**EMC Technologies Pty Ltd**
ABN 82 057 105 549
57 Assembly Drive
Tullamarine Victoria Australia 3043

Ph: + 613 9335 3333
Fax: + 613 9338 9260
email: melb@emctech.com.au

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

| | |
|---|---|
| **FCC ID:** | **EJE-WL0005** |
| **Industry Canada ID:** | **337J-WL0005** |
| **Test Sample:** | Stylistic ST Series Pentablet PC |
| **Model Number:** | ST5010, ST5011 |
| **Codename:** | Ocampa/Ocampa2 |
| **Wireless LAN Module:** | Calexico2 |
| **Model Number:** | WM3B2200BG (11b/g) |
| **Tested for:** | Fujitsu Australia Ltd. |
| **Issue Date:** | 5th February 2004 |





**NATA Accredited Laboratory**
**Number: 5292**

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

## EMC Technologies Report No. M040123_Certification_Ocampa2_Calexico2

## Issue Date: 5th February 2003

## CONTENTS



**Exhibits supplied as part of this report:**
**Photographs**
**Graphs of EMI Measurements**
**Bandedge Plots**
**Channel Bandwidth Plots**
**Peak Power Spectral Density Plots**
**FCC Labelling Details**
**Antenna Information (Monopole Ceramic Chip – YCE-5008)**
**User Manual**
**FCC Pt 15B Ocampa2 DoC**

**Exhibits supplied by Intel:**
**Block Diagram**
**Test Sample Functional Description**
**Test Sample Schematics**
**PCB Layouts**
**WLAN Specifications**

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

| | |
|---|---|
| **Report Number:** | M040123_Certification_Ocampa2_Calexico2 |
| **Test Sample:** | Stylistic ST Series Pentablet PC |
| **Model Number:** | ST5010, ST5011 |
| **Codename:** | Ocampa/Ocampa2 |
| **Wireless LAN Module:** | Calexico2 |
| **Model Number:** | WM3B2200BG (11b/g) |
| **Equipment Type:** | Intentional Radiator (Transceiver) |
| **Manufacturer:** | Intel Corporation |
| | |
| **Manufacturer (Stylistic PC):** | Fujitsu Limited |
| **Address:** | 1405, Ohamaru, Inagi-shi, Tokyo 206-8503, Japan |
| **Contact:** | Mr. Kanbe Katsuhito |
| **FCC ID:** | EJE-WL0005 |
| **Industry Canada ID:** | 337J-WL0005 |
| | |
| **Tested for:** | Fujitsu Australia Ltd |
| **Address:** | 5 Lakeside Drive,<br>Burwood East, VIC 3151 Australia |
| **Phone:** | +613 9845 4300 |
| **Fax:** | +613 9845 4600 |
| **Contact:** | Mr Praveen Rao - Senior Compliance Engineer |
| | |
| **Test Standards:** | FCC Part 15, Subpart C - Intentional Radiators<br>FCC Part 15.247, 2400 - 2483.5 MHz Operation Band<br>ANSI C63.4-1992<br>OET Bulletin No. 63<br><br>RSS-210 Issue 5 Low Power Licence-Exempt RadioCommunication Devices:<br>6.2.2 (o) 2400 – 2483.5 MHz Spread Spectrum<br><br>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 – 29th January 2004 |
| | |
| **Test Officer:** | **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 Signature:** | **Chris Zombolas**<br>**Technical Director**<br>**EMC Technologies Pty Ltd** |

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

## 1.0 INTRODUCTION

This report details the results of EMI tests and measurements performed on the Mini-PCI Wireless LAN Module (Calexico2), Model WM3B2200BG installed in Stylistic ST Series Pentablet PC, Model ST5010, ST5011 (Ocampa/Ocampa2), 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, 5725-5815 MHz |

The results and technical details of the test sample are detailed in this report. The test sample **complies** with the requirements of 47 CFR, Part 15 Subpart C - Section 15.247.

The test sample also complies with the Industry Canada RSS-210 issue 5 (Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands)) clause 6.2.2(o) and the RF exposure requirements of RSS-102.

## 1.1 Summary of Results

**FCC PART 15 Subpart C (Section 15.247: 2400 - 2483.5 MHz band)**

| FCC Part 15, Subpart C Clauses | Industry Canada RSS-210 Clauses | Test Performed | Result |
|---|---|---|---|
| **15.203** | 5.5 | Antenna Requirement | **Not Applicable** |
| **15.205** | 6.3 | Operation in Restricted Bandwidth | **Complies** |
| **15.207** | 6.6 | Conducted Emissions | **Complies** |
| **15.209** | 6.3 | Radiated Emissions | **Complies** |
| **15.247 (a)(2)** | 6.2.2(o)(iv) | Channel Bandwidth | **Complies** |
| **15.247 (b)(3)** | 6.2.2(o)(b) | Peak Output Power | **Complies** |
| **15.247 (b)(5)** | | Radio Frequency Hazard | ***Complies with SAR requirements** |
| **15.247 (c)** | 6.2.2(o)(e1) | Out of Band Emissions | **Complies** |
| **15.247 (d)** | 6.2.2(o)(iv) | Peak Power Spectral Density | **Complies** |

***Refer to EMC Technologies' report M040122_Ocampa2_Calexico2 SAR Report**

The measurement procedure used was in accordance with ANSI C63.4-1992 and OET Bulletin No. 96-43. The instrumentation conformed to the requirements of ANSI C63.2-1987.

## 1.2 Modifications by EMC Technologies

No modifications were required.

