




**Nemko Test Report:** 16262RUS1

**Applicant:** Andrew Corporation  
108 Rand Park Drive  
Garner, NC 27529  
USA

**Equipment Under Test:  
(E.U.T.)** AF8537

**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:** 06 November, 2008

**APPROVED BY:**   
\_\_\_\_\_  
Tom Tidwell, Telecom Direct **DATE:** 10 November, 2008

**Table of Contents**

<b>SECTION 1.</b>	<b>SUMMARY OF TEST RESULTS</b>	<b>3</b>
<b>SECTION 2.</b>	<b>GENERAL EQUIPMENT SPECIFICATION</b>	<b>5</b>
<b>SECTION 3.</b>	<b>RF POWER OUTPUT</b>	<b>7</b>
<b>SECTION 4.</b>	<b>OCCUPIED BANDWIDTH</b>	<b>8</b>
<b>SECTION 5.</b>	<b>SPURIOUS EMISSIONS AT ANTENNA TERMINALS</b>	<b>33</b>
<b>SECTION 6.</b>	<b>FIELD STRENGTH OF SPURIOUS</b>	<b>70</b>
<b>SECTION 7.</b>	<b>TEST EQUIPMENT LIST</b>	<b>71</b>
<b>ANNEX A -</b>	<b>TEST DETAILS</b>	<b>72</b>
<b>ANNEX B -</b>	<b>TEST DIAGRAMS</b>	<b>78</b>

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Section 1. Summary of Test Results**

Manufacturer Andrew Corporation

Model No.: AF8537

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 22, Subpart H.

- |                                     |                            |                                     |                     |
|-------------------------------------|----------------------------|-------------------------------------|---------------------|
| <input checked="" type="checkbox"/> | New Submission             | <input checked="" type="checkbox"/> | Production Unit     |
| <input type="checkbox"/>            | Class II Permissive Change | <input type="checkbox"/>            | Pre-Production Unit |

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

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



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EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Summary Of Test Data**

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	22.913(a)	500W ERP	Complies
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.	Complies
Frequency Stability	22.355	1.5 ppm	NA

**Footnotes:**

- (1) Modulation characteristics were not tested since the E.U.T. processes but does not produce a modulated waveform.
- (2) The equipment under test uses a common oscillator to down-convert the rf input to an intermediate frequency and to up-convert the IF to rf output. The rf input and output frequency are the same.

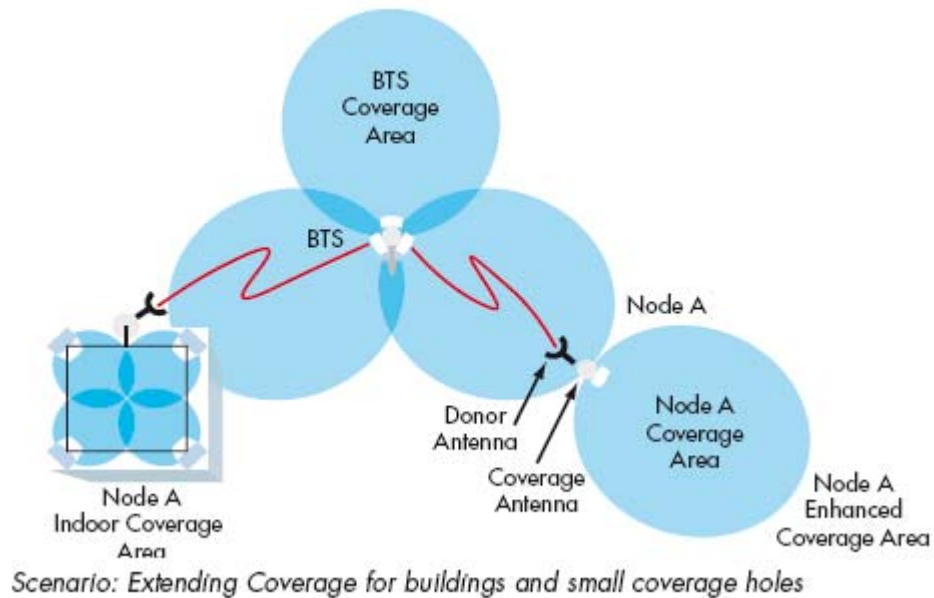
**Section 2. General Equipment Specification**

<b>Supply Voltage Input:</b>	120 Vac				
<b>Frequency Range:</b>	<b>Downlink:</b>	869-894 MHz			
<b>Frequency Range:</b>	<b>Uplink:</b>	824-849 Mhz			
<b>Type of Modulation and Designator:</b>	<b>CDMA W-CDMA (F9W)</b>	<b>GSM (GXW)</b>	<b>TDMA (DXW)</b>	<b>EDGE (G7W)</b>	<b>Analog (F3E/F1D)</b>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Output Impedance:</b>	50 ohms				
<b>RF Output (Rated):</b>	<b>Downlink:</b>	5.0 W 37 dBm			
	<b>Uplink:</b>	1.0 W 30 dBm			
<b>Frequency Translation:</b>	<b>F1-F1</b>	<b>F1-F2</b>	<b>N/A</b>		
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Band Selection:</b>	<b>Software</b>	<b>Duplexer Change</b>	<b>Fullband Coverage</b>		
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

### Description of EUT

The Node A is an RF enhancer which is capable of filtering and amplifying a multitude of distinct sub-bands up to 120 MHz in total anywhere within multiple frequency bands. It is designed to be part of the primary infrastructure

### System Diagram



EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Section 3. RF Power Output**

NAME OF TEST: RF Power Output	PARA. NO.: 22.913
TESTED BY: David Light	DATE: 05 November 2008

**Test Results:** Complies.

**Test Data:**

Direction	Modulation	Composite Power (dBm)	RF Power (W)
Downlink	CDMA	37	5.0
	GSM	37	5.0
	EDGE	37	5.0
	WCDMA	37	5.0
	TDMA	37	5.0
	Analog	37	5.0
Uplink	CDMA	30	1.0
	GSM	30	1.0
	EDGE	30	1.0
	WCDMA	30	1.0
	TDMA	30	1.0
	Analog	30	1.0

**Equipment Used:** 1065-1604-1082-1659-1663

**Measurement Uncertainty:** +/- 1.7 dB

**Temperature:** 22 °C

**Relative Humidity:** 48 %

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

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**Section 4. Occupied Bandwidth**

