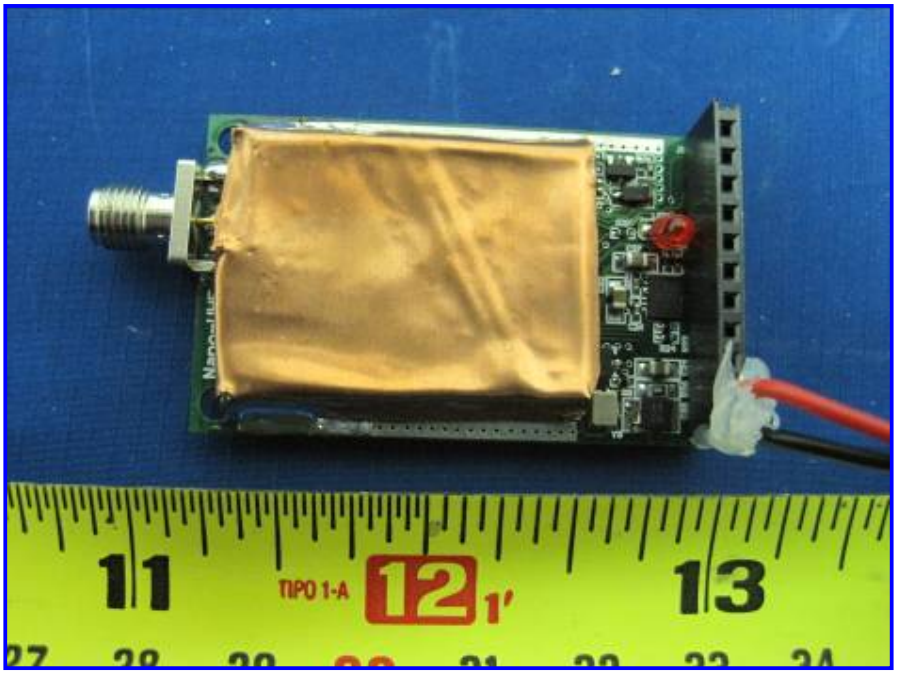
TAGSENSE INC

Nano-UHF RFID Reader

Model: Nano-UHF

03 March 2010
Report No.: SL10011201-TAG-001(15.247)
(This report supersedes)



Modifications made to the product : None

This Test Report is Issued Under the Authority of:	
Dan Coronia Compliance Engineer	Leslie Bai Director of Certification

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

EMC Test Report

To: FCC Part 15.247

SIEMIC, INC.
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Laboratory Introduction

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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

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CONTENTS

1 EXECUTIVE SUMMARY & EUT INFORMATION 6

2 TECHNICAL DETAILS 7

3 MODIFICATION 8

4 TEST SUMMARY 9

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS 10

ANNEX A. TEST INSTRUMENT & METHOD 42

ANNEX B EUT AND TEST SETUP PHOTOGRAPHS 46

ANNEX C. TEST SETUP AND SUPPORTING EQUIPMENT 46

ANNEX D USER MANUAL, BLOCK & CIRCUIT DIAGRAM 50

ANNEX E. SIEMIC ACCREDITATION CERTIFICATES 51

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1 Executive Summary & EUT information

The purpose of this test programmed was to demonstrate compliance of the TagSense, Inc., Model: Nano-UHF against the current Stipulated Standards. The Nano-UHF RFID Reader have demonstrated compliance with the FCC 15.247 2010.

The equipment under test radio operating frequency is 902.78 MHz to 927.29 MHz.

The test has demonstrated that this unit complies with stipulated standards.

EUT Information

EUT Description	:	The Nano-UHF reader is a small, low-power, low-cost RFID reader module that is designed for short-range battery-powered mobile embedded applications, such as cell phone, handled readers, printers, consumers electronics, or smart shelves. An external antenna can be connected via an SMA connector or MMCX connector. A small yet powerful ASCII command set makes this reader useful for many applications.
Model No	:	Nano-UHF
Serial No	:	
Input Power	:	5.3 – 9 V (un-regulated input) 3 – 5 V (regulated)
Classification Per Stipulated Test Standard	:	Frequency Hopping Spread Spectrum System / Device

2 TECHNICAL DETAILS

Purpose	**Compliance testing of Nano-UHF RFID Reader, model Nano-UHF Module with stipulated standard**
Applicant / Client	**TagSense, Inc.**
Manufacturer	**TagSense, Inc. 1035 Cambridge St., Suite 8 Cambridge, MA 02141 USA**
Laboratory performing the tests	**SIEMIC Laboratories**
Test report reference number	**SL10011201-TAG-001(15.247)**
Date EUT received	**19 February 2010**
Standard applied	**47 CFR §15.247: 2010**
Dates of test (from – to)	**19 & 22 February 2010**
No of Units:	**1**
Equipment Category:	**DSS**
Trade Name:	**TagSense, Inc.**
Model :	**Nano-UHF**
RF Operating Frequency (ies)	**902.78 MHz – 927.29 MHz**
Number of Channels :	**50**
Modulation :	**EPC Class 1 Gen 2**
FCC ID :	**XQ7TAGSENSE-NANO**
IC ID :	**N/A**

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:

Frequency Hopping Spread Spectrum System / Device

Test Results Summary

Test Standard 47 CFR Part 15.247: 2010	Description	Pass / Fail
15.203	Antenna Requirement	Pass
15.205	Restricted Band of Operation	Pass
15.207(a)	AC Line Conducted Emissions Voltage	Pass
15.247(a) (1)	Channel Separation	Pass
15.247(a)(1)	Occupied Bandwidth	Pass
15.247(a) (2)	6dB Bandwidth	N/A
15.247(a) (1) (i)	Number of Hopping Channels	Pass
15.247(a) (1) (i)	Time of Occupancy	Pass
15.247(b) (2)	Output Power	Pass
15.247(c)	Antenna Gain > 6 dBi	Pass
15.247(d)	Antenna Port Conducted Spurious Emissions	Pass
15.209; 15.247(d)	Radiated Spurious Emissions	Pass
15.247(e)	Power Spectral Density	N/A
15.247(f)	Hybrid System Requirement	N/A
15.247(g)	Hopping Capability	Pass
15.247(h)	Hopping Coordination Requirement	Pass
15.247(i) §2.1091& §2.1093	Maximum Permissible Exposure	Pass
15.247 (d)	100 kHz Bandwidth of Frequency Band Edge	Pass
ANSI C63.4: 2003 PS: All measurement uncertainties are not taken into consideration for all presented test result.		

The test has demonstrated that this unit complies with stipulated standards.

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 Antenna Requirement

Requirement(s): None

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.

Antenna requirement must meet at least one of the following:

a) Antenna must be permanently attached to the device.

b) Antenna must use a unique type of connector to attach to the device.

c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

Antenna Installation: Please see user manual for detail.

1. Near Field Antenna

Model No.:	N/A
Manufacturer:	TagSense
Frequency Range:	902-928 MHz
Maximum Gain:	0 dBi
Antenna Type/Pattern:	Circular Polarization

2. Flat Patch Antenna

Model No.:	HG908P
Manufacturer:	L-com
Frequency Range:	902-928 MHz
Maximum Gain:	8 dBi
Antenna Type/Pattern:	Circular Polarization

5.2 Conducted Emissions Voltage

Note:

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 150kHz – 30MHz (Average & Quasi-peak) is ±3.5dB.
4. Environmental Conditions

Temperature	25ºC
Relative Humidity	50%
Atmospheric Pressure	1019mbar

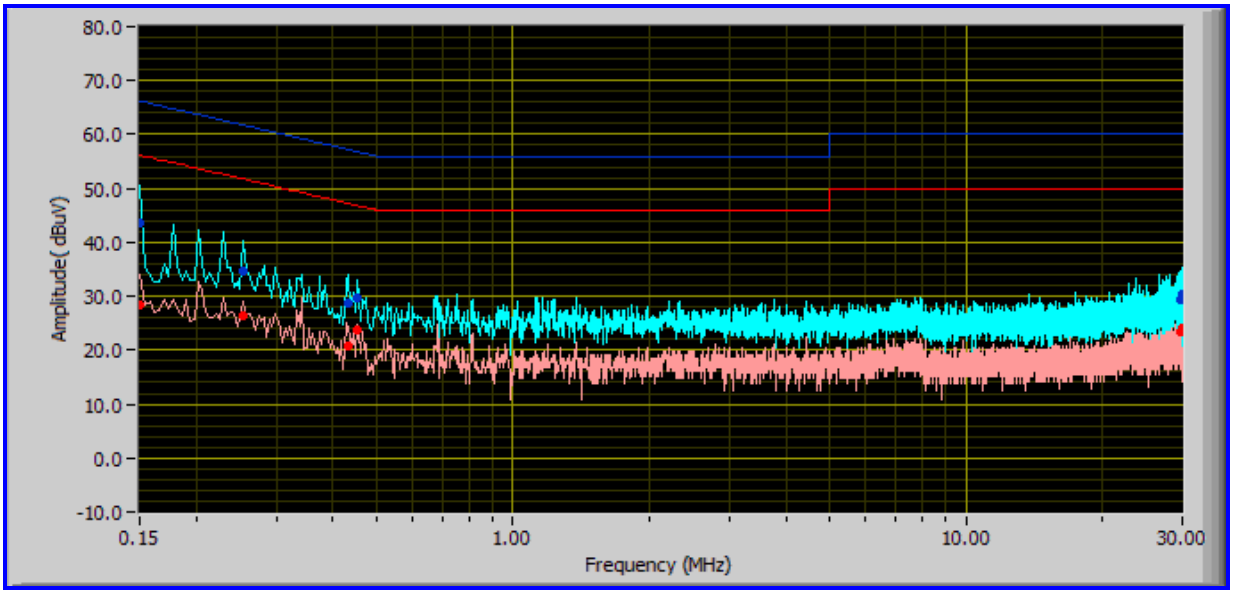
   Test Date : February 19 & 22 2010
   Tested By : Dan Coronia

Standard Requirement:

Frequency of emission (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.

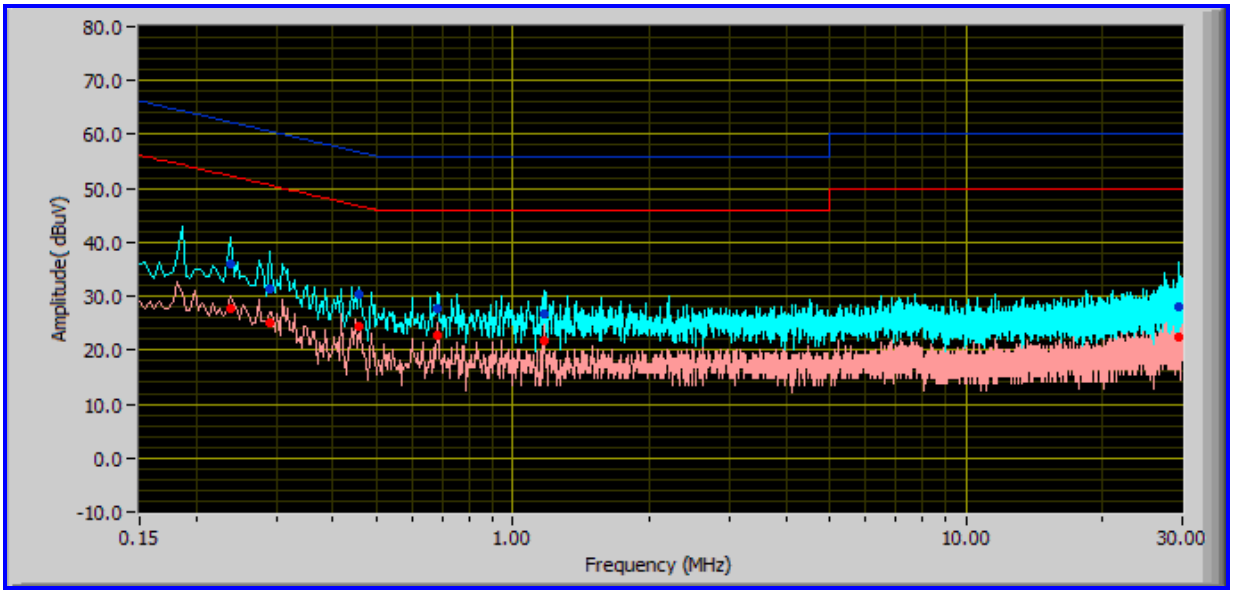
Results: Pass



Quasi-Peak Limit Average Limit

Phase Line Plot at 110Vac, 60Hz

Frequency (MHz)	QP Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Line
0.15	43.64	66.19	PASS	-22.55	28.45	56.19	PASS	-27.74	Phase
0.25	34.59	61.73	PASS	-27.14	26.53	51.73	PASS	-25.20	Phase
0.43	28.78	57.19	PASS	-28.41	20.61	47.19	PASS	-26.59	Phase
0.45	29.60	56.81	PASS	-27.21	23.77	46.81	PASS	-23.04	Phase
29.99	30.44	60.00	PASS	-29.56	24.22	50.00	PASS	-25.78	Phase
29.72	29.42	60.00	PASS	-30.58	23.40	50.00	PASS	-26.60	Phase



Quasi-Peak Limit Average Limit

Neutral Line Plot at 110Vac, 60Hz

Frequency (MHz)	QP Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Line
0.24	35.90	62.28	PASS	-26.38	27.56	52.28	PASS	-24.72	Neutral
0.29	31.41	60.61	PASS	-29.20	25.08	50.61	PASS	-25.53	Neutral
29.46	28.07	60.00	PASS	-31.93	22.55	50.00	PASS	-27.45	Neutral
1.17	26.80	56.00	PASS	-29.20	21.81	46.00	PASS	-24.19	Neutral
0.46	30.30	56.74	PASS	-26.44	24.46	46.74	PASS	-22.28	Neutral
0.68	27.66	56.00	PASS	-28.34	22.80	46.00	PASS	-23.20	Neutral

5.3 Channel Separation

Conducted Measurement

1. 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 25°C; Relative Humidity 50%; Atmospheric Pressure 1019mbar
   Conducted Emissions Measurement Uncertainty
3. 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 – 20GHz is ±1.5dB.
4. Test Date : February 19 & 22 2010
   Tested By : Dan Coronia

Requirement(s): 47 CFR §15.247(a)(1)(i)

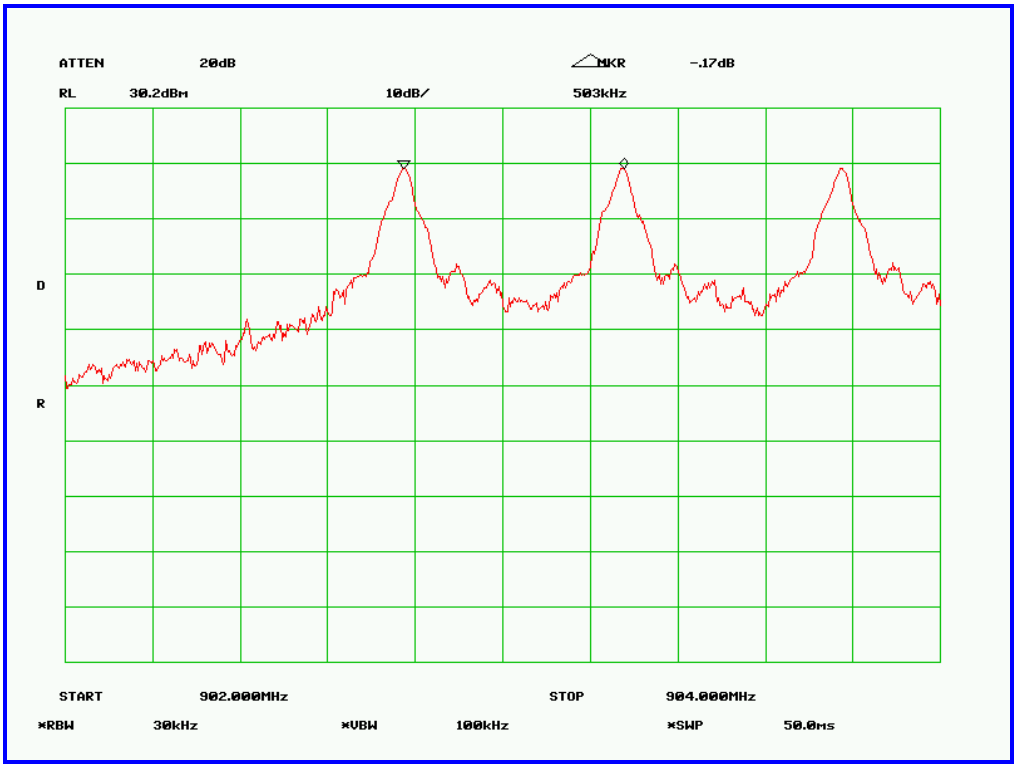
Procedures: The Channel Separation was measured conducted using a spectrum analyzer at low, mid, and hi channels.

