



SAR TEST REPORT

Test Report No. : 27LE0221-HO-D

Applicant : NEC Corporation
Type of Equipment : Factory Computer FC-NOTE series
Model No. : FC-N21S/BY5SS
FCC ID : BSFFC-N21S
Test standard : FCC47CFR 2.1093
FCC OET Bulletin 65, Supplement C
Test Result : Complied

Max. SAR Value (IEEE 802.11a)

: 5180-5320MHz Band 0.701W/kg (5320MHz)
: 5745-5825MHz Band 0.639W/kg (5825MHz)

1. This test report shall not be reproduced except full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above standard(s). We hereby certify that the data contain a true representation of the SAR profile.
4. The test results in this test report are traceable to the national or international standards.

Date of test:

August 3, 4, 20, 2007

Tested by:

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CONTENTS	PAGE
SECTION 1: Client information	4
SECTION 2 : Equipment under test (E.U.T.).....	4
2.1 Identification of E.U.T.....	4
2.2 Identification of Wireless LAN Module	4
2.3 Product Description	5
SECTION 3 : Test standard information	7
3.1 Requirements for compliance testing defined by the FCC.....	7
3.2 Exposure limit	8
SECTION 4 : Test result.....	9
4.1 Result of Max. SAR value.....	9
4.2 Test Location	9
SECTION 5 : Operation of E.U.T. during testing.....	10
5.1 Confirmation before SAR testing.....	10
5.2 Confirmation after SAR testing	10
5.3 Operating modes for SAR testing	11
5.4 Test setup of EUT	13
SECTION 6 : Test surrounding	14
6.1 Measurement uncertainty	14
SECTION 7 : Confirmation before SAR testing	15
7.1 Correlation of EMC power and SAR power	15
7.2 Reference data of SAR test.....	18
7.3 Result of Duty factor verifications	21
SECTION 8 : Measurement results	22
8.1 Body SAR 5GHz (Main antenna/ Low band mode 5180-5320MHz).....	22
8.2 Body SAR 5GHz (Aux antenna/ Low band mode 5180-5320MHz)	23
8.3 Body SAR 5GHz (Main antenna/ High band mode 5745-5825MHz)	24
8.4 Body SAR 5GHz (Aux antenna/ High band mode 5745-5825MHz)	25

APPENDIX 1 : Photographs of test setup	26
1. Photograph of EUT	27
2. Photograph of set up	28
APPENDIX 2 : SAR Measurement data	45
1. Evaluation procedure	46
2. Measurement data (Body SAR 5GHz IEEE 802.11a Low band mode 5180-5320MHz)	47
3. Measurement data (Body SAR 5GHz IEEE 802.11a High band mode 5745-5825MHz)	75
APPENDIX 2 : Test instruments	100
1. Equipment used	101
2. Dosimetry assessment setup	102
3. Configuration and peripherals	103
4. System components	104
5. Test system specifications	106
6. Simulated Tissues Composition (5GHz)	108
7. Simulated Tissue Liquid Parameter confirmation (5GHz)	108
8. System validation data (5GHz)	110
9. Validation measurement data	112
10. 5GHz System Validation Dipole (D5GHz V2, S/N: 1039)	115
11. Dosimetric E-Field Probe Calibration (EX3DV3,S/N: 3507)	126
12. References	135

SECTION 1: Client information

Company Name : NEC Corporation
Address : 10 Nissin-cho 1-chome, Fuchu-shi, Tokyo, 183-8501 Japan
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Contact Person : Aya Igarashi

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

2.1 Identification of E.U.T.

Type of Equipment : Factory Computer FC-NOTE series
Model No. : FC-N21S/BY5SS
Serial No. : S760538MA
Battery : Type : Li-ion Battery
Model Name : S760538MA
Rating : 11.1V / 5200mAh
Manufacturer : NEC Corporation
Option Battery : N/A
Accessary : Strap, Touch pen
Size of EUT : About 299(W)*267(H)*50(D) mm
Country of Manufacture : Japan
Receipt Date of Sample : August 1, 2007
Condition of EUT : Production model
Modification of EUT : No modification by the test lab.

