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Report On

Radio Testing of the
Nokia Solutions and Networks Oy
Flexi Lite BTS 1.9GHz
Radio Access Technology: UTRA (FDD)
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 24

COMMERCIAL-IN-CONFIDENCE

FCC ID: VBNFQFA-01

Document 75927745 Report 01 Issue 1 **October 2014**

Product Service

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October 2014

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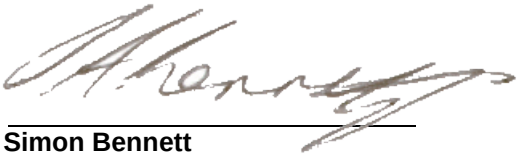

Simon Bennett
Authorised Signatory

DATED 6 October 2014

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SECTION 1

REPORT SUMMARY

Radio Testing of the
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Product Service

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 2.3 GHz Radio Access Technology: UTRA (FDD) In accordance with (2013).

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)	FQFA
Serial Number(s)	L9143700148
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2013) FCC CFR 47 Part 24 (2013)
Order Number Date	464/90547579 29 August 2014
Start of Test	17 September 2014
Finish of Test	26 September 2014
Name of Engineer(s)	Mika Kallankari Jari Veijola

Product Service

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: D521804962

(62 Pages)

NOKIA

Nokia Networks

TEST REPORT NO: D521804962

FCC ID: VBNFQFA-01

Date:	Oulu 01. Oct 2014
Pages:	61
Appendices:	-

Equipment Under Test:	Flexi Lite BTS 1.9GHz Radio Access Technology: UTRA (FDD)
Type:	FQFA
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 24 (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	01. Oct 2014	

CONTENTS

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, § 24.232	8	compliant
2	Modulation Characteristics	§ 2.1047, § 2.201	11	compliant
3	Occupied Bandwidth	§ 2.1049	12	compliant
4	Spurious Emissions at Antenna Terminals	§ 2.1051, § 2.1057, § 24.238	13	compliant
5	Field Strength of Spurious Radiation	§ 2.1053, § 24.238	20	compliant
6	Frequency Stability	§ 2.1055, § 24.235	22	compliant

Table 1 Results – Summary

Measurements guidance: FCC OET laboratory KDB: 662911 D01 Multiple Transmitter Output v01r02 and

FCC KDB 971168 D01 Power Meas License Digital Systems v02r01.

1.1 Test Laboratory

Nokia Solutions and Networks Oy

Kaapelitie 4,

FI-90620, Oulu, Finland

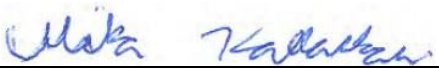
Jari Virta

FCC Reg. No: 411251

1.2 Time Schedule

Test No.	1, 2, 3, 4	5	6
Start of Test:	19.9.2014	17.9.2014	24.9.2014
End of Test:	26.9.2014	23.9.2014	25.9.2014

1.3 Participants

Name	Function	Signature
Mika Kallankari (NSN)	Testing, Setup of EUT	
Jari Veijola (NSN)	Testing, Setup of EUT	

2. EQUIPMENT UNDER TEST

The EUT is a WCDMA Base transceiver station 1.9GHz with 2 power amplifiers.

The BTS performs the radio function of the Base Station System (BSS), and is connected to the Radio Network Controller (RNC) via the Iub interface, and to Mobile Stations (MS) via the Air interface (Antenna). The RNC is further connected to Serving GPRS Support Node (SGSN) or it can be connected to the Mobile Switching Centre (MSC) via IWU (Inter Working Unit).

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 Lite BTS 1.9GHz**	
Radio Access Technology	UTRA	
Duplex mode	Frequency Division Duplex (FDD)	
Channel Bandwidth	Single carrier 5MHz (Config. A), Dual carrier 5MHz (Config. B).	
Supply Voltage	120.0 V AC 60Hz.	
Frequency Bands		
Channel Bandwidth **5MHz**	**Lowest** tunable freq. Single carrier	1932.4MHz
	Dual carriers	1932.4/1937.4MHz
	Middle freq. Single carrier	1960.0MHz
	Dual carriers	1957.4/1962.4MHz
	Highest tunable freq. Single carrier	1987.6MHz
	Dual carriers	1982.6/1987.6MHz
Single carrier		
Rated Output Power (Prat)	5W (37.0dBm) conducted / carrier	
Dual carrier		
Rated Output Power (Prat)	2.5W (34.0dBm) conducted / carrier	
	RX	**TX**
Number of Antenna Ports	2 (ANT1 to ANT2)	2 (ANT1 to ANT2)
MiMo	Yes	Yes

Table 2 Overview of EUT configuration

The tests were performed with one EUT at the antenna ports ANT1or ANT2.

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

Module Name	Serial-No.	Module Type	Config.
FQGA	L9143700148	Flexi Lite BTS	A, B
Other Modules	**Module Type**		**Config.**
-	-		-

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 25.141 UTRA Test Models (TM) for all tests:

- TM 1: All QPSK modulation testing
- TM 5: All 64QAM modulation testing
- TM 6: 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 Lite 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.

3. TEST CONFIGURATION

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

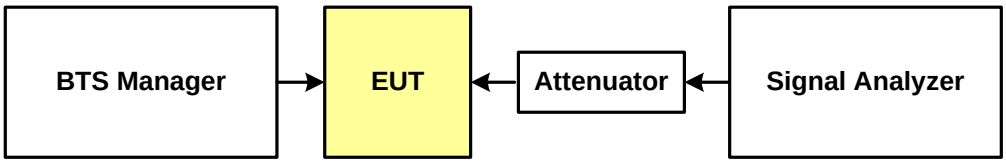


Figure 1 Test Configuration (single output)

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.

Antennas are not supplied with the Base Station. It is the responsibility of the installer to ensure that compliance with this rule part is maintained at the time of installation

A complete list of the measurement equipment is included on page 24 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, § 24.232)

4.1.1. Limits

Para. No. 24.232 (a)(2) . Base stations with an emission bandwidth greater than 1 MHz are limited to 1640 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters

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.

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				
1932.4	37.10	5.13226	6.68	compliant
1960	36.98	4.98360	6.68	compliant
1987.6	36.86	4.85604	6.71	compliant
16QAM-Modulation ANT1				
1932.4	37.03	5.04541	6.71	compliant
1960	36.97	4.97938	6.71	compliant
1987.6	36.83	4.82234	6.73	compliant
16QAM-Modulation ANT2				
1932.4	36.78	4.76728	6.73	compliant
1960	36.94	4.94472	6.71	compliant
1987.6	36.59	4.56316	6.73	compliant
16QAM-Modulation ANT1+ANT2 Calculated Total				
1932.4	39.92	9.81269	-	compliant
1960	39.97	9.92410	-	compliant
1987.6	39.72	9.38550	-	compliant
64QAM-Modulation ANT1				
1932.4	37.04	5.06262	6.73	compliant
1960	36.92	4.92012	6.71	compliant
1987.6	36.83	4.82304	6.73	compliant
64QAM-Modulation ANT2				
1932.4	36.76	4.82304	6.73	compliant
1960	36.96	4.96664	6.71	compliant
1987.6	36.59	4.56158	6.73	compliant
64QAM-Modulation ANT1+ANT2 Calculated Total				
1932.4	39.95	9.88567	-	compliant
1960	39.95	9.88676	-	compliant
1987.6	39.73	9.38462	-	compliant

Table 4 RF Power Output (5 MHz Channel BW)

Config B:

Carrier Frequency [MHz]	RF Power Output		PAPR	Result
	[dBm]	[W]	[dB]	
QPSK-Modulation ANT1				
1932.4/1937.4	33.95/34.22	2.48313/2.64241	6.77885	compliant
1957.4/1962.4	33.97/34.15	2.49460/2.60016	6.70673	compliant
1982.6/1987.6	33.98/33.83	2.50035/2.41546	6.73077	compliant
16QAM-Modulation ANT1				
1932.4/1937.4	33.90/34.17	2.45471/2.61216	6.80288	compliant
1957.4/1962.4	33.90/34.07	2.45471/2.55270	6.75481	compliant
1982.6/1987.6	33.95/33.81	2.48313/2.40436	6.77885	compliant
16QAM-Modulation ANT2				
1932.4/1937.4	33.71/33.97	2.34963/2.49460	6.80288	compliant
1957.4/1962.4	33.82/33.92	2.40991/2.46604	6.75481	compliant
1982.6/1987.6	33.64/33.59	2.31207/2.28560	6.75481	compliant
16QAM-Modulation ANT1+ANT2 Calculated Total				
1932.4/1937.4	36.82/37.08	4.80434/5.10676	-	compliant
1957.4/1962.4	36.87/37.01	4.86461/5.01874	-	compliant
1982.6/1987.6	36.81/36.71	4.79520/4.68996	-	compliant
64QAM-Modulation ANT1				
1932.4/1937.4	33.97/34.24	2.49460/2.65461	6.80288	compliant
1957.4/1962.4	33.91/34.08	2.46037/2.55859	6.73077	compliant
1982.6/1987.6	33.96/33.81	2.41546/2.40436	6.77885	compliant
64QAM-Modulation ANT2				
1932.4/1937.4	33.66/33.92	2.32274/2.46604	6.80288	compliant
1957.4/1962.4	33.83/33.92	2.41546/2.46604	6.73077	compliant
1982.6/1987.6	33.63/33.57	2.306752.27510	6.75481	compliant
64QAM-Modulation ANT1+ANT2 Calculated Total				
1932.4/1937.4	36.83/37.09	4.81733/5.12064	-	compliant
1957.4/1962.4	36.88/37.01	4.87583/5.02463	-	compliant
1982.6/1987.6	36.81/36.70	4.79560/4.67946	-	compliant

Table 5 RF Power Output (5 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 5 MHz (Config. A), which represents the -26dB power bandwidth (see the following section and screenshots on pages 31).

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

Config A: 4M00F9W (Channel bandwidth 5 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 27, 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, § 24.238)

4.3.1. Limits

Para. No 24.238(b). 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.

4.3.2. Test Procedure and Results

The 26dBc occupied bandwidth of the carrier emission is measured using a signal analyzer with Resolution Bandwidth set to 50 kHz (more than 1% of occupied bandwidth); see screenshots on page 31 for details.”

The following tables summarize the results:

Config A:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1		
1932.4	4.568	compliant
1960.0	4.575	compliant
1987.6	4.539	compliant
16QAM-Modulation ANT1		
1932.4	4.549	compliant
1960.0	4.543	compliant
1987.6	4.539	compliant
16QAM-Modulation ANT2		
1932.4	4.538	compliant
1960.0	4.542	compliant
1987.6	4.537	compliant
64QAM-Modulation ANT1		
1932.4	4.538	compliant
1960.0	4.545	compliant
1987.6	4.539	compliant
64QAM-Modulation ANT2		
1932.4	4.538	compliant
1960.0	4.536	compliant
1987.6	4.539	compliant
Measurement Uncertainty:		±48kHz

Table 6 Occupied Bandwidth (5 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, § 24.238)

4.4.1. Limits

Para. No. 24.238(l). The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

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) = <u>-13 dBm</u>

For MiMo output from 2 TX -antenna connectors, each antenna connectors were measured individually and each individual limit lime was reduced by 10log(2). Limit line was calculated to show -16.01dB emission limit, according to FCC KDB 662911 D01 guidance.

4.4.2. Test Procedure and Results

The tests were carried out in accordance with § 24.238. 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 34 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: 1932.4 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	1930	-41.69	compliant
16QAM-Modulation ANT1			
	1930	-42.56	compliant
16QAM-Modulation ANT2			
	1930	-42.12	compliant
64QAM-Modulation ANT1			
	1930	-43.13	compliant
64QAM-Modulation ANT2			
	1930	-41.79	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) (5 MHz CH BW)

Config A Upper band edge:

Carrier Frequency: 1987.6 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	1990	-44.14	compliant
16QAM-Modulation ANT1			
	1990	-43.18	compliant
16QAM-Modulation ANT2			
	1990	-43.08	compliant
64QAM-Modulation ANT1			
	1990	-43.45	compliant
64QAM-Modulation ANT2			
	1990	-43.45	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) (5 MHz CH BW)

Config A Spurious emissions:

Carrier Frequency: 1932.4 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 – 19900	6984.20	-33.93	compliant
16QAM-Modulation ANT1			
0.009 – 19900	6984.20	-33.84	compliant
16QAM-Modulation ANT2			
0.009 – 19900	6975.70	-33.75	compliant
64QAM-Modulation ANT1			
0.009 – 19900	6984.20	-33.91	compliant
64QAM-Modulation ANT2			
0.009 – 19900	6992.60	-33.62	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 (5 MHz Channel BW)

Carrier Frequency: 1960.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 – 19900	6992.60	-33.75	compliant
16QAM-Modulation ANT1			
0.009 – 19900	6984.20	-33.87	compliant
16QAM-Modulation ANT2			
0.009 – 19900	6975.70	-33.75	compliant
64QAM-Modulation ANT1			
0.009 – 19900	6984.20	-33.90	compliant
64QAM-Modulation ANT2			
0.009 – 19900	6984.20	-33.79	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 (5 MHz Channel BW)

Carrier Frequency: 1987.6 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 – 19900	3976.00	-33.65	compliant
16QAM-Modulation ANT1			
0.009 – 19900	3976.00	-33.89	compliant
16QAM-Modulation ANT2			
0.009 – 19900	3976.00	-33.83	compliant
64QAM-Modulation ANT1			
0.009 – 19900	3976.00	-33.91	compliant
64QAM-Modulation ANT2			
0.009 – 19900	6984.20	-33.87	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 11 Spurious Emissions (5 MHz Channel BW)

Config B Lower band edge:

Carrier Frequency: 1932.4/1937.4 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	1930	-43.62	compliant
16QAM-Modulation ANT1			
	1930	-44.61	compliant
16QAM-Modulation ANT2			
	1930	-44.29	compliant
64QAM-Modulation ANT1			
	1930	-44.38	compliant
64QAM-Modulation ANT2			
	1930	-44.29	compliant
Measurement Uncertainty:		f < 1.0GHz: ±1.1dB, 1.0GHz ≤ f <3.6GHz: ±1.2dB, 3.6GHz ≤ f <8.0GHz: ±1.6dB, 8.0GHz ≤ f: ±1.9dB	

Table 12 Spurious Emissions (Lower band edge) (5 MHz CH BW)

Config B Upper band edge:

Carrier Frequency: 1982.6/1987.6 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	1990	-46.70	compliant
16QAM-Modulation ANT1			
	1990	-46.16	compliant
16QAM-Modulation ANT2			
	1990	-46.48	compliant
64QAM-Modulation ANT1			
	1990	-46.27	compliant
64QAM-Modulation ANT2			
	1990	-46.59	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 13 Spurious Emissions (Upper band edge) (5 MHz CH BW)

Config B Spurious emissions:

Carrier Frequency: 1932.4/1937.4 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 – 19900	6984.20	-33.83	compliant
16QAM-Modulation ANT1			
0.009 – 19900	6992.60	-33.64	compliant
16QAM-Modulation ANT2			
0.009 – 19900	6992.60	-33.79	compliant
64QAM-Modulation ANT1			
0.009 – 19900	6992.60	-33.83	compliant
64QAM-Modulation ANT2			
0.009 – 19900	6984.20	-33.85	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 (5 MHz Channel BW)

Carrier Frequency: 1957.4/1962.4 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 – 19900	6992.60	-33.74	compliant
16QAM-Modulation ANT1			
0.009 – 19900	6984.20	-33.78	compliant
16QAM-Modulation ANT2			
0.009 – 19900	6992.60	-33.84	compliant
64QAM-Modulation ANT1			
0.009 – 19900	6984.20	-33.80	compliant
64QAM-Modulation ANT2			
0.009 – 19900	6992.60	-33.64	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 (5 MHz Channel BW)

Carrier Frequency: 1982.6/1987.6 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 – 19900	6992.60	-33.75	compliant
16QAM-Modulation ANT1			
0.009 – 19900	6984.20	-33.80	compliant
16QAM-Modulation ANT2			
0.009 – 19900	6992.60	-33.71	compliant
64QAM-Modulation ANT1			
0.009 – 19900	6992.60	-33.70	compliant
64QAM-Modulation ANT2			
0.009 – 19900	6992.60	-33.76	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 (5 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, § 24.238)

4.5.1. Limits

Para. No. 24.238(l). The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log (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.

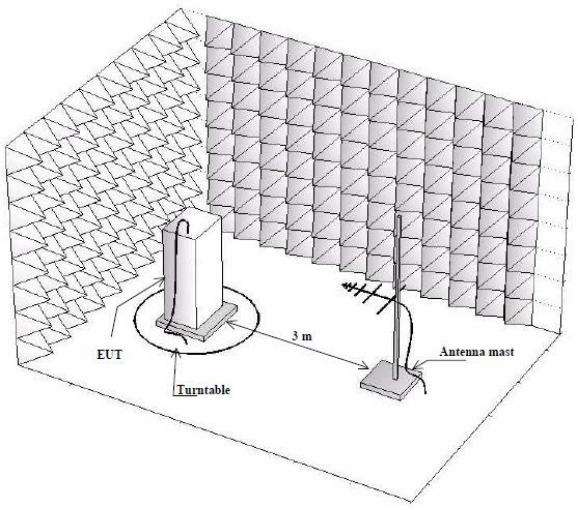


Figure 2 Test Configuration

Photographs of the EUT in the anechoic chamber are shown on page 55 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 - 19900 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 - 19900 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: 1932.4 MHz, 1960.0 MHz and 1987.6 MHz Carrier Frequency config B: 1932.4/1937.4 MHz, 1957.4/1962.4 MHz and 1982.6/1987.6 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation TX1			
30 - 19900	ALL More than 20dB below limit -13 dBm		compliant
Measurement Uncertainty:			±5.4dB

Table 17 Field Strength of Spurious Radiation (5 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, § 24.235)

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. 24.235. (-30 °C to +50 °C) and supply voltage conditions according to § 2.1055.

