

(Configuration 3: Notebook + Vehicle Docking + WLAN + Bluetooth)

(with 12" LCD, resolution: 1024x768)

Test Report
for
FCC Part 15 Subpart B & C

of

Product Name

Noterbook Personal Computer;
Noterbook Personal Computer with Office Docking;
Noterbook Personal Computer with Vehicle Docking

Model

ML900;
ML900 Office Docking;
ML900 Vehicle Docking
(Brand:MOTOROLA)

Applied by:

MITAC Technology Corporation
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Hsinchu Science-Based industrial Park, Hsinchu 300
Taiwan,R. O. C.

Test Performed by:

International Standards Laboratory

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

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

ISL-T10-R29-1

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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
Noterbook Personal Computer;
Noterbook Personal Computer with Office Docking;

Equipment Tested: Noterbook Personal Computer with Vehicle Docking

Model: ML900; ML900 Office Docking; ML900 Vehicle Docking

Applied by: MITAC Technology Corporation

Sample received Date: 2005/07/26

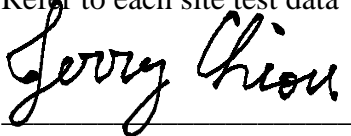
Final test Date : 2005/08/08-2005/09/05

Test Result PASS

Test Site: Chamber 02, Conduction 02

Temperature Refer to each site test data

Humidity: Refer to each site test data

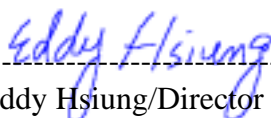


Test Engineer: Jerry Chiou

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



Eddy Hsiung/Director

Test results given in this report apply only to the specific sample(s) tested under stated test conditions. This report shall not be reproduced other than in full without the explicit written consent of ISL. This report totally contains 79 pages, including 1 cover page , 2 contents page, and 76 pages for the test description. This report must not be use to claim product endorsement by NVLAP or any agency of the U.S. Government.

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

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	MPE 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	MPE report attached
15.247 (d)	Power Spectral Density	Pass	

The Bluetooth 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(a)	AC Power Line Emissions	Pass	
15.247(b) (1)	Max. Peak Output Power	Pass	
15.209(a)	Radiated Emissions 30MHz – 25 GHz	Pass	
15.247 (c)	Band Edge Measurement	Pass	
15.247(a)(1)(iii)	Number of Hopping Frequency Used	Pass	
15.247(a) (1)(ii)	Spectrum Bandwidth Of FHSS device	Pass	
15.247(a)(1)	Hopping Channel Separation	Pass	
15.247(a)(1)(iii)	Dwell Time	Pass	

3. TEST RESULTS (802.11b)

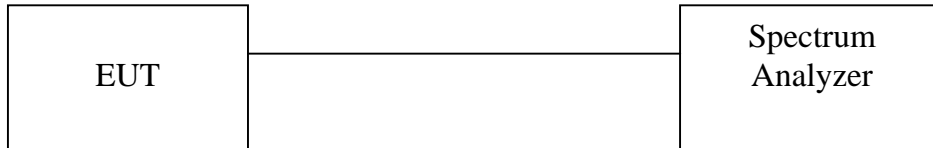
3.1 Bandwidth for DSSS [Section 15.247 (a)(2)]

3.1.1 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

3.1.2 Test Setup



3.1.3 Test Data:

6dB Bandwidth

Test Engineer: Jerry Chiou

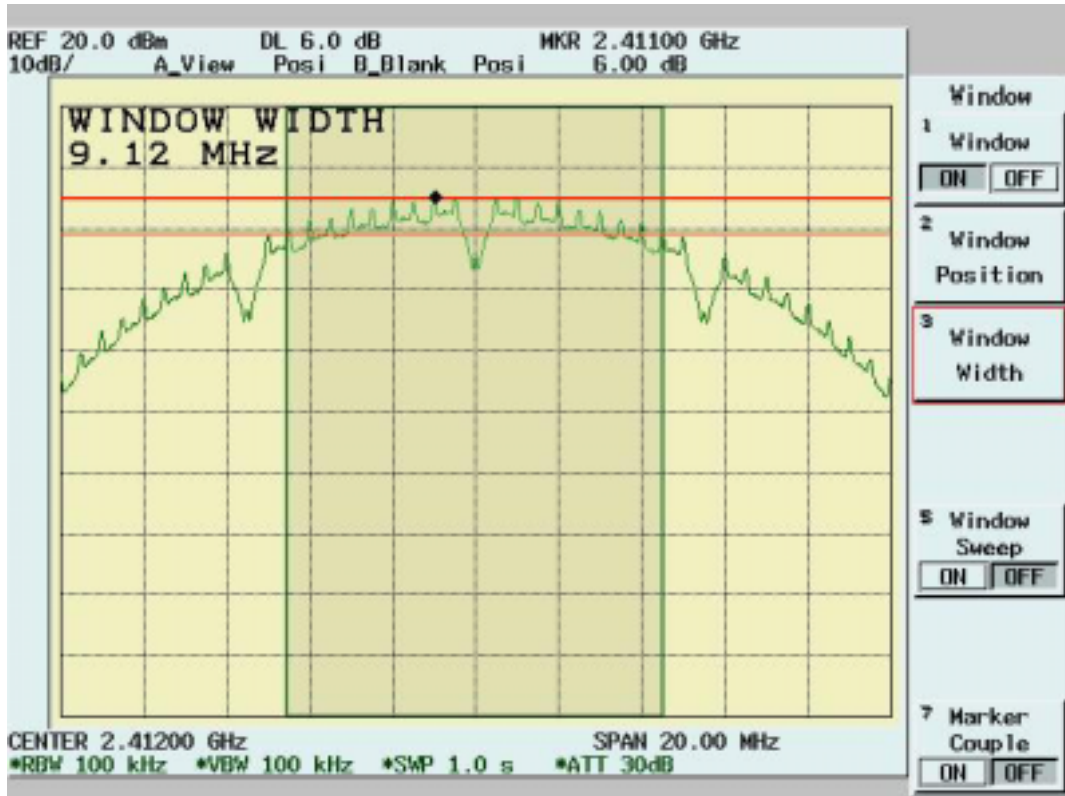
Temperature (): 27

Tx Data Rate=1Mbps

Humidity (%): 55

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	9.12	0.5	Pass
6	2437	9.20	0.5	Pass
11	2462	9.12	0.5	Pass

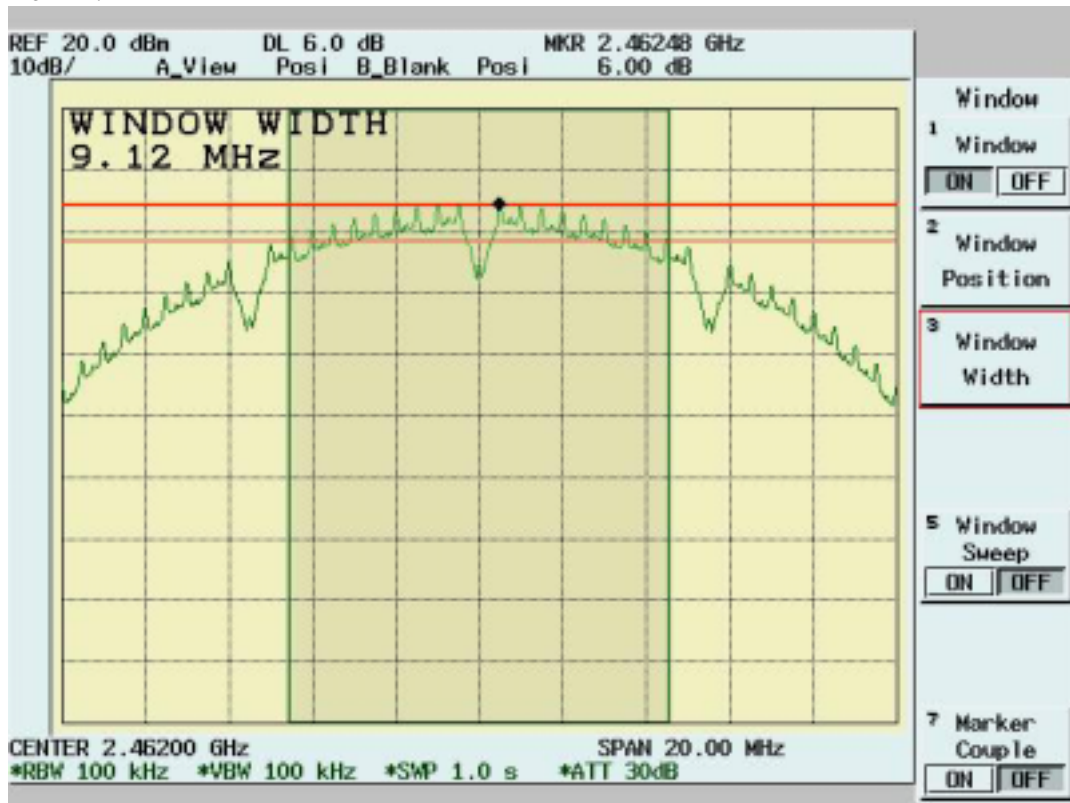
Channel 1:



Channel 6:



Channel 11:

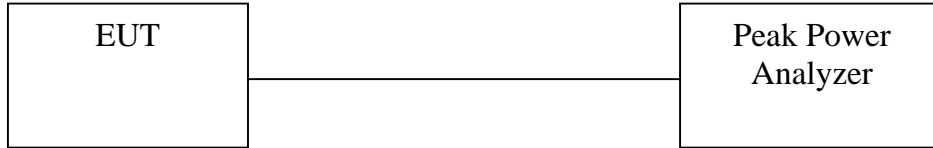


3.2 DSSS Maximum Peak Output Power [Section 15.247 (b)(1)]

3.2.1 Test Procedure

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

3.2.2 Test Setup



3.2.3 Test Data

Maximum Peak Output Power

Test Engineer: Jerry Chiou

Temperature (): 27

Tx Data Rate=1Mbps

Humidity (%): 55

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	16.62	1.10	59.21	17.72	30	Pass
6	2437	16.00	1.10	51.27	17.10	30	Pass
11	2462	15.72	1.10	48.06	16.82	30	Pass

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

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

3.3.1 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.

3.3.2 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.

