TEST REPORT

of

FCC Part 15 Subpart B & C

Product : **Bluetooth VoIP Phone**

Model(s): **CP22**

Applicant: **Wistron Corporation**

Address: **21th Fl., 88, Sec.1, Hsin Tai Wu Rd.,**
Hsichih, Taipei Hsi
Taiwan, R.O.C.

Test Performed by:

International Standards Laboratory
<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; TAF: 0997; NVLAP: 200234-0;
IC: IC4164-1; VCCI: R-1435, C-1440, T-299; NEMKO: ELA 113B
*Address:
No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Lung-Tan Hsiang, Tao Yuan County 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-07LR019FC**
Issue Date : **2007/05/29**

Contents of Report

1. General

1.1 Certification of Accuracy of Test Data

Standards:	CFR 47 Part 15 Subpart B Class B CFR 47 Part 15 Subpart C (Section 15.247)
Test Procedure:	ANSI C63.4:2003
Equipment Tested:	Bluetooth VoIP Phone
Model:	CP22
Applied by:	Wistron Corporation
Sample received Date:	2007/05/17
Final test Date :	2007/05/22-2007/05/25
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:	Leo JL Lin

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

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

Approve & Signature

Roy Hsieh / Manager

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 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. Description of Equipment Under Test (EUT)

Description:	Bluetooth VoIP Phone
Model No.:	CP22
Frequency Range:	2402 ~ 2480 MHz
Support channel:	79 Channels
Modulation Skill:	GFSK (1Mbps)
Antennas Type:	PIFA (Model:CP22 Antenna) made by Darfon Electronics Corp.
Antenna Connected:	The Antenna is clip on the back, use to cover with EUT. The user is not possible to change the antenna without disassembling the card phone.
Antenna peak Gain:	-6.86 dBi
Power Type of Bluetooth module:	3.3 V DC from Rechargeable Battery
Battery Charging:	Charge via PCMCIA Express Directly (5V) from PC

The channels and the operation frequency have listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	2402	01	2403
02	2404	03	2405
04	2406	05	2407
……			
75	2477	76	2478
77	2479	78	2480

PCMCIA Express Connector:	one 26 pins
Front:	Speak Power Button Pair/Link Button Speakerphone Button
Flank:	Volume up/down button

EMI Noise Source:
Crystal:13MHz(XT1),

EMI Solution: Add springs between PCB ground and the shell.

4. TEST RESULTS (Bluetooth)

4.1 Powerline Conducted Emissions

4.1.1 EUT Configuration

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

Power to the EUT was provided through the LISN. The impedance vs. frequency characteristic of the LISN is complied with the limit used.

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

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

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

4.1.2 Test Procedure

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

At the frequencies where the peak values of the emissions were higher than 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.

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

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

4.1.4 Test Data:

Power Line Conducted Emissions (Hot) Channel 00, 39, 78

Address:No.120,Lane 180,San Ho Tsuen,Hsin Ho Road,Lung-Tan Hsiang,
Tao Yuan Conty,Taiwan R.O.C.
Tel:03-4871718

Conducted Emission Measurement

File:Link | Data :#6 | Date: 2007/05/18 Time: PM 05:11:51 | operator:Leo JL Lin | Temperature: 26 ℃ | Humidity: 54 %

Site: Conduction 02 | Phase: L1
Limit: CISPR22 Class B Conduction(QP) | Power: AC 110V/60Hz
Company: | Witness: 3m
EUT Model: CP22
Execute Program:
Note:

Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB
0.1685	0.1	0.03	37.80	65.0	-27.2	35.30	55.0	-19.7
0.2468	0.12	0.07	35.20	61.8	-26.6	33.40	51.8	-18.4
0.3286	0.16	0.1	34.00	59.4	-25.4	31.60	49.4	-17.8
0.4127	0.2	0.08	34.70	57.5	-22.8	33.40	47.5	-14.1
0.5762	0.2	0.07	33.70	56.0	-22.3	32.80	46.0	-13.2
0.7391	0.2	0.07	32.80	56.0	-23.2	32.10	46.0	-13.9
0.8217	0.2	0.07	32.10	56.0	-23.9	31.40	46.0	-14.6
1.2291	0.2	0.07	32.10	56.0	-23.9	31.00	46.0	-15.0
2.6221	0.26	0.11	34.60	56.0	-21.4	32.80	46.0	-13.2
5.5641	0.43	0.16	33.60	60.0	-26.4	28.50	50.0	-21.5
8.1916	0.47	0.19	34.80	60.0	-25.2	30.90	50.0	-19.1
15.8854	0.9	0.31	31.50	60.0	-28.5	25.20	50.0	-24.8

* NOTE: During the test, the EMI receiver was set to M ax. Hold.EUT is being charged, that can't transmit or receive in normal.
Margin = Amplitude + Insertion Loss- Limit
A margin of -8dB means that the emission is 8dB below the limit

Power Line Conducted Emissions (Neutral) Channel 00, 39, 78

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

Conducted Emission Measurement

File:Link | Data :#6 | Date: 2007/05/18 Time: PM 05:49:27 | operator:Leo JL Lin | Temperature: 26 ℃ | Humidity: 54 %

Site: Conduction 02 | Phase: N
Limit: CISPR22 Class B Conduction(QP) | Power: AC 110V/60Hz
Company: | Witness: 3m
EUT Model: CP22
Execute Program:
Note:

Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB
0.1685	0.1	0.03	33.70	65.0	-31.3	31.60	55.0	-23.4
0.2575	0.13	0.08	25.50	61.5	-36.0	9.00	51.5	-42.5
0.3286	0.16	0.1	31.80	59.4	-27.6	31.10	49.4	-18.3
0.4127	0.2	0.08	30.70	57.5	-26.8	25.90	47.5	-21.6
0.4941	0.2	0.07	29.90	56.1	-26.2	27.50	46.1	-18.6
0.5762	0.2	0.07	20.90	56.0	-35.1	15.90	46.0	-30.1
0.6578	0.2	0.07	26.20	56.0	-29.8	23.00	46.0	-23.0
2.4606	0.2	0.1	34.30	56.0	-21.7	33.20	46.0	-12.8
5.5641	0.25	0.16	32.70	60.0	-27.3	28.20	50.0	-21.8
8.2789	0.34	0.19	34.30	60.0	-25.7	30.70	50.0	-19.3
10.9050	0.4	0.23	33.10	60.0	-26.9	26.80	50.0	-23.2
16.4856	0.43	0.31	28.00	60.0	-32.0	21.80	50.0	-28.2

* NOTE: During the test, the EMI receiver was set to Max. Hold.EUT is being charged, that can't transmit or receive in normal.
Margin = Amplitude + Insertion Loss- Limit
A margin of -8dB means that the emission is 8dB below the limit