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 05 November 2008

**Test Results:** Complies.

**Test Data:** See attached plot(s).

**Equipment Used:** 1065-1604-1082-1659-1663

**Measurement Uncertainty:** 1X10<sup>-7</sup> ppm

**Temperature:** 22 °C

**Relative Humidity:** 48 %

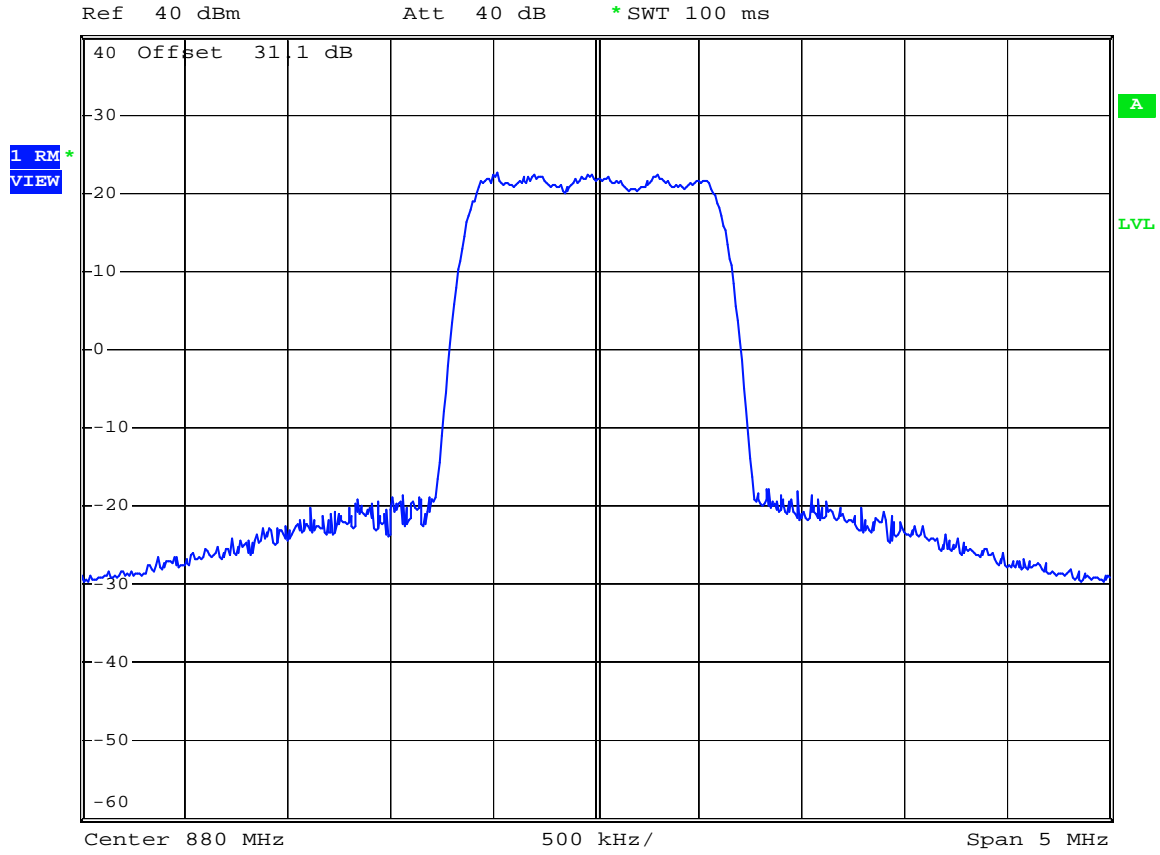


**Test Data – Occupied Bandwidth**

Downlink  
CDMA – Output



\* RBW 30 kHz  
\* VBW 300 kHz  
\* SWT 100 ms



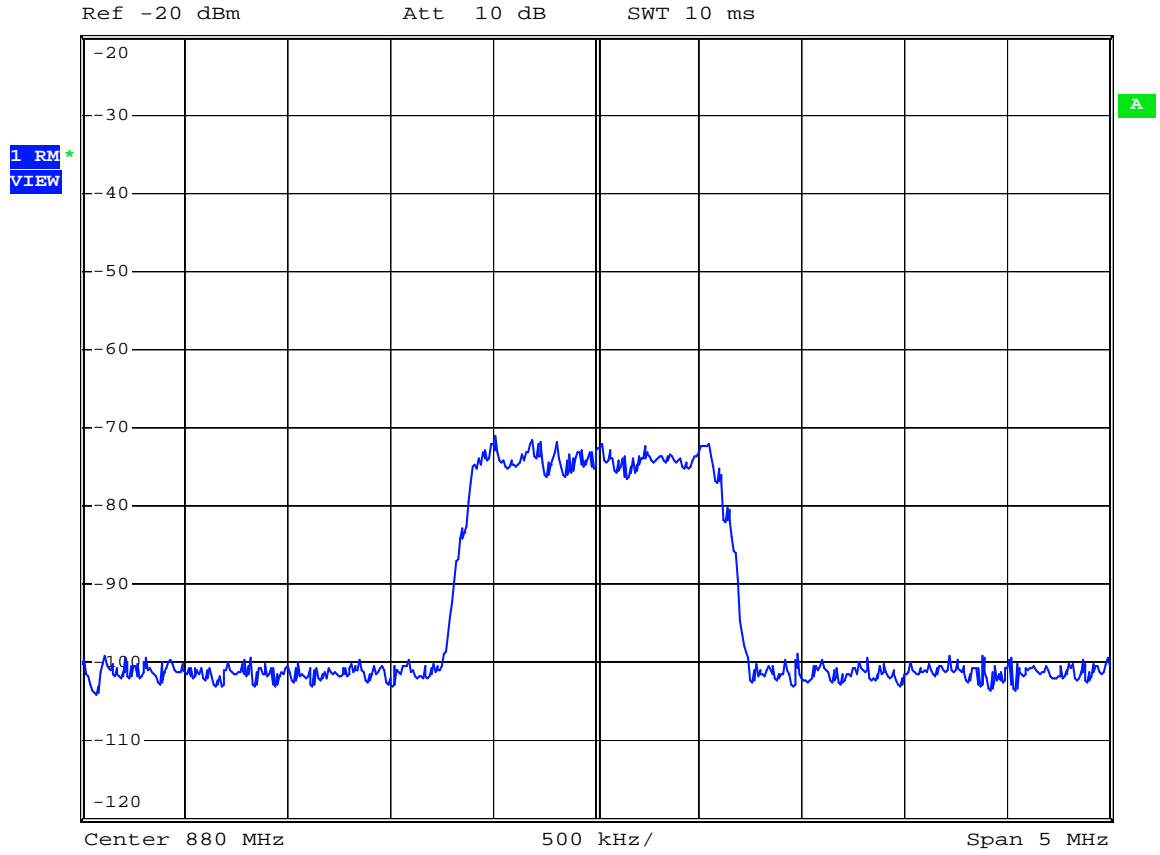
Date: 5.NOV.2008 14:02:56

**Test Data – Occupied Bandwidth**

Downlink  
CDMA – Input



\* RBW 30 kHz  
\* VBW 300 kHz  
SWT 10 ms



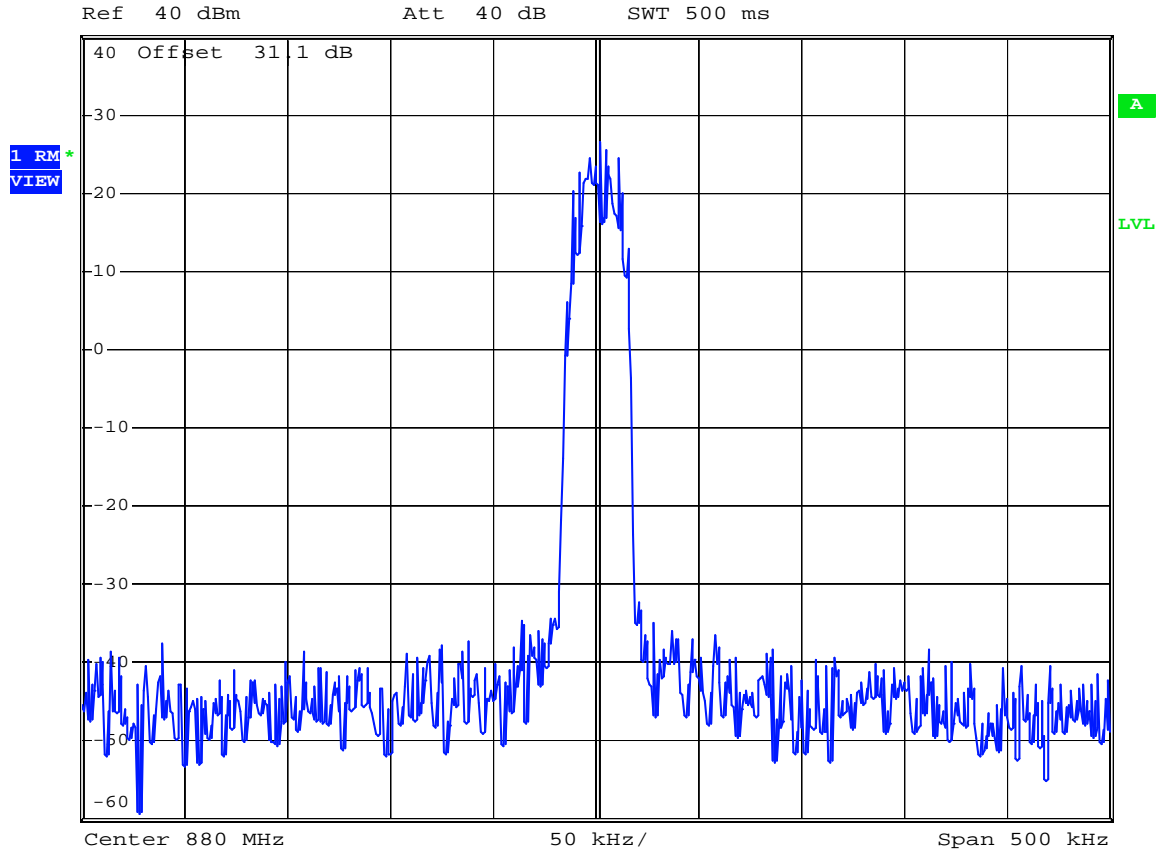
Date: 5.NOV.2008 15:07:24

**Test Data – Occupied Bandwidth**

Downlink  
TDMA - Output



\*RBW 1 kHz  
\*VBW 300 kHz  
SWT 500 ms



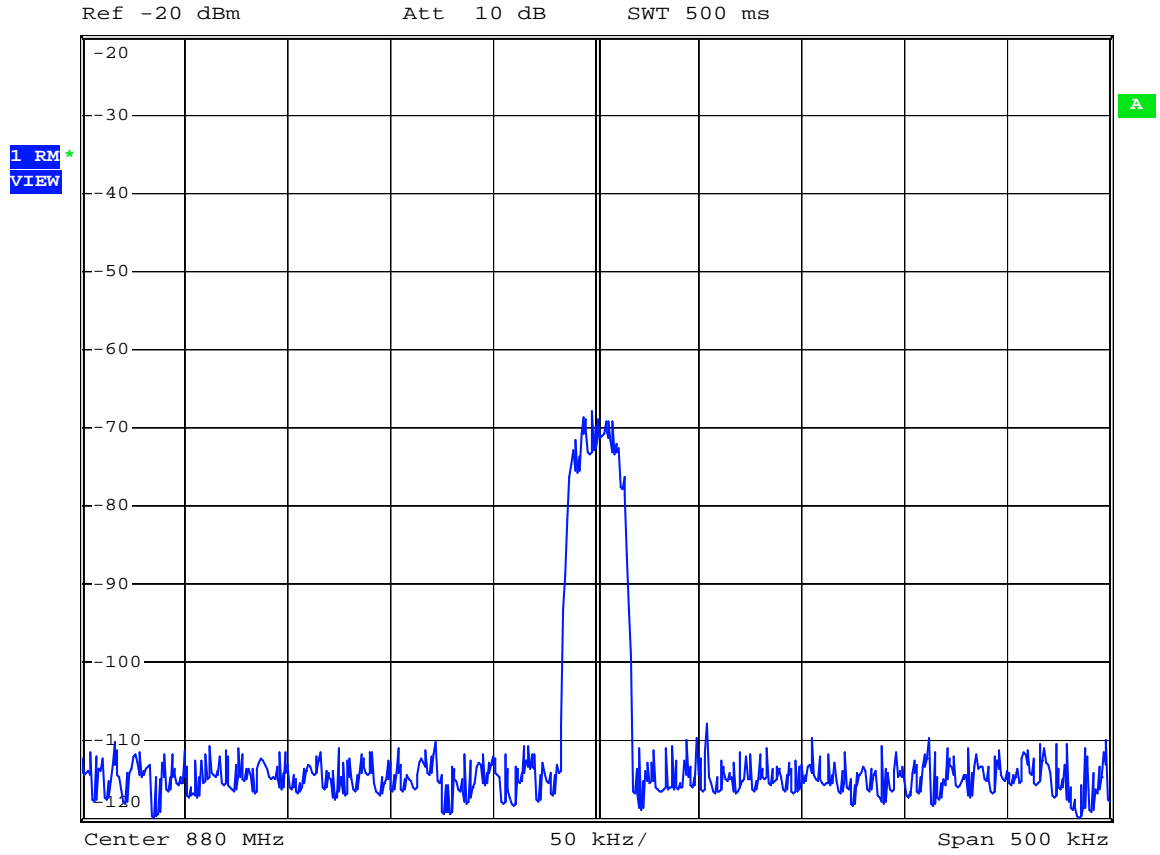
Date: 5.NOV.2008 14:43:37

**Test Data – Occupied Bandwidth**

Downlink  
TDMA – Input



\* RBW 1 kHz  
\* VBW 300 kHz  
SWT 500 ms



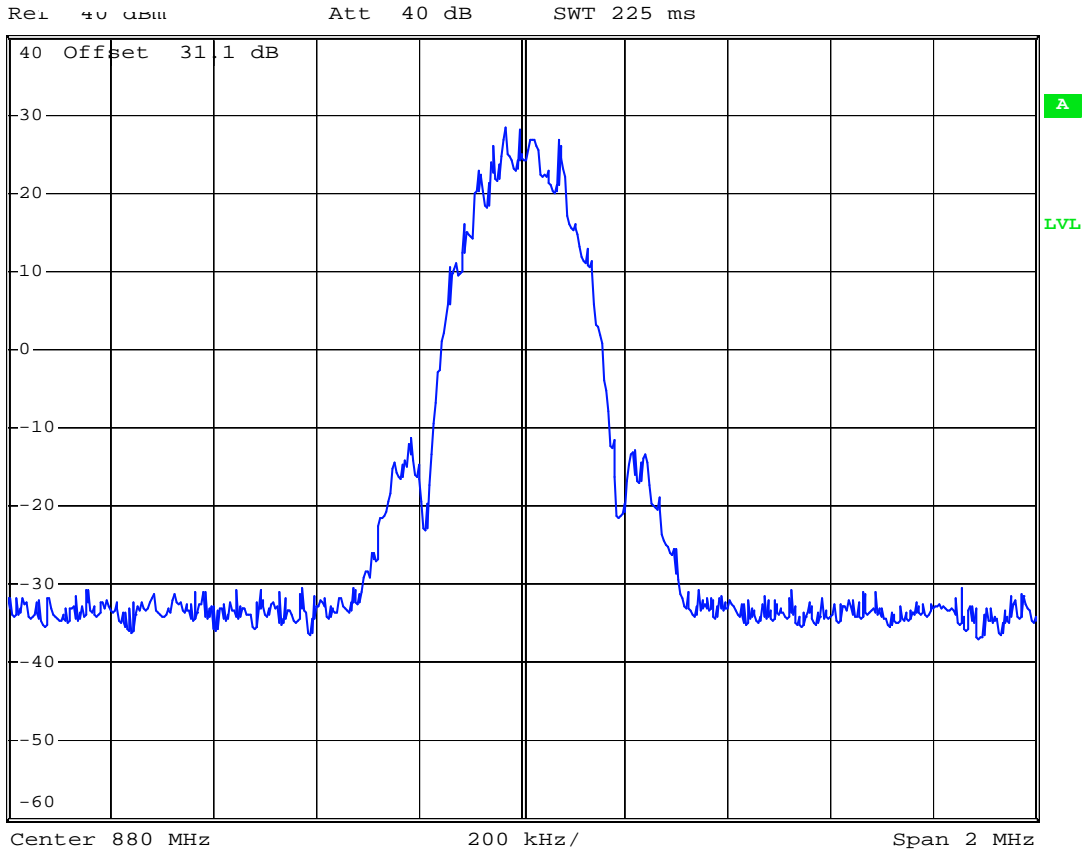
Date: 5.NOV.2008 15:01:45

**Test Data – Occupied Bandwidth**

Downlink  
EDGE – Output



\*RBW 3 kHz  
\*VBW 300 kHz



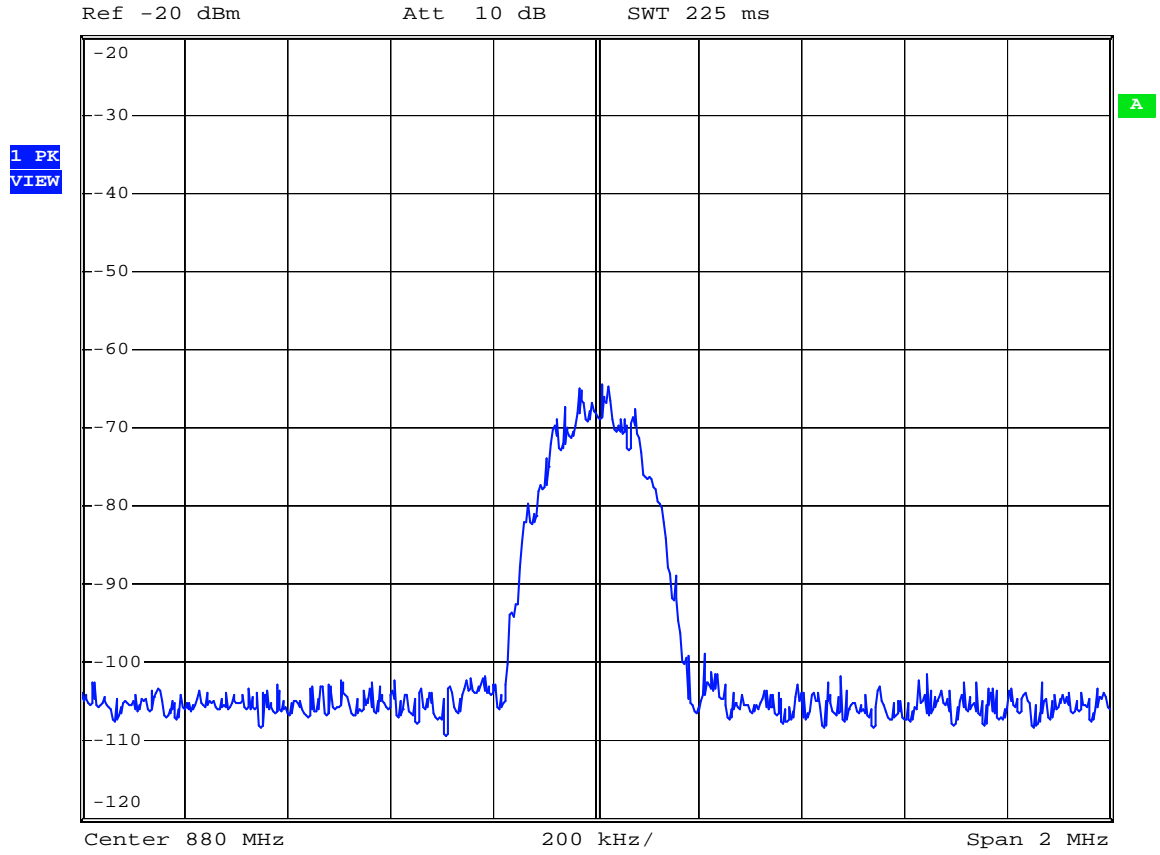
Date: 5.NOV.2008 14:23:50

**Test Data – Occupied Bandwidth**

Downlink  
EDGE – Input



\* RBW 3 kHz  
\* VBW 300 kHz  
SWT 225 ms



Date: 5.NOV.2008 15:06:04

EQUIPMENT: **AF8537**

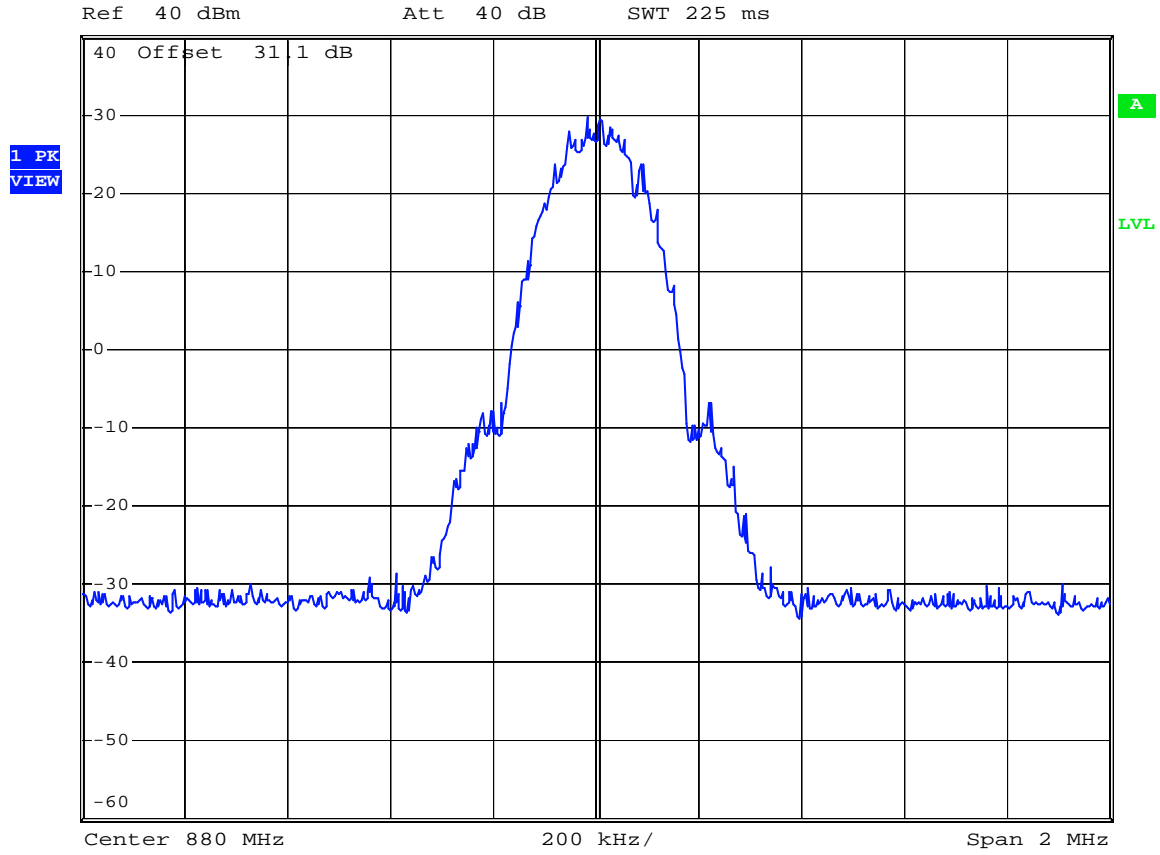
PROJECT NO.: 16262RUS1

**Test Data – Occupied Bandwidth**

Downlink  
GSM – Output



\* RBW 3 kHz  
\* VBW 300 kHz  
SWT 225 ms



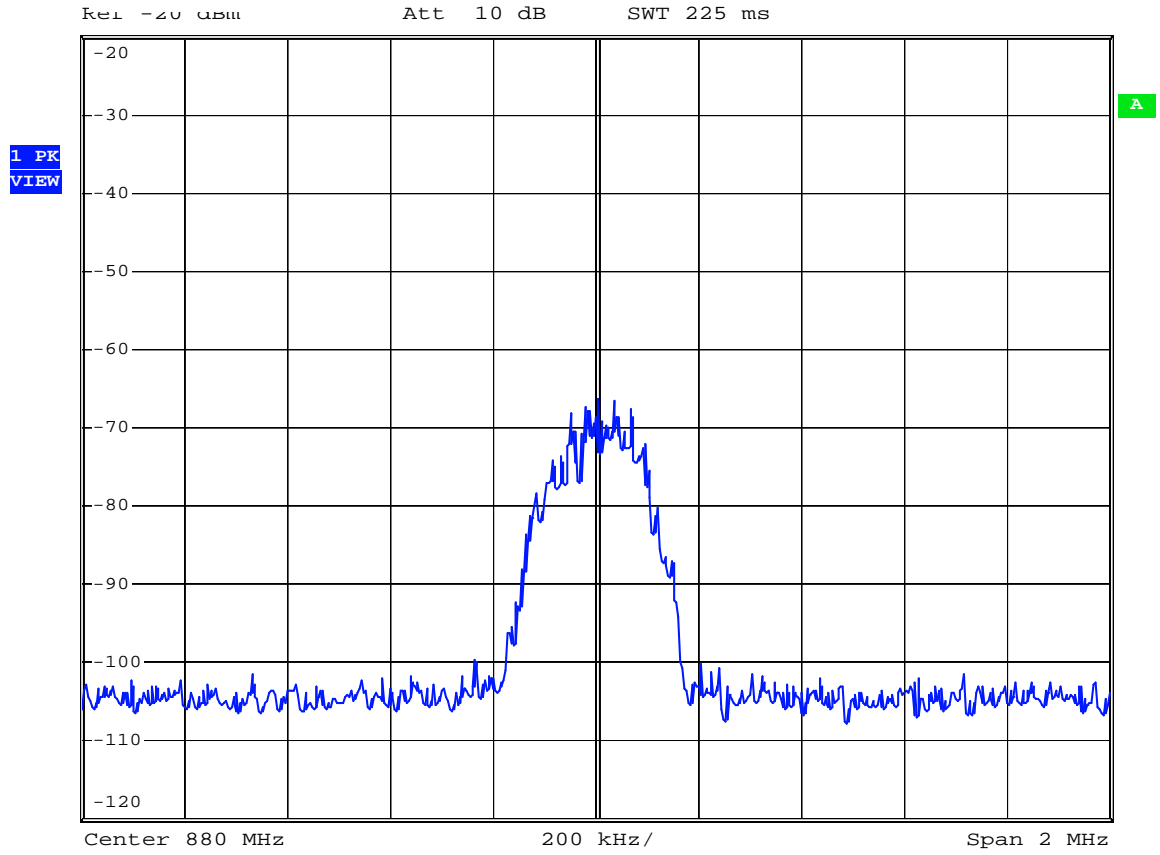
Date: 5.NOV.2008 14:21:45

**Test Data – Occupied Bandwidth**

Downlink  
GSM – Input



\* RBW 3 kHz  
\* VBW 300 kHz  
SWT 225 ms



Date: 5.NOV.2008 15:05:19

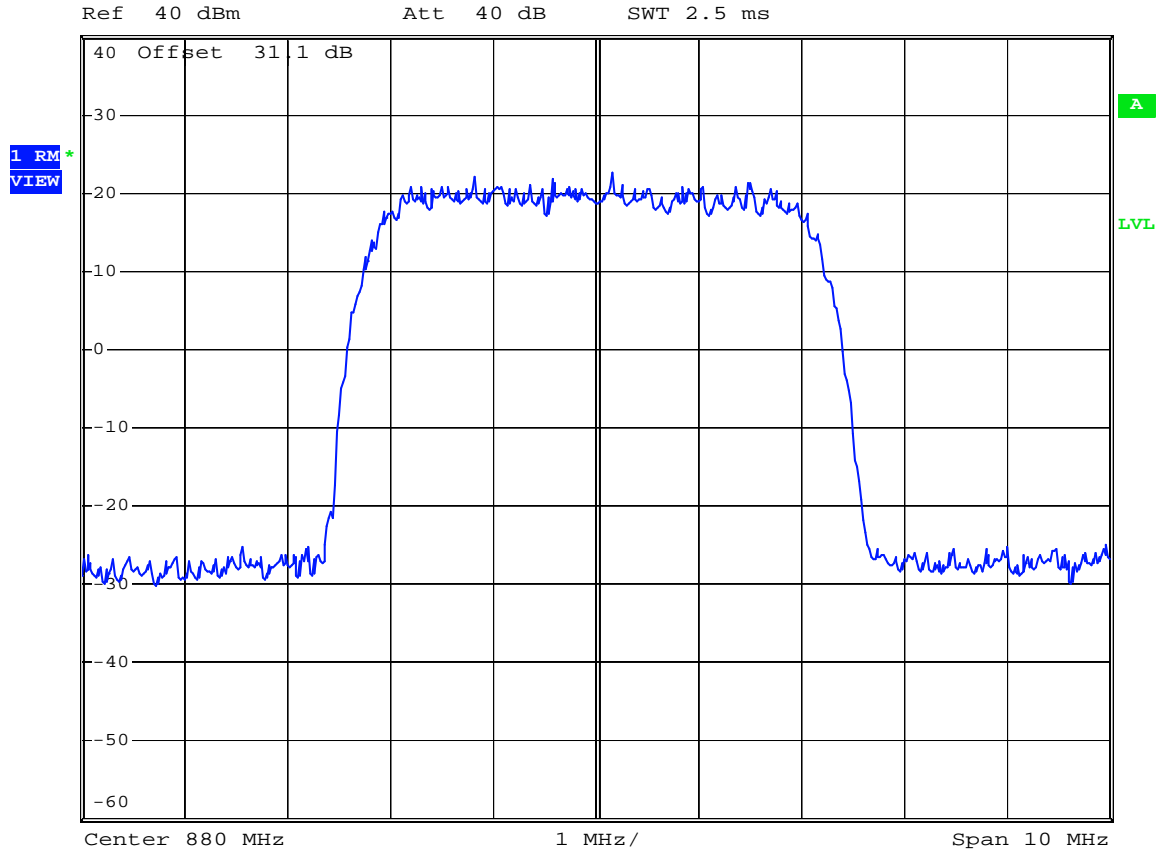


**Test Data – Occupied Bandwidth**

Downlink  
W-CDMA - Output



\* RBW 100 kHz  
\* VBW 300 kHz  
SWT 2.5 ms



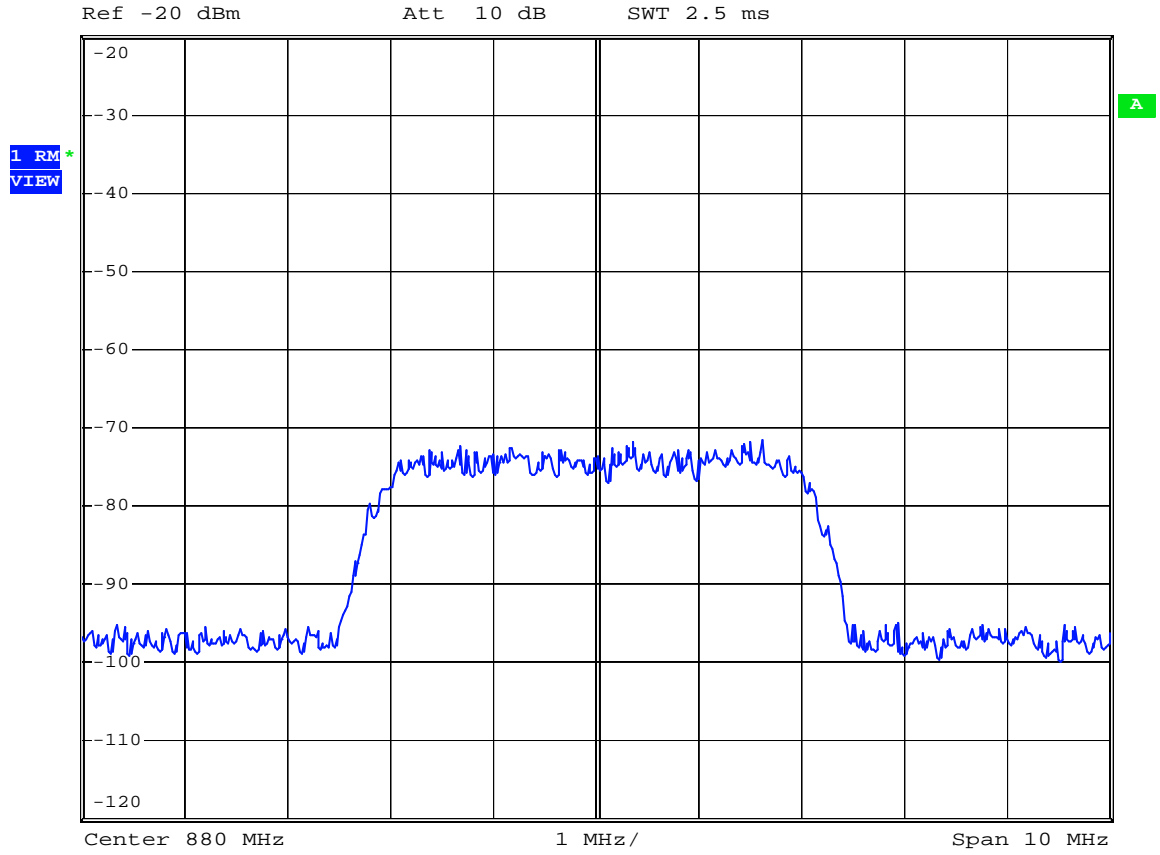
Date: 5.NOV.2008 14:34:00

**Test Data – Occupied Bandwidth**

Downlink  
W-CDMA - Input



\* RBW 100 kHz  
\* VBW 300 kHz  
SWT 2.5 ms



Date: 5.NOV.2008 15:02:55

**Test Data – Occupied Bandwidth**

Downlink  
Analog – Output

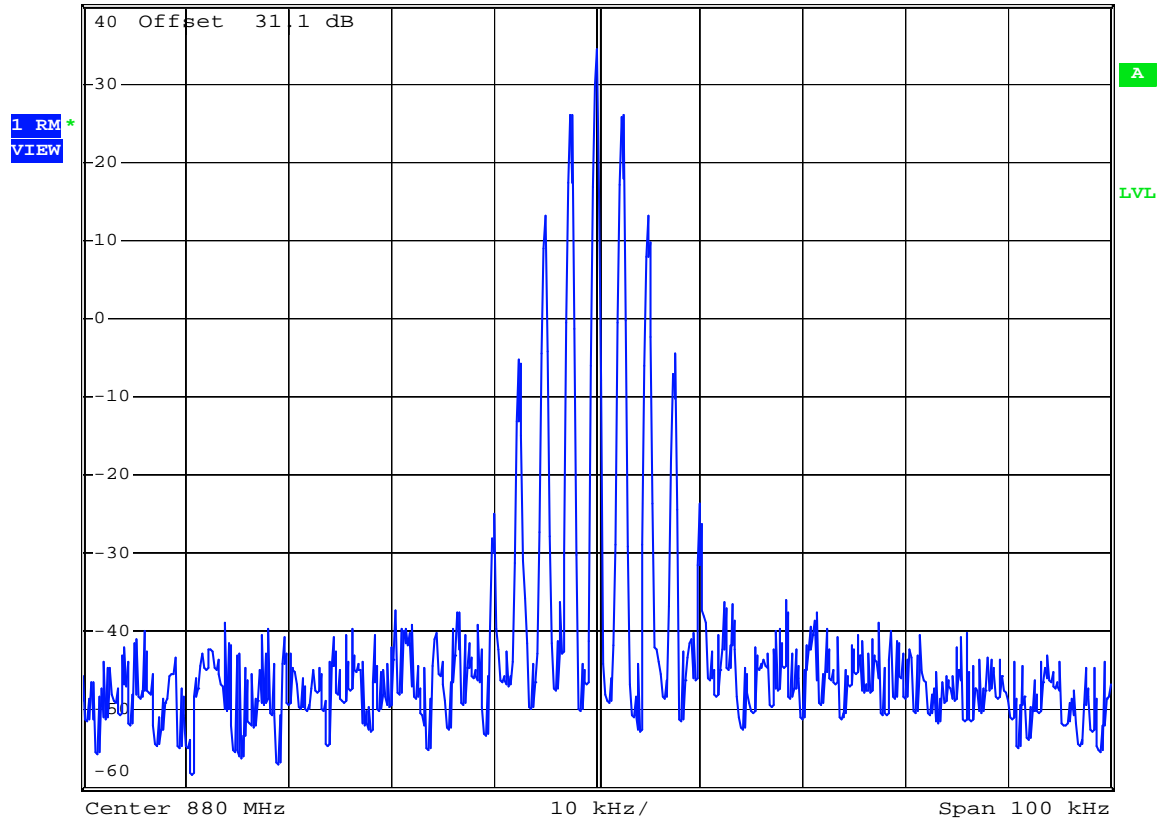


\*RBW 300 Hz  
\*VBW 300 kHz

Ref 40 dBm

Att 40 dB

SWT 1.15 s



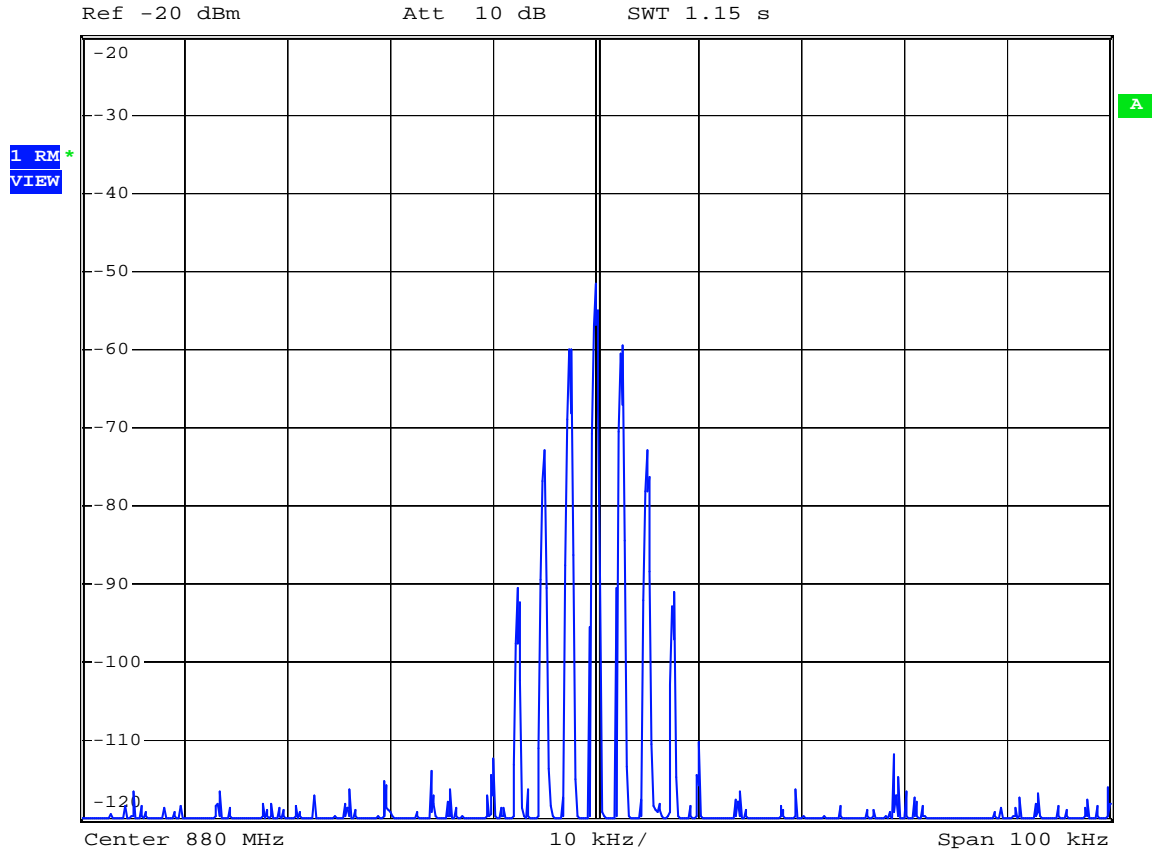
Date: 5.NOV.2008 14:48:14  
2 kHz Tone / 2.5 kHz Deviation