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

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	3MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

3.3.4 Test Data (30MHz – 1GHz):

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

Operator: Jerry Chiou
 Temperature (C): 23
 Humidity (%): 54

07:41:10 PM, Friday, August 12, 2005

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmpGain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
96.93	20.78	9.69	1.90	0.00	32.37	43.50	-11.13	103.00	43.00
314.21	12.58	15.99	3.76	0.00	32.33	46.00	-13.67	196.00	235.00
332.64	12.80	16.10	3.95	0.00	32.85	46.00	-13.15	196.00	235.00
372.41	16.98	16.07	4.25	0.00	37.30	46.00	-8.70	196.00	203.00
497.54	10.48	17.34	5.26	0.00	33.09	46.00	-12.91	196.00	350.00
666.32	17.26	19.00	6.41	0.00	42.67	46.00	-3.33	196.00	219.00
733.25	12.09	19.80	6.89	0.00	38.78	46.00	-7.22	196.00	301.00
833.16	8.70	20.43	7.71	0.00	36.84	46.00	-9.16	196.00	252.00

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

Operator: Jerry Chiou
 Temperature (C): 23
 Humidity (%): 54

07:41:10 PM, Friday, August 12, 2005

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmpGain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
332.64	15.93	16.10	3.95	0.00	35.98	46.00	-10.02	196.00	235.00
353.98	13.26	16.18	4.14	0.00	33.57	46.00	-12.43	196.00	219.00
361.74	13.65	16.13	4.19	0.00	33.96	46.00	-12.04	196.00	219.00
366.59	14.28	16.10	4.22	0.00	34.60	46.00	-11.40	103.00	337.00
498.51	11.77	17.36	5.27	0.00	34.41	46.00	-11.59	196.00	350.00
666.32	17.05	19.00	6.41	0.00	42.45	46.00	-3.55	196.00	219.00
733.25	10.91	19.80	6.89	0.00	37.59	46.00	-8.41	196.00	301.00
833.16	8.93	20.43	7.71	0.00	37.07	46.00	-8.93	196.00	252.00

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

3.3.5 Test Data (1GHz – 25 GHz) .

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
1132.37	48.13 pk	25.11	2.19	34.00	41.43 pk	54.00 av	-12.57	102	103
1332.17	47.77 pk	26.03	2.21	34.11	41.89 pk	54.00 av	-12.11	101	89
1999	44.34 pk	30.99	2.60	35.18	42.75 pk	54.00 av	-11.25	100	43
2151.35	43.28 pk	30.97	2.14	35.19	41.20 pk	54.00 av	-12.80	100	91
2238.76	43.77 pk	30.95	1.87	35.19	41.41 pk	54.00 av	-12.59	101	118
2311.19	52.93 pk	30.94	1.65	35.19	50.33 pk	54.00 av	-3.67	101	141
2326.17	48.62 pk	30.93	1.60	35.19	45.96 pk	54.00 av	-8.04	101	145
2341.16	50.78 pk	30.93	1.56	35.19	48.08 pk	54.00 av	-5.92	101	150
2361.14	50.16 pk	30.93	1.50	35.19	47.40 pk	54.00 av	-6.60	101	156
2491.01	46.15 pk	30.90	1.41	35.20	43.26 pk	54.00 av	-10.74	101	197
2510.99	46.87 pk	30.90	1.36	35.19	43.94 pk	54.00 av	-10.06	102	203
2603.4	44.53 pk	30.94	1.38	35.11	41.74 pk	54.00 av	-12.26	102	232
2675.82	44.37 pk	30.97	1.39	35.04	41.69 pk	54.00 av	-12.31	102	255
4823.84	46.52 pk	34.93	2.12	37.72	45.86 pk	54.00 av	-8.14	100.00	0.00
7235.8	46.32 pk	39.48	2.68	36.83	51.65 pk	54.00 av	-2.35	100.00	32.00
9648.02	46.11 pk	40.57	3.25	34.33	55.60 pk	74.00 pk	-18.40	100.00	5.00
9648.02	33.91 av	40.57	3.25	34.33	43.40 av	54.00 av	-10.60	100.00	5.00

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

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
1164.84	47.02 pk	25.26	2.19	34.02	40.44 pk	54.00 av	-13.56	102	101
1264.74	46.98 pk	25.72	2.20	34.07	40.82 pk	54.00 av	-13.18	101	94
1332.17	46.55 pk	26.03	2.21	34.11	40.68 pk	54.00 av	-13.32	101	89
1664.34	44.58 pk	28.18	2.35	34.52	40.59 pk	54.00 av	-13.41	101	66
1811.69	44.17 pk	29.42	2.46	34.81	41.24 pk	54.00 av	-12.76	100	56
1829.17	43.05 pk	29.57	2.47	34.85	40.24 pk	54.00 av	-13.76	100	55
1839.16	44.23 pk	29.65	2.48	34.86	41.50 pk	54.00 av	-12.50	100	54
1846.65	43.67 pk	29.71	2.49	34.88	40.99 pk	54.00 av	-13.01	100	54
1999	42.01 pk	30.99	2.60	35.18	40.42 pk	54.00 av	-13.58	100	43
2311.19	51.22 pk	30.94	1.65	35.19	48.61 pk	54.00 av	-5.39	101	141
2326.17	46.76 pk	30.93	1.60	35.19	44.10 pk	54.00 av	-9.90	101	145
2373.63	51.52 pk	30.93	1.46	35.19	48.71 pk	54.00 av	-5.29	101	160
2510.99	44.49 pk	30.90	1.36	35.19	41.57 pk	54.00 av	-12.43	102	203
2798.2	42.45 pk	31.02	1.41	34.93	39.95 pk	54.00 av	-14.05	102	294
4824.24	46.98 pk	34.93	2.12	37.72	46.32 pk	54.00 av	-7.68	100.00	286.00
7237.2	46.21 pk	39.48	2.68	36.83	51.54 pk	54.00 av	-2.46	100.00	354.00
9648.04	46.34 pk	40.57	3.25	34.33	55.83 pk	74.00 pk	-18.17	100.00	315.00
9648.04	32.76 av	40.57	3.25	34.33	42.25 av	54.00 av	-11.75	100.00	315.00

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.
- “ * ”: Fundamental Frequency
- “***”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk” : peak mode
- “ av” : average mode
- “---“: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

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

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
1132.37	46.83 pk	25.11	2.19	34.00	40.12 pk	54.00 av	-13.88	102	103
1332.17	47.53 pk	26.03	2.21	34.11	41.66 pk	54.00 av	-12.34	101	89
1999	42.15 pk	30.99	2.60	35.18	40.56 pk	54.00 av	-13.44	100	43
2168.83	41.59 pk	30.97	2.08	35.19	39.45 pk	54.00 av	-14.55	101	96
2231.27	43.40 pk	30.95	1.89	35.19	41.06 pk	54.00 av	-12.94	101	116
2271.23	44.45 pk	30.95	1.77	35.19	41.98 pk	54.00 av	-12.02	101	128
2288.71	45.45 pk	30.94	1.72	35.19	42.92 pk	54.00 av	-11.08	101	134
2313.69	46.93 pk	30.94	1.64	35.19	44.32 pk	54.00 av	-9.68	101	141
2333.67	51.74 pk	30.93	1.58	35.19	49.06 pk	54.00 av	-4.94	101	148
2353.65	48.75 pk	30.93	1.52	35.19	46.01 pk	54.00 av	-7.99	101	154
2363.64	47.73 pk	30.93	1.49	35.19	44.96 pk	54.00 av	-9.04	101	157
2518.48	44.01 pk	30.91	1.36	35.18	41.10 pk	54.00 av	-12.90	102	206
2535.96	45.25 pk	30.91	1.37	35.17	42.36 pk	54.00 av	-11.64	102	211
2610.89	43.13 pk	30.94	1.38	35.10	40.36 pk	54.00 av	-13.64	102	235
4874.2	46.74 pk	35.12	2.14	37.77	46.23 pk	54.00 av	-7.77	100.00	347.00
7311.66	45.47 pk	39.60	2.55	36.70	50.92 pk	54.00 av	-3.08	100.00	346.00
9747.96	44.03 pk	40.35	3.30	34.37	53.31 pk	74.00 pk	-20.69	100.00	360.00
9747.96	28.12 av	40.35	3.30	34.37	37.40 av	54.00 av	-16.60	100.00	360.00

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
1164.84	48.39 pk	25.26	2.19	34.02	41.82 pk	54.00 av	-12.18	102	101
1332.17	47.80 pk	26.03	2.21	34.11	41.93 pk	54.00 av	-12.07	101	89
1392.11	47.23 pk	26.30	2.22	34.14	41.61 pk	54.00 av	-12.39	101	85
1814.19	44.32 pk	29.44	2.46	34.82	41.41 pk	54.00 av	-12.59	100	56
1831.67	44.48 pk	29.59	2.48	34.85	41.70 pk	54.00 av	-12.30	100	55
1844.16	45.45 pk	29.69	2.48	34.87	42.75 pk	54.00 av	-11.25	100	54
2231.27	44.66 pk	30.95	1.89	35.19	42.32 pk	54.00 av	-11.68	101	116
2276.22	45.48 pk	30.94	1.76	35.19	43.00 pk	54.00 av	-11.00	101	130
2316.18	47.05 pk	30.94	1.64	35.19	44.43 pk	54.00 av	-9.57	101	142
2333.67	52.16 pk	30.93	1.58	35.19	49.49 pk	54.00 av	-4.51	101	148
2356.14	46.95 pk	30.93	1.51	35.19	44.19 pk	54.00 av	-9.81	101	155
2503.5	44.63 pk	30.90	1.36	35.20	41.69 pk	54.00 av	-12.31	102	201
2518.48	44.68 pk	30.91	1.36	35.18	41.77 pk	54.00 av	-12.23	102	206
4873.76	47.16 pk	35.12	2.14	37.77	46.65 pk	54.00 av	-7.35	100.00	307.00
7310.16	46.18 pk	39.60	2.55	36.70	51.63 pk	54.00 av	-2.37	100.00	360.00
9748.08	43.92 pk	40.35	3.30	34.37	53.20 pk	74.00 pk	-20.80	100.00	266.00
9748.08	30.15 av	40.35	3.30	34.37	39.43 av	54.00 av	-14.57	100.00	266.00

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.
- “ * ”: Fundamental Frequency
- “***”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk ”: peak mode
- “ av ”: average mode
- “ --- ”: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

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

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
1332.17	47.41 pk	26.03	2.21	34.11	41.53 pk	54.00 av	-12.47	101	89
1814.19	44.28 pk	29.44	2.46	34.82	41.37 pk	54.00 av	-12.63	100	56
1819.18	42.55 pk	29.48	2.47	34.83	39.68 pk	54.00 av	-14.32	100	55
1999	42.48 pk	30.99	2.60	35.18	40.90 pk	54.00 av	-13.10	100	43
2198.8	42.80 pk	30.96	1.99	35.19	40.56 pk	54.00 av	-13.44	101	105
2243.76	42.82 pk	30.95	1.86	35.19	40.44 pk	54.00 av	-13.56	101	120
2256.24	45.64 pk	30.95	1.82	35.19	43.22 pk	54.00 av	-10.78	101	123
2286.21	50.54 pk	30.94	1.73	35.19	48.02 pk	54.00 av	-5.98	101	133
2358.64	50.13 pk	30.93	1.51	35.19	47.37 pk	54.00 av	-6.63	101	156
2378.62	47.89 pk	30.92	1.44	35.20	45.06 pk	54.00 av	-8.94	101	162
2540.96	43.52 pk	30.92	1.37	35.16	40.64 pk	54.00 av	-13.36	102	213
2563.44	43.34 pk	30.93	1.37	35.14	40.49 pk	54.00 av	-13.51	102	220
2623.38	43.03 pk	30.95	1.38	35.09	40.27 pk	54.00 av	-13.73	102	239
4923.94	51.27 pk	35.31	2.15	37.83	50.90 pk	54.00 av	-3.10	100.00	33.00
7384.96	45.54 pk	39.72	2.42	36.56	51.11 pk	54.00 av	-2.89	100.00	27.00
9848.22	45.32 pk	40.13	3.35	34.41	54.40 pk	74.00 pk	-19.60	100.00	0.00
9848.22	31.01 av	40.13	3.35	34.41	40.08 av	54.00 av	-13.92	100.00	0.00