# 2.0 GENERAL INFORMATION

(Information supplied by the Client)

## 2.1 Product Details

| | |
|---|---|
| **Test Sample:** | Stylistic ST Series Pentablet PC |
| **Model Number:** | ST5010, ST5011 |
| **Codename:** | Ocampa/Ocampa2 |
| **Wireless LAN Module:** | Calexico2 |
| **Model Number:** | WM3B2200BG (11b/g) |
| **Interface Type:** | Mini-PCI WLAN Module |
| **FCC ID:** | EJE-WL0005 |
| **Industry Canada ID:** | 337J-WL0005 |
| **Equipment Type:** | Intentional Radiator (Transceiver) |

## 2.2 Test Sample Operational Description

The EUT is a Fujitsu Stylistic ST Series Pentablet PC (Ocampa/Ocampa2) incorporating Mini-PCI Wireless LAN (WLAN) Module (Calexico2, WM3B2200BG).

The intention of this application is to certify the Calexico2 WLAN module (IEEE 802.11b & IEEE 802.11g) for STYLISTIC ST series – model ST5010, ST5011 (Ocampa/Ocampa2).

The highest CPU speed, Banias ULV 1.0GHz model was chosen for the tests and all other Ocampa/Ocampa2 models identical to the tested model except with lower CPU speed shall be declared compliant based on this test report.

## 2.3 Technical Specifications

| | |
|---|---|
| **Modulation Type:** | Direct Sequence Spread Spectrum (DSSS for 802.11b) Orthogonal Frequency Division Multiplexing (OFDM for 802.11g) |
| **Modulation Vs Data Rate:** | |
| **802.11b** | DBPSK – 1Mbps |
| | DQPSK – 2Mbps |
| | CCK – 5.5Mbps, 11Mbps |
| **802.11g** | BPSK – 6Mbps, 9Mbps |
| | QPSK – 12Mbps, 18Mbps |
| | 16QAM – 24Mbps, 36Mbps |
| | 64QAM – 48Mbps, 54Mbps |
| **Maximum Data Rate:** | 802.11b = 11Mbps |
| | 802.11g = 54Mbps |
| **Frequency Range:** | 2.4 –2.4835 GHz for 11b/g (operational range 2.412 – 2.462 GHz) |
| **Number of Channels:** | 11 maximum (for 802.11b and 802.11g) |
| **Antenna Type:** | Monopole Ceramic Chip Antenna |
| **Antenna Model:** | YCE-5008 |
| **Max. Output Power:** | 802.11b = 18 dBm, 802.11g = 15 dBm |
| **Power Supply:** | 3.3 VDC from PCI bus |

**Frequency allocation for 802.11b/g:**

| Channel Number | Frequency (MHz) |
|---|---|
| 1 | 2412 |
| 2 | 2417 |
| 3 | 2422 |
| 4 | 2427 |
| 5 | 2432 |
| 6 | 2437 |
| 7 | 2442 |
| 8 | 2447 |
| 9 | 2452 |
| 10 | 2457 |
| 11 | 2462 |

**EUT Host Details:**

| | |
|---|---|
| **Host PC:** | STYLISTIC ST Series (Pentablet PC) |
| **Model Number:** | ST5010, ST5011 |
| **Codename:** | Ocampa/Ocampa2 |
| **Serial Number:** | Not supplied |
| **Manufacturer:** | Fujitsu Ltd |
| | |
| **CPU Type and Speed:** | Banias ULV 1.0 GHz |
| **SDRAM:** | 256 MB |
| **LCD Screen:** | 10.4" XGA / 12.1 "XGA |
| **Hard Disk Drive:** | 40 GB |
| | |
| **LAN:** | Giga-LAN/10/100Base-T |
| **Wireless LAN Module:** | Calexico2 11b/g |
| **Docking Station Model:** | FPCPR43xx (x: A-Z or blank)<br>FPCPR44xx (x: A-Z or blank) |

**AC Adapter :**

| Adapter Spec | | | Model Number: | Alternate Model Number |
|---|---|---|---|---|
| Volts | Amps | Watts | | |
| 16 | 3.75 | 60 | SEC80N2-16.0 | CP171180-01 |

## 2.4 Test sample configuration

The INTEL Calexico2 utility software was used to set-up the WLAN module to continuously transmit during the tests. The LCD screen was observed for the transmitter status shown by the Calexico2 software.

**Antenna**

The Calexico2 WLAN (WM3B2200BG) is configured with a Monopole Ceramic Chip antenna (refer to attachment for Antenna specifications). The installation of the OEM WLAN module and the Antenna in Fujitsu STYLISTIC Series Pentablet PC is in a controlled environment. The installation is performed during the production/assembly process at the Fujitsu factory.

**AC Adapter**

The AC adapter SEC80N2-16.0 was used for all the tests. This adapter is also identified as CP171180-01. The manufacturer has stated that these adapters are identical electrically and mechanically.

## 2.5 Test Sample Block Diagram

Refer to attachment - EUT Block Diagram

## 2.6 Test Sample Support Equipment

| | |
|---|---|
| **External Monitor/s:** | |
| Conducted EMI | IPEX, Model H566, FCC ID: GKR567 |
| Radiated EMI | Hewlett Packard 15" Colour monitor, Model D2827A, FCC ID: C5F7NFCMC1515X |
| **IR Keyboard:** | P/N N860-7628-T152 |
| **USB Scanner:** | Rapidscan Mobile Colour scanner, M/N FPCSCN01, S/N DF1700100 |
| **USB Floppy Drive/s:** | Fujitsu Model: FPCFDD11, P/N CP032173-01<br>Fujitsu Model: FPCFDD12, P/N CP078720-01<br>USB OMNI Floppy Drive Model # USB F3501 SN W316000096 |
| **Headphones:** | Verbatim Multimedia Stereo headset |
| **PCMCIA Slot:** | 6 MB Compact flash card with Adapter, Apacer P/N 88.10200030 |
| **Memory Card:** | Secure Digital- 32 MB |
| **AC Adapter:** | SEC80N2-16.0 |

## 2.7 Test Procedure

Emissions measurements were performed in accordance with the procedures of ANSI C63.4-1992. Radiated emissions tests were performed at a distance of 3 and 10 metres from the EUT. OET Bulletin 63 dated October 1993 was used for reference.

