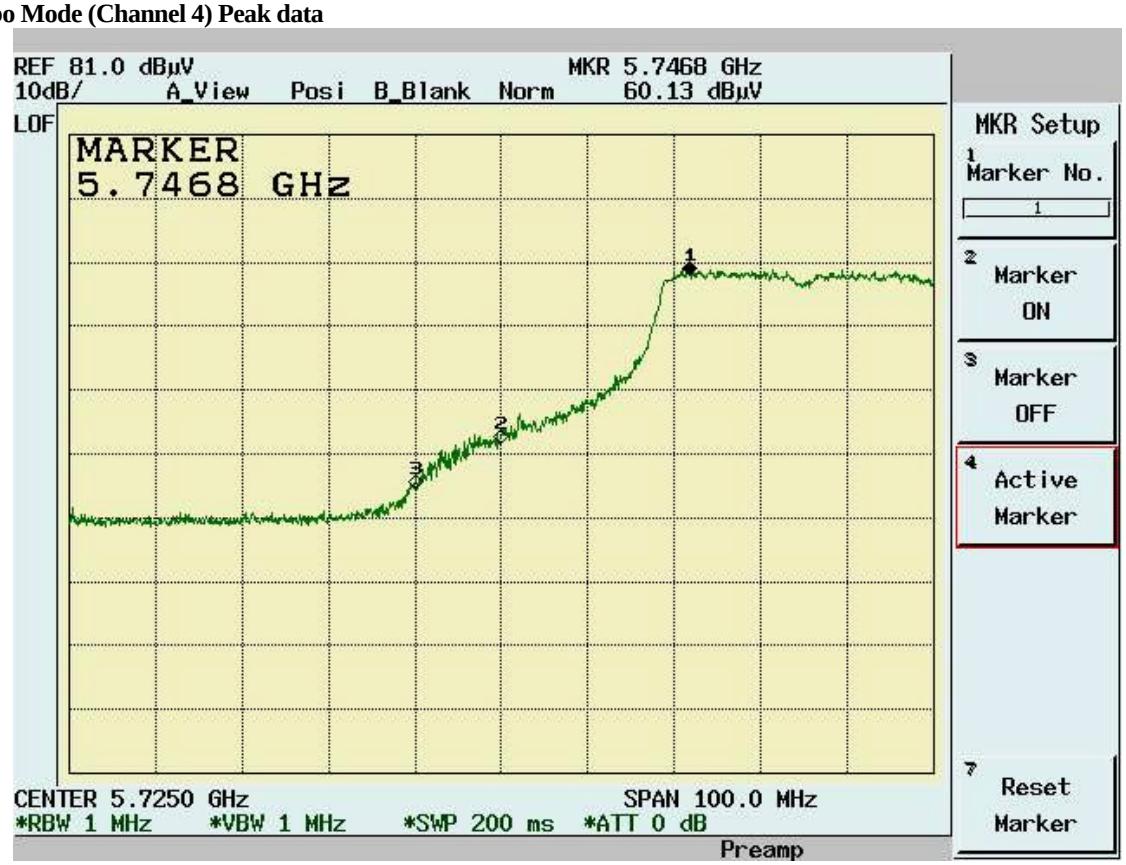
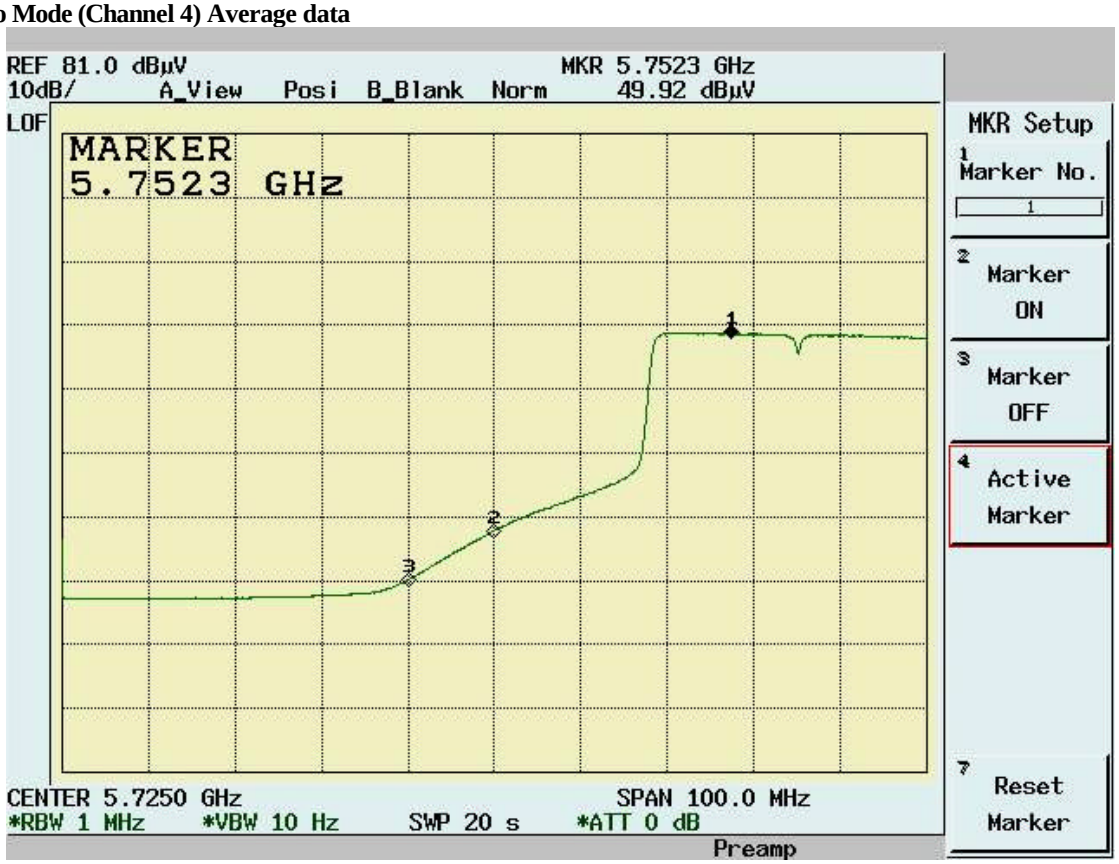
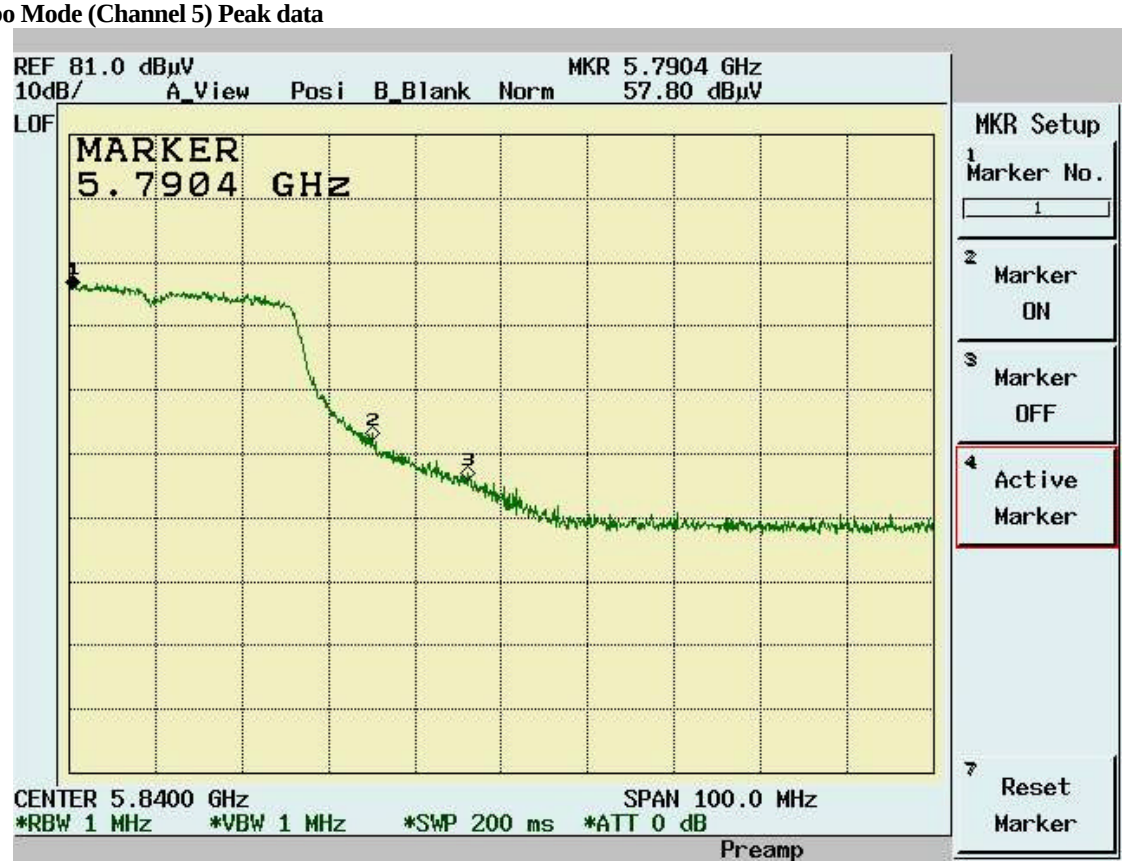
Turbo Mode (Channel 4) Peak data



Turbo Mode (Channel 4) Average data



Turbo Mode (Channel 5) Peak data



Turbo Mode (Channel 5) Average Data

4.7 RF Exposure Measurement [Section 15.407(f)(4) & 1.1307(b)]

Refer to MPE Test Report

4.8 Frequency Stability [Section 15.407(g)]

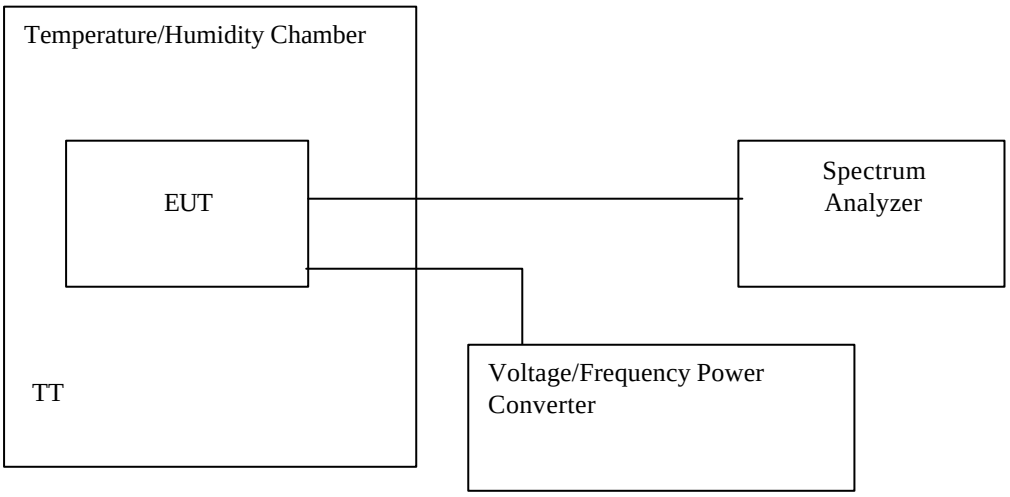
4.8.1 Limits of Frequency Stability Measurement

The frequency tolerance of the carrier sing shall be maintained within +/- 0.02% of the operating frequency over the operation temperature range of EUT (0^0C~35^0C), and variation in the primary supply voltage from 85% to 115% of the rated supply voltage (115V AC) at 20^0C.

4.8.2 Test Procedure

1. The EUT was placed in the Temperature/Humidity Chamber and powered by a Voltage/Frequency Power converter.
2. Connect the RF output of EUT to Spectrum. Turn on the EUT.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the chamber temperature to stabilize. Turn the EUT on and measure the operating frequency after 2, 5, 10 minutes.
5. Set the Voltage/Frequency Power Converter to 85% and 115% of supply voltage, then repeat step 2, 3, 4 respectively.
6. Repeat step 2 , 3, 4, 5 with the temperature of chamber set to the lowest temperature.
7. Repeat step 2 , 3, 4, 5 with the temperature of chamber set to 20^0C.

4.8.3 Test Setup



4.8.4 Test Data

Test Engr: Mailes Hsieh

Operating Frequency:		5180 (Mhz)		Limit: +/- 0.02%			
Temp.	Power Supply	2 minutes		5 minutes		10 minutes	
(^{0}C)	(V AC)	(MHz)	(%)	(MHz)	(%)	(MHz)	
35	132	5179.9836	-0.000317	5179.9670	-0.000637	5179.9810	-0.000367
	115	5179.9974	-0.000050	5179.9862	-0.000266	5179.9730	-0.000521
	97	5180.0062	0.000120	5179.9842	-0.000305	5179.9870	-0.000251
0	132	5180.0134	0.000259	5180.0004	0.000008	5180.0116	0.000224
	115	5180.0018	0.000035	5180.0032	0.000062	5180.0086	0.000166
	97	5180.0144	0.000278	5180.0104	0.000201	5180.0116	0.000224
20	132	5179.9424	-0.001112	5179.9778	-0.000429	5179.9710	-0.000560
	115	5179.9876	-0.000239	5179.9748	-0.000486	5179.9712	-0.000556
	97	5179.9678	-0.000622	5179.9692	-0.000595	5179.9680	-0.000618

5. TEST RESULTS (802.11b) (for Antenna DMA)

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 providedthrough 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 6dß 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 6dß 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)

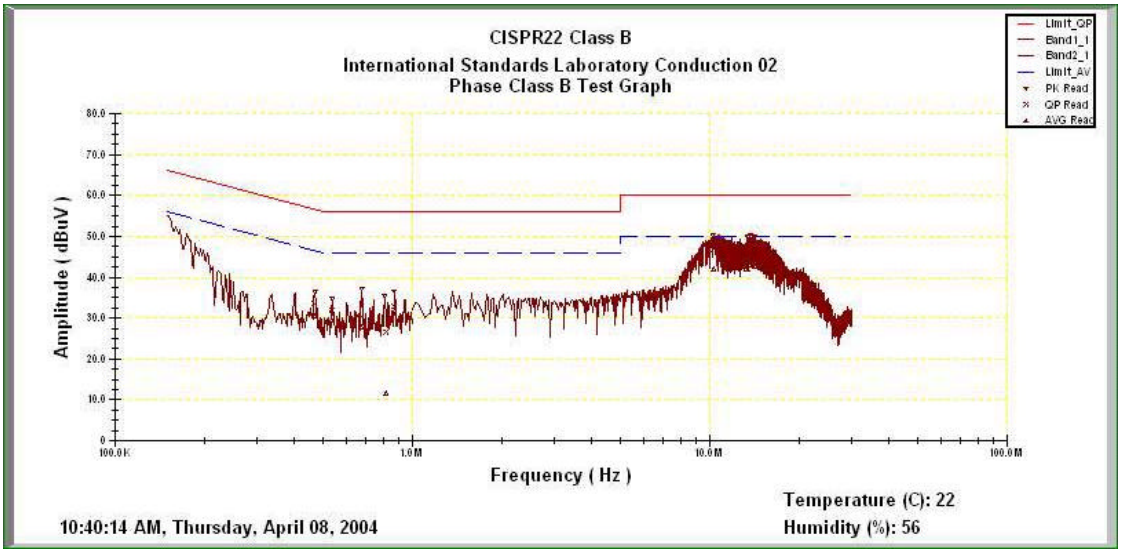
Frequency Range	150 KHz--30MHz
Detector Function	Quasi-Peak/Average
Bandwidth (RBW)	9KHz

