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-WB0054
Industry Canada ID:	337J-WB0054
Test Sample:	LifeBook P Series
Model:	P8010
Radio Modules:	4965AGN Kedron INTEL Mini-PCI WLAN Module & EYSMJCS Bluetooth Module
Report Number:	M071118_Cert_4965AGN_DTS_BT
Issue Date:	7th January 2008

NATA Accredited Laboratory Number: 5292

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Test Sample:	LifeBook P Series
Model:	P8010
Radio Modules:	Kedron INTEL Mini-PCI WLAN Module, Model: 4965AGN (Intel Corp.) Bluetooth Module, Model: EYSMJCS (TAIYO YUDEN)
FCC ID:	EJE-WB0054
Industry Canada ID:	337J-WB0054
Equipment Type:	Intentional Radiator (Transceiver)
Manufacturer (LifeBook):	Fujitsu Ltd - Mobile Computing Division
Address:	1-1 Kamikodanaka 4-Chome, Nakahara-Ku, Kawasaki, Japan
Contact:	Mr. Tsuyoshi Uchihara
Test Standards:	FCC Part 15 – Radio Frequency Devices (May 2007) 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 7 Low Power Licence-Exempt RadioCommunication Devices Annex 8: 2400–2483.5 MHz & 5725–5850 MHz Operation Bands 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:	21st November 2007 to 6th January 2008

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
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1.0 INTRODUCTION

EMI testing was performed on the Fujitsu notebook PC, Model: P8010 with INTEL Mini-PCI Wireless LAN Module (Kedron 802.11a/b/g/n), Model: 4965AGN & TAIYO YUDEN Bluetooth Module, Model: EYSMJCS.

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 Bluetooth module was originally certified by TAIYO YUDEN as a modular approval under FCC ID: RYYEYSMJCS (Canada ID: 4389B-EYSMJCS). 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 configurations IEEE 802.11b, IEEE 802.11g, IEEE 802.11a and IEEE 802.11n are reported in this test report.

The U-NII and DSS (Bluetooth) results are reported separately.
Refer to EMC Technologies' test report: M071118_Cert_4965AGN_NII_BT (U-NII) and M071118_Cert_EYSMJCS_WLAN (Bluetooth).

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 7 - Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Annex 8 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.

1.1 Summary of Results

1.1.1 FCC Subpart C, Section 15.247

FCC Part 15 Subpart C Clauses	Industry Canada RSS-210 Issue 7 and RSS-Gen Clauses	Test Performed	Results
15.203	RSS-Gen (7.1.4)	Antenna Requirement	**Complies**
15.205	2.2 (Table 1)	Operation in Restricted Band	**Complies**
15.207	RSS-Gen (7.2.2)	Conducted Emissions	**Complies**
15.209	RSS-Gen (6)	Radiated Emissions	**Complies**
15.247 (a)(2)	A8.1 (b) (d)	Channel Bandwidth	**Complies**
15.247 (b)(3)	A8.4	Peak Output Power	**Complies**
15.247 (c)	RSS-Gen (7.1.4)	Antenna Gain > 6 dBi	**Not Applicable.** Antenna gain < 6 dBi
15.247 (d)	A8.5	Out of Band Emissions	**Complies**
15.247 (e)	A8.2 (b)	Peak Power Spectral Density	**Complies**
15.247 (f)	A8.3	*Hybrid Systems	**Not Applicable.** EUT does not employ a hybrid system
15.247 (g)	A8.1	Frequency Hopping	**Not Applicable.** EUT does not employ frequency hopping
15.247 (h)	A8.1	Frequency Hopping	**Not Applicable.** EUT does not employ frequency hopping
15.247 (i)	RSS-Gen (5.5)	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: M071118_Cert_4965AGN_NII_BT

1.1.3 FCC Subpart C, Section 15.247 – Bluetooth

Refer to EMC Technologies Report No: M071118_Cert_EYSMJCS_WLAN

1.2 Modifications by EMC Technologies

No modifications were required.