4.6.3. Test Configuration

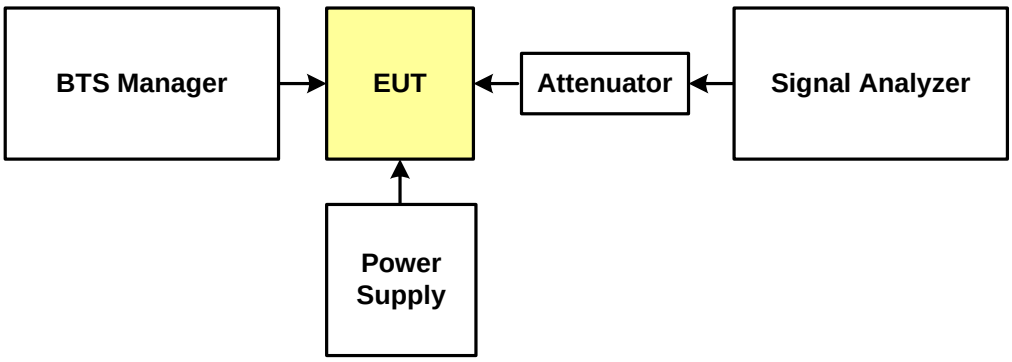


Figure 3 Test Configuration for frequency stability with voltage variation

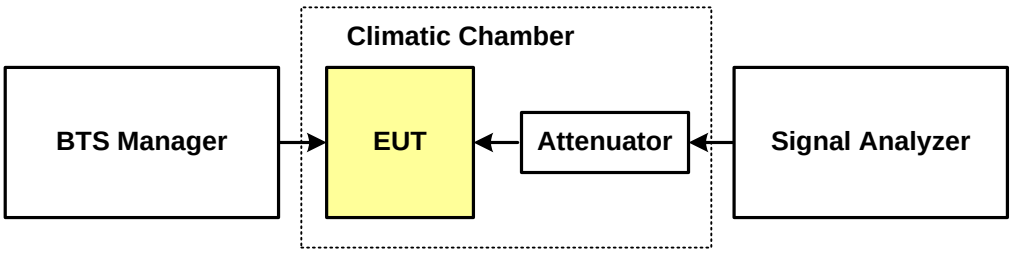


Figure 4 Test Configuration for frequency stability with temperature variation

A complete list of the measurement equipment is included on page 26 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: 1960.0 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
120.0	-30.0	49.91289	0.025	96	0.05	compliant
120.0	-20.0	35.27124	0.018	96	0.05	compliant
120.0	-10.0	26.45762	0.013	96	0.05	compliant
120.0	0.0	19.21111	0.010	96	0.05	compliant
120.0	10.0	14.58488	0.007	96	0.05	compliant
120.0	30.0	12.96585	0.007	96	0.05	compliant
120.0	40.0	7.34484	0.004	96	0.05	compliant
120.0	50.0	-1.73846	-0.001	96	0.05	compliant
16QAM Modulation ANT1						
120.0	-30.0	47.78244	0.024	96	0.05	compliant
120.0	-20.0	36.15329	0.018	96	0.05	compliant
120.0	-10.0	26.24965	0.013	96	0.05	compliant
120.0	0.0	18.75546	0.010	96	0.05	compliant
120.0	10.0	13.64989	0.007	96	0.05	compliant
120.0	30.0	13.50838	0.007	96	0.05	compliant
120.0	40.0	6.11801	0.003	96	0.05	compliant
120.0	50.0	-2.56566	-0.001	96	0.05	compliant
16QAM Modulation ANT2						
120.0	-30.0	48.64328	0.025	96	0.05	compliant
120.0	-20.0	35.79109	0.018	96	0.05	compliant
120.0	-10.0	27.12247	0.014	96	0.05	compliant
120.0	0.0	20.07584	0.010	96	0.05	compliant
120.0	10.0	14.24111	0.007	96	0.05	compliant
120.0	30.0	13.59537	0.007	96	0.05	compliant
120.0	40.0	6.31465	0.003	96	0.05	compliant
120.0	50.0	-2.40096	-0.001	96	0.05	compliant
64QAM Modulation ANT1						
120.0	-30.0	48.21152	0.025	96	0.05	compliant
120.0	-20.0	35.40301	0.018	96	0.05	compliant

120.0	-10.0	26.63047	0.014	96	0.05	compliant
120.0	0.0	21.54679	0.011	96	0.05	compliant
120.0	10.0	14.47508	0.007	96	0.05	compliant
120.0	30.0	13.42344	0.007	96	0.05	compliant
120.0	40.0	7.48970	0.004	96	0.05	compliant
120.0	50.0	-3.69800	-0.002	96	0.05	compliant
64QAM Modulation ANT2						
120.0	-30.0	48.73492	0.025	96	0.05	compliant
120.0	-20.0	37.12318	0.019	96	0.05	compliant
120.0	-10.0	26.19317	0.013	96	0.05	compliant
120.0	0.0	19.74068	0.010	96	0.05	compliant
120.0	10.0	14.68756	0.007	96	0.05	compliant
120.0	30.0	13.69121	0.007	96	0.05	compliant
120.0	40.0	6.15718	0.003	96	0.05	compliant
120.0	50.0	1.85127	0.001	96	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 18 Frequency stability with temp. var. (5 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: 1960.0 MHz						
Supply Voltage (AC) [V]	**Ambient Temperature [°C]**	**Frequency Deviation**		**Manufacturer's Specification**		**Result**
		[Hz]	**[ppm]**	**[Hz]**	**[ppm]**	
QPSK Modulation ANT1						
102.0	20.0	5.67418	0.003	96	0.05	compliant
120.0	20.0	5.76448	0.003	96	0.05	compliant
138.0	20.0	5.63294	0.003	96	0.05	compliant
16QAM Modulation ANT1						
102.0	20.0	6.74782	0.003	96	0.05	compliant
120.0	20.0	4.42239	0.002	96	0.05	compliant
138.0	20.0	5.34740	0.003	96	0.05	compliant
16QAM Modulation ANT2						
102.0	20.0	4.78336	0.002	96	0.05	compliant
120.0	20.0	5.00947	0.003	96	0.05	compliant
138.0	20.0	5.84242	0.003	96	0.05	compliant
64QAM Modulation ANT1						
102.0	20.0	5.12898	0.003	96	0.05	compliant
120.0	20.0	5.27567	0.003	96	0.05	compliant
138.0	20.0	5.44659	0.003	96	0.05	compliant
64QAM Modulation ANT2						
102.0	20.0	6.05682	0.003	96	0.05	compliant
120.0	20.0	4.36062	0.002	96	0.05	compliant
138.0	20.0	4.03366	0.002	96	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 19 Frequency stability with voltage var. (5 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	29.7.2014	29.7.2015	4
2	Signal Analyzer	Rohde & Schwarz: FSQ 26	100403	16.7.2014	16.7.2015	1,2,3,6
3	Vector Network Analyzer	Rohde & Schwarz: ZVA40	100146	8.1.2014	8.1.2015	1,2,3,4,6
4	Vector Network Analyzer	Rohde & Schwarz: ZVL13	101177	9.7.2014	9.7.2015	1,2,3,4,6
5	Calibration Unit	Rohde & Schwarz: ZV-Z54	100125	8.7.2014	8.7.2015	1,2,3,4,6
6	Calibration Kit	Hewlett-Packard: HP85032B	2919A04843	18.7.2014	18.7.2015	1,2,3,4,6
8	Frequency Standard	Datum 8040	23006282	9.1.2014	9.1.2015	6
9	Multimeter	Fluke 83	65870302	8.1.2014	8.1.2015	1, 2, 3, 4, 6
10	Humidity and Temperature Indicator	Vaisala: HMI 31	P3730008	19.12.2013	19.12.2014	1, 2, 3, 4, 6
12	AC Power Supply	Hewlet Packard: 6843A	3531A00208	cnn	-	1, 2, 3, 4, 6
13	Humidity and Temperature Chamber	ARS-0680	4100000357	8.4.2014	8.4.2015	6
14	Attenuator	Aeroflex/Weinschel: 66-20-33	CF0629	cnn	-	1,2,3,4,6
15	EMI Test Receiver	R&S ESU40	100262	8.5.2014	8.5.2015	5
16	Horn Antenna	Emco 3115	75697	30.6.2014	30.6.2015	5
17	Bilog Antenna	Chase CBL6112B	2694	9.7.2014	9.7.2015	5
18	Log Periodic Antenna	R&S HL 025 1-18GHz	348886/007	6.11.2013	6.11.2014	5
19	Log Periodic Antenna	R&S HL 025 1-26.5GHz	356749/012	1.9.2014	1.9.2015	5
20	Amplifier	Miteq AFSX4	902638	cnn	-	5
21	Antenna Mast	Deisel HD240	2401323194	cnn	-	5
22	Mast Controller	Deisel HD100	1001331	cnn	-	5

Table 20 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 12.

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

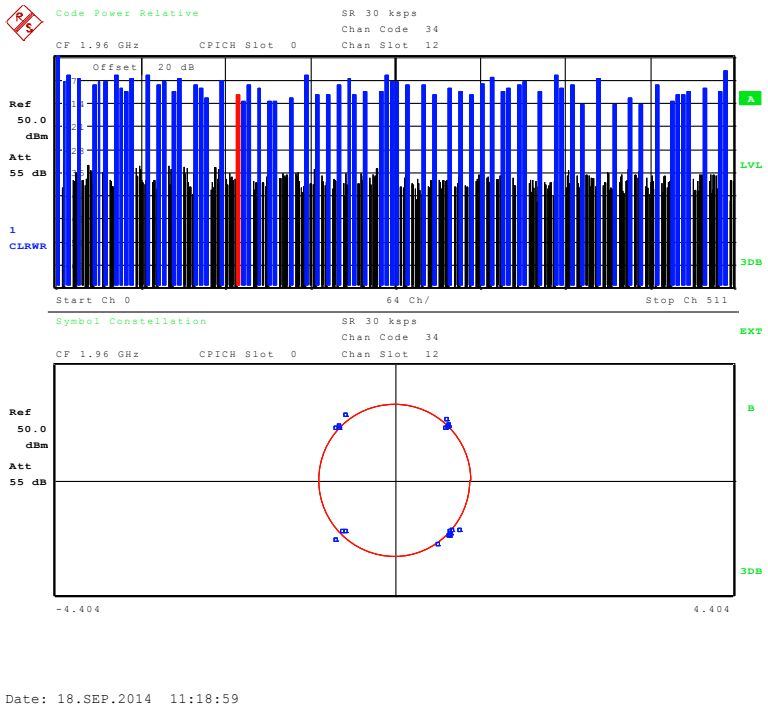


Figure 5 I/Q constellation diagram with code channels – QPSK (1960.0 MHz) (5MHz Channel BW)

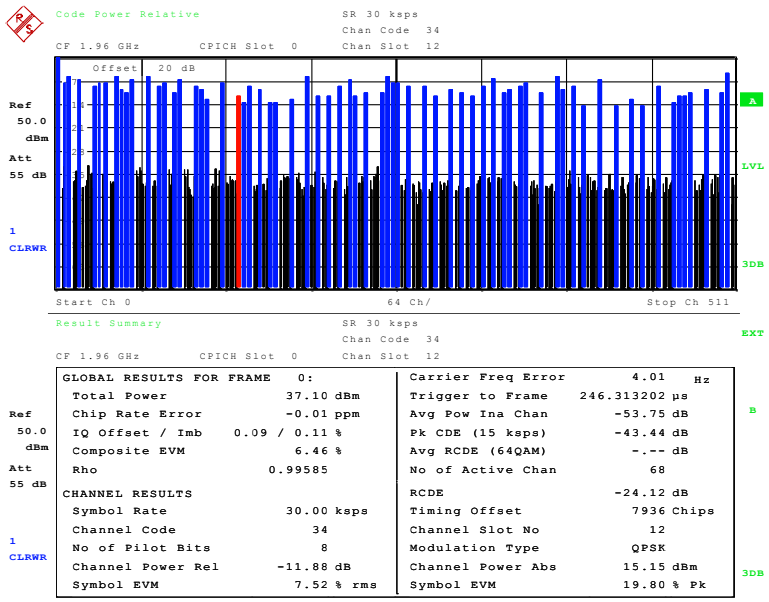


Figure 6 I/Q constellation table with I/Q error – QPSK (1960.0 MHz) (5MHz Channel BW)

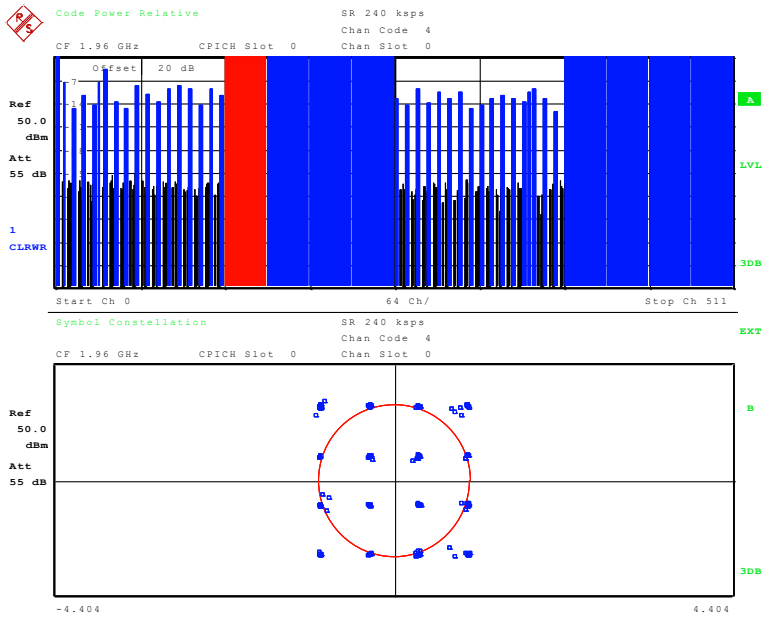


Figure 7 I/Q constellation diagram with code channels – 16QAM (1960.0 MHz) (5MHz Channel BW)

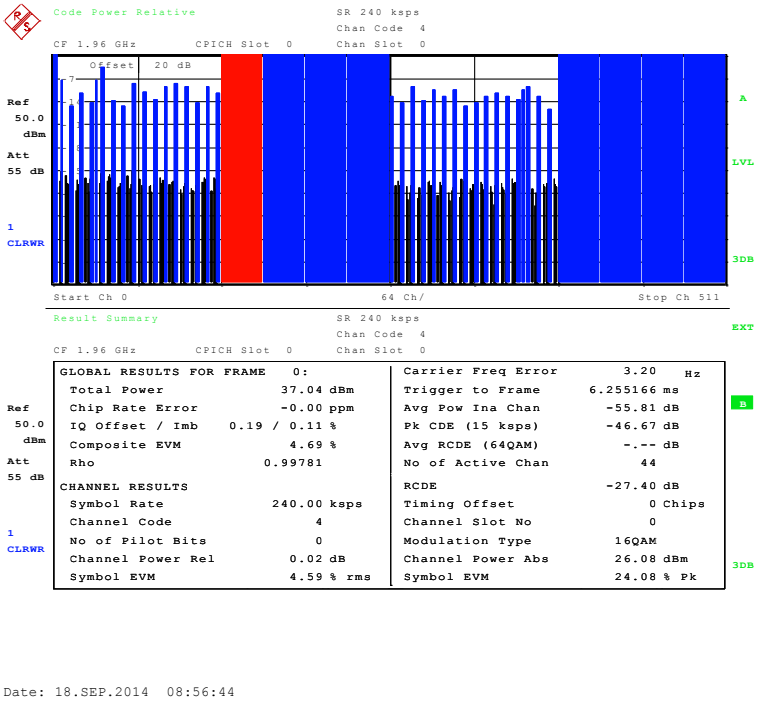


Figure 8 I/Q constellation table with I/Q error – 16QAM (1960.0 MHz) (5MHz Channel BW)

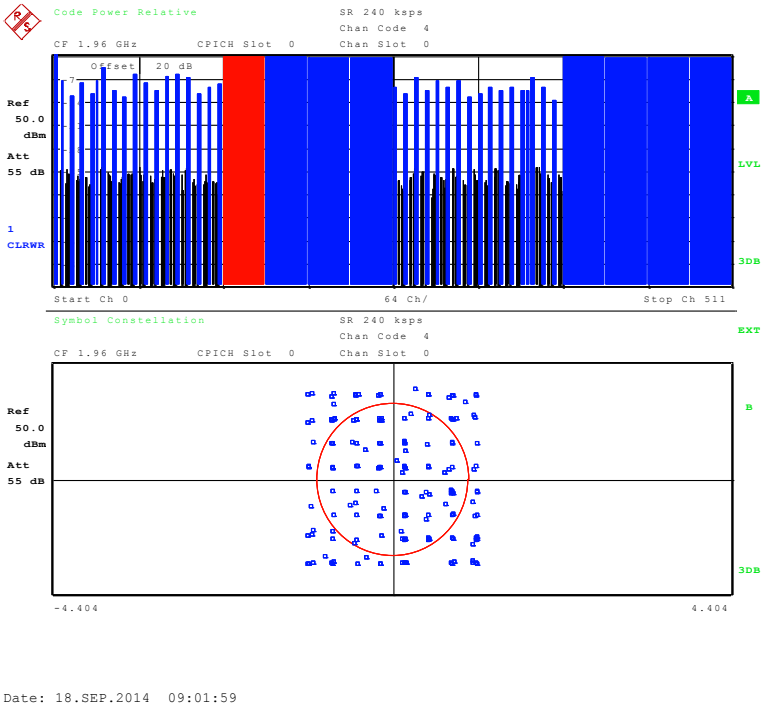


Figure 9 I/Q constellation diagram with code channels – 64QAM (1960.0 MHz) (5MHz Channel BW)

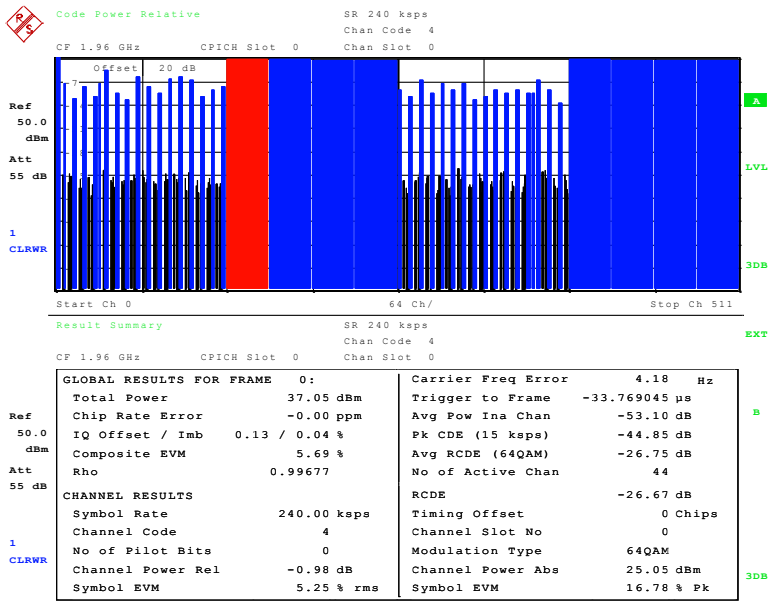


Figure 10 I/Q constellation table with I/Q error – 64QAM (1960.0 MHz) (5MHz Channel BW)

5.2.2. Test No. 3: Occupied Bandwidth

The value of occupied bandwidth is calculated from markers Delta2 and Delta3.

