SGS Germany GmbH

Test Report No.: F1Y10001

FCC ID: VBNFRIG-01

Order No.: F1Y1 **Pages:** 197 **Munich,** Nov 21, 2012

Client:	Nokia Siemens Networks Oy
Equipment Under Test:	Flexi Multiradio 10 BTS RF module 1.7/2.1GHz Radio Access Technology: E-UTRA
Manufacturer:	Nokia Siemens Networks Oy
Task:	Conformance test according to the test specifications mentioned below
Test Specification(s):	FCC 47 CFR Part 2 and 27
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**
Bauer Lab Manager EMC	Nov 21, 2012	
Sperling Qualification Engineer	Nov 21, 2012	

This document was signed electronically.

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1 Summary

The measurements described in this report were conducted pursuant to 47 CFR § 2.947 and § 2.1041. All applicable paragraphs of the 47 CFR parts 2 and 27 of the most current version of the rules were considered.

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	11	compliant
2	Modulation Characteristics	§ 2.1047, § 2.201	16	compliant
3	Occupied Bandwidth	§ 2.1049	17	compliant
4	Spurious Emissions at Antenna Terminals	§ 2.1051, § 2.1057, § 27.53	21	compliant
5	Field Strength of Spurious Radiation	§ 2.1053, § 2.1057, § 27.53, § 27.55	34	compliant
6	Frequency Stability	§ 2.1055, § 27.54	36	compliant

Table 1-1: 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*.

2 References

2.1 Specifications

No	Standard	Title	Date
[1]	FCC 47 CFR Part 2 and 27	Code of Federal Regulations, Title 47: Telecommunication Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations Part 27: Miscelleanous Wireless Communications Services[1]	2011-10

2.2 Glossary of Terms

QPSK	Quadrature Phase Shift Keying -Modulation
16QAM	16 Quadrature Amplitude Modulation
64QAM	64 Quadrature Amplitude Modulation
AC	Alternating Current
BTS	Base Transceiver System
BW	Bandwidth
chk	checked against a calibrated reference
cnn	calibration not necessary
DAkkS	Deutsche Akkreditierungsstelle
DC	Direct Current
EIRP	Equivalent Isotropic Radiated Power
EUT	Equipment Under Test
FCC	Federal Communications Commission
LTE	Long Term Evolution
P	Power
Prat	Rated Output Power
RF	Radio Frequency

3 General Information

3.1 Identification of Client

Jaakko Samuli Sirviö

3.2 Test Laboratory

Nokia Siemens Networks Oy
P.O. Box 319,
Kaapelitie 4,
FI-90620, Oulu, Finland
Jaakko Sirvio

3.3 Time Schedule

Test No.:	1, 2, 3, 4	5	6
Start of Test:	Sep 26, 2012	Sep 29, 2012	Sep 29, 2012
End of Test:	Oct 10, 2012	Oct 2, 2012	Oct 1, 2012

3.4 Participants

Name	Function
Rami Salomäki (NSN)	Testing, Setup of EUT
Hannu Eskola (NSN)	Testing, Setup of EUT
Jarmo Koskela (NSN)	Testing, Setup of EUT
André Stéphane Nakpane (SGS)	Editor

4 Equipment Under Test

The tested equipment is representative for serial production.

4.1 Description of EUT

The BTS performs the full RAN function of LTE system (evolved UTRA). This is sometimes refered 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 others via X2 interface for handover purposes.

4.2 Configuration of EUT

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

Module Type	Flexi Multiradio BTS RF module 1.7/2.1GHz	
Radio Access Technology	E-UTRA	
Frequency Bands	**Uplink**	**Downlink**
Block A:	1710 - 1720 MHz	2110 - 2120 MHz
Block B:	1720 - 1730 MHz	2120 - 2130 MHz
Block C:	1730 - 1735 MHz	2130 - 2135 MHz
Block D:	1735 - 1740 MHz	2135 - 2140 MHz
Block E:	1740 - 1745 MHz	2140 - 2145 MHz
Block F:	1745 - 1755 MHz	2145 - 2155 MHz
	Single Carrier	
Rated Output Power (Prat)	60 W	
Channel Bandwidth	5 MHz (Config. A), 10 MHz (Config. B), 15 MHz (Config. C), 20 MHz (Config. D)	
	RX	**TX**
Number of Antenna Ports	4 (ANT1 to ANT4)	4 (ANT1 to ANT4)
MIMO	Yes	Yes

Table 4-1: Overview of EUT Configuration

The tests were performed with one EUT at the antenna ports ANT1 and/or ANT3, at which the EUT shows the maximum available output power in single carrier and/or MIMO configuration.

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

Module Name	**Serial-No.**	**Module Type**	**Config.**
FRIG	RY123702153	RF module	A, B, C, D
Other Modules	**Module Type**		**Config.**
FSMF	System module		A, B, C, D
FTIF	Transmission module		A, B, C, D

Table 4-2: Configuration of EUT

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

4.3 Operating Conditions

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: QPSK modulation,
- E-TM 3.1: 64QAM modulation,
- E-TM 3.2: 16QAM modulation

The Flexi Multiradio BTS was supplied with 48 V DC.

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.

4.4 Compliance Criteria

The EUT must fulfil the requirements (described in the specifications mentioned in chapter 2.1, Specifications) for the selected test cases.

5 General Description of Tests

5.1 Tested Carrier Frequencies

The measurements were done on several carrier frequencies, according to the following table:

Config A:

Channel Bandwith: 5MHz	
Frequency [MHz]	**Remark**
2112.5	lowest possible carrier frequency
2132.5	frequency at the middle of the band
2152.5	highest possible carrier frequency

Table 5-1: Carrier Frequencies for 5MHz channel bandwidth

Config B:

Channel Bandwith: 10MHz	
Frequency [MHz]	**Remark**
2115.0	lowest possible carrier frequency
2132.5	frequency at the middle of the band
2150.0	highest possible carrier frequency

Table 5-2: Carrier Frequencies for 10MHz channel bandwidth

Config C:

Channel Bandwith: 15MHz	
Frequency [MHz]	**Remark**
2117.5	lowest possible carrier frequency
2132.5	frequency at the middle of the band
2147.5	highest possible carrier frequency

Table 5-3: Carrier Frequencies for 15MHz channel bandwidth

Config D:

Channel Bandwith: 20MHz	
Frequency [MHz]	**Remark**
2120.0	lowest possible carrier frequency
2132.5	frequency at the middle of the band
2145.0	highest possible carrier frequency

Table 5-4: Carrier Frequencies for 20MHz channel bandwidth

5.2 Modulation Characteristics

The EUT supports QPSK, 16QAM and 64QAM modulation.

5.3 Test Configuration

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

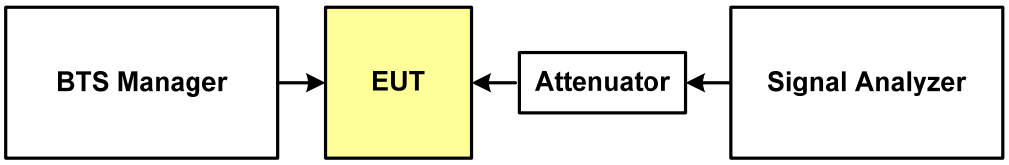


Figure 5-1: Test Configuration (single output)

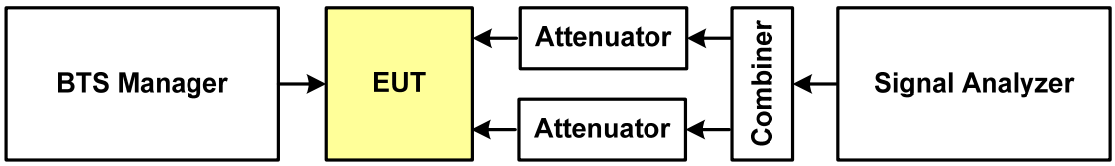


Figure 5-2: Test Configuration (combined output)

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 49 of this measurement report.

5.4 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.

6 Test Results

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

6.1.1 Purpose

The RF power output measurements were performed pursuant to § 2.1046 in order to determine the base station maximum RF output power.

6.1.2 Limits

According to § 27.50, base stations with an emission bandwidth greater than 1 MHz are limited to 1640 watts/MHz peak EIRP.

6.1.3 EUT Operating Condition

The standard setup procedure as described in section 4.3 of this report was used.

6.1.4 Test Configuration

The test configuration used is described in section 5.3 of this report.

6.1.5 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).

The following table shows the measured output powers at the antenna connector. Screenshots of the measurements are included on pages 50 of this report.

Config A:

Carrier Frequency [MHz]	RF Power Output		Result
	[dBm]	[W]	
QPSK-Modulation ANT1			
2112.50	47.90	61.66	compliant
2132.50	47.74	59.43	compliant
2152.50	47.77	59.84	compliant
QPSK-Modulation ANT3			
2112.50	47.38	54.70	compliant
2132.50	47.44	55.46	compliant
2152.50	47.45	55.59	compliant
QPSK-Modulation ANT1+ANT3 Calculated Total			
2112.50	50.66	116.36	compliant
2132.50	50.60	114.89	compliant
2152.50	50.62	115.43	compliant
16QAM-Modulation ANT1			
2112.50	47.66	58.34	compliant
2132.50	47.72	59.16	compliant
2152.50	47.81	60.39	compliant
16QAM-Modulation ANT3			
2112.50	47.35	54.33	compliant
2132.50	47.39	54.83	compliant
2152.50	47.42	55.21	compliant
16QAM-Modulation ANT1+ANT3 Calculated Total			
2112.50	50.52	112.67	compliant
2132.50	50.57	113.98	compliant
2152.50	50.63	115.60	compliant
64QAM-Modulation ANT1			
2112.50	47.63	57.94	compliant
2132.50	47.74	59.43	compliant
2152.50	47.80	60.26	compliant
64QAM-Modulation ANT3			
2112.50	47.32	53.95	compliant
2132.50	47.40	54.95	compliant
2152.50	47.43	55.34	compliant
64QAM-Modulation ANT1+ANT3 Calculated Total			
2112.50	50.49	111.89	compliant
2132.50	50.58	114.38	compliant
2152.50	50.63	115.59	compliant
Measurement Uncertainty:		±0.4dB	

Table 6-1: Results – RF Power Output (5 MHz Channel BW)

Config B:

Carrier Frequency [MHz]	RF Power Output		Result
	[dBm]	[W]	
QPSK-Modulation ANT1			
2115.00	47.64	58.08	compliant
2132.50	47.54	56.75	compliant
2150.00	47.73	59.29	compliant
QPSK-Modulation ANT3			
2115.00	47.38	54.70	compliant
2132.50	47.45	55.59	compliant
2150.00	47.47	55.85	compliant
QPSK-Modulation ANT1+ANT3 Calculated Total			
2115.00	50.52	112.78	compliant
2132.50	50.51	112.34	compliant
2150.00	50.61	115.14	compliant
16QAM-Modulation ANT1			
2115.00	47.64	58.08	compliant
2132.50	47.54	56.75	compliant
2150.00	47.76	59.70	compliant
16QAM-Modulation ANT3			
2115.00	47.40	54.95	compliant
2132.50	47.28	53.46	compliant
2150.00	47.49	56.10	compliant
16QAM-Modulation ANT1+ANT3 Calculated Total			
2115.00	50.53	113.03	compliant
2132.50	50.42	110.21	compliant
2150.00	50.64	115.81	compliant
64QAM-Modulation ANT1			
2115.00	47.65	58.21	compliant
2132.50	47.53	56.62	compliant
2150.00	47.76	59.70	compliant
64QAM-Modulation ANT3			
2115.00	47.39	54.83	compliant
2132.50	47.26	53.21	compliant
2150.00	47.44	55.46	compliant
64QAM-Modulation ANT1+ANT3 Calculated Total			
2115.00	50.53	113.04	compliant
2132.50	50.41	109.83	compliant
2150.00	50.61	115.17	compliant
Measurement Uncertainty:		±0.4dB	

Table 6-2: Results – RF Power Output (10 MHz Channel BW)

Config C:

Carrier Frequency [MHz]	RF Power Output		Result
	[dBm]	[W]	
QPSK-Modulation ANT1			
2117.50	47.65	58.21	compliant
2132.50	47.73	59.29	compliant
2147.50	47.79	60.12	compliant
QPSK-Modulation ANT3			
2117.50	47.41	55.08	compliant
2132.50	47.25	53.09	compliant
2147.50	47.42	55.21	compliant
QPSK-Modulation ANT1+ANT3 Calculated Total			
2117.50	50.54	113.29	compliant
2132.50	50.51	112.38	compliant
2147.50	50.62	115.33	compliant
16QAM-Modulation ANT1			
2117.50	47.71	59.02	compliant
2132.50	47.60	57.54	compliant
2147.50	47.78	59.98	compliant
16QAM-Modulation ANT3			
2117.50	47.38	54.70	compliant
2132.50	47.26	53.21	compliant
2147.50	47.45	55.59	compliant
16QAM-Modulation ANT1+ANT3 Calculated Total			
2117.50	50.56	113.72	compliant
2132.50	50.44	110.75	compliant
2147.50	50.63	115.57	compliant
64QAM-Modulation ANT1			
2117.50	47.69	58.75	compliant
2132.50	47.58	57.28	compliant
2147.50	47.81	60.39	compliant
64QAM-Modulation ANT3			
2117.50	47.37	54.58	compliant
2132.50	47.24	52.97	compliant
2147.50	47.43	55.34	compliant
64QAM-Modulation ANT1+ANT3 Calculated Total			
2117.50	50.54	113.32	compliant
2132.50	50.42	110.25	compliant
2147.50	50.63	115.73	compliant
Measurement Uncertainty:		±0.4dB	

Table 6-3: Results – RF Power Output (15 MHz Channel BW)

Config D:

Carrier Frequency [MHz]	RF Power Output		Result
	[dBm]	[W]	
QPSK-Modulation ANT1			
2120.00	47.77	59.84	compliant
2132.50	47.64	58.08	compliant
2145.00	47.81	60.39	compliant
QPSK-Modulation ANT3			
2120.00	47.30	53.70	compliant
2132.50	47.38	54.70	compliant
2145.00	47.46	55.72	compliant
QPSK-Modulation ANT1+ANT3 Calculated Total			
2120.00	50.55	113.54	compliant
2132.50	50.52	112.78	compliant
2145.00	50.65	116.11	compliant
16QAM-Modulation ANT1			
2120.00	47.77	59.84	compliant
2132.50	47.64	58.08	compliant
2145.00	47.80	60.26	compliant
16QAM-Modulation ANT3			
2120.00	47.44	55.46	compliant
2132.50	47.31	53.83	compliant
2145.00	47.49	56.10	compliant
16QAM-Modulation ANT1+ANT3 Calculated Total			
2120.00	50.62	115.30	compliant
2132.50	50.49	111.90	compliant
2145.00	50.66	116.36	compliant
64QAM-Modulation ANT1			
2120.00	47.73	59.29	compliant
2132.50	47.62	57.81	compliant
2145.00	47.81	60.39	compliant
64QAM-Modulation ANT3			
2120.00	47.44	55.46	compliant
2132.50	47.33	54.08	compliant
2145.00	47.50	56.23	compliant
64QAM-Modulation ANT1+ANT3 Calculated Total			
2120.00	50.60	114.76	compliant
2132.50	50.49	111.89	compliant
2145.00	50.67	116.63	compliant
Measurement Uncertainty:		±0.4dB	

Table 6-4: Results – 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.

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

The occupied bandwidth was measured to be 4.5 MHz (Config. A), 9 MHz (Config. B), 13.5 MHz (Config C) and 18 MHz (Config. D), which represents the 99% power bandwidth (see the following section and screenshots on pages 67). Therefore, the modulation characteristic of the base stations transceiver is

Config A: 4M50D9W (Channel bandwidth 5 MHz)

Config B: 9M00D9W (Channel bandwidth 10 MHz)

Config C: 13M5D9W (Channel bandwidht 15 MHz)

Config D: 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.

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

6.3 Test No. 3: Occupied Bandwidth (§ 2.1049)

6.3.1 Purpose

The measurements are performed to determine the occupied bandwidth of the EUT pursuant to § 2.1049.

6.3.2 Limits

According to § 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.

6.3.3 EUT Operating Condition

The standard setup procedure as described in section 4.3 of this report was used.

6.3.4 Test Configuration

The test configuration used is described in section 5.3 of this report.

6.3.5 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 67 for details). The following table summarizes the results:

Config A:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1		
2112.5	4.4789	compliant
2132.5	4.4789	compliant
2152.5	4.4789	compliant
QPSK-Modulation ANT3		
2112.5	4.4789	compliant
2132.5	4.4789	compliant
2152.5	4.4789	compliant
16QAM-Modulation ANT1		
2112.5	4.4707	compliant
2132.5	4.4707	compliant
2152.5	4.4707	compliant
16QAM-Modulation ANT3		
2112.5	4.4707	compliant
2132.5	4.4707	compliant
2152.5	4.4707	compliant

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
64QAM-Modulation ANT1		
2112.5	4.4789	compliant
2132.5	4.4789	compliant
2152.5	4.4789	compliant
64QAM-Modulation ANT3		
2112.5	4.4789	compliant
2132.5	4.4789	compliant
2152.5	4.4789	compliant
Measurement Uncertainty:		±48kHz

Table 6-5: Results – Occupied Bandwidth (5 MHz Channel BW)

Config B:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1		
2115.0	8.9346	compliant
2132.5	8.9346	compliant
2150.0	8.9346	compliant
QPSK-Modulation ANT3		
2115.0	8.9346	compliant
2132.5	8.9346	compliant
2150.0	8.9346	compliant
16QAM-Modulation ANT1		
2115.0	8.9346	compliant
2132.5	8.9346	compliant
2150.0	8.9346	compliant
16QAM-Modulation ANT3		
2115.0	8.9346	compliant
2132.5	8.9346	compliant
2150.0	8.9346	compliant
64QAM-Modulation ANT1		
2115.0	8.9346	compliant
2132.5	8.9346	compliant
2150.0	8.9346	compliant
64QAM-Modulation ANT3		
2115.0	8.9346	compliant
2132.5	8.9346	compliant
2150.0	8.9346	compliant
Measurement Uncertainty:		±48kHz

Table 6-6: Results – Occupied Bandwidth (10 MHz Channel BW)

Config C:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1		
2117.5	13.4061	compliant
2132.5	13.4061	compliant
2147.5	13.4061	compliant
QPSK-Modulation ANT3		
2117.5	13.4061	compliant
2132.5	13.4061	compliant
2147.5	13.4061	compliant
16QAM-Modulation ANT1		
2117.5	13.4061	compliant
2132.5	13.4061	compliant
2147.5	13.4061	compliant
16QAM-Modulation ANT3		
2117.5	13.4061	compliant
2132.5	13.4061	compliant
2147.5	13.4061	compliant
64QAM-Modulation ANT1		
2117.5	13.4061	compliant
2132.5	13.4061	compliant
2147.5	13.4061	compliant
64QAM-Modulation ANT3		
2117.5	13.4061	compliant
2132.5	13.4061	compliant
2147.5	13.4061	compliant
Measurement Uncertainty:		±96kHz

Table 6-7: Results – Occupied Bandwidth (15 MHz Channel BW)

Config C:

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
QPSK-Modulation ANT1		
2120.0	17.8452	compliant
2132.5	17.8452	compliant
2145.0	17.8452	compliant
QPSK-Modulation ANT3		
2120.0	17.8452	compliant
2132.5	17.8452	compliant
2145.0	17.8452	compliant
16QAM-Modulation ANT1		
2120.0	17.8130	compliant
2132.5	17.8130	compliant
2145.0	17.8130	compliant
16QAM-Modulation ANT3		
2120.0	17.8130	compliant
2132.5	17.8130	compliant
2145.0	17.8130	compliant

Carrier Frequency [MHz]	Occupied Bandwidth [MHz]	Result
64QAM-Modulation ANT1		
2120.0	17.8452	compliant
2132.5	17.8452	compliant
2145.0	17.8452	compliant
64QAM-Modulation ANT3		
2120.0	17.8452	compliant
2132.5	17.8452	compliant
2145.0	17.8452	compliant
Measurement Uncertainty:		±96kHz

Table 6-8: Results – 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.

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

6.4.1 Purpose

The measurements of the spurious emissions at the equipment output terminals were performed pursuant to § 2.1051 in order to verify that all emissions are below the specified limits.

6.4.2 Limits

Compliance with § 27.53 requires that any emission be attenuated below the transmitter power by at least 43 + 10 $\log_{10}$ P (P = transmitter power in Watts).

The compliance limit was calculated in the following way:

Maximum transmitter output power [W]:	P
Maximum transmitter output power [dBm]:	30 + 10 $\log_{10}$ P (conversion from W to dBm)
Attenuation required by FCC:	43 + 10 $\log_{10}$ P

Compliance limit = Maximum transmitter output power - Required attenuation
= 30 + 10 $\log_{10}$ P - (43 + 10 $\log_{10}$ P) = -13 dBm

6.4.3 EUT Operating Condition

The standard setup procedure as described in section 4.3 of this report was used.

6.4.4 Test Configuration

The test configuration used is described in section 5.3 of this report.

6.4.5 Test Procedure and Results

Signal analyzer settings:
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 and at minimum to 30kHz.

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 pages 83 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: 2112.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2110.0	-22.49	compliant
QPSK-Modulation ANT3			
	2110.0	-23.30	compliant
QPSK-Modulation ANT1+ANT3			
	2110.0	-18.60	compliant
16QAM-Modulation ANT1			
	2110.0	-23.81	compliant
16QAM-Modulation ANT3			
	2110.0	-23.61	compliant
16QAM-Modulation ANT1+ANT3			
	2110.0	-22.21	compliant
64QAM-Modulation ANT1			
	2110.0	-22.72	compliant
64QAM-Modulation ANT3			
	2110.0	-24.07	compliant
64QAM-Modulation ANT1+ANT3			
	2110.0	-19.91	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 6-9: Results - Spurious Emissions (Lower bande edge) (5 MHz Channel BW)

Config A Upper band edge:

Carrier Frequency: 2152.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2155.0	-21.40	compliant
QPSK-Modulation ANT3			
	2155.0	-22.44	compliant
QPSK-Modulation ANT1+ANT3			
	2155.0	-19.46	compliant
16QAM-Modulation ANT1			
	2155.0	-21.85	compliant
16QAM-Modulation ANT3			
	2155.0	-22.71	compliant
16QAM-Modulation ANT1+ANT3			
	2155.0	-18.69	compliant
64QAM-Modulation ANT1			
	2155.0	-21.19	compliant
64QAM-Modulation ANT3			
	2155.0	-22.37	compliant
64QAM-Modulation ANT1+ANT3			
	2155.0	-19.00	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 6-10: Results - Spurious Emissions (Upper band edge) (5 MHz Channel BW)

Config A Spurious emissions:

Carrier Frequency: 2132.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 - 22000	2509.760	-37.15	compliant
QPSK-Modulation ANT3			
0.009 - 22000	2547.837	-37.16	compliant
QPSK-Modulation ANT1+ANT3			
0.009 - 22000	2662.067	-30.27	compliant
16QAM-Modulation ANT1			
0.009 - 22000	2652.548	-37.12	compliant
16QAM-Modulation ANT3			
0.009 - 22000	2547.837	-37.15	compliant
16QAM-Modulation ANT1+ANT3			
0.009 - 22000	2505.000	-30.30	compliant
64QAM-Modulation ANT1			
0.009 - 22000	2533.558	-37.18	compliant
64QAM-Modulation ANT3			
0.009 - 22000	2514.519	-37.14	compliant
64QAM-Modulation ANT1+ANT3			
0.009 - 22000	2633.510	-30.32	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 6-11: Results - Spurious Emissions (5 MHz Channel BW)

Config B Lower band edge:

Carrier Frequency: 2115.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2110.0	-24.68	compliant
QPSK-Modulation ANT3			
	2110.0	-24.86	compliant
QPSK-Modulation ANT1+ANT3			
	2110.0	-18.40	compliant
16QAM-Modulation ANT1			
	2110.0	-25.14	compliant
16QAM-Modulation ANT3			
	2110.0	-25.51	compliant
16QAM-Modulation ANT1+ANT3			
	2110.0	-18.88	compliant
64QAM-Modulation ANT1			
	2110.0	-24.37	compliant
64QAM-Modulation ANT3			
	2110.0	-24.40	compliant
64QAM-Modulation ANT1+ANT3			
	2110.0	-18.93	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 6-12: Results - Spurious Emissions (Lower band edge) (10 MHz Channel BW)

Config B Upper band edge:

Carrier Frequency: 2150.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2155.0	-23.15	compliant
QPSK-Modulation ANT3			
	2155.0	-23.83	compliant
QPSK-Modulation ANT1+ANT3			
	2155.0	-17.57	compliant
16QAM-Modulation ANT1			
	2155.0	-23.32	compliant
16QAM-Modulation ANT3			
	2155.0	-23.61	compliant
16QAM-Modulation ANT1+ANT3			
	2155.0	-17.42	compliant
64QAM-Modulation ANT1			
	2155.0	-23.71	compliant
64QAM-Modulation ANT3			
	2155.0	-23.40	compliant
64QAM-Modulation ANT1+ANT3			
	2155.0	-17.44	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 6-13: Results - Spurious Emissions (Upper band edge) (10 MHz Channel BW)

Config B Spurious emissions:

Carrier Frequency: 2132.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 - 22000	2519.279	-37.11	compliant
QPSK-Modulation ANT3			
0.009 - 22000	2505.000	-37.16	compliant
QPSK-Modulation ANT1+ANT3			
0.009 - 22000	2528.798	-30.27	compliant
16QAM-Modulation ANT1			
0.009 - 22000	2500.240	-37.15	compliant
16QAM-Modulation ANT3			
0.009 - 22000	2514.519	-37.15	compliant
16QAM-Modulation ANT1+ANT3			
0.009 - 22000	2576.394	-30.29	compliant
64QAM-Modulation ANT1			
0.009 - 22000	2495.481	-37.14	compliant
64QAM-Modulation ANT3			
0.009 - 22000	2509.760	-37.16	compliant
64QAM-Modulation ANT1+ANT3			
0.009 - 22000	2538.317	-30.28	compliant
Measurement Uncertainty:			f < 1.0GHz: ±1.1dB 1.0GHz ≤ f <3.6GHz: ±1.2dB 3.6GHz ≤ f <8.0GHz: ±1.6dB 8.0GHz ≤ f: ±1.9dB

Table 6-14: Results - Spurious Emissions (10 MHz Channel BW)

Config C Lower band edge:

Carrier Frequency: 2117.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2110.0	-24.18	compliant
QPSK-Modulation ANT3			
	2110.0	-24.00	compliant
QPSK-Modulation ANT1+ANT3			
	2110.0	-17.11	compliant
16QAM-Modulation ANT1			
	2110.0	-23.76	compliant
16QAM-Modulation ANT3			
	2110.0	-23.63	compliant
16QAM-Modulation ANT1+ANT3			
	2110.0	-20.16	compliant
64QAM-Modulation ANT1			
	2110.0	-24.10	compliant
64QAM-Modulation ANT3			
	2110.0	-24.39	compliant
64QAM-Modulation ANT1+ANT3			
	2110.0	-19.63	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 6-15: Results - Spurious Emissions (Lower bande edge) (15 MHz Channel BW)

Config C Upper band edge:

Carrier Frequency: 2147.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2155.0	-23.74	compliant
QPSK-Modulation ANT3			
	2155.0	-24.22	compliant
QPSK-Modulation ANT1+ANT3			
	2155.0	-17.23	compliant
16QAM-Modulation ANT1			
	2155.0	-24.07	compliant
16QAM-Modulation ANT3			
	2155.0	-24.37	compliant
16QAM-Modulation ANT1+ANT3			
	2155.0	-17.75	compliant
64QAM-Modulation ANT1			
	2155.0	-23.27	compliant
64QAM-Modulation ANT3			
	2155.0	-24.11	compliant
64QAM-Modulation ANT1+ANT3			
	2155.0	-17.19	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 6-16: Results - Spurious Emissions (Upper band edge) (15 MHz Channel BW)

Config C Spurious emissions:

Carrier Frequency: 2132.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 - 22000	2495.481	-37.20	compliant
QPSK-Modulation ANT3			
0.009 - 22000	2657.308	-37.16	compliant
QPSK-Modulation ANT1+ANT3			
0.009 - 22000	2514.519	-30.29	compliant
16QAM-Modulation ANT1			
0.009 - 22000	2524.039	-37.14	compliant
16QAM-Modulation ANT3			
0.009 - 22000	2524.038	-37.19	compliant
16QAM-Modulation ANT1+ANT3			
0.009 - 22000	2524.039	-30.27	compliant
64QAM-Modulation ANT1			
0.009 - 22000	2500.240	-37.21	compliant
64QAM-Modulation ANT3			
0.009 - 22000	2490.721	-37.16	compliant
64QAM-Modulation ANT1+ANT3			
0.009 - 22000	2509.760	-30.26	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 6-17: Results - Spurious Emissions (15 MHz Channel BW)

Config D Lower band edge:

Carrier Frequency: 2120.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2110.0	-23.98	compliant
QPSK-Modulation ANT3			
	2110.0	-24.22	compliant
QPSK-Modulation ANT1+ANT3			
	2110.0	-18.93	compliant
16QAM-Modulation ANT1			
	2110.0	-24.34	compliant
16QAM-Modulation ANT3			
	2110.0	-24.22	compliant
16QAM-Modulation ANT1+ANT3			
	2110.0	-20.40	compliant
64QAM-Modulation ANT1			
	2110.0	-24.35	compliant
64QAM-Modulation ANT3			
	2110.0	-24.18	compliant
64QAM-Modulation ANT1+ANT3			
	2110.0	-18.59	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 6-18: Results - Spurious Emissions (Lower band edge) (20 MHz Channel BW)

Config D Upper band edge:

Carrier Frequency: 2145.0 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
	2155.0	-24.30	compliant
QPSK-Modulation ANT3			
	2155.0	-24.52	compliant
QPSK-Modulation ANT1+ANT3			
	2155.0	-20.70	compliant
16QAM-Modulation ANT1			
	2155.0	-23.96	compliant
16QAM-Modulation ANT3			
	2155.0	-24.43	compliant
16QAM-Modulation ANT1+ANT3			
	2155.0	-19.31	compliant
64QAM-Modulation ANT1			
	2155.0	-24.39	compliant
64QAM-Modulation ANT3			
	2155.0	-24.96	compliant
64QAM-Modulation ANT1+ANT3			
	2155.0	-20.12	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 6-19: Results - Spurious Emissions (Upper band edge) (20 MHz Channel BW)

Config D Spurious emissions:

Carrier Frequency: 2132.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation ANT1			
0.009 - 22000	2505.000	-37.14	compliant
QPSK-Modulation ANT3			
0.009 - 22000	2514.519	-37.13	compliant
QPSK-Modulation ANT1+ANT3			
0.009 - 22000	2676.346	-30.27	compliant
16QAM-Modulation ANT1			
0.009 - 22000	2652.548	-37.13	compliant
16QAM-Modulation ANT3			
0.009 - 22000	2505.000	-37.12	compliant
16QAM-Modulation ANT1+ANT3			
0.009 - 22000	2519.279	-30.22	compliant
64QAM-Modulation ANT1			
0.009 - 22000	2543.077	-37.14	compliant
64QAM-Modulation ANT3			
0.009 - 22000	2509.760	-37.14	compliant
64QAM-Modulation ANT1+ANT3			
0.009 - 22000	2647.788	-30.28	compliant
Measurement Uncertainty:			f < 1.0GHz: ±1.1dB 1.0GHz ≤ f <3.6GHz: ±1.2dB 3.6GHz ≤ f <8.0GHz: ±1.6dB 8.0GHz ≤ f: ±1.9dB

Table 6-20: Results - 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.

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

6.5.1 Purpose

The measurement of spurious radiated emissions was performed pursuant to § 2.1053 and § 2.1057 to verify that the field strength of any spurious emissions radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements are attenuated below the specified limits.

6.5.2 Limits

Compliance with § 27.53 requires that all spurious emissions be attenuated below the transmitter power by at least $43 + 10 \log_{10} P$ (P = transmitter power in Watts).

The compliance limit was calculated in the following way:

Maximum transmitter output power [W]: P
Maximum transmitter output power [dBm]: $30 + 10 \log_{10} P$ (conversion from W to dBm)
Attenuation required by FCC: $43 + 10 \log_{10} P$

Compliance limit = Maximum transmitter output power - Required attenuation
= $30 + 10 \log_{10} P - (43 + 10 \log_{10} P)$ = -13 dBm

6.5.3 EUT Operating Condition

The standard setup procedure as described in section 4.3 of this report was used.

6.5.4 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.

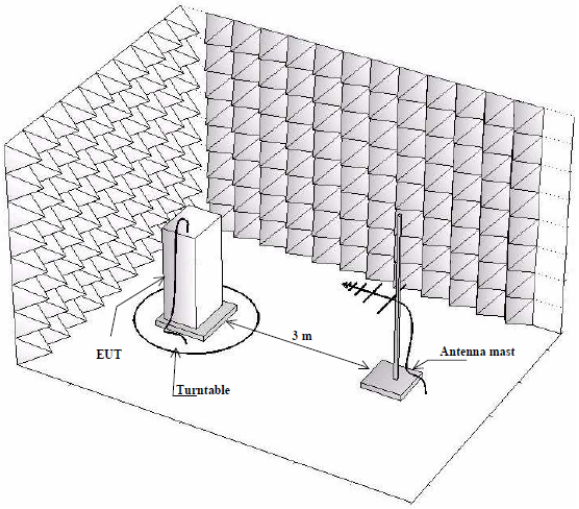


Figure 6-1: Test Configuration

Photographs of the EUT in the anechoic chamber are shown on page 192 of this measurement report.

6.5.5 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 - 22000 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 - 22000 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 192 for details). The antenna factor and cable loss is according to the manufacturer's specification.

Config A:

Carrier Frequency: 2112.5 MHz, 2132.5 MHz and 2152.5 MHz			
Frequency Range [MHz]	**Emission Frequency [MHz]**	**Maximum Emission Level [dBm]**	**Result**
QPSK-Modulation TX1			
30 - 22000			compliant
OR			
30 - 22000	More than 20dB below limit -13 dBm		compliant
Measurement Uncertainty:			±5.4dB

Table 6-21: Results – 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.

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

6.6.1 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 (-30°C to +50 °C) and supply voltage conditions according to § 2.1055.

6.6.2 Limits

According to § 27.54, the frequency of the fundamental emission is required to stay within the authorized frequency block.

6.6.3 EUT Operating Condition

The standard setup procedure as described in section 4.3 of this report was used.

6.6.4 Test Configuration

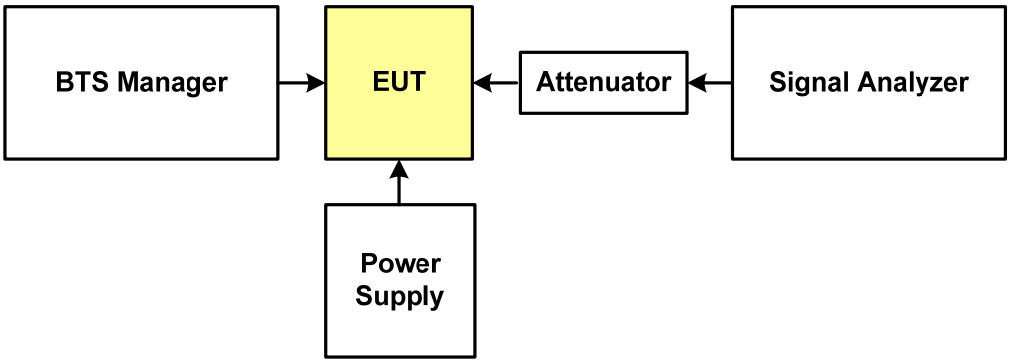


Figure 6-2: Test Configuration for frequency stability with voltage variation

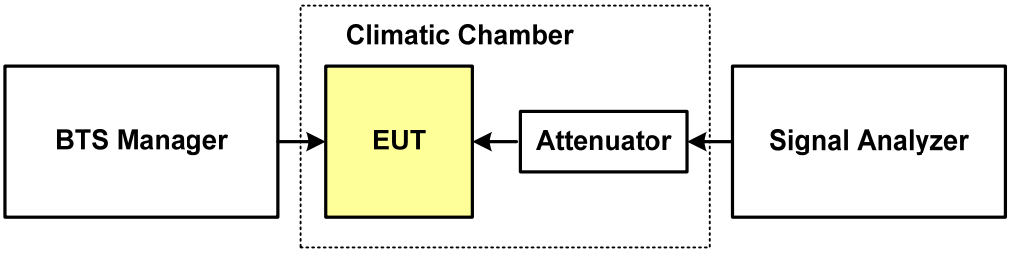


Figure 6-3: Test Configuration for frequency stability with temperature variation

A complete list of the measurement equipment is included on page 49 of this measurement report.

6.6.5 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 at each temperature and the frequency error was measured.

Config A:

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-48.0	-30	-1.93800	-0.00091	106	0.05	compliant
-48.0	-20	-4.82900	-0.00226	106	0.05	compliant
-48.0	-10	8.02437	0.00376	106	0.05	compliant
-48.0	0	4.49974	0.00211	106	0.05	compliant
-48.0	+10	4.48207	0.00210	106	0.05	compliant
-48.0	+30	3.73442	0.00175	106	0.05	compliant
-48.0	+40	10.32586	0.00484	106	0.05	compliant
-48.0	+50	8.31955	0.00390	106	0.05	compliant
QPSK Modulation ANT3						
-48.0	-30	-7.10238	-0.00333	106	0.05	compliant
-48.0	-20	5.17812	0.00243	106	0.05	compliant
-48.0	-10	-17.04360	-0.00799	106	0.05	compliant
-48.0	0	6.09448	0.00286	106	0.05	compliant
-48.0	+10	6.03785	0.00283	106	0.05	compliant
-48.0	+30	5.96051	0.00280	106	0.05	compliant
-48.0	+40	8.25963	0.00387	106	0.05	compliant
-48.0	+50	7.25163	0.00340	106	0.05	compliant
16QAM Modulation ANT1						
-48.0	-30	6.12952	0.00287	106	0.05	compliant
-48.0	-20	5.96916	0.00280	106	0.05	compliant
-48.0	-10	9.90805	0.00465	106	0.05	compliant
-48.0	0	-5.93236	-0.00278	106	0.05	compliant
-48.0	+10	5.34577	0.00251	106	0.05	compliant
-48.0	+30	4.81588	0.00226	106	0.05	compliant
-48.0	+40	8.23612	0.00386	106	0.05	compliant
-48.0	+50	12.20418	0.00572	106	0.05	compliant

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
16QAM Modulation ANT3						
-48.0	-30	5.83349	0.00274	106	0.05	compliant
-48.0	-20	5.85082	0.00274	106	0.05	compliant
-48.0	-10	6.86880	0.00322	106	0.05	compliant
-48.0	0	-4.21367	-0.00198	106	0.05	compliant
-48.0	+10	-4.07956	-0.00191	106	0.05	compliant
-48.0	+30	5.72588	0.00269	106	0.05	compliant
-48.0	+40	8.16926	0.00383	106	0.05	compliant
-48.0	+50	3.53730	0.00166	106	0.05	compliant
64QAM Modulation ANT1						
-48.0	-30	6.29479	0.00295	106	0.05	compliant
-48.0	-20	8.31933	0.00390	106	0.05	compliant
-48.0	-10	8.86036	0.00415	106	0.05	compliant
-48.0	0	3.87559	0.00182	106	0.05	compliant
-48.0	+10	6.57365	0.00308	106	0.05	compliant
-48.0	+30	5.00162	0.00235	106	0.05	compliant
-48.0	+40	9.86998	0.00463	106	0.05	compliant
-48.0	+50	8.18096	0.00384	106	0.05	compliant
64QAM Modulation ANT3						
-48.0	-30	4.49531	0.00211	106	0.05	compliant
-48.0	-20	7.64867	0.00359	106	0.05	compliant
-48.0	-10	5.49992	0.00258	106	0.05	compliant
-48.0	0	1.98848	0.00093	106	0.05	compliant
-48.0	+10	6.38512	0.00299	106	0.05	compliant
-48.0	+30	7.17596	0.00337	106	0.05	compliant
-48.0	+40	10.20572	0.00479	106	0.05	compliant
-48.0	+50	9.43321	0.00442	106	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 6-22: Results – Frequency stability with temp. var. (5 MHz Channel BW)

Config B :

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-48.0	-30	-3.18134	-0.00149	106	0.05	compliant
-48.0	-20	2.94872	0.00138	106	0.05	compliant
-48.0	-10	11.63947	0.00546	106	0.05	compliant
-48.0	0	-5.47628	-0.00257	106	0.05	compliant
-48.0	+10	5.09662	0.00239	106	0.05	compliant
-48.0	+30	3.18078	0.00149	106	0.05	compliant
-48.0	+40	7.45700	0.00350	106	0.05	compliant
-48.0	+50	6.66968	0.00313	106	0.05	compliant
QPSK Modulation ANT3						
-48.0	-30	-8.87982	-0.00416	106	0.05	compliant
-48.0	-20	9.78261	0.00459	106	0.05	compliant
-48.0	-10	6.13892	0.00288	106	0.05	compliant
-48.0	0	-6.16299	-0.00289	106	0.05	compliant
-48.0	+10	3.19430	0.00150	106	0.05	compliant
-48.0	+30	8.73666	0.00410	106	0.05	compliant
-48.0	+40	11.18056	0.00524	106	0.05	compliant
-48.0	+50	8.14655	0.00382	106	0.05	compliant
16QAM Modulation ANT1						
-48.0	-30	3.90511	0.00183	106	0.05	compliant
-48.0	-20	6.56433	0.00308	106	0.05	compliant
-48.0	-10	7.56759	0.00355	106	0.05	compliant
-48.0	0	-2.32244	-0.00109	106	0.05	compliant
-48.0	+10	4.51341	0.00212	106	0.05	compliant
-48.0	+30	5.19962	0.00244	106	0.05	compliant
-48.0	+40	7.94482	0.00373	106	0.05	compliant
-48.0	+50	6.67361	0.00313	106	0.05	compliant
16QAM Modulation ANT3						
-48.0	-30	3.25874	0.00153	106	0.05	compliant
-48.0	-20	6.05758	0.00284	106	0.05	compliant
-48.0	-10	4.19625	0.00197	106	0.05	compliant
-48.0	0	5.69031	0.00267	106	0.05	compliant
-48.0	+10	4.91482	0.00230	106	0.05	compliant
-48.0	+30	4.77168	0.00224	106	0.05	compliant
-48.0	+40	7.47788	0.00351	106	0.05	compliant
-48.0	+50	9.96683	0.00467	106	0.05	compliant

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
64QAM Modulation ANT1						
-48.0	-30	5.16335	0.00242	106	0.05	compliant
-48.0	-20	3.30775	0.00155	106	0.05	compliant
-48.0	-10	5.10172	0.00239	106	0.05	compliant
-48.0	0	-4.86957	-0.00228	106	0.05	compliant
-48.0	+10	-6.10880	-0.00286	106	0.05	compliant
-48.0	+30	3.49722	0.00164	106	0.05	compliant
-48.0	+40	8.63964	0.00405	106	0.05	compliant
-48.0	+50	9.68771	0.00454	106	0.05	compliant
64QAM Modulation ANT3						
-48.0	-30	2.28078	0.00107	106	0.05	compliant
-48.0	-20	4.49905	0.00211	106	0.05	compliant
-48.0	-10	7.47478	0.00351	106	0.05	compliant
-48.0	0	-5.13775	-0.00241	106	0.05	compliant
-48.0	+10	-3.43084	-0.00161	106	0.05	compliant
-48.0	+30	3.18687	0.00149	106	0.05	compliant
-48.0	+40	8.95632	0.00420	106	0.05	compliant
-48.0	+50	6.36694	0.00299	106	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 6-23: Results – Frequency stability with temp. var. (10 MHz Channel BW)

Config C:

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-48.0	-30	3.46681	0.00163	106	0.05	compliant
-48.0	-20	5.95660	0.00279	106	0.05	compliant
-48.0	-10	11.78405	0.00553	106	0.05	compliant
-48.0	0	-5.43399	-0.00255	106	0.05	compliant
-48.0	+10	4.30313	0.00202	106	0.05	compliant
-48.0	+30	8.05532	0.00378	106	0.05	compliant
-48.0	+40	7.94430	0.00373	106	0.05	compliant
-48.0	+50	8.00243	0.00375	106	0.05	compliant
QPSK Modulation ANT3						
-48.0	-30	-5.10607	-0.00239	106	0.05	compliant
-48.0	-20	2.75362	0.00129	106	0.05	compliant
-48.0	-10	7.88607	0.00370	106	0.05	compliant
-48.0	0	5.05769	0.00237	106	0.05	compliant
-48.0	+10	6.05785	0.00284	106	0.05	compliant
-48.0	+30	6.18235	0.00290	106	0.05	compliant
-48.0	+40	9.64347	0.00452	106	0.05	compliant
-48.0	+50	4.80564	0.00225	106	0.05	compliant
16QAM Modulation ANT1						
-48.0	-30	4.15012	0.00195	106	0.05	compliant
-48.0	-20	5.97949	0.00280	106	0.05	compliant
-48.0	-10	6.56331	0.00308	106	0.05	compliant
-48.0	0	1.47380	0.00069	106	0.05	compliant
-48.0	+10	-2.33664	-0.00110	106	0.05	compliant
-48.0	+30	5.02405	0.00236	106	0.05	compliant
-48.0	+40	9.32558	0.00437	106	0.05	compliant
-48.0	+50	7.50149	0.00352	106	0.05	compliant
16QAM Modulation ANT3						
-48.0	-30	7.13540	0.00335	106	0.05	compliant
-48.0	-20	4.81227	0.00226	106	0.05	compliant
-48.0	-10	5.59262	0.00262	106	0.05	compliant
-48.0	0	3.03962	0.00143	106	0.05	compliant
-48.0	+10	3.59618	0.00169	106	0.05	compliant
-48.0	+30	8.29859	0.00389	106	0.05	compliant
-48.0	+40	4.93897	0.00232	106	0.05	compliant
-48.0	+50	7.45686	0.00350	106	0.05	compliant

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
64QAM Modulation ANT1						
-48.0	-30	6.54316	0.00307	106	0.05	compliant
-48.0	-20	4.74212	0.00222	106	0.05	compliant
-48.0	-10	7.84707	0.00368	106	0.05	compliant
-48.0	0	-5.29971	-0.00249	106	0.05	compliant
-48.0	+10	-2.12279	-0.00100	106	0.05	compliant
-48.0	+30	6.79322	0.00319	106	0.05	compliant
-48.0	+40	8.07426	0.00379	106	0.05	compliant
-48.0	+50	9.99856	0.00469	106	0.05	compliant
64QAM Modulation ANT3						
-48.0	-30	8.91306	0.00418	106	0.05	compliant
-48.0	-20	7.78407	0.00365	106	0.05	compliant
-48.0	-10	8.24793	0.00387	106	0.05	compliant
-48.0	0	-4.71678	-0.00221	106	0.05	compliant
-48.0	+10	-3.16481	-0.00148	106	0.05	compliant
-48.0	+30	5.44381	0.00255	106	0.05	compliant
-48.0	+40	7.88743	0.00370	106	0.05	compliant
-48.0	+50	5.63758	0.00264	106	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 6-24: Results – Frequency stability with temp. var. (15 MHz Channel BW)

Config D:

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-48.0	-30	6.98651	0.00328	106	0.05	compliant
-48.0	-20	3.95580	0.00186	106	0.05	compliant
-48.0	-10	9.27970	0.00435	106	0.05	compliant
-48.0	0	-1.95182	-0.00092	106	0.05	compliant
-48.0	+10	5.75825	0.00270	106	0.05	compliant
-48.0	+30	3.21831	0.00151	106	0.05	compliant
-48.0	+40	6.93835	0.00325	106	0.05	compliant
-48.0	+50	6.29427	0.00295	106	0.05	compliant
QPSK Modulation ANT3						
-48.0	-30	7.28874	0.00342	106	0.05	compliant
-48.0	-20	4.40925	0.00207	106	0.05	compliant
-48.0	-10	8.11721	0.00381	106	0.05	compliant
-48.0	0	-8.01578	-0.00376	106	0.05	compliant
-48.0	+10	7.46521	0.00350	106	0.05	compliant
-48.0	+30	4.71626	0.00221	106	0.05	compliant
-48.0	+40	7.86207	0.00369	106	0.05	compliant
-48.0	+50	6.35861	0.00298	106	0.05	compliant
16QAM Modulation ANT1						
-48.0	-30	8.12118	0.00381	106	0.05	compliant
-48.0	-20	-4.64809	-0.00218	106	0.05	compliant
-48.0	-10	10.16911	0.00477	106	0.05	compliant
-48.0	0	-5.73328	-0.00269	106	0.05	compliant
-48.0	+10	6.71899	0.00315	106	0.05	compliant
-48.0	+30	3.11430	0.00146	106	0.05	compliant
-48.0	+40	13.82621	0.00648	106	0.05	compliant
-48.0	+50	7.53538	0.00353	106	0.05	compliant
16QAM Modulation ANT3						
-48.0	-30	5.10294	0.00239	106	0.05	compliant
-48.0	-20	7.10852	0.00333	106	0.05	compliant
-48.0	-10	8.84492	0.00415	106	0.05	compliant
-48.0	0	-5.41417	-0.00254	106	0.05	compliant
-48.0	+10	6.20094	0.00291	106	0.05	compliant
-48.0	+30	6.64787	0.00312	106	0.05	compliant
-48.0	+40	7.14047	0.00335	106	0.05	compliant
-48.0	+50	11.52721	0.00541	106	0.05	compliant

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
64QAM Modulation ANT1						
-48.0	-30	5.17474	0.00243	106	0.05	compliant
-48.0	-20	5.92666	0.00278	106	0.05	compliant
-48.0	-10	5.52179	0.00259	106	0.05	compliant
-48.0	0	-6.01676	-0.00282	106	0.05	compliant
-48.0	+10	6.52339	0.00306	106	0.05	compliant
-48.0	+30	5.49069	0.00257	106	0.05	compliant
-48.0	+40	10.42181	0.00489	106	0.05	compliant
-48.0	+50	8.65792	0.00406	106	0.05	compliant
64QAM Modulation ANT3						
-48.0	-30	5.37135	0.00252	106	0.05	compliant
-48.0	-20	7.84153	0.00368	106	0.05	compliant
-48.0	-10	5.15089	0.00242	106	0.05	compliant
-48.0	0	3.06279	0.00144	106	0.05	compliant
-48.0	+10	5.86481	0.00275	106	0.05	compliant
-48.0	+30	8.70017	0.00408	106	0.05	compliant
-48.0	+40	6.84066	0.00321	106	0.05	compliant
-48.0	+50	10.60857	0.00497	106	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 6-25: Results – 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 30 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: 2132.5 MHz						
Supply Voltage (DC) [V]	**Ambient Temperature [°C]**	**Frequency Deviation [ppm]**		**Manufacturer's Specification**		**Result**
		[Hz]	**[ppm]**	**[Hz]**	**[ppm]**	
QPSK Modulation ANT1						
-40.8	+20	6.69906	0.00314	106	0.05	compliant
-48.0	+20	3.37930	0.00158	106	0.05	compliant
-55.2	+20	6.94799	0.00326	106	0.05	compliant
QPSK Modulation ANT3						
-40.8	+20	2.51004	0.00118	106	0.05	compliant
-48.0	+20	3.48080	0.00163	106	0.05	compliant
-55.2	+20	3.59439	0.00169	106	0.05	compliant
16QAM Modulation ANT1						
-40.8	+20	6.98935	0.00328	106	0.05	compliant
-48.0	+20	9.53951	0.00447	106	0.05	compliant
-55.2	+20	7.00271	0.00328	106	0.05	compliant
16QAM Modulation ANT3						
-40.8	+20	6.54735	0.00307	106	0.05	compliant
-48.0	+20	6.80550	0.00319	106	0.05	compliant
-55.2	+20	-5.10071	-0.00239	106	0.05	compliant
64QAM Modulation ANT1						
-40.8	+20	6.42992	0.00302	106	0.05	compliant
-48.0	+20	10.90713	0.00511	106	0.05	compliant
-55.2	+20	8.50964	0.00399	106	0.05	compliant
64QAM Modulation ANT3						
-40.8	+20	7.14746	0.00335	106	0.05	compliant
-48.0	+20	7.28084	0.00341	106	0.05	compliant
-55.2	+20	2.67504	0.00125	106	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 6-26: Results – Frequency stability with voltage var. (5 MHz Channel BW)

Config B:

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-40.8	+20	6.63062	0.00311	106	0.05	compliant
-48.0	+20	5.28970	0.00248	106	0.05	compliant
-55.2	+20	5.54692	0.00260	106	0.05	compliant
QPSK Modulation ANT3						
-40.8	+20	4.78380	0.00224	106	0.05	compliant
-48.0	+20	4.29795	0.00202	106	0.05	compliant
-55.2	+20	-4.79463	-0.00225	106	0.05	compliant
16QAM Modulation ANT1						
-40.8	+20	7.95956	0.00373	106	0.05	compliant
-48.0	+20	4.96646	0.00233	106	0.05	compliant
-55.2	+20	6.96534	0.00327	106	0.05	compliant
16QAM Modulation ANT3						
-40.8	+20	3.62231	0.00170	106	0.05	compliant
-48.0	+20	3.83647	0.00180	106	0.05	compliant
-55.2	+20	2.70867	0.00127	106	0.05	compliant
64QAM Modulation ANT1						
-40.8	+20	8.65304	0.00406	106	0.05	compliant
-48.0	+20	6.48262	0.00304	106	0.05	compliant
-55.2	+20	6.34306	0.00297	106	0.05	compliant
64QAM Modulation ANT3						
-40.8	+20	3.83597	0.00180	106	0.05	compliant
-48.0	+20	-3.52896	-0.00165	106	0.05	compliant
-55.2	+20	1.98913	0.00093	106	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 6-27: Results – Frequency stability with voltage var. (10 MHz Channel BW)

Config C:

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	**Ambient Temperature [°C]**	**Frequency Deviation [ppm]**		**Manufacturer's Specification**		**Result**
		[Hz]	**[ppm]**	**[Hz]**	**[ppm]**	
QPSK Modulation ANT1						
-40.8	+20	-4.15823	-0.00195	106	0.05	compliant
-48.0	+20	-2.04563	-0.00096	106	0.05	compliant
-55.2	+20	-5.58742	-0.00262	106	0.05	compliant
QPSK Modulation ANT3						
-40.8	+20	3.44380	0.00161	106	0.05	compliant
-48.0	+20	-3.93289	-0.00184	106	0.05	compliant
-55.2	+20	4.68117	0.00220	106	0.05	compliant
16QAM Modulation ANT1						
-40.8	+20	4.85859	0.00228	106	0.05	compliant
-48.0	+20	5.26693	0.00247	106	0.05	compliant
-55.2	+20	-5.10808	-0.00240	106	0.05	compliant
16QAM Modulation ANT3						
-40.8	+20	5.33217	0.00250	106	0.05	compliant
-48.0	+20	3.02569	0.00142	106	0.05	compliant
-55.2	+20	6.25317	0.00293	106	0.05	compliant
64QAM Modulation ANT1						
-40.8	+20	-2.98292	-0.00140	106	0.05	compliant
-48.0	+20	-2.91838	-0.00137	106	0.05	compliant
-55.2	+20	6.81523	0.00320	106	0.05	compliant
64QAM Modulation ANT3						
-40.8	+20	3.51995	0.00165	106	0.05	compliant
-48.0	+20	4.39338	0.00206	106	0.05	compliant
-55.2	+20	-3.97633	-0.00186	106	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 6-28: Results – Frequency stability with voltage var. (15 MHz Channel BW)

Config D:

Carrier Frequency: 2132.5 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation [ppm]		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-40.8	+20	4.51179	0.00212	106	0.05	compliant
-48.0	+20	-4.27783	-0.00201	106	0.05	compliant
-55.2	+20	3.51466	0.00165	106	0.05	compliant
QPSK Modulation ANT3						
-40.8	+20	-3.73854	-0.00175	106	0.05	compliant
-48.0	+20	3.38197	0.00159	106	0.05	compliant
-55.2	+20	4.29310	0.00201	106	0.05	compliant
16QAM Modulation ANT1						
-40.8	+20	3.31397	0.00155	106	0.05	compliant
-48.0	+20	3.44389	0.00161	106	0.05	compliant
-55.2	+20	-3.57482	-0.00168	106	0.05	compliant
16QAM Modulation ANT3						
-40.8	+20	-3.35020	-0.00157	106	0.05	compliant
-48.0	+20	3.98741	0.00187	106	0.05	compliant
-55.2	+20	4.51102	0.00212	106	0.05	compliant
64QAM Modulation ANT1						
-40.8	+20	1.84546	0.00087	106	0.05	compliant
-48.0	+20	-6.49296	-0.00304	106	0.05	compliant
-55.2	+20	4.73946	0.00222	106	0.05	compliant
64QAM Modulation ANT3						
-40.8	+20	2.45712	0.00115	106	0.05	compliant
-48.0	+20	2.53633	0.00119	106	0.05	compliant
-55.2	+20	5.19908	0.00244	106	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 6-29: Results – 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.

7 Test Data and Screenshots

7.1 Part List of the RF Measurement Test Equipment

No.	Test Equipment	Type (Manufacturer)	Serial Number	Calibration date	Calibration due	Test No.
1	Signal Analyzer	Rohde & Schwarz: FSQ 26	100364	01/2012	01/2013	1, 2, 3, 4, 6
2	Vector Signal Generator	Rohde & Schwarz: SMU200A	100935	07/2012	07/2014	1, 2, 3, 4, 6
3	Signal Generator	Rohde & Schwarz: SMP02	836402/004	01/2012	01/2014	1, 2, 3, 4, 6
4	Signal Generator	Rohde & Schwarz: SMP04	845401/001	06/2012	06/2014	4
5	Network Analyzer	Hewlett-Packard: HP8753E	US38431868	07/2012	07/2013	1, 2, 3, 4, 6
6	Network Analyzer	Hewlett-Packard: HP8753ES	US39172107	07/2012	07/2013	6
7	Calibration kit	Hewlett-Packard: HP85032B	2919A04843	07/2012	07/2013	1, 2, 3, 4, 5, 6
8	Power Meter	Rohde & Schwarz: NRP-Z21	100354	01/2011	01/2013	6
9	Frequency Standard	Datum 8040	41005473	01/2012	01/2013	1, 2, 3, 4, 6
10	Multimeter	Fluke 83	65870302	01/2012	01/2013	4
11	Humidity and Temperature Indicator	Vaisala: HMI 31	P3730008	12/2011	12/2012	4
12	DC Power Supply	Sorensen: SGI 80/188	0525A00544	cnn	-	4
13	Interface Unit	Orbis: TX SSU 1700/2100&1900A	SSU-0551-1181	cnn	-	4
14	Dummy load 200W	Spinner: 01BN537792	01343039	cnn	-	4
15	Attenuator	MCE/Weinschel: 66-20-34	BM6886	cnn	-	4
16	Combiner	Weinschel: 1870A	6275	cnn	-	4
17	Attenuator	Aeroflex/Weinschel : 66-20-33	BV3346	cnn	-	4
18	High pass filter	Reactel: 9HSX-3/20-S11	0531	cnn	-	4
19	EMI Test Receiver	R&S ESU40	100262	02/2012	02/2013	5
20	Horn Antenna	Emco 3115	00075697	06/2012	06/2013	5
21	Bilog Antenna	Chase CBL6112B	2694	07/2012	07/2013	5
22	Log. Periodic antenna	HL025	356749/12	07/2012	07/2013	5
23	Signal Generator	R&S SMR 20	832428/30	07/2011	07/2013	5
24	Amplifier	Miteq AFSX4	791117	cnn	-	5
25	Antenna Mast	Deisel HD240	2401323194	cnn	-	5
26	Mast Controller	Deisel HD100	1001331	cnn	-	5

No.	Test Equipment	Type (Manufacturer)	Serial Number	Calibration date	Calibration due	Test No.
27	Amplifier	HP 83017A	3123A00444	cnn	-	5
28	Amplifier	Ciao CA1224-508	103	cnn	-	5

Table 7-1: Part List of the RF Measurement Test Equipment

7.2 Spectral Plots

7.2.1 Test No. 1: RF Power Output

The value 'Power' is the carrier power (RF Power Output) measured by the signal analyzer. 'Offset' is the external attenuation (cable loss of the test set up). The sum of both values is the base station maximum RF output power given on page 11. The external attenuation is frequency dependant. Thus the various 'Offset' values in the screenshots may differ.

