



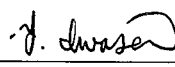
EMI TEST REPORT

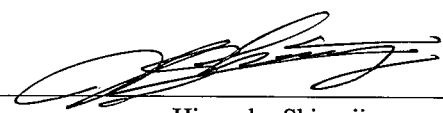
Test Report No. : 23FE0057-HO-1

Applicant : Sharp Corporation
Type of Equipment : TabletPC
Model No. : PC-TN10W
Test standard : FCC Part 15 Subpart C
Section 15.207, Section 15.247
FCC ID : APYNAR0050
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 : April 7 and 11, 2003

Tested by : 
Yoshiaki Iwasa
Head Office EMC Lab.

Approved by : 
Hironobu Shimoji
Group Leader of Head Office EMC Lab.

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SECTION 1: Client information

Company name : Sharp Corporation
Address : 492 Minosho-cho, Yamatokoriyama-shi, Nara 639-1186, Japan
Telephone Number : +81-743-55-7344
Facsimile Number : +81-743-52-0004
Contact Person : Masao Mikamo

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

2.1 Identification of E.U.T.

Type of Equipment : TabletPC
Model No. : PC-TN10W
Serial No. : CG-0001
Rating : AC100-240V (50-60Hz)
Country of Manufacture : Japan
Receipt Date of Sample : April 4, 2003
Condition of EUT : Engineering prototype

2.2 Product Description

SHARP CORPORATION. Model: PC-TN10W (referred to as the EUT in this report) is the TabletPC.
The specification is as following;

Equipment identification	:	TabletPC
Intended use/Purpose of the equipment	:	Wireless LAN Transceiver
Equipment Type	:	Transceiver
Frequency of Operation	:	from 2412MHz to 2462MHz
Rated RF output in Watts	:	16 dBm (Typical) = 40mW (Typical)
Other Clock Frequency	:	32.768MHz, 8MHz, 12MHz, 14.316MHz, 24.576MHz, 25MHz
Frequency tolerance (%/Hz/ppm)	:	better than 25ppm
Emission designation (ITU code)	:	22M0P7D
Modulation	:	DSSS[DBPSK, DQPSK, CCK]
Bandwidth / Channel spacing	:	44MHz / 5MHz
Transmit power or power range	:	MAX 16.25dBm
Duty cycle	:	Up to 100%
Channel access protocol	:	N/A
Mode of operation	:	Simplex
Antenna Type	:	Diversity antenna
Antenna Gain	:	-2 dBi
Operating temperature range	:	10 deg. C. to 40 deg. C.
Power & Signal Cable Length	:	≤3m

***FCC Part 15.31 (e)**

The host device provide the stable power supply (DC: 3.3V), and the TabletPC complies power supply regulation.

***FCC Part 15.203 Antenna requirement**

TabletPC and its antenna comply with this requirement since they are built in host device, PC-TN10W when they are used with a particular antenna connector.

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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	12.8dB 0.1500MHz L1	Complied
2	6dB Bandwidth	ANSI C63.4:2001	Section 15.247(a)(2)	Conducted	N/A	7.655MHz 2412MHz	Complied
3	Maximum Peak Output Power	ANSI C63.4:2001	Section 15.247(b)(3)	Conducted	N/A	2435.1MHz 6.9dB	Complied
4	Out of Band Emission	ANSI C63.4:2001	Section 15.247 (c)	Conducted/ Radiated	N/A	8.7dB 14622.0MHz PK detect	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)	Conducted	N/A	8.5dB 2437.5MHz	Complied

These tests were also referred to FCC 97-114 "Guidance on Measurement for Direct Sequence Spread Spectrum Systems.

3.3 Additions to Standards

No addition, deviation or exclusion has been made from standards.

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.

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3.5 Uncertainty

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test was $\pm 1.3\text{dB}$.

☐ The data listed in this test report may exceed the test limit because it does not have enough margin.

☒ 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 Loop antenna is $\pm 1.9\text{dB}$.

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.5\text{dB}$.

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}$.

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 6.6\text{dB}$.

☐ The data listed in this test report may exceed the test limit because it does not have enough margin.

☒ The data listed in this test report has enough margin.

Other test except Conducted Emission and Spurious Emission(Radiated)

The measurement uncertainty (with a 95% confidence level) for this test was $\pm 3.0\text{dB}$.

☐ The data listed in this test report may exceed the test limit because it does not have enough margin.

☒ The data listed in this test report has enough margin.

3.6 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. No.2 semi anechoic chamber, 7.5 x 5.8 x 5.2m.

