

TEST REPORT

of

FCC Part 15 Subpart B & C

Product : **Cable Modem**

Model(s): **CBW560; CBW560E**

Applicant: **CastleNet Technology Inc.**

Address: **No.64, Chung-Shan Rd. Tu-Cheng City,
Taipei 236
Taiwan, R. O. C.**

Test Performed by:

International Standards Laboratory

<Lung-Tan LAB>

*Site Registration No.

BSMI: SL2-IN-E-0013; TAF: 0997; IC: IC4164-1 ;

VCCI: R-1435, C-1440, T-299, R-2598, C-2845; NEMKO: ELA 113B

*Address:

No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.

Lung-Tan Hsiang, Tao Yuan County 325, Taiwan

*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-08LR021FC**

Issue Date : **2008/07/30**

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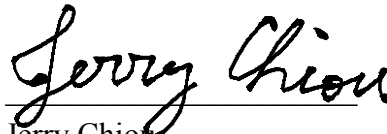


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1. General

1.1 Certification of Accuracy of Test Data

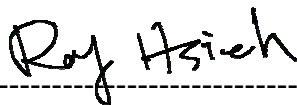
Standards:	CFR 47 Part 15 Subpart B Class B CFR 47 Part 15 Subpart C (Section 15.247)
Test Procedure:	ANSI C63.4:2003
Equipment Tested:	Cable Modem
Model:	CBW560; CBW560E
Applied by:	CastleNet Technology Inc.
Sample received Date:	2008/07/18
Final test Date :	2008/07/24-2008/07/29
Test Result	PASS
Test Site:	Chamber 12, Conduction 03
Temperature	Refer to each site test data
Humidity:	Refer to each site test data
Test Engineer:	


Jerry Chiou

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



Roy Hsieh / Manager

<p>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 76 pages, including 1 cover page, 2 contents page, and 73 pages for the test description.</p>

1.2 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	

2. Description of Equipment Under Test (EUT)

Description: Cable Modem
Condition: Pre-Production
Model: CBW560; CBW560E
Frequency Range of 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:
 WLAN Main antenna: Dipole (P/N: 6602113051-090),
 made by KINSUN.

Antenna Connected: Connected to RF connector on the WLAN module .The
 user is not possible to change the antenna without
 disassembling the EUT.

Antenna peak Gain:
 WLAN Main antenna 2.39dBi(11b,11g)

Power Type of wireless module: 3.3V DC from EUT

The channel and the operation frequency of 802.11b and 802.11g 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		

Power Adaptor:

OEM (Model: AD-121A)
Input: 120VAC~60Hz 18W
Output: 12VDC 1A

Power Cord:

Non-shielded, Detachable (2-pins)

LAN Port:

four

Reset key:

one

Cable in Jack:

one

USB Port:

one

Power In Jack:

one

3. Description of Support Equipment

3.1 Description of Support Equipment

Unit	Model Serial No.	Brand	Power Cord	FCC ID
Notebook PC	Satellite M50	Toshiba	Shielded, Detachable	DoC

3.2 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

- A. Read and write to the disk drives.
- B. Send commands from NB PC to EUT through LAN port.
- C. The RF software makes the transmitter continuously sending RF signals
- D. Repeat the above steps.

	Filename	Issued Date
Continue Tx	CM Test.exe	06/20/2007
Continue Tx	Ping.exe	08/12/2004

3.3 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
DC Power Cord	DC 12V to EUT Power-in Port	1.8M	Non-shielded, Non-detachable	Metal Head
LAN Data Cable	PC to EUT RJ 45 Connector	33 feet	Non-shielded, Detachable	RJ-45, with Plastic Head

4. TEST RESULTS

4.1 Powerline Conducted Emissions [Section 15.207]

4.1.1 EUT Configuration

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 used.

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.

4.1.2 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.

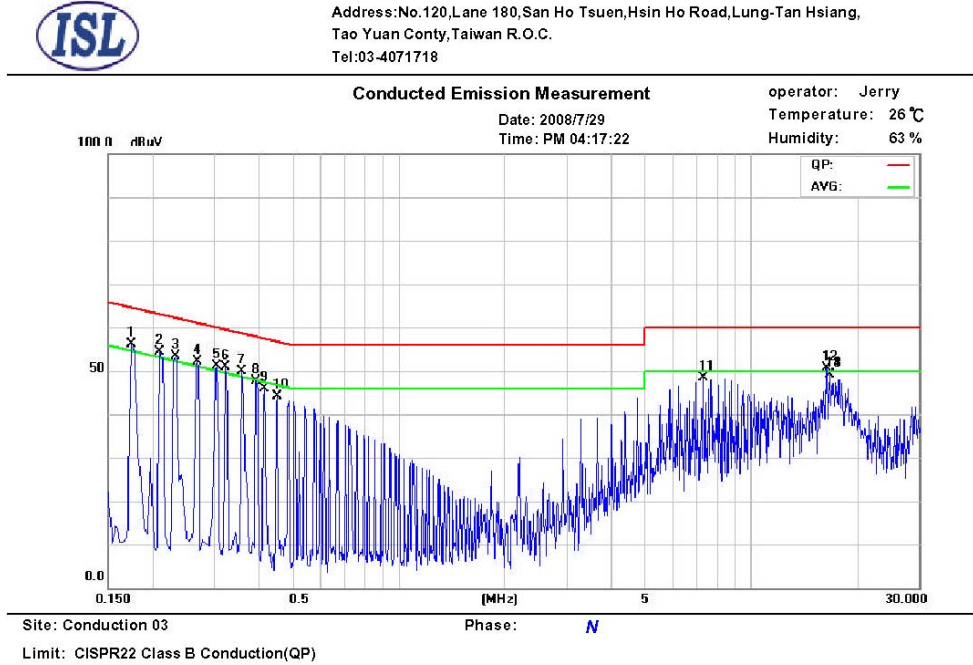
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

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

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

4.1.4 802.11b Test Data:

802.11b Power Line Conducted Emissions (Hot) Lowest, Middle, Highest channel



Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
0.1740	1.26	0.03	49.35	64.7	-15.4	24.33	54.7	-30.4	
0.2100	0.96	0.05	47.67	63.2	-15.5	26.55	53.2	-26.6	
0.2340	0.86	0.06	46.22	62.3	-16.0	27.49	52.3	-24.8	
0.2700	0.72	0.08	48.35	61.1	-12.7	24.55	51.1	-26.5	
0.3060	0.59	0.1	43.27	60.0	-16.8	29.43	50.0	-20.6	
0.3234	0.55	0.1	31.09	59.6	-28.5	27.76	49.6	-21.8	
0.3580	0.48	0.09	36.34	58.7	-22.4	26.98	48.7	-21.7	
0.3940	0.41	0.09	35.91	57.9	-22.0	26.97	47.9	-21.0	
0.4180	0.4	0.08	35.59	57.4	-21.9	28.62	47.4	-18.8	
0.4540	0.39	0.08	35.88	56.8	-20.9	27.61	46.8	-19.1	
7.3380	0.21	0.18	41.15	60.0	-18.8	22.15	50.0	-27.8	
16.4260	0.34	0.31	38.17	60.0	-21.8	26.75	50.0	-23.2	
* 16.7762	0.34	0.31	48.11	60.0	-11.8	37.00	50.0	-13.0	
16.7940	0.34	0.31	36.36	60.0	-23.6	24.09	50.0	-25.9	

*:Maximum data x:Over limit

802.11b Power Line Conducted Emissions (Neutral) Lowest, Middle, Highest channel

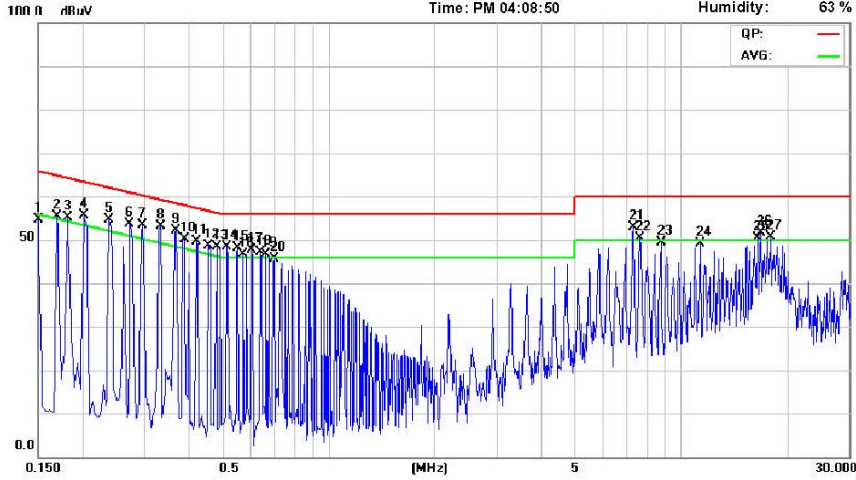


Address: No.120, Lane 180, San Ho Tsuen, Hsin Ho Road, Lung-Tan Hsiang,
Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

Conducted Emission Measurement

Date: 2008/7/29
Time: PM 04:08:50

operator: Jerry
Temperature: 26 °C
Humidity: 63 %



Site: Conduction 03

Phase: L1

Limit: CISPR22 Class B Conduction(QP)

Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
0.1500	1.8	0.02	50.09	66.0	-15.9	32.75	56.0	-23.2	
0.1700	1.56	0.03	48.81	64.9	-16.1	31.14	54.9	-23.8	
0.1820	1.42	0.04	49.52	64.3	-14.8	26.68	54.3	-27.7	
0.2020	1.19	0.05	46.60	63.5	-16.9	24.78	53.5	-28.7	
0.2380	1.01	0.07	48.19	62.1	-13.9	25.19	52.1	-26.9	
0.2740	0.83	0.09	50.36	61.0	-10.6	25.80	51.0	-25.2	
0.2980	0.71	0.1	47.92	60.3	-12.3	26.22	50.3	-24.0	
0.3340	0.63	0.09	47.99	59.3	-11.3	29.13	49.3	-20.2	
0.3700	0.56	0.09	47.86	58.5	-10.6	29.89	48.5	-18.6	
0.3900	0.52	0.09	40.16	58.0	-17.9	30.02	48.0	-18.0	
0.4220	0.48	0.08	39.00	57.4	-18.4	27.70	47.4	-19.7	
0.4580	0.44	0.08	38.06	56.7	-18.6	24.26	46.7	-22.4	
0.4820	0.42	0.07	38.31	56.3	-17.9	23.89	46.3	-22.4	
0.5180	0.4	0.07	36.47	56.0	-19.5	25.58	46.0	-20.4	
0.5540	0.39	0.07	37.16	56.0	-18.8	23.60	46.0	-22.4	

*:Maximum data x:Over limit

Site: Conduction 03

Phase: *L1*

Limit: CISPR22 Class B Conduction(QP)

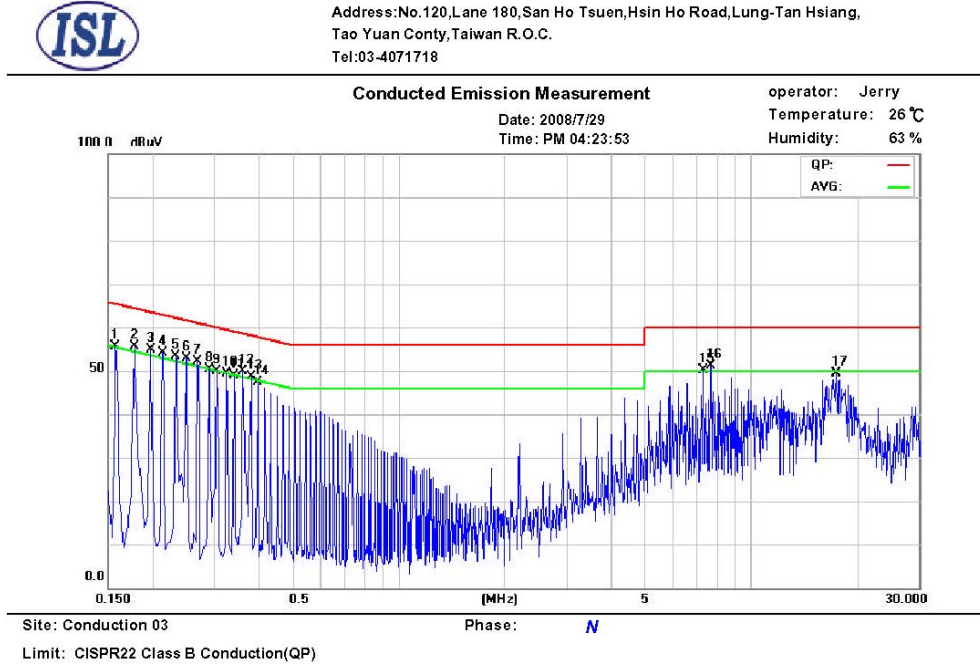
Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
0.5740	0.39	0.07	35.87	56.0	-20.1	22.87	46.0	-23.1	
0.6060	0.38	0.07	38.59	56.0	-17.4	24.22	46.0	-21.7	
0.6420	0.37	0.07	38.85	56.0	-17.1	24.16	46.0	-21.8	
0.6660	0.37	0.07	37.45	56.0	-18.5	29.58	46.0	-16.4	
0.7020	0.36	0.07	36.08	56.0	-19.9	24.00	46.0	-22.0	
7.3533	0.21	0.18	49.83	60.0	-10.1	28.51	50.0	-21.4	
* 7.7115	0.21	0.18	50.03	60.0	-9.97	26.73	50.0	-23.2	
8.7900	0.21	0.2	35.81	60.0	-24.1	23.99	50.0	-26.0	
11.3540	0.26	0.23	35.96	60.0	-24.0	24.26	50.0	-25.7	
16.5060	0.37	0.31	38.09	60.0	-21.9	27.22	50.0	-22.7	
16.8740	0.36	0.31	48.81	60.0	-11.1	24.21	50.0	-25.7	
17.9820	0.34	0.32	24.23	60.0	-35.7	23.77	50.0	-26.2	

*:Maximum data x:Over limit

* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT Channel between Lowest, Middle, Highest 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

4.1.5 802.11g Test Data:

802.11g Power Line Conducted Emissions (Hot) Lowest, Middle, Highest channel



Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
0.1582	1.42	0.02	32.25	65.5	-33.3	21.95	55.5	-33.6	
0.1780	1.22	0.03	47.56	64.5	-17.0	25.62	54.5	-28.9	
0.1980	1.02	0.05	49.18	63.6	-14.5	24.87	53.6	-28.8	
0.2140	0.94	0.05	48.13	63.0	-14.9	28.12	53.0	-24.9	
0.2340	0.86	0.06	43.23	62.3	-19.0	23.14	52.3	-29.1	
0.2500	0.8	0.07	46.41	61.7	-15.3	30.53	51.7	-21.2	
0.2700	0.72	0.08	47.68	61.1	-13.4	26.67	51.1	-24.4	
* 0.2900	0.64	0.09	49.39	60.5	-11.1	27.47	50.5	-23.0	
0.3060	0.59	0.1	39.81	60.0	-20.2	26.43	50.0	-23.6	
0.3260	0.55	0.1	37.09	59.5	-22.4	26.03	49.5	-23.5	
0.3420	0.52	0.09	36.38	59.1	-22.7	27.35	49.1	-21.8	
0.3620	0.48	0.09	38.71	58.6	-19.9	24.34	48.6	-24.3	
0.3820	0.44	0.09	38.87	58.2	-19.3	29.67	48.2	-18.5	
0.3980	0.4	0.09	34.73	57.9	-23.1	24.84	47.9	-23.0	
7.3380	0.21	0.18	39.96	60.0	-20.0	22.80	50.0	-27.2	

*:Maximum data x:Over limit

802.11g Power Line Conducted Emissions (Neutral) Lowest, Middle, Highest channel

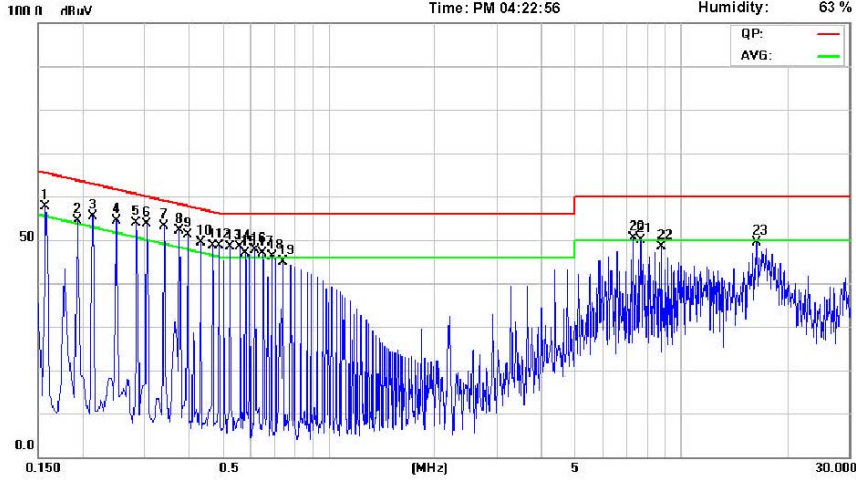


Address: No.120, Lane 180, San Ho Tsuen, Hsin Ho Road, Lung-Tan Hsiang,
Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

Conducted Emission Measurement

Date: 2008/7/29
Time: PM 04:22:56

operator: Jerry
Temperature: 26 °C
Humidity: 63 %



Site: Conduction 03

Phase: L1

Limit: CISPR22 Class B Conduction(QP)

Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
0.1580	1.7	0.02	50.27	65.5	-15.3	25.26	55.5	-30.3	
0.1940	1.27	0.04	48.82	63.8	-15.0	30.72	53.8	-23.1	
0.2140	1.13	0.05	48.02	63.0	-15.0	27.73	53.0	-25.3	
0.2500	0.95	0.07	43.37	61.7	-18.3	24.16	51.7	-27.6	
0.2860	0.77	0.09	48.00	60.6	-12.6	29.33	50.6	-21.3	
0.3060	0.69	0.1	44.36	60.0	-15.7	27.53	50.0	-22.5	
0.3420	0.62	0.09	47.52	59.1	-11.6	28.05	49.1	-21.1	
* 0.3780	0.54	0.09	49.77	58.3	-8.55	27.07	48.3	-21.2	
0.3980	0.5	0.09	42.03	57.9	-15.8	29.24	47.9	-18.6	
0.4340	0.47	0.08	43.82	57.1	-13.3	25.69	47.1	-21.4	
0.4700	0.43	0.07	41.75	56.5	-14.7	24.21	46.5	-22.3	
0.4900	0.41	0.07	47.35	56.1	-8.82	28.72	46.1	-17.4	
0.5260	0.39	0.07	42.90	56.0	-13.1	26.80	46.0	-19.2	
0.5620	0.39	0.07	42.34	56.0	-13.6	29.93	46.0	-16.0	
0.5820	0.38	0.07	40.22	56.0	-15.7	26.86	46.0	-19.1	

*:Maximum data x:Over limit

Site: Conduction 03

Phase: *L1*

Limit: CISPR22 Class B Conduction(QP)

Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
0.6180	0.38	0.07	38.46	56.0	-17.5	23.59	46.0	-22.4	
0.6540	0.37	0.07	39.91	56.0	-16.0	29.88	46.0	-16.1	
0.6900	0.36	0.07	41.54	56.0	-14.4	28.97	46.0	-17.0	
0.7460	0.35	0.07	42.53	56.0	-13.4	27.16	46.0	-18.8	
7.3380	0.21	0.18	37.53	60.0	-22.4	23.86	50.0	-26.1	
7.7020	0.21	0.18	39.83	60.0	-20.1	24.86	50.0	-25.1	
8.8060	0.21	0.2	40.55	60.0	-19.4	23.88	50.0	-26.1	
16.4100	0.37	0.31	43.82	60.0	-16.1	28.80	50.0	-21.2	

*.Maximum data x:Over limit

* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT Channel between Lowest, Middle, Highest 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

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

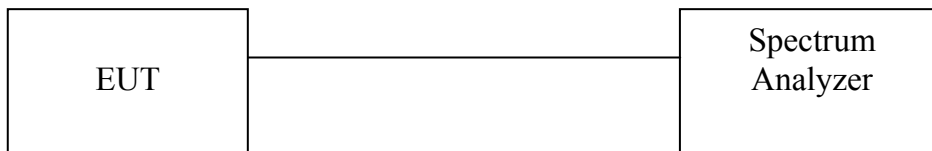
4.2.1 Test Procedure

The test is performed in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, March 23, 2005. The transmitter operates continuously therefore Bandwidth test method is used.

