



# EMI TEST REPORT

Test Report No. : 23LE0055-HO-1

Applicant : Sharp Corporation  
Type of Equipment : Notebook Computer  
Model No. : PC-AV18P  
Test standard : FCC Part 15 Subpart C  
Section 15.207, Section 15.247  
FCC ID : APYNAR0051  
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.
5. This test report does not constitute an endorsement by NIST/NVLAP or U.S. Government.

Date of test : August 04 and 05, 2003

Tested by :

Yoshiaki Iwasa  
EMC Service

Kenichi Adachi  
EMC Service

Approved by :

Hironobu Shimoji  
Group Leader of EMC Service

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Head Office EMC Lab.

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<b>CONTENTS</b>	<b>PAGE</b>
<b>SECTION 1: CLIENT INFORMATION.....</b>	<b>3</b>
<b>SECTION 2: EQUIPMENT UNDER TEST (E.U.T.).....</b>	<b>3</b>
<b>SECTION 3: TEST SPECIFICATION, PROCEDURES &amp; RESULTS.....</b>	<b>4</b>
<b>SECTION 4: OPERATION OF E.U.T. DURING TESTING.....</b>	<b>6</b>
<b>SECTION 5: CONDUCTED EMISSION, SECTION 15.207 .....</b>	<b>7</b>
<b>SECTION 6: 6DB BANDWIDTH, SECTION 15.247(A)(2) .....</b>	<b>7</b>
<b>SECTION 7: MAXIMUM PEAK OUTPUT POWER, SECTION 15.247(B)(3) .....</b>	<b>7</b>
<b>SECTION 8: OUT OF BAND EMISSION AND RESTRICTED BAND EDGE, SECTION 15.247 (C).....</b>	<b>8</b>
<b>SECTION 9: PEAK POWER DENSITY, SECTION 15.247 (C) .....</b>	<b>8</b>
<b>CONTENTS OF APPENDIXS.....</b>	<b>9</b>
<b>APPENDIX 1: PHOTOGRAPHS OF TEST SETUP .....</b>	<b>10</b>
<b>APPENDIX 2:TEST INSTRUMENTS.....</b>	<b>12</b>
<b>APPENDIX 3: DATA OF EMI TEST .....</b>	<b>13</b>

## **SECTION 1: Client information**

Company Name : Sharp Corporation  
Address : 492 Minosho-cho, Yamatokooriyama-shi, Nara, Japan, 631-1186  
Telephone Number : +81-743-55-4426  
Facsimile Number : +81-743-54-2856  
Contact Person : Masaaki Daikoku

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

### **2.1 Identification of E.U.T.**

Type of Equipment : Notebook Computer  
Model No. : PC-AV18P  
Serial No. : -  
Rating : AC100 – 240V  
Country of Manufacture : China  
Receipt Date of Sample : August 2, 2003  
Condition of EUT : Production prototype

### **2.2 Product Description**

Sharp Corporation, Model No: PC-AV18P is the Wireless LAN.

The system is mainly used as a computer.

(Transmitter)

Equipment Type : Transceiver  
Frequency band : 2400-2483.5MHz  
Frequency operation : 2412-2462MHz  
Type of modulation : DSSS  
Bandwidth & Channel spacing : 5MHz  
Transmit power or power range : 11.9dBm  
Antenna Gain : 2.75dBi  
Channel access protocol : Driver  
Mode of operation : Simplex  
Antenna Type : Diversity  
\*Main antenna is for Transmitter, and Sub-antenna is for Receiver.  
Antenna gain : 2.75dBi  
Antenna connector Type : HIROSE U,FL-LP-066, Wireless LAN:IEEE802.11b  
The other clock frequency : 66MHz, 32.768kHz  
Reference standard (radio) : 802.11b  
Method of Frequency Generation : Crystal  
Network Connections : Wired LAN : Ethernet 10/100 Base-T  
Power Supply : AC 120V 60Hz (AC Adapter)  
Temperature of operation : +0 deg. C. -+40 deg. C.  
(receiver)  
Antenna connector type : dual antenna connectors  
Operating voltage (inner) : 3.3V  
Temperature of operation : +0 deg. C. -+40 deg. C.  
FCC 15.31 (e)

The host device PC-AV18P provide the stable power supply (DC:19V), and the Notebook Computer complies power supply regulation.

FCC Part 15.203 Antenna requirement

Notebook Computer and its antenna comply with this requirement since they are built in host device PC-AV18P when they are put up for sale and they are used with a particular antenna connector for this EUT.

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## SECTION 3: Test specification, procedures & results

### 3.1 Test Specification

Test Specification : FCC Part15 Subpart C

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

### 3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2001	Section 15.207	-	N/A	9.4dB 0.2154MHz N	Complied
2	6dB Bandwidth	ANSI C63.4:2001	Section 15.247(a)(2)	Conducted	N/A	-	Complied
3	Maximum Peak Output Power	ANSI C63.4:2001	Section 15.247(b)(3)	Conducted	N/A	-	Complied
4	Out of Band Emission	ANSI C63.4:2001	Section 15.247 (c)	Conducted/ Radiated	N/A	3.2dB 4874MHz Horizontal	Complied
5	Restricted Band Edges	ANSI C63.4:2001	Section 15.247 (c)	Conducted	N/A	-	Complied
6	Power Density	ANSI C63.4:2001	Section 15.247 (d)	-	N/A	-	Complied

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

\*These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".

### 3.3 Confirmation

UL Apex Co., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart C Section 15.207 and 15.247.

### 3.4 Uncertainty

#### Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test was  $\pm 1.3$ dB.  
The data listed in this test report has enough margin.

#### Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is  $\pm 4.5$ dB(3m).  
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is  $\pm 5.2$ dB(3m).  
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is  $\pm 6.6$ dB(3m).  
The result is within Head Office EMC lab's uncertainty.

#### Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test was  $\pm 3.0$ dB.  
The data listed in this test report has enough margin.

### 3.5 Test Location

UL Apex Co., Ltd. Head Office EMC Lab.

No.2 semi anechoic chamber,

No.3 measurement room

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No.2 semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on June 05, 2002. (Registration number: No.2:846015 Industry Canada: No.2: IC4247-2)

\*NVLAP Lab. code: 200572-0

### 3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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

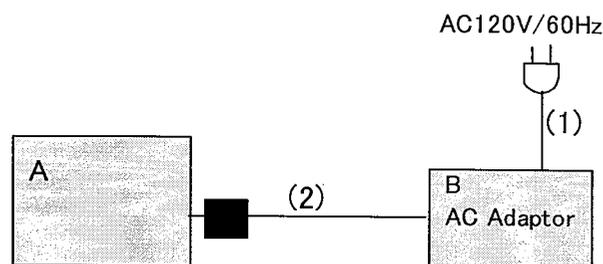
### 4.1 Operating Modes

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used : Continuous transmitting mode (ch1:2412MHz, ch6:2437MHz, ch11:2462MHz)  
11MPPS, CCK

Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

### 4.2 Configuration and peripherals



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

#### Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Notebook Computer	PC-AV18P	-	SHARP	APYNAR0051
B	AC Adapter	EA-MV1V	-	SHARP	-

#### List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	AC cable	2.0	N	Polyvinyl chloride
2	DC cable	1.8	N	Polyvinyl chloride

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MF060b(10.04.03)

## **SECTION 5: Conducted Emission, Section 15.207**

### **Test Procedure**

EUT was placed on a platform of nominal size, 1m by 1.5m, 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 LISN and excess AC cable was 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. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50ohm connectors of the LISN 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 on a reference ground plane 4.0 x 4.0m in a No.2 semi Anechoic Chamber.

The EUT was connected to a Line Impedance Stabilization Network (LISN).

An overview sweep with peak detection has been performed.

The measurements have been performed with a CISPR quasi-peak detector (IF BW 9 kHz).

Measurement range: 0.15-30MHz

Test data : APPENDIX 3  
Test result : Pass  
Test instruments : MCC-13, MLS-06, SA-07, MTR-02, MTA-01

## **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  
Test instruments : SA-07, MCC-06

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

### **Test Procedure**

The Maximum Peak Output Power was measured with a Power Meter connected to the antenna port.

Test data : APPENDIX 3  
Test result : Pass  
Test instruments : MPM-01, MCC-06, PS-03

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## **SECTION 8: Out of Band Emission and Restricted Band Edge, Section 15.247 (c)**

### **[Conducted]**

#### **Test Procedure**

The Out of Band Emission (Conducted) was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3  
Test result : Pass  
Test instruments : SA-07, MCC-06

### **[Radiated]**

#### **Test Procedure**

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

The Radiated Electric Field Strength intensity has been measured in No.2 semi anechoic chamber (7.5x5.8x5.2m) with a ground plane and at a distance of 1m (>10GHz) and 3m (<10GHz).

The measuring antenna height was varied between 1 to 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.

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.