2.0 GENERAL INFORMATION

(Information supplied by the Client)

2.1 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: CP313571 (Main: Right), CP313571 (Aux: Left) Location: Top edge of LCD screen Rx: Nissei Electric Inverted F Antenna, Model: CP313572
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 this report

**Channels tested and reported in the U-NII submission (M071118_Cert_4965AGN_NII_BT)

2.2 EUT (Bluetooth) Details

Transmitter:	Bluetooth
Model Number:	EYSMJCS
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: Left 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	
-	-	
39	2440	
40*	**2441**	
41	2442	
-	-	
78	2479	
79*	**2480**	

*Channels tested and reported in the Bluetooth submission (M071118_Cert_EYSMJCS_WLAN)

2.3 EUT (Notebook PC) Details

EUT:	LifeBook P series
Model Name:	P8010
Serial Number:	Pre-production Sample
Manufacturer:	FUJITSU LIMITED
CPU Type and Speed:	Core2 Duo SL7100 1.2GHz
LCD	12.1”WXGA
Wired LAN:	Marvell 88E8055 : 10 Base-T/100 Base-TX/1000Base-T
Modem:	Agere MDC1.5 modem Model: D40
Port Replicator Model:	FPCPR82
AC Adapter Model:	60W:SED80N2-16.0(Sanken) and PXW1637N (Tamura)(Japan only)
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.

2.5 Test Configuration

Conducted tests were performed at the WLAN 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: FG07-171EAL)

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 Lerderderg Gorge, near the township of Bacchus Marsh in Victoria, Australia. Conducted measurements at an antenna ports were performed at EMC Technologies' laboratory in Keilor Park, 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 (A^2LA).

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: FG07-171EAL)

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 sub-divided 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: FG07-171EAL).

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 Peak/Average Detectors. The measurement data for each frequency range was corrected for cable losses, antenna factors and preamplifier gain. 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 dBμV/m.
V = EMI Receiver Voltage in dBμV. (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 dBμV 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 dBμV/m

Measurement uncertainty with a confidence interval of 95% is:
- Free radiation tests (1000 MHz – 18,000 MHz) ± 4.1 dB

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 dBμV/m @ 3m and 54 dBμV/m @ 3m limits are applied for emissions fall in the restricted bands. The limits for emission outside the restricted band are 20 dB below the fundamental field strength.

Testing was performed while both the WLAN transmitter and Bluetooth transmitter continuously operated. Harmonics related to the WLAN transmitter (2.4 – 2.4835 GHz and 5.725 – 5.850 GHz) is reported below. Harmonics in the frequency band (5.15 – 5.35 GHz), refer to M071118_Cert_4965AGN_NII_BT. Harmonics related to the Bluetooth transmitter refer to M071118_Cert_EYSMJCS_WLAN.

4.3.1.1 Configuration 802.11b

Initial investigations were performed with all data rates: (1 Mbps to 11 Mbps). Peak measurements with 11 Mbps were observed to be worst. However, average measurements are worst with 1 Mbps. Final testing was performed while the transmitter continuously operated with the data rate of 1 Mbps.

Channel 1 - 2412 MHz

Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
2412	105.5	102.1	-	-	-
4824*	65.8	62.4	84.5	64.5	Complies
9648	58.4	55.1	85.5	82.1	Complies
2104	46.2	39.1	85.5	82.1	Complies
2784*	66.3	64.0	84.5	64.5	Complies
2390*	68.6	60.5	84.5	64.5	Complies

*Measurement was performed at 1 m distance and the limits were corrected accordingly.

Channel 6 - 2437 MHz

Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
2437	104.6	101.8	-	-	-
4874*	66.5	63.6	84.5	64.5	Complies
9748	59.6	56.7	84.6	81.8	Complies
2154	50.0	43.2	84.6	81.8	Complies
2834*	61.4	58.9	84.5	64.5	Complies

*Measurement was performed at 1 m distance and the limits were corrected accordingly.

Channel 11 - 2462 MHz

Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
2462	104.4	101.2	-	-	-
4924*	66.1	63.2	84.5	64.5	Complies
9848	59.8	56.3	84.4	81.2	Complies
2204	56.2	51.7	74.0	54.0	Complies
2884*	58.6	55.1	84.5	64.5	Complies
2483.5*	66.7	61.4	84.5	64.5	Complies

*Measurement was performed at 1 m distance and the limits were corrected accordingly.

