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# Report On

Radio Testing of the  
Nokia Solutions and Networks Oy  
Flexi Multiradio 10 BTS RRH 2.6GHz  
Radio Access Technology: E-UTRA (TDD)  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 27

COMMERCIAL-IN-CONFIDENCE

FCC ID: VBNFZHN-01

Document 75934961 Report 01 Issue 1

October 2016



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A handwritten signature in black ink, appearing to read 'Maggie Whiting', written over a horizontal line.

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**Steve Scarfe**  
Authorised Signatory

**DATED**

25 October 2016



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## **SECTION 1**

### **REPORT SUMMARY**

Radio Testing of the  
Nokia Solutions and Networks Oy  
Flexi Multiradio 10 BTS RRH 2.6GHz  
Radio Access Technology: E-UTRA (TDD)  
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 27



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## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Radio Testing of the Nokia Solutions and Networks Oy Flexi Multiradio 10 BTS RRH 2.6GHz Radio Access Technology: E-UTRA (TDD) In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 27.

|                               |                                                                                                                                                       |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective                     | To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out. |
| Manufacturer                  | Nokia Solutions and Networks Oy                                                                                                                       |
| Model Number(s)               | FZHN                                                                                                                                                  |
| Serial Number(s)              | RY161902861                                                                                                                                           |
| Number of Samples Tested      | 1                                                                                                                                                     |
| Test Specification/Issue/Date | FCC CFR 47 Part 2 (2015)<br>FCC CFR 47 Part 27 (2015)                                                                                                 |
| Order Number                  | 90700968                                                                                                                                              |
| Date                          | 18 May 2016                                                                                                                                           |
| Start of Test                 | 08 August 2016                                                                                                                                        |
| Finish of Test                | 20 September 2016                                                                                                                                     |
| Name of Engineer(s)           | Jari Vähämäki<br>Sami Riuttanen                                                                                                                       |



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## **SECTION 2**

### **DISCLAIMERS AND COPYRIGHT**



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## 2.1 DISCLAIMERS AND COPYRIGHT

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## **ANNEX A**

**NOKIA SOLUTIONS AND NETWORKS OY TEST REPORT NO: D536187693**

**TEST REPORT NO: D547351042****ID: VBNFZHN-01**

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**Date:** Oulu 23. Sep 2016

**Pages:** 262

**Appendices:** -

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**Equipment Under Test:** Flexi Multiradio 10 BTS RRH 2.6 GHz  
Radio Access technology: E-UTRA (TDD)

**Type:** FZHN

**Manufacturer:** Nokia Solutions and Networks Oy

**Address:** P.O. Box 319,  
Kaapelitie 4, FI-90620, Oulu, Finland

**Task:** Conformance test according to the specifications  
mentioned below

**Test Specification(s):** FCC 47 CFR part 2 (2015) and  
FCC 47 CFR part 27 (2015)

**Result:** The EUT complies with the requirements of the  
specification



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Nokia Networks

The results relate only to the items tested as described in this test report.

| Approved by:                                                         | Date         | Signature                                                                                    |
|----------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------|
| Jari Virta<br>R&D Line Manager<br>Nokia Solutions and<br>Networks Oy | 23. Sep 2016 | <br>_____ |

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## 1. SUMMARY

The following tests were performed according to the FCC rules in order to verify the compliance of the EUT with the FCC requirements:

**Table 1 Results – Summary**

| Test No. | Measurement                             | FCC Rule                             | Page Number of this Report | Result    |
|----------|-----------------------------------------|--------------------------------------|----------------------------|-----------|
| 1        | RF Power Output                         | § 2.1046, § 27.50                    | 8                          | compliant |
| 2        | Modulation Characteristics              | § 2.1047, § 2.201                    | 18                         | compliant |
| 3        | Occupied Bandwidth                      | § 2.1049                             | 19                         | compliant |
| 4        | Spurious Emissions at Antenna Terminals | § 2.1051, § 2.1057, § 27.53          | 28                         | compliant |
| 5        | Field Strength of Spurious Radiation    | § 2.1053, § 2.1057, § 27.53, § 27.55 | 43                         | compliant |
| 6        | Frequency Stability                     | § 2.1055, § 27.54                    | 45                         | compliant |

In accordance with the FCC Rule §15.3 (z) the equipment was tested with the limits that are valid for an unintentional radiator.

Measurements guidance: FCC OET laboratory KDB: 662911 D01 Multiple Transmitter Output v02.

### 1.1 Test Laboratory

Nokia Solutions and Networks Oy

Kaapelitie 4,

FI-90620, Oulu, Finland

Jari Virta

FCC Reg. No: 411251



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## 1.2 Time Schedule

**Table 2**

| Test No.       | 1, 2, 3, 4  | 5           | 6           |
|----------------|-------------|-------------|-------------|
| Start of Test: | 08 Aug 2016 | 08 Aug 2016 | 14 Sep 2016 |
| End of Test:   | 09 Sep 2016 | 09 Sep 2016 | 20 Sep 2016 |

## 1.3 Participants

**Table 3**

| Name                    | Function              | Signature                            |
|-------------------------|-----------------------|--------------------------------------|
| RF Test person (Nokia)  | Testing, Setup of EUT | Jari Vähämäki <i>Jari Vähämäki</i>   |
| EMC Test person (Nokia) | Testing, Setup of EUT | Sami Riuttanen <i>Sami Riuttanen</i> |

## 2. EQUIPMENT UNDER TEST

The EUT is a LTE Base transceiver station RRH 2.6 GHz with 8 power amplifiers.

The BTS performs the full RAN function of LTE system (evolved UTRA).

This is sometimes referred to as collapsed RAN, where equivalent functions of former 3G BTS and 3G RNC are all integrated into BTS. BTS is connected directly to the core network via S1 interface, and to mobile stations via Air interface (Uu). In addition BTSs are optionally connected directly to each other via X2 interface for handover purposes.

The tested equipment is representative for serial production.

### 2.1 Configuration of EUT

**Table 4 Used different EUT configurations are shown by the following table**

| Module Type             | Flexi Multiradio BTS RRH x.xGHz                                                                                               |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Radio Access Technology | E-UTRA                                                                                                                        |
| Duplex mode             | Time Division Duplex (TDD)                                                                                                    |
| Channel Bandwidth       | Single carrier 20 MHz (Configuration A),<br>Dual carrier 20 MHz (Configuration B),<br>Triple carrier 20 MHz (Configuration C) |



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|                           |                                       |                          |
|---------------------------|---------------------------------------|--------------------------|
| Supply Voltage            | 48.0 V DC                             |                          |
| Frequency Bands           |                                       |                          |
| Channel Bandwidth 20MHz   | Lowest tunable freq. Single carrier   | 2506.0 MHz               |
|                           | Dual carriers                         | 2506.0/2526.0 MHz        |
|                           | Triple carriers                       | 2506.0/2526.0/2546.0 MHz |
|                           | Middle freq. Single carrier           | 2593.0 MHz               |
|                           | Dual carriers                         | 2583.0/2603.0 MHz        |
|                           | Triple carriers                       | 2573.0/2593.0/2613.0 MHz |
|                           | Highest tunable freq. Single carrier  | 2680.0 MHz               |
|                           | Dual carriers                         | 2660.0/2680.0 MHz        |
|                           | Triple carriers                       | 2640.0/2660.0/2680.0 MHz |
| Single carrier            |                                       |                          |
| Rated Output Power (Prat) | 20W (43.0 dBm) conducted / carrier    |                          |
| Dual carrier              |                                       |                          |
| Rated Output Power (Prat) | 10W (40.0 dBm) conducted / carrier    |                          |
| Triple carrier            |                                       |                          |
| Rated Output Power (Prat) | 6.61 W (38.2 dBm) conducted / carrier |                          |
| Downlink/Uplink ratio     | 6/3 to 8/1                            |                          |
|                           | RX                                    | TX                       |
| Number of Antenna Ports   | 8 (ANT1 to ANT8)                      | 8 (ANT1 to ANT8)         |
| MiMo                      | Yes                                   | Yes                      |

The tests were performed with one EUT at the antenna ports 1 (ANT1), 2 (ANT2), 3 (ANT3), 4 (ANT4), 5 (ANT5), 6 (ANT6), 7 (ANT7) and 8 (ANT8).

The used different EUT configurations are shown by the following table:

**Table 5 Configuration of EUT**

| Module Name   | Serial-No.    | Module Type | Config. |
|---------------|---------------|-------------|---------|
| FZHN          | RY161902861   | RRH         | A, B, C |
| Other Modules | Module Type   |             | Config. |
| FSIH          | System module |             | A, B, C |

For a functional description of the modules, please refer to the appropriate related parts and exhibit sections of this certification application.



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## 2.2 Operating Conditions

The EUT supports QPSK, 16QAM and 64QAM modulation. If not stated otherwise, the following standard setup procedure for the EUT was used:

The transmitter was set up according to 3GPP TS 36.141 E-UTRA Test Models (E-TM) for all tests:

- E-TM 1.1: All QPSK modulation testing
- E-TM 3.1: All 64QAM modulation testing
- E-TM 3.2: All 16QAM modulation testing

During the measurements, one carrier channel was tested at a time. The carrier was set to the maximum power level to ensure the maximum emission amplitudes during all measurements.

During the tests, the Flexi Multiradio BTS is transmitting a pseudo random bit pattern on the data channels. This ensures that the measurements of the emission characteristics of the transmitter are pursuant to § 2.1049.

Test models E-TM1.1, E-TM3.1 and E-TM3.2 have uplink/downlink ratio 3:6.

## 3. TEST CONFIGURATION

If not stated otherwise, the following measurement configuration was used to perform all measurements (see figure below).