**Test Data – Occupied Bandwidth**

Downlink  
Analog – Input



\* RBW 300 Hz  
\* VBW 300 kHz  
SWT 1.15 s



Date: 5.NOV.2008 15:00:16

2 kHz Tone / 2.5 kHz Deviation

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

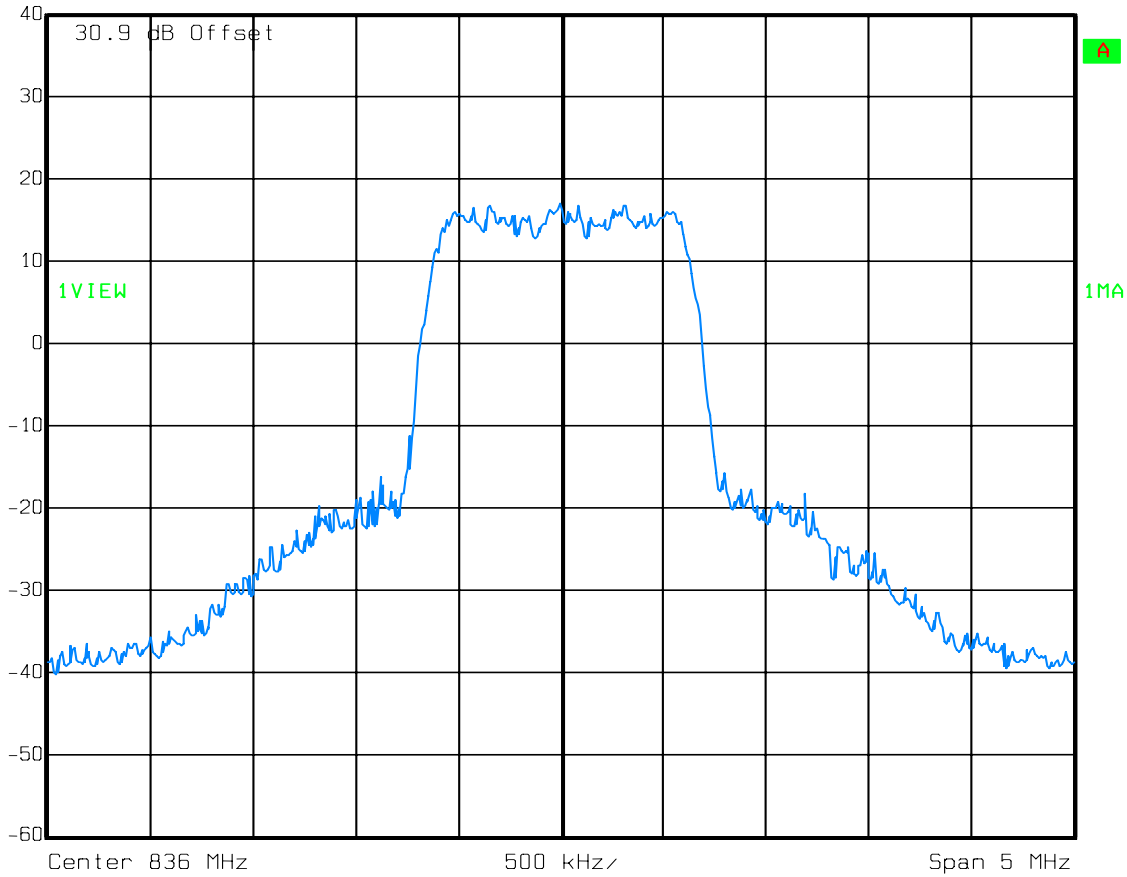
**Test Data – Occupied Bandwidth**

Uplink  
CDMA – Output



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 10:49:03

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

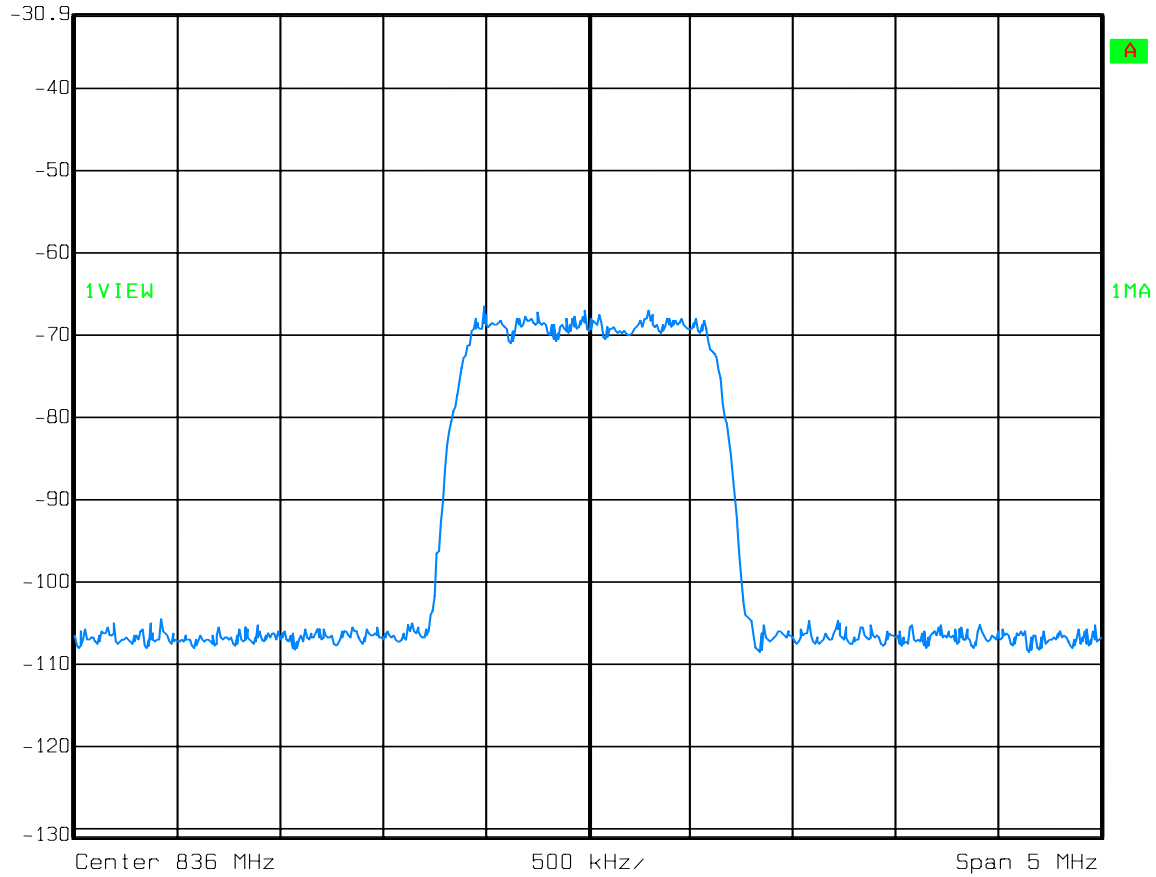
**Test Data – Occupied Bandwidth**

Uplink  
CDMA – Input



Ref Lvl  
-30.9 dBm

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



Date: 03.OCT.2008 10:50:45

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

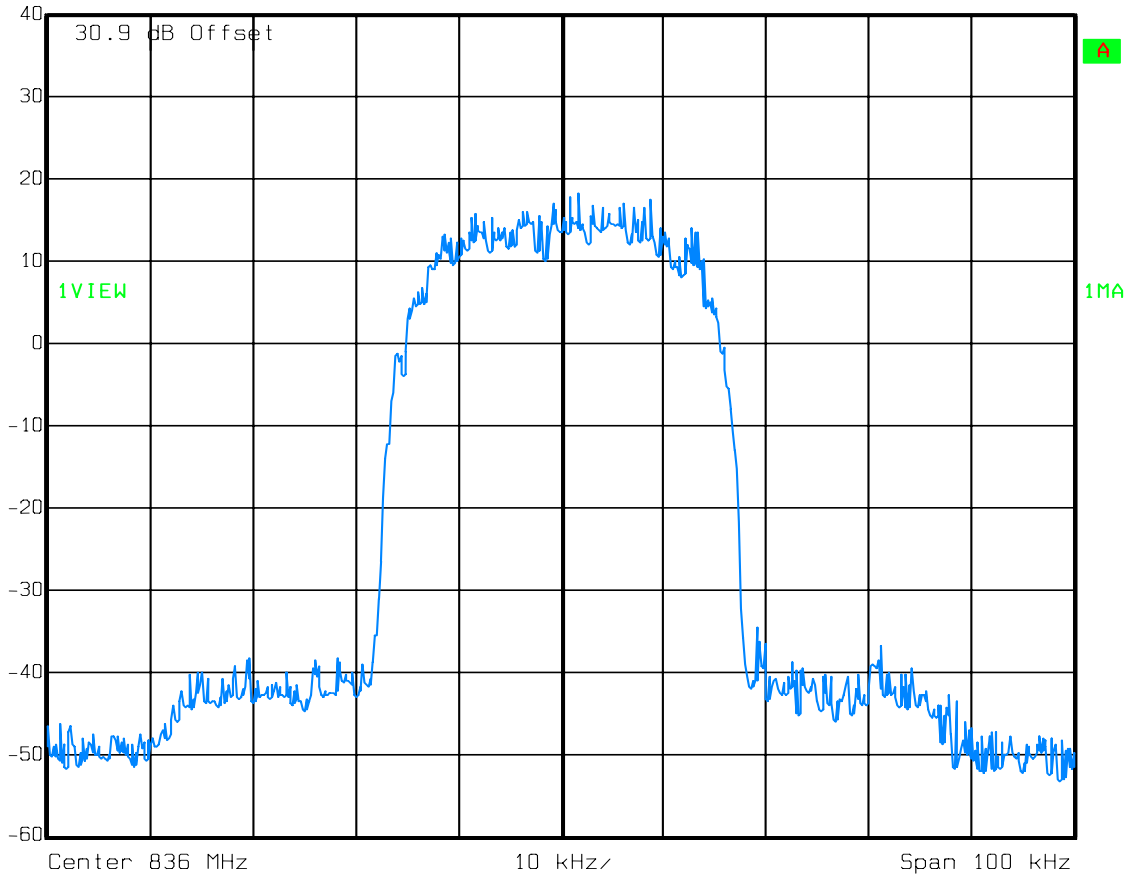
**Test Data – Occupied Bandwidth**

Uplink  
TDMA - Output



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 15:19:41

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

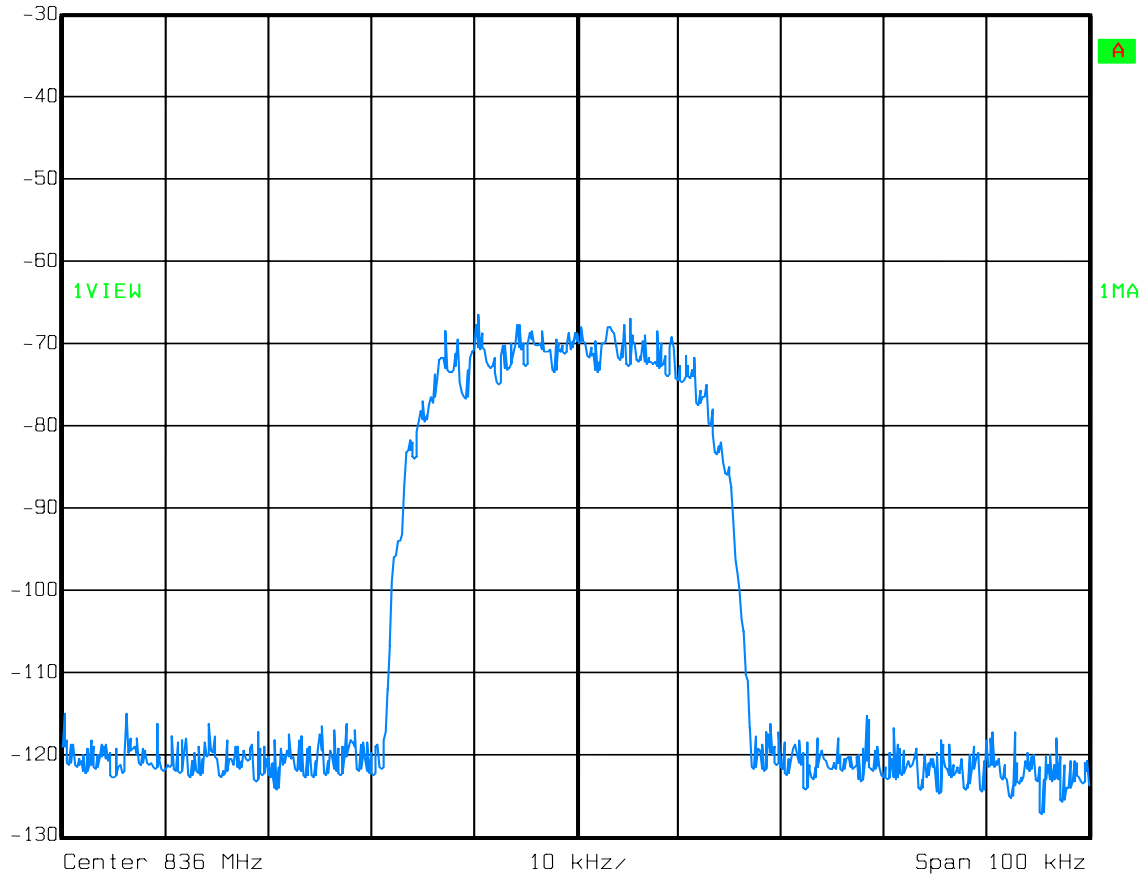
**Test Data – Occupied Bandwidth**

Uplink  
TDMA – Input



Ref Lvl  
-30 dBm

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



Date: 03.OCT.2008 15:16:43



**Test Data – Occupied Bandwidth**

Uplink  
EDGE – Output



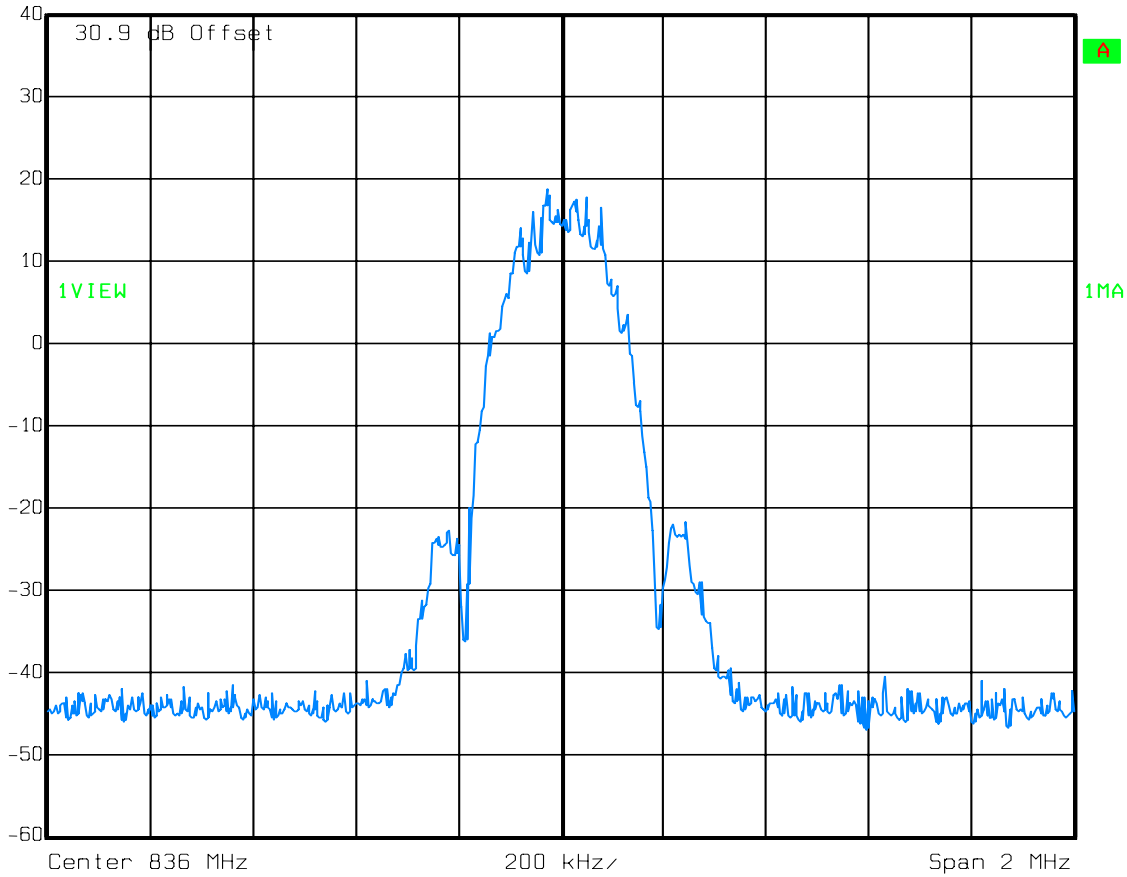
Ref

40 dBm

RBW 3 kHz RF Att 20 dB

VBW 3 kHz

SWT 560 ms Unit dBm



Date: 03.OCT.2008 12:38:40

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

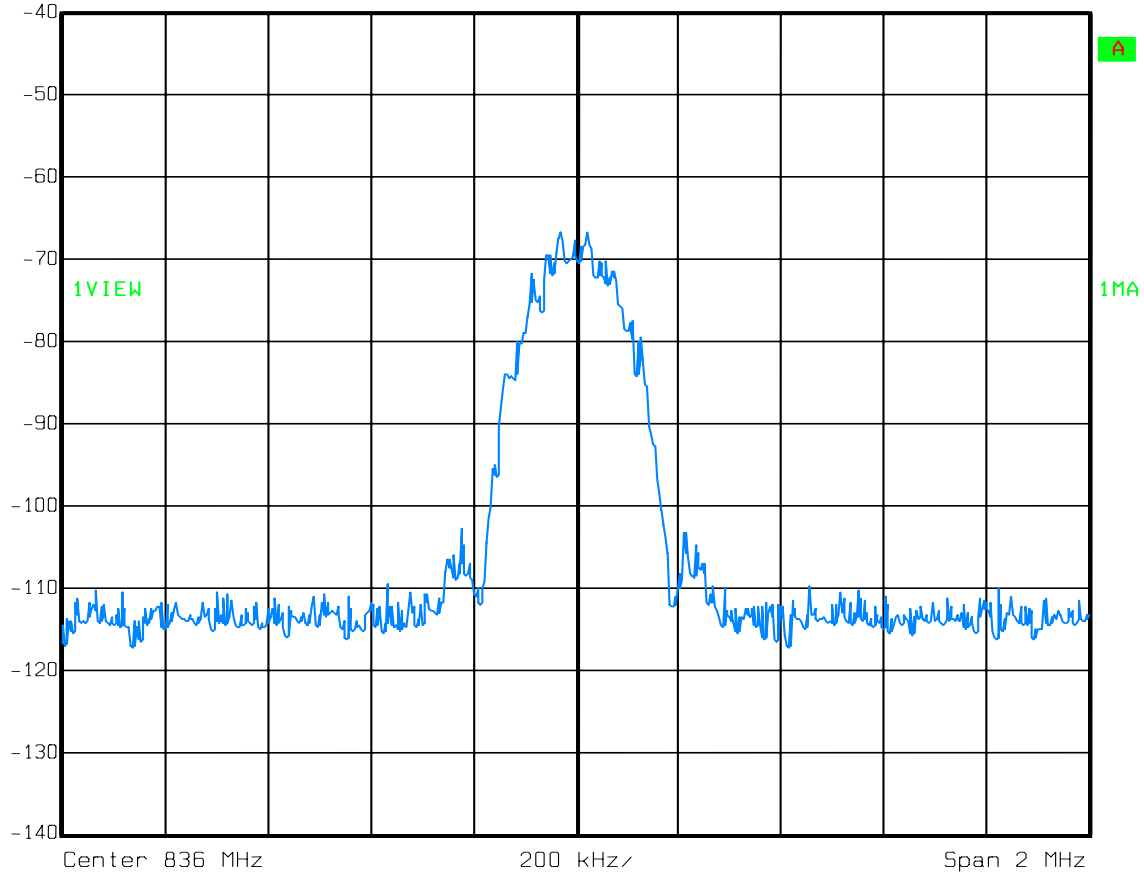
**Test Data – Occupied Bandwidth**

Uplink  
EDGE – Input



Ref Lvl  
-40 dBm

RBW 3 kHz RF Att 0 dB  
VBW 3 kHz  
SWT 560 ms Unit dBm



Date: 03.OCT.2008 12:39:46

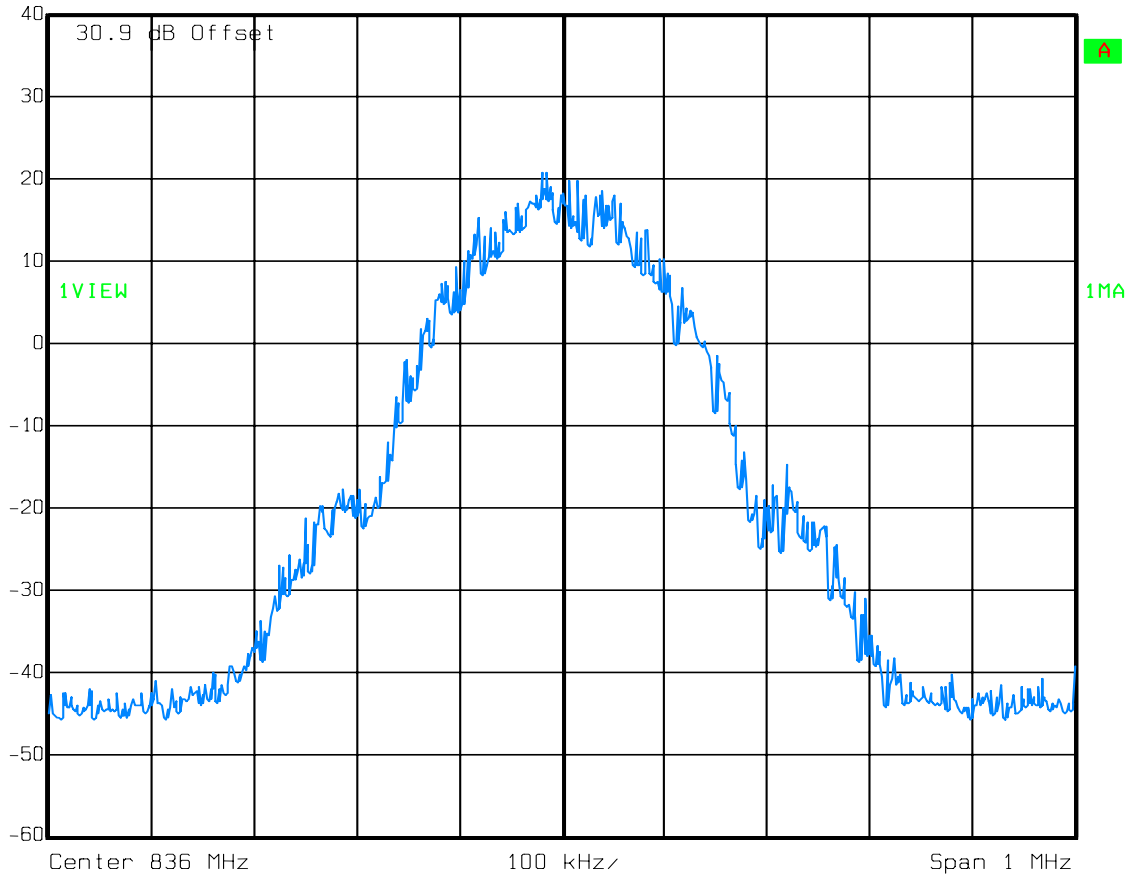
**Test Data – Occupied Bandwidth**

Uplink  
GSM – Output



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 11:04:01

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

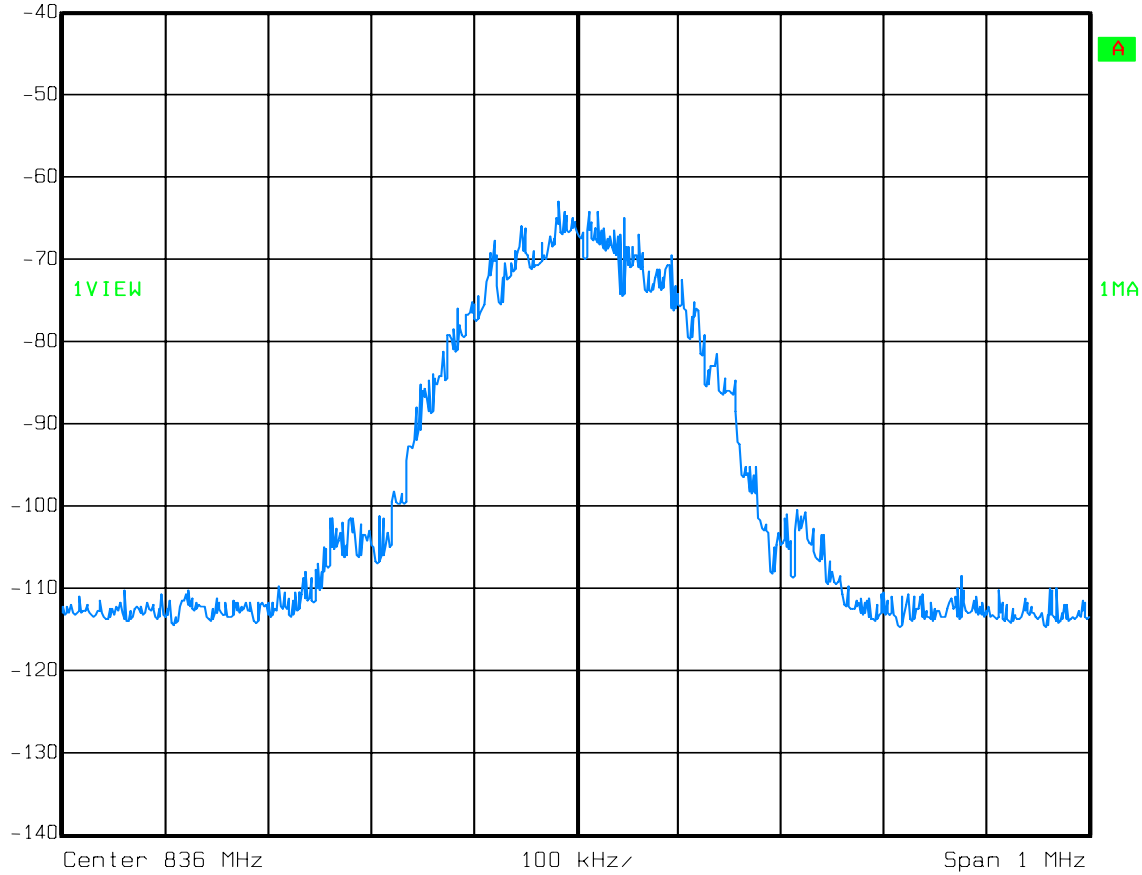
**Test Data – Occupied Bandwidth**

Uplink  
GSM – Input



Re  
-40 dBm

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



Date: 03.OCT.2008 11:02:55

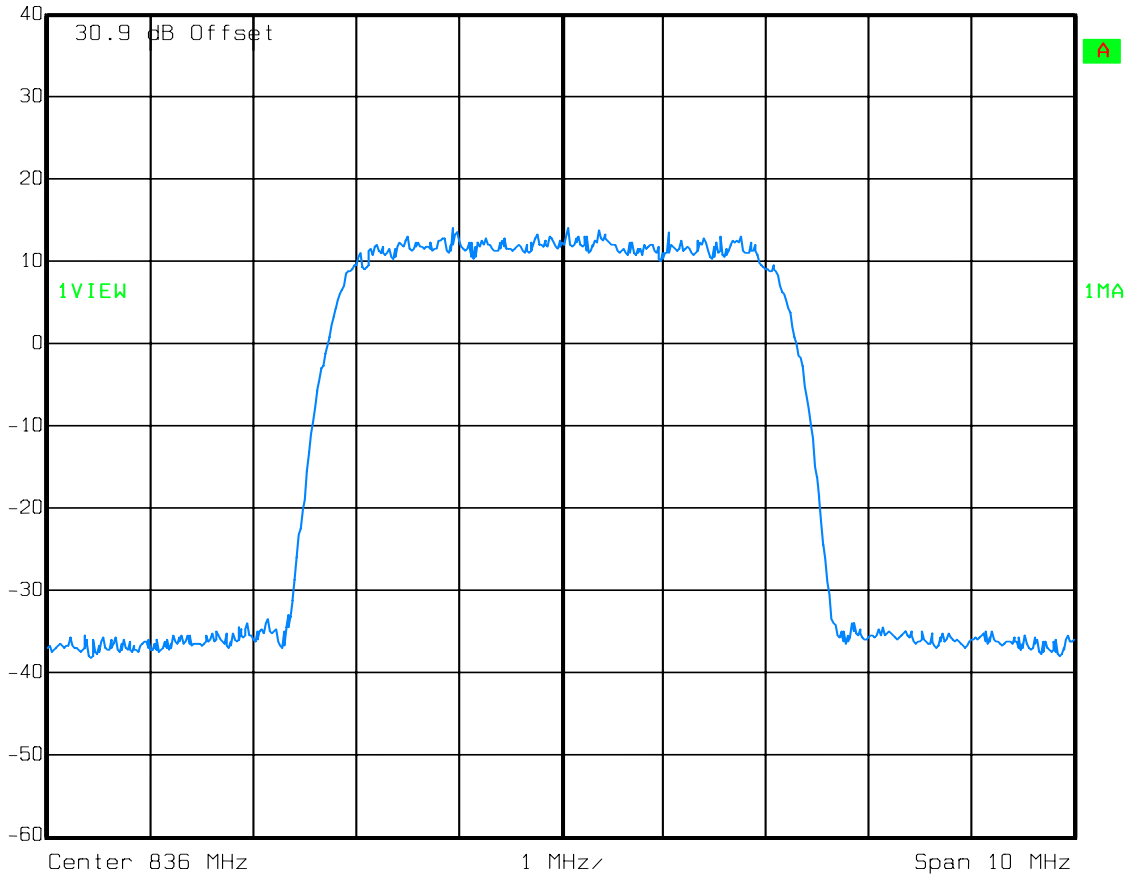
**Test Data – Occupied Bandwidth**

Uplink  
W-CDMA - Output



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 12:47:08

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

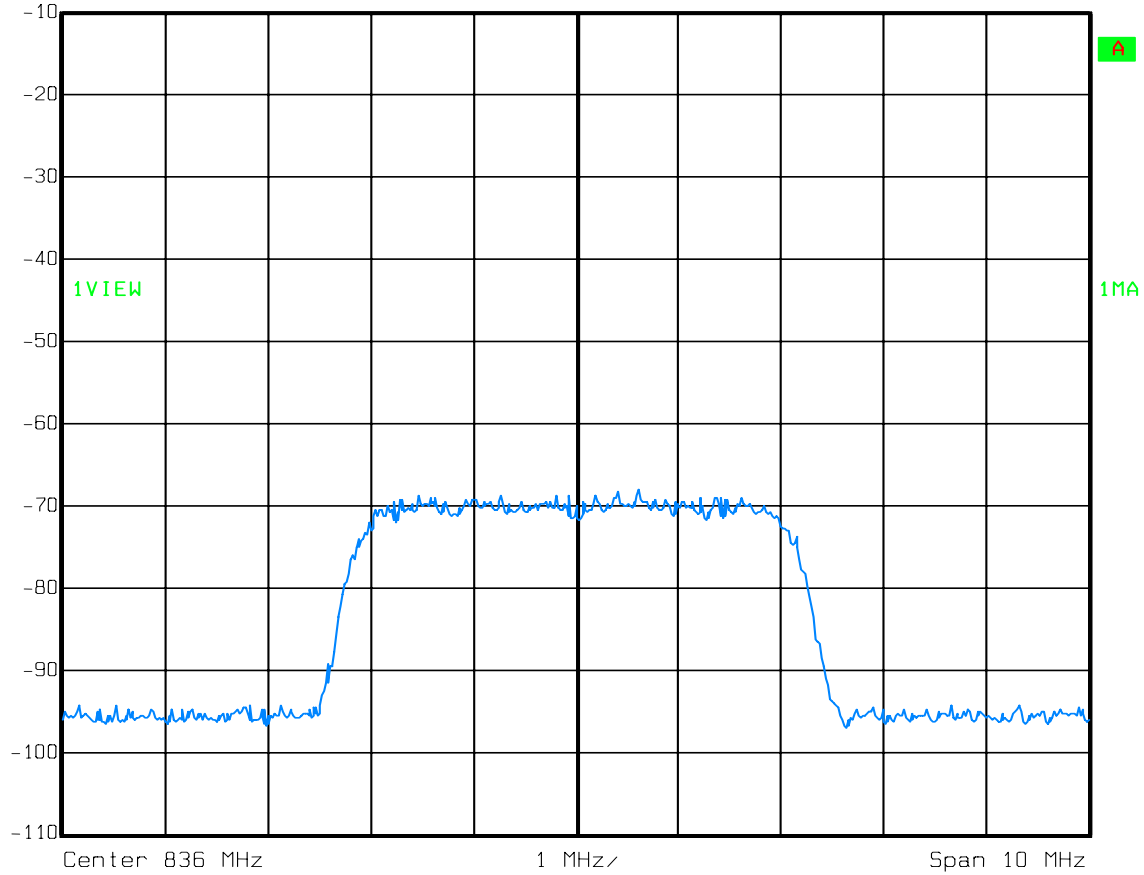
**Test Data – Occupied Bandwidth**

Uplink  
W-CDMA - Input



Ref Lvl  
-10 dBm

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



