Report On

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

COMMERCIAL-IN-CONFIDENCE

FCC ID: VBNFZHJ-01

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DATED 6 May 2014

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SECTION 1

REPORT SUMMARY

Radio Testing of the
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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Radio Testing of the Nokia Solutions and Networks Oy Flexi Multiradio 10 BTS RRH module 2.6 GHz Radio Access technology: E-UTRA (TDD) In accordance with FCC CFR 47 Part 2 and 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)	FZHJ
Serial Number(s)	RY141229174
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 2 (2013) FCC 47 CFR Part 27 (2013)
Order Number Date	451/90486113 30 December 2013
Start of Test	01 April 2014
Finish of Test	17 April 2014
Name of Engineer(s)	Rami Salomäki Kimmo Huuki Jari Veijola

SECTION 2

DISCLAIMERS AND COPYRIGHT

2.1 DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

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ANNEX A

NOKIA SOLUTIONS AND NETWORKS OY TEST REPORT NO: D509925016

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TEST REPORT NO: D509925016

FCC ID: VBNFZHJ-01

Date:	Oulu 25. Apr 2014
Pages:	164
Appendices:	-

Equipment Under Test:	Flexi Multiradio 10 BTS RRH 2.6GHz Radio Access technology: E-UTRA (TDD)
Type:	FZHJ
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 NSN	25. Apr 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	8	compliant
2	Modulation Characteristics	§ 2.1047, § 2.201	14	compliant
3	Occupied Bandwidth	§ 2.1049	15	compliant
4	Spurious Emissions at Antenna Terminals	§ 2.1051, § 2.1057, § 27.53	20	compliant
5	Field Strength of Spurious Radiation	§ 2.1053, § 2.1057, § 27.53, § 27.55	33	compliant
6	Frequency Stability	§ 2.1055, § 27.54	35	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.

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:	01 Apr 2014	08 Arp 2014	14 Apr 2014
End of Test:	07 Apr 2014	11 Apr 2014	17 Apr 2014

1.3 Participants

Name	Function	Signature
Rami Salomäki (NSN)	Testing, Setup of EUT	
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 RRH 2.6GHz with 8 power amplifiers.

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

The tested equipment is representative for serial production.

2.1 Configuration of EUT

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

Module Type	**Flexi Multiradio BTS RRH 2.6GHz**	
Radio Access Technology	E-UTRA	
Duplex mode	Time Division Duplex (TDD)	
Channel Bandwidth	Single carrier 20MHz (Config. A), Dual carrier 20MHz (Config. B).	
Supply Voltage	48.0 V DC	
Frequency Bands		
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)	20W (43.0dBm) conducted / carrier	
Dual carrier		
Rated Output Power (Prat)	10W (40.0dBm) conducted / carrier	
Downlink/Uplink ratio	6/3 to 8/1	
	RX	**TX**
Number of Antenna Ports	8 (ANT1 to ANT8)	8 (ANT1 to ANT8)
MiMo	Yes	Yes

Table 2 Overview of EUT configuration

The tests were performed with one EUT at the antenna ports ANT1, ANT2, ANT3, ANT4, ANT5, ANT6, ANT7 or ANT8.

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

Module Name	Serial-No.	Module Type	Config.
FZHJ	RY141229174	RRH	A, B
Other Modules	**Module Type**		**Config.**
FSMF	System module		A, B
FTIF	Transmission module		A, B
FFHS	Rejection filter		A, B

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

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).

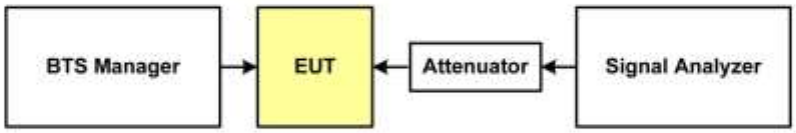

Figure 1 Test Configuration (single output)

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 = ~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.

External filter and Cables insertion losses were measured with ZVA network analyzer. These losses should be added to measured output power results to get correct values in output power test. All this because measurement point is now in Filter antenna port not as normally in RRHs antenna port.

Measured insertion losses are below.

Channel:	Cable and Filter path loss:
2506/2526 MHz	-0.46/-0.35 dB
2593/2583.0/2603.0 MHz	-0.53/-0.38/-0.43 dB
2660/2680 MHz	-0.51/-0.66 dB

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				
2506.0	42.19	16.55770	7.04	compliant
2593.0	42.11	16.25549	6.87	compliant
2680.0	42.26	16.82674	7.16	compliant
QPSK-Modulation ANT2				
2506.0	42.23	16.71091	7.01	compliant
2593.0	42.11	16.25549	6.87	compliant
2680.0	42.15	16.40590	7.16	compliant
QPSK-Modulation ANT3				
2506.0	42.11	16.25549	7.01	compliant
2593.0	42.08	16.14359	6.87	compliant
2680.0	42.12	16.29296	7.16	compliant
QPSK-Modulation ANT4				
2506.0	42.04	15.99558	7.01	compliant
2593.0	41.96	15.70363	6.87	compliant
2680.0	42.01	15.88547	7.16	compliant
QPSK-Modulation ANT5				
2506.0	42.31	17.02159	7.04	compliant
2593.0	42.10	16.21810	6.87	compliant
2680.0	42.06	16.06941	7.16	compliant
QPSK-Modulation ANT6				
2506.0	42.37	17.25838	7.01	compliant
2593.0	42.25	16.78804	6.87	compliant
2680.0	42.10	16.21810	7.16	compliant
QPSK-Modulation ANT7				
2506.0	42.05	16.03245	7.04	compliant
2593.0	42.06	16.06941	6.90	compliant
2680.0	42.00	15.84893	7.16	compliant
QPSK-Modulation ANT8				
2506.0	42.18	16.51962	7.01	compliant
2593.0	42.29	16.94338	6.90	compliant
2680.0	42.18	16.51962	7.16	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total				
2506.0	51.21730	132.35171	-	compliant
2593.0	51.15201	130.37712	-	compliant
2680.0	51.14168	130.06713	-	compliant
16QAM-Modulation ANT1				
2506.0	42.32	17.06082	6.99	compliant
2593.0	42.09	16.18080	6.84	compliant
2680.0	42.14	16.36817	7.10	compliant
16QAM-Modulation ANT2				
2506.0	42.42	17.45822	6.96	compliant
2593.0	42.31	17.02159	6.84	compliant
2680.0	42.25	16.78804	7.10	compliant
16QAM-Modulation ANT3				
2506.0	42.26	16.82674	6.96	compliant

2593.0	42.17	16.48162	6.84	compliant
2680.0	42.17	16.48162	7.10	compliant
16QAM-Modulation ANT4				
2506.0	42.16	16.44372	6.99	compliant
2593.0	42.11	16.25549	6.84	compliant
2680.0	42.05	16.03245	7.10	compliant
16QAM-Modulation ANT5				
2506.0	42.46	17.61976	6.99	compliant
2593.0	42.22	16.67247	6.84	compliant
2680.0	42.16	16.44372	7.13	compliant
16QAM-Modulation ANT6				
2506.0	42.51	17.82379	6.96	compliant
2593.0	42.32	17.06082	6.90	compliant
2680.0	42.16	16.44372	7.10	compliant
16QAM-Modulation ANT7				
2506.0	42.37	17.25838	6.99	compliant
2593.0	42.13	16.33052	6.84	compliant
2680.0	42.04	15.99558	7.13	compliant
16QAM-Modulation ANT8				
2506.0	42.32	17.06082	6.96	compliant
2593.0	42.42	17.45822	6.84	compliant
2680.0	42.30	16.98244	7.10	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total				
2506.0	51.38468	137.55225	-	compliant
2593.0	51.25356	133.46153	-	compliant
2680.0	51.19044	131.53573	-	compliant
64QAM-Modulation ANT1				
2506.0	42.32	17.06082	7.04	compliant
2593.0	42.10	16.21810	6.70	compliant
2680.0	42.11	16.25549	7.19	compliant
64QAM-Modulation ANT2				
2506.0	42.36	17.21869	7.01	compliant
2593.0	42.19	16.55770	6.87	compliant
2680.0	42.21	16.63413	7.19	compliant
64QAM-Modulation ANT3				
2506.0	42.17	16.48162	7.01	compliant
2593.0	42.07	16.10646	6.87	compliant
2680.0	42.08	16.14359	7.16	compliant
64QAM-Modulation ANT4				
2506.0	42.21	16.63413	7.04	compliant
2593.0	42.15	16.40590	6.87	compliant
2680.0	42.07	16.10646	7.16	compliant
64QAM-Modulation ANT5				
2506.0	42.48	17.70109	7.04	compliant
2593.0	42.27	16.86553	6.90	compliant
2680.0	42.21	16.63413	7.19	compliant
64QAM-Modulation ANT6				
2506.0	42.54	17.94734	7.01	compliant
2593.0	42.29	16.94338	6.87	compliant
2680.0	42.15	16.40590	7.16	compliant
64QAM-Modulation ANT7				
2506.0	42.26	16.82674	7.04	compliant
2593.0	42.17	16.48162	6.90	compliant

2680.0	42.03	15.95879	7.19	compliant
64QAM-Modulation ANT8				
2506.0	42.39	17.33804	7.01	compliant
2593.0	42.49	17.74189	6.90	compliant
2680.0	42.34	17.13957	7.19	compliant
64QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total				
2506.0	51.37381	137.20847	-	compliant
2593.0	51.24897	133.32058	-	compliant
2680.0	51.18192	131.27804	-	compliant

Table 4 RF Power Output (20 MHz Channel BW)

Config B:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
2506.0/2526.0	39.14/39.26	8.20352/8.43335	-	compliant
2583.0/2603.0	39.09/39.21	8.10961/8.33681	-	compliant
2660.0/2680.0	39.25/39.06	8.41395/8.05378	-	compliant
QPSK-Modulation ANT2				
2506.0/2526.0	39.25/39.37	8.41395/8.64968	-	compliant
2583.0/2603.0	39.22/39.32	8.35603/8.55067	-	compliant
2660.0/2680.0	39.37/39.13	8.64968/8.18465	-	compliant
QPSK-Modulation ANT3				
2506.0/2526.0	39.00/39.05	7.94328/8.03526	-	compliant
2583.0/2603.0	38.94/38.98	7.83430/7.90679	-	compliant
2660.0/2680.0	38.97/38.87	7.88860/7.70903	-	compliant
QPSK-Modulation ANT4				
2506.0/2526.0	39.21/39.27	8.33681/8.45279	-	compliant
2583.0/2603.0	39.10/39.29	8.12831/8.49180	-	compliant
2660.0/2680.0	39.36/39.26	8.62979/8.43335	-	compliant
QPSK-Modulation ANT5				
2506.0/2526.0	39.26/39.37	8.43335/8.64968	-	compliant
2583.0/2603.0	39.19/39.23	8.29851/8.37529	-	compliant
2660.0/2680.0	39.29/39.09	8.49180/8.10961	-	compliant
QPSK-Modulation ANT6				
2506.0/2526.0	39.39/39.58	8.68960/9.07821	-	compliant
2583.0/2603.0	39.34/39.42	8.59014/8.74984	-	compliant
2660.0/2680.0	39.34/39.27	8.59014/8.45279	-	compliant
QPSK-Modulation ANT7				
2506.0/2526.0	38.96/39.16	7.87046/8.24138	-	compliant
2583.0/2603.0	39.02/39.14	7.97995/8.20352	-	compliant
2660.0/2680.0	39.11/38.91	8.14704/7.78037	-	compliant
QPSK-Modulation ANT8				
2506.0/2526.0	39.11/39.26	8.14704/8.43335	-	compliant
2583.0/2603.0	39.29/39.41	8.49180/8.72971	-	compliant
2660.0/2680.0	39.49/39.35	8.89201/8.60994	-	compliant
QPSK-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total				
2506.0+2526.0	51.27143	134.01170	-	compliant
2583.0+2603.0	51.24286	133.13307	-	compliant
2660.0+2680.0	51.23971	133.03653	-	compliant
16QAM-Modulation ANT1				
2506.0/2526.0	39.25/39.35	8.41395/8.60994	-	compliant

