Nemko Test Report:	41241RUS2
Applicant:	Andrew Corporation 620 N. Greenfield Parkway Garner, NC 27529 USA
Equipment Under Test: (E.U.T.)	MR8518/8518/1918/1918
FCC Identifier:	BCR-881919
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: _____ **DATE:** **08 February 2010**

David Light, Senior Wireless Engineer

APPROVED BY: _____ **DATE:** **15 February 2010**

Tom Tidwell, Telecom Direct

Number of Pages: 59

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Section 1. Summary of Test Results

Manufacturer:	Andrew Corporation
Model No.:	MR8518/8518/1918/1918
Serial No.:	11

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 performance of 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

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	24.232	100W	[1]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.	[2]Not tested
Frequency Stability	24.235		[3]Not applicable

Footnotes:

1 RF power output has not been changed. The gain of the system is increased by removing attenuation from the system.

2 Field strength of spurious emissions testing was not performed because there were no changes to the chassis of the device or to the rf power output.

3 Frequency stability testing was not performed because the device uses a common oscillator to up-convert and down-convert the rf carrier.

Rev1; Revised FCC ID number.

Section 2. General Equipment Specification

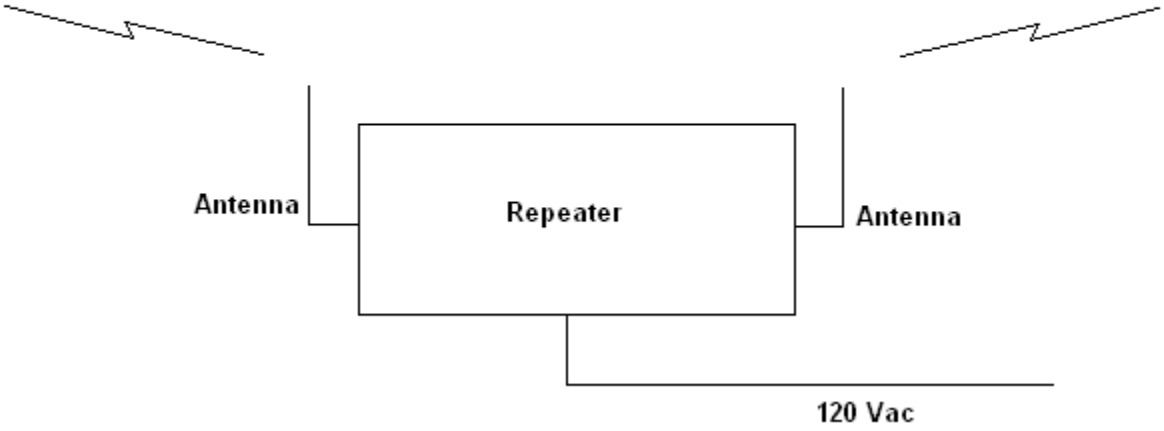
Supply Voltage Input:		120 Vac			
Frequency Range:	**Downlink:**	1930 to 1990 MHz*			
Frequency Range:	**Uplink:**	1850 to 1910 MHz*			
Type of Modulation and Designator:		CDMA (F9W)	GSM (GXW)	EDGE (G7W)	W-CDMA (F9W)
Output Impedance:		50 ohms			
RF Output (Rated):	**Downlink**	18 dBm (63.1 mW)			
RF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

* 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: 08 February 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1082-1472

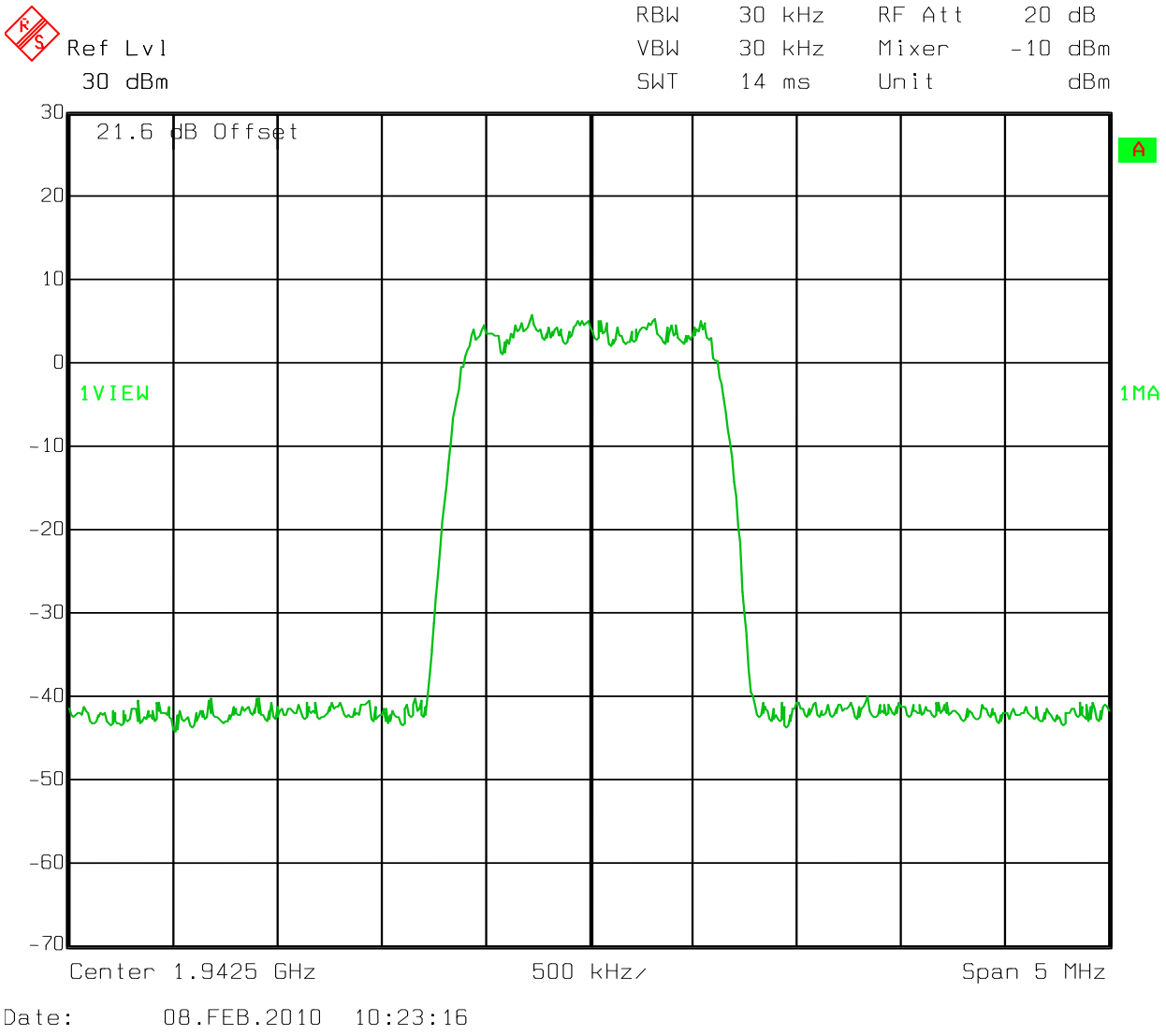
Measurement Uncertainty: $1X10^{-7}$ ppm

