

Nemko Test Report:



Applicant:

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

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

MR8518/1918/1918

FCC Identifier:

BCR-851919

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:

David Light, Senior Wireless Engineer

DATE: 26 January 2010

APPROVED BY:

Tom Tidwell, Telecom Direct

DATE: 26 January 2010

Number of Pages: 55

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EQUIPMENT: **MR8518/1918/1918***PROJECT NO.:* 41242RUS1

Section 1. Summary of Test Results

Manufacturer: Andrew Corporation

Model No.: MR8518/1918/1918

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 18 dBm. The gain of the amplifier is increased by the removal of attenuation in the system. There was no degradation in the performance 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".



NVLAP Lab Code 100426-0

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EQUIPMENT: **MR8518/1918/1918**PROJECT NO.: 41242RUS1

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.

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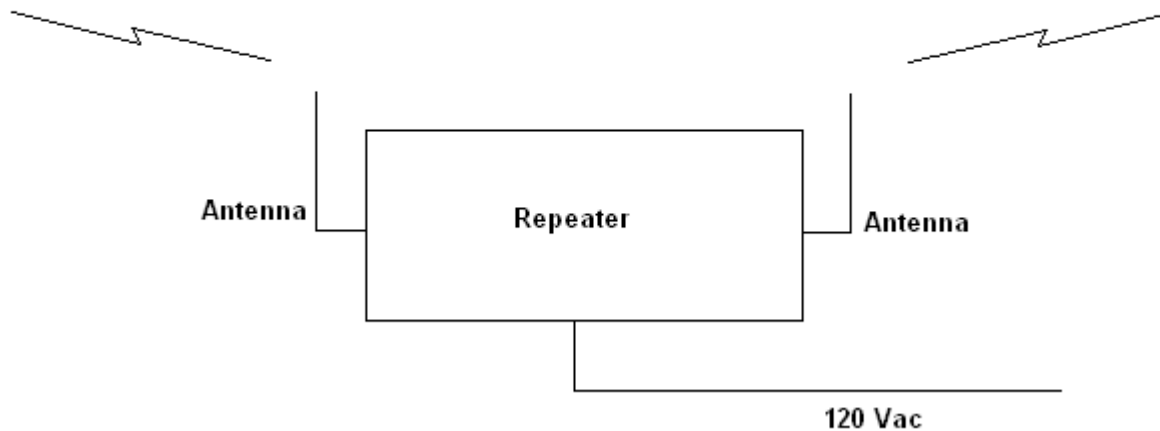
Section 2. General Equipment Specification

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) <input checked="" type="checkbox"/>	GSM (GXW) <input checked="" type="checkbox"/>	W-CDMA (F9W) <input checked="" type="checkbox"/>
			EDGE (G7W) <input checked="" type="checkbox"/>
Output Impedance:	50 ohms		
RF Output (Rated): Downlink:	63.1 mW 18 dBm		
Uplink:	63.1 mW 18 dBm		
Frequency Translation:	F1-F1 <input checked="" type="checkbox"/>	F1-F2 <input type="checkbox"/>	N/A <input type="checkbox"/>
Band Selection:	Software <input checked="" type="checkbox"/>	Duplexer Change <input type="checkbox"/>	Fullband Coverage <input type="checkbox"/>

* Variable bandwidth filter from 200 kHz to 25 MHz

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. They are dual band coverage of the 850 cell band and 1900 PCS band.

System Diagram

EQUIPMENT: **MR8518/1918/1918**

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Section 3. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 26 January 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1082-1472

Measurement Uncertainty: 1X10⁻⁷ ppm

Temperature: 22 °C

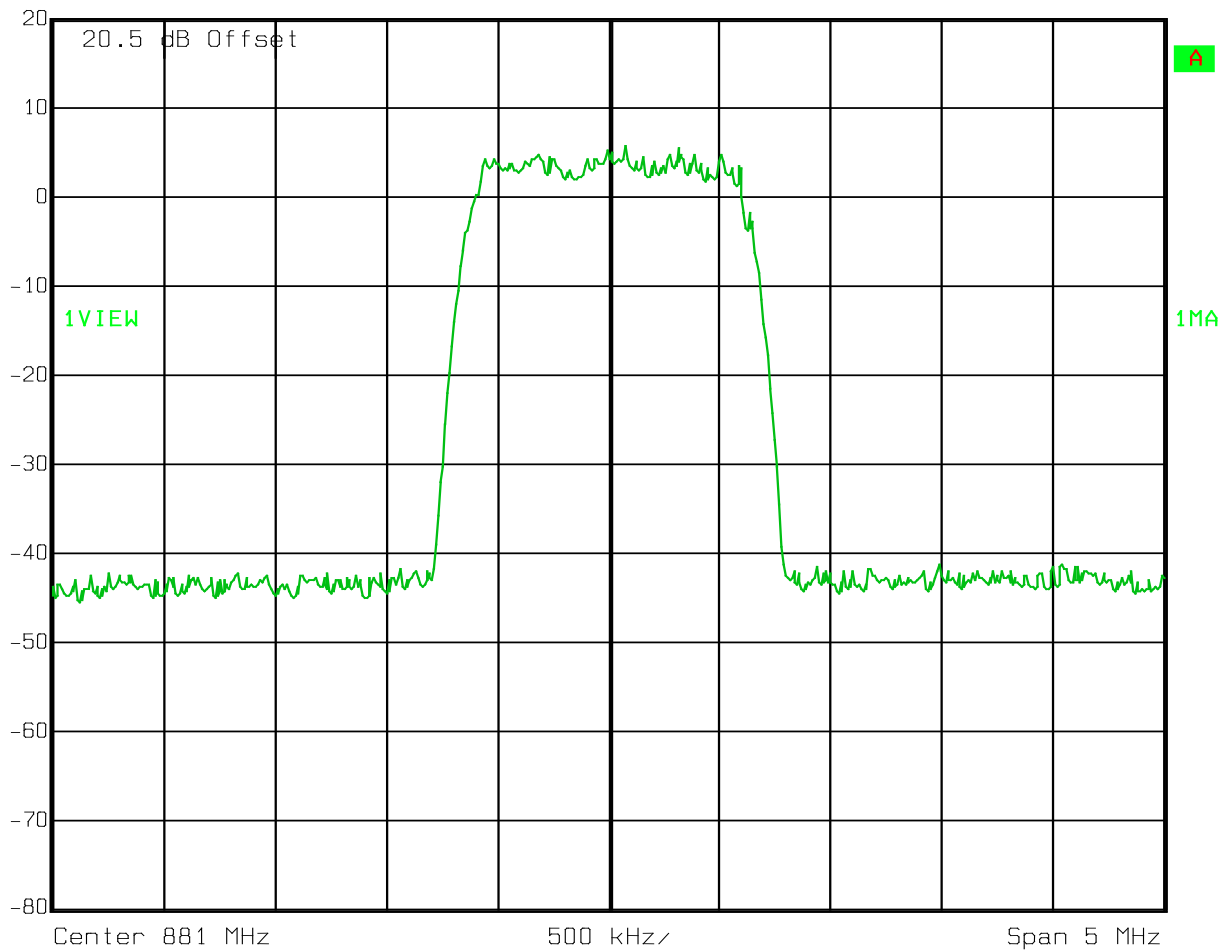
Relative Humidity: 30 %

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Test Data – Occupied BandwidthCDMA - Output
DownlinkRef Lvl
20 dBm

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



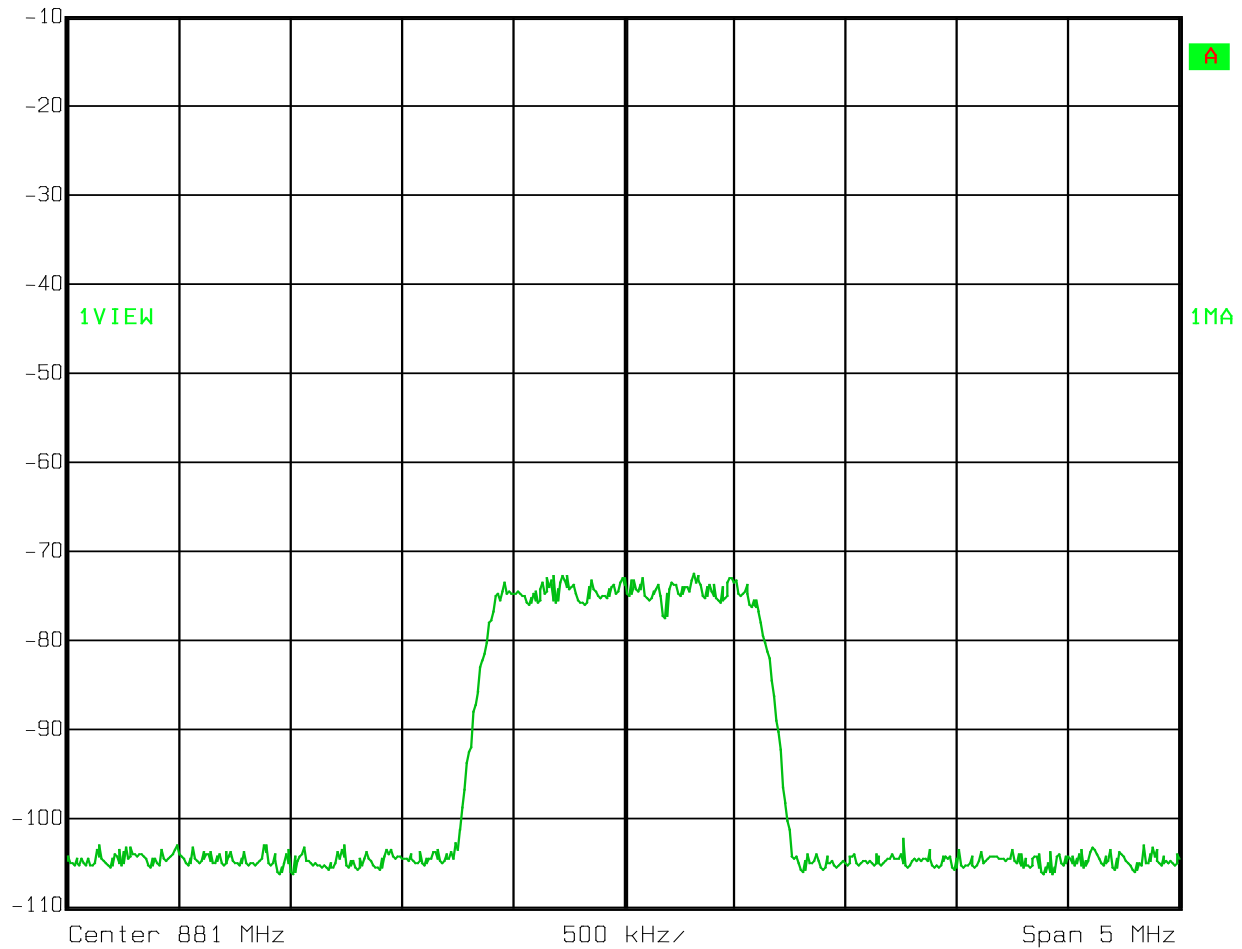
Date: 26.JAN.2010 11:21:22

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Occupied BandwidthCDMA - Input
DownlinkRef Lvl
-10 dBm

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



Date: 26.JAN.2010 09:59:37

EQUIPMENT: **MR8518/1918/1918**

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Test Data – Occupied Bandwidth

