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Report On

Radio Testing of the Nokia Solutions and Networks Oy
AirScale Base Station RRH 2600 MHz
Radio Access technology: E-UTRA (FDD)
In accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 27, Industry Canada RSS-199 and Industry Canada RSS-GEN

COMMERCIAL-IN-CONFIDENCE

FCC ID: VBNAHHB-01
IC: 661AI-AHHB

Document 75944457 Report 01 Issue 1 **February 2019**

Product Service

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February 2019

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SECTION 1

REPORT SUMMARY

Radio Testing of the Nokia Solutions and Networks Oy
AirScale Base Station RRH 2600 MHz
Radio Access technology: E-UTRA (FDD)
In accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 27, Industry Canada RSS-199 and Industry Canada RSS-GEN

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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 AirScale Base Station RRH 2600 MHz Radio Access technology: E-UTRA (FDD) in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 27, Industry Canada RSS-199 and Industry Canada RSS-GEN.

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)	AHHB
Serial Number(s)	L1180321043
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2017) FCC CFR 47 Part 27 (2018) Industry Canada RSS-199 issue 3 (2016) Industry Canada RSS-GEN issue 5 (2018)
Order Number Date	0090931133 06 December 2018
Start of Test	03 December 2018
Finish of Test	30 January 2018
Name of Engineer(s)	Mika Kallankari Jari Veijola

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SECTION 2

DISCLAIMERS AND COPYRIGHT

2.1 DISCLAIMERS AND COPYRIGHT

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ANNEX A

NOKIA SOLUTIONS AND NETWORKS OY TEST REPORT NO: D568352794

Product Service

Nokia Networks

TEST REPORT NO: D568352794

FCC ID: VBNAHHB-01

IC ID: 661AI-AHHB

Date:	Oulu 11. Feb 2019
Pages:	230
Appendices:	-

Equipment Under Test:	Airscale Base Station RRH 2600MHz Radio Access technology: E-UTRA (FDD)
Type:	AHHB
Manufacturer:	Nokia Solutions and Networks Oy
Address:	P.O. Box 319, Kaapelitie 4, FI-90620, Oulu, Finland
Task:	Conformance test according to the specificarions mentioned below
Test Specification(s):	FCC 47 CFR part 2 (2017) and FCC 47 CFR part 27 (2018) Industry Canada RSS-199 issue 3 (2016) Industry Canada RSS-Gen issue 5 (2018)
Result:	The EUT complies with the requirements of the specification

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

Approved by:	**Date**	**Signature**
Jari Virta R&D Line Manager Nokia Solutions and Networks Oy	11 Feb 2019	

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SUMMARY

Due to HW modification to AHHB unit and FCC class 2 permissive change is mandatory to grant the permission to use these configurations.

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

Test No.	Measurement	FCC Rule and RSS Paragraph	Page Number of this Report	Result
1	RF Power Output Transmitter Output Power	§ 2.1046, § 27.50 RSS-199, 4.4 RSS-Gen, 6.12 SRSP-517	9	compliant
2	Spurious Emissions at Antenna Terminals Transmitter Unwanted Emission (Conducted)	§ 2.1051, § 2.1057, § 27.53 RSS-199, 4.5 RSS-Gen, 6.13	45	compliant
3	Field Strength of Spurious Radiation	§ 2.1053, § 2.1057, § 27.53, RSS-199	74	compliant

Table 1 Results – Summary

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 v02r01 and FCC KDB 971168 D01 Power Meas License Digital Systems v03r01.

1.1 Test Laboratory:

Nokia Solutions and Networks Oy

Kaapelitie 4,

FI-90620, Oulu, Finland

Jari Virta

FCC Reg. No: 411251

OATS number: 661AI-1

Testing laboratory accreditation number: T297

1.2 Time Schedule

Test No.	1, 2	3
Start of Test:	3.12.2018	15.1.2019
End of Test:	30.1 2019	21.1.2019

1.3 Participants

Name	Function	Signature
RF Test person (Nokia) Mika Kallankari	Testing, Setup of EUT	
EMC Test person (Nokia) Jari Veijola	Test no 3, Setup of EUT	

2. EQUIPMENT UNDER TEST

The EUT is a LTE Base transceiver station RRH 2600 MHz with 4 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 BTS's 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

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

Module Type	Flexi Multiradio BTS RRH 2600MHz	
Radio Access Technology	E-UTRA	
Duplex mode	Frequency Division Duplex (FDD)	
Channel Bandwidth	Single carrier 5MHz (Config A) Single carrier 10MHz (Config B) Single carrier 15MHz (Config C) Single carrier 20MHz (Config D) Dual carrier 5+5MHz (Config E) Dual carrier 10+10MHz (Config F) Dual carrier 15+15MHz (Config G) Dual carrier 20+20MHz (Config H)	
Supply Voltage	48V DC	
Frequency Bands		
Channel Bandwidth 5 MHz	**Lowest** tunable freq. Singe carrier	2622.5 MHz
	Dual carriers	2622.5/2627.5 MHz
	Middle freq. Single carrier	2655 MHz
	Dual carriers	2652.5/2657.5 MHz
	Highest tunable freq. Single carrier	2687.5 MHz
	Dual carriers	2682.5/2687.5 MHz
Channel Bandwidth 10 MHz	**Lowest** tunable freq. Singe carrier	2625 MHz
	Dual carriers	2625/2635 MHz
	Middle freq. Single carrier	2655 MHz

	Dual carriers	2650/2660 MHz
	Highest tunable freq. Single carrier	2685 MHz
	Dual carriers	2675/2685 MHz
Channel Bandwidth 15 MHz	**Lowest** tunable freq. Singe carrier	2627.5 MHz
	Dual carriers	2627.5/2642.5 MHz
	Middle freq. Single carrier	2655 MHz
	Dual carriers	2647.5/2662.5 MHz
	Highest tunable freq. Single carrier	2682.5 MHz
	Dual carriers	2667.5/2682.5 MHz
Channel Bandwidth 20 MHz	**Lowest** tunable freq. Singe carrier	2630 MHz
	Dual carriers	2630/2650 MHz
	Middle freq. Single carrier	2655 MHz
	Dual carriers	2645/2665 MHz
	Highest tunable freq. Single carrier	2680 MHz
	Dual carriers	2660/2680 MHz
Single carrier		
Rated Output Power (Prat)	40W(46dBm) conducted / carrier	
Dual carriers		
Rated Output Power (Prat)	20W(43dBm) conducted / carrier	
Downlink/Uplink ratio	6/3 to 8/1	
	RX	**TX**
Number of Antenna Ports	4 (ANT1 to ANT4)	4 (ANT1 to ANT4)
MiMo	Yes	Yes

Table 2 Overview of EUT configuration

The tests were performed with one EUT at the antenna ports ANT1, ANT2, ANT3, ANT4.

