



**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-WB0080  
Industry Canada ID: 337J-WB0080

Test Sample: LifeBook T Series  
Model: T900 / TH900

Radio Modules: 622ANHMW Intel Centrino Advanced-N 6200  
Puma Peak 2x2 Half Mini-PCI WLAN Module &  
EYSMJCS Bluetooth Module

Report Number: M091068\_Cert\_622ANHMW\_DTS\_BT

Issue Date: 30<sup>th</sup> November 2009

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.



This document is issued in accordance with NATA's accreditation requirements. The results of tests, calibration and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing and calibration reports.

**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**  
**EMC Technologies Report No. M091068\_Cert\_622ANHWMW\_DTS\_BT**  
**Issue Date: 30<sup>th</sup> November 2009**

**CONTENTS**

|                                                        |                                           |
|--------------------------------------------------------|-------------------------------------------|
| <b>1.0</b>                                             | <b>INTRODUCTION</b>                       |
| <b>2.0</b>                                             | <b>GENERAL INFORMATION</b>                |
| <b>FCC 15.247 (DTS) RESULTS</b>                        |                                           |
| <b>3.0</b>                                             | <b>CONDUCTED EMI MEASUREMENTS</b>         |
| <b>4.0</b>                                             | <b>RADIATED SPURIOUS EMI MEASUREMENTS</b> |
| <b>5.0</b>                                             | <b>PEAK OUTPUT POWER</b>                  |
| <b>6.0</b>                                             | <b>CHANNEL BANDWIDTH</b>                  |
| <b>7.0</b>                                             | <b>PEAK POWER SPECTRAL DENSITY</b>        |
| <b>8.0</b>                                             | <b>RADIO FREQUENCY EXPOSURE</b>           |
| <b>9.0</b>                                             | <b>ANTENNA REQUIREMENT</b>                |
| <b>10.0</b>                                            | <b>COMPLIANCE STATEMENT</b>               |
| <b>11.0</b>                                            | <b>MEASUREMENT UNCERTAINTIES</b>          |
| <b>12.0</b>                                            | <b>TEST REPORT APPENDICES</b>             |
| <b>APPENDIX A: MEASUREMENT INSTRUMENT DETAILS</b>      |                                           |
| <b>APPENDIX B: PHOTOGRAPHS</b>                         |                                           |
| <b>APPENDIX C: OPERATIONAL DESCRIPTION</b>             |                                           |
| <b>APPENDIX D: BLOCK DIAGRAM</b>                       |                                           |
| <b>APPENDIX E: ANTENNA INFORMATION</b>                 |                                           |
| <b>APPENDIX F: SCHEMATIC</b>                           |                                           |
| <b>APPENDIX G: FCC LABELLING DETAILS</b>               |                                           |
| <b>APPENDIX H: USER MANUAL</b>                         |                                           |
| <b>Attachment 1: RF Exposure Information</b>           |                                           |
| <b>Attachment 2: FCC DOC for LifeBook T Series</b>     |                                           |
| <b>Attachment 3: Intel FCC Part 15.247 Test Report</b> |                                           |



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

**Report No. M091068\_Cert\_622ANHWMW\_DTS\_BT**

**Test Sample:** LifeBook T Series  
**Model:** T900 / TH900  
**Radio Modules:** Intel Centrino Advanced-N 6200 Puma Peak 2x2 Half Mini-PCI WLAN Module, Model: 622ANHWMW (Intel Corp.)  
Bluetooth Module, Model: EYSMJCS (Taiyo Yuden)

**FCC ID:** EJE-WB0080  
**Industry Canada ID:** 337J-WB0080  
**Equipment Type:** Intentional Radiator (Transceiver)

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

**Test Standards:** FCC Part 15 – Radio Frequency Devices (July 2008)  
FCC Part 15 Subpart C - Intentional Radiators  
Section 15.247: 2400 – 2483.5 MHz & 5725 – 5850 MHz Operation Bands  
ANSI C63.4 – 2003

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:** 23<sup>rd</sup> to 27<sup>th</sup> November 2009

**Senior Engineer:**

  
\_\_\_\_\_  
**Chieu Huynh - B.Eng (Hons) Electronics**  
**Lee Hopkins**

**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:**

  
\_\_\_\_\_  
**Chieu Huynh**  
**Senior EMC Engineer**  
**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: T900 / TH900 with Intel Centrino Advanced-N 6200 (Puma Peak 802.11a/b/g/n 2x2), Model: 622ANHMW & Taiyo Yuden Bluetooth Module, Model: EYSMJCS.