Config A ANT1:

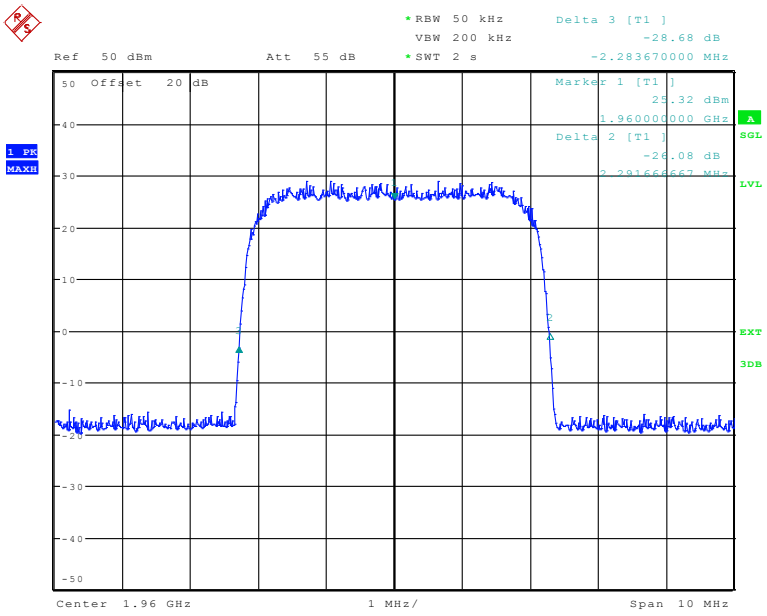


Figure 11 Occupied Bandwidth – QPSK (1960.0 MHz) (5MHz Channel BW)

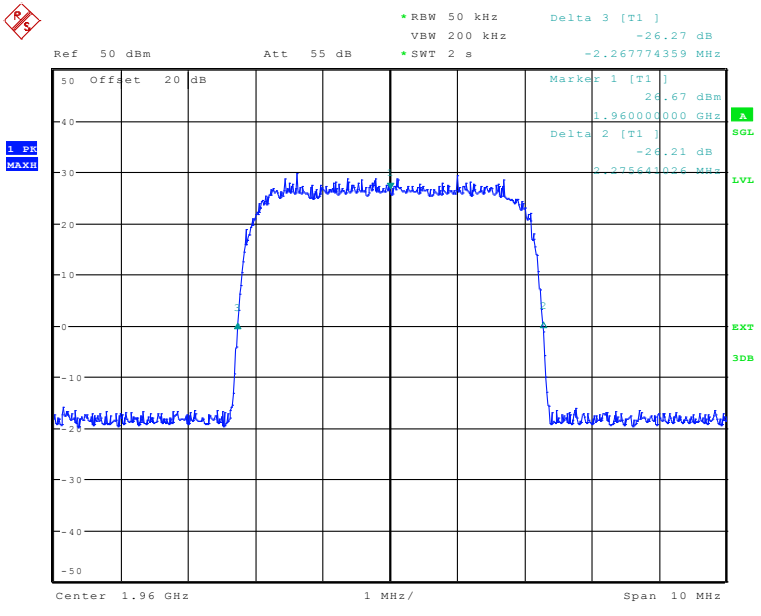


Figure 12 Occupied Bandwidth – 16QAM (1960.0 MHz) (5MHz Channel BW)

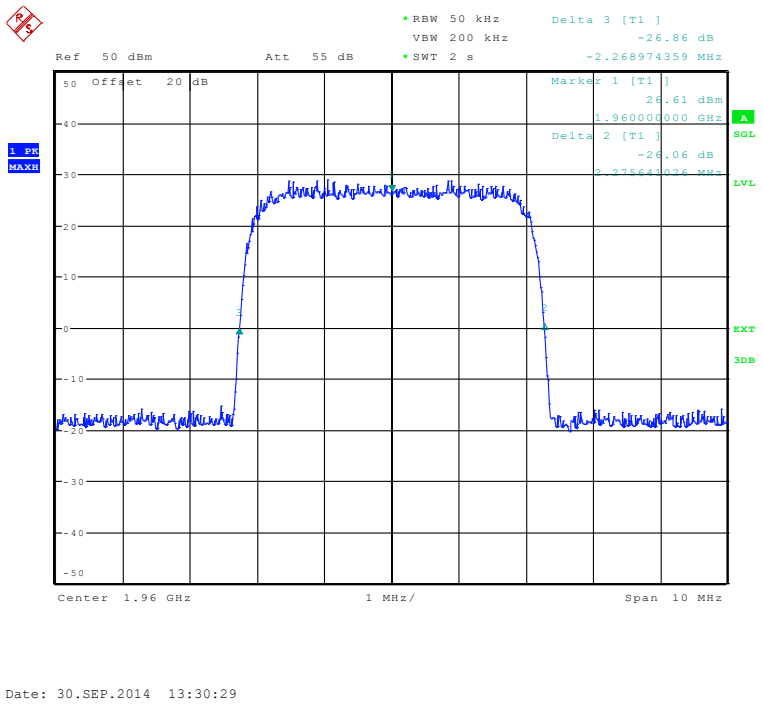


Figure 13 Occupied Bandwidth – 64QAM (1960.0 MHz) (5MHz Channel BW)

Config A ANT2:

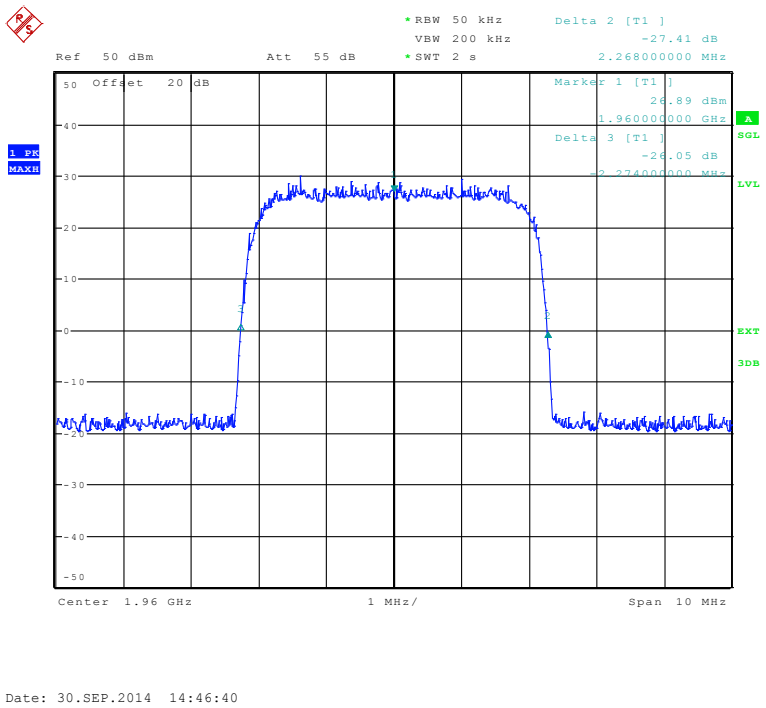


Figure 14 Occupied Bandwidth – 16QAM (1960.0 MHz) (5MHz Channel BW)

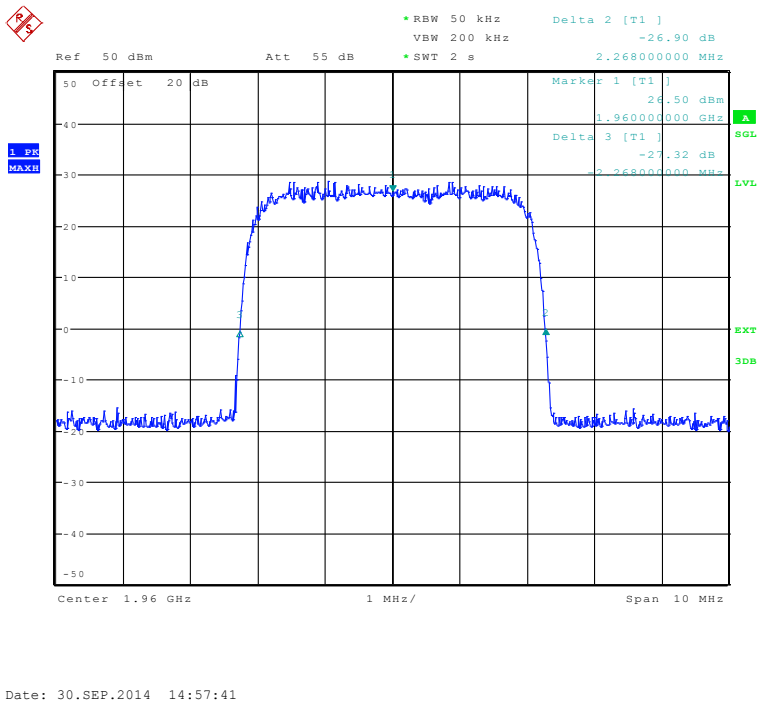


Figure 15 Occupied Bandwidth – 64QAM (1960.0 MHz) (5MHz Channel BW)

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:

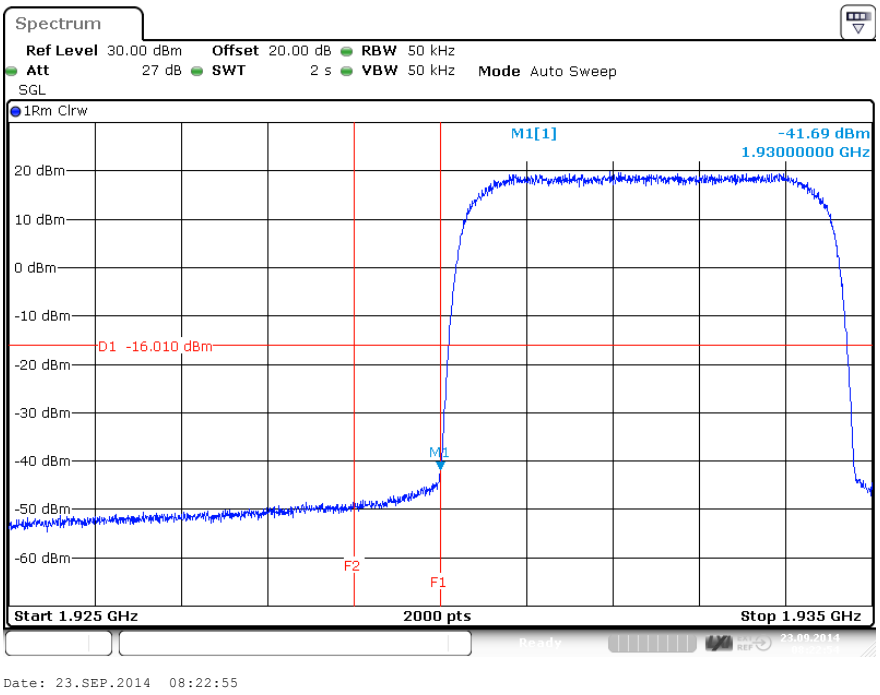


Figure 16 Spurious Emissions (Lower Band Edge) – QPSK (1932.4 MHz) (5MHz Channel BW)

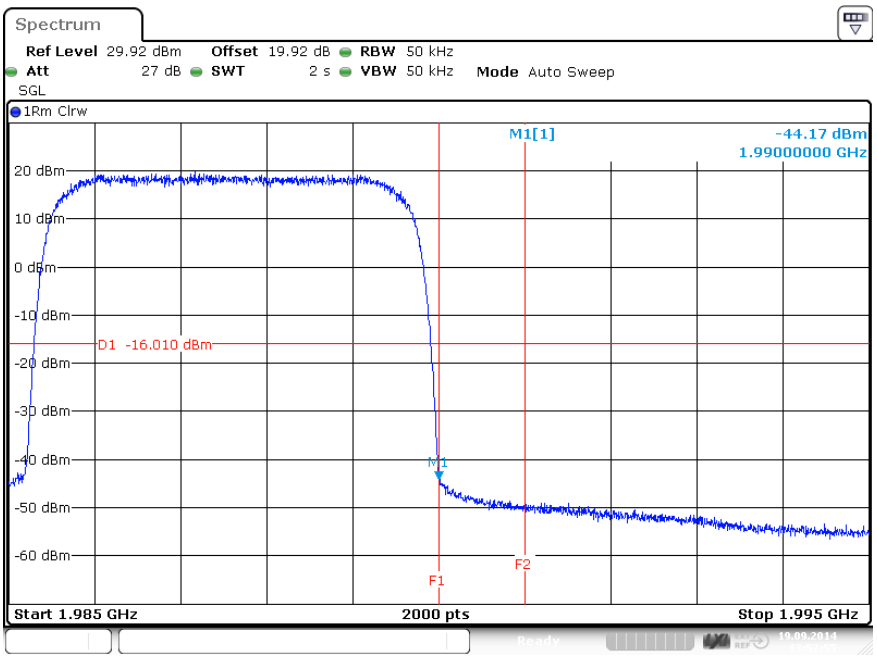


Figure 17 Spurious Emissions (Upper Band Edge) – QPSK (1987.6.0 MHz) (5MHz Channel BW)

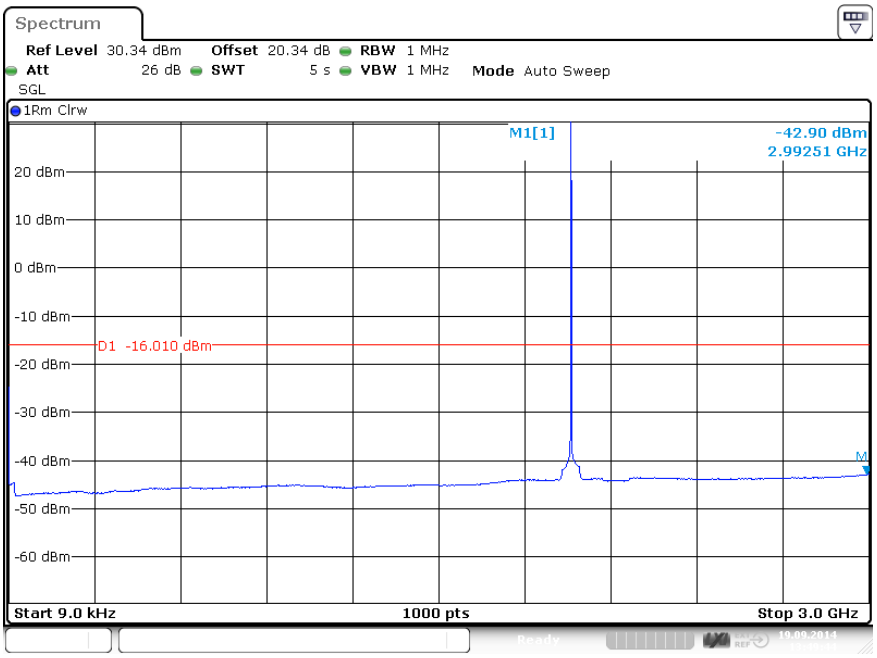


Figure 18 Spurious Emissions (9kHz – 3GHz) - QPSK (1960.0 MHz) (5MHz Channel BW)

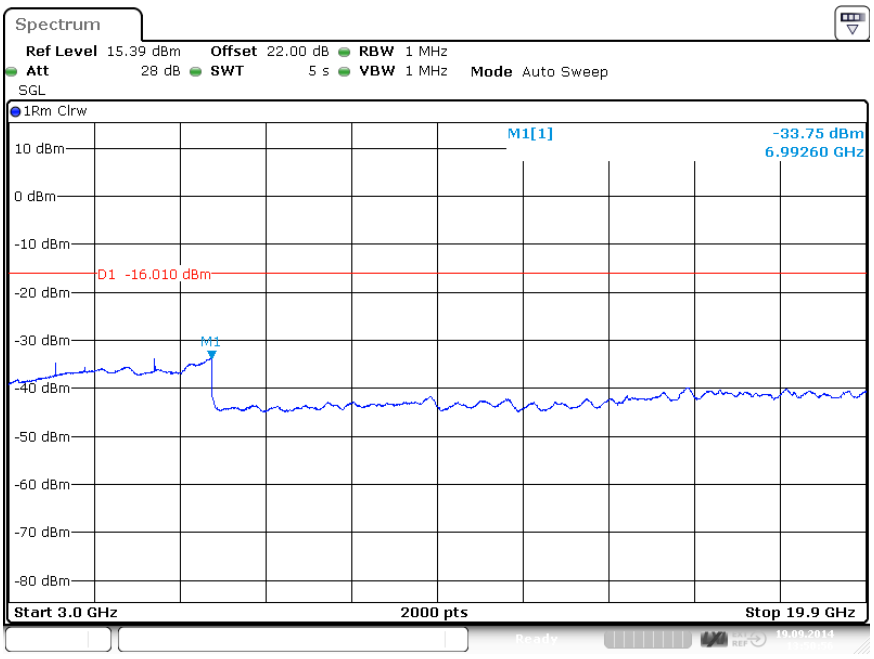


Figure 19 Spurious Emissions (3GHz – 19.900GHz) – QPSK (1960.0 MHz) (5MHz Channel BW)

