



EMI TEST REPORT

Test Report No. : 24DE0090-HO

Applicant : SHARP CORPORATION
Type of Equipment : PDA
Model No. : SL-6000L
Test standard : FCC Part 15 Subpart C
Section 15.207, Section 15.247
FCC ID : APYNAR0052
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 : November 27,28 and December.1 2003

Tested by : 
Naoki Sakamoto
EMC Service

Approved by : 
Hironobu Shimoji
Group Leader of EMC Service

UL Apex Co., Ltd.

Head Office EMC Lab.

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SECTION 1: Client information

Company Name : Sharp Corporation
Address : 492 MINOSHO-CHO, YAMATOKORIYAMA-SHI, NARA, JAPAN
Telephone Number : +81-743-55-7030
Facsimile Number : +81-55-2553
Contact Person : Masayuki Shirono

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

2.1 Identification of E.U.T.

Type of Equipment : PDA
Model No. : SL-6000L
Serial No. : 17
Country of Manufacture : JAPAN
Receipt Date of Sample : November 27, 2003
Condition of EUT : Production prototype

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2.2 Product Description

Sharp Corporation., Model No: SL-6000L is the PDA.

The clock frequency of EUT are CPU 400MHz, CODEC 24MHz, ASIC 3.6864MHz, Clock 32.768kHz

Radio Specification

Equipment Type	:	Transceiver
Frequency band	:	2400-2483.5MHz
Frequency operation	:	2412-2462MHz
Type of modulation	:	DSSS(IEEE802.11b) CCK(5.5/11Mbps), BPSK(1Mbps), QPSK(2Mbps)
Channel spacing	:	5MHz
Mode of operation	:	Simplex
Antenna Type	:	Mica SMD Antenna
Antenna Gain	:	2.5dBi
Antenna connector Type	:	HIROSE U-FL type Antenna
Method of Frequency Generation	:	Synthesizer
Power Supply	:	DC3.3V +/-5%
Temperature of operation	:	0 deg. C. -+50 deg. C.

FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

Type of Equipment and its antenna comply with this requirement since they are built in host device Model No. 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	8.8dB 24.3141MHz 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)	Radiated	N/A	3.7dB 24620.0MHz Horizontal/ Vertical *Base noise	Complied
5	Out of Band Emission	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".

*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.4 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.

Remarks : The EUT was separately tested in accordance with FCC Part 15 Subpart B and Declaration of Conformity was applied

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3.5 Uncertainty

Conducted Emission

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

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ± 4.5 dB(3m).

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB(3m).

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ± 6.6 dB.

3.6 Test Location

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

No.2 semi anechoic chamber and No3 Shield 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

3.7 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

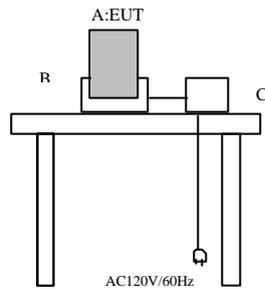
4.1 Operating Modes

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: Transmitting mode(CCK 11Mbps)
 Low Channel :2412MHz(Ch1)
 Mid Channel :2437MHz(Ch6)
 High channel :2462MHz(Ch11)

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 worstcase conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
	Personal mobile tool (PDA)	SL-6000L	17	SHARP	N/A
B	Cradle	CE-ST10	-	SHARP	N/A
C	AC adapter	EA-70	020339-00	SHARP	N/A

List of cables used

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

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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 7.0 x 6.0m in a No.1 / 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

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 Power Meter connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

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SECTION 8: Out of Band Emission, Section 15.247 (c)

[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 3m(Below 10GHz) and 1m(Upper 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.

The noise was measured at each position of all 4 axes X, Y, Z-1, Z-2(with cradle) to compare the level, and the maximum noise level was recorded.

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.

The result was also satisfied the general limits specified in section 15.209(a).

Test data : **APPENDIX 3**

Test result : **Pass**

[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**

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.

Test data : **APPENDIX 3**

Test result : **Pass**

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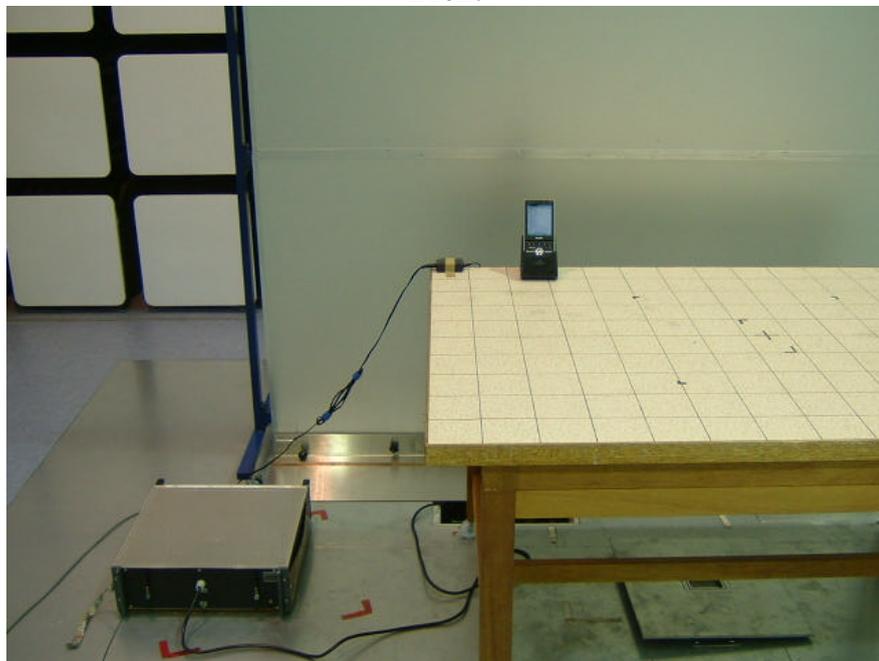
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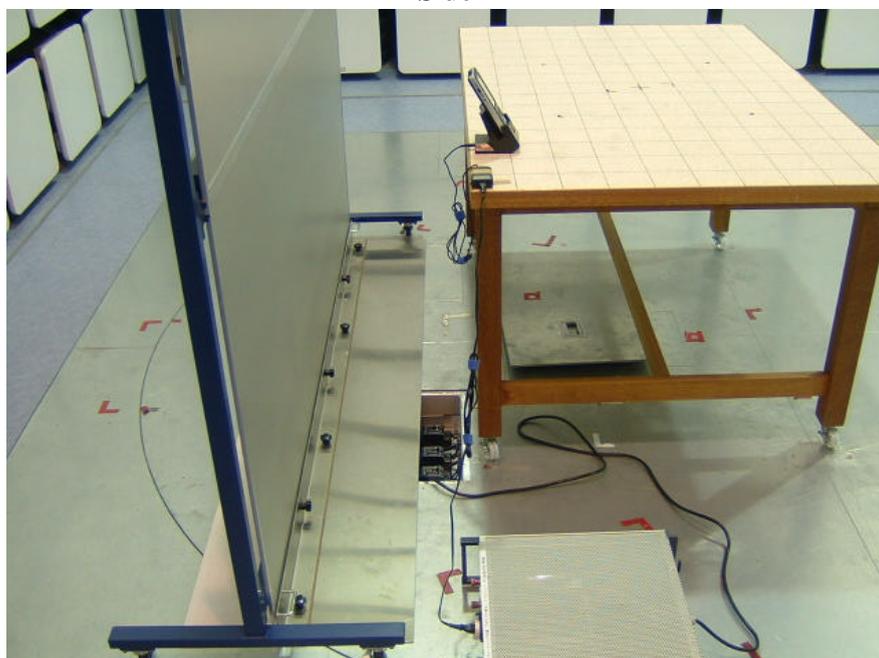
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APPENDIX 1: Photographs of test setup
Conducted Emission

