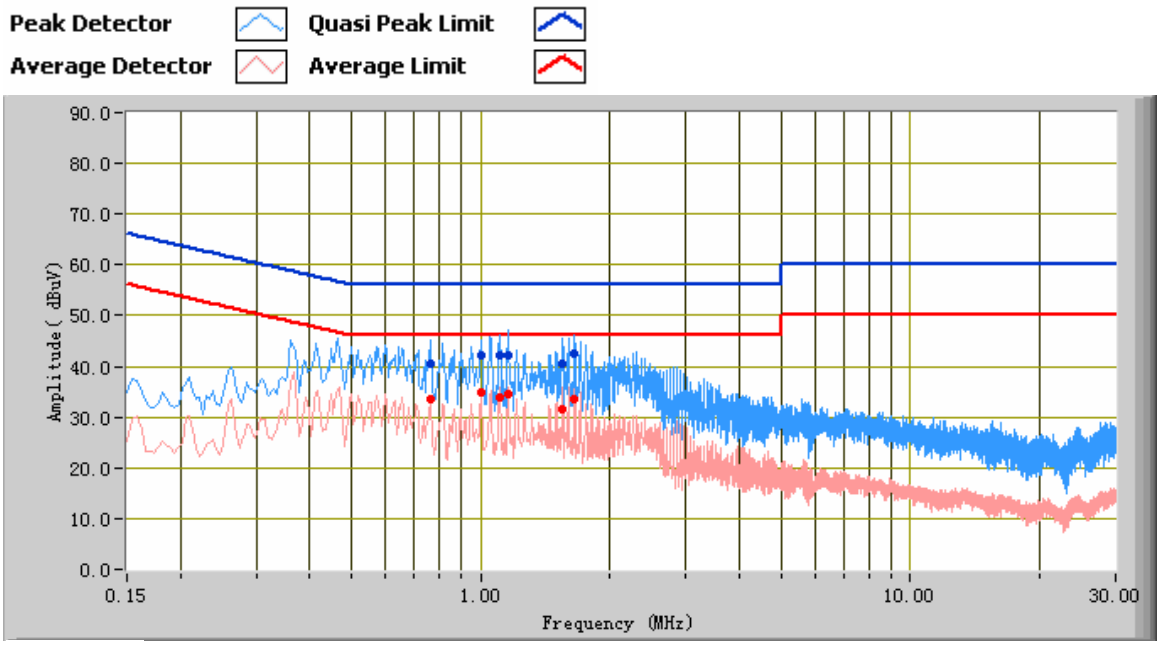
Test Data

Neutral

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
1.06	43.10	56.00	-12.90	36.30	46.00	-9.70	10.16
1.12	39.40	56.00	-16.60	31.44	46.00	-14.56	10.16
1.63	33.72	56.00	-22.28	24.44	46.00	-21.56	10.19
0.47	37.97	56.45	-18.47	31.35	46.45	-15.10	10.17
0.61	35.96	56.00	-20.04	28.32	46.00	-17.68	10.14
1.22	40.56	56.00	-15.44	34.40	46.00	-11.60	10.17

Test Mode:	Transmitting

Mode: 802.11g

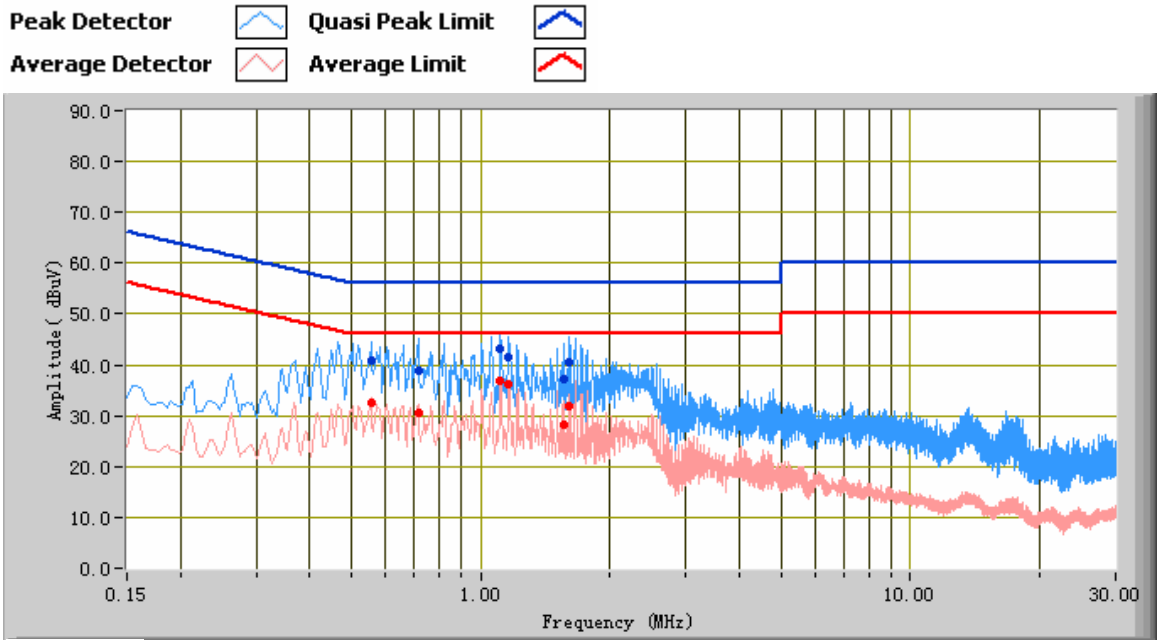


Test Data

Line

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
1.16	42.19	56.00	-13.81	34.44	46.00	-11.56	10.17
1.11	42.17	56.00	-13.83	33.97	46.00	-12.03	10.16
1.65	42.51	56.00	-13.49	33.53	46.00	-12.47	10.19
1.55	40.41	56.00	-15.59	31.48	46.00	-14.52	10.18
1.00	42.30	56.00	-13.70	34.94	46.00	-11.06	10.16
0.76	40.41	56.00	-15.59	33.48	46.00	-12.52	10.14

Test Mode:	Transmitting



Test Data

Neutral

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
1.11	43.30	56.00	-12.70	36.76	46.00	-9.24	10.16
1.16	41.55	56.00	-14.45	36.35	46.00	-9.65	10.17
1.61	40.43	56.00	-15.57	31.78	46.00	-14.22	10.18
0.71	38.92	56.00	-17.08	30.56	46.00	-15.44	10.13
0.55	40.69	56.00	-15.31	32.44	46.00	-13.56	10.16
1.56	37.09	56.00	-18.91	28.08	46.00	-17.92	10.18

5.4 §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 1GHz & 1GHz above (3m & 10m) is +/-6dB.
4. Environmental Conditions

Temperature	22°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

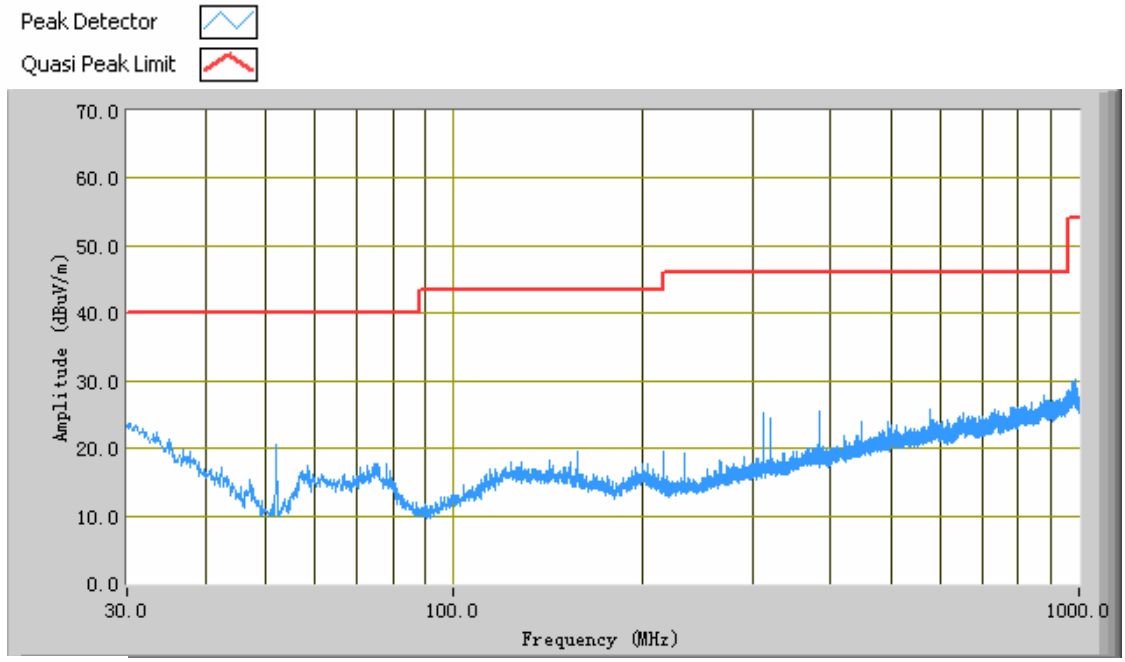
5. Test date : March 13, 2012
   Tested By : William Long

Standard Requirement: The emissions from the Low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges.

Test Result: Pass

Test Mode:	Transmitting Below 1GHz

Mode: 802.11b



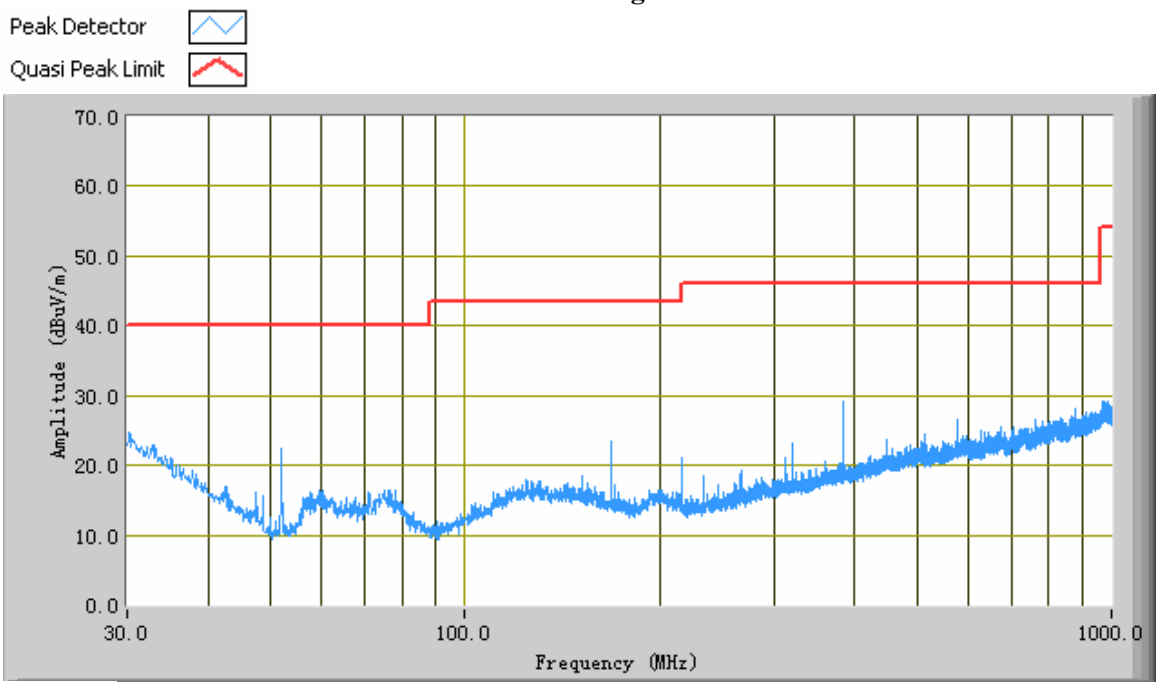
Test Data

Frequency (MHz)	Peak (dBµV/m)	Azimuth	Polarity (H/V)	Height (cm)	Factors (dB)	Limit (dBµV/m)	Margin (dB)
30.48	23.69	184.70	V	200.00	-22.81	40.00	-16.31
957.08	28.33	246.00	V	300.00	-20.02	46.00	-17.67
877.17	27.79	37.30	H	400.00	-21.36	46.00	-18.21
948.23	27.59	0.60	H	400.00	-20.44	46.00	-18.41
929.67	27.43	205.30	H	200.00	-20.77	46.00	-18.57
932.95	27.33	105.80	H	300.00	-20.79	46.00	-18.67

Note: Fast QP measurement performed, more than 20dB below limit so QP test data was not presented.