Config A ANT1:

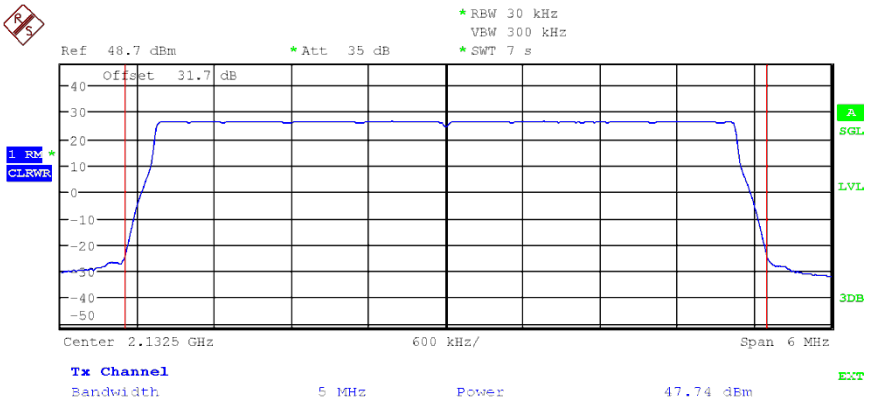


Figure 7-1: RF Power Output – QPSK (2132.5 MHz) (5MHz Channel BW)

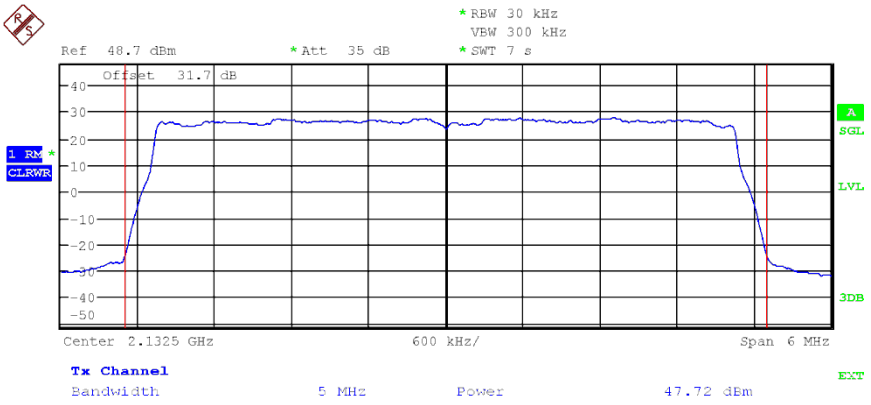


Figure 7-2: RF Power Output – 16QAM (2132.5 MHz) (5MHz Channel BW)

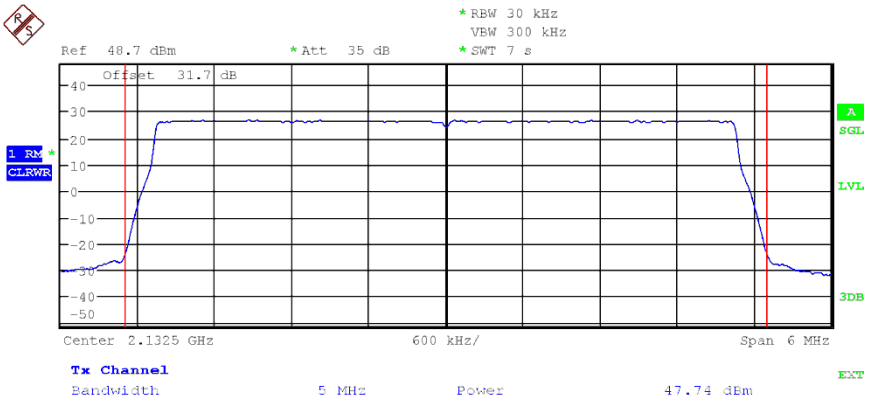


Figure 7-3: RF Power Output – 64QAM (2132.5 MHz) (5MHz Channel BW)

Config B ANT1:

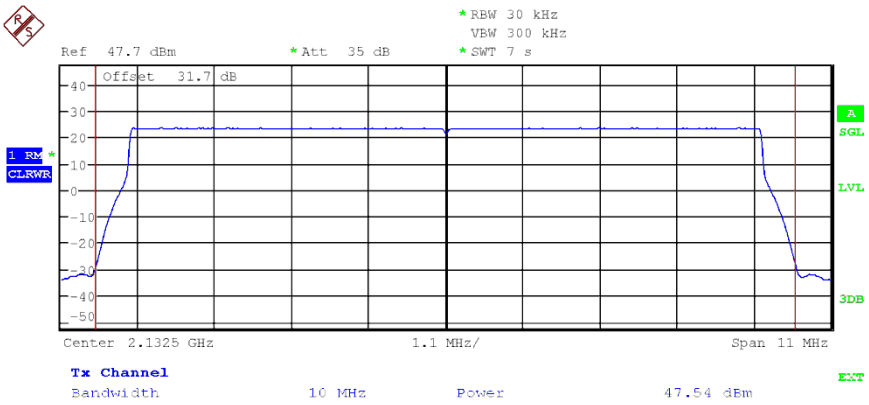


Figure 7-4: RF Power Output – QPSK (2132.5 MHz) (10MHz Channel BW)

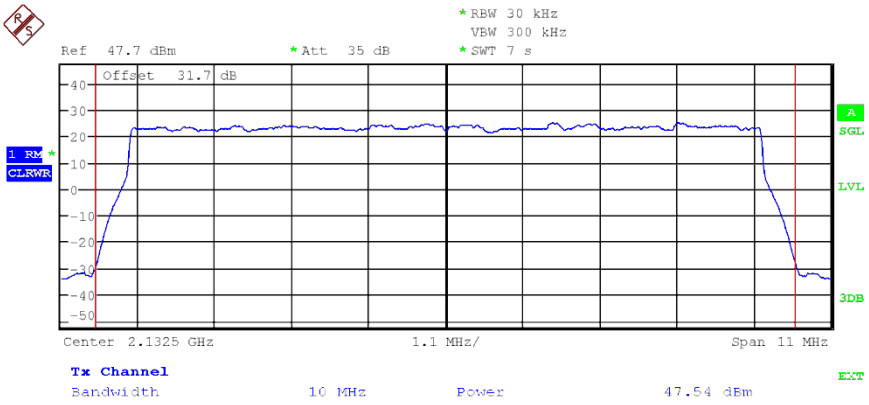


Figure 7-5: RF Power Output – 16QAM (2132.5 MHz) (10MHz Channel BW)

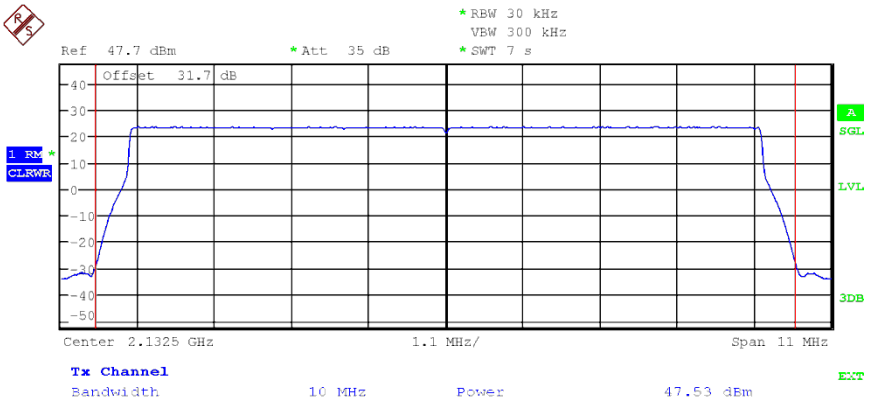


Figure 7-6: RF Power Output – 64QAM (2132.5 MHz) (10MHz Channel BW)

Config C ANT1:

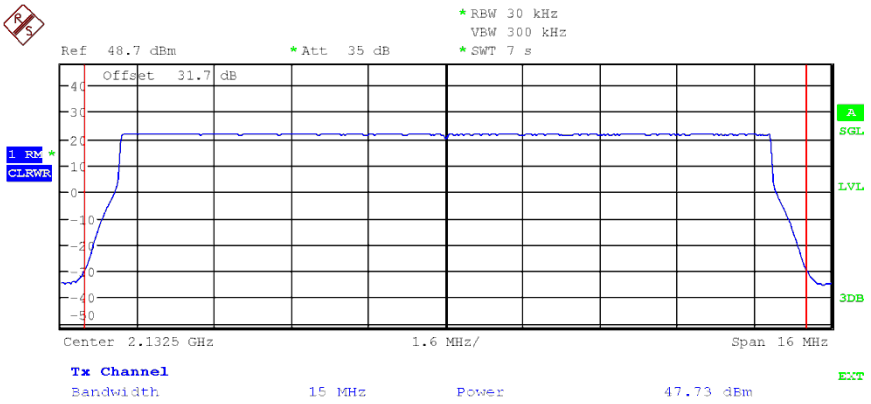


Figure 7-7: RF Power Output – QPSK (2132.5 MHz) (15MHz Channel BW)

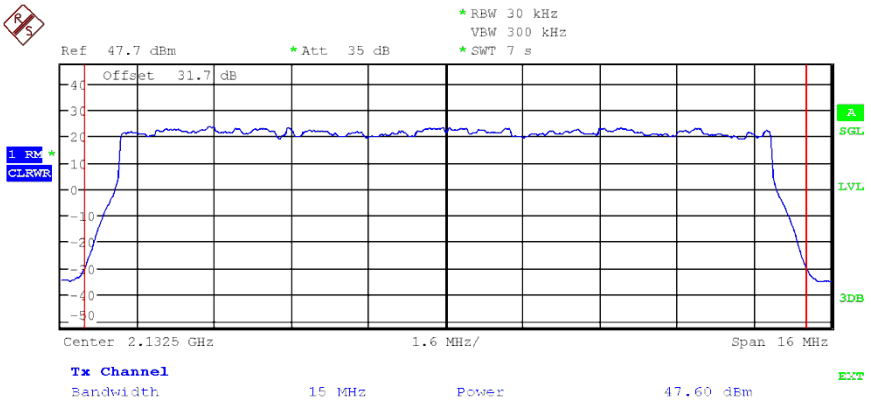


Figure 7-8: RF Power Output – 16QAM (2132.5 MHz) (15MHz Channel BW)

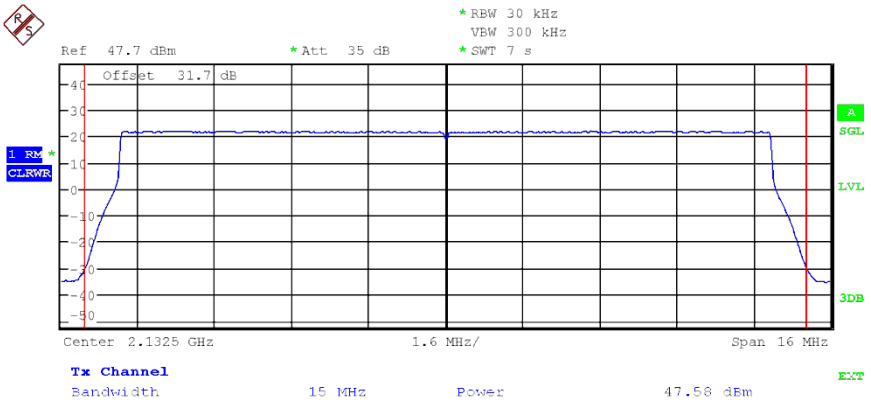


Figure 7-9: RF Power Output – 64QAM (2132.5 MHz) (15MHz Channel BW)

Config D ANT1:

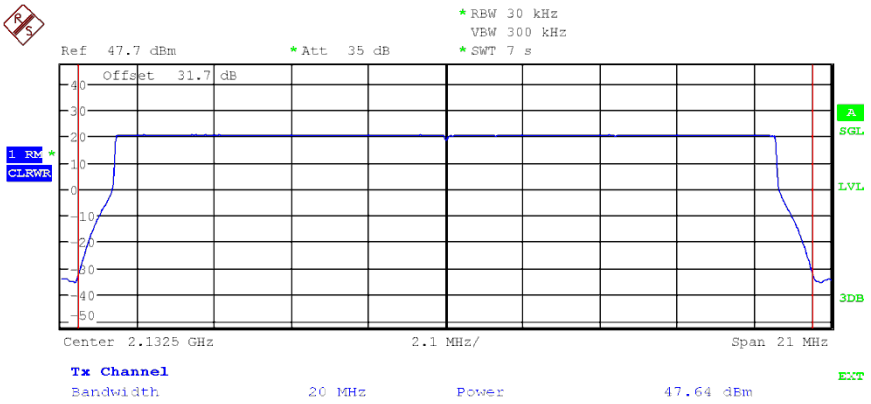


Figure 7-10: RF Power Output – QPSK (2132.5 MHz) (20MHz Channel BW)

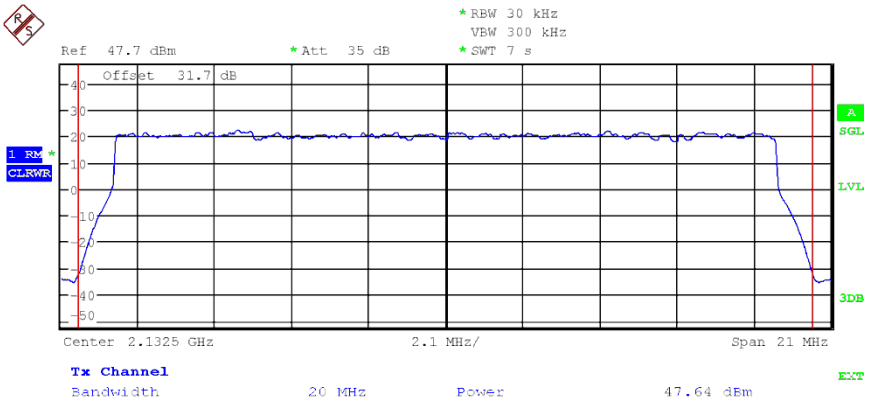


Figure 7-11: RF Power Output – 16QAM (2132.5 MHz) (20MHz Channel BW)

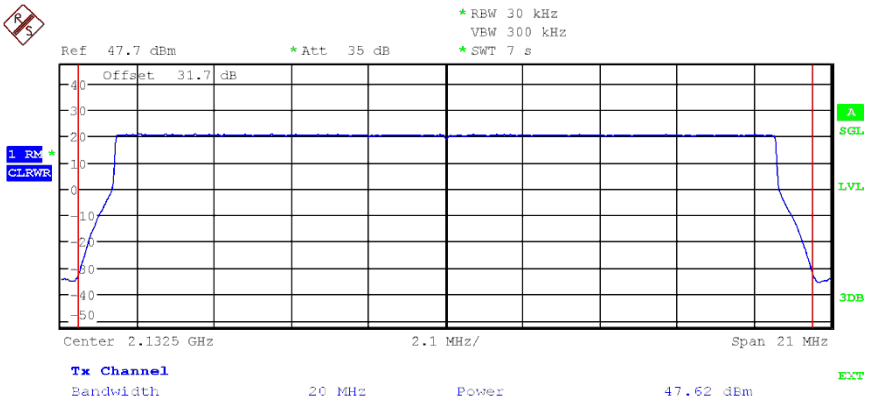


Figure 7-12: RF Power Output – 64QAM (2132.5 MHz) (20MHz Channel BW)

Config A ANT3:

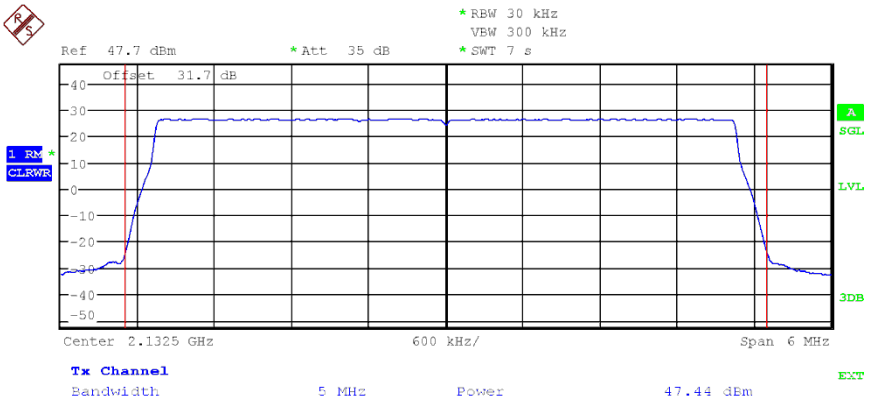


Figure 7-13: RF Power Output – QPSK (2132.5 MHz) (5MHz Channel BW)

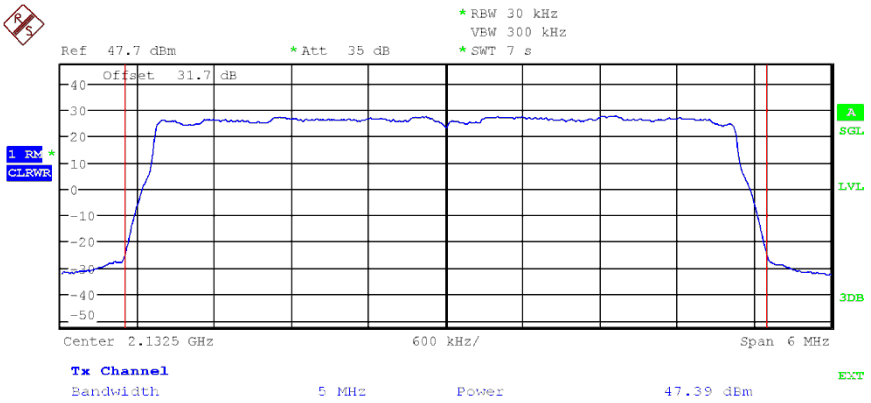


Figure 7-14: RF Power Output – 16QAM (2132.5 MHz) (5MHz Channel BW)

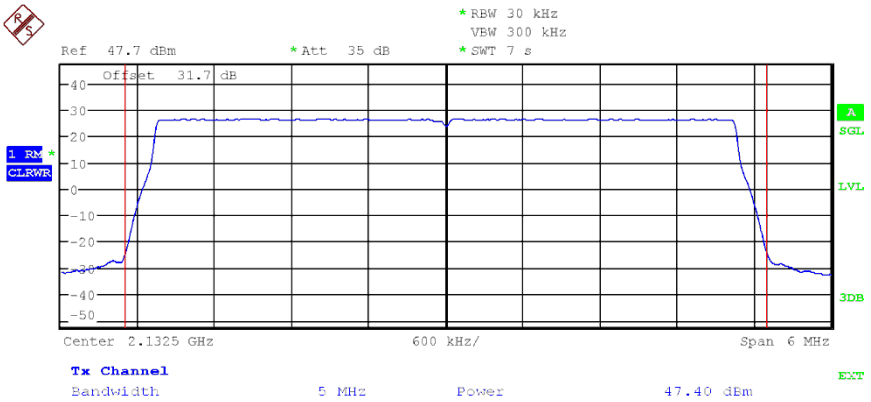


Figure 7-15: RF Power Output – 64QAM (2132.5 MHz) (5MHz Channel BW)

Config B ANT3:

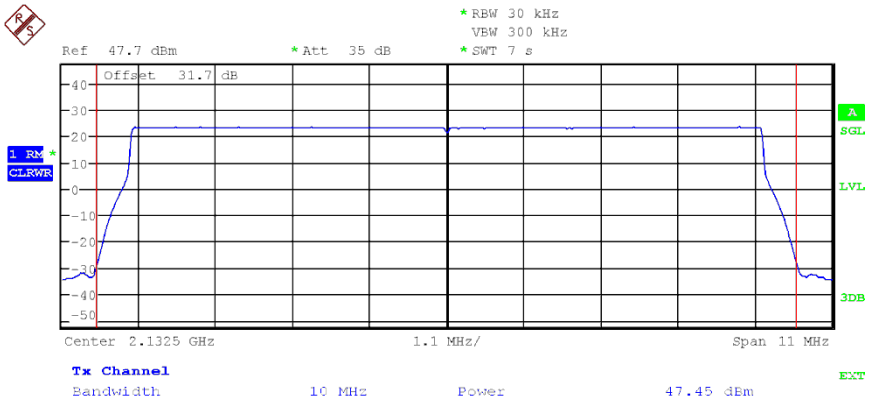


Figure 7-16: RF Power Output – QPSK (2132.5 MHz) (10MHz Channel BW)

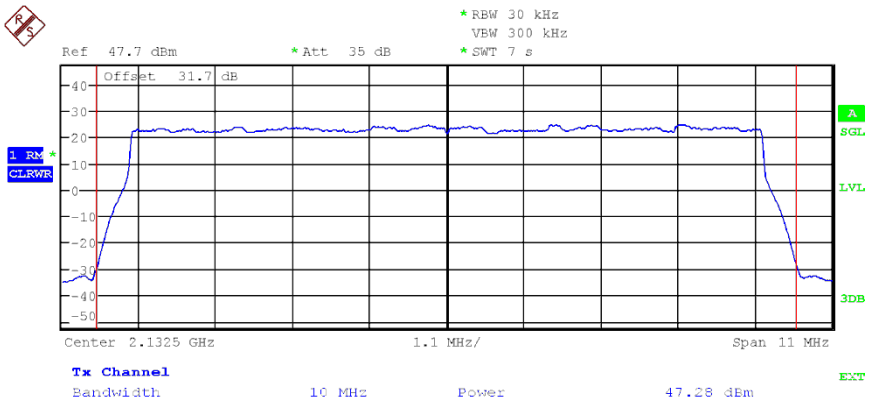


Figure 7-17: RF Power Output – 16QAM (2132.5 MHz) (10MHz Channel BW)

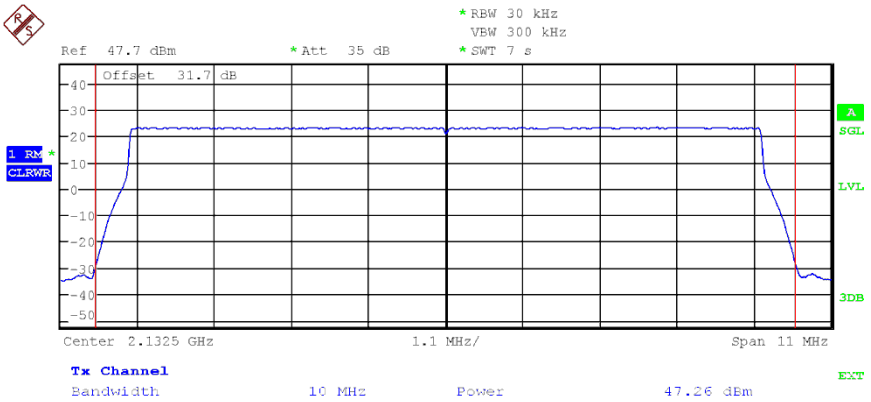


Figure 7-18: RF Power Output – 64QAM (2132.5 MHz) (10MHz Channel BW)

Config C ANT3:

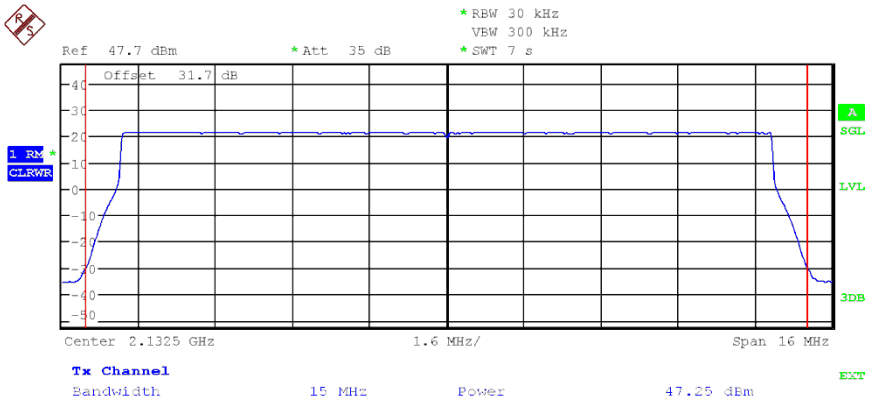


Figure 7-19: RF Power Output – QPSK (2132.5 MHz) (15MHz Channel BW)

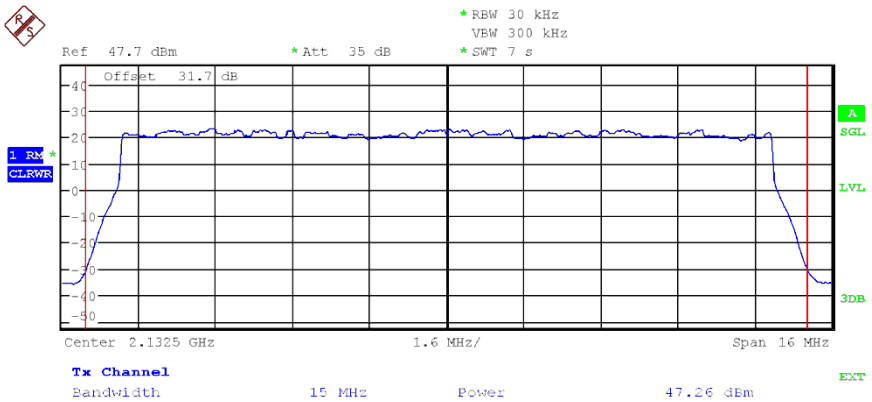


Figure 7-20: RF Power Output – 16QAM (2132.5 MHz) (15MHz Channel BW)

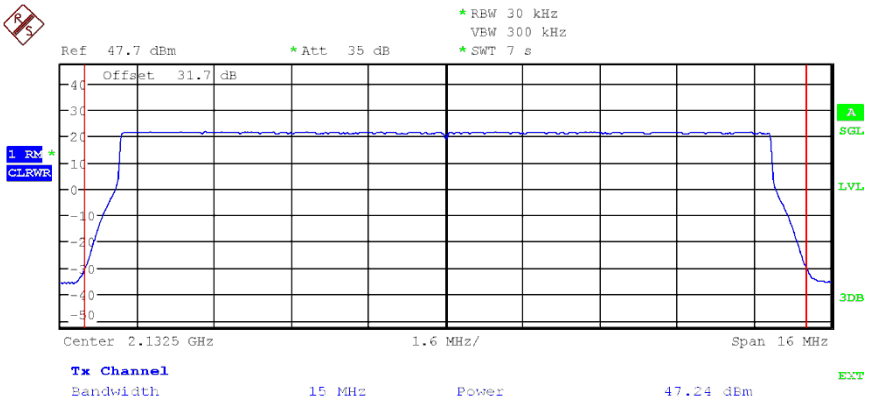


Figure 7-21: RF Power Output – 64QAM (2132.5 MHz) (15MHz Channel BW)

Config D ANT3:

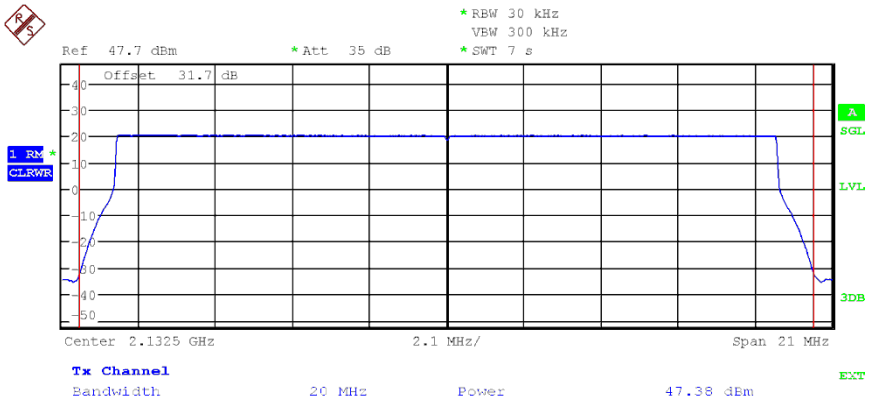


Figure 7-22: RF Power Output – QPSK (2132.5 MHz) (20MHz Channel BW)

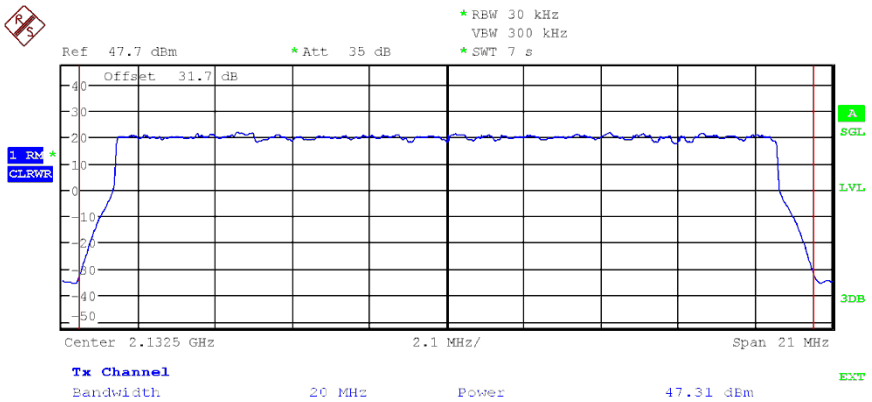


Figure 7-23: RF Power Output – 16QAM (2132.5 MHz) (20MHz Channel BW)

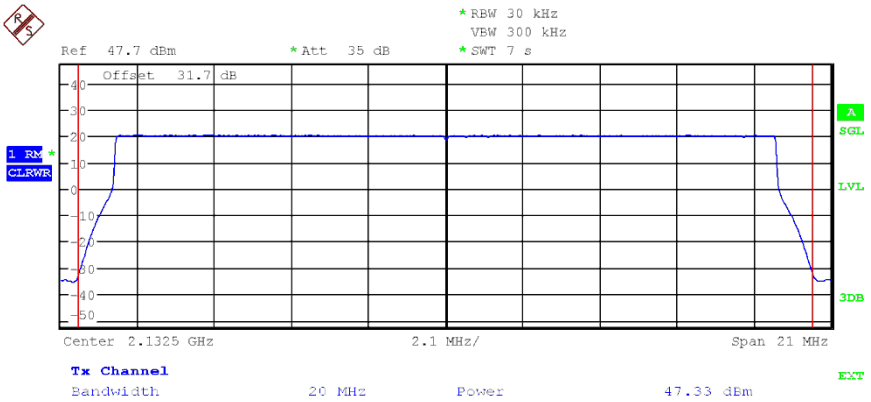


Figure 7-24: RF Power Output – 64QAM (2132.5 MHz) (20MHz Channel BW)

7.2.2 Test No. 2: Modulation Characteristics

No additional measurements are required for the modulation characteristics. Please refer to test no. 3, occupied bandwidth on pages 67.

7.2.3 Test No. 3: Occupied Bandwidth

The value ‘OBW’ is the measured occupied bandwidth.

Config A ANT1:

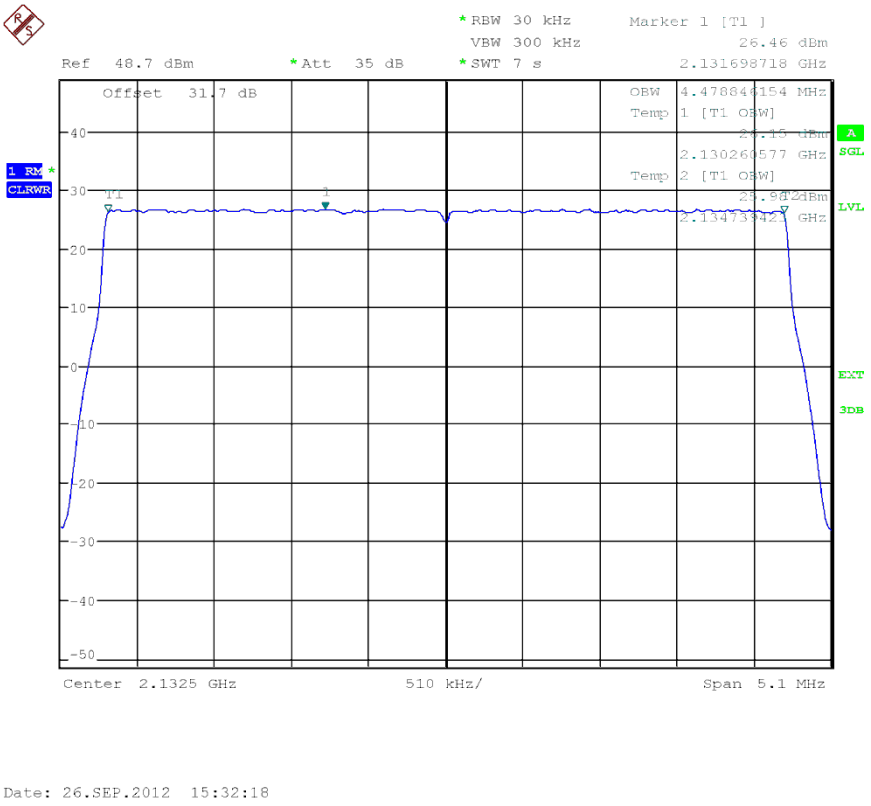


Figure 7-25: Occupied Bandwidth – QPSK (2132.5 MHz) (5MHz Channel BW)

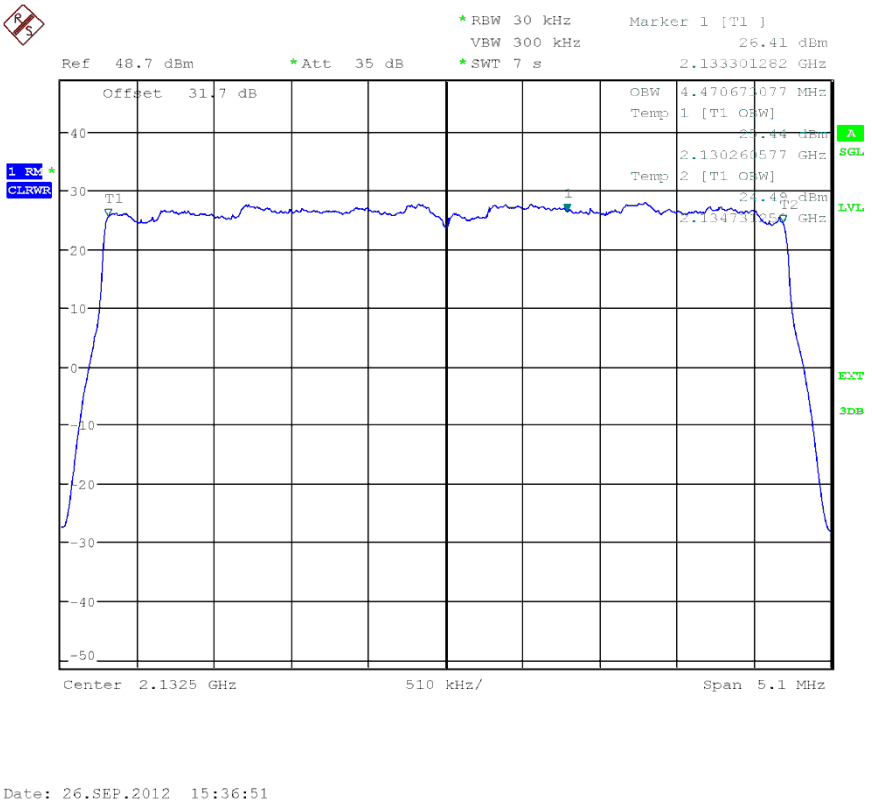


Figure 7-26: Occupied Bandwidth – 16QAM (2132.5 MHz) (5MHz Channel BW)

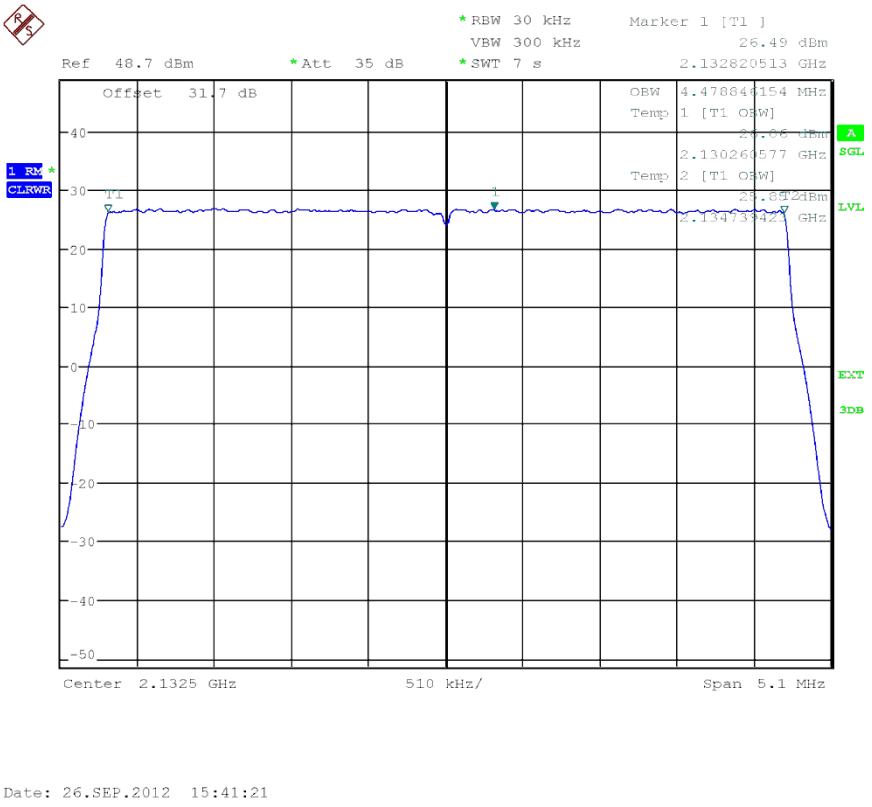


Figure 7-27: Occupied Bandwidth – 64QAM (2132.5 MHz) (5MHz Channel BW)

Config B ANT1:

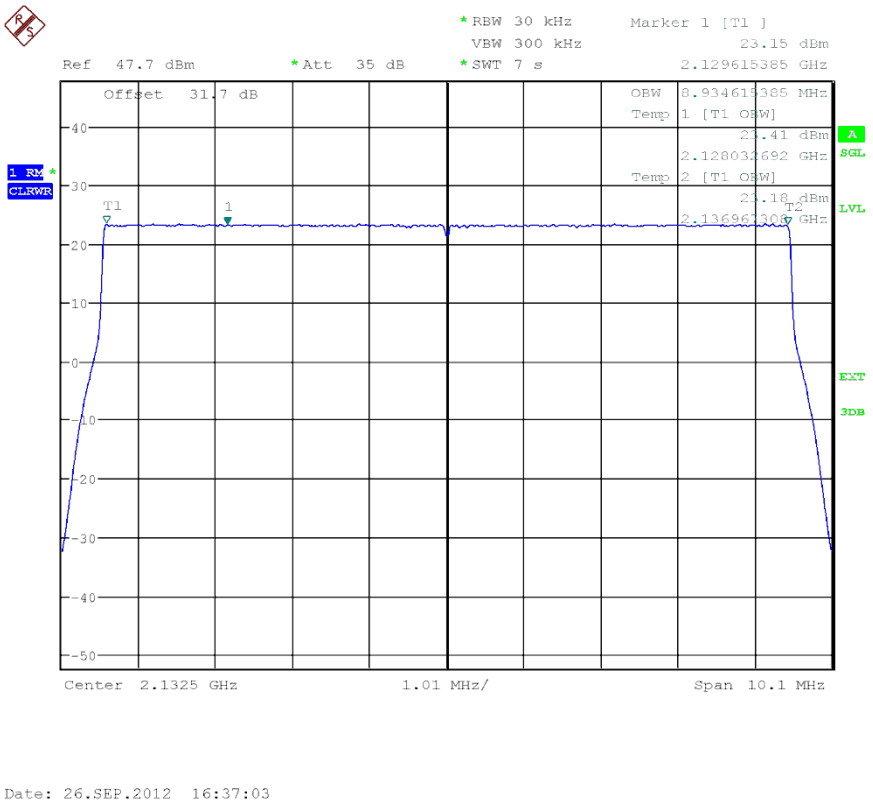


Figure 7-28: Occupied Bandwidth – QPSK (2132.5 MHz) (10MHz Channel BW)

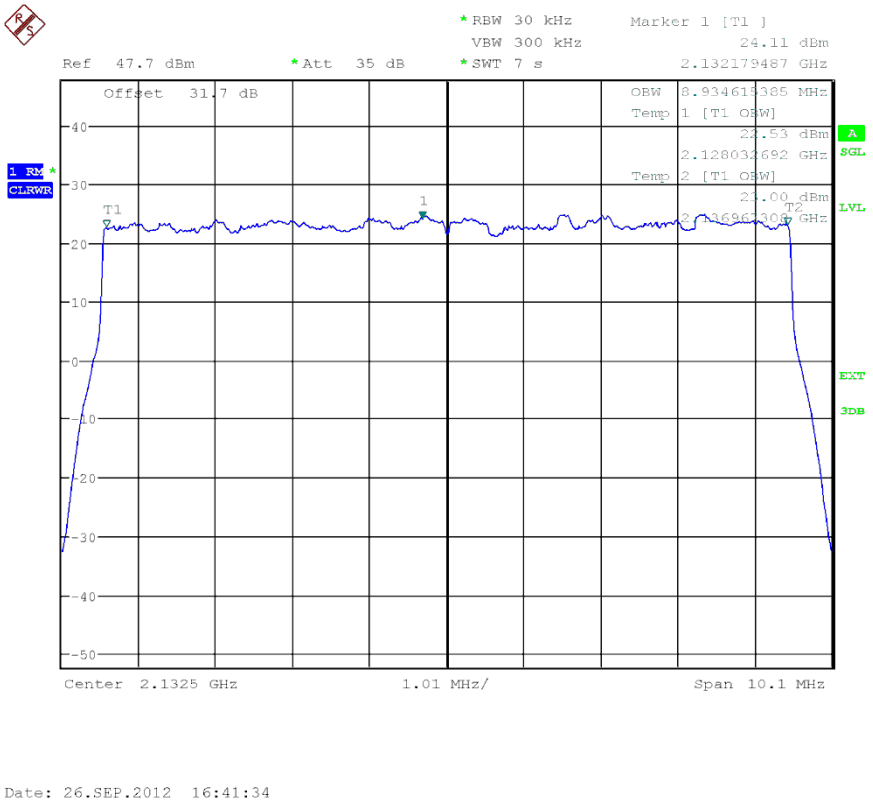


Figure 7-29: Occupied Bandwidth – 16QAM (2132.5 MHz) (10MHz Channel BW)

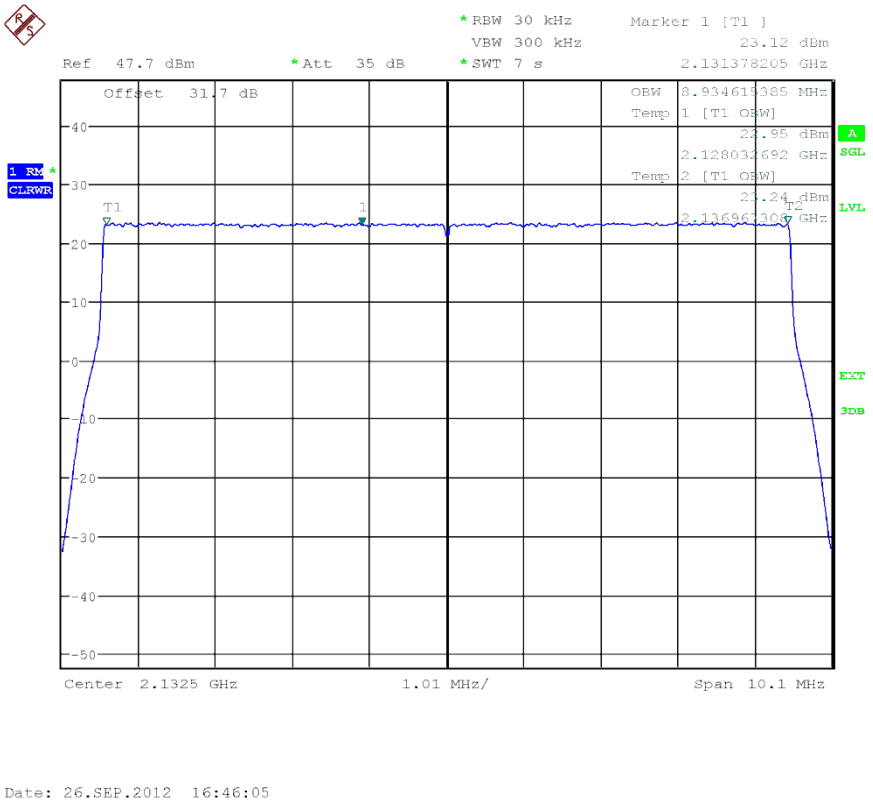


Figure 7-30: Occupied Bandwidth – 64QAM (2132.5 MHz) (10MHz Channel BW)

Config C ANT1:

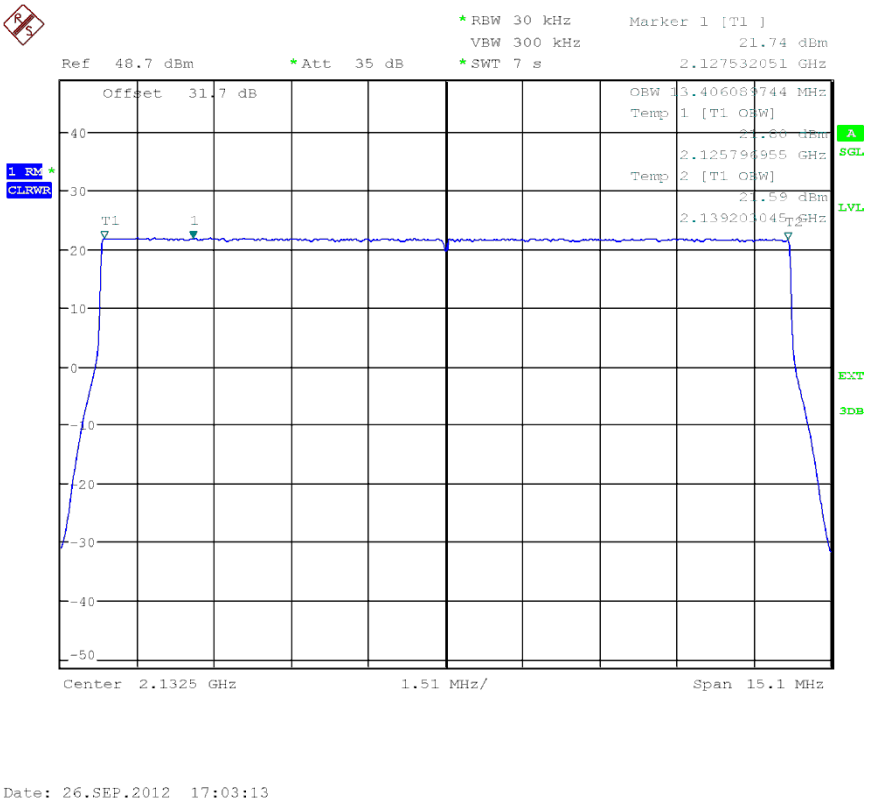


Figure 7-31: Occupied Bandwidth – QPSK (2132.5 MHz) (15MHz Channel BW)

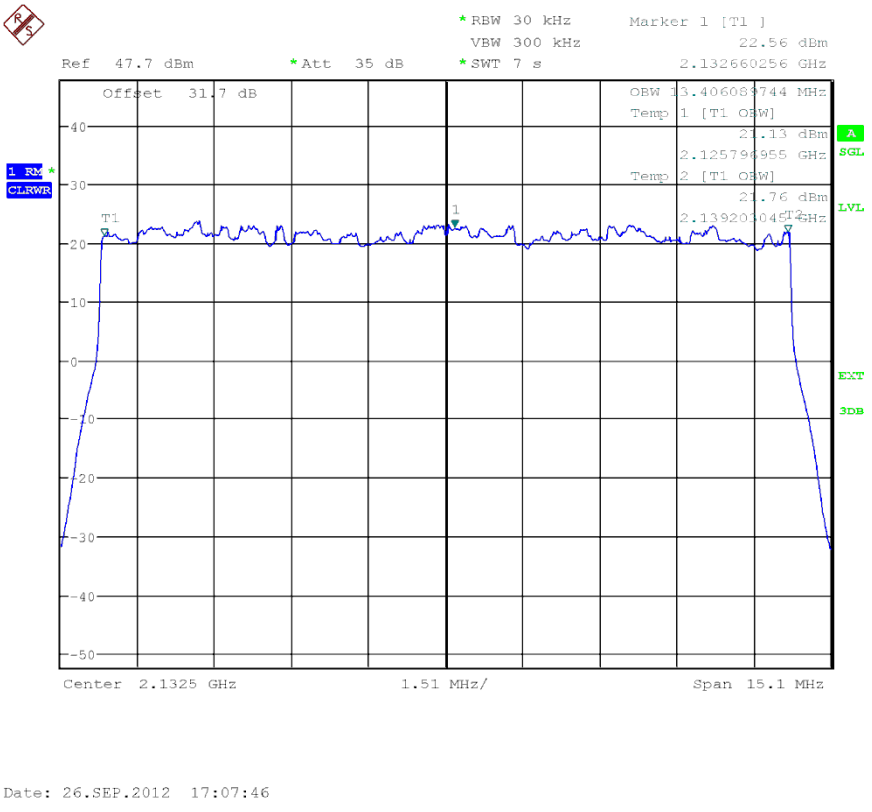


Figure 7-32: Occupied Bandwidth – 16QAM (2132.5 MHz) (15MHz Channel BW)

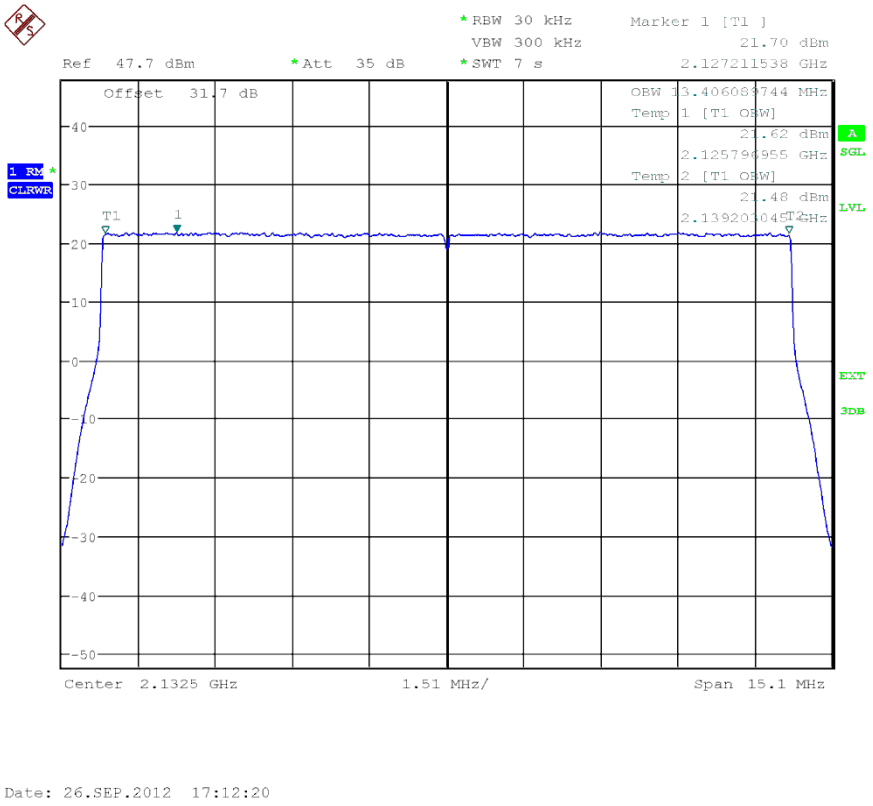


Figure 7-33: Occupied Bandwidth – 64QAM (2132.5 MHz) (15MHz Channel BW)

Config D ANT1:

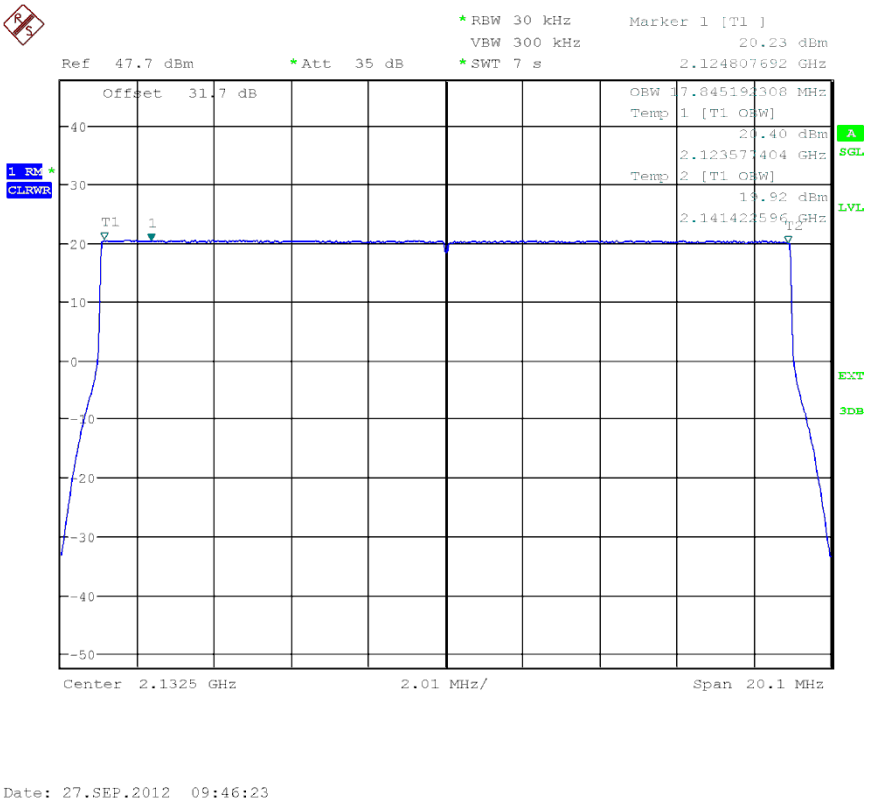


Figure 7-34: Occupied Bandwidth – QPSK (2132.5 MHz) (20MHz Channel BW)

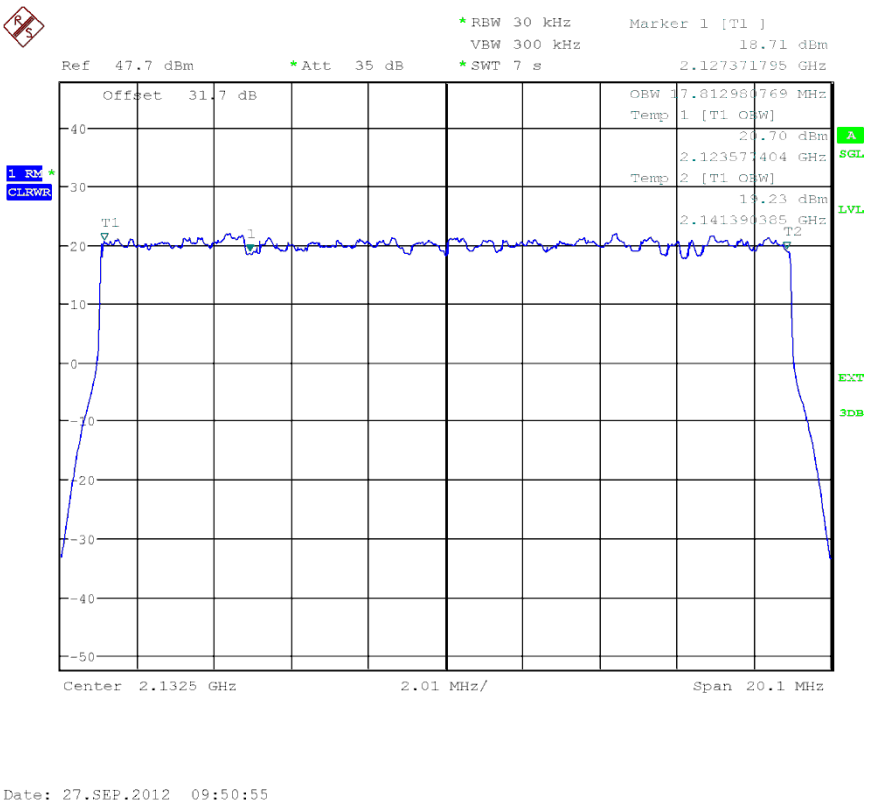


Figure 7-35: Occupied Bandwidth – 16QAM (2132.5 MHz) (20MHz Channel BW)

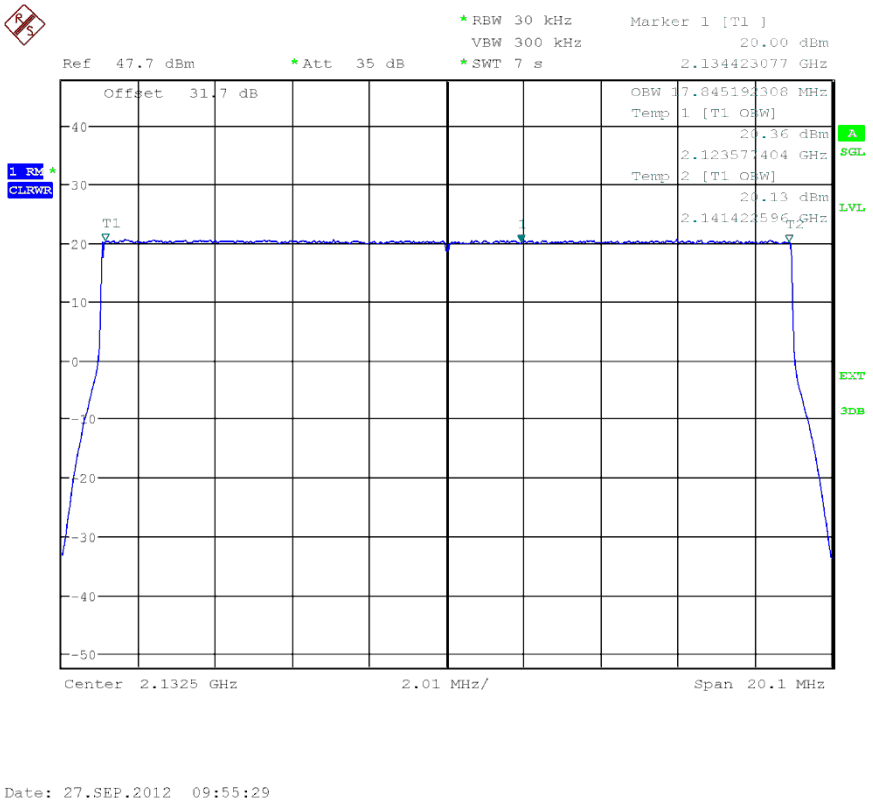


Figure 7-36: Occupied Bandwidth – 64QAM (2132.5 MHz) (20MHz Channel BW)

Config A ANT3:

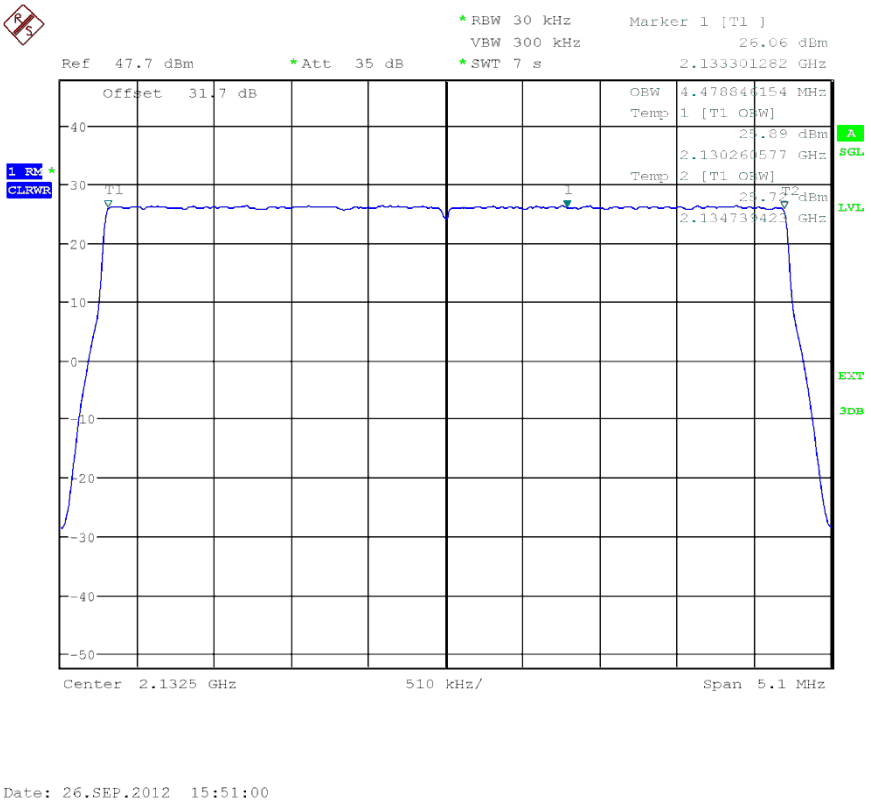


Figure 7-37: Occupied Bandwidth – QPSK (2132.5 MHz) (5MHz Channel BW)

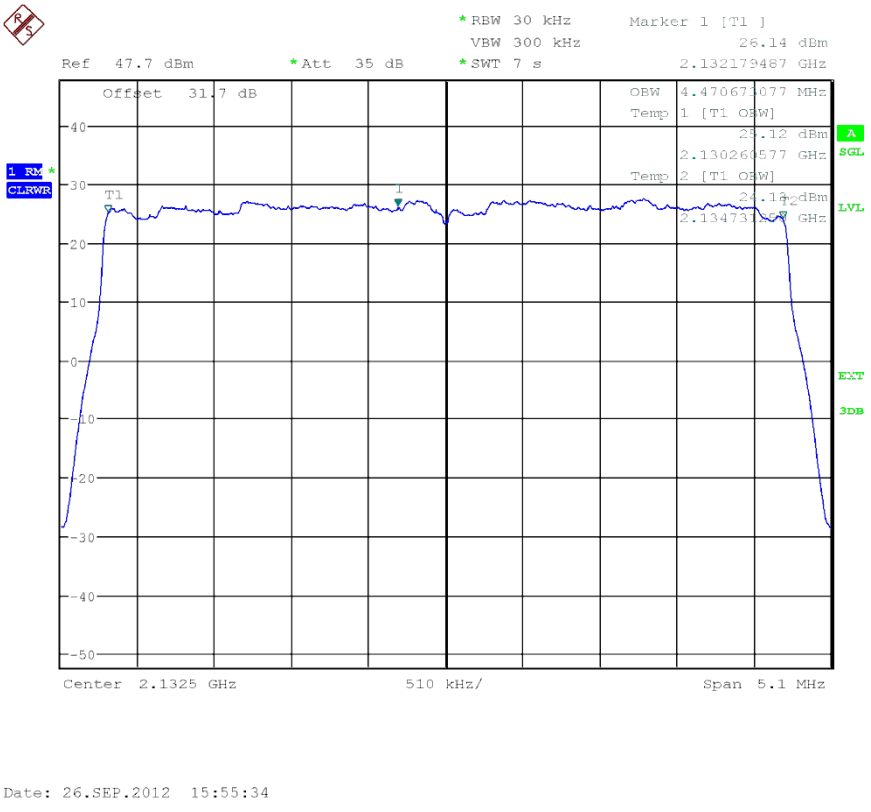


Figure 7-38: Occupied Bandwidth – 16QAM (2132.5 MHz) (5MHz Channel BW)

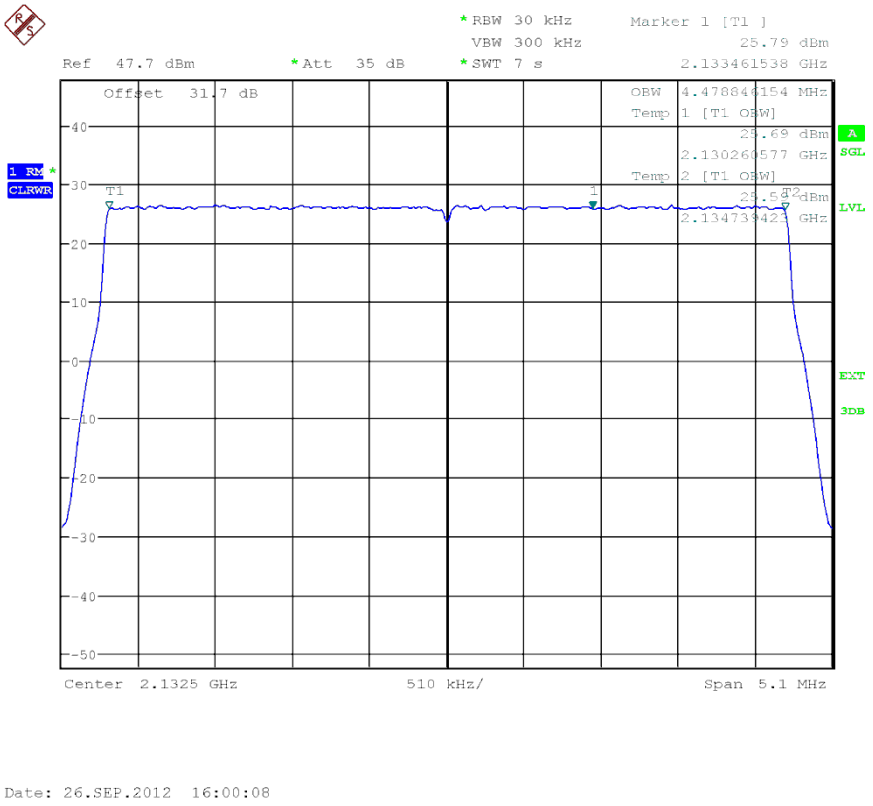


Figure 7-39: Occupied Bandwidth – 64QAM (2132.5 MHz) (5MHz Channel BW)

Config B ANT3:

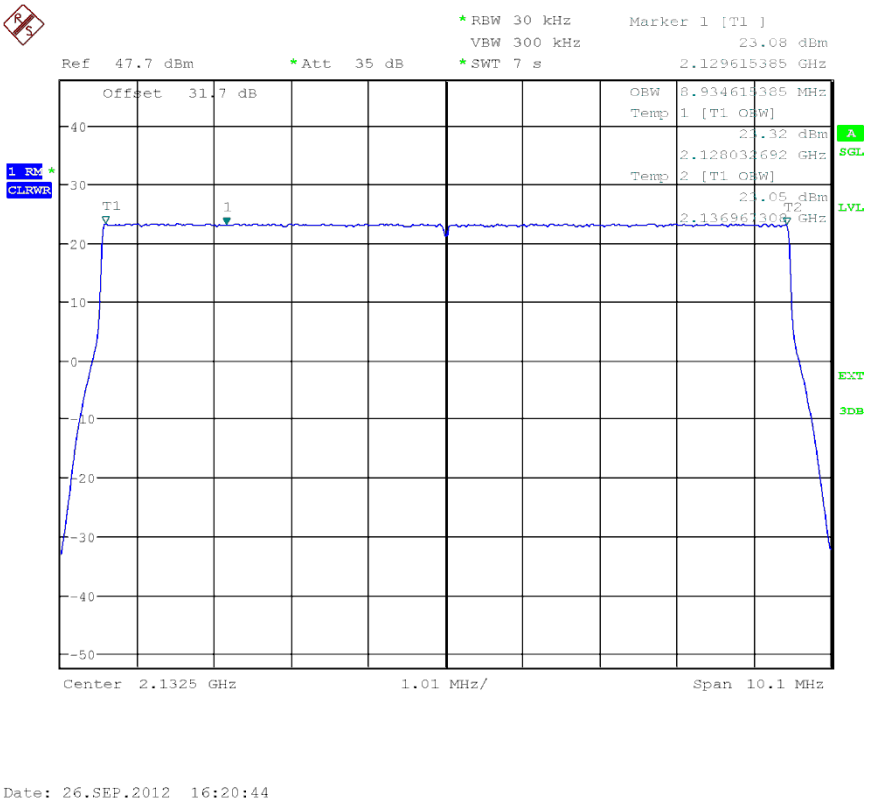


Figure 7-40: Occupied Bandwidth – QPSK (2132.5 MHz) (10MHz Channel BW)

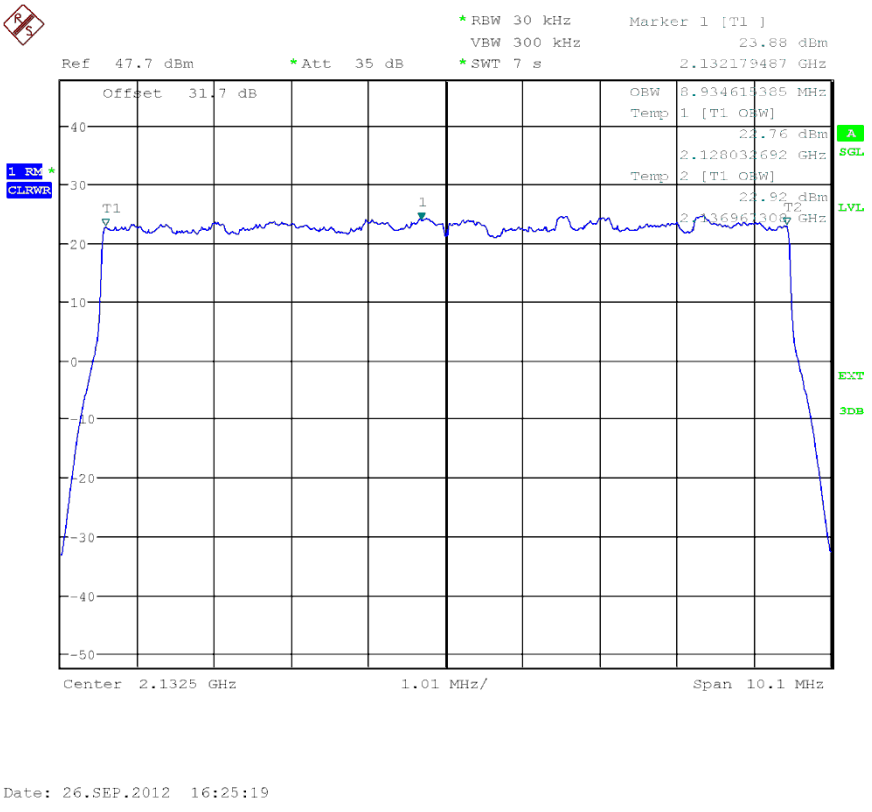


Figure 7-41: Occupied Bandwidth – 16QAM (2132.5 MHz) (10MHz Channel BW)

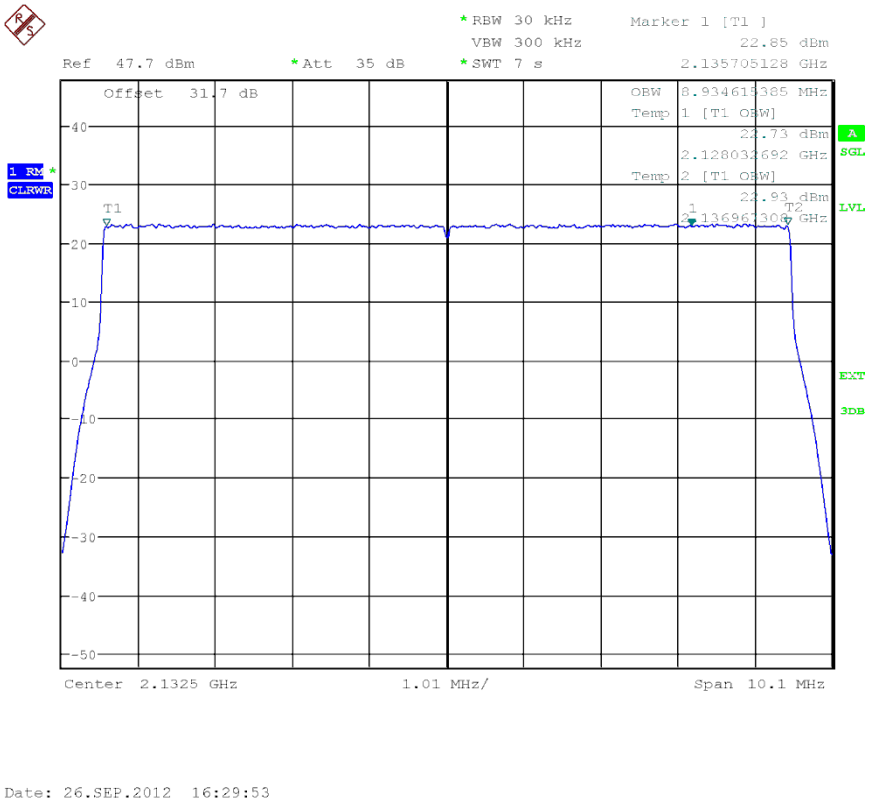


Figure 7-42: Occupied Bandwidth – 64QAM (2132.5 MHz) (10MHz Channel BW)

Config C ANT3:

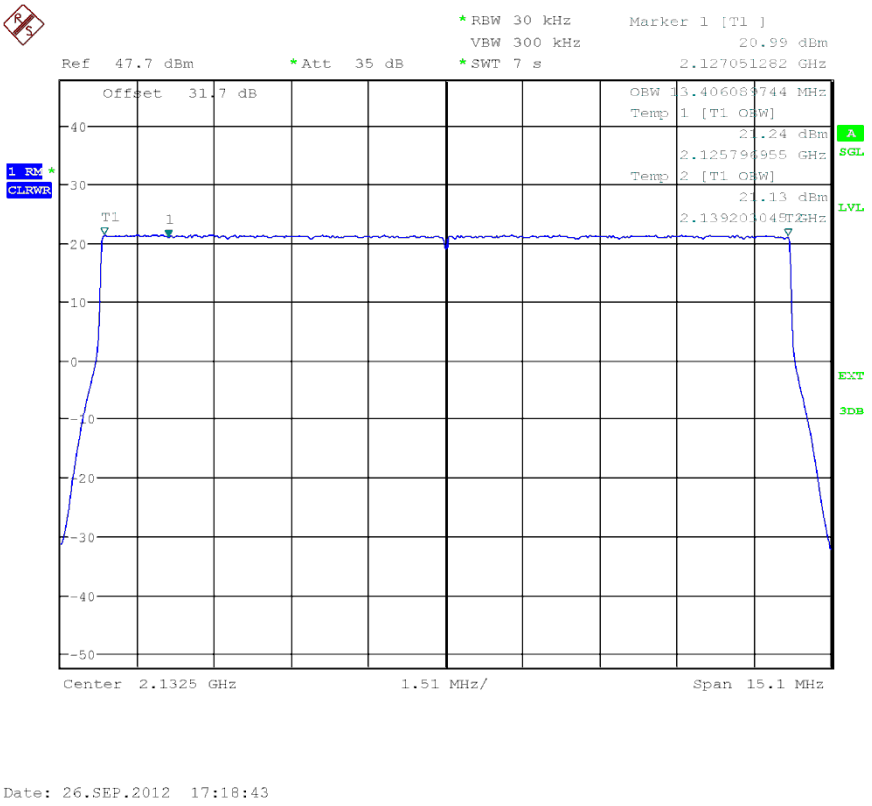


Figure 7-43: Occupied Bandwidth – QPSK (2132.5 MHz) (15MHz Channel BW)

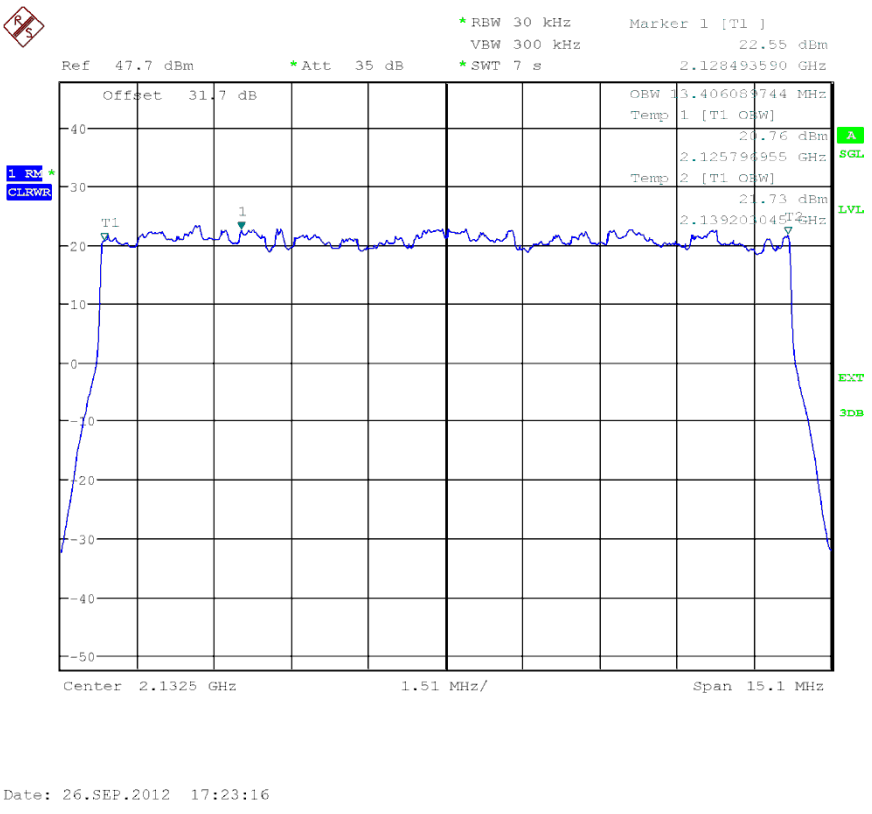


Figure 7-44: Occupied Bandwidth – 16QAM (2132.5 MHz) (15MHz Channel BW)

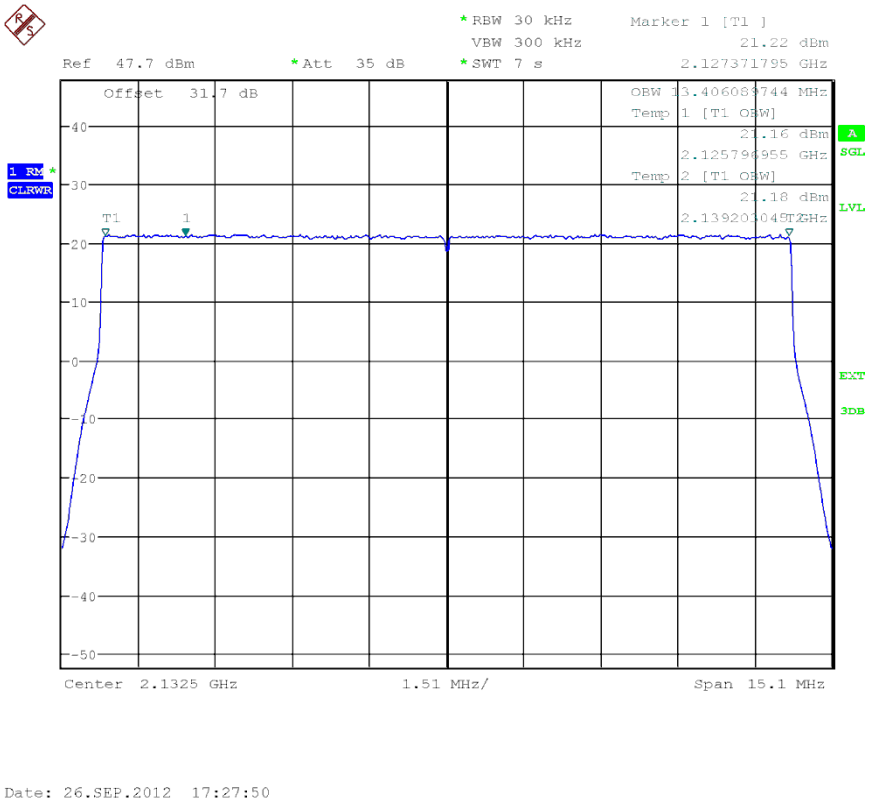


Figure 7-45: Occupied Bandwidth – 64QAM (2132.5 MHz) (15MHz Channel BW)