2.2 Identification of Wireless LAN Module

Type of Equipment	Wireless LAN Module
Model No.	WM3945ABG
Manufacturer	INTEL

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2.3 Product Description

FC-N21S/BY5SS is Factory Computer FC-NOTE series.

EUT's Clock frequencies are 1.2GHz (CPU) , 40MHz (Wireless LAN port).

FCC/IC granted RF module (model No.: WM3945ABG, FCC ID: FD9WM3945ABG / IC Number: 1000M-3945ABG) is installed in the EUT.

The EUT has variant models as follows:

[Example]

FC-N21S/ u v w x y z :

u= Keyboard :

B: Standard keyboard, C: Keyboard with backlight, E: Standard keyboard with cover,

F: Keyboard with backlight with cover

v= OS :

Y: Windows XP Professional SP2 English version, X: Windows XP Professional SP2 Japanese version

w= Memory capacities :

5: 2GBytes, 2: 256Mbytes, 3: 512Mbytes, 4: 1Gbytes

y= HDD / Battery :

S: Standard HDD(60GB) & Standard Battery,

W: Wide range Temperature HDD(40GB) & Wide range Temperature Battery,

F: Silicon Disk (IDE 8GB) & Standard Battery,

L: Silicon Disk (IDE 8GB) & Light Battery

z= WLAN / Security :

S: With Wireless LAN

W: With Wireless LAN & fingerprint authentication

F: With fingerprint authentication

Z: -

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IEEE802.11b / 11g / 11a WLAN

Equipment Type	Transceiver		
Frequency of Operation	11b/11g	2412MHz - 2462MHz *	
	11a	Low	5180MHz - 5240MHz *
		Mid	5260MHz - 5320MHz *
		Upper	5745MHz - 5805MHz *
			5825MHz *
Channel Support	11b/11g (11Channels)	2412, 2417, 2422, 2427, 2432, 2437, 2442, 2447, 2452, 2457, 2462MHz	
	11a (13 Channels)	5180, 5200, 5220, 5240, 5260, 5280, 5300, 5320MHz 5745, 5765, 5785, 5805, 5825MHz	
Type of Modulation	11b	DSSS (DBPSK, DQPSK, CCK)	
	11g/a	OFDM (BPSK, QPSK, 16QAM, 64QAM)	
Bandwidth & Channel spacing	11b/11g	22MHz & 5MHz	
	11a	18MHz & 20MHz	
ITU code	D1D, G1D		
Antenna Type	Monopole		
Antenna Connector Type	U.FL R-SMT		
Antenna Gain	11b/11g	Main: max +0.81dBi Aux: max +0.22dBi	
	11a	Main: max +0.41dBi(5180-5320MHz), -0.82dBi(5745MHz-5820MHz) Aux: max -1.12dBi(5180-5320MHz), -1.46dBi(5745MHz-5820MHz)	
Maximum Output Power (Peak:FCC15.247)	11b/g	23.82dBm (240.99mW)	
	11a	22.97dBm (198.15mW) / 5825MHz	
Maximum Output Power (Peak:FCC15.407)	11a	16.76dBm (47.42mW) / 5745MHz	

* This Wireless Module consists of one chip each of 2.4GHz band and 5GHz band.

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SECTION 3 : Test standard information

3.1 Requirements for compliance testing defined by the FCC

The US Federal Communications Commission has released the report and order "Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. According to the Supplement C of OET Bulletin 65 "Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

1 Specific Absorption Rate (SAR) is a measure of the rate of energy absorption due to exposure to an RF transmitting source (wireless portable device).

2 IEEE/ANSI Std. C95.1-1992 limits are used to determine compliance with FCC ET Docket 93-62.

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3.2 Exposure limit

(A) Limits for Occupational/Controlled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.4	8.0	20.0

(B) Limits for General population/Uncontrolled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.08	1.6	4.0

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

General Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

**NOTE:GENERAL POPULATION/UNCONTROLLED EXPOSURE
SPATIAL PEAK(averaged over any 1g of tissue) LIMIT
1.6 W/kg**

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SECTION 4 : Test result

4.1 Result of Max. SAR value

Max. SAR value (IEEE 802.11a) :	5180-5320MHz Band	0.701W/kg (5320MHz)
:	5745-5825MHz Band	0.460W/kg (5745MHz)

4.2 Test Location

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SECTION 5 : Operation of E.U.T. during testing

5.1 Confirmation before SAR testing

Correlation of EMC power and SAR power (WLAN IEEE802.11a)

Peak Power test

As for the peak power, the data of EMC test(August 7, 16, 2007) is shown as a reference data.
The result is shown in section 7.1.