Result: Harmonic and spurious emissions were recorded up to 25 GHz. Other harmonics were confirmed low with both RBW and VBW reduced. The worst case emissions complied with the FCC limits of sections 15.209 and 15.247 by a margin of 0 dB. The measurement uncertainty for radiated emissions in this band was ± 4.1 dB.

4.3.1.2 Configuration 802.11g and 802.11n

Initial investigations were performed with all data rates: (6 Mbps to 54 Mbps, HT0 to HT7 and HT8 to HT15). No significant in emissions were observed. Final testing was performed while the transmitter continuously operated.

Channel 1 - 2412 MHz

Modes	Data Rates	Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
802.11g	6 Mbps	2412	108.4	95.5	-	-	-
		4824	53.6	40.2	74.0	54.0	Complies
		2784*	65.8	63.6	84.5	64.5	Complies
		2104	46.4	37.8	88.4	75.5	Complies
		2390*	82.1	63.7	84.5	64.5	Complies
802.11n	HT0	2412	107.5	94.8	-	-	-
		Others harmonics and spurious emissions results are similar to the 6 Mbps data rates.					
802.11n	HT8	2412	105.7	87.9	-	-	-
		4824	51.2	37.6	74.0	54.0	Complies
		2784*	66.7	62.5	74.0	54.0	Complies
		2104	44.5	36.8	85.1	67.9	Complies
		2390	65.9	45.9	74.0	54.0	Complies

*Measurement was performed at 1 m distance and the limits were corrected accordingly.

Channel 6 - 2437 MHz

Modes	Data Rates	Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
802.11g	6 Mbps	2437	107.6	95.2	-	-	-
		4874	54.9	41.5	74.0	54.0	Complies
		2834	56.1	54.0	74.0	54.0	Complies
		2154	50.2	42.1	87.6	75.2	Complies
802.11n	HT0	2437	107.4	94.6	-	-	-
		4874	54.2	41.1	74.0	54.0	Complies
		2834	56.0	54.0	74.0	54.0	Complies
		2154	49.7	41.6	87.4	74.6	Complies
802.11n	HT8	2437	103.5	85.2	-	-	-
		4874	51.6	38.4	74.0	54.0	Complies
		2834	57.8	53.1	74.0	54.0	Complies
		2154	50.0	41.4	83.5	65.2	Complies

Channel 11 - 2462 MHz

Modes	Data Rates	Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
802.11g	6 Mbps	2462	107.2	94.8	-	-	-
		4924	54.7	41.0	74.0	54.0	Complies
		2884	52.4	48.9	74.0	54.0	Complies
		2204	56.0	49.7	74.0	54.0	Complies
		2483.5*	82.9	63.8	84.5	64.5	Complies
802.11n	HT0	2462	107.8	94.5	-	-	-
		4924	54.0	40.5	74.0	54.0	Complies
		2884	52.0	49.7	74.0	54.0	Complies
		2204	55.4	50.3	74.0	54.0	Complies
		2483.5*	82.0	62.3	84.5	64.5	Complies
802.11n	HT8	2462	103.1	84.8	-	-	-
		4924	51.4	38.2	74.0	54.0	Complies
		2884	52.9	49.2	74.0	54.0	Complies
		2204	55.6	47.2	74.0	54.0	Complies
		2483.5	61.1	46.9	74.0	54.0	Complies

*Measurement was performed at 1 m distance and the limits were corrected accordingly.

Result: Spurious emissions were recorded up to 25 GHz. Harmonics were confirmed low with both RBW and VBW reduced. The worst case emissions complied with the FCC limits of sections 15.209 and 15.247 by a margin of 0 dB. The measurement uncertainty for radiated emissions in this band was ±4.1 dB.

4.3.1.3 Configuration 802.11a and 802.11n

Initial investigations were performed with all data rates: (6 Mbps to 54 Mbps, HT0 to HT7 and HT8 to HT15). No significant in emissions were observed. Final testing was performed while the transmitter continuously operated.

