



EMC Technologies Pty Ltd

ABN 82 057 105 549
176 Harrick Road
Keilor Park Victoria Australia 3042

Ph: + 613 9365 1000
Fax: + 613 9331 7455
email: melb@emctech.com.au

**EMI TEST REPORT FOR CERTIFICATION
to
FCC PART 15 Subpart C (Section 15.247) & RSS-210**

FCC ID: EJE-WB0046
Industry Canada ID: 337J-WB0046

Test Sample: LifeBook P Series
Model: P7230

Radio Modules: EYTF3CSFT Bluetooth Module &
4965AGN Kedron INTEL Mini-PCI WLAN Module

Report Number: M070228_Cert_EYTF3CSFT_WLAN

Tested for: Fujitsu Australia Ltd.

Issue Date: 14th May 2007

EMC Technologies Pty Ltd reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. EMC Technologies Pty Ltd shall have no liability for any deductions, inferences or generalisations drawn by the client or others from EMC Technologies Pty Ltd issued reports. This report shall not be used to claim, constitute or imply product endorsement by EMC Technologies Pty Ltd.



The tests, calibrations or measurements covered by this document have been performed in accordance with NATA requirements (FCC Part 15 unintentional and intentional emitters in the frequency range 9kHz to 18 GHz) which include the requirements of ISO/IEC 17025 and are traceable to national standards of measurement. This document shall not be reproduced, except in full. The certificate on page 3 may be reproduced in full.

NATA Accredited Laboratory
Number: 5292

EMI TEST REPORT FOR CERTIFICATION
to
FCC PART 15 Subpart C (Section 15.247) & RSS-210
EMC Technologies Report No. M070228_Cert_EYTF3CSFT_WLAN
Issue Date: 14th May 2007

CONTENTS

- 1.0 INTRODUCTION**
- 2.0 GENERAL INFORMATION**

- FCC 15.247 (DTS) RESULTS - Bluetooth**
- 3.0 CONDUCTED EMI MEASUREMENTS**
 - 4.0 SPURIOUS EMI MEASUREMENTS**
 - 5.0 PEAK OUTPUT POWER**
 - 6.0 CHANNEL BANDWIDTH & CHANNEL OCCUPANCY**
 - 7.0 RADIO FREQUENCY EXPOSURE**
 - 8.0 ANTENNA REQUIREMENT**
 - 9.0 COMPLIANCE STATEMENT**

FCC 15.407 (U-NII) RESULTS - WLAN
Refer to Report No: M070228_Cert_4965AGN_NII_BT

FCC 15.247 (DTS) RESULTS – WLAN
Refer to Report No: M070228_Cert_4965AGN_DTS_BT

- APPENDIX A: MEASUREMENT INSTRUMENT DETAILS**
- APPENDIX B: REPORT PHOTOGRAPHS**
- APPENDIX C: OPERATIONAL DESCRIPTION**
- APPENDIX D: BLOCK DIAGRAM**
- APPENDIX E: SCHEMATICS**
- APPENDIX F: ANTENNA DETAILS**
- APPENDIX G: SPECIFICATIONS**
- APPENDIX H: FCC LABELLING DETAILS**
- APPENDIX I: USER MANUAL**
- APPENDIX J: CHANNEL BANDWIDTH PLOTS**
- APPENDIX K: HARMONICS PLOTS**
- APPENDIX L: BANDEDGE PLOTS**
- APPENDIX M: PEAK POWER OUTPUT PLOTS**
- APPENDIX N: BLUETOOTH CHANNEL OCCUPANCY PLOTS**

- Attachment 1: RF Exposure Information**
- Attachment 2: FCC DOC for LifeBook P Series**
- Attachment 3: FCC Part 15B Test Report (Report: FG06-142EAL-2)**



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation for FCC Part 15. This document shall not be reproduced, except in full.