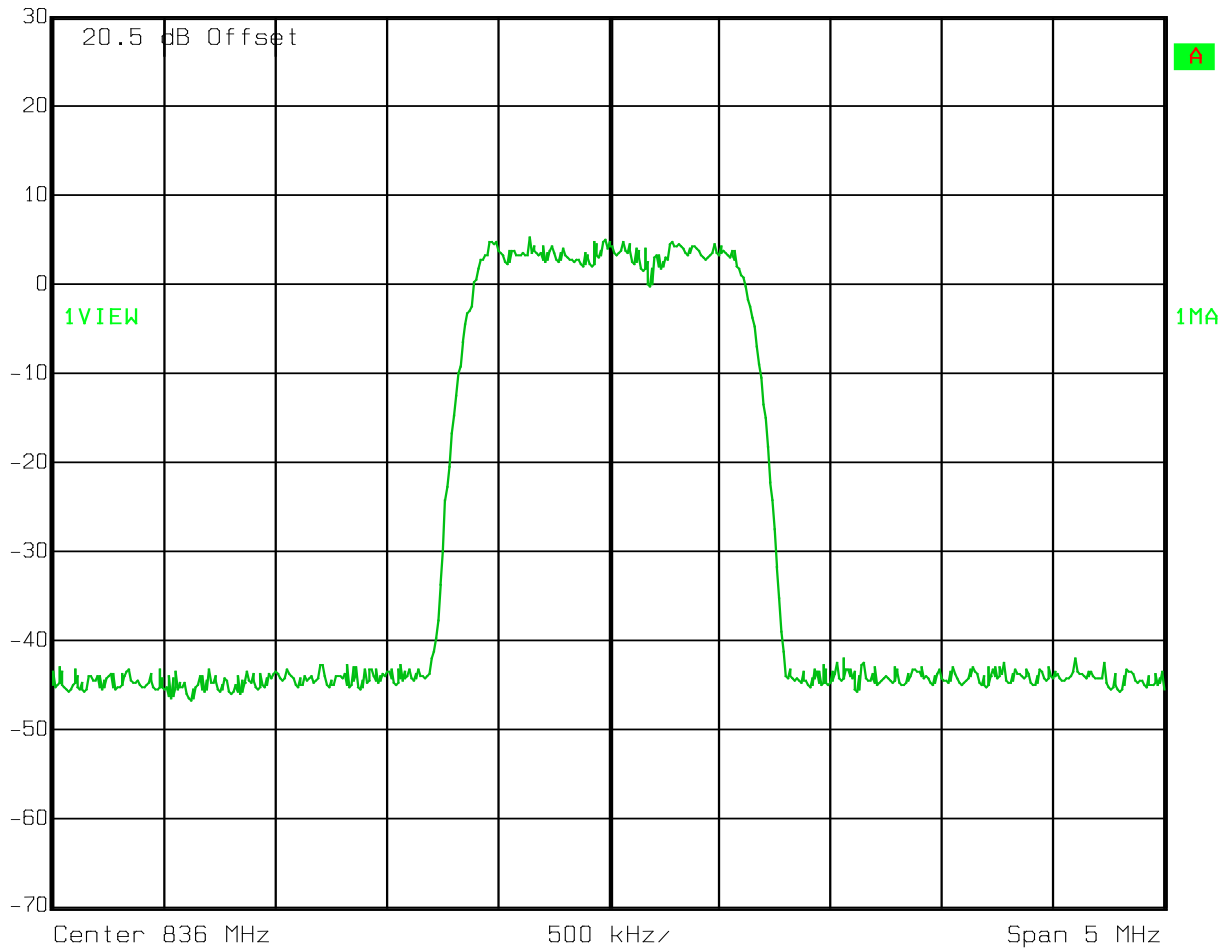
CDMA - Output

Uplink



Ref Lvl
30 dBm

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



Date: 26.JAN.2010 09:57:41

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Occupied Bandwidth

CDMA - Input

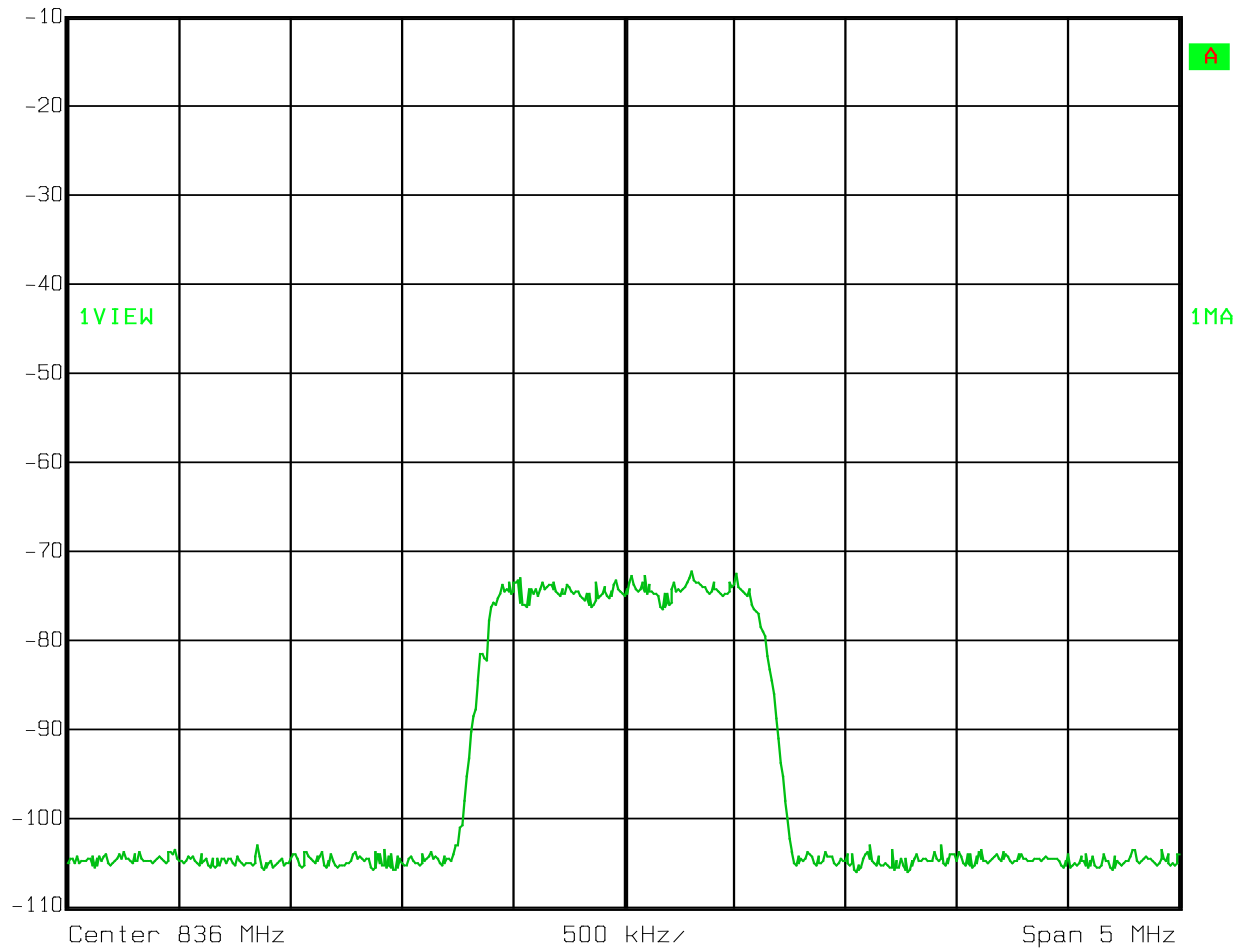
Uplink



Ref Lvl

-10 dBm

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



Date: 26.JAN.2010 09:59:05

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

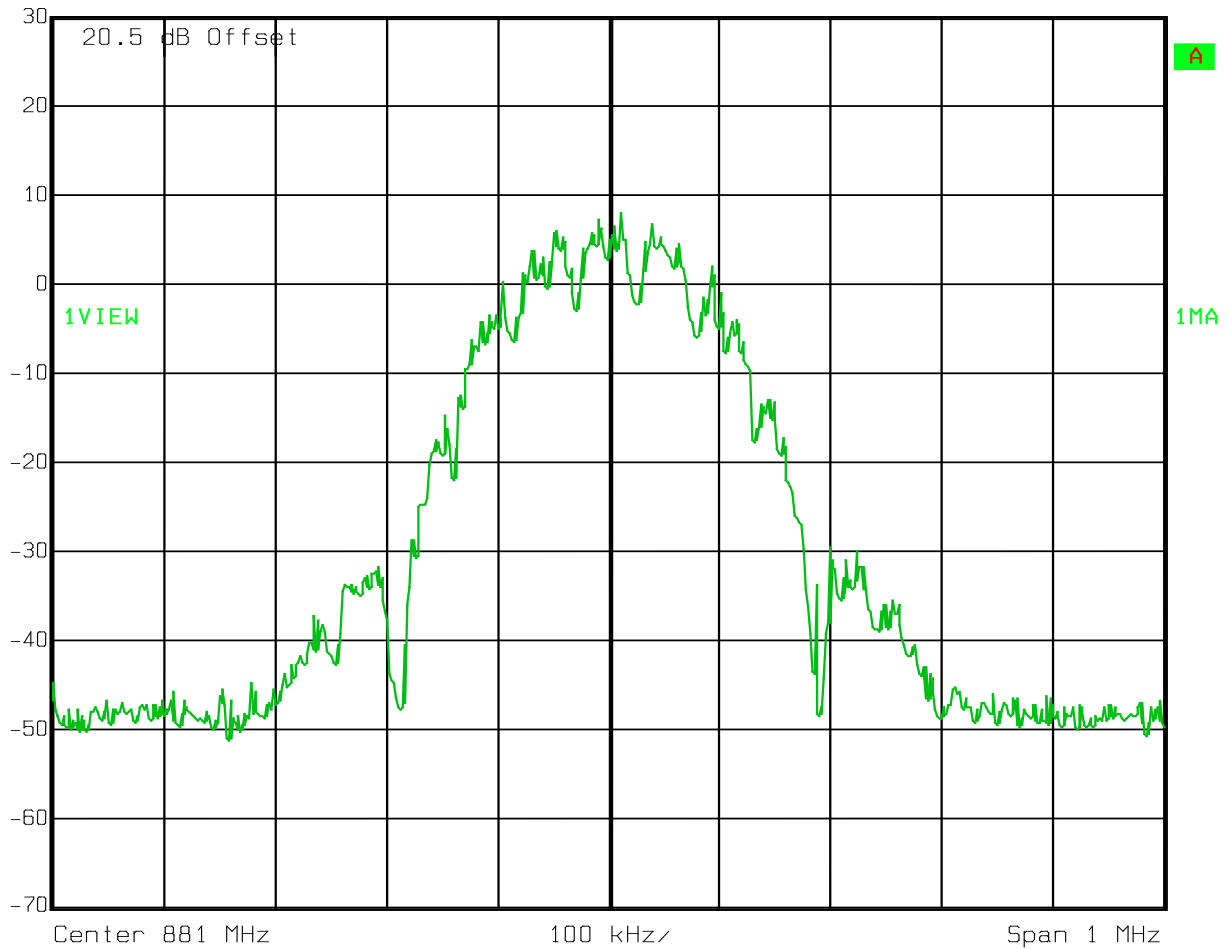
Test Data – Occupied Bandwidth

EDGE - Output

Downlink

Ref Lvl
30 dBm

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



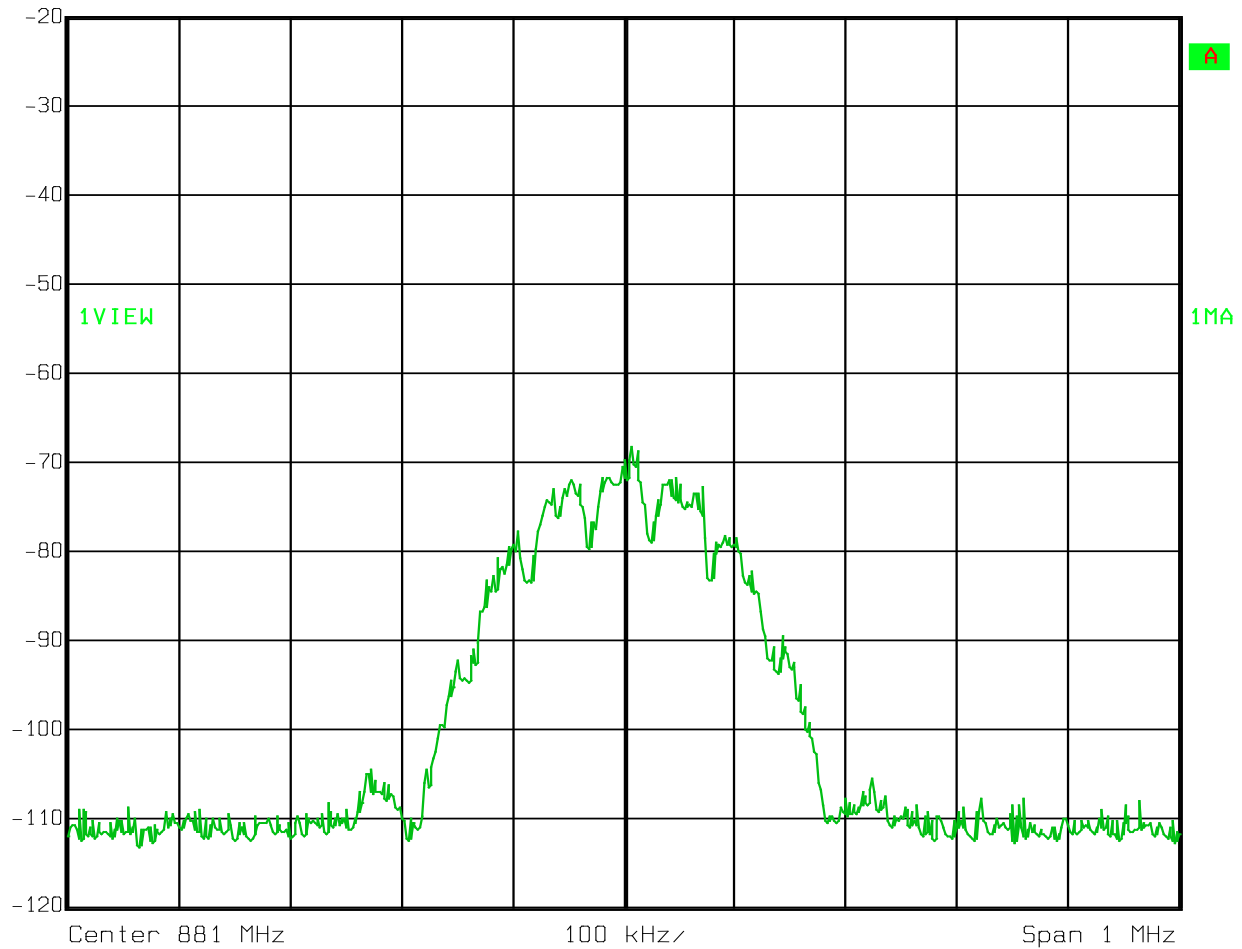
Date: 26.JAN.2010 09:47:49

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Occupied BandwidthEDGE - Input
DownlinkRef Lvl
-20 dBm

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



Date: 26.JAN.2010 10:00:30

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

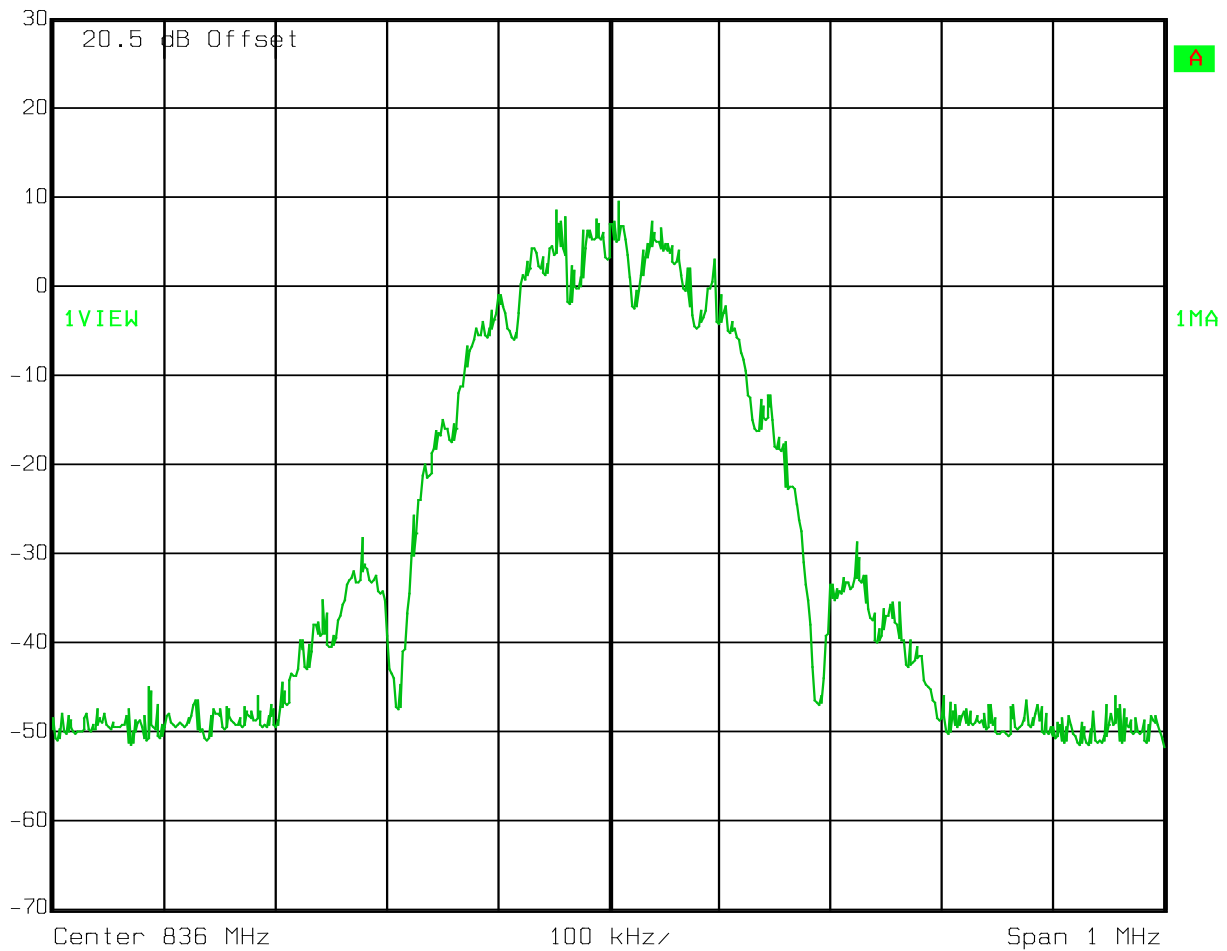
Test Data – Occupied Bandwidth

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: 26.JAN.2010 09:56:38

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Occupied Bandwidth

EDGE - Input

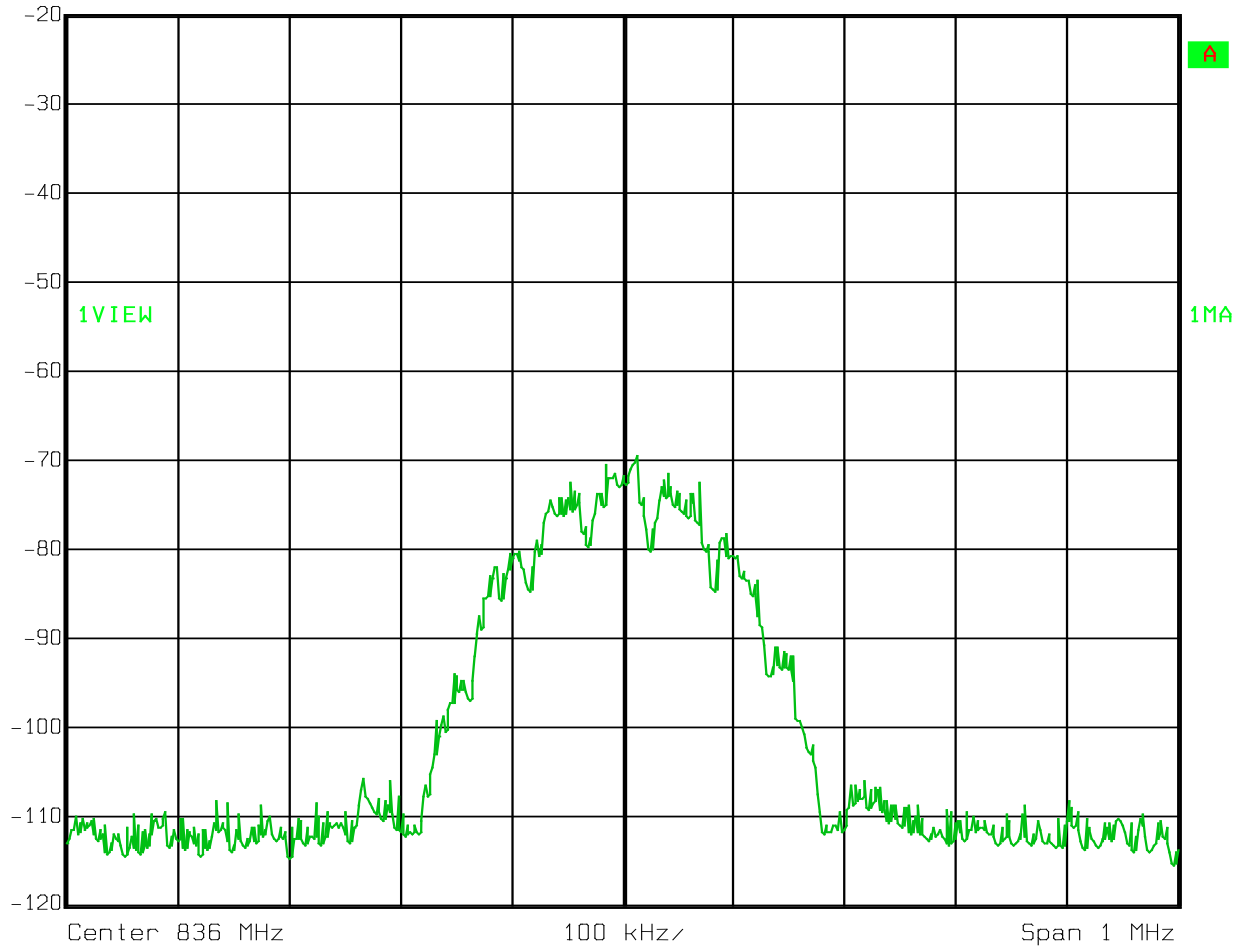
Uplink



Ref Lvl

-20 dBm

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



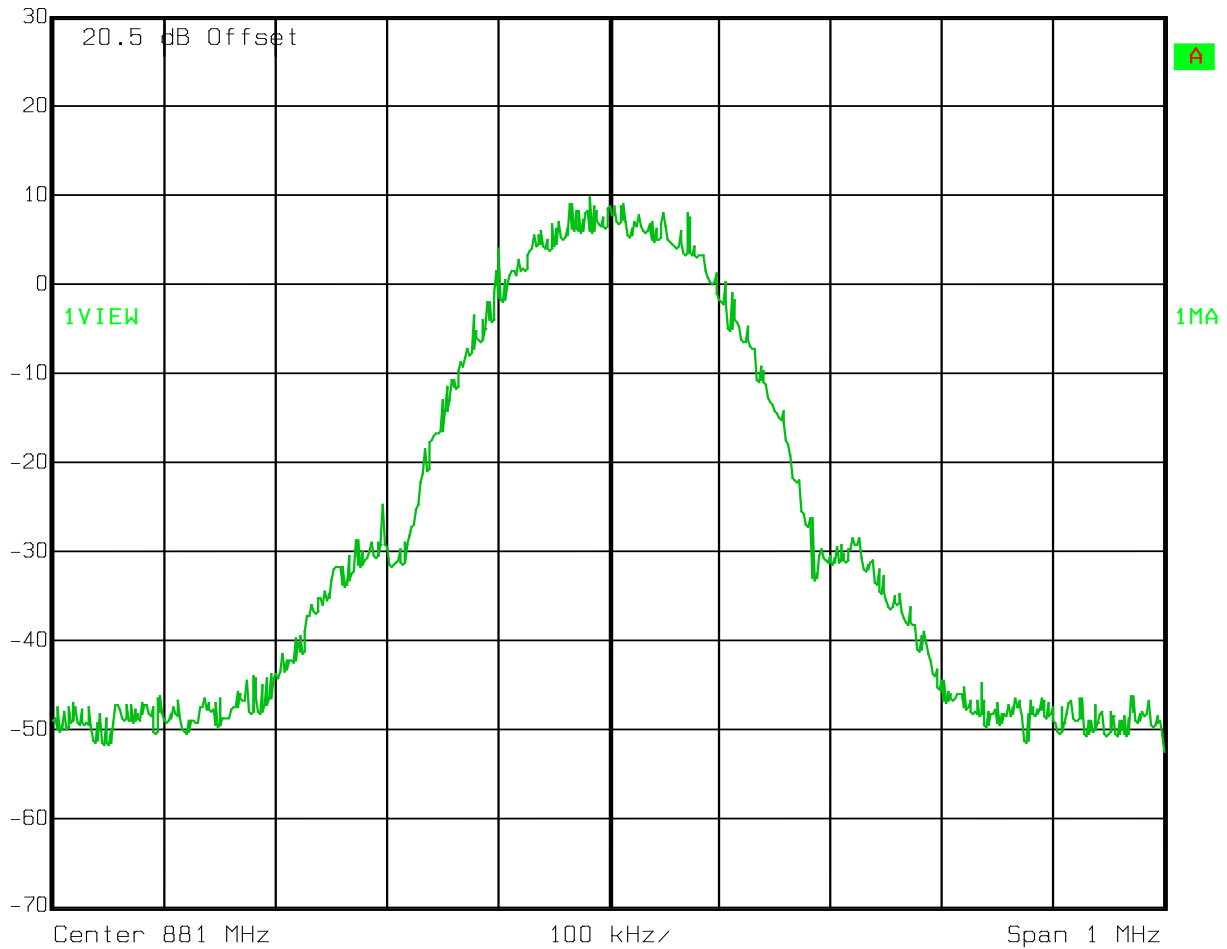
Date: 26.JAN.2010 10:00:57

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

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



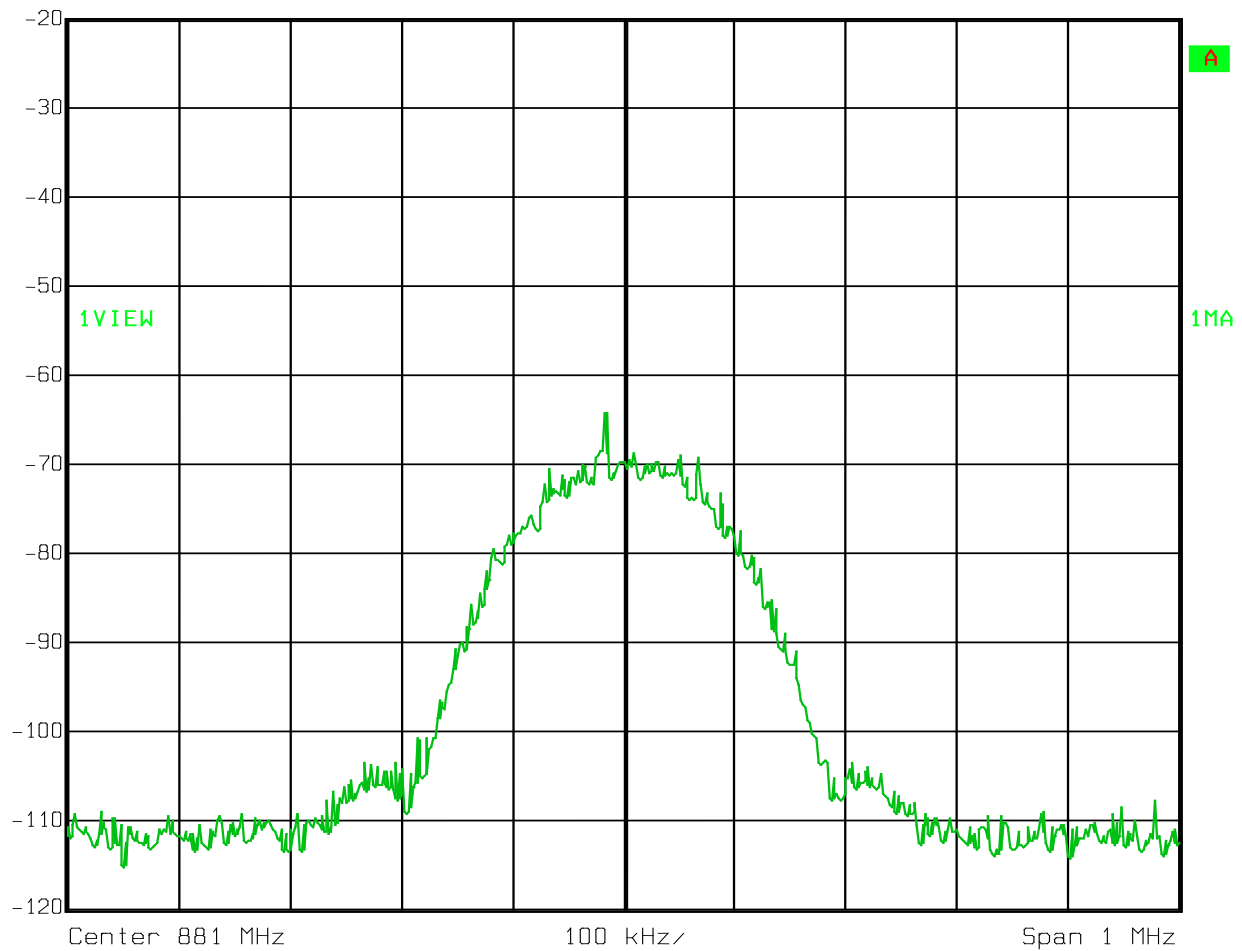
Date: 26.JAN.2010 09:49:00

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Occupied BandwidthGSM - Input
DownlinkRef Lvl
-20 dBm