Front

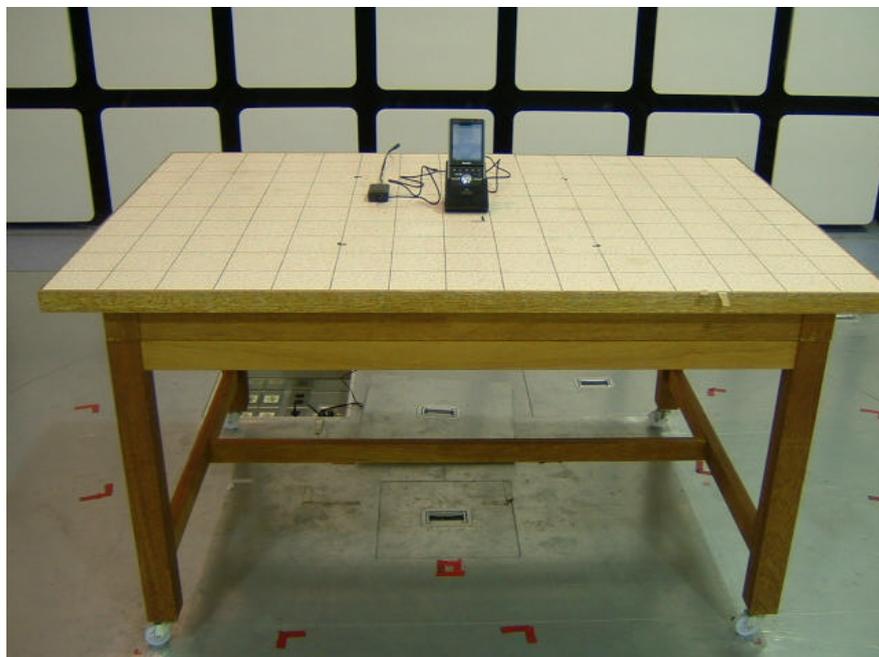


Side

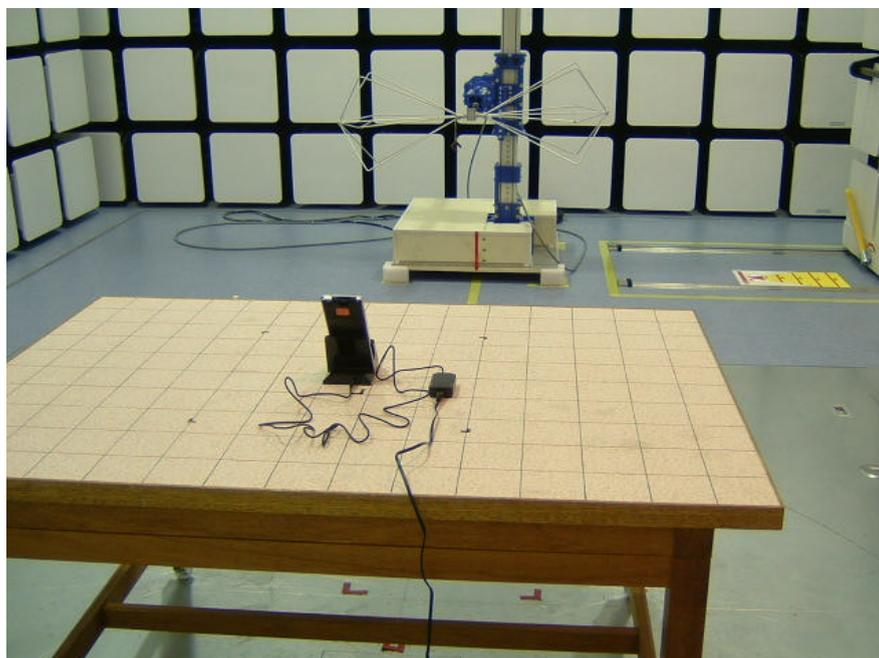


Spurious Emission (Radiated)

Front



Rear



X, Y, Z-1, Z-2 Positions

X-axis



Y-axis



Z-1axis



Z-2axis



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	1 to 8	2003/04/11 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	1	2003/05/08 * 12
MLS-07	LISN	Schwarzbeck	NSLK8127	1	2003/03/18 * 12
MRENT-07	Spectrum Analyzer	Advantest	R3273	1 to 6	2003/10/31 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	1, 4	2003/01/31 * 12
MCC-04	Microwave Cable	Storm	421-011	4	2003/01/14 * 12
MPM-01	Power Meter	Agilent	E4417A	3	2003/11/12 * 12
MPSE-03	Power sensor	Agilent	E9327A	3	2003/04/14 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	4	2003/04/28 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	4	2003/04/28 * 12
MPA-02	Pre Amplifier	Agilent	87405A	4	2003/04/17 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	2, 4, 5, 6	2002/12/24 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	4	2003/05/08 * 12
MPA-01	Pre Amplifier	Agilent	8449B	4	2003/02/08 * 12
MCC-24	Microwave Cable	Storm	-	4	2003/04/30 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	4	2003/09/19 * 12
MAT-19	Attenuator(10dB)	HIROSE	AT-106	4	
MHA-01	Horn Antenna	EMCO	3160-09	4	2003/01/11 * 12
MHA-05	Horn Antenna	Schwarzbeck	BBHA9120D	4	2003/01/11 * 12

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

Test Item :

- 1: AC Conducted emission,
- 2: 6dB Bandwidth
- 3: Maximum Peak Output Power
- 4: Out of Band Emission(Radiated)
- 5: Out of Band Emission(Conducted)
- 6: Peak Power Density

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APPENDIX 3: Data of EMI test

DATA OF CONDUCTION TEST

UL Apex Co., Ltd. Head Office EMC Lab.
No.2 Semi Anechoic Chamber
Report No. : 24DE0090-HO

Applicant : SHARP CORPORATION
Kind of Equipment : PDA
Model No. : SL-6000L
Serial No. : No. 17
Power : AC120V60Hz
Mode : ch.1 Transmitting 11Mbps
Remarks :
Date : 11/27/2003
Phase : Single Phase
Temperature : 18 °C
Humidity : 63 %
Regulation : FCC Part15C § 15.207 (0.15-30MHz)

Engineer : Naoki Sakamoto

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]				QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
1.	0.2010	53.2	39.8	53.0	38.1	0.0	0.1	0.0	53.3	39.9	63.6	53.6	10.3	13.7
2.	0.3040	46.6	39.9	47.0	39.3	0.0	0.1	0.0	47.1	40.0	60.1	50.1	13.0	10.1
3.	0.4067	36.7	30.7	36.4	25.8	0.1	0.1	0.0	36.9	30.9	57.7	47.7	20.8	16.8
4.	0.5079	34.8	27.3	36.5	33.7	0.1	0.1	0.0	36.7	33.9	56.0	46.0	19.3	12.1
5.	7.7270	29.1	26.1	28.5	24.6	0.3	0.9	0.0	30.3	27.3	60.0	50.0	29.7	22.7
6.	24.3141	39.8	37.5	40.9	38.8	0.8	1.6	0.0	43.3	41.2	60.0	50.0	16.7	8.8

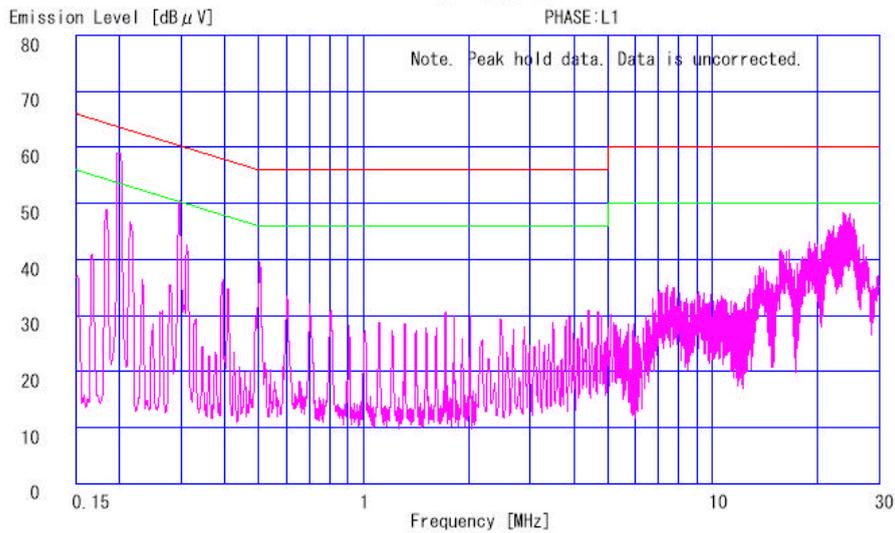
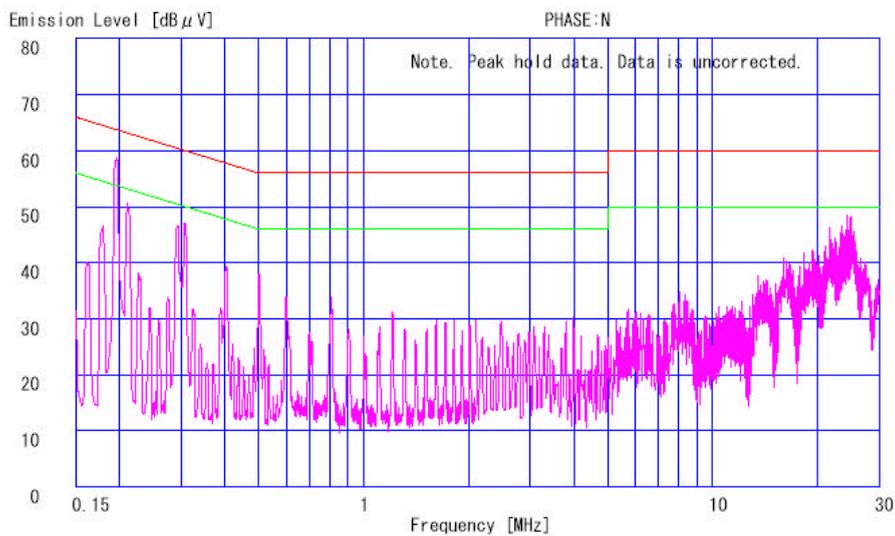
CALCULATION: READING[dB μ V] + LISN FACTOR[dB] + CABLE LOSS[dB] + ATTEN[dB].