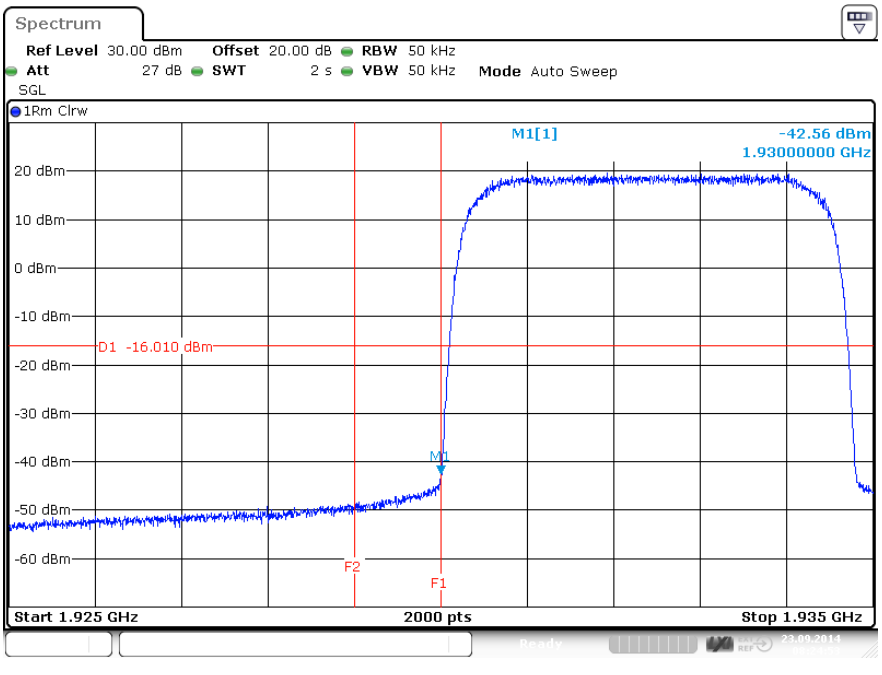
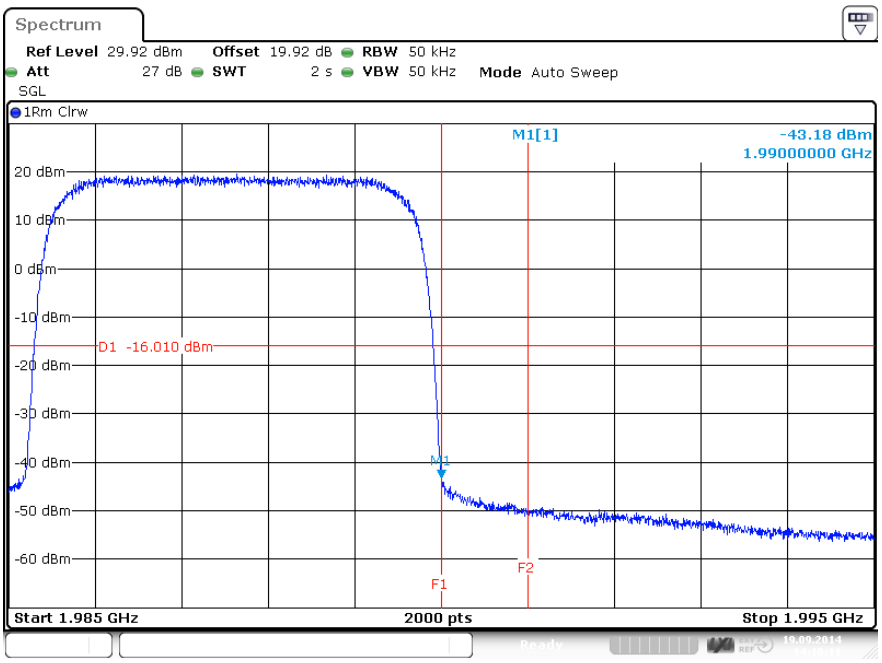
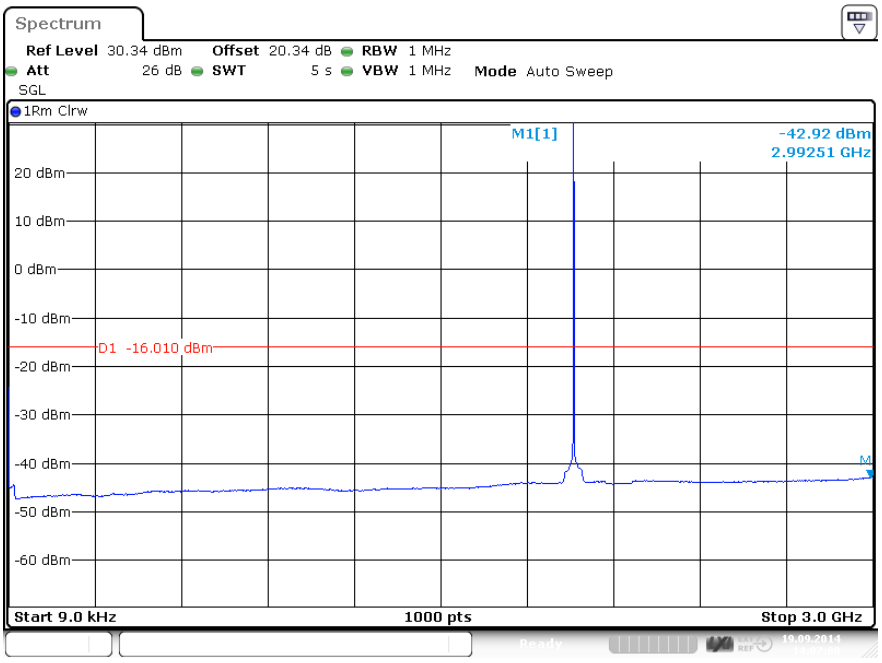


Figure 20 Spurious Emissions (Lower Band Edge) – 16QAM (1932.4 MHz) (5MHz Channel BW)



Date: 19.SEP.2014 14:10:11

Figure 21 Spurious Emissions (Upper Band Edge) – 16QAM (1987.6 MHz) (5MHz Channel BW)



Date: 19.SEP.2014 14:07:00

Figure 22 Spurious Emissions (9kHz – 3GHz) – 16QAM (1960.0 MHz) (5MHz Channel BW)

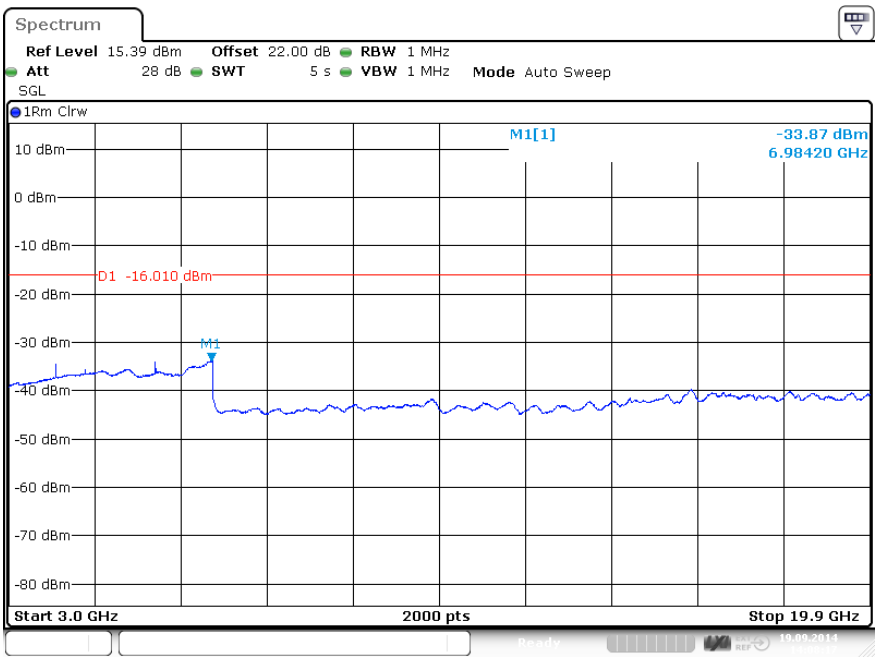


Figure 23 Spurious Emissions (3GHz – 19.900GHz) – 16QAM (1960.0 MHz) (5MHz Channel BW)

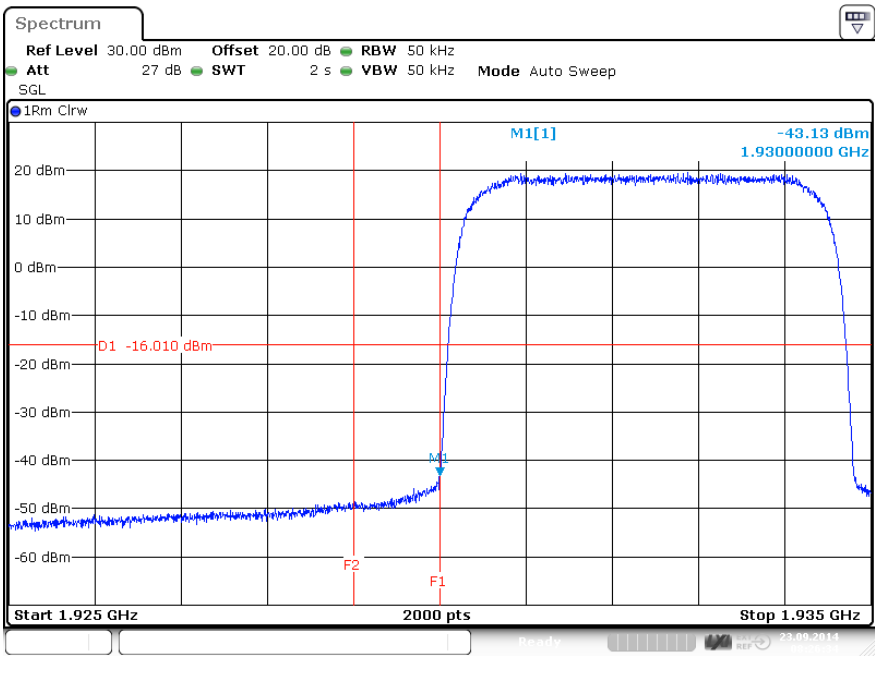


Figure 24 Spurious Emissions (Lower Band Edge) – 64QAM (1932.4 MHz) (5MHz Channel BW)

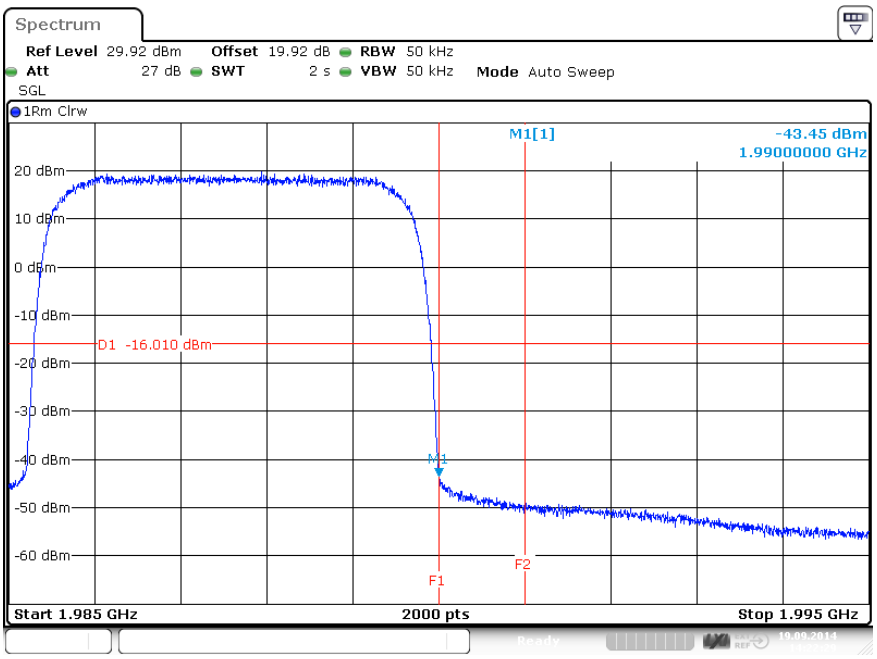


Figure 25 Spurious Emissions (Upper Band Edge) – 64QAM (1987.6 MHz) (5MHz Channel BW)

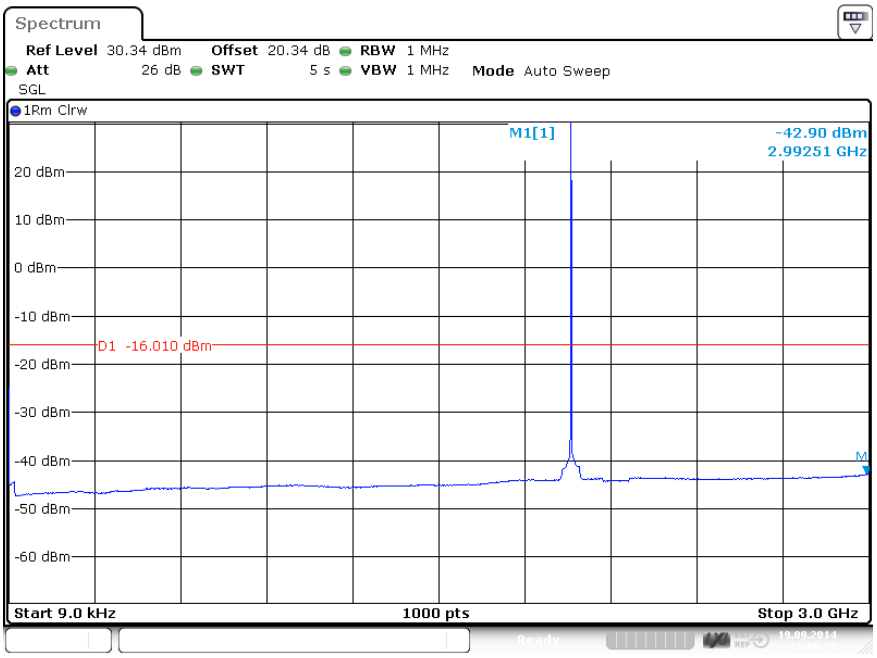


Figure 26 Spurious Emissions (9kHz – 3GHz) – 64QAM (1960.0 MHz) (5MHz Channel BW)

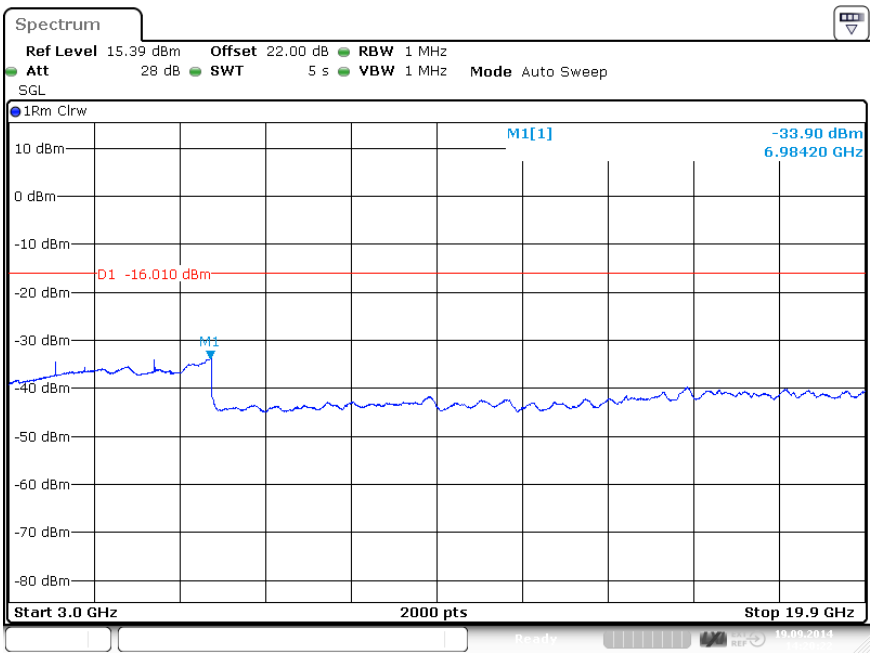


Figure 27 Spurious Emissions (3GHz – 19.900GHz) – 64QAM (1960.0 MHz) (5MHz Channel BW)

Config A ANT2:

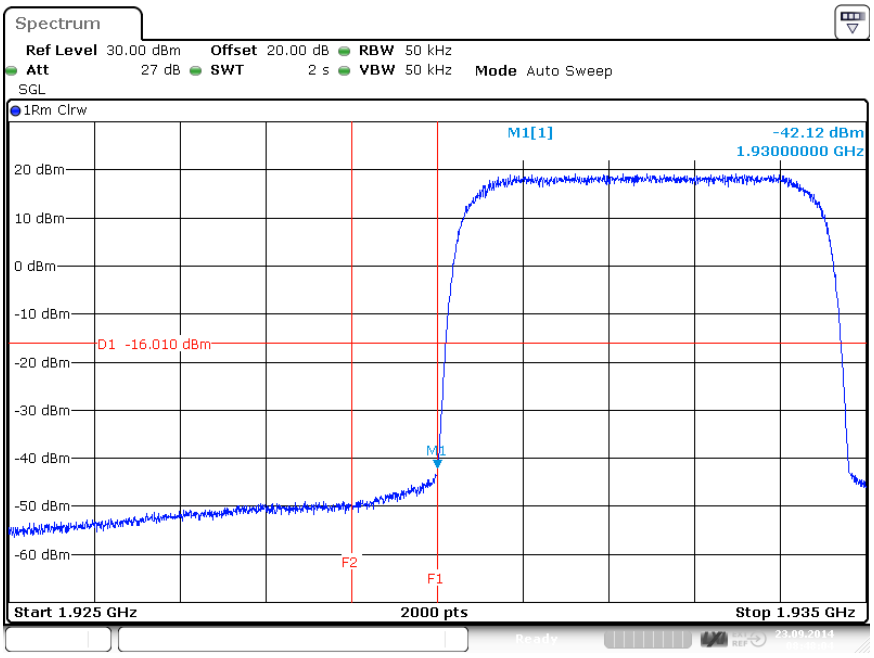


Figure 28 Spurious Emissions (Lower Band Edge) – 16QAM (1932.4 MHz) (5MHz Channel BW)