5.1.4 Test Data:

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

Operator: Mailes Hsieh
Temperature (C): 22
10:40:14 AM, Thursday, April 08, 2004 Humidity (%): 56

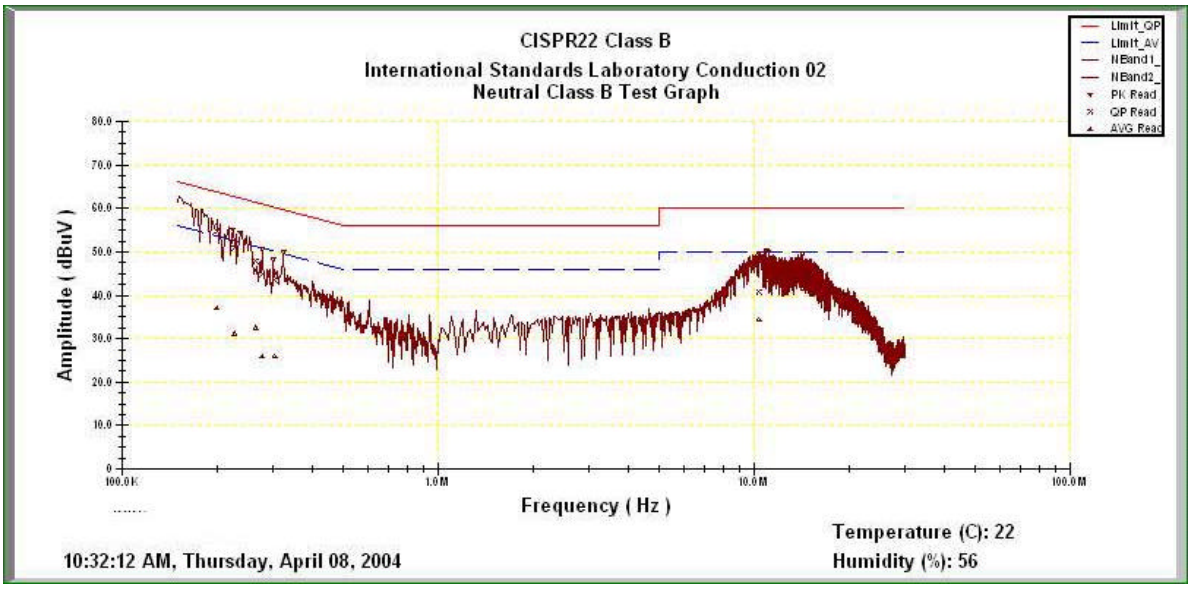
Frequency	LISN Loss	Cable Loss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.46803	0.11	0.03	33.53	56.91	-23.38	30.44	46.91	-16.47
0.53496	0.12	0.03	32.02	56.00	-23.98	29.38	46.00	-16.62
0.67085	0.15	0.04	30.23	56.00	-25.77	27.82	46.00	-18.18
0.81381	0.17	0.06	26.49	56.00	-29.51	11.53	46.00	-34.47
0.86686	0.18	0.06	32.79	56.00	-23.21	30.93	46.00	-15.07
10.2798	0.53	0.19	46.85	60.00	-13.15	42.04	50.00	-7.96
13.4186	0.64	0.26	47.16	60.00	-12.84	41.82	50.00	-8.18
13.688	0.65	0.27	48.22	60.00	-11.78	42.98	50.00	-7.02
13.8204	0.66	0.27	48.53	60.00	-11.47	43.21	50.00	-6.79
14.1525	0.67	0.28	47.82	60.00	-12.18	42.59	50.00	-7.41



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

Operator: Mailes Hsieh
Temperature (C): 22
10:32:12 AM, Thursday, April 08, 2004 Humidity (%): 56

Frequency	LISN Loss	Cable Loss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.19948	0.10	0.02	54.74	64.59	-9.85	37.06	54.59	-17.52
0.22723	0.10	0.02	50.88	63.79	-12.91	31.11	53.79	-22.69
0.26445	0.10	0.02	47.80	62.73	-14.93	32.43	52.73	-20.30
0.27763	0.10	0.02	44.83	62.35	-17.52	25.86	52.35	-26.50
0.30348	0.10	0.02	43.52	61.61	-18.09	25.97	51.61	-25.64
10.3427	0.32	0.19	40.70	60.00	-19.30	34.38	50.00	-15.62
10.9525	0.33	0.20	48.19	60.00	-11.81	43.58	50.00	-6.42
11.0864	0.33	0.21	48.16	60.00	-11.84	43.51	50.00	-6.49
14.1579	0.38	0.28	47.28	60.00	-12.72	42.09	50.00	-7.91
14.2235	0.39	0.28	46.94	60.00	-13.06	41.54	50.00	-8.46



* 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

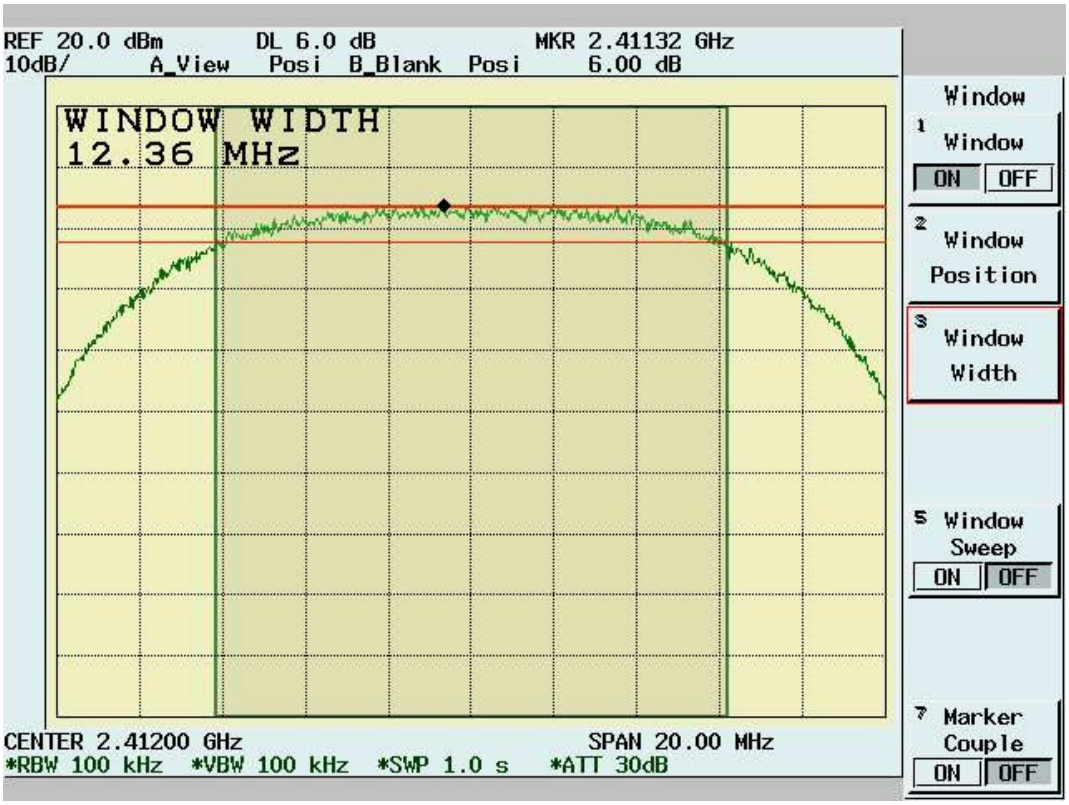
Temp. (deg. C): 25

Test Engr: Mailes Hsieh

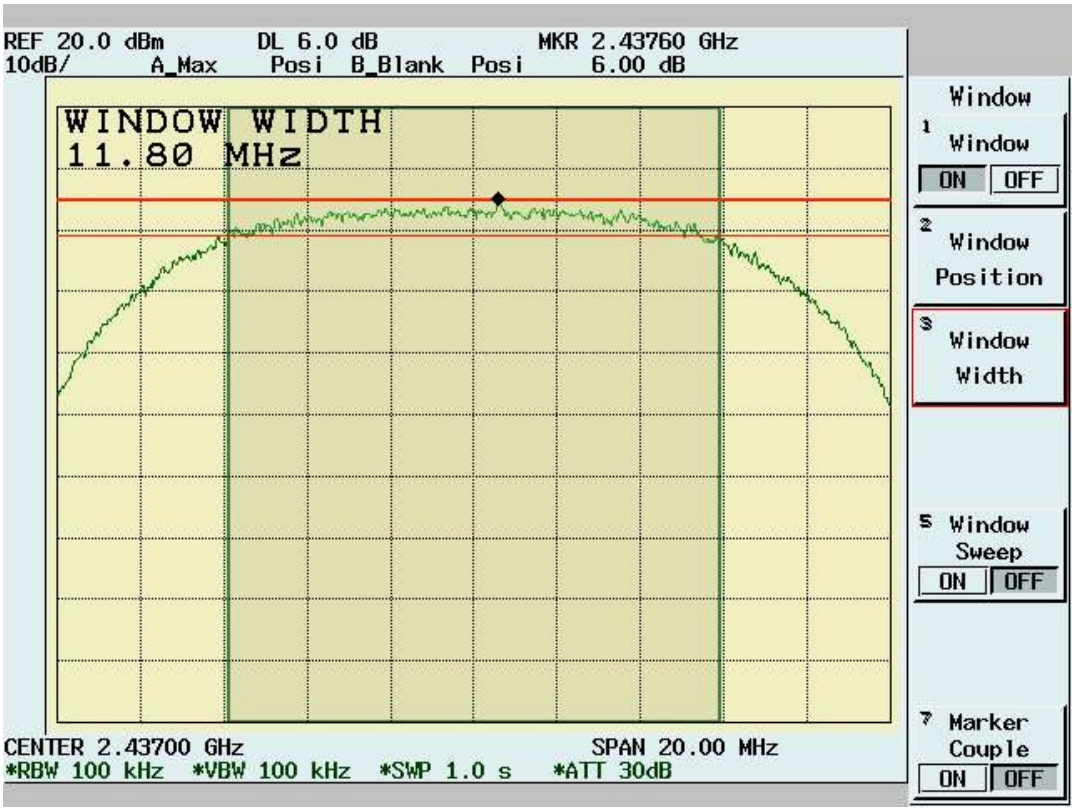
Humidity (%): 50

Chennel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	12.36	0.5	Pass
6	2437	11.8	0.5	Pass
11	2462	12.08	0.5	Pass

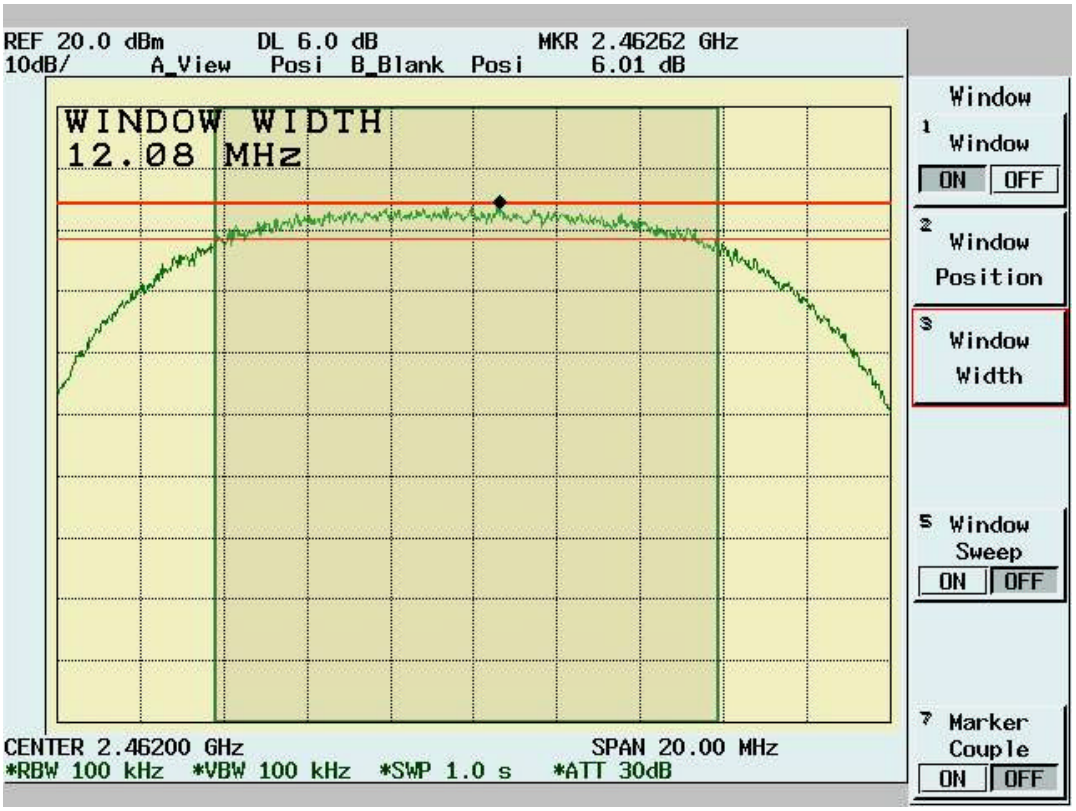
Channel 1:



Channel 6:



Channel 11:


REF 20.0 dBm
10dB/
DL 6.0 dB
A_View
Posi
B_Blank
Posi
MKR 2.46262 GHz
6.01 dB
WINDOW WIDTH
12.08 MHz
CENTER 2.46200 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF

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	21.499	1.1	181.93	22.599	30	Pass
6	2437	21.624	1.1	187.24	22.724	30	Pass
11	2462	21.624	1.1	187.24	22.724	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 acc*ording to EMI Receiver/Spectrum Analyzer Configuration.*

For the test of 2^{nd} to 10^{th} 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)	1MHz

