



Nemko Test Report: 41242RUS2

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

Equipment Under Test: MR8518/1918/1918
(E.U.T.)

FCC Identifier: BCR-851919

In Accordance With: **CFR 47, Part 24, Subpart E**
Broadband PCS 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: 54

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Section 1. Summary of Test ResultsManufacturer: [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 24, Subpart E.



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 increase in gain is accomplished by removing 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".



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Nemko USA, Inc.

EQUIPMENT: MR8518/1918/1918

CFR 47, PART 24, SUBPART E
BROADBAND PCS REPEATERS
PROJECT NO.: 41247RUS2

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	24.232	100W	Not tested
Occupied Bandwidth	2.1049	Input/Output	Complies
Spurious Emissions at Antenna Terminals	24.238(a)	-13 dBm	Complies
Field Strength of Spurious Emissions	24.238(a)	-13 dBm E.I.R.P.	Not tested
Frequency Stability	24.235		NA

Footnotes:

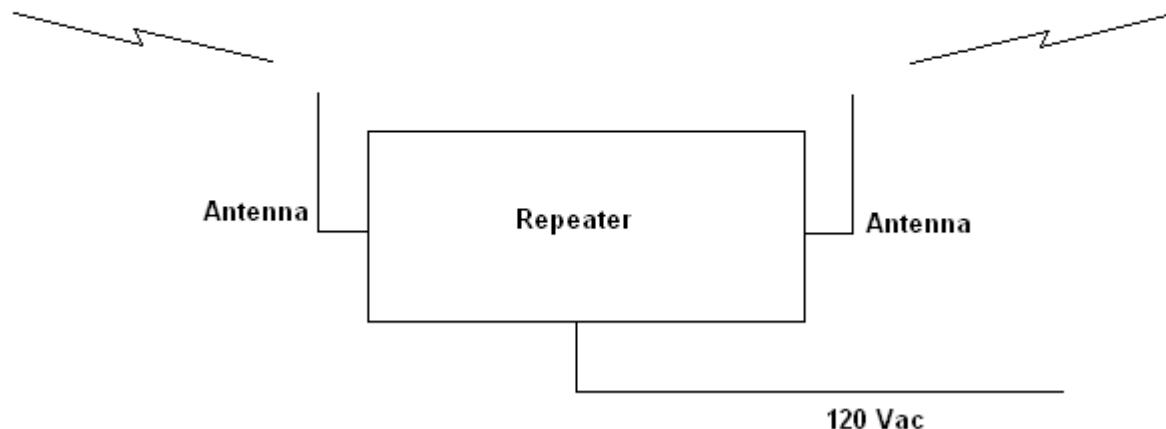
Section 2. General Equipment Specification

Supply Voltage Input:	120 Vac			
Frequency Range:	Downlink: 1930 to 1990 MHz*			
Frequency Range:	Uplink: 1850 to 1910 MHz*			
Type of Modulation and Designator:	CDMA (F9W) GSM (GXW) EDGE (G7W) W-CDMA (F9W)			
Output Impedance:	50 ohms			
RF Output (Rated):	Downlink	18 dBm (63.1 mW)		
RF Output (Rated):	Uplink	18 dBm (63.1 mW)		
Frequency Translation:	F1-F1 <input type="checkbox"/>		F1-F2 <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
Band Selection:	Software <input checked="" type="checkbox"/>	Duplexer Change <input type="checkbox"/>	Fullband Coverage <input type="checkbox"/>	

* Band employs two variable bandwidth filters adjustable 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

Section 3. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 24.238
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 %

Test Data – Occupied Bandwidth

CDMA - Output

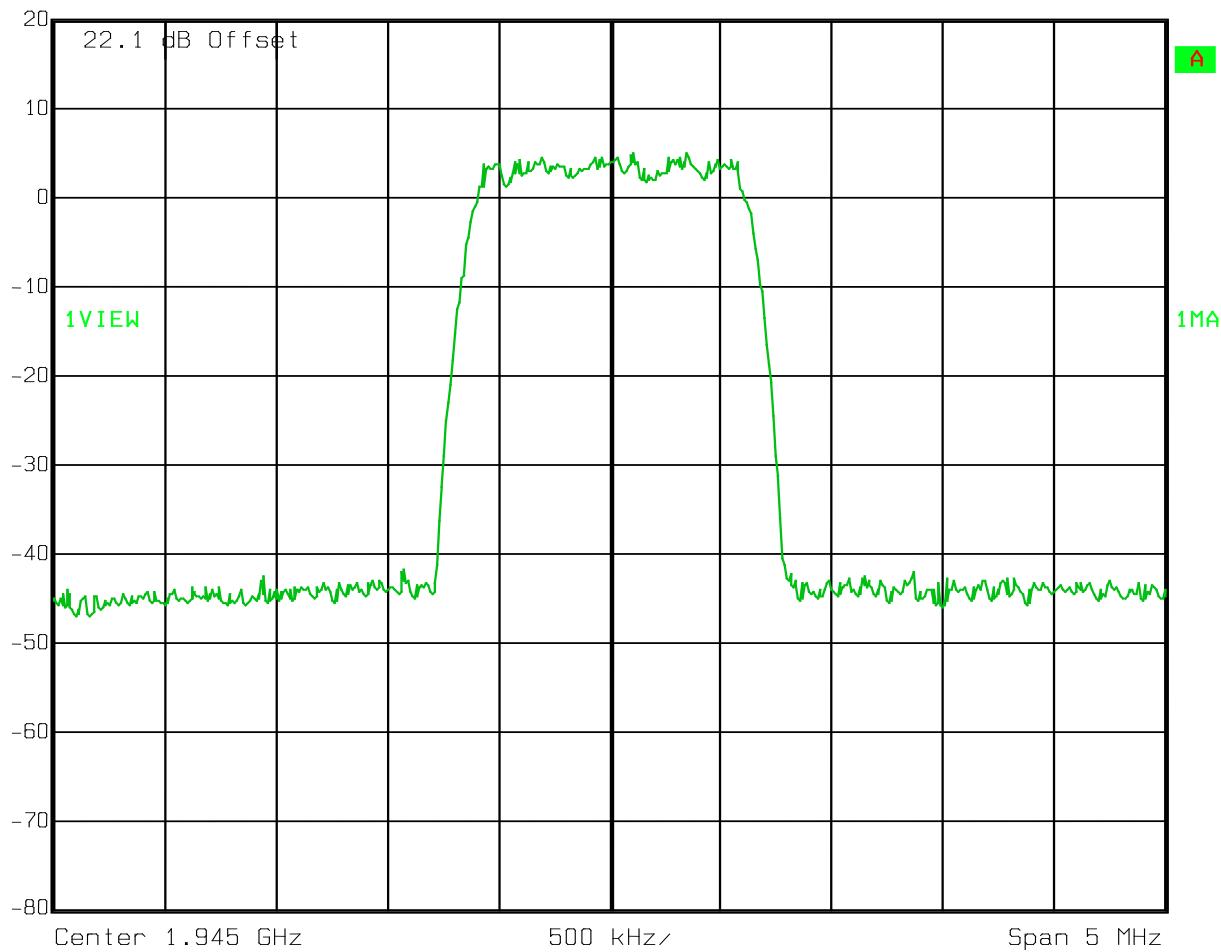
Downlink



Ref Lvl

20 dBm

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

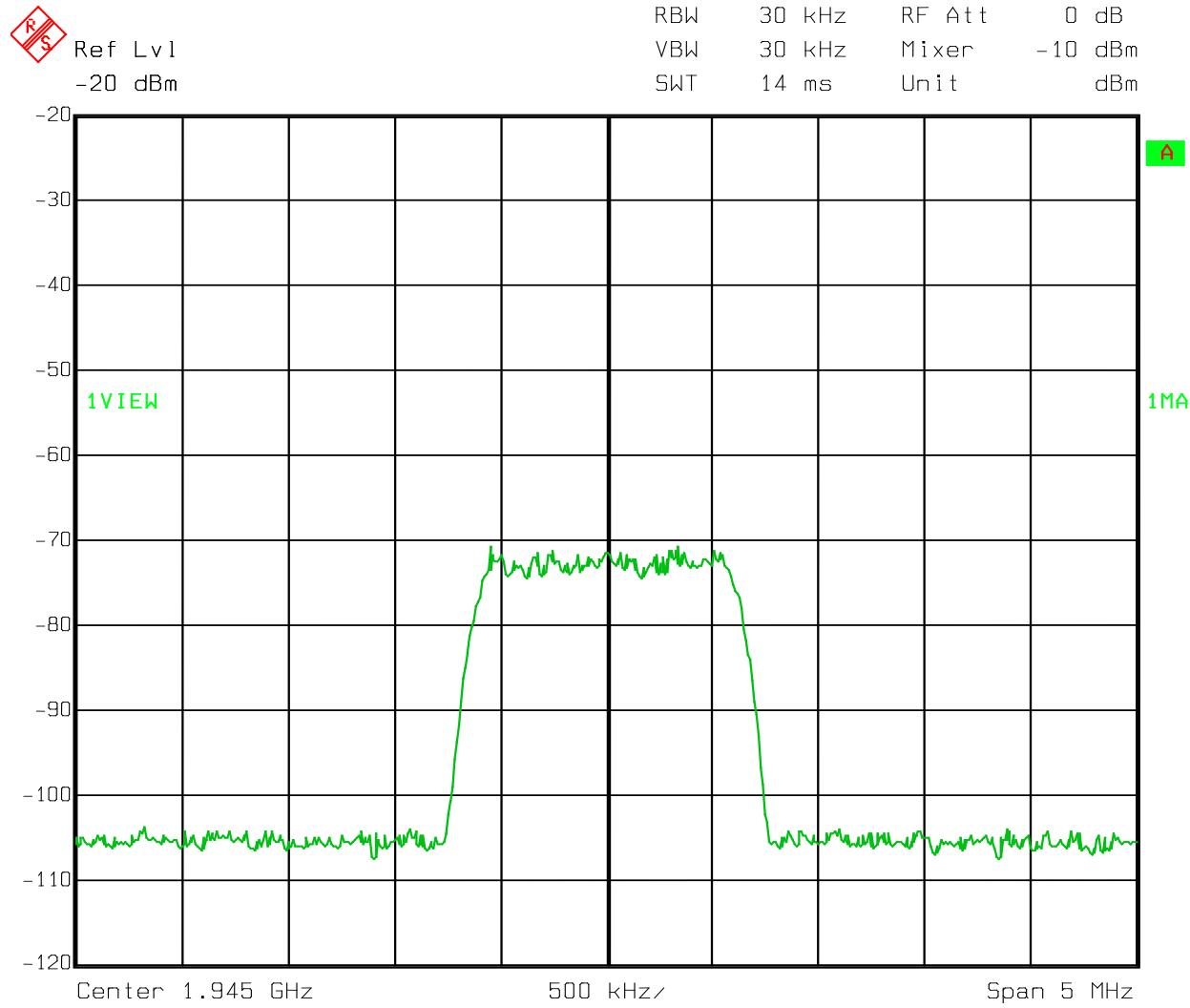


Date: 26.JAN.2010 11:29:07

Test Data – Occupied Bandwidth

CDMA - Input

Downlink

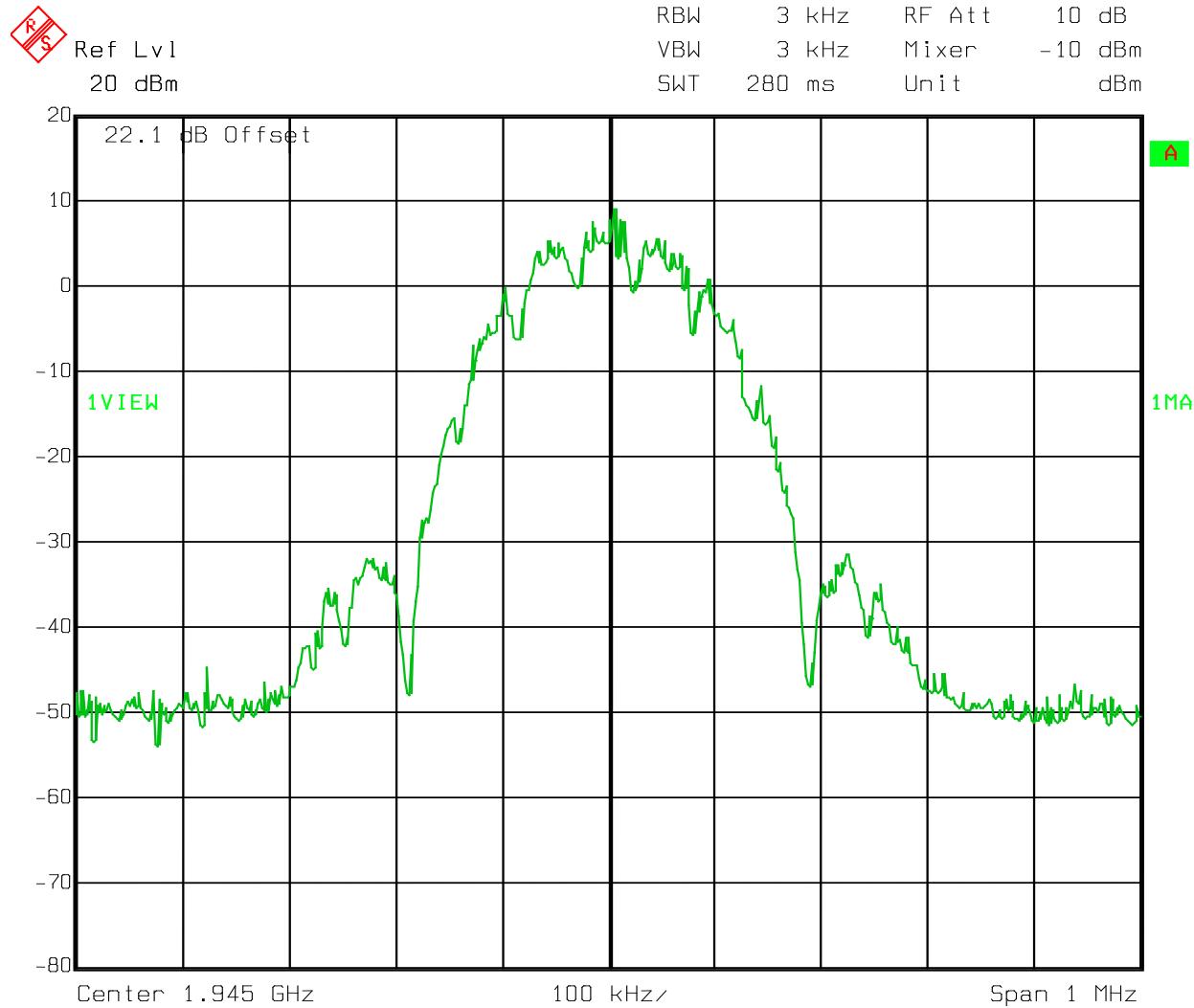


Date: 26.JAN.2010 11:42:40

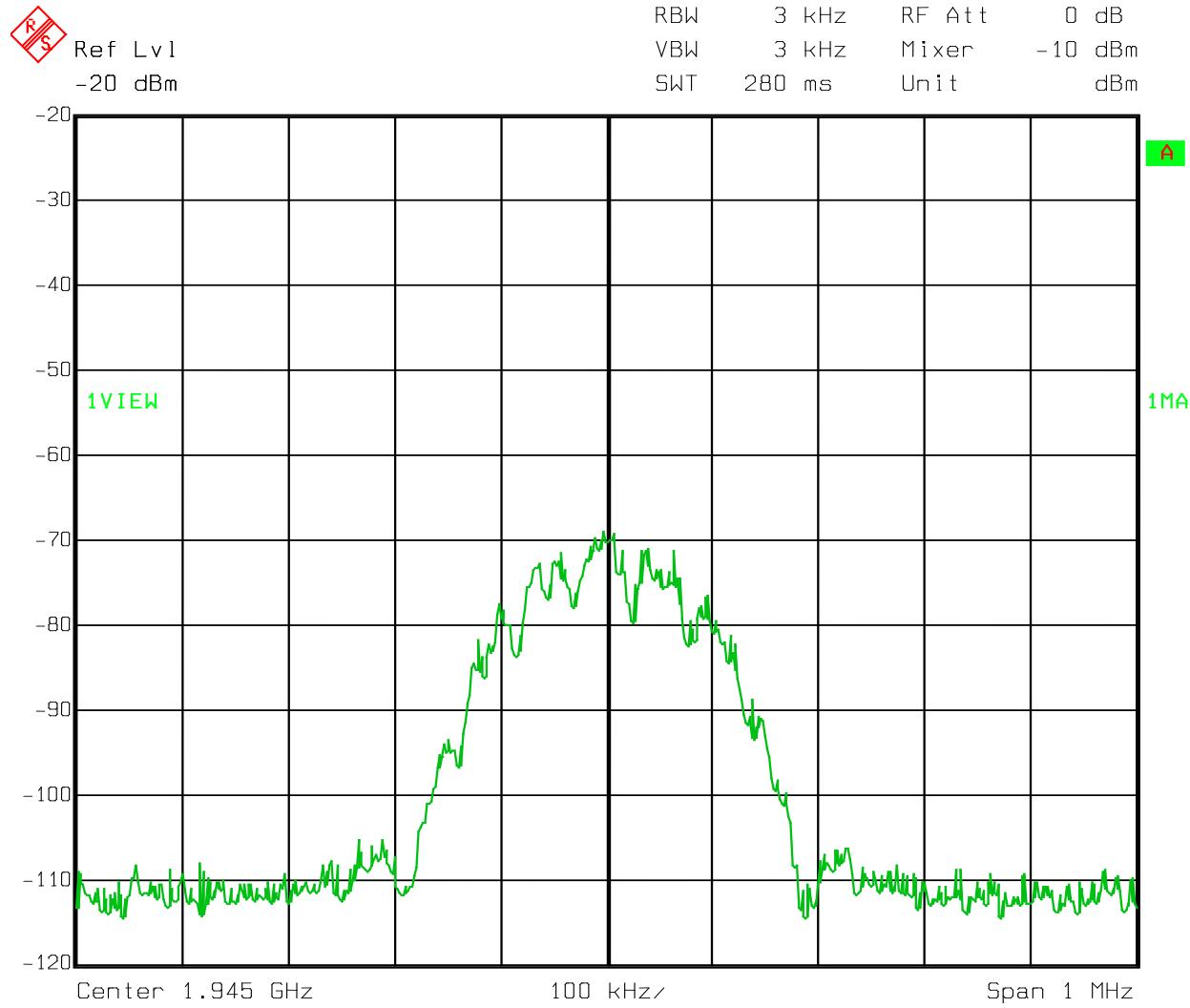
Test Data – Occupied Bandwidth

EDGE - Output

Downlink



Date: 26.JAN.2010 11:30:42

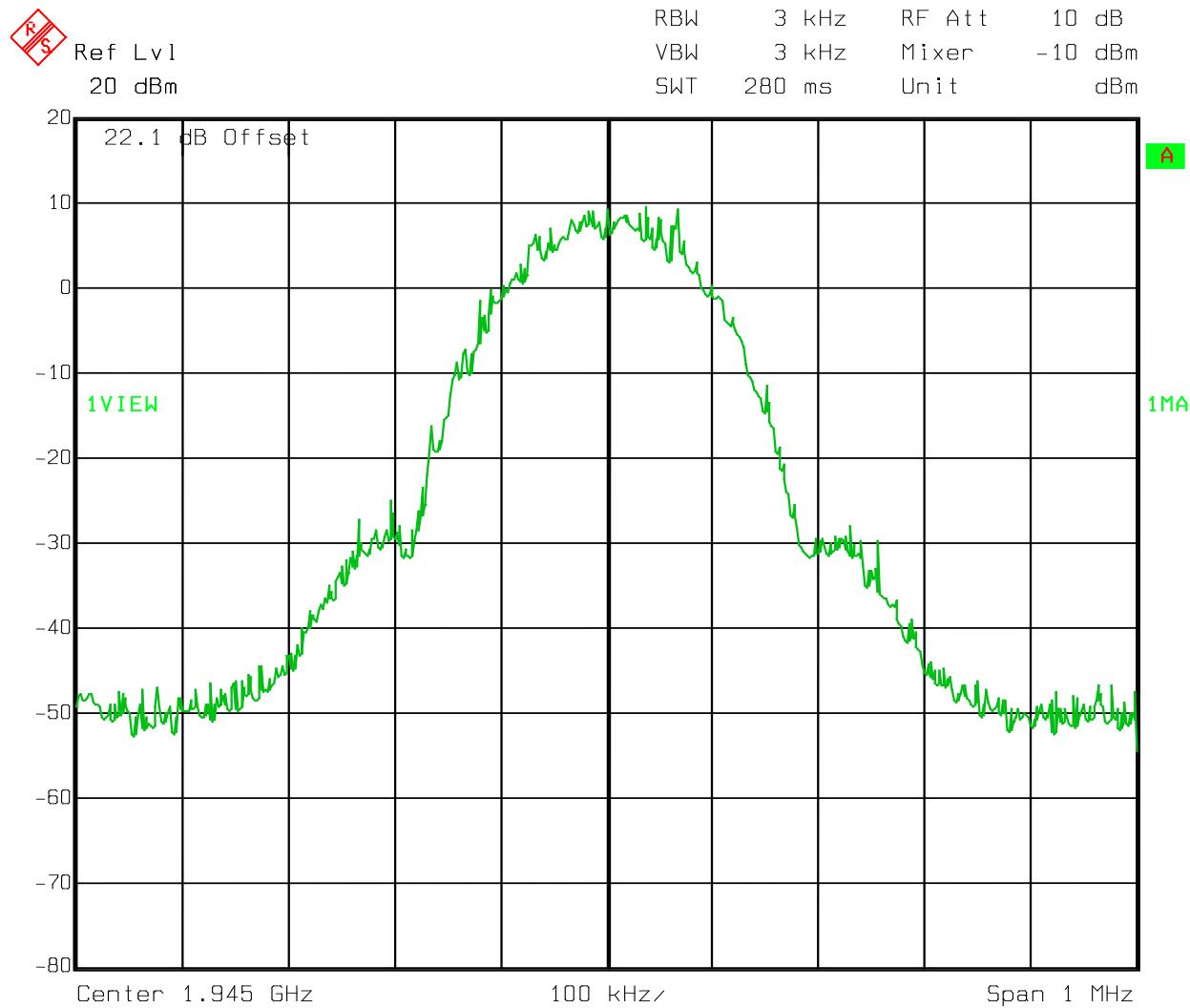
Test Data – Occupied Bandwidth**EDGE - Input****Downlink**