Frequency hopping systems in the 902-928 MHz shall have, hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies.

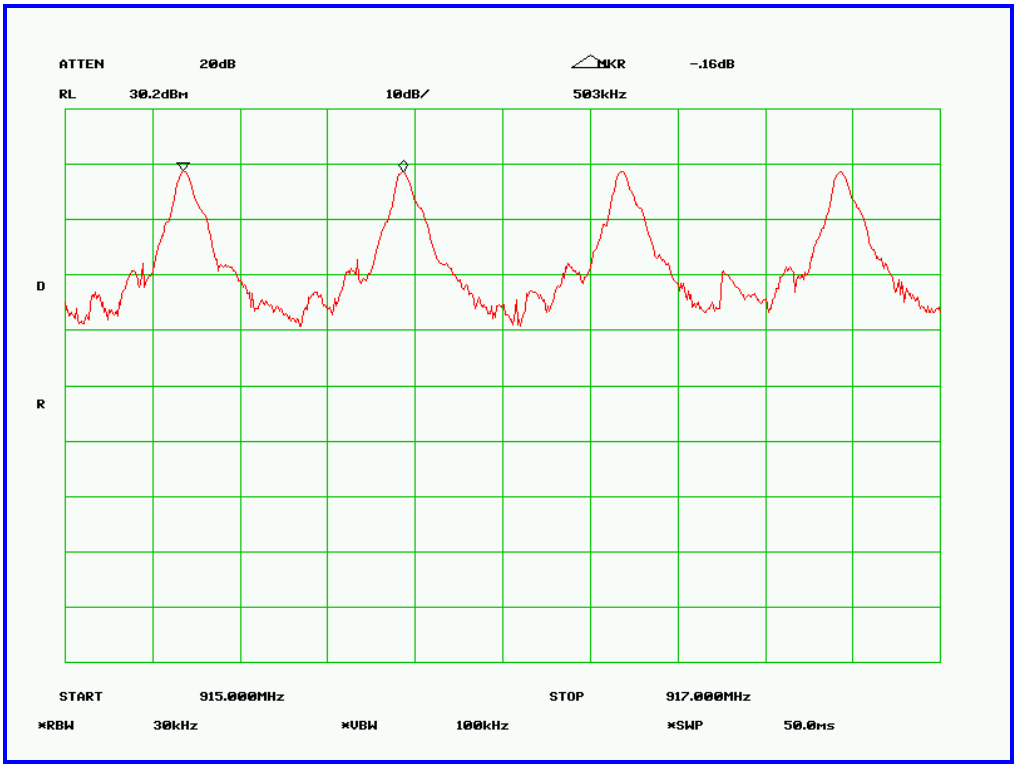
Channel	Channel Frequency (MHz)	Channel Separation (MHz)	20 dB Channel Bandwidth (kHz)
Low	902.78	0.503	282
Mid	914.75	0.503	277
High	927.29	0.503	273

Refer to the attached plots.

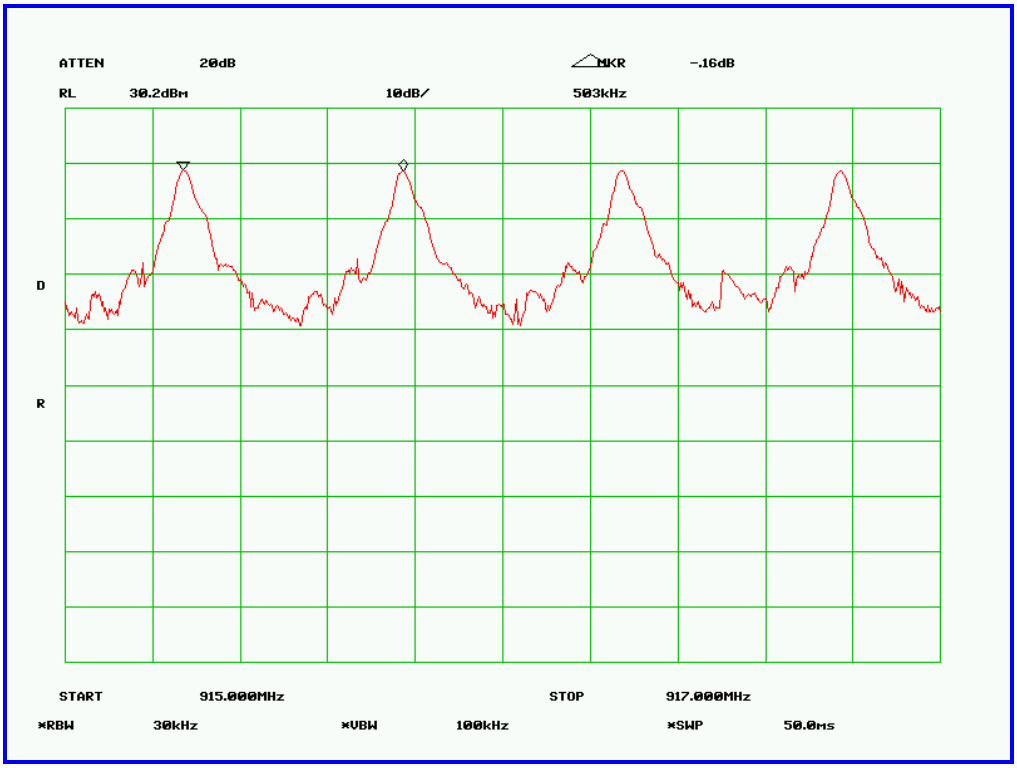
Channel Separation - Low Channel



Channel Separation - Middle Channel



Channel Separation - High Channel



5.4 20 dB Occupied Bandwidth

Conducted Measurement

1. 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 25°C; Relative Humidity 50%; Atmospheric Pressure 1019mbar
   Conducted Emissions Measurement Uncertainty
3. 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 : February 19 & 22 2010
   Tested By : Dan Coronia

Requirement(s): 47 CFR §15.247(a)(1)(i)

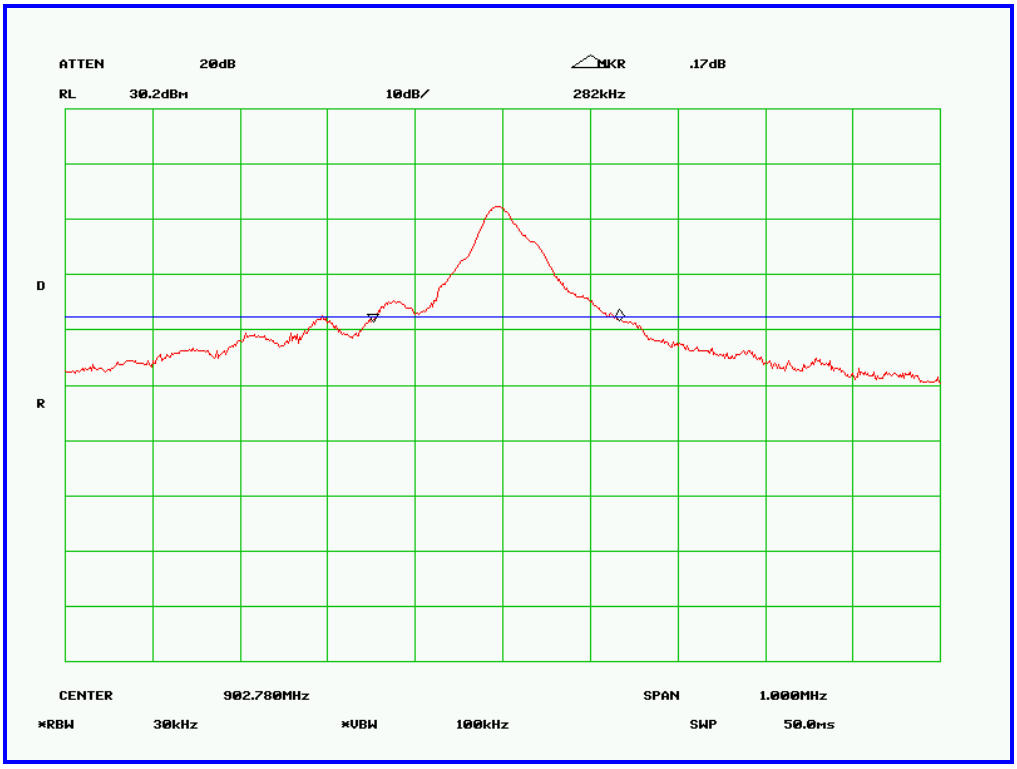
Procedures: The 20 dB bandwidths were measured conducted using a spectrum analyzer at low, mid, and hi channels.

Note: The maximum allowed 20 dB bandwidth of the hopping is 500 kHz.

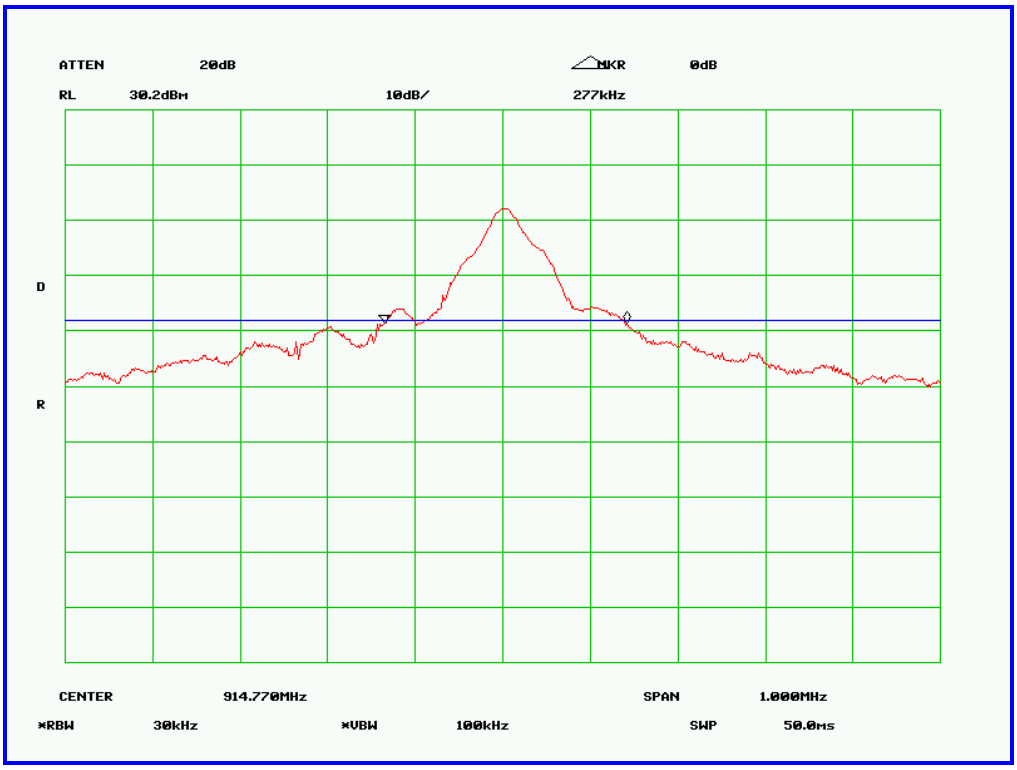
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)
Low	902.78	282
Mid	914.75	277
High	927.29	273

Refer to the attached plots.

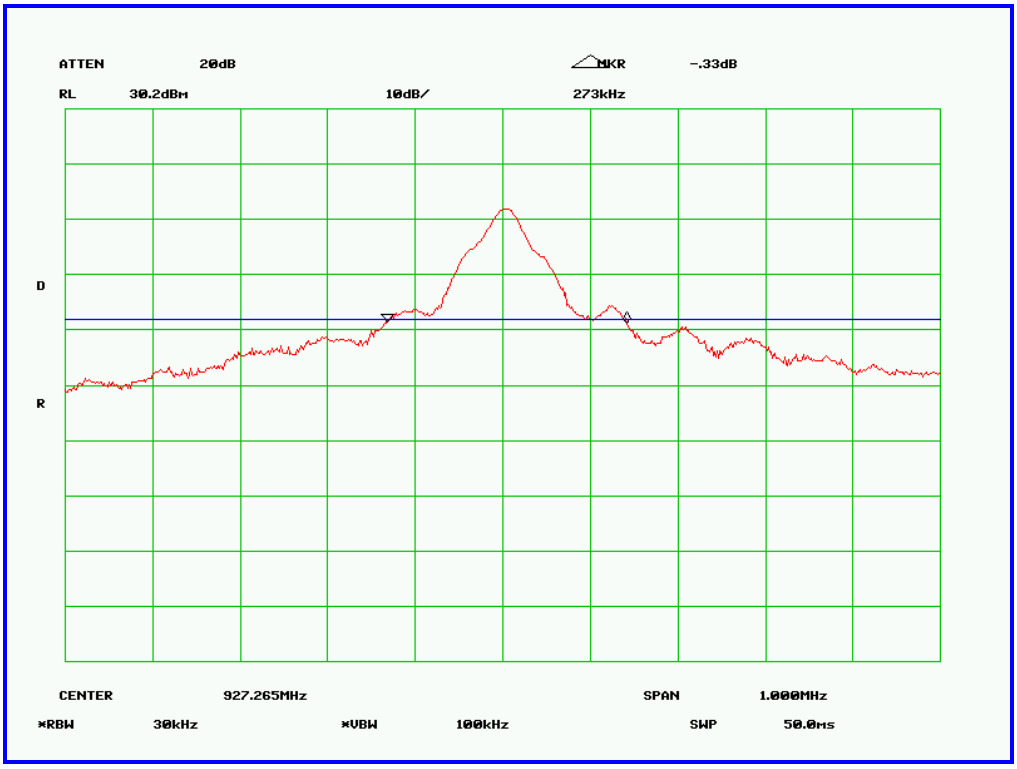
20 dB Bandwidth - Low Channel



20 dB Bandwidth – Middle Channel



20dB Bandwidth – High Channel



5.5 Number of Hopping Channel

	Conducted Measurement		
1.	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.		
	Conducted Emissions Measurement Uncertainty		
2	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	25°C
		Relative Humidity	50%
		Atmospheric Pressure	1019mbar
4	Test Date : February 19 & 22 2010 Tested By : Dan Coronia		

Standard Requirement: 47 CFR §15.247(a)(1)(iii)