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

Humidity (%): 46
Temperature (C): 25

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
99.84	22.45	10.27	3.02	0.00	35.73	43.50	-7.77	200.00	140.00
198.78	24.94	8.86	4.18	0.00	37.98	43.50	-5.52	150.00	346.00
231.76	27.17	9.21	4.48	0.00	40.87	46.00	-5.13	200.00	29.00
298.69	21.10	13.57	4.69	0.00	39.37	46.00	-6.63	100.00	175.00
365.62	22.66	14.83	5.08	0.00	42.57	46.00	-3.43	250.00	173.00
398.6	19.57	15.95	5.31	0.00	40.83	46.00	-5.17	100.00	239.00
431.58	18.91	16.25	5.61	0.00	40.77	46.00	-5.23	150.00	157.00
465.53	15.27	16.80	5.88	0.00	37.95	46.00	-8.05	100.00	9.00
564.47	13.97	19.04	6.57	0.00	39.58	46.00	-6.42	100.00	305.00
864.2	8.76	20.54	8.24	0.00	37.54	46.00	-8.46	100.00	124.00

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

Operator: Mailes Hsieh

Humidity (%): 46
Temperature (C): 25

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
136.7	17.95	10.73	3.54	0.00	32.22	43.50	-11.28	200.00	242.00
364.65	15.38	14.80	5.07	0.00	35.25	46.00	-10.75	200.00	176.00
431.58	12.89	16.25	5.61	0.00	34.75	46.00	-11.25	100.00	203.00
469.41	13.09	16.90	5.89	0.00	35.89	46.00	-10.11	150.00	192.00
497.54	12.74	17.64	6.04	0.00	36.41	46.00	-9.59	100.00	21.00
643.04	7.62	19.07	7.00	0.00	33.70	46.00	-12.30	200.00	262.00
652.74	14.39	19.09	7.05	0.00	40.53	46.00	-5.47	100.00	225.00
661.47	8.12	19.08	7.07	0.00	34.27	46.00	-11.73	100.00	242.00
764.29	5.61	20.07	7.64	0.00	33.32	46.00	-12.68	100.00	209.00
864.2	4.57	20.54	8.24	0.00	33.35	46.00	-12.65	100.00	143.00

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

5.4.5 Test Data (1GHz – 25 GHz) .

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

Operator: Mailes Hsieh

RBW: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R (pk).	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1449.55	66.46	26.57	1.81	46.20	48.64	54.00	-5.36	101	81
1549.45	64.15	27.22	1.87	46.22	47.01	54.00	-6.99	101	74
2351.15	62.96	30.93	2.61	46.21	50.29	54.00	-3.71	101	153
3755.24	51.73	31.86	2.12	46.37	39.34	54.00	-14.66	102	163
4821.68	46.52	34.92	1.28	46.88	35.83	54.00	-18.17	100	18
7233.77	49.21	39.47	3.15	46.21	45.63	54.00	-8.37	101	143

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

Operator: Mailes Hsieh

RBW: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1794.21	63.52	29.27	2.00	46.21	48.59	54.00	-5.41	100	57
2768.23	56.51	31.01	2.82	46.41	43.93	54.00	-10.07	102	284
3758.74	56.38	31.86	2.12	46.37	44.00	54.00	-10.00	102	162
4821.68	52.85	34.92	1.28	46.88	42.17	54.00	-11.83	100	18
7233.77	54.27	39.47	3.15	46.21	50.69	54.00	-3.31	101	143
9643.36	37.57	40.58	3.17	42.07	39.25	54.00	-14.75	102	7

Note:
" * ": Fundamental Frequency
"**": Not in the restricted band, Limit level=Fundamental Emission-20dB
" pk": peak reading
"av": average reading
"---": 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: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1197.30	60.35	25.41	1.63	46.09	41.31	54.00	-12.69	102	98
1796.70	58.25	29.29	2.00	46.21	43.33	54.00	-10.67	100	57
3751.75	52.24	31.85	2.12	46.38	39.84	54.00	-14.16	102	164
4870.63	48.54	35.11	1.25	46.93	37.97	54.00	-16.03	100	13
7305.69	47.02	39.59	3.20	46.18	43.62	54.00	-10.38	101	154
9745.25	35.97	40.36	3.13	41.81	37.65	54.00	-16.35	102	5

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

Operator: Mailes Hsieh

RBW: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
2388.61	58.83	30.92	2.66	46.21	46.20	54.00	-7.80	101	165
2770.73	52.88	31.01	2.82	46.41	40.29	54.00	-13.71	102	285
4870.63	54.13	35.11	1.25	46.93	43.56	54.00	-10.44	100	13
7311.69	53.89	39.60	3.20	46.17	50.52	54.00	-3.48	101	155
9745.25	38.77	40.36	3.13	41.81	40.46	54.00	-13.54	102	5
12172.8	35.51	42.09	3.71	42.81	38.50	54.00	-15.50	100	130

Note:
" * ": Fundamental Frequency
"**": Not in the restricted band, Limit level=Fundamental Emission-20dB
" pk": peak reading
"av": average reading
"---": 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: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R (pk).	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1197.30	60.36	25.41	1.63	46.09	41.31	54.00	-12.69	102	98
1716.78	57.42	28.62	1.96	46.21	41.79	54.00	-12.21	101	63
1796.70	56.60	29.29	2.00	46.21	41.69	54.00	-12.31	100	57
2203.80	52.48	30.96	2.40	46.20	39.64	54.00	-14.36	101	107
4923.08	47.05	35.31	1.23	46.97	36.62	54.00	-17.38	100	8
7383.62	47.46	39.71	3.25	46.14	44.28	54.00	-9.72	101	165

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

Operator: Mailes Hsieh

RBW: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit	Margin (av)	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1794.21	62.69	29.27	2.00	46.21	47.75	54.00	-6.25	100	57
2388.61	58.81	30.92	2.66	46.21	46.19	54.00	-7.81	101	165
2423.58	56.18	30.92	2.71	46.21	43.60	54.00	-10.40	101	176
2985.51	54.16	31.09	2.82	46.57	41.51	54.00	-12.49	103	352
4923.08	52.04	35.31	1.23	46.97	41.60	54.00	-12.40	100	8
7383.62	54.08	39.71	3.25	46.14	50.90	54.00	-3.10	101	165

Note:
" * ": Fundamental Frequency
"**": Not in the restricted band, Limit level=Fundamental Emission-20dB
" pk": peak reading
"av": average reading
"---": 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	2412.6	117.21	---	---
Outside band	2397	83.91	33.3	Pass
11	2462.6	117.12	---	---
Outside band	2476.5	85.6	31.52	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: 1MHz
   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)

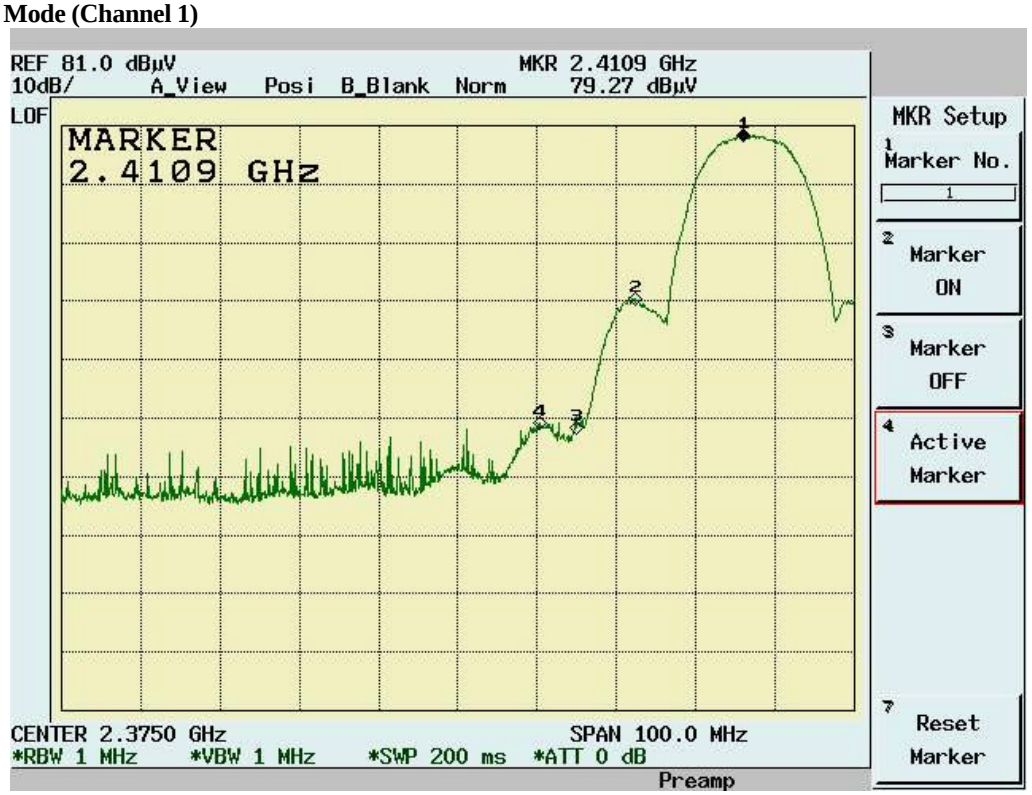
Temp. (deg. C): 25

Test Engr: Mailes Hsieh Humidity (%): 50

Channel	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
1(peak mode)	2410.9	79.27	31.1	110.37	---	---	1MHz	---
Outside band	2397.4	51.34	31.1	82.44	27.93	---	1MHz	Pass
1(average mode)	2412.8	71.06	31.1	102.16	---	---	10Hz	---
Restricted band	2386.8	18.95	31.1	50.05	---	54	10Hz	Pass
11(peak mode)	2460.7	83.27	31.1	114.37	---	---	1MHz	---
Outside band	2477.2	52.13	31.1	83.23	31.14	---	1MHz	Pass
11(average mode)	2461.3	70.48	31.1	101.58	---	---	10Hz	---
Restricted band	2487.2	20.69	31.1	51.79	---	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 Ristricted Band(Radiated)
Average Mode (Channel 11)

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

See MPE 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 Maximu m Hold function is completed.

5.7.2 Test Setup

5.7.3 Test Data

Maximum Peak Output Power Density

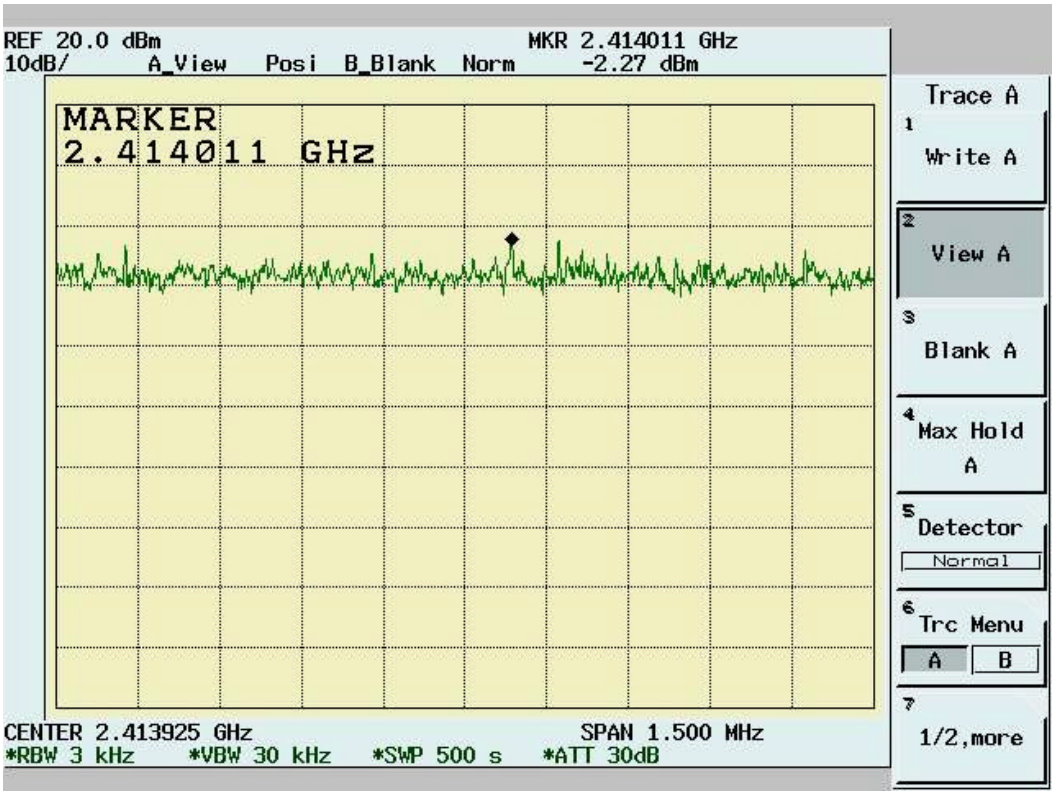
Temp. (deg. C): 25

Test Engr: Mailes Hsieh Humidity (%): 50

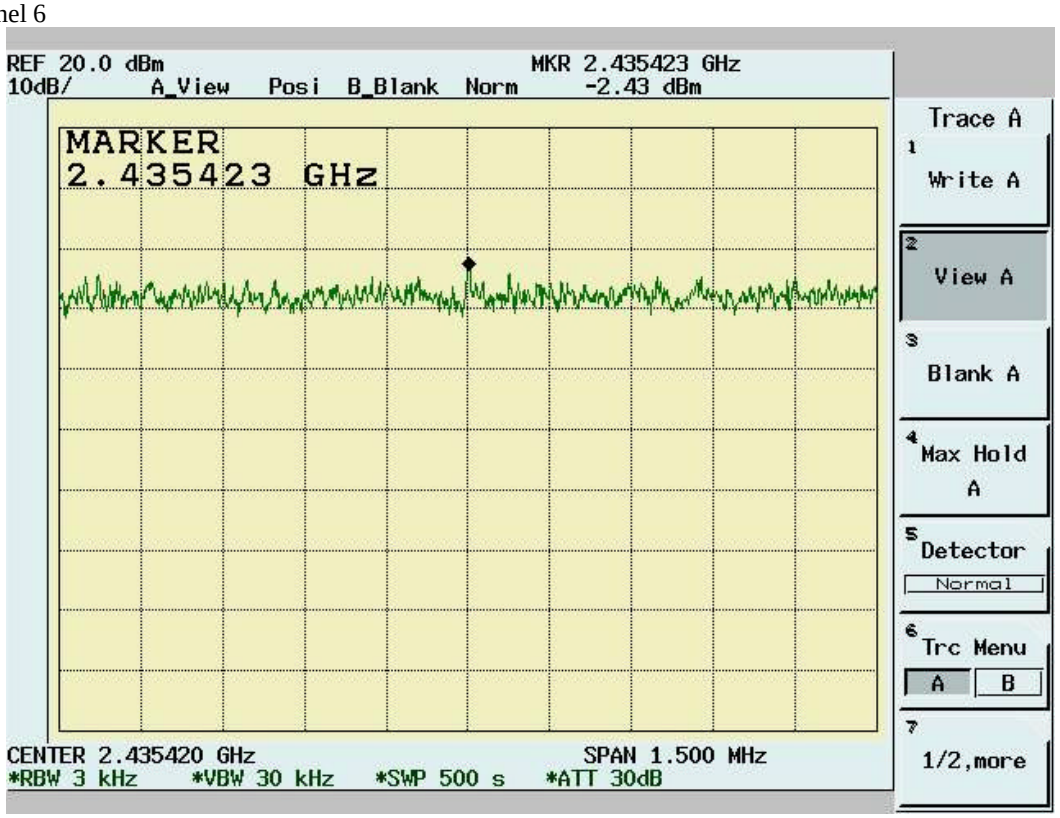
Chennel	Frequency (MHz)	Spectrum Reading (dBm/3KHz)	Cable Loss (dB)	Peak Power Output (dBm/3KHz)	Limit (dBm/3KHz)	Pass/Fail
1	2412	-2.27	1.1	-1.17	8	Pass
6	2437	-2.43	1.1	-1.33	8	Pass
11	2462	-2.37	1.1	-1.27	8	Pass

