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Report On

Radio Testing of the
Nokia Solutions and Networks Oy
Flexi Zone BTS 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: VBNFWHD-01

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Document 75927959 Report 01 Issue 1

December 2014

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SECTION 1

REPORT SUMMARY

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

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 Zone BTS 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)	FWHD
Serial Number(s)	RY143503123
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2013) FCC CFR 47 Part 27 (2013)
Order Number Date	KGR/90553653 23 September 2014
Start of Test	06 October 2014
Finish of Test	12 November 2014
Name of Engineer(s)	Kimmo Huuki 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: D522886124

Product Service

Nokia Networks

TEST REPORT NO: D522886124

FCC ID: VBNFWHD-01

Date:	Nov 11. Oct 2014
Pages:	212
Appendices:	-

Equipment Under Test:	Flexi Zone BTS 2.6GHz Radio Access technology: E-UTRA (TDD)
Type:	FWHD
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 (2013) and FCC 47 CFR part 27 (2013)
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	04.12. 2014	

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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:

Test No.	Measurement	FCC Rule	Page Number of this Report	Result
1	RF Power Output	§ 2.1046, § 27.50		compliant
2	Modulation Characteristics	§ 2.1047, § 2.201		compliant
3	Occupied Bandwidth	§ 2.1049		compliant
4	Spurious Emissions at Antenna Terminals	§ 2.1051, § 2.1057, § 27.53		compliant
5	Field Strength of Spurious Radiation	§ 2.1053, § 2.1057, § 27.53, § 27.55		compliant
6	Frequency Stability	§ 2.1055, § 27.54		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 v01r02 and FCC OET KDB:971168 D01 Power Meas License Digital Systems v02r01.

1.1 Test Laboratory

Nokia Solutions and Networks Oy

Kaapelitie 4,

FI-90620, Oulu, Finland

Jari Virta

FCC Reg. No: 411251

1.2 Time Schedule

Test No.	1, 2, 3, 4	5	6
Start of Test:	06.10.2014	13.10.2014	06.11.2014
End of Test:	14.11.2014	07.11.2014	12.11.2014

1.3 Participants

Name	Function	Signature
Kimmo Huuki (NSN)	Testing, Setup of EUT	
Jari Veijola (NSN)	Testing, Setup of EUT	

2. EQUIPMENT UNDER TEST

The EUT is a LTE Base transceiver station Flexi Zone BTS 2.6GHz 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 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

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

Module Type	**Flexi Zone BTS 2.6GHz**	
Radio Access Technology	E-UTRA	
Duplex mode	Time Division Duplex (TDD)	
Channel Bandwidth	Single carrier 10MHz (Config. A), Dual carrier 10MHz (Config. B), Single carrier 15MHz (Config. C), Dual carrier 15MHz (Config. D), Single carrier 20MHz (Config. E), Dual carrier 20MHz (Config. F).	
Supply Voltage	120 V AC	
Frequency Bands		
Channel Bandwidth **10MHz**	**Lowest** tunable freq. Singe carrier	2501.1MHz
	Dual carriers	2501.0/2511.0MHz
	Middle freq. Single carrier	2593.0MHz
	Dual carriers	2588.0/2598.0MHz
	Highest tunable freq. Single carrier	2685.0MHz
	Dual carriers	2675.0/2685.0MHz
Channel Bandwidth **15MHz**	**Lowest** tunable freq. Singe carrier	2503.5MHz
	Dual carriers	2503.5.0/2518.5MHz
	Middle freq. Single carrier	2593.0MHz
	Dual carriers	2585.5/2600.5MHz
	Highest tunable freq. Single carrier	2682.5MHz
	Dual carriers	2667.5/2682.5.0MHz
Channel Bandwidth **20MHz**	**Lowest** tunable freq. Singe carrier	2506.0MHz
	Dual carriers	2506.0/2526.0MHz
	Middle freq. Single carrier	2593.0MHz
	Dual carriers	2583.0/2603.0MHz
	Highest tunable freq. Single carrier	2680.0MHz
	Dual carriers	2660.0/2680.0MHz
Single carrier		
Rated Output Power (Prat)	5W (37.0dBm) conducted / carrier	
Dual carrier		
Rated Output Power (Prat)	2.5W (34.0dBm) conducted / carrier	
Downlink/Uplink ratio	6/3 to 8/1	
	RX	**TX**
Number of Antenna Ports	4 (ANT1/Main/Div to ANT2/Main/Div)	4 (ANT1/Main/Div to ANT2/Main/Div)
MiMo	Yes	Yes

Table 2 Overview of EUT configuration

The tests were performed with one EUT at the antenna ports ANT1/Main, ANT1/Div, ANT2/Main, ANT2/Div.

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

Module Name	Serial-No.	Module Type	Config.	Antenna
FWHD	RY143503123	472852A.X21	A, C, E	Ant1/Main
FWHD	RY143503123	472852A.X21	A, C, E	Ant1/Div
FWHD	RY143503123	472852A.X21	A, B, C, D, E, F	Ant2/Main
FWHD	RY143503123	472852A.X21	A, B, C, D, E, F	Ant2/Div

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 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

Lowest frequency channel in 10MHz (config A), single carrier is 2501.1MHz and highest 2685MHz. In dual 10MHz carrier case (config B) the lowest frequency is 2501MHz and highest is 2685MHz.

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).

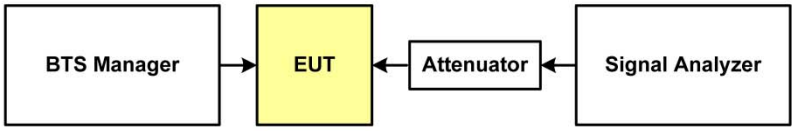

Figure 1 Test Configuration (single output)

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 53 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)

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 = h~2667W

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 (see screenshots). 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.

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

Config A:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1/Main				
2501.1	36.71	4.68813	7.48	compliant
2593.0	36.31	4.27563	7.45	compliant
2685.0	35.92	3.90841	7.48	compliant
QPSK-Modulation ANT1/Div				
2501.1	36.38	4.34510	7.48	compliant
2593.0	36.34	4.30527	7.45	compliant
2685.0	35.80	3.80189	7.48	compliant
QPSK-Modulation ANT2/Main				
2501.1	36.32	4.28549	7.48	compliant
2593.0	36.67	4.64515	7.45	compliant
2685.0	36.24	4.20727	7.48	compliant
QPSK-Modulation ANT2/Div				
2501.1	36.45	4.41570	7.50	compliant
2593.0	36.83	4.81948	7.45	compliant
2685.0	35.99	3.97192	7.45	compliant
QPSK-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2501.1	42.48817	17.73443	-	compliant
2593.0	42.56370	18.04553	-	compliant
2685.0	42.01110	15.88948	-	compliant
16QAM-Modulation ANT1/Main				
2501.1	36.61	4.58142	7.45	compliant
2593.0	36.41	4.37522	7.42	compliant
2685.0	35.92	3.90841	7.45	compliant
16QAM-Modulation ANT1/Div				
2501.1	36.50	4.46684	7.45	compliant
2593.0	36.40	4.36516	7.42	compliant
2685.0	35.81	3.81066	7.45	compliant
16QAM-Modulation ANT2/Main				
2501.1	36.29	4.25598	7.45	compliant
2593.0	36.58	4.54988	7.42	compliant
2685.0	36.19	4.15911	7.42	compliant
16QAM-Modulation ANT2/Div				
2501.1	36.34	4.30527	7.45	compliant
2593.0	36.69	4.66659	7.42	compliant
2685.0	36.06	4.03645	7.42	compliant
16QAM-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2501.1	42.45747	17.60951	-	compliant
2593.0	42.54230	17.95685	-	compliant
2685.0	42.01796	15.91463	-	compliant
64QAM-Modulation ANT1/Main				
2501.1	36.61	4.58142	7.48	compliant
2593.0	36.33	4.29536	7.48	compliant
2685.0	35.91	3.89942	7.48	compliant
64QAM-Modulation ANT1/Div				
2501.1	36.37	4.33511	7.48	compliant