Date: 26.JAN.2010 11:41:51

Test Data – Occupied Bandwidth

GSM - Output

Downlink

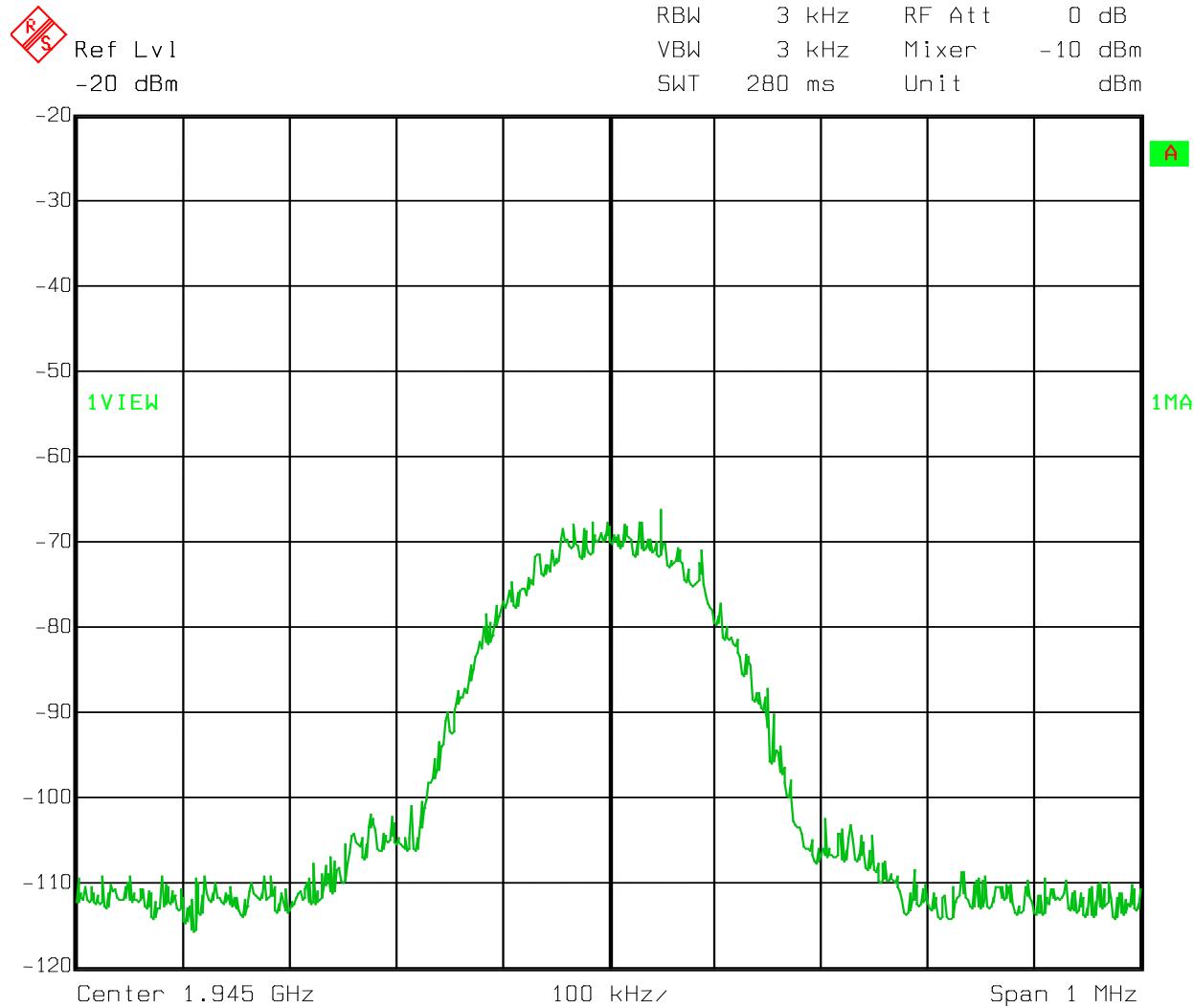


Date: 26.JAN.2010 11:31:58

Test Data – Occupied Bandwidth

GSM - Input

Downlink

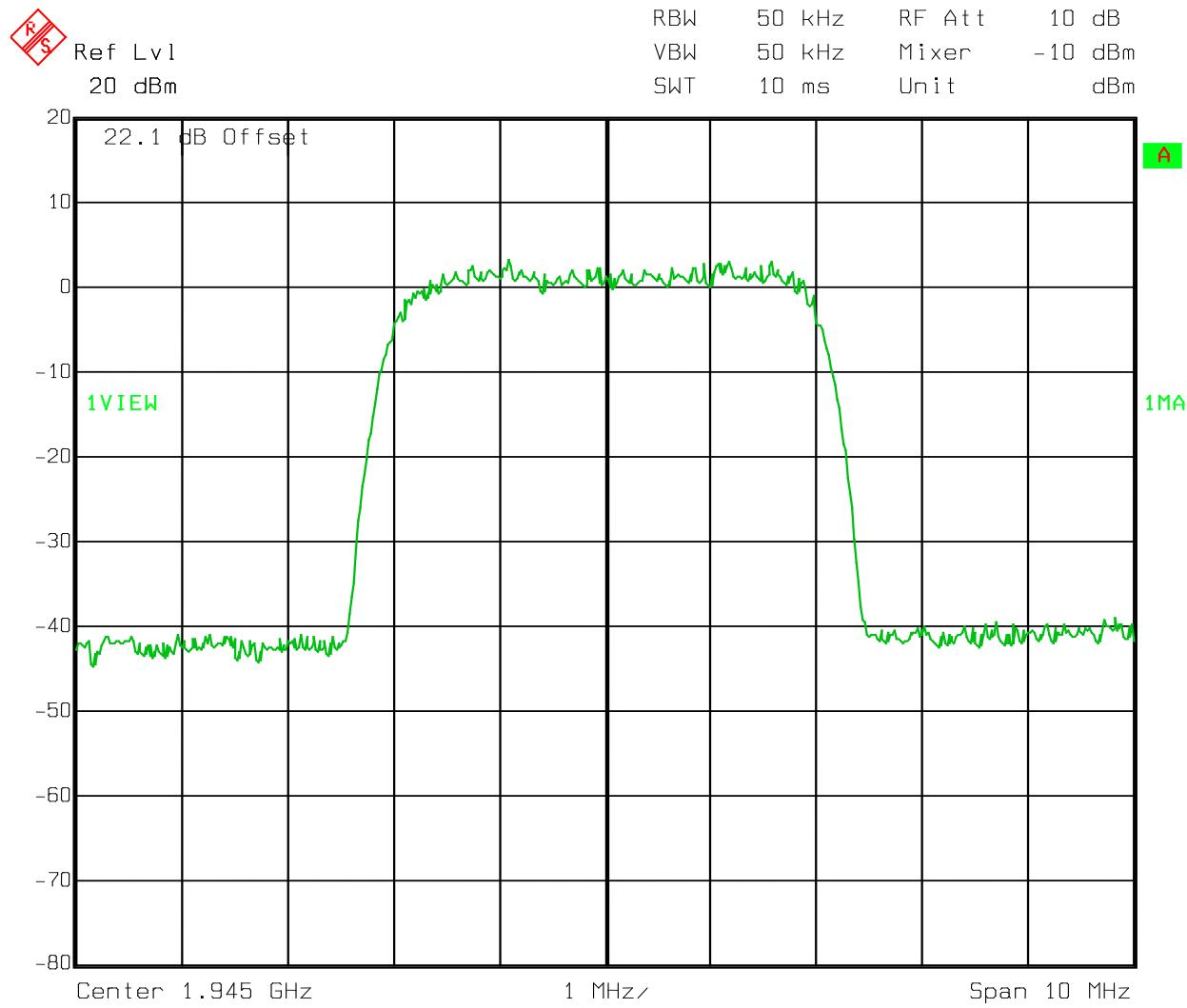


Date: 26.JAN.2010 11:39:36

Test Data – Occupied Bandwidth

W-CDMA - Output

Downlink

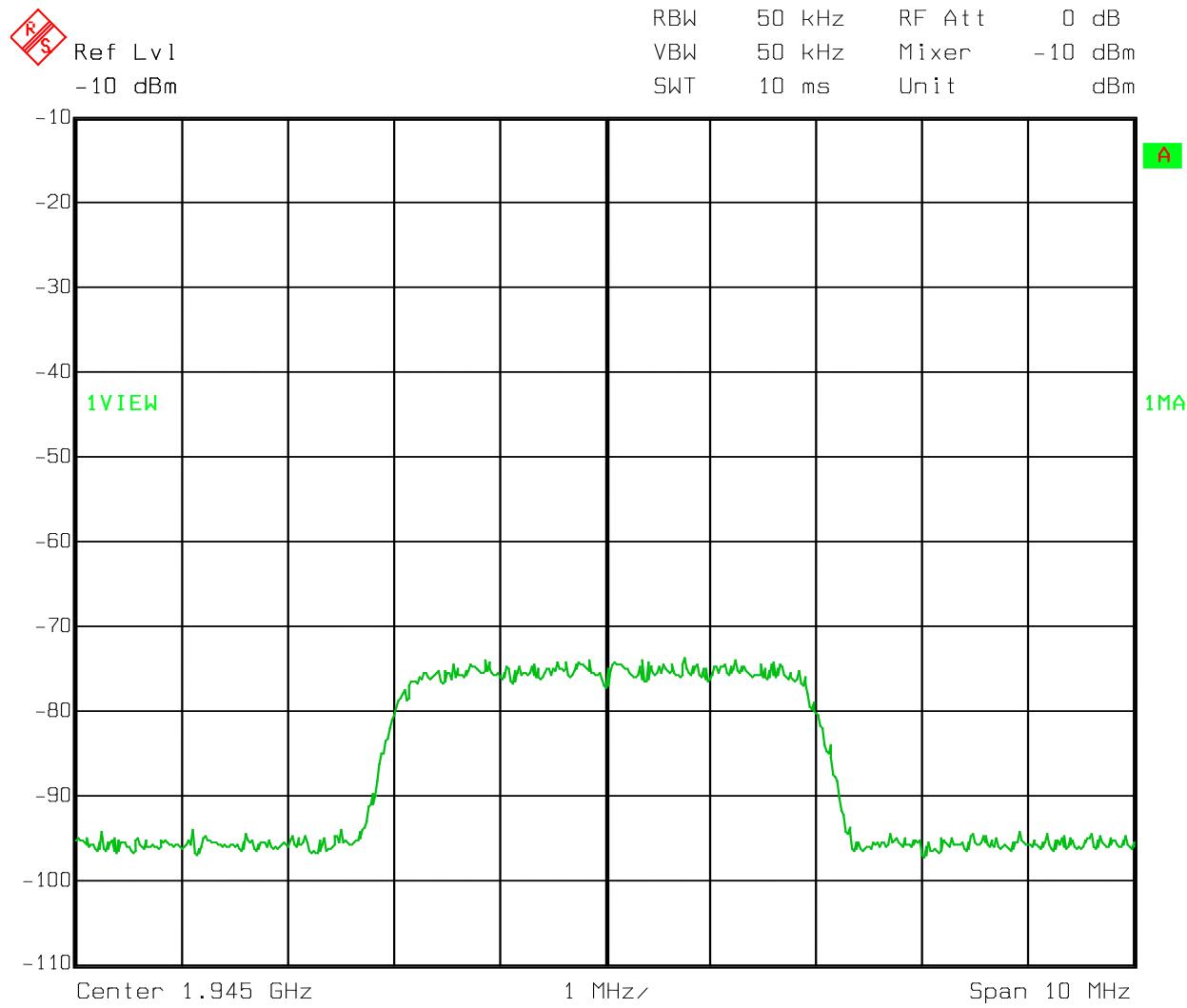


Date: 26.JAN.2010 11:33:27

Test Data – Occupied Bandwidth

W-CDMA - Input

Downlink

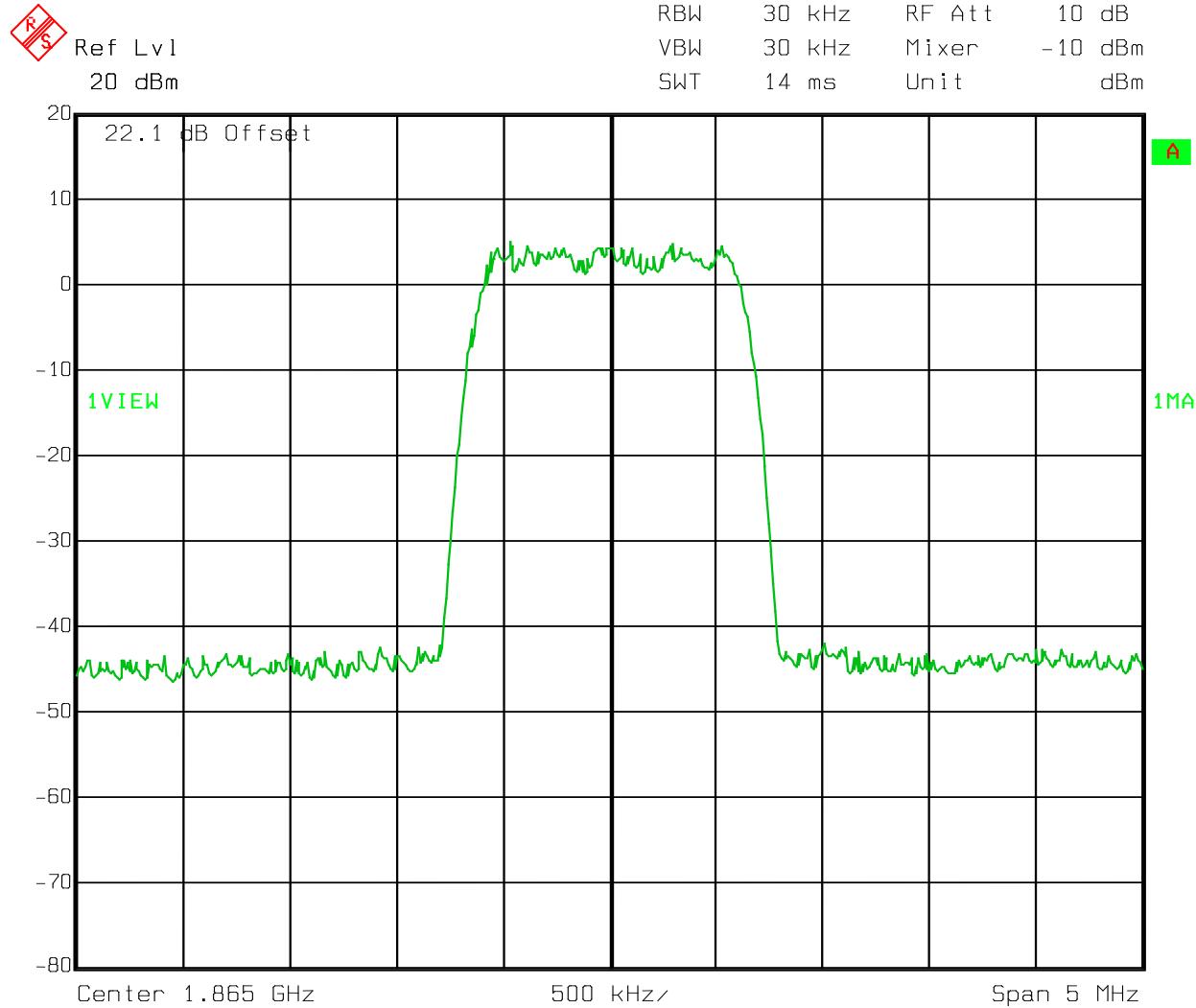


