

Test Report for FCC Part 15 Subpart C

of

Product Name

Tablet Personal Computer

(with Intel PRO/Wireless 2200BG Network Connection inside)

Model

CA27

(Brand:MITAC)

Applied by:

MITAC Technology Corporation
4F, No.1, R&D Road 2,
Hsinchu Science-Based industrial Park, Hsinchu 300
Taiwan,R. O. C.

Test Performed by:

International Standards Laboratory

No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Lung-Tan Hsiang, Tao Yuan County 325
Taiwan, R.O.C.
Tel:(03)407-1718 Fax:(03)407-1738

Report Number: ISL-05LR003FC

Issue Date: 2005/02/02

HC LAB:NVLAP:200234-0;VCCI: R-341,C-354;NEMKO:ELA 113a,113c;BSMI:SL2-IN-E-0037;SL2-R1-E-0037;CNLA:1178

LT LAB:NVLAP:200234-0;VCCI: R-1435,C-1440;NEMKO:ELA 113b,113d;BSMI:SL2-IN-E-0013;CNLA:0997

ISL-T10-R29-1

Contents of Report

1.	General.....	1
1.1	Certification of Accuracy of Test Data.....	1
2.	Test Results Summary.....	2
3.	Description of Equipment Under Test (EUT).....	3
4.	Description of Equipment Under Test (EUT).....	3
5.	TEST RESULTS (802.11b).....	5
5.1	Powerline Conducted Emissions [Section 15.207].....	5
5.1.1	EUT Configuration.....	5
5.1.2	Test Procedure.....	5
5.1.3	EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested).....	5
5.1.4	Test Data:.....	6
5.2	Bandwidth for DSSS [Section 15.247 (a)(2)].....	8
5.2.1	Test Procedure.....	8
5.2.2	Test Setup.....	8
5.2.3	Test Data:.....	8
5.3	DSSS Maximum Peak Output Power [Section 15.247 (b)(1)].....	11
5.3.1	Test Procedure.....	11
5.3.2	Test Setup.....	11
5.3.3	Test Data.....	11
5.4	Radiated Emission Measurement [Section [15.247(c)(4)].....	12
5.4.1	EUT Configuration.....	12
5.4.2	Test Procedure.....	12
5.4.3	EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested).....	12
5.4.4	Test Data (30MHz – 1GHz):.....	13
5.4.5	Test Data (1GHz – 25 GHz)	14
5.5	Band Edge Measurement.....	17
5.5.1	Test Procedure (Conducted)	17
5.5.2	Test Setup (Conducted)	17
5.5.3	Test Data:.....	17
5.5.4	Test Procedure (Radiated).....	19
5.5.5	Test Setup (Radiated).....	19
5.5.6	Test Data.....	20
5.6	RF Exposure Measurement [Section 15.247(b)(4) & 1.1307(b)]	23
5.7	DSSS Peak Power Spectral Density [Section 15.247(d)].....	24
5.7.1	Test Procedure.....	24
5.7.2	Test Setup.....	24
5.7.3	Test Data.....	24
6.	TEST RESULTS (802.11g).....	27
6.1	Powerline Conducted Emissions [Section 15.207].....	27
6.1.1	EUT Configuration.....	27
6.1.2	Test Procedure.....	27

6.1.3	EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)	27
6.1.4	Test Data:	28
6.2	Bandwidth for DSSS [Section 15.247 (a)(2)]	30
6.2.1	Test Procedure	30
6.2.2	Test Setup	30
6.2.3	Test Data:	30
6.3	DSSS Maximum Peak Output Power [Section 15.247 (b)(1)]	33
6.3.1	Test Procedure	33
6.3.2	Test Setup	33
6.3.3	Test Data	33
6.4	Radiated Emission Measurement [Section [15.247(c)(4)]	34
6.4.1	EUT Configuration	34
6.4.2	Test Procedure	34
6.4.3	EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)	34
6.4.4	Test Data (30MHz – 1GHz):	35
6.4.5	Test Data (1GHz – 25 GHz)	36
6.5	Band Edge Measurement	39
6.5.1	Test Procedure (Conducted)	39
6.5.2	Test Setup (Conducted)	39
6.5.3	Test Data:	39
6.5.4	Test Procedure (Radiated)	41
6.5.5	Test Setup (Radiated)	41
6.5.6	Test Data	42
6.6	RF Exposure Measurement [Section 15.247(b)(4) & 1.1307(b)]	45
6.7	DSSS Peak Power Spectral Density [Section 15.247(d)]	46
6.7.1	Test Procedure	46
6.7.2	Test Setup	46
6.7.3	Test Data	46
7.	Appendix	49
7.1	Appendix A: Measurement Procedure for Power line Conducted Emissions	49
7.2	Appendix B: Test Procedure for Radiated Emissions	50
7.3	Appendix C: Test Equipment	51
7.3.1	Test Equipment List	51
7.3.2	Software for Controlling Spectrum/Receiver and Calculating Test Data	52
7.4	Appendix D: Layout of EUT and Support Equipment	53
7.4.1	General Conducted Test Configuration	53
7.4.2	General Radiation Test Configuration	54
7.5	Appendix E: Description of Support Equipment	55
7.5.1	Description of Support Equipment	55
7.5.2	Software for Controlling Support Unit	55
7.5.3	I/O Cable Condition of EUT and Support Units	55
7.6	Appendix F: Accuracy of Measurement	56
7.7	Appendix G: Photographs of EUT Configuration Test Set Up	58
7.8	Appendix H: Antenna Spec	61

1. General

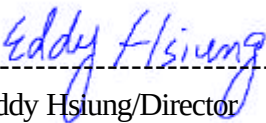
1.1 Certification of Accuracy of Test Data

Standards:	CFR 47 Part 15 Subpart B Class B CFR 47 Part 15 Subpart C (Section 15.247)
Test Procedure:	ANSI C63.4:2003
Equipment Tested:	Tablet Personal Computer (with Intel PRO/Wireless 2200BG Network Connection inside)
Model:	CA27
Applied by:	MITAC Technology Corporation
Sample received Date:	2005/01/20
Final test Date :	2005/01/24-2005/01/31
Test Result	PASS
Test Site:	Chamber 02, Conduction 02
Temperature	Refer to each site test data
Humidity:	Refer to each site test data
Test Engineer:	Mailes Hsieh

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Approve & Signature



Eddy Hsiung/Director

Test results given in this report apply only to the specific sample(s) tested under stated test conditions. This report shall not be reproduced other than in full without the explicit written consent of ISL. This report totally contains 64 pages, including 1 cover page, 2 contents page, and 61 pages for the test description. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

This test data shown below is traceable to NIST or national or international standard. International Standards Laboratory certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

International Standards Laboratory

Report Number: 05LR003FC

HC LAB: NVLAP:200234-0; VCCI: R-341, C-354; NEMKO: ELA 113a, 113c; BSMI: SL2-IN-E-0037; SL2-R1-E-0037; CNLA: 1178
LT LAB: NVLAP:200234-0; VCCI: R-1435, C-1440; NEMKO: ELA 113b, 113d; BSMI: SL2-IN-E-0013; CNLA: 0997

2. Test Results Summary

The 802.11b functions of EUT has been tested according to the FCC regulations listed below:

Tested Standards: 47 CFR Part 15 Subpart C			
Standard Section	Test Type	Result	Remarks
15.207	AC Power Line Emissions	Pass	
15.247(a)(2)	Spectrum Bandwidth Of DSSS device	Pass	
15.247(b)	Max. Peak Output Power	Pass	
15.247(c)	Radiated Emissions 30MHz – 25 GHz	Pass	
15.247 (c)	Band Edge Measurement	Pass	
15.247(b)(4)	Radiation Exposure	Pass	SAR report attached
15.247 (d)	Power Spectral Density	Pass	

The 802.11g functions of EUT has been tested according to the FCC regulations listed below:

Tested Standards: 47 CFR Part 15 Subpart C			
Standard Section	Test Type	Result	Remarks
15.207	AC Power Line Emissions	Pass	
15.247(a)(2)	Spectrum Bandwidth Of DSSS device	Pass	
15.247(b)	Max. Peak Output Power	Pass	
15.247(c)	Radiated Emissions 30MHz – 25 GHz	Pass	
15.247 (c)	Band Edge Measurement	Pass	
15.247(b)(4)	Radiation Exposure	Pass	SAR report attached
15.247 (d)	Power Spectral Density	Pass	

3. Description of Equipment Under Test (EUT)

4. Description of Equipment Under Test (EUT)

Description:	Notebook Personal Computer (with Intel PRO/Wireless 2200BG Network Connection inside)
Model No.:	CA27
FCC ID:	MAU015
Brand:	MITAC
Wireless LAN Module:	Intel, Model: WM3B2200BG
Frequency Range 802.11b/g:	2400 - 2483.5 MHz
Support channel: 802.11b/g	11 Channels
Modulation Skill: 802.11b	DBPSK(1Mbps), DQPSK(2Mbps), CCK(5.5/11Mbps)
802.11g	OFDM (6M - 54Mbps)
Antennas Type:	PIFA, P/N: 23-3E67A57041H made by JOINSOON ELECTRONICS MFG. CO., LTD
Antenna Connected:	Connected to RF connector on the PCB of the 802.11b/g WLAN Adapter. The user is not possible to change the antenna without disassembling the notebook computer.
Antenna peak Gain:	
Main antenna	3.26 dBi (11b/g)
Power Type of LAN module:	3.3V DC from Notebook PC

The channel and the operation frequency of 802.11b and 802.11g is listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437		

CPU:	100 MHz Pentium M 1.1GHz
Power Supply Type:	Auto Switching AC Adapter Delta (Model: ADP-90FB) 90W (3 Pins)
Hard Disk :	Toshiba (Model:MK4025GAS) 40GB
DDR RAM(333):	256MB Kingston (Model: 9905065-003)
Modem Card:	Askey (Model: V1456 VQL-)P1(INT))
Battery:	Li-ion, DC 11.1Volt 4400mAh
UPS Battery:	Li-ion, DC 14.8Volt 2000mAh
LCD:	Toshiba 10.4" XGA TFT (Model:LTD104KA1S)
Inverter:	MITAC (Model:CA25T)
DC-In:	one
USB2.0 Port:	one
Modem Port:	one 4-pin
PCIMCIA Port:	one 68-pin
Line in Port:	one
Line out Port:	one
Port Replicator:	one 60-pin
Private Port:	one 14-pin
Power Cord:	Shielded 3 PIN
Maximum display Resolution:	1024X768 Non-interlaced