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This 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)

*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

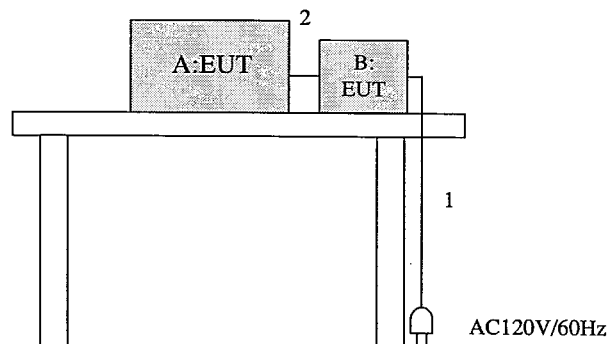
The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used :

1. Transmitting mode (ch1:2412MHz)
2. Transmitting mode (ch6:2437MHz)
3. Transmitting mode (ch11:2462MHz)

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	Remark
A	TabletPC	PC-TN10W	CG-0001	Sharp Corporation	APYNAR0050	EUT
B	AC Adaptor	EA-MU01V	3U015531	Sharp Corporation	APYNAR0050	EUT

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	AC Power Cable	1.9	N	Polyvinyl chloride
2	DC Power Cable	1.05	N	Polyvinyl chloride

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. I/O cables 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. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT on a reference ground plane 4.0 x 4.0m in No.2 semi anechoic chamber (7.5 x 5.8 x 5.2m). 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 : SA-07, MTR-02, MCC-13, MLS-06

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 : MTR-01, MCC-06

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

[Conducted]

Test Procedure

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

Test data : APPENDIX 3
Test result : Pass
Test instruments : MPM-01, MPSE-03, MAT-20

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 : MTR-01, 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 (7.5 x 5.8 x 5.2m) with a ground plane and at a distance of 3m.

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 : MTR-01, MCC-13, MCC-05, MCC-06, MHA-05, MPA-01
MBA-03, MLA-03, MPA-04, MHA-03, MHA-01

SECTION 9: Power Density, Section 15.247(d)

[Conducted]

Test Procedure

The 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-06

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Page 25 : Maximum Peak Output Power

Page 26-39 : Out of Band Emission and Restricted Band Edge

Page 40-41 : Power Density

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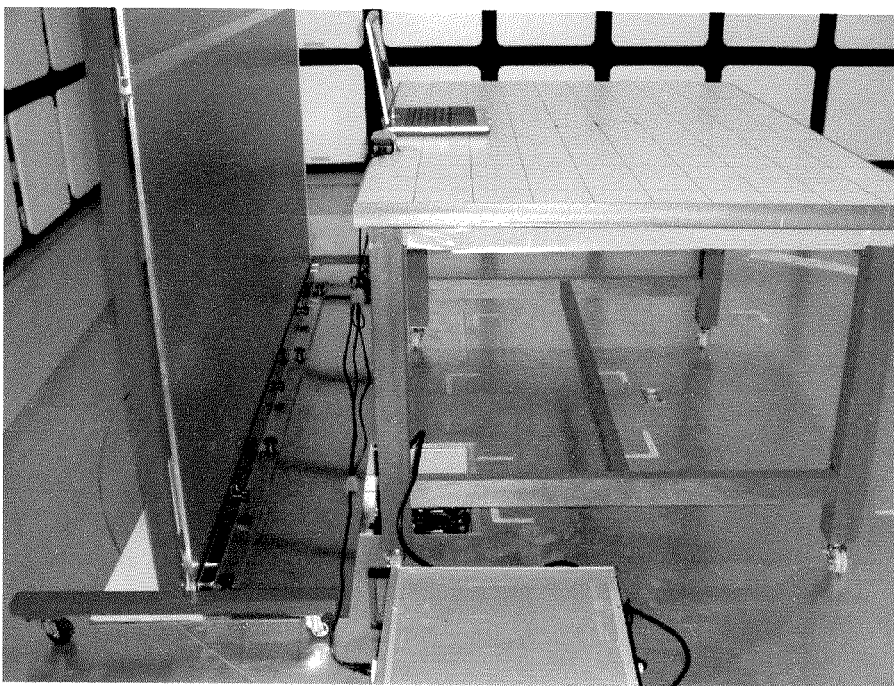
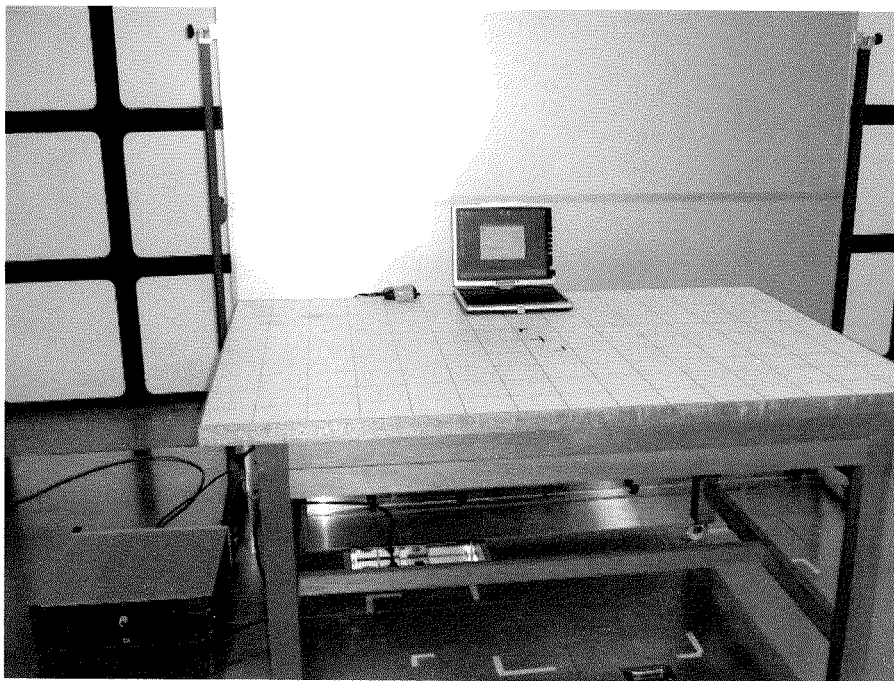
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APPENDIX 1: Photographs of test setup