Date: 03.OCT.2008 12:48:37

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

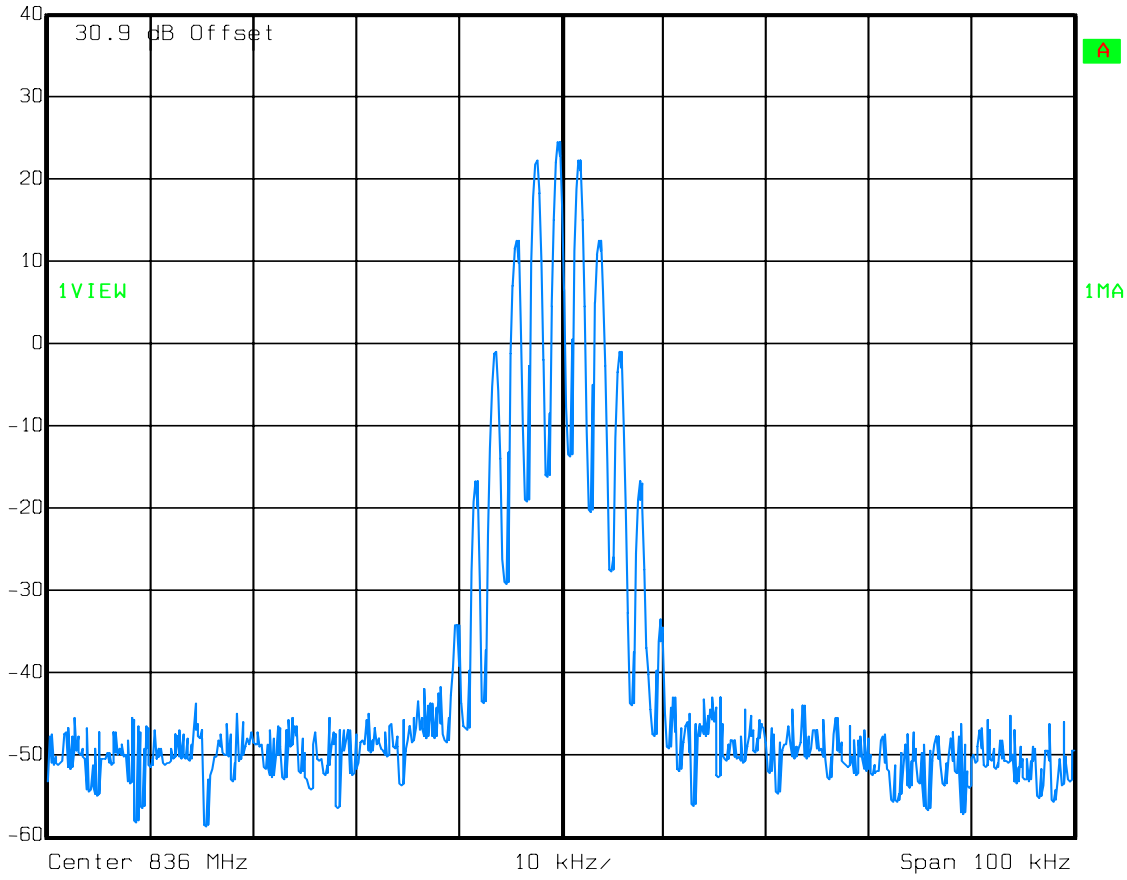
**Test Data – Occupied Bandwidth**

Uplink  
Analog – Output



Ref Lvl  
40 dBm

RBW	500 Hz	RF Att	20 dB
VBW	500 Hz	Mixer	-10 dBm
SWT	2 s	Unit	dBm



Date: 03.OCT.2008 15:14:06

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

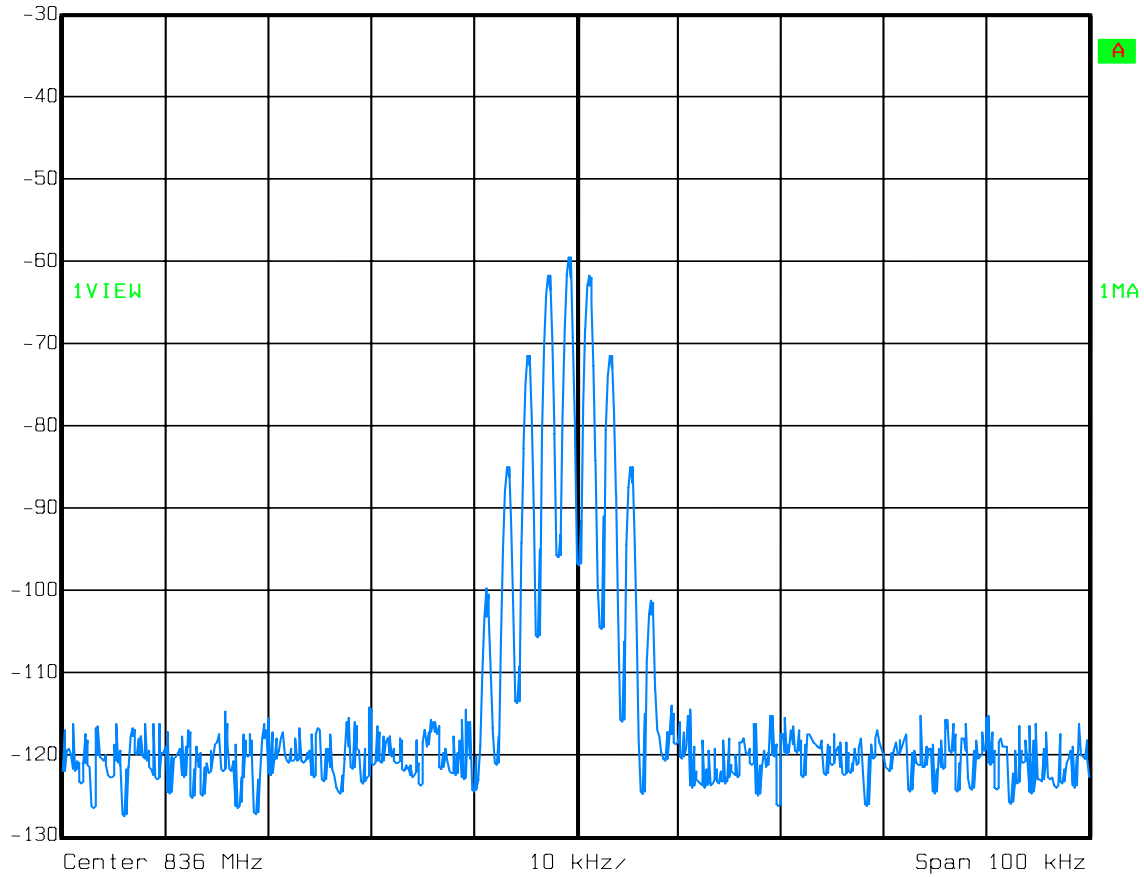
**Test Data – Occupied Bandwidth**

Uplink  
Analog – Input



Ref Lvl  
-30 dBm

RBW	500 Hz	RF Att	0 dB
VBW	500 Hz	Mixer	-10 dBm
SWT	2 s	Unit	dBm



Date: 03.OCT.2008 15:15:15



EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

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## Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 22.917
TESTED BY: David Light	DATE: 05 November 2008

**Test Results:** Complies.

**Test Data:** See attached plot(s).

**Equipment Used:** 1065-1604-1082-1659-1663-1464

**Measurement Uncertainty:** +/- 1.7 dB

**Temperature:** 22 °C

**Relative Humidity:** 35 %

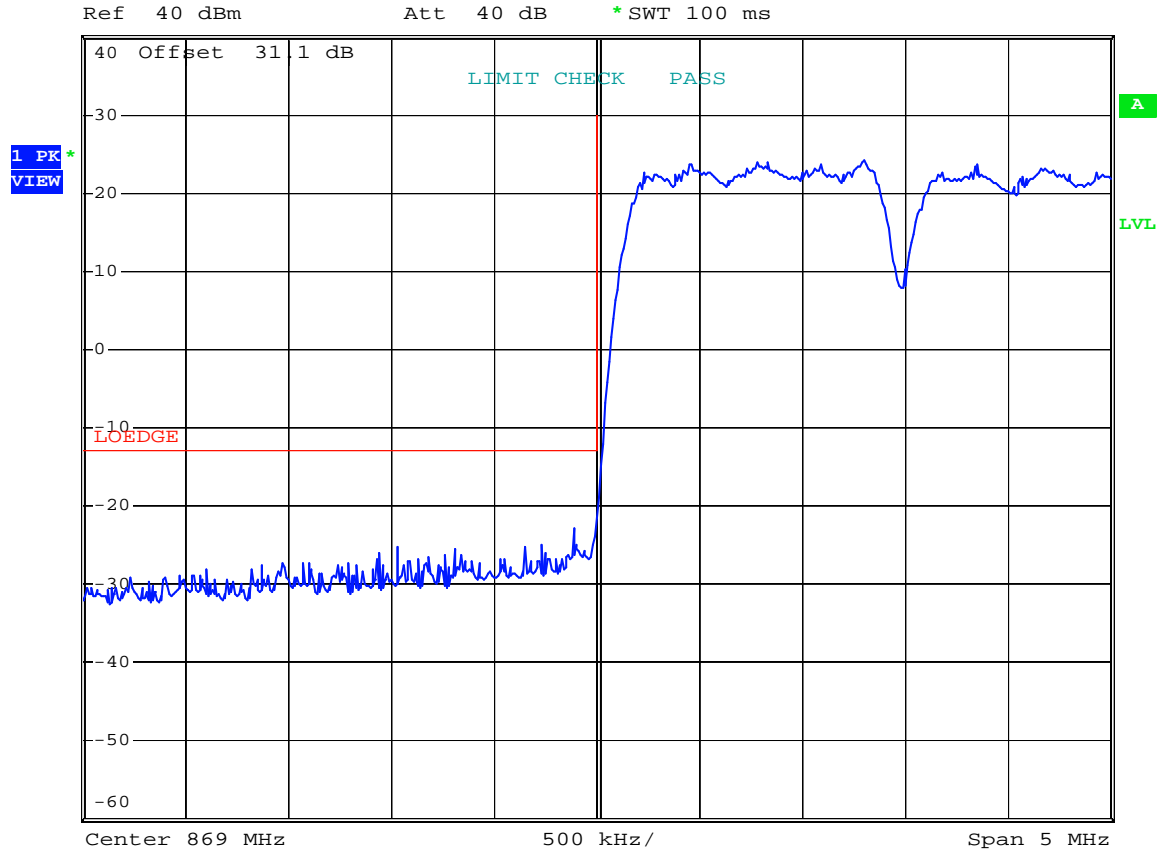
**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Lower Bandedge Intermodulation

CDMA



\*RBW 30 kHz  
\*VBW 300 kHz  
\*SWT 100 ms



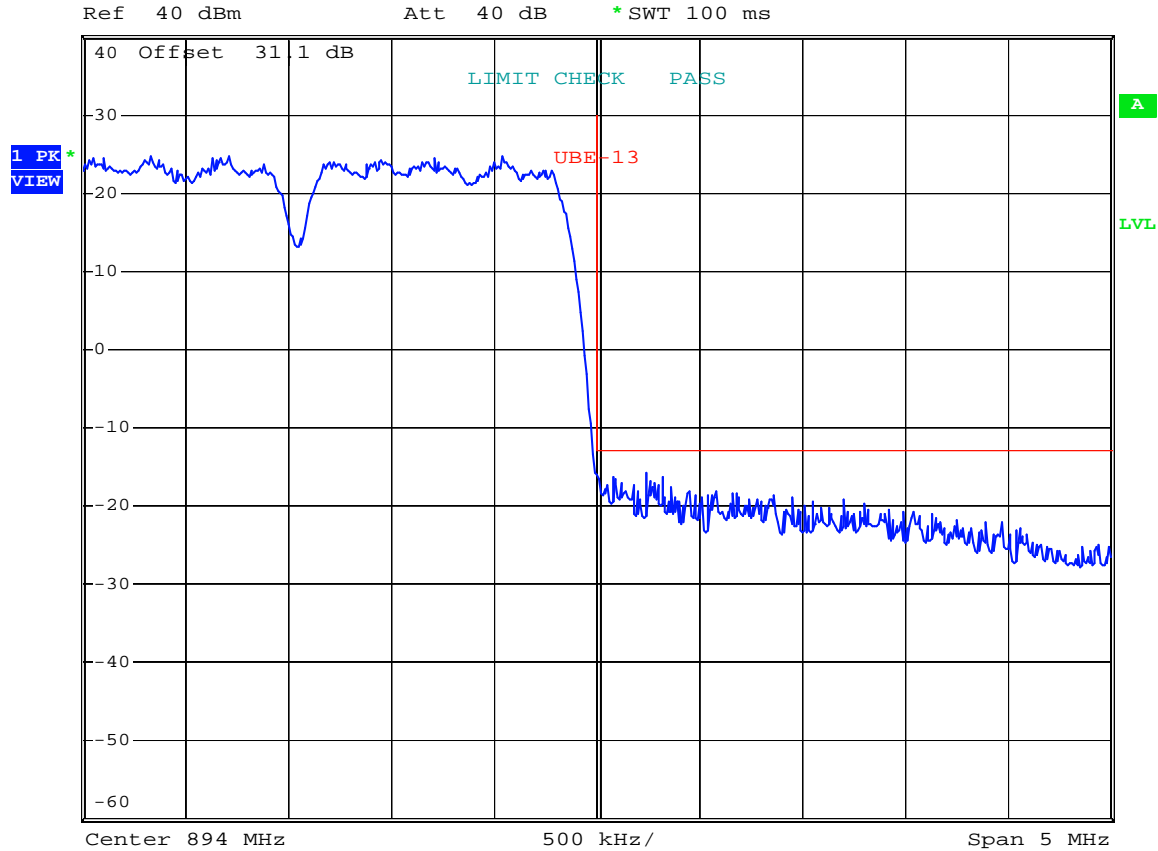
Date: 5.NOV.2008 14:07:35

**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Upper Bandedge Intermodulation  
CDMA



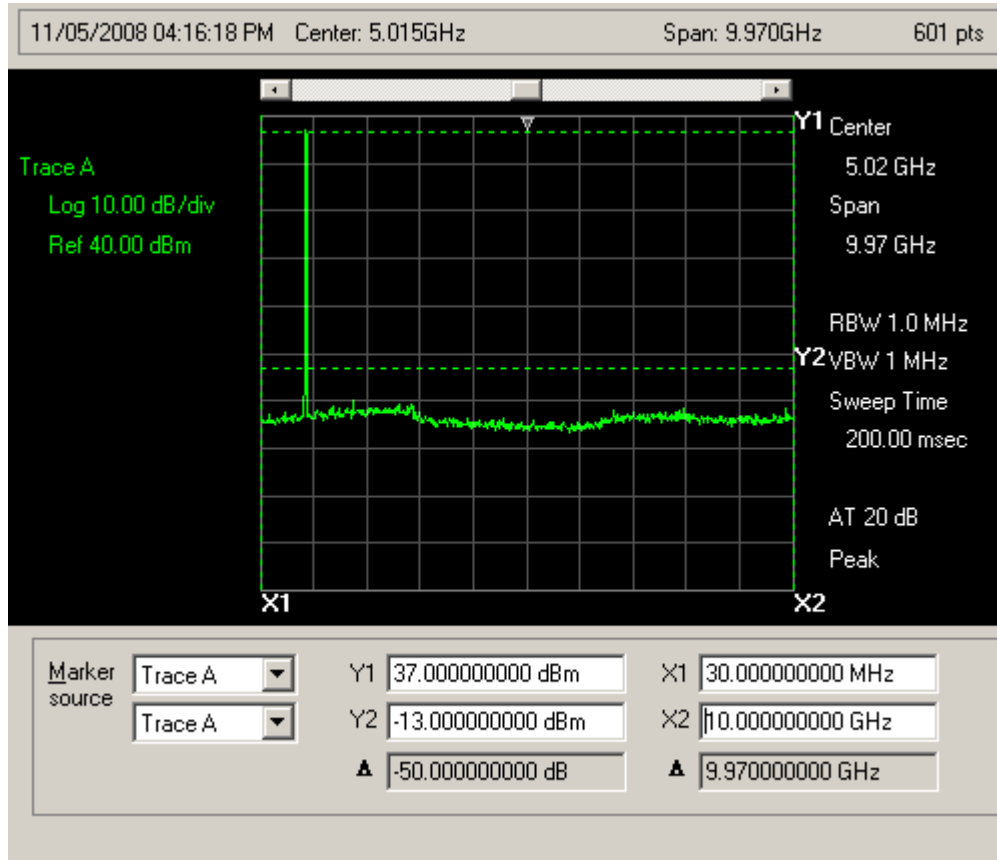
\*RBW 30 kHz  
\*VBW 300 kHz  
\*SWT 100 ms



Date: 5.NOV.2008 14:10:33

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – CDMA - Downlink



**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Lower Bandedge Intermodulation

TDMA

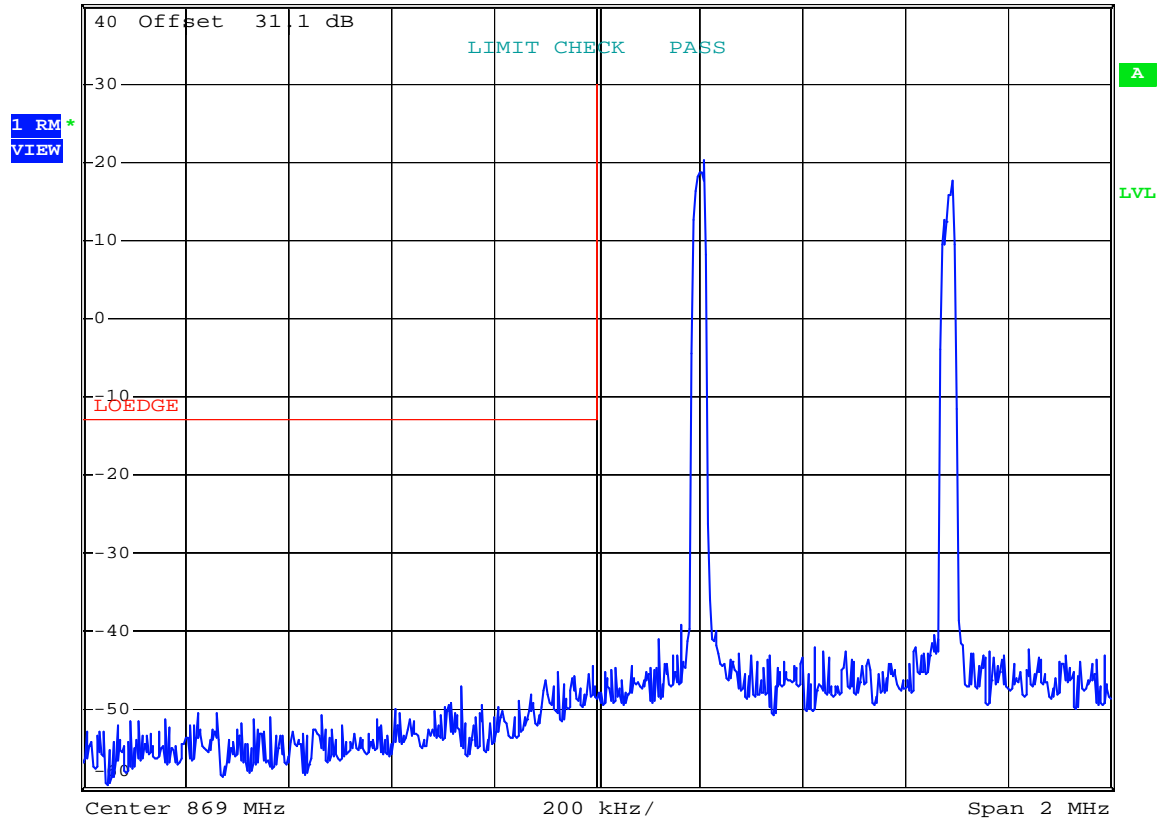


\*RBW 1 kHz  
\*VBW 300 kHz

Ref 40 dBm

Att 40 dB

SWT 2 s



Date: 5.NOV.2008 14:41:10

**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Upper Bandedge Intermodulation

TDMA

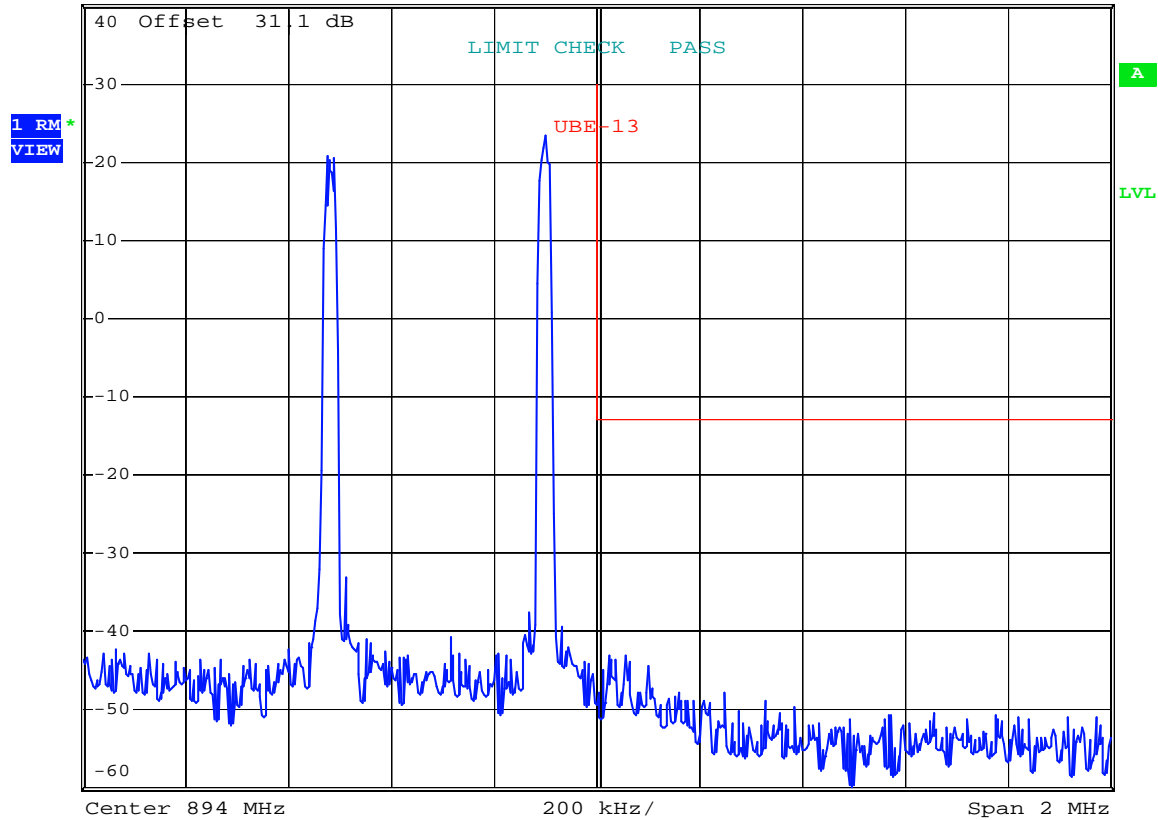


\*RBW 1 kHz  
\*VBW 300 kHz

Ref 40 dBm

Att 40 dB

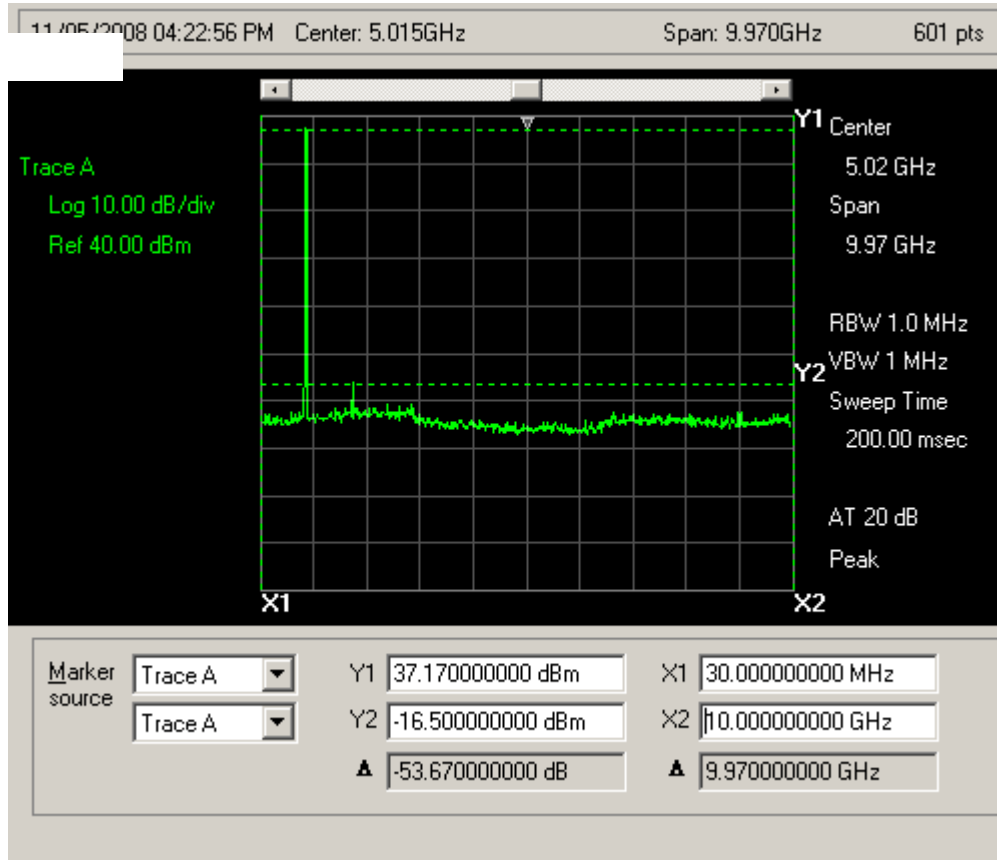
SWT 2 s



Date: 5.NOV.2008 14:42:02

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – TDMA – Downlink

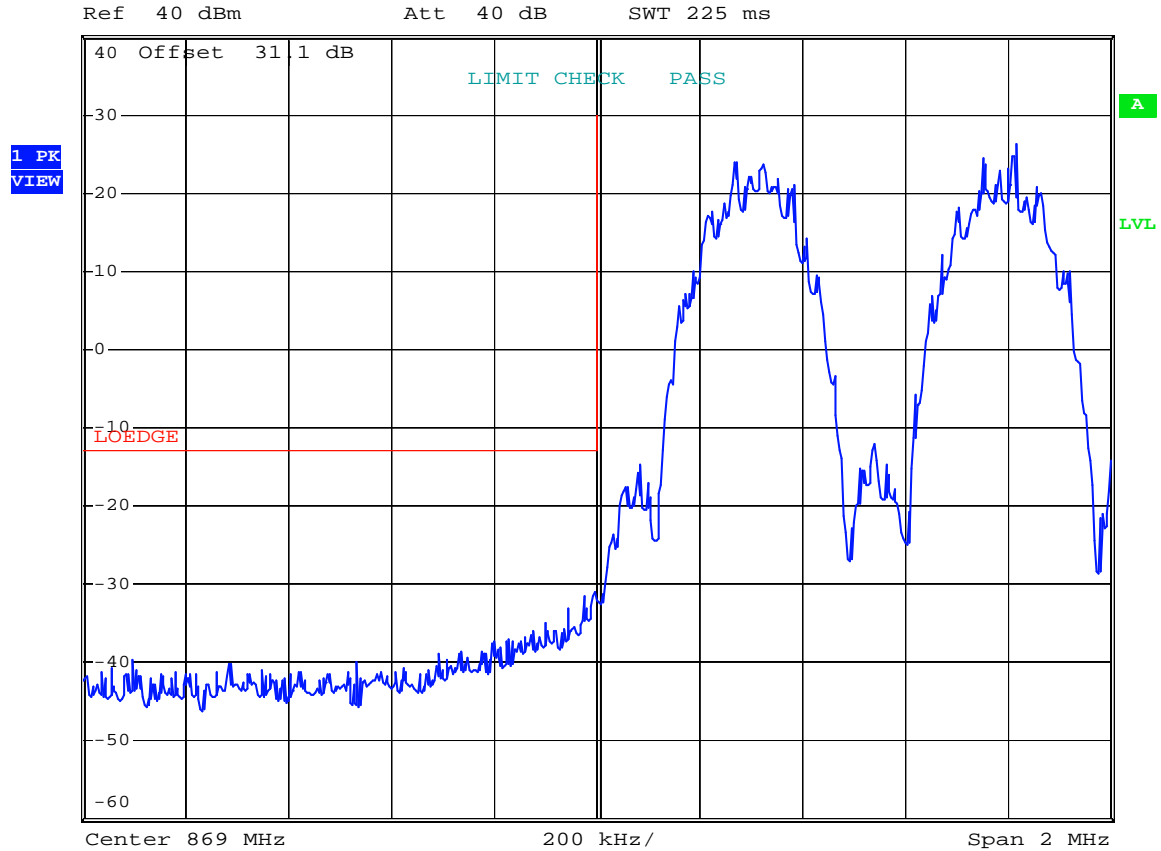


**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Lower Bandedge Intermodulation  
EDGE



\*RBW 3 kHz  
\*VBW 300 kHz  
SWT 225 ms



Date: 5.NOV.2008 14:25:45



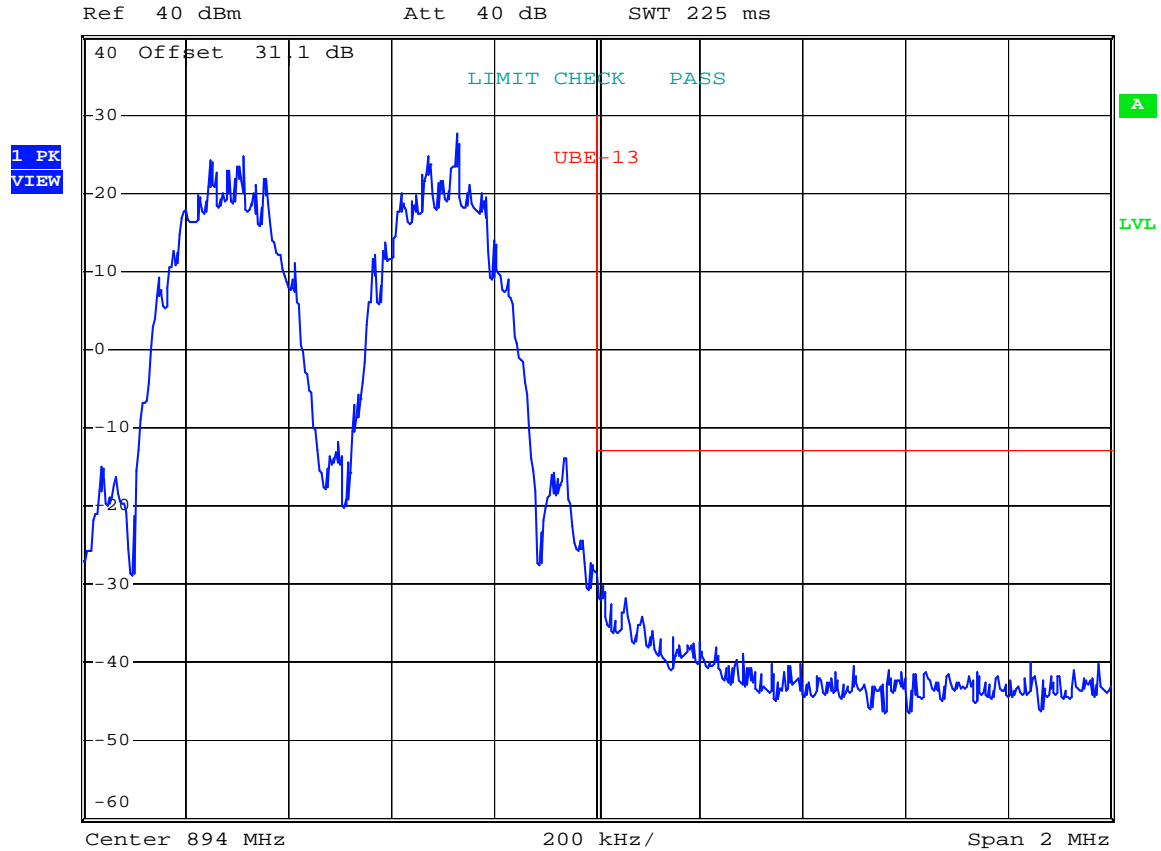
**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Upper Bandedge Intermodulation