EMI TEST REPORT FOR CERTIFICATION
to
FCC PART 15 Subpart C (Section 15.247) & RSS-210

Report Number: M070228_Cert_EYTF3CSFT_WLAN

Test Sample: LifeBook P Series
Model: P7230
Radio Modules: Bluetooth Module, Model: EYTF3CSFT (TAIYO YUDEN)
Kedron INTEL Mini-PCI WLAN Module, Model: 4965AGN (Intel Corp.)

FCC ID: EJE-WB0046
Industry Canada ID: 337J-WB0046
Equipment Type: Intentional Radiator (Transceiver)

LifeBook Manufacturer: Fujitsu Ltd - Mobile Computing Division
Address: 1-1 Kamikodanaka 4-Chome, Nakahara-Ku, Kawasaki, Japan
Contact: Mr. Tsuyoshi Uchihara


Tested for: Fujitsu Australia Ltd

Test Standards: FCC Part 15 – Radio Frequency Devices (August 2006)
FCC Part 15 Subpart C - Intentional Radiators
Section 15.247: 2400 – 2483.5 MHz & 5725 – 5850 MHz Operation Bands
ANSI C63.4 – 2003
OET Bulletin No. 65

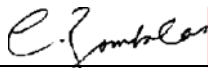
RSS-210 Issue 6 Low Power Licence-Exempt RadioCommunication
Devices: 6.2.2 (o) 2400 – 2483.5 MHz Spread Spectrum

RSS-102 Issue 1 (Provisional), Evaluation Procedure for Mobile and
Portable Radio Transmitters with respect to Health Canada's Safety
Code 6 for Exposure of Humans to Radio Frequency Fields

Test Dates: 14th March to 11th May 2007

Senior Test Engineer: 
Chieu Huynh - B.Eng (Hons) Electronics

Attestation: *I hereby certify that the device(s) described herein were tested as described in this report and that the data included is that which was obtained during such testing.*

Authorised Signatory: 
Chris Zombolas
Technical Director
EMC Technologies Pty Ltd



EMI TEST REPORT FOR CERTIFICATION to FCC PART 15 Subpart C (Section 15.247) & RSS-210

1.0 INTRODUCTION

EMI testing was performed on the Fujitsu notebook PC, Model: T4220 with TAIYO YUDEN Bluetooth Module, Model: EYTF3CSFT and INTEL Mini-PCI Wireless LAN Module (Kedron 802.11a/b/g/n), Model: 4965AGN.

The Bluetooth module was originally certified by TAIYO YUDEN as a modular approval under FCC ID: RYYEYTF3CSFT (Canada ID: 4389AEYTF3CSFT). The Radio modules are installed in a controlled environment at the Fujitsu notebook production/assembly factory.

The Kedron WLAN module was originally certified by INTEL as a modular approval under FCC ID: PD94965AGN (Canada ID: 1000M-4965AGN). The Radio modules are installed in a controlled environment at the Fujitsu notebook production/assembly factory.

The Kedron WLAN supports IEEE 802.11b, IEEE 802.11g, IEEE 802.11a and IEEE 802.11n (DTS & U-NII) configurations. Tests were performed in all configurations and also on the Bluetooth.

DTS results for the Bluetooth are reported in this test report.

The U-NII and DTS (WLAN) results are reported separately.

Refer to EMC Technologies' test report: M070228_Cert_4965AGN_NII_BT and M070228_Cert_4965AGN_DTS_BT.

Test results and procedures were performed in accordance with the following Federal Communications Commission (FCC) standards/regulations:

47 CFR, Part 15, Subpart C:	Rules for intentional radiators (particularly section 15.247)
Section 15.203:	Antenna requirements
Section 15.205:	Restricted bands of operation
Section 15.207:	Conducted Emission Limits
Section 15.209:	Radiated Emission Limits (General requirements)
Section 15.247:	Operation in the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz

The test sample **complied** with the requirements of 47 CFR, Part 15 Subpart C - Section 15.247.