2583.0/2603.0	39.17/39.25	8.26038/8.41395	-	compliant
2660.0/2680.0	39.26/39.05	8.43335/8.03526	-	compliant
16QAM-Modulation ANT2				
2506.0/2526.0	39.40/39.49	8.70964/8.89201	-	compliant
2583.0/2603.0	39.26/39.41	8.43335/8.72971	-	compliant
2660.0/2680.0	39.37/39.16	8.64968/8.24138	-	compliant
16QAM-Modulation ANT3				
2506.0/2526.0	39.12/39.19	8.16582/8.29851	-	compliant
2583.0/2603.0	39.03/39.07	7.99834/8.07235	-	compliant
2660.0/2680.0	39.07/38.92	8.07235/7.79830	-	compliant
16QAM-Modulation ANT4				
2506.0/2526.0	39.16/39.26	8.24138/8.43335	-	compliant
2583.0/2603.0	39.20/39.32	8.31764/8.55067	-	compliant
2660.0/2680.0	39.39/39.12	8.68960/8.16582	-	compliant
16QAM-Modulation ANT5				
2506.0/2526.0	39.37/39.44	8.64968/8.79023	-	compliant
2583.0/2603.0	39.24/39.33	8.39460/8.57038	-	compliant
2660.0/2680.0	39.31/39.19	8.53100/8.29851	-	compliant
16QAM-Modulation ANT6				
2506.0/2526.0	39.50/39.63	8.91251/9.18333	-	compliant
2583.0/2603.0	39.41/39.51	8.72971/8.93305	-	compliant
2660.0/2680.0	39.42/39.26	8.74984/8.43335	-	compliant
16QAM-Modulation ANT7				
2506.0/2526.0	39.21/39.32	8.33681/8.55067	-	compliant
2583.0/2603.0	39.18/39.26	8.27942/8.43335	-	compliant
2660.0/2680.0	39.20/39.01	8.31764/7.96159	-	compliant
16QAM-Modulation ANT8				
2506.0/2526.0	39.39/39.49	8.68960/8.89201	-	compliant
2583.0/2603.0	39.40/39.52	8.70964/8.95365	-	compliant
2660.0/2680.0	39.52/39.32	8.95365/8.55067	-	compliant
16QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total				
2506.0+2526.0	51.40934	137.76943	-	compliant
2583.0+2603.0	51.30960	135.78019	-	compliant
2660.0+2680.0	51.22060	133.88199	-	compliant
64QAM-Modulation ANT1				
2506.0/2526.0	39.15/39.30	8.22243/8.51138	-	compliant
2583.0/2603.0	39.13/39.25	8.18465/8.41395	-	compliant
2660.0/2680.0	39.24/39.06	8.39460/8.05378	-	compliant
64QAM-Modulation ANT2				
2506.0/2526.0	39.47/39.54	8.85116/8.99498	-	compliant
2583.0/2603.0	39.35/39.43	8.60994/8.77001	-	compliant
2660.0/2680.0	39.36/39.14	8.62979/8.20352	-	compliant
64QAM-Modulation ANT3				
2506.0/2526.0	39.10/39.22	8.12831/8.35603	-	compliant
2583.0/2603.0	39.04/39.10	8.01678/8.12831	-	compliant
2660.0/2680.0	39.04/38.95	8.01678/7.85236	-	compliant
64QAM-Modulation ANT4				
2506.0/2526.0	39.26/39.36	8.43335/8.62979	-	compliant
2583.0/2603.0	39.22/39.34	8.35603/8.59014	-	compliant
2660.0/2680.0	39.35/39.23	8.60994/8.37529	-	compliant
64QAM-Modulation ANT5				
2506.0/2526.0	39.44/39.56	8.79023/9.03649	-	compliant
2583.0/2603.0	39.19/39.29	8.29851/8.49180	-	compliant

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2660.0/2680.0	39.40/39.15	8.70964/8.22243	-	compliant
64QAM-Modulation ANT6				
2506.0/2526.0	39.53/39.60	8.97429/9.12011	-	compliant
2583.0/2603.0	39.39/39.50	8.68960/8.91251	-	compliant
2660.0/2680.0	39.30/39.15	8.51138/8.22243	-	compliant
64QAM-Modulation ANT7				
2506.0/2526.0	39.25/39.32	8.41395/8.55067	-	compliant
2583.0/2603.0	39.04/39.17	8.01678/8.26038	-	compliant
2660.0/2680.0	39.09/39.02	8.10961/7.97995	-	compliant
64QAM-Modulation ANT8				
2506.0/2526.0	39.29/39.46	8.49180/8.83080	-	compliant
2583.0/2603.0	39.34/39.48	8.59014/8.87156	-	compliant
2660.0/2680.0	39.25/39.11	8.41395/8.14704	-	compliant
64QAM-Modulation ANT1+ANT2+ANT3+ANT4+ANT5+ANT6+ANT7+ANT8 Calculated Total				
2506.0+2526.0	51.40934	138.33575	-	compliant
2583.0+2603.0	51.30980	135.20108	-	compliant
2660.0+2680.0	51.22060	132.45247	-	compliant

Table 5 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 to be 18 MHz (Config. A), which represents the 99% power bandwidth (see the following section and screenshots on pages 45).

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

Config A: 18M0D9W (Channel bandwidth 20 MHz)

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

Sample modulation screenshots are on page 41, 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.

4.3.2. Test Procedure and Results

The 99% occupied bandwidth of the carrier emission is measured using a signal analyzer with Resolution Bandwidth set to 30 kHz (less than 1% of bandwidth; see screenshots on page 45 for details). The following tables summarize the results:

Config A:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
QPSK-Modulation ANT2		
2506.0	17.8311	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
QPSK-Modulation ANT3		
2506.0	17.8311	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
QPSK-Modulation ANT4		
2506.0	17.8311	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
QPSK-Modulation ANT5		
2506.0	17.8020	compliant
2593.0	17.8311	compliant
2680.0	17.8311	compliant
QPSK-Modulation ANT6		
2506.0	17.8311	compliant
2593.0	17.8311	compliant
2680.0	17.8311	compliant
QPSK-Modulation ANT7		
2506.0	17.8311	compliant
2593.0	17.8311	compliant
2680.0	17.8311	compliant
QPSK-Modulation ANT8		
2506.0	17.8311	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant

16QAM-Modulation ANT1		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.7729	compliant
16QAM-Modulation ANT2		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.7729	compliant
16QAM-Modulation ANT3		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.7729	compliant
16QAM-Modulation ANT4		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.7729	compliant
16QAM-Modulation ANT5		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.7729	compliant
16QAM-Modulation ANT6		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8020	compliant
16QAM-Modulation ANT7		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.7729	compliant
16QAM-Modulation ANT8		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.7729	compliant
64QAM-Modulation ANT1		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
64QAM-Modulation ANT2		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
64QAM-Modulation ANT3		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
64QAM-Modulation ANT4		
2506.0	17.8311	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
64QAM-Modulation ANT5		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant

64QAM-Modulation ANT6		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
64QAM-Modulation ANT7		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
64QAM-Modulation ANT8		
2506.0	17.8020	compliant
2593.0	17.8020	compliant
2680.0	17.8311	compliant
Measurement Uncertainty:		±48kHz

Table 6 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 8 TX -antenna connectors, each antenna connectors were measured individually and each individual limit lime was reduced by 10log(8). Limit line was calculated to show -22.03dB emission limit, according to FCC KDB 662911 D01 guidance.

4.4.2. Test Procedure and Results

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 58 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: 2506.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1			
	2496	-26.54	compliant
QPSK-Modulation ANT2			
	2496	-26.39	compliant
QPSK-Modulation ANT3			
	2496	-26.98	compliant
QPSK-Modulation ANT4			
	2496	-26.29	compliant
QPSK-Modulation ANT5			
	2496	-25.78	compliant
QPSK-Modulation ANT6			
	2496	-25.67	compliant
QPSK-Modulation ANT7			
	2496	-26.21	compliant
QPSK-Modulation ANT8			
	2496	-25.78	compliant
16QAM-Modulation ANT1			
	2496	-26.51	compliant
16QAM-Modulation ANT2			
	2496	-25.80	compliant
16QAM-Modulation ANT3			
	2496	-26.11	compliant
16QAM-Modulation ANT4			
	2496	-26.48	compliant
16QAM-Modulation ANT5			
	2496	-26.84	compliant
16QAM-Modulation ANT6			
	2496	-26.39	compliant
16QAM-Modulation ANT7			
	2496	-27.58	compliant
16QAM-Modulation ANT8			
	2496	-25.54	compliant
64QAM-Modulation ANT1			
	2496	-26.03	compliant
64QAM-Modulation ANT2			
	2496	-26.09	compliant

64QAM-Modulation ANT3			
	2496	-26.56	compliant
64QAM-Modulation ANT4			
	2496	-26.03	compliant
64QAM-Modulation ANT5			
	2496	-26.09	compliant
64QAM-Modulation ANT6			
	2496	-26.21	compliant
64QAM-Modulation ANT7			
	2496	--26.97	compliant
64QAM-Modulation ANT8			
	2496	-26.44	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 7 Spurious Emissions (Lower band edge) (20 MHz CH BW)

Config A Upper band edge:

Carrier Frequency: 2680.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2690	-29.96	compliant
QPSK-Modulation ANT2			
	2690	-27.61	compliant
QPSK-Modulation ANT3			
	2690	-29.77	compliant
QPSK-Modulation ANT4			
	2690	-29.24	compliant
QPSK-Modulation ANT5			
	2690	-28.82	compliant
QPSK-Modulation ANT6			
	2690	-28.41	compliant
QPSK-Modulation ANT7			
	2690	-30.05	compliant
QPSK-Modulation ANT8			
	2690	-29.10	compliant
16QAM-Modulation ANT1			
	2690	-23.63	compliant

16QAM-Modulation ANT2			
	2690	-23.15	compliant
16QAM-Modulation ANT3			
	2690	-23.85	compliant
16QAM-Modulation ANT4			
	2690	-24.32	compliant
16QAM-Modulation ANT5			
	2690	-24.17	compliant
16QAM-Modulation ANT6			
	2690	-23.85	compliant
16QAM-Modulation ANT7			
	2690	-24.96	compliant
16QAM-Modulation ANT8			
	2690	-24.03	compliant
64QAM-Modulation ANT1			
	2690	-27.00	compliant
64QAM-Modulation ANT2			
	2690	-26.41	compliant
64QAM-Modulation ANT3			
	2690	-28.12	compliant
64QAM-Modulation ANT4			
	2690	-28.02	compliant
64QAM-Modulation ANT5			
	2690	-27.54	compliant
64QAM-Modulation ANT6			
	2690	-27.61	compliant
64QAM-Modulation ANT7			
	2690	-28.44	compliant
64QAM-Modulation ANT8			
	2690	-27.72	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 8 Spurious Emissions (Upper band edge) (20 MHz CH BW)

Config A Spurious emissions:

Carrier Frequency: 2593.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1			
0.009 – 26900	5181	-32.92	compliant
QPSK-Modulation ANT2			
0.009 – 26900	5181	-28.32	compliant
QPSK-Modulation ANT3			
0.009 – 26900	5181	-31.31	compliant
QPSK-Modulation ANT4			
0.009 – 26900	5181	-30.97	compliant
QPSK-Modulation ANT5			
0.009 – 26900	5181	-31.79	compliant
QPSK-Modulation ANT6			
0.009 – 26900	5181	-31.80	compliant
QPSK-Modulation ANT7			
0.009 – 26900	5181	-32.17	compliant
QPSK-Modulation ANT8			
0.009 – 26900	5181	-31.14	compliant
16QAM-Modulation ANT1			
0.009 – 26900	5181	-31.52	compliant
16QAM-Modulation ANT2			
0.009 – 26900	5181	-31.21	compliant
16QAM-Modulation ANT3			
0.009 – 26900	5181	-32.27	compliant
16QAM-Modulation ANT4			
0.009 – 26900	5181	-31.56	compliant
16QAM-Modulation ANT5			
0.009 – 26900	5181	-31.03	compliant
16QAM-Modulation ANT6			
0.009 – 26900	5181	-30.90	compliant
16QAM-Modulation ANT7			
0.009 – 26900	5181	-31.47	compliant
16QAM-Modulation ANT8			
0.009 – 26900	5181	-31.59	compliant
64QAM-Modulation ANT1			
0.009 – 26900	5181	-32.04	compliant
64QAM-Modulation ANT2			
0.009 – 26900	5181	-30.98	compliant

64QAM-Modulation ANT3			
0.009 – 26900	5181	-31.48	compliant
64QAM-Modulation ANT4			
0.009 – 26900	5181	-30.89	compliant
64QAM-Modulation ANT5			
0.009 – 26900	5181	-31.49	compliant
64QAM-Modulation ANT6			
0.009 – 26900	5181	-31.39	compliant
64QAM-Modulation ANT7			
0.009 – 26900	5181	-32.41	compliant
64QAM-Modulation ANT8			
0.009 – 26900	5181	-30.83	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 (20 MHz Channel BW)