For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

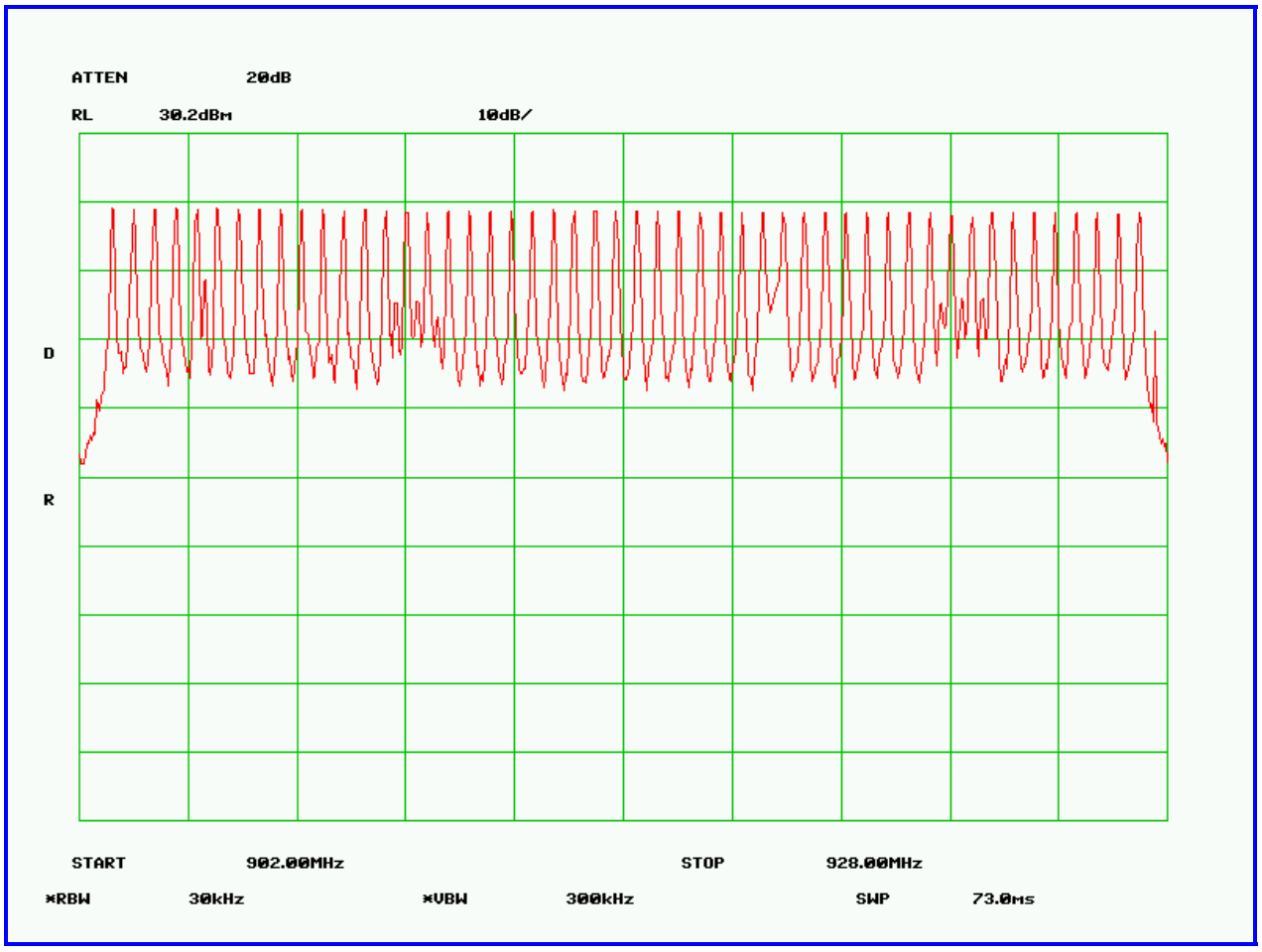
Procedures: The Number of Hopping Channel measurement was taken conducted using a spectrum analyzer.

RBW=30 KHz, VBW > RBW

Test Result: Pass
Total Channel: 50 Channels
Refer to the attached plots.

Number of Hopping Channel

902 – 928 MHz: 50 Channels



5.6 Time of Occupancy

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	25°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4. Test Date : February 19 & 22 2010
   Tested By : Dan Coronia

Standard Requirement: 47 CFR §15.247(a)(1) & RSS210

For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

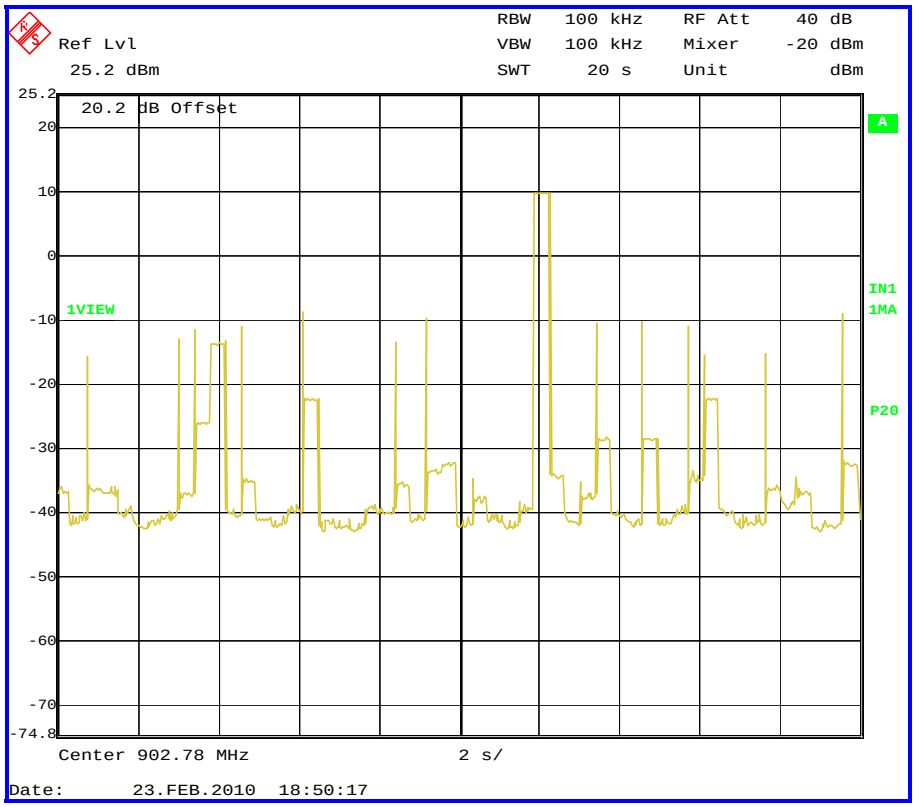
Procedures: The Time of Occupancy measurement was taken conducted using a spectrum analyzer.

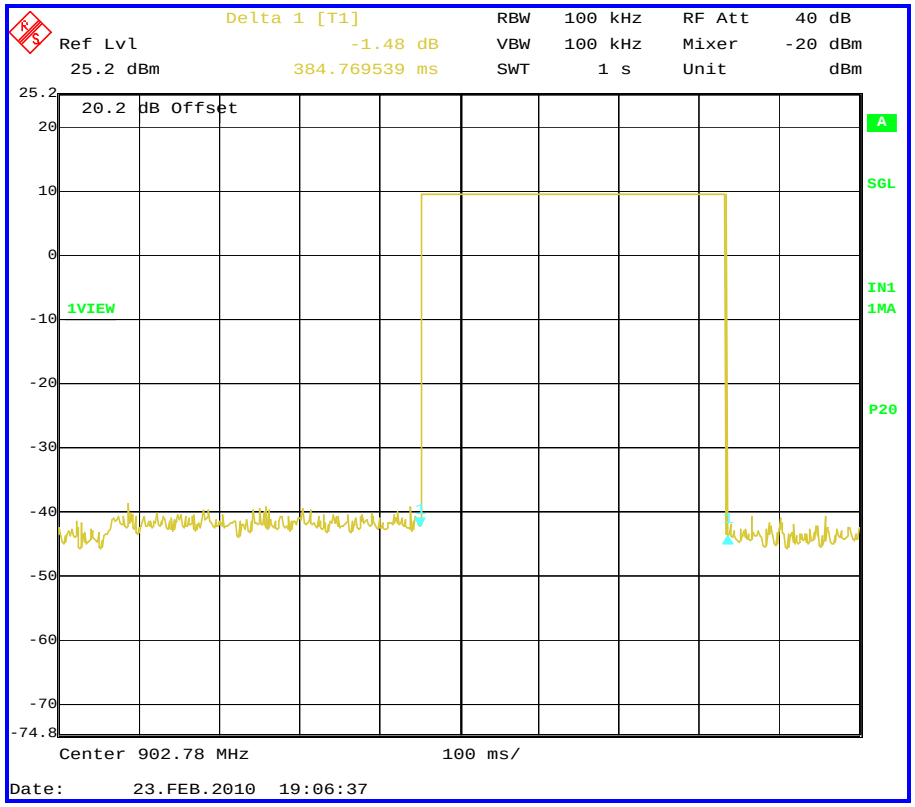
Test Result: Pass

Channel	Channel Frequency (MHz)	Dwell Time (sec)	Limit (sec)
Low	902.78	0.385	0.4
Mid	914.75	0.390	0.4
High	927.29	0.392	0.4

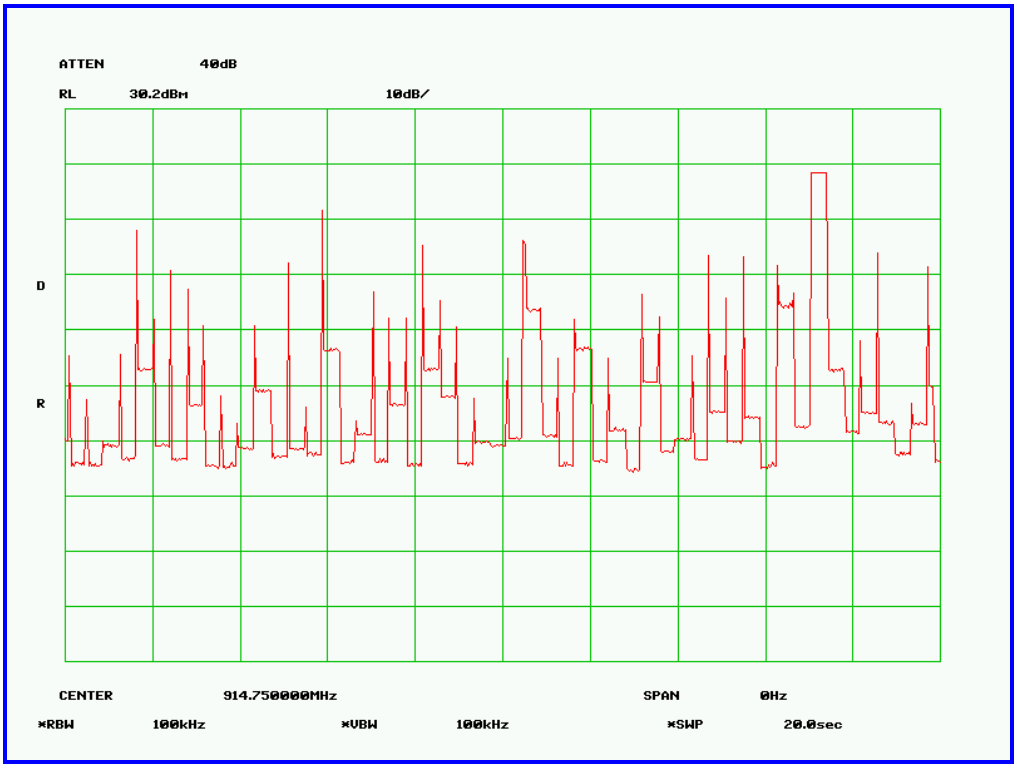
Refer to the attached plots.

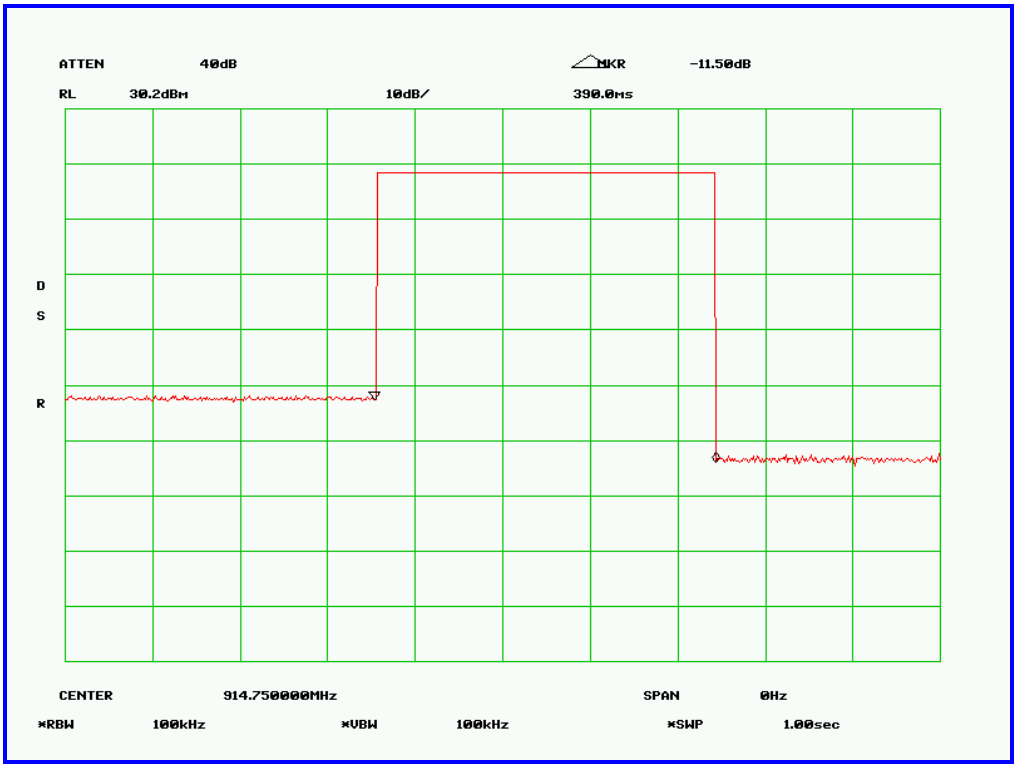
Low Channel


RBW 100 kHz
RF Att 40 dB
Ref Lvl
VBW 100 kHz
Mixer -20 dBm
25.2 dBm
SWT 20 s
Unit dBm
20.2 dB Offset
A
1VIEW
IN1
1MA
P20
25.2
20
10
0
-10
-20
-30
-40
-50
-60
-70
-74.8
Center 902.78 MHz
2 s/
Date: 23.FEB.2010 18:50:17

