



ONE WORLD ◊ OUR APPROVAL

Wireless test report – REP039745

Applicant:

TOPCON POSITIONING SYSTEMS, INC.
7400 National Drive, Livermore CA 94551, USA

Product name:

Multiradio module

Model:

CL55

FCC ID:

WR4-CL55

IC Registration number

6050B-CL55

Variant:

CL-55 LTE VZW, CL-55 LTE VZW +RADIO,
CL-55 LTE VZW SDF, CL-55 LTE VZW +RADIO SDF

Specifications:

- ◆ FCC 47 CFR Part 15 Subpart C, §15.209 and RSS-Gen Issue 5 §8.9
- ◆ FCC 47 CFR Part 15 Subpart C, §15.247 (d) and RSS-247 Issue 3 §5.5
- ◆ FCC 47 CFR Part 15 Subpart E, §15.407 (b) and RSS-247 Issue 3 §6.2
- ◆ FCC 47 CFR Part 27 Subpart C, §27.53 (c) and (h)

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The test report merely corresponds to the tested sample.

The phase of sampling / collection of equipment under test is carried out by the customer.

Test location(s)

| | |
|--------------|--|
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| Website | www.nemko.com |
| Site number | FCC test site registration number: 682159 (10 m semi anechoic chamber) ISED test site number: 9109A |

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 contain in this report are within Nemko Spa's ISO/IEC 17025 accreditation.

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Date of issue: October 19, 2023

Tested by O. Frau (project handler) Signature: 
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(name, function)

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Section 1. Report summary

1.1 Applicant and manufacturer

| | |
|--------------|--|
| Company name | TOPCON POSITIONING SYSTEMS, INC. |
| Address | 7400 National Drive, Livermore CA 94551, USA |

1.2 Test specifications

| | |
|---|--|
| FCC 47 CFR Part 15 Subpart C, §15.209 | Radiated emission limits; general requirements. |
| FCC 47 CFR Part 15 Subpart C, §15.247 | Operation within the bands 902.2-927.8 MHz, 2400-2483.5 MHz, and 5725-5850 MHz. |
| FCC 47 CFR Part 15 Subpart E, §15.407 | Unlicensed National Information Infrastructure Devices |
| FCC 47 CFR Part 27 Subpart C, §27.53 | Emission limits. |
| RSS-Gen Issue 5, April 2018, Amendment 1 (March 2019), Amendment 2 (February 2021) - §8.9 | General Requirements for Compliance of Radio Apparatus - Transmitter emission limits |
| RSS-247 Issue 3, August 2023 - §5.5 | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices - Unwanted emissions |
| RSS-247 Issue 3, August 2023 - §6.2 | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices - Power and unwanted emissions limits |

1.3 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 |

1.4 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 1.5 below. 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 Exclusions

As per quote, the purpose of this report is verification of transmitters colocation. Only inter-modulation products within restricted bands were assessed, other requirements were excluded from the scope of this report.

1.6 Test report revision history

| Revision # | Date of issue | Details of changes made to test report |
|------------|------------------|--|
| REP039745 | October 19, 2023 | Original report issued |

Section 2. Summary of test results

2.1 FCC Part 15 Subpart C, and FCC Part 27 Subpart C test results

| Part | Test description | Verdict |
|-------------|--|---------|
| §15.209 | Radiated emission limits; general requirements. | Pass |
| §15.247 (d) | Spurious emissions. | Pass |
| §15.407 (b) | Undesirable emission limits. | Pass |
| §27.53 (c) | Emission limit for operations in the 746-758 MHz band and the 776-788 MHz band | Pass |
| §27.53 (h) | Emission limit for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands | Pass |

2.2 RSS test results

| Part | Test description | Verdict |
|----------------------|-----------------------------|---------|
| RSS-Gen Issue 5 §8.9 | Transmitter emission limits | Pass |
| RSS-247 Issue 3 §5.5 | Unwanted emissions | Pass |
| RSS-247 Issue 3 §6.2 | Unwanted emission limits | Pass |

Section 3. Equipment under test (EUT) details

3.1 Sample information

| | |
|------------------------|-------------------|
| Receipt date | February 25, 2019 |
| Nemko sample ID number | 367596-2/3 |

3.2 EUT information

| | |
|---------------|---------------------|
| Product name | Multiradio module |
| Model | CL-55 LTE VZW+RADIO |
| Serial number | 1910036AA |

3.3 Technical information

| | |
|---|--|
| Frequency band | WIFI/ BT/BLE: 2400–2483.5 MHz band WIFI: 5150–5250 MHz, 5250–5350 MHz 5450–5725 and 5725–5850 MHz LTE: North American Bands UHF: 902.2 – 927.8 MHz |
| Type of modulation | GFSK, 802.11a/n, OFDM |
| Emission classification (F1D, G1D, D1D) | F1D, W7D |
| EUT power requirements | 8 to 36 V DC |
| Antenna information | The EUT uses a unique antenna coupling. EUT has 2 antenna configurations. First configuration: 4 in 1 antenna Taoglas model MA245-LBIC.008 with 3.0 mt cable and half wave antenna ComAnt model CA915H_A. Second configuration: 4 in 1 antenna Taoglas model MA245-LBIC.008 with 0.4 m cable and half wave antenna ComAnt model CA915H_A. |

3.4 EUT setup diagram

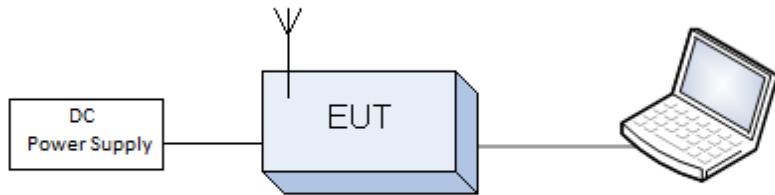


Figure 3.4-1: Setup diagram

3.5 EUT sub assemblies

Table 3.5-1: EUT sub assemblies

| Description | Brand name | Model/Part number | Serial number |
|----------------------------|-----------------|---------------------|---------------|
| General Purpose IoT device | Topcon AG Turin | CL-55 LTE VZW+RADIO | 1910036AA |
| 4 in 1 antenna | Taoglas | MA245-LBIC.008 | -- |
| UHF antenna | ComAnt | CA915H_A | -- |

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

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

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5. Test conditions

5.1 Atmospheric conditions

| | |
|-------------------|---------------|
| Temperature | 18–33 °C |
| Relative humidity | 30–60 % |
| Air pressure | 980–1060 mbar |

Test equipment used for the monitoring of the environmental conditions

| Equipment | Manufacturer | Model no. | Asset no. | Cal cycle | Next cal. |
|-------------------------------|--------------|-----------|--------------|-----------|-----------|
| Thermohygrometer data loggers | Testo | 175-H2 | 20012380/305 | 2013-01 | 2025-01 |
| Thermohygrometer data loggers | Testo | 175-H2 | 38203337/703 | 2013-01 | 2025-01 |
| Barometer | MSR | MSR145B | 330080 | 2013-04 | 2014-04 |

5.2 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 $\pm 5\%$, for which the equipment was designed.

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

| EUT | Type | Test | Range and Setup features | Measurement Uncertainty | Notes |
|-------------|-----------|---|--------------------------|-------------------------|-------|
| Transmitter | Conducted | Frequency error | 0.001 MHz ÷ 40 GHz | 0.08 ppm | (1) |
| | | Carrier power | 10 kHz ÷ 30 MHz | 1.0 dB | (1) |
| | | RF Output Power | 30 MHz ÷ 18 GHz | 1.5 dB | (1) |
| | | | 18 MHz ÷ 40 GHz | 3.0 dB | (1) |
| | | Adjacent channel power | 1 MHz ÷ 18 GHz | 1.6 dB | (1) |
| | | Conducted spurious emissions | 10 kHz ÷ 26 GHz | 3.0 dB | (1) |
| | | | 26 GHz ÷ 40 GHz | 4.5 dB | (1) |
| | | Intermodulation attenuation | 1 MHz ÷ 18 GHz | 2.2 dB | (1) |
| | | Attack time – frequency behaviour | 1 MHz ÷ 18 GHz | 2.0 ms | (1) |
| | | Attack time – power behaviour | 1 MHz ÷ 18 GHz | 2.5 ms | (1) |
| | | Release time – frequency behaviour | 1 MHz ÷ 18 GHz | 2.0 ms | (1) |
| | | Release time – power behaviour | 1 MHz ÷ 18 GHz | 2.5 ms | (1) |
| | | Transient behaviour of the transmitter – Transient frequency behaviour | 1 MHz ÷ 18 GHz | 0.2 kHz | (1) |
| | | Transient behaviour of the transmitter – Power level slope | 1 MHz ÷ 18 GHz | 9% | (1) |
| Radiated | Radiated | Frequency deviation - Maximum permissible frequency deviation | 0.001 MHz ÷ 18 GHz | 1.3% | (1) |
| | | Frequency deviation - Response of the transmitter to modulation frequencies above 3 kHz | 0.001 MHz ÷ 18 GHz | 0.5 dB | (1) |
| | | Dwell time | - | 3% | (1) |
| | | Hopping Frequency Separation | 0.01 MHz ÷ 18 GHz | 1% | (1) |
| | | Occupied Channel Bandwidth | 0.01 MHz ÷ 18 GHz | 2% | (1) |
| | | Modulation Bandwidth | 0.01 MHz ÷ 18 GHz | 2% | (1) |
| | | Radiated spurious emissions | 10 kHz ÷ 26.5 GHz | 6.0 dB | (1) |
| | | | 26.5 GHz ÷ 40 GHz | 8.0 dB | (1) |
| | | Effective radiated power transmitter | 10 kHz ÷ 26.5 GHz | 6.0 dB | (1) |
| | | | 26.5 GHz ÷ 40 GHz | 8.0 dB | (1) |
| Receiver | Conducted | Radiated spurious emissions | 10 kHz ÷ 26.5 GHz | 6.0 dB | (1) |
| | | | 26.5 GHz ÷ 40 GHz | 8.0 dB | (1) |
| | | Sensitivity measurement | 1 MHz ÷ 18 GHz | 6.0 dB | (1) |
| Conducted | Conducted | Conducted spurious emissions | 10 kHz ÷ 26 GHz | 3.0 dB | (1) |
| | | | 26 GHz ÷ 40 GHz | 4.5 dB | (1) |

(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$ which has been derived from the assumed normal probability distribution with infinite degrees of freedom and for a coverage probability of 95 %

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: Equipment list

| Equipment | Manufacturer | Model no. | Asset no. | Cal cycle | Next cal. |
|------------------------------|--------------|---------------------------|------------|-----------|-----------|
| EMI receiver (20 Hz ÷ 8 GHz) | R&S | ESU8 | 100202 | 2023-01 | 2024-01 |
| EMI receiver (20 Hz ÷ 8 GHz) | R&S | ESW44 | 101620 | 2023-05 | 2024-05 |
| Trilog Broadband Antenna | Schwarzbeck | VULB 9162 | 9162-025 | 2021-07 | 2024-07 |
| Bilog antenna (1 ÷ 18 GHz) | Schwarzbeck | STLP 9148 | 9148-123 | 2021-07 | 2024-07 |
| Horn antenna (4 ÷ 40 GHz) | RFSpin | DRH40 | 061106A40 | 2023-02 | 2026-02 |
| Preamplifier (1 ÷ 18 GHz) | Schwarzbeck | BBV9718 | 9718-137 | 2023-08 | 2024-08 |
| Preamplifier (18 ÷ 40 GHz) | Miteq | JS44-18004000-35-8P-R | 1.627 | 2023-08 | 2024-08 |
| Antenna mast | R&S | HCM | 836 529/05 | NCR | NCR |
| Controller | R&S | HCC | 836 620/7 | NCR | NCR |
| Turning-table | R&S | HCT | 835 803/03 | NCR | NCR |
| Semi-anechoic chamber | Nemko | 10m semi-anechoic chamber | 530 | 2021-09 | 2024-09 |
| Shielded room | Siemens | 10m control room | 1947 | NCR | NCR |

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

Section 8. Testing data

8.1 Radiated emission

Definitions and limits

FCC § 15.209 (f)

In accordance with §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in §15.109 that are applicable to the incorporated digital device.

FCC §15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
 - (ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

FCC §27.53 (c)

For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

| | |
|----------------------|---|
| Section 8 | Testing data |
| Test name | Radiated emission limits |
| Specification | FCC §15.209 (f), §15.247 (d), §15.407 (b), §27.53 (c), §27.53 (h) RSS-Gen Issue 5 §8.9, RSS-247 Issue 3 §5.5, RSS-247 Issue 3 §6.2 |

FCC §27.53 (h)

AWS emission limits—

- (1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

- (2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:

(i) Operations in the 2180-2200 MHz band are subject to the out-of-band emission requirements set forth in §27.1134 for the protection of federal government operations operating in the 2200-2290 MHz band.

(ii) For operations in the 2000-2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

(iii) For operations in the 1915-1920 MHz band, the power of any emission between 1930-1995 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

(iv) For operations in the 1995-2000 MHz band, the power of any emission between 2005-2020 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

(3) Measurement procedure.

(i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(ii) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(iii) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

(4) Private agreements.

(i) For AWS operations in the 2000-2020 MHz and 2180-2200 MHz bands, to the extent a licensee establishes unified operations across the AWS blocks, that licensee may choose not to observe the emission limit specified in paragraph (h)(1), above, strictly between its adjacent block licenses in a geographic area, so long as it complies with other Commission rules and is not adversely affecting the operations of other parties by virtue of exceeding the emission limit.

(ii) For AWS operations in the 2000-2020 MHz band, a licensee may enter into private agreements with all licensees operating between 1995 and 2000 MHz to allow the $70 + 10 \log_{10}(P)$ dB limit to be exceeded within the 1995-2000 MHz band.

(iii) An AWS licensee who is a party to a private agreement described in this section (4) must maintain a copy of the agreement in its station files and disclose it, upon request, to prospective AWS assignees, transferees, or spectrum lessees and to the Commission.

RSS-247 Issue 3 §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.

RSS-247 Issue 3 §6.2

6.2.1 Frequency band 5150-5250 MHz

LE-LAN devices are restricted to indoor operation only in the band 5150-5250 MHz. However, original equipment manufacturer (OEM) devices, which are installed in vehicles by vehicles manufacturers, are permitted.

6.2.1.2 Unwanted emission limits

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS)and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

6.2.2 Frequency band 5250-5350 MHz

For devices installed in vehicles, only OEM devices installed by vehicle manufacturers are permitted.

6.2.2.2 Unwanted emission limits

Devices shall comply with the following:

- a. All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
- b. All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text "for indoor use only."