DATA OF CONDUCTION TEST CHART

UL Apex Co., Ltd. Head Office EMC Lab.
 No.2 Semi Anechoic Chamber
 Report No. : 24DE0090-HO

Applicant : SHARP CORPORATION
 Kind of Equipment : PDA
 Model No. : SL-6000L
 Serial No. : No. 17
 Power : AC120V60Hz
 Mode : ch.1 Transmitting 11Mbps
 Remarks :
 Date : 11/27/2003
 Phase : Single Phase
 Temperature : 18 °C
 Humidity : 63 %
 Regulation 1 : FCC Part15C § 15.207 (0.15-30MHz)
 Regulation 2 : FCC Part15C § 15.207 (0.15-30MHz)

Engineer : Naoki Sakamoto



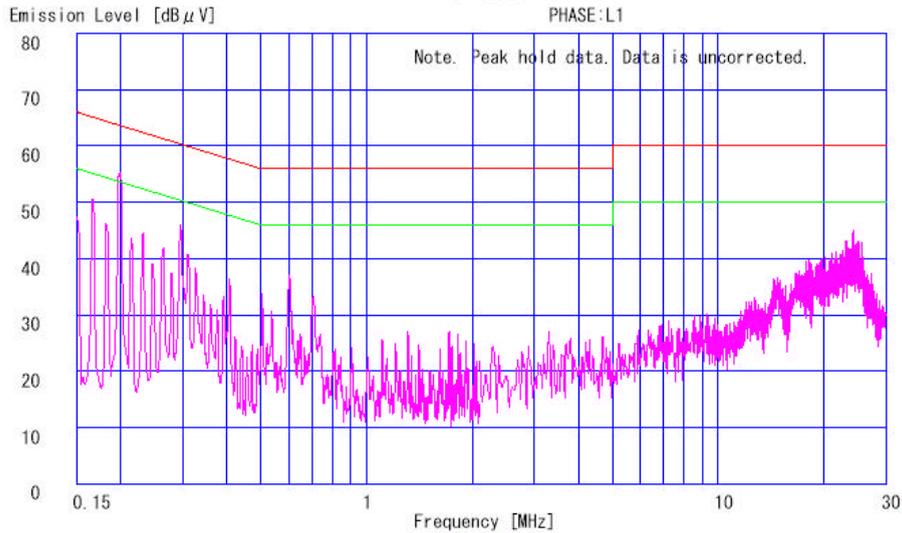
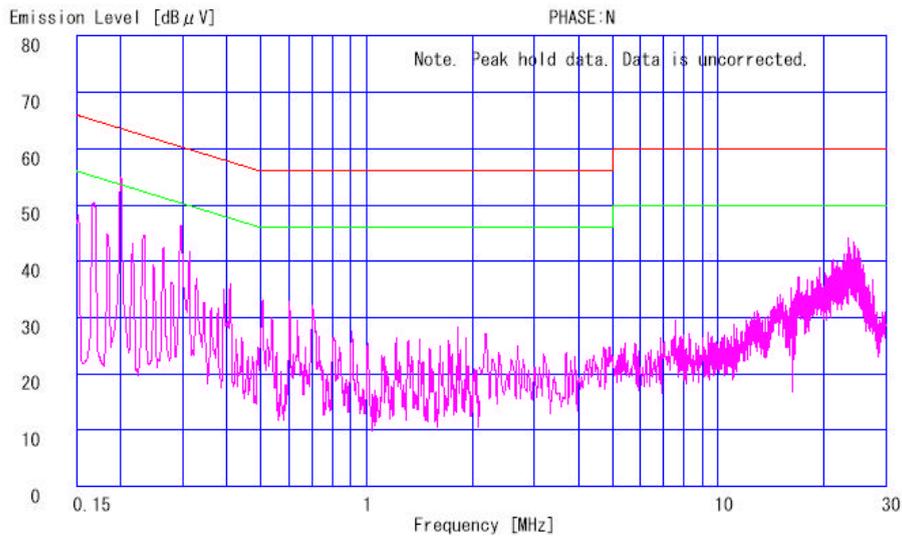
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DATA OF CONDUCTION TEST CHART

UL Apex Co., Ltd. Head Office EMC Lab.
 No.2 Semi Anechoic Chamber
 Report No. : 24DE0090-HO

Applicant : SHARP CORPORATION
 Kind of Equipment : PDA
 Model No. : SL-6000L
 Serial No. : No. 17
 Power : AC120V60Hz
 Mode : ch. 6 Transmitting 11Mbps
 Remarks :
 Date : 11/27/2003
 Phase : Single Phase
 Temperature : 18 °C
 Humidity : 63 %
 Regulation 1 : FCC Part15C s 15. 207 (0. 15-30MHz)
 Regulation 2 : FCC Part15C s 15. 207 (0. 15-30MHz)

Engineer : Naoki Sakamoto



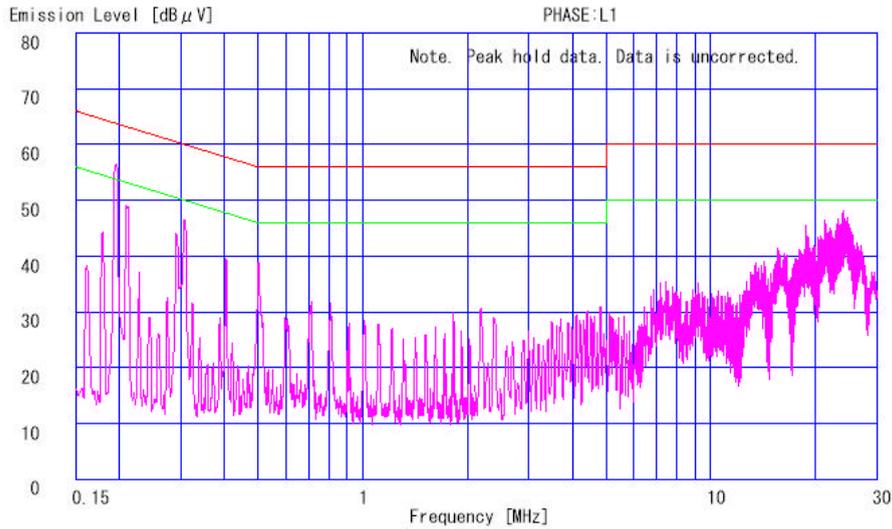
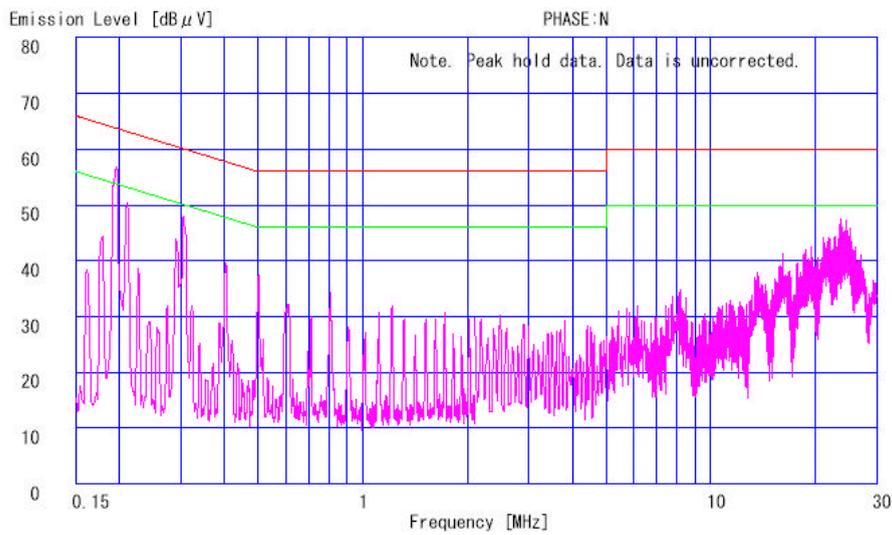
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DATA OF CONDUCTION TEST CHART

