Nemko Test Report:	10213331RUS1
Applicant:	Nokia Siemens Networks 6000 Connection Drive Irving, TX 75039 USA
Equipment Under Test: (E.U.T.)	FXCA
FCC ID:	VBNFXCA-01
In Accordance With:	**CFR 47, Part 22, Subpart H** Cellular Base Stations
Tested By:	Nemko USA, Inc. 802 N. Kealy Lewisville, TX 75057-3136

TESTED BY: _____ **DATE:** **24 August 2011**

David Light, Senior Wireless Engineer

APPROVED BY: _____ **DATE:** **25 August 2011**

Tom Tidwell, Director Nemko Direct for Telecom

Number of Pages: 48

Table of Contents

Section 1. Summary of Test Results

Manufacturer: Nokia Siemens Networks

Model No.: FXCA

Serial No.: L9111300673

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 22, Subpart H.

☐ New Submission ☒ Production Unit

☒ Class II Permissive Change ☐ Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See “Summary of Test Data”.

NVLAP Lab Code 100426-0

Summary Of Test Data

NAME OF TEST	PART 22 PARA. NO.	SPEC.	RESULT
RF Power Output	22.913(a)	1640 W	Complies
Occupied Bandwidth	22.917	Not defined	Complies
Spurious Emissions at Antenna Terminals	22.917	-13 dBm	Complies
Field Strength of Spurious Emissions	22.917	-13 dBm E.R.P.	NT
Frequency Stability	22.355	1.5 ppm	NT

Footnotes: None

NT: Not tested. These measurements were made prior and were found to comply. Please reference Nemko USA test report 1026738RUS2.

Section 2. General Equipment Specification

Supply Voltage Input:	-48 Vdc nominal
Frequency Band:	869 to 894 MHz
Type of Modulation and Designator:	**LTE** **5M0F9W 10M0F9W 15M0F9W**
Maximum No. of Carriers:	6
Output Impedance:	50 ohms
RF Output (Rated):	60 W +47.8 dBm
Band Selection:	**Software** ☒ **Duplexer** ☐ **Fullband** ☐

System Description

The FXCA is a 850 MHz multistandard multicarrier radio module that consists of three individual transceivers designed to support GSM/EDGE, WCDMA and LTE in dedicated or concurrent mode. Each module supports up to six GSM/EDGE carriers in GSM/EDGE dedicated mode, up to four WCDMA carriers in WCDMA dedicated mode and up to four 5 MHz LTE carriers in LTE dedicated mode with one radio branch. In concurrent mode, a combination of all three radio technologies is supported with a single radio branch. Each module is capable to serve three radio branches with multiradio multicarrier radios of up to 60 Watts output power per branch. The LTE modulation was the only function tested under this effort.

The transmitter test setup for LTE dedicated mode provided QPSK, 16 QAM and 64 QAM modulation types for single carrier operation only.

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 23 August 2011

Test Results: Complies.

Measurement Data: Refer to table on next page.

Equipment Used: 1767-1082-1054-1064-1065

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 35 %

Test Data – RF Power Output

Modulation Type	Channel Bandwidth (MHz)	Frequency (MHz)	Measured Output Power		Deviation from rated (dB)
			(dBm)	(W)	
QPSK	5	871.5	47.7	58.9	-0.1
QPSK	5	881.6	47.4	55.0	-0.4
QPSK	5	891.4	47.6	57.5	-0.2
16 QAM	5	871.5	47.5	56.2	-0.3
16 QAM	5	881.6	47.5	56.2	-0.3
16 QAM	5	891.4	47.9	61.7	+0.1
64QAM	5	871.5	47.5	56.2	-0.3
64QAM	5	881.6	47.6	57.5	-0.2
64QAM	5	891.4	47.6	57.5	-0.2
QPSK	10	874.0	47.7	58.9	-0.1
QPSK	10	881.6	47.5	56.2	-0.3
QPSK	10	888.9	47.6	57.5	-0.2
16 QAM	10	874.0	47.7	58.9	-0.1
16 QAM	10	881.6	47.5	56.2	-0.3
16 QAM	10	888.9	47.6	57.5	-0.2
64QAM	10	874.0	47.6	57.5	-0.2
64QAM	10	881.6	47.5	56.2	-0.3
64QAM	10	888.9	47.8	60.3	0
QPSK	15	876.5	47.6	57.5	-0.2
QPSK	15	881.6	47.5	56.2	-0.3
QPSK	15	886.4	47.5	56.2	-0.3
16 QAM	15	876.5	47.9	61.7	+0.1
16 QAM	15	881.6	48.1	64.6	+0.3
16 QAM	15	886.4	48.1	64.6	+0.3
64QAM	15	876.5	47.6	57.5	-0.2
64QAM	15	881.6	47.6	57.5	-0.2
64QAM	15	886.4	47.6	57.5	-0.2

Supply voltage was varied +/- 15%. No fluctuation in output power resulted.