Temperature: 22 °C

Relative Humidity: 30 %

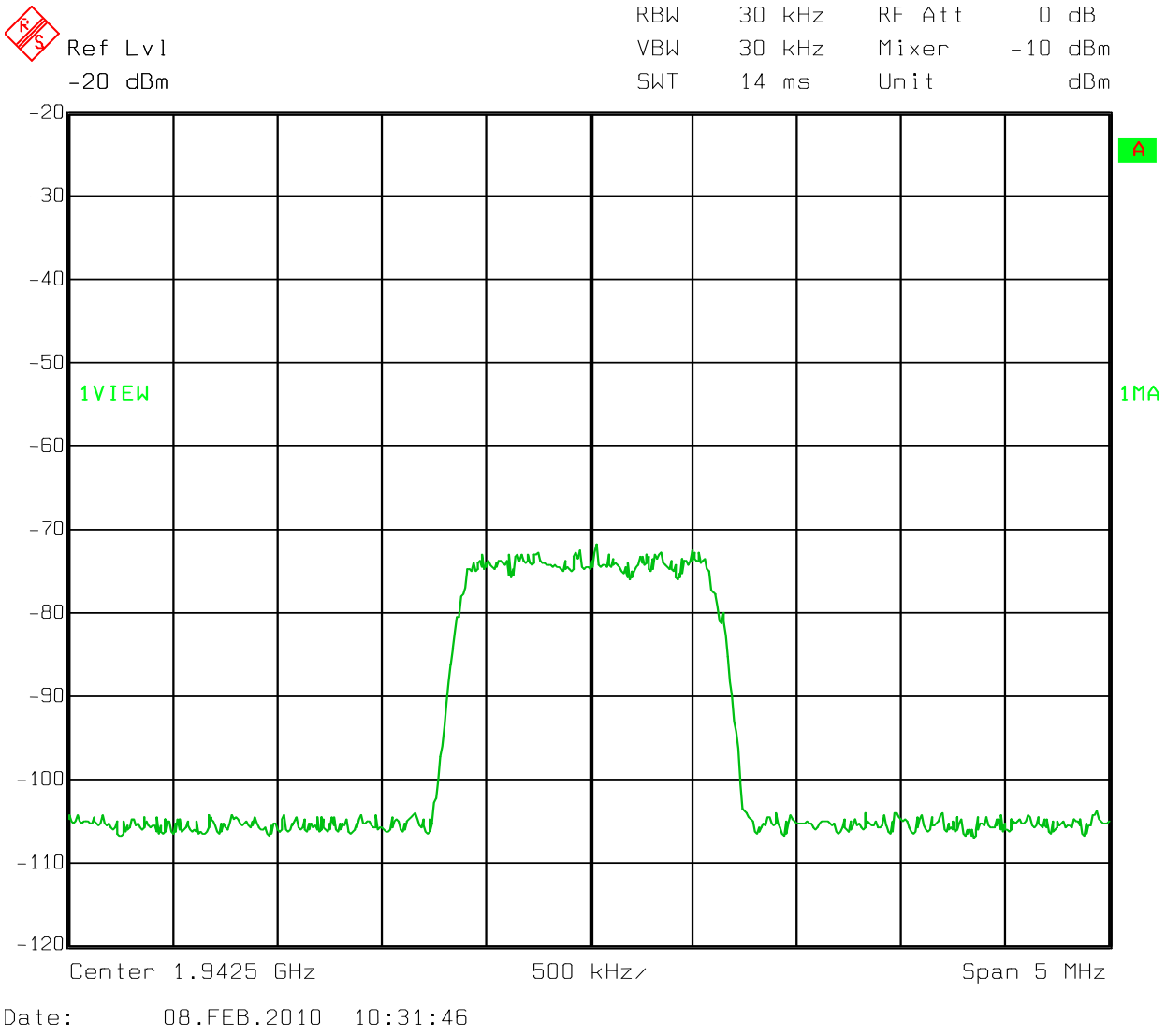
Test Data – Occupied Bandwidth

CDMA - Output
Downlink



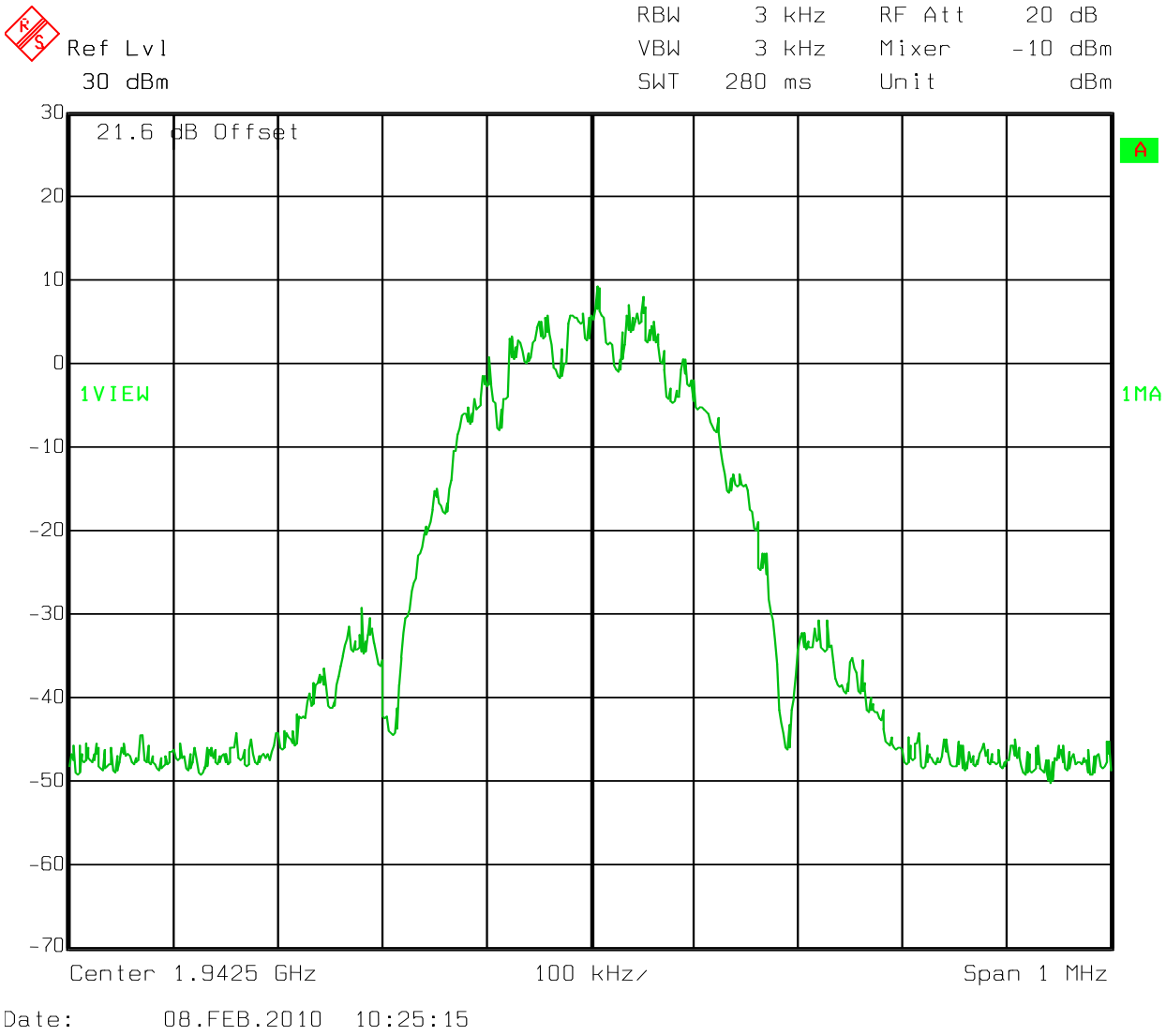
Test Data – Occupied Bandwidth

CDMA - Input
Downlink



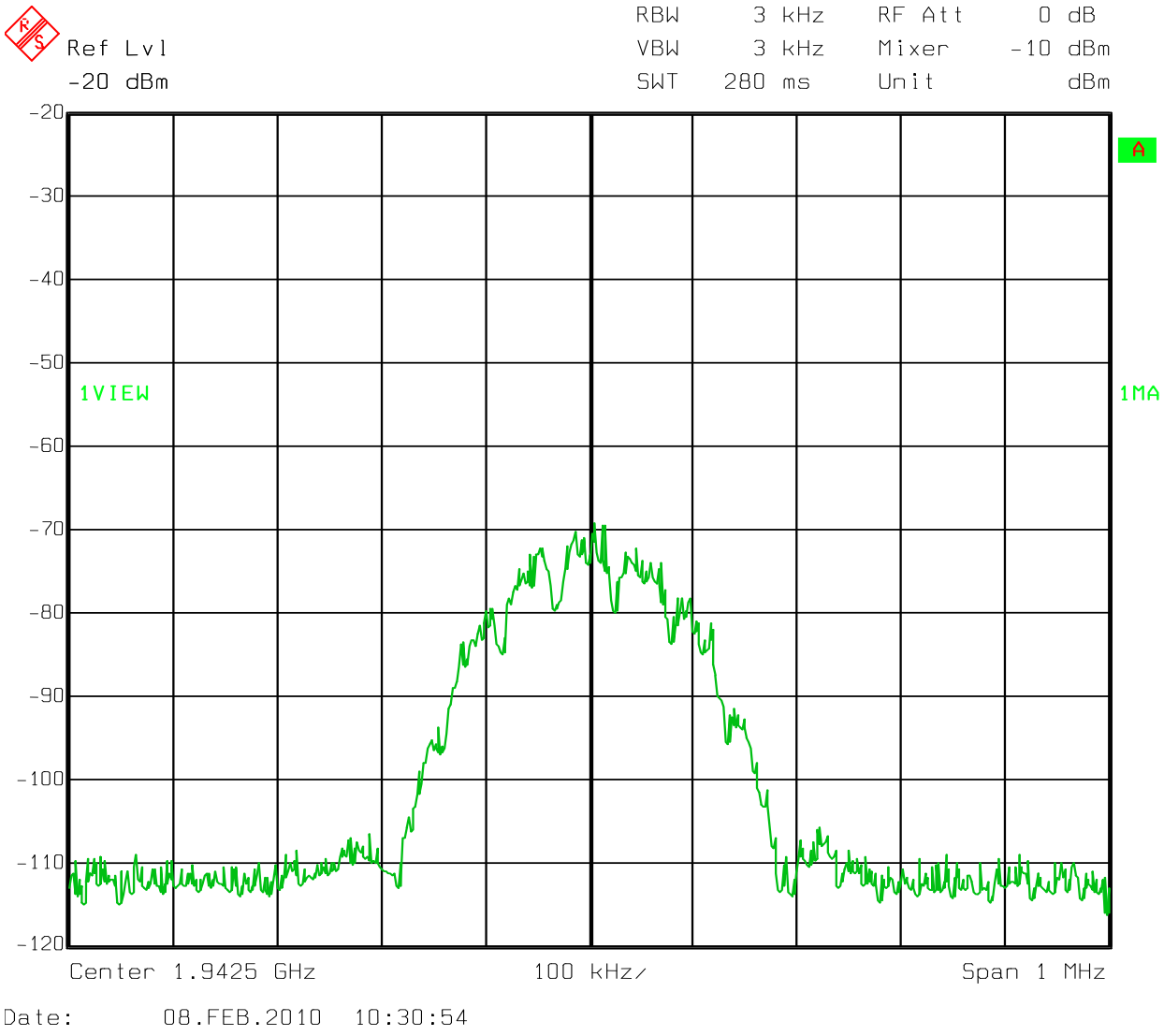
Test Data – Occupied Bandwidth

EDGE - Output
Downlink



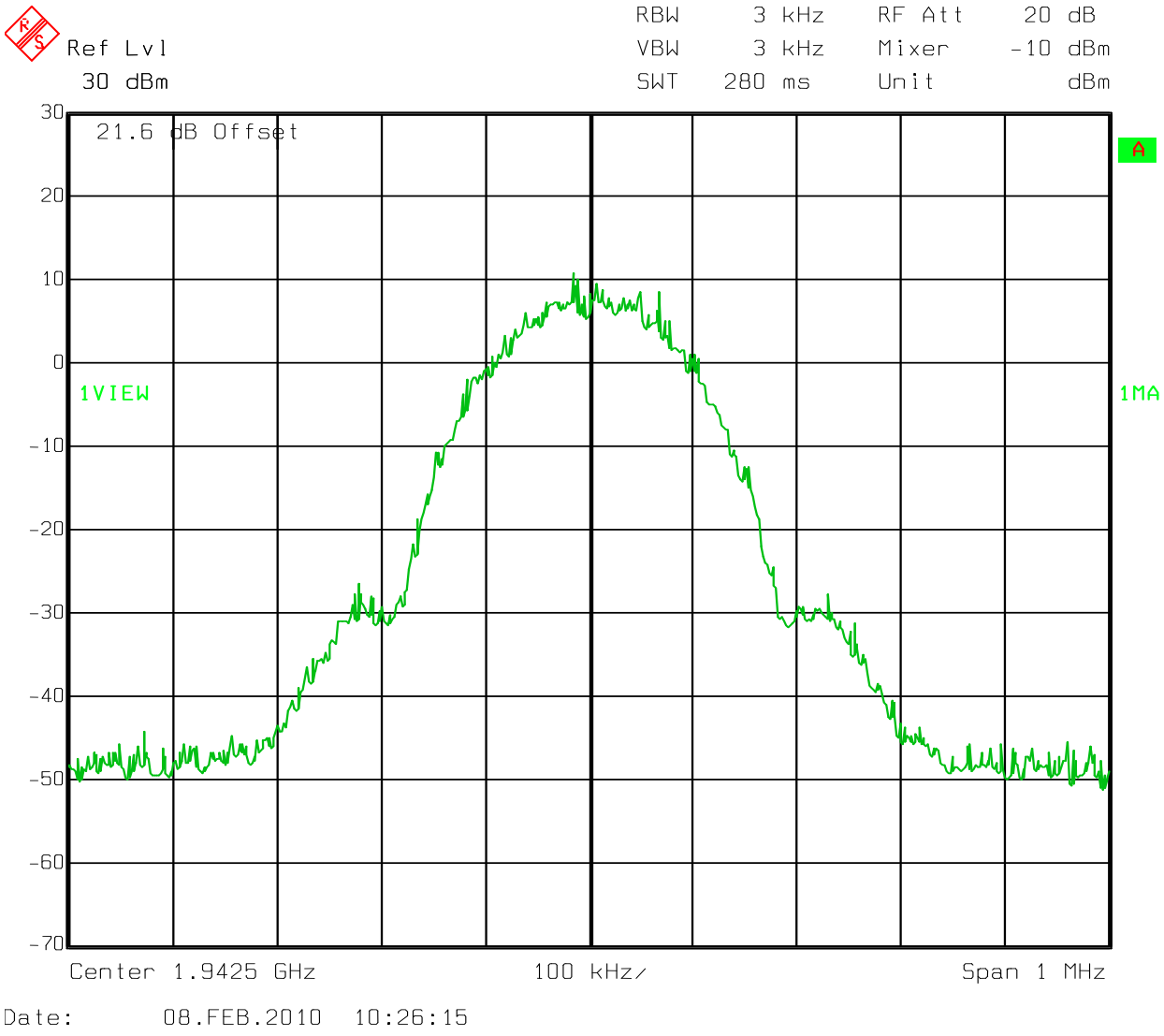
Test Data – Occupied Bandwidth

EDGE - Input
Downlink



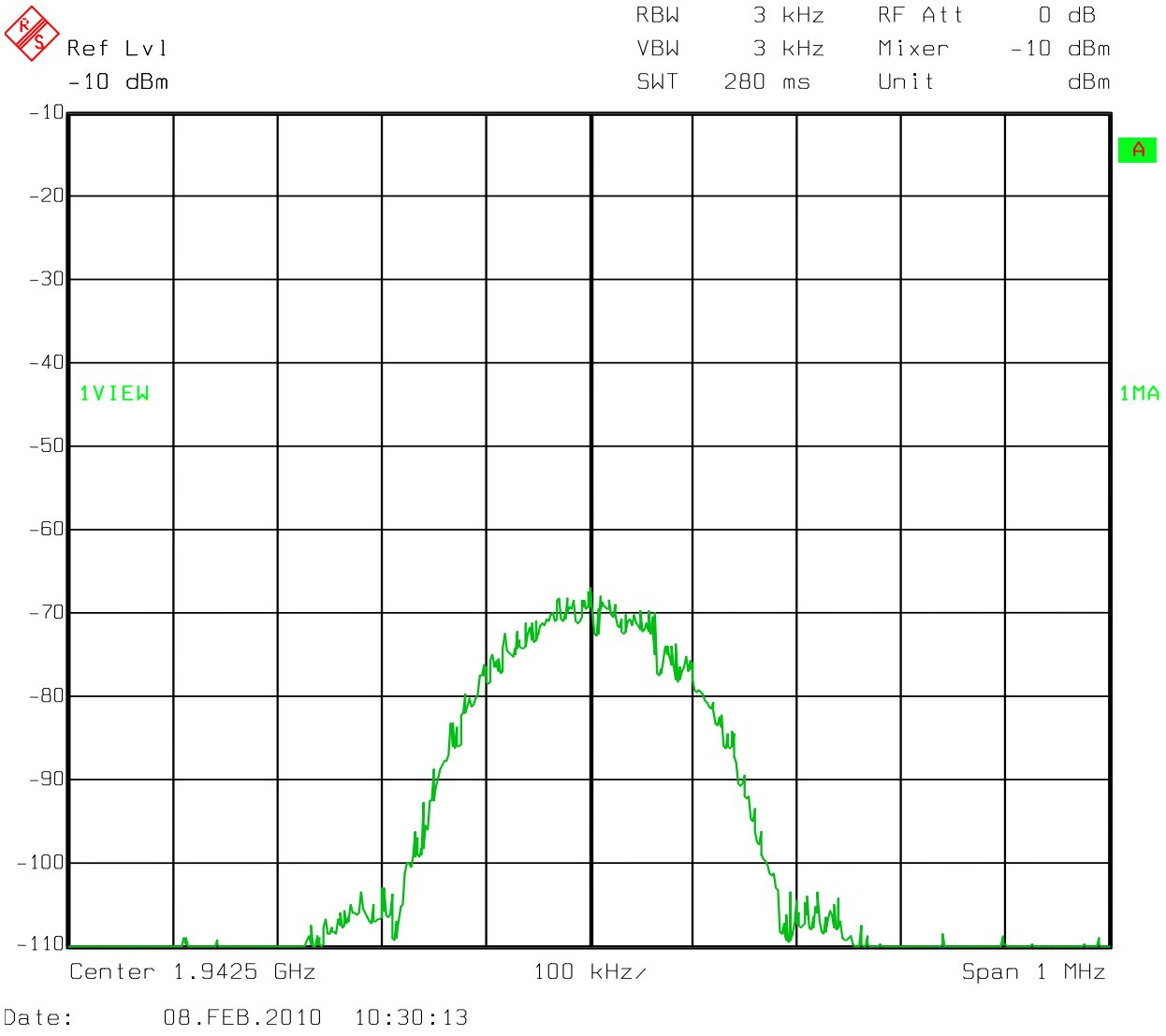
Test Data – Occupied Bandwidth

GSM - Output
Downlink



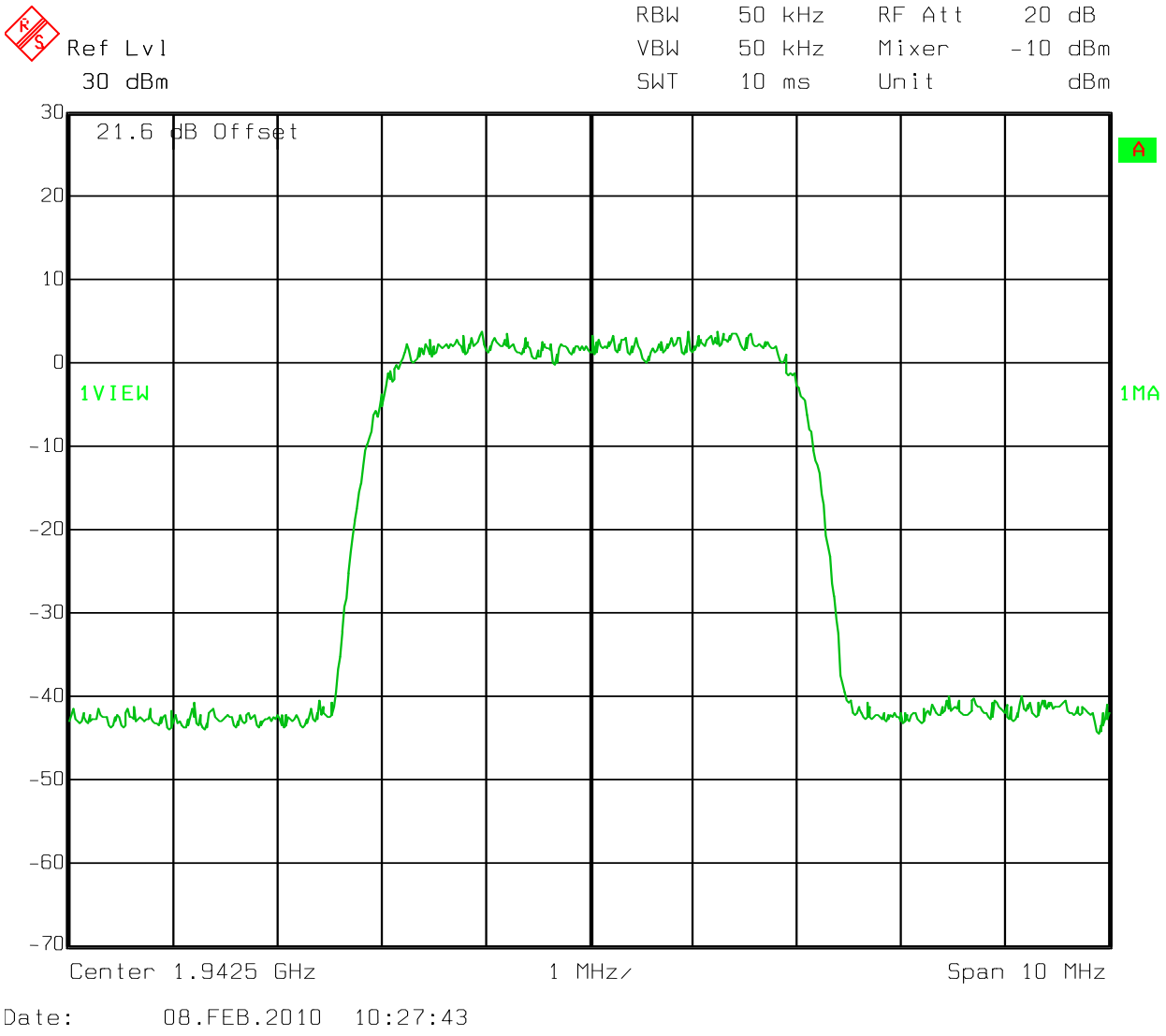
Test Data – Occupied Bandwidth

GSM - Input
Downlink



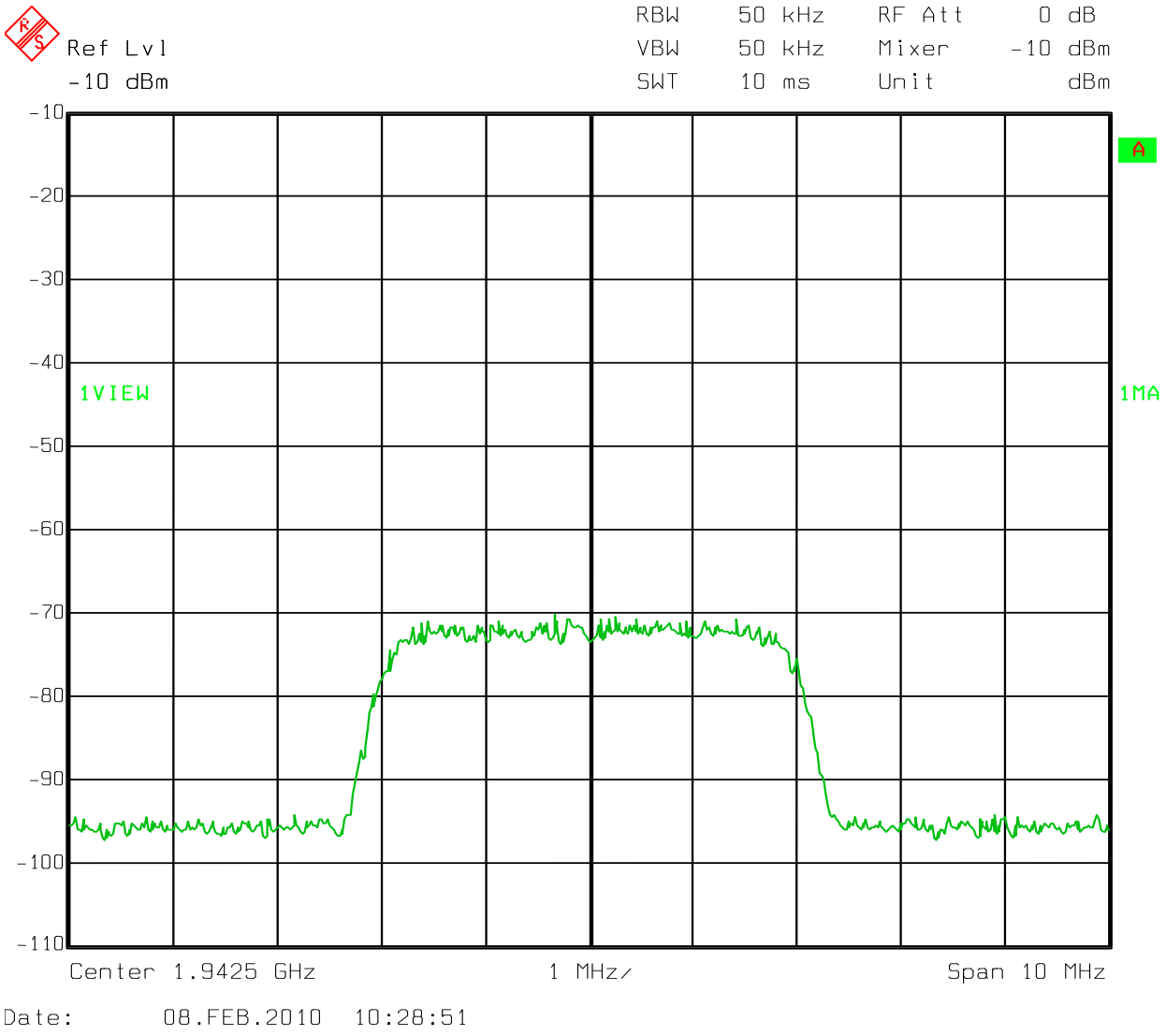
Test Data – Occupied Bandwidth

W-CDMA - Output
Downlink



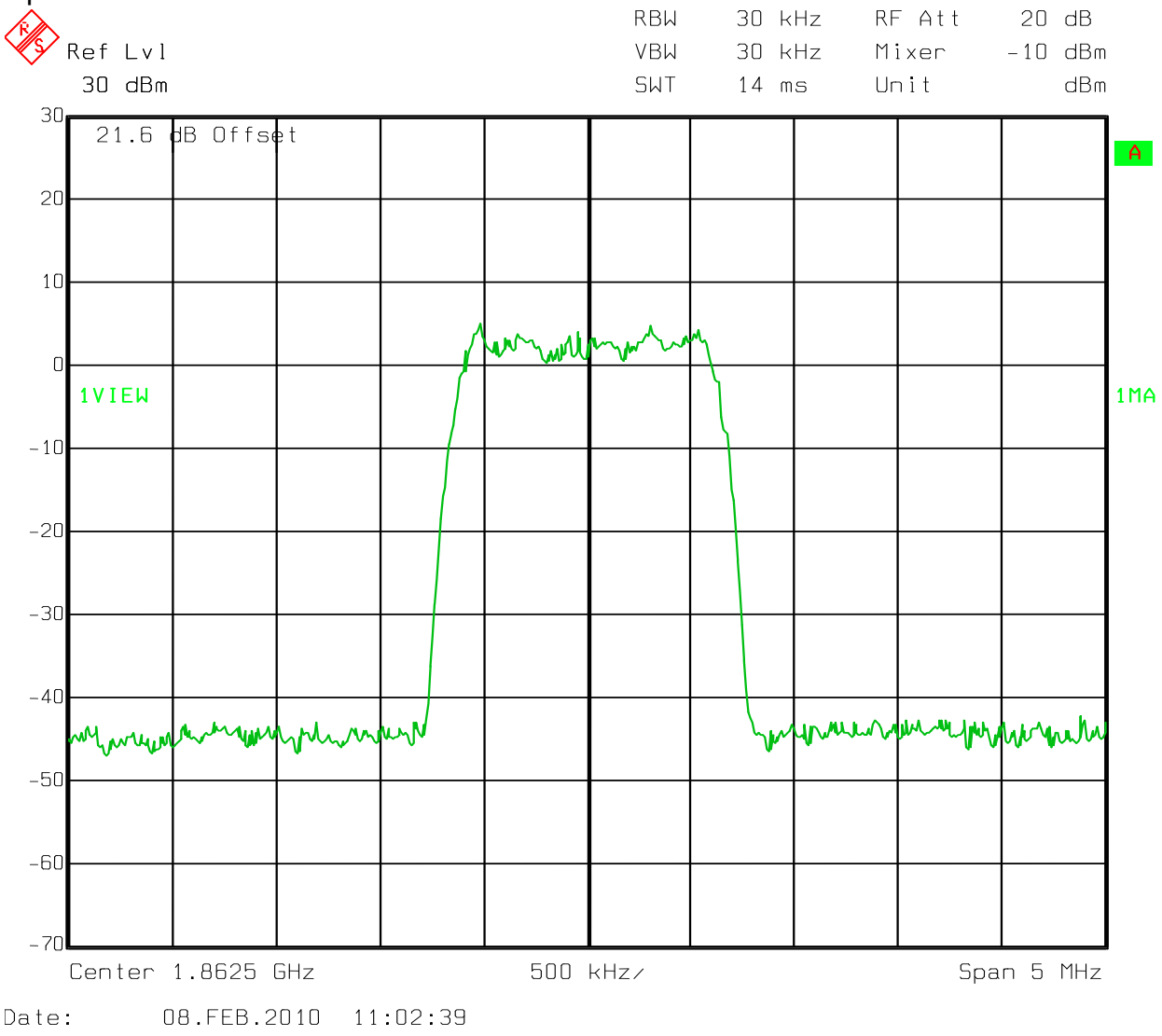
Test Data – Occupied Bandwidth

W-CDMA - Input
Downlink



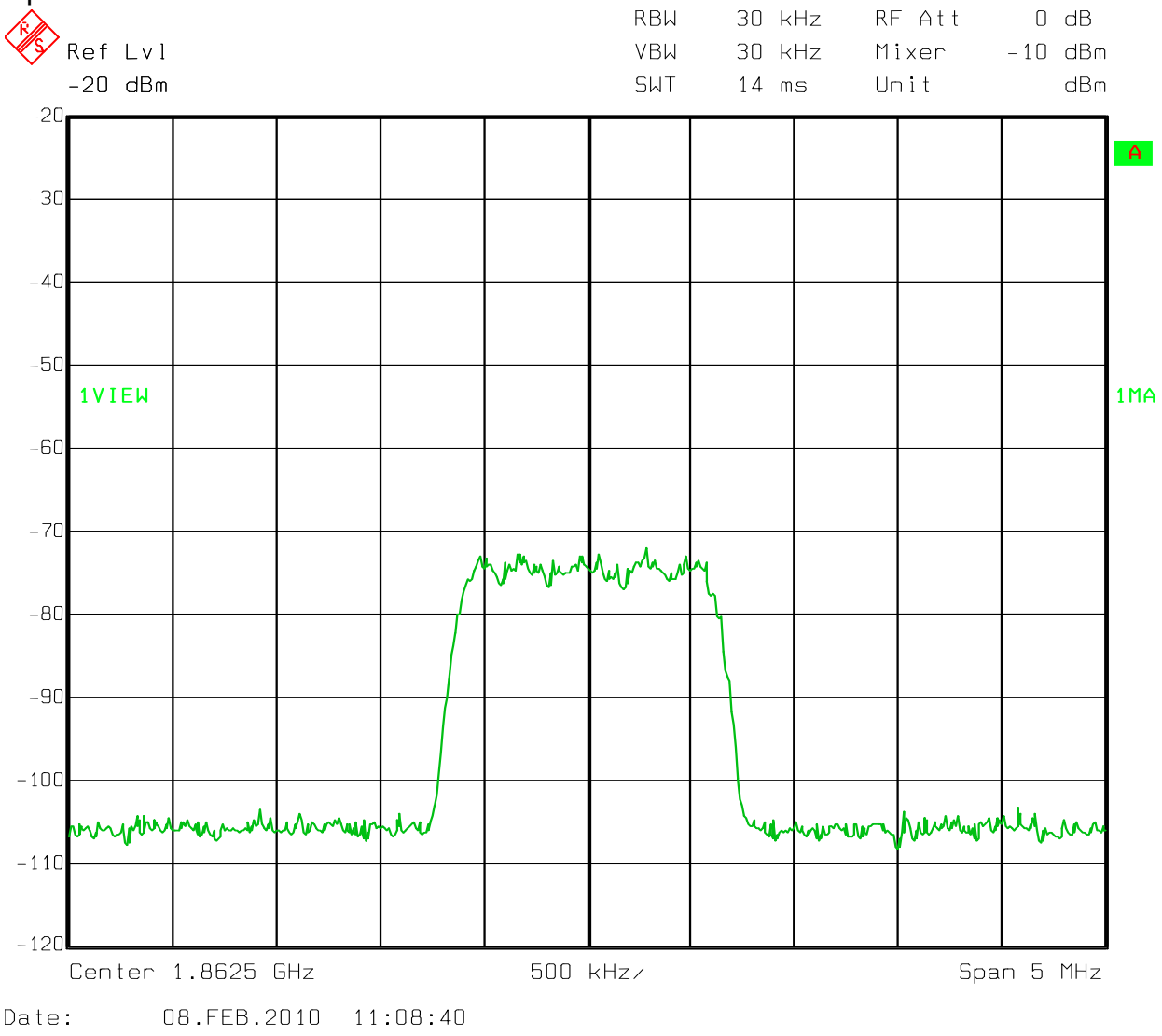