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
SPAN	22MHz

4.2.2 Test Setup



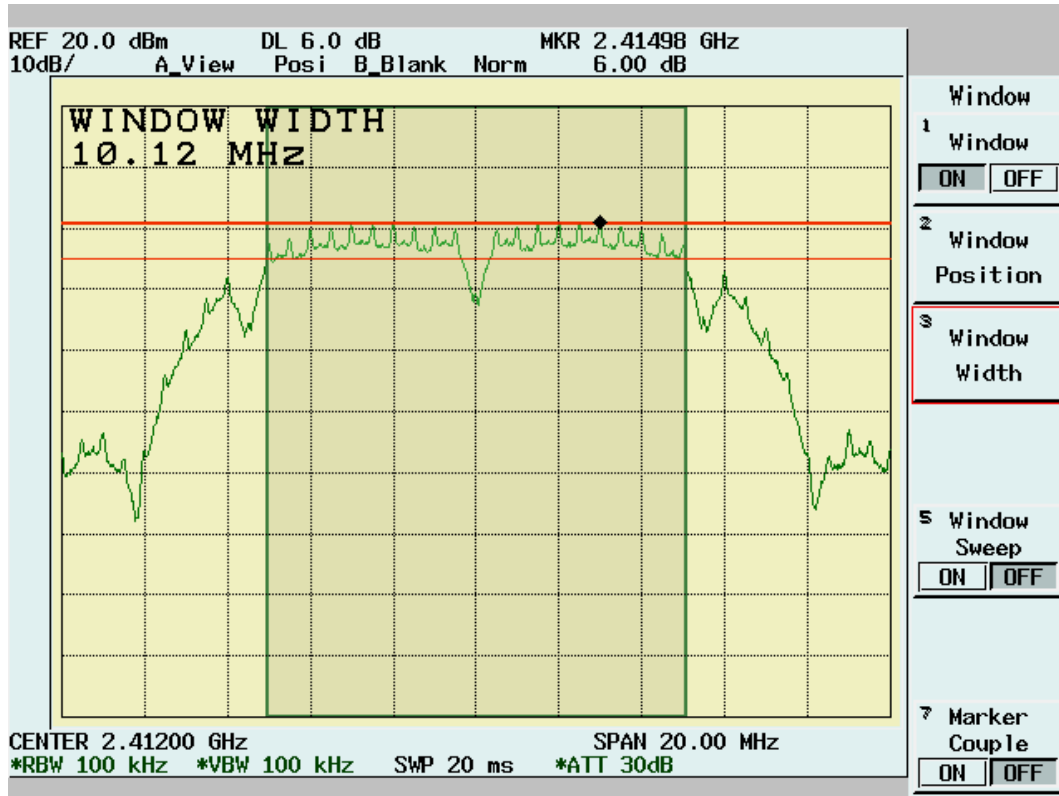
4.2.3 802.11b Test Data:

802.11b 6dB Bandwidth

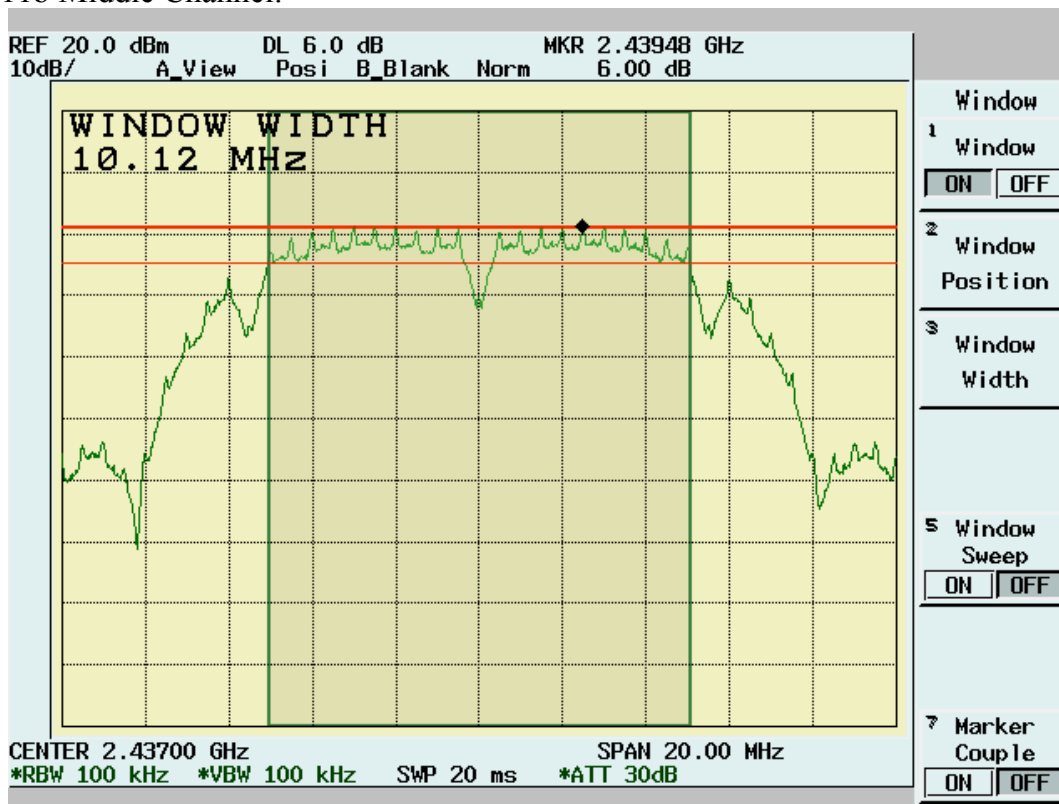
Test Engr: Jerry
Temp. (° C): 27
Humidity (%): 65

Chennel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	10.12	0.5	Pass
6	2437	10.12	0.5	Pass
11	2462	10.12	0.5	Pass

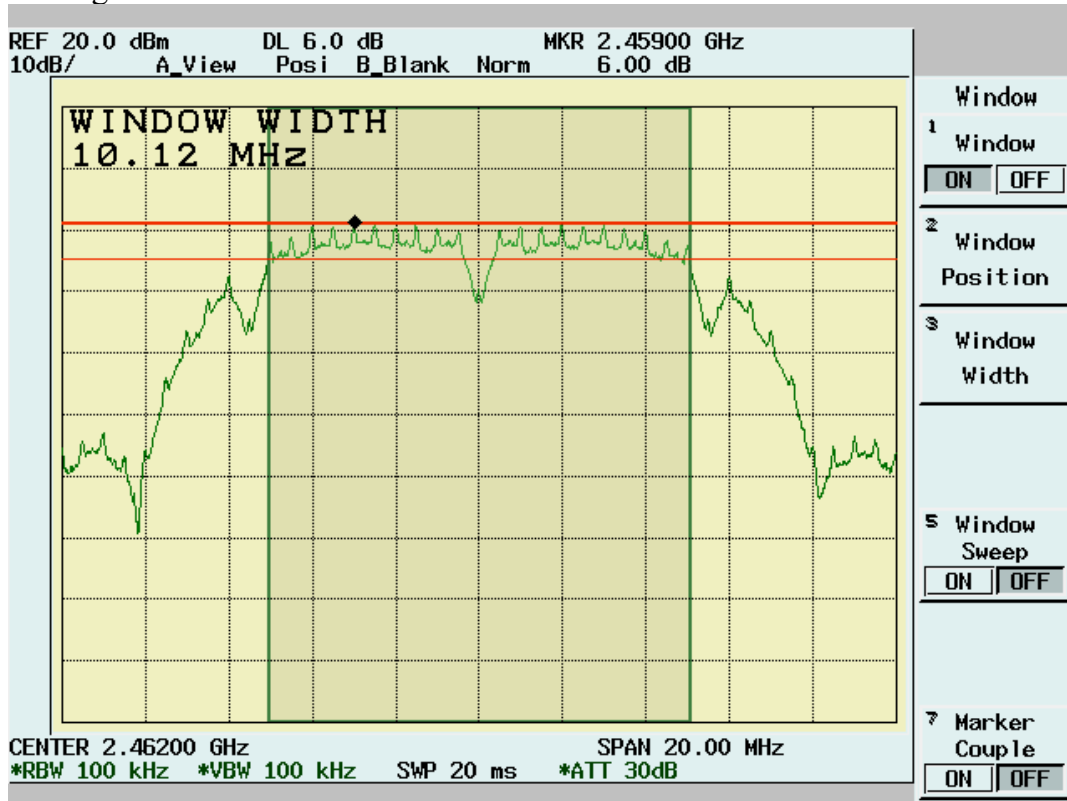
802.11b Lowest Channel:



802.11b Middle Channel:



802.11b Highest Channel:



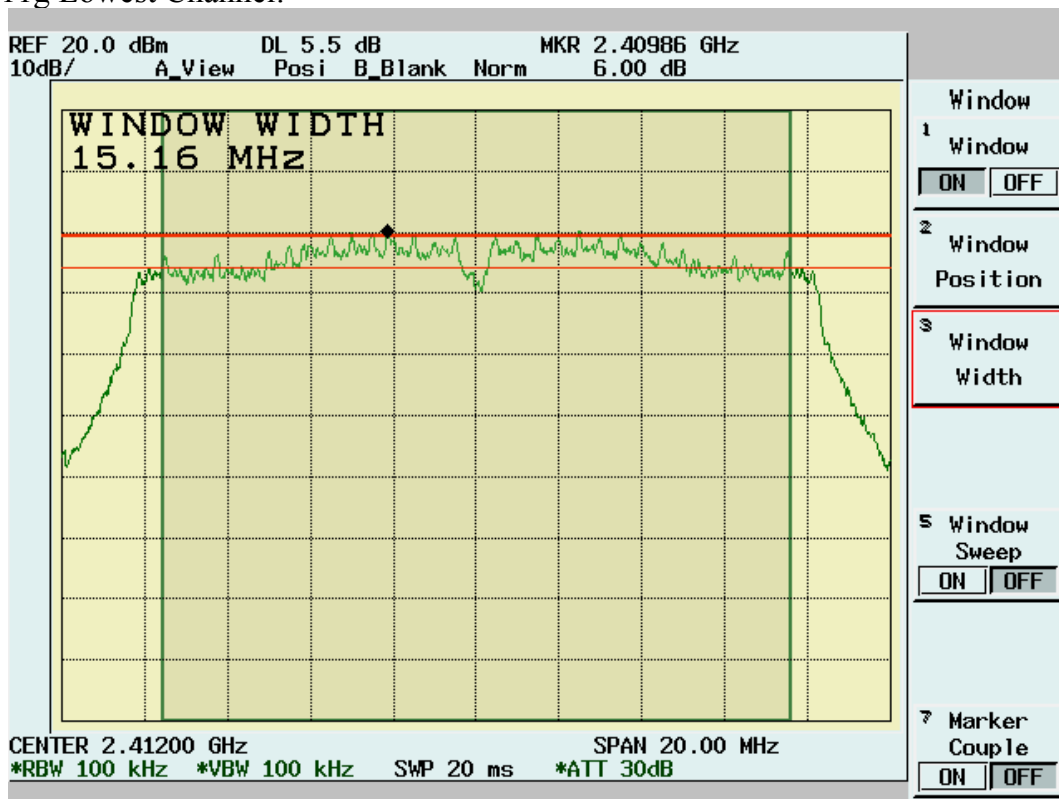
4.2.4 802.11g Test Data:

802.11g 6dB Bandwidth

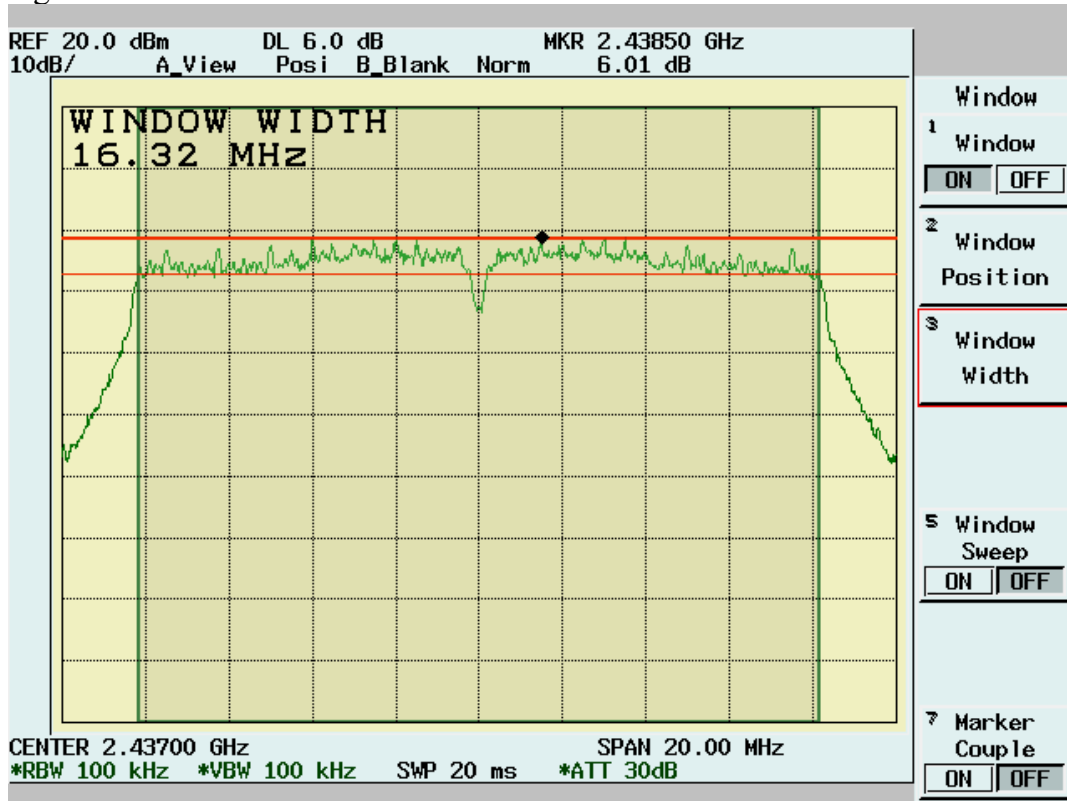
Test Engr: Jerry Temp. (° C): 27
 Humidity (%): 65

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	15.16	0.5	Pass
6	2437	16.32	0.5	Pass
11	2462	15.56	0.5	Pass

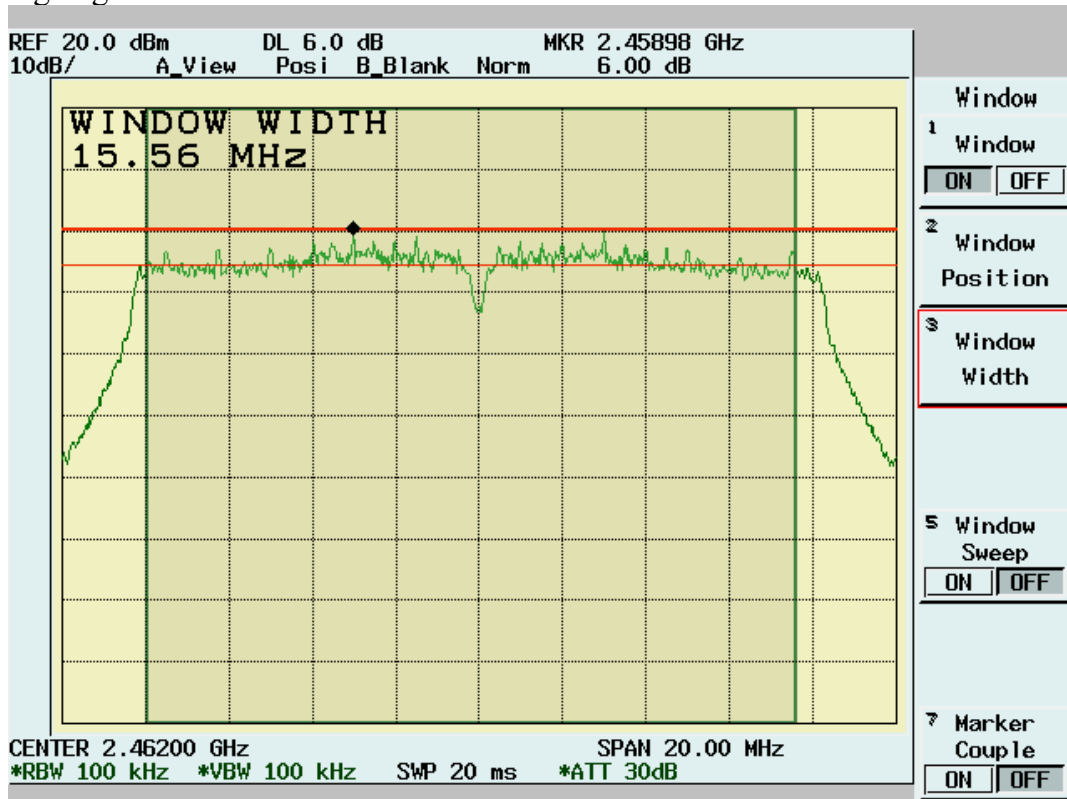
802.11g Lowest Channel:



802.11g Middle Channel:



802.11g Highest Channel:



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

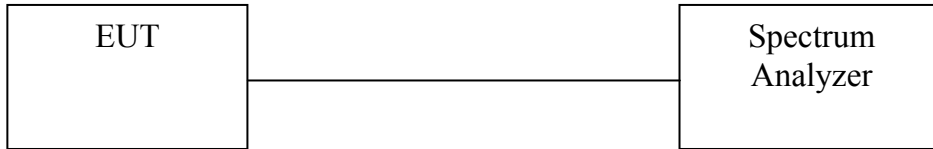
4.3.1 Test Procedure

The Transmitter output of EUT was connected to the spectrum analyzer.

The test is performed in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, March 23, 2005. The transmitter operates continuously therefore Power Output Option 2, Method # 1 is used.

Equipment mode	Spectrum analyzer
Detector function	Channel Power
Channel BW	22MHz
RBW	1MHz
VBW	3MHz
Center frequency	fundamental frequency tested
Sweep time	300ms

4.3.2 Test Setup



4.3.3 802.11b Test Data

802.11b Maximum Peak Output Power

Temp. (° C): 27

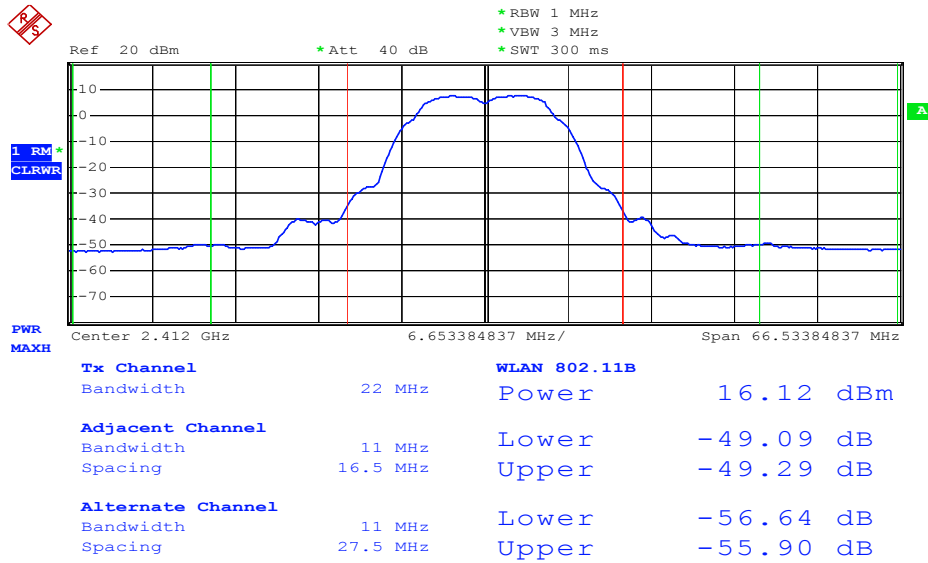
Test Engr: Jerry

Humidity (%): 65

Channel	Frequency (MHz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	16.12	1.1	52.72	17.22	30	Pass
6	2437	16.18	1.1	53.46	17.28	30	Pass
11	2462	16.17	1.1	53.33	17.27	30	Pass

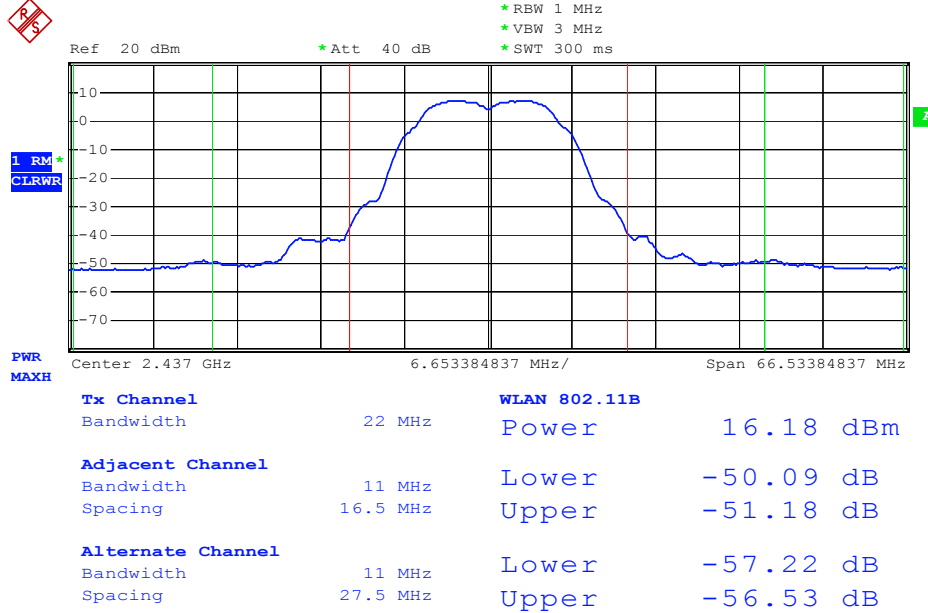
802.11b (dBm)							
Freq.	Bit rate (mbps)						
(MHz)	1	2	5.5	11			
2412	17.22	17.15	16.92	16.77			
2437	17.28	16.97	16.77	16.43			
2462	17.27	17.04	16.76	16.53			

802.11b Lowest Channel:



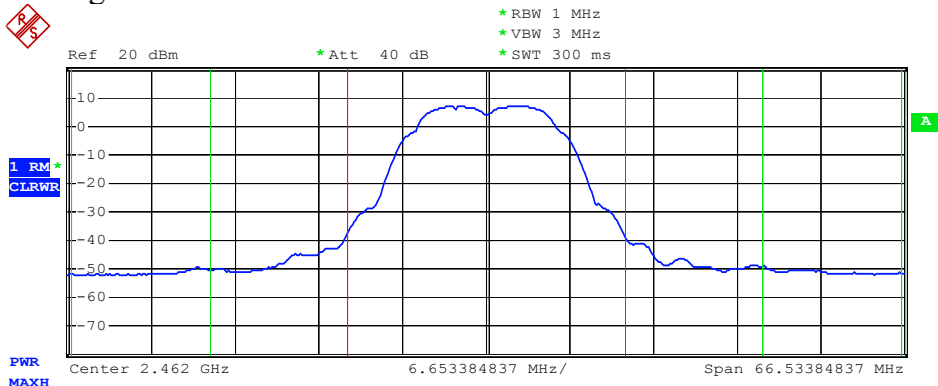
Date: 25.JUL.2008 13:06:41

802.11b Middle Channel:



Date: 25.JUL.2008 15:34:10

802.11b Highest Channel:



Tx Channel		WLAN 802.11B	
Bandwidth	22 MHz	Power	16.17 dBm
Adjacent Channel		Lower	-50.83 dB
Bandwidth	11 MHz	Upper	-51.65 dB
Spacing	16.5 MHz		
Alternate Channel		Lower	-56.99 dB
Bandwidth	11 MHz	Upper	-56.61 dB
Spacing	27.5 MHz		

Date: 25.JUL.2008 15:10:58

4.3.4 802.11g Test Data

802.11g Maximum Peak Output Power

Temp. (° C): 27

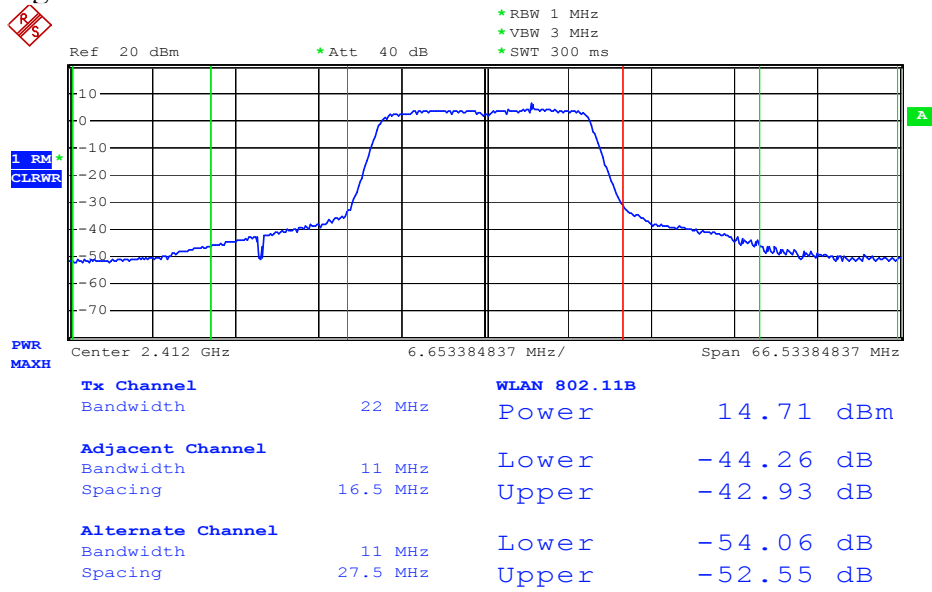
Test Engr: Jerry

Humidity (%): 65

Channel	Frequency (MHz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	14.71	1.1	38.11	15.81	30	Pass
6	2437	14.68	1.1	37.84	15.78	30	Pass
11	2462	14.8	1.1	38.90	15.9	30	Pass