The Puma Peak 2x2 WLAN module was originally certified by INTEL as a modular approval under FCC ID: PD9622ANH (Canada ID: 1000M-622ANH). 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: RYEEYSMJCS (Canada ID: 4389B-EYSMJCS). The Radio modules are installed in a controlled environment at the Fujitsu notebook production/assembly factory.

The intention of this application is to FCC certify Intel Centrino Advanced-N 6200 (Puma Peak 802.11a/b/g/n 2x2), Model: 622ANHMW & Taiyo Yuden Bluetooth Module, Model: EYSMJCS installed in Fujitsu LifeBook T Series, Model: T900 / TH900.

The 622ANHMW 2x2 WLAN supports IEEE 802.11b, IEEE 802.11g, IEEE 802.11a and IEEE 802.11n (DTS & U-NII) configurations.

DTS results for configurations IEEE 802.11b, IEEE 802.11g, IEEE 802.11a and IEEE 802.11n are reported in this test report.

The NII (WLAN) and DSS (Bluetooth) are submitted separately under NII and DSS submissions.

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. The instrumentation conformed to the requirements of ANSI C63.2-1996.



## 1.1 Summary of Results

### 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          | <b>Complies</b>                                                 |
| 15.205                        | 2.2 (Table 1)                                       | Operation in Restricted Band | <b>Complies</b>                                                 |
| 15.207                        | RSS-Gen (7.2.2)                                     | Conducted Emissions          | <b>Note 1</b>                                                   |
| 15.209                        | RSS-Gen (6)                                         | Radiated Emissions           | <b>Complies</b>                                                 |
| 15.247 (a)(2)                 | A8.1 (b) (d)                                        | Channel Bandwidth            | <b>Note 2</b>                                                   |
| 15.247 (b)(3)                 | A8.4                                                | Peak Output Power            | <b>Note 2</b>                                                   |
| 15.247 (c)                    | RSS-Gen (7.1.4)                                     | Antenna Gain > 6 dBi         | <b>Not Applicable.</b><br>Antenna gain < 6 dBi                  |
| 15.247 (d)                    | A8.5                                                | Out of Band Emissions        | <b>Complies</b>                                                 |
| 15.247 (e)                    | A8.2 (b)                                            | Peak Power Spectral Density  | <b>Note 2</b>                                                   |
| 15.247 (f)                    | A8.3                                                | Hybrid Systems (Note 3)      | <b>Not Applicable.</b><br>EUT does not employ a hybrid system   |
| 15.247 (g)                    | A8.1                                                | Frequency Hopping            | <b>Not Applicable.</b><br>EUT does not employ frequency hopping |
| 15.247 (h)                    | A8.1                                                | Frequency Hopping            | <b>Not Applicable.</b><br>EUT does not employ frequency hopping |
| 15.247 (i)                    | RSS-Gen (5.5)                                       | Radio Frequency Hazard       | <b>Complies</b>                                                 |

**Note 1:** Refer to Attachment 2, FCC DOC for LifeBook T Series

**Note 2:** Refer to original approval under FCC ID: PD9622ANH (Canada ID: 1000M-622ANH)

**Note 3:** Hybrid systems are those that employ a combination of both frequency hopping and digital modulations technique.

## 1.2 Modifications by EMC Technologies

No modifications were required.