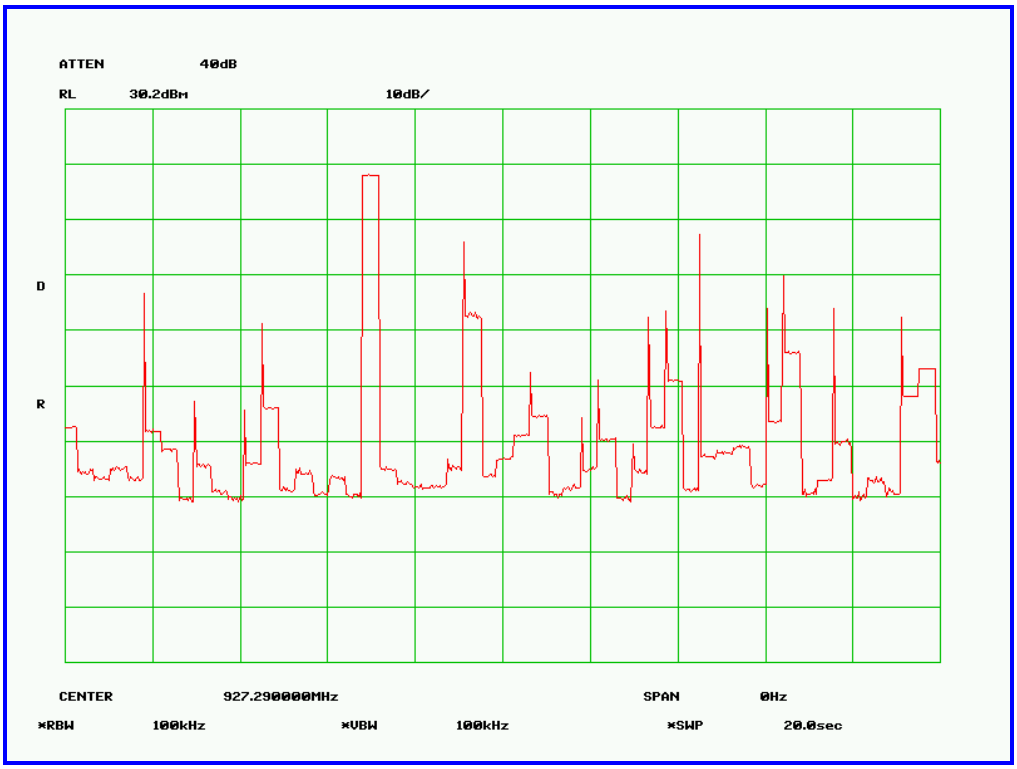

Delta 1 [T1]
RBW 100 kHz
RF Att 40 dB
Ref Lvl
-1.48 dB
VBW 100 kHz
Mixer -20 dBm
25.2 dBm
384.769539 ms
SWT 1 s
Unit dBm
20.2 dB Offset
A
SGL
1VIEW
IN1
1MA
P20
25.2
20
10
0
-10
-20
-30
-40
-50
-60
-70
-74.8
Center 902.78 MHz
100 ms/
Date: 23.FEB.2010 19:06:37

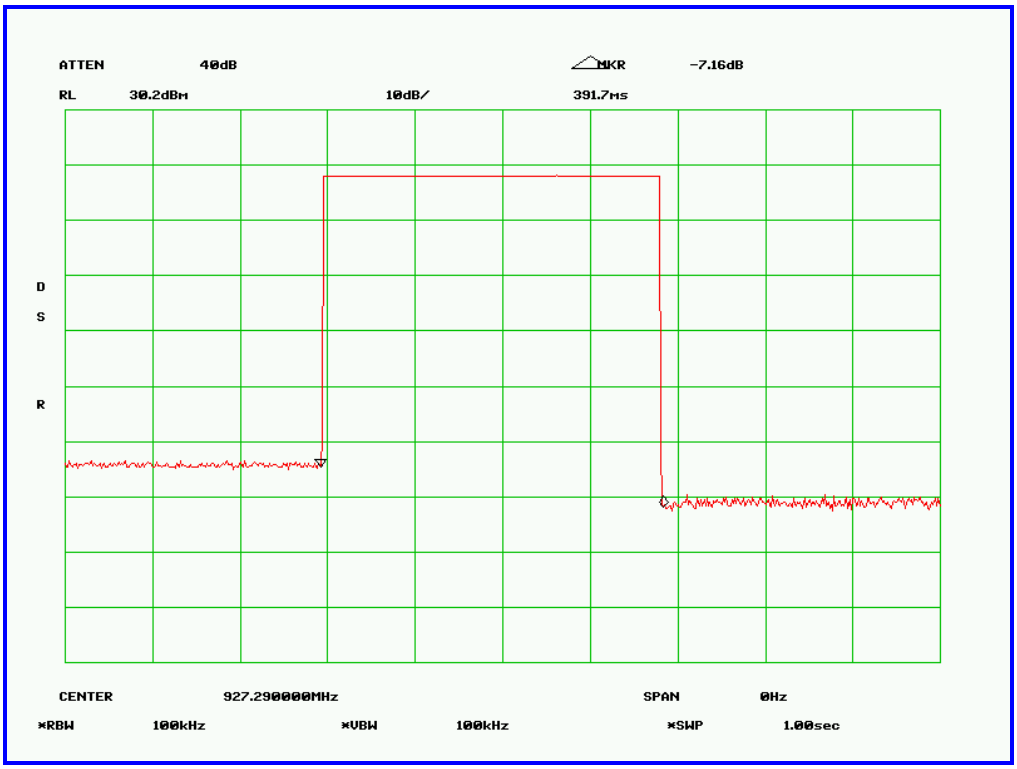
Middle Channel





High Channel





5.7 Peak Output Power

	Conducted Measurement		
1.	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.		
	Conducted Emissions Measurement Uncertainty		
2	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	25°C
		Relative Humidity	50%
		Atmospheric Pressure	1019mbar
4	Test Date : February 19 & 22 2010 Tested By : Dan Coronia		

Standard Requirement: 47 CFR §15.247(b)

Procedures: The peak output power was measured conducted using a spectrum analyzer at low, mid, and hi channels. Peak detector was set to measure the power output. The power is converted from watt to dBm, therefore, 1 watt = 30 dBm.

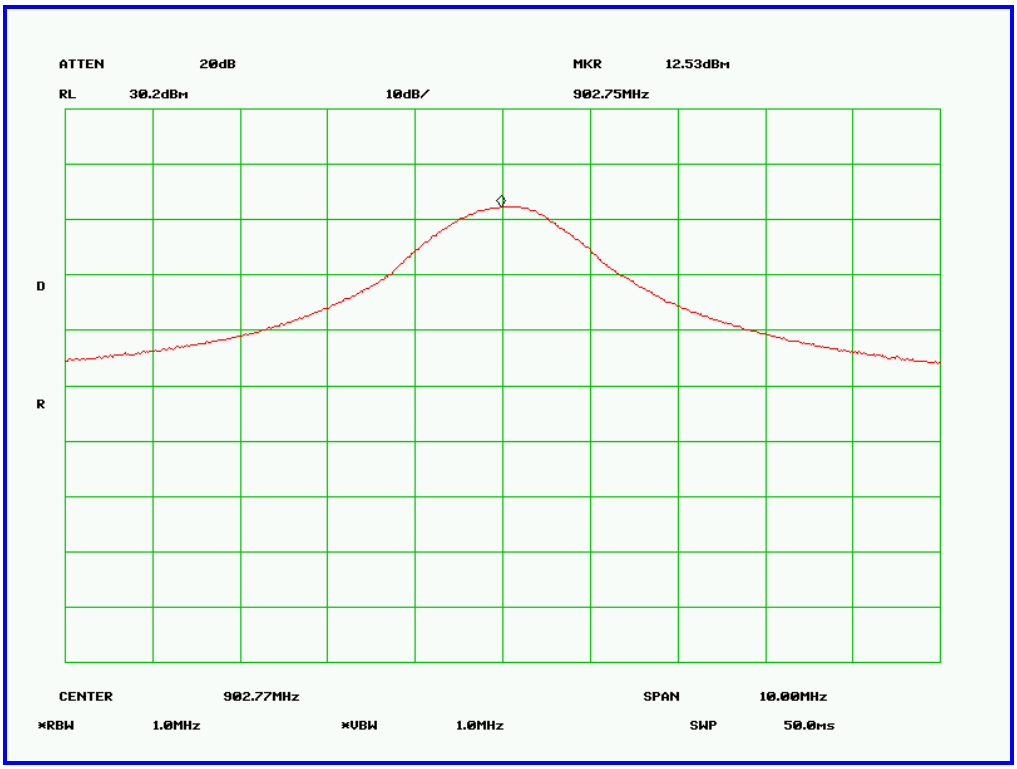
Note: For frequency hopping systems operating in the 902–928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

Test Result: Pass

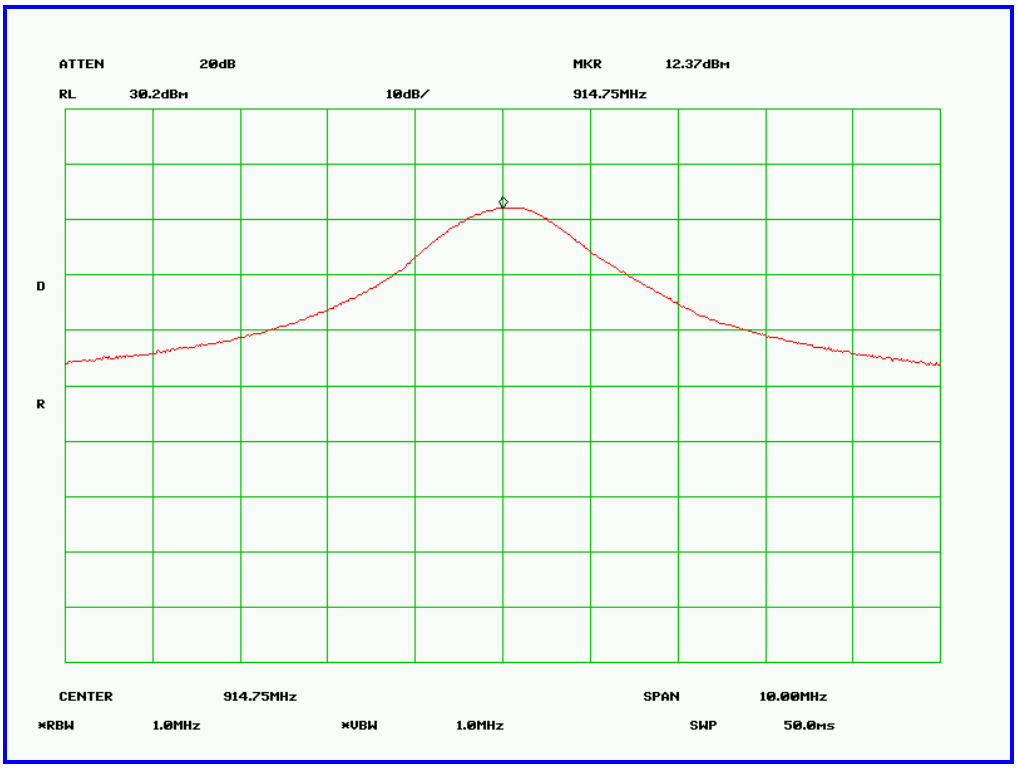
Channel	Channel Frequency (MHz)	Measured Output Power (dBm)	Peak Output Power Limit (dBm)
Low	902.78	12.53	30
Mid	914.75	12.37	30
High	927.29	12.03	30

Refer to the attached plots.

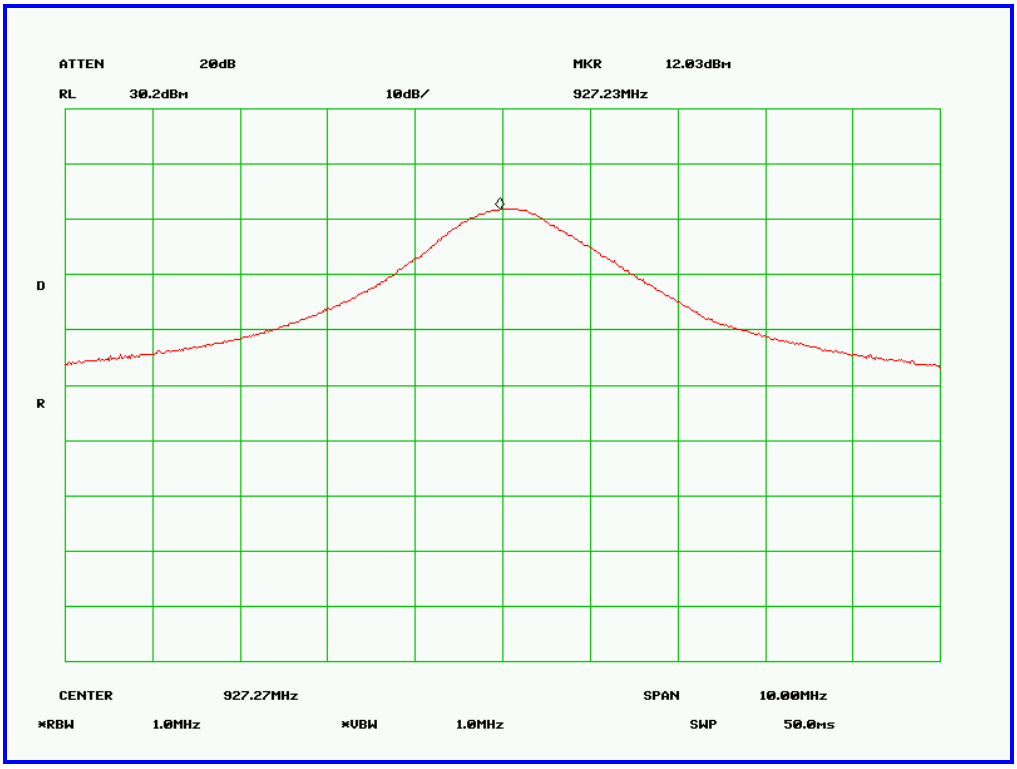
Low Channel



Middle Channel



High Channel



5.8 100 kHz Bandwidth of Frequency Band Edge

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 – 20GHz is ±1.5dB.
3. Environmental Conditions

Temperature	23ºC - 25ºC
Relative Humidity	50%
Atmospheric Pressure	1019mbar

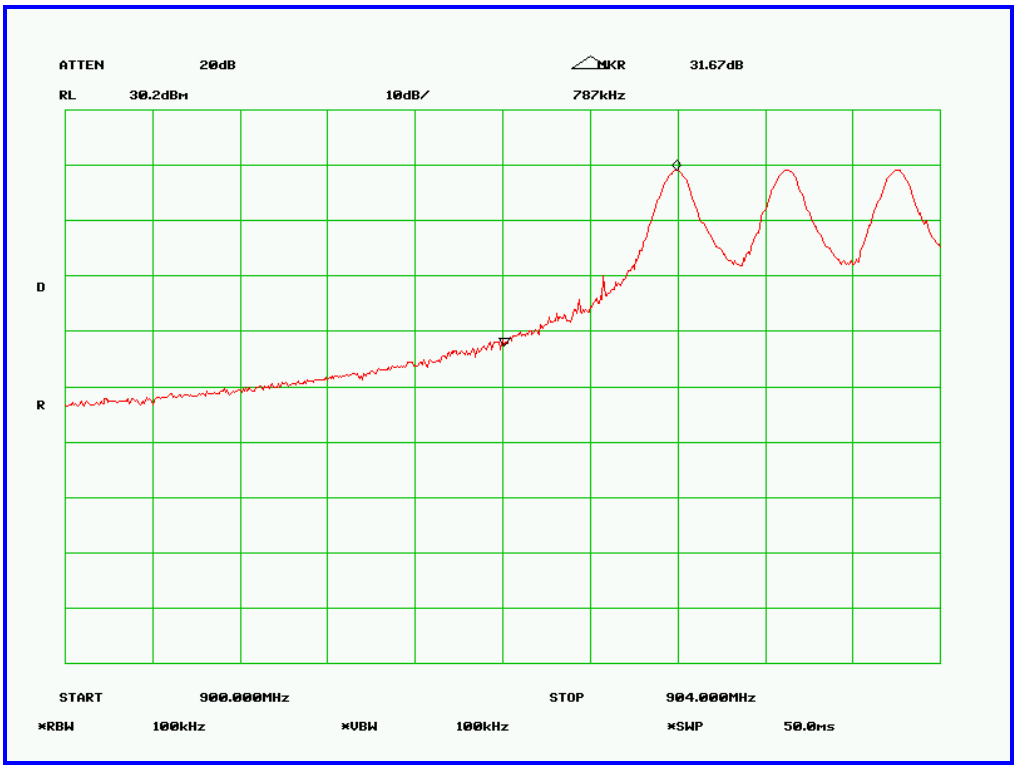
4. Test Date : February 19 & 22 2010
   Tested By : Dan Coronia

Standard Requirement : 47 CFR §15.247(b)

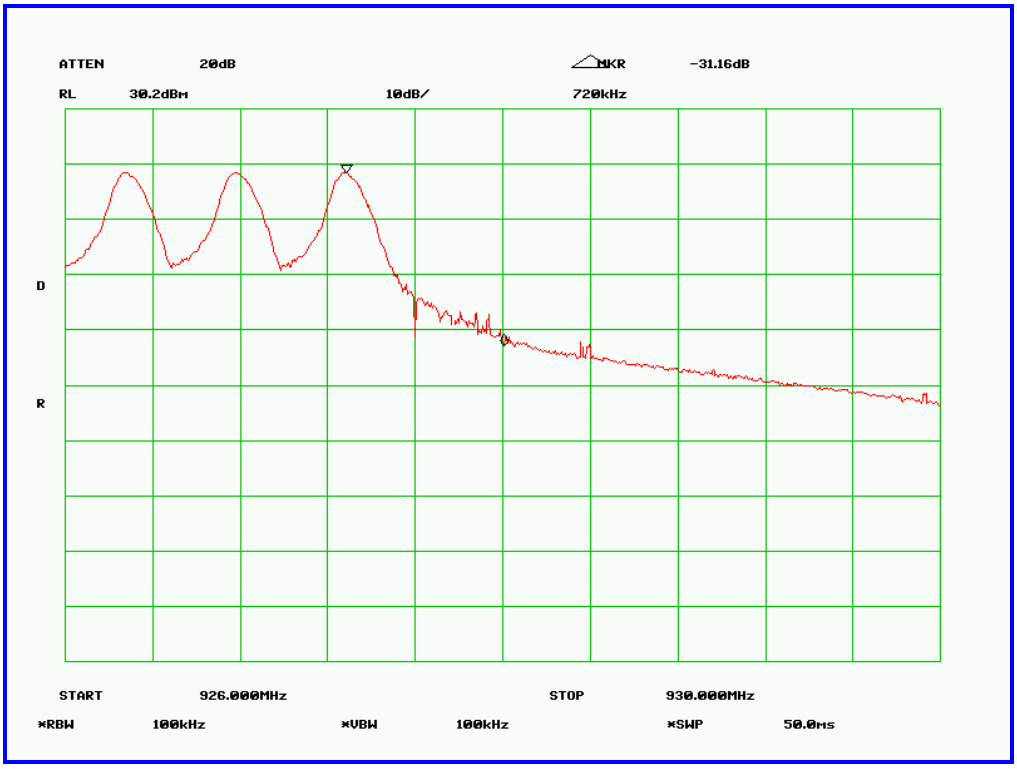
Procedures: in any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required.