Test Mode:	Transmitting Below 1GHz

Mode: 802.11g



Test Data

Frequency (MHz)	Peak (dBµV/m)	Azimuth	Polarity (H/V)	Height (cm)	Factors (dB)	Limit (dBµV/m)	Margin (dB)
30.24	24.66	122.00	V	300.00	-22.63	40.00	-15.34
385.50	29.13	285.00	V	200.00	-30.62	46.00	-16.87
51.95	22.37	189.20	V	100.00	-36.89	40.00	-17.63
877.42	28.01	328.90	V	100.00	-21.35	46.00	-17.99
959.99	27.92	1.10	V	100.00	-19.88	46.00	-18.08
911.85	27.51	260.60	H	100.00	-20.69	46.00	-18.49

Note: Fast QP measurement performed, more than 20dB below limit so QP test data was not presented.

Test Mode:	Transmitting Above 1 GHz

Note: Other modes were verified, only the result of worst case basic rate mode was presented.

Mode: 802.11b

Low Channel (2412 MHz)

Frequency (MHz)	Substituted level (dBµV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4824	38.32	AV	160	1.0	V	34	2.6	26.79	48.13	54	-5.87
4824	37.37	AV	240	1.1	H	33.8	2.6	26.79	46.98	54	-7.02
4824	50.25	PK	123	1.1	V	34	2.6	26.79	60.06	74	-13.94
4824	49.77	PK	160	1.2	H	33.8	2.6	26.79	59.38	74	-14.62
1087.41	33.46	AV	185	1.1	V	25.3	1.1	26.51	33.35	54	-20.65
1087.41	32.71	AV	123	1.1	H	23.8	1.1	26.51	31.10	54	-22.90
1087.41	41.81	PK	185	1.2	V	23.8	1.1	26.51	40.20	74	-33.80
1087.41	42.96	PK	130	1.1	H	25.3	1.1	26.51	42.85	74	-31.15

Middle Channel (2437 MHz)

Frequency (MHz)	Substituted level (dBµV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4874	36.06	AV	125	1.0	V	33.6	2.6	26.78	45.48	54	-8.52
4874	37.49	AV	256	1.1	H	33.8	2.6	26.78	47.11	54	-6.89
4874	47.25	PK	125	1.0	V	33.6	2.6	26.78	56.67	74	-17.33
4874	48.31	PK	256	1.0	H	33.8	2.6	26.78	57.93	74	-16.07
1323.18	31.39	AV	40	1.0	V	25.1	1.3	26.65	31.14	54	-22.86
1323.18	31.09	AV	78	1.0	H	25.1	1.3	26.65	30.84	54	-23.16
1323.18	38.47	PK	40	1.1	V	25.3	1.3	26.65	38.42	74	-35.58
1323.18	38.35	PK	78	1.0	H	25.3	1.3	26.65	38.3	74	-35.70

High Channel (2462 MHz)

Frequency (MHz)	Substituted level (dBµV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4924	36.22	AV	158	1.3	V	34.6	2.7	26.75	46.77	54	-7.23
4924	36.31	AV	250	1.4	H	34.7	2.7	26.75	46.96	54	-7.04
4924	49.42	PK	158	1.1	V	34.6	2.7	26.75	59.97	74	-14.03
4924	47.14	PK	250	1.1	H	34.7	2.7	26.75	57.79	74	-16.21
1458.13	30.06	AV	57	1.3	V	25.3	1.3	26.65	30.01	54	-23.99
1458.13	29.2	AV	243	1.4	H	25.5	1.3	26.65	29.35	54	-24.65
1458.13	38.55	PK	57	1.1	V	25.3	1.3	26.65	38.5	74	-35.50
1458.13	38.32	PK	243	1.2	H	25.5	1.3	26.65	38.47	74	-35.53

Spurious emissions in restricted band:

Frequency (MHz)	Substituted level (dBμV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2367.69	38.45	AV	60	1.2	V	30.1	1.8	26.83	43.52	54	-10.48
2488.54	38.82	AV	120	1.1	V	30.6	1.8	26.83	44.39	54	-9.61
2488.54	33.23	AV	60	1.3	H	30.6	1.8	26.83	38.80	54	-15.20
2367.69	33.19	AV	120	1.2	H	30.1	1.8	26.83	38.26	54	-15.74
2488.54	45.38	PK	165	1.1	V	30.6	1.8	26.83	50.95	74	-23.05
2367.69	44.18	PK	240	1.2	V	30.1	1.8	26.83	49.25	74	-24.75
2488.54	44.72	PK	165	1.3	H	30.6	1.8	26.83	50.29	74	-23.71
2367.69	45.67	PK	240	1.2	H	30.1	1.8	26.83	50.74	74	-23.26

Mode: 802.11g

Low Channel (2412 MHz)

Frequency (MHz)	Substituted level (dBµV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4824	38.32	AV	133	1.1	V	34	2.6	26.79	48.13	54	-5.87
4824	37.37	AV	320	1.1	H	33.8	2.6	26.79	46.98	54	-7.02
4824	50.25	PK	133	1.1	V	34	2.6	26.79	60.06	74	-13.94
4824	49.77	PK	320	1.1	H	33.8	2.6	26.79	59.38	74	-14.62
1184.12	33.46	AV	120	1.2	V	25.3	1.1	26.51	33.35	54	-20.65
1184.12	32.71	AV	133	1.1	H	23.8	1.1	26.51	31.1	54	-22.90
1184.12	41.81	PK	120	1.2	V	23.8	1.1	26.51	40.2	74	-33.80
1184.12	42.96	PK	133	1.1	H	25.3	1.1	26.51	42.85	74	-31.15

Middle Channel (2437 MHz)

Frequency (MHz)	Substituted level (dBµV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4874	36.06	AV	189	1.1	V	33.6	2.6	26.78	45.48	54	-8.52
4874	37.49	AV	156	1.0	H	33.8	2.6	26.78	47.11	54	-6.89
4874	47.25	PK	189	1.0	V	33.6	2.6	26.78	56.67	74	-17.33
4874	48.31	PK	156	1.0	H	33.8	2.6	26.78	57.93	74	-16.07
1387.88	31.39	AV	242	1.1	V	25.1	1.3	26.65	31.14	54	-22.86
1387.88	31.09	AV	134	1.0	H	25.1	1.3	26.65	30.84	54	-23.16
1387.88	38.47	PK	242	1.0	V	25.3	1.3	26.65	38.42	74	-35.58
1387.88	38.35	PK	134	1.0	H	25.3	1.3	26.65	38.3	74	-35.70

High Channel (2462 MHz)

Frequency (MHz)	Substituted level (dBµV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4924	37.22	AV	253	1.1	V	34.6	2.7	26.75	47.77	54	-6.23
4924	36.31	AV	35	1.3	H	34.7	2.7	26.75	46.96	54	-7.04
4924	49.45	PK	253	1.1	V	34.6	2.7	26.75	60.00	74	-14.00
4924	47.14	PK	35	1.3	H	34.7	2.7	26.75	57.79	74	-16.21
1397.52	30.06	AV	268	1.1	V	25.3	1.3	26.65	30.01	54	-23.99
1397.52	29.20	AV	287	1.1	H	25.5	1.3	26.65	29.35	54	-24.65
1397.52	38.55	PK	268	1.1	V	25.3	1.3	26.65	38.50	74	-35.50
1397.52	38.32	PK	187	1.1	H	25.5	1.3	26.65	38.47	74	-35.53

Spurious emissions in restricted band:

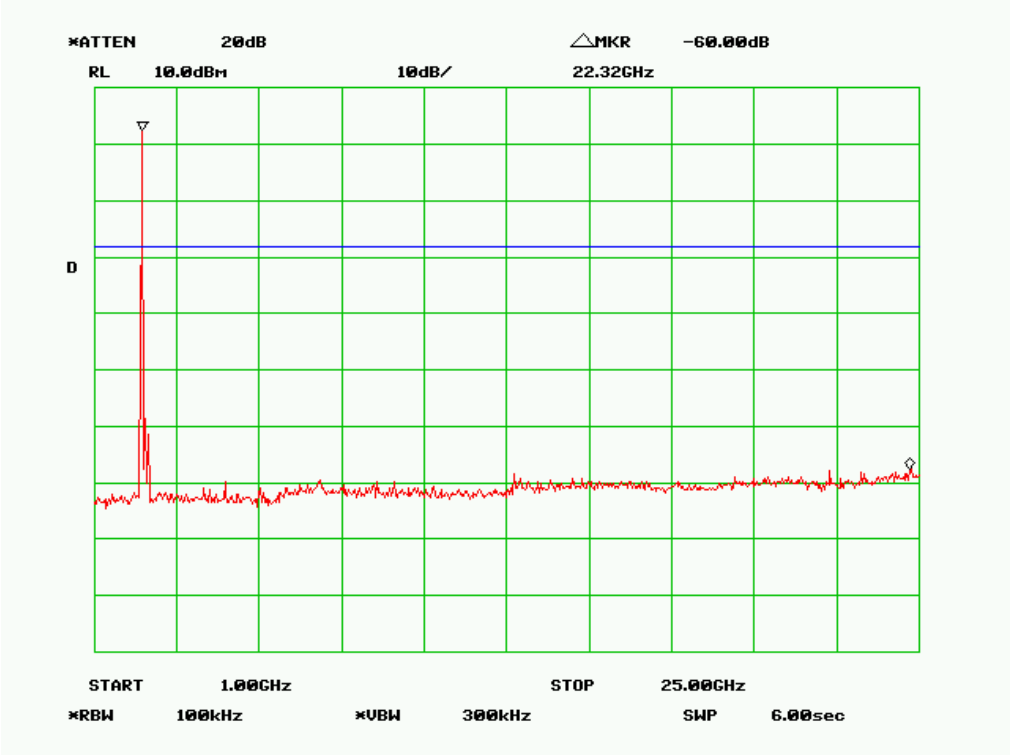
Frequency (MHz)	Substituted level (dBµV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2363.86	37.85	AV	145	1.1	V	30.1	1.8	26.83	42.92	54	-11.08
2485.42	36.58	AV	130	1.1	V	30.6	1.8	26.83	42.15	54	-11.85
2485.42	33.48	AV	334	1.1	H	30.6	1.8	26.83	39.05	54	-14.95
2363.86	33.18	AV	145	1.1	H	30.1	1.8	26.83	38.25	54	-15.75
2485.42	45.79	PK	130	1.1	V	30.6	1.8	26.83	51.36	74	-22.64
2363.86	45.69	PK	145	1.1	V	30.1	1.8	26.83	50.76	74	-23.24
2485.42	45.08	PK	145	1.1	H	30.6	1.8	26.83	50.65	74	-23.35
2363.86	45.22	PK	334	1.1	H	30.1	1.8	26.83	50.29	74	-23.71