2593.0	36.37	4.33511	7.45	compliant
2685.0	35.82	3.81944	7.51	compliant
64QAM-Modulation ANT2/Main				
2501.1	36.35	4.31519	7.51	compliant
2593.0	36.71	4.68813	7.45	compliant
2685.0	36.24	4.20727	7.42	compliant
64QAM-Modulation ANT2/Div				
2501.1	36.30	4.26580	7.45	compliant
2593.0	36.63	4.60257	7.45	compliant
2685.0	36.16	4.13048	7.48	compliant
64QAM-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2501.1	42.42976	17.49751	-	compliant
2593.0	42.53366	17.92117	-	compliant
2685.0	42.05654	16.05660	-	compliant

Table 4 RF Power Output (10 MHz Channel BW)

Config B:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT2/Main				
2501.0/2511.0	33.36/33.90	2.16770/2.18273	7.57	compliant
2588.0/2598.0	33.69/33.54	2.33884/2.25944	7.48	compliant
2675.0/2685.0	33.56/32.89	2.26986/1.94536	7.51	compliant
QPSK-Modulation ANT2/Div				
2501.0/2511.0	33.41/33.62	2.19280/2.30144	7.51	compliant
2588.0/2598.0	33.38/33.29	2.17771/2.13304	7.51	compliant
2675.0/2685.0	33.45/32.84	2.21309/1.92309	7.48	compliant
QPSK-Modulation ANT2/Main+ANT2/Div Calculated Total				
2501.0/2511.0	39.46682	8.84468	-	compliant
2588.0/2598.0	39.49830	8.90903	-	compliant
2675.0/2685.0	39.21760	8.35141	-	compliant
16QAM-Modulation ANT2/Main				
2501.0/2511.0	33.37/33.88	2.17270/2.44343	7.51	compliant
2588.0/2598.0	33.77/33.55	2.38232/2.26464	7.48	compliant
2675.0/2685.0	33.55/32.92	2.26464/1.95884	7.45	compliant
16QAM-Modulation ANT2/Div				
2501.0/2511.0	33.42/33.61	2.19786/2.29615	7.48	compliant
2588.0/2598.0	33.39/33.34	2.18273/2.15774	7.45	compliant
2675.0/2685.0	33.48/32.80	2.22844/1.90546	7.45	compliant
16QAM-Modulation ANT2/Main+ANT2/Div Calculated Total				
2501.0/2511.0	39.59525	9.11014	-	compliant
2588.0/2598.0	39.53636	8.98744	-	compliant
2675.0/2685.0	39.22070	8.35738	-	compliant
64QAM-Modulation ANT2/Main				
2501.0/2511.0	33.41/33.84	2.19280/2.42103	7.51	compliant
2588.0/2598.0	33.73/33.56	2.36048/2.26986	7.45	compliant
2675.0/2685.0	33.51/32.88	2.24388/1.94089	7.48	compliant
64QAM-Modulation ANT2/Div				
2501.0/2511.0	33.35/33.62	2.16272/2.30144	7.51	compliant
2588.0/2598.0	33.45/33.31	2.21309/2.14289	7.48	compliant
2675.0/2685.0	33.41/32.78	2.19280/1.89671	7.54	compliant

64QAM-Modulation ANT2/Main+ANT2/Div Calculated Total				
2501.0/2511.0	39.57990	9.07799	-	compliant
2588.0/2598.0	39.53582	8.98633	-	compliant
2675.0/2685.0	39.17730	8.27428	-	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/Main				
2503.5	36.86	4.85289	7.51	compliant
2593.0	36.42	4.38531	7.45	compliant
2682.5	36.34	4.30527	7.48	compliant
QPSK-Modulation ANT1/Div				
2503.5	36.69	4.66659	7.51	compliant
2593.0	36.53	4.49780	7.51	compliant
2682.5	36.81	4.79733	7.51	compliant
QPSK-Modulation ANT2/Main				
2503.5	36.76	4.74242	7.51	compliant
2593.0	36.67	4.64515	7.48	compliant
2682.5	36.12	4.09261	7.48	compliant
QPSK-Modulation ANT2/Div				
2503.5	36.51	4.47713	7.45	compliant
2593.0	36.38	4.34510	7.45	compliant
2682.5	36.04	4.01791	7.48	compliant
QPSK-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2503.5	42.72747	18.73903	-	compliant
2593.0	42.52206	17.87336	-	compliant
2682.5	42.35859	17.21312	-	compliant
16QAM-Modulation ANT1/Main				
2503.5	36.88	4.87528	7.45	compliant
2593.0	36.46	4.42588	7.42	compliant
2682.5	36.57	4.53942	7.42	compliant
16QAM-Modulation ANT1/Div				
2503.5	36.73	4.70977	7.45	compliant
2593.0	36.51	4.47713	7.45	compliant
2682.5	36.13	4.10204	7.42	compliant
16QAM-Modulation ANT2/Main				
2503.5	36.68	4.65586	7.48	compliant
2593.0	36.66	4.63447	7.45	compliant
2682.5	36.14	4.11150	7.42	compliant
16QAM-Modulation ANT2/Div				
2503.5	36.49	4.45656	7.45	compliant
2593.0	36.38	4.34510	7.40	compliant
2682.5	36.06	4.03645	7.42	compliant
16QAM-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2503.5	42.71783	18.69748	-	compliant
2593.0	42.52430	17.88259	-	compliant
2682.5	42.25035	16.78941	-	compliant
64QAM-Modulation ANT1/Main				
2503.5	36.84	4.83059	7.51	compliant

2593.0	36.38	4.34510	7.51	compliant
2682.5	36.49	4.45656	7.51	compliant
64QAM-Modulation ANT1/Div				
2503.5	36.65	4.62381	7.51	compliant
2593.0	36.54	4.50817	7.48	compliant
2682.5	36.14	4.11150	7.51	compliant
64QAM-Modulation ANT2/Main				
2503.5	36.64	4.61318	7.51	compliant
2593.0	36.69	4.66659	7.51	compliant
2682.5	36.12	4.09261	7.51	compliant
64QAM-Modulation ANT2/Div				
2503.5	36.51	4.47713	7.48	compliant
2593.0	36.48	4.44631	7.48	compliant
2682.5	36.01	3.99025	7.51	compliant
64QAM-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2503.5	42.68220	18.54471	-	compliant
2593.0	42.54456	17.96618	-	compliant
2682.5	42.21438	16.65092	-	compliant

Table 5 RF Power Output (15 MHz Channel BW)