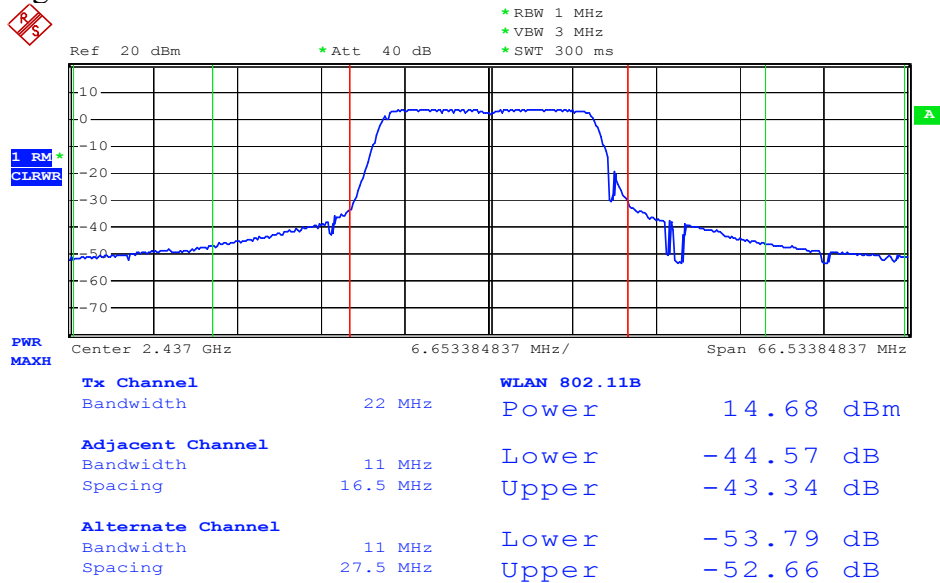
802.11g (dBm)								
Freq.	Bit rate (mbps)							
(MHz)	6	9	12	18	24	36	48	54
2412	15.81	15.76	15.78	15.51	15.05	15.14	14.88	15.09
2437	15.78	15.72	15.5	15.37	14.69	13.69	12.73	13.09
2462	15.9	15.77	15.38	14.98	14.39	13.8	12.73	12.52

802.11g Lowest Channel:



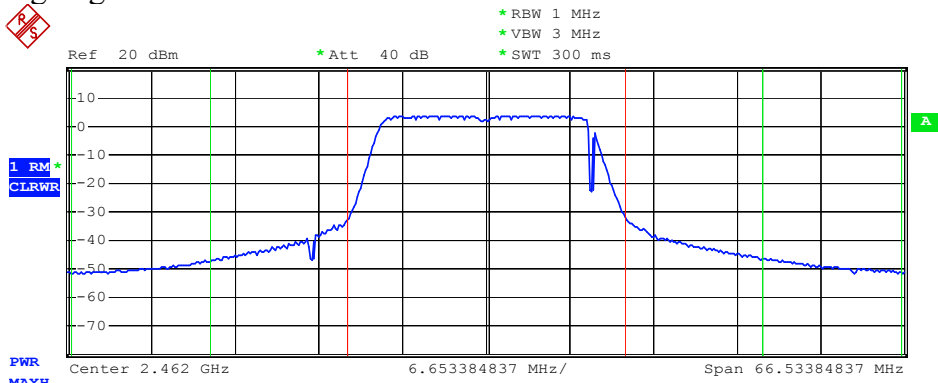
Date: 25.JUL.2008 16:20:48

802.11g Middle Channel:



Date: 25.JUL.2008 16:33:33

802.11g Highest Channel:



Tx Channel		WLAN 802.11B	
Bandwidth	22 MHz	Power	14.80 dBm
Adjacent Channel		Lower	-44.72 dB
Bandwidth	11 MHz	Upper	-43.50 dB
Spacing	16.5 MHz		
Alternate Channel		Lower	-53.75 dB
Bandwidth	11 MHz	Upper	-52.86 dB
Spacing	27.5 MHz		

Date: 25.JUL.2008 16:34:52

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

4.4.1 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.

4.4.2 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.

4.4.3 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)	360KHz

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 / 1KHz

4.4.4 802.11b Test Data (30MHz – 1GHz):

30M – 1GHz Open Field Radiated Emissions (Horizontal) Lowest, Middle, Highest channel



Address: No.120, Lane 180, San Ho Tsuen, Hsin Ho Road
Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

Radiated Emission Measurement
Date: 2008/7/24
Time: PM 05:36:34
Operator: Jerry
Temperature: 26 °C
Humidity: 63 %



Site : Chamber 12

Condition : FCC Class B 3M Radiation

Polarization: *Horizontal*

Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	58.1300	23.99	3.78	1.68	0	29.45	40.00	-10.55	100	13	peak
	132.8200	20.18	8.57	2.33	0	31.08	43.50	-12.42	100	149	peak
	193.9300	24.14	7.04	2.67	0	33.85	43.50	-9.65	156	295	peak
	226.9100	22.66	8.49	2.87	0	34.02	46.00	-11.98	306	104	peak
*	299.6600	24.47	10.84	3.3	0	38.61	46.00	-7.39	100	195	peak
	400.5400	20.48	13.43	3.8	0	37.71	46.00	-8.29	357	101	peak
	583.8700	11.64	16.8	4.54	0	32.98	46.00	-13.02	259	325	peak
	934.0400	9.01	21.18	5.74	0	35.93	46.00	-10.07	100	24	peak

*:Maximum data x:Over limit !:over margin

30M – 1GHz Open Field Radiated Emissions (Vertical) Lowest, Middle, Highest channel

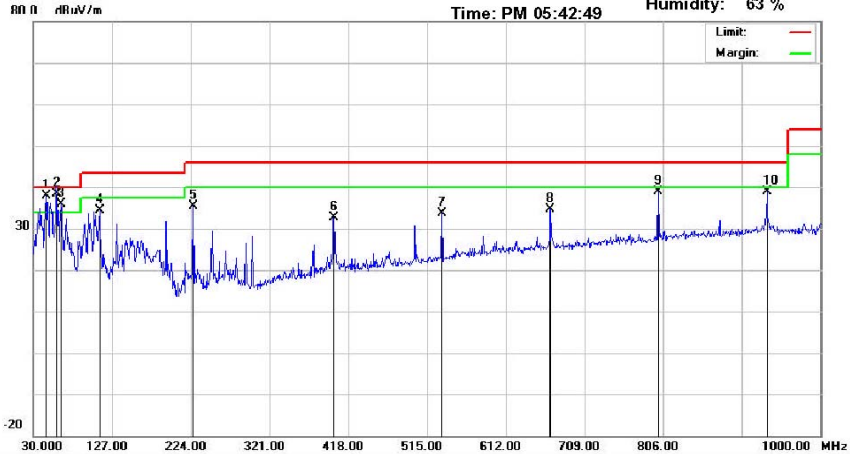


Address: No.120, Lane 180, San Ho Tsuen, Hsin Ho Road
Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

Radiated Emission Measurement

Date: 2008/7/24
Time: PM 05:42:49

Operator: Jerry
Temperature: 26 °C
Humidity: 63 %



Site : Chamber 12

Condition : FCC Class B 3M Radiation

Polarization: Vertical

Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
!	46.4900	26.35	9.88	1.53	0	37.76	40.00	-2.24	348	73	peak
*	58.7200	33.04	3.68	1.69	0	38.41	40.00	-1.59	123	15	QP
!	63.9500	29.80	4.44	1.74	0	35.98	40.00	-4.02	100	36	peak
	111.4800	22.69	9.38	2.2	0	34.27	43.50	-9.23	111	328	peak
	226.9100	24.05	8.49	2.87	0	35.41	46.00	-10.59	105	216	peak
	400.5400	15.52	13.43	3.8	0	32.75	46.00	-13.25	100	101	peak
	533.4300	13.21	16.01	4.33	0	33.55	46.00	-12.45	261	335	peak
	667.2900	11.93	17.9	4.83	0	34.66	46.00	-11.34	357	122	peak
	800.1800	14.17	19.47	5.3	0	38.94	46.00	-7.06	397	170	peak
	934.0400	12.04	21.18	5.74	0	38.96	46.00	-7.04	181	331	peak

*:Maximum data x:Over limit !:over margin

NOTE:

- During the Pre-test, the EUT has been tested for Lowest, Middle, Highest channel 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

1GHz~ 25 GHz (Horizontal), Lowest Channel

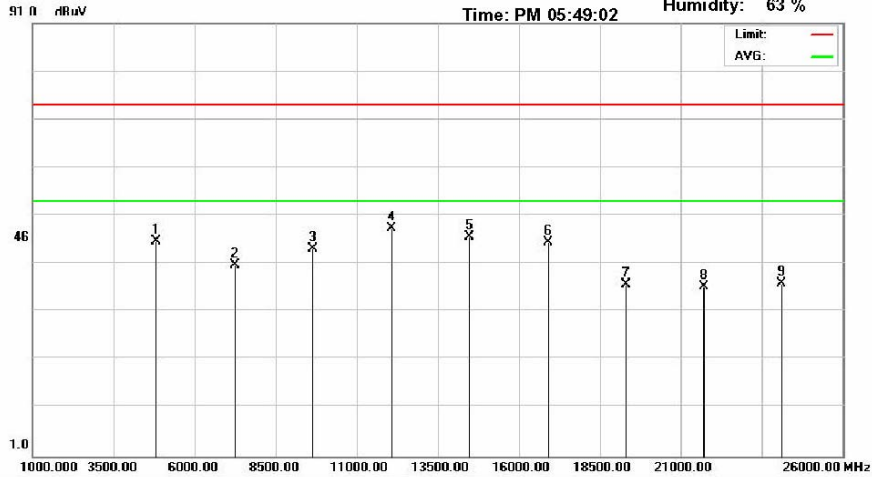


Address: No.120, Lane 130, San Ho Tsuen, Hsin Ho Road
Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

Radiated Emission Measurement

Date: 2008/7/29
Time: PM 05:49:02

Operator: Jerry
Temperature: 26 °C
Humidity: 63 %



Site : Chamber 12

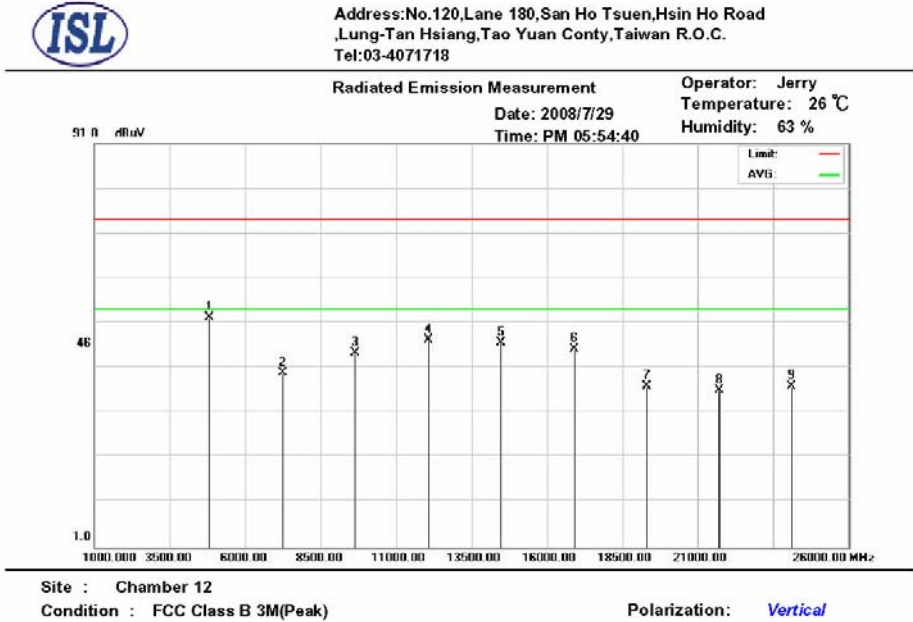
Condition : FCC Class B 3M(Peak)

Polarization: *Horizontal*

Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4824.000	30.12	33.61	8.91	27.01	45.63	74.00	-28.37	156	328	peak
	7236.000	30.01	38.11	3.37	30.86	40.63	74.00	-33.37	100	328	peak
	9646.000	28.34	40.07	4	28.29	44.12	74.00	-29.88	100	263	peak
*	12060.000	33.91	41.74	4.49	31.82	48.32	74.00	-25.68	392	157	peak
	14472.000	29.63	43.62	4.86	31.5	46.61	74.00	-27.39	100	149	peak
	16884.000	28.83	42.23	5.39	31.01	45.44	74.00	-28.56	100	265	peak
	19296.000	28.37	32.42	5.68	29.8	36.67	74.00	-37.33	234	166	peak
	21708.000	24.74	33.1	6.03	27.7	36.17	74.00	-37.83	200	39	peak
	24120.000	25.63	33.35	5.78	27.87	36.89	74.00	-37.11	361	358	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical), Lowest Channel



Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
*	4824.000	36.66	33.61	8.91	27.01	52.17	74.00	-21.83	100	277	peak
	7236.000	29.26	38.11	3.37	30.86	39.88	74.00	-34.12	100	112	peak
	9646.000	28.45	40.07	4	28.29	44.23	74.00	-29.77	122	12	peak
	12060.000	32.76	41.74	4.49	31.82	47.17	74.00	-26.83	390	181	peak
	14472.000	29.65	43.62	4.86	31.5	46.63	74.00	-27.37	100	148	peak
	16884.000	28.59	42.23	5.39	31.01	45.20	74.00	-28.80	147	212	peak
	19296.000	28.56	32.42	5.68	29.8	36.86	74.00	-37.14	302	282	peak
	21708.000	24.57	33.1	6.03	27.7	36.00	74.00	-38.00	319	40	peak
	24120.000	25.54	33.35	5.78	27.87	36.80	74.00	-37.20	334	253	peak

*:Maximum data x:Over limit !:over margin

Note:

- According to the standards used, 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.
- “peak”: peak mode; “avg”: average mode
- 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), Middle Channel



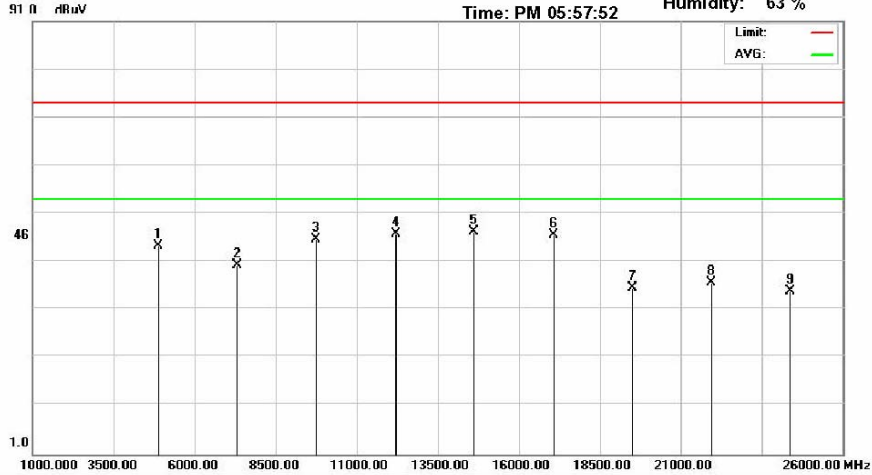
Address: No.120, Lane 180, San Ho Tsuen, Hsin Ho Road
Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

Radiated Emission Measurement

Operator: Jerry
Temperature: 26 °C
Humidity: 63 %

Date: 2008/7/29

Time: PM 05:57:52



Site : Chamber 12

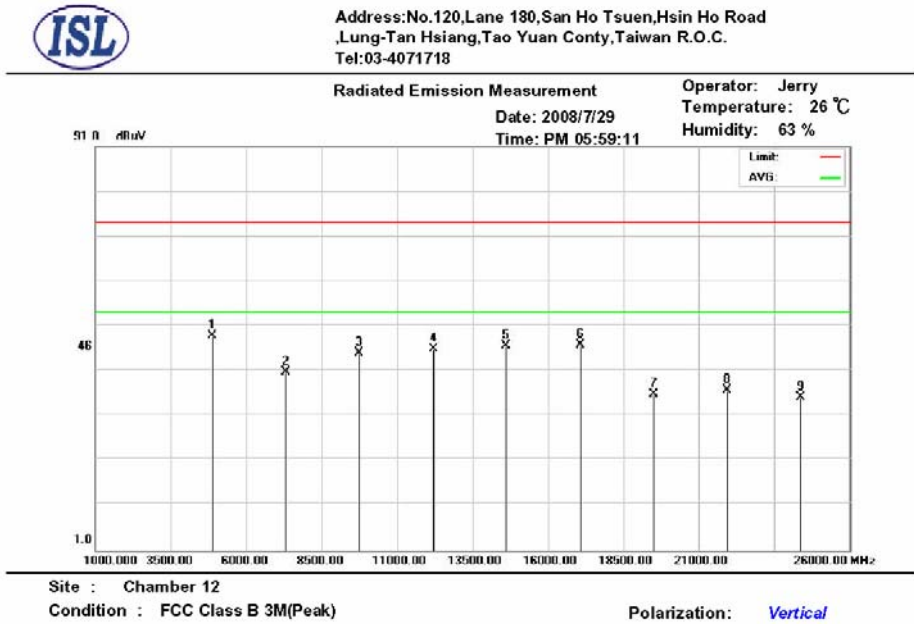
Condition : FCC Class B 3M(Peak)

Polarization: *Horizontal*

Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4874.000	29.07	33.75	8.36	26.93	44.25	74.00	-29.75	294	232	peak
	7311.000	29.41	38.31	3.38	30.79	40.31	74.00	-33.69	100	344	peak
	9748.000	29.84	40.05	4.03	28.35	45.57	74.00	-28.43	124	183	peak
	12185.000	32.22	41.81	4.52	31.87	46.68	74.00	-27.32	380	256	peak
*	14622.000	30.39	43.21	4.87	31.26	47.21	74.00	-26.79	100	188	peak
	17059.000	28.97	43.19	5.43	31.1	46.49	74.00	-27.51	100	253	peak
	19496.000	27.21	32.5	5.71	29.8	35.62	74.00	-38.38	100	359	peak
	21933.000	25.16	33.1	6.07	27.7	36.63	74.00	-37.37	137	286	peak
	24370.000	24.09	33.45	5.56	28.22	34.88	74.00	-39.12	100	204	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical), Middle Channel



Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
*	4874.000	33.70	33.75	8.36	26.93	48.88	74.00	-25.12	135	220	peak
	7311.000	29.87	38.31	3.38	30.79	40.77	74.00	-33.23	100	86	peak
	9748.000	29.34	40.05	4.03	28.35	45.07	74.00	-28.93	161	86	peak
	12185.000	31.43	41.81	4.52	31.87	45.89	74.00	-28.11	337	210	peak
	14622.000	29.65	43.21	4.87	31.26	46.47	74.00	-27.53	322	78	peak
	17059.000	29.26	43.19	5.43	31.1	46.78	74.00	-27.22	100	52	peak
	19496.000	27.39	32.5	5.71	29.8	35.80	74.00	-38.20	281	226	peak
	21933.000	25.12	33.1	6.07	27.7	36.59	74.00	-37.41	216	80	peak
	24370.000	24.34	33.45	5.56	28.22	35.13	74.00	-38.87	279	88	peak

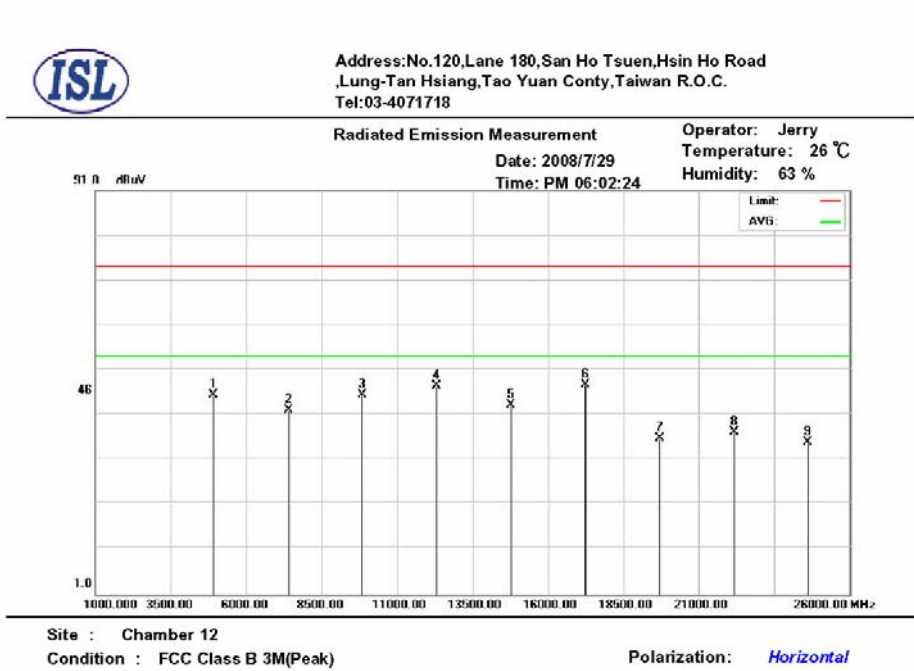
*:Maximum data x:Over limit !:over margin

Note:

- According to the standards used, 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.
- “peak”: peak mode; “avg”: average mode
- 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.