Test Data – Occupied Bandwidth

CDMA - Output
Uplink



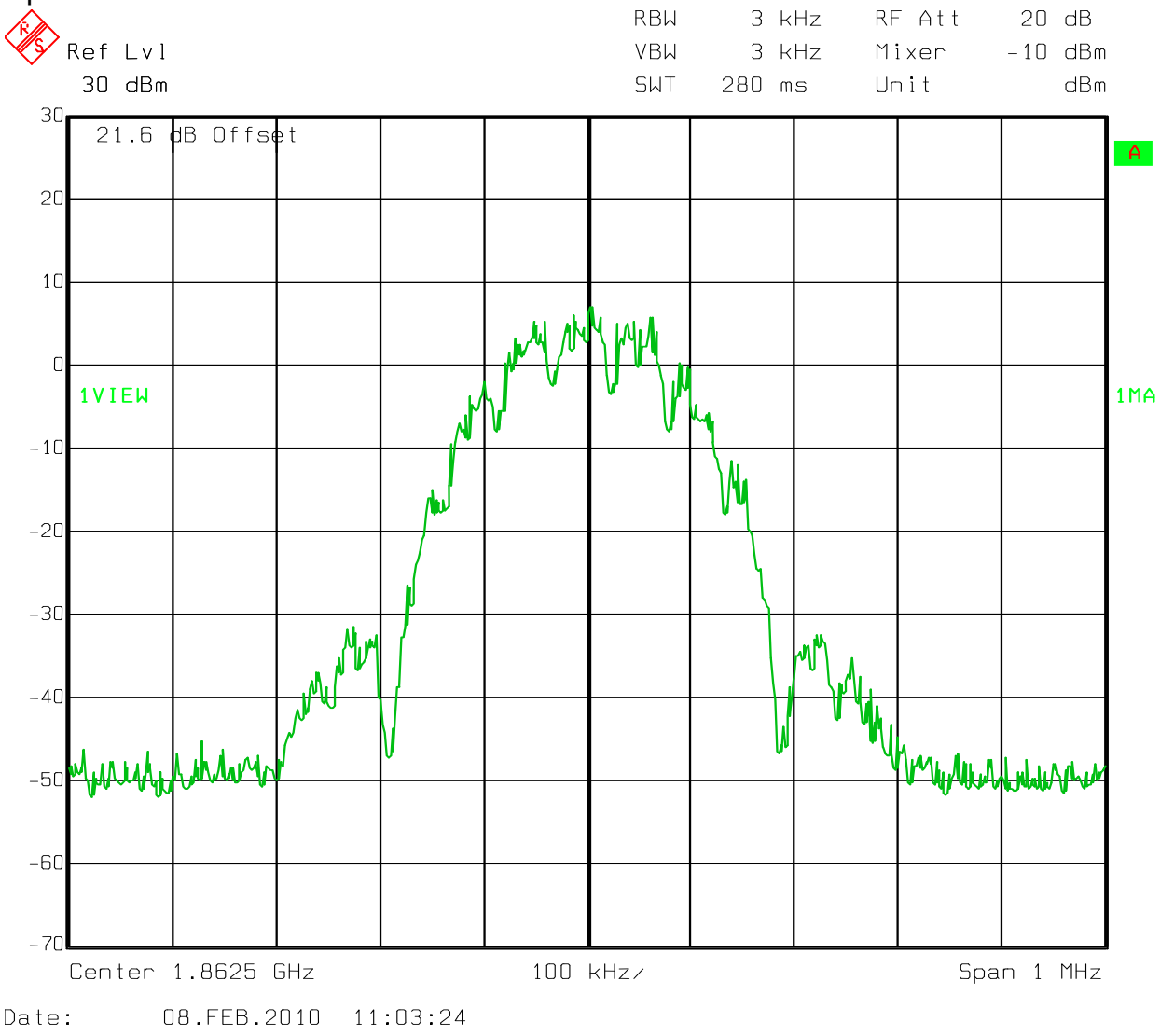
Test Data – Occupied Bandwidth

CDMA - Input
Uplink



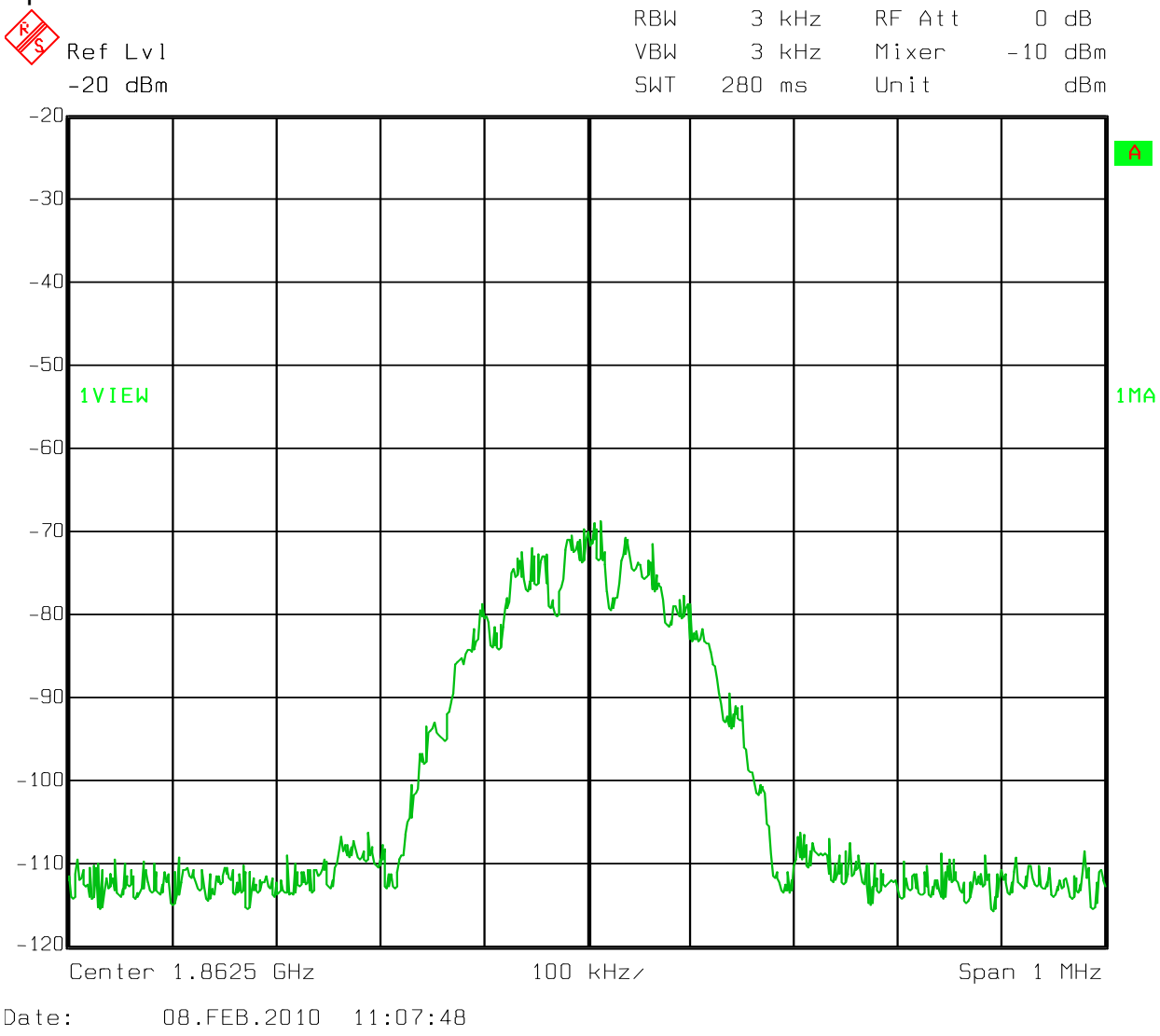
Test Data – Occupied Bandwidth

EDGE - Output
Uplink



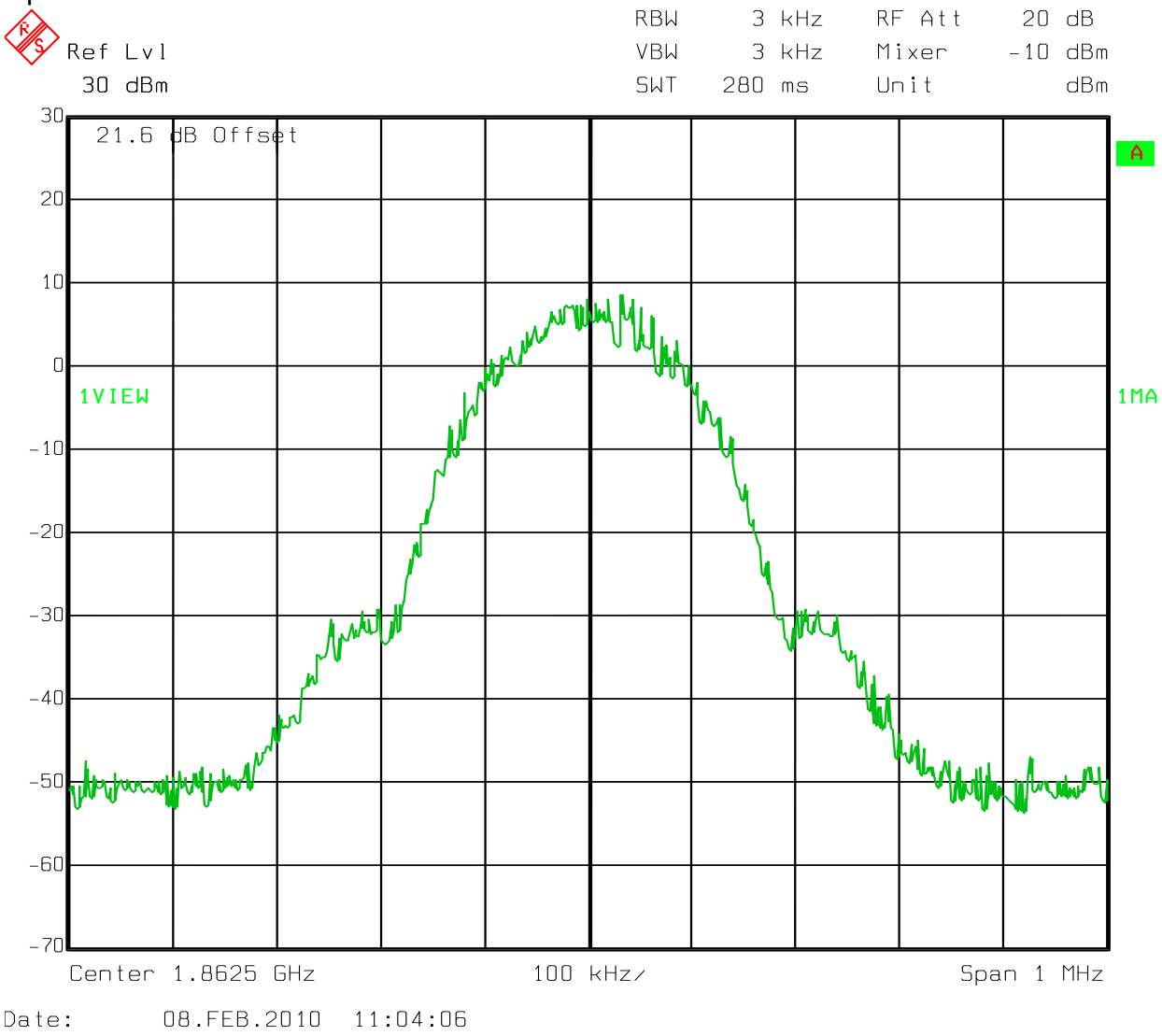
Test Data – Occupied Bandwidth

EDGE - Input
Uplink



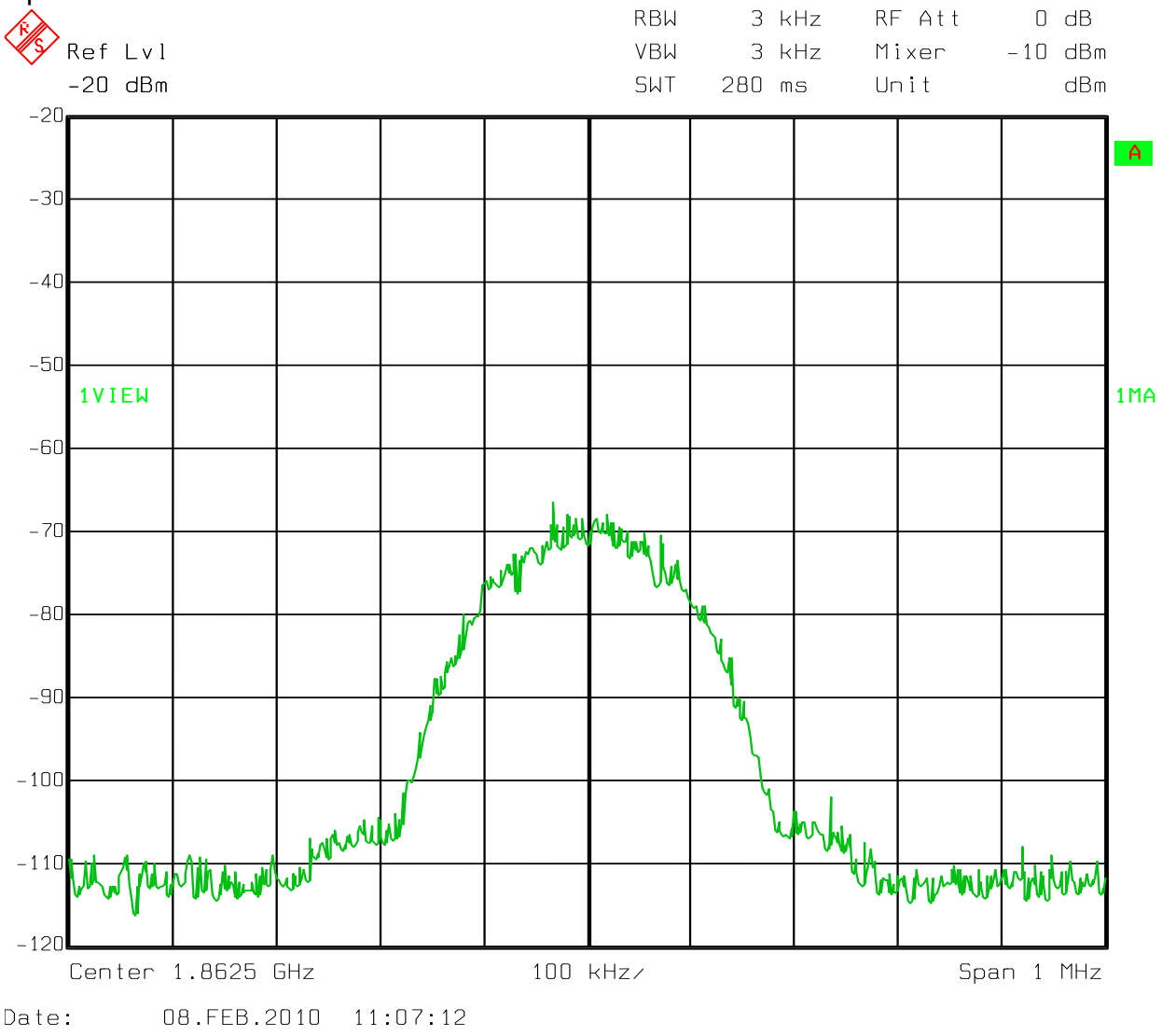
Test Data – Occupied Bandwidth

GSM - Output
Uplink



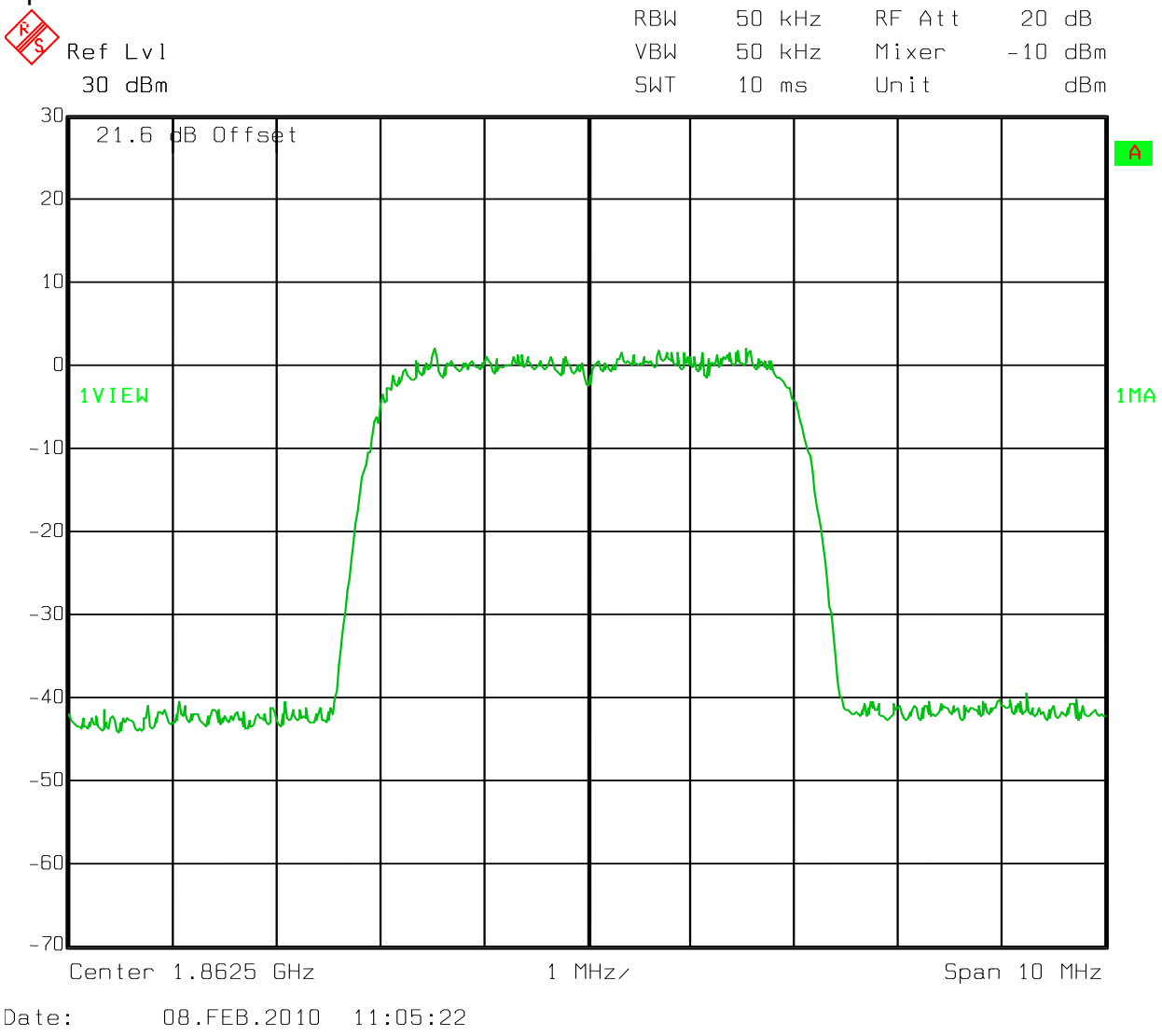
Test Data – Occupied Bandwidth

GSM - Input
Uplink



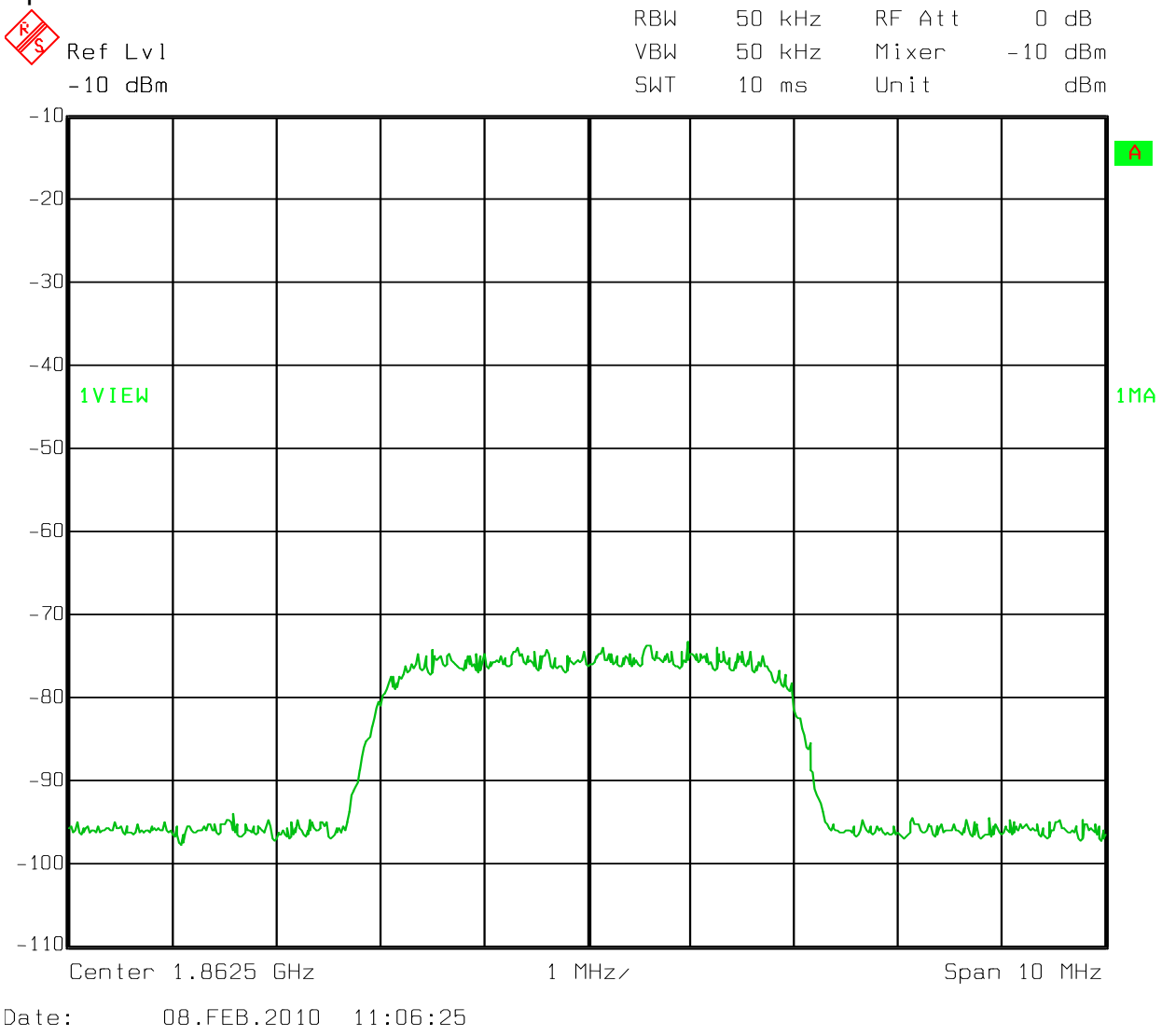
Test Data – Occupied Bandwidth

W-CDMA - Output
Uplink



Test Data – Occupied Bandwidth

W-CDMA - Input
Uplink



Section 4. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 24.238
TESTED BY: David Light	DATE: 08 February 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1082-1472