Config D:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT2/Main				
2503.5/2518.5	33.62/34.05	2.30144/2.54097	7.62	compliant
2585.5/2600.5	33.72/33.56	2.35505/2.26986	7.52	compliant
2667.5/2682.5	33.67/32.89	2.32809/1.94536	7.56	compliant
QPSK-Modulation ANT2/Div				
2503.5/2518.5	33.45/33.91	2.21309/2.46037	7.64	compliant
2585.5/2600.5	33.38/33.28	2.17771/2.12814	7.56	compliant
2667.5/2682.5	33.48/32.67	2.22844/1.84927	7.60	compliant
QPSK-Modulation ANT2/Main+ANT2/Div Calculated Total				
2503.5/2518.5	39.78449	9.51588	-	compliant
2585.5/2600.5	39.50889	8.93076	-	compliant
2667.5/2682.5	39.21747	8.35116	-	compliant
16QAM-Modulation ANT2/Main				
2503.5/2518.5	33.62/34.05	2.30144/2.54097	7.60	compliant
2585.5/2600.5	33.82/33.59	2.40991/2.28560	7.54	compliant
2667.5/2682.5	33.70/32.94	2.34423/1.96789	7.58	compliant
16QAM-Modulation ANT2/Div				
2503.5/2518.5	33.58/33.98	2.28034/2.50035	7.60	compliant
2585.5/2600.5	33.31/33.25	2.14289/2.11349	7.58	compliant
2667.5/2682.5	33.45/32.65	2.21309/1.84077	7.58	compliant
16QAM-Modulation ANT2/Main+ANT2/Div Calculated Total				
2503.5/2518.5	39.83315	9.62310	-	compliant
2585.5/2600.5	39.51914	8.95188	-	compliant
2667.5/2682.5	39.22517	8.36598	-	compliant
64QAM-Modulation ANT2/Main				
2503.5/2518.5	33.63/34.08	2.30675/2.55859	7.64	compliant
2585.5/2600.5	33.77/33.58	2.38232/2.28034	7.60	compliant
2667.5/2682.5	33.45/32.71	2.21309/1.86638	7.68	compliant

64QAM-Modulation ANT2/Div				
2503.5/2518.5	33.50/33.94	2.23872/2.47742	7.66	compliant
2585.5/2600.5	33.37/33.21	2.17270/2.09411	7.56	compliant
2667.5/2682.5	33.44/32.67	2.20800/1.84927	7.62	compliant
64QAM-Modulation ANT2/Main+ANT2/Div Calculated Total				
2503.5/2518.5	39.81432	9.58148	-	compliant
2585.5/2600.5	39.50826	8.92948	-	compliant
2667.5/2682.5	39.10451	8.13675	-	compliant

Table 5 RF Power Output (15 MHz Channel BW)

Config E:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1/Main				
2506.0	36.74	4.72063	7.53	compliant
2593.0	36.73	4.70977	7.48	compliant
2680.0	36.30	4.26580	7.48	compliant
QPSK-Modulation ANT1/Div				
2506.0	36.50	4.46684	7.53	compliant
2593.0	36.55	4.51856	7.48	compliant
2680.0	36.08	4.05509	7.48	compliant
QPSK-Modulation ANT2/Main				
2506.0	37.00	5.01187	7.51	compliant
2593.0	36.75	4.73151	7.48	compliant
2680.0	36.43	4.39542	7.48	compliant
QPSK-Modulation ANT2/Div				
2506.0	36.77	4.75335	7.54	compliant
2593.0	36.67	4.64515	7.51	compliant
2680.0	35.93	3.91742	7.56	compliant
QPSK-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2506.0	42.77671	18.95269	-	compliant
2593.0	42.69630	18.60500	-	compliant
2680.0	42.20989	16.63372	-	compliant
16QAM-Modulation ANT1/Main				
2506.0	36.66	4.63447	7.51	compliant
2593.0	36.7	4.67735	7.42	compliant
2680.0	36.35	4.31519	7.45	compliant
16QAM-Modulation ANT1/Div				
2506.0	36.5	4.46684	7.48	compliant
2593.0	36.44	4.40555	7.45	compliant
2680.0	35.99	3.97192	7.42	compliant
16QAM-Modulation ANT2/Main				
2506.0	36.99	5.00035	7.45	compliant
2593.0	36.75	4.73151	7.45	compliant
2680.0	36.34	4.30527	7.42	compliant
16QAM-Modulation ANT2/Div				
2506.0	36.85	4.84172	7.51	compliant
2593.0	36.67	4.64515	7.48	compliant
2680.0	35.9	3.89045	7.48	compliant

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16QAM-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2506.0	42.77457	18.94337	-	compliant
2593.0	42.66221	18.45957	-	compliant
2680.0	42.17032	16.48282	-	compliant
64QAM-Modulation ANT1/Main				
2506.0	36.61	4.58142	7.51	compliant
2593.0	36.62	4.59198	7.45	compliant
2680.0	36.82	4.80839	7.48	compliant
64QAM-Modulation ANT1/Div				
2506.0	36.5	4.46684	7.54	compliant
2593.0	36.54	4.50817	7.45	compliant
2680.0	36.04	4.01791	7.48	compliant
64QAM-Modulation ANT2/Main				
2506.0	36.96	4.96592	7.51	compliant
2593.0	36.72	4.69894	7.45	compliant
2680.0	36.34	4.30527	7.45	compliant
64QAM-Modulation ANT2/Div				
2506.0	36.91	4.90908	7.57	compliant
2593.0	36.62	4.59198	7.51	compliant
2680.0	35.88	3.87258	7.53	compliant
64QAM-Modulation ANT1/Main+ANT1/Div+ANT2/Main+ANT2/Div Calculated Total				
2506.0	42.76996	18.92326	-	compliant
2593.0	42.64607	18.39107	-	compliant
2680.0	42.30555	17.00414	-	compliant

Table 6 RF Power Output (20 MHz Channel BW)

Config F:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT2/Main				
2506.0/2526.0	33.68/34.10	2.33346/2.57040	7.78	compliant
2583.0/2603.0	33.73/33.49	2.36048/2.23357	7.70	compliant
2660.0/2680.0	33.87/33.03	2.43781/2.00909	7.72	compliant
QPSK-Modulation ANT2/Div				
2506.0/2526.0	33.66/34.09	2.32274/2.56448	7.80	compliant
2583.0/2603.0	33.46/33.31	2.21820/2.14289	7.70	compliant
2660.0/2680.0	33.62/32.69	2.30144/1.85780	7.80	compliant
QPSK-Modulation ANT2/Main+ANT2/Div Calculated Total				
2506.0/2526.0	39.90830	9.79107	-	compliant
2583.0/2603.0	39.52072	8.95514	-	compliant
2660.0/2680.0	39.34809	8.60615	-	compliant
16QAM-Modulation ANT2/Main				
2506.0/2526.0	33.75/34.13	2.37137/2.58821	7.78	compliant
2583.0/2603.0	33.86/33.61	2.43220/2.29615	7.70	compliant
2660.0/2680.0	33.84/33.01	2.42103/1.99986	7.74	compliant
16QAM-Modulation ANT2/Div				
2506.0/2526.0	33.71/34.12	2.34963/2.58226	7.68	compliant
2583.0/2603.0	33.45/33.23	2.21309/2.10378	7.72	compliant

2660.0/2680.0	33.59/32.66	2.28560/1.84502	7.74	compliant
16QAM-Modulation ANT2/Main+ANT2/Div Calculated Total				
2506.0/2526.0	39.95261	9.89148	-	compliant
2583.0/2603.0	39.56419	9.04523	-	compliant
2660.0/2680.0	39.32043	8.55151	-	compliant
64QAM-Modulation ANT2/Main				
2506.0/2526.0	33.71/34.07	2.34963/2.55270	7.78	compliant
2583.0/2603.0	33.79/33.51	2.39332/2.24388	7.74	compliant
2660.0/2680.0	33.81/32.91	2.40436/1.95434	7.74	compliant
64QAM-Modulation ANT2/Div				
2506.0/2526.0	33.69/34.11	2.33884/2.57632	7.78	compliant
2583.0/2603.0	33.46/33.29	2.21820/2.13304	7.76	compliant
2660.0/2680.0	33.60/32.68	2.29087/1.85353	7.74	compliant
64QAM-Modulation ANT2/Main+ANT2/Div Calculated Total				
2506.0/2526.0	39.92001	9.81749	-	compliant
2583.0/2603.0	39.53684	8.98844	-	compliant
2660.0/2680.0	39.29577	8.50310	-	compliant

Table 7 RF Power Output (20 MHz Channel BW)

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

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

The occupied bandwidth was measured by using relative measurement procedure (Config. A, C and E). which represents the -26dB OBW positive frequency between two markers to reference value (see the following section and screenshots on pages 75).

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

Config A: 9M00D9W (Channel bandwidth 10 MHz)

Config C: 13M5D9W (Channel bandwidth 15 MHz)

Config E: 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 71, 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.

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.

According FCC KDB 971168 D01 –guidance. Relative OBW must be measured and reported when it is specified in the applicable rule part in this case §27.53 (5).

4.3.2. Test Procedure and Results

Measurement procedure. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(Screenshots are on page 75 for details). The following tables summarize the results:

Config A:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1/Main		
2501.1	9.70	compliant
2593.0	9.72	compliant
2685.0	9.76	compliant
QPSK-Modulation ANT1/Div		
2501.1	9.70	compliant
2593.0	9.76	compliant
2685.0	9.68	compliant
QPSK-Modulation ANT2/Main		
2501.1	9.70	compliant
2593.0	9.72	compliant
2685.0	9,72	compliant
QPSK-Modulation ANT2/Div		
2501.1	9.70	compliant
2593.0	9.70	compliant
2685.0	9.74	compliant
16QAM-Modulation ANT1/Main		
2501.1	9.68	compliant
2593.0	9.70	compliant
2685.0	9.66	compliant
16QAM-Modulation ANT1/Div		
2501.1	9.56	compliant
2593.0	9.58	compliant
2685.0	9.72	compliant
16QAM-Modulation ANT2/Main		
2501.1	9.56	compliant
2593.0	9.66	compliant

2685.0	9.54	compliant
16QAM-Modulation ANT2/Div		
2501.1	9.58	compliant
2593.0	9.68	compliant
2685.0	9.70	compliant
64QAM-Modulation ANT1/Main		
2501.1	9.64	compliant
2593.0	9.72	compliant
2685.0	9.76	compliant
64QAM-Modulation ANT1/Div		
2501.1	9.70	compliant
2593.0	9.72	compliant
2685.0	9.72	compliant
64QAM-Modulation ANT2/Main		
2501.1	9.70	compliant
2593.0	9.72	compliant
2685.0	9.62	compliant
64QAM-Modulation ANT2/Div		
2501.1	9.64	compliant
2593.0	9.72	compliant
2685.0	9.66	compliant
Measurement Uncertainty:		±48kHz

Table 6 Occupied Bandwidth (10 MHz Channel BW)

Config C:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1/Main		
2503.5	14.62	compliant
2593.0	14.62	compliant
2682.5	14.68	compliant
QPSK-Modulation ANT1/Div		
2503.5	14.62	compliant
2593.0	14.62	compliant
2682.5	14.68	compliant
QPSK-Modulation ANT2/Main		
2503.5	14.71	compliant
2593.0	14.62	compliant
2682.5	14.62	compliant
QPSK-Modulation ANT2/Div		
2503.5	14.65	compliant
2593.0	14.65	compliant
2682.5	14.62	compliant
16QAM-Modulation ANT1/Main		
2503.5	14.38	compliant
2593.0	14.44	compliant
2682.5	14.38	compliant
16QAM-Modulation ANT1/Div		
2503.5	14.44	compliant
2593.0	14.47	compliant
2682.5	14.23	compliant

16QAM-Modulation ANT2/Main		
2503.5	14.20	compliant
2593.0	14.47	compliant
2682.5	14.32	compliant
16QAM-Modulation ANT2/Div		
2503.5	14.38	compliant
2593.0	14.32	compliant
2682.5	14.29	compliant
64QAM-Modulation ANT1/Main		
2503.5	14.53	compliant
2593.0	14.62	compliant
2682.5	14.62	compliant
64QAM-Modulation ANT1/Div		
2503.5	14.74	compliant
2593.0	14.44	compliant
2682.5	14.62	compliant
64QAM-Modulation ANT2/Main		
2503.5	14.41	compliant
2593.0	14.68	compliant
2682.5	14.62	compliant
64QAM-Modulation ANT2/Div		
2503.5	14.38	compliant
2593.0	14.68	compliant
2682.5	14.56	compliant
Measurement Uncertainty:		±48kHz

Table 7 Occupied Bandwidth (15 MHz Channel BW)

Config E:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1/Main		
2506.0	19.40	compliant
2593.0	19.32	compliant
2680.0	19.28	compliant
QPSK-Modulation ANT1/Div		
2506.0	19.32	compliant
2593.0	19.22	compliant
2680.0	19.36	compliant
QPSK-Modulation ANT2/Main		
2506.0	19.36	compliant
2593.0	19.30	compliant
2680.0	19.36	compliant
QPSK-Modulation ANT2/Div		
2506.0	19.36	compliant
2593.0	19.42	compliant
2680.0	19.24	compliant
16QAM-Modulation ANT1/Main		
2506.0	19.20	compliant
2593.0	19.02	compliant
2680.0	19.16	compliant
16QAM-Modulation ANT1/Div		

2506.0	19.32	compliant
2593.0	19.02	compliant
2680.0	19.12	compliant
16QAM-Modulation ANT2/Main		
2506.0	19.19	compliant
2593.0	19.14	compliant
2680.0	18.96	compliant
16QAM-Modulation ANT2/Div		
2506.0	19.16	compliant
2593.0	18.98	compliant
2680.0	19.20	compliant
64QAM-Modulation ANT1/Main		
2506.0	19.32	compliant
2593.0	19.30	compliant
2680.0	19.24	compliant
64QAM-Modulation ANT1/Div		
2506.0	19.32	compliant
2593.0	19.32	compliant
2680.0	19.20	compliant
64QAM-Modulation ANT2/Main		
2506.0	19.28	compliant
2593.0	19.30	compliant
2680.0	19.24	compliant
64QAM-Modulation ANT2/Div		
2506.0	19.20	compliant
2593.0	19.26	compliant
2680.0	19.22	compliant
Measurement Uncertainty:		±48kHz

Table 8 Occupied Bandwidth (20 MHz Channel BW)

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

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 log10 P (conversion from W to dBm)
Attenuation required by FCC:	43 + 10 log10 P

Compliance limit = Maximum transmitter output power - Required attenuation

= 30 − 10 log10 P - (43 + 10 log10 P) = -13 dBm

For MiMo output from 4 TX -antenna connectors, each antenna connectors were measured individually and each individual limit lime was reduced by 10log(4). Limit line was calculated to show -19.02dB emission limit, according to FCC KDB 662911 D01 guidance.