The test sample also complied with the Industry Canada RSS-210 issue 6 (Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands)) clause 6.2.2(o) and the RF exposure requirements of RSS-102.

The measurement procedure used was in accordance with ANSI C63.4-2003 and OET Bulletin No. 65. The instrumentation conformed to the requirements of ANSI C63.2-1996.



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation for FCC Part 15. This document shall not be reproduced, except in full.

1.1 Summary of Results

1.1.1 FCC Subpart C, Section 15.247 - Bluetooth

FCC Part 15, Subpart C Clauses	Industry Canada RSS-210 Clauses	Test Performed	Result
15.203	5.5	Antenna Requirement	Complies
15.205	6.3	Operation in Restricted Band	Complies
15.207	6.6	Conducted Emissions	Complies
15.209	6.3	Radiated Emissions	Complies
15.247 (a)(1)	6.2.2(o)(ii)	Channel Occupancy/Bandwidth	Complies
15.247 (b)(1)	6.2.2(o)(b)	Peak Output Power	Complies
15.247 (c)		Antenna Gain > 6 dBi	Not Applicable. Antenna gain < 6 dBi
15.247 (d)	6.2.2(o)(e1)	Out of Band Emissions	Complies
15.247 (e)	6.2.2(o)(iv)	Peak Power Spectral Density	Not Applicable. EUT is not digital modulated system
15.247 (f)		*Hybrid Systems	Not Applicable. EUT does not employ a hybrid system
15.247 (g)		Frequency Hopping	Complies
15.247 (h)		Frequency Hopping	Complies
15.247 (i)		Radio Frequency Hazard	Complies

*Hybrid systems are those that employ a combination of both frequency hopping and digital modulations technique.

1.1.2 FCC Subpart E, Section 15.407 - WLAN

Refer to EMC Technologies Report No: M070228_Cert_4965AGN_NII_BT

1.1.3 FCC Subpart C, Section 15.247 – WLAN

Refer to EMC Technologies Report No: M070228_Cert_4965AGN_DTS_BT

1.2 Modifications by EMC Technologies

No modifications were required.



2.0 GENERAL INFORMATION
(Information supplied by the Client)

2.1 EUT (Bluetooth) Details

Transmitter: Bluetooth
Model Number: EYTF3CS FT
Manufacturer: TAIYO YUDEN
Network Standard: Bluetooth™ RF Test Specification
Modulation Type: Frequency Hopping Spread Spectrum (FHSS)
Frequency Range: 2402 MHz to 2480 MHz
Number of Channels: 79
Carrier Spacing: 1.0 MHz
Antenna Types: Nissei Electric Inverted F Antenna, Model: CP115428
 Location: Right palm rest area
Antenna gain: Max antenna gain is less than 6 dBi.
 Refer antenna data provided separately
Max. Output Power: 4 dBm
Reference Oscillator: 16 MHz (Built-in)
Power Supply: 3.3 VDC from host.

Frequency allocation:

Channel Number	Frequency (MHz)	Bluetooth Utility power setting
1*	2402	Power (Ext, Int) = 0, 96
2	2403	
3	2404	
.	.	
.	.	
.	.	
39	2440	
40*	2441	
41	2442	
.	.	
.	.	
.	.	
77	2478	
78	2479	
79*	2480	

*Channels tested and reported in this report.



