RADIO TEST REPORT

Test Report No. : 29EE0161-HO-01-A

Applicant	:	**silex technology, Inc.**
Type of Equipment	:	**Wireless 11abg Adapter**
Model No.	:	**SX-10WAG-IT**
FCC ID	:	**N6C-SX10WAGIT**
Test regulation	:	**FCC Part 15 Subpart C 2009 Section 15.207, Section 15.247**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: January 9 to March 5, 2009

Tested by:

Tomohisa Nakagawa EMC Services	Takeshi Choda EMC Services	Tomotaka Sasagawa EMC Services
Kenichi Adachi EMC Services	Hisayoshi Sato EMC Services	Norihisa Hashimoto EMC Services

Approved by :

Tetsuo Maeno
Site Manager 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://uljapan.co.jp/emc/nvlap.html

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SECTION 1: Customer information

Company Name	:	silex technology, Inc.
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Facsimile Number	:	+81-774-98-3758
Contact Person	:	Toshiro Kometani

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

Type of Equipment	:	Wireless 11abg Adapter
Model No.	:	SX-10WAG-IT
Serial No.	:	0080920115A5, 0080920115A7, 0080920115A8
Rating	:	DC 3.3V
Receipt Date of Sample	:	January 8, 2009
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model No: SX-10WAG-IT (referred to as the EUT in this report) is the Wireless 11abg Adapter.

Equipment Type	:	Transceiver
Clock frequency	:	33MHz, 40MHz
Method of Frequency Generation	:	Crystal
Operating voltage (inner)	:	DC3.3V +/-0.3V

	IEEE802.11b	IEEE802.11g	IEEE802.11a
Frequency of operation	2412-2462MHz	2412-2462MHz	5180-5320MHz 5745-5825MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel spacing	5MHz	5MHz	20MHz
ITU Code	G1D	D1D	D1D
Antenna type	Omni-Directional	Omni-Directional	Omni-Directional
Antenna Gain	1.5dBi	1.5dBi	2.1dBi

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part15 Subpart C: 2009, final revised on February 27, 2009
Title	:	FCC 47CFR Part15 Radio Frequency Devices Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

* The revision on February 27, 2009 does not influence the test specification applied to the EUT.

FCC 15.31 (e)
The RF Module has own regulator.
The RF Module is constantly provided voltage (DC3.3V) through own regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement
The EUT has a unique coupling/antenna connector (Reverse SMA). Therefore the equipment complies with the requirement of 15.203/212.

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	**FCC:** ANSI C63.4:2003 7. AC powerline conducted emission measurements	**FCC:** Section 15.207	Conducted	N/A	[QP] 16.3dB 0.15000MHz, L [AV] 12.2dB 0.53454MHz, L	Complied
		IC: RSS-Gen 7.2.2	**IC:** RSS-Gen 7.2.2				
2	6dB Bandwidth	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section 15.247(a)(2)	Conducted	N/A	See data.	Complied
		IC: RSS-Gen 4.6.2	**IC:** RSS-210 A8.2(a)				
3	Maximum Peak Output Power	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section 15.247(b)(3)	Conducted	N/A		Complied
		IC: RSS-Gen 4.8	**IC:** RSS-210 A8.4(4)				
4	Restricted Band Edges	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section 15.247 (d)	Conducted/ Radiated	N/A		Complied
		IC: -	**IC:** RSS-210 A8.5				
5	Power Density	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section 15.247 (e)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.2(b)				
6	Spurious Emission	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section15.247(d)	Conducted/ Radiated	N/A	[Tx] 0.2dB 248.997MHz, Horizontal [Rx] 0.7dB 124.999MHz, Horizontal	Complied
		IC: RSS-Gen 4.9 RSS-Gen 4.10	**IC:** RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3				
Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15.							

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Bandwidth	**IC:** RSS-Gen 4.6.1	**IC:** RSS-Gen 4.6.1	Conducted	N/A	N/A	N/A

* Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room	Conducted emission	Radiated emission (10m*)			Radiated emission (3m*)			Radiated emission (3m*)	
	150kHz-30MHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	1GHz-18GHz	18GHz-40GHz
No.1 semi-anechoic chamber (±)	3.7dB	3.1dB	4.4dB	4.2dB	3.2dB	3.8dB	3.9dB	5.9dB	6.1dB
No.2 semi-anechoic chamber (±)	3.7dB	-	-	-	3.2dB	4.4dB	4.0dB	5.9dB	6.1dB
No.3 semi-anechoic chamber (±)	3.7dB	-	-	-	3.2dB	4.6dB	4.0dB	5.9dB	6.1dB
No.4 semi-anechoic chamber (±)	3.7dB	-	-	-	3.2dB	3.9dB	3.9dB	5.9dB	6.1dB

*10m/3m = Measurement distance

Conducted emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)

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 for this test is 3.0dB.