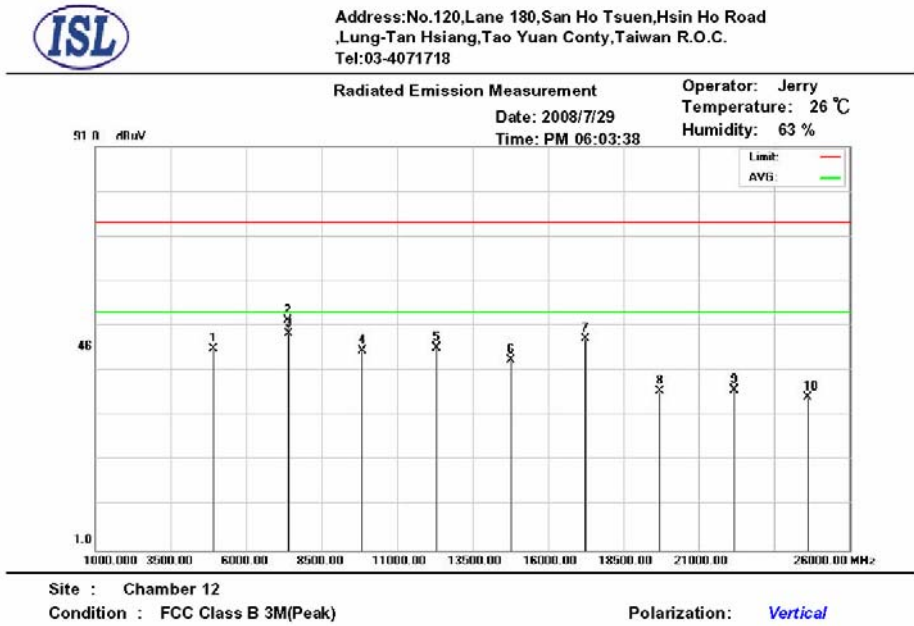
1GHz~ 25 GHz (Horizontal), Highest Channel



Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4924.000	28.68	33.89	9.51	26.74	45.34	74.00	-28.66	192	303	peak
	7386.000	30.96	38.5	3.39	30.71	42.14	74.00	-31.86	283	244	peak
	9848.000	29.75	40.03	4.06	28.41	45.43	74.00	-28.57	367	99	peak
	12310.000	32.97	41.89	4.56	31.92	47.50	74.00	-26.50	136	307	peak
	14772.000	26.60	42.61	4.88	30.96	43.13	74.00	-30.87	170	76	peak
*	17234.000	29.68	43.75	5.44	31.1	47.77	74.00	-26.23	133	330	peak
	19696.000	27.19	32.5	5.74	29.68	35.75	74.00	-38.25	182	307	peak
	22158.000	25.32	33.35	6.11	27.73	37.05	74.00	-36.95	100	70	peak
	24620.000	24.45	33.84	5.43	28.78	34.94	74.00	-39.06	101	142	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical), Highest Channel



Mk.	Frequency (MHz)	RK_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4924.000	29.32	33.89	9.51	26.74	45.98	74.00	-28.02	178	143	peak
	7375.000	40.95	38.47	3.39	30.73	52.08	74.00	-21.92	177	77	peak
*	7388.700	38.17	38.51	3.39	30.71	49.36	54.00	-4.64	277	45	AVG
	9848.000	29.80	40.03	4.06	28.41	45.48	74.00	-28.52	108	98	peak
	12310.000	31.68	41.89	4.56	31.92	46.21	74.00	-27.79	152	209	peak
	14772.000	26.82	42.61	4.88	30.96	43.35	74.00	-30.65	318	197	peak
	17234.000	29.94	43.75	5.44	31.1	48.03	74.00	-25.97	100	9	peak
	19696.000	27.77	32.5	5.74	29.68	36.33	74.00	-37.67	163	76	peak
	22158.000	24.97	33.35	6.11	27.73	36.70	74.00	-37.30	268	282	peak
	24620.000	24.67	33.84	5.43	28.78	35.16	74.00	-38.84	381	184	peak

*:Maximum data x:Over limit !:over margin

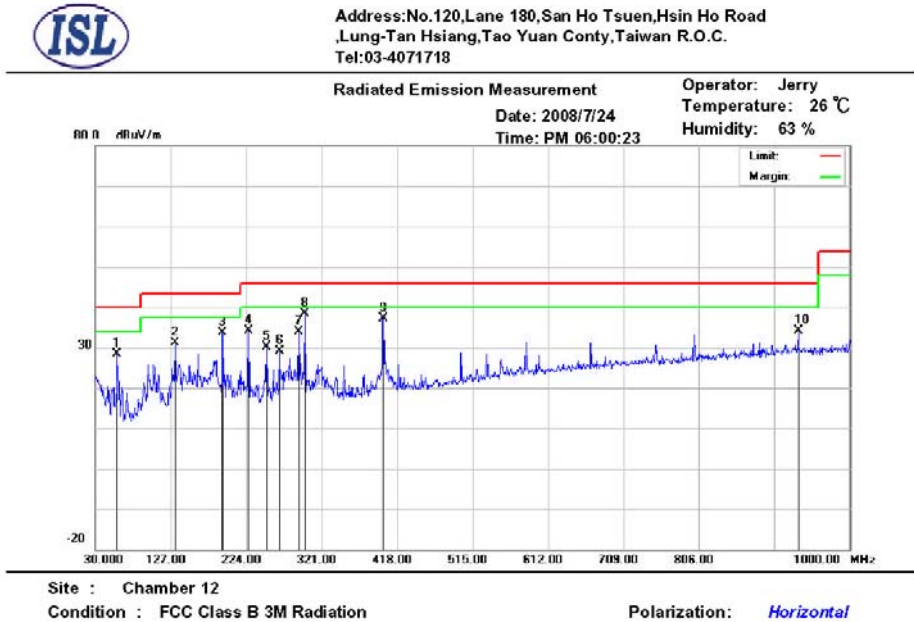
Note:

- According to the standards used, 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.
- “peak”: peak mode; “avg”: average mode
- 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.

4.4.5 802.11g Test Data

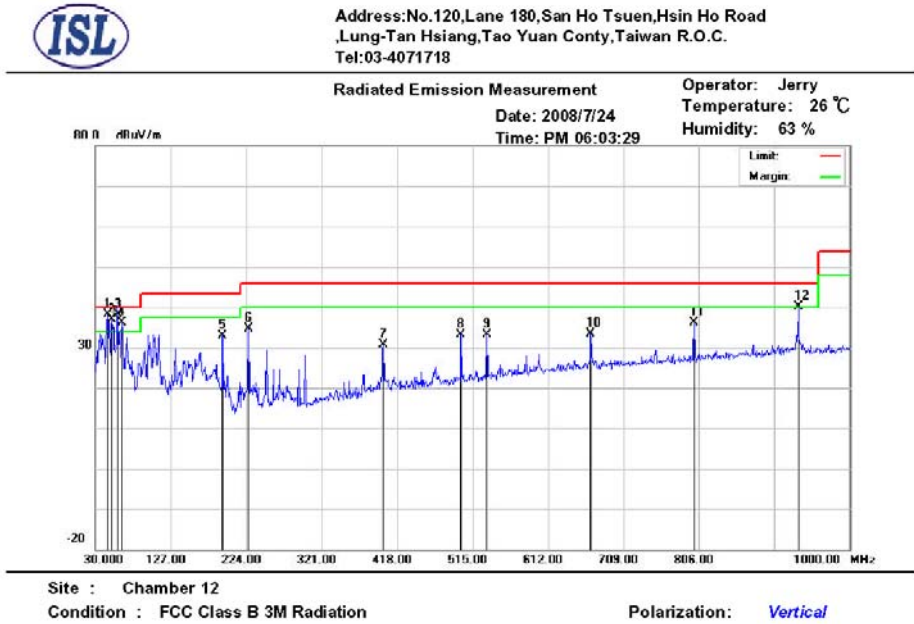
30M – 1GHz Open Field Radiated Emissions (Horizontal) Lowest, Middle, Highest channel



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	58.1300	23.03	3.78	1.68	0	28.49	40.00	-11.51	100	250	peak
	132.8200	20.24	8.57	2.33	0	31.14	43.50	-12.36	364	230	peak
	193.9300	23.80	7.04	2.67	0	33.51	43.50	-9.99	191	14	peak
	226.9100	22.88	8.49	2.87	0	34.24	46.00	-11.76	241	269	peak
	250.1900	17.97	9.23	3	0	30.20	46.00	-15.80	104	157	peak
	266.6800	16.35	9.8	3.1	0	29.25	46.00	-16.75	150	292	peak
	291.9000	20.16	10.6	3.22	0	33.98	46.00	-12.02	172	208	peak
*	299.6600	24.25	10.84	3.3	0	38.39	46.00	-7.61	100	300	peak
	400.5400	20.00	13.43	3.8	0	37.23	46.00	-8.77	118	181	peak
	934.0400	7.20	21.18	5.74	0	34.12	46.00	-11.88	229	43	peak

*:Maximum data x:Over limit !:over margin

30M – 1GHz Open Field Radiated Emissions (Vertical) Lowest, Middle, Highest channel



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
!	46.4900	26.61	9.88	1.53	0	38.02	40.00	-1.98	385	162	peak
!	51.3400	28.47	6.73	1.61	0	36.81	40.00	-3.19	382	151	peak
*	58.7160	32.88	3.68	1.69	0	38.25	40.00	-1.75	126	92	QP
!	63.9500	29.91	4.44	1.74	0	36.09	40.00	-3.91	100	172	peak
	193.9300	23.21	7.04	2.67	0	32.92	43.50	-10.58	273	7	peak
	226.9100	23.20	8.49	2.87	0	34.56	46.00	-11.44	100	319	peak
	400.5400	13.41	13.43	3.8	0	30.64	46.00	-15.36	100	167	peak
	500.4500	13.34	15.47	4.2	0	33.01	46.00	-12.99	292	316	peak
	533.4300	12.89	16.01	4.33	0	33.23	46.00	-12.77	281	214	peak
	667.2900	10.61	17.9	4.83	0	33.34	46.00	-12.66	179	218	peak
	800.1800	11.36	19.47	5.3	0	36.13	46.00	-9.87	240	166	peak
!	934.0400	13.09	21.18	5.74	0	40.01	46.00	-5.99	201	337	peak

*:Maximum data x:Over limit !:over margin

NOTE:

- During the Pre-test, the EUT has been tested for Channel Lowest, Middle, Highest 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

1GHz~ 25 GHz (Horizontal), Lowest Channel

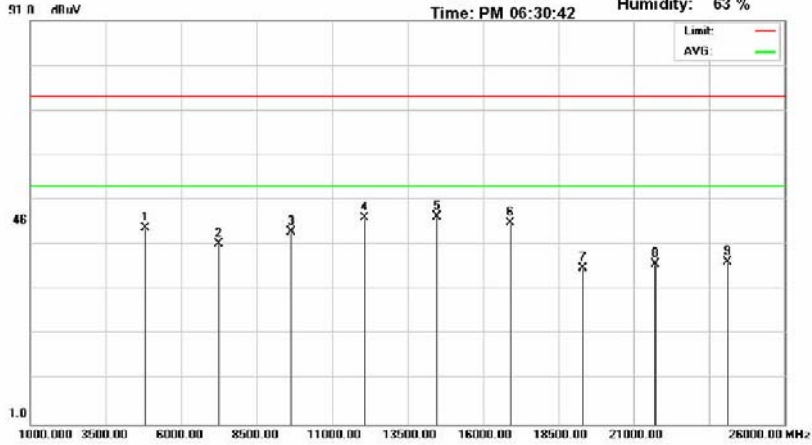


Address: No.120, Lane 180, San Ho Tsuen, Hsin Ho Road
Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

Radiated Emission Measurement

Date: 2008/7/29
Time: PM 06:30:42

Operator: Jerry
Temperature: 26 °C
Humidity: 63 %



Site : Chamber 12

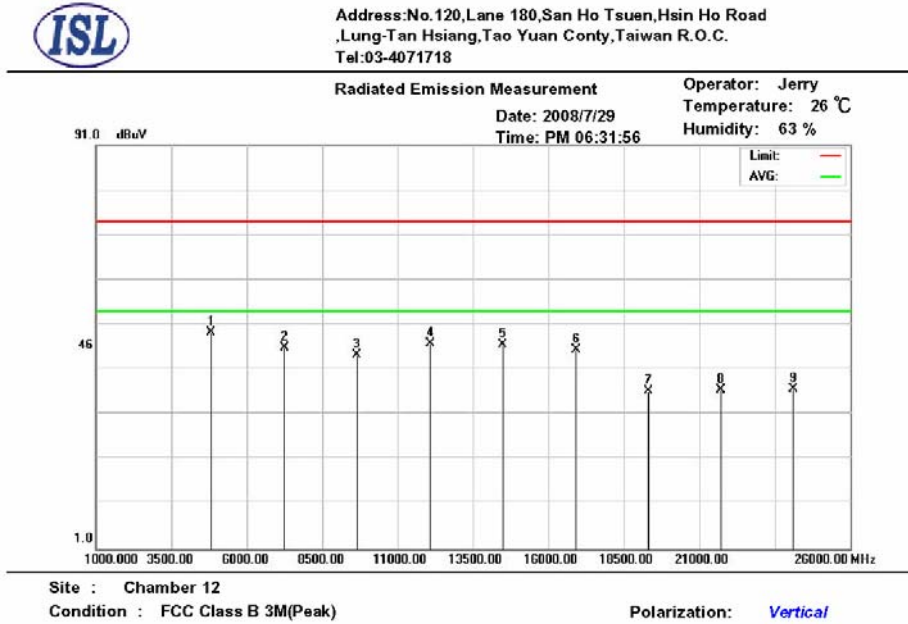
Condition : FCC Class B 3M(Peak)

Polarization: *Horizontal*

Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	Pre_Amp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4824.000	29.18	33.61	8.91	27.01	44.69	74.00	-29.31	100	35	peak
	7236.000	30.54	38.11	3.37	30.86	41.16	74.00	-32.84	370	273	peak
	9646.000	28.10	40.07	4	28.29	43.88	74.00	-30.12	100	252	peak
	12060.000	32.69	41.74	4.49	31.82	47.10	74.00	-26.90	307	133	peak
*	14472.000	30.17	43.62	4.86	31.5	47.15	74.00	-26.85	355	87	peak
	16884.000	29.38	42.23	5.39	31.01	45.99	74.00	-28.01	255	114	peak
	19296.000	27.40	32.42	5.68	29.8	35.70	74.00	-38.30	100	245	peak
	21708.000	25.34	33.1	6.03	27.7	36.77	74.00	-37.23	162	172	peak
	24120.000	25.92	33.35	5.78	27.87	37.18	74.00	-36.82	362	45	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical), Lowest Channel



Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
*	4824.000	33.72	33.61	8.91	27.01	49.23	74.00	-24.77	352	96	peak
	7236.000	35.25	38.11	3.37	30.86	45.87	74.00	-28.13	346	160	peak
	9646.000	28.45	40.07	4	28.29	44.23	74.00	-29.77	100	46	peak
	12060.000	32.42	41.74	4.49	31.82	46.83	74.00	-27.17	349	200	peak
	14472.000	29.60	43.62	4.86	31.5	46.58	74.00	-27.42	100	351	peak
	16884.000	28.91	42.23	5.39	31.01	45.52	74.00	-28.48	100	17	peak
	19296.000	27.91	32.42	5.68	29.8	36.21	74.00	-37.79	146	60	peak
	21708.000	25.12	33.1	6.03	27.7	36.55	74.00	-37.45	100	334	peak
	24120.000	25.40	33.35	5.78	27.87	36.66	74.00	-37.34	100	249	peak

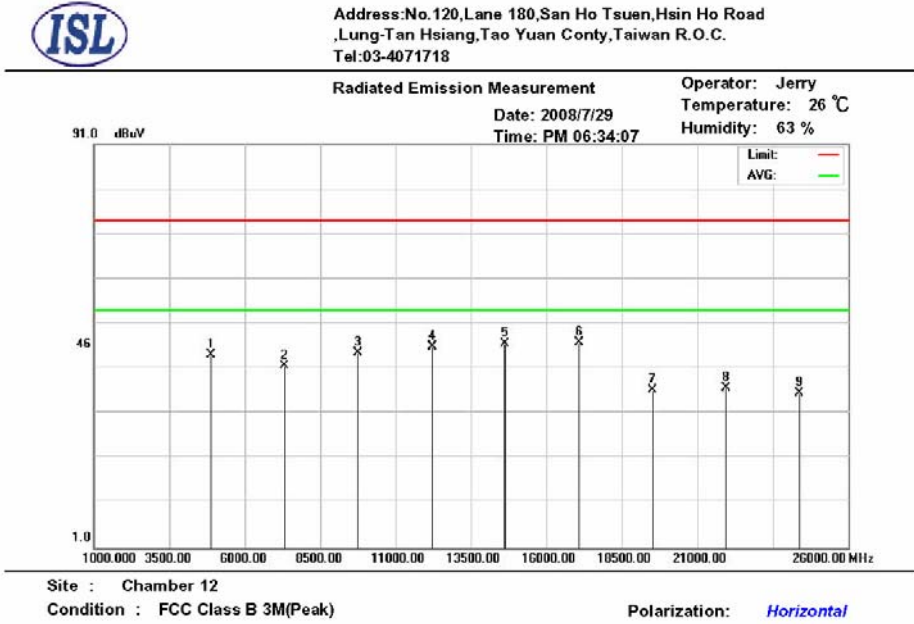
*:Maximum data x:Over limit !:over margin

Note:

- According to the standards used, 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.
- “ peak”: peak mode; “avg”: average mode
- 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.

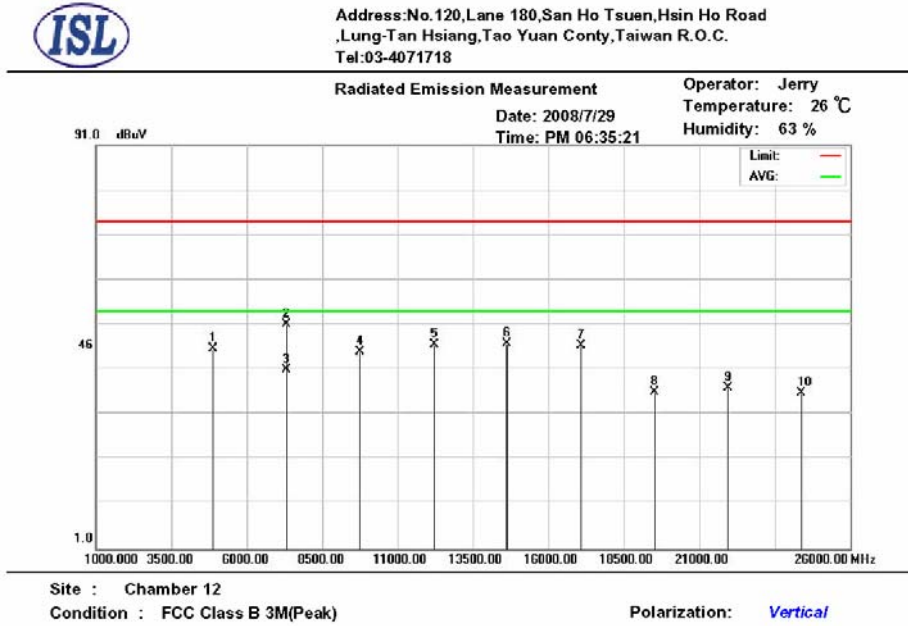
1GHz~ 25 GHz (Horizontal) , Middle Channel



Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4874.000	28.83	33.75	8.36	26.93	44.01	74.00	-29.99	100	351	peak
	7311.000	30.77	38.31	3.38	30.79	41.67	74.00	-32.33	373	153	peak
	9748.000	28.91	40.05	4.03	28.35	44.64	74.00	-29.36	298	54	peak
	12185.000	31.48	41.81	4.52	31.87	45.94	74.00	-28.06	123	24	peak
	14622.000	29.79	43.21	4.87	31.26	46.61	74.00	-27.39	166	175	peak
*	17059.000	29.25	43.19	5.43	31.1	46.77	74.00	-27.23	318	150	peak
	19496.000	27.76	32.5	5.71	29.8	36.17	74.00	-37.83	145	139	peak
	21933.000	25.27	33.1	6.07	27.7	36.74	74.00	-37.26	174	312	peak
	24370.000	24.83	33.45	5.56	28.22	35.62	74.00	-38.38	100	123	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical), Middle Channel



Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4874.000	30.56	33.75	8.36	26.93	45.74	74.00	-28.26	391	208	peak
	7311.000	40.06	38.31	3.38	30.79	50.96	74.00	-23.04	100	287	peak
*	7313.600	30.03	38.32	3.38	30.79	40.94	54.00	-13.06	227	25	AVG
	9748.000	29.24	40.05	4.03	28.35	44.97	74.00	-29.03	289	255	peak
	12185.000	32.19	41.81	4.52	31.87	46.65	74.00	-27.35	370	18	peak
	14622.000	29.95	43.21	4.87	31.26	46.77	74.00	-27.23	241	294	peak
	17059.000	28.83	43.19	5.43	31.1	46.35	74.00	-27.65	193	108	peak
	19496.000	27.55	32.5	5.71	29.8	35.96	74.00	-38.04	100	86	peak
	21933.000	25.38	33.1	6.07	27.7	36.85	74.00	-37.15	396	336	peak
	24370.000	24.89	33.45	5.56	28.22	35.68	74.00	-38.32	100	275	peak

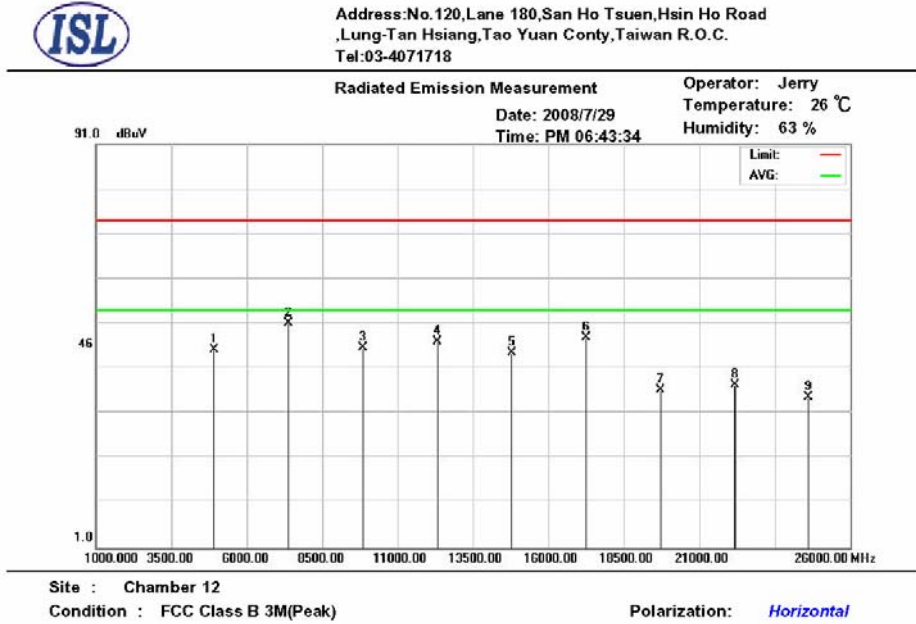
*:Maximum data x:Over limit !:over margin

Note:

- According to the standards used, 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.
- “peak”: peak mode; “avg”: average mode
- 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.