2.2 EUT (WLAN) Details

Transmitter:	Mini-Card Wireless LAN Module
Wireless Module:	Kedron (802.11a/b/g/n)
Model Number:	4965AGN
Manufacturer:	Intel Corporation
Modulation Type:	Direct Sequence Spread Spectrum (DSSS for 802.11b) Orthogonal Frequency Division Multiplexing (OFDM for 802.11g) Orthogonal Frequency Division Multiplexing (OFDM for 802.11a) Orthogonal Frequency Division Multiplexing (OFDM for 802.11n)
2.4 GHz (802.11b/g/n):	DBPSK, DQPSK, CCK, 16QAM and 64QAM
5 GHz (802.11a/n):	BPSK, QPSK, 16QAM and 64QAM
Maximum Data Rate:	802.11b = 11Mbps, 802.11g and 802.11a = 54Mbps 802.11n = 300 Mbps
Frequency Ranges:	2.412 –2.462 GHz for 11b/g/n 5.18 - 5.32 GHz and 5.745 - 5.825 GHz for 11a/n
Number of Channels:	11 channels for 11b/g/n 13 channels for 11a/n with 20 MHz bandwidth 6 channels for 11n with 40 MHz bandwidth
Antenna Types:	Tx: Nissei Electric Inverted F Antenna Model: CP313544-01 (Main: Right), CP313545-01 (Aux: Left) Location: Top edge of LCD screen Rx: Nissei Electric Inverted F Antenna, Model: CP313546-01
Antenna gain:	Max antenna gain is less than 6 dBi. Refer antenna data provided separately
Power Supply:	3.3 VDC from PCI bus

Channels Tested and Output power setting:

Channel and Mode	Frequency MHz	Average Output Power dBm
802.11b/g/n mode		
**Channels 1, 6 and 11	2412, 2437 and 2462	15.5
802.11a/n mode with 20MHz Bandwidth		
*Channels 36	5180	16.5
*Channels 48	5240	16.5
*Channels 64	5320	16.5
**Channels 149	5745	17.5
**Channels 157	5785	17.5
**Channels 165	5825	17.5
802.11n mode with 40MHz Bandwidth		
*Channels 38	5190	14.5
*Channels 46	5230	16.5
*Channels 62	5310	15.5
**Channels 151	5755	17.5
**Channels 159	5795	17.5

*Channels tested and reported in the DTS submission (M070228_Cert_4965AGN_DTS_BT)

**Channels tested and reported in the U-NII submission ((M070228_Cert_4965AGN_NII_BT)



2.3 EUT (Notebook PC) Details

EUT:	LifeBook P series
Model Name:	P7230
Serial Number:	Pre-production Sample
Manufacturer:	FUJITSU LIMITED
CPU Type and Speed:	Core Duo U1400 1.2GHz
LCD	10.6" WXGA
Wired LAN:	Marvell 88E8055 : 10 Base-T/100 Base-TX/1000Base-T
Modem:	Agere MDC1.5 modem Model: D40
Port Replicator Model:	FPCPR72
AC Adapter Model:	60W:SEC80N2-16.0(Sanken)
Voltage:	16 V
Current Specs:	3.75A
Watts:	60W

2.4 Operational Description

The Intel WLAN test software "CRTU" was used to transmit continuously during the tests. For Spurious and Harmonics tests both radio modules (WLAN and Bluetooth) were simultaneously transmitting.

2.5 Test Configuration

Conducted tests were performed at the Bluetooth Antenna ports.

Radiated tests were performed for measuring the harmonics and spurious from the transmitters.

2.6 Technical Specifications

Refer to Appendix G for details

2.7 Block Diagram

Refer to Appendix D - Block Diagram

2.8 Support Equipment

Refer to Attachment 3 – FCC Part 15B Test Report (Report: FG06-142EAL-2)

2.9 Test Procedure

Emissions measurements were performed in accordance with the procedures of ANSI C63.4-2003. Radiated emissions tests were performed at a distance of 1 and 3 metres from the EUT. OET Bulletin 65 dated June 2001 was used for reference.



2.10 Test Facility

2.10.1 General

Radiated Emission measurements were performed at EMC Technologies open area test site (OATS) situated at Lerderberg Gorge, near the township of Bacchus Marsh in Victoria, Australia. Conducted measurements at an antenna ports were performed at EMC Technologies' laboratory in Tullamarine, Victoria Australia.

The above test sites have been accepted for testing by the Federal Communications Commission (FCC) - **FCC Registration Number 90560**.