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

Operator: Jerry Chiou

RBW: 1MHz
 Humidity (%): 41
 Temperature (C): 27

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
1029.97	46.46 pk	24.64	2.17	33.95	39.33 pk	54.00 av	-14.67	102	110
1132.37	46.81 pk	25.11	2.19	34.00	40.11 pk	54.00 av	-13.89	102	103
1164.84	48.30 pk	25.26	2.19	34.02	41.73 pk	54.00 av	-12.27	102	101
1332.17	47.99 pk	26.03	2.21	34.11	42.12 pk	54.00 av	-11.88	101	89
1664.34	43.54 pk	28.18	2.35	34.52	39.55 pk	54.00 av	-14.45	101	66
1811.69	43.66 pk	29.42	2.46	34.81	40.73 pk	54.00 av	-13.27	100	56
1846.65	44.45 pk	29.71	2.49	34.88	41.76 pk	54.00 av	-12.24	100	54
2256.24	44.66 pk	30.95	1.82	35.19	42.24 pk	54.00 av	-11.76	101	123
2286.21	48.97 pk	30.94	1.73	35.19	46.45 pk	54.00 av	-7.55	101	133
2301.2	46.64 pk	30.94	1.68	35.19	44.07 pk	54.00 av	-9.93	101	138
2358.64	48.80 pk	30.93	1.51	35.19	46.04 pk	54.00 av	-7.96	101	156
2386.11	48.27 pk	30.92	1.42	35.20	45.42 pk	54.00 av	-8.58	101	164
2798.2	43.27 pk	31.02	1.41	34.93	40.77 pk	54.00 av	-13.23	102	294
4924.14	53.06 pk	35.31	2.15	37.83	52.70 pk	54.00 av	-1.30	100.00	18.00
7386.4	46.90 pk	39.72	2.42	36.56	52.48 pk	54.00 av	-1.52	100.00	360.00
9848.2	45.07 pk	40.13	3.35	34.41	54.15 pk	74.00 pk	-19.85	100.00	318.00
9848.2	31.31 av	40.13	3.35	34.41	40.38 av	54.00 av	-13.62	100.00	318.00

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.
- “ * ”: Fundamental Frequency
- “***”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk”: peak mode
- “av”: average mode
- “---“: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

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

3.4 Band Edge Measurement

3.4.1 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

3.4.2 Test Setup (Conducted)



3.4.3 Test Data:

Table: Band Edge measurement (Conducted)

Test Engineer: Jerry Chiou

Temperature (): 27

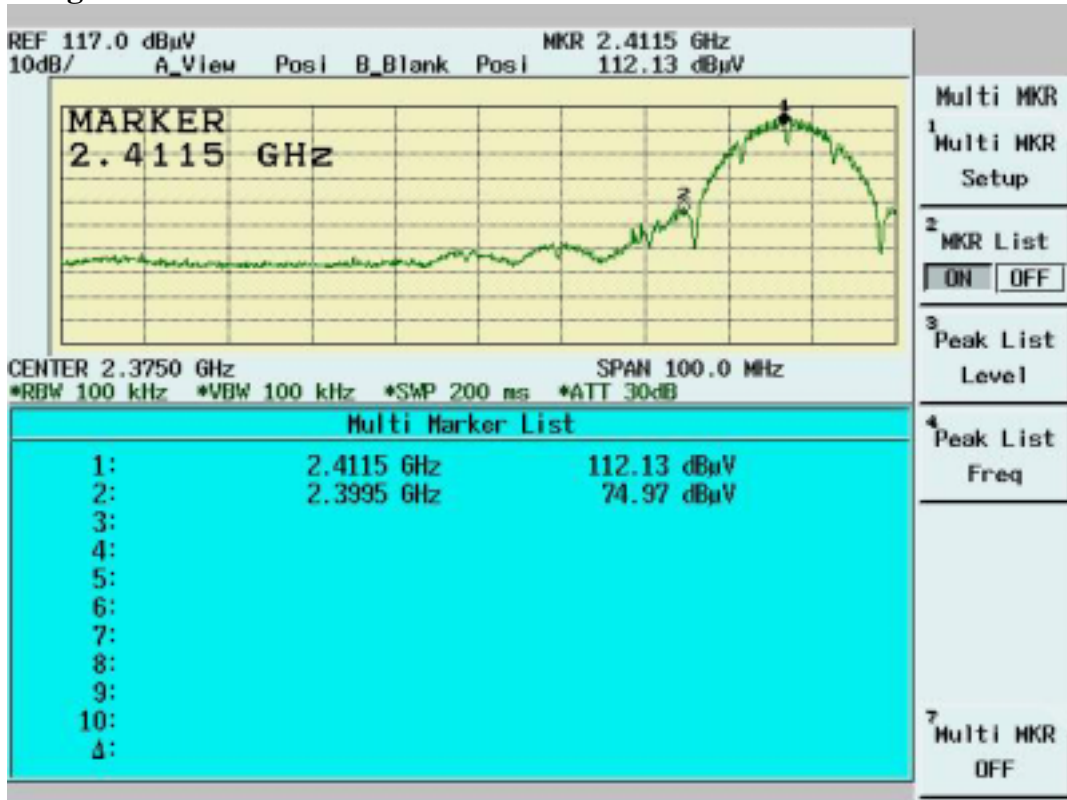
Tx Data Rate=1Mbps

Humidity (%): 55

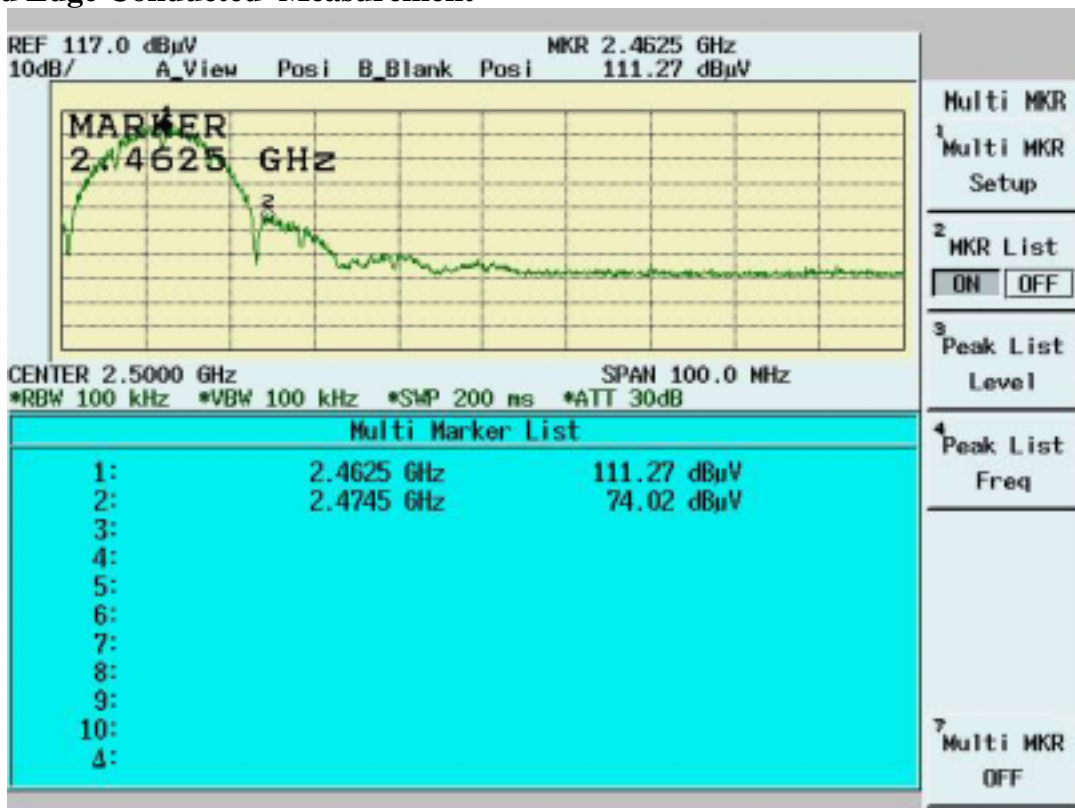
Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
1	2411.5	112.13	---	---
Outside band	2399.5	74.97	37.16	Pass
11	2462.5	111.27	---	---
Outside band	2474.5	74.02	37.25	Pass

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

Band Edge Conducted measurement



Band Edge Conducted Measurement



3.4.4 Test Procedure (Radiated)

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

3.4.5 Test Setup (Radiated)

Same as *Radiated Emission Measurement*

3.4.6 Test Data

Table Band Edge measurement (Radiated)

Test Engineer: Jerry Chiou

Temperature (): 26

Tx Data Rate=1Mbps

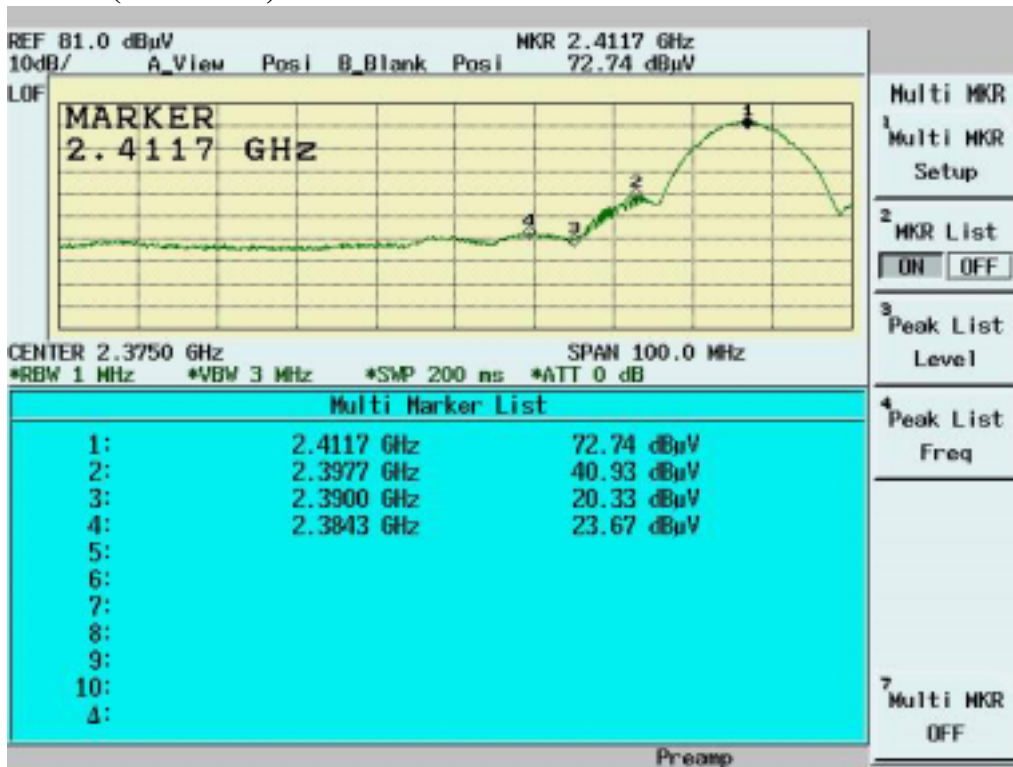
Humidity (%): 43

Description	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	dBc (Limit: > 20dBc)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
Channel_1 (average mode)	2410.7	64.50	35.48	99.98	---	---	10Hz	---
Channel_1 (peak mode)	2411.7	72.74	35.48	108.22	---	---	3MHz	---
Outside band (peak mode)	2397.7	40.93	35.48	76.41	31.81	---	3MHz	Pass
Channel_11 (average mode)	2462.8	63.03	35.50	98.53	---	---	10Hz	---
Channel_11 (peak mode)	2462.8	70.02	35.50	105.52	---	---	3MHz	---
Outside band (peak mode)	2476.5	34.77	35.51	70.28	35.24	---	3MHz	Pass
Channel_1 Restricted band (peak mode)	2384.3	23.67	35.47	59.14	---	74	3MHz	Pass
Restricted band (average mode)	2383.6	13.10	35.47	48.57	---	54	10Hz	Pass
Channel_11 Restricted band (peak mode)	2488.2	22.01	35.51	57.52	---	74	3MHz	Pass
Restricted band (average mode)	2488.3	11.47	35.51	46.98	---	54	10Hz	Pass