Date: 26.JAN.2010 11:38:54

Test Data – Occupied Bandwidth

CDMA - Output

Uplink

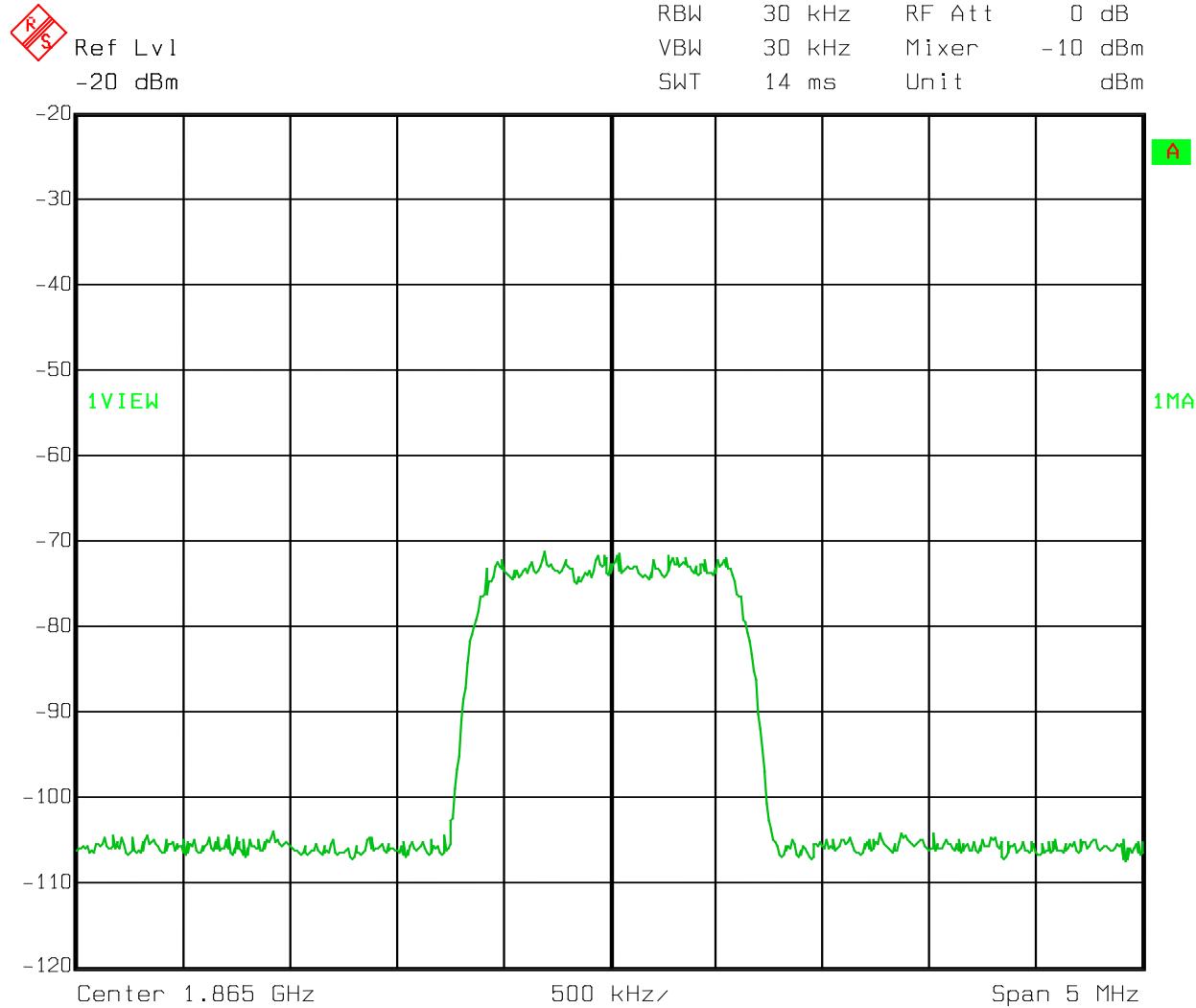


Date: 26.JAN.2010 11:35:34

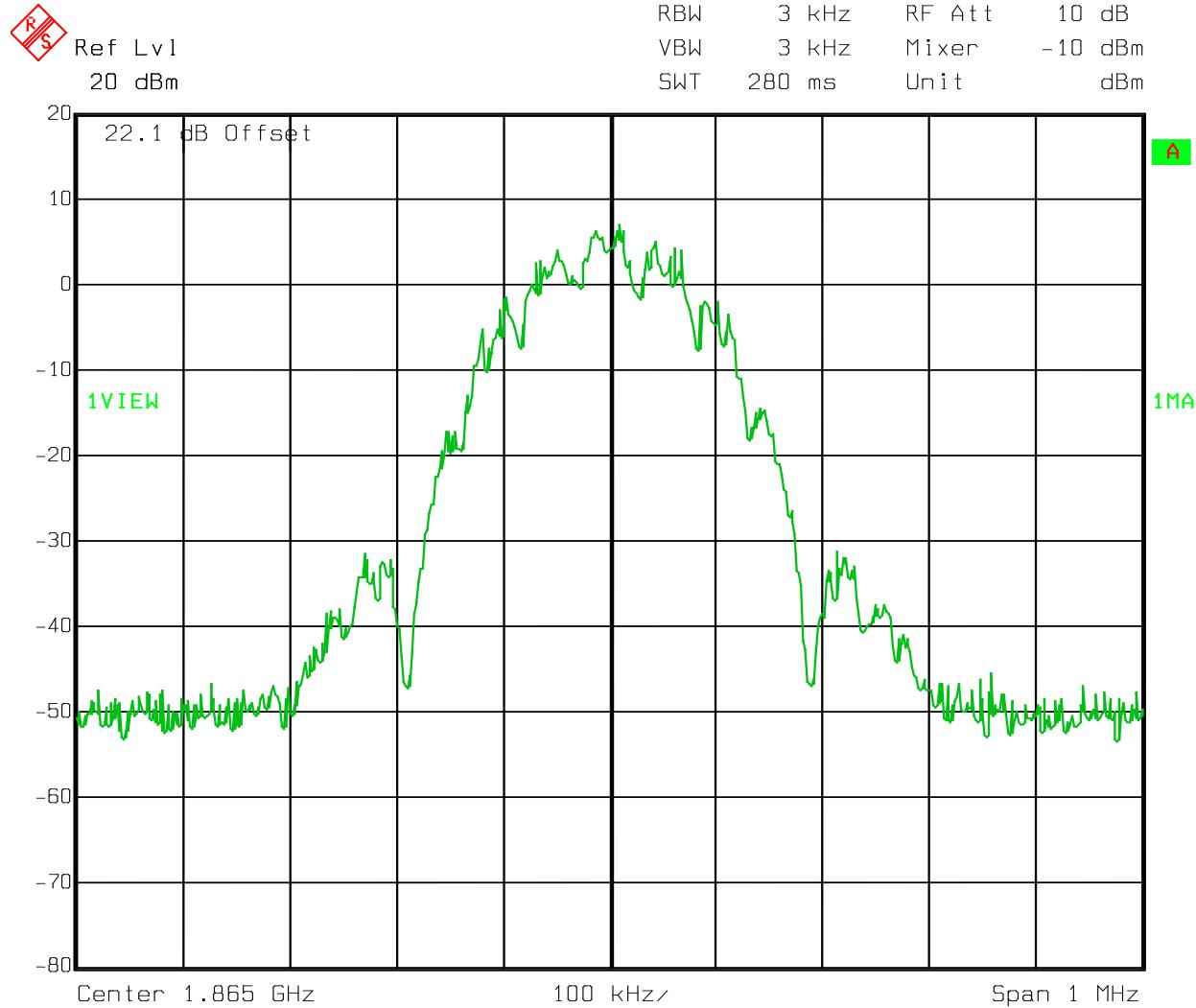
Test Data – Occupied Bandwidth

CDMA - Input

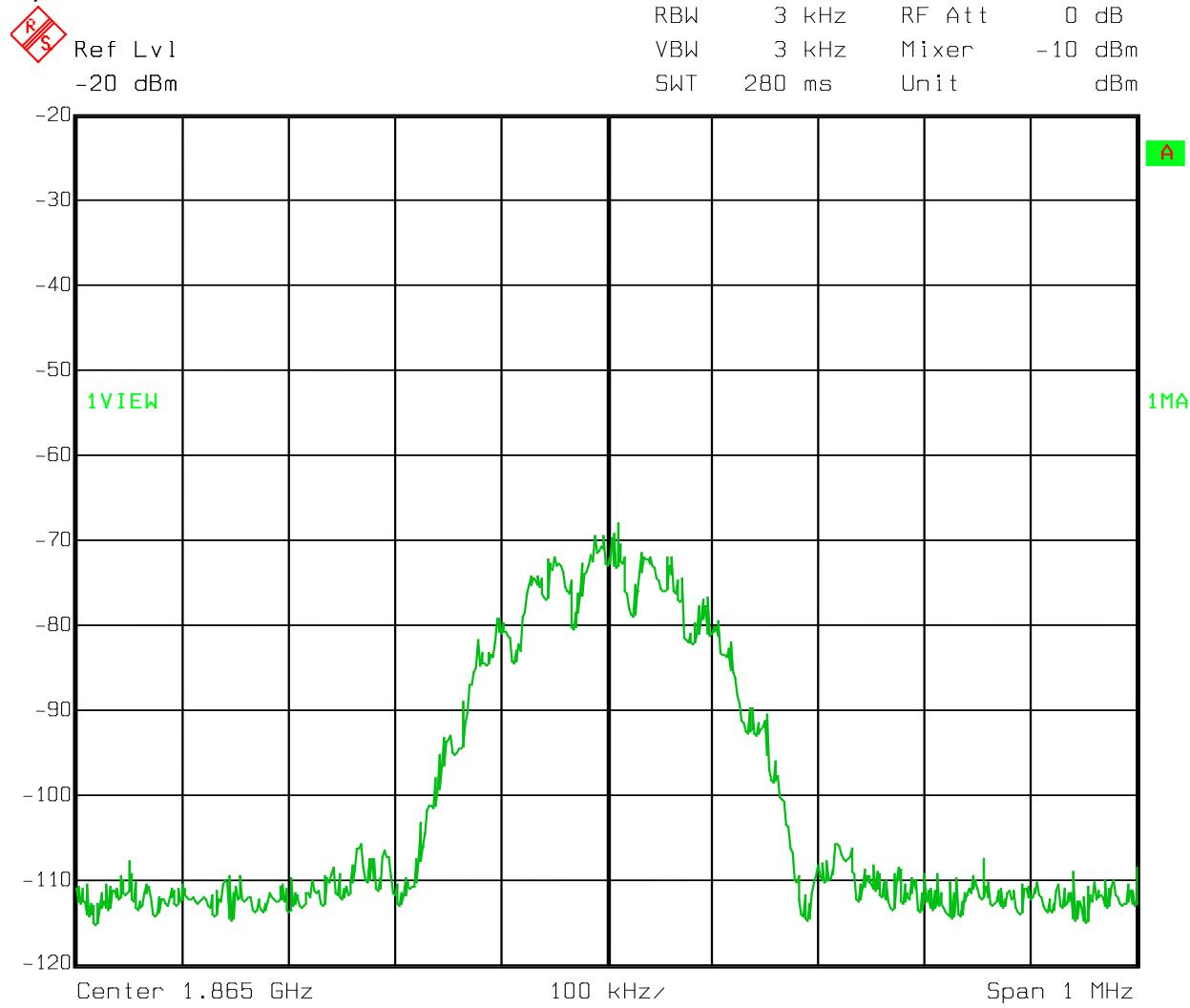
Uplink



Date: 26.JAN.2010 11:43:10

Test Data – Occupied Bandwidth**EDGE - Output****Uplink**

Date: 26.JAN.2010 11:36:12

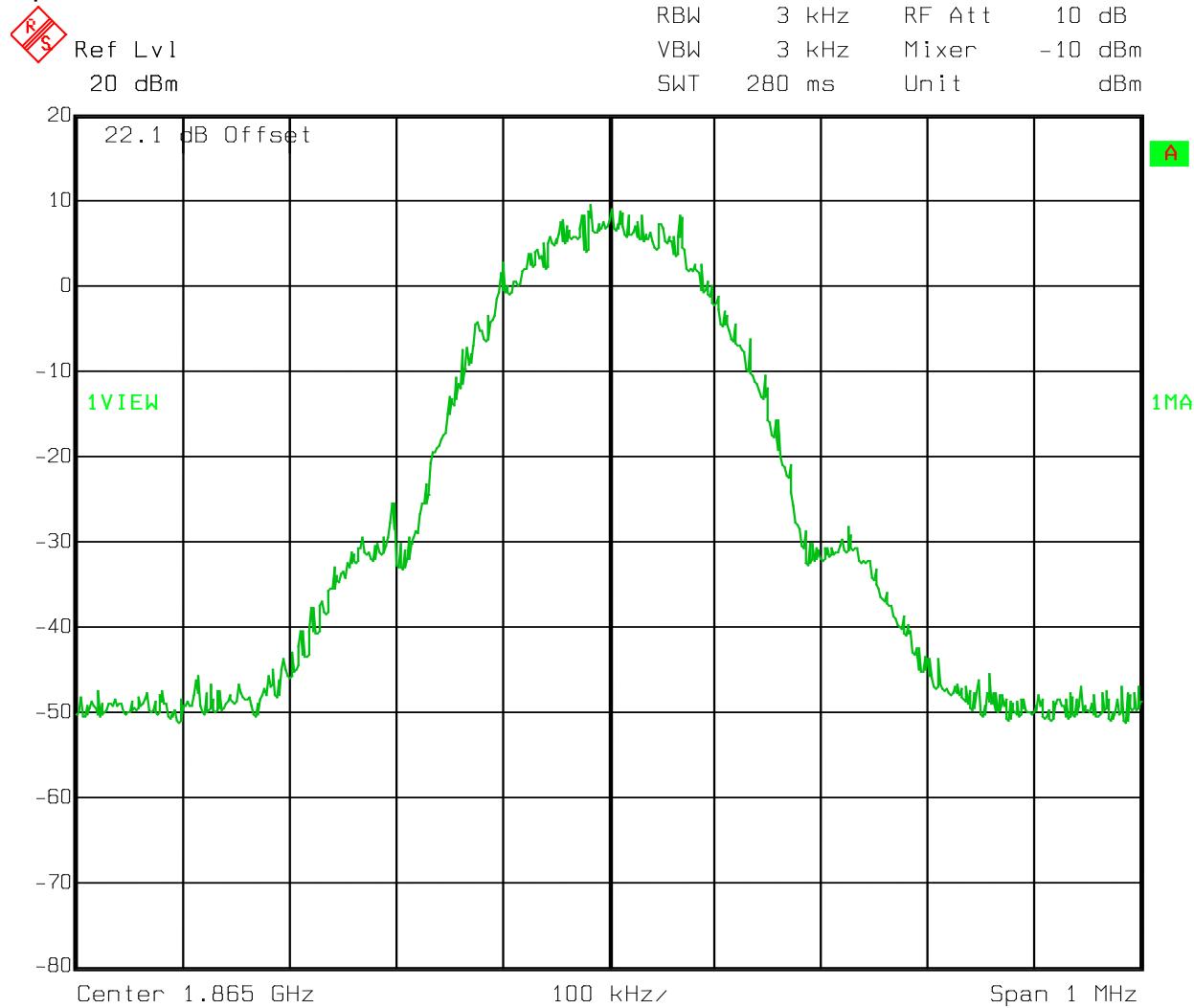
Test Data – Occupied Bandwidth**EDGE - Input****Uplink**