EMC Technologies open area test site (OATS) has also been accepted by Industry Canada for the performance of radiated measurements in accordance with RSS 212, Issue 1 (Provisional). **Industry Canada File Number IC 4161**.

2.10.2 NATA Accreditation

EMC Technologies is accredited in Australia to test to the following standards by the National Association of Testing Authorities (NATA).

“FCC Part 15 unintentional and intentional emitters in the frequency range 9kHz to 18 GHz excluding TV receivers (15.117 and 15.119), TV interface devices (15.115), cable ready consumer electronic equipment (15.118), cable locating equipment (15.213) and unlicensed national information infrastructure devices (Sub part E).”

The current full scope of accreditation can be found on the NATA website: www.nata.asn.au
It also includes a large number of emissions, immunity, SAR, EMR and Safety standards.

NATA is the Australian national laboratory accreditation body and has accredited EMC Technologies to operate to the IEC/ISO17025 requirements. A major requirement for accreditation is the assessment of the company and its personnel as being technically competent in testing to the standards. This requires fully documented test procedures, continued calibration of all equipment to the National Standard at the National Measurements Institute (NMI) and an internal quality system to ISO 9002. NATA has mutual recognition agreements with the National Voluntary Laboratory Accreditation Program (NVLAP) and the American Association for Laboratory Accreditation (A²LA).

2.11 Test Equipment Calibration

All measurement instrumentation and transducers were calibrated in accordance with the applicable standards by an independent NATA registered laboratory such as Agilent Technologies (Australia) Pty Ltd or the National Measurement Institute (NMI). All equipment calibration is traceable to Australia national standards at the National Measurements Institute. The reference antenna calibration was performed by NMI and the working antennas (biconical and log-periodic) calibrated by the NATA approved procedures. The complete list of test equipment used for the measurements, including calibration dates and traceability is contained in Appendix A

2.12 Ambients at OATS

The Open Area Test Site (OATS) is an area of low background ambient signals. No significant broadband ambients are present however commercial radio and TV signals exceed the limit in the FM radio, VHF and UHF television bands. Radiated prescan measurements were performed in the shielded enclosure to check for possible radiated emissions at the frequencies where the OATS ambient signals exceeded the test limit.



FCC 15.247 (DTS) RESULTS

3.0 CONDUCTED EMISSION MEASUREMENTS

Testing was performed in accordance with the requirements of FCC Part 15.207
Refer to Attachment 3 – FCC Part 15B Test Report (Report: FG06-142EAL-2)

4.0 SPURIOUS EMISSION MEASUREMENTS

4.1 Test Procedure

Testing was performed in accordance with the requirements of FCC Part 15.247(d).

Radiated emission measurements were performed to the limits as per section 15.209. The measurements were made at the open area test site.

The EUT was set up on the table top (placed on turntable) of total height 80 cm above the ground plane, and operated as described in section 2 of this report. The test frequency range was subdivided into smaller bands with sufficient frequency resolution to permit reliable display and identification of possible EMI peaks while also permitting fast frequency scan times. Calibrated EMCO 3115, EMCO 3116 and ETS standard gain horn antennas were used for measurements between 1 to 40 GHz.

The measurement of emissions between 30 - 1000 MHz, refer to Attachment 3 – FCC Part 15B Test Report (Report: FG06-142EAL-2).

The measurement of emissions above 1000 MHz was measured using a following setting:

Peak measurements setting: RBW = VBW = 1 MHz

Average measurements setting: RBW = 1 MHz and VBW = 10 Hz

The receiver bandwidth was set to 6 dB.

The EUT was slowly rotated with the Peak Detector set to Max-Hold. This was performed for two antenna heights. When an emission was located, it was positively identified and its maximum level found by rotating the automated turntable, and by varying the antenna height. Each significant peak was investigated with the Quasi-Peak/Average Detectors. The software for cable losses automatically corrected the measurement data for each frequency range, antenna factors and preamplifier gain and all data was then stored on disk in sequential data files. This process was performed for both horizontal and vertical antenna polarisations.