Antenna Port Conducted Spurious Emissions

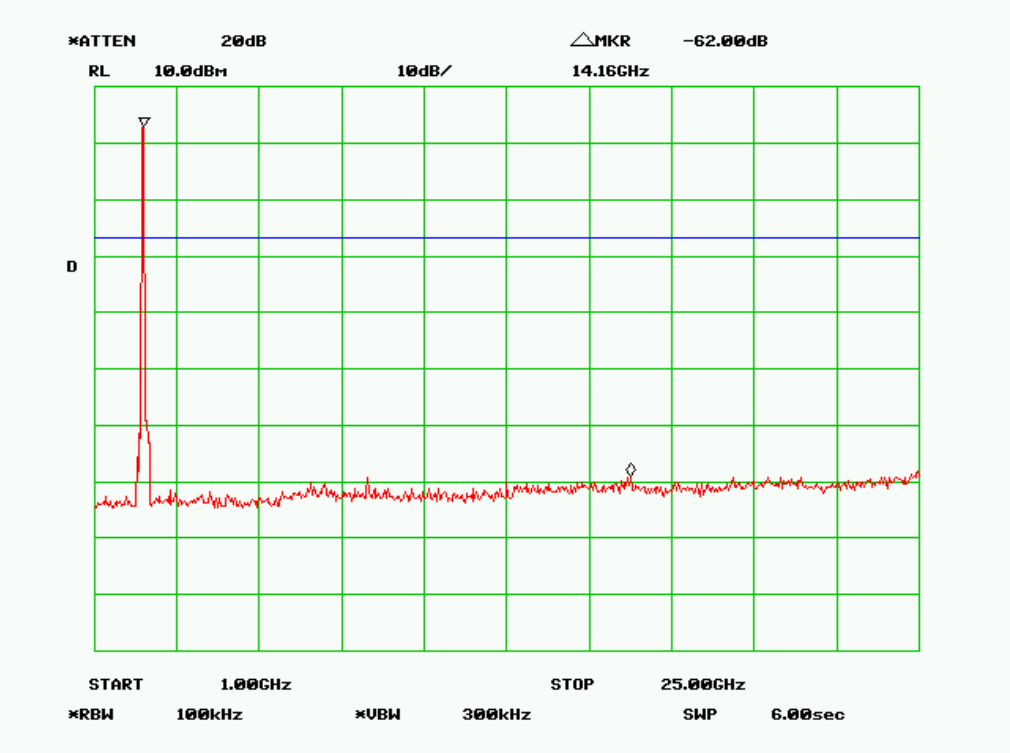
Channel Frequency (MHz)	Delta Value (dBc)	Limit (dBc)	Ref. Plot	Result
802.11b mode				
2412	60.00	20	PLOT1	PASS
2437	62.00	20	PLOT2	PASS
2462	60.67	20	PLOT3	PASS
802.11g mode				
2412	57.66	20	PLOT4	PASS
2437	58.67	20	PLOT5	PASS
2462	55.83	20	PLOT6	PASS

Please refer to the following plots.