EDGE



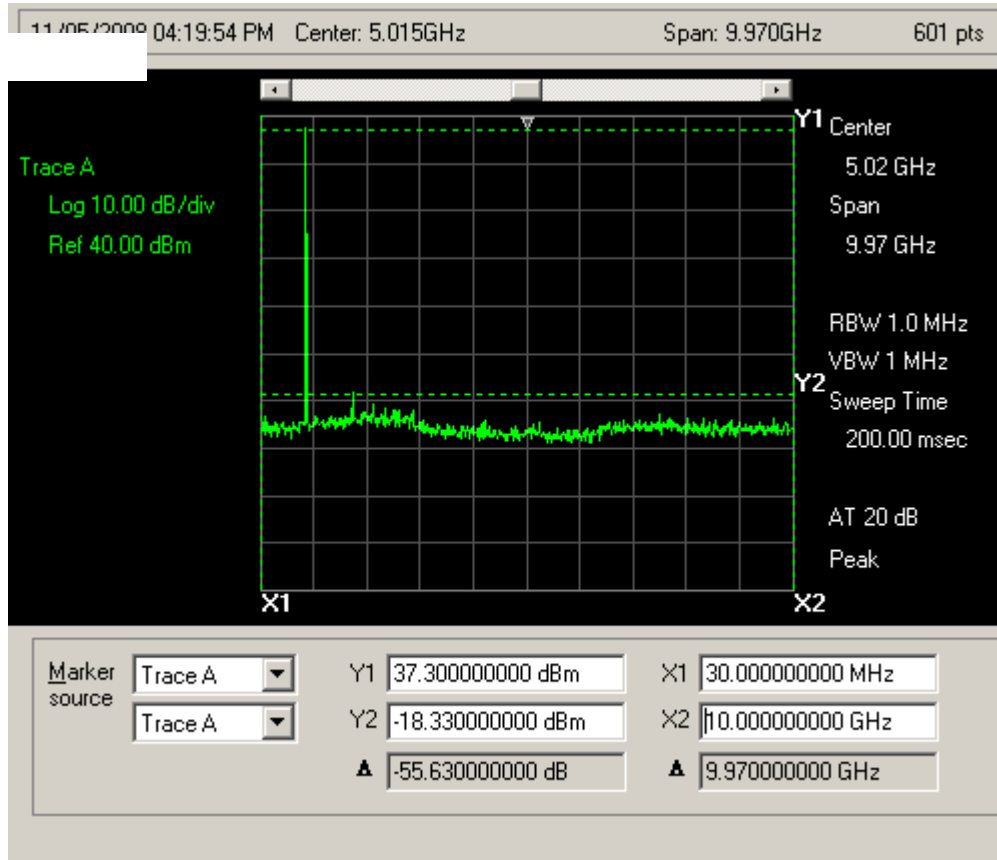
\*RBW 3 kHz  
\*VBW 300 kHz  
SWT 225 ms



Date: 5.NOV.2008 14:26:36

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – EDGE – Downlink



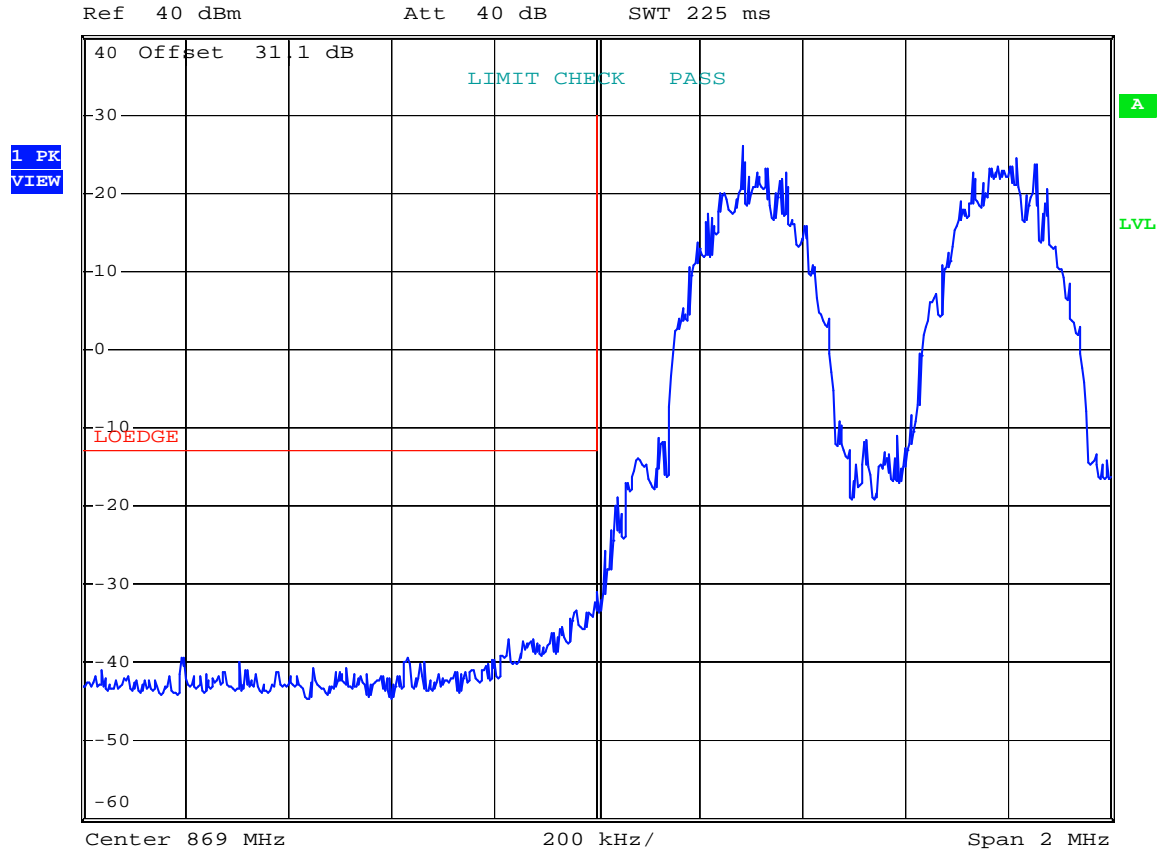
**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Lower Bandedge Intermodulation

GSM



\*RBW 3 kHz  
\*VBW 300 kHz  
SWT 225 ms



Date: 5.NOV.2008 14:20:14

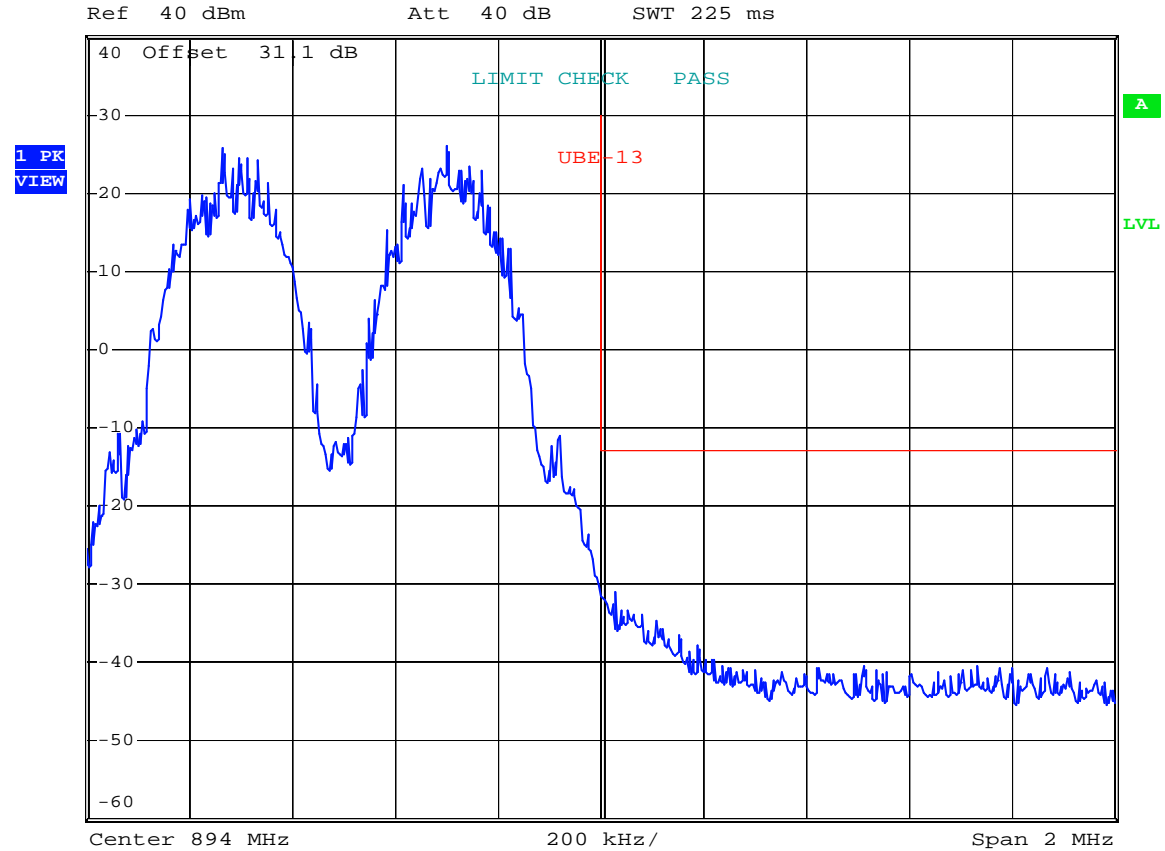
**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Upper Bandedge Intermodulation

GSM



\*RBW 3 kHz  
\*VBW 300 kHz  
SWT 225 ms



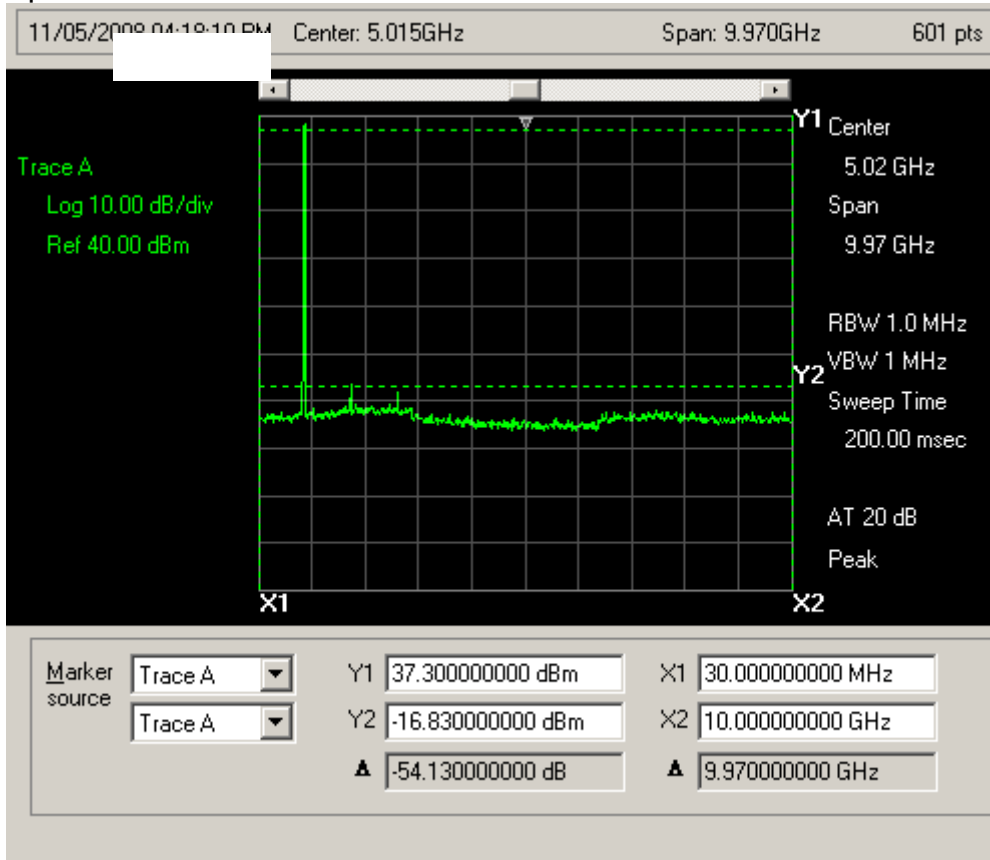
Date: 5.NOV.2008 14:19:07

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – GSM – Downlink



**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Lower Bandedge Intermodulation

W-CDMA



\*RBW 100 kHz

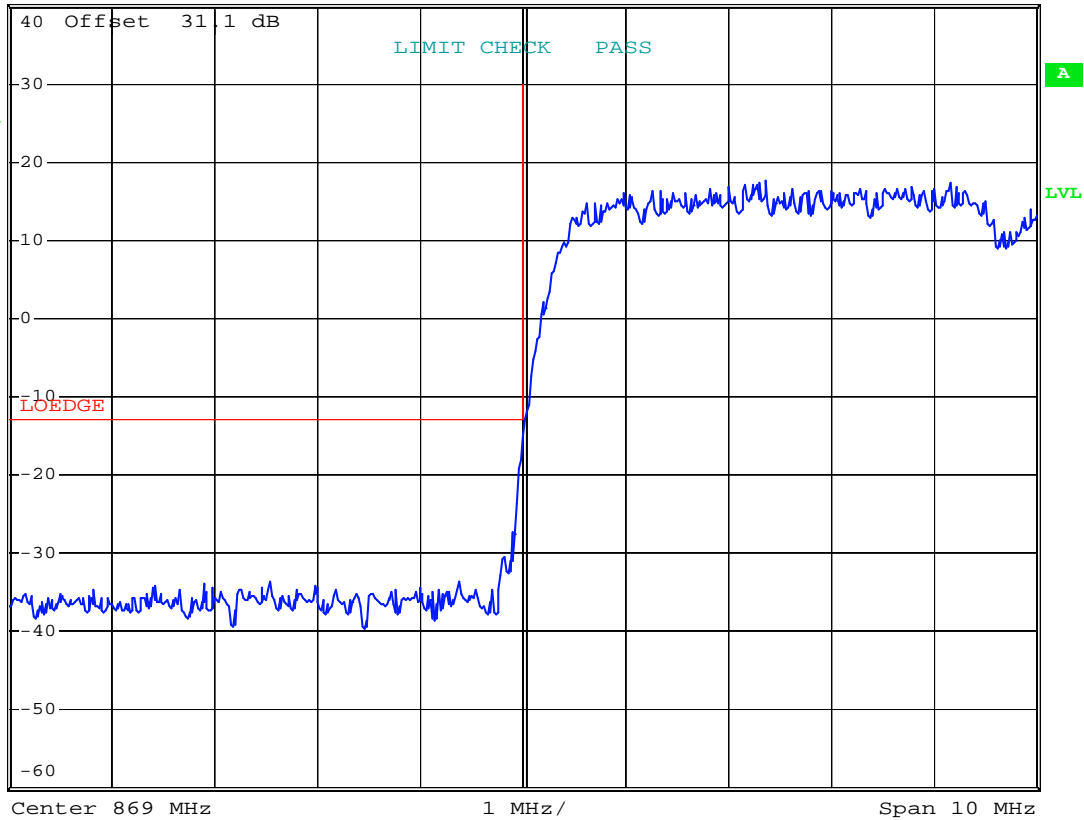
\*VBW 300 kHz

SWT 2.5 ms

Ref 40 dBm

Att 40 dB

1 RM  
VIEW



Date: 5.NOV.2008 14:37:54

**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Upper Bandedge Intermodulation

W-CDMA

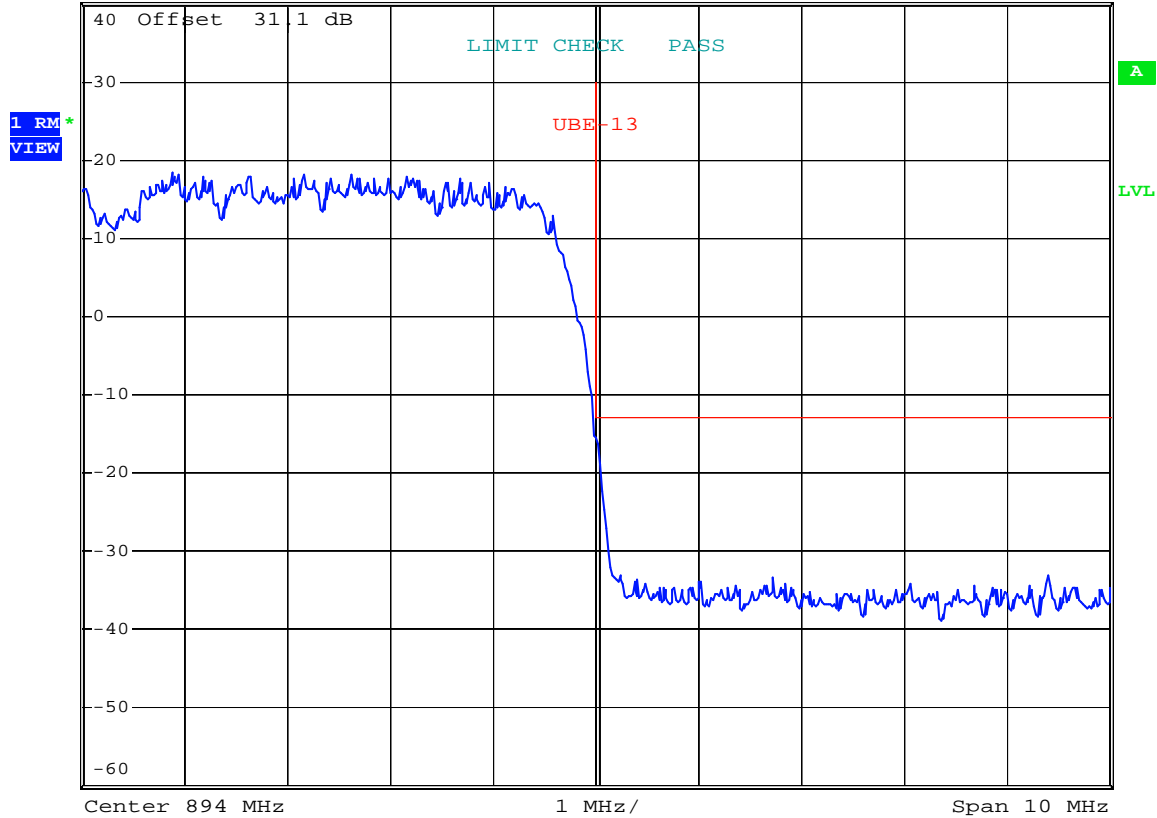


\*RBW 100 kHz  
\*VBW 300 kHz

Ref 40 dBm

Att 40 dB

SWT 2.5 ms



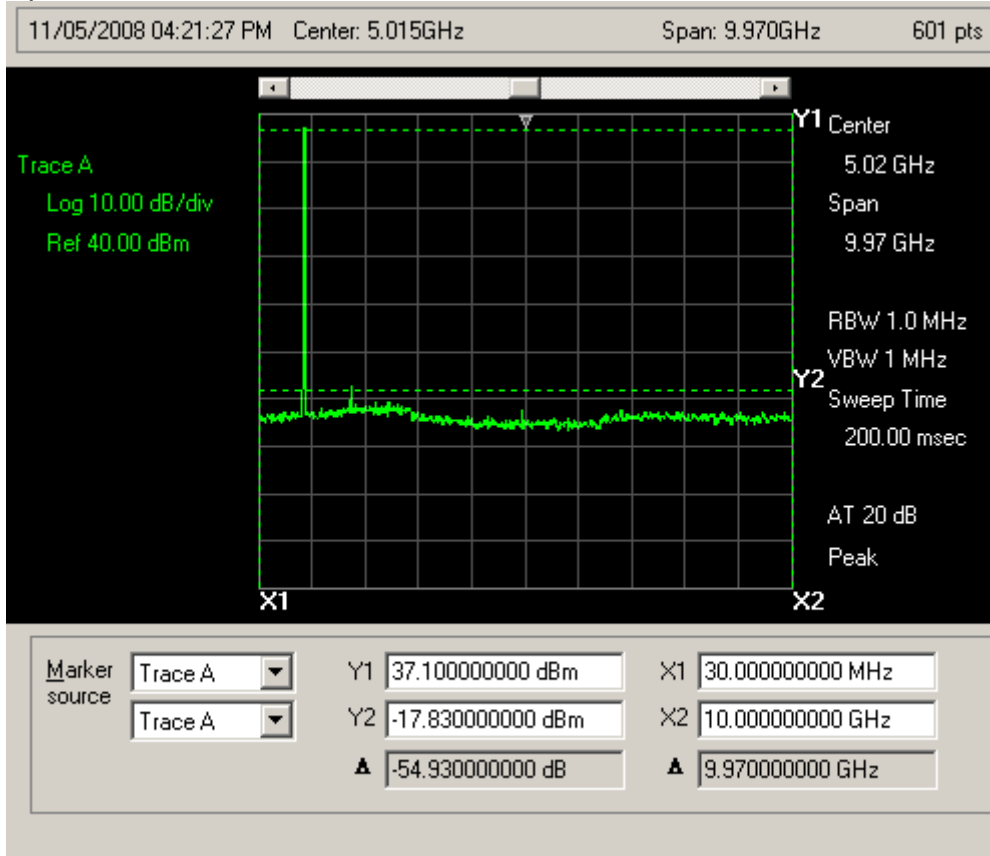
Date: 5.NOV.2008 14:36:20

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – W-CDMA - Downlink





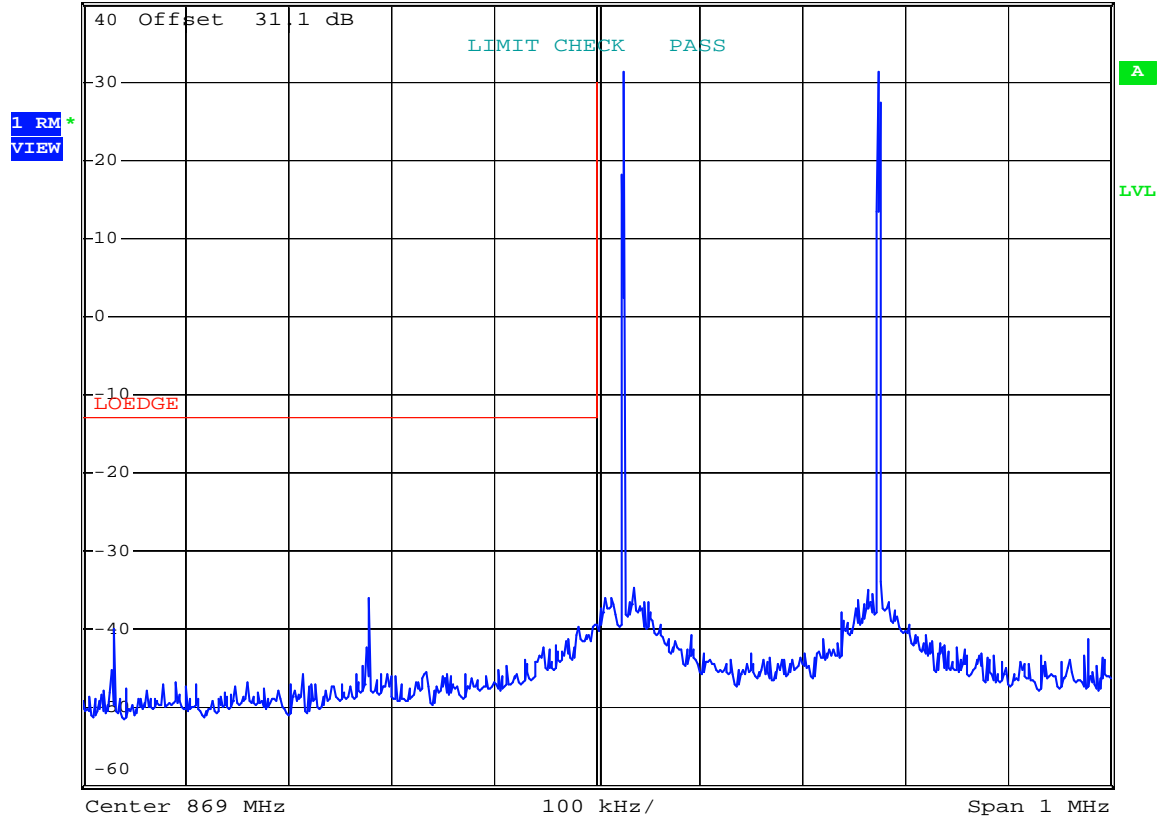
**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Lower Bandedge Intermodulation