UL Apex Co., Ltd. Head Office EMC Lab.
 No.2 Semi Anechoic Chamber
 Report No.: 24DE0090-HO

Applicant : SHARP CORPORATION
 Kind of Equipment : PDA
 Model No. : SL-6000L
 Serial No. : No. 17
 Power : AC120V60Hz
 Mode : ch. 11 Transmitting 11Mbps
 Remarks :
 Date : 11/27/2003
 Phase : Single Phase
 Temperature : 18 °C
 Humidity : 63 %
 Regulation 1 : FCC Part15C § 15.207 (0.15-30MHz)
 Regulation 2 : FCC Part15C § 15.207 (0.15-30MHz)

Engineer : Naoki Sakamoto



Page:

6dB BANDWIDTH (Conducted)

DATA OF 6dB BANDWIDTH (CONDUCTED)

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

Company : Sharp Corporation
Equipment : Personal mobile tool (PDA)
Model : SL-6000L
Sample No. : N0.17
Power : AC120V/60Hz
Mode : Tx (ch1,6,11)
FCC ID : -
IC No. : -

REPORT NO : 24DE0090-HO
REGULATION : Fcc Part15 Subpart C 15.247(a)(2)
TEST DISTANC : -
DATE : 11/28/2003
TEMPERATUR : 21
HUMIDITY : 61%

ENGINEER : Naoki Sakamoto

PK DETECT(RBW 100kHz ,VBW 300kHz)

CH	FREQ	6dB Bandwidth	Limit
	[MHz]	[MHz]	[kHz]
ch1	2412.0	4.8	500.0
ch6	2437.0	4.8	500.0
ch11	2462.0	4.8	500.0

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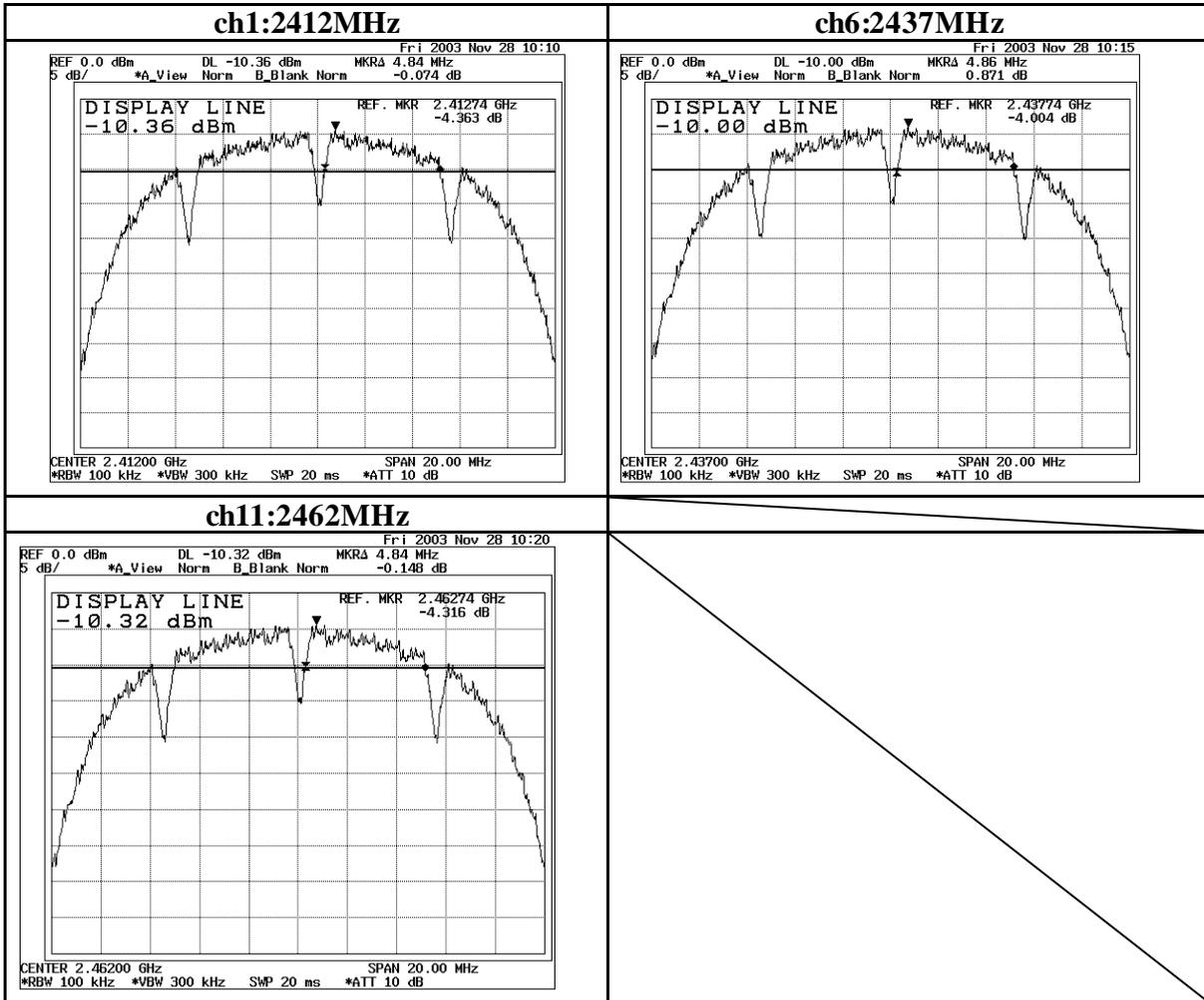
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6dB Bandwidth (Conducted)



Maximum Peak OutPut Power (Conducted)

DATA OF PEAK OUTPUT POWER (CONDUCTED)

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

Company : Sharp Corporation
Equipment : Personal mobile tool (PDA)
Model : SL-6000L
Sample No. : No.17
Power : AC120V/60Hz
Mode : Tx(ch1,6,11)
FCC ID : -
IC No. : -

REPORT NO : 24DE0090-HO
REGULATION : Fcc Part15 Subpart C 15.247(b)(3)
TEST DISTANCE : -
DATE : 11/28/2003
TEMPERATURE : 21
HUMIDITY : 61%

ENGINEER : Naoki Sakamoto

ch	FREQ [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	ATTEN. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
ch1	2412.0	16.54	0.4	0.0	16.94	30.0	13.06
ch6	2437.0	16.47	0.4	0.0	16.87	30.0	13.13
ch11	2462.0	16.48	0.4	0.0	16.88	30.0	13.12

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

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Out of Band Emission : Radiated Emission

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No.2 Semi Anechoic Chamber
Report No. : 24DE0090-H0

Applicant : SHARP CORPORATION
Kind of Equipment : PDA
Model No. : SL-6000L
Serial No. : No. 17
Power : AC120V/60Hz
Mode : ch.1 Transmitting 11Mbps
Remarks :
Date : 11/27/2003
Test Distance : 3 m
Temperature : 18 °C
Humidity : 63 %
Regulation : Fcc 15C § 15. 209(a)

Engineer : Naoki Sakamoto

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	99.50	BB	25.1	16.3	8.3	23.3	1.2	6.1	17.4	8.6	43.5	26.1	34.9
2.	199.00	BB	13.2	13.2	16.2	23.3	1.9	6.0	14.0	14.0	43.5	29.5	29.5
3.	298.50	BB	13.6	13.4	19.6	23.2	2.3	6.0	18.3	18.1	46.0	27.7	27.9
4.	497.50	BB	23.1	25.2	18.2	23.0	3.1	6.2	27.6	29.7	46.0	18.4	16.3
5.	696.50	BB	15.9	16.0	20.7	23.3	3.9	6.1	23.3	23.4	46.0	22.7	22.6
6.	995.00	BB	15.6	15.5	23.7	23.0	4.8	6.1	27.2	27.1	54.0	26.8	26.9

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

Out of Band Emission : Radiated Emission

DATA OF RADIATION TEST

UL Apex Co., Ltd. Head Office EMC Lab.
No.2 Semi Anechoic Chamber
Report No. : 24DE0090-HO

Applicant : SHARP CORPORATION
Kind of Equipment : PDA
Model No. : SL-6000L
Serial No. : No. 17
Power : AC120V/60Hz
Mode : ch. 6 Transmitting 11Mbps
Remarks :
Date : 11/27/2003
Test Distance : 3 m
Temperature : 18 °C
Humidity : 63 %
Regulation : Fcc 15C § 15.209(a)