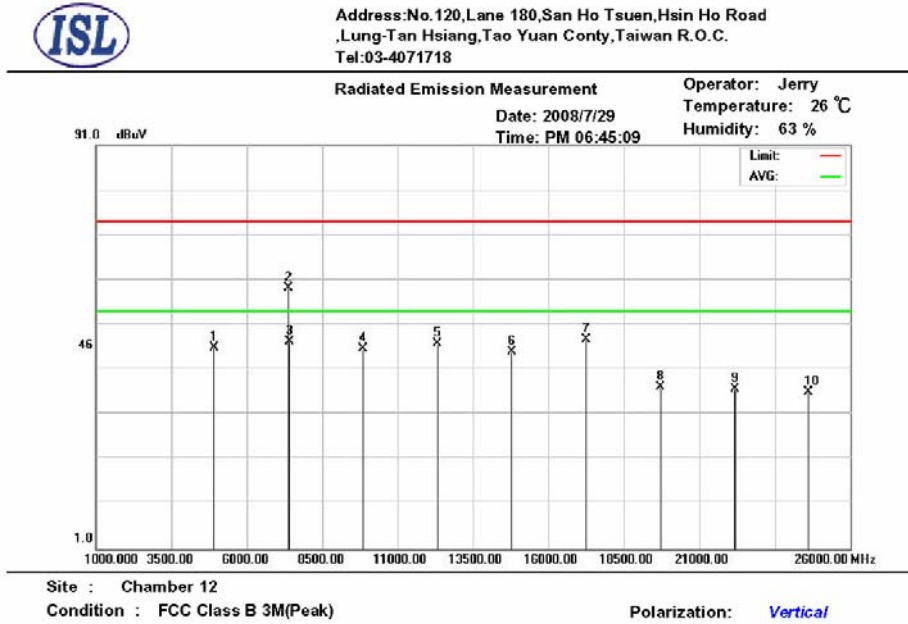
1GHz~ 25 GHz (Horizontal), Highest Channel



Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4924.000	28.57	33.89	9.51	26.74	45.23	74.00	-28.77	328	72	peak
*	7375.000	39.90	38.47	3.39	30.73	51.03	74.00	-22.97	185	293	peak
	9848.000	29.94	40.03	4.06	28.41	45.62	74.00	-28.38	255	309	peak
	12310.000	32.39	41.89	4.56	31.92	46.92	74.00	-27.08	100	343	peak
	14772.000	28.06	42.61	4.88	30.96	44.59	74.00	-29.41	399	134	peak
	17234.000	29.83	43.75	5.44	31.1	47.92	74.00	-26.08	142	244	peak
	19696.000	27.67	32.5	5.74	29.68	36.23	74.00	-37.77	100	173	peak
	22158.000	25.62	33.35	6.11	27.73	37.35	74.00	-36.65	356	195	peak
	24620.000	24.23	33.84	5.43	28.78	34.72	74.00	-39.28	100	314	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical), Highest Channel



Mk.	Frequency (MHz)	RX_R (dBuV)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	4924.000	29.24	33.89	9.51	26.74	45.90	74.00	-28.10	266	98	peak
	7375.000	47.99	38.47	3.39	30.73	59.12	74.00	-14.88	169	181	peak
*	7389.000	35.94	38.51	3.39	30.71	47.13	54.00	-6.87	358	67	AVG
	9848.000	30.02	40.03	4.06	28.41	45.70	74.00	-28.30	255	54	peak
	12310.000	32.27	41.89	4.56	31.92	46.80	74.00	-27.20	196	327	peak
	14772.000	28.50	42.61	4.88	30.96	45.03	74.00	-28.97	344	190	peak
	17234.000	29.69	43.75	5.44	31.1	47.78	74.00	-26.22	388	161	peak
	19696.000	28.66	32.5	5.74	29.68	37.22	74.00	-36.78	100	358	peak
	22158.000	24.91	33.35	6.11	27.73	36.64	74.00	-37.36	331	258	peak
	24620.000	25.47	33.84	5.43	28.78	35.96	74.00	-38.04	100	312	peak

*:Maximum data x:Over limit !:over margin

Note:

- According to the standards used, 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.
- “peak”: peak mode; “avg”: average mode
- 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.

4.5 Band Edge Measurement

4.5.1 Test Procedure

Conducted

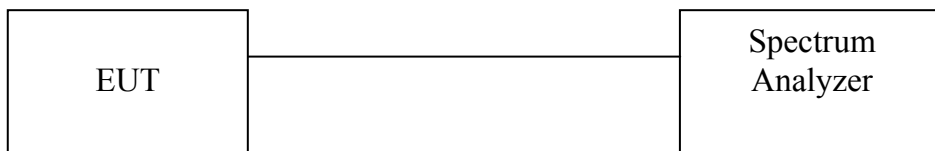
1. The transmitter output of EUT was connected to the spectrum analyzer.
Equipment mode: Spectrum analyzer
Detector function: Peak mode
SPAN: 60MHz
RBW: 100KHz
VBW: 100KHz
Center frequency: 2.4GHz, 2.4835GHz.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed
3. Find the next peak frequency outside the operation frequency band

Radiated

1. Antenna and Turntable test procedure same as Radiated Emission Measurement.
Equipment mode: Spectrum analyzer
Detector function: Peak mode
SPAN: 60MHz
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

4.5.2 Test Setup

Conducted



Radiated

Same as *Radiated Emission Measurement*

4.5.3 802.11b Test Data:

Table: Band Edge measurement

Conducted Test

Temp. (° C): 27
Humidity (%): 65
Test Engr: Jerry

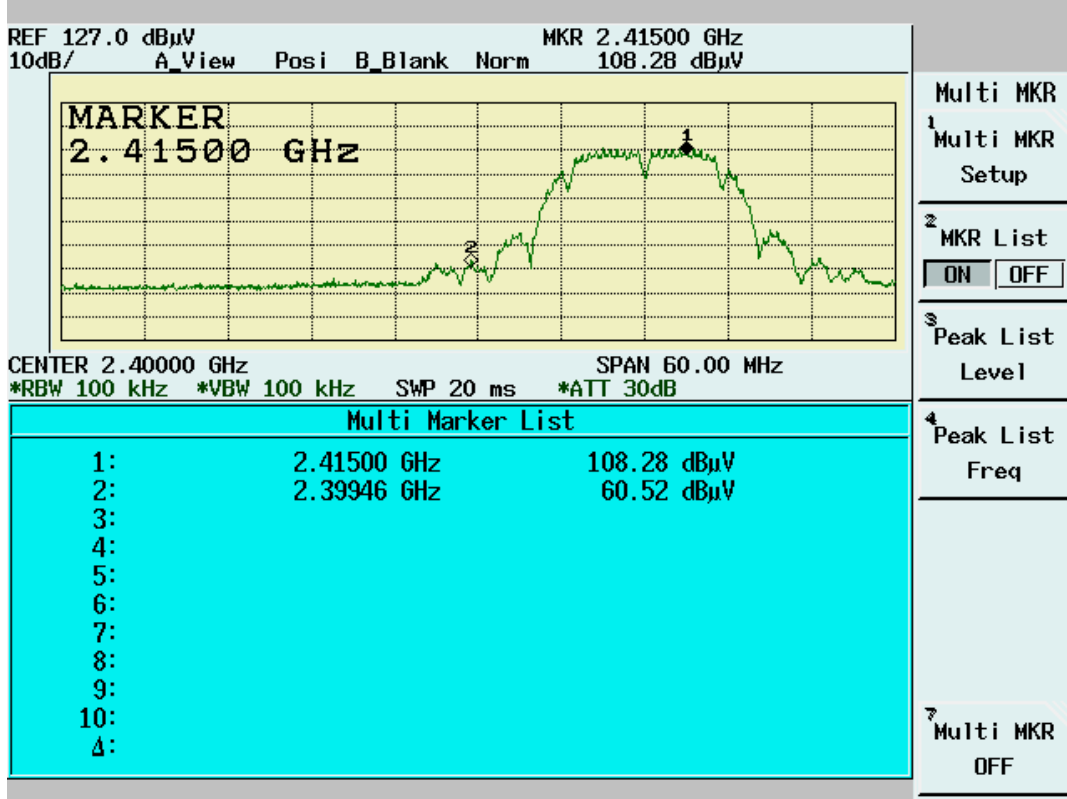
Channel	Frequency	Spectrum Reading	Carrier - Outsideband Limit: >30dB	Pass/Fail
	(MHz)	(dBuV)	(dB)	
1	2415	108.28	---	---
Outside band	2399.46	60.52	47.76	Pass
11	2459.02	107.45	---	---
Outside band	2483.5	53.66	53.79	Pass

Radiated Test

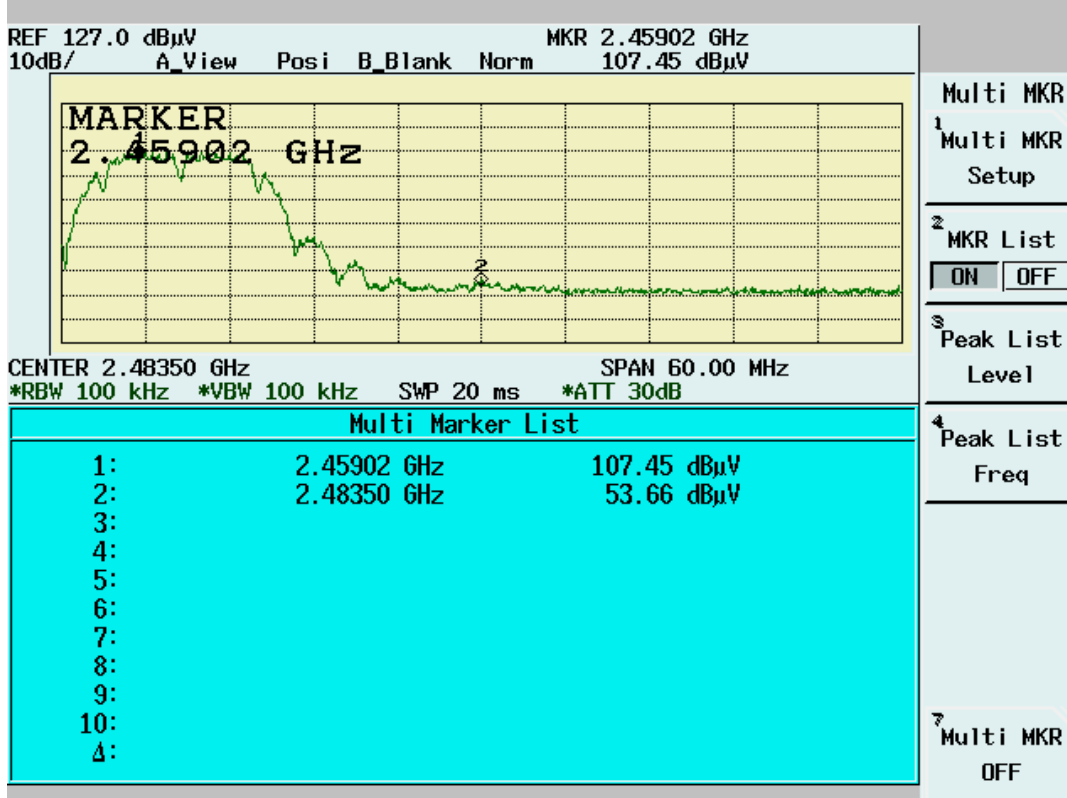
Temp. (° C): 27
Humidity (%): 60
Test Engr: Jerry

Channel	Frequency	Spectrum Reading	Carrier - Outsideband Limit: >30dB	Pass/Fail
	(MHz)	(dBuV)	(dB)	
1	2409.42	72.13	---	---
Outside band	2397.96	26.03	46.1	Pass
11	2464.54	72.16	---	---
Outside band	2483.68	15.43	56.73	Pass

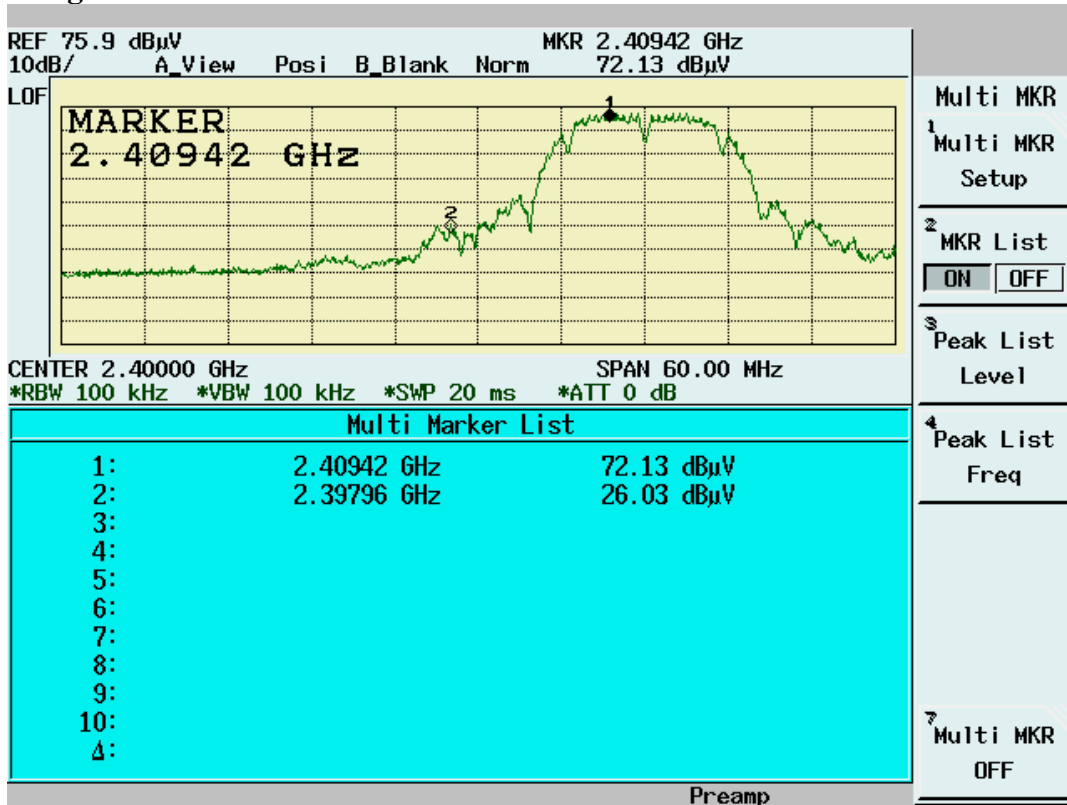
Band Edge Conducted Measurement



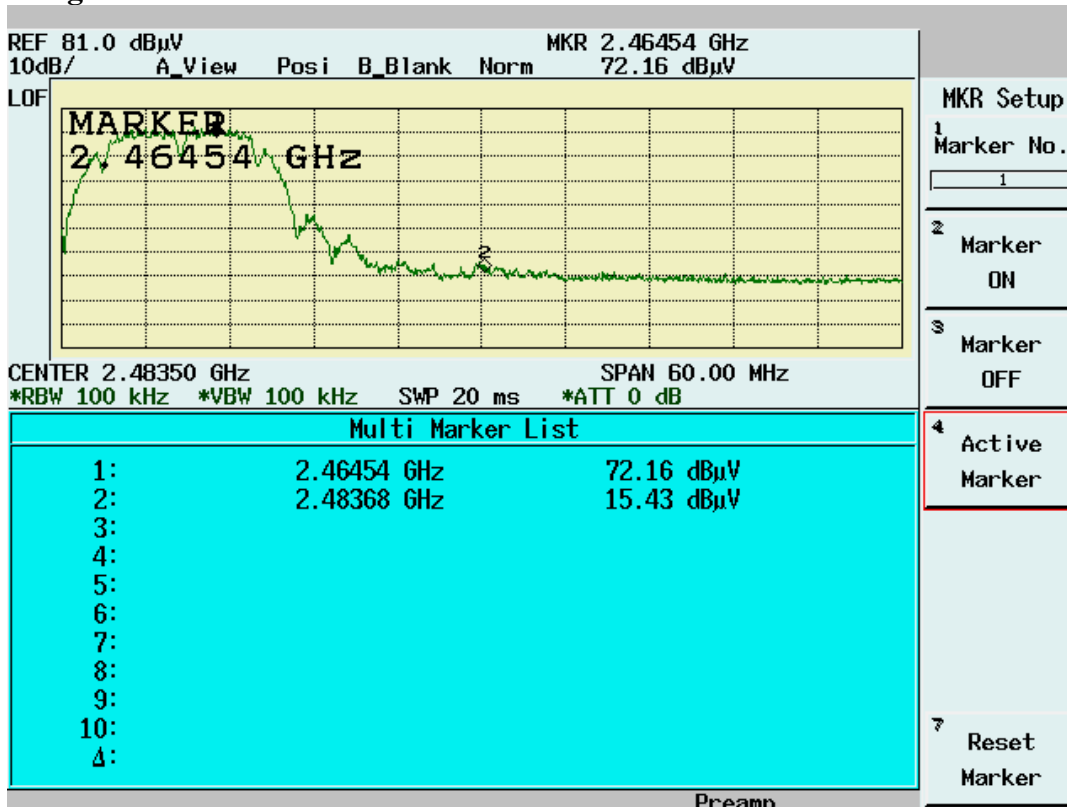
Band Edge Conducted Measurement



Band Edge Radiated Measurement



Band Edge Radiated Measurement



4.5.4 802.11g Test Data:

Table: Band Edge measurement

Conducted Test

Temp. (° C): 27
 Humidity (%): 65
 Test Engr: Jerry

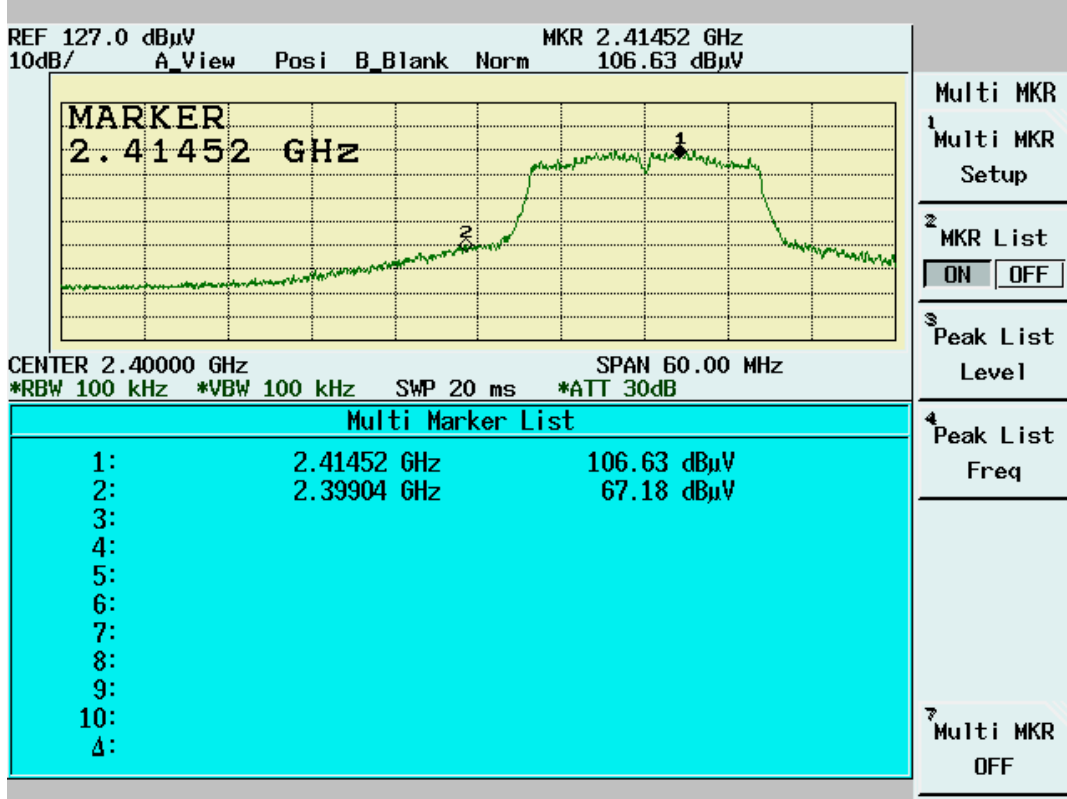
Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >30dB (dB)	Pass/Fail
1	2414.52	106.63	---	---
Outside band	2399.04	67.18	39.45	Pass
11	2461	106.48	---	---
Outside band	2484.16	59.02	47.46	Pass

Radiated Test

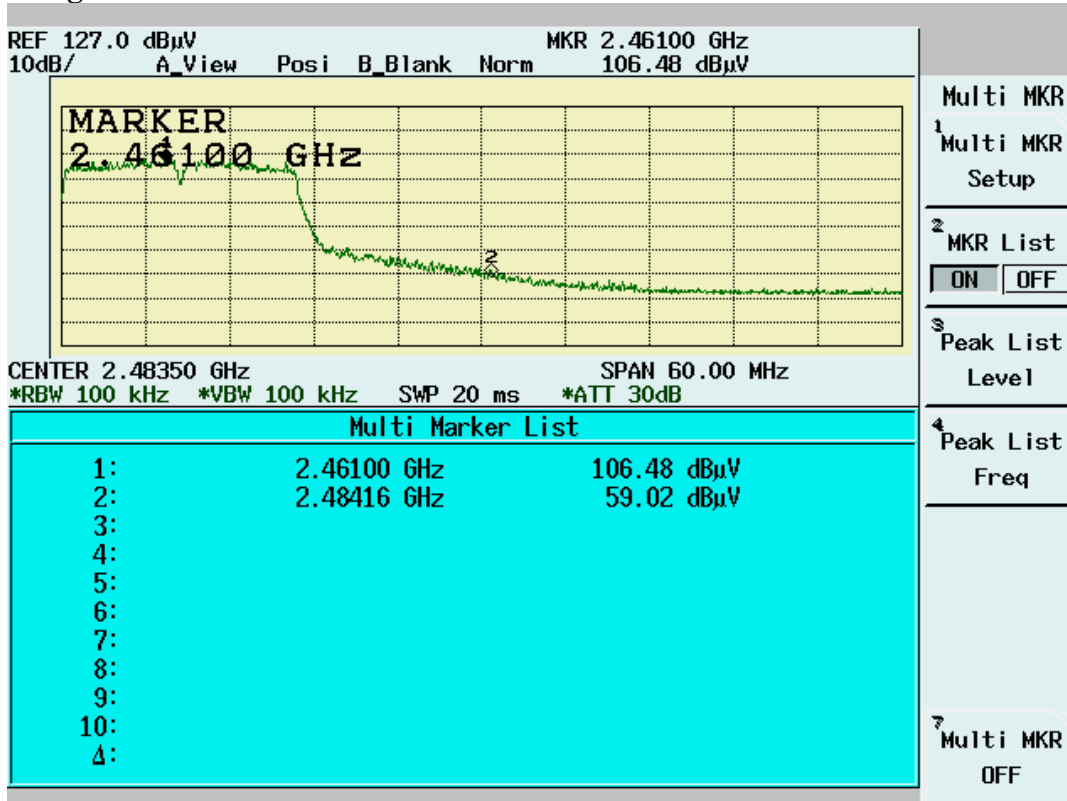
Temp. (° C): 27
 Humidity (%): 60
 Test Engr: Jerry

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >30dB (dB)	Pass/Fail
1	2408.46	70.82	---	---
Outside band	2399.04	34.5	36.32	Pass
11	2464.06	71.83	---	---
Outside band	2484.16	25.47	46.36	Pass