4.2 Calculation of field strength

The field strength was calculated automatically by the software using all the pre-stored calibration data. The method of calculation is shown below:

E = V + AF - G + L Where:

E = Radiated Field Strength in dB μ V/m.

V = EMI Receiver Voltage in dB μ V. (measured value)

AF = Antenna Factor in dB(m⁻¹). (stored as a data array)

G = Preamplifier Gain in dB. (stored as a data array)

L = Cable loss in dB. (stored as a data array of Insertion Loss versus frequency)

- **Example Field Strength Calculation**

Assuming a receiver reading of 34.0 dB μ V is obtained at 90 MHz, the Antenna Factor at that frequency is 9.2 dB. The cable loss is 1.9 dB while the preamplifier gain is 20 dB. The resulting Field Strength is therefore as follows:

$$34.0 + 9.2 + 1.9 - 20 = 25.1 \text{ dB}\mu\text{V/m}$$

Measurement uncertainty with a confidence interval of 95% is:

- Free radiation tests (1000 MHz – 18,000 MHz) \pm 4.1 dB



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation for FCC Part 15. This document shall not be reproduced, except in full.

4.3 Radiated Emissions (Spurious and Harmonics)

4.3.1 Frequency Band: 1 – 40 GHz

All measurements above 1 GHz were initially made over a distance of 3 metres. This was decreased to 1.0 metre as the emission levels from the device were very low.

The 74 dB μ V/m @ 3m and 54 dB μ V/m @ 3m limits are applied for emissions fall in the restricted bands.

Testing was performed while both the WLAN transmitter and Bluetooth transmitter continuously operated. Harmonics related to the Bluetooth transmitter are reported below. Harmonics related to the WLAN transmitter refer to M070228_Cert_4965AGN_NII_BT. and M070228_Cert_4965AGN_DTS_BT.

Channel 1 - 2402 MHz

Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
2402	90.5	59.7	-	-	-
4804	54.6	40.1	74.0	54.0	Complies
2390	49.3	35.6	74.0	54.0	Complies

Channel 40 - 2441 MHz

Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
2441	92.2	60.8	-	-	-
4882	55.1	40.8	74.0	54.0	Complies

Channel 79 - 2480 MHz

Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
2480	93.4	61.5	-	-	-
4960	54.4	40.1	74.0	54.0	Complies
2483.5	53.9	38.0	74.0	54.0	Complies

Result: Harmonic emission was recorded up to 25 GHz. Other harmonics were confirmed low with both RBW and VBW reduced. Emissions complied with the FCC limits of sections 15.209 and 15.247 by a margin of 13.2 dB. The measurement uncertainty for radiated emissions in this band was ± 4.1 dB.

4.3.2 Both WLAN and Bluetooth Transmitters Transmitting

Result: IM spurious emissions were recorded up to 40 GHz. Emissions complied with the FCC limits of sections 15.209, 15.247 and 15.407. The measurement uncertainty for radiated emissions in this band was ± 4.1 dB.

4.3.3 Frequency Band: 30 - 1000 MHz

Testing was performed by Fujitsu General EMC Laboratory, JAPAN accredited by NVLAP (Lab Code: 200373-0).

Results: Complied - refer to Attachment 3 – FCC Part 15B Test Report (Report: FG06-142EAL-2).



4.3.4 RF Conducted Measurements at the antenna terminal

In the 100 kHz bandwidth within the operating band, the highest emissions (spurious/harmonics) level that is produced by the intentional radiator shall be at least 20 dB below.

The transmitter output was connected to the spectrum analyser in peak hold mode.

The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised.

D1 line indicates the 20 dB limit below the highest level of the transmitter

Refer to Appendix K for Harmonics plots

Result: Complies.