Test Result: Pass

Low Channel



High Channel



5.9 Antenna Port Emission

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 Relative Humidity Atmospheric Pressure	25°C 50% 1019mbar
4	Test Date : February 19 & 22 2010 Tested By : Dan Coronia		

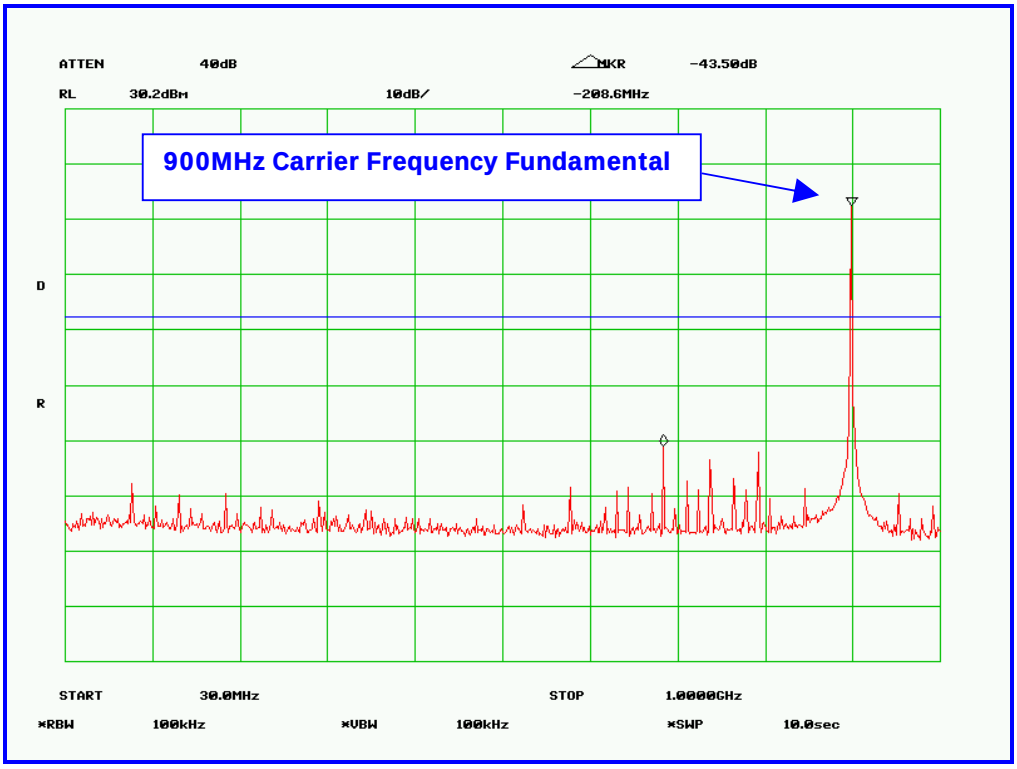
Standard Requirement: 47 CFR §15.247(c)

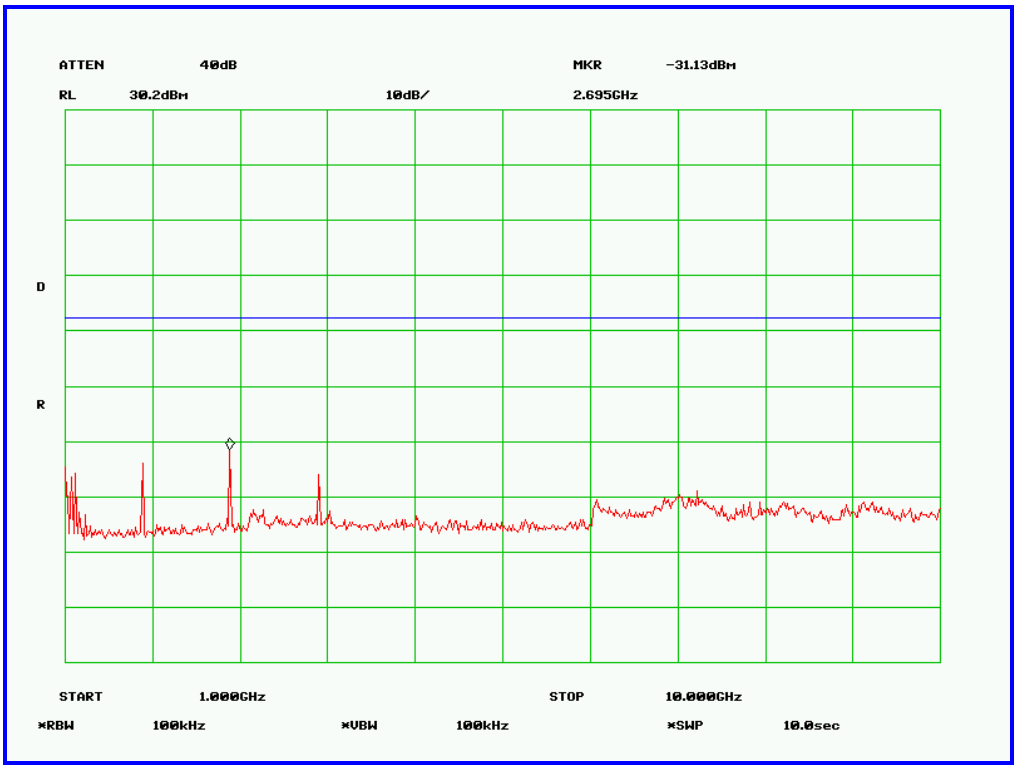
Procedures: The conducted spurious emissions were measured conducted using a spectrum analyzer at low, mid, and hi channels. The limit was determined by attenuating 20 dB of the RF peak power output

Test Result: Pass

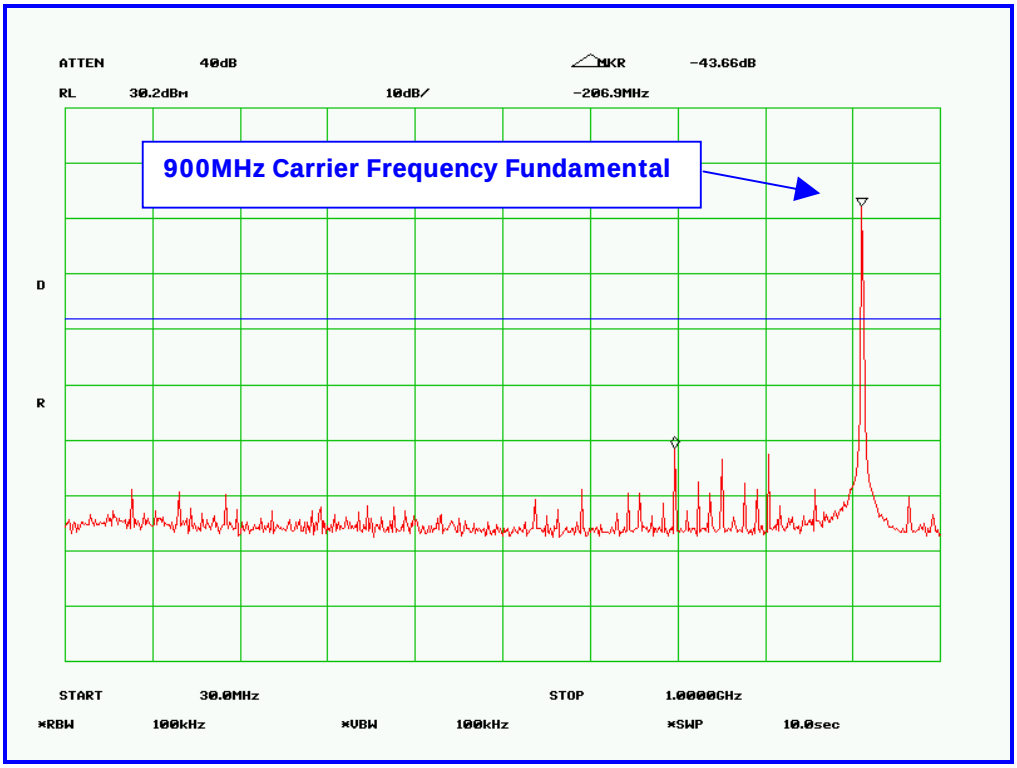
Refer to the attached plots.

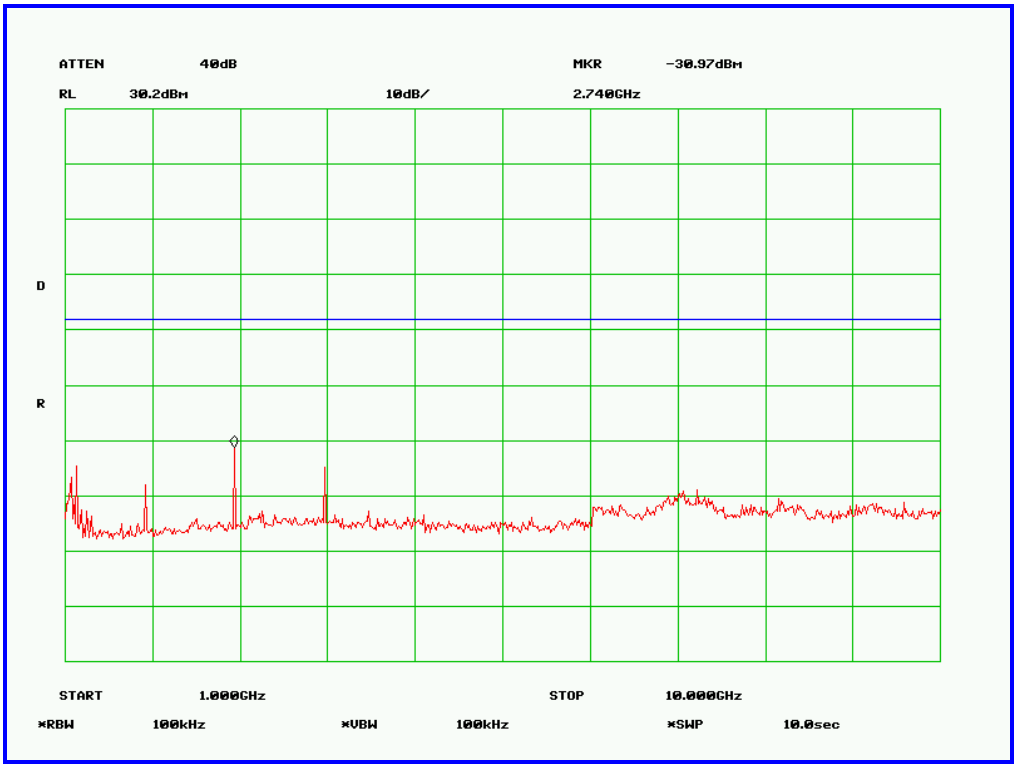
Low Channel


ATTEN 40dB
MKR -43.50dB
RL 30.2dBm
10dB/
-208.6MHz
900MHz Carrier Frequency Fundamental
D
R
START 30.0MHz
STOP 1.0000GHz
*RBW 100kHz
*VBW 100kHz
*SWP 10.0sec

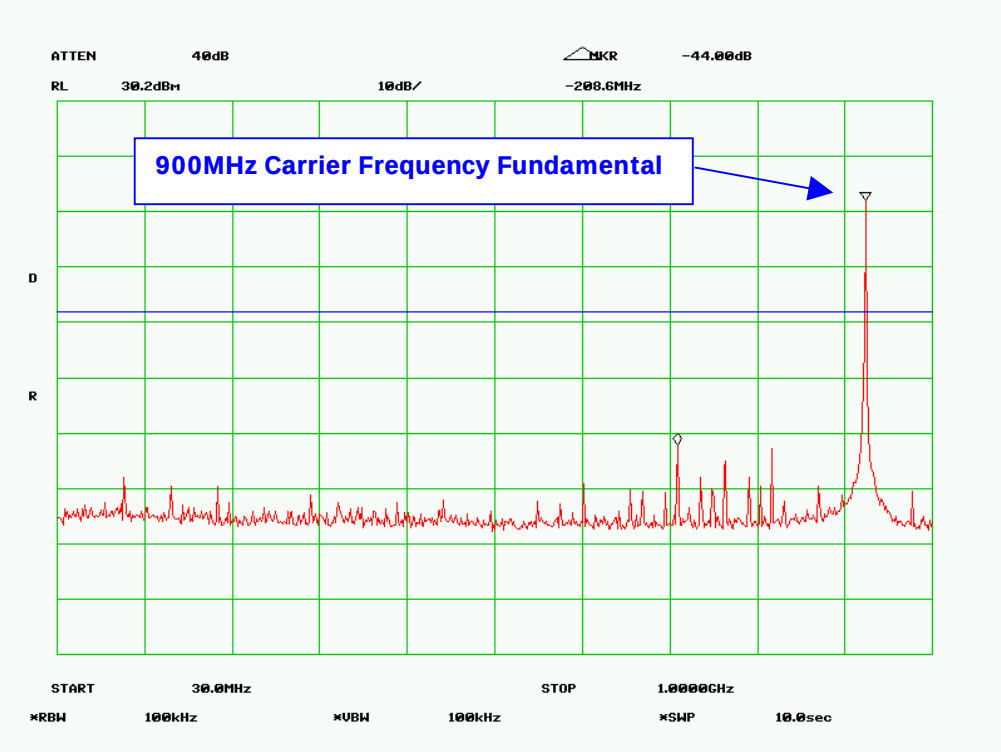

ATTEN 40dB
MKR -31.13dBm
RL 30.2dBm
10dB/
2.695GHz
D
R
START 1.000GHz
STOP 10.000GHz
*RBW 100kHz
*VBW 100kHz
*SWP 10.0sec

