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# RADIO TEST REPORT – 400858-1TRFWL

Type of assessment:

Transmitters co-location

Applicant:

Kontron America

Product:

IoT Gateway

Model:

WPEB-263ACNI(BT)

Includes FCC ID's:

S3I-WPEB263ACNIBT

N7NEM75

Includes IC Registration numbers:

9927A-EB263ACNIBT

2417C-EM75

Specifications:

- Digital Transmission Systems (DTSs)
- Unlicensed National Information Infrastructure Devises
- Cellular Radiotelephone Service
- Miscellaneous Wireless Communications Services
- Broadband Personal Communications Services

Date of issue: November 25, 2020

Andrey Adelberg, Senior EMC/RF Specialist

Tested by

Signature

David Duchesne, EMC/RF Lab Manager

Reviewed by

Signature

Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada.
The tests included in this report are within the scope of this accreditation

## Lab locations

| | | | | |
|---|---|---|---|---|
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| Test site registration | **Organization** | **Recognition numbers and location** | | |
| | FCC/ISED | FCC: CA2040; IC: 2040A-4 (Ottawa/Almonte); FCC: CA2041; IC: 2040G-5 (Montreal); CA0101 (Cambridge) | | |
| Website | www.nemko.com | | | |

## Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

## Copyright notification

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# Report summary

## 1.1 Test specifications

| | |
|---|---|
| FCC 47 CFR Part 15, Subpart C, Clause 15.247 | Operation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–585 MHz |
| FCC 47 CFR Part 15, Subpart E, Clause 15.407(h) | Unlicensed National Information Infrastructure Devises. |
| FCC 47 CFR Part 27, Subpart C | Miscellaneous wireless communications services |
| FCC Part 22 Subpart H | Cellular radiotelephone service. |
| FCC Part 24 Subpart E | Personal communications services |
| RSS-132, Issue 3, January 2013 | Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz |
| RSS-133, Issue 6, A1, January 2018 | 2 GHz Personal Communications Services |
| RSS-139, Issue 3, July 2015 | Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710-1780 MHz and 2110-2180 MHz |
| RSS-247, Issue 2, Feb 2017 | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices |
| RSS-130 Issue 2, February 2019 | Equipment Operating in the Frequency Bands 617–652 MHz, 663–698 MHz, 698–756 MHz and 777–787 MHz |

## 1.2 Test methods

| | |
|---|---|
| ANSI C63.10 v2013 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| ANSI C63.26 v2015 | American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services |

## 1.3 Exclusions

The evaluation was done to ensure there are no additional radiated spurious emissions generated due to simultaneous-transmission operations compared to single transmitter operations testing, and to ensure compliance with the applicable FCC/ISED rules for the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules.

## 1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.3 above. Results obtained indicate that the product under test complies In full with the requirements tested. The test results relate only to the items tested.

*See "Summary of test results" for full details.*

## 1.5 Test report revision history

***Table 1.5-1:*** *Test report revision history*

| Revision # | Date of issue | Details of changes made to test report |
|---|---|---|
| TRF | November 25, 2020 | Original report issued |

# Engineering considerations

## 2.1 Modifications incorporated in the EUT for compliance

There were no modifications performed to the EUT during this assessment.

Section 2

## 2.2 Technical judgment

The EUT consists of two RF modules. Sierra Wireless EM7565 LTE modem, FCC ID N7NEM75 and SparkLAN WPEB-263ACNI(BT) WiFi / Bluetooth module, FCC ID RYK-WPEB263ACNIBT. LTE module can operate in multiple Cellular bands. Those Cellular bands were split into groups. From each group one representative band was selected for transmitters co-location test with either of Wi-Fi bands.

| Group | Band number | Frequency range |
|---|---|---|
| 700 | B12 | 698–716 MHz |
| 700 | B28 | 703–748 MHz |
| 700 | B13 | 777–787 MHz |
| 800 | B26 | 814–849 MHz |
| 800 | B5 | 824–849 MHz |
| 800 | B19 | 829–844 MHz |
| 1700 | B3 | 1710–1785 MHz |
| 1700 | B4 | 1710–1755 MHz |
| 1700 | B66 | 1710–1780 MHz |
| 1700 | B9 | 1749.9–1784.9 MHz |
| 1900 | B2 | 1850–1910 MHz |
| 1900 | B1 | 1920–1980 MHz |
| 2400 | B30 | 2305–2315 MHz |
| 2400 | B41 | 2496–2690 MHz |
| 2400 | B7 | 2500–2570 MHz |

The sampled transmitter frequencies combinations were as follows.
2.4 or 5 GHz Wi-Fi on the middle channel, modulated with 802.11b transmitting simultaneously with 700 group LTE Cellular Band 28 on the middle channel.
2.4 or 5 GHz Wi-Fi on the middle channel, modulated with 802.11b transmitting simultaneously with 800 group LTE Cellular Band 5 on the middle channel.
2.4 or 5 GHz Wi-Fi on the middle channel, modulated with 802.11b transmitting simultaneously with 1700 group LTE Cellular Band 3 on the middle channel.
2.4 or 5 GHz Wi-Fi on the middle channel, modulated with 802.11b transmitting simultaneously with 1900 group LTE Cellular Band 1 on the middle channel.
2.4 or 5 GHz Wi-Fi on the middle channel, modulated with 802.11b transmitting simultaneously with 2500 group LTE Cellular Band 30 on the middle channel.