Average Power test

It was checked that the antenna port power is correlated within 0~+5% (FCC requirements) at EMC test result (August 7, 16, 2007).

5.2 Confirmation after SAR testing

It was checked that the powerdrift is within $\pm 5\%$ in the evaluation procedure of SAR testing.
The result is shown in APPENDIX 2.

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5.3 Operating modes for SAR testing

5.3.1 Setting of EUT

1. IEEE 802.11a Low band mode

Tx frequency band : 5180-5320MHz
Channel : 36ch(5180MHz),52ch(5260MHz),64ch(5320MHz)
Modulation : OFDM (BPSK,QPSK,16QAM,64QAM)
Crest factor * : 1.1(6Mbps),1.2(12Mbps),1.4(24Mbps),1.7(48Mbps)

The result is shown in section 7.3.

* Crest factor decision in SAR testing

Modulation	BPSK (6Mbps)	QPSK (12Mbps)	16QAM (24Mbps)	64QAM (48Mbps)
DutyCycle[%]	91	84	73	58
Crestfactor	1.1	1.2	1.4	1.7

2. IEEE 802.11a High band mode

Tx frequency band : 5745-5825MHz
Channel : 149ch(5745MHz),157ch(5785MHz),165(5825MHz)
Modulation : OFDM (BPSK,QPSK,16QAM,64QAM)
Crest factor * : 1.1(6Mbps),1.2(12Mbps),1.4(24Mbps),1.7(48Mbps)

The result is shown in section 7.3.

* Crest factor decision in SAR testing

Modulation	BPSK (6Mbps)	QPSK (12Mbps)	16QAM (24Mbps)	64QAM (48Mbps)
DutyCycle[%]	91	84	73	58
Crestfactor	1.1	1.2	1.4	1.7

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5.3.2 Measurement procedure (Radiated power is always monitored by Spectrum Analyzer.)

1. IEEE 802.11a Low band mode

The tests from Step1 to Step3 were performed with Main antenna and AUX antenna respectively.

Step1. The data rate in the higher average power* of each modulation was decided, then the worst modulation was searched in the SAR testing.

Step2. The searching for the worst position

This test was performed at the worst condition of Step1.

Step3. The test for the Low and High channels

This test was performed at the worst conditions of Step2.

2. IEEE 802.11a High band mode

The tests from Step1 to Step3 were performed with Main antenna and AUX antenna respectively.

Step4. The data rate in the higher average power* of each modulation was decided, then the worst modulation was searched in the SAR testing.

Step5. The searching for the worst position

This test was performed at the worst condition of Step4.

Step6. The test for the Low and High channels

This test was performed at the worst conditions of Step5.

3. Change distance between EUT and Flat phantom

Step7. Change separation

The measurement was performed with the distance, 5mm, 10mm and 15mm to check if the shortest distance may not have the worst value at the conditions of the highest SAR value.

* Refer to the average power data to Section 7.3.

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5.4 Test setup of EUT

When users operate or carry the EUT, it could be considered to touch or get close to their bodies. In order to assume this situation, we performed the test at the following positions. Please refer to "APPENDIX 1" for more details.