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

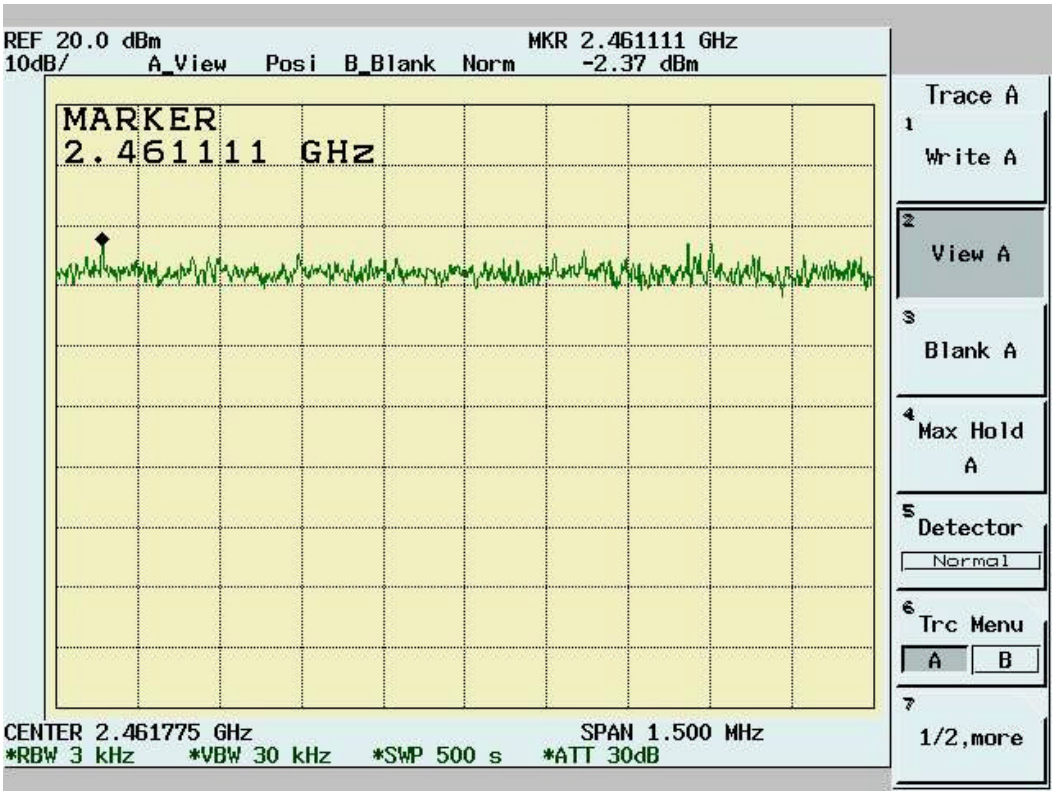
Channel 1



Channel 6



Channel 11


REF 20.0 dBm
10dB/ A_View Posi B_Blank Norm
MKR 2.461111 GHz
-2.37 dBm
MARKER
2.461111 GHz
CENTER 2.461775 GHz
SPAN 1.500 MHz
*RBW 3 kHz
*VBW 30 kHz
*SWP 500 s
*ATT 30dB
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector
Normal
6 Trc Menu
A B
7 1/2,more

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 6dß 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 6dß 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)

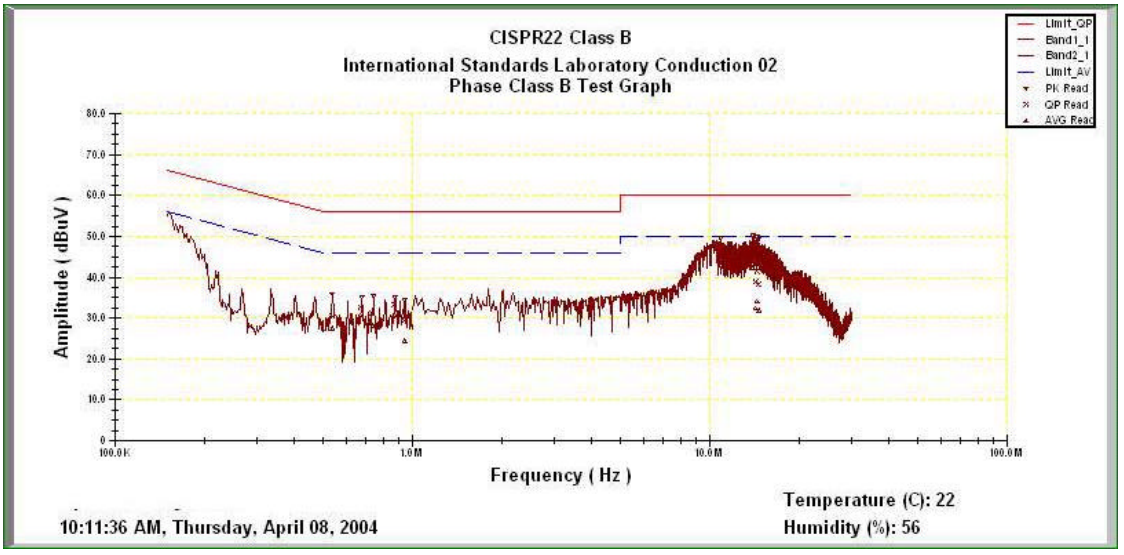
Frequency Range	150 KHz--30MHz
Detector Function	Quasi-Peak/Average
Bandwidth (RBW)	9KHz

6.1.4 Test Data:

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

Operator: Mailes Hsieh
Temperature (C): 22
10:11:36 AM, Thursday, April 08, 2004 Humidity (%): 56

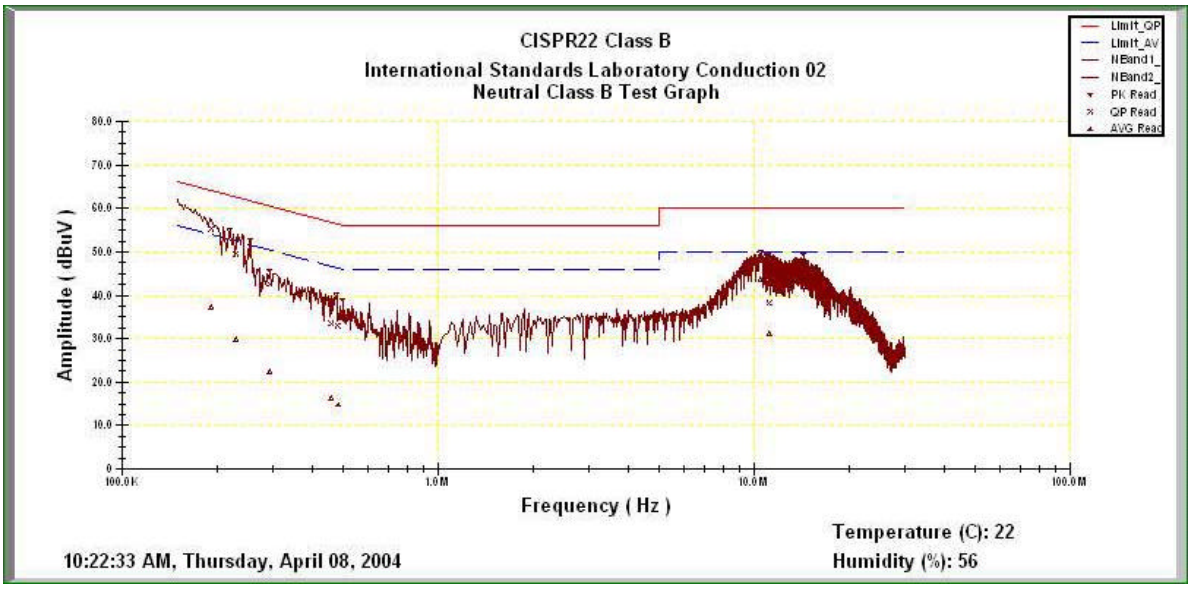
Frequency	LISN Loss	Cable Loss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.53828	0.12	0.03	30.44	56.00	-25.56	27.36	46.00	-18.64
0.6683	0.14	0.04	32.66	56.00	-23.34	30.64	46.00	-15.36
0.73431	0.16	0.05	31.14	56.00	-24.86	28.12	46.00	-17.88
0.86946	0.18	0.06	33.28	56.00	-22.72	30.88	46.00	-15.12
0.93993	0.19	0.07	29.46	56.00	-26.54	24.31	46.00	-21.69
10.9046	0.55	0.20	47.46	60.00	-12.54	43.01	50.00	-6.99
13.9134	0.66	0.27	47.69	60.00	-12.31	42.33	50.00	-7.67
14.2884	0.67	0.28	38.92	60.00	-21.08	32.35	50.00	-17.65
14.4344	0.68	0.29	41.35	60.00	-18.65	34.07	50.00	-15.93
14.6037	0.69	0.29	38.30	60.00	-21.70	31.74	50.00	-18.26



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

Operator: Mailes Hsieh
Temperature (C): 22
10:22:33 AM, Thursday, April 08, 2004 Humidity (%): 56

Frequency	LISN Loss	Cable Loss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.19138	0.10	0.02	55.21	64.82	-9.61	37.26	54.82	-17.56
0.22916	0.10	0.02	49.56	63.74	-14.18	29.72	53.74	-24.02
0.29223	0.10	0.02	42.60	61.94	-19.34	22.29	51.94	-29.65
0.45818	0.11	0.03	33.43	57.19	-23.77	16.38	47.19	-30.82
0.482	0.11	0.03	33.04	56.51	-23.47	14.85	46.51	-31.67
10.491	0.32	0.19	48.06	60.00	-11.94	43.70	50.00	-6.30
10.9588	0.33	0.20	48.22	60.00	-11.78	43.60	50.00	-6.40
11.0265	0.33	0.20	48.04	60.00	-11.96	43.63	50.00	-6.37
11.1362	0.33	0.21	38.20	60.00	-21.80	31.09	50.00	-18.91
14.2993	0.39	0.28	47.25	60.00	-12.75	42.02	50.00	-7.98



* 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

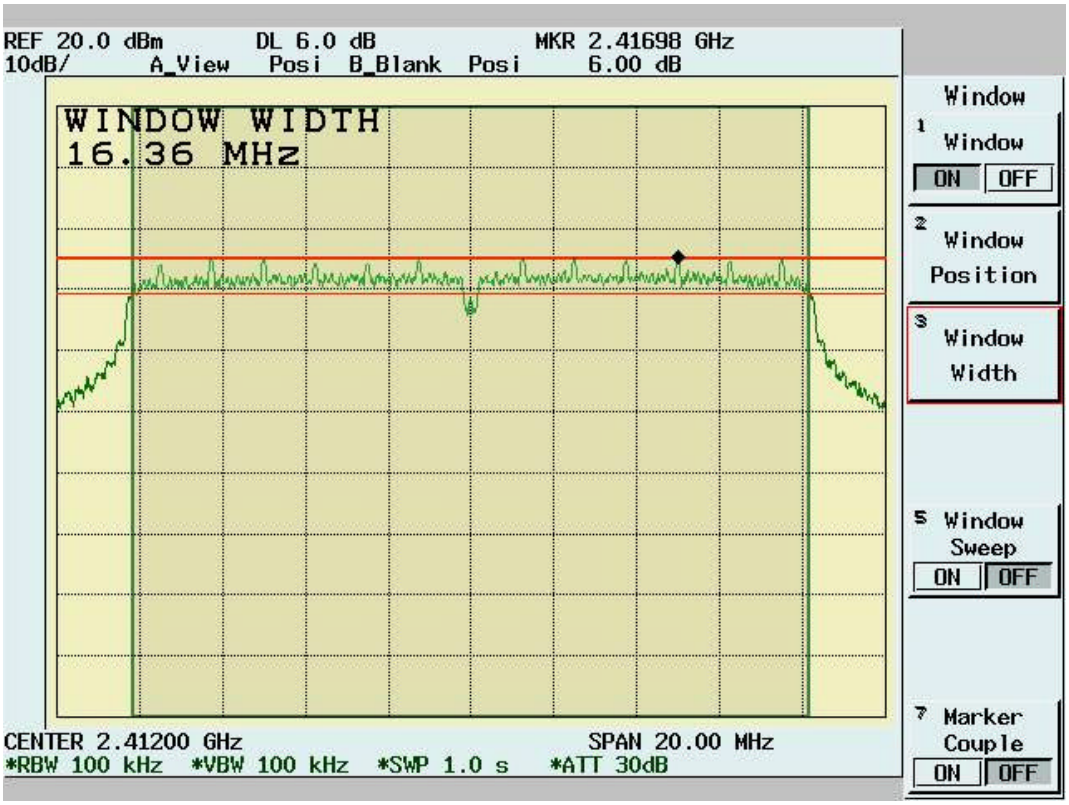
Temp. (deg. C): 25

Test Engr: Mailes Hsieh

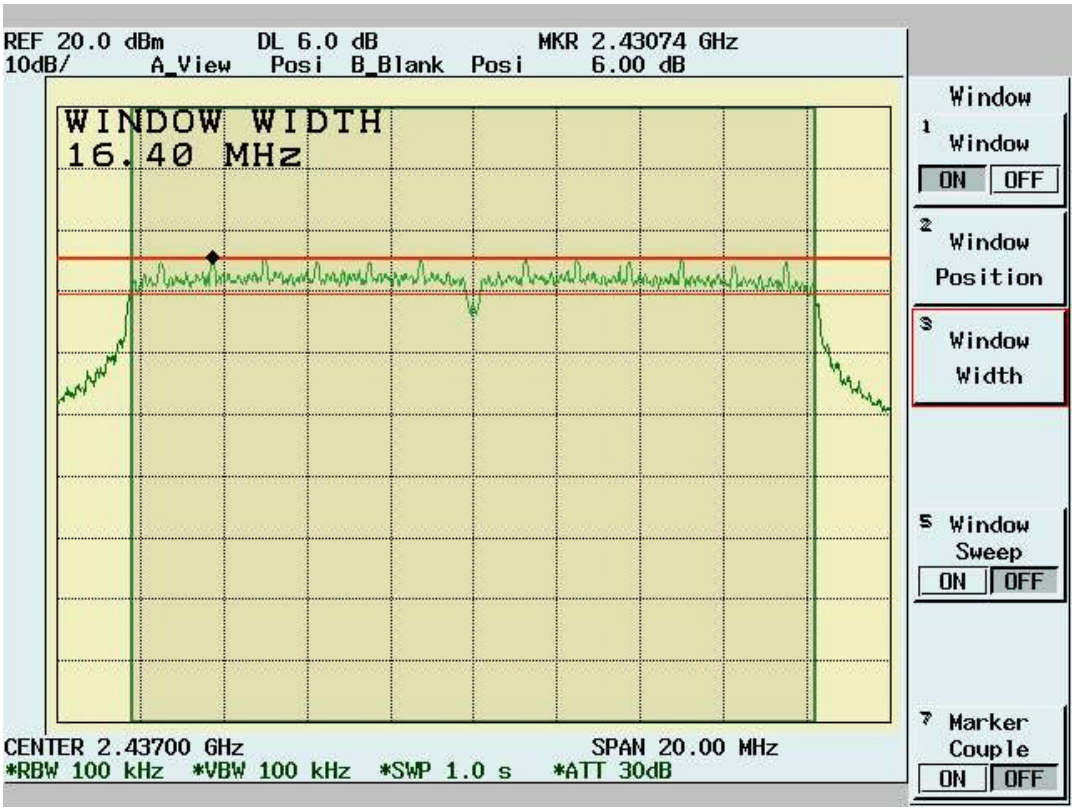
Humidity (%): 50

Chennel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	16.36	0.5	Pass
6	2437	16.4	0.5	Pass
11	2462	16.4	0.5	Pass