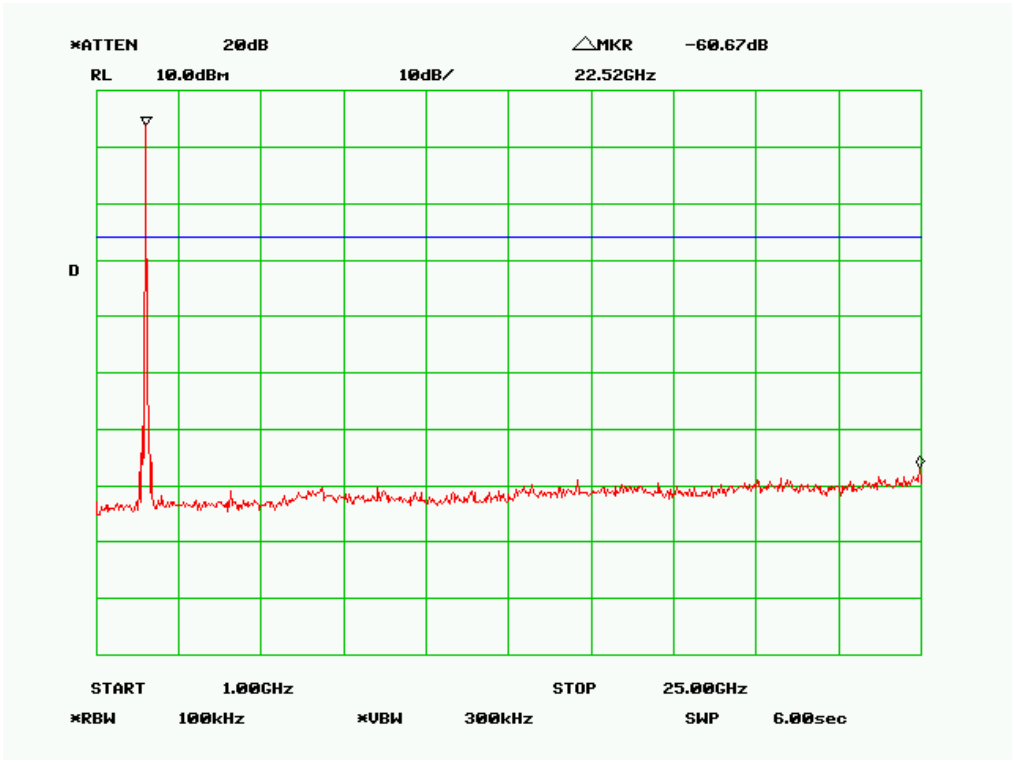
PLOT1- 802.11b Low Channel



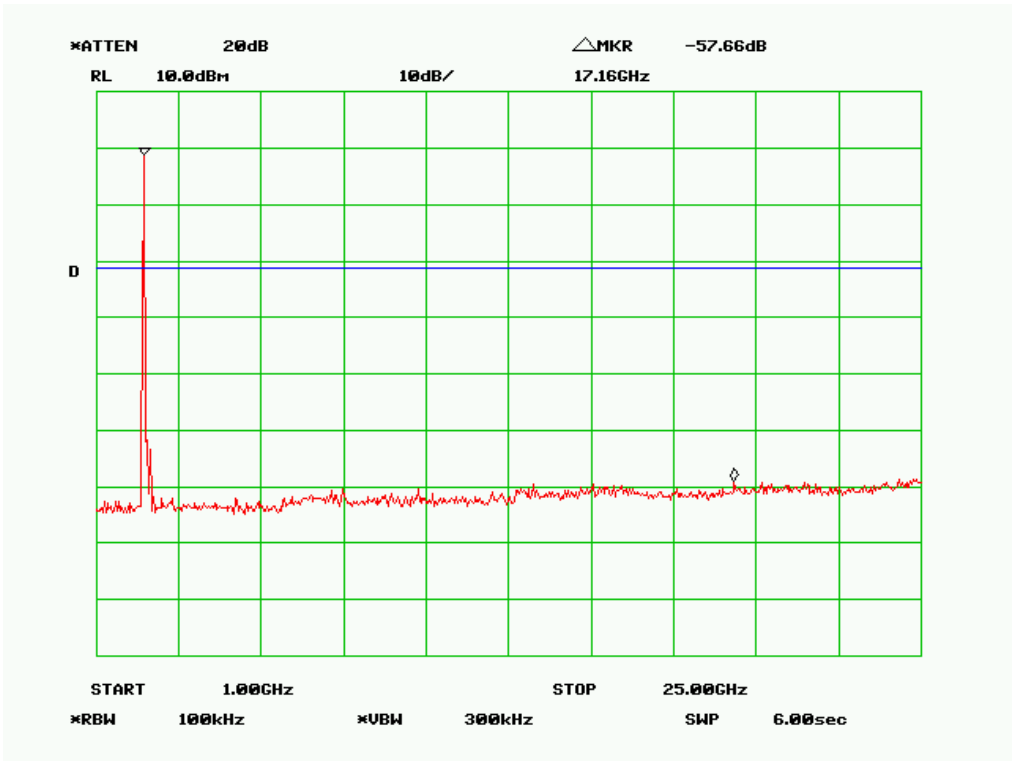
PLOT2- 802.11b Middle Channel



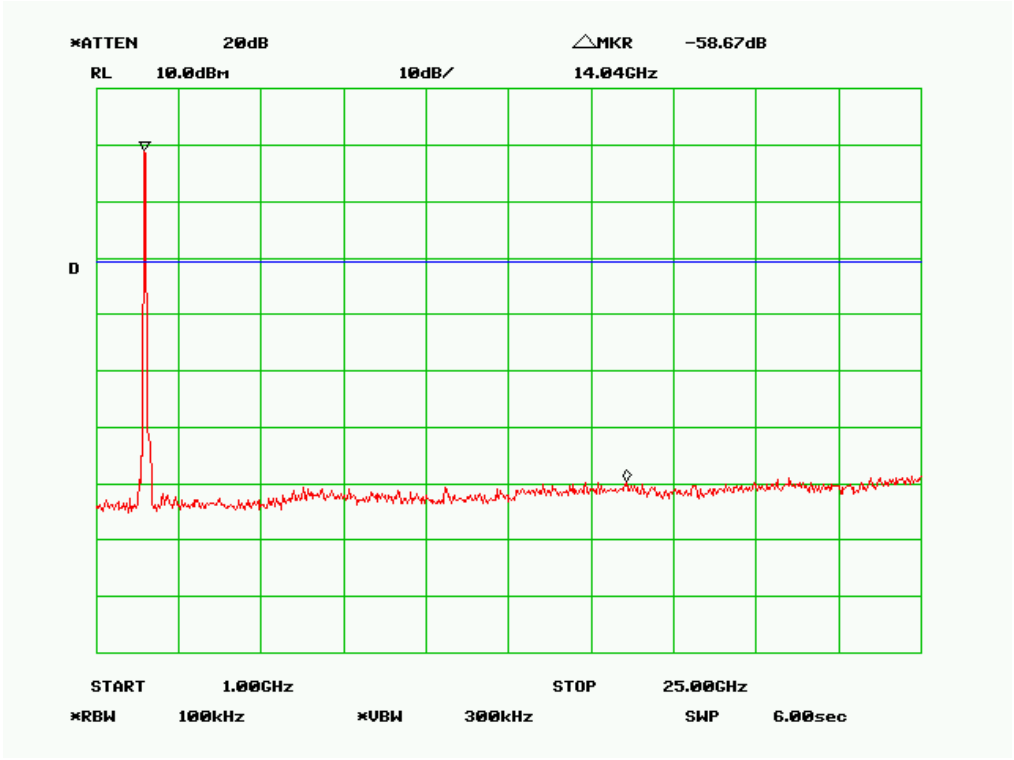
PLOT3- 802.11b High Channel



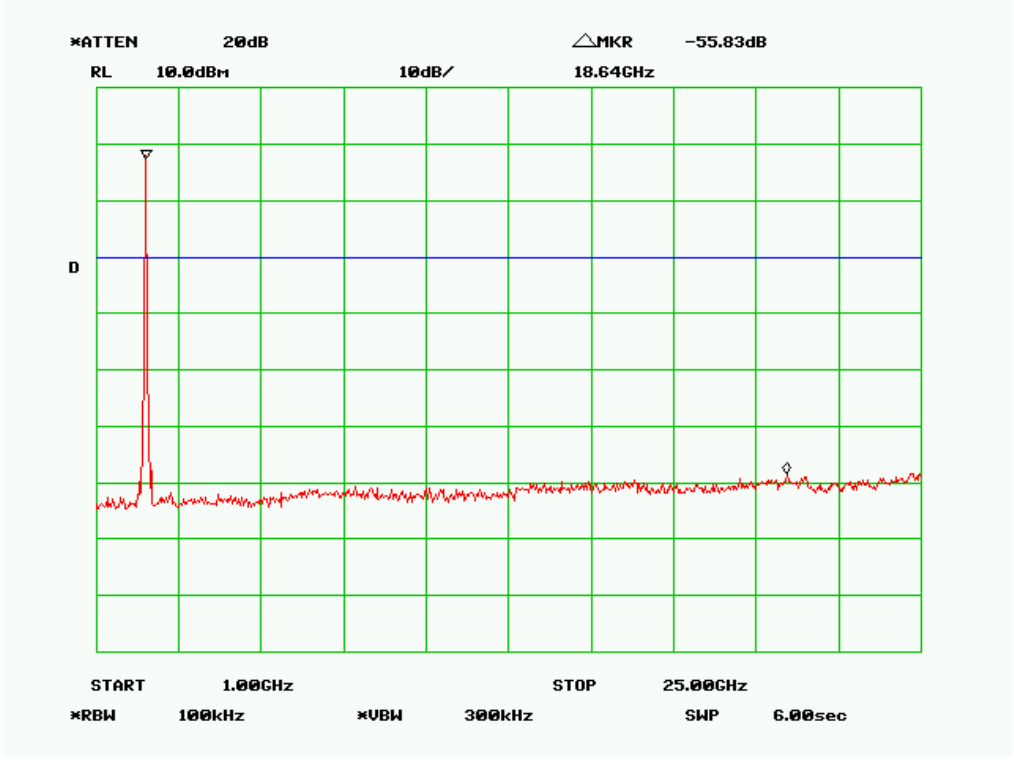
PLOT4- 802.11g Low Channel



PLOT5- 802.11g Middle Channel



PLOT6- 802.11g High Channel



5.5 §15.247(a) (2) – 6 dB BANDWIDTH TESTING

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Environmental Conditions
   Temperature 22°C
   Relative Humidity 50%
   Atmospheric Pressure 1019mbar
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
4. Test date : March 13, 2012
   Tested By : William Long

Requirement(s): 47 CFR §15.247(a)(1)

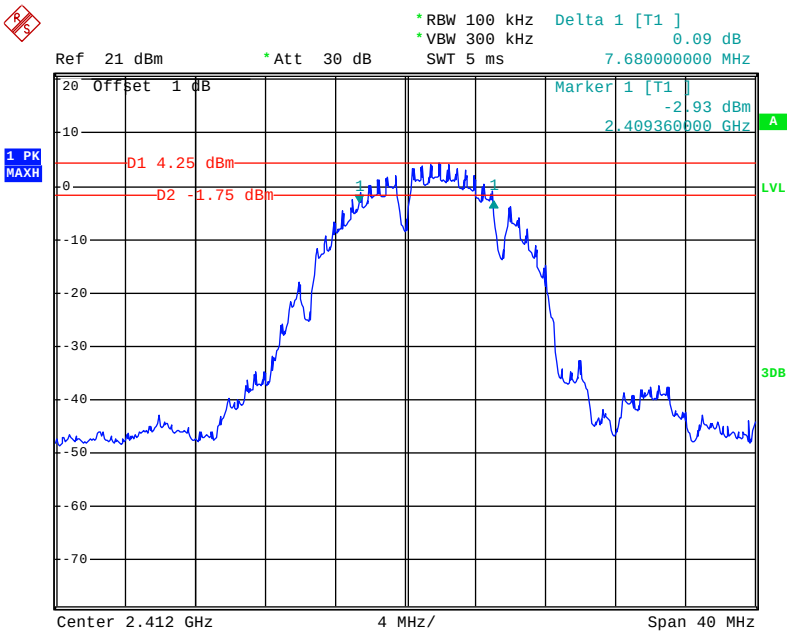
Procedures: The 6dB Bandwidths were measured conducted using a spectrum analyzer at low, middle, and high channels. 6dB Bandwidth Limit: ＞500kHz.

Test Result: Pass.

Please refer to the following tables and plots.

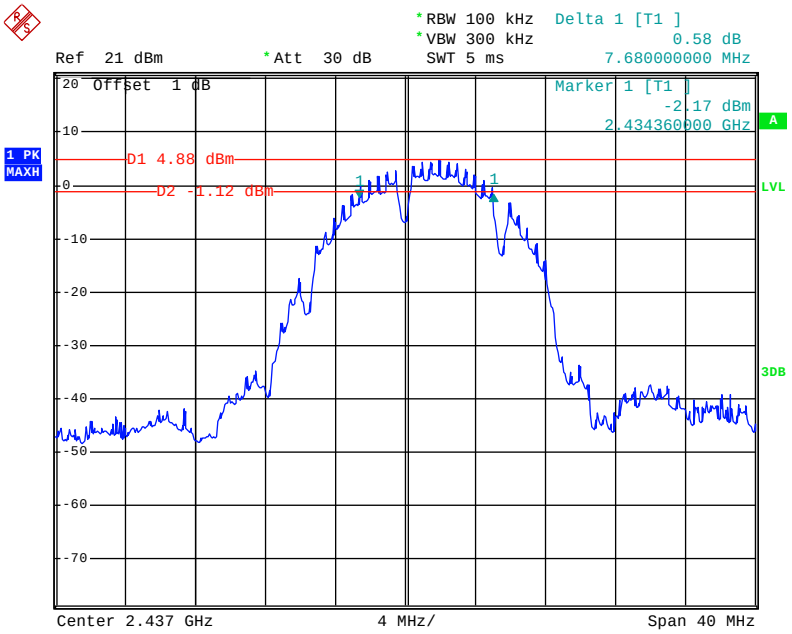
Channel	Channel Frequency (MHz)	Measured 6dB Bandwidth (MHz)	FCC Part 15.247 Limit (kHz)
802.11b mode			
Low	2412	7.68	＞500
Middle	2437	7.68	＞500
High	2462	7.68	＞500
802.11g mode			
Low	2412	15.36	＞500
Middle	2437	15.36	＞500
High	2462	15.36	＞500