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

Module Name	Serial-No.	Module Type	Config.
AHHB	L1180321043	RRH	A, B, C, D, E, F, G, H
Other Modules	**Module Type**		**Config.**
AMIA	AirScale Subrack		A, B, C, D, E, F, G, H
ASIA	AirScale Common unit		A, B, C, D, E, F, G, H
ABIA	AirScale Capacity unit		A, B, C, D, E, F, G, H

Table 3 Configuration of EUT

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

2.2 Operating Conditions

The EUT supports QPSK, 16QAM, 64QAM and 256QAM 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
- E-TM 3.1A: All 256QAM 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.

3. TEST CONFIGURATION

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

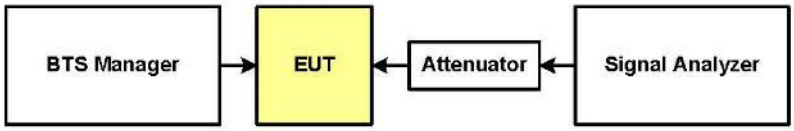

Figure 1 Test Configuration (single output)

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 60 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.

4. TEST RESULTS

4.1 Test No.1: RF Power Output (§ 2.1046, § 27.50, RSS-199, RSS-Gen, SRPS-517)

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 + 10log(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: 33dBW + 10log(10MHz/5.5MHz) dBW = 34.26 dBW = ~2667W Test Procedure and Results

RSS-199 para. no. 4.4: The equivalent isotropically radiated power (e.i.r.p.) of base and fixed station equipment shall comply with the e.i.r.p. limit in SRSP-517.

RSS-199 para. no. 4.4: The PAPR of the transmitter output power of base and fixed station equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

The EUT has been tested without any antennas. Compliance with ERP/EIRP requirements will be addressed at the time of licensing by the installer as required by Industry Canada. Licences must take into account the maximum permissible antenna gain when used in combination with the power settings/measurements recorded in this report to prevent the radiated power exceeding the applicable requirements.

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.

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

Measured laboratory room temperature and humidity during the tests				
Date	Temperature Min-Max:		Humidity Min-Max:	
3 Dec 2018 – 3 Jan 2019	20.3 °C	24.1 °C	5.4 RH%	24.9 RH%

Config A:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2622.5	45.32	34.04	7.39	compliant
2655	45.72	37.33	7.36	compliant
2687.5	45.52	35.65	7.36	compliant
QPSK-Modulation ANT2				
2622.5	45.16	32.81	7.39	compliant
2655	45.58	36.16	7.33	compliant
2687.5	45.35	34.28	7.36	compliant
QPSK-Modulation ANT3				
2622.5	45.10	32.36	7.36	compliant
2655	45.53	35.73	7.33	compliant
2687.5	45.26	33.57	7.36	compliant
QPSK-Modulation ANT4				
2622.5	45.19	33.04	7.39	compliant
2655	45.65	36.73	7.36	compliant
2687.5	45.40	34.67	7.36	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2622.5	51.21	132.25	-	compliant
2655	51.64	133.34	-	compliant
2687.5	51.40	138.17	-	compliant
16QAM-Modulation ANT1				
2622.5	45.32	34.04	7.36	compliant
2655	45.76	37.67	7.36	compliant
2687.5	45.51	35.56	7.39	compliant
16QAM-Modulation ANT2				
2622.5	45.15	32.73	7.39	compliant
2655	45.59	36.22	7.36	compliant
2687.5	45.32	34.04	7.39	compliant
16QAM-Modulation ANT3				
2622.5	45.05	31.99	7.39	compliant

2655	45.47	35.24	7.36	compliant
2687.5	45.25	33.50	7.39	compliant
16QAM-Modulation ANT4				
2622.5	45.21	33.19	7.39	compliant
2655	45.59	36.22	7.36	compliant
2687.5	45.34	34.20	7.39	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2622.5	51.20	131.95	-	compliant
2655	51.62	145.36	-	compliant
2687.5	51.38	137.30	-	compliant
64QAM-Modulation ANT1				
2622.5	45.32	34.04	7.39	compliant
2655	45.73	37.41	7.36	compliant
2687.5	45.54	35.81	7.39	compliant
64QAM-Modulation ANT2				
2622.5	45.10	32.36	7.42	compliant
2655	45.63	36.56	7.39	compliant
2687.5	45.36	34.36	7.39	compliant
64QAM-Modulation ANT3				
2622.5	45.05	31.99	7.39	compliant
2655	45.52	35.65	7.36	compliant
2687.5	45.23	33.34	7.39	compliant
64QAM-Modulation ANT4				
2622.5	45.16	32.81	7.42	compliant
2655	45.62	36.48	7.39	compliant
2687.5	45.37	34.43	7.39	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2622.5	51.18	131.20	-	compliant
2655	51.65	146.09	-	compliant
2687.5	51.40	137.94	-	compliant
256QAM-Modulation ANT1				
2622.5	45.29	33.81	7.39	compliant
2655	45.76	37.67	7.36	compliant
2687.5	45.51	35.56	7.39	compliant
256QAM-Modulation ANT2				
2622.5	45.10	32.36	7.39	compliant
2655	45.52	37.67	7.36	compliant

2687.5	45.29	31.70	7.39	compliant
256QAM-Modulation ANT3				
2622.5	45.01	31.70	7.39	compliant
2655	45.56	35.97	7.36	compliant
2687.5	45.19	33.04	7.39	compliant
256QAM-Modulation ANT4				
2622.5	45.12	32.51	7.39	compliant
2655	45.59	36.22	7.36	compliant
2687.5	45.32	34.04	7.39	compliant
256QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2622.5	51.15	130.37	-	compliant
2655	51.63	145.51	-	compliant
2687.5	51.35	136.45	-	compliant

Table 4 RF Power Output (5 MHz Channel BW)

Config B:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2625	45.49	35.40	7.45	compliant
2655	45.74	34.50	7.28	compliant
2685	45.65	36.73	7.36	compliant
QPSK-Modulation ANT2				
2625	45.30	33.88	7.45	compliant
2655	45.55	35.89	7.28	compliant
2685	45.42	34.83	7.36	compliant
QPSK-Modulation ANT3				
2625	45.16	32.12	7.42	compliant
2655	45.44	34.99	7.28	compliant
2685	45.31	33.96	7.36	compliant
QPSK-Modulation ANT4				
2625	45.33	34.12	7.45	compliant
2655	45.60	36.31	7.28	compliant
2685	45.44	34.99	7.36	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2625	51.34	136.21	-	compliant
2655	51.50	144.69	-	compliant