Channel 1:



Channel 6:



Channel 11:


REF 20.0 dBm
10dB/
DL 6.0 dB
A_View
Posi
B_Blank
Posi
MKR 2.45572 GHz
6.00 dB
WINDOW WIDTH
16.40 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 2.46200 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB

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	21.781	1.1	194.13	22.881	30	Pass
6	2437	21.531	1.1	183.27	22.631	30	Pass
11	2462	21.812	1.1	195.52	22.912	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 acc*ording to EMI Receiver/Spectrum Analyzer Configuration.*

For the test of 2^{nd} to 10^{th} 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)	1MHz

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

Humidity (%): 46
Temperature (C): 25

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
99.84	22.02	10.27	3.02	0.00	35.31	43.50	-8.19	150.00	31.00
198.78	25.45	8.86	4.18	0.00	38.49	43.50	-5.01	150.00	55.00
232.73	27.43	9.33	4.50	0.00	41.26	46.00	-4.74	200.00	55.00
298.69	21.57	13.57	4.69	0.00	39.84	46.00	-6.16	100.00	236.00
365.62	22.02	14.83	5.08	0.00	41.92	46.00	-4.08	200.00	285.00
397.63	20.39	15.92	5.30	0.00	41.61	46.00	-4.39	100.00	301.00
431.58	18.85	16.25	5.61	0.00	40.71	46.00	-5.29	150.00	219.00
465.53	14.70	16.80	5.88	0.00	37.38	46.00	-8.62	250.00	31.00
489.78	18.78	17.43	5.99	0.00	42.21	46.00	-3.79	100.00	31.00
563.5	13.73	19.05	6.56	0.00	39.33	46.00	-6.67	100.00	170.00

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

Operator: Mailes Hsieh

Humidity (%): 46
Temperature (C): 25

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
133.79	18.07	11.02	3.52	0.00	32.61	43.50	-10.89	250.00	298.00
364.65	15.85	14.80	5.07	0.00	35.72	46.00	-10.28	100.00	266.00
431.58	13.48	16.25	5.61	0.00	35.34	46.00	-10.66	100.00	266.00
489.78	16.84	17.43	5.99	0.00	40.26	46.00	-5.74	200.00	233.00
498.51	13.65	17.66	6.04	0.00	37.35	46.00	-8.65	100.00	298.00
643.04	9.86	19.07	7.00	0.00	35.94	46.00	-10.06	100.00	282.00
651.77	14.16	19.10	7.04	0.00	40.30	46.00	-5.70	250.00	298.00
662.44	8.76	19.08	7.07	0.00	34.90	46.00	-11.10	100.00	315.00
696.39	7.79	19.01	7.34	0.00	34.14	46.00	-11.86	150.00	315.00
864.2	7.11	20.54	8.24	0.00	35.89	46.00	-10.11	100.00	68.00

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

6.4.5 Test Data (1GHz – 25 GHz) .

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

Operator: Mailes Hsieh RBW: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1452.05	63.31	26.58	1.81	46.20	45.50	54.00	-8.50	101	81
2366.13	57.80	30.93	2.63	46.21	45.15	54.00	-8.85	101	158
2371.13	62.29	30.93	2.64	46.21	49.64	54.00	-4.36	101	160
4562.94	42.41	33.94	1.40	46.66	31.09	54.00	-22.91	101	44
7947.05	39.10	40.53	3.06	44.00	38.69	54.00	-15.31	100	247
8846.15	38.55	41.15	3.23	42.73	40.19	54.00	-13.81	103	56

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

Operator: Mailes Hsieh RBW: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1472.03	62.09	26.67	1.82	46.21	44.37	54.00	-9.63	101	79
1799.20	62.23	29.31	2.00	46.21	47.34	54.00	-6.66	100	57
2750.75	56.52	31.00	2.82	46.40	43.94	54.00	-10.06	102	279
2775.72	60.63	31.01	2.82	46.41	48.05	54.00	-5.95	102	287
4083.92	51.78	32.45	2.05	46.19	40.09	54.00	-13.91	102	92
7233.77	42.75	39.47	3.15	46.21	39.17	54.00	-14.83	101	143

Note:
" * ": Fundamental Frequency
"**": Not in the restricted band, Limit level=Fundamental Emission-20dB
" pk": peak reading
"av": average reading
"---": 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: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1469.53	67.60	26.66	1.82	46.21	49.87	54.00	-4.13	101	80
1794.21	56.80	29.27	2.00	46.21	41.86	54.00	-12.14	100	57
2396.10	59.24	30.92	2.67	46.21	46.63	54.00	-7.37	101	167
3755.24	52.41	31.86	2.12	46.37	40.01	54.00	-13.99	102	163
5384.62	42.09	35.91	1.13	47.29	31.83	54.00	-22.17	100	110
9769.23	35.80	40.31	3.12	41.74	37.49	54.00	-16.51	101	5

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

Spec: FCC Part 15 Class B & C

Operator: Mailes Hsieh

RBW: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R (pk).	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1876.62	63.68	29.96	2.04	46.20	49.48	54.00	-4.52	100	52
2388.61	59.93	30.92	2.66	46.21	47.31	54.00	-6.69	101	165
3758.74	58.97	31.86	2.12	46.37	46.58	54.00	-7.42	102	162
4080.42	54.08	32.44	2.05	46.19	42.38	54.00	-11.62	102	92
7305.69	41.41	39.59	3.20	46.18	38.02	54.00	-15.98	101	154
8972.03	38.17	40.94	3.18	42.83	39.47	54.00	-14.53	103	27

Note:
" * ": Fundamental Frequency
"**": Not in the restricted band, Limit level=Fundamental Emission-20dB
" pk": peak reading
"av": average reading
"---": 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: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1222.28	66.01	25.52	1.65	46.10	47.08	54.00	-6.92	102	97
1714.29	65.02	28.60	1.96	46.21	49.36	54.00	-4.64	101	63
2203.80	57.18	30.96	2.40	46.20	44.33	54.00	-9.67	100	107
4073.43	50.91	32.42	2.06	46.18	39.21	54.00	-14.79	102	93
7383.62	39.34	39.71	3.25	46.14	36.15	54.00	-17.85	101	165
9775.22	35.80	40.29	3.12	41.73	37.49	54.00	-16.51	101	4

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

Operator: Mailes Hsieh

RBW: 1 MHz
Humidity (%): 46
Temperature (C): 25

Frequency	Rx_R. (pk)	Ant_F.	Cab_L.	PreAmpl	Emission (pk)	Limit (av)	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1796.70	61.84	29.29	2.00	46.21	46.93	54.00	-7.07	100	57
2123.88	61.56	30.98	2.29	46.20	48.62	54.00	-5.38	100	82
2393.61	59.47	30.92	2.67	46.21	46.85	54.00	-7.15	101	167
4181.82	49.17	32.75	1.90	46.29	37.53	54.00	-16.47	102	82
7377.62	43.40	39.70	3.24	46.14	40.20	54.00	-13.80	101	164
9253.75	36.03	40.90	3.20	42.65	37.48	54.00	-16.52	102	15

Note:
" * ": Fundamental Frequency
"**": Not in the restricted band, Limit level=Fundamental Emission-20dB
" pk": peak reading
"av": average reading
"---": 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.

6.5 Band Edge Measurement

6.5.1 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

6.5.2 Test Setup (Conducted)

6.5.3 Test Data:

Table: Band Edge measurement (Conducted)

Temp. (deg. C): 25

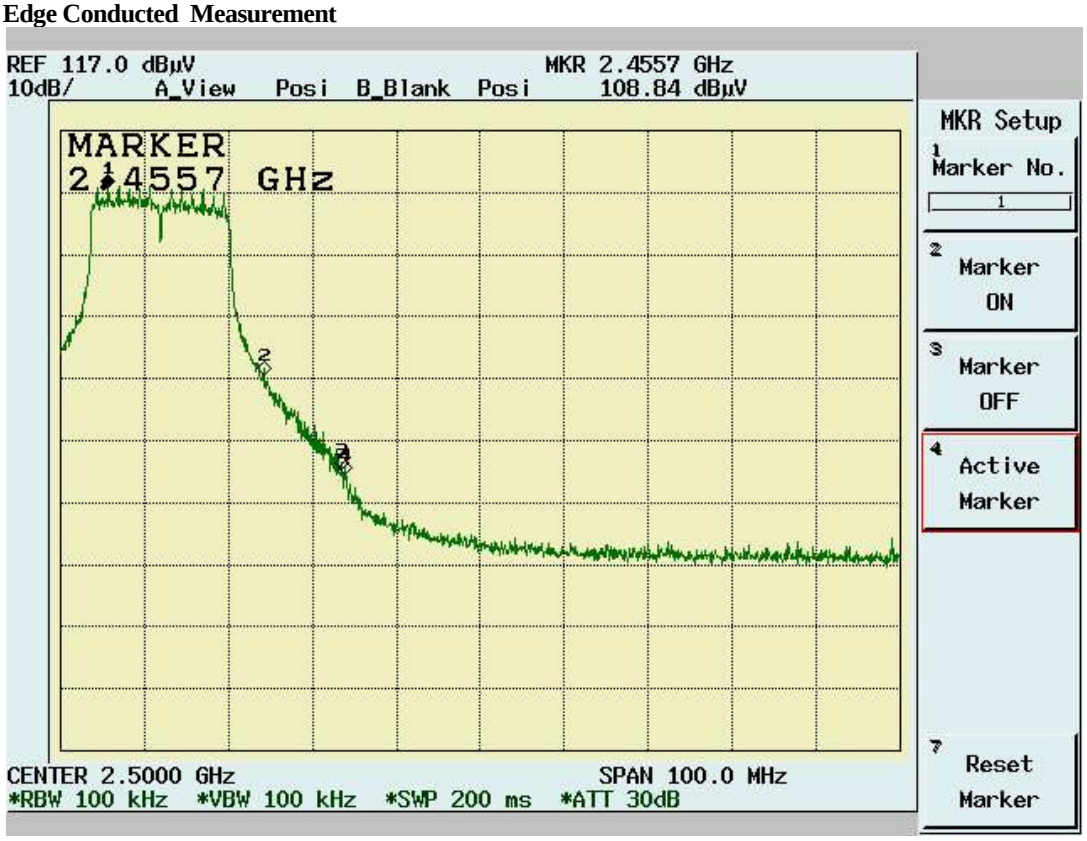
Test Engr: Mailes Hsieh Humidity (%): 50

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
1	2413.2	108.07	---	---
Outside band	2399.7	80.21	27.86	Pass
11	2455.7	108.84	---	---
Outside band	2474.2	78.61	30.23	Pass

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

Band Edge Conducted measurement

Band Edge Conducted Measurement



6.5.4 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: 1MHz
   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.

6.5.5 Test Setup (Radiated)

Same as *Radiated Emission Measurement*

6.5.6 Test Data

Table Band Edge measurement (Radiated)