## 2.8 Test Facility

### 2.8.1 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 emission measurements were performed at EMC Technologies' laboratory in Tullamarine, Victoria Australia.

The above sites have been fully described in a report submitted to the FCC office, and accepted in a letter dated June 14, 2002, **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,** (Registration Date - November 5th 2001).

### 2.8.2 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 emission, 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 Laboratory (NML) 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 ($A^2LA$).

## 2.9 Units of Measurements

### 2.9.1 Conducted Emissions

Measurements are reported in units of dB relative to one microvolt. (dBμV).

### 2.9.2 Radiated Emissions

Measurements are reported in units of dB relative to one microvolt per metre (dBμV/m).

## 2.10 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 Laboratory (NML). All equipment calibration is traceable to Australia national standards at the National Measurements Laboratory. The reference antenna calibration was performed by NML 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 of this report.

## 2.11 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.

## 3.0 CONDUCTED EMISSION MEASUREMENTS

Testing was performed in accordance with the requirements of FCC Part 15.207

### 3.1 Test Procedure

The arrangement specified in ANSI C63.4-1992 was adhered to for the conducted EMI measurements. The EUT was placed in the RF screened enclosure and a CISPR EMI Receiver as defined in ANSI C63.2-1987 was used to perform the measurements.

The EMI Receiver was operated under program control using the Max-Hold function and automatic frequency scanning, measurement and data logging techniques. The specified 0.15 MHz to 30 MHz frequency range was sub-divided into sub-ranges to ensure that all short duration peaks were captured.

### 3.2 Peak Maximising Procedure

The various operating modes of the system were investigated. For each of the sub-ranges, the EMI receiver was set to continuous scan with the Peak detector set to Max-Hold mode. The Quasi-Peak detector and the Average detector were then invoked to measure the actual Quasi-Peak and Average level of the most significant peaks, which were detected.

### 3.3 Calculation of Voltage Levels

The voltage levels were automatically measured in software and compared to the test limit. The method of calculation was as follows:

**VEMI = VRx + LBPF**

Where: **VEMI =** the Measured EMI voltage in dBµV to be compared to the limit.
**VRx =** the Voltage in dBµV read directly at the EMI receiver.
**LBPF =** the insertion loss in dB of the cables and the Limiter and Pass Filter.

### 3.4 Plotting of Conducted Emission Measurement Data

The measurement data pertaining to each frequency sub-range were then concatenated to form a single graph of (peak) amplitude versus frequency. This was performed for both Active and Neutral lines and the composite graph were subsequently plotted. A list of the highest relevant peaks and the respective Quasi-Peak and Average values were also plotted on the graph.

### 3.5 Results of Conducted Emission Measurements (AC Mains Ports)

| Frequency MHz | Line | Measured QP Level dBµV | QP Limit dBµV | ΔQP ±dB | Measured AV Level dBµV | AV Limit dBµV | ΔAV ±dB |
|---|---|---|---|---|---|---|---|
| 0.171 | Active | 47.1 | 64.9 | -17.8 | 29.0 | 54.9 | -25.9 |
| 0.169 | Neutral | 46.2 | 65.0 | -18.8 | 30.0 | 55.0 | -25.0 |
| 0.265 | Neutral | 40.9 | 61.3 | -20.4 | 28.0 | 51.3 | -23.3 |
| 0.268 | Active | 39.8 | 61.2 | -21.4 | 23.5 | 51.2 | -27.7 |
| 11.11 | Active | 33.8 | 60.0 | -26.2 | 22.1 | 50.0 | -27.9 |
| 15.50 | Neutral | 32.1 | 60.0 | -27.9 | 23.0 | 50.0 | -27.0 |

All emissions complied with the Class B quasi peak and average limits by margins of greater than 10 dB. The measurement uncertainty was ±2.0 dB.
Refer to attachment – Graphs of EMI measurement for plots of the conducted EMI measurements.

# 4.0 RADIATED EMISSION MEASUREMENTS

## 4.1 Test Procedure

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

Radiated emission measurements were performed to the limits as per section 15.209.

Testing was performed while the transmitter continuously transmitted on a low, middle and high frequency channel. 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 EMI Receiver was operated under software control via the PC Controller through the IEEE.488 Interface Bus Card Adaptor. 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. A calibrated Biconical antenna was used for measurements between 30 MHz to 232 MHz and a calibrated Logperiodic antenna used for measurements between 230 MHz to 1000 MHz. Calibrated EMCO 3115 and EMCO 3116 Horn antennas were used for measurements between 1 to 25 GHz.

The measurement of emissions between 30 - 1000 MHz was measured with the resolution bandwidth of 120 kHz and the video bandwidth of 300 kHz.

The measurement of emissions above 1000 MHz, appearing in the restricted bands, was made using an average detector with a bandwidth of 1.0 MHz.