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



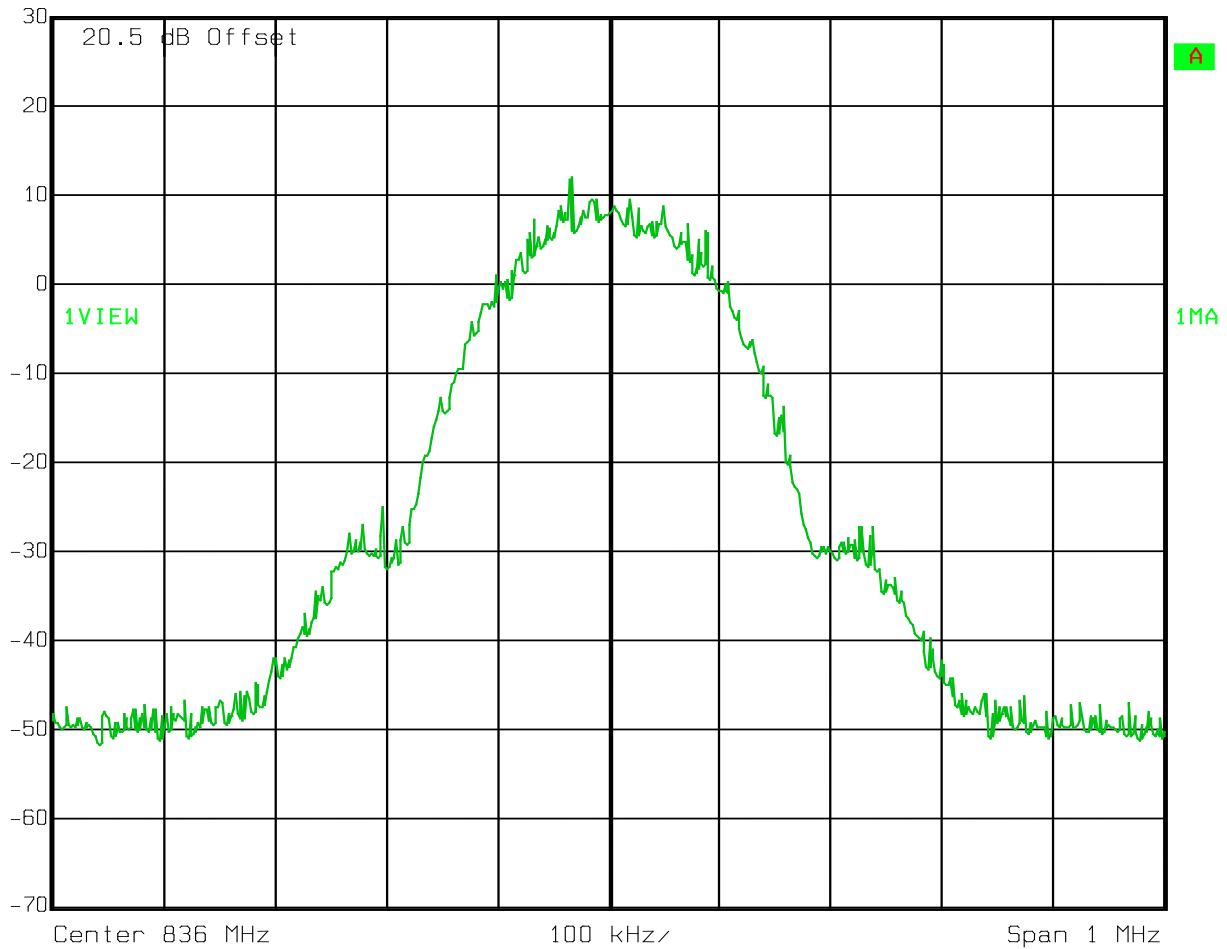
Date: 26.JAN.2010 10:02:08

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

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



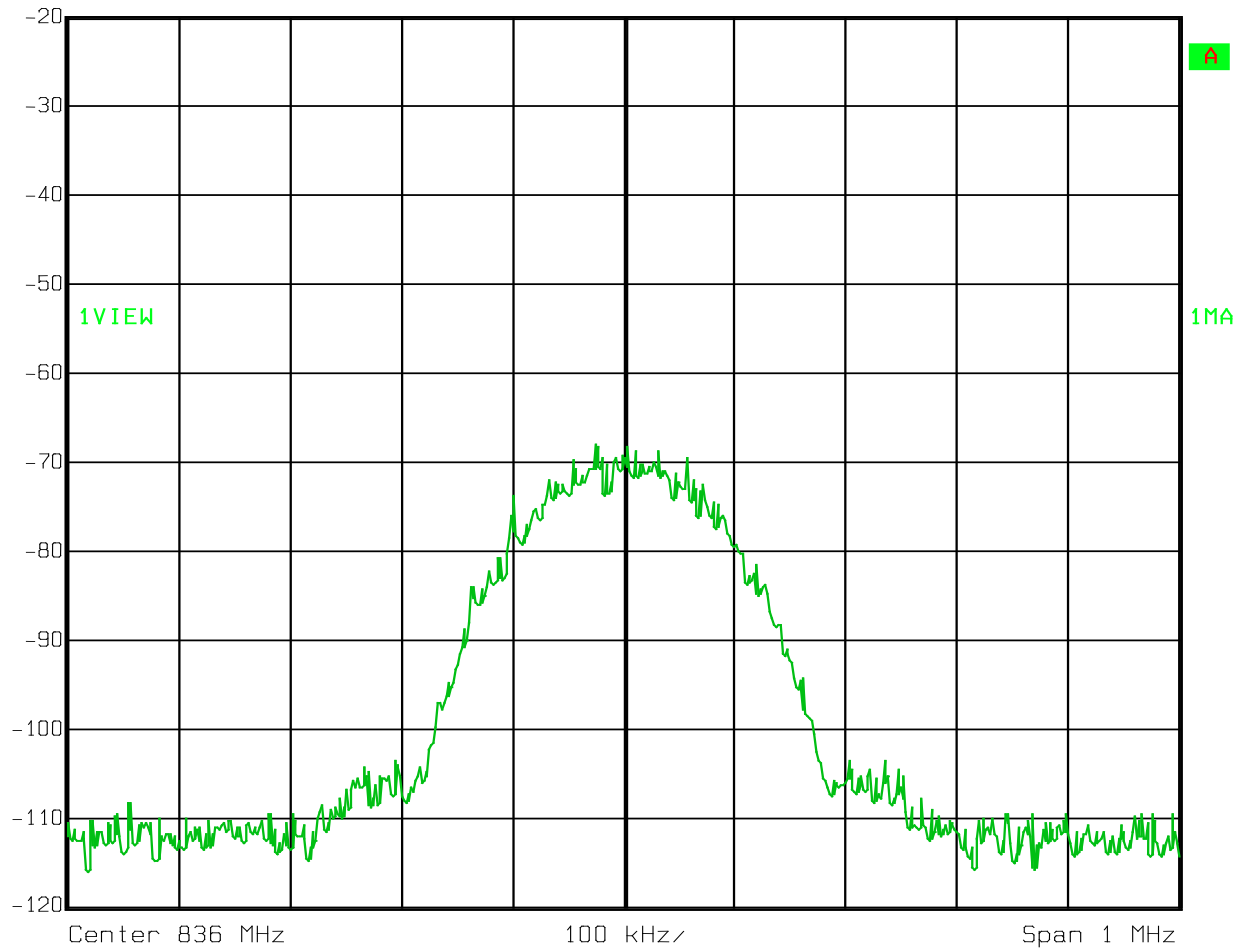
Date: 26.JAN.2010 09:55:58

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Occupied BandwidthGSM - Input
UplinkRef Lvl
-20 dBm