Engineer : Naoki Sakamoto

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	99.50	BB	24.3	17.7	8.3	23.3	1.2	6.1	16.6	10.0	43.5	26.9	33.5
2.	199.00	BB	16.5	16.7	16.2	23.3	1.9	6.0	17.3	17.5	43.5	26.2	26.0
3.	298.50	BB	17.3	20.2	19.6	23.2	2.3	6.0	22.0	24.9	46.0	24.0	21.1
4.	497.50	BB	17.0	25.5	18.2	23.0	3.1	6.2	21.5	30.0	46.0	24.5	16.0
5.	696.50	BB	15.9	16.0	20.7	23.3	3.9	6.1	23.3	23.4	46.0	22.7	22.6
6.	995.00	BB	15.8	15.6	23.7	23.0	4.8	6.1	27.4	27.2	54.0	26.6	26.8

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

Out of Band Emission : Radiated Emission

DATA OF RADIATION TEST

UL Apex Co., Ltd. Head Office EMC Lab.
No.2 Semi Anechoic Chamber
Report No. : 24DE0090-H0

Applicant : SHARP CORPORATION
Kind of Equipment : PDA
Model No. : SL-6000L
Serial No. : No. 17
Power : AC120V/60Hz
Mode : ch. 11 Transmitting 11Mbps
Remarks :
Date : 11/27/2003
Test Distance : 3 m
Temperature : 18 °C
Humidity : 63 %
Regulation : Fcc 15C § 15. 209 (a)

Engineer : Naoki Sakamoto

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	99.50	BB	36.2	23.2	8.3	23.3	1.2	6.1	28.5	15.5	43.5	15.0	28.0	
2.	199.00	BB	16.3	16.4	16.2	23.3	1.9	6.0	17.1	17.2	43.5	26.4	26.3	
3.	298.50	BB	20.6	17.7	19.6	23.2	2.3	6.0	25.3	22.4	46.0	20.7	23.6	
4.	497.50	BB	23.8	27.9	18.2	23.0	3.1	6.2	28.3	32.4	46.0	17.7	13.6	
5.	696.50	BB	16.1	16.0	20.7	23.3	3.9	6.1	23.5	23.4	46.0	22.5	22.6	
6.	995.00	BB	15.5	15.8	23.7	23.0	4.8	6.1	27.1	27.4	54.0	26.9	26.6	

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

Out of Band Emission : Radiated Emission
DATA OF SPURIOUS EMISSIONS(1GHz to 25GHz)

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

COMPANY : Sharp Corporation
EQUIPMENT : Personal mobile tool (PDA)
MODEL : SL-6000L
SAMPLE NO. : No17
POWER : AC120V/60Hz
MODE : Transmitting (CH1:2412MHz)

REGULATION : Fcc Part15 Subpart C 15.247(c)
TEST DISTANCE : 3m / 1m
DATE : 12/01/2003
TEMPERATURE : 22
HUMIDITY : 60%

ENGINEER : Naoki Sakamoto

PKDETECT

No.	FREQ [MHz]	TR READING HOR VER [dBuV/m]		ANT Factor [dBm]	AMP GAIN [dB]	CABLE LOSS [dB]	Attenuator or Filter [dB]	RESULT HOR VER [dBuV/m]		Limit PK [dBuV/m]	MARGIN HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1206.0	43.3	42.6	22.6	37.6	4.6	10.0	42.9	42.2	74.0	31.1	31.9
2	2390.0	42.4	43.5	30.5	36.9	6.3	10.0	52.3	53.4	74.0	21.7	20.6
3	4824.0	46.6	44.1	35.7	36.8	8.9	1.0	55.4	52.9	74.0	18.6	21.1
4	7236.0	43.0	41.4	37.7	36.5	11.0	0.5	55.7	54.1	74.0	18.3	19.9
5	9648.0	43.5	42.1	37.2	37.2	12.9	0.5	56.9	55.5	74.0	17.1	18.5
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Filter - Dfac												
6	12060.0	42.7	42.8	40.3	36.8	14.4	0.5	51.6	51.7	74.0	22.4	22.3
7	14472.0	40.6	41.0	43.0	35.3	15.7	0.6	55.1	55.5	74.0	18.9	18.5
8	16884.0	43.3	42.0	44.7	36.4	17.3	0.4	59.8	58.5	74.0	14.2	15.5
9	19296.0	41.7	42.6	40.8	35.9	18.6	0.9	56.6	57.5	74.0	17.4	16.5
10	21708.0	42.3	41.9	40.5	36.6	19.7	0.6	57.0	56.6	74.0	17.0	17.4
11	24120.0	41.7	41.6	40.2	36.5	20.9	1.7	58.5	58.4	74.0	15.5	15.6

AVDETECT

No.	FREQ [MHz]	TR READING HOR VER [dBuV/m]		ANT Factor [dBm]	AMP GAIN [dB]	CABLE LOSS [dB]	Attenuator or Filter [dB]	RESULT HOR VER [dBuV/m]		Limit AV [dBuV/m]	MARGIN HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1206.0	33.3	33.2	22.6	37.6	4.6	10.0	32.9	32.8	54.0	21.2	21.2
2	2390.0	33.2	33.5	30.5	36.9	6.3	10.0	43.1	43.4	54.0	11.0	10.6
3	4824.0	40.3	35.3	35.7	36.8	8.9	1.0	49.1	44.1	54.0	4.9	9.9
4	7236.0	31.4	31.9	37.7	36.5	11.0	0.5	44.1	44.6	54.0	9.9	9.4
5	9648.0	31.9	31.7	37.2	37.2	12.9	0.5	45.3	45.1	54.0	8.7	8.9
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Filter - Dfac												
6	12060.0	30.7	30.7	40.3	36.8	14.4	0.5	39.6	39.6	54.0	14.4	14.4
7	14472.0	29.3	29.2	43.0	35.3	15.7	0.6	43.8	43.7	54.0	10.2	10.3
8	16884.0	31.1	31.0	44.7	36.4	17.3	0.4	47.6	47.5	54.0	6.4	6.5
9	19296.0	31.6	31.5	40.8	35.9	18.6	0.9	46.5	46.4	54.0	7.5	7.6
10	21708.0	31.6	31.6	40.5	36.6	19.7	0.6	46.3	46.3	54.0	7.7	7.7
11	24120.0	31.9	31.9	40.2	36.5	20.9	1.7	48.7	48.7	54.0	5.3	5.3

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

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

*The limit values at frequencies excepting restricted bands indicated in 15.205 are values 20dB below lower

* Attenuator : 1 to 3.5GHz, Filter : 3.5 to 25GHz

Out of Band Emission : Radiated Emission

DATA OF SPURIOUS EMISSIONS(1GHz to 25GHz)

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

COMPANY : Sharp Corporation
EQUIPMENT : Personal mobile tool (PDA)
MODEL : SL-6000L
SAMPLE NO. : No17
POWER : AC120V/60Hz
MODE : Transmitting (CH6:2437MHz)

REGULATION : Fcc Part15 Subpart C 15.247(c)
TEST DISTANCE : 3m / 1m
DATE : 12/01/2003
TEMPERATURE : 22
HUMIDITY : 60%

ENGINEER : Naoki Sakamoto

PK DETECT

No.	FREQ [MHz]	T/R READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Attenuator or Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER					HOR	VER			
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1218.5	45.1	44.2	22.7	37.6	4.7	10.0	44.9	44.0	74.0	29.1	30.0
2	4874.0	46.4	45.5	36.0	36.8	9.0	1.0	55.6	54.7	74.0	18.4	19.4
3	7311.0	42.5	41.1	37.8	36.6	11.1	0.5	55.3	53.9	74.0	18.7	20.2
4	9748.0	41.6	42.0	36.9	37.2	13.0	0.5	54.8	55.2	74.0	19.2	18.8
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Filter - Dfac												
5	12185.0	39.9	40.8	41.0	36.7	14.3	0.5	49.5	50.4	74.0	24.5	23.6
6	14622.0	40.0	39.3	43.2	35.5	15.9	0.6	54.7	54.0	74.0	19.3	20.0
7	17059.0	42.4	40.3	44.8	36.2	17.8	0.4	59.7	57.6	74.0	14.3	16.4
8	19496.0	41.0	41.6	40.5	36.2	19.0	1.0	55.8	56.4	74.0	18.2	17.6
9	21933.0	41.2	40.8	40.6	36.0	19.6	0.9	56.8	56.4	74.0	17.2	17.6
10	24370.0	40.7	40.6	40.3	36.9	21.0	2.2	57.8	57.7	74.0	16.2	16.3