Channel 149 - 5745 MHz, Tx BW = 20 MHz

Modes	Data Rates	Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
802.11a	6 Mbps	5745	106.4	94.4	-	-	-
		11490	68.6	53.5	74.0	54.0	Complies
		17235	62.7	47.8	86.4	74.4	Complies
		7660	47.3	39.0	74.0	54.0	Complies
		5725	76.7	60.1	86.4	74.4	Complies
802.11n	HT0	5745	106.8	93.8	-	-	-
		11490	68.6	53.4	74.0	54.0	Complies
		17235	62.3	47.5	86.8	73.8	Complies
		7660	47.7	38.5	74.0	54.0	Complies
		5725	81.3	61.8	86.8	73.8	Complies
802.11n	HT8	5745	105.0	87.5	-	-	-
		11490	59.4	43.8	74.0	54.0	Complies
		17235	56.2	43.5	85.0	67.5	Complies
		7660	46.8	37.2	74.0	54.0	Complies
		5725	68.4	50.1	85.0	67.5	Complies

Channel 157 - 5785 MHz, Tx BW = 20 MHz

Modes	Data Rates	Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
802.11a	6 Mbps	5785	106.8	94.5	-	-	-
		11570	66.5	50.7	74.0	54.0	Complies
		17355	62.1	47.0	86.8	74.5	Complies
		7713.4	47.0	38.6	74.0	54.0	Complies
802.11n	HT0	5785	107.0	94.5	-	-	-
		Others harmonics and spurious emissions results are similar to the 6 Mbps data rates.					
802.11n	HT8	5785	104.8	87.1	-	-	-
		Others harmonics and spurious emissions results are similar to the 6 Mbps data rates.					

Channel 165 - 5825 MHz, Tx BW = 20 MHz

Modes	Data Rates	Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
802.11a	6 Mbps	5825	106.7	94.7	-	-	-
		11650	66.1	50.5	74.0	54.0	Complies
		17475	61.8	46.8	86.7	74.7	Complies
		7766.7	46.9	38.4	86.7	74.7	Complies
		5850	63.8	50.6	86.7	74.7	Complies
802.11n	HT0	5825	107.2	94.3	-	-	-
		11650	66.7	51.0	74.0	54.0	Complies
		17475	61.9	47.2	87.2	74.3	Complies
		7766.7	46.7	38.2	87.2	74.3	Complies
		5850	67.4	51.8	87.2	74.3	Complies
802.11n	HT8	5825	104.7	87.2	-	-	-
		11650	57.5	42.4	74.0	54.0	Complies
		17475	55.6	43.3	84.7	67.2	Complies
		7766.7	46.3	37.2	84.7	67.2	Complies
		5850	60.3	48.5	84.7	67.2	Complies

Channel 151 - 5755 MHz, Tx BW = 40 MHz (Wide)

Modes	Data Rates	Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
802.11n	HT0	5755	104.2	88.6	-	-	-
		11510	64.3	49.0	74.0	54.0	Complies
		17265	59.7	45.4	84.2	68.6	Complies
		7673.4	51.6	44.2	74.0	54.0	Complies
		5725	80.1	63.7	84.2	68.6	Complies
802.11n	HT8	5755	102.1	83.3	-	-	-
		Others harmonics and spurious emissions results are lower than to the HT0 data rates.					

Channel 159 - 5795 MHz, Tx BW = 40 MHz (Wide)

Modes	Data Rates	Frequency MHz	Peak Detector dBuV/m	Average Detector dBuV/m	Peak Limit dBuV/m	Average Limit dBuV/m	Result
802.11n	HT0	5795	101.9	82.5	-	-	-
		11590	61.0	45.7	74.0	54.0	Complies
		17385	58.2	44.3	84.3	68.5	Complies
		7726.7	48.9	42.0	74.0	54.0	Complies
		5850	61.6	49.3	84.3	68.5	Complies
802.11n	HT8	5795	104.6	86.0	-	-	-
		Others harmonics and spurious emissions results are lower than to the HT0 data rates.					