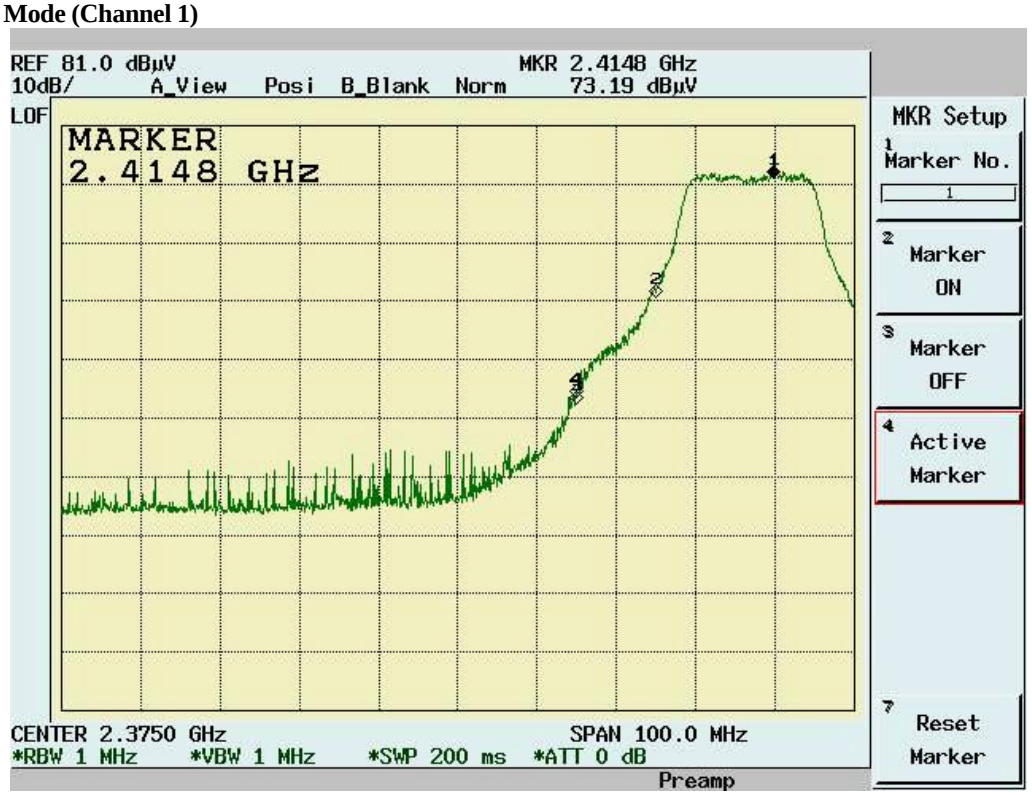
Temp. (deg. C): 25

Test Engr: Mailes Hsieh Humidity (%): 50

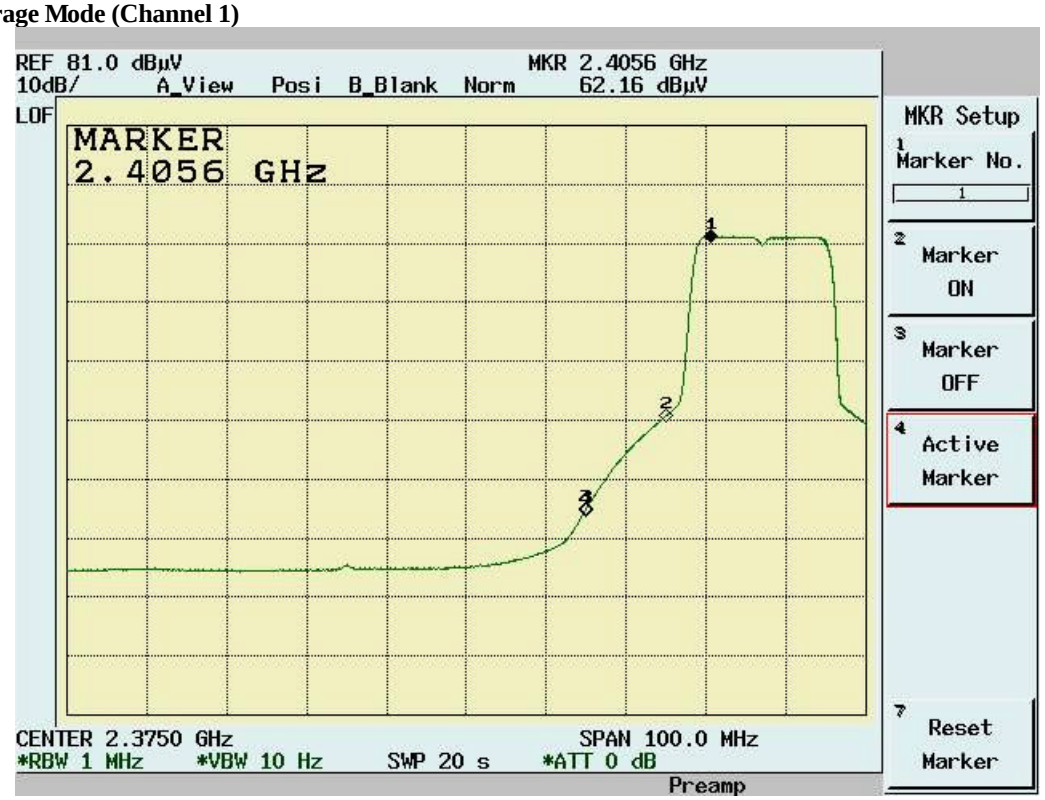
Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	dBc (Limit: > 20dBc)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
1(peak mode)	2414.8	73.19	31.1	104.29	---	---	1MHz	---
Outside band	2400	52.71	31.1	83.81	20.48	---	1MHz	Pass
1(average mode)	2405.6	62.16	31.1	93.26	---	---	10Hz	---
Restricted band	2389.9	15.77	31.1	46.87	---	54	10Hz	Pass
11(peak mode)	2464.7	76.8	31.1	107.9	---	---	1MHz	---
Outside band	2478.5	46.02	31.1	77.12	30.78	---	1MHz	Pass
11(average mode)	2467.2	65.74	31.1	96.84	---	---	10Hz	---
Restricted band	2483.6	21.05	31.1	52.15	---	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.

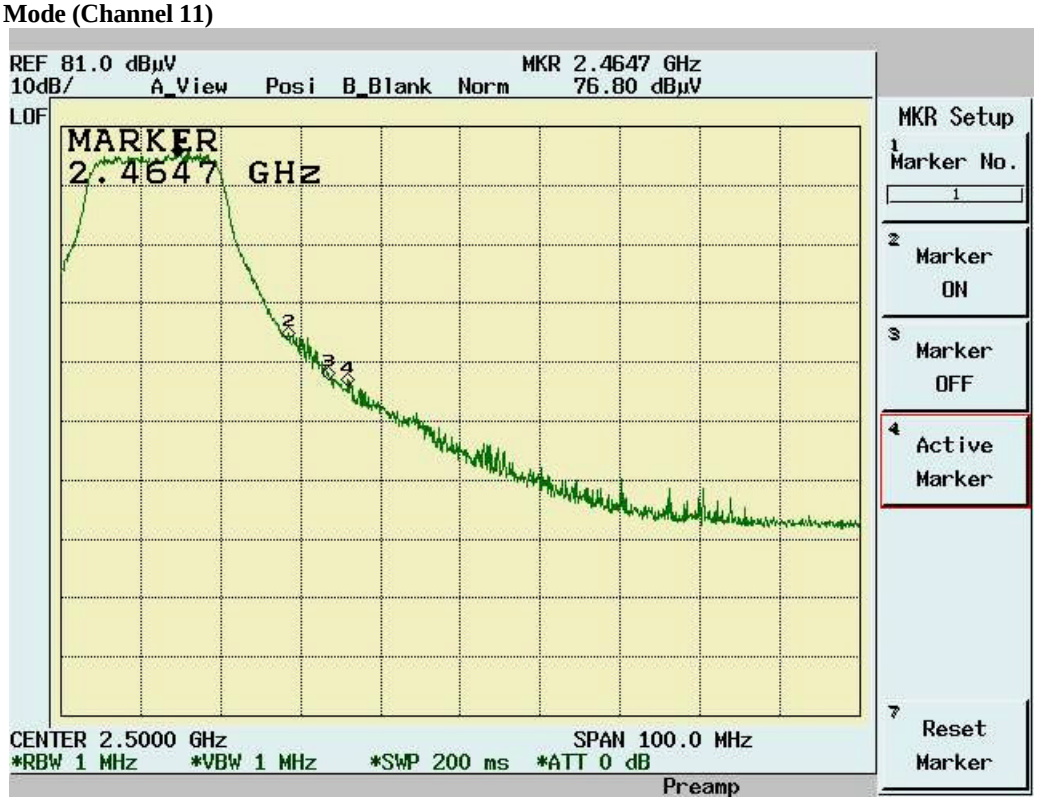
Band Edge measurement for radiated emission in Restricted Band(Radiated)
Peak Mode (Channel 1)



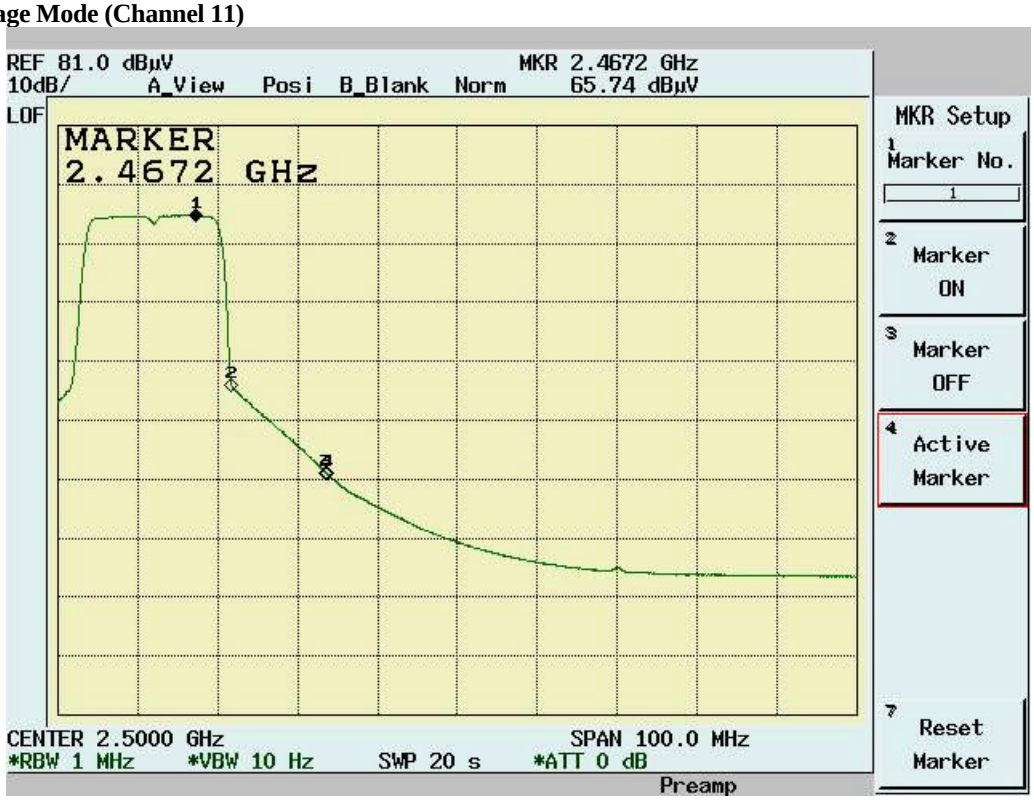
Band Edge measurement for radiated emission in Restricted Band(Radiated)
Average Mode (Channel 1)



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



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



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

See MPE report

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

6.7.1 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 Maximu m Hold function is completed.

6.7.2 Test Setup

6.7.3 Test Data

Maximum Peak Output Power Density

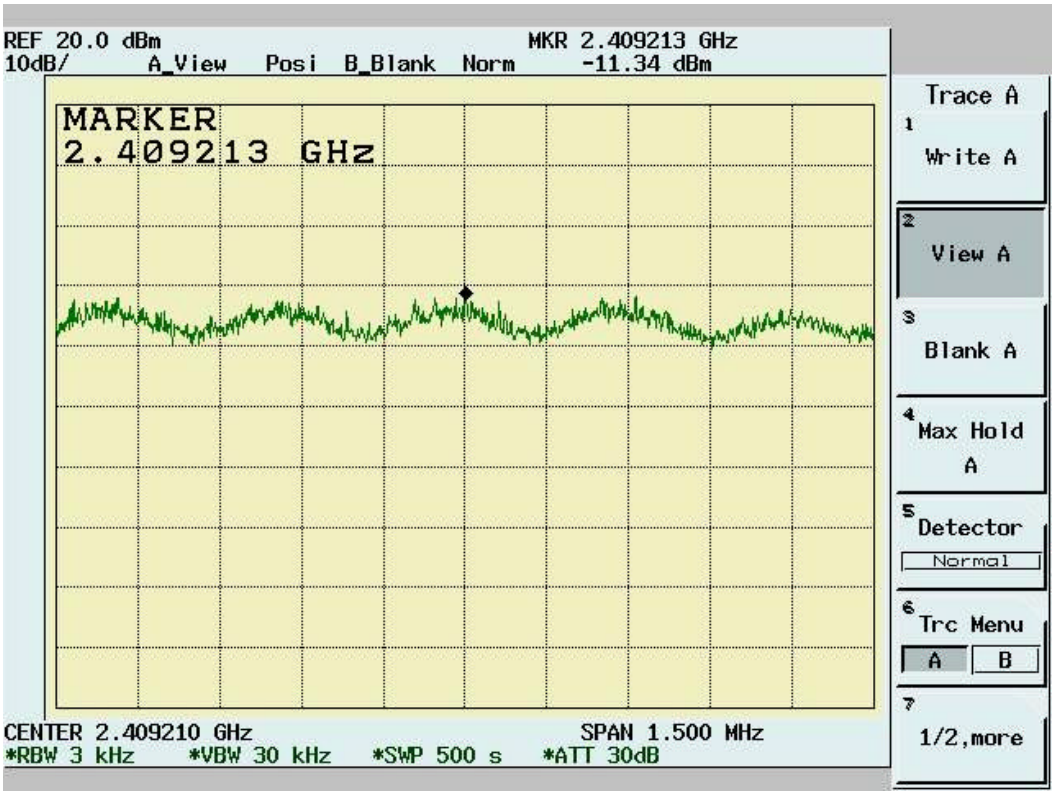
Temp. (deg. C): 25

Test Engr: Mailes Hsieh Humidity (%): 50

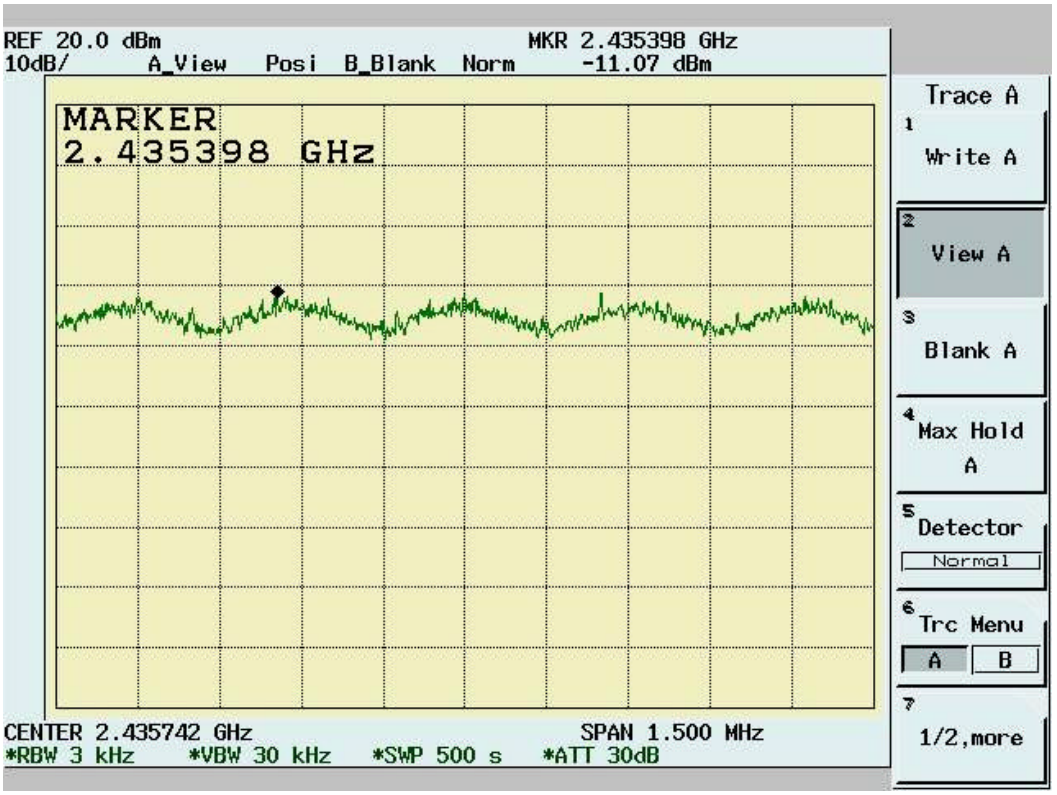
Chennel	Frequency (MHz)	Spectrum Reading (dBm/3KHz)	Cable Loss (dB)	Peak Power Output (dBm/3KHz)	Limit (dBm/3KHz)	Pass/Fail
1	2412	-11.34	1.1	-10.24	8	Pass
6	2437	-11.07	1.1	-9.97	8	Pass
11	2462	-9.8	1.1	-8.7	8	Pass