EUT comes in two model variants. Both models have the same RF module and are identical electrically. 001-0156-03 is a metal box in a plastic box intended for outdoor use, 2-A0CW-20SLB-M2 is a metal box. It was verified, that the radiated RF spurious emissions are similar, the 001-0156-03 is considered representative of both models and all the tests were performed on that model.

## 2.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

# Test conditions

## 3.1 Atmospheric conditions

| | |
|---|---|
| Temperature | 15 °C – 35 °C |
| Relative humidity | 20 % – 75 % |
| Air pressure | 86 kPa (860 mbar) – 106 kPa (1060 mbar) |

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

## 3.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

# Measurement uncertainty

## 4.1 Uncertainty of measurement

Section 4

UKAS Lab 34 and TIA-603-B have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada, Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products.

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

***Table 4.1-1:*** *Measurement uncertainty calculations*

| Test name | Measurement uncertainty, ±dB |
|---|---|
| Radiated spurious emissions | 3.78 |

# Information provided by the applicant

## 5.1 Disclaimer

Section 5

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results contained within this test report. Nemko accepts no responsibility for the information contained within this section and the impact it may have on the test plan and resulting measurements.

## 5.2 Applicant/Manufacture

| | |
|---|---|
| Name | Kontron America |
| Address | 9477 Waples Street, Suite 150, San Diego, CA 92121-2937 |

## 5.3 EUT information

| | |
|---|---|
| Product | IoT Gateway |
| Model | 001-0156-03 |
| Model variant(s) | 2-A0CW-20SLB-M2 |
| Serial number | 448440008 (001-0156-03), 449977005 (2-A0CW-20SLB-M2) |
| Power supply requirements | (001-0156-03) 100–240 $V_{AC}$, 50/60 Hz or 24 $V_{DC}$<br>(2-A0CW-20SLB-M2) 24 $V_{DC}$ |
| Product description and theory of operation | System based on a SMARC computing module, provides cell and Wi-Fi connectivity. Module with Intel Atom x5-E3930 or E3950, up to 8GB DDR3L RAM, up to 32GB eMMC flash storage.<br>Both models are identical electrically. 001-0156-03 is a metal box in a plastic box intended for outdoor use, 2-A0CW-20SLB-M2 is a metal box. 001-0156-03 is considered representative of both models. |
| Antenna information | Wi-Fi: PCTEL, PCTMI2458-RPC: 3 dBi (2.4 GHz range), 5 dBi (5 GHz range)<br>LTE: PCTEL, PCTP/4GLTE: 2 dBi typical gain |

## 5.4 EUT setup details

### 5.4.1 Radio exercise details

| | |
|---|---|
| Operating conditions | Windows 10 with Sparklan software WL356_PCIE_RF_wifi_win10_v1.1; hardware version is “prototype”.<br>EUT was boot up from SSD drive with Windows OS and controlled using CLI and PuttY. |
| Transmitter state | Transmitters were set to transmit continuously at their maximum power at desired channel with selected modulation, channel bandwidth, and operational band. |

### 5.4.2 EUT setup configuration

***Table 5.4-1:*** *EUT sub assemblies*

| Description | Brand name | Model, Part number, Serial number, Revision level |
|---|---|---|
| *EUT1* | Kontron | "Gateway", PN 001-0156-03, SN 448440008 |
| Main PCB | Kontron | PN 801-0128-07, SN 00200C7D2BC0, PCB P2-00538-1 Rev B0 |
| LTE Module | Sierra | Model EM7565, SN 353533100616609, Rev A |
| Wi-Fi Module | Sparklan | Model WPEB-263ACNI (BT), SN 18B60S2002782, Rev G312B02F |
| AC-DC Power Supply | Recom | Model RACM40-24S/0F, SN RACM40-24S/OF19210379 |
| *EUT2* | Kontron | "KBox", PN 2-A0CW-20SLB-M2SN, SN 449977005, |
| Main PCB | Kontron | PN 801-0128-07, SN 00200C7D2BCB, PCB P2-00538-1 Rev B0 |
| LTE Module | Sierra | Model EM7565, SN 353533100616478, Rev.A |
| Wi-Fi Module | Sparklan | Model WPEB-263ACNI (BT), SN 18B60S2002793, Rev G312B02F |

***Table 5.4-2:*** *EUT interface ports*

| Description | Qty. |
|---|---|
| RS-232, RS-485 | 2 |
| GbE Ethernet | 2 |
| USB | 2 |
| Display port | 1 |
| AC input (EUT1 only) | 1 |
| RS-232, RS-485 | 2 |
| DC input | 1 |

***Table 5.4-3:*** *Inter-connection cables*

| Cable description | From | To | Length (m) |
|---|---|---|---|
| STP Cat V | Ethernet port 2 | Unterminated | 4 |
| DB9-DB9 shielded | COM2 | Unterminated | 2 |
| Display Port Cable shielded | Display Port | Display | 2 |
| USB shielded | USB1 | USB HUB | 2 |
| USB shielded | USB2 | SSD Drive | 2 |
| STP Cat V | Ethernet port 2 | Unterminated | 4 |

