



Nemko Test Report: 41237RUS1

Applicant: Andrew Corporation
620 N. Greenfield Parkway
Garner, NC 27529
USA

**Equipment Under Test:
(E.U.T.)** MR8518

FCC Identifier: BCR-MR8518

In Accordance With: **CFR 47, Part 22, Subpart H**
Cellular Band Repeaters

Tested By: Nemko USA Inc.
802 N. Kealy
Lewisville, TX
75057-3136

TESTED BY:

A handwritten signature in black ink, appearing to read 'David Light'.

David Light, Senior Wireless Engineer

DATE: 25 January 2010

APPROVED BY:

A handwritten signature in black ink, appearing to read 'Tom Tidwell'.

Tom Tidwell, Telecom Direct

DATE: 29 January 2010

Number of Pages: 70

Table of Contents

SECTION 1. SUMMARY OF TEST RESULTS.....	3
SECTION 2. GENERAL EQUIPMENT SPECIFICATION	5
SECTION 3. OCCUPIED BANDWIDTH.....	7
SECTION 4. SPURIOUS EMISSIONS AT ANTENNA TERMINALS	28
SECTION 5. TEST EQUIPMENT LIST.....	59
ANNEX A - TEST DETAILS	60
ANNEX B - TEST DIAGRAMS	66

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Section 1. Summary of Test Results

Manufacturer: Andrew Corporation

Model No.: MR8018

Serial No.: 10

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 CFR 47, Part 22, Subpart H.

☐	New Submission	☒	Production Unit
☒	Class II Permissive Change	☐	Pre-Production Unit

Reason for Class II change: Gain has been increased from 70 dB to 78 dB. Output power remains at 22 dBm. The change of gain is accomplished by removing attenuation in the device. There was no degradation of the characteristics of the device.

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".



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EQUIPMENT: **MR8518**PROJECT NO.: 41237RUS1

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	22.913(a)	500W ERP	Not tested
Occupied Bandwidth	Not defined	Input/Output	Complies
Spurious Emissions at Antenna Terminals	22.917	-13 dBm	Complies
Field Strength of Spurious Emissions	22.917	-13 dBm E.I.R.P.	Not Tested
Frequency Stability	22.355	1.5 ppm	NA

Footnotes: Frequency stability is not applicable because the device uses a common oscillator to down-convert and up-convert the rf signal.

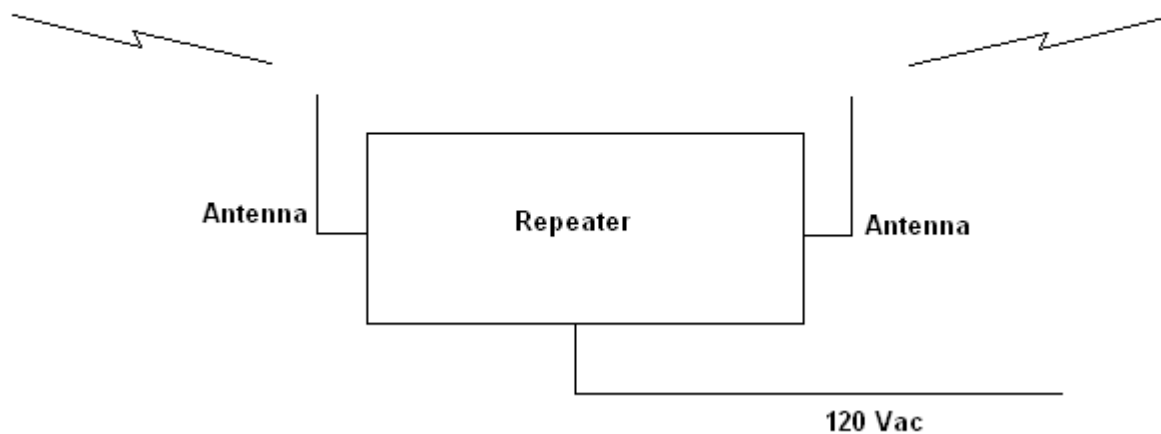
Section 2. General Equipment Specification

Supply Voltage Input:		120 Vac		
Frequency Range:	Downlink:	869 to 894 MHz		
Frequency Range:	Uplink:	824 to 849 MHz		
Type of Modulation and Designator:	CDMA (F9W)	GSM (GXW)	TDMA (DXW)	EDGE (G7W)
	☒	☒	☒	☒
Output Impedance:	50 ohms			
RF Output (Rated):	Downlink:	0.158 W 22 dBm		
	Uplink:	0.158 W 22 dBm		
Frequency Translation:	F1-F1	F1-F2	N/A	
	☒	☐	☐	
Band Selection:	Software	Duplexer Change	Fullband Coverage	
	☒	☐	☐	

Description of EUT

The miniRepeaters are bi-directional amplifiers used to enhance signals between a mobile and a base station in a wireless network. They have been designed to increase signal strength in small and medium sized areas such as offices, shops, basements and manufacturing facilities.

System Diagram



Section 3. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 25 January 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1082-1472

Measurement Uncertainty: 1X10⁻⁷ ppm

Temperature: 22 °C

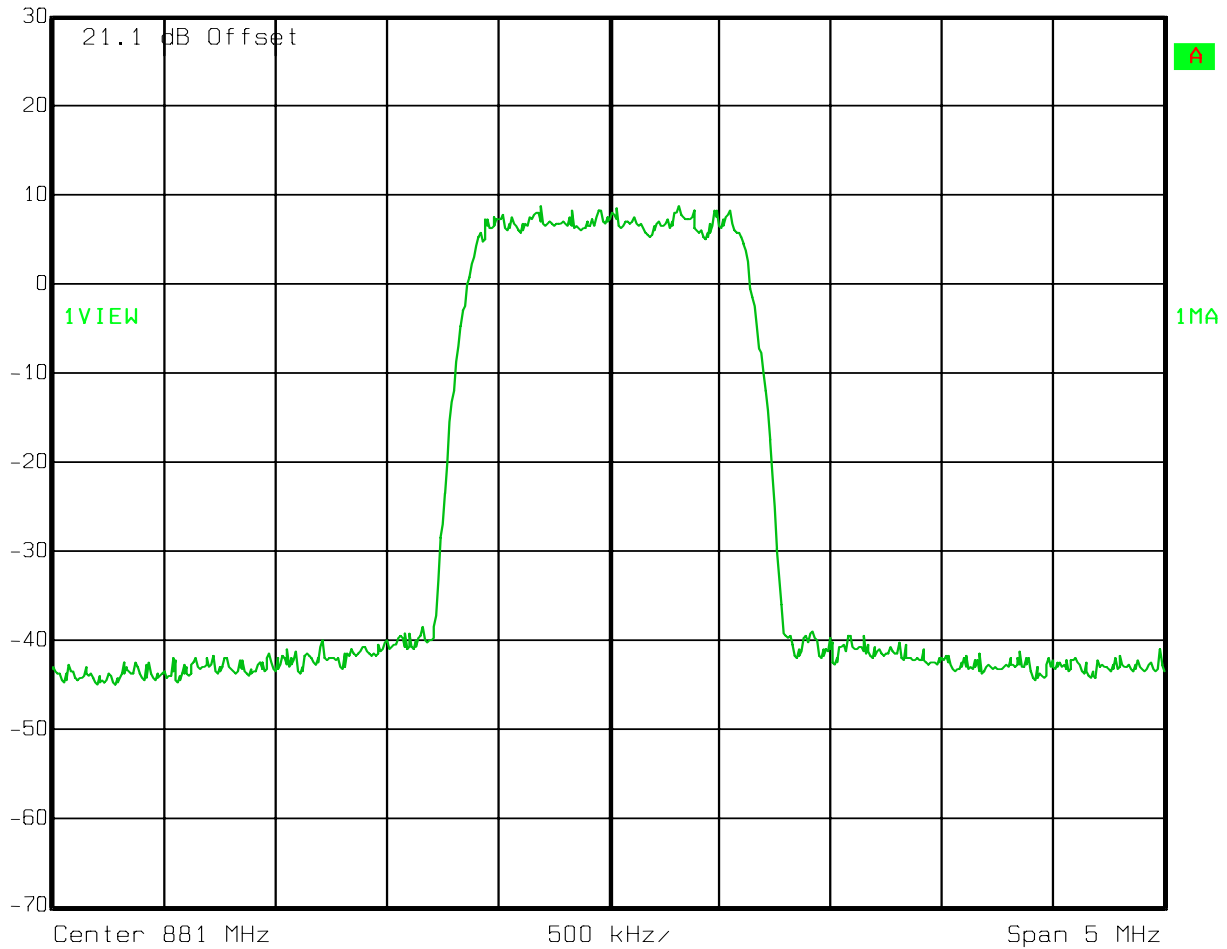
Relative Humidity: 30 %

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthCDMA - Output
DownlinkRef Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



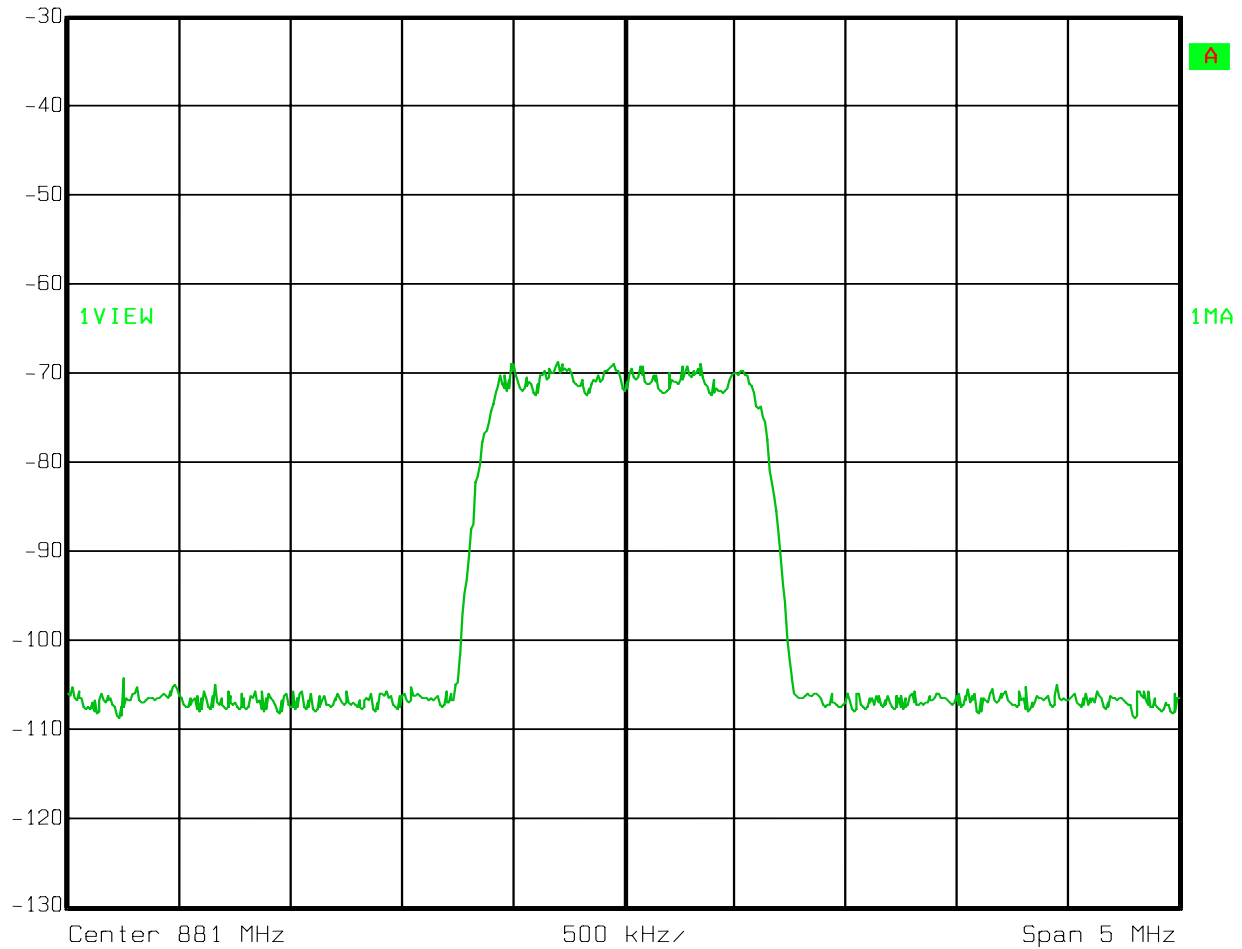
Date: 25.JAN.2010 11:29:43

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthCDMA - Input
DownlinkRef Lvl
-30 dBm

RBW	30 kHz	RF Att	0 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 25.JAN.2010 13:14:24

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

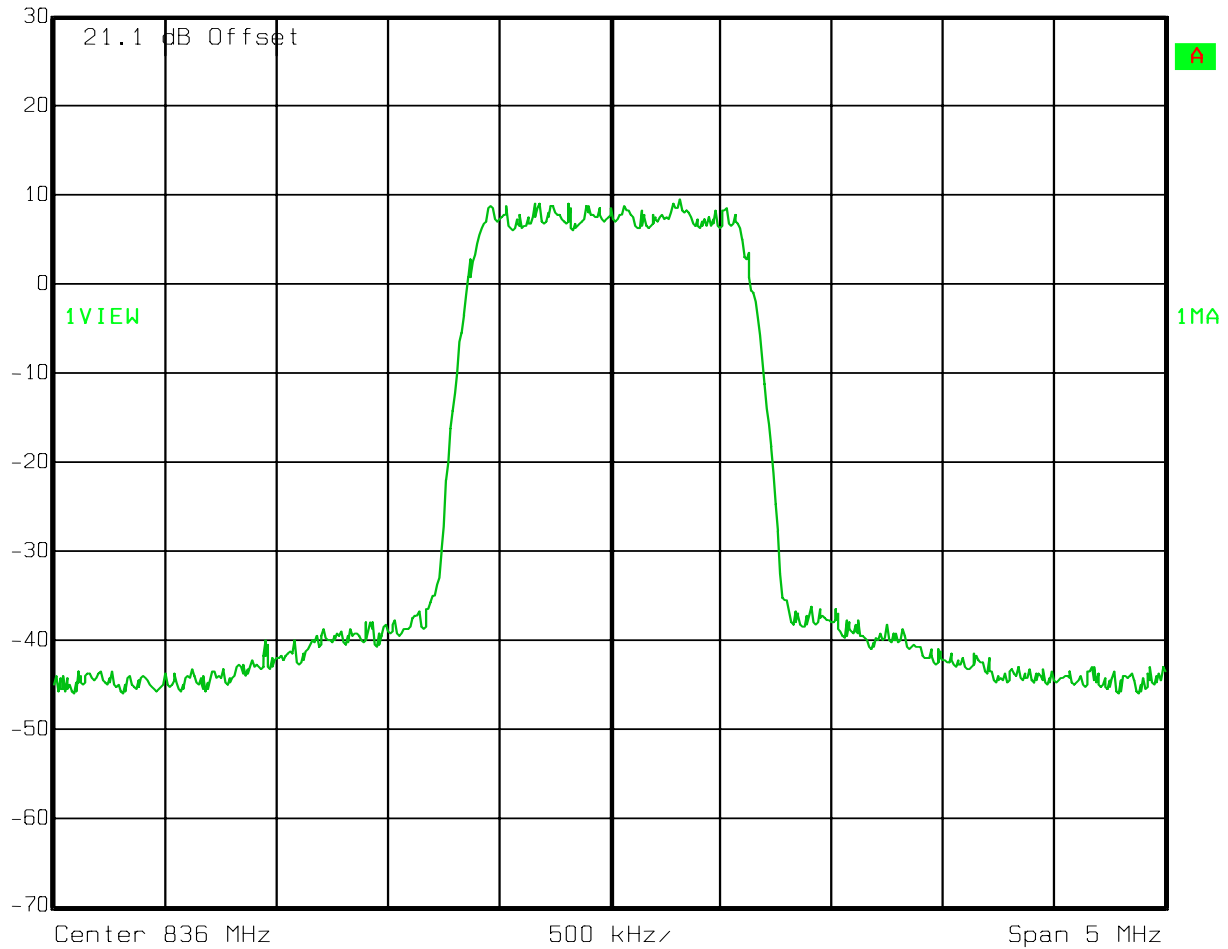
Test Data – Occupied Bandwidth

CDMA - Output

Uplink

Ref Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



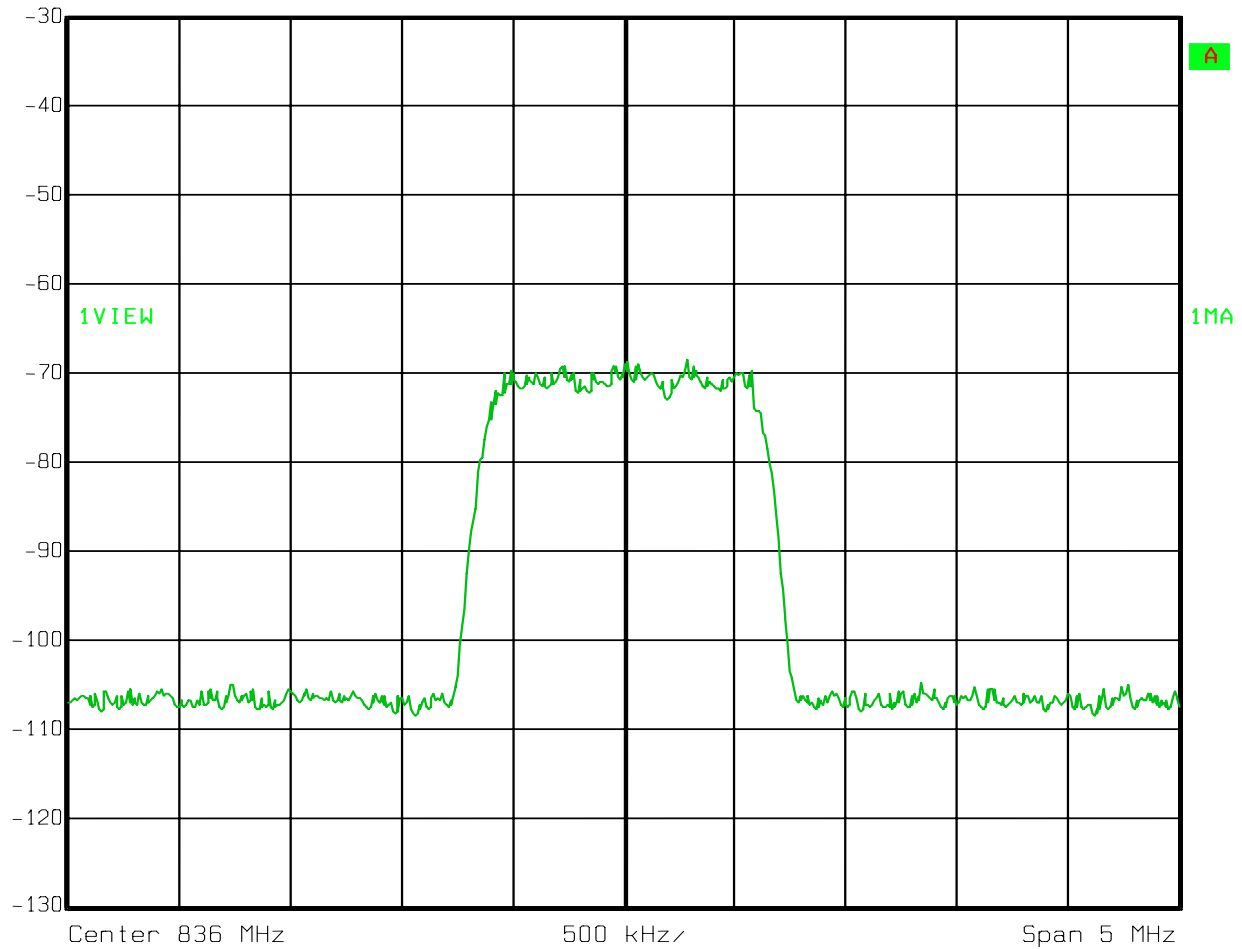
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EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthCDMA - Input
UplinkRef Lvl
-30 dBm

RBW	30 kHz	RF Att	0 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 25.JAN.2010 13:13:55

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

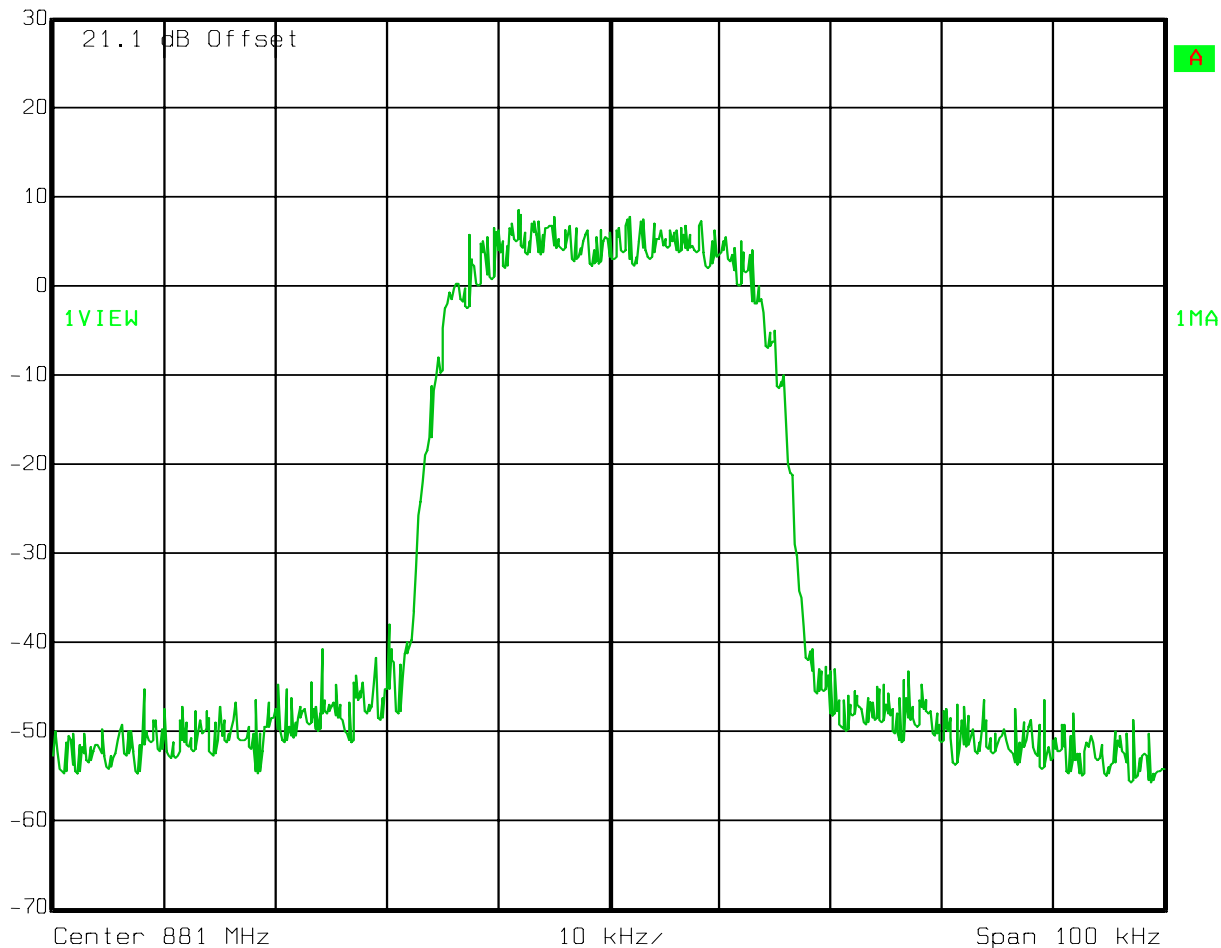
Test Data – Occupied Bandwidth

TDMA - Output

Downlink

Ref Lvl
30 dBm

RBW	300 Hz	RF Att	20 dB
VBW	300 Hz	Mixer	-10 dBm
SWT	5.6 s	Unit	dBm



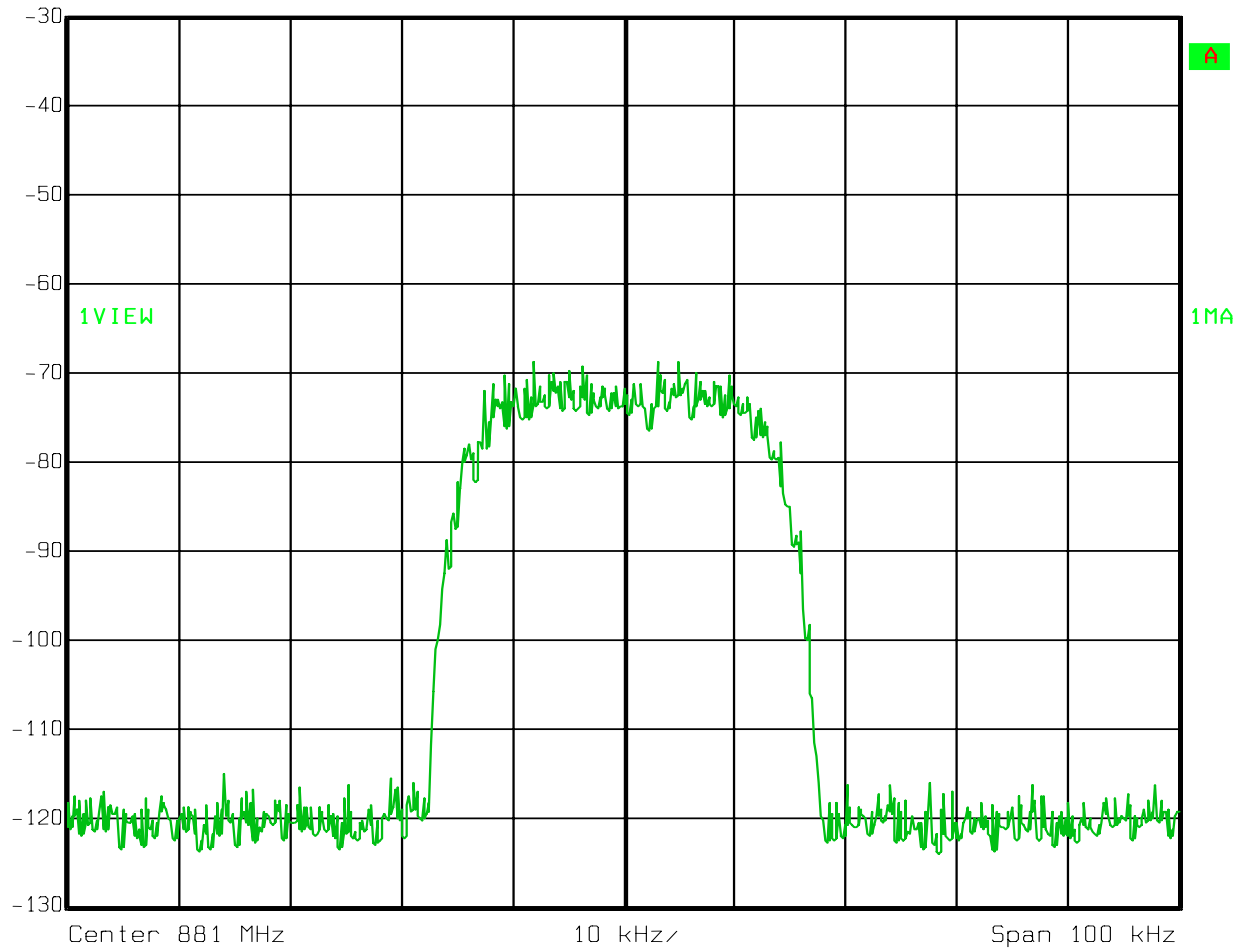
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EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthTDMA - Input
DownlinkRef Lvl
-30 dBm