Analog



S  
1  
Ref 40 dBm Att 40 dB SWT 1 s  
\*RBW 1 kHz  
\*VBW 300 kHz



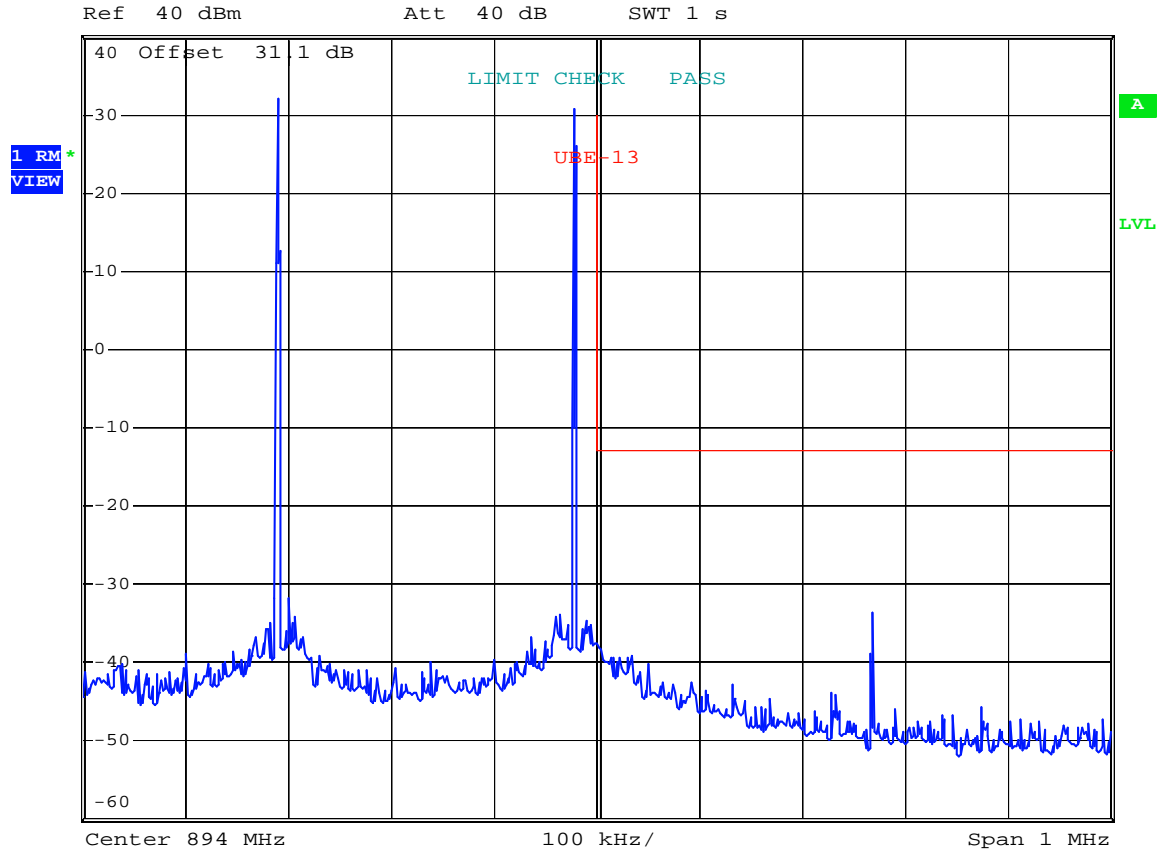
Date: 5.NOV.2008 14:55:33

**Test Data – Spurious Emissions at Antenna Terminals**

Downlink - Upper Bandedge Intermodulation  
Analog



\*RBW 1 kHz  
\*VBW 300 kHz



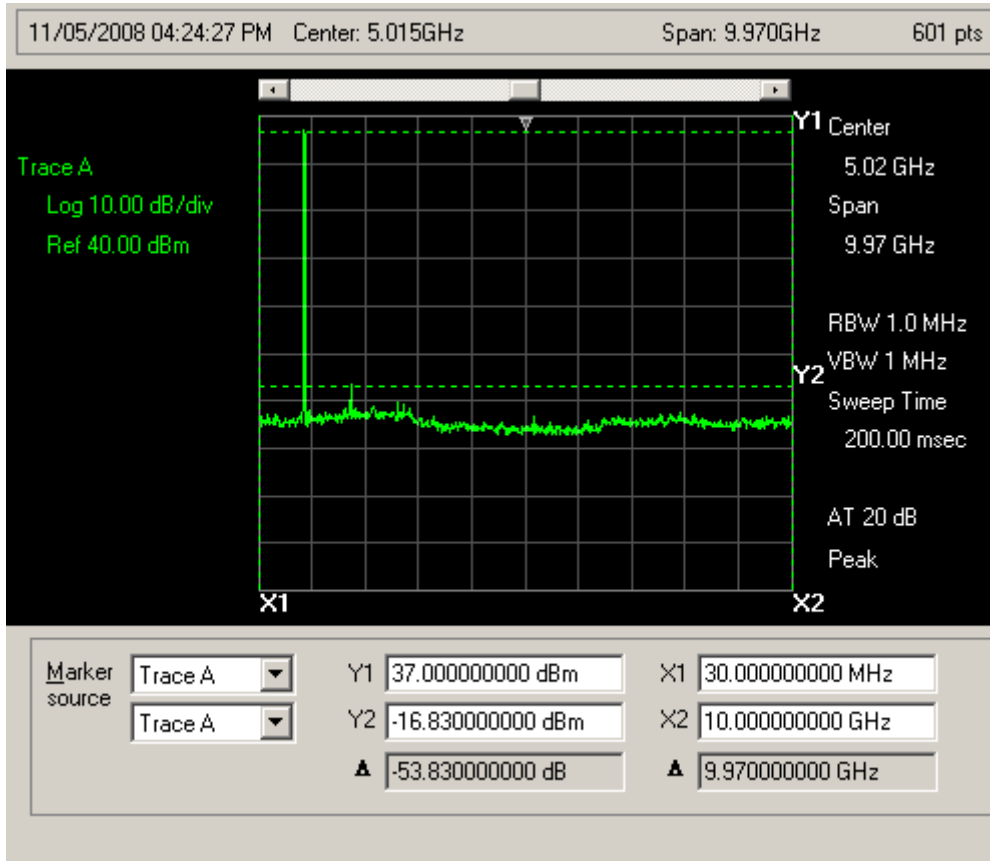
Date: 5.NOV.2008 14:53:15

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – Analog – Downlink



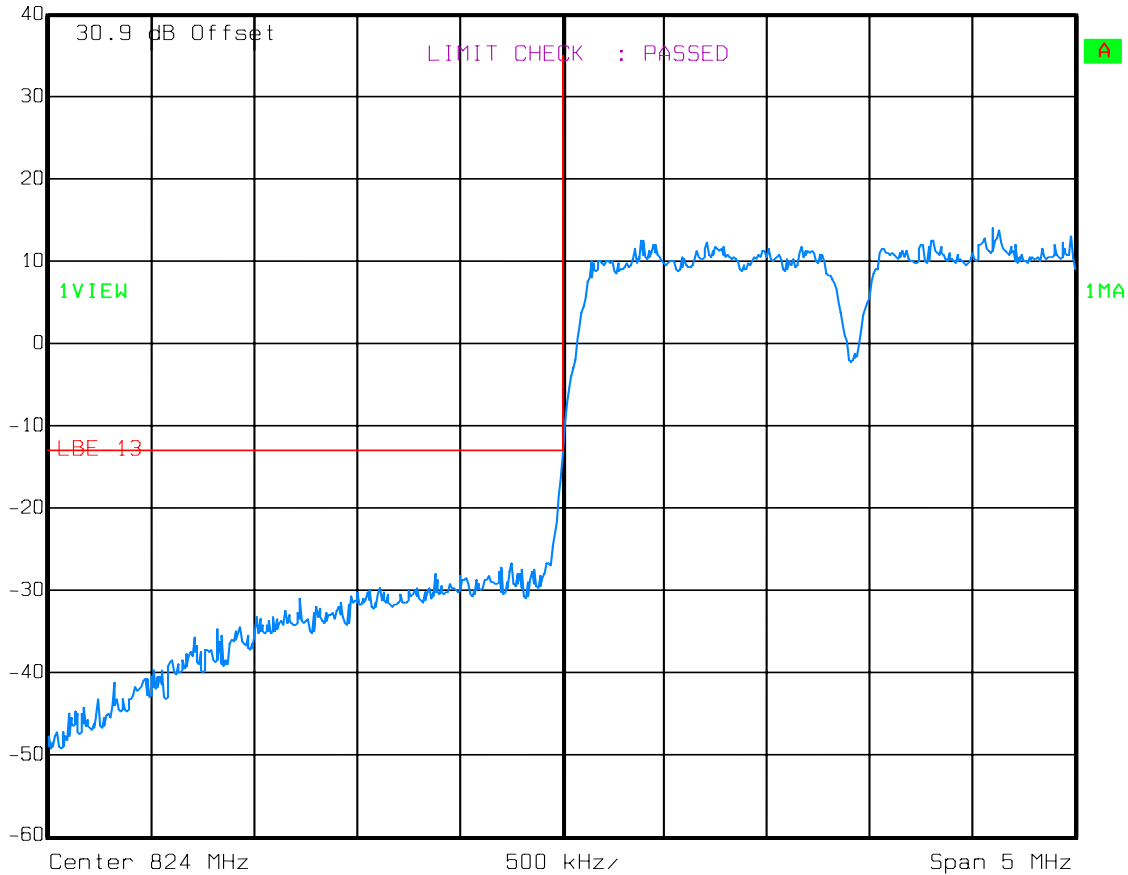
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Lower Bandedge Intermodulation  
CDMA



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 10:42:09

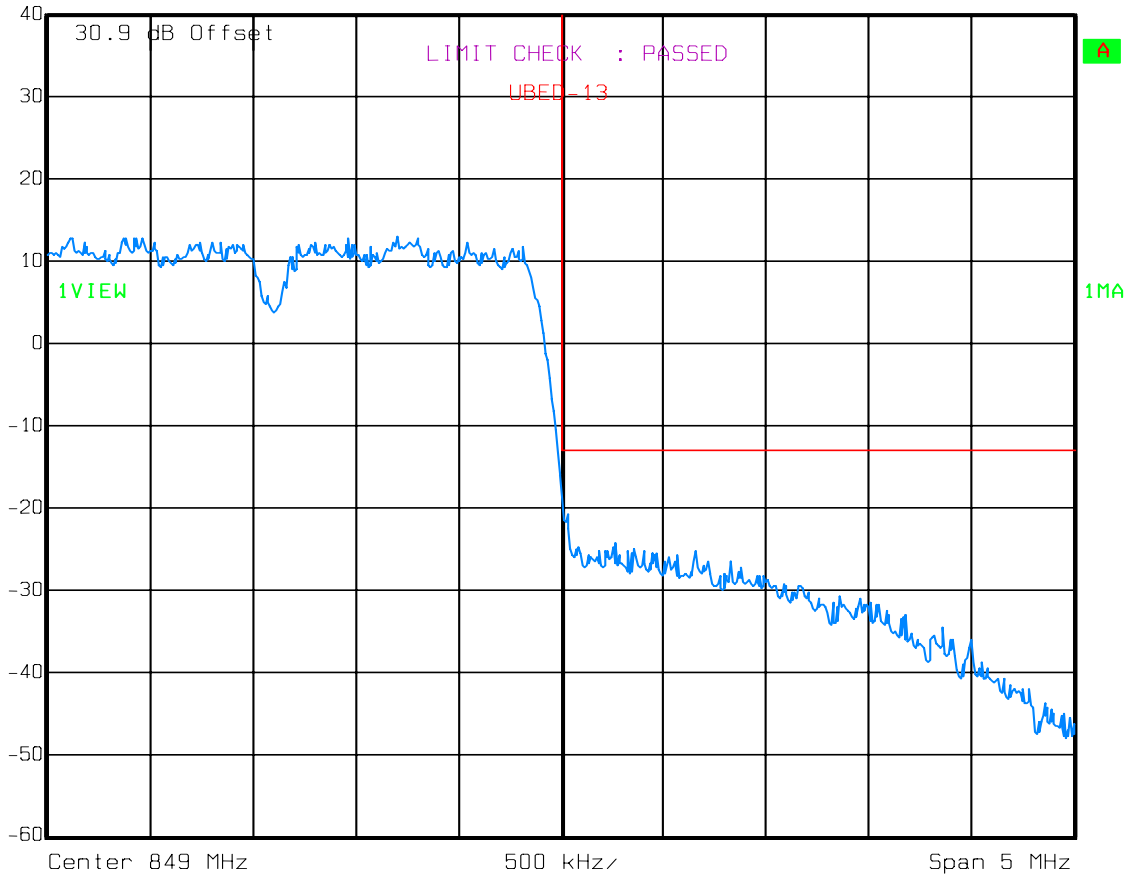
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Upper Bandedge Intermodulation  
CDMA



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 10:44:59

EQUIPMENT: **AF8537**

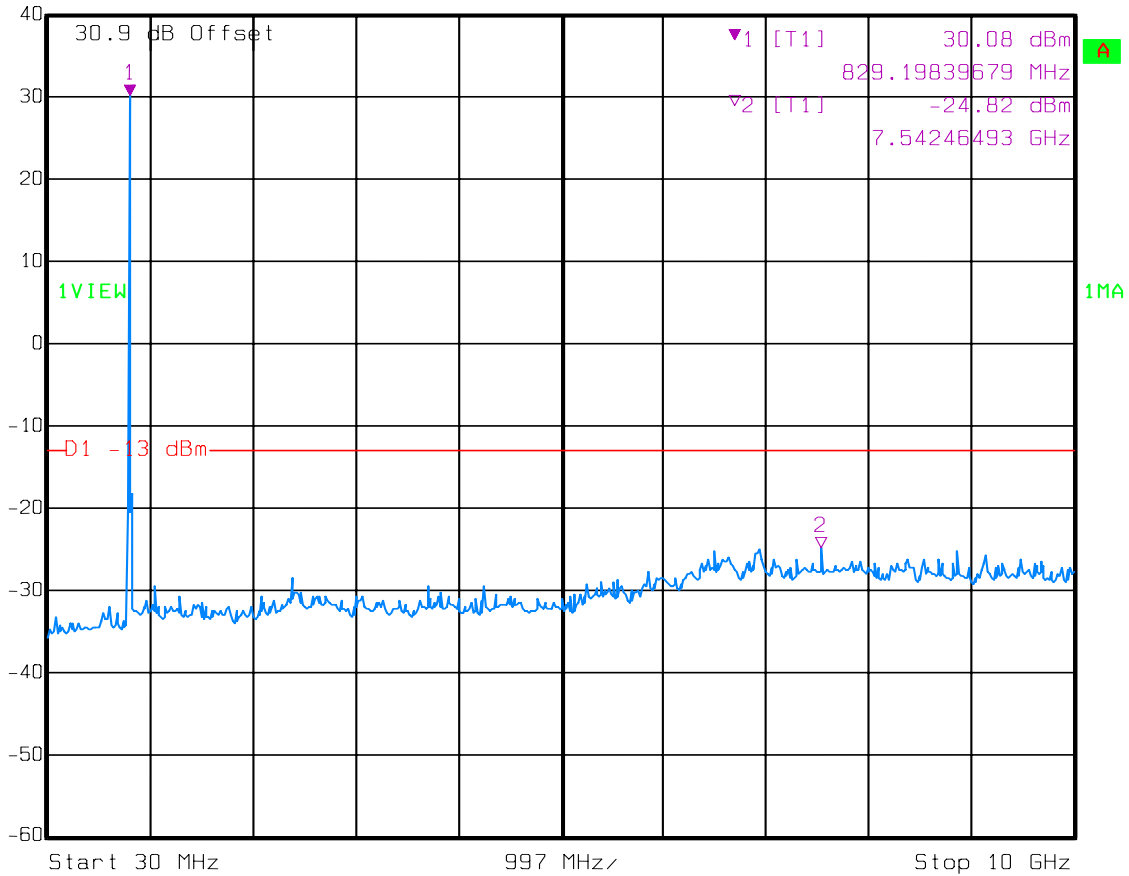
PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

**Spurs – CDMA - Uplink**



Ref Lvl 40 dBm  
Marker 1 [T1] 30.08 dBm  
829.19839679 MHz  
RBW 1 MHz RF Att 20 dB  
VBW 1 MHz  
SWT 100 ms Unit dBm



Date: 03.OCT.2008 10:54:16

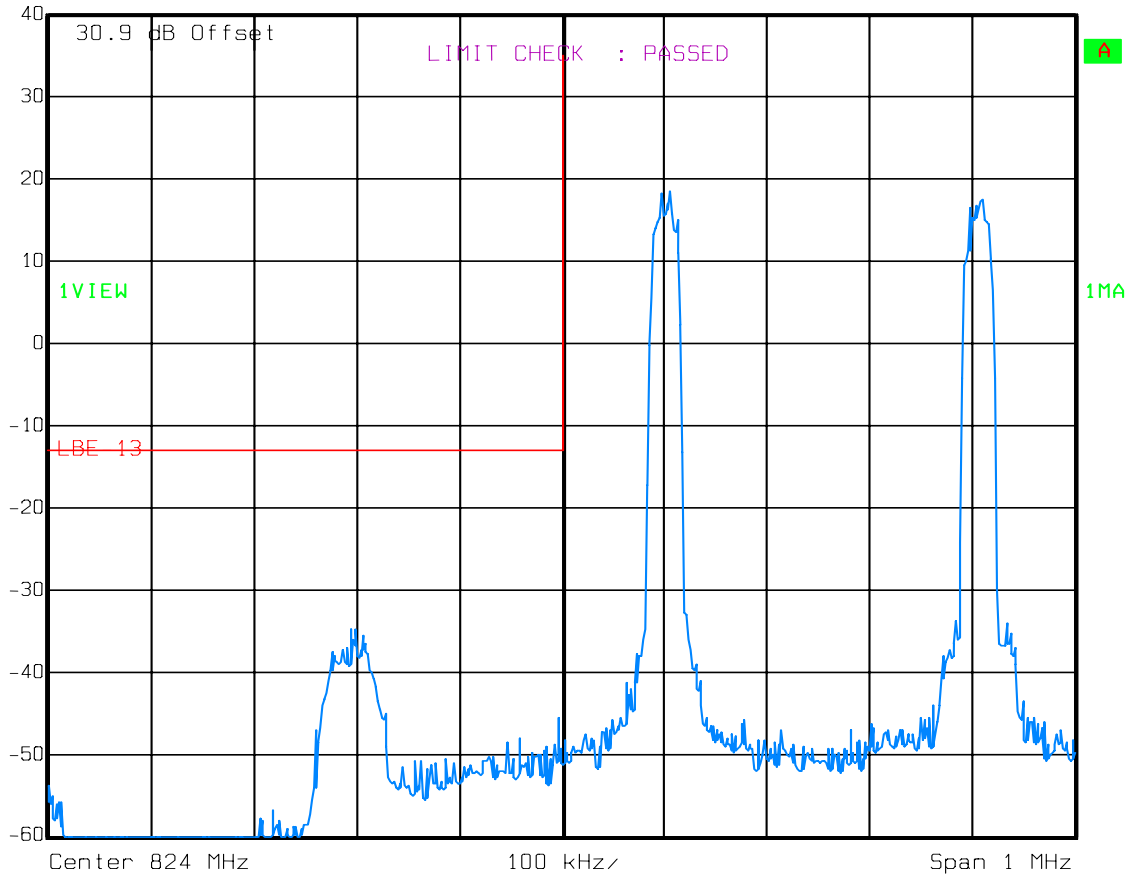
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Lower Bandedge Intermodulation  
TDMA



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 15:24:35

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

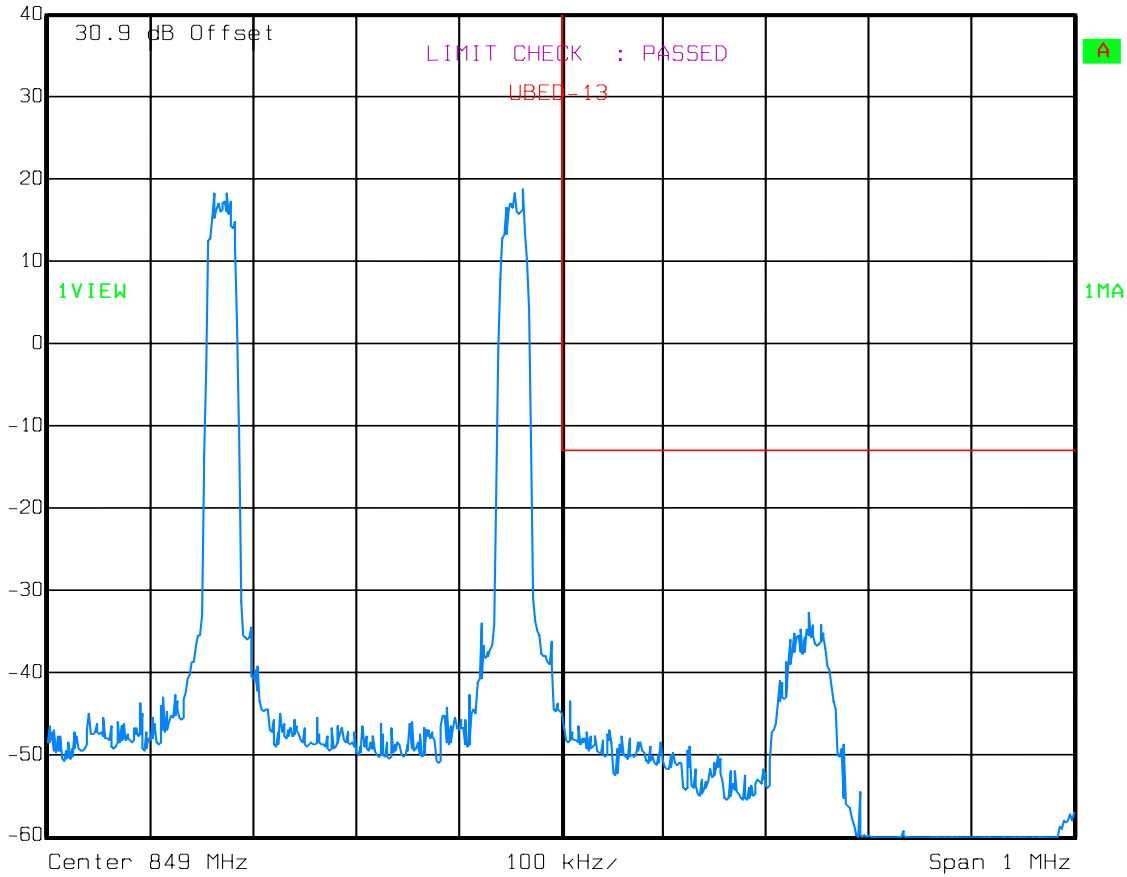
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Upper Bandedge Intermodulation  
TDMA



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 15:23:12



EQUIPMENT: **AF8537**

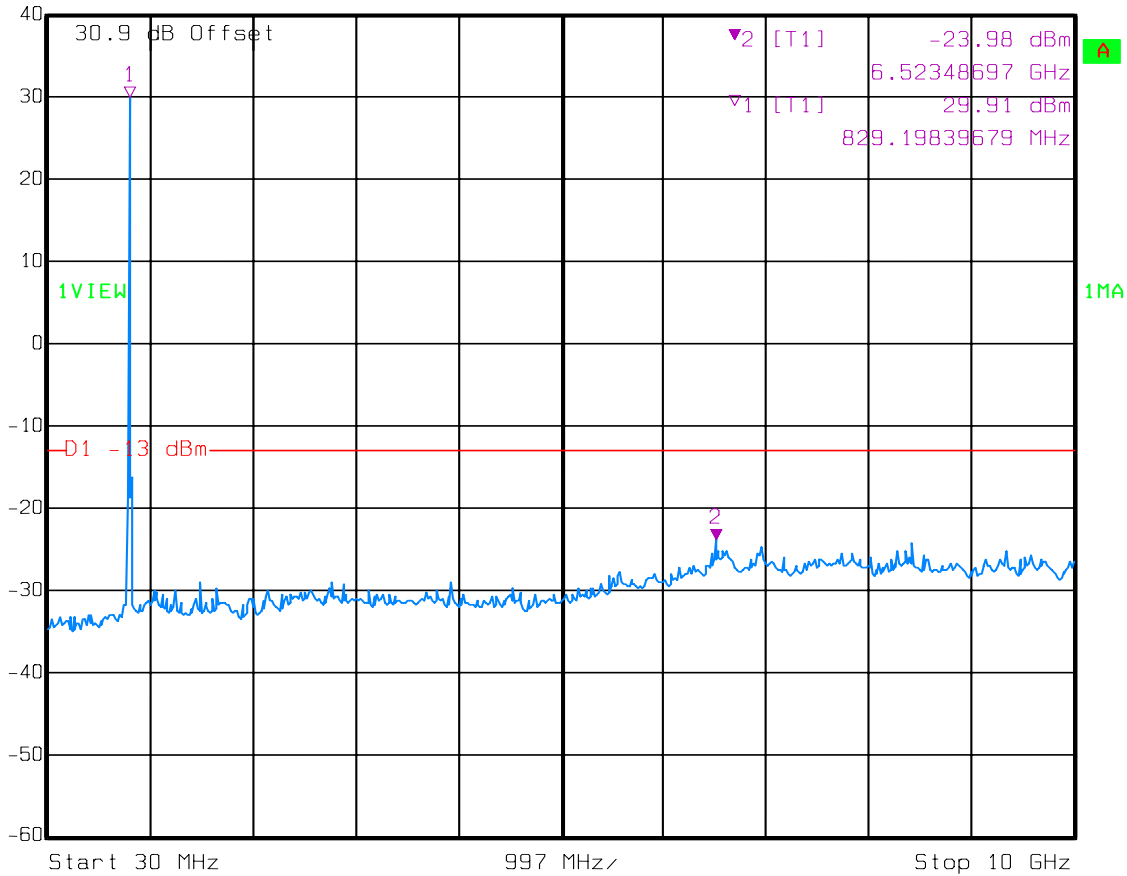
PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – TDMA – Uplink



Marker 2 [T1] RBW 1 MHz RF Att 20 dB  
Re -23.98 dBm VBW 1 MHz Mixer -10 dBm  
40 dBm 6.52348697 GHz SWT 100 ms Unit dBm