1. Main Top (Notebook type)
: The test was performed in touch with top side (Main antenna) of the EUT to the flat phantom.
2. Main Top (Tablet type)
: The test was performed in touch with top side (Main antenna) of the EUT to the flat phantom.
3. Main Back of display (Notebook type)
: The test was performed in touch with right back of display surface (Main antenna) of the EUT to the flat phantom.
4. Main Bottom (Notebook type)
: The test was performed in touch with right bottom surface (Main antenna) of the EUT to the flat phantom.
5. Main Front of display (Tablet type)
: The test was performed in touch with right front of display surface (Main antenna) of the EUT to the flat phantom.
6. Main Right Side (Tablet type)
: The test was performed in touch with right side (Main antenna) of the EUT to the flat phantom.
7. Main Bottom (Tablet type)
: The test was performed in touch with right bottom surface (Main antenna) of the EUT to the flat phantom.
8. AUX Top (Notebook type)
: The test was performed in touch with top side (AUX antenna) of the EUT to the flat phantom.
9. AUX Top (Tablet type)
: The test was performed in touch with top side (AUX antenna) of the EUT to the flat phantom.
10. AUX Back of display (Notebook type)
: The test was performed in touch with left back of display surface (AUX antenna) of the EUT to the flat phantom.
11. AUX Bottom (Notebook type)
: The test was performed in touch with left bottom surface (AUX antenna) of the EUT to the flat phantom.
13. AUX Front of display (Tablet type)
: The test was performed in touch with left front of display surface (AUX antenna) of the EUT to the flat phantom.
14. AUX Left Side (Tablet type)
: The test was performed in touch with left side (AUX antenna) of the EUT to the flat phantom.
15. AUX Bottom (Tablet type)
: The test was performed in touch with left bottom surface (AUX antenna) of the EUT to the flat phantom.
16. AUX Back of display (Notebook type, separation 5mm)
: The measurement opened 5mm distance between the EUT and the flat phantom.
17. AUX Back of display (Notebook type, separation 10mm)
: The measurement opened 10mm distance between the EUT and the flat phantom.
18. AUX Back of display (Notebook type, separation 15mm)
: The measurement opened 15mm distance between the EUT and the flat phantom.

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SECTION 6 : Test surrounding

6.1 Measurement uncertainty

The uncertainty budget has been determined for the DASY4 measurement system according to the SPEAG documents[6][7] and is given in the following Table.

Error Description	Uncertainty value $\pm$ %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or v _{eff}
Measurement System						
Probe calibration	± 6.8	Normal	1	1	± 6.8	∞
Axial isotropy of the probe	± 4.7	Rectangular	$\sqrt{3}$	$(1-cp)^{1/2}$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	$\sqrt{3}$	$(cp)^{1/2}$	± 3.9	∞
Boundary effects	± 2.0	Rectangular	$\sqrt{3}$	1	± 1.2	∞
Probe linearity	± 4.7	Rectangular	$\sqrt{3}$	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	$\sqrt{3}$	1	± 0.6	∞
Readout electronics	± 0.3	Normal	1	1	± 0.3	∞
Response time	± 0.8	Rectangular	$\sqrt{3}$	1	± 0.5	∞
Integration time	± 2.6	Rectangular	$\sqrt{3}$	1	± 1.5	∞
RF ambient Noise	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
RF ambient Reflections	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	Rectangular	$\sqrt{3}$	1	± 0.5	∞
Probe positioning	± 9.9	Rectangular	$\sqrt{3}$	1	± 5.7	∞
Max.SAR Eval.	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Test Sample Related						
Device positioning	± 2.9	Normal	1	1	± 2.9	50
Device holder uncertainty	± 3.6	Normal	1	1	± 3.6	9
Power drift	± 5.0	Rectangular	$\sqrt{3}$	1	± 5.8	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 5.0	Rectangular	1	0.64	± 3.2	∞
Liquid permittivity (target)	± 10.0	Rectangular	$\sqrt{3}$	0.6	± 3.5	∞
Liquid permittivity (meas.)	± 10.0	Rectangular	1	0.6	± 6.0	∞
Combined Standard Uncertainty					± 14.787	
Expanded Uncertainty (k=2)					± 29.57	

SECTION 7 : Confirmation before SAR testing

7.1 Correlation of EMC power and SAR power

7.1.1 EMC power

This data is reference data of EMC test.