2685	51.48	140.52	-	compliant
16QAM-Modulation ANT1				
2625	45.57	36.06	7.42	compliant
2655	45.73	37.41	7.28	compliant
2685	45.65	36.73	7.33	compliant
16QAM-Modulation ANT2				
2625	45.32	34.04	7.42	compliant
2655	45.53	35.73	7.28	compliant
2685	45.43	34.91	7.36	compliant
16QAM-Modulation ANT3				
2625	45.13	32.58	7.42	compliant
2655	45.40	34.67	7.28	compliant
2685	45.31	33.96	7.36	compliant
16QAM-Modulation ANT4				
2625	45.26	33.57	7.24	compliant
2655	45.57	36.06	7.28	compliant
2685	45.44	34.99	7.36	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2625	51.34	136.26	-	compliant
2655	51.58	143.87	-	compliant
2685	51.48	140.60	-	compliant
64QAM-Modulation ANT1				
2625	45.49	35.40	7.45	compliant
2655	45.74	37.50	7.28	compliant
2685	45.62	36.48	7.36	compliant
64QAM-Modulation ANT2				
2625	45.26	33.57	7.45	compliant
2655	45.54	35.81	7.30	compliant
2685	45.39	34.59	7.36	compliant
64QAM-Modulation ANT3				
2625	45.10	32.36	7.45	compliant
2655	45.37	34.43	7.30	compliant
2685	45.26	33.57	7.36	compliant
64QAM-Modulation ANT4				
2625	45.29	33.81	7.45	compliant
2655	45.55	35.89	7.28	compliant
2685	45.43	34.91	7.33	compliant

64QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2625	51.31	135.14	-	compliant
2655	51.57	146.63	-	compliant
2685	51.45	139.56	-	compliant
256QAM-Modulation ANT1				
2625	45.48	35.32	7.42	compliant
2655	45.77	37.76	7.30	compliant
2685	45.64	36.64	7.36	compliant
256QAM-Modulation ANT2				
2625	45.28	33.73	7.45	compliant
2655	45.56	35.97	7.28	compliant
2685	45.38	34.51	7.36	compliant
256QAM-Modulation ANT3				
2625	45.13	32.58	7.42	compliant
2655	45.40	34.67	7.28	compliant
2685	45.30	33.88	7.36	compliant
256QAM-Modulation ANT4				
2625	45.29	33.81	7.45	compliant
2655	45.56	35.97	7.28	compliant
2685	45.44	34.99	7.36	compliant
256QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2625	51.32	135.44	-	compliant
2655	51.60	144.38	-	compliant
2685	51.46	140.04	-	compliant

Table 5 RF Power Output (10 MHz Channel BW)

Config C:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2627.5	45.59	36.22	7.54	compliant
2655	45.78	37.84	7.28	compliant
2682.5	45.67	36.90	7.39	compliant
QPSK-Modulation ANT2				
2627.5	45.43	34.91	7.54	compliant
2655	45.59	36.22	7.30	compliant
2682.5	45.56	35.97	7.42	compliant

QPSK-Modulation ANT3				
2627.5	45.29	33.81	7.51	compliant
2655	45.51	35.56	7.28	compliant
2682.5	45.45	35.08	7.42	compliant
QPSK-Modulation ANT4				
2627.5	45.40	36.67	7.54	compliant
2655	45.60	36.31	7.30	compliant
2682.5	45.56	35.97	7.42	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2627.5	51.45	139.62	-	compliant
2655	51.67	145.94	-	compliant
2682.5	51.58	143.92	-	compliant
16QAM-Modulation ANT1				
2627.5	45.59	36.22	7.48	compliant
2655	45.81	38.11	7.28	compliant
2682.5	45.68	36.98	7.39	compliant
16QAM-Modulation ANT2				
2627.5	45.39	34.59	7.48	compliant
2655	45.57	36.06	7.28	compliant
2682.5	45.53	35.73	7.39	compliant
16QAM-Modulation ANT3				
2627.5	45.28	33.73	7.45	compliant
2655	45.47	35.24	7.28	compliant
2682.5	45.44	34.99	7.39	compliant
16QAM-Modulation ANT4				
2627.5	45.43	34.91	7.48	compliant
2655	45.61	36.39	7.28	compliant
2682.5	45.55	35.89	7.39	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2627.5	51.44	139.46	-	compliant
2655	51.64	145.79	-	compliant
2682.5	51.57	143.60	-	compliant
64QAM-Modulation ANT1				
2627.5	45.61	36.39	7.51	compliant
2655	45.75	37.58	7.28	compliant
2682.5	45.65	36.73	7.42	compliant
64QAM-Modulation ANT2				

2627.5	45.40	34.67	7.51	compliant
2655	45.58	36.14	7.30	compliant
2682.5	45.57	36.06	7.42	compliant
64QAM-Modulation ANT3				
2627.5	45.27	33.65	7.48	compliant
2655	45.46	35.16	7.28	compliant
2682.5	45.42	34.83	7.42	compliant
64QAM-Modulation ANT4				
2627.5	45.41	34.75	7.51	compliant
2655	45.54	35.81	7.28	compliant
2682.5	45.57	36.06	7.42	compliant
64QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2627.5	51.44	139.47	-	compliant
2655	51.60	144.69	-	compliant
2682.5	51.57	143.68	-	compliant
256QAM-Modulation ANT1				
2627.5	45.61	36.39	7.54	compliant
2655	45.78	37.84	7.30	compliant
2682.5	45.64	36.64	7.42	compliant
256QAM-Modulation ANT2				
2627.5	45.38	34.51	7.54	compliant
2655	45.57	36.06	7.30	compliant
2682.5	45.53	35.73	7.42	compliant
256QAM-Modulation ANT3				
2627.5	45.32	34.04	7.51	compliant
2655	45.44	34.99	7.30	compliant
2682.5	45.44	34.99	7.42	compliant
256QAM-Modulation ANT4				
2627.5	45.39	34.59	7.54	compliant
2655	45.54	35.81	7.30	compliant
2682.5	45.49	35.40	7.40	compliant
256QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2627.5	51.45	139.54	-	compliant
2655	51.60	144.71	-	compliant
2682.5	51.55	142.77	-	compliant