Note:

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

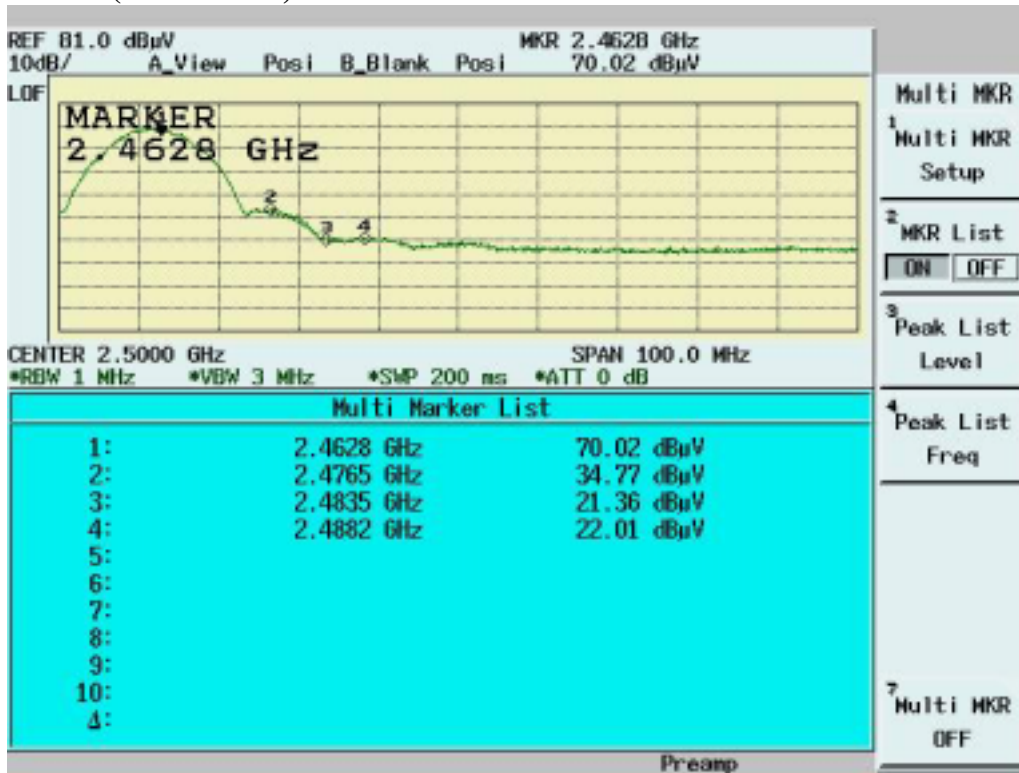
Band Edge measurement for radiated emission in Restricted Band(Radiated) Peak Mode (Channel 1)



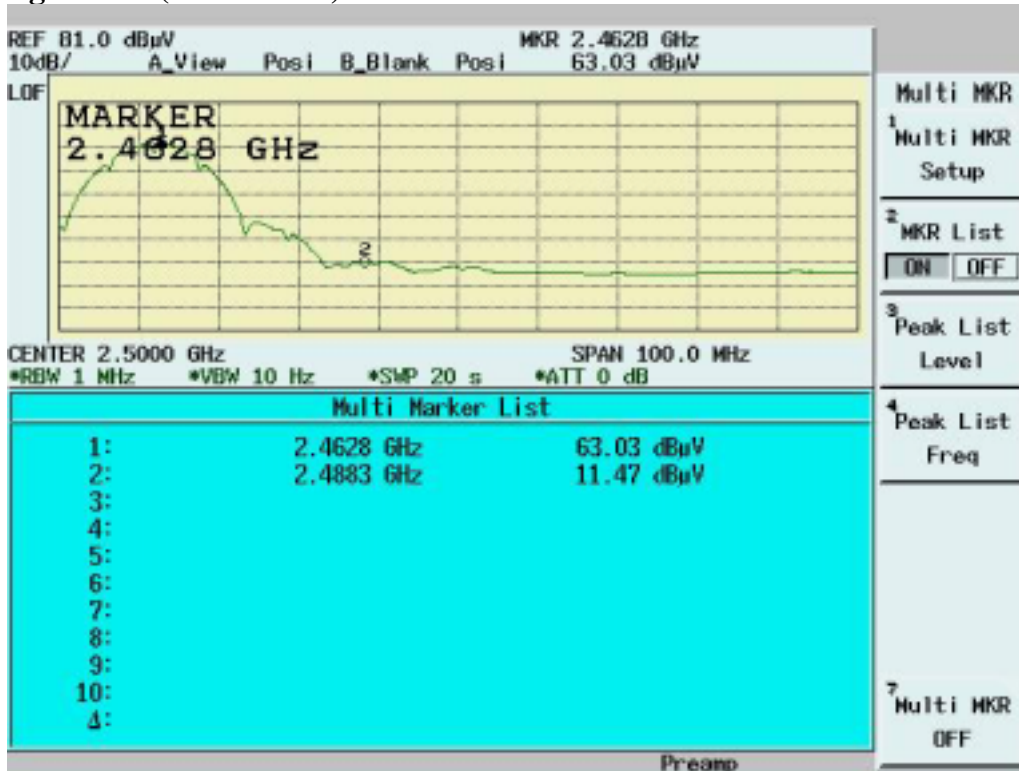
Band Edge measurement for radiated emission in Restricted Band(Radiated) Average Mode (Channel 1)



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



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



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

See MPE report

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

3.6.1 Test Procedure

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

3.6.2 Test Setup



3.6.3 Test Data

Maximum Peak Output Power Density

Test Engineer:Jerry
Chiou

Temperature ():27

Tx Data Rate=1Mbps

Humidity (%):55

Channel	Frequency (MHz)	Spectrum Reading (dBm/3KHz)	Cable Loss (dB)	Peak Power Output (dBm/3KHz)	Limit (dBm/3KHz)	Pass/Fail
1	2412	-8.77	1.10	-7.67	8	Pass
6	2437	-7.66	1.10	-6.56	8	Pass
11	2462	-9.28	1.10	-8.18	8	Pass