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 23 August 2011

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1767-1054-1082-1065-1064

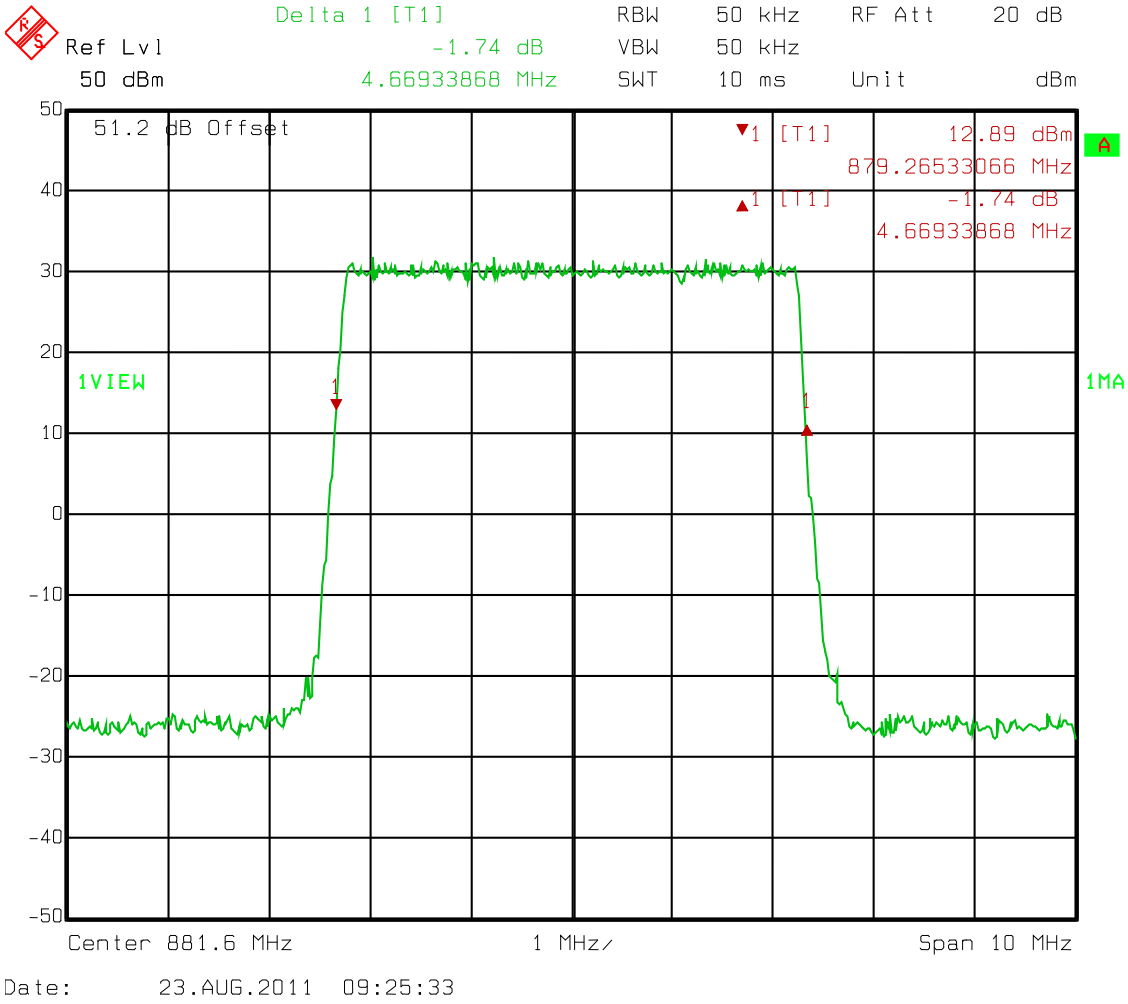
Measurement Uncertainty: +/- 1.6 dB

Temperature: 22 °C

Relative Humidity: 35 %

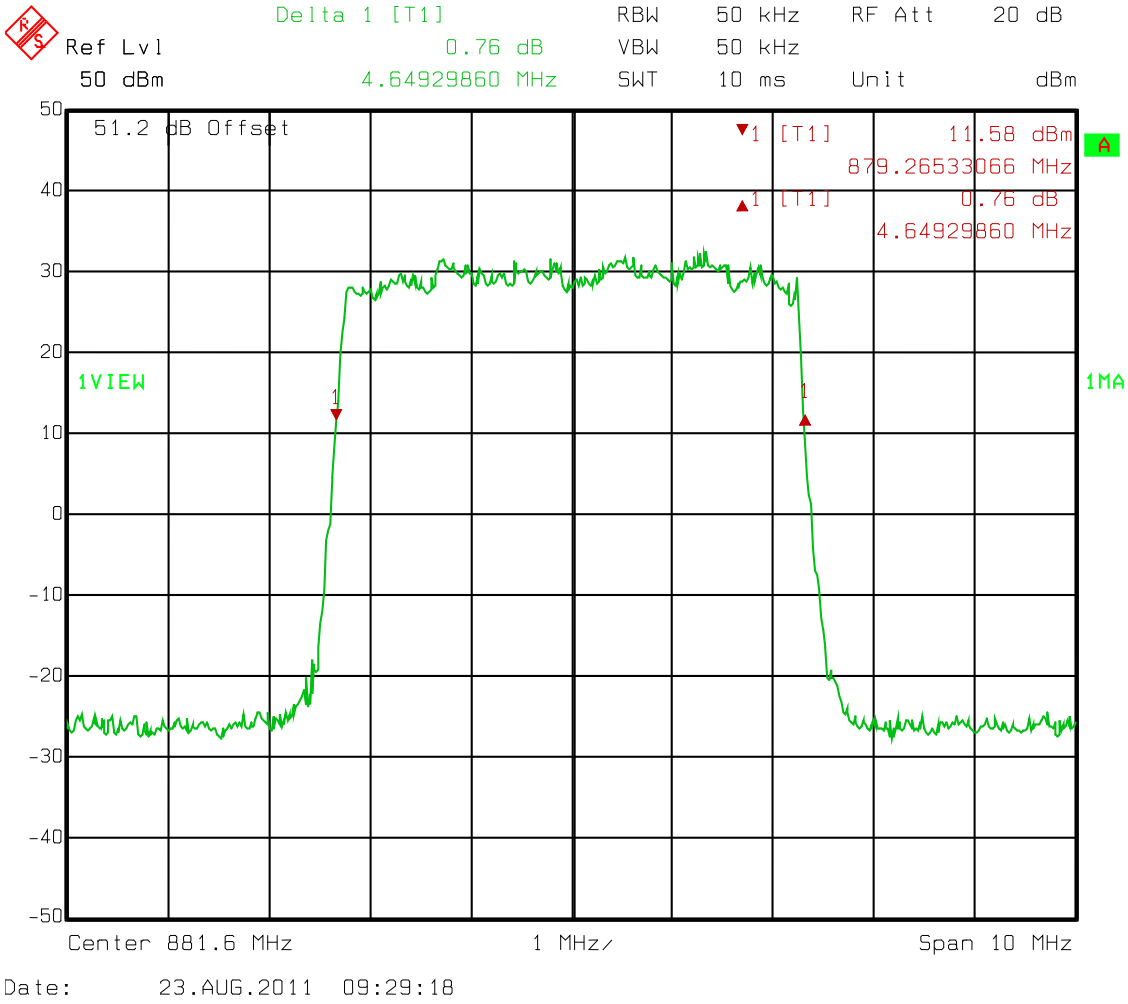
Test Data – Occupied Bandwidth

5 MHz Channel
QPSK
Center Channel
20 dB BW



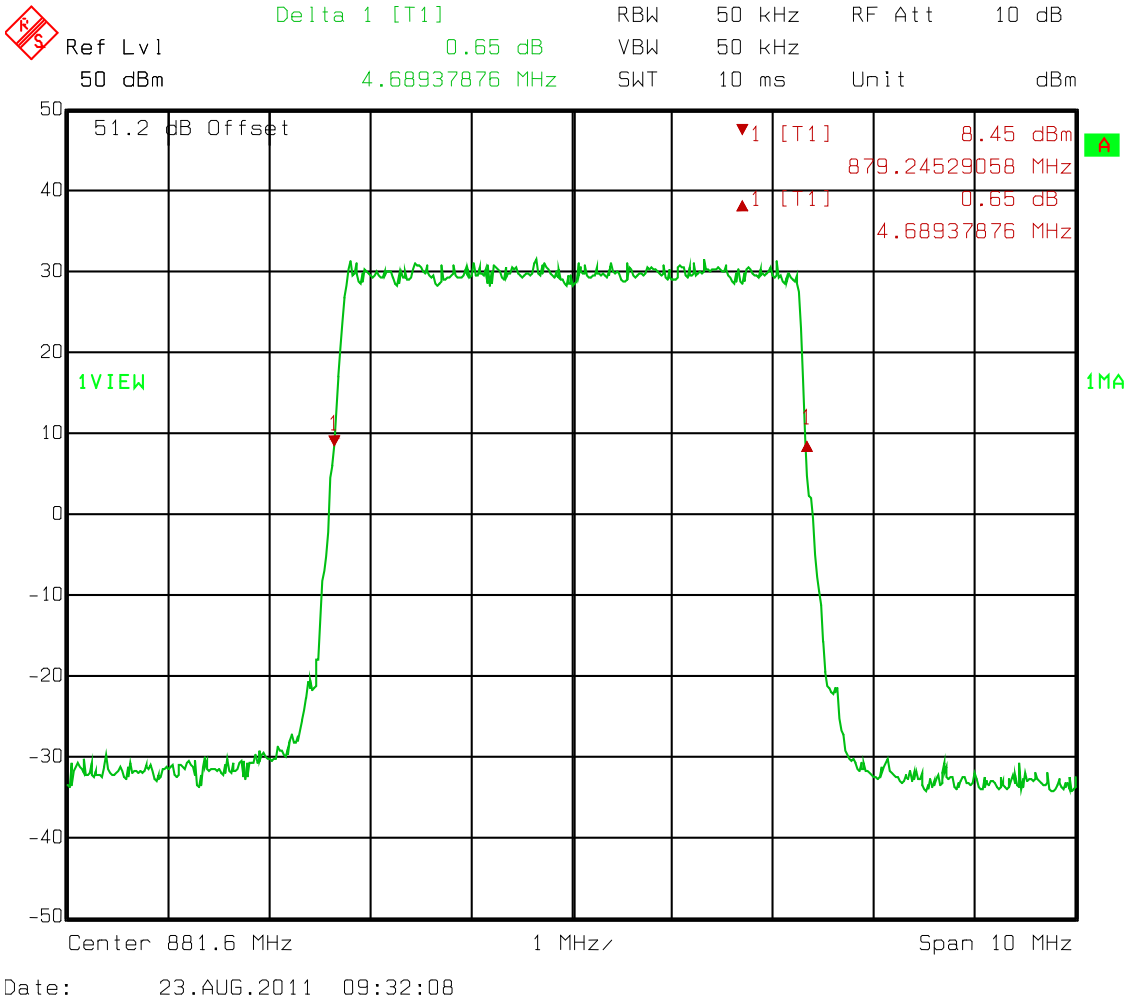
Test Data – Occupied Bandwidth

5 MHz Channel
Center Channel
16 QAM
20 dB BW



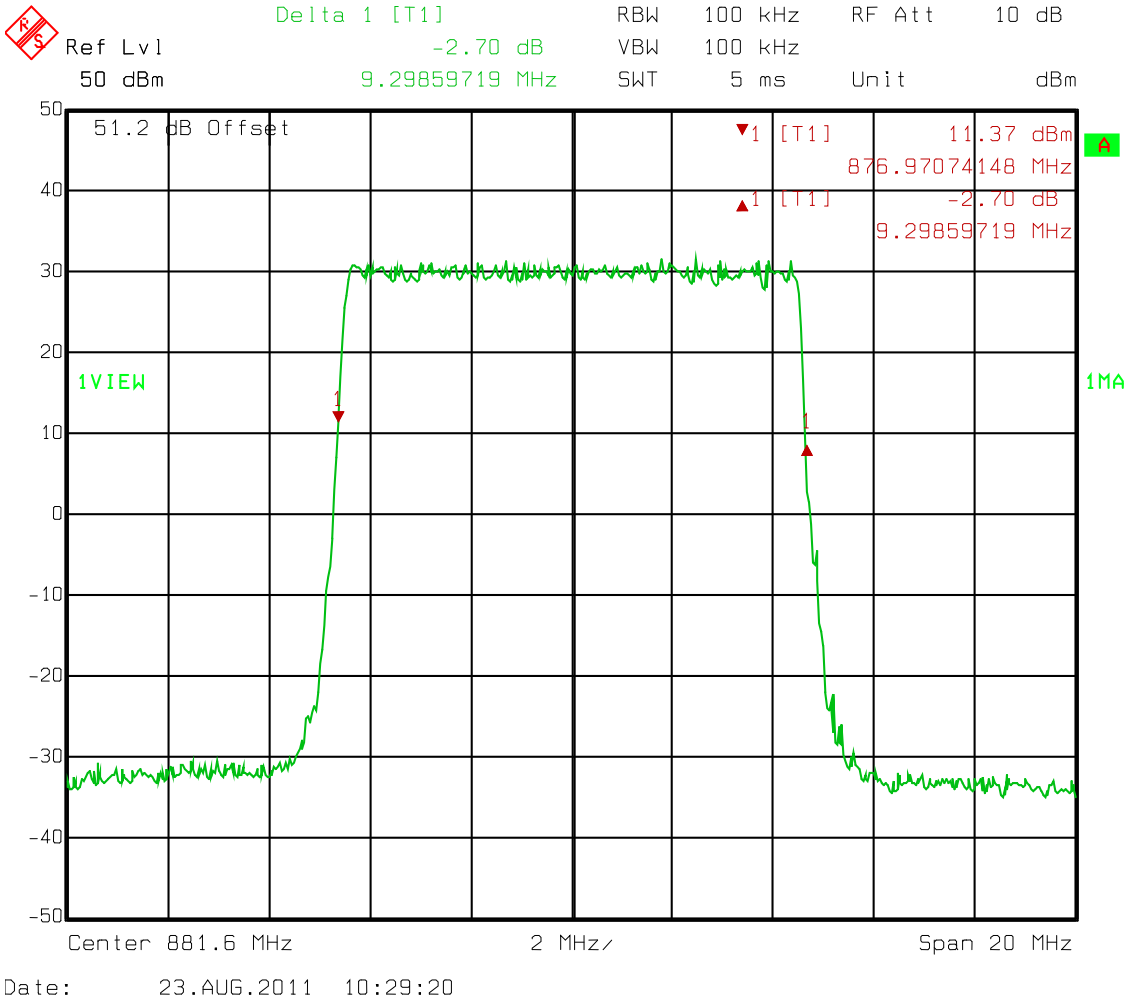
Test Data – Occupied Bandwidth

5 MHz Channel
64 QAM
Center Channel
20 dB BW



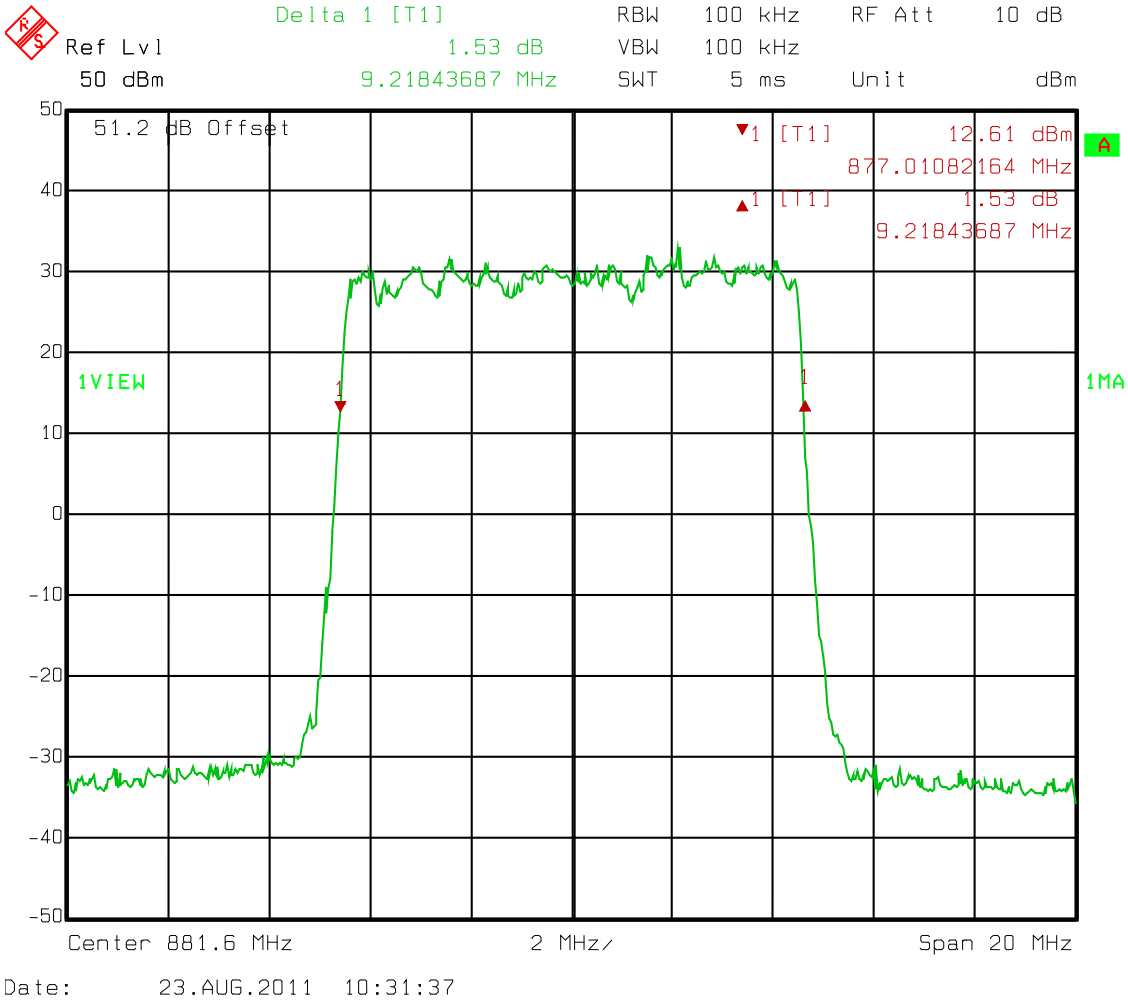
Test Data – Occupied Bandwidth

10 MHz Channel
QPSK
Center Channel
20 dB BW



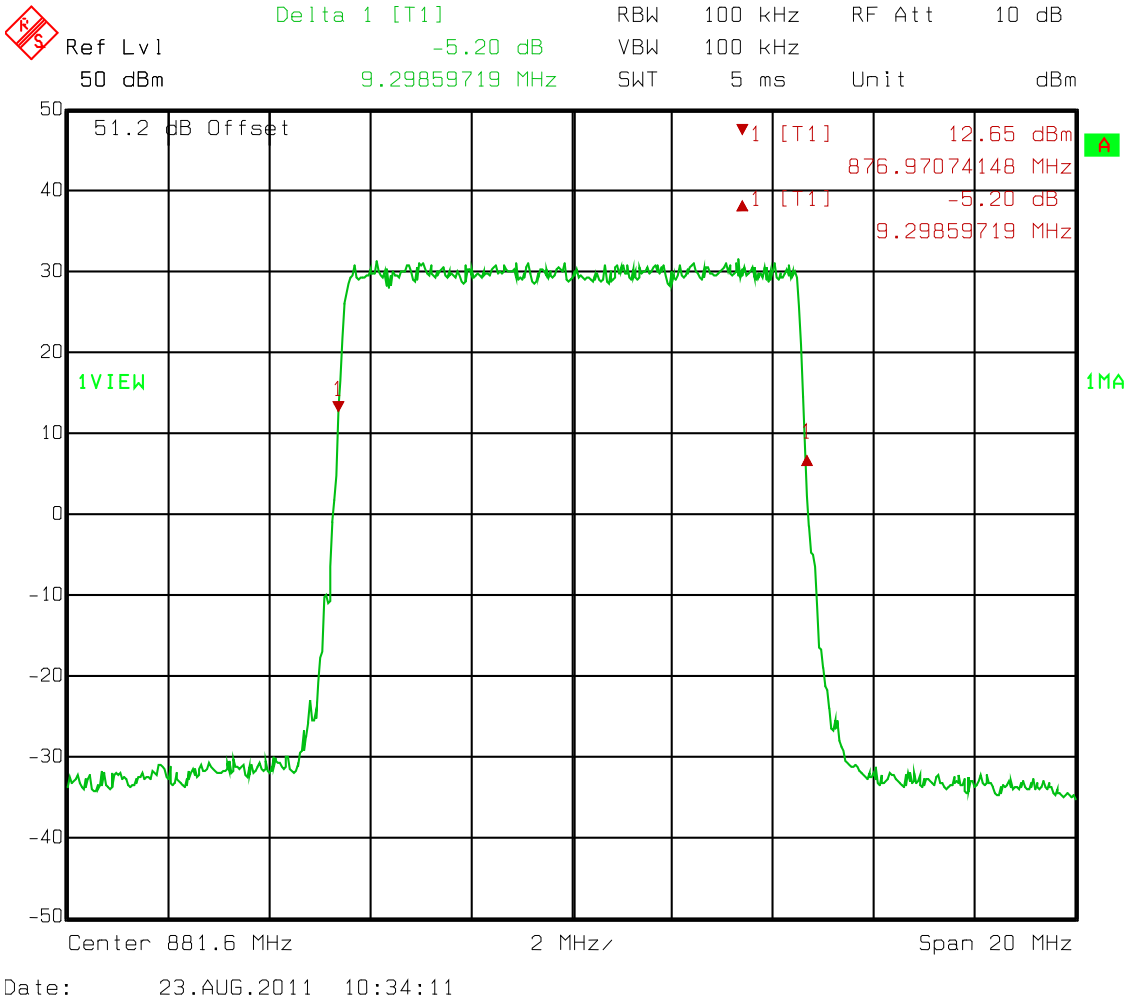