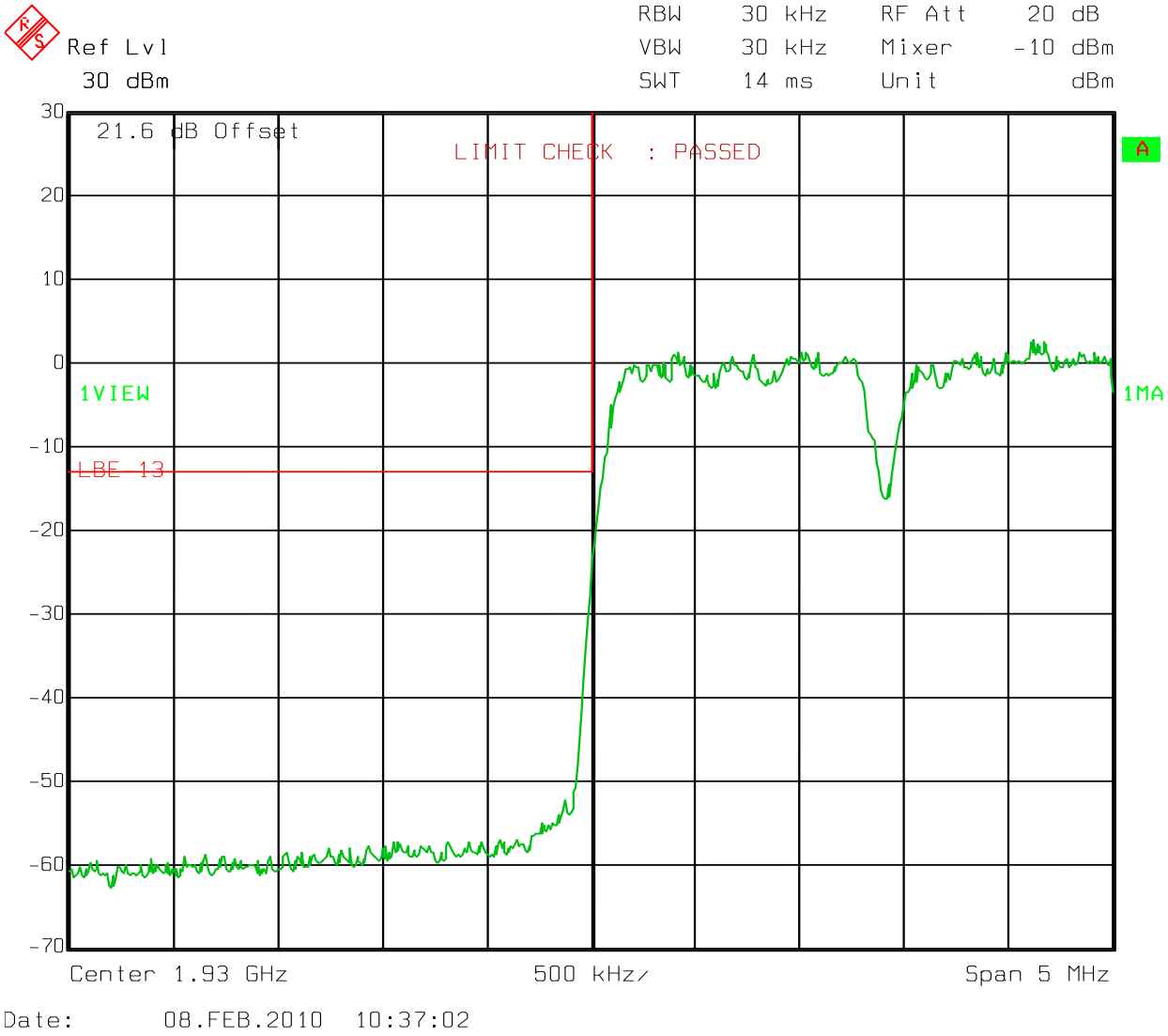
Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 32 %

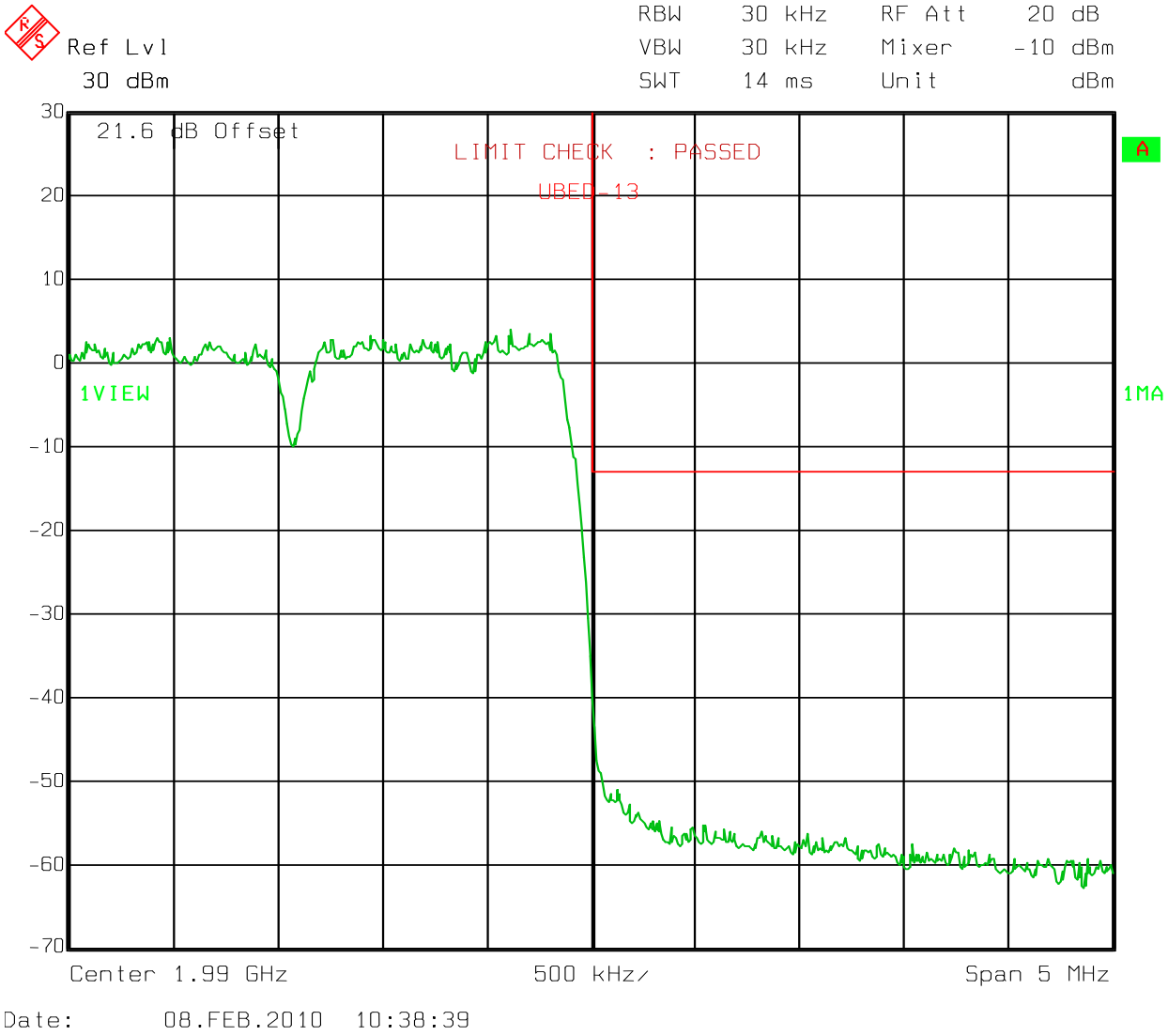
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
CDMA
Downlink



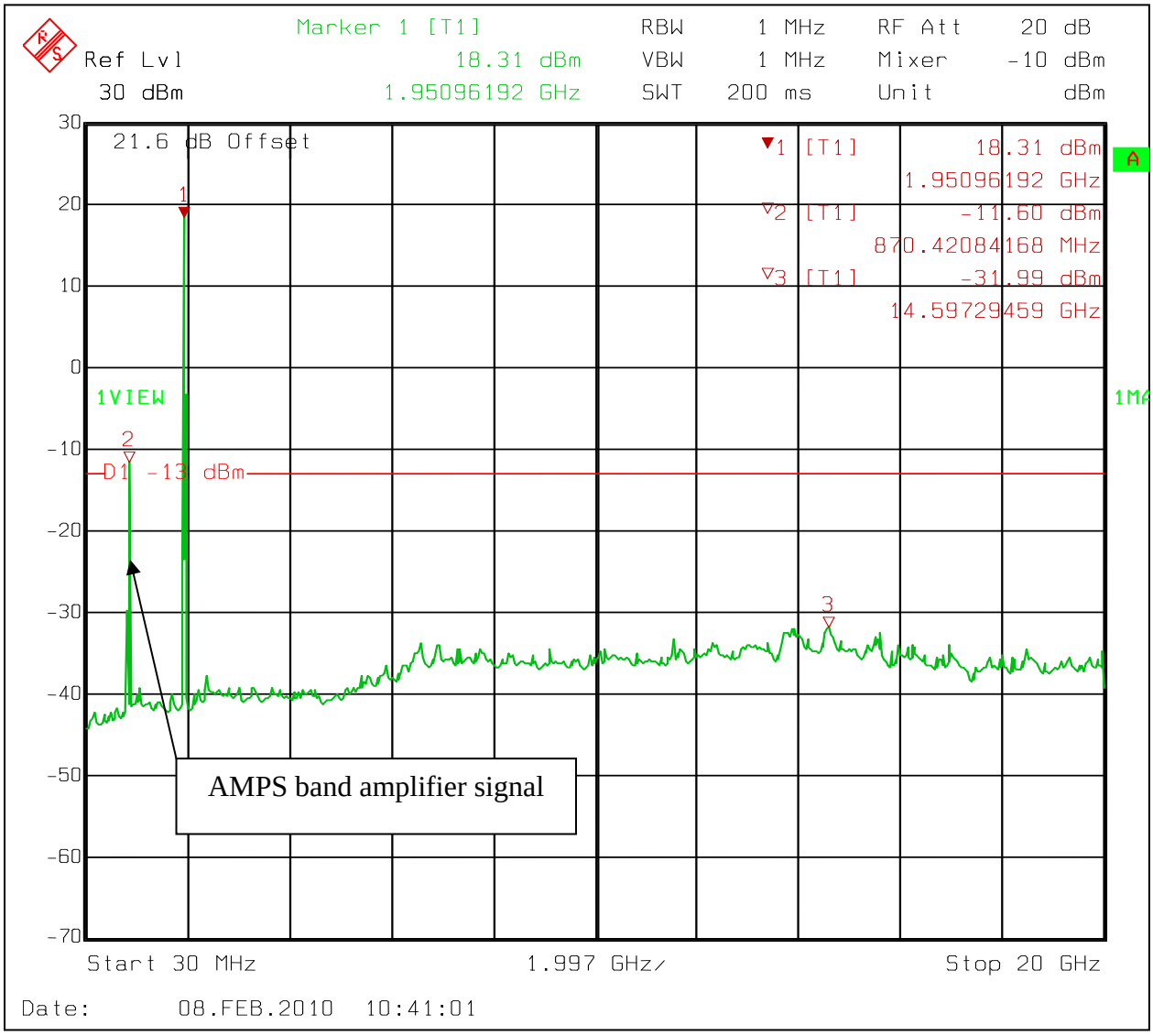
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
CDMA
Downlink



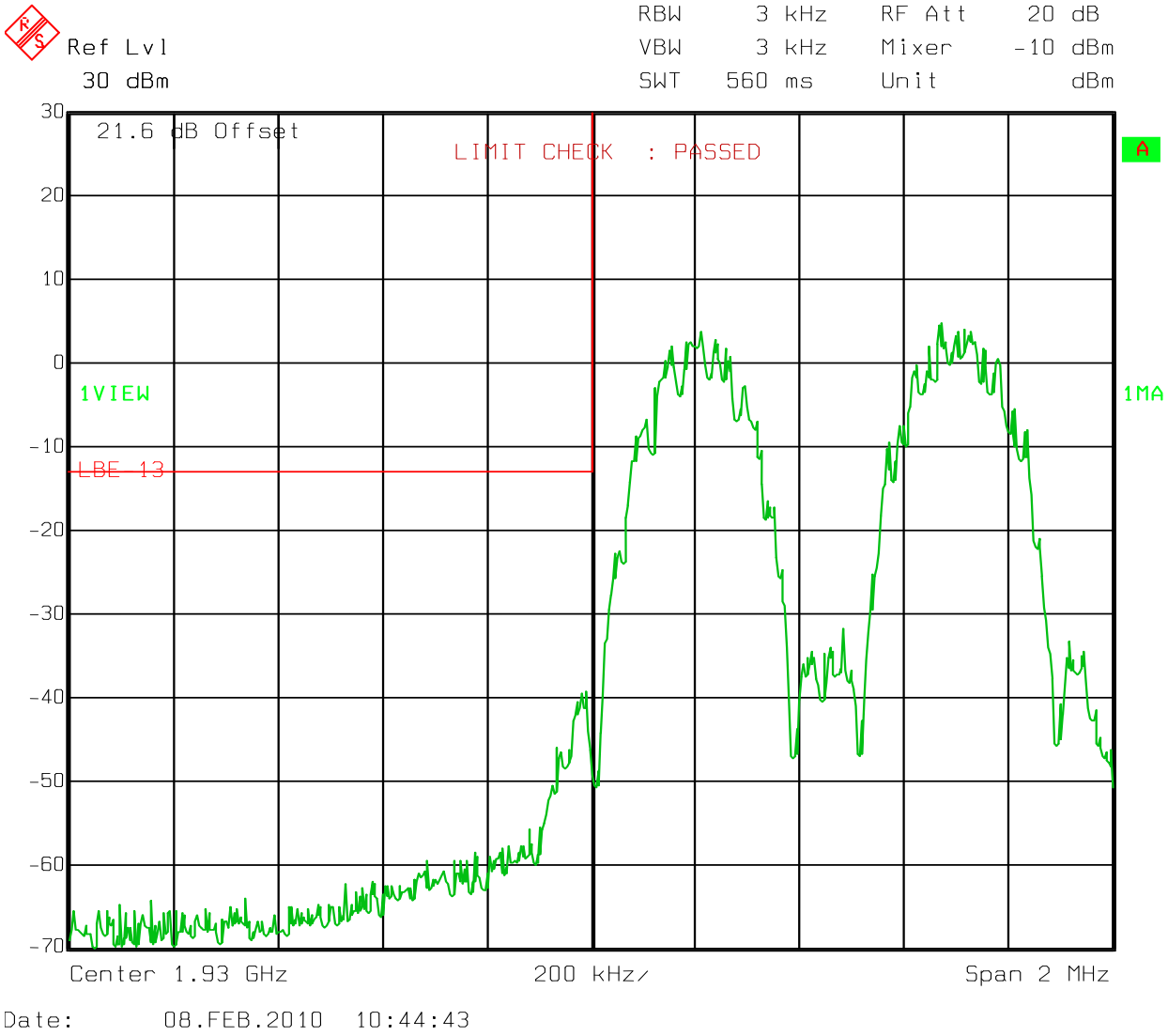
Test Data – Spurious Emissions at Antenna Terminals

Spurs – CDMA
Downlink



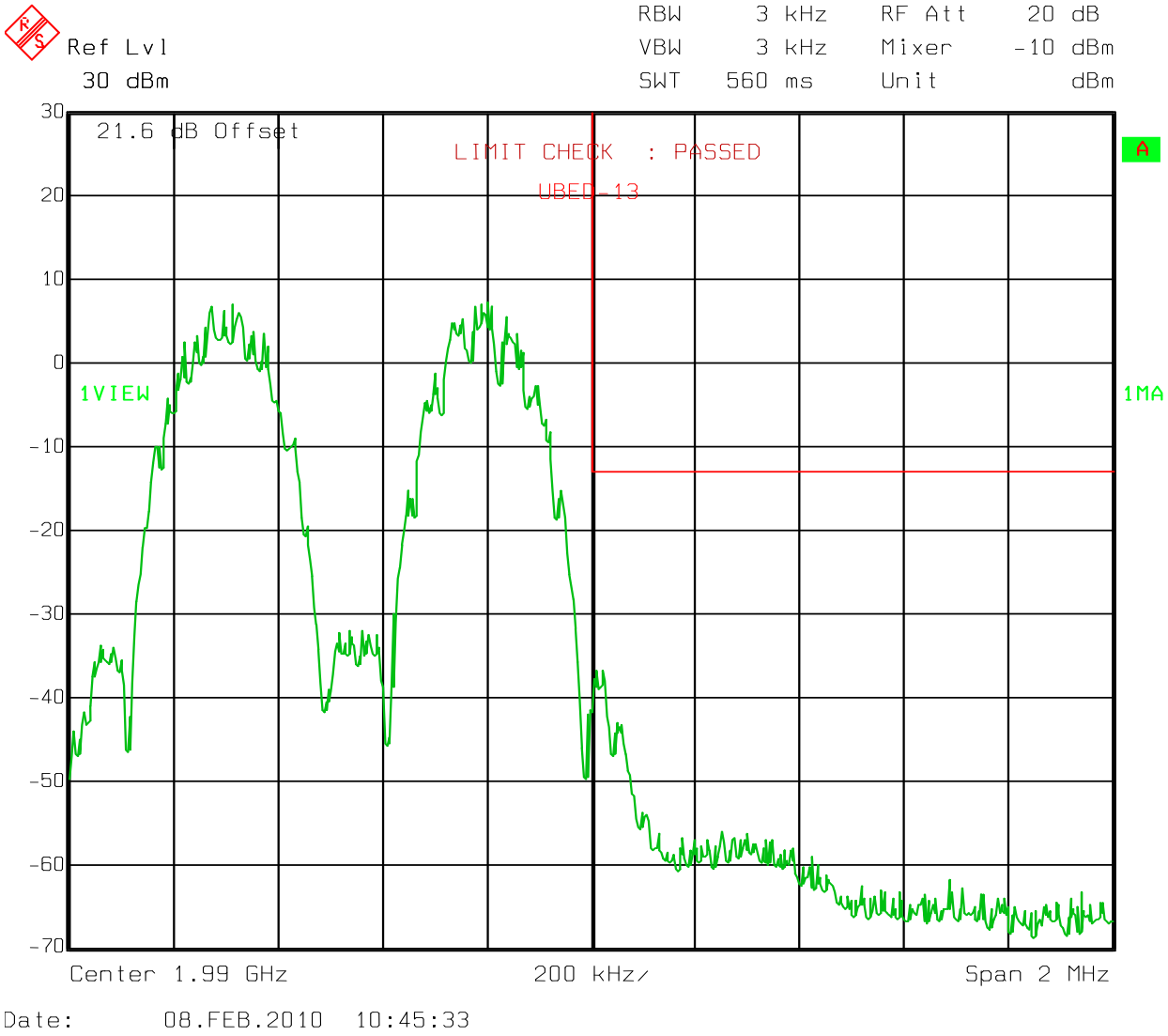
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
EDGE
Downlink