FCC15.407 Maximum Peak Output Power

Date of test: August 16, 2007 (Report No. 27LE0180-YK-B-R1)

ANT:Main (Worst), 12Mbps (Worst)

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
36	5180.0	2.21	1.30	10.09	13.60	22.91
52	5260.0	2.89	1.29	10.08	14.26	26.67
64	5320.0	3.90	1.28	10.08	15.26	33.57
149	5745.0	5.33	1.36	10.07	16.76	47.42
153	5765.0	5.08	1.37	10.06	16.51	44.77
161	5805.0	4.87	1.38	10.06	16.31	42.76

ANT:Aux (Reference), 12Mbps

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
36	5180.0	2.10	1.30	10.09	13.49	22.34
52	5260.0	2.70	1.29	10.08	14.07	25.53
64	5320.0	3.30	1.28	10.08	14.66	29.24
149	5745.0	4.83	1.36	10.07	16.26	42.27
153	5765.0	4.48	1.37	10.06	15.91	38.99
161	5805.0	4.00	1.38	10.06	15.44	34.99

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

FCC15.247 Maximum Peak Output Power)

Date of test: August 7, 2007 (Report No. 27LE0180-YK-A-R1)

[IEEE802.11a] 12Mbps (Worst)

Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
165	5825.0	9.80	2.93	10.24	22.97	198.15

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

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Reference data for SAR testing (Average power of EMC test)

Date of test: August 16, 2007 (Report No. 27LE0180-YK-B-R1)

ANT:Main, 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
36	5180.0	1.90	1.30	10.09	13.29	21.33

ANT:Main, 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
149	5745.0	3.67	1.36	10.07	15.10	32.36

Date of test: August 7, 2007 (Report No. 27LE0180-YK-A)

ANT:Main, 12Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
165	5825.0	1.55	2.93	10.24	14.72	29.65

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

ANT:Aux, 12Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
36	5180.0	0.97	1.30	10.09	12.36	17.22

ANT:Aux, 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
149	5745.0	3.48	1.36	10.07	14.91	30.97

ANT:Aux, 12Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
165	5825.0	1.11	2.93	10.24	14.28	26.79

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7.1.2 SAR power (Average power of SAR test)

Date of test: August 3, 2007

ANT:Main, 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
36	5180.0	1.96	1.29	10.09	13.34	21.58

Date of test: August 20, 2007

ANT:Main, 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
149	5745.0	3.83	1.29	10.07	15.19	33.04

Date of test: August 20, 2007

ANT:Main, 12Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
165	5825.0	3.39	1.29	10.24	14.92	31.05

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

ANT:Aux, 12Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
36	5180.0	1.08	1.29	10.09	12.46	17.62

ANT:Aux, 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
149	5745.0	3.62	1.29	10.07	14.98	31.48

ANT:Aux, 12Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm] [mW]	
165	5825.0	2.89	1.29	10.24	14.42	27.67

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7.2 Reference data of SAR test

7.2.1 Data rate deterring

Date of test: August 3, 2007

11a Low Ba 11a Low Band mode

ANT:Main Average

Modulation	Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]
BPSK	6	5260.0	2.04	1.29	10.08	13.41
BPSK	9	5260.0	1.77	1.29	10.08	13.14
QPSK	12	5260.0	1.27	1.29	10.08	12.64
QPSK	18	5260.0	1.19	1.29	10.08	12.56
16QAM	24	5260.0	0.72	1.29	10.08	12.09
16QAM	36	5260.0	0.19	1.29	10.08	11.56
64QAM	48	5260.0	-0.24	1.29	10.08	11.13
64QAM	54	5260.0	-1.19	1.29	10.08	10.18

ANT:Aux Average

Modulation	Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]
BPSK	6	5260.0	1.91	1.29	10.08	13.28
BPSK	9	5260.0	1.72	1.29	10.08	13.09
QPSK	12	5260.0	1.27	1.29	10.08	12.64
QPSK	18	5260.0	0.80	1.29	10.08	12.17
16QAM	24	5260.0	0.71	1.29	10.08	12.08
16QAM	36	5260.0	0.01	1.29	10.08	11.38
64QAM	48	5260.0	-0.39	1.29	10.08	10.98
64QAM	54	5260.0	-1.19	1.29	10.08	10.18

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Date of test: August 20, 2007

11a High Band mode

ANT:Main Average

Modulation	Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]
BPSK	6	5785.0	3.61	1.29	10.06	14.96
BPSK	9	5785.0	3.59	1.29	10.06	14.94
QPSK	12	5785.0	3.28	1.29	10.06	14.63
QPSK	18	5785.0	3.01	1.29	10.06	14.36
16QAM	24	5785.0	2.60	1.29	10.06	13.95
16QAM	36	5785.0	2.19	1.29	10.06	13.54
64QAM	48	5785.0	-1.25	1.29	10.06	10.10
64QAM	54	5785.0	-3.77	1.29	10.06	7.58

ANT:Aux Average

Modulation	Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]
BPSK	6	5785.0	3.34	1.29	10.06	14.69
BPSK	9	5785.0	3.15	1.29	10.06	14.50
QPSK	12	5785.0	3.05	1.29	10.06	14.40
QPSK	18	5785.0	2.38	1.29	10.06	13.73
16QAM	24	5785.0	2.55	1.29	10.06	13.90
16QAM	36	5785.0	1.55	1.29	10.06	12.90
64QAM	48	5785.0	-1.88	1.29	10.06	9.47
64QAM	54	5785.0	-4.31	1.29	10.06	7.04

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7.2.2 The Power of worst rate of SAR test (Average power of SAR test)

Date of test: August 3, 2007

11a Low Band mode

ANT:Main 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
36	5180.0	1.96	1.29	10.09	13.34	21.58
52	5260.0	2.04	1.29	10.08	13.41	21.93
64	5320.0	3.10	1.29	10.08	14.47	27.99

ANT:Aux 12Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
36	5180.0	1.08	1.29	10.09	12.46	17.62
52	5260.0	1.27	1.29	10.08	12.64	18.37
64	5320.0	2.10	1.29	10.08	13.47	22.23

Date of test: August 20, 2007

11a High Band mode

ANT:Main 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
149	5745.0	3.83	1.29	10.07	15.19	33.04
157	5785.0	3.61	1.29	10.06	14.96	31.33
165	5825.0	3.27	1.29	10.24	14.80	30.20

ANT:Aux 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
149	5745.0	3.62	1.29	10.07	14.98	31.48
157	5785.0	3.34	1.29	10.06	14.69	29.44
165	5825.0	2.93	1.29	10.24	14.46	27.93

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7.3 Result of Duty factor verifications

The maximum duty factor of test mode was checked. The results are in the table below.
When the user uses EUT, the duty factor is not exceeded from the duty factor of the test mode.

IEEE 802.11a Low band mode& High band mode		
DATA rate [Mbps]	Duty [%]	Crest factor for SAR
BPSK (6Mbps)	91	1.1
BPSK (9Mbps)	87	N/A*
QPSK (12Mbps)	84	1.2
QPSK (18Mbps)	78	N/A*
16QAM (24Mbps)	73	1.4
16QAM (36Mbps)	64	N/A*
64QAM (48Mbps)	58	1.7
64QAM (54Mbps)	55	N/A*

*Reference: SAR test was not performed at the data rate.

SECTION 8 : Measurement results

8.1 Body SAR 5GHz (Main antenna/ Low band mode 5180-5320MHz)

Date : August 3, 2007 Measured By : Hisayoshi Sato
Liquid Depth (cm) : 15.0 Model : FC-N21S/BY5SS
Parameters : $\epsilon_r = 46.7, \sigma = 5.49$ Serial No. : S760538MA
Ambient temperature (deg.c.) : 25.0 Modulation : OFDM
Relative Humidity (%) : 55 Crest factor : See to section 7.3

BODY SAR MEASUREMENT RESULTS										
Frequency			Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Bnad	Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum value of multi-peak
Low band 5180- 5320MHz	Step 1. The searching for the worst modulation									
	52	5260	BPSK(6Mbps)	Flat	Main	Top(Notebook type)	0	24.4	24.4	0.224
	52	5260	QPSK(12Mbps)	Flat	Main	Top(Notebook type)	0	24.4	24.4	0.188
	52	5260	16QAM(24Mbps)	Flat	Main	Top(Notebook type)	0	24.4	24.4	0.165
	52	5260	64QAM(48Mbps)	Flat	Main	Top(Notebook type)	0	24.3	24.3	0.121
	Step 2. The searching for the worst position									
	52	5260	BPSK(6Mbps)	Flat	Main	Top(Tablet type)	0	24.4	24.4	0.038
	52	5260	BPSK(6Mbps)	Flat	Main	Back of display(Notebook type)	0	24.4	24.4	0.239
	52	5260	BPSK(6Mbps)	Flat	Main	Bottom(Notebook type)	0	24.4	24.4	0.082
	52	5260	BPSK(6Mbps)	Flat	Main	Front of display(Tablet type)	0	24.3	24.3	0.123
	52	5260	BPSK(6Mbps)	Flat	Main	Right side(Tablet type)	0	24.4	24.4	0.024
	52	5260	BPSK(6Mbps)	Flat	Main	Bottom(Tablet type)	0	24.4	24.4	0.082
	Step 3. The test for the Low and High channels									
	36	5180	BPSK(6Mbps)	Flat	Main	Back of display(Notebook type)	0	24.4	24.4	0.090
	64	5320	BPSK(6Mbps)	Flat	Main	Back of display(Notebook type)	0	24.4	24.4	0.529

8.2 Body SAR 5GHz (Aux antenna/ Low band mode 5180-5320MHz)

Date : August 4, 2007 Measured By : Hisayoshi Sato
Liquid Depth (cm) : 15.0 Model : FC-N21S/BY5SS
Parameters : $\epsilon_r = 47.3, \sigma = 5.51$ Serial No. : S760538MA
Ambient temperature (deg.c.) : 24.4 Modulation : OFDM
Relative Humidity (%) : 53 Crest factor : See to section 7.3

BODY SAR MEASUREMENT RESULTS										
Frequency			Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Band	Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum value of multi-peak
Low band 5180- 5320MHz	Step 1. The searching for the worst modulation									
	52	5260	BPSK(6Mbps)	Flat	AUX	Top(Notebook type)	0	24.3	24.3	0.114
	52	5260	QPSK(12Mbps)	Flat	AUX	Top(Notebook type)	0	24.3	24.3	0.209
	52	5260	16QAM(24Mbps)	Flat	AUX	Top(Notebook type)	0	24.3	24.4	0.166
	52	5260	64QAM(48Mbps)	Flat	AUX	Top(Notebook type)	0	24.4	24.4	0.139
	Step 2. The searching for the worst position									
	52	5260	QPSK(12Mbps)	Flat	AUX	Top(Tablet type)	0	24.4	24.4	0.112
	52	5260	QPSK(12Mbps)	Flat	AUX	Back of display(Notebook type)	0	24.4	24.4	0.518
	52	5260	QPSK(12Mbps)	Flat	AUX	Bottom(Notebook type)	0	24.4	24.4	0.082
	52	5260	QPSK(12Mbps)	Flat	AUX	Front of display(Tablet type)	0	24.4	24.4	0.197
	52	5260	QPSK(12Mbps)	Flat	AUX	Left side(Tablet type)	0	24.4	24.4	0.025
	52	5260	QPSK(12Mbps)	Flat	AUX	Bottom(Tablet type)	0	24.4	24.3	0.083
	Step 3. The test for the Low and High channels									
	36	5180	QPSK(12Mbps)	Flat	AUX	Back of display(Notebook type)	0	24.3	24.3	0.369
	64	5320	QPSK(12Mbps)	Flat	AUX	Back of display(Notebook type)	0	24.3	24.3	0.701
	Step 7. Change separation									
	64	5320	QPSK(12Mbps)	Flat	AUX	Back of display(Notebook type)	5	24.3	24.3	0.379
	64	5320	QPSK(12Mbps)	Flat	AUX	Back of display(Notebook type)	10	24.3	24.3	0.211
	64	5320	QPSK(12Mbps)	Flat	AUX	Back of display(Notebook type)	15	24.3	24.3	0.110

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8.3 Body SAR 5GHz (Main antenna/ High band mode 5745-5825MHz)

Date : August 20, 2007 Measured By : Hisayoshi Sato
Liquid Depth (cm) : 15.0 Model : FC-N21S/BY5SS
Parameters : $\epsilon_r = 44.5, \sigma = 6.23$ Serial No. : S760538MA
Ambient temperature (deg.c.) : 25.0 Modulation : OFDM
Relative Humidity (%) : 55 Crest factor : See to section 7.3

BODY SAR MEASUREMENT RESULTS										
Frequency			Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Band	Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum value of multi-peak
Low band 5745- 5825MHz	Step 4. The searching for the worst modulation									
	157	5785	BPSK(6Mbps)	Flat	Main	Top(Notebook type)	0	24.5	24.5	0.323
	157	5785	QPSK(12Mbps)	Flat	Main	Top(Notebook type)	0	24.5	24.5	0.257
	157	5785	16QAM(24Mbps)	Flat	Main	Top(Notebook type)	0	24.5	24.5	0.250
	157	5785	64QAM(48Mbps)	Flat	Main	Top(Notebook type)	0	24.5	24.5	0.095
	Step 5. The searching for the worst position									
	157	5785	BPSK(6Mbps)	Flat	Main	Top(Tablet type)	0	24.4	24.4	0.239
	157	5785	BPSK(6Mbps)	Flat	Main	Back of display(Notebook type)	0	24.3	24.3	0.297
	157	5785	BPSK(6Mbps)	Flat	Main	Bottom(Notebook type)	0	24.3	24.3	0.017
	157	5785	BPSK(6Mbps)	Flat	Main	Front of display(Tablet type)	0	24.4	24.3	0.304
	157	5785	BPSK(6Mbps)	Flat	Main	Right side(Tablet type)	0	24.1	24.2	0.030
	157	5785	BPSK(6Mbps)	Flat	Main	Bottom(Tablet type)	0	24.3	24.4	0.012
	Step 6. The test for the Low and High channels									
	149	5745	BPSK(6Mbps)	Flat	Main	Top(Notebook type)	0	24.3	24.3	0.456
	165	5825	BPSK(6Mbps)	Flat	Main	Top(Notebook type)	0	24.3	24.3	0.639

8.4 Body SAR 5GHz (Aux antenna/ High band mode 5745-5825MHz)

Date : August 20, 2007 Measured By : Hisayoshi Sato, Miyo Ikuta
Liquid Depth (cm) : 15.0 Model : FC-N21S/BY5SS
Parameters : $\epsilon_r = 44.5, \sigma = 6.23$ Serial No. : S760538MA
Ambient temperature (deg.c.) : 25.0 Modulation : OFDM
Relative Humidity (%) : 55 Crest factor : See to section 7.3

BODY SAR MEASUREMENT RESULTS										
Frequency			Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Mode	Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum of multi-peak
Low band 5745- 5825MHz	Step 4. The searching for the worst modulation									
	157	5785	BPSK(6Mbps)	Flat	Aux	Top(Notebook type)	0	24.4	24.4	0.411
	157	5785	QPSK(12Mbps)	Flat	Aux	Top(Notebook type)	0	24.4	24.4	0.389
	157	5785	16QAM(24Mbps)	Flat	Aux	Top(Notebook type)	0	24.4	24.4	0.382
	157	5785	64QAM(48Mbps)	Flat	Aux	Top(Notebook type)	0	24.4	24.4	0.217
	Step 5. The searching for the worst position									
	157	5785	BPSK(6Mbps)	Flat	Aux	Top(Tablet type)	0	24.4	24.4	0.251
	157	5785	BPSK(6Mbps)	Flat	Aux	Back of display(Notebook type)	0	24.4	24.4	0.395
	157	5785	BPSK(6Mbps)	Flat	Aux	Bottom(Notebook type)	0	24.4	24.4	0.027
	157	5785	BPSK(6Mbps)	Flat	Aux	Front of display(Tablet type)	0	24.4	24.4	0.311
	157	5785	BPSK(6Mbps)	Flat	Aux	Left side(Tablet type)	0	24.3	24.3	0.034
	157	5785	BPSK(6Mbps)	Flat	Aux	Bottom(Tablet type)	0	24.3	24.3	0.028
	Step 6. The test for the Low and High channels									
	149	5745	BPSK(6Mbps)	Flat	Aux	Top(Notebook type)	0	24.4	24.4	0.460
	165	5825	BPSK(6Mbps)	Flat	Aux	Top(Notebook type)	0	24.3	24.3	0.345