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

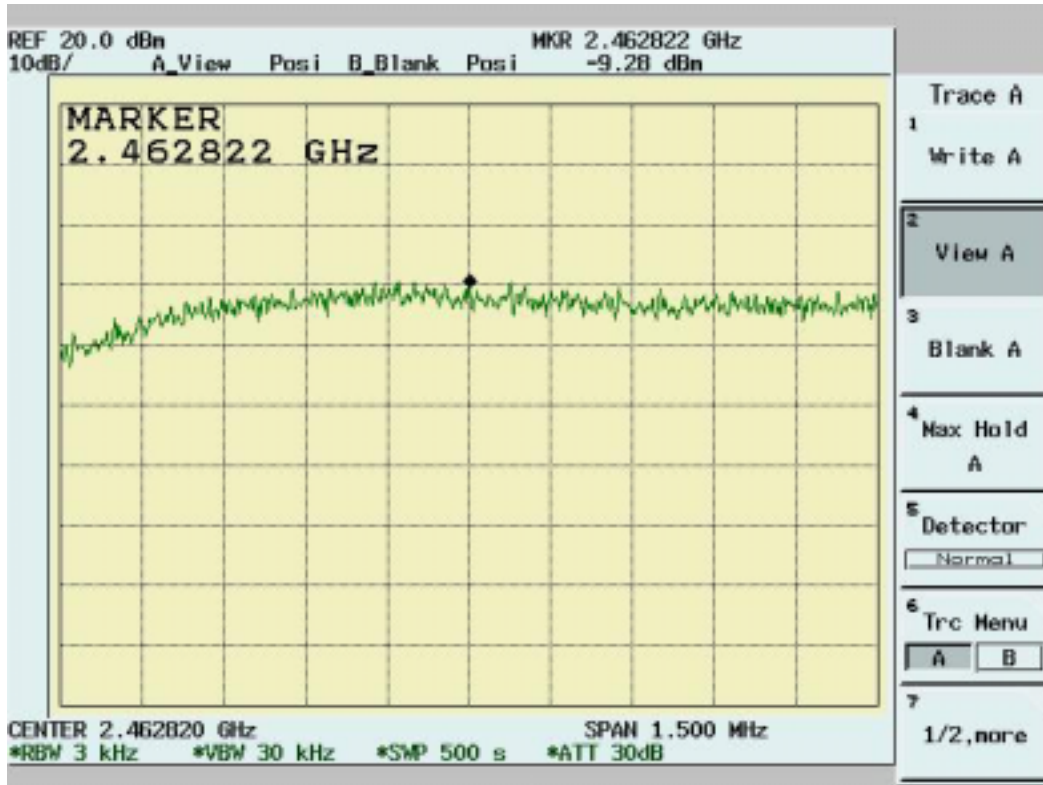
Channel 1



Channel 6



Channel 11



4. TEST RESULTS (802.11g)

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

4.1.1 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

4.1.2 Test Setup



4.1.3 Test Data:

6dB Bandwidth

Test Engineer: Jerry Chiou

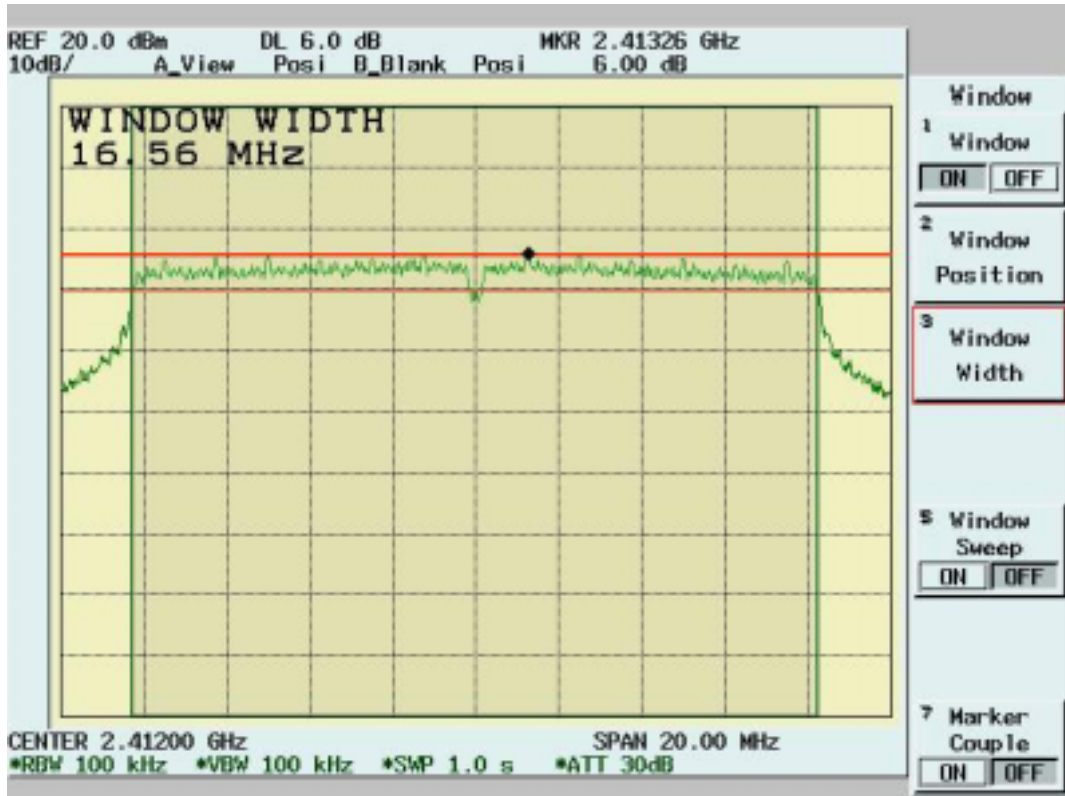
Temperature (): 27

Tx Data Rate=6Mbps

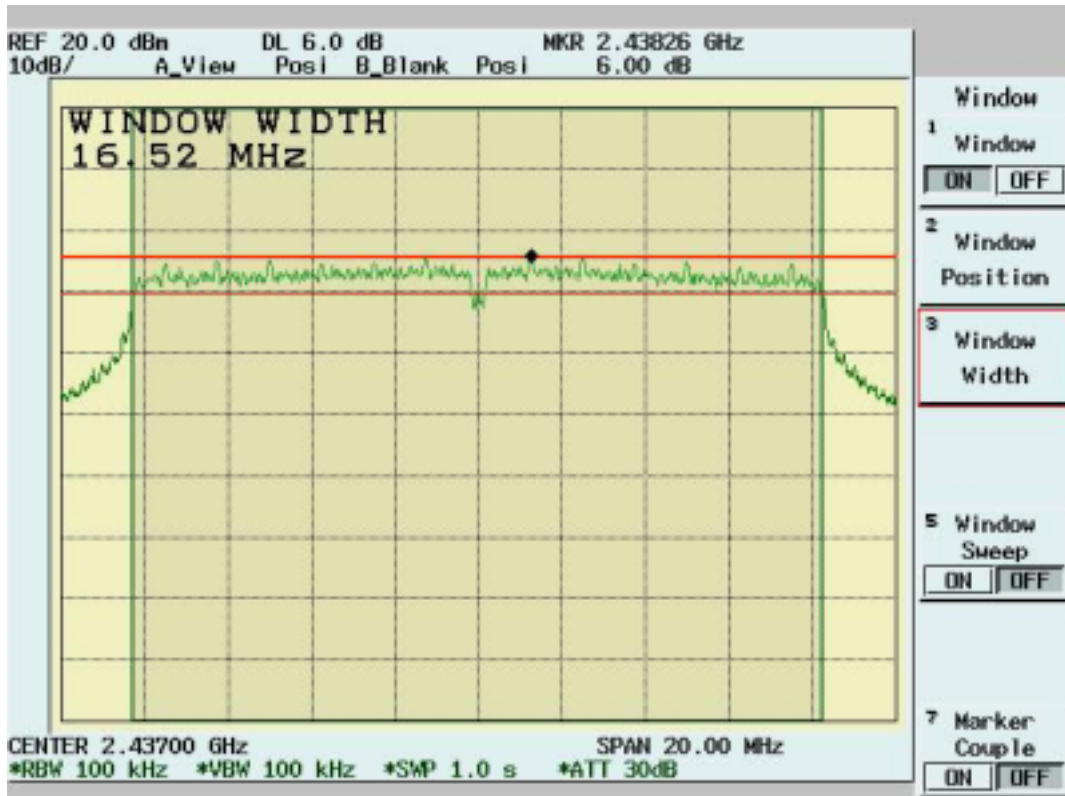
Humidity (%): 55

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	16.56	0.5	Pass
6	2437	16.52	0.5	Pass
11	2462	16.48	0.5	Pass

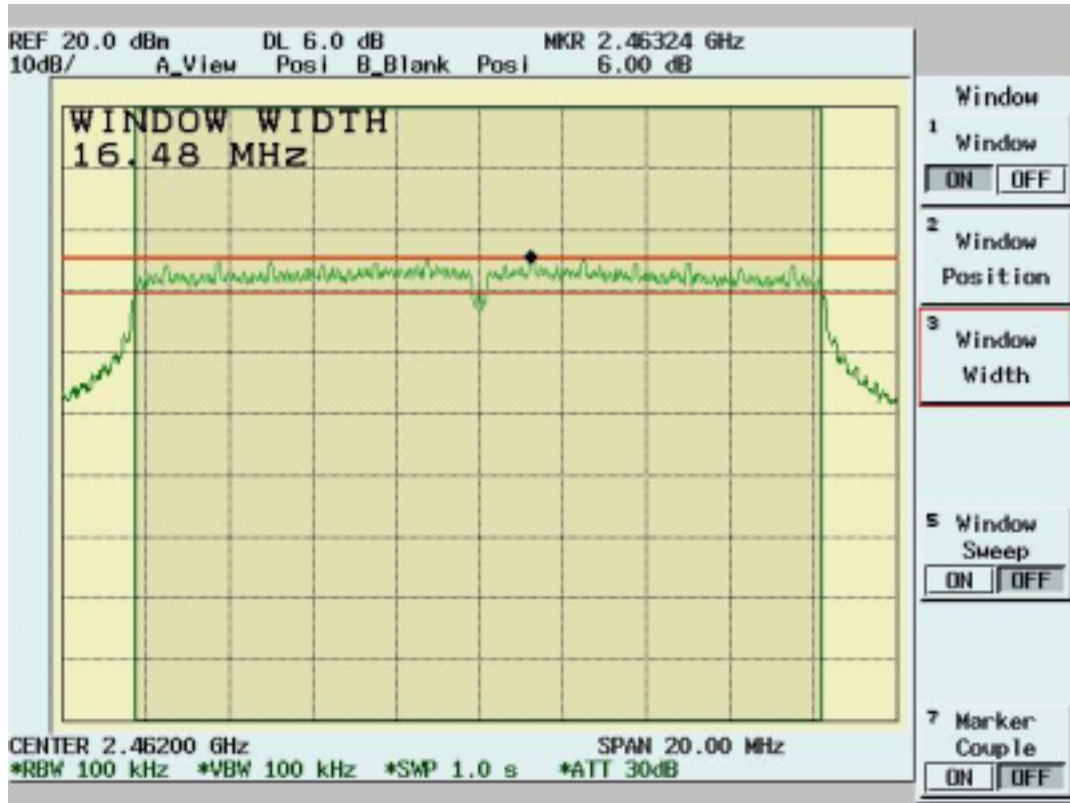
Channel 1:



Channel 6:



Channel 11:

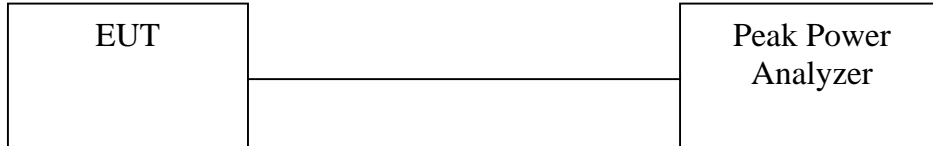


4.2 DSSS Maximum Peak Output Power [Section 15.247 (b)(1)]

4.2.1 Test Procedure

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

4.2.2 Test Setup



4.2.3 Test Data

Maximum Peak Output Power

Test Engineer: Jerry Chiou

Temperature (): 27

Tx Data Rate=6Mbps

Humidity (%): 55

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	15.84	1.10	49.47	16.94	30	Pass
6	2437	15.47	1.10	45.37	16.57	30	Pass
11	2462	15.91	1.10	50.19	17.01	30	Pass

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

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

4.3.1 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.

4.3.2 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.

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

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	3MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

4.3.4 Test Data (30MHz – 1GHz):

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

Operator: Jerry Chiou
Temperature (C): 23
Humidity (%): 54

07:50:07 PM, Friday, August 12, 2005

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmpGain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
96.93	19.12	9.69	1.90	0.00	30.71	43.50	-12.79	103.00	42.00
136.7	18.73	10.63	2.20	0.00	31.56	43.50	-11.94	103.00	239.00
332.64	12.64	16.10	3.95	0.00	32.69	46.00	-13.31	103.00	288.00
372.41	15.02	16.07	4.25	0.00	35.33	46.00	-10.67	196.00	253.00
496.57	9.52	17.32	5.25	0.00	32.08	46.00	-13.92	103.00	239.00
666.32	17.04	19.00	6.41	0.00	42.45	46.00	-3.55	196.00	204.00
733.25	10.96	19.80	6.89	0.00	37.65	46.00	-8.35	196.00	302.00
833.16	8.83	20.43	7.71	0.00	36.97	46.00	-9.03	196.00	269.00
903	13.51	20.64	8.10	0.00	42.25	46.00	-3.75	103.00	239.00

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

Operator: Jerry Chiou
Temperature (C): 23
Humidity (%): 54

07:50:07 PM, Friday, August 12, 2005

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmpGain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
342.34	12.02	16.15	4.04	0.00	32.22	46.00	-13.78	196.00	220.00
357.86	14.20	16.15	4.16	0.00	34.51	46.00	-11.49	196.00	220.00
366.59	13.34	16.10	4.22	0.00	33.66	46.00	-12.34	103.00	337.00
499.48	17.56	17.39	5.28	0.00	40.23	46.00	-5.77	196.00	335.00
532.46	8.94	18.18	5.40	0.00	32.51	46.00	-13.49	103.00	190.00
666.32	16.74	19.00	6.41	0.00	42.15	46.00	-3.85	196.00	204.00
733.25	11.03	19.80	6.89	0.00	37.72	46.00	-8.28	196.00	302.00
833.16	9.02	20.43	7.71	0.00	37.16	46.00	-8.84	196.00	269.00

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

4.3.5 Test Data (1GHz – 25 GHz) .

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
1332.17	48.46 pk	26.03	2.21	34.11	42.59 pk	54.00 av	-11.41	101	89
2208.79	46.58 pk	30.96	1.96	35.19	44.31 pk	54.00 av	-9.69	101	109
2238.76	46.90 pk	30.95	1.87	35.19	44.53 pk	54.00 av	-9.47	101	118
2253.75	46.74 pk	30.95	1.83	35.19	44.33 pk	54.00 av	-9.67	101	123
2336.16	50.88 pk	30.93	1.57	35.19	48.19 pk	54.00 av	-5.81	101	149
2358.64	51.59 pk	30.93	1.51	35.19	48.83 pk	54.00 av	-5.17	101	156
2491.01	50.34 pk	30.90	1.41	35.20	47.45 pk	54.00 av	-6.55	101	197
2510.99	52.45 pk	30.90	1.36	35.19	49.53 pk	54.00 av	-4.47	102	203
2518.48	50.16 pk	30.91	1.36	35.18	47.24 pk	54.00 av	-6.76	102	206
2610.89	48.55 pk	30.94	1.38	35.10	45.77 pk	54.00 av	-8.23	102	235
2623.38	45.23 pk	30.95	1.38	35.09	42.47 pk	54.00 av	-11.53	102	239
2678.32	42.95 pk	30.97	1.39	35.04	40.27 pk	54.00 av	-13.73	102	256
4823.67	46.09 pk	34.93	2.12	37.72	45.43 pk	54.00 av	-8.57	100.00	3.00
9646.54	43.83 pk	40.58	3.25	34.33	53.32 pk	54.00 av	-0.68	100.00	239.00