Table 6 RF Power Output (15 MHz Channel BW)

Config D:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2630	45.65	36.73	7.57	compliant
2655	45.72	37.33	7.28	compliant
2680	45.68	36.98	7.42	compliant
QPSK-Modulation ANT2				
2630	45.46	35.16	7.57	compliant
2655	45.55	35.89	7.25	compliant
2680	45.52	35.65	7.42	compliant
QPSK-Modulation ANT3				
2630	45.33	34.12	7.57	compliant
2655	45.44	34.99	7.25	compliant
2680	45.42	34.83	7.42	compliant
QPSK-Modulation ANT4				
2630	45.42	34.83	7.59	compliant
2655	45.56	35.97	7.25	compliant
2680	45.52	35.65	7.42	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2630	51.49	140.84	-	compliant
2655	51.59	144.19	-	compliant
2680	51.56	143.11	-	compliant
16QAM-Modulation ANT1				
2630	45.61	36.39	7.57	compliant
2655	45.74	37.50	7.25	compliant
2680	45.70	37.15	7.39	compliant
16QAM-Modulation ANT2				
2630	45.43	34.91	7.59	compliant
2655	45.54	35.81	7.25	compliant
2680	45.52	35.65	7.42	compliant
16QAM-Modulation ANT3				
2630	45.34	34.20	7.57	compliant
2655	45.42	34.83	7.25	compliant
2680	45.41	34.75	7.42	compliant
16QAM-Modulation ANT4				
2630	45.48	35.32	7.59	compliant
2655	45.52	35.65	7.25	compliant

2680	45.50	35.48	7.42	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2630	51.49	140.82	-	compliant
2655	51.58	143.79	-	compliant
2680	51.55	143.03	-	compliant
64QAM-Modulation ANT1				
2630	45.62	36.48	7.57	compliant
2655	45.69	37.07	7.28	compliant
2680	45.65	36.73	7.45	compliant
64QAM-Modulation ANT2				
2630	45.43	34.91	7.59	compliant
2655	45.54	35.81	7.25	compliant
2680	45.52	35.65	7.42	compliant
64QAM-Modulation ANT3				
2630	45.32	34.04	7.54	compliant
2655	45.43	34.91	7.28	compliant
2680	45.44	34.99	7.45	compliant
64QAM-Modulation ANT4				
2630	45.43	34.91	7.57	compliant
2655	45.57	36.06	7.28	compliant
2680	45.54	35.81	7.42	compliant
64QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2630	51.47	140.34	-	compliant
2655	51.58	143.85	-	compliant
2680	51.56	143.18	-	compliant
256QAM-Modulation ANT1				
2630	45.59	36.22	7.57	compliant
2655	45.68	36.98	7.28	compliant
2680	45.67	36.90	7.40	compliant
256QAM-Modulation ANT2				
2630	45.42	34.83	7.57	compliant
2655	45.55	35.89	7.28	compliant
2680	45.51	35.56	7.42	compliant
256QAM-Modulation ANT3				
2630	45.35	34.28	7.54	compliant
2655	45.43	34.91	7.28	compliant
2680	45.42	34.83	7.42	compliant

256QAM-Modulation ANT4				
2630	45.43	34.91	7.57	compliant
2655	45.57	36.06	7.28	compliant
2680	45.54	35.81	7.42	compliant
256QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2630	51.47	140.25	-	compliant
2655	51.58	143.85	-	compliant
2680	51.56	143.10	-	compliant

Table 7 RF Power Output (20 MHz Channel BW)

Config E:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2622.5/2627.5	42.78/43.18	18.97/20.18	-	compliant
2652.5/2657.5	43.07/43.03	20.28/20.09	-	compliant
2682.5/2687.5	43.25/42.81	21.13/19.10	-	compliant
QPSK-Modulation ANT2				
2622.5/2627.5	42.66/43.00	18.45/19.95	-	compliant
2652.5/2657.5	42.97/42.94	19.82/19.68	-	compliant
2682.5/2687.5	43.05/42.61	20.28/18.24	-	compliant
QPSK-Modulation ANT3				
2622.5/2627.5	42.51/42.89	17.82/19.45	-	compliant
2652.5/2657.5	42.85/42.86	19.95/19.32	-	compliant
2682.5/2687.5	42.99/42.52	20.18/17.86	-	compliant
QPSK-Modulation ANT4				
2622.5/2627.5	42.60/43.01	18.20/20.00	-	compliant
2652.5/2657.5	43.00/43.02	19.95/20.04	-	compliant
2682.5/2687.5	43.05/42.60	20.18/18.20	-	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2622.5/2627.5	51.87	153.64	-	compliant
2652.5/2657.5	52.00	158.45	-	compliant
2682.5/2687.5	51.91	155.09	-	compliant
16QAM-Modulation ANT1				
2622.5/2627.5	42.80/43.10	19.05/20.42	-	compliant
2652.5/2657.5	43.06/43.04	20.23/20.14	-	compliant

2682.5/2687.5	43.41/43.09	21.93/20.37	-	compliant
16QAM-Modulation ANT2				
2622.5/2627.5	42.83/43.19	19.19/20.84	-	compliant
2652.5/2657.5	42.76/42.86	18.88/19.32	-	compliant
2682.5/2687.5	43.26/42.66	21.18/18.45	-	compliant
16QAM-Modulation ANT3				
2622.5/2627.5	42.77/43.15	18.92/20.65	-	compliant
2652.5/2657.5	42.67/42.67	18.49/18.49	-	compliant
2682.5/2687.5	43.15/42.72	20.65/18.71	-	compliant
16QAM-Modulation ANT4				
2622.5/2627.5	42.85/43.27	19.28/21.23	-	compliant
2652.5/2657.5	42.81/42.88	19.10/19.41	-	compliant
2682.5/2687.5	43.21/42.85	20.94/19.28	-	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2622.5/2627.5	52.03	159.59	-	compliant
2652.5/2657.5	51.88	154.06	-	compliant
2682.5/2687.5	52.08	161.51	-	compliant
64QAM-Modulation ANT1				
2622.5/2627.5	42.81/43.22	19.10/20.99	-	compliant
2652.5/2657.5	43.10/43.14	20.42/20.61	-	compliant
2682.5/2687.5	43.18/42.79	20.80/19.01	-	compliant
64QAM-Modulation ANT2				
2622.5/2627.5	42.64/43.07	18.37/20.28	-	compliant
2652.5/2657.5	42.99/42.92	19.91/19.59	-	compliant
2682.5/2687.5	43.07/42.62	20.28/18.28	-	compliant
64QAM-Modulation ANT3				
2622.5/2627.5	42.54/42.89	17.95/19.45	-	compliant
2652.5/2657.5	42.89/42.84	19.45/19.23	-	compliant
2682.5/2687.5	42.95/42.43	19.72/17.50	-	compliant
64QAM-Modulation ANT4				
2622.5/2627.5	42.62/42.99	18.28/19.91	-	compliant
2652.5/2657.5	42.95/42.98	19.72/19.86	-	compliant
2682.5/2687.5	43.06/42.59	20.23/18.16	-	compliant
64QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2622.5/2627.5	51.88	154.32	-	compliant
2652.5/2657.5	52.01	158.79	-	compliant
2682.5/2687.5	51.87	153.97	-	compliant