6.2.3 Frequency bands 5470-5600 MHz and 5650-5725 MHz

Until further notice, devices subject to this section shall not be capable of transmitting in the band 5600-5650 MHz. This restriction is for the protection of Environment Canada's weather radars operating in this band.

| | |
|----------------------|---|
| Section 8 | Testing data |
| Test name | Radiated emission limits |
| Specification | FCC §15.209 (f), §15.247 (d), §15.407 (b), §27.53 (c), §27.53 (h) RSS-Gen Issue 5 §8.9, RSS-247 Issue 3 §5.5, RSS-247 Issue 3 §6.2 |



6.2.3.2 Unwanted emission limits

Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p. at 5850 MHz instead of 5725 MHz.

6.2.4 Frequency band 5725-5850 MHz

6.2.4.1 General

The following requirements apply to devices operating in the range 5725-5850 MHz. For devices that have channels that span across 5850 MHz (e.g. 5725-5895 MHz), the requirements are described in section 6.2.5.

6.2.4.3 Unwanted emission limits

Devices operating in the band 5725-5850 MHz shall comply with the following e.i.r.p. spectral density limits:

- a. 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- b. 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- c. 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- d. -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

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

| Frequency, MHz | Field strength of emissions µV/m | Field strength of emissions dB μ V/m | Measurement distance, m |
|-------------------|-------------------------------------|---|-------------------------|
| 0.009–0.490 | 2400/F | 67.6 – 20 × log ₁₀ (F) | 300 |
| 0.490–1.705 | 24000/F | 87.6 – 20 × 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: 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 | | | |

Table 8.1-3: 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 | |
| 8.41425–8.41475 | 167.72–173.2 | 3500–4400 | Above 38.6 |
| 12.29–12.293 | 240–285 | 4500–5150 | |
| 12.51975–12.52025 | 322–335.4 | 5350–5460 | |

Note: Certain frequency bands listed in Table 8.1-3 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard

Test summary

| | |
|-----------------|--------------------|
| Test start date | September 18, 2023 |
| Test engineer | P. Barbieri |

Observations, settings and special notes

The spectrum was searched from 30 MHz to 40 GHz.
EUT's LTE and WIFI transmitters were set to transmit continuously, different channel setting has been investigated as per provided by client's setup
Radiated measurements were performed at a distance of 3 m.

Spectrum analyzer settings for frequencies below 1000 MHz:

| | |
|----------------------|------------|
| Detector mode | Quasi-Peak |
| Resolution bandwidth | 120 kHz |
| Trace mode | Max Hold |
| Measurement time | 100 ms |

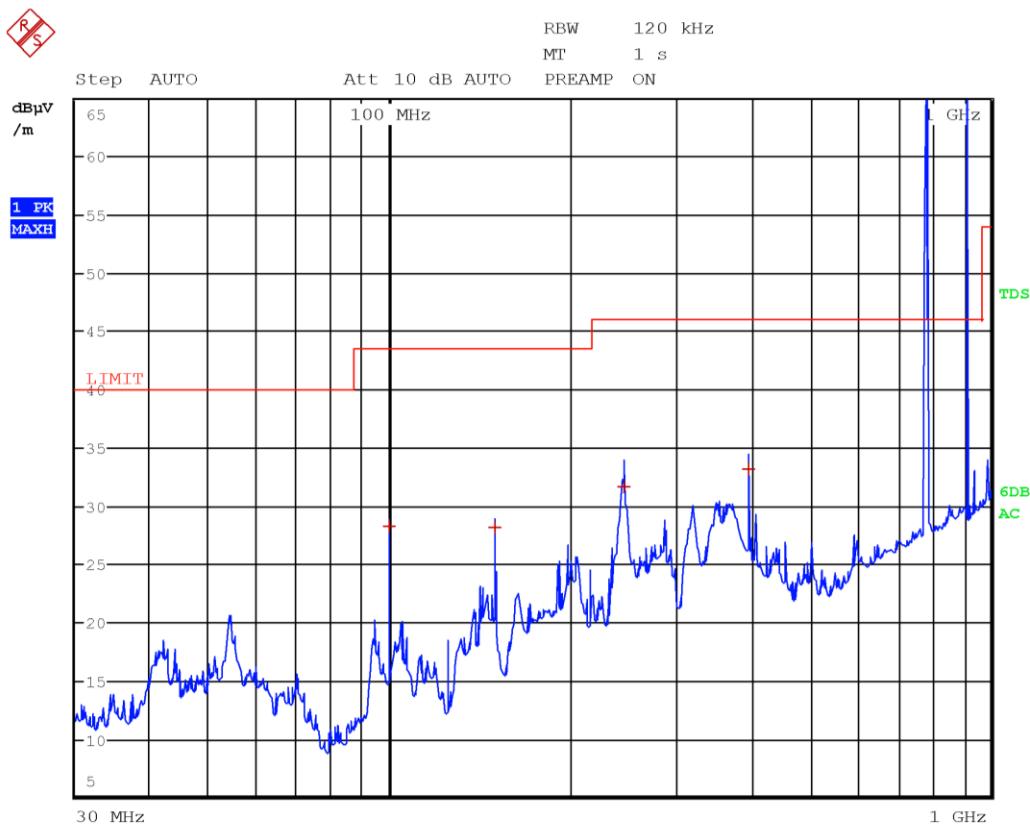
Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

| | |
|-----------------------|----------|
| 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: | 3 MHz |
| Detector mode: | Average |
| Trace mode: | Max Hold |

8.1.4 Test data

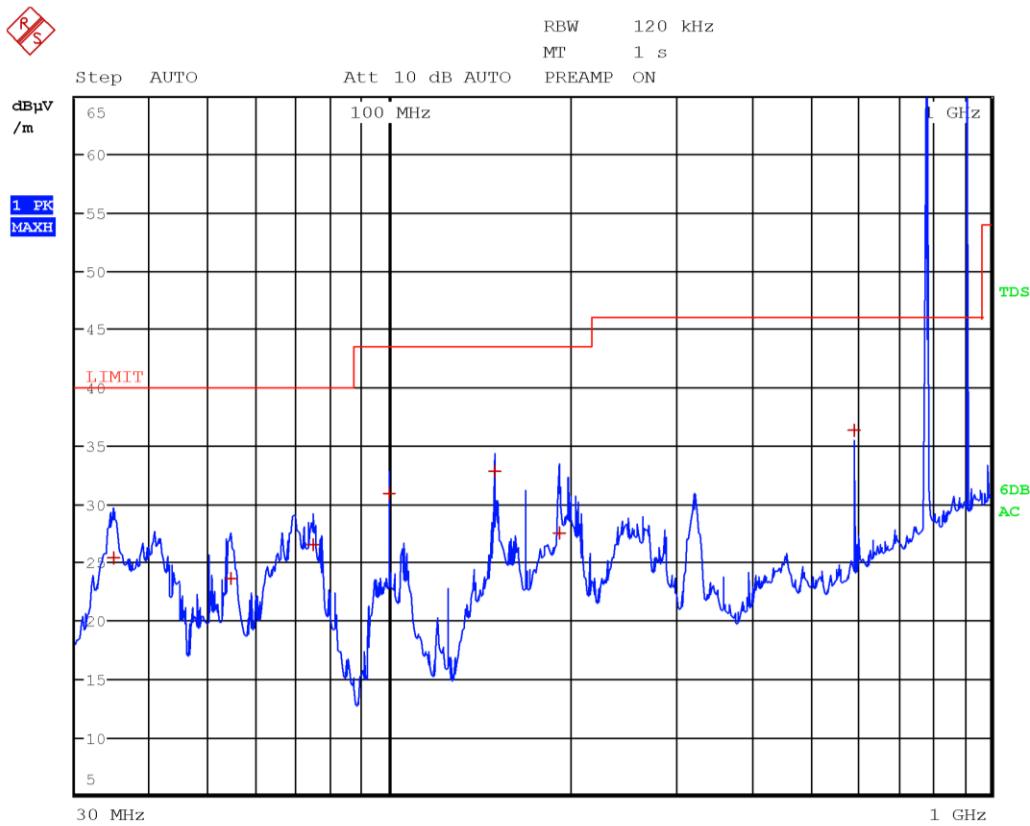


Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector |
|-----------------|----------------|----------------|-------------|----------|
| 99.9900 | 28.2 | 43.5 | -15.3 | QP |
| 150.0000 | 28.1 | 43.5 | -15.4 | QP |
| 245.9400 | 31.7 | 46.0 | -14.3 | QP |
| 245.9700 | 31.7 | 46.0 | -14.3 | QP |
| 396.0000 | 33.3 | 46.0 | -12.7 | QP |
| 782.0000 | 113.1 | -- | -- | PK |
| 915.0000 | 116.9 | -- | -- | PK |

Limit exceeded by the carriers

8.1.4 Test data, continued

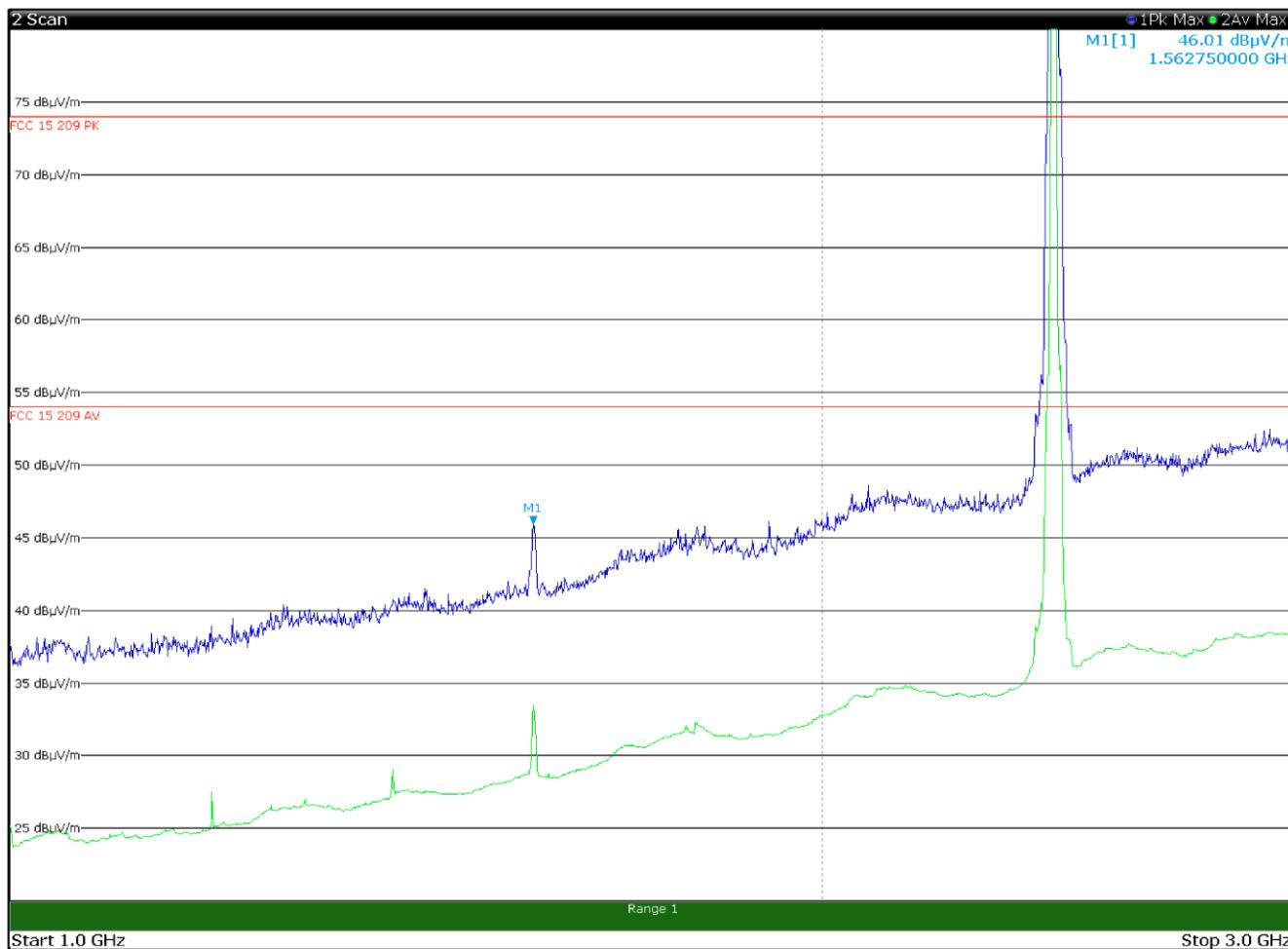


Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector |
|-----------------|----------------|----------------|-------------|----------|
| 34.6800 | 25.4 | 40.0 | -14.6 | QP |
| 54.4800 | 23.7 | 40.0 | -16.3 | QP |
| 74.5500 | 26.5 | 40.0 | -13.5 | QP |
| 99.9900 | 31.0 | 43.5 | -12.5 | QP |
| 150.0000 | 32.8 | 43.5 | -10.7 | QP |
| 191.1600 | 27.5 | 43.5 | -16.0 | QP |
| 594.0000 | 36.3 | 46.0 | -9.7 | QP |
| 782.0000 | 109.7 | -- | -- | PK |
| 915.0000 | 127.8 | -- | -- | PK |