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

## 4.2 Calculation of field strength

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

**E = V + AF - G + L** Where:

**E** = Radiated Field Strength in 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 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 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
  (30 MHz – 1,000 MHz) ± 3.7 dB

## 4.3 Results - Out of Band Emissions (Spurious and Harmonics)

### 4.3.1 Frequency Band: 1 – 25 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 54 dBμV/m limit at 3 metres has been converted to 64 dBμV/m at 1 metre using a factor of 20 dB per decade where emissions were located in the restricted bands.

The field strength at 2483.5 MHz when the EUT was operating at its highest channel (2462 MHz), was 38.1 dBμV/m peak (noise floor) and was > 20 dB below the maximum field strength of the in-band carrier.

The field strength at 2400 MHz when the EUT was operating at its lowest channel (2412 MHz), was 36.7 dBμV/m peak (noise floor) and was > 20 dB below the maximum field strength of the in-band carrier.

Measurements were made on a low (channel 1, 2412 MHz), middle (channel 6, 2437 MHz) and high (Channel 11, 2462 MHz) frequency channel.

#### 4.3.1.1 Configuration 802.11b

Initial investigations were performed with three modulation types: (DBPSK, DQPSK and CCK). No significant differences in emissions were observed. Final testing was performed while the transmitter continuously operated with the modulation rate of 1 Mbps (DBPSK).

**Channel 1 - 2412 MHz**

| Frequency MHz | Level dBuV/m | | Antenna Polarization | Peak Limit dBuV/m | Average Limit dBuV/m | Result |
|---|---|---|---|---|---|---|
| | Peak Detector | Average Detector | | | | |
| 2412 | Transmitter | Fundamental | | | | |
| 4824 | 55.2 | 39.8 | Vert/Hort | 74.0 | 54.0 | Pass |
| 7236 | 62.4 | 43.9 | Vert/Hort | - | - | Pass |
| 9648 | 58.9 | 41.1 | Vert/Hort | - | - | Pass |
| 12060 | 52.1 | 40.3 | Vert/Hort | 74.0 | 54.0 | Pass |
| 14472 | 54.1 | 41.8 | Vert/Hort | 74.0 | 54.0 | Pass |
| 16884 | 54.7 | 42.2 | Vert/Hort | - | - | Pass |
| 19296 | 57.3 | 44.4 | Vert/Hort | 84.0* (1m) | 64.0* (1m) | Pass |
| 21708 | 60.7 | 45.9 | Vert/Hort | - | - | Pass |
| 24120 | 61.2 | 46.7 | Vert/Hort | - | - | Pass |

**Channel 6 - 2437 MHz**

| Frequency MHz | Level dBuV/m | | Antenna Polarization | Peak Limit dBuV/m | Average Limit dBuV/m | Result |
|---|---|---|---|---|---|---|
| | Peak Detector | Average Detector | | | | |
| 2437 | Transmitter | Fundamental | | | | |
| 4874 | 54.8 | 40.3 | Vert/Hort | 74.0 | 54.0 | Pass |
| 7311 | 63.1 | 43.7 | Vert/Hort | 74.0 | 54.0 | Pass |
| 9748 | 58.7 | 41.4 | Vert/Hort | - | - | Pass |
| 12185 | 52.5 | 40.6 | Vert/Hort | 74.0 | 54.0 | Pass |
| 14622 | 53.8 | 41.6 | Vert/Hort | - | - | Pass |
| 17059 | 55.6 | 43.5 | Vert/Hort | - | - | Pass |
| 19496 | 57.4 | 44.3 | Vert/Hort | 84.0* (1m) | 64.0* (1m) | Pass |
| 21933 | 60.0 | 45.8 | Vert/Hort | - | - | Pass |
| 24370 | 62.4 | 46.9 | Vert/Hort | - | - | Pass |

**Channel 11 - 2462 MHz**

| Frequency MHz | Level dBuV/m | | Antenna Polarization | Peak Limit dBuV/m | Average Limit dBuV/m | Result |
|---|---|---|---|---|---|---|
| | Peak Detector | Average Detector | | | | |
| 2462 | Transmitter | Fundamental | | | | |
| 4924 | 54.4 | 40.1 | Vert/Hort | 74.0 | 54.0 | Pass |
| 7386 | 61.4 | 43.4 | Vert/Hort | 74.0 | 54.0 | Pass |
| 9848 | 57.7 | 41.0 | Vert/Hort | - | - | Pass |
| 12310 | 52.4 | 40.1 | Vert/Hort | 74.0 | 54.0 | Pass |
| 14772 | 54.2 | 42.3 | Vert/Hort | - | - | Pass |
| 17234 | 55.8 | 44.7 | Vert/Hort | - | - | Pass |
| 19696 | 57.6 | 45.2 | Vert/Hort | 84.0* (1m) | 64.0* (1m) | Pass |
| 22158 | 59.9 | 45.9 | Vert/Hort | 84.0* (1m) | 64.0* (1m) | Pass |
| 24620 | 62.1 | 47.9 | Vert/Hort | - | - | Pass |

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

Harmonics were recorded within the restricted bands of up to 25 GHz and complied with the FCC Class B average limits by a margin of greater than 10 dB. Harmonics were below the limit in section 15.209. The measurement uncertainty for radiated emissions in this band was ±4.1 dB.

**Result:** Complies

#### 4.3.1.2 Configuration 802.11g

Initial investigations were performed with four modulation types: (BPSK, QPSK, 16QAM and 64QAM). No significant differences in emissions were observed. Final testing was performed while the transmitter continuously operated with the modulation rate of 6 Mbps (BPSK).