## 2.0 GENERAL INFORMATION

(Information supplied by the Client)

### 2.1 EUT (WLAN) Details

|                            |                                                                                |
|----------------------------|--------------------------------------------------------------------------------|
| <b>Transmitter:</b>        | Half Mini-Card Wireless LAN Module                                             |
| <b>Wireless Module:</b>    | Intel Centrino Advanced-N 6200 Puma Peak 2x2 (11a/b/g/n)                       |
| <b>Model Number:</b>       | 622ANHMMW                                                                      |
| <b>Manufacturer:</b>       | Intel Corporation                                                              |
| <b>Frequency Ranges:</b>   | 2.412 – 2.462 GHz<br>5.18 - 5.32 GHz, 5.5 – 5.7 GHz and 5.745 - 5.825 GHz      |
| <b>Maximum Data Rates:</b> | 802.11b = 11Mbps, 802.11g and 802.11a = 54Mbps<br>802.11n = 450 Mbps           |
| <b>Antenna Types:</b>      | Nissei Electric Inverted F (1 <sup>st</sup> , 2 <sup>nd</sup> )                |
| <b>Antenna gain:</b>       | Max antenna gain is less than 6 dBi.<br>Refer antenna data provided separately |
| <b>Power Supply:</b>       | 3.3 VDC from PCI bus                                                           |

#### Channels and Output Power Settings:

| Modes                              | Channels         | Frequency MHz       | Average Output Power (dBm) |
|------------------------------------|------------------|---------------------|----------------------------|
| <b>802.11b</b>                     | 1, 6 and 11      | 2412, 2437 and 2462 | 16.5                       |
| <b>802.11g</b>                     | 1                | 2412                | 15.5                       |
|                                    | 6                | 2437                | 16.5                       |
|                                    | 11               | 2462                | 15.5                       |
| <b>802.11a</b>                     | 36, 40 and 48    | 5180, 5200 and 5240 | 16.5                       |
|                                    | 52, 60 and 64    | 5260, 5300 and 5320 |                            |
|                                    | 100, 120 and 140 | 5500, 5600 and 5700 |                            |
|                                    | 149, 157 and 165 | 5745, 5785 and 5825 |                            |
| <b>802.11n<br/>20MHz Bandwidth</b> | 1                | 2412                | 15.5                       |
|                                    | 6                | 2437                | 16.5                       |
|                                    | 11               | 2462                | 15.5                       |
|                                    | 36, 40 and 48    | 5180, 5200 and 5240 | 16.5                       |
|                                    | 52, 60 and 64    | 5260, 5300 and 5320 |                            |
|                                    | 100, 120 and 140 | 5500, 5600 and 5700 |                            |
|                                    | 149, 157 and 165 | 5745, 5785 and 5825 |                            |
| <b>802.11n<br/>40MHz Bandwidth</b> | 3                | 2422                | 12                         |
|                                    | 6                | 2437                | 16.5                       |
|                                    | 9                | 2452                | 12                         |
|                                    | 38, 54 and 62    | 5190, 5270 and 5310 | 16.5                       |
|                                    | 102, 118 and 134 | 5510, 5590 and 5670 |                            |
|                                    | 151 and 159      | 5755 and 5795       |                            |

The 622ANHMMW is capable of using multiple antennas transmitting simultaneously (two antennas). In any two antennas transmitting, the power level is 3 dB lower (50%) for each antenna port than if a single antenna was transmitting.



## 2.2 EUT (Notebook PC) Details

**Host:** LifeBook T series  
**\*Model Name:** T900 / TH900  
**Serial Number:** Pre-production Sample  
**Manufacturer:** FUJITSU LIMITED

**CPU Type and Speed:** Core i7 M620 2.67GHz  
**LCD:** 13.3" WXGA  
**Wired LAN:** Intel 82577LM : 10 Base-T/100 Base-TX/1000Base-T  
**Modem:** Agere MDC1.5 modem Model: D40  
**Port Replicator Model:** ZPR0030

**AC Adapter Model:** 80W: SEE100P2-19.0 (Sanken), SEC100P3-19.0 (Sanken) and ADP-80NB A (Delta)  
 100W: SEE120P2-19.0 (Sanken)  
**Voltage:** 19V  
**Current Specs:** 4.22A / 5.27A  
**Watts:** 80W / 100W

\*The model numbers shown T900 and TH900 are for the same product. The difference is for marketing purposes. "H" in the model name means "Home" which is for the consumer market, while no "H" means it is for the commercial market.

## 2.3 Test Configuration

The Intel WLAN test software "CRTU" was used to transmit continuously during the tests.

Conducted tests were performed at the WLAN Antenna ports.

Radiated harmonics and spurious emissions were performed while the transmitter transmits continuously.

## 2.4 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.

## 2.5 Test Facility

### 2.5.1 General

EMC Technologies Pty Ltd is listed by the FCC as a test laboratory able to perform compliance testing for the public. EMC Technologies is listed as an FCC part 47CFR2.948 test lab and may perform the testing required under Parts 15 and 18 – **FCC Registration Number 90560**

EMC Technologies Pty Ltd has also been accredited as a Conformity Assessment Body (CAB) by Australian Communications and Media Authority (ACMA) under the APECTEL MRA and is designated to perform compliance testing on equipment subject to Declaration of Conformity (DoC) and Certification under Parts 15 & 18 of the FCC Commission's rules – **Registration Number 494713 & Designation number AU0001.**

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 OATS number - IC 3569B-1.**

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.





## 2.5.2 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](http://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<sup>2</sup>LA).

## 2.6 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 EMC Technologies. The complete list of test equipment used for the measurements, including calibration dates and traceability is contained in Appendix A

## 2.7 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 by Fujitsu General EMC Laboratory, JAPAN accredited by NVLAP (Lab Code: 200373-0).

### 4.0 RADIATED 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 and 15.247. The measurements were made at the open area test site. All measurements above 1 GHz were made over a distance of 3 and 1 metres.

Calibrated EMCO 3115, EMCO 3116 and ETS standard gain horn antennas were used for measurements between 1 to 40 GHz.

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<sup>-1</sup>). (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:

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



### 4.3 Radiated Emissions (Spurious and Harmonics)

This transmitter module was originally tested and certified by the manufacturer as a stand-alone module outside a laptop (host) with higher gain antennas. Refer to manufacturer's original test report (Attachment 3) for full results showing compliance with the spurious and harmonics limits. However, to ensure the transmitter module install in T900 / TH900 LifeBook is still in compliance, verification tests were performed at the worst case (frequencies with higher average output power) or selected frequencies for harmonics and spurious emissions.

All orientations were investigated and tested. Worst results were reported below.

#### 4.3.1 Frequency Band: 1 – 40 GHz

The 74 dB $\mu$ V/m @ 3m and 54 dB $\mu$ V/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 the WLAN transmitter continuously operated. Harmonics related to the WLAN transmitter operated in the frequency bands 2.4 – 2.4835 GHz and 5.725 – 5.850 GHz are reported below. Harmonics in the frequency bands 5.15 – 5.35 GHz and 5.47 – 5.725 GHz, refer to M091068\_Cert\_622ANHMW\_NII\_BT.

##### 4.3.1.1 Configuration 802.11b

Initial investigations were performed with all data rates: (1 Mbps to 11 Mbps). Final testing was performed while the transmitter continuously operated with the data rate of 1 Mbps.

Harmonics were measured for channels where the average output power was highest.

##### Channel 1 - 2462 MHz

| Frequency MHz | Peak Detector dBuV/m | Average Detector dBuV/m | Peak Limit dBuV/m             | Average Limit dBuV/m | Result   |
|---------------|----------------------|-------------------------|-------------------------------|----------------------|----------|
| 2462          | 104.7                | 100.5                   | Transmitter Fundamental Level |                      |          |
| 4924          | 56.1                 | 52.0                    | 74.0                          | 54.0                 | Complied |
| 7386          | 51.4                 | 41.8                    | 74.0                          | 54.0                 | Complied |
| 2390          | 53.6                 | 48.9                    | 74.0                          | 54.0                 | Complied |

**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 2.0 dB.

**4.3.1.2 Configuration 802.11g and 802.11n**

Measurements were performed with the EUT operating in the worst case mode of single antenna transmitting and the data rate at 6 Mbps or MCS0. For multiple antennas transmitting like two antennas transmitting, the power level is 3 dB lower (50%) with respect to single antenna mode.

Harmonics were measured for channels where the RF output power was highest.

Initial investigations were performed with all data rates: (6 Mbps to 54 Mbps and MCS0 to MCS7). Final testing was performed while the transmitter continuously operated in the worst case condition.

**802.11g - Channel 11 - 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          | 107.8                | 96.0                    | Transmitter Fundamental Level |                      |          |
|         |            | 4874          | 53.2                 | 38.5                    | 74.0                          | 54.0                 | Complied |
|         |            | 7311          | 52.7                 | 40.0                    | 74.0                          | 54.0                 | Complied |

**802.11n - Tx BW = 20 MHz, 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   |
|---------|------------|---------------|----------------------|-------------------------|-------------------------------|----------------------|----------|
| 802.11n | MCS0       | 2437          | 108.0                | 96.1                    | Transmitter Fundamental Level |                      |          |
|         |            | 4874          | 53.3                 | 38.5                    | 74.0                          | 54.0                 | Complied |
|         |            | 7311          | 52.8                 | 40.1                    | 74.0                          | 54.0                 | Complied |

**802.11n - Tx BW = 40 MHz, 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   |
|---------|------------|---------------|----------------------|-------------------------|-------------------------------|----------------------|----------|
| 802.11n | MCS0       | 2437          | 104.3                | 92.4                    | Transmitter Fundamental Level |                      |          |
|         |            | 4874          | Lower than 6Mbps     |                         |                               |                      | Complied |
|         |            | 7311          |                      |                         |                               |                      | Complied |

**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 > 10 dB.

**4.3.1.3 Configuration 802.11a and 802.11n**

Measurements were performed with the EUT operating in the worst case mode of single antenna transmitting and the data rate at 6 Mbps or MCS0. For multiple antennas transmitting like two antennas transmitting, the power level is 3 dB lower (50%) with respect to single antenna mode.

Harmonics were measured for channels where the RF output power was highest.

Initial investigations were performed with all data rates: (6 Mbps to 54 Mbps and MCS0 to MCS7). Final testing was performed while the transmitter continuously operated in the worst case condition.

**802.11a - Channel 149 - 5745 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                           | 102.4                | 91.2                    | Transmitter Fundamental Level |                      |          |
|         |            | Harmonics and spurious are low |                      |                         |                               |                      | Complied |

**802.11n - Tx BW = 20 MHz, Channel 165 - 5825 MHz**

| Modes   | Data Rates | Frequency MHz                  | Peak Detector dBuV/m | Average Detector dBuV/m | Peak Limit dBuV/m             | Average Limit dBuV/m | Result   |
|---------|------------|--------------------------------|----------------------|-------------------------|-------------------------------|----------------------|----------|
| 802.11n | MCS0       | 5825                           | 102.5                | 91.1                    | Transmitter Fundamental Level |                      | Complied |
|         |            | Harmonics and spurious are low |                      |                         |                               |                      |          |

**802.11n - Tx BW = 40 MHz, Channel 159 - 5795 MHz**

| Modes   | Data Rates | Frequency MHz                  | Peak Detector dBuV/m | Average Detector dBuV/m | Peak Limit dBuV/m             | Average Limit dBuV/m | Result   |
|---------|------------|--------------------------------|----------------------|-------------------------|-------------------------------|----------------------|----------|
| 802.11n | MCS0       | 5795                           | 99.7                 | 88.4                    | Transmitter Fundamental Level |                      | Complied |
|         |            | Harmonics and spurious are low |                      |                         |                               |                      |          |

**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 > 10 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).

**4.3.3 RF Conducted Measurements at the Antenna Terminal (including Band Edge)**

Refer to original approval under FCC ID: PD9622ANH (Canada ID: 1000M-622ANH) certified by INTEL.

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



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

Refer to original approval under FCC ID: PD9622ANH (Canada ID: 1000M-622ANH) certified by INTEL.

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

## 6.0 CHANNEL BANDWIDTH

Refer to original approval under FCC ID: PD9622ANH (Canada ID: 1000M-622ANH) certified by INTEL.