Date: 03.OCT.2008 15:18:26

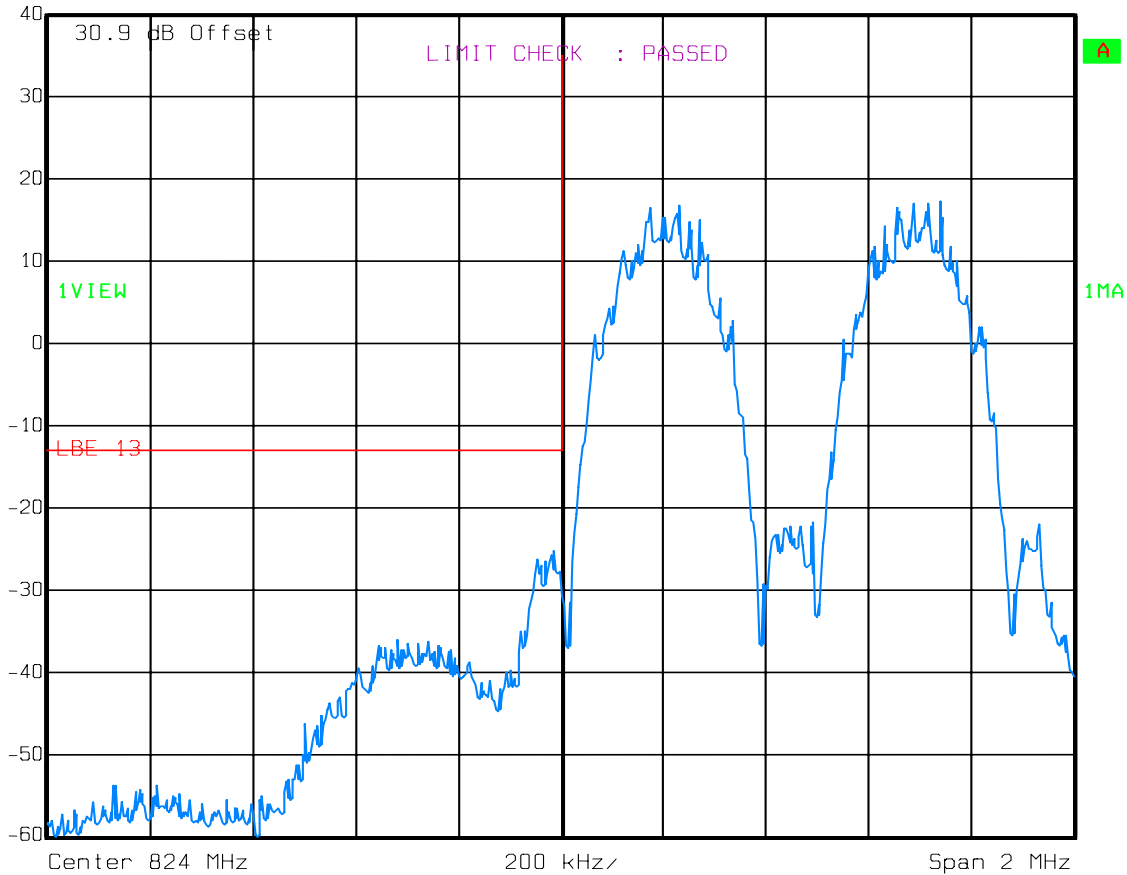
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Lower Bandedge Intermodulation  
EDGE



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 12:36:20

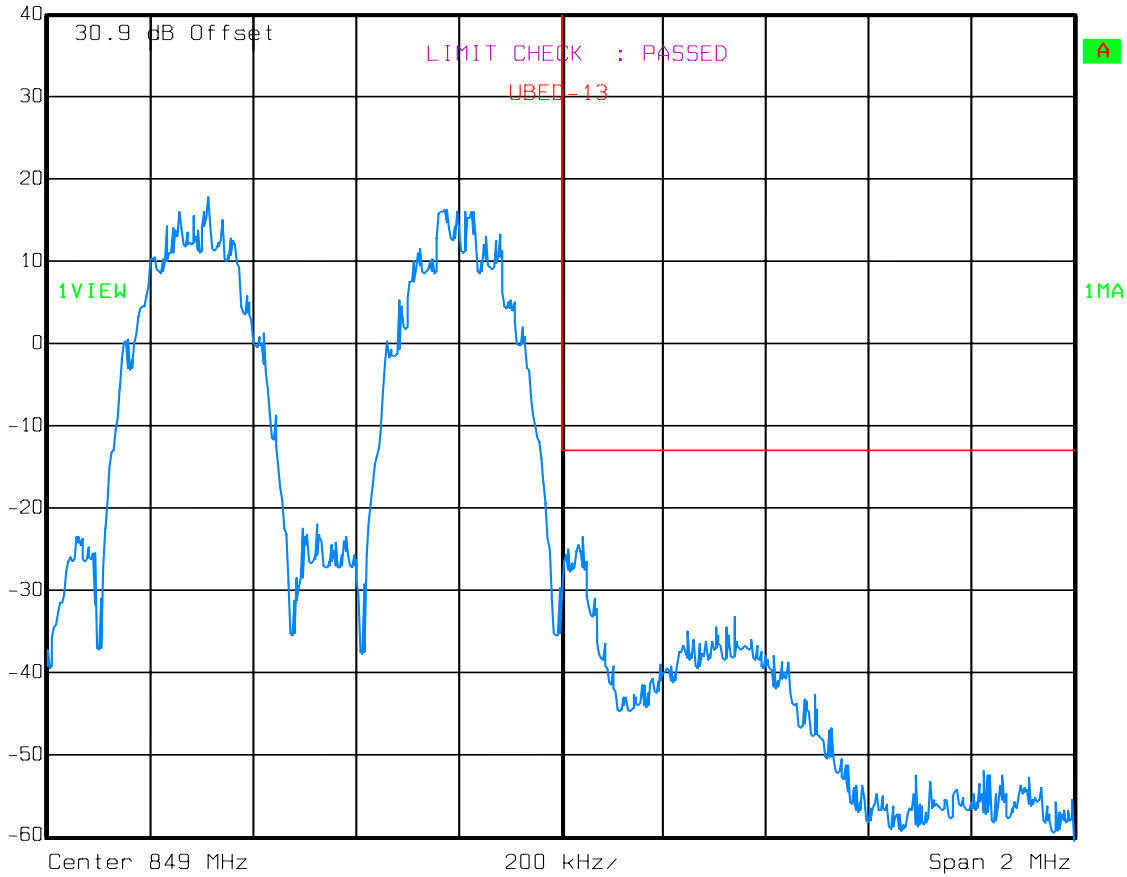
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Upper Bandedge Intermodulation  
EDGE



Ref Lvl  
40 dBm

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



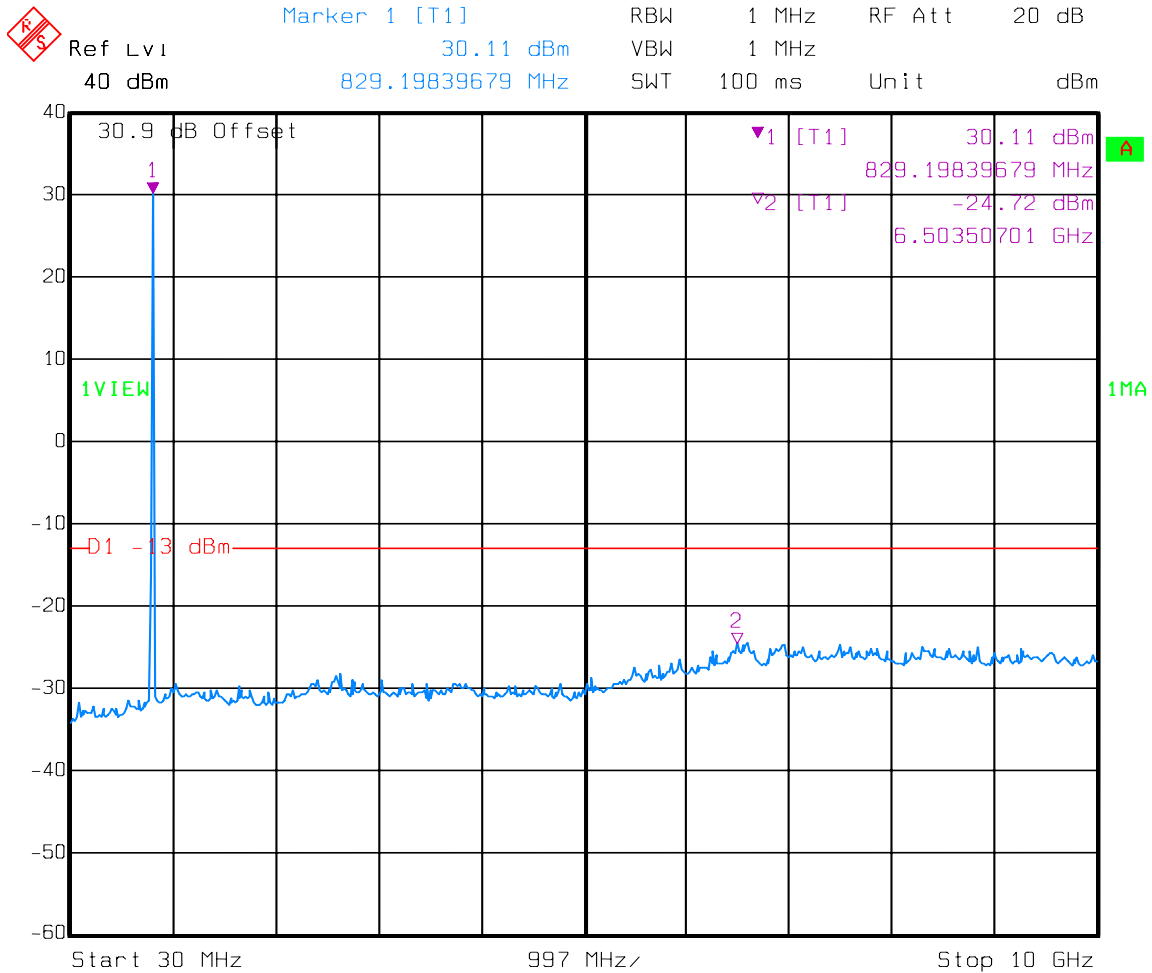
Date: 03.OCT.2008 12:37:49

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – EDGE – Uplink



Date: 03.OCT.2008 12:42:03

**Test Data – Spurious Emissions at Antenna Terminals**

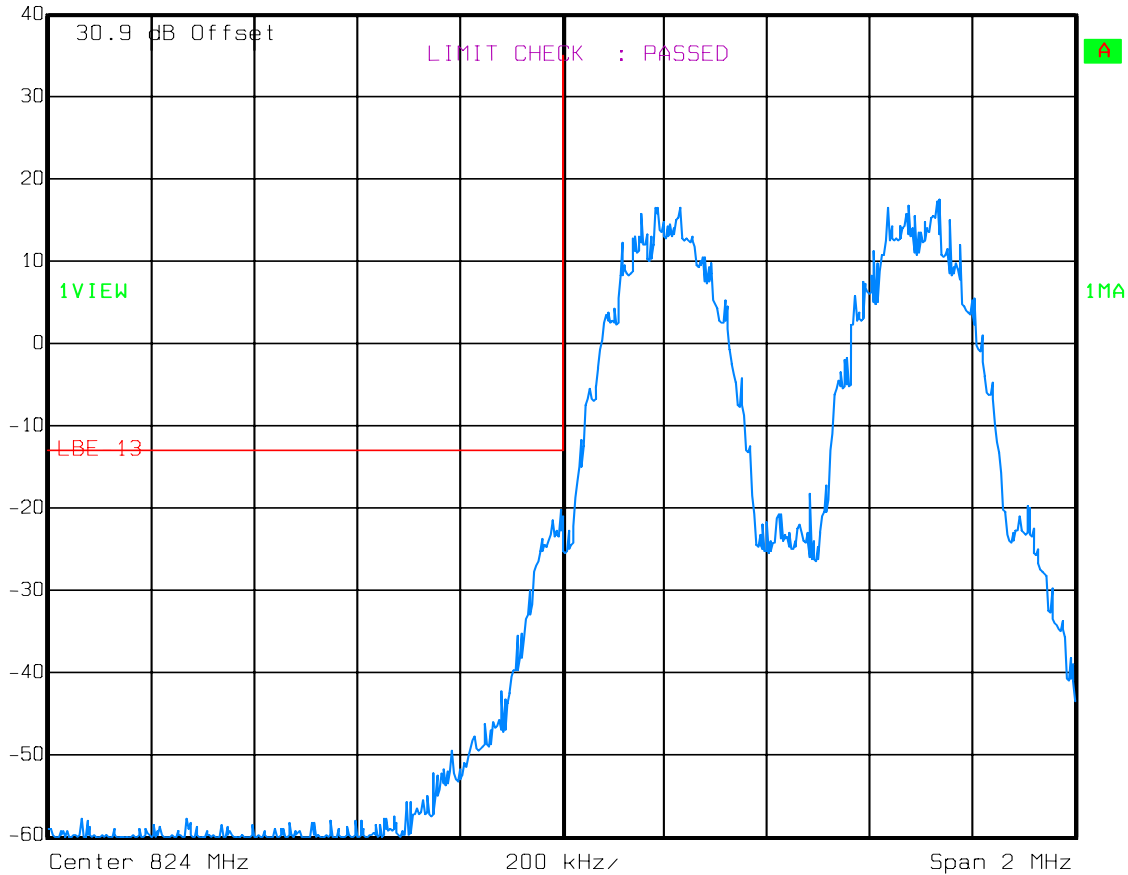
Uplink - Lower Bandedge Intermodulation

GSM



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 11:07:40

**Test Data – Spurious Emissions at Antenna Terminals**

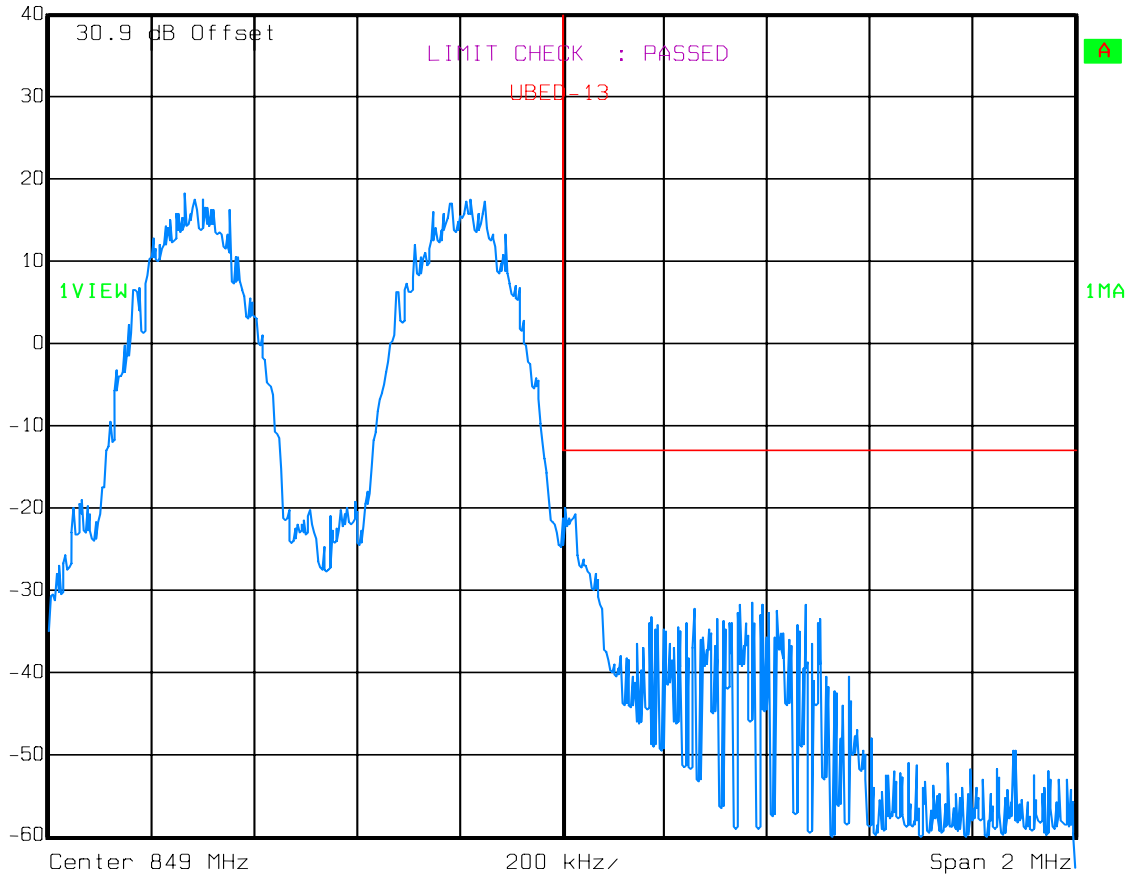
Uplink - Upper Bandedge Intermodulation

GSM



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 11:06:37

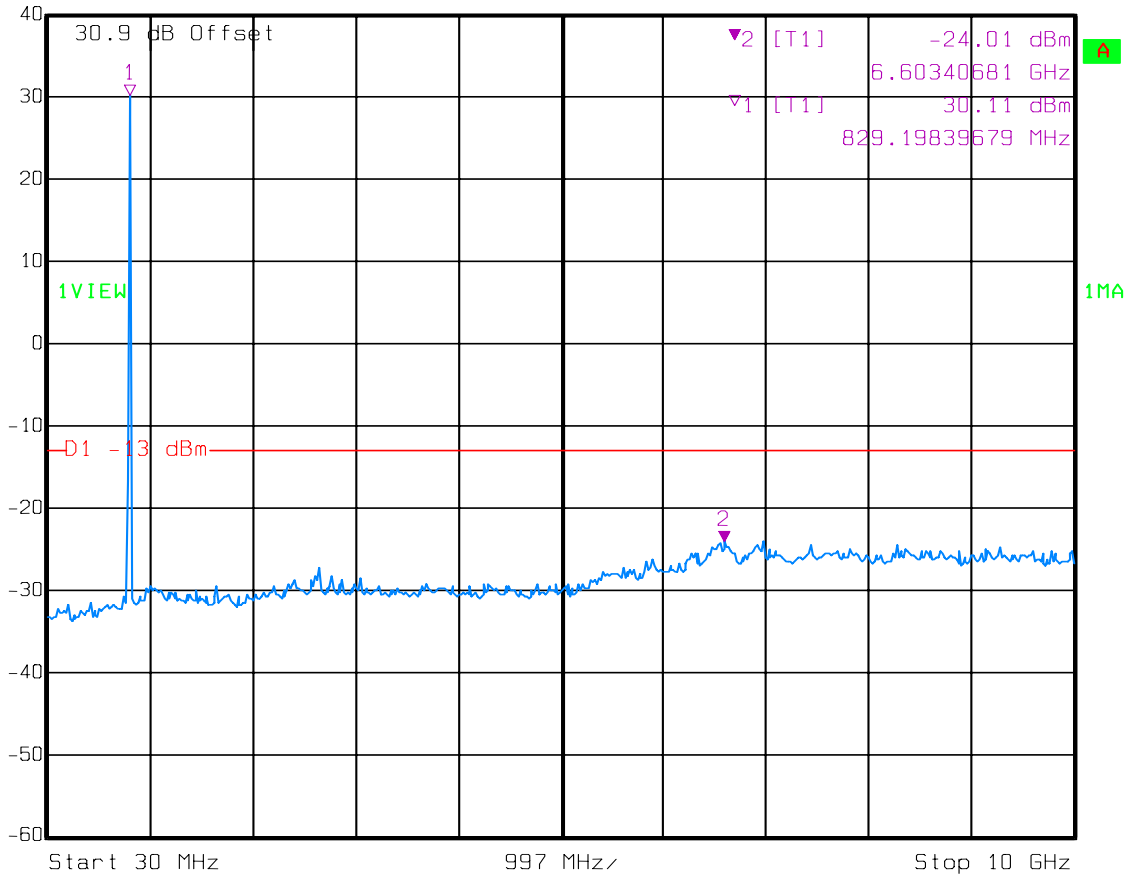
EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – GSM – Uplink

	Ref	Marker 2 [T1]	RBW	1 MHz	RF Att	20 dB
	40 dBm	-24.01 dBm	VBW	1 MHz		
		6.60340681 GHz	SWT	100 ms	Unit	dBm



Date: 03.OCT.2008 11:01:07

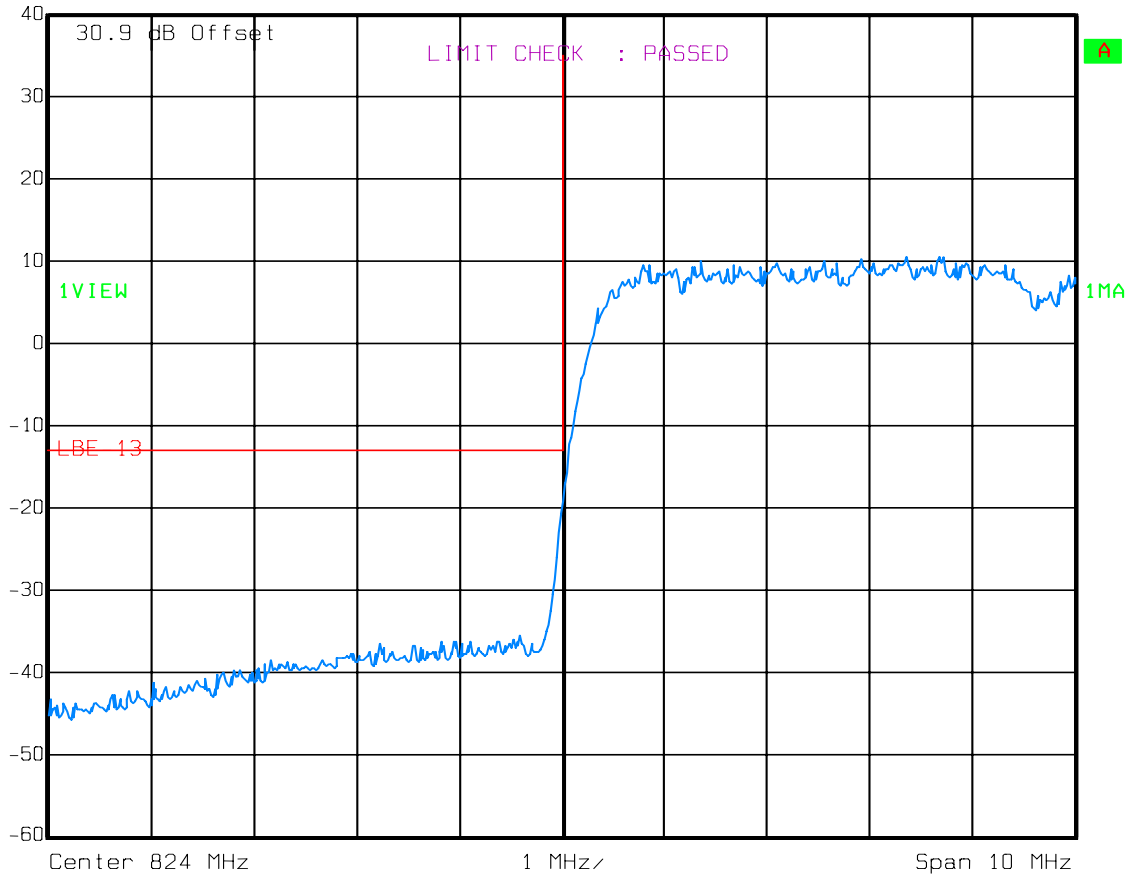
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Lower Bandedge Intermodulation  
W-CDMA



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 12:57:57



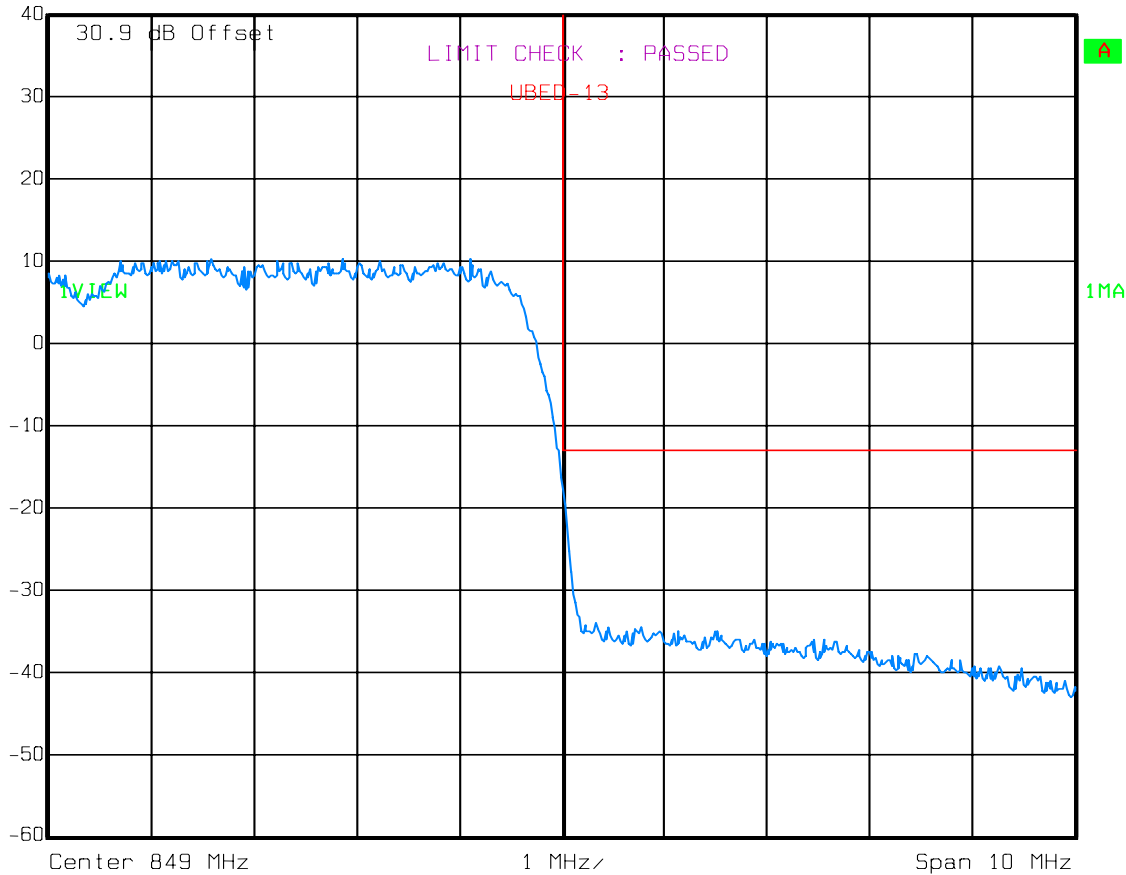
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Upper Bandedge Intermodulation  
W-CDMA