EMI Noise Source:

Crystal:

1.Main Board:	14.318MHz (X881), 16MHz (X880), 24.576MHz (X882), 32.768MHz (X883)
2.Control Board:	3.579MHz(Y1260),
3.PCMCIA Board:	7.37MHZ(Y1330)
Clock Generator:U895	

EMI Solution:

- 1 Adding two Slice electric conduction cloth between main-board and battery slot
- 2.Adding one gasket on above of left side Panel Type: 1.5*1*2cm.
- 3.Adding two springs below USB port
- 4.Adding one spring below Line in Port
- 5.Adding one spring below Line out Port
- 6.Adding one copper tape on USB port Type:15.*1.5cm
- 7.Adding one copper tape on Line out Port Type: 1.5*1cm
- 8.Adding two springs below Private Port and contact bracket
- 9.Adding one gasket below Hard Disk Type: 5*1*0.3cm
- 10.Adding one gasket below panel Type: 3*1*0.3cm
- 11.Adding one Slice electric conduction cloth on battery box Type:3*1cm

5. TEST RESULTS (802.11b)

5.1 Powerline Conducted Emissions [Section 15.207]

5.1.1 EUT Configuration

The conducted emission test setups are in accordance with Figs 9, 10(a) and 10(b) of ANSI C63.4-2001, CFR 47 Part 15 Subpart B; or EN55022:1994/ A1:1995/A2:1997; CISPR 22:1993/A1:1995/A2:1996.

The EUT was set up on the non-conductive table that is 1.0 by 1.5 meter, 80cm above ground. The wall of the shielded room was located 40cm to the rear of the EUT.

Power to the EUT was provided through the LISN. The impedance vs. frequency characteristic of the LISN is complied with the limit shown on the figure 1 of ANSI C63.4-2001.

Both lines (neutral and hot) were connected to the LISN in series at testing. A coaxial-type connector which provides one 50 ohms terminating impedance was provided for connecting the test instrument. The excess length of the power cord was folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

If the EUT is a Personal Computer or a peripheral of personal computer, and the personal computer has an auxiliary AC outlet which can be used for providing power to an external monitor, then all measurements will be made with the monitor power from first the computer-mounted AC outlet and then a floor-mounted AC outlet.

5.1.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The main power line conducted EMI tests were run on the hot and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

At the frequencies where the peak values of the emissions were higher than 6dB below the applicable limits, the emissions were also measured with the quasi-peak detectors. At the frequencies where the quasi-peak values of the emissions were higher than 6dB below the applicable average limits, the emissions were also measured with the average detectors.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

5.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range	150 KHz--30MHz
Detector Function	Quasi-Peak/Average
Bandwidth (RBW)	9KHz

5.1.4 Test Data:

Power Line Conducted Emissions (Hot) Channel 1, 6, 11

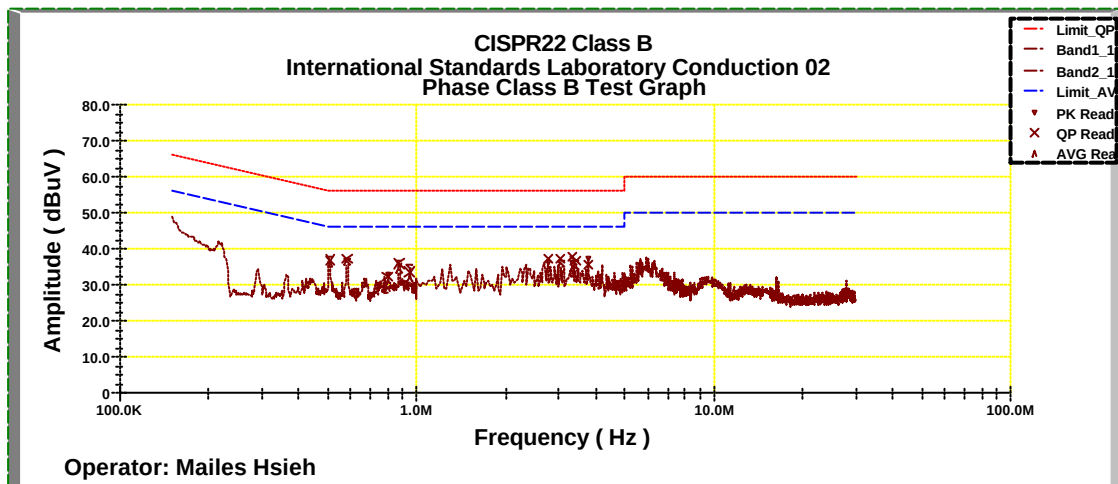
Operator: Mailes Hsieh

Temperature (C): 24

Humidity (%): 50

12:42:41 PM, Saturday, January 29, 2005

Frequency	LISN Loss	Cable Loss	QP Corrt.	QP Limit	QP Margin	AVE Corrt.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.51085	0.12	0.07	36.88	56.00	-19.12	35.43	46.00	-10.57
0.58228	0.13	0.07	37.19	56.00	-18.81	35.88	46.00	-10.12
0.79788	0.17	0.07	32.24	56.00	-23.76	28.56	46.00	-17.44
0.87305	0.18	0.07	35.91	56.00	-20.09	33.68	46.00	-12.32
0.94388	0.19	0.07	33.60	56.00	-22.40	31.28	46.00	-14.72
2.76372	0.20	0.11	37.34	56.00	-18.66	34.16	46.00	-11.84
3.05394	0.20	0.12	37.10	56.00	-18.90	35.65	46.00	-10.35
3.34432	0.20	0.12	37.71	56.00	-18.29	34.43	46.00	-11.57
3.41862	0.20	0.13	36.71	56.00	-19.29	34.20	46.00	-11.80
3.77977	0.20	0.13	35.45	56.00	-20.55	32.14	46.00	-13.86



Power Line Conducted Emissions (Neutral) Channel 1, 6, 11

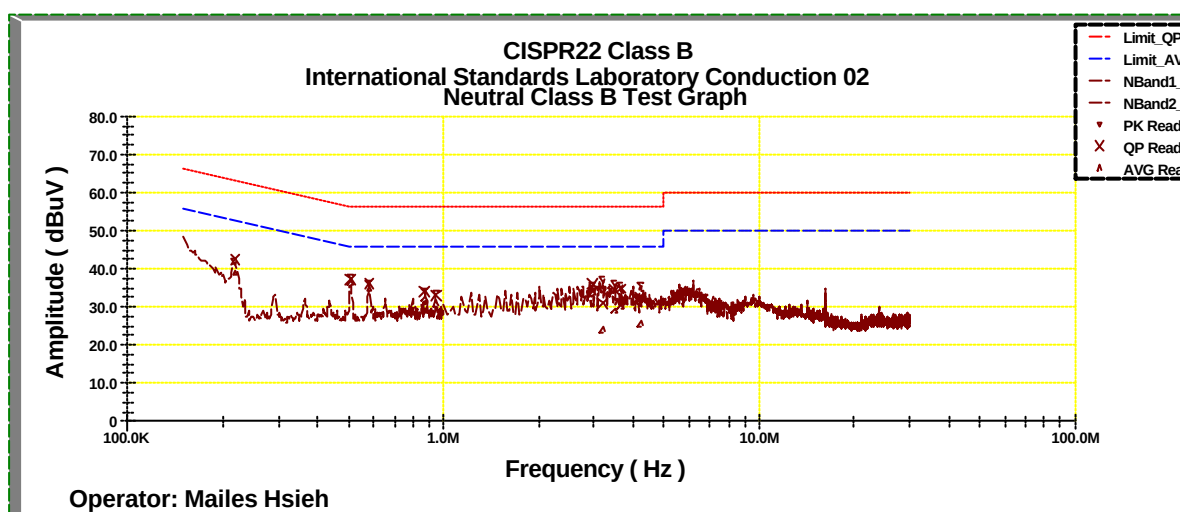
Operator: Mailes Hsieh

Temperature (C): 24

Humidity (%): 50

12:31:57 PM, Saturday, January 29, 2005

Frequency	LISN Loss	Cable Loss	QP Corrt.	QP Limit	QP Margin	AVE Corrt.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.21913	0.10	0.06	42.46	64.02	-21.57	38.97	54.02	-15.06
0.50883	0.12	0.07	37.27	56.00	-18.73	36.18	46.00	-9.82
0.58250	0.13	0.07	36.07	56.00	-19.93	34.64	46.00	-11.36
0.87273	0.18	0.07	34.15	56.00	-21.85	32.04	46.00	-13.96
0.94523	0.19	0.07	32.92	56.00	-23.08	30.68	46.00	-15.32
2.97641	0.20	0.11	36.02	56.00	-19.98	33.66	46.00	-12.34
3.19295	0.20	0.12	30.86	56.00	-25.14	23.94	46.00	-22.06
3.48707	0.20	0.13	34.35	56.00	-21.65	28.91	46.00	-17.09
3.63170	0.20	0.13	34.71	56.00	-21.29	29.78	46.00	-16.22
4.21447	0.20	0.14	32.26	56.00	-23.74	25.57	46.00	-20.43



* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT Channel between 1, 6, 11 to get the maximum reading of all these channels.