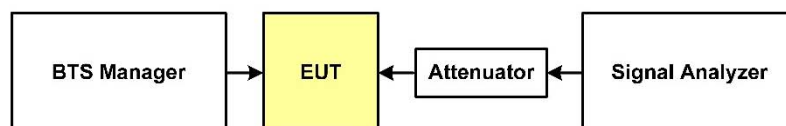


Figure 1 Test Configuration (single output)



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The RF output of the transceiver (cell) under test is connected to a signal analyzer via a high power attenuator to protect the input of the signal analyzer from high RF power levels. A description of the analyzer settings is given in each of the sections describing the measurements. The other transceivers are terminated.

A complete list of the measurement equipment is included on page 56 of this measurement report.

### **3.1 Calibration of the Test Equipment**

All relevant test equipment has a valid calibration from an external calibration laboratory. Additionally the signal analyzer has a built-in self-calibration procedure. This calibration procedure was activated prior to the measurements so that the analyzer is deemed accurate. High quality cables were used to connect the measurement equipment to the EUT. The actual loss of the attenuator and the cables was measured with a high precision network analyzer and taken into account for all measurements.



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## 4. TEST RESULTS

### 4.1 Test No. 1: RF Power Output (§ 2.1046, § 27.50)

#### 4.1.1 Limits

Para. No. 27.50 (h).(1) Main, booster and base stations. (i) The maximum EIRP of a main, booster or base station shall not exceed 33 dBW +  $10\log(X/Y)$  dBW, where X is the actual channel width in MHz and Y is either 6 MHz if prior to transition or the station is in the MBS following transition or 5.5 MHz if the station is in the LBS and UBS following transition, except as provided in paragraph (h)(1)(ii) of this section.

Sample calculation:  $33\text{dBW} + 10\log(10\text{MHz}/5.5\text{MHz}) \text{ dBW} = 34.26 \text{ dBW} = \sim 2667\text{W}$

#### 4.1.2 Test Procedure and Results

Detachable Antenna: The maximum output power at the antenna terminals was measured using a signal analyzer.

The RF power was measured with a frequency sweep across the carrier. The carrier power was calculated from the signal analyzer by integration over the result. The base station maximum output power is the sum of the measured carrier power and the external attenuation (cable loss of the test set up).

For the MiMo output, RF power output was measured from each antenna port individually and the results summed mathematically in accordance to FCC KDB 662911 D01 -guidance.



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Peak to average power (PAPR) was examined using CCDF method and  
0.1% value recorded in dB to the tables below.



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The following table shows the measured output powers at the antenna connector.

**Table 6 Configuration A**

| Carrier Frequency [MHz] | RF Power Output |         | PAPR 0.1% | Result    |
|-------------------------|-----------------|---------|-----------|-----------|
|                         | [dBm]           | [W]     | [dB]      |           |
| QPSK-Modulation ANT1    |                 |         |           |           |
| 2506                    | 42.5718         | 18.0791 | 7.6231    | compliant |
| 2593                    | 42.4266         | 17.4848 | 7.5652    | compliant |
| 2680                    | 42.2428         | 16.7602 | 7.5942    | compliant |
| QPSK-Modulation ANT2    |                 |         |           |           |
| 2506                    | 42.7087         | 18.6581 | 7.6231    | compliant |
| 2593                    | 42.4935         | 17.7562 | 7.56521   | compliant |
| 2680                    | 42.1657         | 16.4653 | 7.5942    | compliant |
| QPSK-Modulation ANT3    |                 |         |           |           |
| 2506                    | 42.5386         | 17.9413 | 7.6231    | compliant |
| 2593                    | 42.5949         | 18.1757 | 7.5652    | compliant |
| 2680                    | 42.3539         | 17.1945 | 7.5942    | compliant |
| QPSK-Modulation ANT4    |                 |         |           |           |
| 2506                    | 42.7345         | 18.7695 | 7.6231    | compliant |
| 2593                    | 42.4830         | 17.7133 | 7.5652    | compliant |
| 2680                    | 42.4912         | 17.7468 | 7.5942    | compliant |
| QPSK-Modulation ANT5    |                 |         |           |           |
| 2506                    | 42.7727         | 18.9351 | 7.62318   | compliant |
| 2593                    | 42.4083         | 17.4112 | 7.5652    | compliant |
| 2680                    | 42.3504         | 17.1806 | 7.5942    | compliant |
| QPSK-Modulation ANT6    |                 |         |           |           |
| 2506                    | 42.6832         | 18.5489 | 7.6231    | compliant |
| 2593                    | 42.4694         | 17.6579 | 7.5652    | compliant |
| 2680                    | 42.2657         | 16.8486 | 7.5942    | compliant |
| QPSK-Modulation ANT7    |                 |         |           |           |
| 2506                    | 42.7674         | 18.9121 | 7.6231    | compliant |
| 2593                    | 42.4467         | 17.5658 | 7.5652    | compliant |
| 2680                    | 42.2781         | 16.8970 | 7.5942    | compliant |
| QPSK-Modulation ANT8    |                 |         |           |           |
| 2506                    | 42.5938         | 18.1710 | 7.5942    | compliant |
| 2593                    | 42.4272         | 17.4872 | 7.5652    | compliant |
| 2680                    | 42.2109         | 16.6376 | 7.5942    | compliant |

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| QPSK-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total  |         |         |         |           |
|---------------------------------------------------------------------------|---------|---------|---------|-----------|
| 2506                                                                      | 51.70   | 148.02  | -       | compliant |
| 2593                                                                      | 51.50   | 141.25  | -       | compliant |
| 2680                                                                      | 51.33   | 135.73  | -       | compliant |
| 64QAM-Modulation ANT1                                                     |         |         |         |           |
| 2506                                                                      | 42.5428 | 17.9591 | 7.5942  | compliant |
| 2593                                                                      | 42.4667 | 17.6470 | 7.5621  | compliant |
| 2680                                                                      | 42.2380 | 16.7417 | 7.6231  | compliant |
| 64QAM-Modulation ANT2                                                     |         |         |         |           |
| 2506                                                                      | 42.6753 | 18.5153 | 7.5942  | compliant |
| 2593                                                                      | 42.5039 | 17.7987 | 7.5942  | compliant |
| 2680                                                                      | 42.1989 | 16.5917 | 7.5942  | compliant |
| 64QAM-Modulation ANT3                                                     |         |         |         |           |
| 2506                                                                      | 42.4995 | 17.7808 | 7.5942  | compliant |
| 2593                                                                      | 42.5116 | 17.8305 | 7.56217 | compliant |
| 2680                                                                      | 42.3868 | 17.3252 | 7.5942  | compliant |
| 64QAM-Modulation ANT4                                                     |         |         |         |           |
| 2506                                                                      | 42.8154 | 19.1222 | 7.5942  | compliant |
| 2593                                                                      | 42.4966 | 17.7689 | 7.5652  | compliant |
| 2680                                                                      | 42.5127 | 17.8349 | 7.5942  | compliant |
| 64QAM-Modulation ANT5                                                     |         |         |         |           |
| 2506                                                                      | 42.8271 | 19.1738 | 7.5942  | compliant |
| 2593                                                                      | 42.4129 | 17.4295 | 7.5652  | compliant |
| 2680                                                                      | 42.3879 | 17.3297 | 7.6232  | compliant |
| 64QAM-Modulation ANT6                                                     |         |         |         |           |
| 2506                                                                      | 42.7263 | 18.7339 | 7.5942  | compliant |
| 2593                                                                      | 42.5081 | 17.8160 | 7.5652  | compliant |
| 2680                                                                      | 42.3323 | 17.1092 | 7.6231  | compliant |
| 64QAM-Modulation ANT7                                                     |         |         |         |           |
| 2506                                                                      | 42.7269 | 18.7366 | 7.5942  | compliant |
| 2593                                                                      | 42.4177 | 17.4488 | 7.5652  | compliant |
| 2680                                                                      | 42.2219 | 16.6798 | 7.6231  | compliant |
| 64QAMK-Modulation ANT8                                                    |         |         |         |           |
| 2506                                                                      | 42.6490 | 18.4035 | 7.5942  | compliant |
| 2593                                                                      | 42.4254 | 17.4799 | 7.5652  | compliant |
| 2680                                                                      | 42.1774 | 16.5097 | 7.5942  | compliant |
| 64QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total |         |         |         |           |
| 2506                                                                      | 51.72   | 148.43  | -       | compliant |
| 2593                                                                      | 51.50   | 141.22  | -       | compliant |