4.3.5 Band Edge Measurements

In the 100 kHz bandwidth within the operating band, the highest emissions (spurious/harmonics) level that is produced by the intentional radiator shall be at least 20 dB below.

Testing was performed while the transmitter continuously transmitted on a low (2402 MHz) and high frequency (2480 MHz) channel.

The transmitter output was connected to the spectrum analyser in peak hold mode.

The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised.

BE Frequency (MHz) within the restricted band	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
2390	35.2	Low	74.0	54.0	Pass
2483.5	47.6	Low	74.0	54.0	Pass

Refer to Appendix L for Band Edge plots

Result: Complies.

5.0 PEAK OUTPUT POWER - Section 15.247 (b)(1)

Testing was performed in accordance with the requirements of FCC Part 15.247(b)(1).

Measurements were performed while the Bluetooth transmitter continuously transmitted.

The maximum antenna gains were less than 6 dBi.

The transmitter output was connected to the spectrum analyser in peak hold mode.

The resolution bandwidth of 1 MHz and the video bandwidth of 3 MHz were utilised.

Variation by +/- 15% of the supply voltage, in accordance with section 15.31(e), to the computer power supply power did not cause any variations to the RF output power.

Frequency MHz	Power dBm	Limit dBm	Power mW	Limit mW	Power Plots
2402	3.5	30	2.3	1000	Appendix M
2441	3.7	30	2.4	1000	Appendix M
2480	3.9	30	2.5	1000	Appendix M

Result: Complies.



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation for FCC Part 15. This document shall not be reproduced, except in full.

6.0 CHANNEL BANDWIDTH & CHANNEL OCCUPANCY

Testing was carried out in accordance with the requirements of FCC Part 15.247(a)(1)(iii)

The EUT was a Frequency Hopping Spread Spectrum transmitter and operated as described in section 2 of this report.

6.1 Channel Bandwidth

In the band 2400 - 2483.5 MHz the hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

The transmitter output was connected to the spectrum analyser in peak hold mode.

A resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised.

Frequency MHz	Bandwidth kHz	Result	20 dB Bandwidth Plots
2402	751.5	Complies	Appendix J
2441	756.5	Complies	Appendix J
2480	756.5	Complies	Appendix J

6.2 Channel Occupancy

79 channels were observed operating between 2400 to 2483.5 MHz. Refer to Appendix N for number of channel plot.

The channel separation of 1 MHz was recorded. Refer to Appendix N for number of channel separation plot.

The device was observed to have a dwell time of 420.8 uS. Refer to Appendix N for dwell time plot.

The specification allows for a dwell time not exceeding 0.4 seconds.

The maximum period is 79 channels x 0.4 seconds = 31.6 seconds.

During the test the transmitter was observed to activate on average 316 times in 31.6 seconds.

The transmitter therefore occupies in one channel for $316 \times 420.8 \text{ uS} = 0.133 \text{ seconds}$.

Result: Complies.



7.0 RADIO FREQUENCY EXPOSURE (HAZARD) INFORMATION

Testing was performed in accordance with the requirements of FCC Part 15.247(i)

Spread spectrum transmitters operating in the 2400 - 2483.5 MHz and 5725 – 5850 MHz bands are required to be operated in a manner that ensures that the public is not exposed to RF energy levels in accordance with CFR 47, Section 1.1307(b)(1).

Transmitter # 1 (WLAN): The antennas location: Top edge of LCD screen and projected distance of less than 20cm from user.

Transmitter # 2 (Bluetooth): The antenna location: Right palm rest area and projected distance of less than 20cm from user.

The separation distance between the WLAN and BT antennas is less than 20cm. Therefore, they are co-located transmitters. Testing was performed with both WLAN and BT transmitters transmitting continuously.

In accordance with this section and also section 2.1093 this device has been defined as a portable device.

