



Global Product Certification  
EMC-EMF Safety Approvals

**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: sales@emctech.com.au

**RADIO TEST REPORT FOR CERTIFICATION**  
**to**  
**FCC PART 15 Subpart C (Section 15.247) & RSS-210**  
**DSS – Bluetooth**

**Client:** Fujitsu Australia Ltd  
**Test Sample:** LIFEBOOK T series  
**Model:** T725  
**FCC ID:** EJE-WB0091  
**Industry Canada ID:** 337J-WB0091

**Radio Module:** Intel Stonepeak 7265NGW (802.11 a/b/g/n/ac Wireless LAN + BT V 4.0)  
FCC ID: PD97265NG  
IC ID: 1000M-7265NG

**Report Number:** M141038a-1 (Superseded report M141038-1)

**Issue Date:** 01 December 2014

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.

**RADIO TEST REPORT FOR CERTIFICATION**  
**to**  
**FCC PART 15 Subpart C (Section 15.247) & RSS-210**  
**EMC Technologies Report No. M141038a-1**  
**Issue Date: 01 December 2014**

**CONTENTS**

- 1. INTRODUCTION**
  - 2. GENERAL INFORMATION**
  - 3. RADIATED SPURIOUS EMISSION MEASUREMENTS**
  - 4. 20 dB BANDWIDTH**
  - 5. NUMBER OF HOPPING CHANNELS**
  - 6. TIME OF OCCUPANCY (DWELL TIME)**
  - 7. MAXIMUM PEAK OUTPUT POWER & ANTENNA GAIN**
  - 8. CONDUCTED SPURIOUS EMISSIONS**
  - 9. RADIO FREQUENCY EXPOSURE (HAZARD) INFORMATION**
  - 10. ANTENNA REQUIREMENT**
  - 11. COMPLIANCE STATEMENT**
  - 12. MEASUREMENT UNCERTAINTY**
- APPENDIX A MEASUREMENT INSTRUMENTATION DETAILS**

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

**Report No. M141038a-1**

**Client:** Fujitsu Australia Ltd  
**Test Sample:** LifeBook T Series  
**Model:** T725  
**FCC ID:** EJE-WB0091  
**Industry Canada ID:** 337J-WB0091  
**Equipment Type:** Intentional Radiator (Transceiver)

**Radio Module:** Intel Stonepeak 7265NGW (802.11 a/b/g/n/ac Wireless LAN + BT V 4.0)  
FCC ID: PD97265NG  
IC ID: 1000M-7265NG

**Manufacturer (LifeBook):** Fujitsu Ltd  
**Address:** 1-1 Kamikodanaka 4-Chome, Nakahara-Ku, Kawasaki, Japan

**Standards:** FCC Part 15 – *Radio Frequency Devices (October 2009)*  
FCC Part 15 Subpart C – *Intentional Radiators*  
Section 15.247 – *Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz.*

FCC Public Notice DA 00-75 *Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems*

ANSI C63.4 – 2009 *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*

RSS-210 Issue 8 *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:** 31<sup>st</sup> October, 5<sup>th</sup> to 7<sup>th</sup> November and 13<sup>th</sup> November 2014

**Test Engineers:**



**Matthew Grimwood**  
**EMC Test Officer**



**Mahan Ghassempouri**  
**EMC Test Officer**

**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:**



**Rob Weir**  
**Facility Manager, Melbourne**  
**EMC Technologies Pty Ltd**

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

### 1.0 INTRODUCTION

EMI testing was performed on the Portable PC Fujitsu LifeBook T Series, Model: T725 incorporating an Intel Stonepeak 7265NGW (802.11 a/b/g/n/ac Wireless LAN + BT V 4.0), Model: 7265NGW radio module.

The 7265NGW module was originally certified by INTEL Corporation as a modular approval under FCC ID: PD97265NG (Canada ID: 1000M-7265NG).

The intention of this application is to FCC certify Intel Stonepeak 7265NGW (802.11 a/b/g/n/ac Wireless LAN + BT V 4.0), Model: 7265NGW installed in Portable PC Fujitsu LifeBook T Series, Model: T725.