RBW	300 Hz	RF Att	0 dB
VBW	300 Hz	Mixer	-10 dBm
SWT	5.6 s	Unit	dBm



Date: 25.JAN.2010 13:12:57

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

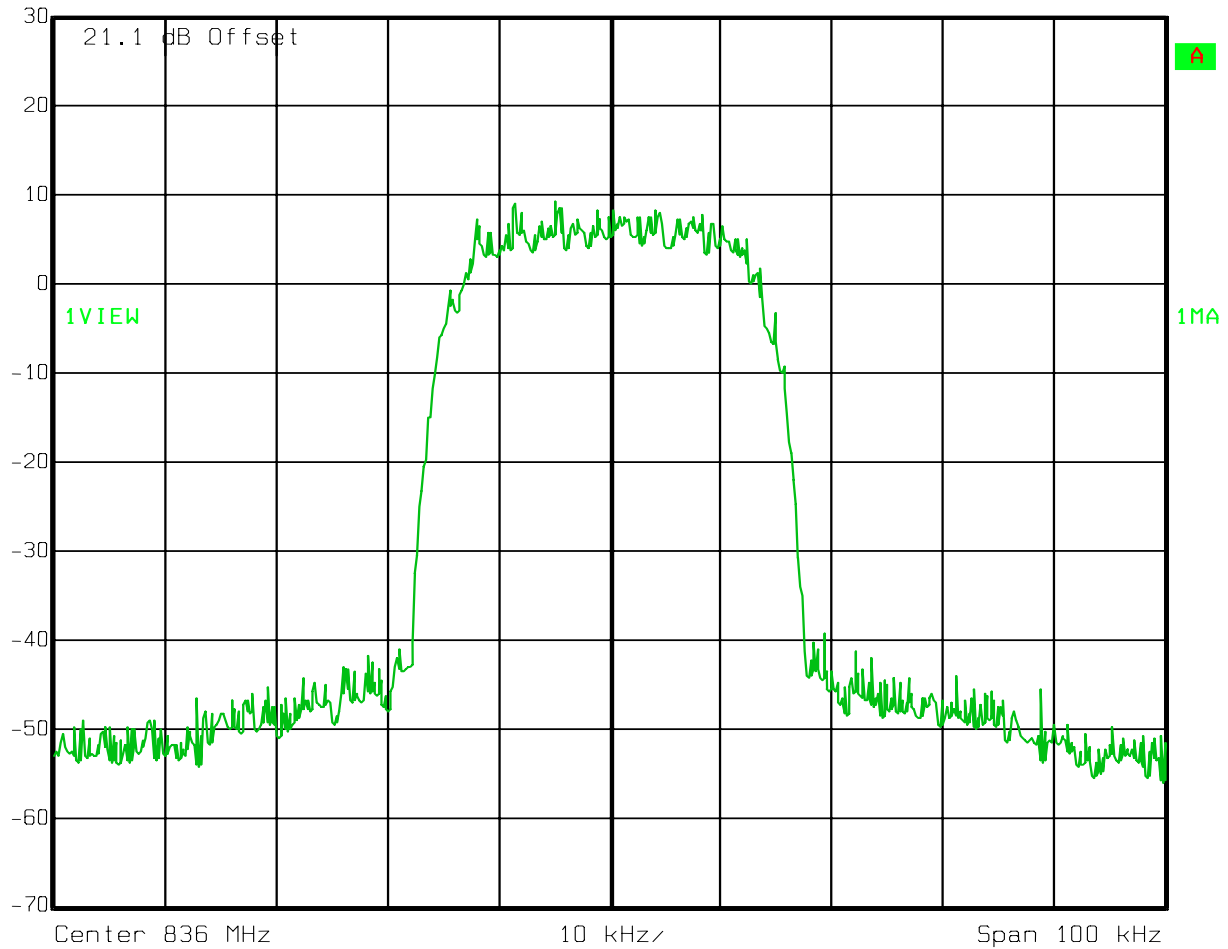
Test Data – Occupied Bandwidth

TDMA - Output

Uplink

Ref Lvl
30 dBm

RBW	300 Hz	RF Att	20 dB
VBW	300 Hz	Mixer	-10 dBm
SWT	5.6 s	Unit	dBm



Date: 25.JAN.2010 10:44:30

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied Bandwidth

TDMA - Input

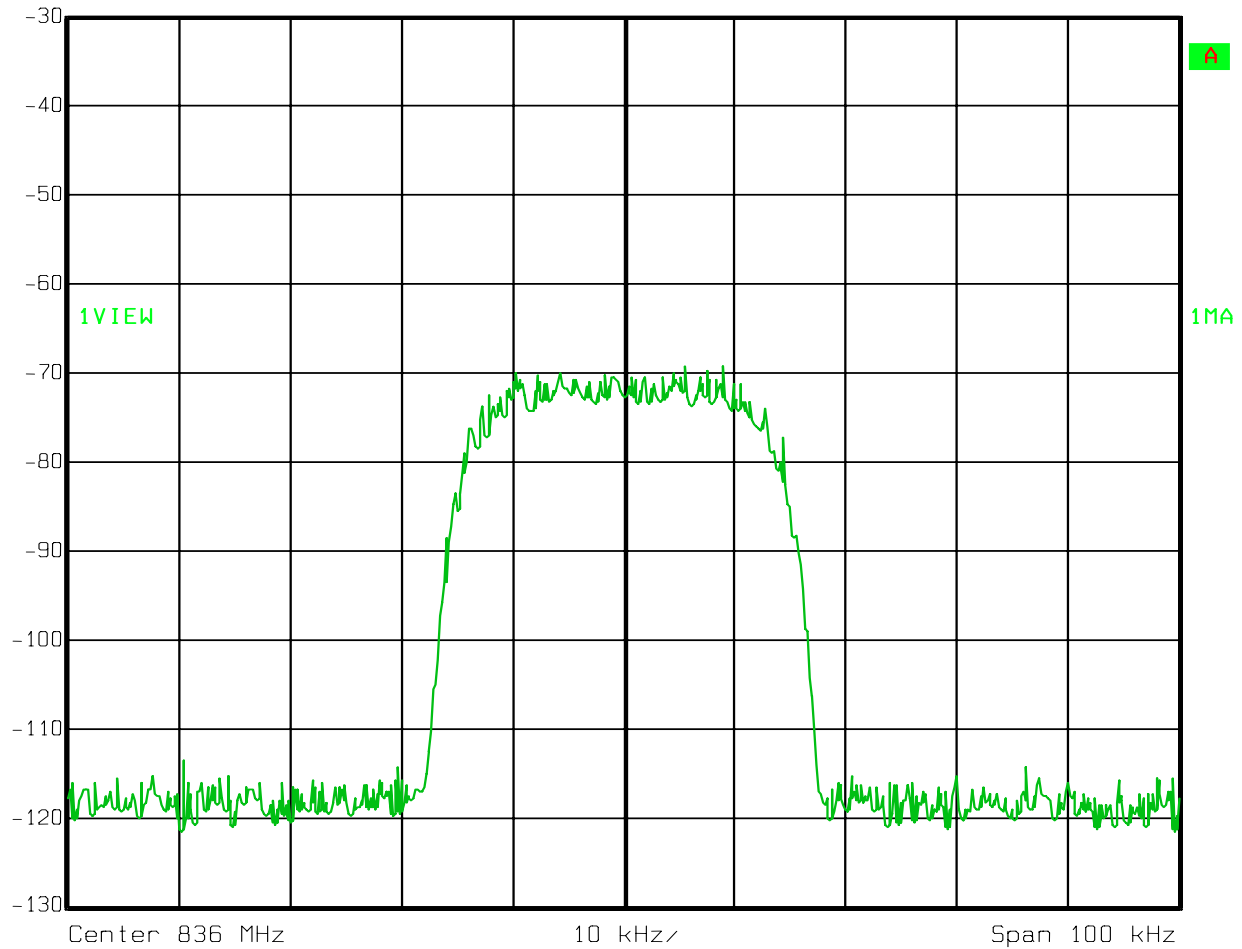
Uplink



Ref Lvl

-30 dBm

RBW	300 Hz	RF Att	0 dB
VBW	300 Hz	Mixer	-10 dBm
SWT	5.6 s	Unit	dBm



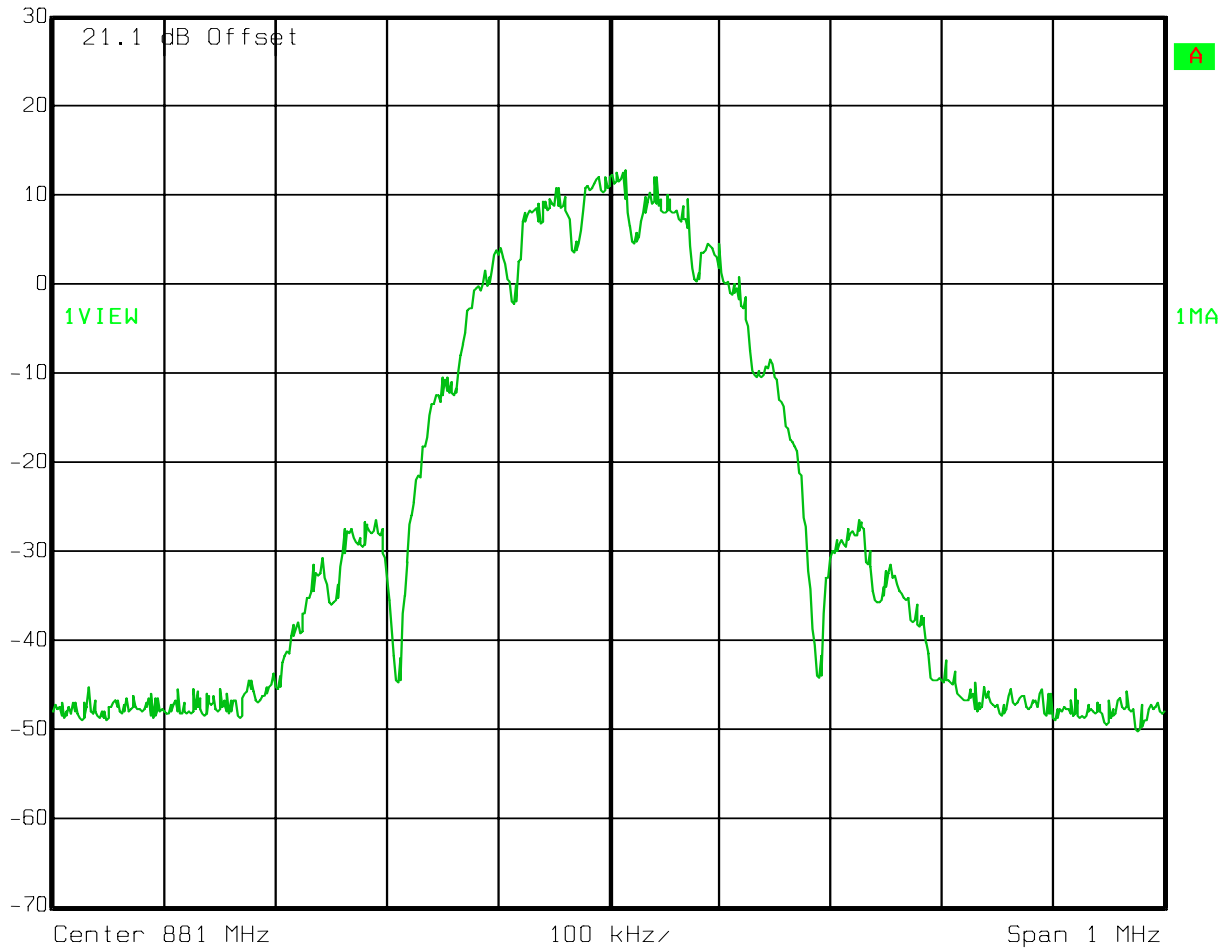
Date: 25.JAN.2010 13:12:05

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthEDGE - Output
DownlinkRef Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	280 ms	Unit	dBm



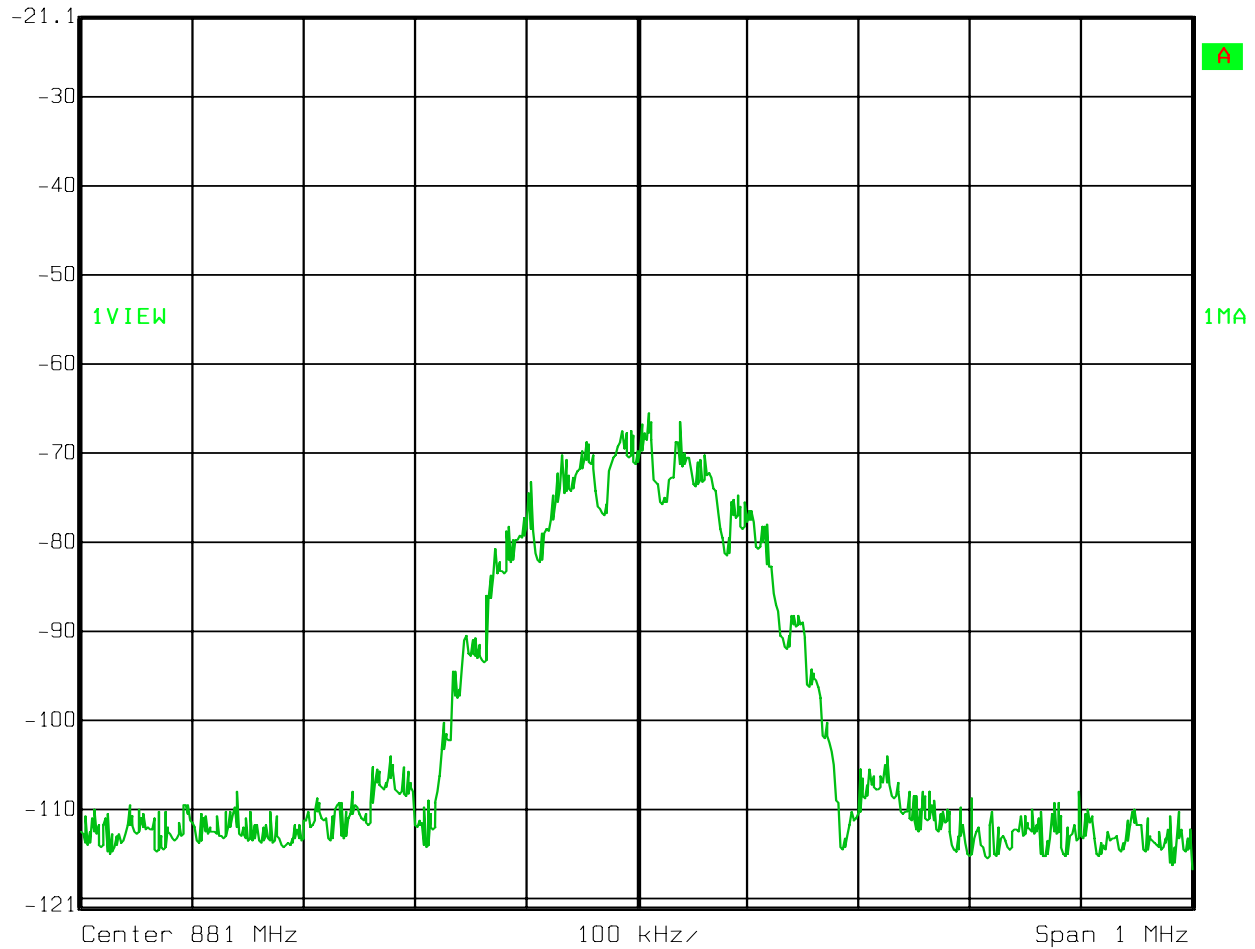
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EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthEDGE - Input
DownlinkRef Lvl
-21.1 dBm

RBW	3 kHz	RF Att	0 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	280 ms	Unit	dBm



Date: 25.JAN.2010 13:10:14

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

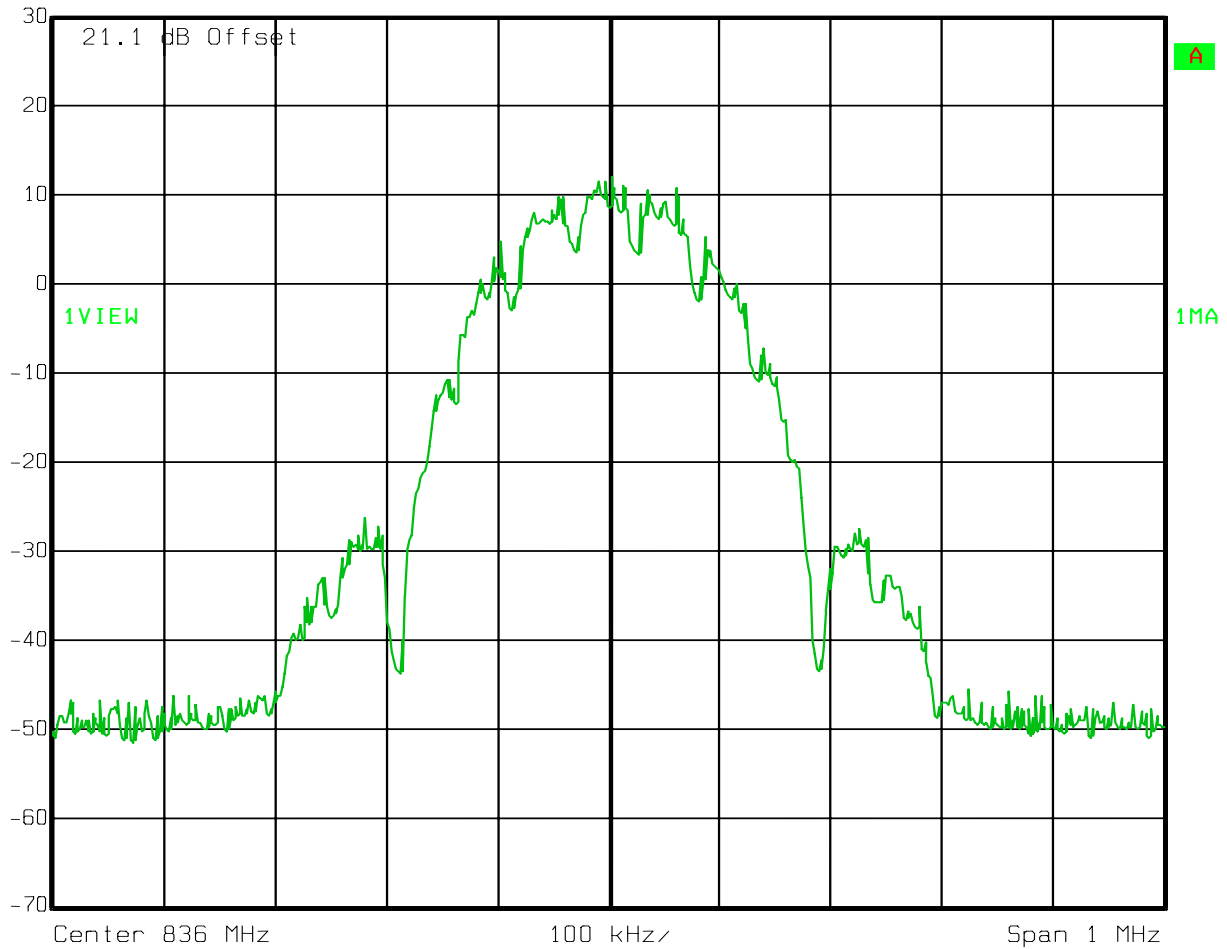
Test Data – Occupied Bandwidth

EDGE - Output

Uplink

Ref Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	280 ms	Unit	dBm



Date: 25.JAN.2010 10:48:14

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

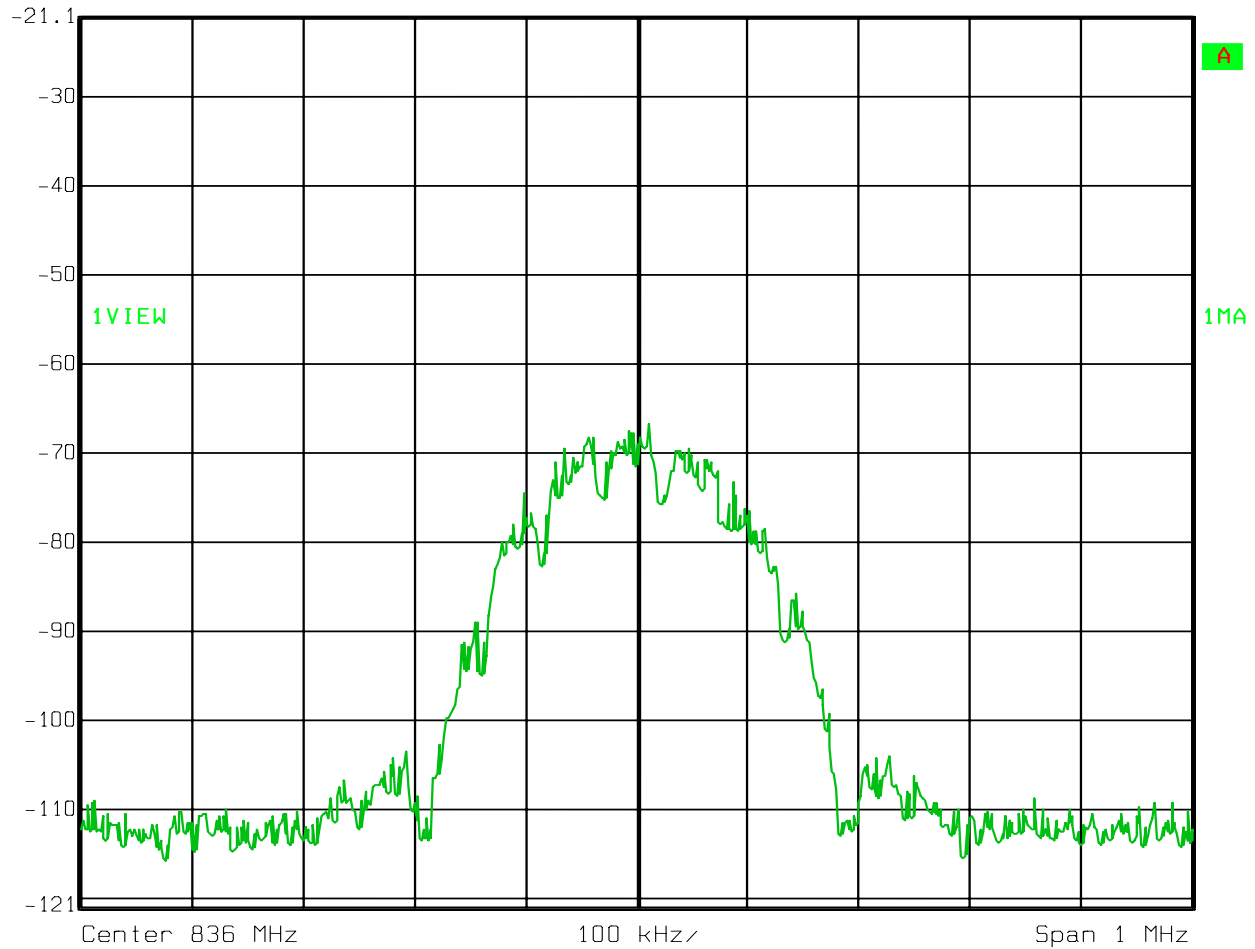
Test Data – Occupied Bandwidth

EDGE - Input

Uplink

Ref Lvl
-21.1 dBm

RBW	3 kHz	RF Att	0 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	280 ms	Unit	dBm



