



RADIO TEST REPORT

Test Report No. : 27KE0162-HO-C

Applicant : Fujitsu Limited
Type of Equipment : B-PAD
Model No. : CA06178-A521
FCC ID : EJE-BPAD05
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 26 to 29, 2007

Tested by:

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Approved by :

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NVLAP LAB CODE: 200572-0

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SECTION 1: Client information

Company Name : Fujitsu Limited
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Telephone Number : +81-44-754-3885
Contact Person : Ken Uchihara

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

2.1 Identification of E.U.T.

Type of Equipment : B-PAD
Model No. : CA06178-A521
Serial No. : 0001
Rating : AC100 – 240V, DC3.7V (Battery)
Country of Manufacture : Japan
Receipt Date of Sample : July 18, 2007
Condition of EUT : Production model
Modification of EUT : No modification by the test lab.

2.2 Product Description

Model No: CA06178- A521 (referred to as the EUT in this report) is the B-PAD.

The EUT contains IEEE802.11b/g Wireless LAN and Bluetooth modules. Those modules do not transmit simultaneously.

The EUT has a variant model, CA06178-A621. The difference in two models is model name only.

The EUT is a PDA for business. This unit is carrying the newest Intel XScale in CPU and adopting WindowsCE.5.0 as operating system. Moreover, the packaging of various I/O and I/F to the EUT is carried out to PDA size.

- 3.5 inch TFT color transmissive LCD (320x240 pixel), LED back light, touch panel
- Built in numeric keypad
- Integrated Magnetic Card Reader
- Barcode Reader
- Bluetooth Module
- IEEE802.11b/g Wireless LAN Module

Clock frequencies of the EUT are as shown on the following table:

CPU	520MHz, 13MHz, 125MHz, 32.768kHz
3.5 inch TFT color transmissive LCD (320x240 pixel), LED back light, touch panel	6.25MHz
Built in numeric keypad	4.033355MHz
Audio Codec	24.576MHz
CF Card	48MHz
Integrated Magnetic Card Reader	4.915MHz
IEEE802.11b/g Wireless LAN Module	40MHz
Bluetooth Module	16MHz, 32.768kHz

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		IEEE802.11b/g Wireless LAN
Frequency band	Lower limit	2412MHz
	Upper limit	2462MHz
Type of Modulation		DSSS, OFDM
Antenna Type		$\lambda/4$ dielectric chip antenna
Antenna Connector Type		W. FL
Antenna Gain		1.8dBi
ITU code		G1D(DSSS), D1D(OFDM)
Power Supply (Inner)		DC 3.3V

* For Wireless LAN module test, please see UL Japan Test Report No. 27KE0162-HO-A.

		Bluetooth
Frequency band	Lower limit	2402MHz
	Upper limit	2480MHz
Bandwidth & Channel spacing		1MHz & 1MHz / CH
Type of Modulation		FHSS
Antenna Type		$\lambda/4$ dielectric chip antenna
Antenna Connector Type		U. FL
Antenna Gain		-4.3dBi
ITU code		F1D
Power Supply (Inner)		DC 3.3V

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) constantly to RF Modules 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 IC: RSS-Gen 7.2.2	FCC: Section 15.207 IC: RSS-Gen 7.2.2	-	N/A	10.6dB 0.50300MHz AV, L	Complied
2	Carrier Frequency Separation	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.247(a)(1) IC: RSS-210 A8.1 (b)	Conducted	N/A	See data.	Complied
3	20dB Bandwidth	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.247(a)(1) IC: RSS-210 A8.1 (a)	Conducted	N/A		Complied
4	Number of Hopping Frequency	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.247(a)(1)(iii) IC: RSS-210 A8.1 (d)	Conducted	N/A		Complied
5	Dwell time	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.247(a)(1)(iii) IC: RSS-210 A8.1 (d)	Conducted	N/A		Complied
6	Maximum Peak Output Power	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.8	FCC: Section 15.247(b)(1) IC: RSS-210 A8.4 (2)	Conducted	N/A		Complied
7	Band Edge Compliance	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.247(d) IC: RSS-210 A8.5	Conducted	N/A		Complied
8	Spurious Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.9 RSS-Gen 4.10	FCC: Section 15.247(d) IC: RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3	Conducted/ Radiated	N/A	[Tx] 7.3dB 24800.0MHz Hori., Vert., AV [Rx] 8.9dB 935.980MHz Hori., QP	Complied

Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15.

*These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

*These tests were performed without any deviations from test procedure except for additions or exclusions.

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3.3 Addition to standards

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

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 ± 2.66 dB.

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 ± 4.59 dB(3m).

The measurement uncertainty for this test using Logperiodic antenna is ± 4.62 dB(3m).

The measurement uncertainty for this test using Horn antenna is ± 5.27 dB.

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

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty for this test is ± 3.0 dB.

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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.