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

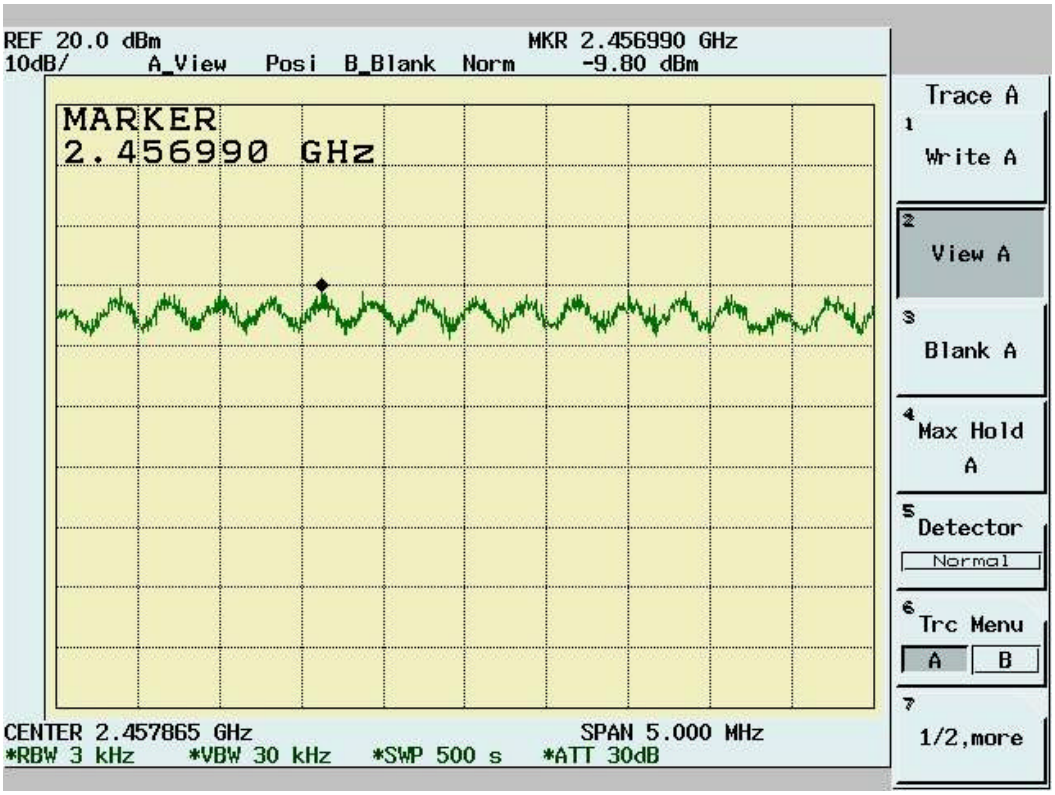
Channel 1



Channel 6



Channel 11


REF 20.0 dBm
10dB/ A_View Posi B_Blank Norm
MKR 2.456990 GHz
-9.80 dBm
MARKER
2.456990 GHz
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector
Normal
6 Trc Menu
A B
7 1/2,more
CENTER 2.457865 GHz
SPAN 5.000 MHz
*RBW 3 kHz *VBW 30 kHz *SWP 500 s *ATT 30dB

7. Appendix

7.1 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.

7.2 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°C. 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 reading 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.

7.3 Appendix C: Test Equipment

7.3.1 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	06/02/2003	06/02/2004
Conduction	Digital Hygro-Thermometer Conduct	MicroLife	HT-2126G	ISL-Conduction02	12/04/2002	12/04/2004
Conduction	EMI Receiver 03	HP	85460A	3448A00209	01/08/2004	01/08/2005
Conduction	LISN 01	R&S	ESH2-Z5	890485/013	04/30/2003	04/30/2004
Conduction	LISN 04	EMCO	3810/2	9604-1429	12/18/2003	12/18/2004
Radiation	BILOG Antenna 08	Schaffner	CBL6112B	2756	06/03/2003	06/03/2004
Radiation	Coaxial Cable Chmb 02-10M	Belden	RG-8/U	Chmb 02-10M	09/09/2003	09/09/2004
Radiation	Microwave Cable Chmb 02 3M	HUBER+SUHNER AG.	Sucoflex 103	42731/3 & 42729/3	03/17/2004	03/17/2005
Radiation	Digital Hygro-Thermometer Chmb 02	MicroLife	HT-2126G	Chmb 02	12/04/2002	12/04/2004
Radiation	EMI Receiver 02	HP	85460A	3448A00183	10/02/2003	10/02/2004
Radiation	EMI Receiver 04	AFJ	ER 55CR	55390143233	05/20/2003	05/20/2004
Radiation	Spectrum Analyzer 13	Advantest	R3132	121200411	02/12/2004	02/12/2005
Rad. Above 1Ghz	Horn Antenna 02	Com-Power	AH-118	10088	02/17/2004	02/17/2005
Rad. Above 1Ghz	Horn Antenna 04	Com-Power	AH-826	081-001	01/07/2004	01/07/2005
Rad. Above 1Ghz	Horn Antenna 05	Com-Power	AH-640	100A	09/18/2003	09/18/2005
Rad. Above 1Ghz	Microwave Cable RF SK-01	HUBER+SUHNER AG.	Sucoflex 102	22139 /2	02/17/2004	02/17/2005
Rad. Above 1Ghz	Peak Power Analyzer	HP	8990A	3621A01269	01/02/2004	01/02/2005
Rad. Above 1Ghz	Power Sensor Radar	HP	84815A	3318A01828	01/02/2004	01/02/2006
Rad. Spurious Emission	Power Meter 01	HP	438A	3513U06187	01/07/2004	01/07/2005
Rad. Spurious Emission	Power Sensor RF 01	HP	8481H	MY41091048	06/17/2003	06/17/2004
Rad. Above 1Ghz	Preamplifier 02	MITEQ	AFS44-00102650-40-10P-44	728229	05/13/2003	05/13/2004
Rad. Above 1Ghz	Preamplifier 09	MITEQ	AFS44-00102650-40-10P-44	858687	05/13/2003	05/13/2004
Rad. Above 1Ghz	Preamplifier 10	MITEQ	JS-26004000-27-5A	818471	N/A	N/A
Rad. Above 1Ghz	Spectrum Analyzer 07	Advantest	R3182	110600649	04/08/2004	04/08/2005

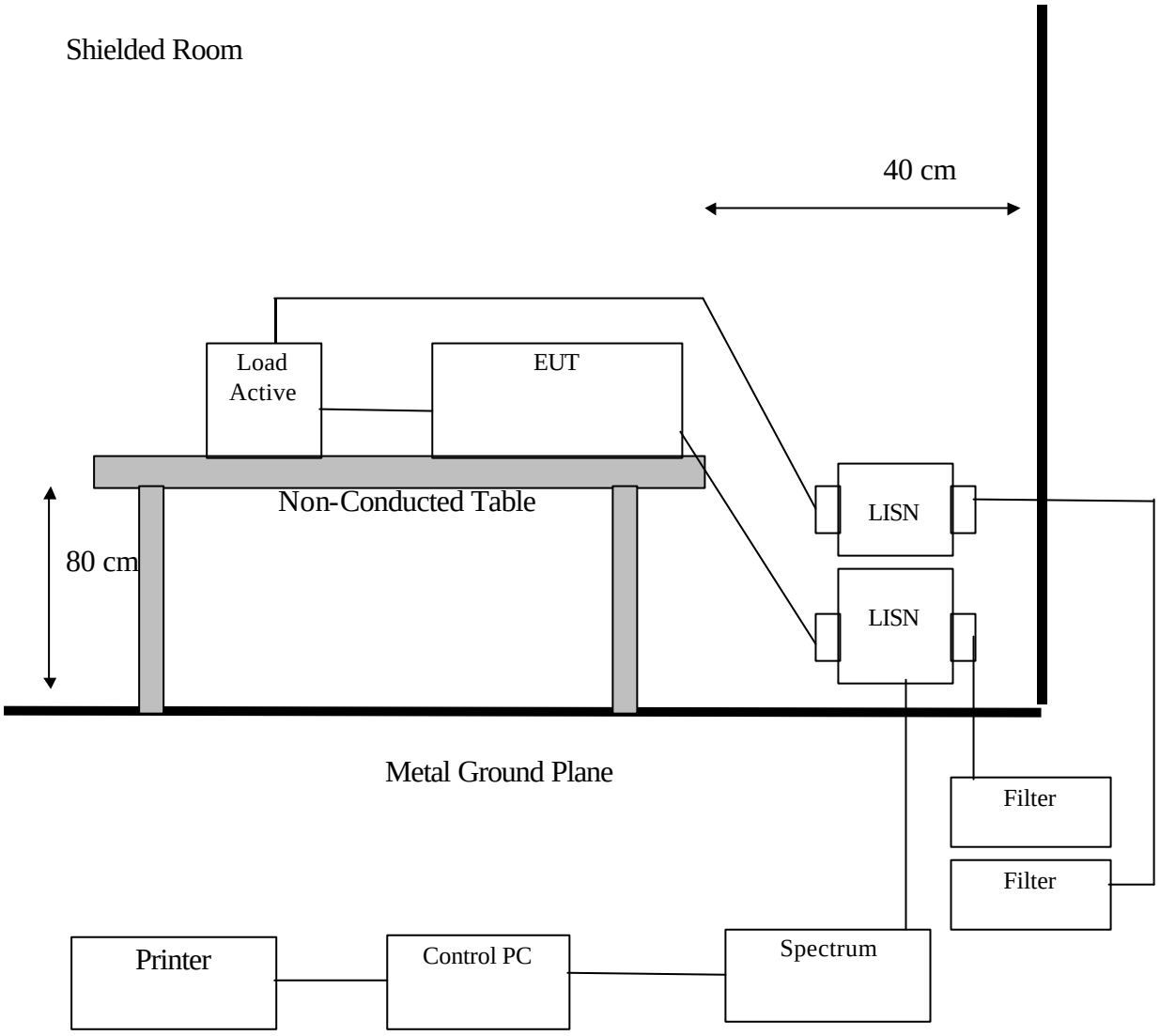
Note: Calibration is traceable to NIST or national or international standards.

7.3.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

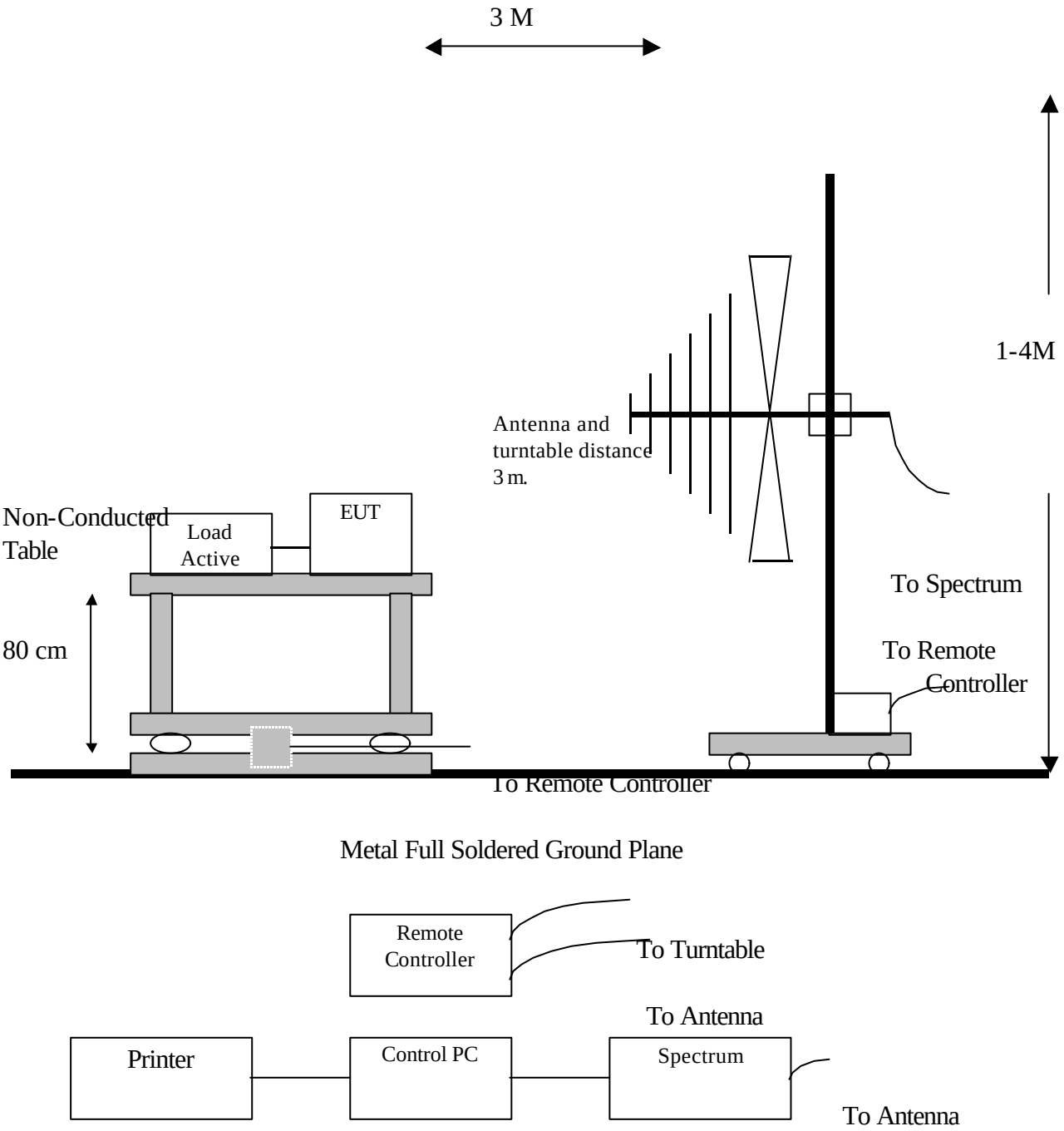
Radiation/Conduction	Filename	Version	Issued Date
Conduction	Tile.exe	1.12E	7/7/2000
Radiation	Tile.exe	1.12C	6/16/2000

7.4 Appendix D: Layout of EUT and Support Equipment

7.4.1 General Conducted Test Configuration



7.4.2 General Radiation Test Configuration



7.5 Appendix E: Description of Support Equipment

7.5.1 Description of Support Equipment

Support Unit 1.

