

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C REQUIREMENT**

OF
Airpanel V110

MODEL No.
Airpanel: VSWM24668-1W/1M/1E/1J/1G

FCC ID: GSS-MW251V110

REPORT NO: 030030-RF-ID

ISSUE DATE: Mar. 10 2003

Prepared for
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VERIFICATION OF COMPLIANCE

Applicant: ViewSonic Corp.
381 Brea Canyon Road Walnut, CA91789, USA

Product Description: Smart Display with built-in mini PCI wireless LAN Card, 2.4GHz DirectSequence Spread Spectrum Data Transceiver.

Model No.: VSWM246678-1W/1M/1E/1J/1G

Model Difference: All the above models are same except the model number designed

Brand Name: ViewSonic

Serial Number: N/A

File Number: 030030-RF-ID

Date of test: September 25 ~ December 10, 2002

We hereby certify that:

The above equipment was tested by C&C Laboratory Co., Ltd. The test data , data evaluation , test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (1992) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247

The test results of this report relate only to the tested sample identified in this report.

Approved By



Vincent Su / Vice Manager
C&C Laboratory Co., Ltd..

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1. GENERAL INFORMATION

1.1 Product Description

The View Sonic Corp. Model: Airpanel:VSWM24668-1W/1M/1E/1J/1G,Docking: VSACC24669-1W/1M/1E/1J/1G (referred to as the EUT in this report) is a LCD Display built-with Mini PCI IEEE 802.11b module. The EUT is compliance with IEEE802.11b Standard.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 2.412GHz – 2.462GHz; 11 channels;
- B). Transmit Power: 16dBm
- C). Modulation type: Direct Sequence spread Spectrum, (CCK; DQPSK; DBPSK)
- D). Transition Speed: 1/2/5.5/11Mbps
- E). Antenna Designation: 0dBi , PIFA Antenna; Non-User Replaceable (Fixed)

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: GSS-MW251V110 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure

1.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (1992). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of C&C Laboratory, Co., Ltd. No. 81-1, 210 Lane, Pa-de 2nd Road, Lu-Chu Hsiang, Taoyuan, Taiwan, R.O.C.. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 1992 and CISPR 22/EN 55022 requirements..

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-1992. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-1992.

2.4 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

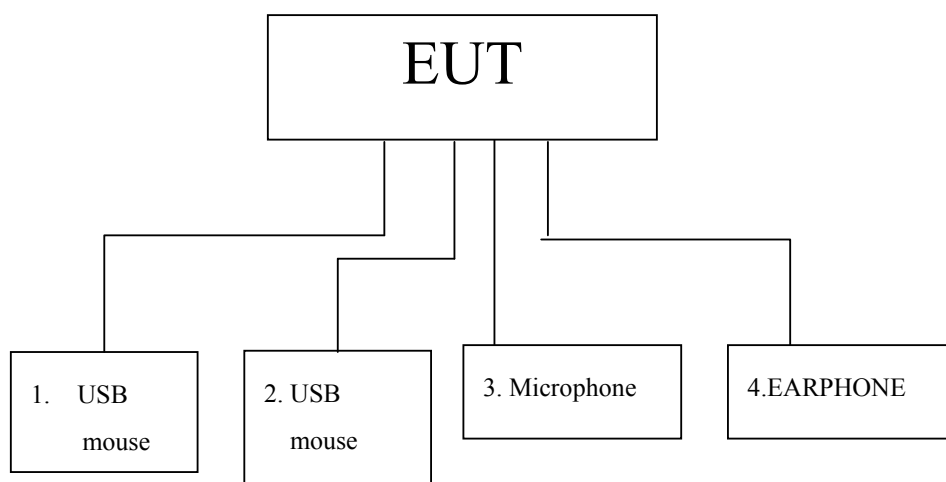


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Data Cable	Power Cord
1	USB-MOUSE	LOGITECH	M-BB48	FCC DoC	DoC	Shielded,1.8m	N/A
2	USB-MOUSE	LOGITECH	M-BB48	FCC DoC	DoC	Shielded,1.8m	N/A
3	Microphone	KOKA	SX-M	N/A	I3-0	Unshielded,2.8m	N/A
4	EARPHONE	GITON	GT-2004v	N/A	N/A	UnShielded,1.8m	N/A

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.209(a) (f)	Spurious Emission	Compliant
§15.207(a)	Conducted Emission	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.247(b)	Peak Output Power	Compliant
§15.247(c)	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(d)	Power Density	Compliant
§15.203	Antenna Requirement	Compliant

4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel 1(2412MHz) 、6(2437MHz) and 11(2462MHz) with 11Mbps highest data rate are chosen for testing.

The Radiated Spurious Emission was measured as EUT X,Y and Z axes, the worse case Y axes was reported.

5. SPURIOUS RADIATED EMISSION TEST

5.1 Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

5.2 EUT Setup

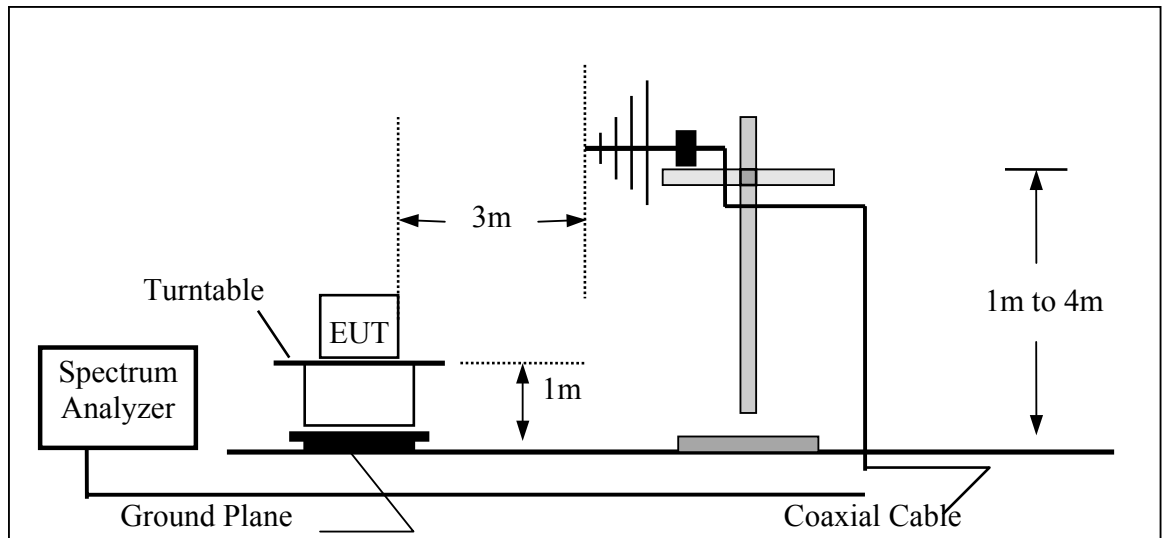
1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-1992.
2. The EUT was put in the front of the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 110Vac/60Hz power source.

5.3 Measurement Procedure

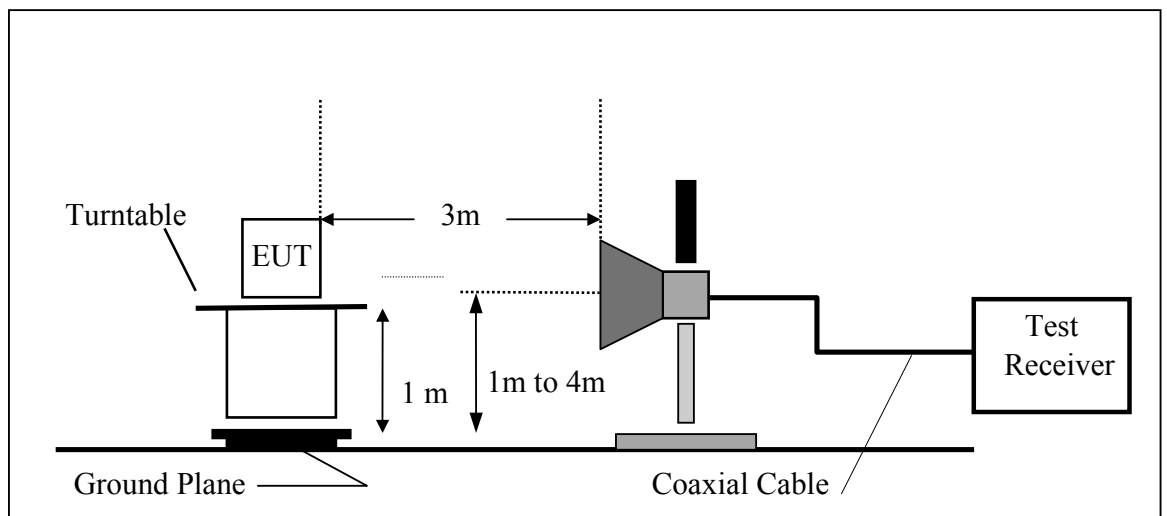
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

5.4 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-Up Frequency Over 1 GHz



5.5 Measurement Equipment Used:

Open Area Test Site # 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	ADVANTEST	R3261A	N/A	03/19/2002	03/18/2003
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	ROHDE & SCHWARZ	FSP30	100112	06/29/2002	06/28/2003
EMI Test Receiver	R&S	ESVS20	838804/004	01/05/2002	01/04/2003
Pre-Amplifier	HP	8447D	2944A09173	03/04/2002	03/03/2003
Bilog Antenna	SCHWAZBECK	VULB9163	145	07/06/2002	07/05/2003
Turn Table	EMCO	2081-1.21	9709-1885	N.C.R	N.C.R
Antenna Tower	EMCO	2075-2	9707-2060	N.C.R	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R	N.C.R
Site NSA	C&C	N/A	N/A	11/17/2002	11/16/2003
Horn antenna	Schwarzbeck	BBHA 9120	D210	2/24/2002	2/23/2003
Pre-Amplifier	HP	8449B	3008B00965	10/01/2002	10/02/2003

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

5.6 Measurement Result

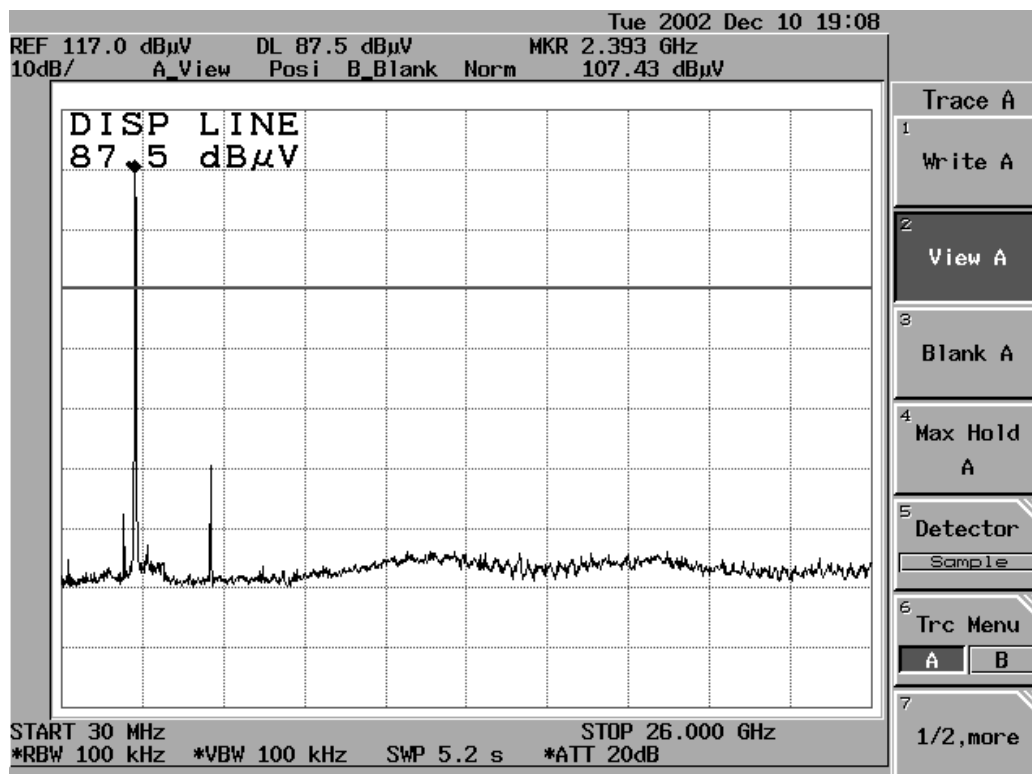
Refer to attach tabular data sheets.

NOTE:

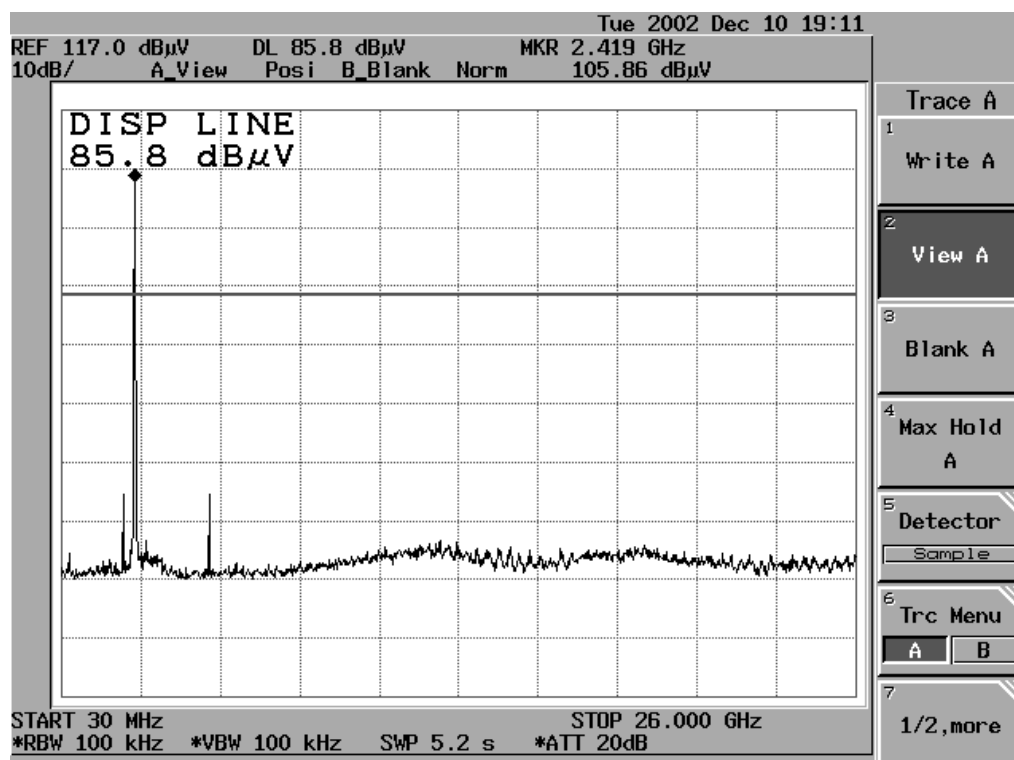
The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

Conducted Spurious Emission Measurement Result

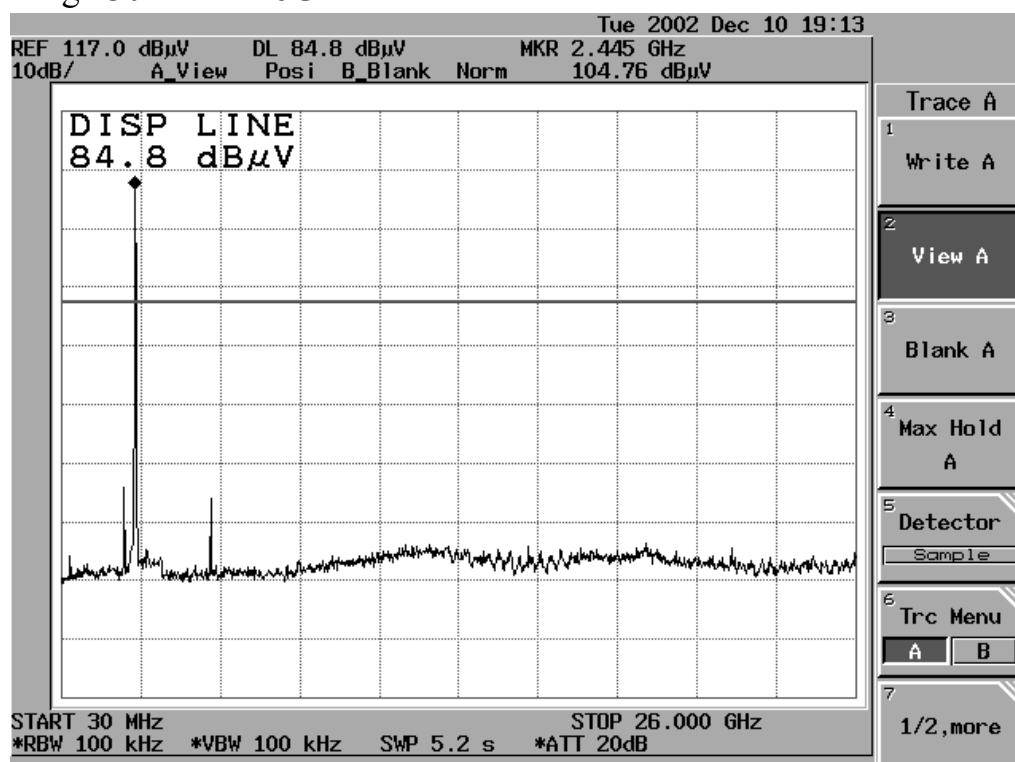
CH Low 30MHz – 26GHz



CH Mid 30MHz – 26GHz



CH High 30MHz – 26GHz



Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode: TX CH Low Y+Docking Mode

Test Date : Nov. 11 2002

Fundamental Frequency: 2412MHz

Test By: Robin

Temperature : 23 °C

Pol: Ver./Hor

Humidity : 65 %

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
98.63	V	Peak	21.65	13.85	35.50	43.50	-8.00
118.21	V	Peak	28.7	11.80	40.50	43.50	-3.00
129.09	V	Peak	24.67	11.25	35.92	43.50	-7.58
386.70	V	Peak	19.72	20.00	39.72	46.00	-6.28
561.29	V	Peak	13.83	24.53	38.36	46.00	-7.64
826.00	V	Peak	13.27	26.73	40.00	46.00	-6.00
118.21	H	Peak	25.16	11.80	36.96	43.50	-6.54
165.00	H	Peak	23.35	11.77	35.12	43.50	-8.38
264.55	H	Peak	22.78	15.96	38.74	46.00	-7.26
396.70	H	Peak	21.85	20.54	42.39	46.00	-3.61
461.32	H	Peak	19.74	20.70	40.44	46.00	-5.56
495.12	H	Peak	17.28	22.28	39.56	46.00	-6.44

Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz °
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode: TX CH Mid Y+Docking Mode

Test Date : Nov. 11 2002

Fundamental Frequency: 2438MHz

Test By: Robin

Temperature : 23 °C

Pol: Ver./Hor.

Humidity : 65 %

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
98.08	V	Peak	21.54	13.74	35.28	43.50	-8.22
118.21	V	Peak	28.78	11.80	40.58	43.50	-2.92
165.00	V	Peak	24.78	11.77	36.55	43.50	-6.95
386.70	V	Peak	19.87	20.00	39.87	46.00	-6.13
395.15	V	Peak	17.84	20.46	38.30	46.00	-7.70
527.50	V	Peak	15.29	23.48	38.77	46.00	-7.23
98.63	H	Peak	22.85	13.85	36.70	43.50	-6.80
118.21	H	Peak	22.87	11.80	20.54	43.50	-22.96
258.02	H	Peak	23.71	16.12	20.37	46.00	-25.63
386.70	H	Peak	24.32	20.00	20.82	46.00	-25.18
395.15	H	Peak	21.35	20.46	21.54	46.00	-24.46
461.32	H	Peak	21.13	20.70	25.84	46.00	-20.16

Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz °
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode: TX CH High Y+Docking Mode

Test Date : Nov. 11 2002

Fundamental Frequency: 2462MHz

Test By: Robin

Temperature : 23 °C

Pol: Ver./Hor.

Humidity : 65 %

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
98.08	V	Peak	24.19	13.74	37.93	43.50	-5.57
118.21	V	Peak	28.37	11.80	40.17	43.50	-3.33
165.00	V	Peak	23.59	11.77	35.36	43.50	-8.14
386.70	V	Peak	20.91	20.00	40.91	46.00	-5.09
395.15	V	Peak	17.79	20.46	38.25	46.00	-7.75
561.29	V	Peak	14.82	24.53	39.35	46.00	-6.65
98.63	H	Peak	20.68	13.85	34.53	43.50	-8.97
118.21	H	Peak	24.35	11.80	36.15	43.50	-7.35
165.00	H	Peak	24.29	11.77	36.06	43.50	-7.44
386.70	H	Peak	23.82	20.00	43.82	46.00	-2.18
461.32	H	Peak	20.03	20.70	40.73	46.00	-5.27
495.12	H	Peak	18.70	22.28	40.98	46.00	-5.02

Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz °
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode: TX CH Low Y+Docking Mode

Test Date : Nov. 11 2002

Fundamental Frequency: 2412 MHz

Test By: Robin

Temperature : 23 °C

Pol: Vertical

Humidity : 65 %

Freq. (MHz)	Peak Reading	AV Reading	Ant./CL CF(dB)	Actual FS		Peak Limit	AV Limit	Margin (dB)	
	(dBuV)	(dBuV)		Peak (dBuV/m)	AV (dBuV/m)	(dBuV/m)	(dBuV/m)		
1880.0	58.48		-8.07	50.41		74.00	54.00	-3.59	Peak
2040.0	54.73		-7.44	47.29		74.00	54.00	-6.71	Peak
4070.0	45.51		-1.07	44.44		74.00	54.00	-9.56	Peak
4824.0	51.28		0.30	51.58		74.00	54.00	-2.42	Peak
7236.0	--					74.00	54.00		
9648.0	--					74.00	54.00		
12060.0	--					74.00	54.00		
14472.0	--					74.00	54.00		
16884.0	--					74.00	54.00		
19296.0	--					74.00	54.00		
21708.0	--					74.00	54.00		
24120.0	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency °
- (2) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Setting 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode: TX CH Low Y+Docking Mode Test Date : Nov. 11 2002
 Fundamental 2412 MHz Test By: Robin
 Frequency:
 Temperature : 30 °C Pol: Horizontal
 Humidity : 55%

Freq. (MHz)	Peak Reading	AV Reading	Ant./CL CF(dB)	Actual FS		Peak Limit	AV Limit	Margin (dB)	
	(dBuV)	(dBuV)		Peak (dBuV/m)	AV (dBuV/m)	(dBuV/m)	(dBuV/m)		
1220.0	50.12		-10.46	39.66		74.00	54.00	-14.34	Peak
1288.0	49.46		-10.29	39.17		74.00	54.00	-14.83	Peak
1880.0	53.04		-8.07	44.97		74.00	54.00	-9.03	Peak
4070.0	41.02		-1.07	39.95		74.00	54.00	-14.05	Peak
4824.0	47.67		0.30	47.97		74.00	54.00	-6.03	Peak
7236.0	--					74.00	54.00		
9648.0	--					74.00	54.00		
12060.0	--					74.00	54.00		
14472.0	--					74.00	54.00		
16884.0	--					74.00	54.00		
19296.0	--					74.00	54.00		
21708.0	--					74.00	54.00		
24120.0	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency °
- (2) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Setting 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode: TX CH Mid Y+Docking Mode Test Date : Nov. 11 2002
 Fundamental: 2438 MHz Test By: Robin
 Frequency:
 Temperature : 30 °C Pol: Vertical
 Humidity : 55%

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
1020.0	52.67		-11.64	41.03		74.00	54.00	-12.97	Peak
1920.0	54.00		-7.91	46.09		74.00	54.00	-7.91	Peak
2064.0	56.06		-7.35	48.71		74.00	54.00	-5.29	Peak
4120.0	51.21		-0.94	50.27		74.00	54.00	-3.73	Peak
4870.0	46.74		0.35	47.09		74.00	54.00	-6.91	Peak
4876.0	--					74.00	54.00		
7314.0	--					74.00	54.00		
9752.0	--					74.00	54.00		
12190.0	--					74.00	54.00		
14628.0	--					74.00	54.00		
17066.0	--					74.00	54.00		
19504.0	--					74.00	54.00		
21942.0	--					74.00	54.00		
24380.0	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency °
- (2) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Setting 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode: TX CH MID Y+Docking Mode Test Date : Nov. 11 2002
 Fundamental: 2438 MHz Test By: Robin
 Frequency:
 Temperature : 30 °C Pol: Horizontal
 Humidity : 55%

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
1220.0	50.87		-10.46	40.41		74.00	54.00	-13.59	Peak
1288.0	49.67		-10.29	39.38		74.00	54.00	-14.62	Peak
1648.0	51.20		-8.75	42.45		74.00	54.00	-11.55	Peak
2064.0	51.40		-7.35	44.05		74.00	54.00	-9.95	Peak
4120.0	47.39		-0.94	46.45		74.00	54.00	-7.55	Peak
4876.0	--					74.00	54.00		
7314.0	--					74.00	54.00		
9752.0	--					74.00	54.00		
12190.0	--					74.00	54.00		
14628.0	--					74.00	54.00		
17066.0	--					74.00	54.00		
19504.0	--					74.00	54.00		
21942.0	--					74.00	54.00		
24380.0	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency °
- (2) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Setting 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX CH High Y+Docking Mode	Test Date :	Nov. 11 2002
Fundamental	2462 MHz	Test By:	Robin
Frequency:		Pol:	Vertical
Temperature :	30 °C		
Humidity :	55%		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
1020.0	48.27		-11.64	36.63		74.00	54.00	-17.37	Peak
1220.0	47.67		-10.46	37.21		74.00	54.00	-16.79	Peak
1956.0	49.09		-7.77	41.32		74.00	54.00	-12.68	Peak
2088.0	53.65		-7.26	46.39		74.00	54.00	-7.61	Peak
4170.0	47.65		-0.82	46.83		74.00	54.00	-7.17	Peak
4920.0	45.66		0.39	46.05		74.00	54.00	-7.95	Peak
4924.0	--					74.00	54.00		
7386.0	--					74.00	54.00		
9848.0	--					74.00	54.00		
12310.0	--					74.00	54.00		
14772.0	--					74.00	54.00		
17234.0	--					74.00	54.00		
19696.0	--					74.00	54.00		
22158.0	--					74.00	54.00		
24620.0	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency °
- (2) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Setting 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode: TX CH High Y+Docking Mode Test Date : Nov. 11 2002
 Fundamental: 2462 MHz Test By: Robin
 Frequency:
 Temperature : 30 °C Pol: Horizontal
 Humidity : 55%

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
1196.0	50.27		-10.53	39.74		74.00	54.00	-14.26
1716.0	50.05		-8.57	41.48		74.00	54.00	-12.52
1956.0	55.91		-7.77	48.14		74.00	54.00	-5.86
2088.0	50.17		-7.26	42.91		74.00	54.00	-11.09
4170.0	45.74		-0.82	44.92		74.00	54.00	-9.08
4920.0	50.00		0.39	50.39		74.00	54.00	-3.61
4924.0	--					74.00	54.00	
7386.0	--					74.00	54.00	
9848.0	--					74.00	54.00	
12310.0	--					74.00	54.00	
14772.0	--					74.00	54.00	
17234.0	--					74.00	54.00	
19696.0	--					74.00	54.00	
22158.0	--					74.00	54.00	
24620.0	--					74.00	54.00	

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency °
- (2) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column °
- (4) Spectrum Setting 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.

6. AC POWER LINE CONDUCTED EMISSION TEST

6.1 Standard Applicable

According to §15.207. frequency within 150KHz to 30MHz shall not exceed

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

6.2 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-1992.
2. The EUT was plug-in the host PC via USB port. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 110Vac/60Hz power source.

6.3 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

6.4 Measurement Equipment Used:

Conducted Emission Test Site # 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESHS30	828144/003	08/08/2002	08/07/2003
LISN	R&S	ESH2-Z5	843285/010	12/10/2001	12/09/2002
LISN	EMCO	3825/2	9003-1628	07/26/2002	07/25/2003
Spectrum Analyzer	ADVANTEST	R3261A	91720031	N/A	N/A
2X2 WIRE ISN	R&S	ENY22	100020	06/20/2002	06/19/2003
FOUR WIRE ISN	R&S	ENY41	100006	06/20/2002	06/19/2003

6.5 Measurement Result

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Operation Mode: TX + RX Mode

Test Date : Sep. 02 2002

Fundamental Frequency:

Test By: Robin

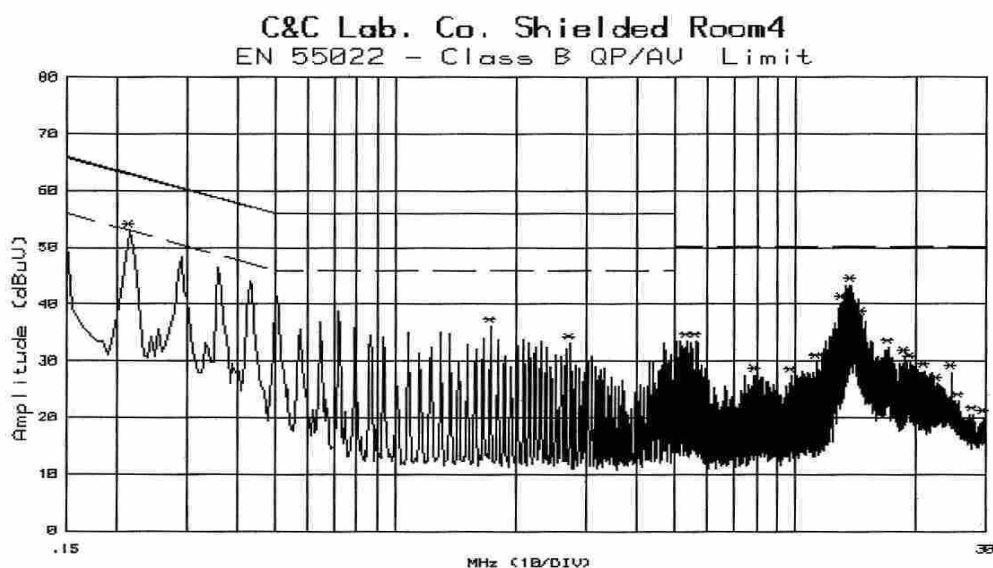
Temperature : 30 °C

Humidity : 50%

FREQ MHz	Q.P. Raw dBuV	AVG Raw dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.215	52.90	43.90	63.01	53.01	-10.11	-9.11	L1
1.730	36.10	---	56.00	46.00	-19.90	---	L1
2.740	33.10	---	56.00	46.00	-22.90	---	L1
13.080	40.30	---	60.00	50.00	-19.70	---	L1
13.740	43.40	---	60.00	50.00	-16.60	---	L1
14.670	37.60	---	60.00	50.00	-22.40	---	L1
0.215	40.60	47.40	63.01	53.01	-22.41	-5.61	L2
1.000	47.40	43.80	56.00	46.00	-8.60	---	L2
2.430	38.10	---	56.00	46.00	-17.90	---	L2
13.040	41.90	---	60.00	50.00	-18.10	---	L2
13.680	41.30	---	60.00	50.00	-18.70	---	L2
14.760	35.90	---	60.00	50.00	-24.10	---	L2

Remark :

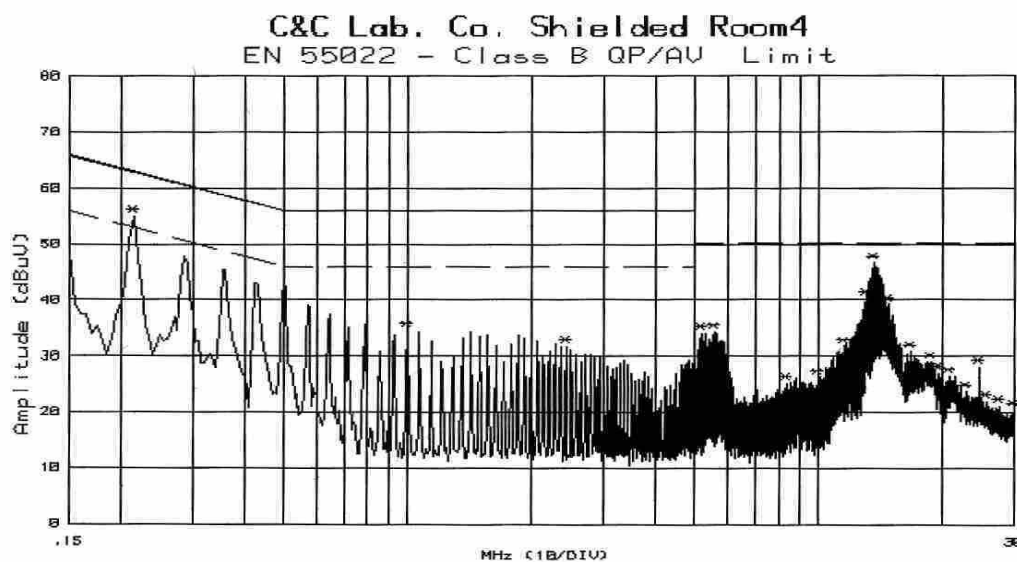
- (1) Measuring frequencies from 0.15 MHz to 30MHz °
- (2) The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Qusia-Peak detector and Average detector.
- (3) “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.
- (4) The IF bandwidth of SPA between 0.15MHz to 30MHz was 10KHz;
The IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9KHz;
- (5) L1 = Line One (Hot side) / L2 = Line Two (Neutral side)

Conducted Test Data L1

Customer:VIEW SONIC
Model :VSWM24668-1W
Mode :.
Reading :Peak(R&S Receiver)
Remark :TX+RX

File#: 907
Humd.:50 (%)
Port :L1

Date : 2 Sep 2002 16:19:22
Temp. :30 (C)
Tested by:MARKBA LEE



Customer:VIEW SONIC
Model :VSWM24668-1W
Mode :.
Reading :Peak(R&S Receiver)
Remark :TX+RX

File#: 906
Humd.:50 (%)
Port :L2

Date : 2 Sep 2002 16:08:57
Temp. :30 (C)
Tested by:MARKBA LEE

7. 6 dB Bandwidth Measurement

7.1 Standard Applicable

According to § 15.247(a)(2), DSSS Systems operating in the 2400MHz-2483.5 MHz and 5725MHz – 5850MHz bands. The Minimum 6dB bandwidth shall be at least 500KHz.

7.2 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	Model No.	Serial No.	LAST CAL.	Cal. Due.
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/23/2002	07/22/2003
low loss cable	Huber + Suhner	Sucoflex 104	N/A	N/A	N/A

7.3 Test Set-up:

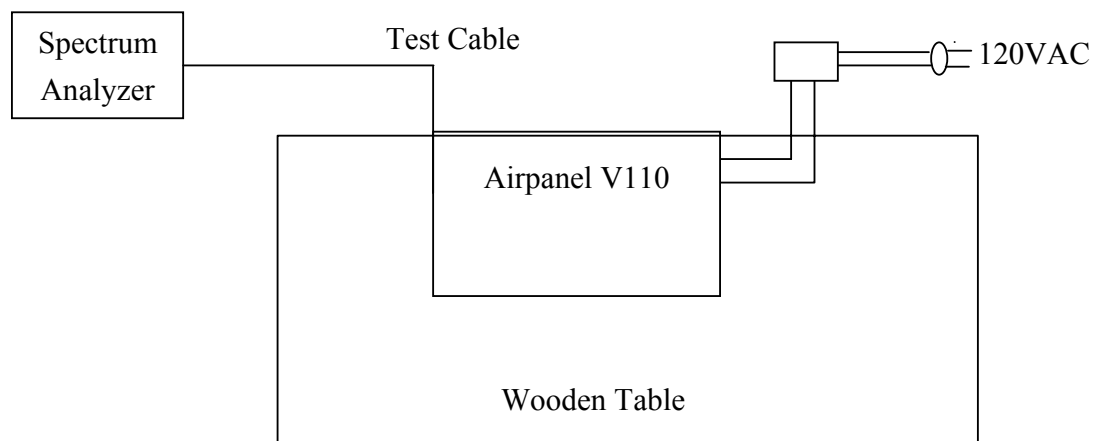


Fig. 4

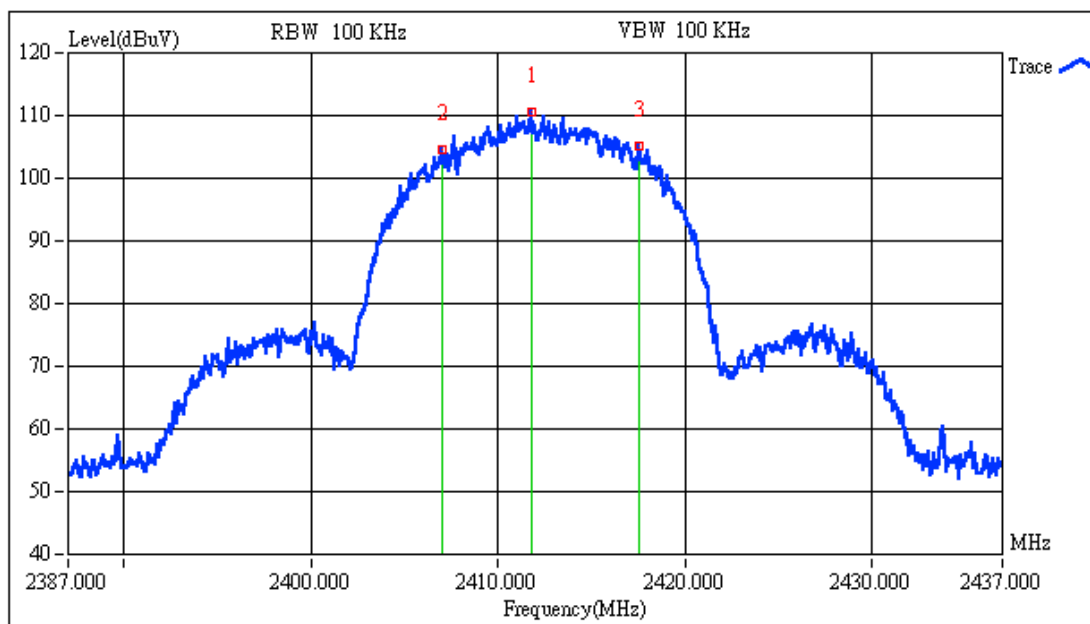
Fig. 4 : Measurement setup for testing on Antenna connector

7.4 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW = RBW, Span= 2MHz, Sweep=auto
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

7.5 Measurement Result

CH	Bandwidth (MHz)	Bandwidth (KHz)	Result
Lower	10.6	> 500	PASS
Mid	10.6	> 500	PASS
Higher	10.6	> 500	PASS

6dB Band Width Test Data CH-LOW

Custom Name:

View Sonic

Engineer:

markba lee

Peak 2411.80 MHz

Band Width

110.48 dBuV

10.600 MHz

Model Name:

VSWM24668

Report No.:

020047-R

Delta1 2407.00 MHz

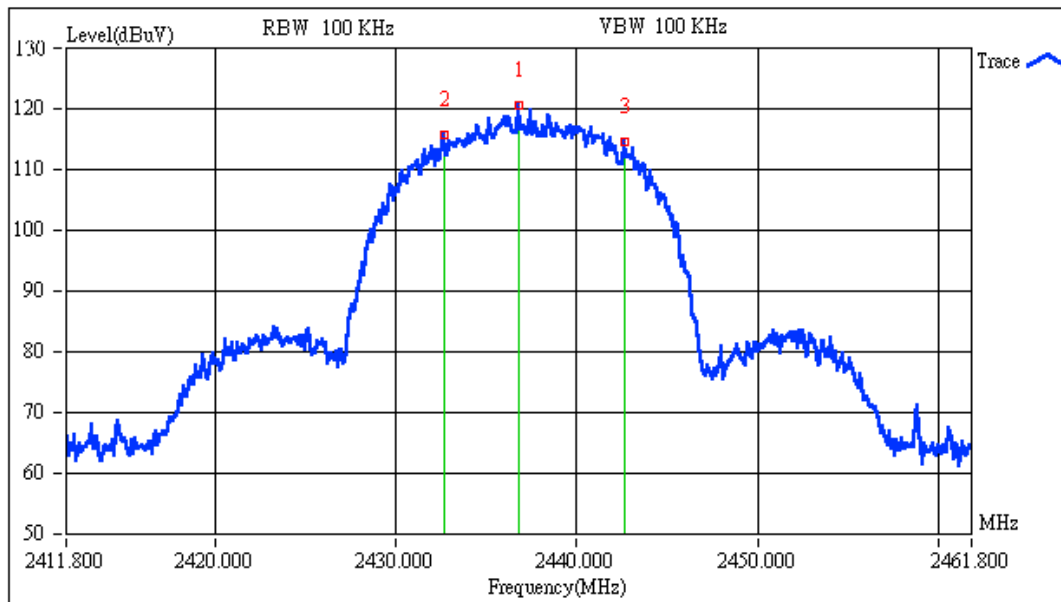
Delta2 2417.60 MHz

Test Mode:

TX CH-1

104.49 dBuV

105.02 dBuV

6dB Band Width Test Data CH-MID

Custom Name:

View Sonic

Engineer:

markba lee

Peak 2436.80 MHz

Band Width

Model Name:

VSWM24668

Report No.:

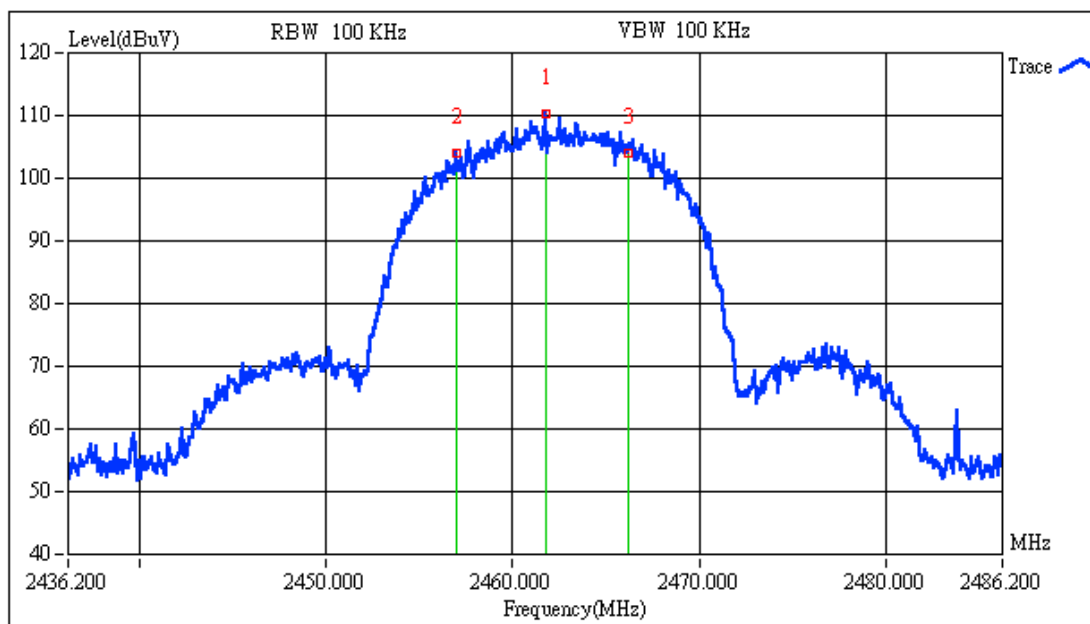
020047-R

119.88 dBuV

10.600 MHz

Test Mode:

TX CH-6

6dB Band Width Test Data CH-HIGH

Custom Name:

View Sonic

Engineer:

markba lee

Peak 2461.80 MHz

Band Width

110.16 dBuV

10.600 MHz

Model Name:

VSWM24668

Report No.:

020047-R

Delta1 2457.00 MHz Delta2 2467.60 MHz

Test Mode:

TX CH-11

104.07 dBuV

104.27 dBuV

8. PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

According to §15.247(b)(2), for direct sequence systems, the maximum peak output power of the intentional radiator shall not exceed 1 Watt.

8.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Channel power function, RBW, VBW = 1MHz)
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

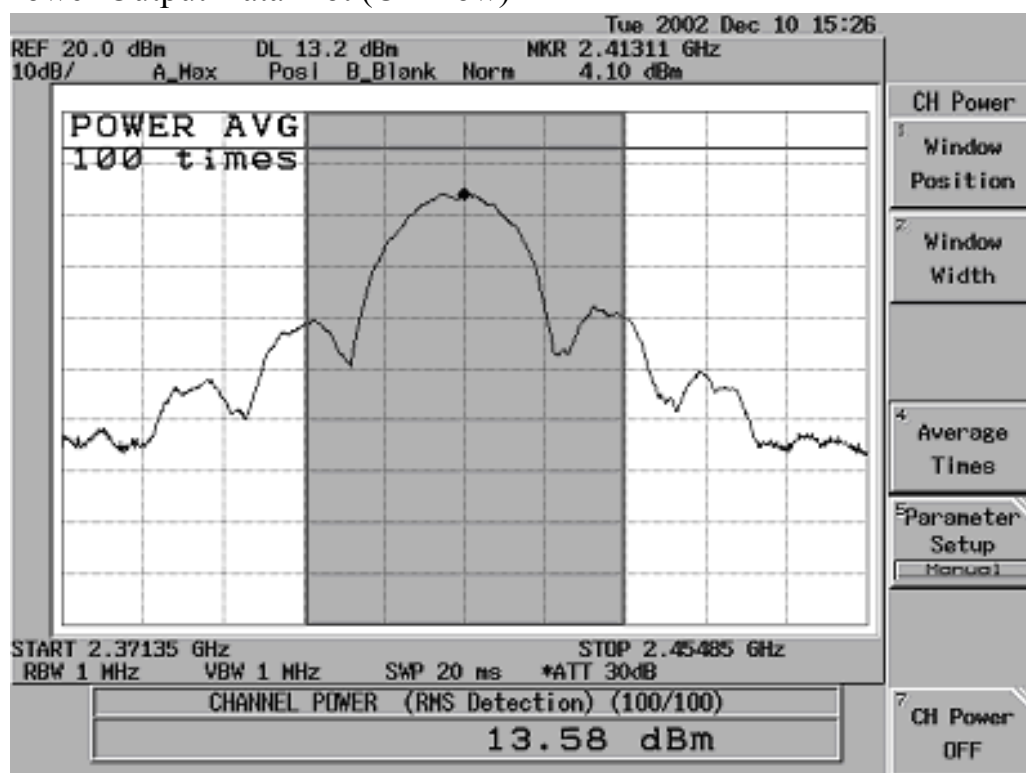
8.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	Model No.	Serial No.	LAST CAL.	Cal. Due.
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/23/2002	07/22/2003
low loss cable	Huber + Suhner	Sucoflex 104	N/A	N/A	N/A

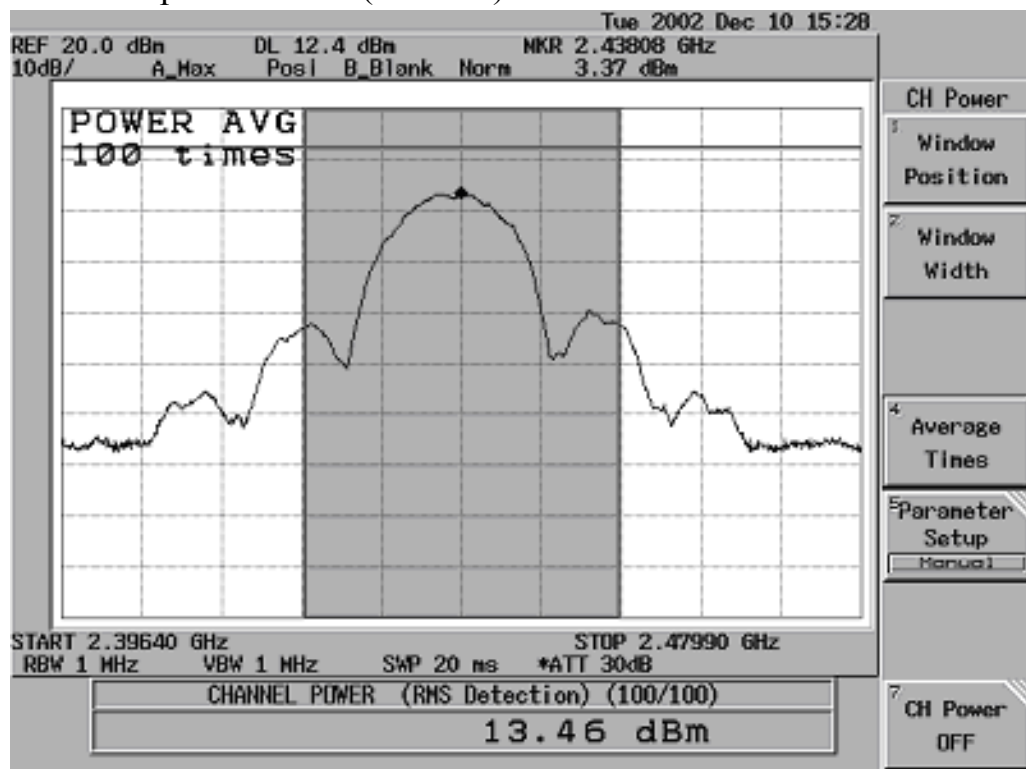
8.4 Test Results:

CH	Reading Power dBm	Cable Loss dB	Output Power dBm	Output Power W	Limit (W)	Result
LOWER	13.58	1.20	14.78	0.03006	1	PASS
MID	13.46	1.20	14.66	0.02924	1	PASS
HIGHER	12.64	1.20	13.84	0.02421	1	PASS

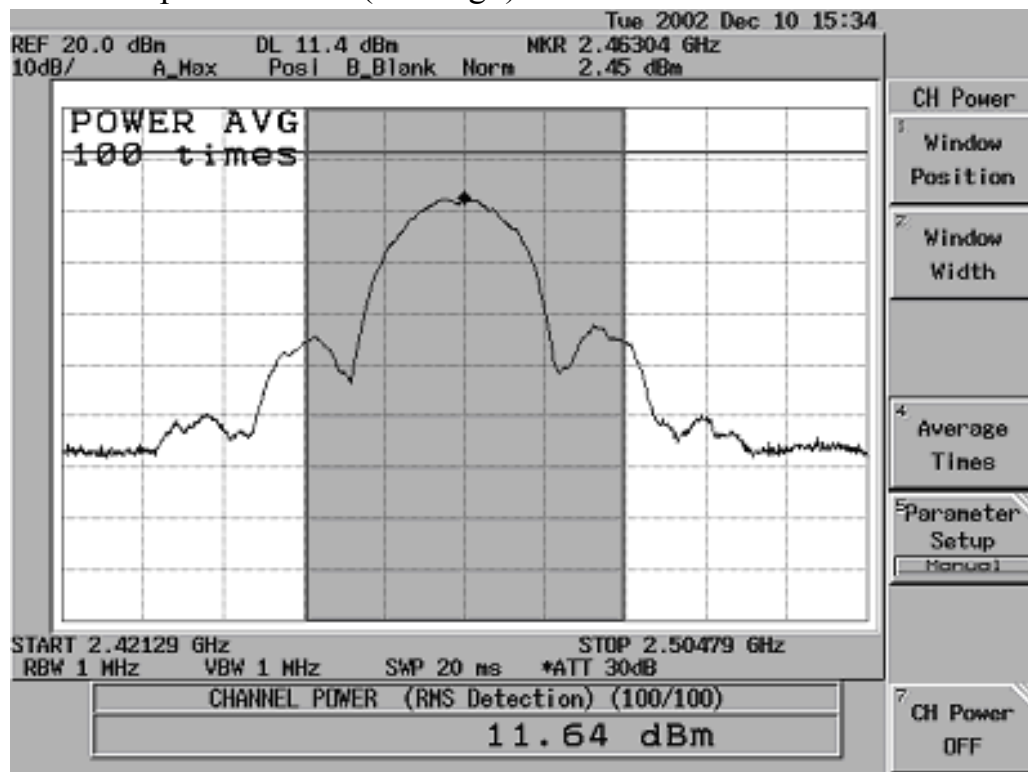
Peak Power Output Data Plot (CH Low)



Peak Power Output Data Plot (CH Mid)



Peak Power Output Data Plot (CH High)



9. 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

9.1 Standard Applicable

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

9.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW,VBW=100KHz, Start = 2.3857GHz, Stop = 2.406GHz or Start = 2.4751GHz, Stop = 2.495GHz, Sweep = auto.
5. Mark Peak ,2.4GHz and 2.4835GHz and record the max. level.
6. Repeat above procedures until all frequency measured were complete.

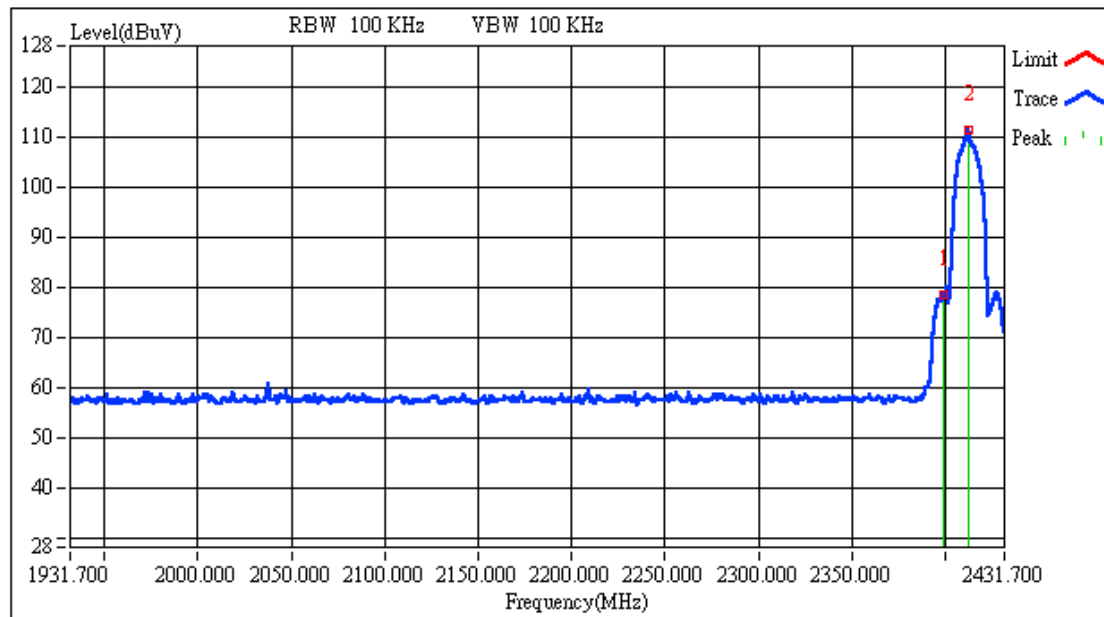
9.3 Measurement Result

Refer to attach spectrum analyzer data chart.

9.4 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	Model No.	Serial No.	LAST CAL.	Cal. Due.
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/23/2002	07/22/2003
low loss cable	Huber + Suhner	Sucoflex 104	N/A	N/A	N/A

Out of Band Test Data CH-LOW



Custom Name:

View Sonic

Engineer:

markba.lee

Model Name:

VSWM24668-1 W

Report No.:

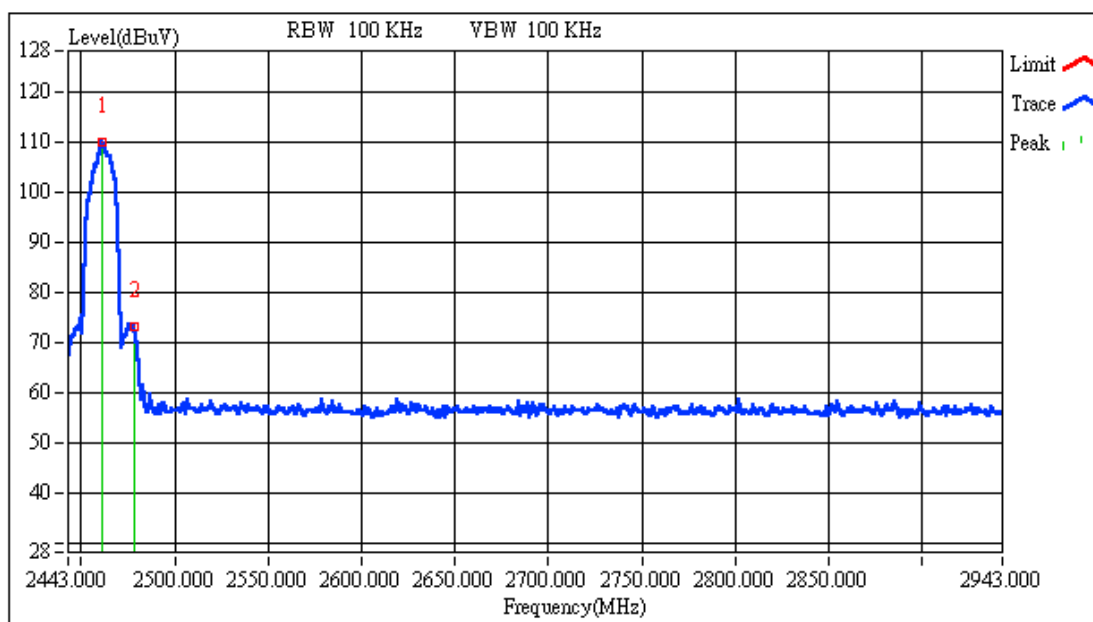
020047-R

Test Mode:

TX CH-1

	Frequency(MHz)	Read Level (dBuV)	Probe (dB)	Cable Loss (dB)	Level(dBuV)
1	2398.7000	78.29	0.00	0.00	78.29
2	2412.7000	111.16	0.00	0.00	111.16

Out of Band Test Data CH-HIGH



Custom Name:

View Sonic

Engineer:

markba lee

Model Name:

VSWM24668-1 W

Report No.:

020047-R

Test Mode:

TX CH-11

	Frequency(MHz)	Read Level (dBuV)	Probe (dB)	Cable Loss (dB)	Level(dBuV)
1	2461.0000	109.79	0.00	0.00	109.79
2	2478.0000	73.13	0.00	0.00	73.13

10. Peak Power Spectral Density

10.1 Standard Applicable

According to §15.247(d), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3kHz band during any time interval of continuous transmission.

10.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3KHz, VBW = 3KHz, Span = 300KHz, Sweep=100s
4. Record the max. reading.
5. Repeat above procedures until all frequency measured were complete.

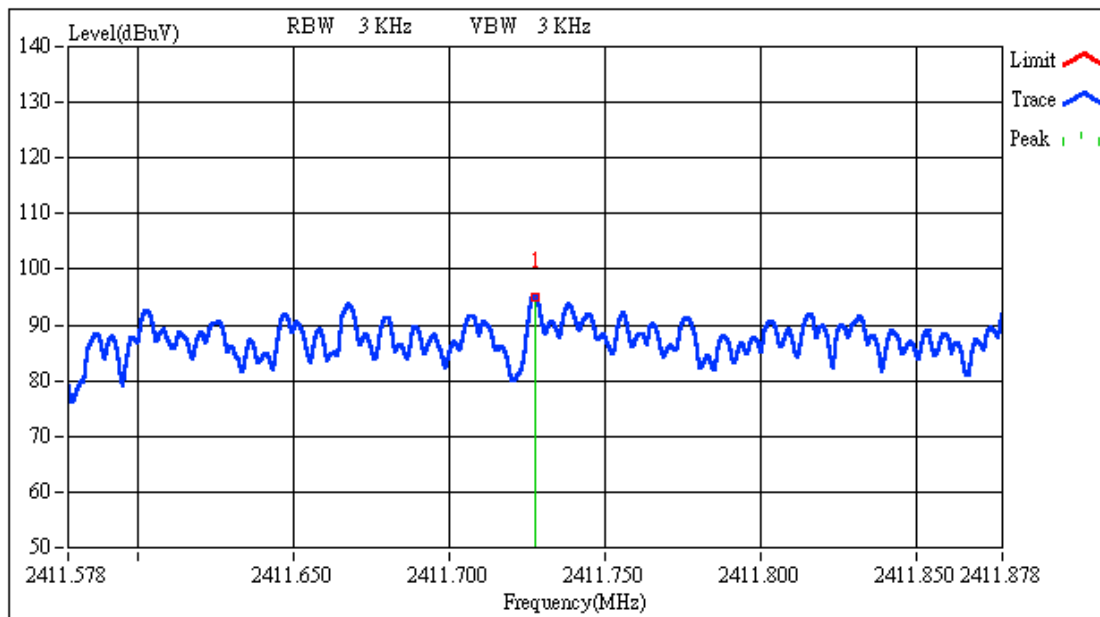
10.3 Measurement Result

	Reading dBm	Cable Loss dB	Density dBm	Limint dBm	Result
CH-LOW	-11.90	1.20	-10.70	8	PASS
CH-MID	-11.40	1.20	-10.20	8	PASS
CH-HIGH	-11.77	1.20	-10.57	8	PASS

Refer to attached spectrum analyzer data chart.

10.4 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	Model No.	Serial No.	LAST CAL.	Cal. Due.
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/23/2002	07/22/2003
low loss cable	Huber + Suhner	Sucoflex 104	N/A	N/A	N/A

Power Density Test Data CH-LOW

Custom Name:

View Sonic

Engineer:

markba.lee

Model Name:

VSWM24668-1W

Report No.:

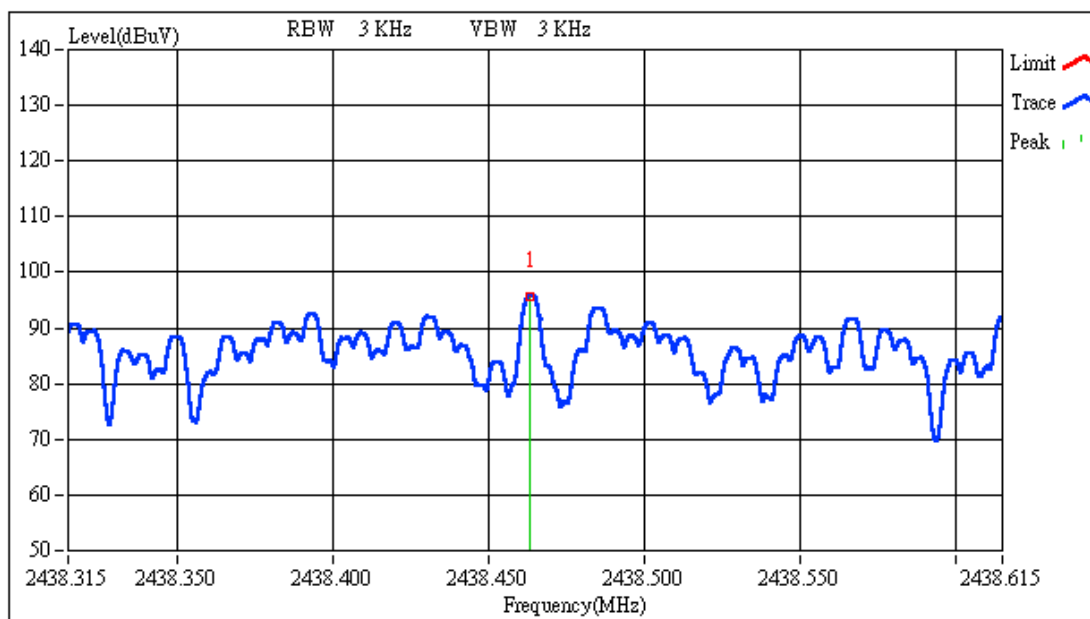
020047-R

Test Mode:

TX CH-1

	Frequency(MHz)	Read Level (dBuV)	Probe (dB)	Cable Loss (dB)	Level(dBuV)
1	2411.7276	95.10	0.00	0.00	95.10

Power Density Test Data CH-MID



Custom Name:

View Sonic

Engineer:

markba lee

Model Name:

VSWM24668-1 W

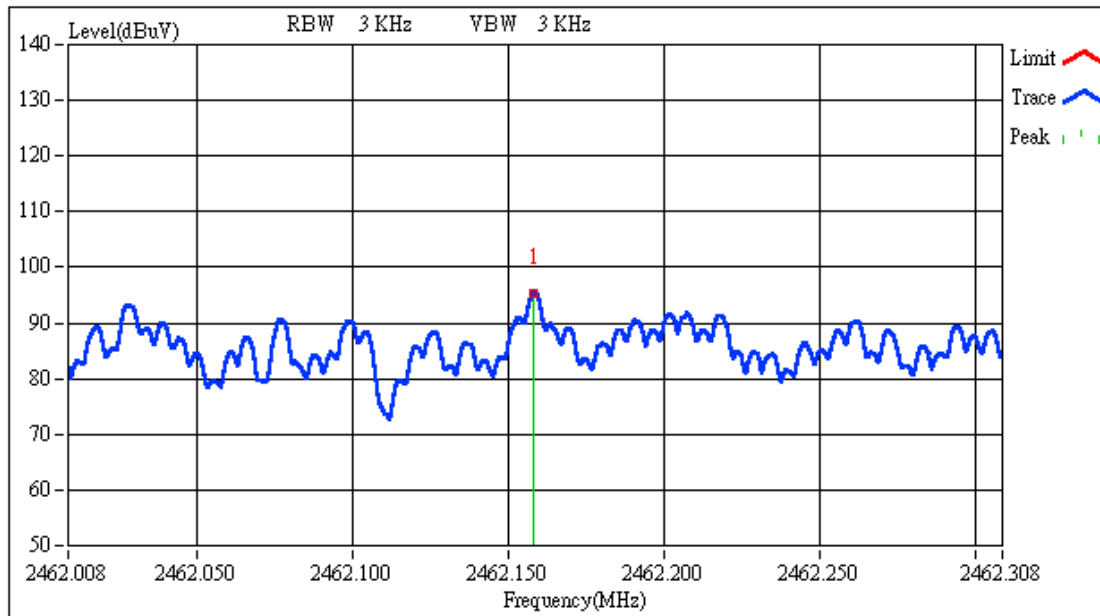
Report No.:

020047-R

Test Mode:

TX CH-6

	Frequency(MHz)	Read Level (dBuV)	Probe (dB)	Cable Loss (dB)	Level(dBuV)
1	2438.4630	95.60	0.00	0.00	95.60

Power Density Test Data CH-HIGH

Custom Name:

View Sonic

Engineer:

markba lee

Model Name:

VSWM24668-1 W

Report No.:

020047-R

Test Mode:

TX CH-11

	Frequency(MHz)	Read Level (dBuV)	Probe (dB)	Cable Loss (dB)	Level(dBuV)
1	2462.1578	95.23	0.00	0.00	95.23

11. ANTENNA REQUIREMENT

11.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

And according to §15.246(1), if transmitting antennas of directional gain greater than 6dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 0 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.



12. RF Exposure

12.1 Standard Applicable

According to §15.247(b)(4) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This device is classed as a Portable Device.

12.2 Measurement Result:

Refer to SAR test report.