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 15.209:	Radiated Emission Limits (General requirements)
Section 15.247:	Operation in the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz

### 1.1 Summary of Results

#### FCC Subpart C, Section 15.247, Measured at EMC Technologies

FCC Part 15 Subpart C Clauses	Industry Canada RSS-210 Issue 8 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>
15.209	RSS-Gen (6)	Radiated emissions limits	<b>Complies</b>
15.247 (d)	RSS-210 Clause A8.5	Radiated emissions	<b>Complies</b>
15.247 (i)	RSS-Gen (5.5)	Radio Frequency Hazard	<b>Complies</b>

#### FCC Subpart C, Section 15.247, Inspected in original module report

FCC Part 15 Subpart C Clauses	Industry Canada RSS-210 Issue 8 and RSS-Gen Clauses	Test Performed	Results
15.247 (a)(1)	A8.1 (b)	20 dB Bandwidth	<b>Complies (Note 1)</b>
15.247 (a)(1)(iii)	A8.1 (d)	Number of hopping channels	<b>Complies (Note 1)</b>
15.247 (a)(1)(iii)	A8.1 (d)	Time of occupancy (dwell time)	<b>Complies (Note 1)</b>
15.247 (b)	A8.4 (2)	Maximum peak output power and antenna gain	<b>Complies (Note 1)</b>
15.247 (d)	A8.5	Conducted spurious emissions	<b>Complies (Note 1)</b>

**Note 1:** Refer to the original module report from Intel.

## 1.2 Modifications by EMC Technologies

No modifications were required.

## 2.0 GENERAL INFORMATION

(Information supplied by the Client)

### 2.1 EUT (Bluetooth/EDR) Details

<b>Transmitter:</b>	Mini PCIe Wireless LAN Card
<b>Wireless Module:</b>	Intel Stonepeak 7265NGW (802.11 a/b/g/n/ac Wireless LAN + BT V 4.0)
<b>Model Number:</b>	7265NGW
<b>Manufacturer:</b>	Intel Corporation
<b>Frequency Ranges:</b>	2402 MHz to 2480 MHz
<b>Number of Channels:</b>	79 for Bluetooth/EDR
<b>Carrier Spacing:</b>	1 MHz for Bluetooth/EDR
<b>Antenna Types:</b>	Tx1 Antenna: Nissei CP659380-A Tx/Rx2 Antenna: Nissei CP659380-B
<b>Antenna gain:</b>	1.91 dBi (Max antenna gain is less than 6 dBi) Refer antenna data provided separately
<b>Maximum Output Power:</b>	6 dBm for Bluetooth/EDR

### 2.2 EUT (Notebook PC) Details

<b>NoteBook PC:</b>	Portable PC LifeBook T series
<b>Model Name:</b>	T725
<b>Serial Number:</b>	Pre-production Sample
<b>Manufacturer:</b>	FUJITSU LIMITED
<b>CPU Type and Speed:</b>	Core i7 2.6GHz
<b>LCD</b>	12.5"HD+(1366x768) : LP125WH2
<b>Wired LAN:</b>	Intel 218LM : 10 Base-T/100 Base-TX/1000Base-T
<b>Modem:</b>	Non
<b>Port Replicator Model:</b>	FPCPR213
<b>AC Adapter Model:</b>	ADP-65YH B
<b>Voltage out:</b>	19 V
<b>Current out:</b>	3.42A
<b>Watts:</b>	65W

### 2.3 Test Configuration

The Intel test software "DRTU" was used to control the transmitter module enabling it to transmit continuously and with selected channels.

Radiated harmonics and spurious emission measurements were performed while the radio module transmitted a modulated signal continuously.

## 2.4 Test Facility

### 2.4.1 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 has also been accepted by Industry Canada for the performance of radiated measurements in accordance with RSS 212, Issue 1 (Provisional) - **Industry Canada number 3569B.**

Measurements were performed at EMC Technologies' laboratory in Keilor Park, Victoria Australia.