Test Data – Occupied Bandwidth

10 MHz Channe
Center Channel
16 QAM
20 dB BW



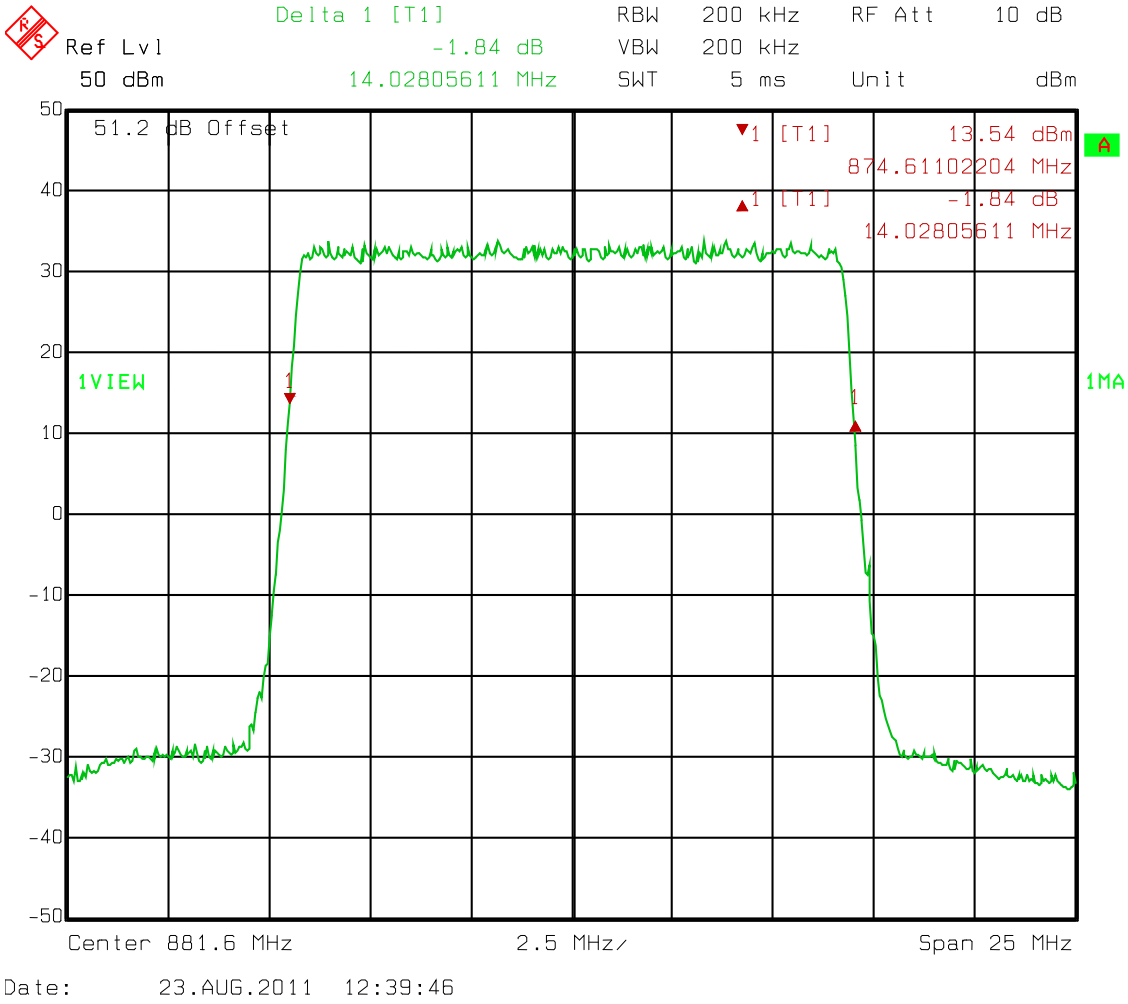
Test Data – Occupied Bandwidth

10 MHz Channel
64 QAM
Center Channel
20 dB BW



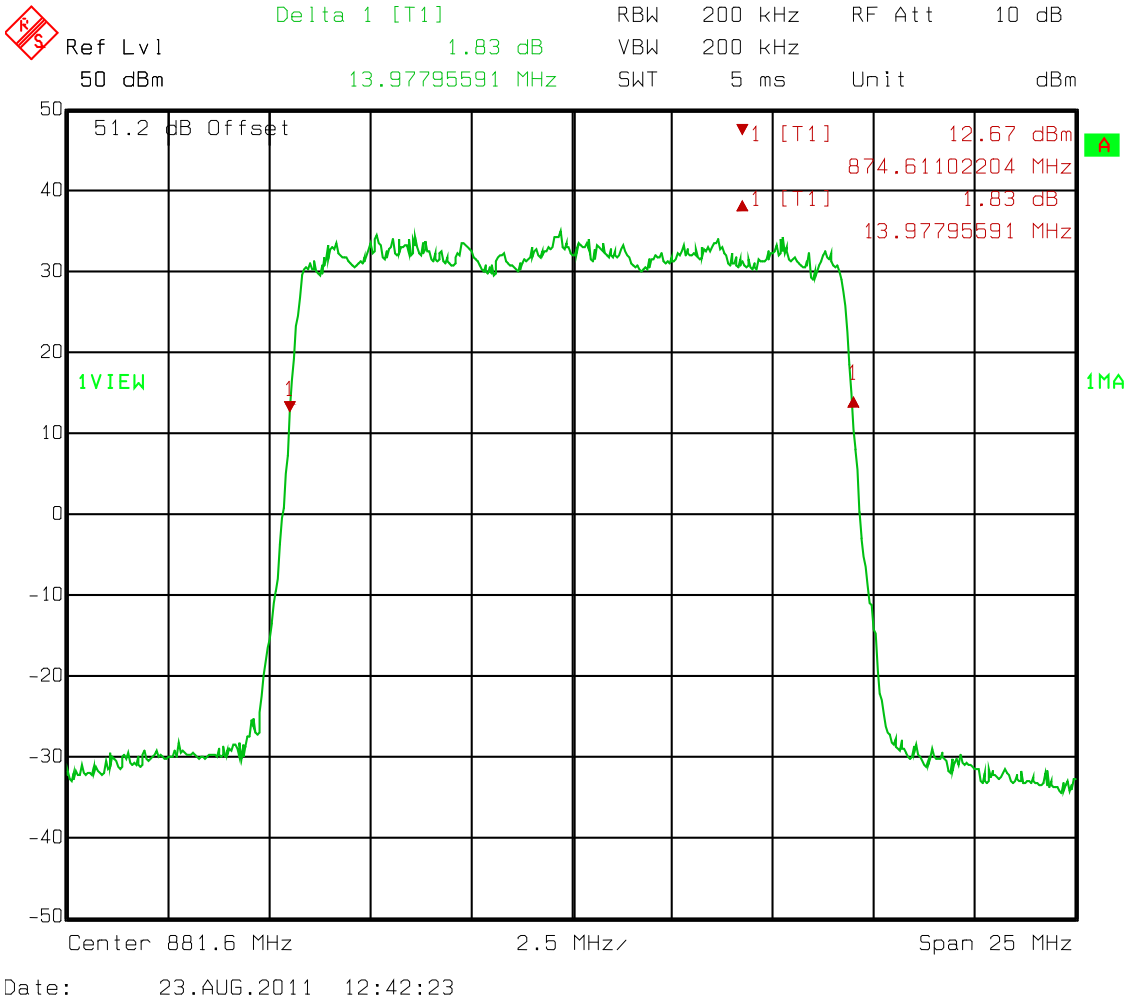
Test Data – Occupied Bandwidth

15 MHz Channel
QPSK
Center Channel
20 dB BW



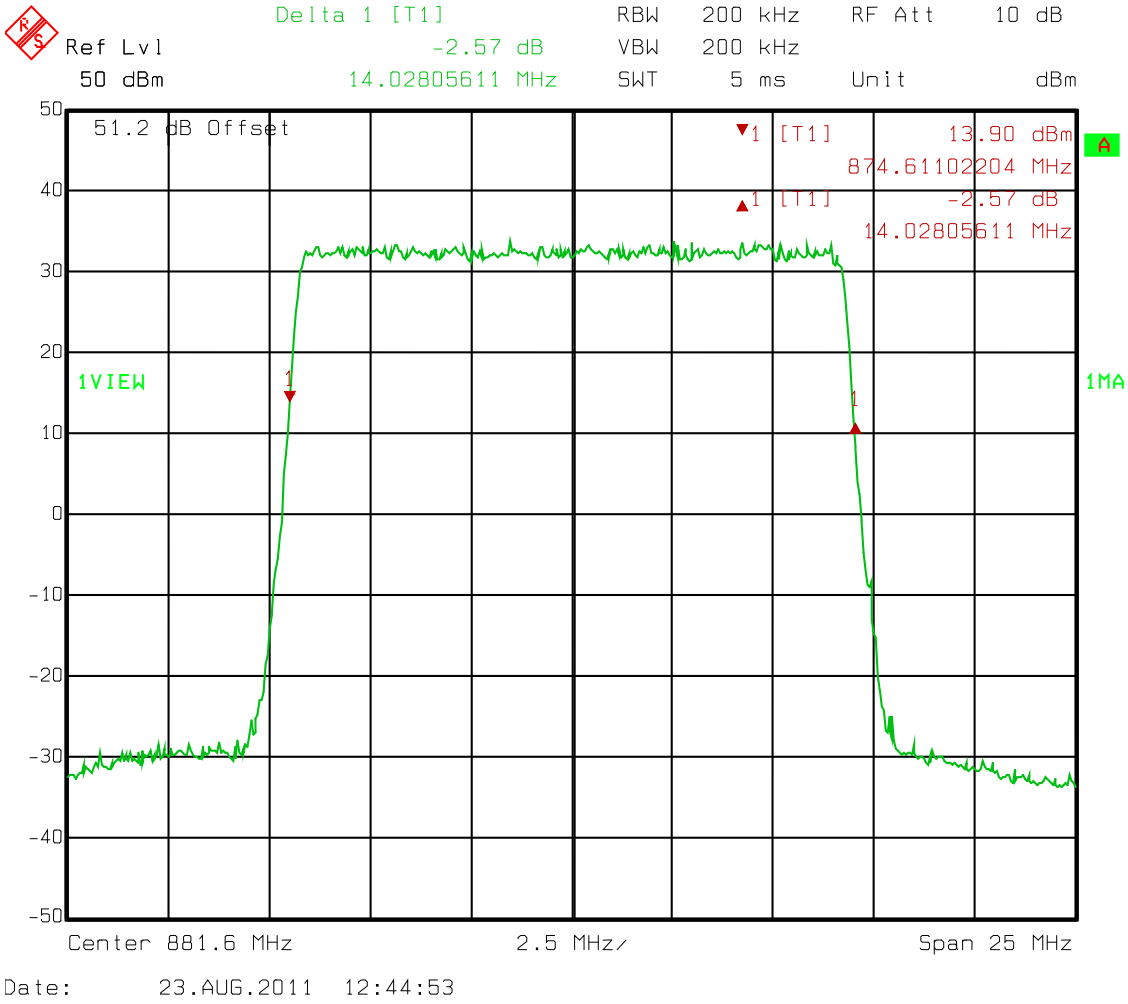
Test Data – Occupied Bandwidth

15 MHz Channe
Center Channel
16 QAM
20 dB BW



Test Data – Occupied Bandwidth

15 MHz Channel
64 QAM
Center Channel
20 dB BW



Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 23 August 2011

Test Results: Complies.

Test Data: Refer to plots below

Equipment Used: 1767-1082-1064-1065-1054-1054-1058

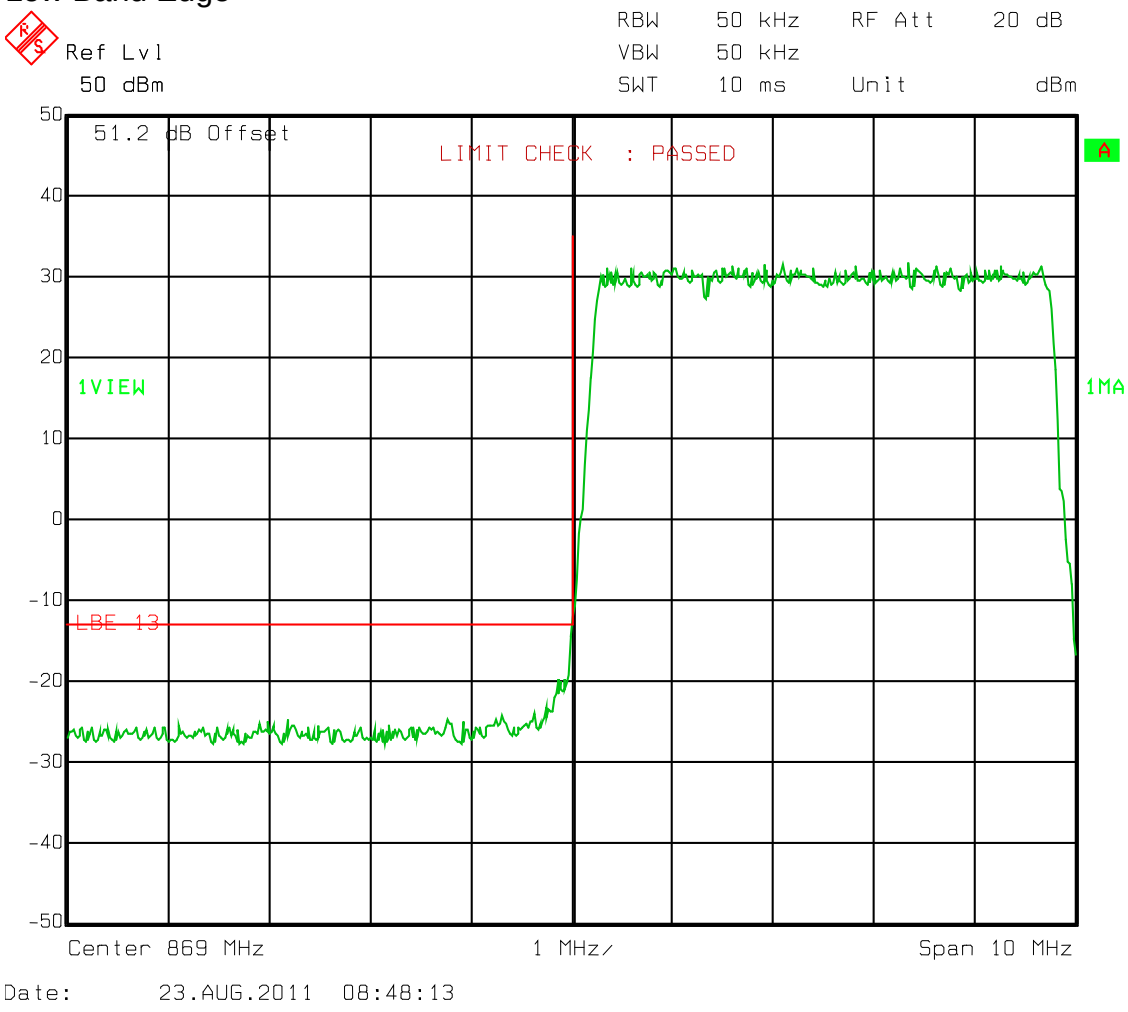
Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 35 %