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|                                                                           |         |         |        |           |
|---------------------------------------------------------------------------|---------|---------|--------|-----------|
| 2680                                                                      | 51.34   | 136.12  | -      | compliant |
| 16QAM-Modulation ANT1                                                     |         |         |        |           |
| 2506                                                                      | 42.5618 | 18.0376 | 7.5942 | compliant |
| 2593                                                                      | 42.4571 | 17.6080 | 7.5621 | compliant |
| 2680                                                                      | 42.2332 | 16.7232 | 7.5652 | compliant |
| 16QAM-Modulation ANT2                                                     |         |         |        |           |
| 2506                                                                      | 42.6404 | 18.3669 | 7.5942 | compliant |
| 2593                                                                      | 42.4621 | 17.6283 | 7.5621 | compliant |
| 2680                                                                      | 42.1441 | 16.3835 | 7.5652 | compliant |
| 16QAM-Modulation ANT3                                                     |         |         |        |           |
| 2506                                                                      | 42.5241 | 17.8817 | 7.5942 | compliant |
| 2593                                                                      | 42.5994 | 18.1944 | 7.5652 | compliant |
| 2680                                                                      | 42.3943 | 17.3552 | 7.5362 | compliant |
| 16QAM-Modulation ANT4                                                     |         |         |        |           |
| 2506                                                                      | 42.7815 | 18.9736 | 7.5942 | compliant |
| 2593                                                                      | 42.5232 | 17.8780 | 7.5652 | compliant |
| 2680                                                                      | 42.5380 | 17.9391 | 7.3623 | compliant |
| 16QAM-Modulation ANT5                                                     |         |         |        |           |
| 2506                                                                      | 42.7939 | 19.0279 | 7.5942 | compliant |
| 2593                                                                      | 42.4366 | 17.5252 | 7.5652 | compliant |
| 2680                                                                      | 42.4009 | 17.3816 | 7.5652 | compliant |
| 16QAM-Modulation ANT6                                                     |         |         |        |           |
| 2506                                                                      | 42.6972 | 18.6087 | 7.5942 | compliant |
| 2593                                                                      | 42.5416 | 17.9539 | 7.5362 | compliant |
| 2680                                                                      | 42.3676 | 17.2488 | 7.5652 | compliant |
| 16QAM-Modulation ANT7                                                     |         |         |        |           |
| 2506                                                                      | 42.6900 | 18.5780 | 7.5942 | compliant |
| 2593                                                                      | 42.4573 | 17.6088 | 7.5362 | compliant |
| 2680                                                                      | 42.2480 | 16.7803 | 7.5362 | compliant |
| 16QAM-Modulation ANT8                                                     |         |         |        |           |
| 2506                                                                      | 42.5950 | 18.1761 | 7.5942 | compliant |
| 2593                                                                      | 42.3962 | 17.3628 | 7.5652 | compliant |
| 2680                                                                      | 42.1857 | 16.5413 | 7.5362 | compliant |
| 16QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total |         |         |        |           |
| 2506                                                                      | 51.69   | 147.65  | -      | compliant |
| 2593                                                                      | 51.52   | 141.76  | -      | compliant |
| 2680                                                                      | 51.34   | 136.35  | -      | compliant |



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**Table 7 Configuration B**

| Carrier Frequency<br>[MHz]                                                  | RF Power Output    |                  | PAPR 0.1% | Result    |
|-----------------------------------------------------------------------------|--------------------|------------------|-----------|-----------|
|                                                                             | [dBm]              | [W]              | [dB]      |           |
| QPSK-Modulation ANT1                                                        |                    |                  |           |           |
| 2506/2526                                                                   | 40.1167/ 40.237    | 10.2724/ 10.5609 | -         | compliant |
| 2583/2603                                                                   | 39.33719/ 39.13464 | 8.5846/ 8.1934   | -         | compliant |
| 2660/2680                                                                   | 39.30745/ 39.10745 | 8.526/ 8.1423    | -         | compliant |
| QPSK-Modulation ANT2                                                        |                    |                  |           |           |
| 2506/2526                                                                   | 40.23603/ 40.39159 | 10.5585/ 10.9436 | -         | compliant |
| 2583/2603                                                                   | 40.21991/ 39.95024 | 10.5194/ 9.8861  | -         | compliant |
| 2660/2680                                                                   | 39.89463/ 39.7425  | 9.7603/ 9.4243   | -         | compliant |
| QPSK-Modulation ANT3                                                        |                    |                  |           |           |
| 2506/2526                                                                   | 40.31168/ 40.45615 | 10.744/ 11.1075  | -         | compliant |
| 2583/2603                                                                   | 40.35665/ 40.11219 | 10.8559/ 10.2617 | -         | compliant |
| 2660/2680                                                                   | 40.283/ 40.19728   | 10.6733/ 10.4647 | -         | compliant |
| QPSK-Modulation ANT4                                                        |                    |                  |           |           |
| 2506/2526                                                                   | 40.33889/ 40.42161 | 10.8116/ 11.0195 | -         | compliant |
| 2583/2603                                                                   | 40.30724/ 40.0733  | 10.7331/ 10.1702 | -         | compliant |
| 2660/2680                                                                   | 40.35769/ 40.07678 | 10.8585/ 10.1784 | -         | compliant |
| QPSK-Modulation ANT5                                                        |                    |                  |           |           |
| 2506/2526                                                                   | 40.43051/ 40.50673 | 11.0421/ 11.2376 | -         | compliant |
| 2583/2603                                                                   | 40.24627/ 39.96488 | 10.5834/ 9.9195  | -         | compliant |
| 2660/2680                                                                   | 40.06653/ 39.905   | 10.1544/ 9.7836  | -         | compliant |
| QPSK-Modulation ANT6                                                        |                    |                  |           |           |
| 2506/2526                                                                   | 40.30148/ 40.41126 | 10.7188/ 10.9932 | -         | compliant |
| 2583/2603                                                                   | 40.23189/ 40.10848 | 10.5485/ 10.2529 | -         | compliant |
| 2660/2680                                                                   | 40.08052/ 40.00081 | 10.1871/ 10.0019 | -         | compliant |
| QPSK-Modulation ANT7                                                        |                    |                  |           |           |
| 2506/2526                                                                   | 40.39561/ 40.47723 | 10.9537/ 11.1615 | -         | compliant |
| 2583/2603                                                                   | 40.19443/ 40.00765 | 10.4579/ 10.0176 | -         | compliant |
| 2660/2680                                                                   | 40.12493/ 39.90012 | 10.2918/ 9.7726  | -         | compliant |
| QPSK-Modulation ANT8                                                        |                    |                  |           |           |
| 2506/2526                                                                   | 40.26634/ 40.39158 | 10.6325/ 10.9435 | -         | compliant |
| 2583/2603                                                                   | 40.24869/ 39.97801 | 10.5893/ 9.9495  | -         | compliant |
| 2660/2680                                                                   | 40.04609/ 39.79962 | 10.1067/ 9.5491  | -         | compliant |
| QPSK-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8    Calculated Total |                    |                  |           |           |
| 2506 + 2562                                                                 | 52.40              | 173.70           | -         | compliant |
| 2583 + 2603                                                                 | 52.08              | 161.52           | -         | compliant |
| 2660 + 2680                                                                 | 51.98              | 157.88           | -         | compliant |

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|                                                                           |                  |                |   |           |
|---------------------------------------------------------------------------|------------------|----------------|---|-----------|
| 64QAM-Modulation ANT1                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.3092 /39.437  | 8.5293/ 8.7841 | - | compliant |
| 2583/2603                                                                 | 39.3254 /39.1371 | 8.5613/ 8.198  | - | compliant |
| 2660/2680                                                                 | 39.2691 /39.0742 | 8.451/ 8.0801  | - | compliant |
| 64QAM-Modulation ANT2                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.3691 /39.5118 | 8.6479/ 8.9367 | - | compliant |
| 2583/2603                                                                 | 39.4193 /39.4235 | 8.7484/ 8.7569 | - | compliant |
| 2660/2680                                                                 | 39.1743 /39.0425 | 8.2686/ 8.0214 | - | compliant |
| 64QAM-Modulation ANT3                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.4694 /39.6683 | 8.8499/ 9.2646 | - | compliant |
| 2583/2603                                                                 | 39.4905 /39.337  | 8.8929/ 8.5841 | - | compliant |
| 2660/2680                                                                 | 39.4859 /39.277  | 8.8836/ 8.4664 | - | compliant |
| 64QAM-Modulation ANT4                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.5645 /39.665  | 9.0459/ 9.2576 | - | compliant |
| 2583/2603                                                                 | 39.2541 /39.4568 | 8.422/ 8.8242  | - | compliant |
| 2660/2680                                                                 | 39.4926 /39.3124 | 8.8973/ 8.5356 | - | compliant |
| 64QAM-Modulation ANT5                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.5723 /39.7611 | 9.0622/ 9.4649 | - | compliant |
| 2583/2603                                                                 | 39.4328 /39.2155 | 8.7756/ 8.3474 | - | compliant |
| 2660/2680                                                                 | 39.236 /39.1547  | 8.3868/ 8.2314 | - | compliant |
| 64QAM-Modulation ANT6                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.4467 /39.5645 | 8.8038/ 9.0459 | - | compliant |
| 2583/2603                                                                 | 39.377 /39.3317  | 8.6636/ 8.5738 | - | compliant |
| 2660/2680                                                                 | 39.3578 /39.2033 | 8.6255/ 8.3239 | - | compliant |
| 64QAM-Modulation ANT7                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.5235 /39.6443 | 8.9608/ 9.2137 | - | compliant |
| 2583/2603                                                                 | 39.4014 /39.2352 | 8.7123/ 8.3853 | - | compliant |
| 2660/2680                                                                 | 39.2226 /39.1543 | 8.3611/ 8.2306 | - | compliant |
| 64QAMK-Modulation ANT8                                                    |                  |                |   |           |
| 2506/2526                                                                 | 39.4312 /39.5589 | 8.7724/ 9.0342 | - | compliant |
| 2583/2603                                                                 | 39.3812 /39.1621 | 8.672/ 8.2454  | - | compliant |
| 2660/2680                                                                 | 39.2294 /39.0445 | 8.3742/ 8.0251 | - | compliant |
| 64QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total |                  |                |   |           |
| 2506 + 2526                                                               | 51.57            | 143.67         | - | compliant |
| 2583 + 2603                                                               | 51.38            | 137.36         | - | compliant |
| 2660 + 2680                                                               | 51.28            | 134.16         | - | compliant |
| 16QAM-Modulation ANT1                                                     |                  |                |   |           |
| 2506/2562                                                                 | 39.3707 /39.4724 | 8.651/ 8.856   | - | compliant |
| 2583/2603                                                                 | 39.3433 /39.124  | 8.5967/ 8.1733 | - | compliant |