### 2.4.2 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).

## 2.5 Test Equipment Calibration

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 (bi-log and horn) calibrated by EMC Technologies. The complete list of test equipment used for the measurements, including calibration dates and traceability is contained in Appendix A

## FCC 15.247 RESULTS (Bluetooth/EDR)

### 3.0 RADIATED SPURIOUS EMISSION MEASUREMENTS

#### 3.1 Test Procedure

Testing was performed in accordance with the requirements of FCC Part 15.247(d). The measurement procedure used was in accordance with ANSI C63.4-2009. The instrumentation conformed to the requirements of ANSI C63.2-2009.

Radiated emission measurements were performed to the limits as per section 15.209 and 15.247. Measurement below 1 GHz were performed at the distance of 10 metres. 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 above 1000 MHz. A calibrated Bi-Log antenna was used for measurements below 1000 MHz.

The measurement of emissions above 1000 MHz was measured using a following setting:  
Quasi-Peak measurements setting: RBW = 120 kHz and VBW = 300 kHz

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. The procedure was repeated with the device orientated in three orthogonal axis to further maximise the emission. In this instance the device antennas are located in the swivel display, this was adjusted to give maximum emissions.

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.

#### 3.2 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 $\mu$ V/m.
- V** = EMI Receiver Voltage in dB $\mu$ V. (measured value)
- AF** = Antenna Factor in dB(m<sup>-1</sup>). (stored as a data array of factor versus frequency)
- G** = Preamplifier Gain in dB. (stored as a data array of gain versus frequency)
- L** = Cable insertion 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 $\mu$ 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 20.0 dB. The resulting Field Strength is therefore as follows:

$$34.0 + 9.2 + 1.9 - 20.0 = 25.1 \text{ dB}\mu\text{V/m}$$

### 3.3 Results

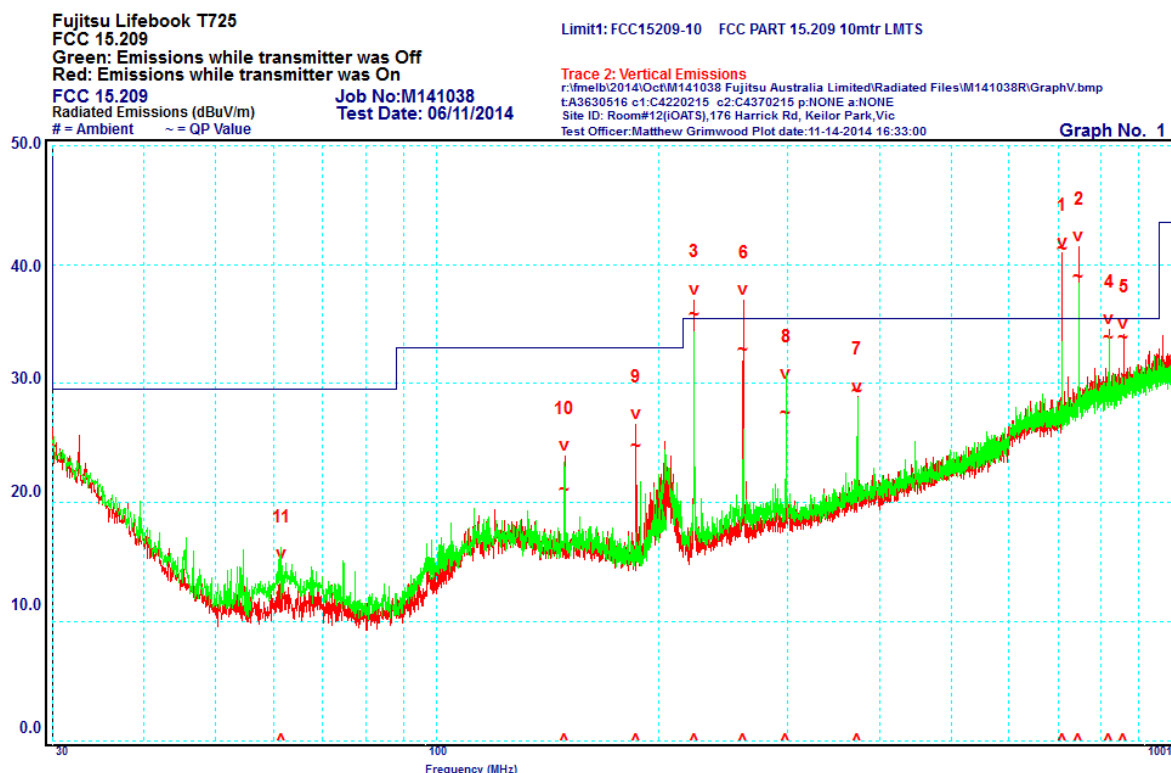
This transmitter module was originally tested and certified by the manufacturer as a stand-alone module outside a laptop (host) with higher gain antennas. Refer to manufacturer's original test report (FCC 15C) for full results showing compliance with the spurious and harmonics limits.