Limit exceeded by the carriers

8.1.4 Test data, continued



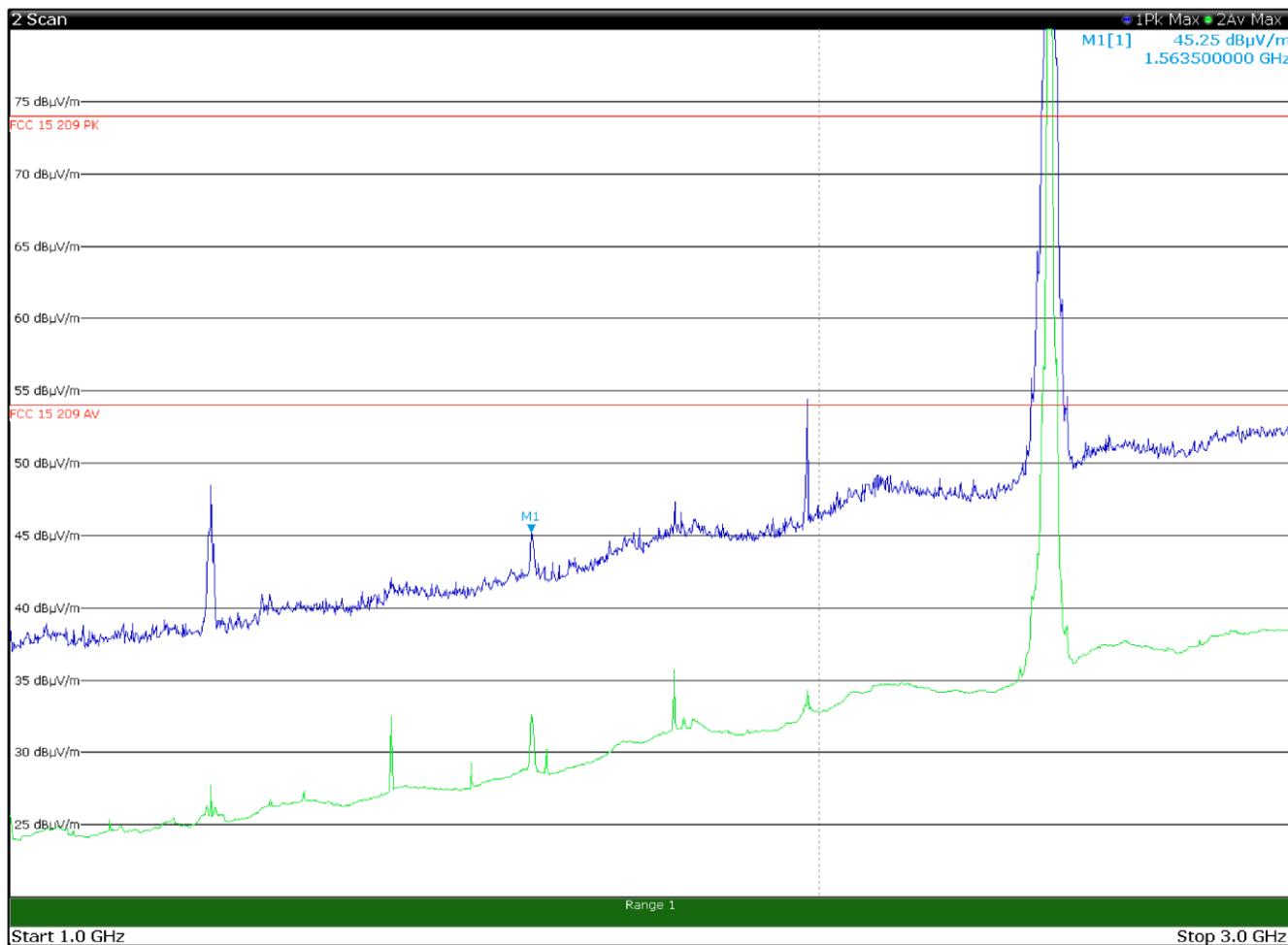
Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector |
|-----------------|----------------|----------------|-------------|----------|
| 1564.0000 | 46.9 | 82.2 | -35.3 | Pk |
| 2437.0000 | 112.8 | -- | -- | Pk |

Limit exceeded by the carriers

The limit for FCC 27.53 is -13 dBm. Limit (dBμV/m) = limit (dBm) + 95.23 = 82.2 dBμV/m

8.1.4 Test data, continued



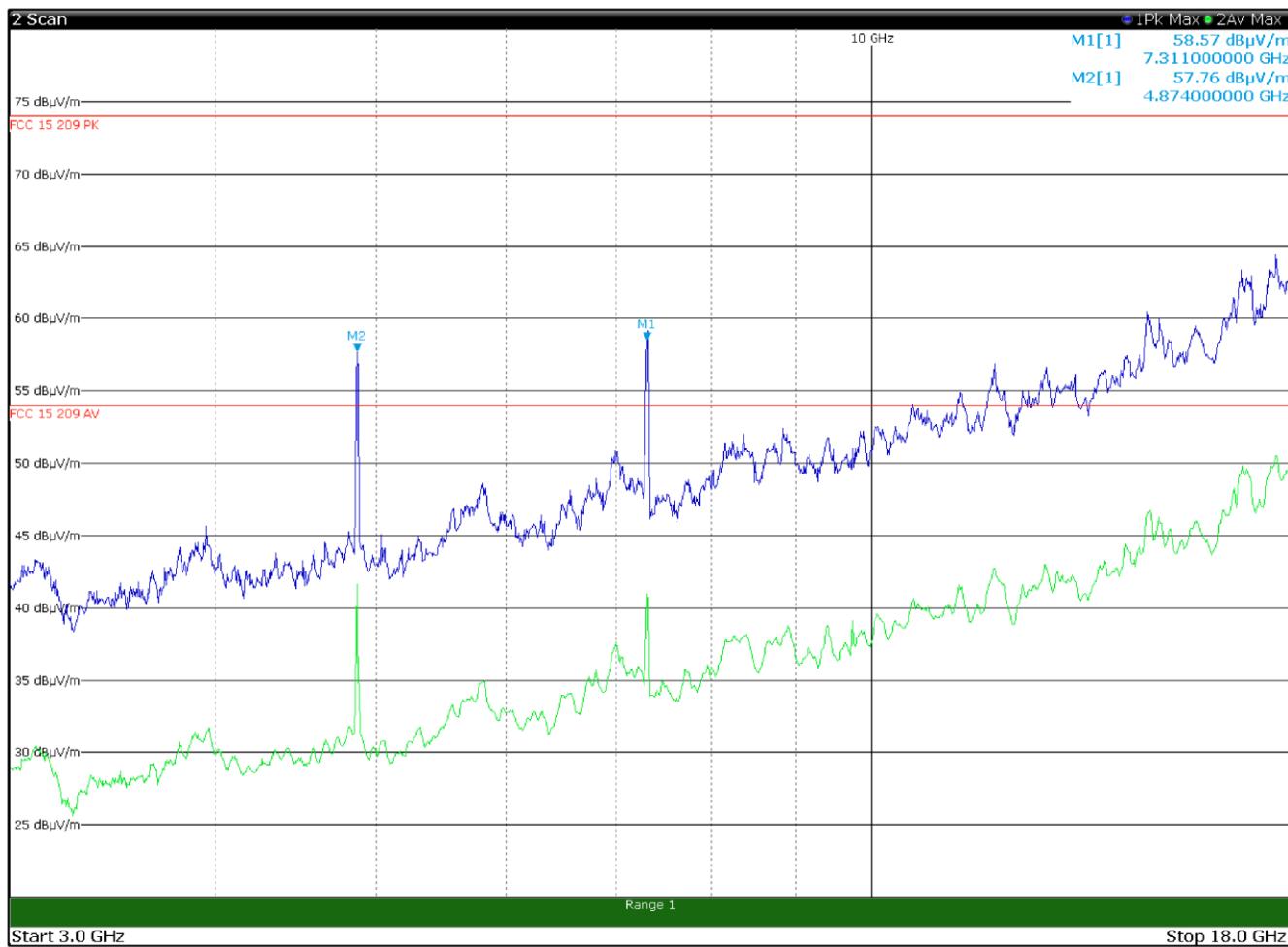
Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 1188.0000 | 48.5 | 74.0 | -25.5 | Pk |
| 1564.0000 | 45.3 | 82.2 | -36.9 | Pk |
| 1980.0000 | 54.4 | 74.0 | -19.6 | Pk |
| 2437.0000 | 105.4 | -- | -- | Pk |

Limit exceeded by the carriers

The limit for FCC 27.53 is -13 dBm. Limit (dB μ V/m) = limit (dBm) + 95.23 = 82.2 dB μ V/m

8.1.4 Test data, continued

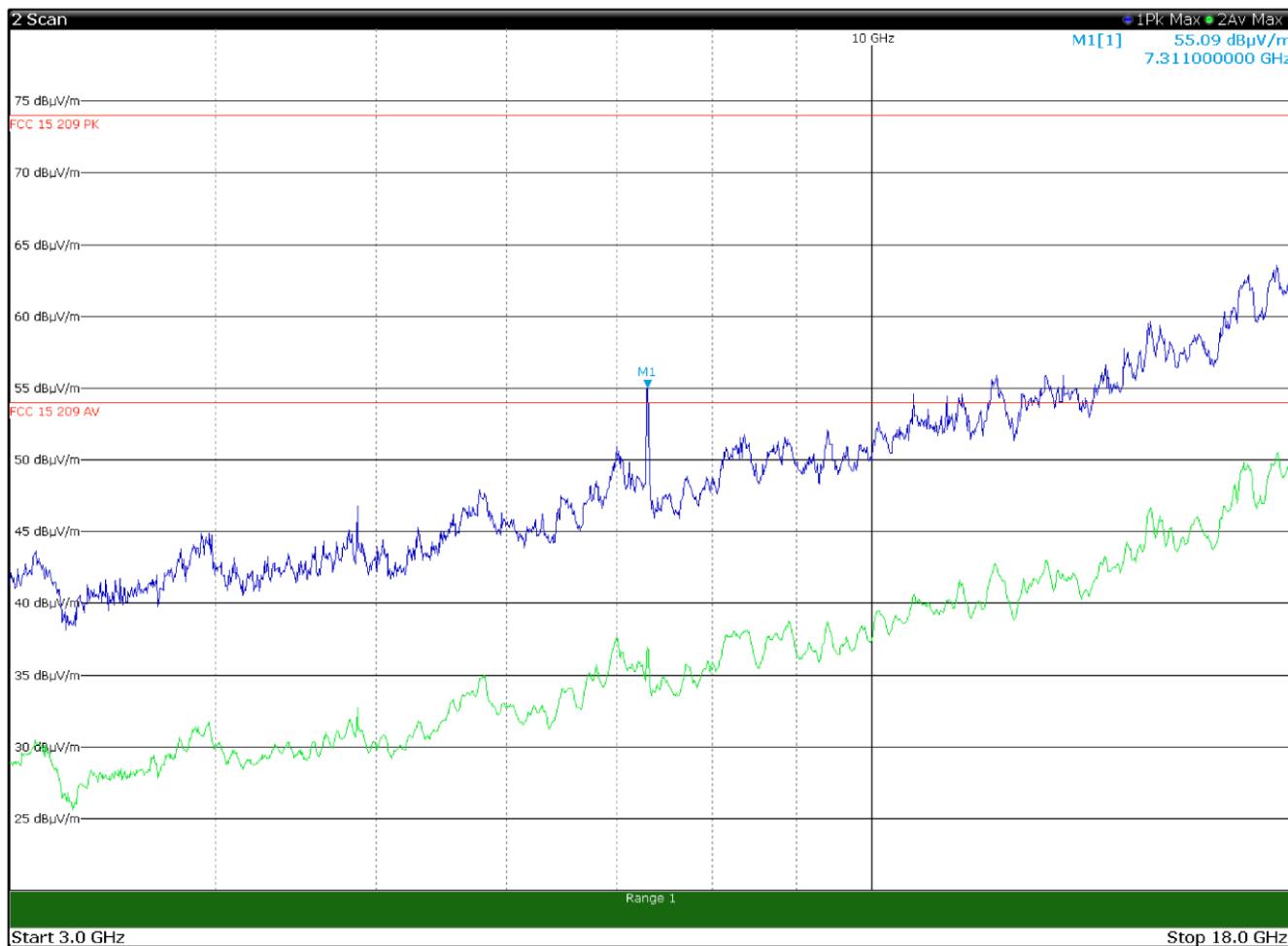


Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 4874.0000 | 57.8 | 74.0 | -16.2 | Pk |
| 4874.0000 | 49.4 | 54.0 | -4.6 | Av |
| 7311.0000 | 58.6 | 74.0 | -15.4 | Pk |
| 7311.0000 | 50.2 | 54.0 | -3.8 | Av |

The correction factor for the average value of pulsed emissions is $20 \log (DC) = 20 \log (0.38) = 8.4 \text{ dB}$

8.1.4 Test data, continued

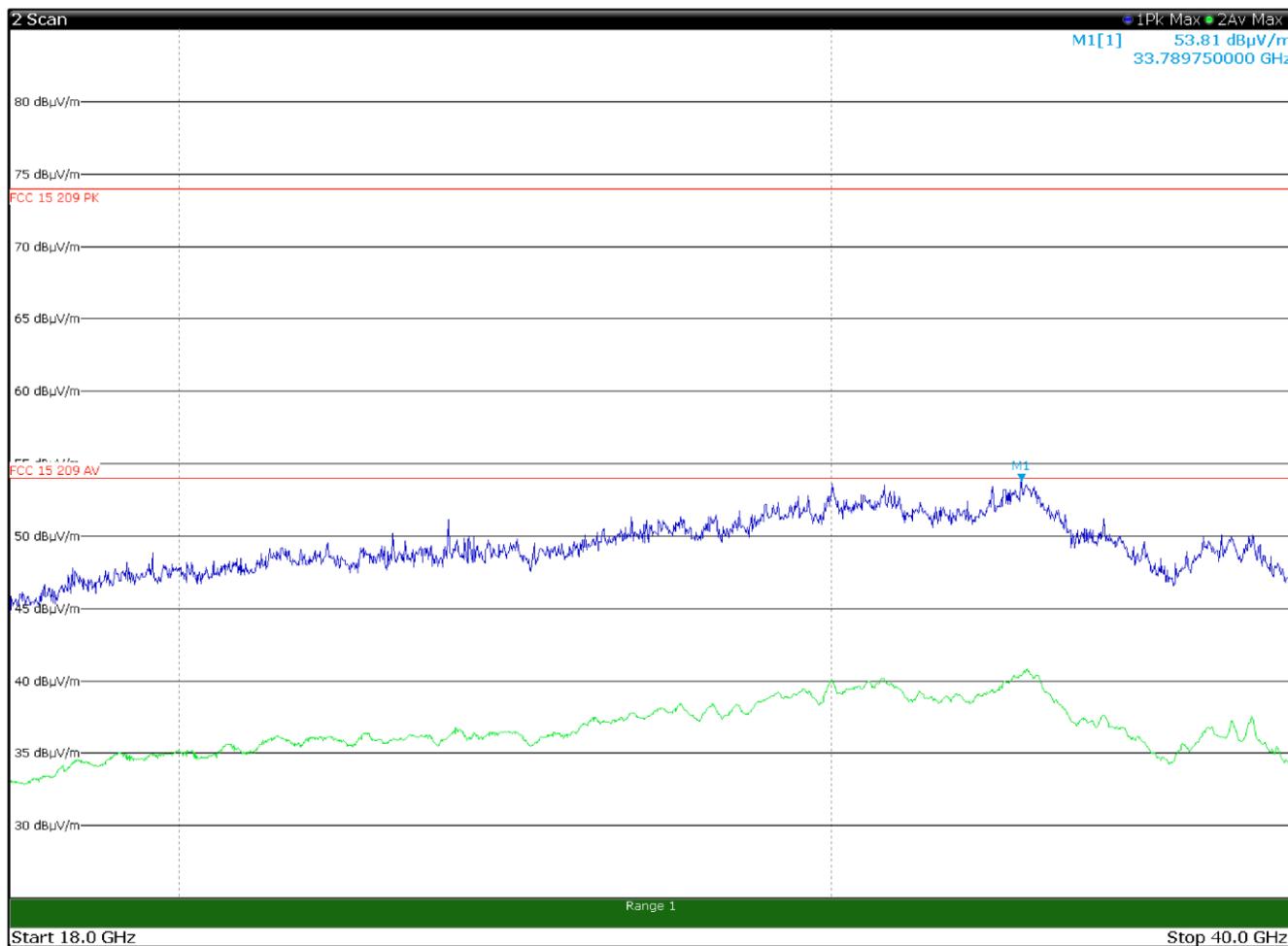


Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 4874.0000 | 47.2 | 74.0 | -26.8 | Pk |
| 4874.0000 | 38.8 | 54.0 | -15.2 | Av |
| 7311.0000 | 55.1 | 74.0 | -18.9 | Pk |
| 7311.0000 | 46.7 | 54.0 | -7.3 | Av |