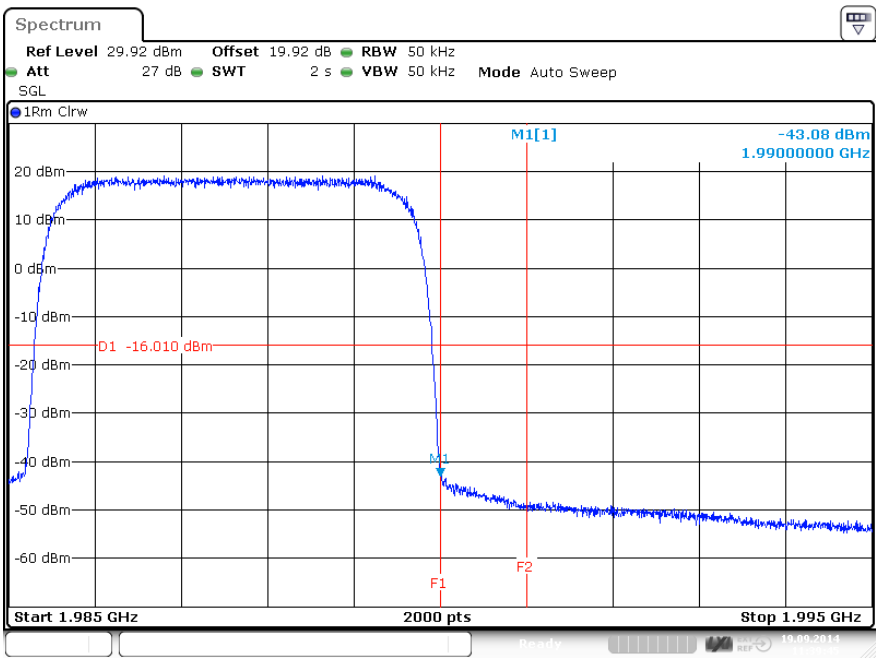


Figure 29 Spurious Emissions (Upper Band Edge) – 16QAM (1987.6 MHz) (5MHz Channel BW)

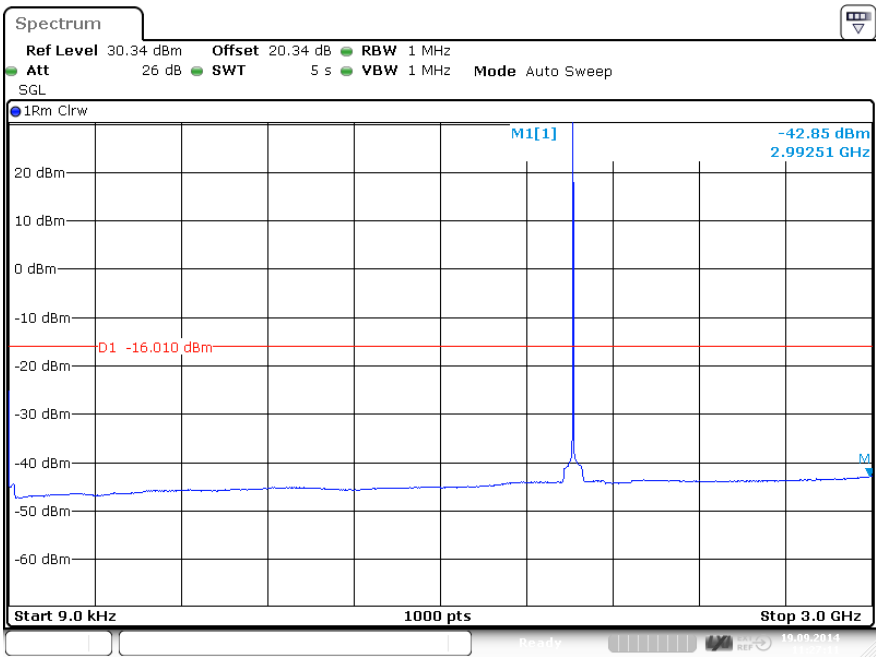


Figure 30 Spurious Emissions (9kHz – 3GHz) – 16QAM (1960.0 MHz) (5MHz Channel BW)

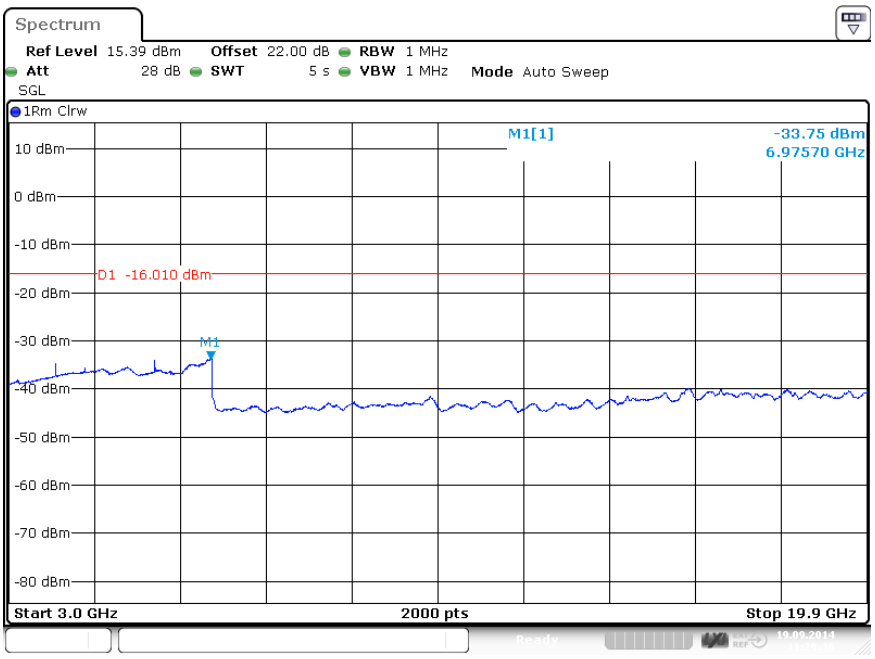


Figure 31 Spurious Emissions (3GHz – 19.900GHz) – 16QAM (1960.0 MHz) (5MHz Channel BW)

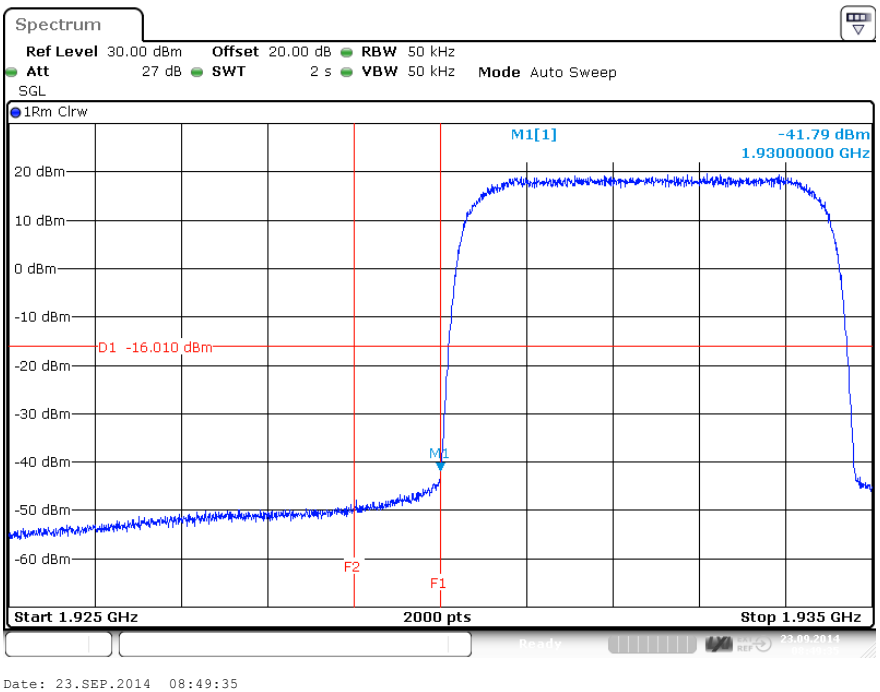


Figure 32 Spurious Emissions (Lower Band Edge) – 64QAM (1932.4 MHz) (5MHz Channel BW)

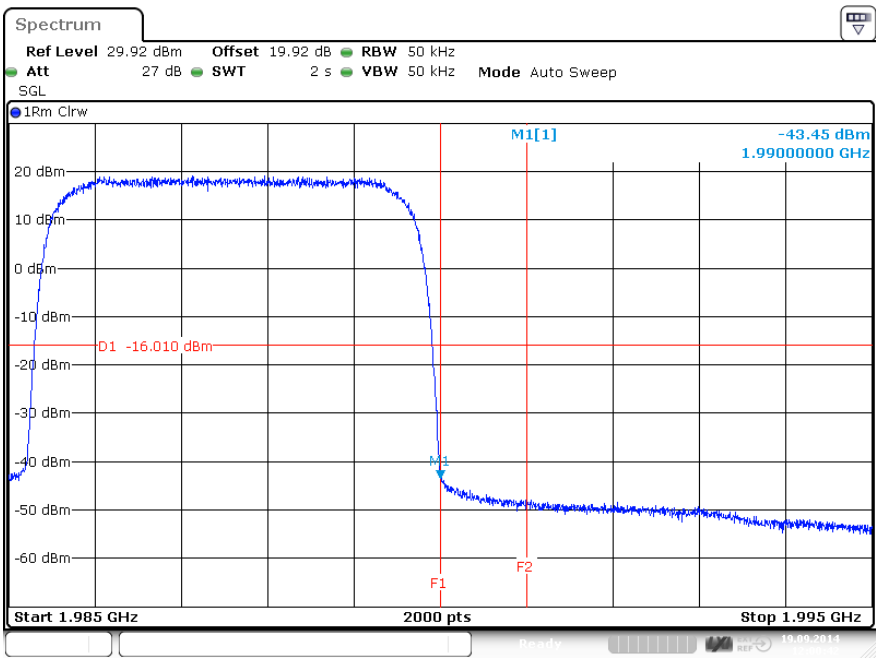


Figure 33 Spurious Emissions (Upper Band Edge) – 64QAM (1987.6 MHz) (5MHz Channel BW)

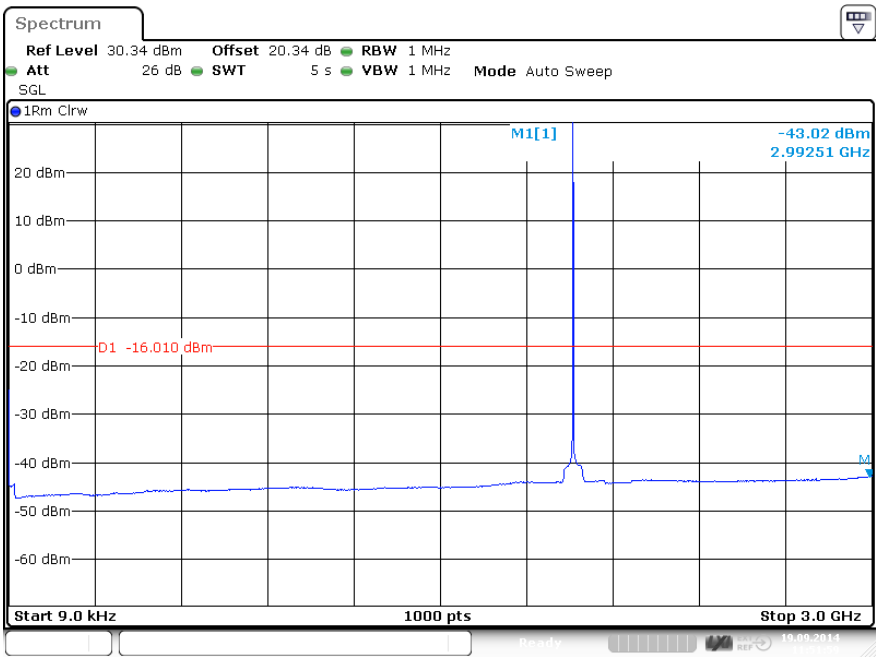


Figure 34 Spurious Emissions (9kHz – 3GHz) – 64QAM (1960.0 MHz) (5MHz Channel BW)

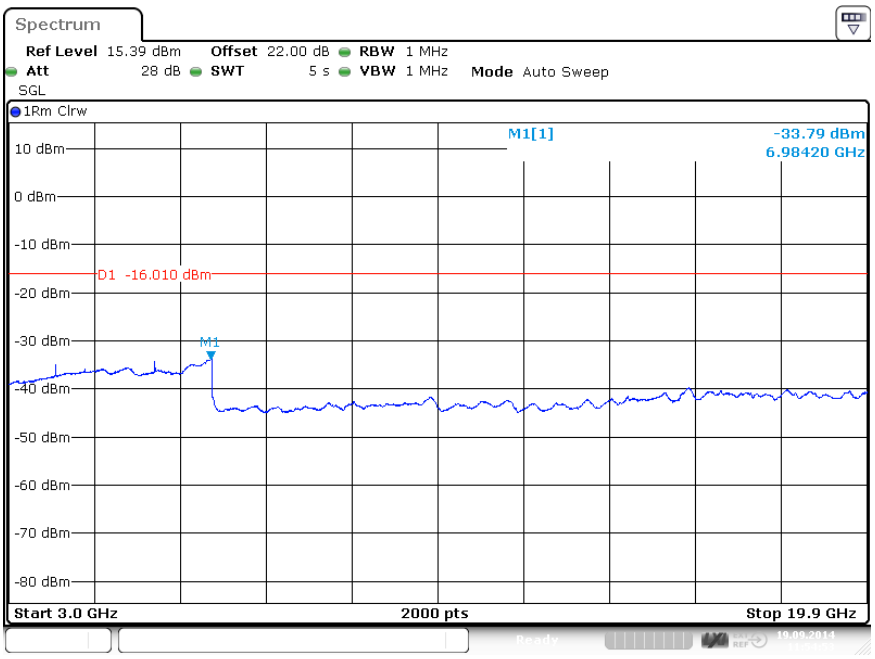


Figure 35 Spurious Emissions (3GHz – 19.900GHz) – 64QAM (1960.0 MHz) (5MHz Channel BW)

Config B ANT1:

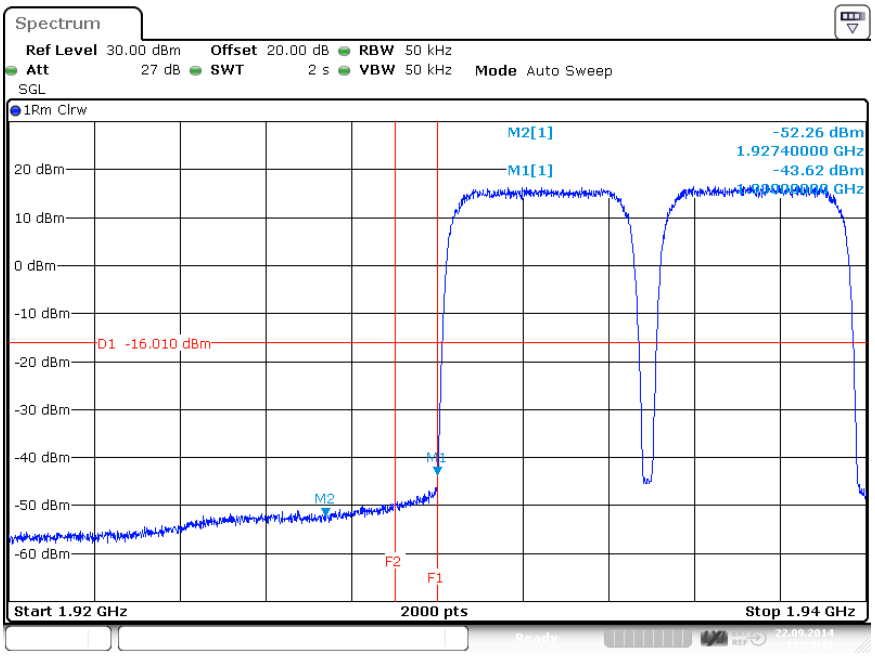


Figure 36 Spurious Emissions (Lower Band Edge) – QPSK (1932.4/1937.4 MHz) (5MHz Channel BW)

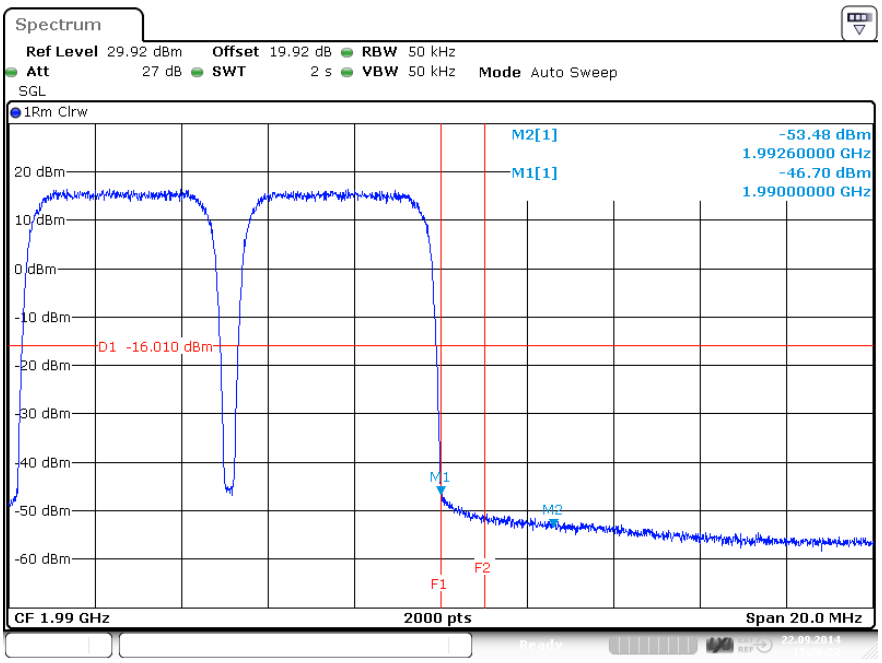


Figure 37 Spurious Emissions (Upper Band Edge) – QPSK (1982.6/1987.6 MHz) (5MHz Channel BW)