Config D ANT3:

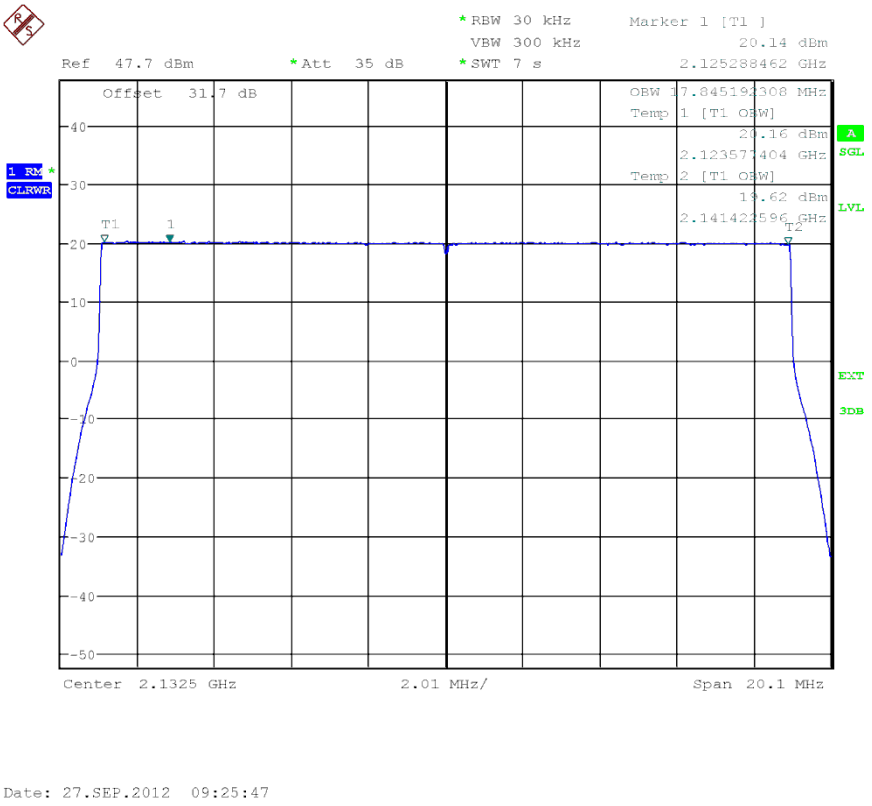


Figure 7-46: Occupied Bandwidth – QPSK (2132.5 MHz) (20MHz Channel BW)

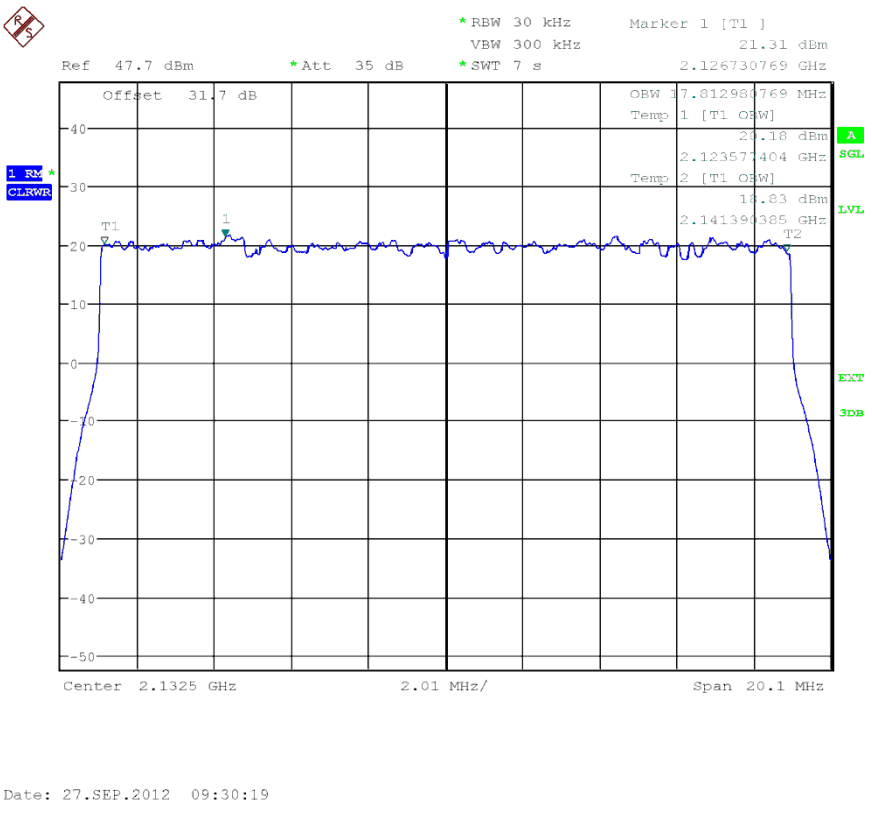


Figure 7-47: Occupied Bandwidth – 16QAM (2132.5 MHz) (20MHz Channel BW)

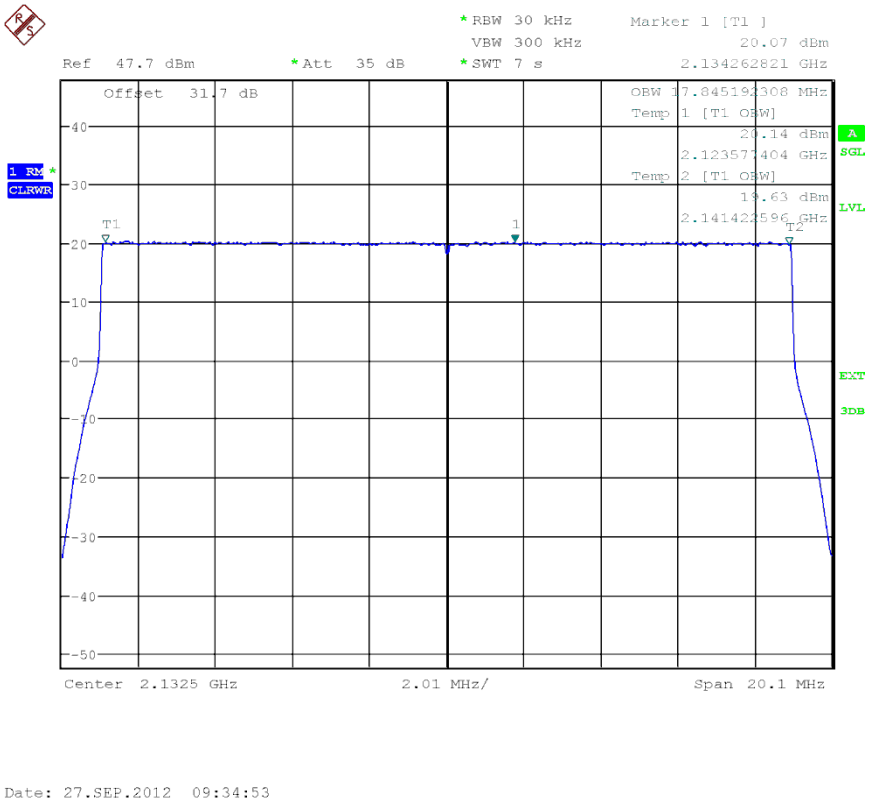


Figure 7-48: Occupied Bandwidth – 64QAM (2132.5 MHz) (20MHz Channel BW)

7.2.4 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:

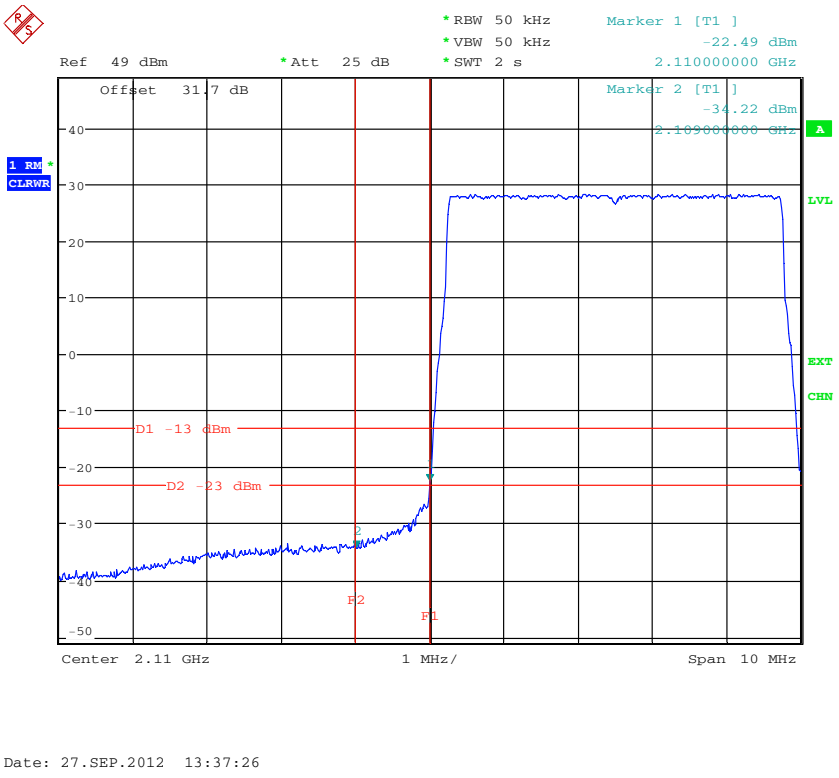


Figure 7-49: Spurious Emissions (Lower Band Edge) – QPSK (2112.5 MHz) (5MHz Channel BW)

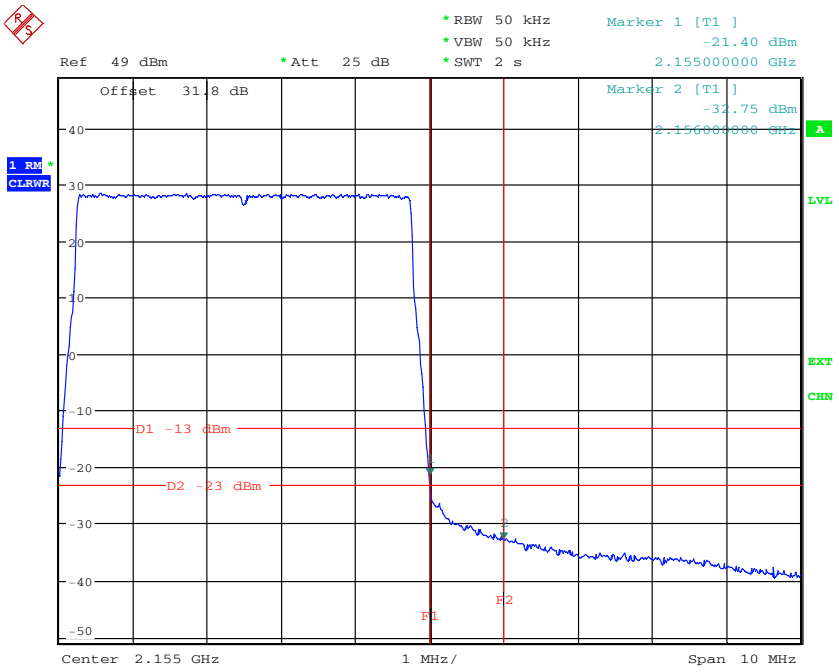


Figure 7-50: Spurious Emissions (Upper Band Edge) – QPSK (2152.5 MHz) (5MHz Channel BW)

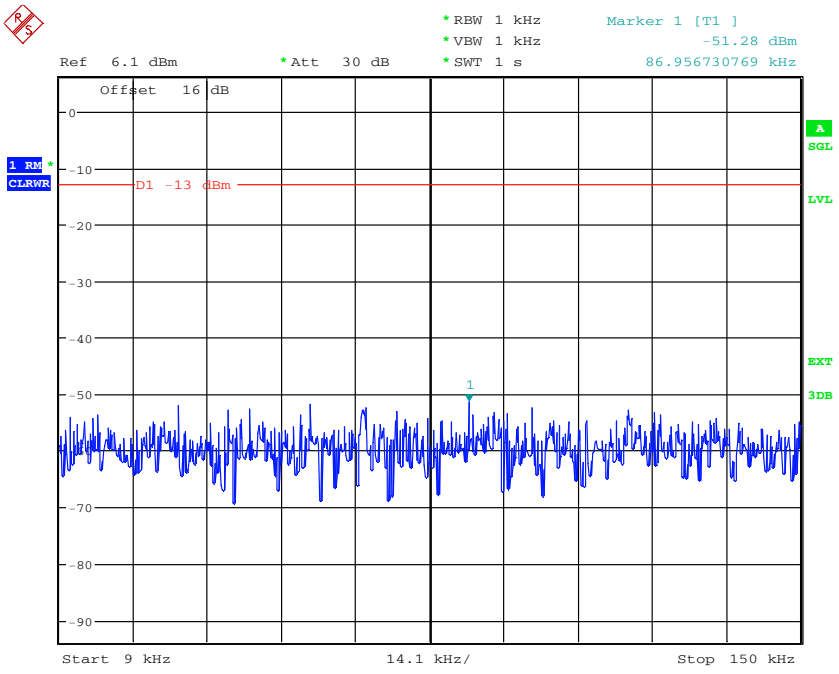
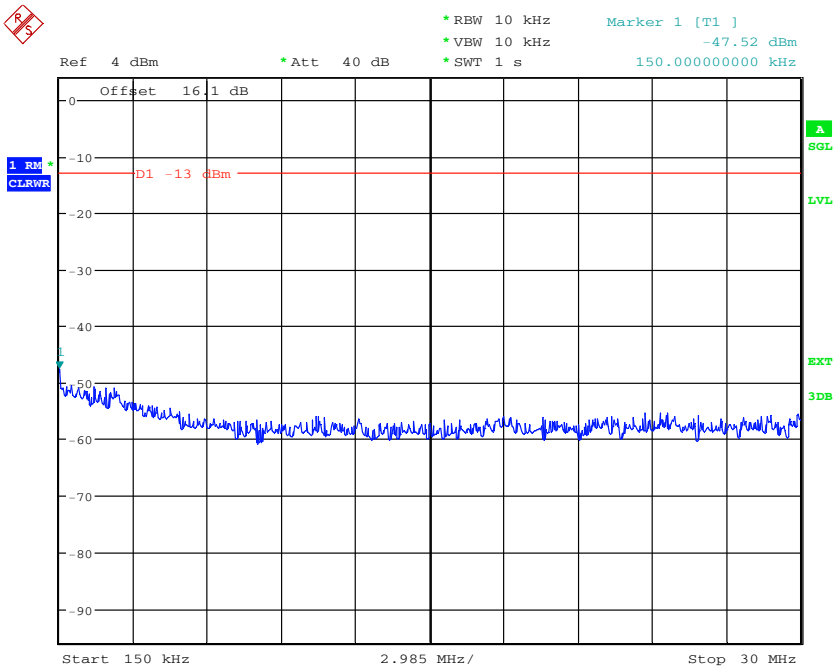
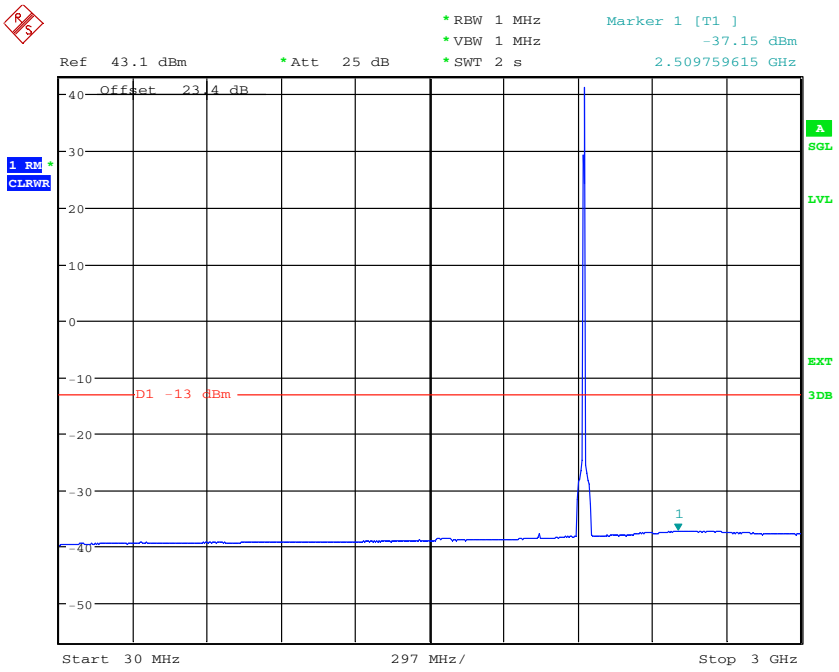


Figure 7-51: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (5MHz Channel BW)



Date: 4.OCT.2012 10:40:16

Figure 7-52: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (5MHz Channel BW)



Date: 4.OCT.2012 10:46:39

Figure 7-53: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

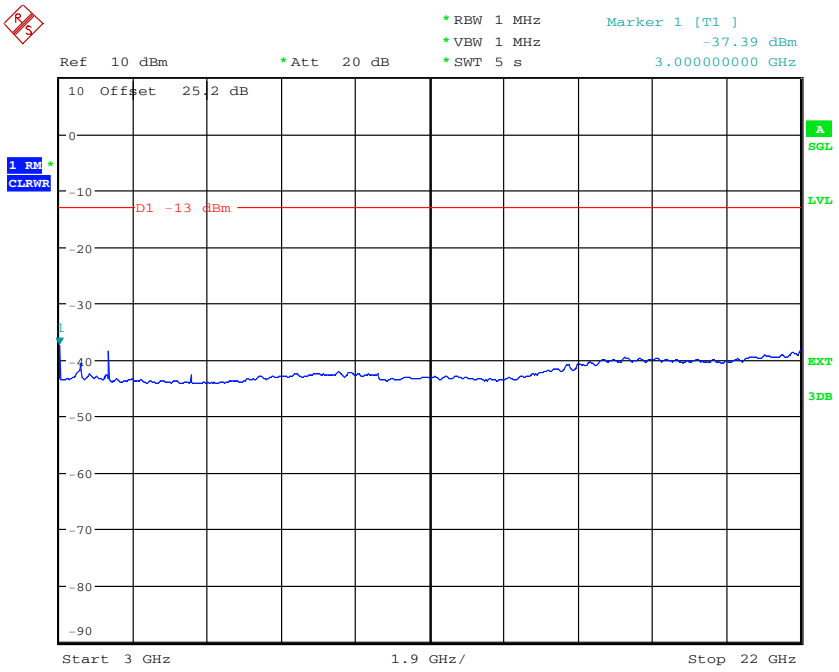


Figure 7-54: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

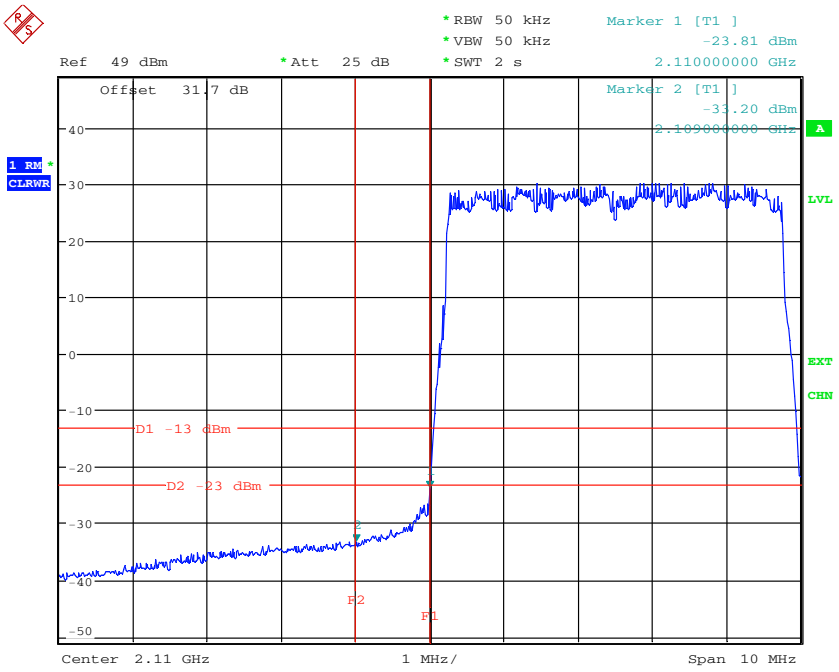


Figure 7-55: Spurious Emissions (Lower Band Edge) – 16QAM (2112.5 MHz) (5MHz Channel BW)

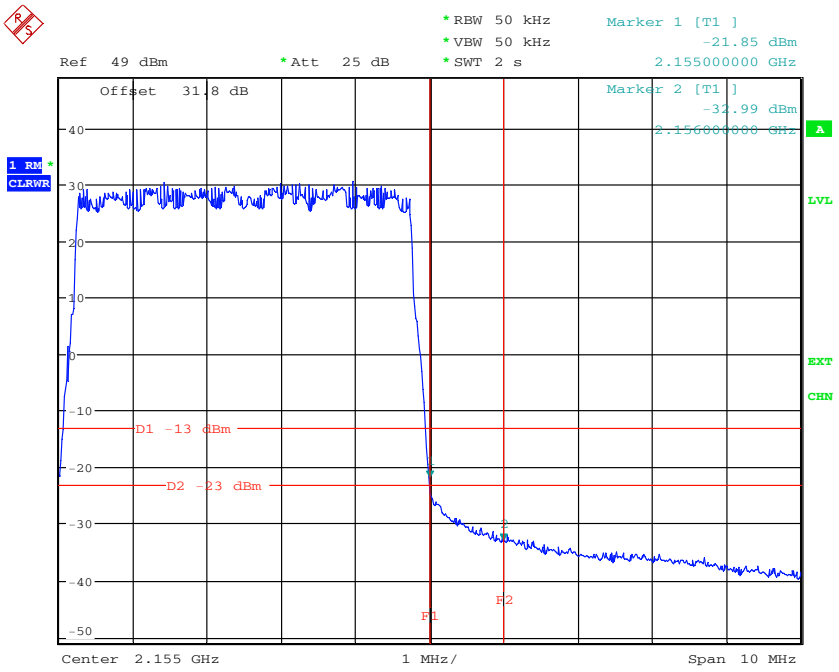


Figure 7-56: Spurious Emissions (Upper Band Edge) – 16QAM (2152.5 MHz) (5MHz Channel BW)

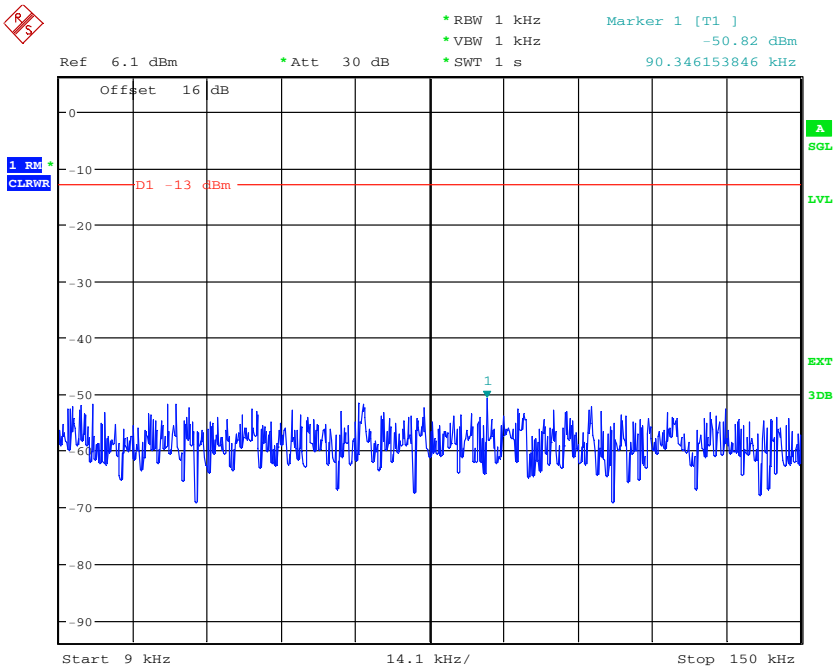


Figure 7-57: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

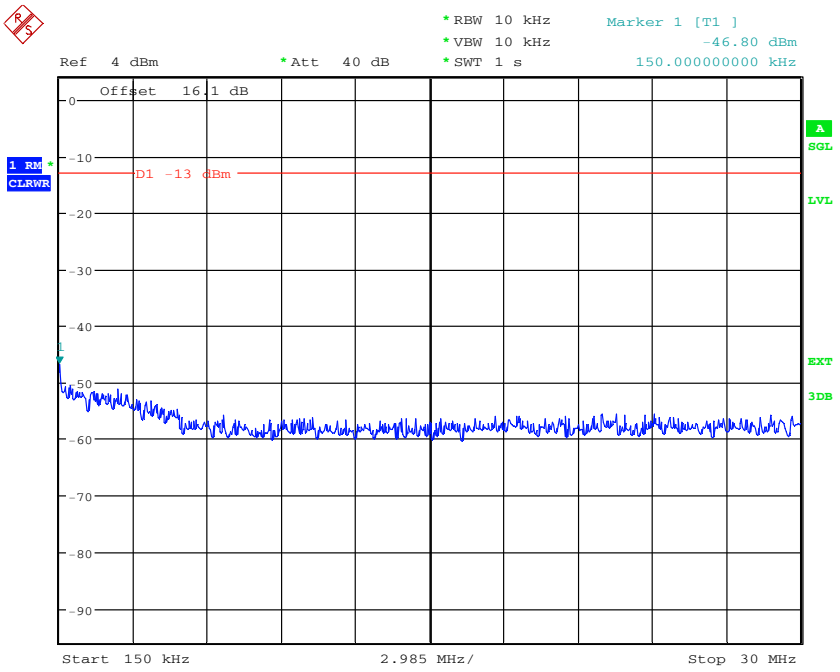


Figure 7-58: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

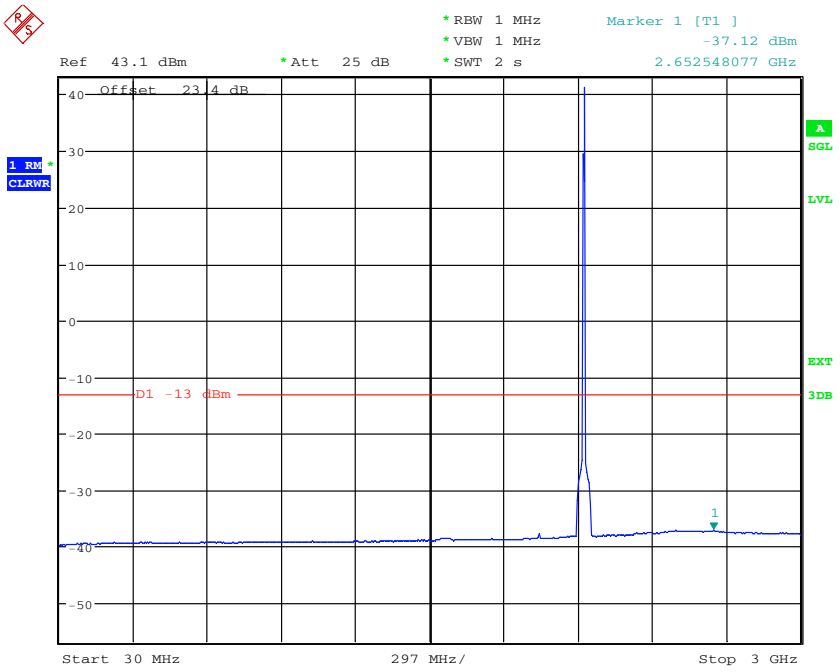


Figure 7-59: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

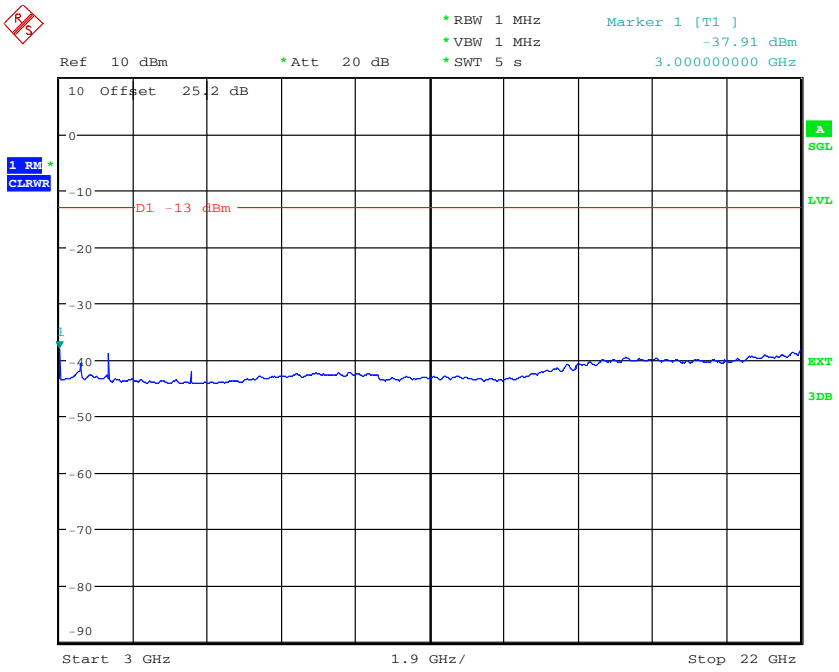


Figure 7-60: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

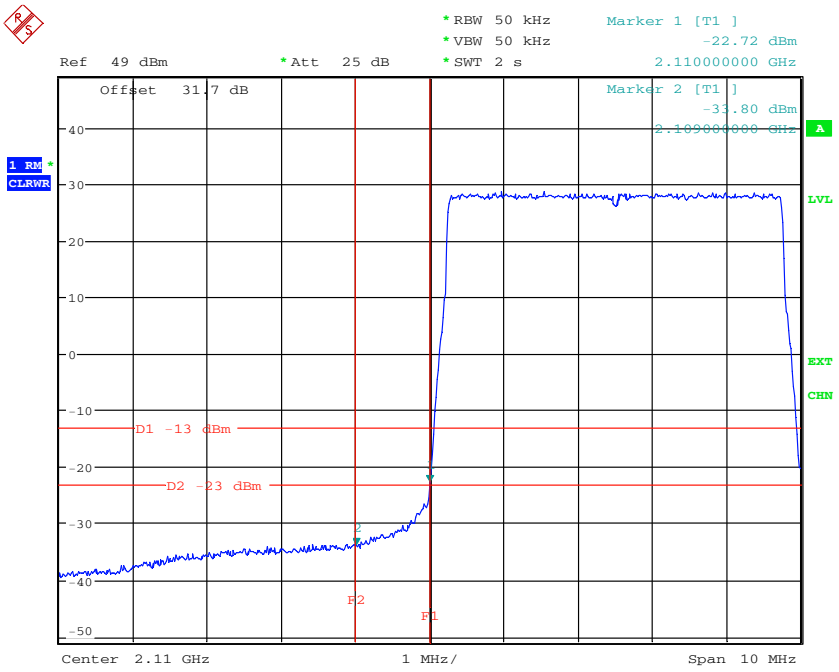


Figure 7-61: Spurious Emissions (Lower Band Edge) – 64QAM (2112.5 MHz) (5MHz Channel BW)

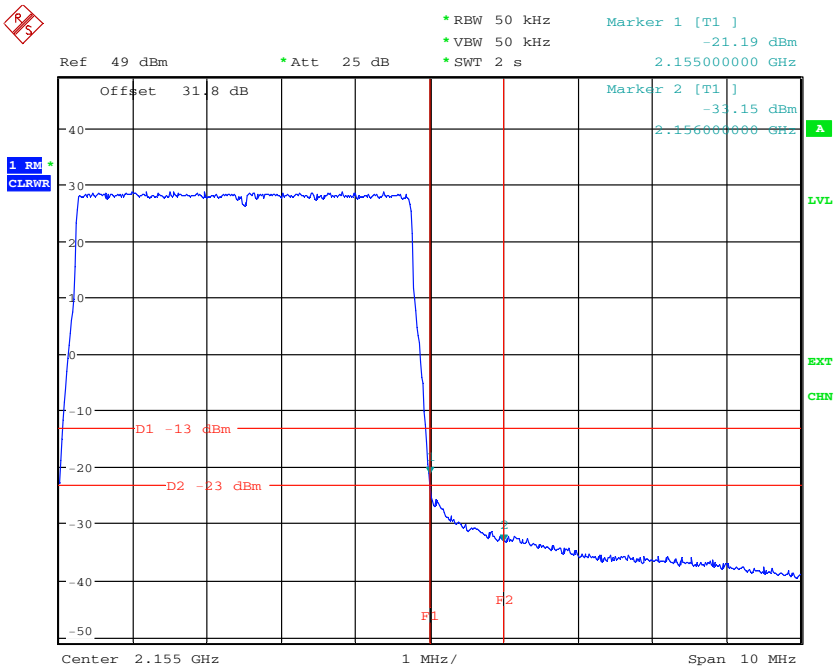


Figure 7-62: Spurious Emissions (Upper Band Edge) – 64QAM (2152.5 MHz) (5MHz Channel BW)

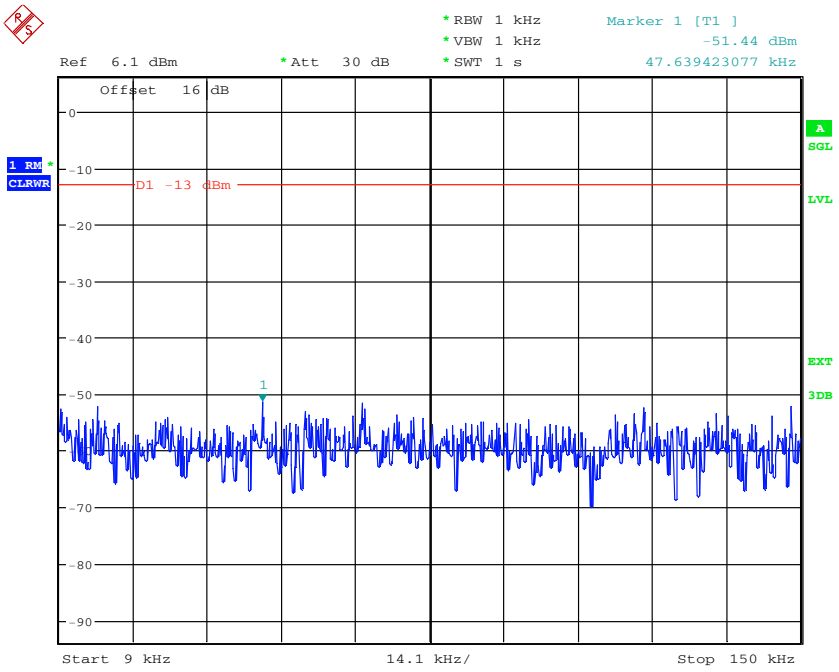


Figure 7-63: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)

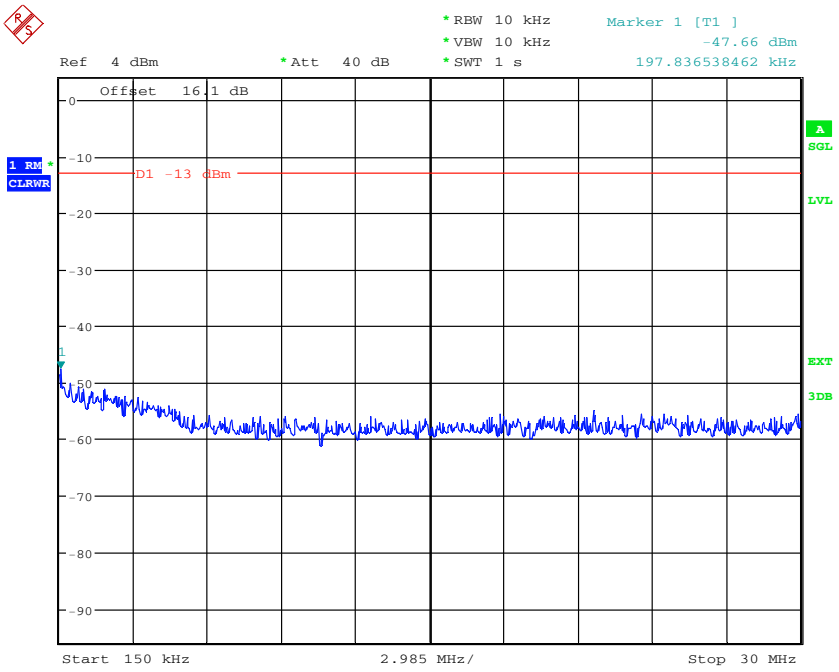


Figure 7-64: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)

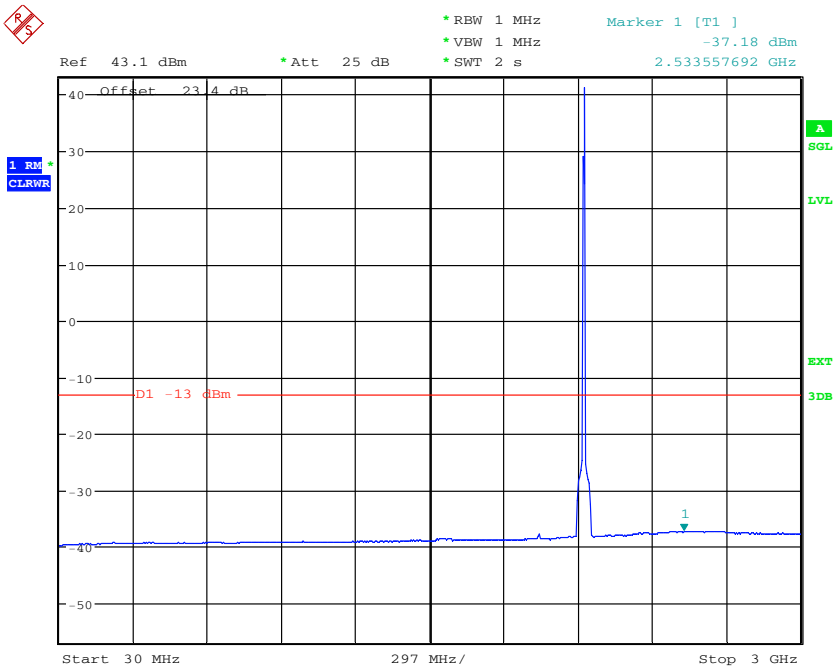


Figure 7-65: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)

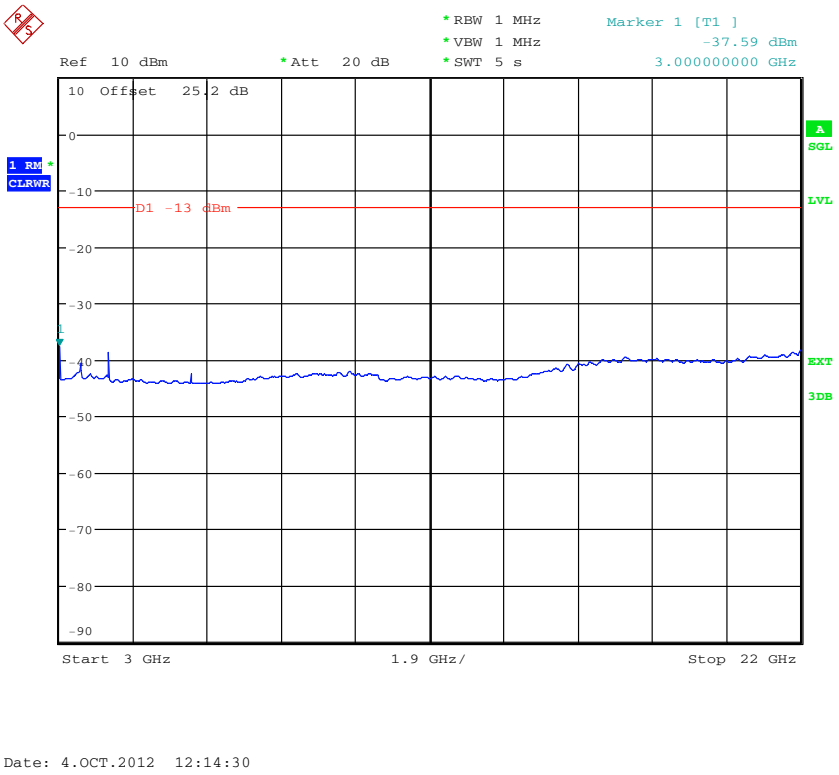
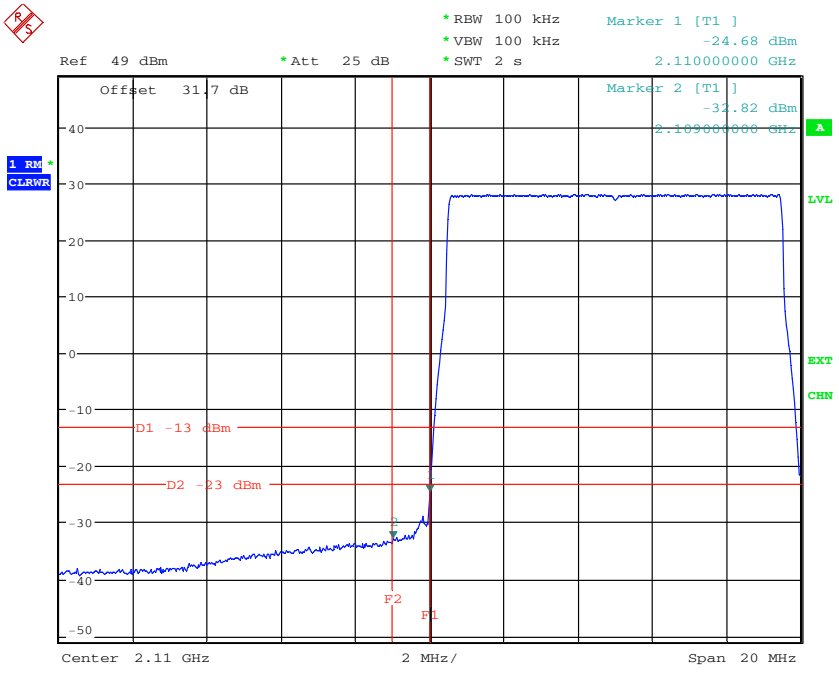


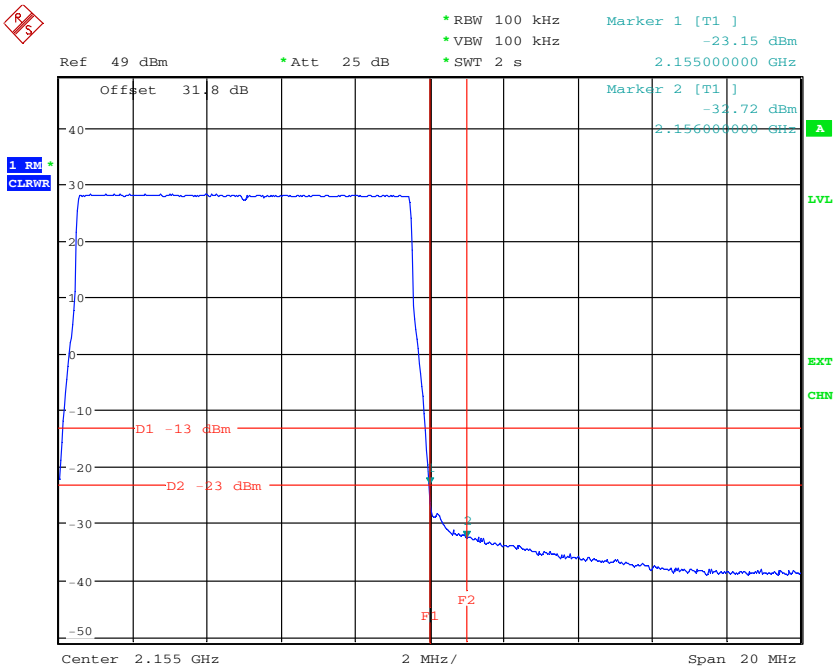
Figure 7-66: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)

Config B ANT1:



Date: 27.SEP.2012 16:15:27

Figure 7-67: Spurious Emissions (Lower Band Edge) – QPSK (2115.0 MHz) (10MHz Channel BW)



Date: 27.SEP.2012 16:17:15

Figure 7-68: Spurious Emissions (Upper Band Edge) – QPSK (2150.0 MHz) (10MHz Channel BW)

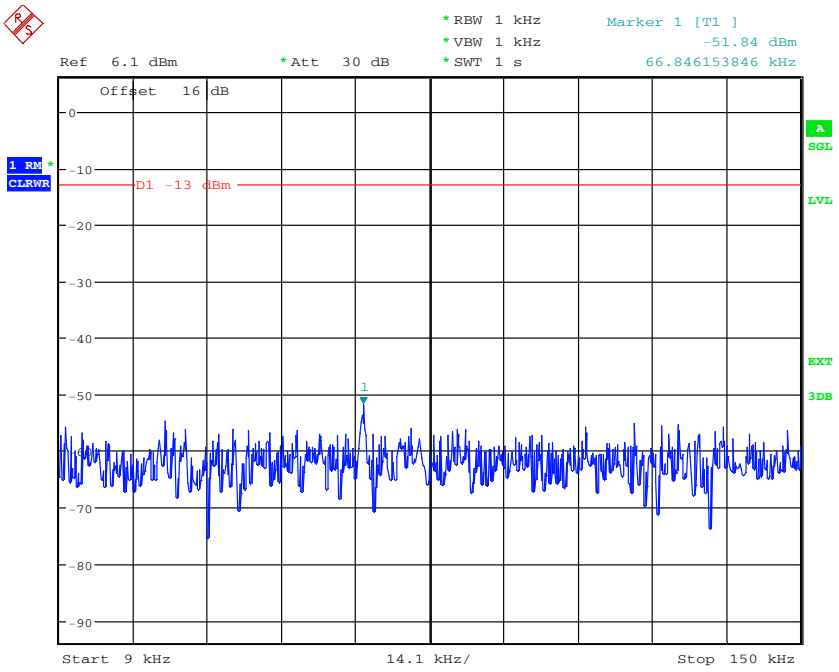


Figure 7-69: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (10MHz Channel BW)

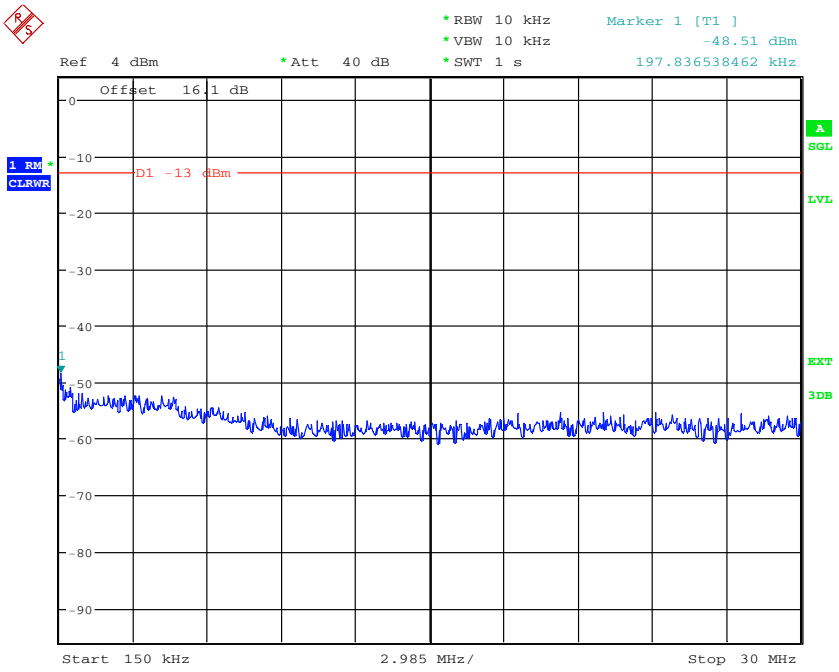
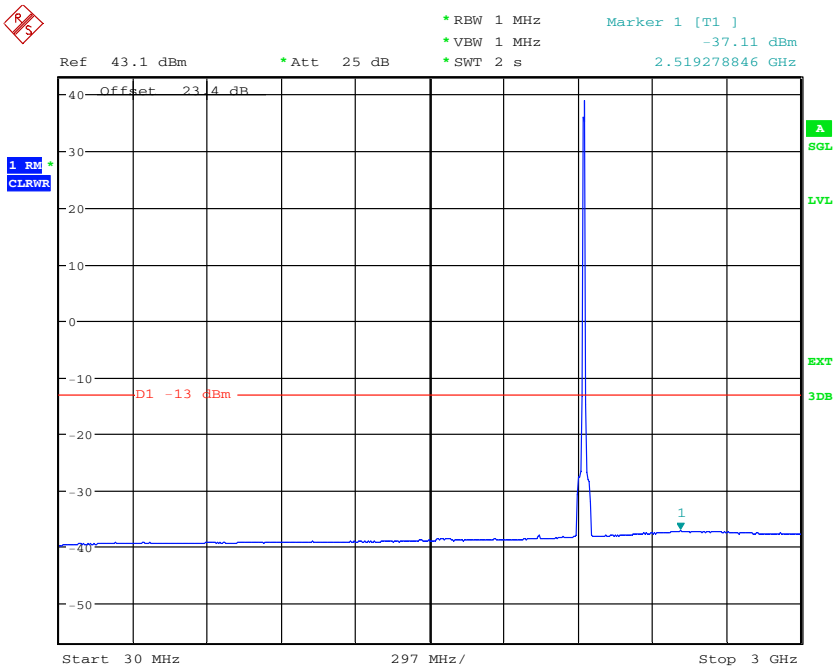
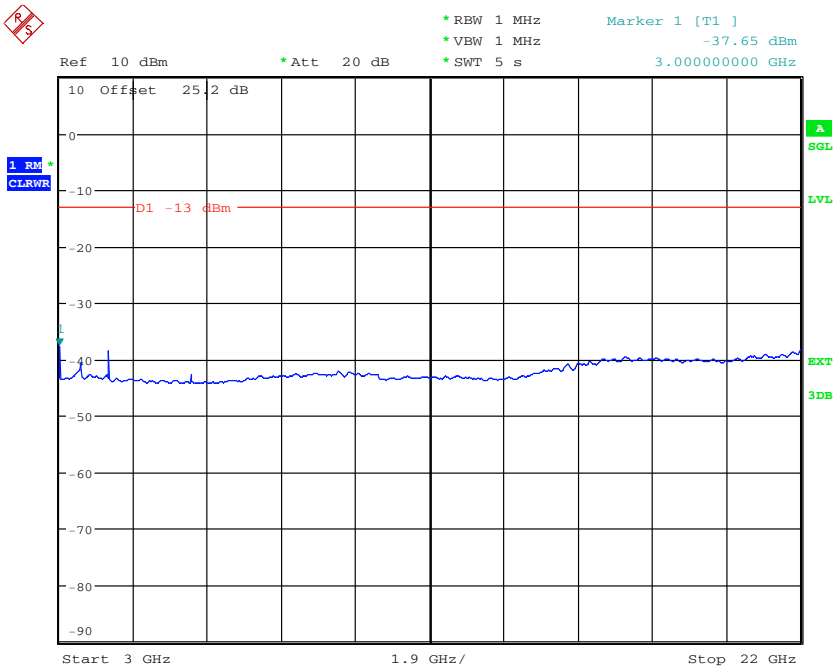


Figure 7-70: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (10MHz Channel BW)



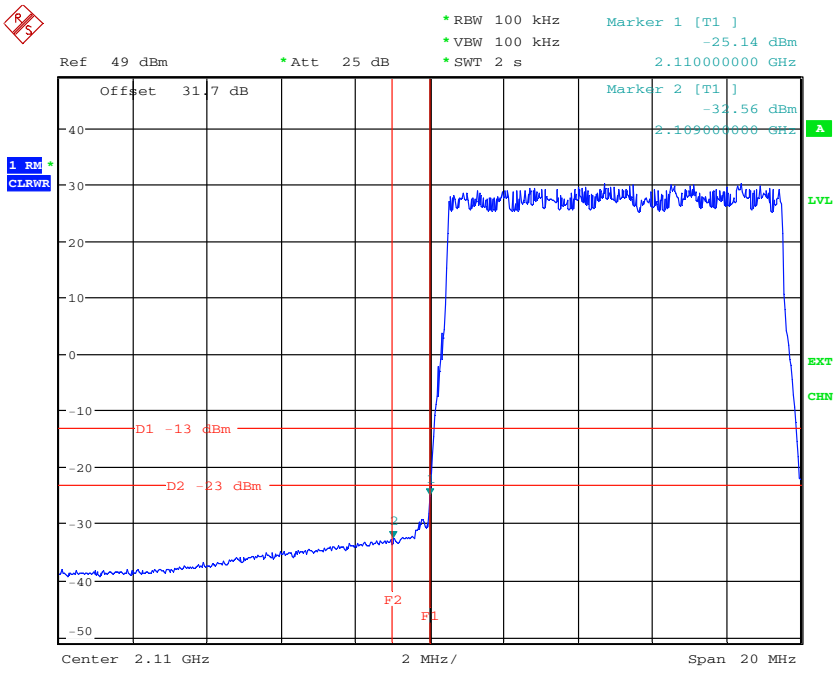
Date: 4.OCT.2012 13:11:56

Figure 7-71: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (10MHz Channel BW)



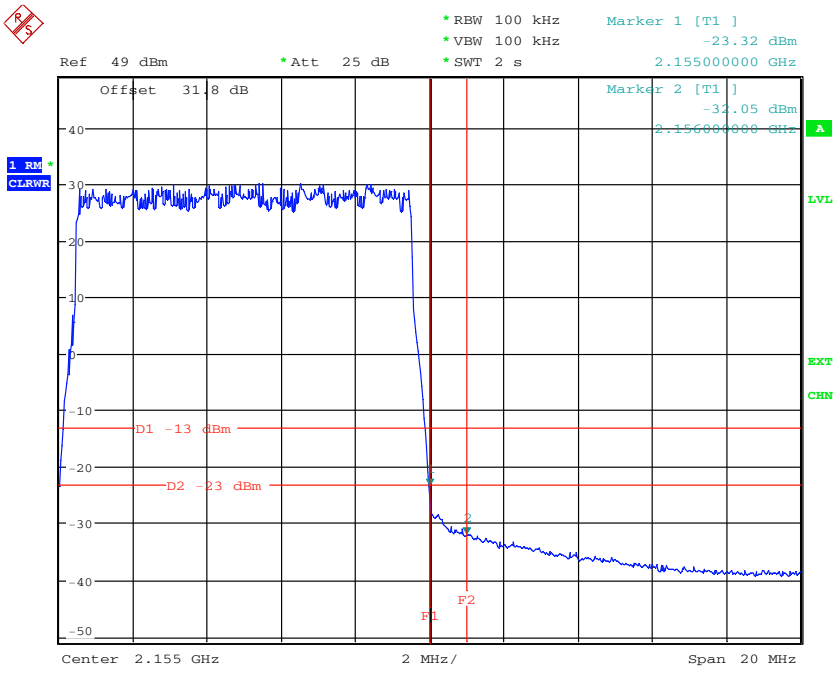
Date: 4.OCT.2012 13:12:31

Figure 7-72: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (10MHz Channel BW)



Date: 27.SEP.2012 16:19:05

Figure 7-73: Spurious Emissions (Lower Band Edge) – 16QAM (2115.0 MHz) (10MHz Channel BW)



Date: 27.SEP.2012 16:20:35

Figure 7-74: Spurious Emissions (Upper Band Edge) – 16QAM (2150.0 MHz) (10MHz Channel BW)

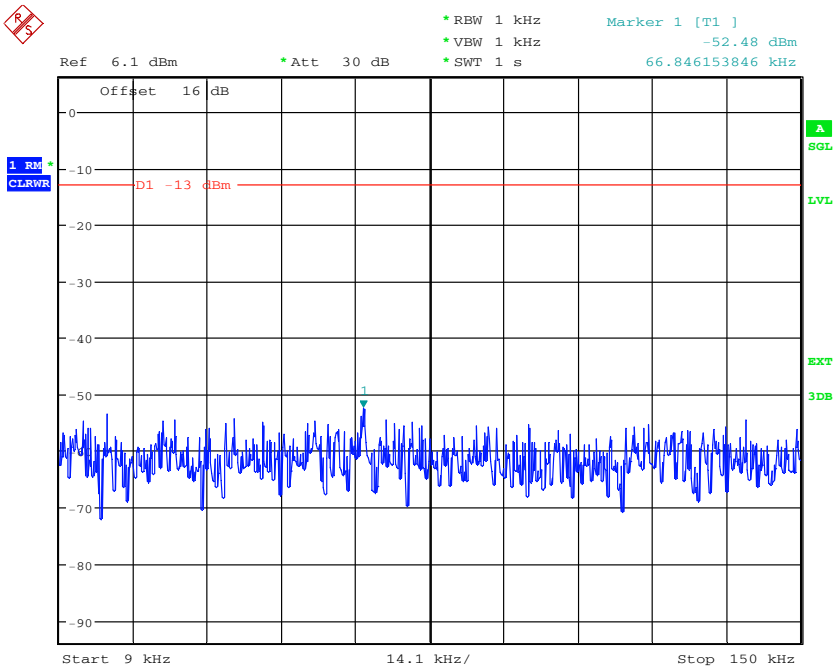


Figure 7-75: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)

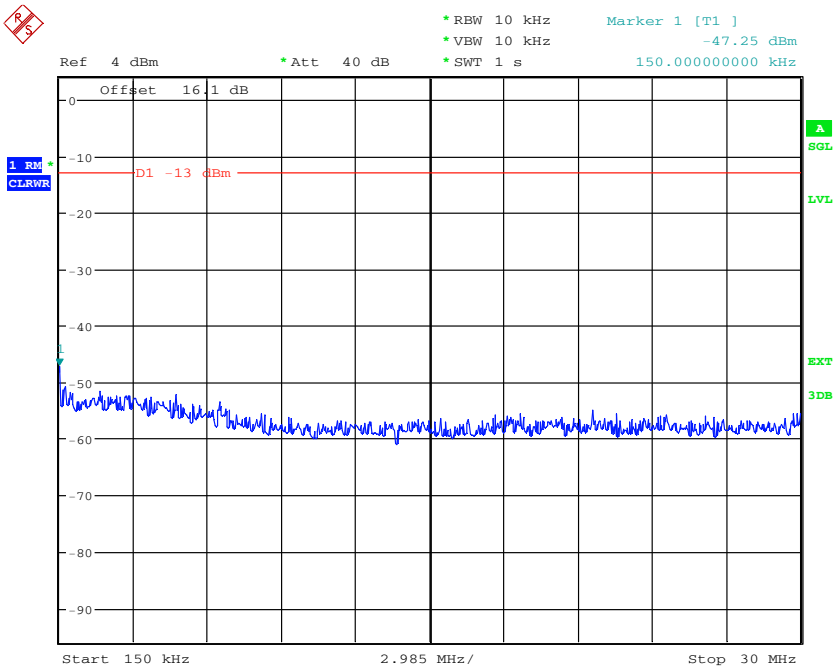
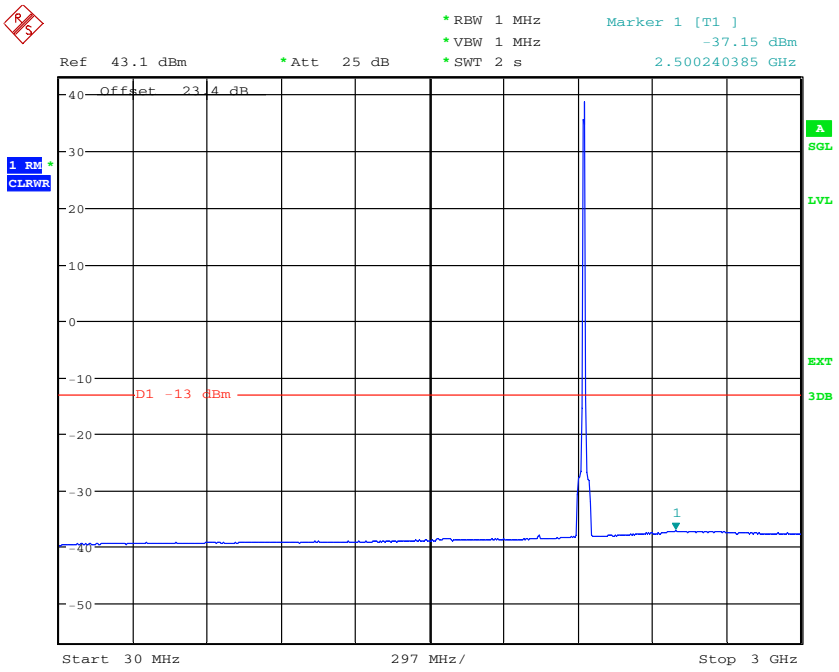
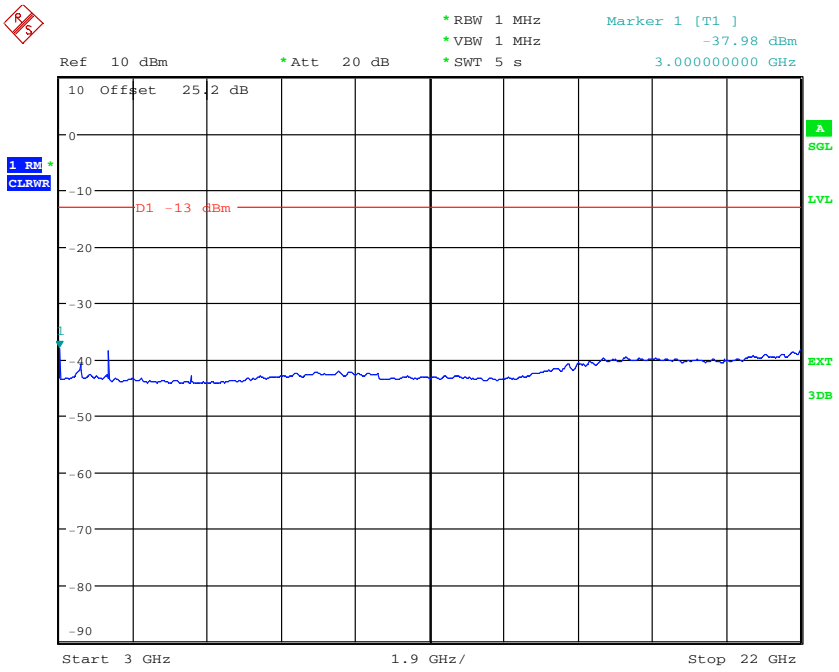


Figure 7-76: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)



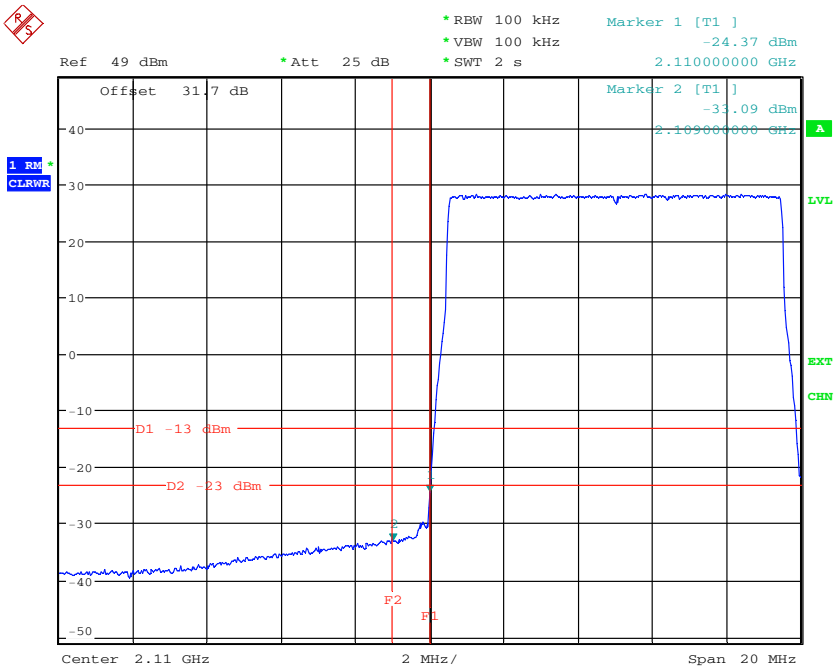
Date: 4.OCT.2012 13:14:03

Figure 7-77: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)



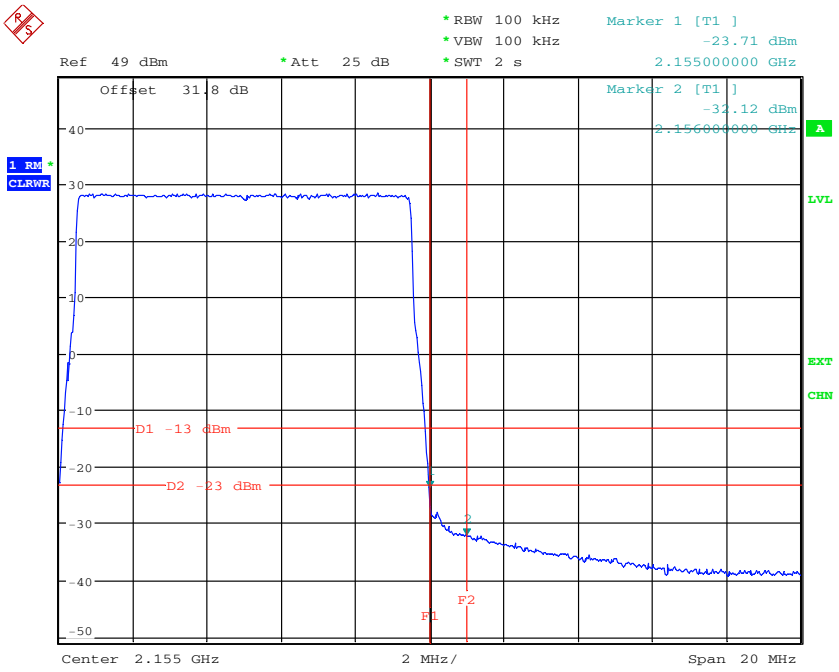
Date: 4.OCT.2012 13:14:36

Figure 7-78: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)



Date: 27.SEP.2012 16:22:19

Figure 7-79: Spurious Emissions (Lower Band Edge) – 64QAM (2115.0 MHz) (10MHz Channel BW)



Date: 27.SEP.2012 16:24:04

Figure 7-80: Spurious Emissions (Upper Band Edge) – 64QAM (2150.0 MHz) (10MHz Channel BW)

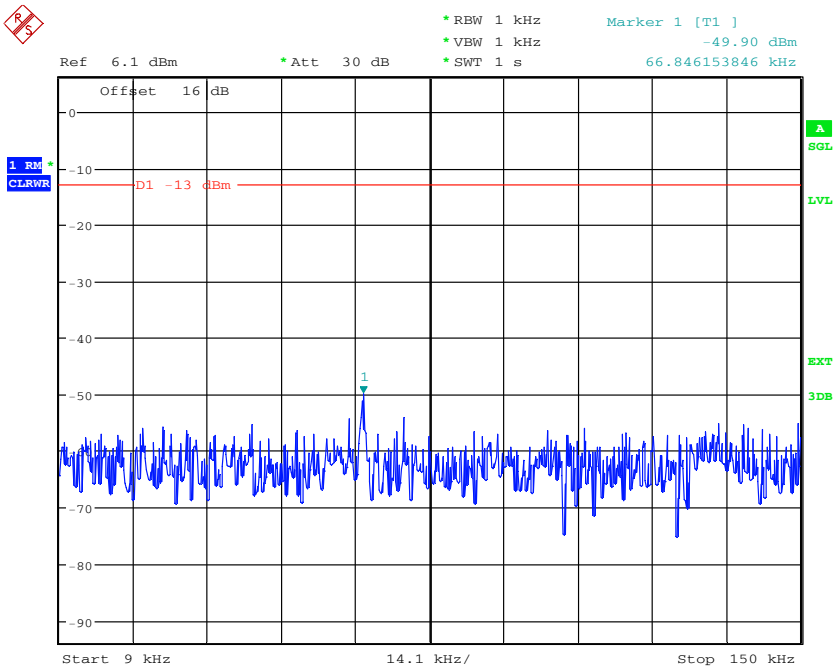


Figure 7-81: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)