However, to ensure the transmitter module installed in the T725 LifeBook is still in compliance, verification tests were performed. Final testing was performed while the transmitter continuously operated in the worst case condition and only those are reported.

#### 3.3.1 Frequency Band: 30 - 1000 MHz

The measurements were made at a distance of 10 metres. Each frequency band and modulation types were checked, the highest emissions are reported.

##### Vertical Emissions:

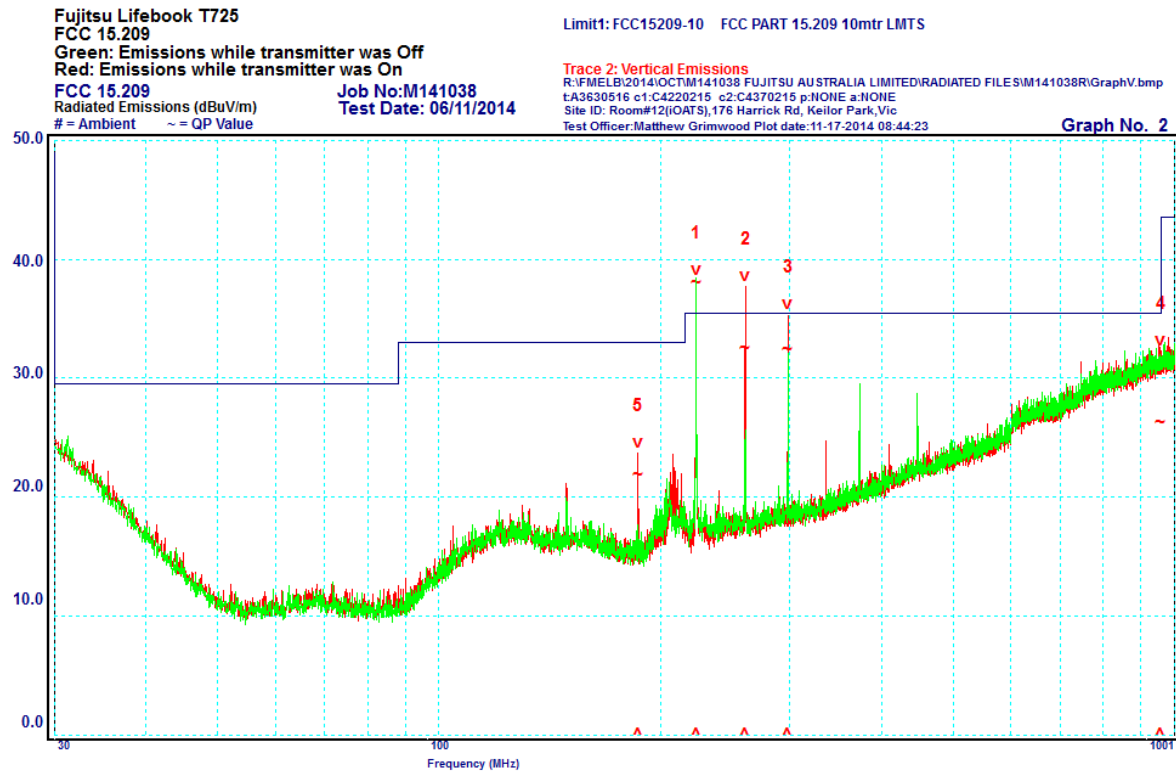


Peak	Frequency MHz	Polarization	Quasi Peak dBuV/m	Quasi Peak Limit dBuV/m	Margin dB	Result
1	708.70	Vertical	41.3	35.5	5.8	Note1
2	746.00	Vertical	39.0	35.5	3.5	Note1
3	223.81	Vertical	35.7	35.5	0.2	Note1
4	820.58	Vertical	33.8	35.5	-1.7	Note1
5	857.90	Vertical	33.8	35.5	-1.7	Complied
6	261.10	Vertical	32.8	35.5	-2.7	Note1
7	373.00	Vertical	29.3	35.5	-6.2	Note1
8	298.40	Vertical	27.4	35.5	-8.1	Note1
9	186.48	Vertical	24.8	33.0	-8.2	Complied
10	149.21	Vertical	21.0	33.0	-12.0	Note1
11	61.44	Vertical	12.4	29.5	-17.1	Note1

Note1: ambient measurements with transmitter off were recorded (green trace) to verify emission source was not the radio module.



## Horizontal Emissions:



Peak	Frequency MHz	Polarization	Quasi Peak dBuV/m	Quasi Peak Limit dBuV/m	Margin dB	Result
1	223.81	Horizontal	38.0	35.5	2.5	Note1
2	261.11	Horizontal	32.5	35.5	-3.0	Note1
3	298.40	Horizontal	32.4	35.5	-3.1	Note1
4	959.53	Horizontal	26.2	35.5	-9.3	Note1
5	186.50	Horizontal	21.8	33.0	-11.2	Complied

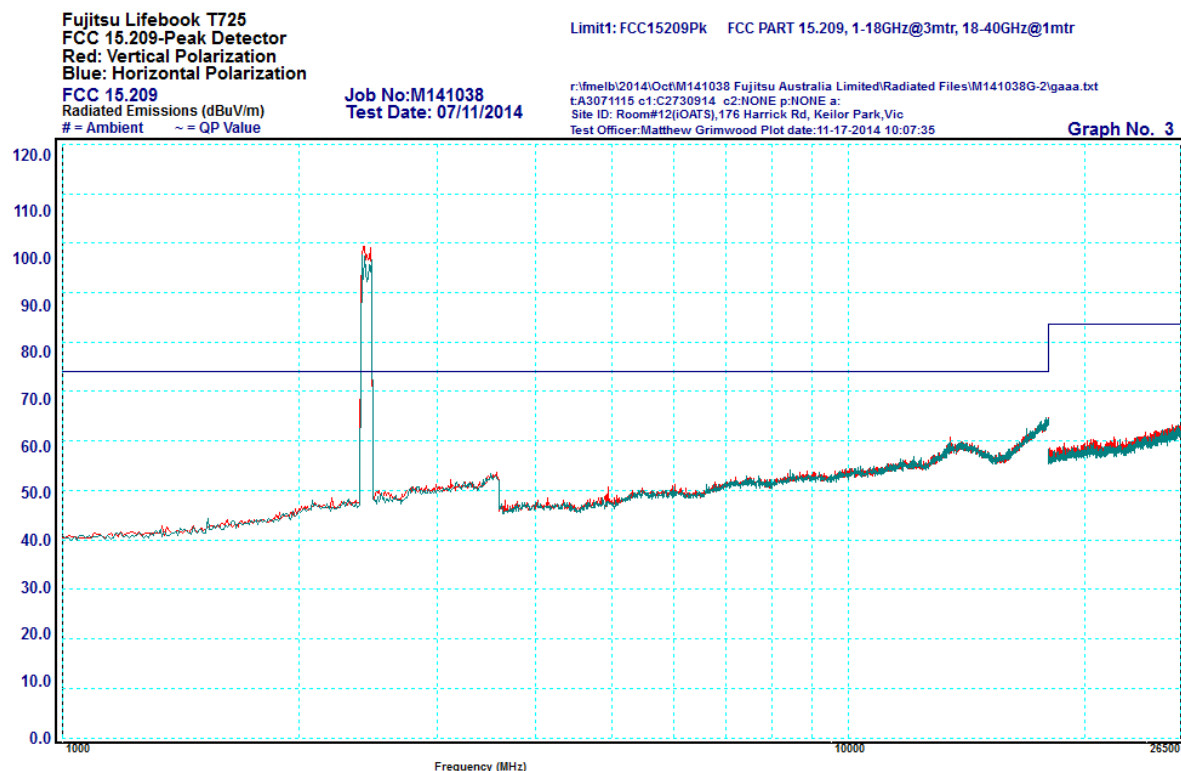
Note1: ambient measurements with transmitter off were recorded (green trace) to verify emission source was not the radio module.