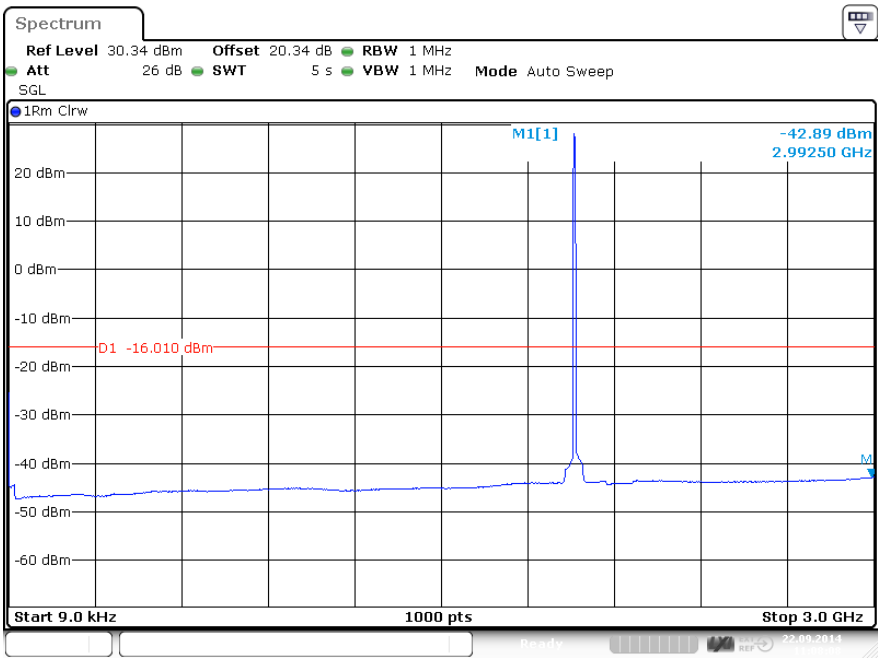


Figure 38 Spurious Emissions (9kHz – 3GHz) - QPSK (1957.4/1962.4 MHz) (5MHz Channel BW)

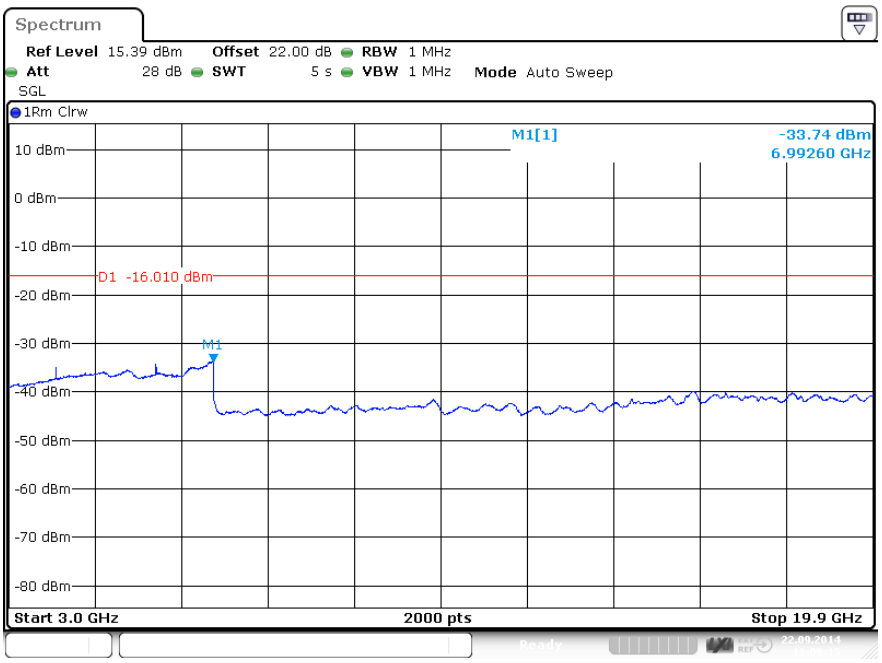


Figure 39 Spurious Emissions (3GHz – 19.900GHz) – QPSK (1957.4/1962.4 MHz) (5MHz Channel BW)

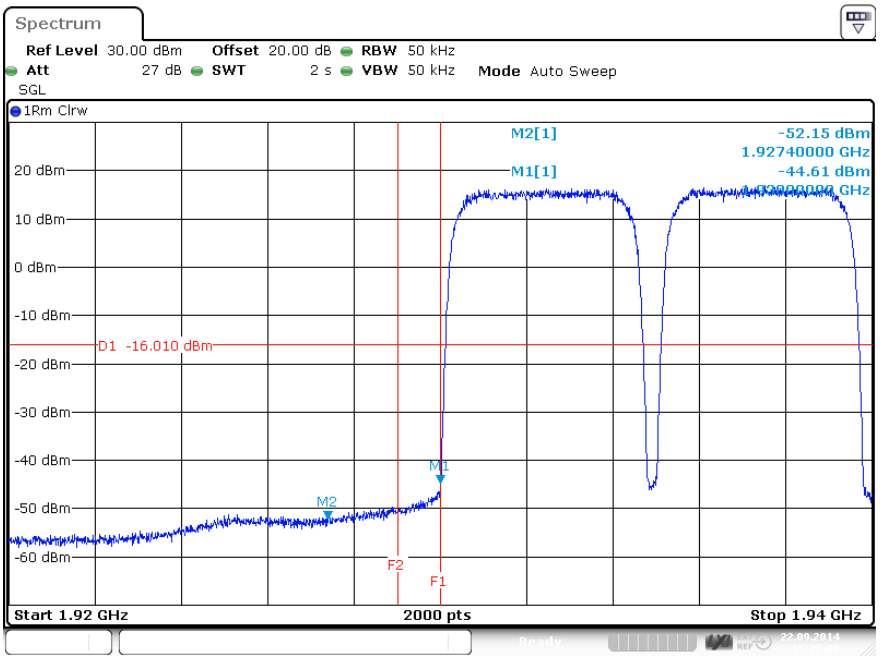


Figure 40 Spurious Emissions (Lower Band Edge) – 16QAM (1932.4/1937.4 MHz) (5MHz Channel BW)

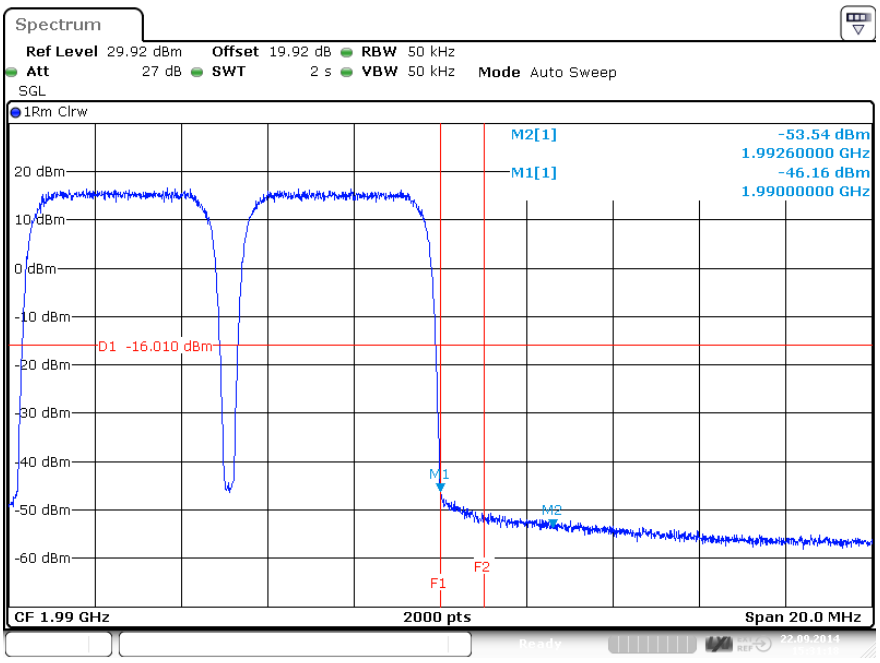


Figure 41 Spurious Emissions (Upper Band Edge) – 16QAM (1982.6/1987.6 MHz) (5MHz Channel BW)

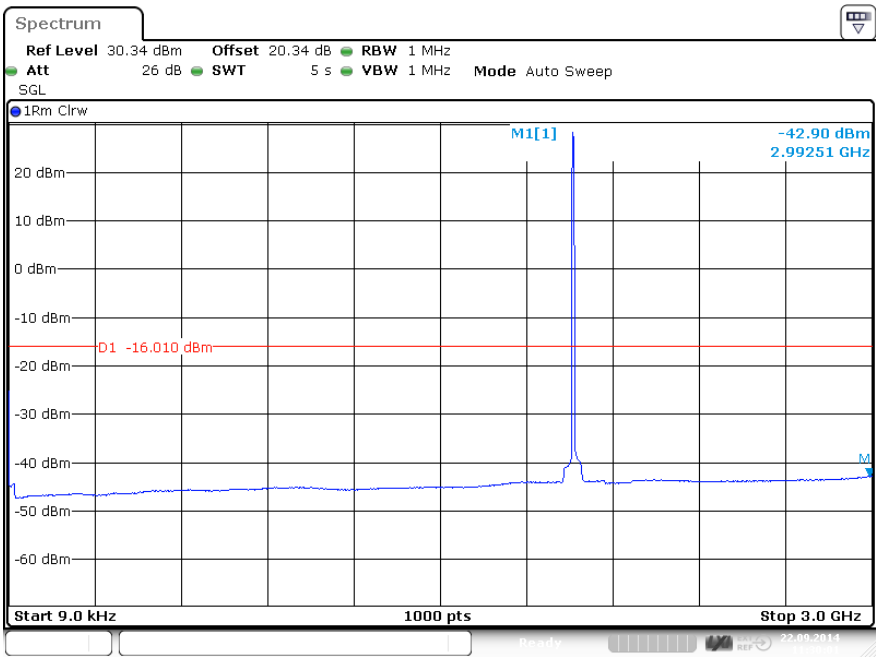


Figure 42 Spurious Emissions (9kHz – 3GHz) – 16QAM (1957.4/1962.4MHz) (5MHz Channel BW)

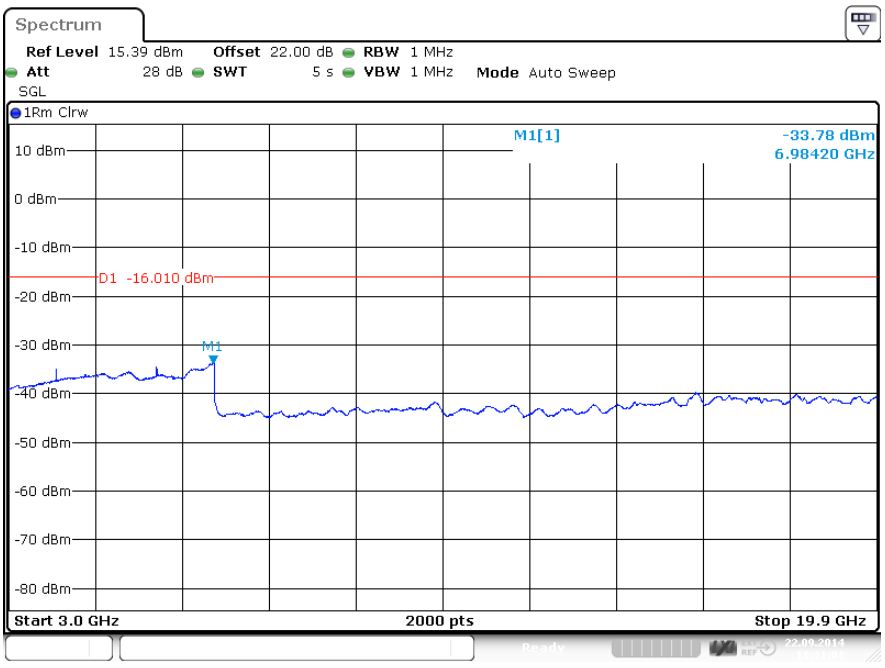


Figure 43 Spurious Emissions (3GHz – 19.900GHz) – 16QAM (1957.4/1962.4 MHz) (5MHz Channel BW)

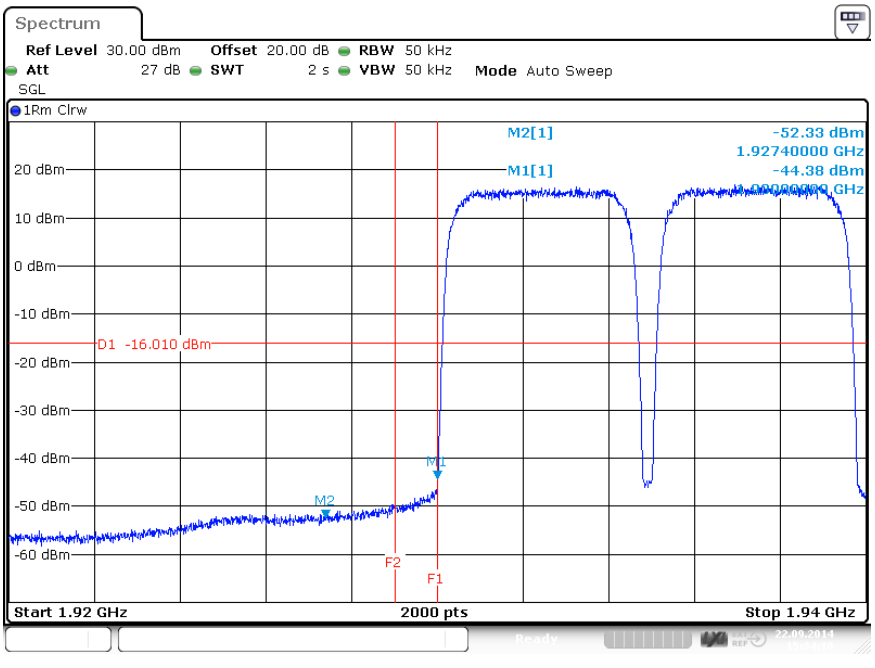


Figure 44 Spurious Emissions (Lower Band Edge) – 64QAM (1932.4/1937.4 MHz) (5MHz Channel BW)

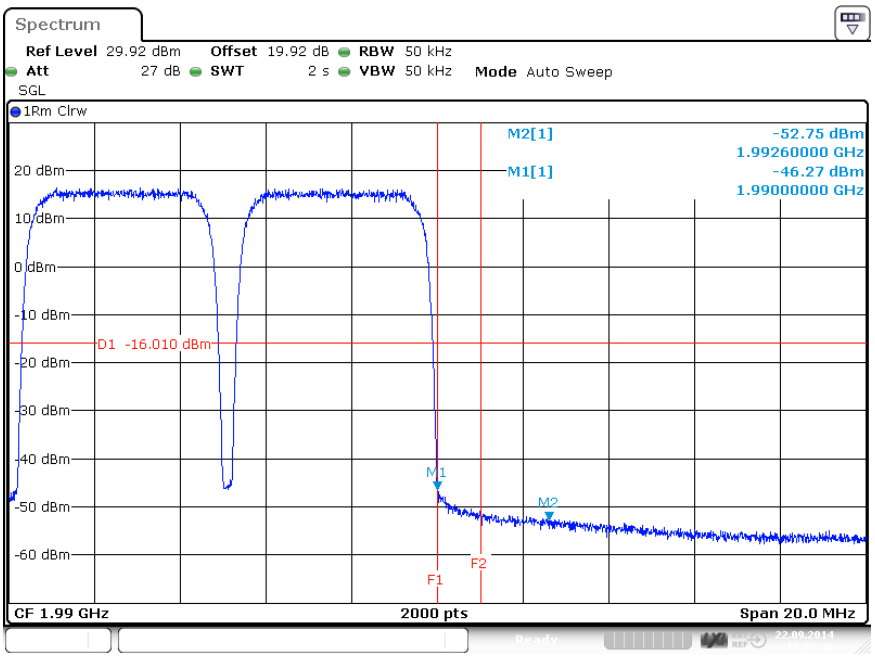


Figure 45 Spurious Emissions (Upper Band Edge) – 64QAM (1982.6/1987.6 MHz) (5MHz Channel BW)

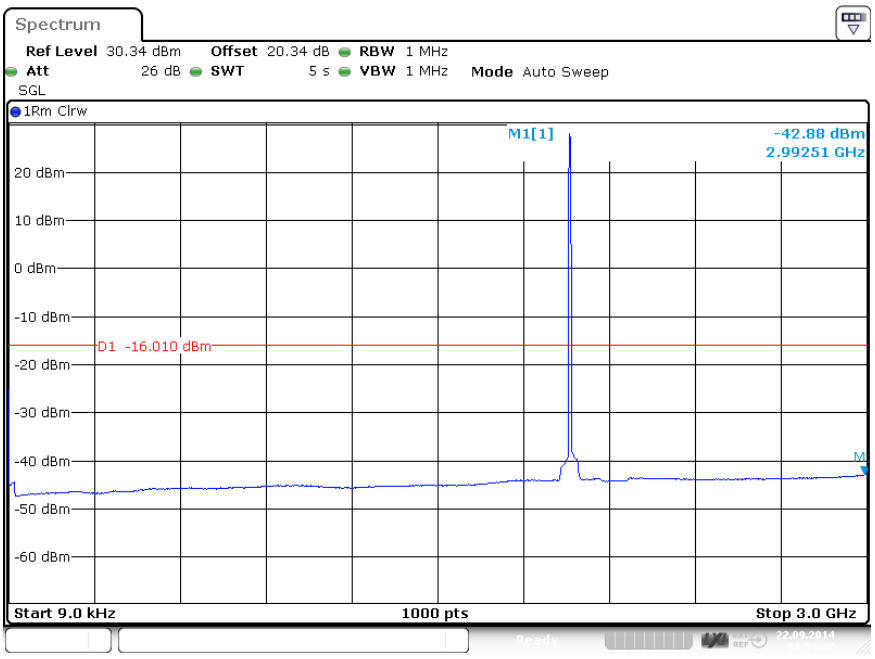


Figure 46 Spurious Emissions (9kHz – 3GHz) – 64QAM (1957.4/1962.4 MHz) (5MHz Channel BW)