AV DETECT

No.	FREQ [MHz]	T/R READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Attenuator or Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER					HOR	VER			
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1218.5	34.3	34.1	22.7	37.6	4.7	10.0	34.1	33.9	54.0	19.9	20.1
2	4874.0	39.1	32.9	36.0	36.8	9.0	1.0	48.3	42.1	54.0	5.7	11.9
3	7311.0	30.8	31.2	37.8	36.6	11.1	0.5	43.6	44.0	54.0	10.4	10.0
4	9748.0	31.4	32.0	36.9	37.2	13.0	0.5	44.6	45.2	54.0	9.4	8.8
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Filter - Dfac												
5	12185.0	30.7	30.8	41.0	36.7	14.3	0.5	40.3	40.4	54.0	13.7	13.6
6	14622.0	29.7	29.7	43.2	35.5	15.9	0.6	44.4	44.4	54.0	9.6	9.6
7	17059.0	31.2	31.1	44.8	36.2	17.8	0.4	48.5	48.4	54.0	5.5	5.6
8	19496.0	31.5	31.6	40.5	36.2	19.0	1.0	46.3	46.4	54.0	7.7	7.6
9	21933.0	31.3	31.2	40.6	36.0	19.6	0.9	46.9	46.8	54.0	7.1	7.2
10	24370.0	31.2	31.3	40.3	36.9	21.0	2.2	48.3	48.4	54.0	5.7	5.6

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

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

*The limit values at frequencies excepting restricted bands indicated in 15.205 are values 20dB below lower

* Attenuator : 1 to 3.5GHz, Filter : 3.5 to 25GHz

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MF060b(10.04.03)

Out of Band Emission : Radiated Emission

DATA OF SPURIOUS EMISSIONS(1GHz to 25GHz)

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

COMPANY : Sharp Corporation
EQUIPMENT : Personal mobile tool (PDA)
MODEL : SL-6000L
SAMPLE NO. : No17
POWER : AC120V/60Hz
MODEL : Transmitting (CH11:2462MHz)

REGULATION : Fcc Part15 Subpart C 15.247(c)
TEST DISTANCE : 3m / 1m
DATE : 12/01/2003
TEMPERATURE : 22
HUMIDITY : 60%

ENGINEER : Naoki Sakamoto

PK DETECT

No.	FREQ [MHz]	T/R READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Attenuator or Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1231.0	45.6	44.0	22.7	37.6	4.6	10.0	45.3	43.7	74.0	28.8	30.4
2	2483.5	44.5	43.7	22.7	37.6	4.6	10.0	44.2	43.4	75.0	30.8	31.6
3	4924.0	46.6	43.9	36.3	36.8	9.0	1.0	56.1	53.4	74.0	17.9	20.6
4	7386.0	39.9	43.9	37.9	36.6	11.1	0.5	52.8	56.8	74.0	21.2	17.2
5	9848.0	44.0	43.3	36.6	37.3	13.1	0.5	56.9	56.2	74.0	17.1	17.8
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Filter - Dfac												
6	12310.0	40.3	40.2	41.6	36.6	14.6	0.5	50.9	50.8	74.0	23.1	23.2
7	14772.0	39.9	39.6	43.3	35.6	15.9	0.6	54.6	54.3	74.0	19.4	19.7
8	17234.0	41.9	41.1	45.2	36.2	17.5	0.3	59.2	58.4	74.0	14.8	15.6
9	19696.0	40.5	40.7	40.6	36.0	18.8	1.3	55.7	55.9	74.0	18.3	18.1
10	22158.0	41.7	41.9	40.6	35.7	19.9	1.4	58.4	58.6	74.0	15.6	15.4
11	24620.0	44.8	45.2	40.4	36.9	21.1	2.6	62.5	62.9	74.0	11.5	11.1

AV DETECT

No.	FREQ [MHz]	T/R READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Attenuator or Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1218.5	33.1	33.1	22.7	37.6	4.6	10.0	32.8	32.8	54.0	21.2	21.2
2	2483.5	34.3	34.3	22.7	37.6	4.6	10.0	34.0	34.0	55.0	21.0	21.0
3	4924.0	39.3	32.1	36.3	36.8	9.0	1.0	48.8	41.6	54.0	5.2	12.4
4	7386.0	30.9	31.3	37.9	36.6	11.1	0.5	43.8	44.2	54.0	10.2	9.8
5	9848.0	34.8	33.4	36.6	37.3	13.1	0.5	47.7	46.3	54.0	6.3	7.7
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Filter - Dfac												
6	12310.0	30.6	30.6	41.6	36.6	14.6	0.5	41.2	41.2	54.0	12.8	12.8
7	14772.0	29.7	29.8	43.3	35.6	15.9	0.6	44.4	44.5	54.0	9.6	9.5
8	17234.0	31.6	31.5	45.2	36.2	17.5	0.3	48.9	48.8	54.0	5.1	5.2
9	19696.0	31.5	31.3	40.6	36.0	18.8	1.3	46.7	46.5	54.0	7.3	7.5
10	22158.0	31.6	31.6	40.6	35.7	19.9	1.4	48.3	48.3	54.0	5.7	5.7
11	24620.0	32.6	32.6	40.4	36.9	21.1	2.6	50.3	50.3	54.0	3.7	3.7

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

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

*The limit values at frequencies excepting restricted bands indicated in 15.205 are values 20dB below lower

* Attenuator : 1 to 3.5GHz, Filter : 3.5 to 25GHz

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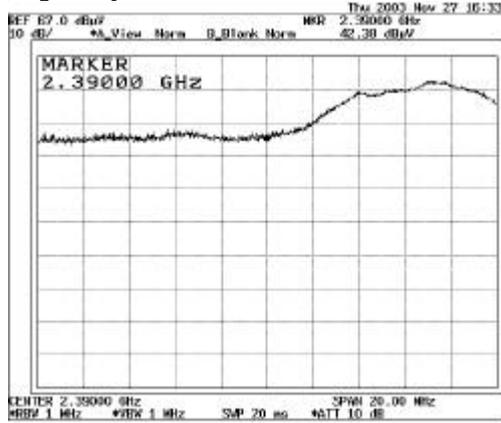
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MF060b(10.04.03)

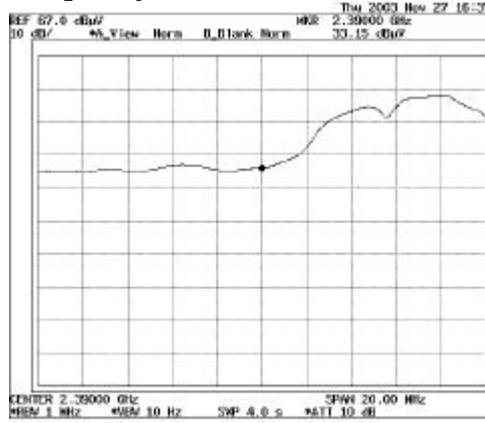
Out of Band Emission : Restricted Band Edges (Radiated)

Ch1:2412MHz

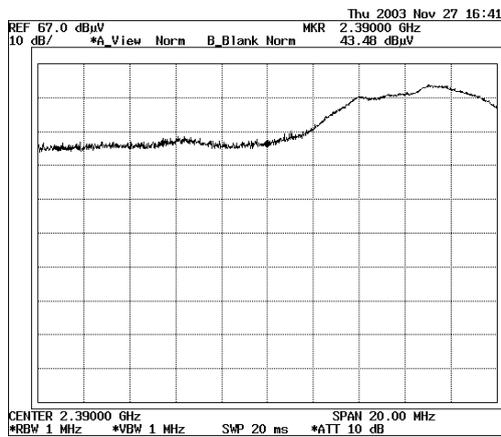
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Frequency:2390MHz Hor (Av)



Frequency:2390MHz Ver (Pk)



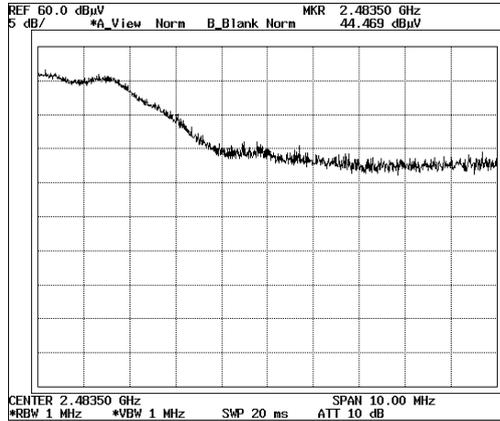
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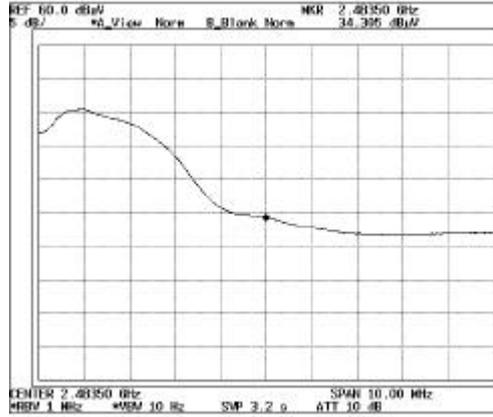
Out of Band Emission : Restricted Band Edges (Radiated)