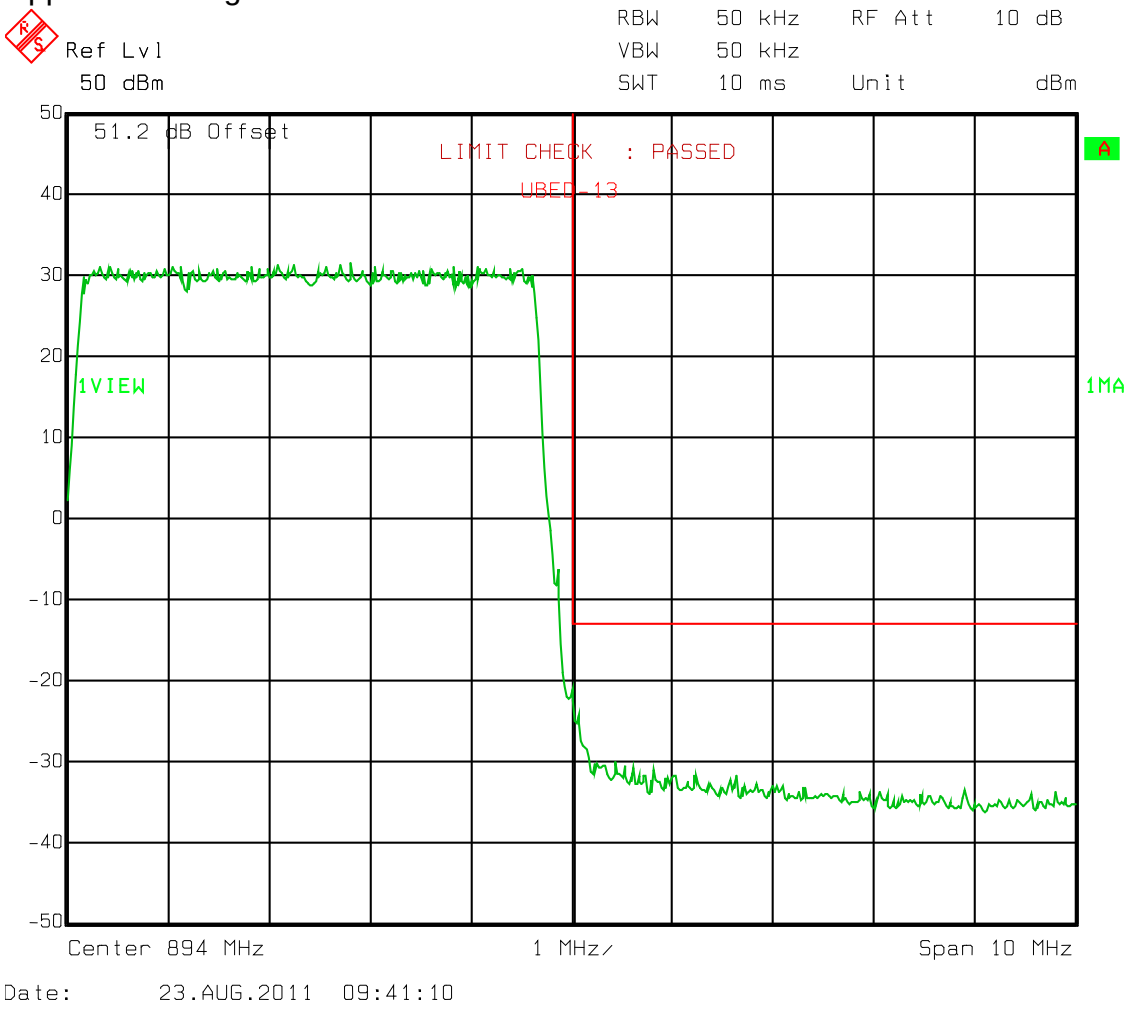
Test Data – Spurious Emissions

5 MHz Channel
QPSK
Low Band Edge



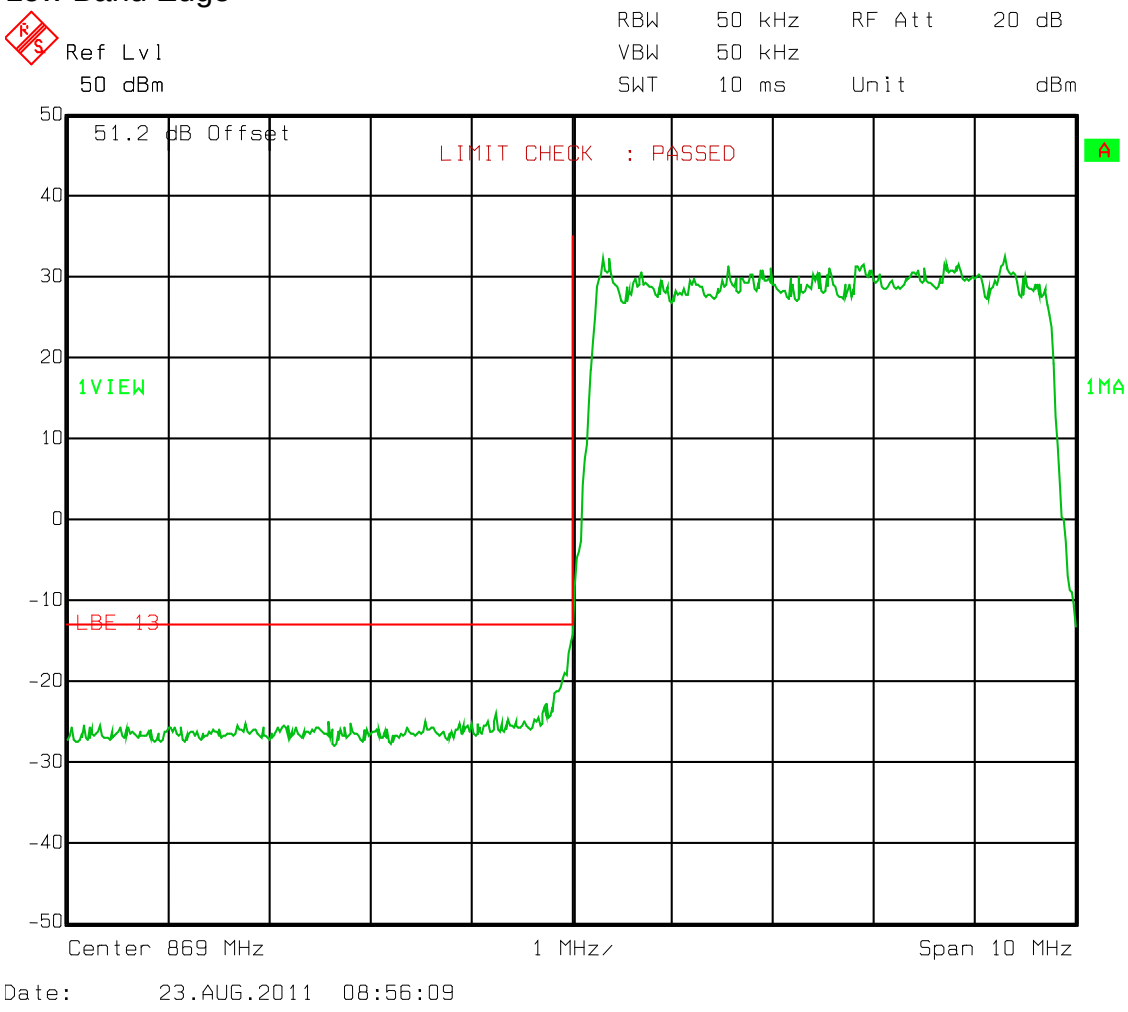
Test Data – Spurious Emissions

5 MHz Channel
QPSK
Upper Band Edge



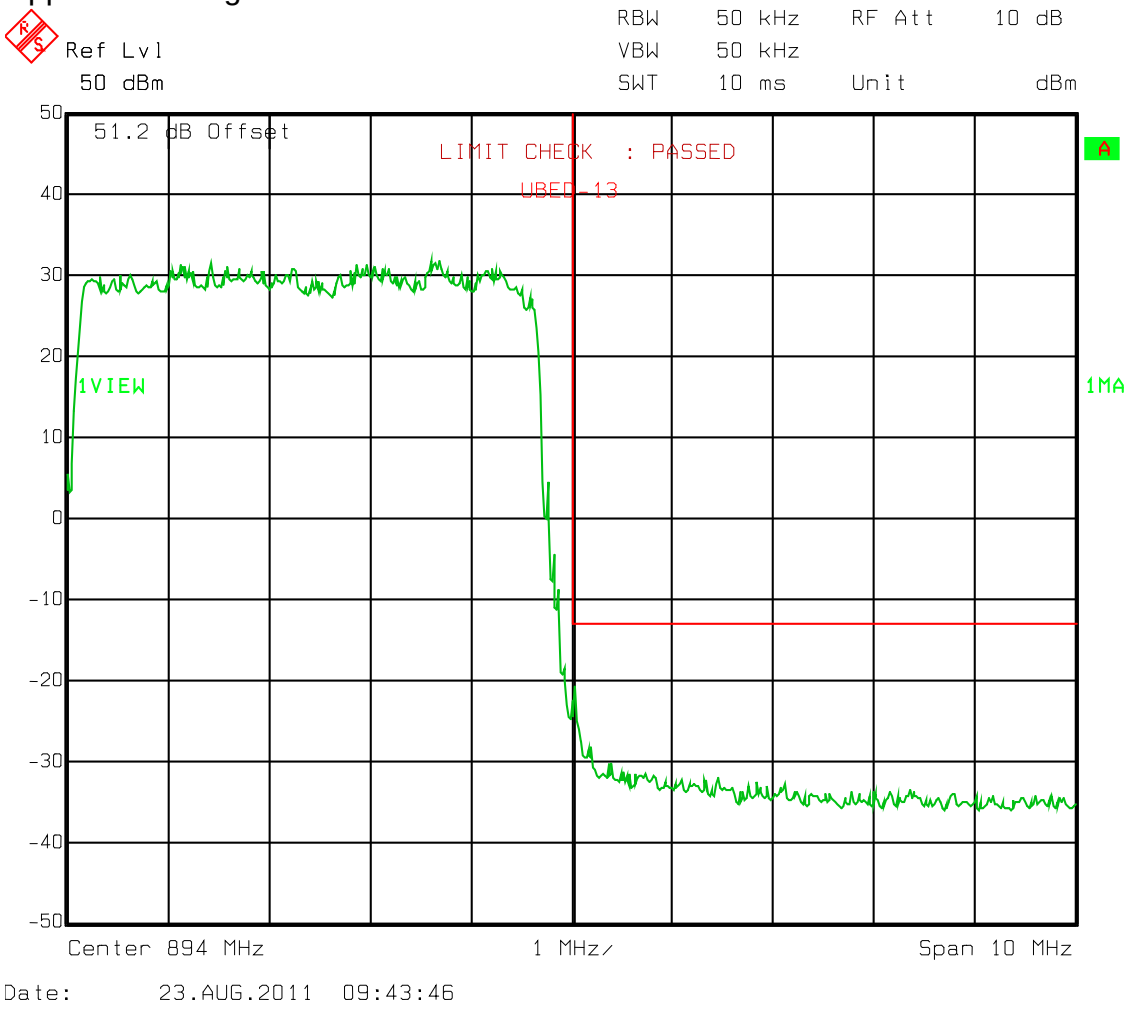
Test Data – Spurious Emissions

5 MHz Channel
16 QAM
Low Band Edge



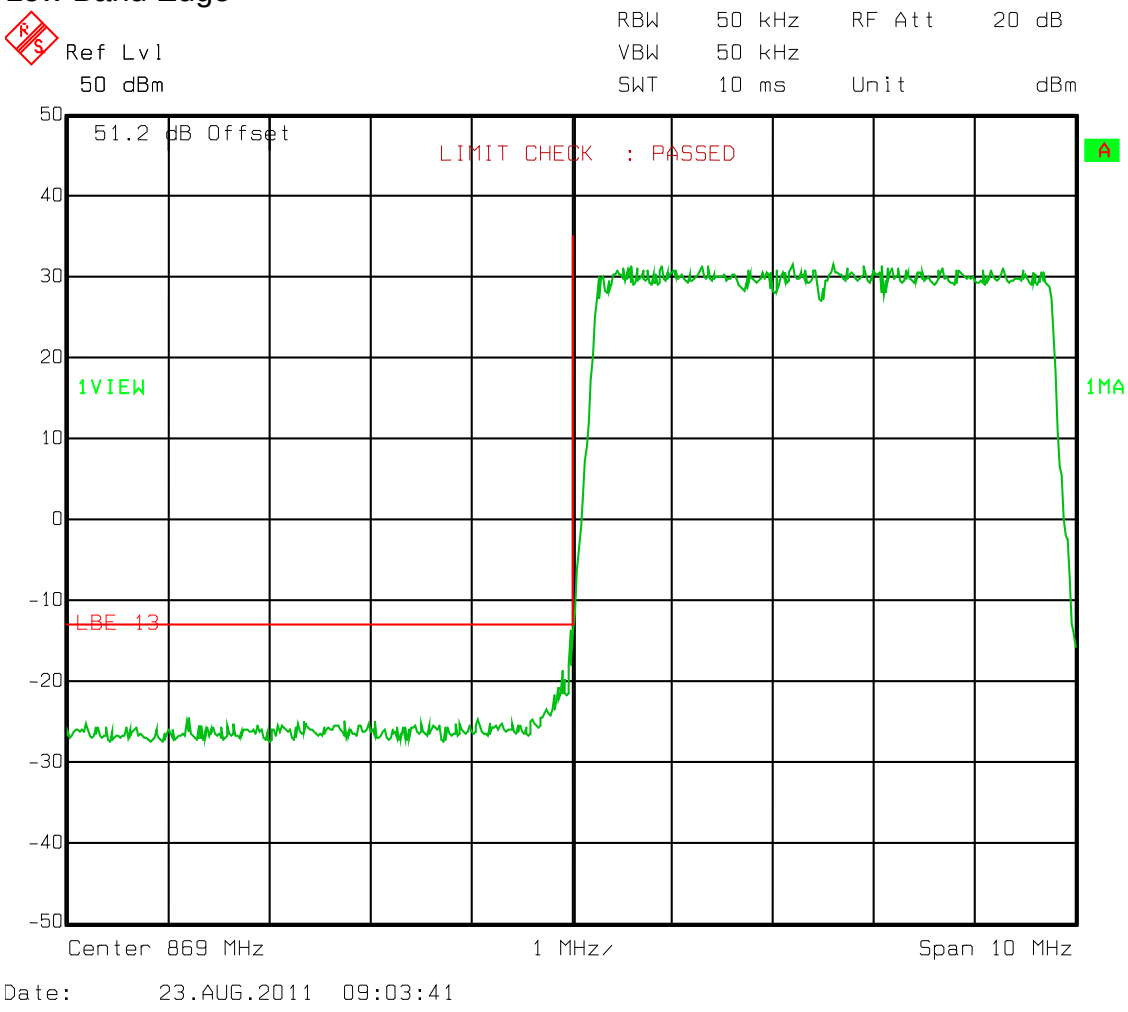
Test Data – Spurious Emissions

5 MHz Channel
16 QAM
Upper Band Edge



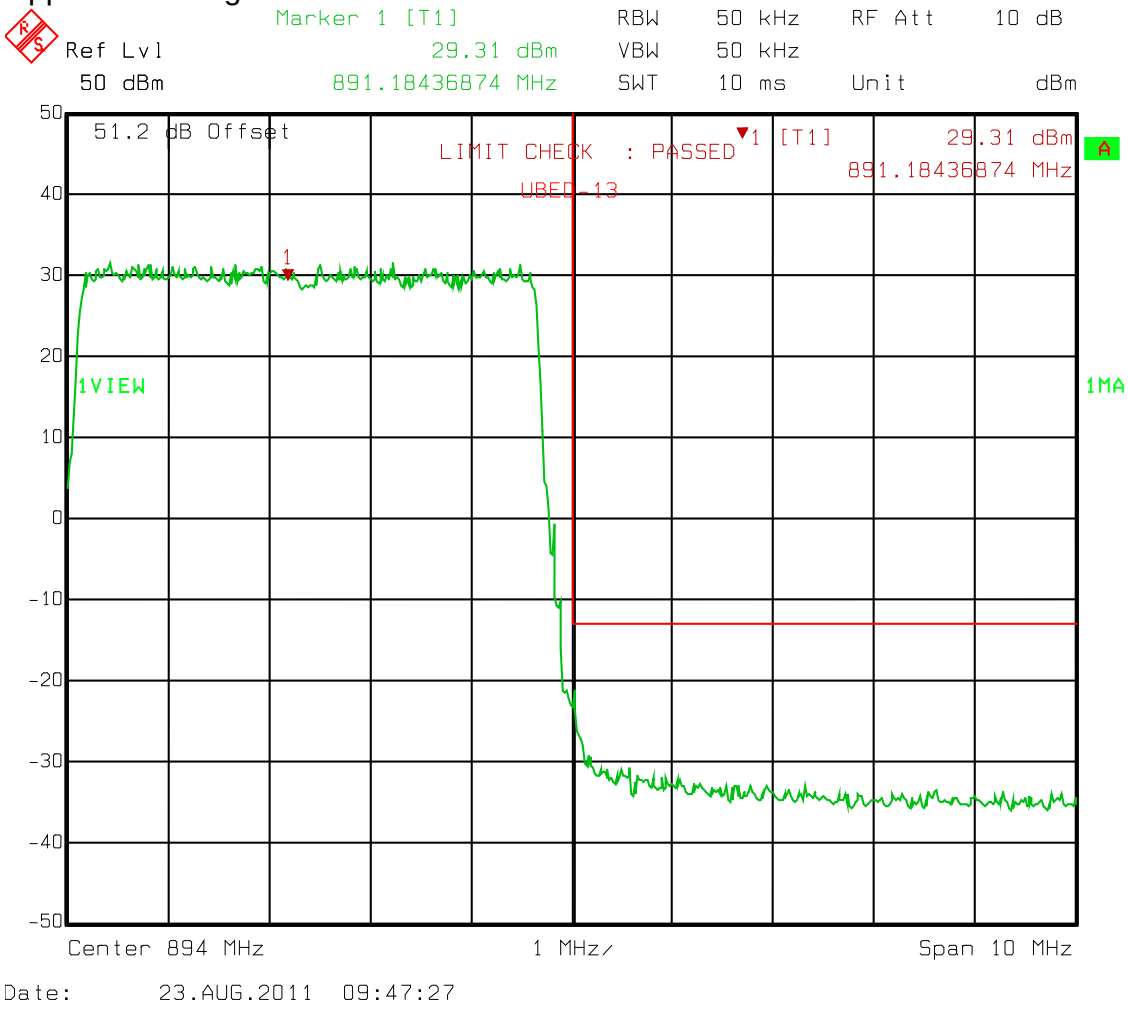
Test Data – Spurious Emissions

5 MHz Channel
64 QAM
Low Band Edge



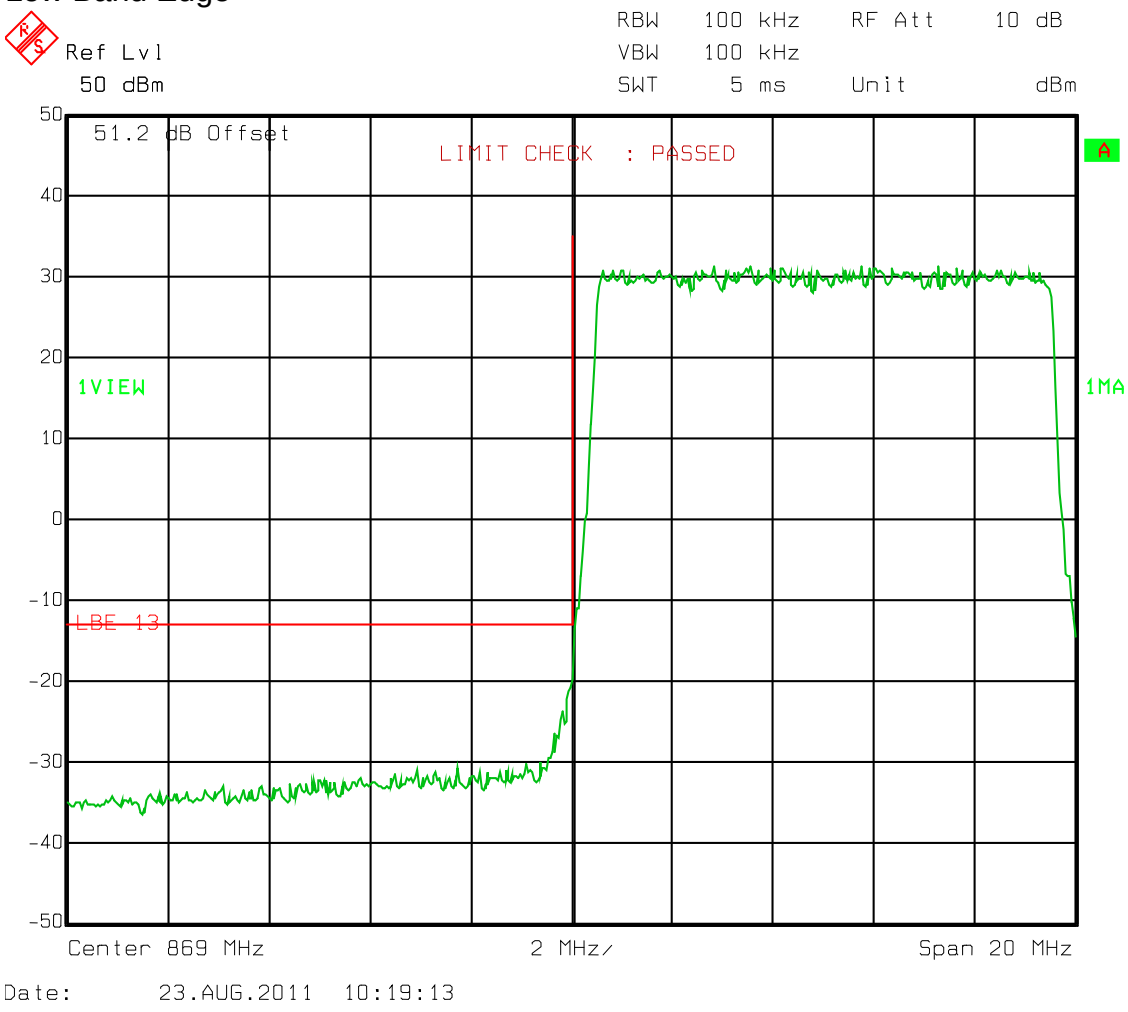
Test Data – Spurious Emissions

5 MHz Channel
64 QAM
Upper Band Edge



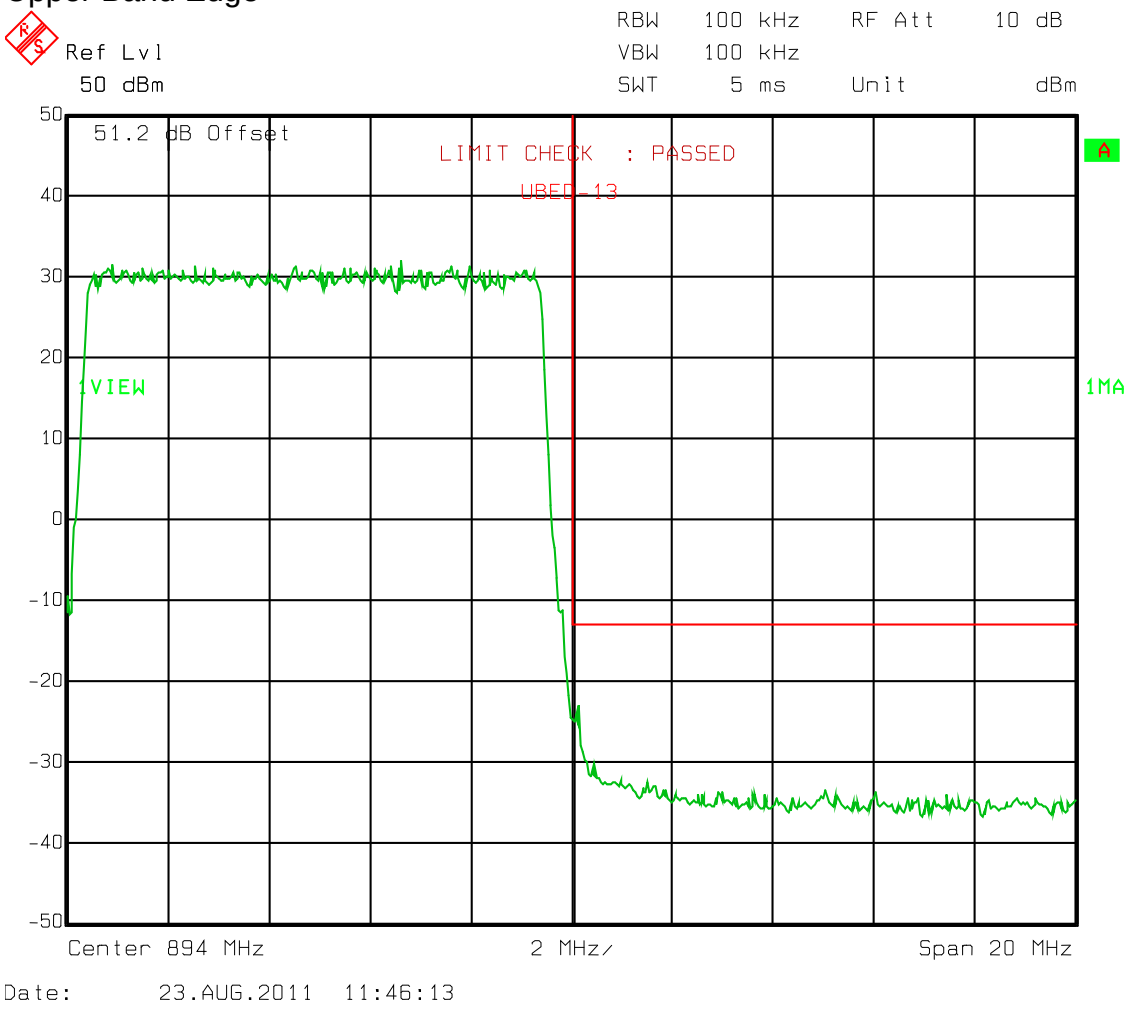
Test Data – Spurious Emissions

10 MHz Channel
QPSK
Low Band Edge



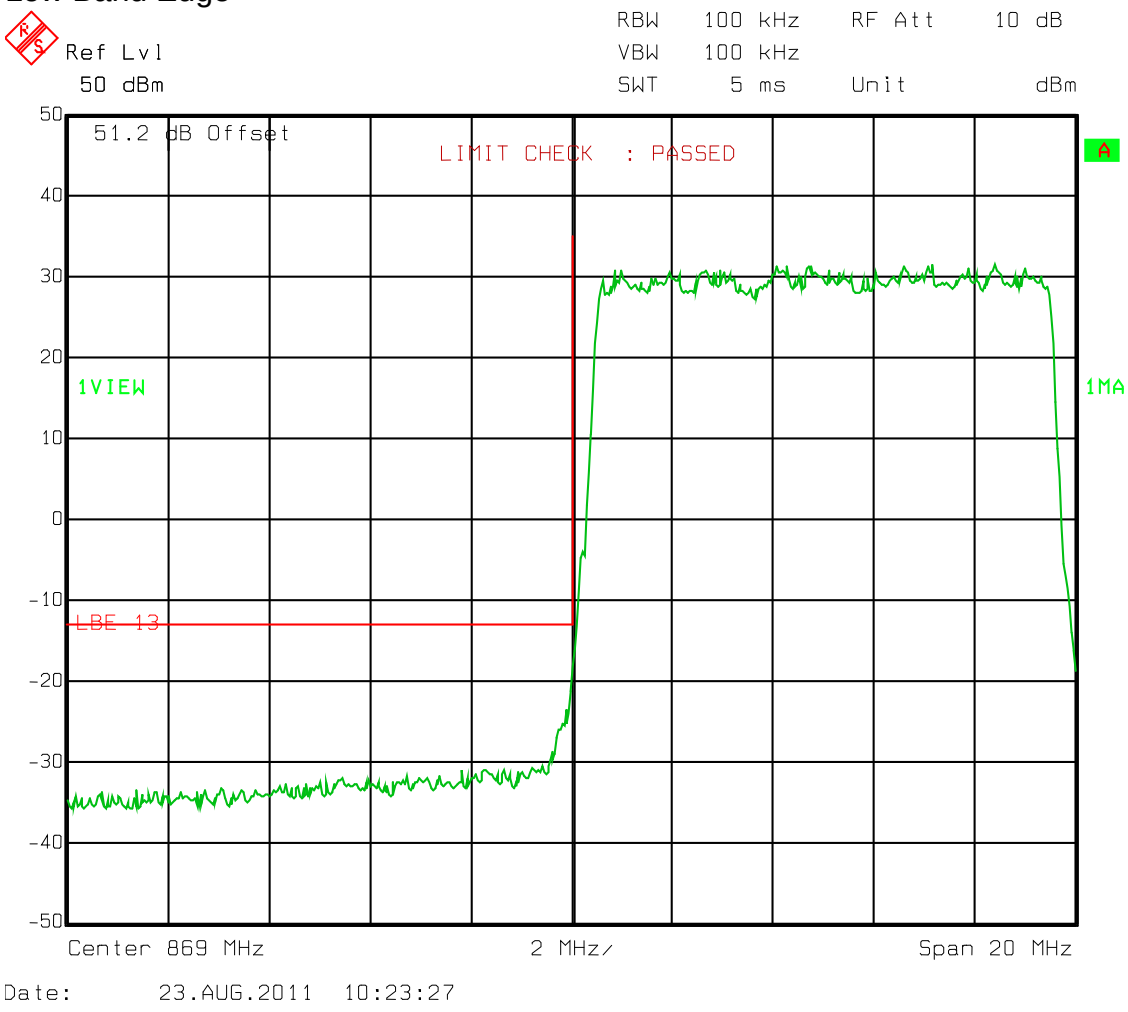
Test Data – Spurious Emissions

10 MHz Channel
QPSK
Upper Band Edge