Date: 26.JAN.2010 11:41:00

Test Data – Occupied Bandwidth

GSM - Output

Uplink

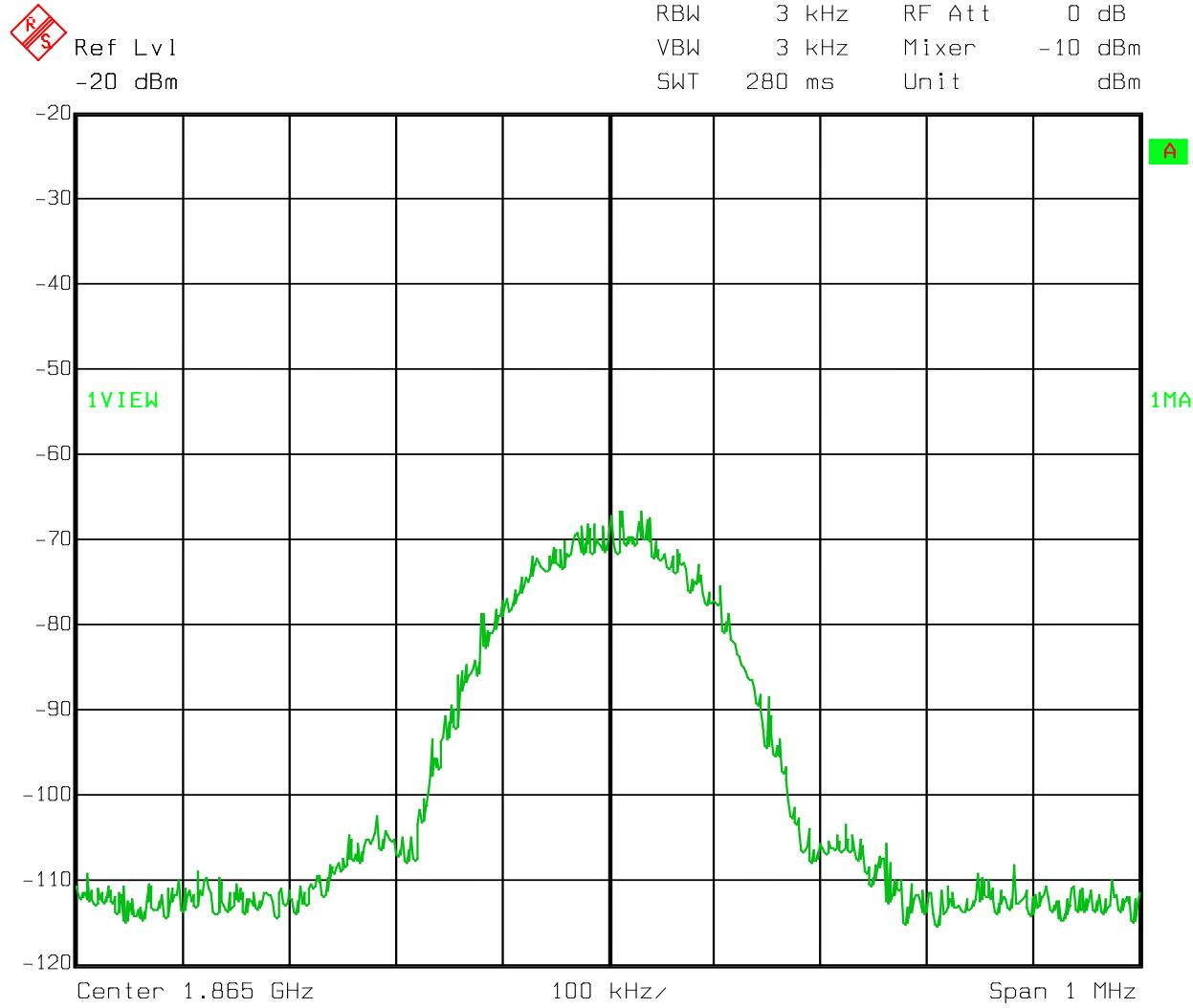


Date: 26.JAN.2010 11:36:36

Test Data – Occupied Bandwidth

GSM - Input

Uplink

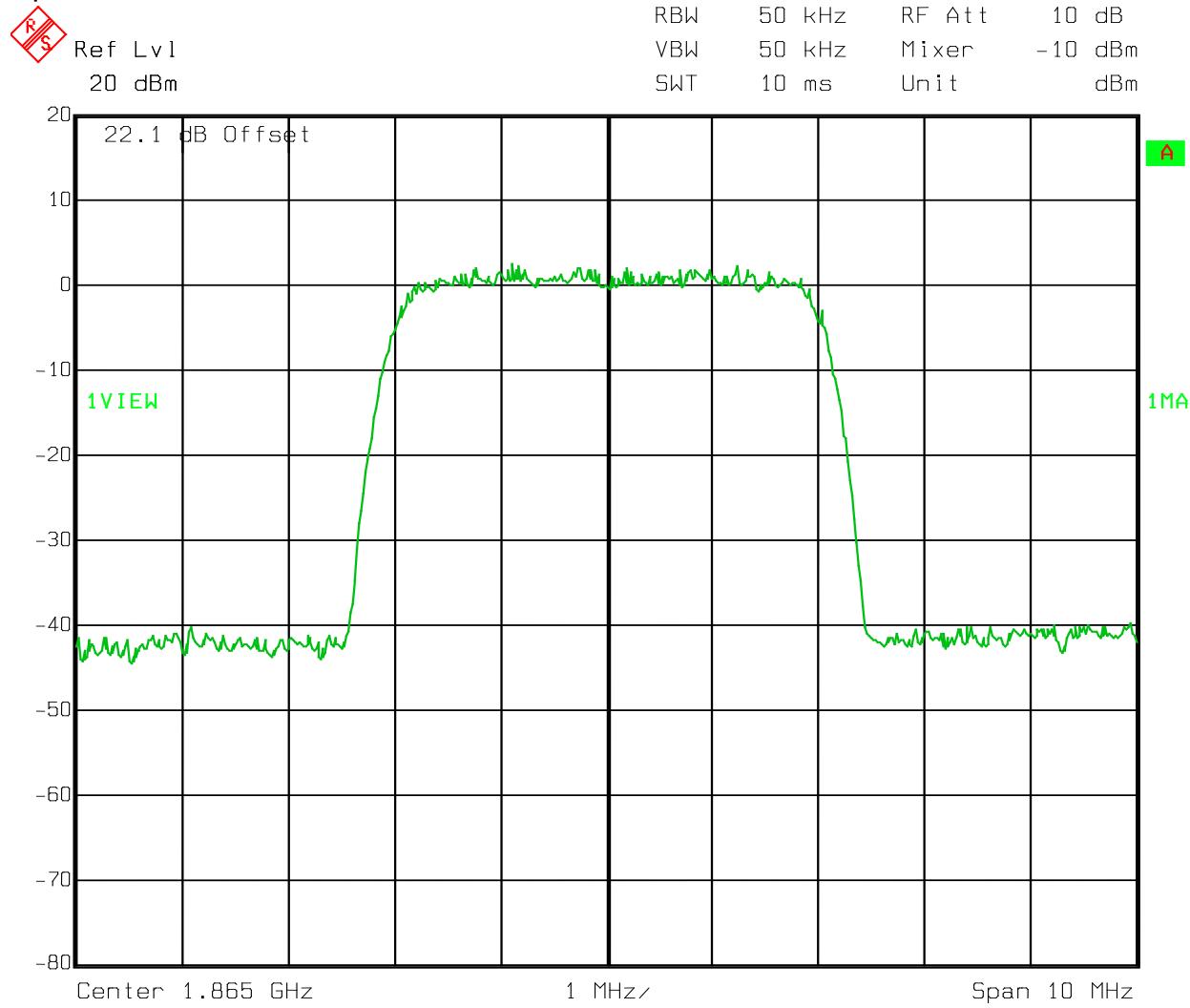


Date: 26.JAN.2010 11:39:58

Test Data – Occupied Bandwidth

W-CDMA - Output

Uplink

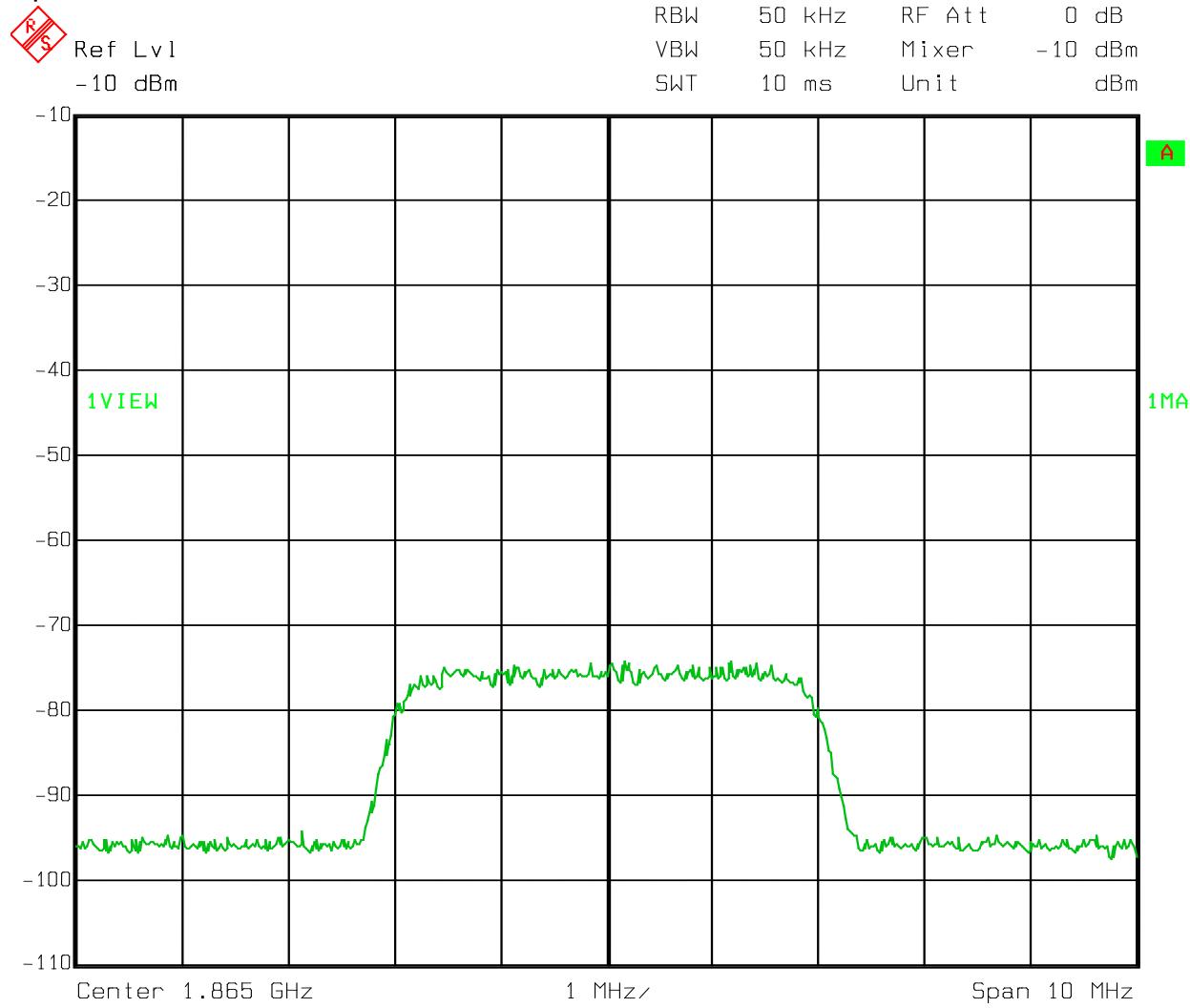


Date: 26.JAN.2010 11:37:09

Test Data – Occupied Bandwidth

W-CDMA - Input

Uplink



Date: 26.JAN.2010 11:38:16

Section 4. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals PARA. NO.: 24.238

TESTED BY: David Light DATE: 26 January 2010

Test Results: Complies.**Test Data:** See attached plot(s).**Equipment Used:** 1036-1082-1472**Measurement Uncertainty:** +/- 1.7 dB**Temperature:** 22 °C**Relative Humidity:** 32 %

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

CDMA

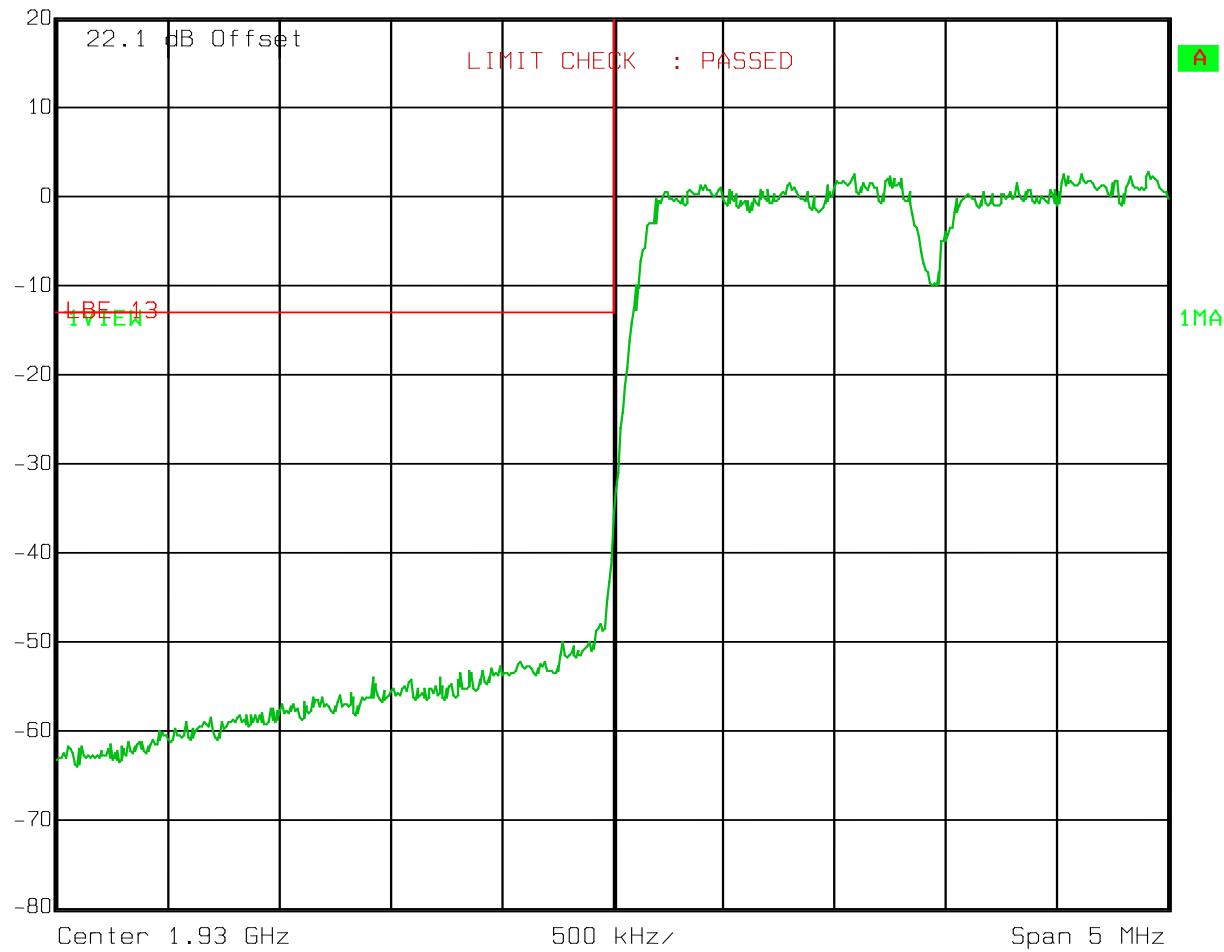
Downlink



Ref Lvl

20 dBm

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



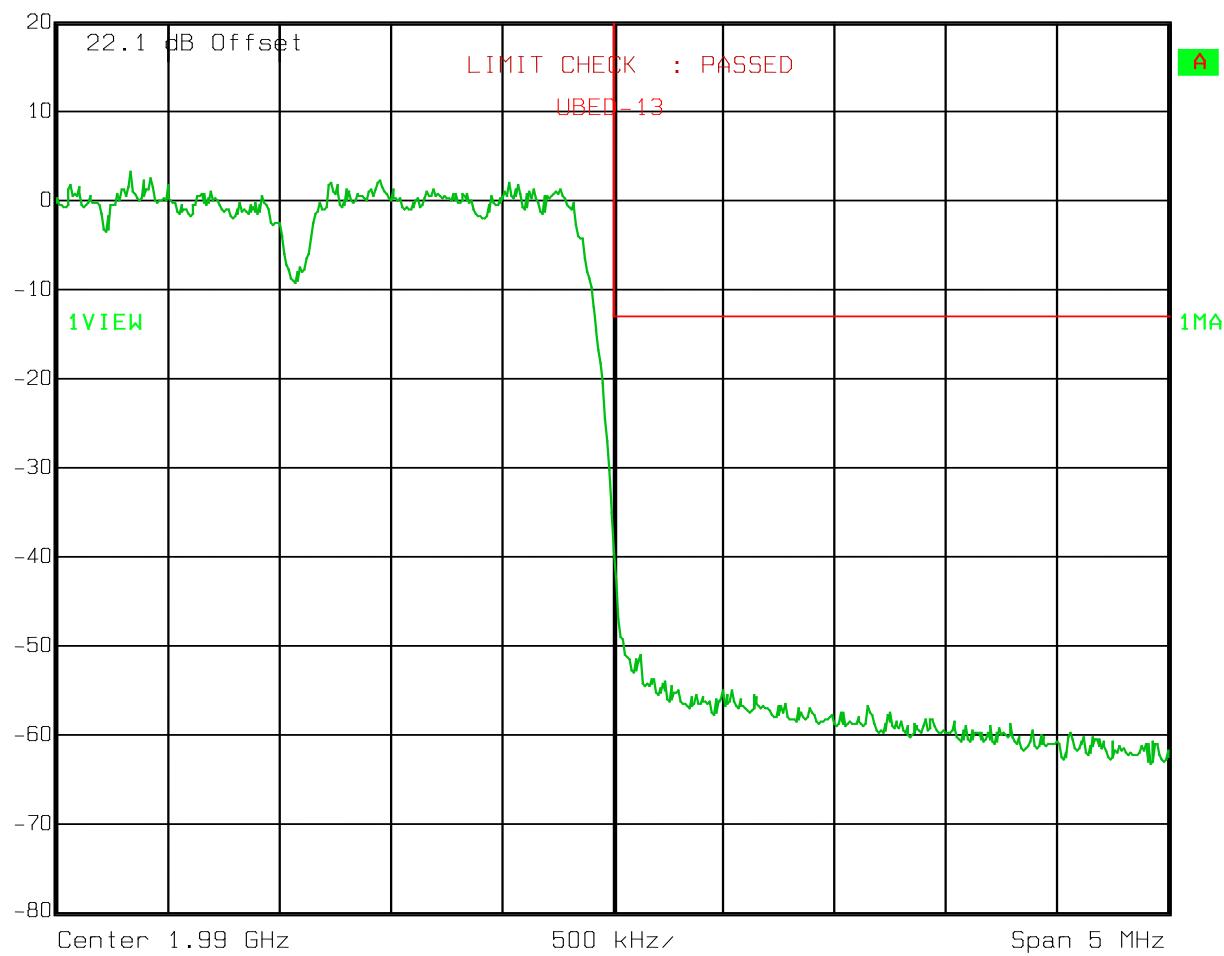
Date: 26.JAN.2010 13:20:52

Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

CDMA

Downlink

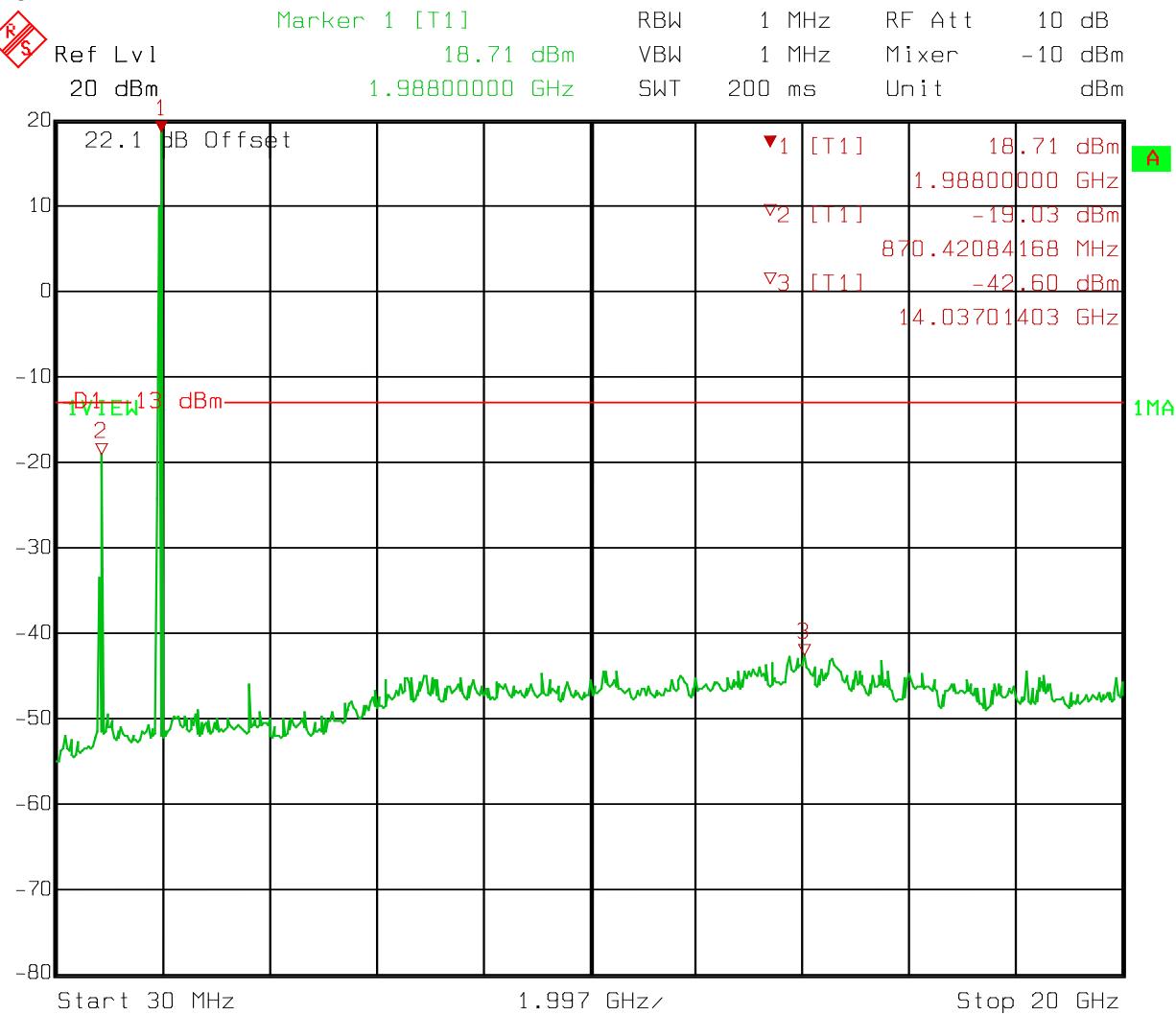
Ref Lvl
20 dBmRBW 30 kHz RF Att 10 dB
VBW 30 kHz Mixer -10 dBm
SWT 14 ms Unit dBm