**Channel 1 - 2412 MHz**

| Frequency MHz | Level dBuV/m | | Antenna Polarization | Peak Limit dBuV/m | Average Limit dBuV/m | Result |
|---|---|---|---|---|---|---|
| | Peak Detector | Average Detector | | | | |
| 2412 | Transmitter | Fundamental | | | | |
| 4824 | 49.2 | 37.6 | Vert/Hort | 74.0 | 54.0 | Pass |
| 7236 | 56.9 | 41.4 | Vert/Hort | - | - | Pass |
| 9648 | 53.0 | 39.8 | Vert/Hort | - | - | Pass |
| 12060 | 52.1 | 40.1 | Vert/Hort | 74.0 | 54.0 | Pass |
| 14472 | 53.8 | 41.9 | Vert/Hort | 74.0 | 54.0 | Pass |
| 16884 | 55.6 | 44.2 | Vert/Hort | - | - | Pass |
| 19296 | 57.7 | 45.7 | Vert/Hort | 84.0* (1m) | 64.0* (1m) | Pass |
| 21708 | 59.3 | 46.5 | Vert/Hort | - | - | Pass |
| 24120 | 62.0 | 47.7 | Vert/Hort | - | - | Pass |

**Channel 6 - 2437 MHz**

| Frequency MHz | Level dBuV/m | | Antenna Polarization | Peak Limit dBuV/m | Average Limit dBuV/m | Result |
|---|---|---|---|---|---|---|
| | Peak Detector | Average Detector | | | | |
| 2437 | Transmitter | Fundamental | | | | |
| 4874 | 49.4 | 37.9 | Vert/Hort | 74.0 | 54.0 | Pass |
| 7311 | 57.7 | 42.1 | Vert/Hort | 74.0 | 54.0 | Pass |
| 9748 | 53.1 | 40.3 | Vert/Hort | - | - | Pass |
| 12185 | 51.9 | 40.3 | Vert/Hort | 74.0 | 54.0 | Pass |
| 14622 | 53.6 | 42.3 | Vert/Hort | - | - | Pass |
| 17059 | 55.4 | 44.6 | Vert/Hort | - | - | Pass |
| 19496 | 57.8 | 45.8 | Vert/Hort | 84.0* (1m) | 64.0* (1m) | Pass |
| 21933 | 59.9 | 46.5 | Vert/Hort | - | - | Pass |
| 24370 | 61.7 | 47.8 | Vert/Hort | - | - | Pass |

**Channel 11 - 2462 MHz**

| Frequency MHz | Level dBuV/m | | Antenna Polarization | Peak Limit dBuV/m | Average Limit dBuV/m | Result |
|---|---|---|---|---|---|---|
| | Peak Detector | Average Detector | | | | |
| 2462 | Transmitter | Fundamental | | | | |
| 4924 | 48.5 | 37.5 | Vert/Hort | 74.0 | 54.0 | Pass |
| 7386 | 57.1 | 42.8 | Vert/Hort | 74.0 | 54.0 | Pass |
| 9848 | 51.3 | 39.2 | Vert/Hort | - | - | Pass |
| 12310 | 50.9 | 39.4 | Vert/Hort | 74.0 | 54.0 | Pass |
| 14772 | 52.2 | 41.3 | Vert/Hort | - | - | Pass |
| 17234 | 54.9 | 43.7 | Vert/Hort | - | - | Pass |
| 19696 | 57.2 | 45.6 | Vert/Hort | 84.0* (1m) | 64.0* (1m) | Pass |
| 22158 | 59.9 | 46.9 | Vert/Hort | 84.0* (1m) | 64.0* (1m) | Pass |
| 24620 | 61.9 | 47.7 | Vert/Hort | - | - | Pass |

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

Harmonics were recorded within the restricted bands of up to 25 GHz and complied with the FCC Class B average limits by a margin of greater than 10 dB. Harmonics were below the limit in section 15.209. The measurement uncertainty for radiated emissions in this band was ±4.1 dB.

**Result:** Complies

### 4.3.2 Frequency Band: 30 - 1000 MHz

Testing was performed at a distance of 10 metres.

Initial investigations were performed with both configurations (802.11b and 802.11g) and all modulation types: (BPSK, QPSK, 16QAM, 64QAM, DBPSK, DQPSK and CCK). No significant differences in emissions were observed. Final testing was performed while the transmitter continuously operated with configuration 802.11g on the low (Channel 1, 2412 MHz) frequency channel with the modulation rate of 6 Mbps (BPSK).

The reported frequencies in the tables below are mainly concerned with the Host PC emissions and not directly related to the Calexico2 WLAN module emissions.

**Vertical Polarity**

| Frequency MHz | Polarisation | QP Measured dBμV/m | QP Limit dBμV/m | ΔQP ± dB |
|---|---|---|---|---|
| 501.01 | Vertical | 34.9 | 36.0 | -1.1 |
| 601.27 | Vertical | 32.4 | 36.0 | -3.6 |
| 495.52 | Vertical | 32.1 | 36.0 | -3.9 |
| 363.41 | Vertical | 29.8 | 36.0 | -6.2 |
| 198.52 | Vertical | 26.6 | 33.5 | -6.9 |
| 198.10 | Vertical | 26.5 | 33.5 | -7.0 |
| 197.62 | Vertical | 26.0 | 33.5 | -7.5 |
| 201.27 | Vertical | 25.8 | 33.5 | -7.7 |
| 120.49 | Vertical | 25.5 | 33.5 | -8.0 |
| 235.30 | Vertical | 26.0 | 36.0 | -10.0 |
| 118.04 | Vertical | 23.1 | 33.5 | -10.4 |
| 116.76 | Vertical | 22.4 | 33.5 | -11.1 |
| 81.95 | Vertical | 17.6 | 30.0 | -12.4 |
| 86.21 | Vertical | 16.3 | 30.0 | -13.7 |
| 110.97 | Vertical | 18.9 | 33.5 | -14.6 |
| 100.03 | Vertical | 17.9 | 33.5 | -15.6 |