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|---------------------------------------------------------------------------|------------------|----------------|---|-----------|
| 2660/2680                                                                 | 39.2684 /39.0547 | 8.4497/ 8.0439 | - | compliant |
| 16QAM-Modulation ANT2                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.4006 /39.5174 | 8.7108/ 8.9482 | - | compliant |
| 2583/2603                                                                 | 39.4235 /39.143  | 8.7568/ 8.2092 | - | compliant |
| 2660/2680                                                                 | 39.1446 /38.983  | 8.2122/ 7.9122 | - | compliant |
| 16QAM-Modulation ANT3                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.48 /39.6229   | 8.8716/ 9.1683 | - | compliant |
| 2583/2603                                                                 | 39.5518 /39.3513 | 9.0195/ 8.6124 | - | compliant |
| 2660/2680                                                                 | 39.4413 /39.2521 | 8.7929/ 8.4181 | - | compliant |
| 16QAM-Modulation ANT4                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.5172 /39.6841 | 8.9478/ 9.2985 | - | compliant |
| 2583/2603                                                                 | 39.4568 /39.2711 | 8.8242/ 8.4549 | - | compliant |
| 2660/2680                                                                 | 39.4475 /39.2588 | 8.8055/ 8.4309 | - | compliant |
| 16QAM-Modulation ANT5                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.5739 /39.788  | 9.0655/ 9.5235 | - | compliant |
| 2583/2603                                                                 | 39.3708 /39.2675 | 8.6513/ 8.4479 | - | compliant |
| 2660/2680                                                                 | 39.2382 /39.1916 | 8.3912/ 8.3015 | - | compliant |
| 16QAM-Modulation ANT6                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.391 /39.6449  | 8.6917/ 9.2149 | - | compliant |
| 2583/2603                                                                 | 39.4432 /39.2999 | 8.7966/ 8.5111 | - | compliant |
| 2660/2680                                                                 | 39.2701 /39.2074 | 8.453/ 8.3319  | - | compliant |
| 16QAM-Modulation ANT7                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.5368 /39.6121 | 8.9884/ 9.1456 | - | compliant |
| 2583/2603                                                                 | 39.4417 /39.2423 | 8.7936/ 8.3991 | - | compliant |
| 2660/2680                                                                 | 39.2698 /39.0987 | 8.4523/ 8.1259 | - | compliant |
| 16QAM-Modulation ANT8                                                     |                  |                |   |           |
| 2506/2526                                                                 | 39.5018 /39.5446 | 8.9162/ 9.0045 | - | compliant |
| 2583/2603                                                                 | 39.3899 /39.2028 | 8.6893/ 8.323  | - | compliant |
| 2660/2680                                                                 | 39.2692 /39.0782 | 8.4513/ 8.0875 | - | compliant |
| 16QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total |                  |                |   |           |
| 2506 + 2526                                                               | 51.58            | 144.01         | - | compliant |
| 2583 + 2603                                                               | 51.36            | 137.26         | - | compliant |
| 2660 + 2680                                                               | 51.26            | 133.65         | - | compliant |



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**Table 8 Configuration C**

| Carrier Frequency [MHz]                                                     | RF Power Output     |                  | PAPR 0.1% | Result    |
|-----------------------------------------------------------------------------|---------------------|------------------|-----------|-----------|
|                                                                             | [dBm]               | [W]              | [dB]      |           |
| QPSK-Modulation ANT1                                                        |                     |                  |           |           |
| 2506/ 2526/ 2546                                                            | 38.15 /38.38 /38.35 | 6.53 /6.89 /6.84 | -         | compliant |
| 2573/ 2593/ 2613                                                            | 38.24 /38.29 /38.11 | 6.67 /6.75 /6.47 | -         | compliant |
| 2640/ 2660/ 2680                                                            | 38.13 /38.17 /37.71 | 6.5 /6.56 /5.9   | -         | compliant |
| QPSK-Modulation ANT2                                                        |                     |                  |           |           |
| 2506/ 2526/ 2546                                                            | 38.35 /38.61 /38.36 | 6.84 /7.26 /6.85 | -         | compliant |
| 2573/ 2593/ 2613                                                            | 38.33 /38.35 /37.51 | 6.81 /6.84 /5.64 | -         | compliant |
| 2640/ 2660/ 2680                                                            | 38.1 /38.2 /37.3    | 6.46 /6.61 /5.37 | -         | compliant |
| QPSK-Modulation ANT3                                                        |                     |                  |           |           |
| 2506/ 2526/ 2546                                                            | 38.41 /38.64 /38.45 | 6.93 /7.31 /7    | -         | compliant |
| 2573/ 2593/ 2613                                                            | 38.67 /38.71 /38.2  | 7.36 /7.43 /6.61 | -         | compliant |
| 2640/ 2660/ 2680                                                            | 38.34 /38.3 /38.38  | 6.82 /6.76 /6.89 | -         | compliant |
| QPSK-Modulation ANT4                                                        |                     |                  |           |           |
| 2506/ 2526/ 2546                                                            | 38.43 /38.63 /37.88 | 6.97 /7.29 /6.14 | -         | compliant |
| 2573/ 2593/ 2613                                                            | 38.59 /38.65 /38.3  | 7.23 /7.33 /6.76 | -         | compliant |
| 2640/ 2660/ 2680                                                            | 38.4 /38.51 /37.89  | 6.92 /7.1 /6.15  | -         | compliant |
| QPSK-Modulation ANT5                                                        |                     |                  |           |           |
| 2506/ 2526/ 2546                                                            | 38.37 /38.79 /38.82 | 6.87 /7.57 /7.62 | -         | compliant |
| 2573/ 2593/ 2613                                                            | 38.26 /38.45 /38.49 | 6.7 /7 /7.06     | -         | compliant |
| 2640/ 2660/ 2680                                                            | 38.07 /38.29 /38.33 | 6.41 /6.75 /6.81 | -         | compliant |
| QPSK-Modulation ANT6                                                        |                     |                  |           |           |
| 2506/ 2526/ 2546                                                            | 38.31 /38.7 /38.8   | 6.78 /7.41 /7.59 | -         | compliant |
| 2573/ 2593/ 2613                                                            | 38.62 /38.71 /38.48 | 7.28 /7.43 /7.05 | -         | compliant |
| 2640/ 2660/ 2680                                                            | 38.25 /38.46 /38.49 | 6.68 /7.01 /7.06 | -         | compliant |
| QPSK-Modulation ANT7                                                        |                     |                  |           |           |
| 2506/ 2526/ 2546                                                            | 38.4 /38.63 /38.79  | 6.92 /7.29 /7.57 | -         | compliant |
| 2573/ 2593/ 2613                                                            | 38.69 /38.72 /38.5  | 7.4 /7.45 /7.08  | -         | compliant |
| 2640/ 2660/ 2680                                                            | 38.38 /38.44 /38.12 | 6.89 /6.98 /6.49 | -         | compliant |
| QPSK-Modulation ANT8                                                        |                     |                  |           |           |
| 2506/ 2526/ 2546                                                            | 38.41 /38.68 /38.57 | 6.93 /7.38 /7.19 | -         | compliant |
| 2573/ 2593/ 2613                                                            | 38.57 /38.58 /38.3  | 7.19 /7.21 /6.76 | -         | compliant |
| 2640/ 2660/ 2680                                                            | 38.27 /38.34 /38.01 | 6.71 /6.82 /6.32 | -         | compliant |
| QPSK-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8    Calculated Total |                     |                  |           |           |
| 2506 + 2526 + 2546                                                          | 52.30               | 169.97           | -         | compliant |



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|---------------------------------------------------------------------------|---------------------|------------------|---|-----------|
| 2573 + 2593 + 2613                                                        | 52.24               | 167.51           | - | compliant |
| 2640 + 2660 + 2680                                                        | 52.01               | 158.97           | - | compliant |
| 64QAM-Modulation ANT1                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.24 /38.45 /38.4  | 6.67 /7 /6.92    | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.38 /38.31 /37.89 | 6.89 /6.78 /6.15 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.18 /38.22 /37.83 | 6.58 /6.64 /6.07 | - | compliant |
| 64QAM-Modulation ANT2                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.29 /38.53 /38.5  | 6.75 /7.13 /7.08 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.43 /38.44 /38.28 | 6.97 /6.98 /6.73 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.09 /38.09 /37.87 | 6.44 /6.44 /6.12 | - | compliant |
| 64QAM-Modulation ANT3                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.36 /38.6 /38.57  | 6.85 /7.24 /7.19 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.57 /38.59 /38.67 | 7.19 /7.23 /7.36 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.5 /38.52 /38.23  | 7.08 /7.11 /6.65 | - | compliant |
| 64QAM-Modulation ANT4                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.51 /38.54 /38.49 | 7.1 /7.14 /7.06  | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.39 /38.38 /38.49 | 6.9 /6.89 /7.06  | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.28 /38.34 /38.4  | 6.73 /6.82 /6.92 | - | compliant |
| 64QAM-Modulation ANT5                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.46 /38.72 /38.63 | 7.01 /7.45 /7.29 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.46 /38.54 /38.33 | 7.01 /7.14 /6.81 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.09 /38.23 /38.32 | 6.44 /6.65 /6.79 | - | compliant |
| 64QAM-Modulation ANT6                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.32 /38.68 /38.77 | 6.79 /7.38 /7.53 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.54 /38.64 /38.43 | 7.14 /7.31 /6.97 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.29 /38.39 /38.11 | 6.75 /6.9 /6.47  | - | compliant |
| 64QAM-Modulation ANT7                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.35 /38.53 /38.66 | 6.84 /7.13 /7.35 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.54 /38.53 /38.59 | 7.14 /7.13 /7.23 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.4 /38.4 /38.14   | 6.92 /6.92 /6.52 | - | compliant |
| 64QAMK-Modulation ANT8                                                    |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.41 /38.63 /38.73 | 6.93 /7.29 /7.46 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.46 /38.51 /38.52 | 7.01 /7.1 /7.11  | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.31 /38.37 /38.03 | 6.78 /6.87 /6.35 | - | compliant |
| 64QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total |                     |                  |   |           |
| 2506 + 2526 + 2546                                                        | 52.32               | 170.57           | - | compliant |
| 2573 + 2593 + 2613                                                        | 52.26               | 168.23           | - | compliant |
| 2640 + 2660 + 2680                                                        | 52.04               | 159.96           | - | compliant |
| 16QAM-Modulation ANT1                                                     |                     |                  |   |           |