Conducted Emission



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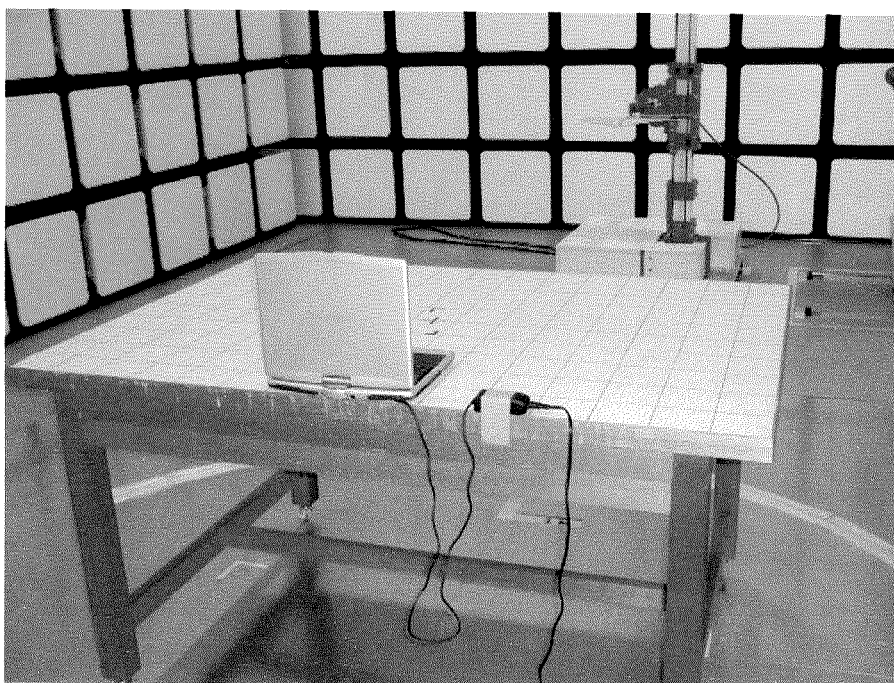
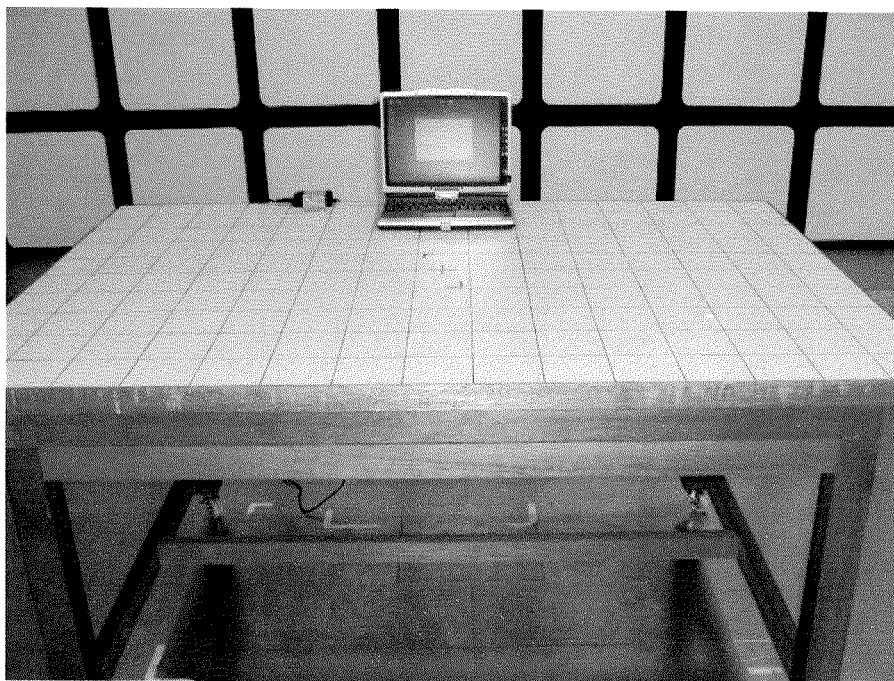
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Spurious Emission(Radiated)



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