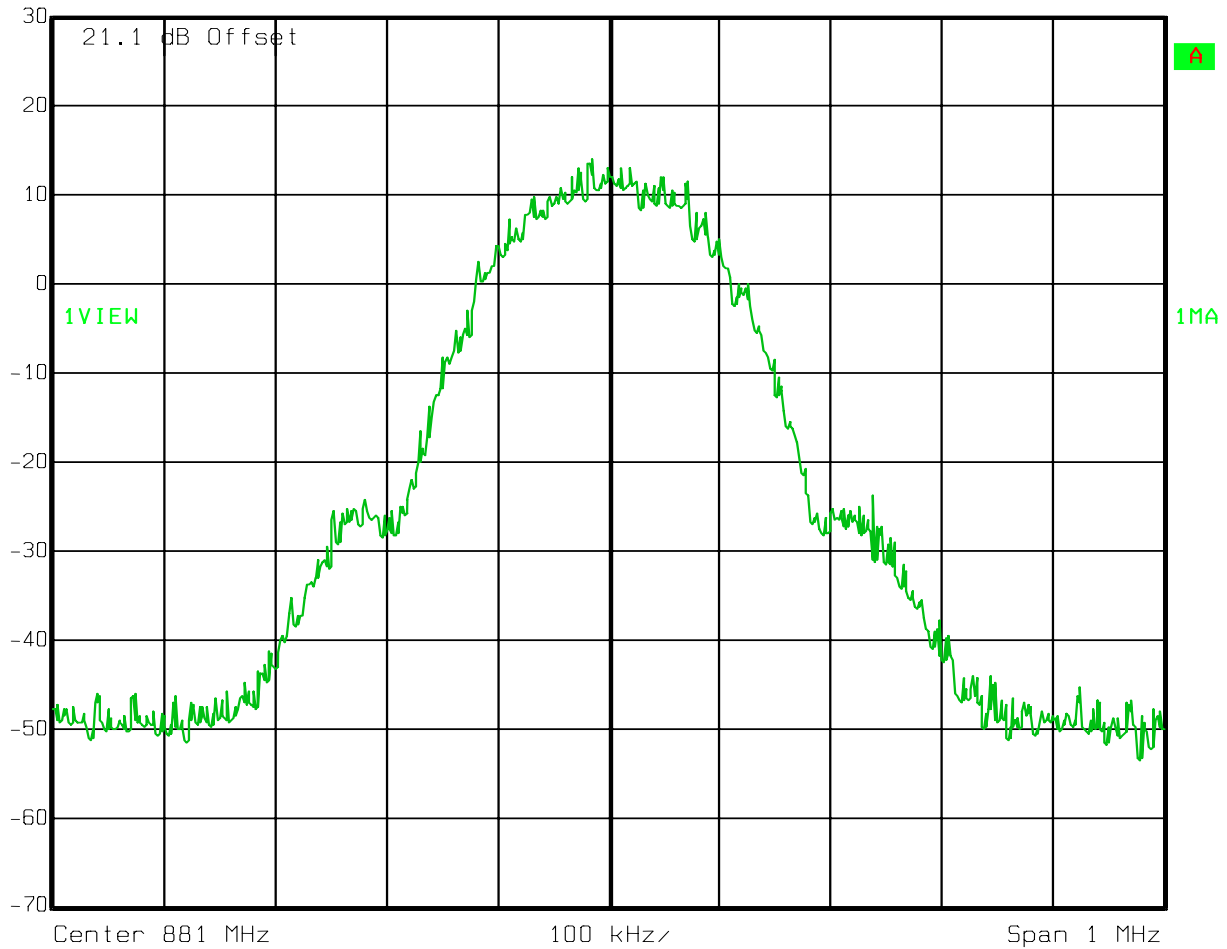
Date: 25.JAN.2010 13:09:32

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthGSM - Output
DownlinkRef Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	280 ms	Unit	dBm



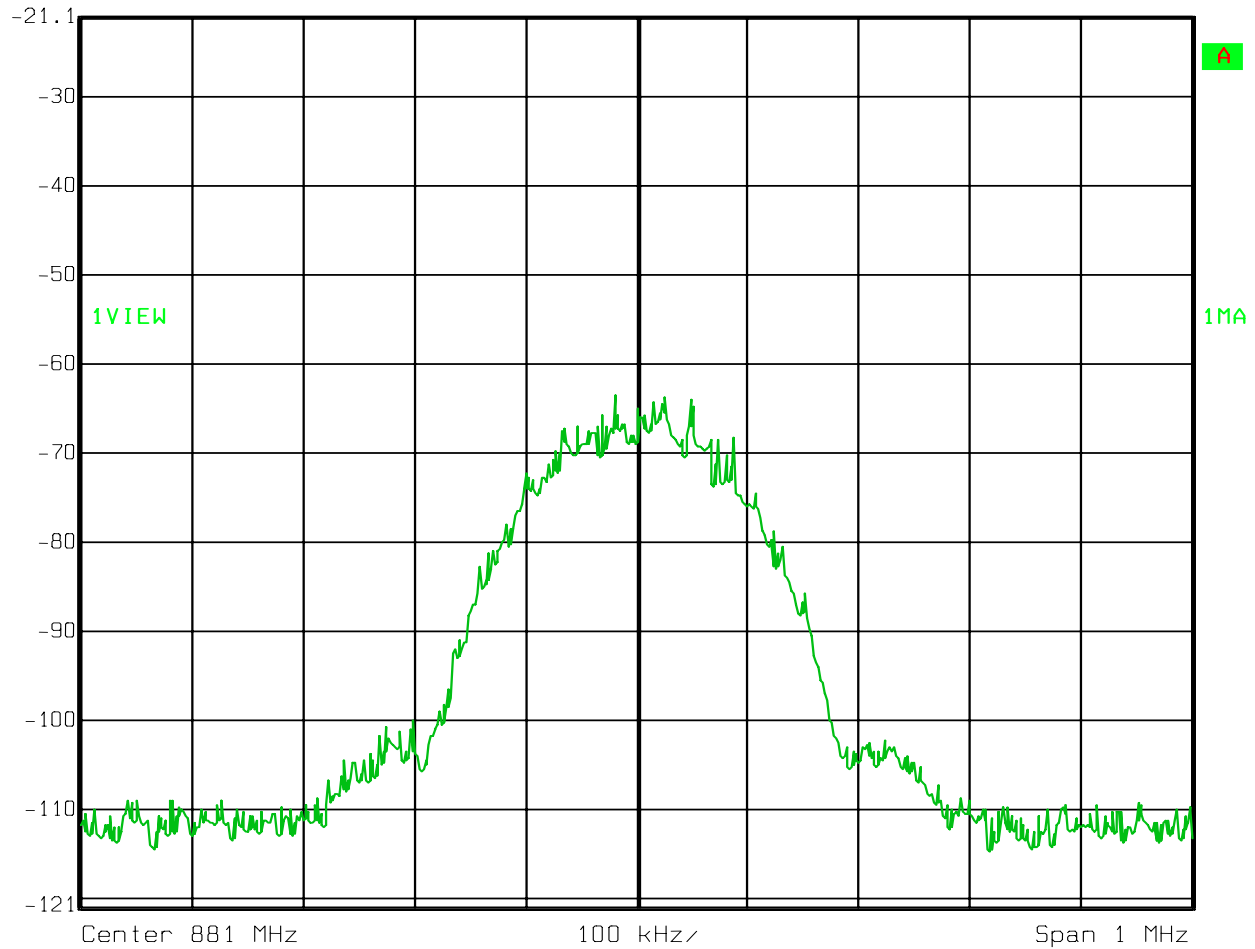
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EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthGSM - Input
DownlinkRef Lvl
-21.1 dBm

RBW	3 kHz	RF Att	0 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	280 ms	Unit	dBm



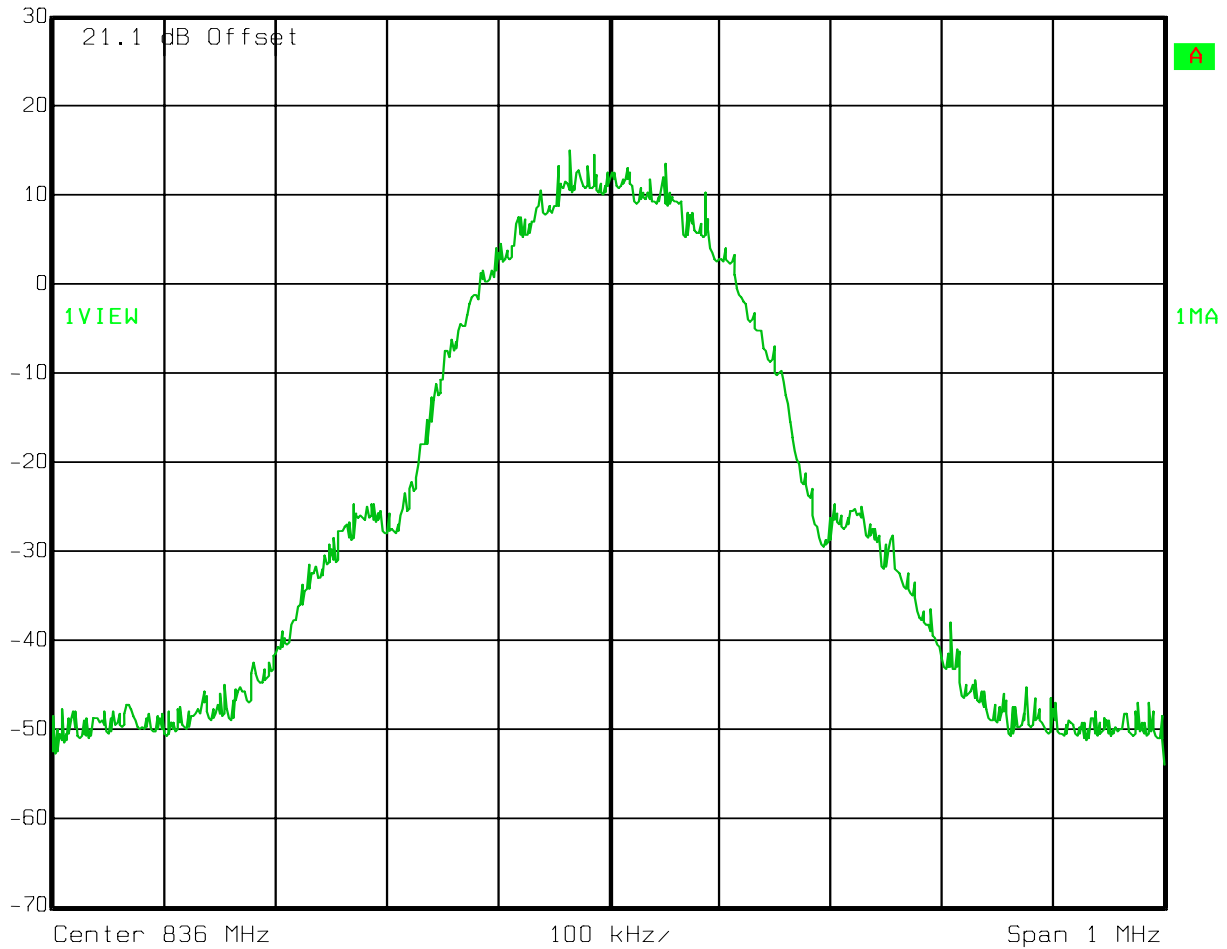
Date: 25.JAN.2010 13:08:24

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthGSM - Output
UplinkRef Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	280 ms	Unit	dBm



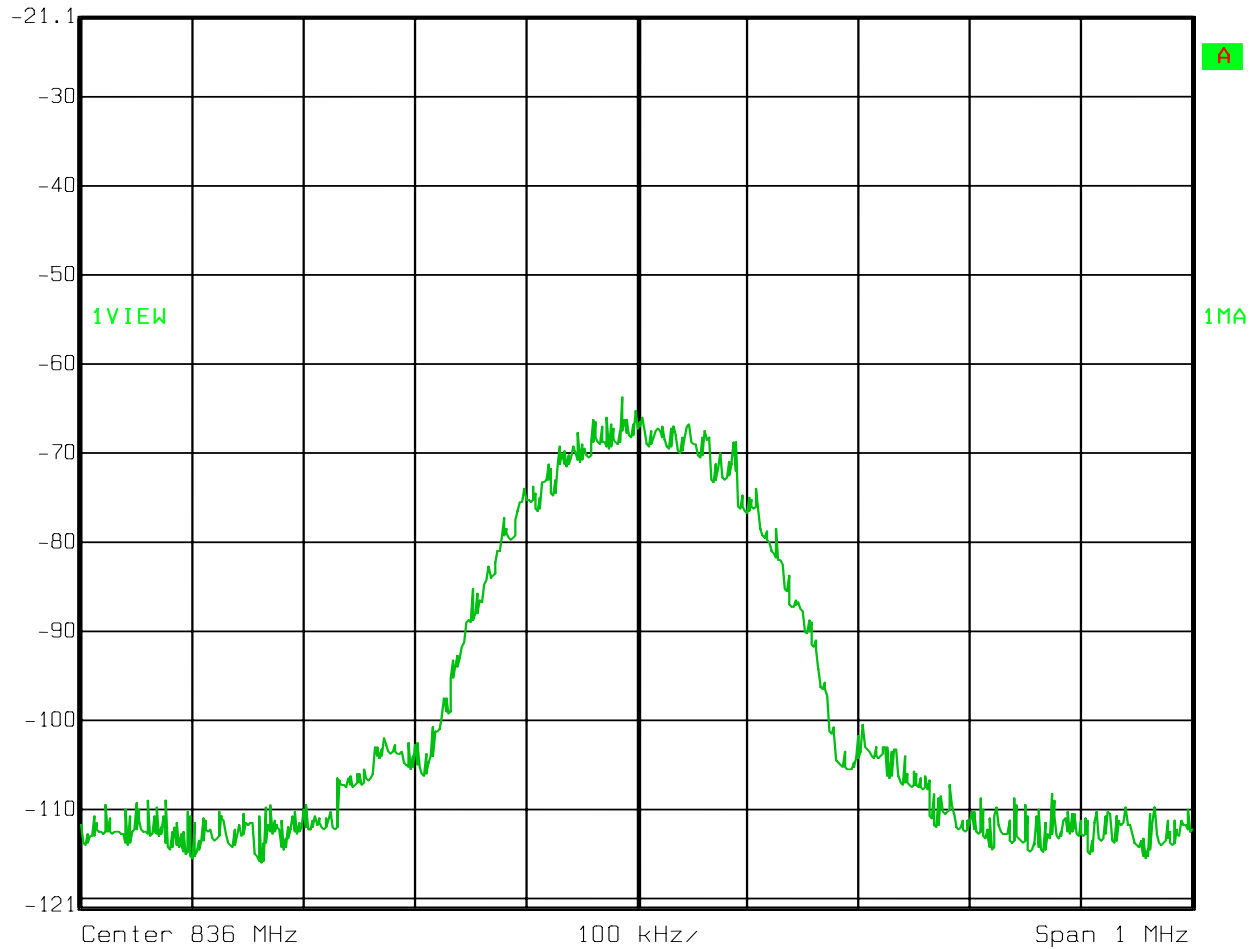
Date: 25.JAN.2010 10:49:45

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthGSM - Input
UplinkRef Lvl
-21.1 dBm

RBW	3 kHz	RF Att	0 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	280 ms	Unit	dBm



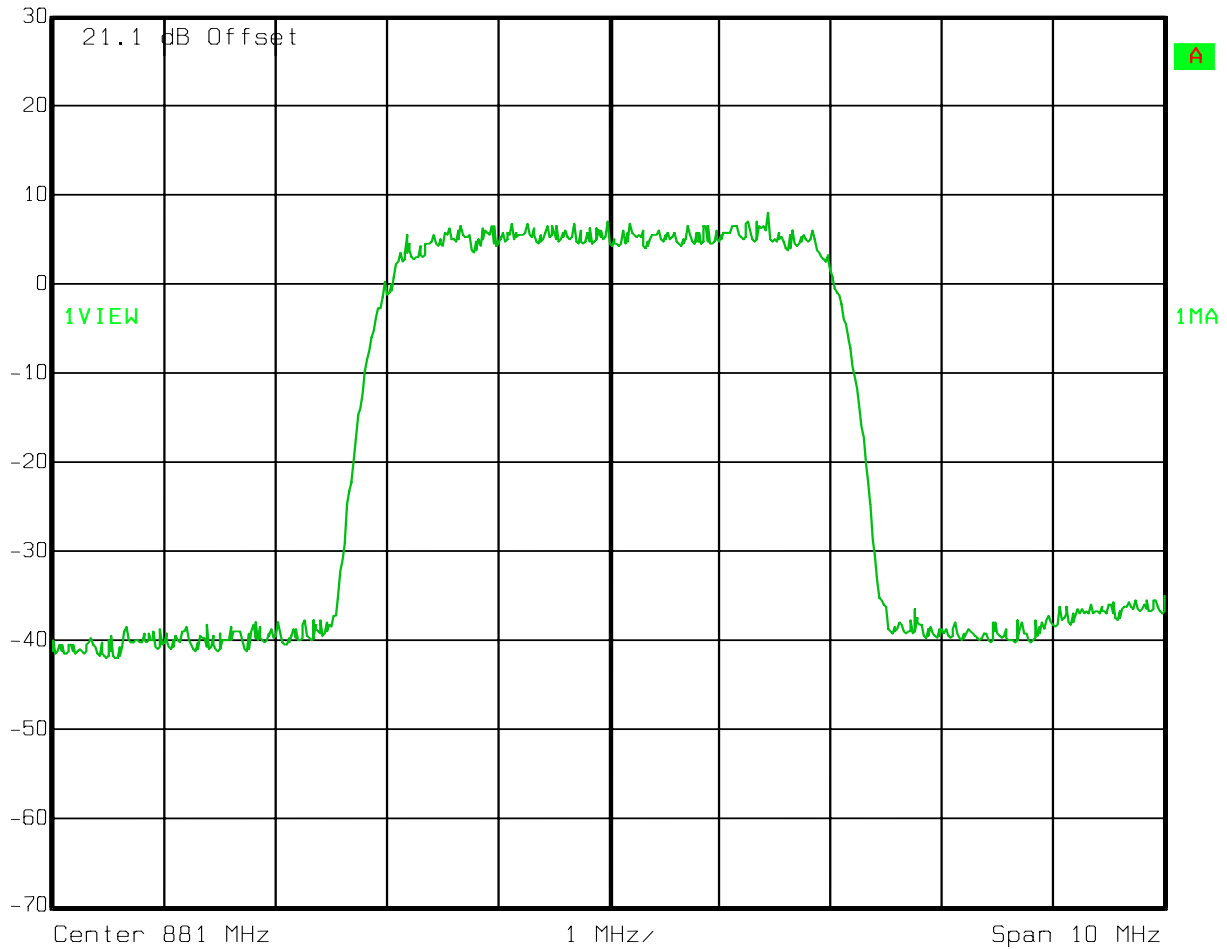
Date: 25.JAN.2010 13:07:35

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Occupied BandwidthWCDMA - Output
DownlinkRef Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	10 ms	Unit	dBm



Date: 25.JAN.2010 11:35:19

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

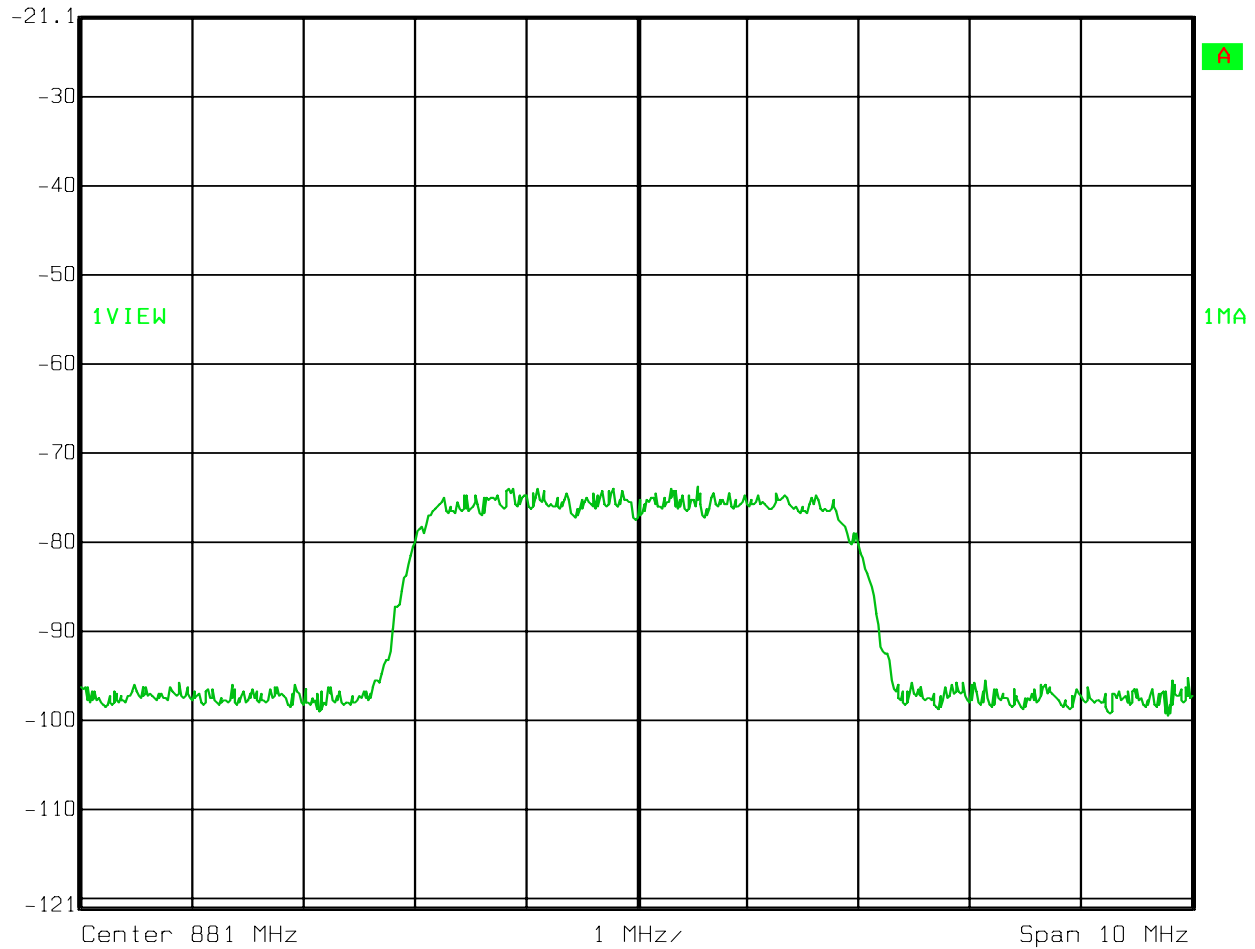
Test Data – Occupied Bandwidth

WCDMA - Input
Downlink



Ref Lvl
-21.1 dBm

RBW	50 kHz	RF Att	0 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	10 ms	Unit	dBm