3.5 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	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
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	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 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	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* 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.3 and No.4 shielded rooms.

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

Refer to APPENDIX 1 to 3.

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

4.1 Operating Mode(s)

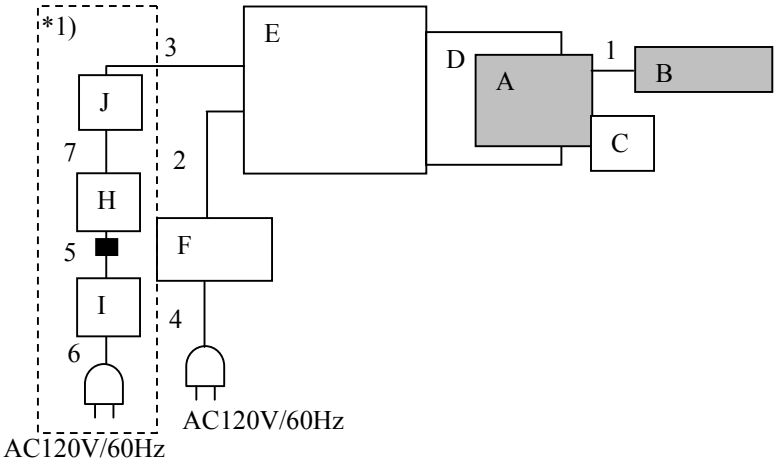
Test Item	Operating Mode	Tested frequency	Used Antenna
Conducted Emission Spurious Emission	-IEEE802.11b Transmitting (Tx), 11Mbps, Payload: PN9	2412MHz(L) 2437MHz(M) 2462MHz(H)	A
	-IEEE802.11g Transmitting (Tx), 24Mbps, Payload: PN9		
	-IEEE802.11a Transmitting (Tx), 24Mbps, Payload: PN9	5745MHz(L) 5785MHz(M) 5825MHz(H)	A
	-IEEE802.11g Transmitting (Tx/Rx), 48Mbps, Turbo, Payload: PN9	2437MHz(M)	A
	-IEEE802.11a Transmitting (Tx/Rx), 48Mbps, Turbo, Payload: PN9	5760MHz(L) 5805MHz(H)	A
	-IEEE802.11b/g Receiving (Rx)	2437MHz(M)	A
	-IEEE802.11a Receiving (Rx)	5785MHz(M)	A
6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	-IEEE802.11b Transmitting (Tx), 11Mbps, Payload: PN9	2412MHz(L) 2437MHz(M) 2462MHz(H)	A
	-IEEE802.11g Transmitting (Tx), 24Mbps, Payload: PN9		
	-IEEE802.11a Transmitting (Tx), 24Mbps, Payload: PN9	5745MHz(L) 5785MHz(M) 5825MHz(H)	A
	-IEEE802.11g Transmitting (Tx), 48Mbps, Turbo, Payload: PN9	2437MHz(M)	A
	-IEEE802.11a Transmitting (Tx/Rx), 48Mbps, Turbo, Payload: PN9	5760MHz(L) 5805MHz(H)	A
Restricted Band Edge	-IEEE802.11b Transmitting (Tx), 11Mbps, Payload: PN9	2412MHz(L) 2462MHz(H)	A
	-IEEE802.11g Transmitting (Tx), 24Mbps, Payload: PN9		
	-IEEE802.11a Transmitting (Tx), 24Mbps, Payload: PN9	5745MHz(L) 5825MHz(H)	A
	-IEEE802.11a Transmitting (Tx), 48Mbps, Turbo, Payload: PN9	5760MHz(L) 5805MHz(H)	A
*Transmitting duty was 100% on all tests.			

*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum power.

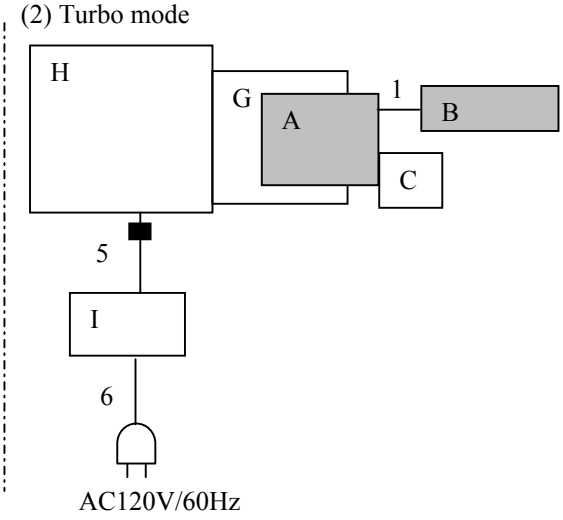
*Radiated Emission level at Turbo mode has no difference from the ones at usual operation mode.
Power Density level at Turbo mode is less than the ones at usual operation mode.
Therefore, only the test items such as Conducted Emission, 6dB Bandwidth, 99% Occupied Bandwidth, Maximum Peak Output Power, and Spurious Emission (Conducted) that would be influenced by the Turbo mode were performed