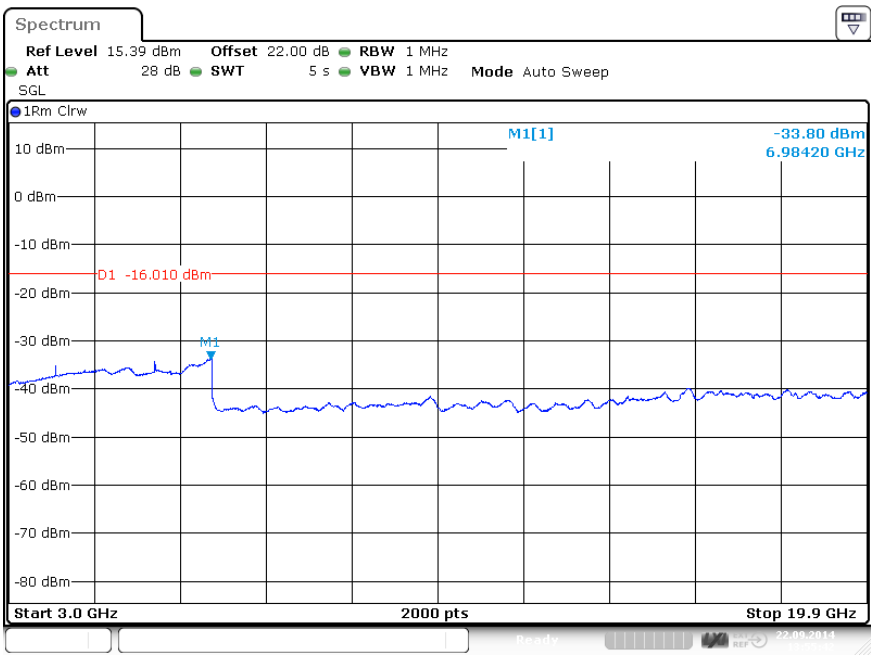


Figure 47 Spurious Emissions (3GHz – 19.900GHz) – 64QAM (1957.5/1962.5 MHz) (5MHz Channel BW)

Config B ANT2:

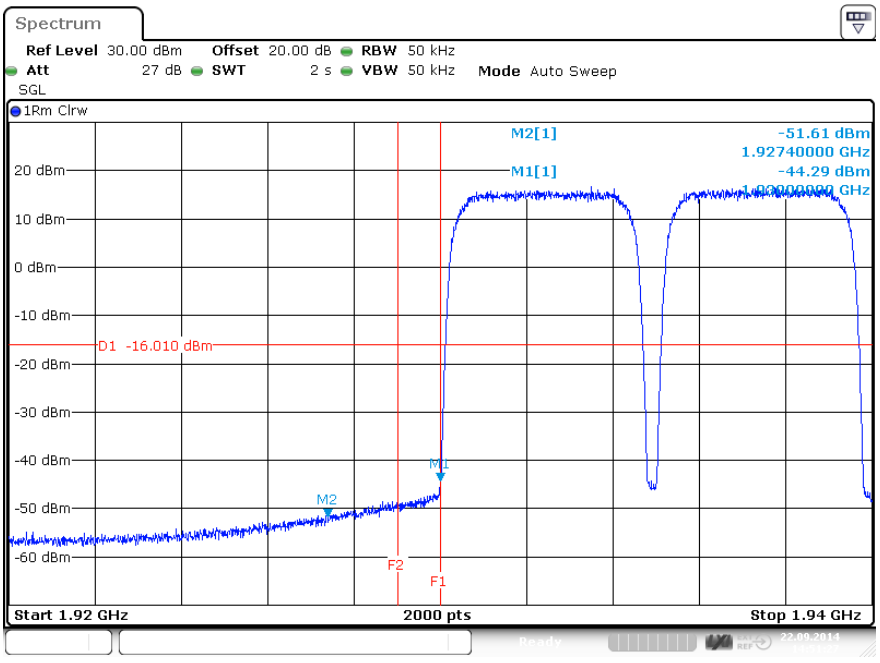


Figure 48 Spurious Emissions (Lower Band Edge) – 16QAM (1932.4/1937.4 MHz) (5MHz Channel BW)

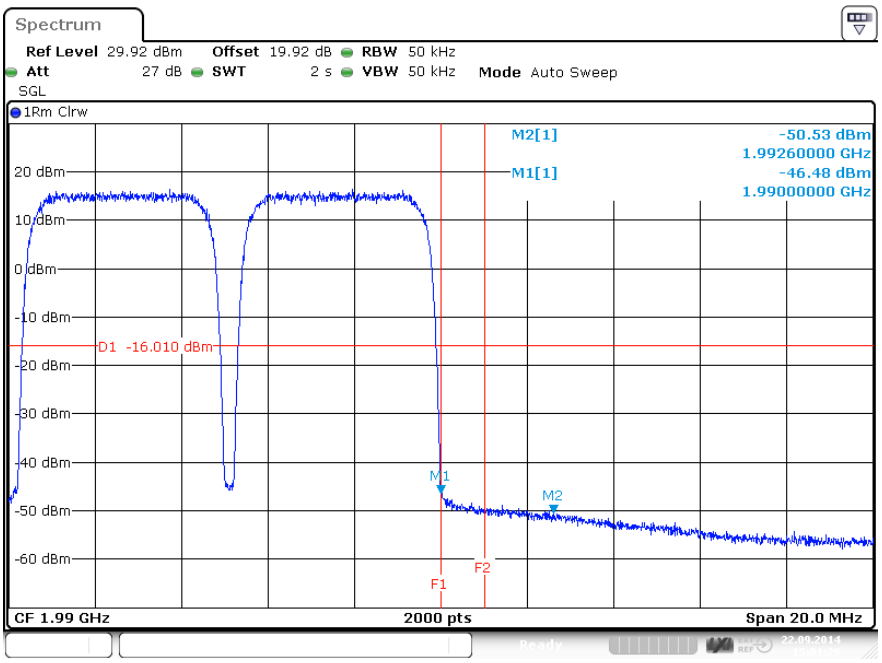


Figure 49 Spurious Emissions (Upper Band Edge) – 16QAM (1982.6/1987.6 MHz) (5MHz Channel BW)

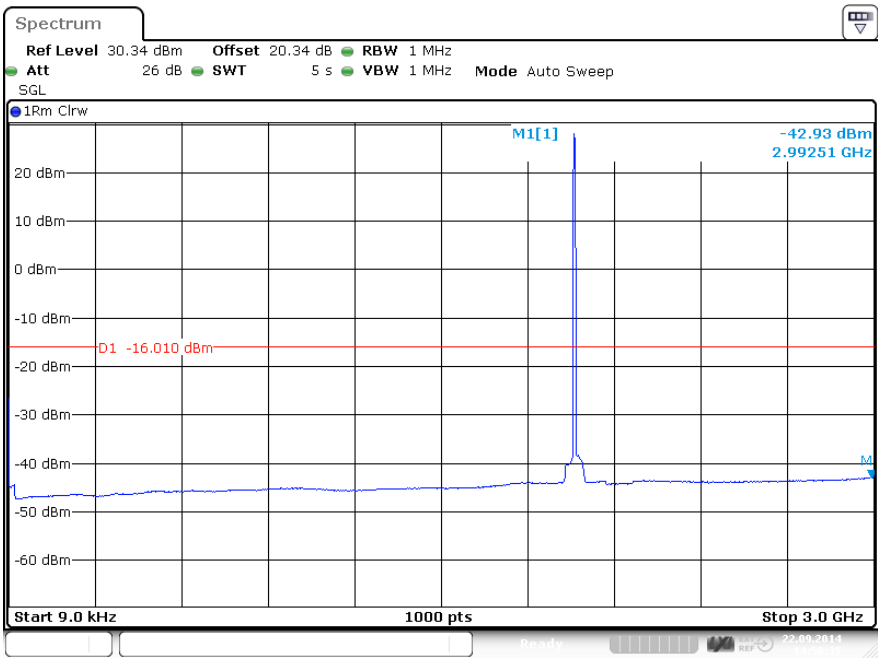


Figure 50 Spurious Emissions (9kHz – 3GHz) – 16QAM (1957.4/1962.4 MHz) (5MHz Channel BW)

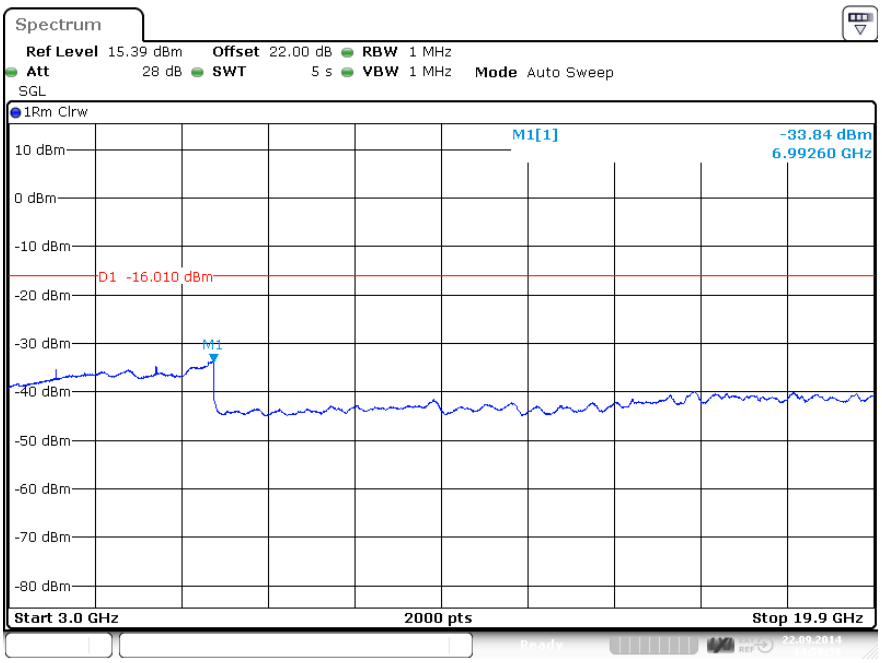


Figure 51 Spurious Emissions (3GHz – 19.900GHz) – 16QAM (1957.4/1962.4 MHz) (5MHz Channel BW)

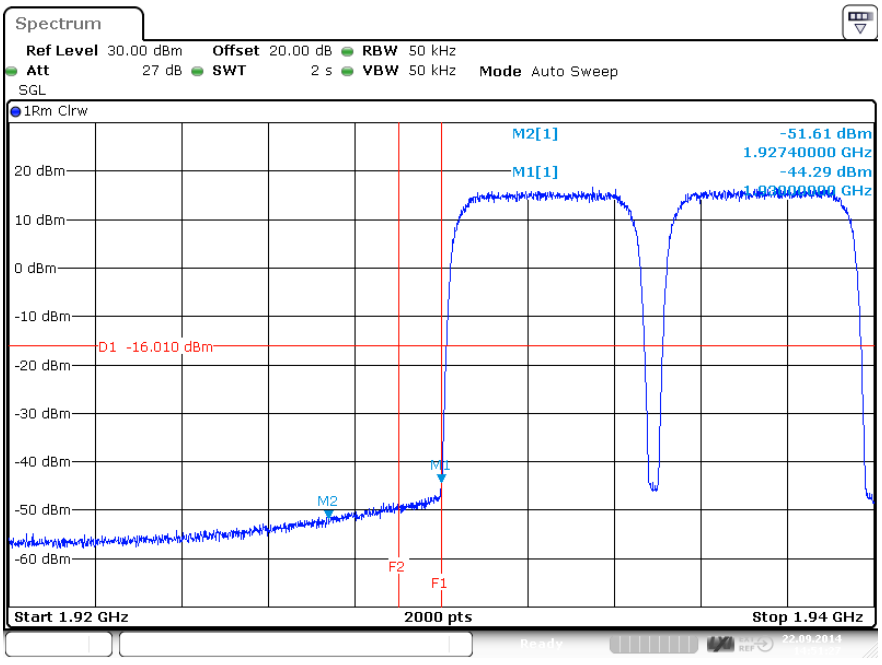


Figure 52 Spurious Emissions (Lower Band Edge) – 64QAM (1932.4/1937.4 MHz) (5MHz Channel BW)

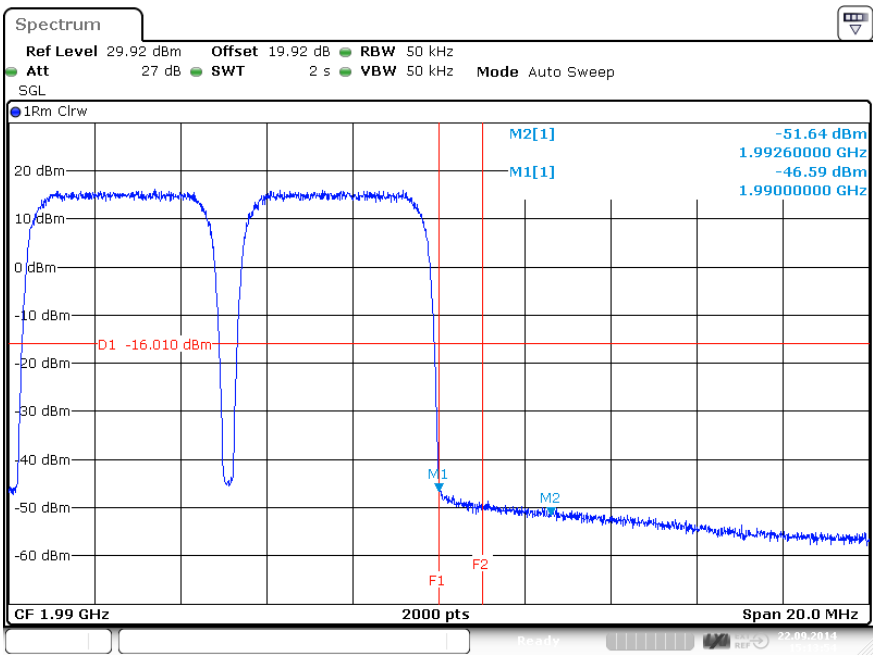


Figure 53 Spurious Emissions (Upper Band Edge) – 64QAM (1982.6/1987.6 MHz) (5MHz Channel BW)

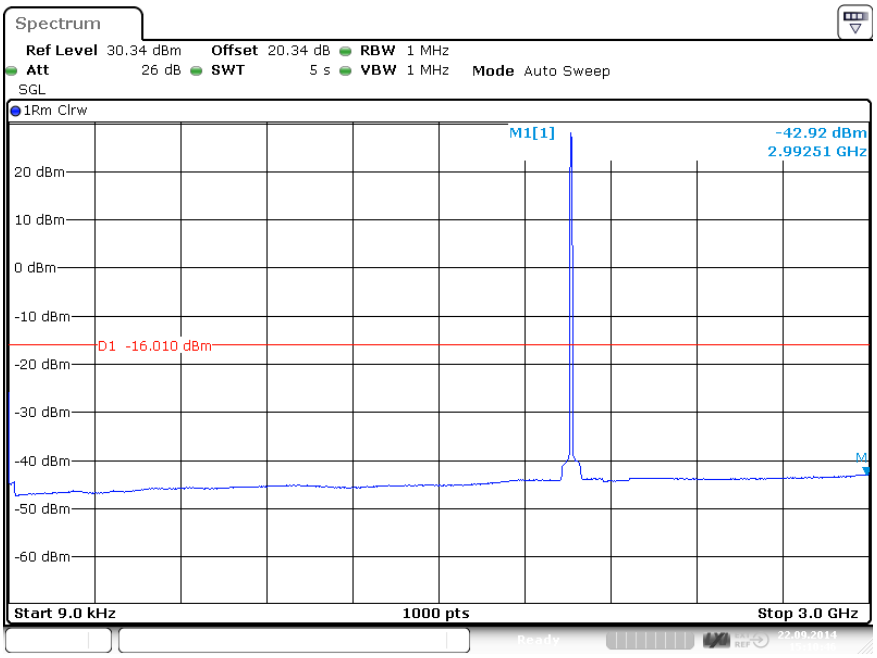


Figure 54 Spurious Emissions (9kHz – 3GHz) – 64QAM (1957.4/1962.4 MHz) (5MHz Channel BW)

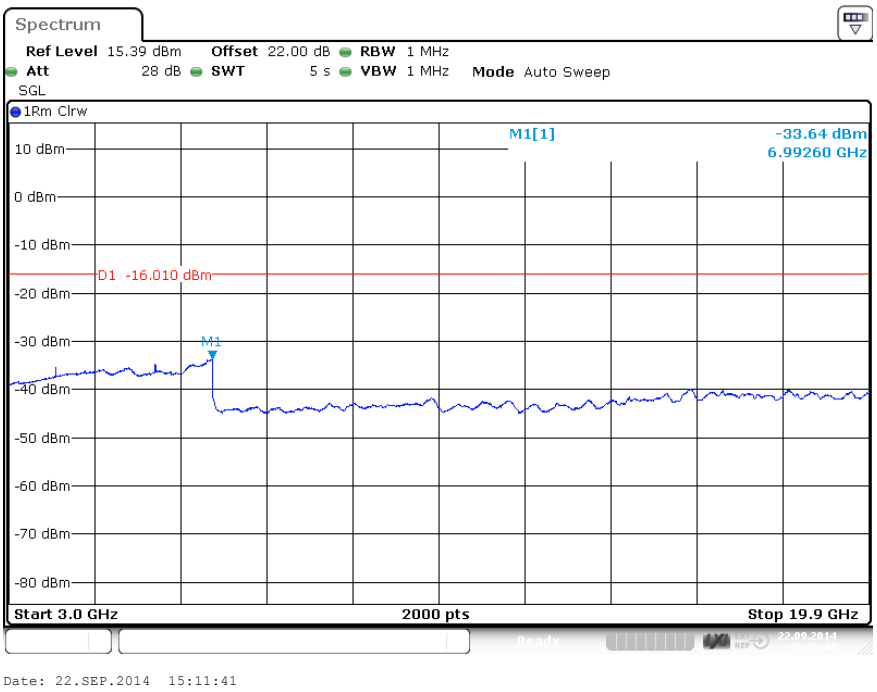


Figure 55 Spurious Emissions (3GHz – 19.900GHz) – 64QAM (1957.4/1962.4 MHz) (5MHz Channel BW)