Result: Harmonic and spurious emissions were recorded up to 40 GHz. Other harmonics were low and confirmed with both RBW and VBW reduced. Emissions complied with the FCC limits of section 15.209 and 15.247 by a margin of 5.2 dB. The measurement uncertainty for radiated emissions in this band was ±4.1 dB.

4.3.2 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: FG07-171EAL).

4.3.3 RF Conducted Measurements at the Antenna Terminal

Testing was performed by Aegis Labs Inc. CA, USA accredited by A2LA (Certificate Number: 1111.01)

Results: Complied – refer to attachment 4, Aegis test report number: INTEL-060907F with FCC ID: PD94965AGN.

4.3.4 Band Edge Measurements

Complied (refer to section 4.3 – radiated emissions).

5.0 PEAK OUTPUT POWER - Section 15.247 (b)(3)

Testing was performed in accordance with the requirements of FCC Part 15.247(b)(3).

Measurements were performed while the WLAN transmitter continuously transmitted.

The maximum antenna gains were less than 6 dBi.

The peak output power measurement was performed using the integration method as per test method # 3 of DA 02-2138. The resolution bandwidth of 1 MHz was used. The video bandwidth of 30 kHz was used (VBW ≥ 1/T, where T (worst case) = 88 μS.

Variation by +/- 15% of the supply voltage, in accordance with Section 15.31(e), to the computer power supply did not vary the output power observed.

The EUT is capable of using two antennas transmitting simultaneously (HT8 DATA mode) the power level is 3dB lower (50%) than if a single antenna was transmitting.

5.1 Configuration 802.11a and 802.11n

Initial investigations were performed with all data rates: (6 Mbps to 54 Mbps, HT0 to HT7 and HT8 to HT15). Peak power with lowest data rates (6 Mbps, HT0 and HT8) was observed to be slightly worst. Final testing was performed while the transmitter continuously operated on the lowest data rates.

Modes	Data Rates	Frequency MHz	P dBm	Limit dBm	P mW	Limit mW	Result
Tx BW = 20 MHz							
802.11a	6 Mbps	5745	17.5	30	56.2	1000	Complies
		5785	17.1	30	51.3	1000	Complies
		5825	17.3	30	53.7	1000	Complies
802.11n	HT0	5745	17.6	30	57.4	1000	Complies
		5785	17.3	30	53.7	1000	Complies
		5825	17.2	30	52.5	1000	Complies
802.11n	HT8	5745	14.9	30	30.9	1000	Complies
		5785	15.0	30	31.6	1000	Complies
		5825	14.8	30	30.2	1000	Complies
Tx BW = 40 MHz (Wide)							
802.11n	HT0	5755	17.8	30	60.3	1000	Complies
		5795	18.0	30	63.1	1000	Complies
802.11n	HT8	5755	15.4	30	34.7	1000	Complies
		5795	15.3	30	33.9	1000	Complies

5.2 Configuration 802.11b

Initial investigations were performed with three modulation types: (DBPSK, DQPSK and CCK). Power with CCK modulation (rate = 11 Mbps) was observed to be slightly worst. Final testing was performed while the transmitter continuously operating with the modulation rate of 11 Mbps (CCK).

Frequency MHz	P dBm	Limit dBm	P mW	Limit mW	Result
2412	15.6	30	36.3	1000	Complies
2437	15.5	30	35.5	1000	Complies
2462	15.3	30	33.9	1000	Complies

5.3 Configuration 802.11g and 802.11n

Initial investigations were performed with all data rates: (6 Mbps to 54 Mbps, HT0 to HT7 and HT8 to HT15). Peak power with lowest data rates (6 Mbps, HT0 and HT8) was observed to be slightly worst. Final testing was performed while the transmitter continuously operated on the lowest data rates.