4.2 FHSS Maximum Peak Output Power

4.2.1 Test Procedure

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

4.2.2 Test Setup

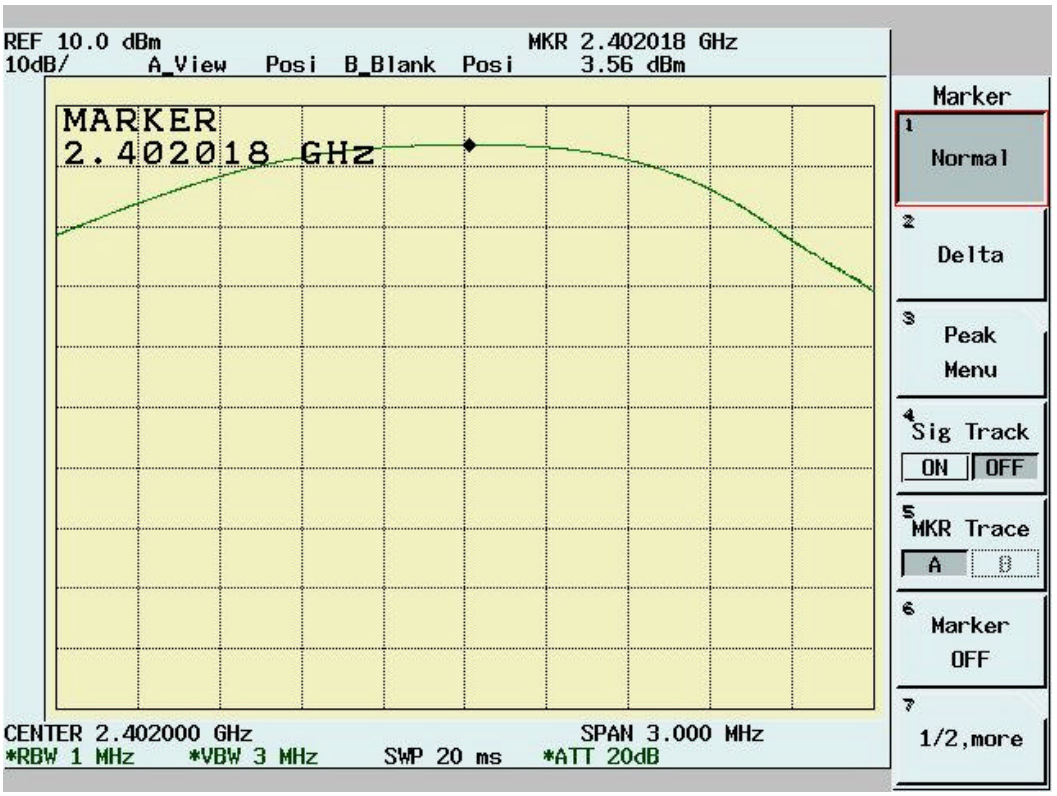
4.2.3 Test Data

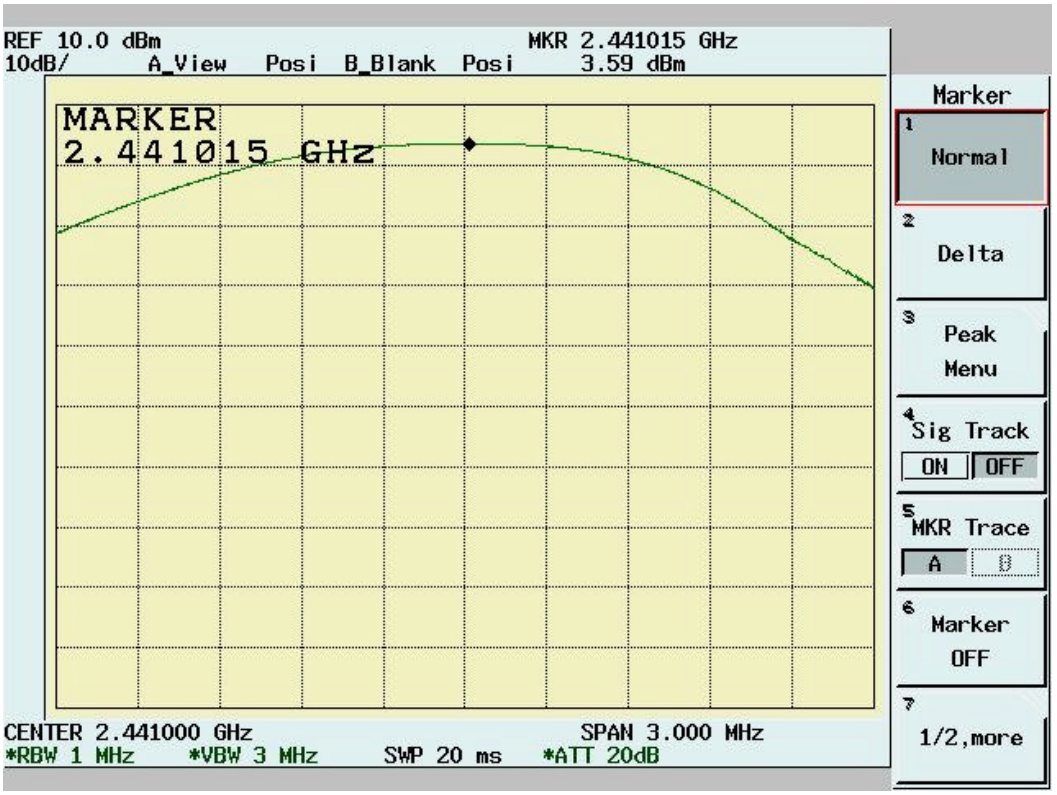
Maximum Peak Output Power

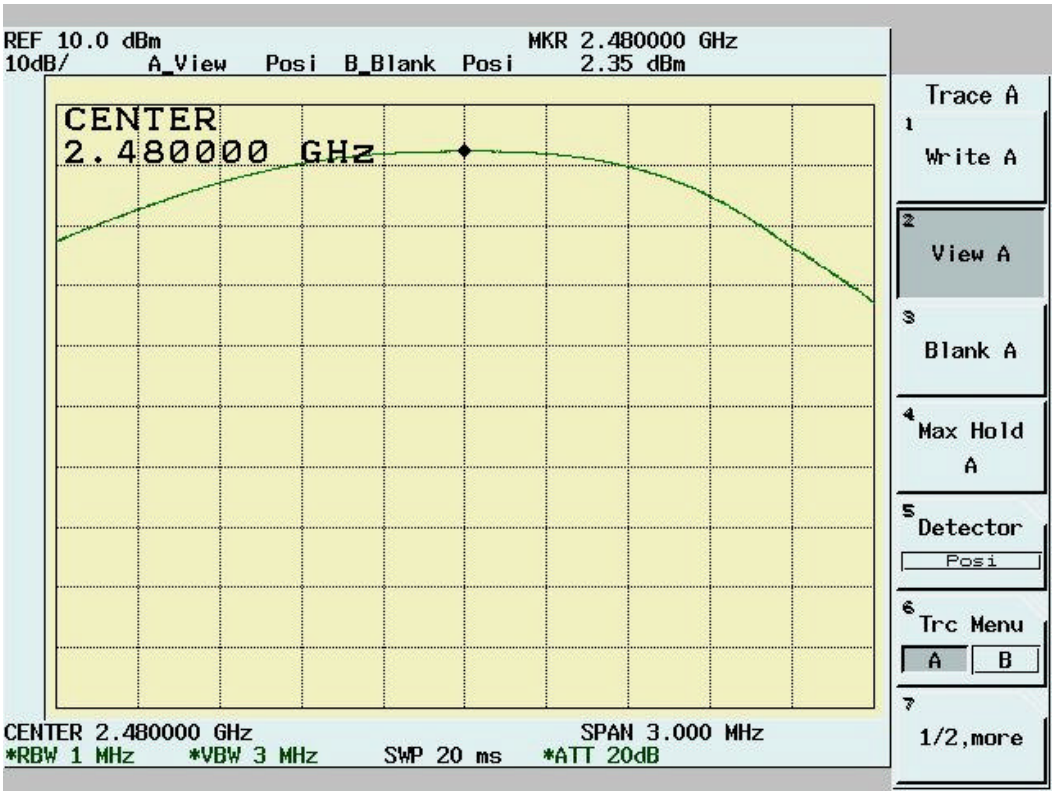
Temperature (℃):24

Test Engineer:Leo JL Lin Humidity (%):56

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
00	**2402**	3.56	0.25	2.40	3.81	30	Pass
39	**2441**	3.59	0.25	2.42	3.84	30	Pass
78	**2480**	2.35	0.25	1.82	2.60	30	Pass




REF 10.0 dBm
10dB/ A_View Posi B_Blank Posi
MKR 2.441015 GHz
3.59 dBm
MARKER
2.441015 GHz
CENTER 2.441000 GHz
SPAN 3.000 MHz
*RBW 1 MHz *VBW 3 MHz SWP 20 ms *ATT 20dB
Marker
1 Normal
2 Delta
3 Peak Menu
4 Sig Track ON OFF
5 MKR Trace A B
6 Marker OFF
7 1/2,more


REF 10.0 dBm
10dB/ A_View Posi B_Blank Posi
MKR 2.480000 GHz
2.35 dBm
CENTER
2.480000 GHz
CENTER 2.480000 GHz
SPAN 3.000 MHz
*RBW 1 MHz *VBW 3 MHz SWP 20 ms *ATT 20dB
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector Posi
6 Trc Menu A B
7 1/2,more

4.3 Radiated Emission Measurement

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 ac*cording 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.

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

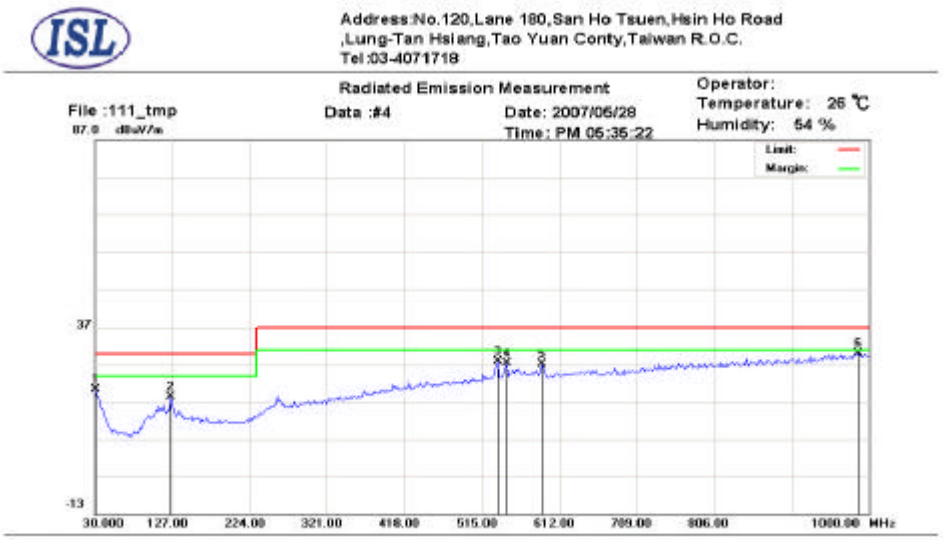
Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz

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 00, 39, 78



Site : Chamber 02
Condition : CISPR22 ClassB 10M Radiation
Company :
EUT Model:
Execute Program :
Note :

Polarization: Horizontal
Power :
Witness:

Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	30.0000	0.70	18.8	0.84	0	20.34	30.00	-9.66			peak
	125.0600	4.36	12.2	1.71	0	18.27	30.00	-11.73			peak
	534.3999	5.20	18.5	4.26	0	27.96	37.00	-9.04			peak
	546.0398	4.29	18.87	4.33	0	27.49	37.00	-9.51			peak
	590.6598	3.78	18.76	4.56	0	27.10	37.00	-9.90			peak
*	986.4200	2.62	21.19	6.4	0	30.21	37.00	-6.79			peak

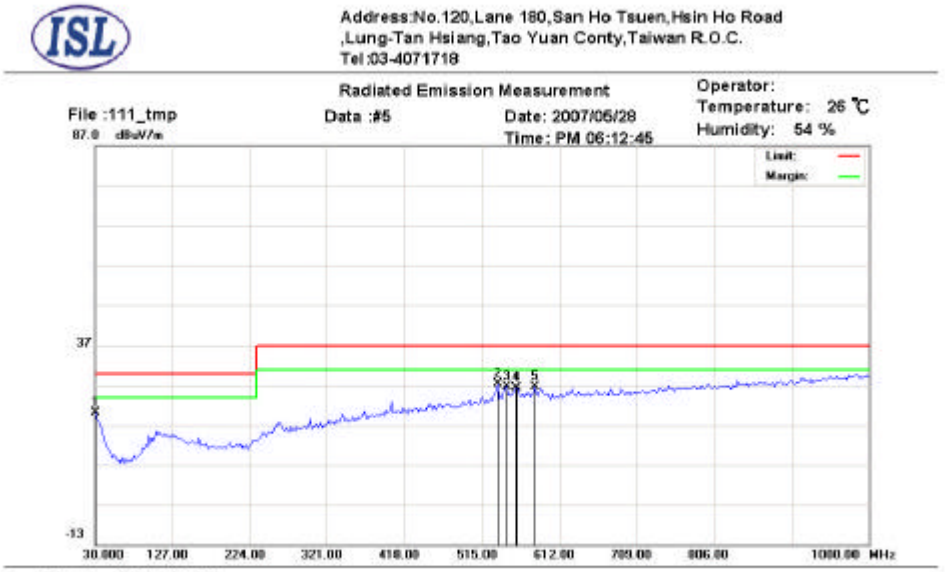
*:Maximum data x:Over limit !:over margin

NOTE:

- During the Pre-test, the EUT has been tested for Channel 00, 39, 78 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

30M – 1GHz Open Field Radiated Emissions (Vertical) Channel 00, 39, 78



Site : Chamber 02
Condition : CISPR22 ClassB 10M Radiation
Company :
EUT Model:
Execute Program :
Note :

Polarization: Vertical
Power :
Witness: 10m

Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	30.0000	0.48	18.8	0.84	0	20.12	30.00	-9.88			peak
*	534.4000	4.51	18.5	4.26	0	27.27	37.00	-9.73			peak
	546.0400	3.33	18.87	4.33	0	26.53	37.00	-10.47			peak
	557.6800	2.93	18.95	4.41	0	26.29	37.00	-10.71			peak
	580.9600	3.24	18.81	4.54	0	26.59	37.00	-10.41			peak

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

NOTE:

- During the Pre-test, the EUT has been tested for Channel 00, 39, 78 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)

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1GHz~ 25 GHz (Horizontal), Channel 00: 2402 MHz

Operator: Leo JL Lin

RBW: 1MHz
Humidity (%): 52
Temperature (C): 23

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
1601.9	38.55pk	27.66	2.31	23.75	44.77pk	54.00av	-9.23	101	70
4789.21	37.74pk	34.00	5.14	27.53	49.35pk	54.00av	-4.65	100	21

1GHz~ 25 GHz (Vertical), Channel 00: 2402 MHz

Operator: Leo JL Lin

RBW: 1MHz
Humidity (%): 52
Temperature (C): 23

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
1601.9	42.99pk	27.66	2.31	23.75	49.20 pk	54.00av	-4.80	101	70
4803.7	38.29 pk	34.05	5.14	27.51	49.97 pk	54.00av	-4.03	100	20

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 39 : 2441 MHz

Operator: Leo JL Lin

RBW: 1MHz
Humidity (%): 52
Temperature (C): 23

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
1626.87	39.13 pk	27.87	2.32	23.75	45.56 pk	54.00av	-8.44	101	69
4876.12	38.68 pk	34.33	5.13	27.41	50.73 pk	54.00av	-3.27	100	12
7309.69	33.47 pk	38.44	3.89	26.56	49.24 pk	54.00av	-4.76	101	154

1GHz~ 25 GHz (Vertical), Channel 39 : 2441 MHz

Operator: Leo JL Lin

RBW: 1MHz
Humidity (%): 52
Temperature (C): 23

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
1626.87	43.05 pk	27.87	2.32	23.75	49.49 pk	54.00 av	-4.51	101	69
4876.12	37.16 pk	34.33	5.13	27.41	49.21 pk	54.00 av	-4.79	100	12

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 78: 2480 MHz

Operator: Leo JL Lin

RBW: 1MHz
Humidity (%): 52
Temperature (C): 23

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
1651.85	39.22 pk	28.08	2.34	23.75	45.89 pk	54.00av	-8.11	101	67
4948.55	34.17 pk	34.60	5.13	27.31	46.59 pk	54.00av	-7.41	100	5
7425.57	30.92 pk	38.90	3.95	26.52	47.26 pk	54.00av	-6.74	101	171