5.2.4. Test No. 5: Field Strength of Spurious Radiation

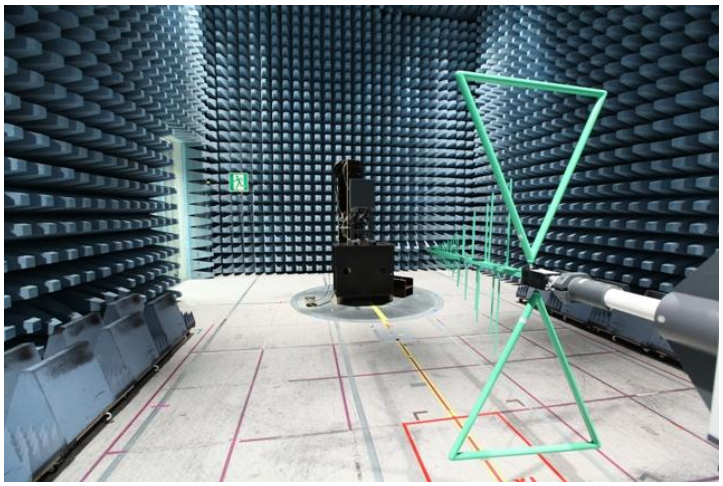


Figure 56 Photograph of the anechoic chamber with the EUT

Config A:

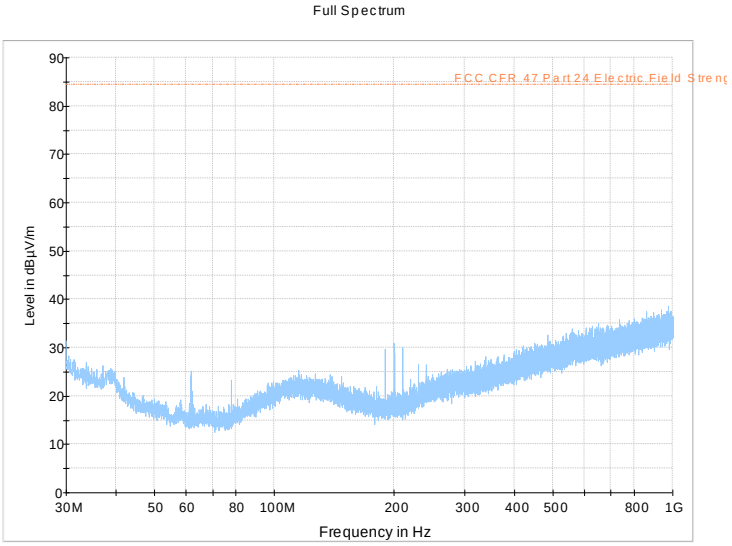


Figure 57 Radiated Emission 30 MHz – 1 GHz (1932.4 MHz and 1960 MHz) (5MHz Channel BW)

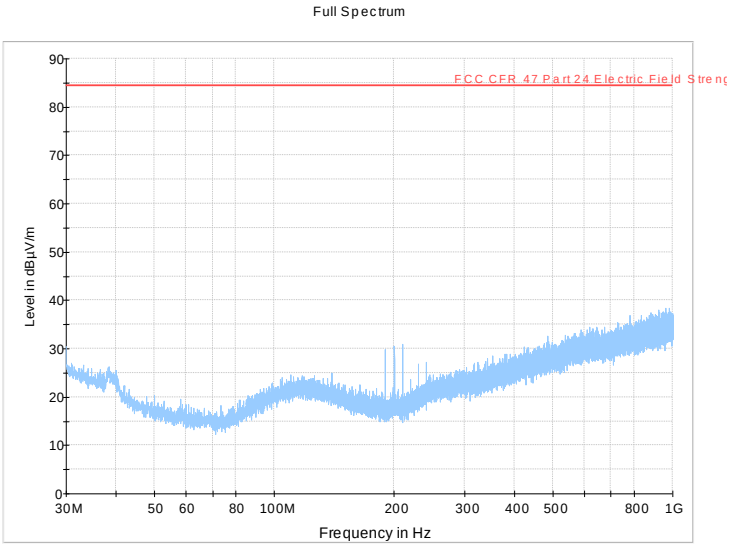


Figure 58 Radiated Emission 30 MHz – 1 GHz (1960 MHz and 1987.6 MHz) (5MHz Channel BW)

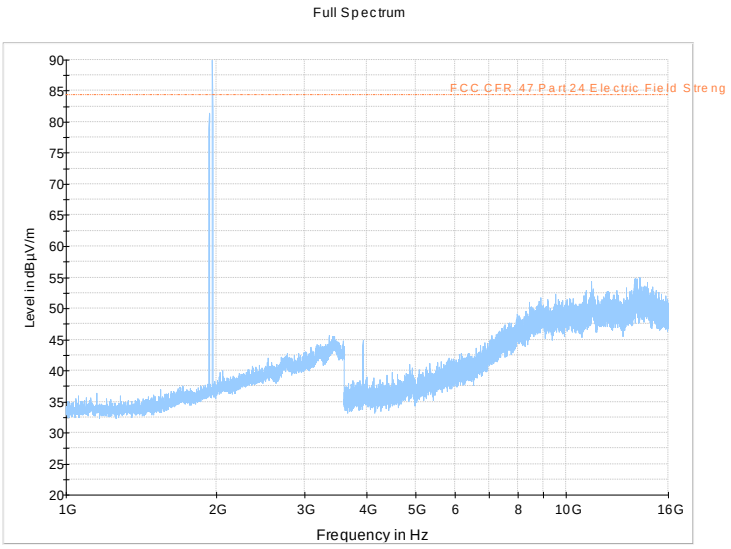


Figure 59 Radiated Emission 1 GHz – 16 GHz (1932.4 MHz and 1960 MHz) (5MHz Channel BW)

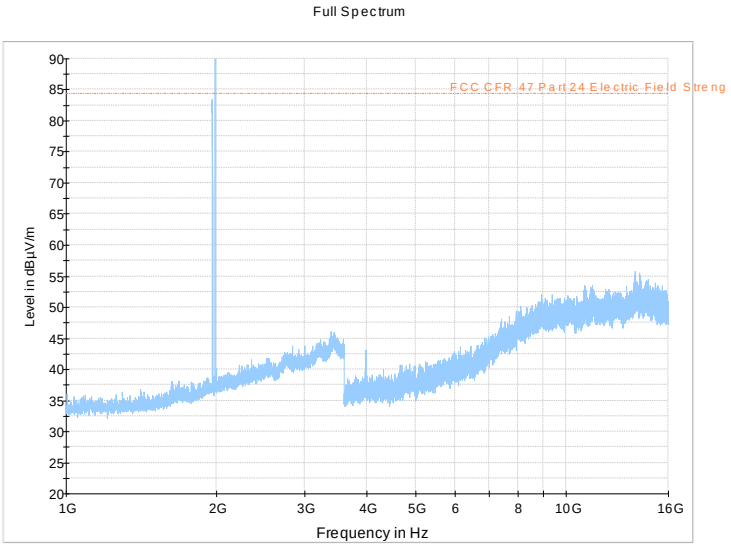


Figure 60 Radiated Emission 1 GHz – 16 GHz (1960 MHz and 1987.6 MHz) (5MHz Channel BW)

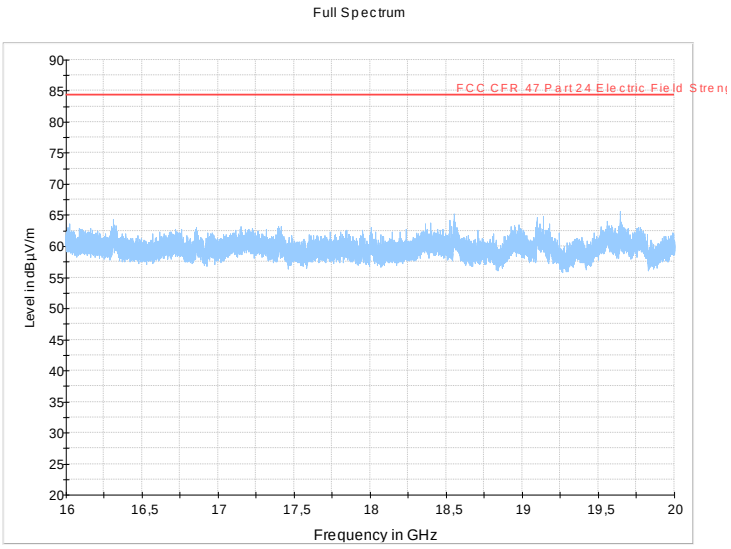


Figure 61 Radiated Emission 16 GHz – 19.9 GHz (1932.4 MHz and 1960 MHz) (5MHz Channel BW)

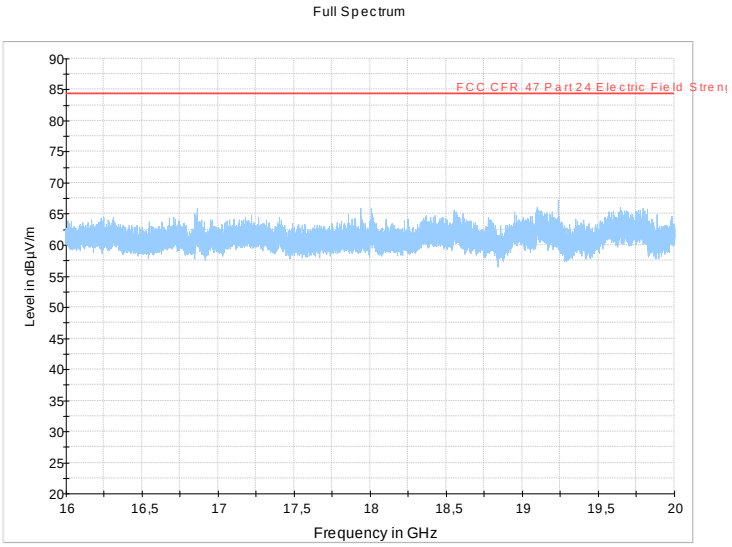


Figure 62 Radiated Emission 16 GHz – 19.9 GHz (1960 MHz and 1987.6 MHz) (5MHz Channel BW)

Config B:

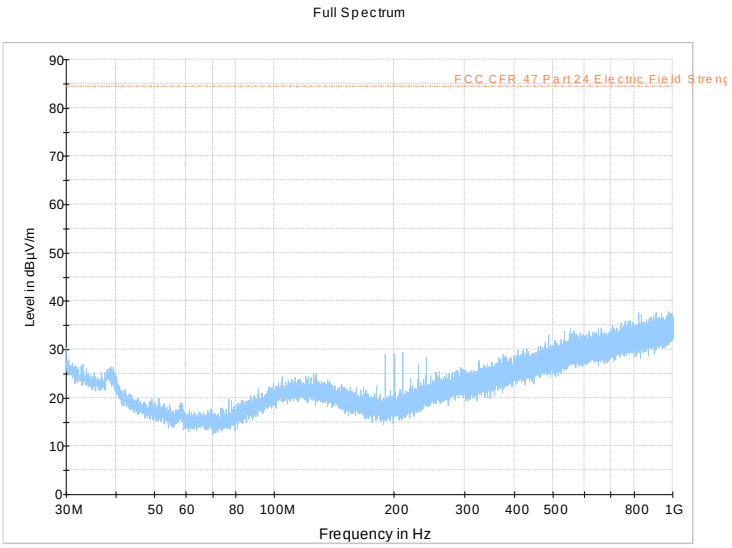


Figure 63 Radiated Emission 30 MHz – 1 GHz (1932.4/1937.4 MHz and 1957.4/1962.4 MHz) (5MHz Channel BW)

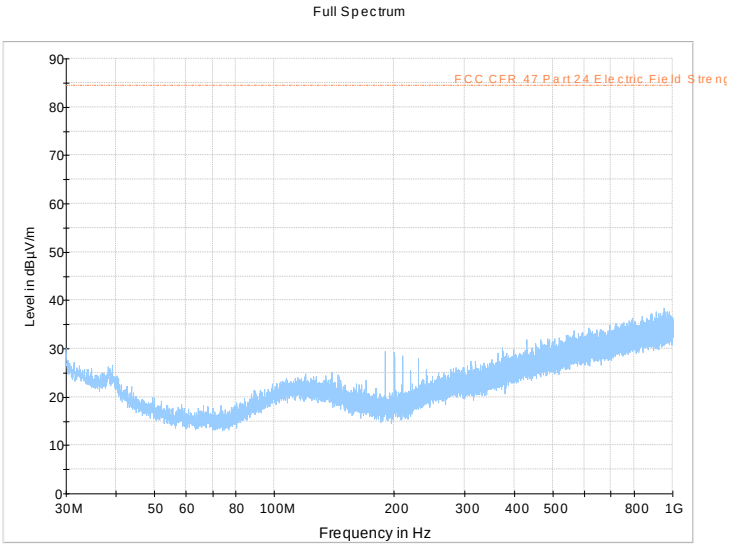


Figure 64 Radiated Emission 30 MHz – 1 GHz (1957.4/1962.4 MHz and 1982.6/1987.6 MHz) (5MHz Channel BW)

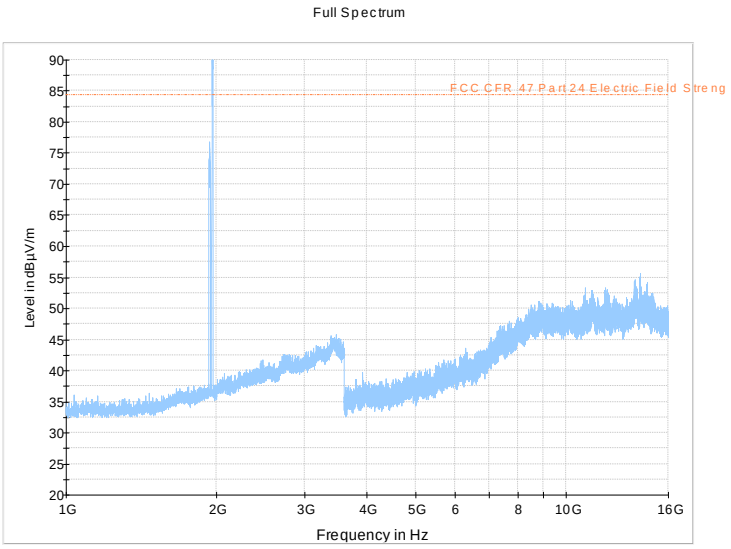


Figure 65 Radiated Emission 1 GHz – 16 GHz (1932.4/1937.4 MHz and 1957.4/1962.4 MHz) (5MHz Channel BW)

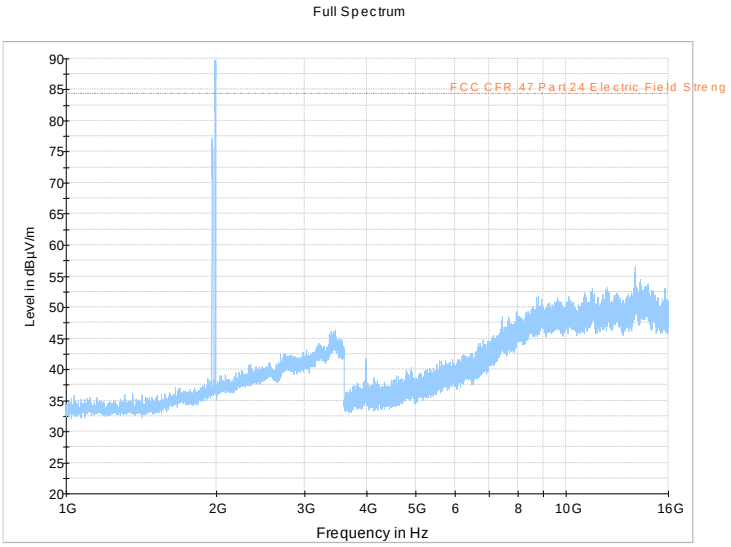


Figure 66 Radiated Emission 1 GHz – 16 GHz (1957.4/1962.4 MHz and 1982.6/1987.6 MHz) (5MHz Channel BW)

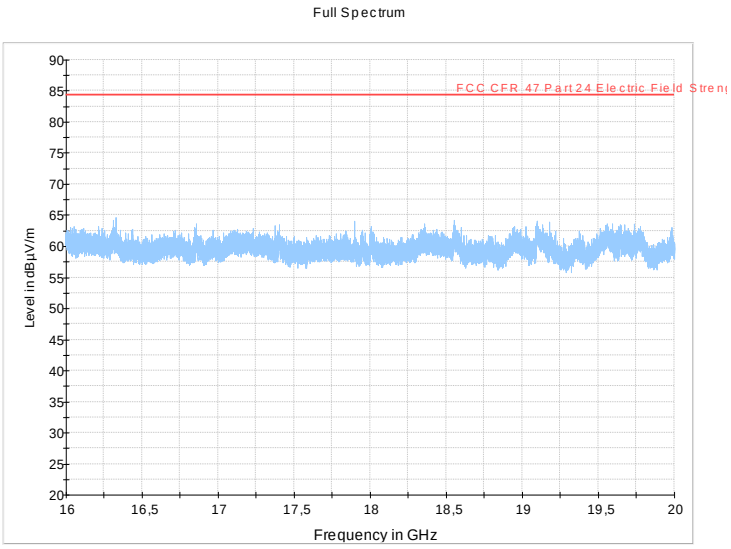


Figure 67 Radiated Emission 16 GHz – 19.9 GHz (1932.4/1937.4 MHz and 1957.4/1962.4 MHz) (5MHz Channel BW)

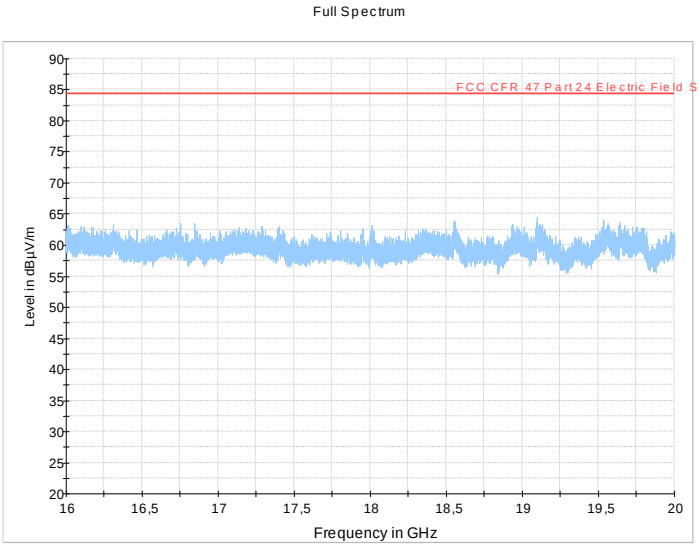


Figure 68 Radiated Emission 16 GHz – 19.9 GHz (1957.4/1962.4 MHz and 1982.6/1987.6 MHz) (5MHz Channel BW)