**Horizontal Polarity**

| Frequency MHz | Polarisation | QP Measured dBμV/m | QP Limit dBμV/m | ΔQP ± dB |
|---|---|---|---|---|
| 601.23 | Horizontal | 32.2 | 36.0 | -3.8 |
| 400.82 | Horizontal | 28.9 | 36.0 | -7.1 |
| 429.93 | Horizontal | 26.5 | 36.0 | -9.5 |
| 369.94 | Horizontal | 25.9 | 36.0 | -10.1 |
| 364.06 | Horizontal | 25.8 | 36.0 | -10.2 |
| 364.31 | Horizontal | 25.5 | 36.0 | -10.5 |
| 240.02 | Horizontal | 22.1 | 36.0 | -13.9 |
| 99.28 | Horizontal | 18.4 | 33.5 | -15.1 |
| 119.74 | Horizontal | 17.9 | 33.5 | -15.6 |
| 117.35 | Horizontal | 15.8 | 33.5 | -17.7 |

The highest radiated emission peak occurred at 501.01 (Vertical polarity) and complied with FCC quasi peak limit by a margin of 1.1 dB. The measurement uncertainty in this band was ± 3.7 dB. Refer to tables above for results.

**Result:** Complies.

### 4.3.3 Band Edge Measurements

The highest emission level that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the operating band.

Testing was performed while transmitter continuously transmitted on a low and high frequency channel.

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

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

#### 4.3.3.1 Configuration 802.11b

Refer to attachment – Band Edge - 802.11b
*NB:* D1 line indicates the highest level of the transmitter
D2 line indicates 20 dB limit below D1.

#### 4.3.3.2 Configuration 802.11g

Refer to attachment – Band Edge - 802.11g
*NB:* D1 line indicates the highest level of the transmitter
D2 line indicates 20 dB limit below D1.

**Result:** Complies.

## 5.0 Peak Output Power - Section 15.247 (b)(1) & (3)

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

Measurements were performed while the transmitter continuously transmitted.

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

The Peak Output Power (P) was calculated as follows:

**P = R + G + C where R is the recorded peak power**
**G is the antenna gain in dBi &**
**C is the cable loss**

Testing was performed while the transmitter continuously transmitted on a low (channel 1, 2412 MHz), middle (channel 6, 2437 MHz) and high (Channel 11, 2462 MHz) frequency channel.

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.

### 5.1 Configuration 802.11b

Initial investigations were performed with three modulation types: (DBPSK, DQPSK and CCK). Power with DBPSK modulation (rate = 1 Mbps) was observed to be slightly worst (approximately 0.5 dB). Final testing was performed while the transmitter continuously operating with the modulation rate of 1 Mbps (DBPSK).

The resolution bandwidth of 20 MHz and the video bandwidth of 20 MHz were utilised.

| Frequency MHz | R dBm | Coax Loss dB | G dBi | P dBm | Limit dBm | P mW | Limit mW |
|---|---|---|---|---|---|---|---|
| 2412 | 16.61 | 2.0 | 0.69 | 19.30 | 30 | 85.1 | 1000 |
| 2437 | 16.48 | 2.0 | 0.69 | 19.17 | 30 | 82.6 | 1000 |
| 2462 | 16.35 | 2.0 | 0.69 | 19.04 | 30 | 80.2 | 1000 |

The specification limit is 1W (30 dBm).

**Result:** Complies.

### 5.2 Configuration 802.11g - Normal Operating Mode

Initial investigations were performed with four modulation types: (BPSK, QPSK, 16QAM and 64QAM). Power with BPSK modulation (rate = 6 Mbps) was observed to be slightly worst (approximately 0.5 dB). Final testing was performed while the transmitter continuously operated with the modulation rate of 6 Mbps (BPSK).

The resolution bandwidth of 20 MHz and the video bandwidth of 20 MHz were utilised.

| Frequency MHz | R dBm | Coax Loss dB | G dBi | P dBm | Limit dBm | P mW | Limit mW |
|---|---|---|---|---|---|---|---|
| 2412 | 18.62 | 2.0 | 0.69 | 21.31 | 30 | 135.2 | 1000 |
| 2437 | 18.35 | 2.0 | 0.69 | 21.04 | 30 | 127.1 | 1000 |
| 2462 | 18.59 | 2.0 | 0.69 | 21.28 | 30 | 134.3 | 1000 |

The specification limit is 1W (30 dBm).

**Result:** Complies

## 6.0 Channel Bandwidth

Testing was performed in accordance with the requirements of FCC Part 15.247(a)(2)

In the band 2400 - 2483.5 MHz the minimum 6 dB bandwidth was at least 500 kHz. The 6 dB bandwidth was measured while the transmitter continuously transmitted on a low, middle and high frequency channel.

The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.

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

Measurements were made on a low (channel 1, 2412 MHz), middle (channel 6, 2437 MHz) and high (Channel 11, 2462 MHz) frequency channel.

## 6.1 Configuration 802.11b

Initial investigations were performed with three modulation types: (DBPSK, DQPSK and CCK). No significant differences in bandwidth were observed. Final testing was performed while the transmitter continuously operating with the modulation rate of 1 Mbps (DBPSK).

| Frequency MHz | Bandwidth MHz | Result | 6 dB Bandwidth Plots |
|---|---|---|---|
| 2412.0 | 9.18 | Complies | *Note 1 |
| 2437.0 | 9.02 | Complies | *Note 1 |
| 2462.0 | 9.34 | Complies | *Note 1 |

The minimum 6 dB bandwidth is at least 500 kHz
*Note 1: Refer to attachment, Bandwidth - 802.11b

**Result:** Complies

## 6.2 Configuration 802.11g - Normal Operating Mode

Initial investigations were performed with four modulation types: (BPSK, QPSK, 16QAM and 64QAM). No significant differences in bandwidth were observed. Final testing was performed while the transmitter continuously operated with the modulation rate of 6 Mbps (BPSK).

| Frequency MHz | Bandwidth MHz | Result | 6 dB Bandwidth Plots |
|---|---|---|---|
| 2412.0 | 16.43 | Complies | *Note 1 |
| 2437.0 | 16.47 | Complies | *Note 1 |
| 2462.0 | 16.51 | Complies | *Note 1 |

The minimum 6 dB bandwidth is at least 500 kHz
*Note 1: Refer to attachment, Bandwidth - 802.11g

**Result:** Complies

## 7.0 Radio Frequency Exposure (Hazard) Information

Testing was performed in accordance with the requirements of FCC Part 15.247(b)(5)

Spread spectrum transmitters operating in the 2400 - 2483.5 MHz band 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 2.1091 this device has been defined as a portable device whereby a distance of 20 cm normally cannot be maintained between the user and the device.

In accordance with Section 1.1310, the Maximum Permissible Exposure (MPE) limit for the General Population/Uncontrolled Exposure of 1.0 has been applied, i.e 1mW/cm$^2$.

The maximum distance from the antenna at which the MPE is met or exceeded has been calculated from the equation relating field strength in V/m, transmit power in watts, transmit antenna gain and separation distance in metres:

E, V/m = (√ (30 * P *G)) / d
Power density, mW/cm$^2$ = E$^2$/3770
E for MPE: = E$^2$/3770
E = √1*3770
E = 61.4 V/m

The max Antenna (Monopole Ceramic Chip) gain = 0.69 dBi

**Conducted Power**
Highest output power was calculated. The result was extracted from section 3.0 of this report.

| Frequency MHz | Modulation | Maximum Conducted Output Power Measured |
|---|---|---|
| 2437 | DSSS (802.11b) | 19.3 dBm (85.1mW) |
| 2437 | OFDM (802.11g) | 21.31 dBm (135.2mW) |

The total power (P*G) measured at the Antenna of WLAN Module (Calexico2, WM3B2200BG – Ocampa/Ocampa2)

The maximum transmitter power measured (DSSS) = 19.3 dBm or 85.1milliwatts.
d = √ (30 * P *G) / E
= √ (30 * 0.085) / 61.4
= 0.026metres or 2.6 cm

The maximum transmitter power measured (OFDM) = 21.31 dBm or 135.2 milliwatts.
d = √ (30 * P *G) / E
= √ (30 * 0.135) / 61.4
= 0.033metres or 3.3 cm

**Conclusion:**
Calculations show that this device with described antenna does meet the MPE requirements for portable devices falling below the 20 cm clearance required and the SAR value of 1.03 mW/g complies with the FCC human exposure requirements of 47 CFR 2.1093 (d).
Refer to EMC Technologies' report - M040122_Ocampa2_Calexico2 SAR Report for details of SAR compliance.

## 8.0 Peak Power Spectral Density - Section 15.247(d)

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

The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.

The resolution bandwidth of 3 kHz and the video bandwidth of 30 kHz were utilised

Testing was performed while the transmitter continuously transmitted on a low (channel 1, 2412 MHz), middle (channel 6, 2437 MHz) and high (Channel 11, 2462 MHz) frequency channel.

## 8.1 Configuration 802.11b

Initial investigations were performed with three modulation types: (DBPSK, DQPSK and CCK). No significant differences in peak power spectral density were observed. Final testing was performed while the transmitter continuously operating with the modulation rate of 1 Mbps (DBPSK).

| Frequency MHz | Level dBm | Limit dBm | Result | Spectral Density plots |
|---|---|---|---|---|
| 2412.0 | -12.50 | 8.0 | Complies | *Note 1 |
| 2437.0 | -13.45 | 8.0 | Complies | *Note 1 |
| 2462.0 | -12.81 | 8.0 | Complies | *Note 1 |

The specification limit is 8 dBm in any 3 kHz band during a continuous transmission.
*Note 1: Refer to attachment, Spectral Density - 802.11b

**Result:** Complies

## 8.2 Configuration 802.11g - Normal Operating Mode

Initial investigations were performed with four modulation types: (BPSK, QPSK, 16QAM and 64QAM). No significant differences in peak power spectral density were observed. Final testing was performed while the transmitter continuously operated with the modulation rate of 6 Mbps (BPSK).

| Frequency Hz | Level dBm | Limit dBm | Result | Spectral Density plots |
|---|---|---|---|---|
| 2412.0 | -17.88 | 8.0 | Complies | *Note 1 |
| 2437.0 | -17.65 | 8.0 | Complies | *Note 1 |
| 2462.0 | -18.16 | 8.0 | Complies | *Note 1 |

The specification limit is 8 dBm in any 3 kHz band during a continuous transmission.
*Note 1: Refer to attachment, Spectral Density - 802.11g

**Result:** Complies

## 9. 0 Antenna Requirement

Testing to the requirements of FCC Part 15.203 was not applicable as 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 Mini-PCI Wireless LAN Module (Calexico2), Model WM3B2200BG installed in Fujitsu Stylistic ST Series Pentablet PC, Model ST5010, ST5011 (Ocampa/Ocampa2), tested on behalf of Fujitsu Australia Ltd, **complies** 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 complies with the Industry Canada RSS-210 issue 5 (Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands)) clause 6.2.2(o) 2400 – 2483.5 MHz Spread Spectrum requirements and the RF exposure requirements of RSS-102.