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

Operator: Jerry Chiou

RBW: 1MHz
 Humidity (%): 41
 Temperature (C): 27

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
1064.94	49.20 pk	24.80	2.18	33.97	42.21 pk	54.00 av	-11.79	102	108
1264.74	47.86 pk	25.72	2.20	34.07	41.71 pk	54.00 av	-12.29	101	94
1332.17	49.39 pk	26.03	2.21	34.11	43.52 pk	54.00 av	-10.48	101	89
1799.2	43.81 pk	29.31	2.45	34.79	40.79 pk	54.00 av	-13.21	100	57
2208.79	49.43 pk	30.96	1.96	35.19	47.16 pk	54.00 av	-6.84	101	109
2238.76	50.74 pk	30.95	1.87	35.19	48.38 pk	54.00 av	-5.62	101	118
2256.24	49.94 pk	30.95	1.82	35.19	47.51 pk	54.00 av	-6.49	101	123
2491.01	51.81 pk	30.90	1.41	35.20	48.92 pk	54.00 av	-5.08	101	197
2510.99	53.36 pk	30.90	1.36	35.19	50.44 pk	54.00 av	-3.56	102	203
2518.48	51.44 pk	30.91	1.36	35.18	48.52 pk	54.00 av	-5.48	102	206
2610.89	49.02 pk	30.94	1.38	35.10	46.25 pk	54.00 av	-7.75	102	235
2620.88	46.84 pk	30.95	1.38	35.09	44.08 pk	54.00 av	-9.92	102	238
4824.98	46.23 pk	34.93	2.12	37.72	45.57 pk	54.00 av	-8.43	100.00	217.00
9647.89	42.63 pk	40.57	3.25	34.33	52.12 pk	54.00 av	-1.88	100.00	189.00

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.
- “ * ”: Fundamental Frequency
- “***”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk” : peak mode
- “av”: average mode
- “---“: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

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

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
1332.17	48.35 pk	26.03	2.21	34.11	42.48 pk	54.00 av	-11.52	101	89
1841.66	44.62 pk	29.67	2.48	34.87	41.90 pk	54.00 av	-12.10	100	54
2148.85	42.64 pk	30.97	2.15	35.19	40.57 pk	54.00 av	-13.43	100	90
2196.3	43.63 pk	30.96	2.00	35.19	41.40 pk	54.00 av	-12.60	101	105
2231.27	51.83 pk	30.95	1.89	35.19	49.49 pk	54.00 av	-4.51	101	116
2278.72	50.63 pk	30.94	1.75	35.19	48.13 pk	54.00 av	-5.87	101	131
2293.71	51.69 pk	30.94	1.70	35.19	49.14 pk	54.00 av	-4.86	101	135
2353.65	52.79 pk	30.93	1.52	35.19	50.05 pk	54.00 av	-3.95	101	154
2518.48	50.27 pk	30.91	1.36	35.18	47.36 pk	54.00 av	-6.64	102	206
2535.96	51.27 pk	30.91	1.37	35.17	48.39 pk	54.00 av	-5.61	102	211
2563.44	46.90 pk	30.93	1.37	35.14	44.05 pk	54.00 av	-9.95	102	220
2600.9	47.80 pk	30.94	1.38	35.11	45.01 pk	54.00 av	-8.99	102	232
2638.36	45.73 pk	30.96	1.38	35.08	42.99 pk	54.00 av	-11.01	102	243
4873.89	46.44 pk	35.12	2.14	37.77	45.93 pk	54.00 av	-8.07	100.00	238.00
9747.98	43.55 pk	40.35	3.30	34.37	52.83 pk	54.00 av	-1.17	100.00	244.00

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

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
1067.43	49.22 pk	24.81	2.18	33.97	42.24 pk	54.00 av	-11.76	102	107
1164.84	47.42 pk	25.26	2.19	34.02	40.85 pk	54.00 av	-13.15	102	101
1264.74	47.56 pk	25.72	2.20	34.07	41.41 pk	54.00 av	-12.59	101	94
1332.17	49.41 pk	26.03	2.21	34.11	43.53 pk	54.00 av	-10.47	101	89
2201.3	43.52 pk	30.96	1.99	35.19	41.27 pk	54.00 av	-12.73	101	106
2231.27	52.64 pk	30.95	1.89	35.19	50.30 pk	54.00 av	-3.70	101	116
2313.69	52.79 pk	30.94	1.64	35.19	50.18 pk	54.00 av	-3.82	101	141
2358.64	52.60 pk	30.93	1.51	35.19	49.84 pk	54.00 av	-4.16	101	156
2518.48	50.17 pk	30.91	1.36	35.18	47.26 pk	54.00 av	-6.74	102	206
2535.96	52.05 pk	30.91	1.37	35.17	49.16 pk	54.00 av	-4.84	102	211
2598.4	47.12 pk	30.94	1.38	35.11	44.32 pk	54.00 av	-9.68	102	231
2638.36	46.05 pk	30.96	1.38	35.08	43.31 pk	54.00 av	-10.69	102	243
2798.2	43.09 pk	31.02	1.41	34.93	40.59 pk	54.00 av	-13.41	102	294
4874.13	46.33 pk	35.12	2.14	37.77	45.82 pk	54.00 av	-8.18	100.00	173.00
9747.88	43.26 pk	40.35	3.30	34.37	52.54 pk	54.00 av	-1.46	100.00	286.00

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.
- “ * ”: Fundamental Frequency
- “**”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk ”: peak mode
- “ av ”: average mode
- “---“: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

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

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 41
Temperature (C): 27

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
1332.17	49.26 pk	26.03	2.21	34.11	43.39 pk	54.00 av	-10.61	101	89
1841.66	43.09 pk	29.67	2.48	34.87	40.38 pk	54.00 av	-13.62	100	54
2153.85	43.52 pk	30.97	2.13	35.19	41.43 pk	54.00 av	-12.57	100	91
2226.27	44.87 pk	30.95	1.91	35.19	42.54 pk	54.00 av	-11.46	101	114
2256.24	52.06 pk	30.95	1.82	35.19	49.64 pk	54.00 av	-4.36	101	123
2286.21	53.36 pk	30.94	1.73	35.19	50.84 pk	54.00 av	-3.16	101	133
2318.68	51.25 pk	30.94	1.63	35.19	48.62 pk	54.00 av	-5.38	101	143
2386.11	51.92 pk	30.92	1.42	35.20	49.07 pk	54.00 av	-4.93	101	164
2518.48	49.70 pk	30.91	1.36	35.18	46.78 pk	54.00 av	-7.22	102	206
2540.96	47.06 pk	30.92	1.37	35.16	44.18 pk	54.00 av	-9.82	102	213
2560.94	48.31 pk	30.92	1.37	35.15	45.46 pk	54.00 av	-8.54	102	219
2598.4	47.15 pk	30.94	1.38	35.11	44.35 pk	54.00 av	-9.65	102	231
2665.83	43.60 pk	30.97	1.39	35.05	40.91 pk	54.00 av	-13.09	102	252
4927.67	46.37 pk	35.33	2.15	37.83	46.02 pk	54.00 av	-7.98	100.00	281.00
9848.02	44.23 pk	40.13	3.35	34.41	53.31 pk	54.00 av	-0.69	100.00	212.00

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

Operator: Jerry Chiou

RBW: 1MHz
 Humidity (%): 41
 Temperature (C): 27

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
1064.94	49.76 pk	24.80	2.18	33.97	42.77 pk	54.00 av	-11.23	102	108
1332.17	48.55 pk	26.03	2.21	34.11	42.68 pk	54.00 av	-11.32	101	89
2226.27	47.23 pk	30.95	1.91	35.19	44.90 pk	54.00 av	-9.10	101	114
2238.76	47.70 pk	30.95	1.87	35.19	45.34 pk	54.00 av	-8.66	101	118
2256.24	54.22 pk	30.95	1.82	35.19	51.80 pk	54.00 av	-2.20	101	123
2286.21	52.16 pk	30.94	1.73	35.19	49.63 pk	54.00 av	-4.37	101	133
2358.64	53.38 pk	30.93	1.51	35.19	50.61 pk	54.00 av	-3.39	101	156
2386.11	55.06 pk	30.92	1.42	35.20	52.21 pk	54.00 av	-1.79	101	164
2518.48	52.46 pk	30.91	1.36	35.18	49.55 pk	54.00 av	-4.45	102	206
2545.95	48.60 pk	30.92	1.37	35.16	45.73 pk	54.00 av	-8.27	102	214
2563.44	49.83 pk	30.93	1.37	35.14	46.98 pk	54.00 av	-7.02	102	220
2618.38	48.34 pk	30.95	1.38	35.09	45.58 pk	54.00 av	-8.42	102	237
2665.83	45.18 pk	30.97	1.39	35.05	42.49 pk	54.00 av	-11.51	102	252
4925	47.44 pk	35.32	2.15	37.83	47.08 pk	54.00 av	-6.92	100.00	360.00
9848.04	43.82 pk	40.13	3.35	34.41	52.90 pk	54.00 av	-1.10	100.00	271.00

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.
- “ * ”: Fundamental Frequency
- “**”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk ”: peak mode
- “ av ”: average mode
- “---“: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

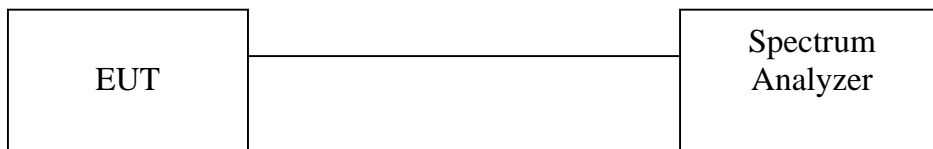
All frequencies from 1GHz to 25 GHz have been tested.

4.4 Band Edge Measurement

4.4.1 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

4.4.2 Test Setup (Conducted)



4.4.3 Test Data:

Table: Band Edge measurement (Conducted)