1GHz~ 25 GHz (Vertical), Channel 78 : 2480 MHz

Operator: Leo JL Lin

RBW: 1MHz
Humidity (%): 52
Temperature (C): 23

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
1651.85	43.32 pk	28.08	2.34	23.75	49.99 pk	54.00av	-4.01	101	67
4948.55	32.63 pk	34.60	5.13	27.31	45.04 pk	54.00av	-8.96	100	5

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:

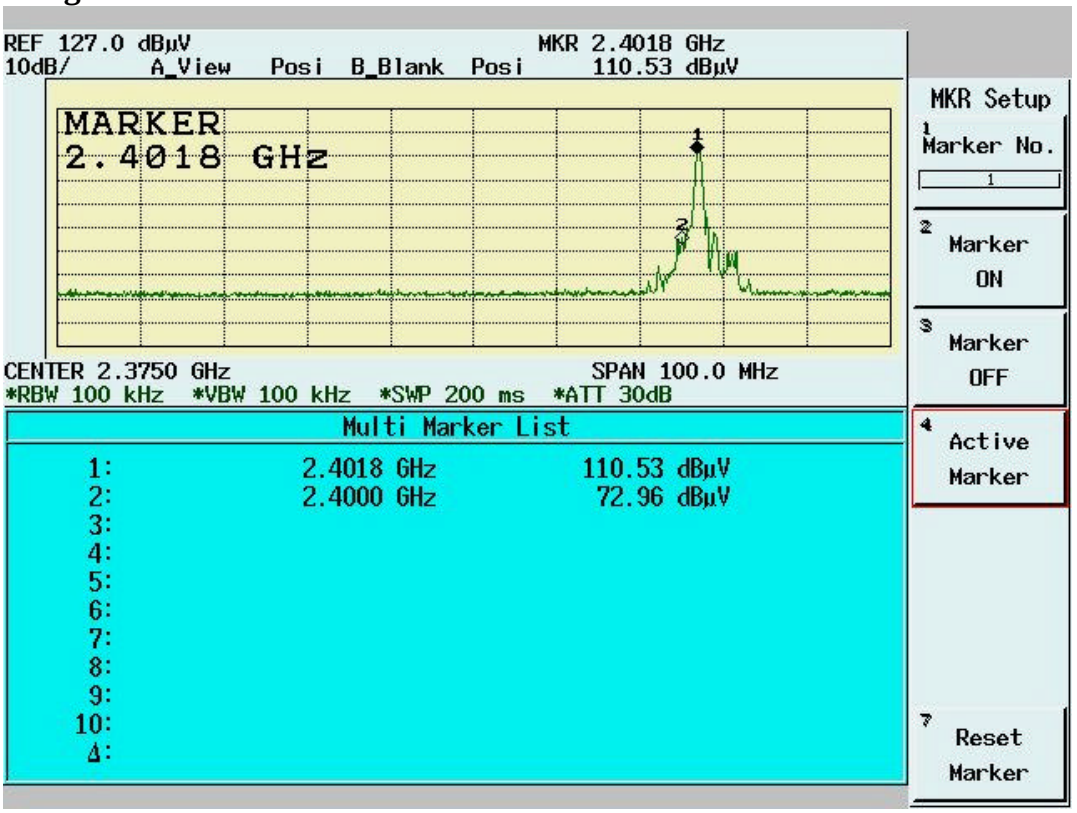
Table: Band Edge measurement (Conducted)

Temperature (℃):24

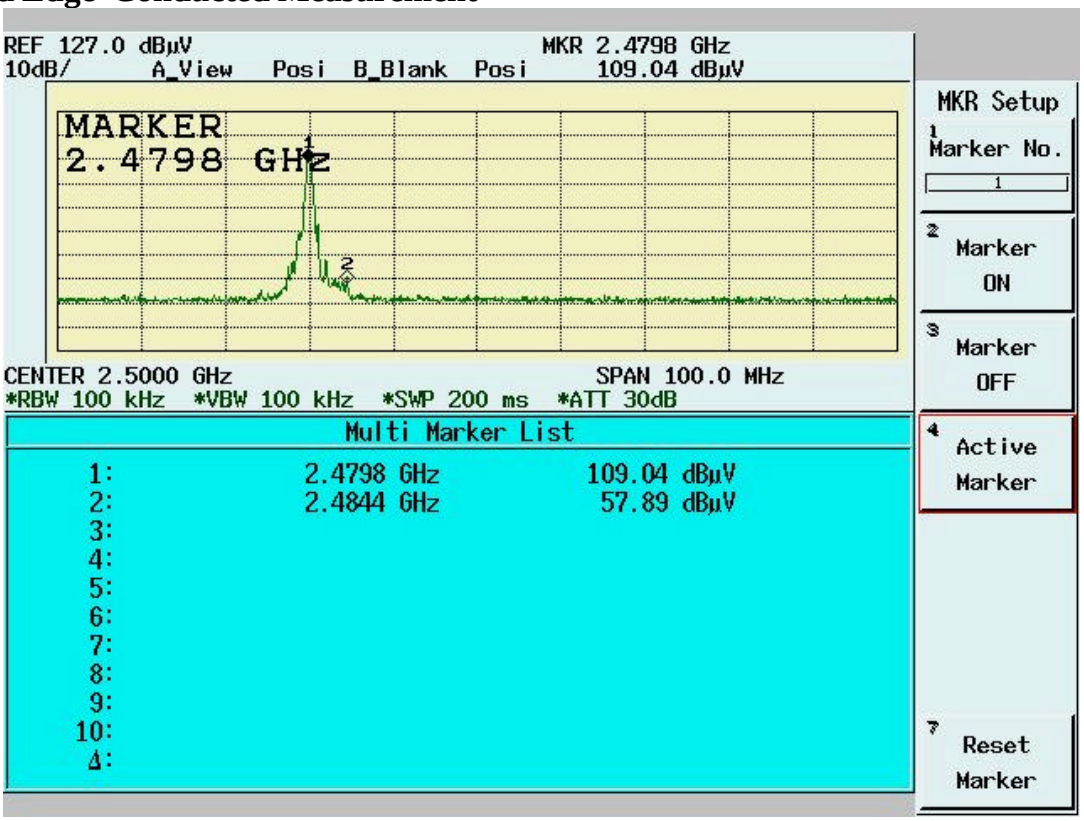
Test Engineer:Leo JL Lin Humidity (%):56

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2401.8	108.5	---	---
Outside band	2400.0	73.0	35.6	Pass
78	2479.8	109.0	---	---
Outside band	2484.4	57.9	51.2	Pass

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: 2.375GHz, 2.500GHz.
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:Leo JL Lin Temperature (℃):24

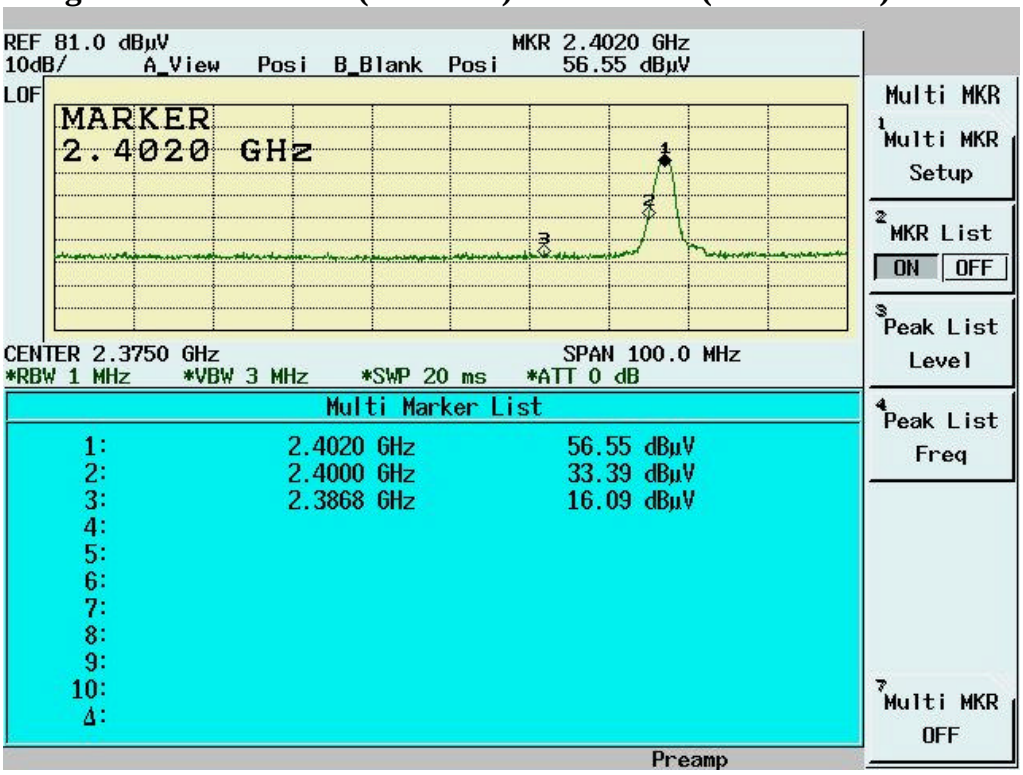
Data Rate Humidity (%):56

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_00 (average mode)	2402.10	22.65	35.48	58.13	---	---	10Hz	---
Channel_00 (peak mode)	2402.00	56.55	35.48	92.03	---	---	3MHz	---
Outside band (peak mode)	2400.00	33.39	35.48	68.87	23.16	---	3MHz	Pass
Channel_78 (average mode)	2480.10	24.55	35.51	60.06	---	---	10Hz	---
Channel_78 (peak mode)	2480.10	59.92	35.51	95.43	---	---	3MHz	---
Outside band (peak mode)	2483.70	19.76	35.51	55.27	40.16	---	3MHz	Pass
Channel_00 Restricted band (peak mode)	2386.80	16.09	35.47	51.56	---	74	3MHz	Pass
Restricted band (average mode)	2389.30	4.84	35.47	40.31	---	54	10Hz	Pass
Channel_78 Restricted band (peak mode)	2483.70	19.76	35.51	55.27	---	74	3MHz	Pass
Restricted band (average mode)	2484.10	7.40	35.51	42.91	---	54	10Hz	Pass

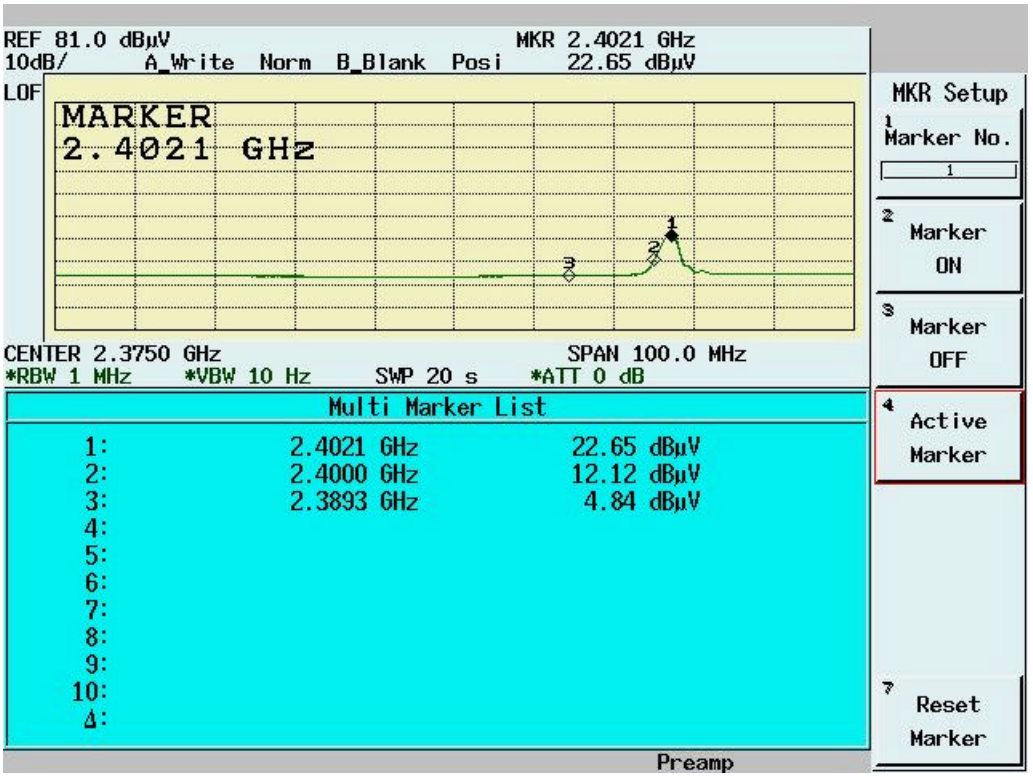
Note:

- 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.

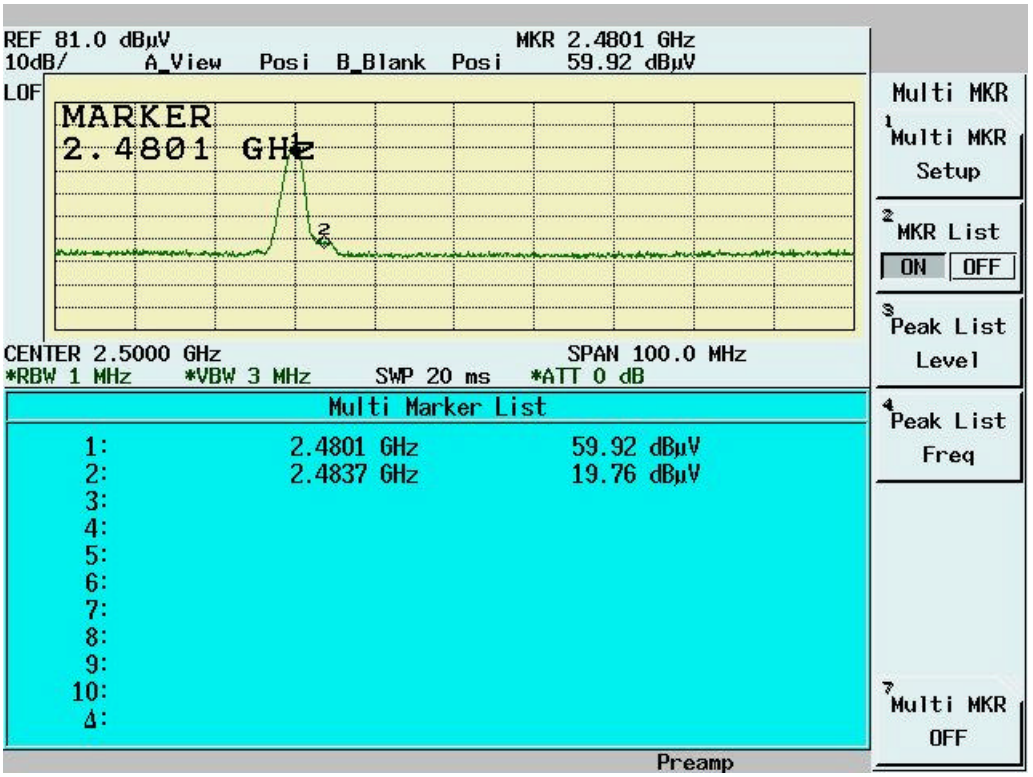
Band Edge Restricted Band (Radiated)-Peak Mode (Channel 00)



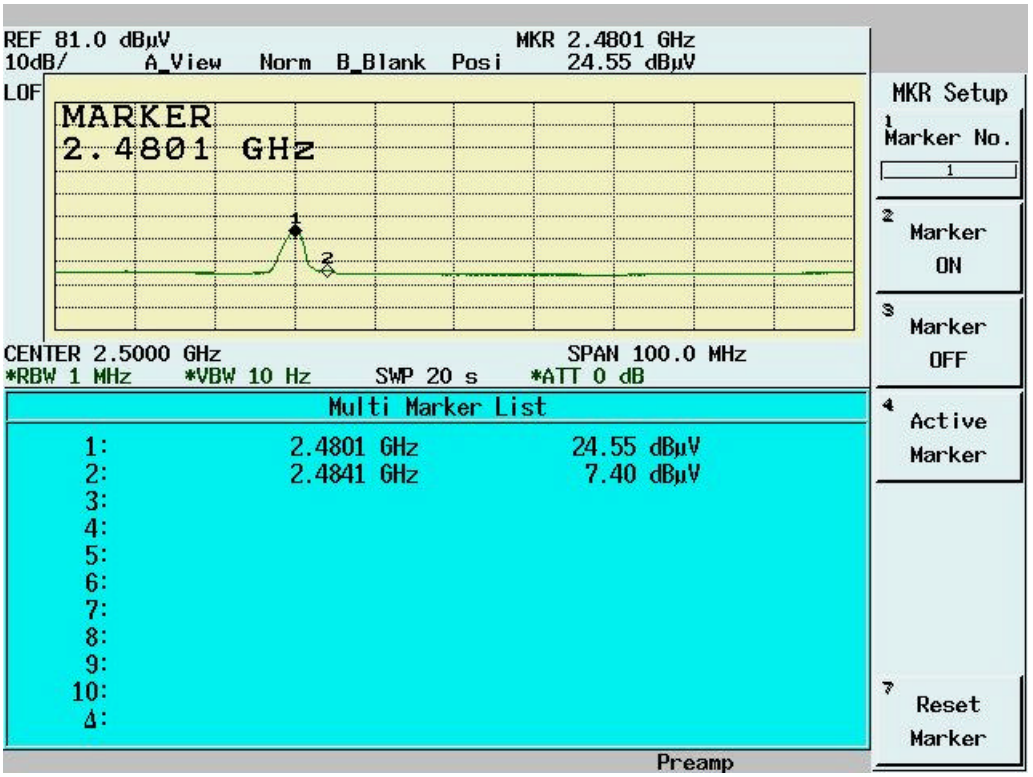
Band Edge Restricted Band (Radiated)-Average Mode (Channel 00)



Band Edge Restricted Band (Radiated)-Peak Mode (Channel 78)



Band Edge Restricted Band (Radiated)-Average Mode (Channel 78)



4.5 Bandwidth & Hopping Channel Separation

4.5.1 Standard Applicable

According to §15.247(a)(1), frequency hopping system shall have, hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies.

4.5.2 Test Procedure

■ Bandwidth Test Procedure

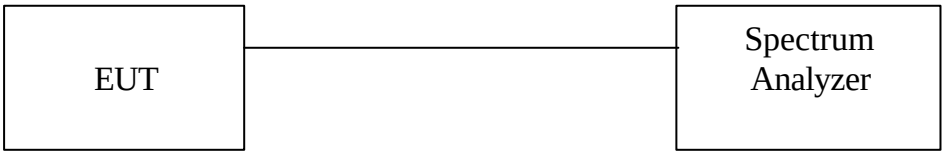
The Transmitter output of EUT was connected to the spectrum analyzer. The 20 dB bandwidth of the fundamental frequency was measured. The setting of spectrum analyzer is as follows

Equipment mode	Spectrum analyzer
Detector function	Peak mode
RBW	30KHz
VBW	100KHz

■ Hopping Channel Separation Test Procedure

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.
   Equipment mode: Spectrum analyzer
   RBW: 100KHz
   VBW: 300KHz
   SPAN:3MHz
2. By using the Max-Hold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by spectrum analyzer Marker function.
4. Repeat above procedures until all frequencies measured were complete.

4.5.3 Test Setup



4.5.4 Test Data

20dB Bandwidth

Temperature (℃):24

Test Engineer:Leo JL Lin Humidity (%):56

Channel	Frequency (MHz)	20dB Bandwidth (KHz)	Limit (KHz)	Pass/Fail
00	**2402**	894	≦ 1000	Pass
39	**2441**	894	≦ 1000	Pass
78	**2480**	894	≦ 1000	Pass

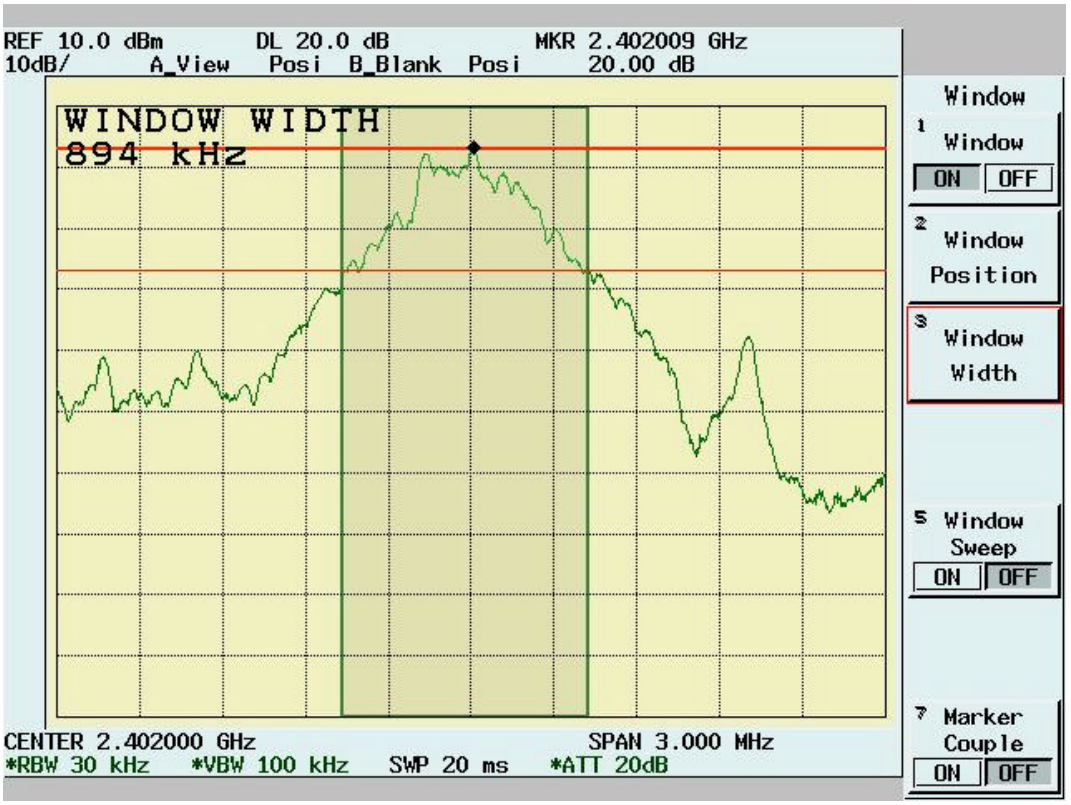
Hopping Channel Separation

Temperature (℃):24

Test Engineer:Leo JL Lin Humidity (%):56

Channel	Frequency (MHz)	Separation (KHz)	Limit (KHz)	Pass/Fail
00	**2402**	996	≧ 894	Pass
39	**2441**	999	≧ 894	Pass
78	**2480**	999	≧ 894	Pass

20dB Bandwidth Channel 00:



20dB Bandwidth Channel 39:

20dB Bandwidth Channel 78:

Hopping Channel Separation Channel 00

Hopping Channel Separation Channel 39

Hopping Channel Separation Channel 78