SAR testing was performed in accordance with OET Bulletin 65 and reported under EMC Technologies reports M070235_Cert_4965AGN_SAR_2.4 and M070235_Cert_4965AGN_SAR_5.6. The highest SAR value is 0.04 mW/g which complies with the FCC human exposure requirements of 47 CFR 2.1093 (d).



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation for FCC Part 15. This document shall not be reproduced, except in full.

8.0 ANTENNA REQUIREMENT

This intentional radiator was designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

9.0 COMPLIANCE STATEMENT

The Fujitsu notebook PC, Model: P7230 with TAIYO YUDEN Bluetooth Module, Model: EYTF3CSFT and INTEL Mini-PCI Wireless LAN Module ((Kedron 802.11a/b/g/n), Model: 4965AGN, tested on behalf of Fujitsu Australia Ltd, **complied** with the requirements of 47 CFR, Part 15 Subpart C - Rules for Radio Frequency Devices (intentional radiators), Section 15.247 - Operation in the frequency band 2400 - 2483.5 MHz.

The test sample also complied with the Industry Canada RSS-210 issue 6 (Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands)) clause 6.2.2(o) 2400 – 2483.5 MHz Spread Spectrum requirements and the RF exposure requirements of RSS-102.

Results were as follows:

FCC Subpart C, Section 15.247 - Bluetooth

FCC Part 15 Subpart C Clauses	Industry Canada RSS-210 Clauses	Test Performed	Results
15.203	5.5	Antenna Requirement	Complies
15.205	6.3	Operation in Restricted Band	Complies
15.207	6.6	Conducted Emissions	Complies
15.209	6.3	Radiated Emissions	Complies
15.247 (a)(2)	6.2.2(o)(iv)	Channel Bandwidth	Complies
15.247 (b)(3)	6.2.2(o)(b)	Peak Output Power	Complies
15.247 (c)		Antenna Gain > 6 dBi	Not Applicable. Antenna gain < 6 dBi
15.247 (d)	6.2.2(o)(e1)	Out of Band Emissions	Complies
15.247 (e)	6.2.2(o)(iv)	Peak Power Spectral Density	Complies
15.247 (f)		*Hybrid Systems	Not Applicable. EUT does not employ a hybrid system
15.247 (g)		Frequency Hopping	Not Applicable. EUT is not a frequency hopping
15.247 (h)		Frequency Hopping	Not Applicable. EUT is not a frequency hopping
15.247 (i)		Radio Frequency Hazard	Complies

*Hybrid systems are those that employ a combination of both frequency hopping and digital modulations technique.

FCC Subpart E, Section 15.407 - WLAN

Refer to EMC Technologies Report No: M070228_Cert_4965AGN_NII_BT

FCC Subpart C, Section 15.247 – WLAN

Refer to EMC Technologies Report No: M070228_Cert_4965AGN_DTS_BT



TEST REPORT APPENDICES

APPENDIX A: MEASUREMENT INSTRUMENT DETAILS
APPENDIX B: REPORT PHOTOGRAPHS
APPENDIX C: OPERATIONAL DESCRIPTION
APPENDIX D: BLOCK DIAGRAM
APPENDIX E: SCHEMATICS
APPENDIX F: ANTENNA DETAILS
APPENDIX G: SPECIFICATIONS
APPENDIX H: FCC LABELLING DETAILS
APPENDIX I: USER MANUAL
APPENDIX J: CHANNEL BANDWIDTH PLOTS
APPENDIX K: HARMONICS PLOTS
APPENDIX L: BANDEDGE PLOTS
APPENDIX M: PEAK POWER OUTPUT PLOTS
APPENDIX N: BLUETOOTH CHANNEL OCCUPANCY PLOTS

Attachment 1: RF Exposure Information

Attachment 2: FCC DOC for LifeBook P Series

Attachment 3: FCC Part 15B Test Report (Report: FG06-142EAL-2)



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation for FCC Part 15. This document shall not be reproduced, except in full.