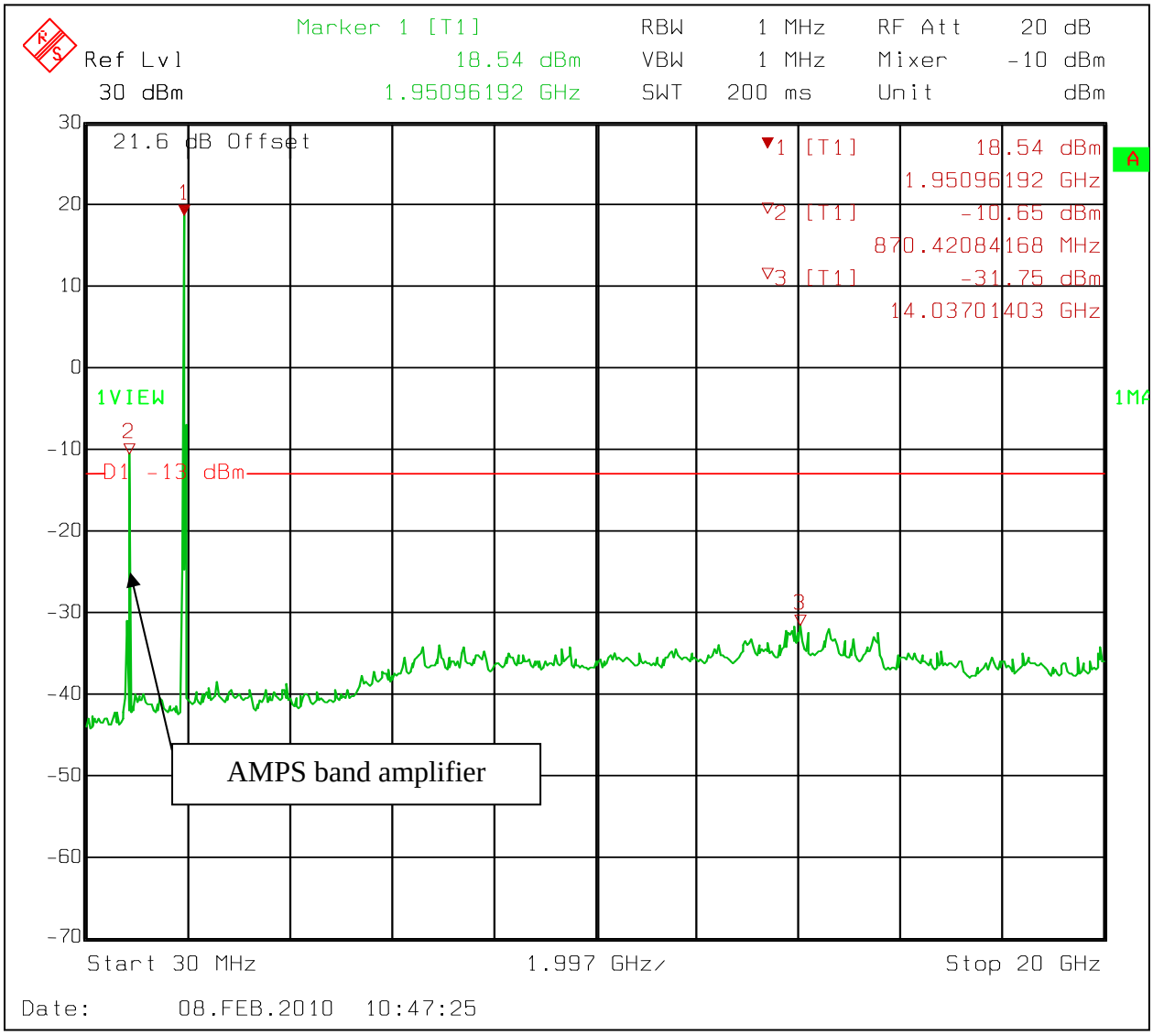
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
EDGE
Downlink



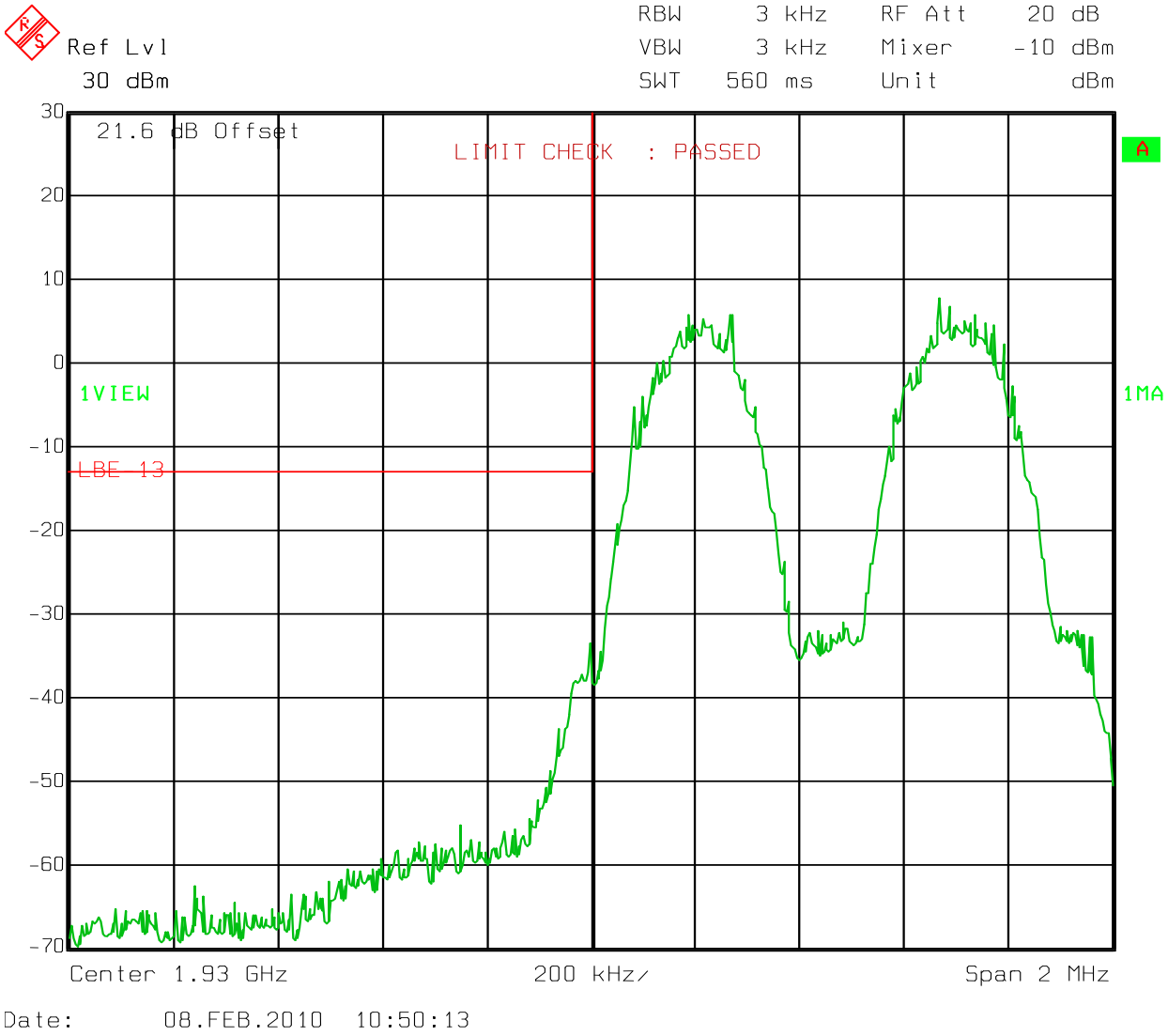
Test Data – Spurious Emissions at Antenna Terminals

Spurs – EDGE
Downlink



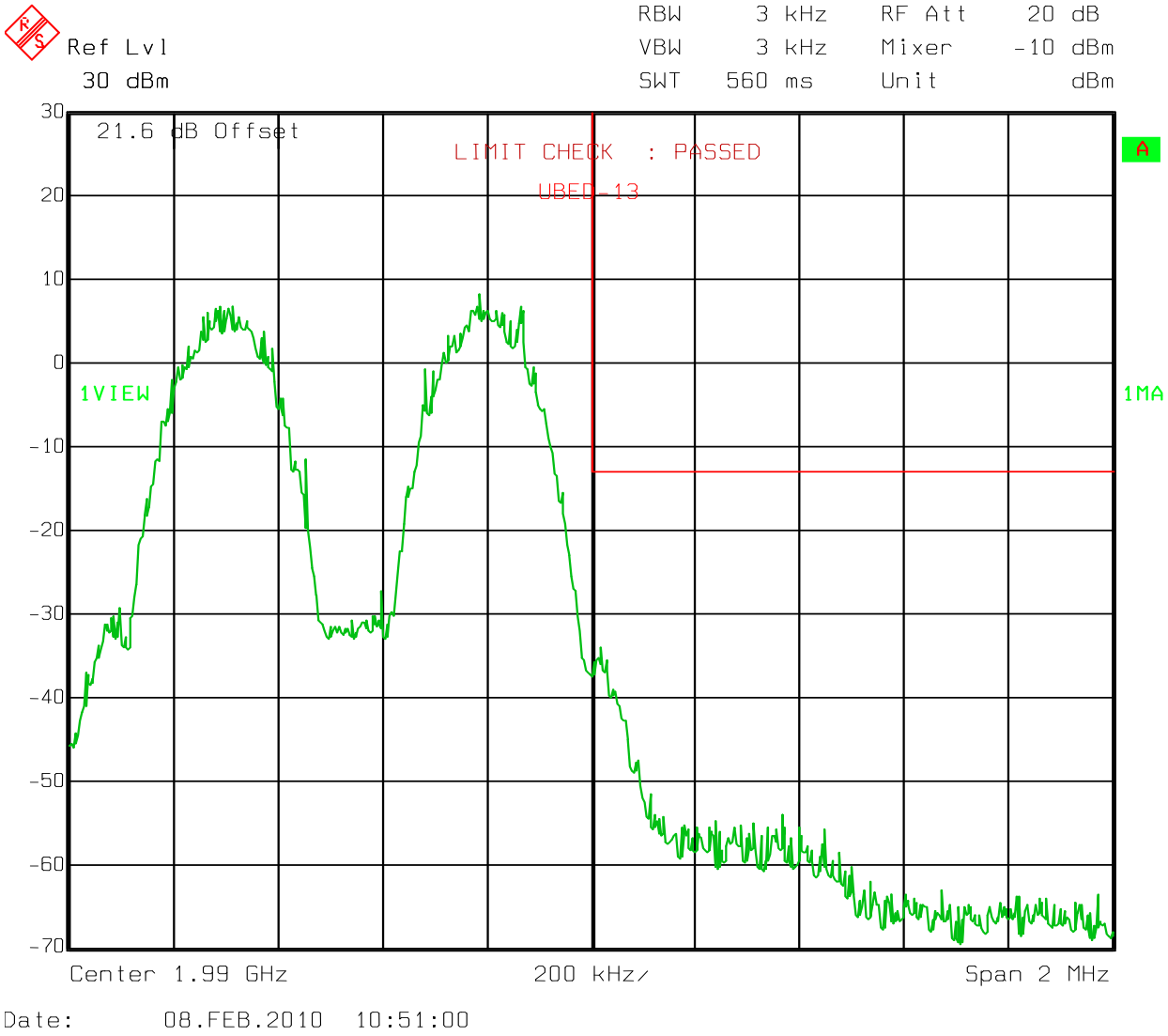
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
GSM
Downlink



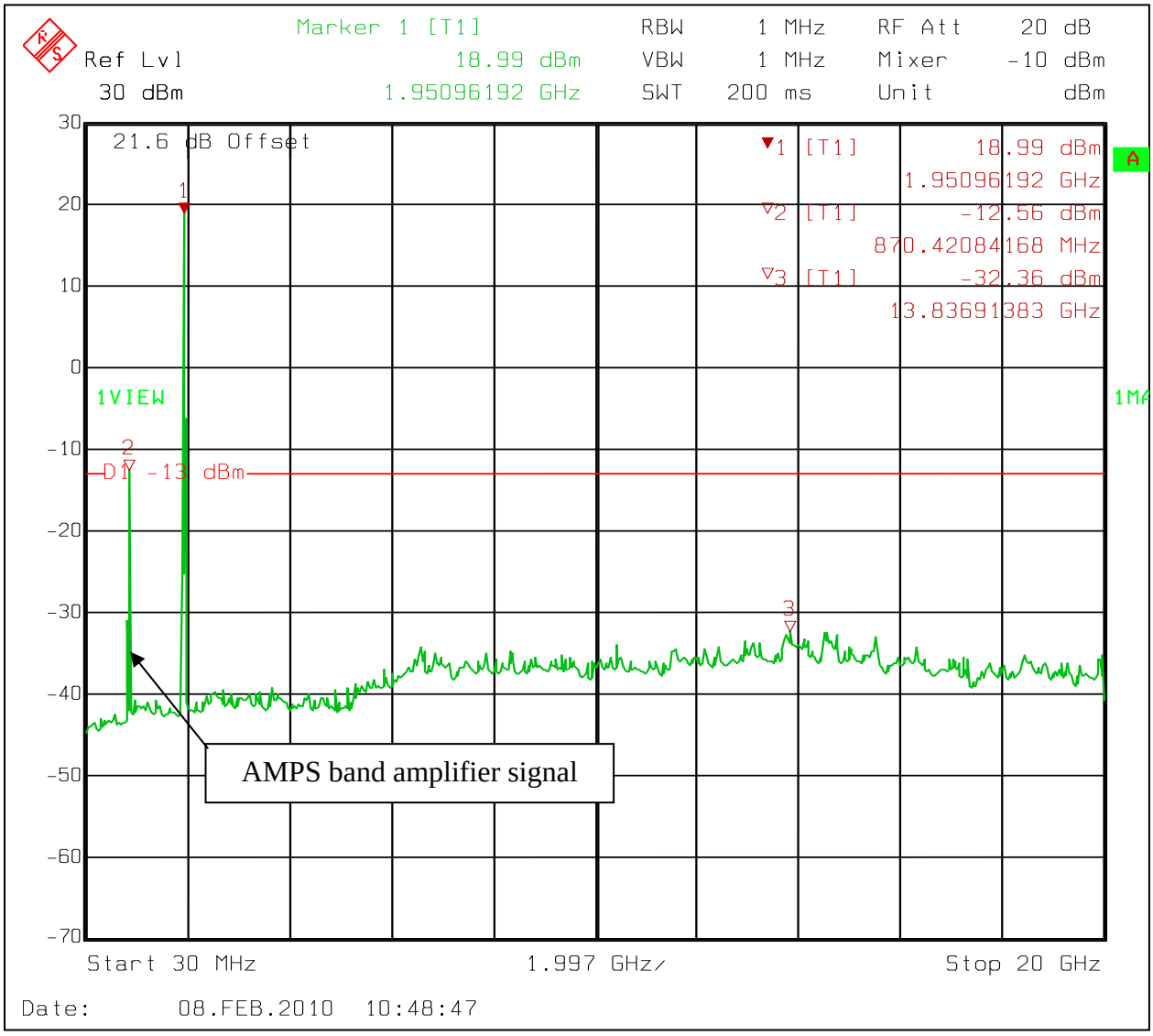
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
GSM
Downlink



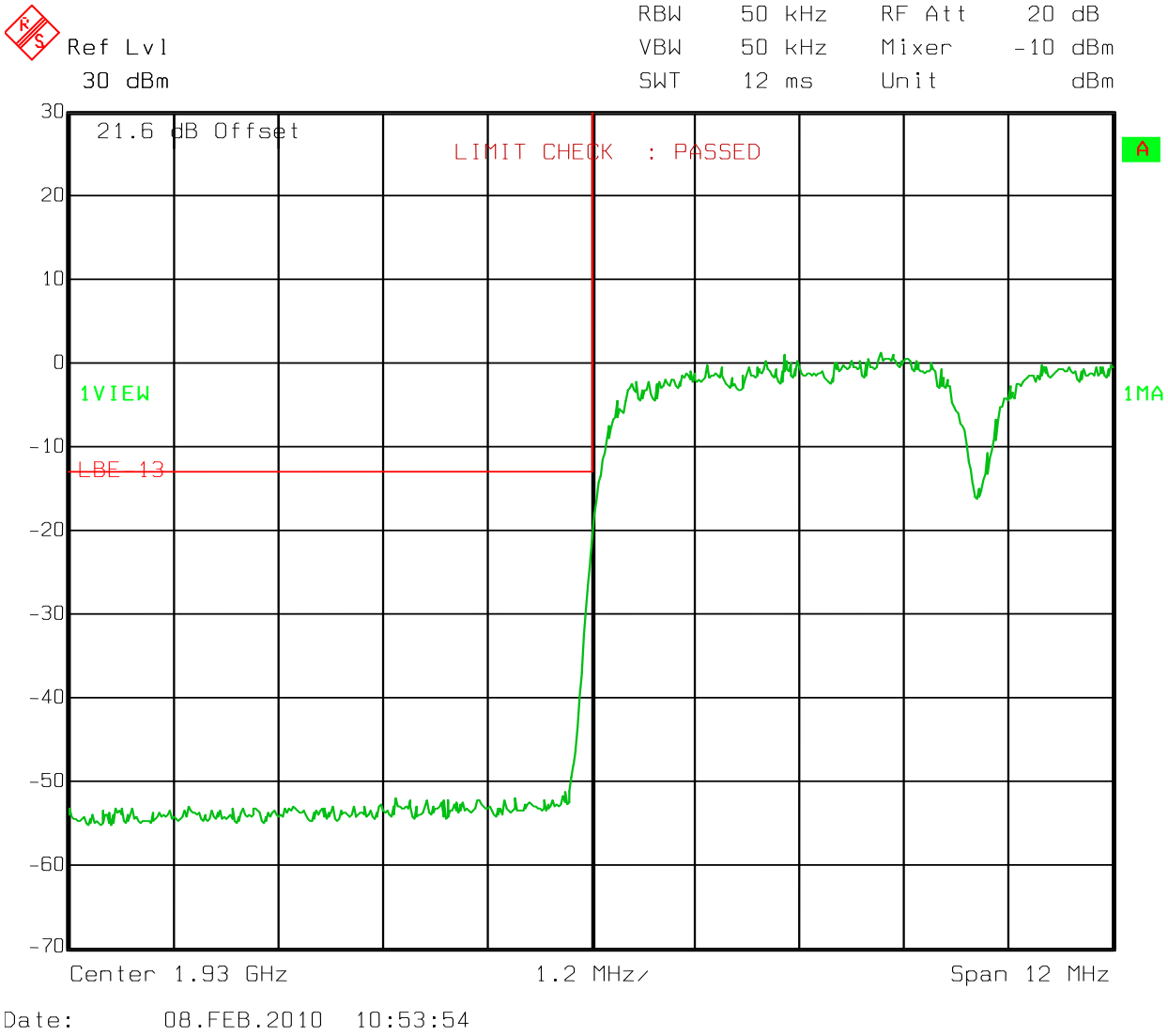
Test Data – Spurious Emissions at Antenna Terminals