### 3.3.2 Frequency Band: 1 – 26.5 GHz

The limits for emissions falling in the restricted band measured using peak and average detector are 74 dB $\mu$ V/m and 54 dB $\mu$ V/m, respectively (measured at 3m distance). For convenience these limits were applied across the entire range. The actual limits for emissions outside the restricted band are 20 dB below the fundamental field strength. The limits are adjusted by 10.5 dB when measurements were performed at the distance of 1m.

Testing was performed while the Bluetooth module continuously transmitted. The worst case measurements are reported in this document.

#### Peak emissions, 1 GHz – 26.5 GHz



Note: intentional transmitter emissions are exempted from the limit.

## Average emissions, 1 GHz – 26.5 GHz

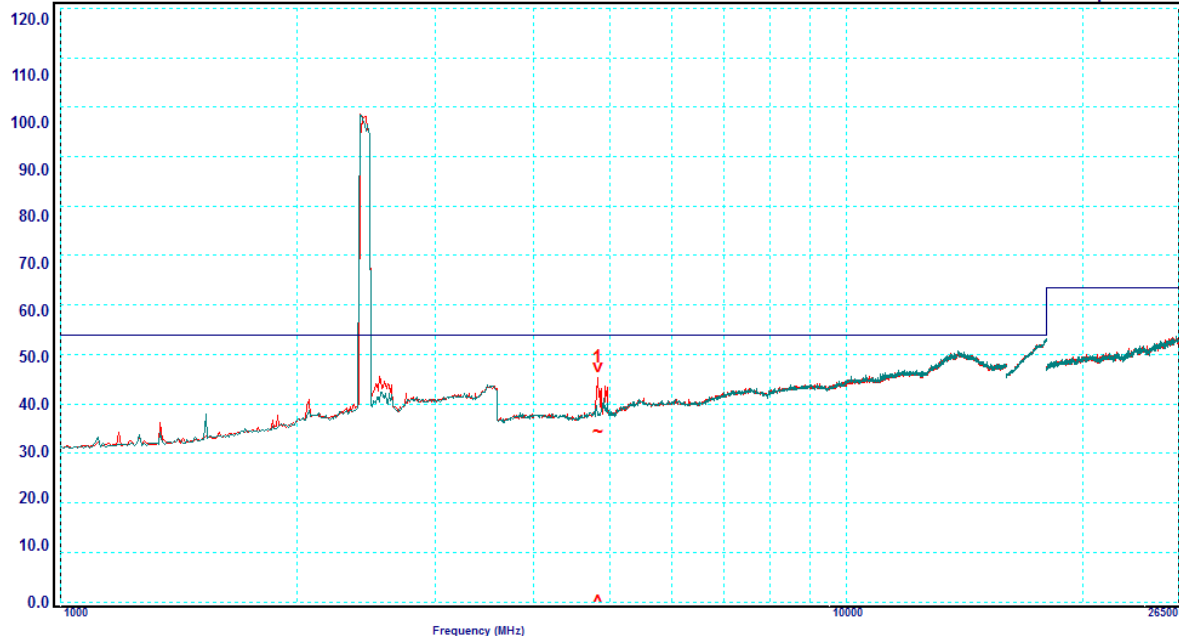
Fujitsu Lifebook T725  
FCC 15.209-Average Detector  
Red: Vertical Polarization  
Blue: Horizontal Polarization  
FCC 15.209  
Radiated Emissions (dBuV/m)  
# = Ambient ~ = QP Value

Job No: M141038  
Test Date: 07/11/2014

Limit1: FCC15209Av FCC PART 15.209, 1-18GHz@3mtr, 18-40GHz@1mtr

r:\fmeib\2014\Oct\M141038 Fujitsu Australia Limited\Radiated Files\M141038G-2\gaaa.txt  
t:A3071115 c1:C2730914 c2:NONE p:NONE a:  
Site ID: Room#12(iQATS),176 Harrick Rd, Keilor Park, Vic  
Test Officer: Matthew Grimwood Plot date: 11-17-2014 10:09:18

Graph No. 4



Peak	Frequency MHz	Polarization	Average dBuV/m	Average Limit dBuV/m	Margin dB	Result
1	4831.92	Vertical	34.2	54.0	-19.8	Complied

Note: intentional transmitter emissions are exempted from the limit.