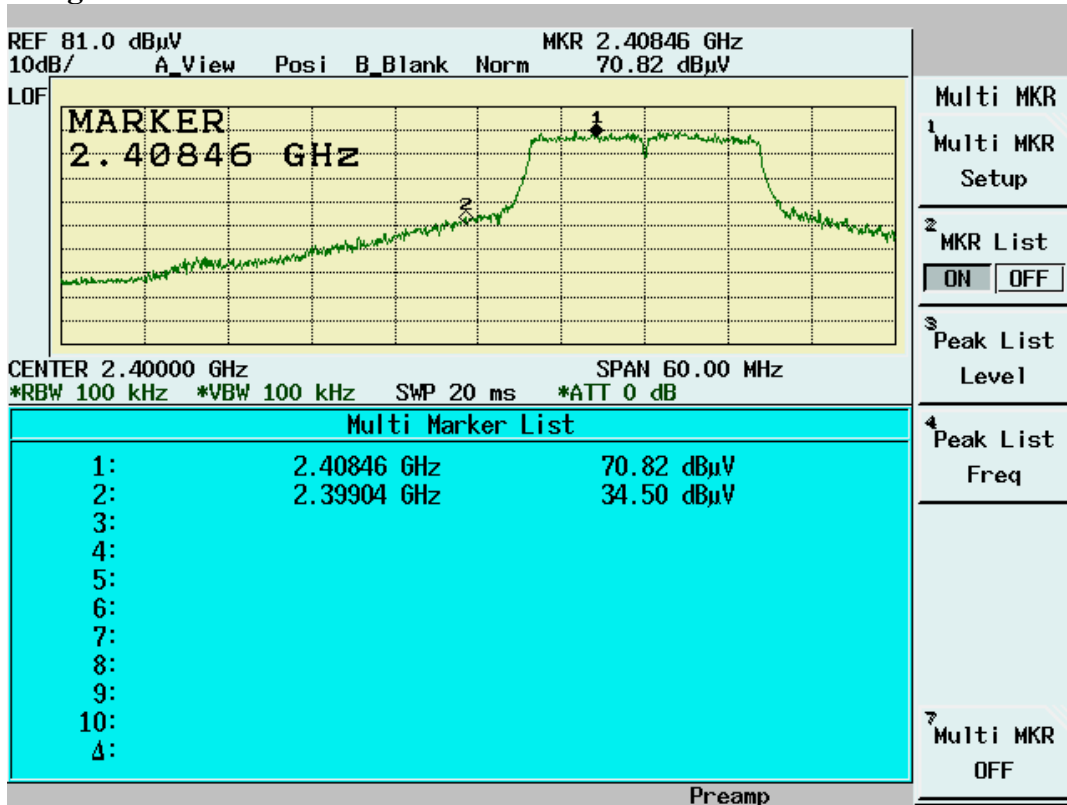
Band Edge Conducted Measurement



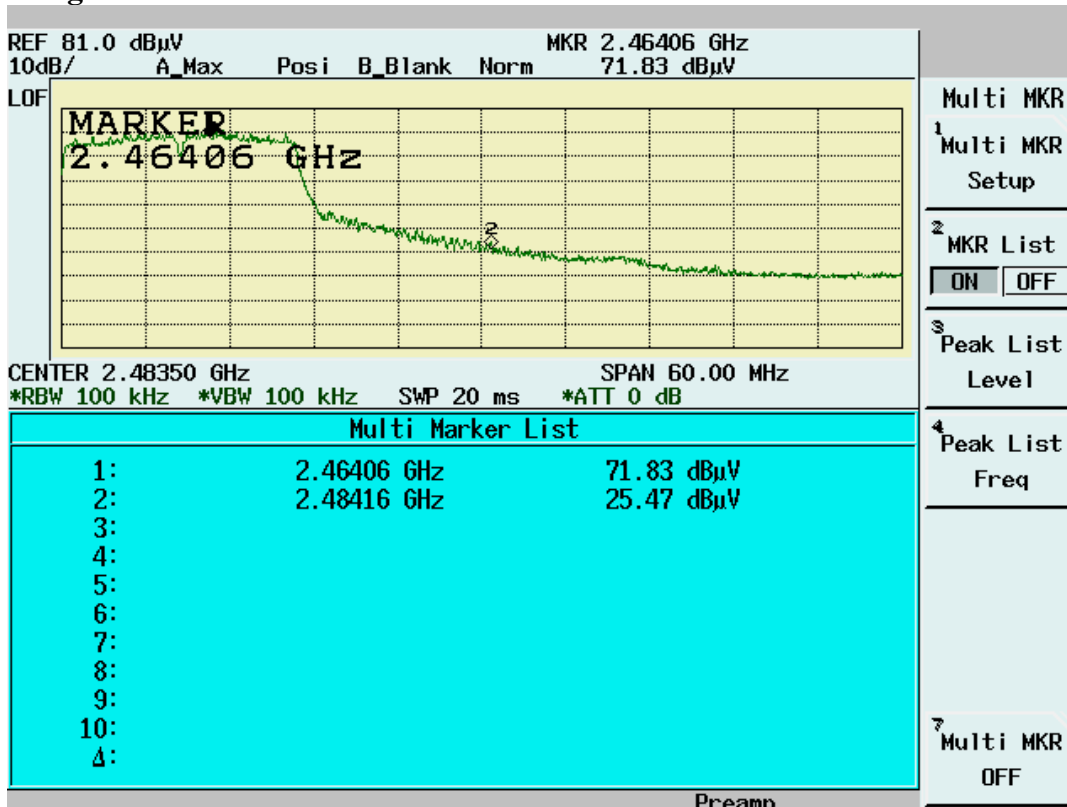
Band Edge Conducted Measurement



Band Edge Radiated Measurement



Band Edge Radiated Measurement



4.6 Band Edge Restricted Bands Measurement

4.6.1 Test Procedure (Radiated)

1. Antenna and Turntable test procedure same as Radiated Emission Measurement.
Equipment mode: Spectrum analyzer
Detector function: Peak mode
SPAN: 60MHz
RBW: 1MHz
VBW: 3MHz
Center frequency: 2.39GHz, 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
4. For peak frequency emission level measurement in Restricted Band
Change RBW: 1MHz
VBW: 10Hz / 1KHz
5. Get the spectrum reading after Maximum Hold function is completed.

4.6.2 Test Setup (Radiated)

Same as *Radiated Emission Measurement*

4.6.3 802.11b Test Data

Table Band Edge Measurement (Radiated)

Temp. (° C): 27

Test Engr: Jerry

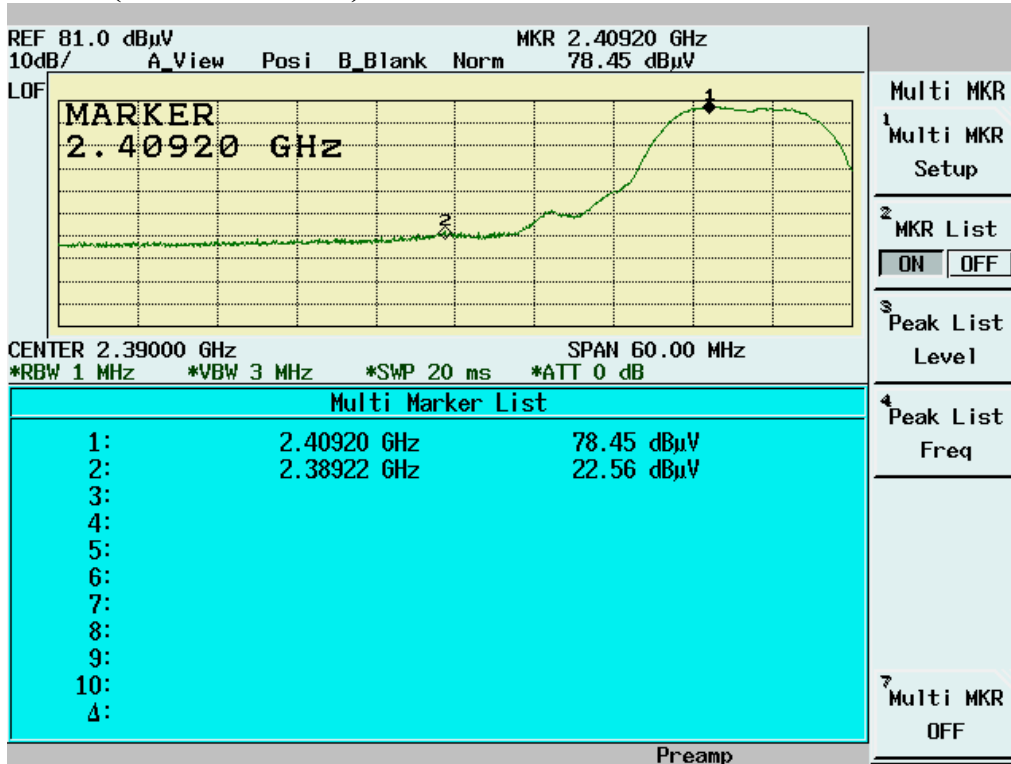
Humidity (%): 60

Description	Frequency (MHz)	Spectrum Reading (dBUV)	Correction Factor (dB/m)	Emission Level (dBUV/m)	Limit (dBUV/m)	Equip. Setup VBW	Pass or Fail
Channel_1 (peak mode)	2409.2	78.45	30.71	109.16	---	3MHz	---
Channel_1 (average mode)	2414.24	73.84	30.71	104.55	---	10Hz	---
Channel_11 (peak mode)	2465.44	78.13	30.76	108.89	---	3MHz	---
Channel_11 (average mode)	2464.78	74.12	30.76	104.88	---	10Hz	---
Channel_1 Restricted band (peak mode)	2389.22	22.56	30.69	53.25	74	3MHz	Pass
Restricted band (average mode)	2389.04	12.52	30.69	43.21	54	10Hz	Pass
Channel_11 Restricted band (peak mode)	2484.34	24.44	30.78	55.22	74	3MHz	Pass
Restricted band (average mode)	2483.56	15.84	30.78	46.62	54	10Hz	Pass

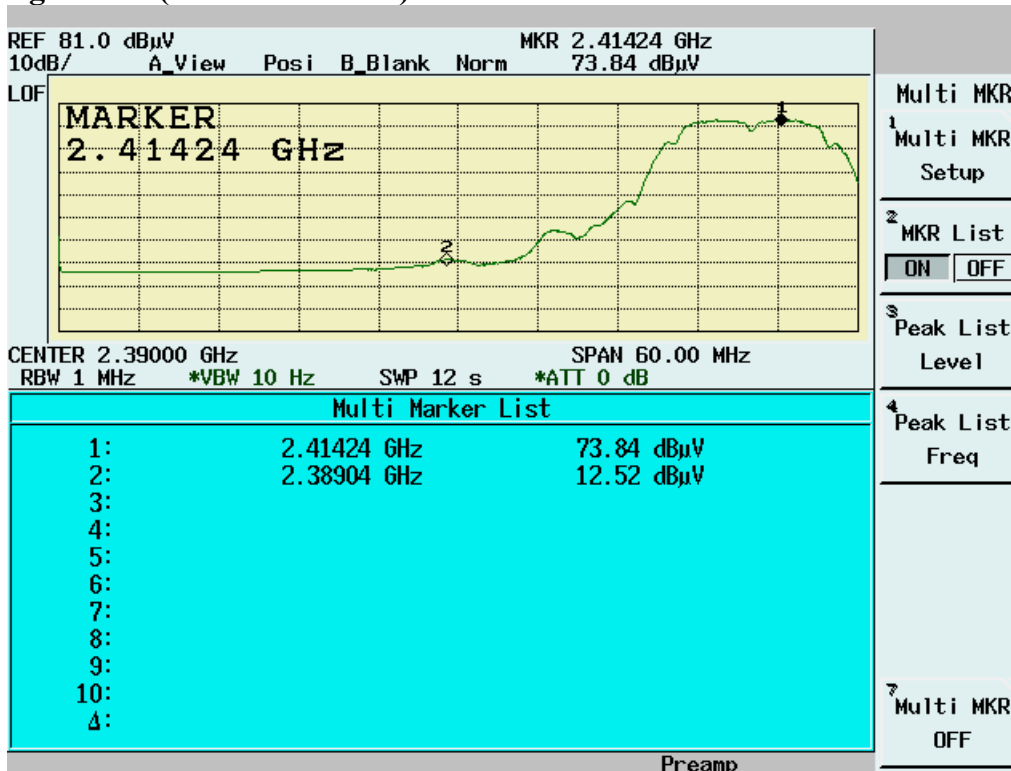
Note:

- 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.

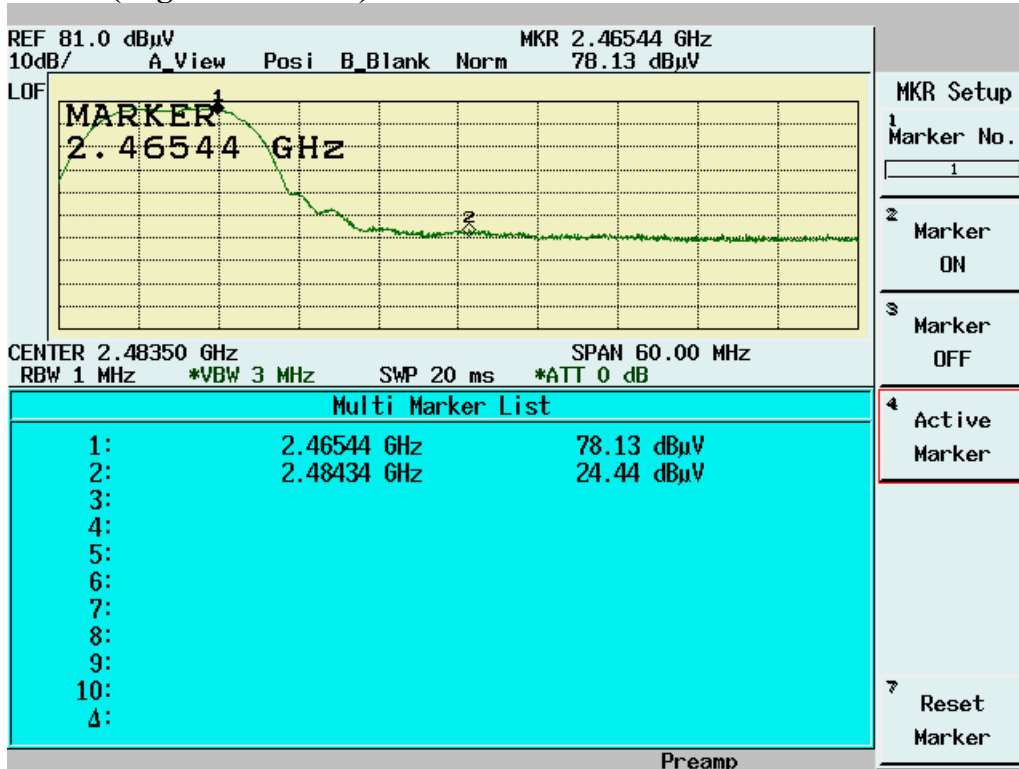
Band Edge measurement for radiated emission in Restricted Band (Radiated) Peak Mode (Lowest Channel)



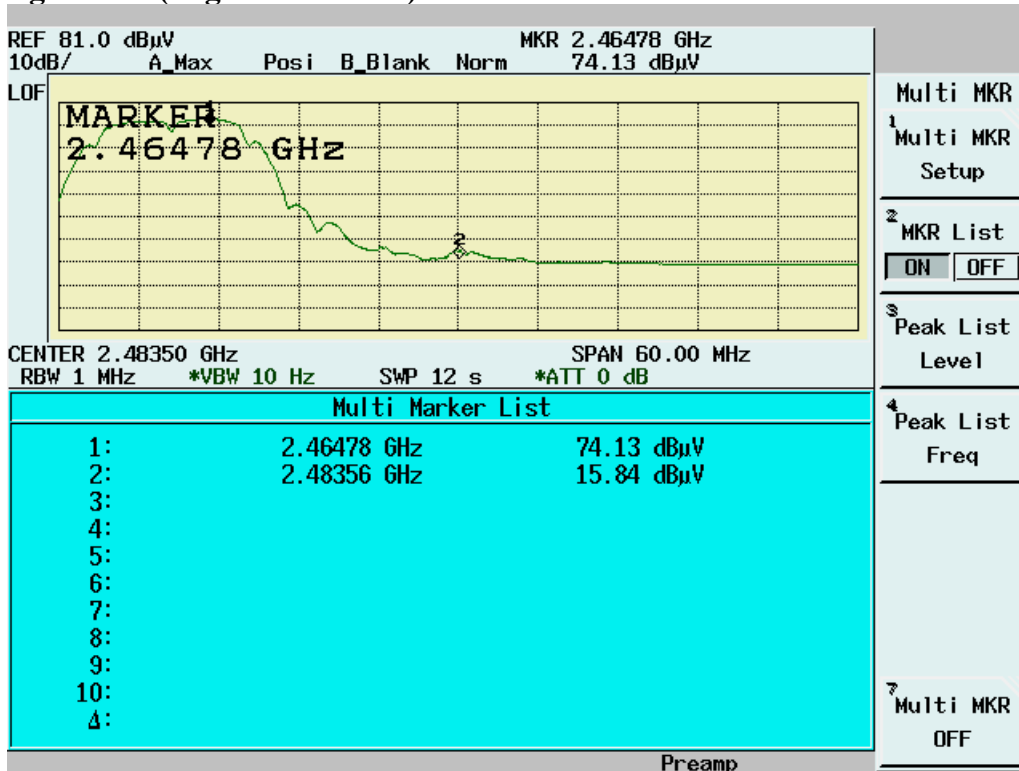
Band Edge measurement for radiated emission in Restricted Band (Radiated) Average Mode (Lowest Channel)



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



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



4.6.4 802.11g Test Data

Table Band Edge Measurement (Radiated)

Temp. (° C): 27

Test Engr: Jerry

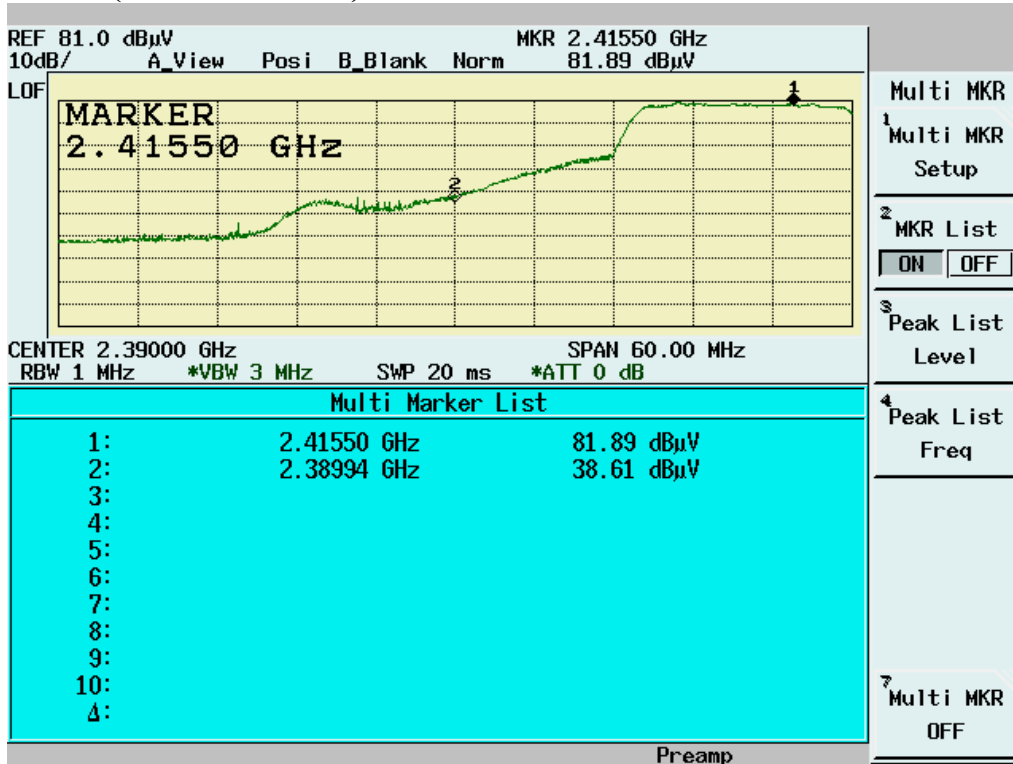
Humidity (%): 60

Description	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
Channel_1 (peak mode)	2415.5	81.89	30.71	112.6	---	3MHz	---
Channel_1 (average mode)	2415.2	72.93	30.71	103.64	---	1KHz	---
Channel_11 (peak mode)	2467	79.83	30.76	110.59	---	3MHz	---
Channel_11 (average mode)	2464.78	72.96	30.76	103.72	---	1KHz	---
Channel_1 Restricted band (peak mode)	2389.94	38.61	30.69	69.3	74	3MHz	Pass
Restricted band (average mode)	2390	17.32	30.69	48.01	54	1KHz	Pass
Channel_11 Restricted band (peak mode)	2484.88	38.34	30.78	69.12	74	3MHz	Pass
Restricted band (average mode)	2483.5	17.47	30.78	48.25	54	1KHz	Pass

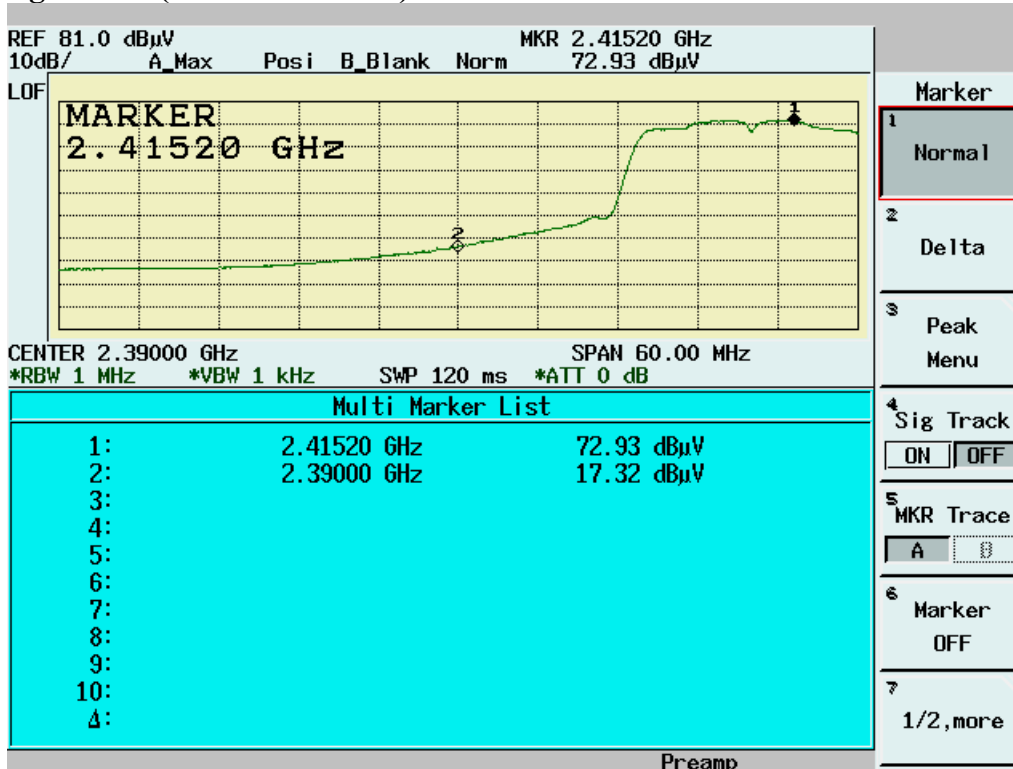
Note:

- 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.