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



Date: 26.JAN.2010 10:01:38

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

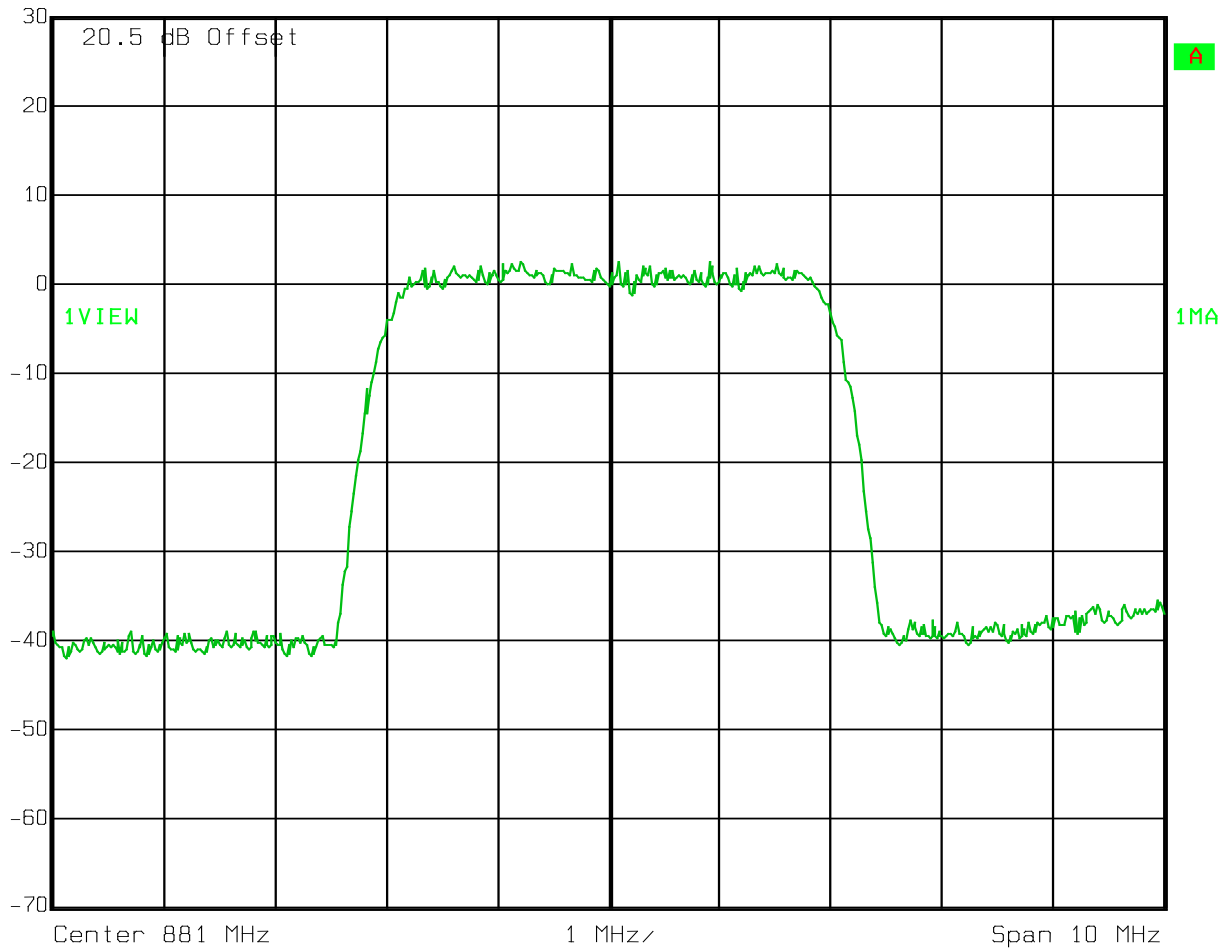
Test Data – Occupied Bandwidth

WCDMA - Output
Downlink



Ref Lvl
30 dBm

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



Date: 26.JAN.2010 09:52:06

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

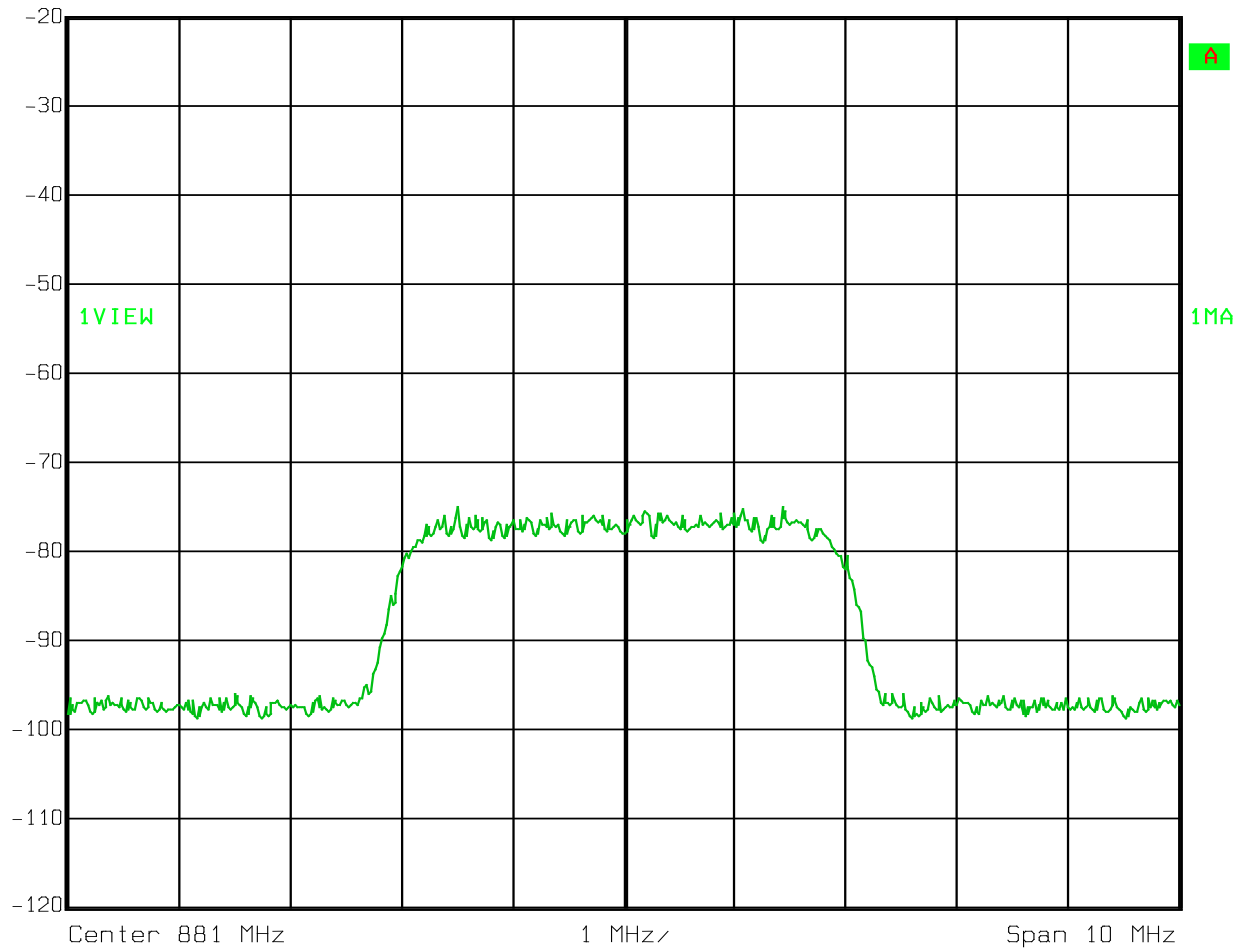
Test Data – Occupied Bandwidth

WCDMA - Input
Downlink



Ref Lvl
-20 dBm

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



Date: 26.JAN.2010 10:03:07

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

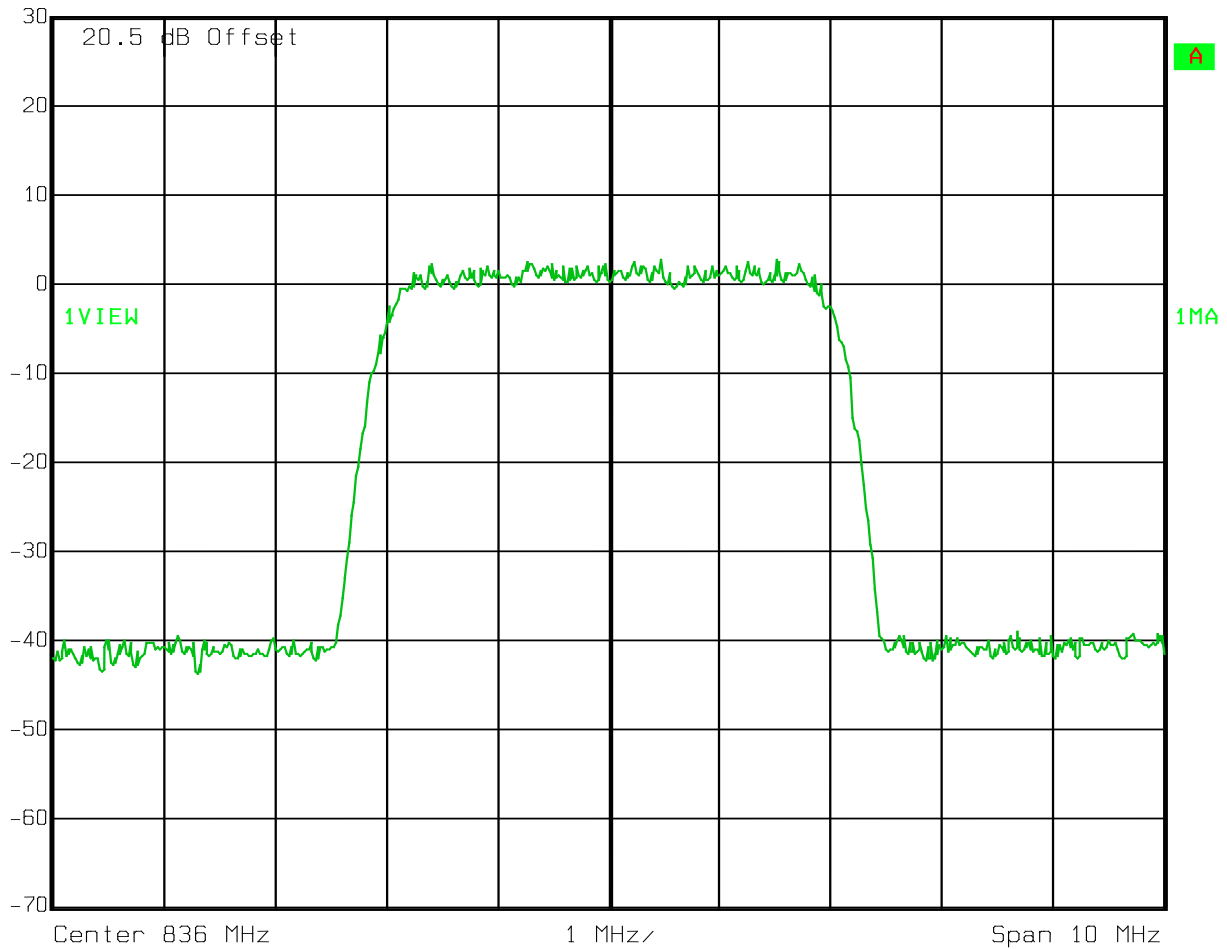
Test Data – Occupied Bandwidth

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: 26.JAN.2010 09:54:57

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Occupied Bandwidth

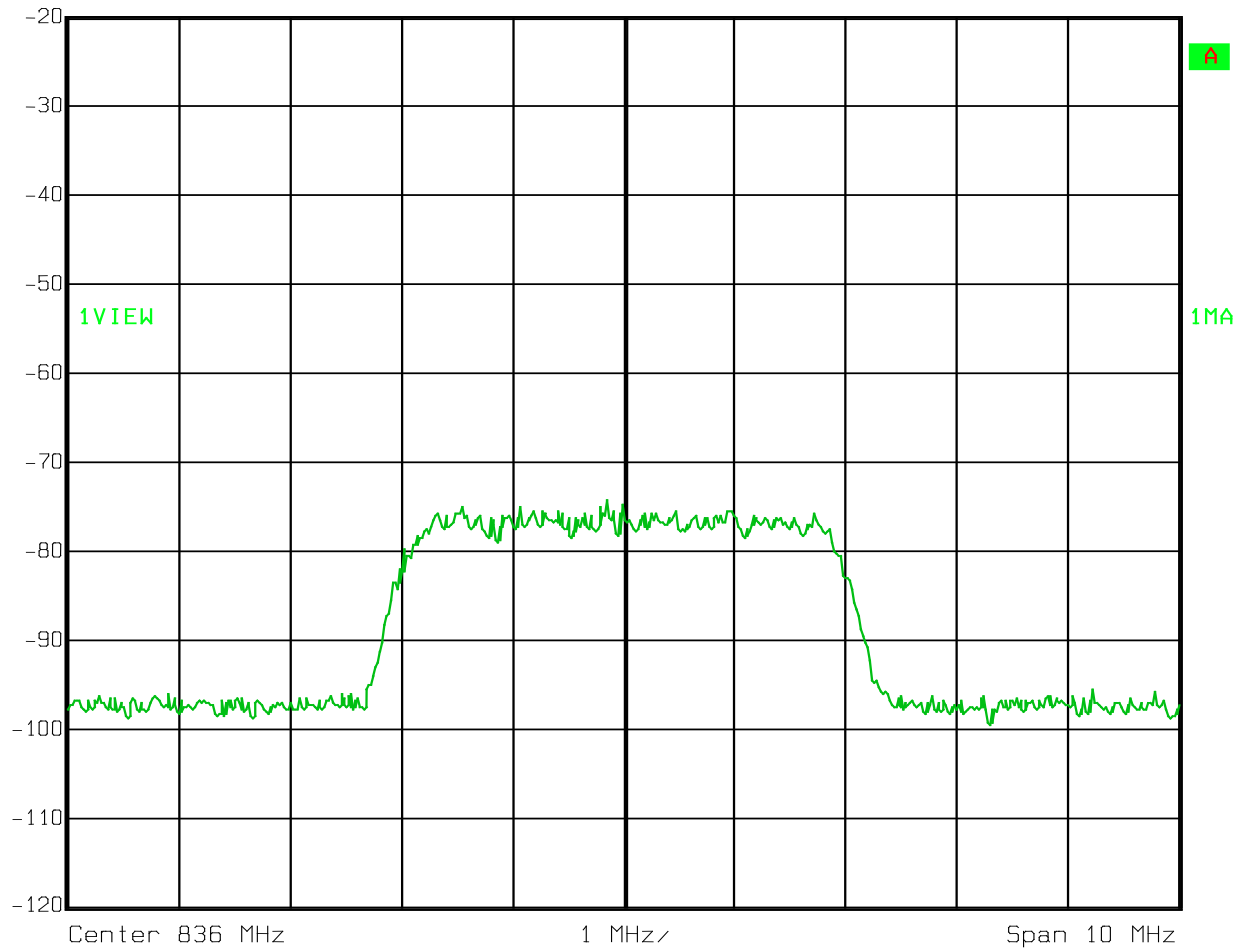
WCDMA - Input

Uplink



Ref Lvl
-20 dBm

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



Date: 26.JAN.2010 10:03:36

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Section 4. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals PARA. NO.: 22.917

TESTED BY: David Light

DATE: 26 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: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