Test Engineer: Jerry Chiou

Temperature (): 27

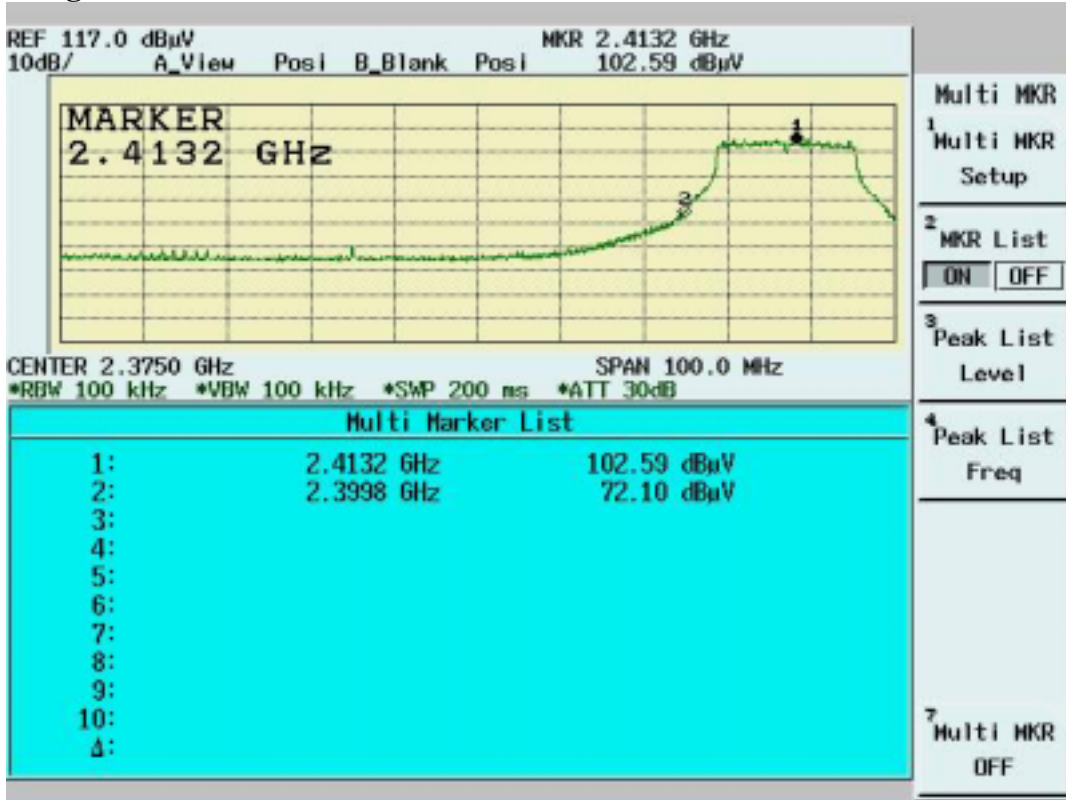
Tx Data Rate=6Mbps

Humidity (%): 55

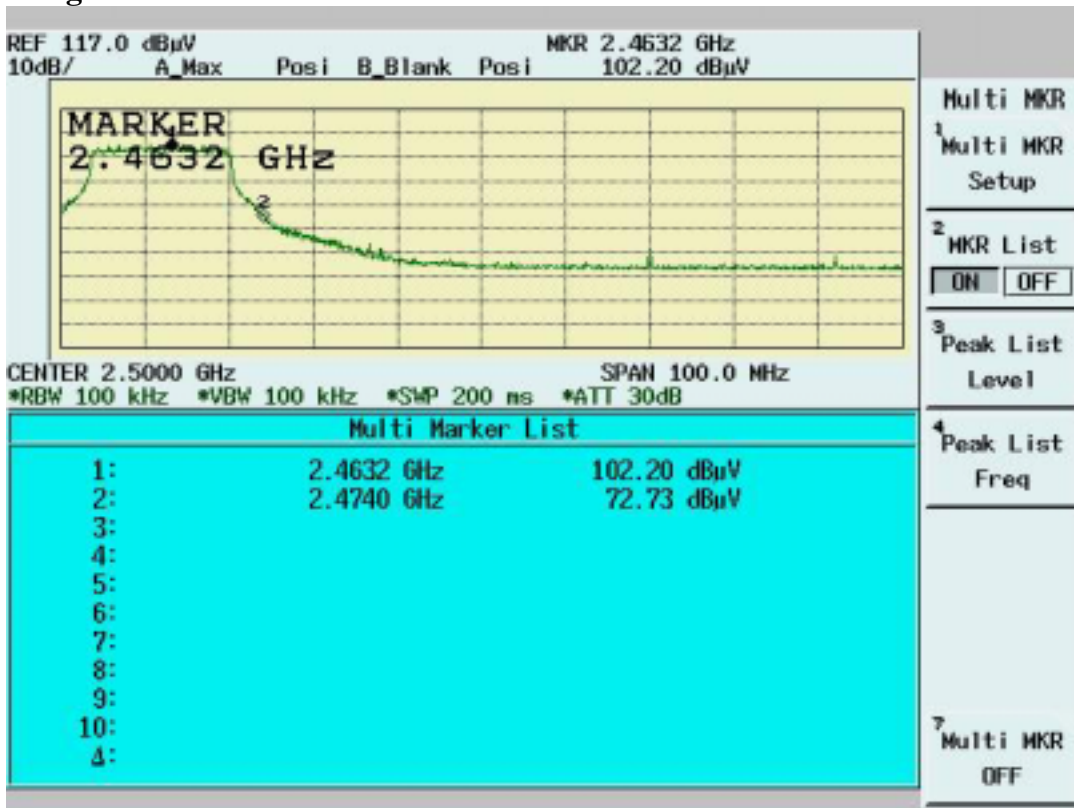
Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
1	2413.2	102.59	---	---
Outside band	2399.8	72.10	30.49	Pass
11	2463.2	102.20	---	---
Outside band	2474.0	72.73	29.47	Pass

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

Band Edge Conducted measurement



Band Edge Conducted Measurement



4.4.4 Test Procedure (Radiated)

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

4.4.5 Test Setup (Radiated)

Same as *Radiated Emission Measurement*

4.4.6 Test Data

Table Band Edge measurement (Radiated)

Test Engineer: Jerry Chiou

Temperature (): 26

Tx Data Rate=6Mbps

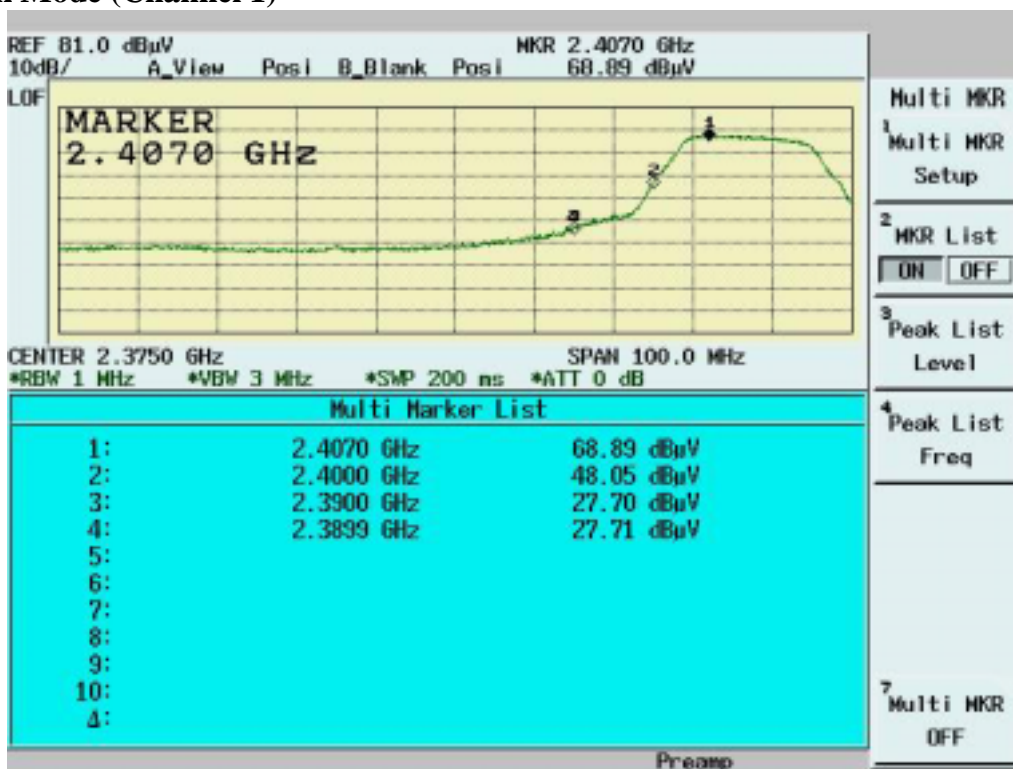
Humidity (%): 43

Description	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	dBc (Limit: > 20dBc)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
Channel_1 (average mode)	2410.4	54.30	35.48	89.78	---	---	10Hz	---
Channel_1 (peak mode)	2407.0	68.89	35.48	104.37	---	---	3MHz	---
Outside band (peak mode)	2400.0	48.05	35.48	83.53	20.84	---	3MHz	Pass
Channel_11 (average mode)	2463.2	52.63	35.50	88.13	---	---	10Hz	---
Channel_11 (peak mode)	2457.7	67.22	35.50	102.72	---	---	3MHz	---
Outside band (peak mode)	2475.8	37.47	35.51	72.98	29.74	---	3MHz	Pass
Channel_1 Restricted band (peak mode)	2389.9	27.71	35.47	63.18	---	74	3MHz	Pass
Restricted band (average mode)	2390.0	10.73	35.47	46.20	---	54	10Hz	Pass
Channel_11 Restricted band (peak mode)	2483.7	31.22	35.51	66.73	---	74	3MHz	Pass
Restricted band (average mode)	2483.5	12.48	35.51	47.99	---	54	10Hz	Pass

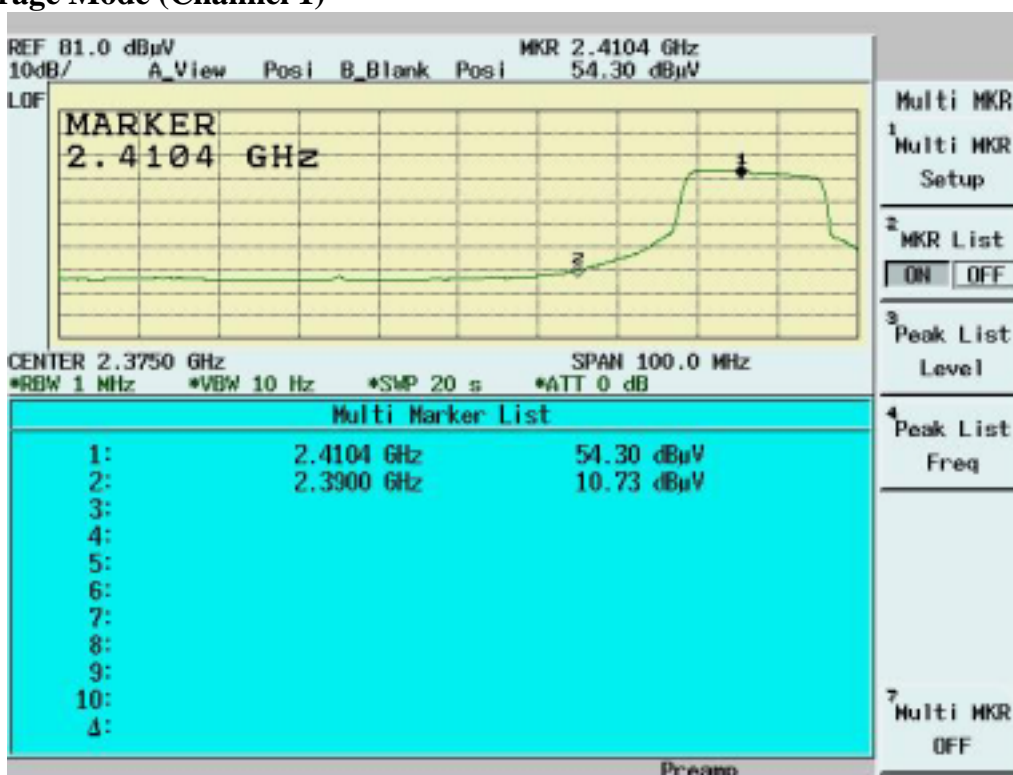
Note:

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

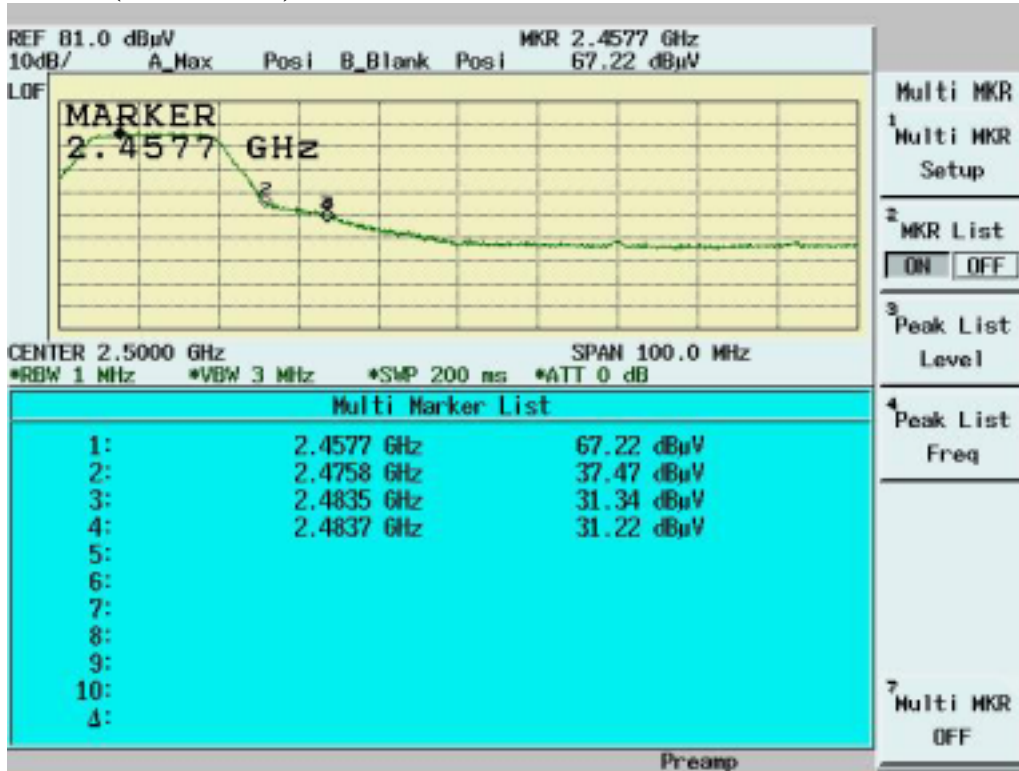
Band Edge measurement for radiated emission in Restricted Band(Radiated) Peak Mode (Channel 1)



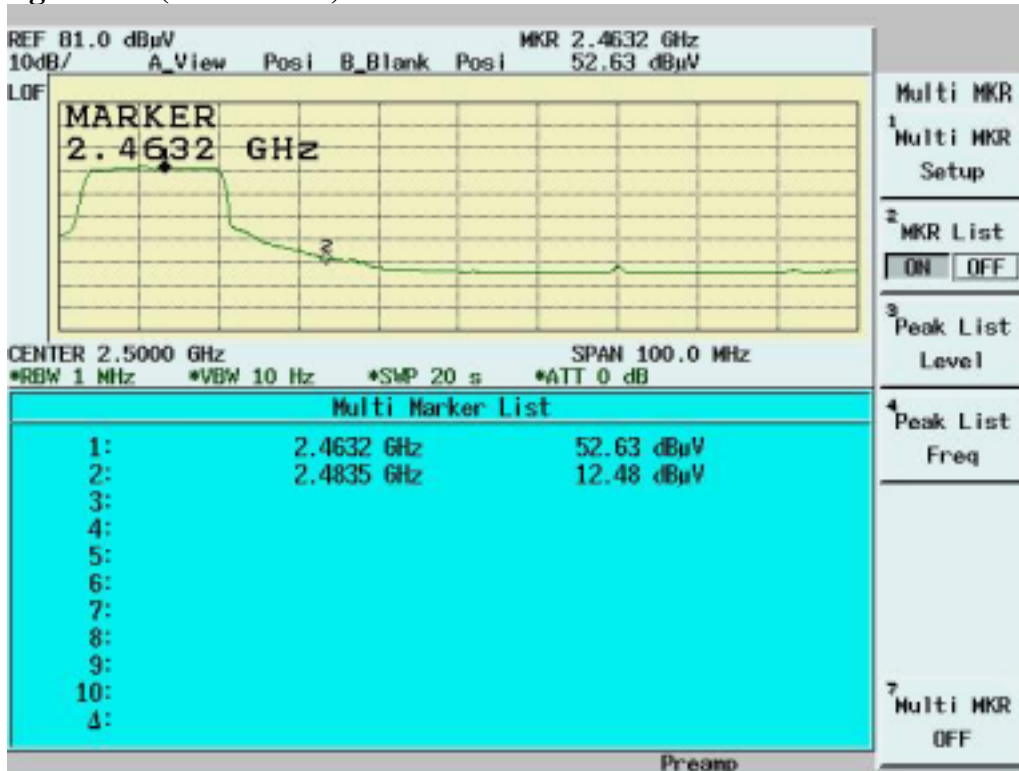
Band Edge measurement for radiated emission in Restricted Band(Radiated) Average Mode (Channel 1)



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



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



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

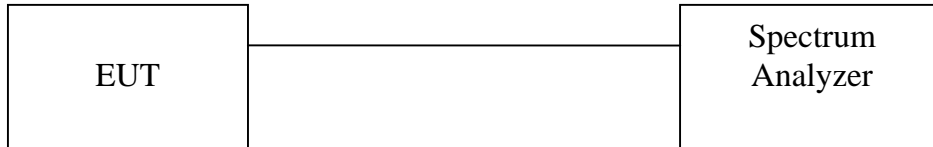
See MPE report

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

4.6.1 Test Procedure

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

4.6.2 Test Setup



4.6.3 Test Data

Maximum Peak Output Power Density

Test Engineer:Jerry
Chiou

Temperature ():27

Tx Data Rate=6Mbps

Humidity (%):55

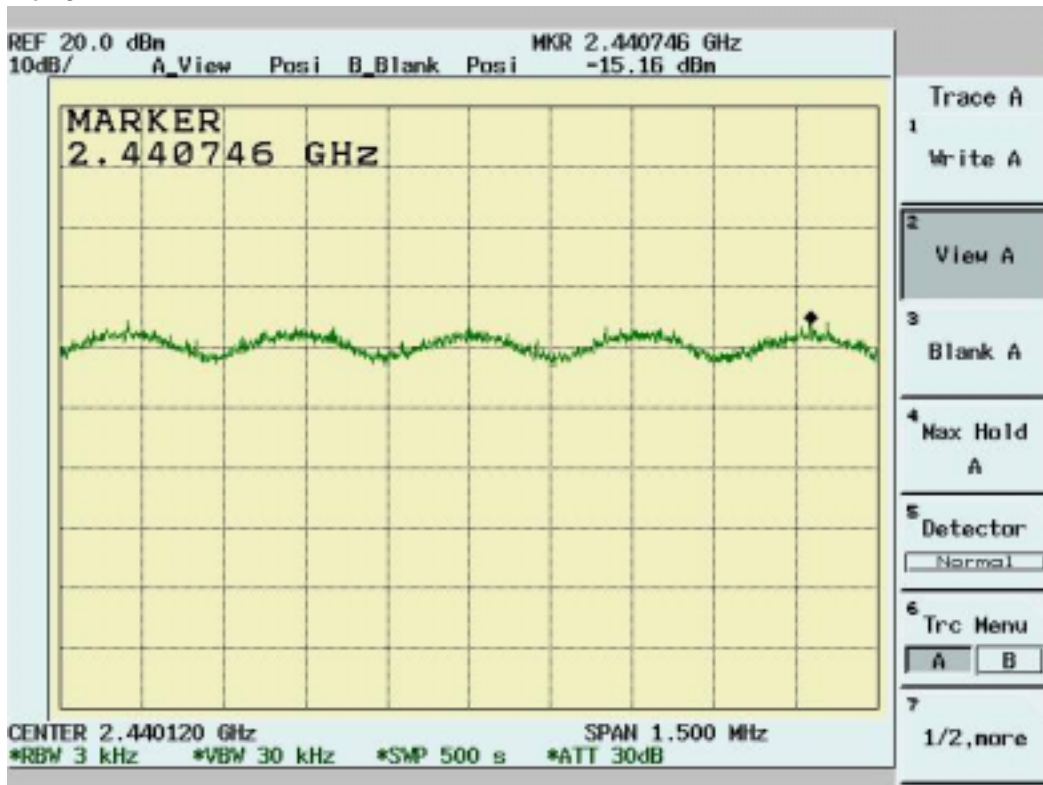
Channel	Frequency (MHz)	Spectrum Reading (dBm/3KHz)	Cable Loss (dB)	Peak Power Output (dBm/3KHz)	Limit (dBm/3KHz)	Pass/Fail
1	2412	-14.24	1.10	-13.14	8	Pass
6	2437	-15.16	1.10	-14.06	8	Pass
11	2462	-14.96	1.10	-13.86	8	Pass

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

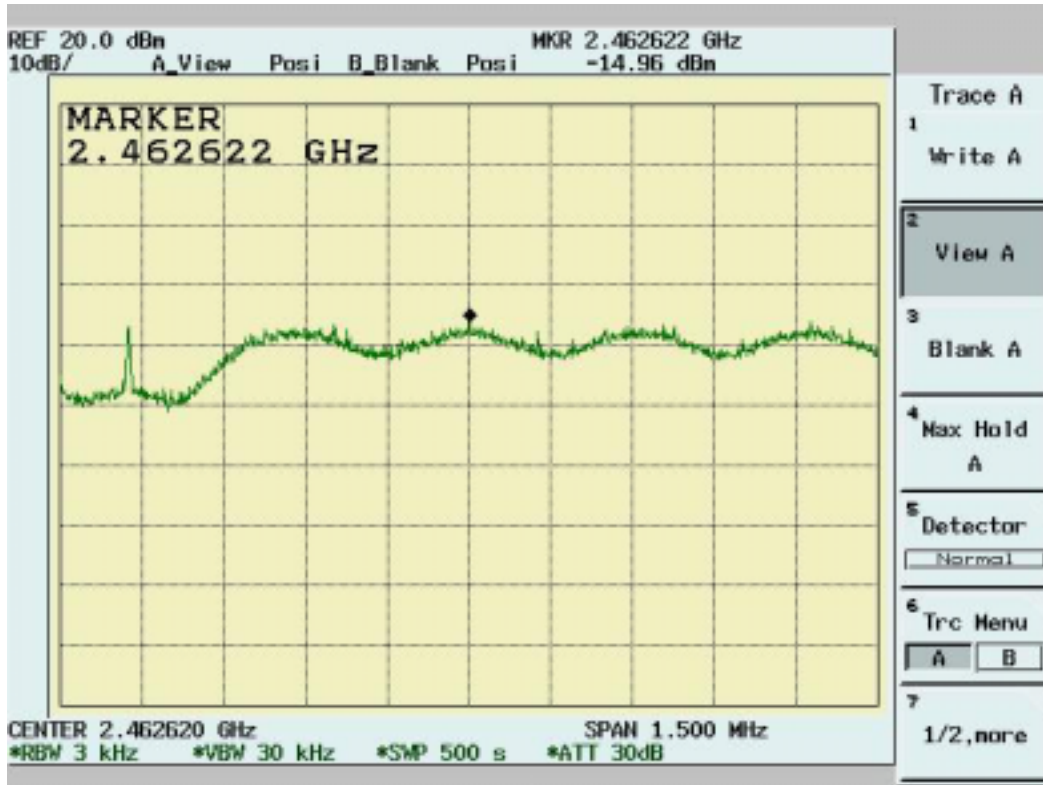
Channel 1



Channel 6



Channel 11



5. TEST RESULTS (Bluetooth)

5.1 FHSS Maximum Peak Output Power

5.1.1 Test Procedure

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

5.1.2 Test Setup



5.1.3 Test Data

Maximum Peak Output Power

Temperature ():25

Humidity (%):55

Test Engineer:Jerry Chiou

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
00	2412	3.52	1.10	2.90	4.62	30	Pass
39	2437	3.01	1.10	2.58	4.11	30	Pass
78	2462	2.69	1.10	2.39	3.79	30	Pass