Config B Lower band edge:

Carrier Frequency: 2506.0/2526.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2496	-28.81	compliant
QPSK-Modulation ANT2			
	2496	-28.55	compliant
QPSK-Modulation ANT3			
	2496	-29.74	compliant
QPSK-Modulation ANT4			
	2496	-28.50	compliant
QPSK-Modulation ANT5			
	2496	-28.67	compliant
QPSK-Modulation ANT6			
	2496	-28.20	compliant
QPSK-Modulation ANT7			
	2496	-24.94	compliant
QPSK-Modulation ANT8			
	2496	-28.38	compliant
16QAM-Modulation ANT1			
	2496	-29.83	compliant

16QAM-Modulation ANT2			
	2496	-29.39	compliant
16QAM-Modulation ANT3			
	2496	-30.02	compliant
16QAM-Modulation ANT4			
	2496	-29.19	compliant
16QAM-Modulation ANT5			
	2496	-28.94	compliant
16QAM-Modulation ANT6			
	2496	-28.66	compliant
16QAM-Modulation ANT7			
	2496	-29.93	compliant
16QAM-Modulation ANT8			
	2496	-28.21	compliant
64QAM-Modulation ANT1			
	2496	-28.82	compliant
64QAM-Modulation ANT2			
	2496	-28.74	compliant
64QAM-Modulation ANT3			
	2496	-29.65	compliant
64QAM-Modulation ANT4			
	2496	-28.68	compliant
64QAM-Modulation ANT5			
	2496	-28.84	compliant
64QAM-Modulation ANT6			
	2496	-27.44	compliant
64QAM-Modulation ANT7			
	2496	-28.75	compliant
64QAM-Modulation ANT8			
	2496	-28.36	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 10 Spurious Emissions (Lower band edge) (20 MHz CH BW)

Config B Upper band edge:

Carrier Frequency: 2660.0/2680.0 MHz			
Frequency Range [MHz]	Emission Frequency [MHz]	Maximum Emission Level [dBm]	Result
QPSK-Modulation ANT1			
	2690	-30.49	compliant
QPSK-Modulation ANT2			
	2690	-29.65	compliant
QPSK-Modulation ANT3			
	2690	-30.36	compliant
QPSK-Modulation ANT4			
	2690	-29.47	compliant
QPSK-Modulation ANT5			
	2690	-30.72	compliant
QPSK-Modulation ANT6			
	2690	-28.47	compliant
QPSK-Modulation ANT7			
	2690	-30.4	compliant
QPSK-Modulation ANT8			
	2690	-29.52	compliant
16QAM-Modulation ANT1			
	2690	-30.99	compliant
16QAM-Modulation ANT2			
	2690	-30.34	compliant
16QAM-Modulation ANT3			
	2690	-31.11	compliant
16QAM-Modulation ANT4			
	2690	-30.23	compliant
16QAM-Modulation ANT5			
	2690	-30.05	compliant
16QAM-Modulation ANT6			
	2690	-29.72	compliant
16QAM-Modulation ANT7			
	2690	-30.97	compliant
16QAM-Modulation ANT8			
	2690	-30.51	compliant
64QAM-Modulation ANT1			
	2690	-30.67	compliant
64QAM-Modulation ANT2			
	2690	-28.87	compliant

64QAM-Modulation ANT3			
	2690	-29.65	compliant
64QAM-Modulation ANT4			
	2690	-29.96	compliant
64QAM-Modulation ANT5			
	2690	-29.56	compliant
64QAM-Modulation ANT6			
	2690	-28.75	compliant
64QAM-Modulation ANT7			
	2690	-29.95	compliant
64QAM-Modulation ANT8			
	2690	-28.44	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 (Upper band edge) (20 MHz CH BW)

Config B Spurious emissions:

Carrier Frequency: 2583.0/2603.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 – 26900	5181	-32.46	compliant
QPSK-Modulation ANT2			
0.009 – 26900	5181	-32.63	compliant
QPSK-Modulation ANT3			
0.009 – 26900	5181	-32.77	compliant
QPSK-Modulation ANT4			
0.009 – 26900	5181	-32.67	compliant
QPSK-Modulation ANT5			
0.009 – 26900	5181	-32.78	compliant
QPSK-Modulation ANT6			
0.009 – 26900	5181	-31.97	compliant
QPSK-Modulation ANT7			
0.009 – 26900	5181	-32.00	compliant
QPSK-Modulation ANT8			
0.009 – 26900	5181	-32.22	compliant
16QAM-Modulation ANT1			
0.009 – 26900	5181	-31.71	compliant

16QAM-Modulation ANT2			
0.009 – 26900	5181	-33.04	compliant
16QAM-Modulation ANT3			
0.009 – 26900	5181	-32.28	compliant
16QAM-Modulation ANT4			
0.009 – 26900	5181	-32.00	compliant
16QAM-Modulation ANT5			
0.009 – 26900	5181	-31.98	compliant
16QAM-Modulation ANT6			
0.009 – 26900	5181	-31.77	compliant
16QAM-Modulation ANT7			
0.009 – 26900	5181	-31.95	compliant
16QAM-Modulation ANT8			
0.009 – 26900	5181	-31.73	compliant
64QAM-Modulation ANT1			
0.009 – 26900	5181	-31.73	compliant
64QAM-Modulation ANT2			
0.009 – 26900	5181	-31.72	compliant
64QAM-Modulation ANT3			
0.009 – 26900	5181	-32.28	compliant
64QAM-Modulation ANT4			
0.009 – 26900	5181	-32.26	compliant
64QAM-Modulation ANT5			
0.009 – 26900	5181	-32.16	compliant
64QAM-Modulation ANT6			
0.009 – 26900	5181	-31.89	compliant
64QAM-Modulation ANT7			
0.009 – 26900	5181	-31.96	compliant
64QAM-Modulation ANT8			
0.009 – 26900	5181	-31.49	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 12 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.

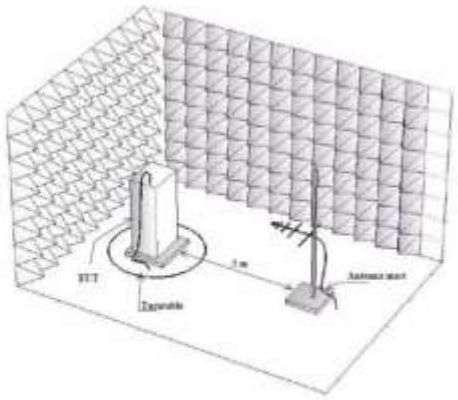

Figure 2 Test Configuration

Photographs of the EUT in the anechoic chamber are shown on page 155 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: 2506.0 MHz, 2593.0 MHz and 2680.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation TX1			
30 - 26500	ALL More than 20dB below limit -13 dBm		compliant
Measurement Uncertainty:			±5.4dB

Table 13 Field Strength of Spurious Radiation (20 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

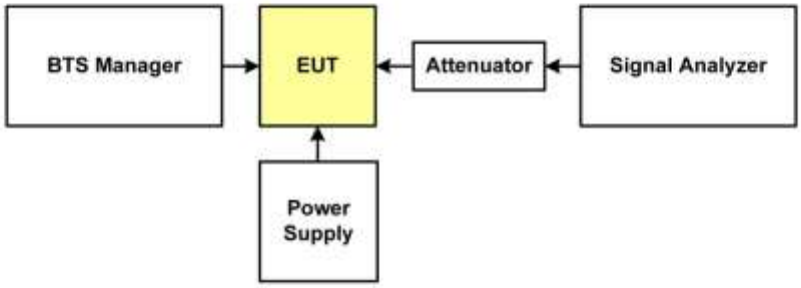

Figure 3 Test Configuration for frequency stability with voltage variation

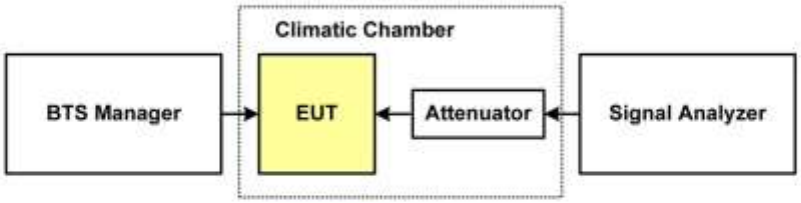

Figure 4 Test Configuration for frequency stability with temperature variation

A complete list of the measurement equipment is included on page 40 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 (DC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-48.0	-30.0	-10.32052	-0.004	129	0.05	compliant
-48.0	-20.0	-4.67126	-0.002	129	0.05	compliant
-48.0	-10.0	8.88102	0.003	129	0.05	compliant
-48.0	0.0	13.48642	0.005	129	0.05	compliant
-48.0	10.0	10.56465	0.004	129	0.05	compliant
-48.0	30.0	-9.59342	-0.004	129	0.05	compliant
-48.0	40.0	9.67421	0.004	129	0.05	compliant
-48.0	50.0	6.23117	0.002	129	0.05	compliant
QPSK Modulation ANT2						
-48.0	-30.0	-4.01223	-0.002	129	0.05	compliant
-48.0	-20.0	-3.17401	-0.001	129	0.05	compliant
-48.0	-10.0	8.59870	0.003	129	0.05	compliant
-48.0	0.0	12.77890	0.005	129	0.05	compliant
-48.0	10.0	9.86783	0.004	129	0.05	compliant
-48.0	30.0	-9.30454	-0.004	129	0.05	compliant
-48.0	40.0	7.15546	0.003	129	0.05	compliant
-48.0	50.0	-6.76108	-0.003	129	0.05	compliant
QPSK Modulation ANT3						
-48.0	-30.0	-4.03451	-0.002	129	0.05	compliant
-48.0	-20.0	-3.81111	-0.001	129	0.05	compliant
-48.0	-10.0	10.92924	0.004	129	0.05	compliant
-48.0	0.0	12.45683	0.005	129	0.05	compliant
-48.0	10.0	10.54268	0.004	129	0.05	compliant
-48.0	30.0	7.74292	0.003	129	0.05	compliant
-48.0	40.0	7.43226	0.003	129	0.05	compliant
-48.0	50.0	-6.38321	-0.002	129	0.05	compliant
QPSK Modulation ANT4						
-48.0	-30.0	-4.88872	-0.002	129	0.05	compliant
-48.0	-20.0	-5.62670	-0.002	129	0.05	compliant

-48.0	-10.0	8.35085	0.003	129	0.05	compliant
-48.0	0.0	13.36661	0.005	129	0.05	compliant
-48.0	10.0	9.52148	0.004	129	0.05	compliant
-48.0	30.0	-8.86187	-0.003	129	0.05	compliant
-48.0	40.0	8.74853	0.003	129	0.05	compliant
-48.0	50.0	-6.57693	-0.003	129	0.05	compliant
QPSK Modulation ANT5						
-48	-30	-4.62208	-0.002	129	0.05	compliant
-48	-20	-6.04308	-0.002	129	0.05	compliant
-48	-10	18.32605	0.007	129	0.05	compliant
-48	0	11.56208	0.004	129	0.05	compliant
-48	10	11.70761	0.005	129	0.05	compliant
-48	30	-9.54410	-0.004	129	0.05	compliant
-48	40	7.37234	0.003	129	0.05	compliant
-48	50	-7.64941	-0.003	129	0.05	compliant
QPSK Modulation ANT6						
-48	-30	-5.61923	-0.002	129	0.05	compliant
-48	-20	4.55502	0.002	129	0.05	compliant
-48	-10	-6.12655	-0.002	129	0.05	compliant
-48	0	11.18930	0.004	129	0.05	compliant
-48	10	9.92032	0.004	129	0.05	compliant
-48	30	6.59965	0.003	129	0.05	compliant
-48	40	8.20071	0.003	129	0.05	compliant
-48	50	-5.85850	-0.002	129	0.05	compliant
QPSK Modulation ANT7						
-48	-30	-7.64795	-0.003	129	0.05	compliant
-48	-20	4.29799	0.002	129	0.05	compliant
-48	-10	-7.43924	-0.003	129	0.05	compliant
-48	0	9.83067	0.004	129	0.05	compliant
-48	10	8.93125	0.003	129	0.05	compliant
-48	30	6.51201	0.003	129	0.05	compliant
-48	40	5.74914	0.002	129	0.05	compliant
-48	50	4.94631	0.002	129	0.05	compliant
QPSK Modulation ANT8						
-48	-30	-6.46603	-0.002	129	0.05	compliant
-48	-20	-5.40773	-0.002	129	0.05	compliant
-48	-10	5.01848	0.002	129	0.05	compliant
-48	0	10.87234	0.004	129	0.05	compliant
-48	10	9.69348	0.004	129	0.05	compliant
-48	30	7.62885	0.003	129	0.05	compliant
-48	40	6.69085	0.003	129	0.05	compliant
-48	50	-5.64617	-0.002	129	0.05	compliant