Date: 26.JAN.2010 13:21:54

Test Data – Spurious Emissions at Antenna Terminals

Spurs – CDMA

Downlink



Date: 26.JAN.2010 13:23:29

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

EDGE

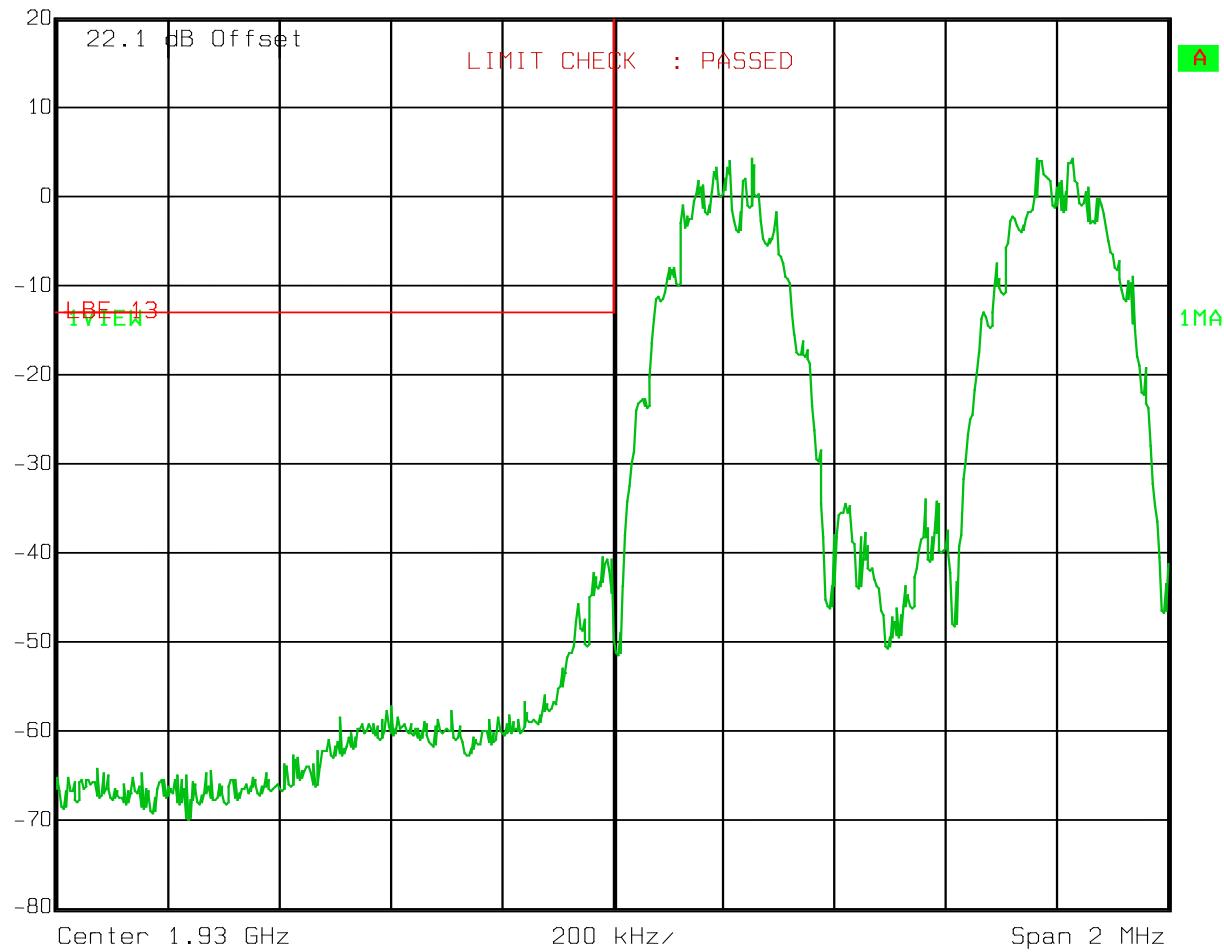
Downlink



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 13:25:15

Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

EDGE

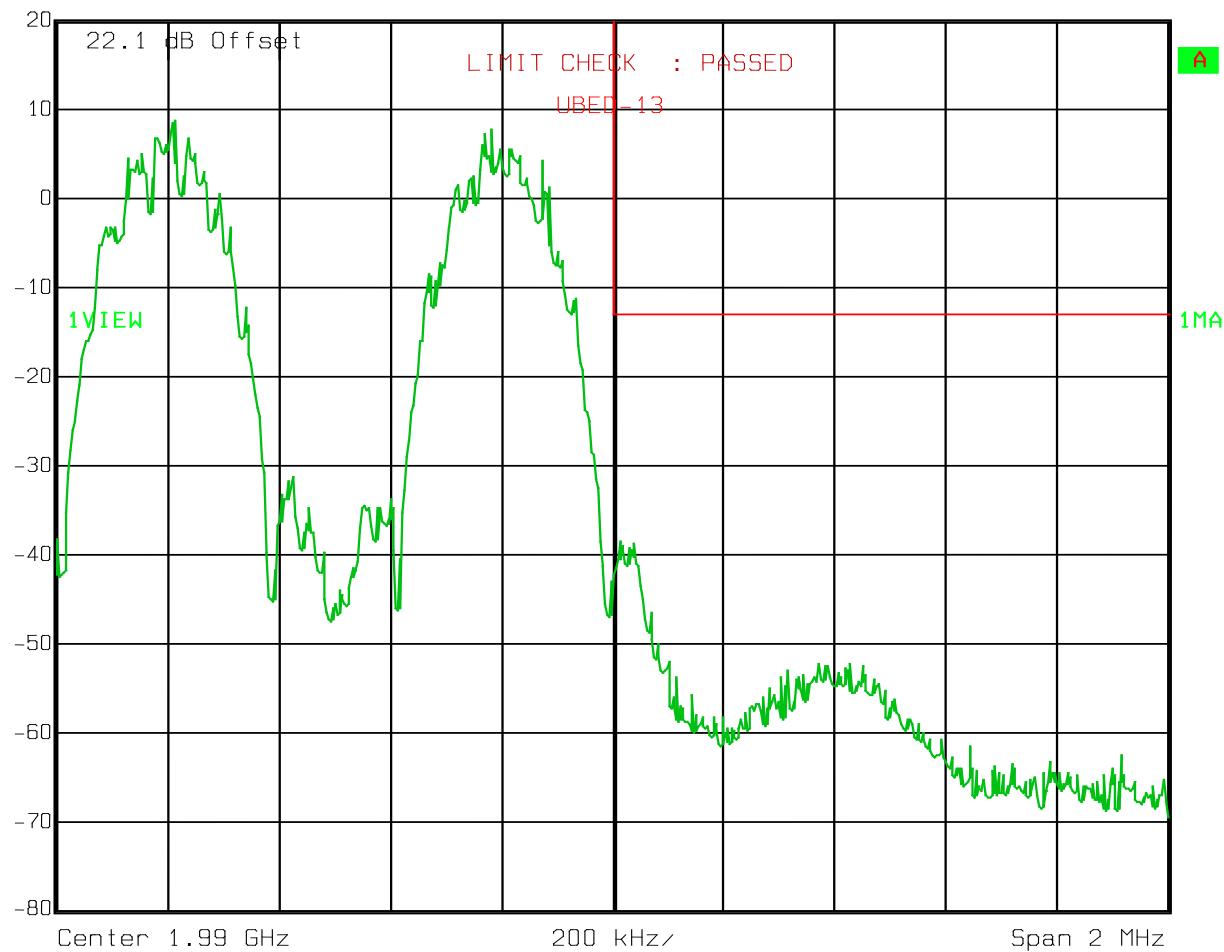
Downlink



Ref Lvl

20 dBm

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

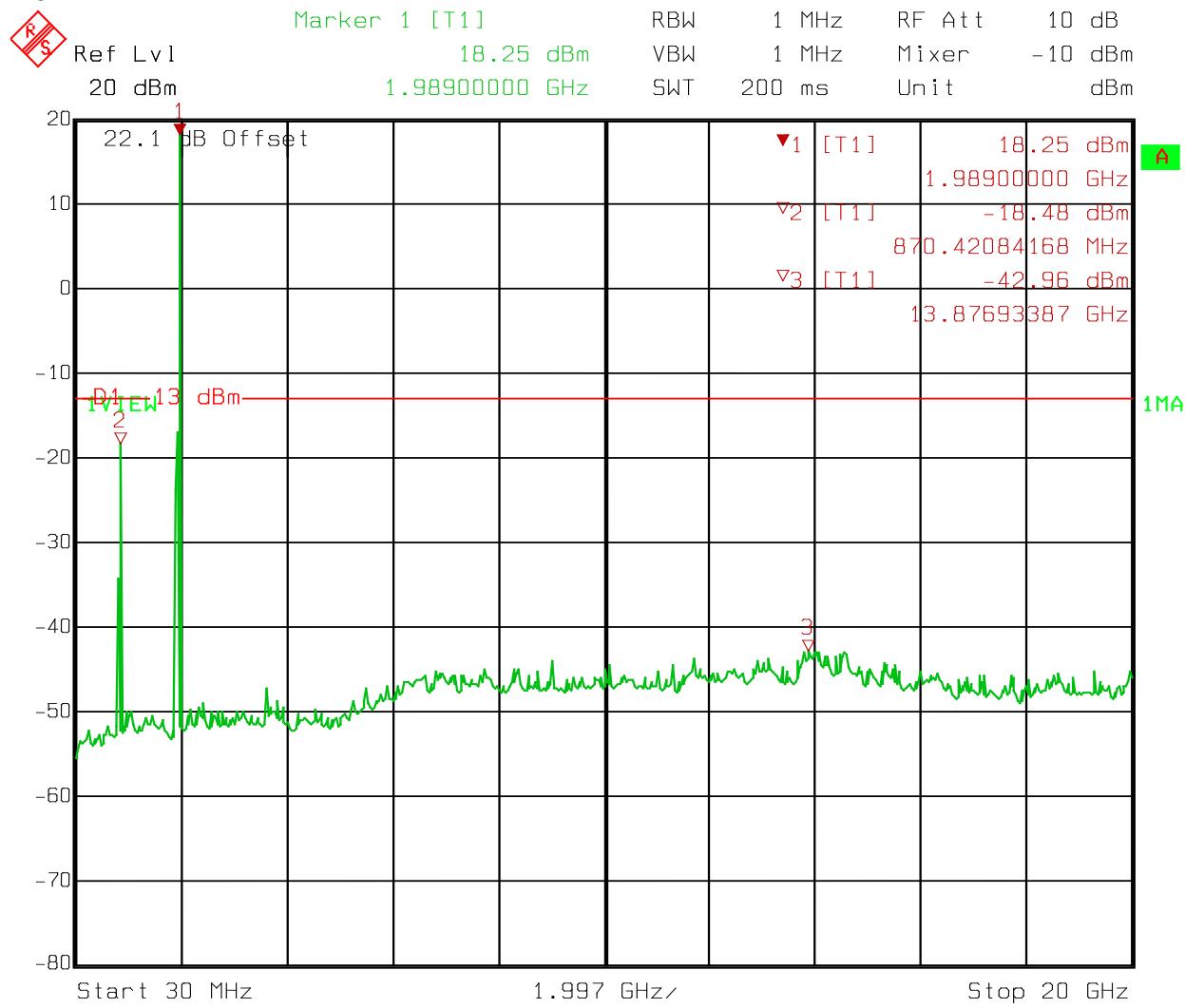


Date: 26.JAN.2010 13:26:02

Test Data – Spurious Emissions at Antenna Terminals

Spurs – EDGE

Downlink



Date: 26.JAN.2010 13:27:31

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

GSM

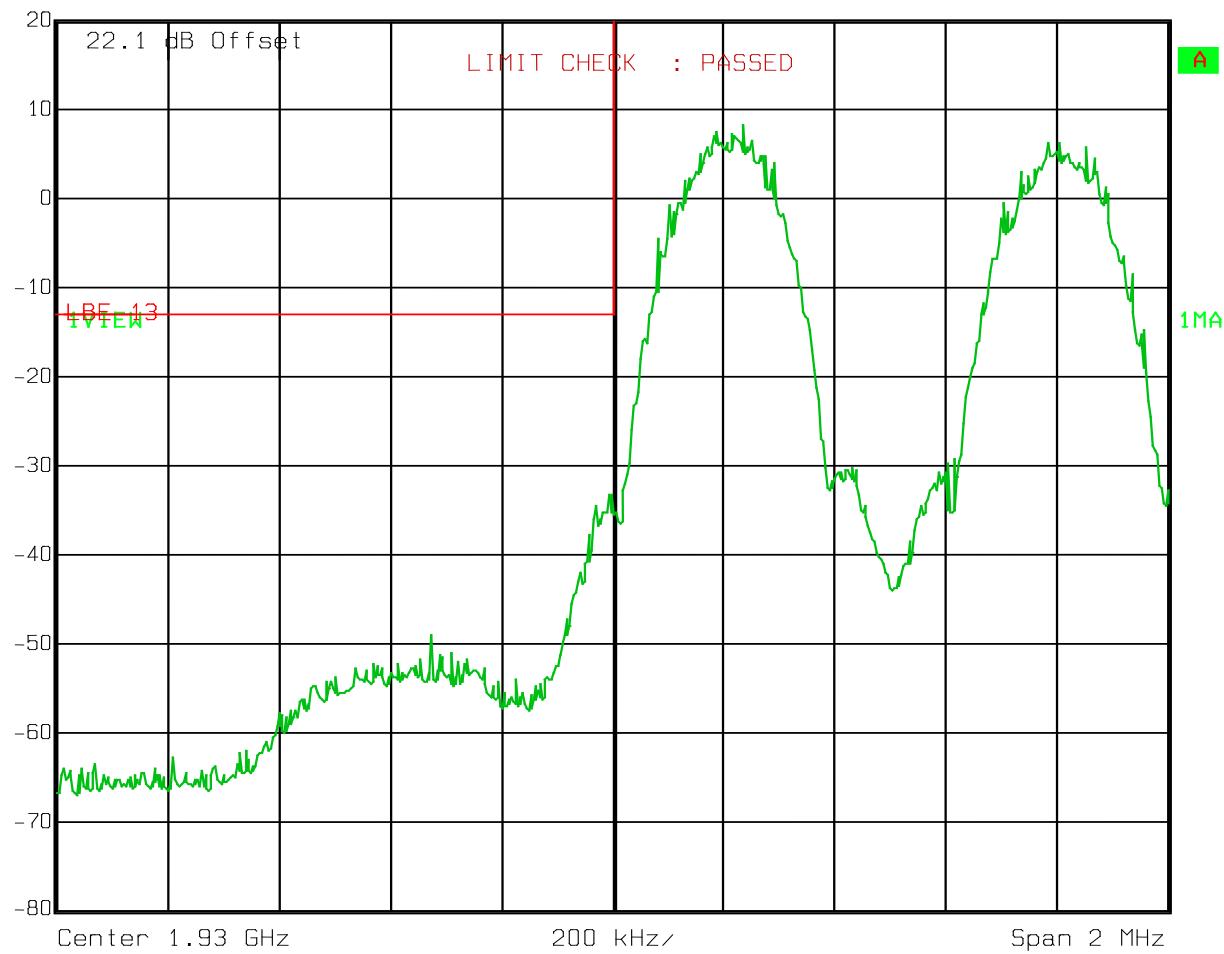
Downlink



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 13:29:20

Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

GSM

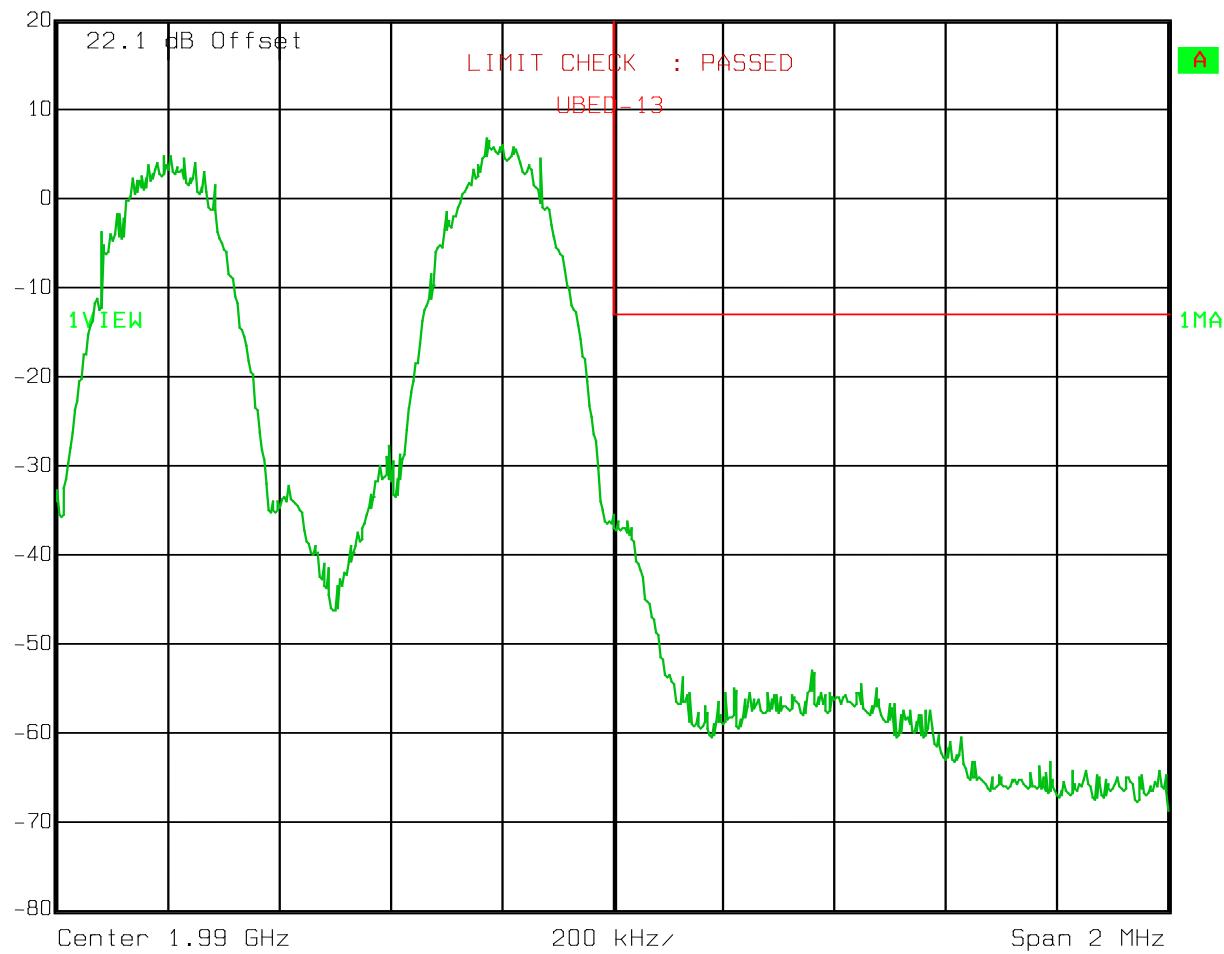
Downlink



Ref Lvl

20 dBm

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

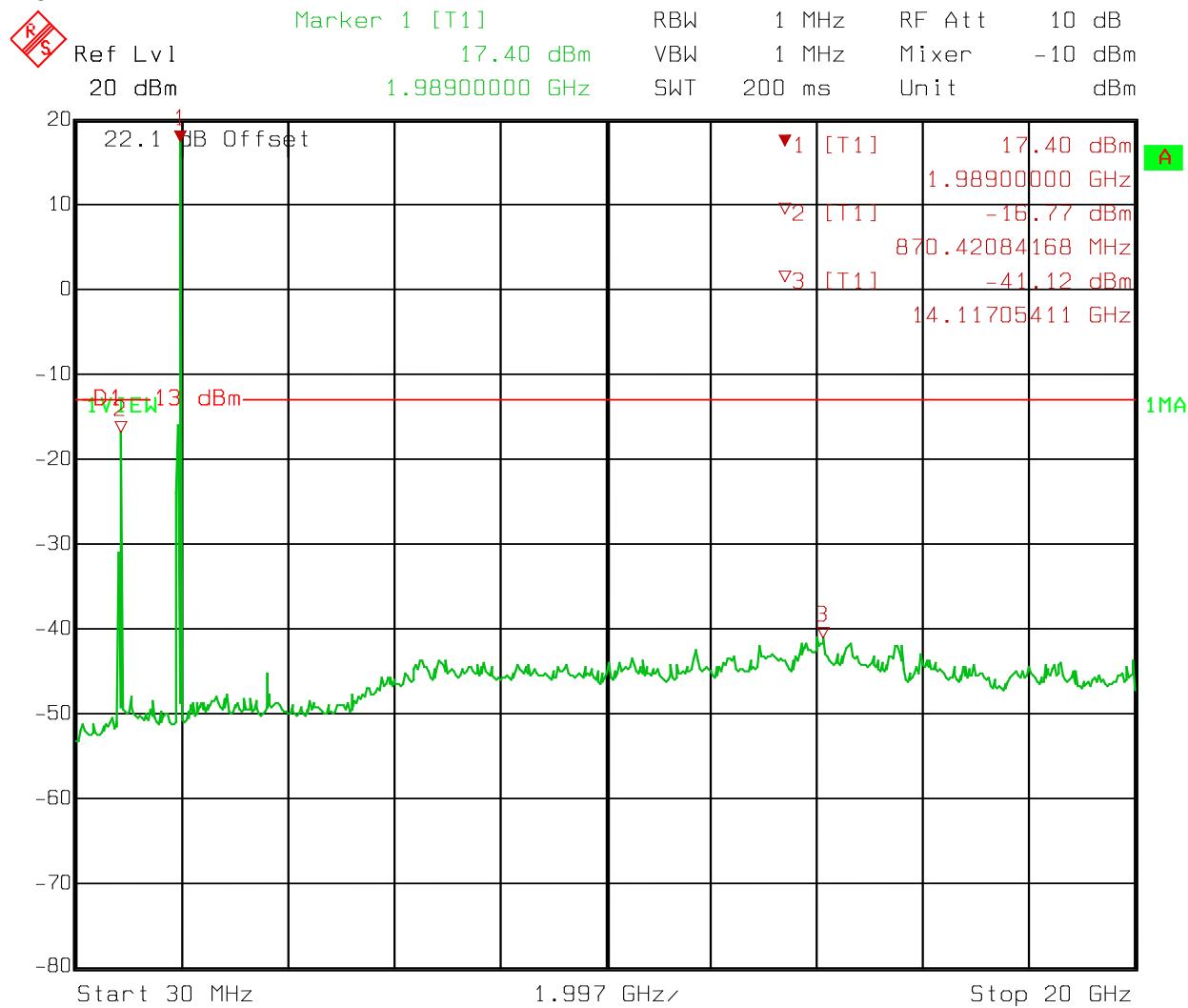


Date: 26.JAN.2010 13:30:18

Test Data – Spurious Emissions at Antenna Terminals