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|---------------------------------------------------------------------------|---------------------|------------------|---|-----------|
| 2506/ 2526/ 2546                                                          | 38.17 /38.4 /38.32  | 6.56 /6.92 /6.79 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.25 /38.31 /38.94 | 6.68 /6.78 /7.83 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.17 /38.22 /37.83 | 6.56 /6.64 /6.07 | - | compliant |
| 16QAM-Modulation ANT2                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.32 /38.54 /38.4  | 6.79 /7.14 /6.92 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.34 /38.33 /38.14 | 6.82 /6.81 /6.52 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.05 /38.11 /37.9  | 6.38 /6.47 /6.17 | - | compliant |
| 16QAM-Modulation ANT3                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.35 /38.6 /38.58  | 6.84 /7.24 /7.21 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.65 /38.71 /38.47 | 7.33 /7.43 /7.03 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.43 /38.4 /38.39  | 6.97 /6.92 /6.9  | - | compliant |
| 16QAM-Modulation ANT4                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.44 /38.72 /38.61 | 6.98 /7.45 /7.26 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.56 /38.63 /38.38 | 7.18 /7.29 /6.89 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.2 /38.35 /38.05  | 6.61 /6.84 /6.38 | - | compliant |
| 16QAM-Modulation ANT5                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.44 /38.72 /38.61 | 6.98 /7.45 /7.26 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.56 /38.63 /38.38 | 7.18 /7.29 /6.89 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.2 /38.35 /38.05  | 6.61 /6.84 /6.38 | - | compliant |
| 16QAM-Modulation ANT6                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.42 /38.69 /38.58 | 6.95 /7.4 /7.21  | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.56 /38.65 /38.42 | 7.18 /7.33 /6.95 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.29 /38.42 /38.14 | 6.75 /6.95 /6.52 | - | compliant |
| 16QAM-Modulation ANT7                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.46 /38.65 /38.54 | 7.01 /7.33 /7.14 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.59 /38.6 /38.37  | 7.23 /7.24 /6.87 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.41 /38.44 /38.12 | 6.93 /6.98 /6.49 | - | compliant |
| 16QAM-Modulation ANT8                                                     |                     |                  |   |           |
| 2506/ 2526/ 2546                                                          | 38.38 /38.64 /38.52 | 6.89 /7.31 /7.11 | - | compliant |
| 2573/ 2593/ 2613                                                          | 38.52 /38.53 /38.24 | 7.11 /7.13 /6.67 | - | compliant |
| 2640/ 2660/ 2680                                                          | 38.25 /38.34 /38    | 6.68 /6.82 /6.31 | - | compliant |
| 16QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total |                     |                  |   |           |
| 2506 + 2526 + 2546                                                        | 52.16               | 164.46           | - | compliant |
| 2573 + 2593 + 2613                                                        | 52.30               | 169.66           | - | compliant |
| 2640 + 2660 + 2680                                                        | 52.02               | 159.17           | - | compliant |



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The base station maximum output power was found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.



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#### 4.2 Test No. 2: Modulation Characteristics (§ 2.1047, § 2.201)

The occupied bandwidth was measured to be 18 MHz (Configuration A), which represents the 99% power bandwidth (see the following section and screenshots on pages 71).

Therefore, the modulation characteristic of the base stations transceiver is:

##### **Configuration A: 18M0D9W** (Channel bandwidth 20 MHz)

No further testing is required under this section of the FCC rules. No measurements other than the occupied bandwidth are required.

Sample modulation screenshots are on page 62, in I/Q constellation diagrams and tables, showing QPSK, 16QAM and 64QAM –modulation generation.

The modulation characteristics were found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.



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### 4.3 Test No. 3: Occupied Bandwidth (§ 2.1049)

#### 4.3.1 Limits

Para. No. 2.1049. The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to 0.5% of the emitted power.

#### 4.3.2 Test Procedure and Results

The 99% occupied bandwidth of the carrier emission is measured using a signal analyzer with Resolution Bandwidth set according to reference document *971168 D01 Power Meas License Digital Systems v02r02*, section 4.2 Occupied bandwidth 99% measurement procedure (see screenshots for details). The following tables summarize the results:

**Table 9 Configuration A**

| Carrier Frequency [MHz] | Occupied Bandwidth [MHz] | Result    |
|-------------------------|--------------------------|-----------|
| QPSK-Modulation ANT1    |                          |           |
| 2506                    | 17.80                    | compliant |
| 2593                    | 17.83                    | compliant |
| 2680                    | 17.83                    | compliant |
| QPSK-Modulation ANT2    |                          |           |
| 2506                    | 17.83                    | compliant |
| 2593                    | 17.83                    | compliant |
| 2680                    | 17.83                    | compliant |
| QPSK-Modulation ANT3    |                          |           |
| 2506                    | 17.83                    | compliant |
| 2593                    | 17.83                    | compliant |
| 2680                    | 17.83                    | compliant |
| QPSK-Modulation ANT4    |                          |           |
| 2506                    | 17.83                    | compliant |
| 2593                    | 17.83                    | compliant |
| 2680                    | 17.83                    | compliant |



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|                       |       |           |
|-----------------------|-------|-----------|
| QPSK-Modulation ANT5  |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.80 | compliant |
| QPSK-Modulation ANT6  |       |           |
| 2506                  | 17.83 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.80 | compliant |
| QPSK-Modulation ANT7  |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.83 | compliant |
| QPSK-Modulation ANT8  |       |           |
| 2506                  | 17.83 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.83 | compliant |
| 64QAM-Modulation ANT1 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.83 | compliant |
| 64QAM-Modulation ANT2 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.8  | compliant |
| 64QAM-Modulation ANT3 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.83 | compliant |
| 64QAM-Modulation ANT4 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.83 | compliant |
| 64QAM-Modulation ANT5 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.80 | compliant |
| 64QAM-Modulation ANT6 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |

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|                       |       |           |
|-----------------------|-------|-----------|
| 2680                  | 17.8  | compliant |
| 64QAM-Modulation ANT7 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.83 | compliant |
| 64QAM-Modulation ANT8 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.83 | compliant |
| 16QAM-Modulation ANT1 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.8  | compliant |
| 16QAM-Modulation ANT2 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.8  | compliant |
| 16QAM-Modulation ANT3 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.8  | compliant |
| 16QAM-Modulation ANT4 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.8  | compliant |
| 16QAM-Modulation ANT5 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.77 | compliant |
| 16QAM-Modulation ANT6 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.77 | compliant |
| 16QAM-Modulation ANT7 |       |           |
| 2506                  | 17.80 | compliant |
| 2593                  | 17.83 | compliant |
| 2680                  | 17.8  | compliant |
| 16QAM-Modulation ANT8 |       |           |
| 2506                  | 17.80 | compliant |

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|                          |       |           |
|--------------------------|-------|-----------|
| 2593                     | 17.83 | compliant |
| 2680                     | 17.77 | compliant |
| Measurement Uncertainty: |       | ±48kHz    |



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**Table 10 Configuration B**

| Carrier Frequency [MHz] | Occupied Bandwidth [MHz] | Result    |
|-------------------------|--------------------------|-----------|
| QPSK-Modulation ANT1    |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.97                    | compliant |
| QPSK-Modulation ANT2    |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.97                    | compliant |
| QPSK-Modulation ANT3    |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.86                    | compliant |
| QPSK-Modulation ANT4    |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.97                    | compliant |
| QPSK-Modulation ANT5    |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.97                    | compliant |
| QPSK-Modulation ANT6    |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.97                    | compliant |
| QPSK-Modulation ANT7    |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.97                    | compliant |
| QPSK-Modulation ANT8    |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.97                    | compliant |
| 64QAM-Modulation ANT1   |                          |           |
| 2506/ 2526              | 37.97                    | compliant |
| 2583/ 2603              | 37.97                    | compliant |
| 2660/ 2680              | 37.97                    | compliant |

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|                       |       |           |
|-----------------------|-------|-----------|
| 64QAM-Modulation ANT2 |       |           |
| 2506/ 2526            | 37.85 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 37.97 | compliant |
| 64QAM-Modulation ANT3 |       |           |
| 2506/ 2526            | 37.97 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 37.97 | compliant |
| 64QAM-Modulation ANT4 |       |           |
| 2506/ 2526            | 37.97 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 37.97 | compliant |
| 64QAM-Modulation ANT5 |       |           |
| 2506/ 2526            | 37.97 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 37.97 | compliant |
| 64QAM-Modulation ANT6 |       |           |
| 2506/ 2526            | 37.97 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 37.97 | compliant |
| 64QAM-Modulation ANT7 |       |           |
| 2506/ 2526            | 37.97 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 38.09 | compliant |
| 64QAM-Modulation ANT8 |       |           |
| 2506/ 2526            | 37.97 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 37.97 | compliant |
| 16QAM-Modulation ANT1 |       |           |
| 2506/ 2526            | 37.97 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 37.86 | compliant |
| 16QAM-Modulation ANT2 |       |           |
| 2506/ 2526            | 37.97 | compliant |
| 2583/ 2603            | 37.97 | compliant |
| 2660/ 2680            | 37.86 | compliant |
| 16QAM-Modulation ANT3 |       |           |
| 2506/ 2526            | 37.86 | compliant |
| 2583/ 2603            | 37.97 | compliant |

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|                          |       |           |
|--------------------------|-------|-----------|
| 2660/ 2680               | 37.86 | compliant |
| 16QAM-Modulation ANT4    |       |           |
| 2506/ 2526               | 37.97 | compliant |
| 2583/ 2603               | 37.97 | compliant |
| 2660/ 2680               | 37.86 | compliant |
| 16QAM-Modulation ANT5    |       |           |
| 2506/ 2526               | 37.97 | compliant |
| 2583/ 2603               | 37.97 | compliant |
| 2660/ 2680               | 37.86 | compliant |
| 16QAM-Modulation ANT6    |       |           |
| 2506/ 2526               | 37.97 | compliant |
| 2583/ 2603               | 37.97 | compliant |
| 2660/ 2680               | 37.86 | compliant |
| 16QAM-Modulation ANT7    |       |           |
| 2506/ 2526               | 37.97 | compliant |
| 2583/ 2603               | 37.97 | compliant |
| 2660/ 2680               | 37.86 | compliant |
| 16QAM-Modulation ANT8    |       |           |
| 2506/ 2526               | 37.97 | compliant |
| 2583/ 2603               | 37.97 | compliant |
| 2660/ 2680               | 37.86 | compliant |
| Measurement Uncertainty: |       | ±48kHz    |

**Table 11 Configuration C**

| Carrier Frequency<br>[MHz] | Occupied Bandwidth<br>[MHz] | Result    |
|----------------------------|-----------------------------|-----------|
| QPSK-Modulation ANT1       |                             |           |
| 2506/ 2526/ 2546           | 57.66                       | compliant |
| 2573/ 2593/ 2613           | 57.66                       | compliant |
| 2640/ 2660/ 2680           | 57.66                       | compliant |
| QPSK-Modulation ANT2       |                             |           |
| 2506/ 2526/ 2546           | 57.66                       | compliant |
| 2573/ 2593/ 2613           | 57.66                       | compliant |
| 2640/ 2660/ 2680           | 57.66                       | compliant |
| QPSK-Modulation ANT3       |                             |           |
| 2506/ 2526/ 2546           | 57.66                       | compliant |
| 2573/ 2593/ 2613           | 57.66                       | compliant |
| 2640/ 2660/ 2680           | 57.66                       | compliant |
| QPSK-Modulation ANT4       |                             |           |

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|                       |       |           |
|-----------------------|-------|-----------|
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| QPSK-Modulation ANT5  |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| QPSK-Modulation ANT6  |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| QPSK-Modulation ANT7  |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| QPSK-Modulation ANT8  |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 64QAM-Modulation ANT1 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.48 | compliant |
| 64QAM-Modulation ANT2 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 64QAM-Modulation ANT3 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 64QAM-Modulation ANT4 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 64QAM-Modulation ANT5 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |

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|                       |       |           |
|-----------------------|-------|-----------|
| 64QAM-Modulation ANT6 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 64QAM-Modulation ANT7 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 64QAM-Modulation ANT8 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 16QAM-Modulation ANT1 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.48 | compliant |
| 16QAM-Modulation ANT2 |       |           |
| 2506/ 2526/ 2546      | 57.55 | compliant |
| 2573/ 2593/ 2613      | 57.55 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 16QAM-Modulation ANT3 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.48 | compliant |
| 2640/ 2660/ 2680      | 57.48 | compliant |
| 16QAM-Modulation ANT4 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 16QAM-Modulation ANT5 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.48 | compliant |
| 2640/ 2660/ 2680      | 57.48 | compliant |
| 16QAM-Modulation ANT6 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.66 | compliant |
| 16QAM-Modulation ANT7 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |

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|                       |       |           |
|-----------------------|-------|-----------|
| 2640/ 2660/ 2680      | 57.48 | compliant |
| 16QAM-Modulation ANT8 |       |           |
| 2506/ 2526/ 2546      | 57.66 | compliant |
| 2573/ 2593/ 2613      | 57.66 | compliant |
| 2640/ 2660/ 2680      | 57.48 | compliant |

The occupied bandwidths were found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.



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#### 4.4 Test No. 4: Spurious Emissions at Antenna Terminals (§ 2.1051, § 2.1057, § 27.53)

##### 4.4.1 Limits

Para. No. 27.53(l). For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts.

(l)(2) For fixed and temporary fixed digital stations, the attenuation shall be not less than  $43 + 10 \log (P)$  dB (P = transmitter power in Watts).

The compliance limit was calculated in the following way:

Maximum transmitter output power [W]: P

Maximum transmitter output power [dBm]:  $30 + 10 \log_{10} P$   
(conversion from W to dBm)

Attenuation required by FCC:  $43 + 10 \log_{10} P$

Compliance limit = Maximum transmitter output power - Required  
attenuation

$$= 30 + 10 \log_{10} P - (43 + 10 \log_{10} P) = \underline{-13 \text{ dBm}}$$

For MiMo output from 8 TX -antenna connectors, each antenna connectors were measured individually and each individual limit line was reduced by  $10 \log(8)$ . Limit line was calculated to show -22.03dB emission limit, according to FCC KDB 662911 D01 guidance.

##### 4.4.2 Test Procedure and Results



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The tests were carried out in accordance with § 27.53. For all frequency ranges except two (immediately below and above the carrier frequency block) a 1 MHz resolution bandwidth was used for the measurements.

In the 1 MHz frequency bands immediately outside and adjacent to the carrier frequency block the resolution bandwidth is lowered to 1% of the 26 dB occupied bandwidth of the transmitted carrier.

According to § 2.1057, all emissions including the fundamental frequency from the lowest radio frequency generated in the equipment, without going below 9 kHz, up to the 10th harmonic were investigated.

The following tables summarize the worst case detected emission levels (see screenshots on page 119 for details). The external attenuation (cable loss of the set up) is already added in the results. It can be seen separately as the 'Offset' value in the screenshots.

**Table 12 Configuration A, Lower band edge**

| Carrier Frequency: 2506 MHz |                          |                              |           |
|-----------------------------|--------------------------|------------------------------|-----------|
| Frequency Range [MHz]       | Emission Frequency [MHz] | Maximum Emission Level [dBm] | Result    |
| QPSK-Modulation ANT1        |                          |                              |           |
|                             | 2496                     | -31.19                       | compliant |
| QPSK-Modulation ANT2        |                          |                              |           |
|                             | 2496                     | -28.64                       | compliant |
| QPSK-Modulation ANT3        |                          |                              |           |
|                             | 2496                     | -26.85                       | compliant |
| QPSK-Modulation ANT4        |                          |                              |           |
|                             | 2496                     | -26.75                       | compliant |
| QPSK-Modulation ANT5        |                          |                              |           |
|                             | 2496                     | -26.49                       | compliant |
| QPSK-Modulation ANT6        |                          |                              |           |
|                             | 2496                     | -26.58                       | compliant |
| QPSK-Modulation ANT7        |                          |                              |           |



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|                       |      |        |           |
|-----------------------|------|--------|-----------|
|                       | 2496 | -25.99 | compliant |
| QPSK-Modulation ANT8  |      |        |           |
|                       | 2498 | -26.6  | compliant |
| 64QAM-Modulation ANT1 |      |        |           |
|                       | 2496 | -29.27 | compliant |
| 64QAM-Modulation ANT2 |      |        |           |
|                       | 2496 | -28.91 | compliant |
| 64QAM-Modulation ANT3 |      |        |           |
|                       | 2496 | -28.74 | compliant |
| 64QAM-Modulation ANT4 |      |        |           |
|                       | 2496 | -28.42 | compliant |
| 64QAM-Modulation ANT5 |      |        |           |
|                       | 2496 | -28.44 | compliant |
| 64QAM-Modulation ANT6 |      |        |           |
|                       | 2496 | -28.57 | compliant |
| 64QAM-Modulation ANT7 |      |        |           |
|                       | 2496 | -27.71 | compliant |
| 64QAM-Modulation ANT8 |      |        |           |
|                       | 2496 | -26.91 | compliant |
| 16QAM-Modulation ANT1 |      |        |           |
|                       | 2496 | -27.68 | compliant |
| 16QAM-Modulation ANT2 |      |        |           |
|                       | 2496 | -28.95 | compliant |
| 16QAM-Modulation ANT3 |      |        |           |
|                       | 2496 | -28.77 | compliant |
| 16QAM-Modulation ANT4 |      |        |           |
|                       | 2496 | -28.49 | compliant |
| 16QAM-Modulation ANT5 |      |        |           |
|                       | 2496 | -27.02 | compliant |
| 16QAM-Modulation ANT6 |      |        |           |
|                       | 2496 | -28.72 | compliant |
| 16QAM-Modulation ANT7 |      |        |           |
|                       | 2496 | -27.72 | compliant |
| 16QAM-Modulation ANT8 |      |        |           |
|                       | 2496 | -27.42 | compliant |