256QAM-Modulation ANT1				
2622.5/2627.5	42.78/43.28	18.97/21.28	-	compliant
2652.5/2657.5	43.15/43.14	20.65/20.61	-	compliant
2682.5/2687.5	43.21/42.90	20.94/19.50	-	compliant
256QAM-Modulation ANT2				
2622.5/2627.5	42.53/42.98	17.91/19.86	-	compliant
2652.5/2657.5	42.91/42.94	19.54/19.68	-	compliant
2682.5/2687.5	43.05/42.57	20.18/18.07	-	compliant
256QAM-Modulation ANT3				
2622.5/2627.5	42.44/42.91	17.54/19.82	-	compliant
2652.5/2657.5	42.83/42.81	19.19/19.10	-	compliant
2682.5/2687.5	42.92/42.45	19.59/17.58	-	compliant
256QAM-Modulation ANT4				
2622.5/2627.5	42.54/42.97	17.95/19.82	-	compliant
2652.5/2657.5	42.94/42.91	19.68/19.54	-	compliant
2682.5/2687.5	43.04/42.64	20.14/18.37	-	compliant
256QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2622.5/2627.5	51.84	152.84	-	compliant
2652.5/2657.5	51.99	157.99	-	compliant
2682.5/2687.5	51.89	154.37	-	compliant

Table 8 RF Power Output (5+5 MHz Channel BW)

Config F:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2625/2635	43.02/43.33	20.04/21.53	-	compliant
2650/2660	43.26/43.28	21.18/21.28	-	compliant
2675/2685	43.49/42.97	22.34/19.82	-	compliant
QPSK-Modulation ANT2				
2625/2635	42.83/43.16	19.19/20.70	-	compliant
2650/2660	43.03/43.09	20.09/20.37	-	compliant
2675/2685	43.27/42.85	21.23/19.82	-	compliant
QPSK-Modulation ANT3				
2625/2635	42.83/43.11	19.19/20.46	-	compliant
2650/2660	42.98/42.98	19.86/19.86	-	compliant
2675/2685	43.19/42.73	20.84/18.75	-	compliant
QPSK-Modulation ANT4				

2625/2635	42.91/43.15	19.54/20.65	-	compliant
2650/2660	43.01/43.10	20.00/20.42	-	compliant
2675/2685	43.27/42.78	21.23/18.97	-	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2625/2635	52.08	161.31	-	compliant
2650/2660	52.12	163.06	-	compliant
2675/2685	52.12	162.99	-	compliant
16QAM-Modulation ANT1				
2625/2635	43.05/43.28	20.18/21.28	-	compliant
2650/2660	43.18/43.24	20.80/21.09	-	compliant
2675/2685	43.47/42.99	22.23/19.91	-	compliant
16QAM-Modulation ANT2				
2625/2635	42.91/43.17	19.54/20.75	-	compliant
2650/2660	43.02/43.02	20.04/20.04	-	compliant
2675/2685	43.25/42.72	21.13/18.71	-	compliant
16QAM-Modulation ANT3				
2625/2635	42.70/43.02	18.62/20.04	-	compliant
2650/2660	42.97/42.91	19.82/19.54	-	compliant
2675/2685	43.19/42.69	20.84/18.58	-	compliant
16QAM-Modulation ANT4				
2625/2635	42.81/43.05	19.10/20.18	-	compliant
2650/2660	42.97/43.09	19.82/20.37	-	compliant
2675/2685	43.32/42.85	21.48/19.28	-	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2625/2635	52.03	159.71	-	compliant
2650/2660	52.08	161.52	-	compliant
2675/2685	52.10	162.16	-	compliant
64QAM-Modulation ANT1				
2625/2635	43.04/43.25	20.14/21.13	-	compliant
2650/2660	43.21/43.27	20.94/21.23	-	compliant
2675/2685	43.48/43.05	22.28/20.18	-	compliant
64QAM-Modulation ANT2				
2625/2635	42.83/43.12	19.19/20.58	-	compliant
2650/2660	42.99/43.06	19.91/20.23	-	compliant
2675/2685	43.20/42.78	20.89/18.97	-	compliant
64QAM-Modulation ANT3				
2625/2635	42.74/43.00	18.79/19.95	-	compliant

2650/2660	42.94/42.99	19.68/19.91	-	compliant
2675/2685	43.20/42.66	20.89/18.45	-	compliant
64QAM-Modulation ANT4				
2625/2635	42.82/43.09	19.14/20.37	-	compliant
2650/2660	43.05/43.09	20.18/20.37	-	compliant
2675/2685	43.26/42.84	21.18/19.23	-	compliant
64QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2625/2635	52.02	159.23	-	compliant
2650/2660	52.11	162.45	-	compliant
2675/2685	52.10	162.09	-	compliant
256QAM-Modulation ANT1				
2625/2635	43.00/43.25	19.95/21.13	-	compliant
2650/2660	43.28/43.31	21.28/21.43	-	compliant
2675/2685	43.49/42.99	22.34/19.91	-	compliant
256QAM-Modulation ANT2				
2625/2635	42.85/43.10	19.28/20.42	-	compliant
2650/2660	42.99/43.00	19.91/19.95	-	compliant
2675/2685	43.22/42.83	20.99/19.19	-	compliant
256QAM-Modulation ANT3				
2625/2635	42.74/42.94	18.79/19.68	-	compliant
2650/2660	42.90/42.89	19.5019.45	-	compliant
2675/2685	43.14/42.63	20.65/18.32	-	compliant
256QAM-Modulation ANT4				
2625/2635	42.76/43.02	18.88/20.04	-	compliant
2650/2660	43.00/43.02	19.95/20.04	-	compliant
2675/2685	43.28/42.79	21.28/19.01	-	compliant
256QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2625/2635	51.99	158.18	-	compliant
2650/2660	52.08	161.52	-	compliant
2675/2685	52.09	161.64	-	compliant