802.11b Low Channel



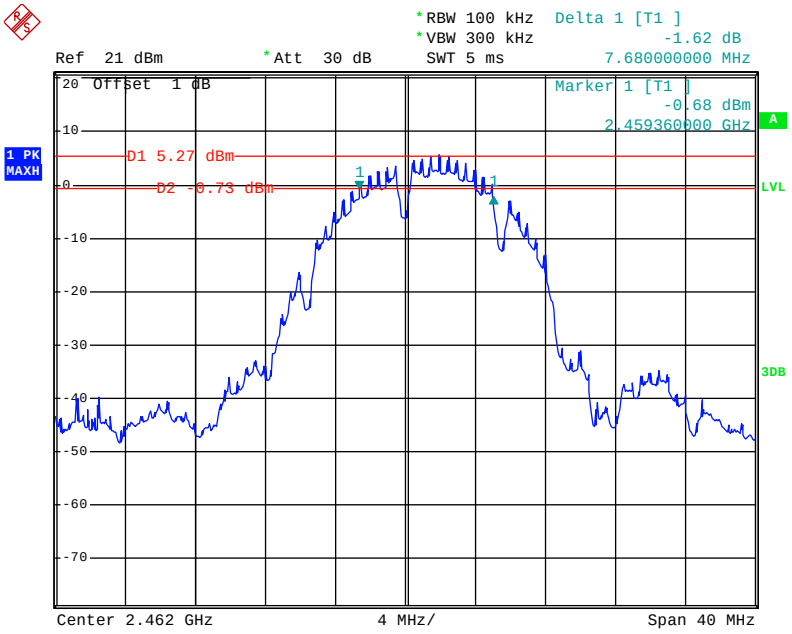
Date: 13.MAR.2012 22:32:04

802.11b Middle Channel



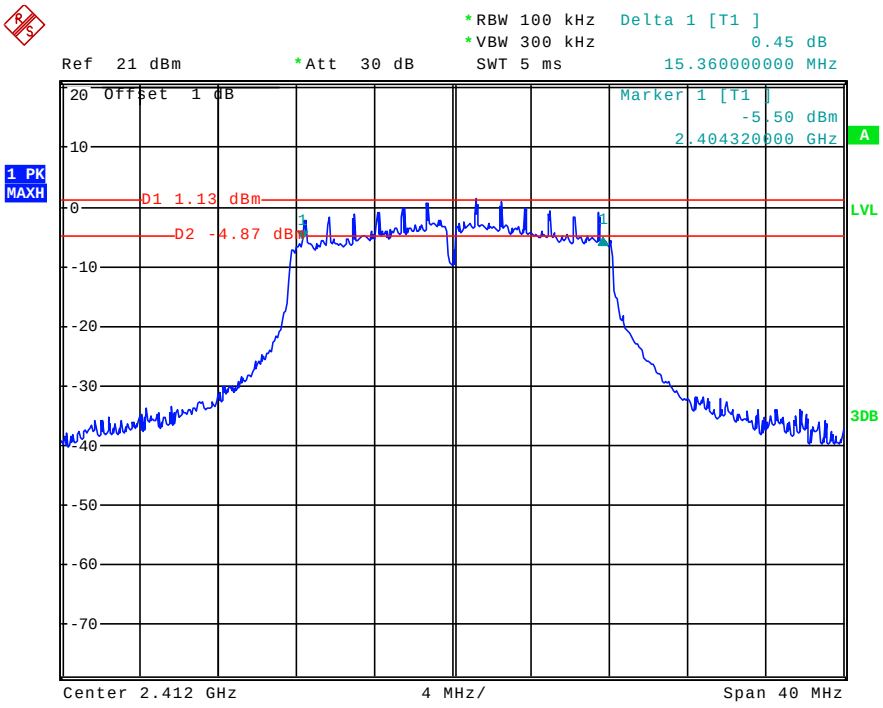
Date: 13.MAR.2012 22:34:13

802.11b High Channel



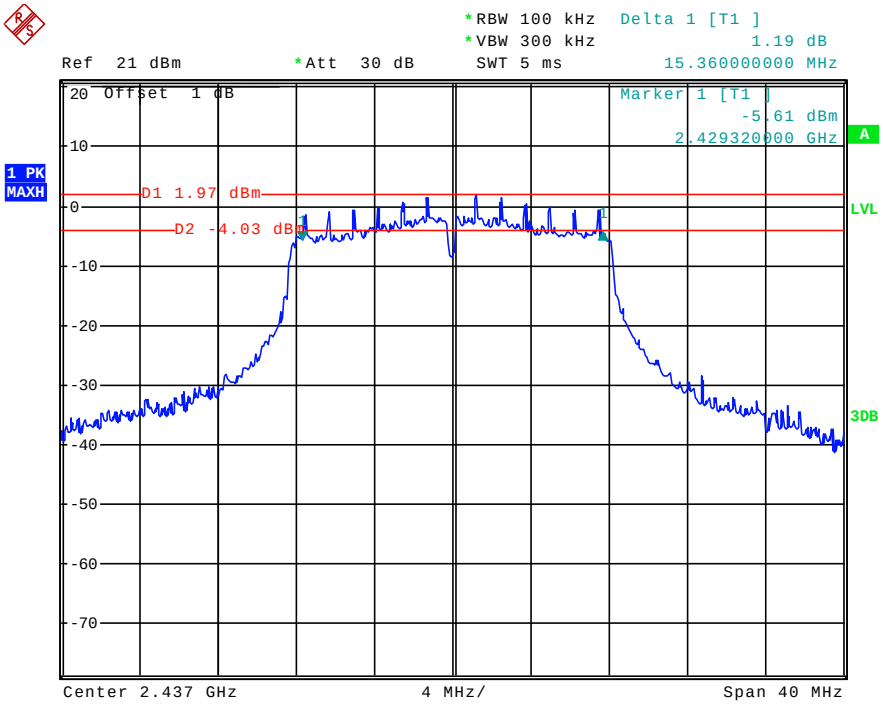
Date: 13.MAR.2012 22:29:00

802.11g Low Channel



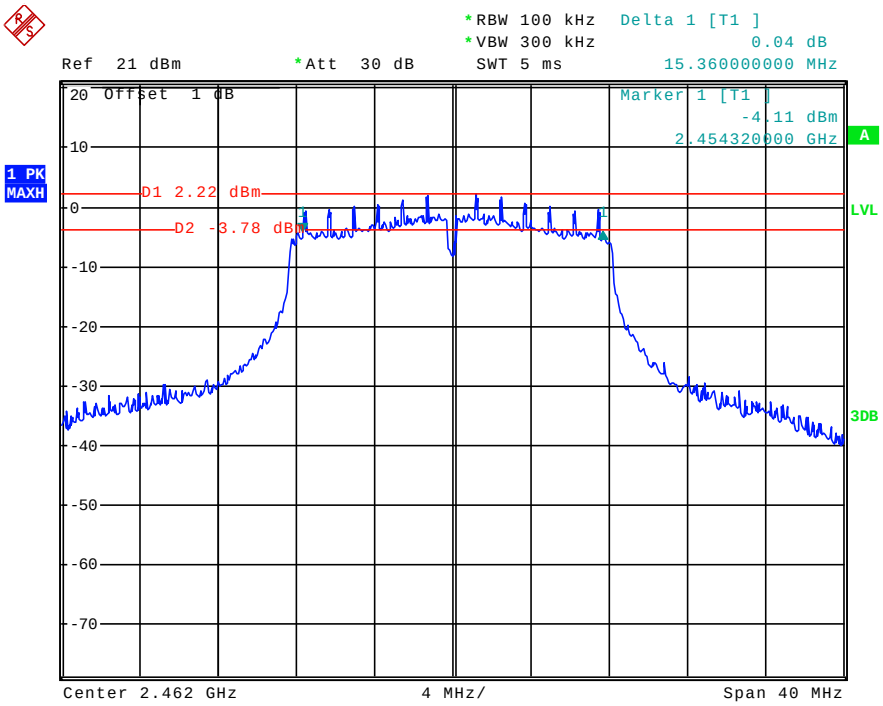
Date: 13.MAR.2012 22:57:06

802.11g Middle Channel



Date: 13.MAR.2012 23:01:02

802.11g High Channel



Date: 13.MAR.2012 22:53:33

5.6 §15.247(b) (3) - Maximum Peak Output Power

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	16°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4. Test date : March 13, 2012
   Tested By : William Long

Standard Requirement: 47 CFR §15.247(b)

Procedures: The peak output power was measured conducted using a spectrum analyzer at low, middle, and high channels. Peak detector was set to measure the power output. The power is converted from watt to dBm, therefore, 1 watt = 30 dBm. The highest antenna gain that will be used is 2dBi.

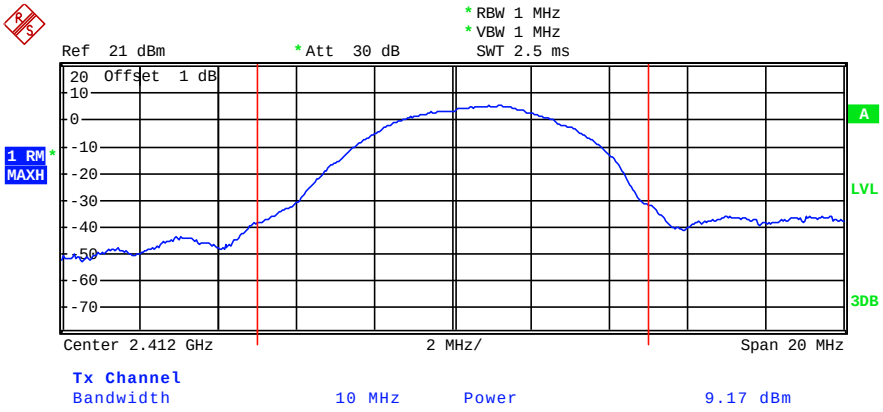
Test Result: Pass.

Please refer to the following tables and plots.

Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)
802.11b mode				
Low	2412	1	9.17	30
Middle	2437	1	10.48	30
High	2462	1	11.13	30
802.11g mode				
Low	2412	6	6.95	30
Middle	2437	6	7.50	30
High	2462	6	8.80	30

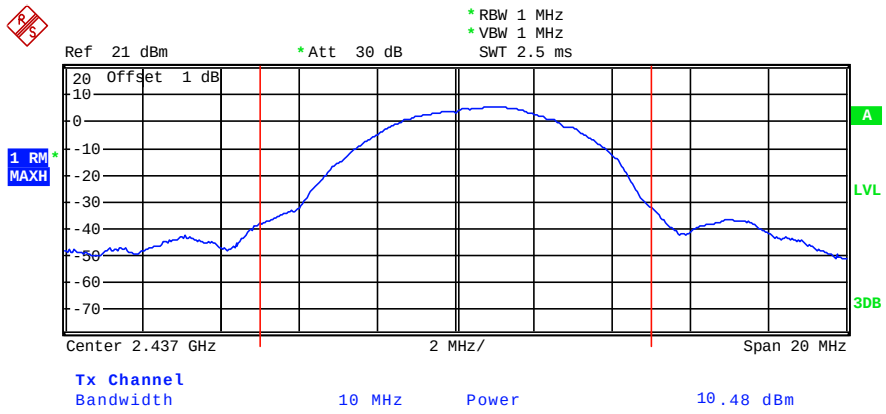
802.11b Mode:

802.11b RF Output Power, Low Channel



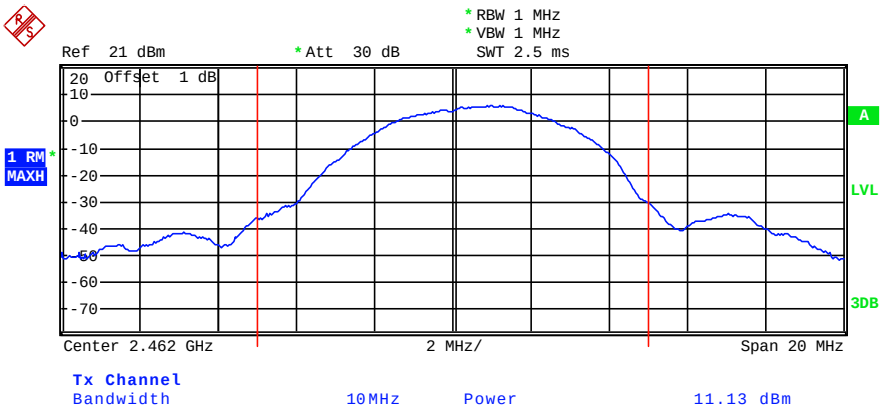
Date: 13.MAR.2012 22:19:14

802.11b RF Output Power, Middle Channel



Date: 13.MAR.2012 22:21:39

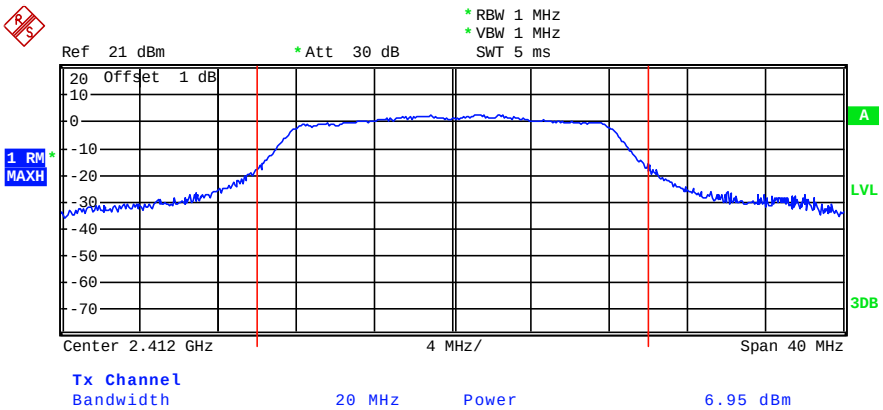
802.11b RF Output Power, High Channel



Date: 13.MAR.2012 22:23:04

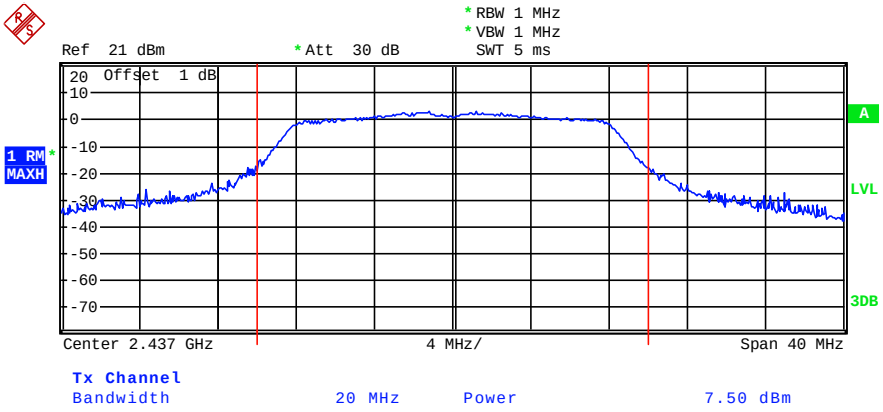
802.11g Mode:

802.11g RF Output Power, Low Channel



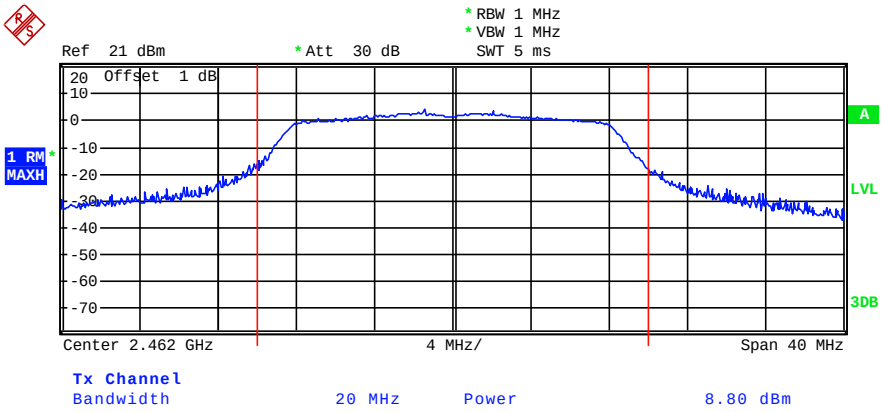
Date: 13.MAR.2012 22:48:38

802.11g RF Output Power, Middle Channel



Date: 13.MAR.2012 22:49:48

802.11g RF Output Power, High Channel



Date: 13.MAR.2012 22:50:21

5.7 §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

1. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))