Ch11:2462MHz

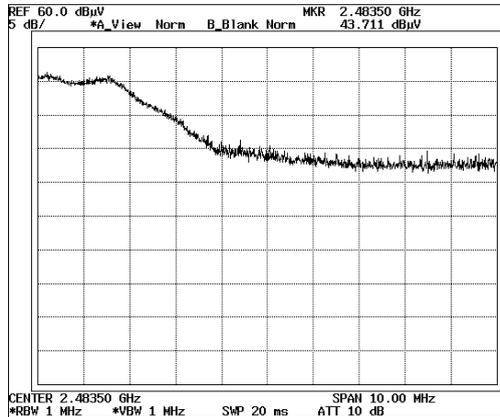
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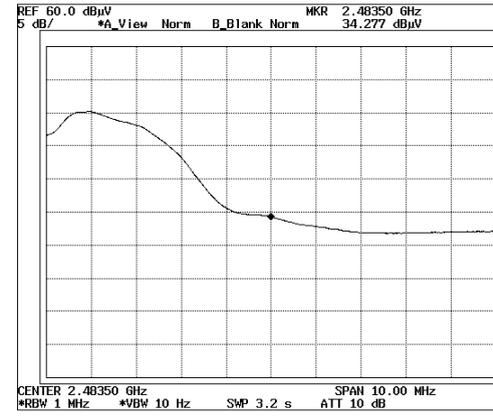
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Frequency:2483.5MHz Ver (Pk)



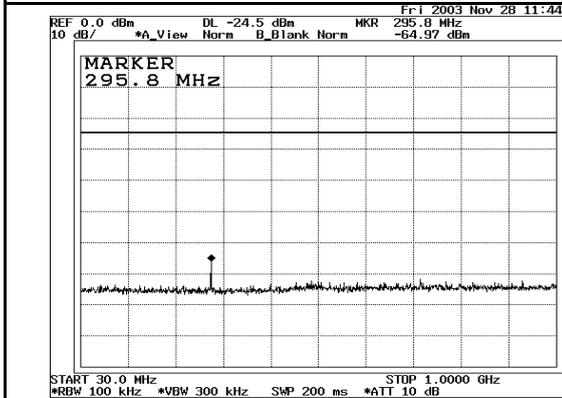
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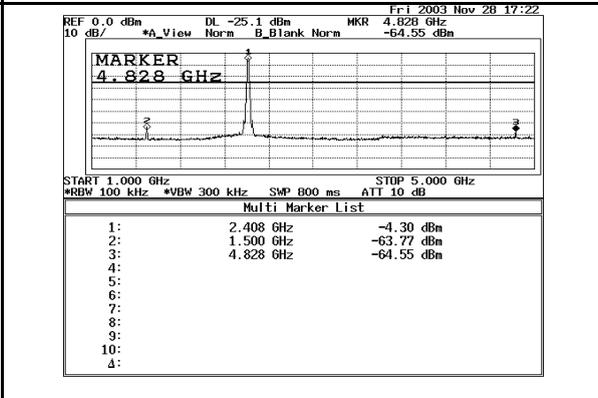
Out of Band Emission : Conducted