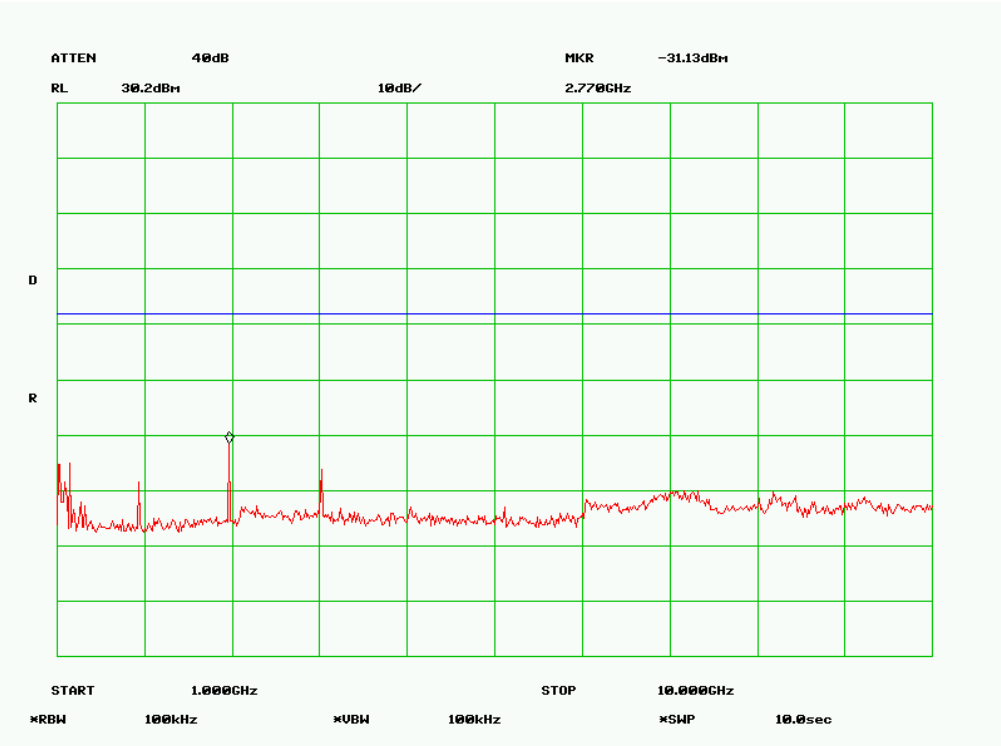
Middle Channel





High Channel





5.10 Radiated Spurious Emission < 1GHz

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	25°C
	Relative Humidity	50%
	Atmospheric Pressure	1019mbar

Test Date : February 19 & 22 2010
Tested By : Dan Coronia

Standard Requirement: 47 CFR §15.247(c)

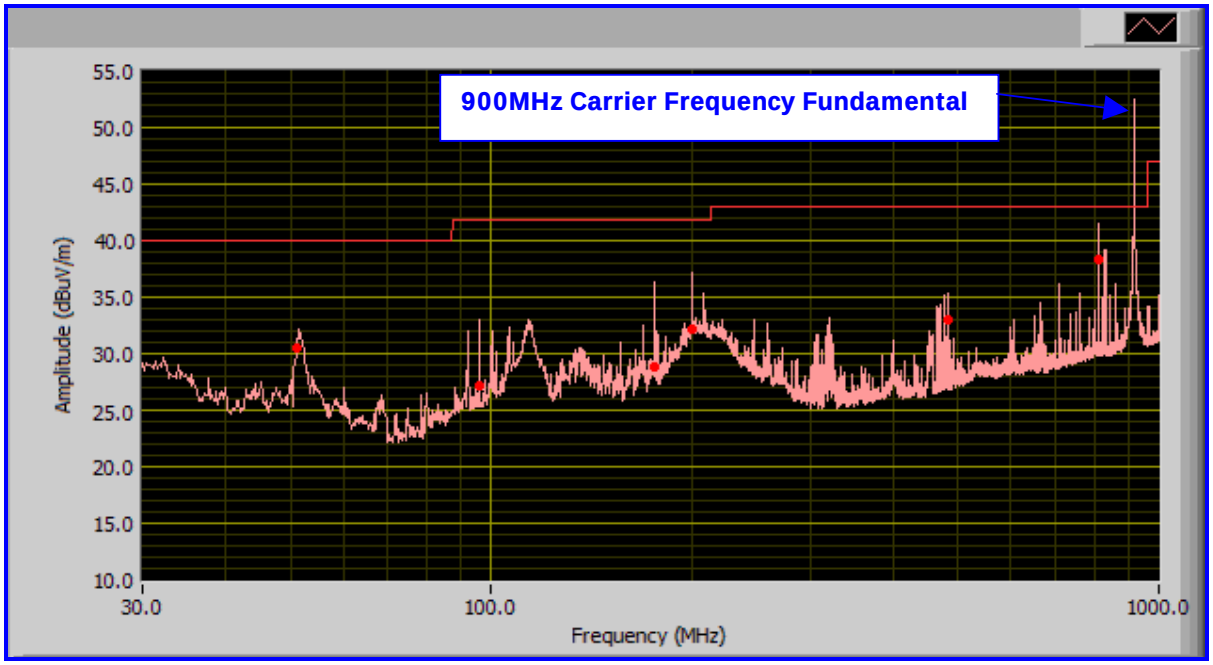
Procedures: Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set to transmit at mid channel. Note that setting the channel other than mid, the spurious emissions are the same.

The limit is converted from microvolts/meter to decibel microvolts/meter.

Sample Calculation: Corrected Amplitude = Raw Amplitude (dBμV/m) + ACF(dB) + Cable Loss(dB)

Test Result: Pass

Near Field Antenna

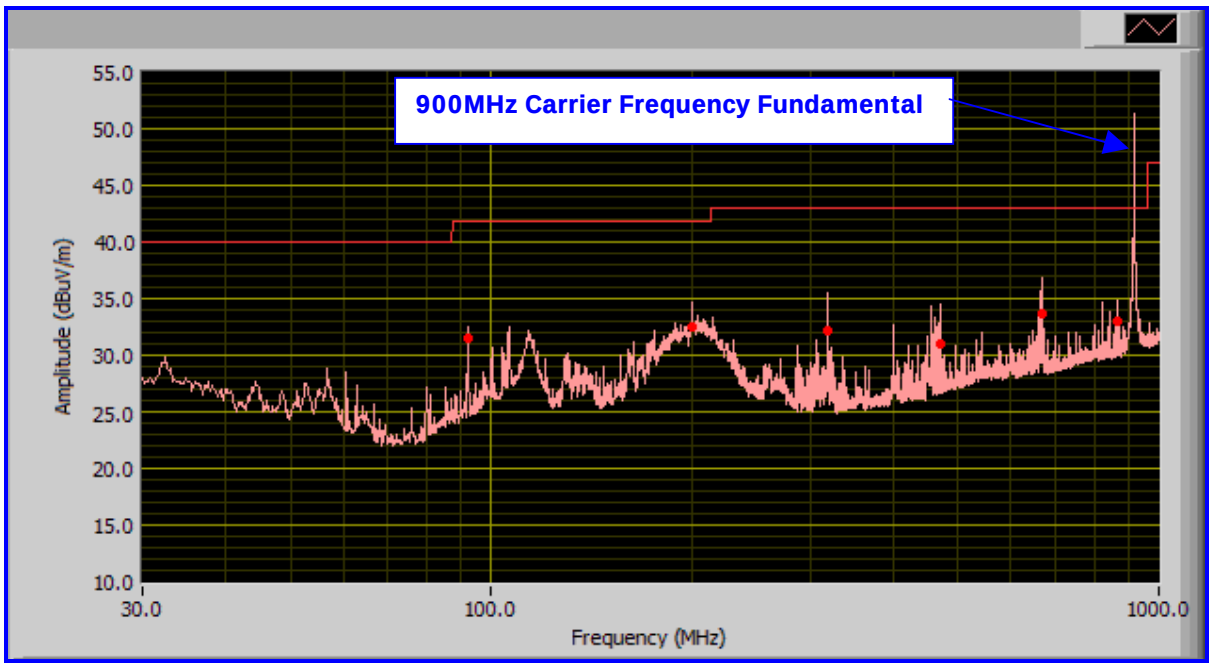


Limit

Frequency (MHz)	Quasi-Peak (dBµV/m)	Turntable position (deg)	Polarity	Antenna height (cm)	Limit (dBµV/m)	Margin (dB)
481.89	33.41	151.00	V	186.00	46.00	-12.59
96.02	19.67	255.00	V	111.00	43.50	-23.83
51.52	30.34	5.00	H	120.00	40.00	-9.66
199.90	32.38	107.00	H	151.00	43.50	-11.12
175.95	27.69	104.00	H	138.00	43.50	-15.81
814.77	38.16	201.00	H	167.00	46.00	-7.84

Radiated Emissions Table

Flat Patch Antenna



Limit

Frequency (MHz)	Quasi-Peak (dBµV/m)	Turntable position (deg)	Polarity	Antenna height (cm)	Limit (dBµV/m)	Margin (dB)
92.26	31.65	22.00	V	125.00	43.50	-11.85
471.32	31.35	88.00	H	130.00	46.00	-14.65
666.62	33.89	150.00	H	118.00	46.00	-12.11
321.94	32.34	163.00	V	383.00	46.00	-13.66
199.99	32.94	95.00	H	264.00	43.50	-10.56
868.51	33.73	98.00	H	109.00	46.00	-12.27

Radiated Emissions Table

5.11 Radiated Spurious Emissions > 1GHz

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	25°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

   Test Date : February 19 & 22 2010
   Tested By : Dan Coronia

Standard Requirement: 47 CFR §15.247(d)

Procedures: Equipment was setup in a semi-anechoic chamber. For measurements above 1 GHz an average measurement was taken with a 10 Hz video bandwidth. The EUT was tested at low, mid and high with the highest output power. Investigated up to 10th harmonics of the operating frequency.

Sample Calculation:

EUT Field Strength = Raw Amplitude (dBµV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation(dB, if used)

@ 902.78MHz @ 3 Meter (Near Field Antenna)

Frequency (GHz)	Reading (dBuV/m)	Direction Degree	Height Meter	Polar H / V	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	15.247/15.209 Limit (dBuV/m)	15.247/15.209 Margin	Comments
1.806	57.57	186.0	1.1	v	25.70	2.16	31.98	53.45	74.00	-20.55	Peak
1.806	56.09	237.0	1.2	h	25.70	2.16	31.98	51.97	74.00	-22.03	Peak
1.806	52.39	186.0	1.1	v	25.70	2.16	31.98	48.27	54.00	-5.73	Ave
1.806	50.98	237.0	1.2	h	25.70	2.16	31.98	46.86	54.00	-7.14	Ave
2.708	51.38	111.0	1.1	v	28.80	2.72	32.08	50.82	74.00	-23.18	Peak
2.708	49.62	156.0	1.0	h	28.80	2.72	32.08	49.06	74.00	-24.94	Peak
2.708	45.76	111.0	1.1	v	28.80	2.72	32.08	45.20	54.00	-8.80	Ave
2.708	42.59	156.0	1.0	h	28.80	2.72	32.08	42.03	54.00	-11.97	Ave
3.611	50.83	217.0	1.1	v	31.20	3.44	32.37	53.10	74.00	-20.91	Peak
3.611	52.15	338.0	1.1	h	31.20	3.44	32.37	54.42	74.00	-19.59	Peak
3.611	44.79	217.0	1.1	v	31.20	3.44	32.37	47.06	54.00	-6.95	Ave
3.611	46.81	338.0	1.1	h	31.20	3.44	32.37	49.08	54.00	-4.92	Ave
4.514	45.89	185.0	1.1	v	32.20	4.13	32.49	49.73	74.00	-24.28	Peak
4.514	45.09	223.0	1.1	h	32.20	4.13	32.49	48.93	74.00	-25.08	Peak
4.514	35.90	185.0	1.1	v	32.20	4.13	32.49	39.74	54.00	-14.27	Peak
4.514	34.20	223.0	1.1	h	32.20	4.13	32.49	38.04	54.00	-15.97	Ave

Note: Emission was scanned up to 10 GHz; no emissions were detected above the noise floor which was at least 20 dB below the specification limit.

@ 914.75MHz @ 3Meter

Frequency (GHz)	Reading (dBuV/m)	Direction Degree	Height Meter	Polar H / V	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	15.247/15.209 Limit (dBuV/m)	15.247/15.209 Margin	Comments
1.830	56.88	358.0	1.0	v	25.70	2.16	31.98	52.76	74.00	-21.24	Peak
1.830	58.00	202.0	1.5	h	25.70	2.16	31.98	53.88	74.00	-20.12	Peak
1.830	51.91	358.0	1.0	v	25.70	2.16	31.98	47.79	54.00	-6.21	Ave
1.830	52.95	202.0	1.5	h	25.70	2.16	31.98	48.83	54.00	-5.17	Ave
2.744	50.87	165.0	1.5	v	28.80	2.72	32.08	50.31	74.00	-23.69	Peak
2.744	50.66	118.0	1.5	h	28.80	2.72	32.08	50.10	74.00	-23.90	Peak
2.744	45.17	165.0	1.5	v	28.80	2.72	32.08	44.61	54.00	-9.39	Ave
2.744	45.07	118.0	1.5	h	28.80	2.72	32.08	44.51	54.00	-9.49	Ave
3.659	51.00	337.0	1.3	v	31.20	3.44	32.37	53.27	74.00	-20.74	Peak
3.659	49.22	201.0	1.3	h	31.20	3.44	32.37	51.49	74.00	-22.52	Peak
3.659	44.63	337.0	1.3	v	31.20	3.44	32.37	46.90	54.00	-7.11	Ave
3.659	42.89	201.0	1.3	h	31.20	3.44	32.37	45.16	54.00	-8.84	Ave
4.574	47.10	162.0	1.3	v	32.2	4.13	32.49	50.94	74.00	-23.07	Peak
4.574	45.56	80.0	1.3	h	32.2	4.13	32.49	49.40	74.00	-24.61	Peak
4.574	39.63	162.0	1.3	v	32.2	4.13	32.49	43.47	54.00	-10.54	Ave
4.574	35.71	80.0	1.3	h	32.2	4.13	32.49	39.55	54.00	-14.46	Ave

Note: Emission was scanned up to 10 GHz; no emissions were detected above the noise floor which was at least 20 dB below the specification limit.

@ 927.29MHz @ 3Meter

Frequency (GHz)	Reading (dBuV/m)	Direction Degree	Height Meter	Polar H / V	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	15.247/15.209 Limit (dBuV/m)	15.247/15.209 Margin	Comments
1.855	55.01	241.0	1.4	v	25.70	2.16	31.98	50.89	74.00	-23.11	Peak
1.855	59.03	226.0	1.5	h	25.70	2.16	31.98	54.91	74.00	-19.09	Peak
1.855	49.95	241.0	1.4	v	25.70	2.16	31.98	45.83	54.00	-8.17	Ave
1.855	53.95	226.0	1.5	h	25.70	2.16	31.98	49.83	54.00	-4.17	Ave
2.782	49.65	355.0	1.1	v	28.80	2.72	32.08	49.09	74.00	-24.91	Peak
2.782	49.53	276.0	1.7	h	28.80	2.72	32.08	48.97	74.00	-25.03	Peak
2.782	43.67	355.0	1.1	v	28.80	2.72	32.08	43.11	54.00	-10.89	Ave
2.782	43.87	276.0	1.7	h	28.80	2.72	32.08	43.31	54.00	-10.69	Ave
3.709	51.09	213.0	1.1	v	31.20	3.44	32.37	53.36	74.00	-20.65	Peak
3.709	50.32	342.0	1.1	h	31.20	3.44	32.37	52.59	74.00	-21.42	Peak
3.709	45.48	213.0	1.1	v	31.20	3.44	32.37	47.75	54.00	-6.26	Ave
3.709	44.22	342.0	1.1	h	31.20	3.44	32.37	46.49	54.00	-7.51	Ave
4.636	47.92	243.0	1.2	v	32.20	4.13	32.49	51.76	74.00	-22.25	Peak
4.636	46.26	252.0	1.2	h	32.20	4.13	32.49	50.10	74.00	-23.91	Peak
4.636	39.10	243.0	1.2	v	32.20	4.13	32.49	42.94	54.00	-11.07	Ave
4.636	37.32	252.0	1.2	h	32.20	4.13	32.49	41.16	54.00	-12.85	Ave

Note: Emission was scanned up to 10 GHz; no emissions were detected above the noise floor which was at least 20 dB below the specification limit.

