



# RADIO TEST REPORT

Test Report No. : 27BE0185-HO-A

**Applicant** : silex technology, Inc.  
**Type of Equipment** : Wireless 11g MiniPCI Adapter  
**Model No.** : SX-10WG  
**FCC ID** : N6C-SX10WG  
**Test standard** : FCC Part 15 Subpart C  
Section 15.207, Section 15.247: 2006  
\*Only Spurious emission and Maximum power  
test items were performed  
based on addition of antenna.  
**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 the above regulation.
4. The test results in this report are traceable to the national or international standards.


**Date of test:**

September 30 and October 2, 2006

**Tested by:**

  
Hiroka Umeyama  
EMC Services

**Approved by :**

  
Naoki Sakamoto  
Group Leader of  
EMC Services



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.  
\*As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://ulapex.jp/emc/nvlap.htm>

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## **SECTION 1: Client information**

Company Name : silex technology, Inc.  
Address : 15-15 Takaida Higashi-Osaka-shi Osaka, 577-0802 Japan  
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Contact Person : Toshirou Kometani

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

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

Type of Equipment : Wireless 11g MiniPCI Adapter  
Model No. : SX-10WG  
Serial No. : YM050727  
Country of Manufacture : JAPAN  
Rating : DC3.3V(+/-10%) / 0.5A  
Receipt Date of Sample : August 24, 2006  
Condition of EUT : Production Prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)

## 2.2 Product Description

Model No: SX-10WG is the Wireless 11g MiniPCI Adapter for a station of Wireless LAN 11b/g.

|                        |   |
|------------------------|---|
| <b>Clock frequency</b> | Wireless chip set: 2.4GHz   |
| <b>Feature of EUT</b>  | This is the IEEE802.11b/g Wireless LAN Adapter.<br>This Adapter has MiniPCI I/F for connecting to Host Computer.<br>The Host Computer can be Wireless LAN Station by connecting this adapter. (PC, or Embedded System or etc..) |

|  |   |
|--|---|
| <b>Equipment Type</b>                  | Transceiver   |
| <b>Frequency of Operation</b>          | 2412-2462MHz  |
| <b>Bandwidth &amp; channel spacing</b> | 22MHz / 5MHz  |
| <b>Type of Modulation</b>              | DSSS / OFDM   |
| <b>Antenna Type</b>                    | Omni-Directional Antenna(IWX-241XRSX9-417)<br>Omni-Directional Antenna(UU33006A0C0)<br>*Additional Antenna (ANTB24-052A0) |
| <b>Antenna Connector Type</b>          | I-PEX   |
| <b>Antenna Gain</b>                    | 2.4 dBi   |
| <b>Mode of Operation</b>               | Simplex   |
| <b>ITU code</b>                        | G1D, D1D  |
| <b>Method of Frequency Generation</b>  | Crystal   |
| <b>Power Supply</b>                    | DC3.3V (+/-10%)   |

*\*The rest of the test which, were not affected by the addition of the antenna, were performed in the Test Report No. 25JE0262-HO-1a.*

### **SECTION 3: Test specification, procedures & results**

#### **3.1 Test Specification**

Test Specification : FCC Part15 Subpart C : 2006  
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207 Conducted limits : 2006  
Section 15.247 Operation within the bands 902-928MHz,  
2400-2483.5MHz, and 5725-5850MHz : 2006

#### **FCC 15.31 (e)**

Power Source, DC3.3V (+/-10%) (not regulated) of EUT is supplied from the Wireless Access point in which EUT is installed. Testing of the radiation of the input power was performed and complied with this requirement. As for details, please refer to Appendix 4.

#### **FCC Part 15.203 Antenna requirement**

The EUT has a unique antenna connector (I-PEX). Therefore the equipment complies with the requirement of 15.203.

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### 3.2 Procedures and results

| No. | Item                      | Test Procedure   | Specification   | Remarks                | Deviation | Worst margin                         | Results  |
|-----|---------------------------|--|---|------------------------|-----------|--------------------------------------|----------|
| 1   | Conducted emission        | FCC: ANSI C63.4:2003<br>7. AC powerline conducted emission measurements<br>IC: RSS-Gen 7.2.2       | FCC: Section 15.207<br>IC: RSS-Gen 7.2.2                              | -                      | N/A *1)   | N/A                                  | N/A      |
| 2   | 6dB Bandwidth             | FCC: ANSI C63.4:2003<br>13. Measurement of intentional radiators<br>IC: RSS-Gen 4.4.2              | FCC: Section 15.247(a)(2)<br>IC: RSS-210 A8.2(1)                      | Conducted              | N/A *1)   | N/A                                  | N/A      |
| 3   | Maximum Peak Output Power | FCC: ANSI C63.4:2003<br>13. Measurement of intentional radiators<br>IC: RSS-Gen 4.6                | FCC: Section 15.247(b)(3)<br>IC: RSS-210 A8.4(4)                      | Conducted              | N/A       | See data.                            | Complied |
| 4   | Restricted Band Edges     | FCC: ANSI C63.4:2003<br>13. Measurement of intentional radiators<br>IC: -                          | FCC: Section 15.247 (d)<br>IC: RSS-210 A8.5                           | Conducted/<br>Radiated | N/A *1)   | N/A                                  | N/A      |
| 5   | Power Density             | FCC: ANSI C63.4:2003<br>13. Measurement of intentional radiators<br>IC: -                          | FCC: Section 15.247 (e)<br>IC: RSS-210 A8.2(2)                        | Conducted              | N/A *1)   | N/A                                  | N/A      |
| 6   | Spurious Emission         | FCC: ANSI C63.4:2003<br>13. Measurement of intentional radiators<br>IC: RSS-Gen 4.7<br>RSS-Gen 4.8 | FCC: Section 15.247(d)<br>IC: RSS-210 A8.5<br>RSS-Gen 7.2.1 and 7.2.3 | Conducted/<br>Radiated | N/A       | 3.1dB, 196.482MHz,<br>Horizontal, QP | Complied |

Note: UL Apex's EMI Work Procedures No.QPM05 and QPM15.

\*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

\*1) The test which was performed in the Test Report No. 25JE0262-HO-1a since there is no influence by the addition of the antenna.

\*These tests were also referred to "Guidance on Measurement of Digital Transmission Systems Operating under Section 15.247".

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### 3.3 Uncertainty

#### Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is  $\pm 4.59\text{dB}(3\text{m})/\pm 4.58\text{dB}(10\text{m})$ .

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is  $\pm 4.62\text{dB}(3\text{m})/\pm 4.60\text{dB}(10\text{m})$ .

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is  $\pm 5.27\text{dB}$ .

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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

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

### 3.4 Test Location

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|                            | 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 | 313583                  | IC4247A                | 19.2 x 11.2 x 7.7m         | 7.0 x 6.0m   | Preparation room |
| No.2 semi-anechoic chamber | 655103                  | IC4247A-2              | 7.5 x 5.8 x 5.2m           | 4.0 x 4.0m   | -                |
| No.3 semi-anechoic chamber | 148738                  | IC4247A-3              | 12.0 x 8.5 x 5.9m          | 6.8 x 5.75m  |                  |
| No.3 shielded room         | -                       | -                      | 4.0 x 6.0 x 2.7m           | N/A  | -                |
| No.4 semi-anechoic chamber | 134570                  | IC4247A-4              | 12.0 x 8.5 x 5.9m          | 6.8 x 5.75m  | -                |
| No.4 shielded room         | -                       | -                      | 4.0 x 6.0 x 2.7m           | N/A  | -                |
| No.5 semi-anechoic chamber | -                       | -                      | 6.0 x 6.0 x 3.9m           | N/A  | -                |
| No.6 shielded room         | -                       | -                      | 4.0 x 4.5 x 2.7m           | 2.0 x 2.0 m  | -                |
| No.6 measurement room      | -                       | -                      | 4.75 x 5.4 x 3.0m          | 4.75 x 5.4 m   | -                |
| No.7 shielded room         | -                       | -                      | 4.7 x 7.5 x 2.7m           | 4.7 x 7.5m   | -                |
| No.8 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, No.2, No.3 and No.4 semi-anechoic chambers and No.7 shielded room.

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

Refer to APPENDIX 1 to 3.

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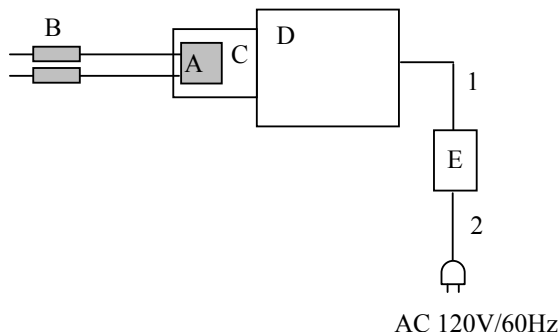
## SECTION 4: Operation of E.U.T. during testing

### 4.1 Operating Modes

The mode used for testing : IEEE 802.11b / 11g  
Low Channel: 2412MHz (Ch1)  
Mid Channel: 2437MHz (Ch6)  
High Channel: 2462MHz (Ch11)

\*There are two antenna ports, A and B. Antennas, Antenna cables, and RF output power of Antenna port A and B are identical. The comparative tests of Maximum Peak Output Power between Antenna Port A and B found that there was no difference in the output level (value) between Antenna Port A and B. Therefore, other tests were performed with Antenna Port B only.

### 4.2 Configuration and peripherals



\*Cabling and setup were 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           | Remarks         |
|-----|------------------------------|----------------|---------------|------------------------|-----------------|
| A   | Wireless 11g MiniPCI Adapter | SX-10WG        | YM050727      | silex technology, Inc. | EUT, N6C-SX10WG |
| B   | Antenna                      | ANTB24-052A0   | 1,2           | silex technology       | EUT             |
| C   | Mini PCI Cardbus Adapter     | -              | -             | silex technology       | -               |
| D   | PC                           | PP350N009X31 2 | Z2026858J     | TOSHIBA                | -               |
| E   | Adapter                      | PA3241V-1ACA   | 0210A0010919G | TOSHIBA                | -               |

#### List of cables used

| No. | Name     | Length (m) | Shield     |            | Remarks |
|-----|----------|------------|------------|------------|---------|
|     |          |            | Cable      | Connector  |         |
| 1   | DC Cable | 2.0        | Unshielded | Unshielded | -       |
| 2   | AC Cable | 2.0        | Unshielded | Unshielded | -       |

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## **SECTION 5: Spurious Emission**

### **[Radiated]**

#### **Test Procedure**

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, 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 linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

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.

#### **20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of FCC15.205.**

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

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

**Test data** : APPENDIX 2  
**Test result** : Pass

## **SECTION 6: Maximum Peak Output Power**

### **Test Procedure**

The test was made with the spectrum analyzer that has a function of channel-power measurements.

**Test data** : APPENDIX 2  
**Test result** : Pass

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