## 4.0 20 dB BANDWIDTH

Refer to original Intel module test report (submitted). Testing was performed by AT4 Wireless, S.A. with FCC registration number 720267 and Canadian Certification reference number IC 4621A-1. Report 41273RRF.001.

## 5.0 NUMBER OF HOPPING CHANNELS

Refer to original Intel module test report (submitted). Testing was performed by AT4 Wireless, S.A. with FCC registration number 720267 and Canadian Certification reference number IC 4621A-1. Report 41273RRF.001.

## 6.0 TIME OF OCCUPANCY (DWEIL TIME)

Refer to original Intel module test report (submitted). Testing was performed by AT4 Wireless, S.A. with FCC registration number 905266 and Canadian Certification reference number IC 4621A-1. Report 41273RRF.001.

It was not deemed likely that the frequency hopping parameters will be affected by the host equipment.

## 7.0 MAXIMUM PEAK OUTPUT POWER & ANTENNA GAIN

Refer to original Intel module test report (submitted). Testing was performed by AT4 Wireless, S.A. with FCC registration number 720267 and Canadian Certification reference number IC 4621A-1. Report 41273RRF.001.

## 8.0 CONDUCTED SPURIOUS EMISSIONS

Refer to original Intel module test report (submitted). Testing was performed by AT4 Wireless, S.A. with FCC registration number 720267 and Canadian Certification reference number IC 4621A-1. Report 41273RRF.001.

## 9.0 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 exemption for the Bluetooth transmitter was reported under EMC Technologies report number M141024\_ FCC\_7265NGW\_SAR\_2.4.

## 10.0 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.

## 11.0 COMPLIANCE STATEMENT

The Portable PC Fujitsu LifeBook T Series, Model: T725 with Intel Stonepeak 7265NGW, Model: 7265NGW (802.11 a/b/g/n/ac Wireless LAN + BT V 4.0), 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 8 - Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Annex 8 and the RF exposure requirements of RSS-102.

## 12.0 MEASUREMENT UNCERTAINTY

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%.

## APPENDIX A MEASUREMENT INSTRUMENTATION DETAILS

Equipment Type	Make/Model/Serial Number	Last Cal. dd/mm/yy	Due Date dd/mm/yy	Cal. Interval
<b>EMI Receiver</b>	R&S ESU40 20 Hz – 40 GHz Sn: 100392 (R-140)	09/10/2014	09/10/2015	1 Year, *2
<b>Antennas</b>	SUNOL JB6 BICONILOG 30 – 6000 MHz Sn. A012312 (A-363)	16/05/2014	16/05/2015	1 Year, *2
	EMCO 3115 Broadband Horn 1 – 18 GHz Sn. 8908-3282 (A-004)	16/01/2012	16/01/2015	3 Year, *1
	ETS-Lindgren Horn 3160-09 18-26.5 GHz Sn. 66032 (A-307)	12/11/2012	12/11/2015	3 Year, *1
	ETS-Lindgren Horn 3160-10 26.5-40 GHz Sn. 66032 (A-306)	12/11/2012	12/11/2015	3 Year, *1
<b>Cables</b>	Room 12 Inbuilt cable Panel 1 to 3m (C-421)	4/02/2014	4/02/2015	1 Year, *1
	Room 12 Inbuilt cable Panel 1 to 10m (C-422)	6/02/2014	6/02/2015	1 Year, *1
	Sucoflex 102 Huber & Suhner Sn. 27319/2 (C-273)	26/06/2014	26/06/2015	1 Year, *1
<b>Pre-Amplifier</b>	Electronic Development SG18-B3015 1 – 18 GHz Sn. 1 (A-288)	27/02/2014	27/02/2015	1 Year, *1

Note \*1. Internal NATA calibration.

Note \*2. External NATA / A2LA calibration