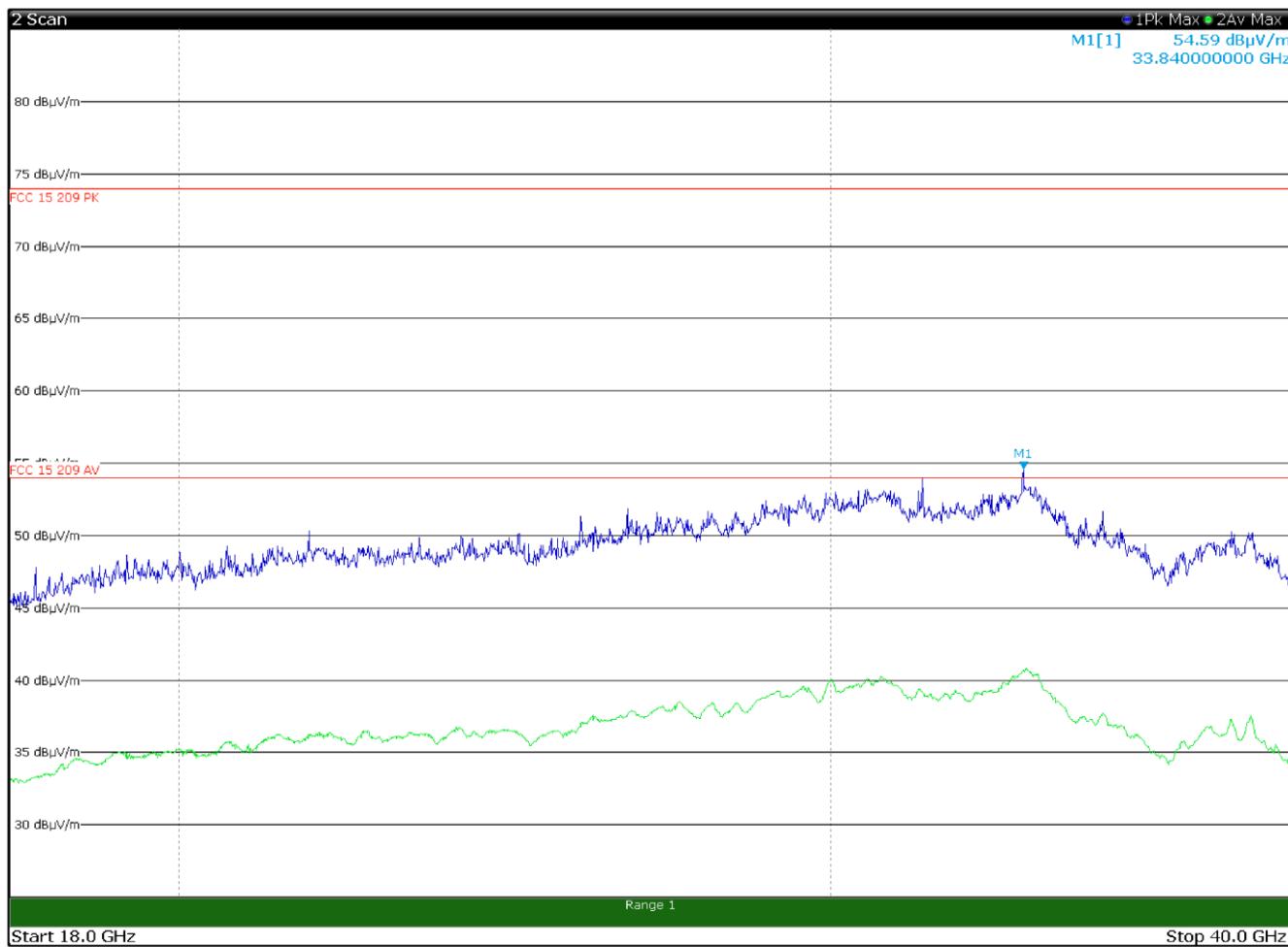
The correction factor for the average value of pulsed emissions is $20 \log (DC) = 20 \log (0.38) = 8.4 \text{ dB}$

8.1.4 Test data, continued



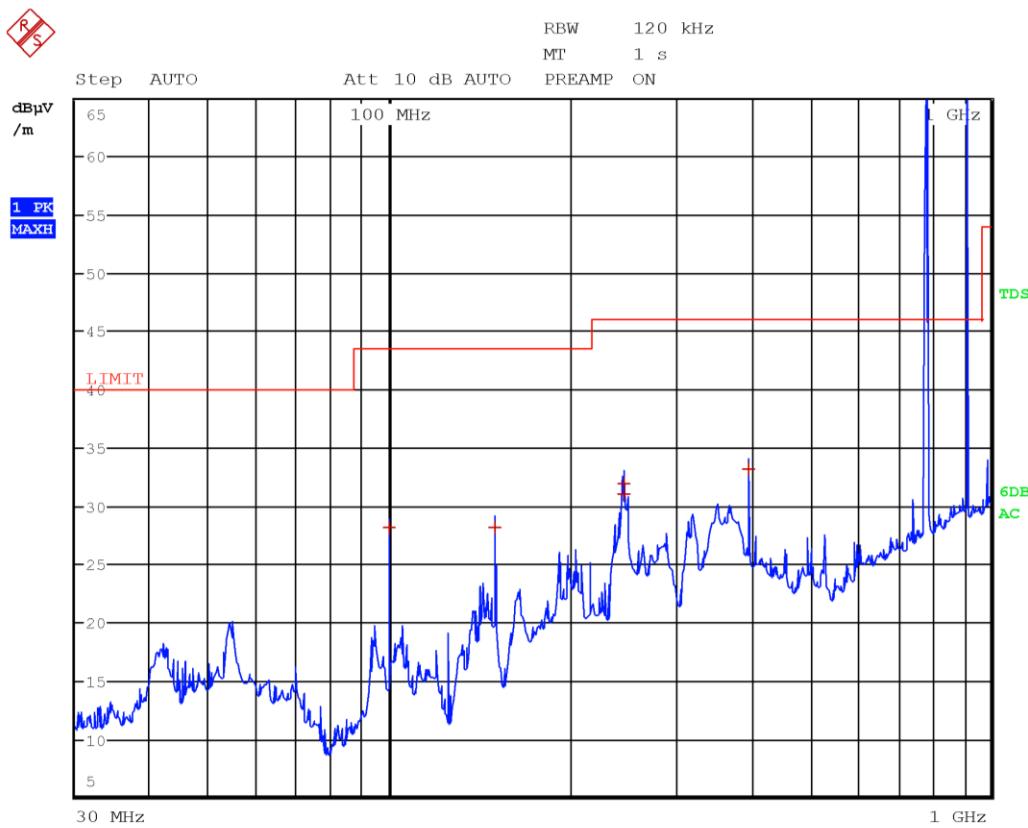
Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

8.1.4 Test data, continued



Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

8.1.4 Test data, continued

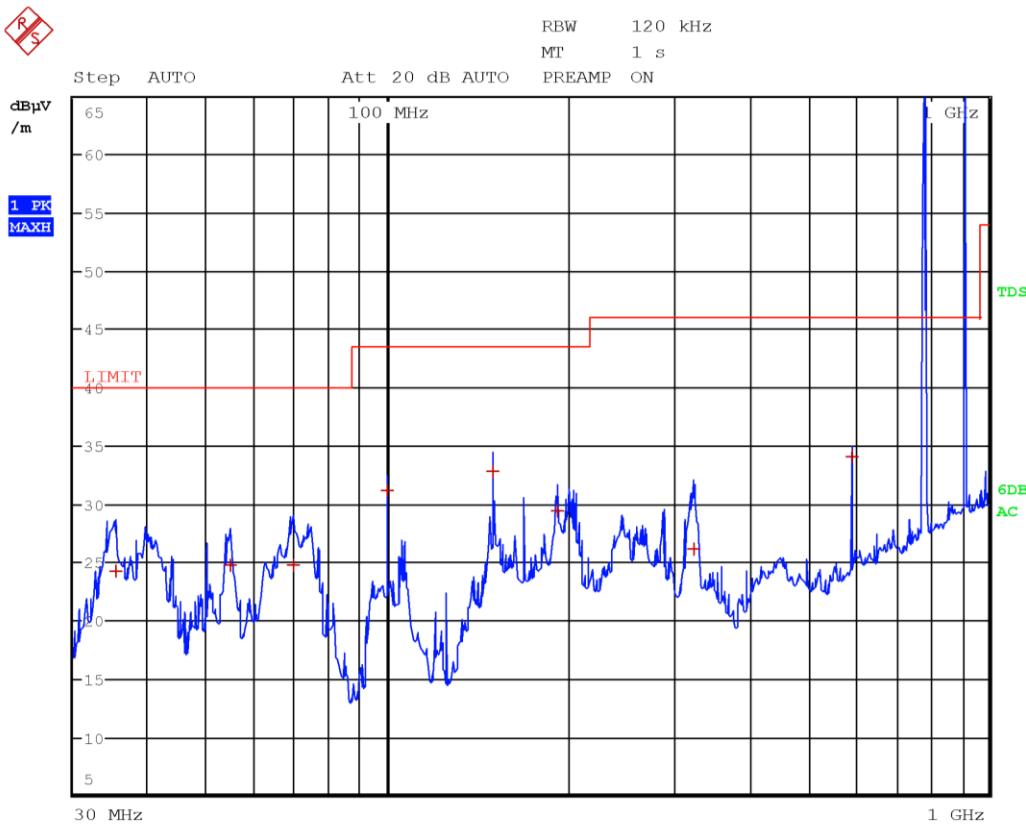


Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 99.9900 | 28.2 | 43.5 | -15.3 | QP |
| 150.0000 | 28.1 | 43.5 | -15.4 | QP |
| 245.9400 | 31.9 | 46.0 | -14.1 | QP |
| 245.9700 | 31.1 | 46.0 | -14.9 | QP |
| 396.0000 | 33.2 | 46.0 | -12.8 | QP |
| 782.0000 | 113.4 | -- | -- | PK |
| 915.0000 | 116.8 | -- | -- | PK |

Limit exceeded by the carriers

8.1.4 Test data, continued

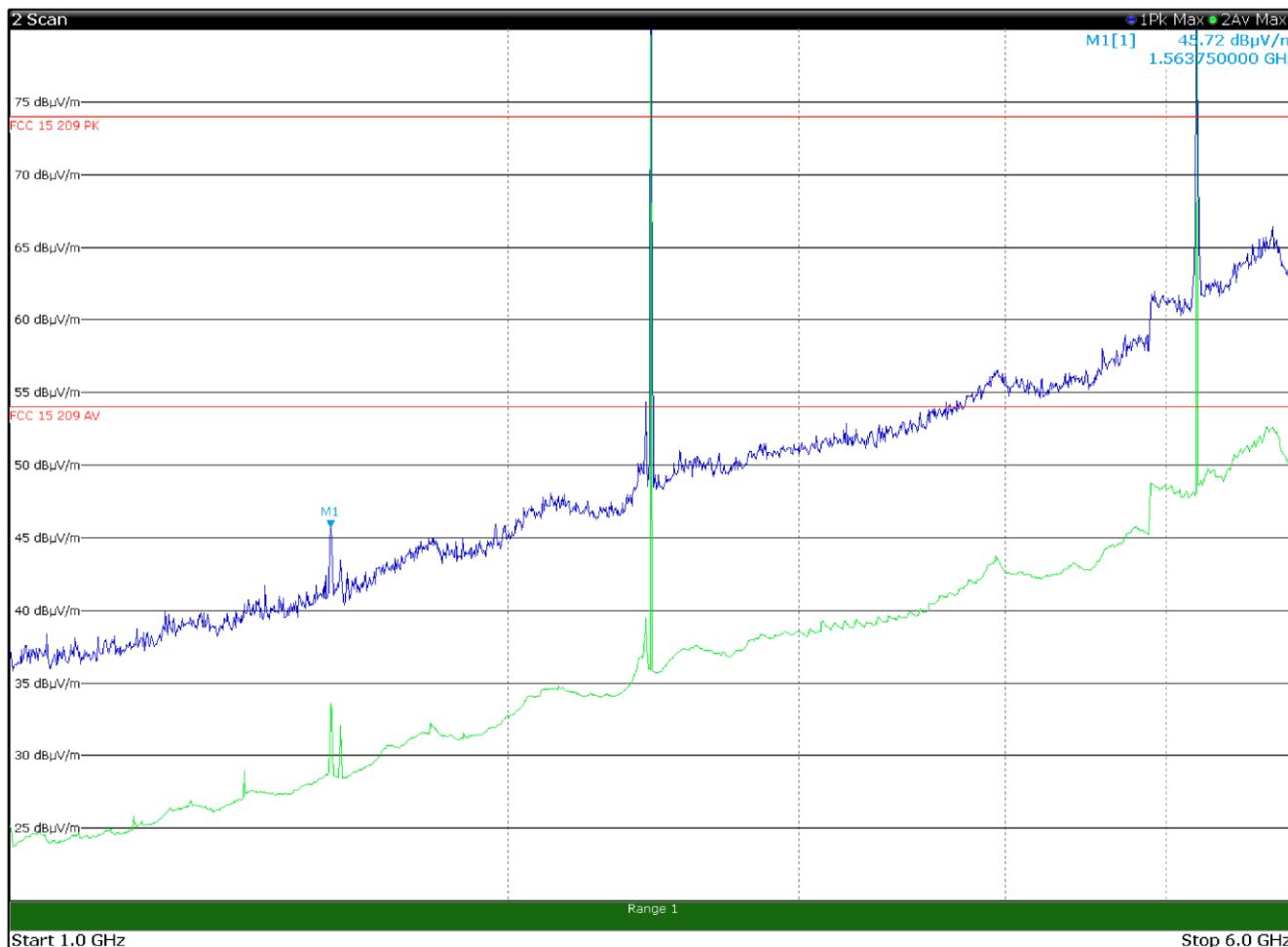


Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector |
|-----------------|----------------|----------------|-------------|----------|
| 35.3400 | 24.3 | 40.0 | -15.7 | QP |
| 54.6600 | 24.8 | 40.0 | -15.2 | QP |
| 69.6900 | 24.7 | 40.0 | -15.3 | QP |
| 99.9900 | 31.2 | 43.5 | -12.3 | QP |
| 150.0000 | 32.9 | 43.5 | -10.6 | QP |
| 192.0600 | 29.5 | 43.5 | -14.0 | QP |
| 323.1000 | 26.1 | 46.0 | -19.9 | QP |
| 594.0000 | 34.1 | 46.0 | -11.9 | QP |
| 782.0000 | 109.8 | -- | -- | PK |
| 915.0000 | 127.6 | -- | -- | PK |