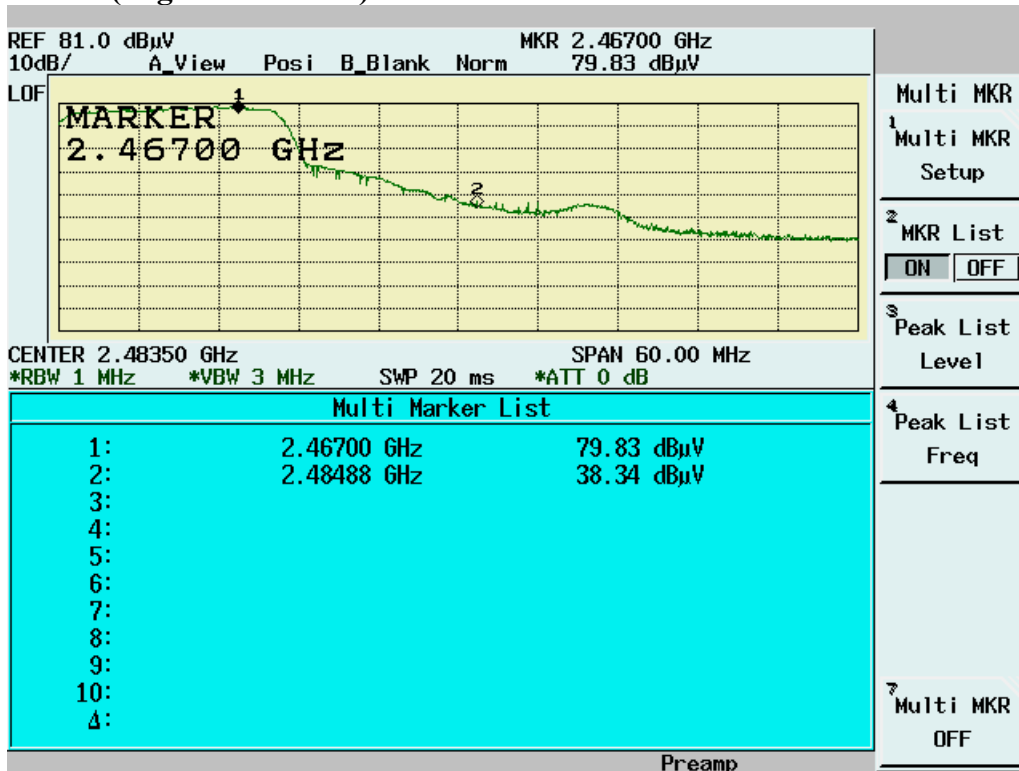
Band Edge measurement for radiated emission in Restricted Band (Radiated) Peak Mode (Lowest Channel)



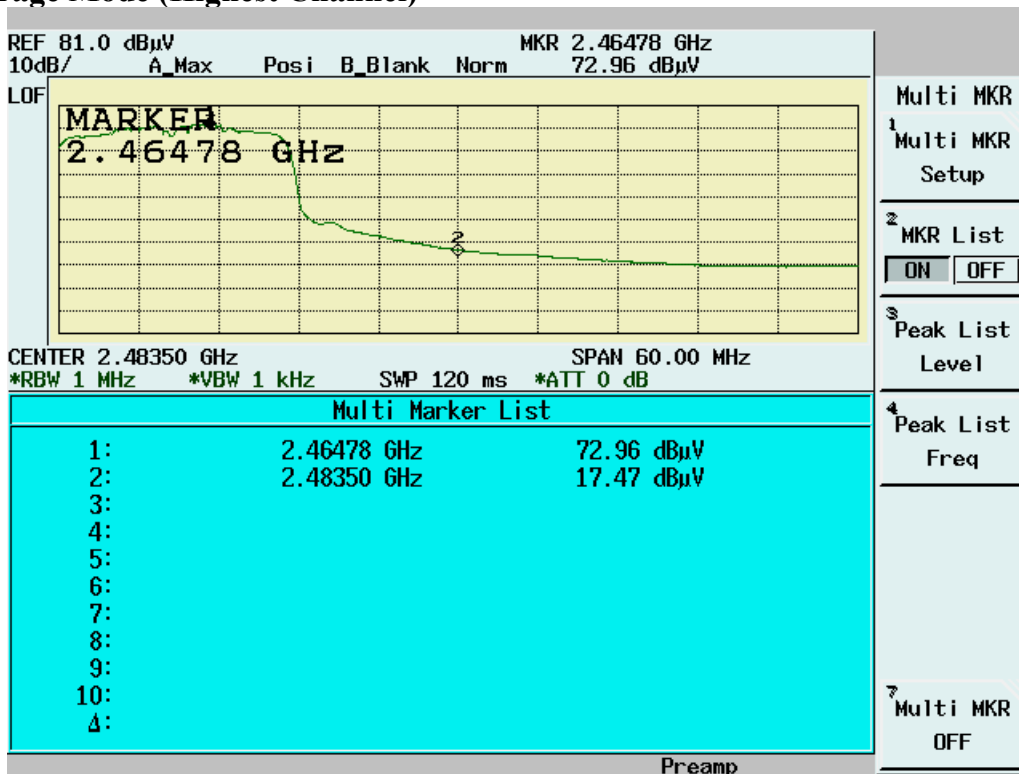
Band Edge measurement for radiated emission in Restricted Band (Radiated) Average Mode (Lowest Channel)



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



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



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

See MPE report

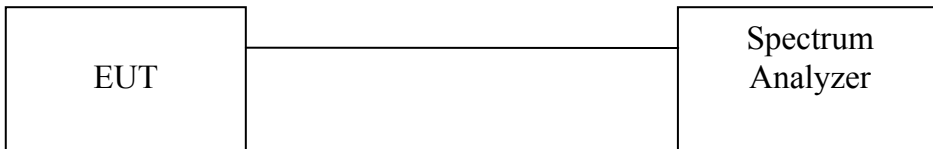
4.8 DSSS Peak Power Spectral Density [Section 15.247(d)]

4.8.1 Test Procedure

The test is performed in accordance with FCC document “Measurement of Digital Transmission Systems Operating under Section 15.247”, March 23, 2005. The transmitter operates continuously therefore Power Spectral Density Option 1 is used.

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.

4.8.2 Test Setup



4.8.3 802.11b Test Data

802.11b Maximum Peak Output Power Density

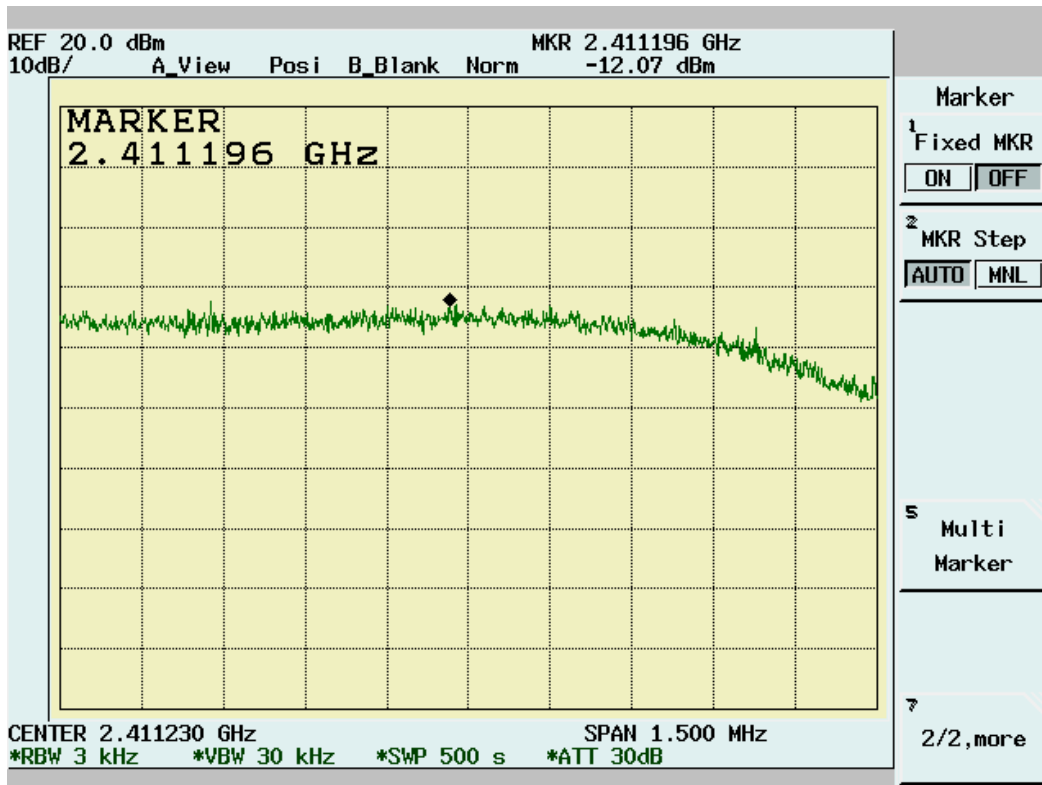
Temp. (° C): 27

Test Engr: Jerry

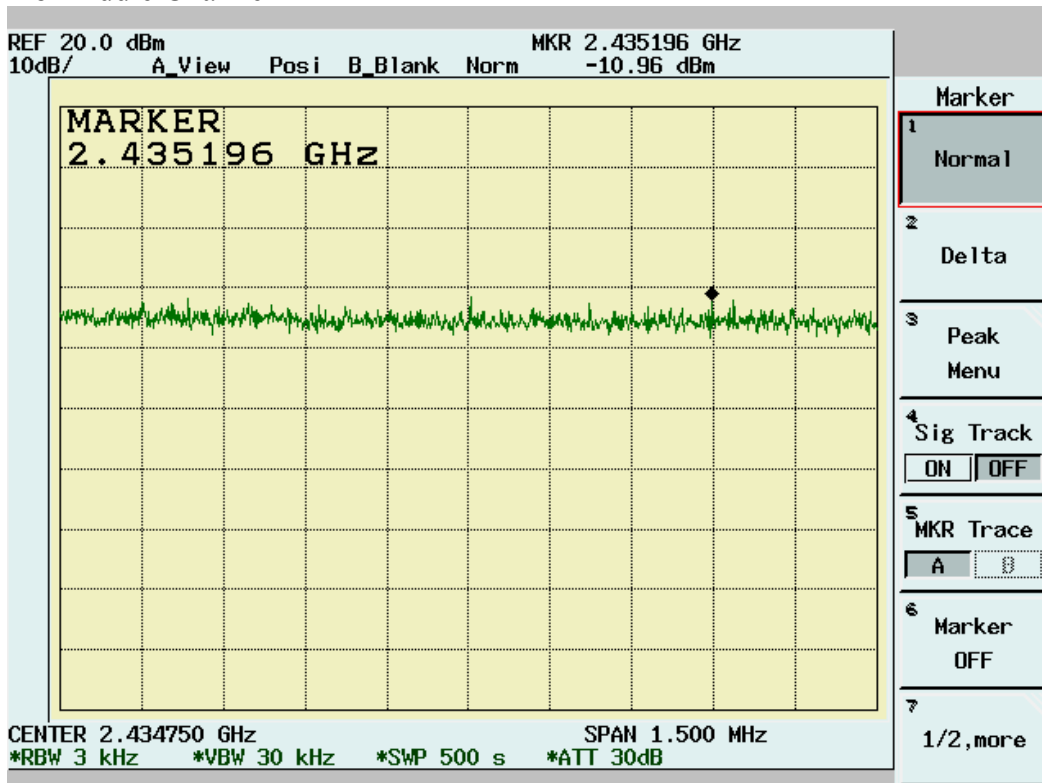
Humidity (%): 65

Chennel	Frequency	Spectrum	Cable Loss	Power Density (dBm/3KHz)	Limit	Pass/Fail
	(MHz)	Reading (dBm/3KHz)	(dB)		(dBm/3KHz)	
1	2412	-12.07	1.1	-10.97	8	Pass
6	2437	-10.96	1.1	-9.86	8	Pass
11	2462	-11.03	1.1	-9.93	8	Pass

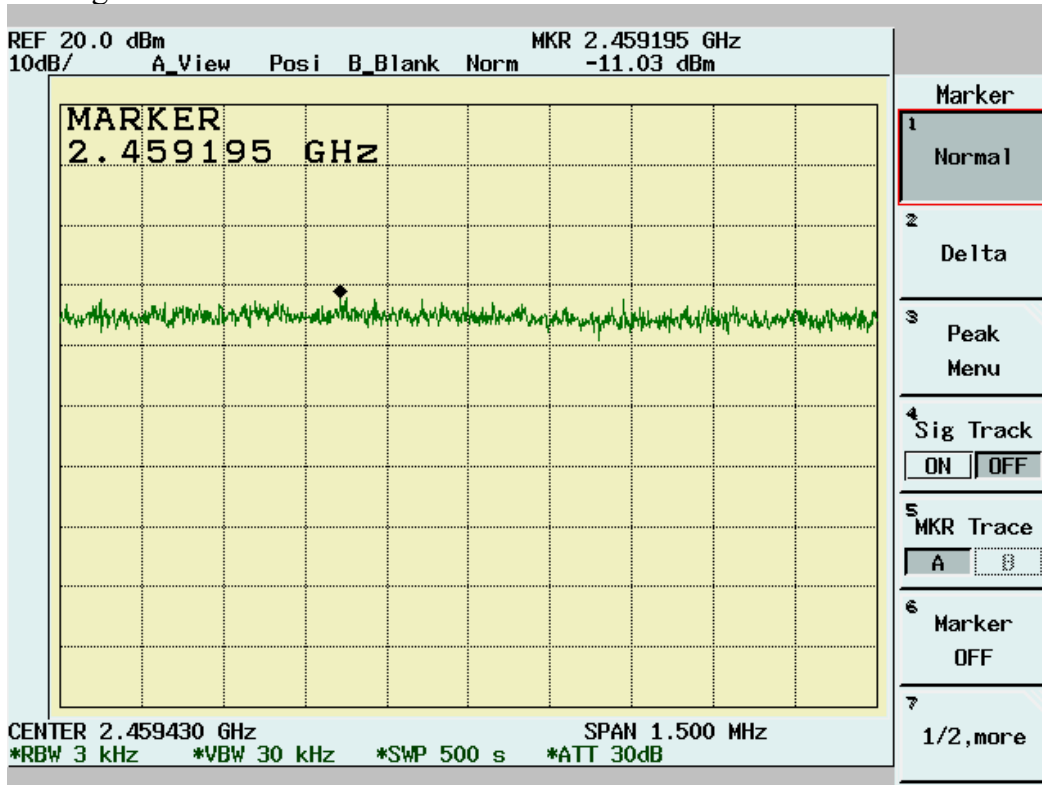
802.11b Lowest Channel



802.11b Middle Channel



802.11b Highest Channel



4.8.4 802.11g Test Data

802.11g Maximum Peak Output Power Density

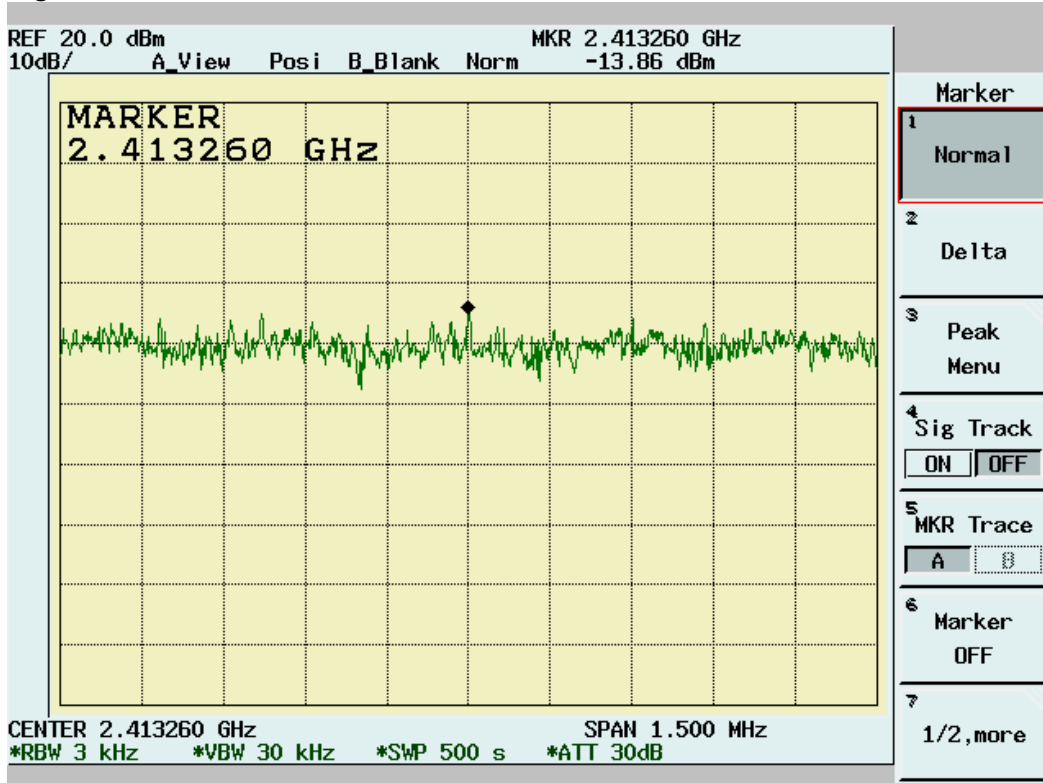
Temp. (° C): 27

Test Engr: Jerry

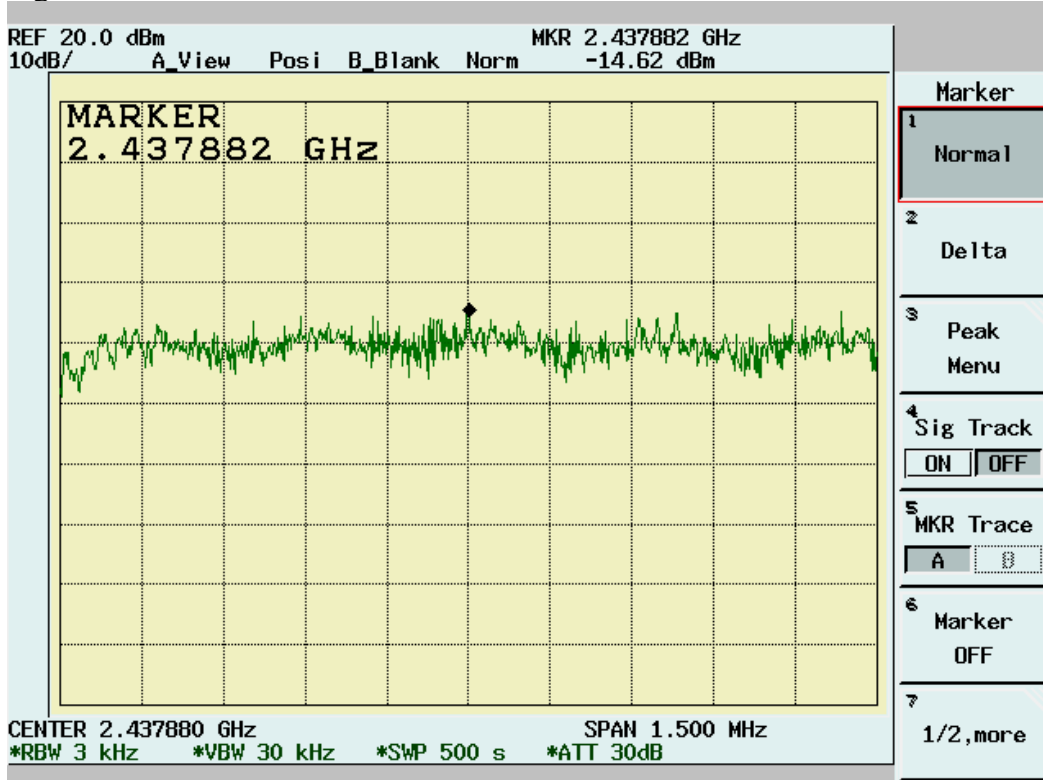
Humidity (%): 65

Chennel	Frequency (MHz)	Spectrum Reading (dBm/3KHz)	Cable Loss (dB)	Power Density (dBm/3KHz)	Limit (dBm/3KHz)	Pass/Fail
1	2412	-13.86	1.1	-12.76	8	Pass
6	2437	-14.62	1.1	-13.52	8	Pass
11	2462	-15.23	1.1	-14.13	8	Pass

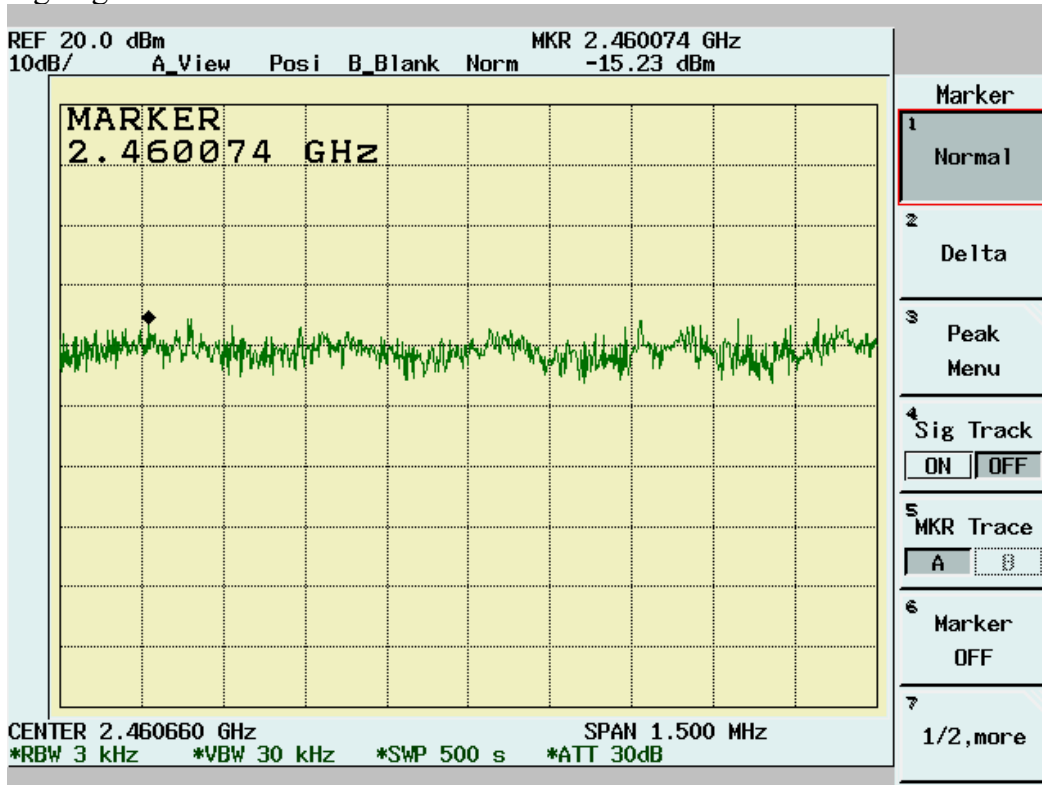
802.11g Lowest Channel



802.11g Middle Channel



802.11g Highest Channel



5. Appendix

5.1 Appendix A: Measurement Procedure for Power line Conducted Emissions

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the required standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

If the EUT is supplied with a flexible power cord, the power cord length in excess of the distance separating the EUT from the LISN shall be folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall not be longer than 1 meter. The excess power cord shall be bundled as described above. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.