**Results were as follows:**

**FCC PART 15 Subpart C (Section 15.247: 2400 - 2483.5 MHz band)**

| FCC Part 15, Subpart C Clauses | Industry Canada RSS-210 Clauses | Test Performed | Result |
|---|---|---|---|
| **15.203** | 5.5 | Antenna Requirement | **Not Applicable** |
| **15.205** | 6.3 | Operation in Restricted Bandwidth | **Complies** |
| **15.207** | 6.6 | Conducted Emissions | **Complies** |
| **15.209** | 6.3 | Radiated Emissions | **Complies** |
| **15.247 (a)(2)** | 6.2.2(o)(iv) | Channel Bandwidth | **Complies** |
| **15.247 (b)(3)** | 6.2.2(o)(b) | Peak Output Power | **Complies** |
| **15.247 (b)(5)** | | Radio Frequency Hazard | ***Complies with SAR requirements** |
| **15.247 (c)** | 6.2.2(o)(e1) | Out of Band Emissions | **Complies** |
| **15.247 (d)** | 6.2.2(o)(iv) | Peak Power Spectral Density | **Complies** |

***Refer to EMC Technologies' report M040122_Ocampa2_Calexico2 SAR Report**

# APPENDIX A
# MEASUREMENT INSTRUMENTATION DETAILS

| EQUIPMENT TYPE | MAKE/MODEL SERIAL NUMBER | LAST CAL. DD/MM/YY | DUE DATE DD/MM/YY | CAL. INTERVAL |
|---|---|---|---|---|
| **EMI RECEIVER** | HP 8574B System Components | 12/02/03 | 12/02/04 | 1 YEAR *2 |
| | | | | |
| **EMI RECEIVER** | Rohde & Schwarz, Model ESIB40<br>SN 1088 7490, 20 Hz – 40 GHz | 09/07/03 | 09/07/04 | 1 YEAR *3 |
| | | | | |
| **EMI RECEIVER** | Rohde & Schwarz, Model FSET22<br>SN 1080 3508, 100 Hz – 22 GHz | 31/10/03 | 31/10/04 | 1 YEAR *3 |
| **RF PRE-SELECTOR** | Rohde & Schwarz, Model FSET-Z22<br>SN 1070 2009, 100 Hz – 22 GHz | 31/10/03 | 31/10/04 | 1 YEAR *3 |
| | | | | |
| **ANTENNAS** | EMCO 93110B BICONICAL | 20/08/03 | 20/08/04 | 1 YEAR *1 |
| | 20 - 300 MHz Sn. 9804-3092 | | | |
| | | | | |
| | EMCO 93146A LOG PERIODIC | 11/07/03 | 11/07/04 | 1 YEAR *1 |
| | 200 -1000MHz Sn. 5033 | | | |
| | | | | |
| | EMCO 3115 DOUBLE RIDGED HORN<br>1 - 18 GHz Sn: 8908-3282 | 29/01/03 | 29/01/04 | 1 YEAR *1 |
| | | | | |
| | EMCO 3116 Double Ridged Guide Horn | -------- | -------- | *4 |
| | 18 – 40 GHz Sn 2276 | | | |
| | | | | |
| **LISN** | EMCO 3825/2 50ohm / 50 microH | 10/02/03 | 10/02/04 | 1 YEAR *1 |
| | 0.009 – 30MHz Sn.9607-2567 | | | |

Note *1. In-house calibration. Refer to Quality Manual.
Note *2. NATA calibration by Agilent Technologies (Aust) Pty Ltd
Note *3. NATA calibration by Rohde & Schwarz
Note *4. Manufacturer's calibration

## TEST SITES

| | | | | |
|---|---|---|---|---|
| **Shielded Room Test Laboratory** | **Melbourne**<br>11m x 8m x 4m Chamber-semi-anechoic<br>8.8m x 5.8m x 3.1m Test Chamber<br>3.4m x 6.1m x 2.5m Test Chamber<br>3.4m x 7.3m x 7.5m Test Chamber | Feb 03<br>N/A<br>N/A<br>N/A | Feb 04<br>N/A<br>N/A<br>N/A | 1 Year *1<br>N/A<br>N/A<br>N/A |
| **Open Area Test Site** | **Melbourne**<br>3/10 Metre site. 1-4 metre antenna mast. 1.2 metre/400 kg Turntable. (Situated at Lerderderg Gorge, near Bacchus Marsh, Victoria) | 21/01/03 | 21/01/04 | 1 Year *1 |

Note *1. In-house calibration. Refer to Quality Manual.

# TEST REPORT EXHIBITS

**Exhibits supplied as part of this report:**
**Photographs**
**Graphs of EMI Measurements**
**Bandedge Plots**
**Channel Bandwidth Plots**
**Peak Power Spectral Density Plots**
**FCC Labelling Details**
**Antenna Information (Monopole Ceramic Chip – YCE-5008)**
**User Manual**
**FCC Pt 15B Ocampa2 DoC**

**Exhibits supplied by Intel:**
**Block Diagram**
**Test Sample Functional Description**
**Test Sample Schematics**
**PCB Layouts**
**WLAN Specifications**