2. Environmental Conditions

Temperature	16oC
Relative Humidity	50%
Atmospheric Pressure	1019mbar

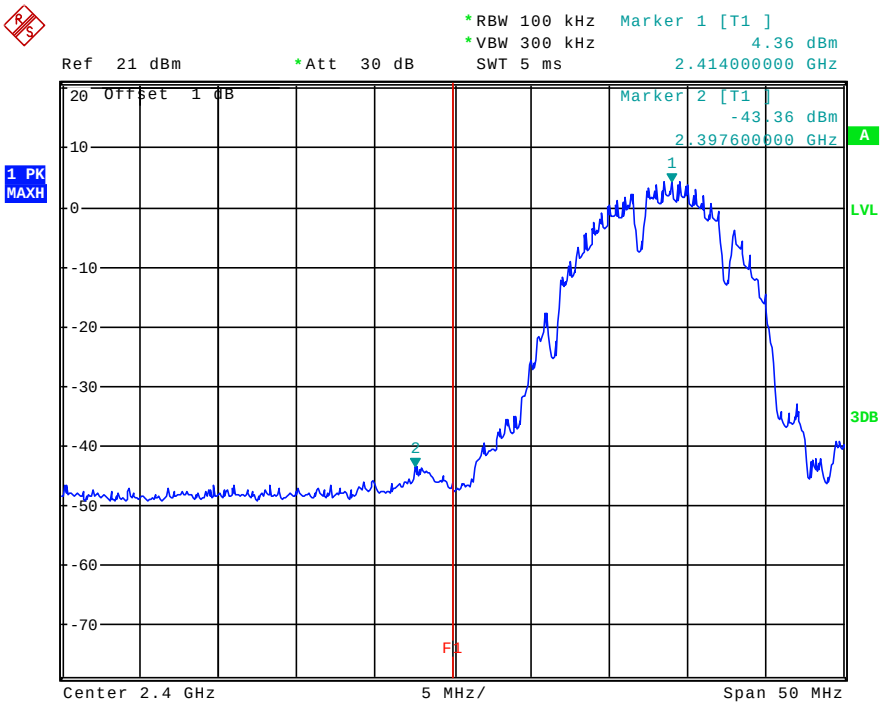
3. Test date : March 13, 2012
Tested By : William Long

Test Result: Pass.

Please refer to the following tables and plots.

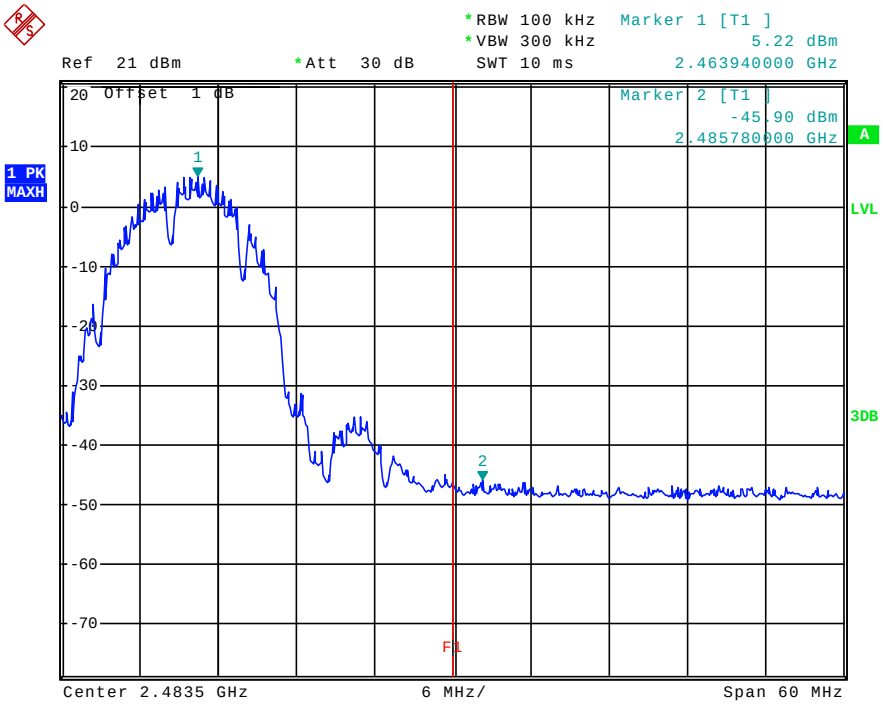
Frequency (MHz)	Delta Peak to band emission (dBc)	Limit (dBc)
802.11b mode		
2397.60	47.72	20
2485.78	51.12	20
802.11g mode		
2399.80	33.48	20
2483.86	41.94	20

802.11b: Band Edge, Left Side



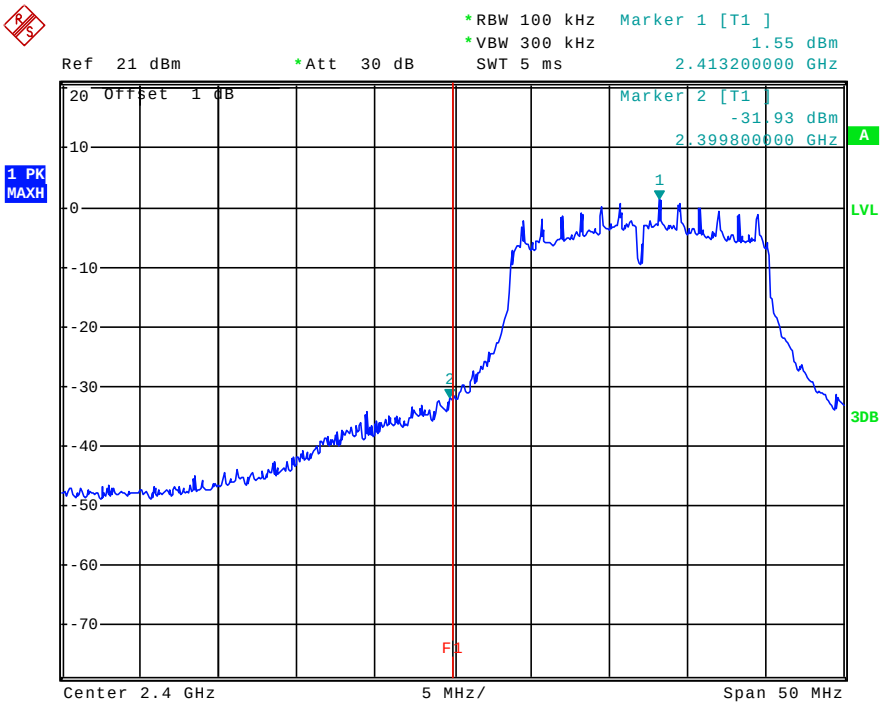
Date: 13.MAR.2012 22:40:35

802.11b: Band Edge, Right Side



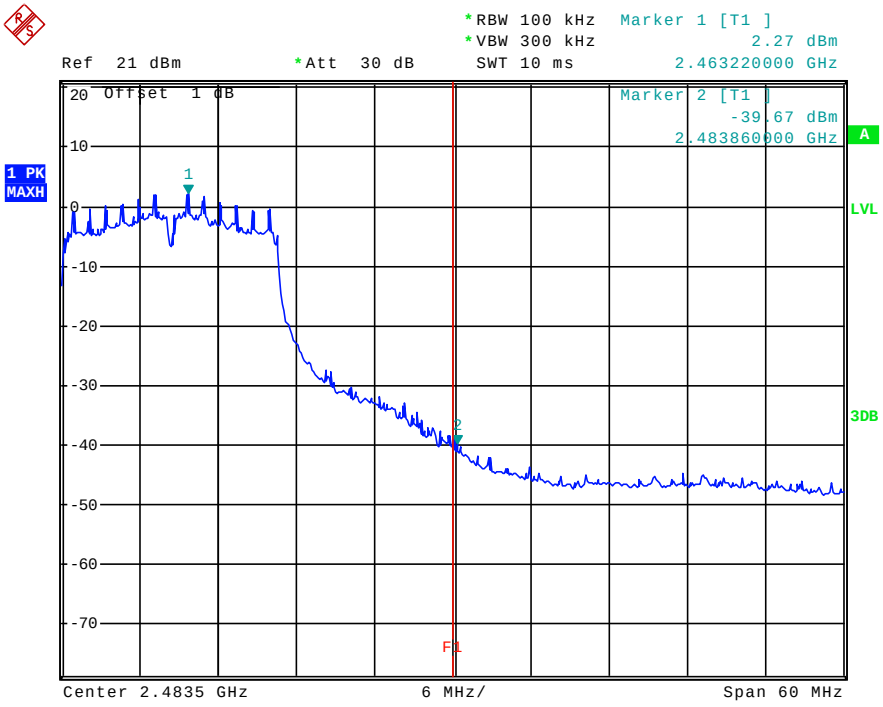
Date: 13.MAR.2012 22:43:53

802.11g: Band Edge, Left Side



Date: 13.MAR.2012 23:04:21

802.11g: Band Edge, Right Side



Date: 13.MAR.2012 23:13:07

5.8 §15.247(e) - POWER SPECTRAL DENSITY

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Environmental Conditions
   Temperature 22°C
   Relative Humidity 50%
   Atmospheric Pressure 1019mbar
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
4. Test date : March 13 to March 14, 2012
   Tested By : William Long

Requirement(s): 47 CFR §15.247(e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

Procedures: The power spectral density measurement was taken conducted using a spectrum analyzer.

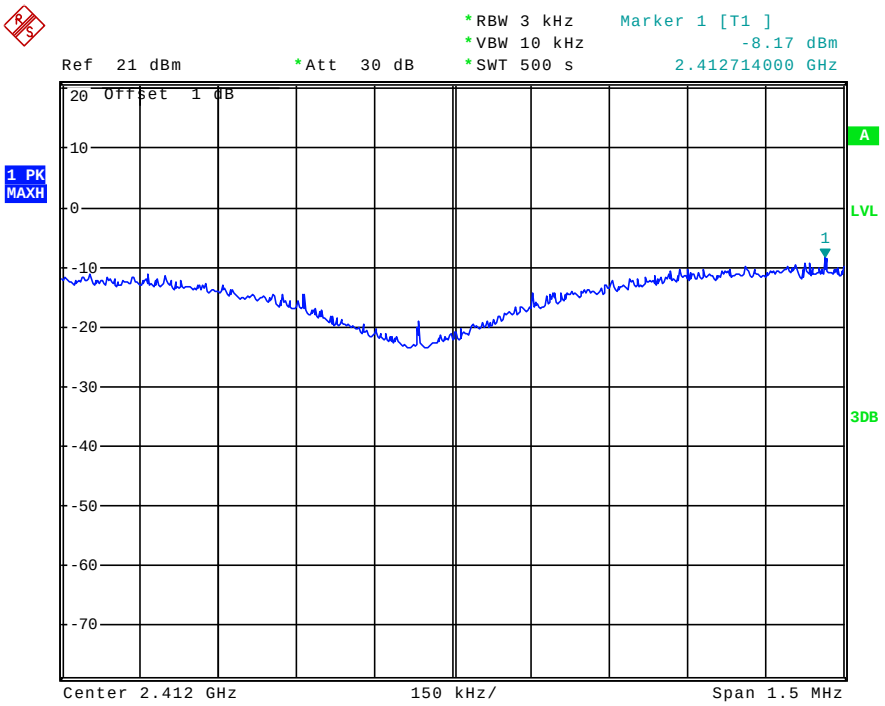
RBW=3kHz, VBW>RBW, Sweep time to SPAN/RBW(s).

Test Result: Pass.

Please refer to the following tables and plots.