Limit exceeded by the carriers

8.1.4 Test data, continued



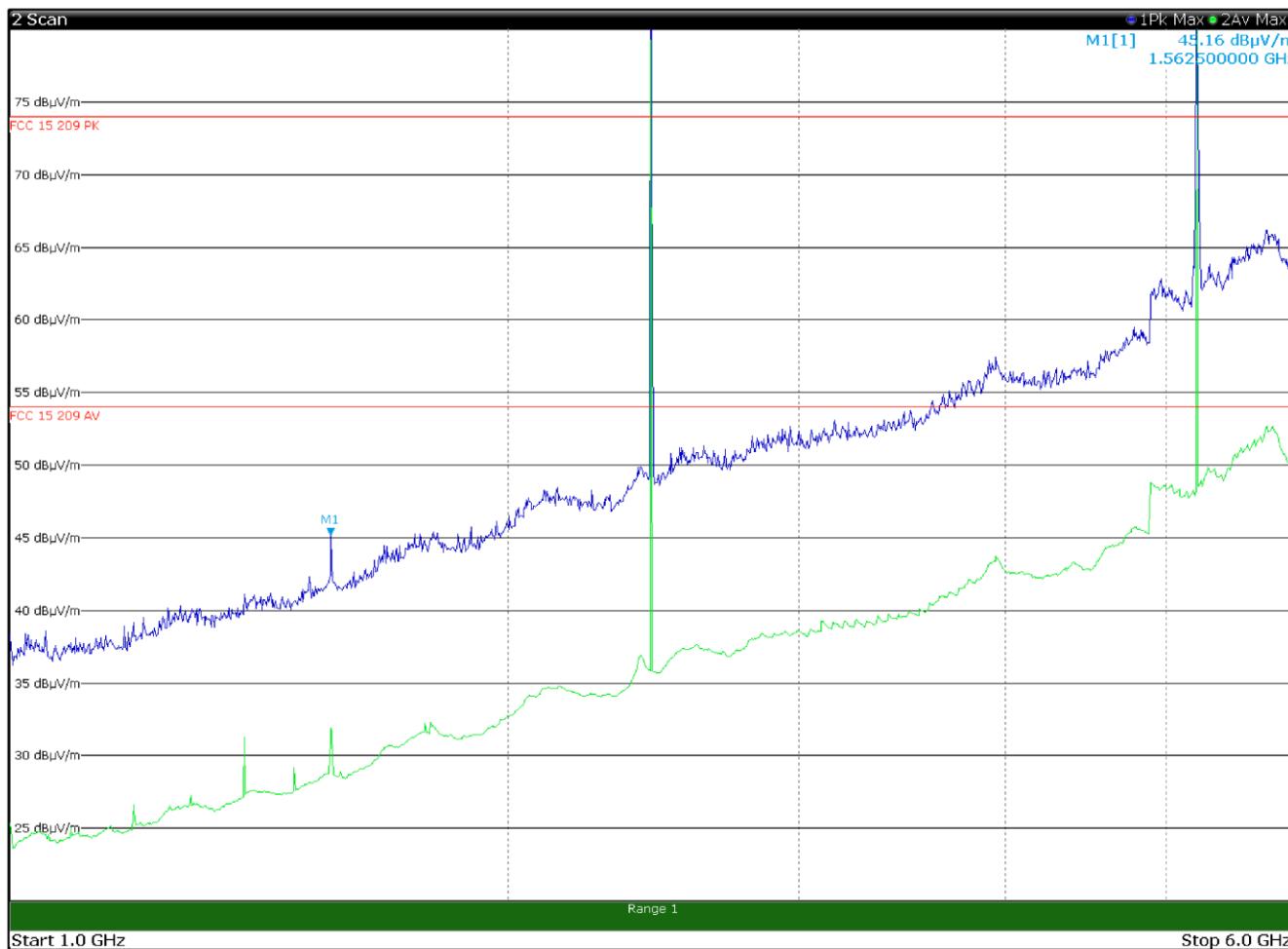
Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 1564.0000 | 45.8 | 82.2 | -36.4 | Pk |
| 2441.0000 | 98.1 | -- | -- | Pk |
| 5220.0000 | 116.2 | -- | -- | Pk |

Limit exceeded by the carriers

The limit for FCC 27.53 is -13 dBm. Limit (dB μ V/m) = limit (dBm) + 95.23 = 82.2 dB μ V/m

8.1.4 Test data, continued



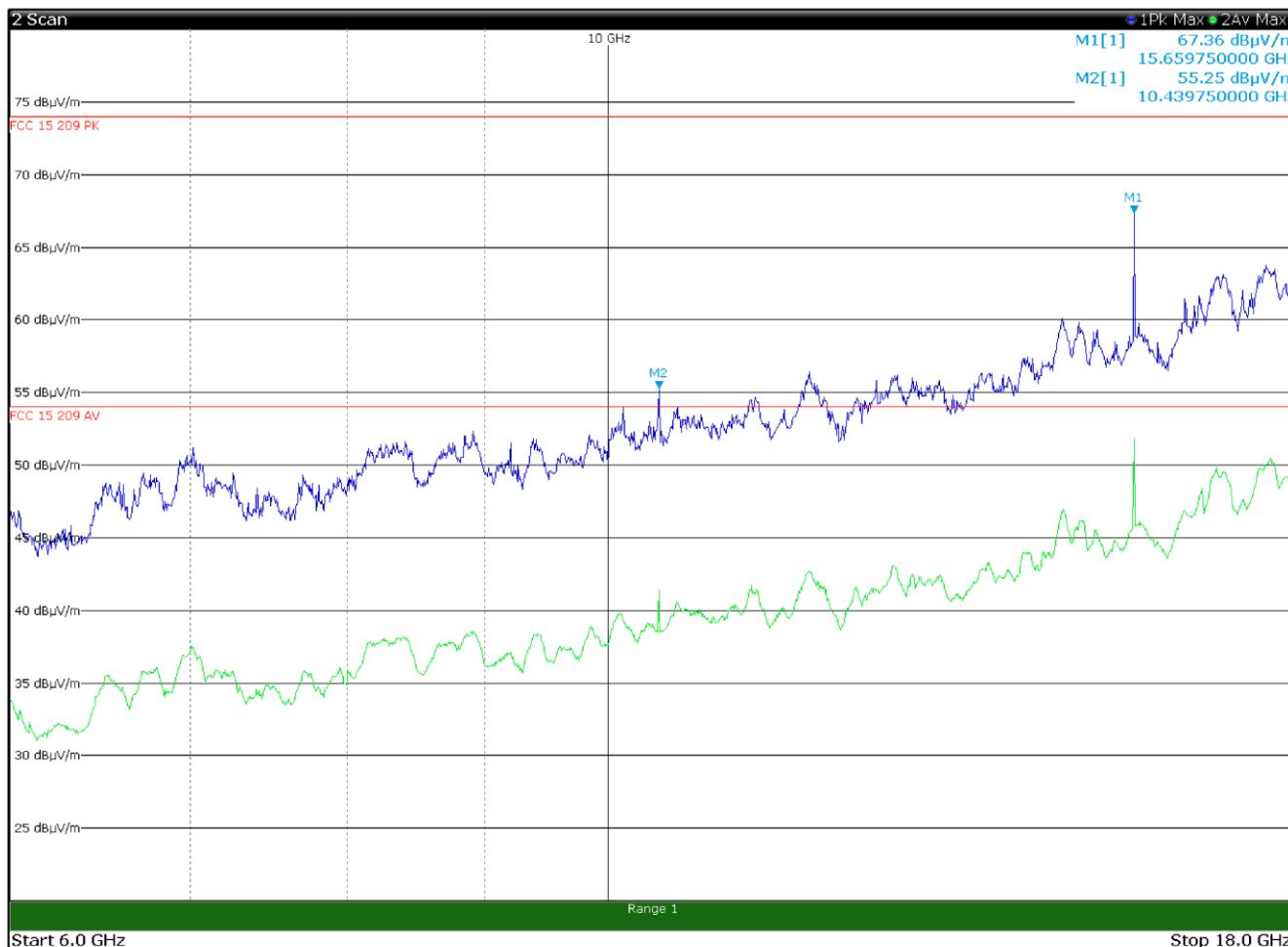
Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 1564.0000 | 46.5 | 82.2 | -35.7 | Pk |
| 2441.0000 | 89.5 | -- | -- | Pk |
| 5220.0000 | 105.6 | -- | -- | Pk |

Limit exceeded by the carriers

The limit for FCC 27.53 is -13 dBm. Limit (dB μ V/m) = limit (dBm) + 95.23 = 82.2 dB μ V/m

8.1.4 Test data, continued



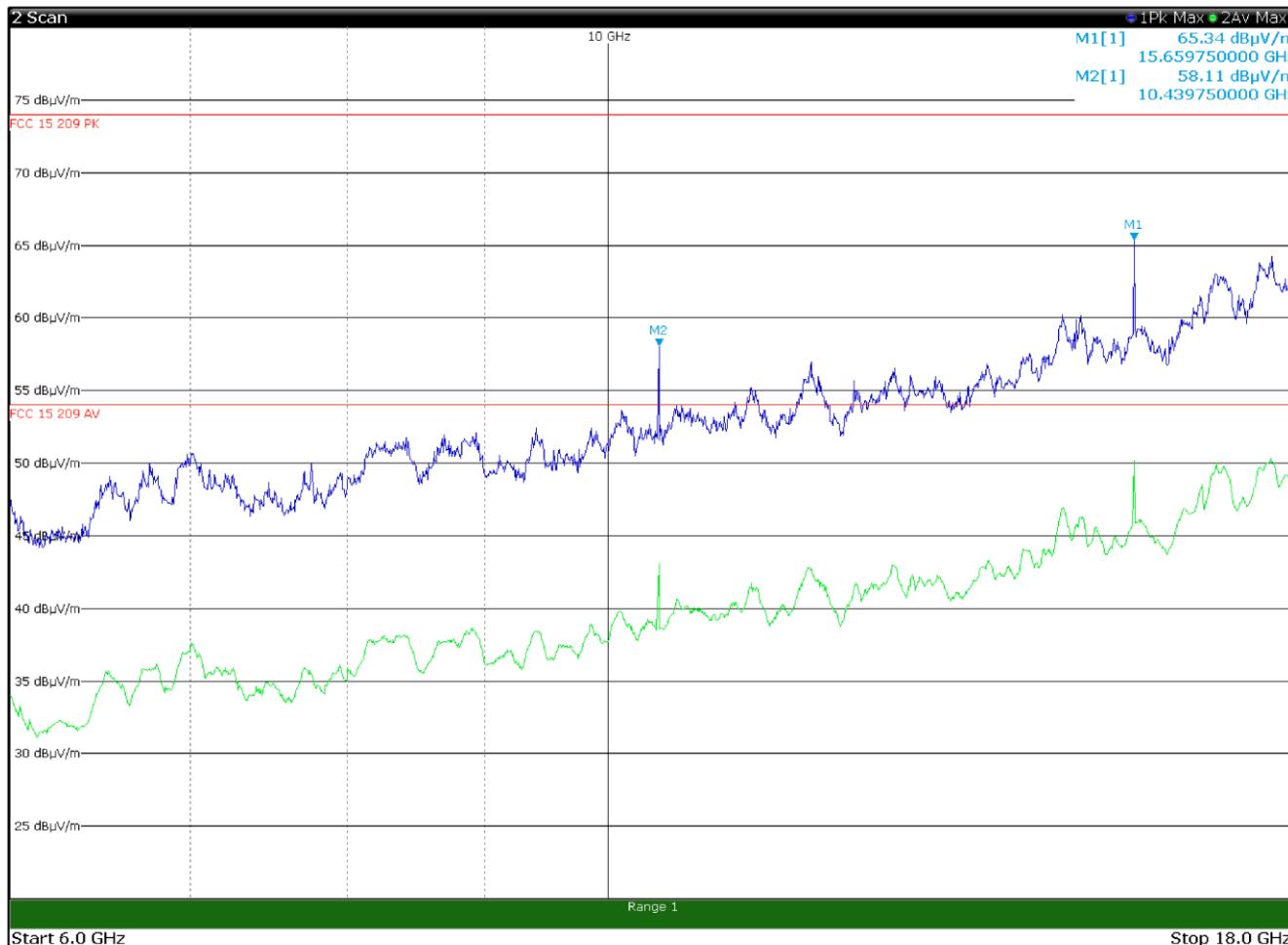
Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 10439.7500 | 55.3 | 68.2 | -12.9 | Pk |
| 15439.7500 | 67.4 | 74.0 | -6.6 | Pk |
| 15439.7500 | 52.5 | 54.0 | -1.5 | Av |

The limit for FCC 15.407 is -27 dBm. Limit (dB μ V/m) = limit (dBm) + 95.23 = 68.2 dB μ V/m

The correction factor for the average value of pulsed emissions is $20 \log (DC) = 20 \log (0.18) = 14.9$ dB

8.1.4 Test data, continued



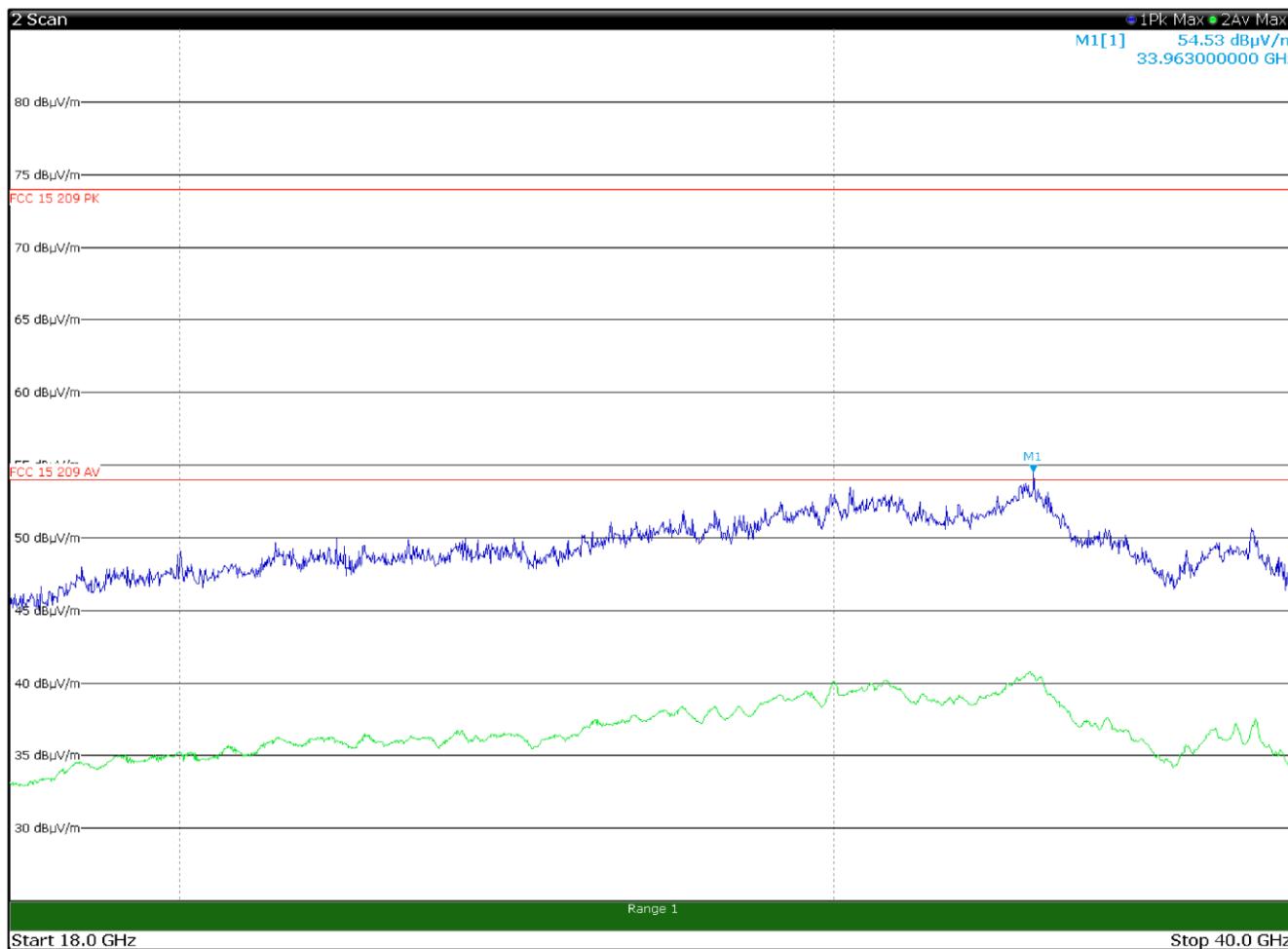
Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 10439.7500 | 58.2 | 68.2 | -10.0 | Pk |
| 15659.7500 | 65.4 | 74.0 | -8.6 | Pk |
| 15659.7500 | 50.5 | 54.0 | -3.5 | Av |

The limit for FCC 15.407 is -27 dBm. Limit (dB μ V/m) = limit (dBm) + 95.23 = 68.2 dB μ V/m

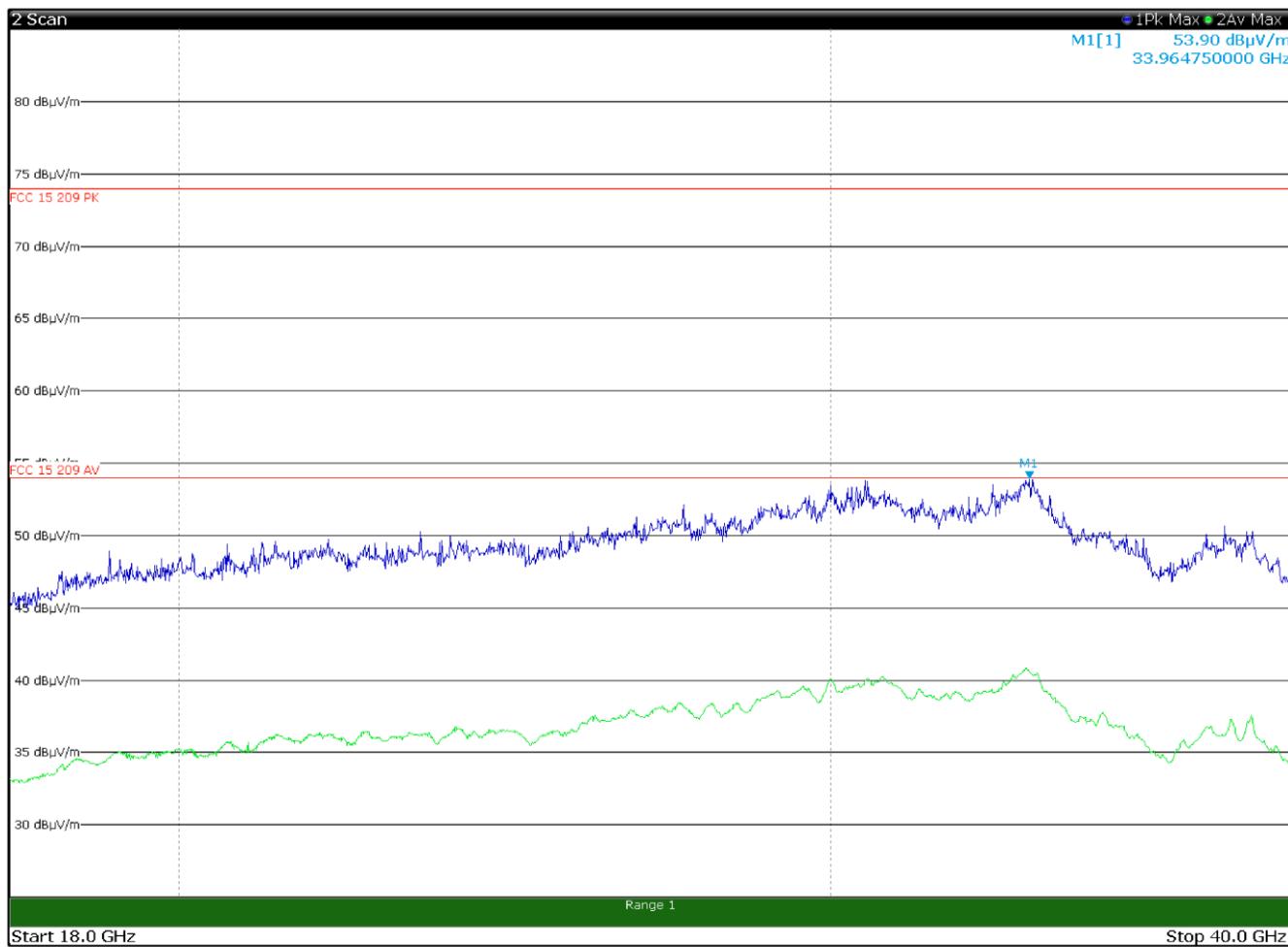
The correction factor for the average value of pulsed emissions is $20 \log (DC) = 20 \log (0.18) = 14.9$ dB

8.1.4 Test data, continued



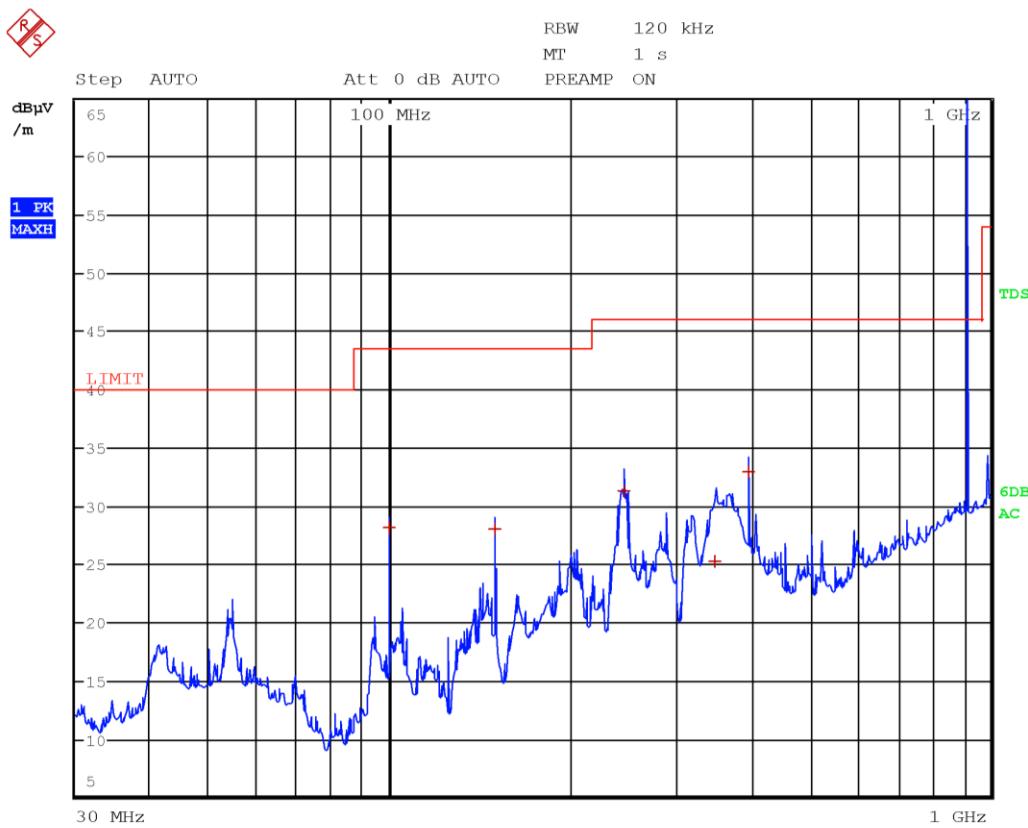
Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

8.1.4 Test data, continued



Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 782 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

8.1.4 Test data, continued

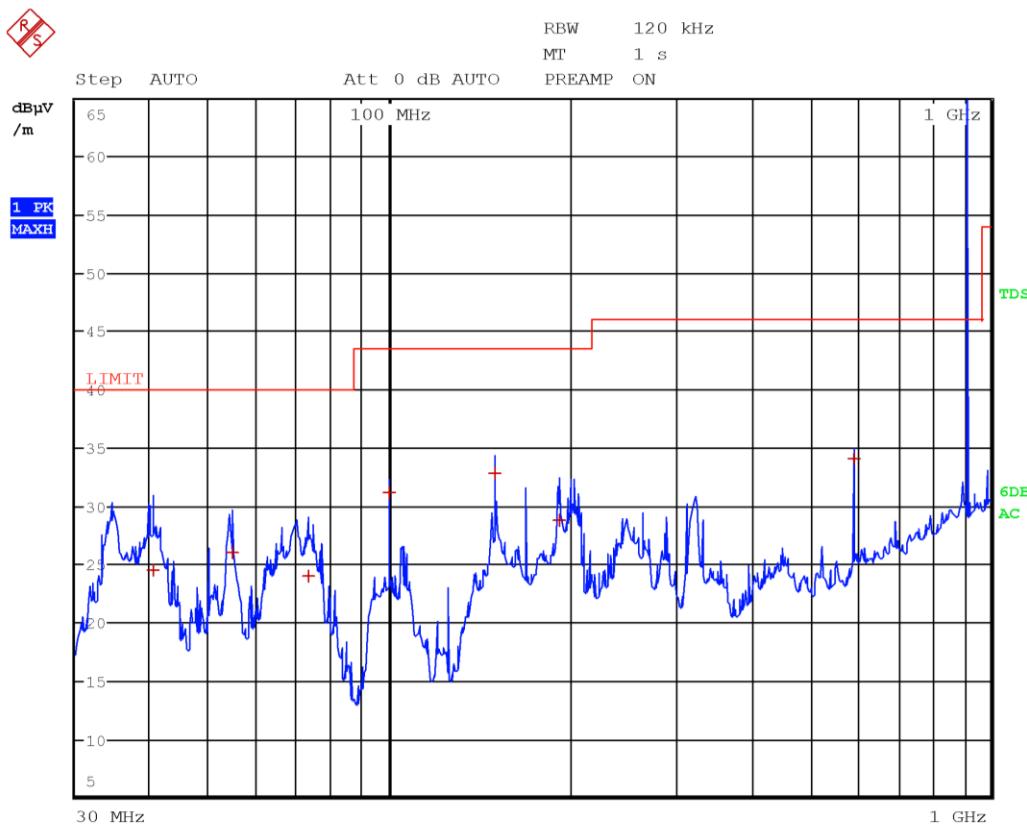


Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 99.9900 | 28.1 | 43.5 | -15.4 | QP |
| 150.0000 | 28.0 | 43.5 | -15.5 | QP |
| 245.5800 | 31.3 | 46.0 | -14.7 | QP |
| 348.7800 | 25.3 | 46.0 | -20.7 | QP |
| 396.0000 | 33.0 | 46.0 | -13.0 | QP |
| 915.0000 | 116.5 | -- | -- | PK |

Limit exceeded by the carriers

8.1.4 Test data, continued

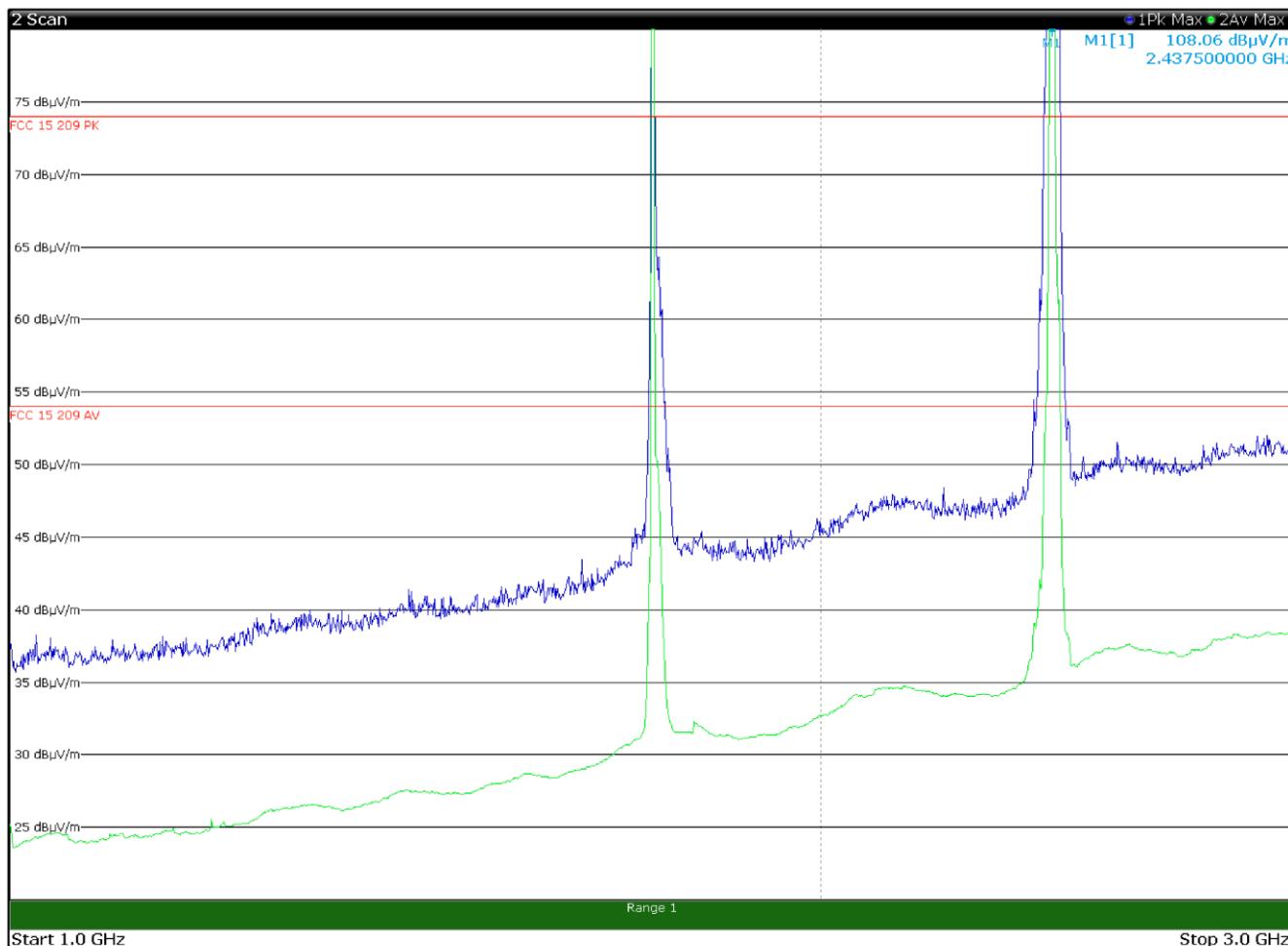


Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 40.3500 | 24.5 | 40.0 | -15.5 | QP |
| 54.6600 | 26.1 | 40.0 | -13.9 | QP |
| 73.1400 | 24.0 | 40.0 | -16.0 | QP |
| 99.9900 | 31.2 | 43.5 | -12.3 | QP |
| 150.0000 | 32.8 | 43.5 | -10.7 | QP |
| 192.0300 | 28.7 | 43.5 | -14.8 | QP |
| 594.0000 | 34.1 | 46.0 | -11.9 | QP |
| 915.0000 | 127.5 | -- | -- | PK |