Date: 25.JAN.2010 13:06:18

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

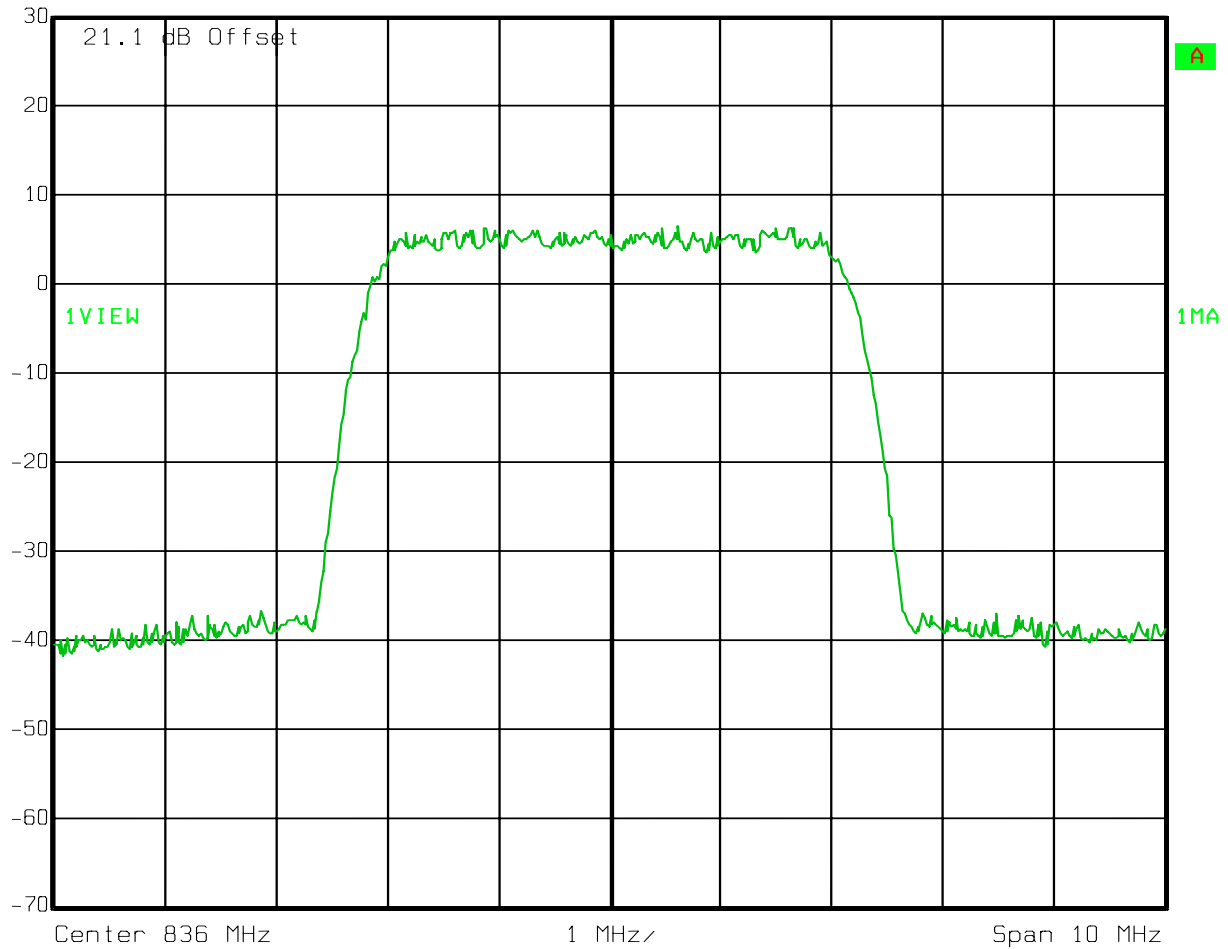
Test Data – Occupied Bandwidth

WCDMA - Output

Uplink

Ref Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	10 ms	Unit	dBm



Date: 25.JAN.2010 10:53:25

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

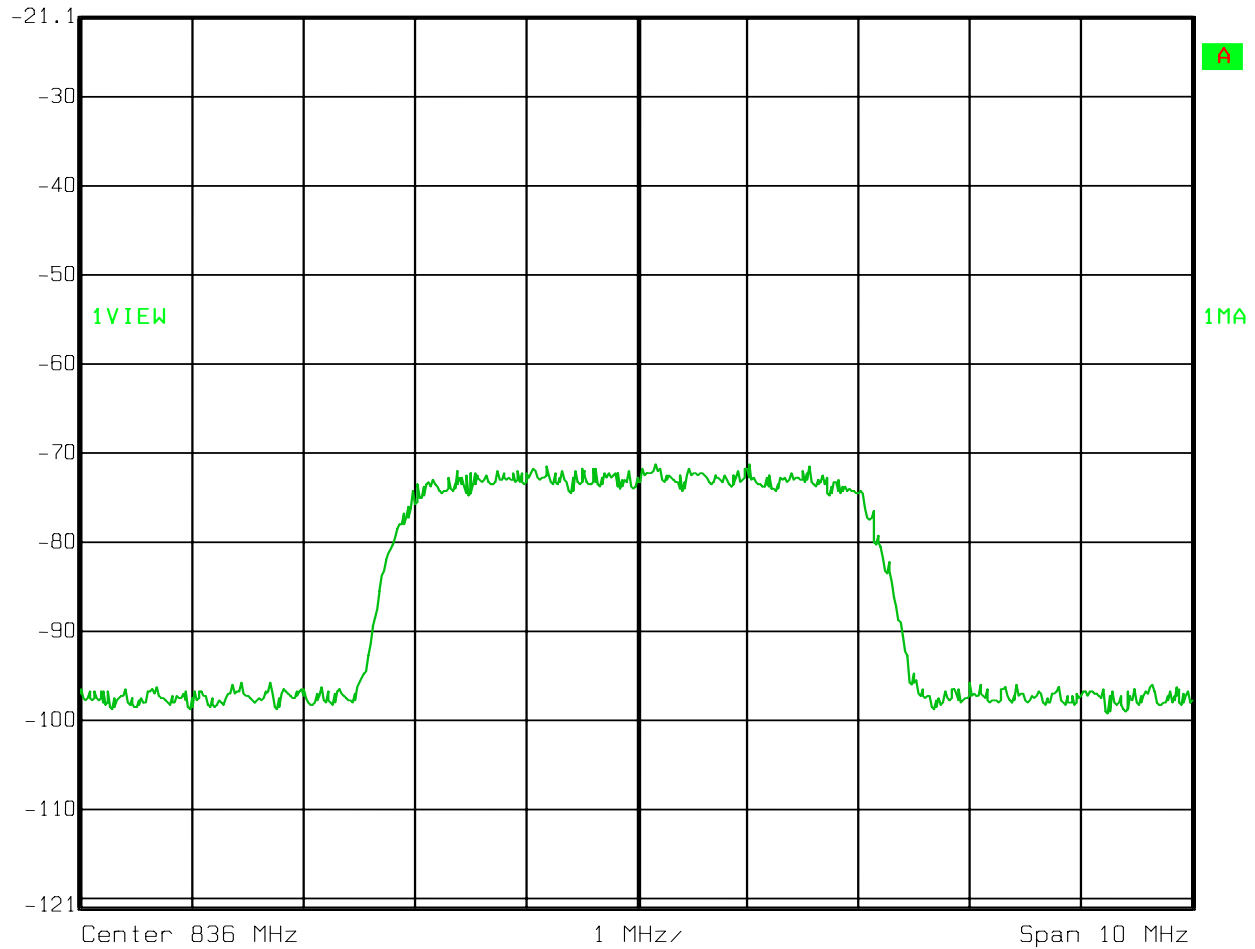
Test Data – Occupied Bandwidth

WCDMA - Input

Uplink

Ref Lvl
-21.1 dBm

RBW	50 kHz	RF Att	0 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	10 ms	Unit	dBm



Date: 25.JAN.2010 13:05:13

Section 4. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 22.917
TESTED BY: David Light	DATE: 25 January 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1472-1082

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 35 %

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

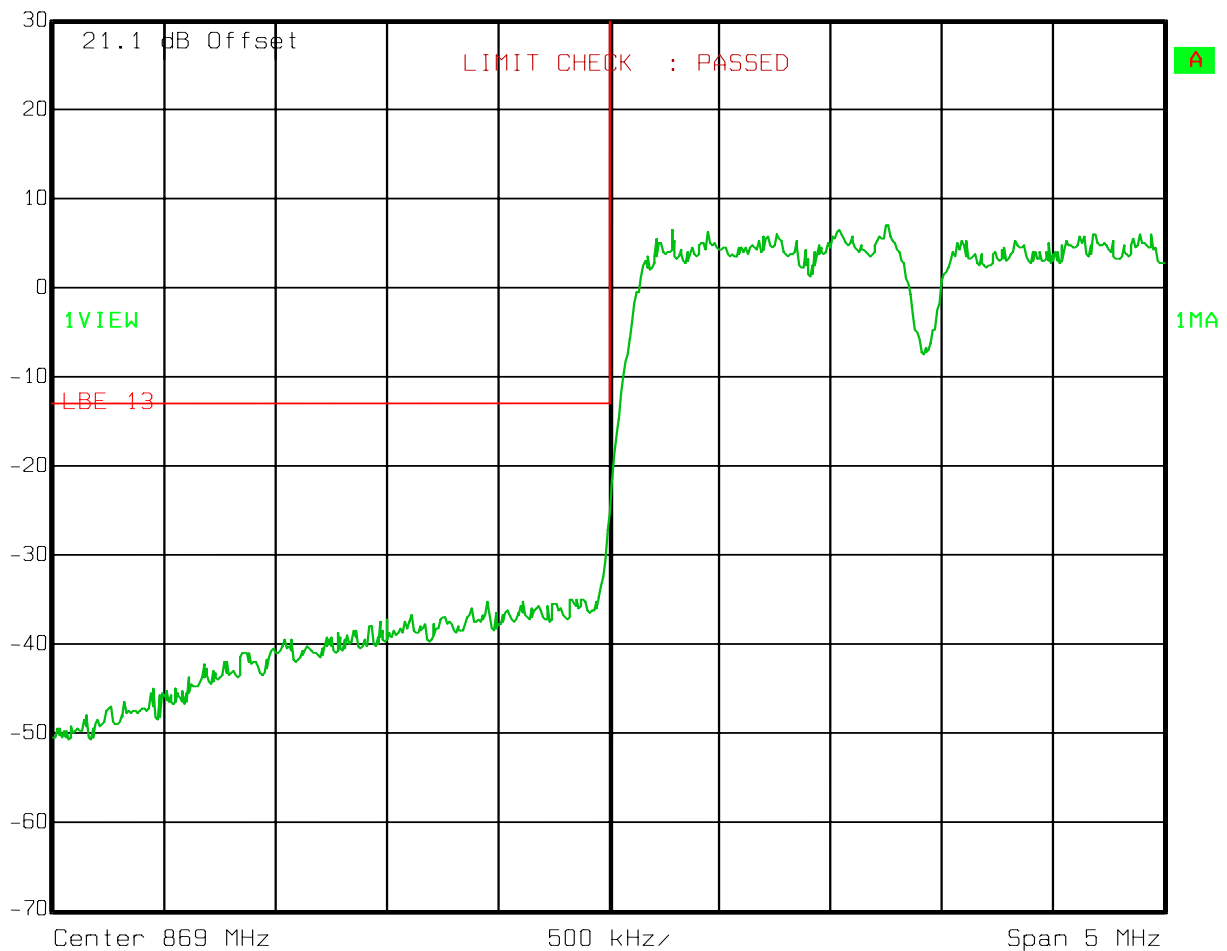
Lower Bandedge Intermodulation

CDMA

Downlink

Ref Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 25.JAN.2010 11:38:52

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

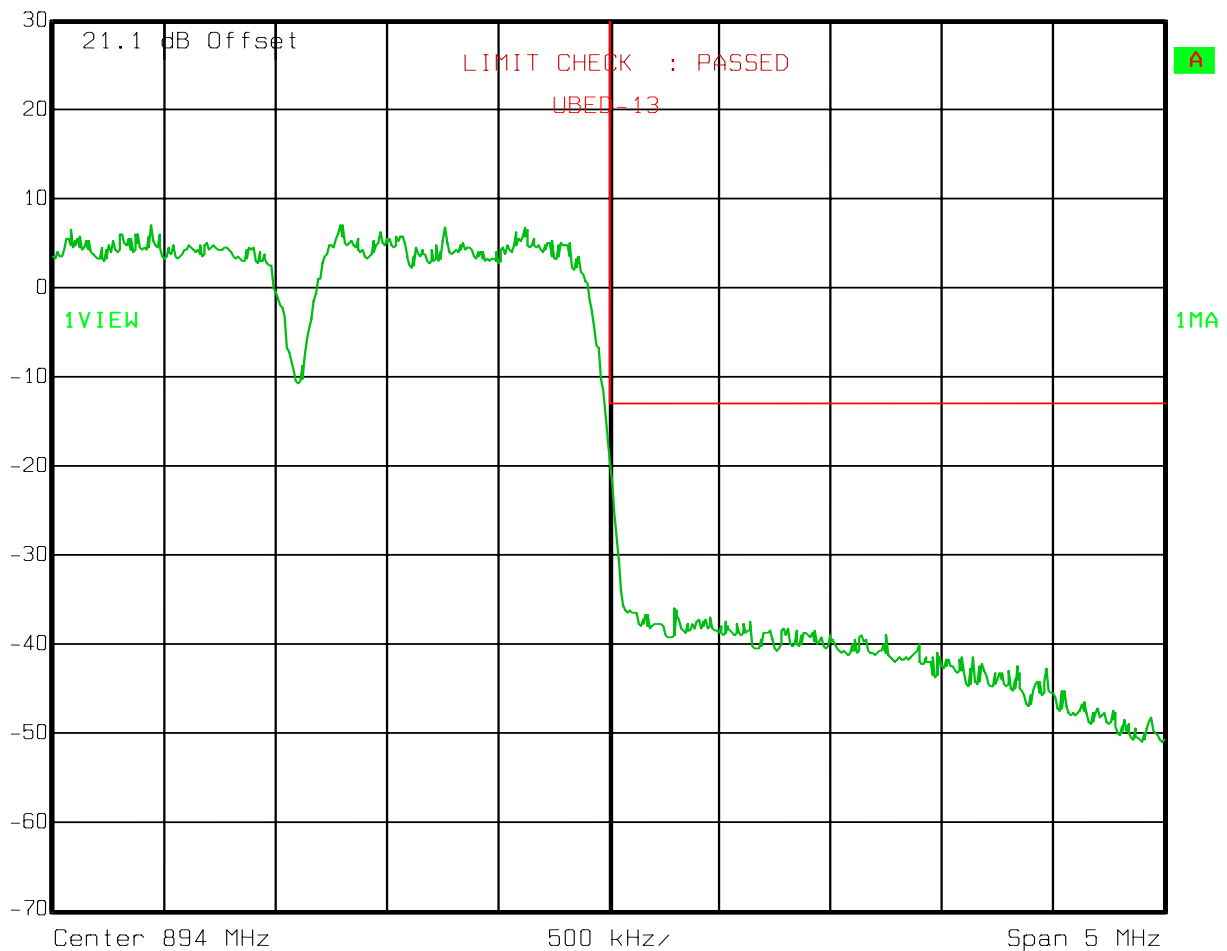
Upper Bandedge Intermodulation

CDMA

Downlink

Ref Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 25.JAN.2010 11:39:53

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

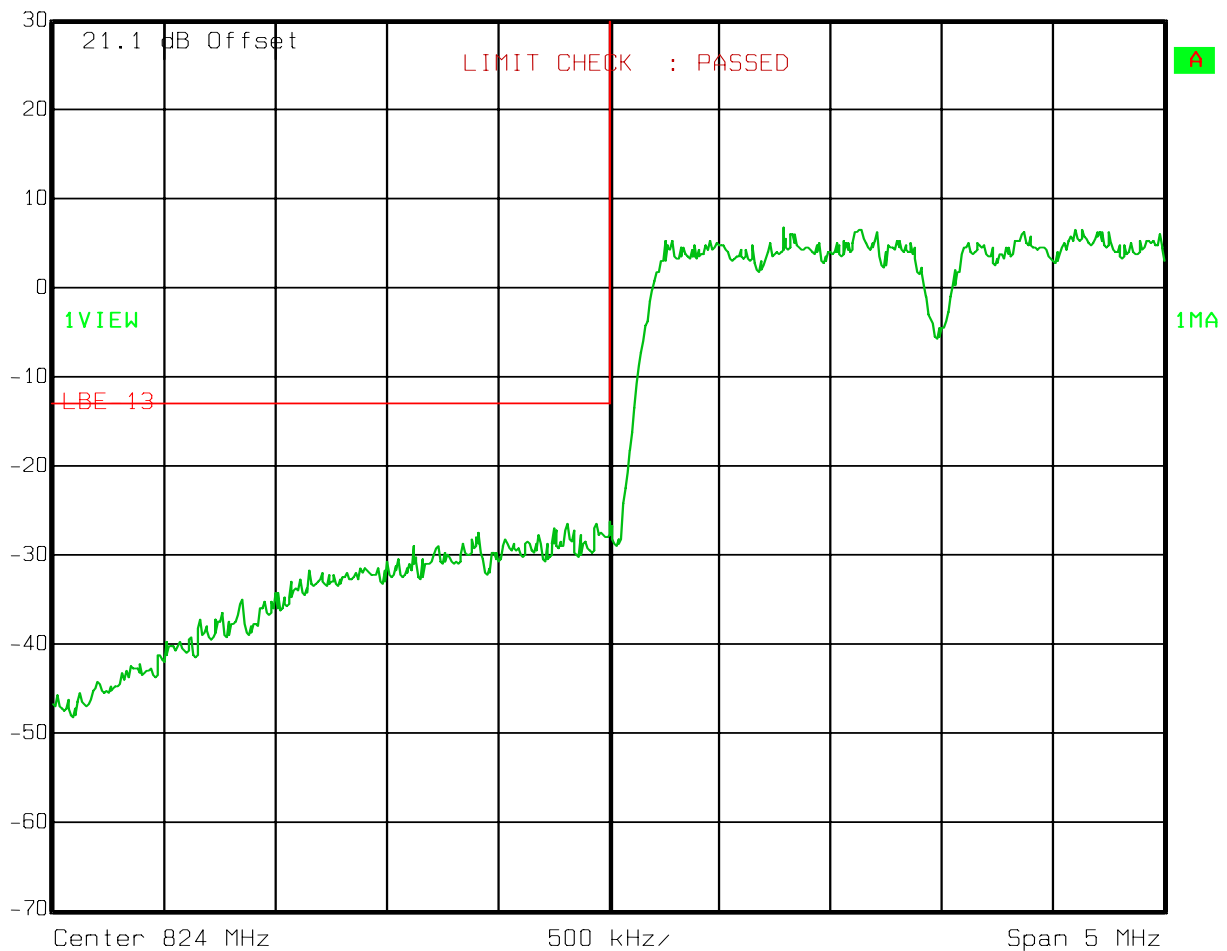
Lower Bandedge Intermodulation

CDMA

Uplink

Ref Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 25.JAN.2010 11:01:49

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

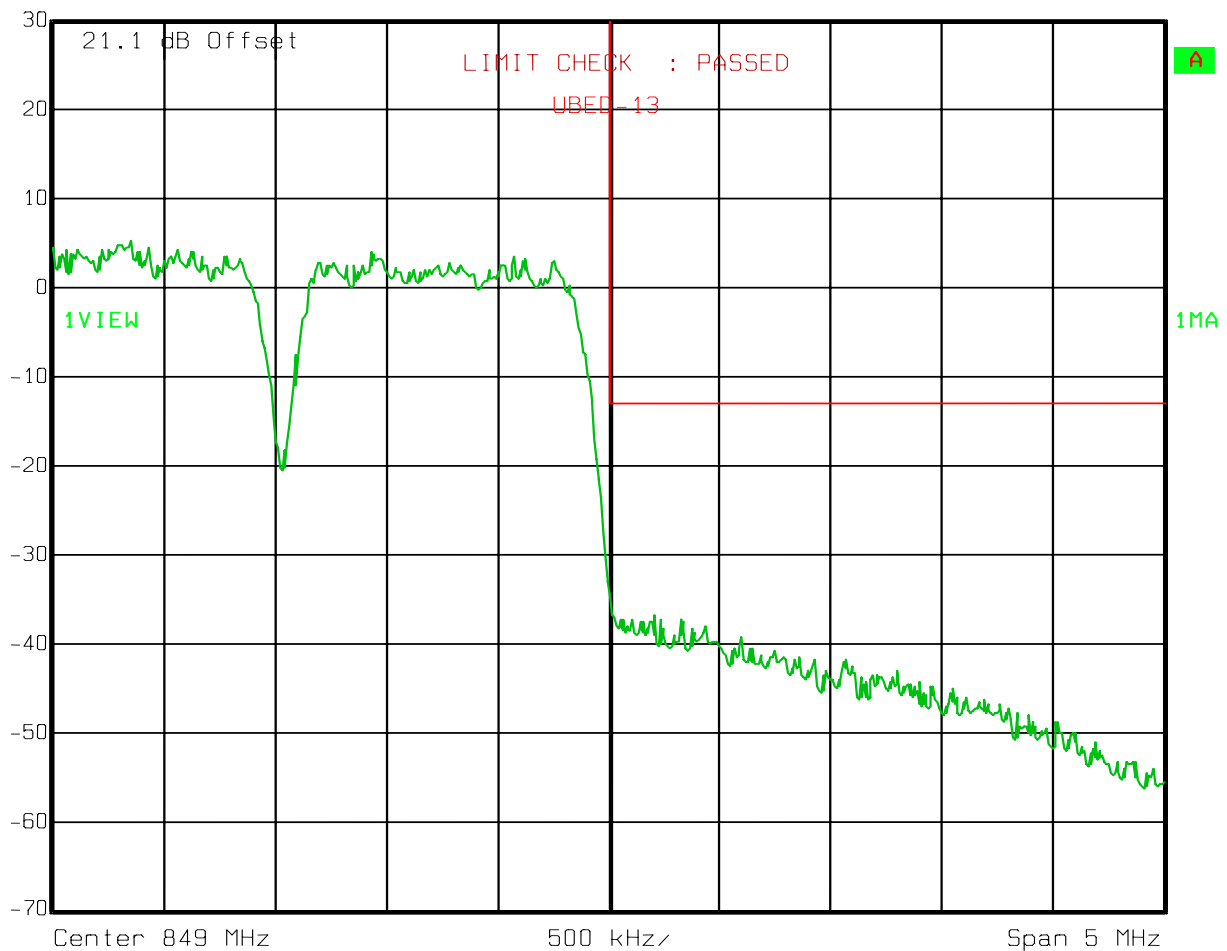
Upper Bandedge Intermodulation

CDMA

Uplink

Ref Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 25.JAN.2010 11:03:15

EQUIPMENT: **MR8518**

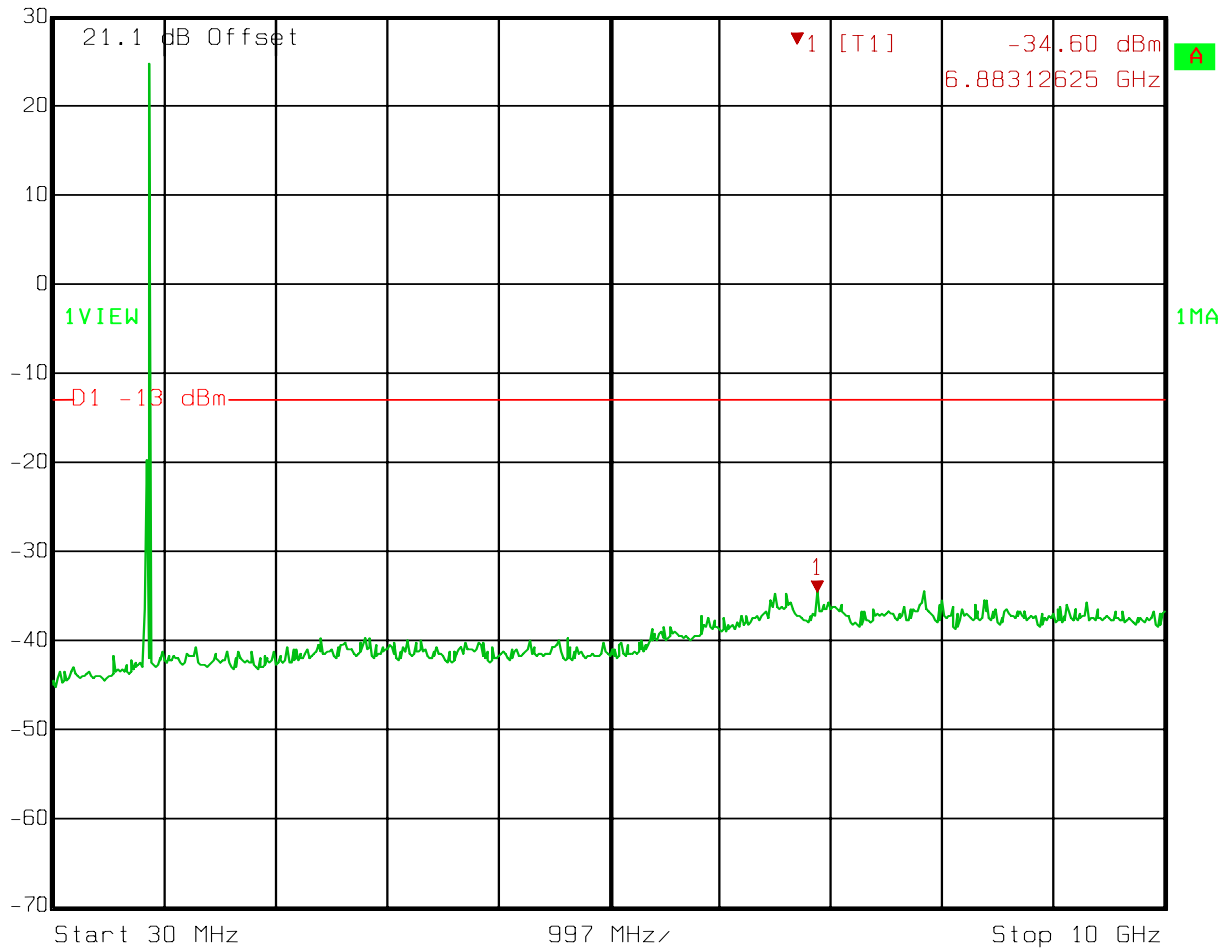
PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

Spurs – CDMA - Downlink



Ref Lvl 30 dBm
Marker 1 [T1] -34.60 dBm
6.88312625 GHz
RBW 1 MHz
VBW 1 MHz
SWT 100 ms
RF Att 20 dB
Mixer -10 dBm
Unit dBm