Table 9 RF Power Output (10+10MHz channel BW)

Config G:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2627.5/2642.5	43.01/43.31	20.00/21.43	-	compliant

2647.5/2662.5	43.19/43.27	20.84/21.23	-	compliant
2667.5/2682.5	43.46/43.03	22.18/20.09	-	compliant
QPSK-Modulation ANT2				
2627.5/2642.5	42.85/43.08	19.28/20.32	-	compliant
2647.5/2662.5	43.01/43.12	20.00/20.51	-	compliant
2667.5/2682.5	43.27/42.88	21.23/19.41	-	compliant
QPSK-Modulation ANT3				
2627.5/2642.5	42.81/42.92	19.10/19.59	-	compliant
2647.5/2662.5	42.92/43.01	19.59/20.00	-	compliant
2667.5/2682.5	43.21/42.78	20.94/18.97	-	compliant
QPSK-Modulation ANT4				
2627.5/2642.5	42.92/43.08	19.59/20.32	-	compliant
2647.5/2662.5	43.09/43.11	20.37/20.46	-	compliant
2667.5/2682.5	43.33/42.90	21.53/19.50	-	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2627.5/2642.5	52.03	159.63	-	compliant
2647.5/2662.5	52.12	163.01	-	compliant
2667.5/2682.5	52.14	163.85	-	compliant
16QAM-Modulation ANT1				
2627.5/2642.5	42.92/43.09	19.59/20.37	-	compliant
2647.5/2662.5	43.25/43.18	21.13/20.80	-	compliant
2667.5/2682.5	43.60/43.09	22.91/20.37	-	compliant
16QAM-Modulation ANT2				
2627.5/2642.5	42.85/43.20	19.28/20.89	-	compliant
2647.5/2662.5	42.99/43.24	19.91/21.09	-	compliant
2667.5/2682.5	43.18/42.74	20.80/18.79	-	compliant
16QAM-Modulation ANT3				
2627.5/2642.5	42.82/42.84	19.14/19.23	-	compliant
2647.5/2662.5	42.74/43.02	18.79/20.04	-	compliant
2667.5/2682.5	43.11/42.59	20.46/18.16	-	compliant
16QAM-Modulation ANT4				
2627.5/2642.5	42.71/42.92	18.66/19.59	-	compliant
2647.5/2662.5	43.33/43.17	21.53/20.75	-	compliant
2667.5/2682.5	43.12/42.70	20.51/18.62	-	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2627.5/2642.5	51.95	156.75	-	compliant
2647.5/2662.5	52.15	164.04	-	compliant

2667.5/2682.5	52.06	160.62	-	compliant
64QAM-Modulation ANT1				
2627.5/2642.5	43.05/43.22	20.18/20.99	-	compliant
2647.5/2662.5	43.18/43.25	20.80/21.13	-	compliant
2667.5/2682.5	43.40/43.09	21.88/20.37	-	compliant
64QAM-Modulation ANT2				
2627.5/2642.5	42.87/43.05	19.36/20.18	-	compliant
2647.5/2662.5	43.04/43.11	20.14/20.46	-	compliant
2667.5/2682.5	43.27/42.88	21.23/19.41	-	compliant
64QAM-Modulation ANT3				
2627.5/2642.5	42.76/42.86	18.88/19.32	-	compliant
2647.5/2662.5	42.83/42.95	19.19/19.72	-	compliant
2667.5/2682.5	43.18/42.75	20.80/18.84	-	compliant
64QAM-Modulation ANT4				
2627.5/2642.5	42.86/43.10	19.32/20.42	-	compliant
2647.5/2662.5	43.05/43.08	20.18/20.32	-	compliant
2667.5/2682.5	43.31/42.87	21.43/19.36	-	compliant
64QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2627.5/2642.5	52.00	158.66	-	compliant
2647.5/2662.5	52.09	161.95	-	compliant
2667.5/2682.5	52.13	163.32	-	compliant
256QAM-Modulation ANT1				
2627.5/2642.5	43.05/43.27	20.18/21.23	-	compliant
2647.5/2662.5	43.26/43.27	21.18/21.23	-	compliant
2667.5/2682.5	43.45/43.06	22.13/20.23	-	compliant
256QAM-Modulation ANT2				
2627.5/2642.5	42.87/43.10	19.36/20.42	-	compliant
2647.5/2662.5	42.99/43.06	19.91/20.23	-	compliant
2667.5/2682.5	43.25/42.79	21.13/19.01	-	compliant
256QAM-Modulation ANT3				
2627.5/2642.5	42.70/42.92	18.62/19.59	-	compliant
2647.5/2662.5	42.86/42.89	19.32/19.45	-	compliant
2667.5/2682.5	43.12/42.70	20.51/18.62	-	compliant
256QAM-Modulation ANT4				
2627.5/2642.5	42.88/43.05	19.41/20.18	-	compliant
2647.5/2662.5	42.96/43.07	19.77/20.28	-	compliant
2667.5/2682.5	43.28/42.86	21.28/19.32	-	compliant
256QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				

2627.5/2642.5	52.01	159.00	-	compliant
2647.5/2662.5	52.08	161.37	-	compliant
2667.5/2682.5	52.10	162.24	-	compliant

Table 10 RF Power Output (15+15MHz channel BW)

Config H:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2630/2650	43.03/43.30	20.09/21.38	-	compliant
2645/2665	43.25/43.33	21.13/21.53	-	compliant
2660/2680	43.42/43.14	21.98/20.61	-	compliant
QPSK-Modulation ANT2				
2630/2650	42.90/43.05	19.50/20.18	-	compliant
2645/2665	43.10/43.20	20.42/20.89	-	compliant
2660/2680	43.11/42.93	20.46/19.63	-	compliant
QPSK-Modulation ANT3				
2630/2650	42.94/43.12	19.68/20.51	-	compliant
2645/2665	43.02/43.15	20.04/20.65	-	compliant
2660/2680	43.21/42.85	20.94/19.28	-	compliant
QPSK-Modulation ANT4				
2630/2650	42.95/43.14	19.72/20.61	-	compliant
2645/2665	43.00/43.11	19.95/20.46	-	compliant
2660/2680	43.18/42.91	20.80/19.54	-	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2630/2650	52.09	161.67	-	compliant
2645/2665	52.18	165.09	-	compliant
2660/2680	52.13	163.24	-	compliant
16QAM-Modulation ANT1				
2630/2650	42.99/43.19	19.91/20.84	-	compliant
2645/2665	43.30/43.35	21.38/21.63	-	compliant
2660/2680	43.38/43.02	21.78/20.04	-	compliant
16QAM-Modulation ANT2				
2630/2650	42.99/43.16	19.91/20.70	-	compliant
2645/2665	43.20/43.27	20.89/21.23	-	compliant
2660/2680	43.25/42.91	21.13/19.54	-	compliant
16QAM-Modulation ANT3				

