EMI TEST REPORT

Test Report No. : 25BE0202-HO-1

Applicant	:	**Sony Corporation**
Type of Equipment	:	**Personal Computer**
Model No.	:	**PCV-E21L**
Test standard	:	**FCC Part 15 Subpart C** **Section 15.207, Section 15.247 : 2004**
FCC ID	:	**AK8PCVE21L**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test: July 5 to October 19, 2004

Tested by:

Makoto Kosaka
EMC Service

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Approved by :

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CONTENTS PAGE

SECTION 1: Client information 3
SECTION 2: Equipment under test (E.U.T.) 3
SECTION 3: Test specification, procedures & results 5
SECTION 4: Operation of E.U.T. during testing 7
SECTION 5: Conducted Emission, Section 15.207 9
SECTION 6: 6dB Bandwidth, Section 15.247(a)(2) 9
SECTION 7: Maximum Peak Output Power, Section 15.247(b)(3) 9
SECTION 8: Spurious Emission, Section 15.247 (c) 10
SECTION 9: Peak Power Density, Section 15.247 (d) 10
APPENDIX 1: Photographs of test setup 11
Conducted Emission 11
Spurious Emission (Radiated) 12
APPENDIX 2:Test instruments 13
APPENDIX 3: Data of EMI test 14
Conducted Emission 14
6dB Bandwidth(DSSS and other forms of modulation) 30
Maximum Peak OutPut Power (DSSS and other forms of modulation) 34
Spurious Emission (Radiated:LAN-11b,Tx2412MHz) below 1GHz 42
Spurious Emission (Radiated:LAN-11b,Tx2437MHz) below 1GHz 43
Spurious Emission (Radiated:LAN-11b,Tx2462MHz) below 1GHz 44
Spurious Emission (Radiated:LAN-11g,Tx2412MHz) below 1GHz 45
Spurious Emission (Radiated:LAN-11g,Tx2437MHz) below 1GHz 46
Spurious Emission (Radiated:LAN-11g,Tx2462MHz) below 1GHz 47
Spurious Emission (Reciever,Tx2402) below 1GHz 48
Spurious Emission (Reciever,Tx2440) below 1GHz 49
Spurious Emission (Reciever,Tx2479) below 1GHz 50
Spurious Emission (Radiated:LAN-11b,Tx2412MHz(Worst)+Reciever,Tx2402) below 1GHz 51
Spurious Emission (Radiated:LAN-11b,Tx2412MHz(Worst)+Reciever,Tx2440) below 1GHz 52
Spurious Emission (Radiated:LAN-11b,Tx2412MHz(Worst)+Reciever,Tx2479) below 1GHz 53
Spurious Emission (Radiated:LAN-11g,Tx2412MHz(Worst)+Reciever,Tx2402) below 1GHz 54
Spurious Emission (Radiated:LAN-11g,Tx2412MHz(Worst)+Reciever,Tx2440) below 1GHz 55
Spurious Emission (Radiated:LAN-11g,Tx2412MHz(Worst)+Reciever,Tx2479) below 1GHz 56
Spurious Emission (Radiated:LAN-11b,Tx2412MHz) above 1GHz 57
Spurious Emission (Radiated:LAN-11b,Tx2437MHz) above 1GHz 58
Spurious Emission (Radiated:LAN-11b,Tx2462MHz) above 1GHz 59
Spurious Emission (Radiated:LAN-11g,Tx2412MHz) above 1GHz 60
Spurious Emission (Radiated:LAN-11g,Tx2437MHz) above 1GHz 61
Spurious Emission (Radiated:LAN-11g,Tx2462MHz) above 1GHz 62
Spurious Emission (Reciever,Tx2402) above 1GHz 63
Spurious Emission (Reciever,Tx2440) above 1GHz 64
Spurious Emission (Reciever,Tx2479) above 1GHz 65
Spurious Emission (Radiated:LAN-11b,Tx2412MHz(Worst)+Reciever,Tx2402) above 1GHz 66
Spurious Emission (Radiated:LAN-11b,Tx2412MHz(Worst)+Reciever,Tx2440) above 1GHz 67
Spurious Emission (Radiated:LAN-11b,Tx2412MHz(Worst)+Reciever,Tx2479) above 1GHz 68
Spurious Emission (Radiated:LAN-11g,Tx2412MHz(Worst)+Reciever,Tx2402) above 1GHz 69
Spurious Emission (Radiated:LAN-11g,Tx2412MHz(Worst)+Reciever,Tx2440) above 1GHz 70
Spurious Emission (Radiated:LAN-11g,Tx2412MHz(Worst)+Reciever,Tx2479) above 1GHz 71
Conducted Spurious Emission(DSSS and other forms of modulation) 72
Conducted emission Band Edge compliance (DSSS and other forms of modulation) 90
Power Density (DSSS and other forms of modulation) 92
99%Occupied Bandwidth(DSSS and other forms of modulation) 96

SECTION 1: Client information

Company Name	:	Sony Corporation
Address	:	6-7-35 Kitashinagawa Shinagawa-ku, Tokyo, 141-0001 Japan
Telephone Number	:	+81-3-5795-8702
Facsimile Number	:	+81-3-5795-8981
Contact Person	:	Michio Kobayashi

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Personal Computer
Model No.	:	PCV-E21L
Serial No.	:	16 (for Spurious Emission (Radiated) and Conducted emission (AC) test) 24 (for Other tests)
Rating	:	AC120V/60Hz
Country of Manufacture	:	Japan
Receipt Date of Sample	:	July 2, 2004
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: PCV-E21L (referred to as the EUT in this report) is the Desktop Personal Computer.
The following Wireless devices are included;
2.4GHz Wireless LAN Module (802.11b/g), 2.4GHz Wireless Receiver (Module)

System clock:

Wireless LAN Module (802.11b/g)	27.000MHz, 24.576MHz, 25MHz, 14.318MHz, 32.768MHz, 4.00MHz、40.0MHz
Wireless Receiver (Module)	13MHz 12MHz (internal CPU clock)

.

[Wireless LAN IEEE802.11b, g]

Equipment Type	:	Transceiver
Frequency of operation	:	2412-2462MHz
Type of modulation	:	DSSS
Channel spacing	:	5MHz (11 channels)
Duty cycle	:	65% per full cycle
Mode of operation	:	Simplex
Antenna Type	:	PIFA (Planar Inverted-F Antenna)
Antenna Gain	:	+0.98 dBi
Antenna Connector Type	:	U. FL
Method of Frequency Generation	:	Crystal and Synthesizer
Operating voltage (inner)	:	DC 3.3V

[Wireless Receiver]

Equipment Type	:	Transceiver
Frequency of operation	:	2402-2479MHz
Type of modulation	:	DSSS
Channel spacing	:	1MHz (78 channels)
Duty cycle	:	10% per full cycle
Mode of operation	:	Simplex
Antenna Type	:	PIFA (Planar Inverted-F Antenna)
Antenna Gain	:	less than +2.14 dBi
Antenna Connector Type	:	Non (because antenna is printed trace)
Method of Frequency Generation	:	Synthesizer
Operating voltage (inner)	:	DC 3.3V

FCC 15.31 (e)

This EUT provides stable voltage constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2004

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits: 2004
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz: 2004

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	21.6dB 0.1858MHz, QP, L	Complied
2	6dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(2)	Conducted	N/A	See data	Complied
3	Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(b)(3)	Conducted	N/A	See data	Complied
4	Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (c)	Conducted/ Radiated	N/A	1.2dB 2400.0MHz Horizontal, AV	Complied
5	Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (c)	Conducted	N/A	See data	Complied
6	Power Density	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (d)	Conducted	N/A	See data	Complied

Note: UL Apex's EMI Work Procedures No.QPM05.

Uncertainty:

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is ±1.3dB.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ±4.5dB(3m)/ ±4.7dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ±5.2dB(3m)/ ±3.8dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ±6.6dB.

*These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".
*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

	Listed date (for FCC)	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	February 01, 2002	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	June 05, 2002	846015	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	-	3.1 x 5.0 x 2.7m	N/A	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

3.4 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used :
1. Transmitting mode of Wireless LAN IEEE802.11b/g
2. Transmitting mode of Receiver
3. Simultaneous Transmitting mode
(Wireless LAN IEEE802.11b/g + Receiver + Wireless Keyboard + Wireless Mouse)

1. Transmitting mode of Wireless LAN IEEE802.11b/g (for all tests (radiated, conducted emission and other tests))

	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
Wireless LAN IEEE802.11b	Ch1: 2412MHz	Ch6: 2437MHz	Ch11: 2462MHz	---	---	---
Wireless LAN IEEE802.11g	---	---	---	Ch1: 2412MHz	Ch6: 2437MHz	Ch11: 2462MHz
Remark	The radio was transmitting at full power on the specified channels in the maximum and it allowed duty cycle and at a data rate of 11Mbps (11b)/54Mbps (11g). Packet Type: Maximum, Payload: PN9 The results of the final measurements were the IEEE 802.11b DSSS (CCK, 11Mbps) and IEEE 802.11g DSSS (OFDM, 54Mbps) modulation as the highest data rate. The confirmation was made which antennas, main or sub antenna, has higher carrier level. As a result, the test was made with sub antenna for radiated/conducted emission tests and with main antenna for the other tests.					

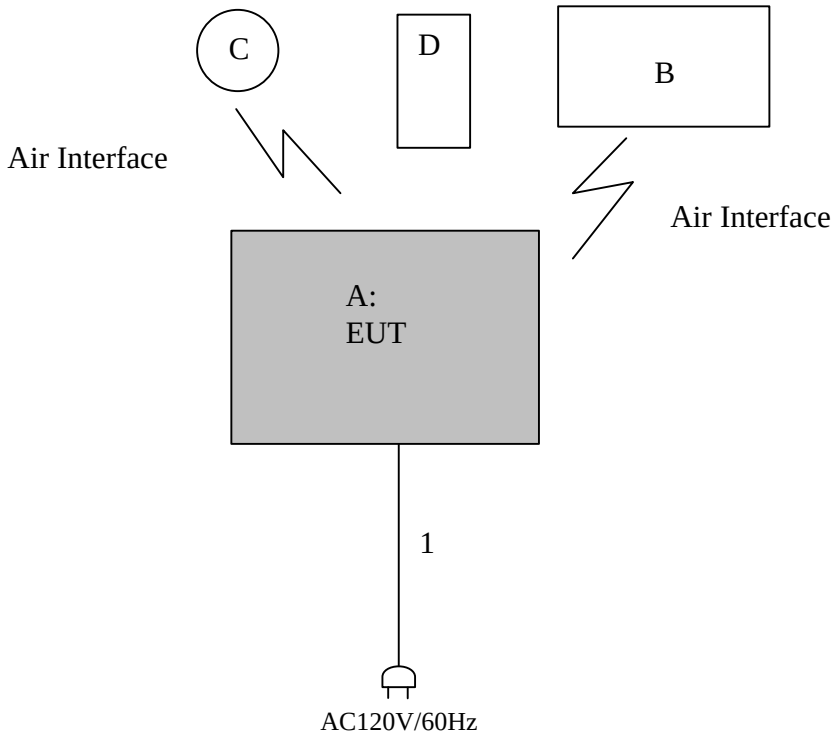
2. Transmitting mode of Receiver (for all tests (radiated, conducted emission and other tests))

	Test 1	Test 2	Test 3
Receiver	Ch1: 2402MHz	Ch39: 2440MHz	Ch78: 2479MHz
Remark	Receiver is mounted in the case of EUT.		

3. Simultaneous Transmitting mode (for radiated and conducted emission tests only)

	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
Wireless LAN IEEE802.11b (11Mbps, Packet Type: MAX, Payload: PN9)	Ch1:2412MHz of worst radiated spurious emission in above-mentioned "1" mode.	Ch1:2412MHz of worst radiated spurious emission in above-mentioned "1" mode.	Ch1:2412MHz of worst radiated spurious emission in above-mentioned "1" mode. *1)	---	---	---
Wireless LAN IEEE802.11g (54Mbps, Packet Type: MAX, Payload: PN9)	---	---	---	Ch1:2412MHz of worst radiated spurious emission in above-mentioned "1" mode.	Ch1:2412MHz of worst radiated spurious emission in above-mentioned "1" mode.	Ch1:2412MHz of worst radiated spurious emission in above-mentioned "1" mode. *1)
Receiver	Ch1: 2402MHz	Ch39: 2440MHz	Ch78: 2479MHz	Ch1: 2402MHz	Ch39: 2440MHz	Ch78: 2479MHz
Wireless Keyboard	Ch1: 2402MHz	Ch39: 2440MHz	Ch78: 2479MHz	Ch1: 2402MHz	Ch39: 2440MHz	Ch78: 2479MHz
Wireless Mouse	Ch1: 2402MHz	Ch44: 2445MHz	Ch78: 2479MHz	Ch1: 2402MHz	Ch44: 2445MHz	Ch78: 2479MHz
Remark	*1) The transmitting channel of Wireless LAN IEEE802.11b/g was set as High Channel (2462MHz), when measuring 2483.5MHz band edge. The confirmation was made which antennas, main or sub antenna, has higher carrier level. As a result, the test was made with sub antenna for radiated/conducted emission tests and with main antenna for the other tests.					

4.2 Configuration and peripherals



* Cabling was taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Personal Computer	PCV-E21L	16 *1) 24 *2)	SONY	AK8PCVE21L
B	Wireless Keyboard	VGP-WKB1	T6000020	SONY	AK8VGPWKB1
C	Wireless Mouse	VGP-WMS1	PA9	SONY	AK8VGPWMS1
D	Remote Commander	RM-VC10U	10U	SONY	-

*1)for Spurious Emission (Radiated) and Conducted emission (AC) test
*2)for Other tests

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	AC Power Cable	1.8	N	Polyvinyl chloride

SECTION 5: Conducted Emission, Section 15.207

Test Procedure and conditions

EUT was placed on a platform of nominal size, 0.5m by 1.0m, raised 80cm above the conducting ground plane.
The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

1) For the tests on EUT with other peripherals (as a whole system)
I/O cable and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

2) For the tests on EUT itself (as a stand alone equipment)
Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN /(AMN) to the input power source. All unused 50ohm connectors of the LISN(AMN) were resistively terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber or a Measurement Room.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

Detector : CISPR quasi-peak detector (IF BW 9 kHz)
Measurement range : 0.15-30MHz
Test data : APPENDIX 3
Test result : Pass

SECTION 6: 6dB Bandwidth, Section 15.247(a)(2)

Test Procedure

The minimum 6dB bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 7: Maximum Peak Output Power, Section 15.247(b)(3)

Test Procedure

The Maximum Peak Output Power was measured with a Spectrum Analyzer connected to the antenna port.
The test was made with the spectrum analyzer that has a function of channel – power measurement.

Test data : APPENDIX 3
Test result : Pass

SECTION 8: Spurious Emission, Section 15.247 (c)

[Conducted]

Test Procedure
The Spurious Emission was measured with a spectrum analyzer connected to the antenna port.

[Radiated]

Test Procedure
EUT was placed on a platform of nominal size, 0.5m by 0.5m, raised 80cm above the conducting ground plane.
The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).
The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver or the Spectrum Analyzer.
In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

When not satisfying the requirement of Section 15.209, 20dBc was applied the restricted band of Section 15.205.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver / Spectrum Analyzer	Spectrum Analyzer
Detector IF Bandwidth	QP: BW 120kHz(T/R) 20dBc : RBW: 100kHz VBW: 300kHz (S/A)	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

Test data : APPENDIX 3
Test result : Pass

- The carrier level (or, noise levels) was (or were) measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.
With the position, the noise levels of all the frequencies was measured.

SECTION 9: Peak Power Density, Section 15.247 (d)

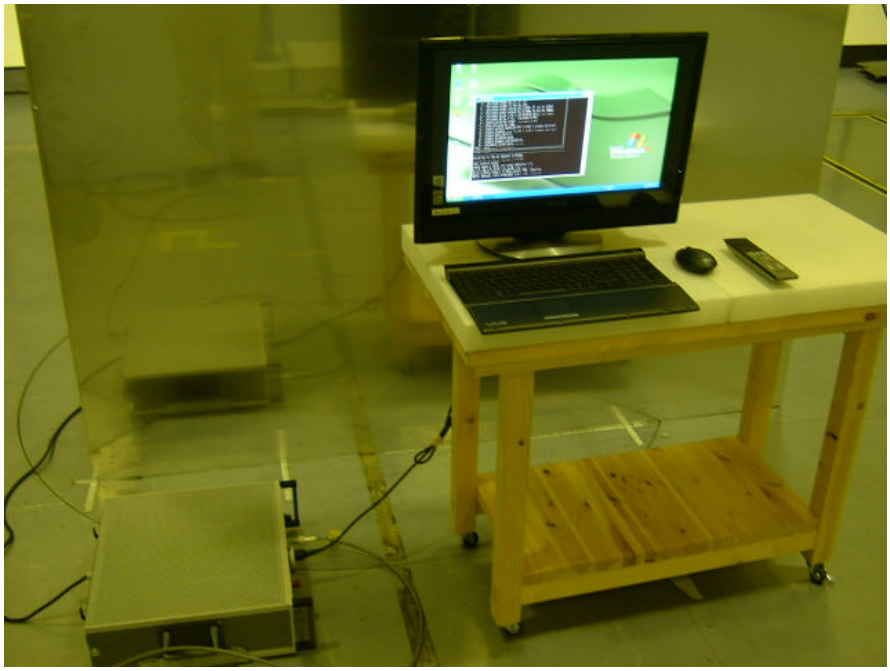
[Conducted]
Test Procedure
The Peak Power Density was measured with a spectrum analyzer connected to the antenna port.
The test was made with the spectrum analyzer that has a function of channel-power measurement.

Test data : APPENDIX 3
Test result : Pass

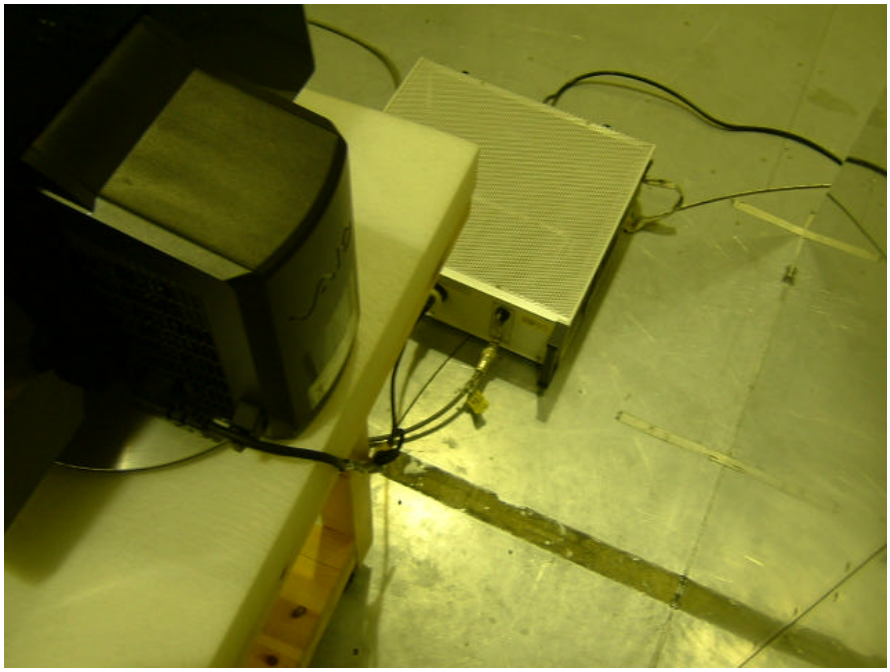
APPENDIX 1: Photographs of test setup

Conducted Emission

Front

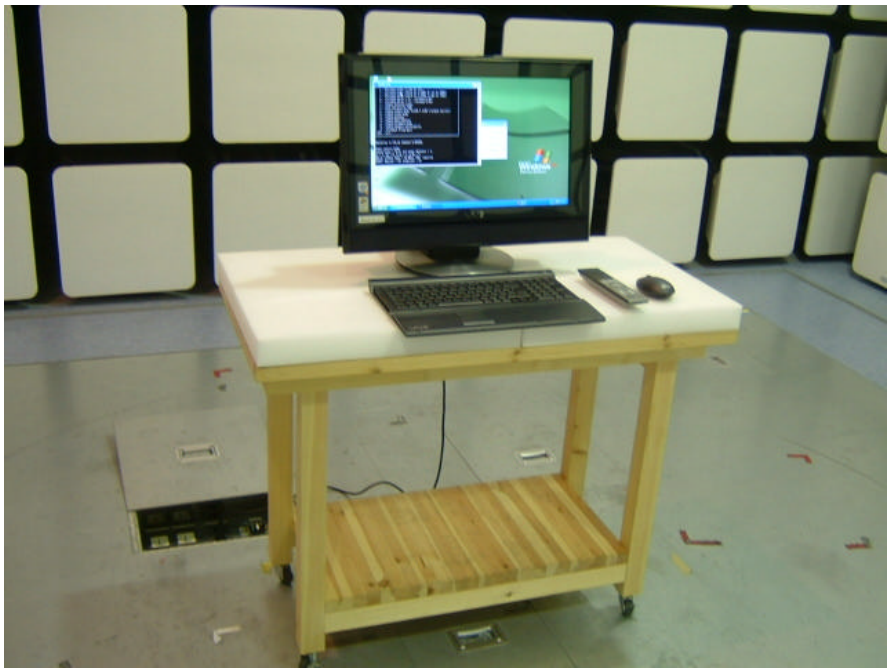


Rear



Spurious Emission (Radiated)

Front



Rear

APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2004/04/12 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/10/14 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2004/10/14 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2004/02/03 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	RE	2004/02/18 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2004/02/24 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2003/12/16 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/01/10 * 12
MCC-04	Microwave Cable	Storm	421-011	RE	2004/01/06 * 12
MCC-24	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2004/02/06 * 12
MPA-06	Pre Amplifier	Hewlett Packard	8447D	RE	2004/08/29 * 12
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE/CE	2003/12/27 * 12
MHA-01	Horn Antenna	EMCO	3160-09	RE	2004/01/10 * 12
MPA-05	Pre Amplifier	TSJ	PreAmp	RE	2004/06/12 * 12
MCC-05	Microwave Cable	Storm	421-011	RE	2004/01/06 * 12
MCC-23	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE/CE	2003/11/12 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2003/11/10 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/Agilent/TSJ	-	CE	2003/12/24 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	AT	2004/06/12 * 12
MAT-20	Attenuator(10dB)(above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	AT	2004/01/28 * 12
MAT-23	Attenuator(10dB)(above1GHz)	Orient Microwave	BX10-0476-00	AT	2004/03/30 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	RE	2004/09/19 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
Test Item:

CE AC Main Conducted Emission
RE: Radiated Spurious Emission
AT Antenna Terminal Conducted Spurious Emission

APPENDIX 3: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 03:26:43

Applicant : Sony Corporation
Kind of EUT : Personal Computer
Model No. : PCV-E21L
Serial No. : 16

Report No. : 25BE0202-HO
Power : AC120V/60Hz
Temp°C/Humi% : 24deg.C / 46%
Operator : Makoto Kosaka

Mode / Remarks : LAN-11g 54Mbps PN9 Tx 2412MHz Receiver Tx 2479MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)

NO	FREQ	READING		C.F	RESULT		LIMIT		MARGIN		PHASE
		QP	AV		QP	AV	QP	AV	QP	AV	
	[MHz]	[dBμV]	[dBμV]	[dB]	[dBμV]	[dBμV]	[dBμV]	[dBμV]	[dB]	[dB]	
1	0.1500	41.6	----	0.1	41.7	----	66.0	----	24.3	----	N
2	0.1858	41.2	----	0.2	41.4	----	64.2	----	22.8	----	N
3	0.2622	31.4	----	0.3	31.7	----	61.4	----	29.7	----	N
4	0.3948	24.1	----	0.5	24.6	----	58.0	----	33.4	----	N
5	0.9170	17.9	----	0.6	18.5	----	56.0	----	37.5	----	N
6	3.3517	22.9	----	0.8	23.7	----	56.0	----	32.3	----	N
7	8.7535	20.6	----	1.2	21.8	----	60.0	----	38.2	----	N
8	19.6132	19.2	----	2.2	21.4	----	60.0	----	38.6	----	N
9	0.1500	41.3	----	0.1	41.4	----	66.0	----	24.6	----	L
10	0.1858	42.4	----	0.2	42.6	----	64.2	----	21.6	----	L
11	0.2622	30.2	----	0.3	30.5	----	61.4	----	30.9	----	L
12	0.3948	23.6	----	0.5	24.1	----	58.0	----	33.9	----	L
13	0.9170	17.0	----	0.6	17.6	----	56.0	----	38.4	----	L
14	3.3517	22.3	----	0.8	23.1	----	56.0	----	32.9	----	L
15	8.7535	20.7	----	1.2	21.9	----	60.0	----	38.1	----	L
16	19.6132	18.0	----	2.2	20.2	----	60.0	----	39.8	----	L

CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

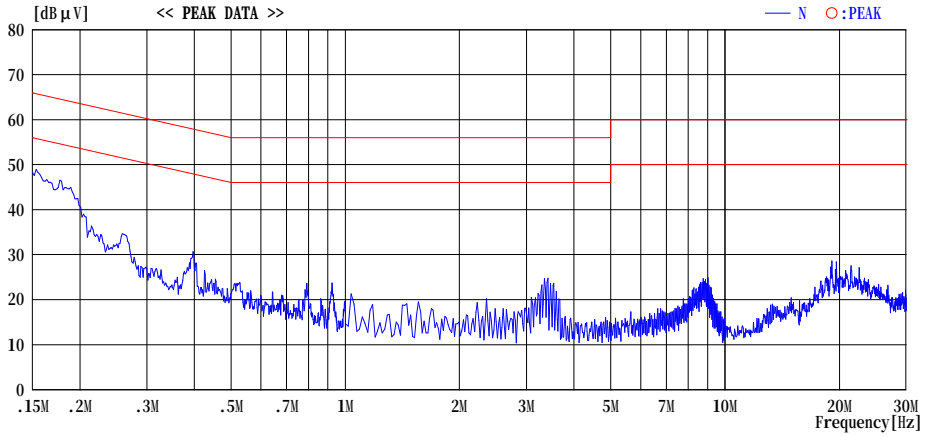
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 00:46:05

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11b 11Mbps PN9 Tx 2412MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



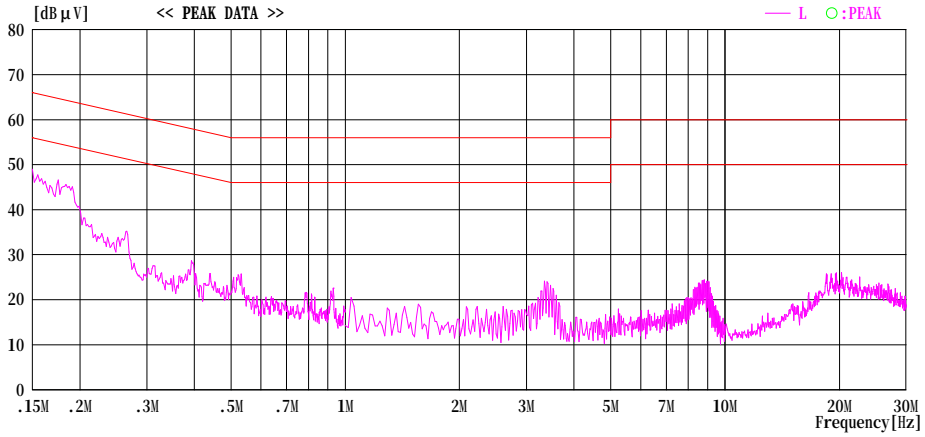


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

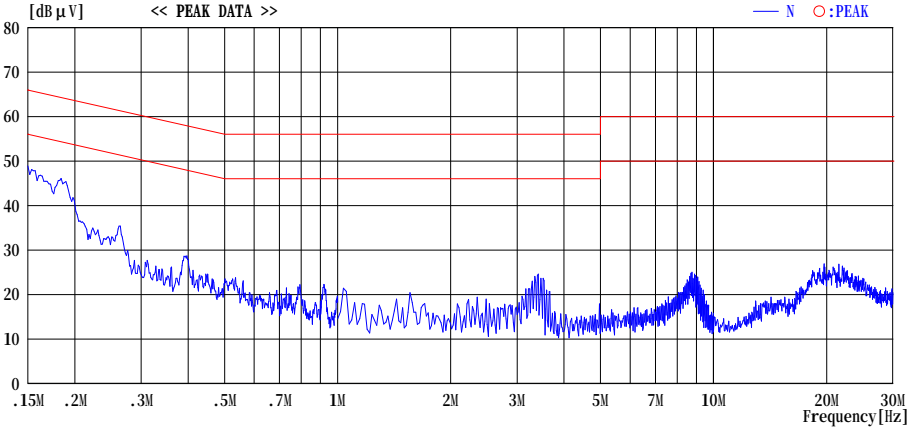
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 00:59:46

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11b 11Mbps PN9 Tx 2437MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



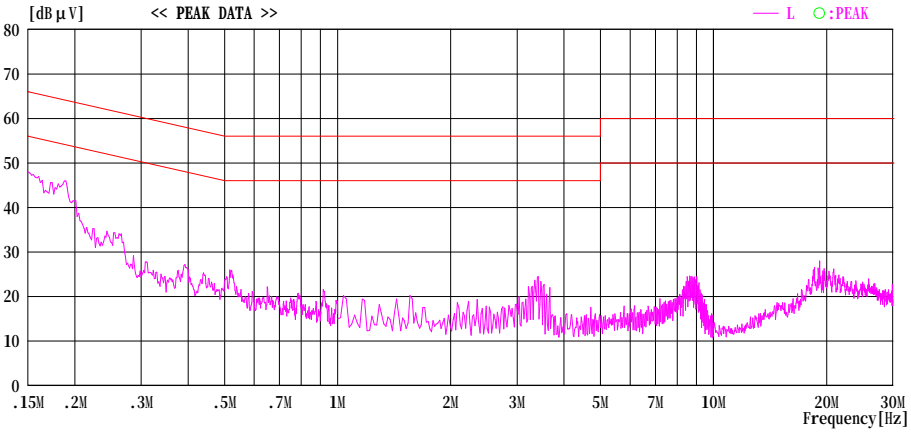


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

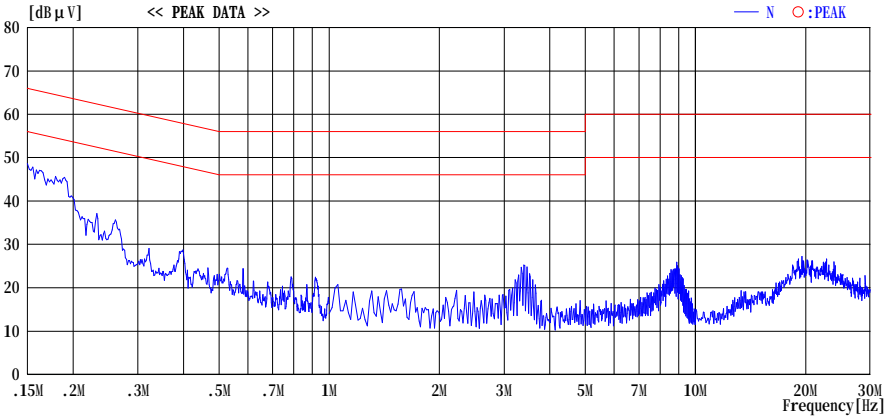
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 01:09:41

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11b 11Mbps PN9 Tx 2462MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



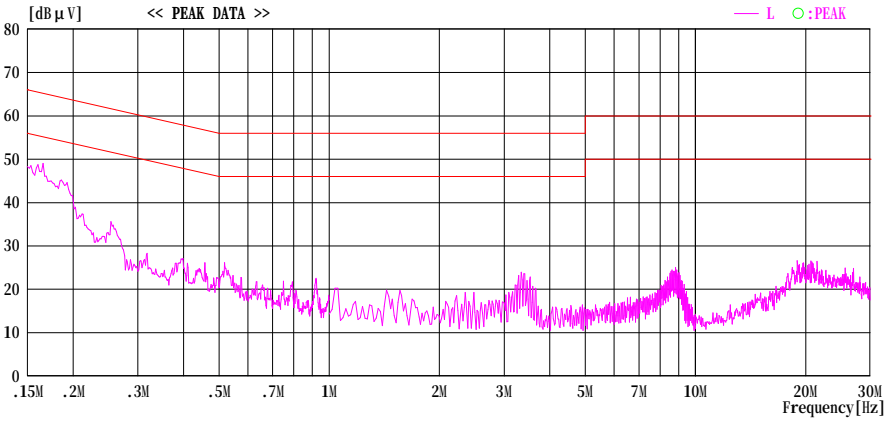


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

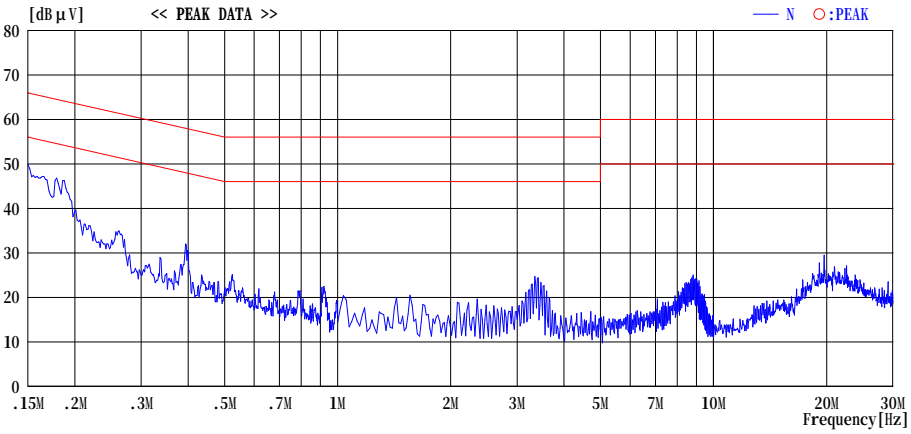
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 01:21:33

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11g 54Mbps PN9 Tx 2412MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



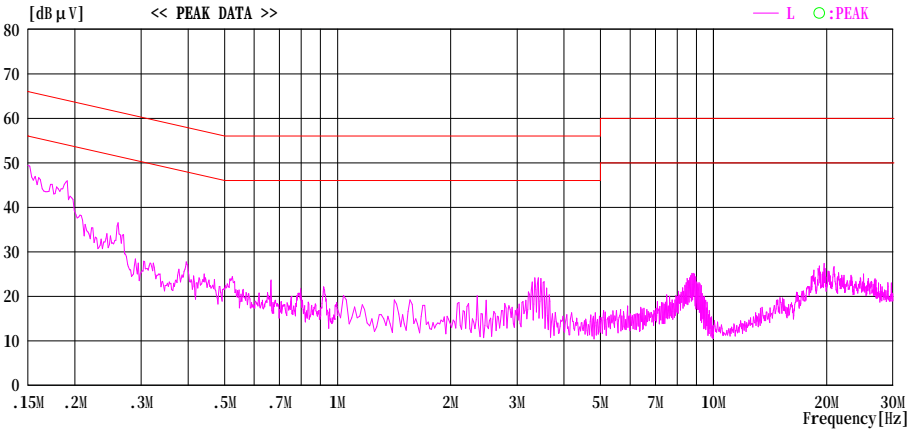


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

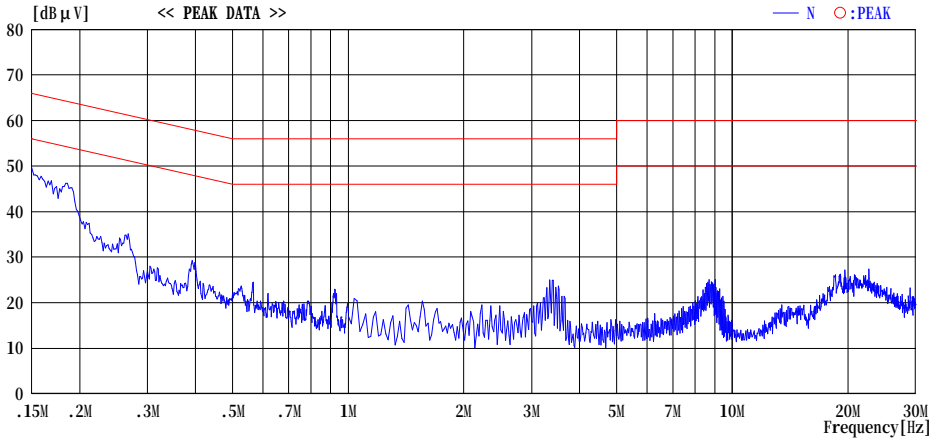
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 01:29:06

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11g 54Mbps PN9 Tx 2437MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



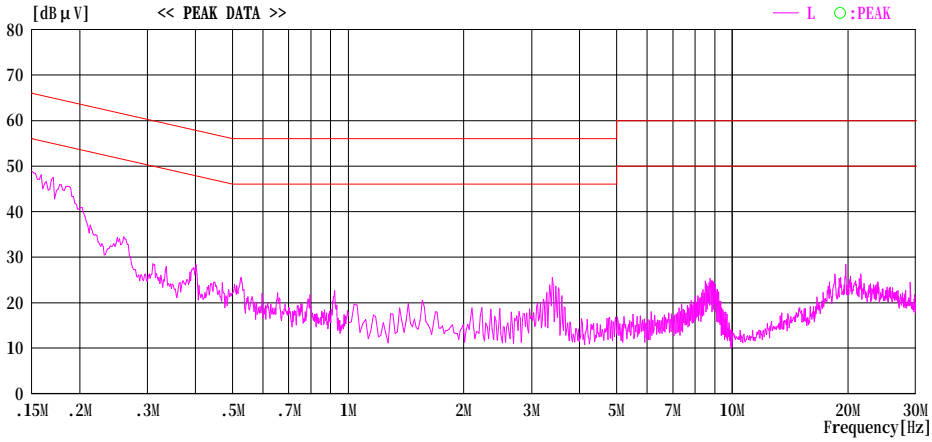


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

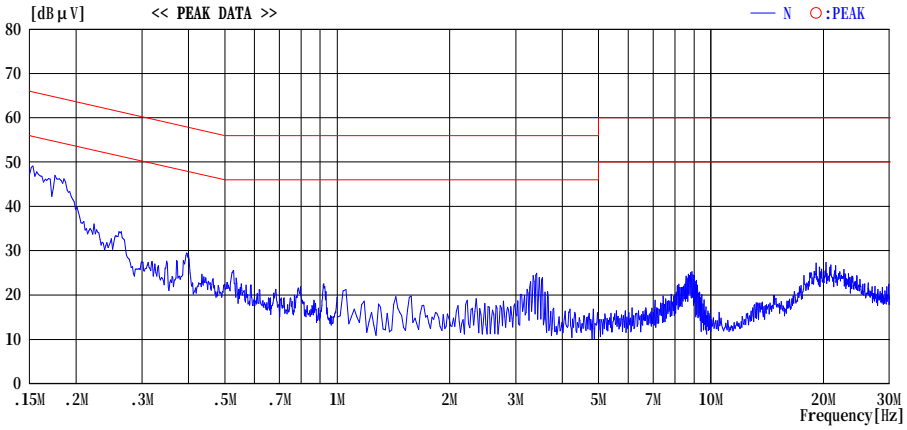
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 01:34:28

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11g 54Mbps PN9 Tx 2462MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



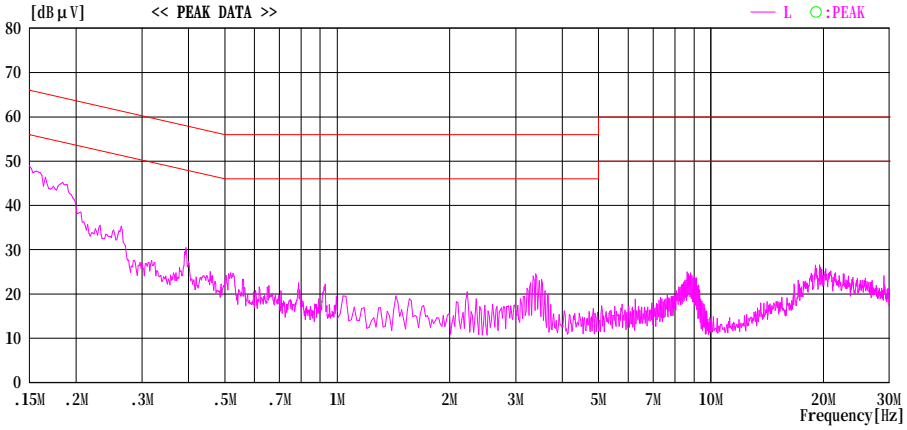


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

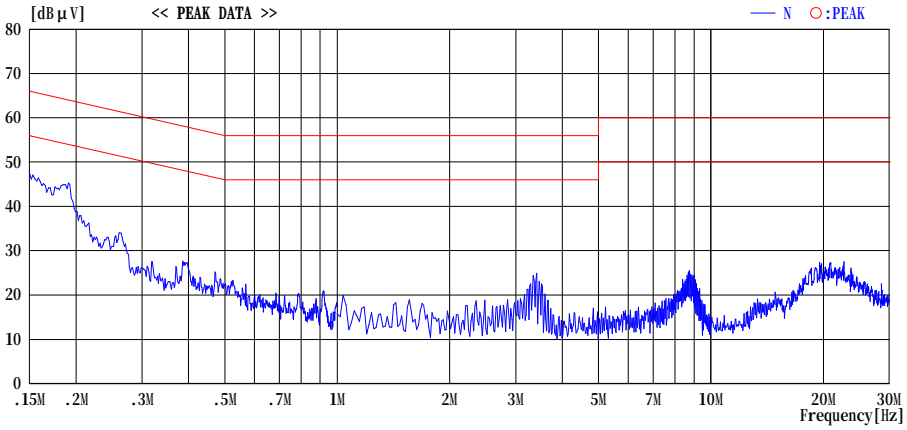
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 01:41:40

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : Receiver Tx 2402MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



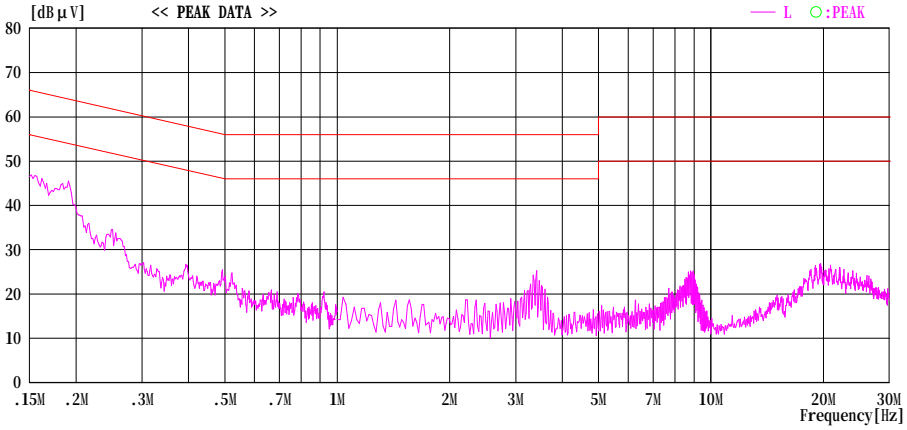


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

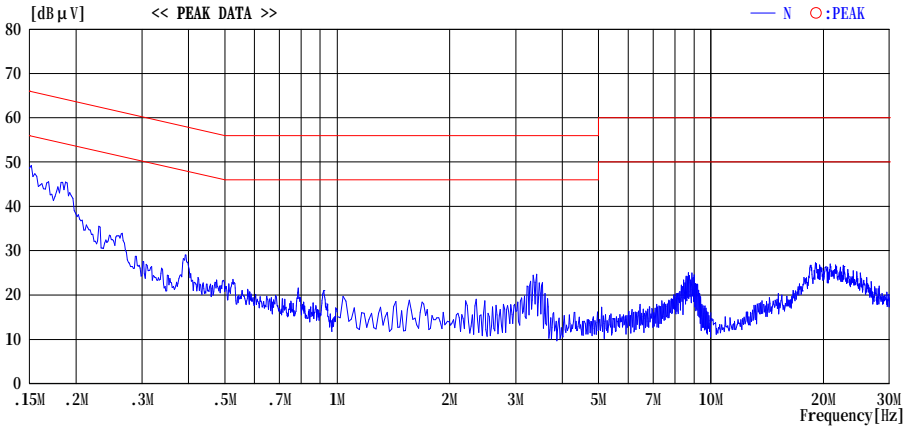
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 01:47:15

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : Receiver Tx 2440MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



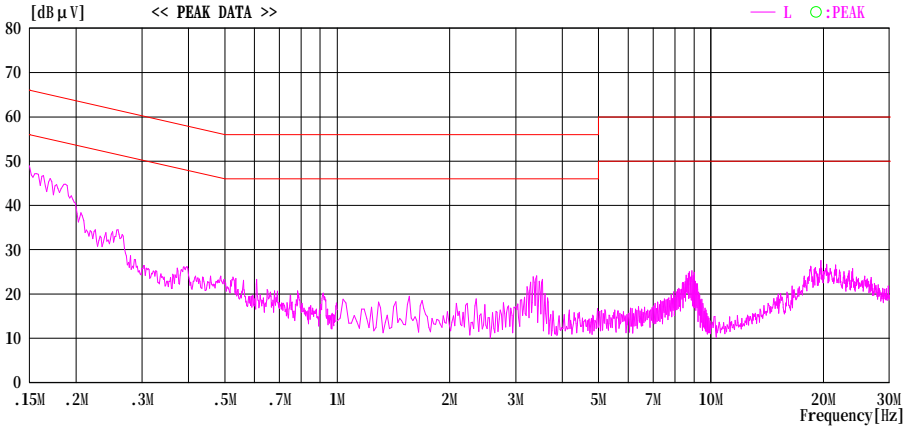


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

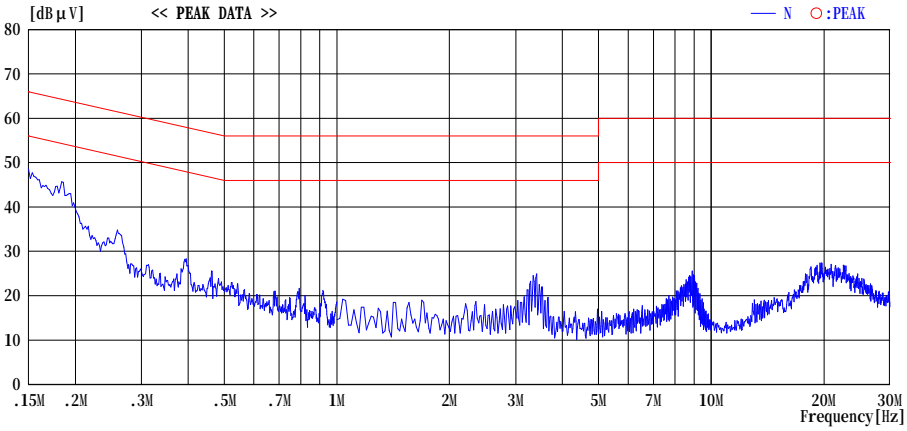
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 02:36:28

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : Receiver Tx 2479MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



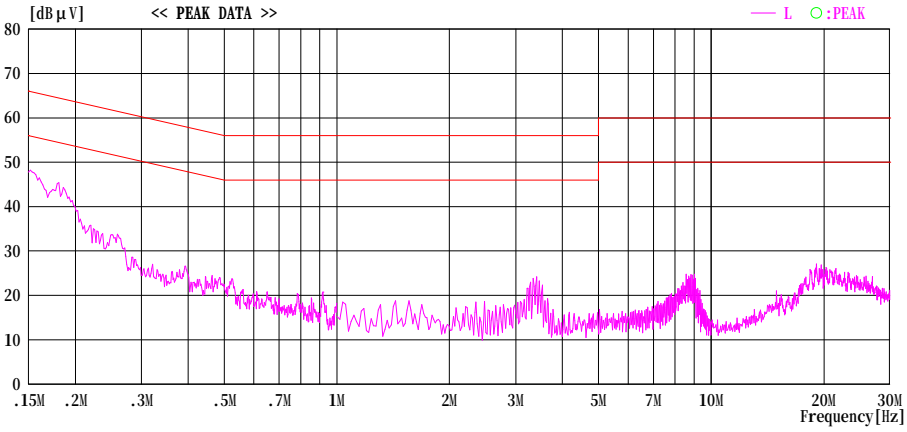


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

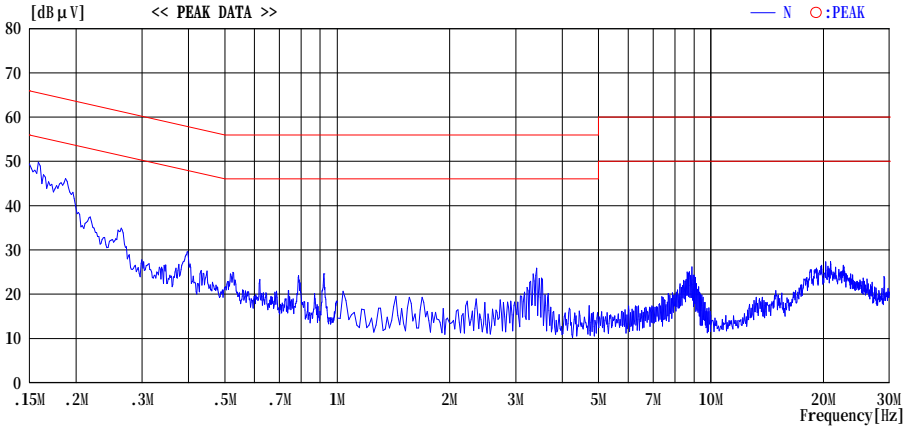
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 02:51:48

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11b 11Mbps PN9 Tx 2412MHz Receiver Tx 2402MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



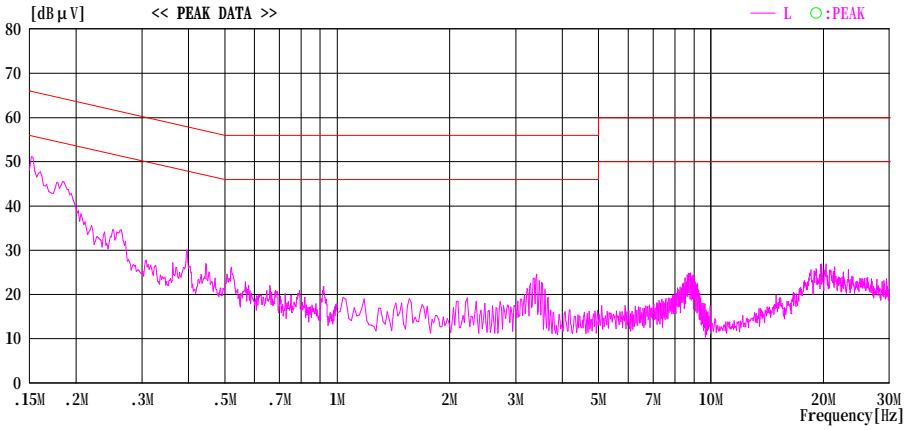


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

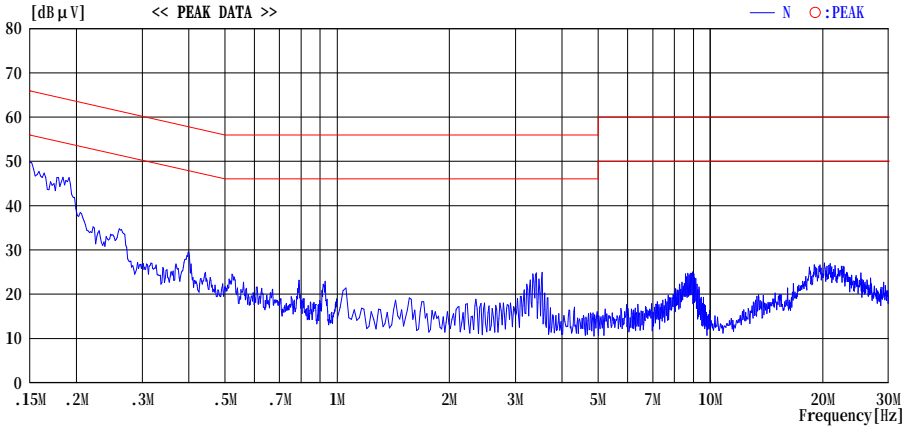
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 02:58:46

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11b 11Mbps PN9 Tx 2412MHz Receiver Tx 2440MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



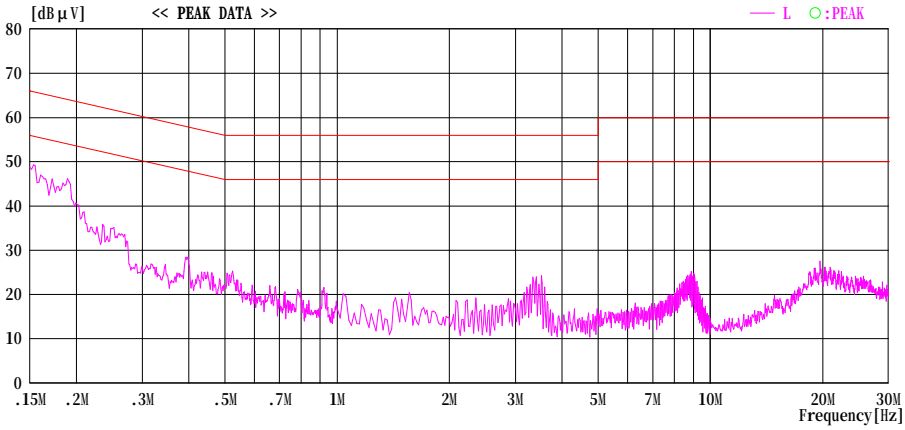


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

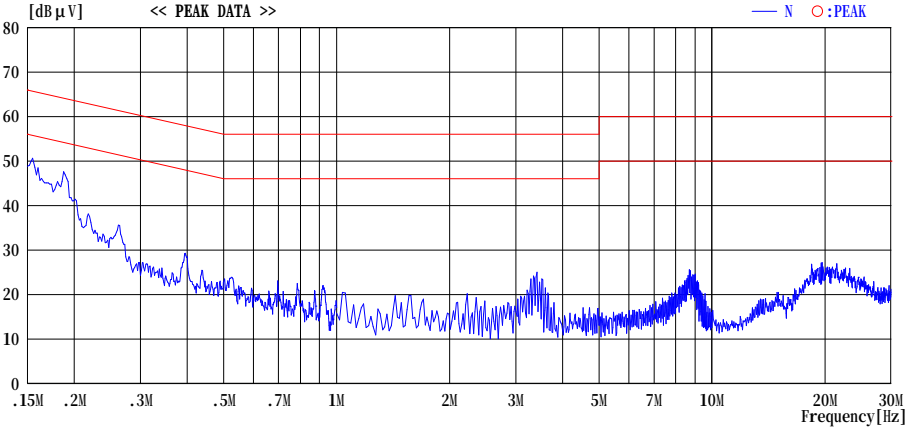
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 03:04:23

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11b 11Mbps PN9 Tx 2412MHz Receiver Tx 2479MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



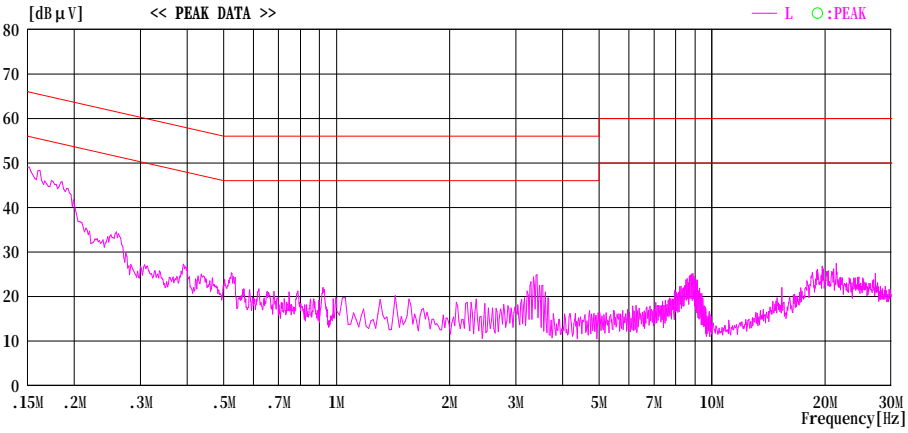


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

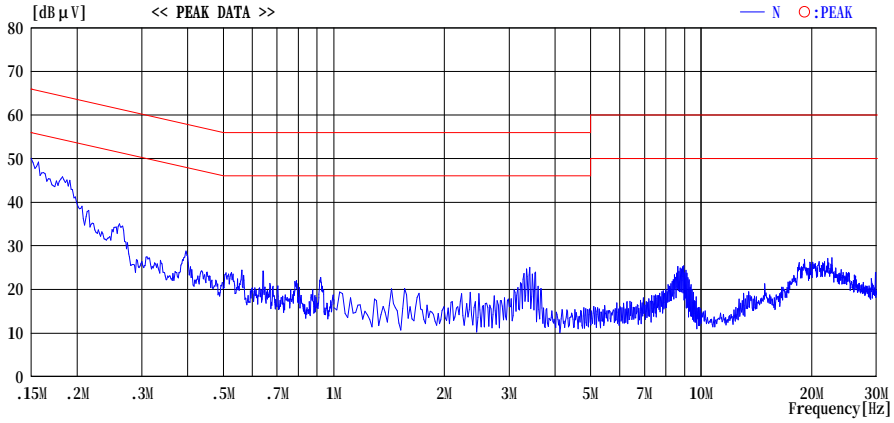
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 03:13:57

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11g 54Mbps PN9 Tx 2412MHz Receiver Tx 2402MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



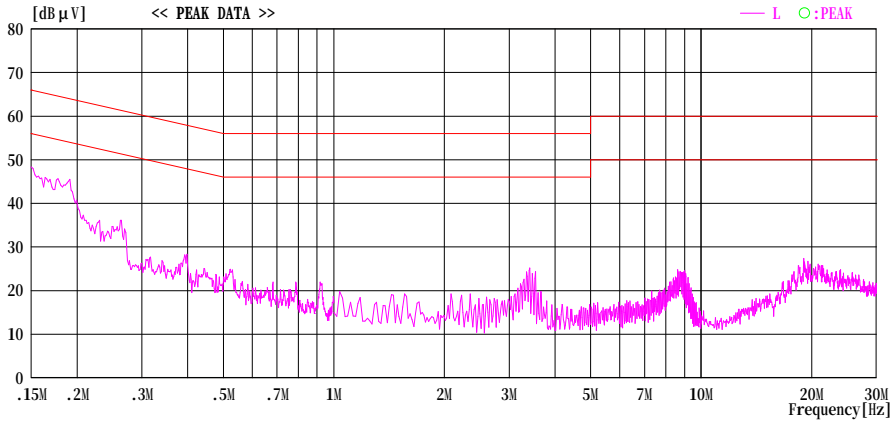


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

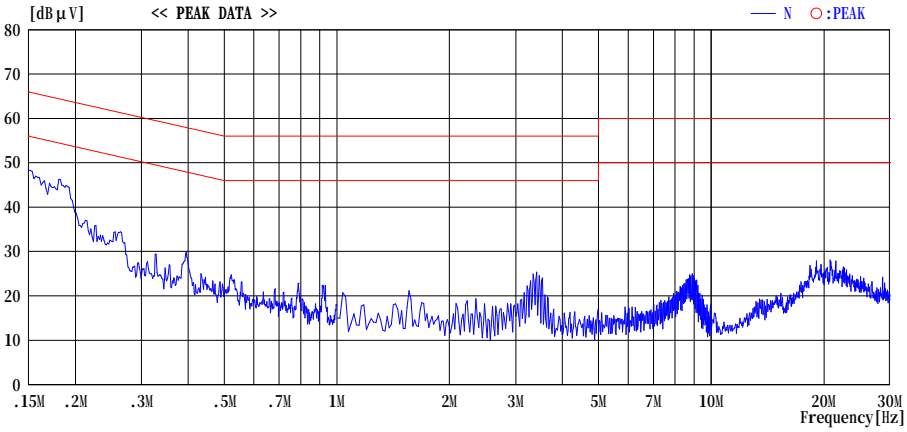
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 03:20:07

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11g 54Mbps PN9 Tx 2412MHz Receiver Tx 2440MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



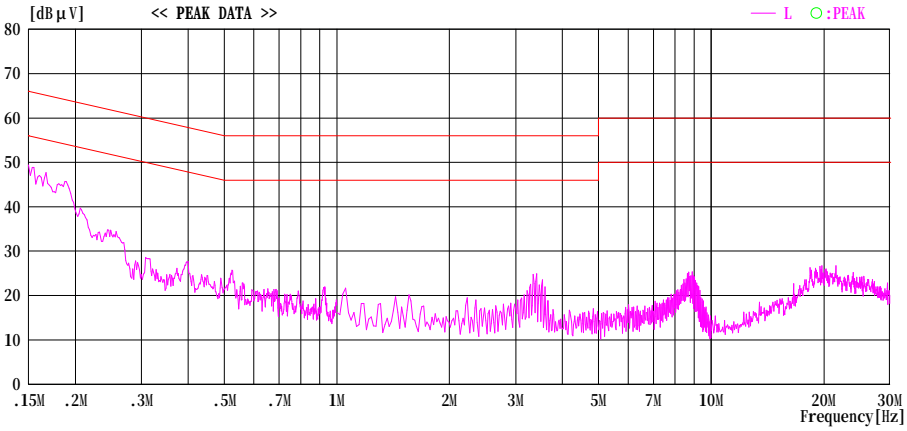


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

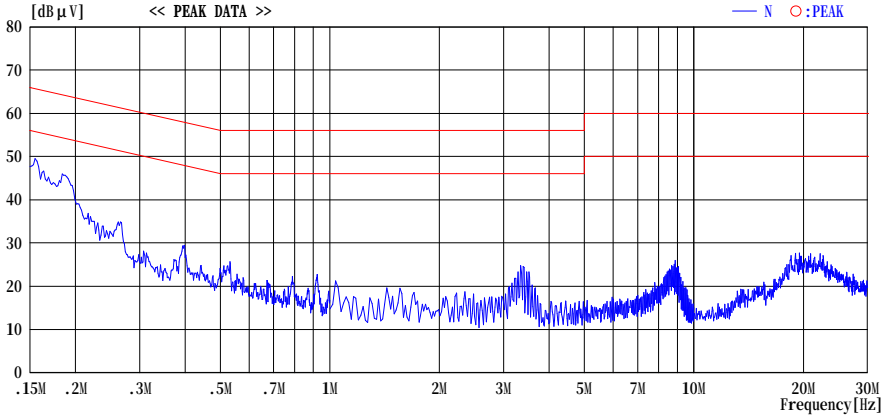
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/10/14 03:26:43

Applicant	: Sony Corporation	Report No.	: 25BE0202-HO
Kind of EUT	: Personal Computer	Power	: AC120V/60Hz
Model No.	: PCV-E21L	Temp°C/Humi%	: 24deg.C / 46%
Serial No.	: 16	Operator	: Makoto Kosaka

Mode / Remarks : LAN-11g 54Mbps PN9 Tx 2412MHz Receiver Tx 2479MHz

LIMIT : FCC15C § 15.207 (QP)
FCC15C § 15.207 (AV)



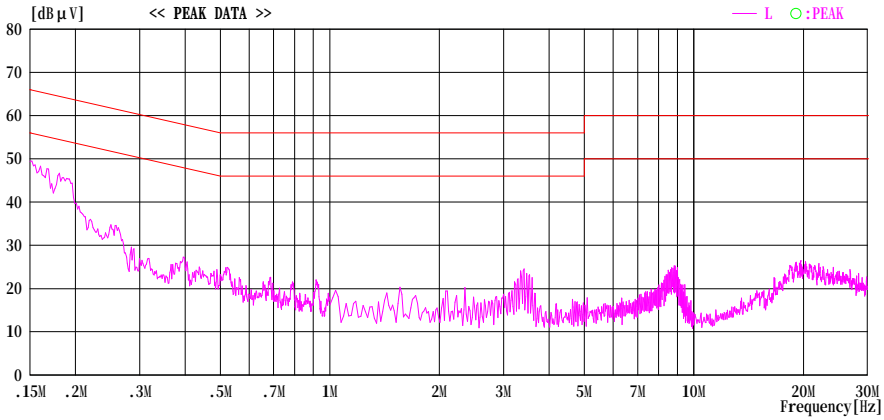


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

6dB Bandwidth(DSSS and other forms of modulation)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

Company	: Sony Corporation	REPORT NO	: 25BE0202-HO
Equipment	: Personal Computer	REGULATION	: Fcc Part15 Subpart C 15.247(a)(2)
Model	: PCV-E21L	TEST DISTANCE	: -
Sample No.	: 24	DATE	: 07/05/2004 and 10/18/2004
Power	: AC120V/60Hz	TEMPERATURE	: 25deg.C and 23deg.C
Mode	: Tx	HUMIDITY	: 50% and 48%
		ENGINEER	: Hiroka Umeyama and Makoto Kosaka

[IEEE802.11b 11Mbps] Main Antenna

Ch	Freq. [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
Low	2412.0	11.262	500.0
Mid	2437.0	11.569	500.0
High	2462.0	11.312	500.0

[IEEE802.11g 54Mbps] Main Antenna

Ch	Freq. [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
Low	2412.0	16.499	500.0
Mid	2437.0	16.516	500.0
High	2462.0	16.532	500.0

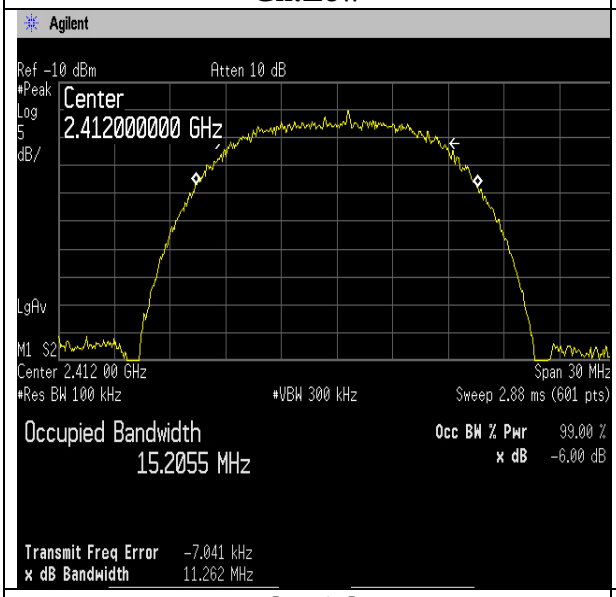
Receiver

Ch	Freq. [MHz]	6dB Bandwidth [kHz]	Limit [kHz]
Low	2402.0	930.597	500.0
Mid	2440.0	914.097	500.0
High	2479.0	909.450	500.0

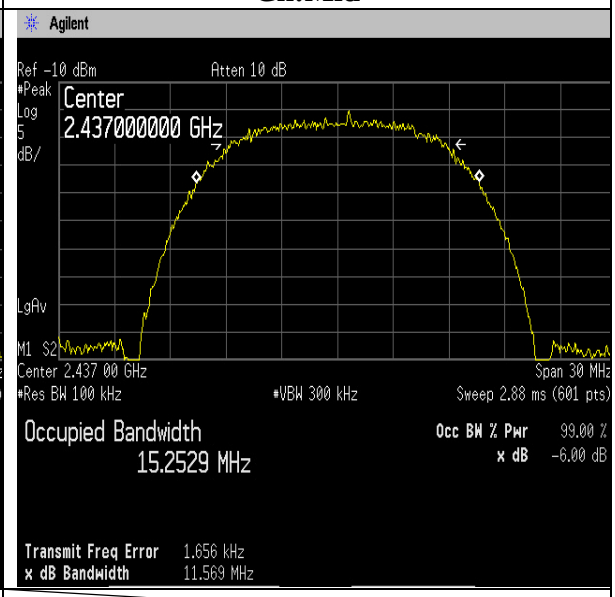
6dB Bandwidth(DSSS and other forms of modulation)

[IEEE802.11b]Main Antenna

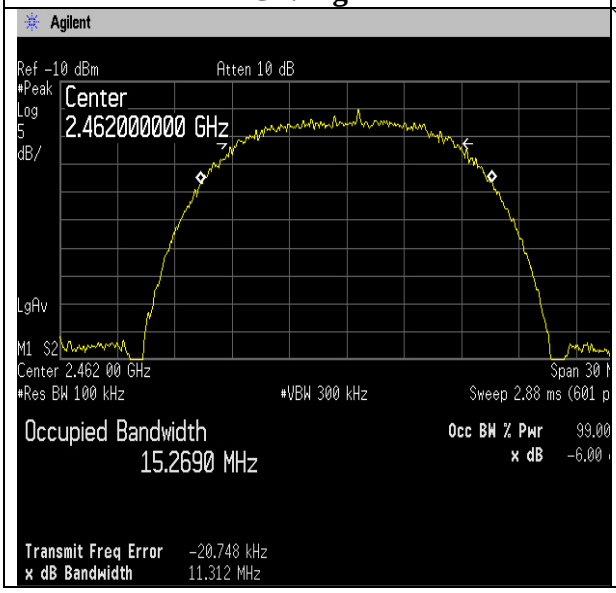
Ch:Low



Ch:Mid



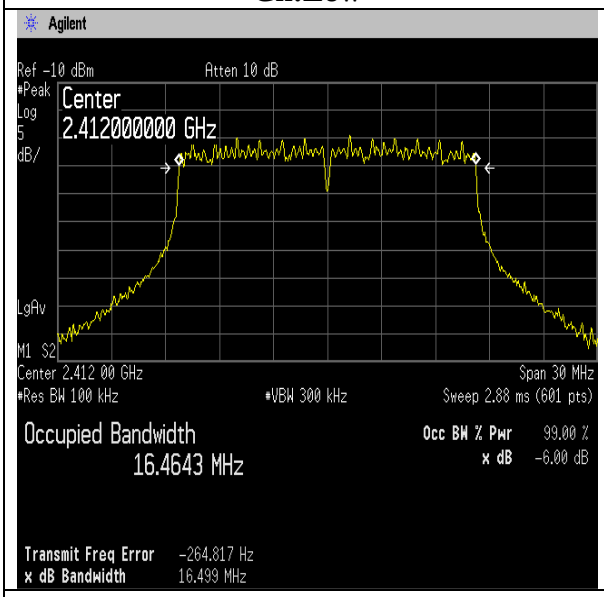
Ch:High



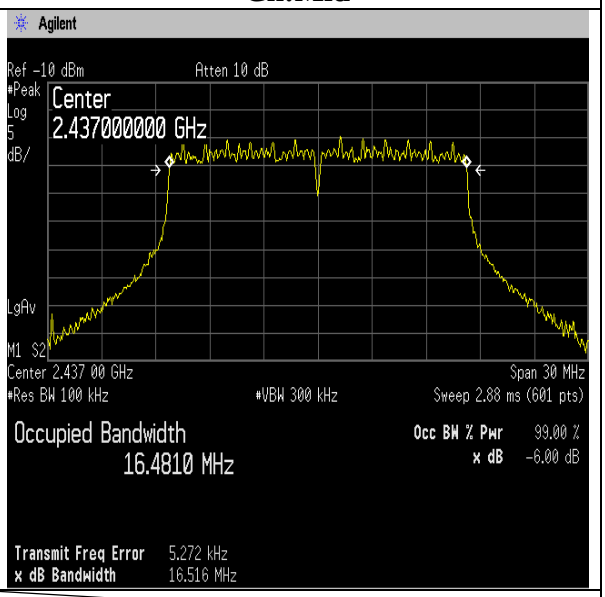
6dB Bandwidth(DSSS and other forms of modulation)

[IEEE802.11g 54Mbps]Main Antenna

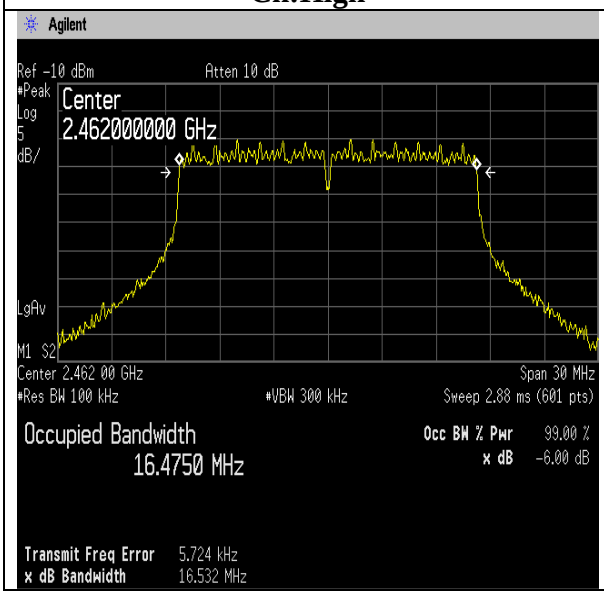
Ch:Low



Ch:Mid

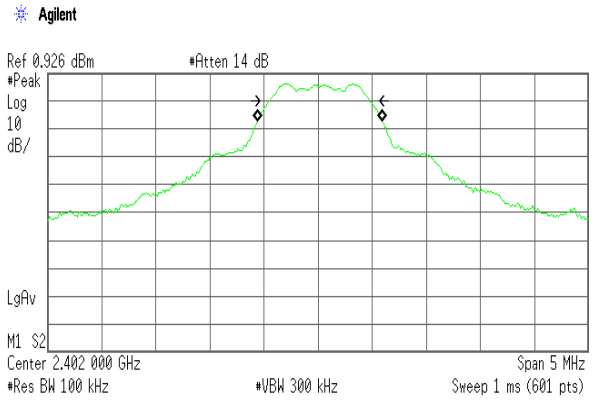


Ch:High



6dB Bandwidth(DSSS and other forms of modulation)Receiver

Ch:Low

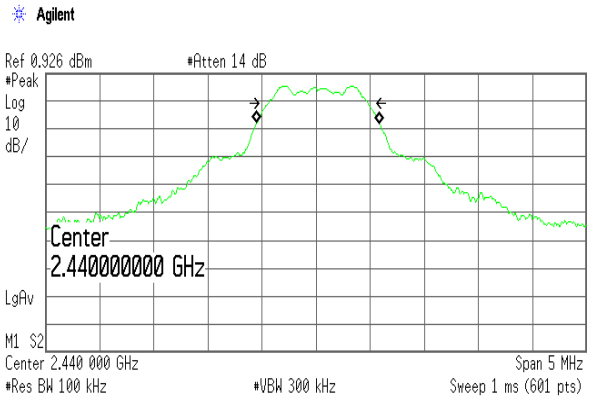


Occupied Bandwidth
1.1539 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 18.006 kHz
x dB Bandwidth 930.597 kHz

Ch:Mid

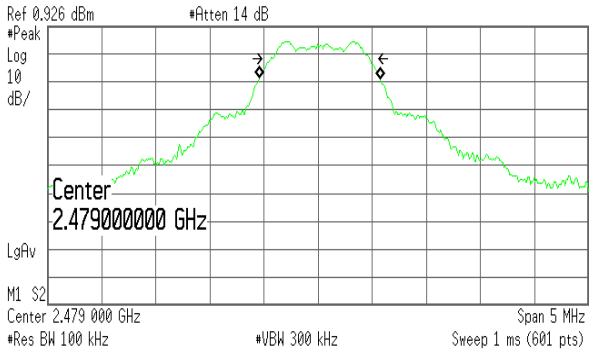


Occupied Bandwidth
1.1295 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 18.702 kHz
x dB Bandwidth 914.097 kHz

Ch:High



Occupied Bandwidth
1.1163 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 15.918 kHz
x dB Bandwidth 909.450 kHz

Maximum Peak OutPut Power (DSSS and other forms of modulation)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

Company : Sony Corporation
Equipment : Personal Computer
Model : PCV-E21L
Sample No. : 24
Power : AC120V/60Hz
Mode : Tx

REPORT NO : 25BE0202-HO
REGULATION : Fcc Part15 Subpart C 15.247(b)(3)
TEST DISTANCE : -
DATE : 07/05/2004 and 10/18/2004
TEMPERATURE : 25deg.C and 23deg.C
HUMIDITY : 50% and 48%
ENGINEER : Hiroka Umeyama and Makoto Kosaka

[IEEE802.11 b] Main Antenna

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2412.0	-0.10	2.68	20.00	22.58	30.00	7.42
Mid	2437.0	-0.24	2.68	20.00	22.44	30.00	7.56
High	2462.0	-0.20	2.68	20.00	22.48	30.00	7.52

[IEEE802.11 b] Sub Antenna

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2412.0	-0.49	2.68	20.00	22.19	30.00	7.81
Mid	2437.0	-0.45	2.68	20.00	22.23	30.00	7.77
High	2462.0	-0.57	2.68	20.00	22.11	30.00	7.89

[IEEE802.11 g54Mbps] Main Antena

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2412.0	-0.11	2.68	20.00	22.57	30.00	7.43
Mid	2437.0	-0.40	2.68	20.00	22.28	30.00	7.72
High	2462.0	-0.41	2.68	20.00	22.27	30.00	7.73

[IEEE802.11 g54Mbps] Sub Antena

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2412.0	-0.56	2.68	20.00	22.12	30.00	7.88
Mid	2437.0	-0.58	2.68	20.00	22.10	30.00	7.90
High	2462.0	-0.88	2.68	20.00	21.80	30.00	8.20

[IEEE802.11 g18Mbps] Main Antena

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2412.0	0.67	2.68	20.00	23.35	30.00	6.65
Mid	2437.0	0.21	2.68	20.00	22.89	30.00	7.11
High	2462.0	0.26	2.68	20.00	22.94	30.00	7.06

[IEEE802.11 g18Mbps] Sub Antena

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2412.0	0.44	2.68	20.00	23.12	30.00	6.88
Mid	2437.0	0.10	2.68	20.00	22.78	30.00	7.22
High	2462.0	0.39	2.68	20.00	23.07	30.00	6.93

Receiver

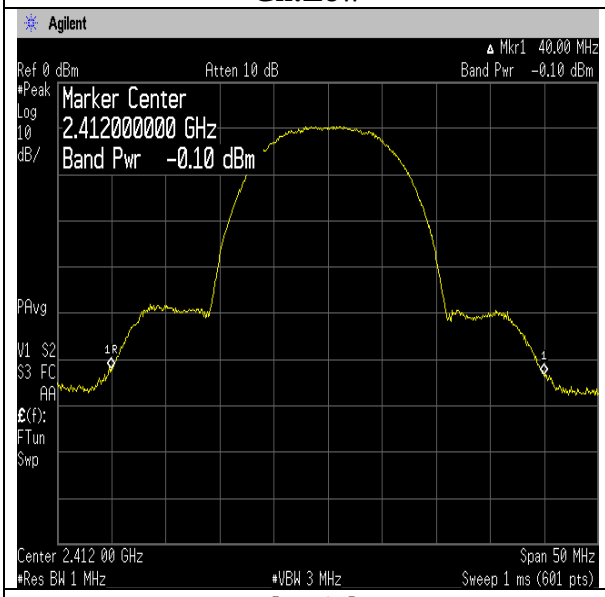
Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2402.0	-1.52	1.13	0.00	-0.39	30.00	30.39
Mid	2440.0	-2.25	1.09	0.00	-1.16	30.00	31.16
High	2479.0	-3.05	1.18	0.00	-1.87	30.00	31.87

Sample Calculation:
Result = Reading + Cable Loss(customer's Cable) + Attenuator
* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

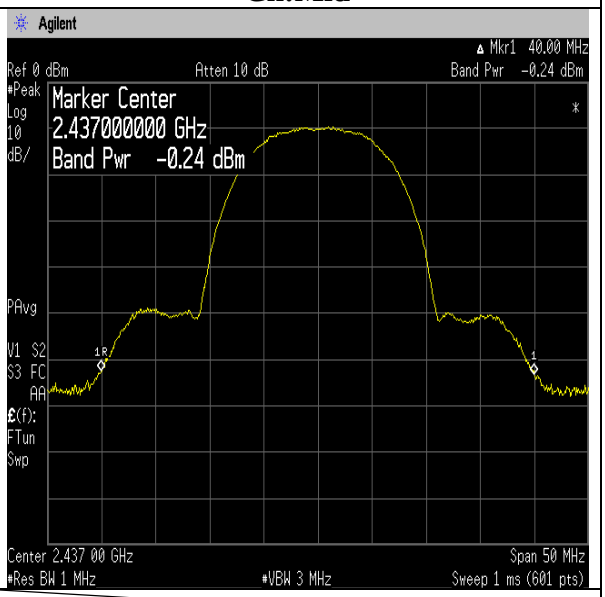
Maximum Peak OutPut Power (DSSS and other forms of modulation)

[IEEE802.11b]Main Antenna

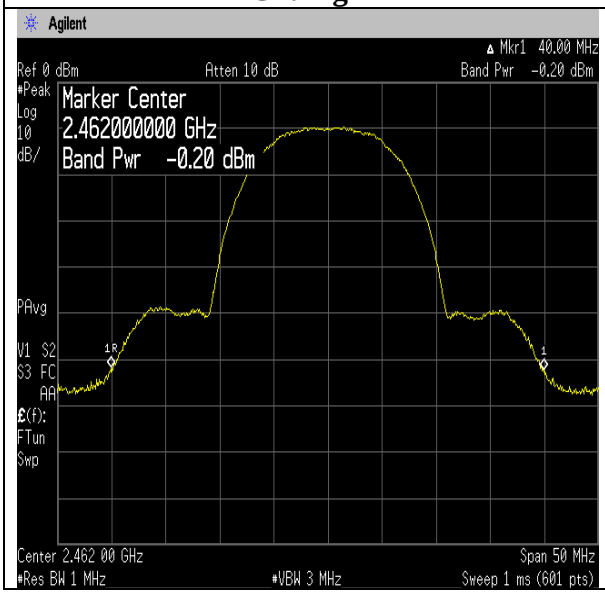
Ch:Low



Ch:Mid



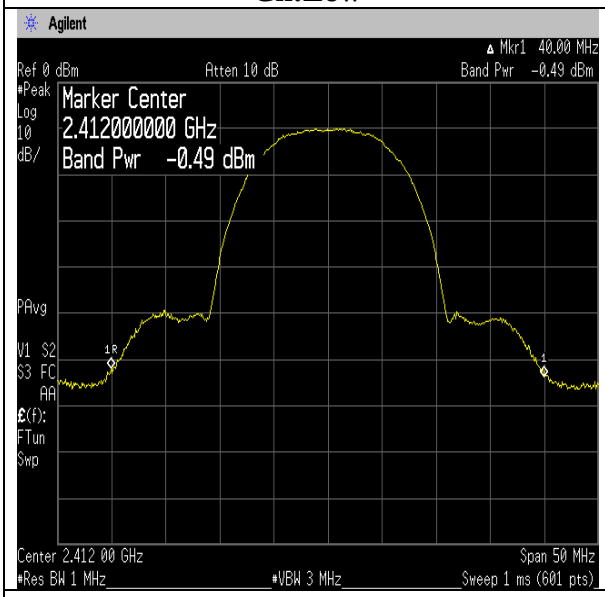
Ch:High



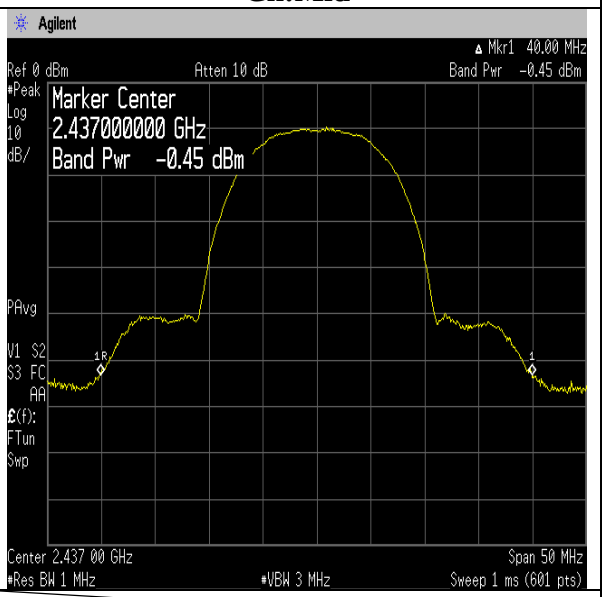
Maximum Peak OutPut Power (DSSS and other forms of modulation)

[IEEE802.11b]Sub Antenna

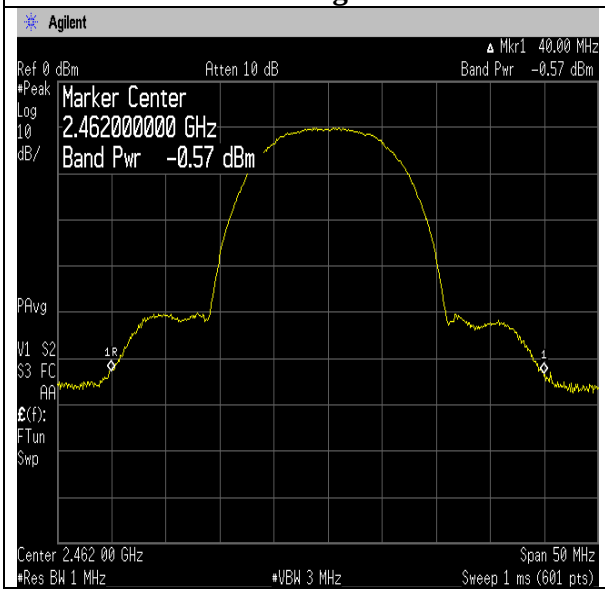
Ch:Low



Ch:Mid



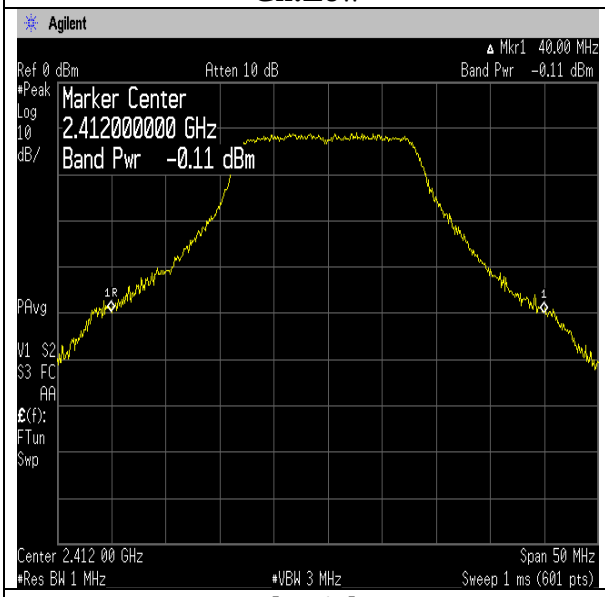
Ch:High



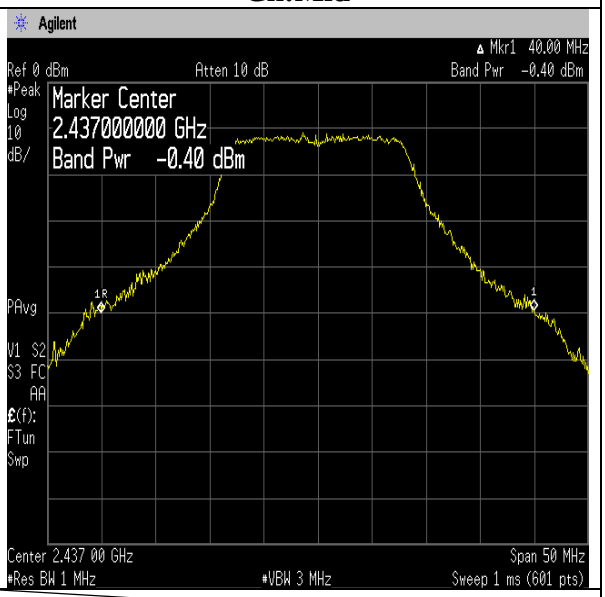
Maximum Peak OutPut Power (DSSS and other forms of modulation)

[IEEE802.11g 54Mbps]Main Antenna

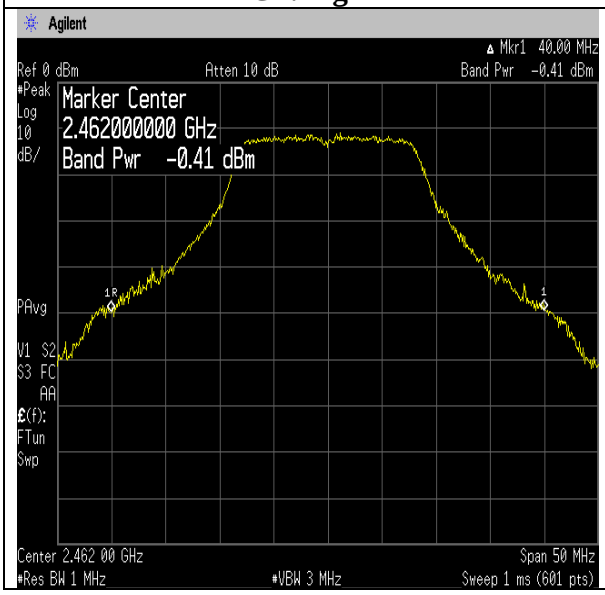
Ch:Low



Ch:Mid



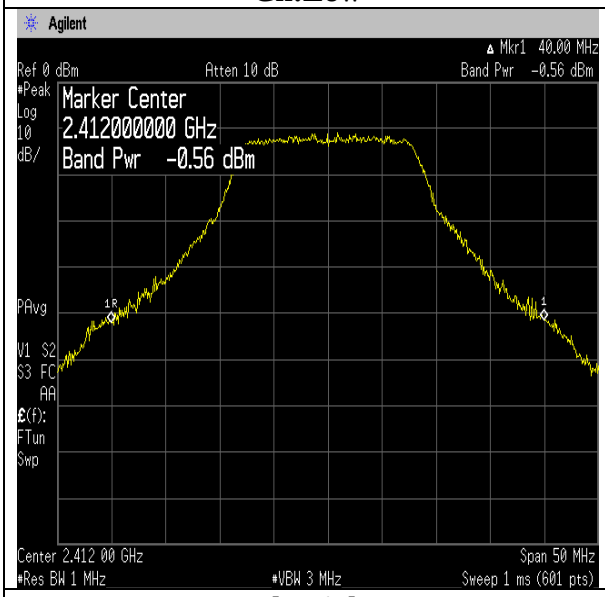
Ch:High



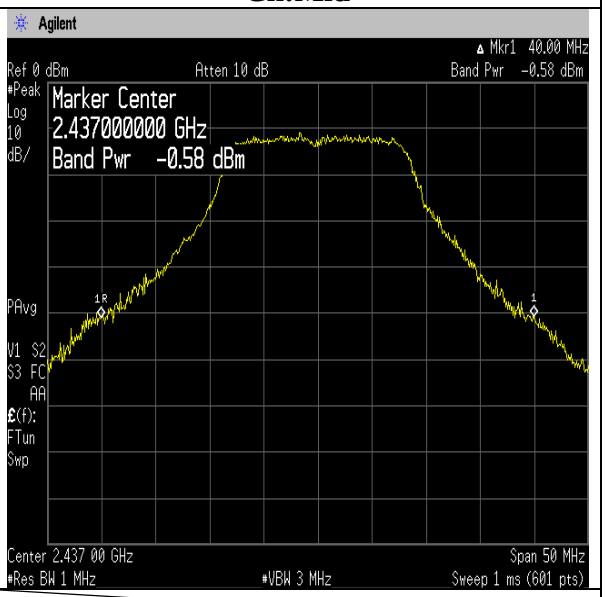
Maximum Peak OutPut Power (DSSS and other forms of modulation)

[IEEE802.11g 54Mbps]Sub Antenna

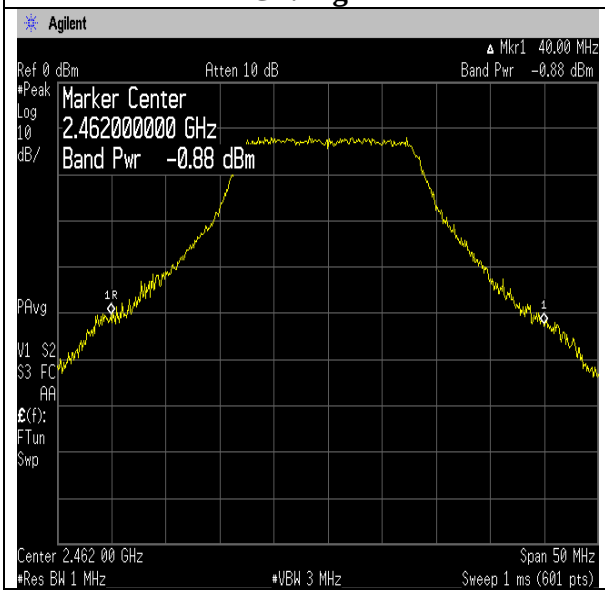
Ch:Low



Ch:Mid



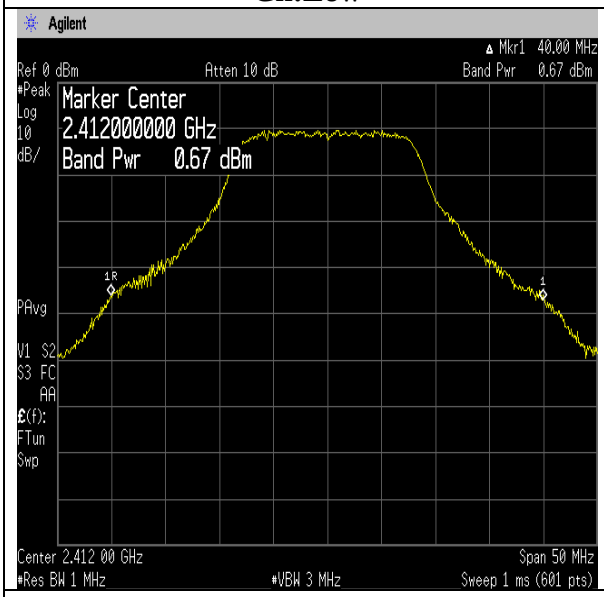
Ch:High



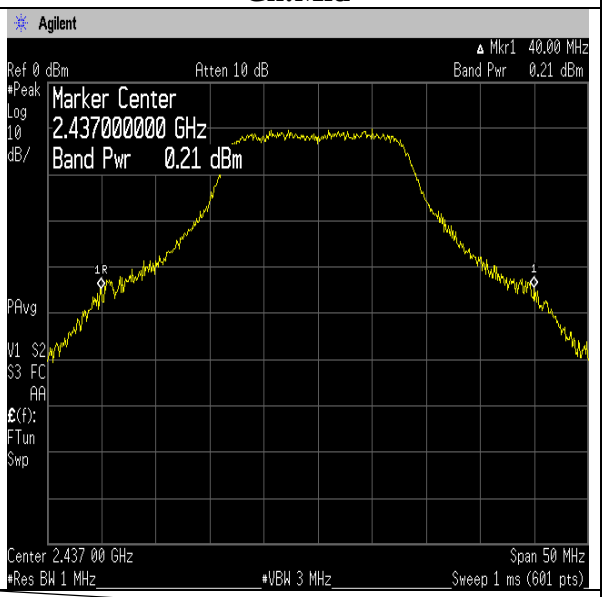
Maximum Peak OutPut Power (DSSS and other forms of modulation)

[IEEE802.11g 18Mbps]Main Antenna

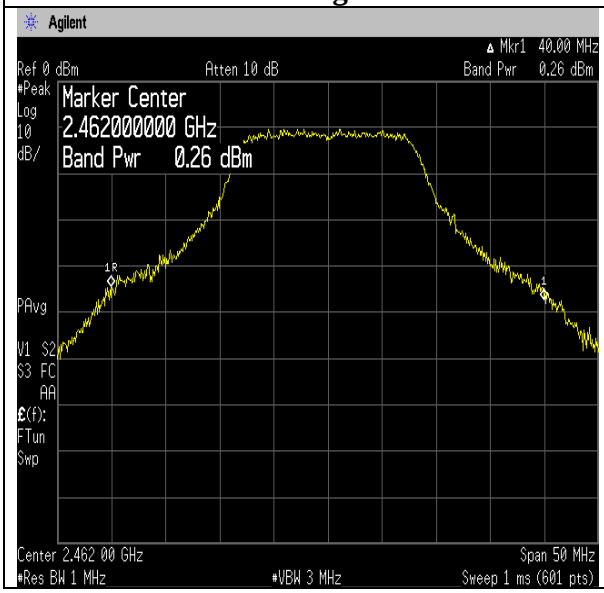
Ch:Low



Ch:Mid



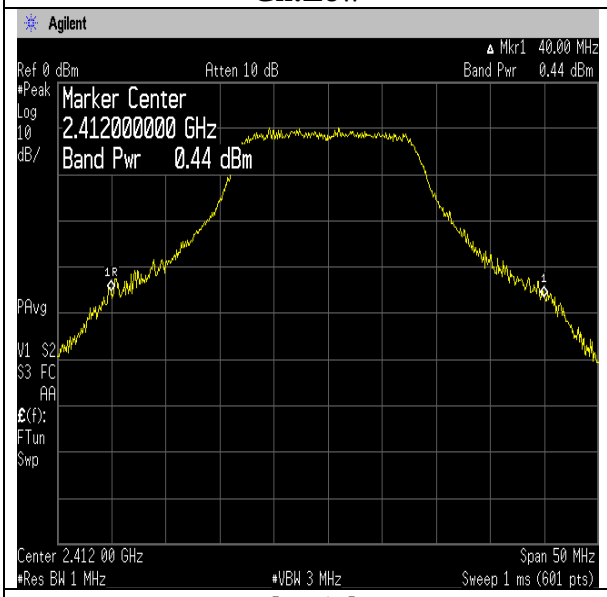
Ch:High



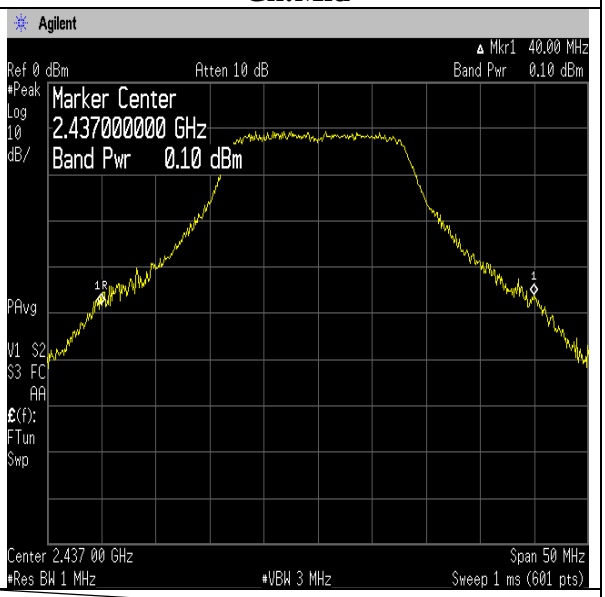
Maximum Peak OutPut Power (DSSS and other forms of modulation)

[IEEE802.11g 18Mbps]Sub Antenna

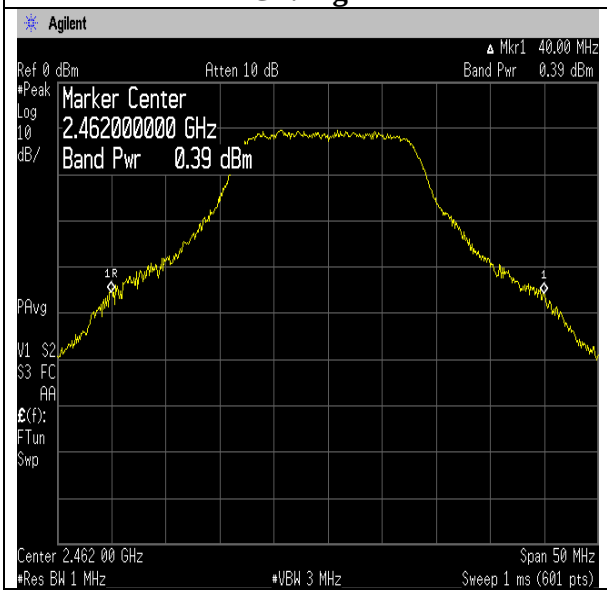
Ch:Low



Ch:Mid

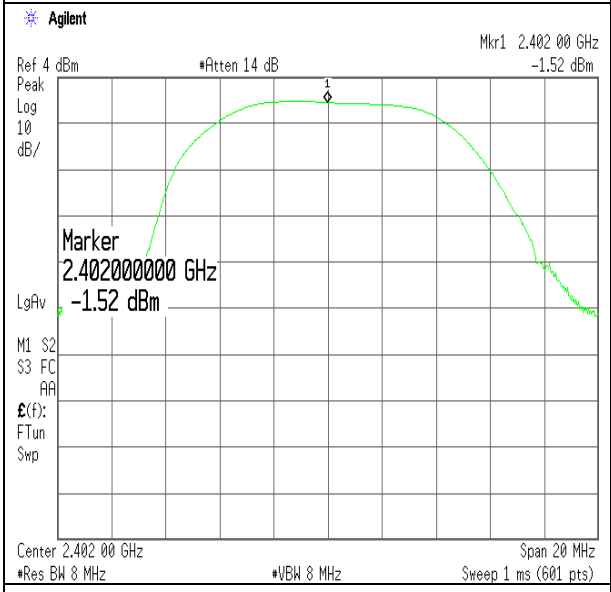


Ch:High

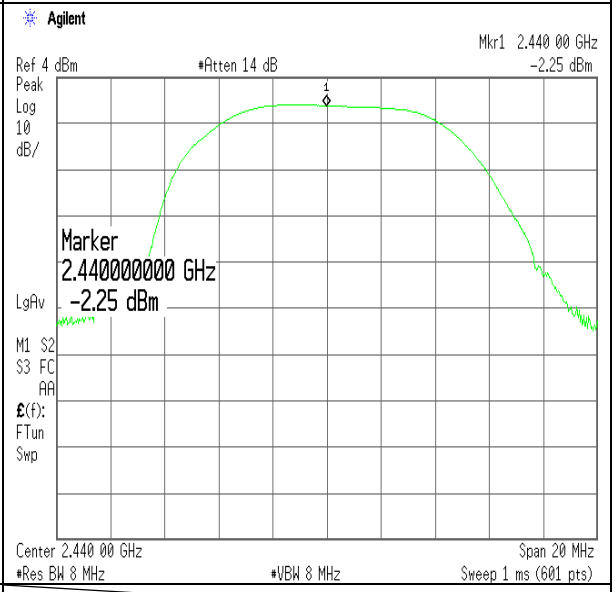
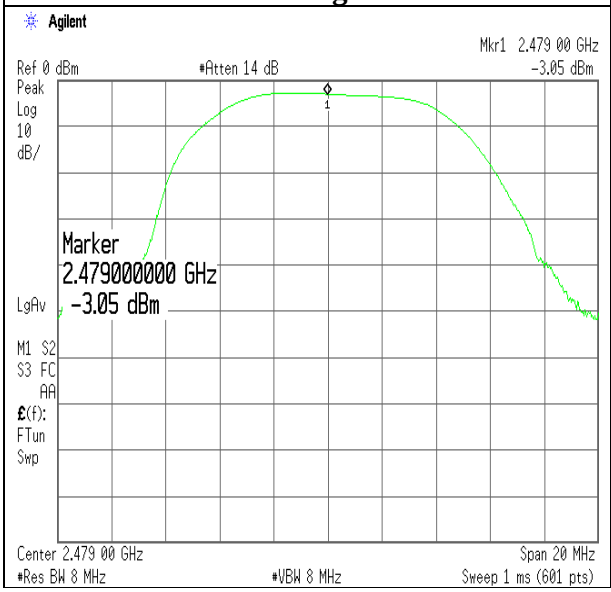


Maximum Peak OutPut Power (DSSS and other forms of modulation)Receiver

Ch:Low



Ch:Mid



Ch:High