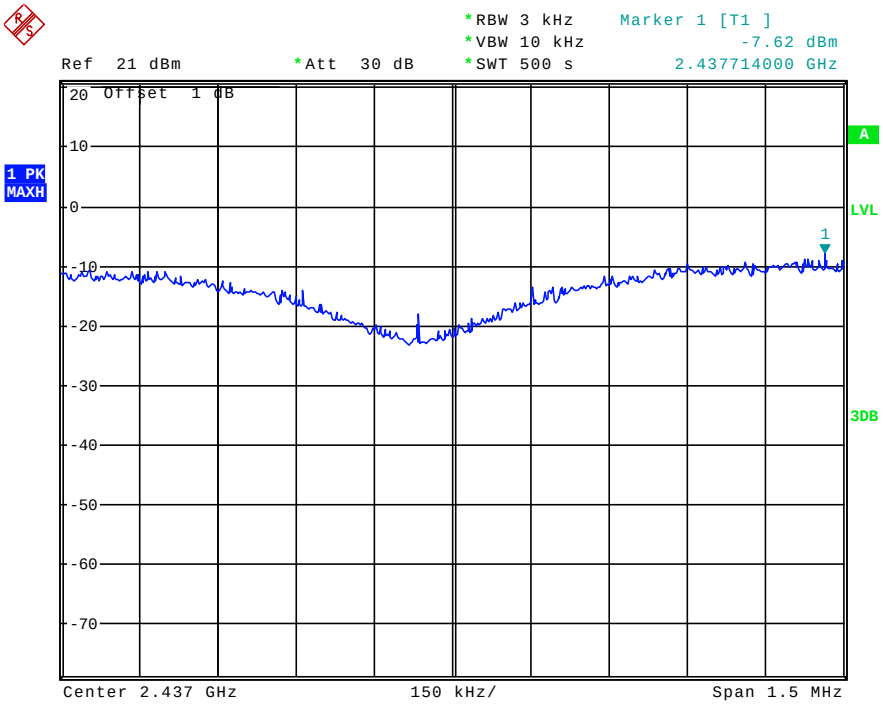
Channel	Frequency (MHz)	Data Rate	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11b mode					
Low	2412	1	-8.17	8	Pass
Middle	2437	1	-7.62	8	Pass
High	2462	1	-7.36	8	Pass
802.11g mode					
Low	2412	6	-13.26	8	Pass
Middle	2437	6	-12.49	8	Pass
High	2462	6	-12.42	8	Pass

Power Spectral Density, 802.11b Low Channel



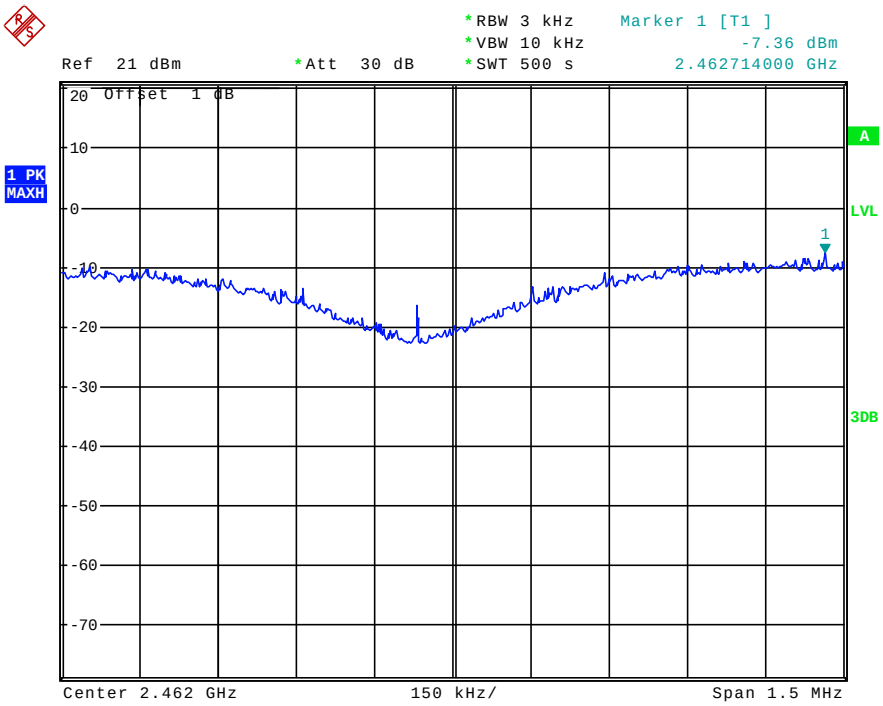
Date: 13.MAR.2012 23:26:50

Power Spectral Density, 802.11b Middle Channel



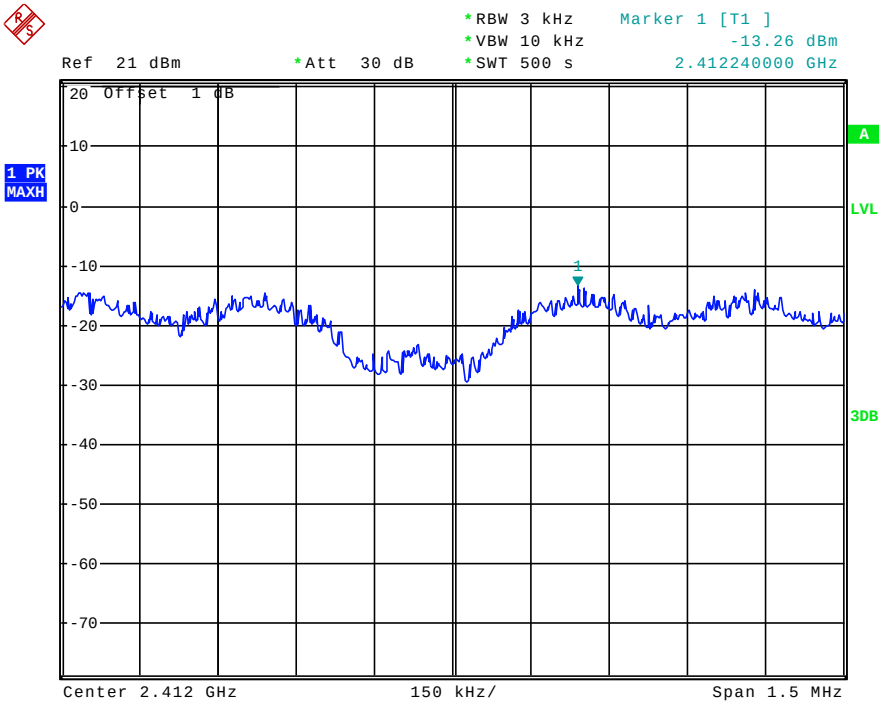
Date: 13.MAR.2012 23:36:10

Power Spectral Density, 802.11b High Channel



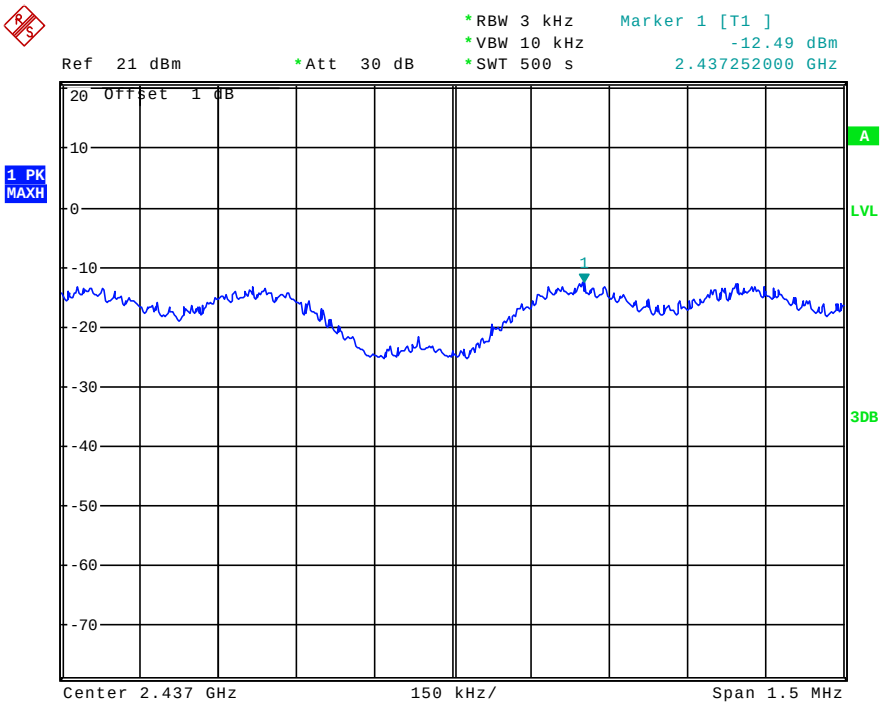
Date: 13.MAR.2012 23:47:23

Power Spectral Density, 802.11g Low Channel



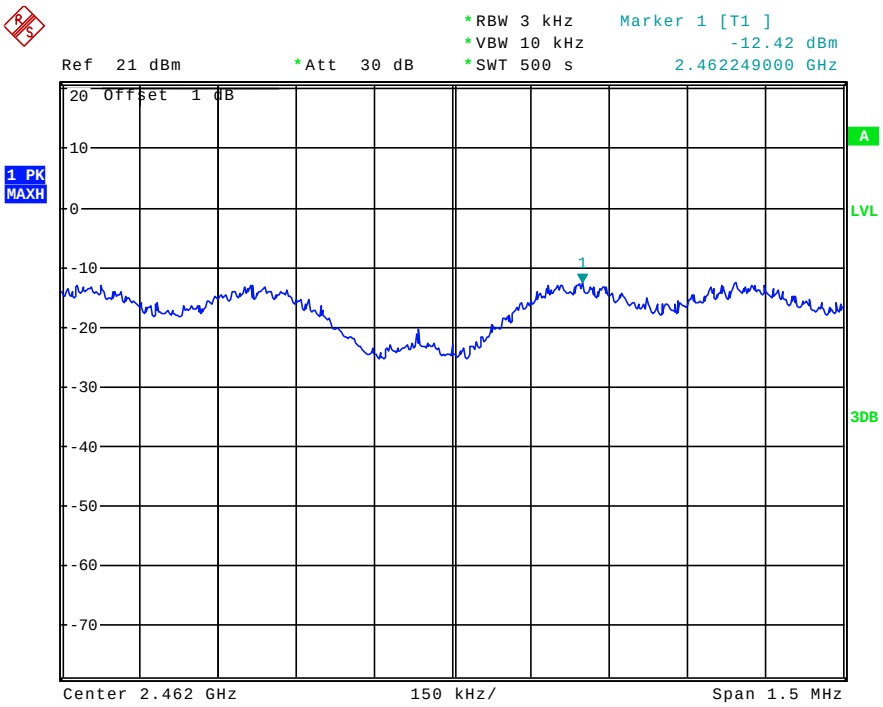
Date: 13.MAR.2012 23:57:28

Power Spectral Density, 802.11g Middle Channel



Date: 14.MAR.2012 00:08:35

Power Spectral Density, 802.11g High Channel



Date: 14.MAR.2012 00:18:39

Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Calibration Date	Calibration Due Date
AC Conducted Emissions			
R&S EMI Test Receiver	ESPI3	08/26/2011	08/25/2012
R&S LISN	LI-115	05/26/2011	05/25/2012
Radiated Emissions			
Spectrum Analyzer	8563E	01/10/2012	01/09/2013
EMI Receiver	ESPI3	08/26/2011	08/25/2012
Antenna(1 ~18GHz)	3115	10/04/2011	10/03/2012
Antenna (30MHz~2GHz)	JB1	10/04/2011	10/03/2012
Chamber	3m	04/12/2011	04/11/2013
Pre-Amplifier(1 ~ 18GHz)	AMF-7D-00101800-30-10P	05/26/2011	05/25/2012
Horn Antenna (18~40GHz)	AH-840	07/23/2011	07/23/2012
Microwave Pre-Amp (18~40GHz)	PA-840	Every 2000 Hours	
Signal Analyzer	8665B	01/21/2012	02/20/2013
Temperature/Humidity Chamber	1007H	06/08/2011	06/07/2012

Annex A.ii. CONDUCTED EMISSIONS TEST DESCRIPTION

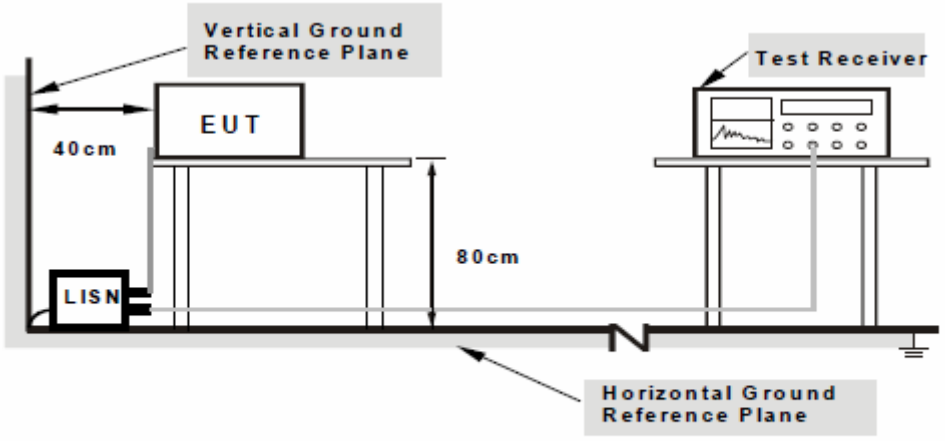
Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.