4.2 Configuration and peripherals

(1) Normal mode



(2) Turbo mode



■ : Standard Ferrite Core

* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
*1) Used for Conducted Emission test only.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless 11abg Adapter	SX-10WAG-IT	0080920115A7 0080920115A5 *2) 0080920115A8 *3)	silex	EUT
B	Antenna	ANTB98-061	001	silex	EUT
C	50 ohm terminator	HP909D	03745	HP	-
D	PCMCIA-MiniPCI converted adapter card	-	-	silex	-
E	Jig	-	-	silex	-
F	AC adapter	VE10B-050	-	FAIRWAY	-
G	PCMCIA-MiniPCI converted adapter card	-	-	silex	-
H	Personal Computer	TYPE1171-81J	97-H2623	IBM	-
I	AC adapter	02K6542	1Z0RM101GHL	IBM	-
J	Bridge	FX-08IS	07GF11145CRSB	PCI	-

*2) Used for the test on January 9, 2009
*3) Used for the test of 11a Turbo mode only

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.12	Shielded	Shielded	-
2	DC Cable	0.9	Unshielded	Unshielded	-
3	LAN Cable	0.9	Unshielded	Unshielded	-
4	AC Cable	0.45	Unshielded	Unshielded	-
5	DC Cable	1.8	Unshielded	Unshielded	-
6	AC Cable	1.0	Unshielded	Unshielded	-
7	LAN Cable	2.0	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)
I/O cable and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm when not connected to the measuring equipment.

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

Detector : quasi-peak and average detector (IF BW 9 kHz)
Measurement range : 0.15-30MHz
Test data : APPENDIX 2
Test result : Pass

SECTION 6: Spurious Emission

[Conducted]
Test Procedure
The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.
It was measured based on "1. RF antenna conducted test" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
The following spectrum analyzer setting was used:

- RBW: 100kHz
- VBW: 300kHz
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

Test data : APPENDIX 2
Test result : Pass

[Radiated]
Test Procedure
It was measured based on "2. Radiated emission test" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m 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.
The radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.

In any 100kHz bandwidth outside the restricted 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 / Table 2 of RSS-210 2.7 (IC) and outside the restricted band of FCC15.205 / Table 1 of RSS-210 2.7 (IC).

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver / Spectrum Analyzer	Spectrum Analyzer *1)
Detector IF Bandwidth	QP: BW 120kHz(T/R) 20dBc : RBW: 100kHz VBW: 300kHz (S/A)	PK: RBW: 1MHz/VBW: 1MHz AV *2): RBW: 1MHz/VBW: 10Hz 20dBc: RBW: 100kHz/VBW: 300kHz

*1) The Spectrum Analyzer was used in 3dB resolution bandwidth.
*2) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of Module and Antenna 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 7: Bandwidth

6dB Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.
It was measured based on "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
The following spectrum analyzer setting was used:

- Span: 50MHz
- RBW: 100kHz
- VBW: 300kHz
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

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

99% Occupied Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.
The following spectrum analyzer setting was used:

- Span: Enough width to display 20dB Bandwidth
- RBW: as close to 1% of the Span as is possible without being below 1%
- VBW: Three times of RBW
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

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

SECTION 8: Maximum Peak Output Power

Test Procedure

The Maximum Peak Output Power was measured with a power meter (tested bandwidth: 50MHz) connected to the antenna port.
It was measured based on "Power Output Option 1" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".

Test data : APPENDIX 2
Test result : Pass

SECTION 9: Peak Power Density

[Conducted]
Test Procedure
The Peak Power Density was measured with a spectrum analyzer connected to the antenna port.
It was measured based on "PSD Option 1" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".

		[IEEE802.11b]	**[IEEE802.11g]**	**[IEEE802.11a]**
- Span	:	9MHz	18MHz	18MHz
- RBW	:	30kHz *)	30kHz *)	30kHz *)
- VBW	:	100kHz	100kHz	100kHz
- Sweep	:	300sec (Span/RBW)	600sec (Span/RBW)	600sec (Span/RBW)
- Detector	:	Peak	Peak	Peak
- Trace	:	Clear Write	Clear Write	Clear Write

*) The test was not performed at RBW: 3kHz that was stated in the Regulation.
However, the measurement value with RBW: 3kHz is less than the value of RBW: 30kHz and the test data met the limit with RBW: 3kHz.

Test data : APPENDIX 2
Test result : Pass