2630/2650	42.71/42.94	18.66/19.68	-	compliant
2645/2665	42.88/43.09	19.41/20.37	-	compliant
2660/2680	42.98/42.64	19.86/18.37	-	compliant
16QAM-Modulation ANT4				
2630/2650	42.82/43.21	19.14/20.94	-	compliant
2645/2665	43.06/43.10	20.23/20.42	-	compliant
2660/2680	43.35/42.95	21.63/19.72	-	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2630/2650	52.04	159.79	-	compliant
2645/2665	52.19	165.56	-	compliant
2660/2680	52.10	162.08	-	compliant
64QAM-Modulation ANT1				
2630/2650	43.11/43.35	20.46/21.63	-	compliant
2645/2665	43.27/43.33	21.23/21.53	-	compliant
2660/2680	43.41/43.17	21.93/20.75	-	compliant
64QAM-Modulation ANT2				
2630/2650	42.85/43.13	19.28/20.56	-	compliant
2645/2665	42.99/43.15	19.91/20.65	-	compliant
2660/2680	43.15/42.87	20.65/19.36	-	compliant
64QAM-Modulation ANT3				
2630/2650	42.86/43.06	19.32/20.23	-	compliant
2645/2665	42.93/43.03	19.63/20.09	-	compliant
2660/2680	43.12/42.83	20.51/19.19	-	compliant
64QAM-Modulation ANT4				
2630/2650	42.84/43.13	19.23/20.56	-	compliant
2645/2665	43.01/43.09	20.00/20.37	-	compliant
2660/2680	43.12/42.93	20.51/19.63	-	compliant
64QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2630/2650	52.08	161.27	-	compliant
2645/2665	52.13	163.41	-	compliant
2660/2680	52.11	162.54	-	compliant
256QAM-Modulation ANT1				
2630/2650	43.15/43.32	20.65/21.48	-	compliant
2645/2665	43.30/43.45	21.38/22.13	-	compliant
2660/2680	43.44/43.15	22.08/20.65	-	compliant
256QAM-Modulation ANT2				
2630/2650	42.86/43.09	19.32/20.37	-	compliant

2645/2665	43.02/43.08	20.04/20.32	-	compliant
2660/2680	43.24/42.87	21.09/19.36	-	compliant
256QAM-Modulation ANT3				
2630/2650	42.76/43.03	18.88/20.09	-	compliant
2645/2665	42.93/43.02	19.63/20.04	-	compliant
2660/2680	43.09/42.78	20.37/18.97	-	compliant
256QAM-Modulation ANT4				
2630/2650	42.87/43.10	19.36/20.42	-	compliant
2645/2665	42.91/43.07	19.54/20.28	-	compliant
2660/2680	43.18/42.90	20.80/19.50	-	compliant
256QAM-Modulation ANT1+ANT2+ANT3+ANT4 Calculated Total				
2630/2650	52.06	160.57	-	compliant
2645/2665	52.13	163.38	-	compliant
2660/2680	52.12	162.82	-	compliant

Table 11 RF Power Output (20+20MHz channel BW)

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

Test No. 2: Spurious Emissions at Antenna Terminals (§ 2.1051, § 2.1057, § 27.53) and Transmitter unwanted emissions (RSS-199, RSS-Gen)

4.1.2. Limits

Para. No. 27.53(m). 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.

(m)(2) For digital base stations, the attenuation shall be not less than 43 + 10 log10 (P) dB.

RSS-199 para. No. 4.5 (a) For base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least 43 + 10 log10 p.

The compliance limit was calculated in the following way:

Maximum transmitter output power [W]:	P
Maximum transmitter output power [dBm]:	30 + 10 log10 P (conversion from W to dBm)
Attenuation required by FCC and IC:	43 + 10 log10 P

Compliance limit = Maximum transmitter output power - Required attenuation

= 30 + 10 log10 P - (43 + 10 log10 P) = <u>-13 dBm</u>

For MiMo output each antenna connectors were measured individually and each individual limit line was reduced by additional 10log(4) -6.02dB (four way MiMo config) and limit line was calculated to show -19.02dB emission limit, according to FCC KDB 662911 D02 guidance.

4.1.3. Test Procedure and Results

The tests were carried out in accordance with § 27.53. For all frequency ranges except two (immediately below and above the carrier frequency block). Resolution bandwidth of atleast 1% of OBW or greater was employed.

In the 1MHz bands immediately outside and adjacent to the authorized frequency range or channel, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter was employed.

RSS-199 para. No. 4.5 In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment,

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

According RSS-Gen para. No. 6.13 In measuring unwanted emissions, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency given below:

(a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency were investigated.

The following tables summarize the worst case detected emission levels in all antenna ports (see screenshots of highest emission antenna on page 61 for details). The external attenuation (cable loss of the set up) is already added in the results. Limit line is set fixed to level -19.02dB.

Measured laboratory room temperature and humidity during the tests				
Date	Temperature Min-Max:		Humidity Min-Max:	
3 Dec 2018 – 29 Jan 2019	20.2°C	24.1°C	3.8 RH%	24.9 RH%

Config A Lower band edge:

Carrier Frequency: 2622.5 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1			
	2620	-29.66	compliant
QPSK-Modulation ANT2			
	2620	-30.53	compliant
QPSK-Modulation ANT3			
	2620	-30.47	compliant
QPSK-Modulation ANT4			
	2619	-29.52	compliant
16QAM-Modulation ANT1			
	2620	-29.64	compliant
16QAM-Modulation ANT2			
	2620	-30.15	compliant
16QAM-Modulation ANT3			
	2620	-30.86	compliant
16QAM-Modulation ANT4			
	2620	-31.03	compliant
64QAM-Modulation ANT1			

	2620	-29.88	compliant
64QAM-Modulation ANT2			
	2620	-30.08	compliant
64QAM-Modulation ANT3			
	2620	-30.49	compliant
64QAM-Modulation ANT4			
	2620	-30.47	compliant
256QAM-Modulation ANT1			
	2620	-29.33	compliant
256QAM-Modulation ANT2			
	2620	-29.33	compliant
256QAM-Modulation ANT3			
	2620	-30.65	compliant
256QAM-Modulation ANT4			
	2620	-29.75	compliant
Measurement Uncertainty:		f < 1.0GHz: ±1.1dB, 1.0GHz ≤ f <3.6GHz: ±1.2dB, 3.6GHz ≤ f <8.0GHz: ±1.6dB, 8.0GHz ≤ f: ±1.9dB	

Table 20 Spurious Emissions (Lower band edge) (5 MHz CH BW)

Config A Upper band edge:

Carrier Frequency: 2687.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2690	-28.88	compliant
QPSK-Modulation ANT2			
	2690	-28.47	compliant
QPSK-Modulation ANT3			
	2690	-28.74	compliant
QPSK-Modulation ANT4			
	2690	-29.02	compliant
16QAM-Modulation ANT1			
	2690	-28.81	compliant
16QAM-Modulation ANT2			

	2690	-29.38	compliant
16QAM-Modulation ANT3			
	2690	-29.74	compliant
16QAM-Modulation ANT4			
	2690	-28.27	compliant
64QAM-Modulation ANT1			
	2690	-28.70	compliant
64QAM-Modulation ANT2			
	2690	-28.39	compliant
64QAM-Modulation ANT3			
	2690	-28.83	compliant
64QAM-Modulation ANT4			
	2690	-28.95	compliant
256QAM-Modulation ANT1			
	2690	-28.74	compliant
256QAM-Modulation ANT2			
	2690	-28.82	compliant
256QAM-Modulation ANT3			
	2690	-29.17	compliant
256QAM-Modulation ANT4			
	2690	-28.74	compliant

Table 21 Spurious Emissions (Upper band edge) (5 MHz CH BW)

Config A Spurious emissions:

Carrier Frequency: 2655 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1			
0.009 – 26900	2659	-22.59	compliant
QPSK-Modulation ANT2			
0.009 – 26900	2660	-23.42	compliant
QPSK-Modulation ANT3			
0.009 – 26900	2659	-19.33	compliant
QPSK-Modulation ANT4			
0.009 – 26900	2659	-23.17	compliant
16QAM-Modulation ANT1			
0.009 – 26900	2659	-22.07	compliant

16QAM-Modulation ANT2			
0.009 – 26900	2659	-22.66	compliant
16QAM-Modulation ANT3			
0.009 – 26900	2659	-22.05	compliant
16QAM-Modulation ANT4			
0.009 – 26900	2659	-22.51	compliant
64QAM-Modulation ANT1			
0.009 – 26900	2659	-21.94	compliant
64QAM-Modulation ANT2			
0.009 – 26900	2659	-20.33	compliant
64QAM-Modulation ANT3			
0.009 – 26900	2659	-22.18	compliant
64QAM-Modulation ANT4			
0.009 – 26900	2659	-19.90	compliant
256QAM-Modulation ANT1			
0.009 – 26900	2651	-22.77	compliant
256QAM-Modulation ANT2			
0.009 – 26900	2659	-20.36	compliant
256QAM-Modulation ANT3			
0.009 – 26900	2659	-23.40	compliant
256QAM-Modulation ANT4			
0.009 – 26900	2659	-22.29	compliant
Measurement Uncertainty:		f < 1.0GHz: ±1.1dB, 1.0GHz ≤ f <3.6GHz: ±1.2dB, 3.6GHz ≤ f <8.0GHz: ±1.6dB, 8.0GHz ≤ f: ±1.9dB	

Table 22 Spurious Emissions (5 MHz Channel BW)

Config B Lower band edge:

Carrier Frequency: 2625 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1			
	2620	-31.67	compliant
QPSK-Modulation ANT2			
	2620	-33..41	compliant
QPSK-Modulation ANT3			
	2620	-29.57	compliant

QPSK-Modulation ANT4			
	2620	-32.39	compliant
16QAM-Modulation ANT1			
	2620	-32.20	compliant
16QAM-Modulation ANT2			
	2620	-33.09	compliant
16QAM-Modulation ANT3			
	2620	-30.44	compliant
16QAM-Modulation ANT4			
	2620	-32.66	compliant
64QAM-Modulation ANT1			
	2620	-32.21	compliant
64QAM-Modulation ANT2			
	2620	-33.12	compliant
64QAM-Modulation ANT3			
	2620	-32.66	compliant
64QAM-Modulation ANT4			
	2620	-33.09	compliant
256QAM-Modulation ANT1			
	2620	-31.69	compliant
256QAM-Modulation ANT2			
	2620	-30.53	compliant
256QAM-Modulation ANT3			
	2620	-33.25	compliant
256QAM-Modulation ANT4			
	2620	-32.53	compliant
Measurement Uncertainty:		f < 1.0GHz: ±1.1dB, 1.0GHz ≤ f <3.6GHz: ±1.2dB, 3.6GHz ≤ f <8.0GHz: ±1.6dB, 8.0GHz ≤ f: ±1.9dB	

Table 23 Spurious Emissions (Lower band edge) (10 MHz CH BW)

Config B Upper band edge:

Carrier Frequency: 2685 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2690	-30.13	compliant

QPSK-Modulation ANT2			
	2690	-30.96	compliant
QPSK-Modulation ANT3			
	2690	-30.54	compliant
QPSK-Modulation ANT4			
	2690	-32.10	compliant
16QAM-Modulation ANT1			
	2690	-29.64	compliant
16QAM-Modulation ANT2			
	2690	-30.39	compliant
16QAM-Modulation ANT3			
	2690	-29.59	compliant
16QAM-Modulation ANT4			
	2690	-30.92	compliant
64QAM-Modulation ANT1			
	2690	-29.58	compliant
64QAM-Modulation ANT2			
	2690	-31.23	compliant
64QAM-Modulation ANT3			
	2690	-30.93	compliant
64QAM-Modulation ANT4			
	2690	-29.73	compliant
256QAM-Modulation ANT1			
	2690	-28.08	compliant
256QAM-Modulation ANT2			
	2690	-30.81	compliant
256QAM-Modulation ANT3			
	2690	-28.98	compliant
256QAM-Modulation ANT4			
	2690	-31.53	compliant
Measurement Uncertainty:		f < 1.0GHz: ±1.1dB, 1.0GHz ≤ f <3.6GHz: ±1.2dB, 3.6GHz ≤ f <8.0GHz: ±1.6dB, 8.0GHz ≤ f: ±1.9dB	

Table 24 Spurious Emissions (Upper band edge) (10 MHz CH BW)

Config B Spurious emissions:

Carrier Frequency: 2655 MHz