2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.

3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.

4. All other supporting equipments were powered separately from another main supply.



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration1.

Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.

2. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.

3. High peaks, relative to the limit line, were then selected.

4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made.

5. Steps 2 to 4 were then repeated for the LIVE line (for AC mains) or DC line (for DC power).

Description of Conducted Emission Program

This EMC Measurement software run LabView automation software and offers a common user interface for electromagnetic interference (EMI) measurements. This software is a modern and powerful tool for controlling and monitoring EMI test receivers and EMC test systems. It guarantees reliable collection, evaluation, and documentation of measurement results. Basically, this program will run a pre-scan measurement before it proceeds with the final measurement. The pre-scan routine will run the common scan range from 150 kHz to 30 MHz; the program will first start a peak and average scan on selectable measurement time and step size. After the program complete the pre-scan, this program will perform the Quasi Peak and Average measurement, based on the pre-scan peak data reduction result.

Sample Calculation Example

At 20 MHz limit = 250 μV = 47.96 dBμV

Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.20 dB

Q-P reading obtained directly from EMI Receiver = 40.00 dBμV
(Calibrated for system losses)

Therefore, Q-P margin = 47.96 – 40.00 = 7.96 i.e. **7.96 dB below limit**

Annex A. iii RADIATED EMISSIONS TEST DESCRIPTION

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 10th Harmonic , was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

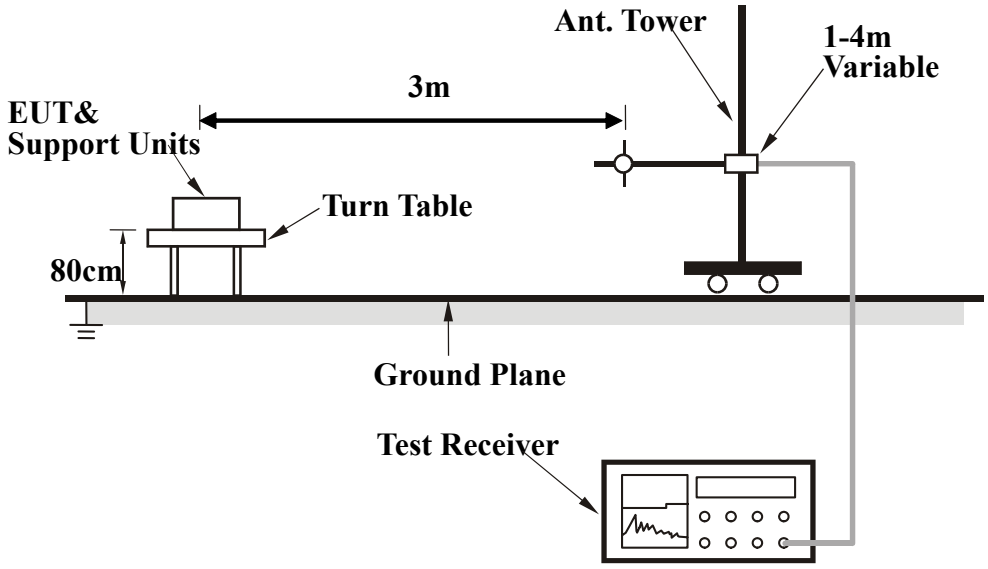
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred, clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS).

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:
1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement
1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.

2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on an open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ◦ to 360 ◦ with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.

5. Repeat step 4 until all frequencies need to be measured was complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

where
Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)
And the average value is

Average = Peak Value + Duty Factor or
Set RBW = 1MHz, VBW = 10Hz.

Note :
If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

Annex B. EUT AND TEST SETUP PHOTOGRAPHS

Please see attachment

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

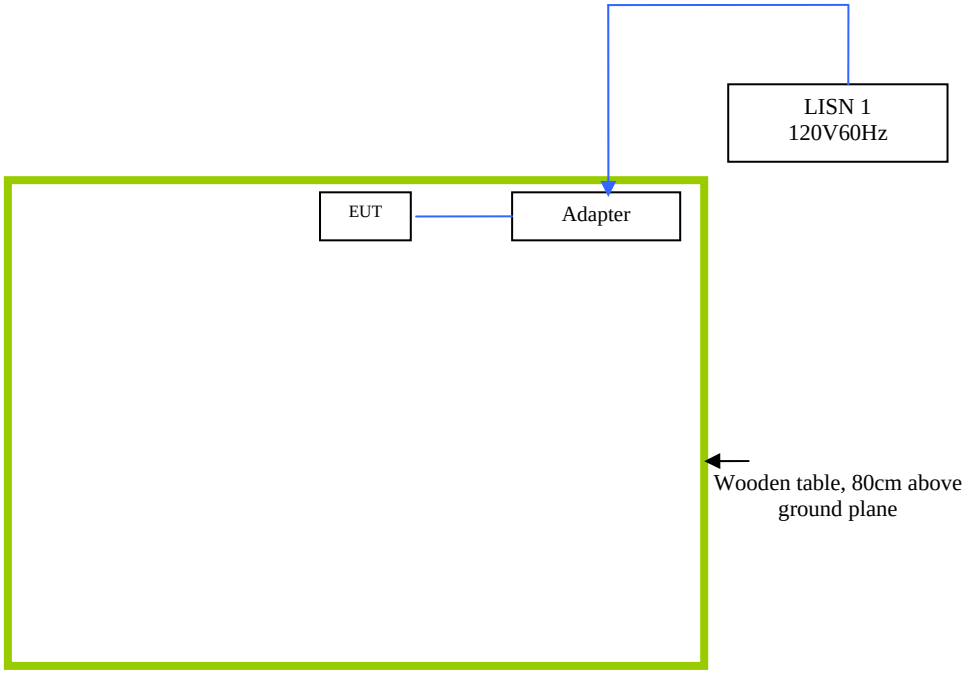
EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

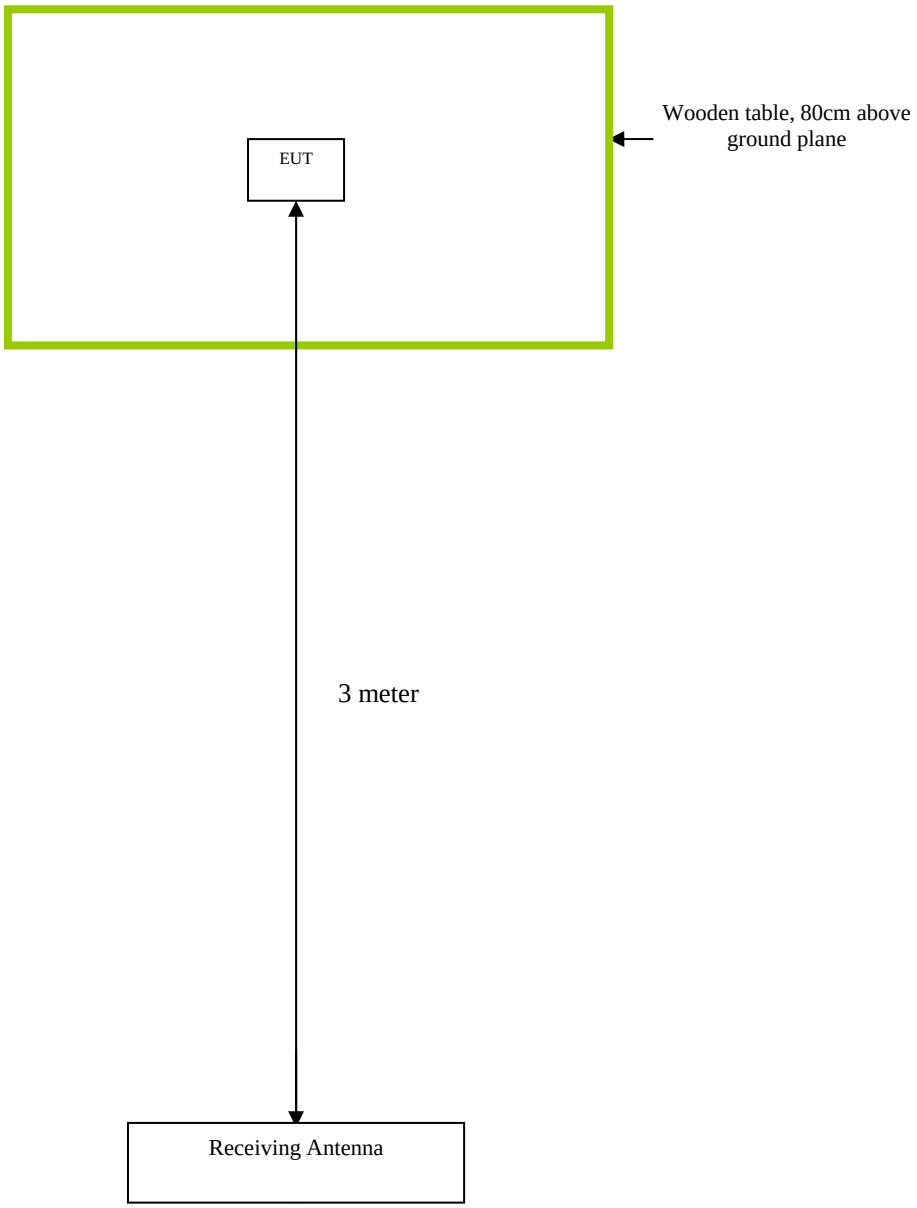
The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
N/A	N/A	N/A

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was continuously transmitting to stimulate the worst case.

Annex D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment

Annex E. SIEMIC ACCREDITATION CERTIFICATES

SEFTON™

To: SIEMIC ,2206 Ringwood Avenue,San Jose,C,USA

Declaration letter

Dear Sir,

Model No.: S-450 i9

We declare that there is no electrical change has been made to the equipment that alters the compliance characteristics. The difference of these two models is for different logo and color.Please kindly handle on the project.

Thank you!

Signature: Jonathan

Printed name/title: JONATHAN/General Manager
Tel: 606-7777
Fax: 606-7777
Address: CALLE 13 #15-61,BOGOTA,COLOMBIA