@ 902.78MHz @ 3 Meter (Flat Patch Antenna)

Frequency (GHz)	Reading (dBuV/m)	Direction Degree	Height Meter	Polar H / V	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	15.247/15.209 Limit (dBuV/m)	15.247/15.209 Margin	Comments
1.806	55.52	360.0	1.9	v	25.70	2.16	31.98	51.40	74.00	-22.60	Peak
1.806	56.30	284.0	2.1	h	25.70	2.16	31.98	52.18	74.00	-21.82	Peak
1.806	50.02	360.0	1.9	v	25.70	2.16	31.98	45.90	54.00	-8.10	Ave
1.806	51.33	284.0	2.1	h	25.70	2.16	31.98	47.21	54.00	-6.79	Ave
2.708	55.39	181.0	1.0	v	28.80	2.72	32.08	54.83	74.00	-19.17	Peak
2.708	53.18	213.0	1.3	h	28.80	2.72	32.08	52.62	74.00	-21.38	Peak
2.708	50.06	181.0	1.0	v	28.80	2.72	32.08	49.50	54.00	-4.50	Ave
2.708	47.63	213.0	1.3	h	28.80	2.72	32.08	47.07	54.00	-6.93	Ave
3.611	53.52	359.0	1.3	v	31.20	3.44	32.37	55.79	74.00	-18.22	Peak
3.611	53.97	49.0	1.2	h	31.20	3.44	32.37	56.24	74.00	-17.77	Peak
3.611	48.21	359.0	1.3	v	31.20	3.44	32.37	50.48	54.00	-3.53	Ave
3.611	48.51	49.0	1.2	h	31.20	3.44	32.37	50.78	54.00	-3.23	Ave
4.514	46.76	211.0	1.0	v	32.20	4.13	32.49	50.60	74.00	-23.41	Peak
4.514	46.37	219.0	1.1	h	32.20	4.13	32.49	50.21	74.00	-23.80	Peak
4.514	38.94	211.0	1.0	v	32.20	4.13	32.49	42.78	54.00	-11.23	Ave
4.514	37.40	219.0	1.1	h	32.20	4.13	32.49	41.24	54.00	-12.77	Ave

Note: Emission was scanned up to 10 GHz; no emissions were detected above the noise floor which was at least 20 dB below the specification limit.

@ 914.75MHz @ 3Meter

Frequency (GHz)	Reading (dBuV/m)	Direction Degree	Height Meter	Polar H / V	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	15.247/15.209 Limit (dBuV/m)	15.247/15.209 Margin	Comments
1.830	56.30	268.0	1.1	v	25.70	2.16	31.98	52.18	74.00	-21.82	Peak
1.830	57.31	360.0	1.2	h	25.70	2.16	31.98	53.19	74.00	-20.81	Peak
1.830	51.33	268.0	1.1	v	25.70	2.16	31.98	47.21	54.00	-6.79	Ave
1.830	52.19	360.0	1.2	h	25.70	2.16	31.98	48.07	54.00	-5.93	Ave
2.744	57.95	203.0	1.2	v	28.80	2.72	32.08	57.39	74.00	-16.61	Peak
2.744	53.29	349.0	1.3	h	28.80	2.72	32.08	52.73	74.00	-21.27	Peak
2.744	52.70	203.0	1.2	v	28.80	2.72	32.08	52.14	54.00	-1.86	Ave
2.744	47.92	349.0	1.3	h	28.80	2.72	32.08	47.36	54.00	-6.64	Ave
3.659	55.27	285.0	1.2	v	31.20	3.44	32.37	57.54	74.00	-16.47	Peak
3.659	54.10	200.0	1.3	h	31.20	3.44	32.37	56.37	74.00	-17.64	Peak
3.659	49.87	285.0	1.2	v	31.20	3.44	32.37	52.14	54.00	-1.87	Ave
3.659	48.88	200.0	1.3	h	31.20	3.44	32.37	51.15	54.00	-2.86	Ave
4.574	47.63	235.0	1.3	v	32.2	4.125	32.49	51.465	74.00	-22.54	Peak
4.574	46.72	260.0	1.2	h	32.2	4.125	32.49	50.555	74.00	-23.45	Peak
4.574	40.34	235.0	1.3	v	32.2	4.125	32.49	44.175	54.00	-9.83	Ave
4.574	37.38	260.0	1.2	h	32.2	4.125	32.49	41.215	54.00	-12.79	Ave

Note: Emission was scanned up to 10 GHz; no emissions were detected above the noise floor which was at least 20 dB below the specification limit.

@ 927.29MHz @ 3Meter

Frequency (GHz)	Reading (dBuV/m)	Direction Degree	Height Meter	Polar H / V	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	15.247/15.209 Limit (dBuV/m)	15.247/15.209 Margin	Comments
1.855	57.60	58.0	1.5	v	25.70	2.16	31.98	53.48	74.00	-20.52	Peak
1.855	58.78	264.0	1.5	h	25.70	2.16	31.98	54.66	74.00	-19.34	Peak
1.855	52.31	58.0	1.5	v	25.70	2.16	31.98	48.19	54.00	-5.81	Ave
1.855	53.71	264.0	1.5	h	25.70	2.16	31.98	49.59	54.00	-4.41	Ave
2.782	59.11	0.0	1.1	v	28.80	2.72	32.08	58.55	74.00	-15.45	Peak
2.782	58.73	342.0	1.0	h	28.80	2.72	32.08	58.17	74.00	-15.83	Peak
2.782	53.12	0.0	1.1	v	28.80	2.72	32.08	52.56	54.00	-1.44	Ave
2.782	53.23	343.0	1.0	h	28.80	2.72	32.08	52.67	54.00	-1.33	Ave
3.709	54.62	282.0	1.1	v	31.20	3.44	32.37	56.89	74.00	-17.12	Peak
3.709	52.50	200.0	1.0	h	31.20	3.44	32.37	54.77	74.00	-19.24	Peak
3.709	49.06	282.0	1.1	v	31.20	3.44	32.37	51.33	54.00	-2.67	Ave
3.709	47.09	200.0	1.0	h	31.20	3.44	32.37	49.36	54.00	-4.64	Ave
4.636	48.81	243.0	1.2	v	32.20	4.13	32.49	52.65	74.00	-21.36	Peak
4.636	46.76	252.0	1.2	h	32.20	4.13	32.49	50.60	74.00	-23.41	Peak
4.636	42.10	243.0	1.2	v	32.20	4.13	32.49	45.94	54.00	-8.06	Ave
4.636	38.14	252.0	1.2	h	32.20	4.13	32.49	41.98	54.00	-12.03	Ave

Note: Emission was scanned up to 10 GHz; no emissions were detected above the noise floor which was at least 20 dB below the specification limit.

Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Calibration Due
AC Conducted Emissions		
R&S EMI Test Receiver	ESIB40	04/25/2010
R&S LISN	ESH2-Z5	04/24/2010
CHASE LISN	MN2050B	04/24/2010
Radiated Emissions		
Spectrum Analyzer	8564E	04/26/2010
EMI Receiver	ESIB 40	04/25/2010
R&S LISN	ESH2-Z5	04/24/2010
CHASE LISN	MN2050B	04/24/2010
Antenna(1 ~18GHz)	3115	01/04/2010
Antenna (30MHz~2GHz)	JB1	01/04/2010
Chamber	3m	04/18/2010
Pre-Amplifier(1 ~ 26GHz)	8449	04/24/2010
Horn Antenna (18~40GHz)	AH-840	03/19/2010
Microwave Pre-Amp (18~40GHz)	PA-840	03/19/2010

Note: * - Functional Verification

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.

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).

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.

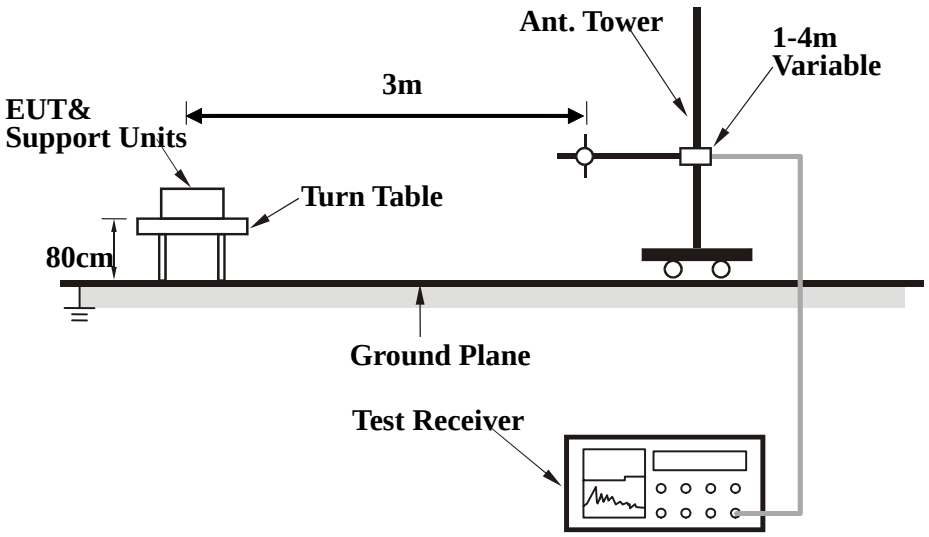
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable 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 a 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 the attachment

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

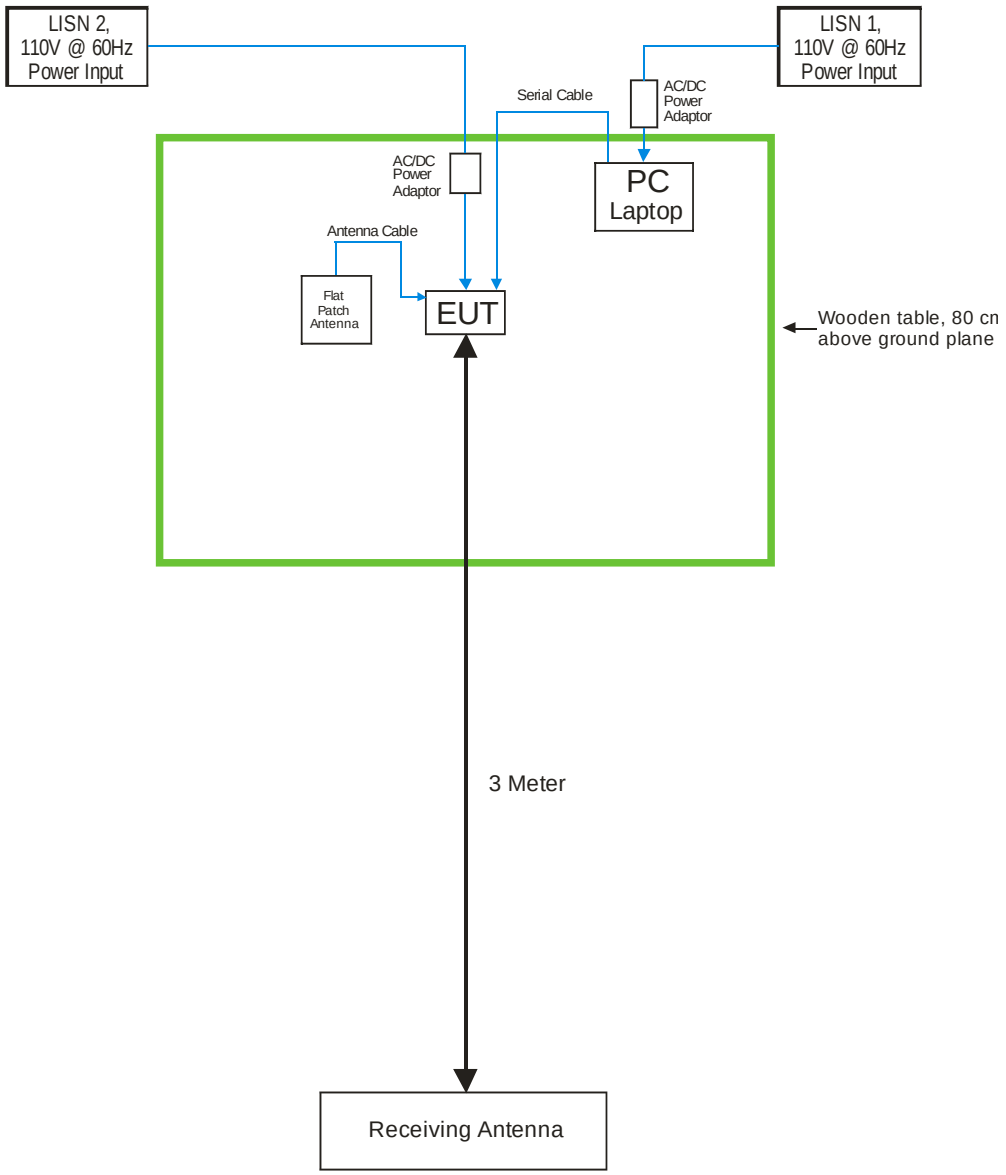
EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

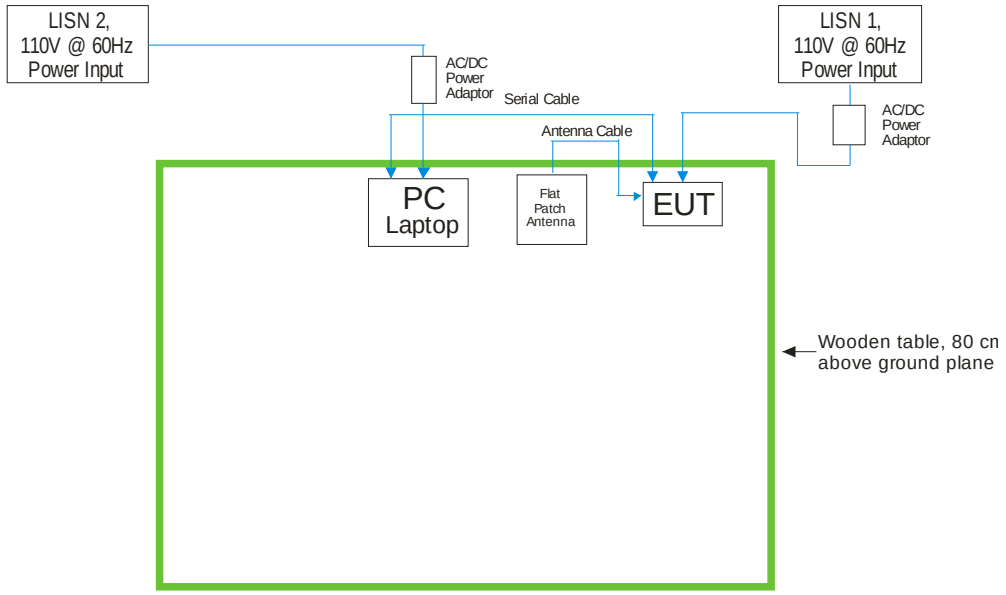
The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
PC Laptop / DELL	Latitude DS520	Serial Cable , <1 meter From PC Laptop to EUT

Block Configuration Diagram for Radiated Emission



Block Configuration Diagram for Conducted Emission



Annex C.ii. EUT OPERATING CONDITIONS

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

Test	Description Of Operation
Emissions	The radio was set to constant transmitting mode frequency hopping, while Activboard is configured for continuous playing song to simulate worst case.