EUT setup configuration, continued

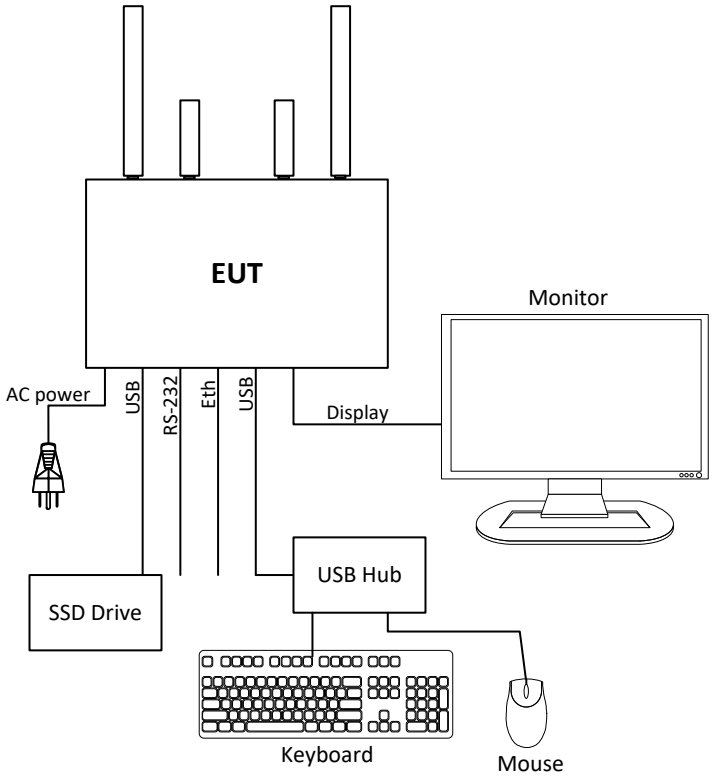


***Figure 5.4-1:*** *Radiated testing block diagram*

# Summary of test results

## 6.1 Testing location

| | |
|---|---|
| Test location (s) | Ottawa |

Section 6

## 6.2 Testing period

| | | | |
|---|---|---|---|
| Test start date | November 3, 2020 | Test end date | November 4, 2020 |

## 6.3 Sample information

| | | | |
|---|---|---|---|
| Receipt date | November 3, 2020 | Nemko sample ID number(s) | 1, 2 |

## 6.4 Test results

***Table 6.4-1:*** *Test results*

| Test description | Verdict |
|---|---|
| Radiated Spurious emissions (multiple standards) | Pass |

Notes: Only radiated spurious emissions assessment was done as part of transmitter co-location assessment.

# Test equipment

## 7.1 Test equipment list

Section 7

***Table 7.1-1:*** *Equipment list*

| Equipment | Manufacturer | Model no. | Asset no. | Cal cycle | Next cal. |
|---|---|---|---|---|---|
| 3 m EMI test chamber | TDK | SAC-3 | FA002047 | 1 year | January 24, 2021 |
| Flush mount turntable | Sunol | FM2022 | FA002082 | — | NCR |
| Controller | Sunol | SC104V | FA002060 | — | NCR |
| Antenna mast | Sunol | TLT2 | FA002061 | — | NCR |
| Receiver/spectrum analyzer | Rohde & Schwarz | ESU 26 | FA002043 | 1 year | November 8, 2020 |
| Spectrum analyzer | Rohde & Schwarz | FSU | FA001877 | 1 year | April 31, 2021 |
| Preamp (1–18 GHz) | ETS Lindgren | 124334 | FA002877 | 1 year | October 13, 2021 |
| Bilog antenna (20–3000 MHz) | Sunol | JB3 | FA002108 | 1 year | January 14, 2021 |
| Horn antenna (1–18 GHz) | EMCO | 3115 | FA000825 | 1 year | April 31, 2021 |
| Horn antenna (18–40 GHz) | EMCO | 3116 | FA001847 | 1 year | May 7, 2021 |
| Pre-amplifier (18–26 GHz) | Narda | BBS-1826N612 | FA001550 | — | VOU |
| Pre-amplifier (26–40 GHz) | Narda | DBL-2640N610 | FA001556 | — | VOU |

Notes: NCR - no calibration required, VOU - verify on use

# Testing data

## 8.1 Radiated spurious (unwanted) emissions

### Section 8 8.1.1 References, definitions and limits

**FCC §15.247:**

(d) Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

**FCC §15.407:**

(b) All emissions outside of the allocated band shall not exceed an e.i.r.p. of −27 dBm/MHz.
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. The provisions of §15.205 apply to intentional radiators operating under this section.

**FCC §22.359:**

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

**FCC §24.238:**

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

**FCC §27.53:**

The power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

**RSS-130:**

4.7.1 General unwanted emissions limits
The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

**RSS-139:**

6.6 The emission power shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

**RSS-132:**

5.5 The power of emissions shall be attenuated (in dB) below the transmitter output power P ( dBW) by at least 43 + 10 log10p (watts).