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

4.1 Operating Modes

The mode used for test : Transmitting mode(Packet size DH5, PRBS9)

- Low Channel : 2402MHz
- Mid Channel : 2441MHz
- High Channel : 2480MHz

Receiving mode

- Mid Channel : 2441MHz

Inquiry mode

*The test was performed with the above transmitting modes, which had the maximum packet size (DH5).

Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.
However, the limit level 125mW of AFH mode was used for the test.

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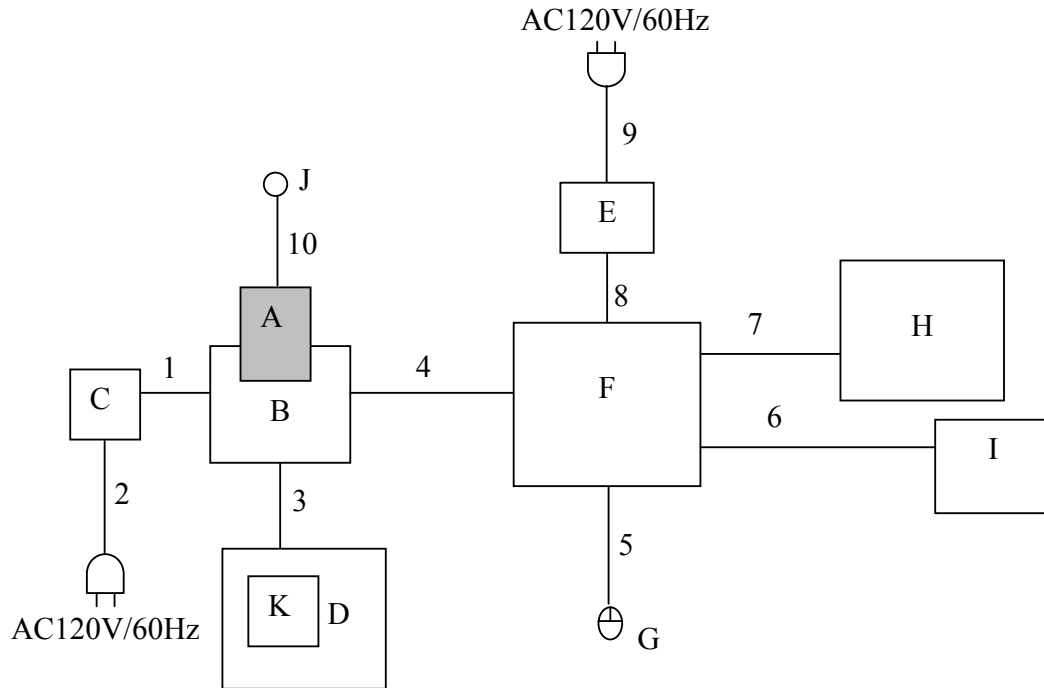
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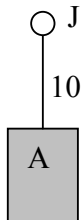
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4.2 Configuration and peripherals

[Conducted Emission test]



[Radiated Emission test]



[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	B-PAD	CA06178-A521	0001	Fujitsu Frontech Ltd.	EUT
B	CRADLE	KD02902-299	1	Fujitsu Frontech Ltd.	-
C	AC Adapter	CP235934-01	05202854A	Fujitsu Frontech Ltd.	-
D	Battery Charger	CA05951-7081	1	TOCAD ENERGY CO., LTD	
E	AC Adapter	02K6750	11S02K6750Z1Z 2UP2950KD	IBM	-
F	PC	T23 (= 2647-LJ3)	97-ALT9W	IBM	-
G	Mouse	M-SA551	LZB92663446	LOGITECH	-
H	Printer	BJF860	K10201	Canon	-
I	Monitor	17inch	0D5431-64180- 59T-197C	Dell	-
J	Head set	-	-	-	-
K	Battery	CA50601-1003	-	TOCAD ENERGY CO., LTD	-

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	DC cable	1.0	Unshielded	Unshielded
2	AC cable	2.0	Unshielded	Unshielded
3	DC cable	0.18	Unshielded	Unshielded
4	USB cable	1.0	Shielded	Shielded
5	Mouse cable	2.0	Unshielded	Unshielded
6	Monitor cable	1.5	Unshielded	Unshielded
7	Parallel cable	1.0	Unshielded	Unshielded
8	DC cable	2.0	Unshielded	Unshielded
9	AC cable	1.0	Unshielded	Unshielded
10	Earphone cable	1.2	Unshielded	Unshielded

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m 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

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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, 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 / 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	QP: BW 120kHz(T/R)	PK: RBW:1MHz/VBW: 1MHz
IF Bandwidth	20dBc : RBW: 100kHz VBW: 300kHz (S/A)	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

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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.

Test data	: APPENDIX 2
Test result	: Pass

SECTION 9: Carrier Frequency Separation

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 2
Test result	: Pass

SECTION 10: Number of Hopping Frequency

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 2
Test result	: Pass

SECTION 11: Dwell time

Test Procedure

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

Test data	: APPENDIX 2
Test result	: Pass