Annex D USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment

Annex E. SIEMIC ACCREDITATION CERTIFICATES

SIEMIC ACREDITATION DETAILS: A2LA Certificate Number: 2742.01

THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

SIEMIC LABORATORIES
San Jose, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005*).

Presented this 11th day of July 2008.

President
For the Accreditation Council
Certificate Number 2742.01
Valid to September 30, 2010

For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

ACCREDITED PRODUCT CERTIFICATION BODY

A2LA has accredited

SIEMIC INC.
San Jose, CA

for technical competence as a
Product Certification Body

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC Guide 65:1996 *General requirements for bodies operating product certification systems*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system for a Telecommunications Certification Body (TCB) meeting FCC (U.S.), IDA (Singapore) and IC (Canada) requirements.

Presented this 9th day of January 2009.

President
For the Accreditation Council
Certificate Number: 2742.02
Valid to: September 30, 2010

For the product certification schemes to which this accreditation applies, please refer to the certification body's Scope of Accreditation.

SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 65:1996

SIEMIC INC.
2206 Ringwood Ave.
San Jose, CA 95131
Mr. Snell Leong (Authorized Representative) Phone: 408 526 1188
www.siemic.com

PRODUCT CERTIFICATION CONFORMITY ASSESSMENT BODY (CAB)

Valid to: September 30, 2010 Certificate Number: 2742.02

In recognition of the successful completion of the A2LA Certification Body Accreditation Program evaluation, including the US Federal Communications Commission (FCC), Industry Canada (IC) and Singapore (IDA) requirements for the indicated types of product certifications, accreditation is granted to this organization to perform the following product certification schemes:

Economy	Scope
Federal Communication Commission - (FCC)	
Unlicensed Radio Frequency Devices	A1, A2, A3, A4
Licensed Radio Frequency Devices	B1, B2, B3, B4
Telephone Terminal Equipment	C

**Please refer to FCC TCB Program Roles and Responsibilities, v04, released February 14, 2008 detailing scopes, roles and responsibilities. http://www.fcc.gov/oet/ea/FCC-Overview-TCB-Program.pdf*

Industry Canada - (IC)	
Radio	All Radio Standards Specifications (RSS) in Category I Equipment Standards List Radio

**Please refer to Industry Canada (IC) website at: http://www.ic.gc.ca/epic/site/smt-gst.nsf/en/h_sf01342e.html*

IDA – Singapore	
Line Terminal Equipment	All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2008, Annex 2
Radio-Communication Equipment	All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2008, Annex 2

**Please refer to Info-Communication Development Authority (iDA) Singapore website at: http://www.ida.gov.sg/doc/Policies%20and%20Regulation/Policies_and_Regulation_Level2/20060609145118/MRARecScheme.pdf*

(A2LA Cert. No. 2742.02) 01/09/09 Page 1 of 1

SIEMIC ACREDITATION DETAILS: FCC Test Site Registration No. 783147

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

December 20, 2007

Registration Number: 783147

SIEMIC Laboratories
2206 Ringwood Avenue,
San Jose, CA 95131

Attention: Leslie Bai

Re: Measurement facility located at San Jose
3 & 10 meter site
Date of Renewal: December 20, 2007

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish
Industry Analyst

SIEMIC ACREDITATION DETAILS: Industry of Canada CAB ID : US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

March 4, 2009

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by Industry Canada (IC), under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	SIEMIC, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, CA 95131 USA
Identification No.:	US0160
Recognized Scope:	CS-03 Part I, II, V, VI, VII and VIII

You may submit test data to IC to verify that the equipment to be imported into Canada satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. Please contact Ms. Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov if you have any questions.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: CAB Program Manager

NIST

SIEMIC ACREDITATION DETAILS: Industry of Canada Test Site Registration No. 4842-1

Industry Canada Industrie Canada

May 23rd, 2008

OUR FILE: 46405-4842
Submission No: 126429

Siemic Inc.
2206 Ringwood Ave.
San Jose CA 95131
USA

Attention: Leslie Bai

Dear Sir/Madame:

The Bureau has received your application for the registration / renewal of a 3/10m OATS. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought **(4842A-1).** Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please be informed that the Bureau is now utilizing a **new site numbering scheme** in order to simplify the electronic filing process. Our goal is to reduce the number of secondary codes associated to one particular company. The following changes have been made to your record.

- Your primary code is: **4842**

- The company number associated to the site(s) located at the above address is: **4842A**

- The table below is a summary of the changes made to the unique site registration number(s):

New Site Number	Obsolete Site Number	Description of Site	Expiry Date (YYYY-MM-DD)
4842A-1	4842-1	3m Chamber	2010-05-23

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 meter OATS or 3 meter chamber). If the test facility is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to exceed two years. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL;
http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00052e.html.

If you have any questions, you may contact the Bureau by e-mail at certification.bureau@ic.gc.c
Please reference our file and submission number above for all correspondence.

Yours sincerely,

S. Proulx
Test & Measurement Specialist
Certification and Engineering Bureau
3701 Carling Ave., Building 94
Ottawa, Ontario K2H 8S2

SIEMIC ACREDITATION DETAILS: FCC DOC CAB Recognition : US1109

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

August 28, 2008

Siemic Laboratories
2206 Ringwood Ave.,
San Jose, CA 95131

Attention: Leslie Bai

Re: Accreditation of Siemic Laboratories
Designation Number: US1109
Test Firm Registration #: 540430

Dear Sir or Madam:

We have been notified by American Association for Laboratory Accreditation that Siemic Laboratories has been accredited as a Conformity Assessment Body (CAB).

At this time Siemic Laboratories is hereby designated to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Parts 15 and 18 of the Commission's Rules.

This designation will expire upon expiration of the accreditation or notification of withdrawal of designation.

Sincerely,

George Tannahill

George Tannahill
Electronics Engineer

SIEMIC ACREDITATION DETAILS: Australia CAB ID : US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

November 20, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Australian Communications and Media Authority (ACMA) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	Siemic, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, CA 95131
Identification No.:	US0160
Recognized Scope:	EMC: AS/NZS 4251.1 (until 5/31/2009), AS/NZS 4251.2 (until 5/31/2009), AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR 22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 Radiocommunications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06, AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/NZS 60950.1

You may submit test data to ACMA to verify that the equipment to be imported into Australia satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements. Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. Please contact Ms. Ramona Saar, at (301) 975-5521 or ramona.saar@nist.gov if you have questions.

Sincerely,

David F. Alderman

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Snell Leong, Siemic, Inc.; Ramona Saar, NIST

NIST

SIEMIC ACREDITATION DETAILS: Korea CAB ID: US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

October 1, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Radio Research Agency (RRA) Korea Communications Commission (KCC) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	SIEMIC, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, CA 95131
Identification No.:	US0160
Recognized Scope:	**EMI:** KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI **EMS:** KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN-61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS **Wireless:** RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 **Wired:** President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6 President Notice 20664, RRL Notice 2008-7 with attachment 4

You may submit test data to RRA/KCC to verify that the equipment to be imported into Korea satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

SIEMIC ACREDITATION DETAILS: Taiwan BSMI Accreditation No. SL2-IN-E-1130R

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

May 3, 2006

Mr. Leslie Bai
SIEMIC Laboratories
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

I am pleased to inform you that your laboratory has been recognized by the Chinese Taipei's Bureau of Standards, Metrology, and Inspection (BSMI) under the Asia Pacific Economic Cooperation (APEC) Mutual Recognition Arrangement (MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. You may submit test data to BSMI to verify that the equipment to be imported into Chinese Taipei satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements. The pertinent designation information is as follows:

- BSMI number: **SL2-IN-E-1130R** (Must be applied to the test reports)
- U.S Identification No: **US0160**
- Scope of Designation: **CNS 13438**
- Authorized signatory: **Mr. Leslie Bai**

The names of all recognized CABs will be posted on the NIST website at http://ts.nist.gov/mra. If you have any questions, please contact Mr. Dhillon at 301-975-5521. We appreciate your continued interest in our international conformity assessment activities.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group

cc: Jogindar Dhillon

NIST

SIEMIC ACREDITATION DETAILS: Taiwan NCC CAB ID: US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

November 25, 2008

Mr. LeslieBai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the National Communications Commission (NCC) for the requested scope expansion under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	SIEMIC, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, CA 95131
Identification No.:	US0160
Current Scope:	LP0002
Additional Scope:	PSTN01, ADSL01, ID0002, IS6100 and CNS 14336

You may submit test data to NCC to verify that the equipment to be imported into China satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

SIEMIC ACREDITATION DETAILS: Mexico NOM Recognition

CANIETI

CAMARA NACIONAL DE LA INDUSTRIA ELECTRONICA, DE TELECOMUNICACIONES E INFORMATICA

Laboratorio Valentín V. Rivero

México D.F. a 16 de octubre de 2006.

LESLIE BAI
DIRECTOR OF CERTIFICATION
SIEMIC LABORATORIES, INC.
ACCESSING GLOBAL MARKETS
P R E S E N T E

En contestación a su escrito de fecha 5 de septiembre del año en curso, le comento que estamos muy interesados en su intención de firmar un Acuerdo de Reconocimiento Mutuo, para lo cual adjunto a este escrito encontrara el Acuerdo en idioma ingles y español prellenado de los cuales le pido sea revisado y en su caso corregido, para que si esta de acuerdo poder firmarlo para mandarlo con las autoridades Mexicanas para su visto bueno y así poder ejercer dicho acuerdo.

Aprovecho este escrito para mencionarle que nuestro intermediario gestor será la empresa Isabel de México, S. A. de C. V., empresa que ha colaborado durante mucho tiempo con nosotros en lo relacionado a la evaluación de la conformidad y que cuenta con amplia experiencia en la gestoría de la certificación de cumplimiento con Normas Oficiales Mexicanas de producto en México.

Me despido de usted enviándole un cordial saludo y esperando sus comentarios al Acuerdo que nos ocupa.

Atentamente:

Ing. Faustino Gómez González
Gerente Técnico del Laboratorio de
CANIETI.

Culiacán 71
Hipódromo Condesa
06100 México, D.F.
Tel. 5264-0909 con 12 líneas
Fax 5264 0466
www.canieti.org

SIEMIC ACREDITATION DETAILS: Hong Kong OFTA CAB ID : US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

December 8, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Office of the Telecommunications Authority (OFTA) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	SIEMIC, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, California 95131 USA
Identification No.:	US0160
Recognized Scope:	**Radio:** HKTA 1002, 1007, 1008, 1010, 1015, 1016, 1020, 1022, 1026, 1027, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1039, 1041, 1042, 1043, 1044, 1046, 1047, 1048, 1049, 1051 **Telecom:** HKTA 2011, 2012, 2013, 2014, 2017, 2018, 2022, 2024, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033

You may submit test data to OFTA to verify that the equipment to be imported into Hong Kong satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,

David F. Alderman

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

SIEMIC ACREDITATION DETAILS: Australia ACMA CAB ID: US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

November 20, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Australian Communications and Media Authority (ACMA) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	Siemic, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, CA 95131
Identification No.:	US0160
Recognized Scope:	EMC: AS/NZS 4251.1 (until 5/31/2009), AS/NZS 4251.2 (until 5/31/2009), AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR 22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 Radiocommunications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06, AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/NZS 60950.1

You may submit test data to ACMA to verify that the equipment to be imported into Australia satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements. Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. Please contact Ms. Ramona Saar, at (301) 975-5521 or ramona.saar@nist.gov if you have questions.

Sincerely,

David F. Alderman

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Snell Leong, Siemic, Inc.; Ramona Saar, NIST

NIST

SIEMIC ACREDITATION DETAILS: Australia NATA Recognition

Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

November 4, 2008

Under Australian government legislation, the Australian Communications and Media Authority (ACMA) has determined the National Association of Testing Authorities, Australia (NATA) as an accreditation body as per Section 409(1) of the Telecommunications Act 1997 (Cth). Pursuant to Section 409(2) of the Telecommunications Act 1997 (Cth), I am pleased to advise that your laboratory has been determined as a Recognised Testing Authority (RTA).

This determination has been made on the basis of your accreditation by A2LA accreditation no. 2742.01 and the Mutual Recognition Agreement between NATA and A2LA. It is effective from 11 July 2008. RTA status applies only to the following standards and is contingent upon their continued inclusion in your laboratory's scope of accreditation.

AS/ACIF S002, AS/ACIF S003, AS/ACIF S004,
AS/ACIF S006, AS/ACIF S016, AS/ACIF S031,
AS/ACIF S038, AS/ACIF S041 and
AS/ACIF S043.2

As an RTA, your laboratory has the following obligations:
1. the laboratory shall continue to meet all of the accreditation criteria of A2LA;
2. the authorised representative of the laboratory shall notify NATA of changes to the staff or operations of the laboratory which would affect the performance of the tests for which the laboratory has been determined;
3. compliance of equipment shall be reported on test reports bearing the A2LA logo/endorsement.

Current information on the Australian Communications and Media Authority and regulatory requirements for telecommunications products within Australia can be obtained from the ACMA's web-site at "http://www.acma.gov.au". Further information about NATA may be gained by visiting "http://www.nata.asn.au".

Please note that AS/ACIF S040 and New Zealand standards do not form part of the RTA scheme.

Your RTA listing will appear on the NATA website shortly.

Kind Regards

Chris Norton,
Senior Scientific Officer
Measurement Science and Technology
National Association of Testing Authorities (NATA)
71-73 Flemington Road
North Melbourne Vic 3051
Australia
Ph: +61 3 9329 1633 Fx: +61 3 9326 5148
E-Mail: Christopher.Norton@nata.asn.au
Internet: www.nata.asn.au

SIEMIC ACREDITATION DETAILS: VCCI Radiated Test Site Registration No. R-3083

VCCI Council

CERTIFICATE

Company: SIEMIC Inc.
<Member No. 3081 >

Facility: SIEMIC Inc.
(Radiation 3 meter site)

Location of Facility:
2206 Ringwood Avenue, San Jose, CA 95131 USA

This is to certify that the following measuring facility has been registered in accordance with the Rules for Voluntary Control Measures

Registration No.: R-3083
Date of Registration: June 12 , 2009
This Certificate is valid until September 30 , 2010

VCCI Council

SIEMIC ACREDITATION DETAILS: VCCI Conducted (Main Port) Test Site Registration No. C-3421

VCCI Council

CERTIFICATE

Company: SIEMIC Inc.

<Member No. 3081 >

Facility: SIEMIC Inc.

(Main Ports Conducted Interference Measurement)

Location of Facility:

2206 Ringwood Avenue, San Jose, CA 95131 USA

This is to certify that the following measuring facility has been registered in accordance with the Rules for Voluntary Control Measures

Registration No.: C-3421

Date of Registration: June 12 , 2009

This Certificate is valid until September 30 , 2010

VCCI Council

SIEMIC ACREDITATION DETAILS: VCCI Conducted (Telecom Port) Test Site Registration No. T-1597

VCCI Council

CERTIFICATE

Company: SIEMIC Inc.

<Member No. 3081 >

Facility: SIEMIC Inc.

(Telecominication Ports Conducted Interference Measurement)

Location of Facility:

2206 Ringwood Avenue, San Jose, CA 95131 USA

This is to certify that the following measuring facility has been registered in accordance with the Rules for Voluntary Control Measures

Registration No.: T-1597

Date of Registration: June 12 , 2009

This Certificate is valid until September 30 , 2010

VCCI Council