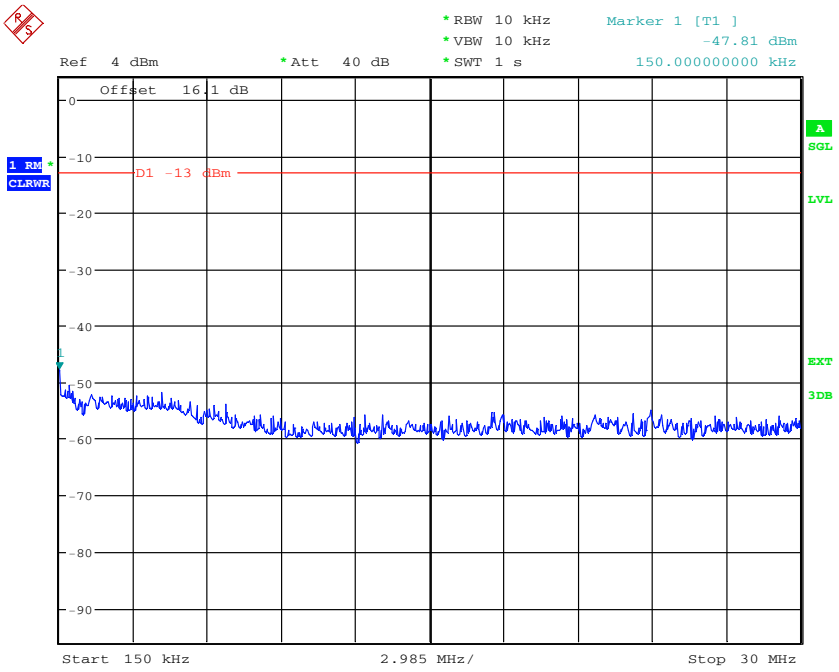
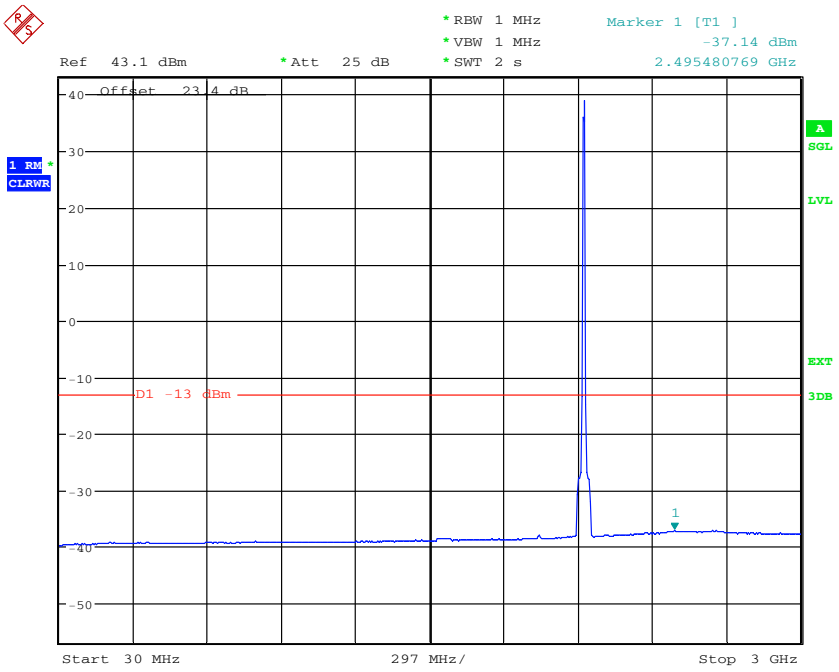
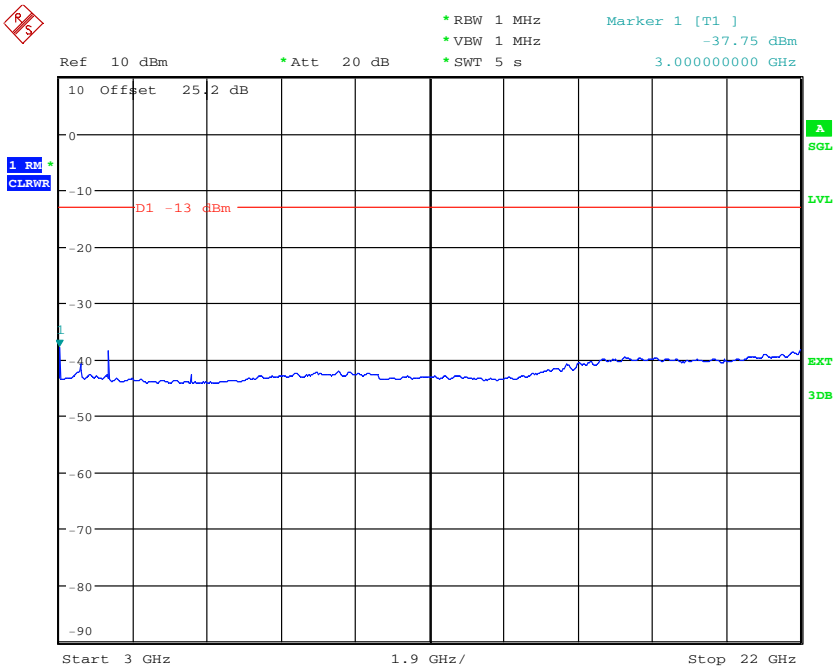


Figure 7-82: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)



Date: 4.OCT.2012 13:16:10

Figure 7-83: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)



Date: 4.OCT.2012 13:16:42

Figure 7-84: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)

Config C ANT1:

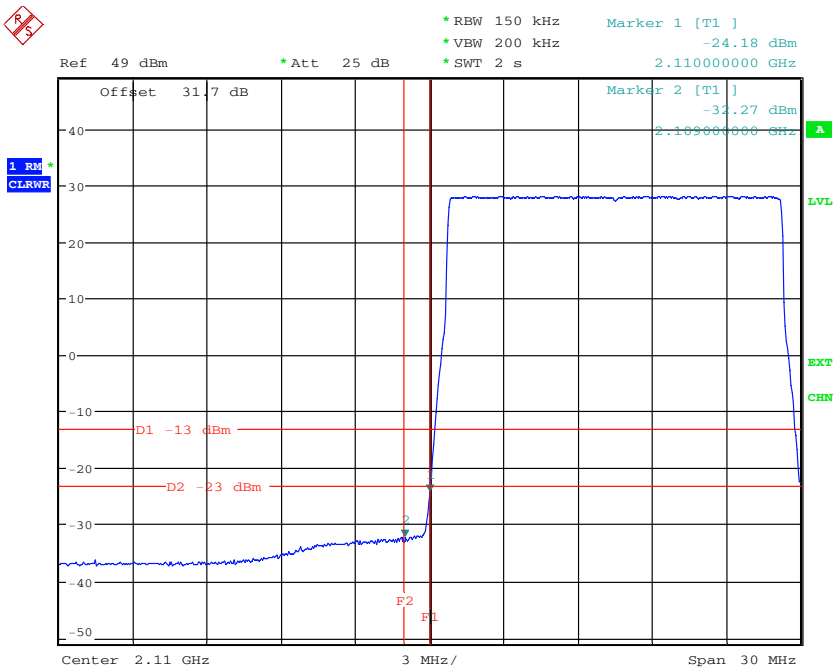


Figure 7-85: Spurious Emissions (Lower Band Edge) – QPSK (2117.5 MHz) (15MHz Channel BW)

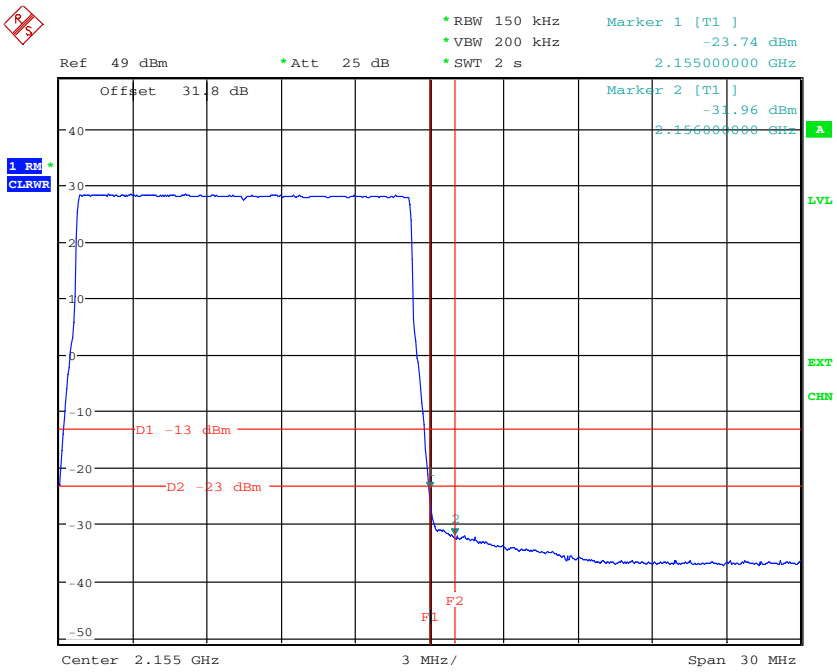


Figure 7-86: Spurious Emissions (Upper Band Edge) – QPSK (2147.5 MHz) (15MHz Channel BW)

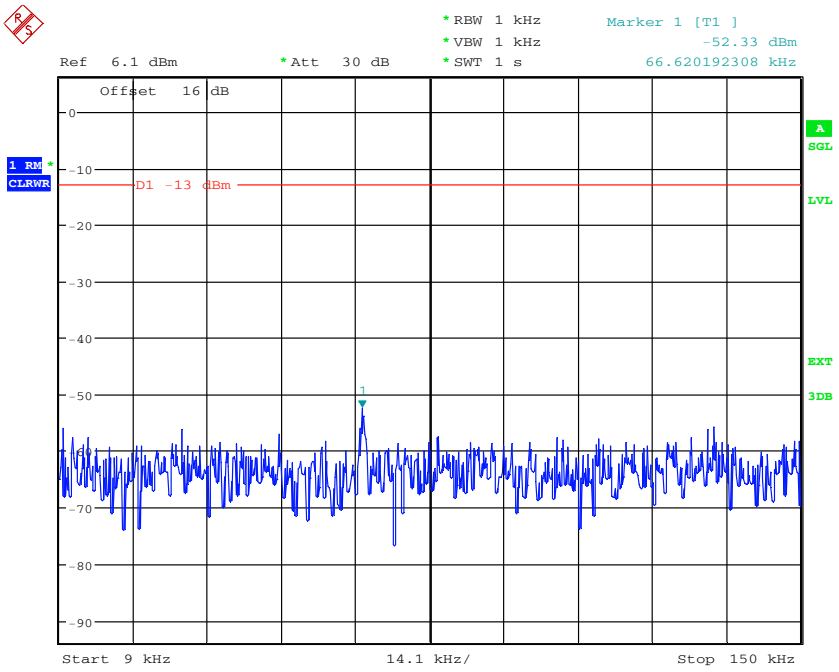


Figure 7-87: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (15MHz Channel BW)

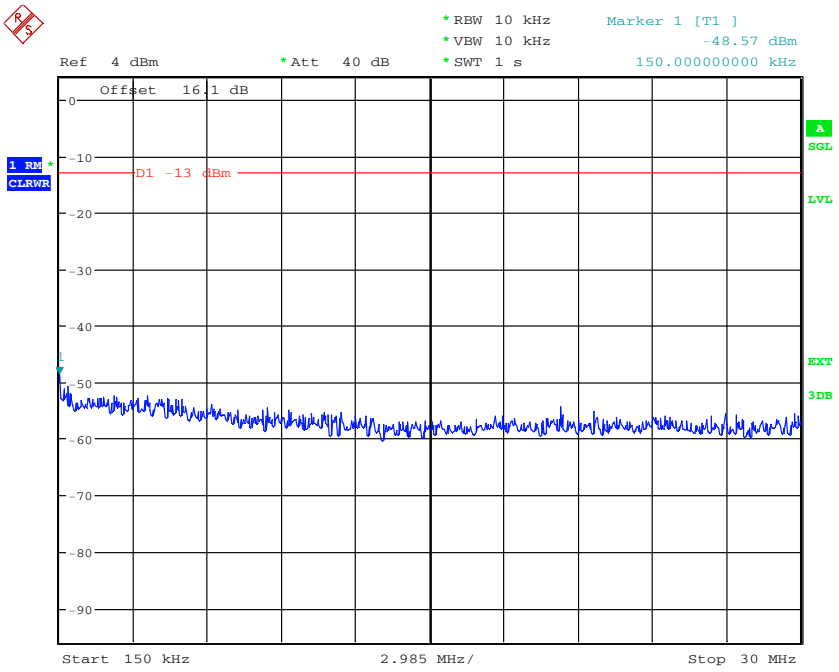


Figure 7-88: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (15MHz Channel BW)

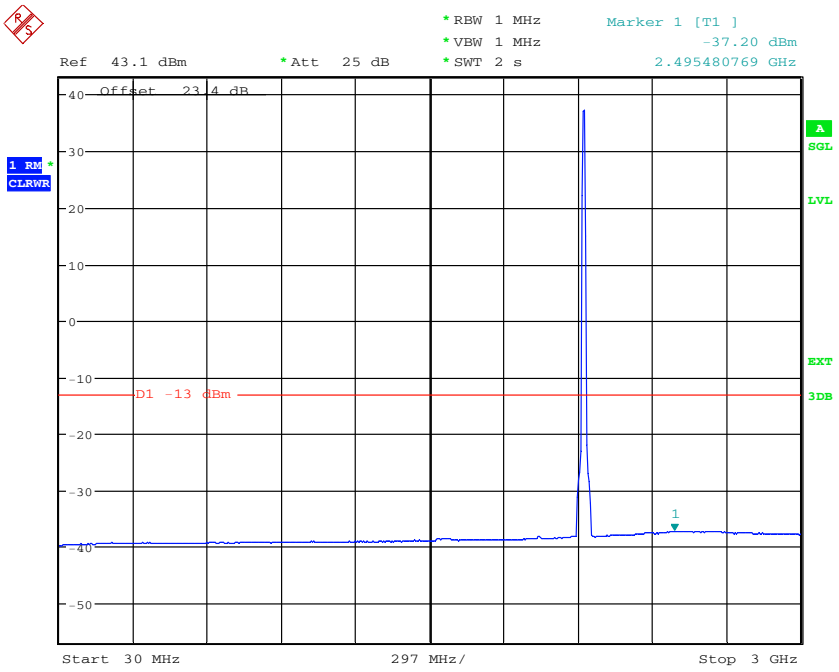


Figure 7-89: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (15MHz Channel BW)

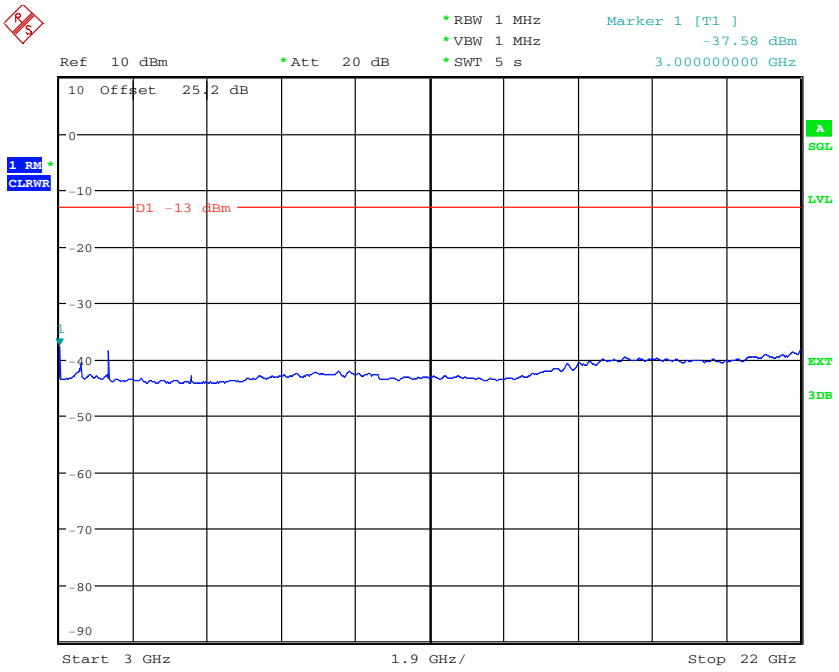
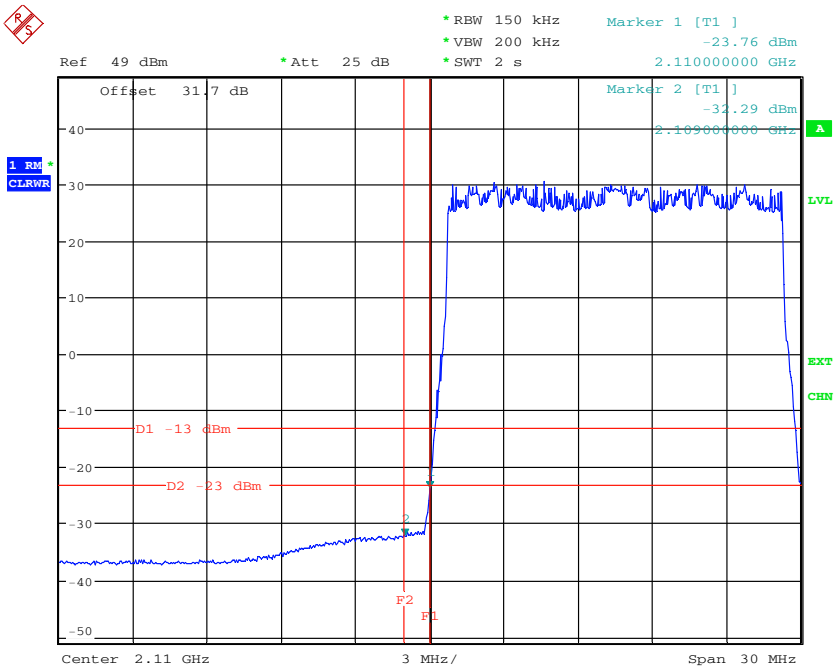
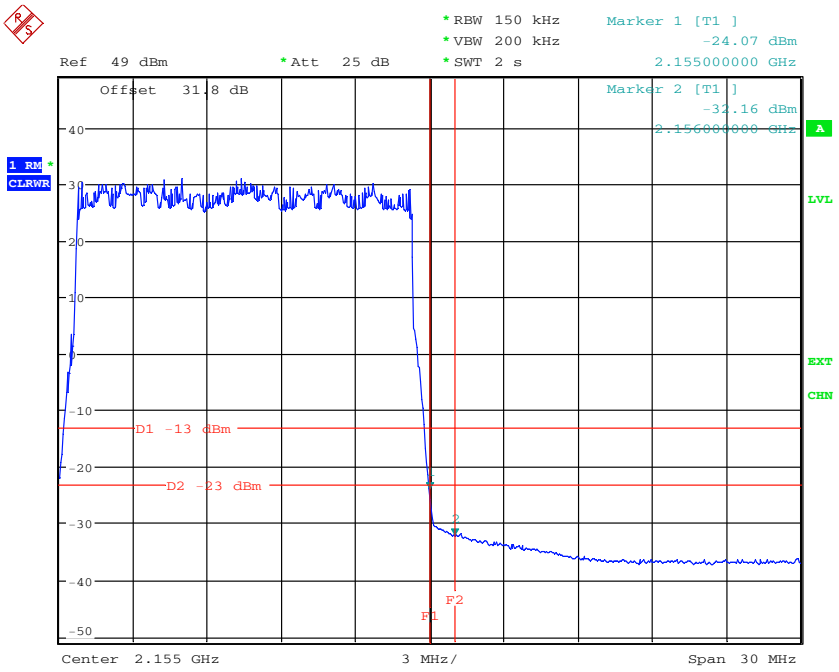


Figure 7-90: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (15MHz Channel BW)



Date: 27.SEP.2012 16:43:50

Figure 7-91: Spurious Emissions (Lower Band Edge) – 16QAM (2117.5 MHz) (15MHz Channel BW)



Date: 28.SEP.2012 13:08:51

Figure 7-92: Spurious Emissions (Upper Band Edge) – 16QAM (2147.5 MHz) (15MHz Channel BW)

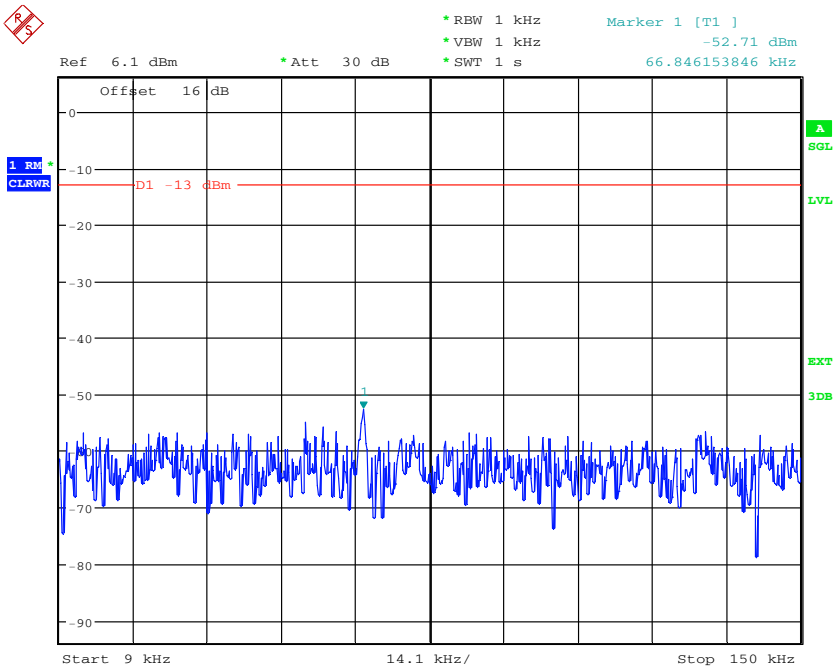


Figure 7-93: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

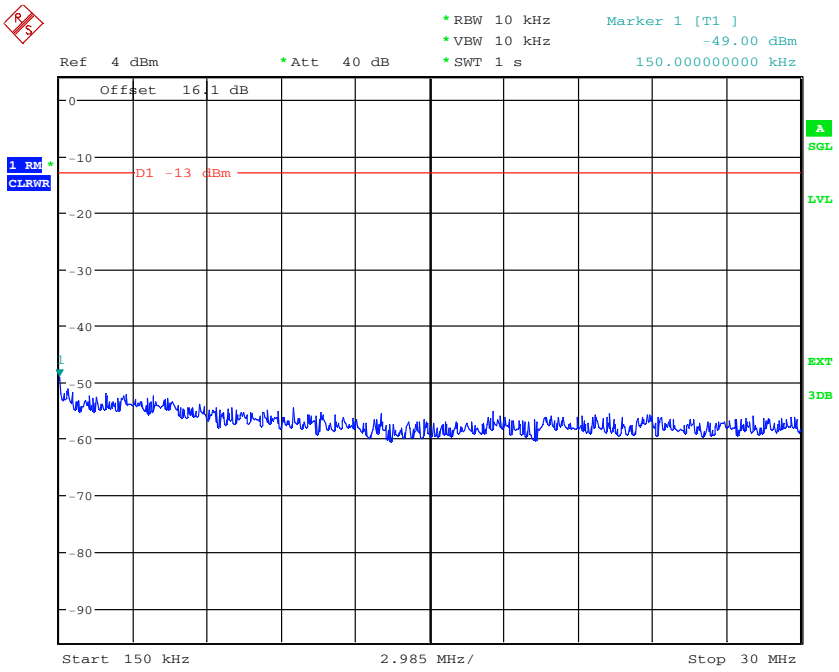


Figure 7-94: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

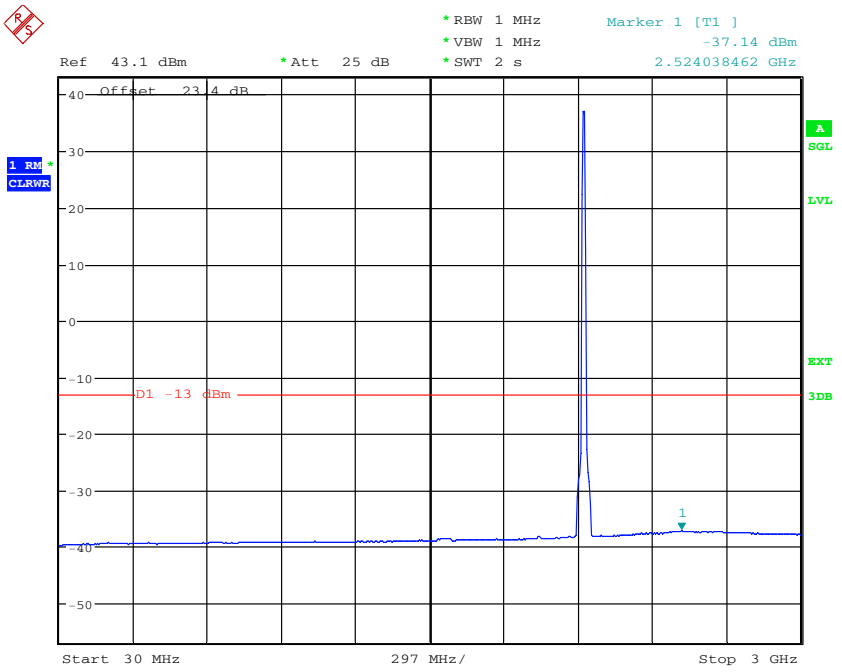


Figure 7-95: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

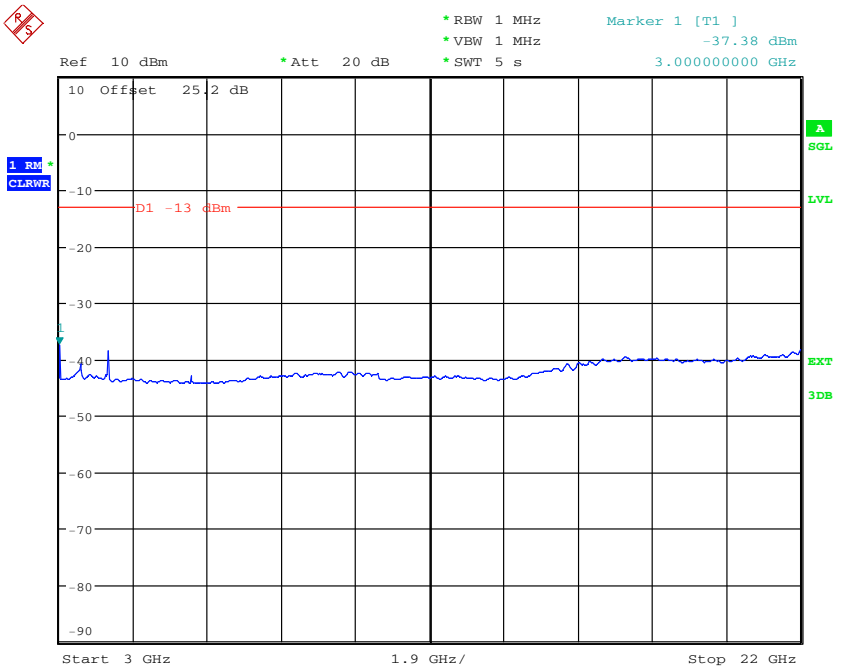
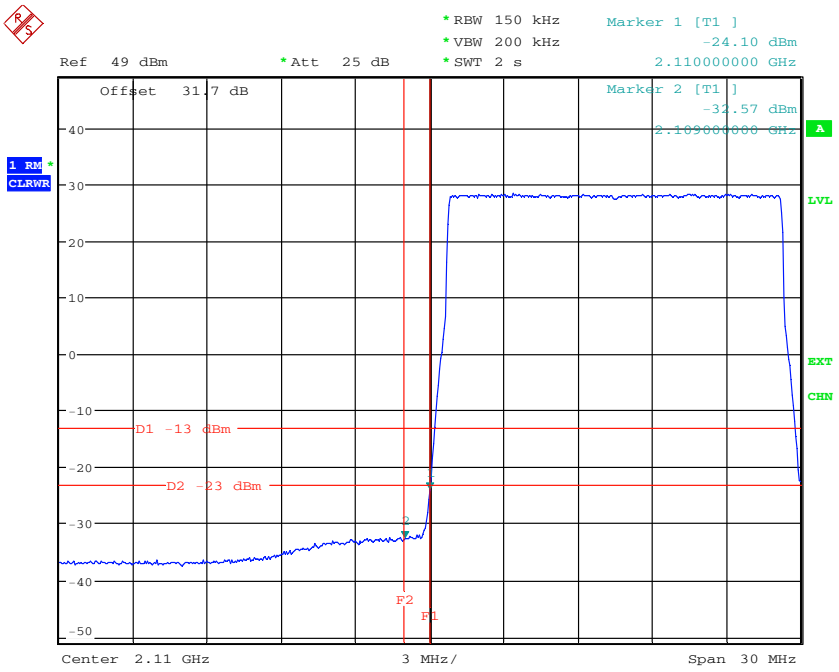
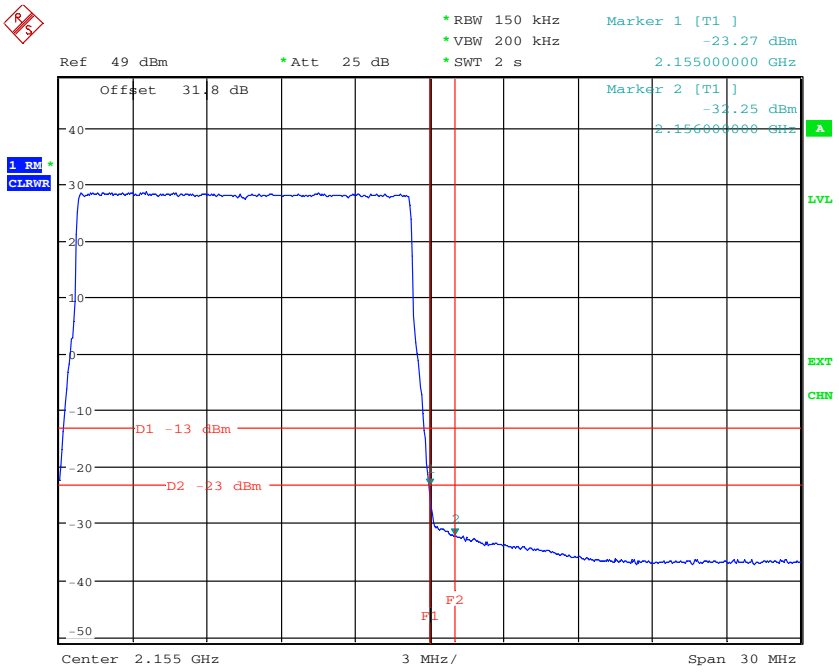


Figure 7-96: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)



Date: 27.SEP.2012 16:47:22

Figure 7-97: Spurious Emissions (Lower Band Edge) – 64QAM (2117.5 MHz) (15MHz Channel BW)



Date: 28.SEP.2012 13:13:54

Figure 7-98: Spurious Emissions (Upper Band Edge) – 64QAM (2147.5 MHz) (15MHz Channel BW)

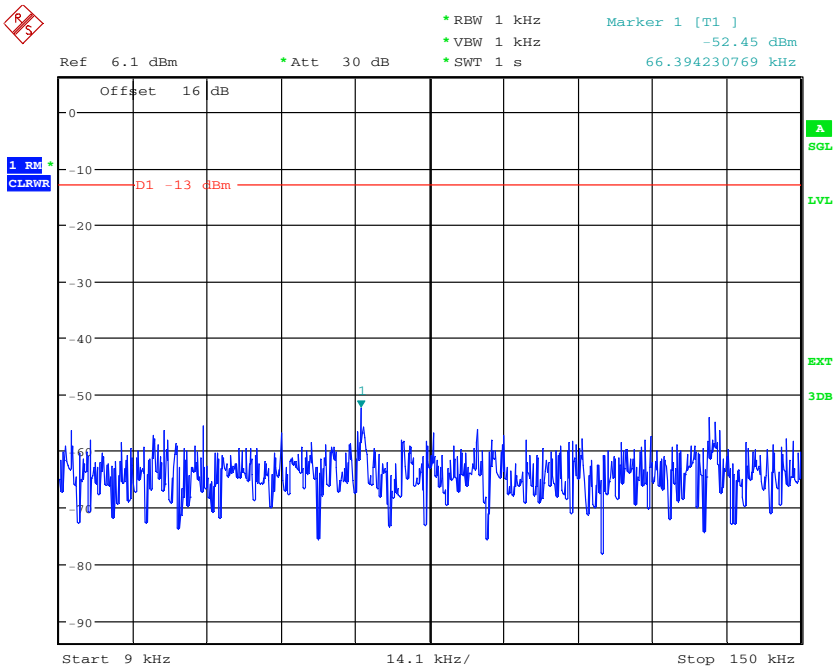


Figure 7-99: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)

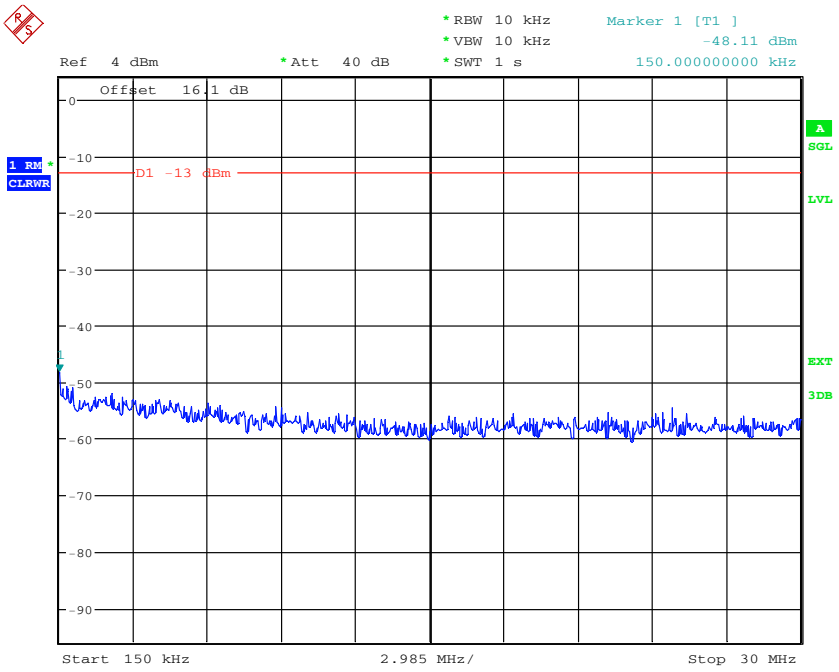
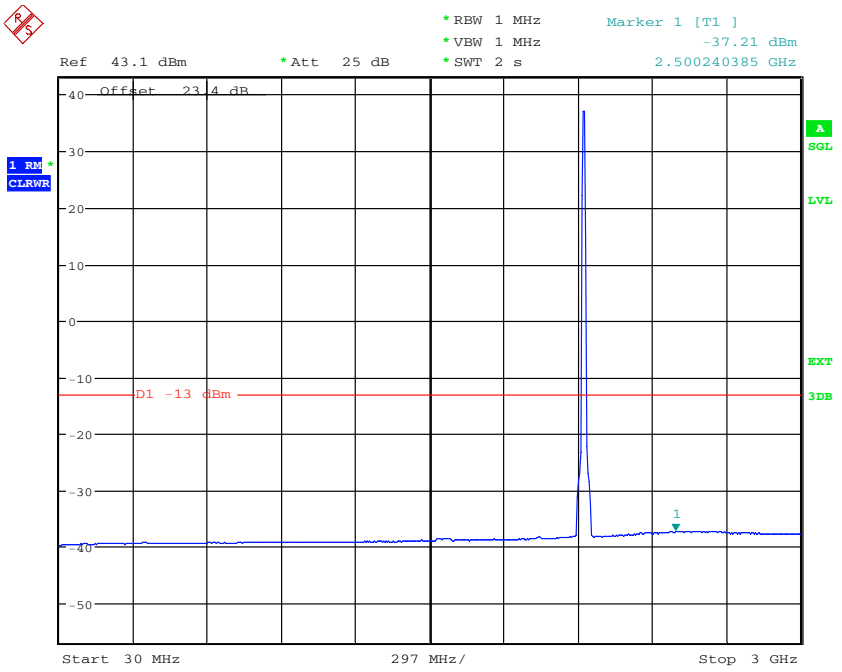
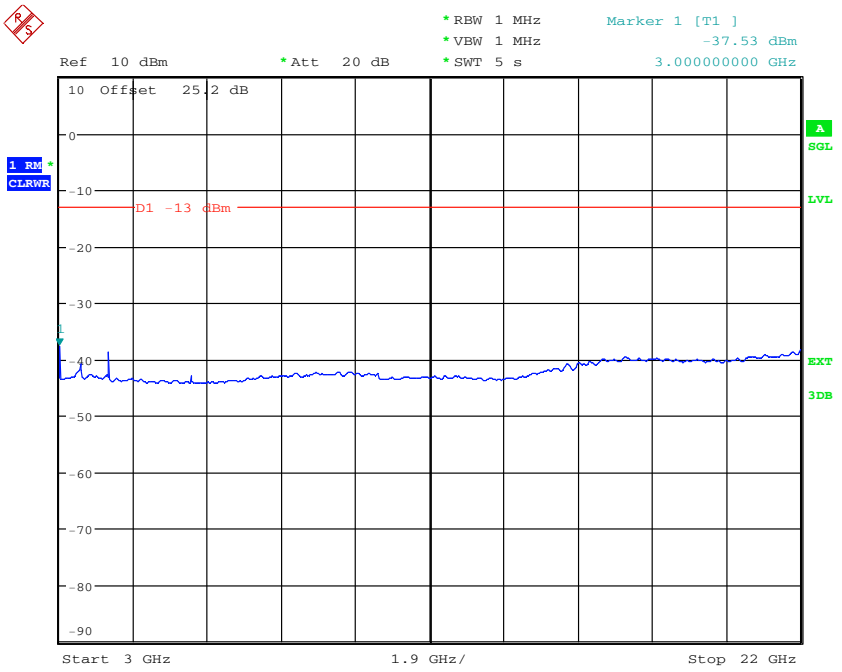


Figure 7-100: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)



Date: 4.OCT.2012 13:30:03

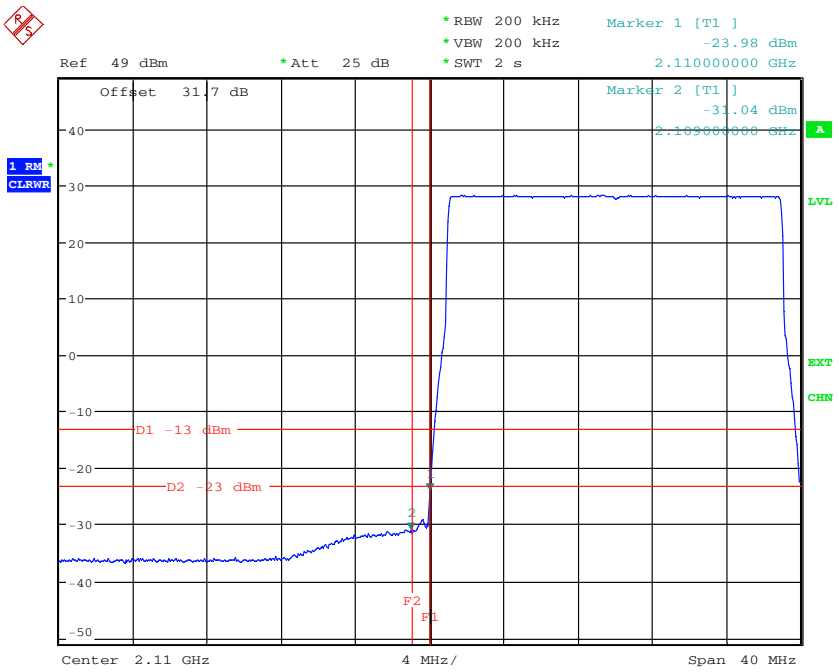
Figure 7-101: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)



Date: 4.OCT.2012 13:30:38

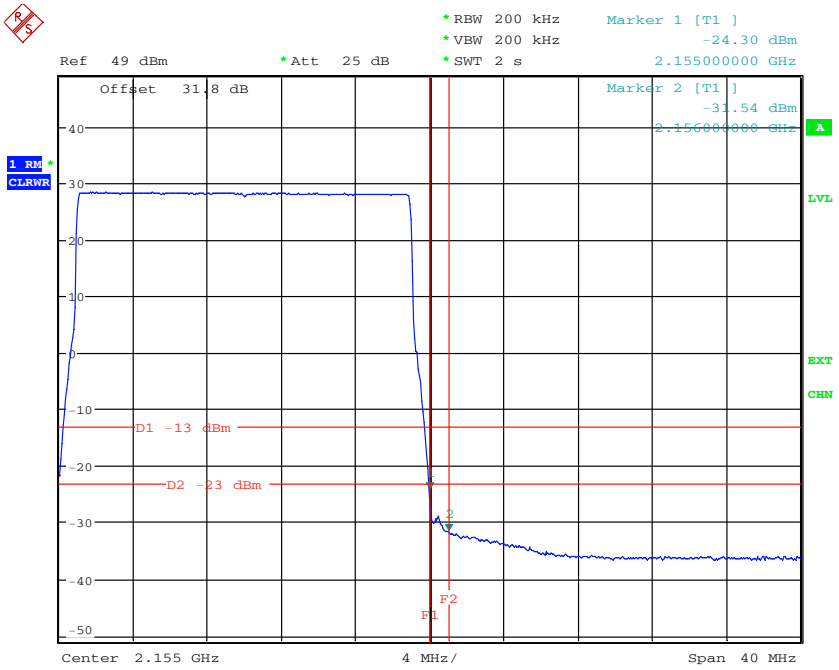
Figure 7-102: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)

Config D ANT1:



Date: 28.SEP.2012 10:16:42

Figure 7-103: Spurious Emissions (Lower Band Edge) – QPSK (2120.0 MHz) (20MHz Channel BW)



Date: 28.SEP.2012 10:18:38

Figure 7-104: Spurious Emissions (Upper Band Edge) – QPSK (2145.0 MHz) (20MHz Channel BW)

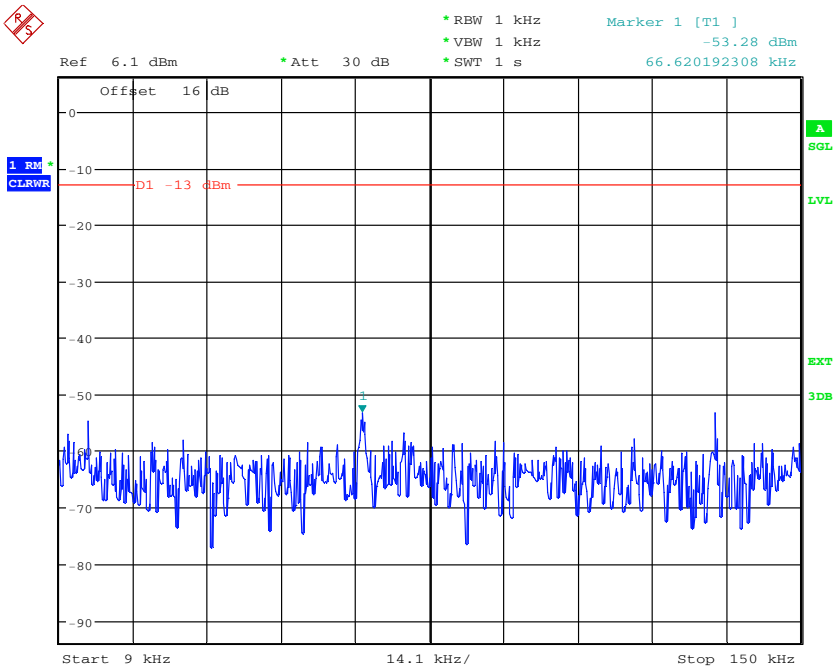


Figure 7-105: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (20MHz Channel BW)

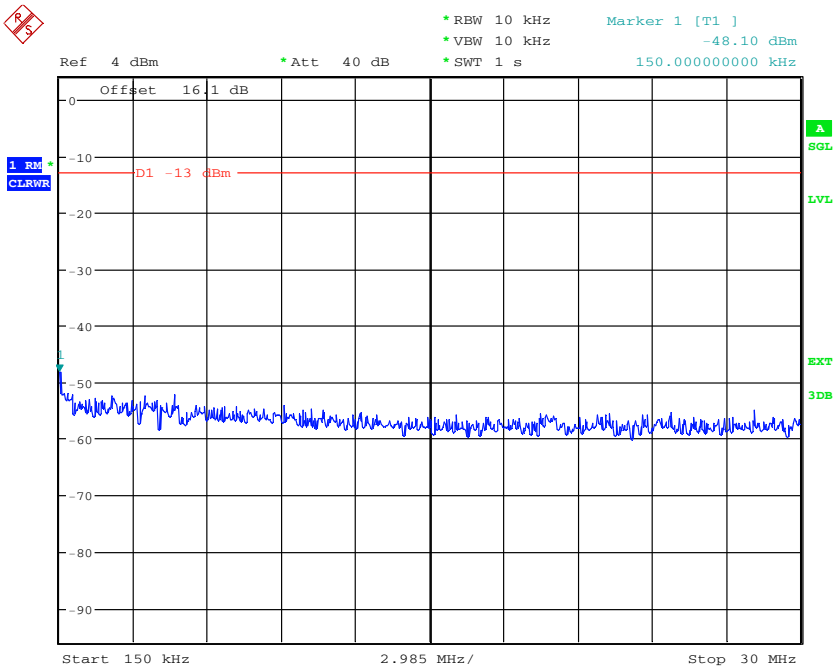
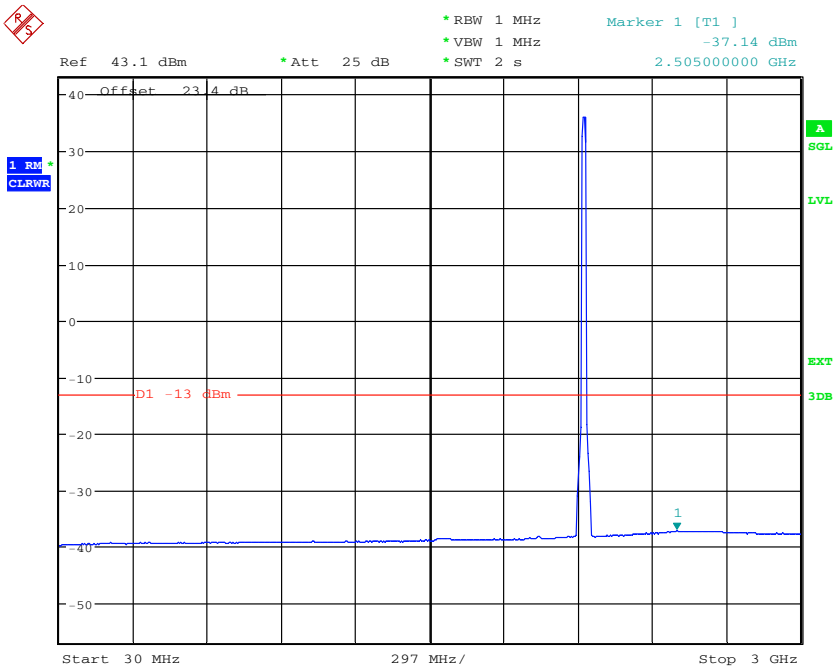
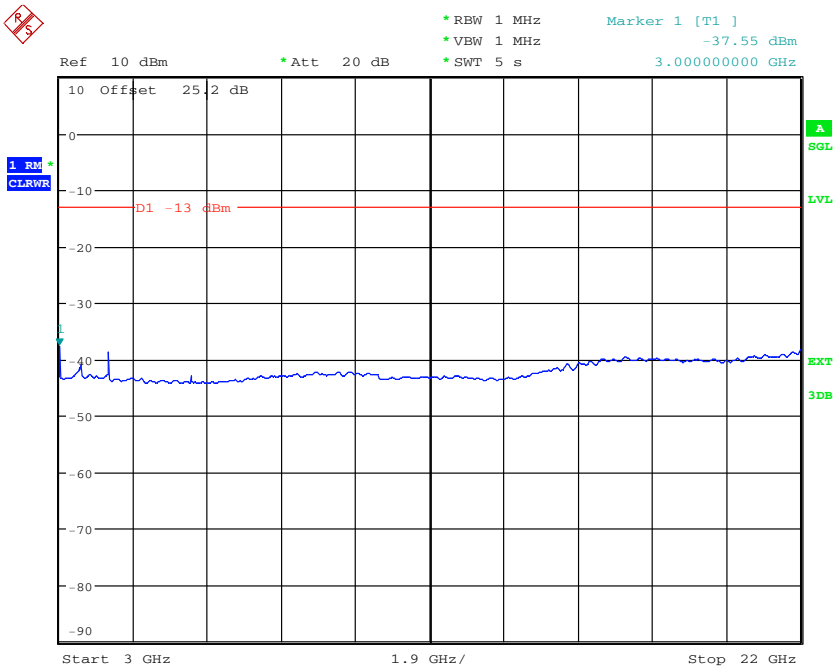


Figure 7-106: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (20MHz Channel BW)



Date: 4.OCT.2012 13:58:07

Figure 7-107: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (20MHz Channel BW)



Date: 4.OCT.2012 13:59:00

Figure 7-108: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (20MHz Channel BW)

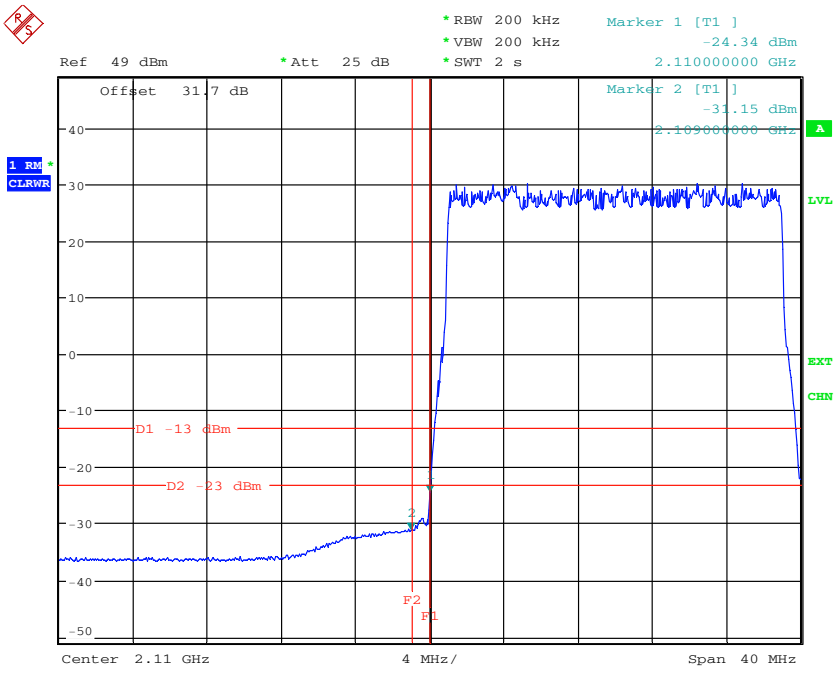


Figure 7-109: Spurious Emissions (Lower Band Edge) – 16QAM (2120.0 MHz) (20MHz Channel BW)

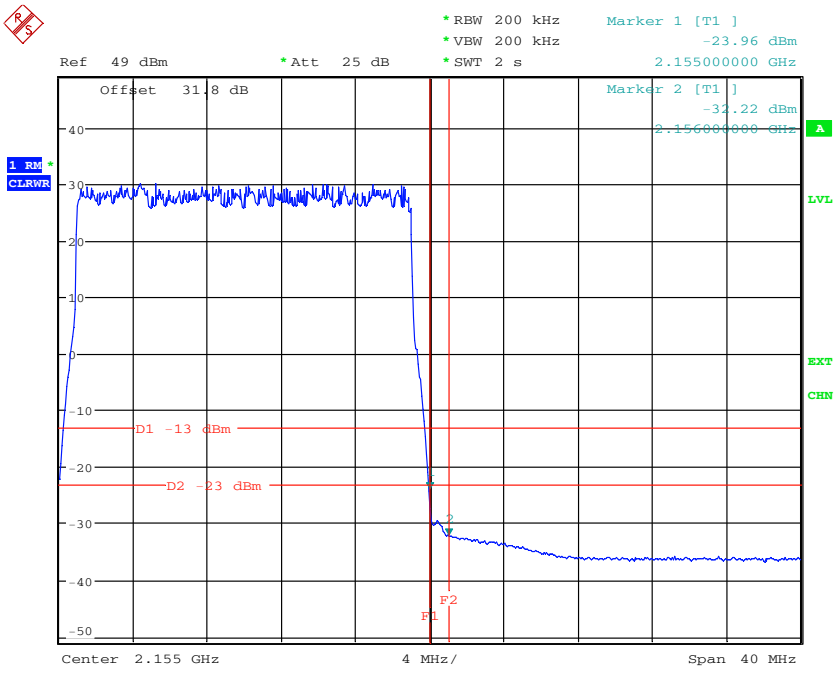


Figure 7-110: Spurious Emissions (Upper Band Edge) – 16QAM (2145.0 MHz) (20MHz Channel BW)

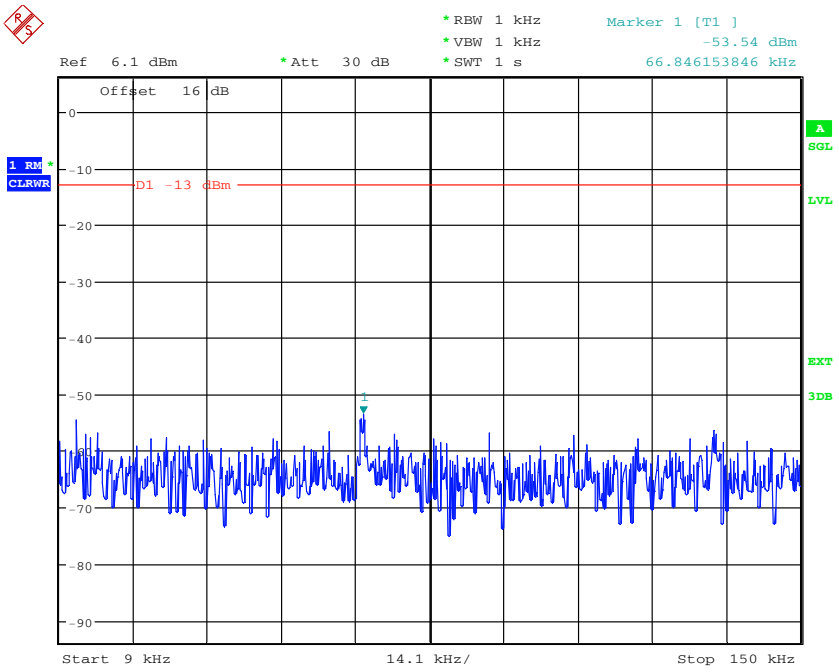


Figure 7-111: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)

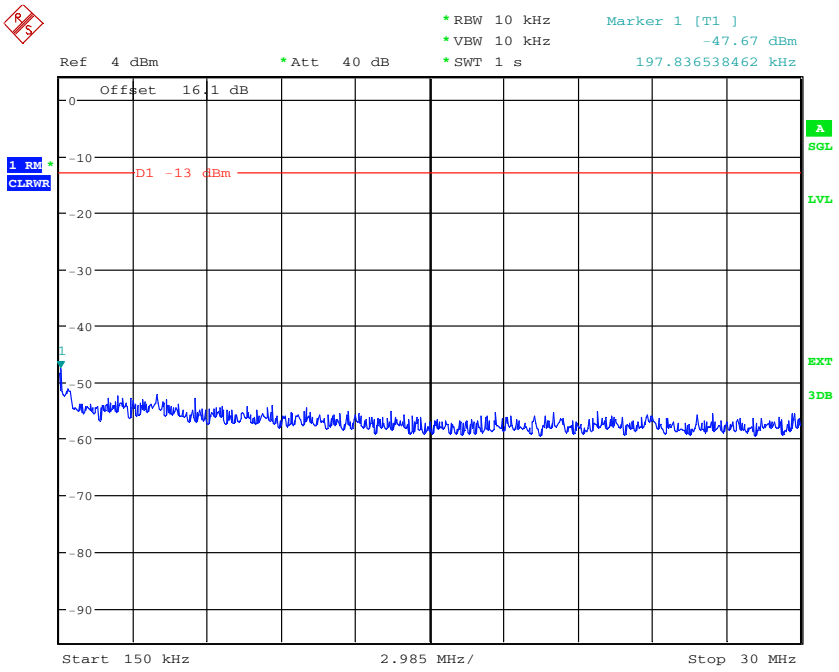
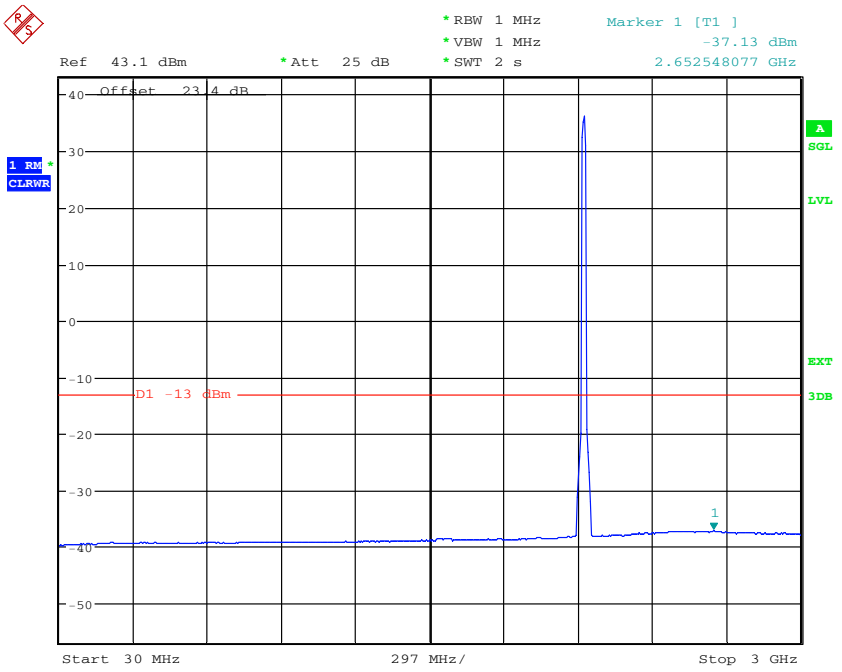
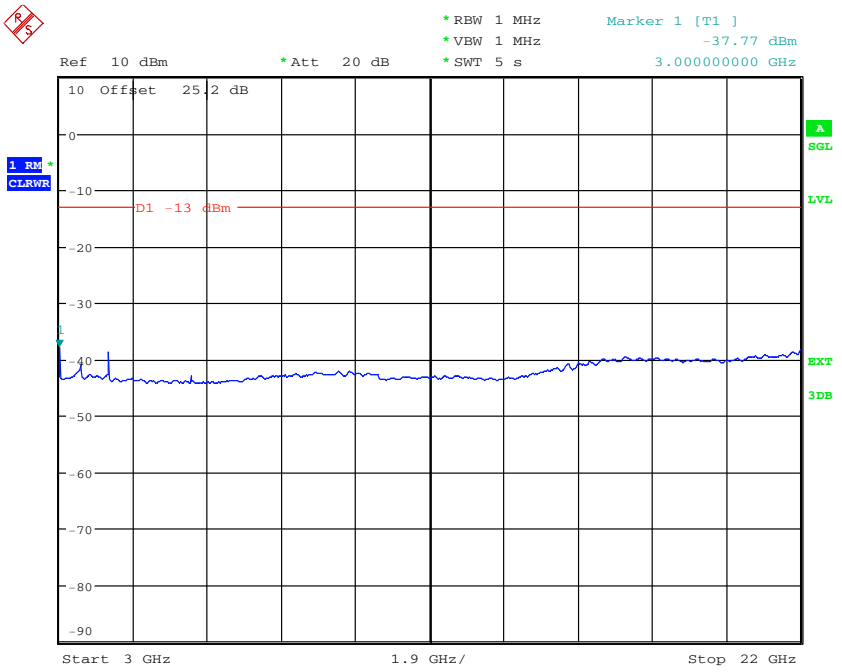


Figure 7-112: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)



Date: 4.OCT.2012 14:00:58

Figure 7-113: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)



Date: 4.OCT.2012 14:01:42

Figure 7-114: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)

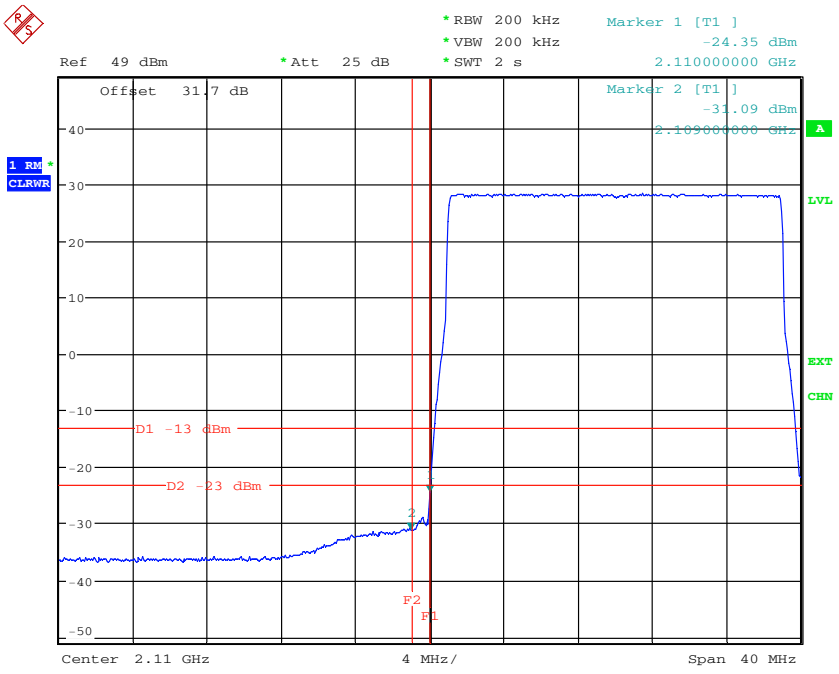


Figure 7-115: Spurious Emissions (Lower Band Edge) – 64QAM (2120.0 MHz) (20MHz Channel BW)

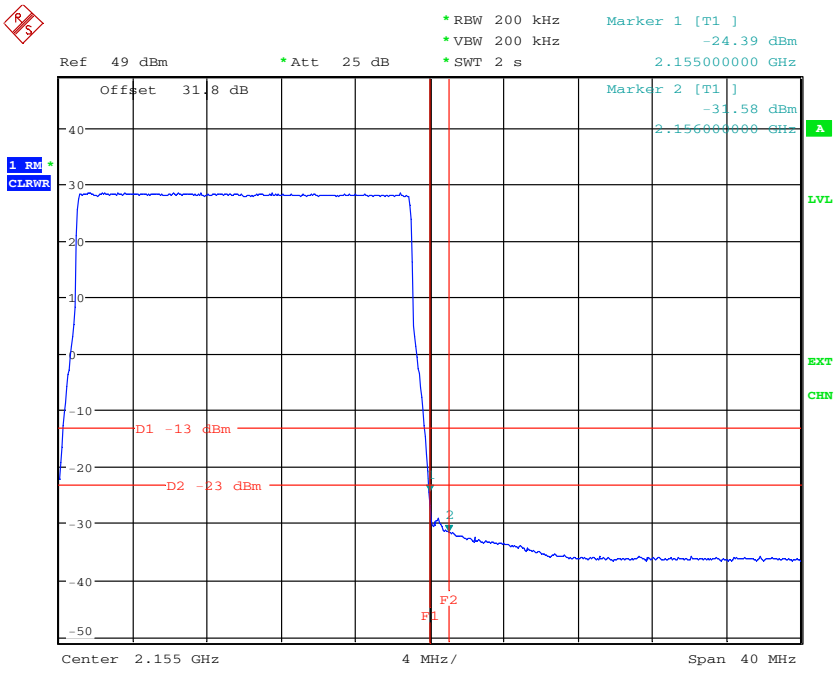
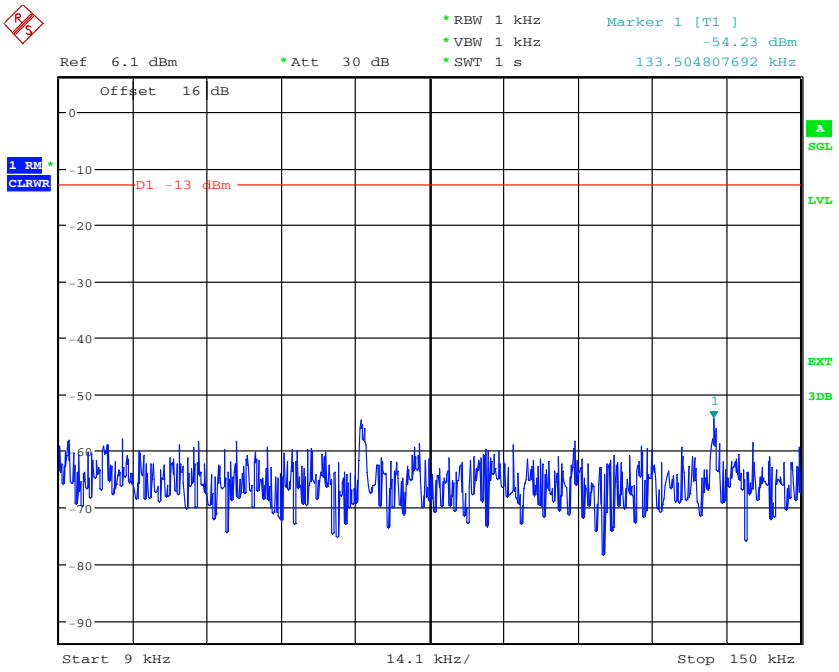
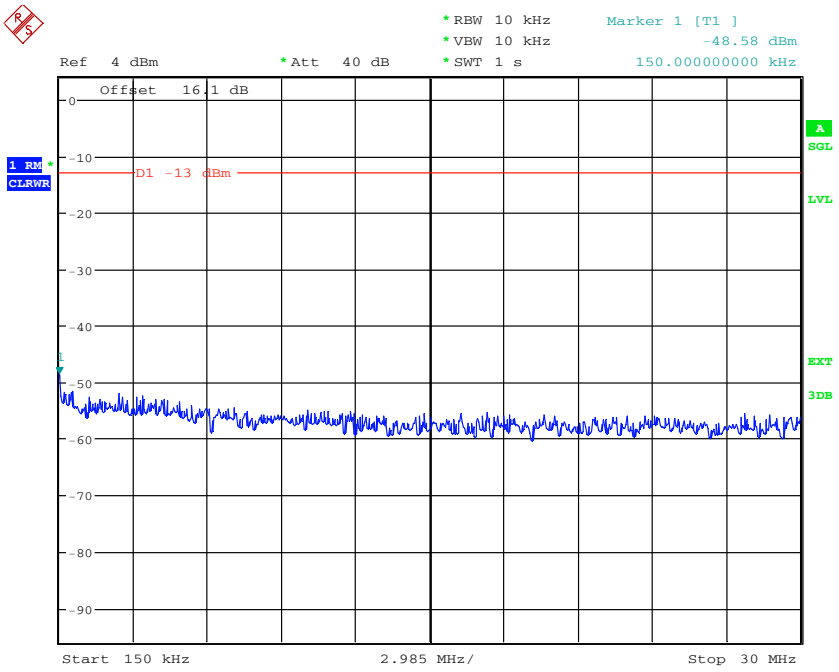


Figure 7-116: Spurious Emissions (Upper Band Edge) – 64QAM (2145.0 MHz) (20MHz Channel BW)



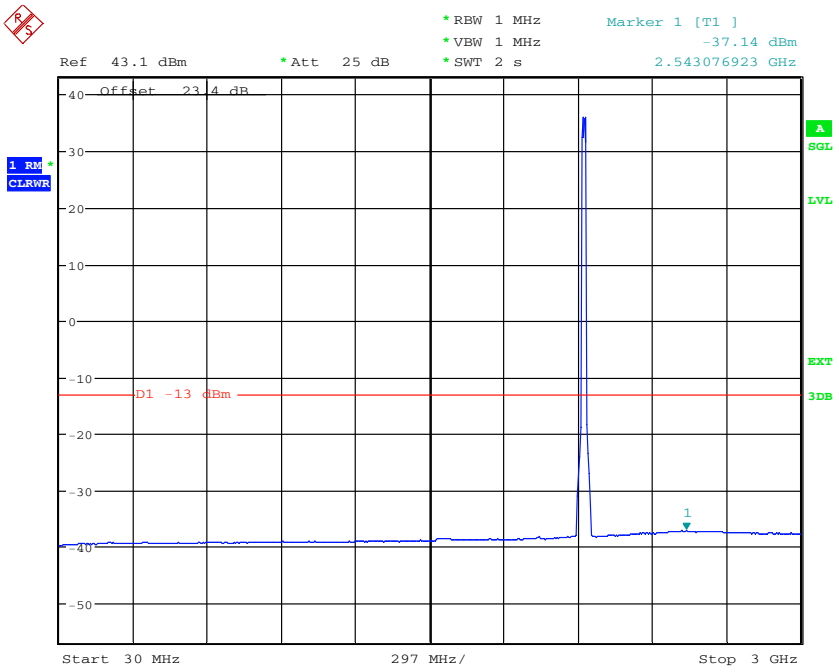
Date: 4.OCT.2012 14:02:26

Figure 7-117: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)



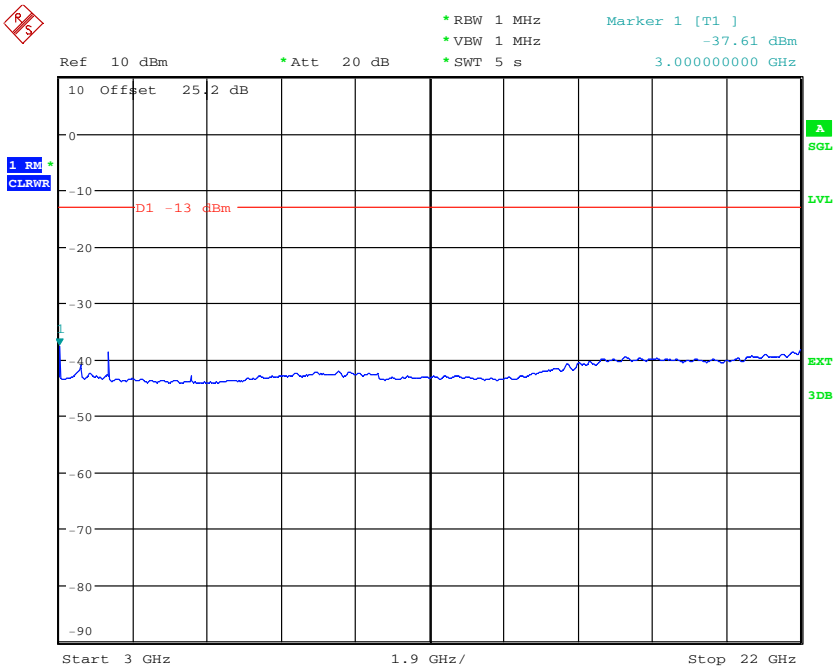
Date: 4.OCT.2012 14:02:55

Figure 7-118: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)



Date: 4.OCT.2012 14:03:32

Figure 7-119: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)



Date: 4.OCT.2012 14:04:08

Figure 7-120: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)

Config A ANT3:

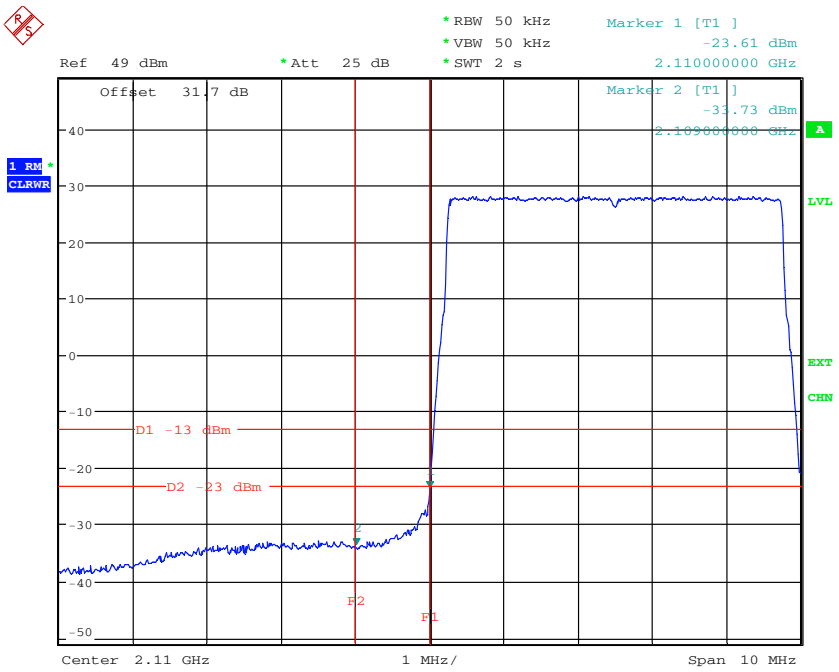


Figure 7-121: Spurious Emissions (Lower Band Edge) – QPSK (2112.5 MHz) (5MHz Channel BW)