The interconnecting cables were arranged and moved to get the maximum emission. Both the line of power cord, hot and neutral, were measured.

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.

5.2 Appendix B: Test Procedure for Radiated Emissions

Preliminary Measurements in the Anechoic Chamber

The radiated emissions are initially measured in the anechoic chamber at a measurement distance of 3 meters. Desktop EUT are placed on a wooden stand 0.8 meter in height. The measurement antenna is 3 meters from the EUT. The test setup in anechoic chamber is the same as open site. The turntable rotated 360°. The antenna height is varied from 1-2.5m. The primary objective of the radiated measurements in the anechoic chamber is to identify the frequency spectrum in the absence of the electromagnetic environment existing on the open test site. The frequencies can then be pre-selected on the open test site to obtain the corresponding amplitude. The initial scan is made with the spectrum analyzer in automatic sweep mode. The spectrum peaks are then measured manually to determine the exact frequencies.

Measurements on the Open Site or 10m EMC Chamber

The radiated emissions test will then be repeated on the open site or 10m EMC chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of the 3 or 10 meter open field sites. Desktop EUT are set up on a wooden stand 0.8 meter above the ground.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both readings are recorded with the quasi-peak detector with 120KHz bandwidth. For frequency between 30 MHz and 1000MHz, the reading is recorded with peak detector or quasi-peak detector. For frequency above 1 GHz, the reading is recorded with peak detector or average detector with 1 MHz bandwidth.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum emission. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.

5.3 Appendix C: Test Equipment

5.3.1 Test Equipment List

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction	Coaxial Cable 1F-C2	Harbourindustries	RG400	1F-C2	02/13/2008	02/13/2009
Conduction	Digital Hygro-Thermometer Conduct	MicroLife	HT-2126G	ISL-Conduction02	12/26/2007	12/26/2008
Conduction	EMI Receiver 07	Schwarzbeck Mess-Elektronik	FCKL 1528	1528-201	08/31/2007	08/30/2008
Conduction	LISN 01	R&S	ESH2-Z5	890485/013	01/03/2008	01/03/2009
Conduction	LISN 06	R&S	ESH3-Z5	828874/009	12/14/2007	12/14/2008
Radiation	BILOG Antenna 08	Schaffner	CBL6112B	2756	06/13/2008	06/12/2009
Radiation	Coaxial Cable Chmb 02-10M	Belden	RG-8/U	Chmb 02-10M	02/13/2008	02/12/2009
Radiation	Digital Hygro-Thermometer Chmb 02	MicroLife	HT-2126G	Chmb 02	12/26/2006	12/26/2008
Radiation	EMI Receiver 02	HP	85460A	3448A00183	12/29/2007	12/28/2008
Radiation	Spectrum Analyzer 13	Advantest	R3132	121200411	03/16/2008	03/15/2009
Radiation	Horn Antenna 02	Com-Power	AH-118	10088	12/28/2007	12/27/2008
Radiation	Horn Antenna 04	Com-Power	AH-826	081-001	03/23/2008	03/22/2009
Radiation	Microwave Cable RF SK-01	HUBER+SUHNERAG.	Sucoflex 102	22139 /2	06/01/2008	06/01/2009
Radiation	Preamplifier 09	MITEQ	AFS44-00102650-40-10P-44	858687	04/02/2008	04/02/2009
Radiation	High Pass Filter 01	HEWLETT-PACKARD	84300-80038	001	N/A	N/A
Radiation	Spectrum Analyzer 19	R&S	FSP40	100116	09/12/2007	09/12/2008
Radiation	Spectrum Analyzer 14	Advantest	R3182	140600028	12/06/2007	12/06/2008

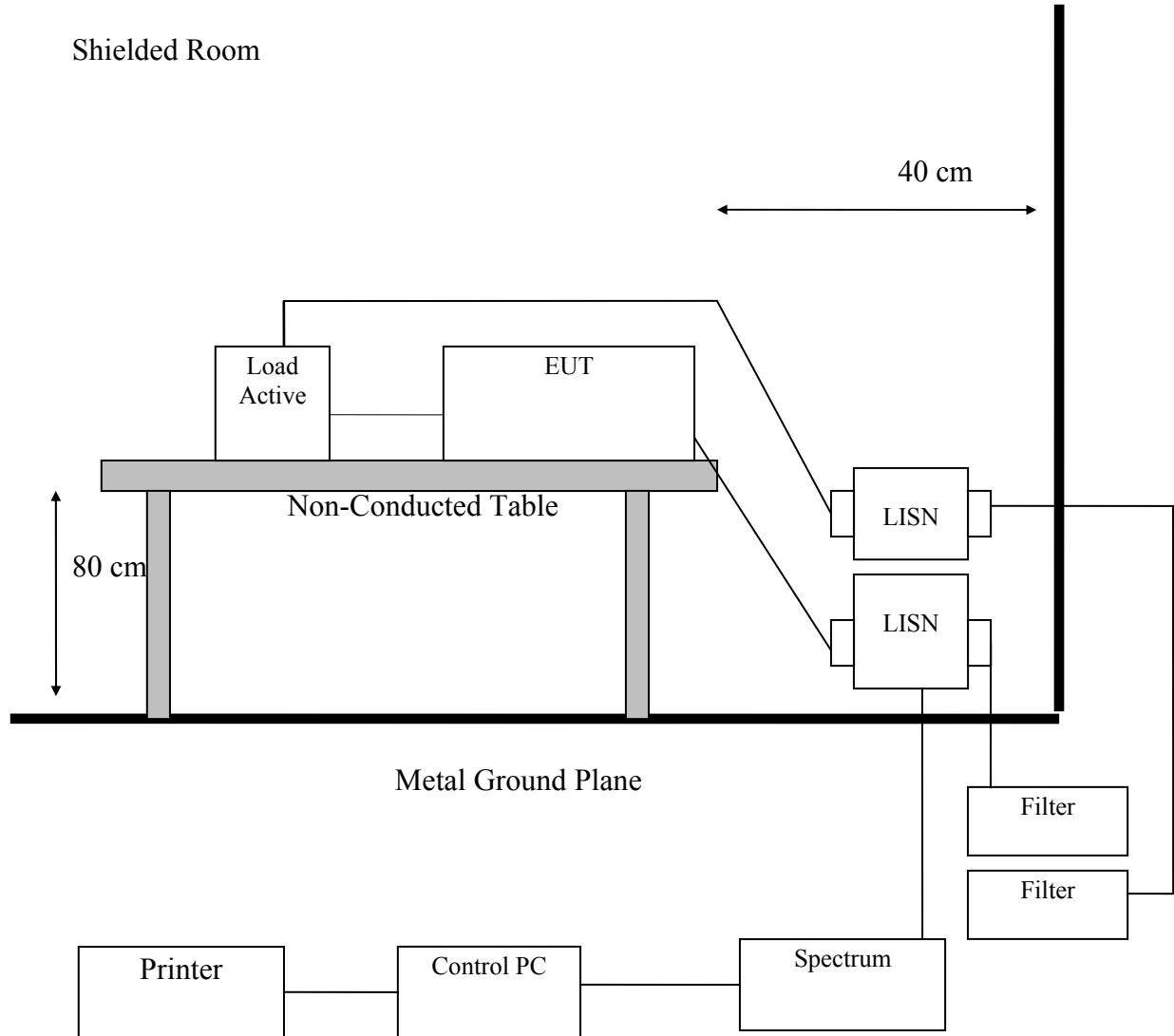
Note: Calibration is traceable to NIST or national or international standards.

5.3.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

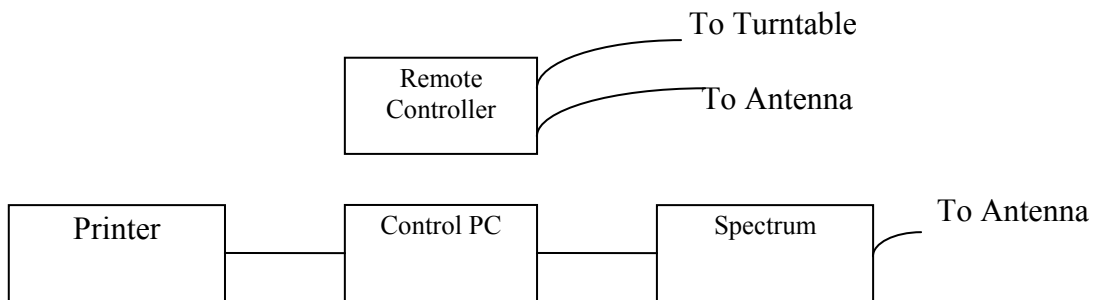
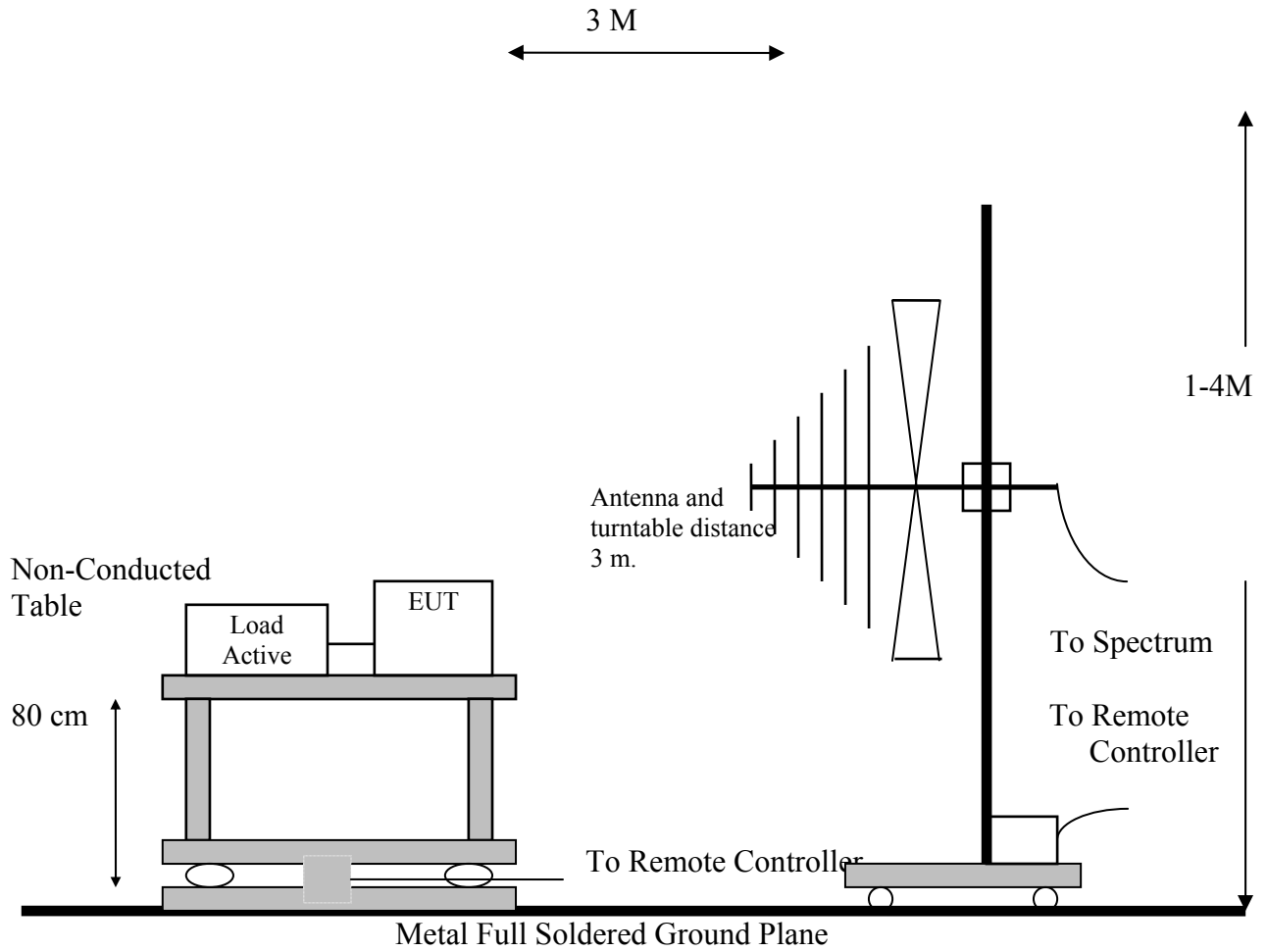
Radiation/Conduction	Filename	Version	Issued Date
Conduction	Tile.exe	1.12E	7/7/2000
Radiation	Tile.exe	1.12C	6/16/2000

5.4 Appendix D: Layout of EUT and Support Equipment

5.4.1 General Conducted Test Configuration



5.4.2 General Radiation Test Configuration



5.5 Appendix E: Accuracy of Measurement

The measurement uncertainty refers to CISPR 16-4-2:2003. The coverage factor $k = 2$ yields approximately a 95 % level of confidence.

<Conduction 03>: $\pm 0.88\text{dB}$

<Chamber 12 (3M)>

1GHz~18GHz: $\pm 2.62\text{dB}$

18GHz~26GHz: $\pm 2.94\text{dB}$

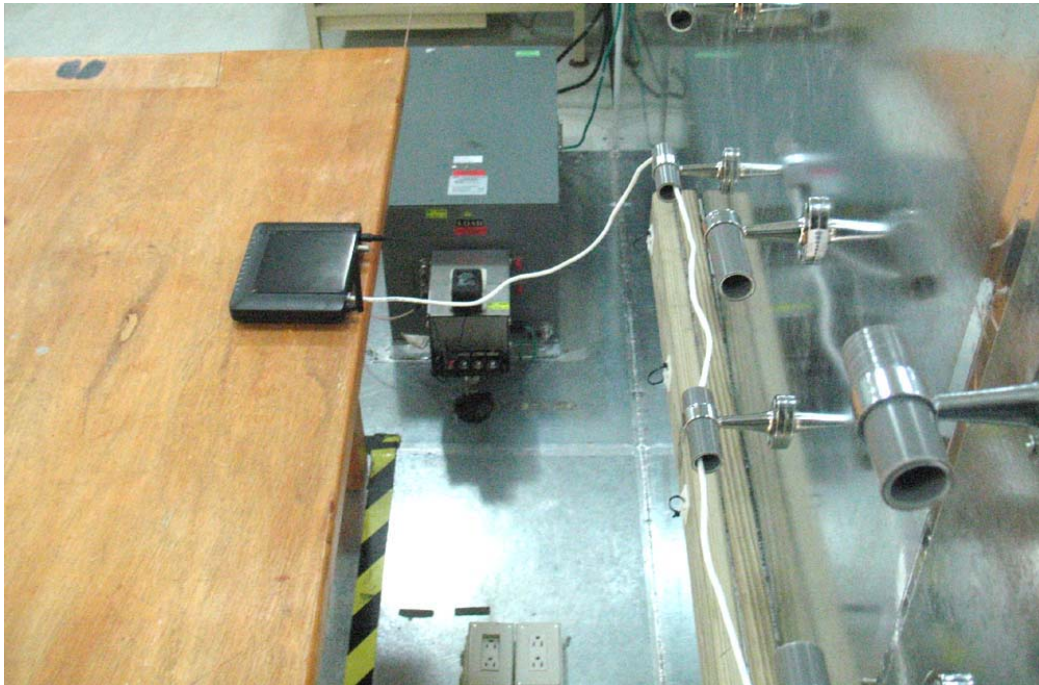
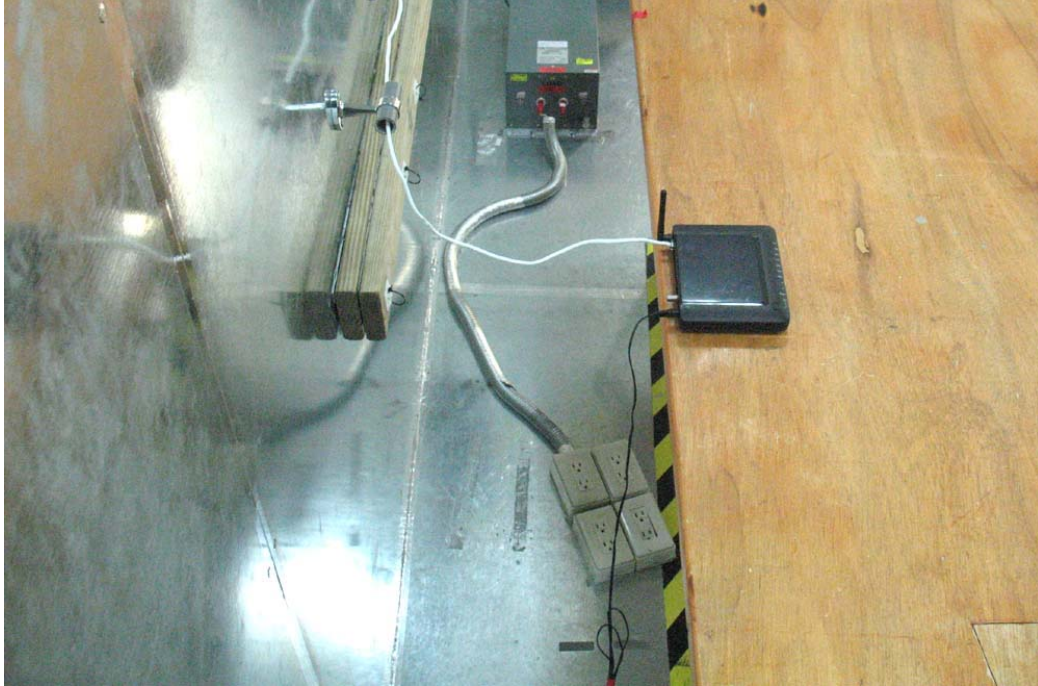
26GHz~40GHz: $\pm 2.70\text{dB}$

5.6 Appendix F: Photographs of EUT Configuration Test Set Up

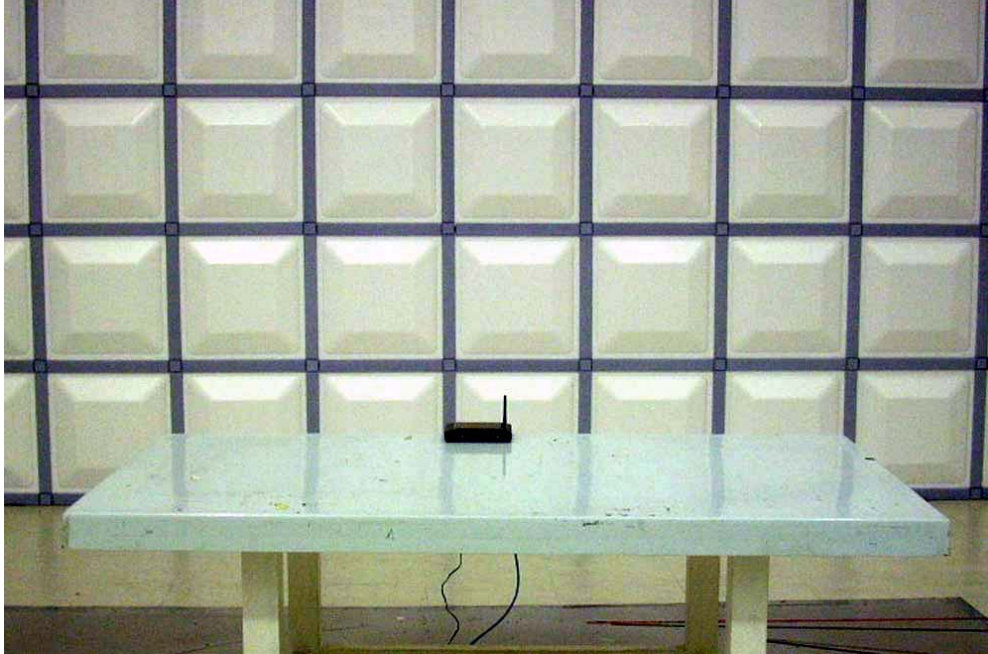
The Front View of Highest Conducted Set-up For EUT



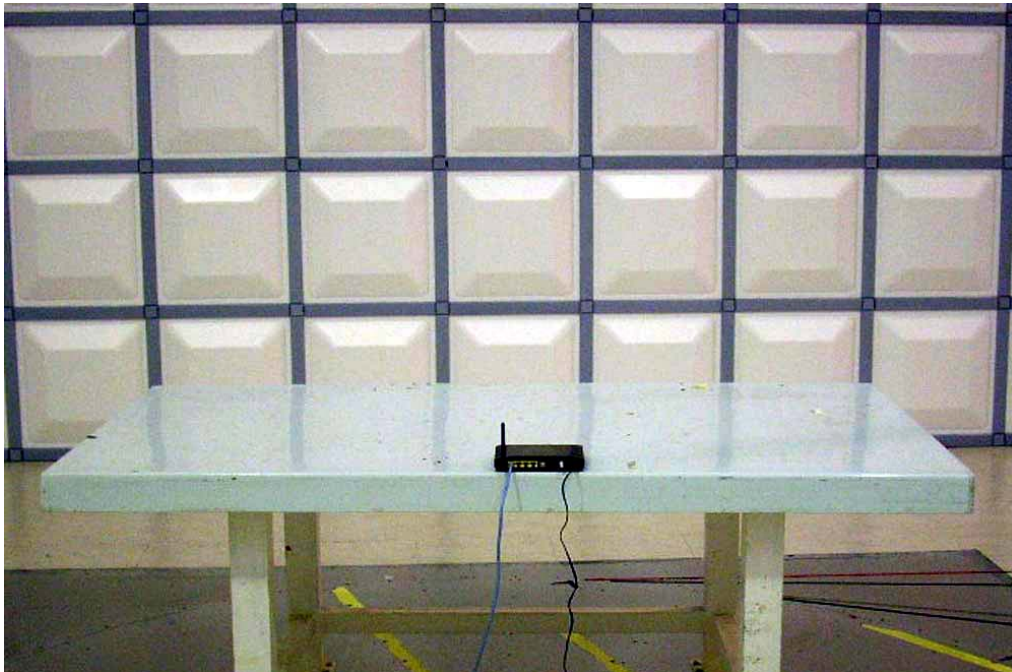
The Back View of Highest Conducted Set-up For EUT



The Front View of Highest Radiated Set-up For EUT



The Back View of Highest Radiated Set-up For EUT



5.7 Appendix G: Antenna Spec.

Please refer to the attached file.