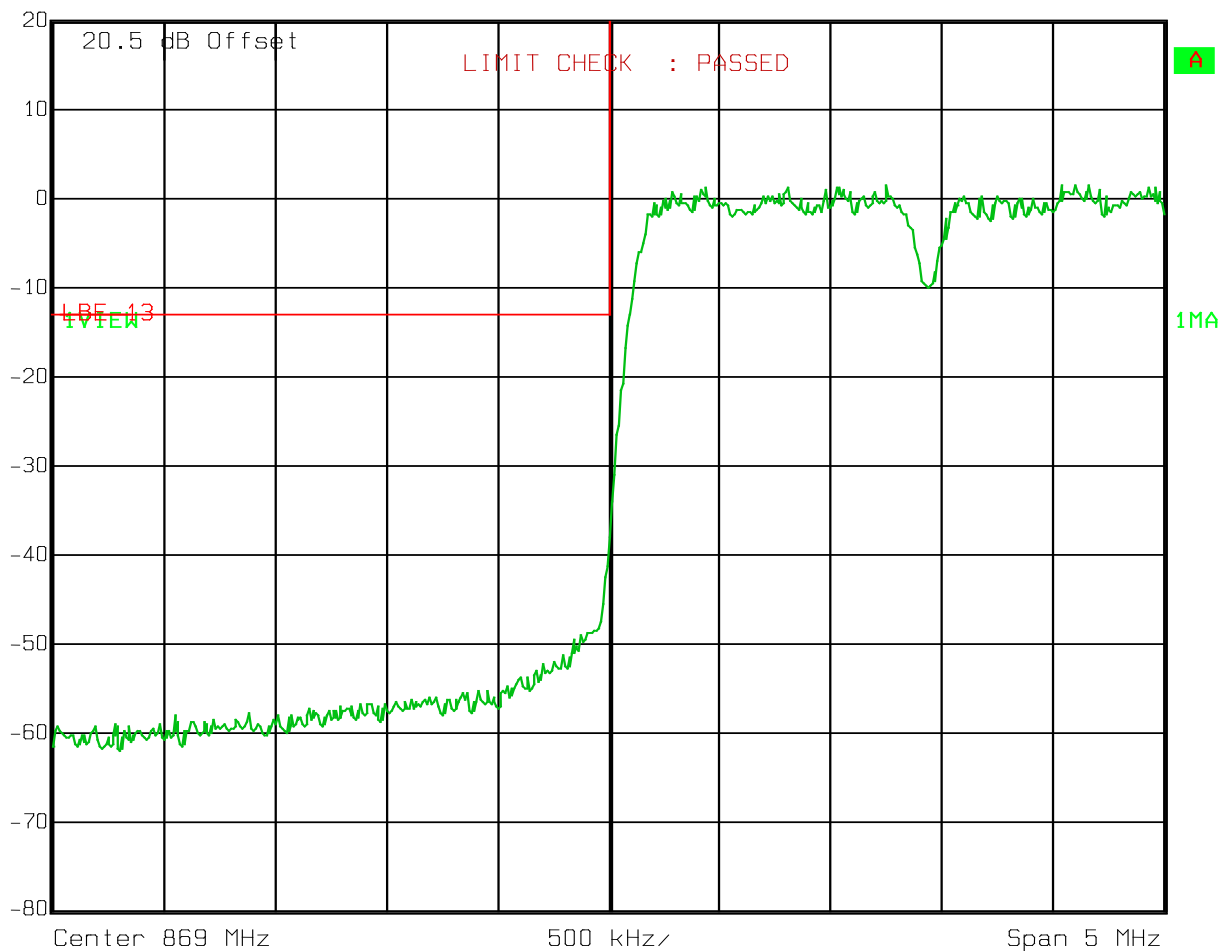
Lower Bandedge Intermodulation

CDMA

Downlink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 10:58:16

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

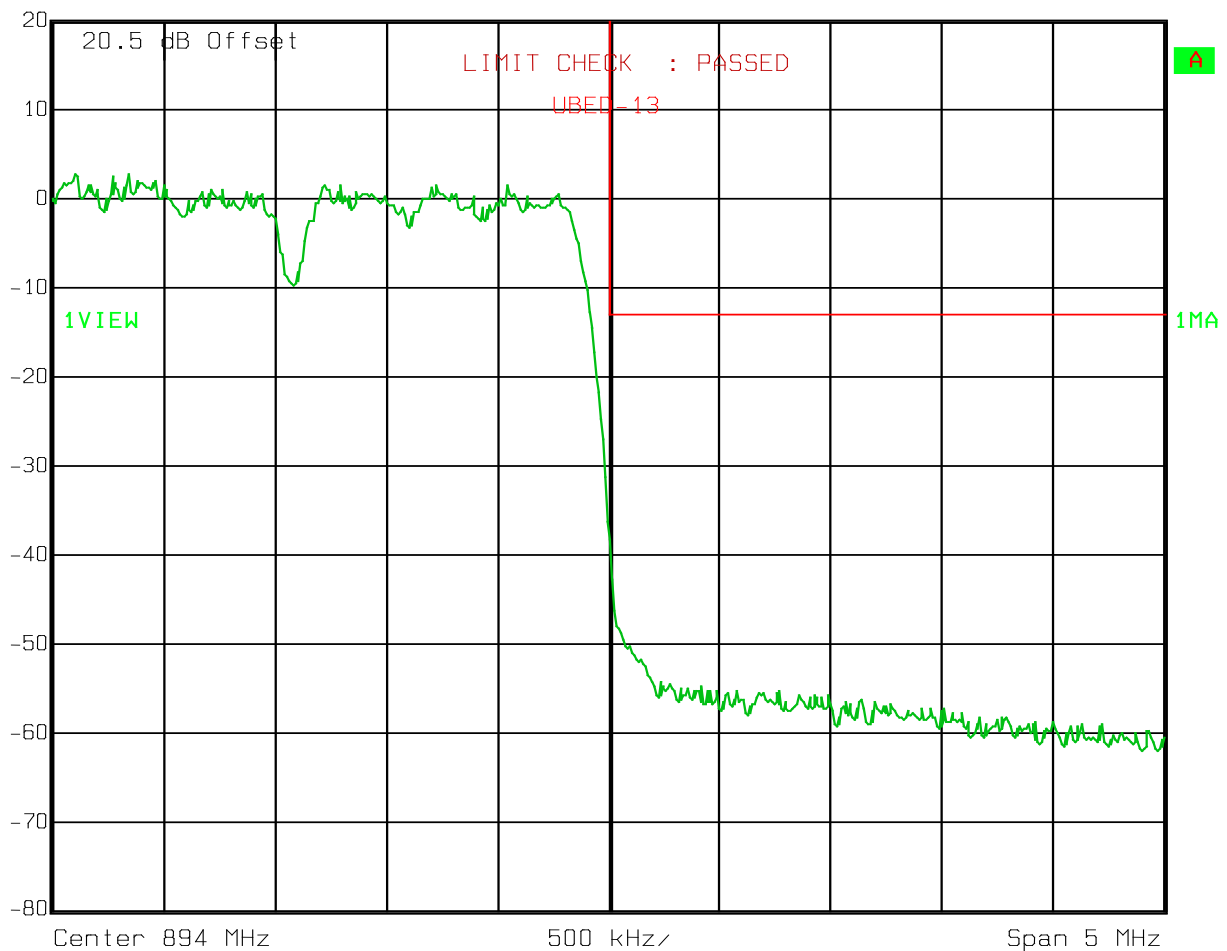
Upper Bandedge Intermodulation

CDMA

Downlink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 10:59:40

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

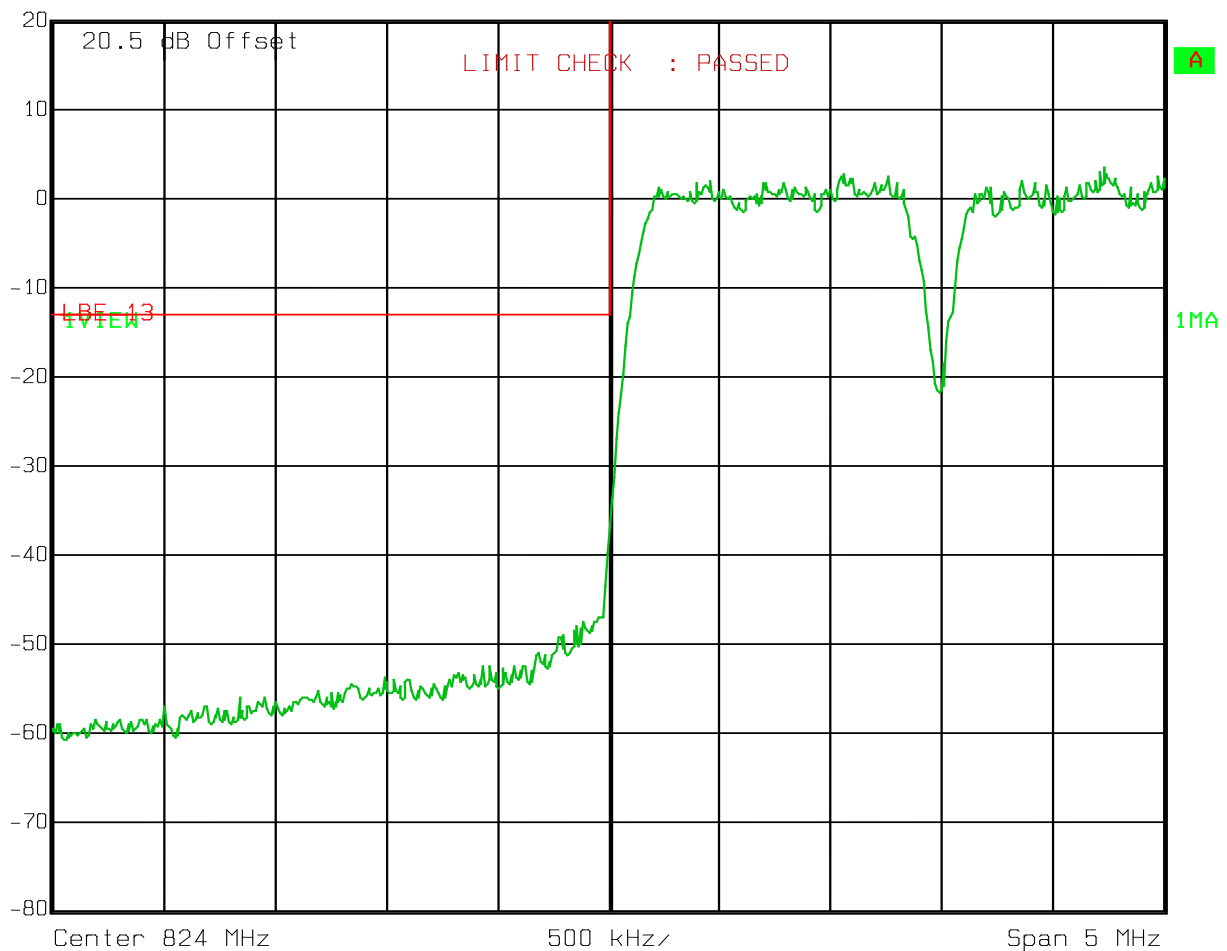
Lower Bandedge Intermodulation

CDMA

Uplink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 10:09:47

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

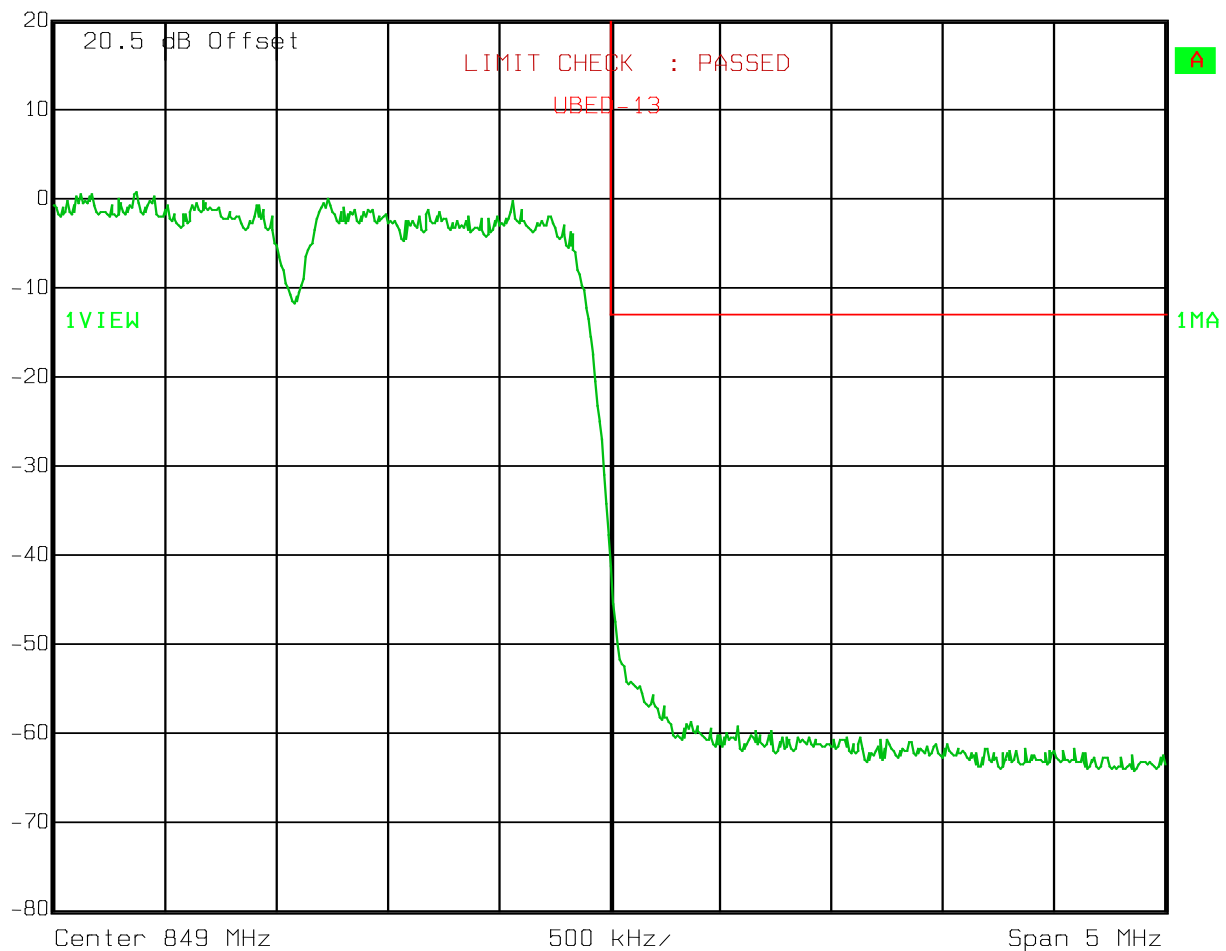
Upper Bandedge Intermodulation

CDMA

Uplink

Ref Lvl
20 dBm

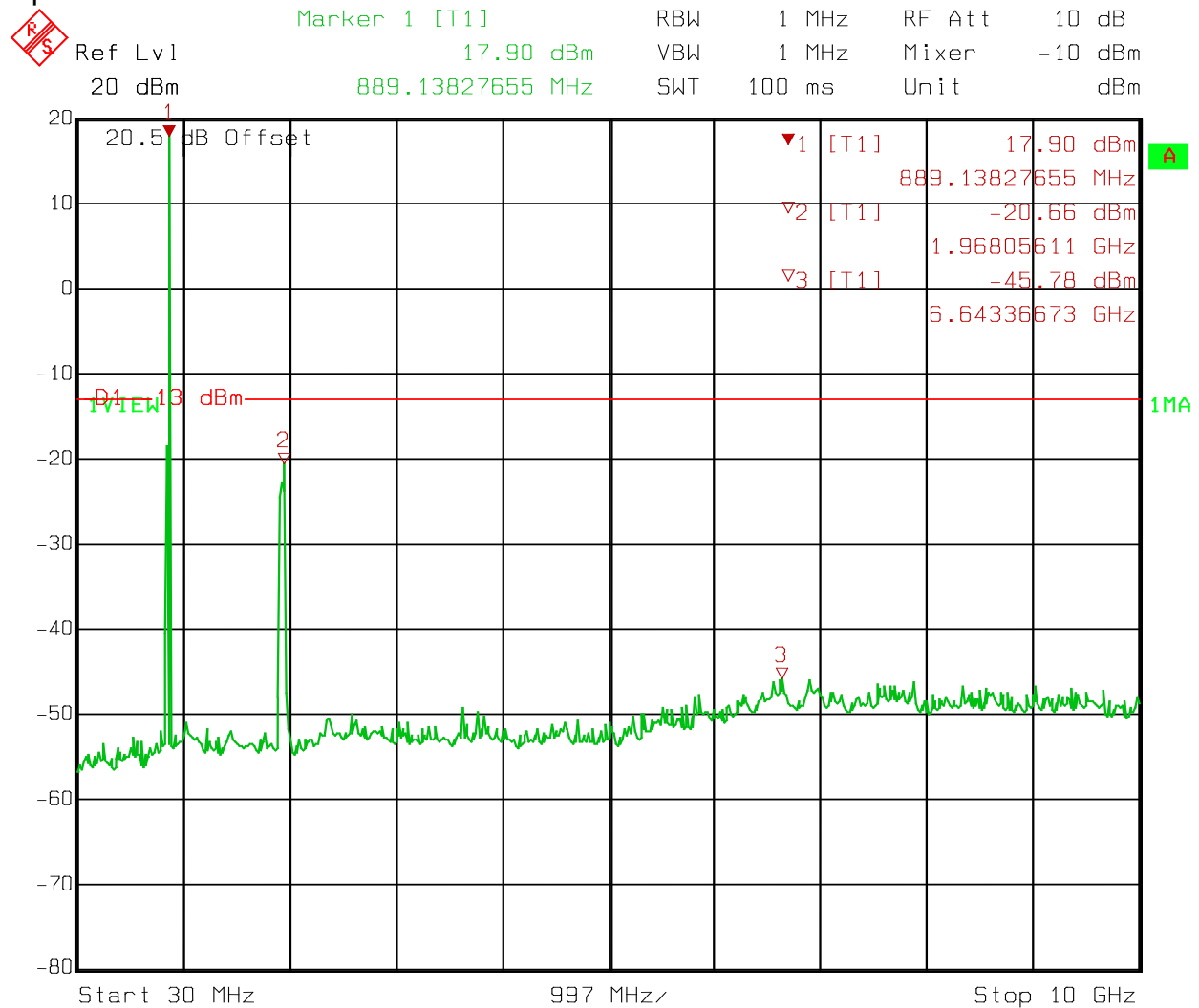
RBW	30 kHz	RF Att	10 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 26.JAN.2010 10:11:07