Spurs – GSM

Downlink



Date: 26.JAN.2010 13:31:10

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

W-CDMA

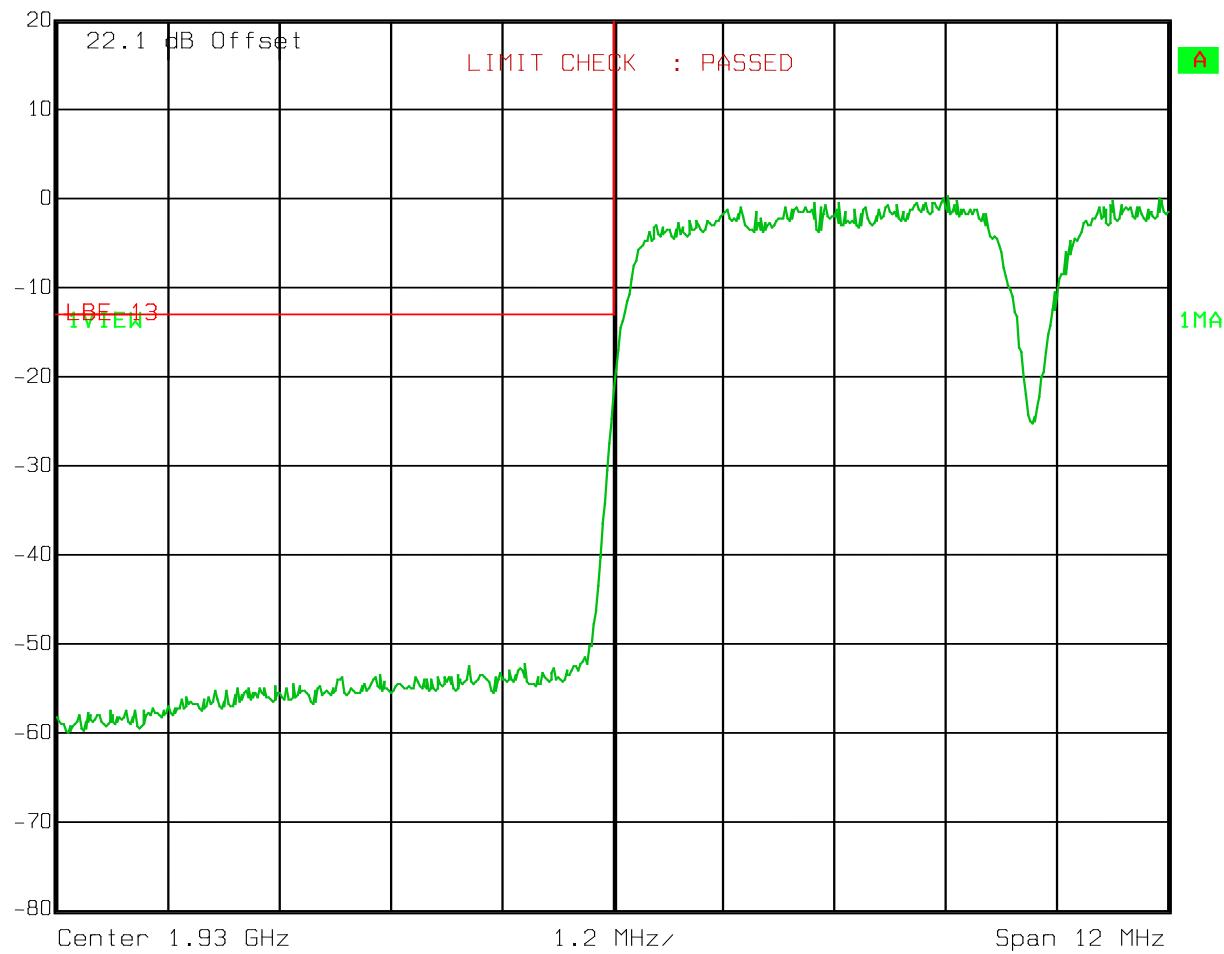
Downlink



Ref Lvl

20 dBm

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



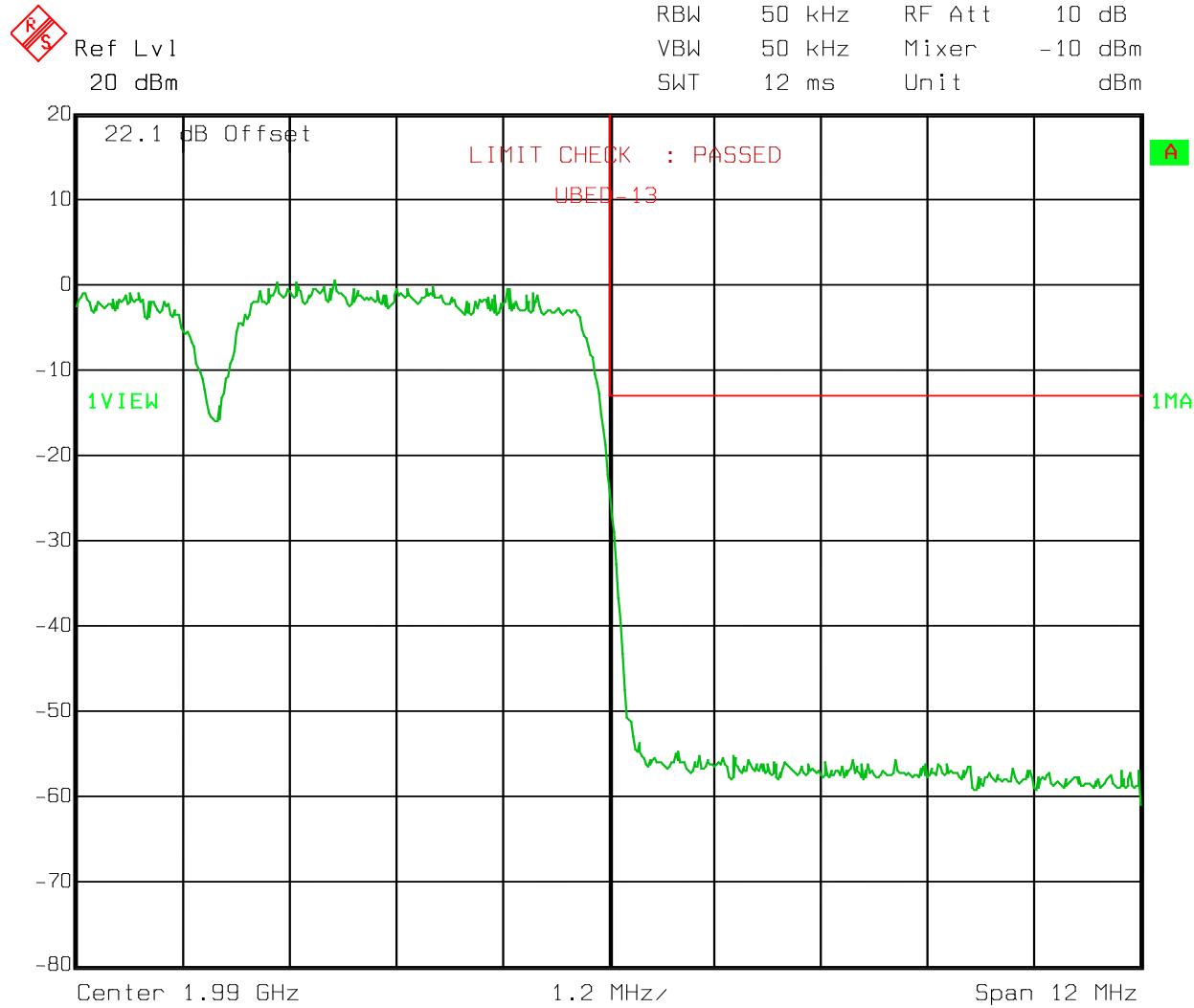
Date: 26.JAN.2010 13:34:08

Test Data – Spurious Emissions at Antenna Terminals

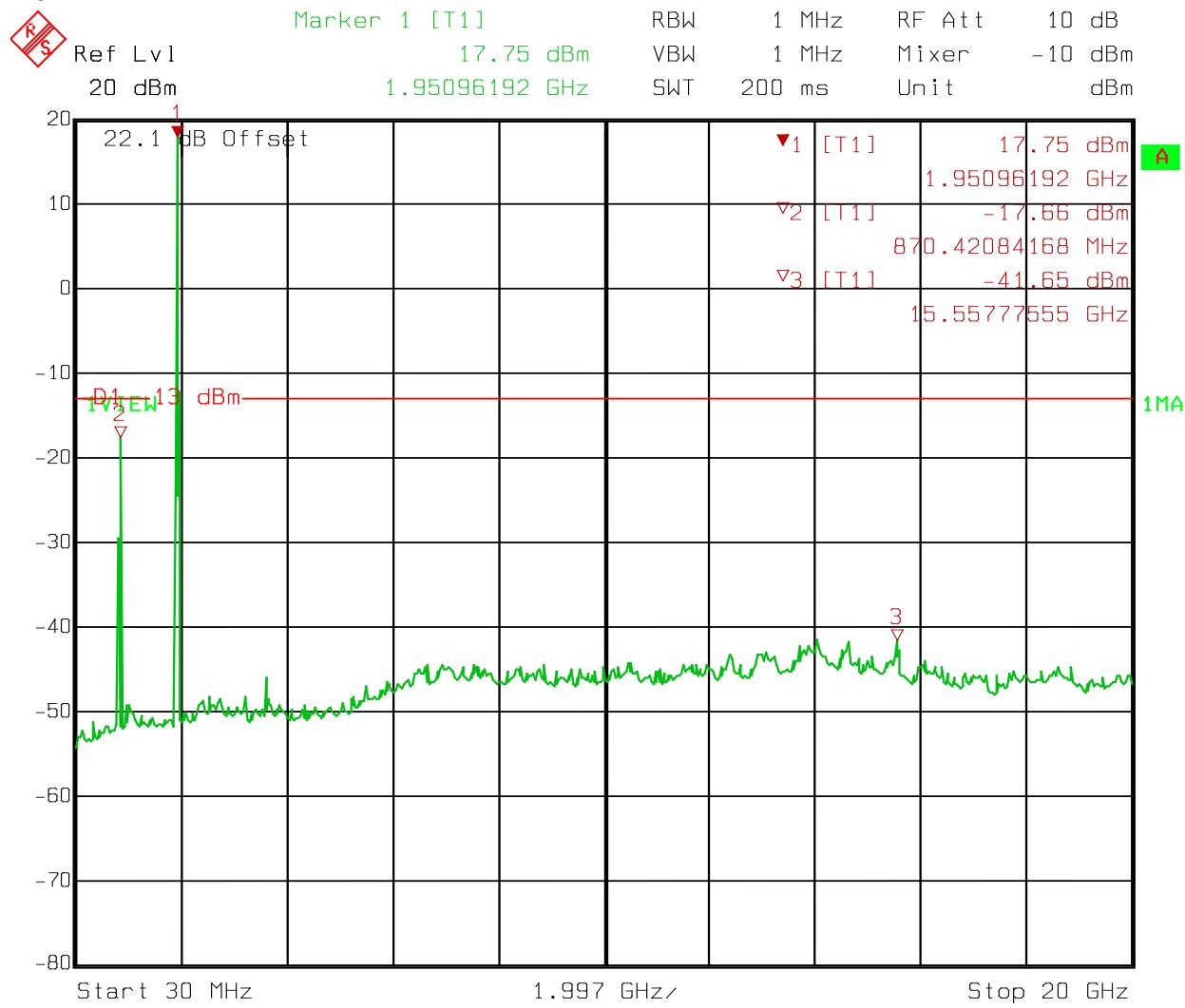
Upper Bandedge Intermodulation

W-CDMA

Downlink



Date: 26.JAN.2010 13:35:08

Test Data – Spurious Emissions at Antenna TerminalsSpurs – W-CDMA -
Downlink

Date: 26.JAN.2010 13:36:10

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

CDMA

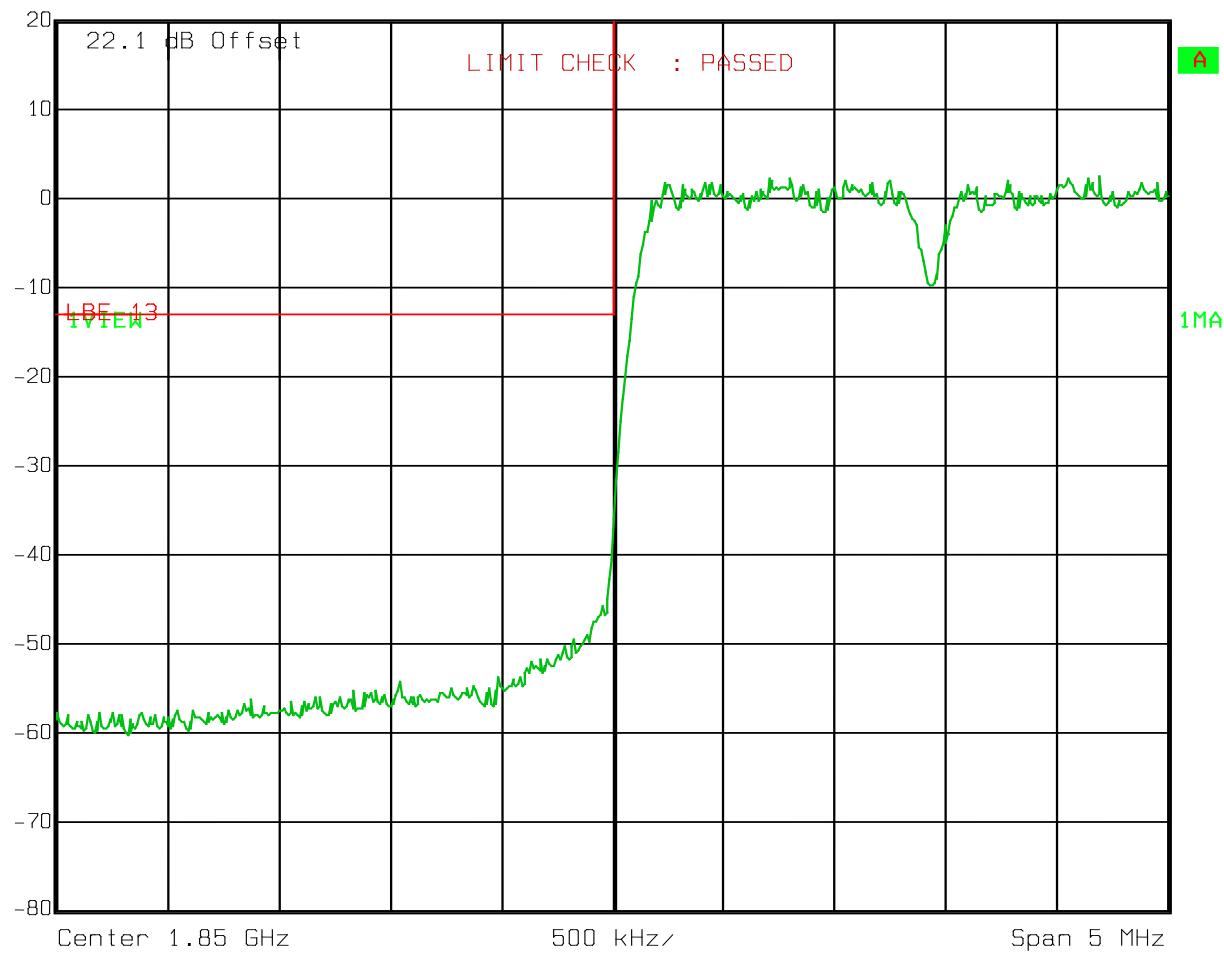
Uplink



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 12:59:52

Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

CDMA

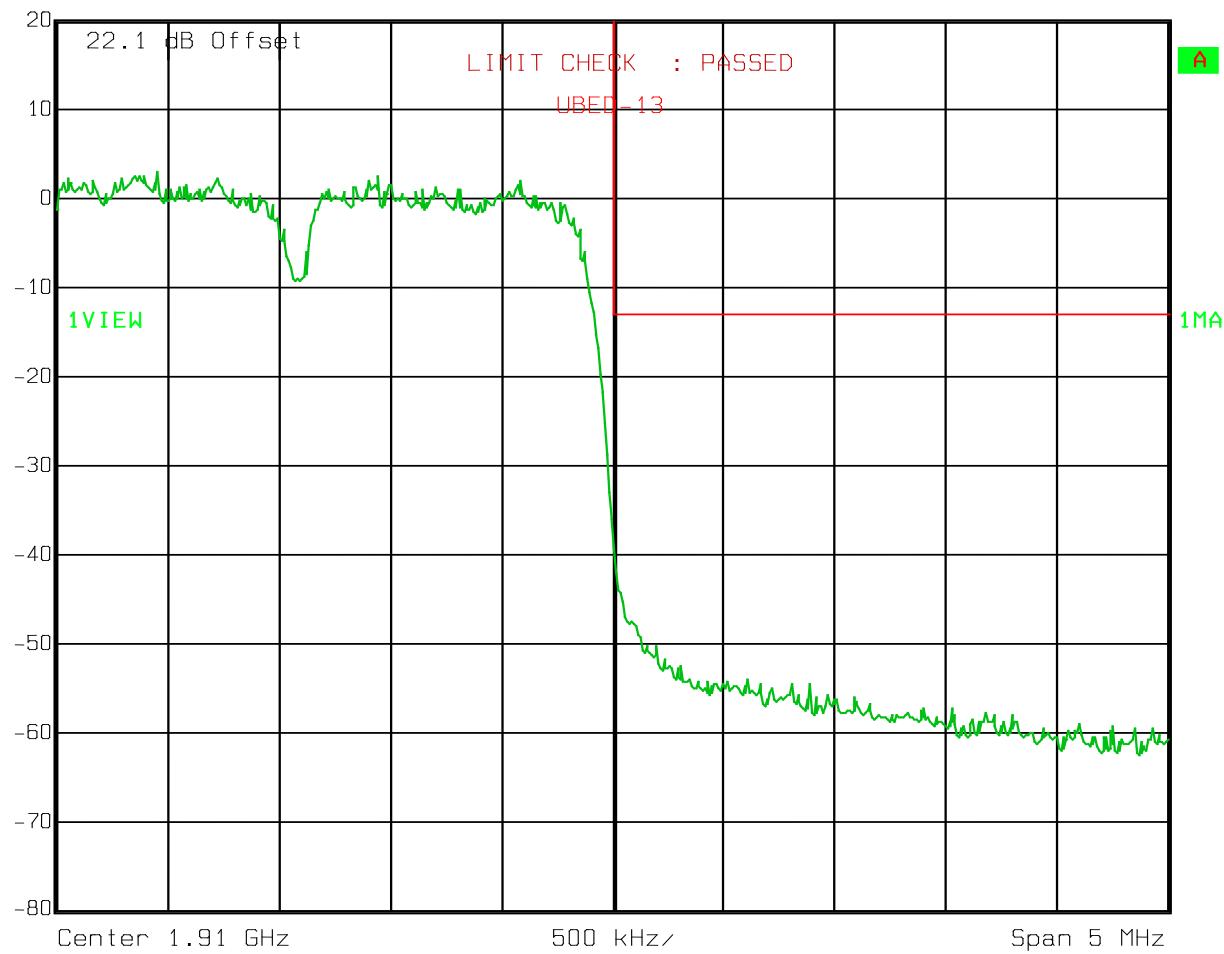
Uplink



Ref Lvl

20 dBm

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

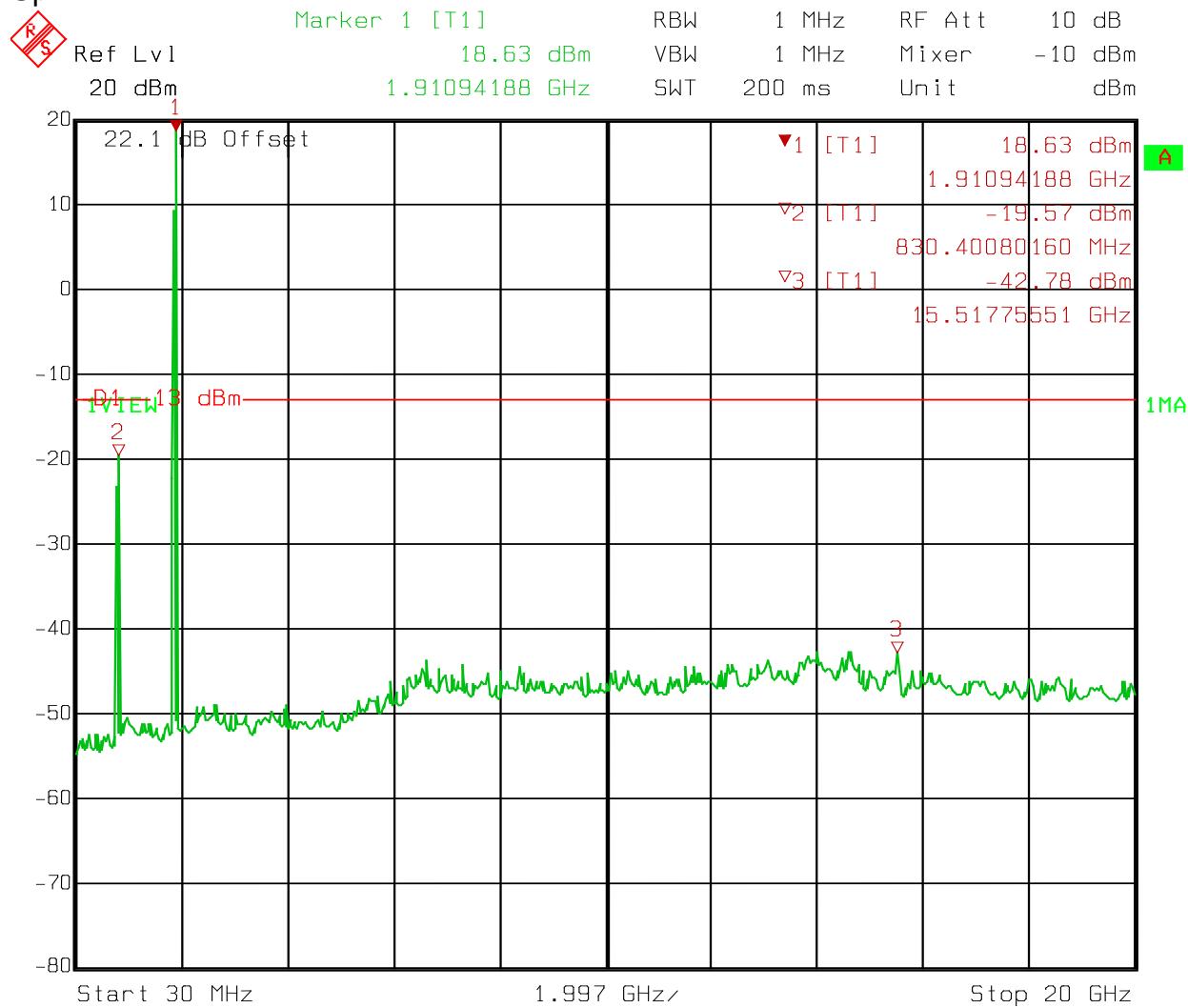


Date: 26.JAN.2010 13:01:14

Test Data – Spurious Emissions at Antenna Terminals

Spurs – CDMA

Uplink



Date: 26.JAN.2010 13:02:32

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

