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

OF

Airpanel V150

MODEL No.:
Airpanel: VSMW24667-1W/1M/1E/1J/1G

ID:GSS-MW251V150

REPORT NO: 030031-RF-ID

ISSUE DATE: Mar. 10, 2003

Prepared for

ViewSonic Corp.
381 Brea Canyon Road,
Walnut, CA 91789,USA

Prepared by

C&C LABORATORY, CO., LTD.
#B1, 1st Fl., Universal Center,
No. 183, Sec. 1, Tatung Rd., Hsi Chih,
Taipei Hsien, Taiwan, R.O.C.
TEL: (02)8642-2071~3
FAX: (02)8642-2256

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 Direct Sequence Spread Spectrum Data Transceiver.
Model No.:	Airpanel: VSMW24667-1W/1M/1E/1J/1G Docking: VSACC24670-1W/1M/1E/1J/1G
Model Difference:	All the above models are same except the model number designed
Serial Number:	N/A
File Number:	030031-RF-ID
Date of test:	October 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: VSMW24667-1W/1M/1E/1J/1G;Docking: VSACC24670-1W/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-MW251V150 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 were performed according to the procedures in ANSI C63.4 (1992) and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

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

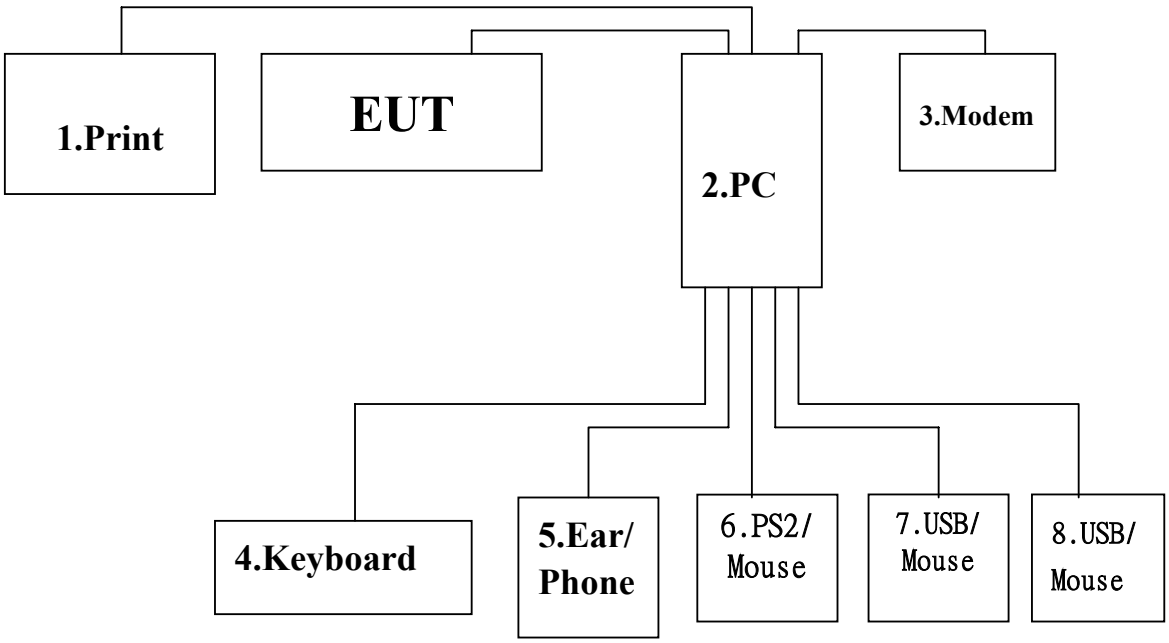


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Data Cable	Power Cord
1	Printer	HP	2225C	DSI6XU2225	3137S01428	Shielded,1.8m	***UnShielded,1.8m***
2	PC	Compaq	EVO D300	FCC DoC	6K1BKF83F0ZZ	N/A	***UnShielded,1.8m***
3	Modem	Hayes	231AA	BFJ9D93108US	A08431083982	*Shielded,1.8m*	***UnShielded,1.8m***
4	Keyboard	Compaq	SK-2800C	GYUR79SK	B1C790BCPJ73JQ	Shielded,1.8m	N/A
5	Earphome	TOKYO	SX-M	N/A	A5-3	Unshielded,1.8m	N/A
6	PS2/Mouse	Compaq	SK-2800C	GYUR79SK	B1C790BCPJ73JQ	Shielded,1.8m	N/A
7	USB-MOUSE	LOGITECH	M-BB48	FCC DoC	DoC	Shielded,1.8m	N/A
8	USB-MOUSE	LOGITECH	M-BB48	FCC DoC	DoC	Shielded,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
§1.1310 and §2.1093	RF exposures	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

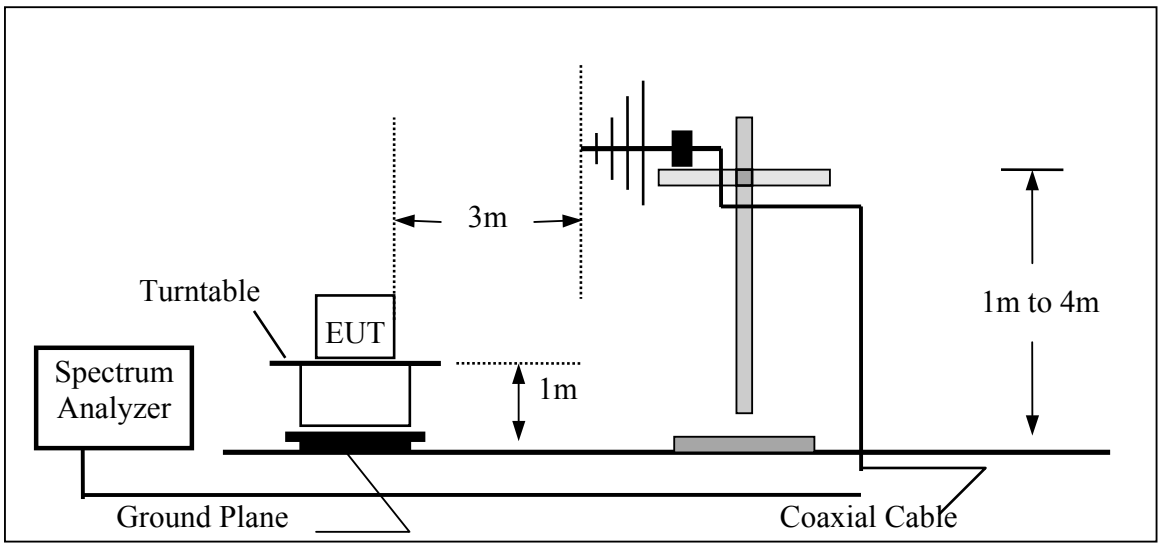
1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-1992.
2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, 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.

5.3 Measurement Procedure

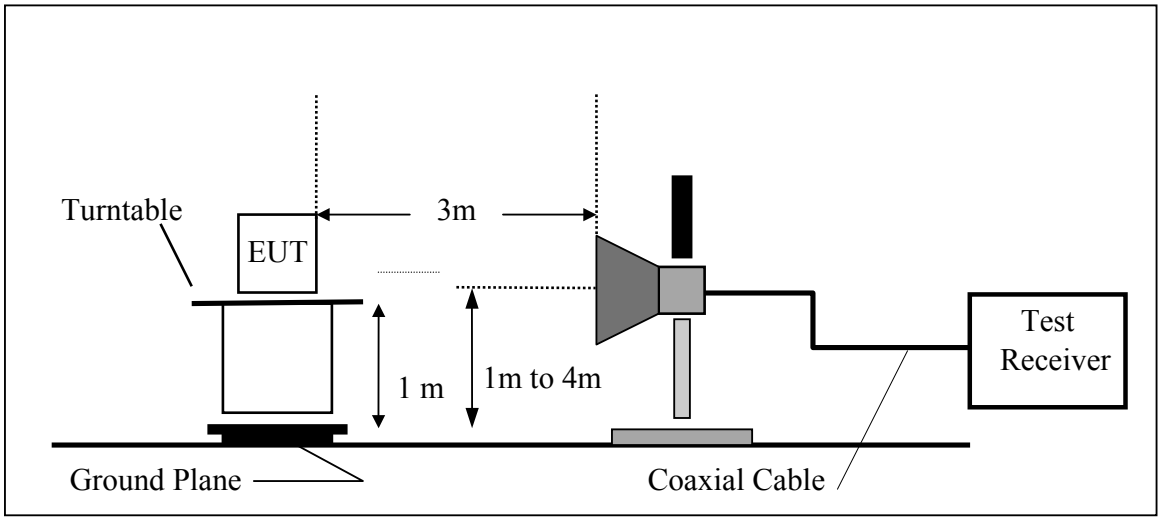
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was 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