**RSS-133:**

6.5 The emission power shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).

**RSS-247:**

5.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

6.2 All emissions outside the allocated band shall not exceed −27 dBm/MHz e.i.r.p.

References, definitions and limits, continued

***Table 8.1-1:*** *FCC §15.209 and RSS-Gen – Radiated emission limits*

| | Field strength of emissions | | |
|---|---|---|---|
| **Frequency, MHz** | **µV/m** | **dBµV/m** | **Measurement distance, m** |
| 0.009–0.490 | 2400/F | $67.6 - 20 \times \log_{10}(F)$ | 300 |
| 0.490–1.705 | 24000/F | $87.6 - 20 \times \log_{10}(F)$ | 30 |
| 1.705–30.0 | 30 | 29.5 | 30 |
| 30–88 | 100 | 40.0 | 3 |
| 88–216 | 150 | 43.5 | 3 |
| 216–960 | 200 | 46.0 | 3 |
| above 960 | 500 | 54.0 | 3 |

Notes: In the emission table above, the tighter limit applies at the band edges.
For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

***Table 8.1-2:*** *ISED restricted frequency bands*

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090–0.110 | 12.57675–12.57725 | 399.9–410 | 7.25–7.75 |
| 0.495–0.505 | 13.36–13.41 | 608–614 | 8.025–8.5 |
| 2.1735–2.1905 | 16.42–16.423 | 960–1427 | 9.0–9.2 |
| 3.020–3.026 | 16.69475–16.69525 | 1435–1626.5 | 9.3–9.5 |
| 4.125–4.128 | 16.80425–16.80475 | 1645.5–1646.5 | 10.6–12.7 |
| 4.17725–4.17775 | 25.5–25.67 | 1660–1710 | 13.25–13.4 |
| 4.20725–4.20775 | 37.5–38.25 | 1718.8–1722.2 | 14.47–14.5 |
| 5.677–5.683 | 73–74.6 | 2200–2300 | 15.35–16.2 |
| 6.215–6.218 | 74.8–75.2 | 2310–2390 | 17.7–21.4 |
| 6.26775–6.26825 | 108–138 | 2483.5–2500 | 22.01–23.12 |
| 6.31175–6.31225 | 149.9–150.05 | 2655–2900 | 23.6–24.0 |
| 8.291–8.294 | 156.52475–156.52525 | 3260–3267 | 31.2–31.8 |
| 8.362–8.366 | 156.7–156.9 | 3332–3339 | 36.43–36.5 |
| 8.37625–8.38675 | 162.0125–167.17 | 3345.8–3358 | Above 38.6 |
| 8.41425–8.41475 | 167.72–173.2 | 3500–4400 | |
| 12.29–12.293 | 240–285 | 4500–5150 | |
| 12.51975–12.52025 | 322–335.4 | 5350–5460 | |

Note: Certain frequency bands listed in Table 8.1-2 and above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

References, definitions and limits, continued

***Table 8.1-3:*** *FCC restricted frequency bands*

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090–0.110 | 16.42–16.423 | 399.9–410 | 4.5–5.15 |
| 0.495–0.505 | 16.69475–16.69525 | 608–614 | 5.35–5.46 |
| 2.1735–2.1905 | 16.80425–16.80475 | 960–1240 | 7.25–7.75 |
| 4.125–4.128 | 25.5–25.67 | 1300–1427 | 8.025–8.5 |
| 4.17725–4.17775 | 37.5–38.25 | 1435–1626.5 | 9.0–9.2 |
| 4.20725–4.20775 | 73–74.6 | 1645.5–1646.5 | 9.3–9.5 |
| 6.215–6.218 | 74.8–75.2 | 1660–1710 | 10.6–12.7 |
| 6.26775–6.26825 | 108–121.94 | 1718.8–1722.2 | 13.25–13.4 |
| 6.31175–6.31225 | 123–138 | 2200–2300 | 14.47–14.5 |
| 8.291–8.294 | 149.9–150.05 | 2310–2390 | 15.35–16.2 |
| 8.362–8.366 | 156.52475–156.52525 | 2483.5–2500 | 17.7–21.4 |
| 8.37625–8.38675 | 156.7–156.9 | 2690–2900 | 22.01–23.12 |
| 8.41425–8.41475 | 162.0125–167.17 | 3260–3267 | 23.6–24.0 |
| 12.29–12.293 | 167.72–173.2 | 3332–3339 | 31.2–31.8 |
| 12.51975–12.52025 | 240–285 | 3345.8–3358 | 36.43–36.5 |
| 12.57675–12.57725 | 322–335.4 | 3600–4400 | Above 38.6 |
| 13.36–13.41 | | | |

## 8.1.2 Test summary

| | | | |
|---|---|---|---|
| Verdict | Pass | | |
| Tested by | Andrey Adelberg | Test date | November 3, 2020 |

### 8.1.3 Observations, settings and special notes

- As part of the current assessment, the test range of 9 kHz to 10th harmonic has been fully considered and compared to the actual frequencies utilized within the EUT. Since the EUT contains a transmitter in the GHz range, the EUT has been deemed compliant without formal testing in the 9 kHz to 30 MHz test range, therefore formal test results (tabular data and/or plots) are not provided within this test report.
- EUT was set to transmit with 100 % duty cycle. The EUT was transmitting on both MIMO chains simultaneously
- Radiated measurements were performed at a distance of 3 m.
- Licensed bands' limit of −13 dBm EIRP was converted to a theoretical field strength equivalent of 82.23 dBµV/m. It was decided that the more stringent unlicensed bands limit applies for the product of simultaneous transmission of two transmitters, therefore only one limit line (unlicensed) appears on the spectral plots. UNII bands limit of −27 dBm EIRP or theoretical field strength equivalent of 68.23 dBµV/m was considered but wans't shown on the plots below.

Spectrum analyser settings for radiated measurements within restricted bands below 1 GHz:

| | |
|---|---|
| Resolution bandwidth: | 100 kHz |
| Video bandwidth: | 300 kHz |
| Detector mode: | Peak |
| Trace mode: | Max Hold |

Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

| | |
|---|---|
| Resolution bandwidth: | 1 MHz |
| Video bandwidth: | 3 MHz |
| Detector mode: | Peak |
| Trace mode: | Max Hold |

Spectrum analyser settings for average radiated measurements within restricted bands above 1 GHz:

| | |
|---|---|
| Resolution bandwidth: | 1 MHz |
| Video bandwidth: | 10 Hz |
| Detector mode: | Peak |
| Trace mode: | Max Hold |

### 8.1.4 Test data

***Table 8.1-4:*** *Radiated field strength worst case measurement results*

| Details | Frequency, MHz | Peak Field strength, dBµV/m | Limit, dBµV/m | Margin, dB |
|---|---|---|---|---|
| Wi-Fi: 2.4 GHz, LTE Band 30 | 2563.2 | 57.98 | 82.23 | 24.25 |
| Wi-Fi: 5 GHz, LTE Band 3 | 1996.1 | 57.55 | 82.23 | 24.68 |
| Wi-Fi: 5 GHz, LTE Band 30 | 5000.0 | 49.81 | 54.00 | 4.19 |
| Wi-Fi: 2.4 GHz, LTE Band 30 | 6933.2 | 53.76 | 82.23 | 28.47 |

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

Test data, continued

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 2.4 GHz Wi-Fi | LTE band 1 |

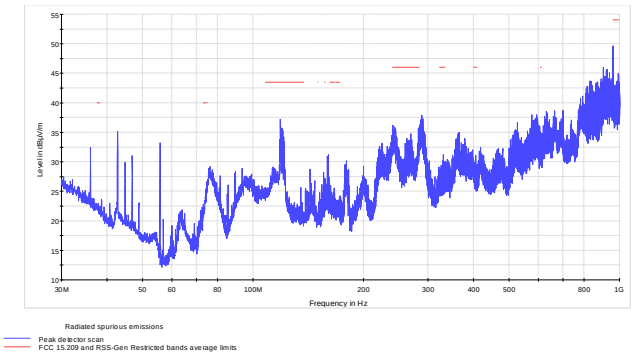


***Figure 8.1-1:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 2.4 GHz Wi-Fi | LTE band 3 |

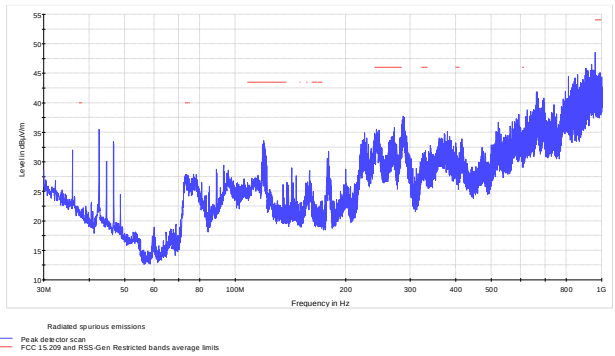


***Figure 8.1-2:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 2.4 GHz Wi-Fi | LTE band 5 |

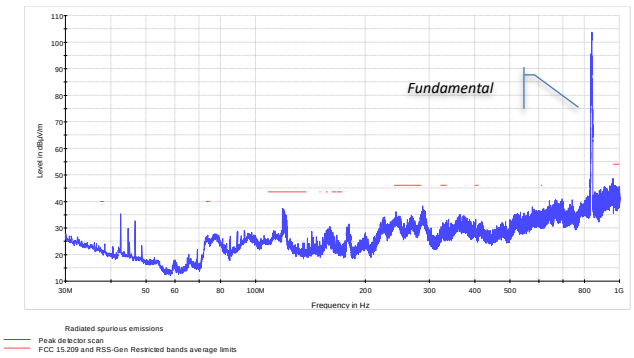


***Figure 8.1-3:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 2.4 GHz Wi-Fi | LTE band 28 |

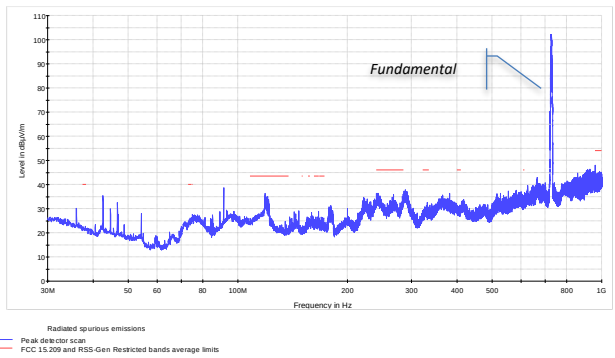


***Figure 8.1-4:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 2.4 GHz Wi-Fi | LTE band 30 |

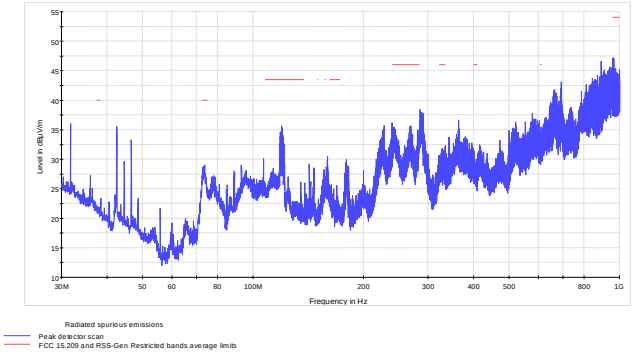


***Figure 8.1-5:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 5 GHz Wi-Fi | LTE band 1 |

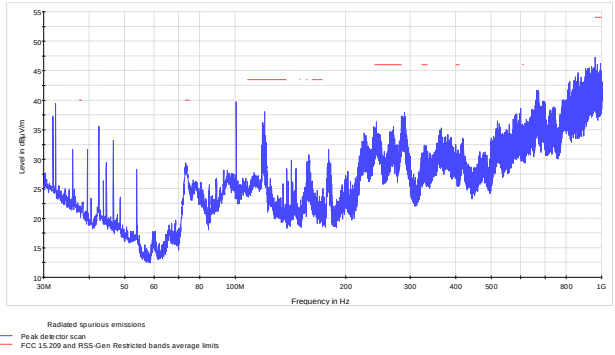


***Figure 8.1-6:*** *Radiated spurious emissions*

Test data, continued

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 5 GHz Wi-Fi | LTE band 3 |

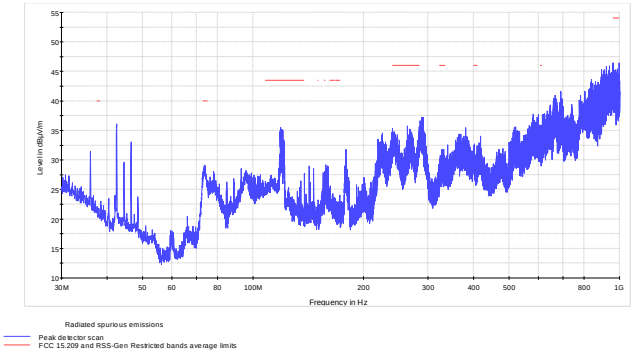


***Figure 8.1-7:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 5 GHz Wi-Fi | LTE band 5 |

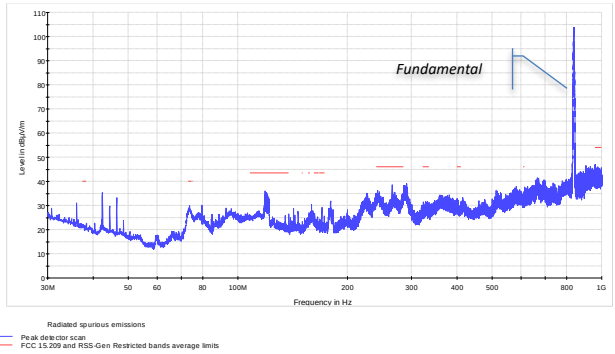


***Figure 8.1-8:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 5 GHz Wi-Fi | LTE band 28 |

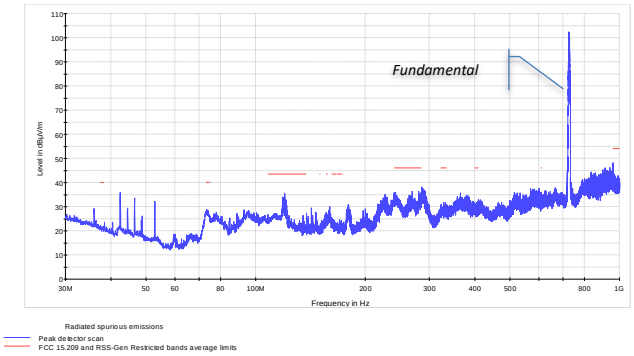


***Figure 8.1-9:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 30–1000 MHz | 5 GHz Wi-Fi | LTE band 30 |

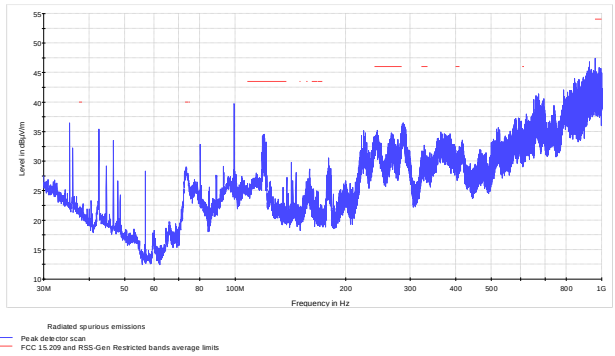


***Figure 8.1-10:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 2.4 GHz Wi-Fi | LTE band 1 |

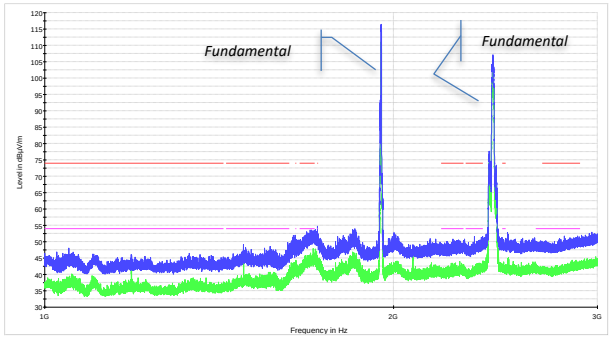


***Figure 8.1-11:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 2.4 GHz Wi-Fi | LTE band 3 |

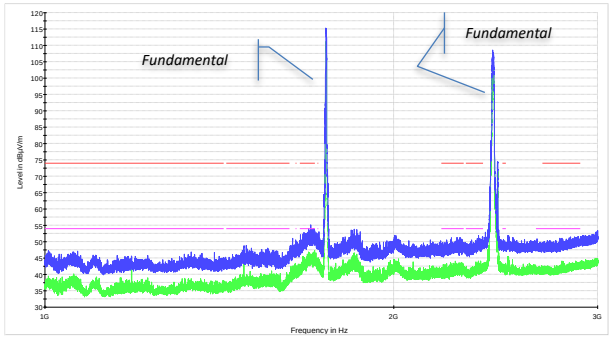


***Figure 8.1-12:*** *Radiated spurious emissions*

Test data, continued

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 2.4 GHz Wi-Fi | LTE band 5 |

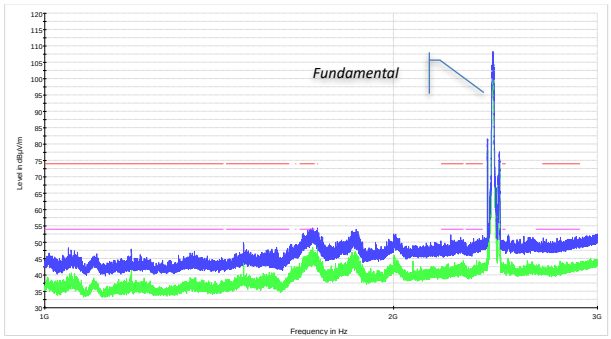


***Figure 8.1-13:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 2.4 GHz Wi-Fi | LTE band 28 |

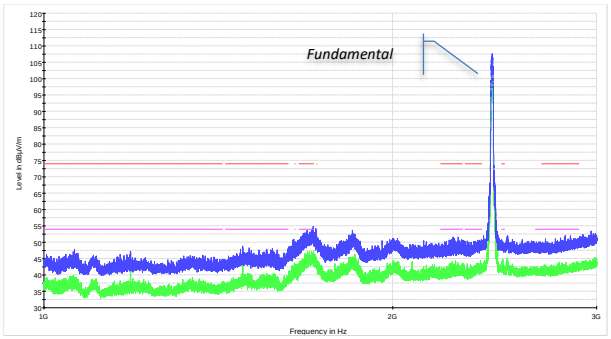


***Figure 8.1-14:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 2.4 GHz Wi-Fi | LTE band 30 |

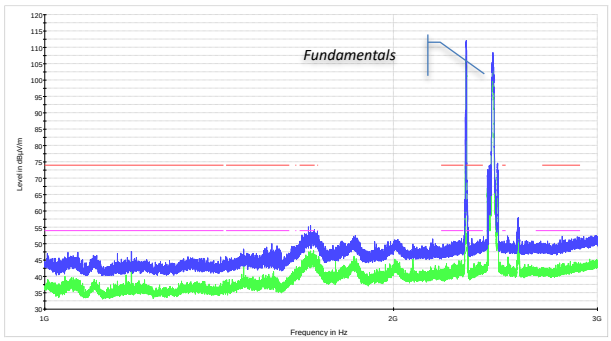


***Figure 8.1-15:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 5 GHz Wi-Fi | LTE band 1 |

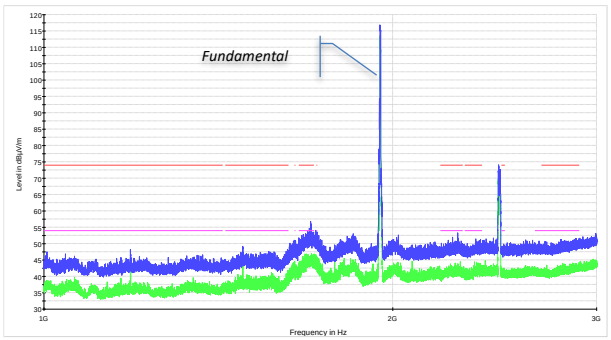


***Figure 8.1-16:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 5 GHz Wi-Fi | LTE band 3 |

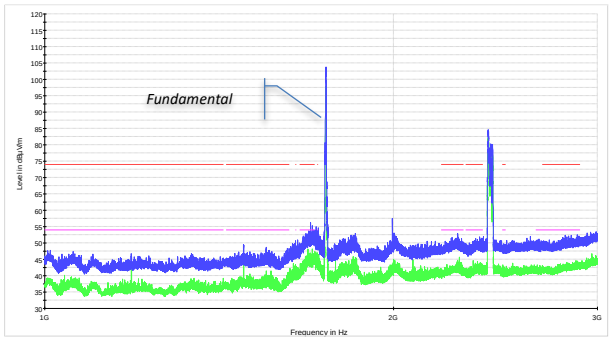


***Figure 8.1-17:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 5 GHz Wi-Fi | LTE band 5 |

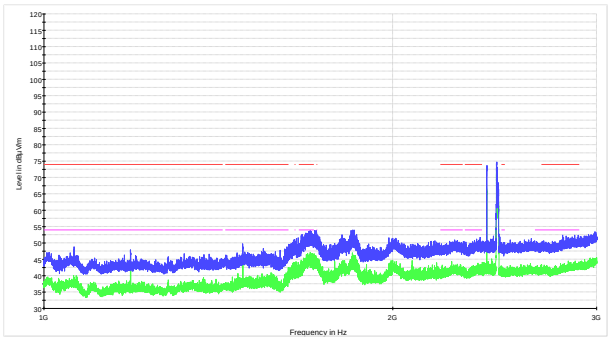


***Figure 8.1-18:*** *Radiated spurious emissions*

Test data, continued

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 5 GHz Wi-Fi | LTE band 28 |

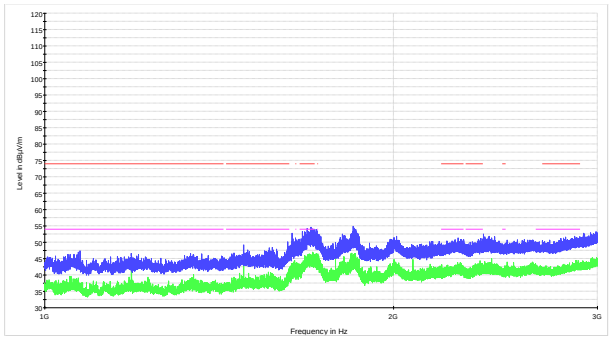


***Figure 8.1-19:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 1–3 GHz | 5 GHz Wi-Fi | LTE band 30 |

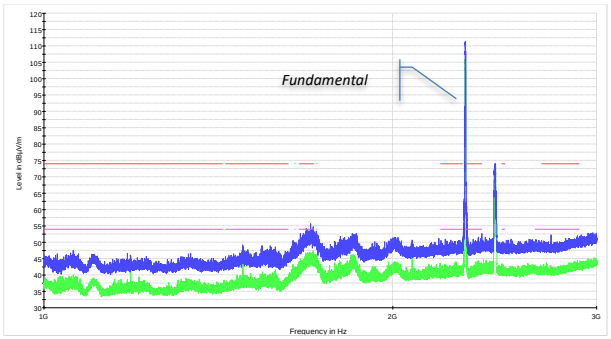


***Figure 8.1-20:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 3–18 GHz | 2.4 GHz Wi-Fi | LTE band 1 |

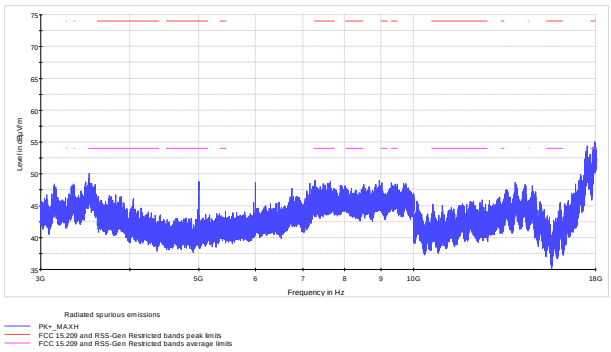


***Figure 8.1-21:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 3–18 GHz | 2.4 GHz Wi-Fi | LTE band 3 |

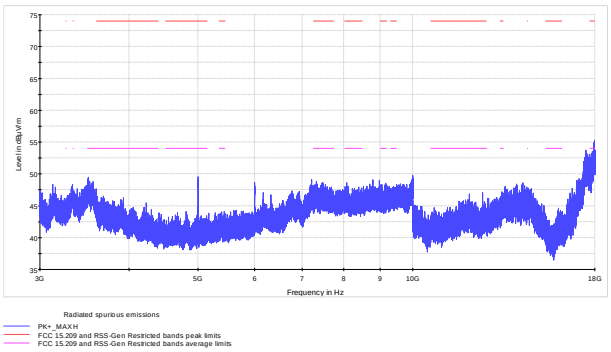


***Figure 8.1-22:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 3–18 GHz | 2.4 GHz Wi-Fi | LTE band 5 |

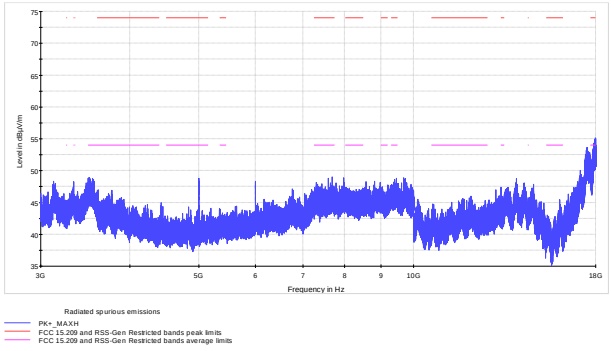


***Figure 8.1-23:*** *Radiated spurious emissions*

| Frequency range | Transmitter 1 | Transmitter 2 |
|---|---|---|
| 3–18 GHz | 2.4 GHz Wi-Fi | LTE band 28 |

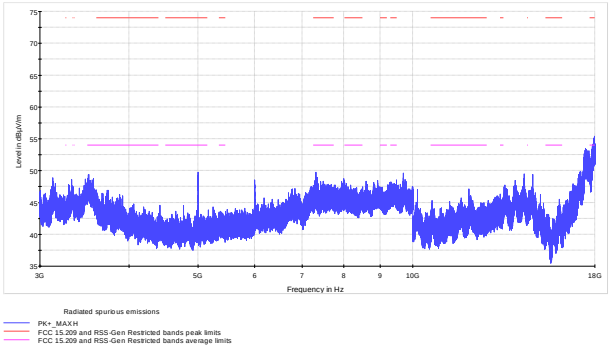


***Figure 8.1-24:*** *Radiated spurious emissions*