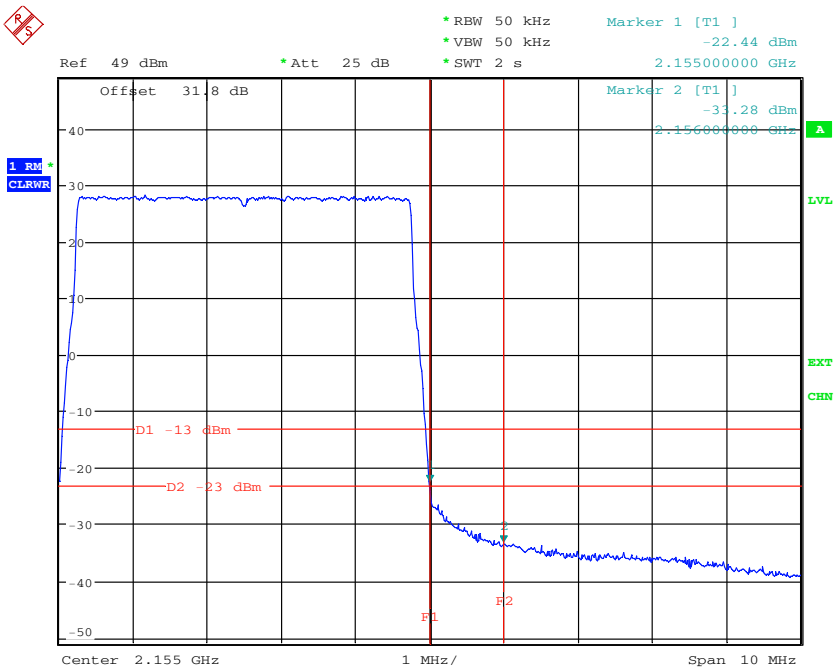


Figure 7-122: Spurious Emissions (Upper Band Edge) – QPSK (2152.5 MHz) (5MHz Channel BW)

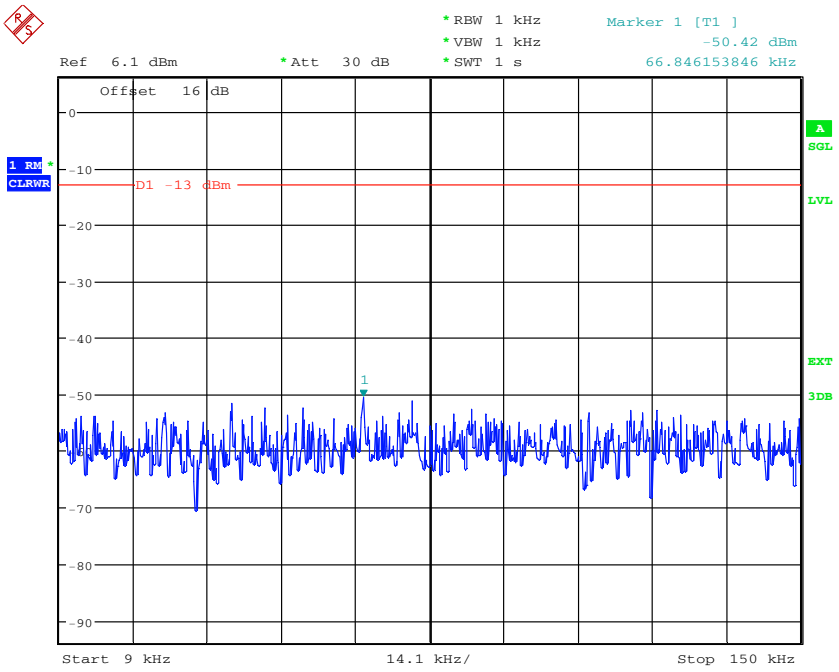


Figure 7-123: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

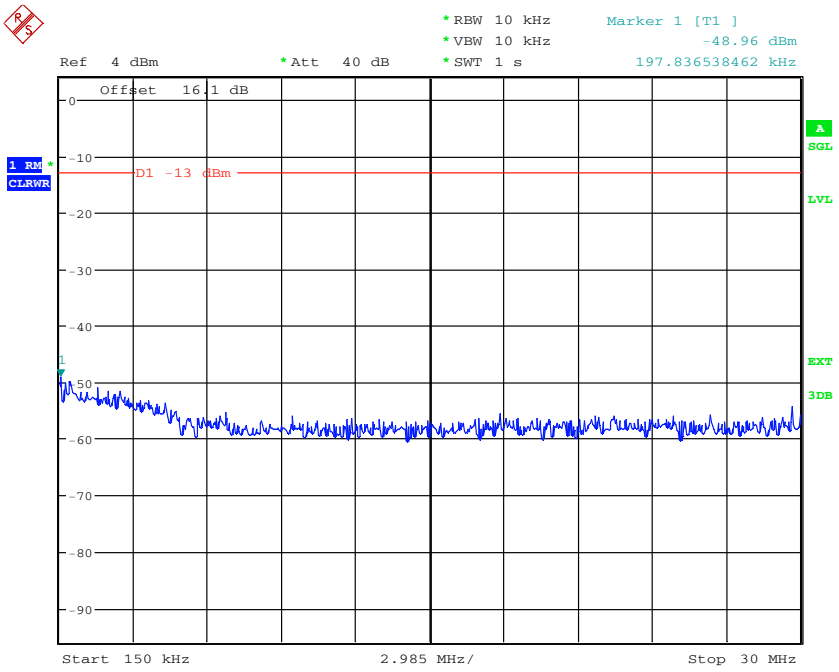


Figure 7-124: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

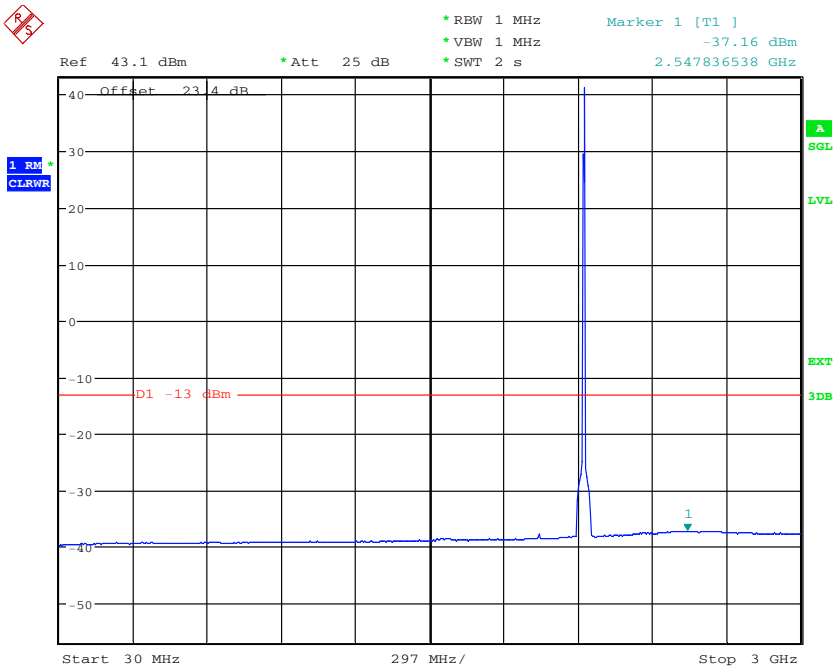


Figure 7-125: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

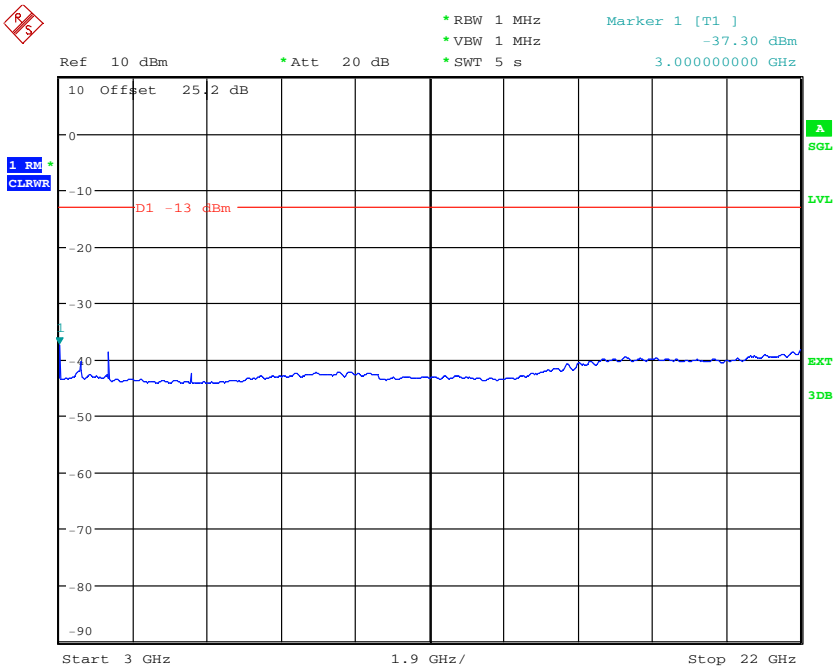


Figure 7-126: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

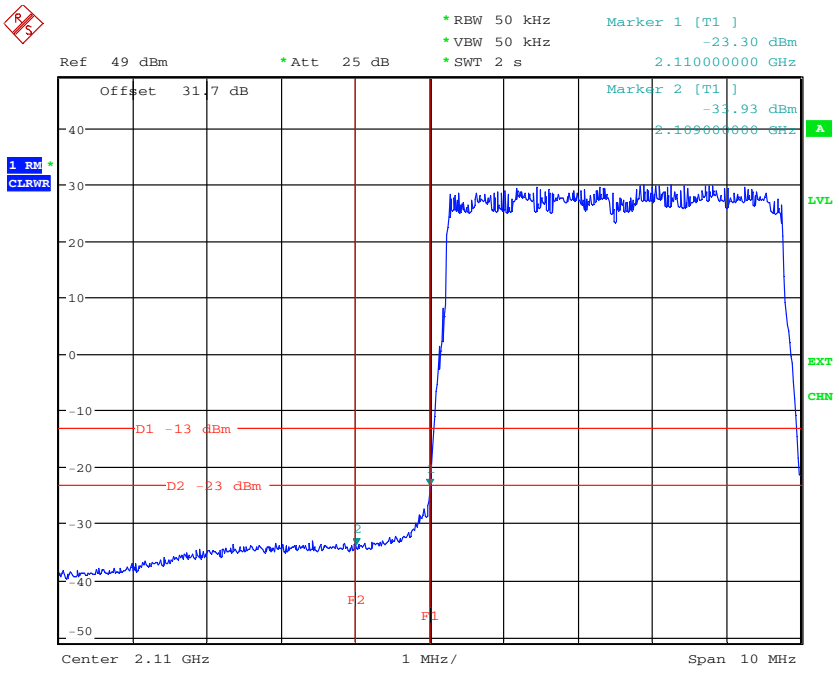


Figure 7-127: Spurious Emissions (Lower Band Edge) – 16QAM (2112.5 MHz) (5MHz Channel BW)

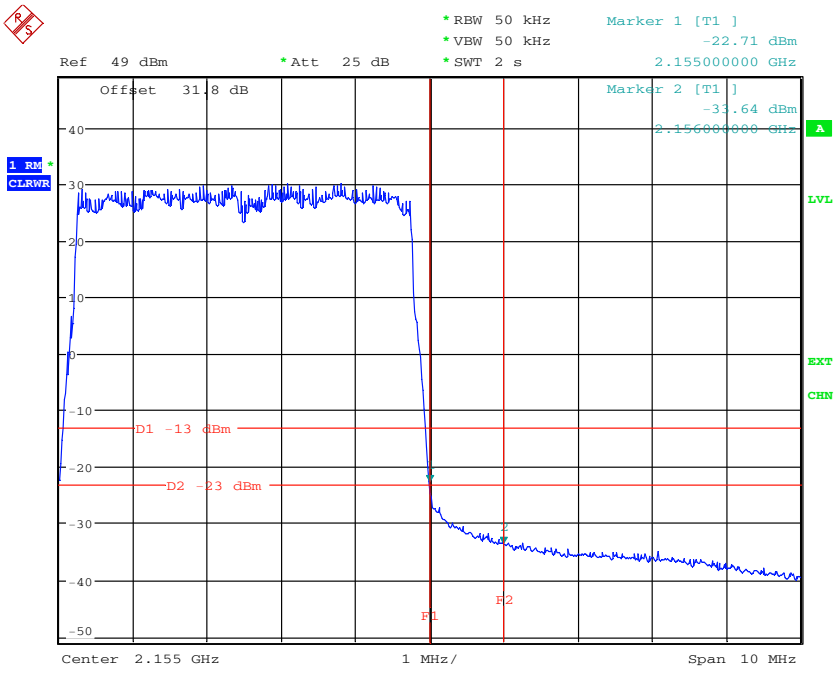


Figure 7-128: Spurious Emissions (Upper Band Edge) – 16QAM (2152.5 MHz) (5MHz Channel BW)

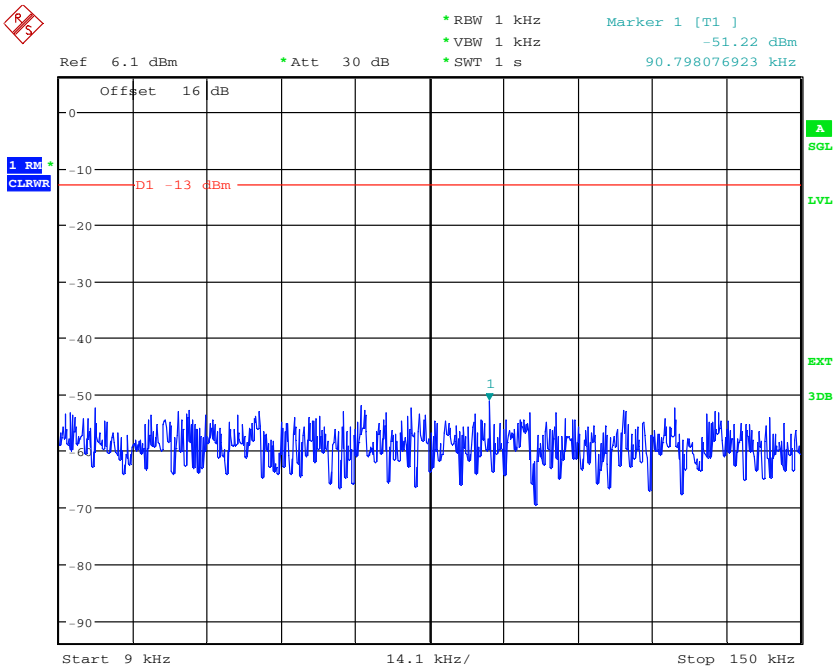


Figure 7-129: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

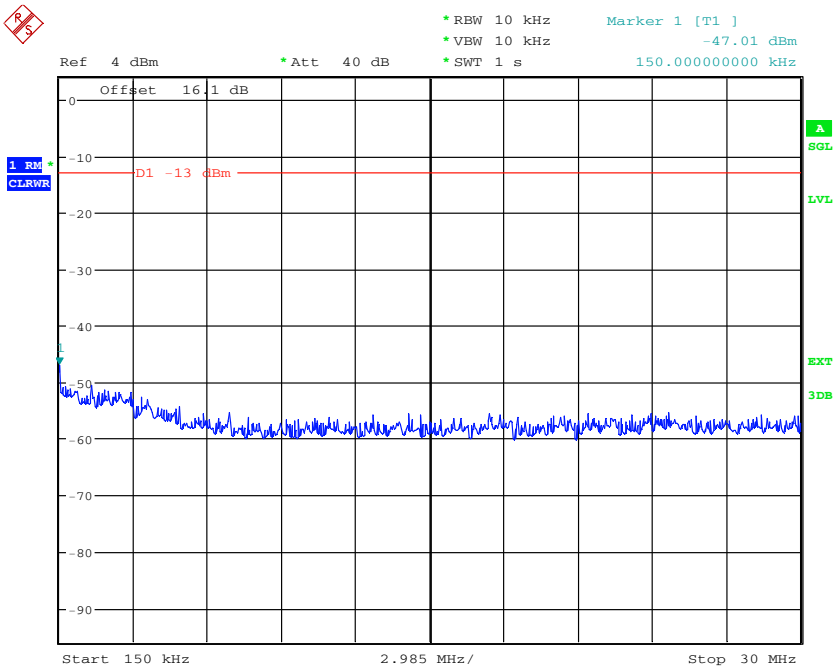


Figure 7-130: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

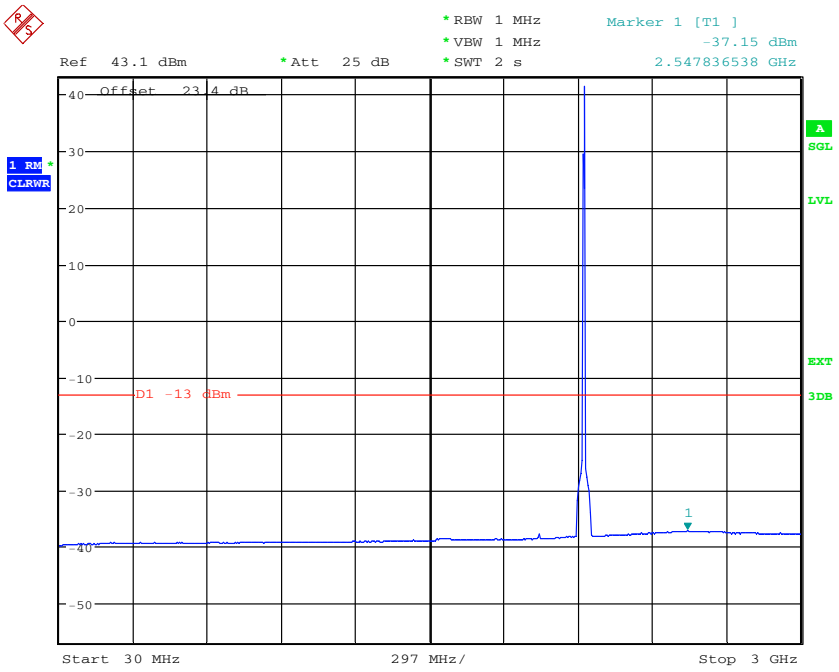


Figure 7-131: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

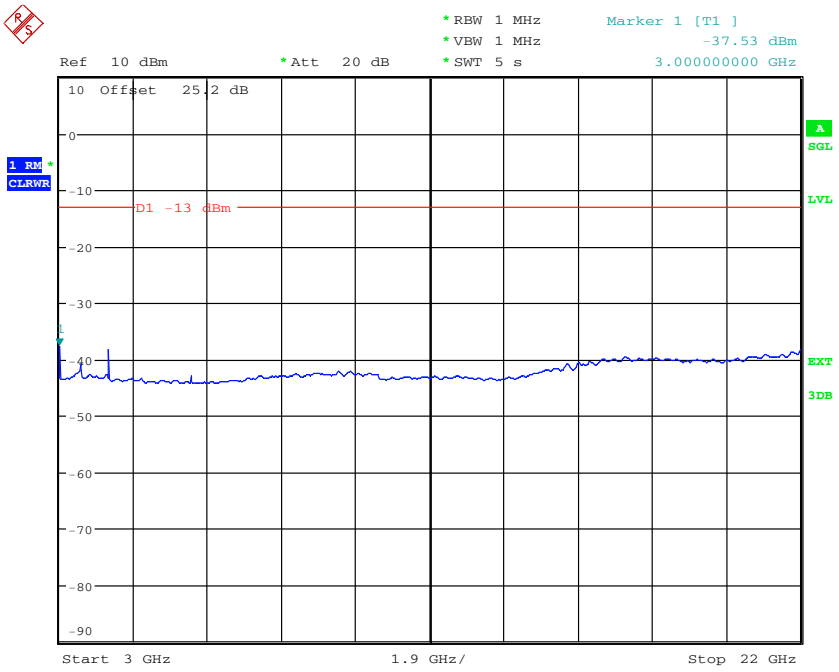


Figure 7-132: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

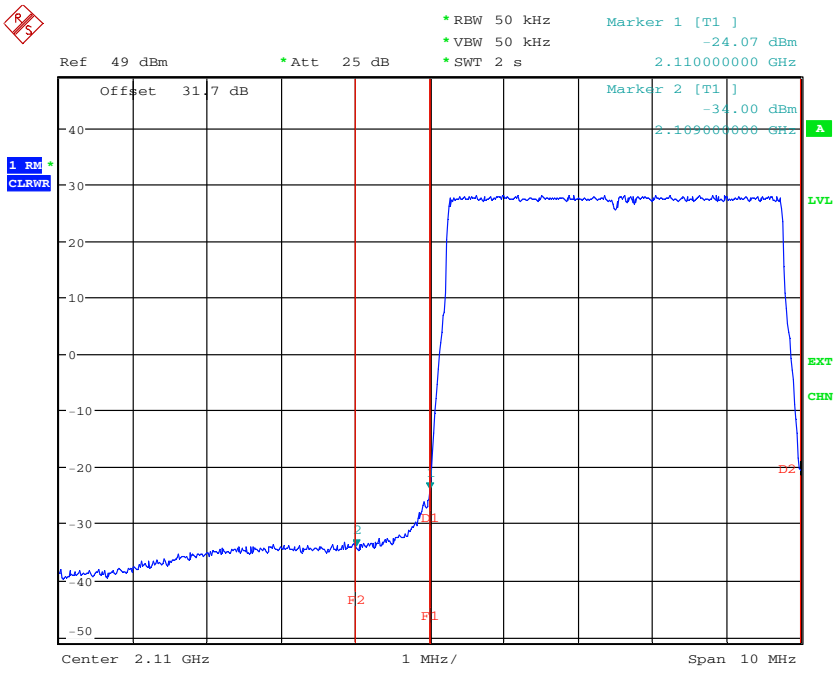


Figure 7-133: Spurious Emissions (Lower Band Edge) – 64QAM (2112.5 MHz) (5MHz Channel BW)

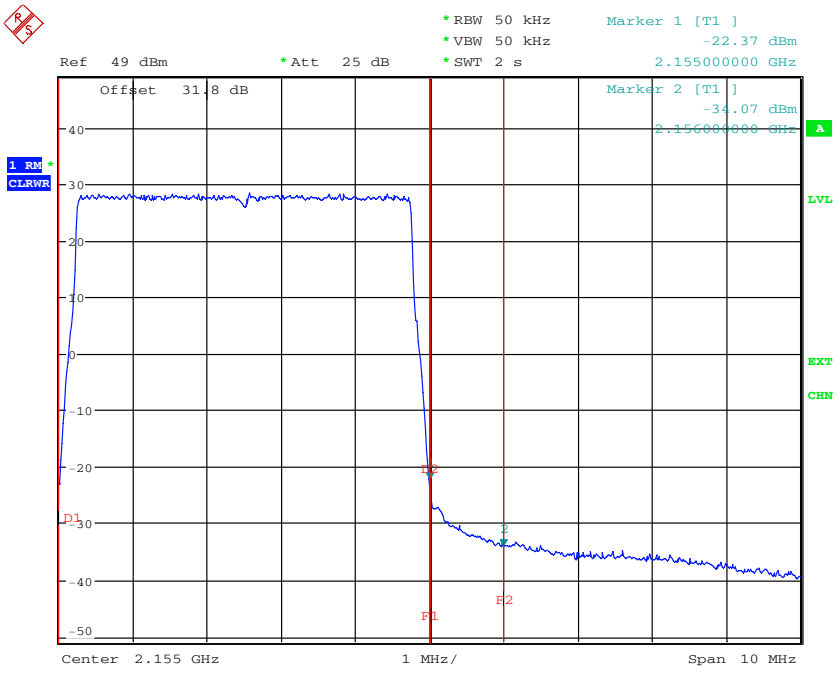


Figure 7-134: Spurious Emissions (Upper Band Edge) – 64QAM (2152.5 MHz) (5MHz Channel BW)

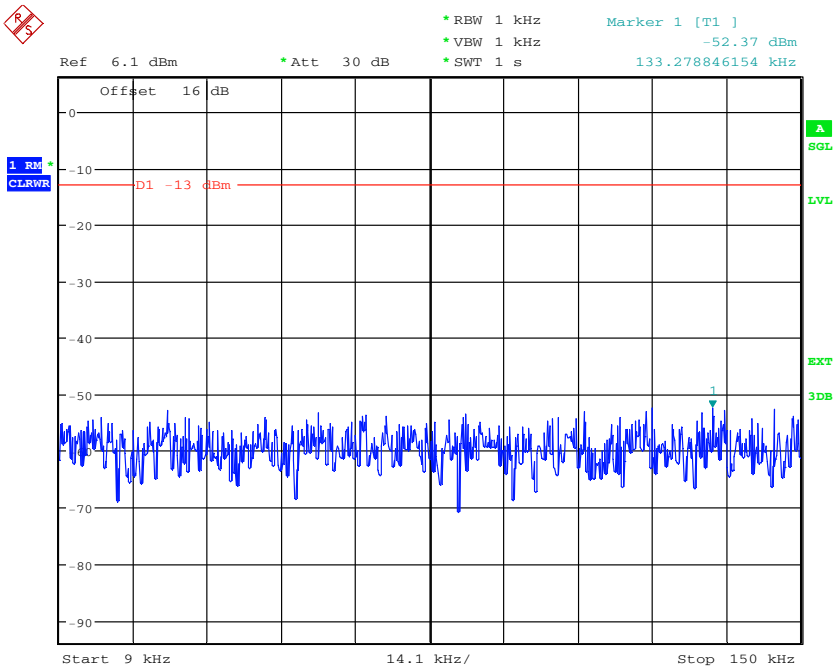


Figure 7-135: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)

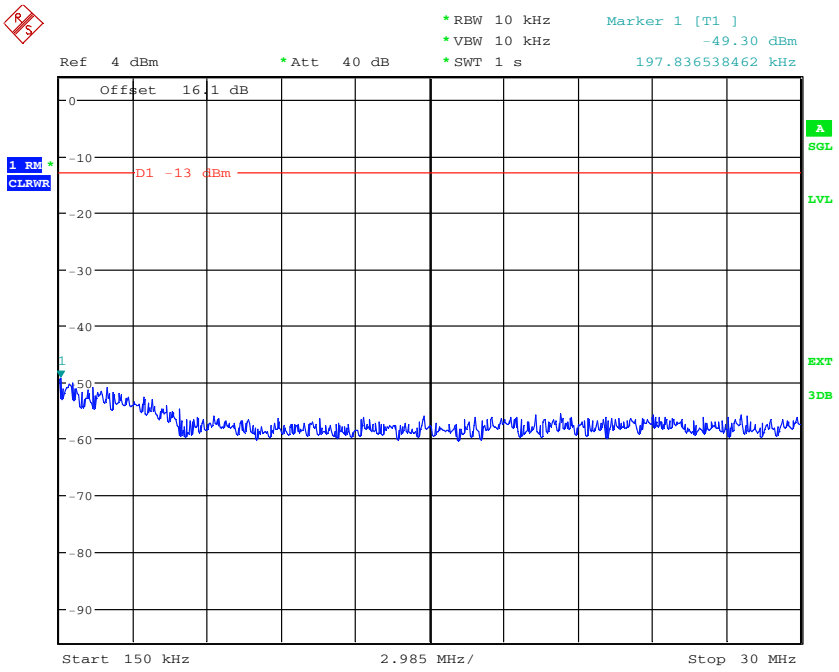
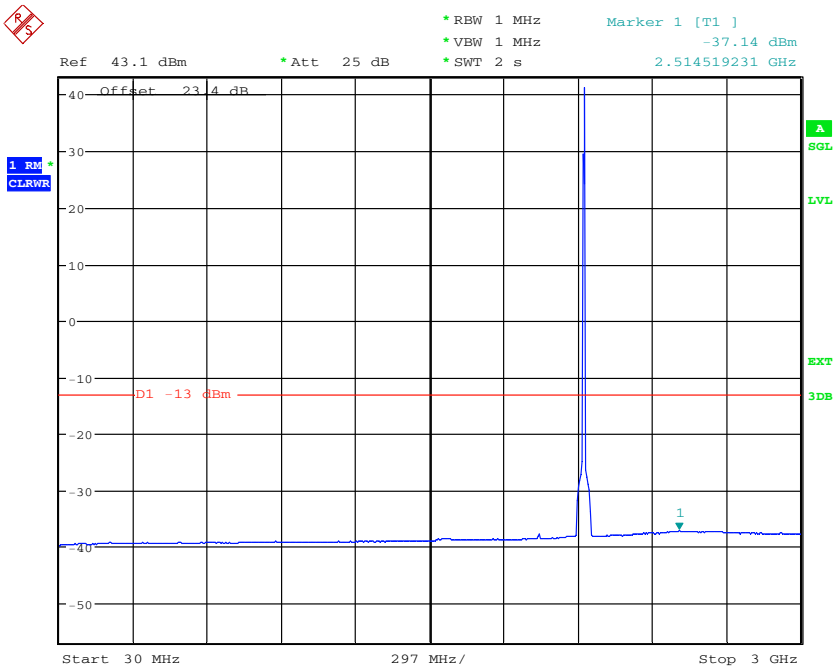
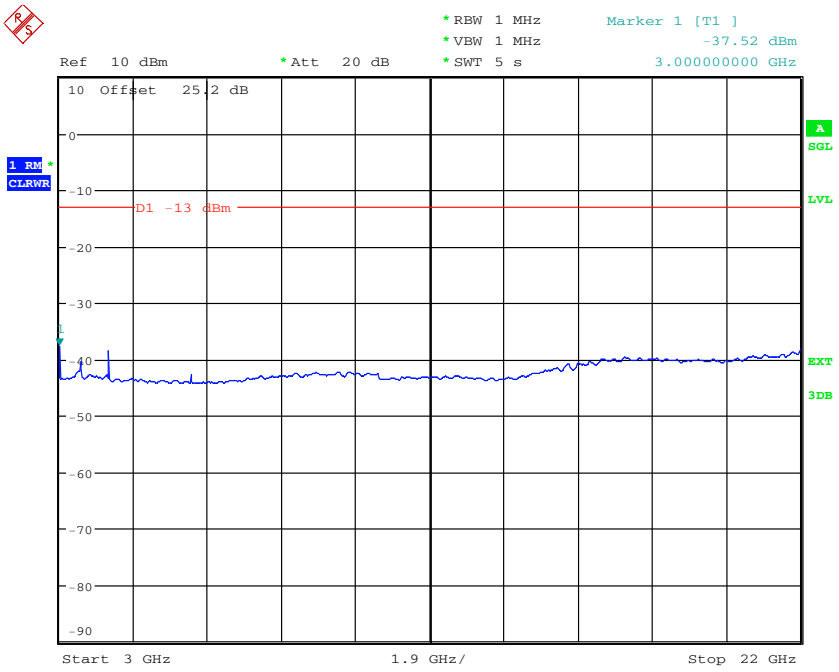


Figure 7-136: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)



Date: 4.OCT.2012 12:22:55

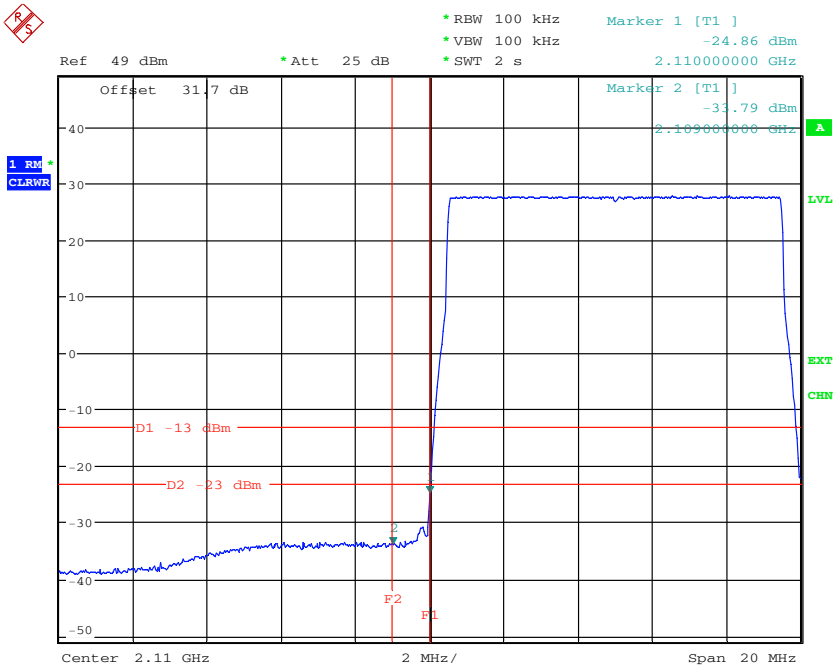
Figure 7-137: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)



Date: 4.OCT.2012 12:23:45

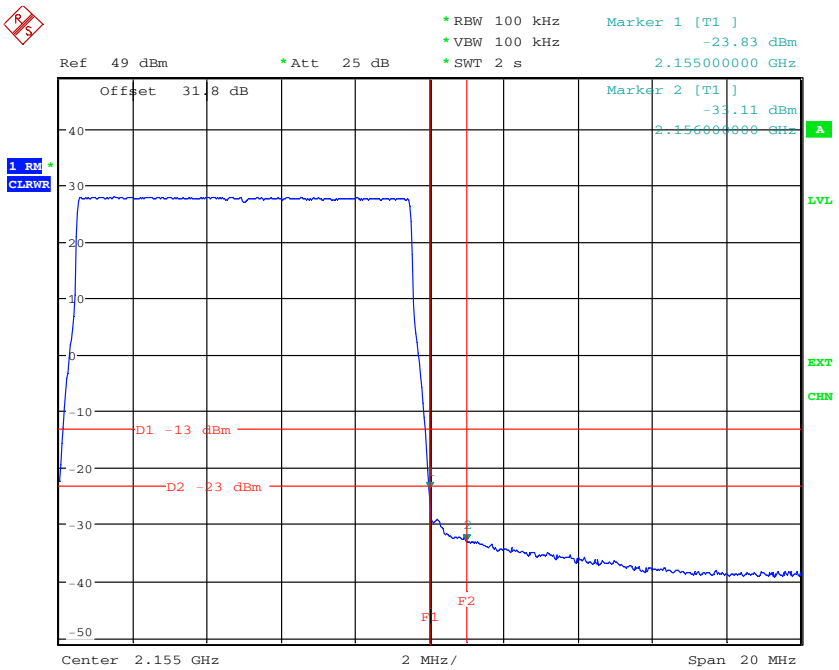
Figure 7-138: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)

Config B ANT3:



Date: 27.SEP.2012 15:55:45

Figure 7-139: Spurious Emissions (Lower Band Edge) – QPSK (2115.0 MHz) (10MHz Channel BW)



Date: 27.SEP.2012 16:02:27

Figure 7-140: Spurious Emissions (Upper Band Edge) – QPSK (2150.0 MHz) (10MHz Channel BW)

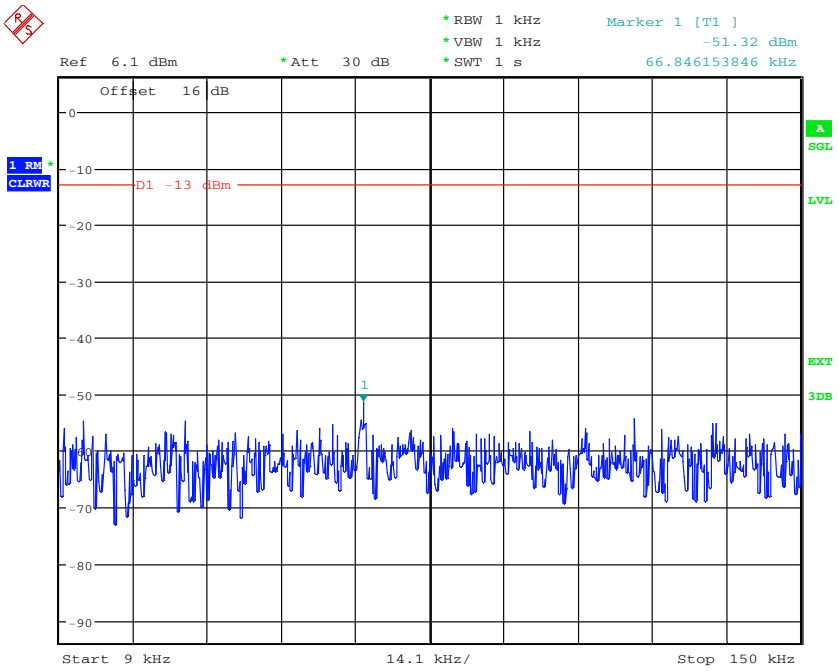


Figure 7-141: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (10MHz Channel BW)

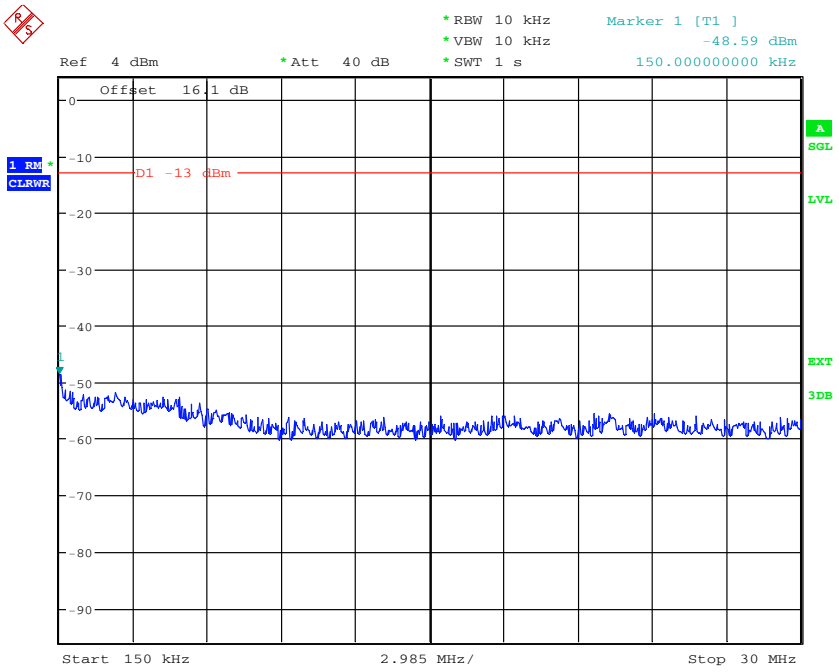
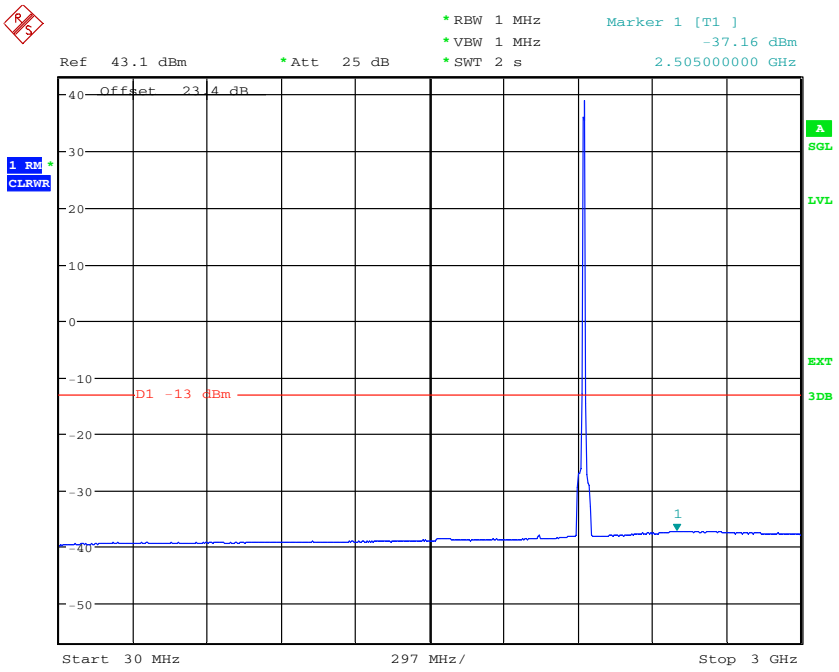
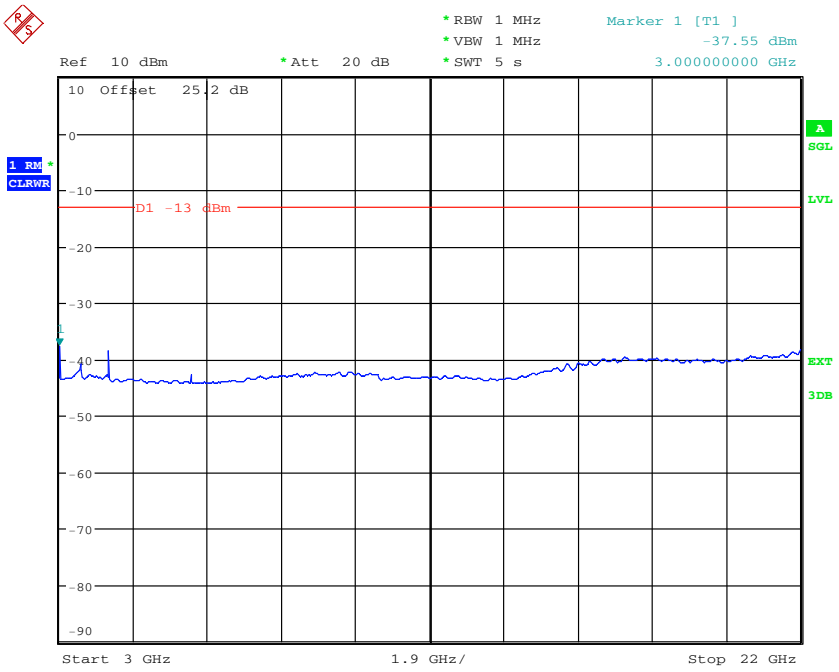


Figure 7-142: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (10MHz Channel BW)



Date: 4.OCT.2012 13:02:52

Figure 7-143: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (10MHz Channel BW)



Date: 4.OCT.2012 13:04:25

Figure 7-144: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (10MHz Channel BW)

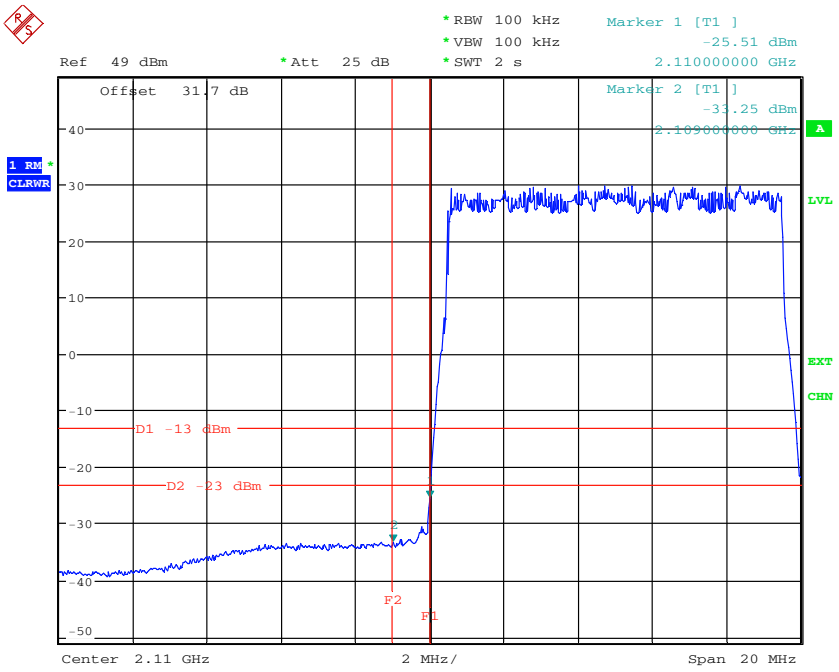


Figure 7-145: Spurious Emissions (Lower Band Edge) – 16QAM (2115.0 MHz) (10MHz Channel BW)

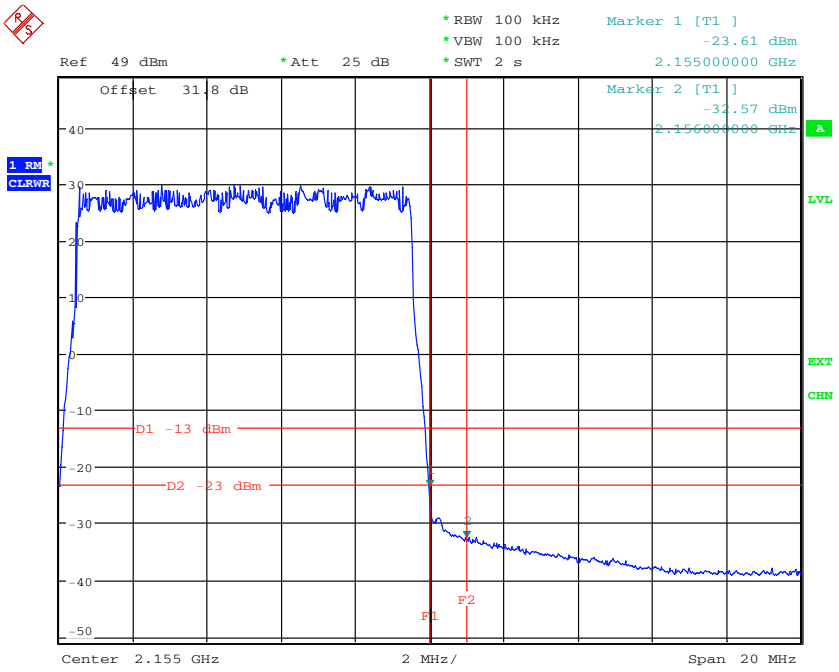


Figure 7-146: Spurious Emissions (Upper Band Edge) – 16QAM (2150.0 MHz) (10MHz Channel BW)

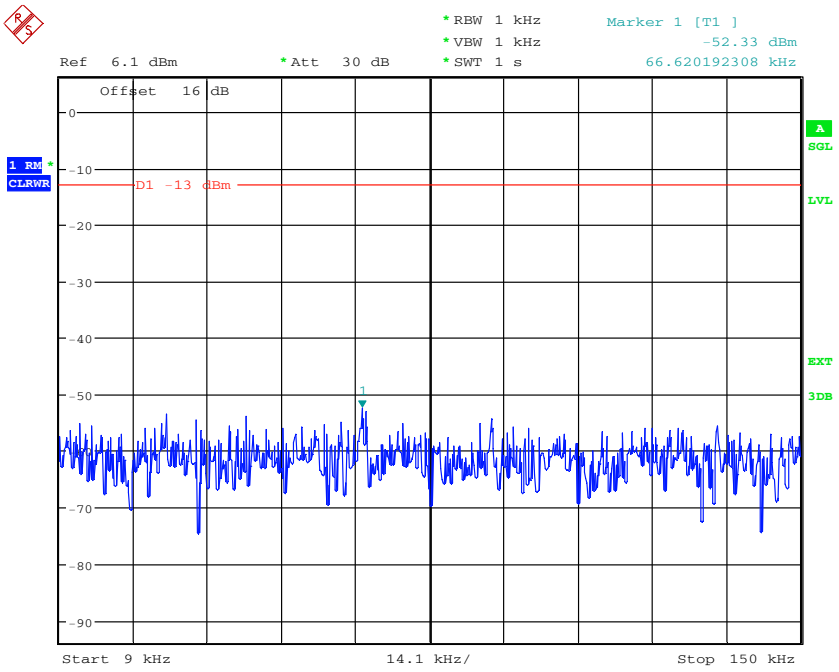


Figure 7-147: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)

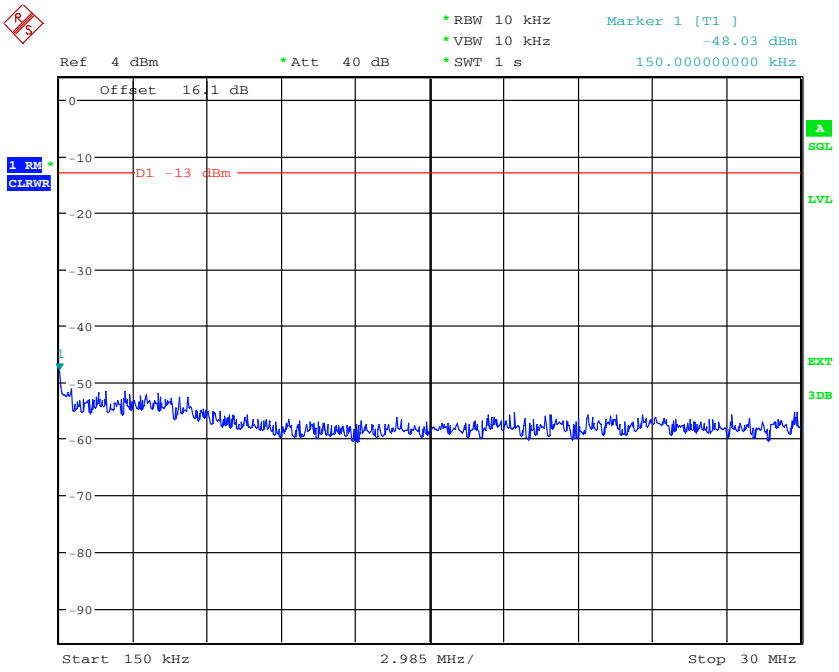


Figure 7-148: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)

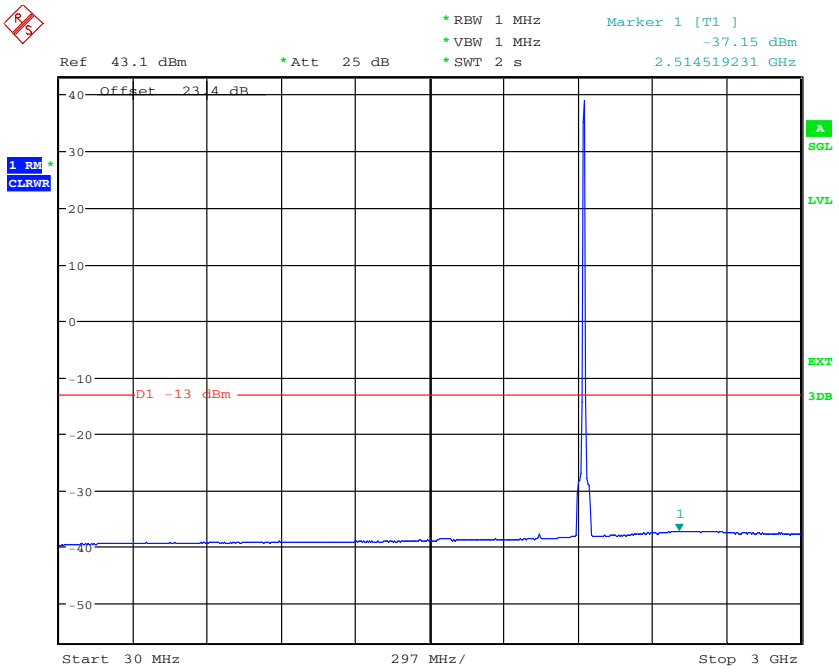


Figure 7-149: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)

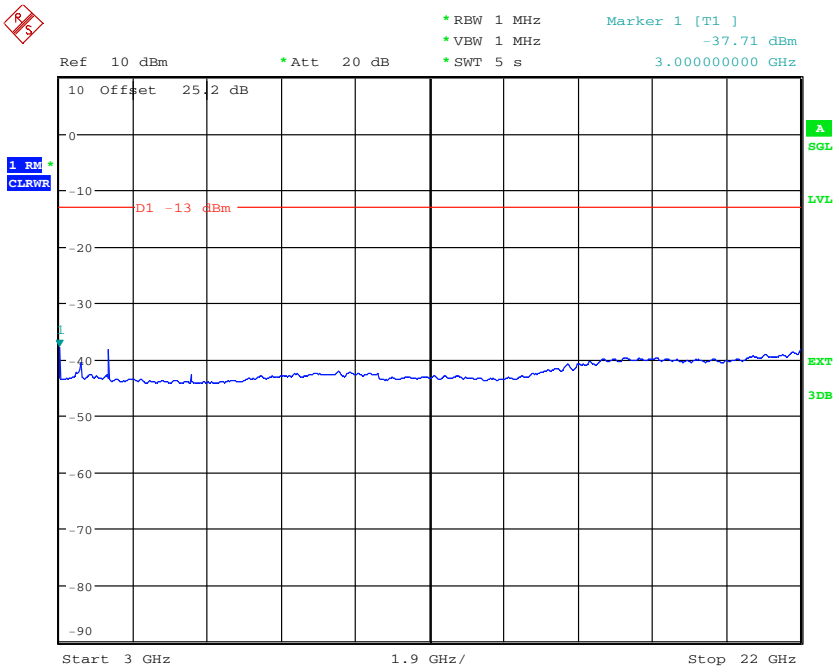
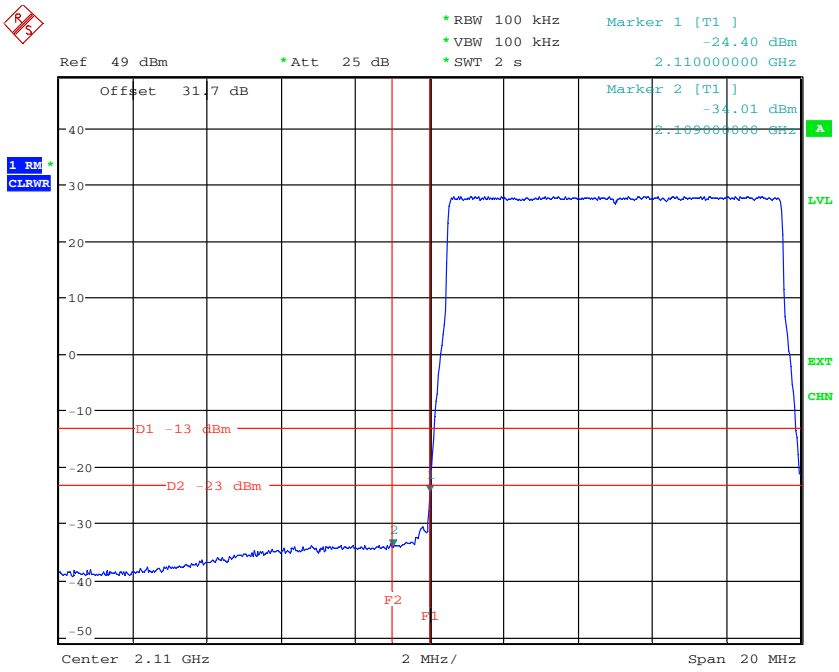
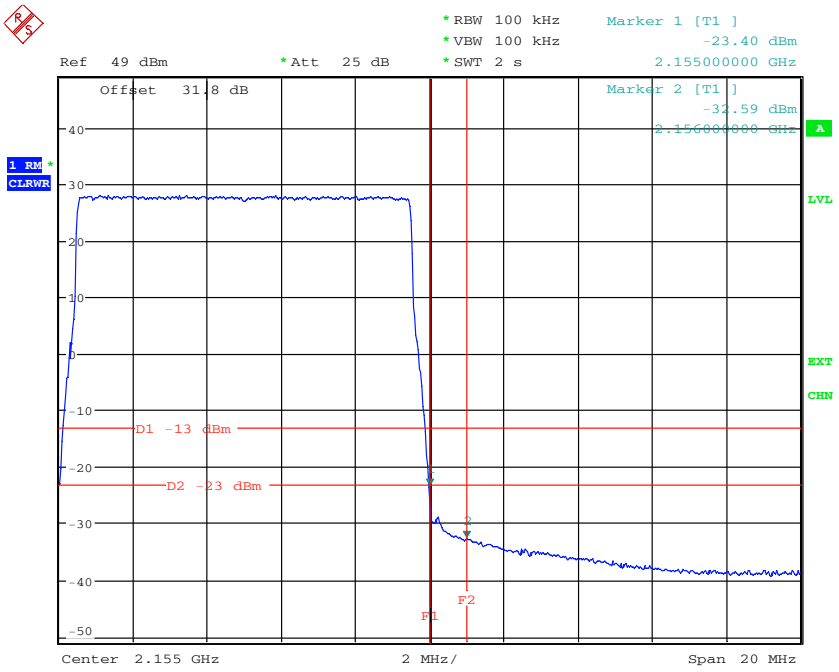


Figure 7-150: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)



Date: 27.SEP.2012 16:09:31

Figure 7-151: Spurious Emissions (Lower Band Edge) – 64QAM (2115.0 MHz) (10MHz Channel BW)



Date: 27.SEP.2012 16:11:09

Figure 7-152: Spurious Emissions (Upper Band Edge) – 64QAM (2150.0 MHz) (10MHz Channel BW)

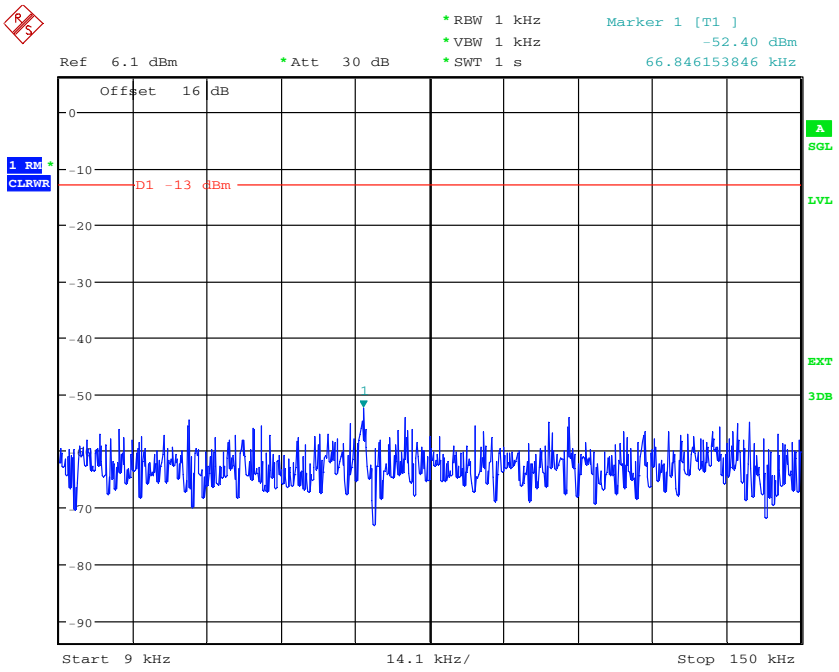


Figure 7-153: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)

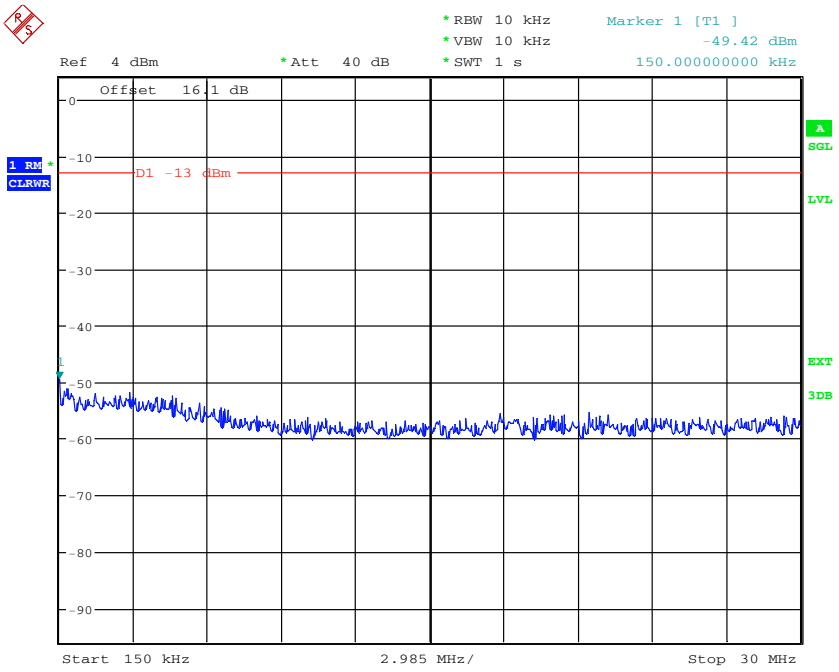
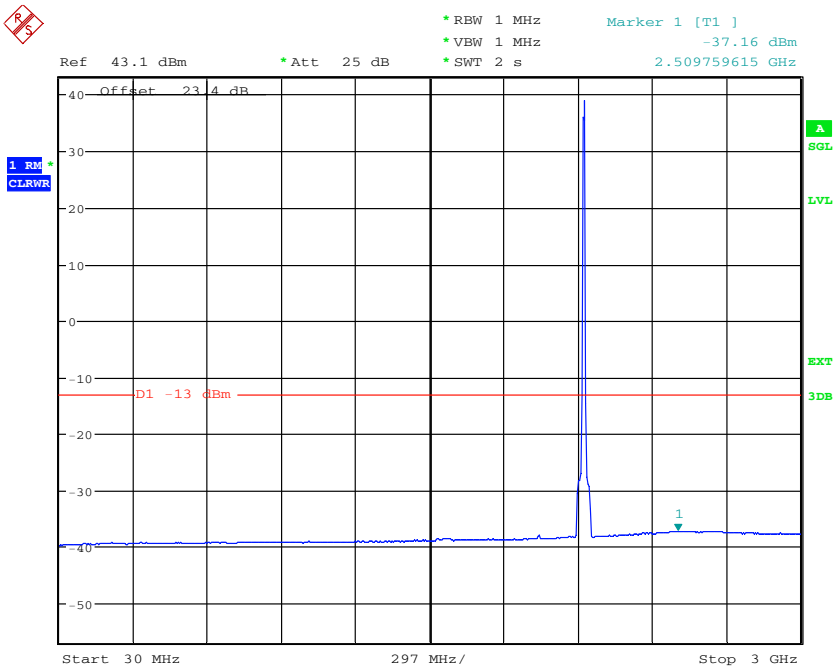
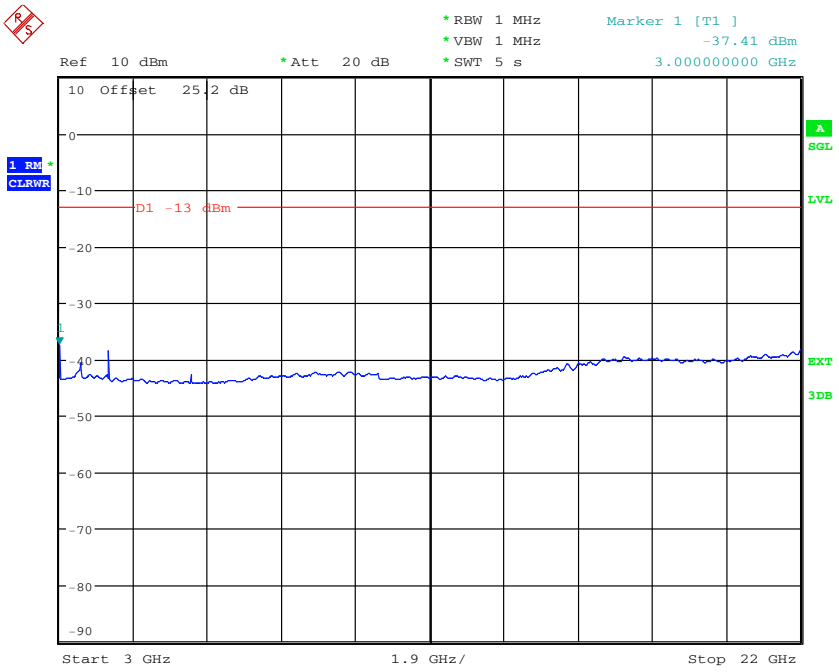


Figure 7-154: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)



Date: 4.OCT.2012 13:08:30

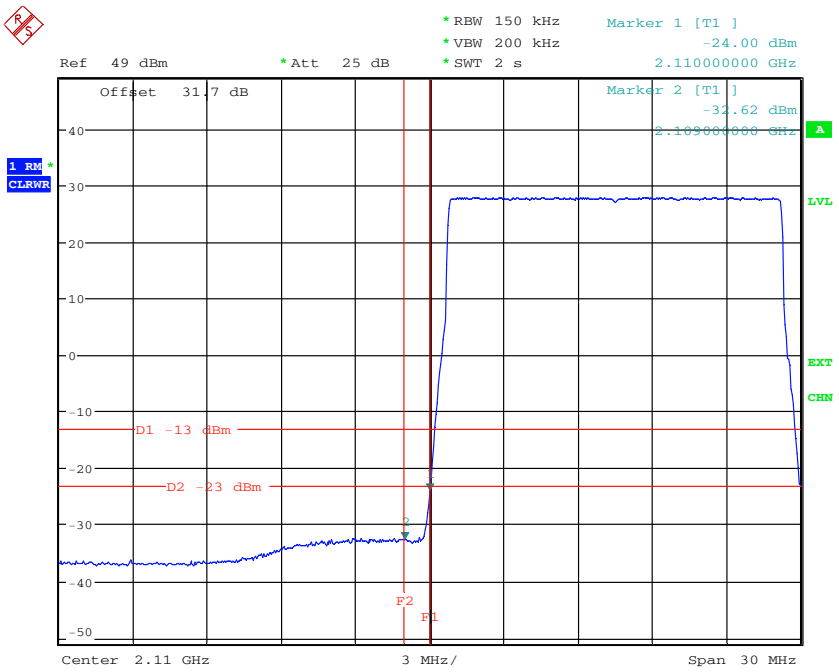
Figure 7-155: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)



Date: 4.OCT.2012 13:09:05

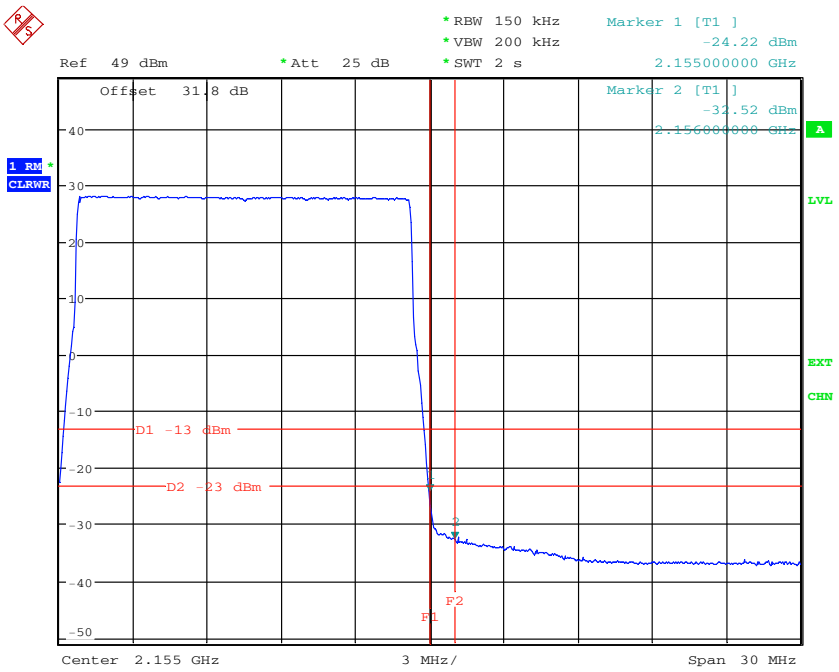
Figure 7-156: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)

Config C ANT3:



Date: 27.SEP.2012 16:52:13

Figure 7-157: Spurious Emissions (Lower Band Edge) – QPSK (2117.5 MHz) (15MHz Channel BW)



Date: 28.SEP.2012 13:19:21

Figure 7-158: Spurious Emissions (Upper Band Edge) – QPSK (2147.5 MHz) (15MHz Channel BW)

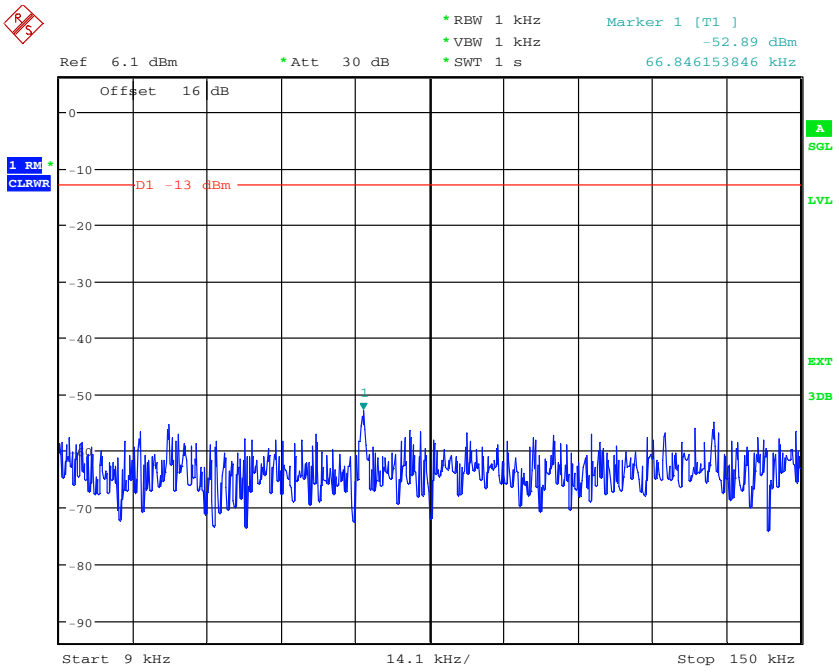


Figure 7-159: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (15MHz Channel BW)