Margin = Amplitude + Insertion Loss- Limit

A margin of -8dB means that the emission is 8dB below the limit

5.2 Bandwidth for DSSS [Section 15.247 (a)(2)]

5.2.1 Test Procedure

The Transmitter output of EUT was connected to the spectrum analyzer. The 6 dB bandwidth of the fundamental frequency was measured. The setting of spectrum analyzer is as follows

Equipment mode	Spectrum analyzer
Detector function	Peak mode
RBW	100KHz
VBW	100KHz

5.2.2 Test Setup



5.2.3 Test Data:

6dB Bandwidth

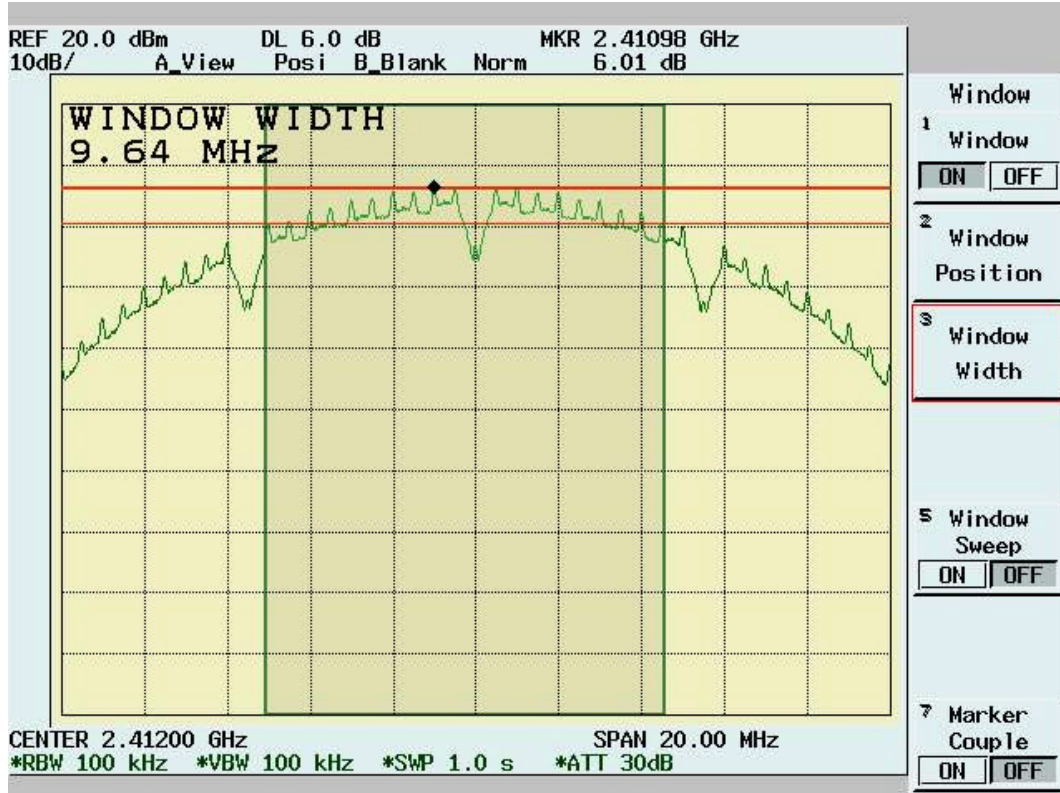
Temp. (deg. C): 25

Test Engr: Mailes
Hsieh

Humidity (%): 50

Chennel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	9.64	0.5	Pass
6	2437	9.56	0.5	Pass
11	2462	9.56	0.5	Pass

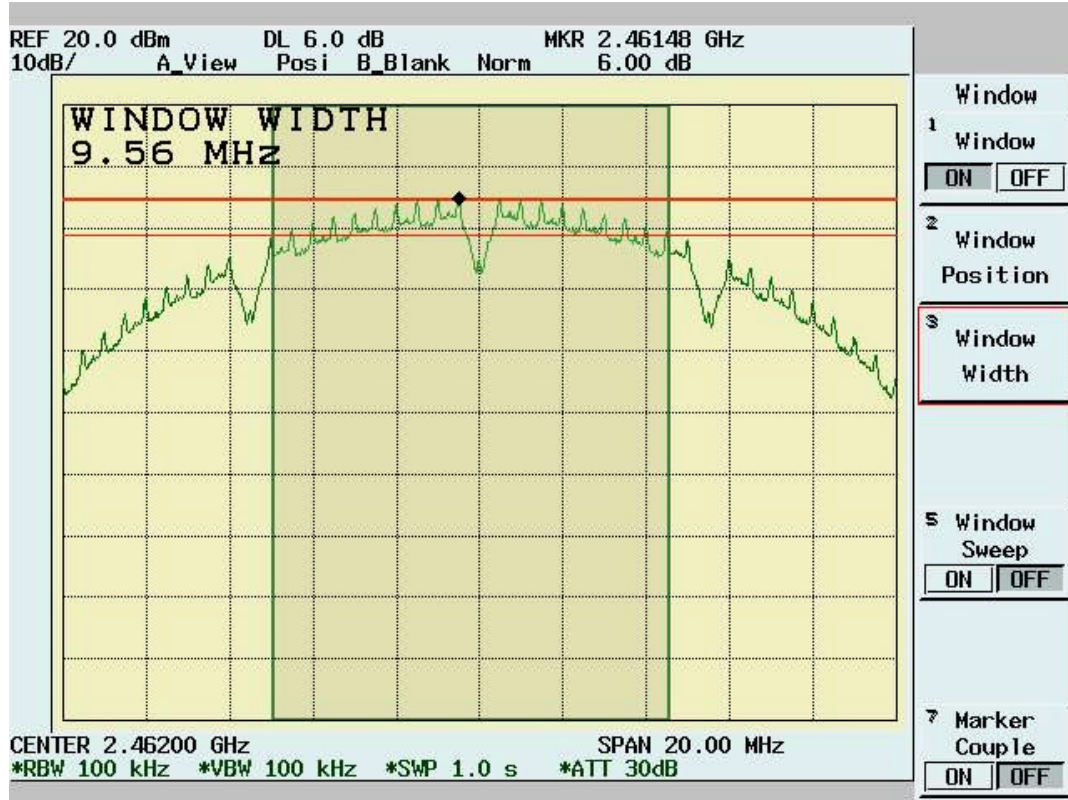
Channel 1:



Channel 6:



Channel 11:



5.3 DSSS Maximum Peak Output Power [Section 15.247 (b)(1)]

5.3.1 Test Procedure

The Transmitter output of EUT was connected to the peak power analyzer.

5.3.2 Test Setup



5.3.3 Test Data

Maximum Peak Output Power

Temp. (deg. C): 25

Test Engr: Mailes Hsieh

Humidity (%): 50

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	16.238	1.1	54.18	17.338	30	Pass
6	2437	15.684	1.1	47.69	16.784	30	Pass
11	2462	15.363	1.1	44.29	16.463	30	Pass

Note: Two RF output(MAIN & AUX) have been test,the worse data shown above.

5.4 Radiated Emission Measurement [Section [15.247(c)(4)]

5.4.1 EUT Configuration

The equipment under test was set up on the 10 meter chamber with measurement distance of 3 meters. The EUT was placed on a non-conductive table 80cm above ground.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

5.4.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. We found the maximum readings by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured.

30M to 1GHz: The highest emissions between 30 MHz to 1000 MHz were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission.

1GHz – 25GHz: The highest emissions were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in peak mode to determine the precise amplitude of the emission. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission. During test the EMI receiver and spectrum was setup according to *EMI Receiver/Spectrum Analyzer Configuration*.

For the test of 2nd to 10th harmonics frequencies, the equipment setup was also refer to *EMI Receiver/Spectrum Analyzer Configuration*. The frequencies were tested using Peak mode first, if the test data is higher than the emissions limit, an additional measurement using Average mode will be performed and the average reading will be compared to the limit and record in test report.

5.4.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz
Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	3MHz
Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

5.4.4 Test Data (30MHz – 1GHz):**30M – 1GHz Open Field Radiated Emissions (Horizontal) Channel 1, 6, 11**

Operator: Mailes Hsieh

Temperature (C): 21

11:27:11 AM, Saturday, January 29, 2005

Humidity (%): 51

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmpGain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
366.59	13.26	14.83	4.22	0.00	32.30	46.00	-13.70	99.00	337.00
400.54	13.05	15.90	4.44	0.00	33.40	46.00	-12.60	99.00	337.00
432.55	13.65	16.16	4.69	0.00	34.50	46.00	-11.50	99.00	108.00
527.61	8.73	18.22	5.36	0.00	32.30	46.00	-13.70	146.00	156.00
623.64	8.27	18.95	6.11	0.00	33.32	46.00	-12.68	99.00	206.00
719.67	5.21	19.43	6.79	0.00	31.44	46.00	-14.56	99.00	190.00
833.16	1.96	20.43	7.71	0.00	30.10	46.00	-15.90	196.00	300.00
839.95	5.85	20.50	7.73	0.00	34.08	46.00	-11.92	196.00	300.00
866.14	6.31	20.54	7.97	0.00	34.82	46.00	-11.18	99.00	238.00
899.12	3.31	20.40	8.08	0.00	31.80	46.00	-14.20	146.00	7.00

30M – 1GHz Open Field Radiated Emissions (Vertical) Channel 1, 6, 11

Operator: Mailes Hsieh

Temperature (C): 21

11:31:55 AM, Saturday, January 29, 2005

Humidity (%): 51

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmpGain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
366.59	15.64	14.83	4.22	0.00	34.69	46.00	-11.31	153.00	25.00
400.54	10.87	15.90	4.44	0.00	31.22	46.00	-14.78	153.00	25.00
432.55	10.59	16.16	4.69	0.00	31.44	46.00	-14.56	102.00	124.00
466.5	11.53	16.70	4.96	0.00	33.19	46.00	-12.81	102.00	305.00
559.62	11.48	18.82	5.60	0.00	35.91	46.00	-10.09	102.00	9.00
719.67	3.95	19.43	6.79	0.00	30.18	46.00	-15.82	153.00	80.00
759.44	2.37	20.10	7.04	0.00	29.51	46.00	-16.49	153.00	227.00
833.16	5.77	20.43	7.71	0.00	33.91	46.00	-12.09	102.00	157.00
839.95	8.89	20.50	7.73	0.00	37.12	46.00	-8.88	102.00	321.00
899.12	4.64	20.40	8.08	0.00	33.12	46.00	-12.88	102.00	141.00

NOTE:

During the Pre-test, the EUT has been tested for Channel 1, 6, 11 transmit from Main and Aux antenna respectively to get all the critical emission frequencies. In the final test all the critical emission frequencies has been tested and the test data are listed above.