Spurs – GSM
Downlink



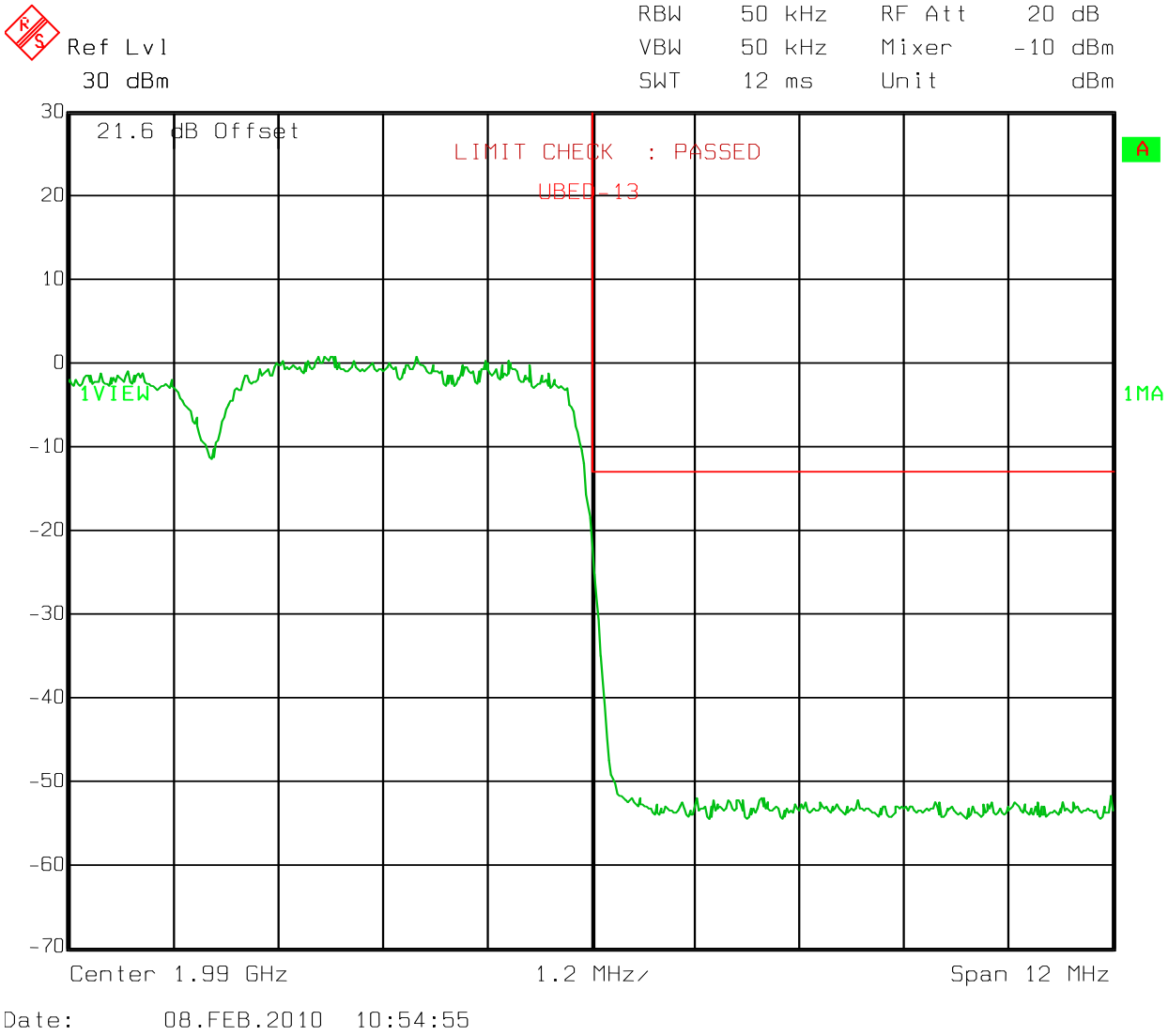
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
W-CDMA
Downlink



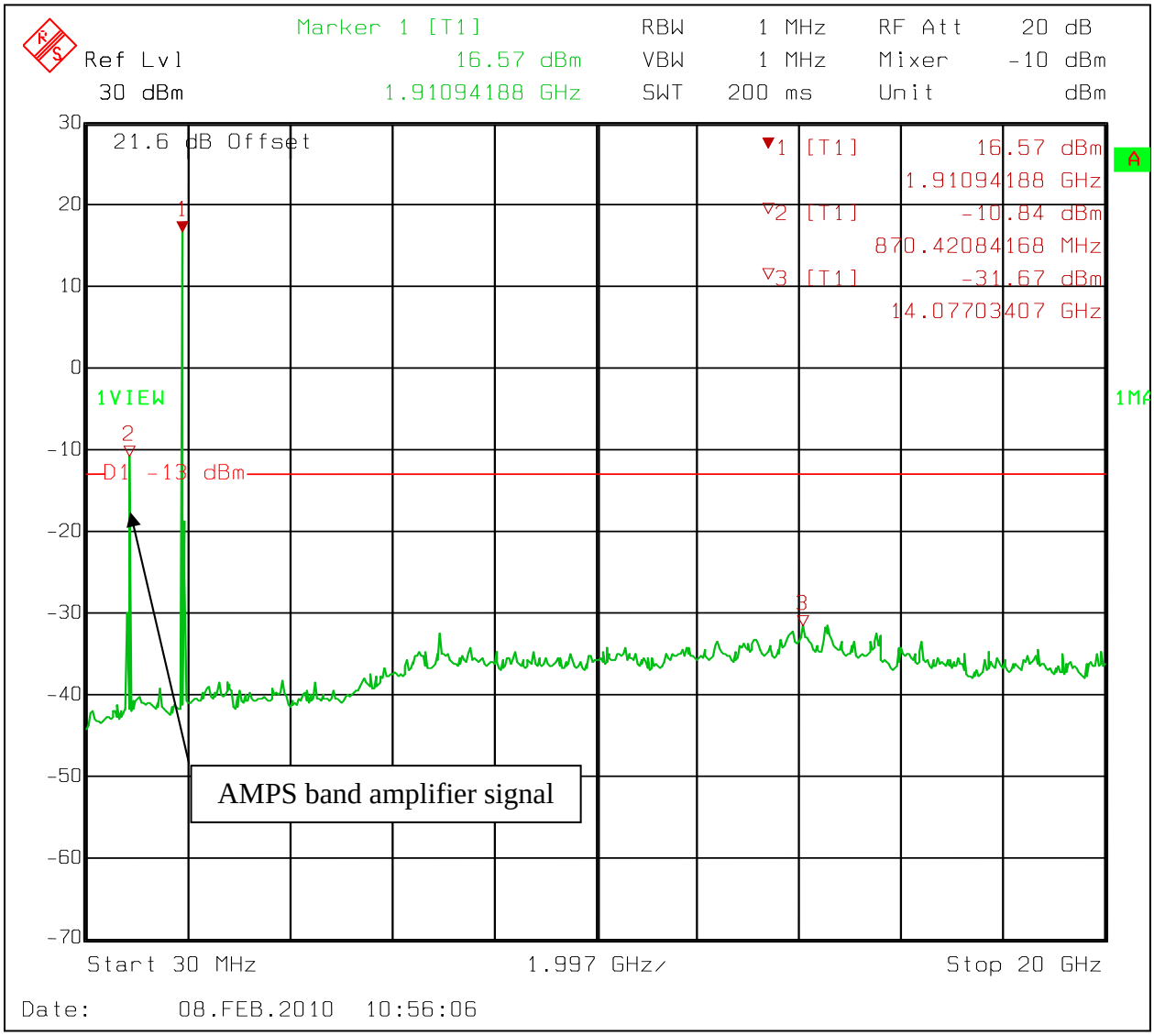
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
W-CDMA
Downlink



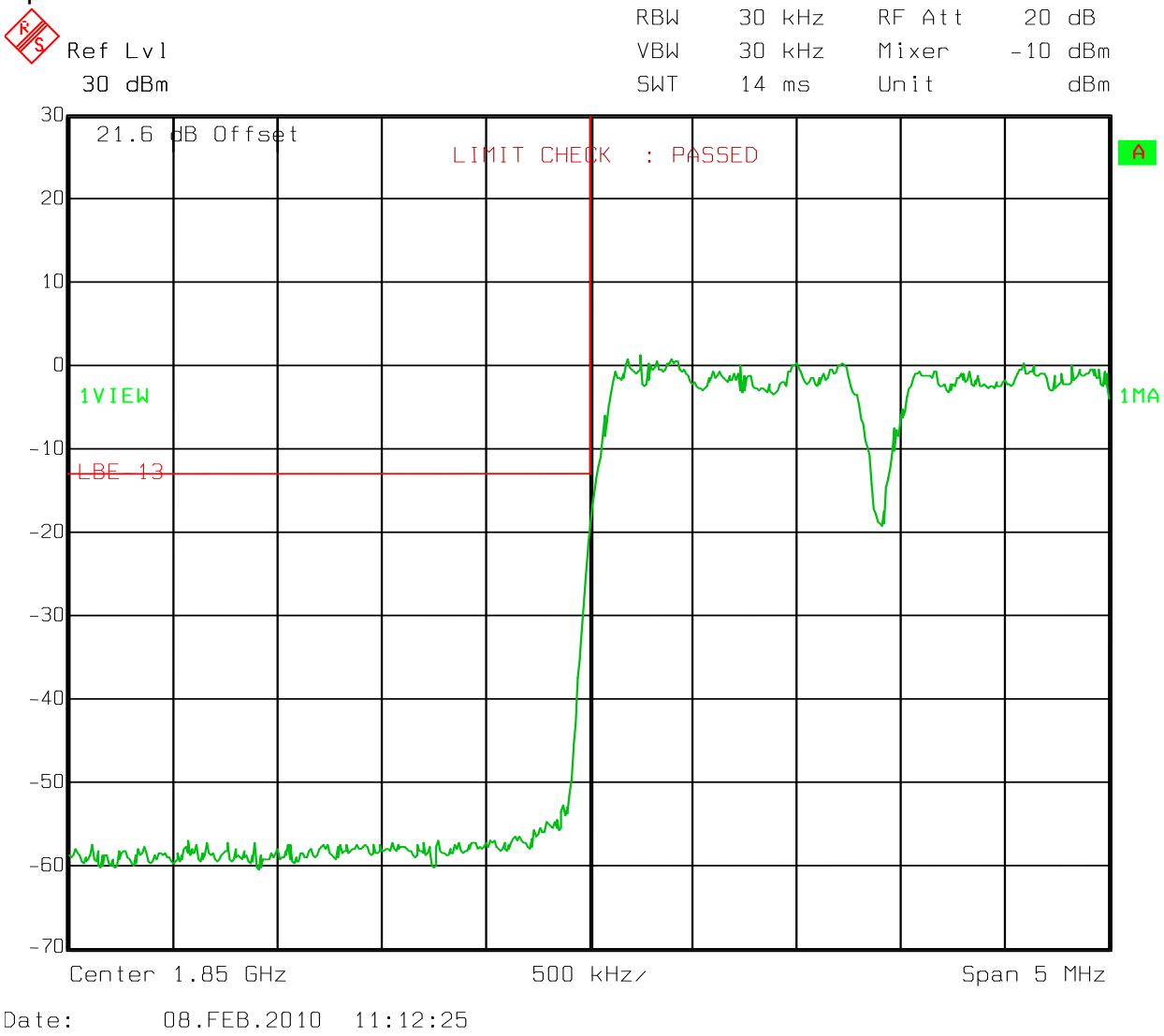
Test Data – Spurious Emissions at Antenna Terminals

Spurs – W-CDMA -
Downlink



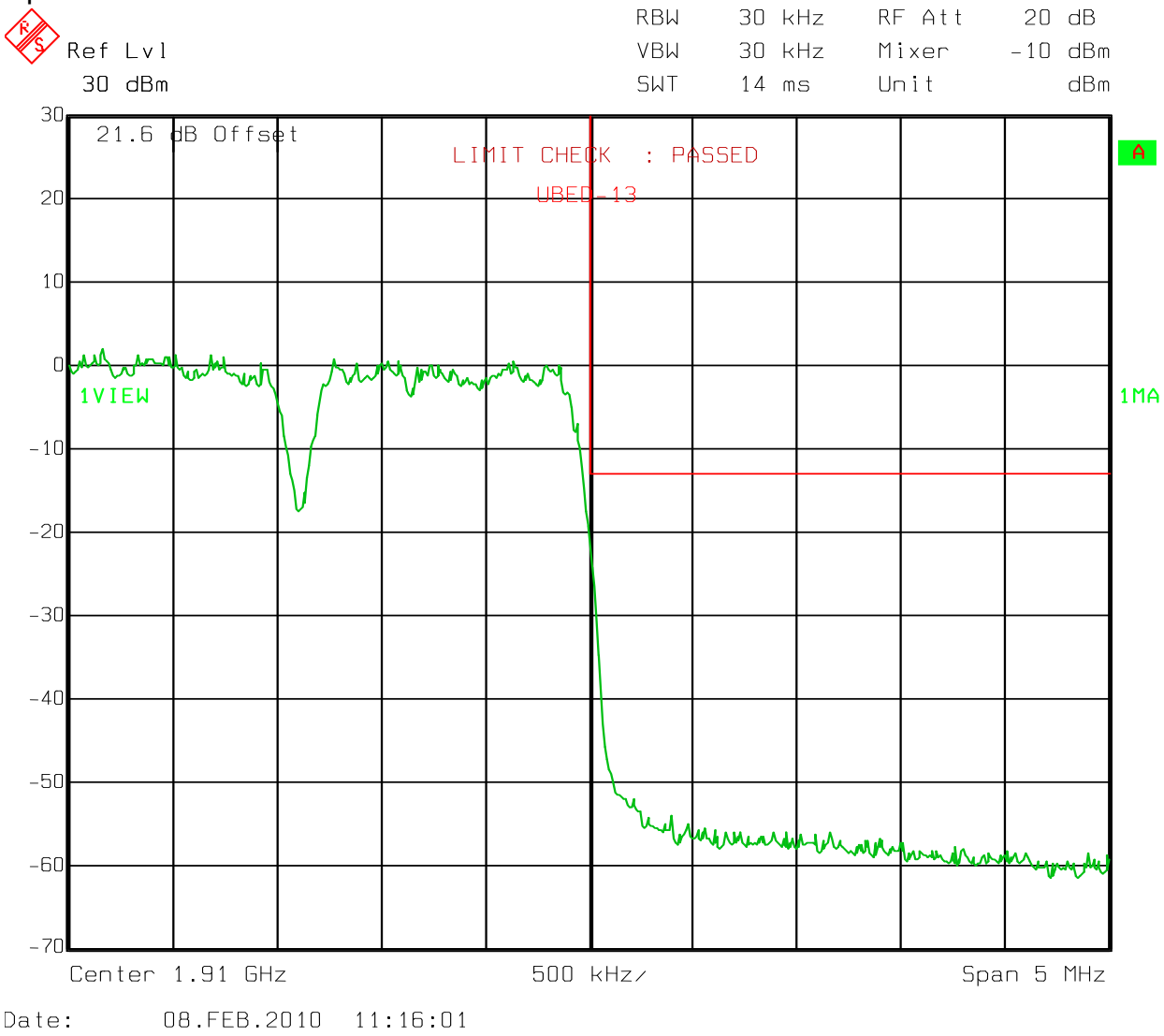
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
CDMA
Uplink



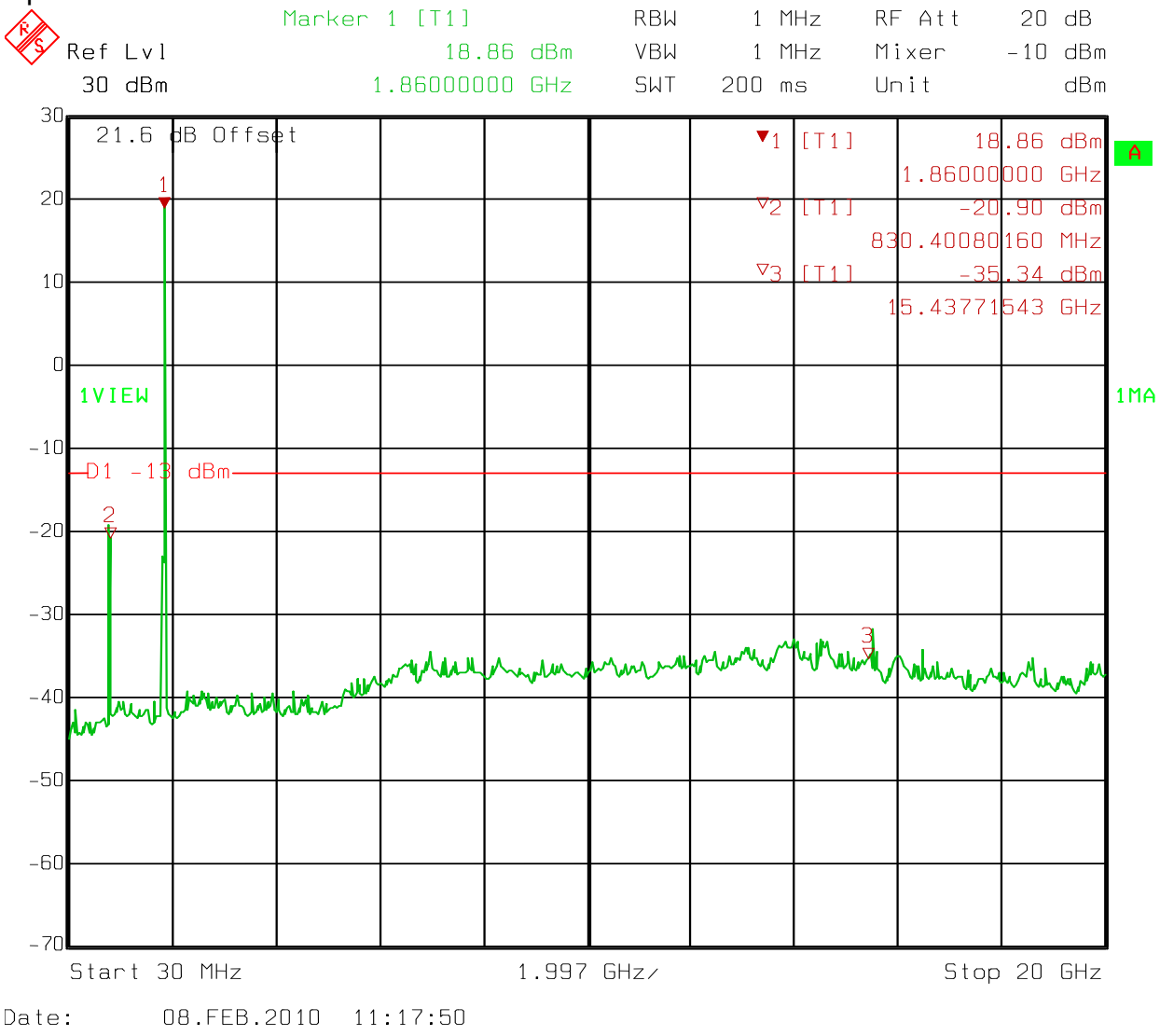
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
CDMA
Uplink



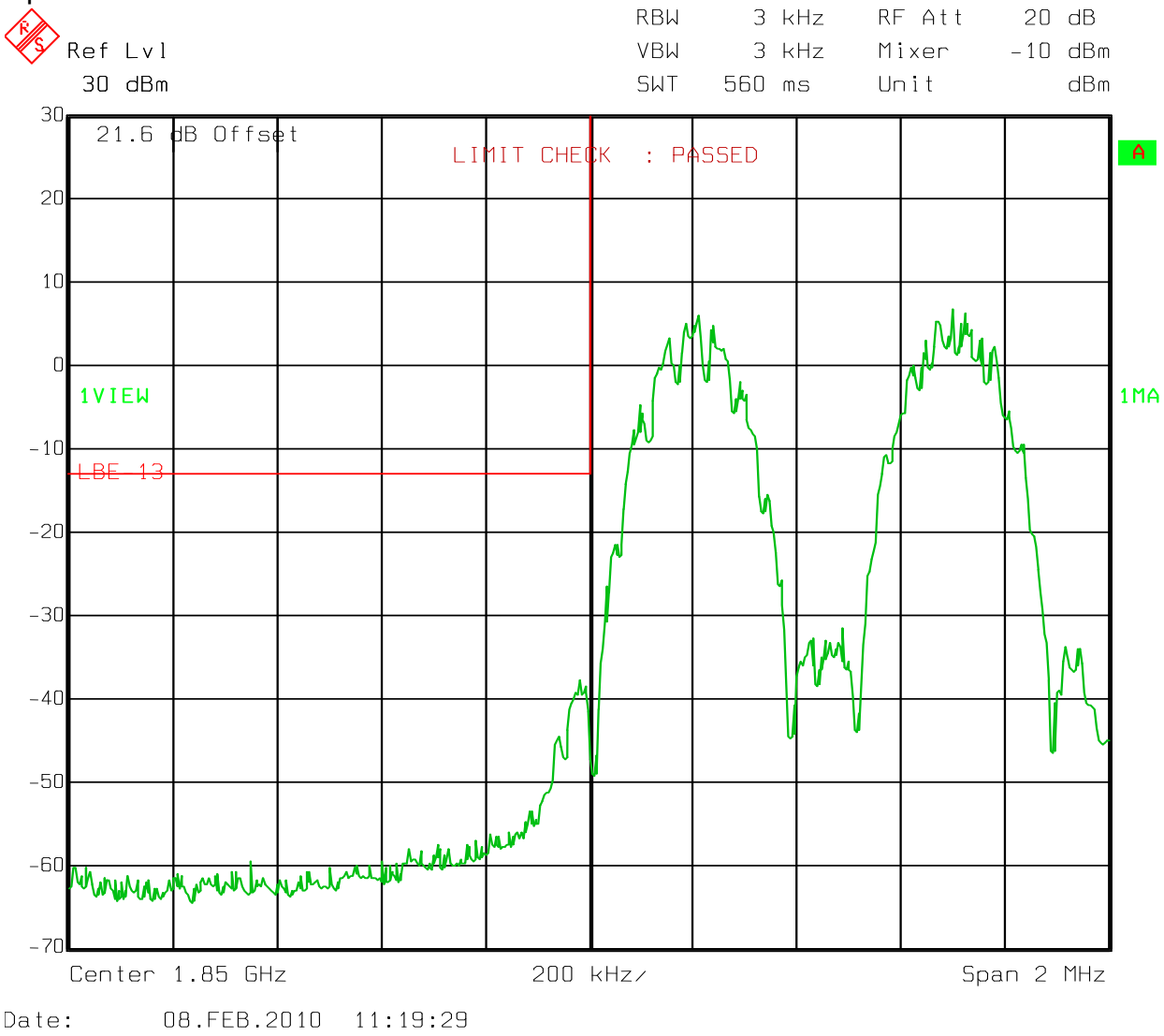
Test Data – Spurious Emissions at Antenna Terminals