4.4.2. 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) 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 94 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.

Config A Lower band edge:

Carrier Frequency: 2501.1 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
	2496	-26.13	compliant
QPSK-Modulation ANT1/Div			
	2495.7	-26.54	compliant
QPSK-Modulation ANT2/Main			
	2495.7	-26.64	compliant
QPSK-Modulation ANT2/Div			
	2495.7	-26.71	compliant
16QAM-Modulation ANT1/Main			
	2496	-26.18	compliant
16QAM-Modulation ANT1/Div			
	2495.7	-25.62	compliant
16QAM-Modulation ANT2/Main			
	2495.7	-26.48	compliant
16QAM-Modulation ANT2/Div			
	2495.7	-26.87	compliant
64QAM-Modulation ANT1/Main			
	2496	-26.74	compliant
64QAM-Modulation ANT1/Div			
	2495.7	-26.52	compliant
64QAM-Modulation ANT2/Main			
	2495.7	-26.80	compliant
64QAM-Modulation ANT2/Div			
	2495.7	27.05	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 9 Spurious Emissions (Lower band edge) (10 MHz CH BW)

Config A Upper band edge:

Carrier Frequency: 2685.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
	2690	-22.03	compliant
QPSK-Modulation ANT1/Div			
	2690	-22.43	compliant
QPSK-Modulation ANT2/Main			
	2690	-21.99	compliant
QPSK-Modulation ANT2/Div			
	2690	-22.02	compliant
16QAM-Modulation ANT1/Main			
	2690	-22.68	compliant
16QAM-Modulation ANT1/Div			
	2690	-23.32	compliant
16QAM-Modulation ANT2/Main			
	2690	-22.82	compliant
16QAM-Modulation ANT2/Div			
	2690	-22,79	compliant
64QAM-Modulation ANT1/Main			
	2690	-21.42	compliant
64QAM-Modulation ANT1/Div			
	2690	-21.66	compliant
64QAM-Modulation ANT2/Main			
	2690	-22.64	compliant
64QAM-Modulation ANT2/Div			
	2690	-22.60	compliant
		f < 1.0GHz: ±1.1dB, 1.0GHz ≤ f <3.6GHz: ±1.2dB, Measurement Uncertainty:3.6GHz ≤ f <8.0GHz: ±1.6dB, 8.0GHz ≤ f: ±1.9dB	

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

Config A Spurious emissions:

Carrier Frequency: 2501.1 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5001.6	-38.26	compliant
QPSK K-Modulation ANT1/Div			
0.009 – 26900	5002	-38.84	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5001.6	-38.54	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5002	-38.62	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5001.6	-37.97	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5002	-38.28	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5002	-38.11	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5002	-38.87	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5002	-38.35	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5002	-38.28	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5002	-38.54	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5002	-38.51	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 11 Spurious Emissions (10 MHz Channel BW)

Config A Spurious emissions:

Carrier Frequency: 2593.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5181	-36.72	compliant
QPSK K-Modulation ANT1/Div			
0.009 – 26900	5181	-36.13	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5181	-37.66	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5181	-37.17	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5181	-36.32	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5181	-36.09	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5181	-36.37	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5181	-35.63	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5181	-36.32	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5181	-36.42	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5181	-35.72	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5181	-37.28	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 12 Spurious Emissions (10 MHz Channel BW)

Config A Spurious emissions:

Carrier Frequency: 2685.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5372	-38.70	compliant
QPSK K-Modulation ANT1/Div			
0.009 – 26900	5372	-38.76	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5372	-38.40	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5372	-38.77	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5372	-38.97	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5372	-38.60	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5372	-38.50	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5372	-38.82	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5372	-38.63	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5372	-38.87	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5372	-38.29	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5372	-38.56	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 13 Spurious Emissions (10 MHz Channel BW)

Config B Lower band edge:

Carrier Frequency: 2501.0/2511.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT2/Main			
	2496	-23.06	compliant
QPSK-Modulation ANT2/Div			
	2496	-23.34	compliant
16QAM-Modulation ANT2/Main			
	2496	-23.26	compliant
16QAM-Modulation ANT2/Div			
	2496	-23.75	compliant
64QAM-Modulation ANT2/Main			
	2496	-23.54	compliant
64QAM-Modulation ANT2/Div			
	2496	-23.24	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 14 Spurious Emissions (Lower band edge) (10 MHz CH BW)

Config B Upper band edge:

Carrier Frequency: 2675.0/2685.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
	2690	-25.12	compliant
QPSK-Modulation ANT2/Div			
	2690	-25.59	compliant
16QAM-Modulation ANT2/Main			
	2690	-24.78	compliant
16QAM-Modulation ANT2/Div			
	2690	-25.05	compliant
64QAM-Modulation ANT2/Main			
	2690	-24.15	compliant
64QAM-Modulation ANT2/Div			
	2690	-24.60	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 15 Spurious Emissions (Upper band edge) (10 MHz CH BW)

Config B Spurious emissions:

Carrier Frequency: 2501.0/2511.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
0.009 – 26900	5002	-39.72	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5002	-39.83	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5002	-39.39	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5002	-39.89	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5002	-39.90	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5002	-39.90	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 16 Spurious Emissions (10 MHz Channel BW)

Config B Spurious emissions:

Carrier Frequency: 2588.0/2598.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
0.009 – 26900	5181	-36.71	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5181	-37.63	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5181	-36.59	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5181	-38.39	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5181	-36.69	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5181	-37.18	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 17 Spurious Emissions (10 MHz Channel BW)

Config B Spurious emissions:

Carrier Frequency: 2675.0/2685.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
0.009 – 26900	5348	-39.86	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5360	-38.43	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5360	-38.41	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5360	-38.49	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5360	-37.47	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5360	-38.54	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 18 Spurious Emissions (10 MHz Channel BW)

Config C Lower band edge:

Carrier Frequency: 2503.5 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
	2496	-20.96	compliant
QPSK-Modulation ANT1/Div			
	2496	-21.37	compliant
QPSK-Modulation ANT2/Main			
	2496	-21.31	compliant
QPSK-Modulation ANT2/Div			
	2496	-21.50	compliant
16QAM-Modulation ANT1/Main			
	2496	-21.22	compliant
16QAM-Modulation ANT1/Div			
	2496	-21.56	compliant
16QAM-Modulation ANT2/Main			
	2496	-22.88	compliant
16QAM-Modulation ANT2/Div			
	2496	-21.73	compliant
64QAM-Modulation ANT1/Main			
	2496	-21.72	compliant
64QAM-Modulation ANT1/Div			
	2496	-22.02	compliant
64QAM-Modulation ANT2/Main			
	2496	-22.05	compliant
64QAM-Modulation ANT2/Div			
	2496	-21.50	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 19 Spurious Emissions (Lower band edge) (15 MHz CH BW)

Config C Upper band edge:

Carrier Frequency: 2682.5 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
	2690	-23.15	compliant
QPSK-Modulation ANT1/Div			
	2690	-22.56	compliant
QPSK-Modulation ANT2/Main			
	2690	-23.58	compliant
QPSK-Modulation ANT2/Div			
	2690	-23.63	compliant
16QAM-Modulation ANT1/Main			
	2690	-24.63	compliant
16QAM-Modulation ANT1/Div			
	2690	-25.86	compliant
16QAM-Modulation ANT2/Main			
	2690	-26.20	compliant
16QAM-Modulation ANT2/Div			
	2690	-25.12	compliant
64QAM-Modulation ANT1/Main			
	2690	-23.09	compliant
64QAM-Modulation ANT1/Div			
	2690	-23.05	compliant
64QAM-Modulation ANT2/Main			
	2690	-23.11	compliant
64QAM-Modulation ANT2/Div			
	2690	-23.50	compliant
		f < 1.0GHz: ±1.1dB, 1.0GHz ≤ f <3.6GHz: ±1.2dB, Measurement Uncertainty:3.6GHz ≤ f <8.0GHz: ±1.6dB, 8.0GHz ≤ f: ±1.9dB	

Table 20 Spurious Emissions (Upper band edge) (15 MHz CH BW)

Config C Spurious emissions:

Carrier Frequency: 2503.5 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5002	-40.09	compliant
QPSK-Modulation ANT1/Div			
0.009 – 26900	5002	-39,53	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5002	-37.82	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5002	-37.99	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5002	-37.28	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5002	-37.76	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5002	-37.61	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5002	-39.10	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5002	-38.35	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5002	-37.74	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5002	-37.86	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5002	-38.14	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 21 Spurious Emissions (15 MHz Channel BW)

Config C Spurious emissions:

Carrier Frequency: 2593 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5181	-34.51	compliant
QPSK-Modulation ANT1/Div			
0.009 – 26900	5181	-36.23	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5181	-34.28	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5181	-37.67	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5181	-34.98	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5181	-39.32	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5181	-34.53	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5181	-35.02	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5181	-35.20	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5181	-35.27	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5181	-34.61	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5181	-34.78	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 (15 MHz Channel BW)

Config C Spurious emissions:

Carrier Frequency: 2682.5 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5360	-36.33	compliant
QPSK-Modulation ANT1/Div			
0.009 – 26900	5360	-35.72	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5360	-38.28	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5360	-37.16	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5360	-38.77	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5360	-36.78	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5360	-37.02	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5360	-37.47	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5360	-36.35	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5360	-36.83	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5360	-40.72	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5360	-39.51.	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 (15 MHz Channel BW)

Config D Lower band edge:

Carrier Frequency: 2503.5/2518.5MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT2/Main			
	2496	-23.60	compliant
QPSK-Modulation ANT2/Div			
	2496	-23.71	compliant
16QAM-Modulation ANT2/Main			
	2496	-24.17	compliant
16QAM-Modulation ANT2/Div			
	2496	-24.34	compliant
64QAM-Modulation ANT2/Main			
	2496	-24.13	compliant
64QAM-Modulation ANT2/Div			
	2496	-23.59	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 (Lower band edge) (15 MHz CH BW)

Config D Upper band edge:

Carrier Frequency: 2667.5/2682.5MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT2/Main			
	2690	-26.03	compliant
QPSK-Modulation ANT2/Div			
	2690	-26.11	compliant
16QAM-Modulation ANT2/Main			
	2690	-26.73	compliant
16QAM-Modulation ANT2/Div			
	2690	-26.96	compliant
64QAM-Modulation ANT2/Main			
	2690	-25.84	compliant
64QAM-Modulation ANT2/Div			
	2690	-26.54	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 25 Spurious Emissions (Upper band edge) (15 MHz CH BW)

Config D Spurious emissions:

Carrier Frequency: 2503.5/2518.5MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
0.009 – 26900	5026	-38.22	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5026	-38.57	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5026	-37.87	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5026	-38.38	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5026	-38.06	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5026	-39.30	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 26 Spurious Emissions (15 MHz Channel BW)

Config D Spurious emissions:

Carrier Frequency: 2585.5/2600.5MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT2/Main			
0.009 – 26900	5193	-36.08	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5193	-38.05	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5193	-37.91	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5193	-36.71	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5193	-38.14	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5193	-36.97	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 27 Spurious Emissions (15 MHz Channel BW)

Config D Spurious emissions:

Carrier Frequency: 2667.5/2682.5MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
0.009 – 26900	5.3480	-42.01	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5.3480	-40.81	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5.3480	-40.95	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5.3480	-39.69	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5.3480	-41.25	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5.3480	-40.36	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 28 Spurious Emissions (15 MHz Channel BW)

Config E Lower band edge:

Carrier Frequency: 2506.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
	2496	-22.99	compliant
QPSK-Modulation ANT1/Div			
	2496	-22.99	compliant
QPSK-Modulation ANT2/Main			
	2496	-22.02	compliant
QPSK-Modulation ANT2/Div			
	2496	-22.19	compliant
16QAM-Modulation ANT1/Main			
	2496	-22.39	compliant
16QAM-Modulation ANT1/Div			
	2496	-22.63	compliant
16QAM-Modulation ANT2/Main			
	2496	-22.07	compliant
16QAM-Modulation ANT2/Div			
	2496	-21.64	compliant
64QAM-Modulation ANT1/Main			
	2496	-22.48	compliant
64QAM-Modulation ANT1/Div			
	2496	-22.67	compliant
64QAM-Modulation ANT2/Main			
	2496	-22.01	compliant
64QAM-Modulation ANT2/Div			
	2496	-22.03	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 29 Spurious Emissions (Lower band edge) (20 MHz CH BW)

Config E Upper band edge:

Carrier Frequency: 2680.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
	2690	-24.37	compliant
QPSK-Modulation ANT1/Div			
	2690	-24.85	compliant
QPSK-Modulation ANT2/Main			
	2690	-24.22	compliant
QPSK-Modulation ANT2/Div			
	2690	-25.41	compliant
16QAM-Modulation ANT1/Main			
	2690	-24.36	compliant
16QAM-Modulation ANT1/Div			
	2690	-24.68	compliant
16QAM-Modulation ANT2/Main			
	2690	-23.60	compliant
16QAM-Modulation ANT2/Div			
	2690	-24.36	compliant
64QAM-Modulation ANT1/Main			
	2690	-24.62	compliant
64QAM-Modulation ANT1/Div			
	2690	-24.86	compliant
64QAM-Modulation ANT2/Main			
	2690	-24.49	compliant
64QAM-Modulation ANT2/Div			
	2690	-25.12	compliant
		f < 1.0GHz: ±1.1dB, 1.0GHz ≤ f <3.6GHz: ±1.2dB, Measurement Uncertainty:3.6GHz ≤ f <8.0GHz: ±1.6dB, 8.0GHz ≤ f: ±1.9dB	

Table 30 Spurious Emissions (Upper band edge) (20 MHz CH BW)

Config E Spurious emissions:

Carrier Frequency: 2506.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5014	-39.31	compliant
QPSK-Modulation ANT1/Div			
0.009 – 26900	5014	-39.28	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5014	-37.72	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5014	-39.01	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5014	-39.12	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5014	-39.32	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5014	-39.09	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5014	-38.95	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5014	-39.57	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5014	-39.65	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5014	-39.18	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5014	-38.99	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 31 Spurious Emissions (20 MHz Channel BW)

Config E Spurious emissions:

Carrier Frequency: 2593.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5193	-37.15	compliant
QPSK-Modulation ANT1/Div			
0.009 – 26900	5193	-36.95	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5193	-36.93	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5193	-37.06	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5193	-37.00	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5193	-38.77	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5193	-36.91	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5193	-37.14	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5193	-37.13	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5193	-36.96	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5193	-37.66	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5193	-36.99	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 32 Spurious Emissions (20 MHz Channel BW)

Config E Spurious emissions:

Carrier Frequency: 2680.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1/Main			
0.009 – 26900	5348	-39.78	compliant
QPSK-Modulation ANT1/Div			
0.009 – 26900	5348	-40.22	compliant
QPSK-Modulation ANT2/Main			
0.009 – 26900	5348	-41.20	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5348	-42.31	compliant
16QAM-Modulation ANT1/Main			
0.009 – 26900	5348	-39.95	compliant
16QAM-Modulation ANT1/Div			
0.009 – 26900	5348	-41.72	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5348	-40.24	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5348	-40.31	compliant
64QAM-Modulation ANT1/Main			
0.009 – 26900	5348	-39.76	compliant
64QAM-Modulation ANT1/Div			
0.009 – 26900	5348	-41.76	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5348	-39.96	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5348	-40.37	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 33 Spurious Emissions (20 MHz Channel BW)

Config F Lower band edge:

Carrier Frequency: 2506.0/2526.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT2/Main			
	2496	-24.64	compliant
QPSK-Modulation ANT2/Div			
	2496	-24.92	compliant
16QAM-Modulation ANT2/Main			
	2496	-25.77	compliant
16QAM-Modulation ANT2/Div			
	2496	-26.46	compliant
64QAM-Modulation ANT2/Main			
	2496	-25.10	compliant
64QAM-Modulation ANT2/Div			
	2496	-25.87	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 34 Spurious Emissions (Lower band edge) (20 MHz CH BW)

Config F Upper band edge:

Carrier Frequency: 2660.0/2680.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT2/Main			
	2690	-27.81	compliant
QPSK-Modulation ANT2/Div			
	2690	-27.80	compliant
16QAM-Modulation ANT2/Main			
	2690	-27.56	compliant
16QAM-Modulation ANT2/Div			
	2690	-27.59	compliant
64QAM-Modulation ANT2/Main			
	2690	-26.57	compliant
64QAM-Modulation ANT2/Div			
	2690	-27.49	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 35 Spurious Emissions (Upper band edge) (20 MHz CH BW)

Config F Spurious emissions:

Carrier Frequency: 2506.0/2526.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
0.009 – 26900	5025.5	-37.72	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5025.5	-39.05	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5025.5	-39.09	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5025.5	-39,31	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5026	-39.18	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5025.5	-39.40	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 36 Spurious Emissions (20 MHz Channel BW)

Config F Spurious emissions:

Carrier Frequency: 2583.0/2603.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
0.009 – 26900	5193	-36.71	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5193	-38.56	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5193	-36.74	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5193	-38.94	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5193	-36.77	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5193	-37.48	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 37 Spurious Emissions (20 MHz Channel BW)

Config F Spurious emissions:

Carrier Frequency: 2660.0/2680.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT2/Main			
0.009 – 26900	5348	-41.23	compliant
QPSK-Modulation ANT2/Div			
0.009 – 26900	5348	-41.75	compliant
16QAM-Modulation ANT2/Main			
0.009 – 26900	5348	-41.18	compliant
16QAM-Modulation ANT2/Div			
0.009 – 26900	5348	-41.33	compliant
64QAM-Modulation ANT2/Main			
0.009 – 26900	5348	-41.09	compliant
64QAM-Modulation ANT2/Div			
0.009 – 26900	5348	-41.58	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 38 Spurious Emissions (20 MHz Channel BW)

The measured conducted emission levels were found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.

4.5 Test No. 5: Field Strength of Spurious Radiation (§ 2.1053, § 2.1057, § 27.53)

4.5.1. 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 log (P) dB (P = transmitter power in Watts).

4.5.2. Test Configuration

The measurements were performed in an anechoic chamber. The radiated test site complies with the site attenuation requirements listed in ANSI C63.4 2003 and is listed with the FCC.

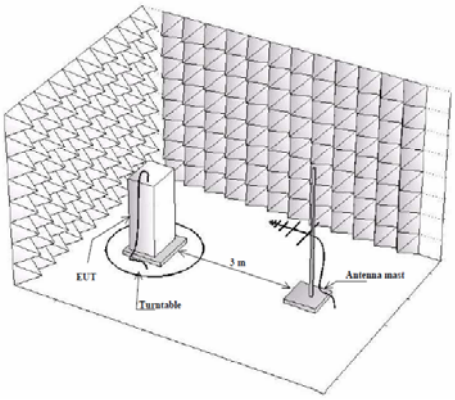

Figure 2 Test Configuration

Photographs of the EUT in the anechoic chamber are shown on page 204 of this measurement report.

4.5.3. Test Procedure and Results

TIA/EIA-603-C-2004, Section 2.2.12

The test was performed in a semi-anechoic shielded room. The EUT was placed on a non-conductive 0.8 m high table standing on the turntable. During the test in the frequency range 30 - 26500 MHz the distance from the EUT to the measuring antenna was 3 m. In order to find the maximum levels of the disturbance radiation the angle of the turntable, the height of the measuring antenna were varied during

the tests. The test was performed with the measuring antenna being both in horizontal and vertical polarizations.

Vertical and horizontal polarizations in the frequency range 30 - 26500 MHz was first measured by using the peak detector. During the peak detector scan the turntable was rotated from 0° to 360° with 30° step with the antenna heights 1.0 m and 2.5 m.

The limit of -13 dBm has been calculated to correspond 84.4 dB (µV/m). Spurious emissions closer than 20 dB to the limit was measured with average detector.

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

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The EUT was replaced with a reference substitution antenna with a known gain referenced to an isotropic radiator $G_{Antenna[dBi]}$. This antenna was fed with a signal at the spurious frequency $P_{Gen[dBm]}$. The level of the signal was adjusted to repeat the previously measured level. The resulting

EIRP is the signal level fed to the reference antenna corrected for gain referenced to an isotropic.

The formula below was used to calculate the EIRP of the EUT.

$$P_{EIRP[dbm]} = P_{Gen[dBm]} - L_{Cable[dB]} + G_{Antenna[dBi]}$$

Worst case detected emission levels are reported in the following table (refer to spectral plots included on pages 100 for details). The antenna factor and cable loss is according to the manufacturer's specification.

Config A, B:

Carrier Frequency Config A: 2501.1 MHz, 2593.0 MHz and 2685.0 MHz Carrier Frequency Config B: 2501.0/2511.0 MHz, 2588.0/2598.0 MHz and 2675.0/2685.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation TX1			
30 - 26500	5355.405667	-17.60	compliant
Measurement Uncertainty:			±5.4dB

Table 39 Field Strength of Spurious Radiation (10 MHz Channel BW)

The measured emission levels were found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.

4.6 Test No. 6: Frequency Stability (§ 2.1055, § 27.54)

4.6.1. Purpose

Frequency stability measurements were performed to verify that the frequency deviation of the emission stays within the licensee's frequency block under extreme temperature

4.6.2. Limits

Para. No. 27.54. (-30 °C to +50 °C) and supply voltage conditions according to § 2.1055.

4.6.3. Test Configuration

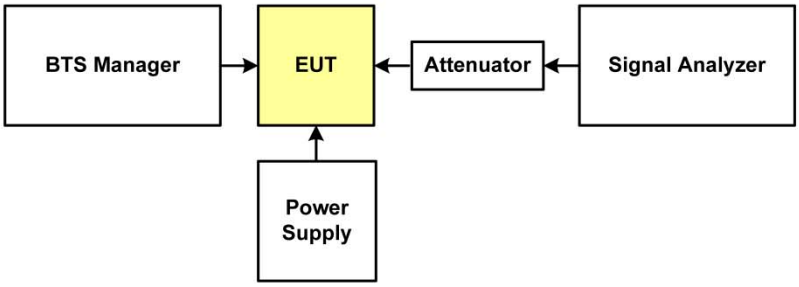

Figure 3 Test Configuration for frequency stability with voltage variation

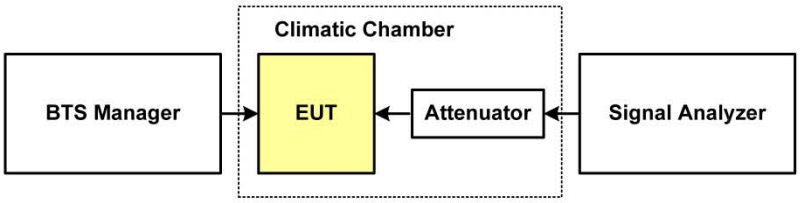

Figure 4 Test Configuration for frequency stability with temperature variation

A complete list of the measurement equipment is included on page 70 of this measurement report.

4.6.4. Test Procedure and Results

Frequency Stability with Temperature Variation:

The supply voltage of the EUT was set to the nominal value and the temperature of the environmental chamber was varied in 10 degree steps from -30 degrees Celsius to +50 degrees Celsius. The EUT was allowed to stabilize 60 min. at each temperature and the frequency error was measured.

Config A:

Carrier Frequency: 2593.0 MHz						
Supply Voltage (AC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1/Main						
120.0	-30.0	33.95198	0.013	129	0.05	compliant
120.0	-20.0	-46.20376	-0.018	129	0.05	compliant
120.0	-10.0	-27.46312	-0.011	129	0.05	compliant
120.0	0.0	13.73498	0.005	129	0.05	compliant
120.0	10.0	-50.56839	-0.020	129	0.05	compliant
120.0	30.0	-46.60153	-0.018	129	0.05	compliant
120.0	40.0	-57.30707	-0.022	129	0.05	compliant
120.0	50.0	-52.24173	-0.020	129	0.05	compliant
QPSK Modulation ANT1/Div						
120.0	-30.0	-40.38270	-0.016	129	0.05	compliant
120.0	-20.0	28.06486	0.011	129	0.05	compliant
120.0	-10.0	-54.07857	-0.021	129	0.05	compliant
120.0	0.0	-47.65002	-0.018	129	0.05	compliant
120.0	10.0	-28.94328	-0.011	129	0.05	compliant
120.0	30.0	-32.00068	-0.012	129	0.05	compliant
120.0	40.0	-40.32078	-0.016	129	0.05	compliant
120.0	50.0	-54.80799	-0.021	129	0.05	compliant
QPSK Modulation ANT2/Main						
120.0	-30.0	-58.43306	-0.023	129	0.05	compliant
120.0	-20.0	-38.88607	-0.015	129	0.05	compliant
120.0	-10.0	-44.78136	-0.017	129	0.05	compliant
120.0	0.0	25.59180	0.010	129	0.05	compliant
120.0	10.0	39.00027	0.015	129	0.05	compliant
120.0	30.0	-45.38655	-0.018	129	0.05	compliant
120.0	40.0	45.14711	0.017	129	0.05	compliant
120.0	50.0	-43.57350	-0.017	129	0.05	compliant
QPSK Modulation ANT2/Div						
120.0	-30.0	19.20378	0.007	129	0.05	compliant
120.0	-20.0	-33.39078	-0.013	129	0.05	compliant

120.0	-10.0	-37.61554	-0.015	129	0.05	compliant
120.0	0.0	39.75994	0.015	129	0.05	compliant
120.0	10.0	-45.99933	-0.018	129	0.05	compliant
120.0	30.0	-49.69688	-0.019	129	0.05	compliant
120.0	40.0	47.29504	0.018	129	0.05	compliant
120.0	50.0	24.90060	0.010	129	0.05	compliant
16QAM Modulation ANT1/Main						
120.0	-30.0	27.94034	0.011	129	0.05	compliant
120.0	-20.0	-50.52600	-0.019	129	0.05	compliant
120.0	-10.0	17.96208	0.007	129	0.05	compliant
120.0	0.0	-33.71179	-0.013	129	0.05	compliant
120.0	10.0	-29.39523	-0.011	129	0.05	compliant
120.0	30.0	-39.38921	-0.015	129	0.05	compliant
120.0	40.0	-41.48465	-0.016	129	0.05	compliant
120.0	50.0	-68.29578	-0.026	129	0.05	compliant
16QAM Modulation ANT1/Div						
120.0	-30.0	-26.22867	-0.010	129	0.05	compliant
120.0	-20.0	-18.50877	-0.007	129	0.05	compliant
120.0	-10.0	-63.48229	-0.024	129	0.05	compliant
120.0	0.0	28.56544	0.011	129	0.05	compliant
120.0	10.0	45.57776	0.018	129	0.05	compliant
120.0	30.0	-31.61145	-0.012	129	0.05	compliant
120.0	40.0	-52.22595	-0.020	129	0.05	compliant
120.0	50.0	-46.62978	-0.018	129	0.05	compliant
16QAM Modulation ANT2/Main						
120.0	-30.0	-34.54366	-0.013	129	0.05	compliant
120.0	-20.0	-49.02780	-0.019	129	0.05	compliant
120.0	-10.0	38.47400	0.015	129	0.05	compliant
120.0	0.0	45.72890	0.018	129	0.05	compliant
120.0	10.0	28.31129	0.011	129	0.05	compliant
120.0	30.0	-46.18923	-0.018	129	0.05	compliant
120.0	40.0	-41.93065	-0.016	129	0.05	compliant
120.0	50.0	-31.54481	-0.012	129	0.05	compliant
16QAM Modulation ANT2/Div						
120.0	-30.0	-41.74930	-0.016	129	0.05	compliant
120.0	-20.0	30.75289	0.012	129	0.05	compliant
120.0	-10.0	-35.88920	-0.014	129	0.05	compliant
120.0	0.0	18.18291	0.007	129	0.05	compliant
120.0	10.0	-34.91181	-0.013	129	0.05	compliant
120.0	30.0	67.44464	0.026	129	0.05	compliant
120.0	40.0	46.25497	0.018	129	0.05	compliant
120.0	50.0	34.11510	0.013	129	0.05	compliant