Test Data – Spurious Emissions at Antenna Terminals

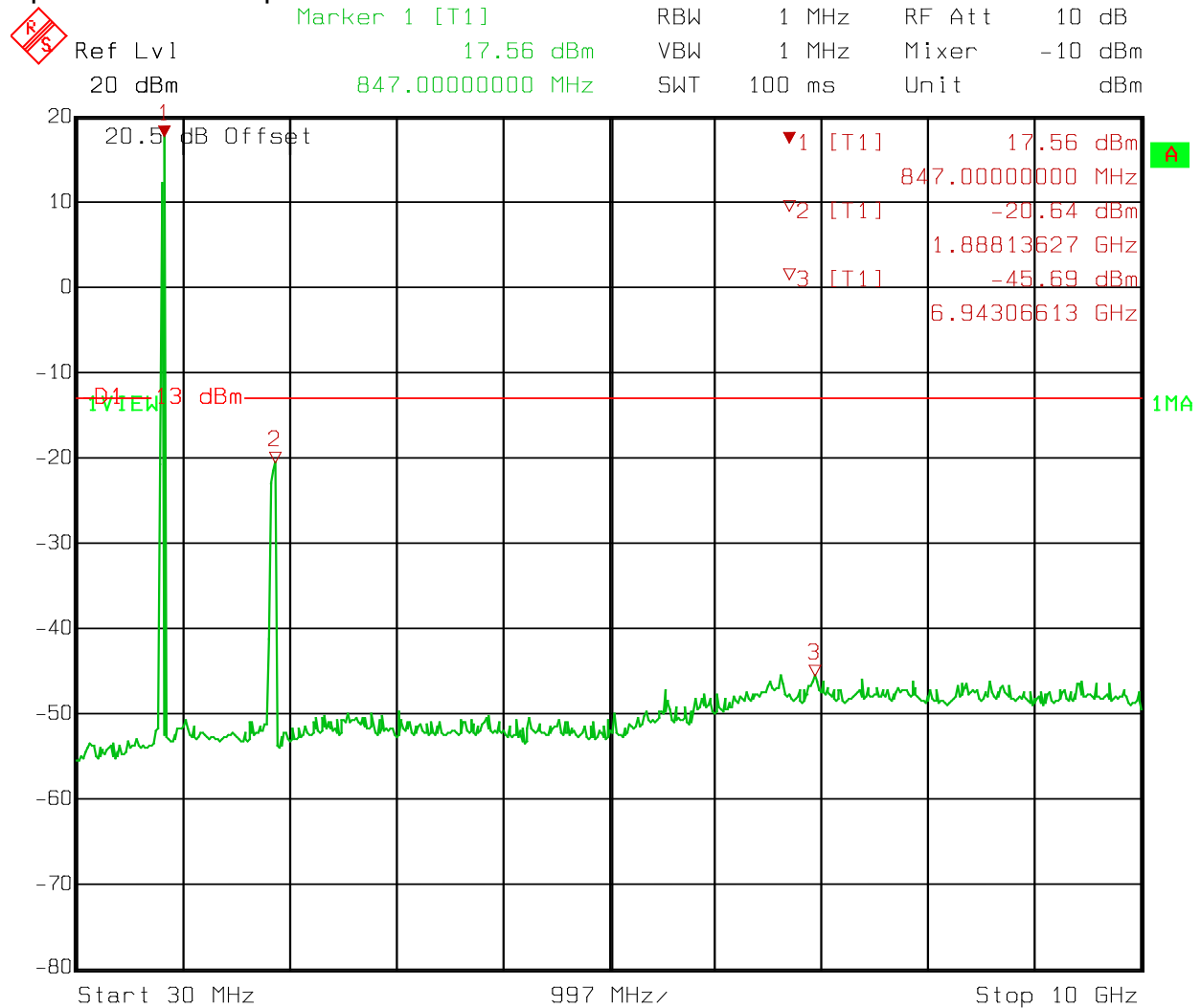
Spurs – CDMA - Downlink



Date: 26.JAN.2010 11:01:27

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

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

Date: 26.JAN.2010 10:12:42

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

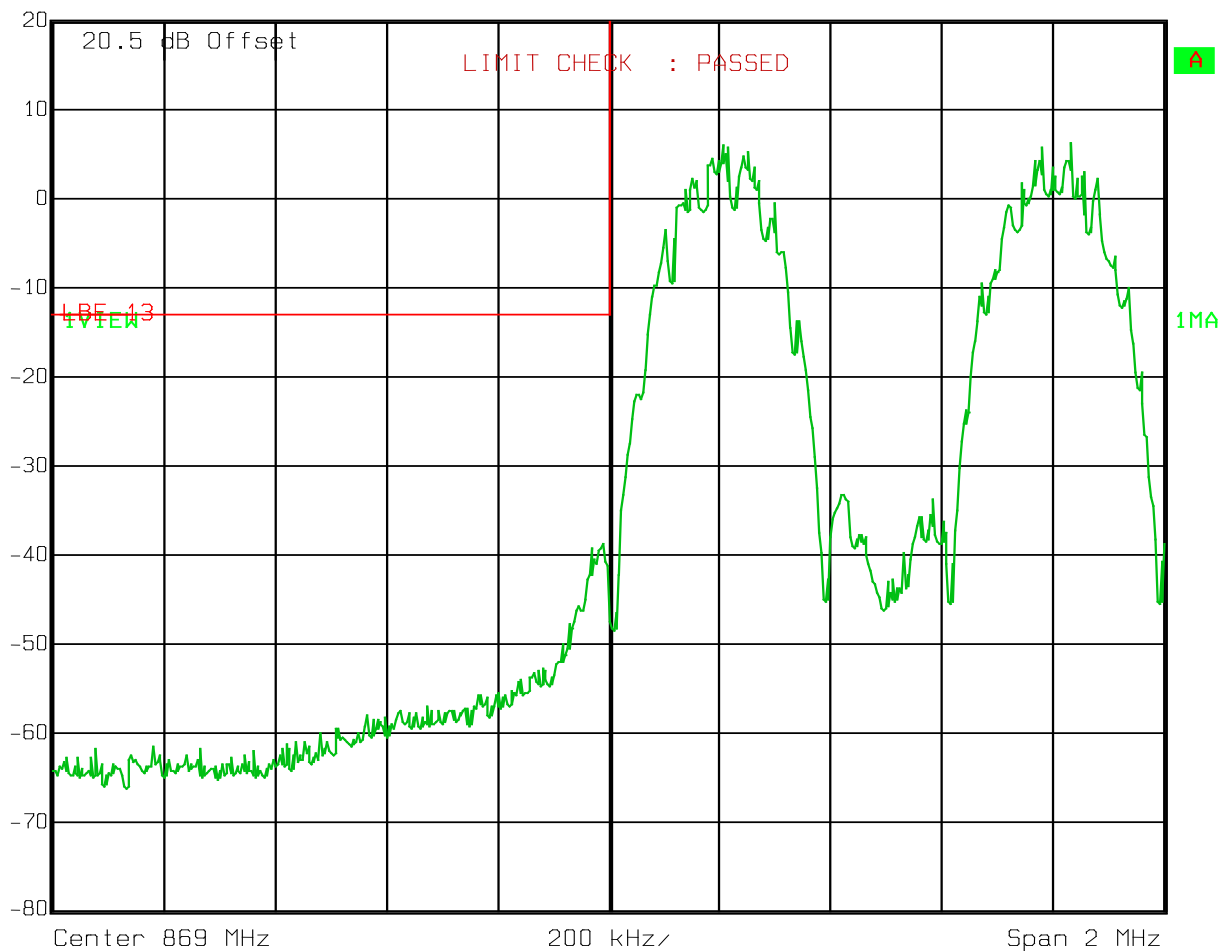
Lower Bandedge Intermodulation

EDGE

Downlink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 11:03:19

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

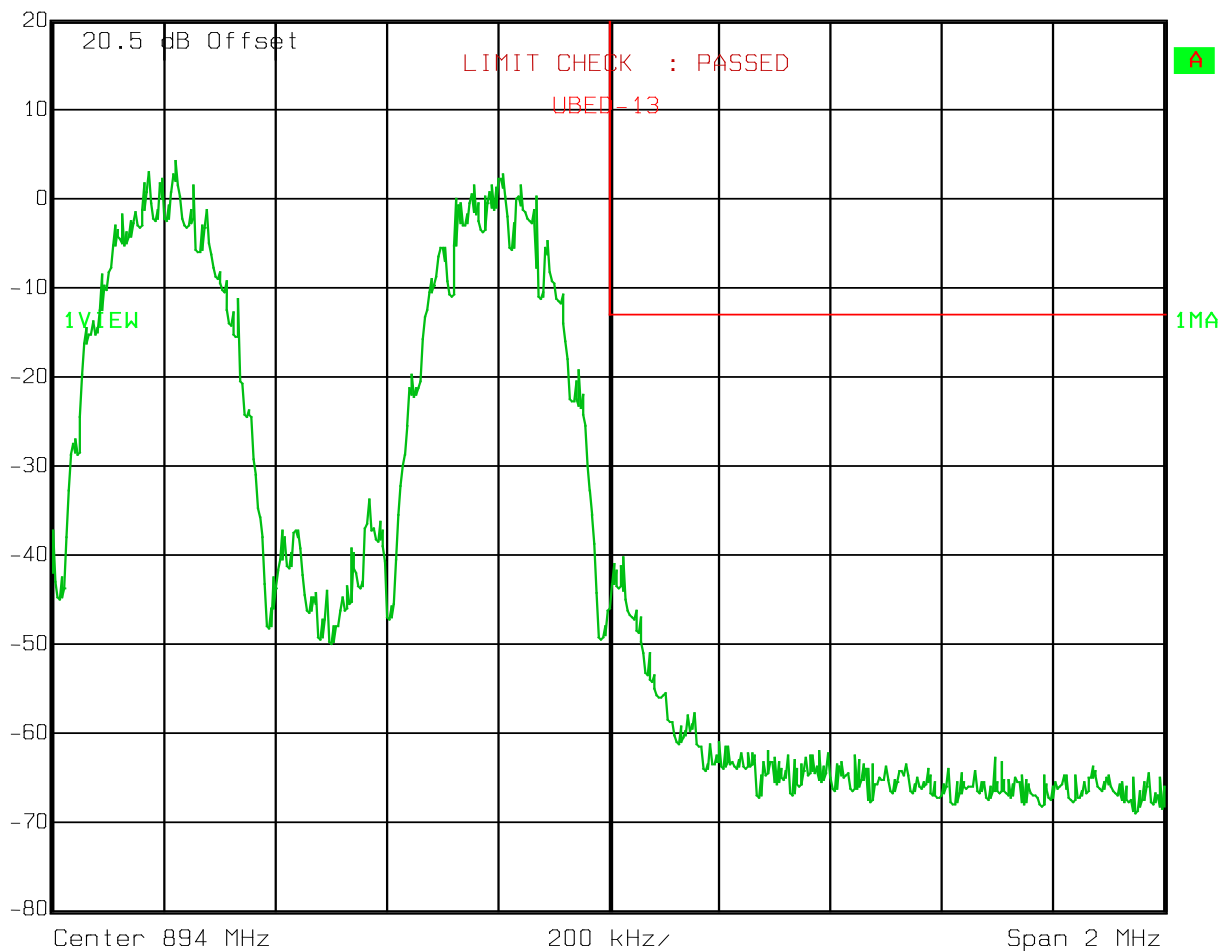
Upper Bandedge Intermodulation

EDGE

Downlink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 11:04:06

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

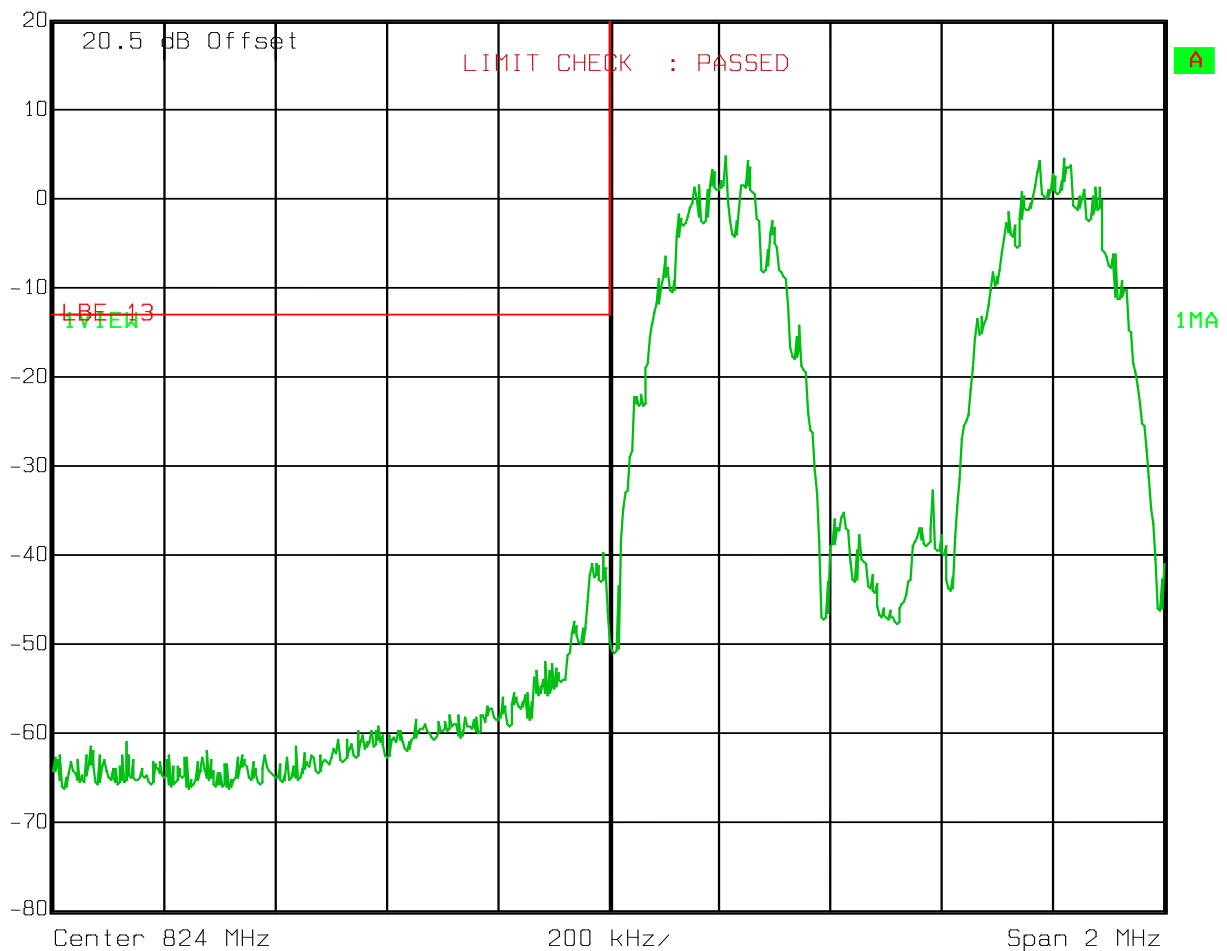
Lower Bandedge Intermodulation

EDGE

Uplink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 10:14:38

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

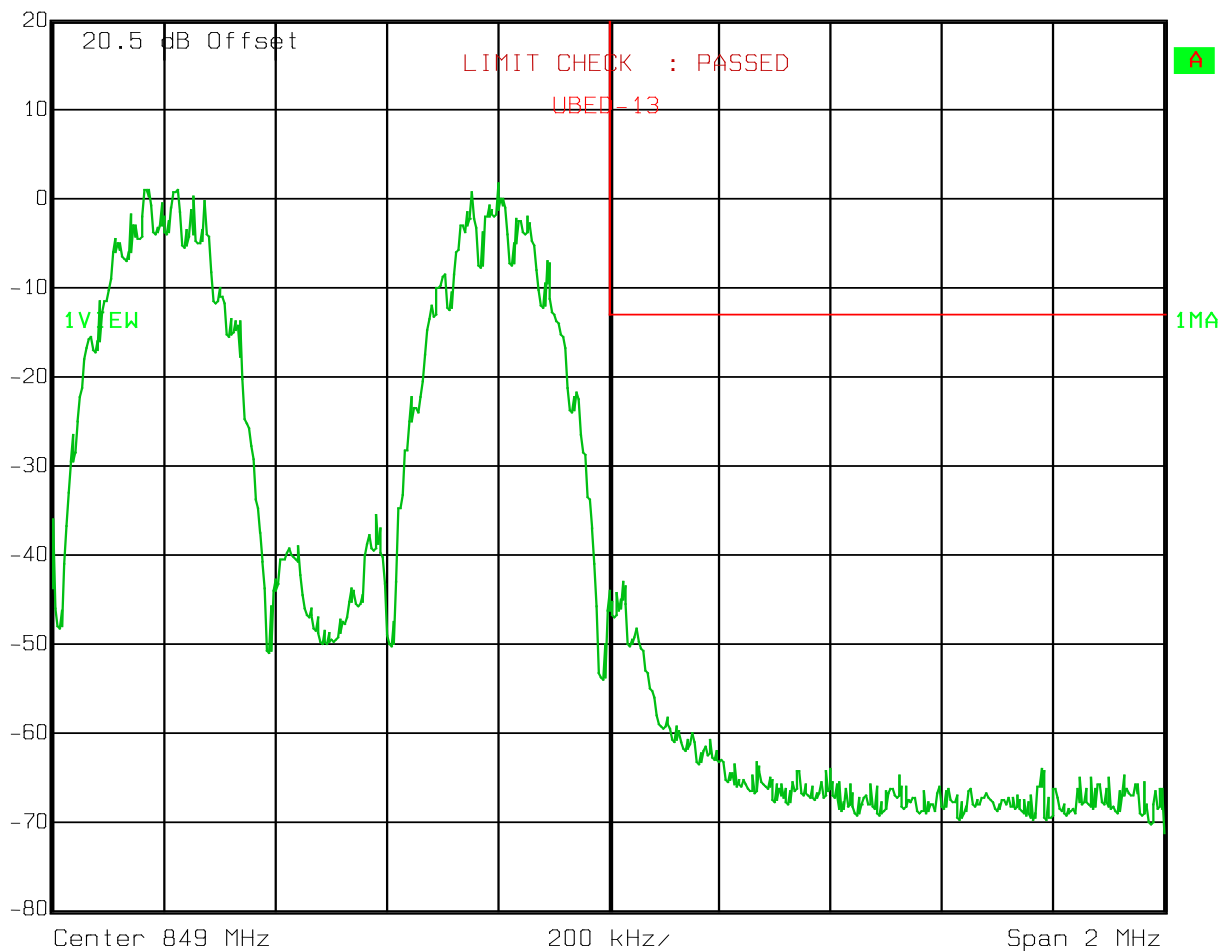
Upper Bandedge Intermodulation

EDGE

Uplink

Ref Lvl
20 dBm

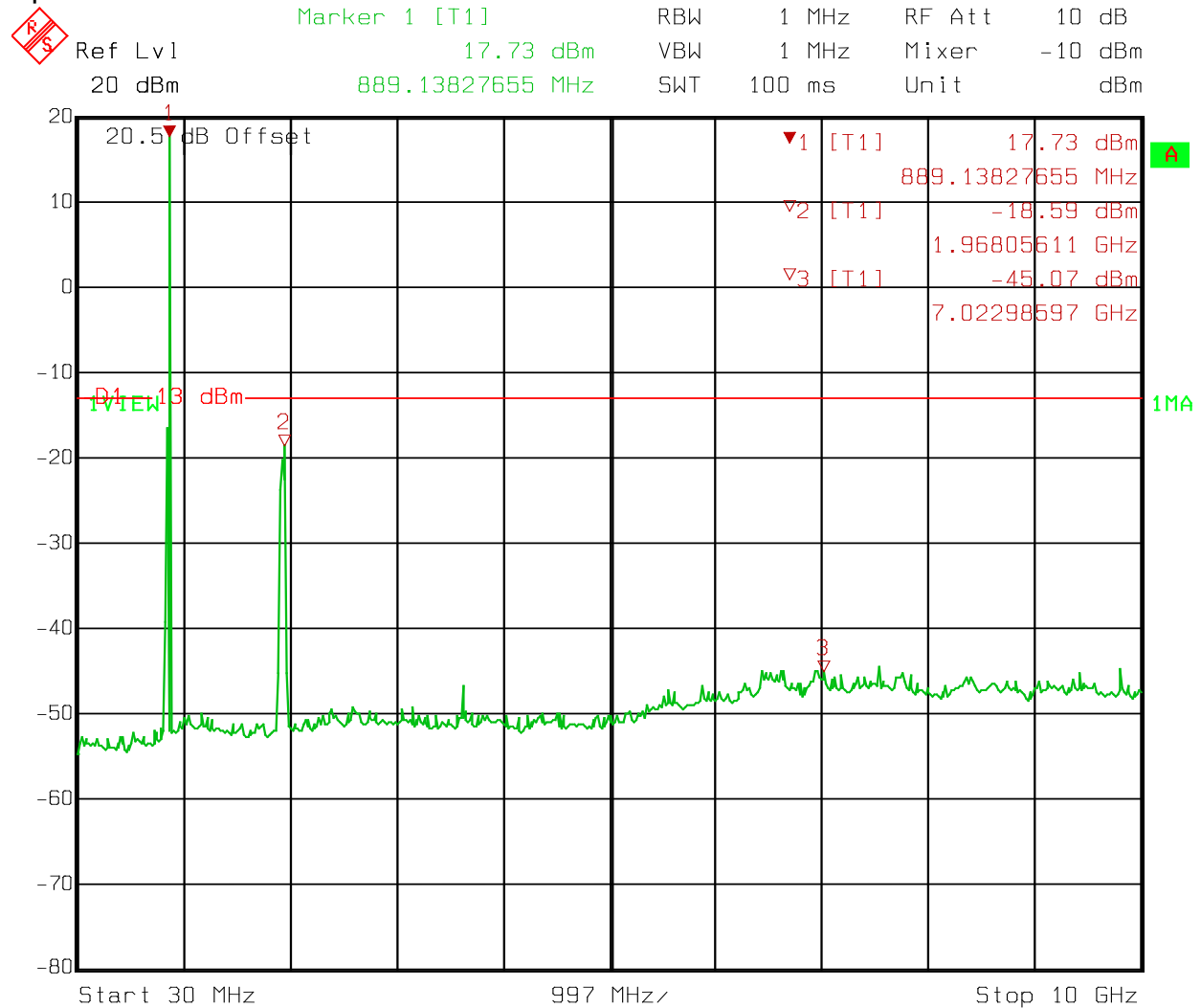
RBW	3 kHz	RF Att	10 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