Test data : APPENDIX 3  
Test result : Pass  
Test instruments : MHA-06, MHA-02, MPA-01, MPA-02, MBA-03, MLA-03,  
MAT-07, MCC-13, MCC-11, MCC-24, SA-07, MTR-02

## **SECTION 9: Peak Power Density, Section 15.247 (c)**

### **[Conducted]**

#### **Test Procedure**

The Peak Power Density was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3  
Test result : Pass  
Test instruments : MTR-01, MCC-05

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## **CONTENTS OF APPENDIXS**

### **APPENDIX 1: Photographs of test setup**

Page 10	: Conducted Emission
Page 11	: Spurious Emission (Radiated)

### **APPENDIX 2: Test instruments**

Page 12	: Test instruments
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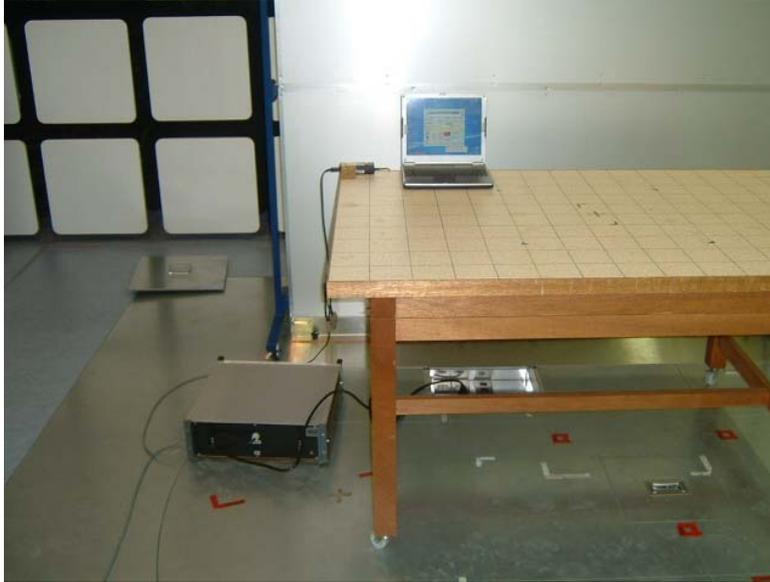
### **APPENDIX 3: Data of EMI test**

Page 13-16	: Conducted Emission
Page 17-22	: Radiated Emission
Page 23-24	: 6dB Bandwidth
Page 25	: Maximum Peak Output Power
Page 26-28	: Out of Band Emission
Page 29-30	: Peak Power Density
Page 31-32	: 99% Occupied Bandwidth

**APPENDIX 1: Photographs of test setup**

**Conducted Emission**

**Front**



**Side**

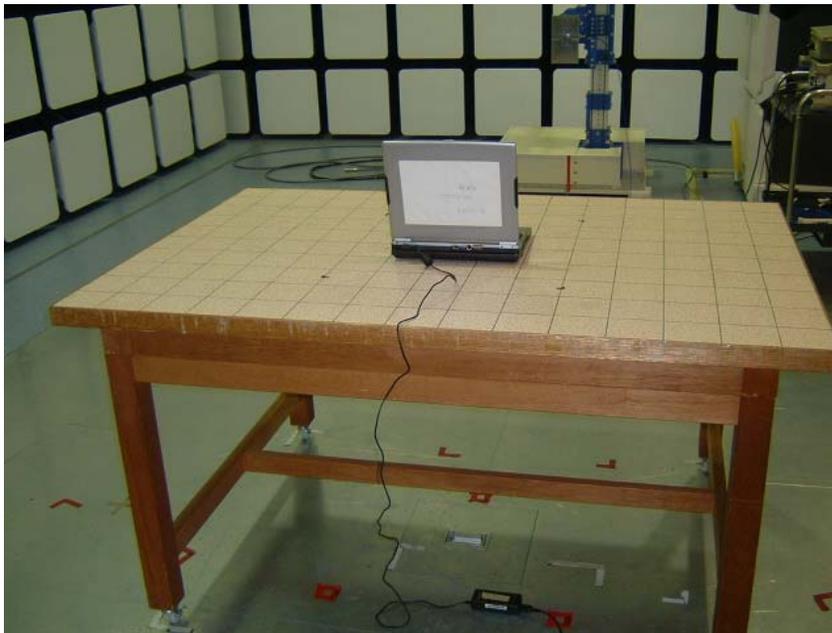


### Spurious Emission (Radiated)

**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	04/11/2003 * 12
MCC-11	Microwave coaxial cable	Suhner	SUCOFLEX 104	RE	03/27/2003 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	02/08/2003 * 12
MCC-24	Microwave Cable	Storm	-	RE	04/30/2003 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	01/11/2003 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	01/11/2003 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	05/08/2003 * 12
MPA-02	Pre Amplifier	Agilent	87405A	RE	04/17/2003 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	04/28/2003 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	04/28/2003 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	12/24/2002 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	01/31/2003 * 12
SA-07	Spectrum Analyzer	Advantest	R3273	RE	12/10/2002 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	CE	03/18/2003 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	CE	05/08/2003 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	11/01/2002 * 12

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

Test item:

CE: Conducted emission,

RE: Radiated emission,

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MF060b(10.04.03)

**APPENDIX 3: Data of EMI test**

**DATA OF CONDUCTION TEST**

UL Apex Co., Ltd. Head Office EMC Lab.  
No.2 Semi Anchoic Chamber  
Report No. : 23LE0055-HO

Applicant : SHARP Corporation  
Kind of Equipment : Notebook Computer  
Model No. : PC-AV18P  
Serial No. : -  
Power : AC120V/60Hz  
Mode : Transmitting (2462MHz)  
Remarks :  
Date : 8/5/2003  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 66 %  
Regulation : FCC 15.207 (0.15-30MHz)

*Y. Iwasa*

Engineer : Yoshiaki Iwasa

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dBuV]	AV	QP [dBuV]	AV				QP [dBuV]	AV	QP [dBuV]	AV	QP [dB]	AV
1.	0.1500	55.4	-	52.5	-	0.0	0.1	0.0	55.5	-	66.0	56.0	10.5	-
2.	0.2154	53.5	41.4	51.5	39.1	0.0	0.1	0.0	53.6	41.5	63.0	53.0	9.4	11.5
3.	0.2861	45.4	-	42.3	-	0.0	0.1	0.0	45.5	-	60.6	50.6	15.1	-
4.	0.3581	41.6	-	41.1	-	0.1	0.1	0.0	41.8	-	58.8	48.8	17.0	-
5.	0.4286	34.0	-	32.3	-	0.1	0.1	0.0	34.2	-	57.3	47.3	23.1	-
6.	5.6618	32.5	-	30.2	-	0.2	0.6	0.0	33.3	-	60.0	50.0	26.7	-

CALCULATION: READING[dB $\mu$ V] + LISN FACTOR[dB] + CABLE LOSS[dB] + ATTEN[dB].

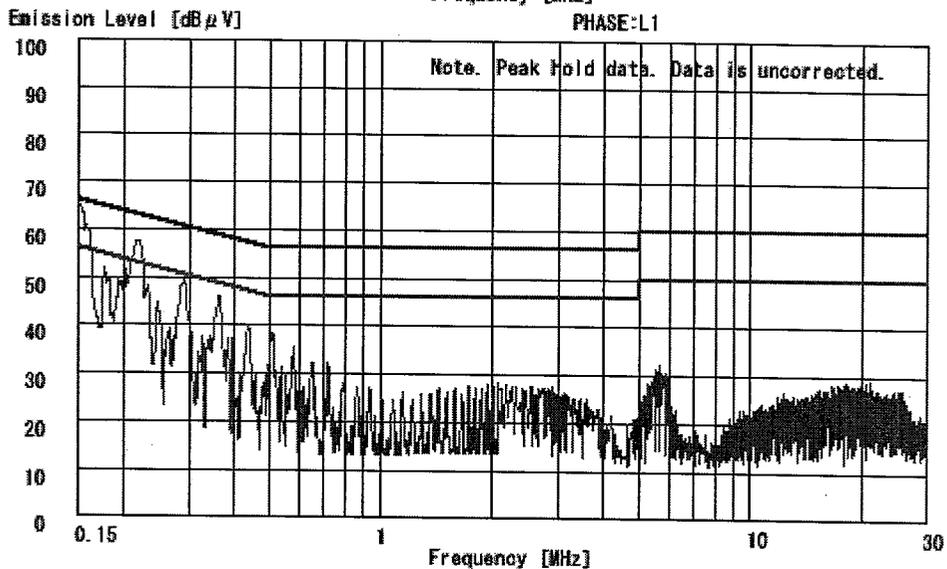
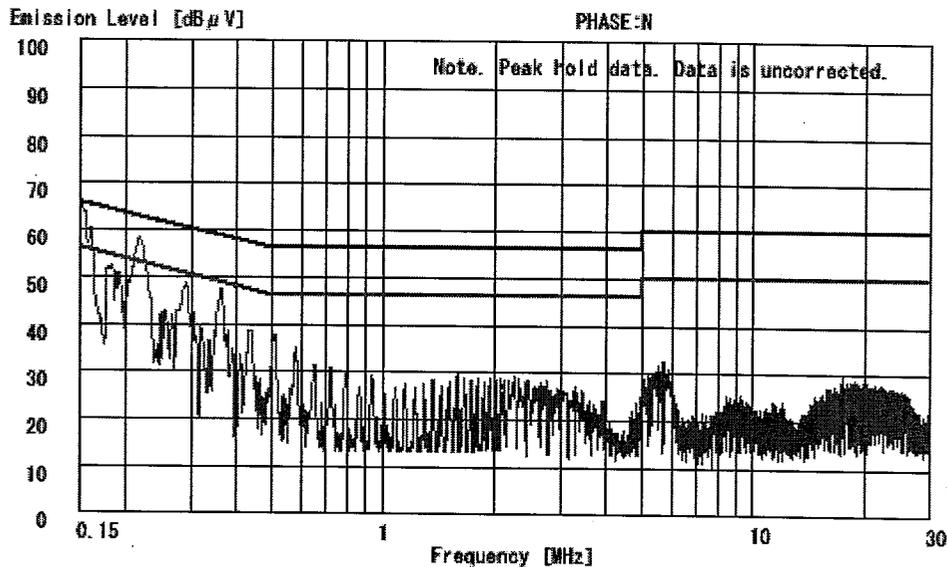
Except for the above table : 20dB margin data below the limits.