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

## 7.0 PEAK POWER SPECTRAL DENSITY

Refer to original approval under FCC ID: PD9622ANH (Canada ID: 1000M-622ANH) certified by INTEL.

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

## 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 M091069\_Cert\_622ANH MW\_SAR\_2.4\_BT (2.4 GHz) and M091069\_Cert\_622ANH MW\_SAR\_5.6\_BT (5.18 – 5.825 GHz). SAR values of 0.182 mW/g (DTS) and 0.068 mW/g (NII) were measured which complied 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: T900 / TH900 with Intel Centrino Advanced-N 6200 (Puma Peak 802.11a/b/g/n 2x2), Model: 622ANHMHW & Taiyo Yuden 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          | <b>Complies</b>                                                 |
| 15.205                        | 2.2 (Table 1)                                       | Operation in Restricted Band | <b>Complies</b>                                                 |
| 15.207                        | RSS-Gen (7.2.2)                                     | Conducted Emissions          | <b>Note 1</b>                                                   |
| 15.209                        | RSS-Gen (6)                                         | Radiated Emissions           | <b>Complies</b>                                                 |
| 15.247 (a)(2)                 | A8.1 (b) (d)                                        | Channel Bandwidth            | <b>Note 2</b>                                                   |
| 15.247 (b)(3)                 | A8.4                                                | Peak Output Power            | <b>Note 2</b>                                                   |
| 15.247 (c)                    | RSS-Gen (7.1.4)                                     | Antenna Gain > 6 dBi         | <b>Not Applicable.</b><br>Antenna gain < 6 dBi                  |
| 15.247 (d)                    | A8.5                                                | Out of Band Emissions        | <b>Complies</b>                                                 |
| 15.247 (e)                    | A8.2 (b)                                            | Peak Power Spectral Density  | <b>Note 2</b>                                                   |
| 15.247 (f)                    | A8.3                                                | Hybrid Systems (Note 3)      | <b>Not Applicable.</b><br>EUT does not employ a hybrid system   |
| 15.247 (g)                    | A8.1                                                | Frequency Hopping            | <b>Not Applicable.</b><br>EUT does not employ frequency hopping |
| 15.247 (h)                    | A8.1                                                | Frequency Hopping            | <b>Not Applicable.</b><br>EUT does not employ frequency hopping |
| 15.247 (i)                    | RSS-Gen (5.5)                                       | Radio Frequency Hazard       | <b>Complies</b>                                                 |

**Note 1:** Refer to Attachment 2, FCC DOC for LifeBook T Series

**Note 2:** Refer to original approval under FCC ID: PD9622ANH (Canada ID: 1000M-622ANH)

**Note 3:** Hybrid systems are those that employ a combination of both frequency hopping and digital modulations technique.



## 11.0 MEASUREMENT UNCERTAINTIES

EMC Technologies has evaluated the equipment and the methods used to perform the emissions testing. The estimated measurement uncertainties for emissions tests shown within this report are as follows:

|                             |                     |         |
|-----------------------------|---------------------|---------|
| <b>Conducted Emissions:</b> | 9 kHz to 30 MHz     | ±3.2 dB |
| <b>Radiated Emissions:</b>  | 30 MHz to 300 MHz   | ±5.1 dB |
|                             | 300 MHz to 1000 MHz | ±4.7 dB |
|                             | 1 GHz to 18 GHz     | ±4.6 dB |

The above expanded uncertainties are based on standard uncertainties multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%.

## 12.0 TEST REPORT APPENDICES

**APPENDIX A: MEASUREMENT INSTRUMENT DETAILS**

**APPENDIX B: PHOTOGRAPHS**

**APPENDIX C: OPERATIONAL DESCRIPTION**

**APPENDIX D: BLOCK DIAGRAM**

**APPENDIX E: ANTENNA INFORMATION**

**APPENDIX F: SCHEMATIC**

**APPENDIX G: FCC LABELLING DETAILS**

**APPENDIX H: USER MANUAL**

**Attachment 1: RF Exposure Information**

**Attachment 2: FCC DOC for LifeBook T Series**

**Attachment 3: Intel FCC Part 15.247 Test Report**