EDGE

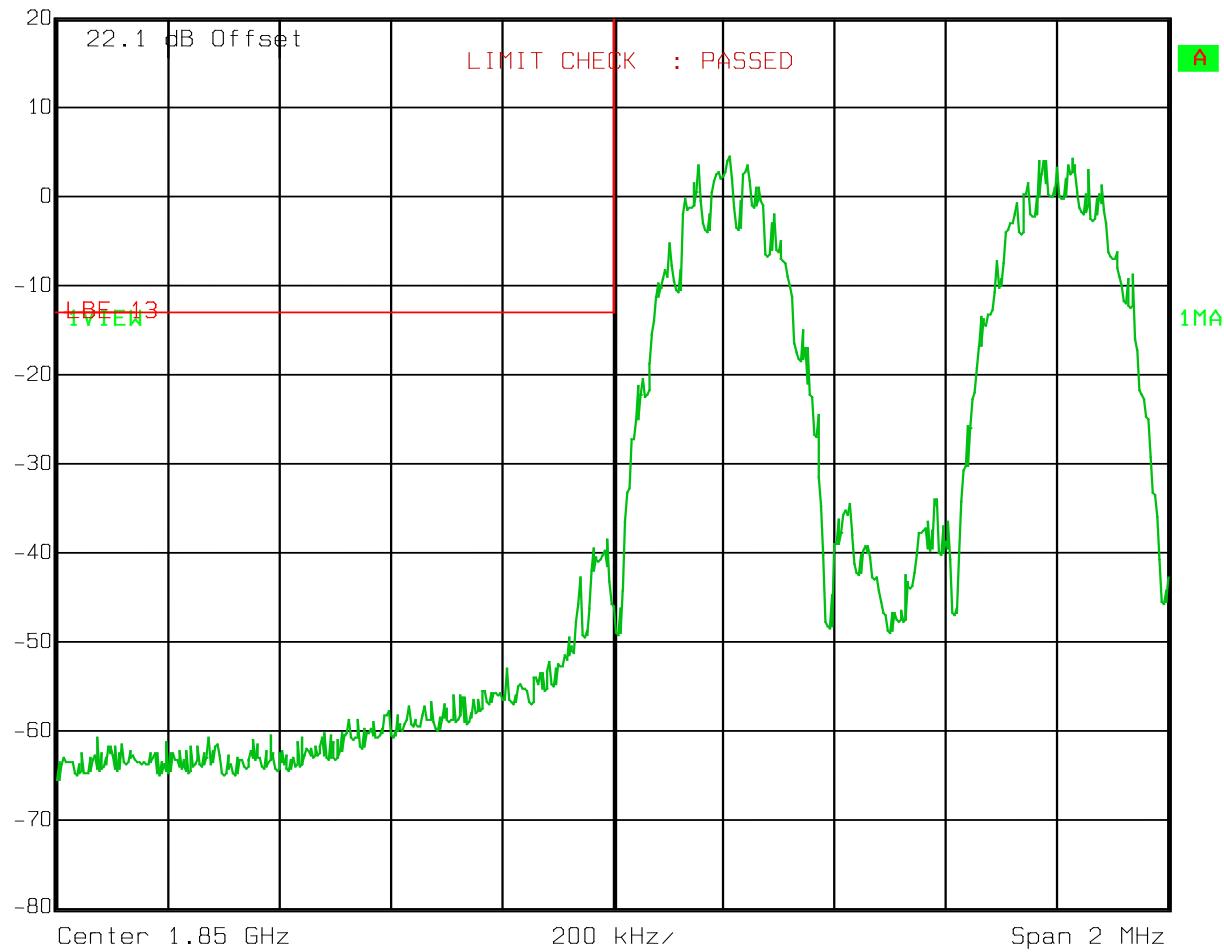
Uplink



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 13:04:44

Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

EDGE

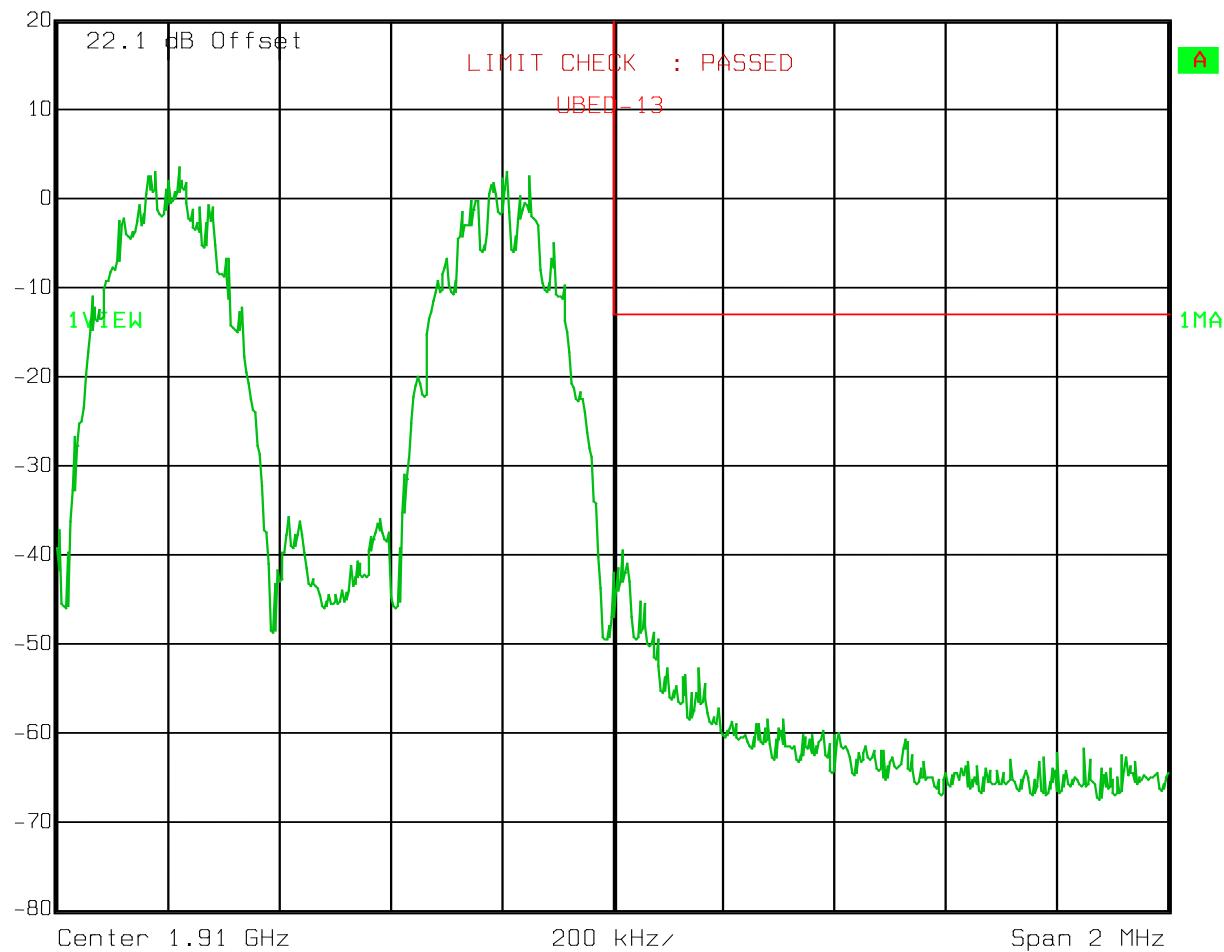
Uplink



Ref Lvl

20 dBm

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

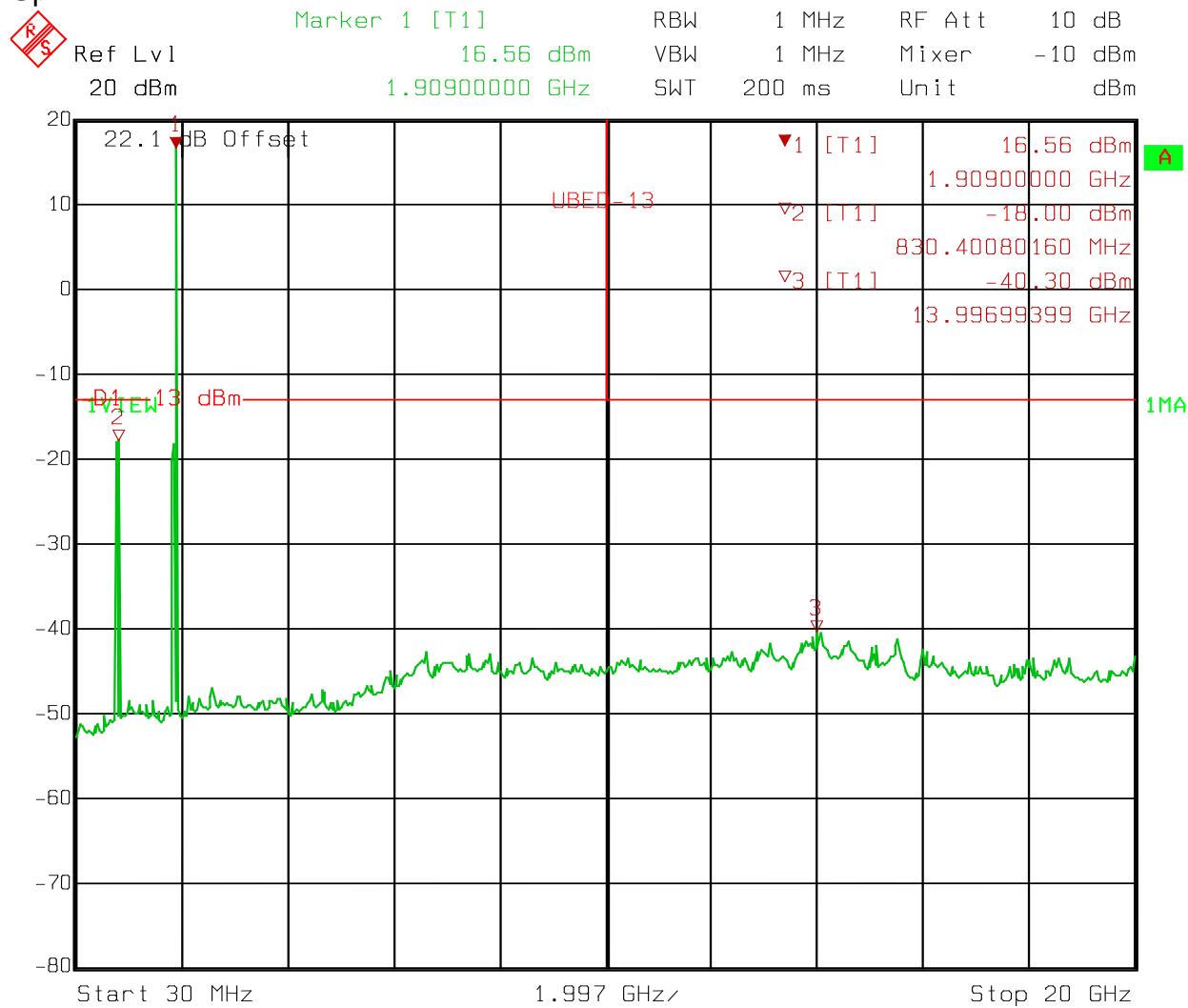


Date: 26.JAN.2010 13:05:32

Test Data – Spurious Emissions at Antenna Terminals

Spurs – EDGE

Uplink



Date: 26.JAN.2010 13:06:47

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

GSM

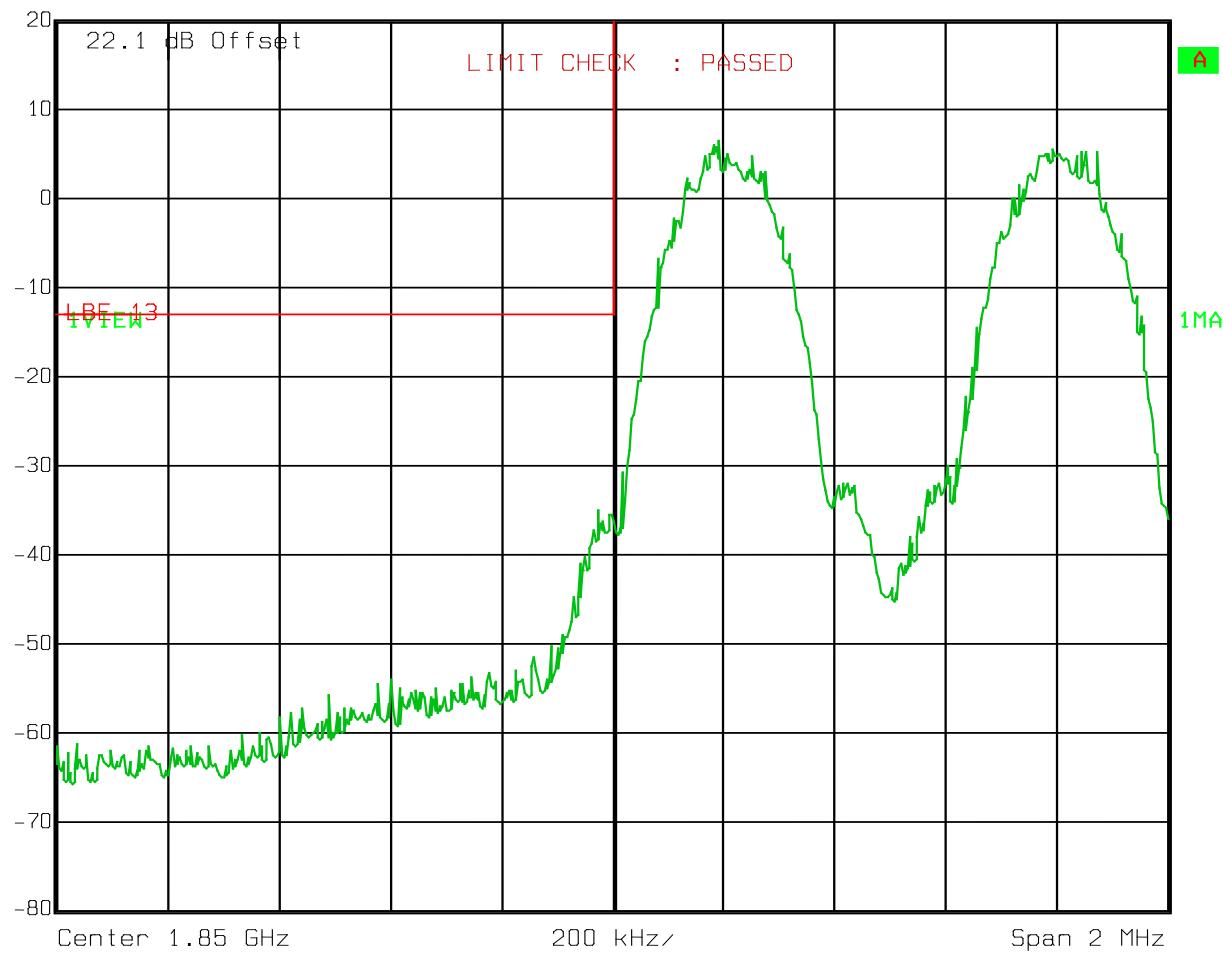
Uplink



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 13:08:29

Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

GSM

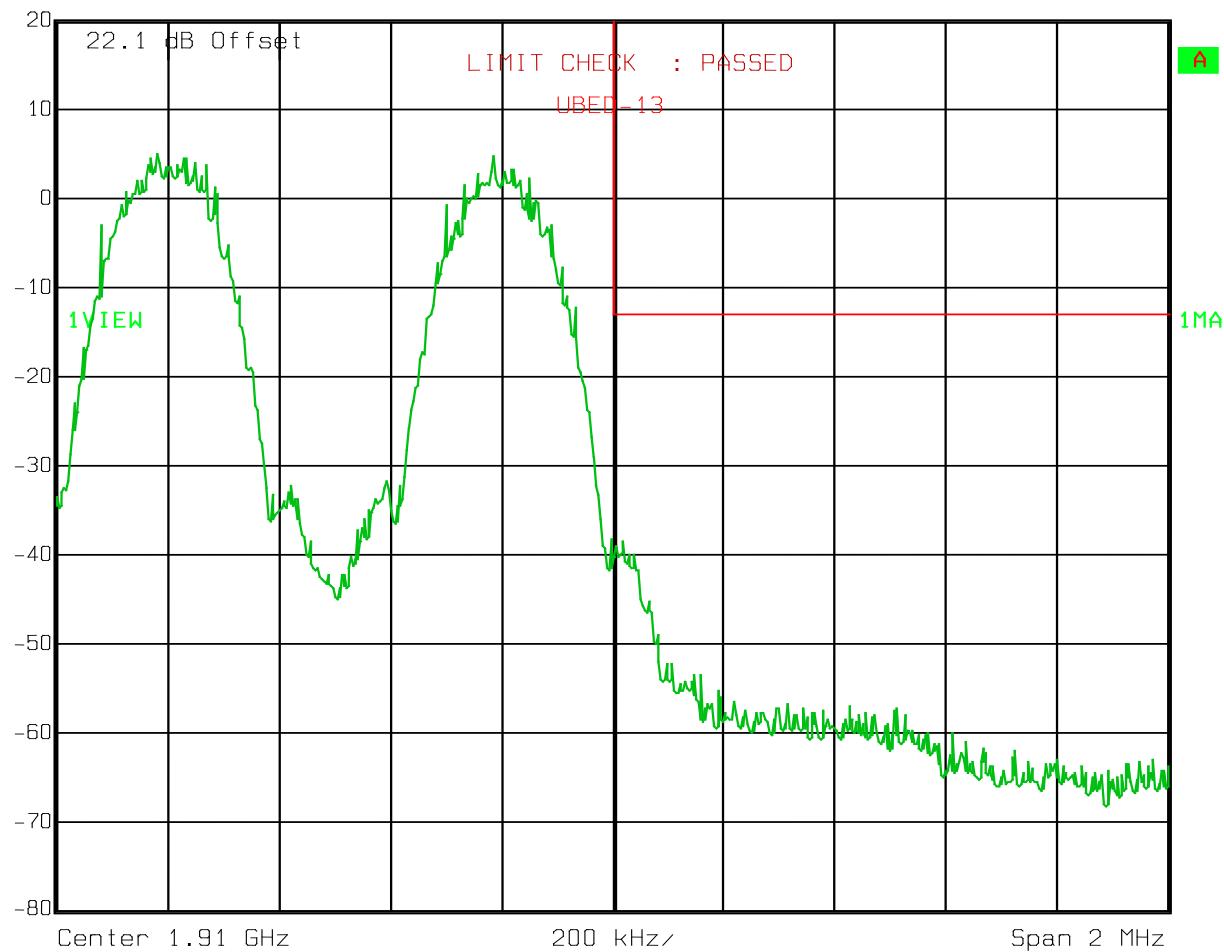
Uplink



Ref Lvl

20 dBm

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

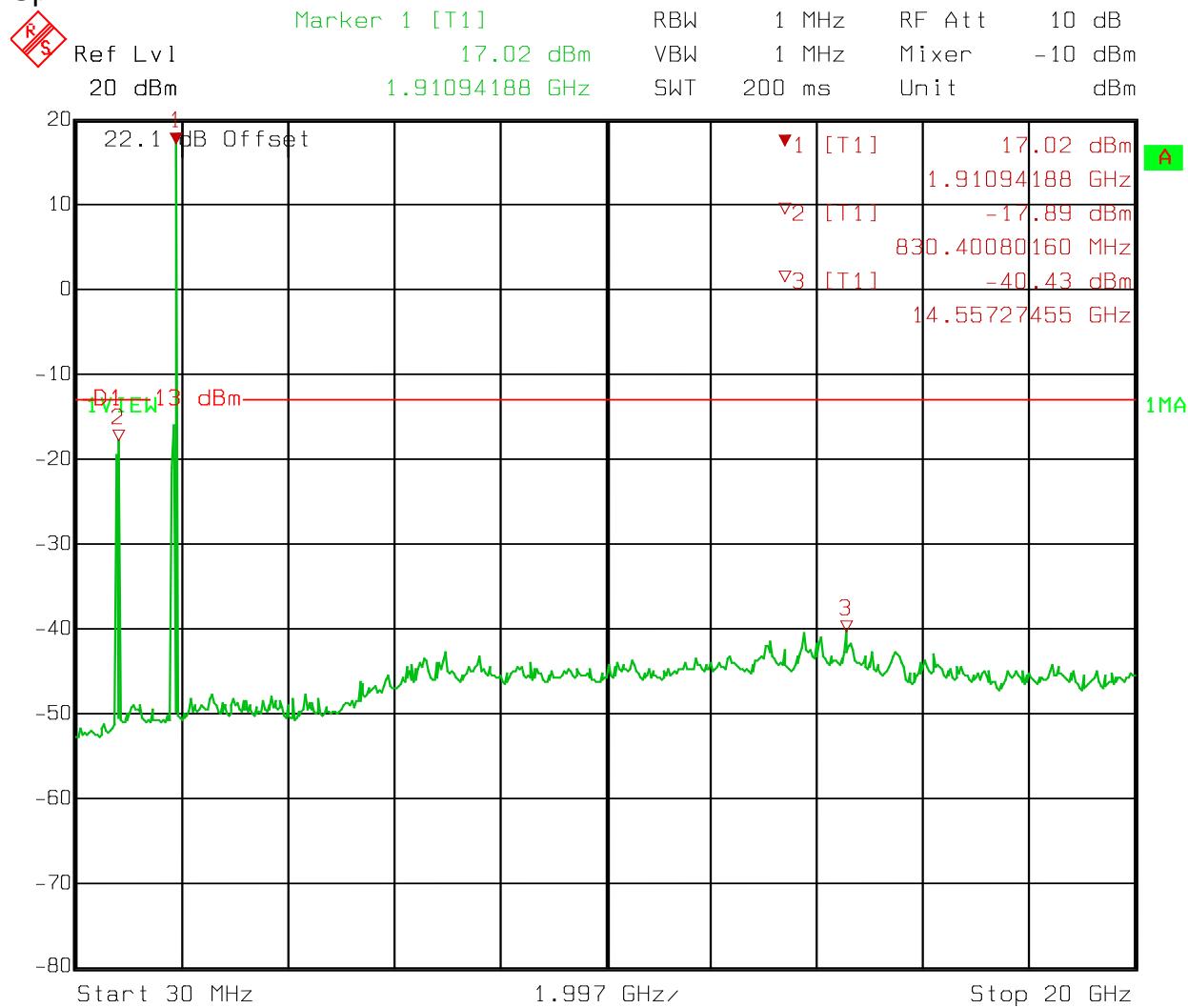


Date: 26.JAN.2010 13:09:23

Test Data – Spurious Emissions at Antenna Terminals

Spurs – GSM

Uplink



Date: 26.JAN.2010 13:10:20

Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

W-CDMA

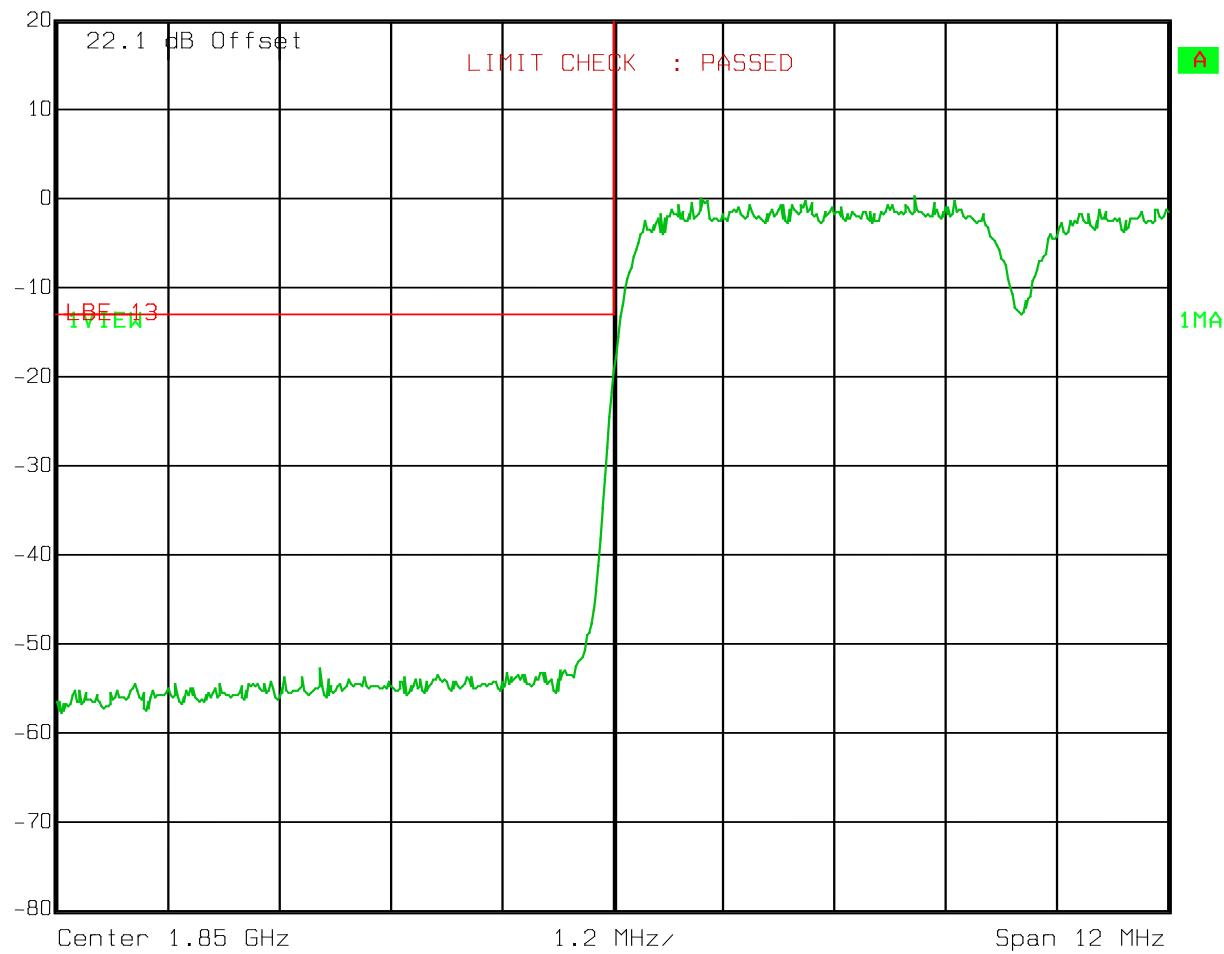
Uplink



Ref Lvl

20 dBm

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



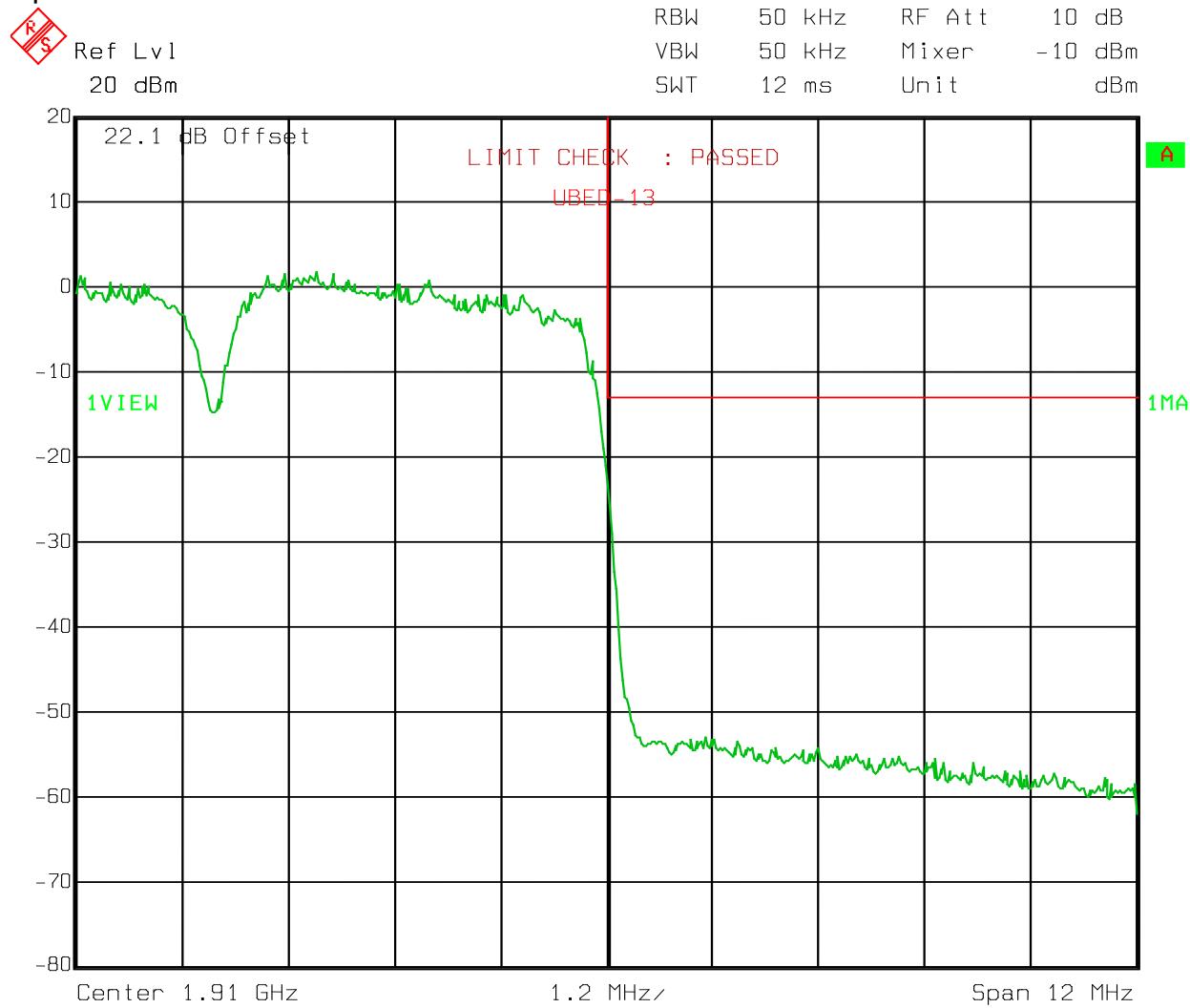
Date: 26.JAN.2010 13:15:53

Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

W-CDMA

Uplink

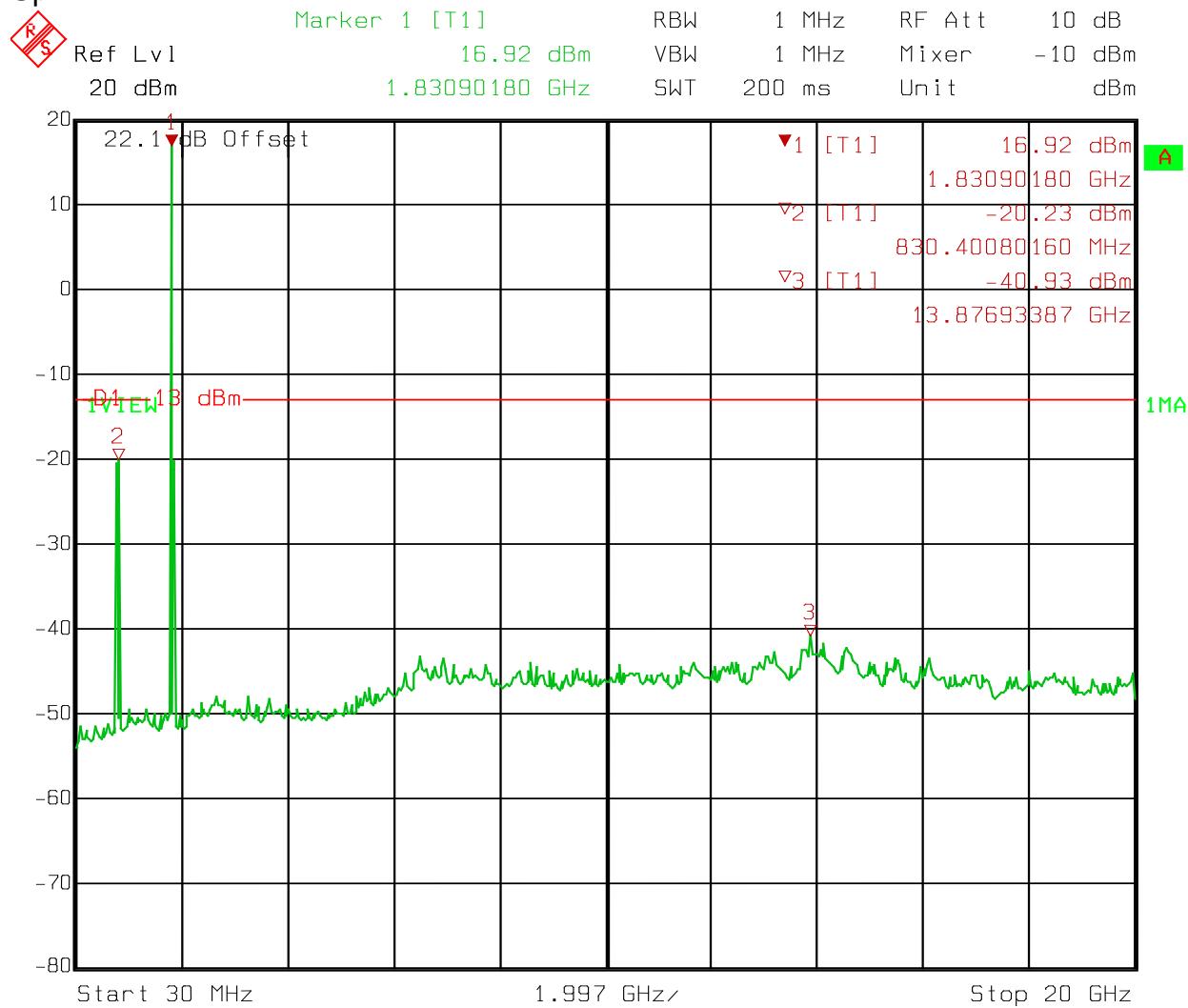


Date: 26.JAN.2010 13:14:48

Test Data – Spurious Emissions at Antenna Terminals

Spurs – W-CDMA -

Uplink



Date: 26.JAN.2010 13:16:54

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

Nemko USA, Inc.

EQUIPMENT: MR8518/1918/1918

CFR 47, PART 24, SUBPART E
BROADBAND PCS REPEATERS
PROJECT NO.: 41247RUS2

ANNEX A - TEST DETAILS

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

NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 24.238

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least $43 + 10 \log (P)$ dB.

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

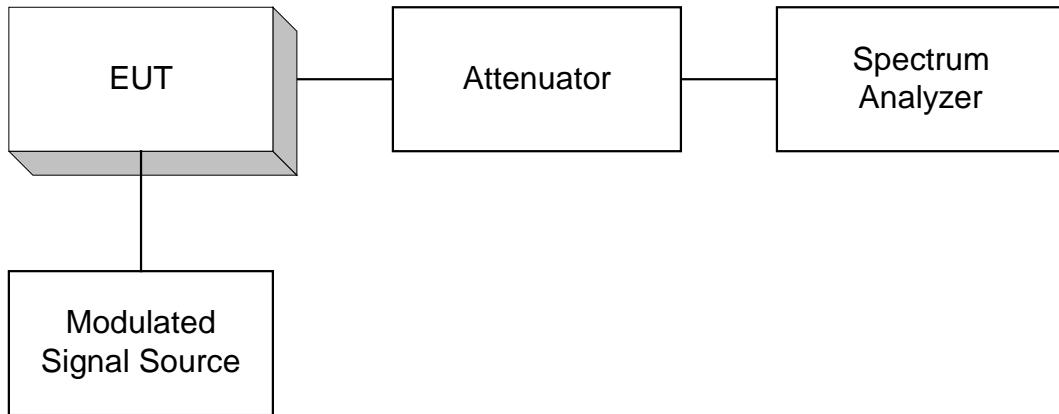
To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

Nemko USA, Inc.

EQUIPMENT: MR8518/1918/1918

CFR 47, PART 24, SUBPART E
BROADBAND PCS REPEATERS
PROJECT NO.: 41247RUS2

ANNEX B - TEST DIAGRAMS

Para. No. 2.989 - Occupied Bandwidth**Para. No. 2.991 Spurious Emissions at Antenna Terminals**