Ref Lvl  
40 dBm

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



Date: 03.OCT.2008 12:55:01

EQUIPMENT: **AF8537**

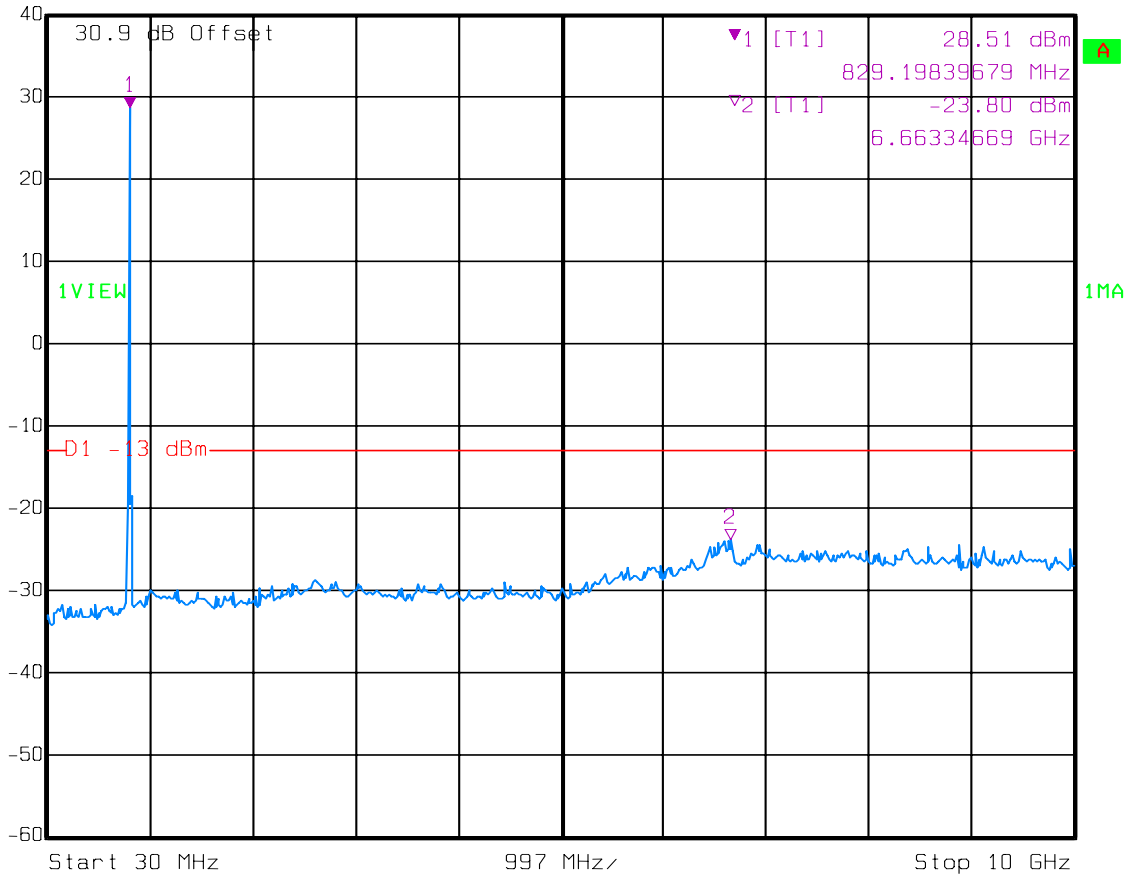
PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

Spurs – W-CDMA - Uplink



Ref Lvl 40 dBm  
 Marker 1 [T1] 28.51 dBm  
 829.19839679 MHz  
 RBW 1 MHz RF Att 20 dB  
 VBW 1 MHz  
 SWT 100 ms Unit dBm



Date: 03.OCT.2008 12:50:22

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

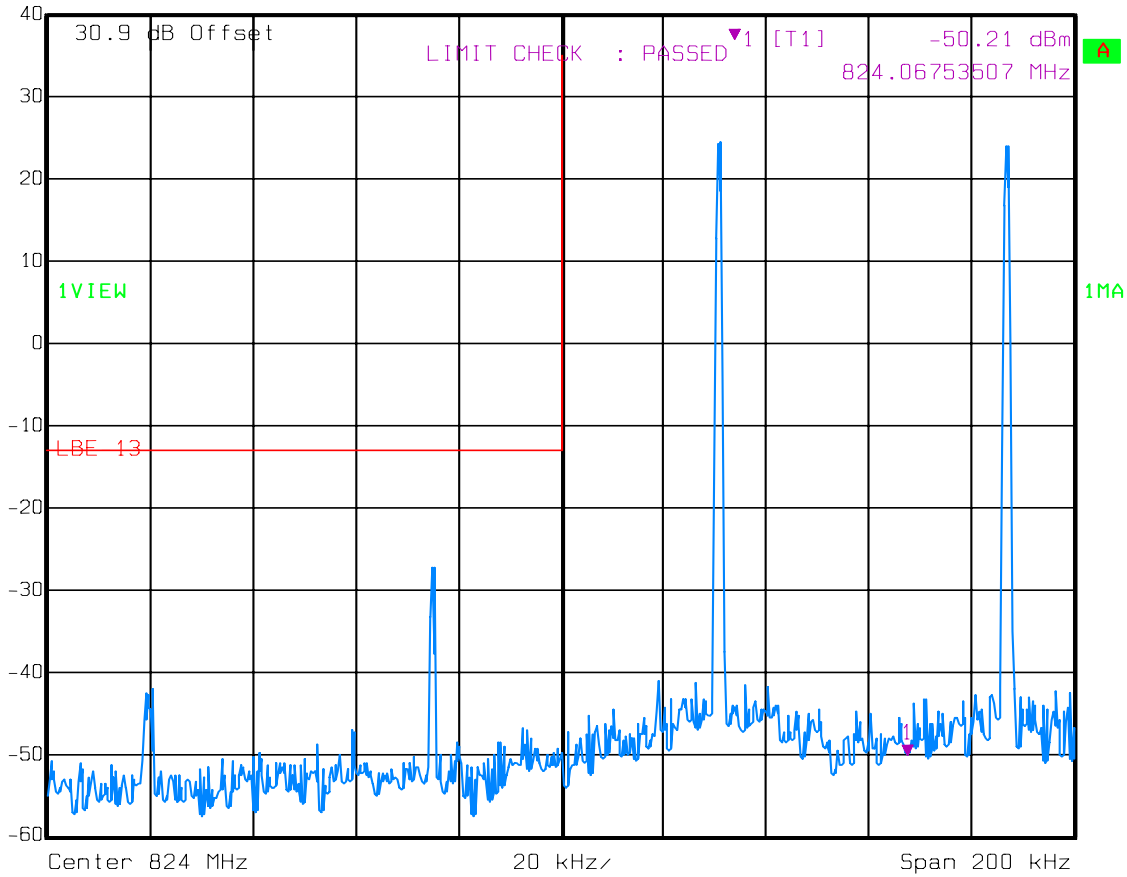
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Lower Bandedge Intermodulation

Analog



Ref Lvl	Marker 1 [T1]	RBW	500 Hz	RF Att	20 dB
40 dBm	-50.21 dBm	VBW	500 Hz	Mixer	-10 dBm
	824.06753507 MHz	SWT	4 s	Unit	dBm



Date: 03.OCT.2008 15:08:27

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

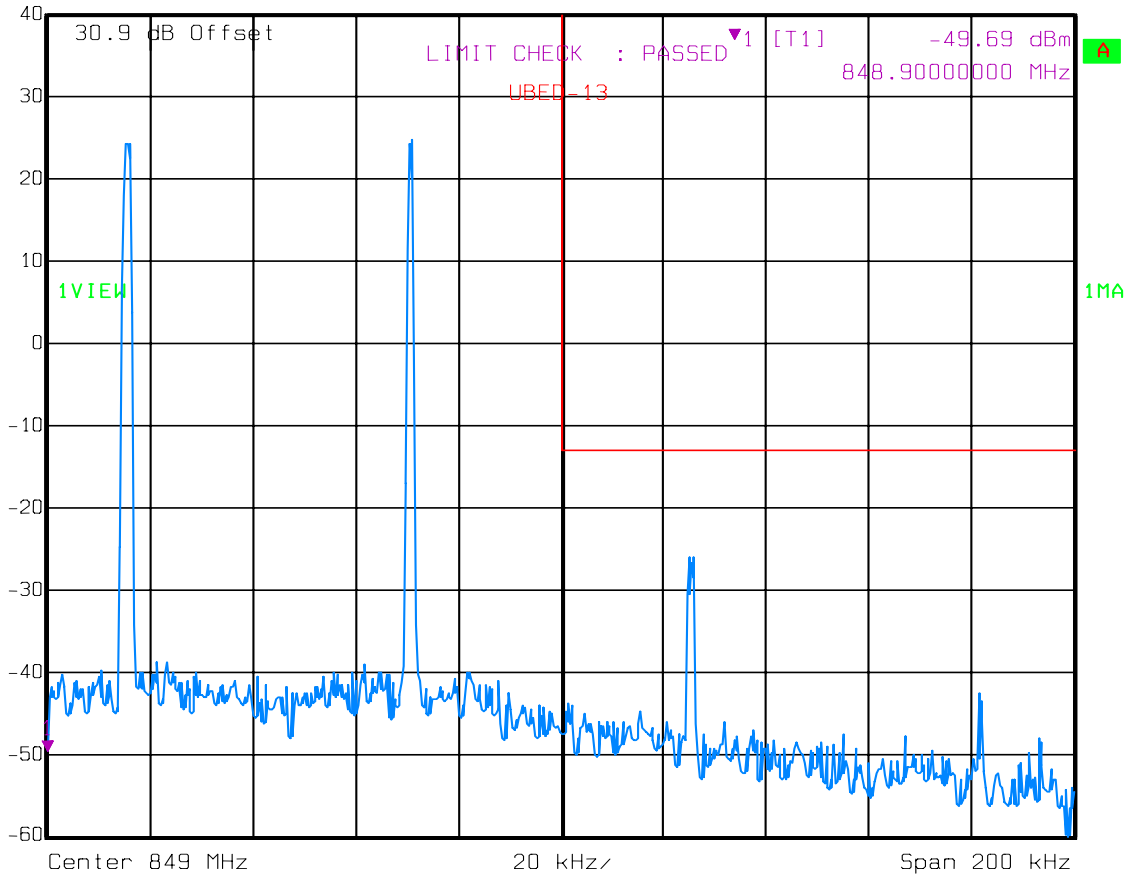
**Test Data – Spurious Emissions at Antenna Terminals**

Uplink - Upper Bandedge Intermodulation

Analog



Ref Lvl	Marker 1 [T1]	RBW	500 Hz	RF Att	20 dB
40 dBm	-49.69 dBm	VBW	500 Hz	Mixer	-10 dBm
	848.90000000 MHz	SWT	4 s	Unit	dBm



Date: 03.OCT.2008 15:10:35

EQUIPMENT: **AF8537**

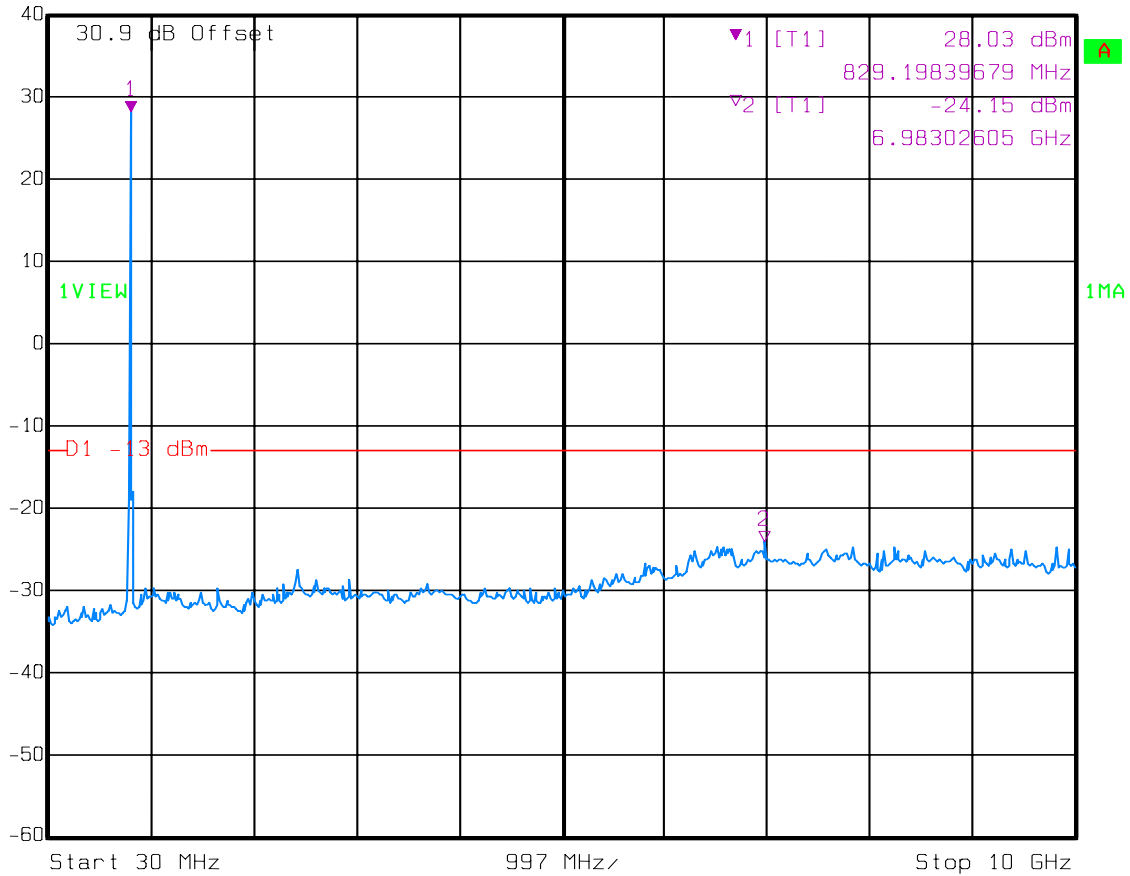
PROJECT NO.: 16262RUS1

**Test Data – Spurious Emissions at Antenna Terminals**

**Spurs – Analog – Uplink**



Ref Lvl 40 dBm  
Marker 1 [T1] 28.03 dBm  
829.19839679 MHz  
RBW 1 MHz RF Att 20 dB  
VBW 1 MHz Mixer -10 dBm  
SWT 100 ms Unit dBm



Date: 03.OCT.2008 15:12:36

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

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**Section 6. Field Strength of Spurious**

NAME OF TEST: Field Strength of Spurious	PARA. NO.: 22.917
TESTED BY: David Light	DATE: 05 November 2008

**Test Results:** Complies.

**Test Data:** The spectrum was searched from 30 MHz to the tenth harmonic of the carrier. There were no emissions detected above the noise floor which was at least 20 dB below the specification limit.

**Analyzer Settings:** RBW = VBW = 1 MHz / Peak detector

**Equipment Used:** 1464-1484-1485-1016-993-791-1763

**Measurement Uncertainty:** +/-1.7 dB

**Temperature:** 22 °C

**Relative Humidity:** 48 %

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**Section 7. Test Equipment List**

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1065	ATTENUATOR	NARDA 776B-10	NONE	CBU	N/A
1604	ATTENUATOR	NARDA 776B-20	NONE	N/A	N/A
1659	Spectrum Analyzer	Rhode & Schwarz FSP	973353	01/24/07	01/24/09
1082	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	CBU	N/A
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/24/07	01/24/09
1484	Cable	Storm PR90-010-072	N/A	05/07/08	05/07/09
1485	Cable	Storm PR90-010-216	N/A	05/07/08	05/07/09
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	05/07/08	05/07/09
993	Horn antenna	A.H. Systems SAS-200/571	XXX	08/31/07	08/30/09
791	PREAMP, 25dB	Nemko USA, Inc. LNA25	398	05/07/08	05/07/09
1763	Bilog Antenna	Schaffner CBL 6111D	22926	10/21/07	10/20/08
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/24/07	01/24/09
1663	Spectrum Analyzer	Rhode & Schwarz FSP3	100073	06/03/08	06/03/09

**ANNEX A - TEST DETAILS**



EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

**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: **AF8537**

PROJECT NO.: 16262RUS1

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**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

**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

EQUIPMENT: **AF8537**

PROJECT NO.: 16262RUS1

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<b>NAME OF TEST: Field Strength of Spurious Radiation</b>	<b>PARA. NO.: 2.1053</b>
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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.

<b>NAME OF TEST: Frequency Stability</b>	<b>PARA. NO.: 2.1055</b>
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**Minimum Standard:** Para. No. 22.355. The transmitter carrier frequency shall remain within the tolerances given in Table C-1.

Table C-1

<b>Freq. Range (MHz)</b>	<b>Base, fixed</b>	<b>Mobile &gt; 3 W</b>	<b>Mobile ≤ 3 W</b>
821 to 896	1.5	2.5	2.5

**Method Of Measurement:**

Frequency Stability With Voltage Variation:

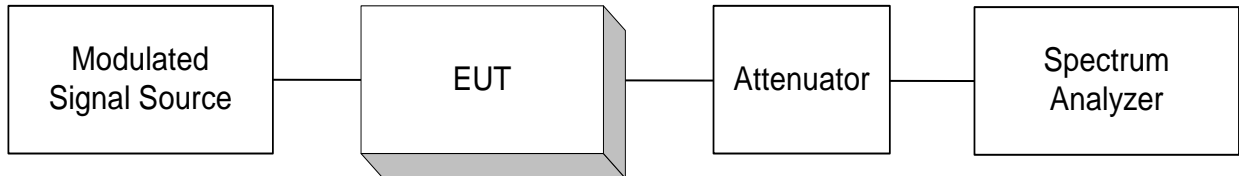
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the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

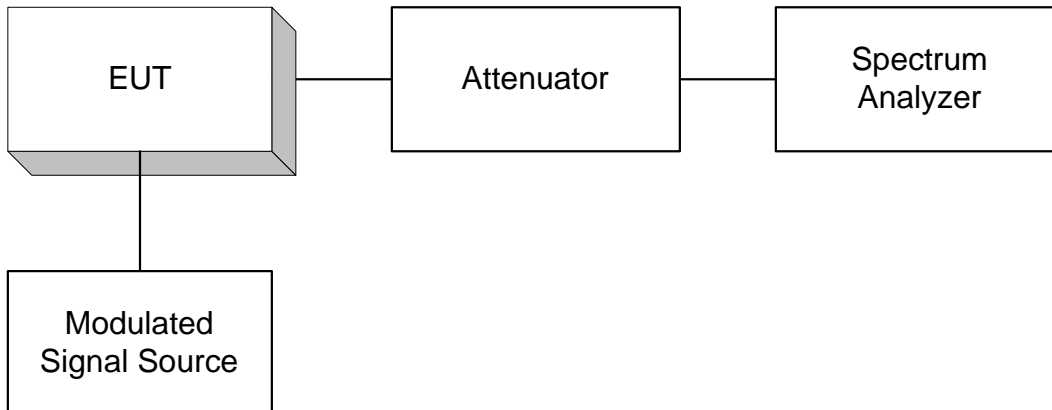
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

**ANNEX B - TEST DIAGRAMS**

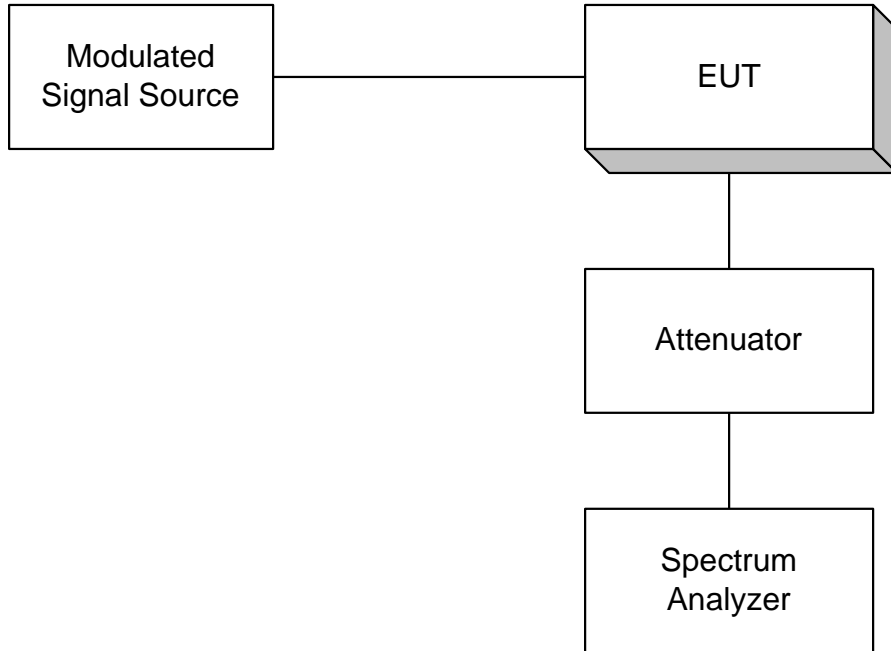
**Para. No. 2.1046 - R.F. Power Output**



**Para. No. 2.1049 - Occupied Bandwidth**

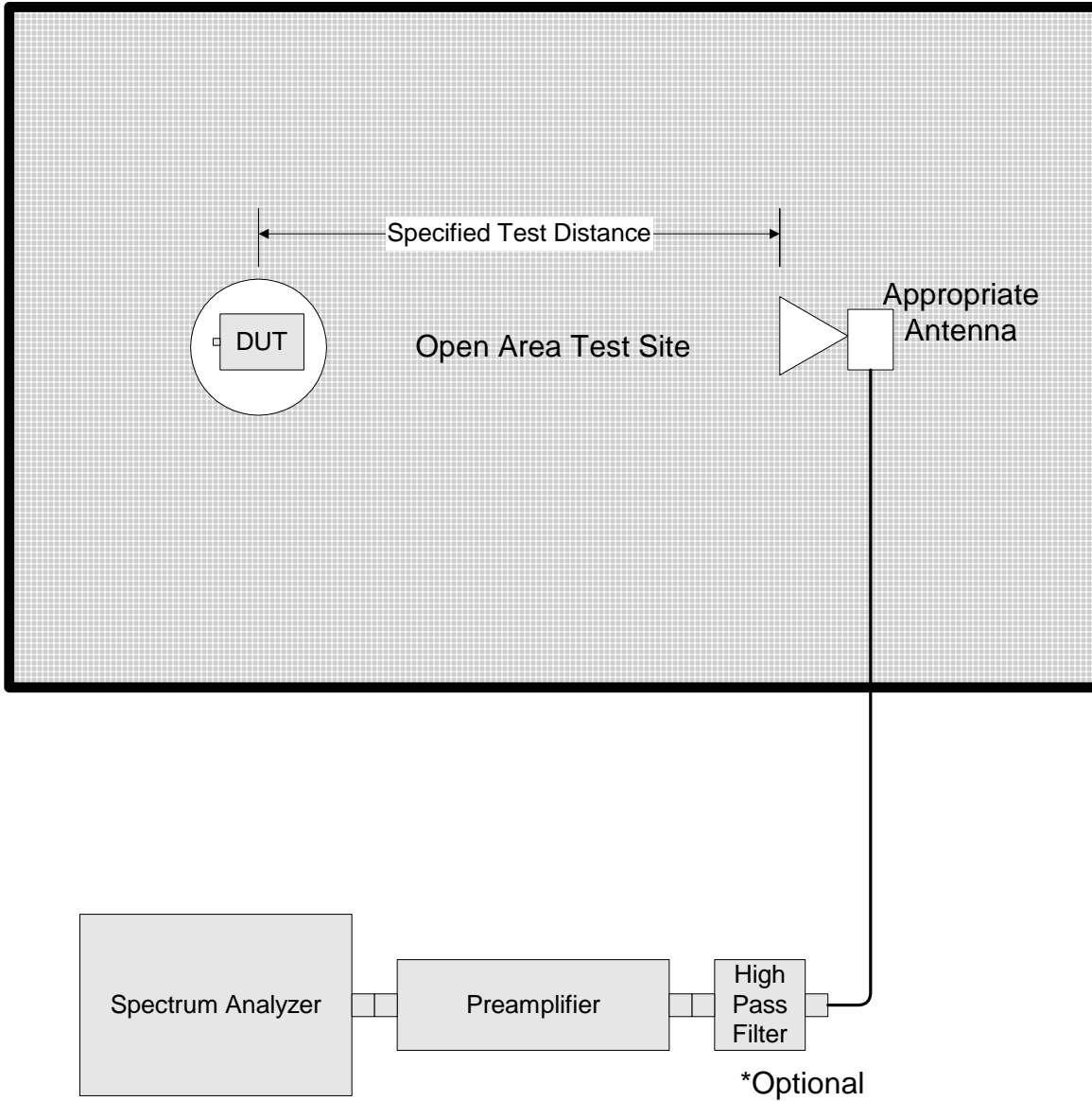


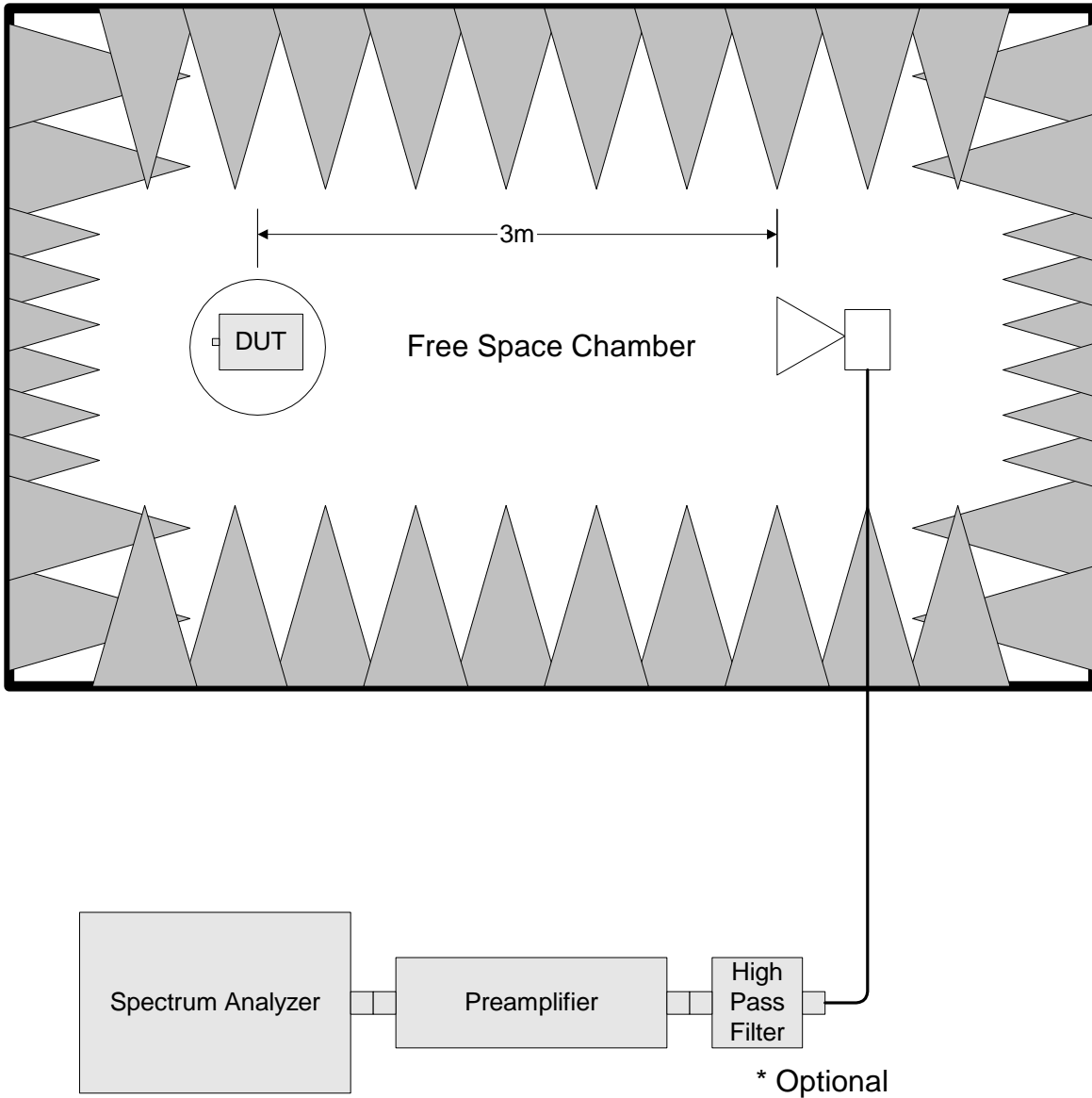
**Para. No. 2.1051 Spurious Emissions at Antenna Terminals**





**Para. No. 2.1053 - Field Strength of Spurious Radiation**





**Para. No. 2.1055 - Frequency Stability**