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 30MHz to 1GHz have been tested

International Standards Laboratory

Report Number: 05LR003FC

HC LAB: NVLAP:200234-0; VCCI: R-341, C-354; NEMKO: ELA 113a, 113c; BSMI: SL2-IN-E-0037; SL2-R1-E-0037; CNLA: 1178

LT LAB: NVLAP:200234-0; VCCI: R-1435, C-1440; NEMKO: ELA 113b, 113d; BSMI: SL2-IN-E-0013; CNLA: 0997

5.4.5 Test Data (1GHz – 25 GHz) .**1GHz~ 25 GHz (Horizontal), Channel 1: 2412 MHz**

Operator: Mailes Hsieh

RBW: 1MHz

Humidity (%): 40

Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1399.6	50.93 pk	26.34	2.22	34.15	45.34 pk	54.00 av	-8.66	101	84
1841.66	47.09 pk	29.67	2.48	34.87	44.38 pk	54.00 av	-9.62	100	54
2308.69	49.27 pk	30.94	1.66	35.19	46.67 pk	54.00 av	-7.33	101	140
2508.49	47.16 pk	30.90	1.36	35.19	44.24 pk	54.00 av	-9.76	102	203
4821.68	42.50 pk	34.92	2.12	37.71	41.83 pk	54.00 av	-12.17	100	18

1GHz~ 25 GHz (Vertical), Channel 1: 2412 MHz

Operator: Mailes Hsieh

RBW: 1MHz

Humidity (%): 40

Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1986.51	46.32 pk	30.89	2.59	35.15	44.64 pk	54.00 av	-9.36	100	44
2143.86	46.97 pk	30.97	2.16	35.19	44.92 pk	54.00 av	-9.08	100	88
2308.69	53.41 pk	30.94	1.66	35.19	50.81 pk	54.00 av	-3.19	101	140
2383.62	50.09 pk	30.92	1.43	35.20	47.25 pk	54.00 av	-6.75	101	163
2456.04	47.04 pk	30.91	1.38	35.20	44.13 pk	54.00 av	-9.87	101	186
4821.68	40.63 pk	34.92	2.12	37.71	39.96 pk	54.00 av	-14.04	100	18

Note:

According to ANSI C63.4-2001 8.3.1.2 Notes(1):Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.

“ * ”: Fundamental Frequency

“**”: Not in the restricted band, Limit level=Fundamental Emission-20dB

“ pk”: peak mode

“av”: average mode

“---“: No meter reading data due to the emission level is smaller than spectrum noise level.

The Spectrum noise level+Correction Factor < Limit - 6 dB

Margin=Corrected Amplitude – Limit

Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal) , Channel 6 : 2437 MHz

Operator: Mailes Hsieh

RBW: 1MHz
Humidity (%): 40
Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1399.6	50.42 pk	26.34	2.22	34.15	44.83 pk	54.00 av	-9.17	101	84
2011.49	46.27 pk	31.00	2.56	35.18	44.65 pk	54.00 av	-9.35	100	47
2193.81	47.99 pk	30.96	2.01	35.19	45.77 pk	54.00 av	-8.23	101	104
2333.67	49.97 pk	30.93	1.58	35.19	47.29 pk	54.00 av	-6.71	101	148
2783.22	46.60 pk	31.01	1.41	34.95	44.08 pk	54.00 av	-9.92	102	289
4979.02	40.21 pk	35.52	2.16	37.89	40.01 pk	54.00 av	-13.99	100	2
9745.25	39.59 pk	40.36	3.30	34.37	48.88 pk	54.00 av	-5.12	102	5

1GHz~ 25 GHz (Vertical), Channel 6 : 2437 MHz

Operator: Mailes Hsieh

RBW: 1MHz
Humidity (%): 40
Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
2171.33	49.23 pk	30.97	2.08	35.19	47.09 pk	54.00 av	-6.91	101	97
2333.67	50.21 pk	30.93	1.58	35.19	47.53 pk	54.00 av	-6.47	101	148
2386.11	46.99 pk	30.92	1.42	35.20	44.14 pk	54.00 av	-9.86	101	164
2406.09	47.95 pk	30.92	1.51	35.20	45.19 pk	54.00 av	-8.81	101	171
2608.39	46.76 pk	30.94	1.38	35.10	43.98 pk	54.00 av	-10.02	102	234
5440.56	40.56 pk	35.95	2.83	37.91	41.44 pk	54.00 av	-12.56	100	126
9007.99	38.75 pk	40.90	3.07	33.69	49.03 pk	54.00 av	-4.97	103	20

Note:

According to ANSI C63.4-2001 8.3.1.2 Notes(1):Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.

“ * ”: Fundamental Frequency

“**”: Not in the restricted band, Limit level=Fundamental Emission-20dB

“ pk ”: peak mode

“ av ”: average mode

“ --- ”: No meter reading data due to the emission level is smaller than spectrum noise level.

The Spectrum noise level+Correction Factor < Limit - 6 dB

Margin=Corrected Amplitude – Limit

Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal), Channel 11: 2462 MHz

Operator: Mailes Hsieh

RBW: 1MHz

Humidity (%): 40

Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1764.24	47.48 pk	29.02	2.43	34.72	44.21 pk	54.00 av	-9.79	100	59
2198.8	47.20 pk	30.96	1.99	35.19	44.96 pk	54.00 av	-9.04	101	105
2286.21	47.71 pk	30.94	1.73	35.19	45.19 pk	54.00 av	-8.81	101	133
2356.14	48.77 pk	30.93	1.51	35.19	46.02 pk	54.00 av	-7.98	101	155
2433.57	48.85 pk	30.91	1.38	35.20	45.94 pk	54.00 av	-8.06	101	179
9841.16	42.48 pk	40.15	3.35	34.40	51.58 pk	54.00 av	-2.42	101	3

1GHz~ 25 GHz (Vertical), Channel 11 : 2462 MHz

Operator: Mailes Hsieh

RBW: 1MHz

Humidity (%): 40

Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1839.16	47.95 pk	29.65	2.48	34.86	45.21 pk	54.00 av	-8.79	100	54
1999	45.73 pk	30.99	2.60	35.18	44.14 pk	54.00 av	-9.86	100	43
2193.81	50.16 pk	30.96	2.01	35.19	47.95 pk	54.00 av	-6.05	101	104
2286.21	49.63 pk	30.94	1.73	35.19	47.11 pk	54.00 av	-6.89	101	133
2358.64	48.31 pk	30.93	1.51	35.19	45.55 pk	54.00 av	-8.45	101	156
2533.47	47.16 pk	30.91	1.37	35.17	44.27 pk	54.00 av	-9.73	102	211
9841.16	40.07 pk	40.15	3.35	34.40	49.16 pk	54.00 av	-4.84	101	3
12316.7	39.21 pk	41.92	3.68	35.61	49.19 pk	54.00 av	-4.81	100	168

Note:

According to ANSI C63.4-2001 8.3.1.2 Notes(1):Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.

“ * ”: Fundamental Frequency

“**”: Not in the restricted band, Limit level=Fundamental Emission-20dB

“ pk ”: peak mode

“ av ”: average mode

“ --- ”: No meter reading data due to the emission level is smaller than spectrum noise level.

The Spectrum noise level+Correction Factor < Limit - 6 dB

Margin=Corrected Amplitude – Limit

Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit.

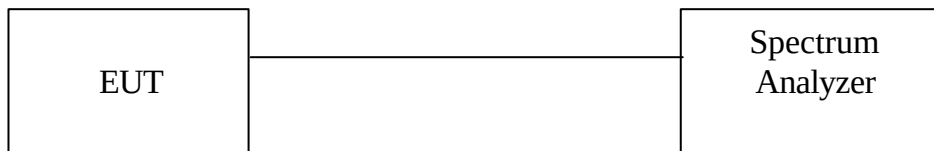
All frequencies from 1GHz to 25 GHz have been tested.

5.5 Band Edge Measurement

5.5.1 Test Procedure (Conducted)

1. The transmitter output of EUT was connected to the spectrum analyzer.
Equipment mode: Spectrum analyzer
Detector function: Peak mode
SPAN: 100MHz
RBW: 100KHz
VBW: 100KHz
Center frequency: 2.4GHz, 2.4835GHz.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed
3. Find the next peak frequency outside the operation frequency band

5.5.2 Test Setup (Conducted)



5.5.3 Test Data:

Table: Band Edge measurement (Conducted)

Temp. (deg. C): 25

Test Engr: Mailes Hsieh Humidity (%): 50

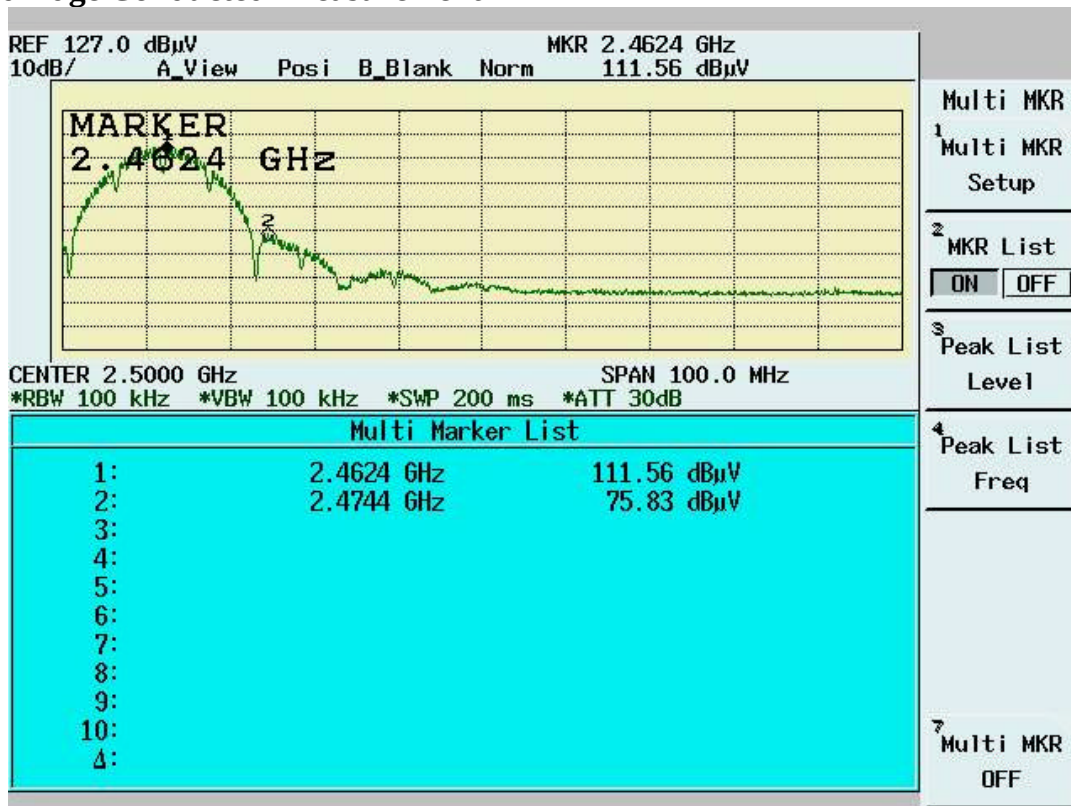
Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
1	2411.5	113.34	---	---
Outside band	2400	73.91	39.43	Pass
11	2462.4	111.56	---	---
Outside band	2474.4	75.83	35.73	Pass

Note: Two RF output(MAIN & AUX) have been test,the worse data shown above.

Band Edge Conducted measurement



Band Edge Conducted Measurement



5.5.4 Test Procedure (Radiated)

1. Antenna and Turntable test procedure same as Radiated Emission Measurement.
Equipment mode: Spectrum analyzer
Detector function: Peak mode
SPAN: 100MHz
RBW: 1MHz
VBW: 3MHz
Center frequency: 2.395GHz, 2.48GHz.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed.
3. Find the next peak frequency outside the operation frequency band
4. For peak frequency emission level measurement in Restricted Band ,
Change RBW: 1MHz
VBW: 10Hz
Span: 100MHz.
5. Get the spectrum reading after Maximum Hold function is completed.

5.5.5 Test Setup (Radiated)

Same as *Radiated Emission Measurement*

5.5.6 Test Data

Table Band Edge measurement (Radiated)

Temp. (deg. C): 25

Test Engr: Mailes Hsieh

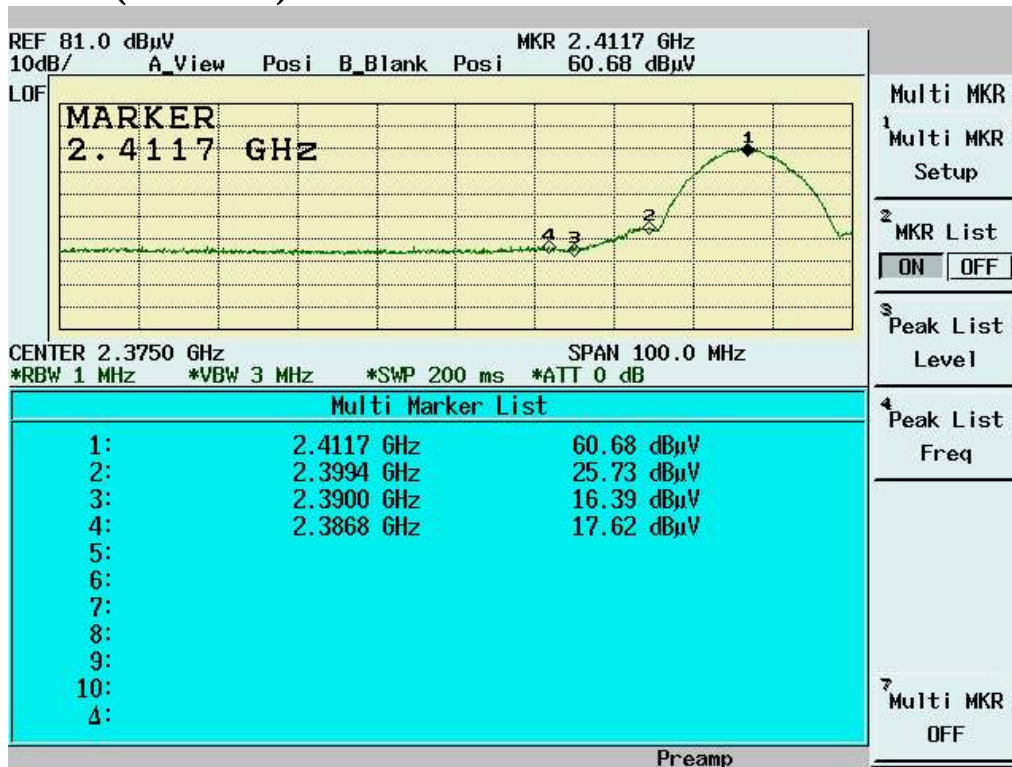
Humidity (%): 50

Description	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	dBc (Limit: > 20dBc)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
Channel_1 (average mode)	2410.8	54.57	35.48	90.05	---	---	10Hz	---
Channel_1 (peak mode)	2411.7	60.68	35.48	96.16	---	---	3MHz	---
Outside band (peak mode)	2399.4	25.73	35.48	61.21	34.95	---	3MHz	Pass
Channel_11 (average mode)	2462.7	48.97	35.5	84.47	---	---	10Hz	---
Channel_11 (peak mode)	2462.8	55.38	35.5	90.88	---	---	3MHz	---
Outside band (peak mode)	2474.2	23.55	35.51	59.06	31.82	---	3MHz	Pass
Channel_1 Restricted band (peak mode)	2386.8	17.62	35.47	53.09	---	74	3MHz	Pass
Restricted band (average mode)	2385.7	6.27	35.47	41.74	---	54	10Hz	Pass
Channel_11 Restricted band (peak mode)	2490.2	17.63	35.51	53.14	---	74	3MHz	Pass
Restricted band (average mode)	2488.1	6.55	35.51	42.06	---	54	10Hz	Pass

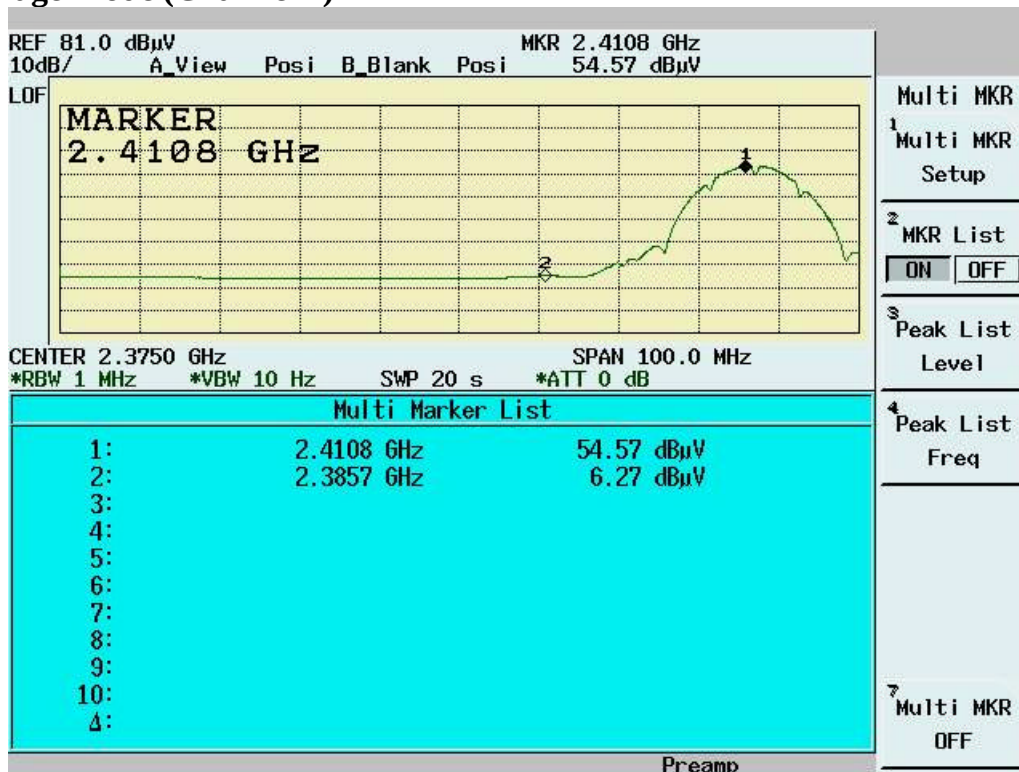
Note:

- ✂✂ The Spectrum plot of emission level measurement in Restricted band is attached.
- ✂✂ Emission Level=Spectrum Reading+Correction Factor
- ✂✂ Correction Factor=Antenna Factor+cable loss–amplifier gain
- ✂✂ Both Horizontal and Vertical polarizaion have been tested and the worst data is listed above.

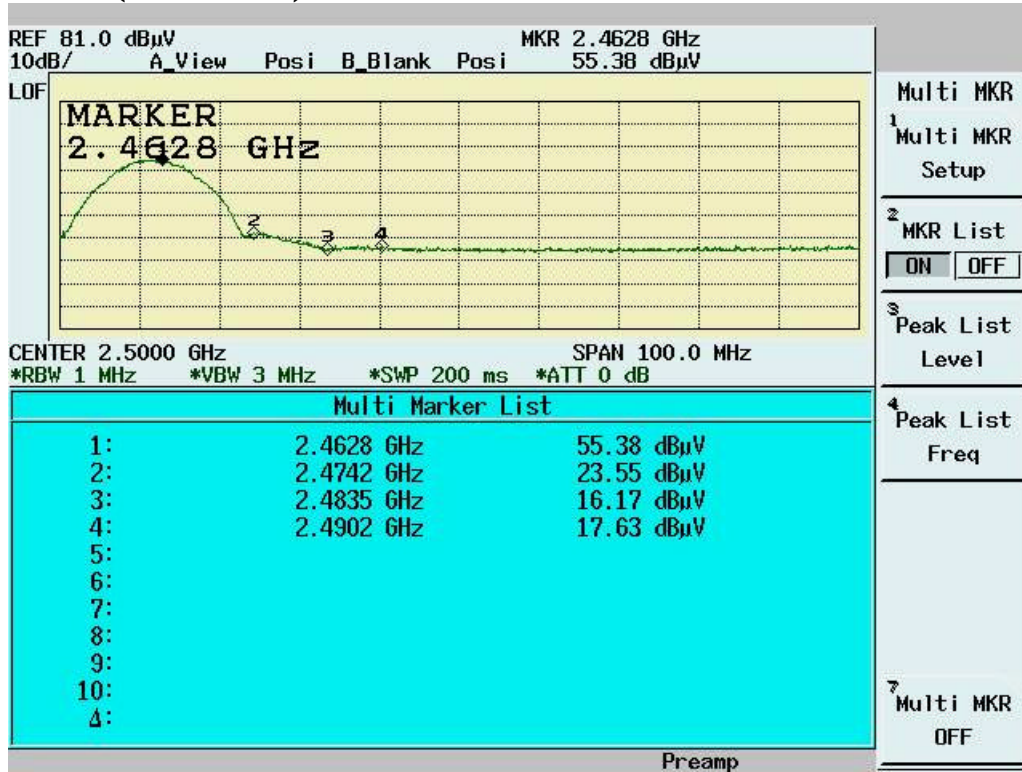
**Band Edge measurement for radiated emission in Restricted Band(Radiated)
Peak Mode (Channel 1)**