Spurs – CDMA
Uplink



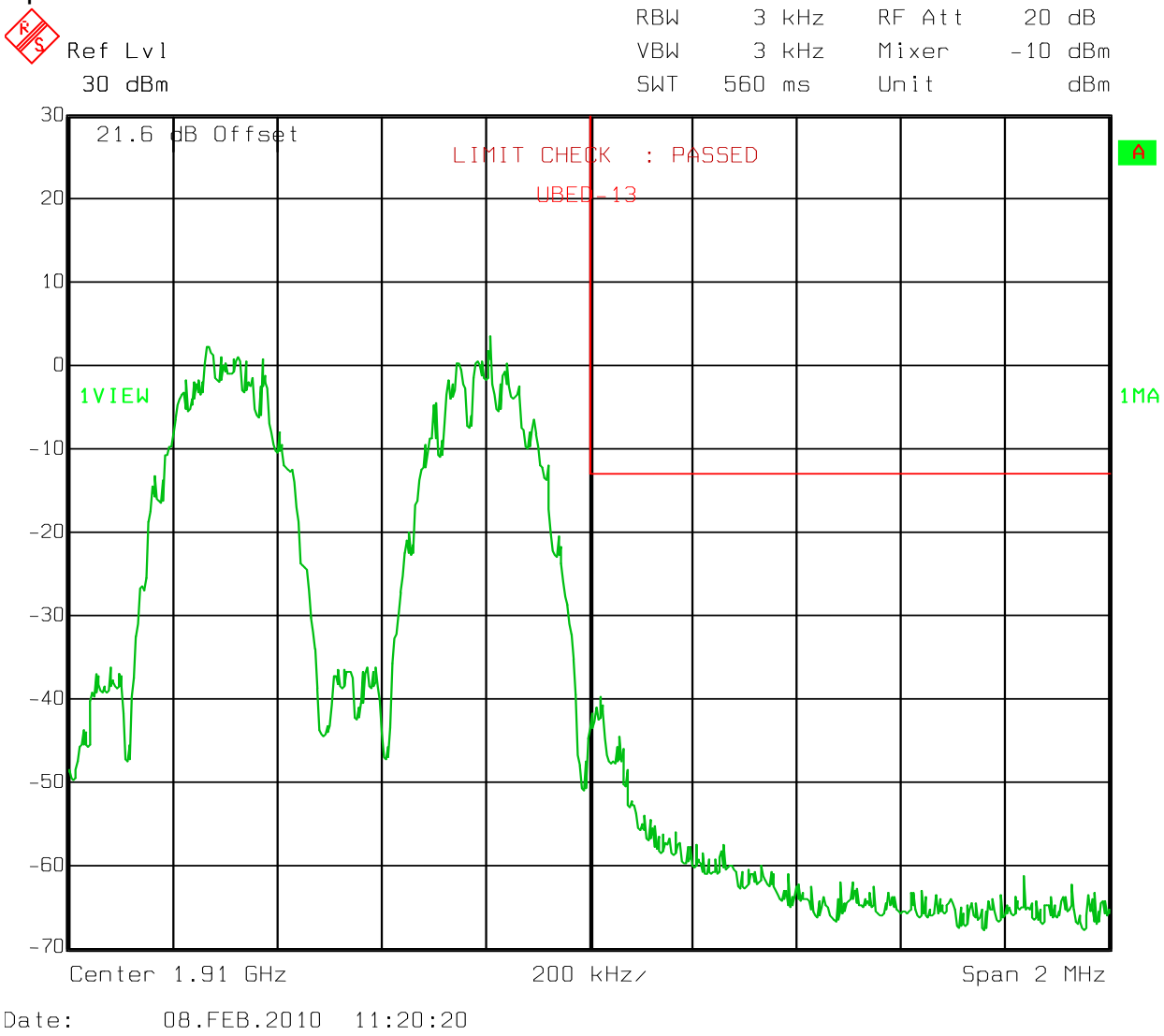
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
EDGE
Uplink



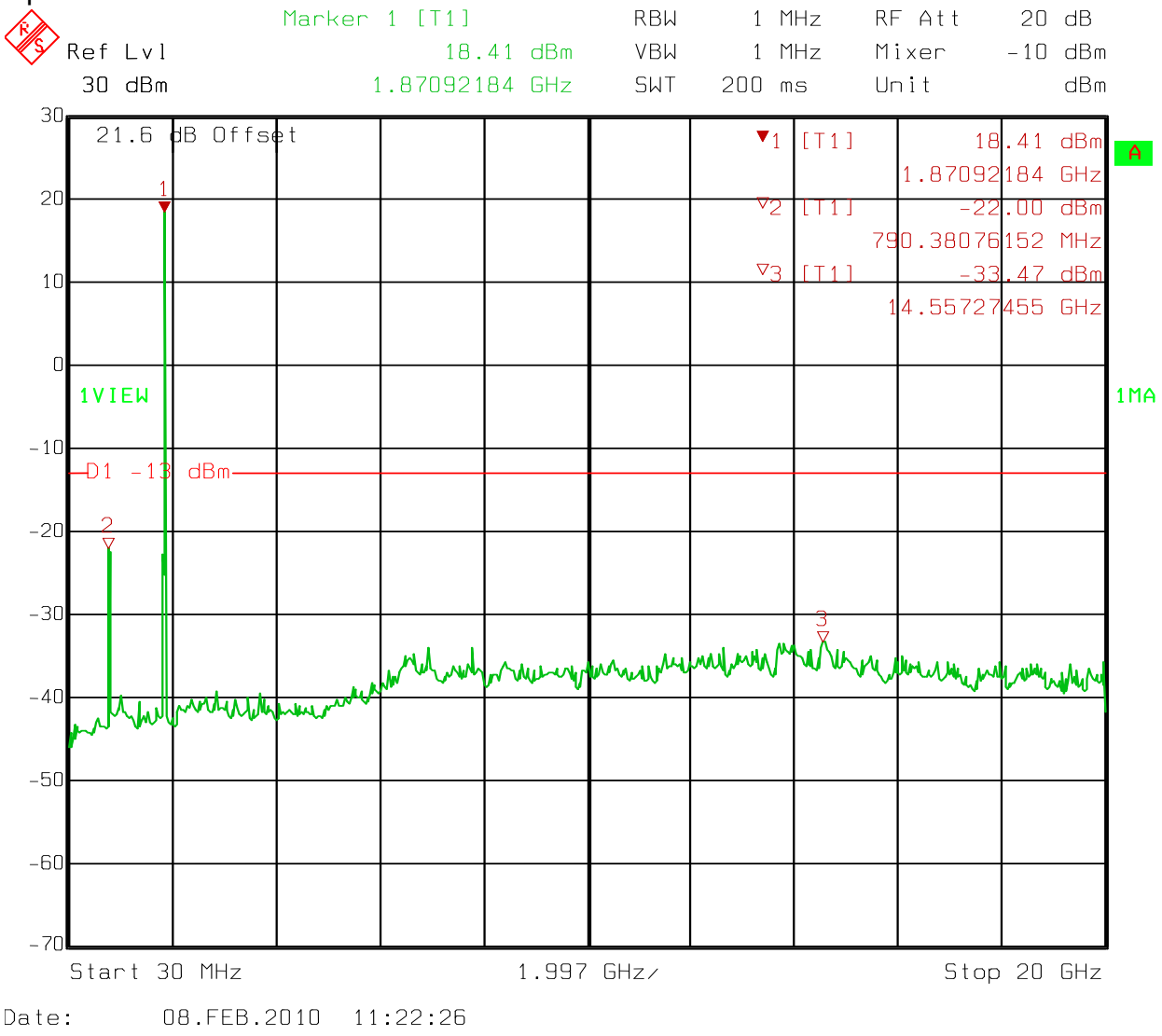
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
EDGE
Uplink



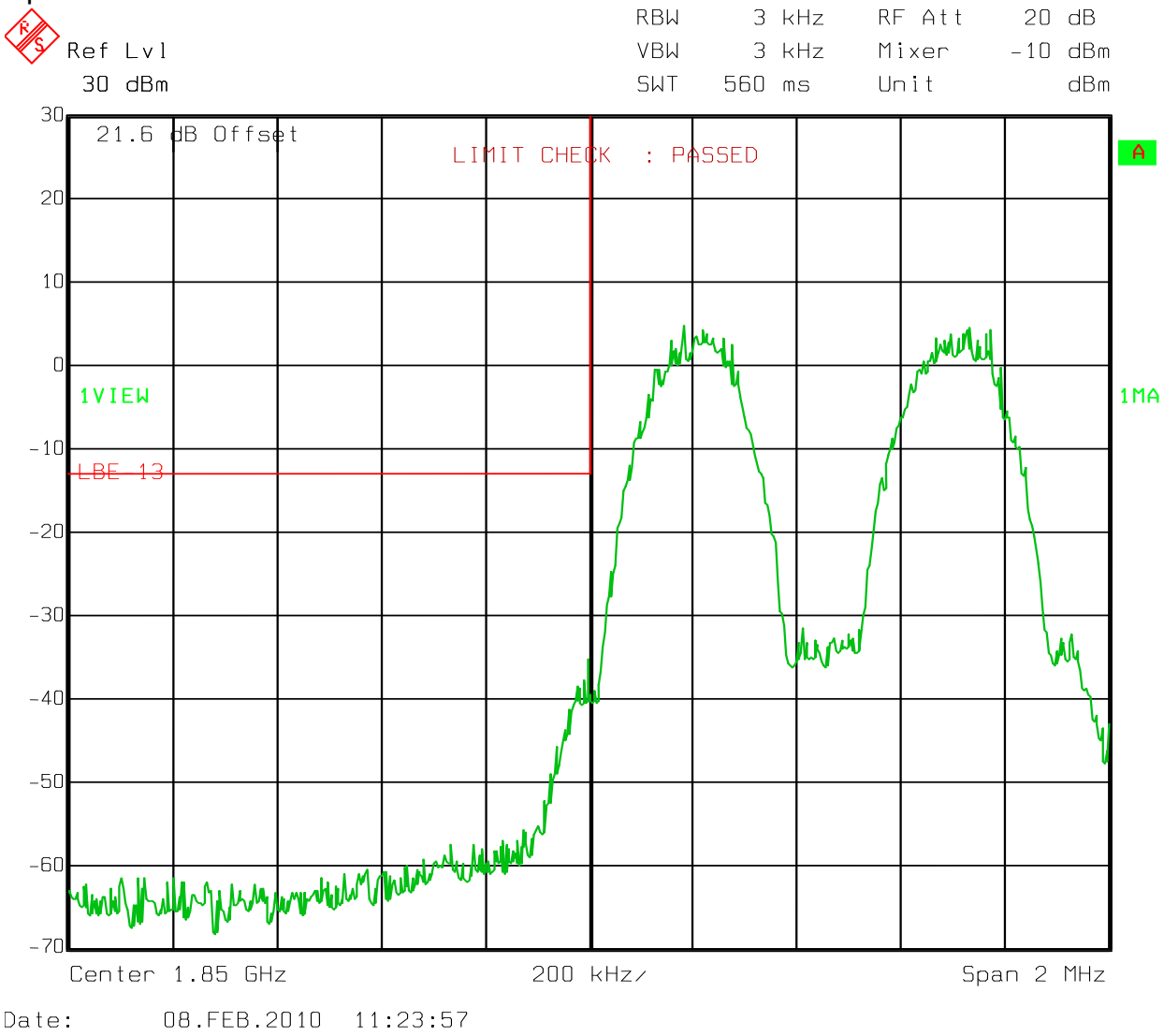
Test Data – Spurious Emissions at Antenna Terminals

Spurs – EDGE
Uplink



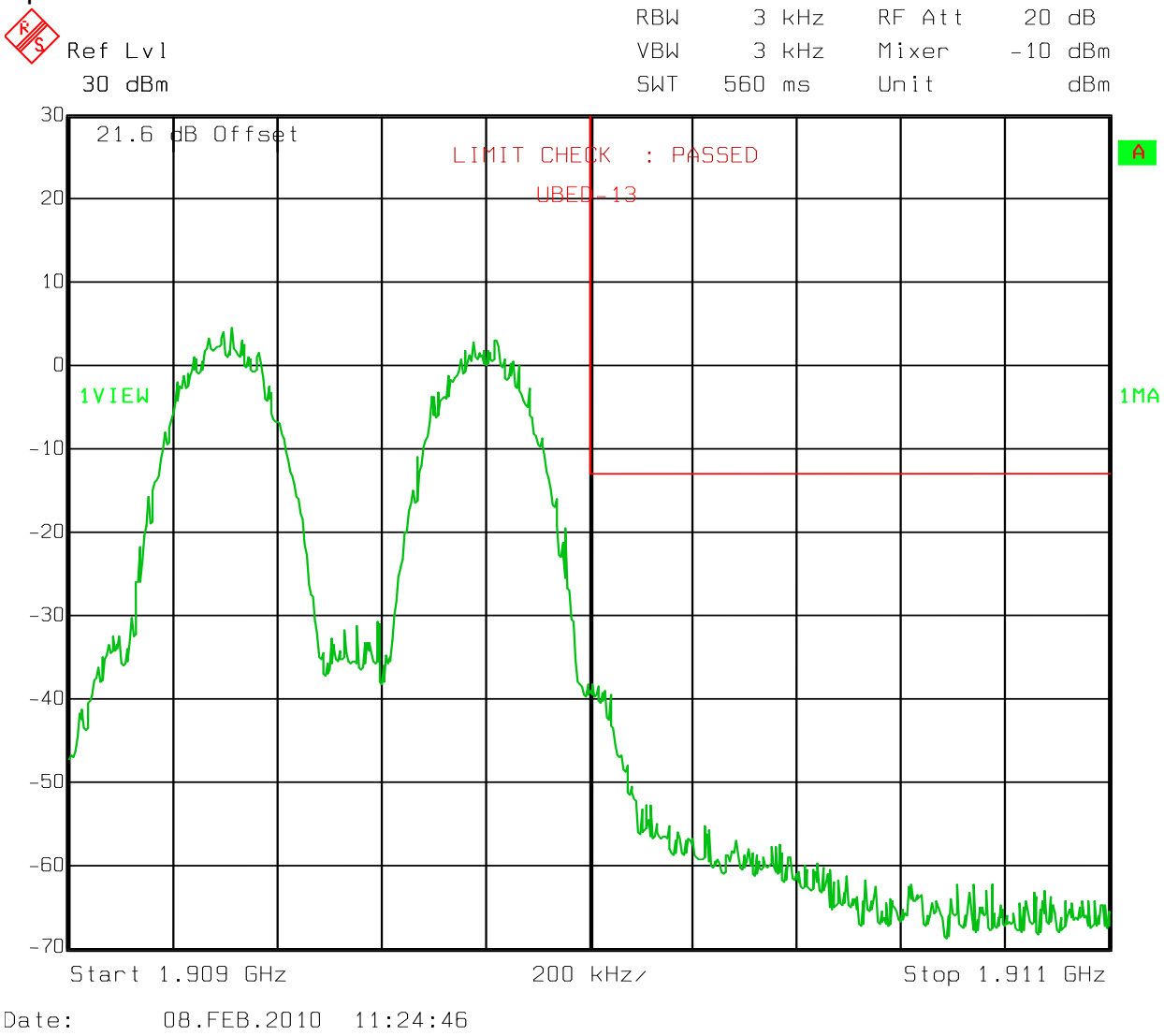
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
GSM
Uplink



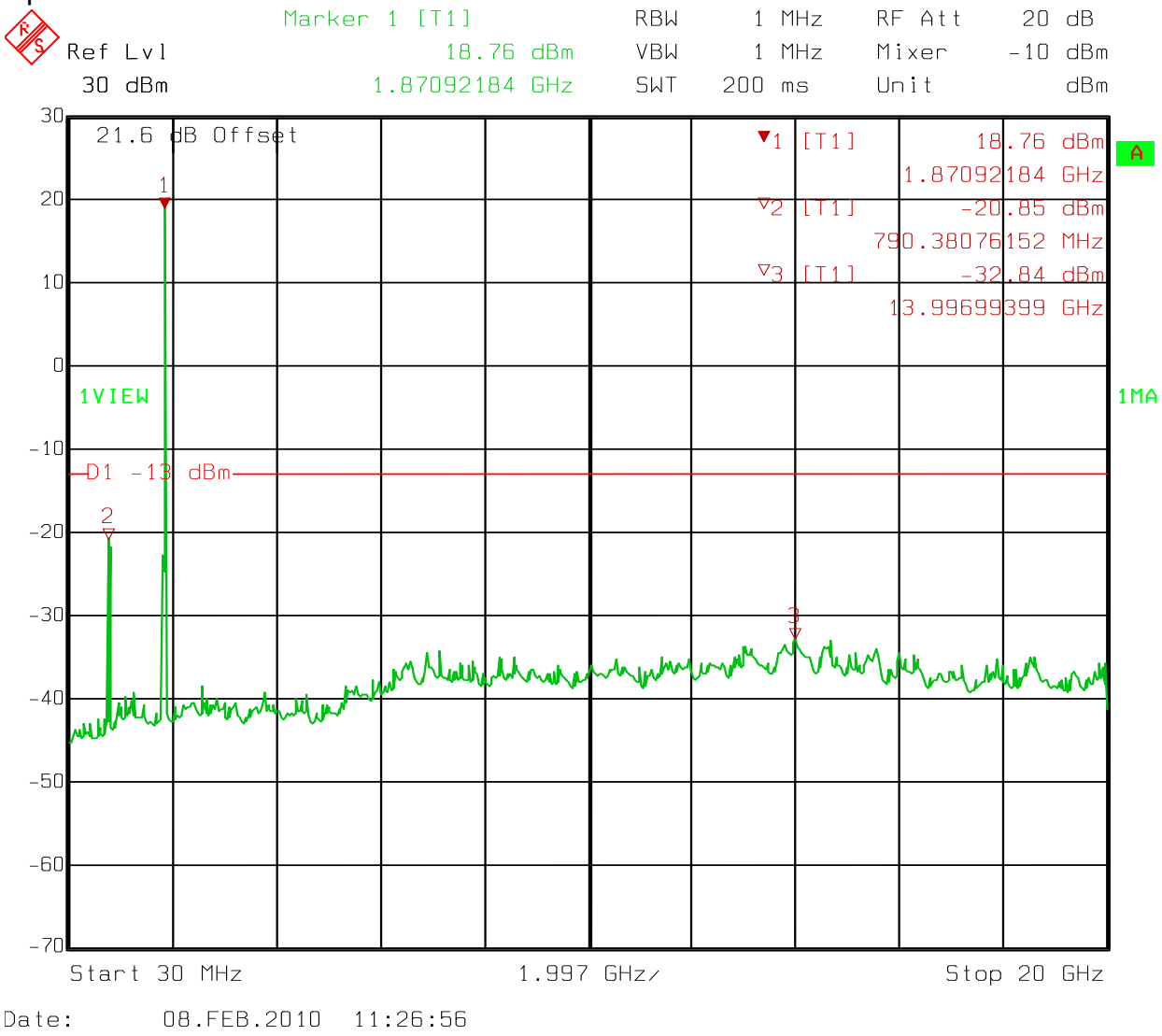
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
GSM
Uplink