**DATA OF CONDUCTION TEST CHART**

UL Apex Co., Ltd. Head Office EMC Lab.  
 No.2 Semi Anechoic Chamber  
 Report No. : 23LE0055-HO

Applicant : SHARP Corporation  
 Kind of Equipment : Personal Computer  
 Model No. : PC-MV1214  
 Serial No. : -  
 Power : AC120V/60Hz  
 Mode : Transmitting (2412MHz)  
 Remarks :  
 Date : 8/5 /2003  
 Phase : Single Phase  
 Temperature : 25 °C  
 Humidity : 66 %  
 Regulation 1 : FCC 15.207 (0.15-30MHz)  
 Regulation 2 : None

*Y. Iwasa*  
 Engineer : Yoshiaki Iwasa



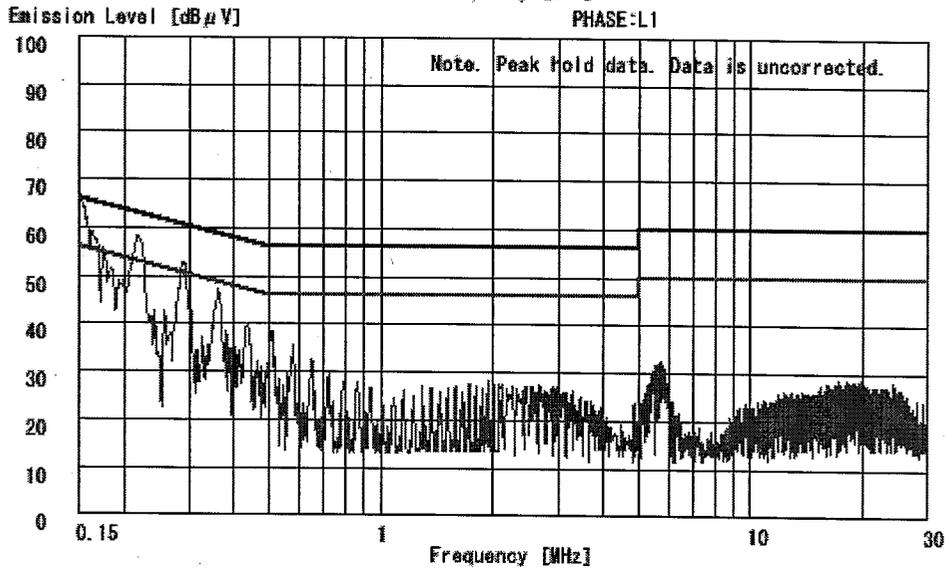
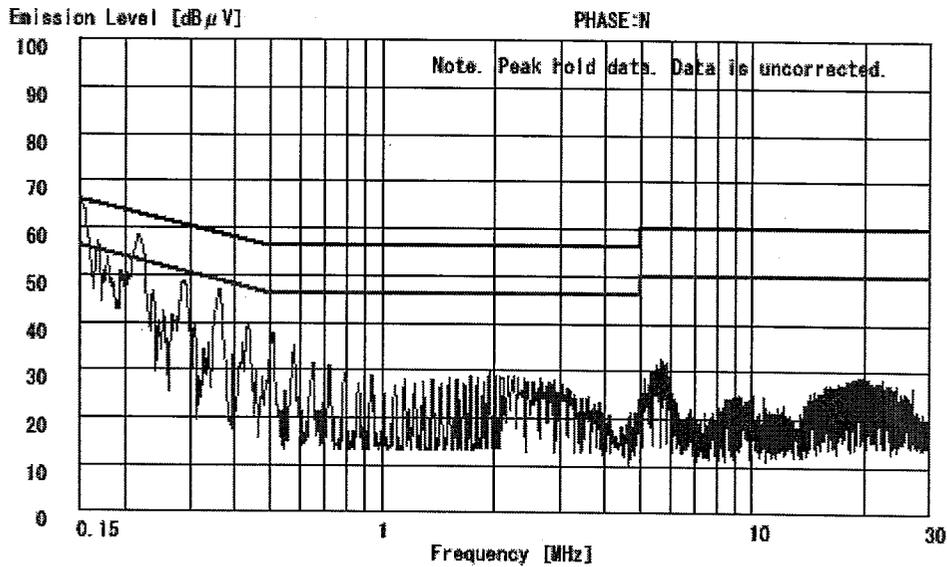
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**DATA OF CONDUCTION TEST CHART**

UL Apex Co., Ltd. Head Office EMC Lab.  
 No.2 Semi Anechoic Chamber  
 Report No. : 23LE0055-H0

Applicant : SHARP Corporation  
 Kind of Equipment : Personal Computer  
 Model No. : PC-WV1214  
 Serial No. : -  
 Power : AC120V/60Hz  
 Mode : Transmitting (2437MHz)  
 Remarks :  
 Date : 8/5 /2003  
 Phase : Single Phase  
 Temperature : 25 °C  
 Humidity : 66 %  
 Regulation 1 : FCC 15.207 (0.15-30MHz)  
 Regulation 2 : None

*Y. Iwasa*  
 Engineer : Yoshiaki Iwasa



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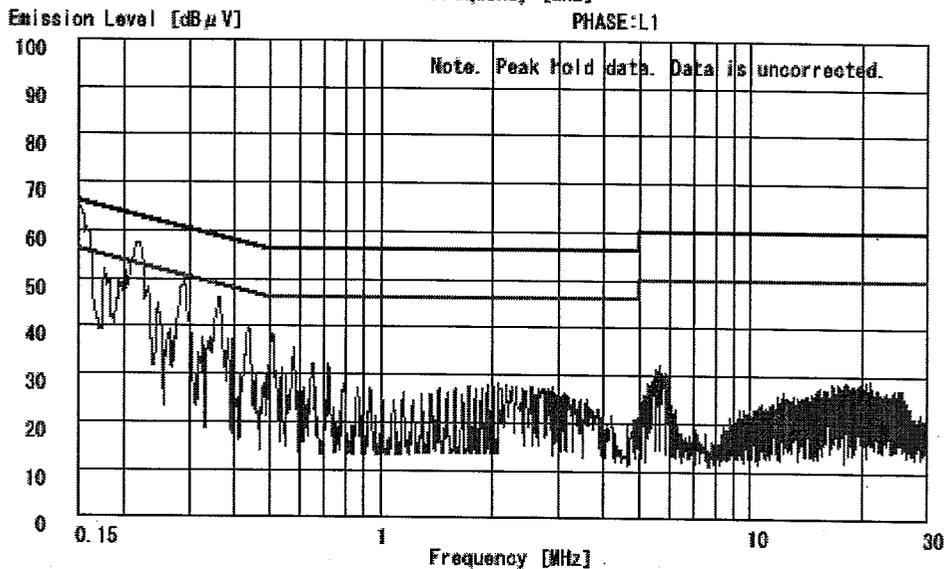
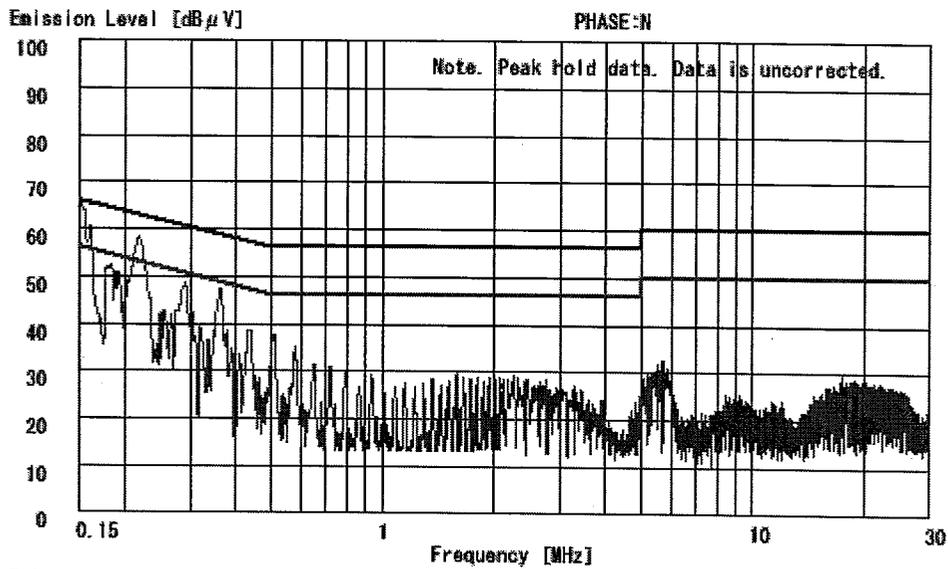
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 Mode : Transmitting (2462MHz)  
 Remarks :  
 Date : 8/5 /2003  
 Phase : Single Phase  
 Temperature : 25 °C  
 Humidity : 65 %  
 Regulation 1 : FCC 15.207 (0.15-30MHz)  
 Regulation 2 : None

*Y. Iwasa*

Engineer : Yoshiaki Iwasa



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Report No. : 23LE0055-HO

Applicant : SHARP Corporation  
Kind of Equipment : Notebook Computer  
Model No. : PC-AV18P  
Serial No. :  
Power : AC 120V / 60Hz  
Mode : Transmitting (2412MHz)  
Remarks : DETECTOR: OP  
Date : 8/4/2003  
Test Distance : 3 m  
Temperature : 26 °C  
Humidity : 53 %  
Regulation : FCC § 15.247(C)

*K. Adachi*  
Engineer : Kenichi Adachi

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	64.95	BB	31.8	31.7	6.6	23.7	1.0	6.0	21.7	31.6	40.0	18.3	18.4
2.	227.30	BB	35.3	35.2	16.6	22.8	2.1	6.0	37.2	37.1	46.0	8.8	8.9
3.	259.76	BB	38.3	38.7	17.5	23.2	2.1	6.0	40.7	41.1	46.0	5.3	4.9
4.	389.65	BB	39.8	38.9	17.0	23.2	2.7	6.2	42.5	41.6	46.0	3.5	4.4
5.	398.98	BB	33.4	31.8	17.3	23.2	2.7	6.2	36.4	34.8	46.0	9.6	11.2
6.	454.59	BB	35.5	38.1	17.8	23.0	2.8	6.2	39.3	41.9	46.0	6.7	4.1

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

Except for the above table : 20dB margin data below the limits.  
ANT.TYPE:30MHz-300MHz : Biconical Antenna / 300MHz-1000MHz : Logperiodic Antenna

**DATA OF RADIATION TEST**

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No.2 Semi Anechoic Chamber  
Report No. : 23LE0055-HO

Applicant : SHARP Corporation  
Kind of Equipment : Notebook Computer  
Model No. : PC-AV18P  
Serial No. :  
Power : AC 120V / 60Hz  
Mode : Transmitting (2437MHz)  
Remarks : DETECTOR: QP  
Date : 8/4/2003  
Test Distance : 3 m  
Temperature : 26 °C  
Humidity : 53 %  
Regulation : FCC § 15. 247(C)

*K. Adachi*  
Engineer : Kenichi Adachi

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB $\mu$ V/m]	MARGIN	
			HOR [dB $\mu$ V]	VER [dB $\mu$ V]					HOR [dB $\mu$ V/m]	VER [dB $\mu$ V/m]		HOR [dB]	VER [dB]
1.	84.95	BB	34.5	37.4	6.6	23.7	1.0	6.0	24.4	27.3	40.0	15.6	12.7
2.	227.30	BB	32.5	32.6	16.6	22.8	2.1	6.0	34.4	34.5	46.0	11.6	11.5
3.	259.76	BB	37.1	37.4	17.5	23.2	2.1	6.0	39.5	39.8	46.0	6.5	6.2
4.	389.65	BB	39.3	39.1	17.0	23.2	2.7	6.2	42.0	41.8	46.0	4.0	4.2
5.	398.98	BB	32.9	31.6	17.3	23.2	2.7	6.2	35.9	34.6	46.0	10.1	11.4
6.	454.59	BB	35.8	36.6	17.8	23.0	2.8	6.2	39.6	40.4	46.0	6.4	5.6

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

Except for the above table : 20dB margin data below the limits.

ANT.TYPE:30MHz-300MHz : Biconical Antenna / 300MHz-1000MHz : Logperiodic Antenna

## DATA OF RADIATION TEST

UL Apex Co., Ltd. Head Office EMC Lab.  
No.2 Semi Anechoic Chamber  
Report No. : 23LE0055-HO

Applicant : SHARP Corporation  
Kind of Equipment : Notebook Computer  
Model No. : PC-AV18P  
Serial No. :  
Power : AC 120V / 60Hz  
Mode : Transmitting (2462MHz)  
Remarks : DETECTOR: OP  
Date : 8/4/2003  
Test Distance : 3 m  
Temperature : 26 °C  
Humidity : 53 %  
Regulation : FCC § 15. 247 (C)

*K. Adachi*  


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Engineer : Kenichi Adachi

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB $\mu$ V/m]	MARGIN	
			HOR [dB $\mu$ V]	VER [dB/m]					HOR [dB $\mu$ V/m]	VER [dB $\mu$ V/m]		HOR [dB]	VER [dB]
1.	64.95	BB	38.2	37.3	6.6	23.7	1.0	6.0	26.1	27.2	40.0	13.9	12.8
2.	227.30	BB	33.0	32.6	16.6	22.8	2.1	6.0	34.9	34.5	48.0	11.1	11.5
3.	259.76	BB	36.8	37.2	17.5	23.2	2.1	6.0	39.2	39.6	48.0	6.8	6.4
4.	389.65	BB	38.8	39.4	17.0	23.2	2.7	6.2	41.5	42.1	48.0	4.5	3.9
5.	398.98	BB	32.7	31.5	17.3	23.2	2.7	6.2	35.7	34.5	48.0	10.3	11.5
6.	454.59	BB	35.6	36.5	17.8	23.0	2.8	6.2	39.4	40.3	48.0	6.6	5.7

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

Except for the above table : 20dB margin data below the limits.

ANT.TYPE:30MHz-300MHz : Biconical Antenna / 300MHz-1000MHz : Logperiodic Antenna

## DATA OF SPURIOUS EMISSIONS(1GHz to 26.5GHz)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : SHARP Corporation  
EQUIPMENT : Notebook Computer  
MODEL : PC-AV18P  
S/N : -  
FCC ID : APYNAR0051  
IC Number : -  
POWER : AC120V / 60Hz  
MODE : Transmitting(Ch:2412MHz)

REPORT NO : 23LE0055-HO  
REGULATION : FCC Part 15 Subpart C 15.247(c)  
TEST DISTANCE : 3m  
DATE : 08/04/2003  
TEMPERATURE : 27 deg. C  
HUMIDITY : 58 %

*K. Adachi*  
ENGINEER : Kenichi Adachi

**PK DETECT** (RBW: 1MHz, VBW:1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]					HOR [dB]	VER [dB]			
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass.</b>												
1	1062.0	48.5	59.5	21.8	37.8	3.0	0.0	35.5	46.5	74.0	38.5	27.5
2	1206.0	48.2	50.6	22.6	37.6	3.1	0.0	36.3	38.7	74.0	37.7	35.3
3	1388.6	60.6	63.2	23.6	37.4	3.3	0.0	50.2	52.7	74.0	23.8	21.3
4	2390.0	48.3	46.2	30.5	36.9	4.4	0.0	46.3	44.2	74.0	27.7	29.8
5	4824.0	57.6	43.1	35.7	36.8	6.4	0.0	62.8	48.3	74.0	11.2	25.7
6	7236.0	44.7	44.6	37.7	36.5	7.6	0.0	53.5	53.4	74.0	20.5	20.6
7	9648.0	46.5	46.1	37.2	37.2	9.0	0.0	55.4	55.0	74.0	18.6	19.0
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac</b>												
8	12060.0	45.5	45.8	40.3	36.8	9.9	0.0	49.4	49.7	74.0	24.6	24.3
9	14472.0	44.7	45.5	43.1	35.4	11.0	0.0	54.0	54.7	74.0	20.0	19.3
10	16884.0	48.4	47.2	44.7	36.4	12.2	0.0	59.4	58.1	74.0	14.6	15.9
11	19296.0	47.8	47.0	40.8	35.9	13.0	0.0	56.3	55.5	74.0	17.7	18.5
12	21708.0	47.0	46.8	40.5	36.6	14.2	0.0	55.6	55.4	74.0	18.4	18.6
13	24120.0	46.5	47.0	40.2	36.5	14.7	0.0	55.5	56.0	74.0	18.5	18.0

**AV DETECT** (RBW: 1MHz, VBW:10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]					HOR [dB]	VER [dB]			
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass.</b>												
1	1062.0	35.1	39.8	21.8	37.8	3.0	0.0	22.1	26.8	54.0	31.9	27.2
2	1206.0	35.2	35.6	22.6	37.6	3.1	0.0	23.3	23.7	54.0	30.7	30.3
3	1388.6	36.3	35.2	23.6	37.4	3.3	0.0	25.8	24.7	54.0	28.2	29.3
4	2390.0	34.5	34.1	30.5	36.9	4.4	0.0	32.5	32.1	54.0	21.5	21.9
5	4824.0	45.4	33.5	35.7	36.8	6.4	0.0	50.6	38.7	54.0	3.4	15.3
6	7236.0	32.6	32.7	37.7	36.5	7.6	0.0	41.3	41.5	54.0	12.7	12.5
7	9648.0	34.0	33.9	37.2	37.2	9.0	0.0	42.9	42.9	54.0	11.1	11.1
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac</b>												
8	12060.0	33.3	33.5	40.3	36.8	9.9	0.0	37.2	37.4	54.0	16.8	16.6
9	14472.0	32.7	33.1	43.1	35.4	11.0	0.0	42.0	42.4	54.0	12.0	11.6
10	16884.0	35.1	35.2	44.7	36.4	12.2	0.0	46.1	46.1	54.0	7.9	7.9
11	19296.0	35.0	35.0	40.8	35.9	13.0	0.0	43.4	43.5	54.0	10.6	10.5
12	21708.0	34.9	34.6	40.5	36.6	14.2	0.0	43.5	43.2	54.0	10.5	10.8
13	24120.0	34.7	35.1	40.2	36.5	14.7	0.0	43.6	44.1	54.0	10.4	9.9

Test Distance 1.0m : Distance Factor(Dfac) =  $20\log(3/1.0) = 9.5$  dB

\*1: Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*2: In the frequency over the third harmonic, the noise from the EUT was not seen. The data above is its base noise.

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## DATA OF SPURIOUS EMISSIONS(1GHz to 26.5GHz)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : SHARP Corporation  
EQUIPMENT : Notebook Computer  
MODEL : PC-AV18P  
S/N : -  
FCC ID : APYNAR0051  
IC Number : -  
POWER : AC120V / 60Hz  
MODE : Transmitting(Ch:2437MHz)

REPORT NO : 23LE0055-HO  
REGULATION : FCC Part 15 Subpart C 15.247(c)  
TEST DISTANCE : 3m  
DATE : 08/04/2003  
TEMPERATURE : 27 deg. C  
HUMIDITY : 58 %

*K. Adachi*  
ENGINEER : Kenichi Adachi

**PK DETECT** (RBW: 1MHz, VBW:1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER [dB]
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass.</b>												
1	1062.0	48.5	59.3	21.8	37.8	3.0	0.0	35.5	46.3	74.0	38.5	27.7
2	1218.5	49.0	50.4	22.7	37.6	3.1	0.0	37.2	38.6	74.0	36.8	35.4
3	1390.0	60.6	63.2	23.6	37.4	3.3	0.0	50.2	52.7	74.0	23.8	21.3
4	4874.0	58.1	45.5	36.0	36.8	6.4	0.0	63.7	51.1	74.0	10.3	22.9
5	7311.0	46.3	45.3	37.8	36.6	7.6	0.0	55.2	54.2	74.0	18.8	19.8
6	9748.0	45.7	46.1	36.9	37.2	9.0	0.0	54.4	54.8	74.0	19.6	19.2
<b>Test distance 1meters RESULT=Reading + ANT factor - Amp Gain + CABLE LOSS + Band Pass - Dfac</b>												
7	12185.0	45.4	45.8	41.0	36.7	10.0	0.0	50.1	50.5	74.0	23.9	23.5
8	14622.0	44.1	46.4	43.2	35.5	11.1	0.0	53.4	55.7	74.0	20.6	18.3
9	17059.0	46.4	46.1	44.8	36.2	12.3	0.0	57.7	57.4	74.0	16.3	16.6
10	19496.0	46.9	46.2	40.5	36.0	13.0	0.0	55.0	54.2	74.0	19.0	19.8
11	21933.0	46.1	47.1	40.6	36.0	14.3	0.0	55.5	56.5	74.0	18.5	17.5
12	24370.0	48.1	48.6	40.3	36.9	14.9	0.0	56.9	57.4	74.0	17.1	16.6

**AV DETECT** (RBW: 1MHz, VBW:10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER [dB]
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass.</b>												
1	1062.0	35.1	39.8	21.8	37.8	3.0	0.0	22.1	26.8	54.0	31.9	27.2
2	1218.5	35.2	37.8	22.7	37.6	3.1	0.0	23.4	26.0	54.0	30.6	28.0
3	1390.0	36.3	35.2	23.6	37.4	3.3	0.0	25.8	24.7	54.0	28.2	29.3
4	4874.0	45.2	33.3	36.0	36.8	6.4	0.0	50.8	38.9	54.0	3.2	15.1
5	7311.0	35.2	32.7	37.8	36.6	7.6	0.0	44.1	41.5	54.0	9.9	12.5
6	9748.0	34.2	34.2	36.9	37.2	9.0	0.0	42.9	42.9	54.0	11.1	11.1
<b>Test distance 1meters RESULT=Reading + ANT factor - Amp Gain + CABLE LOSS + Band Pass - Dfac</b>												
7	12185.0	33.3	33.4	41.0	36.7	10.0	0.0	38.1	38.1	54.0	15.9	15.9
8	14622.0	32.8	33.2	43.2	35.5	11.1	0.0	42.1	42.5	54.0	11.9	11.5
9	17059.0	34.4	34.3	44.8	36.2	12.3	0.0	45.8	45.6	54.0	8.2	8.4
10	19496.0	34.0	34.5	40.5	36.0	13.0	0.0	42.1	42.6	54.0	11.9	11.4
11	21933.0	34.9	34.3	40.6	36.0	14.3	0.0	44.2	43.7	54.0	9.8	10.3
12	24370.0	35.1	35.1	40.3	36.9	14.9	0.0	43.9	43.9	54.0	10.1	10.1

Test Distance 1.0m : Distance Factor(Dfac) =  $20\log(3/1.0) = 9.5$  dB

\*1: Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*2: In the frequency over the third harmonic, the noise from the EUT was not seen. The data above is its base noise.

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## DATA OF SPURIOUS EMISSIONS(1GHz to 26.5GHz)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : SHARP Corporation  
EQUIPMENT : Notebook Computer  
MODEL : PC-AV18P  
S/N : -  
FCC ID : APYNAR0051  
IC Number : -  
POWER : AC120V / 60Hz  
MODE : Transmitting(Ch:2462MHz)

REPORT NO : 23LE0055-HO  
REGULATION : FCC Part 15 Subpart C 15.247(c)  
TEST DISTANCE : 3m  
DATE : 08/04/2003  
TEMPERATURE : 27 deg. C  
HUMIDITY : 58 %

*K. Adachi*  
ENGINEER : Kenichi Adachi

**PK DETECT** (RBW: 1MHz, VBW:1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]					HOR [dB]	VER [dB]			
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass.</b>												
1	1062.0	48.5	59.3	21.8	37.8	3.0	0.0	35.5	46.3	74.0	38.5	27.7
2	1231.0	48.6	52.0	22.7	37.6	3.2	0.0	36.9	40.3	74.0	37.1	33.7
3	1390.0	60.6	63.2	23.6	37.4	3.3	0.0	50.2	52.7	74.0	23.8	21.3
4	2483.5	48.8	47.8	30.6	36.9	4.5	0.0	46.9	45.9	74.0	27.1	28.1
5	4924.0	57.0	45.4	36.3	36.8	6.5	0.0	63.0	51.4	74.0	11.0	22.6
6	7386.0	47.2	44.3	37.9	36.6	7.7	0.0	56.1	53.2	74.0	17.9	20.8
7	9848.0	47.1	46.5	36.6	37.3	9.1	0.0	55.5	54.9	74.0	18.5	19.1
<b>Test distance 1meters RESULT=Reading + Antenna factor - Amp Gain + CABLE LOSS + Band Pass - Dfac</b>												
8	12310.0	46.4	46.0	41.6	36.6	10.0	0.0	51.9	51.5	74.0	22.1	22.5
9	14772.0	46.6	45.7	43.3	35.6	11.2	0.0	55.9	55.1	74.0	18.1	18.9
10	17234.0	46.5	46.7	45.4	36.2	12.4	0.0	58.6	58.8	74.0	15.4	15.2
11	19696.0	47.1	46.2	40.6	36.0	13.1	0.0	55.2	54.3	74.0	18.8	19.7
12	22158.0	46.3	46.4	40.6	35.7	14.4	0.0	56.1	56.2	74.0	17.9	17.8
13	24620.0	47.9	47.5	40.4	36.9	15.0	0.0	56.8	56.4	74.0	17.2	17.6

**AV DETECT** (RBW: 1MHz, VBW:10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]					HOR [dB]	VER [dB]			
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass.</b>												
1	1062.0	35.1	39.8	21.8	37.8	3.0	0.0	22.1	26.8	54.0	31.9	27.2
2	1231.0	35.3	39.2	22.7	37.6	3.2	0.0	23.6	27.5	54.0	30.4	26.5
3	1390.0	36.3	35.2	23.6	37.4	3.3	0.0	25.8	24.7	54.0	28.2	29.3
4	2483.5	34.7	34.3	30.6	36.9	4.5	0.0	32.8	32.4	54.0	21.2	21.6
5	4924.0	43.4	33.3	36.3	36.8	6.5	0.0	49.4	39.2	54.0	4.6	14.8
6	7386.0	34.3	32.7	37.9	36.6	7.7	0.0	43.2	41.6	54.0	10.8	12.4
7	9848.0	34.4	34.3	36.6	37.3	9.1	0.0	42.8	42.8	54.0	11.2	11.2
<b>Test distance 1meters RESULT=Reading + ANT factor - Amp Gain + CABLE LOSS + Band Pass - Dfac</b>												
8	12310.0	33.9	33.4	41.6	36.6	10.0	0.0	39.4	38.9	54.0	14.6	15.1
9	14772.0	34.3	33.6	43.3	35.6	11.2	0.0	43.7	43.0	54.0	10.3	11.0
10	17234.0	34.7	34.6	45.4	36.2	12.4	0.0	46.8	46.7	54.0	7.2	7.3
11	19696.0	34.4	34.8	40.6	36.0	13.1	0.0	42.5	42.9	54.0	11.5	11.1
12	22158.0	34.4	34.3	40.6	35.7	14.4	0.0	44.2	44.1	54.0	9.8	9.9
13	24620.0	35.0	35.0	40.4	36.9	15.0	0.0	43.9	44.0	54.0	10.1	10.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5 dB

\*1: Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*2: In the frequency over the third harmonic, the noise from the EUT was not seen. The data above is its base noise.

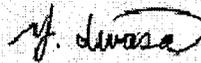
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## DATA OF 6dB BANDWIDTH

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

Company : SHARP Corporation  
Equipment : Notebook Computer  
Model : PC-AV18P  
Sample No. :-  
Power : AC120V/60Hz  
Mode : Transmitting (IEEE 802.11b)  
FCC ID : APYNAR0051  
IC No. :-

REPORT NO : 23LE0055-HO  
REGULATION : Fcc Part15 Subpart C 15.247(a)  
TEST DISTANCE : -  
DATE : 08/05/2003  
TEMPERATURE : 25deg.C  
HUMIDITY : 60%

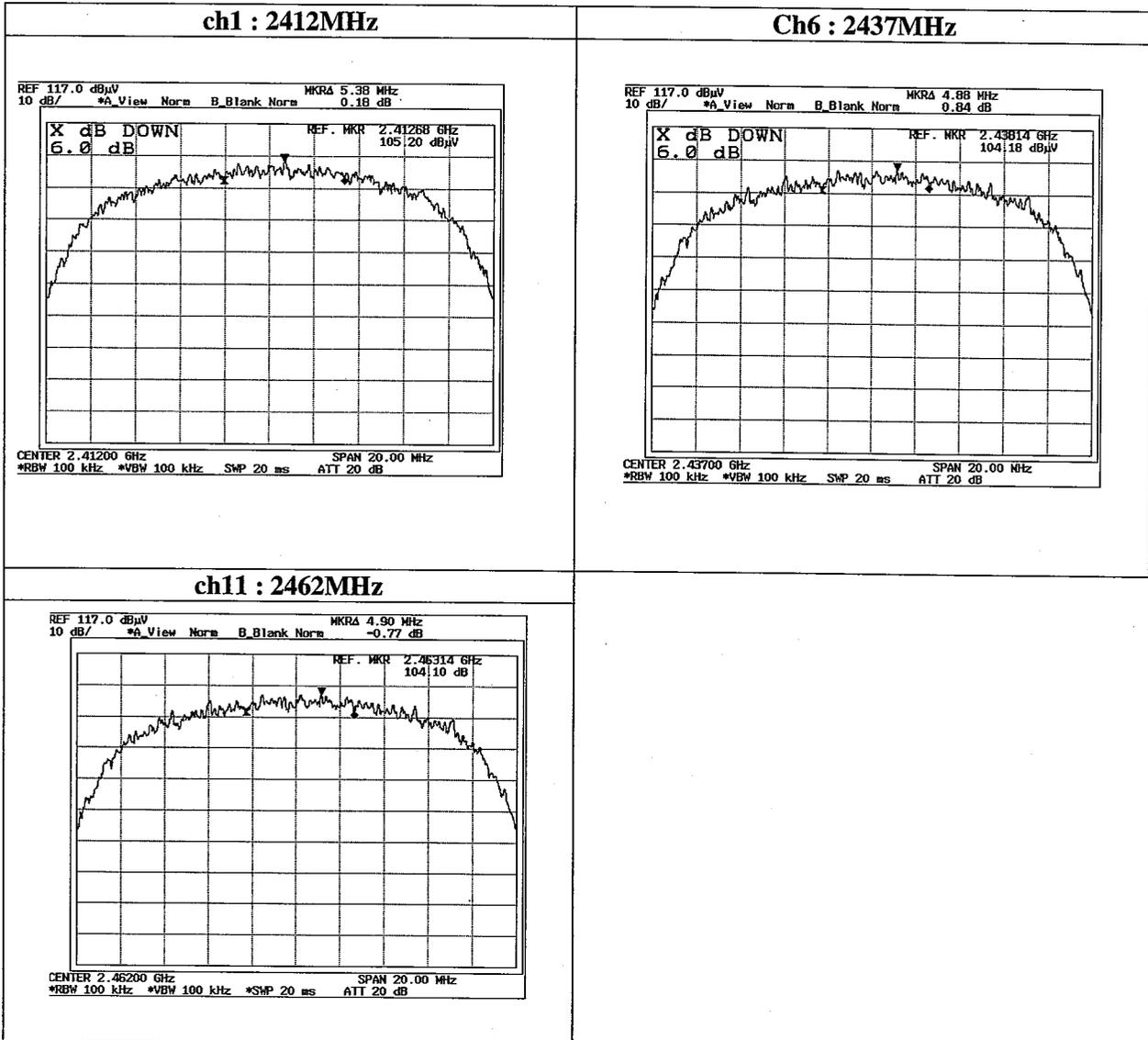


ENGINEER : Yoshiaki Iwasa

Data Rate 11Mbps

CH	FREQ	6dB Bandwidth	Limit
	[MHz]	[MHz]	[kHz]
Low(1)	2412.0	5.4	500.0
Mid(6)	2437.0	4.9	500.0
High(11)	2462.0	4.9	500.0

**6dB Bandwidth (Conducted)**



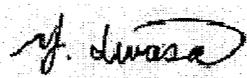
## DATA OF PEAK OUTPUT POWER(CONDUCTED)

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

Company : SHARP Corporation  
Equipment : Notebook Computer  
Model : PC-AV18P  
Sample No. :-  
Power : AC120V/60Hz  
Mode : Transmitting (IEEE 802.11b)

REPORT NO : 23LE0055-HO  
REGULATION : Fcc Part15 Subpart C 15.247(b)(3)  
TEST DISTANCE : -  
DATE : 08/05/2003  
TEMPERATURE : 25deg.C  
HUMIDITY : 60%

FCC ID : APYNAR0051  
IC No. :-

  
ENGINEER : Yoshiaki Iwasa

ch	FREQ [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	ATTEN. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low(1)	2412.0	5.90	0.0	6.0	11.9	30.0	18.1
Mid(6)	2437.0	5.50	0.0	6.0	11.5	30.0	18.5
High(11)	2462.0	5.40	0.0	6.0	11.4	30.0	18.6

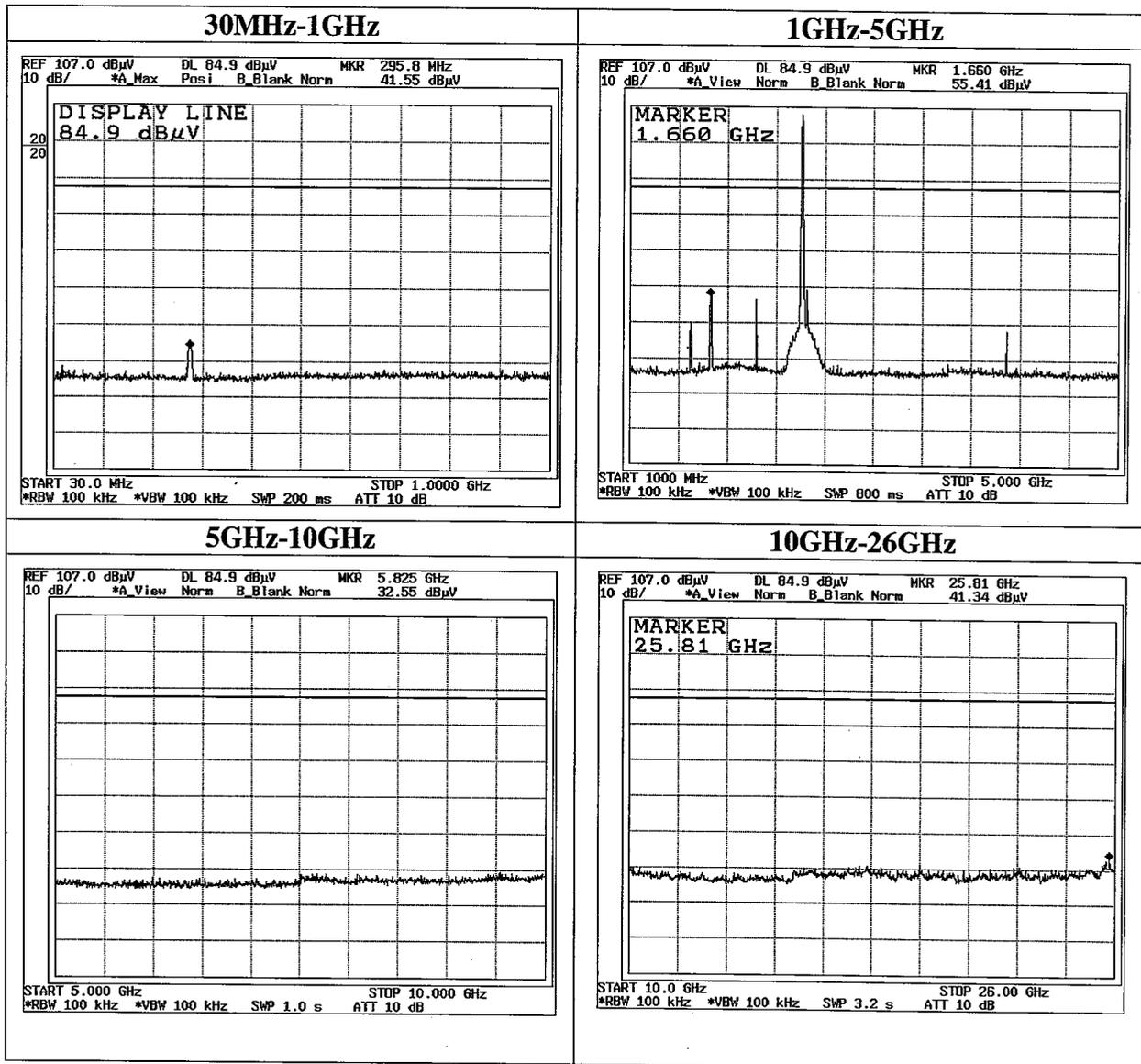
Measured with a powermeter

Sample Calculation : Result = Reading + (Cable+ATTEN.)Loss

## Out Band Emissions (Conducted)

Data Rate : 11Mbps

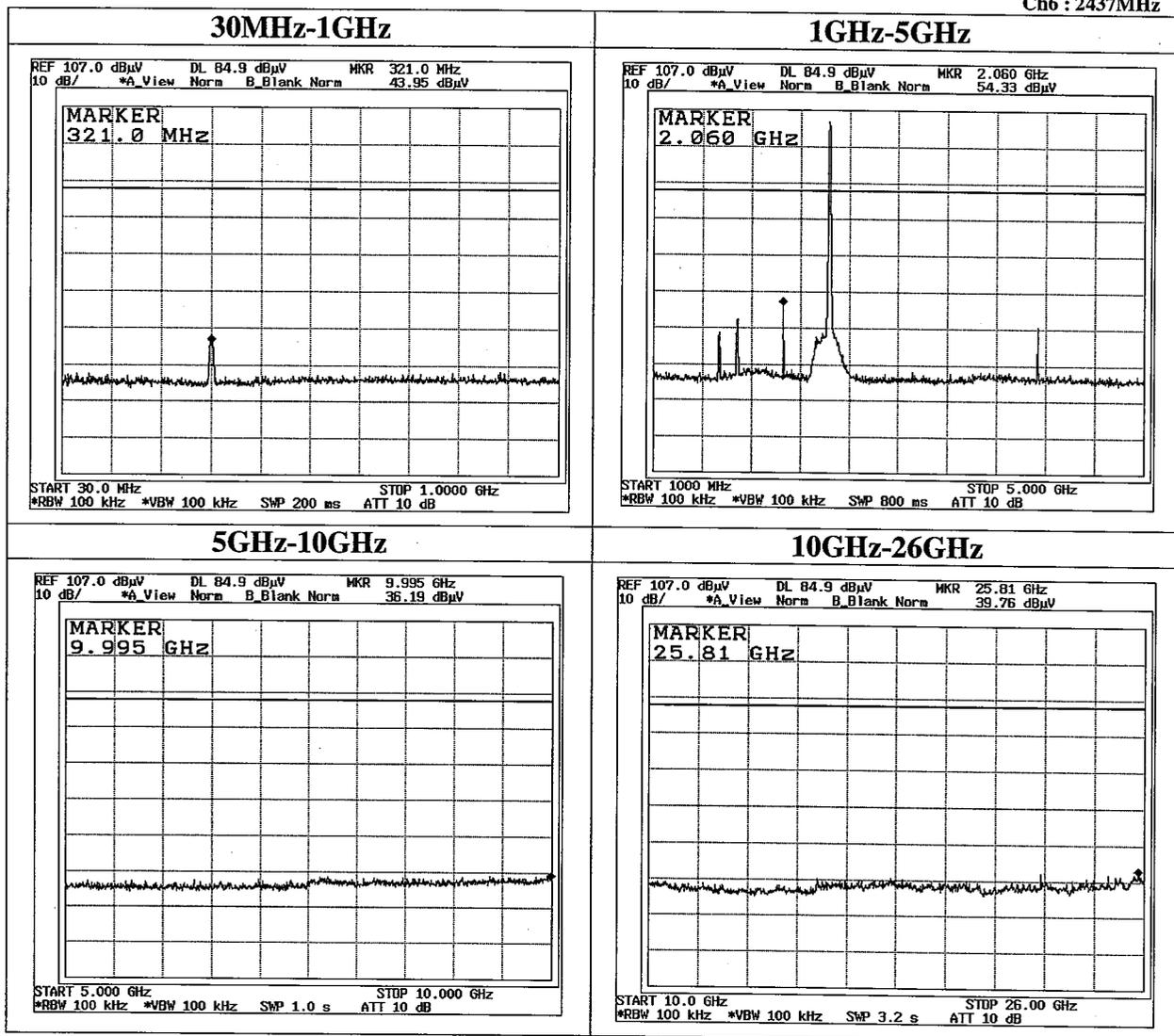
ch1 : 2412MHz



## Out Band Emissions (Conducted)

Data Rate : 11Mbps

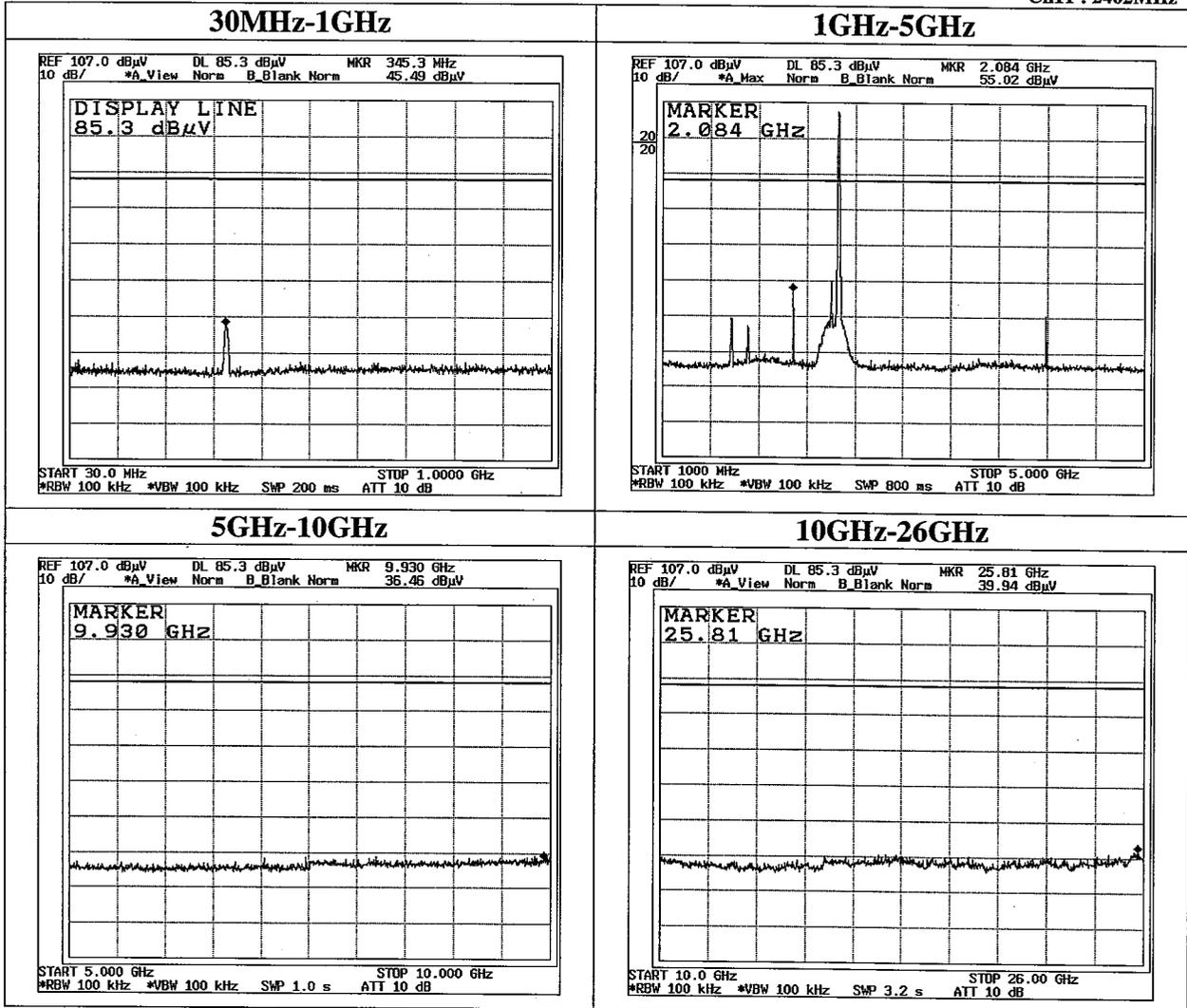
Ch6 : 2437MHz



## Out Band Emissions (Conducted)

Data Rate : 11Mbps

Ch11 : 2462MHz

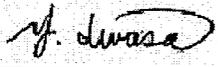


## DATA OF POWER DENSITY(CONDUCTED)

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

Company : SHARP Corporation  
Equipment : Notebook Computer  
Model : PC-AV18P  
Sample No. :-  
Power : AC120V/60Hz  
Mode : Transmitting (IEEE 802.11b)  
FCC ID : APYNAR0051  
IC No. :-

REPORT NO : 23LE0055-HO  
REGULATION : Fcc Part15 Subpart C 15.247(d)  
TEST DISTANCE : -  
DATE : 08/05/2003  
TEMPERATURE : 25deg.C  
HUMIDITY : 60%

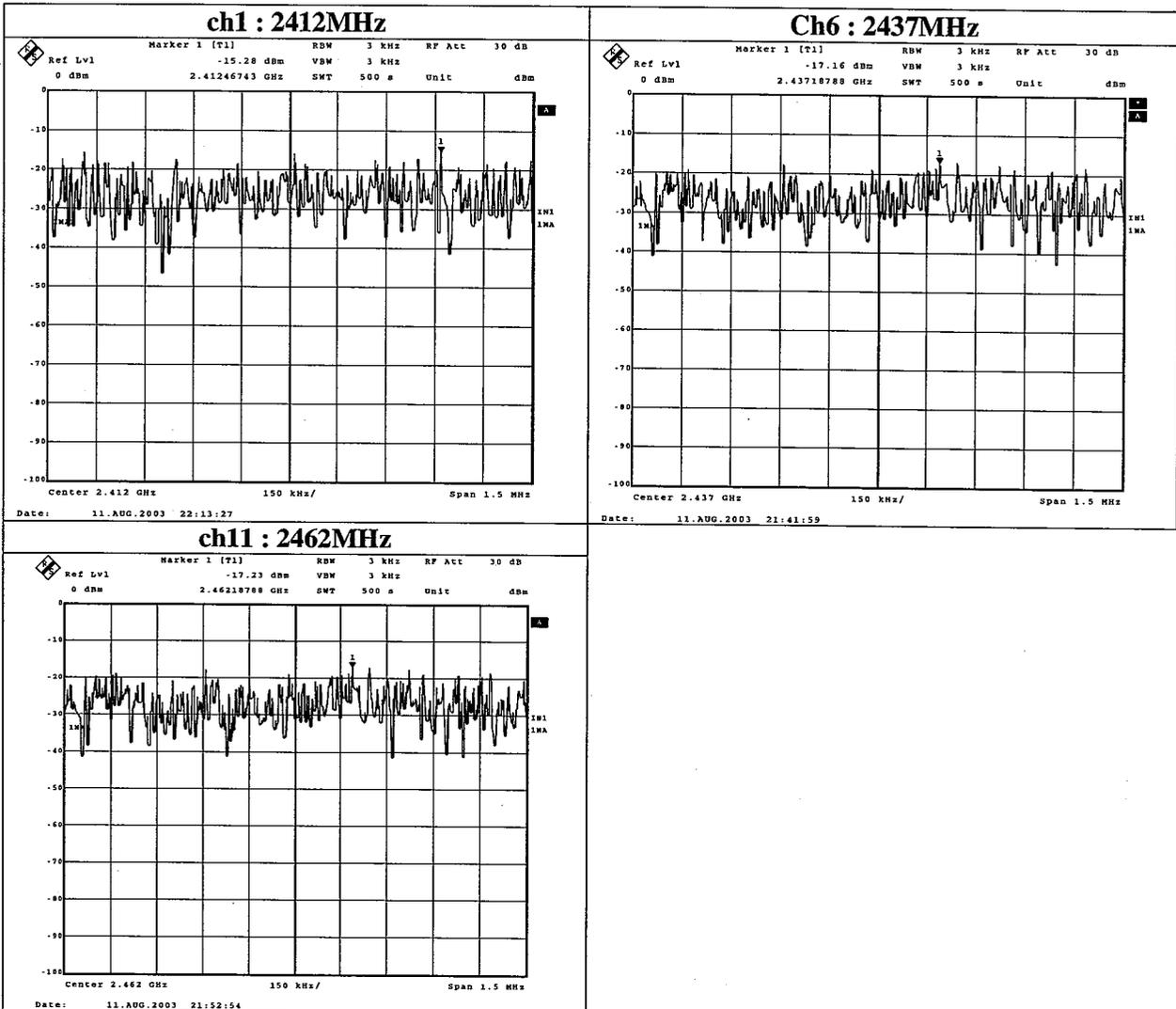
  
ENGINEER : Yoshiaki Iwasa

ch	FREQ [MHz]	S/A Reading [dBm]	Cable Loss [dB]	ATTEN. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
ch1	2412.5	-15.23	2.9	0.0	-12.3	8.0	20.3
ch6	2437.2	-17.16	3.0	0.0	-14.2	8.0	22.2
ch11	2462.2	-17.23	3.0	0.0	-14.2	8.0	22.2

Sample Calculation:

Result = Reading + (Cable+ATTEN.)Loss

## Power Density

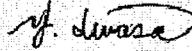


## DATA OF 99% Occupied Bandwidth

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

Company : SHARP Corporation  
Equipment : Notebook Computer  
Model : PC-AV18P  
Sample No. : -  
Power : AC120V/60Hz  
Mode : Transmitting (IEEE 802.11b)  
FCC ID : APYNAR0051  
IC No. : -

REPORT NO : 23LE0055-HO  
REGULATION : RSS-210 (issue 5)  
TEST DISTANCE : -  
DATE : 08/05/2003  
TEMPERATURE : 25deg.C  
HUMIDITY : 60%



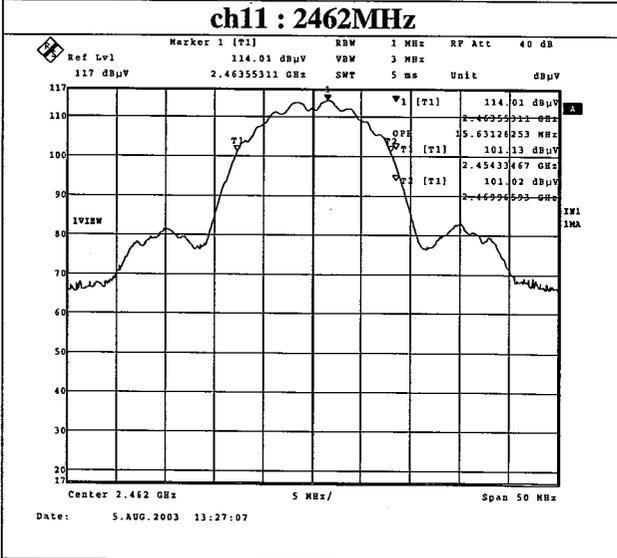
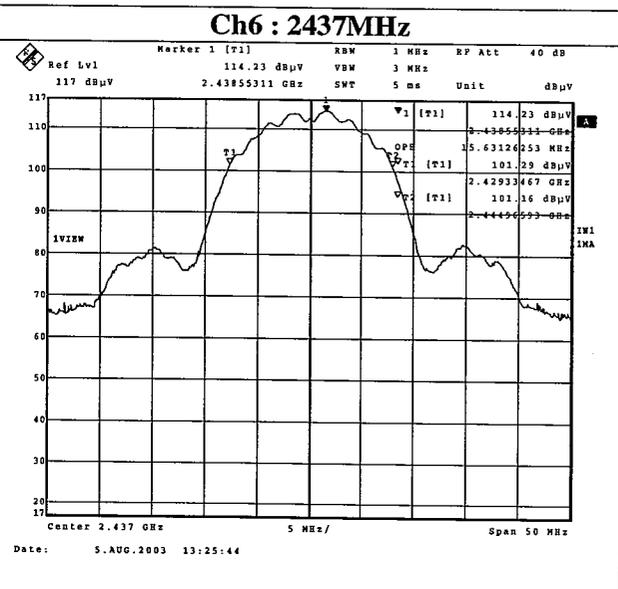
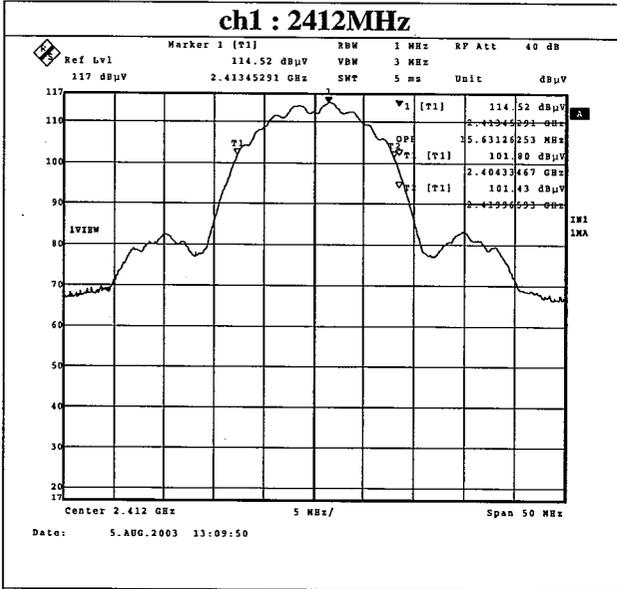
ENGINEER : Yoshiaki Iwasa

802.11b 11Mbps

ch	FREQ [MHz]	99% Occupied Bandwidth [MHz]
Low(1)	2412.0	15.6
Mid(6)	2437.0	15.6
High(11)	2462.0	15.6

## 99% Occupied Bandwidth

ch1 : 2412MHz



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