Description:	Notebook Personal Computer
Model No.:	Aspire1510,ZP2,ZP2A
Brand:	acer
AC Power Adapter Manufacturer:	LSE(Model:ADP-90FB REV:F) LSE(Model:0202C1990) LSE(Model:0317A19135) Delta(Model:ADP-90FB REV:F) LiteOn(Model:ADP-135DBB)
HDD:	HGST (Model: IC25N030ATMR04-0)
Modem Card:	Ambit (Model: T60M283.10)
FDD:	Panasonic (Model:UJ-266A343FC)
SDRAM:	Infineon (Model:HYS64D32020GDL-6-B)
1394 C0nnector:	one 4 Pins
USB Connector:	four 4 Pins
RJ11 Connector:	one 2 Pins
RJ45 Connector:	one 8 Pins
VGA Connector:	one 15 Pins
PCMCIA Slot	one
Line out Port:	one
Line-in Port:	one
Parallel Port	one 25pins
DC IN Port:	one
Battery:	Li-ION DC14.8V 4400mAh
LCD:	QSI (Model:QD150XL06-01)
CPU	AMD Athlon 64 2800+, 3000+, 4000+

Support Unit 2.

Description:	USB 2.0 Card Reader/Writer
Model Number:	UID12W
Serial Number:	N/A
Power Supply Type:	From USB Port
USB 2.0 Port:	one 4-pin
SD/MMC Card Slot:	one
SecureDigital Card (Option):	SD (Model: SD-M16B1) 16MB
USB Cable:	Shielded, Detachable (With Cord)
FCC ID:	(Comply with FCC DOC)

Support Unit 3.

Description:	USB 2.0 Card Reader/Writer
Model Number:	UID12W
Serial Number:	N/A
Power Supply Type:	From USB Port
USB 2.0 Port:	one 4-pin
SD/MMC Card Slot:	one
SecureDigital Card (Option):	SD (Model: SD-M16B1) 16MB
USB Cable:	Shielded, Detachable (With Cord)
FCC ID:	(Comply with FCC DOC)

Support Unit 4.

Description:	Digital Video Camera
Model:	DCR-PC100
Serial Number:	173009
Power Supply Type:	AC Power Adaptor (SONY, Model: AC-L10A)
Power Cord:	Nonshielded, Detachable
FCC ID:	(Comply with FCC DOC)

Support Unit 5.

Description:	DELL USB Mouse
Model Number:	M-UR69
Serial Number:	LNA24412741
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A (Comply with FCC DOC)

Support Unit 6.

Description:	DELL USB Keyboard
Model Number:	RT7D10
Serial Number:	TH-05695W-37171-2B7-1021
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	AQ6-7D10

Support Unit 7.

Description:	KOKA Headphone
Model Number:	ST-304
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 8.

Description:	KOKA Microphone
Model Number:	DM-510
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 9.

Description:	HP Printer (for parallel interface port)
Model Number:	C2642A
Serial Number:	TH84T1N3J3
Power Supply Type:	AC Adaptor (HP Model: C2175A)
Power Cord:	Non-shielded, Detachable
Data Cable:	Shielded, Detachable, With Metal Hood
FCC ID:	B94C2642X

Support Unit 10.

Description:	DELL 19” LCD Monitor
Model:	2000FP
AC Adapter:	DELL(ADP-70EB)
Serial Number:	N/A
DSUB In:	One 15 Pins
DVI In:	One Pins
S-Video In:	One7 Pins
Power Cord:	Non-shielded, Detachable
FCC ID:	(Comply with FCC DOC)

7.5.2 Software for Controlling Support Unit

A test program which generates a complete line of continuously repeating "H" pattern is used as the software test program. The program was executed as follows:

A. Read and write to the disk drives.
B. R/W memory card form EUT USB Port through Card Reader/Writer
C. R/W memory card form EUT USB Port through Card Reader/Writer
D. Capture the image from digital video camera then transfer to display.(CCD).
E. Send audio signal to the headphone.
F. Receive audio signal from the microphone.
G. Send H pattern to the parallel port device (Printer).
H. Send H pattern to the video port device (LCD Monitor).
I. The RF software makes the transmitter contiunely sending RF signals
J. Repeat the above steps.

	Filename	Issued Date
Monitor	HH.bat	8/20/1991
Printer1	Wordpad.exe	11/11/1999
Digital Video Camera	Divpcam.exe	12/10/1998
Winthrax	Winthrax.exe	5/21/1996
Winthrax	Winthrax.exe	5/21/1996
Atheros_1.6.2002	ART.exe	2003/12/17

7.5.3 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to AC Power Cord Inlet (3-pin)	1.8M	Nonshielded, Detachable	Plastic Head
Printer Data Cable	Printer to PC Parallel port	1.5M	Shielded, Detachable	Metal Head
Microphone Data Cable	Microphone to PC Line In Port	1.5M	Nonshielded, Undetachable	Plastic Head
Headphone Data Cable	Headphone to PC Line Out Port	1.2M	Nonshielded, Undetachable	Plastic Head
Keyboard Data Cable	Keyboard to PC Keyboard port	1.8M	Shielded, Undetachable	Metal Head
Mouse Data Cable	Mouse to PC Mouse port	1.8M	Shielded, Un-detachable	Metal Head
Digital Video Camera 1394 Data Cable	Digital Video Camera to 1394 port of PC	1.0M	Shielded, Detachable	Metal Head
USB Data Cable	EUT USB Port to Card Reader/Writer	1.0 M	Shielded, detachable (with cord)	Metal Head
USB Data Cable	EUT USB Port to Card Reader/Writer	1.0 M	Shielded, detachable (with cord)	Metal Head
LCD Monitor D-SUB Data Cable	LCD Monitor to EUT D-SUB Port	1.6M	Shielded, Detachable	Metal Head
LCD Monitor S Data Cable	LCD Monitor to EUT S Port	1.6M	Shielded, Detachable	Metal Head

7.6 Appendix F: Accuracy of Measurement

Test Site: Conduction 02

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	k=2	0.104	k=1	0.052
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.330	k=1	0.165
3	Receiver Calibration	Rectangular	k=1.73	1.000	k=1	0.577
4	LISN Factor Calibration	Normal	k=2	1.200	k=1	0.600
5	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
6	Combined Standard Uncertainty Uc(y)	Normal			k=1	0.850
7	**Total Uncertainty @95% mim. Confidence Level**	**Normal**	**k=2**	**1.701**		

Measurement Uncertainty Calculations:

Uc (y) = square root (u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2)

U = 2 * Uc (y)

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS : The treatment of Uncertainty in EMC Measurement.

Test Site: Chamber 02-3M

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	k=2	0.067	k=1	0.034
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.103	k=1	0.052
3	Receiver Calibration	Rectangular	k=1.73	1.000	k=1	0.577
4	Antenna Factor Calibration	Normal	k=2	1.700	k=1	0.850
5	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
6	Combined Standard Uncertainty Uc(y)	Normal			k=1	1.029
7	**Total Uncertainty @95% mim. Confidence Level**	**Normal**	**k=2**	**2.059**		

Measurement Uncertainty Calculations:

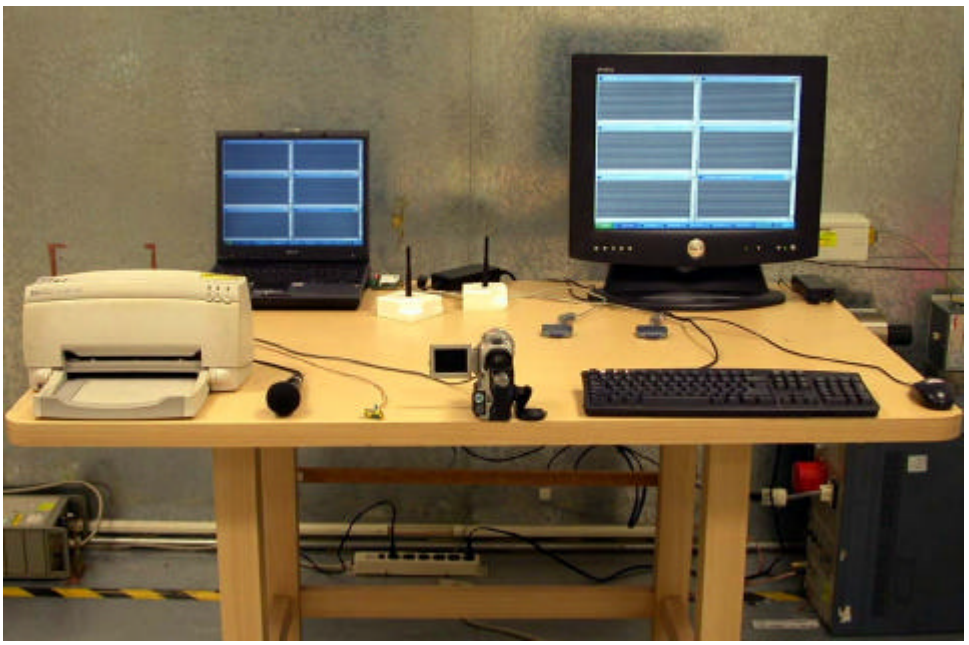
Uc (y) = square root (u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2)

U = 2 * Uc (y)

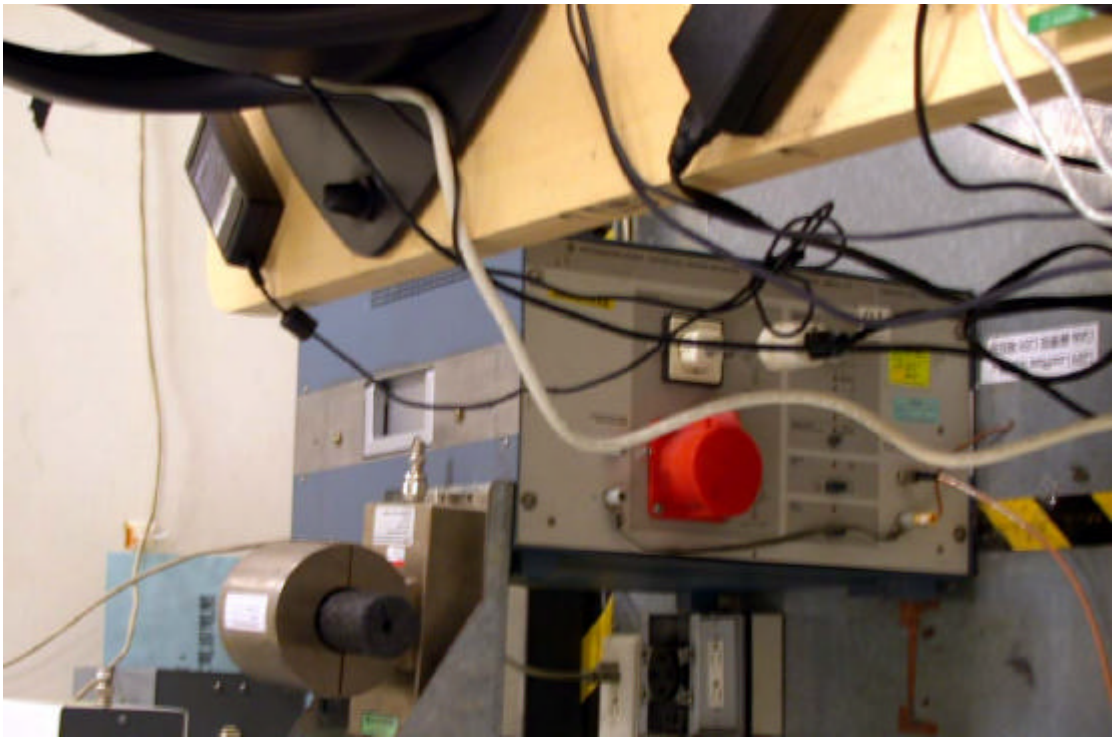
Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS : The treatment of Uncertainty in EMC Measurement.

7.7 Appendix G: Photographs of EUT Configuration Test Set Up

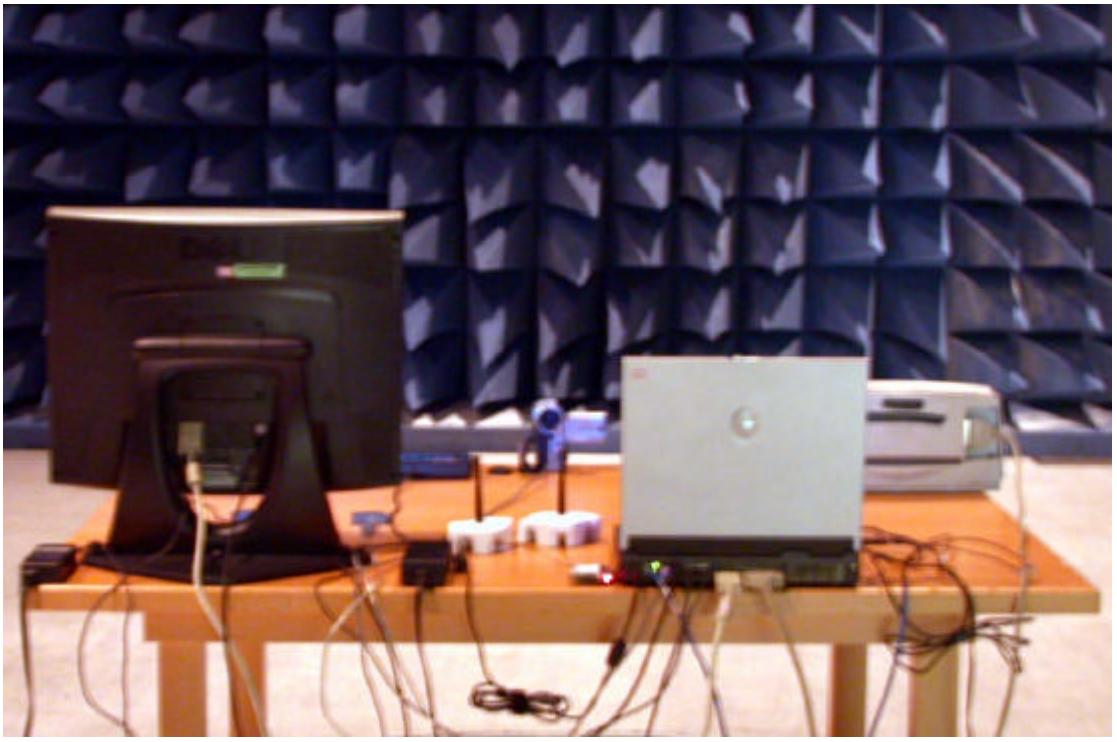
The Front View of Highest Conducted Set-up For EUT



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

7.8 Appendix H: Antenna Spec.

Please refer to the attached file.