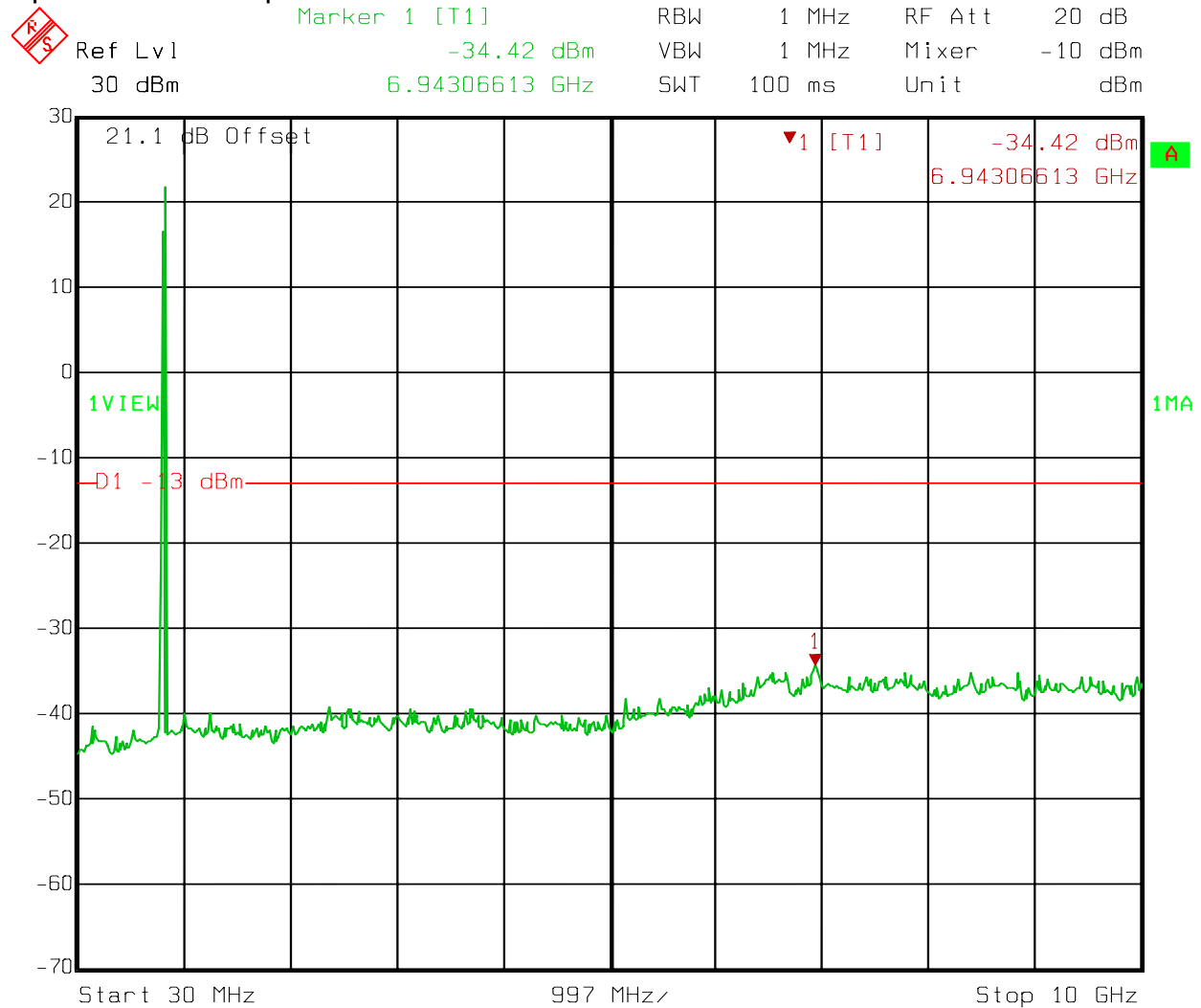
Date: 25.JAN.2010 11:40:43

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

Spurs – CDMA - Uplink



Date: 25.JAN.2010 11:04:54

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

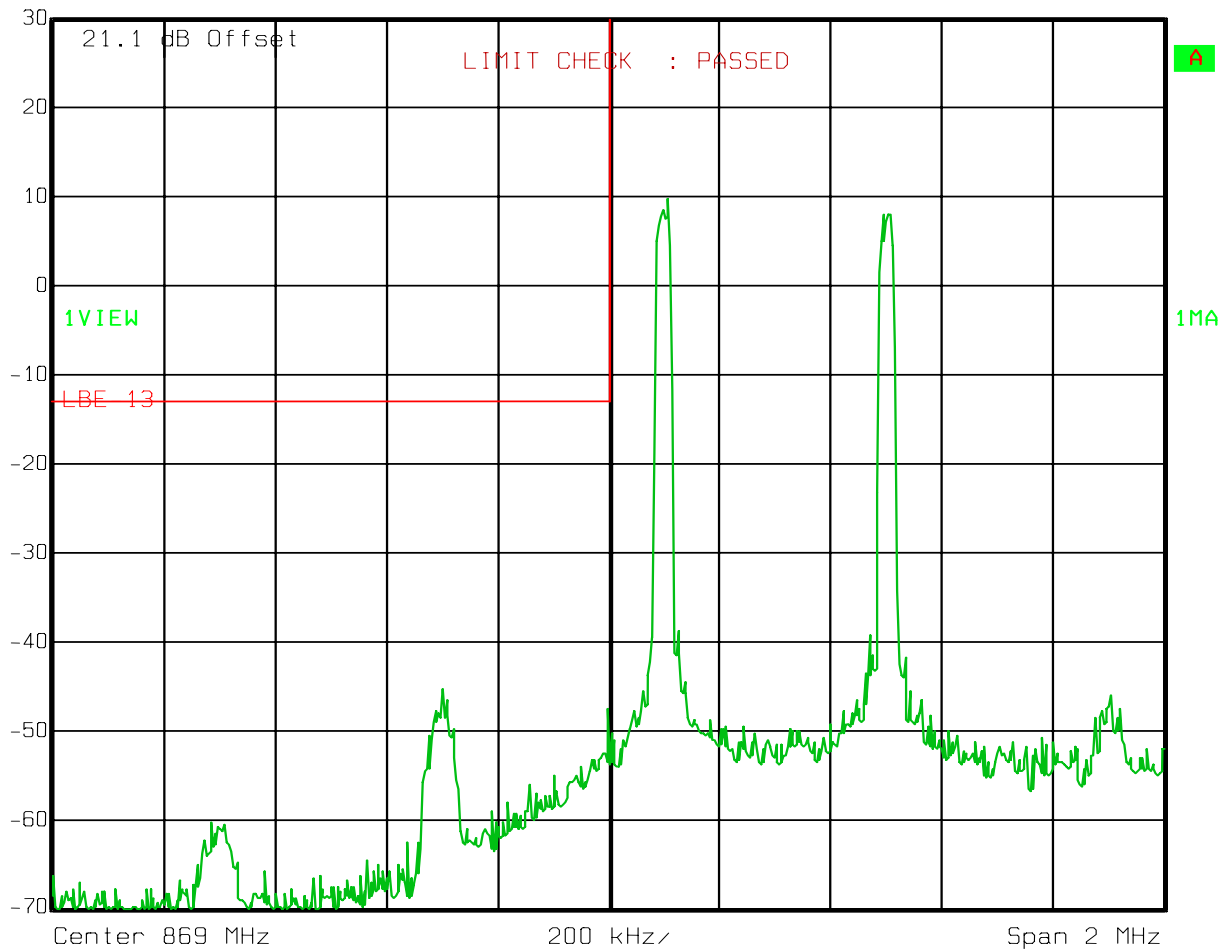
Lower Bandedge Intermodulation

TDMA

Downlink

Ref Lvl
30 dBm

RBW	1 kHz	RF Att	20 dB
VBW	1 kHz	Mixer	-10 dBm
SWT	5 s	Unit	dBm



Date: 25.JAN.2010 11:42:33

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

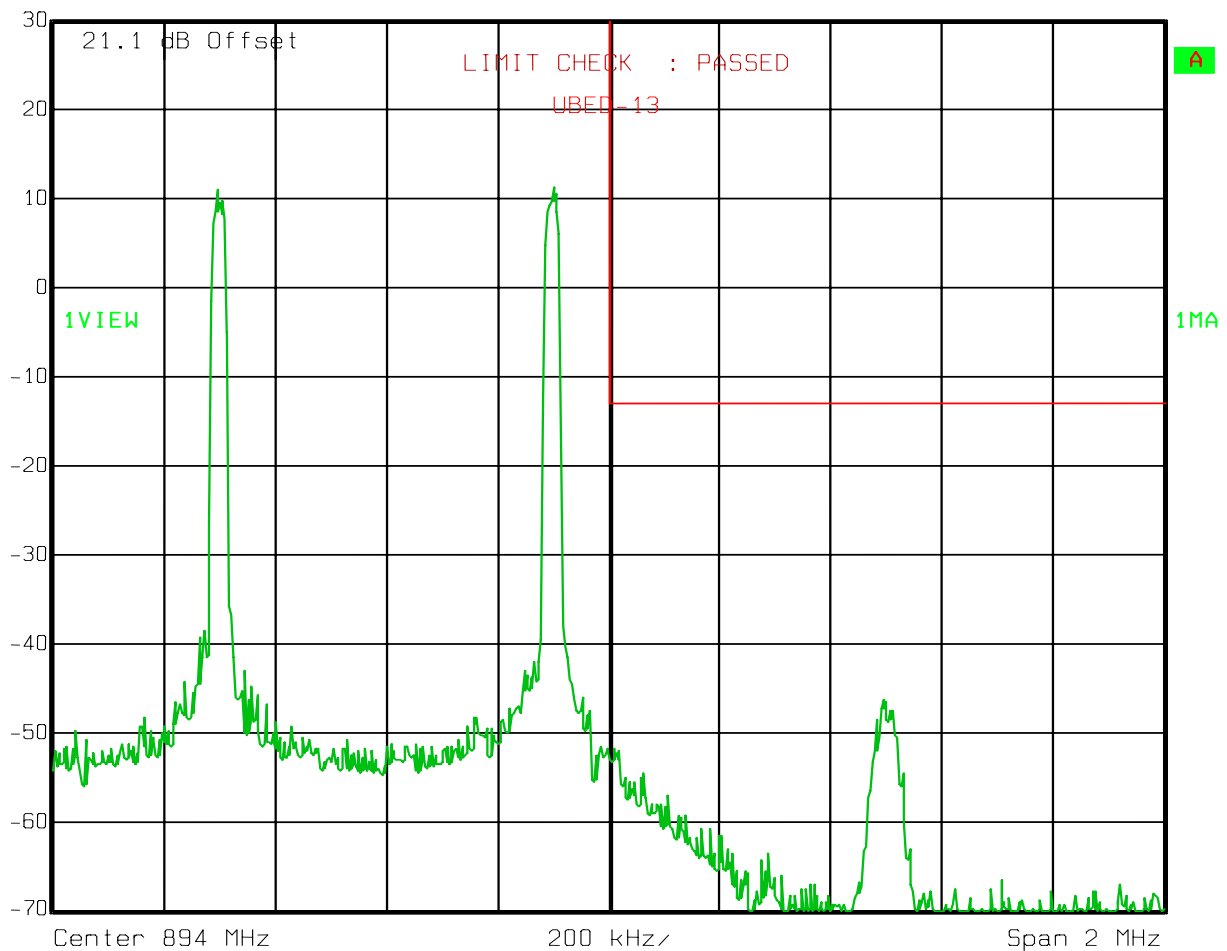
Upper Bandedge Intermodulation

TDMA

Downlink

Ref Lvl
30 dBm

RBW	1 kHz	RF Att	20 dB
VBW	1 kHz	Mixer	-10 dBm
SWT	5 s	Unit	dBm



Date: 25.JAN.2010 11:43:31

EQUIPMENT: **MR8518**

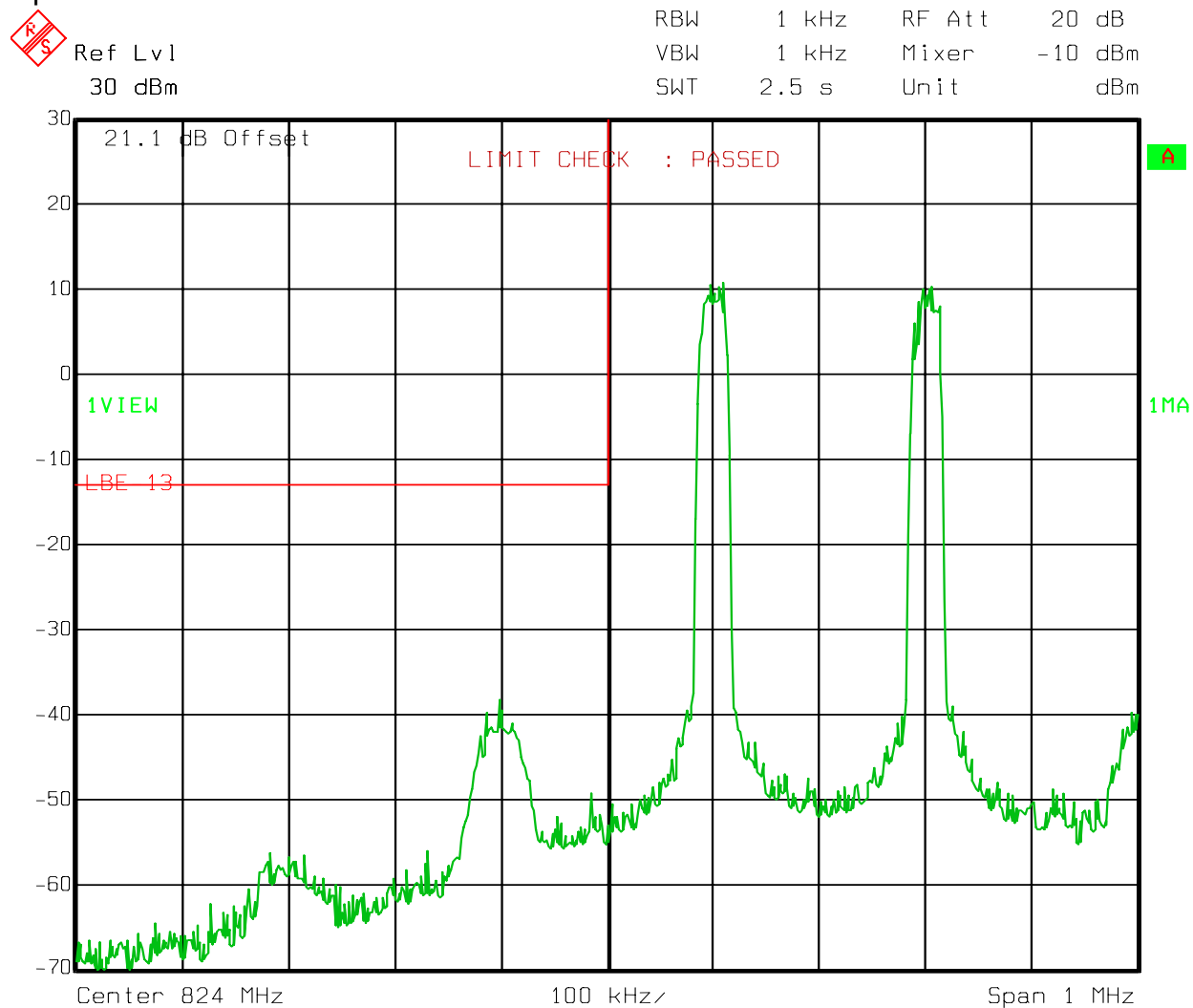
PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

TDMA

Uplink



Date: 25.JAN.2010 11:07:36

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

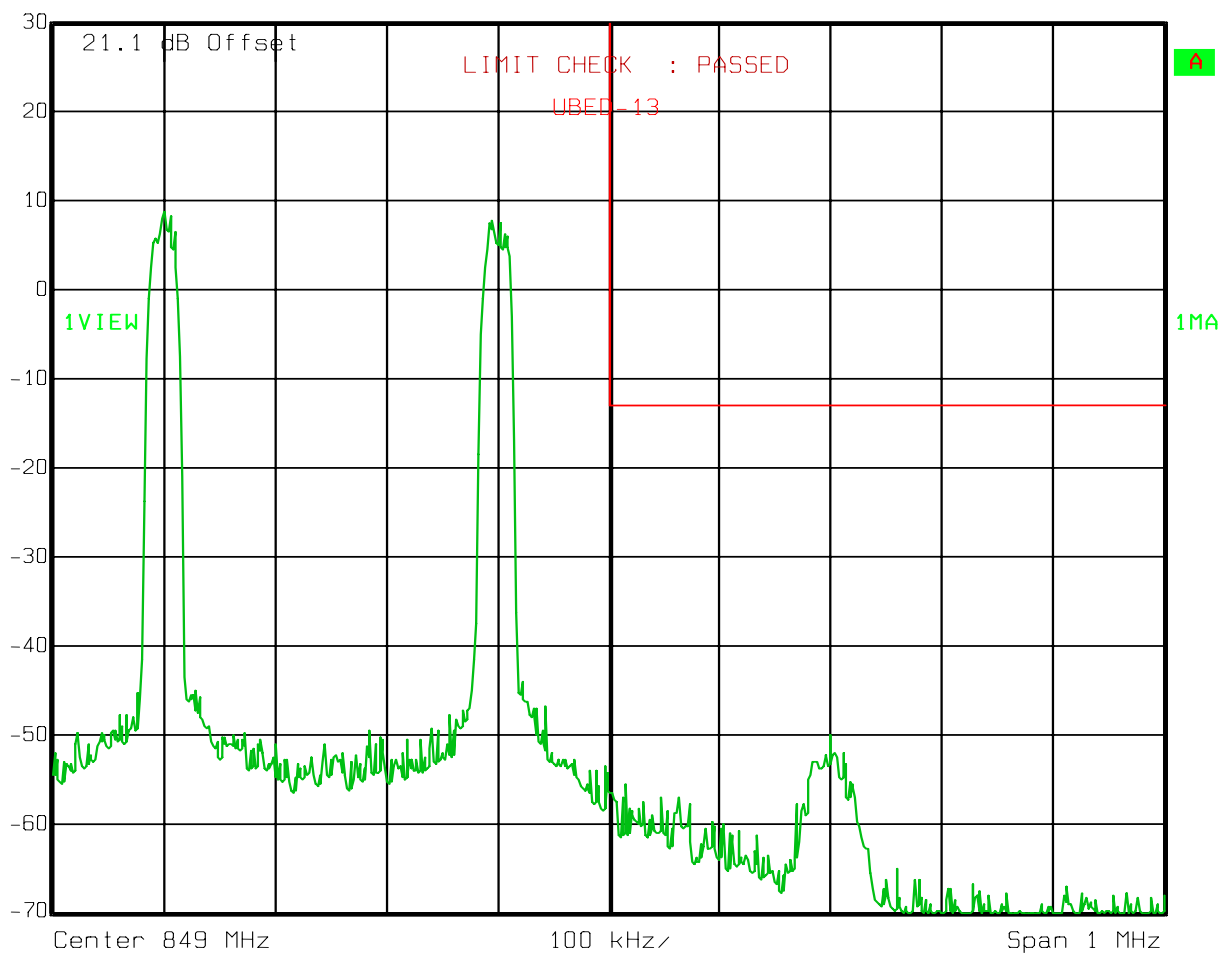
Upper Bandedge Intermodulation

TDMA

Uplink

Ref Lvl
30 dBm

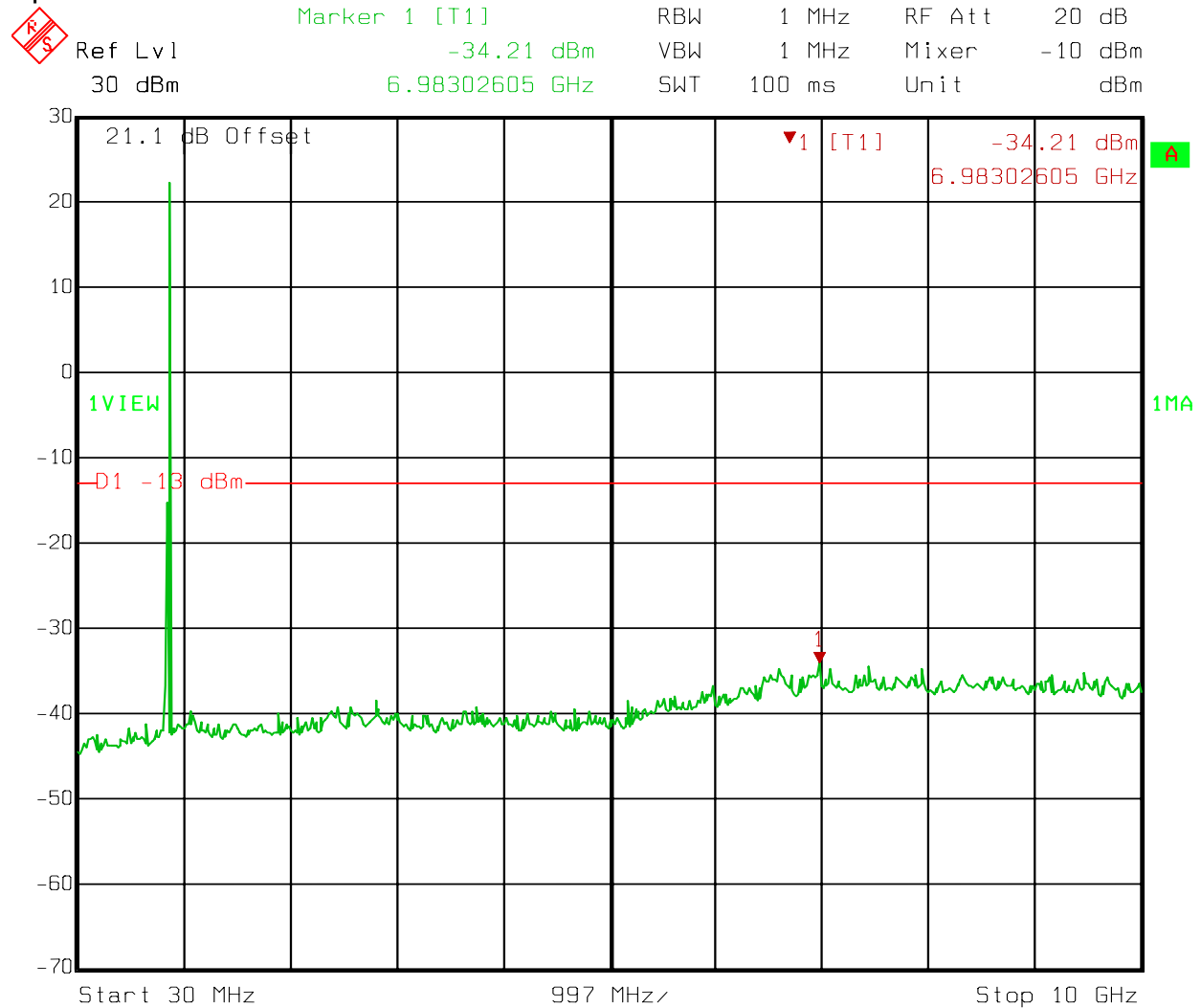
RBW	1 kHz	RF Att	20 dB
VBW	1 kHz	Mixer	-10 dBm
SWT	2.5 s	Unit	dBm



Date: 25.JAN.2010 11:08:43

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals**Spurs – TDMA - Downlink**

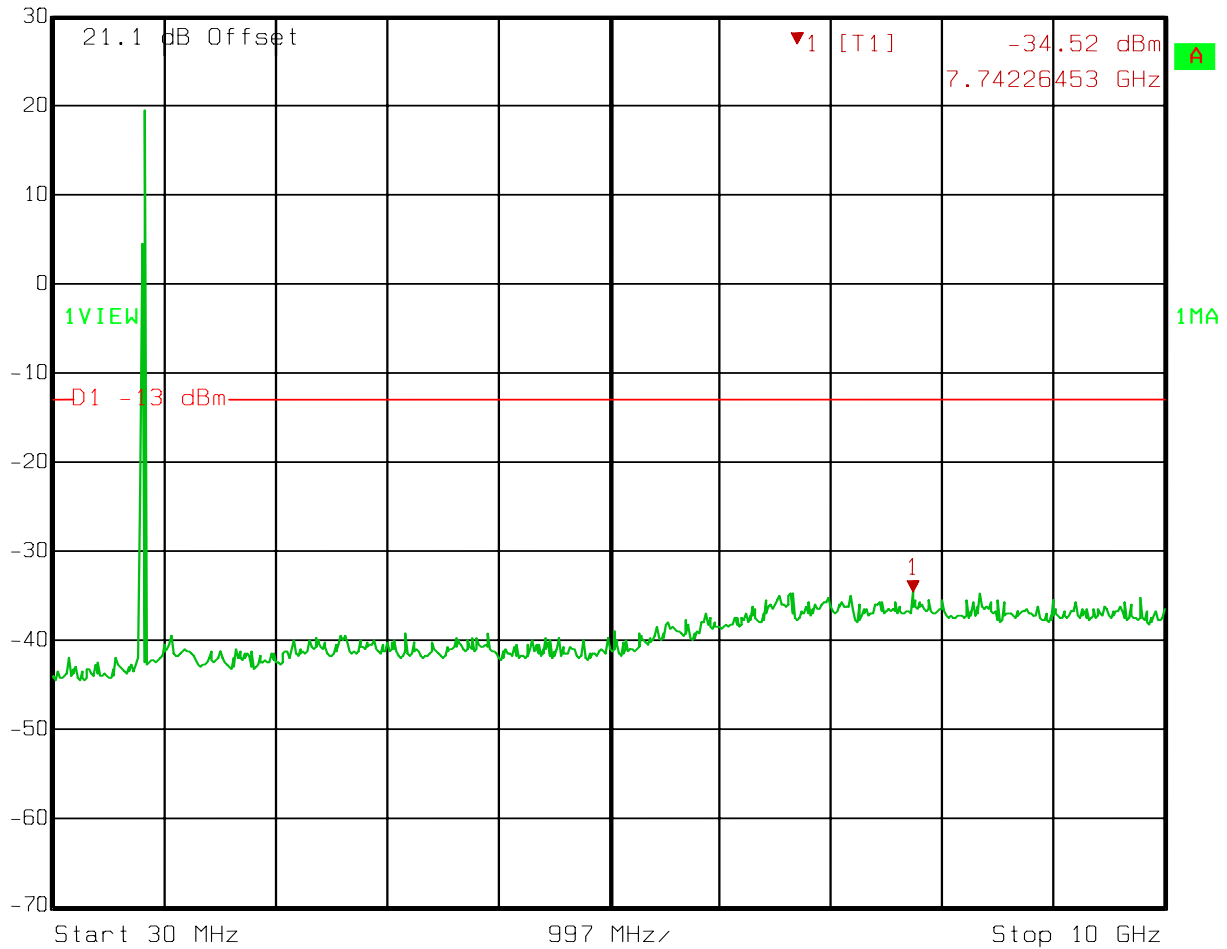
Date: 25.JAN.2010 11:44:18

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals**Spurs – TDMA - Uplink**

Marker 1 [T1] RBW 1 MHz RF Att 20 dB
Ref Lvl -34.52 dBm VBW 1 MHz Mixer -10 dBm
30 dBm 7.74226453 GHz SWT 100 ms Unit dBm