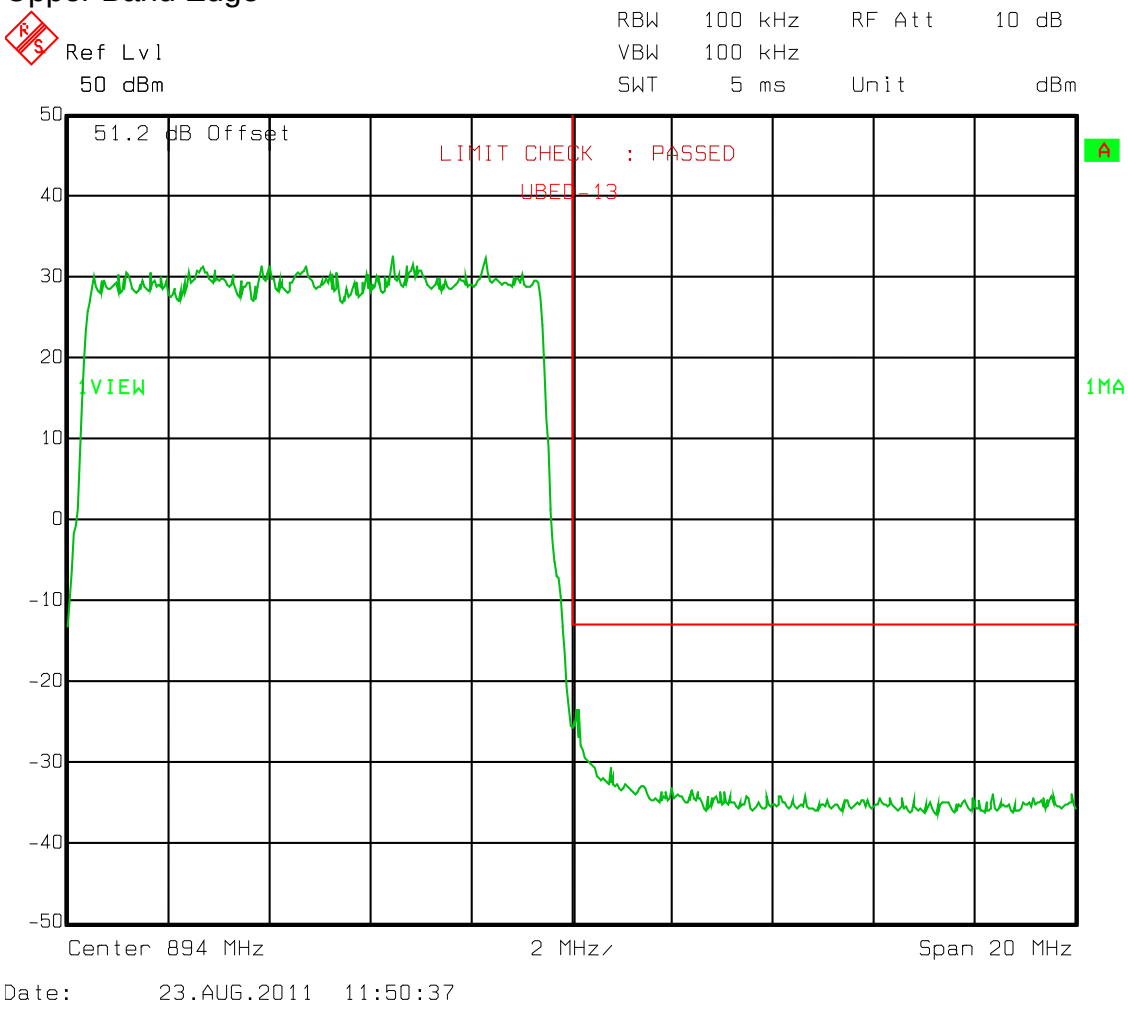
Test Data – Spurious Emissions

10 MHz Channel
16 QAM
Low Band Edge



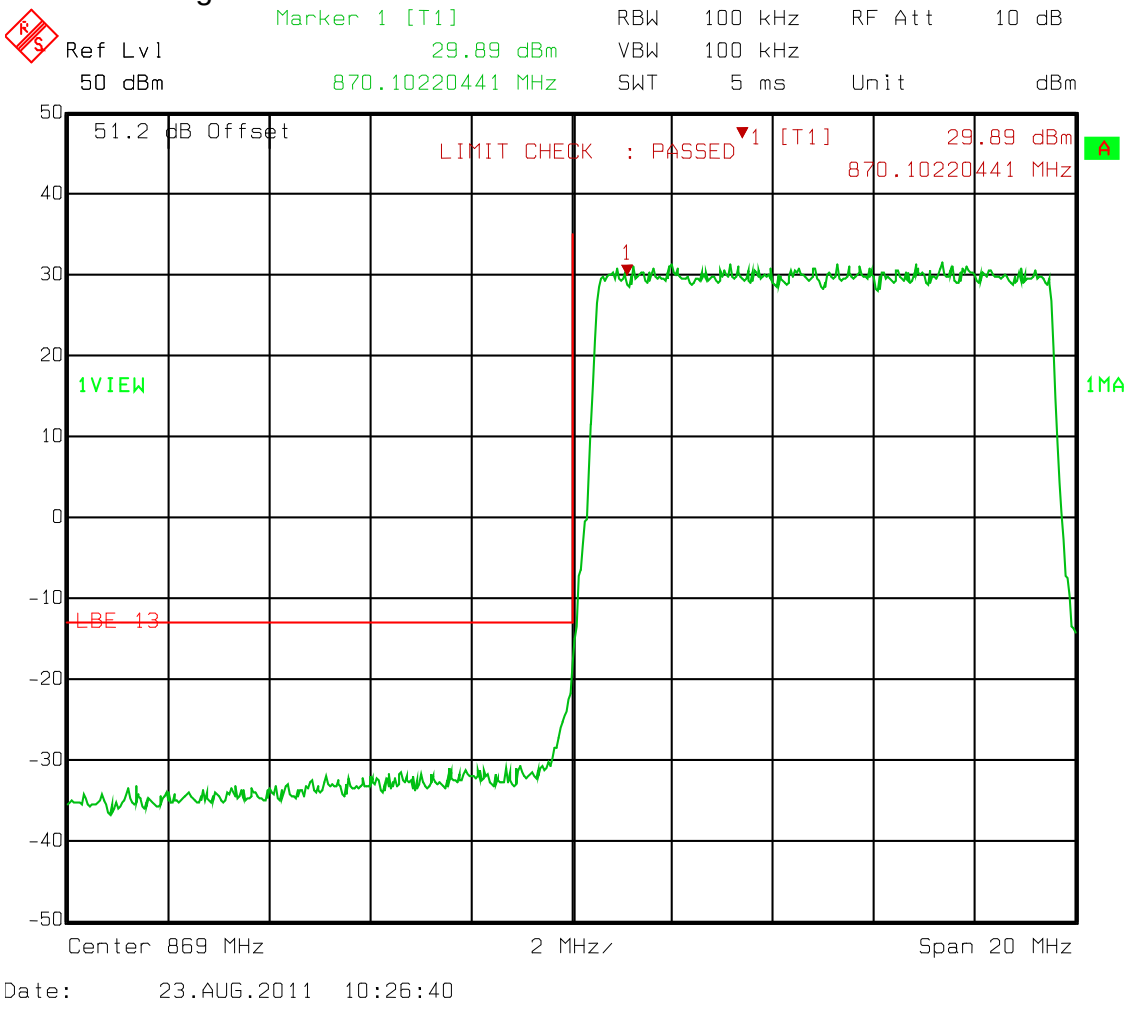
Test Data – Spurious Emissions

10 MHz Channel
16 QAM
Upper Band Edge



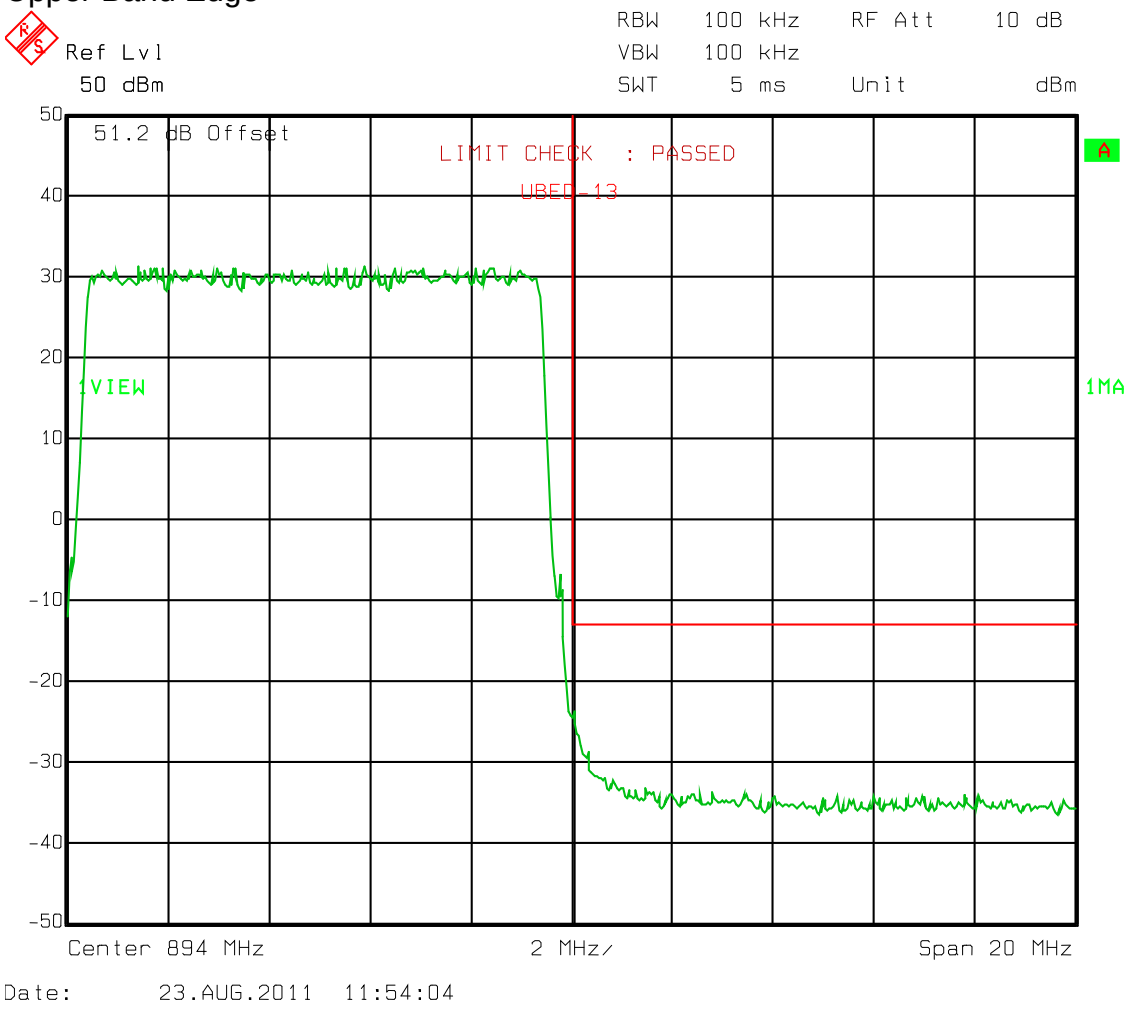
Test Data – Spurious Emissions

10 MHz Channel
64 QAM
Low Band Edge



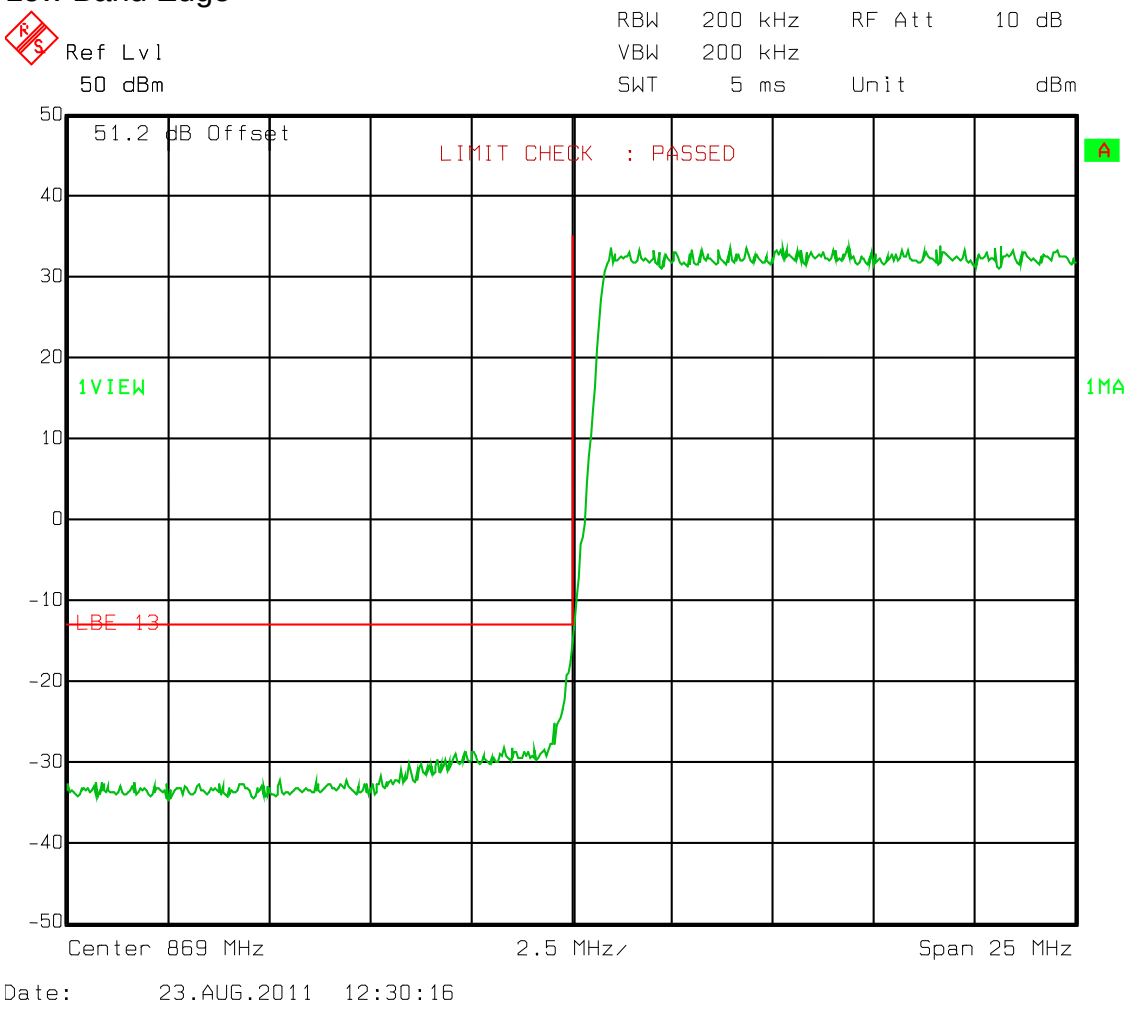
Test Data – Spurious Emissions

10 MHz Channel
64 QAM
Upper Band Edge



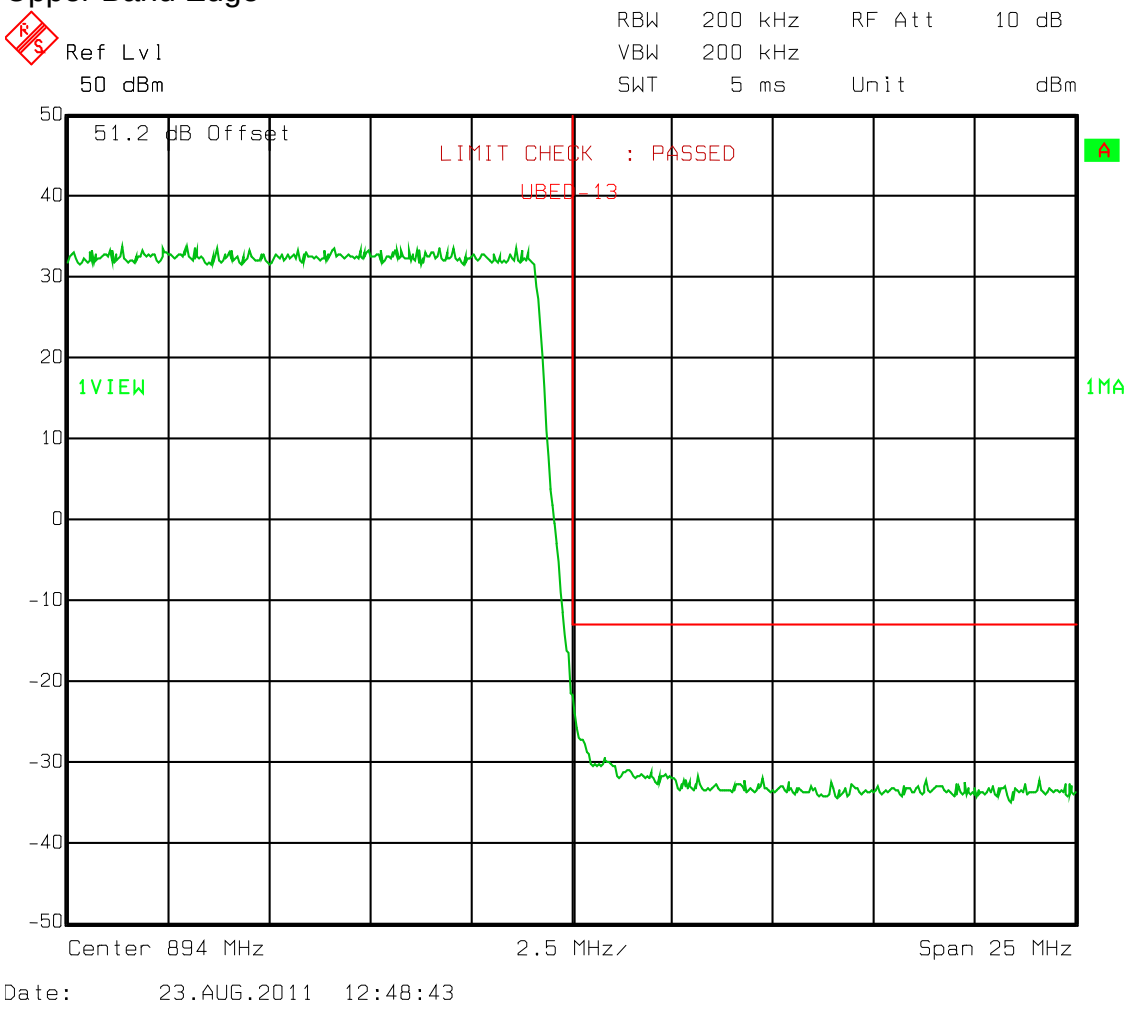
Test Data – Spurious Emissions

15 MHz Channel
QPSK
Low Band Edge



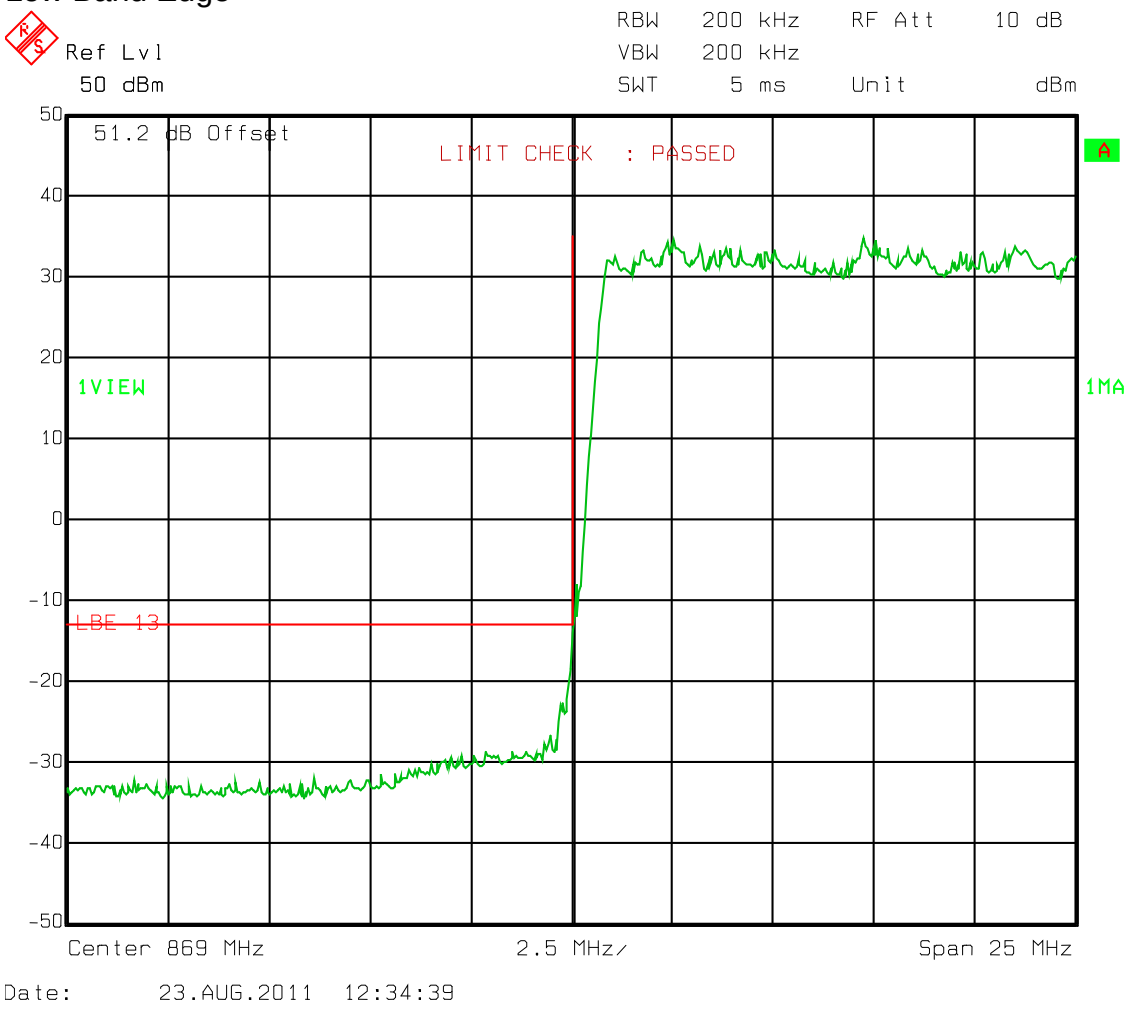
Test Data – Spurious Emissions

15 MHz Channel
QPSK
Upper Band Edge



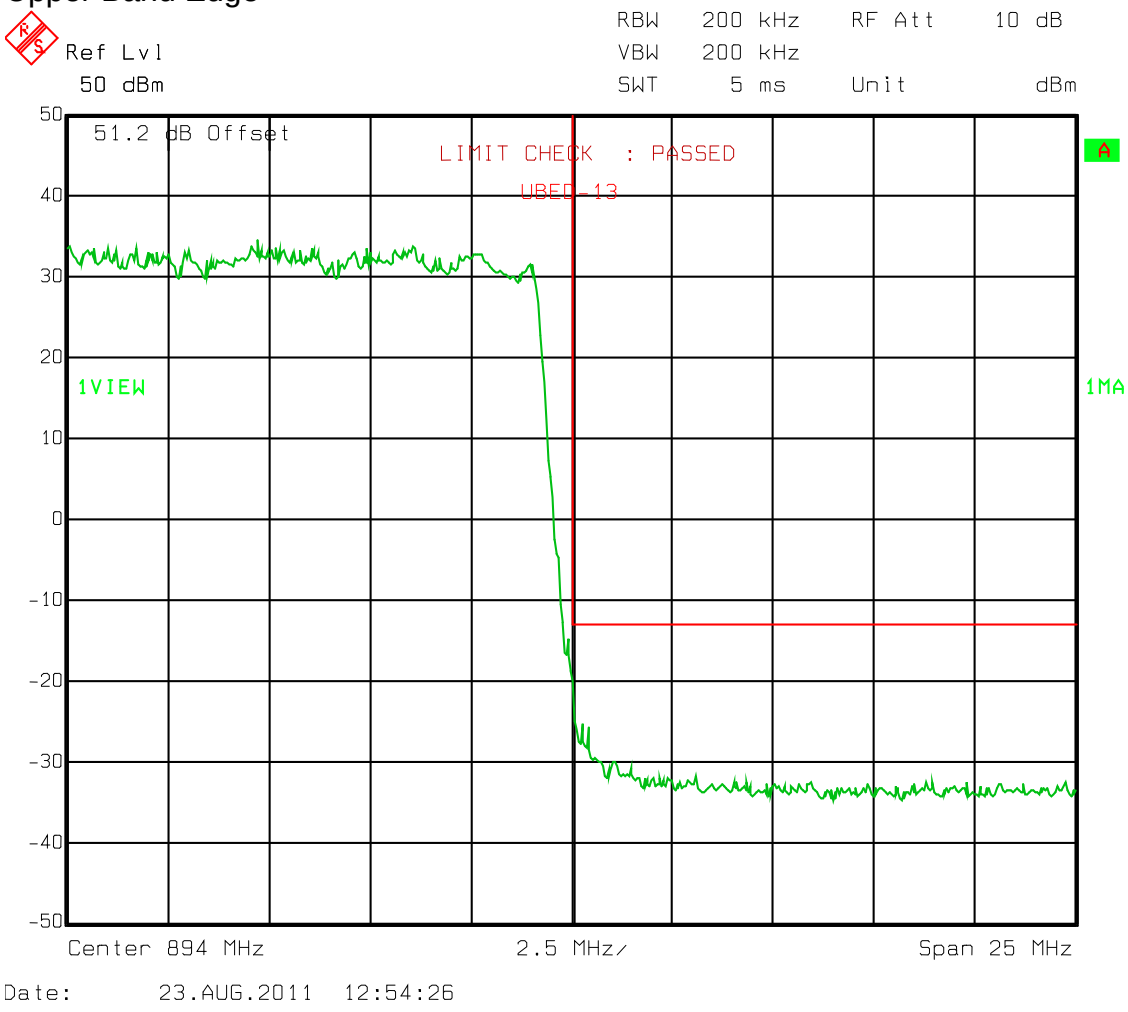
Test Data – Spurious Emissions

15 MHz Channel
16 QAM
Low Band Edge



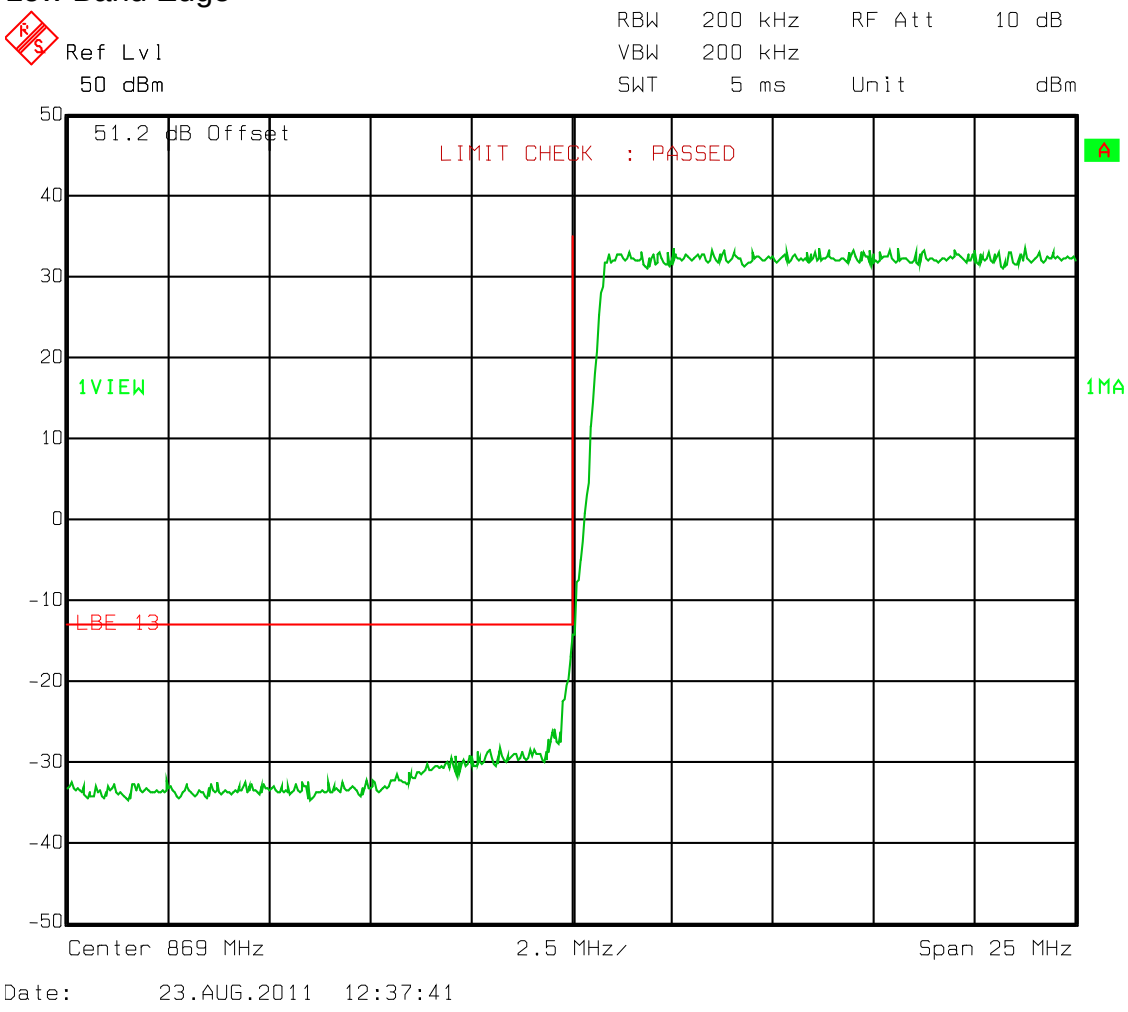
Test Data – Spurious Emissions

15 MHz Channel
16 QAM
Upper Band Edge