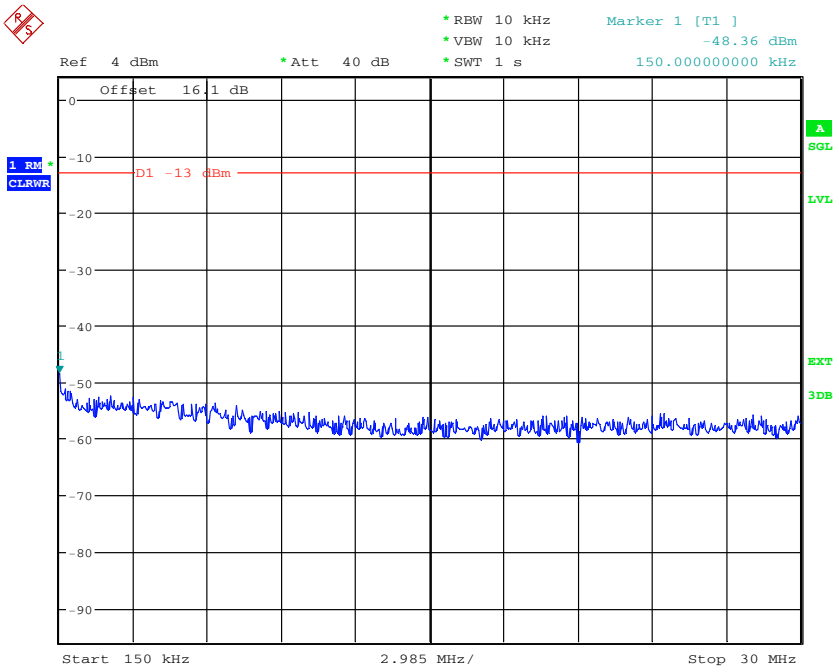
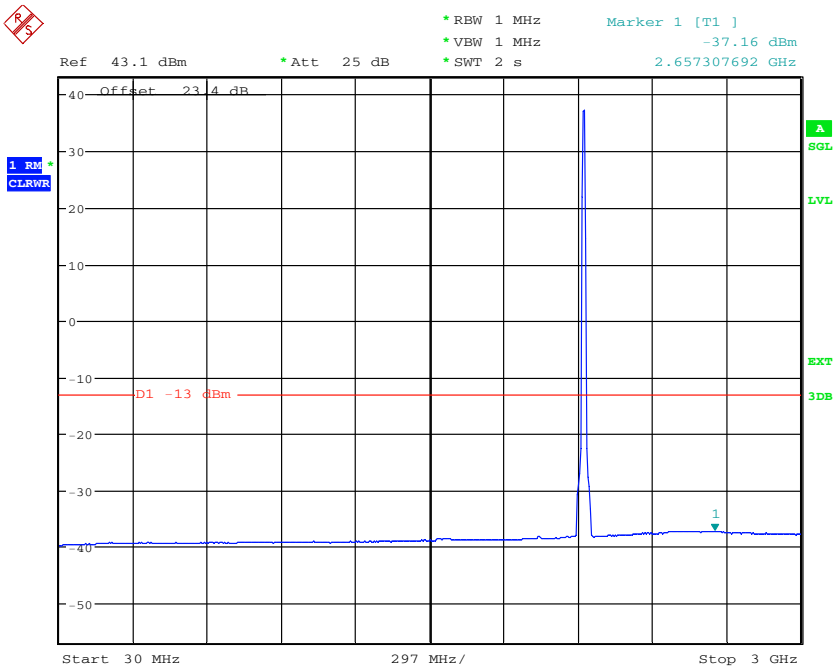
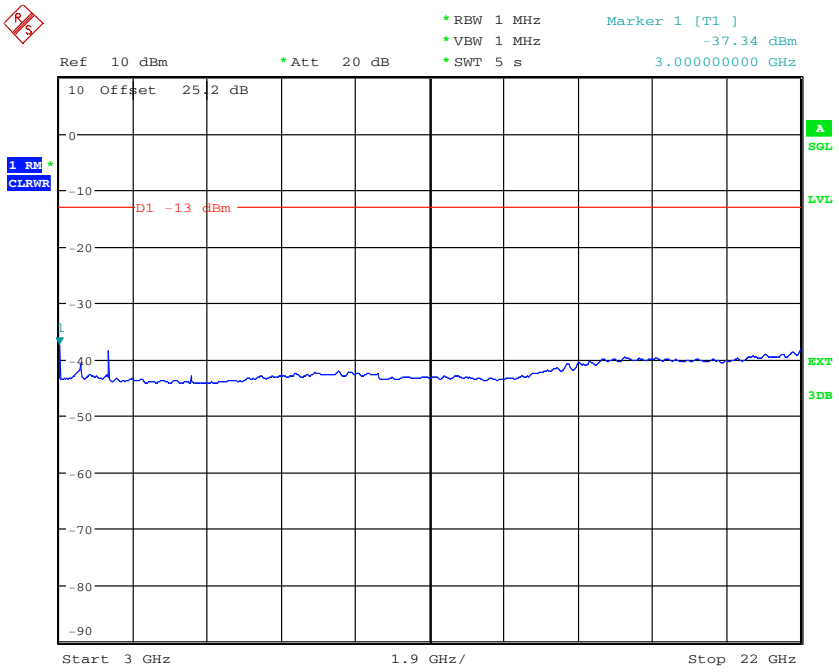


Figure 7-160: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (15MHz Channel BW)



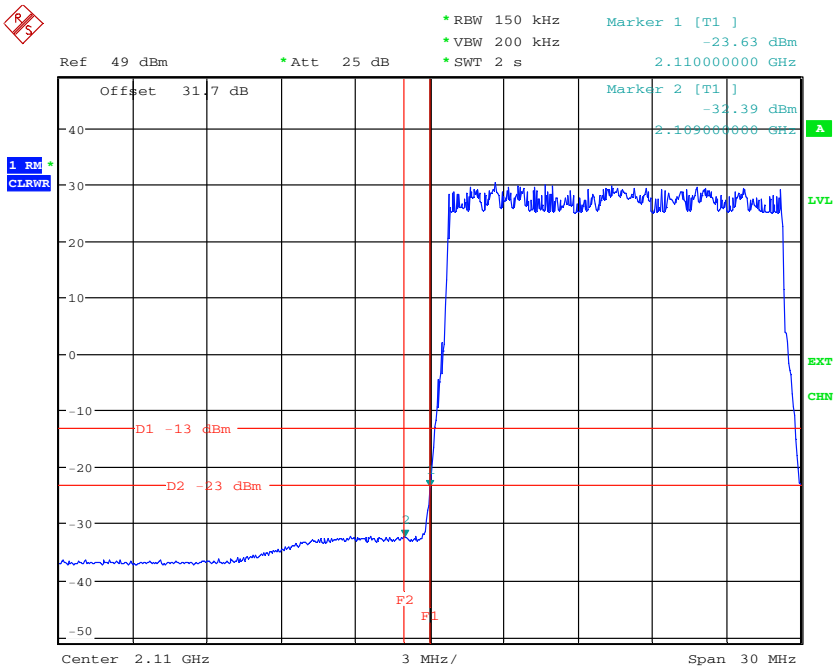
Date: 4.OCT.2012 13:33:27

Figure 7-161: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (15MHz Channel BW)



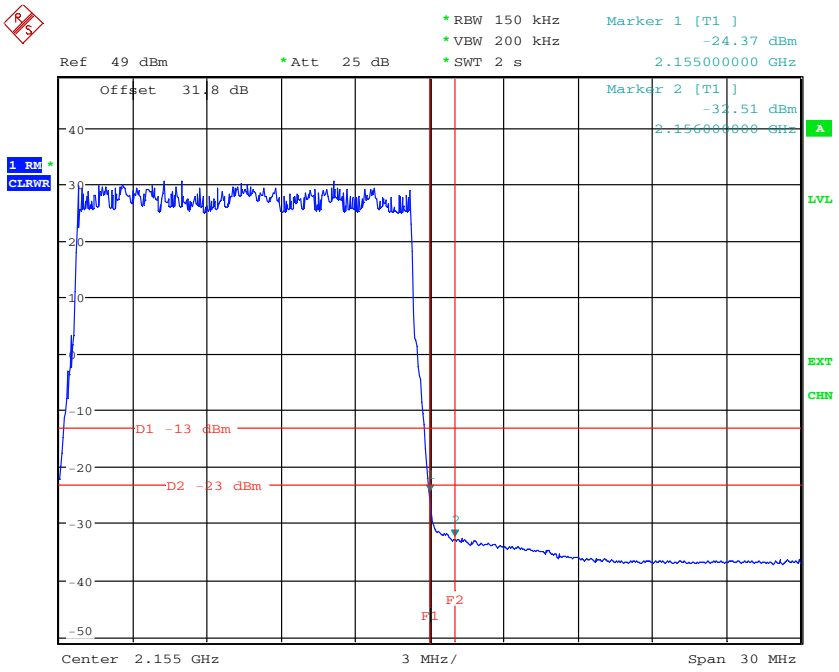
Date: 4.OCT.2012 13:33:57

Figure 7-162: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (15MHz Channel BW)



Date: 27.SEP.2012 16:55:23

Figure 7-163: Spurious Emissions (Lower Band Edge) – 16QAM (2117.5 MHz) (15MHz Channel BW)



Date: 28.SEP.2012 13:24:06

Figure 7-164: Spurious Emissions (Upper Band Edge) – 16QAM (2147.5 MHz) (15MHz Channel BW)

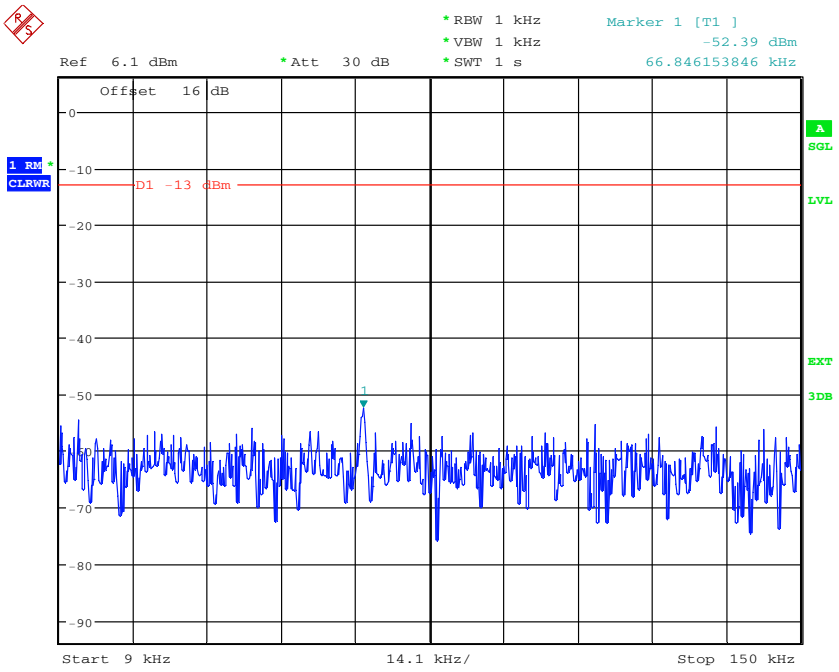


Figure 7-165: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

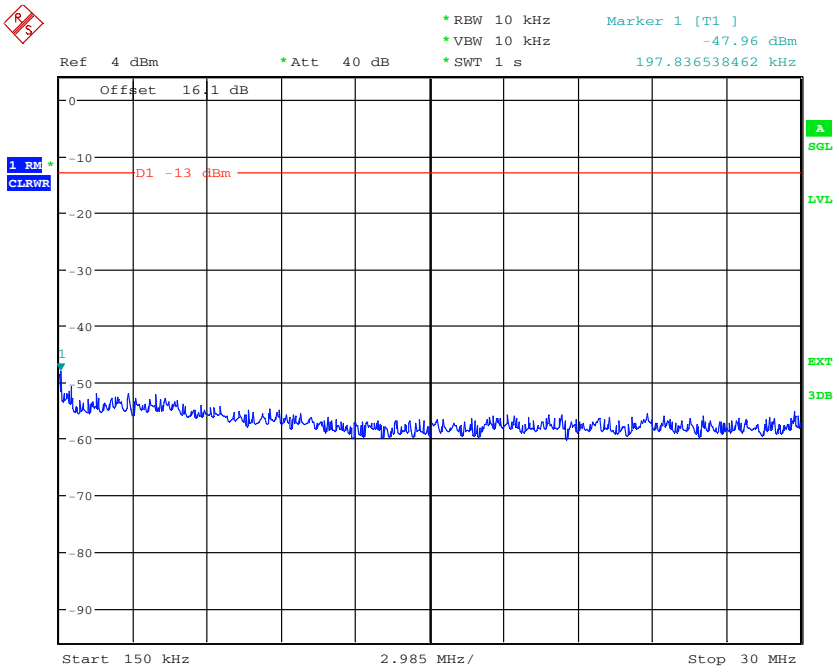


Figure 7-166: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

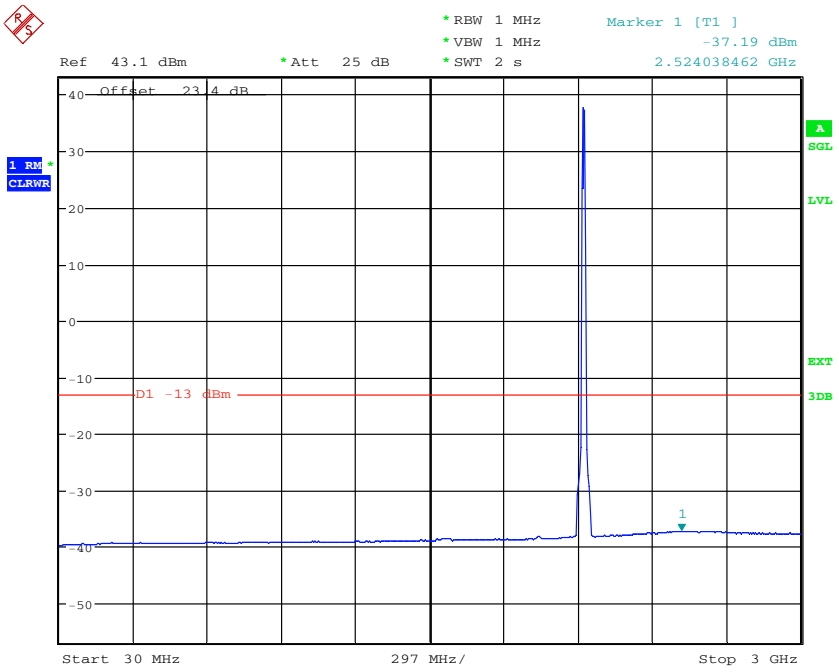


Figure 7-167: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

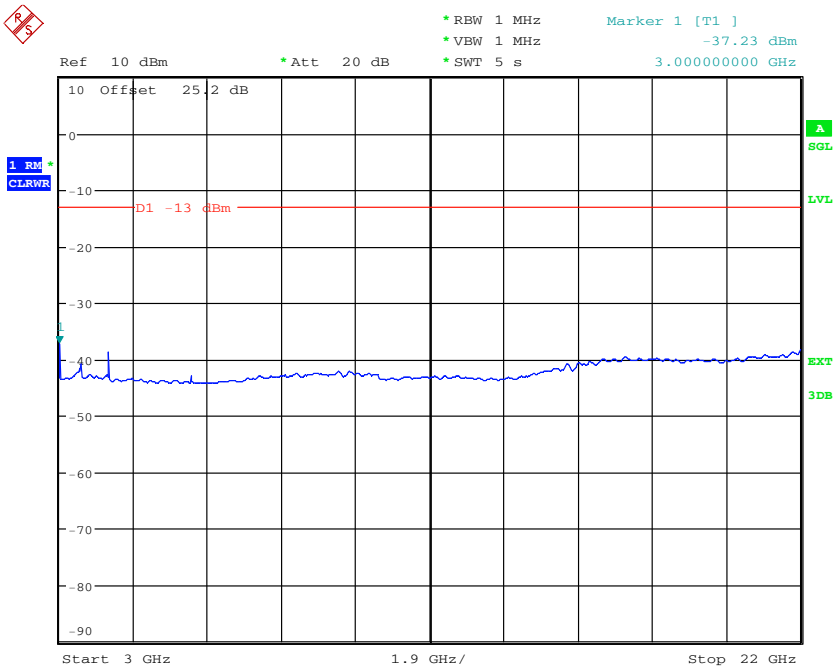
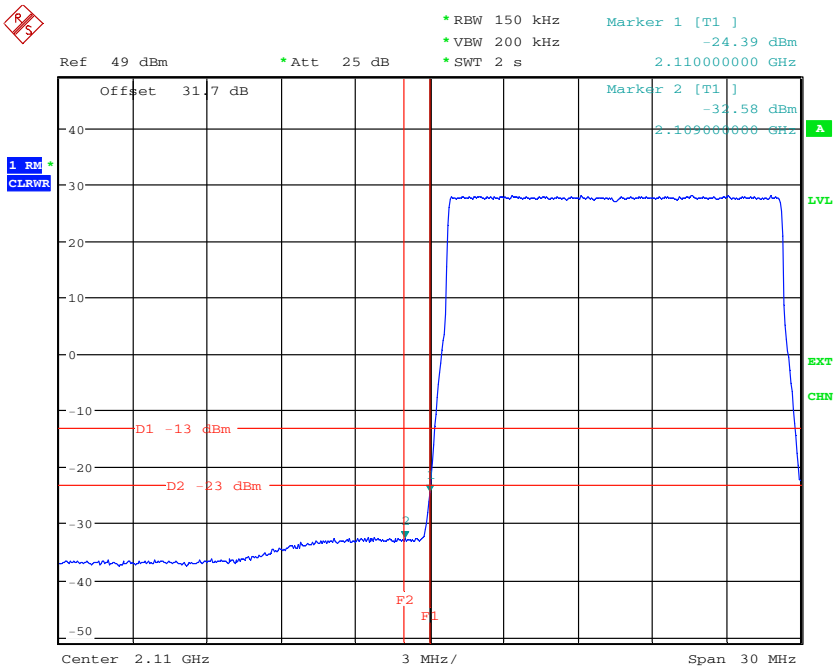
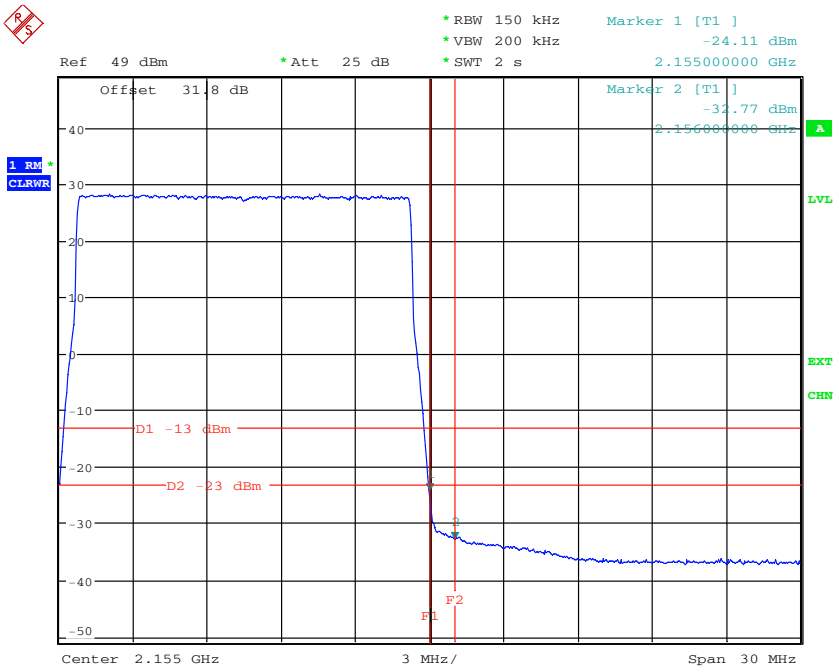


Figure 7-168: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)



Date: 27.SEP.2012 16:58:29

Figure 7-169: Spurious Emissions (Lower Band Edge) – 64QAM (2117.5 MHz) (15MHz Channel BW)



Date: 28.SEP.2012 13:26:15

Figure 7-170: Spurious Emissions (Upper Band Edge) – 64QAM (2147.5 MHz) (15MHz Channel BW)

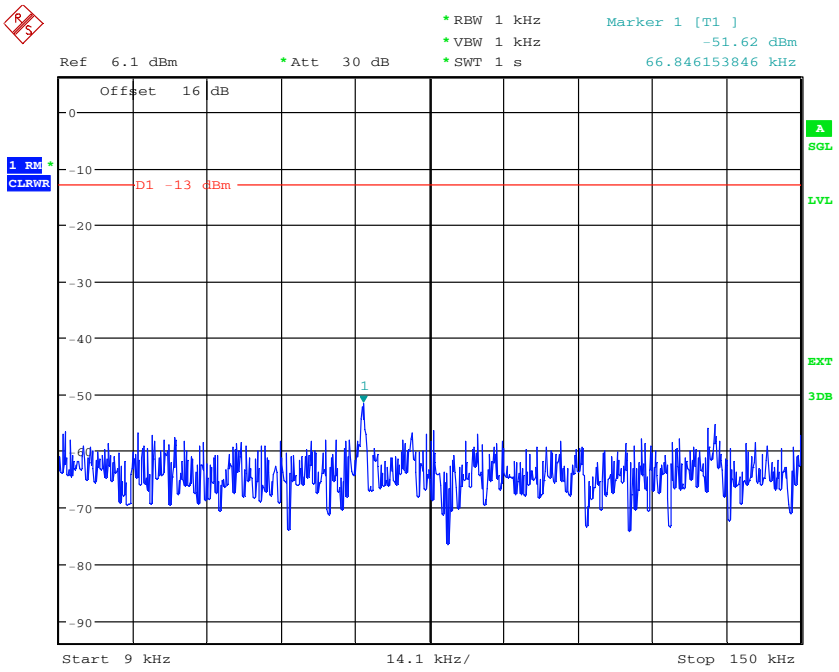


Figure 7-171: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)

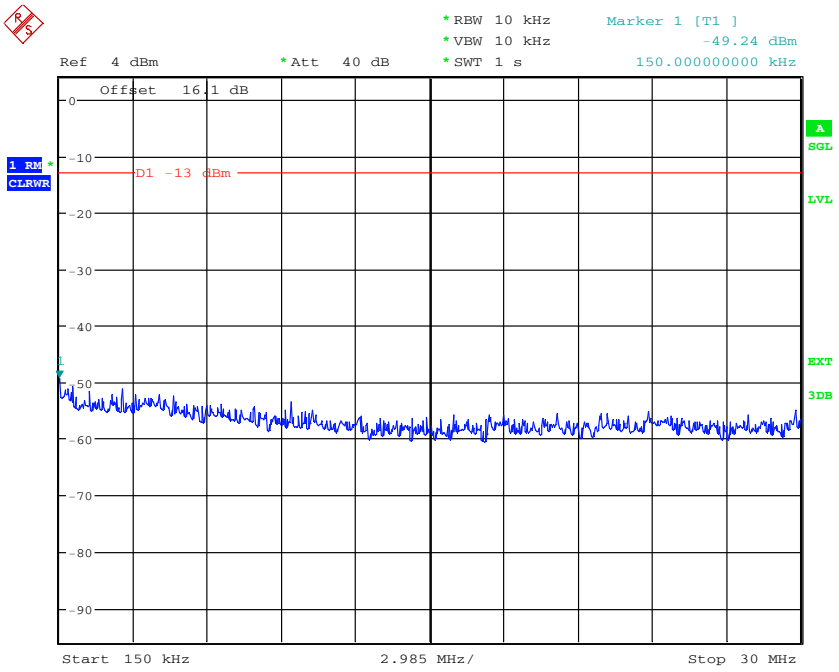
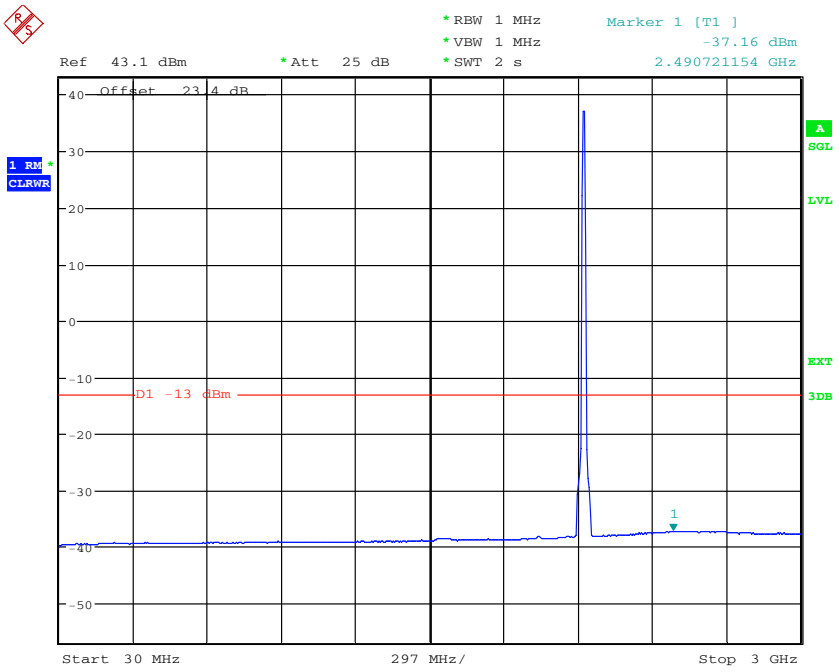
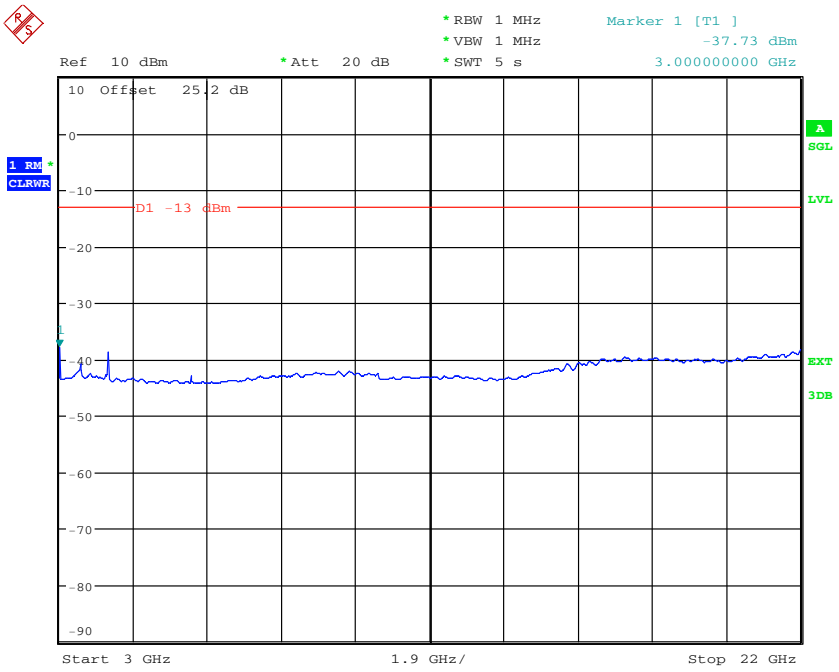


Figure 7-172: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)



Date: 4.OCT.2012 13:38:23

Figure 7-173: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)



Date: 4.OCT.2012 13:38:57

Figure 7-174: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)

Config D ANT3:

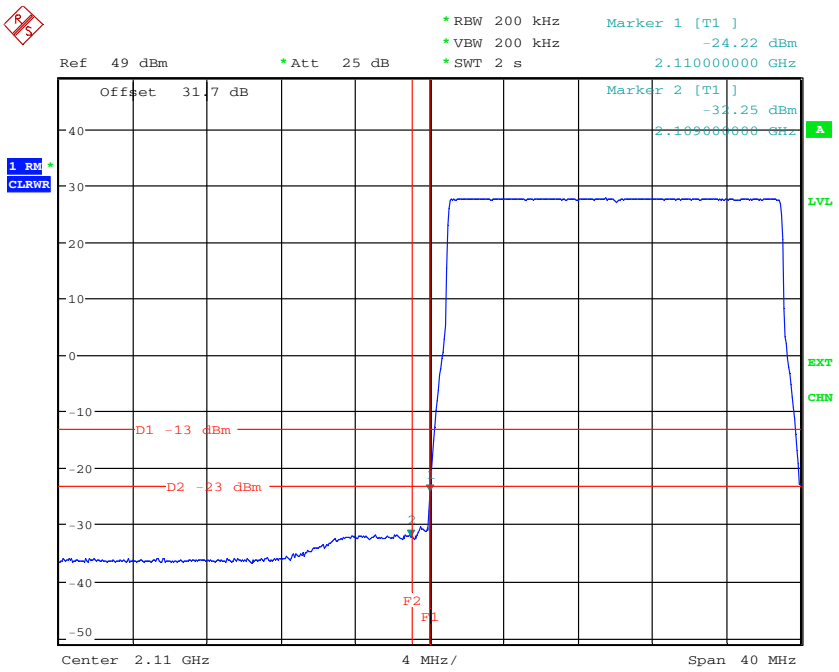


Figure 7-175: Spurious Emissions (Lower Band Edge) – QPSK (2120.0 MHz) (20MHz Channel BW)

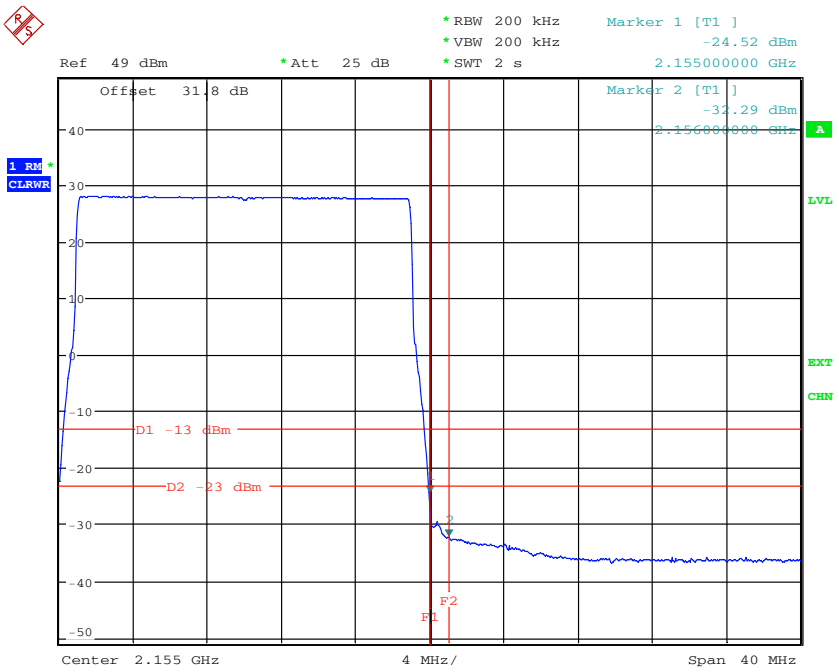


Figure 7-176: Spurious Emissions (Upper Band Edge) – QPSK (2145.0 MHz) (20MHz Channel BW)

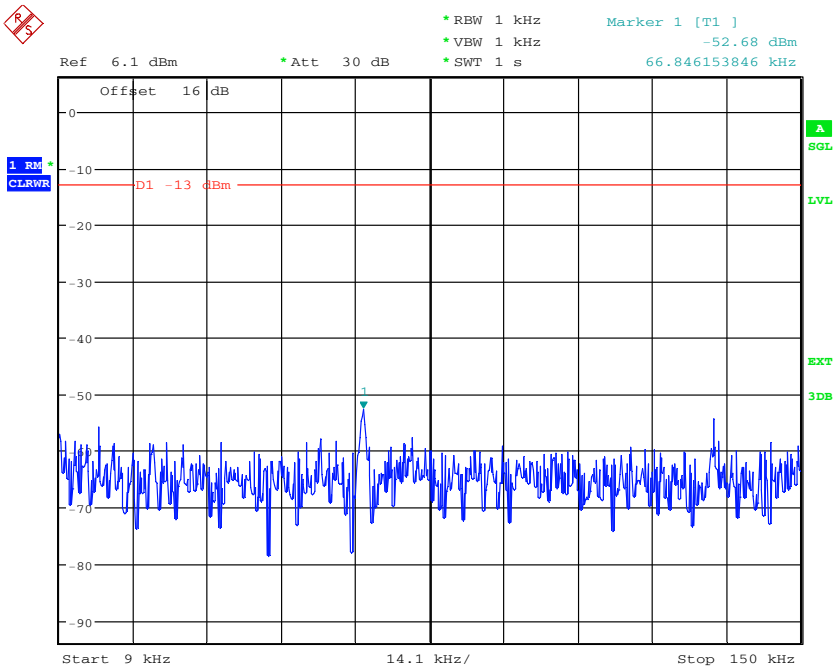


Figure 7-177: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (20MHz Channel BW)

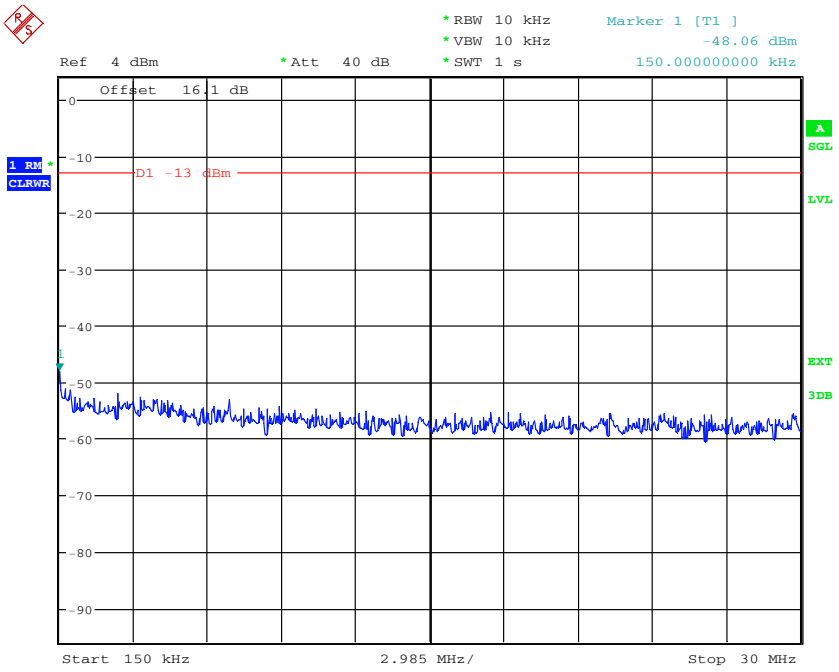
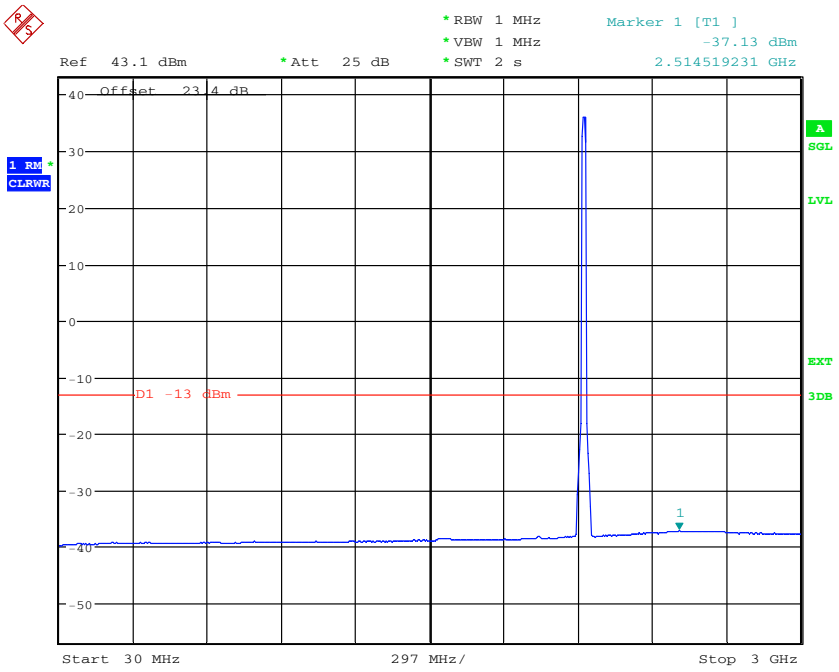
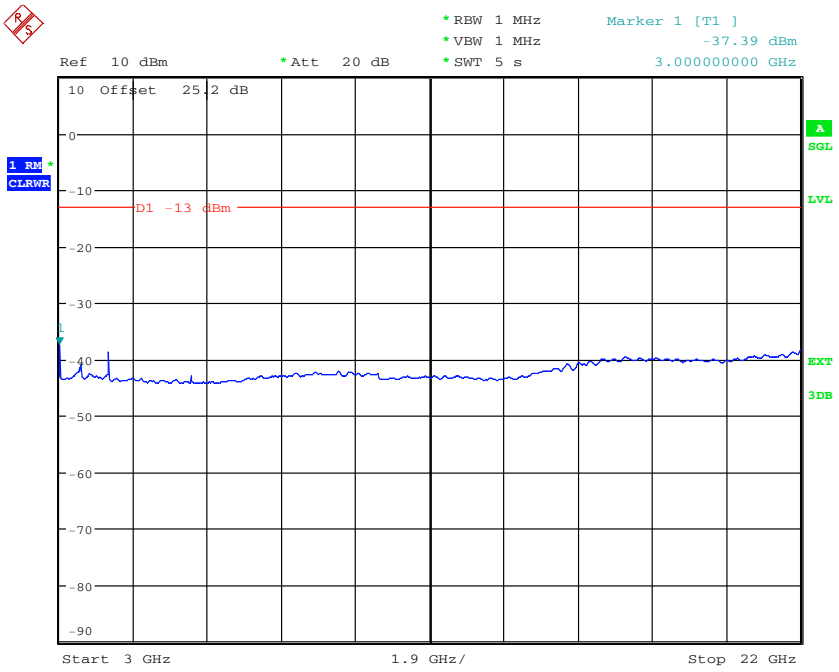


Figure 7-178: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (20MHz Channel BW)



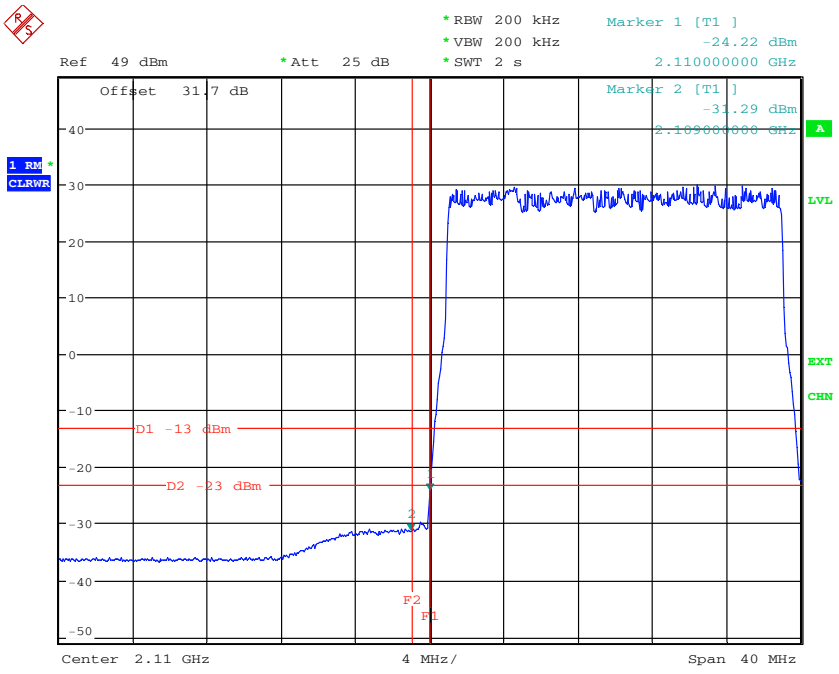
Date: 4.OCT.2012 13:49:40

Figure 7-179: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (20MHz Channel BW)



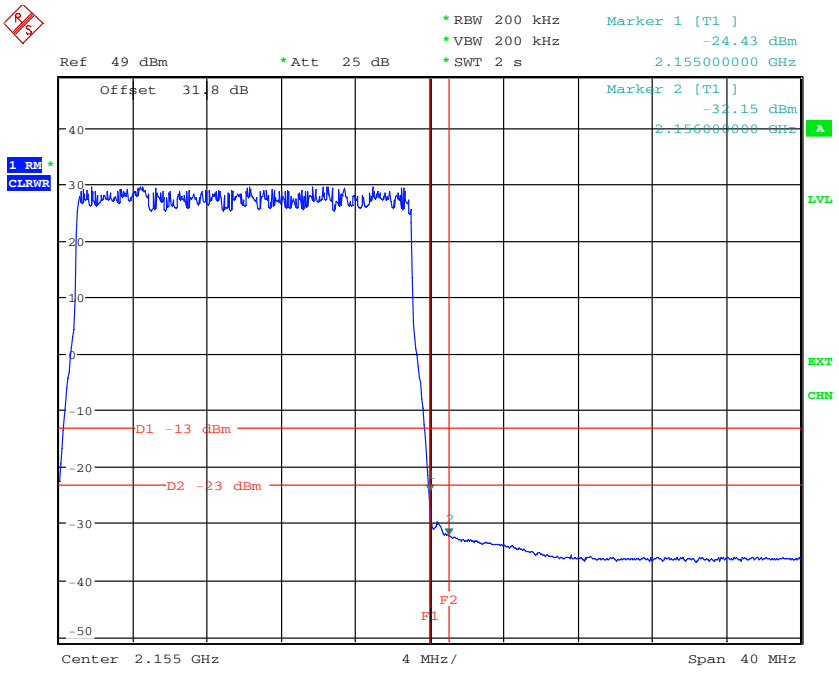
Date: 4.OCT.2012 13:50:13

Figure 7-180: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (20MHz Channel BW)



Date: 28.SEP.2012 10:04:01

Figure 7-181: Spurious Emissions (Lower Band Edge) – 16QAM (2120.0 MHz) (20MHz Channel BW)



Date: 28.SEP.2012 10:07:06

Figure 7-182: Spurious Emissions (Upper Band Edge) – 16QAM (2145.0 MHz) (20MHz Channel BW)

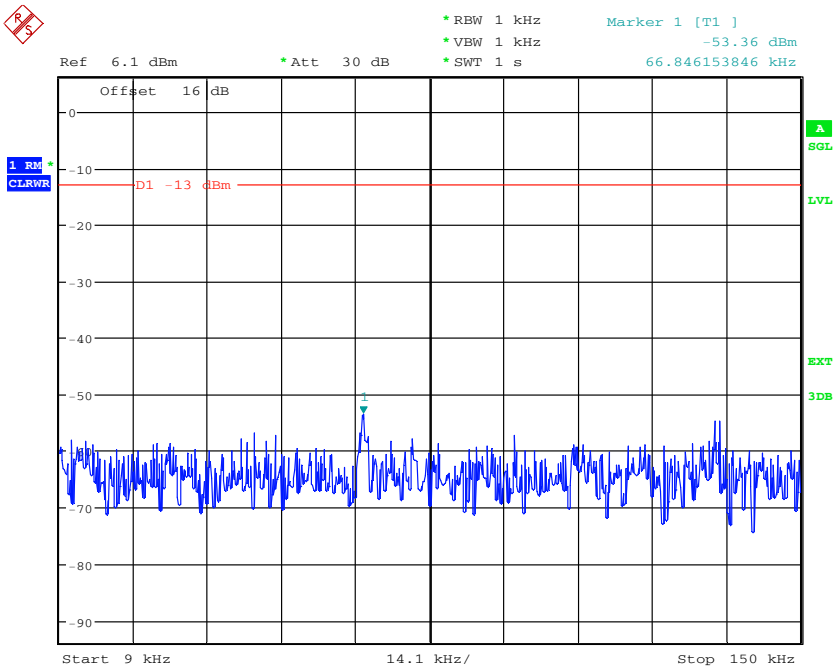


Figure 7-183: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)

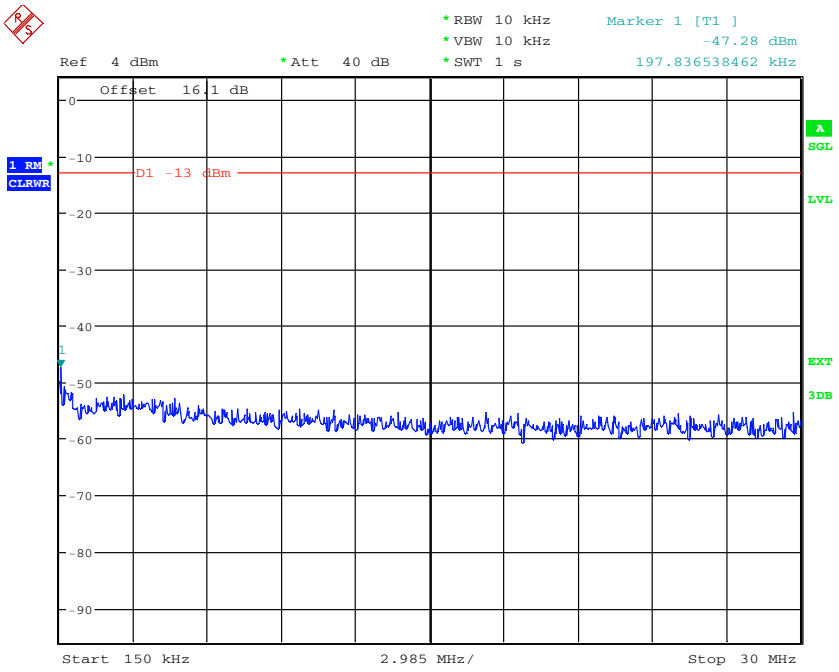
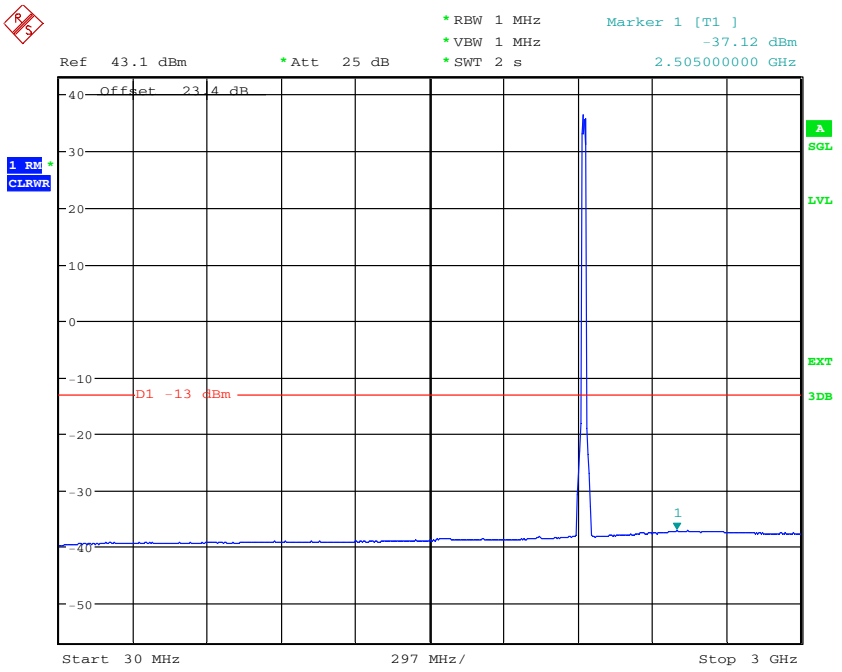
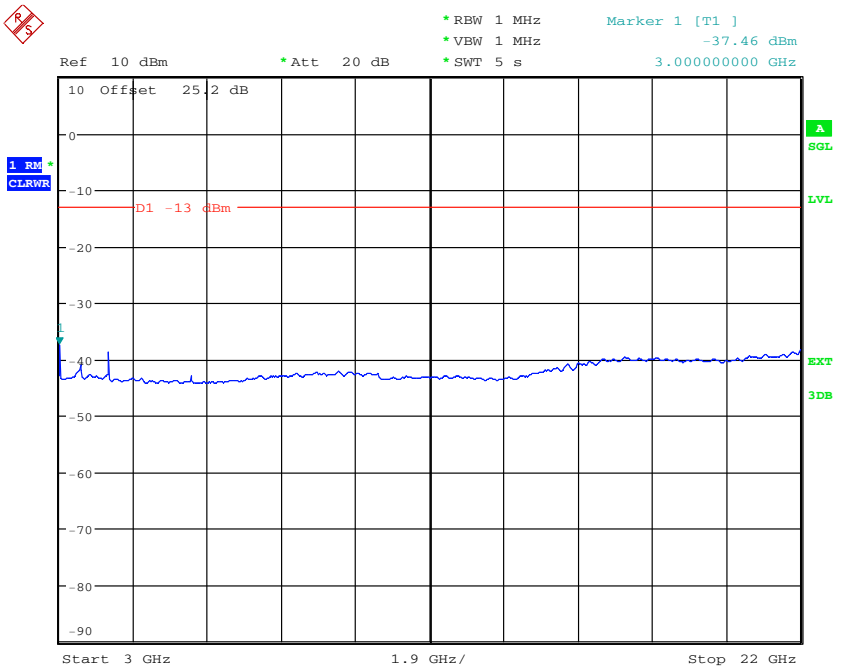


Figure 7-184: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)



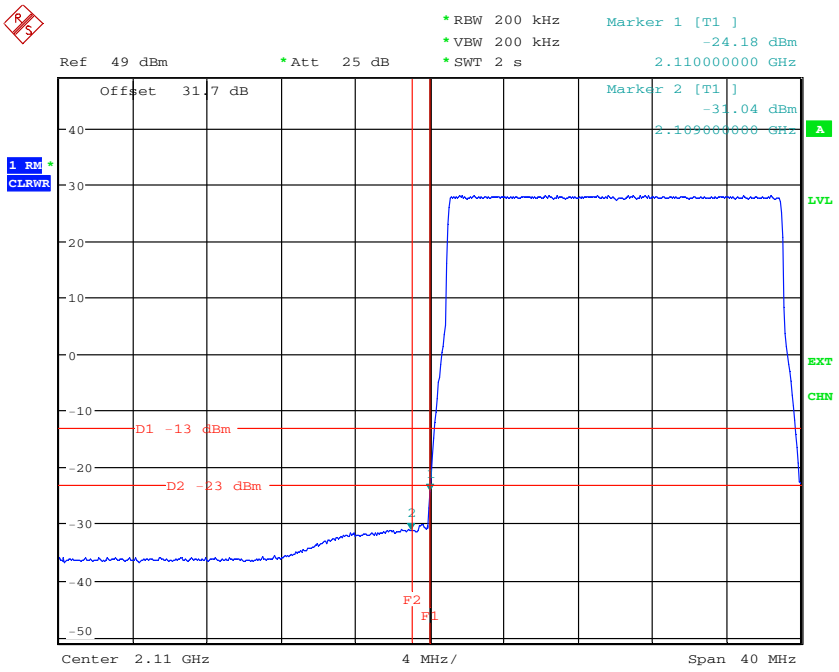
Date: 4.OCT.2012 13:51:58

Figure 7-185: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)



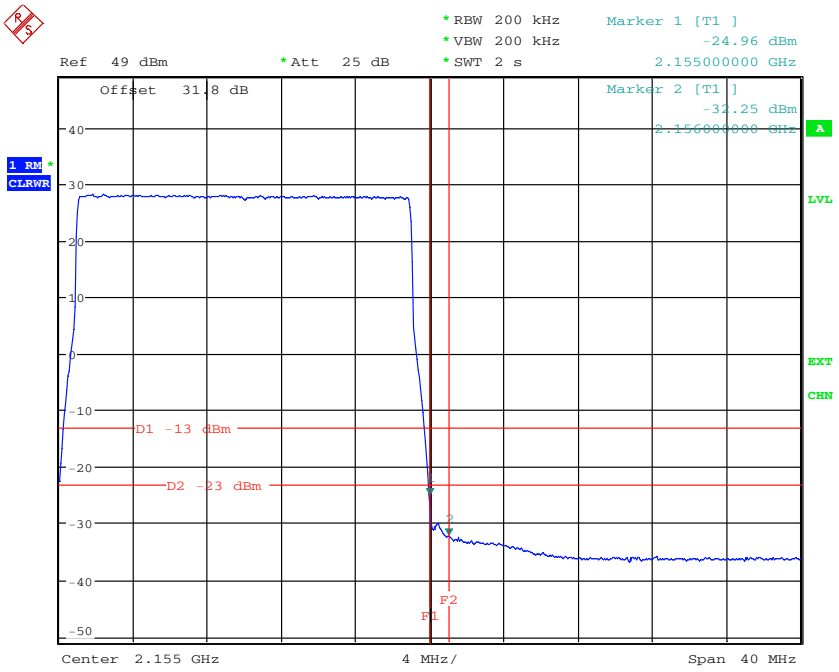
Date: 4.OCT.2012 13:52:30

Figure 7-186: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)



Date: 28.SEP.2012 10:09:00

Figure 7-187: Spurious Emissions (Lower Band Edge) – 64QAM (2120.0 MHz) (20MHz Channel BW)



Date: 28.SEP.2012 10:10:51

Figure 7-188: Spurious Emissions (Upper Band Edge) – 64QAM (2145.0 MHz) (20MHz Channel BW)

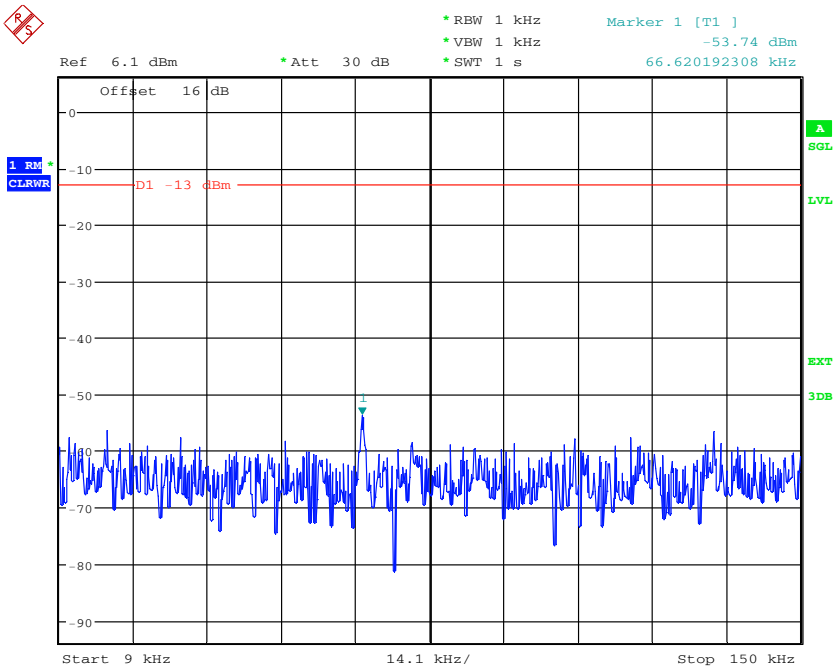


Figure 7-189: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)

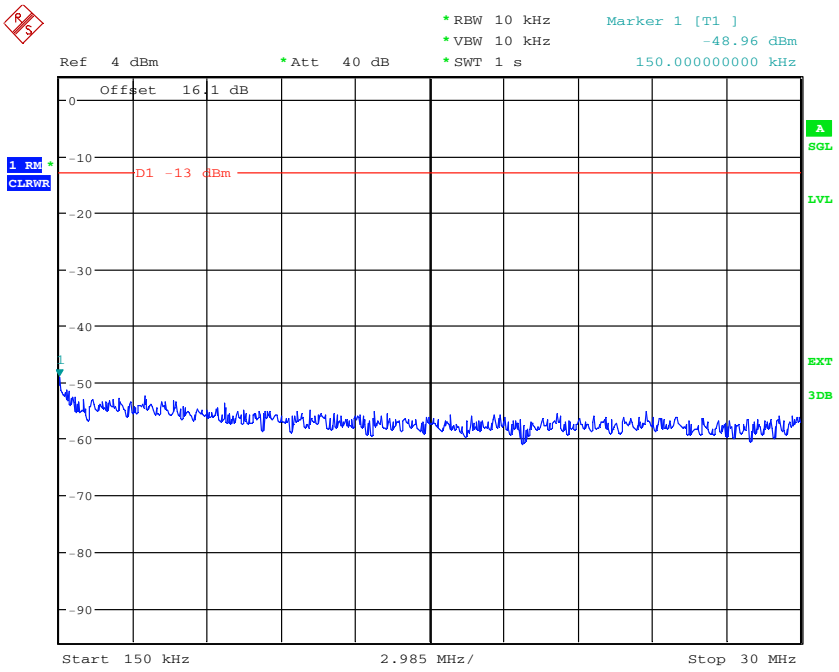
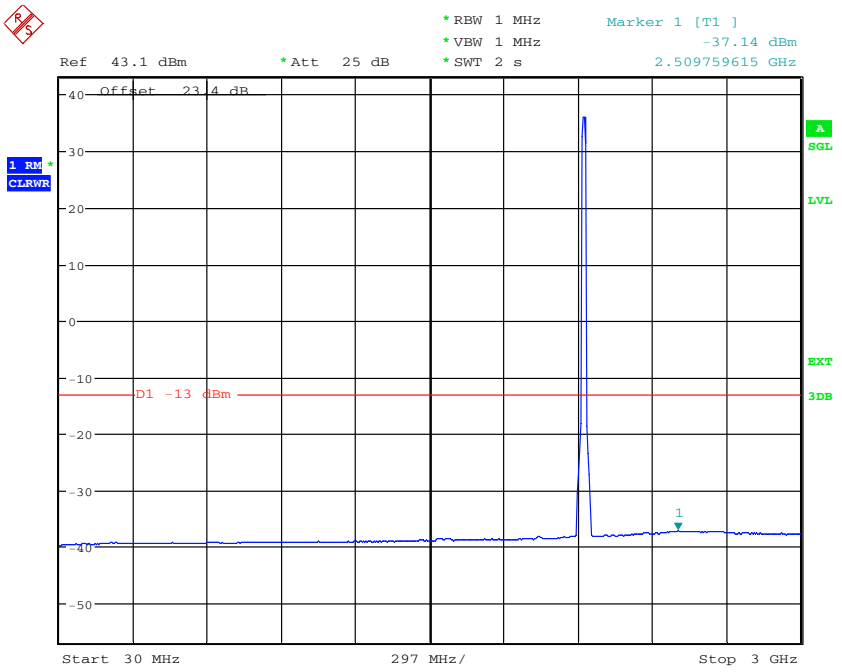
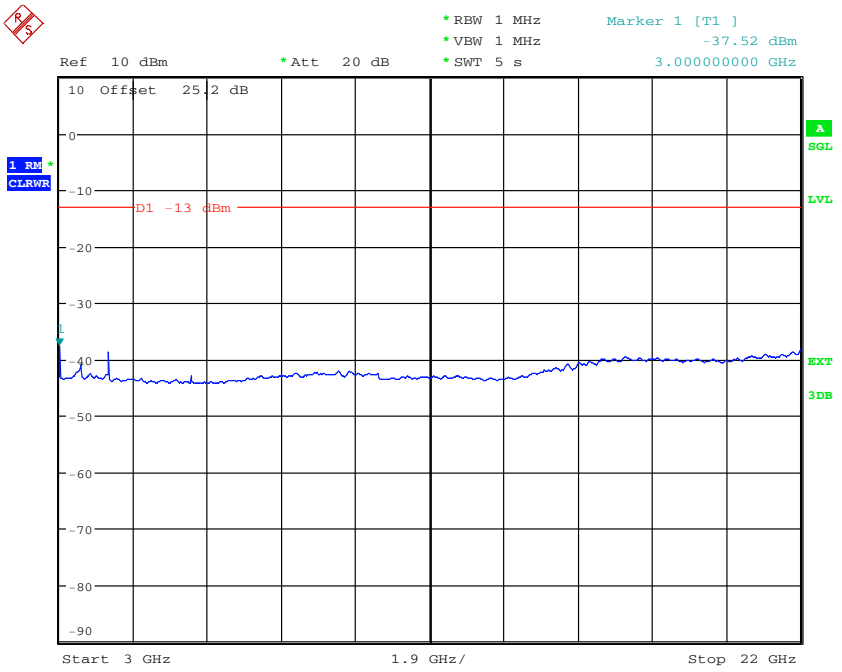


Figure 7-190: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)



Date: 4.OCT.2012 13:54:24

Figure 7-191: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)



Date: 4.OCT.2012 13:54:58

Figure 7-192: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)

Config A ANT1 + ANT3:

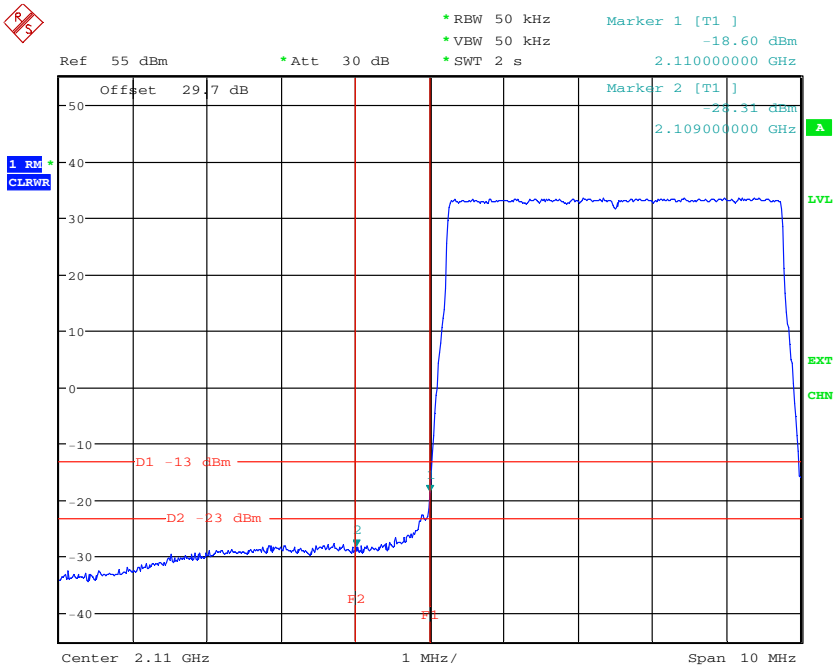


Figure 7-193: Spurious Emissions (Lower Band Edge) – QPSK (2112.5 MHz) (5MHz Channel BW)

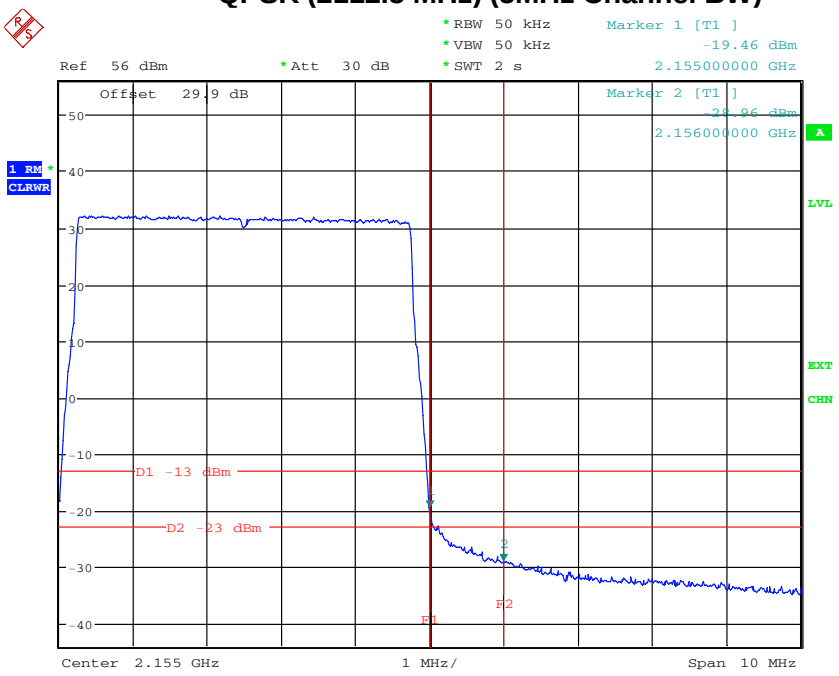


Figure 7-194: Spurious Emissions (Upper Band Edge) – QPSK (2152.5 MHz) (5MHz Channel BW)

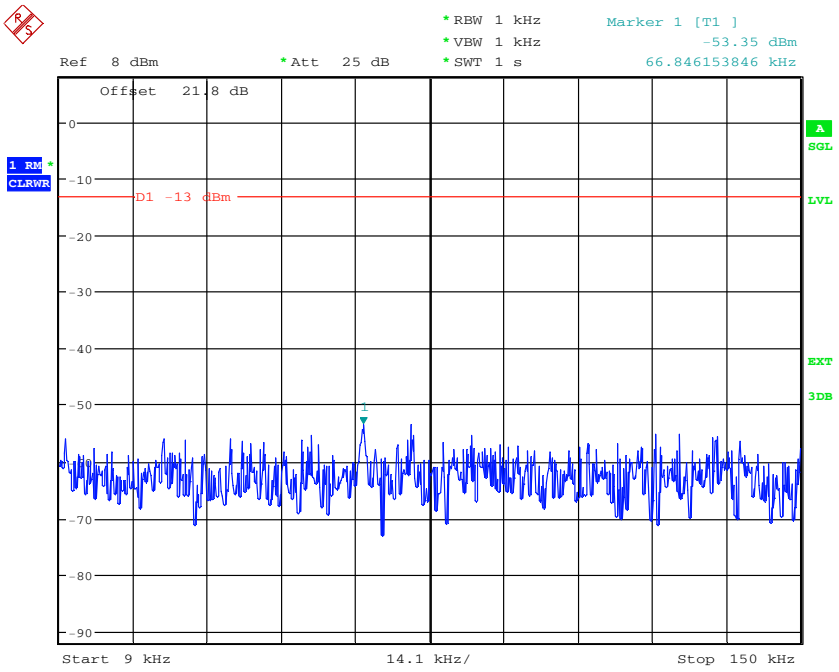


Figure 7-195: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

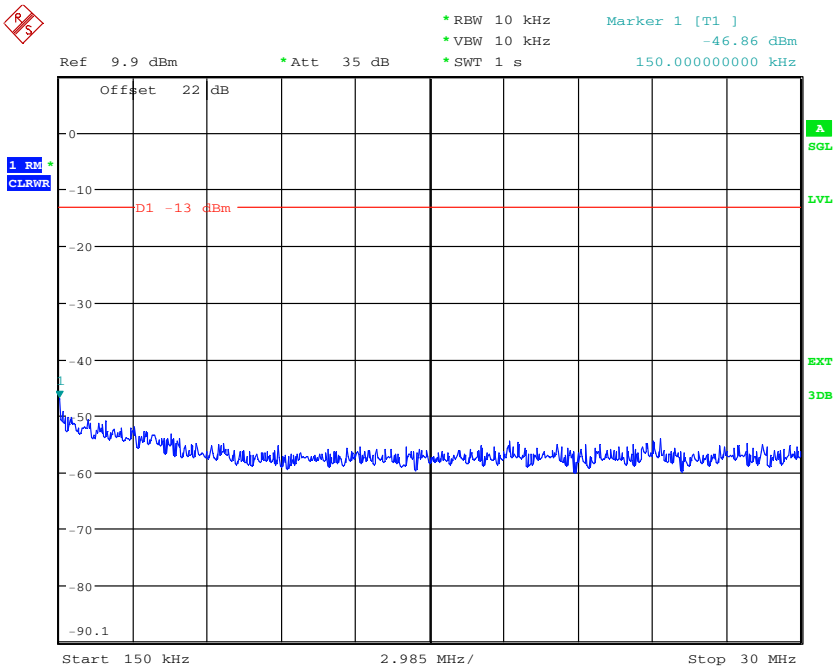


Figure 7-196: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

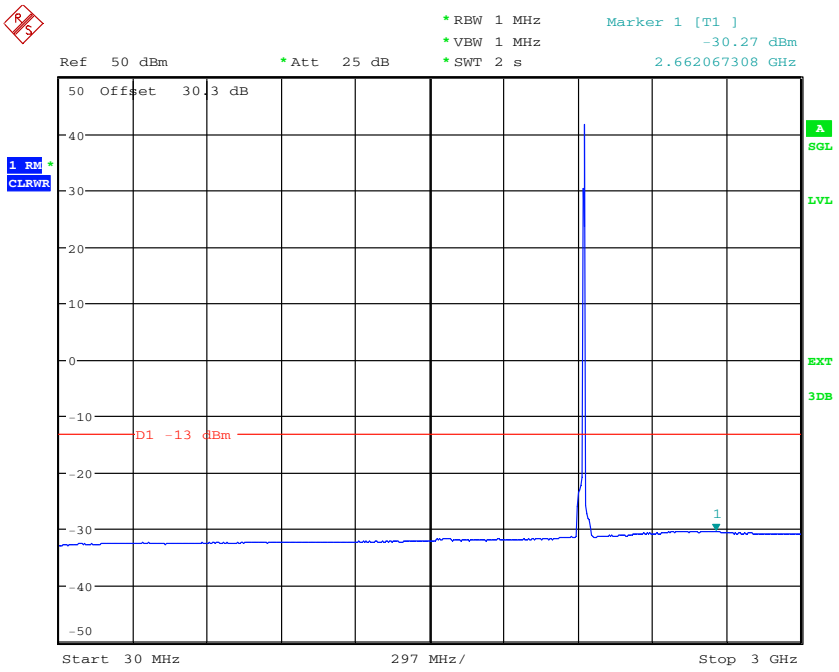


Figure 7-197: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

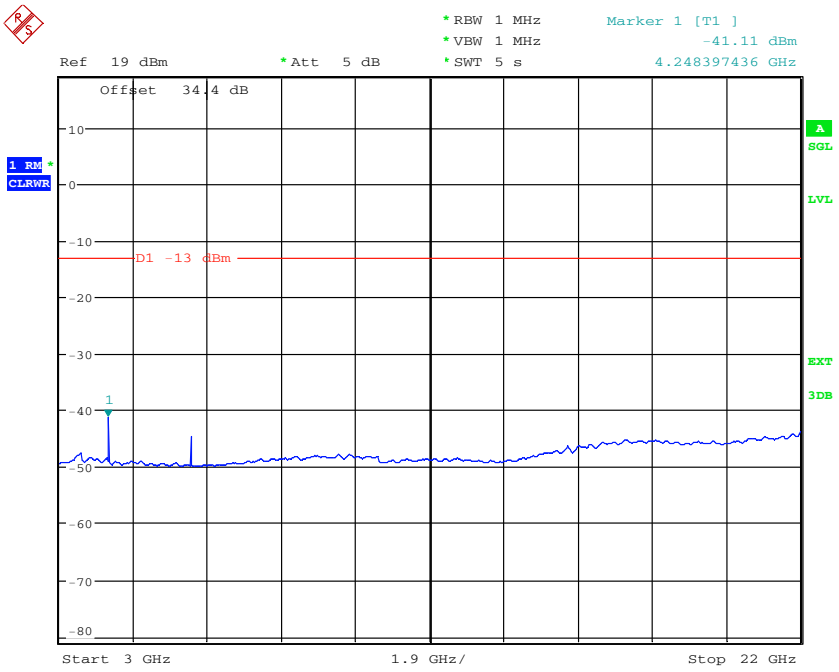


Figure 7-198: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (5MHz Channel BW)

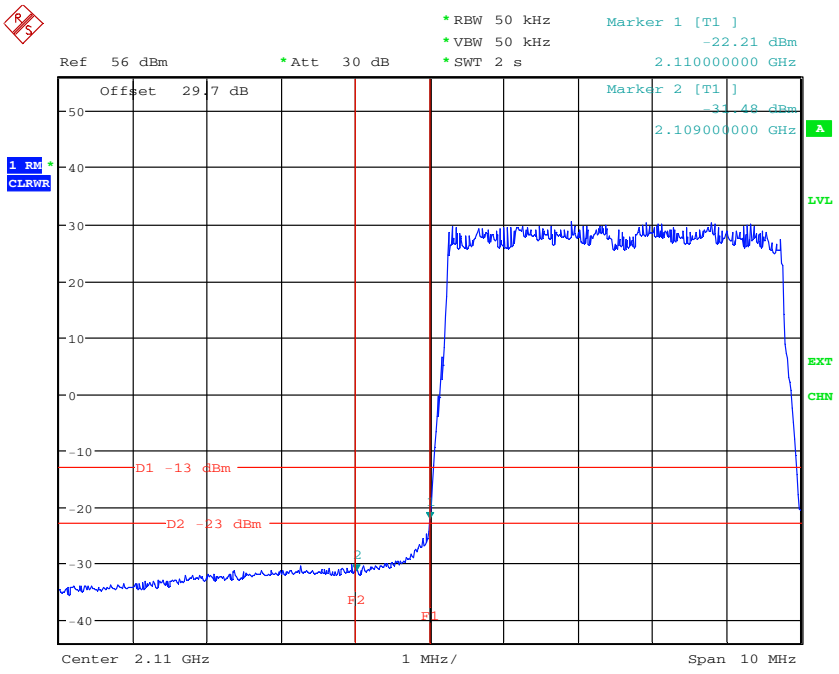


Figure 7-199: Spurious Emissions (Lower Band Edge) – 16QAM (2112.5 MHz) (5MHz Channel BW)

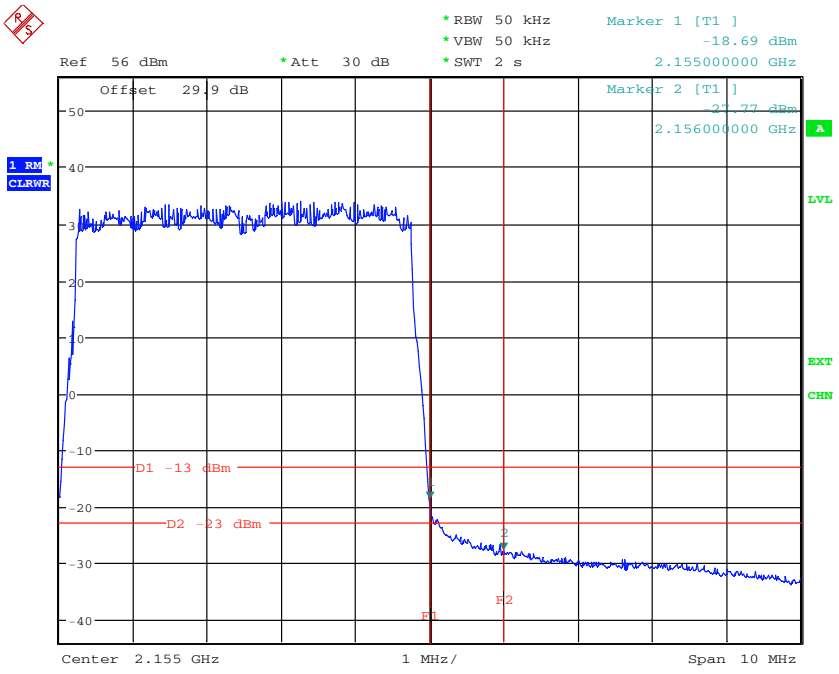


Figure 7-200: Spurious Emissions (Upper Band Edge) – 16QAM (2152.5 MHz) (5MHz Channel BW)

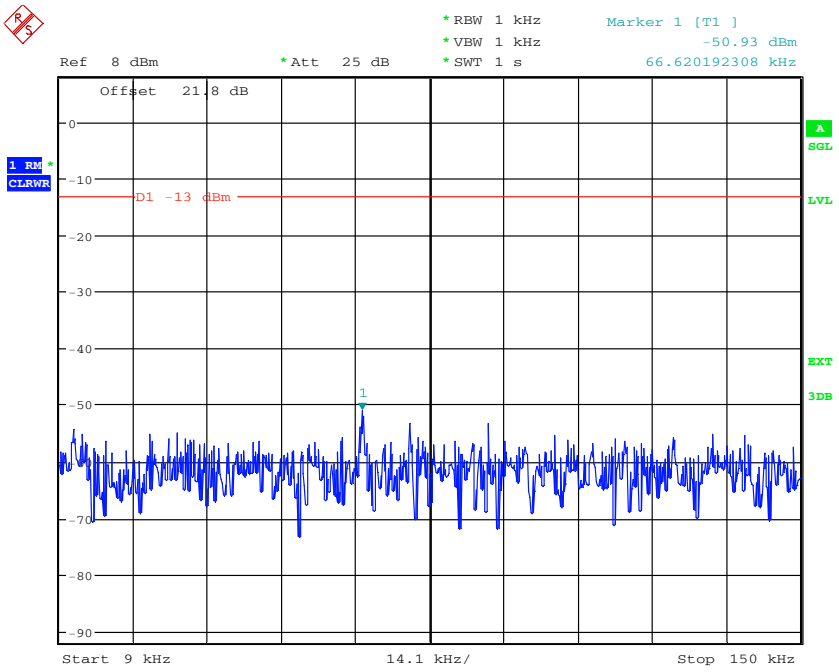


Figure 7-201: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)

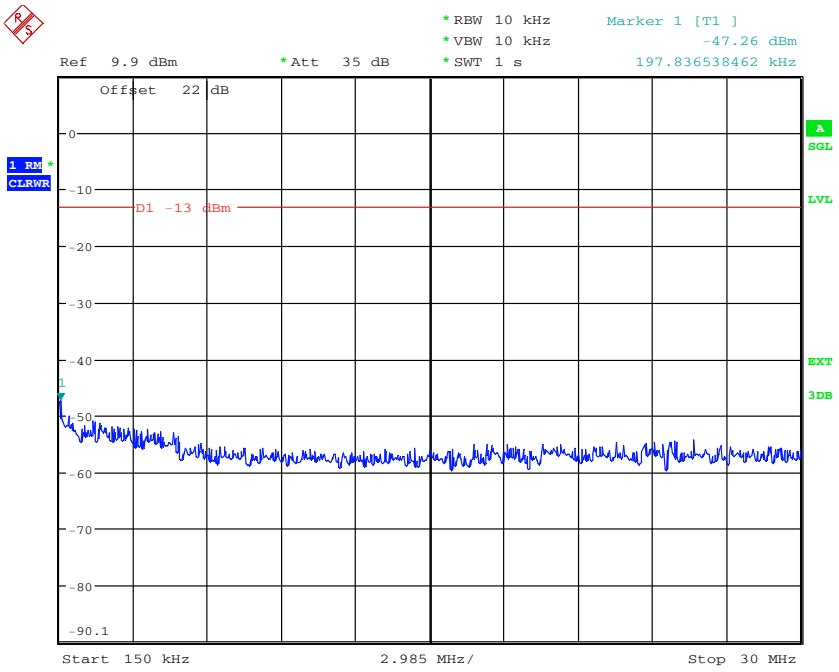
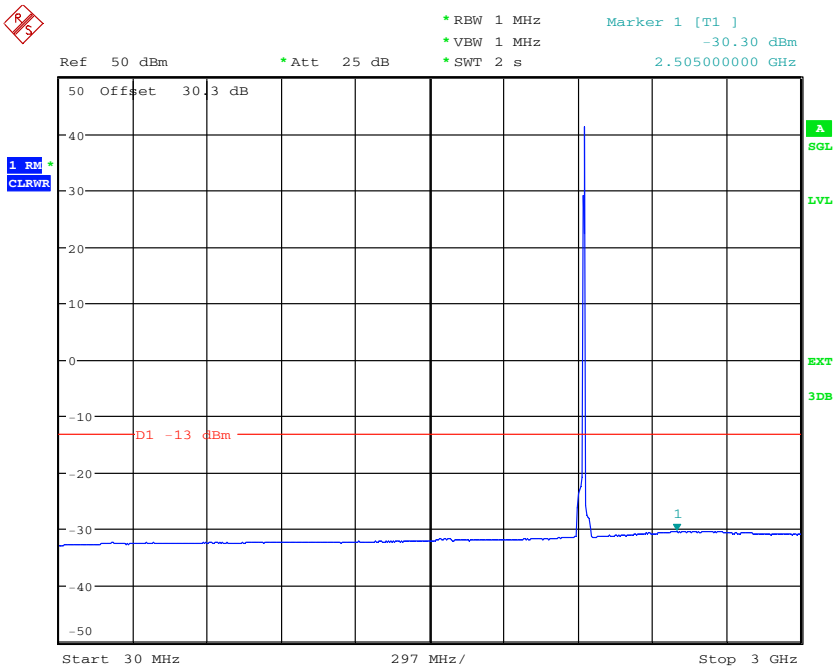
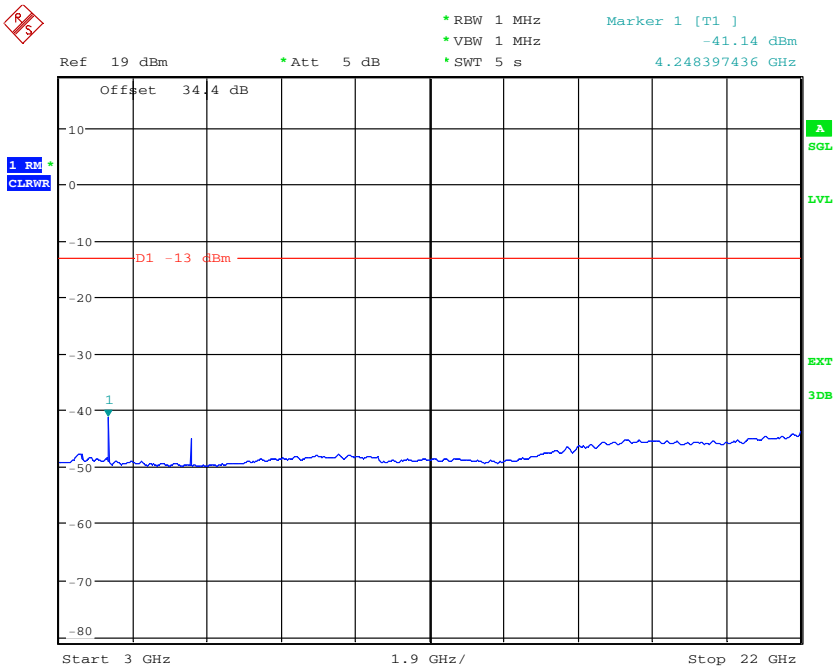


Figure 7-202: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)



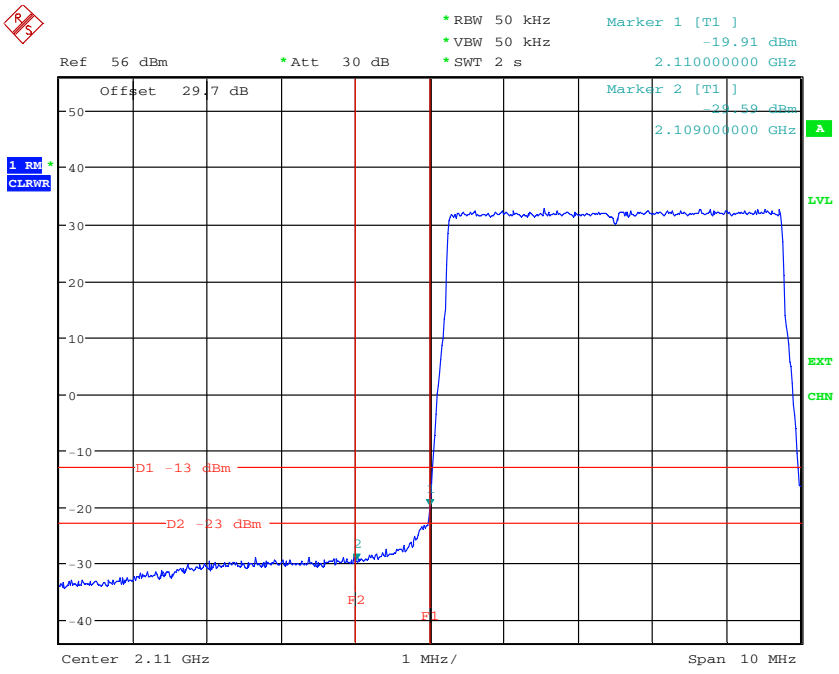
Date: 9.OCT.2012 14:57:09

Figure 7-203: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)



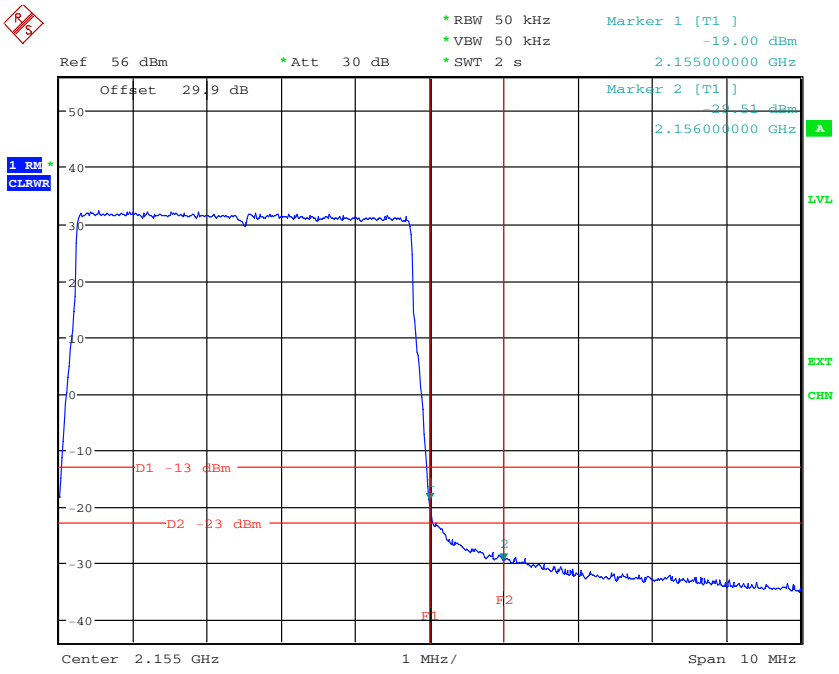
Date: 10.OCT.2012 10:21:06

Figure 7-204: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (5MHz Channel BW)



Date: 8.OCT.2012 14:11:07

Figure 7-205: Spurious Emissions (Lower Band Edge) – 64QAM (2112.5 MHz) (5MHz Channel BW)



Date: 8.OCT.2012 14:12:20

Figure 7-206: Spurious Emissions (Upper Band Edge) – 64QAM (2152.5 MHz) (5MHz Channel BW)

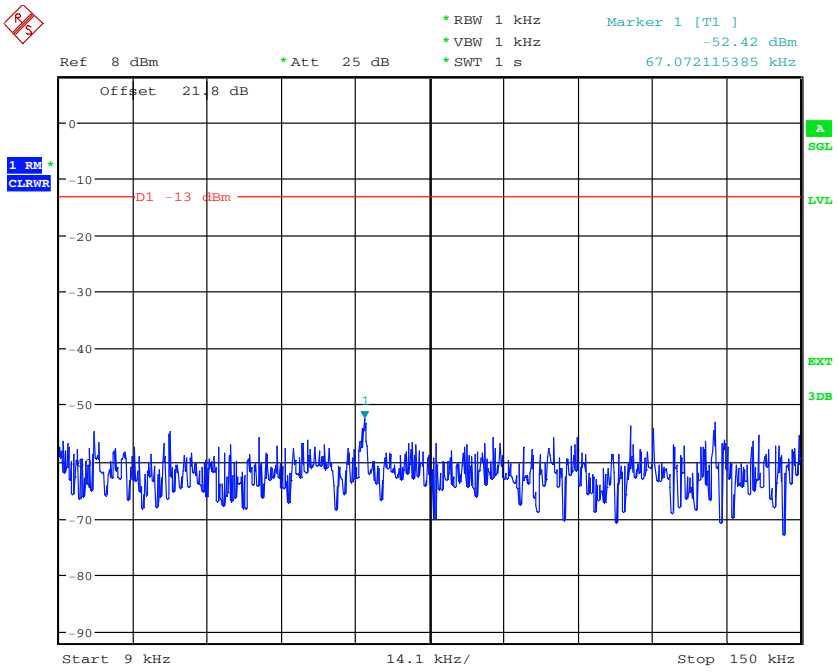


Figure 7-207: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)

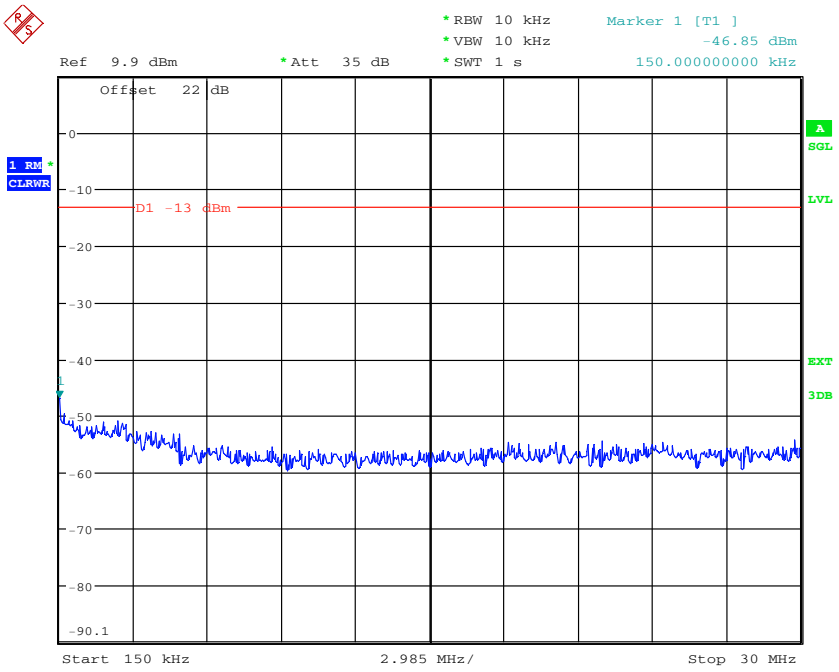
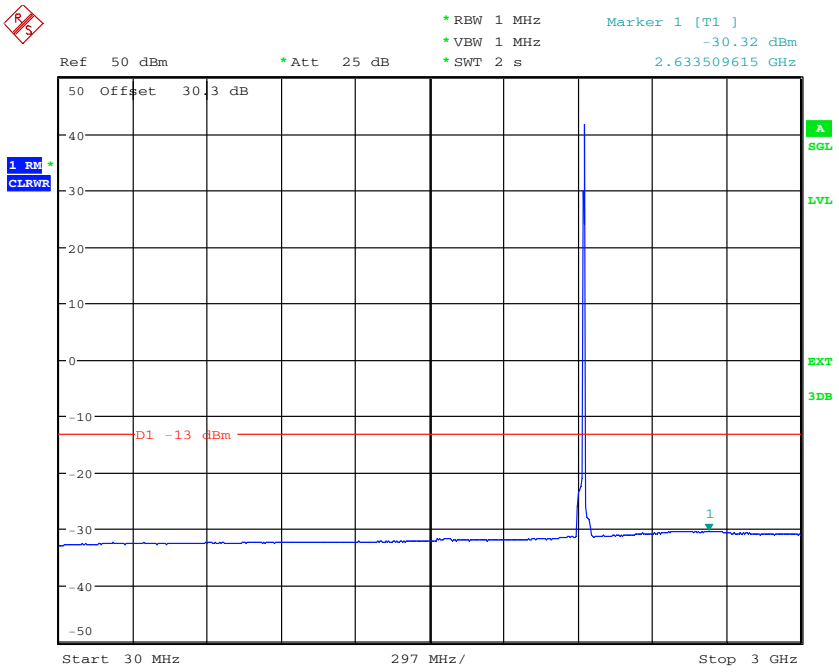
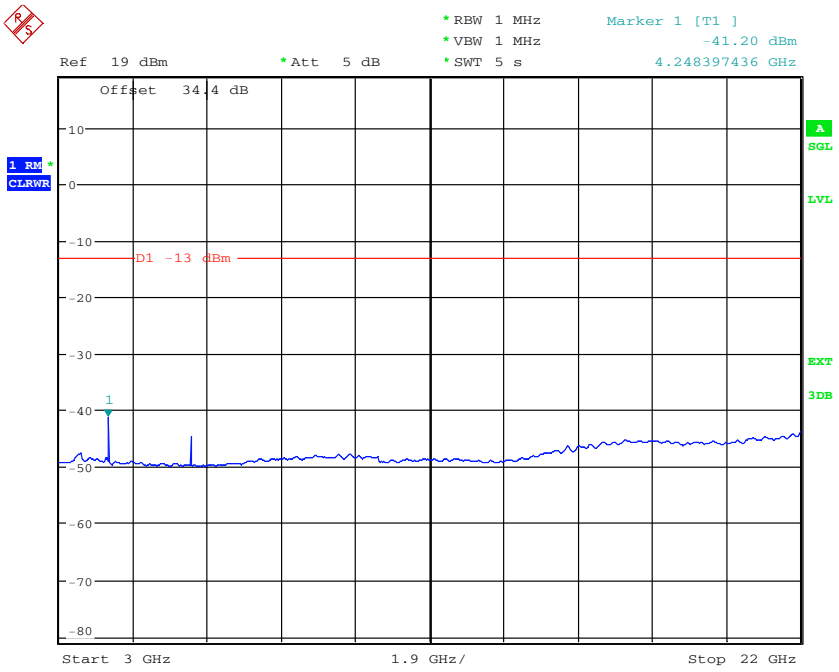


Figure 7-208: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)



Date: 9.OCT.2012 14:59:19

Figure 7-209: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)



Date: 10.OCT.2012 10:22:30

Figure 7-210: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (5MHz Channel BW)

Config B ANT1 + ANT3:

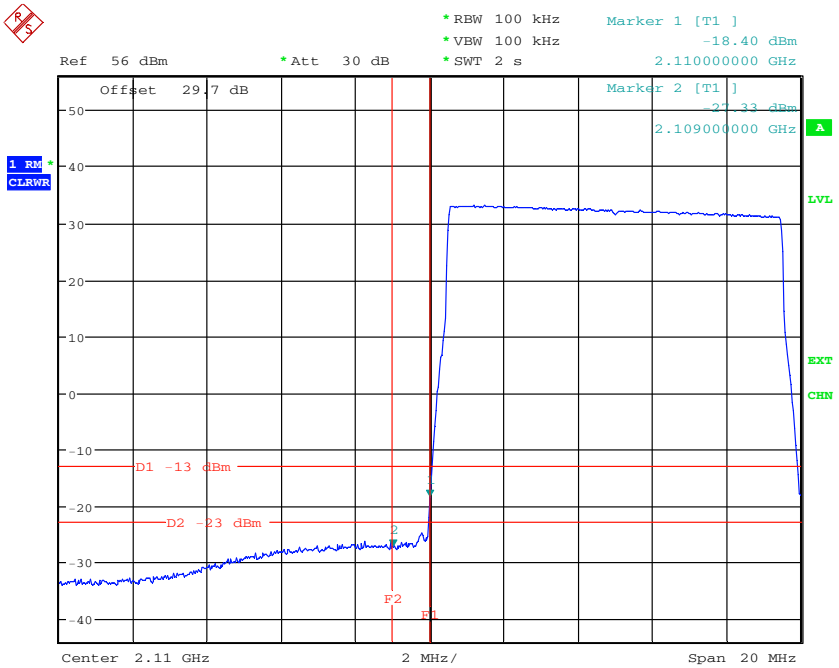


Figure 7-211: Spurious Emissions (Lower Band Edge) – QPSK (2115.0 MHz) (10MHz Channel BW)

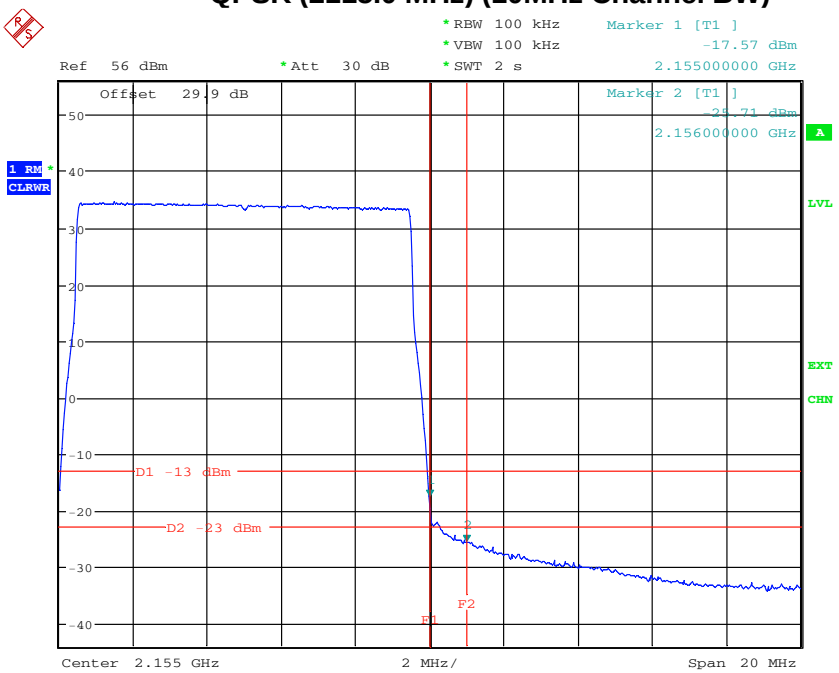


Figure 7-212: Spurious Emissions (Upper Band Edge) – QPSK (2150.0 MHz) (10MHz Channel BW)

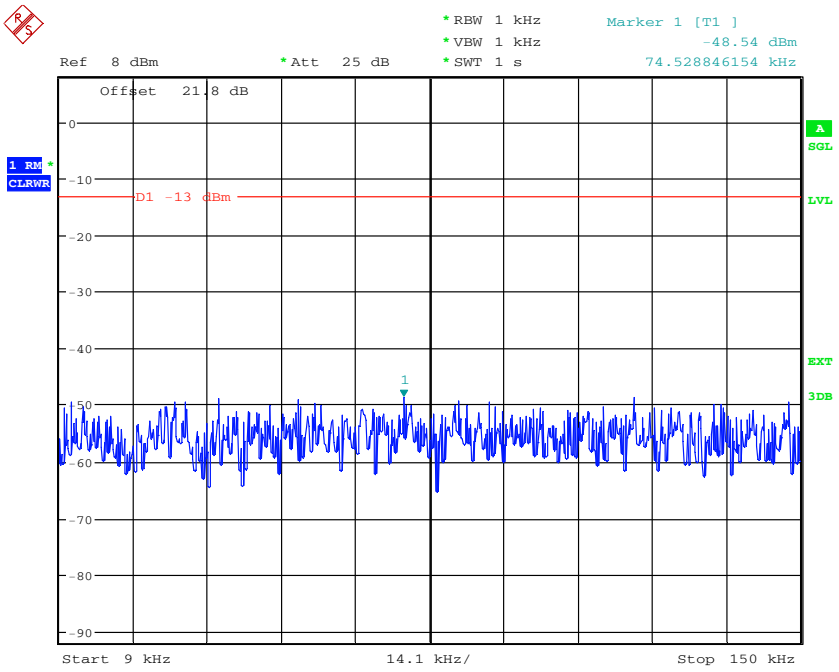


Figure 7-213: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (10MHz Channel BW)

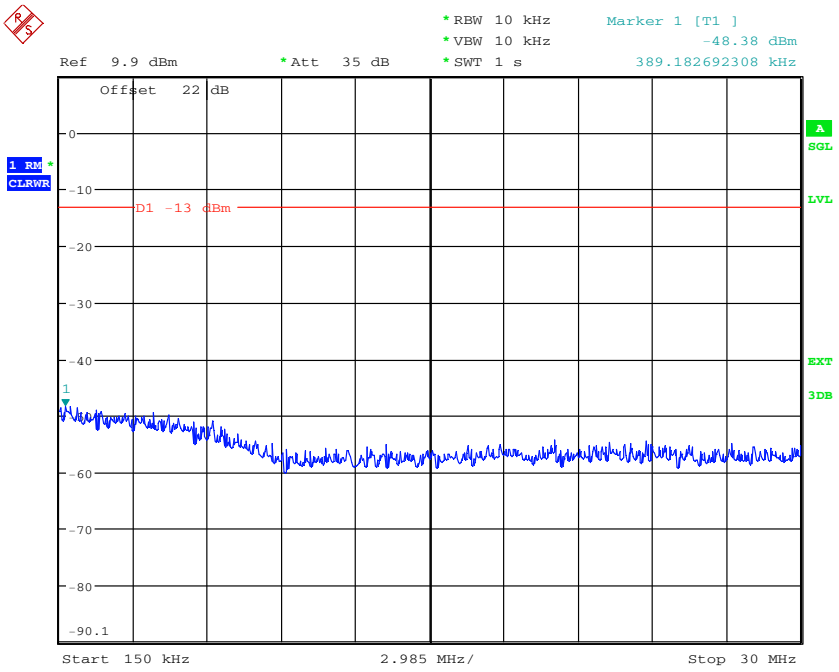


Figure 7-214: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (10MHz Channel BW)

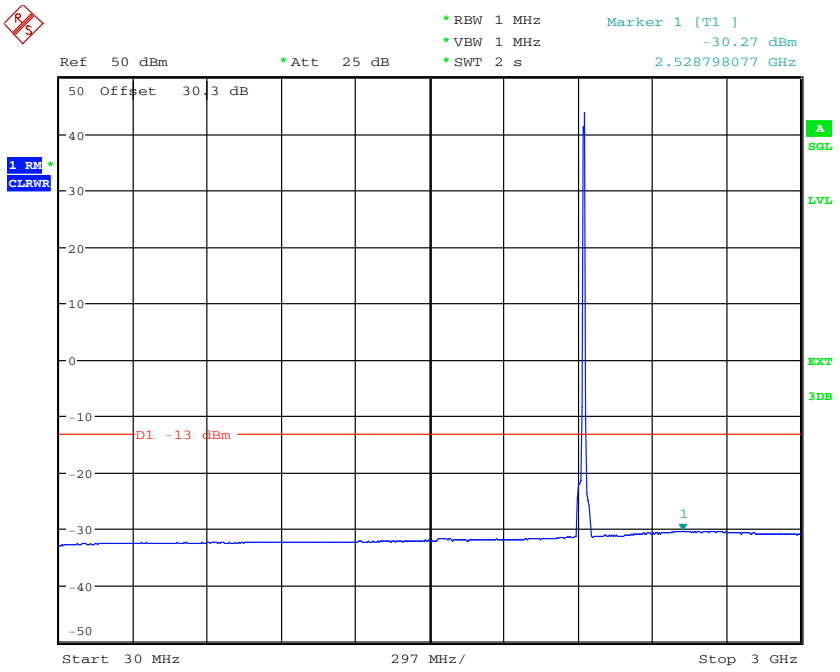


Figure 7-215: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (10MHz Channel BW)

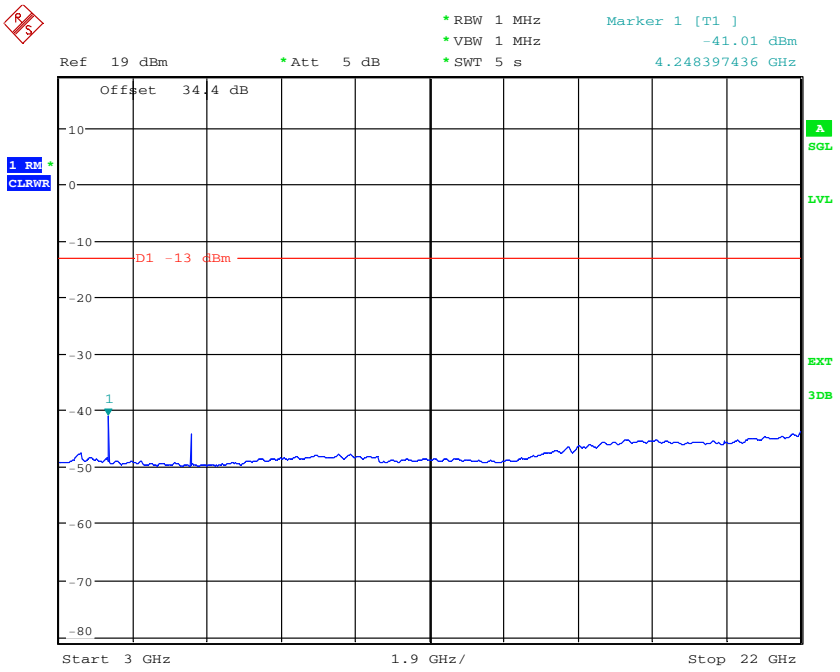


Figure 7-216: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (10MHz Channel BW)

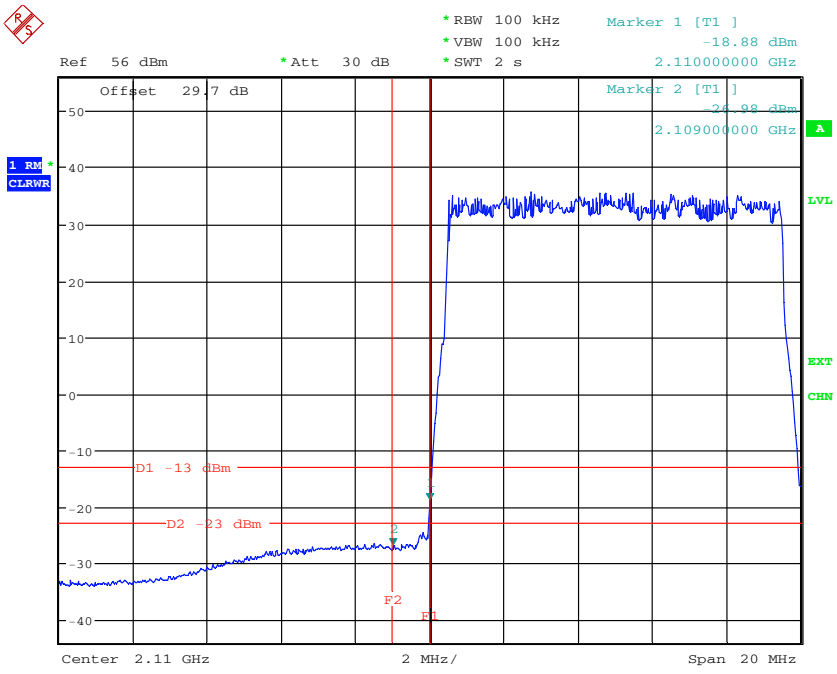


Figure 7-217: Spurious Emissions (Lower Band Edge) – 16QAM (2115.0 MHz) (10MHz Channel BW)

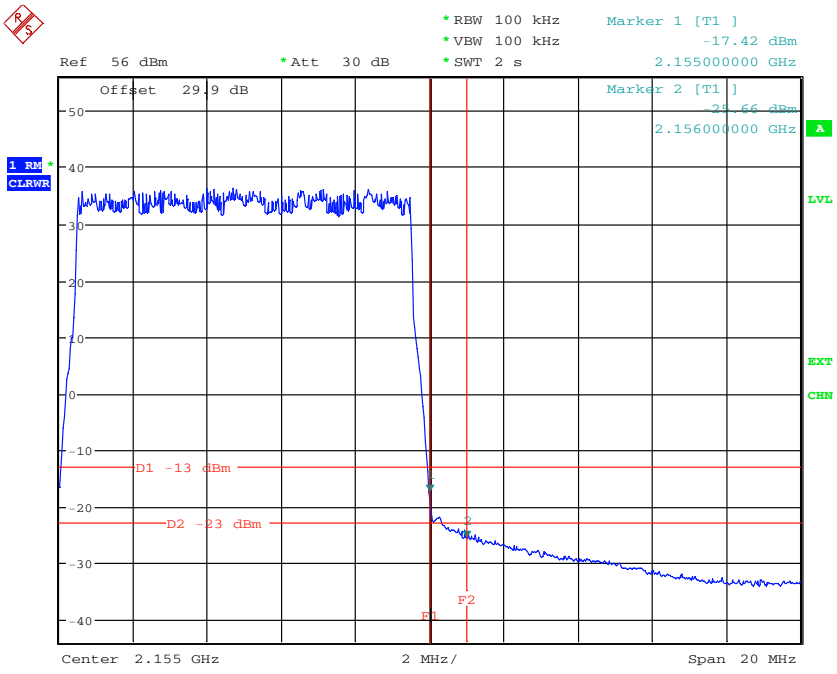


Figure 7-218: Spurious Emissions (Upper Band Edge) – 16QAM (2150.0 MHz) (10MHz Channel BW)

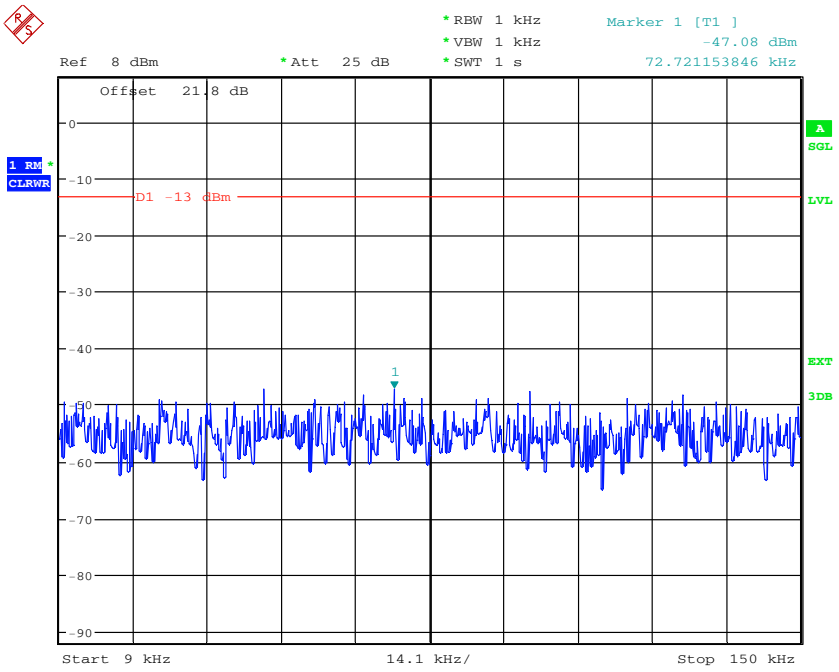


Figure 7-219: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)

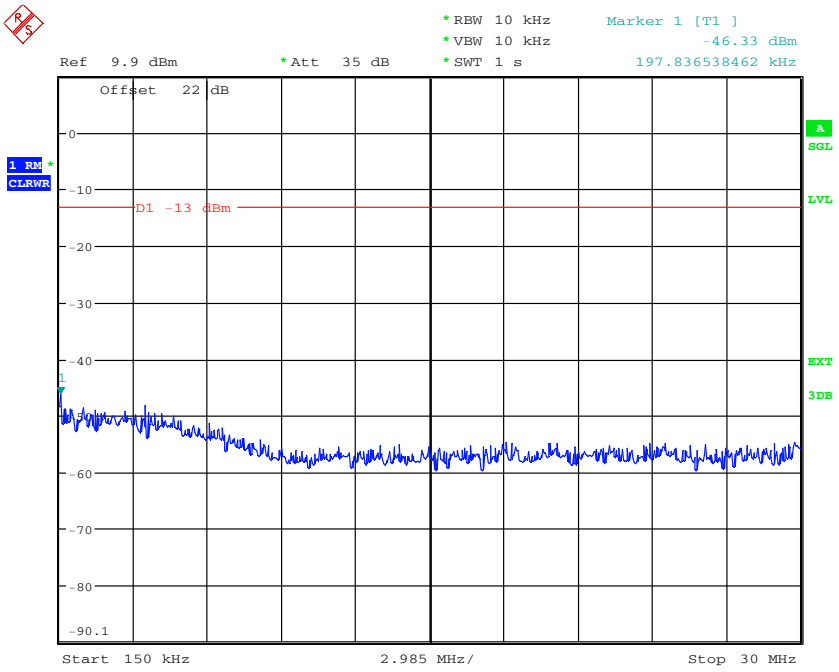


Figure 7-220: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)

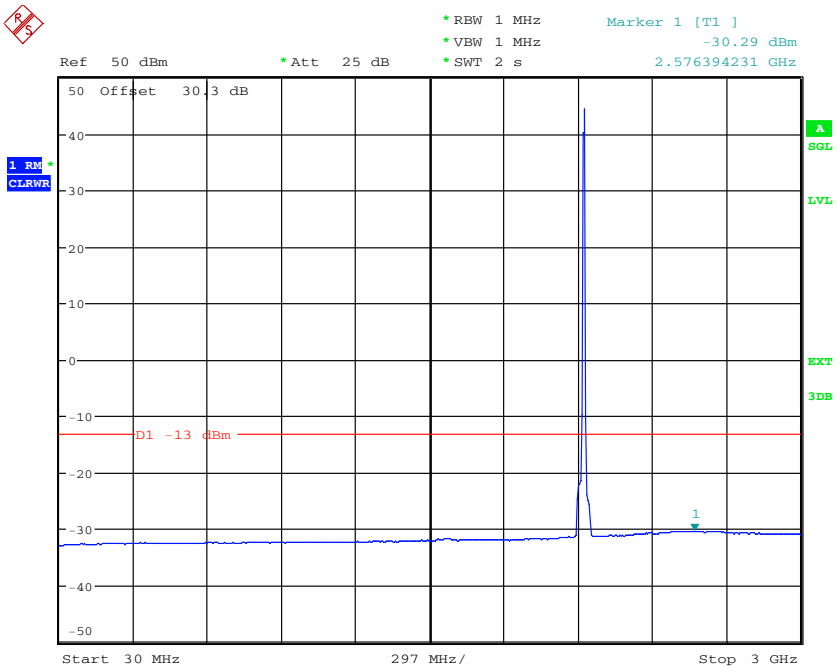


Figure 7-221: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)

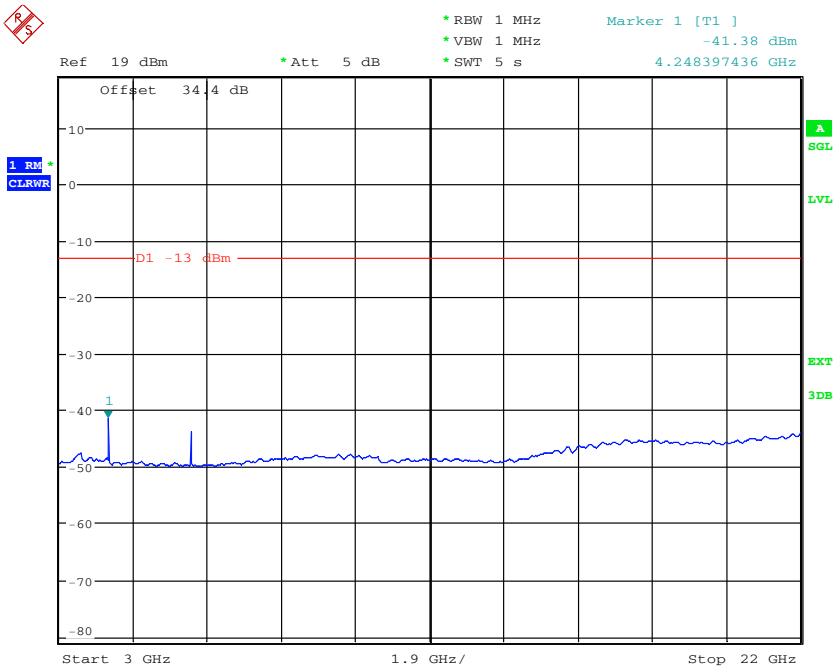


Figure 7-222: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (10MHz Channel BW)

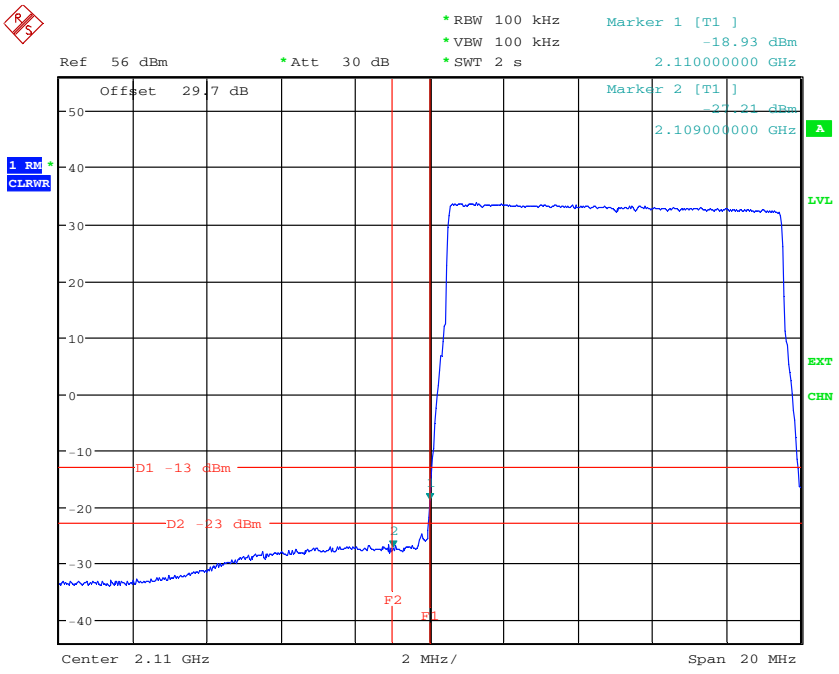


Figure 7-223: Spurious Emissions (Lower Band Edge) – 64QAM (2115.0 MHz) (10MHz Channel BW)

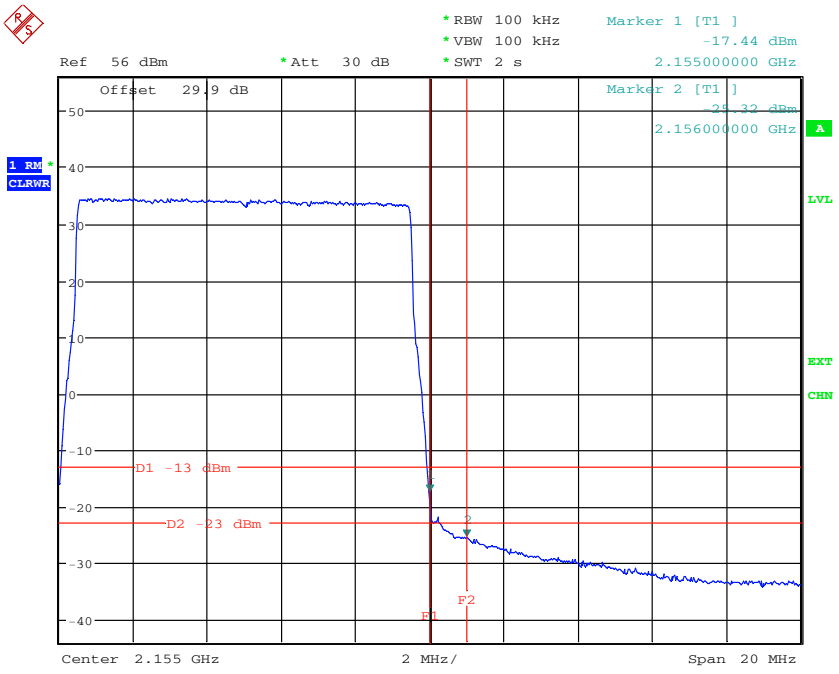


Figure 7-224: Spurious Emissions (Upper Band Edge) – 64QAM (2150.0 MHz) (10MHz Channel BW)

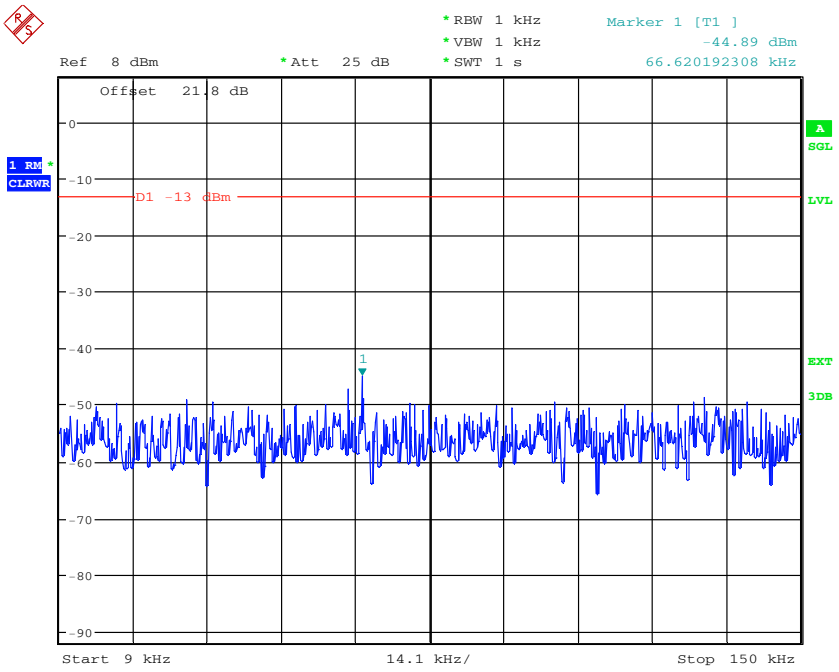


Figure 7-225: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)

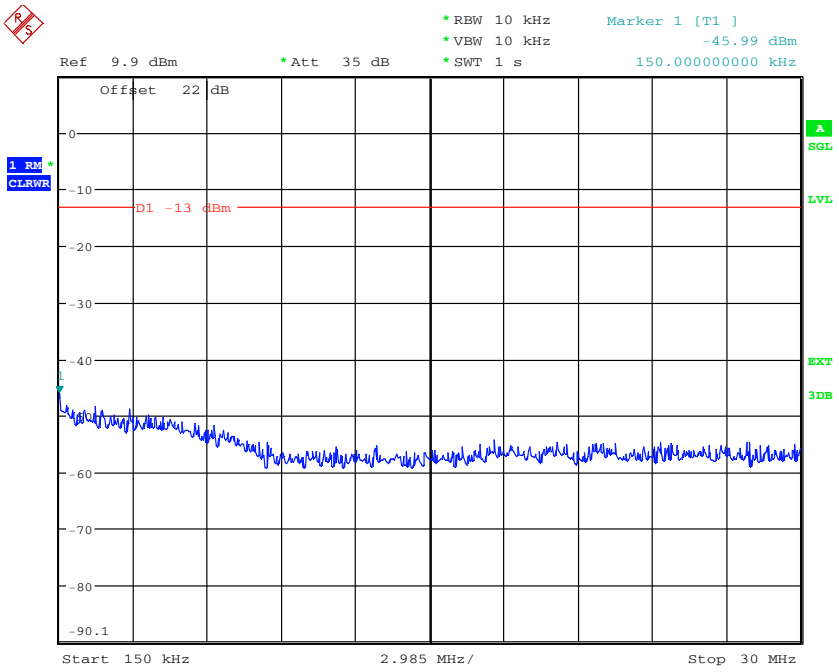


Figure 7-226: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)

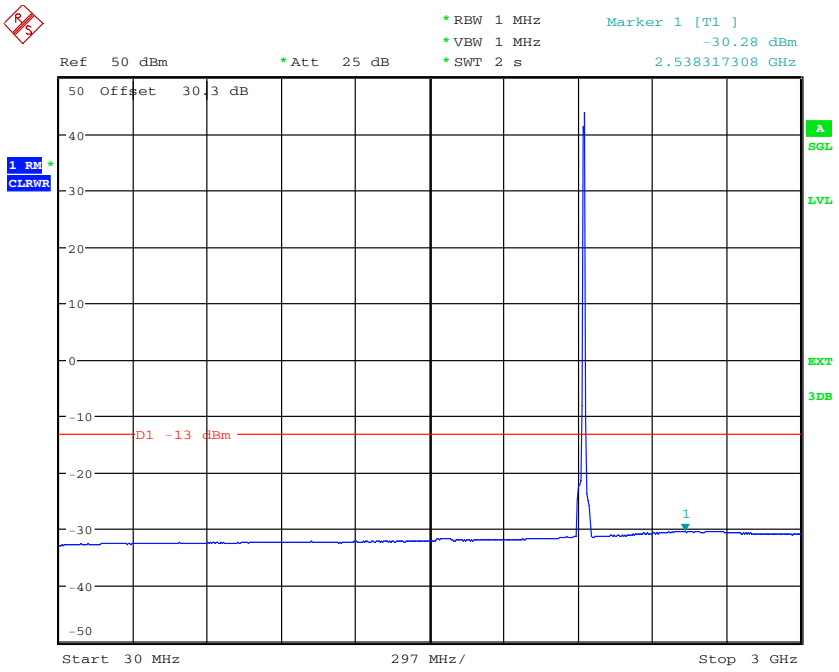


Figure 7-227: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)

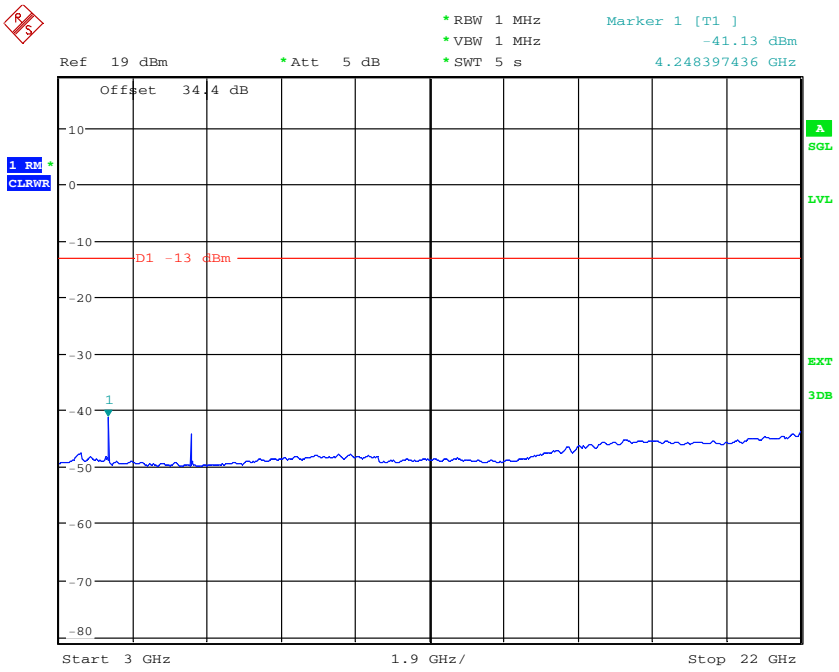


Figure 7-228: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (10MHz Channel BW)

Config C ANT1 + ANT3:

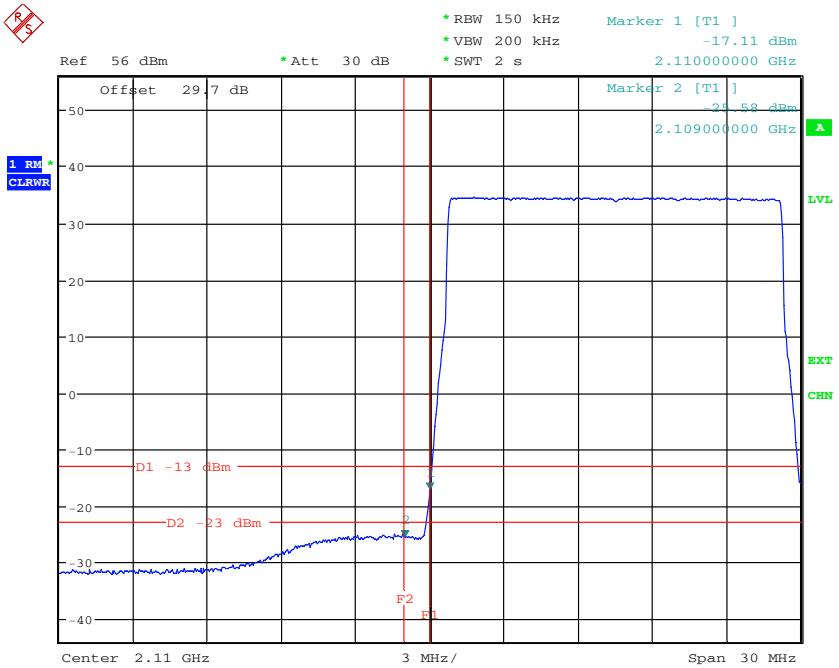


Figure 7-229: Spurious Emissions (Lower Band Edge) – QPSK (2117.5 MHz) (15MHz Channel BW)

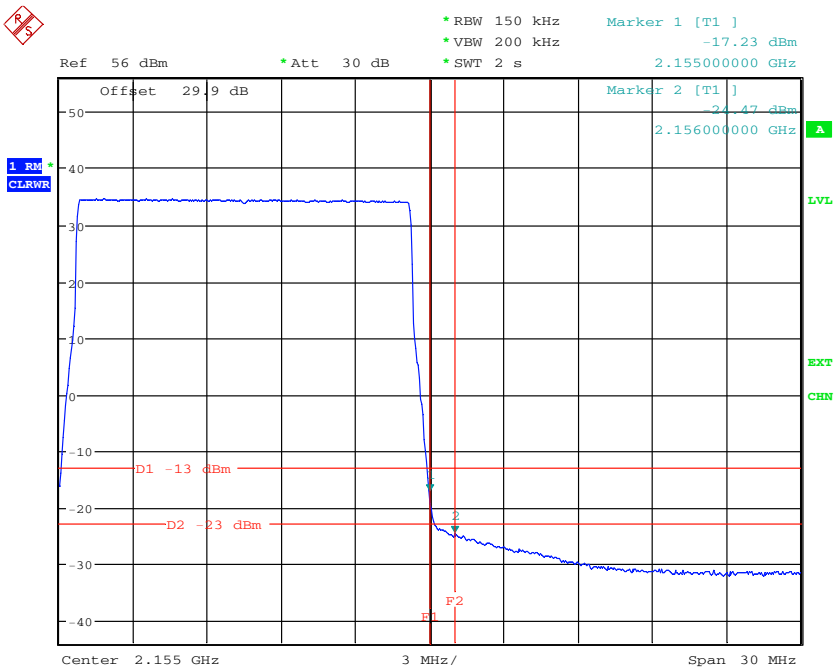


Figure 7-230: Spurious Emissions (Upper Band Edge) – QPSK (2147.5 MHz) (15MHz Channel BW)

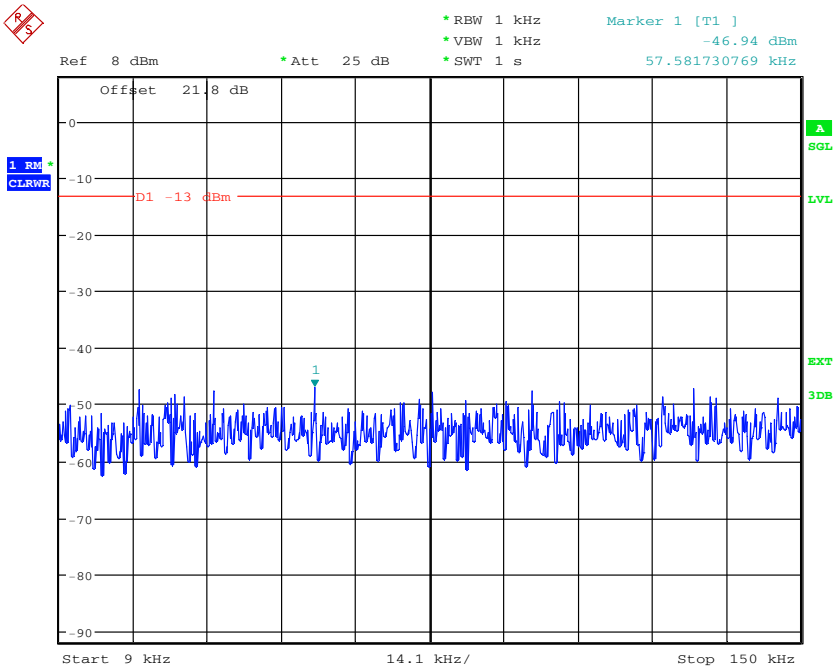


Figure 7-231: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (15MHz Channel BW)

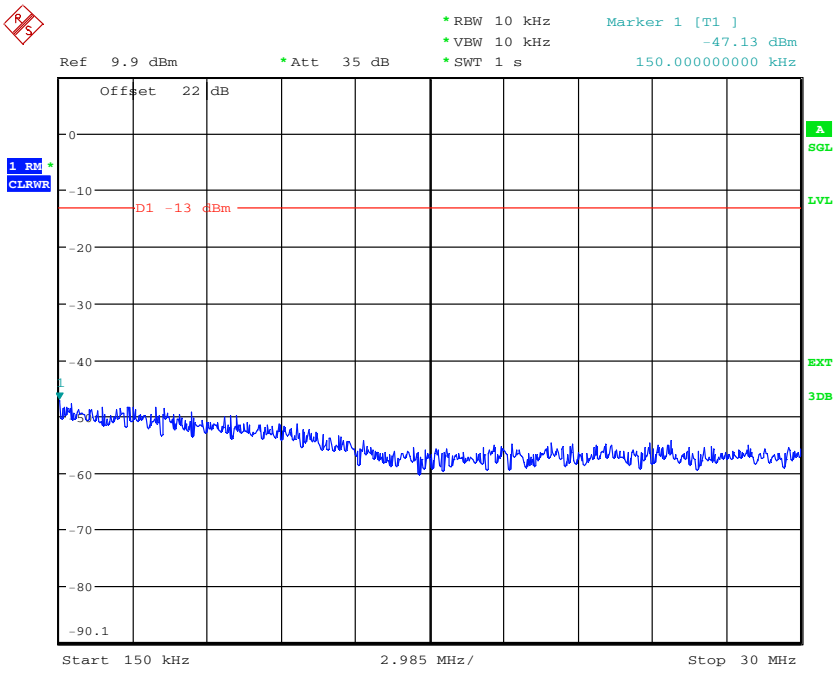
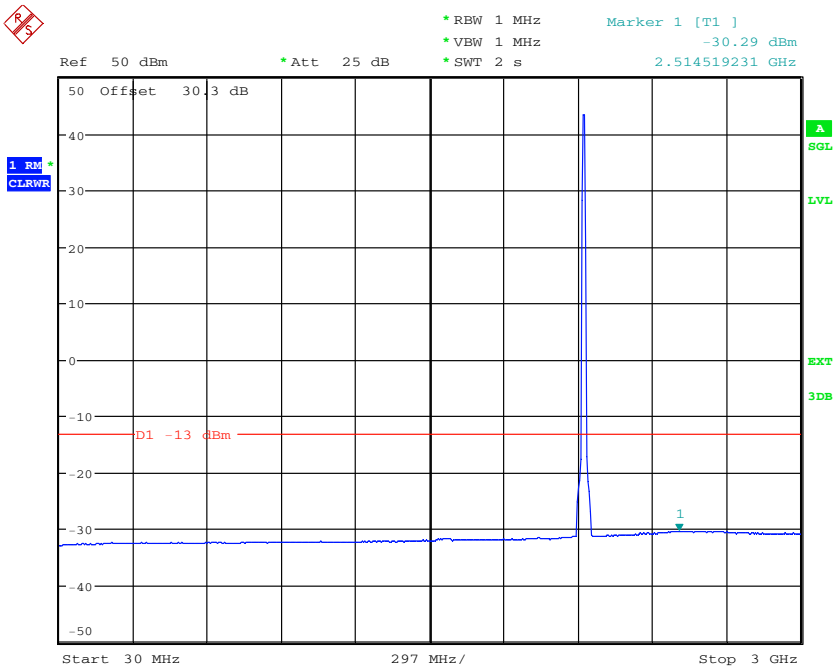
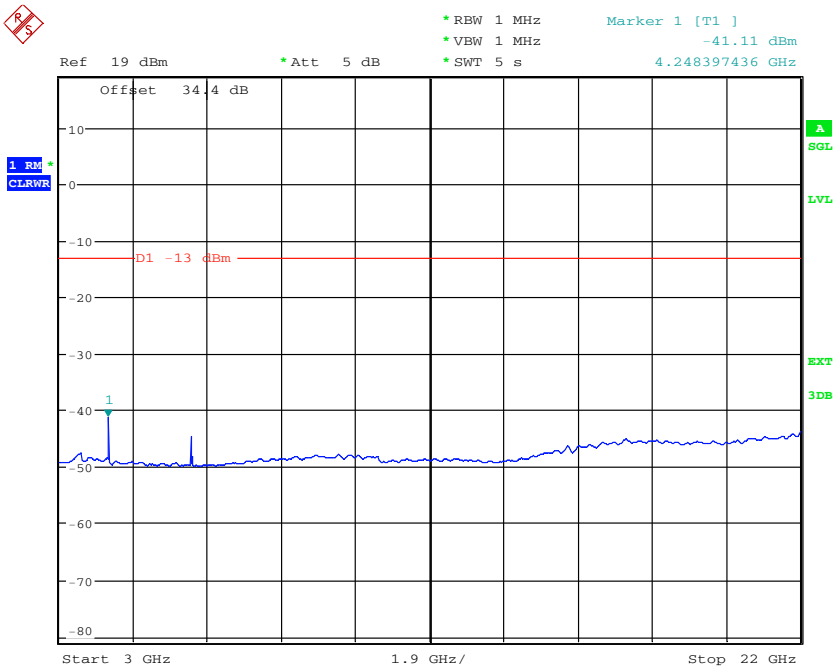


Figure 7-232: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (15MHz Channel BW)



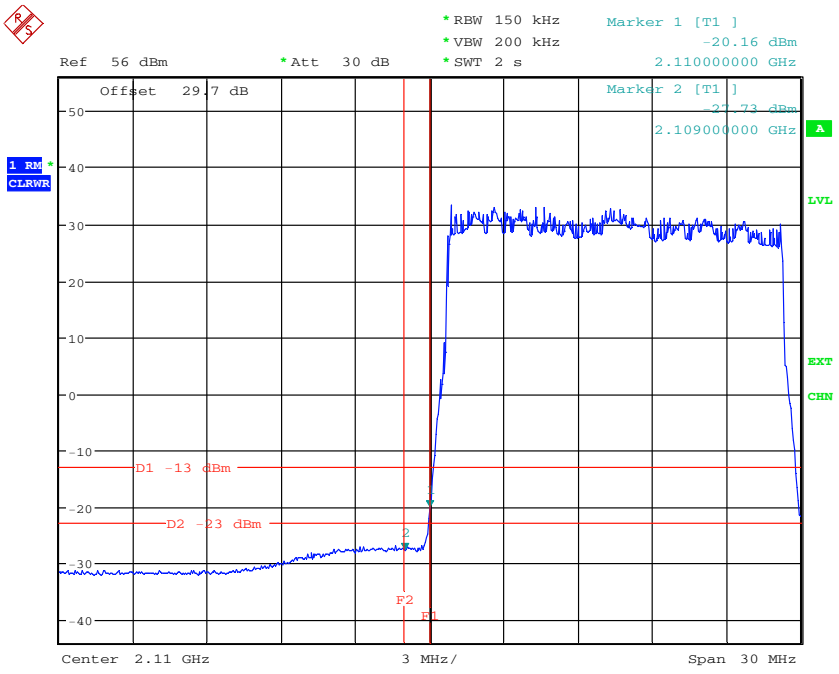
Date: 9.OCT.2012 14:18:25

Figure 7-233: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (15MHz Channel BW)



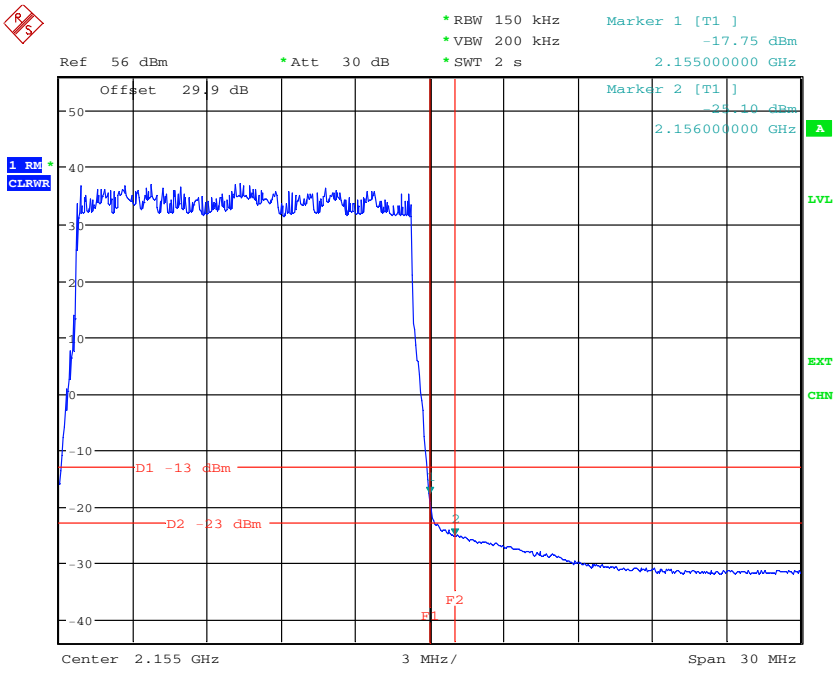
Date: 10.OCT.2012 10:40:55

Figure 7-234: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (15MHz Channel BW)