Date: 25.JAN.2010 11:09:36

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

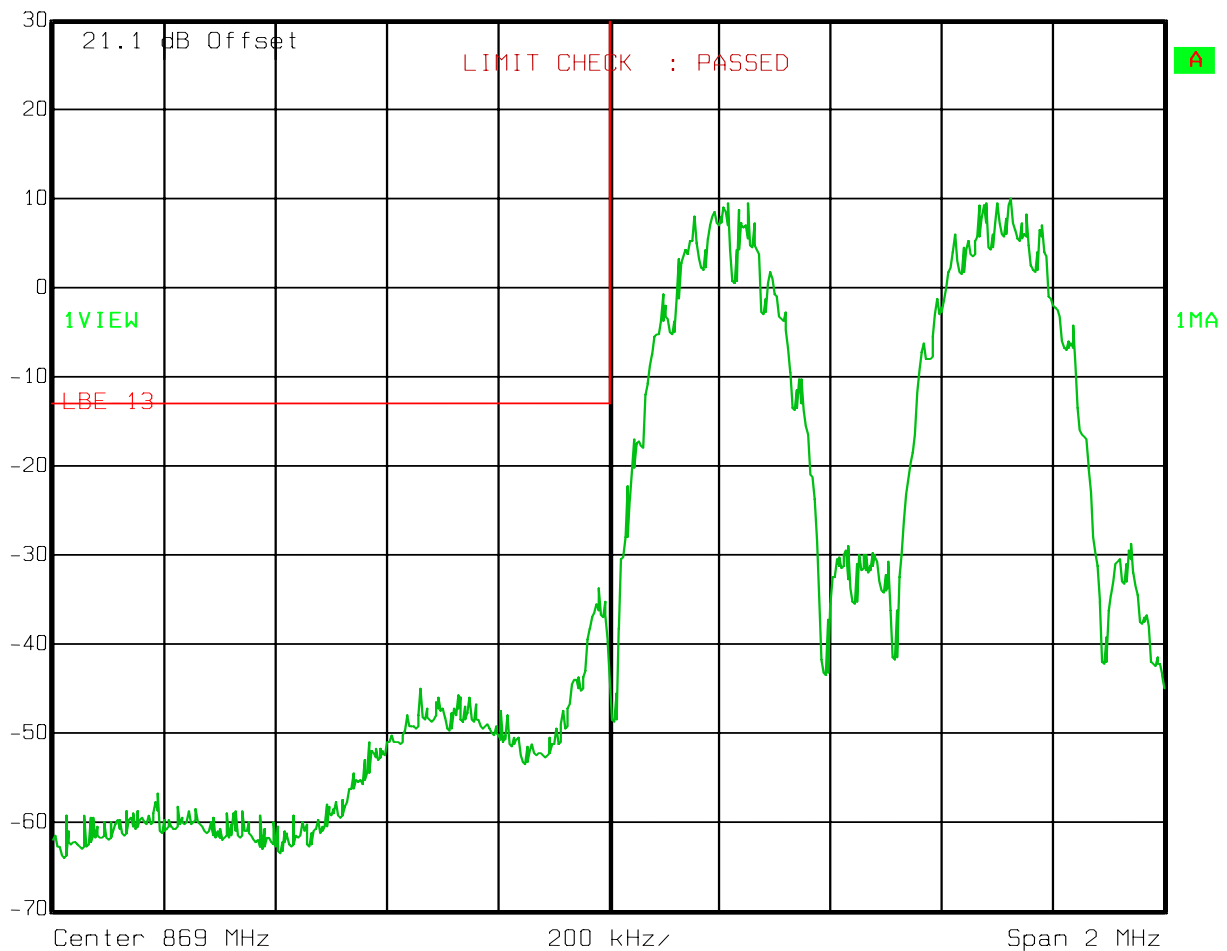
Lower Bandedge Intermodulation

EDGE

Downlink

Ref Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



Date: 25.JAN.2010 11:45:52

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

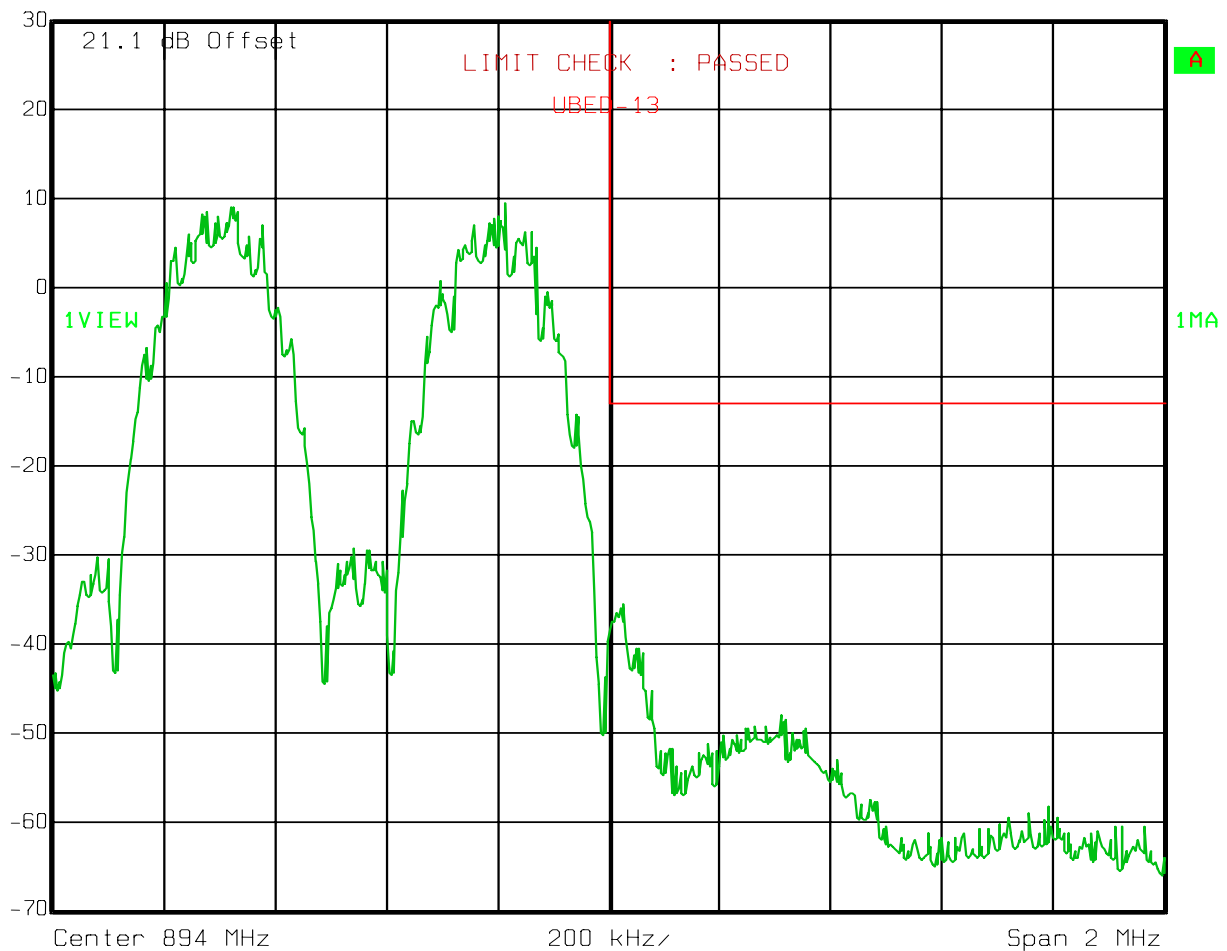
Upper Bandedge Intermodulation

EDGE

Downlink

Ref Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



Date: 25.JAN.2010 11:46:39

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

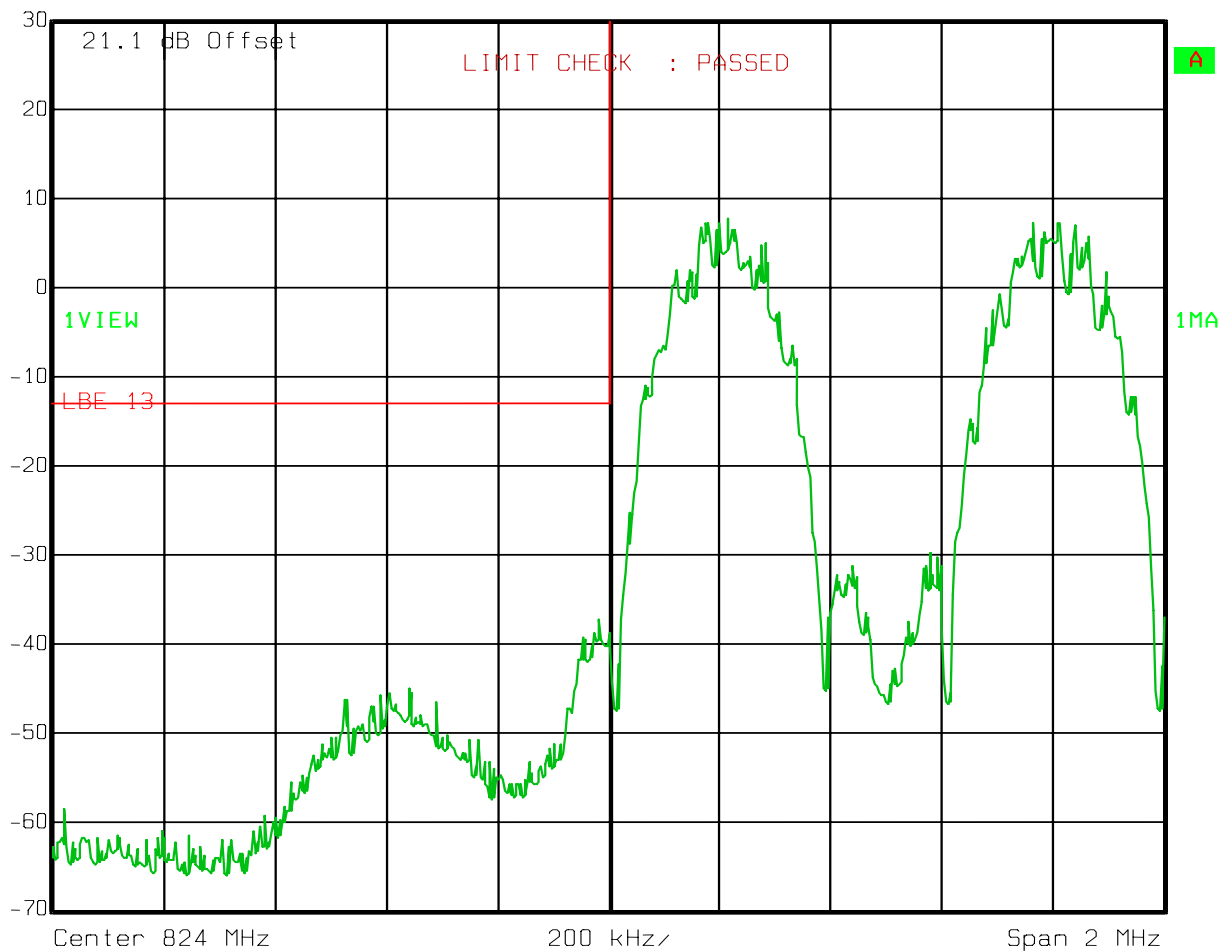
Lower Bandedge Intermodulation

EDGE

Uplink

Ref Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



Date: 25.JAN.2010 11:12:09

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

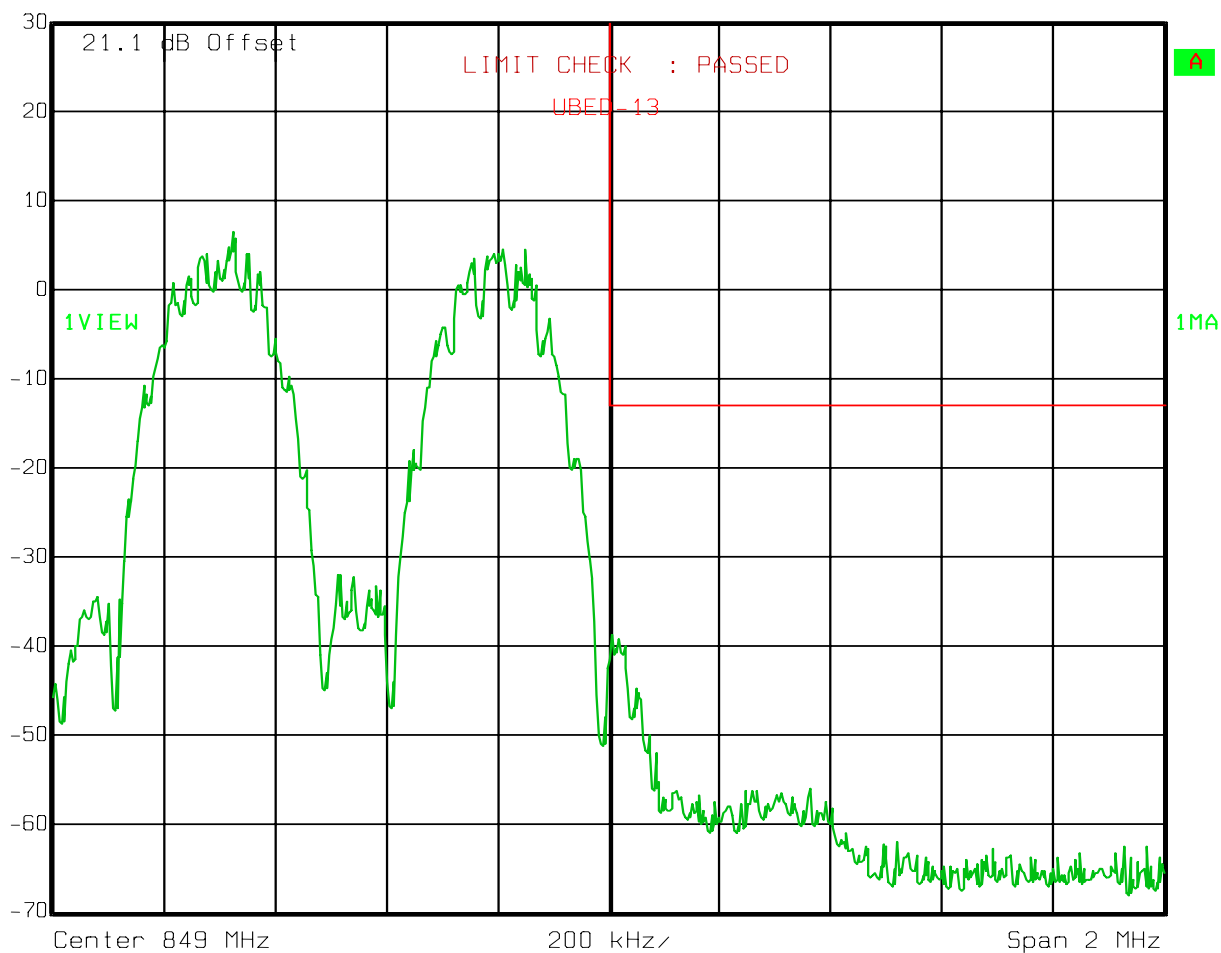
Upper Bandedge Intermodulation

EDGE

Uplink

Ref Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



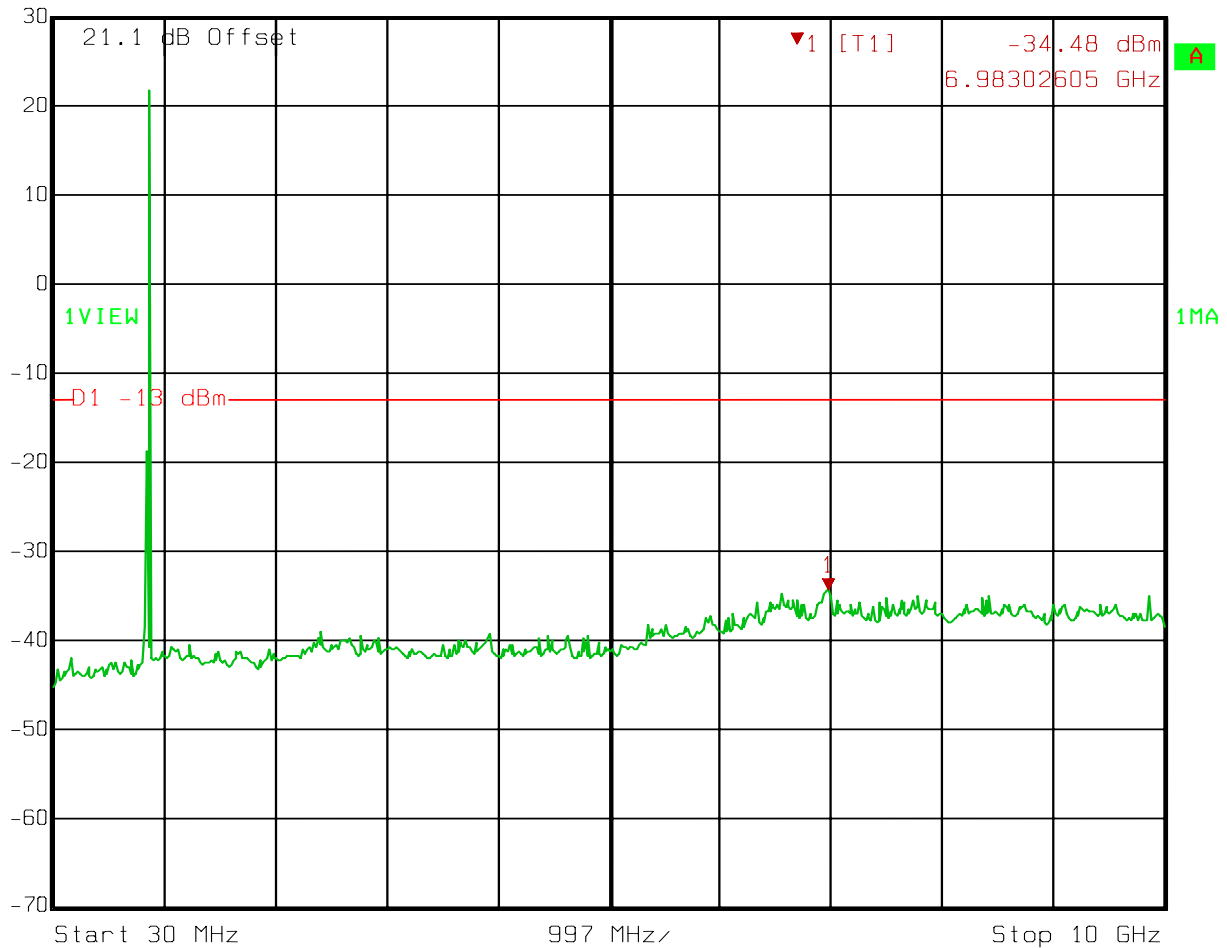
Date: 25.JAN.2010 11:13:10

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals**Spurs – EDGE - Downlink**

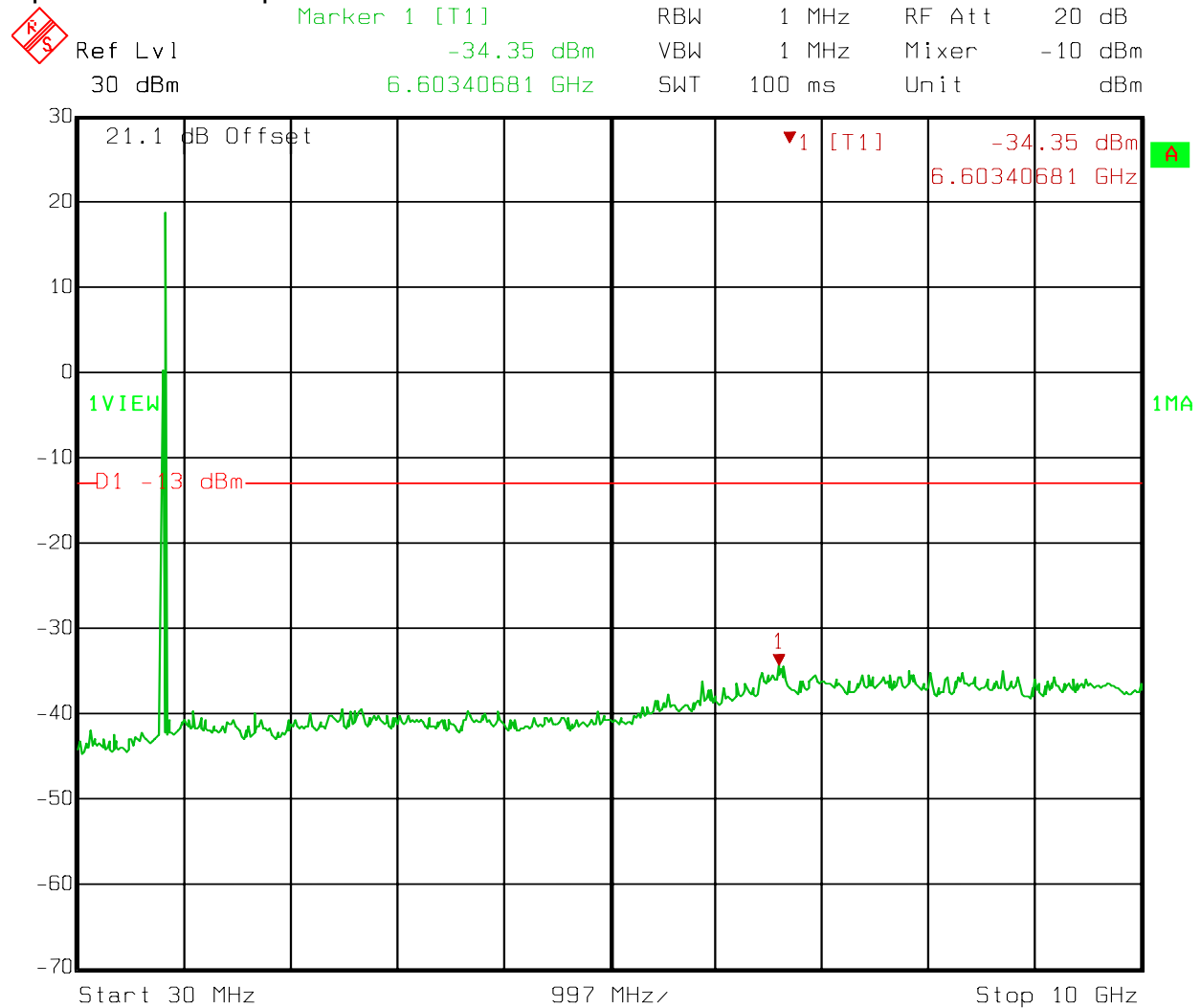
Ref Lvl 30 dBm
Marker 1 [T1] -34.48 dBm
6.98302605 GHz
RBW 1 MHz
VBW 1 MHz
SWT 100 ms
RF Att 20 dB
Mixer -10 dBm
Unit dBm



Date: 25.JAN.2010 11:47:31

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals**Spurs – EDGE - Uplink**

Date: 25.JAN.2010 11:14:10

EQUIPMENT: **MR8518**

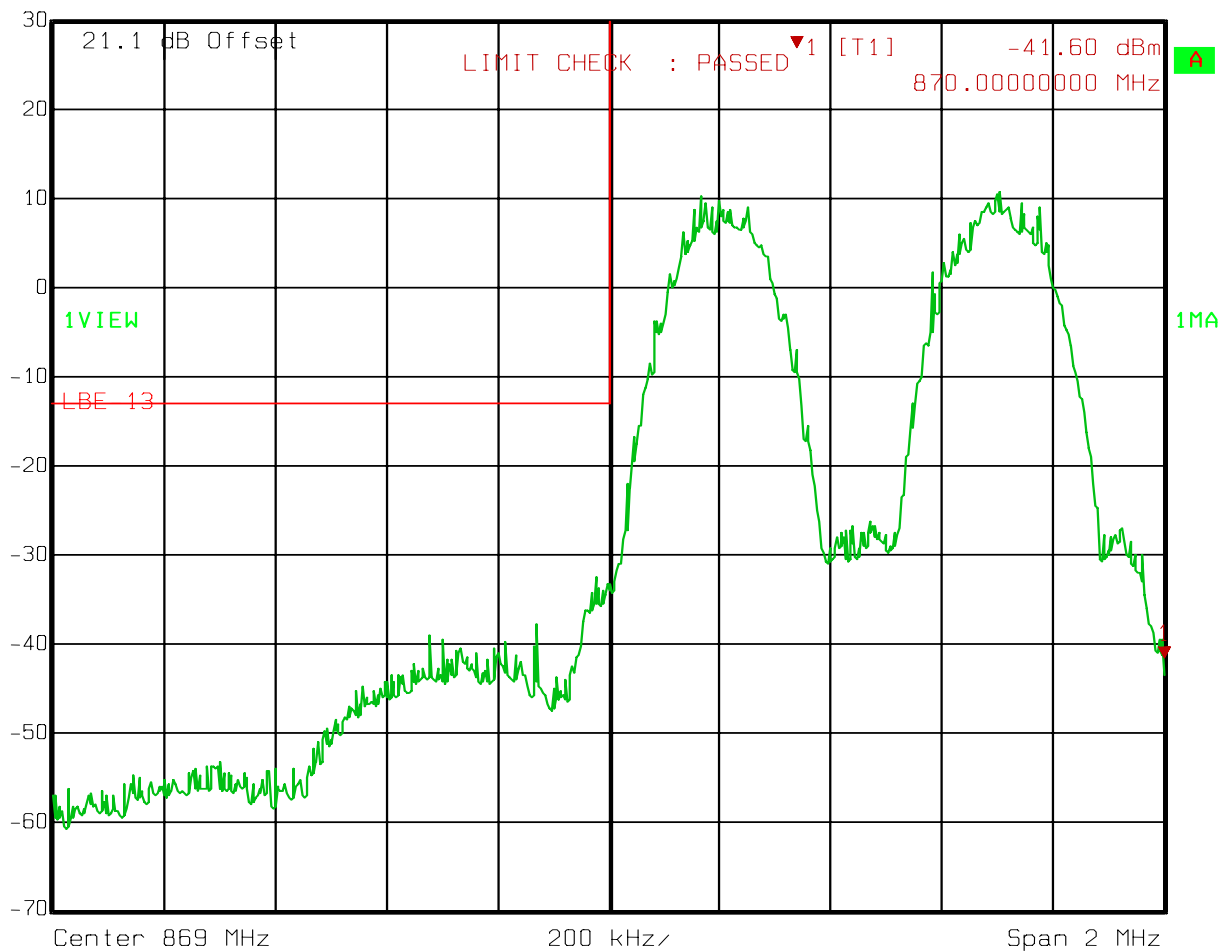
PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