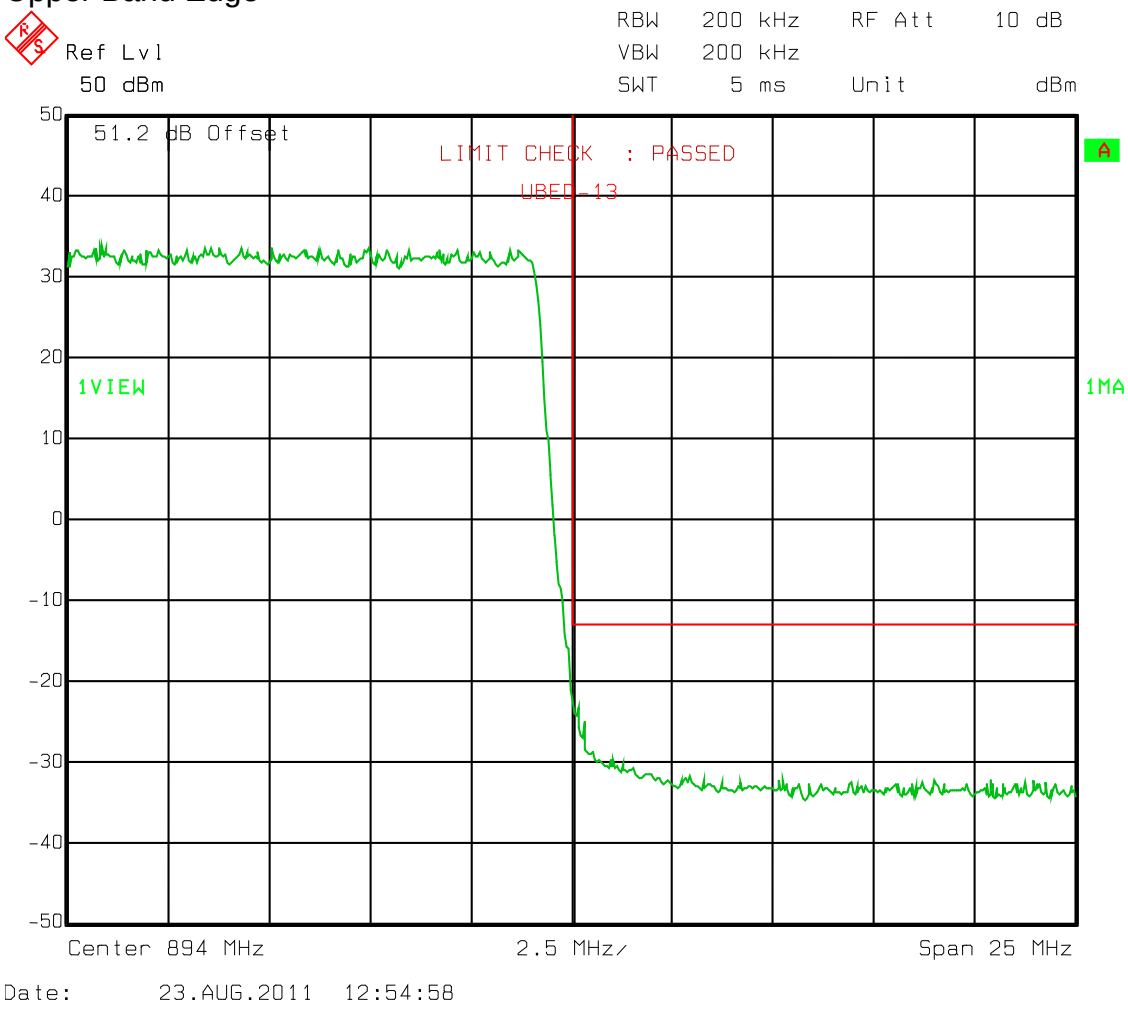
Test Data – Spurious Emissions

15 MHz Channel
64 QAM
Low Band Edge



Test Data – Spurious Emissions

15 MHz Channel
64 QAM
Upper Band Edge

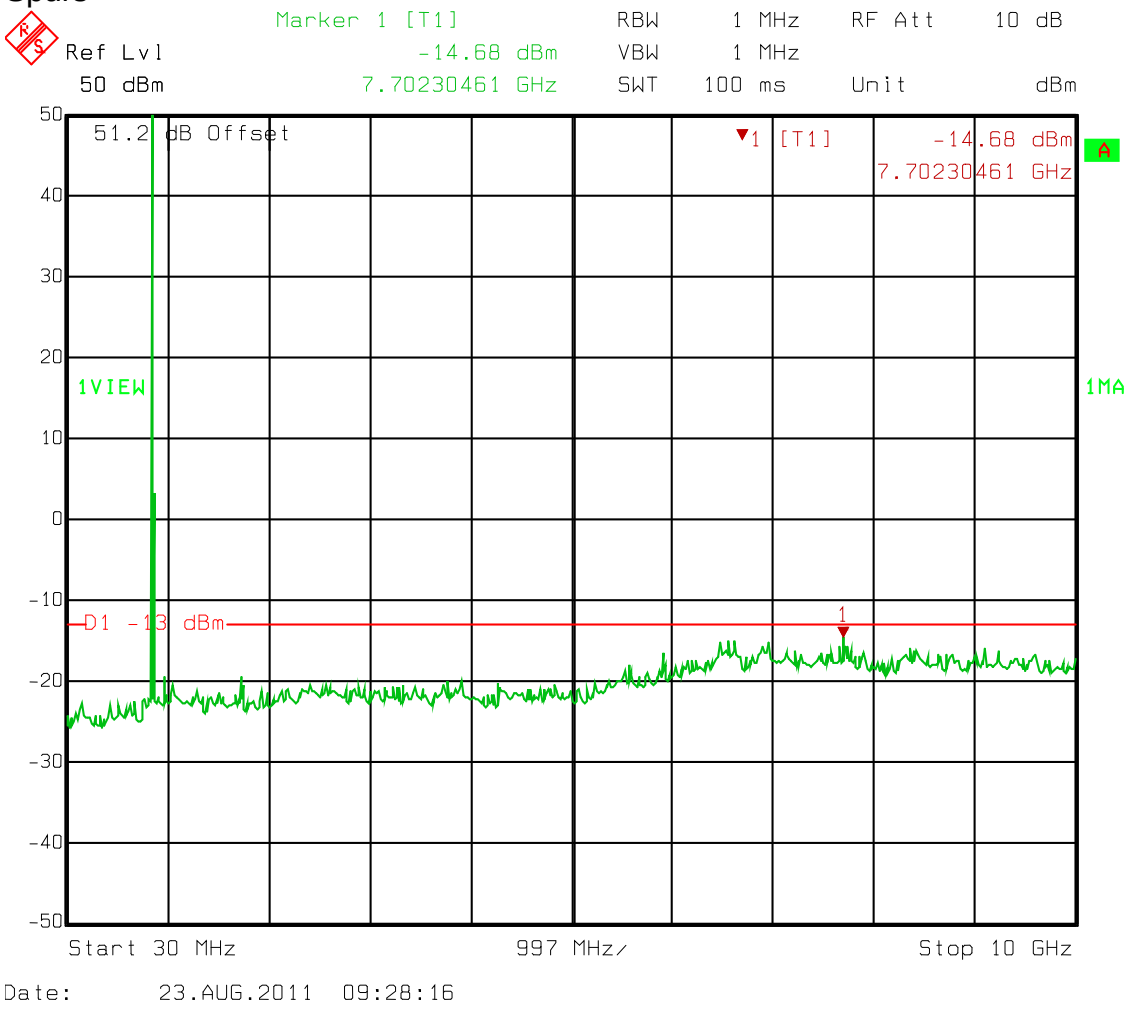


Test Data – Spurious Emissions

QPSK

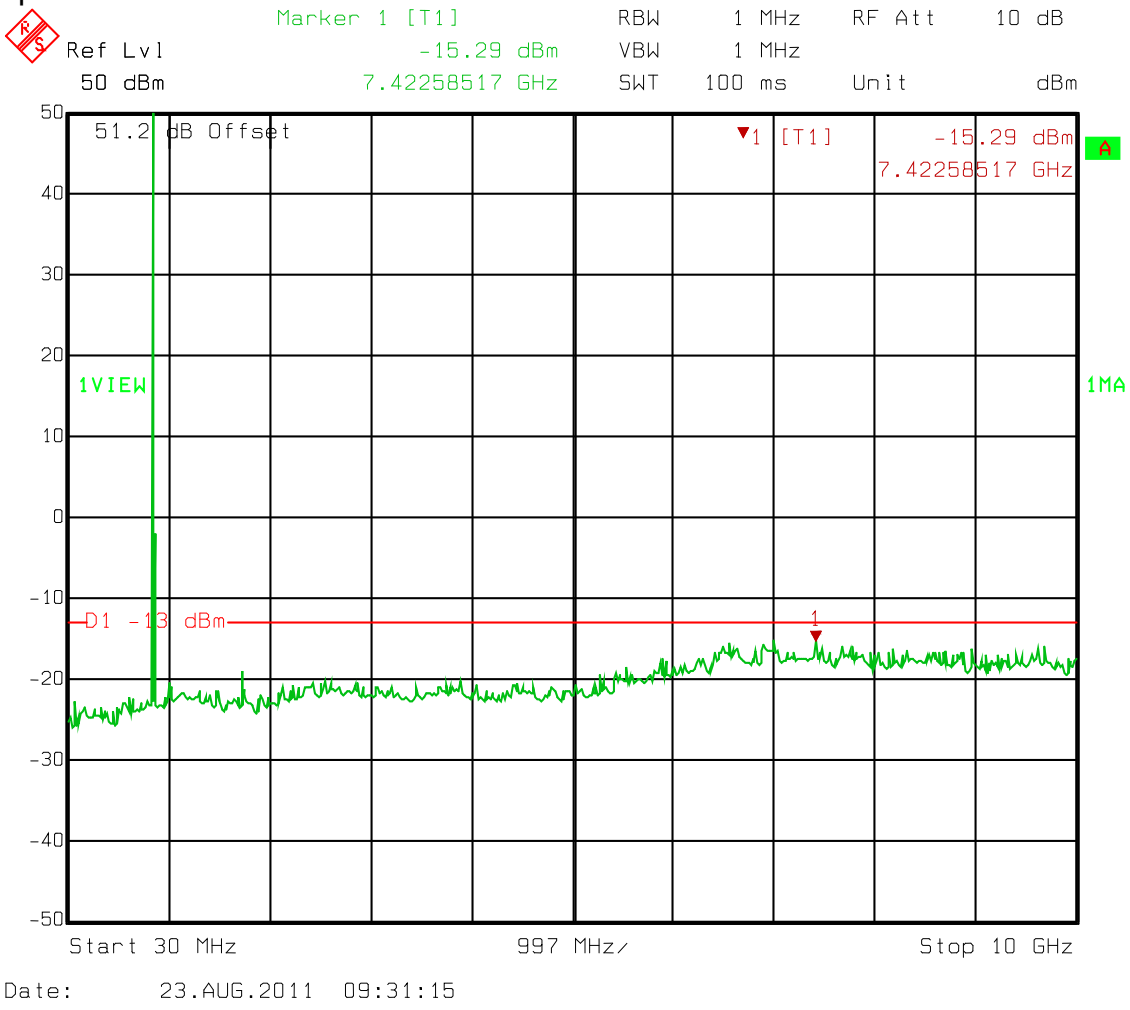
Center Channel

Spurs



Test Data – Spurious Emissions

16 QAM
Center Channel
Spurs

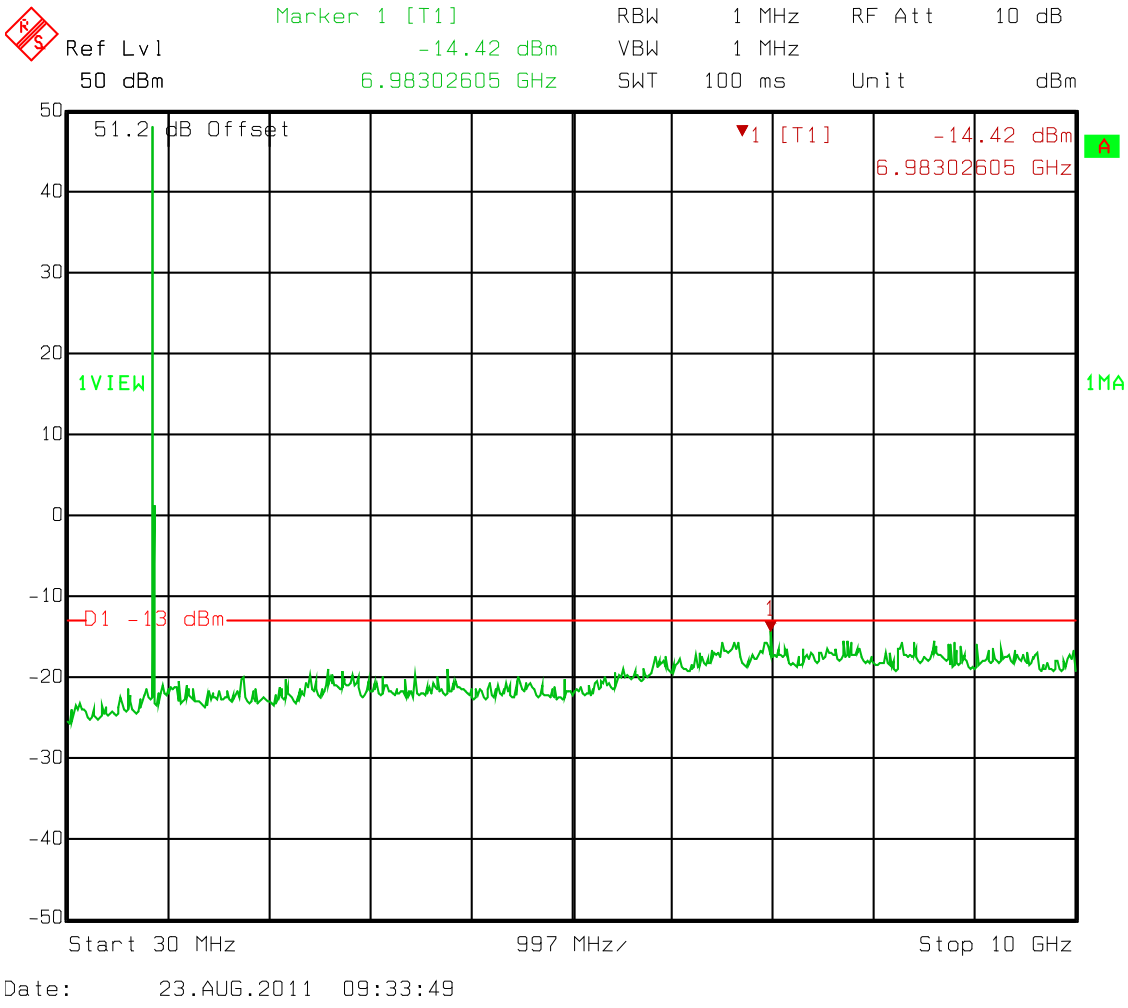


Test Data – Spurious Emissions

64 QAM

Spurs

Center Channel



Section 6. Test Equipment List

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
1054	Directional Coupler, Dual	Narda	3020A	34366	N/R	
1064	Attenuator	Narda	776B-20		N/R	
1065	Attenuator	Narda	776B-10		N/R	
1082	Cable, 2m	Astrolab	32027-2-29094-72TC		N/R	
1763	Antenna, Bilog	Schaffner	CBL 6111D	22926	11-Feb-2011	11-Feb-2012
1767	Receiver,	Rohde & Schwartz	ESIB26	837491/0002	01-Dec-2010	01-Dec-2011