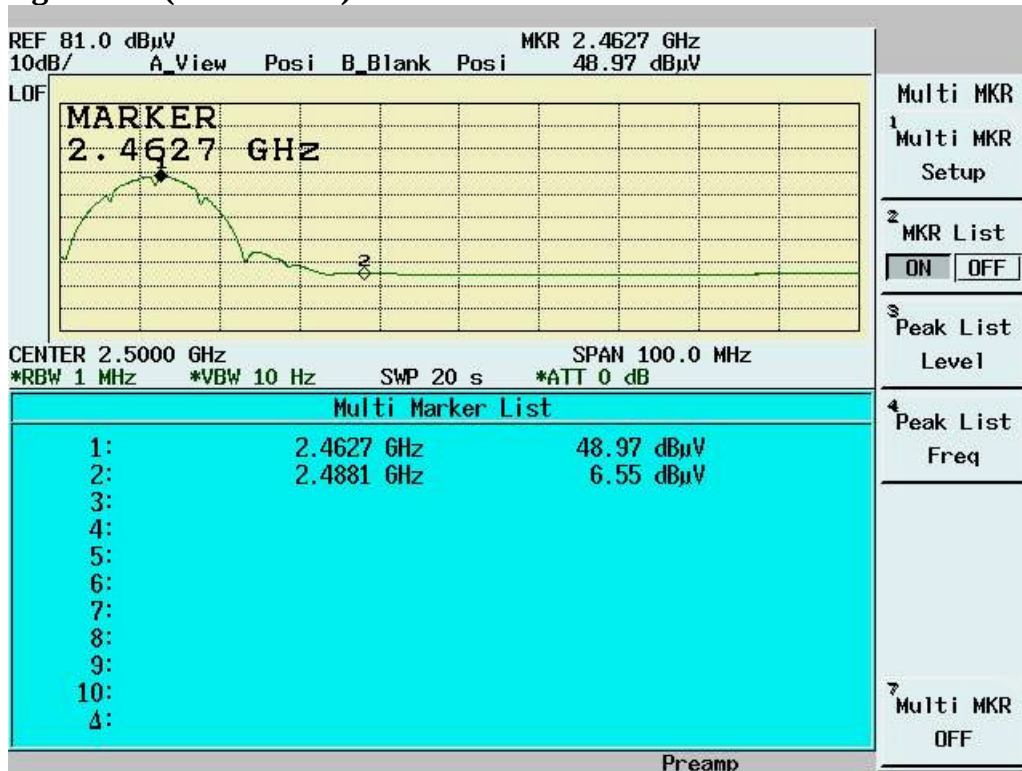
**Band Edge measurement for radiated emission in Restricted Band(Radiated)
Average Mode (Channel 1)**



**Band Edge measurement for radiated emission in Restricted Band(Radiated)
Peak Mode (Channel 11)**



**Band Edge measurement for radiated emission in Restricted Band(Radiated)
Average Mode (Channel 11)**



5.6 RF Exposure Measurement [Section 15.247(b)(4) & 1.1307(b)]

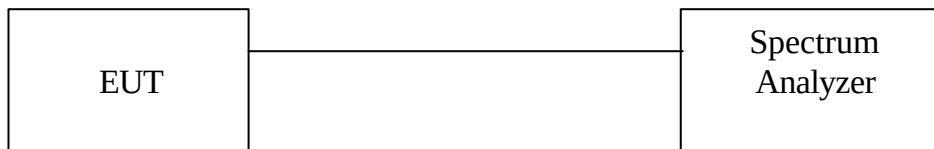
See SAR report

5.7 DSSS Peak Power Spectral Density [Section 15.247(d)]

5.7.1 Test Procedure

1. The Transmitter output of EUT was connected to the spectrum analyzer.
Equipment mode: Spectrum analyzer
Detector function: Peak mode
SPAN:1.5MHz
RBW: 3KHz
VBW: 30KHz
Center frequency: fundamental frequency tested.
Sweep time= 500 sec.
2. Using Peak Search to read the peak power after Maximum Hold function is completed.

5.7.2 Test Setup



5.7.3 Test Data

Maximum Peak Output Power Density

Temp. (deg. C): 25

Test Engr:

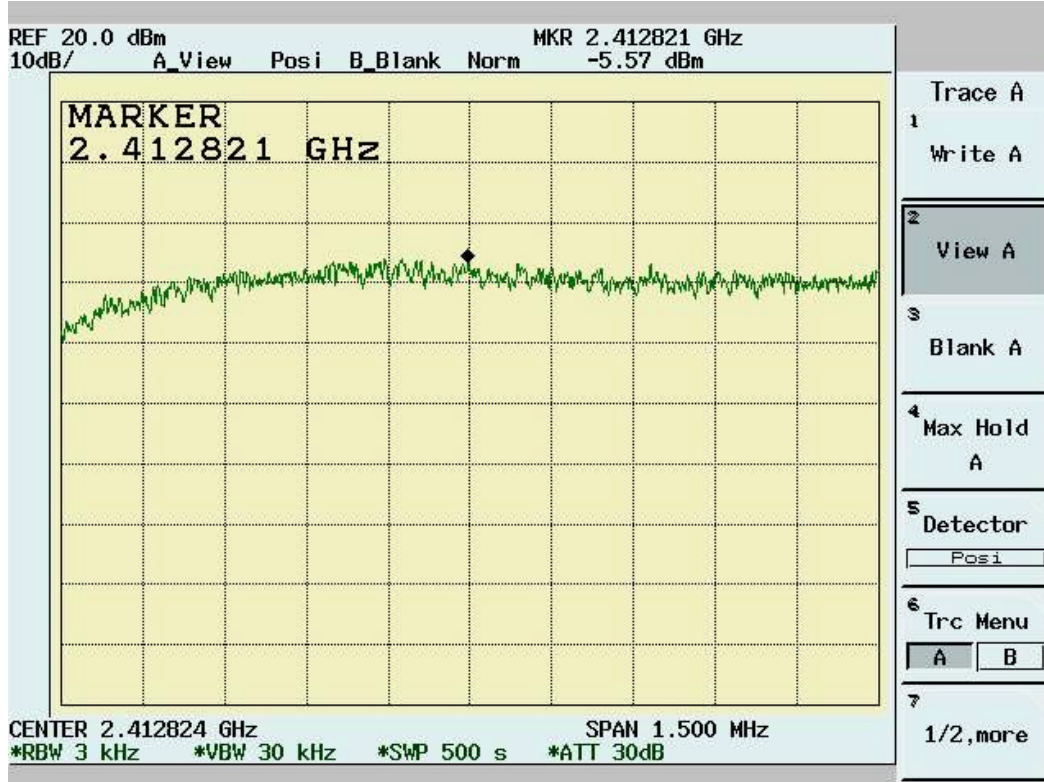
Mailes Hsieh

Humidity (%): 50

Channel	Frequency (MHz)	Spectrum Reading (dBm/3KHz)	Cable Loss (dB)	Peak Power Output (dBm/3KHz)	Limit (dBm/3KHz)	Pass/Fail
1	2412	-5.57	1.1	-4.47	8	Pass
6	2437	-5.87	1.1	-4.77	8	Pass
11	2462	-8.02	1.1	-6.92	8	Pass

Note: Two RF output(MAIN & AUX) have been test,the worse data shown above.

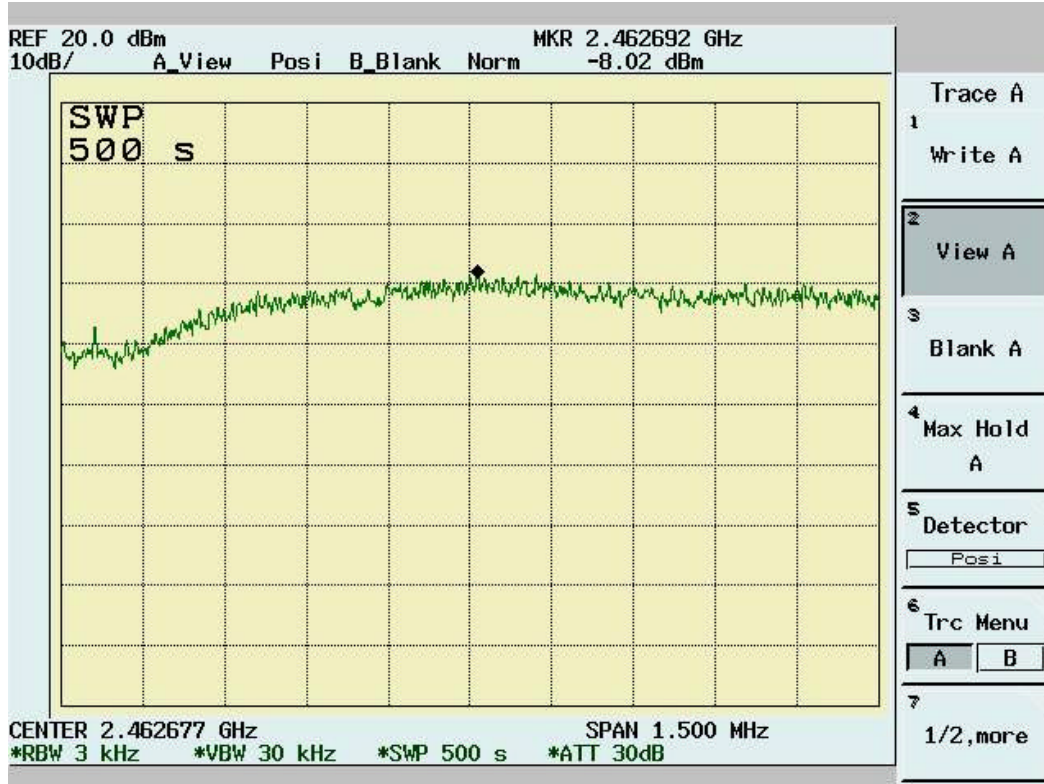
Channel 1



Channel 6



Channel 11



International Standards Laboratory

Report Number: 05LR003FC

HC LAB: NVLAP:200234-0; VCCI: R-341, C-354; NEMKO: ELA 113a, 113c; BSMI: SL2-IN-E-0037; SL2-R1-E-0037; CNLA: 1178

LT LAB: NVLAP:200234-0; VCCI: R-1435, C-1440; NEMKO: ELA 113b, 113d; BSMI: SL2-IN-E-0013; CNLA: 0997

6. TEST RESULTS (802.11g)

6.1 Powerline Conducted Emissions [Section 15.207]

6.1.1 EUT Configuration

The conducted emission test setups are in accordance with Figs 9, 10(a) and 10(b) of ANSI C63.4-2001, CFR 47 Part 15 Subpart B; or EN55022:1994/ A1:1995/A2:1997; CISPR 22:1993/A1:1995/A2:1996.

The EUT was set up on the non-conductive table that is 1.0 by 1.5 meter, 80cm above ground. The wall of the shielded room was located 40cm to the rear of the EUT.

Power to the EUT was provided through the LISN. The impedance vs. frequency characteristic of the LISN is complied with the limit shown on the figure 1 of ANSI C63.4-2001.

Both lines (neutral and hot) were connected to the LISN in series at testing. A coaxial-type connector which provides one 50 ohms terminating impedance was provided for connecting the test instrument. The excess length of the power cord was folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

If the EUT is a Personal Computer or a peripheral of personal computer, and the personal computer has an auxiliary AC outlet which can be used for providing power to an external monitor, then all measurements will be made with the monitor power from first the computer-mounted AC outlet and then a floor-mounted AC outlet.

6.1.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The main power line conducted EMI tests were run on the hot and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

At the frequencies where the peak values of the emissions were higher than 6dB below the applicable limits, the emissions were also measured with the quasi-peak detectors. At the frequencies where the quasi-peak values of the emissions were higher than 6dB below the applicable average limits, the emissions were also measured with the average detectors.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

6.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range	150 KHz--30MHz
Detector Function	Quasi-Peak/Average
Bandwidth (RBW)	9KHz

6.1.4 Test Data:

Power Line Conducted Emissions (Hot) Channel 1, 6, 11

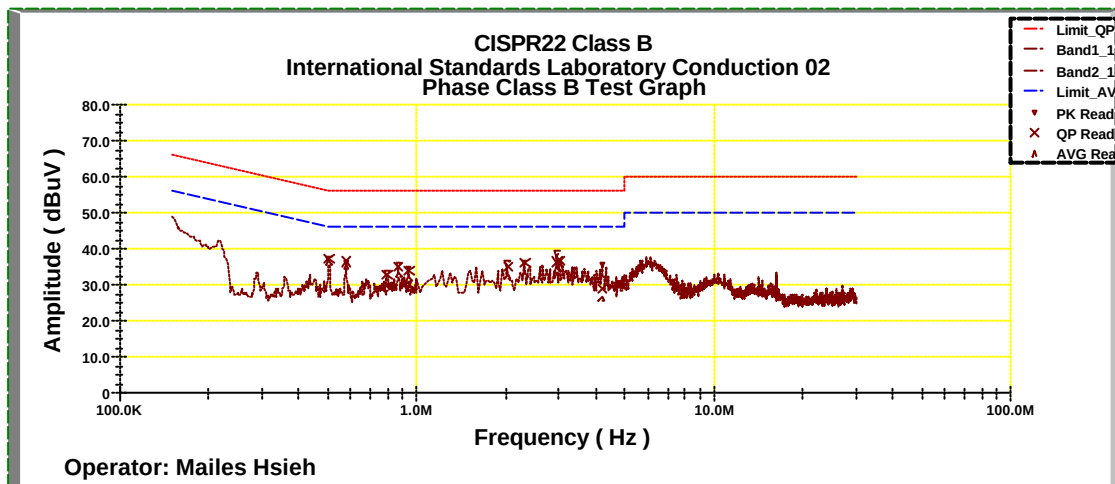
Operator: Mailes Hsieh

Temperature (C): 24

12:12:19 PM, Saturday, January 29, 2005

Humidity (%): 50

Frequency	LISN Loss	Cable Loss	QP Corrt.	QP Limit	QP Margin	AVE Corrt.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.50738	0.12	0.07	37.15	56.00	-18.85	35.92	46.00	-10.08
0.57858	0.13	0.07	36.49	56.00	-19.51	35.08	46.00	-10.92
0.79463	0.17	0.07	32.74	56.00	-23.26	29.12	46.00	-16.88
0.86991	0.18	0.07	34.90	56.00	-21.10	32.56	46.00	-13.44
0.94063	0.19	0.07	33.88	56.00	-22.12	31.75	46.00	-14.25
2.02521	0.20	0.09	35.08	56.00	-20.92	32.10	46.00	-13.90
2.31835	0.20	0.10	36.06	56.00	-19.94	32.70	46.00	-13.30
2.96718	0.20	0.11	36.31	56.00	-19.69	34.04	46.00	-11.96
3.04133	0.20	0.12	36.80	56.00	-19.20	35.20	46.00	-10.80
4.19909	0.20	0.14	28.92	56.00	-27.08	25.91	46.00	-20.09



Power Line Conducted Emissions (Neutral) Channel 1, 6, 11

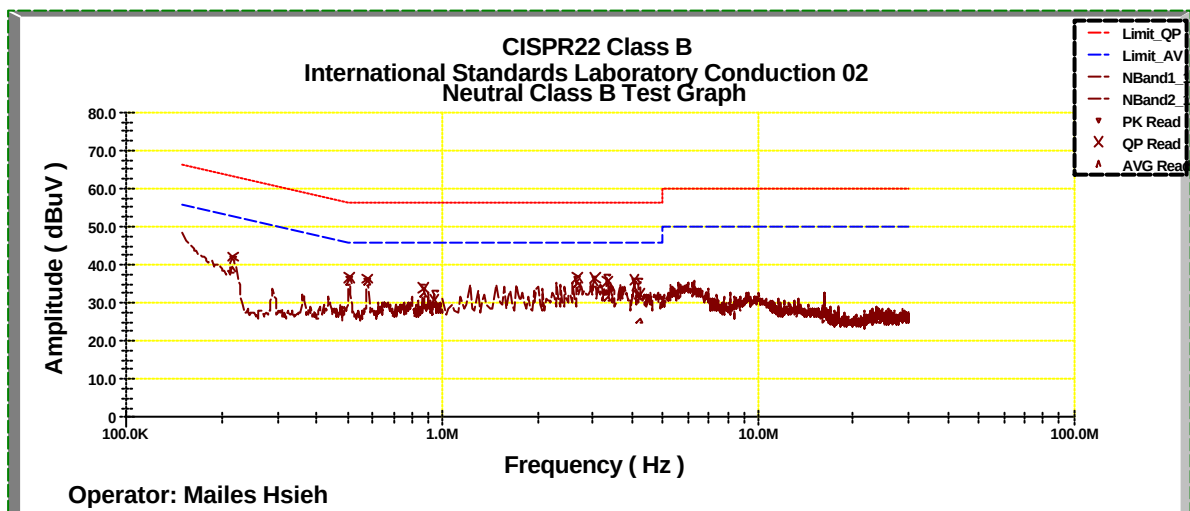
Operator: Mailes Hsieh

Temperature (C): 24

Humidity (%): 50

12:21:33 PM, Saturday, January 29, 2005

Frequency	LISN Loss	Cable Loss	QP Corrt.	QP Limit	QP Margin	AVE Corrt.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.21658	0.10	0.06	42.16	64.10	-21.94	38.59	54.10	-15.51
0.50906	0.12	0.07	36.66	56.00	-19.34	35.45	46.00	-10.55
0.58056	0.13	0.07	36.33	56.00	-19.67	35.13	46.00	-10.87
0.87010	0.18	0.07	33.89	56.00	-22.11	31.87	46.00	-14.13
0.94198	0.19	0.07	30.68	56.00	-25.32	30.56	46.00	-15.44
2.68206	0.20	0.11	36.75	56.00	-19.25	34.59	46.00	-11.41
3.04515	0.20	0.12	36.56	56.00	-19.44	35.00	46.00	-11.00
3.33343	0.20	0.12	35.68	56.00	-20.32	30.99	46.00	-15.01
4.05035	0.20	0.14	35.91	56.00	-20.09	33.75	46.00	-12.25
4.20997	0.20	0.14	32.33	56.00	-23.67	25.26	46.00	-20.74



* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT Channel between 1, 6, 11 to get the maximum reading of all these channels.
Margin = Amplitude + Insertion Loss- Limit
A margin of -8dB means that the emission is 8dB below the limit

6.2 Bandwidth for DSSS [Section 15.247 (a)(2)]

6.2.1 Test Procedure

The Transmitter output of EUT was connected to the spectrum analyzer. The 6 dB bandwidth of the fundamental frequency was measured. The setting of spectrum analyzer is as follows

Equipment mode	Spectrum analyzer
Detector function	Peak mode
RBW	100KHz
VBW	100KHz

6.2.2 Test Setup



6.2.3 Test Data:

6dB Bandwidth

Temp. (deg. C): 25

Test Engr: Mailes
Hsieh

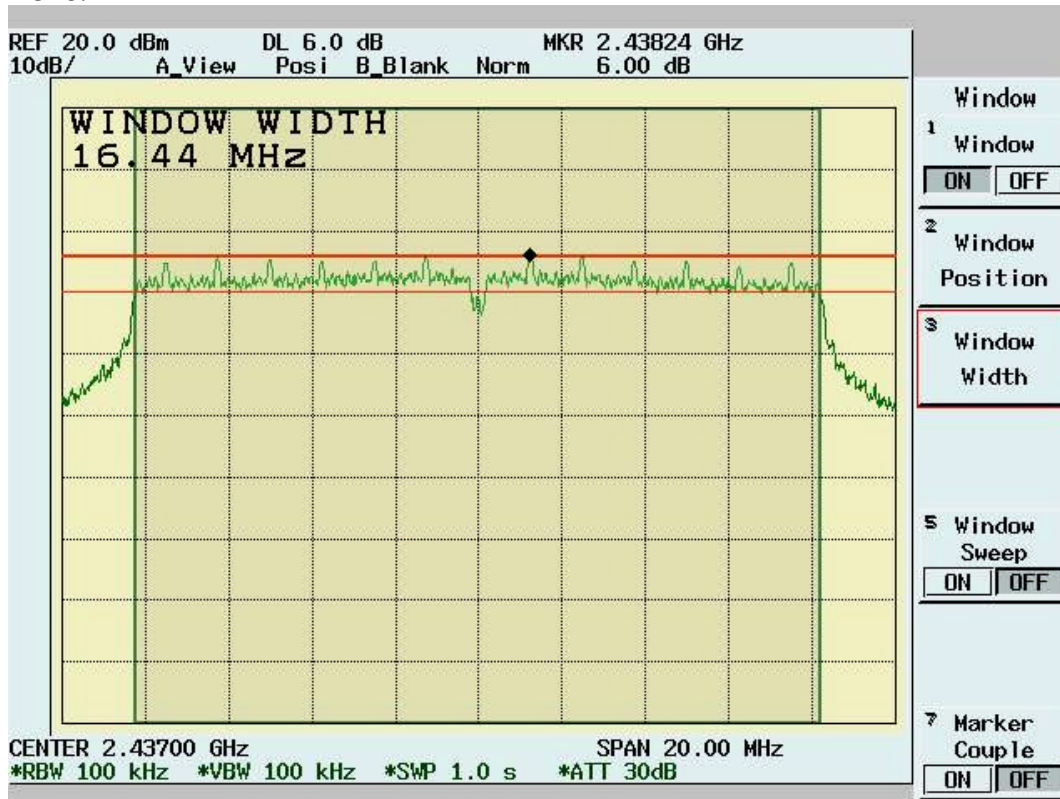
Humidity (%): 50

Chennel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	16.44	0.5	Pass
6	2437	16.44	0.5	Pass
11	2462	16.48	0.5	Pass

Channel 1:



Channel 6:



Channel 11:

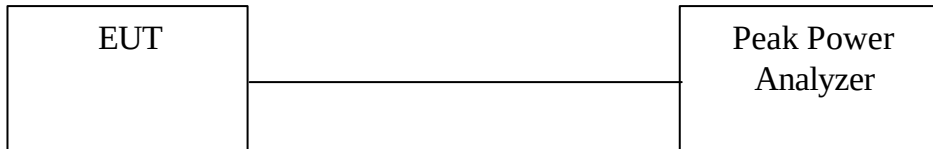


6.3 DSSS Maximum Peak Output Power [Section 15.247 (b)(1)]

6.3.1 Test Procedure

The Transmitter output of EUT was connected to the peak power analyzer.

6.3.2 Test Setup



6.3.3 Test Data

Maximum Peak Output Power

Temp. (deg. C): 25

Test Engr: Mailes Hsieh

Humidity (%): 50

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	17.928	1.1	79.95	19.028	30	Pass
6	2437	17.553	1.1	73.33	18.653	30	Pass
11	2462	17.174	1.1	67.20	18.274	30	Pass

Note: Two RF output(MAIN & AUX) have been test,the worse data shown above.

6.4 Radiated Emission Measurement [Section [15.247(c)(4)]

6.4.1 EUT Configuration

The equipment under test was set up on the 10 meter chamber with measurement distance of 3 meters. The EUT was placed on a non-conductive table 80cm above ground.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

6.4.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. We found the maximum readings by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured.

30M to 1GHz: The highest emissions between 30 MHz to 1000 MHz were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission.

1GHz – 25GHz: The highest emissions were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in peak mode to determine the precise amplitude of the emission. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission. During test the EMI receiver and spectrum was setup according to *EMI Receiver/Spectrum Analyzer Configuration*.

For the test of 2nd to 10th harmonics frequencies, the equipment setup was also refer to *EMI Receiver/Spectrum Analyzer Configuration*. The frequencies were tested using Peak mode first, if the test data is higher than the emissions limit, an additional measurement using Average mode will be performed and the average reading will be compared to the limit and record in test report.

6.4.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz
Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	3MHz
Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

6.4.4 Test Data (30MHz – 1GHz):**30M – 1GHz Open Field Radiated Emissions (Horizontal) Channel 1, 6, 11**

Operator: Mailes Hsieh

Temperature (C): 21

11:35:52 AM, Saturday, January 29, 2005

Humidity (%): 51

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmpGain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
366.59	12.59	14.83	4.22	0.00	31.64	46.00	-14.36	102.00	333.00
400.54	10.78	15.90	4.44	0.00	31.13	46.00	-14.87	102.00	349.00
432.55	13.41	16.16	4.69	0.00	34.26	46.00	-11.74	102.00	349.00
527.61	8.13	18.22	5.36	0.00	31.71	46.00	-14.29	146.00	157.00
559.62	6.94	18.82	5.60	0.00	31.36	46.00	-14.64	102.00	153.00
623.64	8.94	18.95	6.11	0.00	33.99	46.00	-12.01	102.00	202.00
719.67	5.58	19.43	6.79	0.00	31.80	46.00	-14.20	196.00	252.00
839.95	6.81	20.50	7.73	0.00	35.04	46.00	-10.96	102.00	267.00
866.14	3.59	20.54	7.97	0.00	32.09	46.00	-13.91	196.00	268.00
899.12	2.40	20.40	8.08	0.00	30.88	46.00	-15.12	196.00	301.00

30M – 1GHz Open Field Radiated Emissions (Vertical) Channel 1, 6, 11

Operator: Mailes Hsieh

Temperature (C): 21

11:39:44 AM, Saturday, January 29, 2005

Humidity (%): 51

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmpGain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
366.59	15.62	14.83	4.22	0.00	34.66	46.00	-11.34	102.00	353.00
400.54	13.12	15.90	4.44	0.00	33.47	46.00	-12.53	102.00	353.00
432.55	11.59	16.16	4.69	0.00	32.44	46.00	-13.56	102.00	122.00
466.5	11.35	16.70	4.96	0.00	33.01	46.00	-12.99	102.00	304.00
559.62	10.22	18.82	5.60	0.00	34.64	46.00	-11.36	102.00	24.00
679.9	7.20	19.00	6.49	0.00	32.69	46.00	-13.31	102.00	287.00
833.16	5.18	20.43	7.71	0.00	33.32	46.00	-12.68	102.00	155.00
839.95	8.06	20.50	7.73	0.00	36.29	46.00	-9.71	102.00	155.00
866.14	2.75	20.54	7.97	0.00	31.25	46.00	-14.75	196.00	123.00
899.12	5.54	20.40	8.08	0.00	34.02	46.00	-11.98	102.00	155.00

NOTE:

During the Pre-test, the EUT has been tested for Channel 1, 6, 11 transmit from Main and Aux antenna respectively to get all the critical emission frequencies. In the final test all the critical emission frequencies has been tested and the test data are listed above.

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 30MHz to 1GHz have been tested

International Standards Laboratory

Report Number: 05LR003FC

HC LAB: NVLAP:200234-0; VCCI: R-341, C-354; NEMKO: ELA 113a, 113c; BSMI: SL2-IN-E-0037; SL2-R1-E-0037; CNLA: 1178

LT LAB: NVLAP:200234-0; VCCI: R-1435, C-1440; NEMKO: ELA 113b, 113d; BSMI: SL2-IN-E-0013; CNLA: 0997

6.4.5 Test Data (1GHz – 25 GHz) .

1GHz~ 25 GHz (Horizontal), Channel 1: 2412 MHz

Operator: Mailes Hsieh

RBW: 1MHz
Humidity (%): 40
Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1979.02	45.95 pk	30.82	2.58	35.14	44.21 pk	54.00 av	-9.79	100	44
2021.48	46.55 pk	31.00	2.53	35.18	44.90 pk	54.00 av	-9.10	100	50
2278.72	47.30 pk	30.94	1.75	35.19	44.81 pk	54.00 av	-9.19	101	131
2308.69	51.41 pk	30.94	1.66	35.19	48.82 pk	54.00 av	-5.18	101	140
2336.16	47.55 pk	30.93	1.57	35.19	44.87 pk	54.00 av	-9.13	101	149
5157.34	40.88 pk	35.73	2.55	37.91	41.25 pk	54.00 av	-12.75	100	45

1GHz~ 25 GHz (Vertical), Channel 1: 2412 MHz

Operator: Mailes Hsieh

RBW: 1MHz
Humidity (%): 40
Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1222.28	51.91 pk	25.52	2.20	34.05	45.58 pk	54.00 av	-8.42	102	97
2208.79	50.17 pk	30.96	1.96	35.19	47.90 pk	54.00 av	-6.10	101	109
2233.77	46.88 pk	30.95	1.89	35.19	44.53 pk	54.00 av	-9.47	101	116
2311.19	53.93 pk	30.94	1.65	35.19	51.33 pk	54.00 av	-2.67	101	141
5048.95	42.26 pk	35.64	2.28	37.91	42.27 pk	54.00 av	-11.73	100	14

Note:

- According to ANSI C63.4-2001 8.3.1.2 Notes(1):Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.
- “ * ”: Fundamental Frequency
- “**”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk”: peak mode
- “av”: average mode
- “---“: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal) , Channel 6 : 2437 MHz

Operator: Mailes Hsieh

RBW: 1MHz

Humidity (%): 40

Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1991.51	45.91 pk	30.93	2.59	35.16	44.27 pk	54.00 av	-9.73	100	44
2143.86	46.47 pk	30.97	2.16	35.19	44.42 pk	54.00 av	-9.58	100	88
2231.27	48.26 pk	30.95	1.89	35.19	45.92 pk	54.00 av	-8.08	101	116
2333.67	51.37 pk	30.93	1.58	35.19	48.69 pk	54.00 av	-5.31	101	148
2558.44	47.03 pk	30.92	1.37	35.15	44.18 pk	54.00 av	-9.82	102	218

1GHz~ 25 GHz (Vertical), Channel 6 : 2437 MHz

Operator: Mailes Hsieh

RBW: 1MHz

Humidity (%): 40

Temperature (C): 28

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1984.02	45.73 pk	30.87	2.59	35.15	44.04 pk	54.00 av	-9.96	100	44
2063.94	45.88 pk	30.99	2.40	35.18	44.08 pk	54.00 av	-9.92	100	63
2198.8	47.20 pk	30.96	1.99	35.19	44.96 pk	54.00 av	-9.04	101	105
2231.27	49.94 pk	30.95	1.89	35.19	47.60 pk	54.00 av	-6.40	101	116
2333.67	53.68 pk	30.93	1.58	35.19	51.00 pk	54.00 av	-3.00	101	148

Note:

According to ANSI C63.4-2001 8.3.1.2 Notes(1):Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.

“ * ”: Fundamental Frequency

“**”: Not in the restricted band, Limit level=Fundamental Emission-20dB

“ pk ”: peak mode

“ av ”: average mode

“ --- ”: No meter reading data due to the emission level is smaller than spectrum noise level.

The Spectrum noise level+Correction Factor < Limit - 6 dB

Margin=Corrected Amplitude – Limit

Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.