Limit exceeded by the carriers

8.1.4 Test data, continued

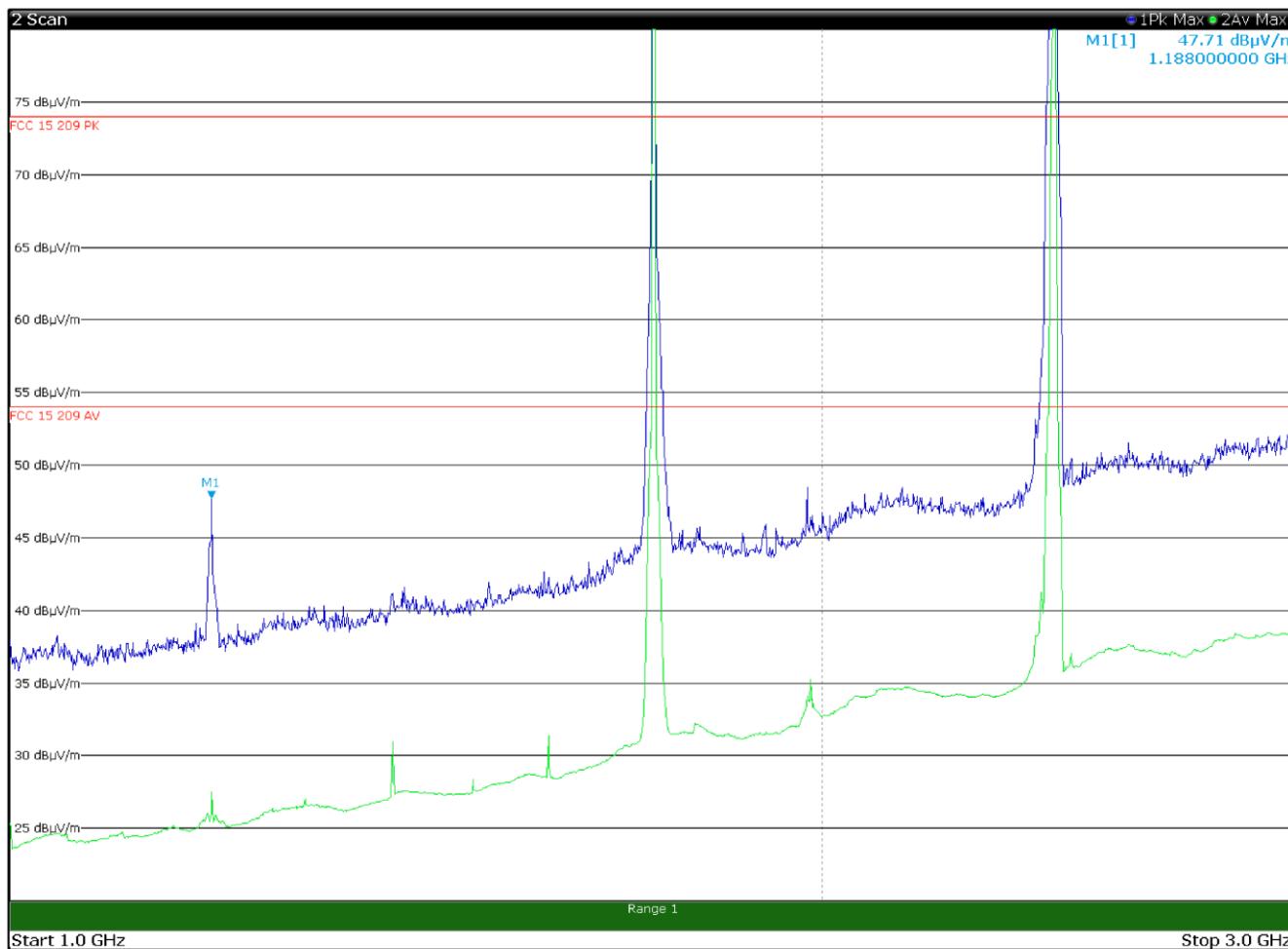


Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 1732.5000 | 110.2 | -- | -- | Pk |
| 2437.0000 | 112.8 | -- | -- | Pk |

Limit exceeded by the carriers

8.1.4 Test data, continued

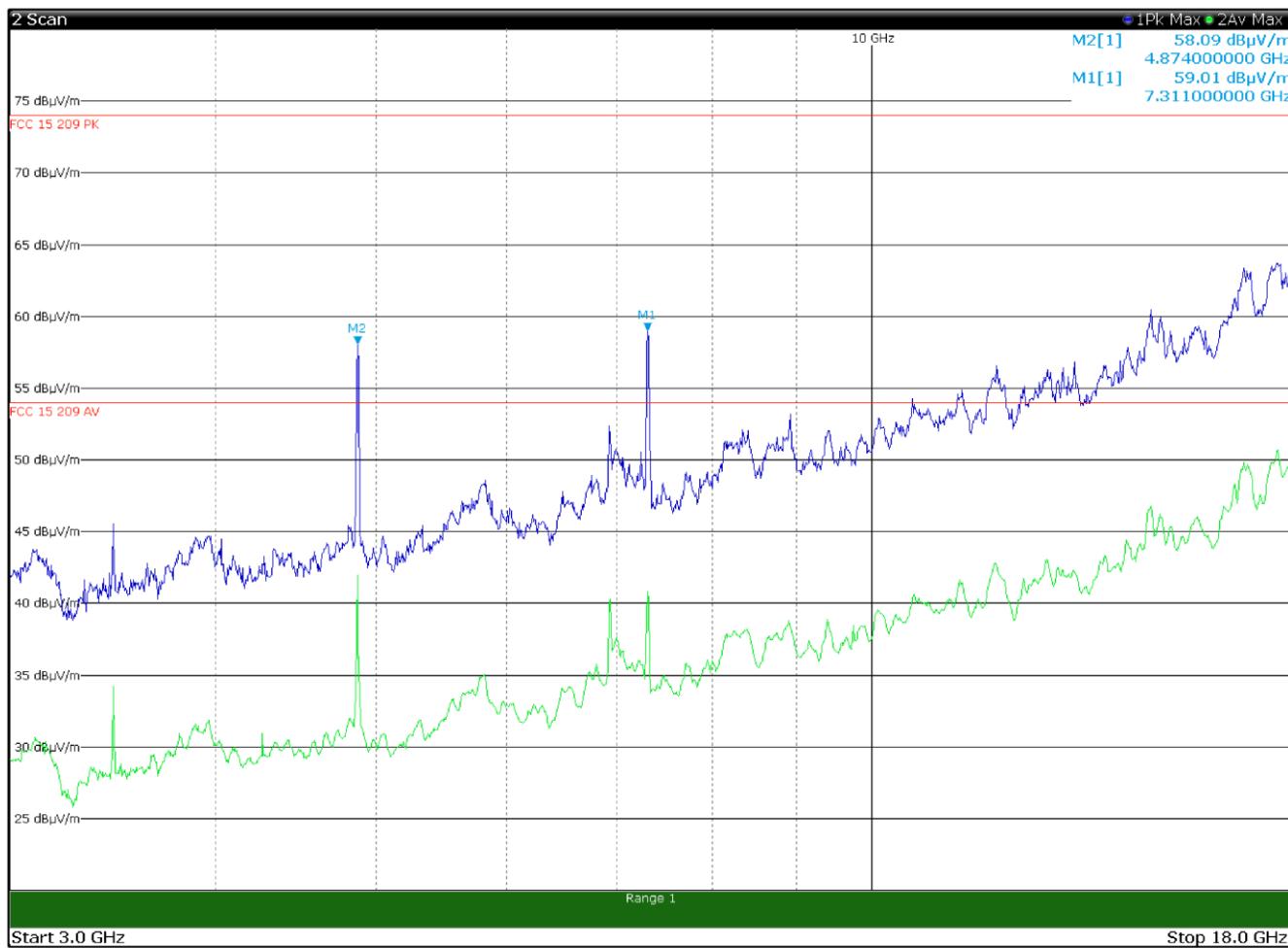


Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 1188.0000 | 47.8 | 74.0 | -26.2 | Pk |
| 1732.5000 | 109.4 | -- | -- | Pk |
| 2437.0000 | 105.1 | -- | -- | Pk |

Limit exceeded by the carriers

8.1.4 Test data, continued

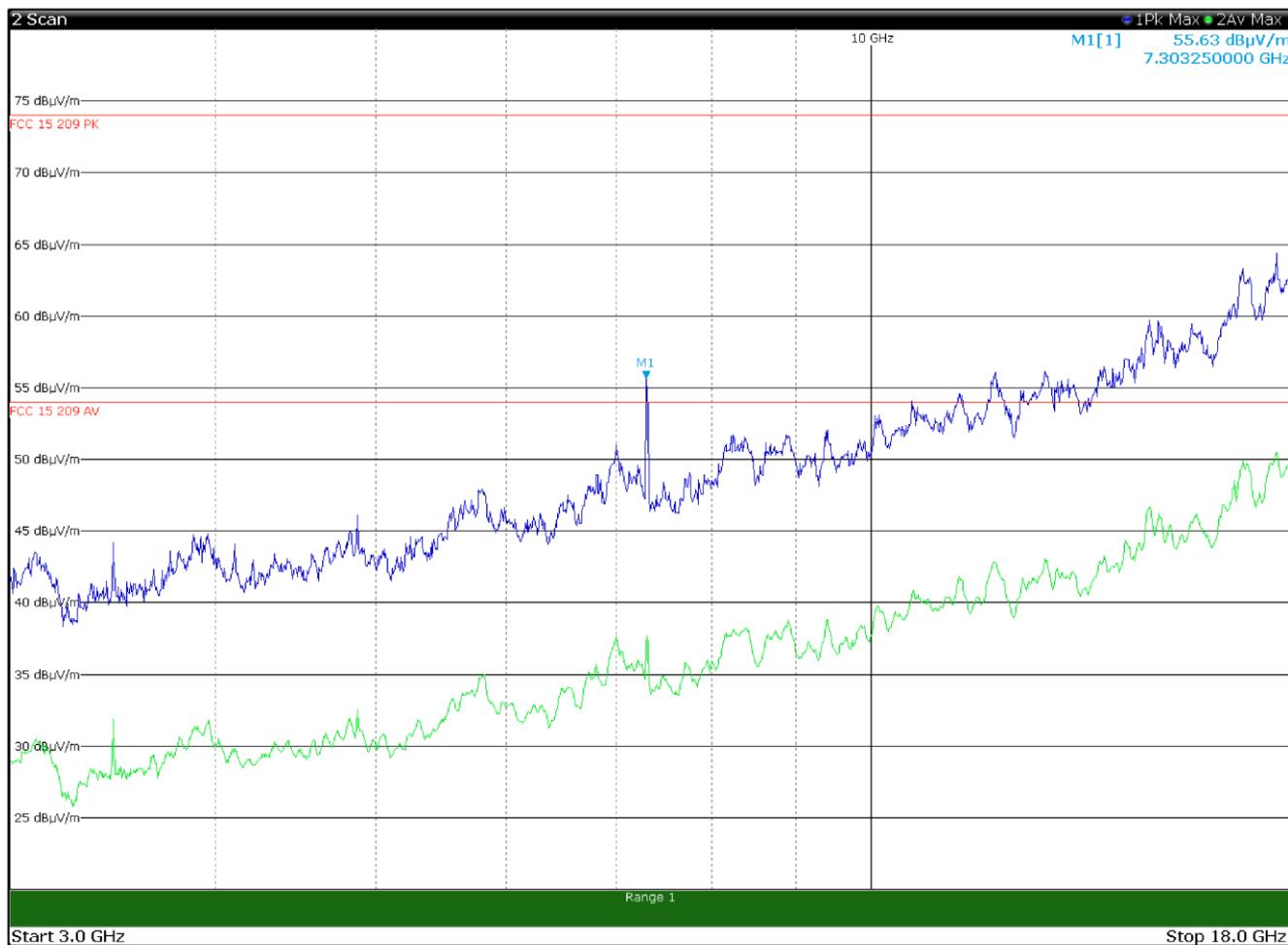


Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 4874.0000 | 58.1 | 74.0 | -15.9 | Pk |
| 4874.0000 | 49.7 | 54.0 | -4.3 | Av |
| 7311.0000 | 59.1 | 74.0 | -14.9 | Pk |
| 7311.0000 | 50.7 | 54.0 | -3.3 | Av |

The correction factor for the average value of pulsed emissions is $20 \log (DC) = 20 \log (0.38) = 8.4 \text{ dB}$

8.1.4 Test data, continued

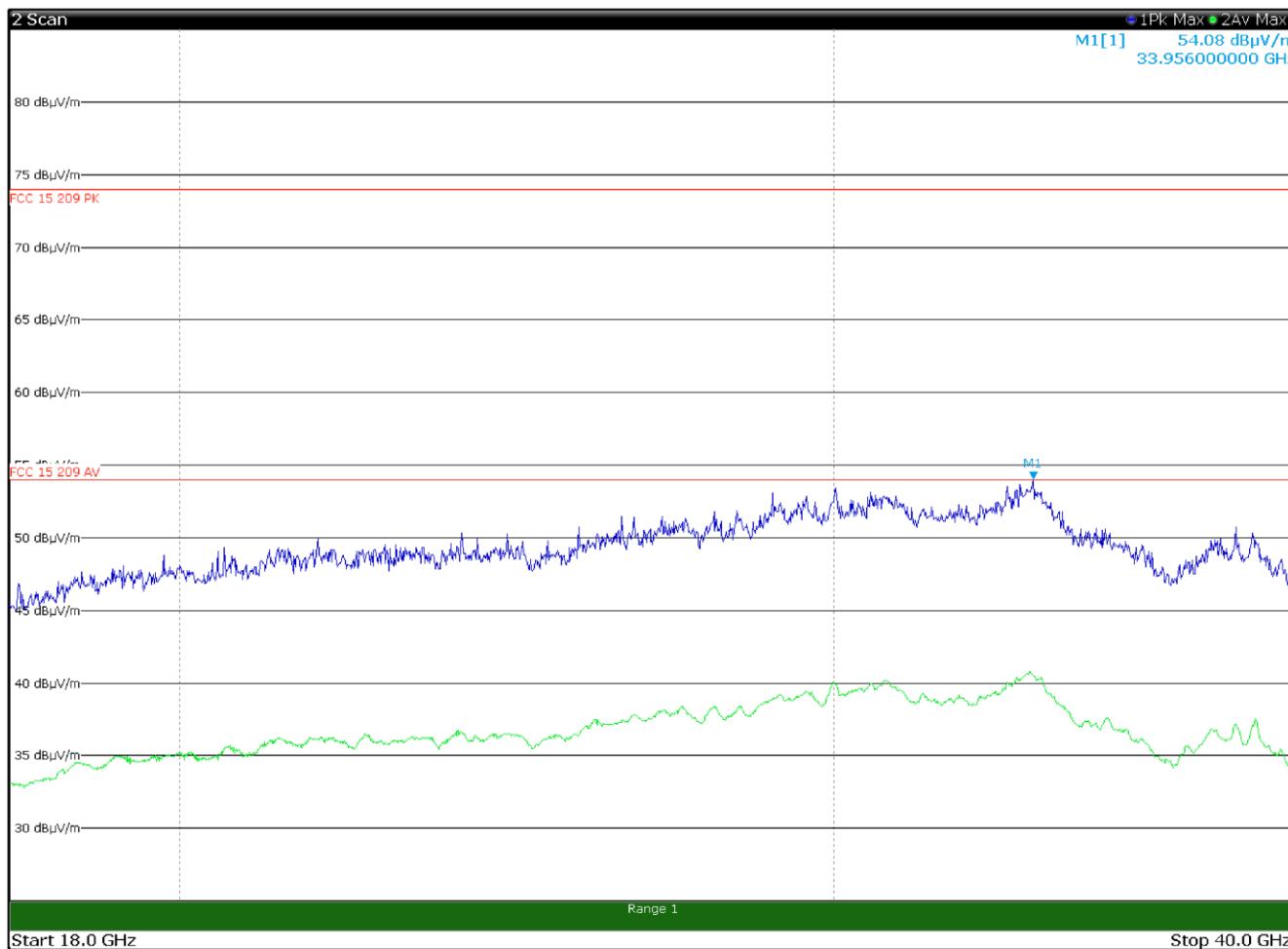


Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 4874.0000 | 46.5 | 74.0 | -27.5 | Pk |
| 4874.0000 | 38.1 | 54.0 | -15.9 | Av |
| 7303.2500 | 55.7 | 74.0 | -18.3 | Pk |
| 7303.2500 | 47.3 | 54.0 | -6.7 | Av |

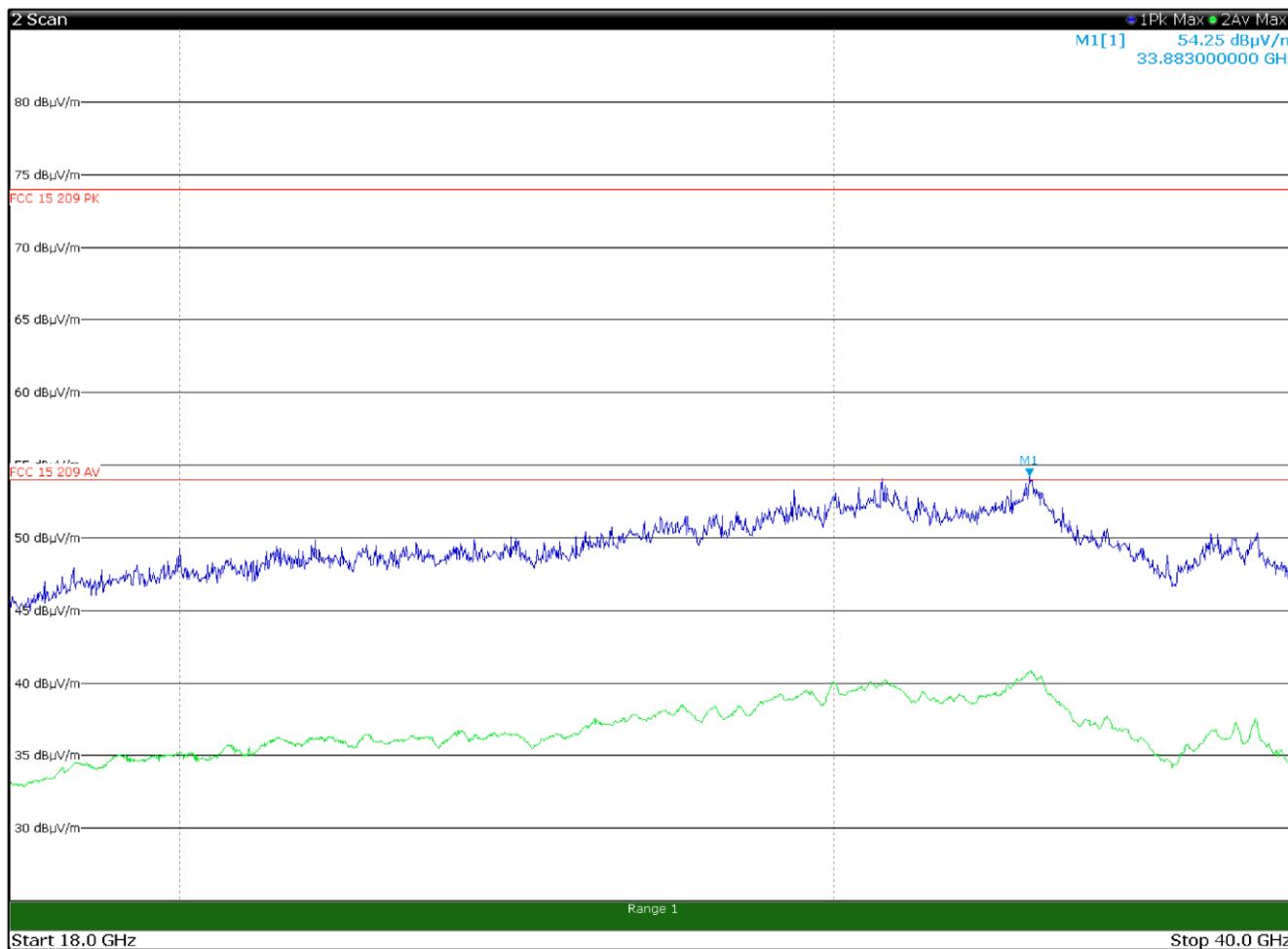
The correction factor for the average value of pulsed emissions is $20 \log (DC) = 20 \log (0.38) = 8.4 \text{ dB}$

8.1.4 Test data, continued



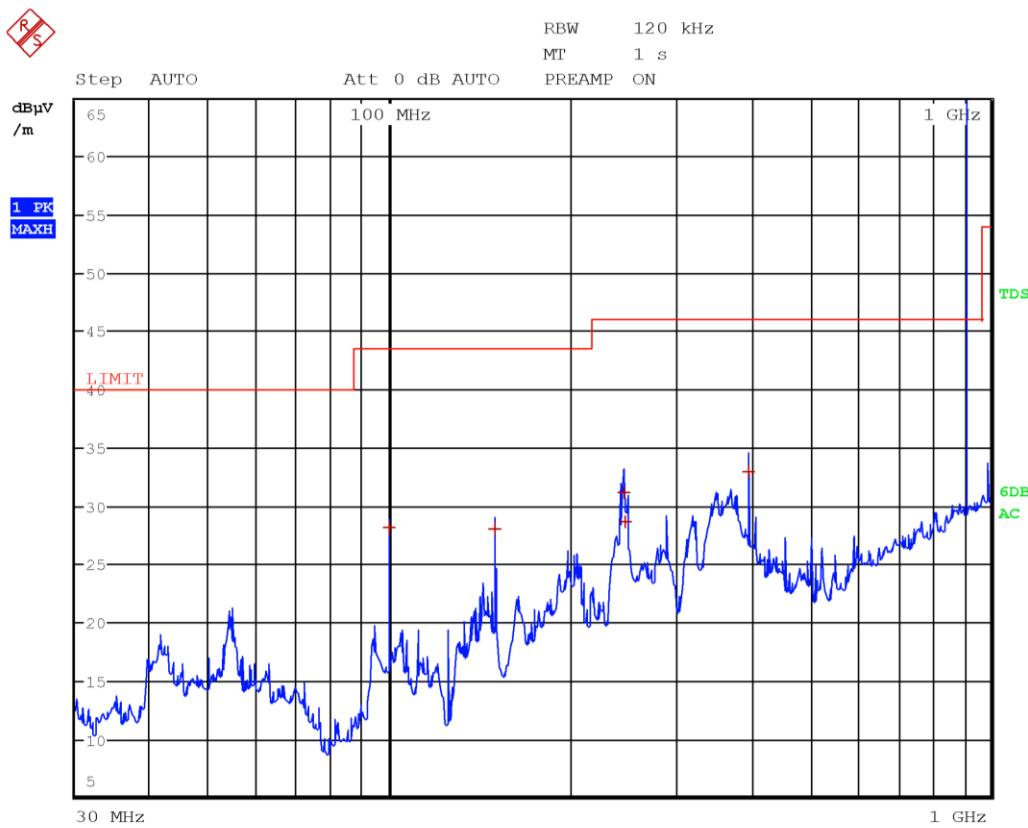
Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

8.1.4 Test data, continued



Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 2437 MHz and BT Tx at 2441 MHz (antenna configuration 1)

8.1.4 Test data, continued

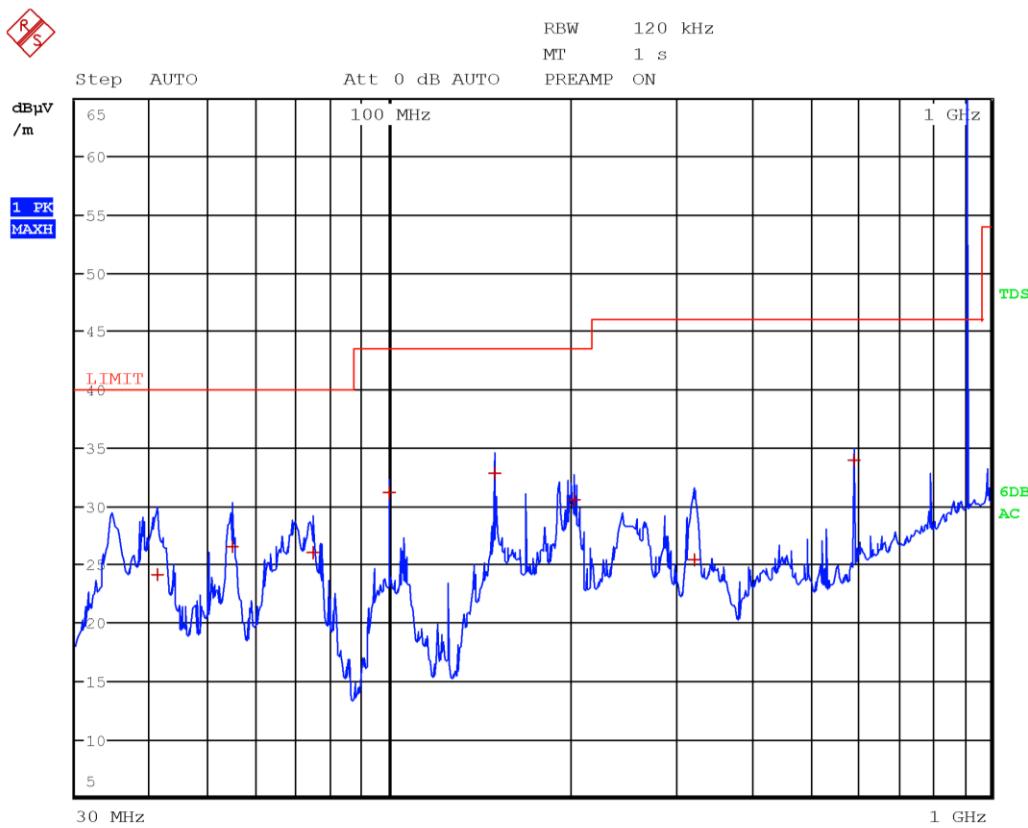


Radiated spurious emissions with antenna in horizontal polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector |
|-----------------|----------------|----------------|-------------|----------|
| 99.9900 | 28.1 | 43.5 | -15.4 | QP |
| 150.0000 | 28.0 | 43.5 | -15.5 | QP |
| 245.5200 | 31.3 | 46.0 | -14.7 | QP |
| 246.7200 | 28.7 | 46.0 | -17.3 | QP |
| 396.0000 | 32.9 | 46.0 | -13.1 | QP |
| 915.0000 | 116.9 | -- | -- | PK |

Limit exceeded by the carriers

8.1.4 Test data, continued



Radiated spurious emissions with antenna in vertical polarization and with
LTE Tx at 1732.5 MHz, UHF Tx at 915 MHz, WIFI Tx at 5220 MHz and BT Tx at 2441 MHz (antenna configuration 1)

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Detector |
|-----------------|----------------------|----------------------|-------------|----------|
| 41.1300 | 24.1 | 40.0 | -15.9 | QP |
| 54.6000 | 26.5 | 40.0 | -13.5 | QP |
| 74.5500 | 26.0 | 40.0 | -14.0 | QP |
| 99.9900 | 31.2 | 43.5 | -12.3 | QP |
| 150.0000 | 32.8 | 43.5 | -10.7 | QP |
| 202.9500 | 30.6 | 43.5 | -12.9 | QP |
| 320.9700 | 25.4 | 46.0 | -20.6 | QP |
| 594.0000 | 34.0 | 46.0 | -12.0 | QP |
| 915.0000 | 127.7 | -- | -- | PK |

Limit exceeded by the carriers