Date: 26.JAN.2010 10:15:29

EQUIPMENT: **MR8518/1918/1918**

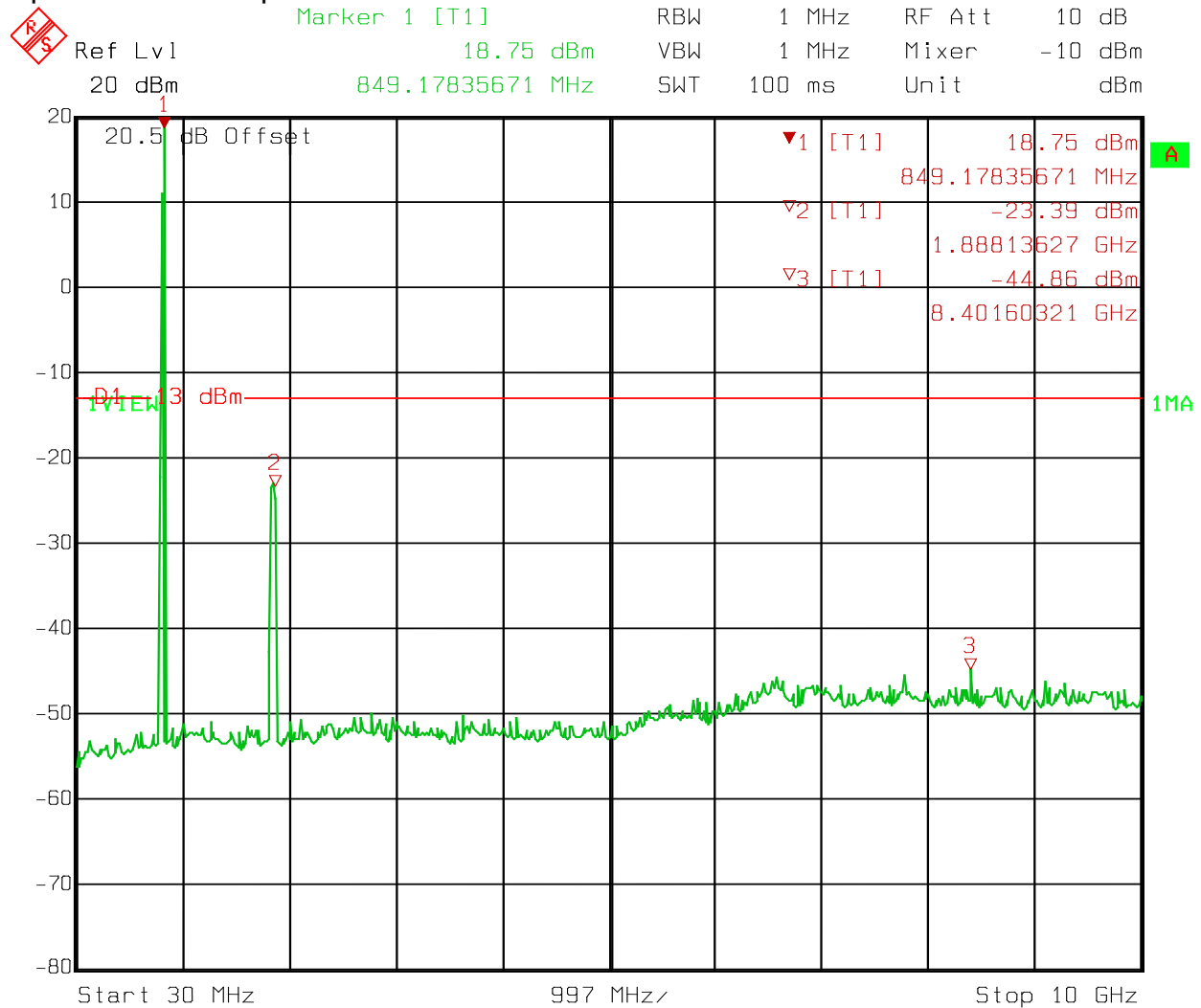
PROJECT NO.: 41242RUS1

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

Date: 26.JAN.2010 11:05:20

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

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

Date: 26.JAN.2010 10:17:51

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

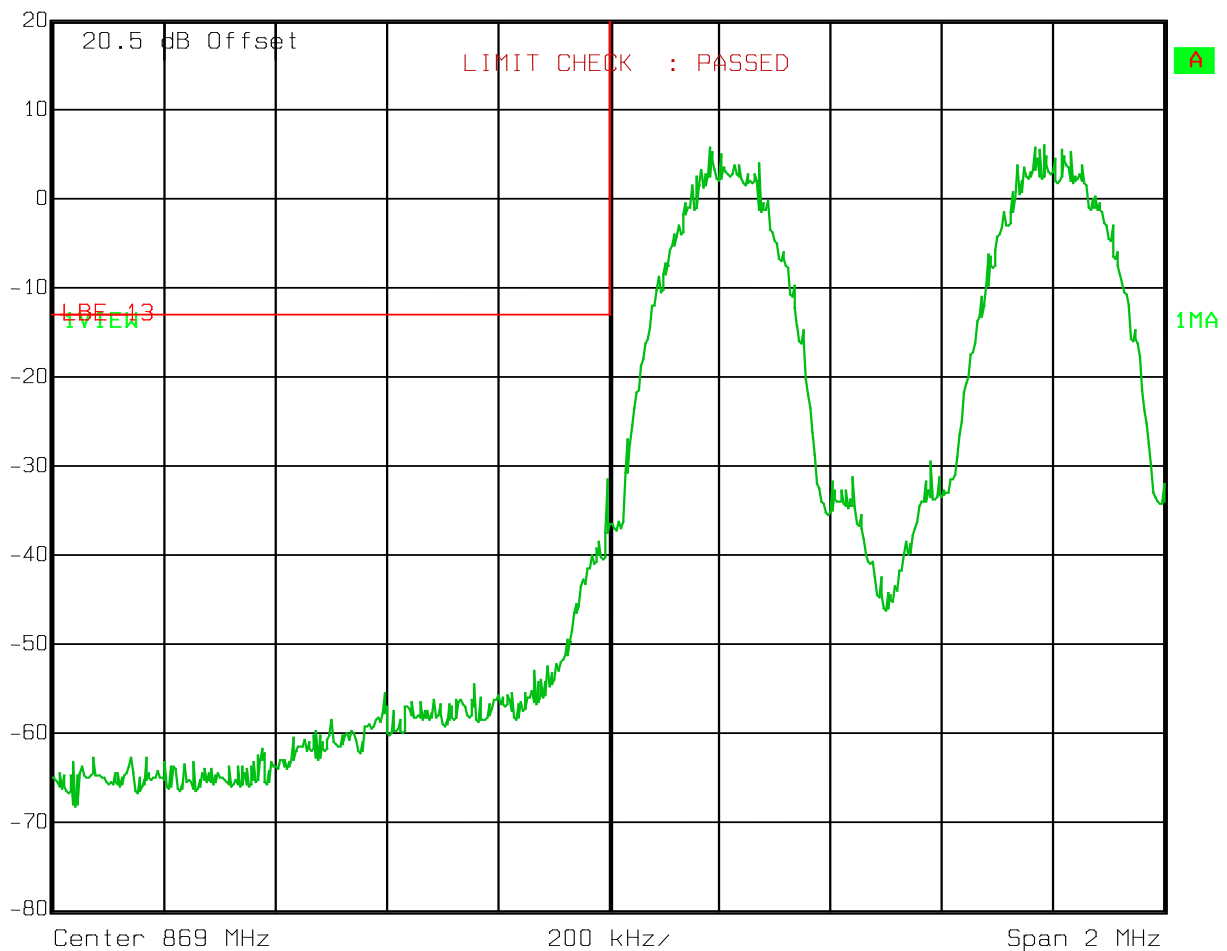
Lower Bandedge Intermodulation

GSM

Downlink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 11:07:04

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

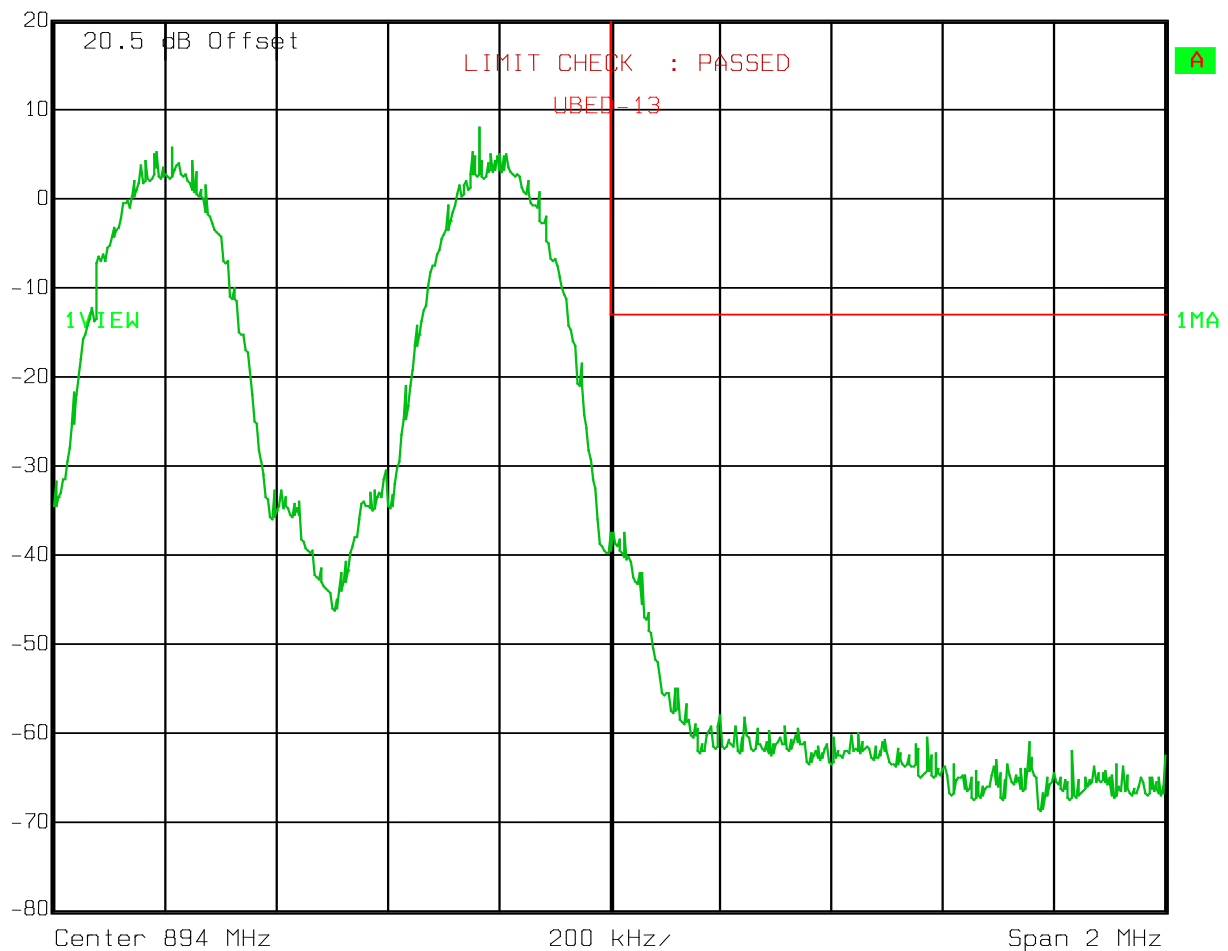
Upper Bandedge Intermodulation

GSM

Downlink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 11:08:15

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

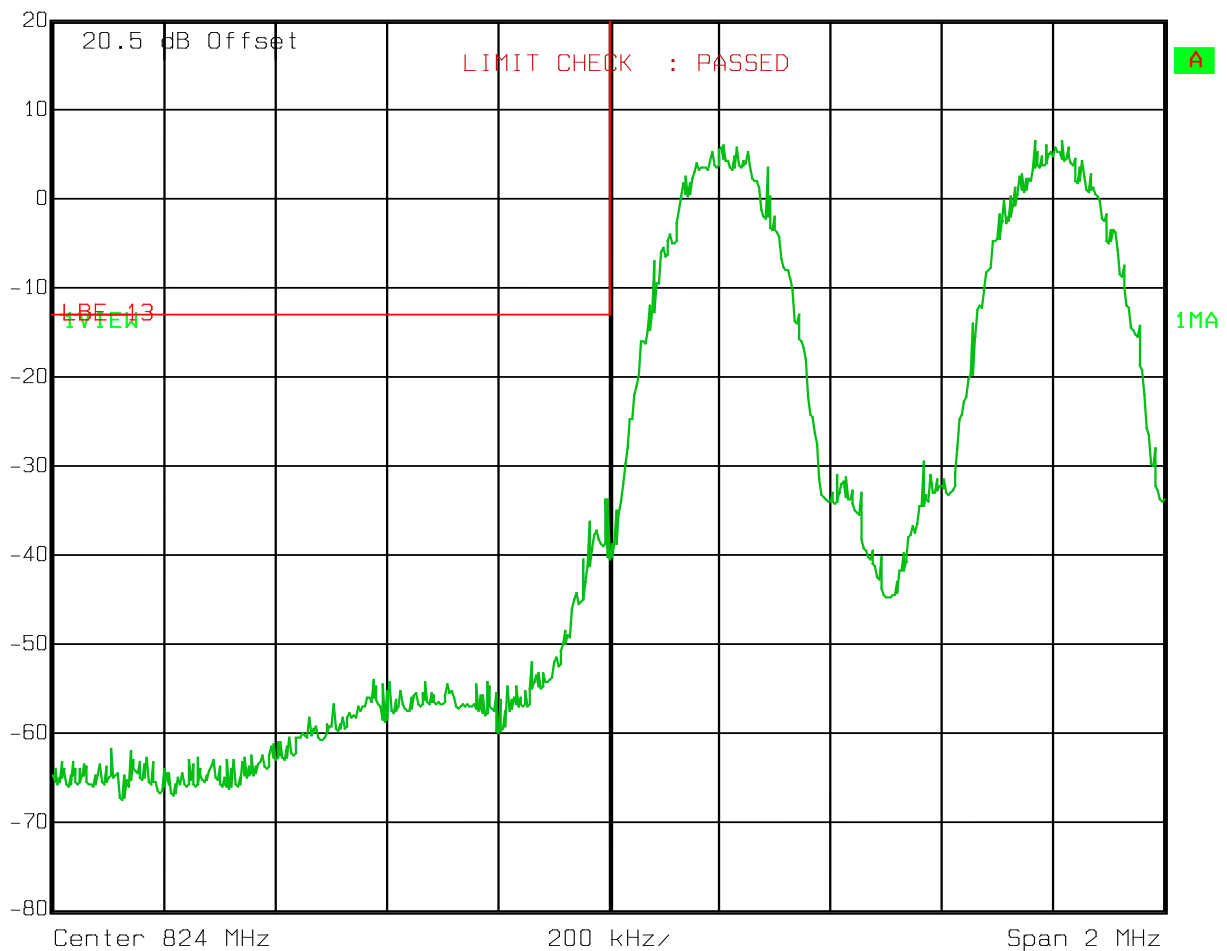
Lower Bandedge Intermodulation

GSM

Uplink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 10:19:30

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

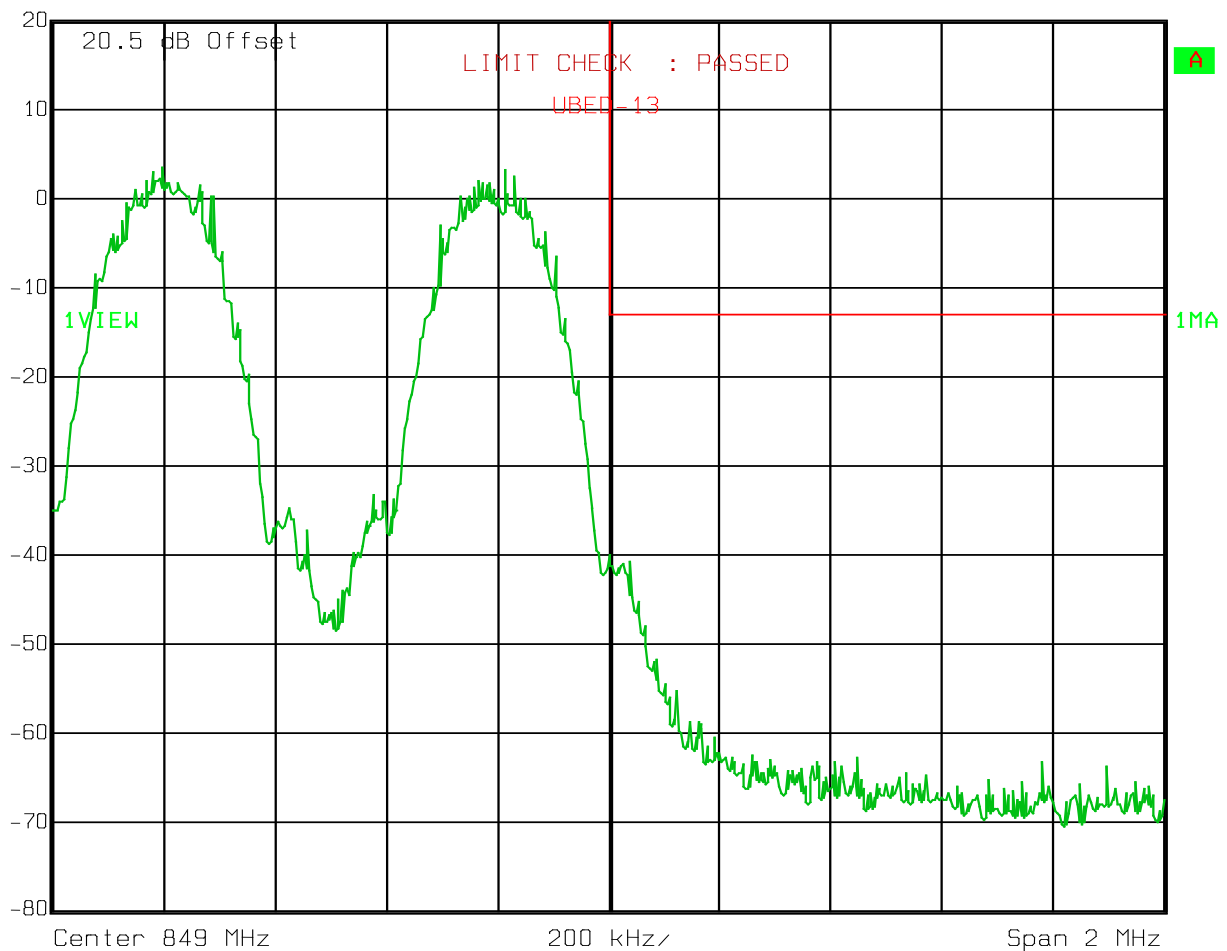
Upper Bandedge Intermodulation

GSM

Uplink

Ref Lvl
20 dBm

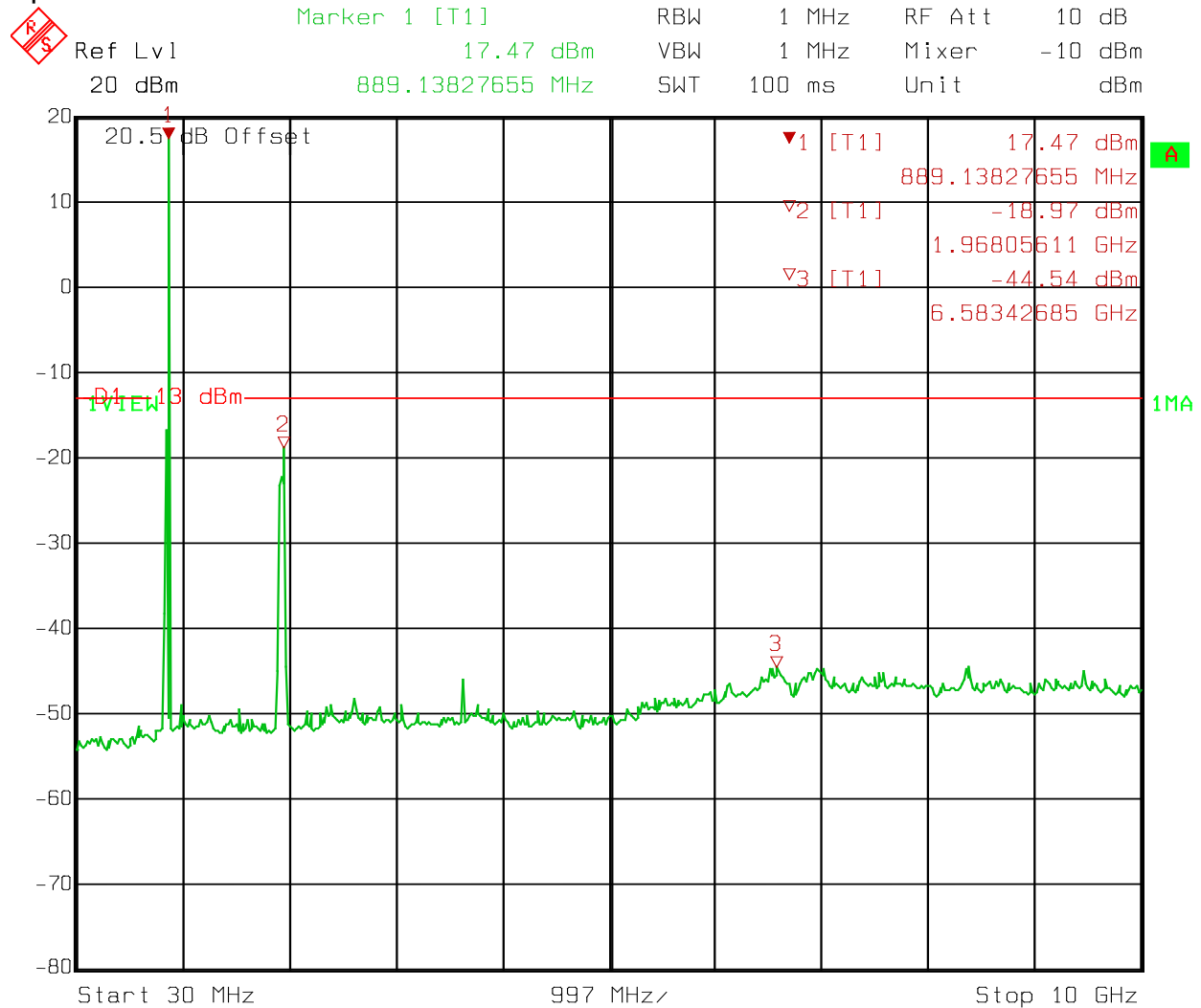
RBW	3 kHz	RF Att	10 dB
VBW	3 kHz	Mixer	-10 dBm
SWT	560 ms	Unit	dBm