Date: 8.OCT.2012 15:40:00

Figure 7-235: Spurious Emissions (Lower Band Edge) – 16QAM (2117.5 MHz) (15MHz Channel BW)



Date: 8.OCT.2012 15:52:26

Figure 7-236: Spurious Emissions (Upper Band Edge) – 16QAM (2147.5 MHz) (15MHz Channel BW)

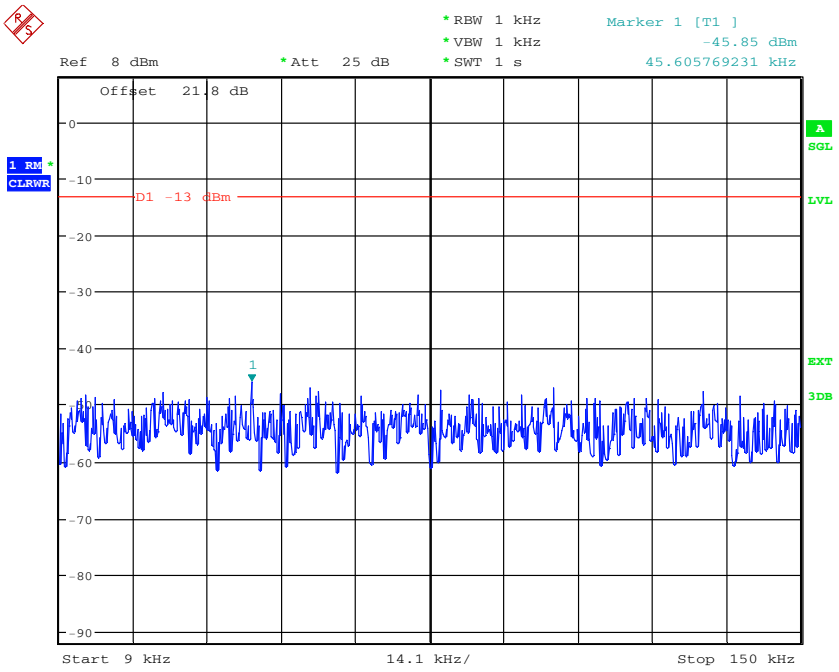


Figure 7-237: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

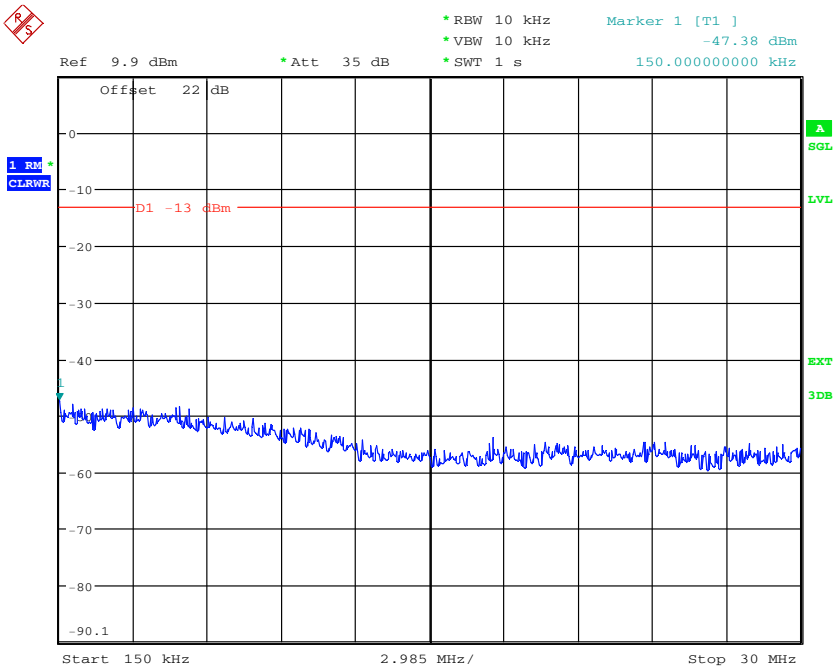


Figure 7-238: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

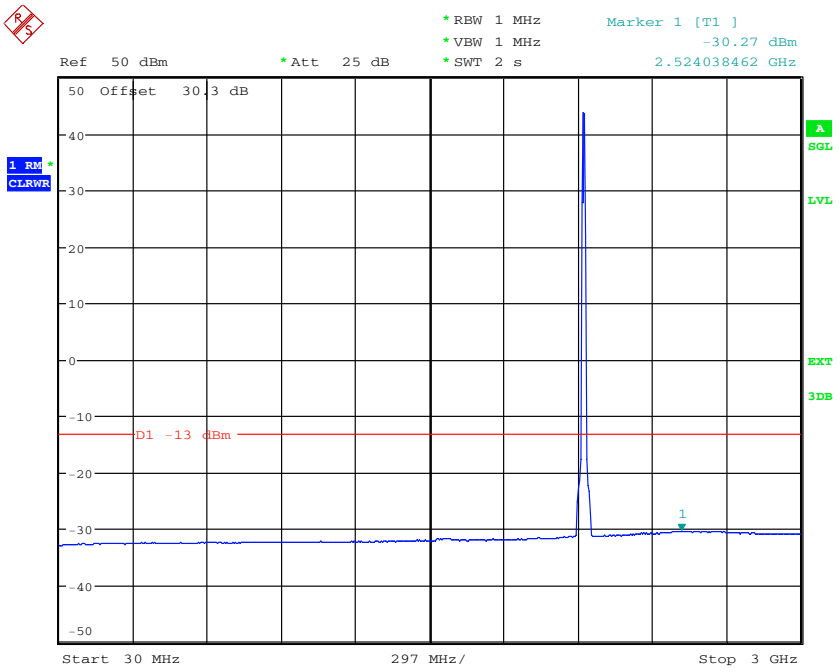


Figure 7-239: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)

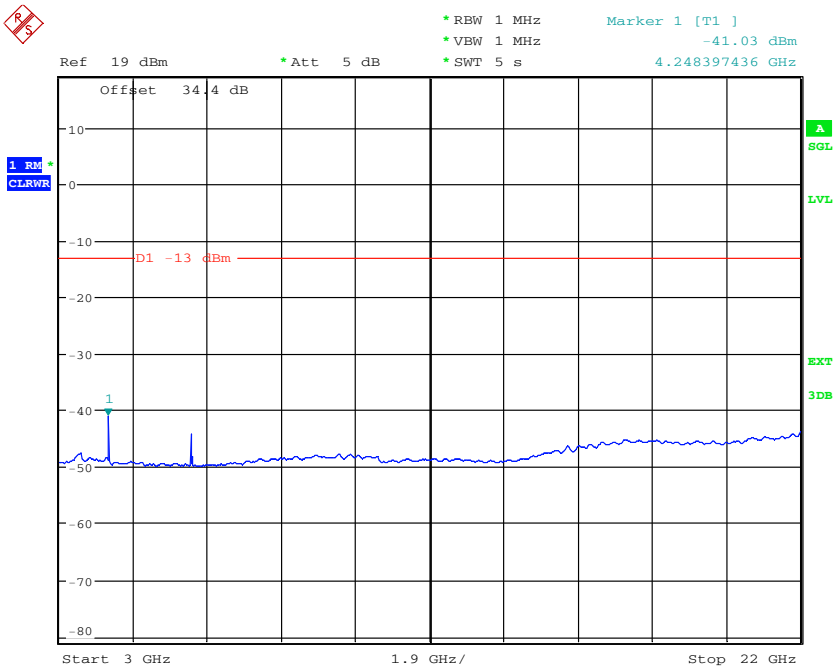
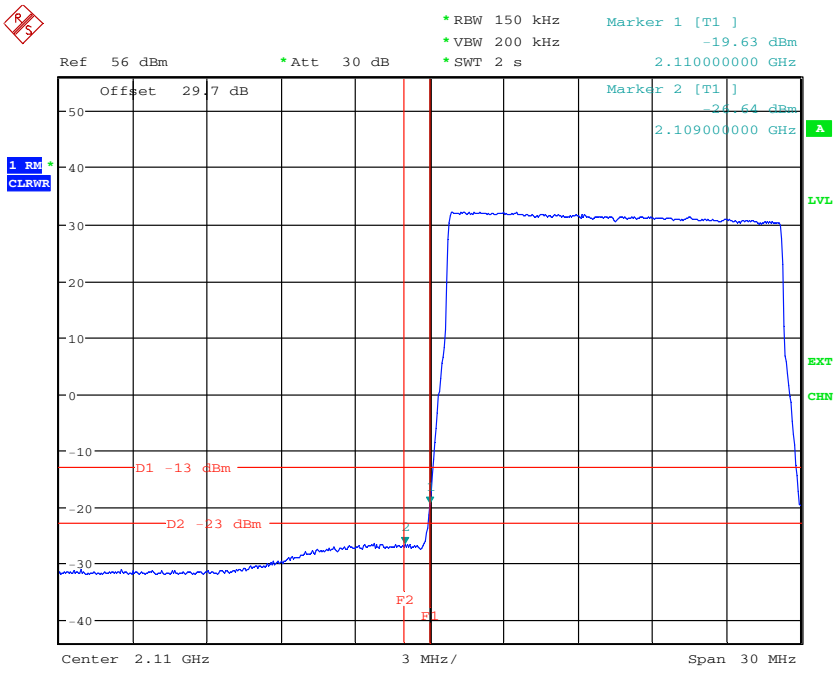
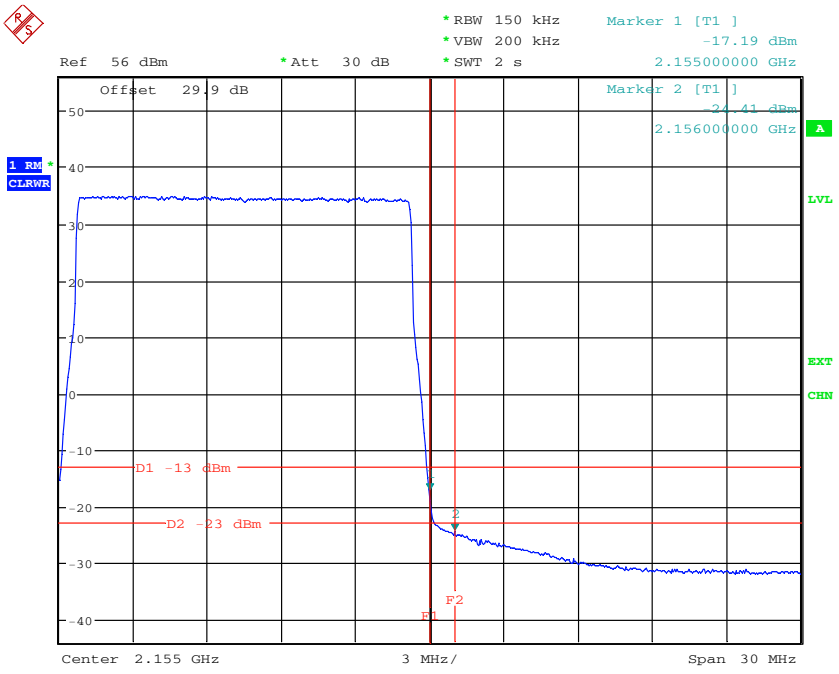


Figure 7-240: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (15MHz Channel BW)



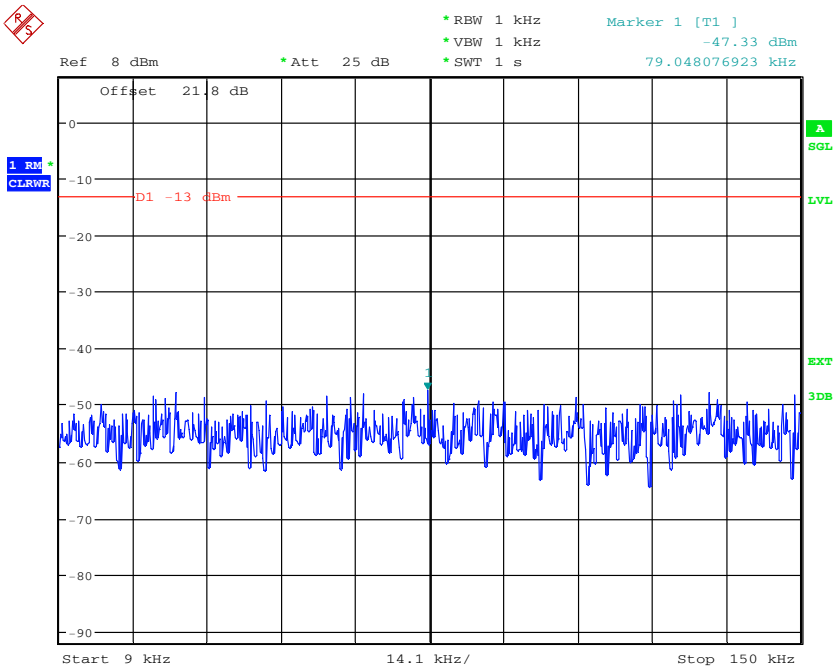
Date: 8.OCT.2012 15:42:04

Figure 7-241: Spurious Emissions (Lower Band Edge) – 64QAM (2117.5 MHz) (15MHz Channel BW)



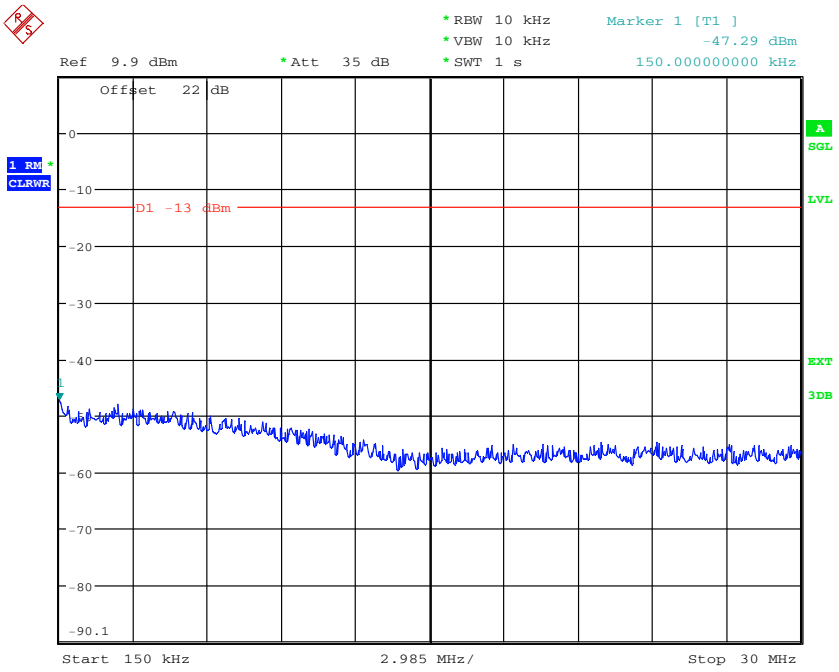
Date: 8.OCT.2012 16:10:04

Figure 7-242: Spurious Emissions (Upper Band Edge) – 64QAM (2147.5 MHz) (15MHz Channel BW)



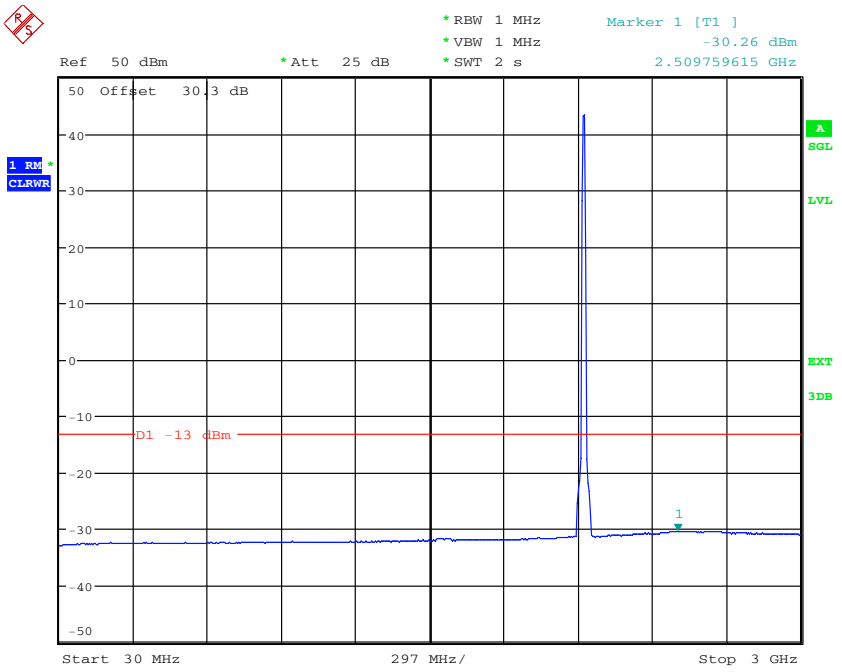
Date: 9.OCT.2012 14:23:56

Figure 7-243: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)



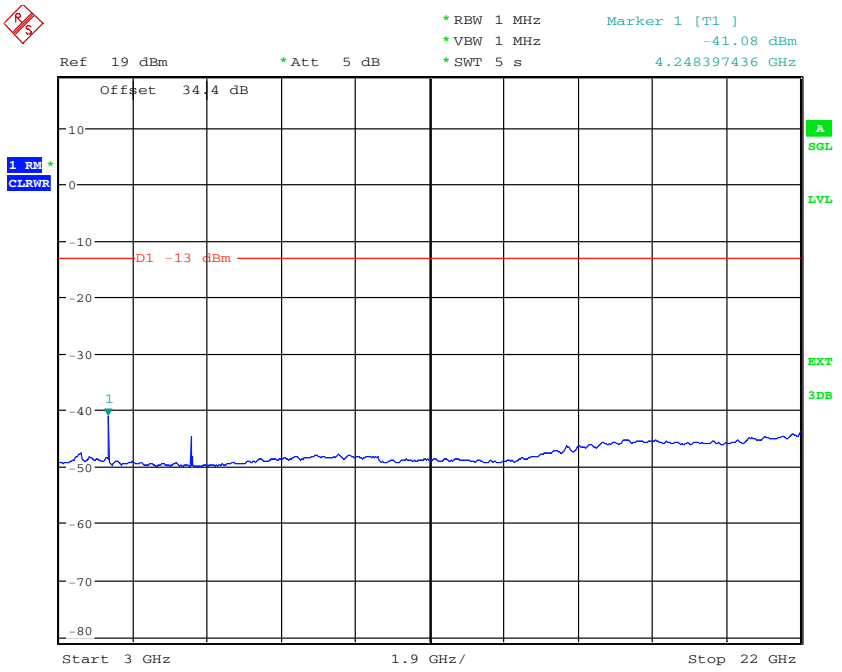
Date: 9.OCT.2012 14:24:26

Figure 7-244: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)



Date: 9.OCT.2012 14:25:55

Figure 7-245: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)



Date: 10.OCT.2012 10:39:07

Figure 7-246: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (15MHz Channel BW)

Config D ANT1 + ANT3:

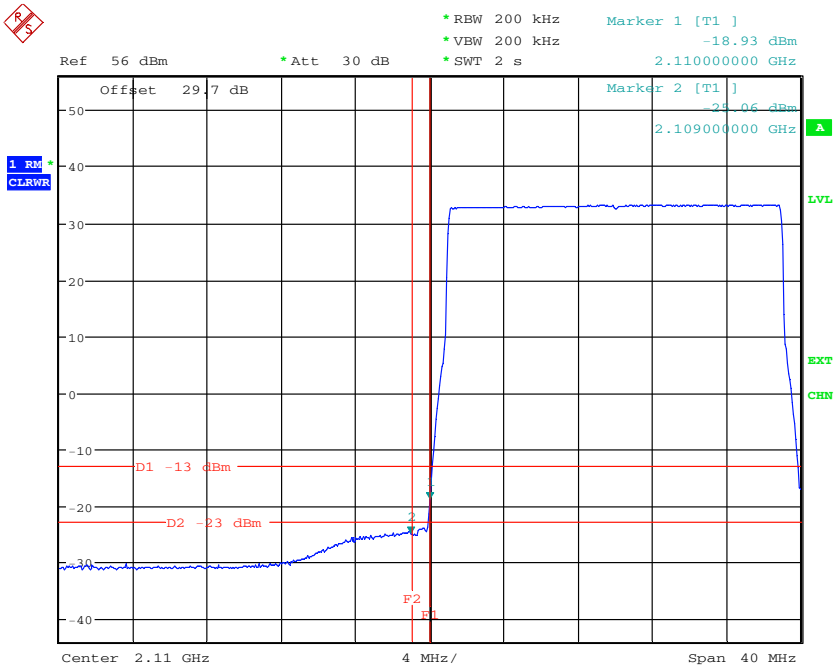


Figure 7-247: Spurious Emissions (Lower Band Edge) – QPSK (2120.0 MHz) (20MHz Channel BW)

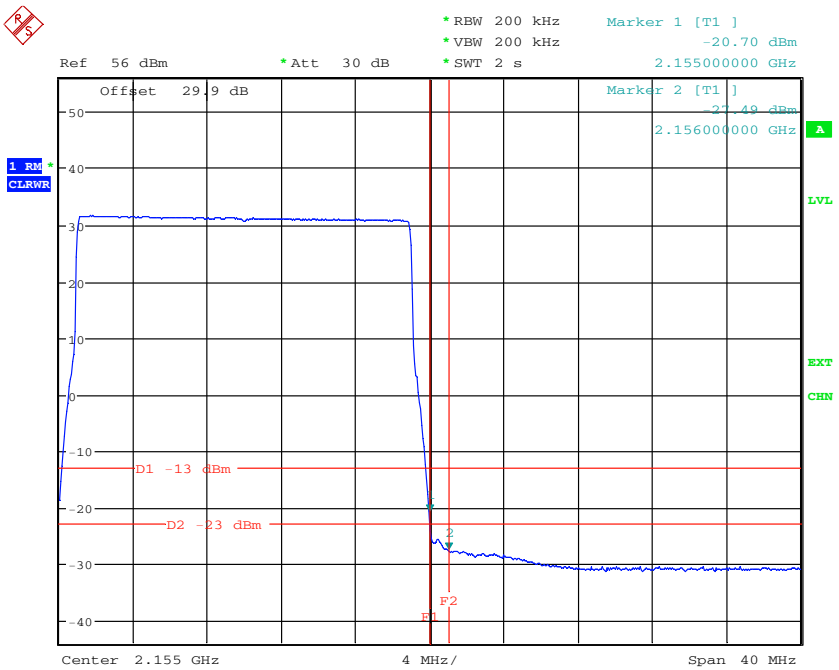


Figure 7-248: Spurious Emissions (Upper Band Edge) – QPSK (2145.0 MHz) (20MHz Channel BW)

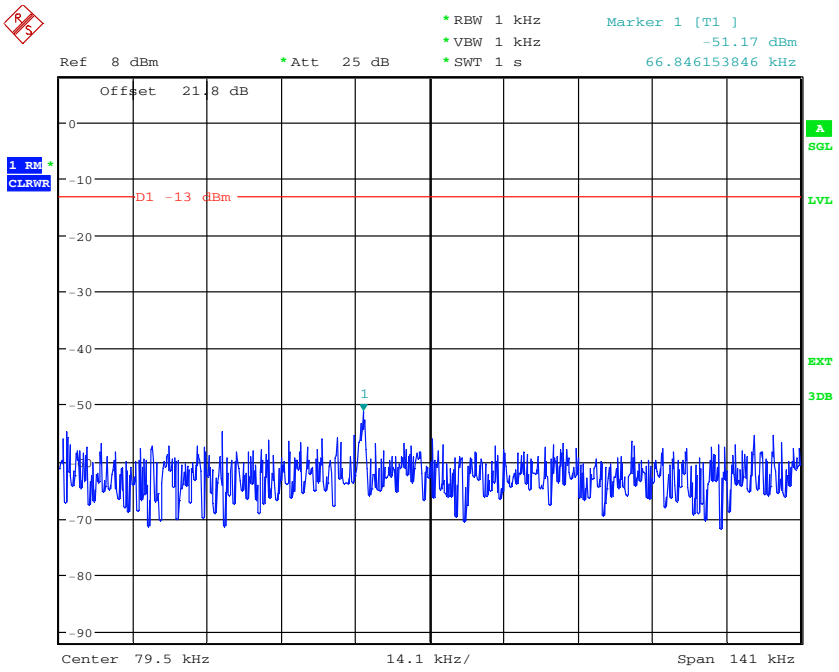


Figure 7-249: Spurious Emissions (9kHz – 150kHz) – QPSK (2132.5 MHz) (20MHz Channel BW)

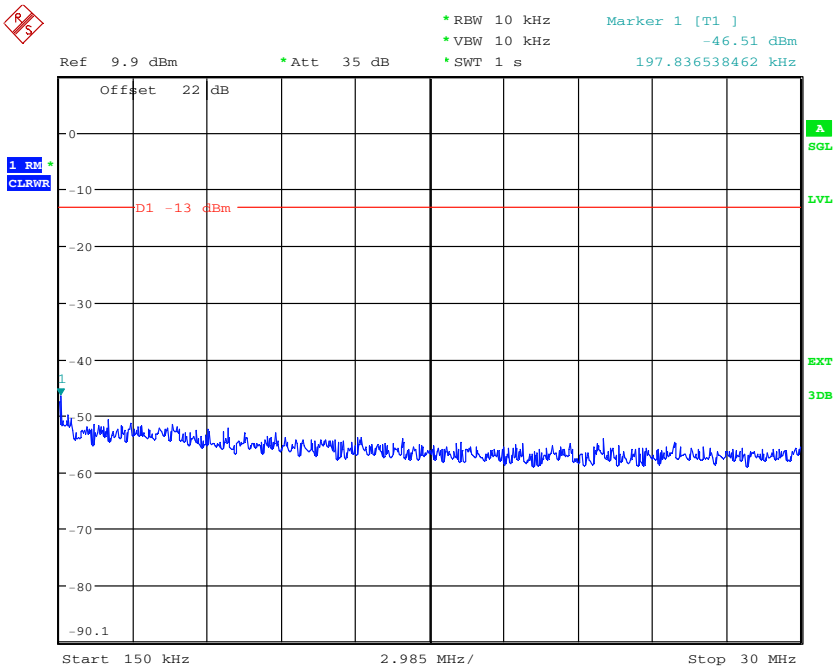


Figure 7-250: Spurious Emissions (150kHz – 30MHz) – QPSK (2132.5 MHz) (20MHz Channel BW)

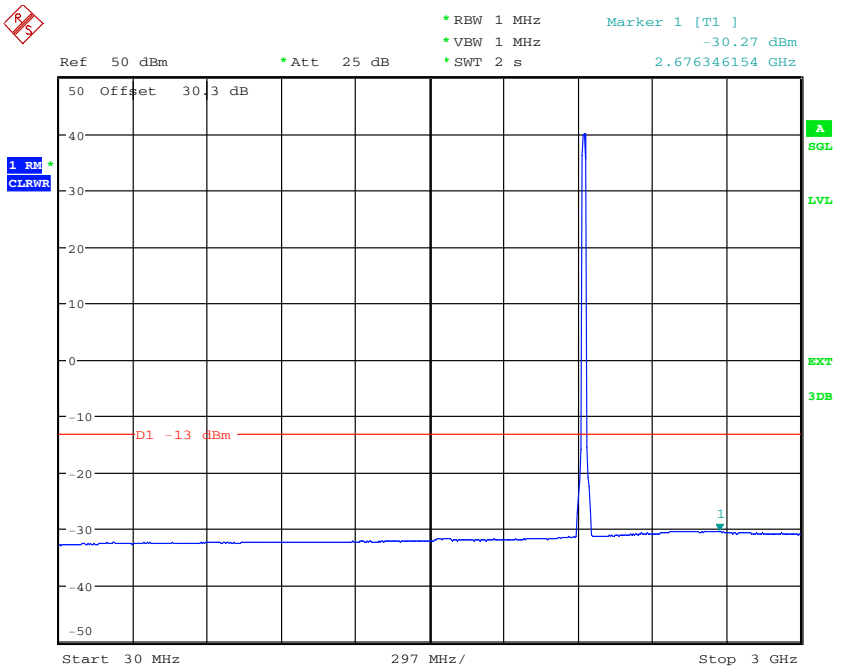


Figure 7-251: Spurious Emissions (30MHz – 3GHz) – QPSK (2132.5 MHz) (20MHz Channel BW)

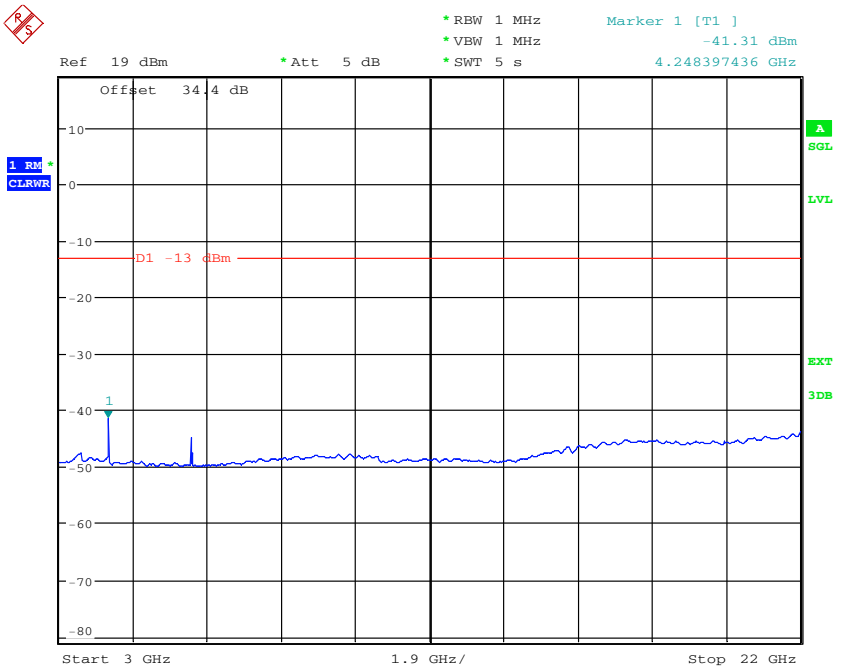


Figure 7-252: Spurious Emissions (3GHz – 22GHz) – QPSK (2132.5 MHz) (20MHz Channel BW)

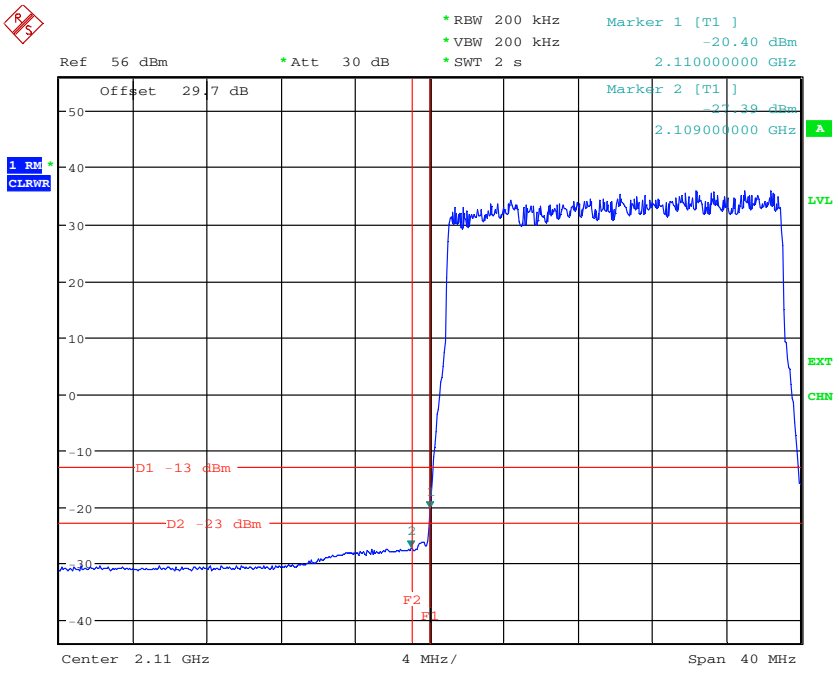


Figure 7-253: Spurious Emissions (Lower Band Edge) – 16QAM (2120.0 MHz) (20MHz Channel BW)

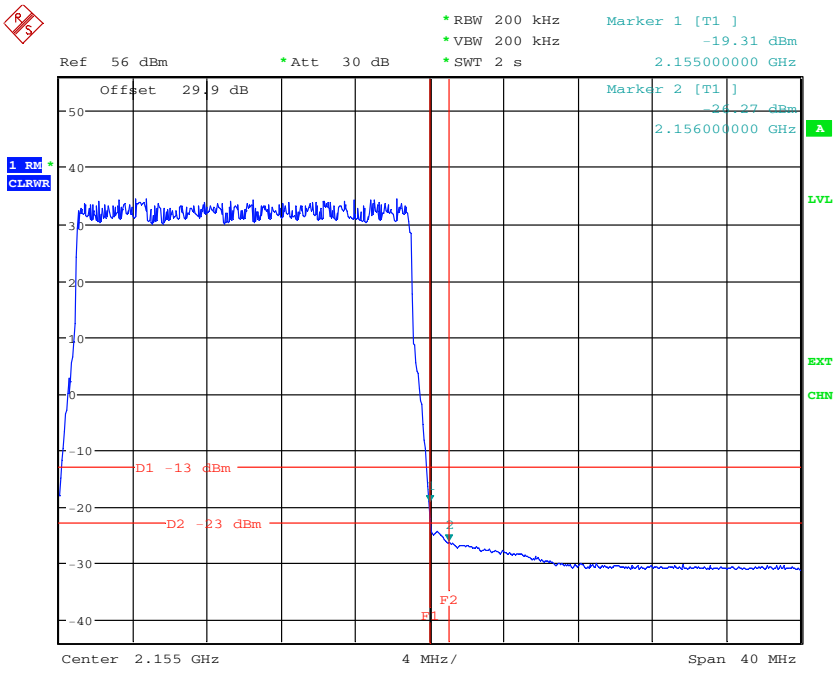


Figure 7-254: Spurious Emissions (Upper Band Edge) – 16QAM (2145.0 MHz) (20MHz Channel BW)

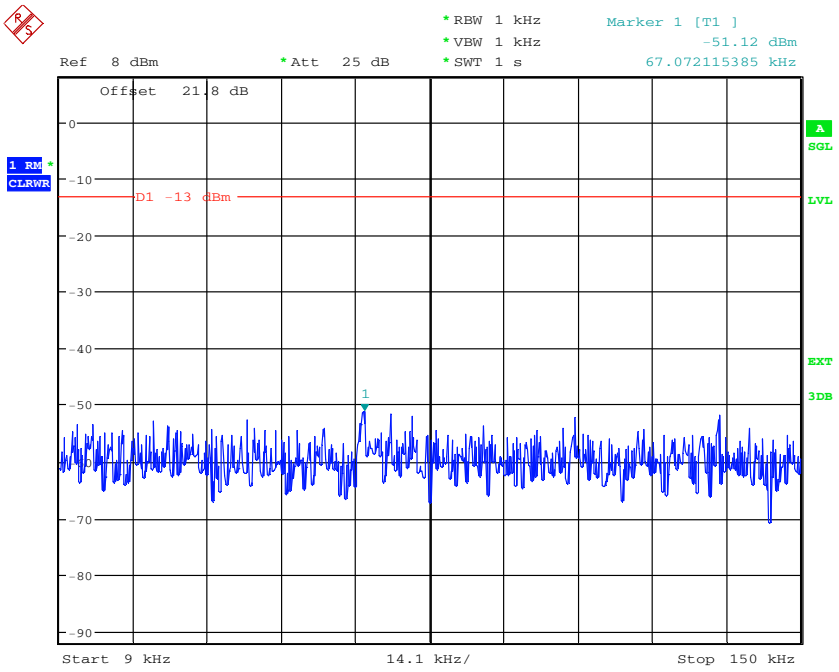


Figure 7-255: Spurious Emissions (9kHz – 150kHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)

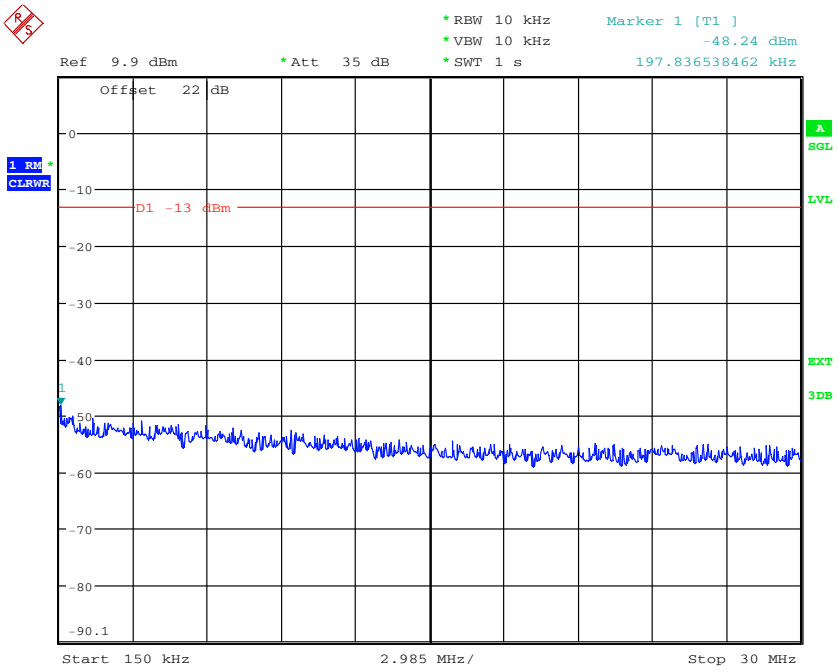


Figure 7-256: Spurious Emissions (150kHz – 30MHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)

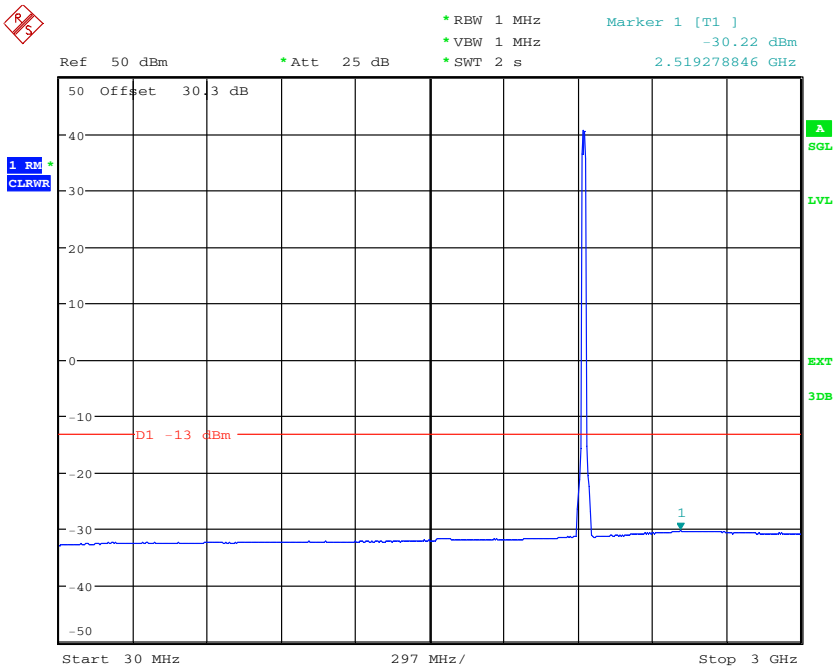


Figure 7-257: Spurious Emissions (30MHz – 3GHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)

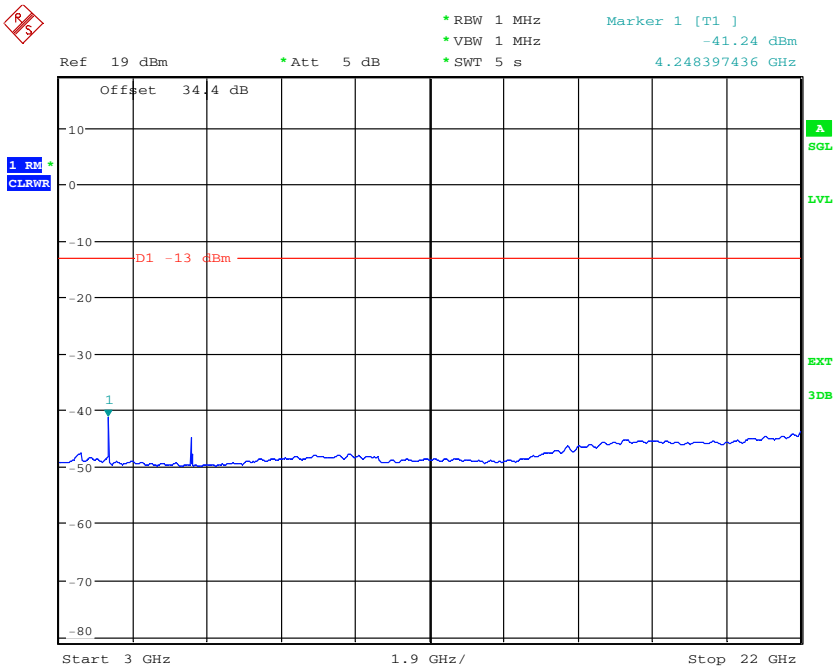


Figure 7-258: Spurious Emissions (3GHz – 22GHz) – 16QAM (2132.5 MHz) (20MHz Channel BW)

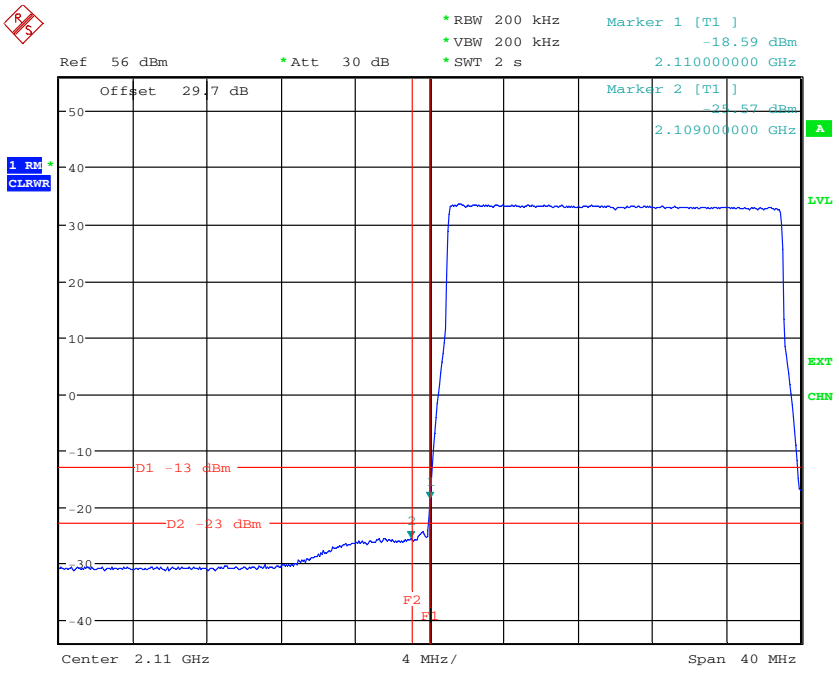


Figure 7-259: Spurious Emissions (Lower Band Edge) – 64QAM (2120.0 MHz) (20MHz Channel BW)

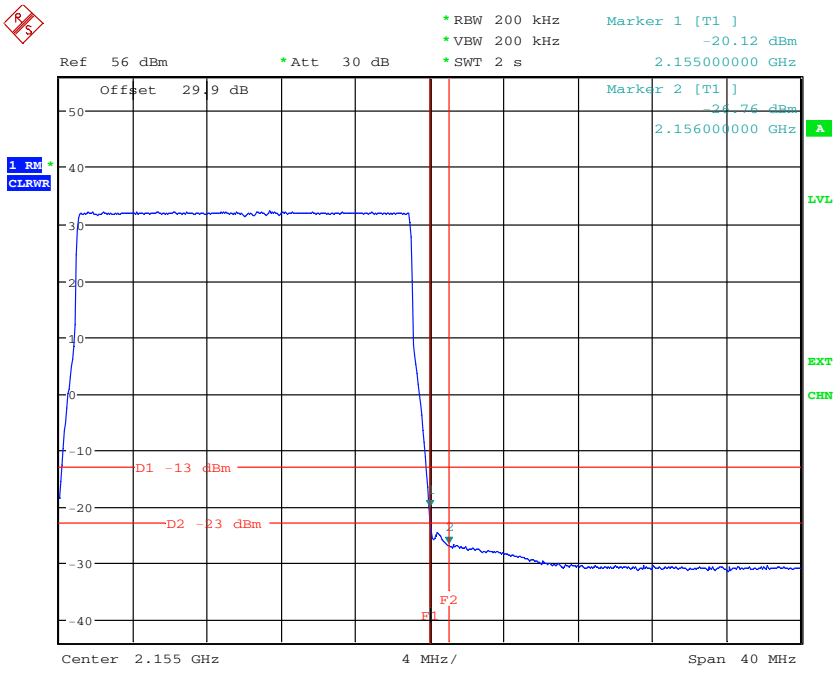


Figure 7-260: Spurious Emissions (Upper Band Edge) – 64QAM (2145.0 MHz) (20MHz Channel BW)

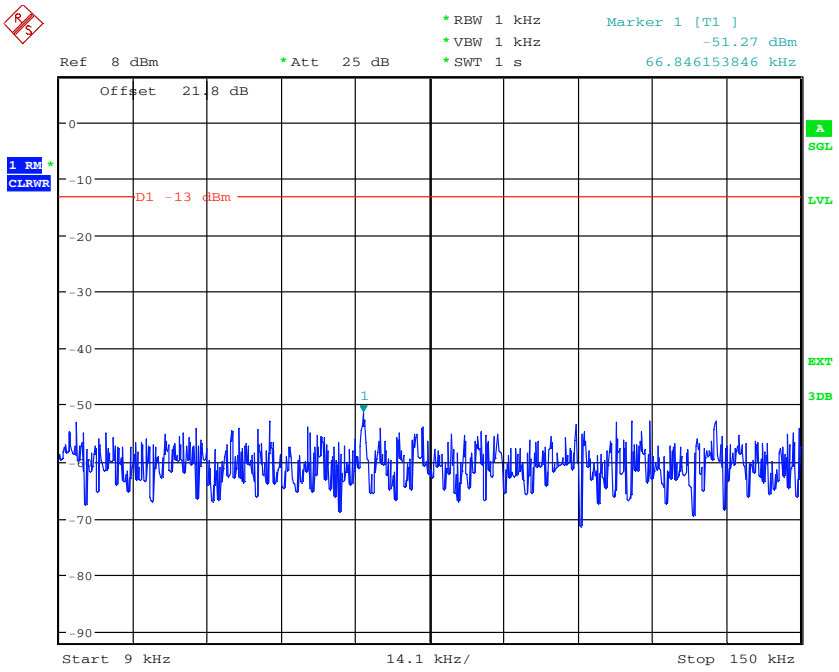


Figure 7-261: Spurious Emissions (9kHz – 150kHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)

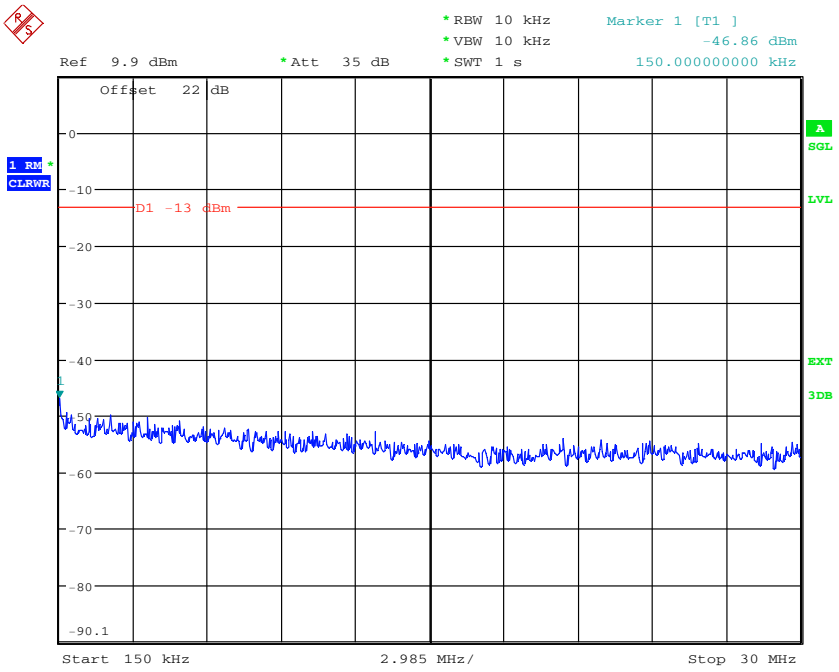


Figure 7-262: Spurious Emissions (150kHz – 30MHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)

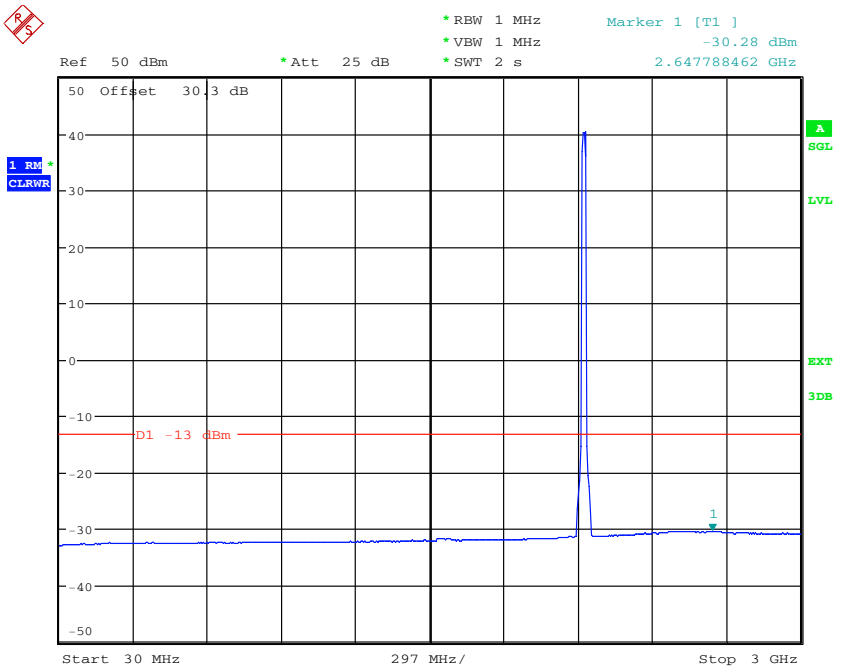


Figure 7-263: Spurious Emissions (30MHz – 3GHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)

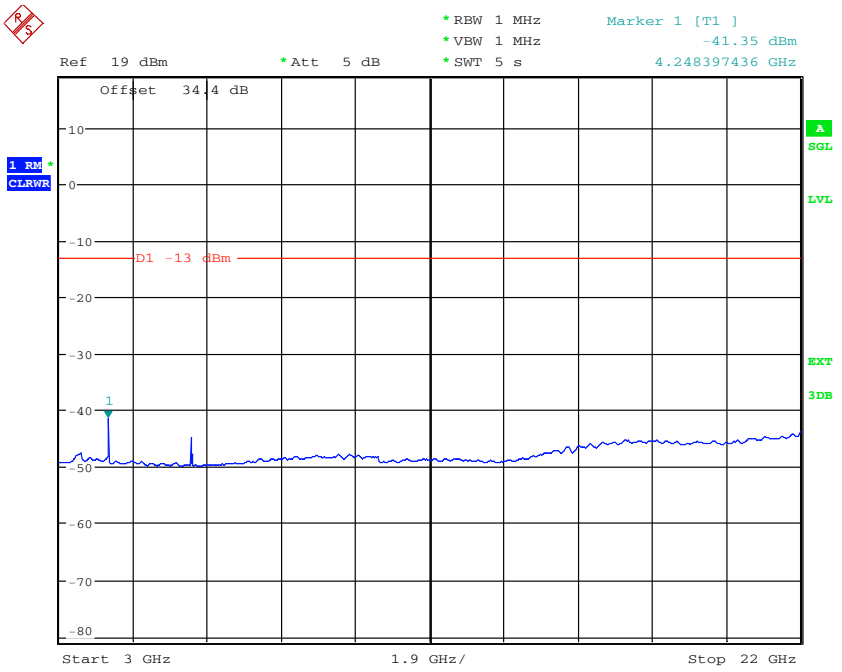


Figure 7-264: Spurious Emissions (3GHz – 22GHz) – 64QAM (2132.5 MHz) (20MHz Channel BW)

7.2.5 Test No. 5: Field Strength of Spurious Radiation

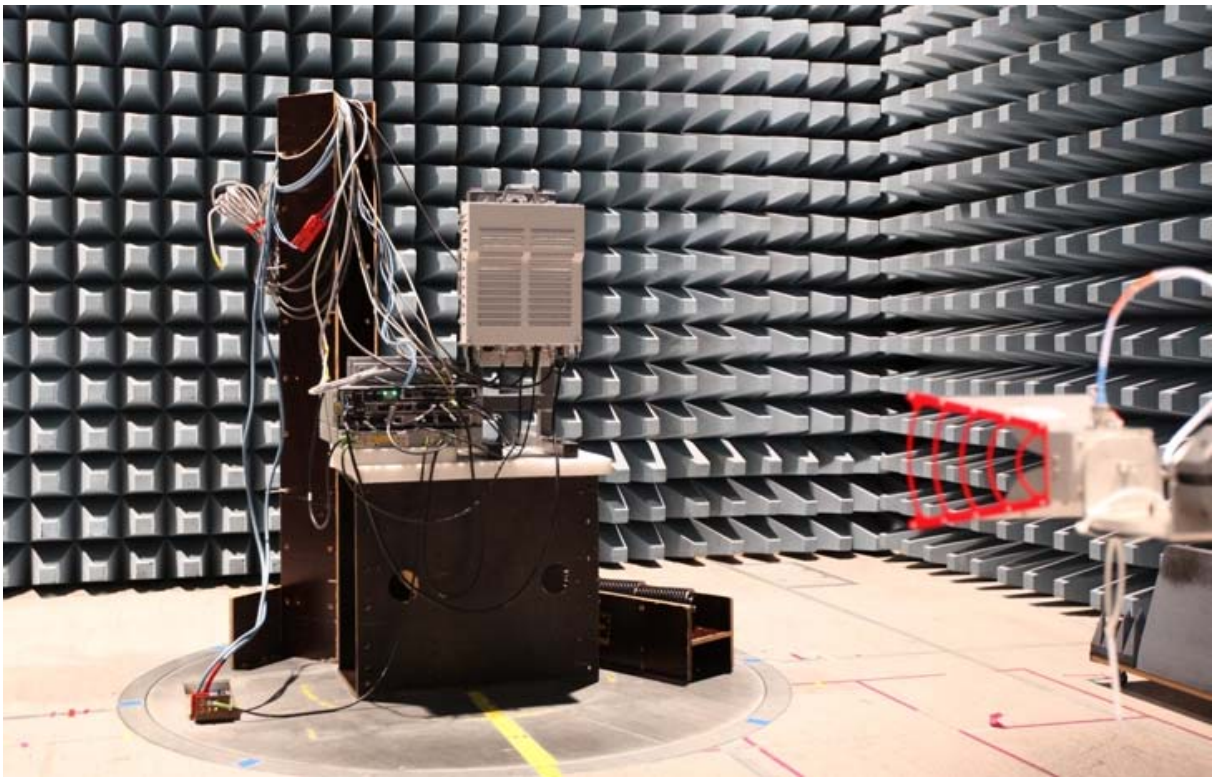


Figure 7-265: Photograph of the anechoic chamber with the EUT

Config A:

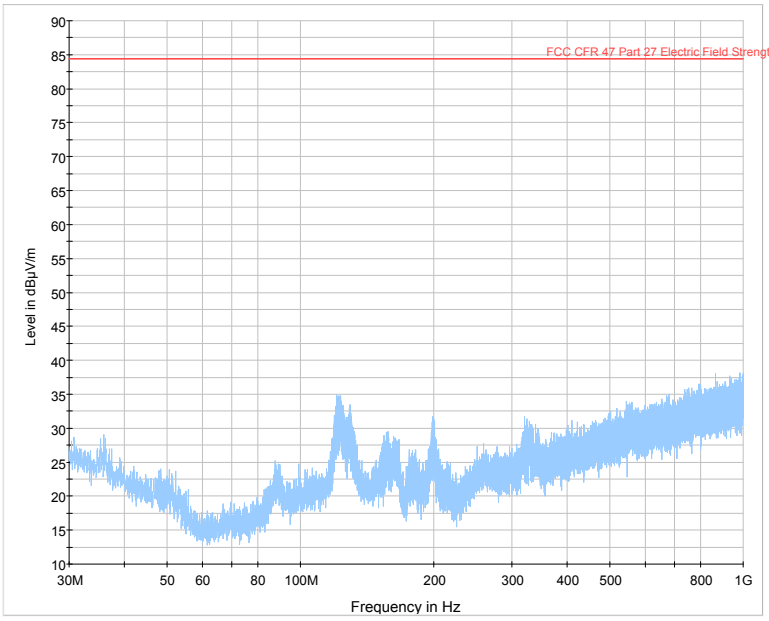


Figure 7-266: Radiated Emission 30 MHz – 1 GHz (2112.5 MHz) (5MHz Channel BW)

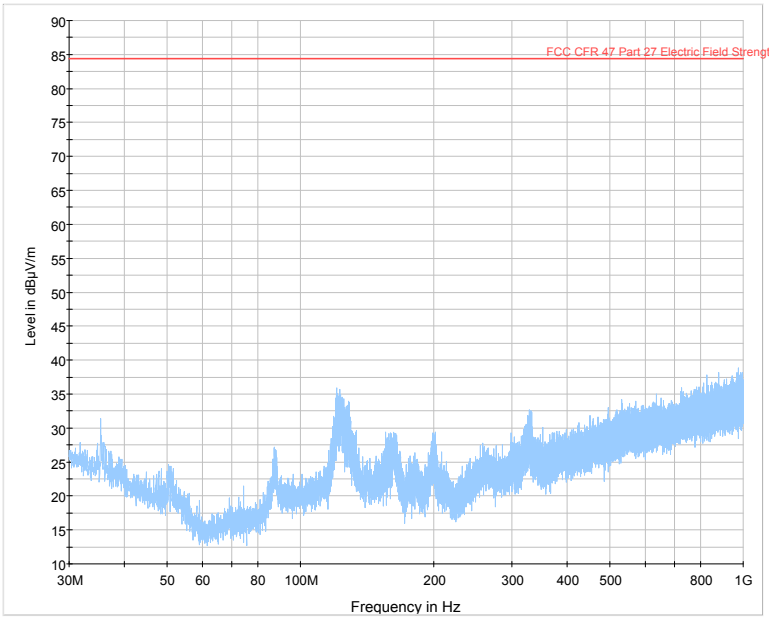


Figure 7-267: Radiated Emission 30 MHz – 1 GHz (2132.5 MHz) (5MHz Channel BW)

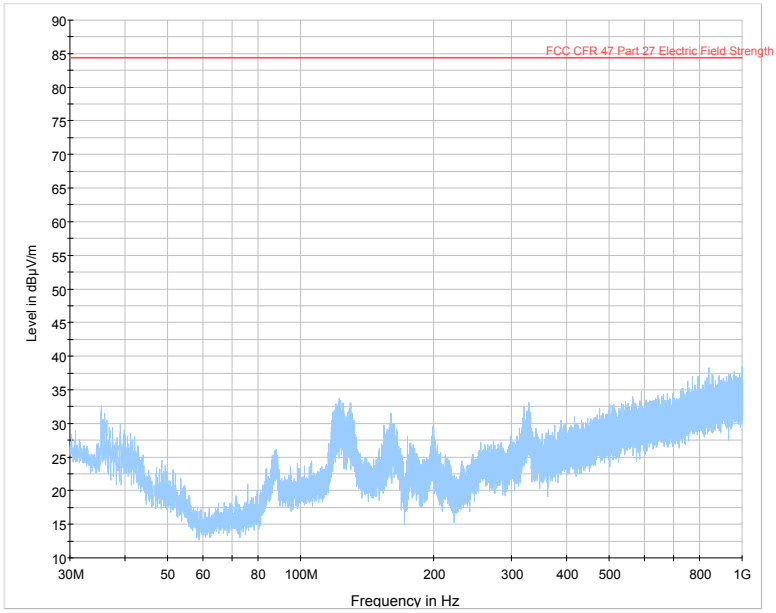


Figure 7-268: Radiated Emission 30 MHz – 1 GHz (2152.5 MHz) (5MHz Channel BW)

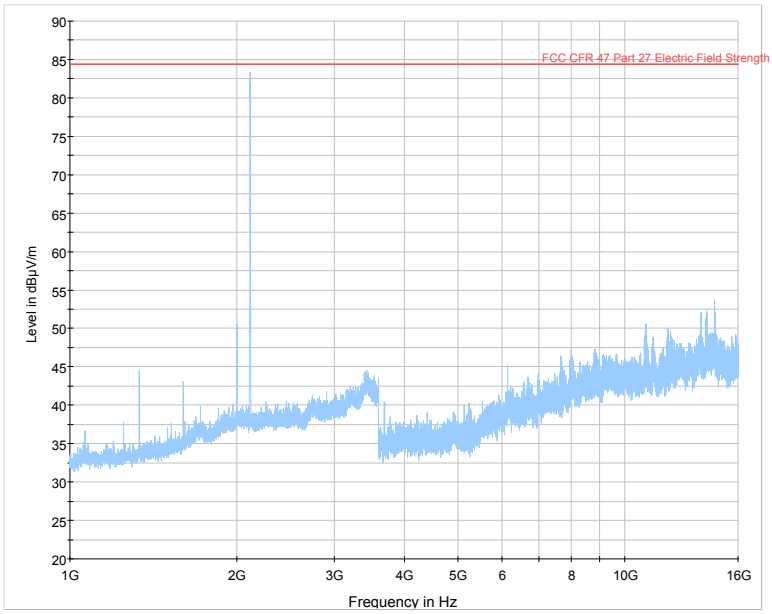


Figure 7-269: Radiated Emission 1 GHz – 16 GHz (2112.5 MHz) (5MHz Channel BW)

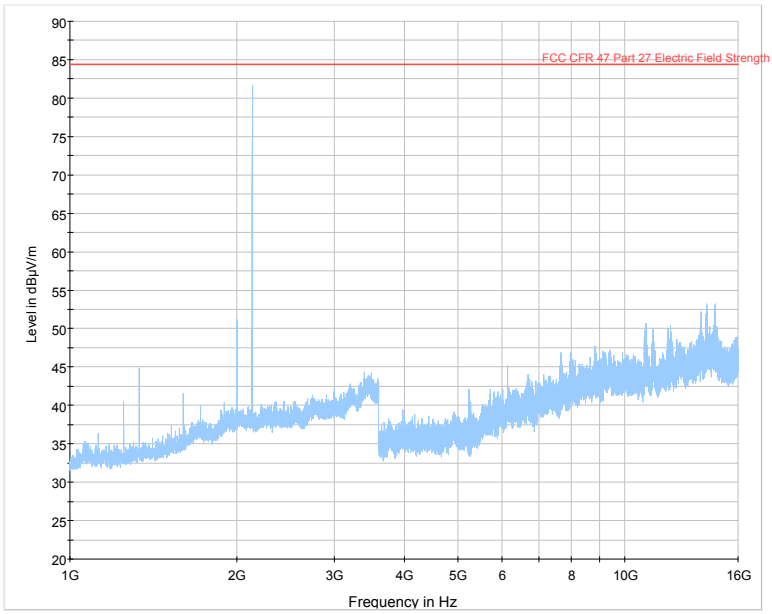


Figure 7-270: Radiated Emission 1 GHz – 16 GHz (2132.5 MHz) (5MHz Channel BW)

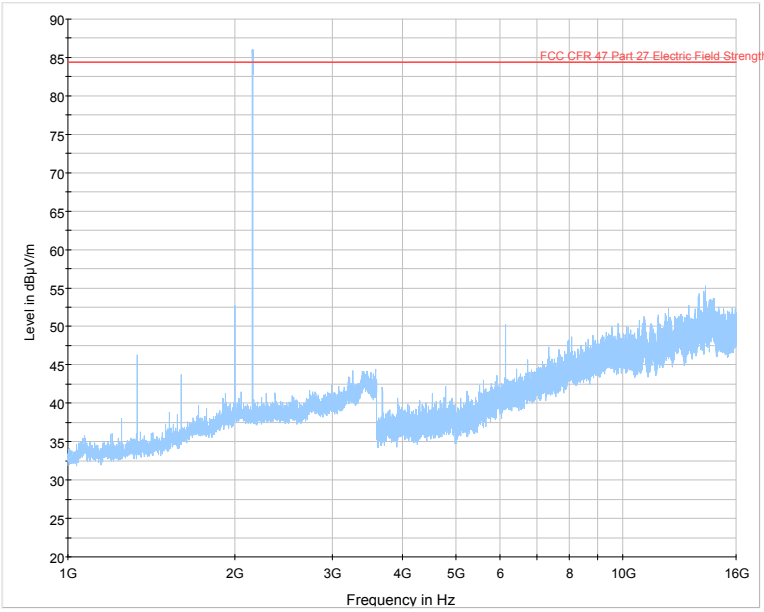


Figure 7-271: Radiated Emission 1 GHz – 16 GHz (2152.5 MHz) (5MHz Channel BW)

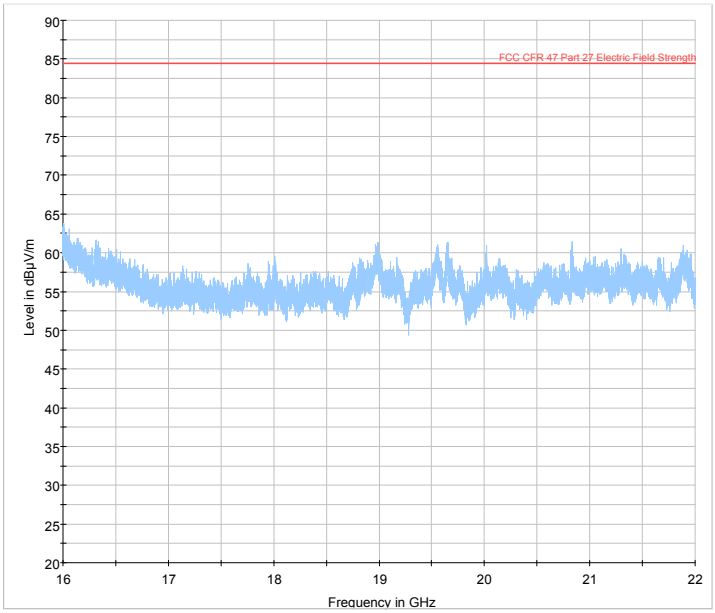


Figure 7-272: Radiated Emission 16 GHz – 22 GHz (2112.5 MHz) (5MHz Channel BW)

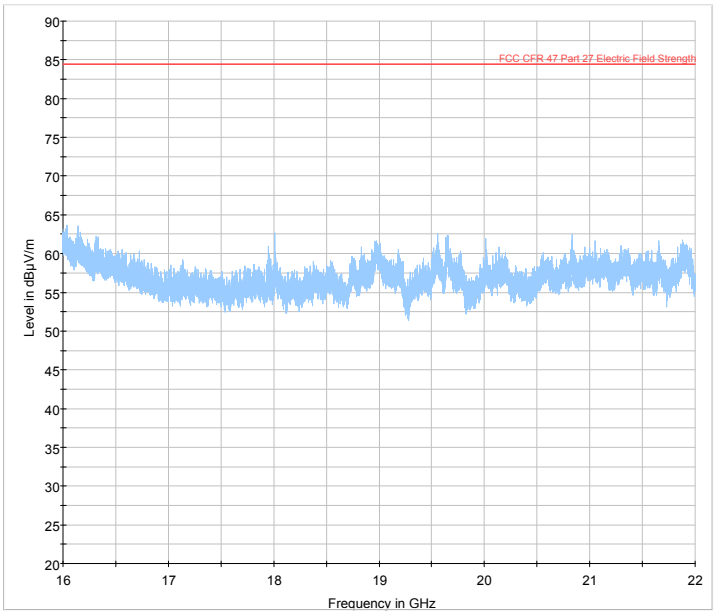


Figure 7-273: Radiated Emission 16 GHz – 22 GHz (2132.5 MHz) (5MHz Channel BW)

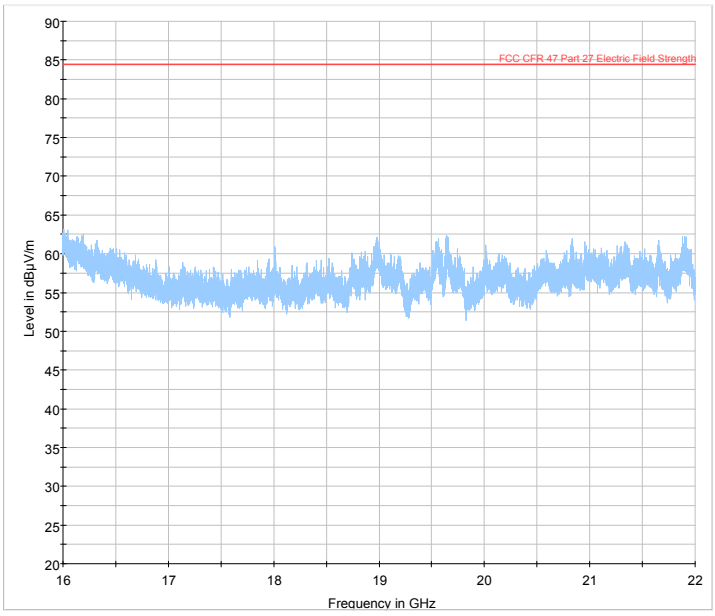


Figure 7-274: Radiated Emission 16 GHz – 22 GHz (2152.5 MHz) (5MHz Channel BW)

8 Disclaimer

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