Modes	Data Rates	Frequency MHz	P dBm	Limit dBm	P mW	Limit mW	Result
802.11a	6 Mbps	2412	15.5	30	35.5	1000	Complies
		2437	15.7	30	37.2	1000	Complies
		2462	15.4	30	34.7	1000	Complies
802.11n	HT0	2412	15.6	30	36.3	1000	Complies
		2437	15.5	30	35.5	1000	Complies
		2462	15.5	30	35.5	1000	Complies
802.11n	HT8	2412	13.0	30	20.0	1000	Complies
		2437	12.5	30	17.8	1000	Complies
		2462	12.8	30	19.1	1000	Complies

6.0 CHANNEL BANDWIDTH

Testing was performed by Aegis Labs Inc. CA, USA accredited by A2LA (Certificate Number: 1111.01)

Results: Complied – refer to attachment 4, Aegis test report number: INTEL-060907F with FCC ID: PD94965AGN.

7.0 PEAK POWER SPECTRAL DENSITY

Testing was performed by Aegis Labs Inc. CA, USA accredited by A2LA (Certificate Number: 1111.01)

Results: Complied – refer to attachment 4, Aegis test report number: INTEL-060907F with FCC ID: PD94965AGN.

8.0 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).

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 M071142_Cert_4965AGN_SAR_2.4 and M071142_Cert_4965AGN_SAR_5.6. SAR value is measured low (noise floor) which complies with the FCC human exposure requirements of 47 CFR 2.1093 (d).

9.0 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.

10.0 COMPLIANCE STATEMENT

The Fujitsu notebook PC, Model: P8010 with INTEL Mini-PCI Wireless LAN Module ((Kedron 802.11a/b/g/n), Model: 4965AGN and Bluetooth Module, Model: EYSMJCS, **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 and 5725 – 5850 MHz.

The test sample also complied with the Industry Canada RSS-210 issue 7 - Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Annex 8 and the RF exposure requirements of RSS-102.

Results were as follows:

FCC Subpart C, Section 15.247

FCC Part 15 Subpart C Clauses	Industry Canada RSS-210 Issue 7 and RSS-Gen Clauses	Test Performed	Results
15.203	RSS-Gen (7.1.4)	Antenna Requirement	**Complies**
15.205	2.2 (Table 1)	Operation in Restricted Band	**Complies**
15.207	RSS-Gen (7.2.2)	Conducted Emissions	**Complies**
15.209	RSS-Gen (6)	Radiated Emissions	**Complies**
15.247 (a)(2)	A8.1 (b) (d)	Channel Bandwidth	**Complies**
15.247 (b)(3)	A8.4	Peak Output Power	**Complies**
15.247 (c)	RSS-Gen (7.1.4)	Antenna Gain > 6 dBi	**Not Applicable.** Antenna gain < 6 dBi
15.247 (d)	A8.5	Out of Band Emissions	**Complies**
15.247 (e)	A8.2 (b)	Peak Power Spectral Density	**Complies**
15.247 (f)	A8.3	*Hybrid Systems	**Not Applicable.** EUT does not employ a hybrid system
15.247 (g)	A8.1	Frequency Hopping	**Not Applicable.** EUT does not employ frequency hopping
15.247 (h)	A8.1	Frequency Hopping	**Not Applicable.** EUT does not employ frequency hopping
15.247 (i)	RSS-Gen (5.5)	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: M071118_Cert_4965AGN_NII_BT

FCC Subpart C, Section 15.247 – Bluetooth
Refer to EMC Technologies Report No: M071118_Cert_EYSMJCS_WLAN

11.0 TEST REPORT APPENDICES

APPENDIX A: MEASUREMENT INSTRUMENT DETAILS
APPENDIX B: PHOTOGRAPHS
APPENDIX C: FUNCTIONAL DESCRIPTION
APPENDIX D: BLOCK DIAGRAM
APPENDIX E: SCHEMATICS
APPENDIX F: ANTENNA INFORMATION
APPENDIX G: SPECIFICATIONS
APPENDIX H: FCC LABELLING DETAILS
APPENDIX I: USER MANUAL

Attachment 1: RF Exposure Information
Attachment 2: FCC DOC for LifeBook P Series
Attachment 3: FCC Part 15B Test Report (Report: FG07-171EAL)
Attachment 4: INTEL Part 15.247 Test Report (Report: INTEL-060907F)