Date: 26.JAN.2010 10:20:28

EQUIPMENT: **MR8518/1918/1918**

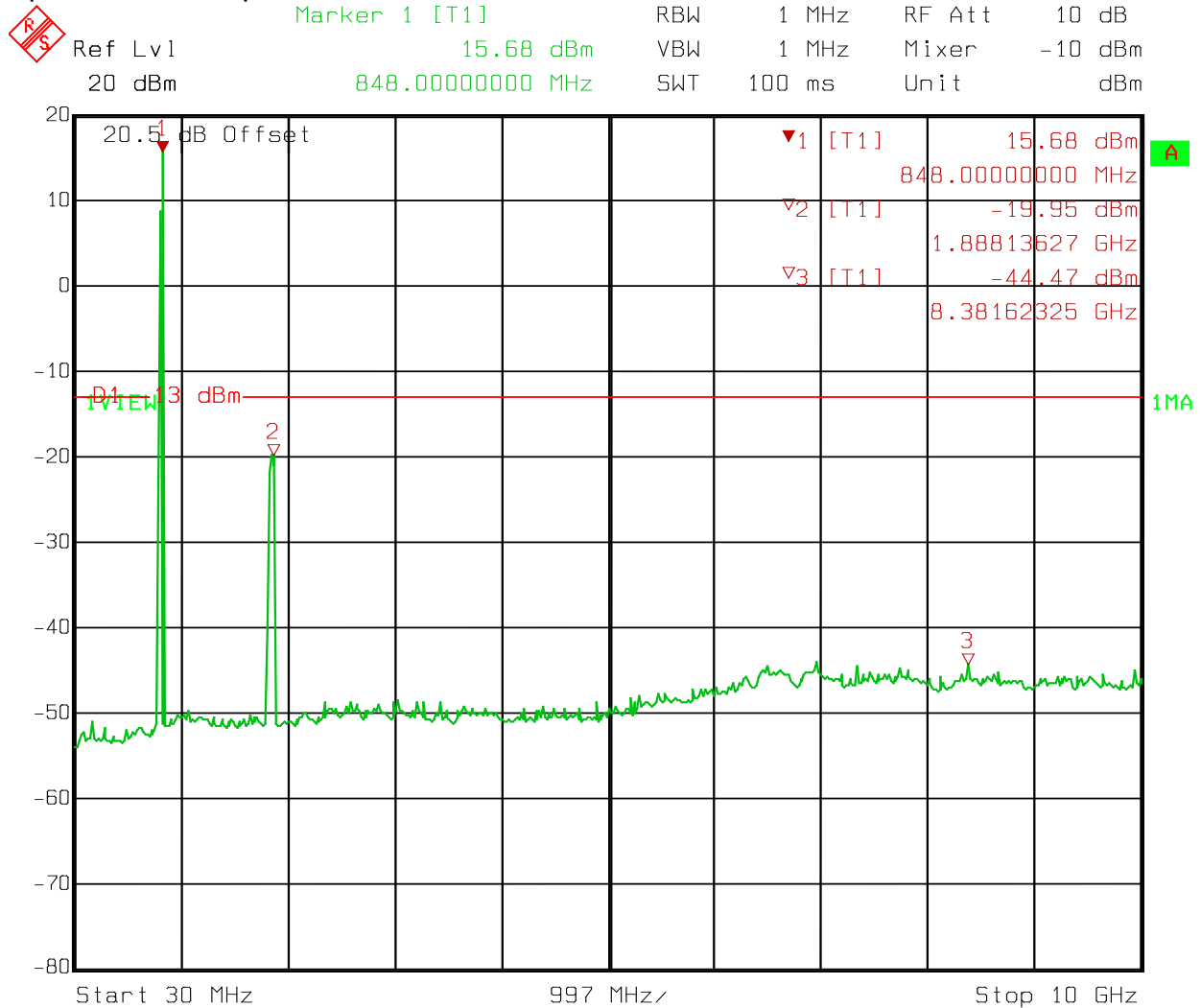
PROJECT NO.: 41242RUS1

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

Date: 26.JAN.2010 11:09:25

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

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

Date: 26.JAN.2010 10:22:13

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

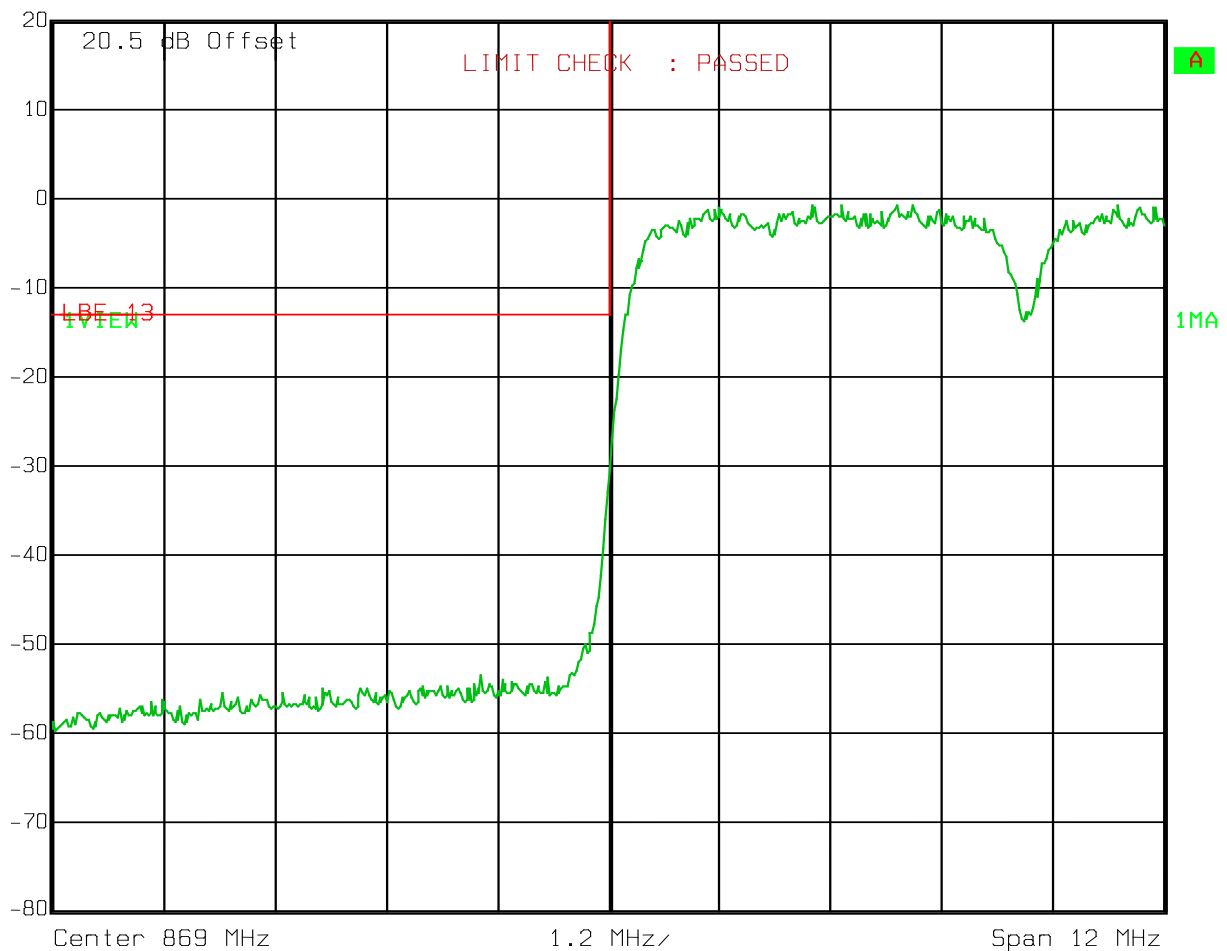
Lower Bandedge Intermodulation

W-CDMA

Downlink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 11:13:56

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

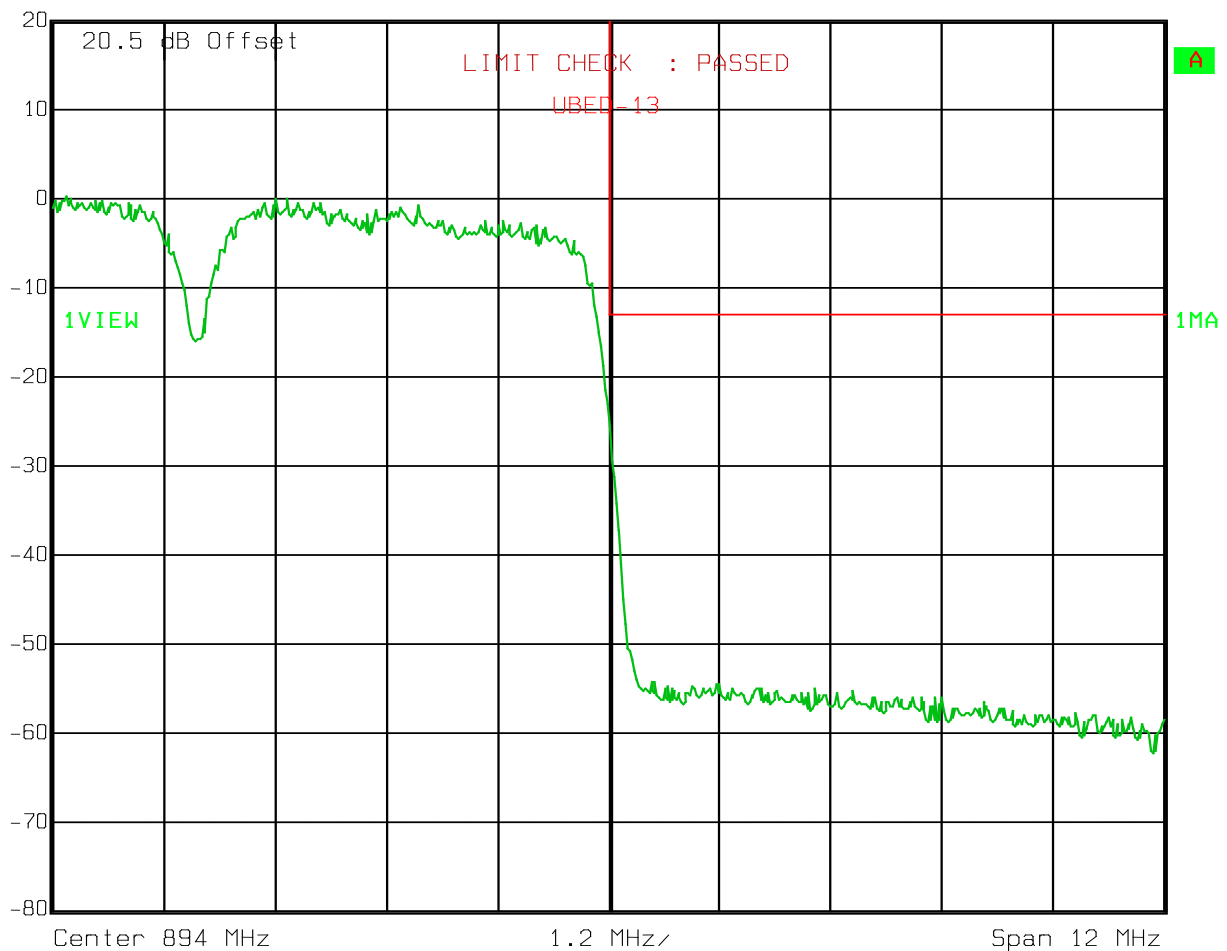
Upper Bandedge Intermodulation

W-CDMA

Downlink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 11:15:00

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

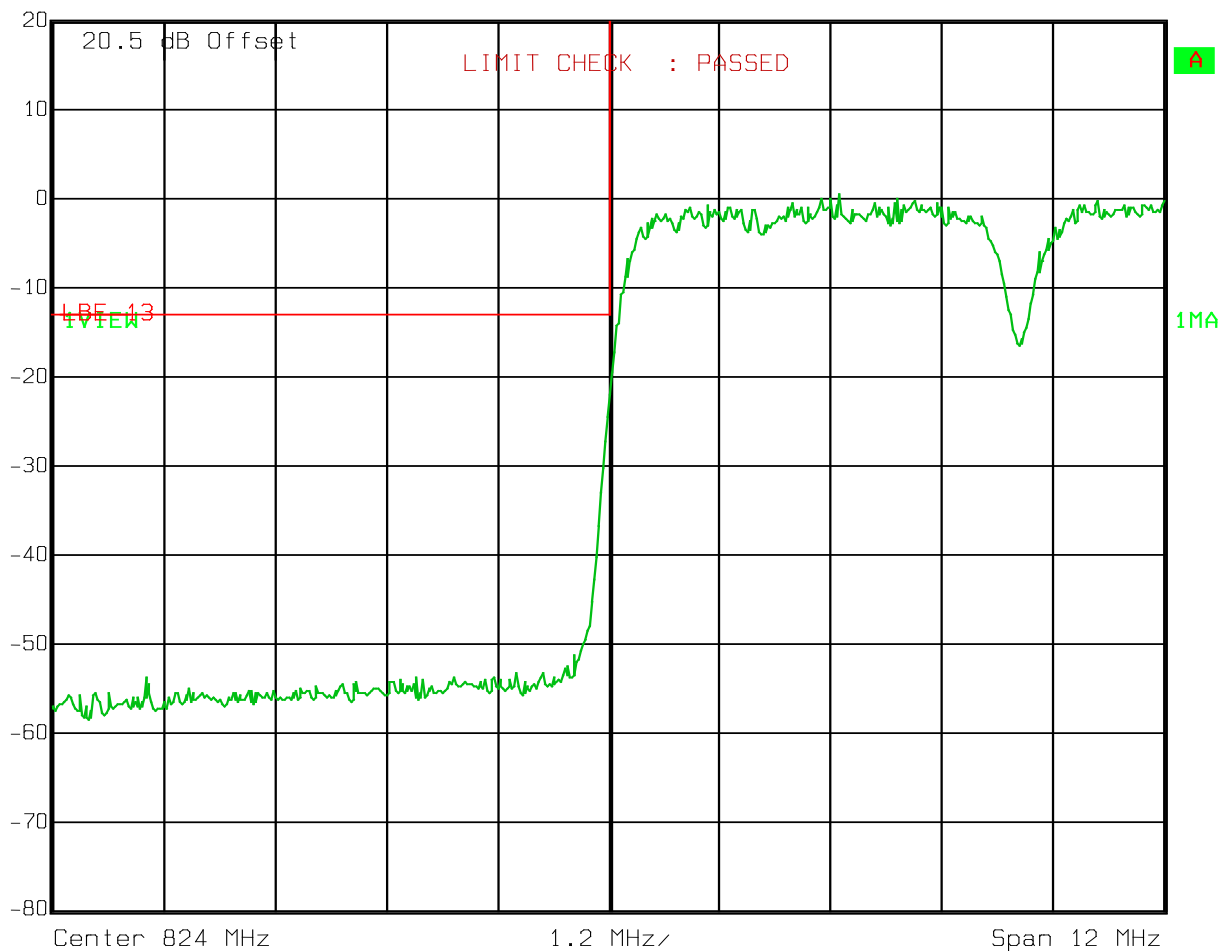
Lower Bandedge Intermodulation

W-CDMA

Uplink

Ref Lvl
20 dBm

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



Date: 26.JAN.2010 10:25:52

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

Test Data – Spurious Emissions at Antenna Terminals

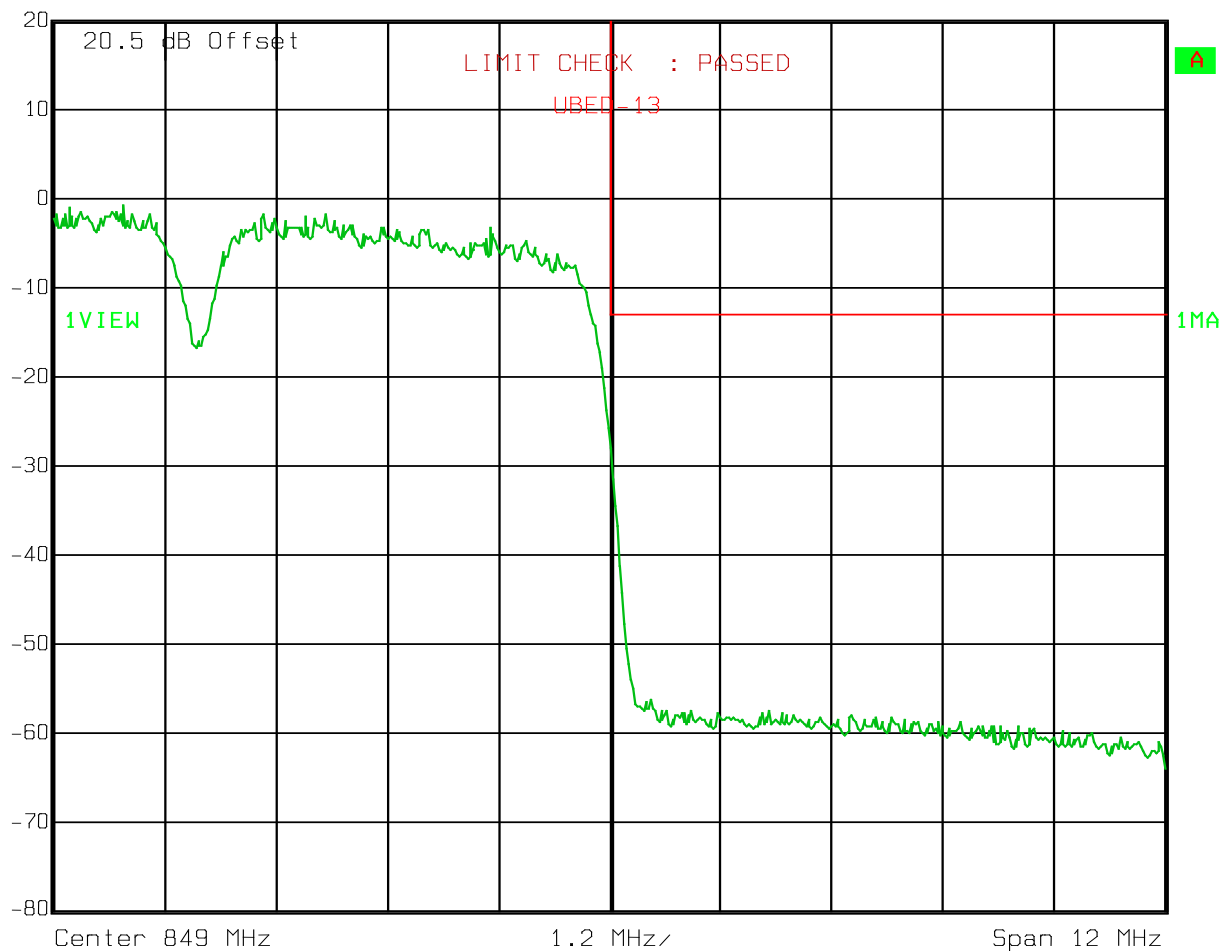
Upper Bandedge Intermodulation

W-CDMA

Uplink

Ref Lvl
20 dBm

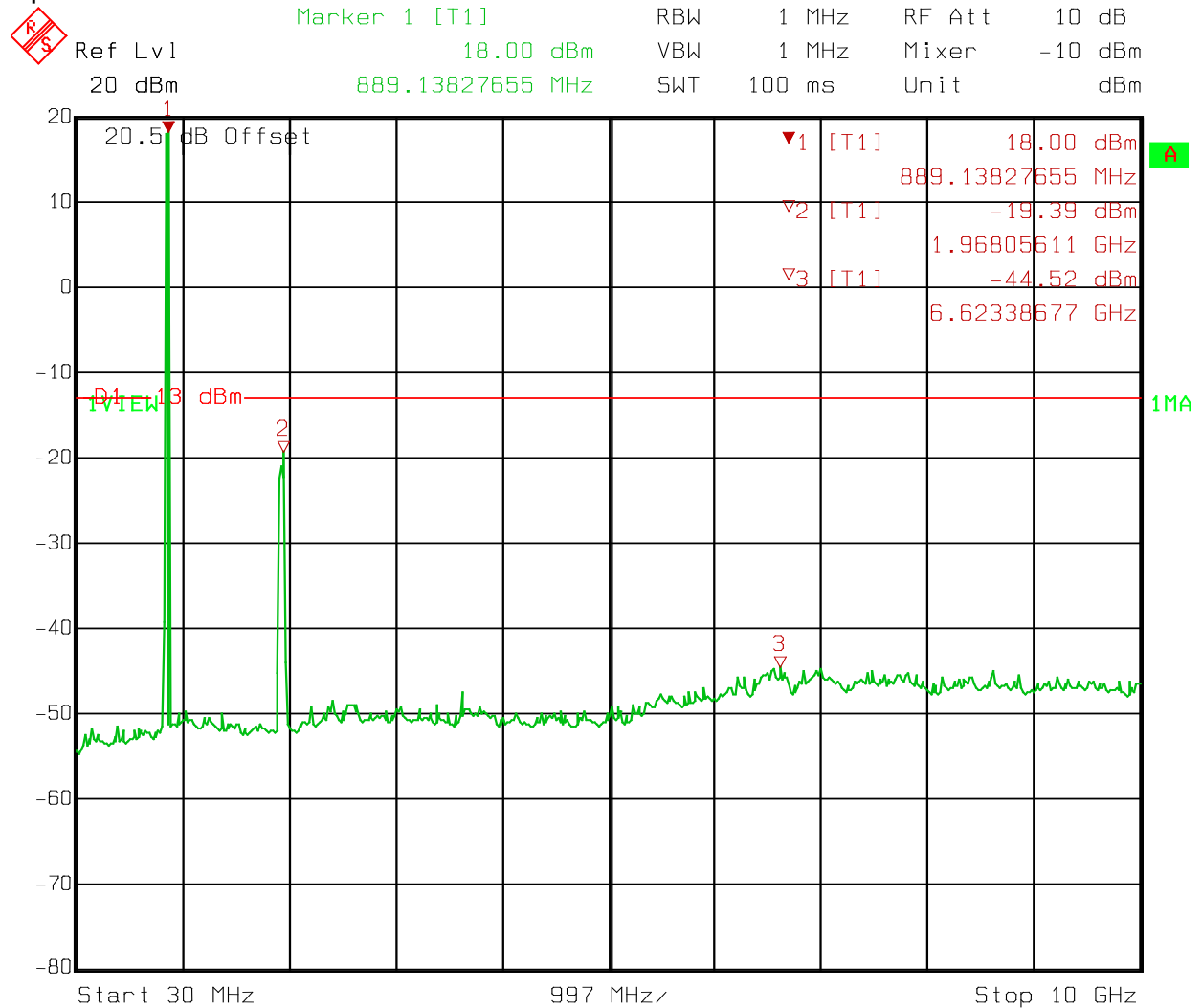
RBW	50 kHz	RF Att	10 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	12 ms	Unit	dBm



Date: 26.JAN.2010 10:27:01

EQUIPMENT: **MR8518/1918/1918**

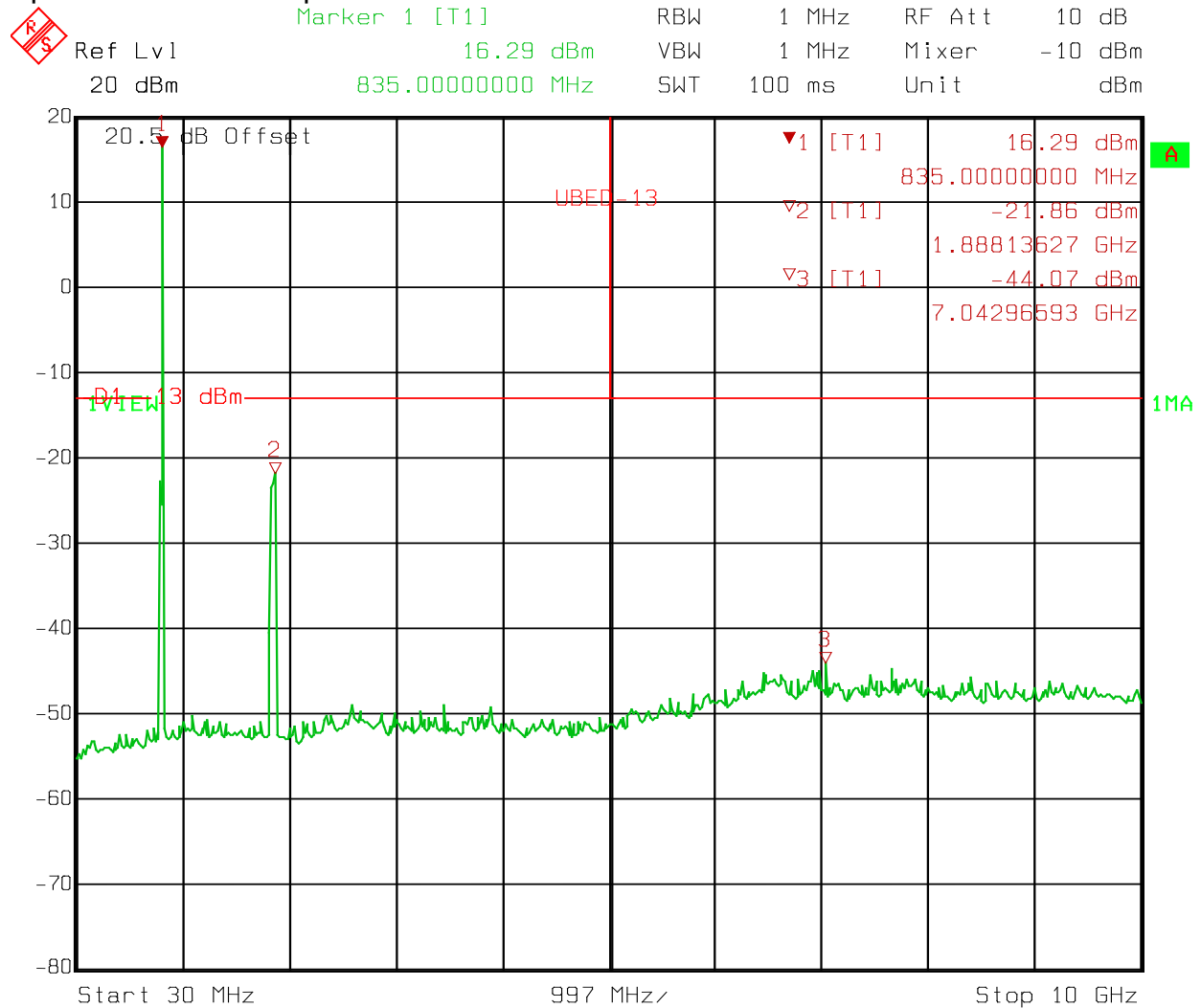
PROJECT NO.: 41242RUS1

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

Date: 26.JAN.2010 11:15:59

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

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

Date: 26.JAN.2010 10:28:13

EQUIPMENT: **MR8518/1918/1918**PROJECT NO.: 41242RUS1

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

EQUIPMENT: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

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: **MR8518/1918/1918**

PROJECT NO.: 41242RUS1

**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 (< 1 MHz 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

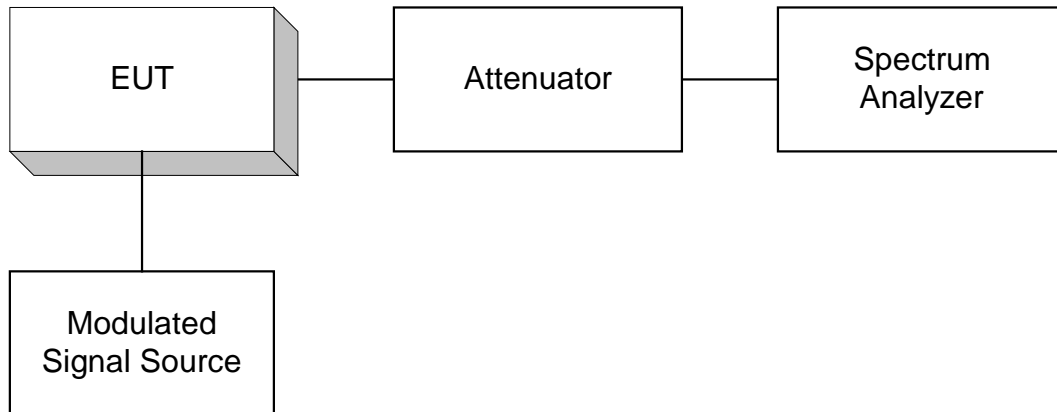
RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: \geq RBW
Sweep: Auto
Video Avg: Disabled

W-CDMA

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

ANNEX B - TEST DIAGRAMS

Para. No. 2.1049 - Occupied Bandwidth



Para. No. 2.1051 Spurious Emissions at Antenna Terminals