Ch1 : 2412MHz

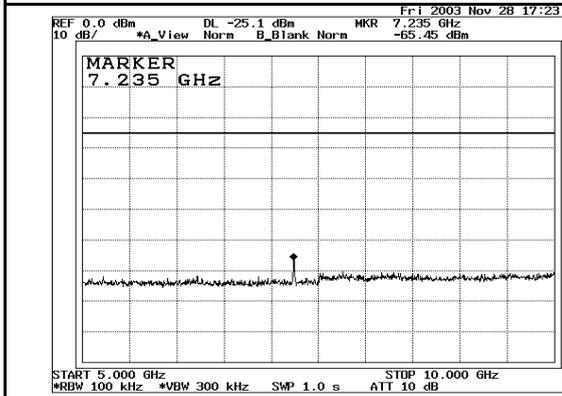
30MHz-1GHz



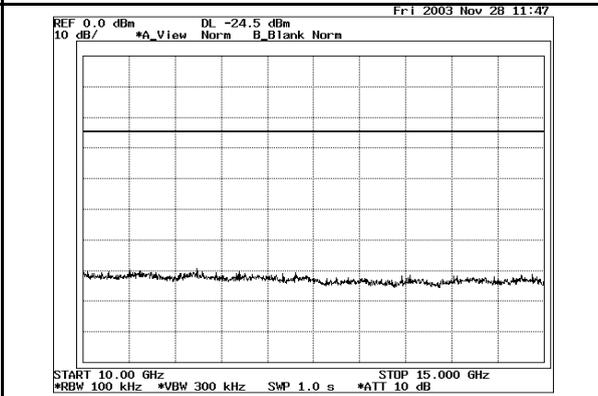
1GHz-5GHz



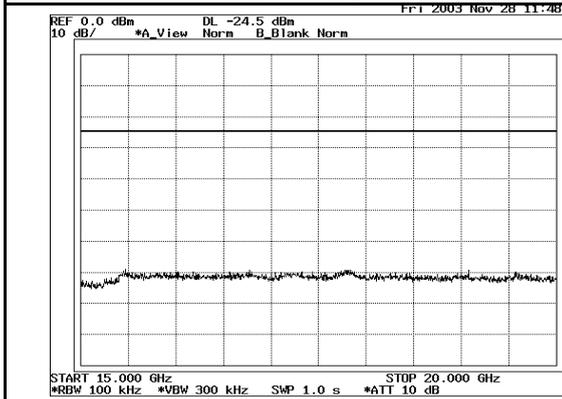
5GHz-10GHz



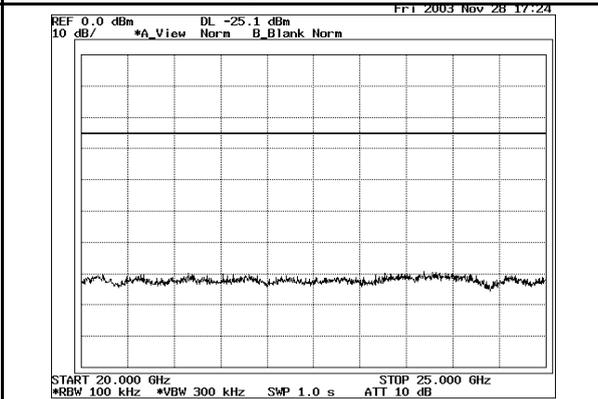
10GHz-15GHz



15GHz-20GHz



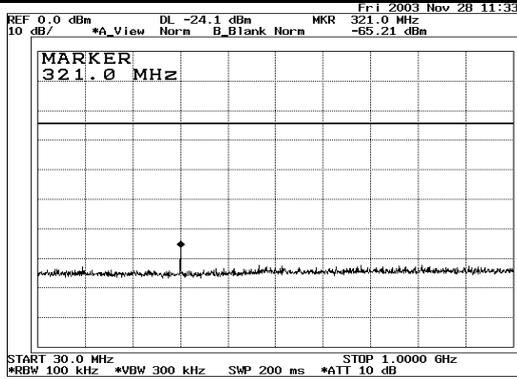
20GHz-25GHz



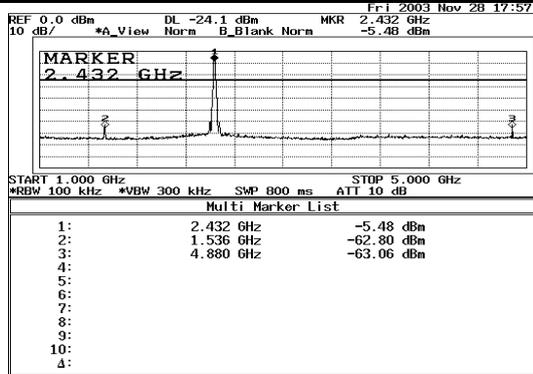
Out of Band Emission : Conducted

Ch6 : 2437MHz

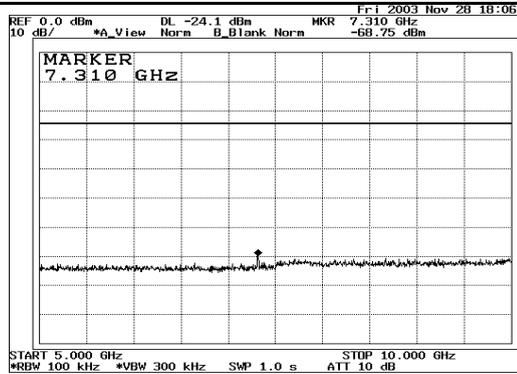
30MHz-1GHz



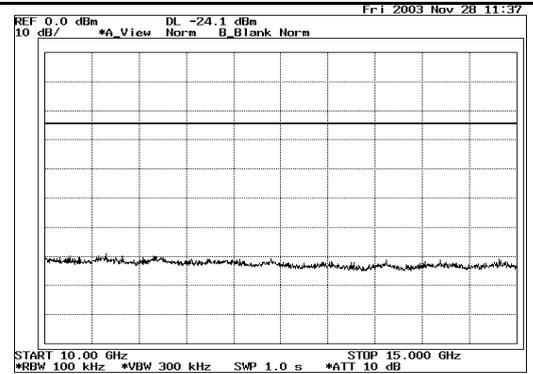
1GHz-5GHz



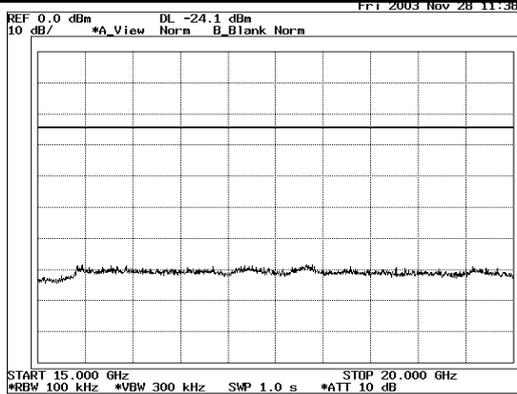
5GHz-10GHz



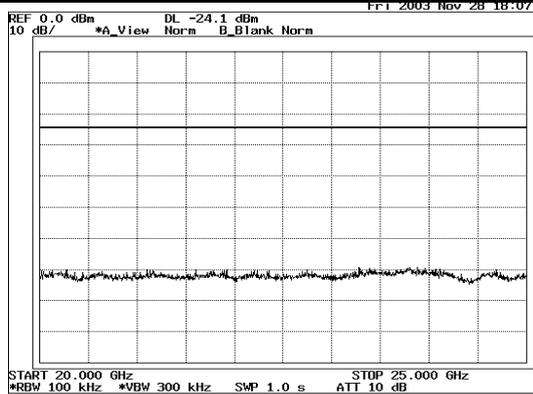
10GHz-15GHz



15GHz-20GHz



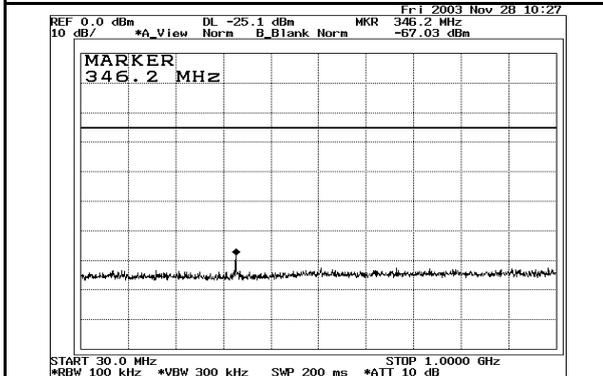
20GHz-25GHz



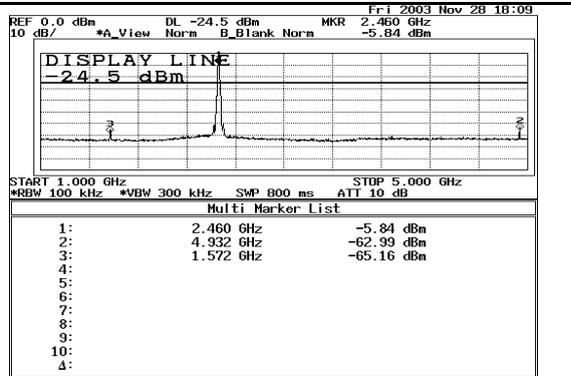
Out of Band Emission : Conducted

Ch11 : 2462MHz

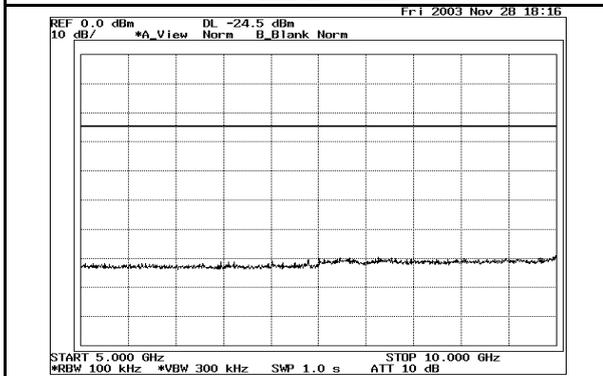
30MHz-1GHz



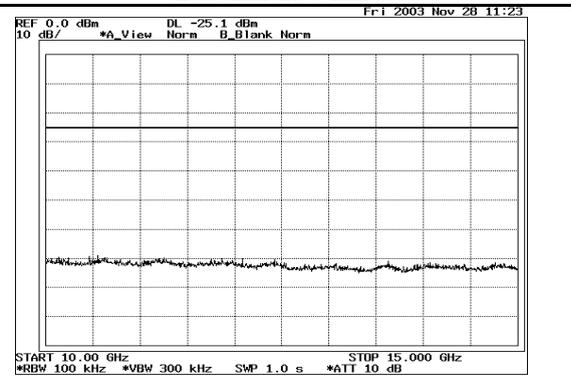
1GHz-5GHz



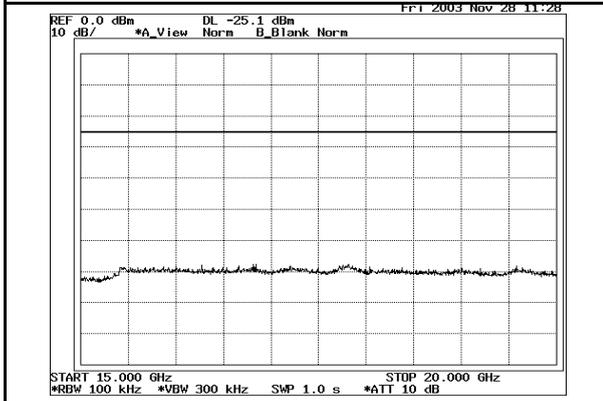
5GHz-10GHz



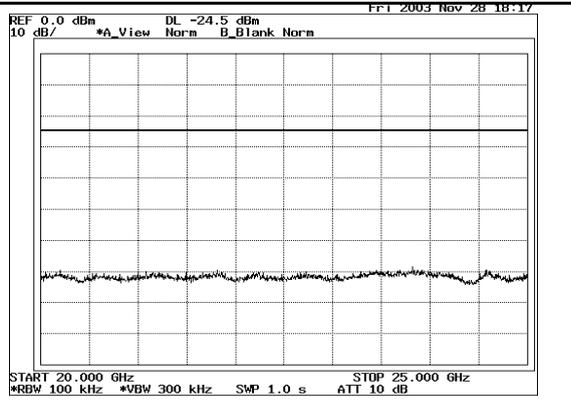
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



Power Density (Conducted)

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

COMPANY : Sharp Corporation
EQUIPMENT : Personal mobile tool (PDA)
MODEL : SL-6000L
SAMPLE NO. : No.17
POWER : AC120V/60Hz
MODE : Tx (ch1,6,11)

REGULATION : Fcc Part15 Subpart C 15.247(d)
TEST DISTANCE : -
DATE : 11/28/2003
TEMPERATURE : 21
HUMIDITY : 61%

ENGINEER : Naoki Sakomoto

ch	FREQ [MHz]	S/A Reading [dBm]	Cable Loss [dB]	ATTEN [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
ch1	2412.6	-18.42	0.4	6.0	-12.0	8.0	20.0
ch6	2437.6	-18.43	0.4	6.0	-12.0	8.0	20.0
ch11	2462.6	-18.78	0.4	6.0	-12.4	8.0	20.4

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

UL Apex Co., Ltd.

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Facsimile : +81 596 24 8124

MF060b(10.04.03)

Power Density