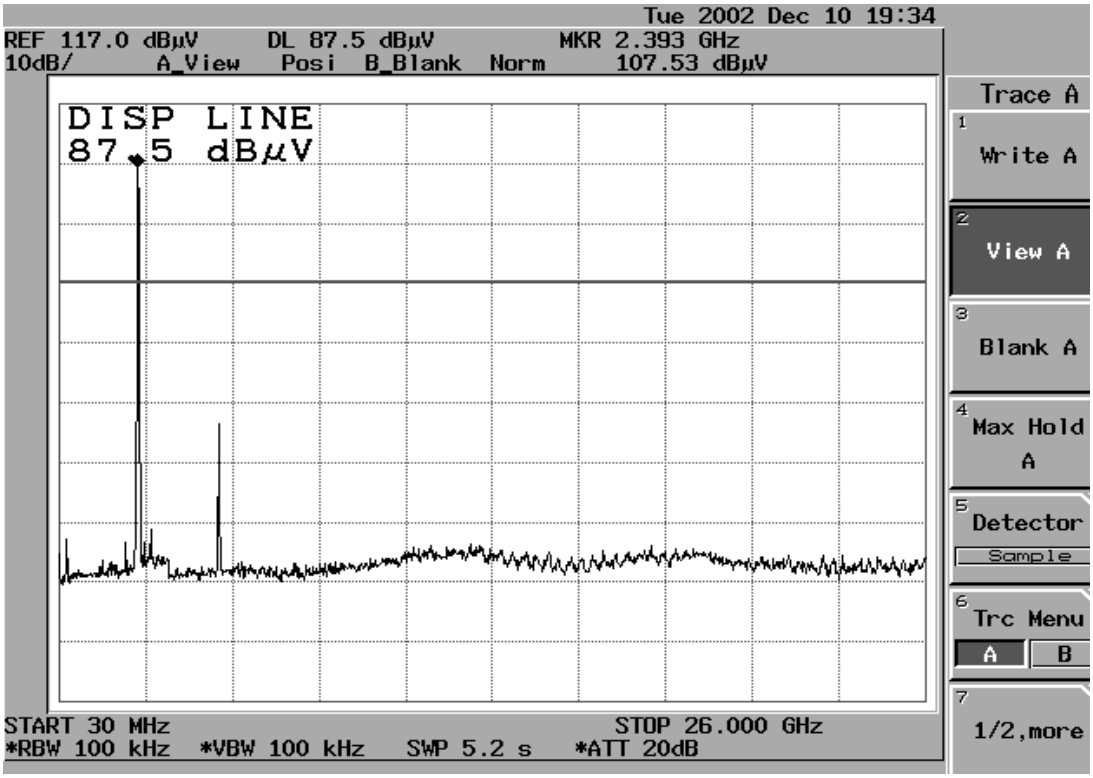
Refer to attach tabular data sheets.

NOTE:

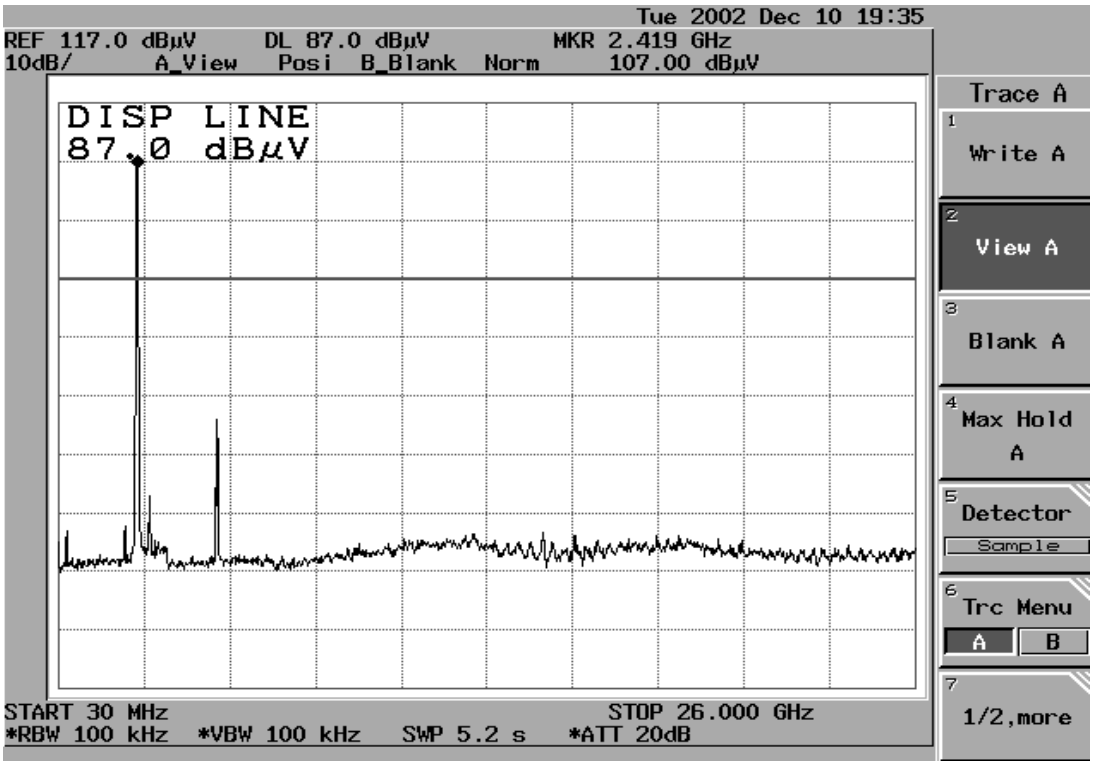
The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

Conducted Spurious Emission Measurement Result

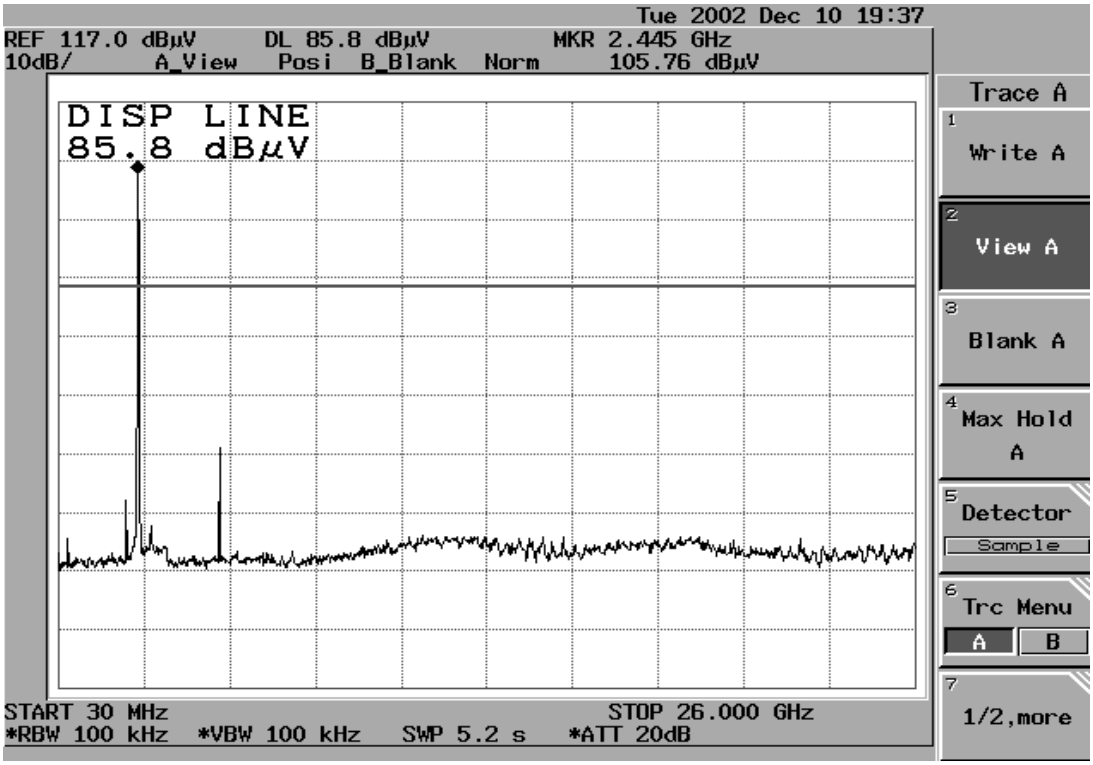
CH Low 30MHz – 26GHz



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
Temperature :	23 ℃	Test By:	Robin
Humidity :	65 %	Pol:	Ver./Hor