GSM

Downlink

Ref Lvl
30 dBmMarker 1 [T1]
-41.60 dBm
870.0000000 MHzRBW 3 kHz RF Att 20 dB
VBW 3 kHz Mixer -10 dBm
SWT 560 ms Unit dBm

Date: 25.JAN.2010 11:49:01

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

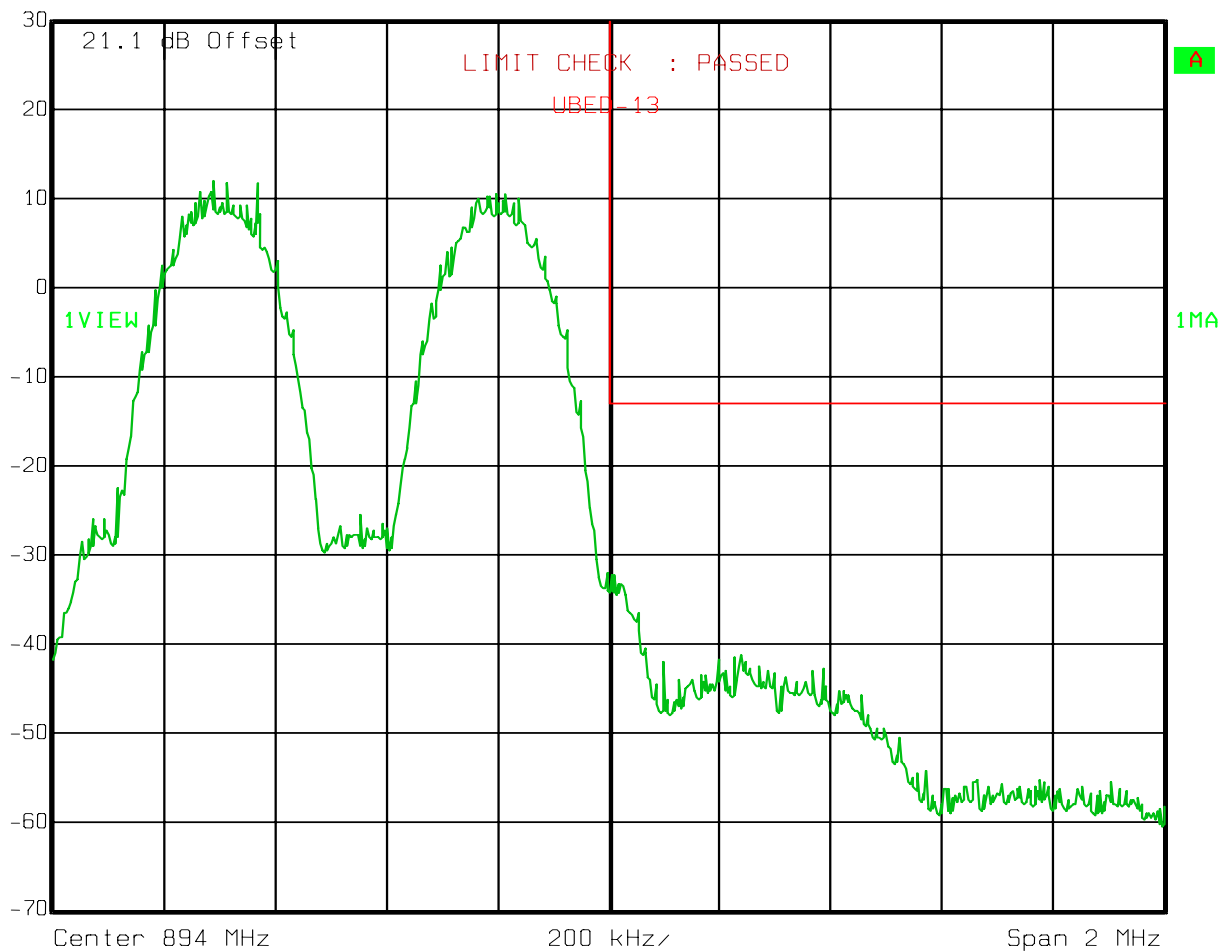
Upper Bandedge Intermodulation

GSM

Downlink

Ref Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



Date: 25.JAN.2010 11:49:49

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

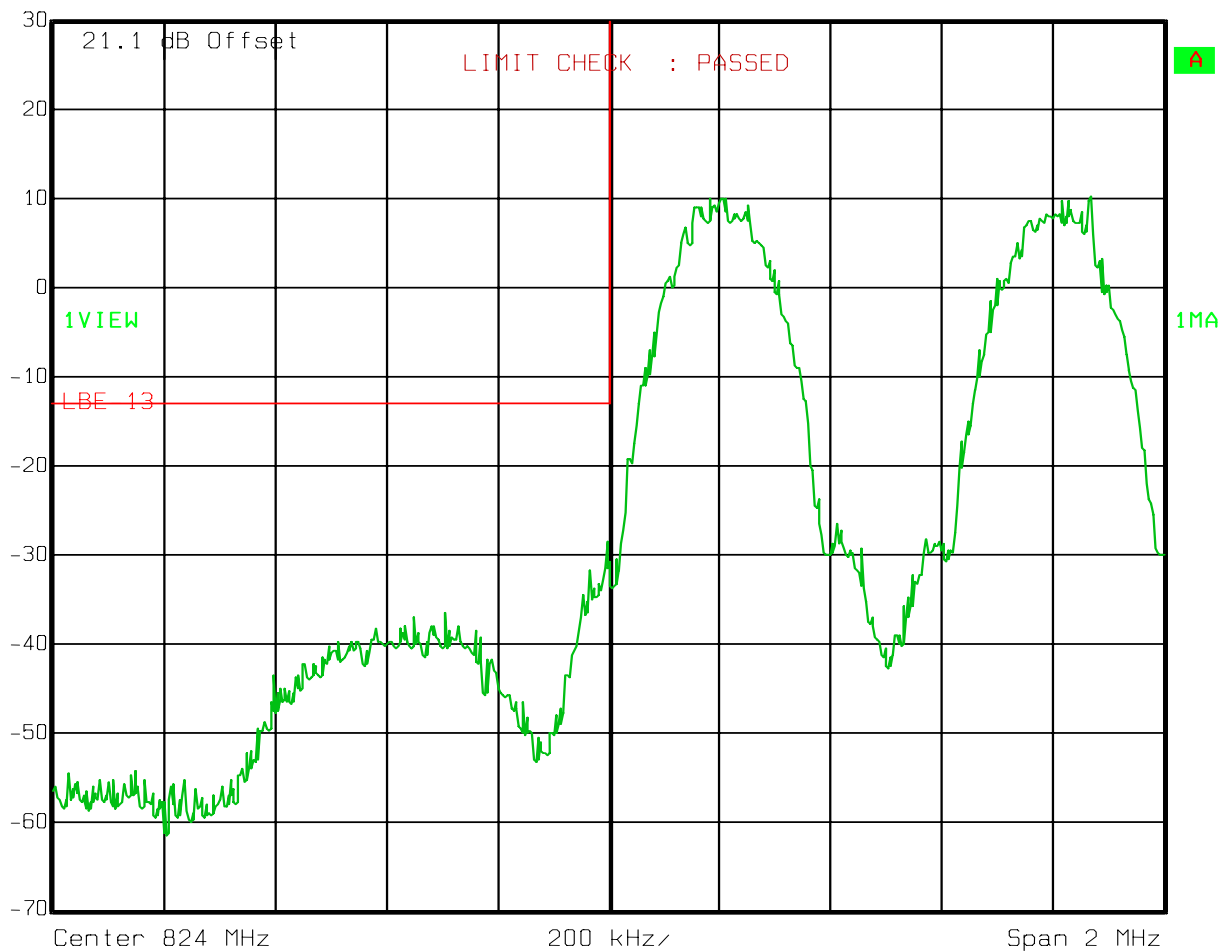
Lower Bandedge Intermodulation

GSM

Uplink

Ref Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



Date: 25.JAN.2010 11:16:05

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

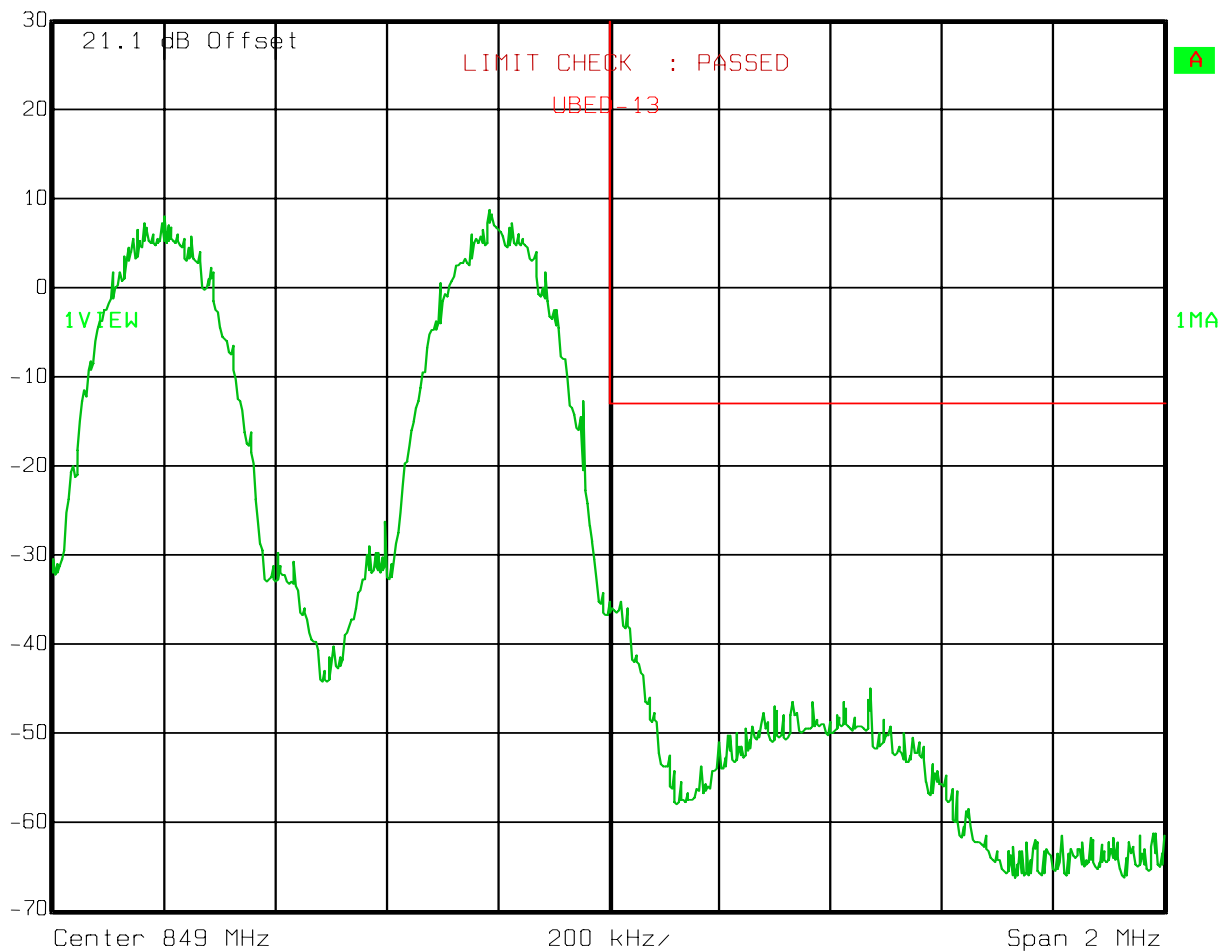
Upper Bandedge Intermodulation

GSM

Uplink

Ref Lvl
30 dBm

RBW	3 kHz	RF Att	20 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



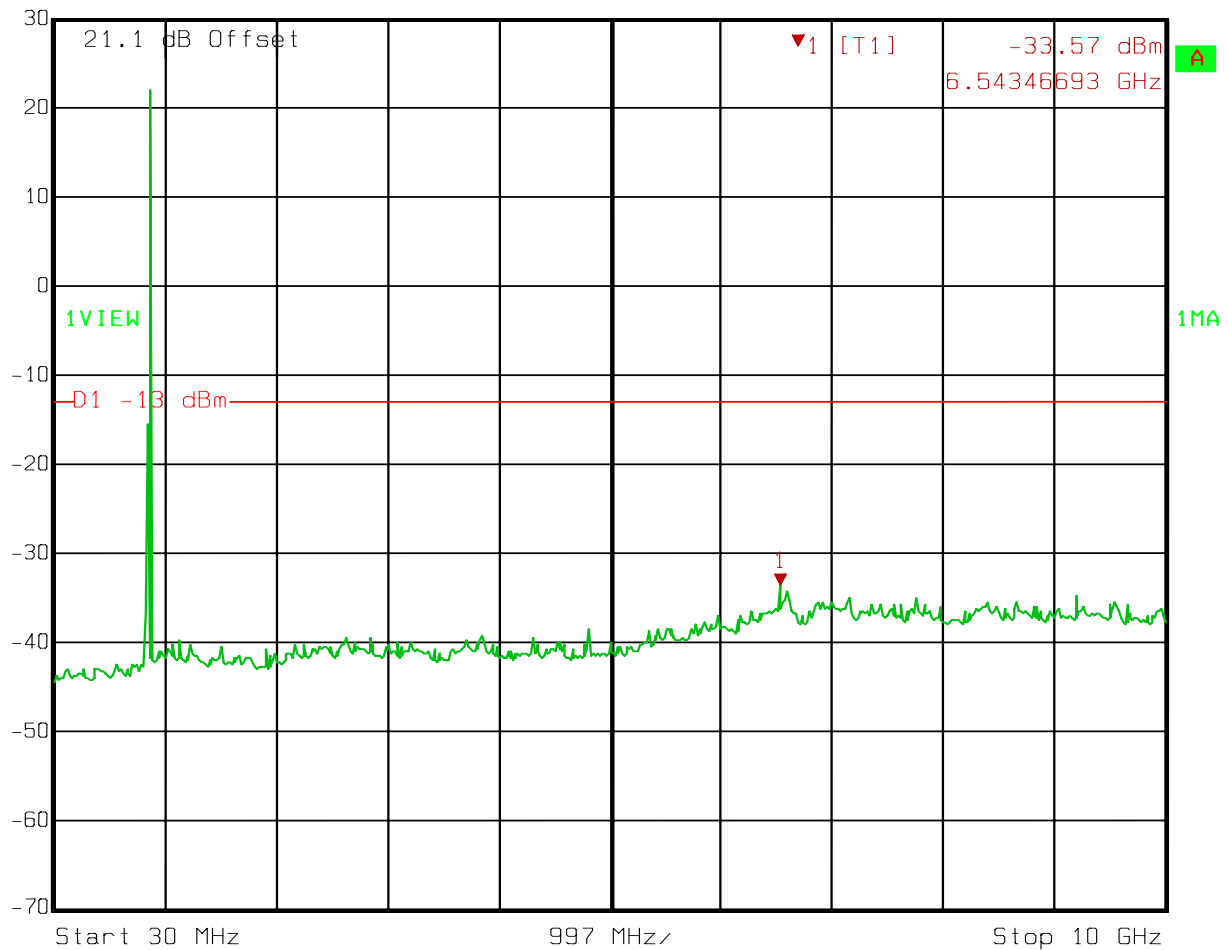
Date: 25.JAN.2010 11:16:56

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals**Spurs – GSM - Downlink**

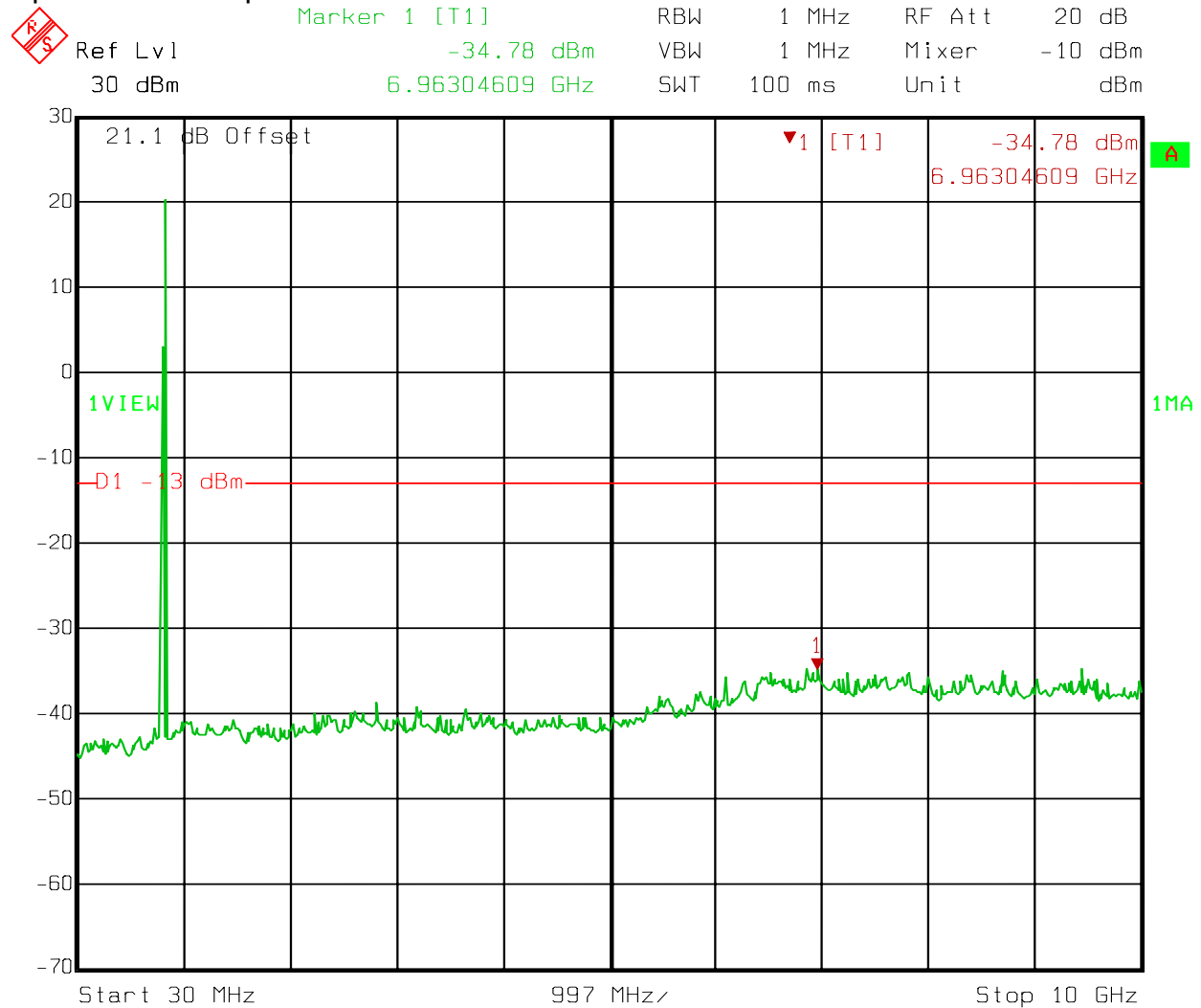
 Ref Lvl 30 dBm Marker 1 [T1] -33.57 dBm RBW 1 MHz RF Att 20 dB
6.54346693 GHz VBW 1 MHz Mixer -10 dBm
SWT 100 ms Unit dBm