16QAM Modulation ANT1						
-48.0	-30.0	-4.77937	-0.002	129	0.05	compliant
-48.0	-20.0	-4.45074	-0.002	129	0.05	compliant
-48.0	-10.0	7.73927	0.003	129	0.05	compliant
-48.0	0.0	10.76523	0.004	129	0.05	compliant
-48.0	10.0	10.51744	0.004	129	0.05	compliant
-48.0	30.0	8.75283	0.003	129	0.05	compliant
-48.0	40.0	7.04430	0.003	129	0.05	compliant
-48.0	50.0	-6.78615	-0.003	129	0.05	compliant
16QAM Modulation ANT2						
-48.0	-30.0	-4.41823	-0.002	129	0.05	compliant
-48.0	-20.0	-8.62873	-0.003	129	0.05	compliant
-48.0	-10.0	9.78983	0.004	129	0.05	compliant
-48.0	0.0	10.60016	0.004	129	0.05	compliant
-48.0	10.0	10.02567	0.004	129	0.05	compliant
-48.0	30.0	-9.85604	-0.004	129	0.05	compliant
-48.0	40.0	8.79046	0.003	129	0.05	compliant
-48.0	50.0	-6.40019	-0.002	129	0.05	compliant
16QAM Modulation ANT3						
-48.0	-30.0	-4.06379	-0.002	129	0.05	compliant
-48.0	-20.0	-8.49076	-0.003	129	0.05	compliant
-48.0	-10.0	12.35713	0.005	129	0.05	compliant
-48.0	0.0	10.47935	0.004	129	0.05	compliant
-48.0	10.0	10.77350	0.004	129	0.05	compliant
-48.0	30.0	7.25574	0.003	129	0.05	compliant
-48.0	40.0	6.61947	0.003	129	0.05	compliant
-48.0	50.0	-10.19170	-0.004	129	0.05	compliant
16QAM Modulation ANT4						
-48.0	-30.0	-5.76198	-0.002	129	0.05	compliant
-48.0	-20.0	-4.14425	-0.002	129	0.05	compliant
-48.0	-10.0	6.43840	0.002	129	0.05	compliant
-48.0	0.0	12.37141	0.005	129	0.05	compliant
-48.0	10.0	11.09094	0.004	129	0.05	compliant
-48.0	30.0	-10.15594	-0.004	129	0.05	compliant
-48.0	40.0	-4.95650	-0.002	129	0.05	compliant
-48.0	50.0	-9.35408	-0.004	129	0.05	compliant
16QAM Modulation ANT5						
-48	-30	-5.07923	-0.002	129	0.05	compliant
-48	-20	-5.10931	-0.002	129	0.05	compliant
-48	-10	16.7128	0.006	129	0.05	compliant
-48	0	10.13920	0.004	129	0.05	compliant
-48	10	9.49910	0.004	129	0.05	compliant

-48	30	-10.86190	-0.004	129	0.05	compliant
-48	40	6.48472	0.003	129	0.05	compliant
-48	50	-7.12717	-0.003	129	0.05	compliant
16QAM Modulation ANT6						
-48	-30	-10.81130	-0.004	129	0.05	compliant
-48	-20	5.00353	0.002	129	0.05	compliant
-48	-10	-7.61362	-0.003	129	0.05	compliant
-48	0	11.74925	0.005	129	0.05	compliant
-48	10	11.60748	0.004	129	0.05	compliant
-48	30	6.97730	0.003	129	0.05	compliant
-48	40	7.47861	0.003	129	0.05	compliant
-48	50	-7.00394	-0.003	129	0.05	compliant
16QAM Modulation ANT7						
-48	-30	-7.12960	-0.003	129	0.05	compliant
-48	-20	-5.64092	-0.002	129	0.05	compliant
-48	-10	4.57479	0.002	129	0.05	compliant
-48	0	12.49357	0.005	129	0.05	compliant
-48	10	-9.80773	-0.004	129	0.05	compliant
-48	30	-6.94875	-0.003	129	0.05	compliant
-48	40	7.04651	0.003	129	0.05	compliant
-48	50	5.60337	0.002	129	0.05	compliant
16QAM Modulation ANT8						
-48	-30	-5.66098	-0.002	129	0.05	compliant
-48	-20	5.10796	0.002	129	0.05	compliant
-48	-10	5.07032	0.002	129	0.05	compliant
-48	0	11.09652	0.004	129	0.05	compliant
-48	10	10.76601	0.004	129	0.05	compliant
-48	30	7.61189	0.003	129	0.05	compliant
-48	40	7.38672	0.003	129	0.05	compliant
-48	50	-7.04058	-0.003	129	0.05	compliant
64QAM Modulation ANT1						
-48.0	-30.0	-5.72585	-0.002	129	0.05	compliant
-48.0	-20.0	-6.42280	-0.002	129	0.05	compliant
-48.0	-10.0	10.20430	0.004	129	0.05	compliant
-48.0	0.0	11.60440	0.004	129	0.05	compliant
-48.0	10.0	10.01649	0.004	129	0.05	compliant
-48.0	30.0	7.35576	0.003	129	0.05	compliant
-48.0	40.0	6.76760	0.003	129	0.05	compliant
-48.0	50.0	-9.12409	-0.004	129	0.05	compliant
64QAM Modulation ANT2						
-48.0	-30.0	-4.37238	-0.002	129	0.05	compliant
-48.0	-20.0	-5.16146	-0.002	129	0.05	compliant

-48.0	-10.0	9.80615	0.004	129	0.05	compliant
-48.0	0.0	11.99650	0.005	129	0.05	compliant
-48.0	10.0	10.61670	0.004	129	0.05	compliant
-48.0	30.0	-8.86778	-0.003	129	0.05	compliant
-48.0	40.0	8.90782	0.003	129	0.05	compliant
-48.0	50.0	-8.76978	-0.003	129	0.05	compliant
64QAM Modulation ANT3						
-48.0	-30.0	-4.08170	-0.002	129	0.05	compliant
-48.0	-20.0	-3.88573	-0.001	129	0.05	compliant
-48.0	-10.0	8.61568	0.003	129	0.05	compliant
-48.0	0.0	12.14730	0.005	129	0.05	compliant
-48.0	10.0	11.81206	0.005	129	0.05	compliant
-48.0	30.0	6.91792	0.003	129	0.05	compliant
-48.0	40.0	6.60256	0.003	129	0.05	compliant
-48.0	50.0	-7.32425	-0.003	129	0.05	compliant
64QAM Modulation ANT4						
-48.0	-30.0	-4.38507	-0.002	129	0.05	compliant
-48.0	-20.0	-4.09441	-0.002	129	0.05	compliant
-48.0	-10.0	10.53441	0.004	129	0.05	compliant
-48.0	0.0	13.44160	0.005	129	0.05	compliant
-48.0	10.0	10.52228	0.004	129	0.05	compliant
-48.0	30.0	-10.23865	-0.004	129	0.05	compliant
-48.0	40.0	8.48614	0.003	129	0.05	compliant
-48.0	50.0	-5.78251	-0.002	129	0.05	compliant
64QAM Modulation ANT5						
-48.0	-30	-5.38310	-0.002	129	0.05	compliant
-48.0	-20	-3.64770	-0.001	129	0.05	compliant
-48.0	-10	17.68470	0.007	129	0.05	compliant
-48.0	0	11.67712	0.005	129	0.05	compliant
-48.0	10	10.10377	0.004	129	0.05	compliant
-48.0	30	-8.36302	-0.003	129	0.05	compliant
-48.0	40	7.58491	0.003	129	0.05	compliant
-48.0	50	-6.96048	-0.003	129	0.05	compliant
64QAM Modulation ANT6						
-48.0	-30	-7.90669	-0.003	129	0.05	compliant
-48.0	-20	4.64203	0.002	129	0.05	compliant
-48.0	-10	-8.82833	-0.003	129	0.05	compliant
-48.0	0	11.06170	0.004	129	0.05	compliant
-48.0	10	11.23823	0.004	129	0.05	compliant
-48.0	30	-8.13920	-0.003	129	0.05	compliant
-48.0	40	8.44551	0.003	129	0.05	compliant
-48.0	50	-5.85850	-0.002	129	0.05	compliant

64QAM Modulation ANT7						
-48.0	-30	-4.82011	-0.002	129	0.05	compliant
-48.0	-20	-7.03307	-0.003	129	0.05	compliant
-48.0	-10	-8.04060	-0.003	129	0.05	compliant
-48.0	0	11.34340	0.004	129	0.05	compliant
-48.0	10	10.19081	0.004	129	0.05	compliant
-48.0	30	-7.97432	-0.003	129	0.05	compliant
-48.0	40	7.04954	0.003	129	0.05	compliant
-48.0	50	5.01181	0.002	129	0.05	compliant
64QAM Modulation ANT8						
-48.0	-30	-5.10338	-0.002	129	0.05	compliant
-48.0	-20	4.96734	0.002	129	0.05	compliant
-48.0	-10	4.88264	0.002	129	0.05	compliant
-48.0	0	11.03328	0.004	129	0.05	compliant
-48.0	10	11.03413	0.004	129	0.05	compliant
-48.0	30	9.26850	0.004	129	0.05	compliant
-48.0	40	-5.88580	-0.002	129	0.05	compliant
-48.0	50	-6.52258	-0.003	129	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 14 Frequency stability with temp. var. (20 MHz Channel BW)

Frequency Stability with Voltage Variation:

The EUT was placed in a climatic chamber and allowed to stabilize at +20 degrees Celsius for at least 60 minutes. With the supply voltage of the EUT set to 85% of the nominal value, the frequency error was measure. This procedure was repeated at 100% and 115% of the nominal supply voltage value.

Config A:

Carrier Frequency: 2593.0 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-40.8	20.0	-7.72983	-0.003	129	0.05	compliant
-48.0	20.0	-12.92521	-0.005	129	0.05	compliant
-55.2	20.0	-12.29491	-0.005	129	0.05	compliant
QPSK Modulation ANT2						
-40.8	20.0	-9.68065	-0.004	129	0.05	compliant
-48.0	20.0	-6.84156	-0.003	129	0.05	compliant
-55.2	20.0	-9.11414	-0.004	129	0.05	compliant
QPSK Modulation ANT3						
-40.8	20.0	-12.66137	-0.005	129	0.05	compliant
-48.0	20.0	6.71935	0.003	129	0.05	compliant
-55.2	20.0	-10.37869	-0.004	129	0.05	compliant
QPSK Modulation ANT4						
-40.8	20.0	-12.67207	-0.005	129	0.05	compliant
-48.0	20.0	-8.61071	-0.003	129	0.05	compliant
-55.2	20.0	-10.29875	-0.004	129	0.05	compliant
QPSK Modulation ANT5						
-40.8	20	10.81969	0.004	129	0.05	compliant
-48	20	11.30429	0.004	129	0.05	compliant
-55.2	20	9.42923	0.004	129	0.05	compliant
QPSK Modulation ANT6						
-40.8	20	10.762977	0.004	129	0.05	compliant
-48	20	10.04871	0.004	129	0.05	compliant
-55.2	20	10.67835	0.004	129	0.05	compliant
QPSK Modulation ANT7						
-40.8	20	9.48495	0.004	129	0.05	compliant
-48	20	10.94487	0.004	129	0.05	compliant
-55.2	20	7.50193	0.003	129	0.05	compliant
QPSK Modulation ANT8						
-40.8	20	8.91288	0.003	129	0.05	compliant

-48	20	9.31689	0.004	129	0.05	compliant
-55.2	20	8.49959	0.003	129	0.05	compliant
16QAM Modulation ANT1						
-40.8	20.0	-13.79768	-0.005	129	0.05	compliant
-48.0	20.0	-11.13499	-0.004	129	0.05	compliant
-55.2	20.0	-13.41714	-0.005	129	0.05	compliant
16QAM Modulation ANT2						
-40.8	20.0	-12.86041	-0.005	129	0.05	compliant
-48.0	20.0	-8.51049	-0.003	129	0.05	compliant
-55.2	20.0	-11.92184	-0.005	129	0.05	compliant
16QAM Modulation ANT3						
-40.8	20.0	-11.36261	-0.004	129	0.05	compliant
-48.0	20.0	-10.03947	-0.004	129	0.05	compliant
-55.2	20.0	-11.26392	-0.004	129	0.05	compliant
16QAM Modulation ANT4						
-40.8	20.0	-10.01353	-0.004	129	0.05	compliant
-48.0	20.0	-10.68393	-0.004	129	0.05	compliant
-55.2	20.0	-14.96606	-0.006	129	0.05	compliant
16QAM Modulation ANT5						
-40.8	20	11.30546	0.004	129	0.05	compliant
-48	20	10.60609	0.004	129	0.05	compliant
-55.2	20	9.11782	0.004	129	0.05	compliant
16QAM Modulation ANT6						
-40.8	20	9.79629	0.004	129	0.05	compliant
-48	20	11.12381	0.004	129	0.05	compliant
-55.2	20	8.09022	0.003	129	0.05	compliant
16QAM Modulation ANT7						
-40.8	20	9.17742	0.004	129	0.05	compliant
-48	20	10.94565	0.004	129	0.05	compliant
-55.2	20	9.57722	0.004	129	0.05	compliant
16QAM Modulation ANT8						
-40.8	20	10.16976	0.004	129	0.05	compliant
-48	20	9.53403	0.004	129	0.05	compliant
-55.2	20	9.48682	0.004	129	0.05	compliant
64QAM Modulation ANT1						
-40.8	20.0	-11.34880	-0.004	129	0.05	compliant
-48.0	20.0	-11.48312	-0.004	129	0.05	compliant
-55.2	20.0	-14.18091	-0.005	129	0.05	compliant
64QAM Modulation ANT2						
-40.8	20.0	-11.21693	-0.004	129	0.05	compliant
-48.0	20.0	-8.50427	-0.003	129	0.05	compliant
-55.2	20.0	-14.22576	-0.005	129	0.05	compliant

64QAM Modulation ANT3						
-40.8	20.0	-11.23040	-0.004	129	0.05	compliant
-48.0	20.0	-10.18334	-0.004	129	0.05	compliant
-55.2	20.0	-10.89857	-0.004	129	0.05	compliant
64QAM Modulation ANT4						
-40.8	20.0	-11.47589	-0.004	129	0.05	compliant
-48.0	20.0	-12.32795	-0.005	129	0.05	compliant
-55.2	20.0	-11.98432	-0.005	129	0.05	compliant
64QAM Modulation ANT5						
-40.8	20	10.29276	0.004	129	0.05	compliant
-48	20	10.87641	0.004	129	0.05	compliant
-55.2	20	10.52866	0.004	129	0.05	compliant
64QAM Modulation ANT6						
-40.8	20	11.08593	0.004	129	0.05	compliant
-48	20	9.04225	0.003	129	0.05	compliant
-55.2	20	10.35567	0.004	129	0.05	compliant
64QAM Modulation ANT7						
-40.8	20	11.2701	0.004	129	0.05	compliant
-48	20	10.09706	0.004	129	0.05	compliant
-55.2	20	11.4700	0.004	129	0.05	compliant
64QAM Modulation ANT8						
-40.8	20	9.50646	0.004	129	0.05	compliant
-48	20	8.43260	0.003	129	0.05	compliant
-55.2	20	8.58138	0.003	129	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 15 Frequency stability with voltage var. (20 MHz Channel BW)

The measured frequency stability was found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.

5. TEST DATA AND SCREENSHOTS

5.1 Part List of the RF Measurement Test Equipment

No.	Test Equipment	Manufacturer & Type	Serial Number	Calibration date	Calibration due	Test No.
1	Signal Analyzer	Rohde & Schwarz: FSV 30	100781	05/2013	05/2014	1, 2, 3, 4, 6
2	Signal Analyzer	Rohde & Schwarz: FSQ 26	100403	07/2013	07/2014	
2	Vector Signal Generator	Rohde & Schwarz: SMU200A	100949	07/2013	07/2015	1, 2, 3, 6
3	Signal Generator	Rohde & Schwarz: SMP02	102283/020	08/2013	08/2015	1, 2, 3, 6
4	Vector Network Analyzer	Rohde & Schwarz: ZVA40	100146	02/2013	02/2014	4
5	Vector Network Analyzer	Rohde & Schwarz: ZVL13	101177	02/2013	02/2014	4
6	Calibration Unit	Rohde & Schwarz: ZV-Z54	100125	07/2013	06/2014	4
7	Calibration Kit	Hewlett-Packard: HP85032B	2919A04843	07/2013	07/2014	4
8	Power Meter	Rohde & Schwarz: NRP-Z21	102555	07/2012	07/2014	1, 2, 3, 6
9	Frequency Standard	Datum 8040	23006282	07/2013	07/2014	6
10	Multimeter	Fluke 83	65870302	01/2014	01/2015	1, 2, 3, 4, 6
11	Humidity and Temperature Indicator	Vaisala: HMI 31	P3730008	12/2013	12/2014	1, 2, 3, 4, 6
12	DC Power Supply	Sorensen: SGI 80/188	0525A00547	cnn	-	1, 2, 3, 4, 6
13	Interface Unit	Orbis: TX SSU Platform 700-2700A	SSU-1113-2155	cnn	-	1, 2, 3, 6
14	Altenuator	Aeroflex/Weinschel: 48-20-34	BV3390	cnn	-	4
15	EMI Test Receiver	R&S ESU40	100262	02/2014	02/2015	5
16	Horn Antenna	Emco 3115	6346	11/2013	11/2014	5
17	Bilog Antenna	Chase CBL6112B	2694	06/2013	06/2014	5
18	Log Periodic Antenna	R&S 1-26.5GHz	356749/012	07/2013	07/2014	5
19	Amplifier	Miteq AFSX4	902638	cnn	-	5
20	Antenna Mast	Deisel HD240	2401323194	cnn	-	5
21	Mast Controller	Deisel HD100	1001331	cnn	-	5

Table 16 Part List of the RF Measurement Test Equipment

5.2 Spectral Plots

5.2.1. Test No. 2: Modulation Characteristics

No additional measurements are required for the modulation characteristics. Please refer to test no. 3, occupied bandwidth on page 15.

Screenshots below shows information about the modulations I/Q constellation form and modulation information table, displaying error to ideal modulation symbols.

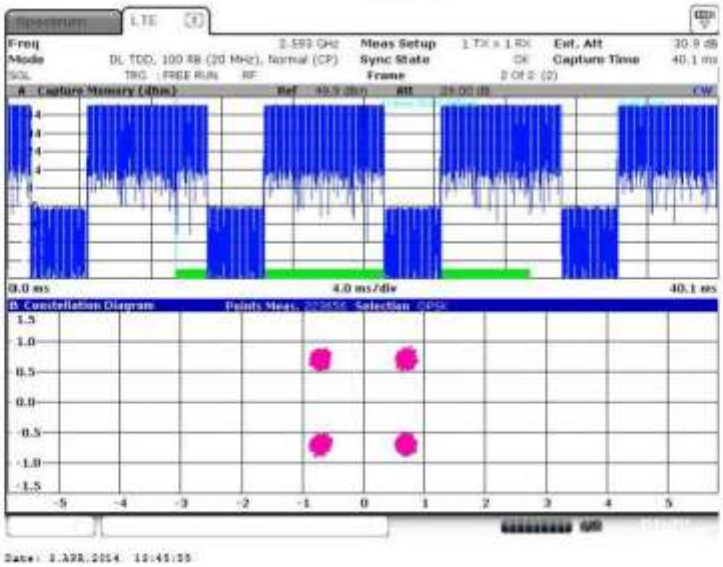

Figure 5 I/Q constellation diagram with capture buffer – QPSK (2593.0 MHz) (20MHz Channel BW)

Figure 6 I/Q constellation table with I/Q error – QPSK (2593.0 MHz) (20MHz Channel BW)

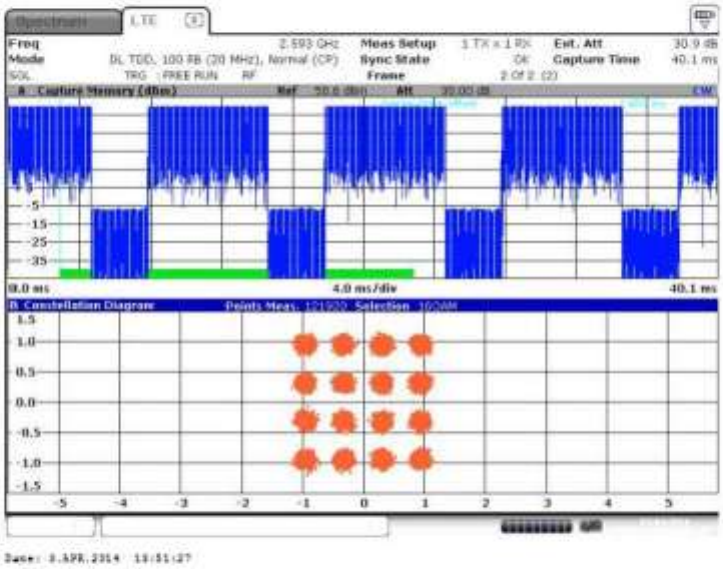

Figure 7 I/Q constellation diagram with capture buffer – 16QAM (2593.0 MHz) (20MHz Channel BW)

Figure 8 I/Q constellation table with I/Q error – 16QAM (2593.0 MHz) (20MHz Channel BW)

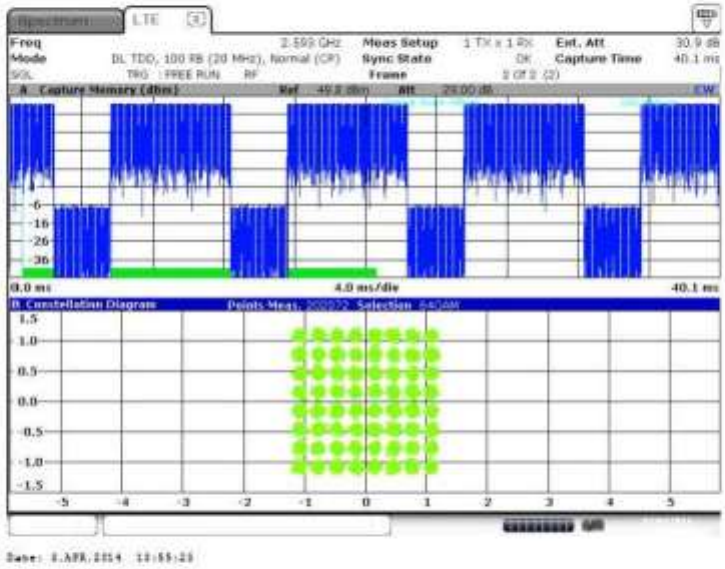

Figure 9 I/Q constellation diagram with capture buffer – 64QAM (2593.0 MHz) (20MHz Channel BW)

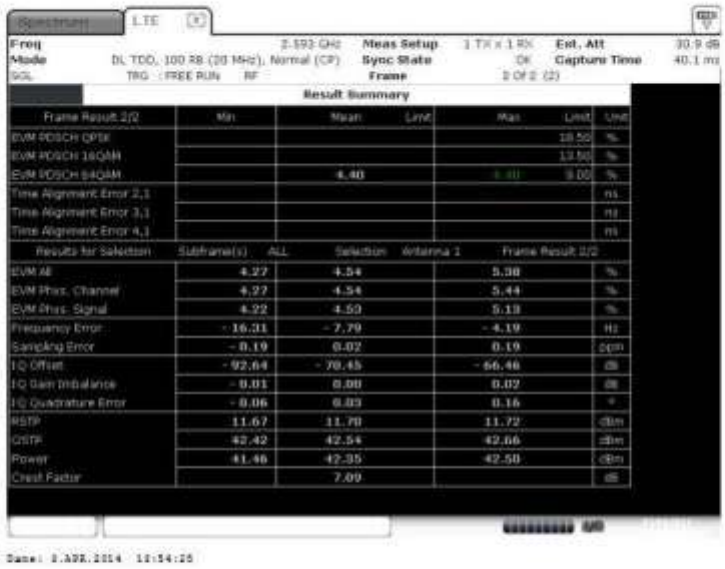

Figure 10 I/Q constellation table with I/Q error – 64QAM (2593.0 MHz) (20MHz Channel BW)

5.2.2. Test No. 3: Occupied Bandwidth

The value 'Occ Bw' is the measured occupied bandwidth.

Config A ANT1:

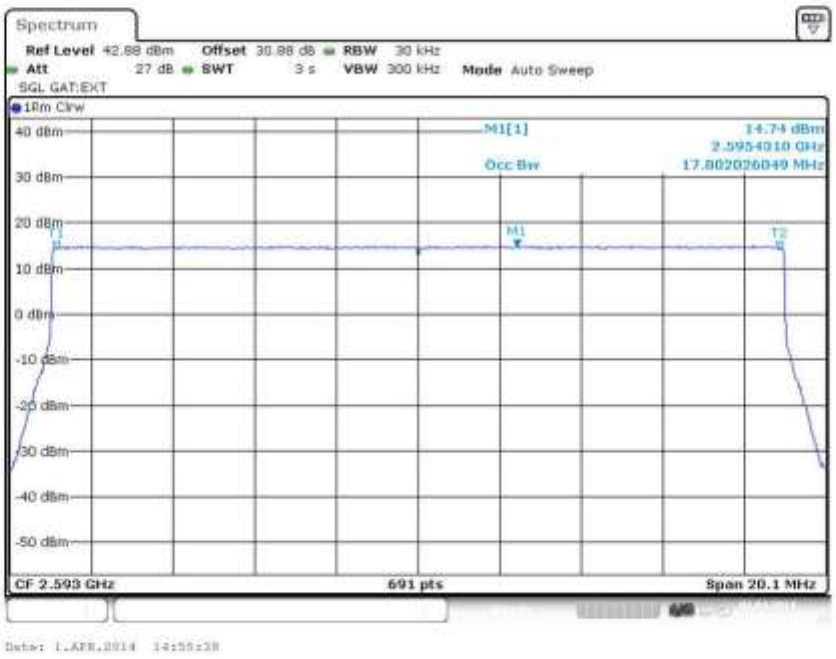

Figure 11 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

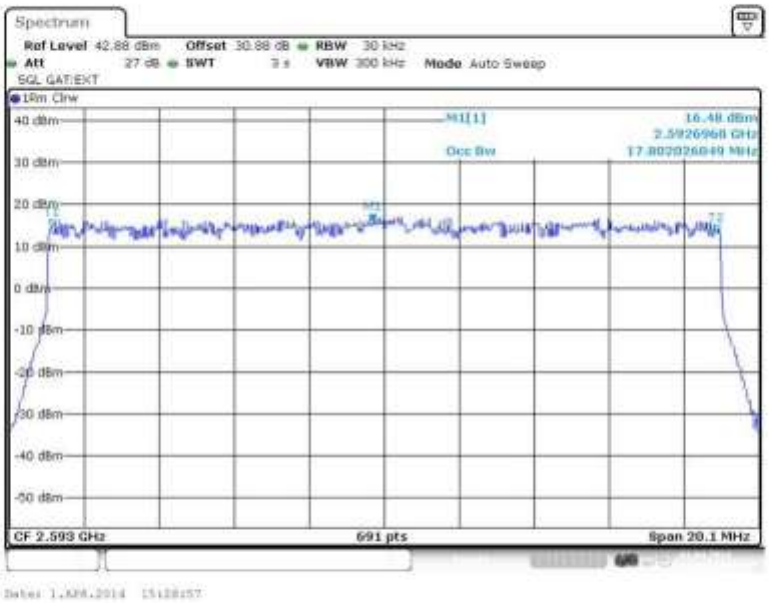

Figure 12 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

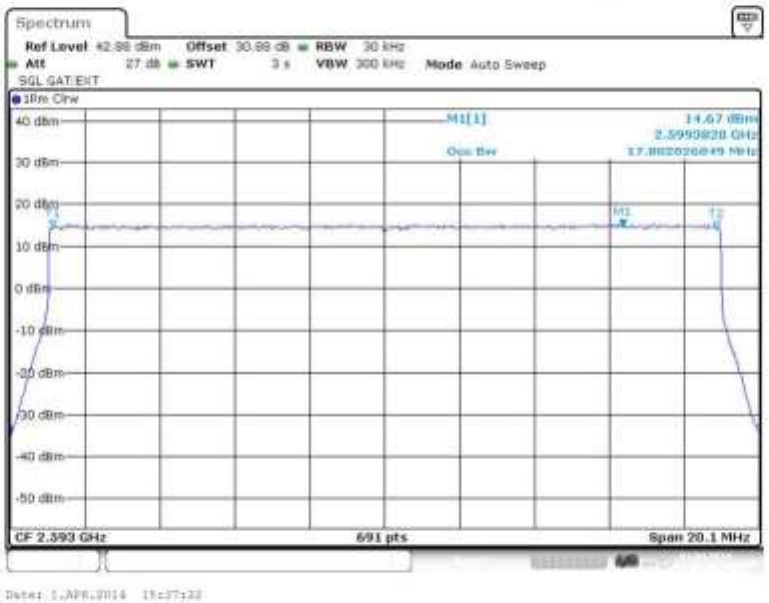

Figure 13 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config A ANT2:

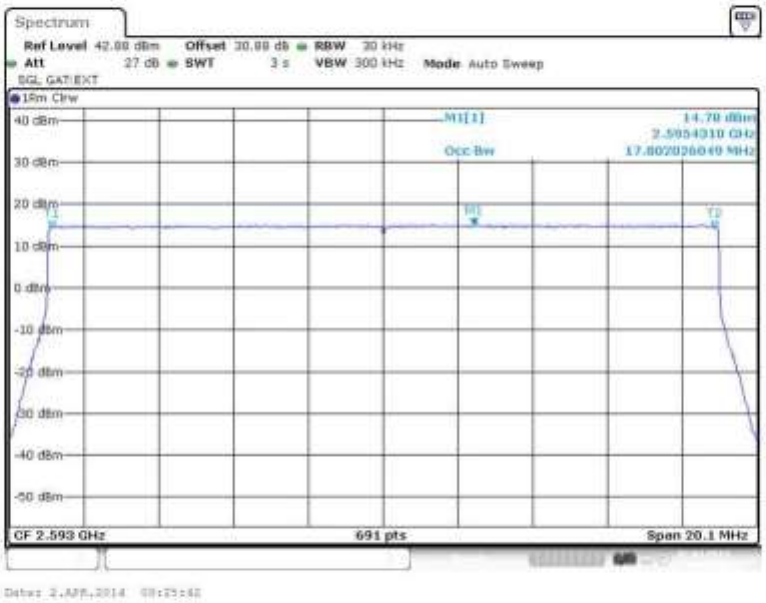

Figure 14 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

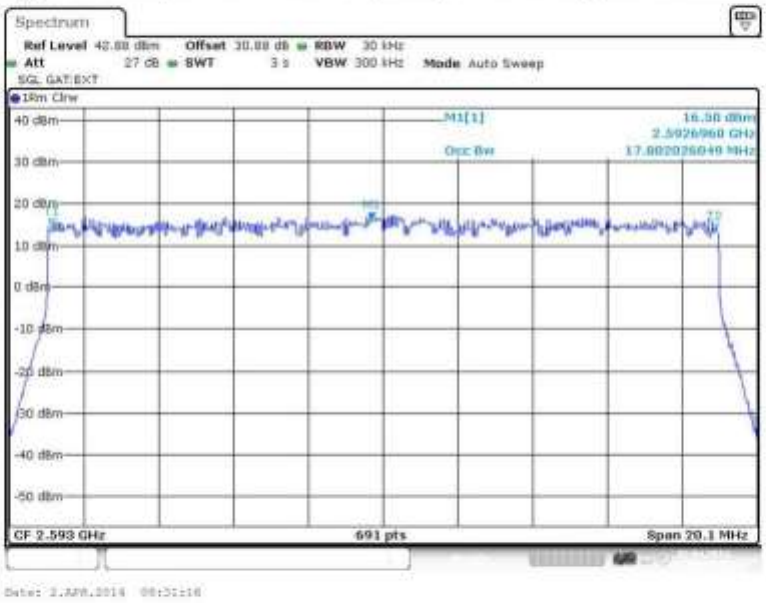

Figure 15 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

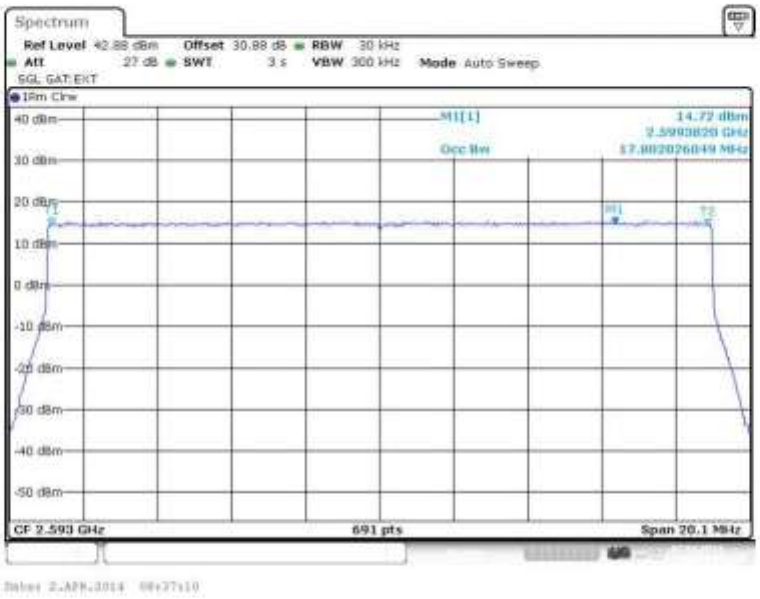

Figure 16 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config A ANT3:

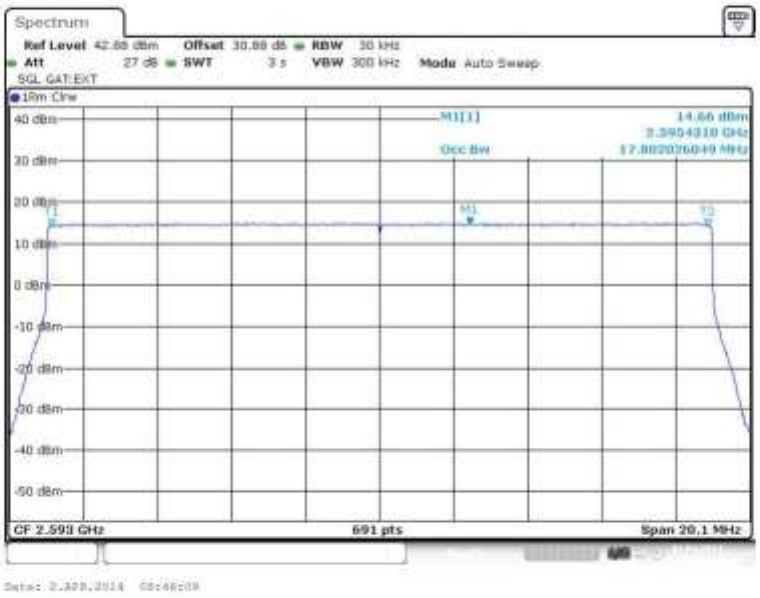

Figure 17 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

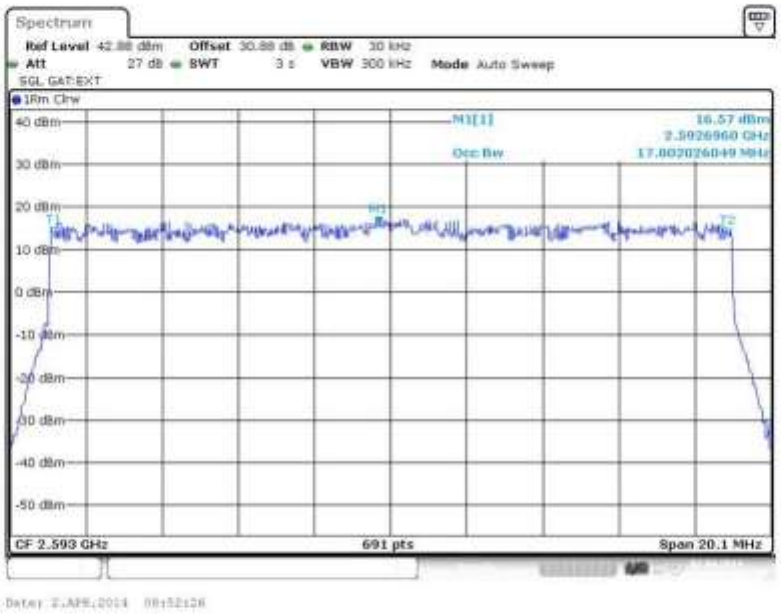

Figure 18 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

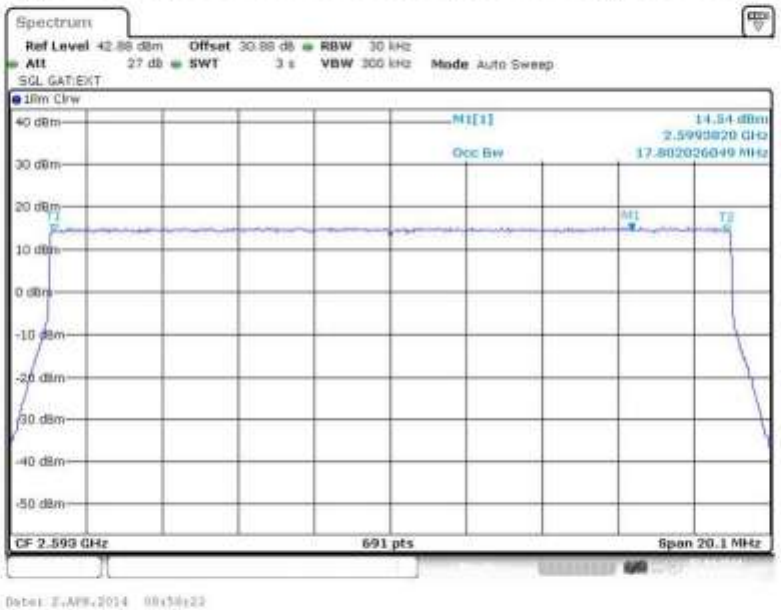

Figure 19 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config A ANT4:

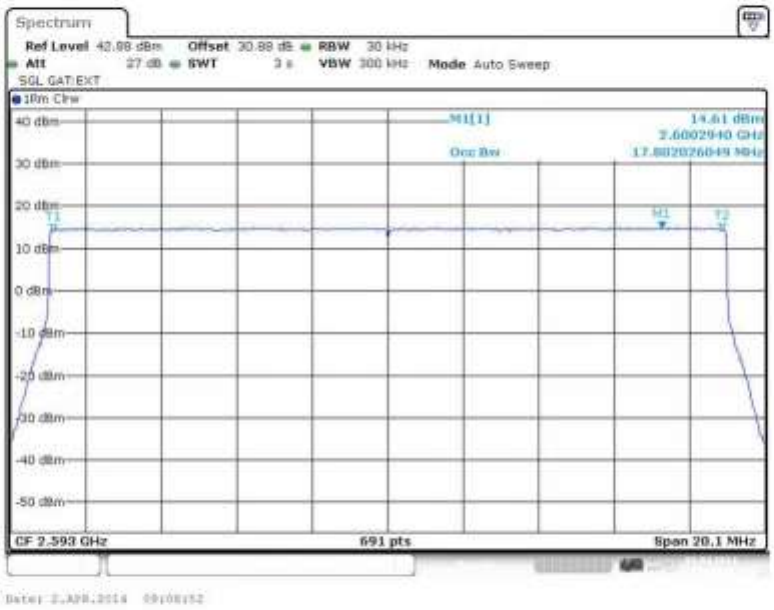

Figure 20 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

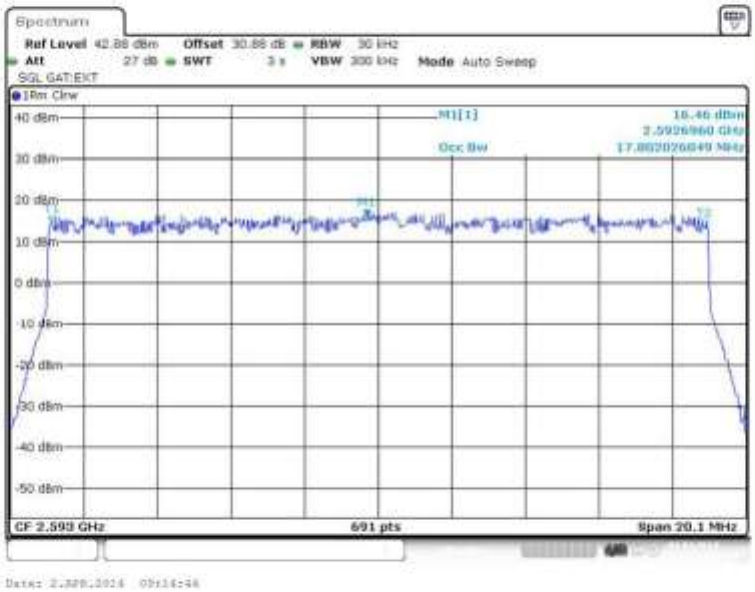

Figure 21 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

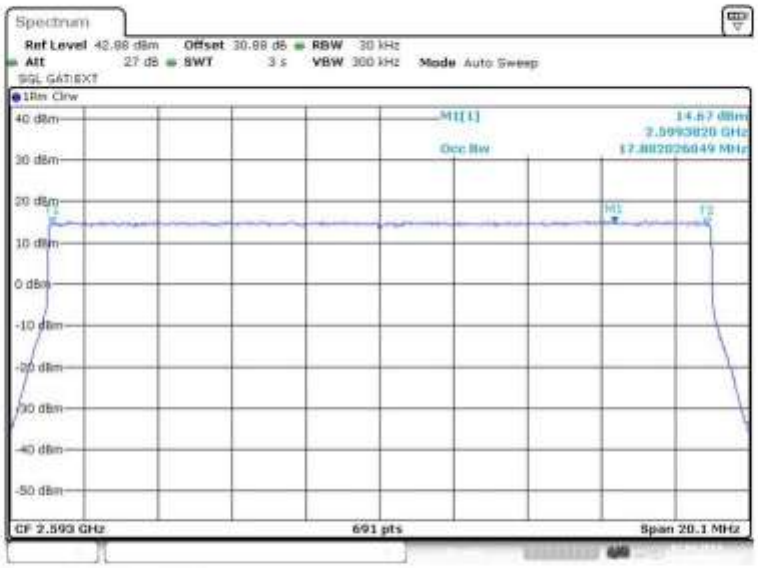

Figure 22 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config A ANT5:

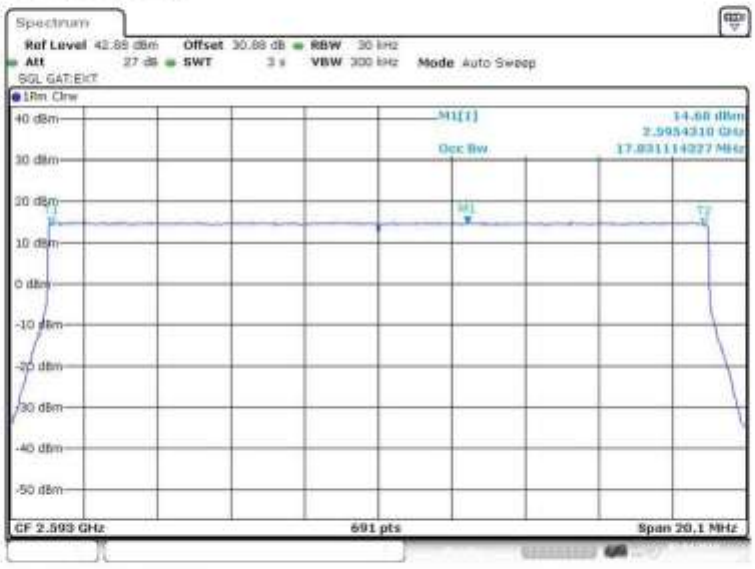

Figure 23 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

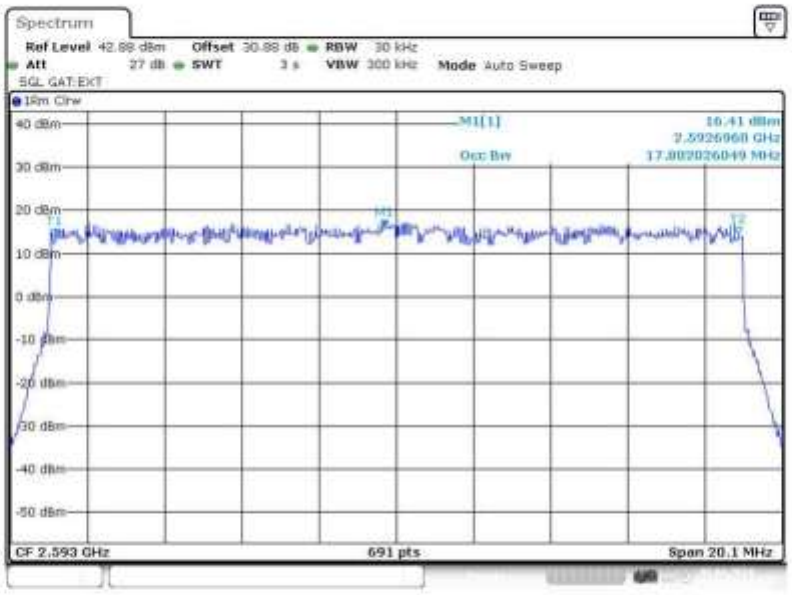

Figure 24 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

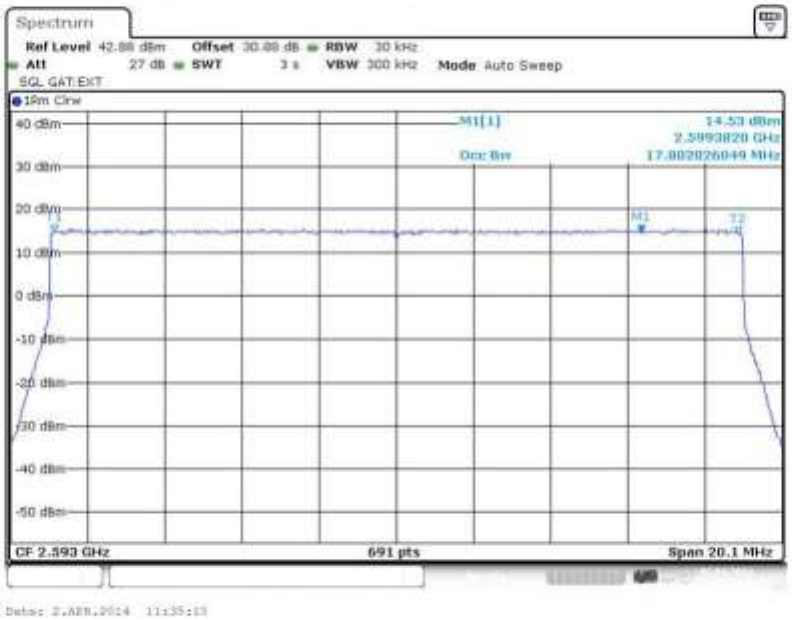

Figure 25 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config A ANT6:

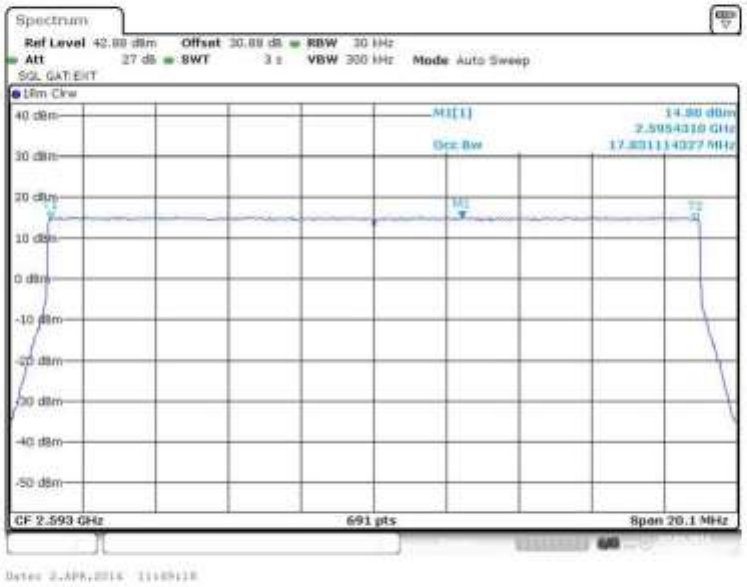

Figure 26 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

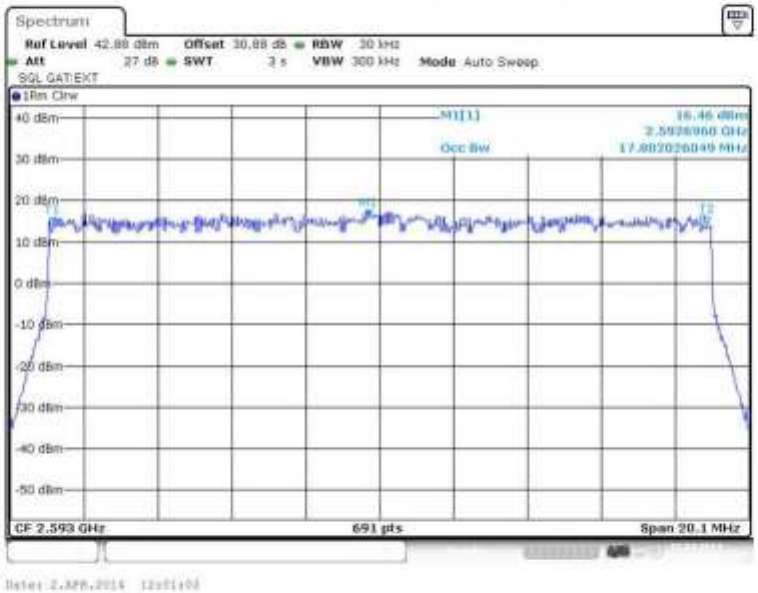

Figure 27 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

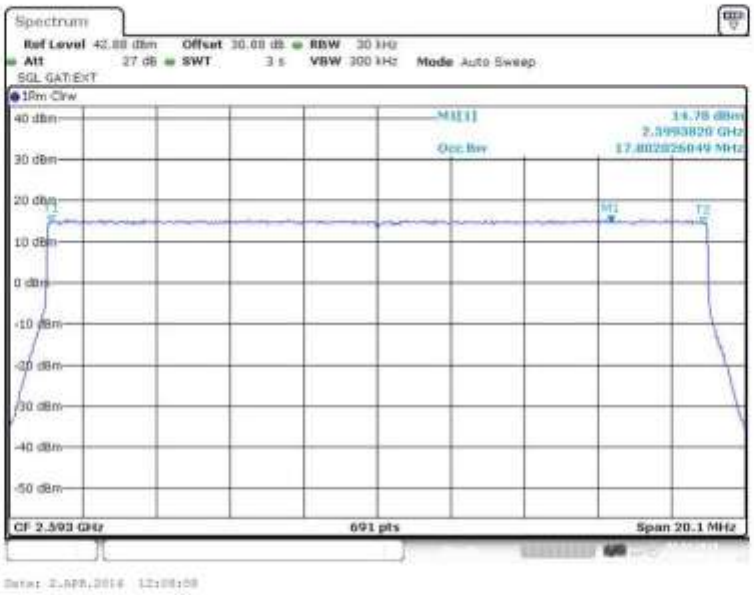

Figure 28 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config A ANT7:

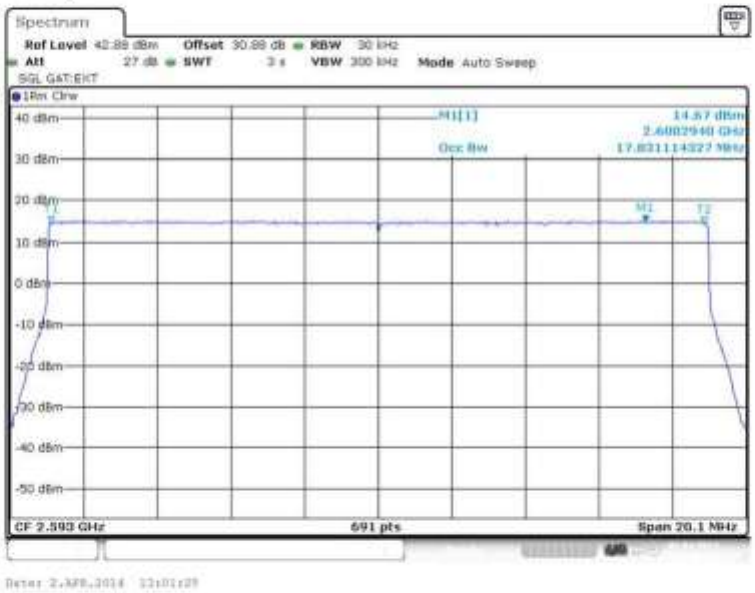

Figure 29 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

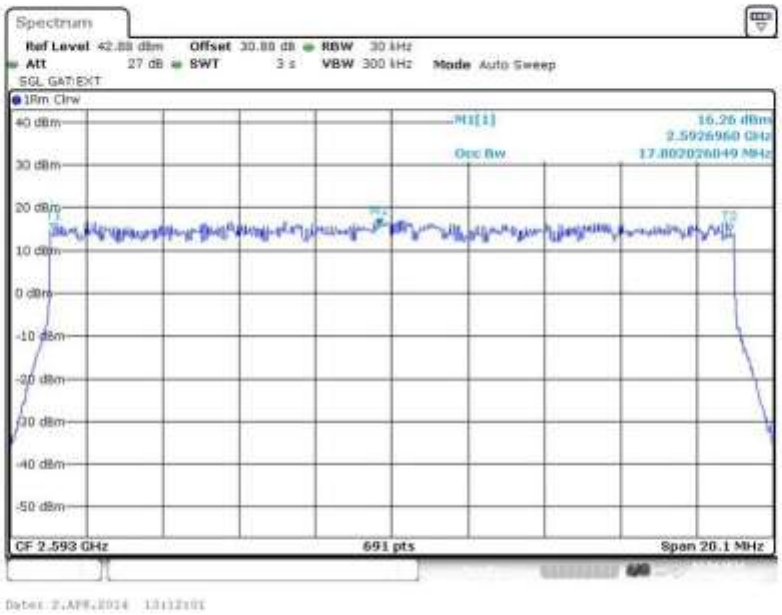

Figure 30 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

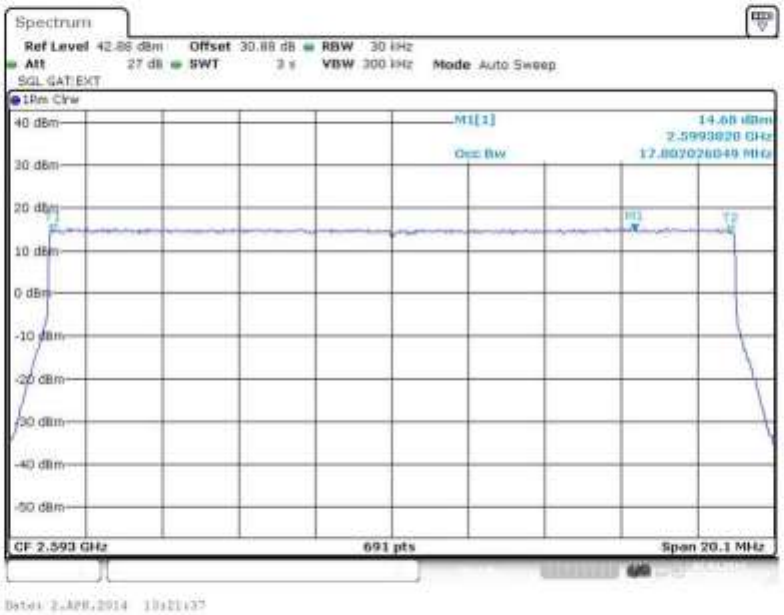

Figure 31 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config A ANT8:

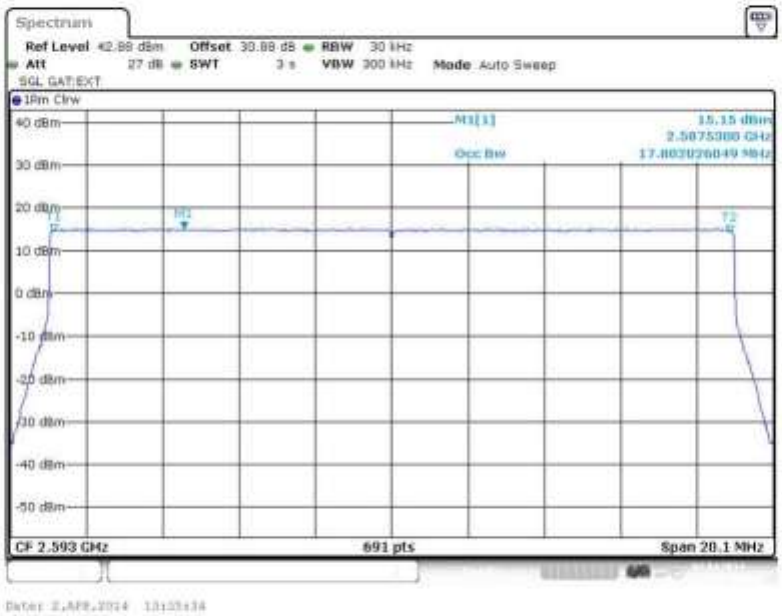

Figure 32 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

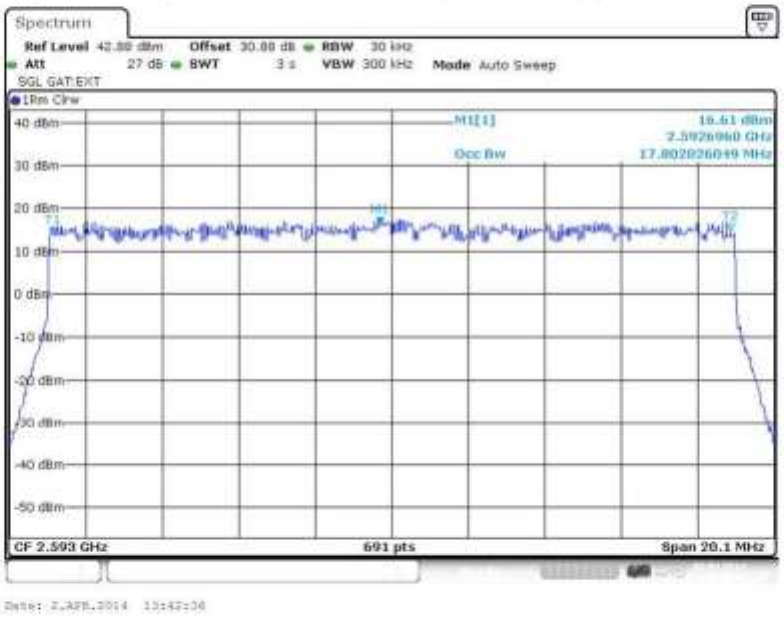

Figure 33 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

5.2.3. Test No. 4: Spurious Emissions at the Antenna Terminals

The external attenuation (cable loss of the setup) can be seen as the 'Offset' value in the screenshots. The external attenuation is frequency dependant. Thus the various 'Offset' values in the screenshots may differ.

Config A ANT1:

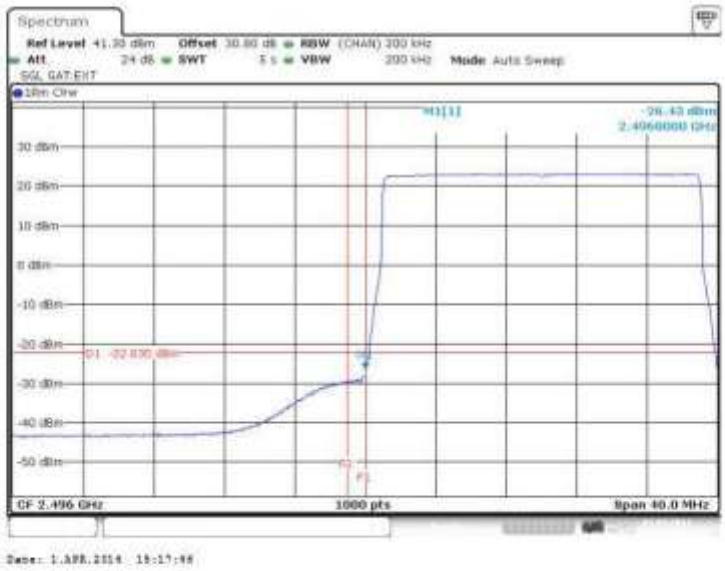

Figure 35 Spurious Emissions (Lower Band Edge) – QPSK (2506.0 MHz) (20MHz Channel BW)