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|                          |                                                                                                                                                                  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement Uncertainty: | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$ |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Table 13 Configuration A, Upper band edge**

| Carrier Frequency: 2680 MHz |                          |                              |           |
|-----------------------------|--------------------------|------------------------------|-----------|
| Frequency Range [MHz]       | Emission Frequency [MHz] | Maximum Emission Level [dBm] | Result    |
| QPSK-Modulation ANT1        |                          |                              |           |
|                             | 2690                     | -29.55                       | compliant |
| QPSK-Modulation ANT2        |                          |                              |           |
|                             | 2690                     | -28.92                       | compliant |
| QPSK-Modulation ANT3        |                          |                              |           |
|                             | 2690                     | -29.16                       | compliant |
| QPSK-Modulation ANT4        |                          |                              |           |
|                             | 2690                     | -28.29                       | compliant |
| QPSK-Modulation ANT5        |                          |                              |           |
|                             | 2690                     | -30.26                       | compliant |
| QPSK-Modulation ANT6        |                          |                              |           |
|                             | 2690                     | -28.89                       | compliant |
| QPSK-Modulation ANT7        |                          |                              |           |
|                             | 2690                     | -28.8                        | compliant |
| QPSK-Modulation ANT8        |                          |                              |           |
|                             | 2690                     | -27.39                       | compliant |
| 64QAM-Modulation ANT1       |                          |                              |           |
|                             | 2690                     | -29.58                       | compliant |
| 64QAM-Modulation ANT2       |                          |                              |           |
|                             | 2690                     | -28.85                       | compliant |
| 64QAM-Modulation ANT3       |                          |                              |           |
|                             | 2690                     | -30.68                       | compliant |
| 64QAM-Modulation ANT4       |                          |                              |           |
|                             | 2690                     | -29.38                       | compliant |
| 64QAM-Modulation ANT5       |                          |                              |           |
|                             | 2690                     | -30.51                       | compliant |
| 64QAM-Modulation ANT6       |                          |                              |           |

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|                          |      |                                                                                                                                                                  |           |
|--------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                          | 2691 | -28.42                                                                                                                                                           | compliant |
| 64QAM-Modulation ANT7    |      |                                                                                                                                                                  |           |
|                          | 2691 | -28.5                                                                                                                                                            | compliant |
| 64QAM-Modulation ANT8    |      |                                                                                                                                                                  |           |
|                          | 2691 | -29.99                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT1    |      |                                                                                                                                                                  |           |
|                          | 2690 | -29.54                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT2    |      |                                                                                                                                                                  |           |
|                          | 2690 | -29.12                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT3    |      |                                                                                                                                                                  |           |
|                          | 2690 | -28.22                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT4    |      |                                                                                                                                                                  |           |
|                          | 2690 | -27.41                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT5    |      |                                                                                                                                                                  |           |
|                          | 2690 | -30.33                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT6    |      |                                                                                                                                                                  |           |
|                          | 2691 | -28.47                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT7    |      |                                                                                                                                                                  |           |
|                          | 2690 | -28.64                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT8    |      |                                                                                                                                                                  |           |
|                          | 2690 | -29.63                                                                                                                                                           | compliant |
| Measurement Uncertainty: |      | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$ |           |



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**Table 14 Configuration A, Spurious emissions (Upper band edge)**

| Carrier Frequency: 2593 MHz |                          |                              |           |
|-----------------------------|--------------------------|------------------------------|-----------|
| Frequency Range [MHz]       | Emission Frequency [MHz] | Maximum Emission Level [dBm] | Result    |
| QPSK-Modulation ANT1        |                          |                              |           |
| 0.009 - 26900               | 5181                     | -30.95                       | compliant |
| QPSK-Modulation ANT2        |                          |                              |           |
| 0.009 - 26900               | 5193                     | -29.85                       | compliant |
| QPSK-Modulation ANT3        |                          |                              |           |
| 0.009 - 26900               | 5193                     | -29.27                       | compliant |
| QPSK-Modulation ANT4        |                          |                              |           |
| 0.009 - 26900               | 5193                     | -29.43                       | compliant |
| QPSK-Modulation ANT5        |                          |                              |           |
| 0.009 - 26900               | 5193                     | -28.45                       | compliant |
| QPSK-Modulation ANT6        |                          |                              |           |
| 0.009 - 26900               | 5193                     | -30.57                       | compliant |
| QPSK-Modulation ANT7        |                          |                              |           |
| 0.009 - 26900               | 5193                     | -30.18                       | compliant |
| QPSK-Modulation ANT8        |                          |                              |           |
| 0.009 - 26900               | 5193                     | -30.04                       | compliant |
| 64QAM-Modulation ANT1       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -28.42                       | compliant |
| 64QAM-Modulation ANT2       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -31.38                       | compliant |
| 64QAM-Modulation ANT3       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -28.13                       | compliant |
| 64QAM-Modulation ANT4       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -28.52                       | compliant |
| 64QAM-Modulation ANT5       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -28.29                       | compliant |
| 64QAM-Modulation ANT6       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -28.83                       | compliant |
| 64QAM-Modulation ANT7       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -28.78                       | compliant |
| 64QAM-Modulation ANT8       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -29.62                       | compliant |
| 16QAM-Modulation ANT1       |                          |                              |           |
| 0.009 - 26900               | 5193                     | -29.88                       | compliant |
| 16QAM-Modulation ANT2       |                          |                              |           |

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|                          |      |                                                                                                                                                                  |           |
|--------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 0.009 - 26900            | 5193 | -29.37                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT3    |      |                                                                                                                                                                  |           |
| 0.009 - 26900            | 5193 | -27.99                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT4    |      |                                                                                                                                                                  |           |
| 0.009 - 26900            | 5193 | -30.97                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT5    |      |                                                                                                                                                                  |           |
| 0.009 - 26900            | 5193 | -29.54                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT6    |      |                                                                                                                                                                  |           |
| 0.009 - 26900            | 5193 | -29.21                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT7    |      |                                                                                                                                                                  |           |
| 0.009 - 26900            | 5193 | -29.48                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT8    |      |                                                                                                                                                                  |           |
| 0.009 - 26900            | 5193 | -29.41                                                                                                                                                           | compliant |
| Measurement Uncertainty: |      | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$ |           |

**Table 15 Configuration B, Lower band edge**

| Carrier Frequency: 2506.0 MHz/ 2526.0 MHz |                          |                              |           |
|-------------------------------------------|--------------------------|------------------------------|-----------|
| Frequency Range [MHz]                     | Emission Frequency [MHz] | Maximum Emission Level [dBm] | Result    |
| QPSK-Modulation ANT1                      |                          |                              |           |
|                                           | 2496                     | -28.3                        | compliant |
| QPSK-Modulation ANT2                      |                          |                              |           |
|                                           | 2496                     | -26.62                       | compliant |
| QPSK-Modulation ANT3                      |                          |                              |           |
|                                           | 2496                     | -27.42                       | compliant |
| QPSK-Modulation ANT4                      |                          |                              |           |
|                                           | 2496                     | -26.6                        | compliant |
| QPSK-Modulation ANT5                      |                          |                              |           |
|                                           | 2496                     | -26.84                       | compliant |
| QPSK-Modulation ANT6                      |                          |                              |           |
|                                           | 2496                     | -26.65                       | compliant |
| QPSK-Modulation ANT7                      |                          |                              |           |
|                                           | 2496                     | -29.66                       | compliant |
| QPSK-Modulation ANT8                      |                          |                              |           |

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|                          |      |                                                                                                     |           |
|--------------------------|------|-----------------------------------------------------------------------------------------------------|-----------|
|                          | 2496 | -27.43                                                                                              | compliant |
| 64QAM-Modulation ANT1    |      |                                                                                                     |           |
|                          | 2496 | -27.24                                                                                              | compliant |
| 64QAM-Modulation ANT2    |      |                                                                                                     |           |
|                          | 2496 | -28.27                                                                                              | compliant |
| 64QAM-Modulation ANT3    |      |                                                                                                     |           |
|                          | 2496 | -28.36                                                                                              | compliant |
| 64QAM-Modulation ANT4    |      |                                                                                                     |           |
|                          | 2496 | -26.53                                                                                              | compliant |
| 64QAM-Modulation ANT5    |      |                                                                                                     |           |
|                          | 2496 | -27.76                                                                                              | compliant |
| 64QAM-Modulation ANT6    |      |                                                                                                     |           |
|                          | 2496 | -26.90                                                                                              | compliant |
| 64QAM-Modulation ANT7    |      |                                                                                                     |           |
|                          | 2496 | -27.55                                                                                              | compliant |
| 64QAM-Modulation ANT8    |      |                                                                                                     |           |
|                          | 2496 | -27.1                                                                                               | compliant |
| 16QAM-Modulation ANT1    |      |                                                                                                     |           |
|                          | 2496 | -28.09                                                                                              | compliant |
| 16QAM-Modulation ANT2    |      |                                                                                                     |           |
|                          | 2496 | -30.09                                                                                              | compliant |
| 16QAM-Modulation ANT3    |      |                                                                                                     |           |
|                          | 2496 | -28                                                                                                 | compliant |
| 16QAM-Modulation ANT4    |      |                                                                                                     |           |
|                          | 2496 | -27.44                                                                                              | compliant |
| 16QAM-Modulation ANT5    |      |                                                                                                     |           |
|                          | 2496 | -26.73                                                                                              | compliant |
| 16QAM-Modulation ANT6    |      |                                                                                                     |           |
|                          | 2496 | -28.33                                                                                              | compliant |
| 16QAM-Modulation ANT7    |      |                                                                                                     |           |
|                          | 2496 | -27.68                                                                                              | compliant |
| 16QAM-Modulation ANT8    |      |                                                                                                     |           |
|                          | 2496 | -25.72                                                                                              | compliant |
| Measurement Uncertainty: |      | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$ |           |