Date: 25.JAN.2010 11:50:32

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals**Spurs – GSM - Uplink**

Date: 25.JAN.2010 11:17:44

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

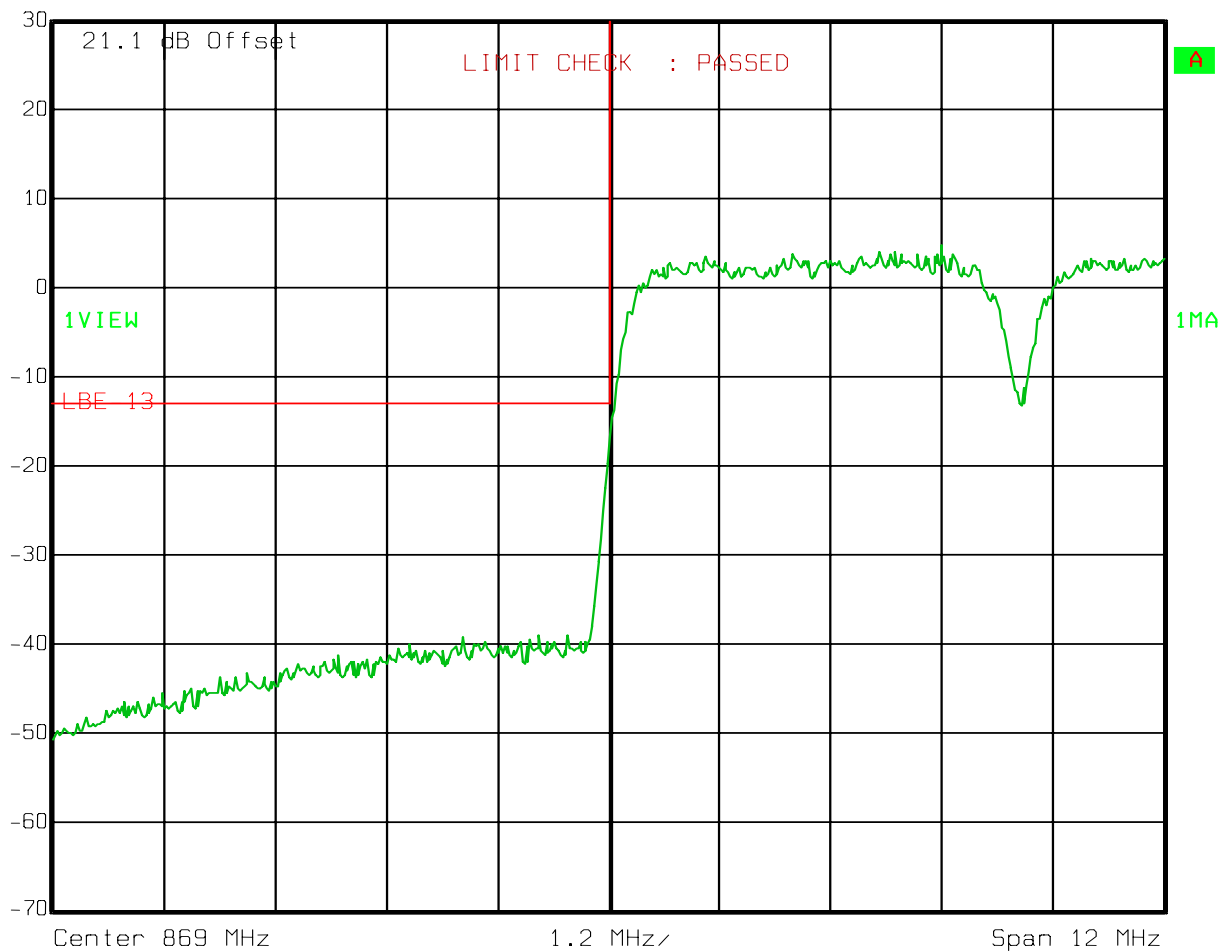
Lower Bandedge Intermodulation

W-CDMA

Downlink

Ref Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	12 ms	Unit	dBm



Date: 25.JAN.2010 11:55:49

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

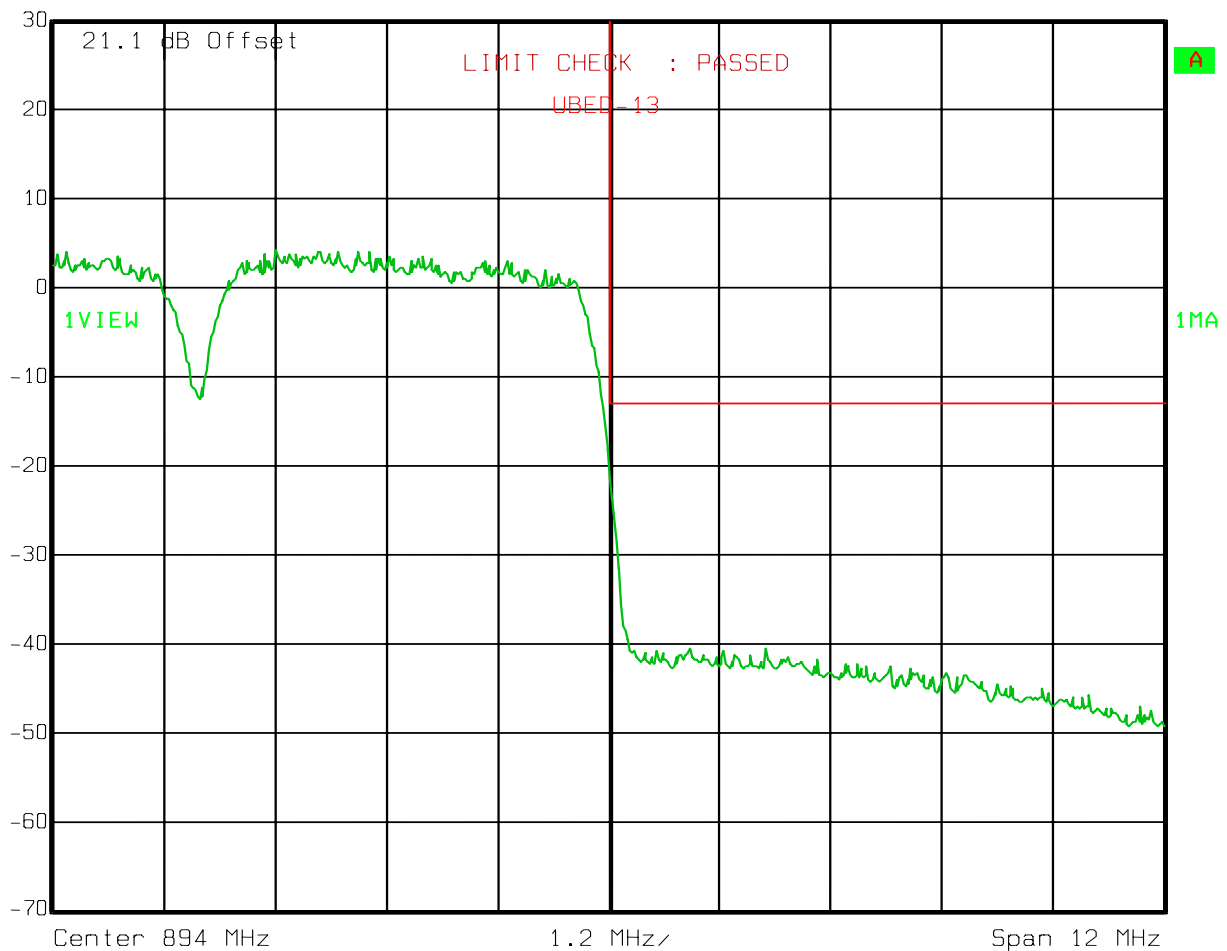
Upper Bandedge Intermodulation

W-CDMA

Downlink

Ref Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	12 ms	Unit	dBm



Date: 25.JAN.2010 11:56:44

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

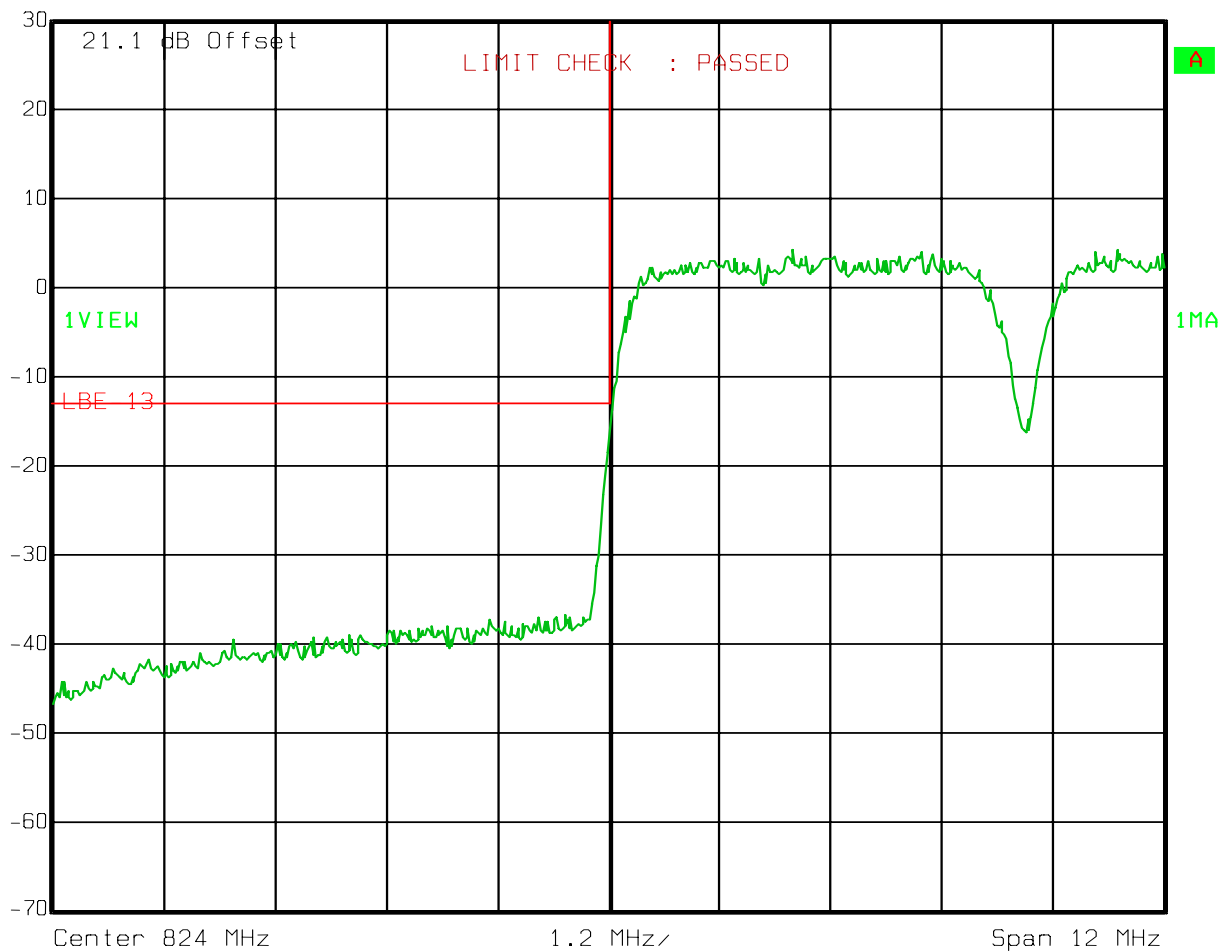
Lower Bandedge Intermodulation

W-CDMA

Uplink

Ref Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	12 ms	Unit	dBm



Date: 25.JAN.2010 11:21:18

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals

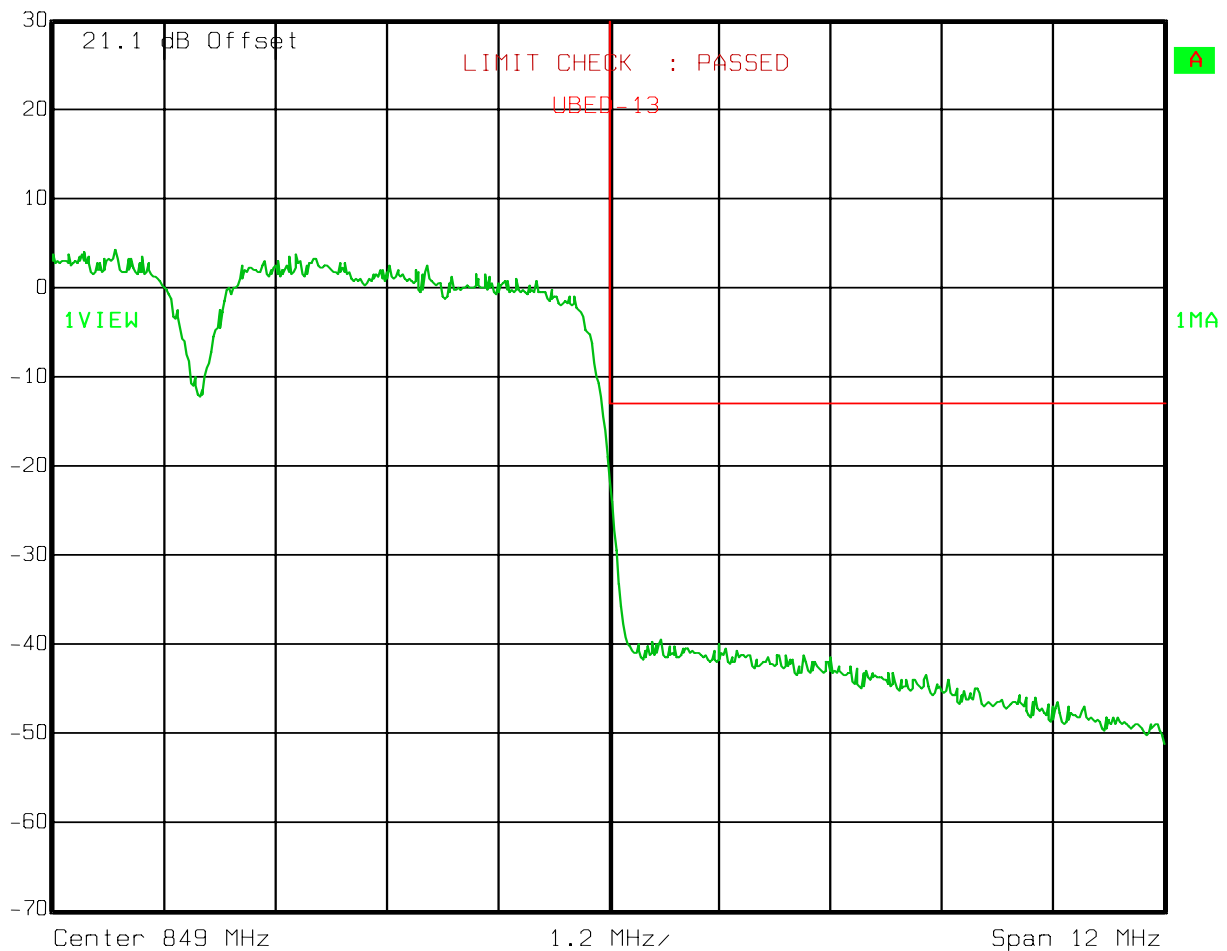
Upper Bandedge Intermodulation

W-CDMA

Uplink

Ref Lvl
30 dBm

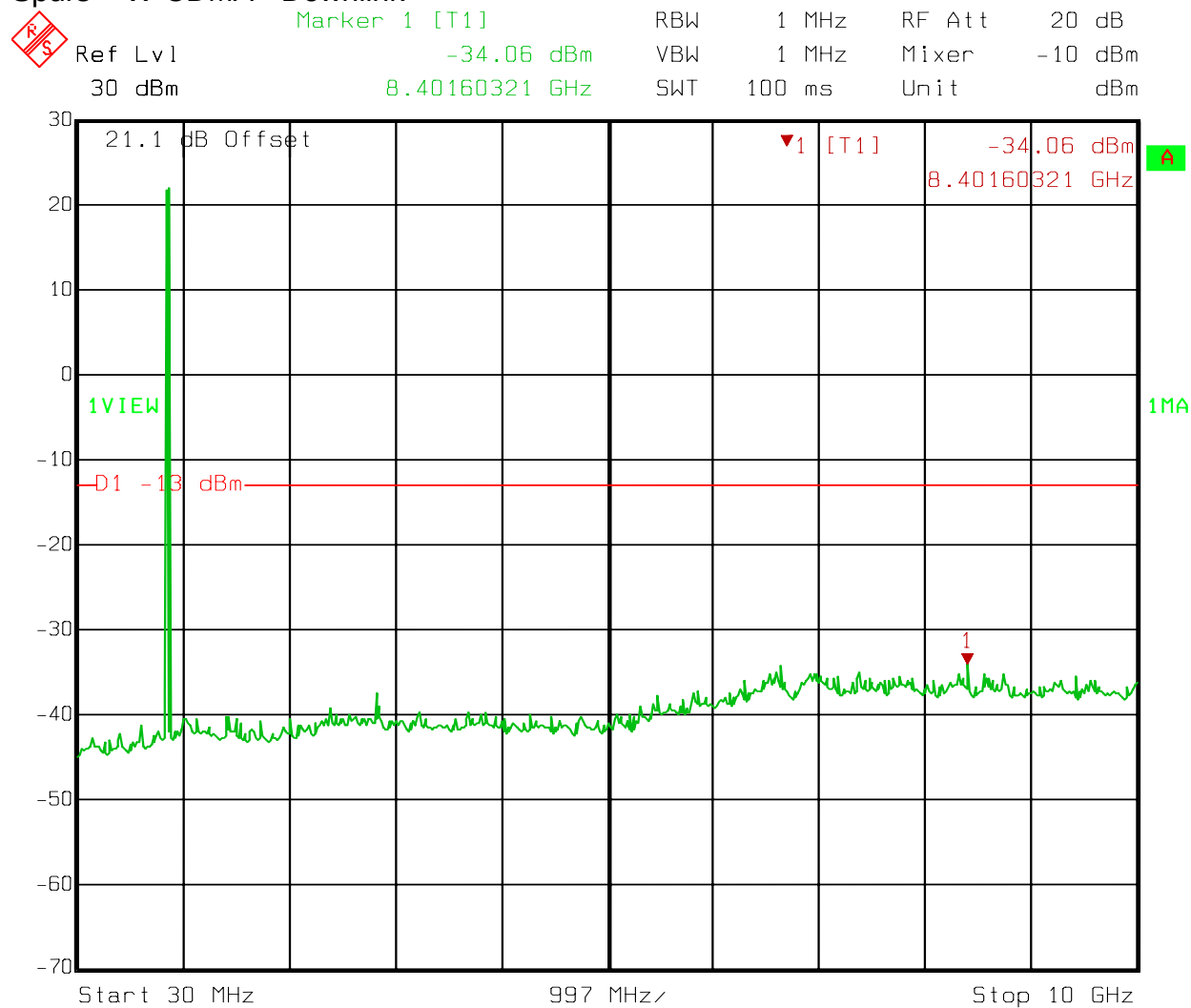
RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	12 ms	Unit	dBm



Date: 25.JAN.2010 11:22:29

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals**Spurs – W-CDMA - Downlink**

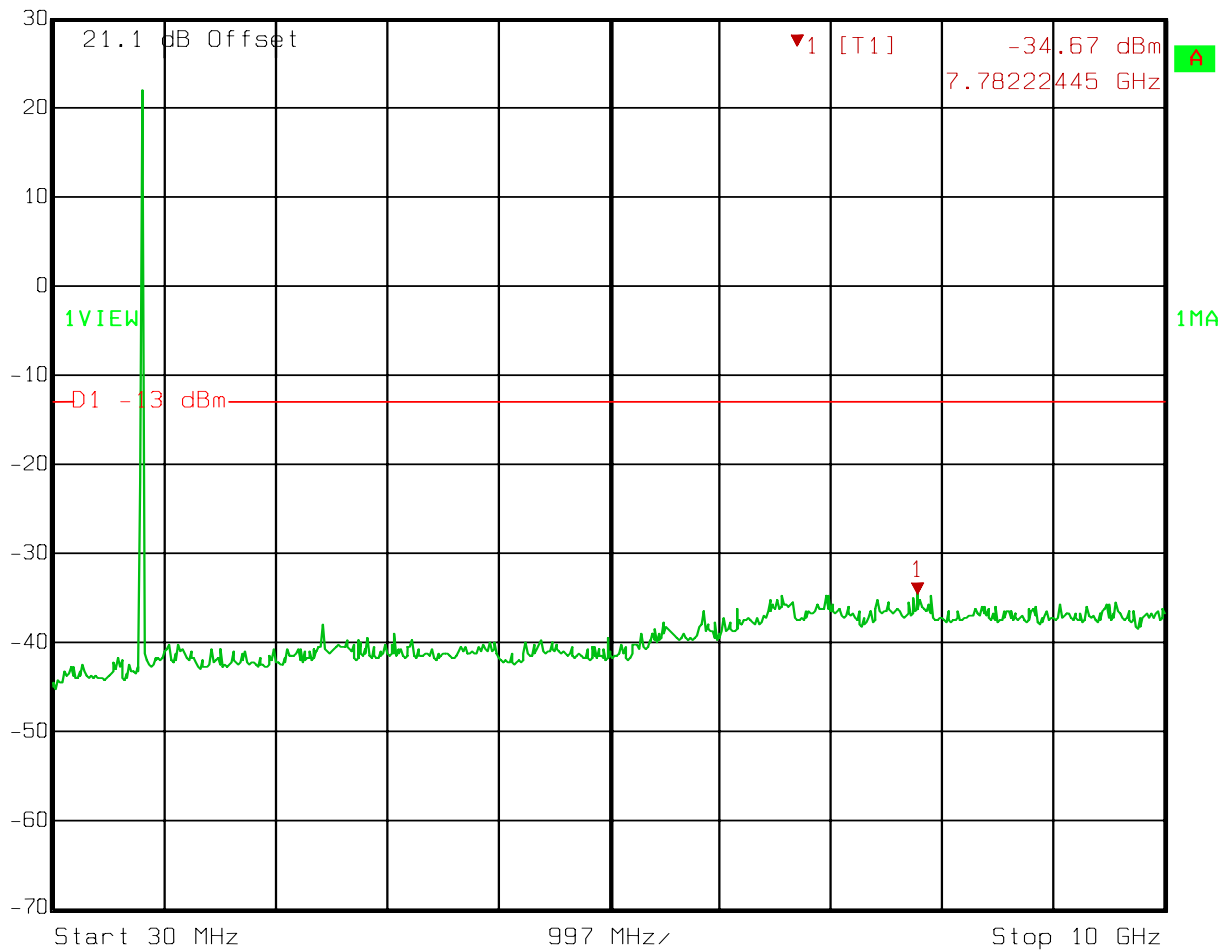
Date: 25.JAN.2010 11:57:24

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

Test Data – Spurious Emissions at Antenna Terminals**Spurs – W-CDMA - Uplink**

Ref Lvl 30 dBm
Marker 1 [T1] -34.67 dBm
7.78222445 GHz
RBW 1 MHz
VBW 1 MHz
SWT 100 ms
RF Att 20 dB
Mixer -10 dBm
Unit dBm



Date: 25.JAN.2010 11:23:25

EQUIPMENT: **MR8518**PROJECT NO.: 41237RUS1

Section 5. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	01/19/09	01/20/11
1082	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	CBU	N/A
1472	20db Attenuator DC 18 Ghz	Omni Spectra 20600-20db	NONE	CBU	N/A

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.

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 2.1049

Minimum Standard: Not defined (Input/Output)

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

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

**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: $\geq$ 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: $\geq$ RBW
Sweep: Auto
Video Avg: Disabled

TDMA

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

W-CDMA

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

NAME OF TEST: Field Strength of Spurious Radiation	PARA. NO.: 2.1053
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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

TIA/EIA-603-1992

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.

EQUIPMENT: **MR8518**

PROJECT NO.: 41237RUS1

NAME OF TEST: Frequency Stability**PARA. NO.: 2.1055****Minimum Standard:**

Para. No. 22.355. The transmitter carrier frequency shall remain within the tolerances given in Table C-1.

Table C-1

Freq. Range (MHz)	Base, fixed	Mobile > 3 W	Mobile ≤ 3 W
821 to 896	1.5	2.5	2.5

Method Of Measurement:Frequency Stability With Voltage Variation:

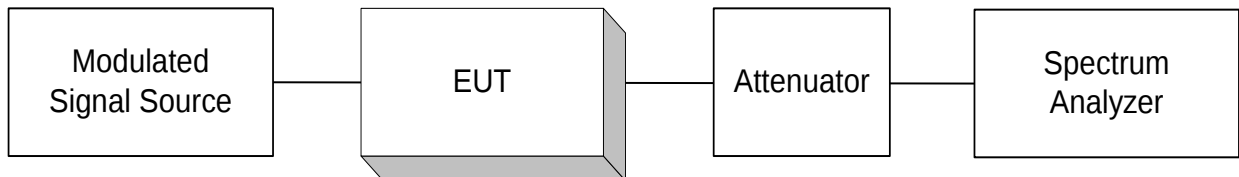
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation:

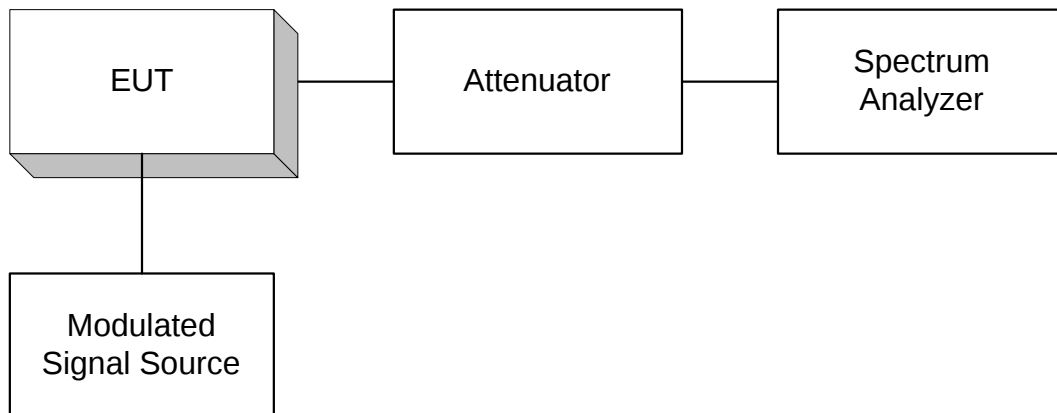
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

ANNEX B - TEST DIAGRAMS

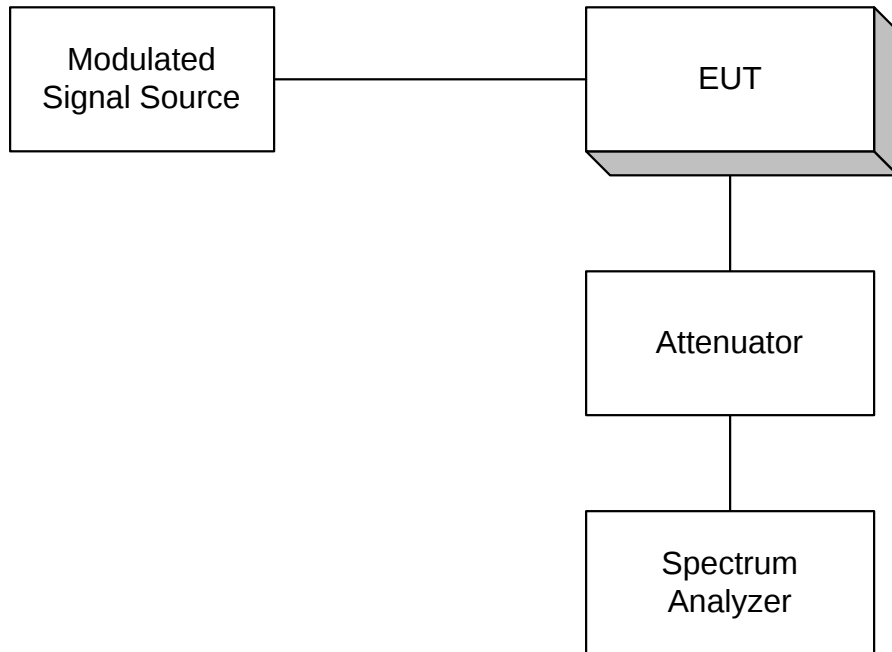
Para. No. 2.1046 - R.F. Power Output



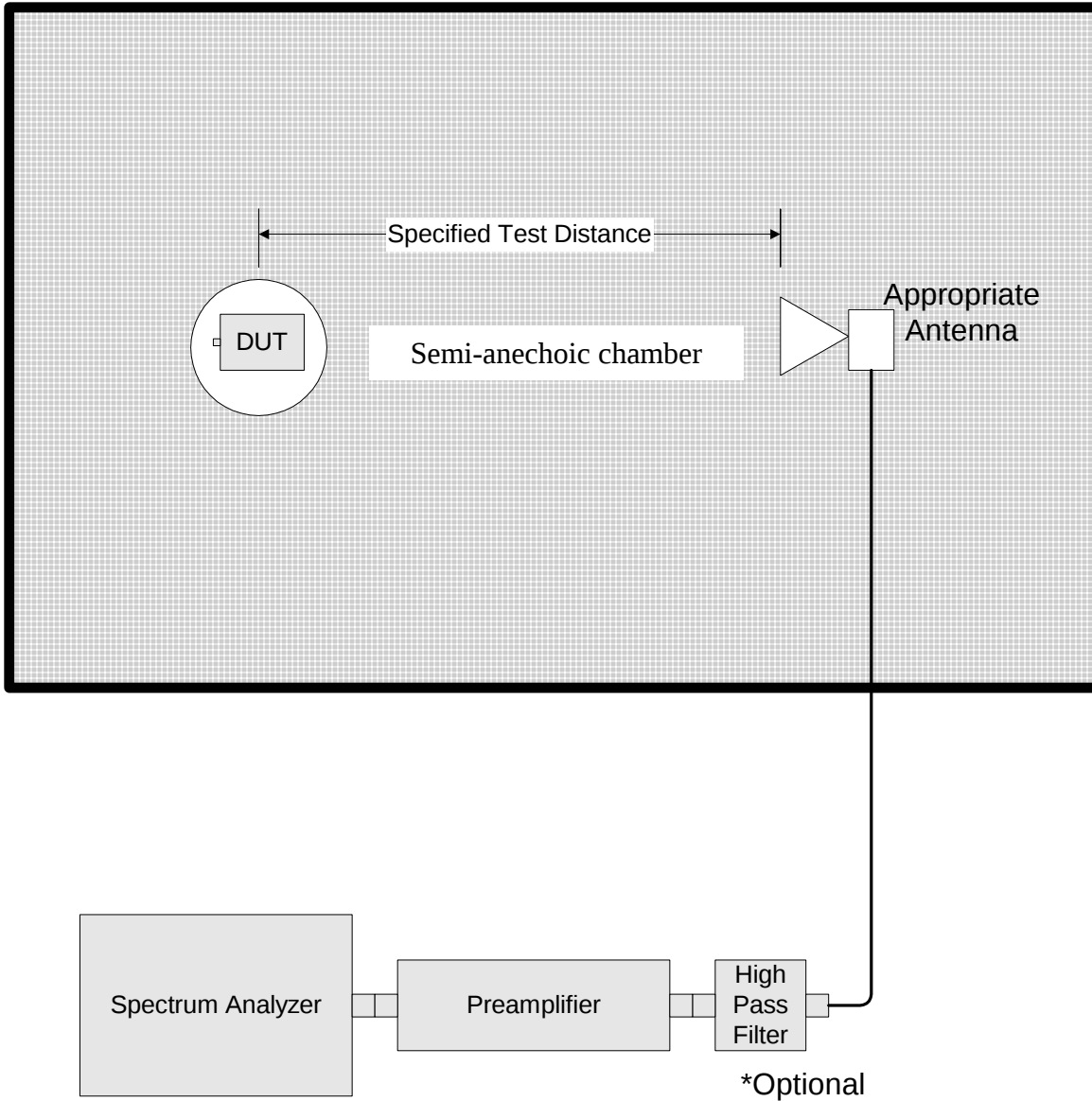
Para. No. 2.1049 - Occupied Bandwidth



Para. No. 2.1051 Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Spurious Radiation



Para. No. 2.1055 - Frequency Stability