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)
165.000	V	Peak	52.05	-17.68	34.37	43.50	-9.13
231.368	V	Peak	51.18	-14.73	36.45	46.00	-9.55
395.152	V	Peak	53.28	-10.11	43.17	46.00	-2.83
461.328	V	Peak	50.03	-8.96	41.07	46.00	-4.93
527.504	V	Peak	49.56	-7.99	41.57	46.00	-4.43
165.000	H	Peak	48.95	-17.68	31.27	43.50	-12.23
297.192	H	Peak	45.23	-12.56	32.67	46.00	-13.33
386.704	H	Peak	50.53	-10.37	40.16	46.00	-5.84
461.328	H	Peak	48.23	-8.96	39.27	46.00	-6.73
527.504	H	Peak	45.74	-7.99	37.75	46.00	-8.25

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
Temperature :	23 ℃	Test By:	Robin
Humidity :	65 %	Pol:	Ver./Hor.

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)
129.096	V	Peak	44.33	-17.98	26.35	43.50	-17.15
231.368	V	Peak	47.85	-14.73	33.12	46.00	-12.88
395.152	V	Peak	53.72	-10.11	43.61	46.00	-2.39
461.328	V	Peak	50.06	-8.96	41.10	46.00	-4.90
527.504	V	Peak	49.24	-7.99	41.25	46.00	-4.75
165.000	H	Peak	48.50	-17.68	30.82	43.50	-12.68
193.288	H	Peak	46.10	-15.79	30.31	43.50	-13.19
386.704	H	Peak	51.05	-10.37	40.68	46.00	-5.32
395.152	H	Peak	48.08	-10.11	37.97	46.00	-8.03
461.328	H	Peak	48.32	-8.96	39.36	46.00	-6.64
527.504	H	Peak	46.04	-7.99	38.05	46.00	-7.95

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
Temperature :	23 ℃	Test By:	Robin
Humidity :	65 %	Pol:	Ver./Hor.

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)
165.000	V	Peak	54.86	-17.68	37.18	43.50	-6.32
231.368	V	Peak	48.21	-14.73	33.48	46.00	-12.52
258.024	V	Peak	46.65	-13.38	33.27	46.00	-12.73
395.152	V	Peak	53.78	-10.11	43.67	46.00	-2.33
461.328	V	Peak	49.61	-8.96	40.65	46.00	-5.35
527.504	V	Peak	48.37	-7.99	40.38	46.00	-5.62
165.000	H	Peak	48.89	-17.68	31.21	43.50	-12.29
297.192	H	Peak	44.89	-12.56	32.33	46.00	-13.67
386.704	H	Peak	51.42	-10.37	41.05	46.00	-4.95
395.152	H	Peak	48.55	-10.11	38.44	46.00	-7.56
461.328	H	Peak	48.41	-8.96	39.45	46.00	-6.55
527.504	H	Peak	46.59	-4.09	42.50	46.00	-3.50

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
Temperature :	23 ℃	Test By:	Robin
Humidity :	65 %	Pol:	Vertical

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)	
1200	60.31		-10.51	49.80		74.00	54.00	-4.20	Peak
1848	56.72		-8.19	48.53		74.00	54.00	-5.47	Peak
1884	60.56		-8.06	52.50		74.00	54.00	-1.50	Peak
1968	56.73		-8.06	48.67		74.00	54.00	-5.33	Peak
4070	43.58		-1.07	42.51		74.00	54.00	-11.49	Peak
4824	--					74.00	54.00		
7236	--					74.00	54.00		
9648	--					74.00	54.00		
12060	--					74.00	54.00		
14472	--					74.00	54.00		
16884	--					74.00	54.00		
19296	--					74.00	54.00		
21708	--					74.00	54.00		
24120	--					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
Temperature :	30 ℃	Test By:	Robin
Humidity :	55%	Pol:	HORIZONTAL

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)	
1080.0	60.31		-10.51	49.80		74.00	54.00	-4.20	Peak
1200.0	56.72		-8.19	48.53		74.00	54.00	-5.47	Peak
1876.0	60.56		-8.06	52.50		74.00	54.00	-1.50	Peak
4824	--					74.00	54.00		
7236	--					74.00	54.00		
9648	--					74.00	54.00		
12060	--					74.00	54.00		
14472	--					74.00	54.00		
16884	--					74.00	54.00		
19296	--					74.00	54.00		
21708	--					74.00	54.00		
24120	--					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
Temperature :	30 ℃	Test By:	Robin
Humidity :	55%	Pol:	Vertical

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)	
1080.0	59.86		-11.24	48.62		74.00	54.00	-5.38	Peak
1200.0	59.28		-10.51	48.77		74.00	54.00	-5.23	Peak
1912.0	59.82		-7.95	51.87		74.00	54.00	-2.13	Peak
4888	--					74.00	54.00		
7332	--					74.00	54.00		
9776	--					74.00	54.00		
12220	--					74.00	54.00		
14664	--					74.00	54.00		
17108	--					74.00	54.00		
19552	--					74.00	54.00		
21996	--					74.00	54.00		
24440	--					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
Temperature :	30 ℃	Test By:	Robin
Humidity :	55%	Pol:	Horizontal

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)	
1080.0	60.01		-11.24	48.77		74.00	54.00	-5.23	Peak
1200.0	61.72		-10.51	51.21		74.00	54.00	-2.79	Peak
1744.0	60.14		-8.50	51.64		74.00	54.00	-2.36	Peak
1924.0	61.53	51.20	-7.90	53.63	43.30	74.00	54.00	-10.70	AV
4888	--					74.00	54.00		
7332	--					74.00	54.00		
9776	--					74.00	54.00		
12220	--					74.00	54.00		
14664	--					74.00	54.00		
17108	--					74.00	54.00		
19552	--					74.00	54.00		
21996	--					74.00	54.00		
24440	--					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
Temperature :	30 ℃	Test By:	Robin
Humidity :	55%	Pol:	Vertical

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)	
1080.0	58.06		-11.24	46.82		74.00	54.00	-7.18	Peak
1200.0	56.69		-10.51	46.18		74.00	54.00	-7.82	Peak
1920.0	55.99		-7.95	48.04		74.00	54.00	-5.96	Peak
1988.0	57.90		-7.64	50.26		74.00	54.00	-3.74	Peak
4924	--					74.00	54.00		
7386	--					74.00	54.00		
9848	--					74.00	54.00		
12310	--					74.00	54.00		
14772	--					74.00	54.00		
17234	--					74.00	54.00		
19696	--					74.00	54.00		
22158	--					74.00	54.00		
24620	--					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
Temperature :	30 ℃	Test By:	Robin
Humidity :	55%	Pol:	Horizontal

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)	
1080.0	59.09		-11.24	47.85		74.00	54.00	-6.15	Peak
1200.0	59.17		-10.51	48.66		74.00	54.00	-5.34	Peak
1821.0	57.93		-7.91	50.02		74.00	54.00	-3.98	Peak
1992.0	60.01		-7.64	52.37		74.00	54.00	-1.63	Peak
4924	--					74.00	54.00		
7386	--					74.00	54.00		
9848	--					74.00	54.00		
12310	--					74.00	54.00		
14772	--					74.00	54.00		
17234	--					74.00	54.00		
19696	--					74.00	54.00		
22158	--					74.00	54.00		
24620	--					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
Fundamental Frequency: Low
Temperature : 30 ℃
Test Date : Oct.29 2002
Test By: Robin
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
0.159	61.0	45.2	65.52	55.52	-4.52	-10.32	L1
0.226	53.4	43.1	62.60	52.60	-9.20	-9.50	L1
0.579	47.0	42.8	56.00	46.00	-9.00	-3.20	L1
2.350	49.0	39.4	56.00	46.00	-7.00	-6.60	L1
12.257	50.4	44.2	60.00	50.00	-9.60	-5.80	L1
0.165	59.8	46.2	65.21	55.21	-5.41	-9.01	L2
0.229	53.2	44.1	62.49	52.49	-9.29	-8.39	L2
0.299	42.4	---	60.27	50.27	-17.87	---	L2
1.694	48.8	20.0	56.00	46.00	-7.20	-26.00	L2
9.910	44.4	---	60.00	50.00	-15.60	---	L2
12.143	50.8	26.5	60.00	50.00	-9.20	-23.50	L2

Remark：

(1) Measuring frequencies from 0.15 MHz to 30MHz。

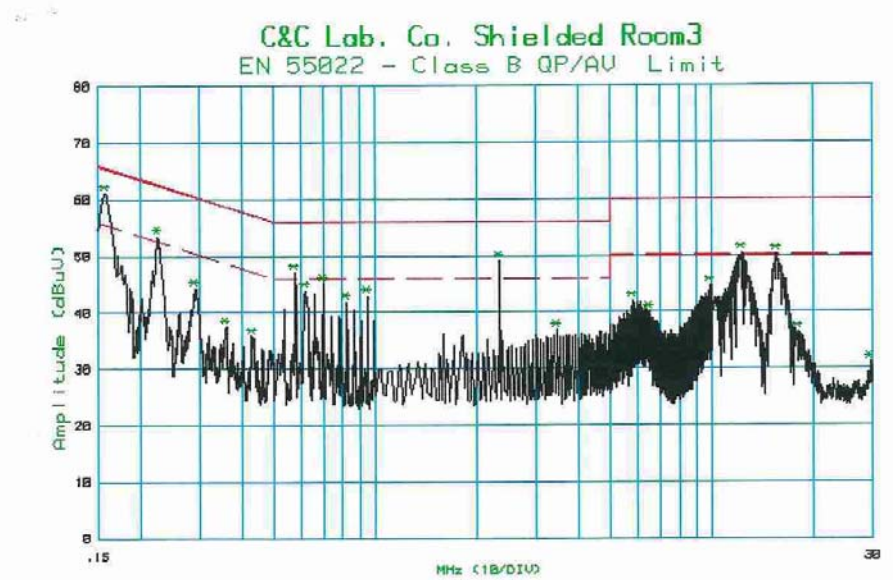
(2) The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Qusia-Peak detector and Average detector.

(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)

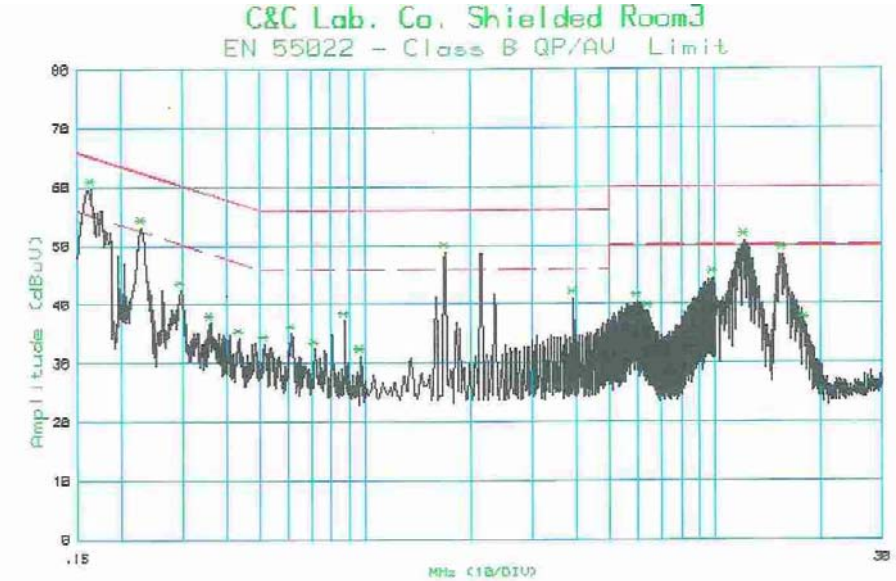
Conducted Test Data L1



Customer:VIEWSONIC
Model :VSMW24667-1W
Mode :110V
Reading :Peak(R3261C SPA)
Remark :TX+RX

File#: 2588
Humd.:70 (%)
Port :L1

Date :29 Oct 2002 15:11:11
Temp. :26 (C)
Tested by:ROBIN



Customer:VIEWSONIC
Model :VSMW24667-1W
Mode :110V
Reading :Peak(R3261C SPA)
Remark :TX+RX

File#: 2589
Humd.:70 (%)
Port :L2

Date :29 Oct 2002 15:23:42
Temp. :26 (C)
Tested by:ROBIN

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:

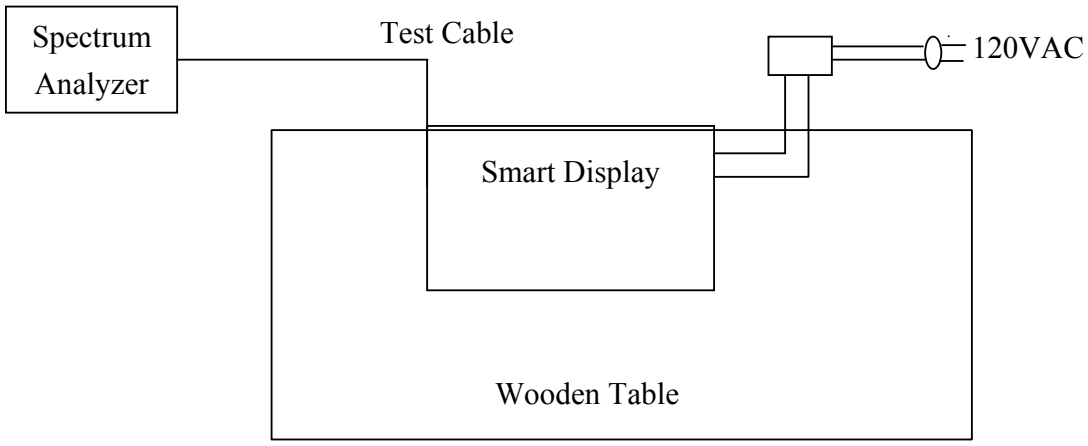


Fig. 4

Fig. 4 : Measurement setup for testing on Antenna connector

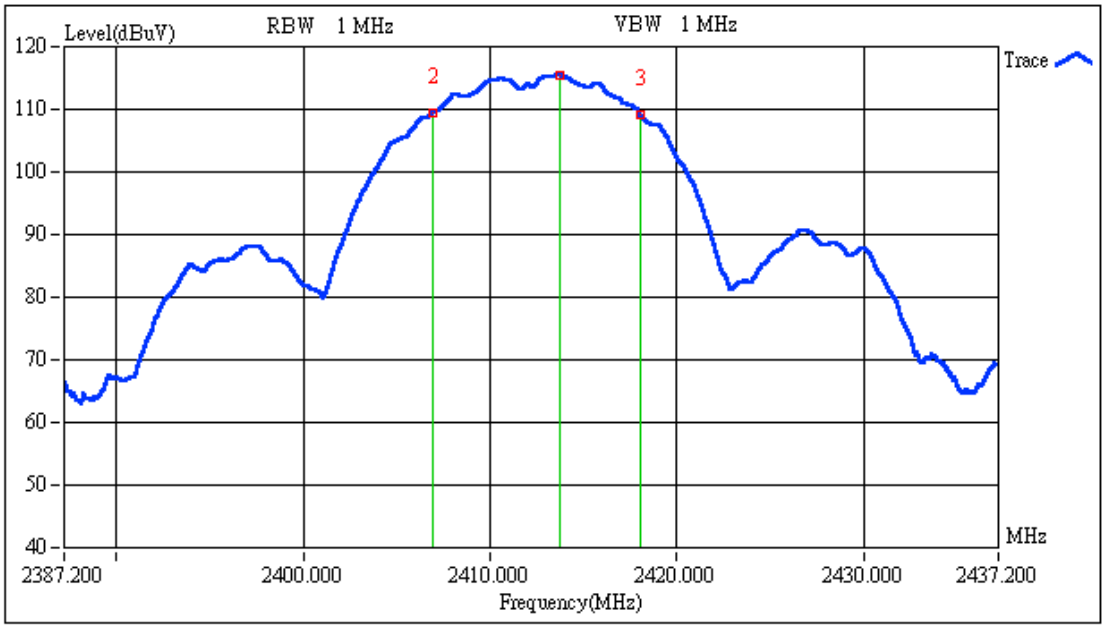
7.4 Measurement Procedure

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	11	> 500	PASS
Mid	11.1	> 500	PASS
Higher	11.1	> 500	PASS

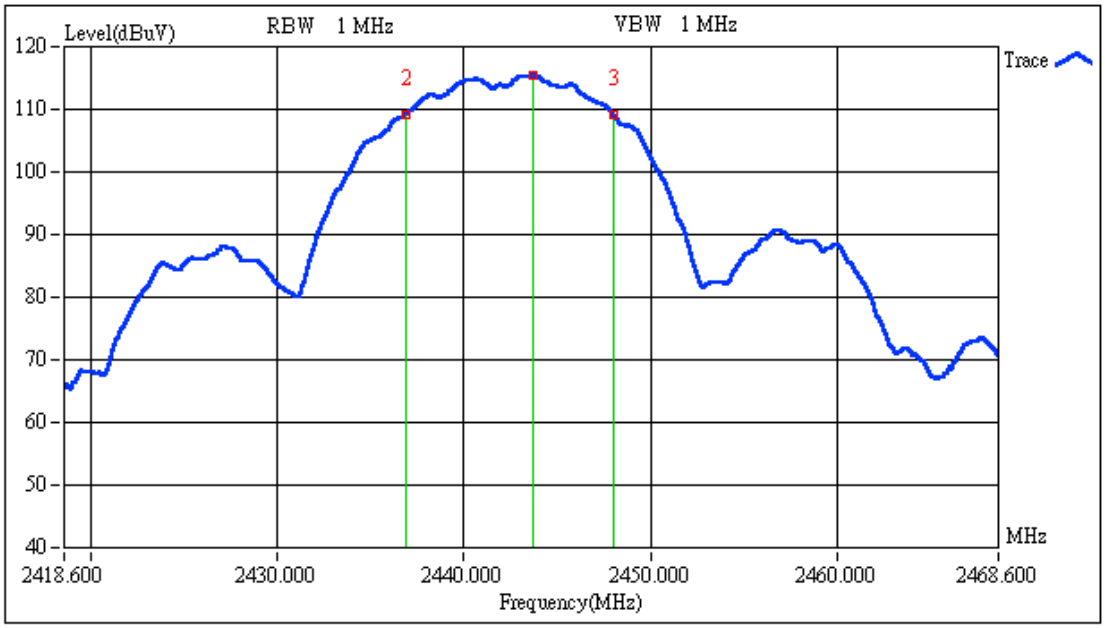
6dB Band Width Test Data CH-LOW



Custom Name: VIEWSONIC
Engineer:
Model Name: 24667-1W
Report No.:
Test Mode: TX CH LOW

Peak 0.00 MHz
0.00 dBuV
Band Width 11.100 MHz
Delta1 2406.90 MHz
109.31 dBuV
Delta2 2418.00 MHz
109.18 dBuV

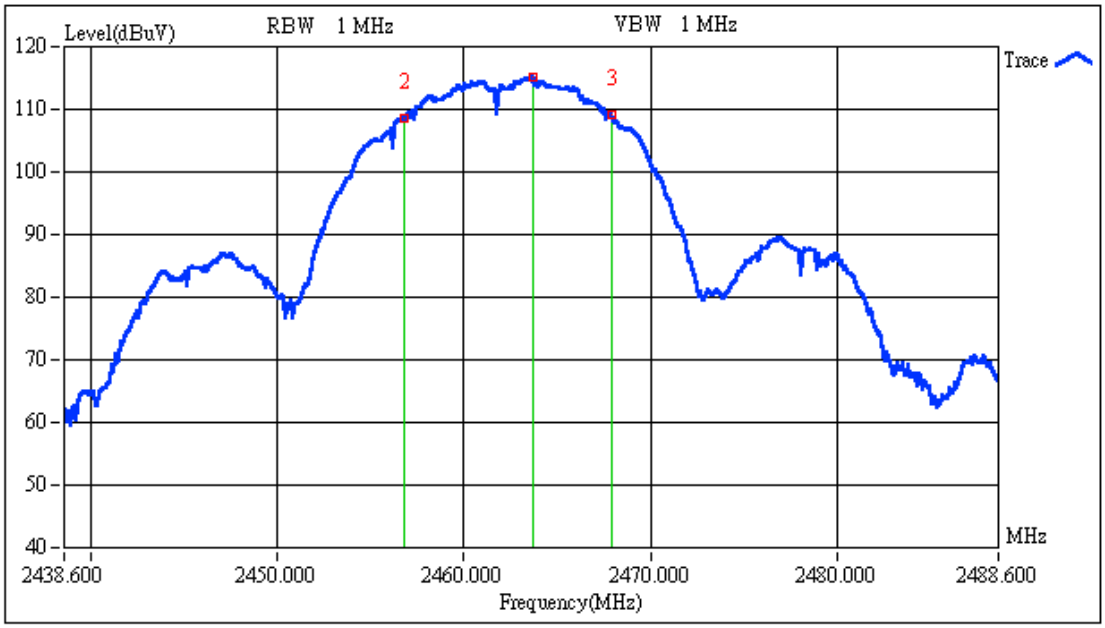
6dB Band Width Test Data CH-MID



Custom Name: VIEWSONIC
Engineer:
Model Name: 24667-1W
Report No.:
Test Mode: TX CH MID

Peak	0.00 MHz		Band Width	11.100 MHz
	0.00 dBuV			
Delta1	2436.90 MHz	Delta2	2448.00 MHz	
	109.28 dBuV		109.27 dBuV	

6dB Band Width Test Data CH-HIGH



Custom Name: VIEWSONIC
Engineer:
Model Name: 24667-1W
Report No.:
Test Mode: TX CH HIGH

Peak 0.00 MHz
0.00 dBuV
Band Width 11.100 MHz
Delta1 2456.80 MHz
108.70 dBuV
Delta2 2467.90 MHz
109.16 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.

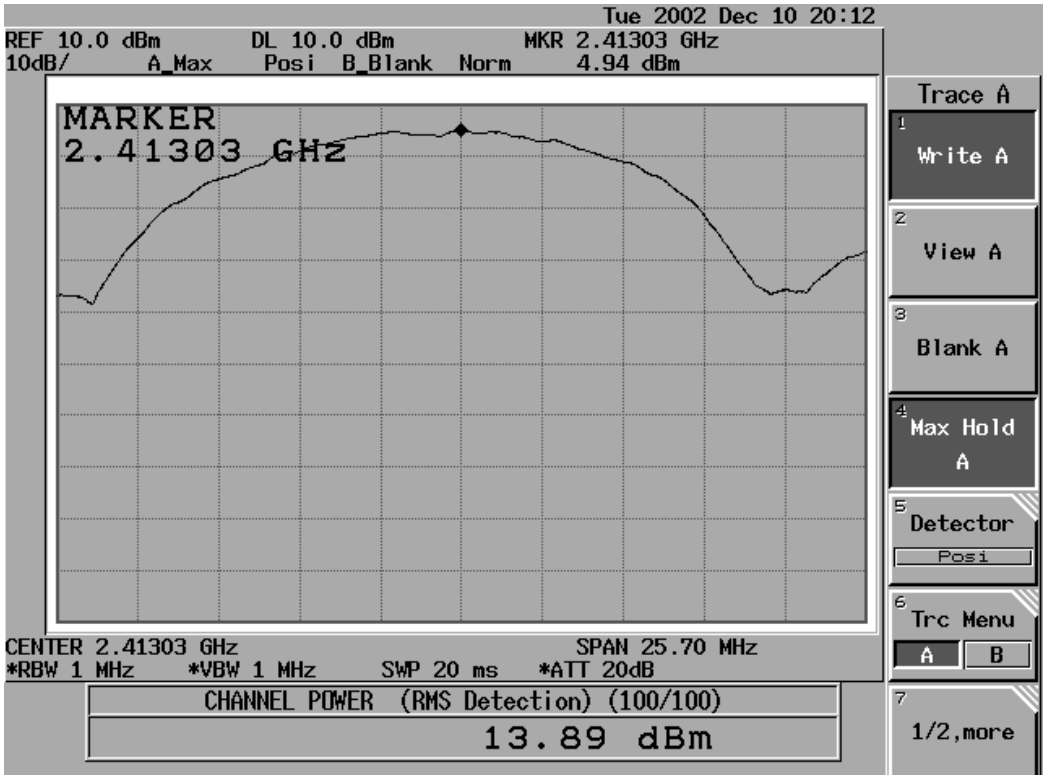
8.3 Measurement Equipment Used:

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

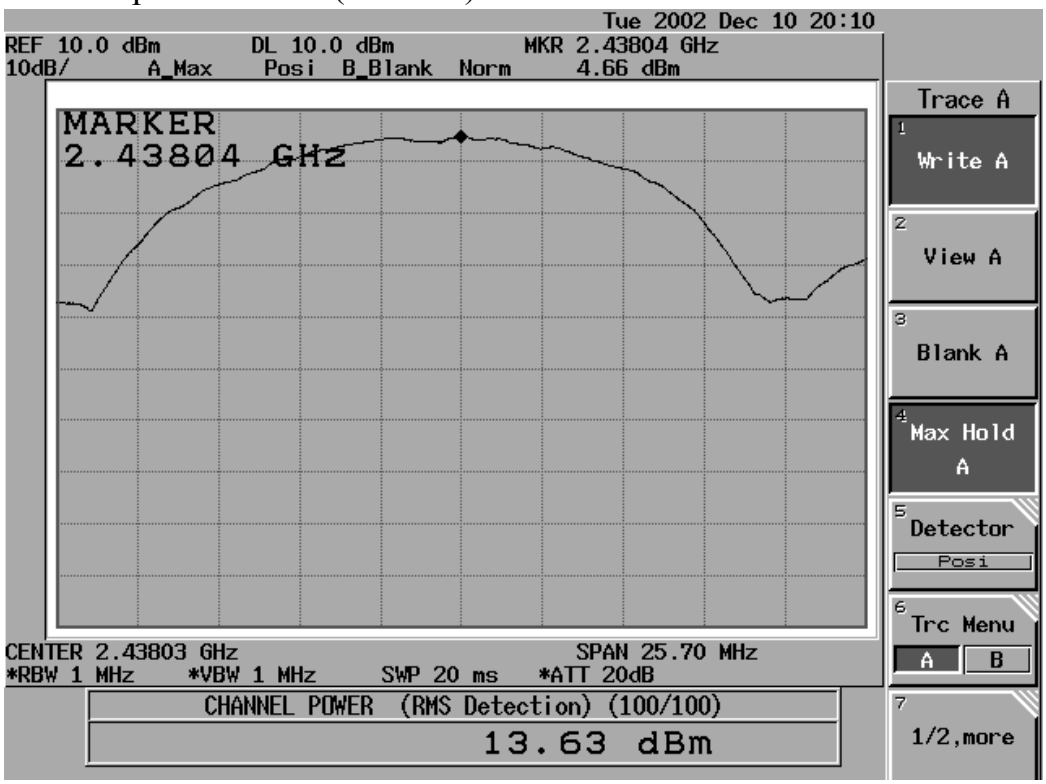
8.4 Test Results:

CH	Reading Power dBm	Cabble Loss dB	Output Power dBm	Output Power W	Limit (W)	Result
LOWER	13.89	0.50	14.39	0.02748	1	PASS
MID	13.63	0.50	14.13	0.02588	1	PASS
HIGHER	12.88	0.50	13.38	0.02178	1	PASS

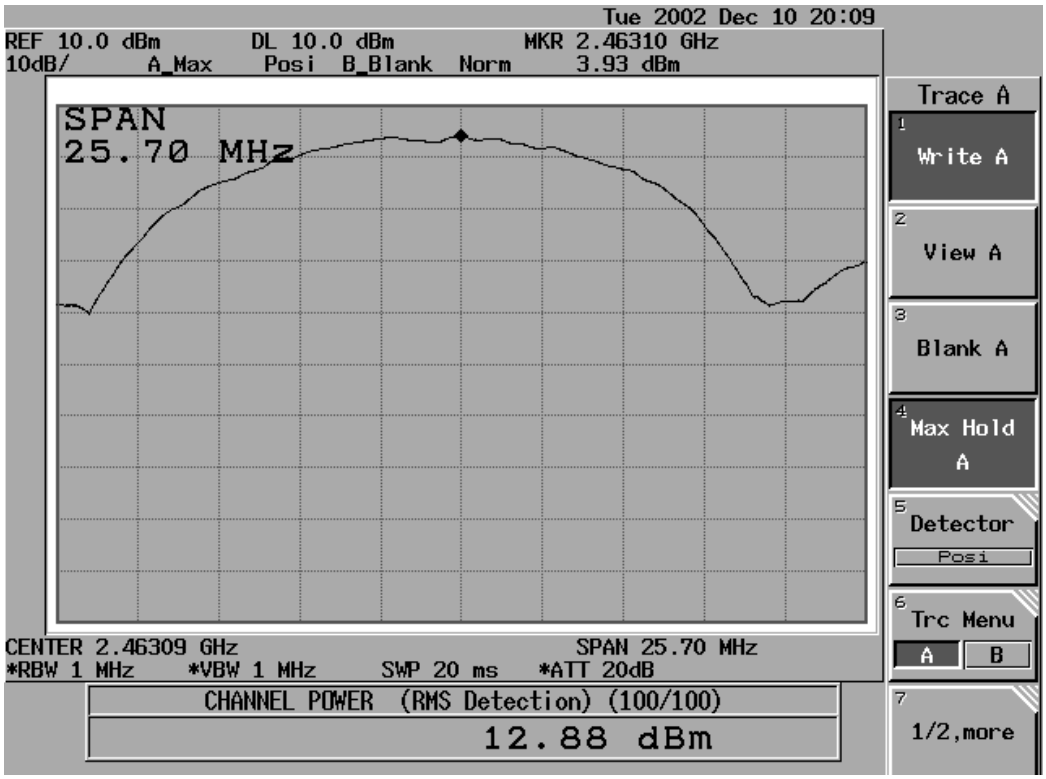
Peak Power Output Data Plot (CH Low)



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 in 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 in15.209(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.

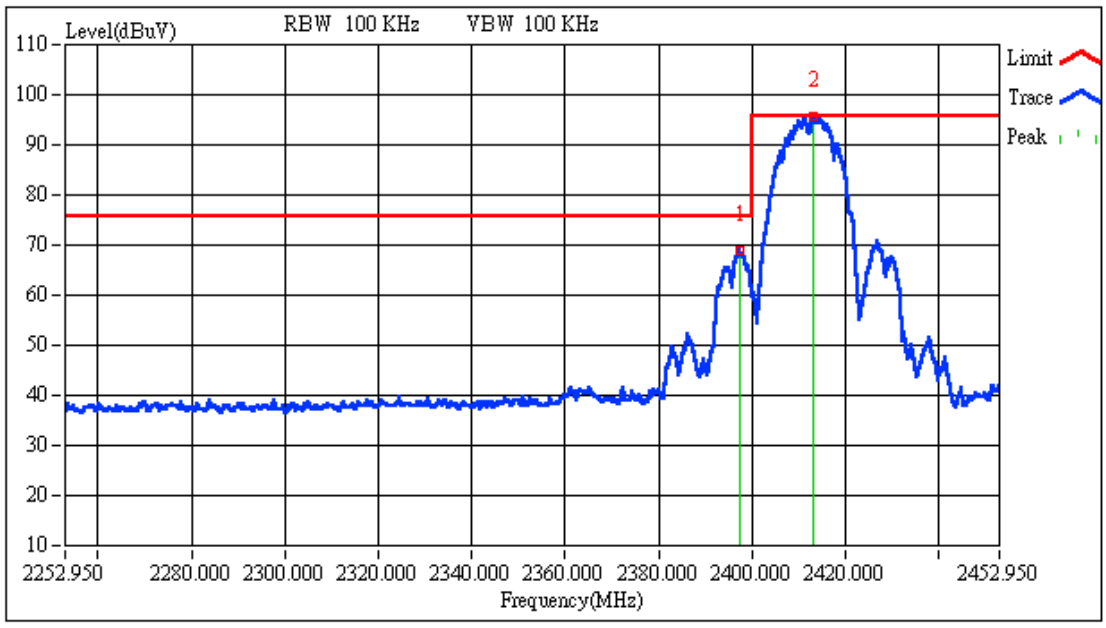
9.3 Measurement Result

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: VIEWSONIC

Engineer:

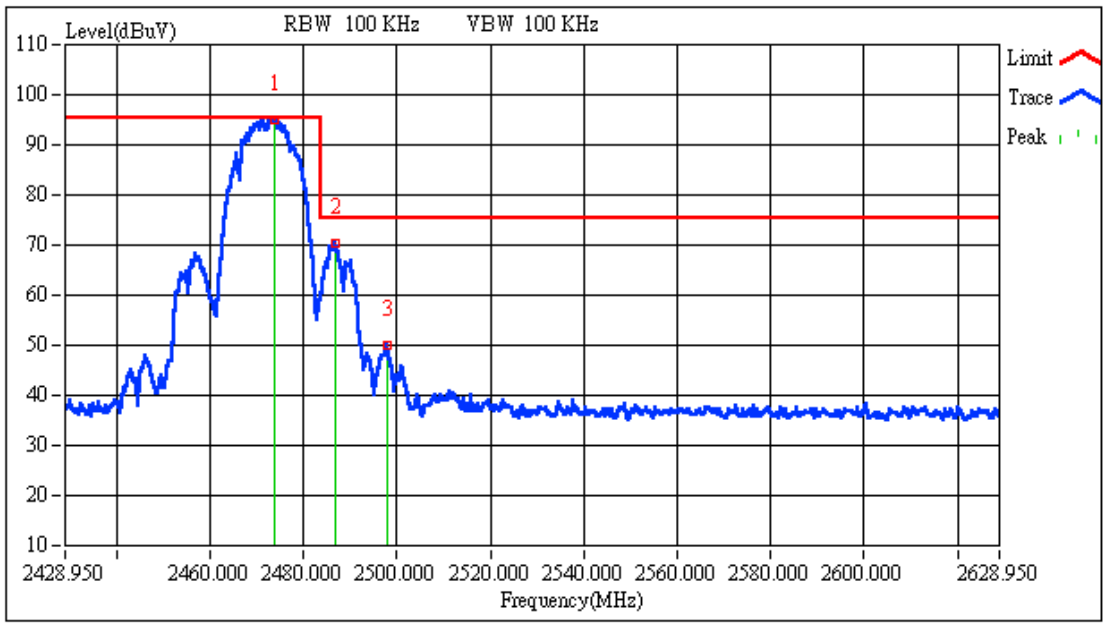
Model Name: VSMW24667

Report No.:

Test Mode: CH LOW

	Frequency(MHz)	Read Level (dBuV)	Probe (dB)	Cable Loss (dB)	Level(dBuV)
1	2397.3500	68.82	0.00	0.00	68.82
2	2412.9500	95.73	0.00	0.00	95.73

Out of Band Test Data CH-HIGH



Custom Name: VIEWSONIC

Engineer:

Model Name: VSMW24667

Report No.:

Test Mode: CH HIGH

	Frequency(MHz)	Read Level (dBuV)	Probe (dB)	Cable Loss (dB)	Level(dBuV)
1	2473.7500	95.08	0.00	0.00	95.08
2	2486.9500	70.46	0.00	0.00	70.46
3	2497.7500	49.99	0.00	0.00	49.99

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

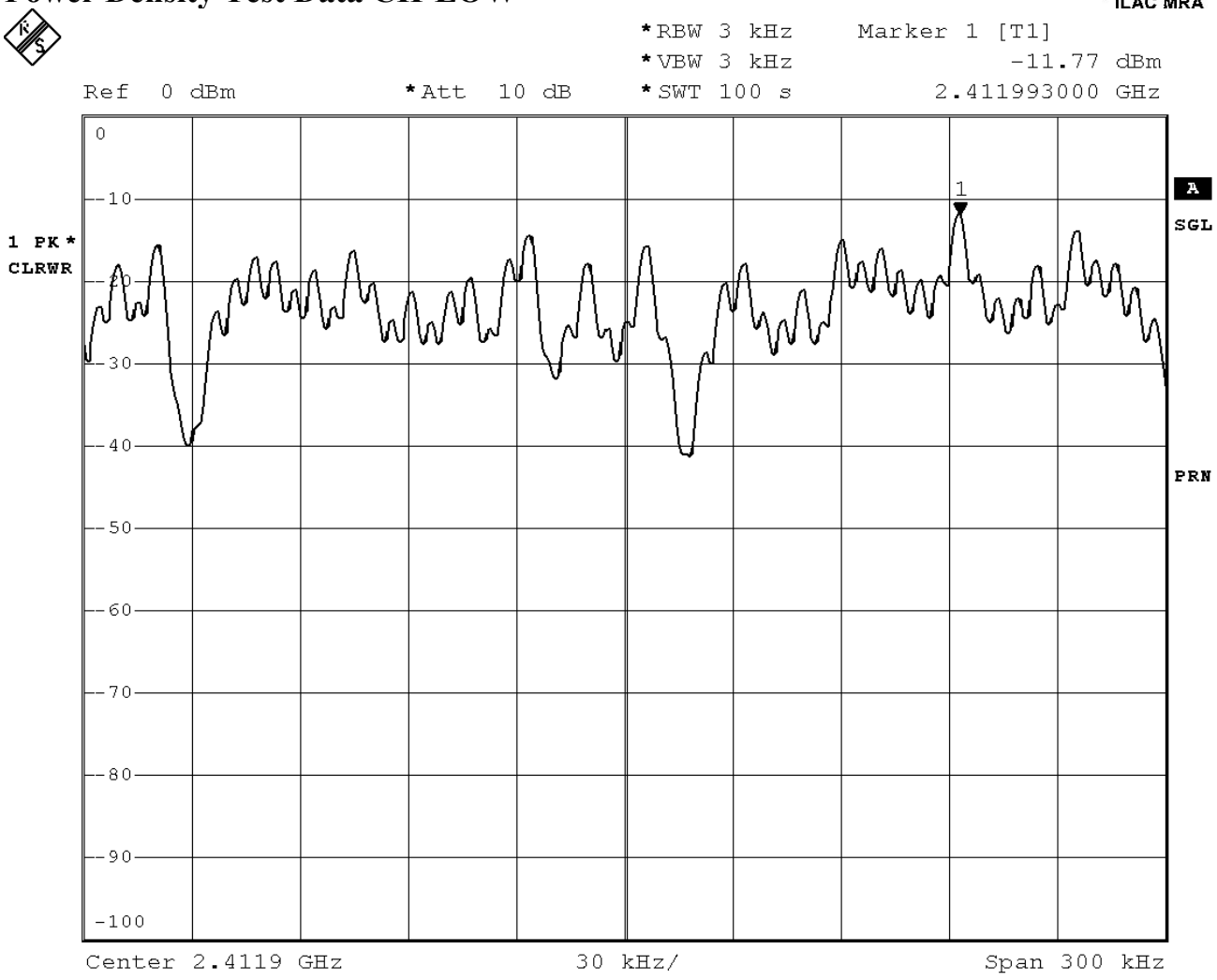
	Reading dBm	Cable Loss dB	Density dBm	Limint dBm	Result
CH-LOW	-11.77	0.50	-11.27	8	PASS
CH-MID	-11.82	0.50	-11.32	8	PASS
CH-HIGH	-9.90	0.50	-9.40	8	PASS

Refer to attached spectrum analyzer data chart.

10.4 Measurement Equipment Used:

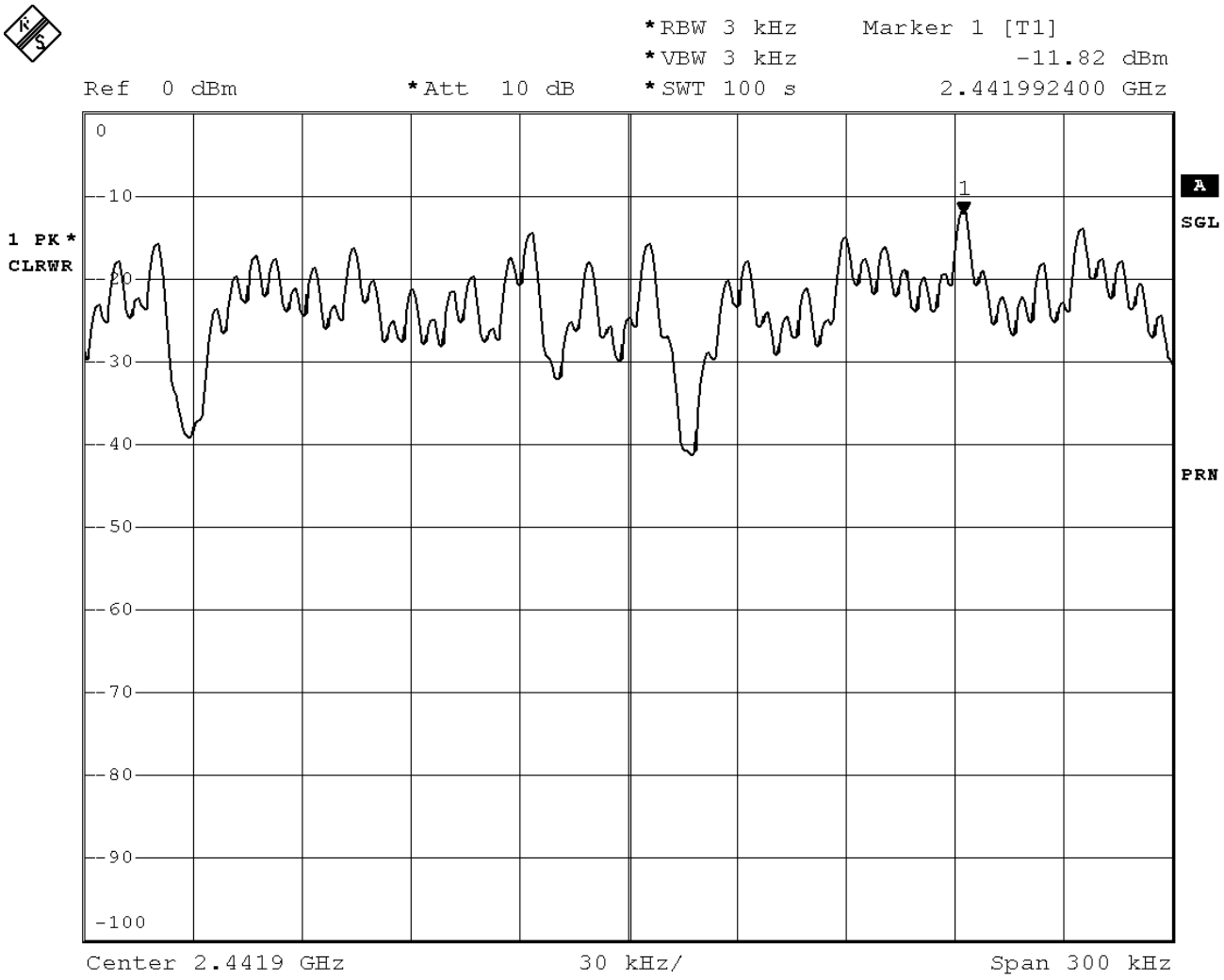
EQUIPMENT TYPE	MFR	Model No.	Serial No.	LAST CAL.	Cal. Due.
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/23/2002	07/22/2003
low loss cable	Huber + Suhner	Sucoflex 104	N/A	N/A	N/A

Power Density Test Data CH-LOW



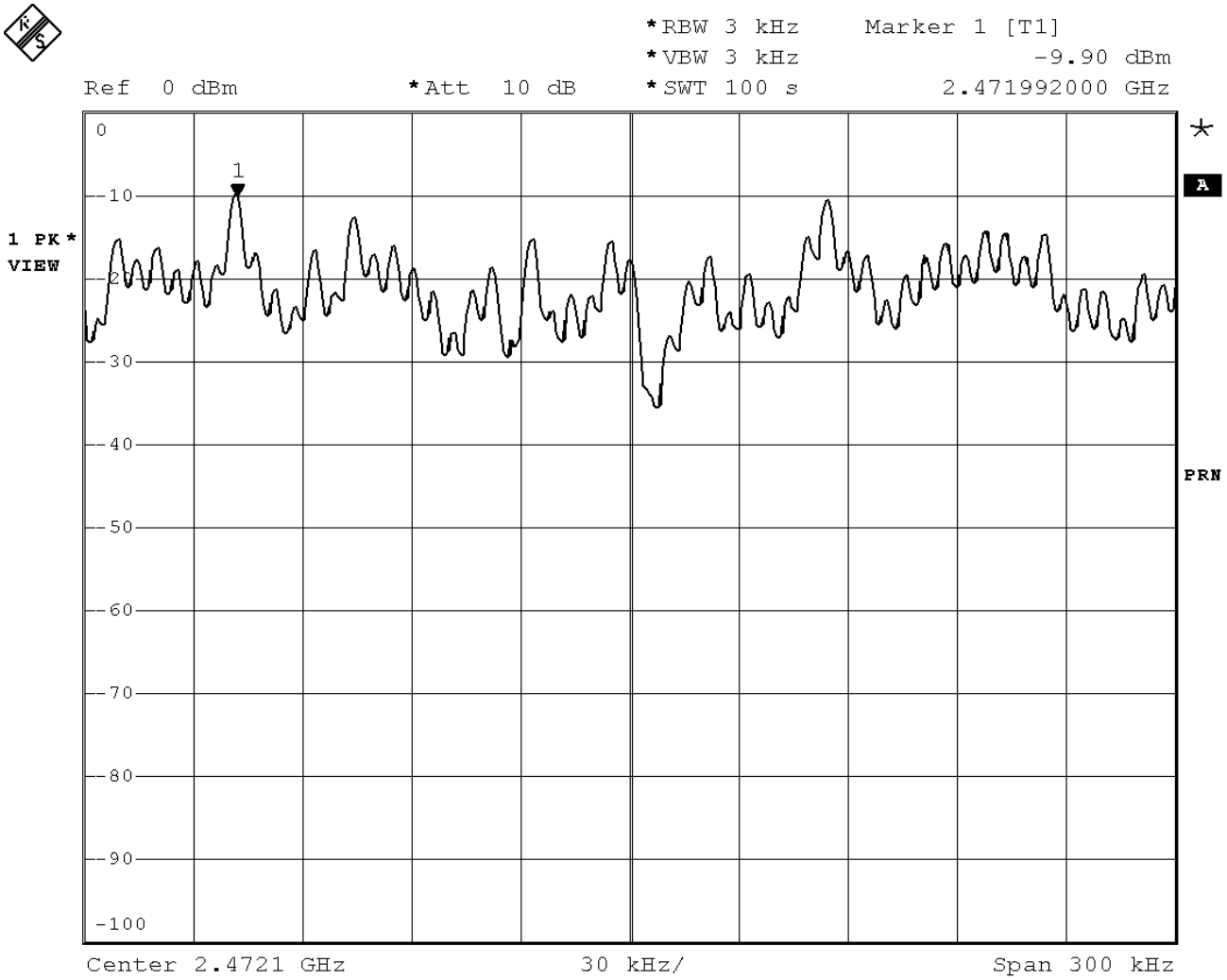
Date: 15.NOV.2002 07:33:55

Power Density Test Data CH-MID



Date: 15.NOV.2002 07:37:38

Power Density Test Data CH-HIGH



Date: 15.NOV.2002 07:44:49

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 gins 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.