ANNEX A - TEST DETAILS

NAME OF TEST: RF Power Output PARA. NO.: 2.1046

Minimum Standard: Para. No. 22.913(a). The maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 watts.

Method Of Measurement:

Detachable Antenna:
The peak power at antenna terminals is measured using an in-line peak power meter. Power output is measured with the maximum rated input level.

Integral Antenna:
The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

NAME OF TEST: Occupied Bandwidth **PARA. NO.: 2.1049**

Minimum Standard: Not defined

Method Of Measurement:

CDMA

Spectrum analyzer settings:
RBW=VBW=30 kHz
Span: 5 MHz
Sweep: Auto

GSM / EDGE

RBW=VBW= 3 kHz
Span: 1 MHz
Sweep: Auto

TDMA

RBW=VBW= 1 kHz
Span: 1 MHz
Sweep: Auto

W-CDMA

RBW=VBW= 100 kHz
Span: 10 MHz
Sweep: Auto

NAME OF TEST: Spurious Emission at Antenna Terminals **PARA. NO.: 2.1051**

Minimum Standard: Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least 43 + 10 log P. This is equivalent to -13 dBm absolute power.

Method Of Measurement:

Method Of Measurement:

Spectrum analyzer settings:

CDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 30 kHz (< 1MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: 6 Sweeps

GSM / EDGE

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: Disabled

TDMA

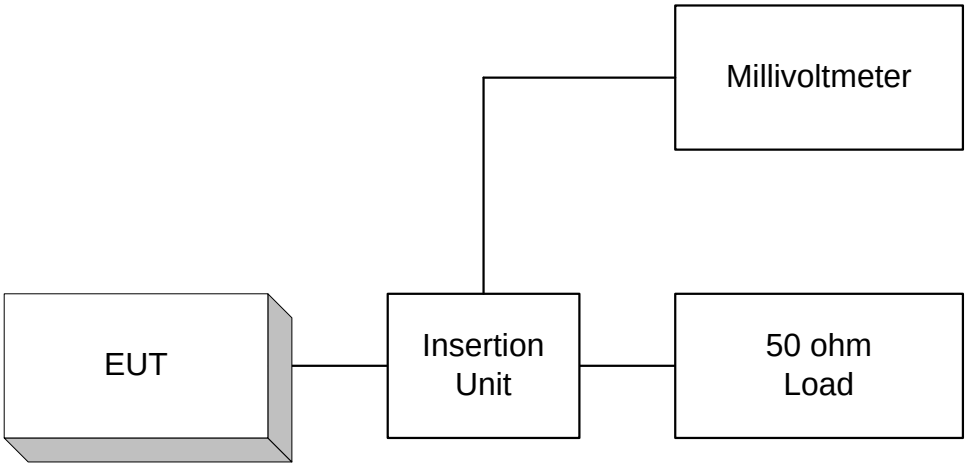
RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: Disabled

W-CDMA

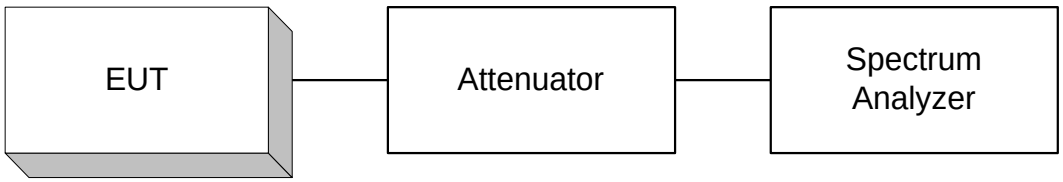
RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 100 kHz (< 1MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: 6 Sweeps

ANNEX B - TEST DIAGRAMS

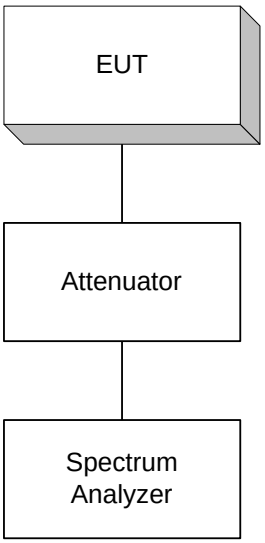
Para. No. 2.985 - R.F. Power Output



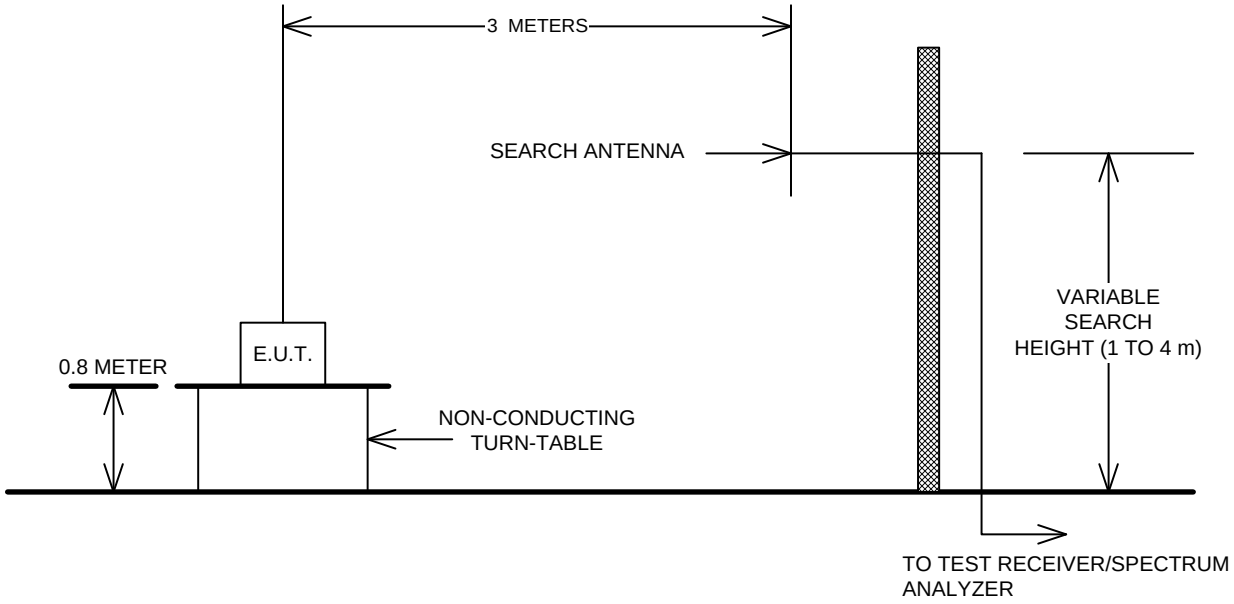
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability