RADIO TEST REPORT

Test Report No. : 27KE0198-HO-A

Applicant	:	**NEC INFRONTIA CORPORATION**
Type of Equipment	:	**Mobile Terminal EX**
Model No.	:	**S1613-01A**
FCC ID	:	**S4JS1613-01A**
Test standard	:	**FCC Part 15 Subpart C 2007** **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.

Date of test: June 25 to August 22, 2007

Tested by:

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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.htm

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SECTION 1: Client information

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

2.1 Identification of E.U.T.

Type of Equipment	:	Mobile Terminal EX
Model No.	:	S1613-01A
Serial No.	:	#9 used for Radiated spurious emission above 1GHz (11b & 11g, Receiving) #10 used for all other tests
Rating	:	DC12V (AC Adapter input: AC100V-240V)
Country of Manufacture	:	Japan
Receipt Date of Sample	:	June 22, 2007
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No modification by the test lab.

2.2 Product Description

Model No: S1613-01A (referred to as the EUT in this report) is the Mobile Terminal EX.
Clock frequency : 1GHz (CPU), 40MHz (Wireless LAN port)

Equipment Type	Transceiver		
Frequency of Operation	11b/11g	2412MHz - 2462MHz	
	11a	Low	5180MHz - 5240MHz *1)
		Mid	5260MHz - 5320MHz *1) *2)
		Add	5500MHz - 5700MHz *1) *2)
		Upper	5745MHz - 5805MHz *1)
			5825MHz
Type of Modulation	11b	DSSS DBPSK : 1Mbps DQPSK : 2Mbps CCK : 5.5Mbps, 11Mbps	
	11a/11g	OFDM BPSK : 6Mbps, 9Mbps QPSK : 12Mbps, 18Mbps 16QAM : 24Mbps, 36Mbps 64QAM : 48Mbps, 54Mbps	
Channel spacing	11b/11g	5MHz	
	11a	20MHz	
Power Supply (inner)	DC3.3V, DC1.8V		
Antenna Type	Internal antenna		
Antenna Connector Type	U.FL (ANT-A and ANT-B)		
Antenna Gain	0dBi		

*1) Refer to 27KE0198-HO-B, FCC Part 15E(FCC 15.407) report.
*2) Refer to 27KE0198-HO-C, FCC Part 15 Subpart E (FCC 15.407 DFS test only) report.
Remarks : This Wireless Module consists of 1 chip each of 2.4GHz band and 5GHz band.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part15 Subpart C: 2007
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

FCC 15.31 (e)
This EUT provides stable voltage(DC3.3V, 1.8V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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	-	N/A	6.8dB 1.25390MHz, AV, N	Complied
		IC: RSS-Gen 7.2.2	**IC:** RSS-Gen 7.2.2				
2	6dB Bandwidth	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**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:** ANSI C63.4:2003 13. Measurement of intentional radiators	**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:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section 15.247 (d)	Conducted/ Radiated	N/A		Complied
		IC: -	**IC:** RSS-210 A8.5				
5	Power Density	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section 15.247 (e)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.2(b)				
6	Spurious Emission	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section15.247(d)	Conducted/ Radiated	N/A	**[Tx]** 0.5dB 90.007MHz Horizontal **[Rx]** 0.1dB 47.801MHz Vertical	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.							

*These tests were also referred to "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247".
*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.6.1	-	Conducted	N/A	N/A	N/A

3.4 Uncertainty

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

Conducted Emission
The measurement uncertainty for this test is ±2.66dB.
The data listed in this test report has enough margin, more than the site margin.

Spurious Emission (Radiated)
The measurement uncertainty for this test using Biconical antenna is ±4.59dB(3m).
The measurement uncertainty for this test using Logperiodic antenna is ±4.62dB(3m).
The measurement uncertainty for this test using Horn antenna is ±5.27dB.
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	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247-3	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	IC4247-4	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	-

* 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, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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

4.1 Operating Modes

The mode used for test :

WLAN Transmitting (Tx) 11b mode (Payload: PN9)
- Low Channel : 2412MHz(Ch1)
- Mid Channel : 2437MHz(Ch6)
- High Channel : 2462MHz(Ch11)

WLAN Transmitting (Tx) 11g mode (Payload: PN9)
- Low Channel : 2412MHz(Ch1)
- Mid Channel : 2437MHz(Ch6)
- High Channel : 2462MHz(Ch11)

WLAN Transmitting (Tx) 11a mode (Payload: PN9)
- High Channel : 5825MHz(Ch165)

WLAN Receiving (Rx) 11b mode
- Mid Channel : 2437MHz(Ch6)

WLAN Receiving (Rx) 11g mode
- Mid Channel : 2437MHz(Ch6)

WLAN Receiving (Rx) 11a mode
- High Channel : 5825MHz(Ch165)

Conditions: 1) Data Rate : 11b: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps
11g/11a:6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
2) Antenna Connector: ANT-A, ANT-B

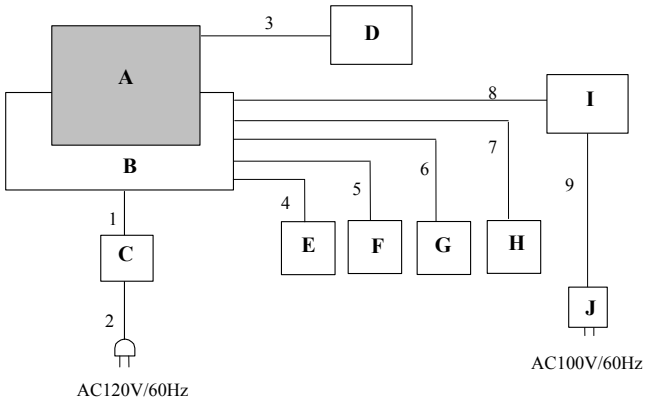
As a result of preliminary test, the formal test was performed under the worst conditions of the above modes.
See the below table for the details of the worst conditions.

Worst Conditions:

Test Item	IEEE802.11b	IEEE802.11g/11a
All tests	Data Rate: 11Mbps Antenna Connector: ANT-A	Data Rate: 54Mbps Antenna Connector: ANT-A

4.2 Configuration and peripherals

1) Conducted emission and Radiated spurious emission



* Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

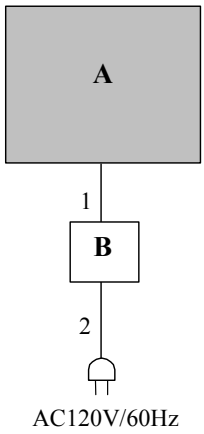
No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Mobile Terminal EX	S1613-01A	#9 *1) #10 *2)	NEC INFRONTIA	EUT
B	Single Docking Station EX	3024A APX	000109022593	NEC INFRONTIA	-
C	AC Adaptor	SQN36W12P-00	0403A0000176G	NAGANO	-
D	Headphone	LT-100	-	Panasonic	-
E	USB Keyboard	TK-U12FY	040107169	ELECOM	-
F	Mouse	M-UB48	LZE02650788	Logitech	-
G	Ten key	TK-BT3	0609200440	ELECOM	-
H	External Floppy Disk Drive	CF-VFDU03	0322374	Panasonic	-
I	Wireless LAN access point	CG-WLBARAG2	1072210051202516	Corega	-
J	AC Adaptor	MT18-3053280-A1	-	Corega	-

*1) Used for Radiated spurious emission above 1GHz, Receiving mode 11b & 11g only.
*2) Used for all other tests.

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	DC Cable	1.2	Unshielded	Unshielded
2	AC Cable	1.8	Unshielded	Unshielded
3	Audio Cable	3.0	Unshielded	Unshielded
4	USB Cable	1.4	Shielded	Shielded
5	USB Cable	0.8	Shielded	Shielded
6	USB Cable	0.8	Shielded	Shielded
7	USB Cable	0.3	Shielded	Shielded
8	LAN Cable	2.0	Unshielded	Unshielded
9	DC Cable	1.8	Unshielded	Unshielded

2) Antenna terminal conducted test



* 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	Mobile Terminal EX	S1613-01A	#10	NEC INFRONTIA	EUT
B	AC Adaptor	S1596-04/ADPI004	0604B0002947G	NEC INFRONTIA	-

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	DC Cable	1.2	Unshielded	Unshielded
2	AC Cable	1.8	Unshielded	Unshielded

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane 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 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.

Test data : APPENDIX 2
Test result : Pass

[Radiated]
Test Procedure
EUT was placed on a urethane platform of nominal size, 1m by 1.5m, 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), 1m(Upper 10GHz), 0.3m(Upper 30GHz).
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 / 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
Detector IF Bandwidth	QP: BW 120kHz(T/R) 20dBc : RBW: 100kHz VBW: 300kHz (S/A)	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz 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 7: Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

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 ".

Test data : APPENDIX 2
Test result : Pass