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|  | 3.6GHz ≤ f < 8.0GHz: ±1.6dB, |
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**Table 16 Configuration B, Upper band edge**

| Carrier Frequency: 2660 MHz/ 2680 MHz |                          |                              |           |
|---------------------------------------|--------------------------|------------------------------|-----------|
| Frequency Range [MHz]                 | Emission Frequency [MHz] | Maximum Emission Level [dBm] | Result    |
| QPSK-Modulation ANT1                  |                          |                              |           |
|                                       | 2690                     | -30.37                       | compliant |
| QPSK-Modulation ANT2                  |                          |                              |           |
|                                       | 2690                     | -27.47                       | compliant |
| QPSK-Modulation ANT3                  |                          |                              |           |
|                                       | 2690                     | -31.38                       | compliant |
| QPSK-Modulation ANT4                  |                          |                              |           |
|                                       | 2690                     | -27.59                       | compliant |
| QPSK-Modulation ANT5                  |                          |                              |           |
|                                       | 2691                     | -30.54                       | compliant |
| QPSK-Modulation ANT6                  |                          |                              |           |
|                                       | 2690                     | -31.78                       | compliant |
| QPSK-Modulation ANT7                  |                          |                              |           |
|                                       | 2691                     | -29.94                       | compliant |
| QPSK-Modulation ANT8                  |                          |                              |           |
|                                       | 2690                     | -28.08                       | compliant |
| 64QAM-Modulation ANT1                 |                          |                              |           |
|                                       | 2690                     | -32.21                       | compliant |
| 64QAM-Modulation ANT2                 |                          |                              |           |
|                                       | 2690                     | -31.57                       | compliant |
| 64QAM-Modulation ANT3                 |                          |                              |           |
|                                       | 2690                     | -30.52                       | compliant |
| 64QAM-Modulation ANT4                 |                          |                              |           |
|                                       | 2690                     | -31.51                       | compliant |
| 64QAM-Modulation ANT5                 |                          |                              |           |
|                                       | 2690                     | -32.21                       | compliant |
| 64QAM-Modulation ANT6                 |                          |                              |           |
|                                       | 2691                     | -30.55                       | compliant |
| 64QAM-Modulation ANT7                 |                          |                              |           |
|                                       | 2691                     | -29.71                       | compliant |
| 64QAM-Modulation ANT8                 |                          |                              |           |

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|--------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                          | 2691 | -30.87                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT1    |      |                                                                                                                                                                  |           |
|                          | 2690 | -29.48                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT2    |      |                                                                                                                                                                  |           |
|                          | 2690 | -29.6                                                                                                                                                            | compliant |
| 16QAM-Modulation ANT3    |      |                                                                                                                                                                  |           |
|                          | 2690 | -32.11                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT4    |      |                                                                                                                                                                  |           |
|                          | 2690 | -27.93                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT5    |      |                                                                                                                                                                  |           |
|                          | 2690 | -30.92                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT6    |      |                                                                                                                                                                  |           |
|                          | 2691 | -30.7                                                                                                                                                            | compliant |
| 16QAM-Modulation ANT7    |      |                                                                                                                                                                  |           |
|                          | 2690 | -31.08                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT8    |      |                                                                                                                                                                  |           |
|                          | 2690 | -27.15                                                                                                                                                           | compliant |
| Measurement Uncertainty: |      | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$ |           |

**Table 17 Configuration B, Spurious emissions**

| Carrier Frequency: 2583/2603 MHz |                          |                              |           |
|----------------------------------|--------------------------|------------------------------|-----------|
| Frequency Range [MHz]            | Emission Frequency [MHz] | Maximum Emission Level [dBm] | Result    |
| QPSK-Modulation ANT1             |                          |                              |           |
| 0.009 - 26900                    | 5193                     | -31.89                       | compliant |
| QPSK-Modulation ANT2             |                          |                              |           |
| 0.009 - 26900                    | 5193                     | -28.72                       | compliant |
| QPSK-Modulation ANT3             |                          |                              |           |
| 0.009 - 26900                    | 5181                     | -28.33                       | compliant |
| QPSK-Modulation ANT4             |                          |                              |           |
| 0.009 - 26900                    | 5181                     | -27.97                       | compliant |
| QPSK-Modulation ANT5             |                          |                              |           |
| 0.009 - 26900                    | 5193                     | -29.21                       | compliant |
| QPSK-Modulation ANT6             |                          |                              |           |
| 0.009 - 26900                    | 5181                     | -28.83                       | compliant |

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|--------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| QPSK-Modulation ANT7     |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -28.95                                                                                                                                                                       | compliant |
| QPSK-Modulation ANT8     |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -29.76                                                                                                                                                                       | compliant |
| 64QAM-Modulation ANT1    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -29.04                                                                                                                                                                       | compliant |
| 64QAM-Modulation ANT2    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -28.9                                                                                                                                                                        | compliant |
| 64QAM-Modulation ANT3    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -28.48                                                                                                                                                                       | compliant |
| 64QAM-Modulation ANT4    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -27.07                                                                                                                                                                       | compliant |
| 64QAM-Modulation ANT5    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -30.28                                                                                                                                                                       | compliant |
| 64QAM-Modulation ANT6    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -29.00                                                                                                                                                                       | compliant |
| 64QAM-Modulation ANT7    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -30.38                                                                                                                                                                       | compliant |
| 64QAM-Modulation ANT8    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -29.87                                                                                                                                                                       | compliant |
| 16QAM-Modulation ANT1    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -31.14                                                                                                                                                                       | compliant |
| 16QAM-Modulation ANT2    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -27.93                                                                                                                                                                       | compliant |
| 16QAM-Modulation ANT3    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -29.81                                                                                                                                                                       | compliant |
| 16QAM-Modulation ANT4    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -30.83                                                                                                                                                                       | compliant |
| 16QAM-Modulation ANT5    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -29.27                                                                                                                                                                       | compliant |
| 16QAM-Modulation ANT6    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -30.56                                                                                                                                                                       | compliant |
| 16QAM-Modulation ANT7    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5181 | -30.12                                                                                                                                                                       | compliant |
| 16QAM-Modulation ANT8    |      |                                                                                                                                                                              |           |
| 0.009 - 26900            | 5193 | -28.00                                                                                                                                                                       | compliant |
| Measurement Uncertainty: |      | $f < 1.0\text{GHz}$ : $\pm 1.1\text{dB}$ ,<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}$ : $\pm 1.2\text{dB}$ ,<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}$ : $\pm 1.6\text{dB}$ , |           |

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**Table 18 Configuration C, Lower band edge**

| Carrier Frequency: 2506 2526/2546 MHz |                          |                              |           |
|---------------------------------------|--------------------------|------------------------------|-----------|
| Frequency Range [MHz]                 | Emission Frequency [MHz] | Maximum Emission Level [dBm] | Result    |
| QPSK-Modulation ANT1                  |                          |                              |           |
|                                       | 2496                     | -29.74                       | compliant |
| QPSK-Modulation ANT2                  |                          |                              |           |
|                                       | 2496                     | -25.92                       | compliant |
| QPSK-Modulation ANT3                  |                          |                              |           |
|                                       | 2496                     | -26.59                       | compliant |
| QPSK-Modulation ANT4                  |                          |                              |           |
|                                       | 2496                     | -27.25                       | compliant |
| QPSK-Modulation ANT5                  |                          |                              |           |
|                                       | 2496                     | -26.2                        | compliant |
| QPSK-Modulation ANT6                  |                          |                              |           |
|                                       | 2496                     | -26.57                       | compliant |
| QPSK-Modulation ANT7                  |                          |                              |           |
|                                       | 2496                     | -28.45                       | compliant |
| QPSK-Modulation ANT8                  |                          |                              |           |
|                                       | 2498                     | -25.78                       | compliant |
| 64QAM-Modulation ANT1                 |                          |                              |           |
|                                       | 2496                     | -28.87                       | compliant |
| 64QAM-Modulation ANT2                 |                          |                              |           |
|                                       | 2496                     | -27.06                       | compliant |
| 64QAM-Modulation ANT3                 |                          |                              |           |
|                                       | 2496                     | -28.76                       | compliant |
| 64QAM-Modulation ANT4                 |                          |                              |           |
|                                       | 2496                     | -28.48                       | compliant |
| 64QAM-Modulation ANT5                 |                          |                              |           |
|                                       | 2496                     | -26.43                       | compliant |
| 64QAM-Modulation ANT6                 |                          |                              |           |
|                                       | 2496                     | -26.57                       | compliant |
| 64QAM-Modulation ANT7                 |                          |                              |           |
|                                       | 2496                     | -28.09                       | compliant |
| 64QAM-Modulation ANT8                 |                          |                              |           |

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|                          |      |                                                                                                                                                                  |           |
|--------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                          | 2496 | -27.95                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT1    |      |                                                                                                                                                                  |           |
|                          | 2496 | -26.89                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT2    |      |                                                                                                                                                                  |           |
|                          | 2496 | -26.24                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT3    |      |                                                                                                                                                                  |           |
|                          | 2496 | -29.55                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT4    |      |                                                                                                                                                                  |           |
|                          | 2496 | -28.74                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT5    |      |                                                                                                                                                                  |           |
|                          | 2496 | -28.76                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT6    |      |                                                                                                                                                                  |           |
|                          | 2496 | -28.22                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT7    |      |                                                                                                                                                                  |           |
|                          | 2496 | -28.27                                                                                                                                                           | compliant |
| 16QAM-Modulation ANT8    |      |                                                                                                                                                                  |           |
|                          | 2496 | -27.96                                                                                                                                                           | compliant |
| Measurement Uncertainty: |      | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$ |           |

**Table 19 Configuration C Upper band edge**

| Carrier Frequency: 2640/2660 /2680 MHz |                          |                              |           |
|----------------------------------------|--------------------------|------------------------------|-----------|
| Frequency Range [MHz]                  | Emission Frequency [MHz] | Maximum Emission Level [dBm] | Result    |
| QPSK-Modulation ANT1                   |                          |                              |           |
|                                        | 2690                     | -31.06                       | compliant |
| QPSK-Modulation ANT2                   |                          |                              |           |
|                                        | 2690                     | -29.98                       | compliant |
| QPSK-Modulation ANT3                   |                          |                              |           |
|                                        | 2690                     | -31.14                       | compliant |
| QPSK-Modulation ANT4                   |                          |                              |           |
|                                        | 2690                     | -27.23                       | compliant |
| QPSK-Modulation ANT5                   |                          |                              |           |
|                                        | 2691                     | -31.67                       | compliant |

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