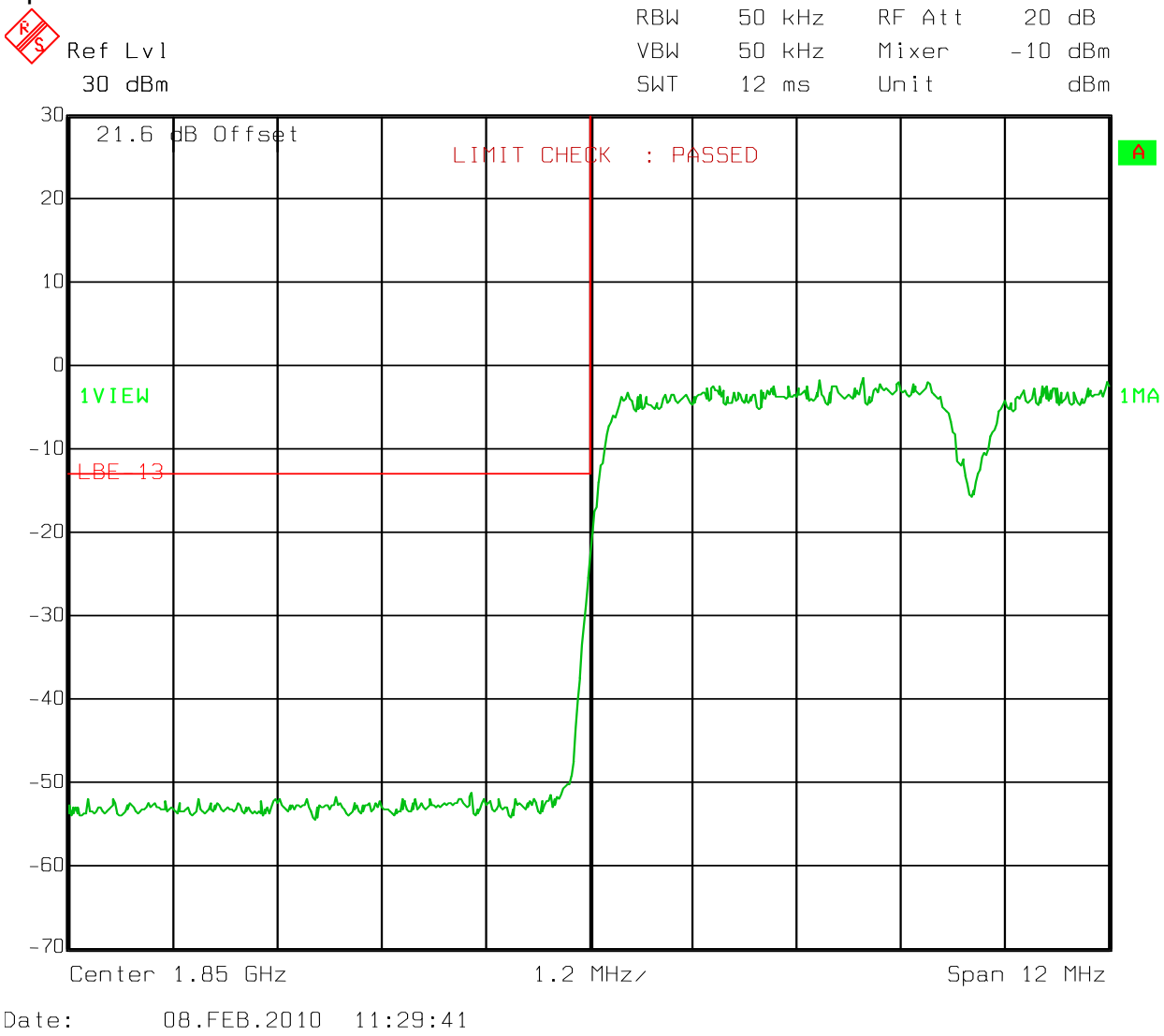
Test Data – Spurious Emissions at Antenna Terminals

Spurs – GSM
Uplink



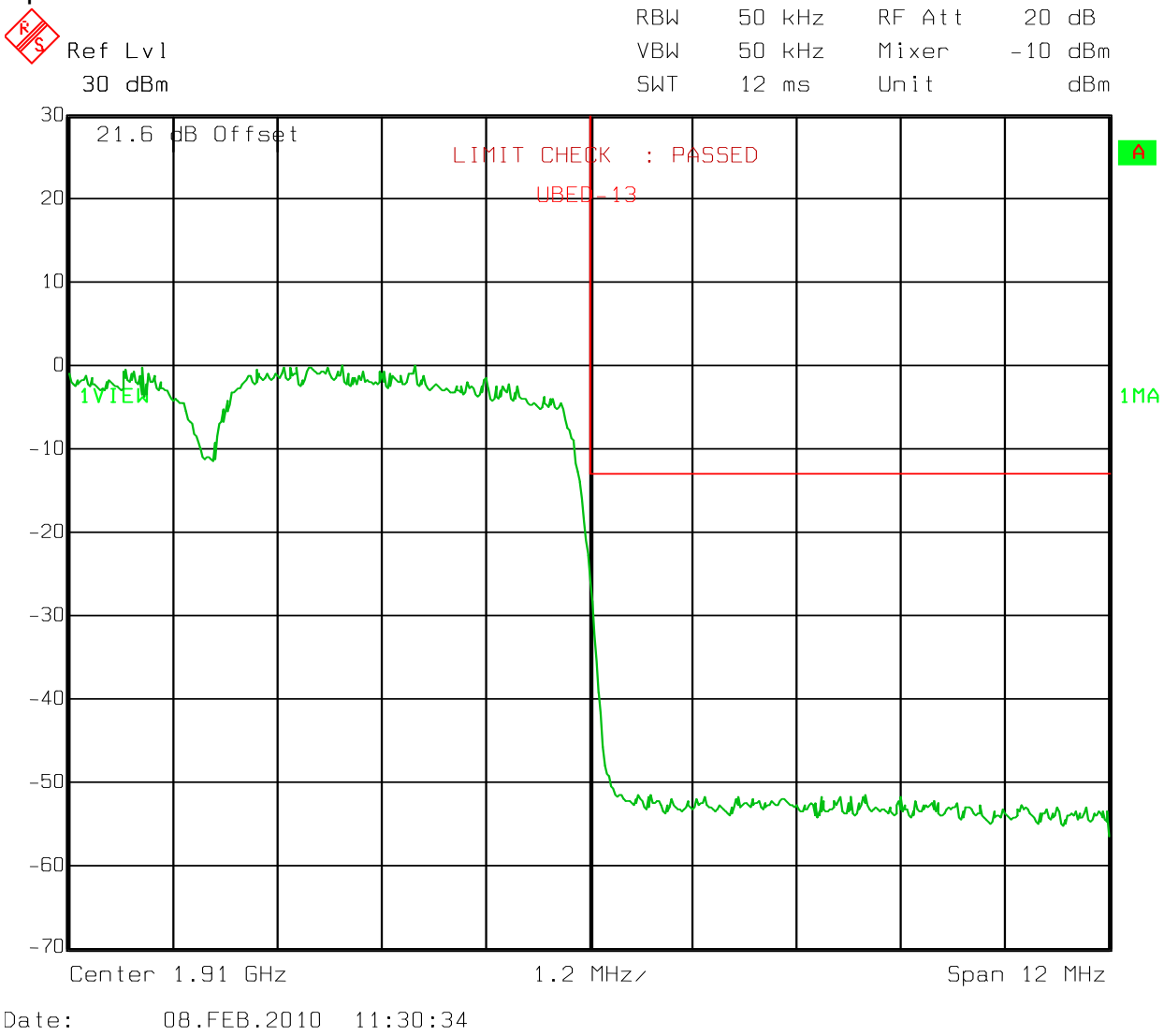
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
W-CDMA
Uplink



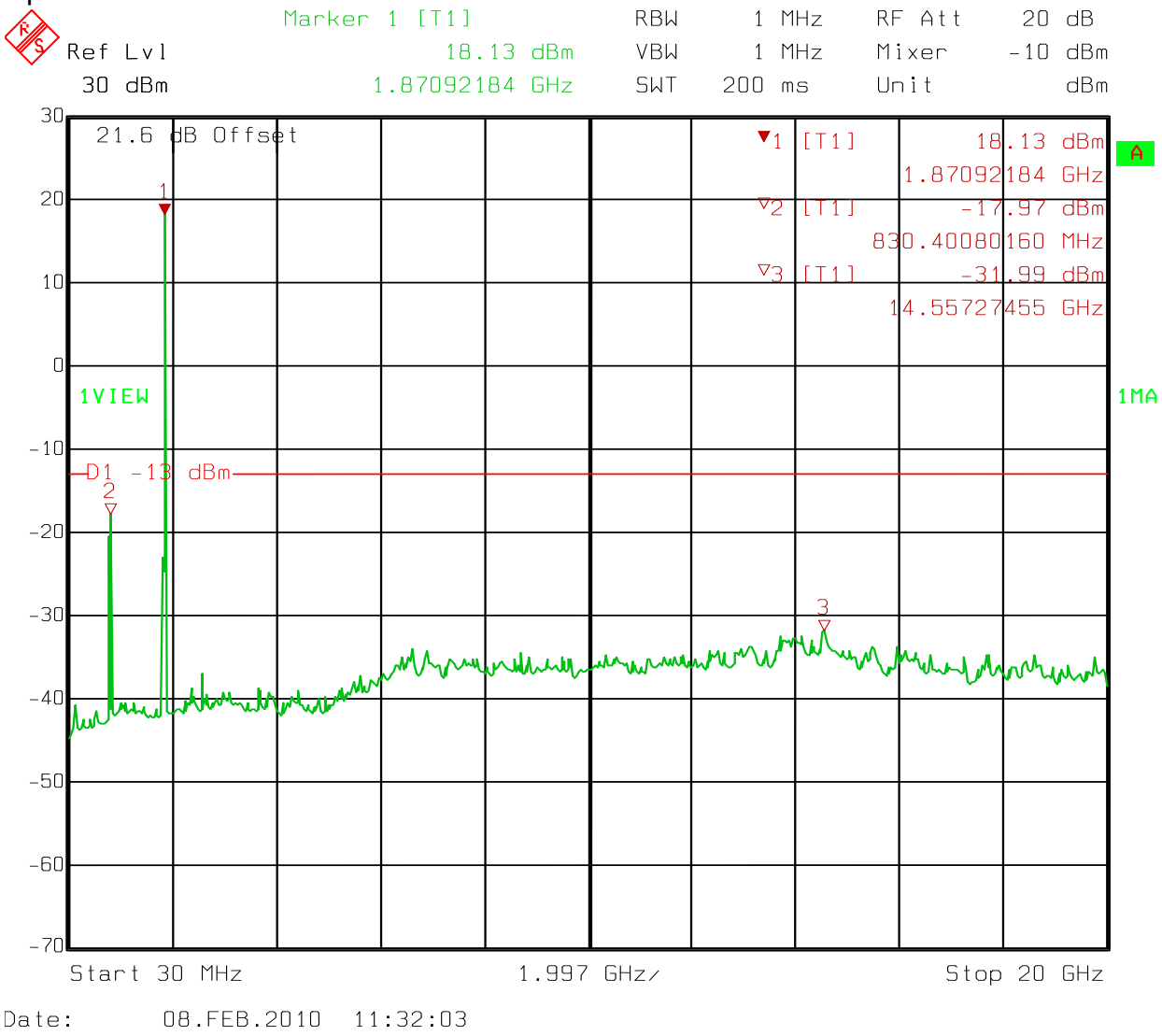
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
W-CDMA
Uplink



Test Data – Spurious Emissions at Antenna Terminals

Spurs – W-CDMA -
Uplink



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.24.232. Base stations are limited to 1640 watts peak E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100 watts.

Method Of Measurement:

Detachable Antenna:
The peak power at antenna terminals is measured using an in-line peak power meter or spectrum analyzer. 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 an isotropic radiator. 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 eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic radiator.

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: ≥ 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

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.

NAME OF TEST: Field Strength of Spurious Radiation 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 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 an isotropic radiator. 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 eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic radiator.

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

Minimum Standard: Para. No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Method Of Measurement:

Frequency Stability With Voltage Variation

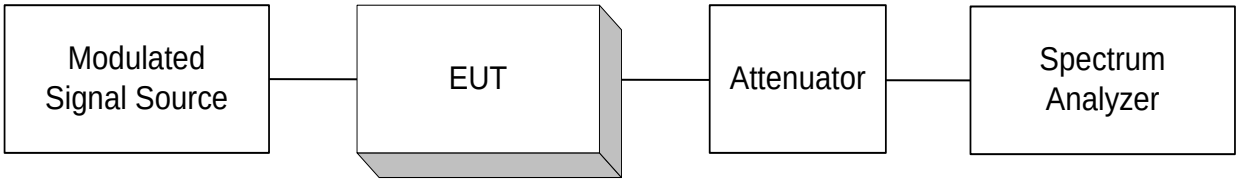
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the 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

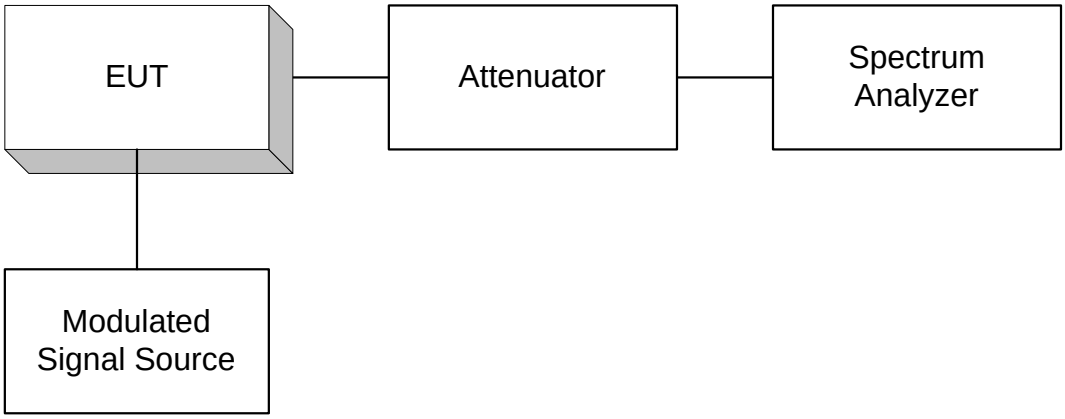
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

ANNEX B - TEST DIAGRAMS

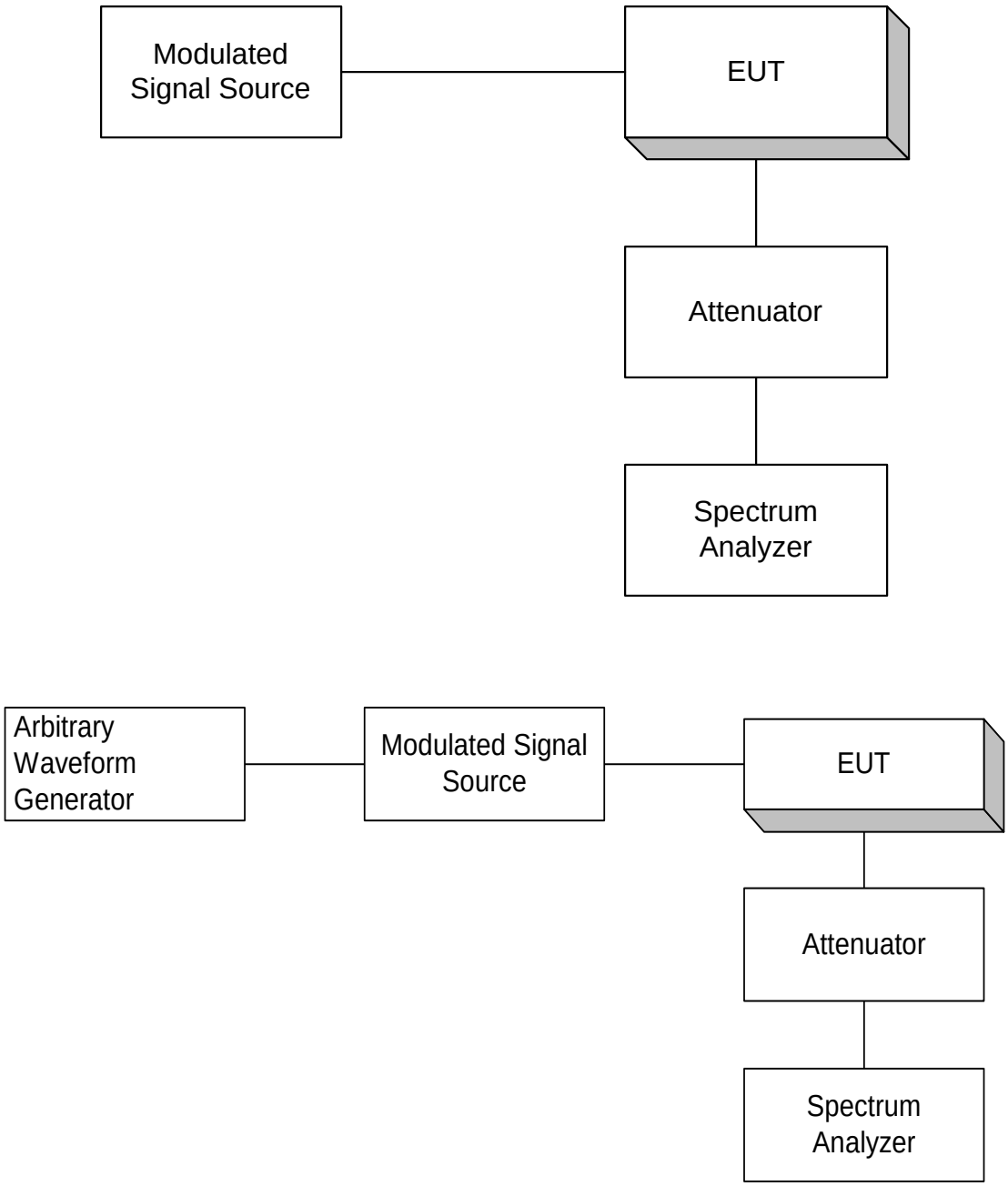
Para. No. 2.985 - R.F. Power Output



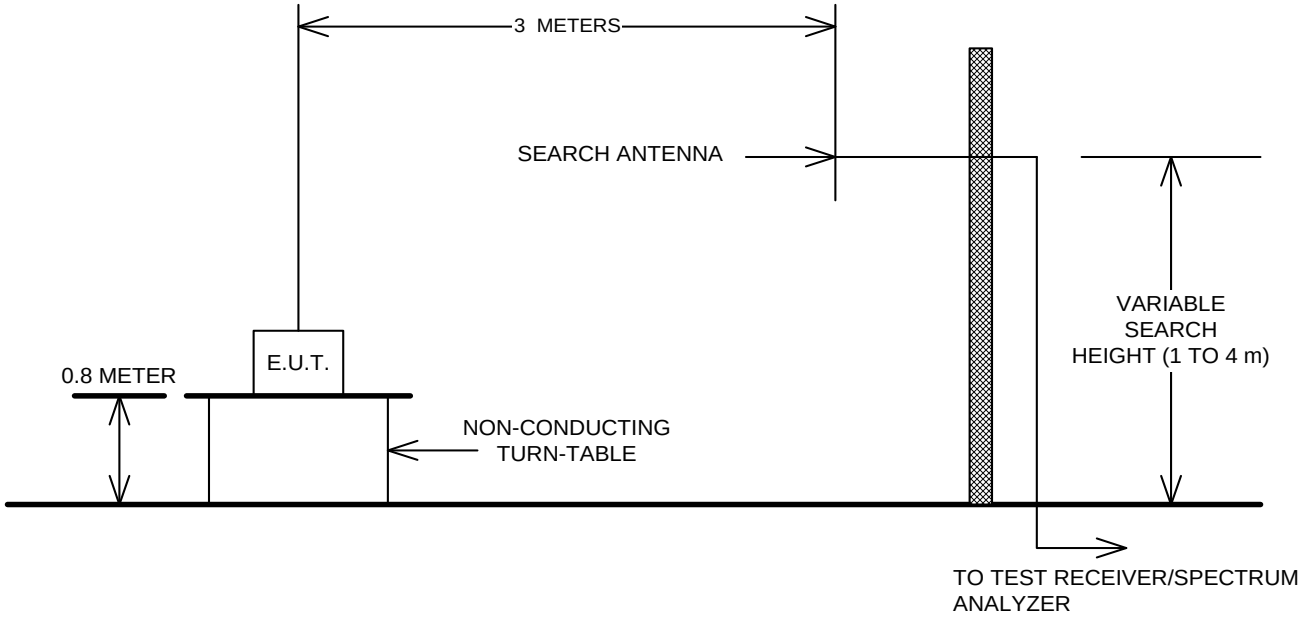
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability