

Nemko Test Report: 4L0457RUS1REV1

Applicant: Andrew Corporation

Equipment Under Test: MR803P-TR Repeater
(E.U.T.)

In Accordance With: **FCC Part 90, Subpart I**
Private Land Mobile Repeater

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

Authorized By: 
Tom Tidwell, Frontline Manager

Date: 10/7/04

Total Number of Pages: 85

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EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Section 1. Summary of Test Results

Manufacturer: Andrew Corporation

Model No.: MR803P-TR

Serial No.: 011

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 FCC Part 90, Subpart I.



New Submission



Production Unit



Class II Permissive Change



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: MR803P-TR Repeater**PROJECT NO.:** 4L0457R

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	MEAS.	RESULT
RF Power Output	90.205		39.02	Complies
Audio Frequency Response	TIA EIA-603.3.2.6	N/A	N/A	N/A
Audio Low-Pass Filter Response	TIA EIA-603.3.2.6	N/A	N/A	N/A
Modulation Limiting	TIA EIA-603.3.2.6	N/A	N/A	N/A
Occupied Bandwidth	90.210	Plots	Plots	Complies
Spurious Emissions at Antenna Terminals	90.210	-13 dBm	Plots	Complies
Field Strength of Spurious Emissions	90.210	-13 dBm E.R.P.	E.R.P.	Complies
Frequency Stability	90.213			Complies
Transient Frequency Behavior	90.214	N/A	N/A	N/A

Footnotes For N/A's:

- (1) Since the E.U.T. does not contain modulation circuitry modulation testing was not performed.
- (2) Since the E.U.T. is not a keyed carrier system, Transient Frequency Behavior was not performed.

Indoor Temperature: 21°C
 Humidity: 51%

Outdoor Temperature: 19 °C
 Humidity: 65 %

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Section 2. General Equipment Specification

Transmitter

Supply Voltage Input: 115V AC

Frequency Range: 806-824MHz

851-869MHz

Tunable Bands: 806-824MHz

851-869MHz

Type(s) of Modulation:	F3E (Voice)	F1D	F2D	GXW (iDEN)	Other
	☒	☐	☐	☒	☐

Maximum Input: +0dBm

Output Impedance: NA

RF Power Output (rated):	Single:	+34dBm
	Composite:	+24dBm (2-Carrier)

Frequency Translation:	F1-F1	F1-F2	N/A
	☐	☐	☒

Band Selection:	Software	Duplexer Change	Fullband Coverage
	☐	☐	☒

Nemko USA

FCC PART 90, SUBPART I
PRIVATE LAND MOBILE REPEATER

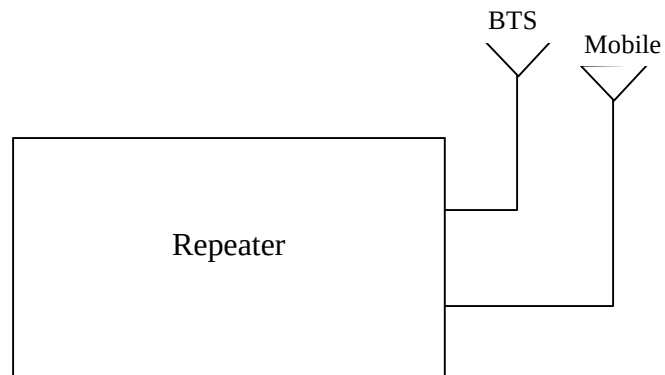
EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: **4L0457R**

Modifications Made During Testing

No Modifications made during testing

System Diagram



EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.985
TESTED BY: Dustin Oaks	DATE: 07/29/2004

Test Results: Complies**Measurement Data:**

iDEN

Frequency (MHz)	Measured Power (dBm)	Rated Power (dBm)
UL806	27.02	27
UL824	27.06	27
DL851	27.01	27
DL869	27.16	27

Analog

Frequency (MHz)	Measured Power (dBm)	Rated Power (dBm)
UL806	34.00	34
UL821	34.00	34
DL851	34.02	34
DL866	34.09	34

Equipment Used: 1036, 1052, 1053, 1626, 1627, 1964, 1092**Measurement Uncertainty:** +/- 1.6 dB**Temperature:** 21 °C**Relative Humidity:** 51 %

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: **4L0457R**

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.989
TESTED BY: Dustin Oaks	DATE: 07/29/2004

Test Results: Complies

Test Data: See attached graph(s).

Equipment Used: 1036, 1052, 1053, 1626, 1627, 1964, 1092, 1073, 1051, 0973

Measurement Uncertainty: +/- 1.6 dB

Temperature: 21 °C

Relative Humidity: 51 %

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

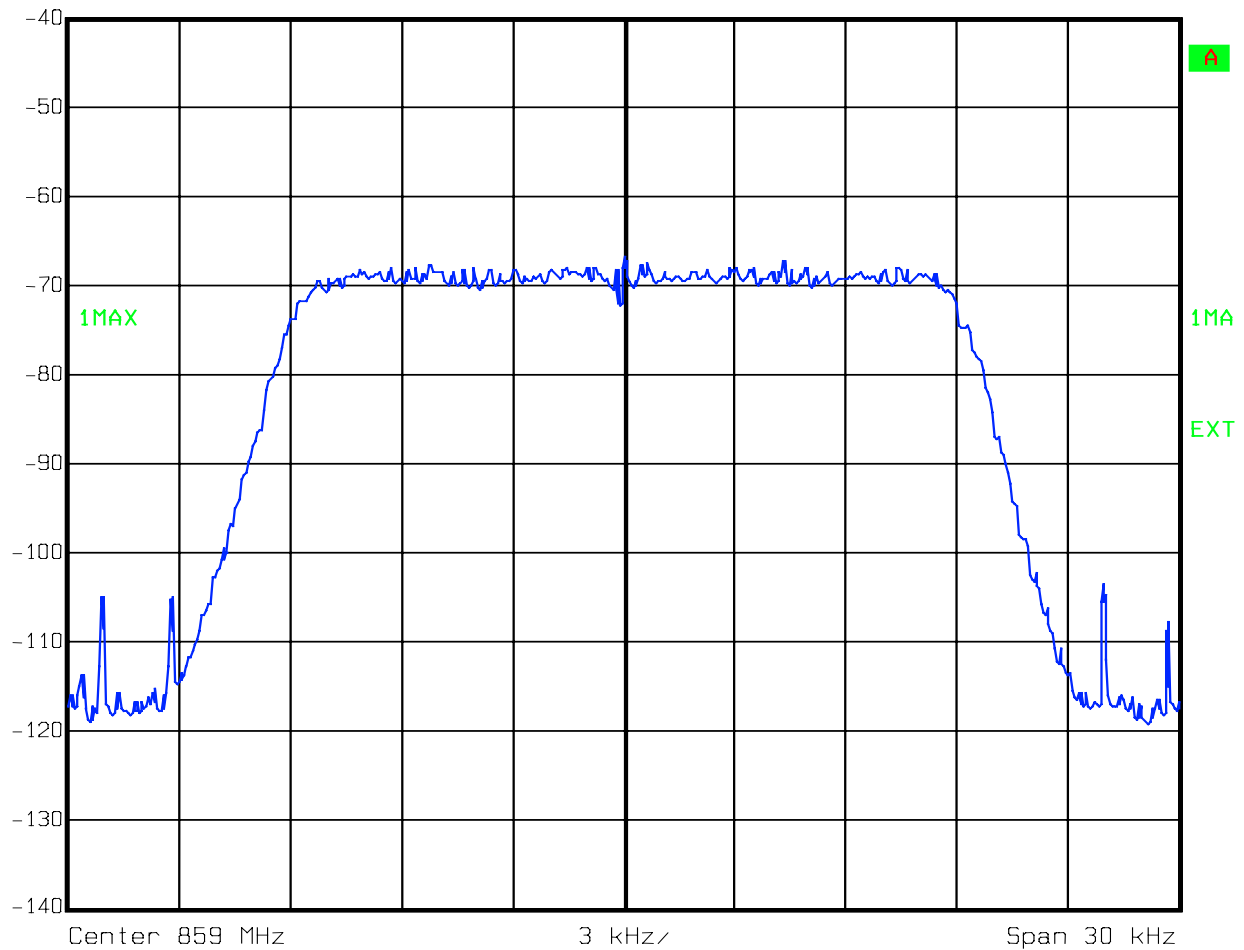
Band Width and Input/Output

Downlink - Input iDEN



Ref Lvl
-40 dBm

RBW	1 kHz	RF Att	0 dB
VBW	1 kHz		
SWT	150 ms	Unit	dBm

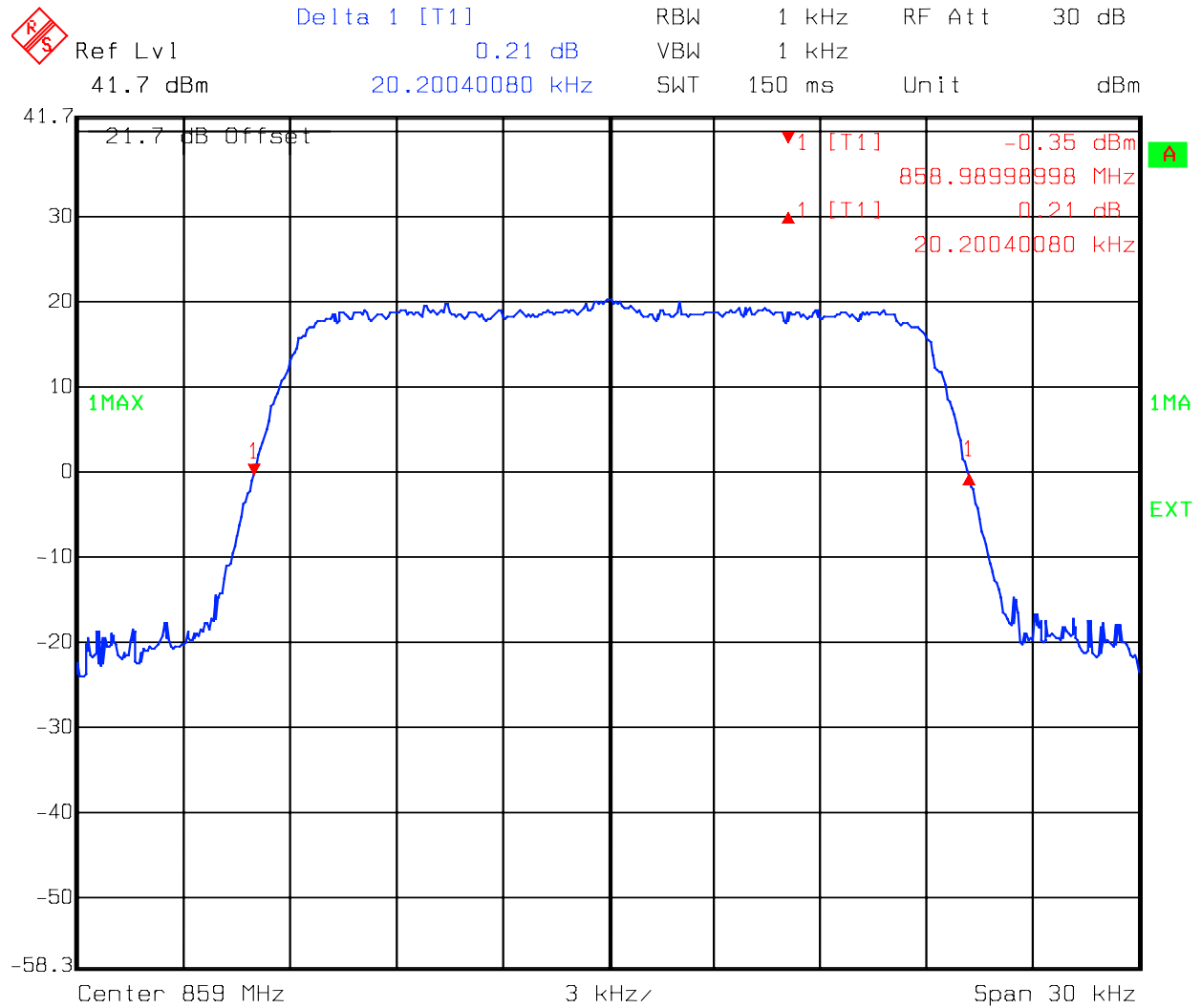


Date: 29.JUL.2004 19:13:18

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Output iDEN

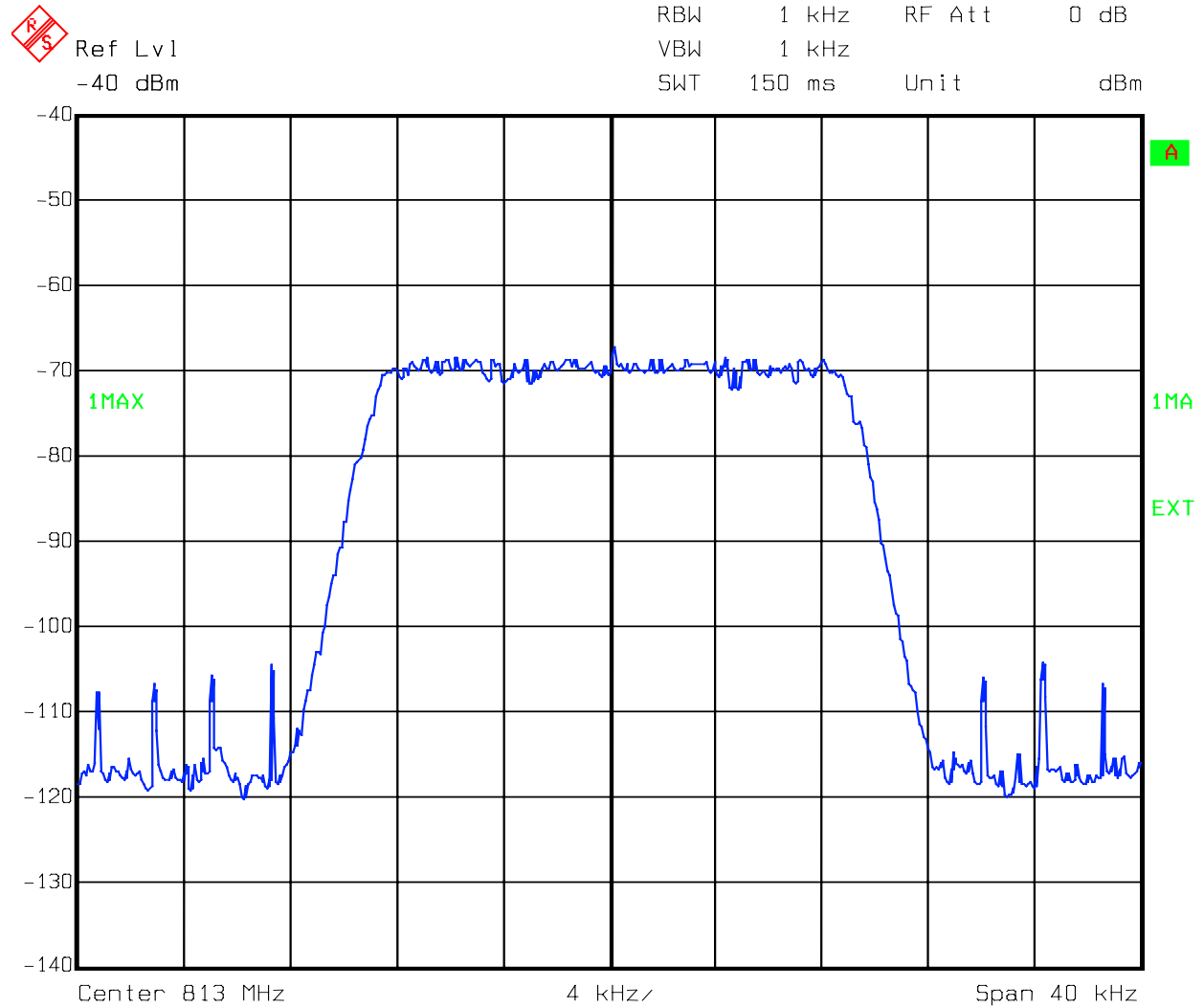


Date: 29.JUL.2004 19:11:57

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Input iDEN

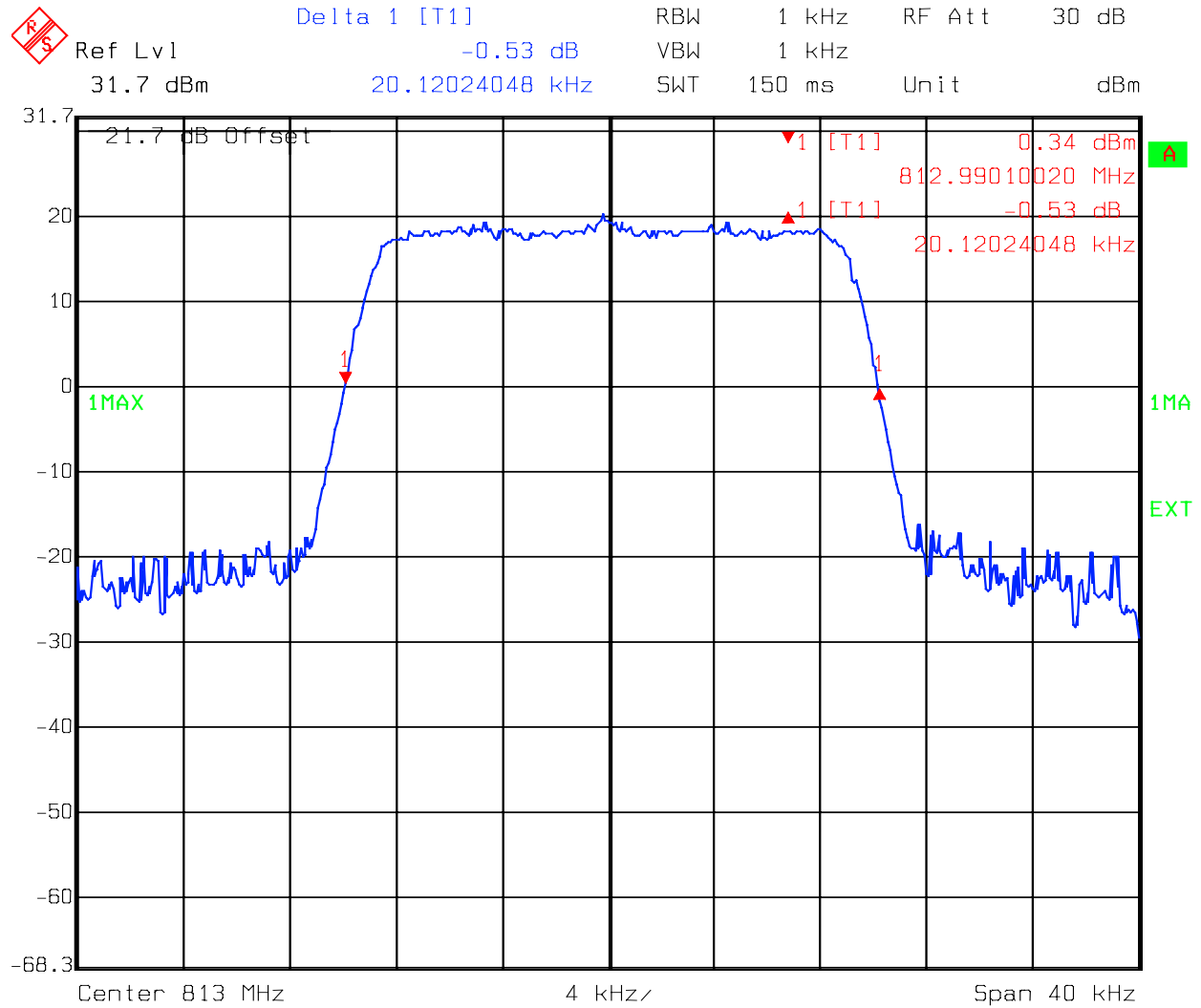


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EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

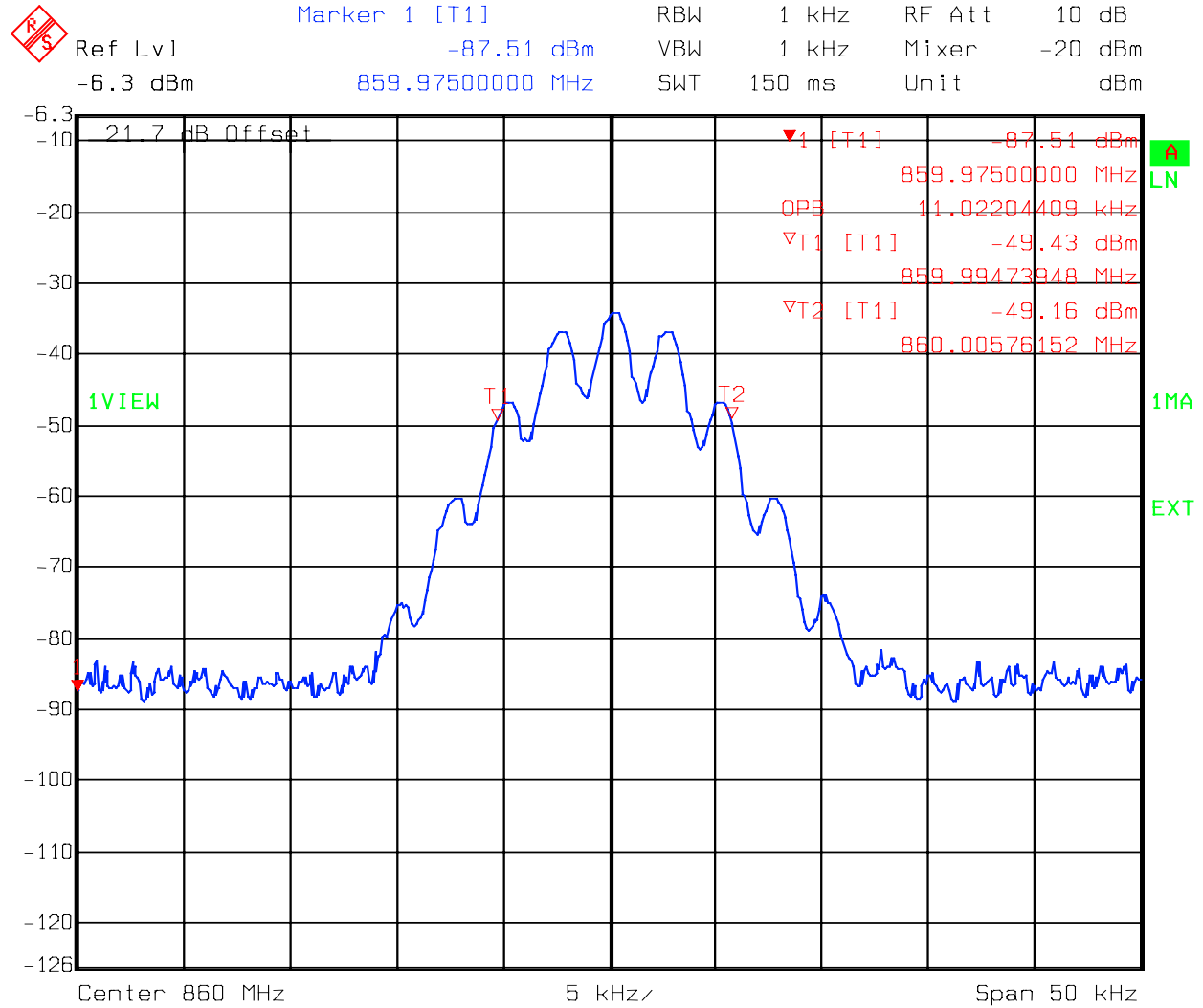
Uplink - Output iDEN



EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Input Analog
2.5 kHz tone at 3 kHz deviation

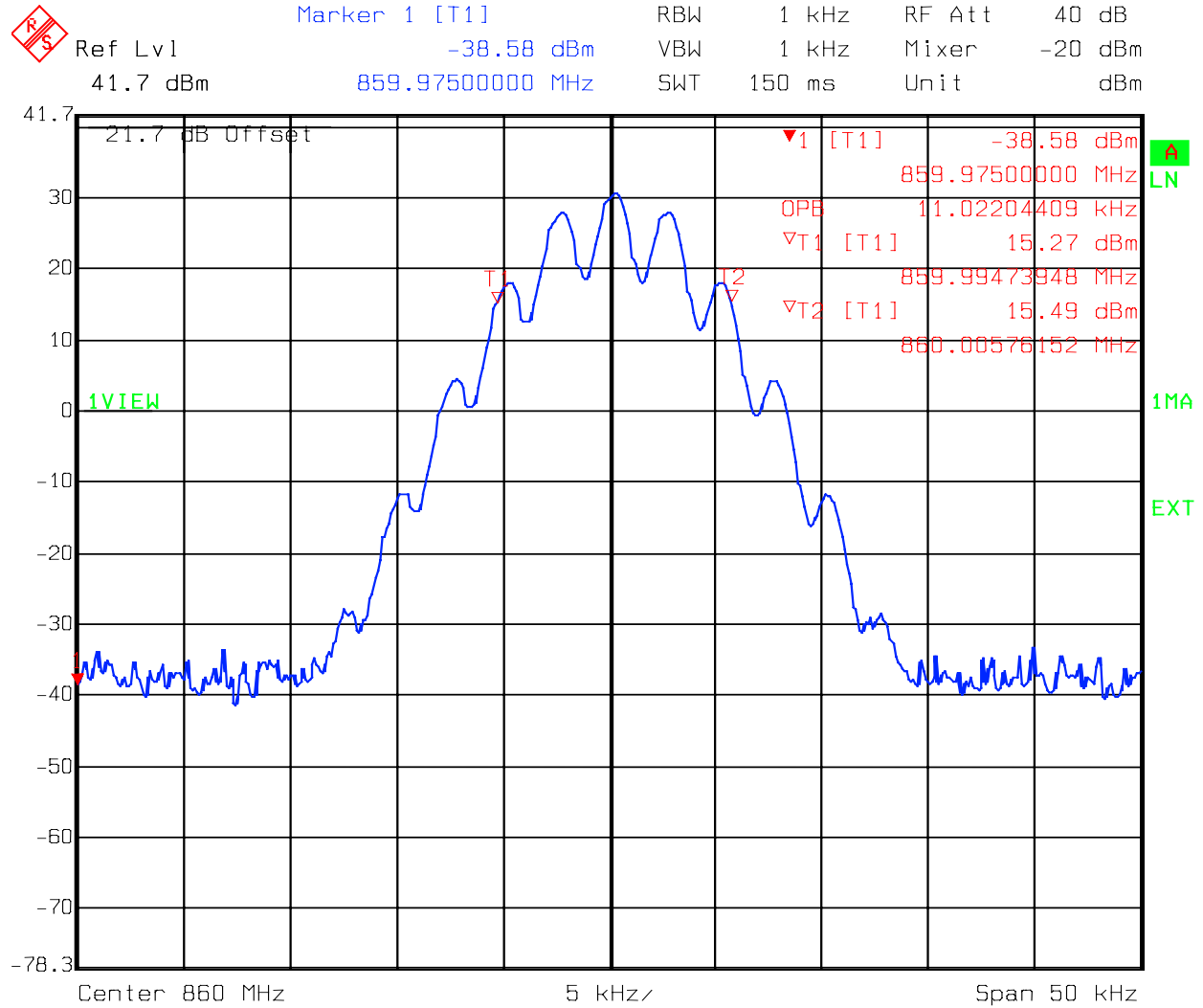


Date: 30.JUL.2004 02:08:04

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Output Analog
2.5 kHz tone at 3 kHz deviation

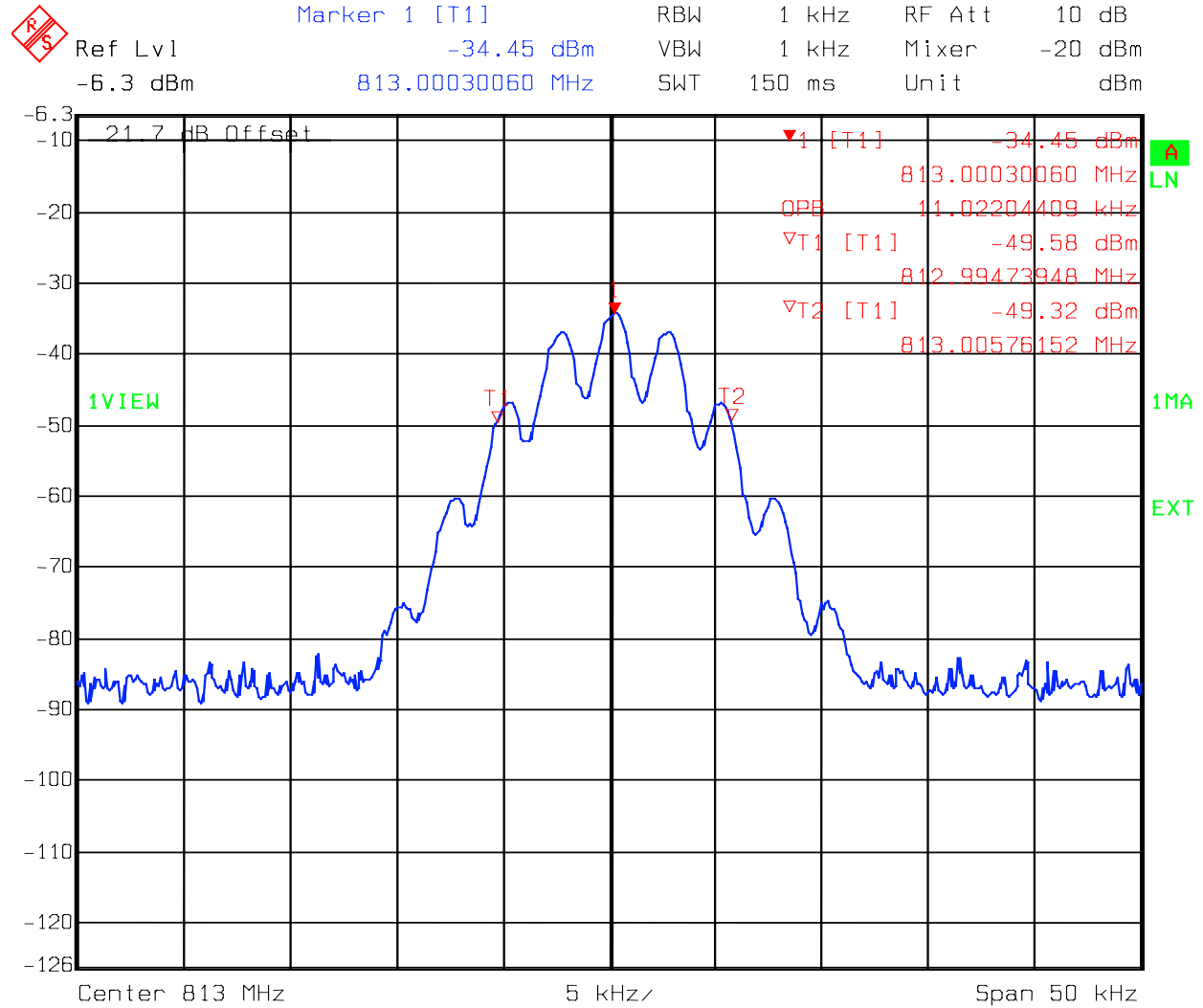


Date: 30.JUL.2004 02:11:33

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Input Analog
2.5 kHz tone at 3 kHz deviation

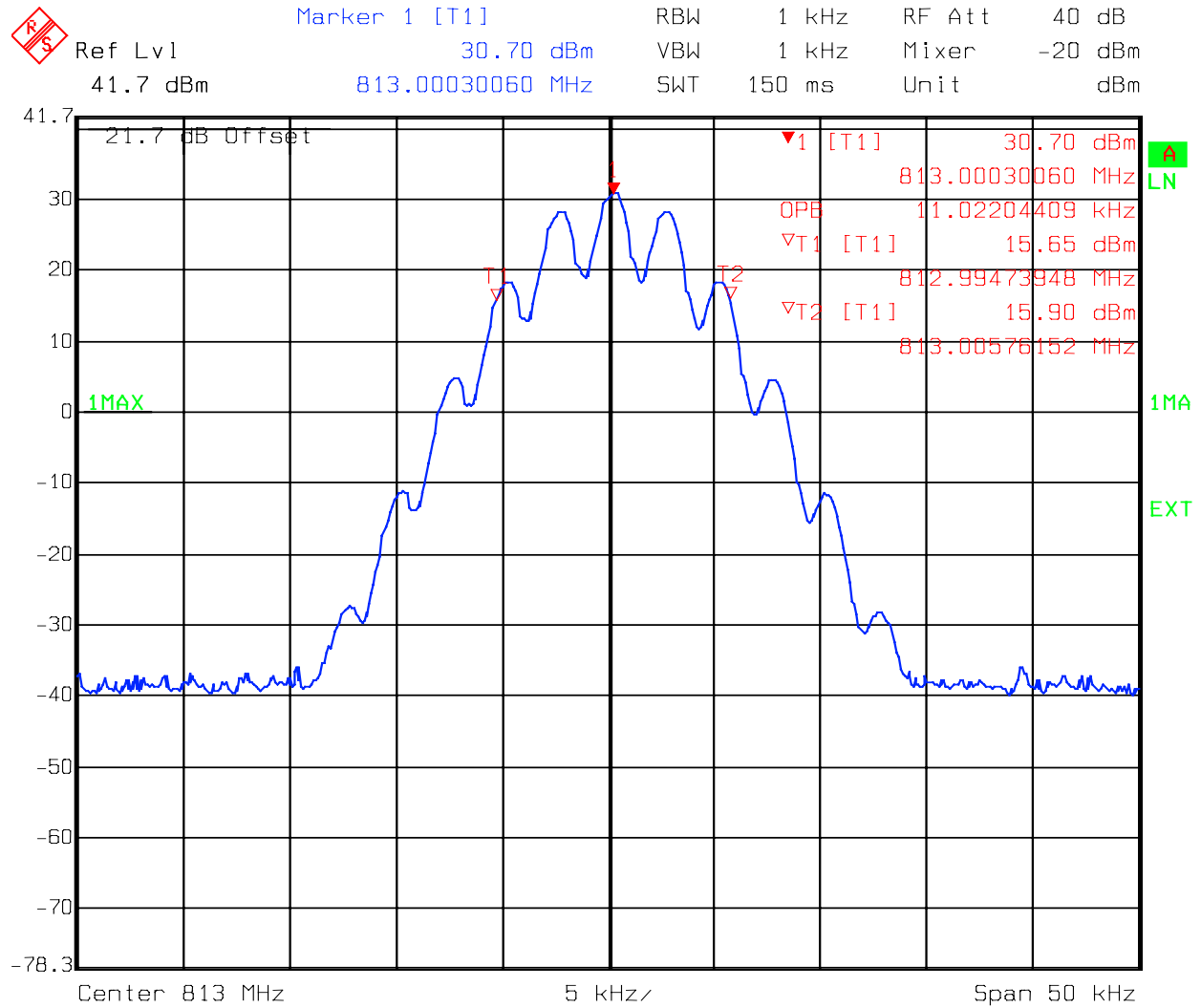


Date: 30.JUL.2004 02:06:42

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Output Analog
2.5 kHz tone at 3 kHz deviation



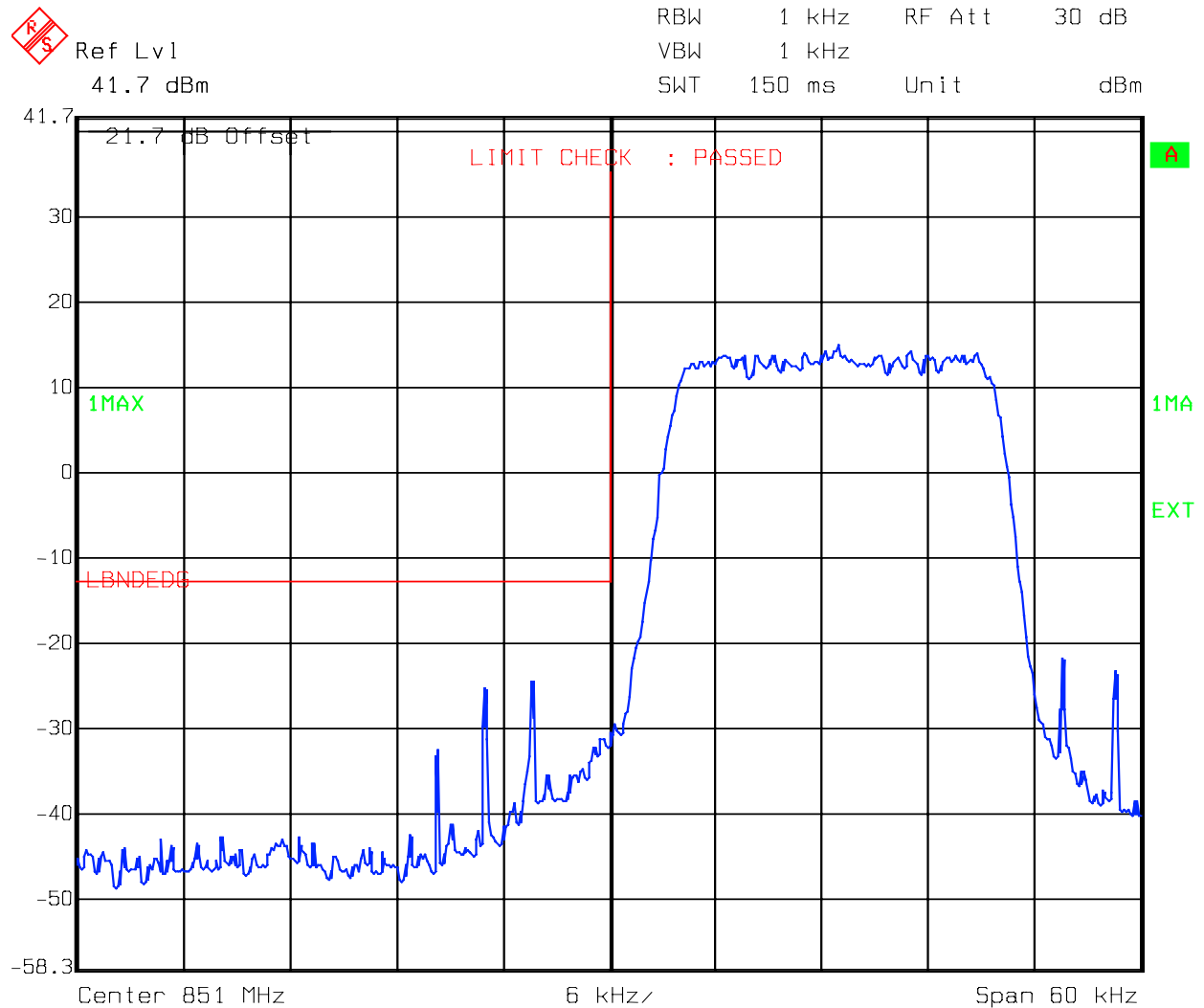
Date: 30.JUL.2004 02:04:02

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Band Edge

Downlink - Lower iDEN

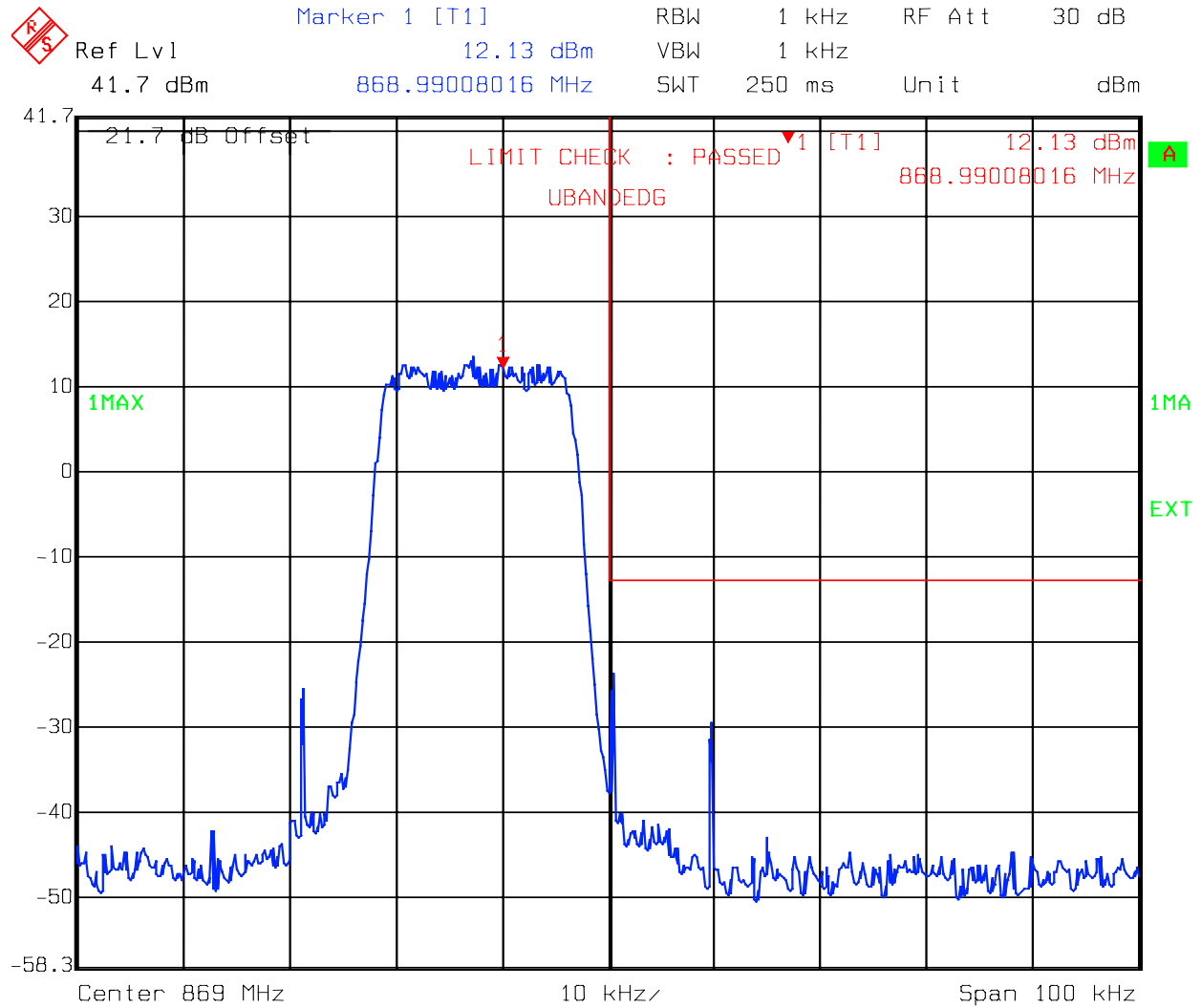


Date: 29.JUL.2004 19:15:34

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Upper iDEN

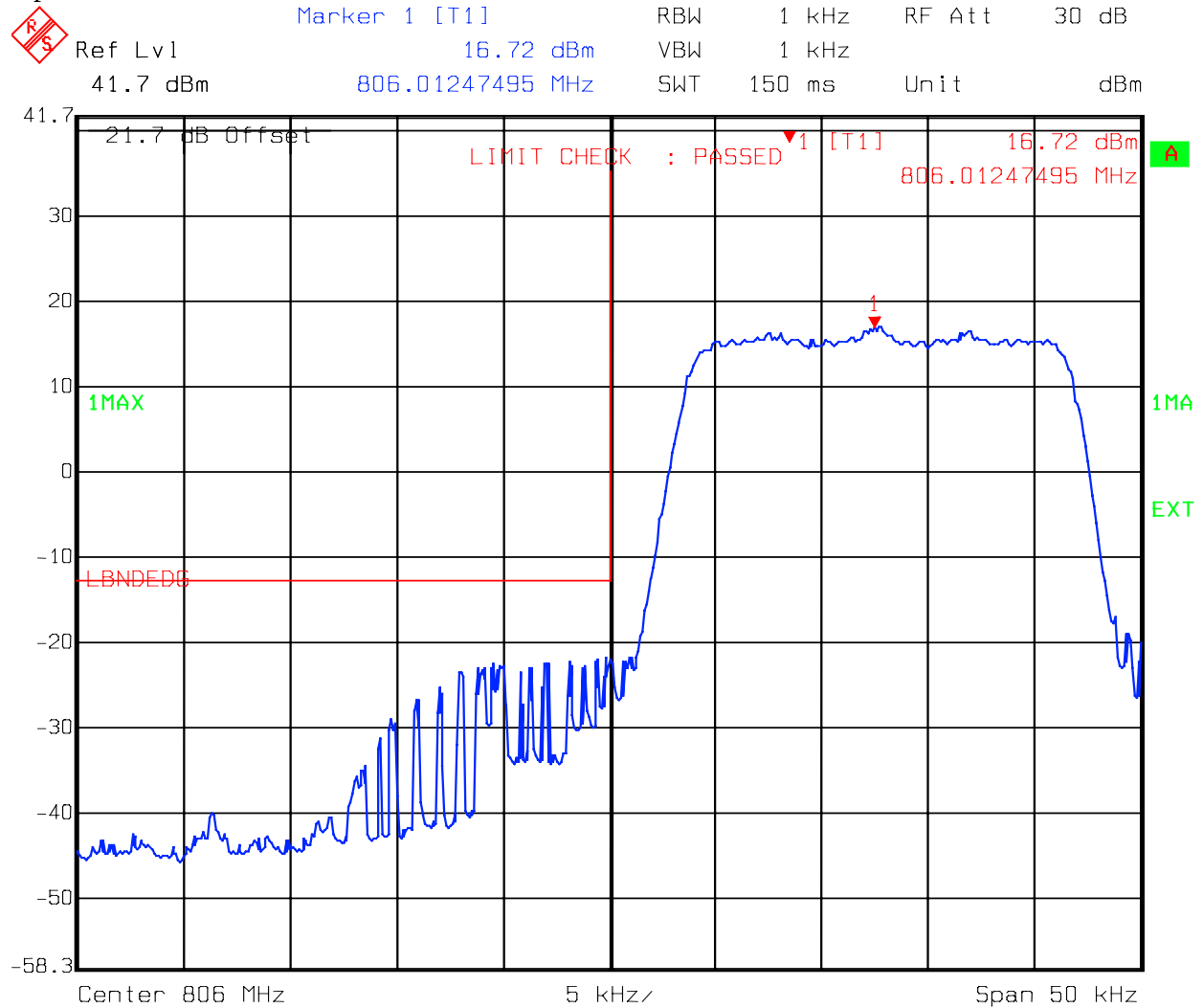


Date: 29.JUL.2004 20:28:06

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Lower iDEN

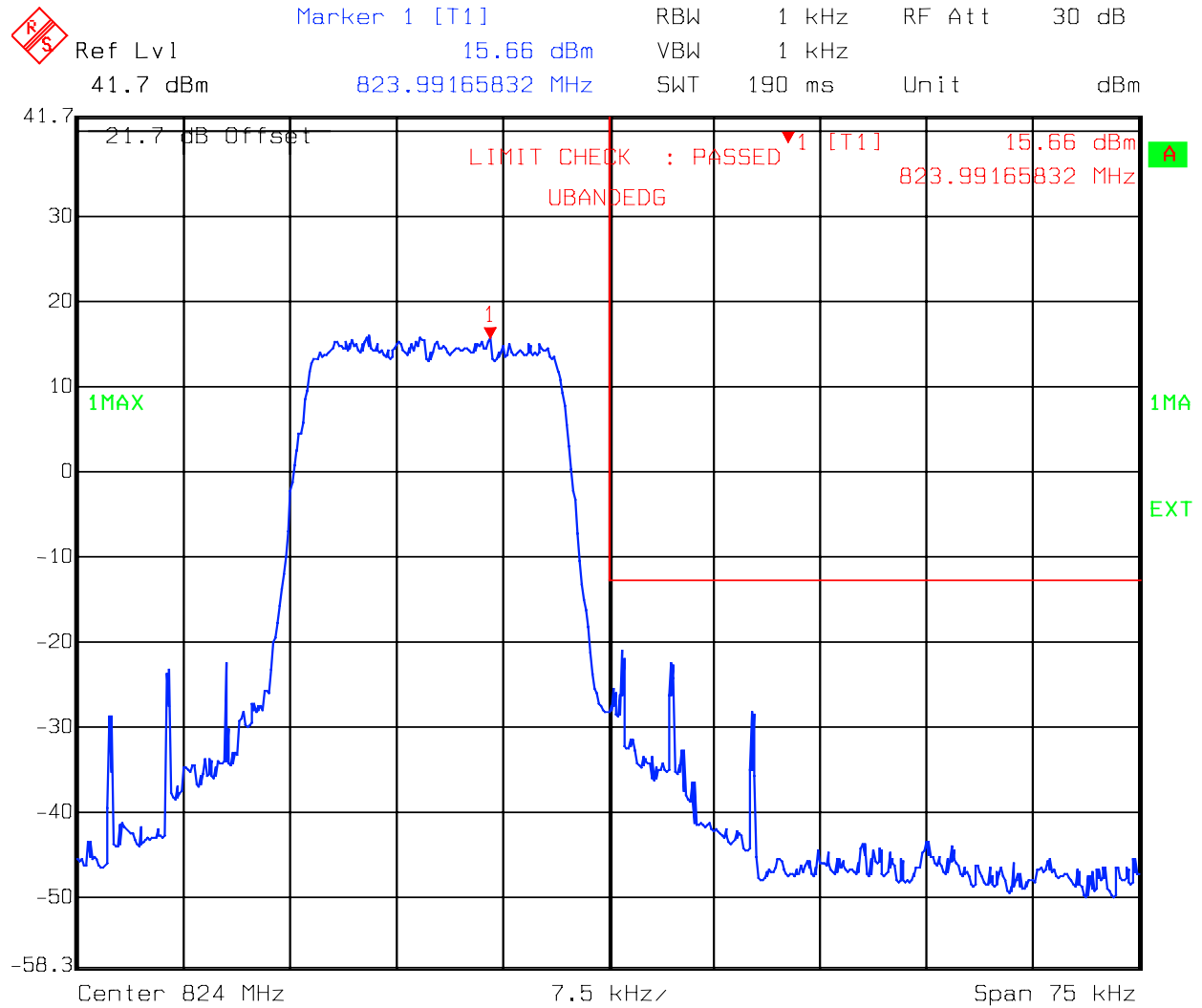


Date: 29.JUL.2004 19:40:16

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Upper iDEN

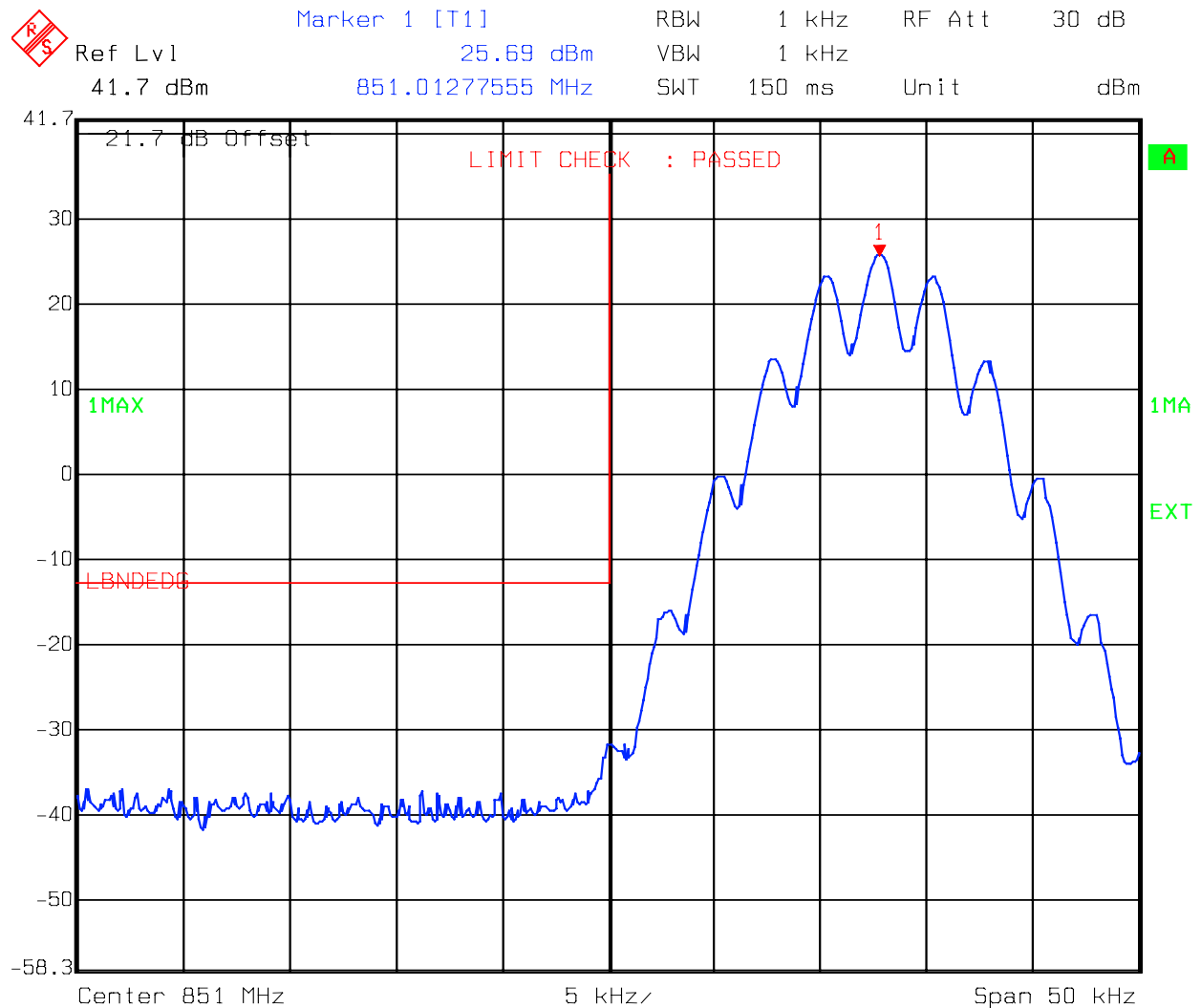


Date: 29.JUL.2004 20:05:06

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Lower Analog
851.0125 MHz, +34 dBm

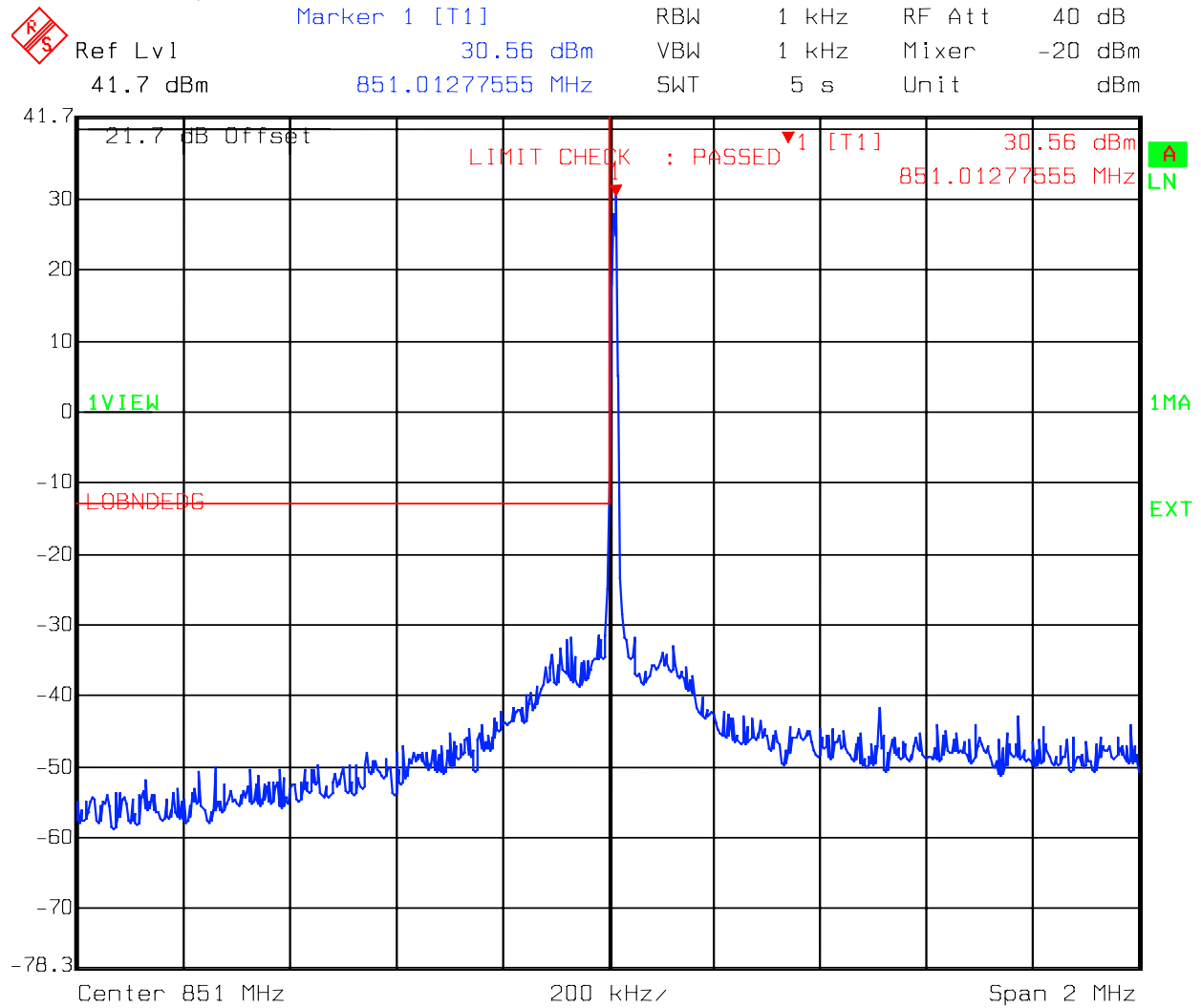


Date: 29.JUL.2004 18:32:45

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Lower Analog
851.0125 MHz, +34 dBm

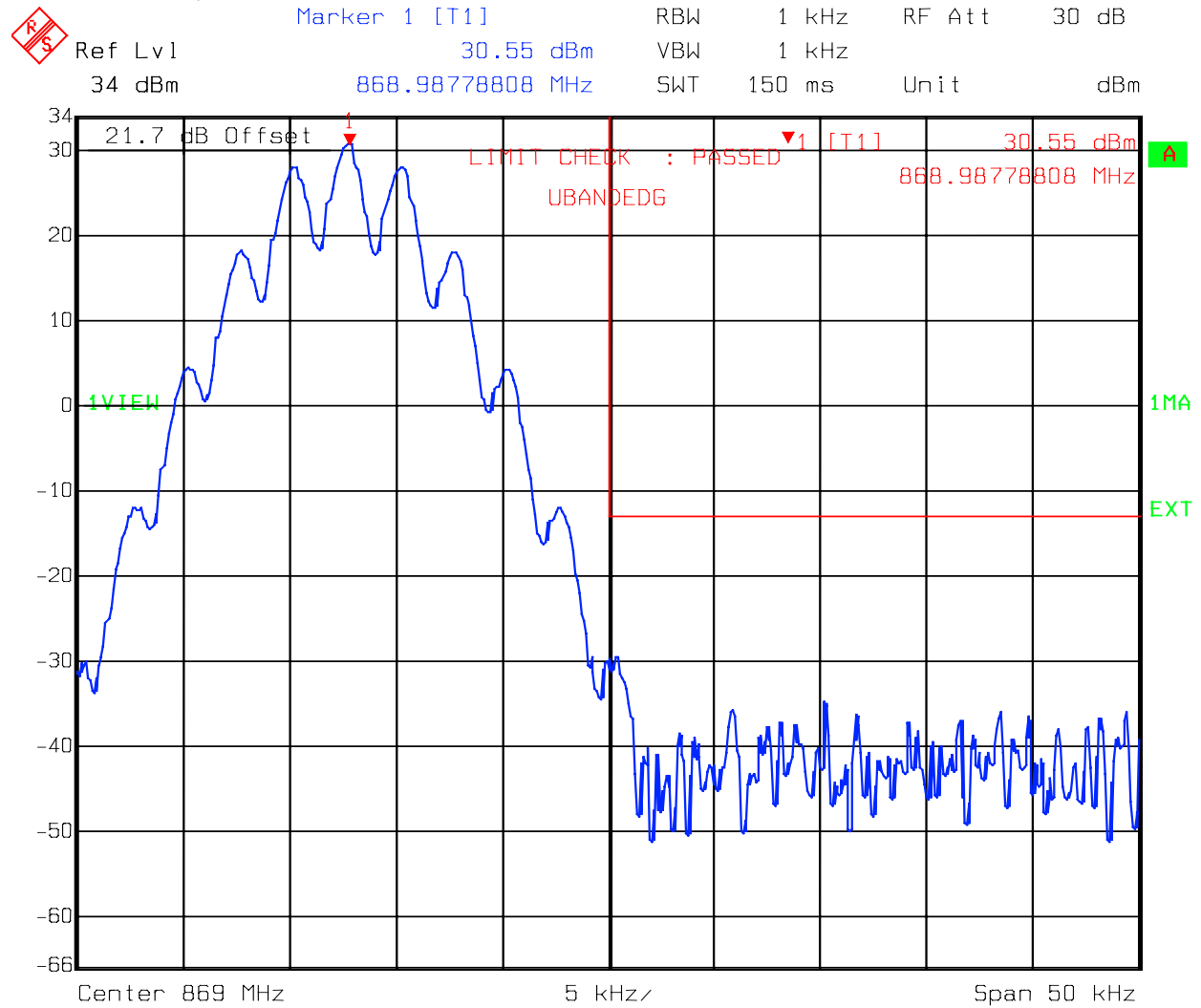


Date: 30.JUL.2004 00:12:38

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Upper Analog
868.9875 MHz, +34 dBm

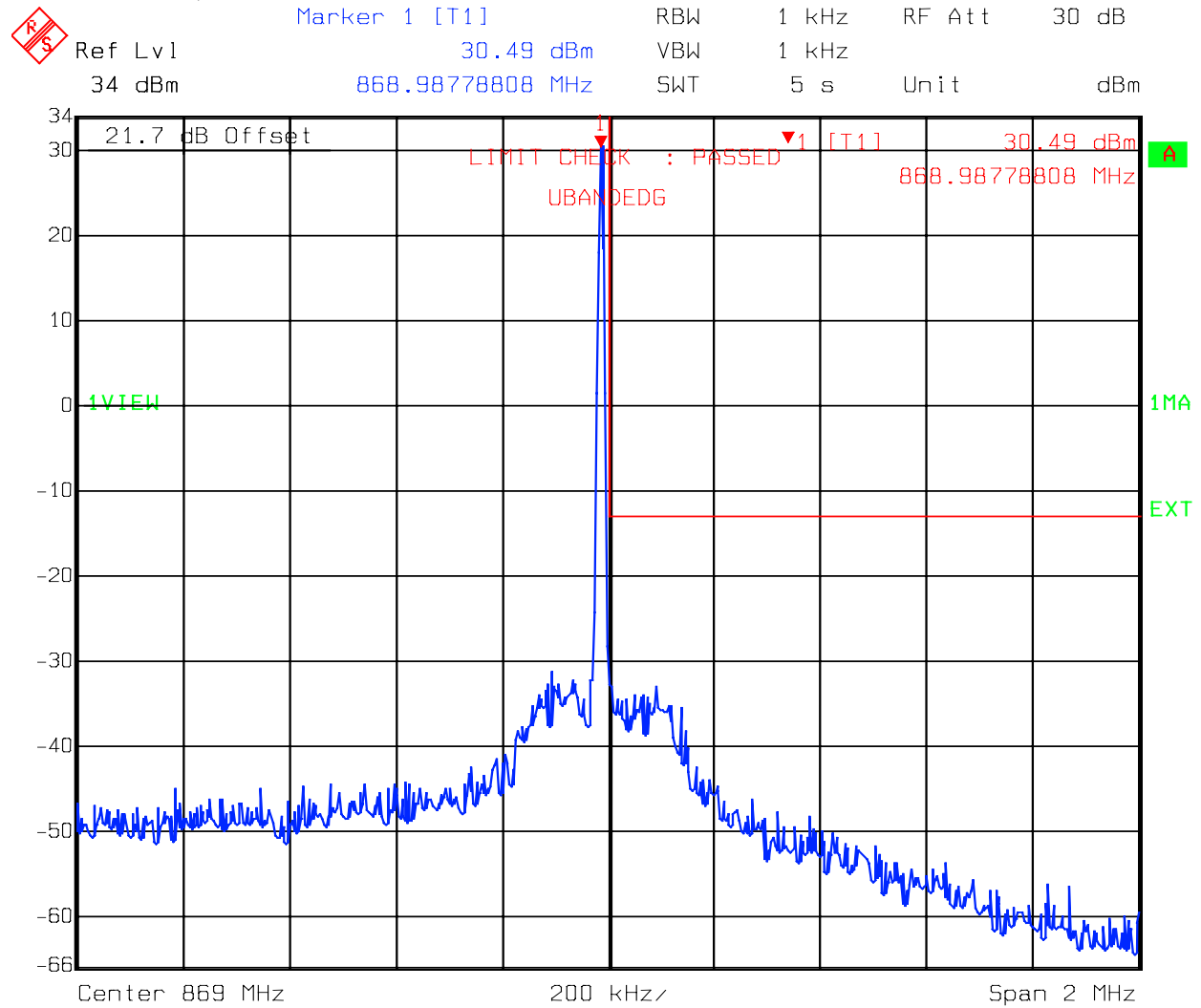


Date: 30.JUL.2004 00:00:32

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Upper Analog
868.9875 MHz, +34 dBm

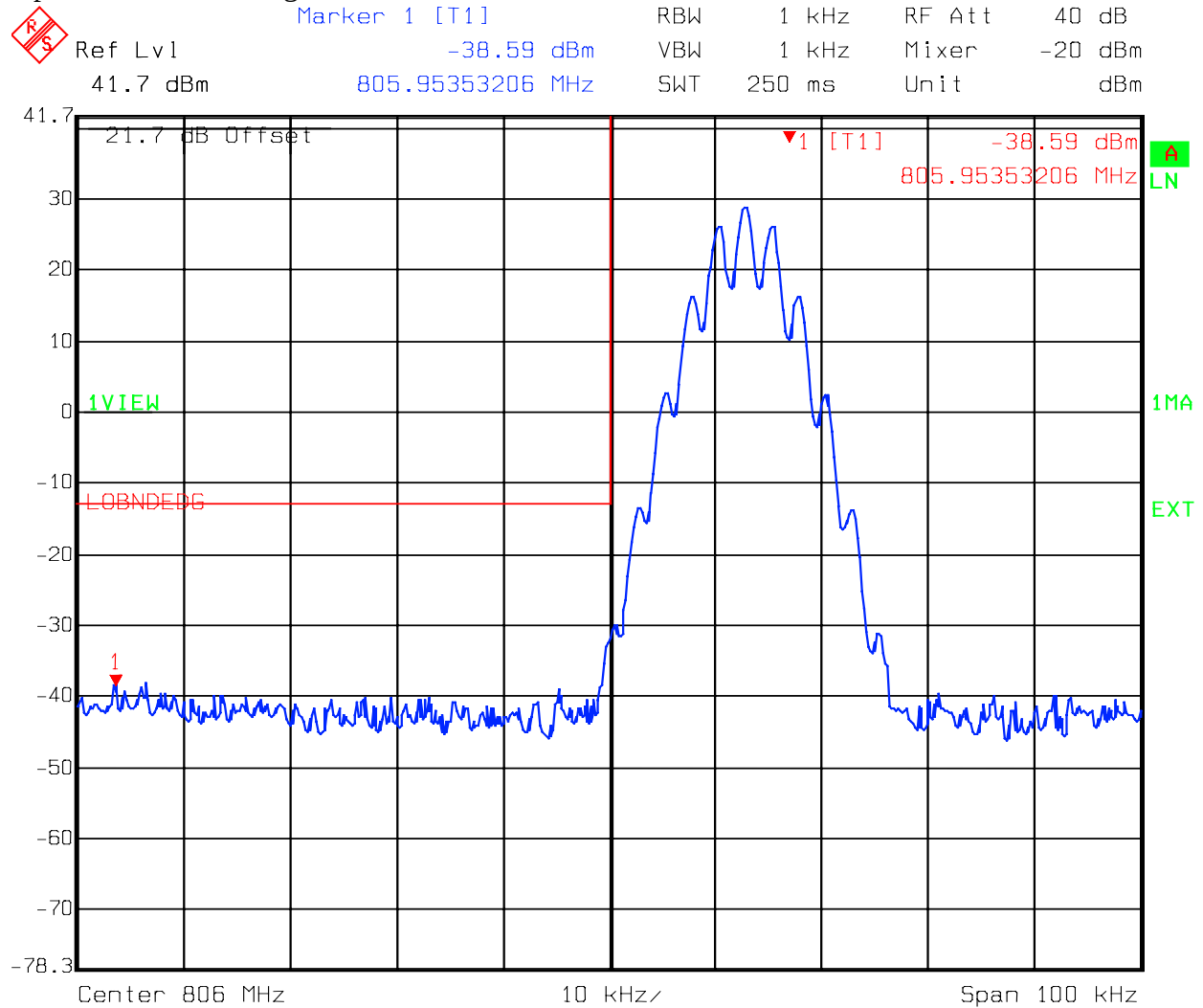


Date: 30.JUL.2004 00:01:47

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Lower Analog

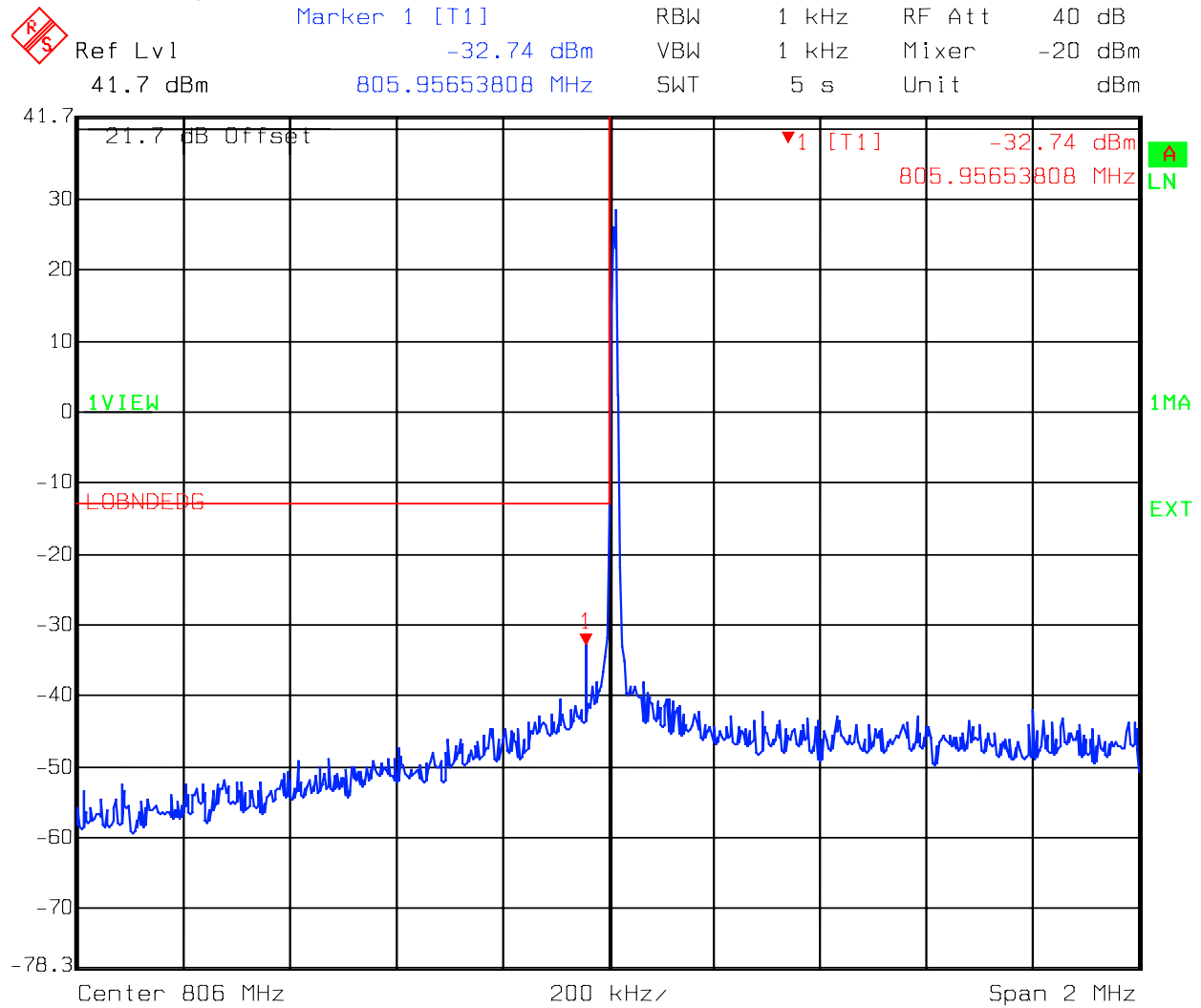


Date: 30.JUL.2004 01:58:49

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Lower Analog
806.0125 MHz, +34 dBm

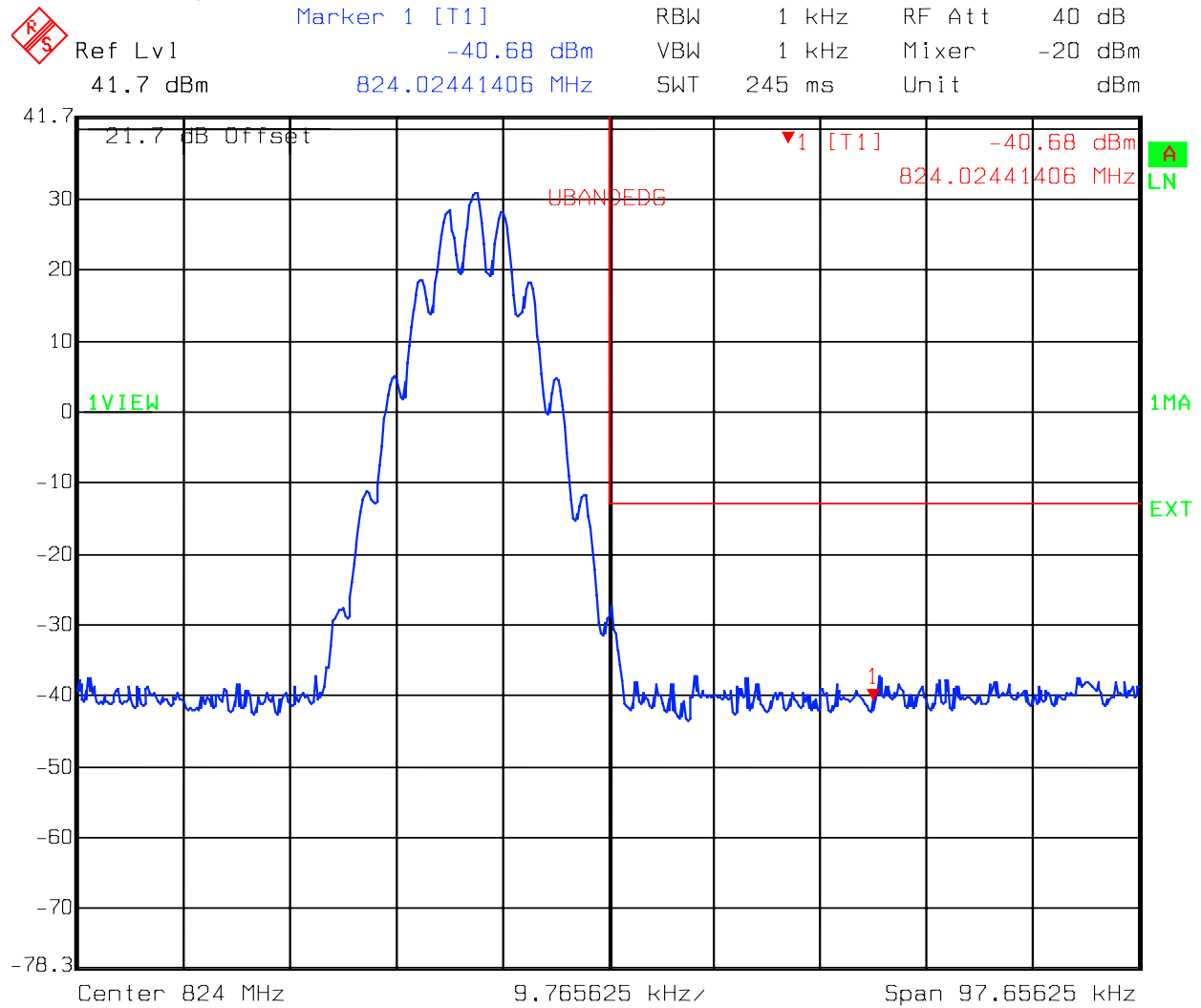


Date: 30.JUL.2004 01:57:44

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Upper Analog
823.9875 MHz, +34 dBm

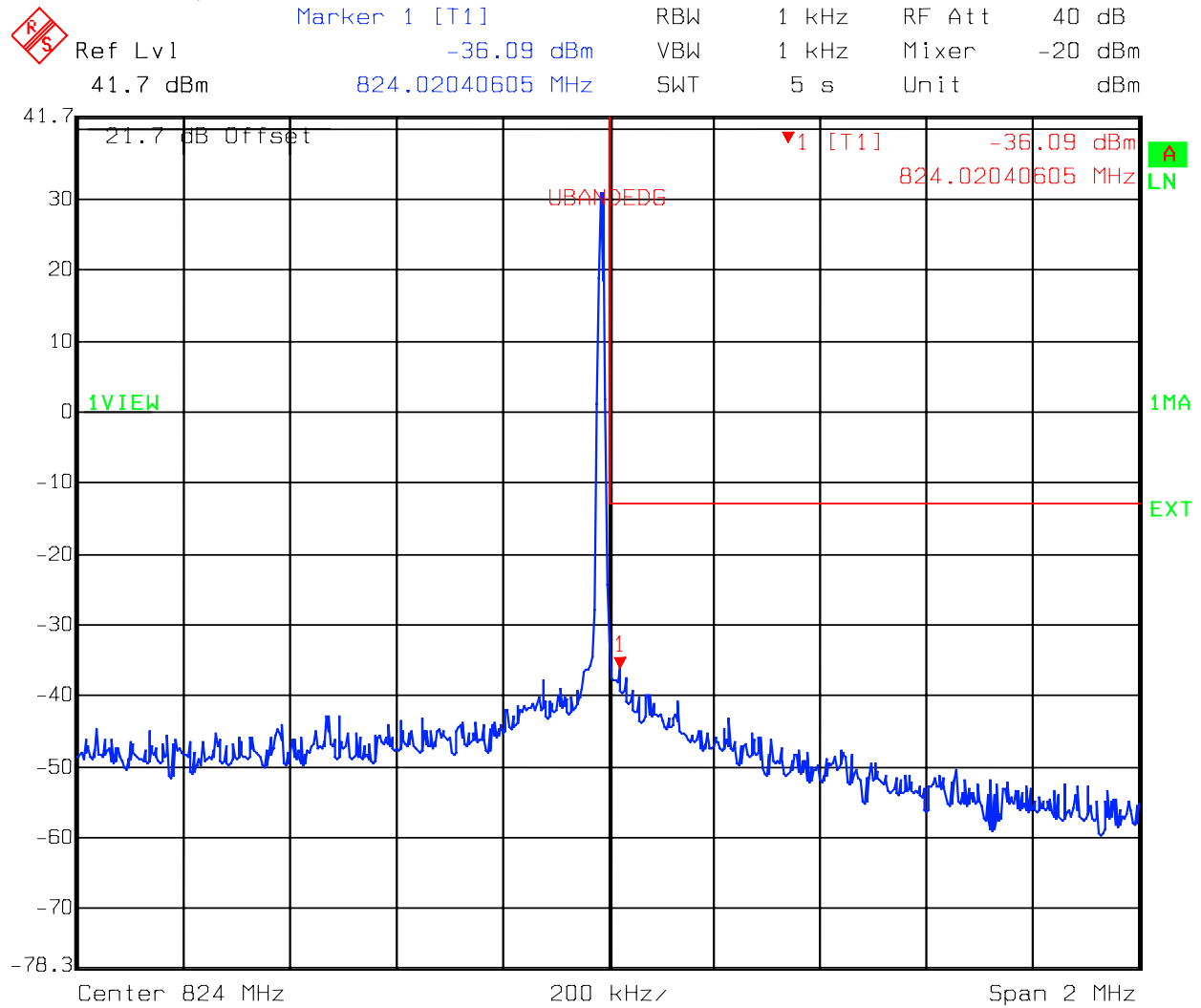


Date: 30.JUL.2004 01:50:40

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

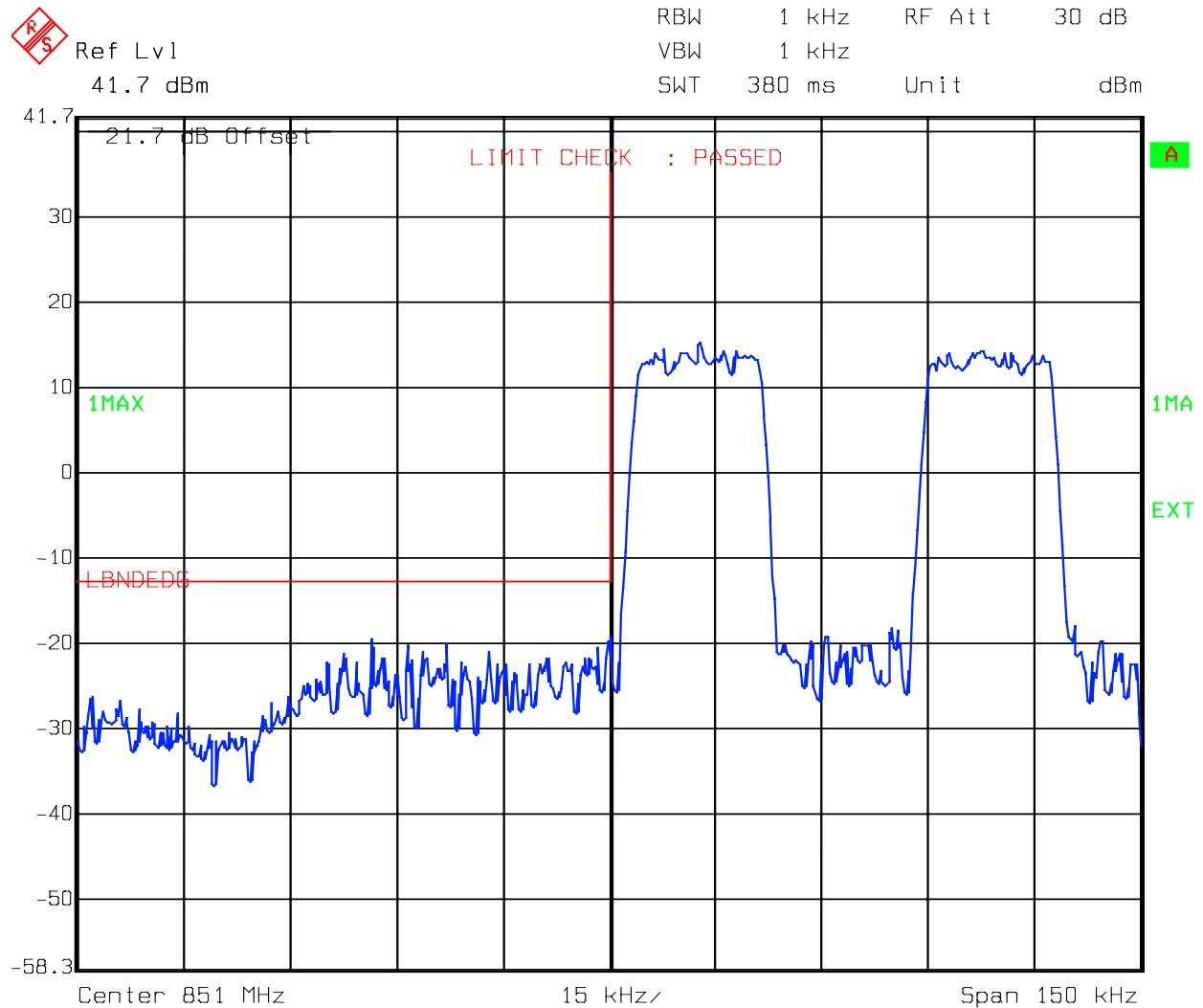
Uplink - Upper Analog
823.9875 MHz, +34 dBm



Date: 30.JUL.2004 01:52:27

Intermodulation

Downlink - Lower iDEN

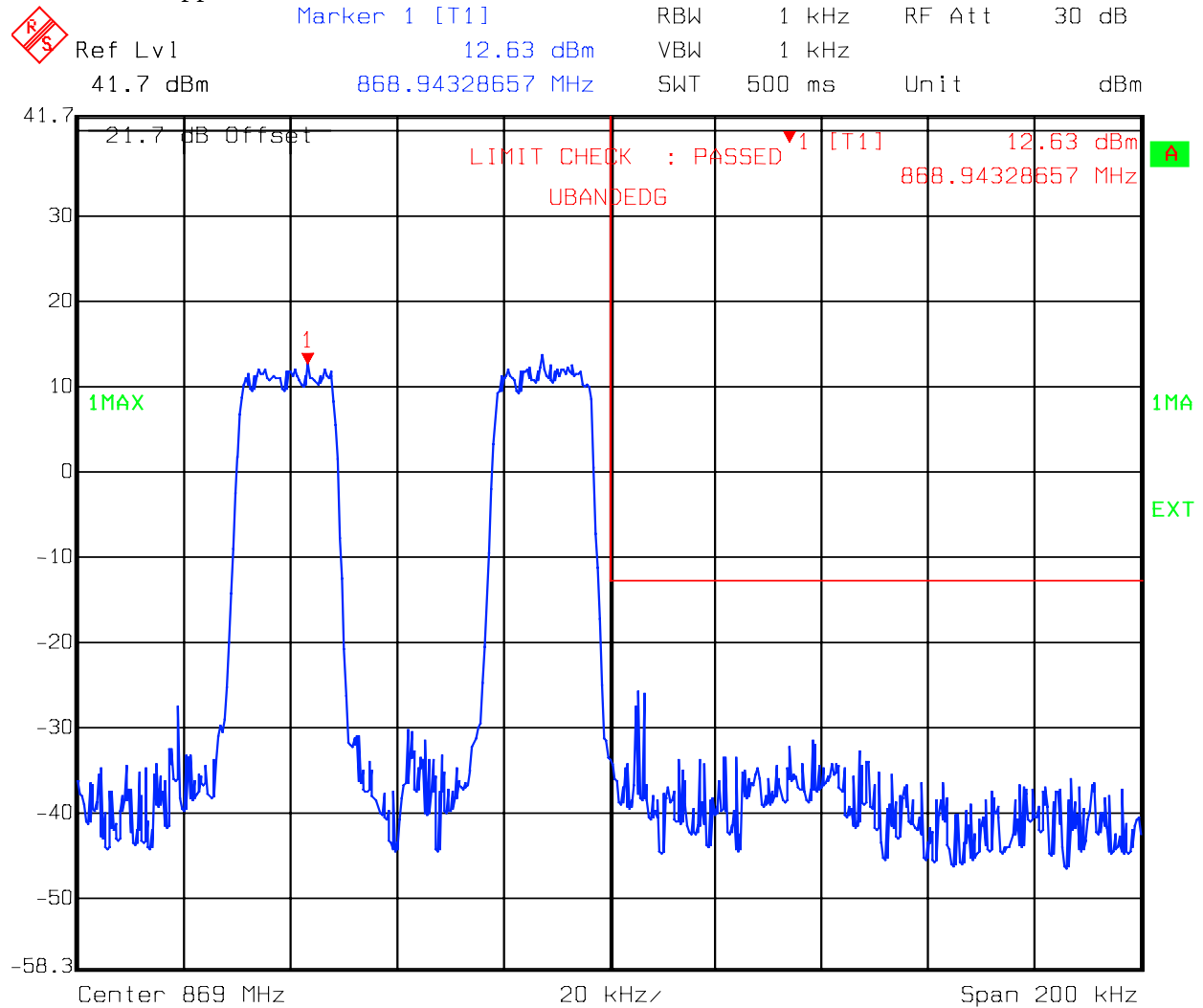


Date: 29.JUL.2004 19:17:30

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

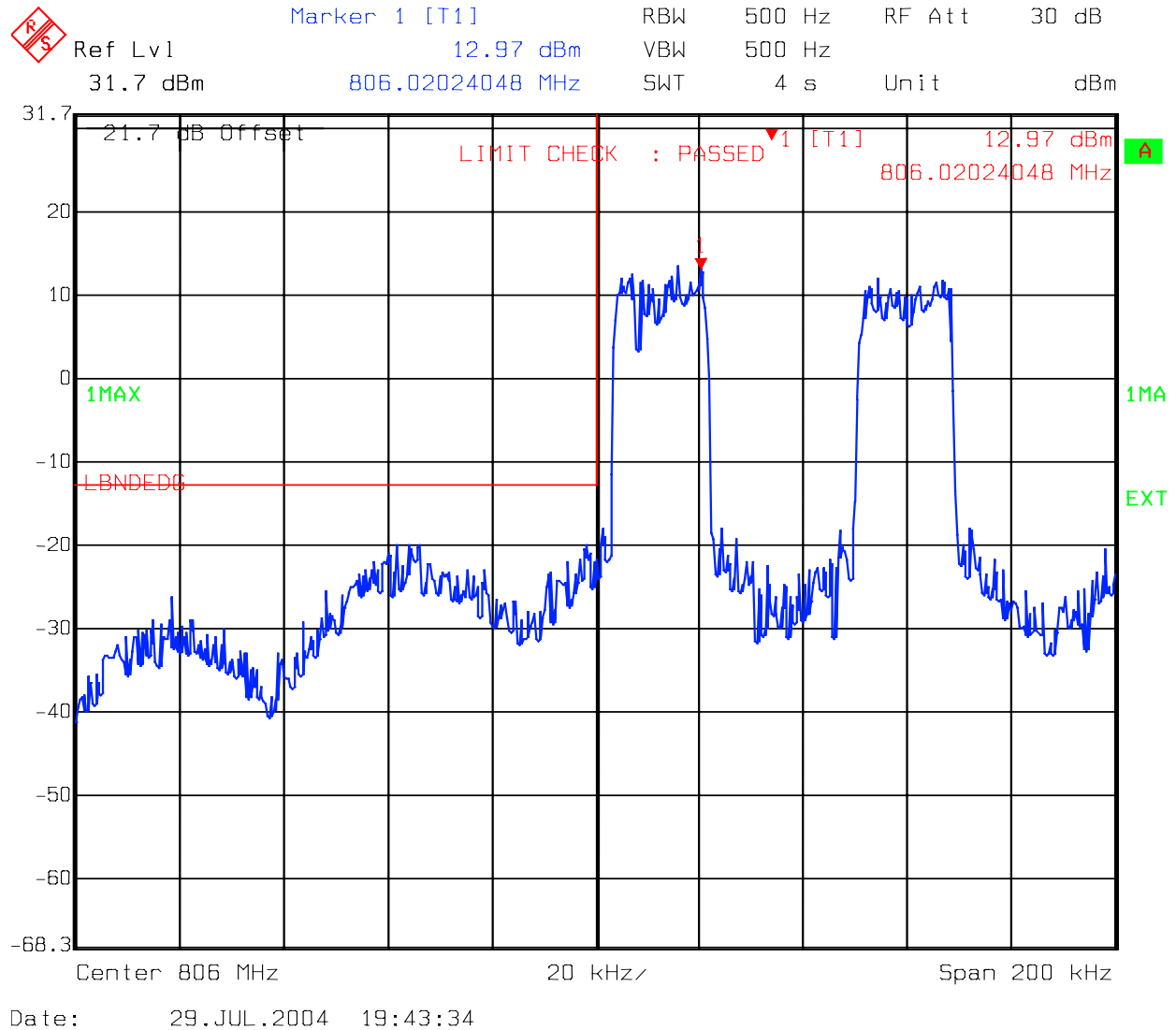
Downlink - Upper iDEN



EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

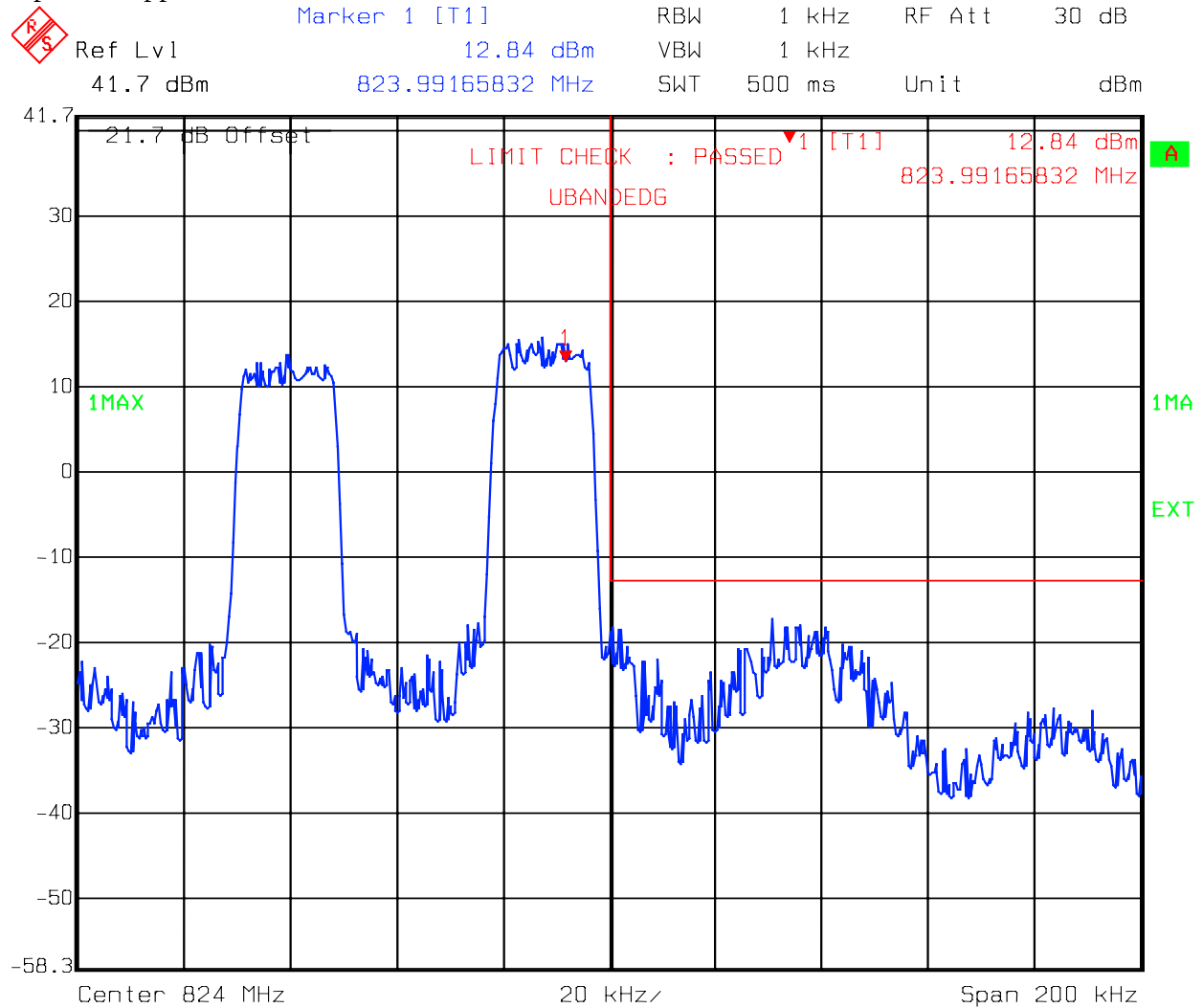
Uplink - Lower iDEN



EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Upper iDEN

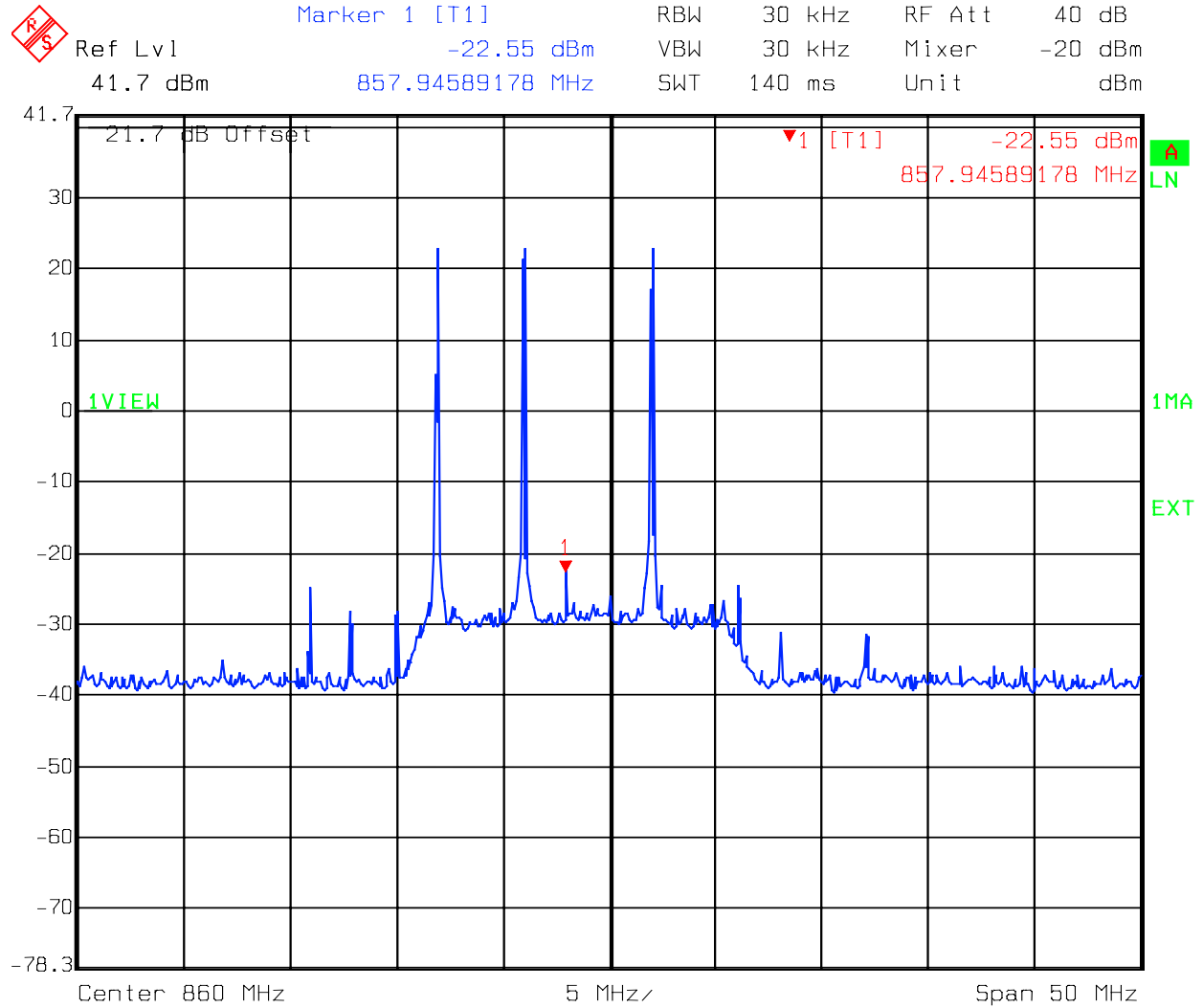


Date: 29.JUL.2004 20:06:21

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink – 3 Signal Intermodulation, Analogue
22.5 dBm/carrier



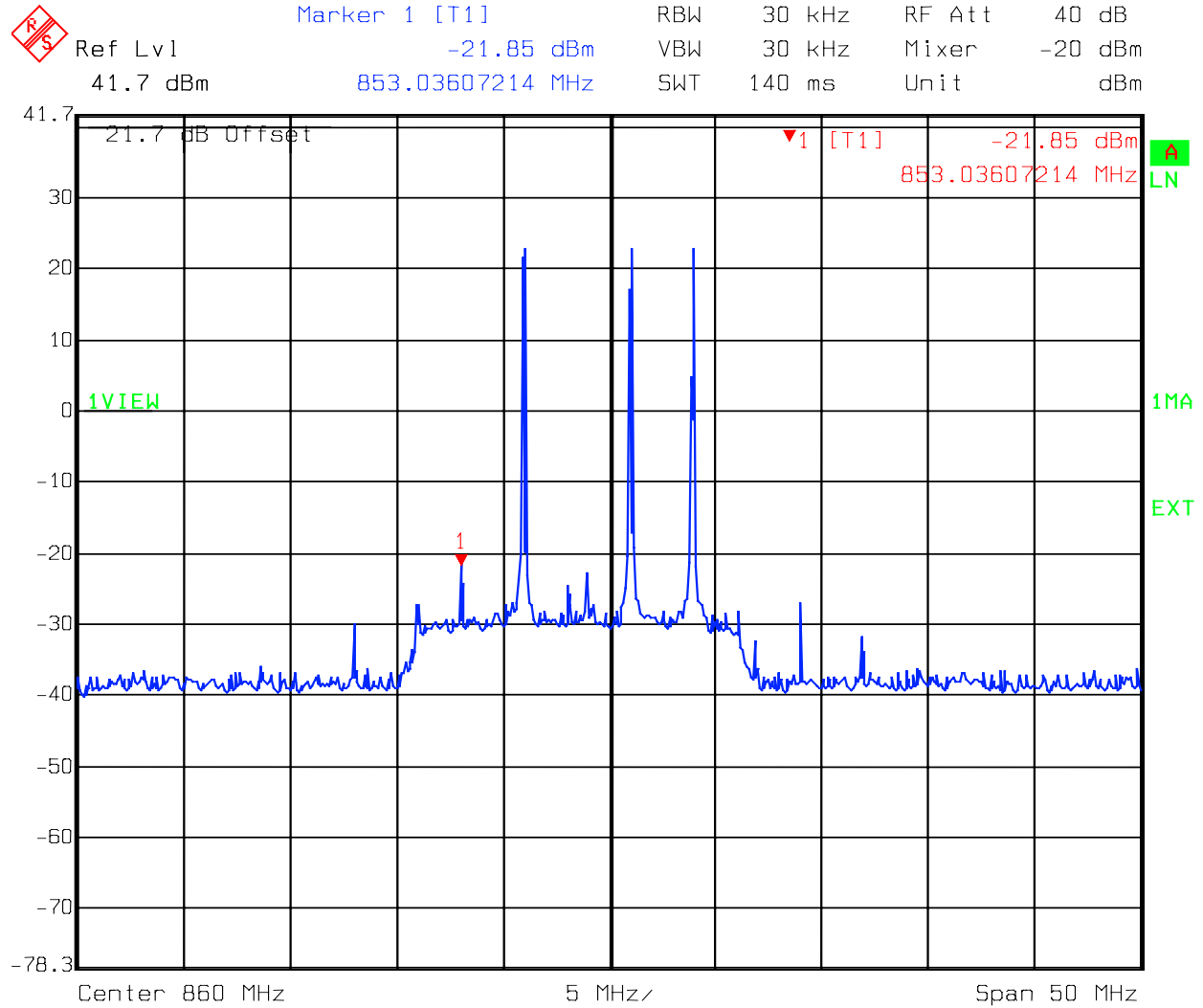
Date: 30.JUL.2004 00:42:29

851.9375 MHz, 856.0125 MHz, 862.0125 MHz

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink – 3 Signal Intermodulation, Analogue
22.5 dBm/carrier



Date: 30.JUL.2004 00:38:31

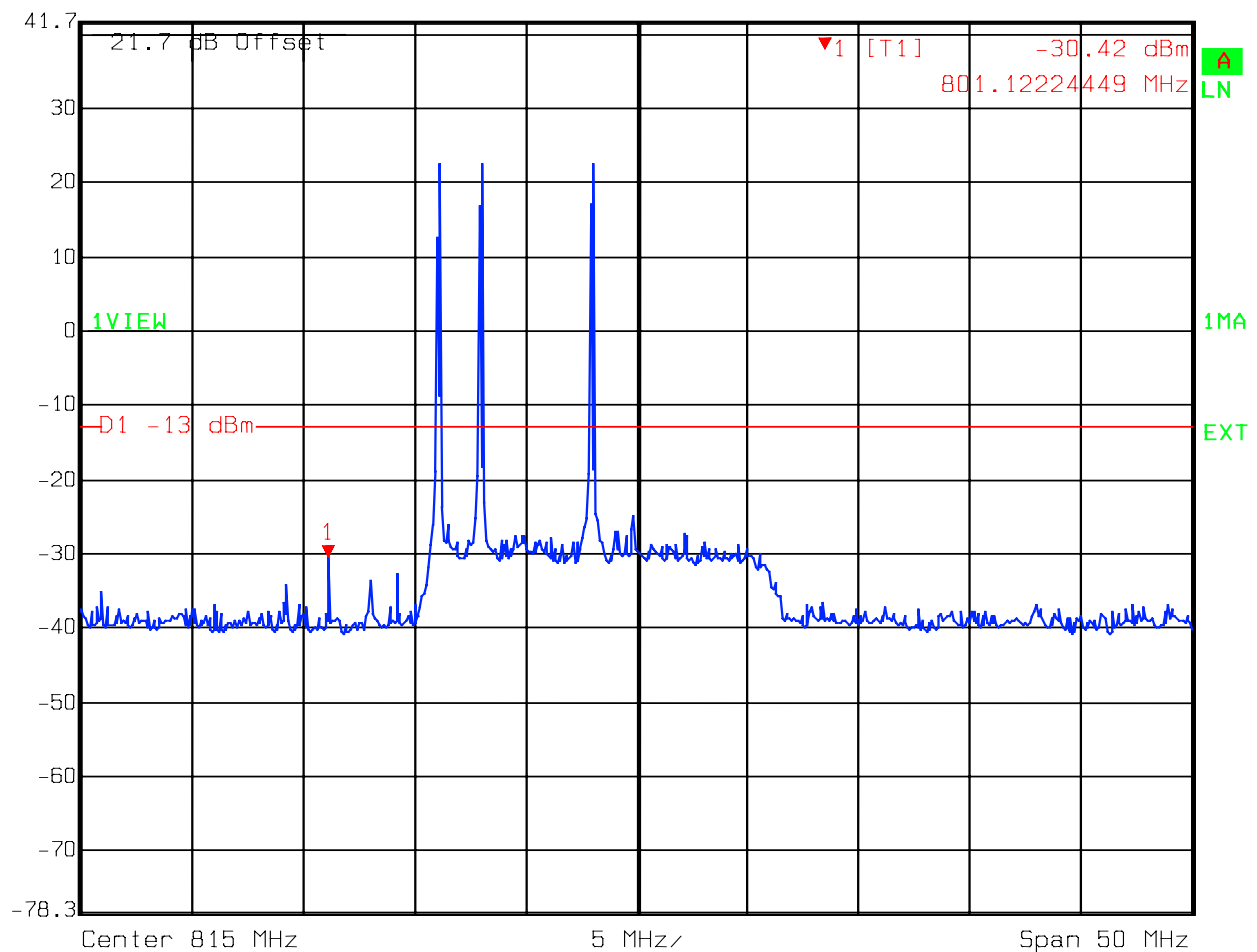
856.0125 MHz, 863.9375 MHz, 861.0125 MHz

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink – 3 Signal Intermodulation, Analogue
22.5 dBm/carrier
806.0125 MHz, 808.0125 MHz, 813.0125 MHz

	Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	40 dB
	41.7 dBm	-30.42 dBm	VBW	30 kHz	Mixer	-20 dBm
		801.12224449 MHz	SWT	140 ms	Unit	dBm



Date: 30.JUL.2004 01:39:09

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

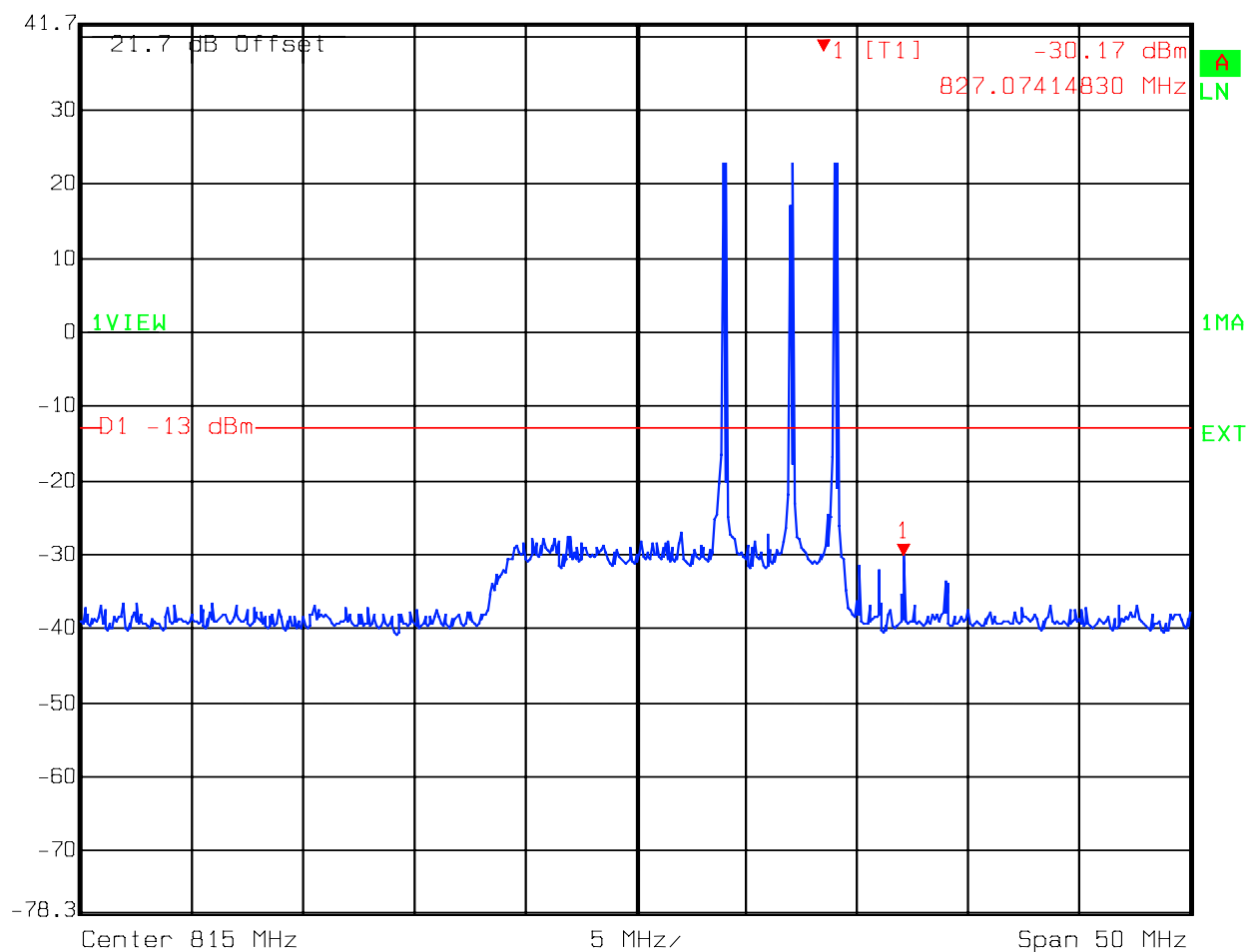
Uplink – 3 Signal Intermodulation, Analogue

22.5 dBm/carrier

818.9875 MHz, 822.0125 MHz, 823.9875 MHz



Ref Lvl	Marker 1 [T1]	RBW	30 kHz	RF Att	40 dB
41.7 dBm	-30.17 dBm	VBW	30 kHz	Mixer	-20 dBm
	827.07414830 MHz	SWT	140 ms	Unit	dBm



Date: 30.JUL.2004 01:45:54

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

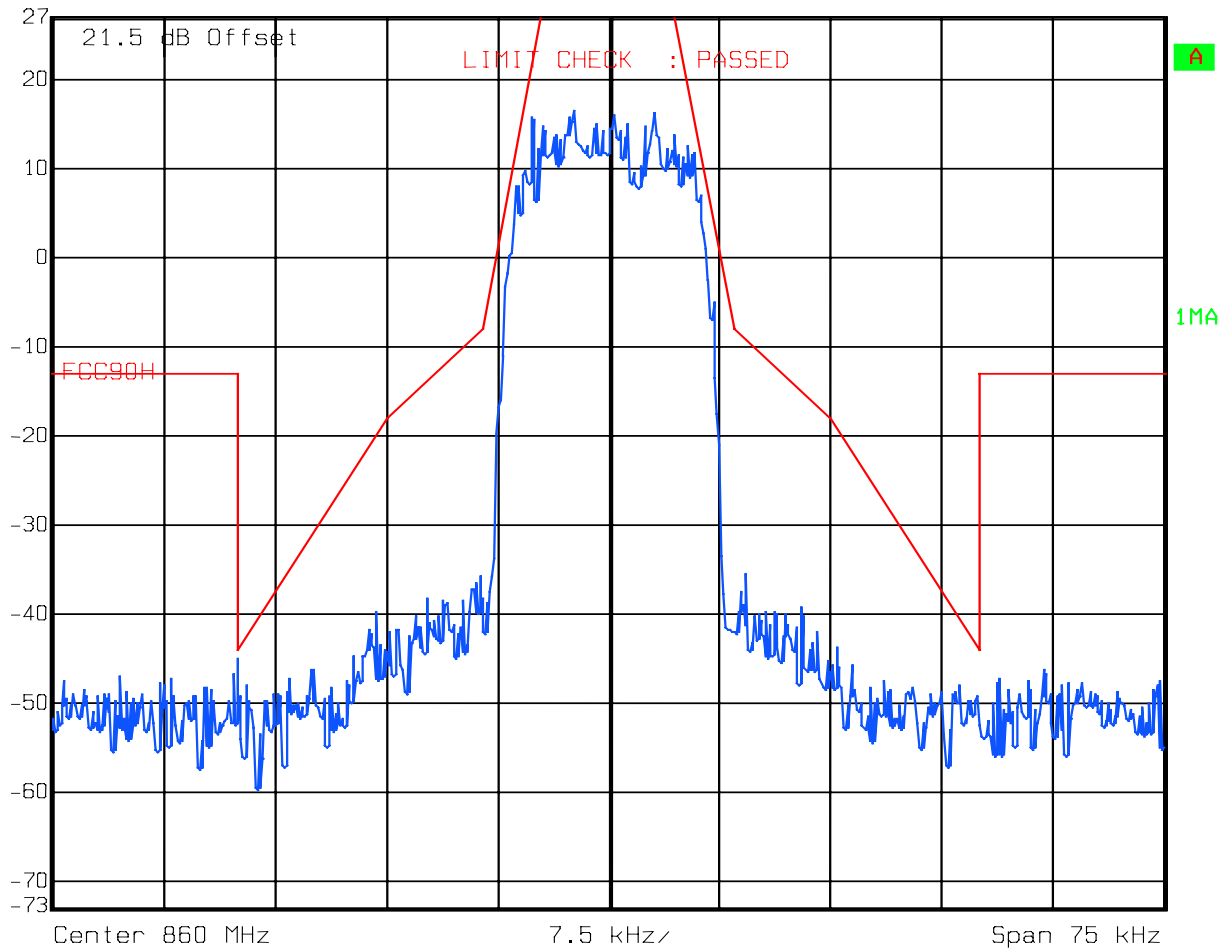
Spectral Mask

Downlink - iDEN



Ref Lvl
27 dBm

RBW 300 Hz RF Att 20 dB
VBW 300 Hz
SWT 4.2 s Unit dBm



Date: 06.OCT.2004 13:09:34

EQUIPMENT: MR803P-TR Repeater

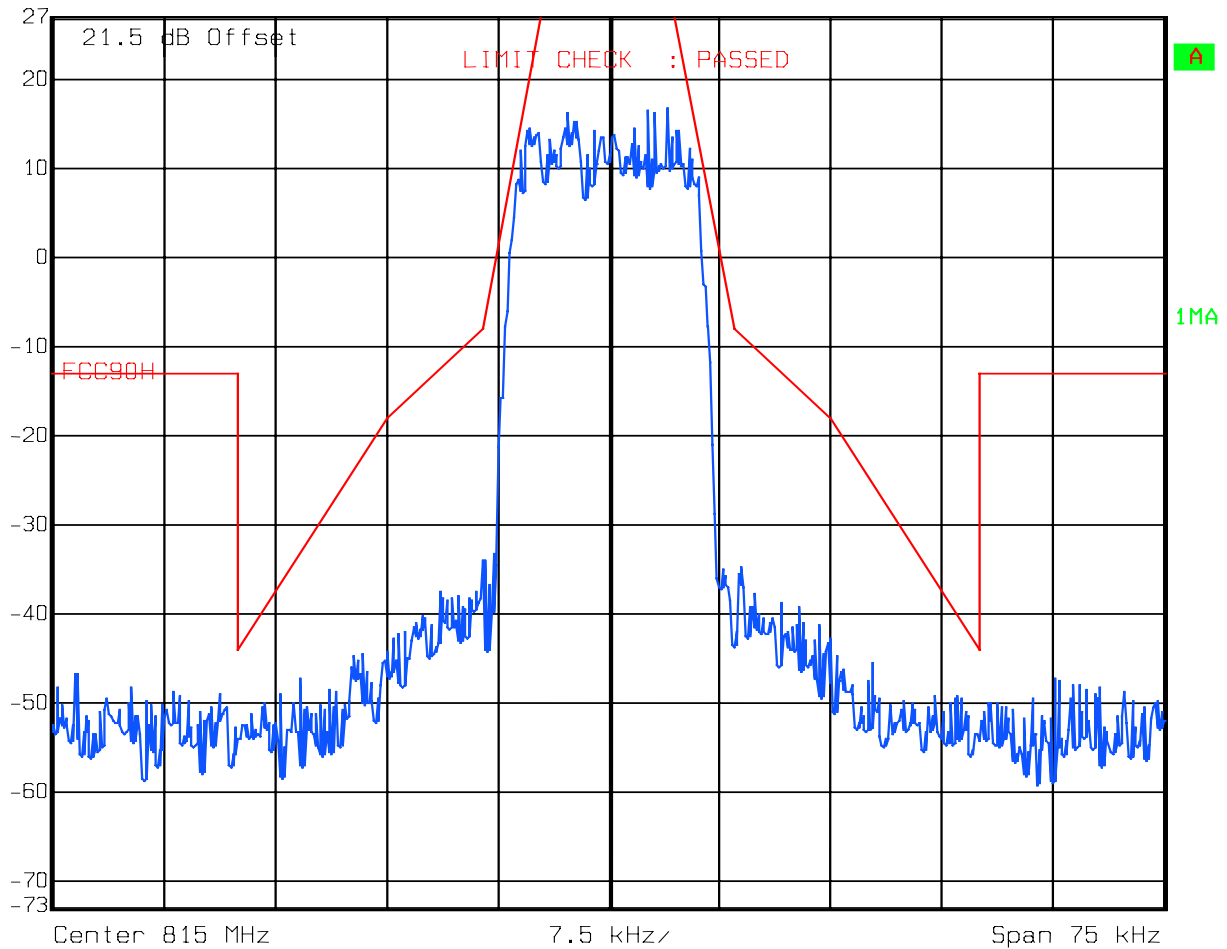
PROJECT NO.: 4L0457R

Uplink - iDEN



Ref Lvl
27 dBm

RBW 300 Hz RF Att 20 dB
VBW 300 Hz
SWT 4.2 s Unit dBm



Date: 06.OCT.2004 12:51:21

EQUIPMENT: MR803P-TR Repeater

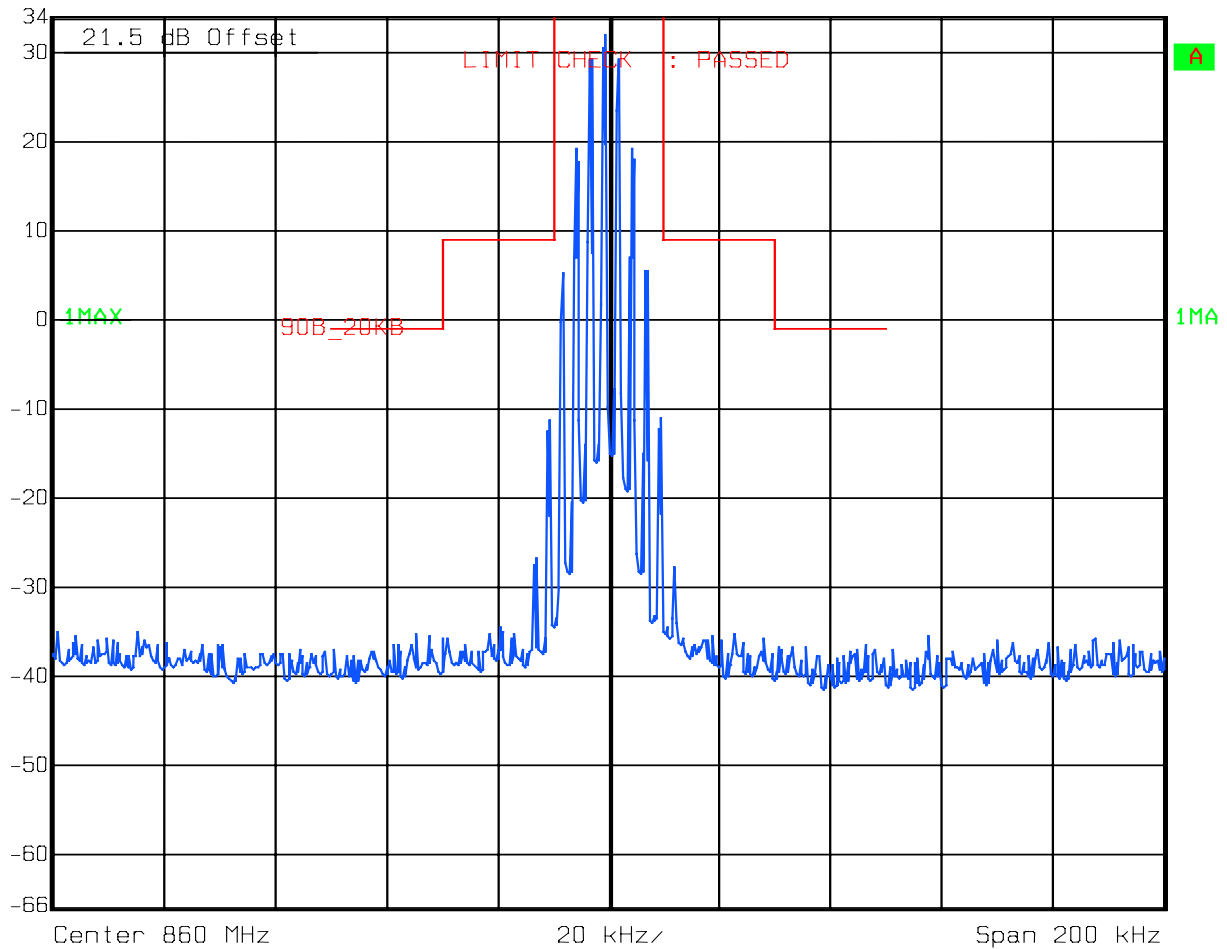
PROJECT NO.: 4L0457R

Downlink - Analog



Ref Lvl
34 dBm

RBW 300 Hz RF Att 30 dB
VBW 300 Hz
SWT 11.5 s Unit dBm



Date: 05.OCT.2004 15:13:18

Nemko USA

FCC PART 90, SUBPART I
PRIVATE LAND MOBILE REPEATER

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: **4L0457R**

Uplink – iDEN

EQUIPMENT: MR803P-TR Repeater

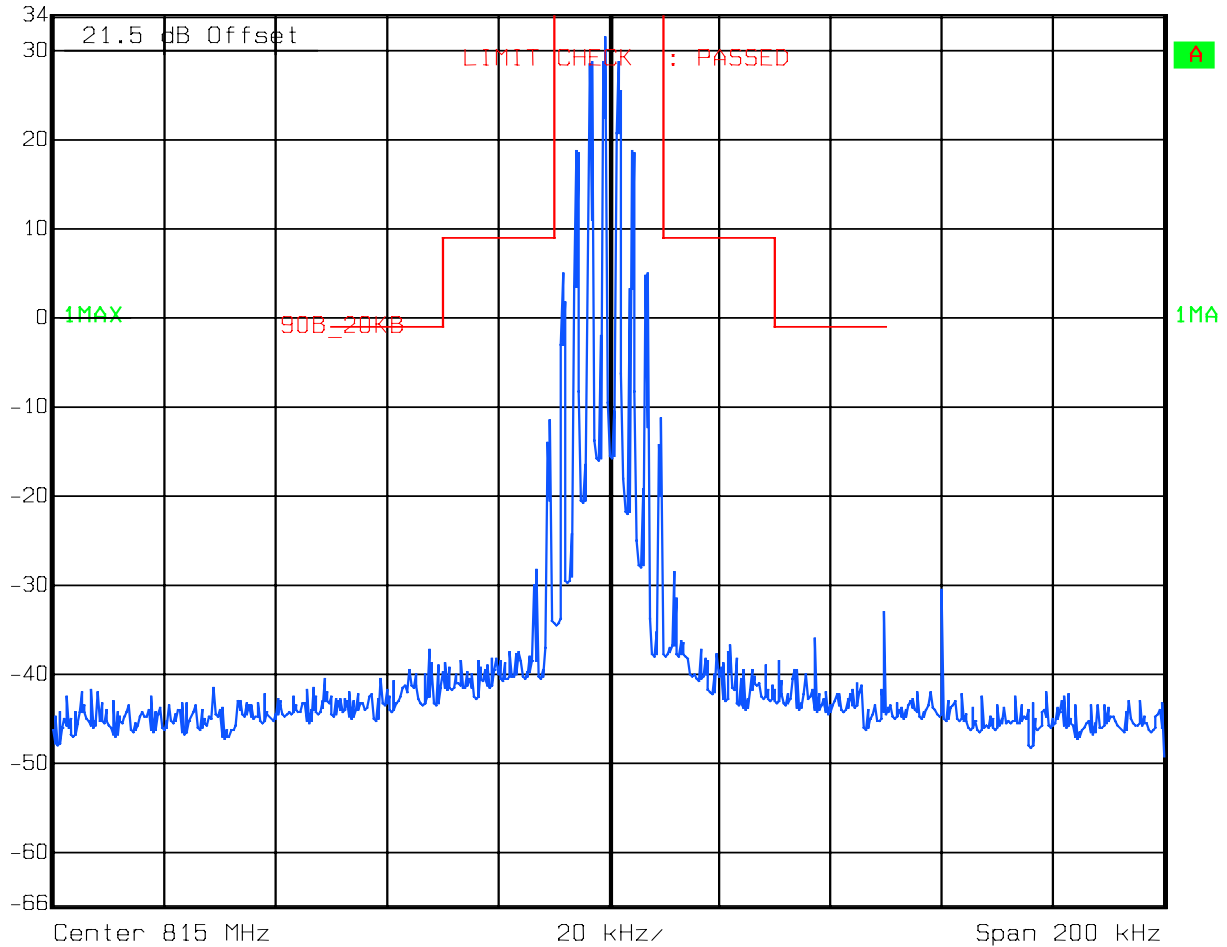
PROJECT NO.: 4L0457R

Uplink - Analog



Ref Lvl
34 dBm

RBW 300 Hz RF Att 30 dB
VBW 300 Hz
SWT 11.5 s Unit dBm



Date: 05.OCT.2004 15:17:06

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.991
TESTED BY: Dustin Oaks	DATE: 07/28/2004

Test Results: Complies

Test Data: See attached graph(s).

Equipment Used: 1036, 1053, 1627, 1471, 1973, 1092

Measurement Uncertainty: +/- 1.6 dB

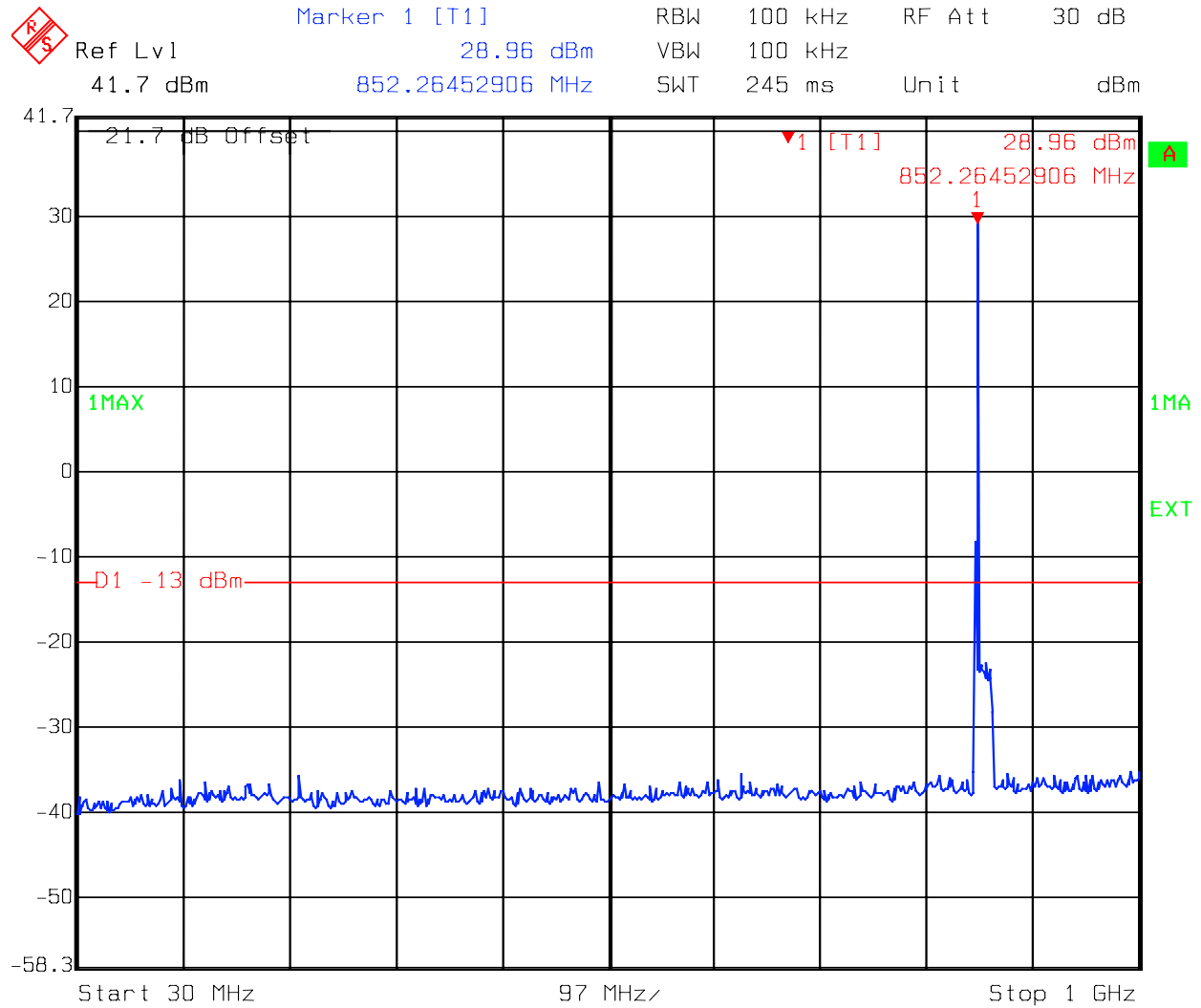
Temperature: 21 °C

Relative Humidity: 51 %

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Low Channel iDEN

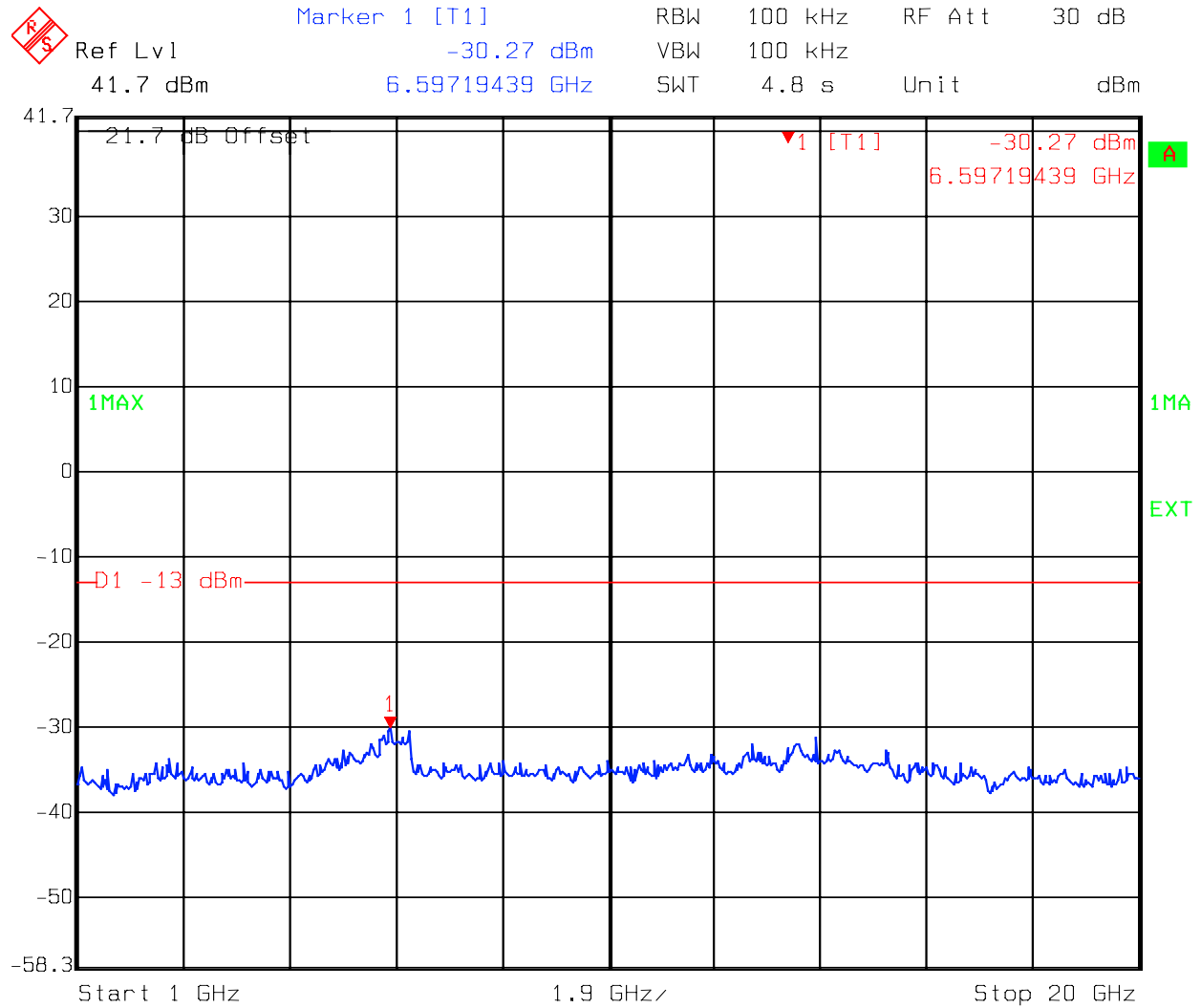


Date: 29.JUL.2004 19:27:34

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Low Channel iDEN

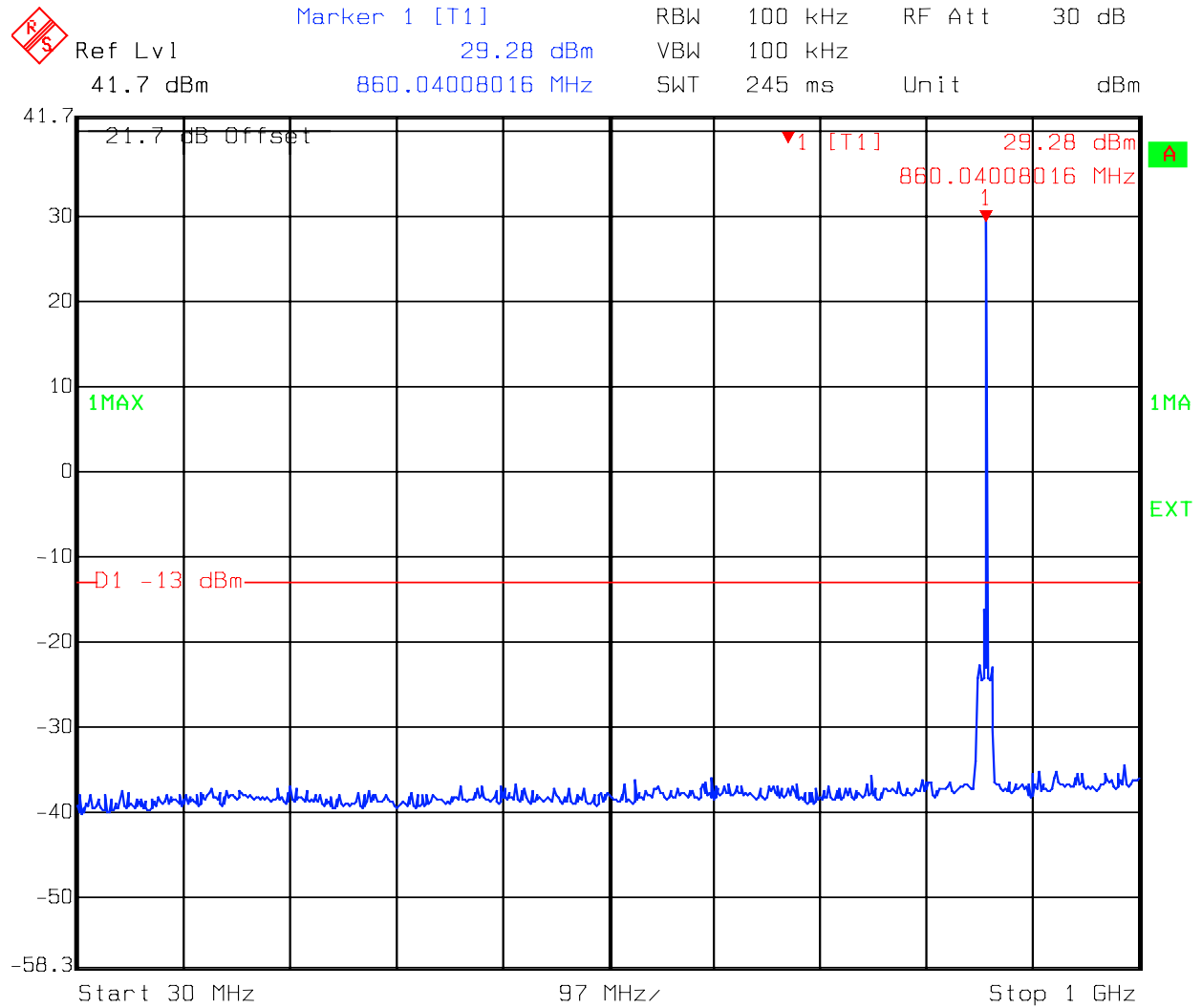


Date: 29.JUL.2004 19:28:01

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Mid Channel iDEN

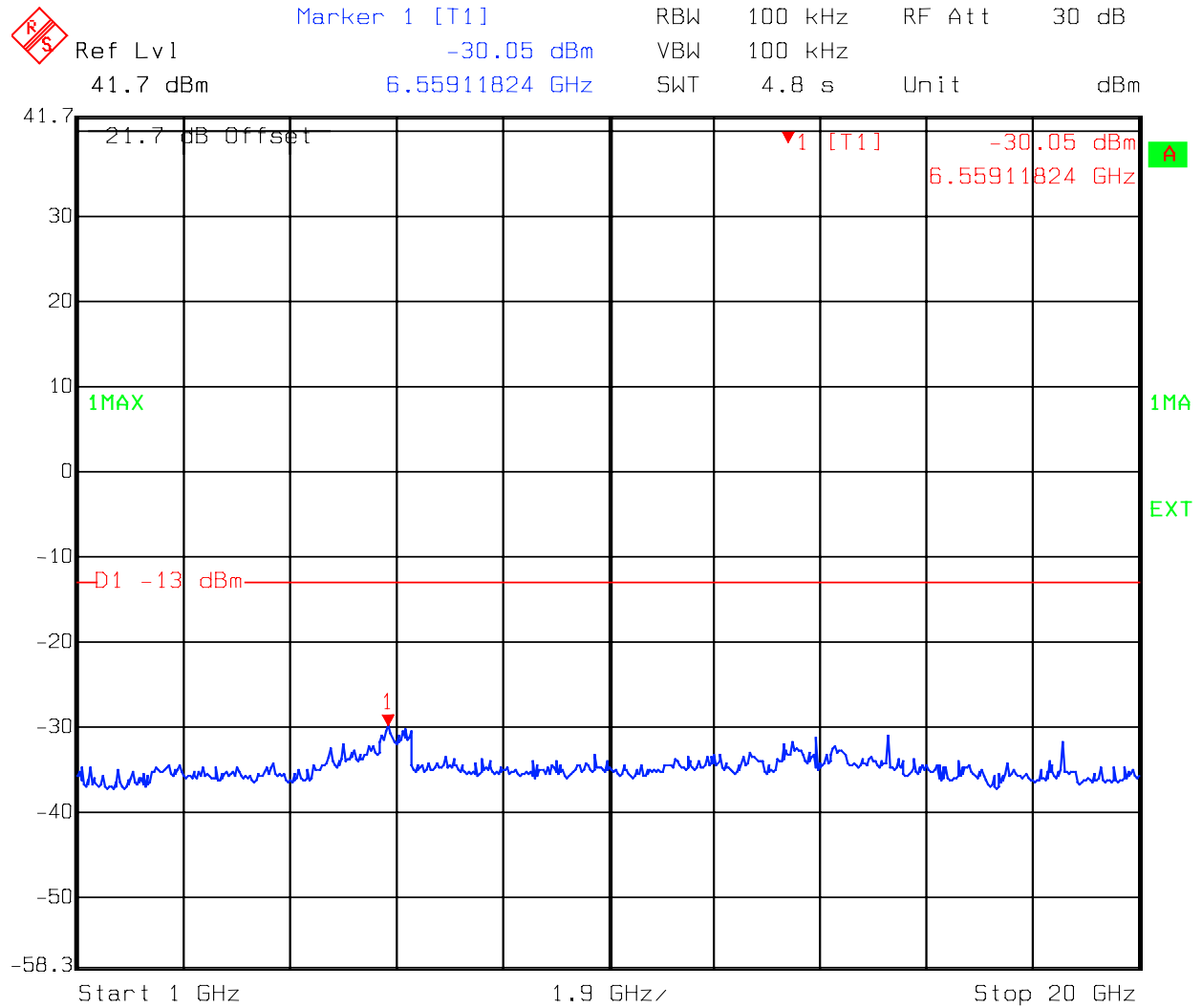


Date: 29.JUL.2004 19:26:58

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Mid Channel iDEN

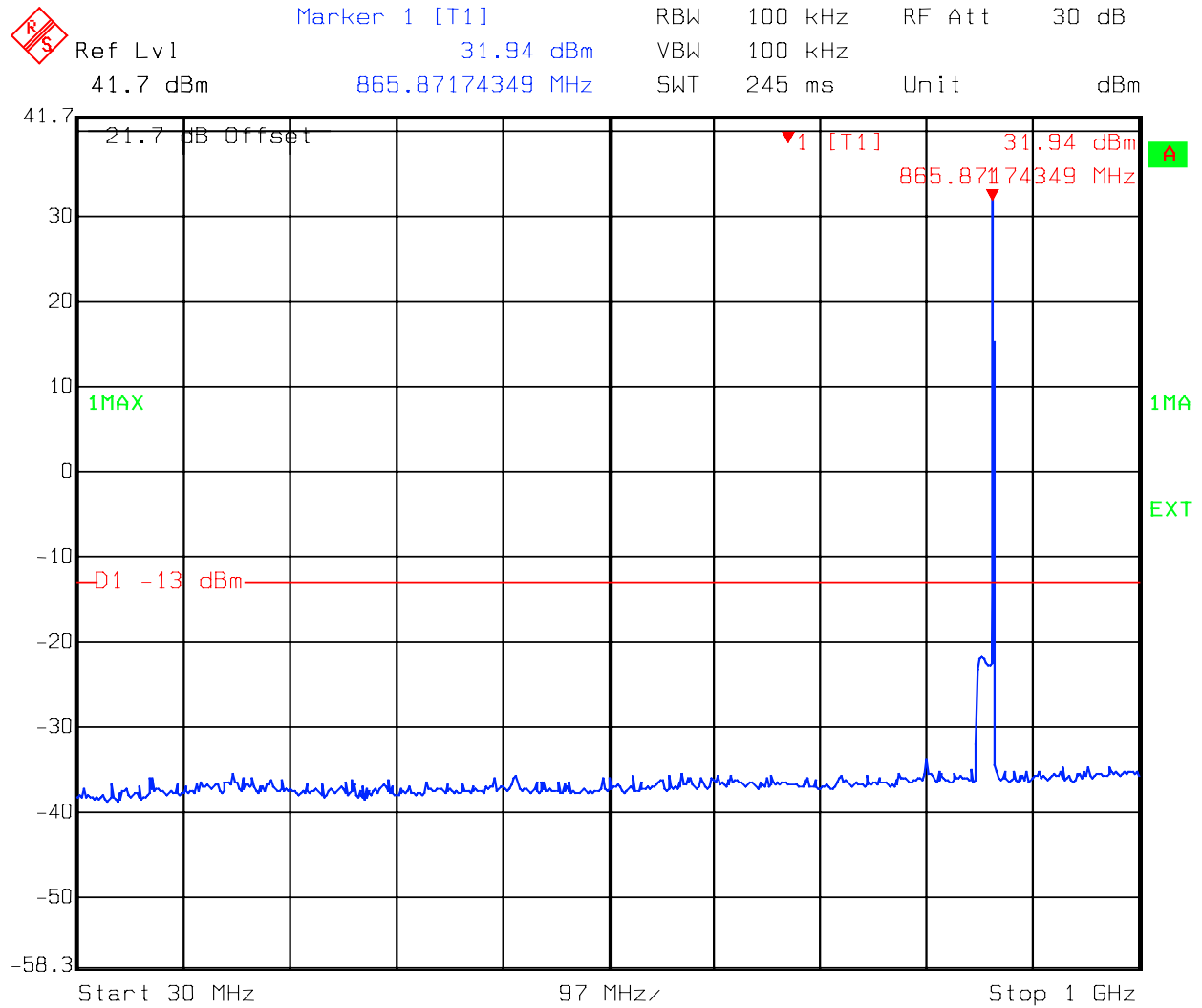


Date: 29.JUL.2004 19:26:27

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Upper Channel iDEN

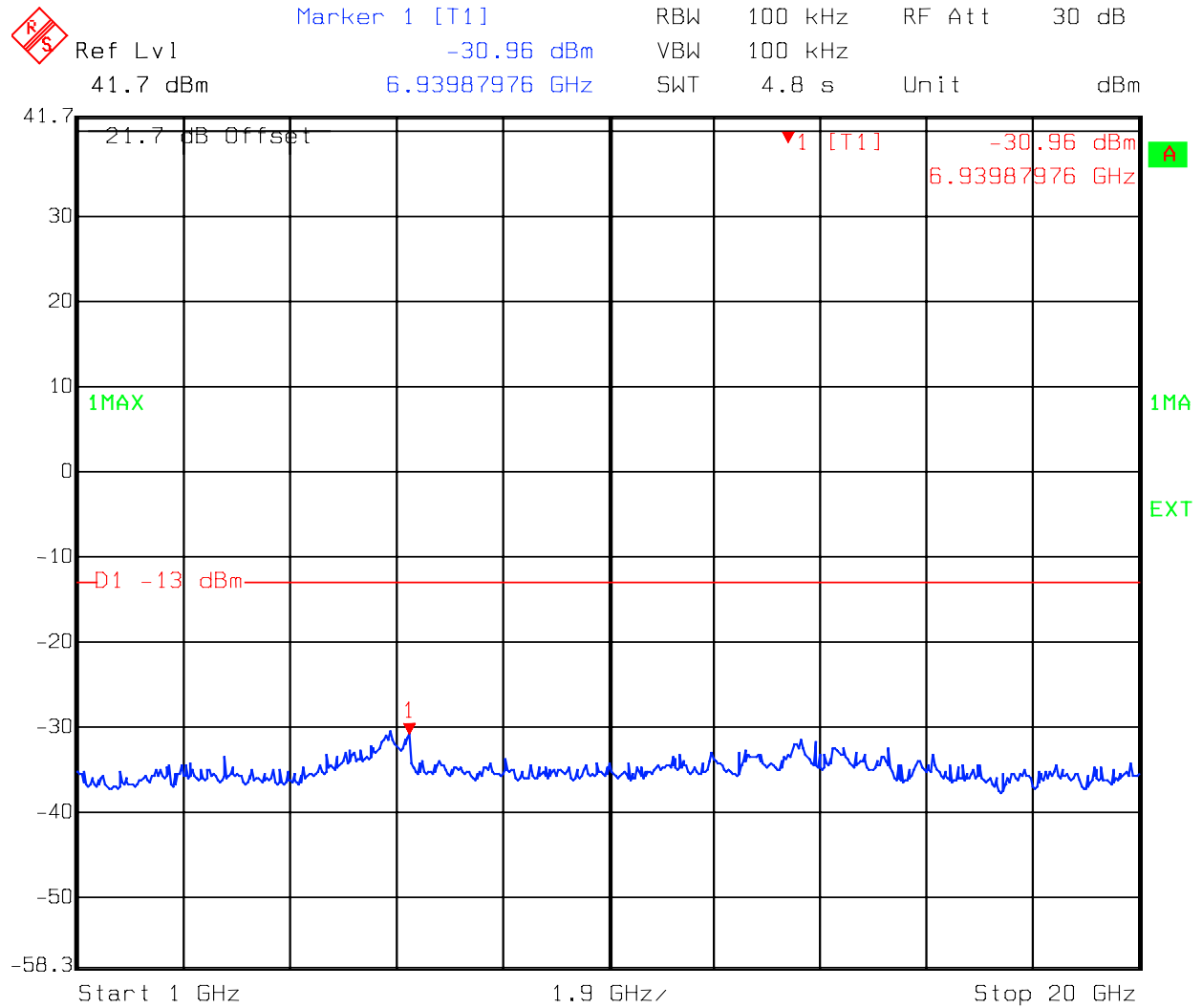


Date: 29.JUL.2004 19:24:59

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Upper Channel iDEN

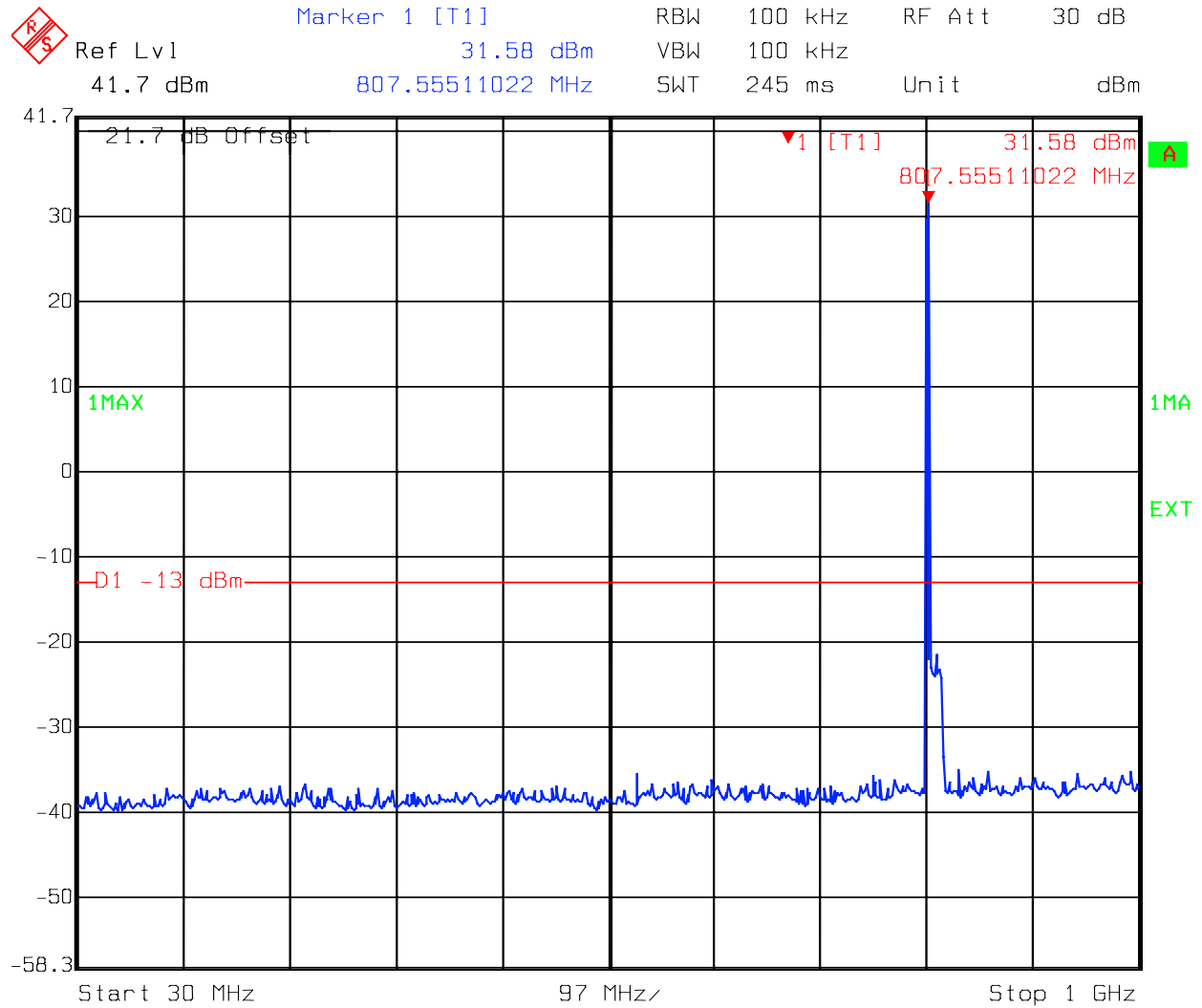


Date: 29.JUL.2004 19:25:22

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Lower Channel iDEN

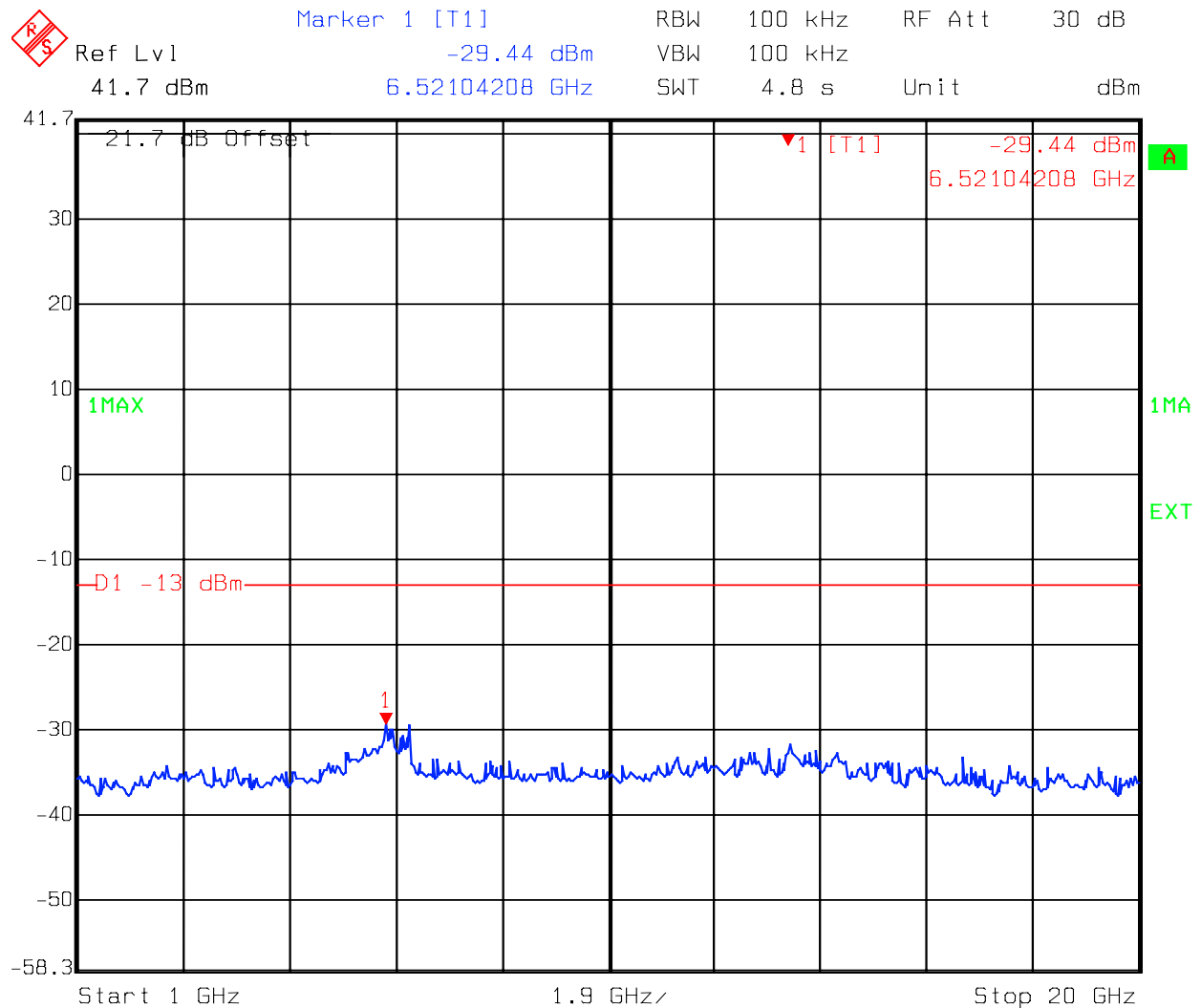


Date: 29.JUL.2004 19:58:13

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Lower Channel iDEN

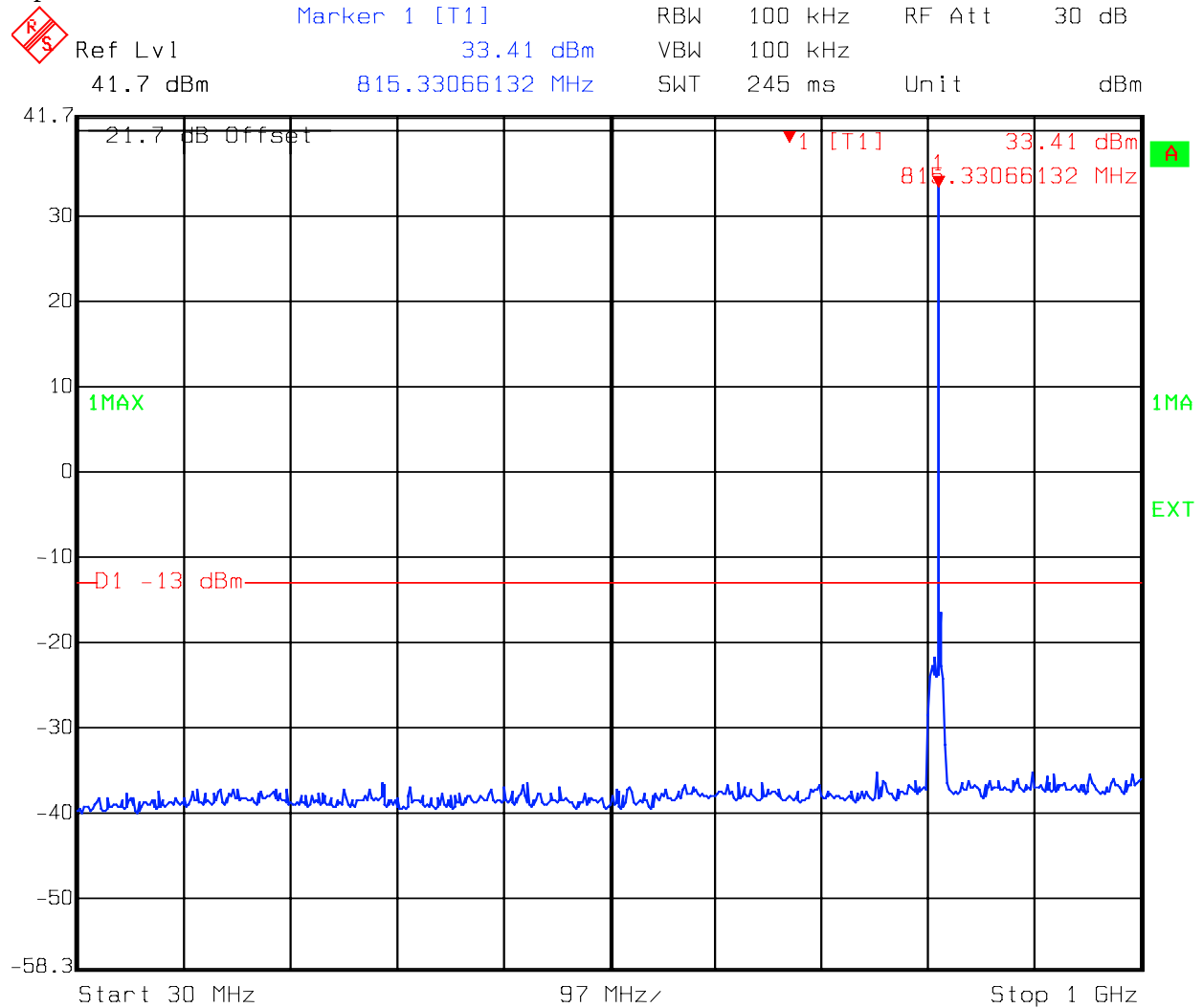


Date: 29.JUL.2004 19:58:38

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Mid Channel iDEN

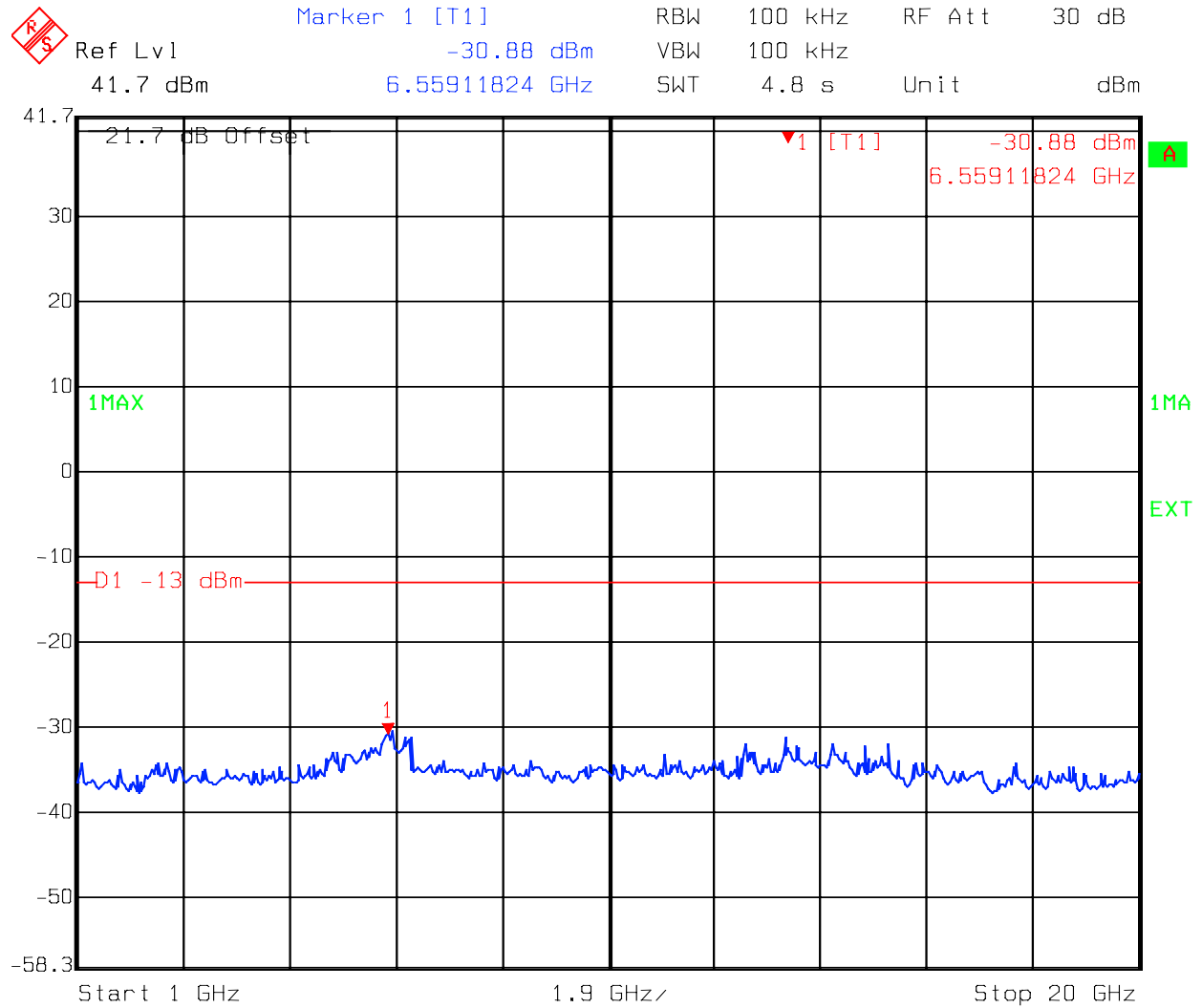


Date: 29.JUL.2004 19:56:51

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Mid Channel iDEN

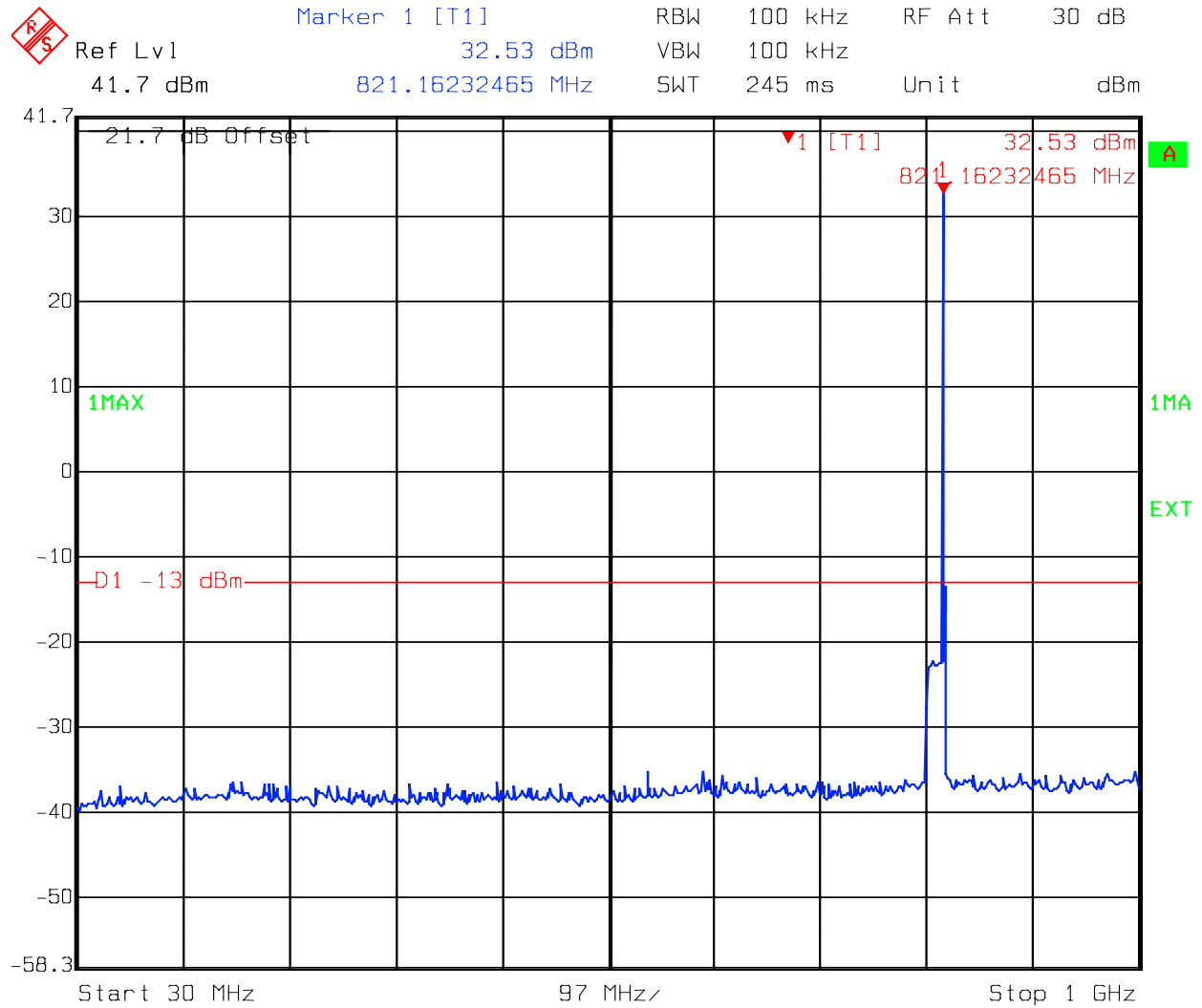


Date: 29.JUL.2004 19:57:16

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Upper Channel iDEN

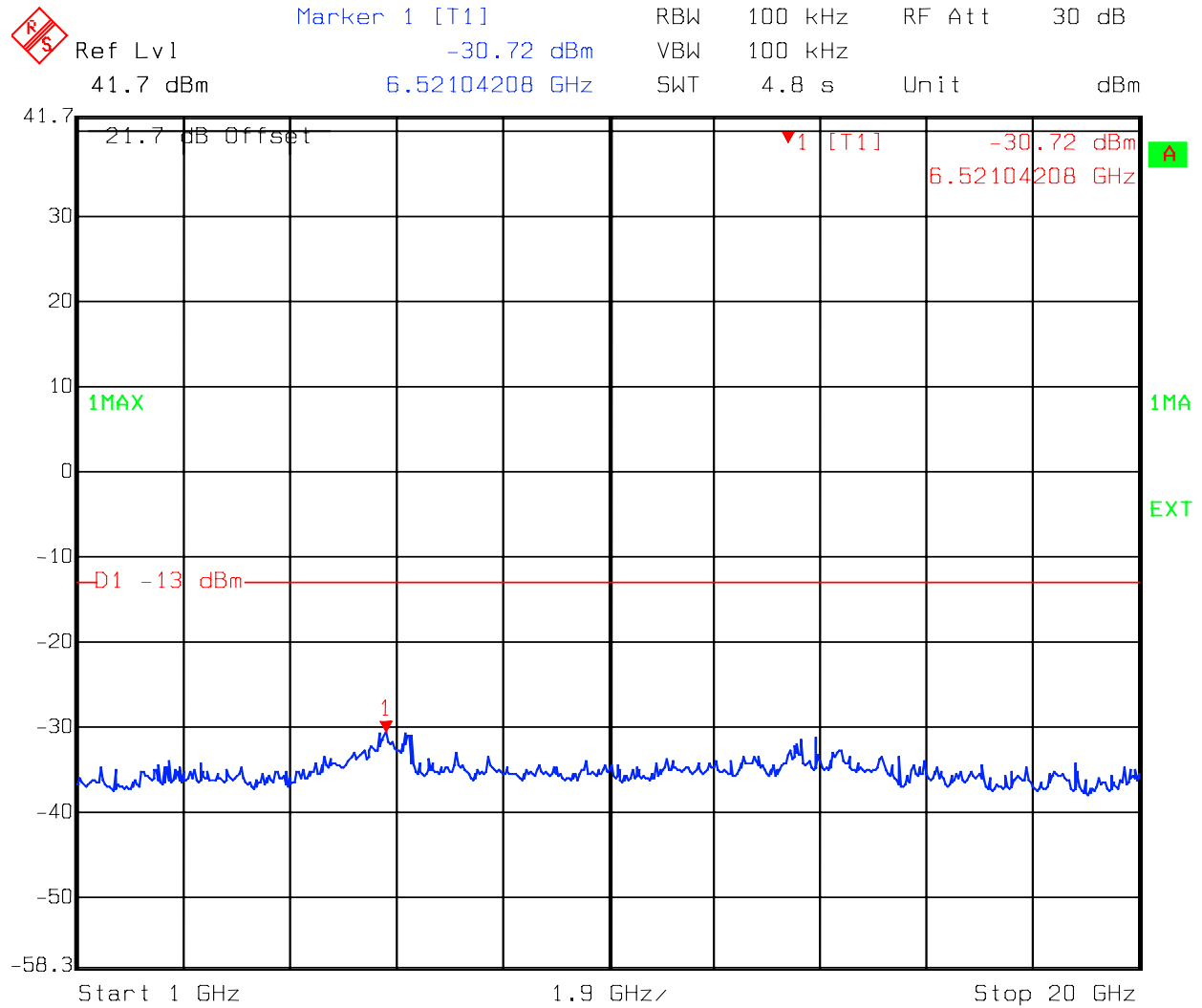


Date: 29.JUL.2004 19:55:38

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink - Upper Channel iDEN

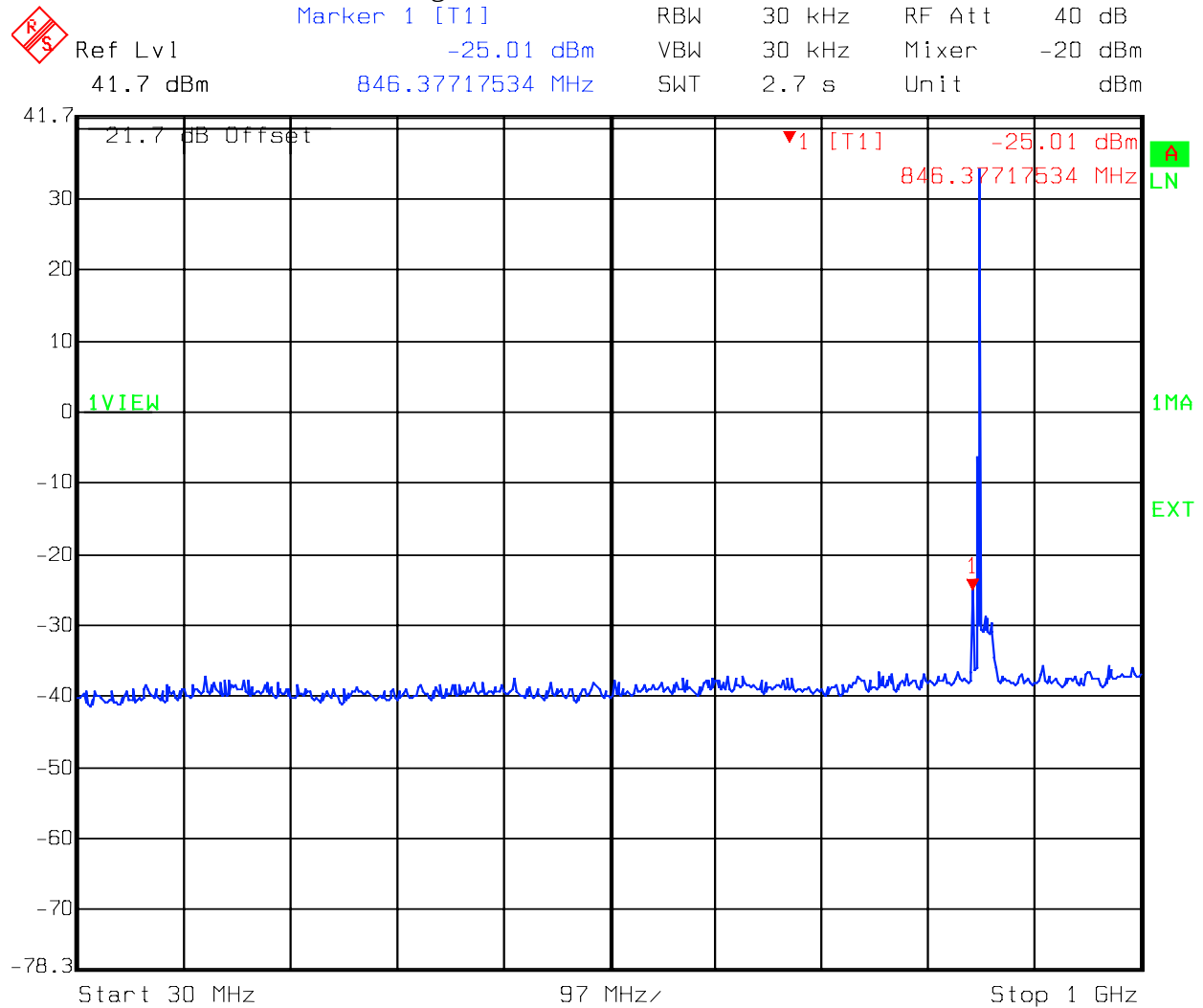


Date: 29.JUL.2004 19:56:06

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Lower Channel Analog

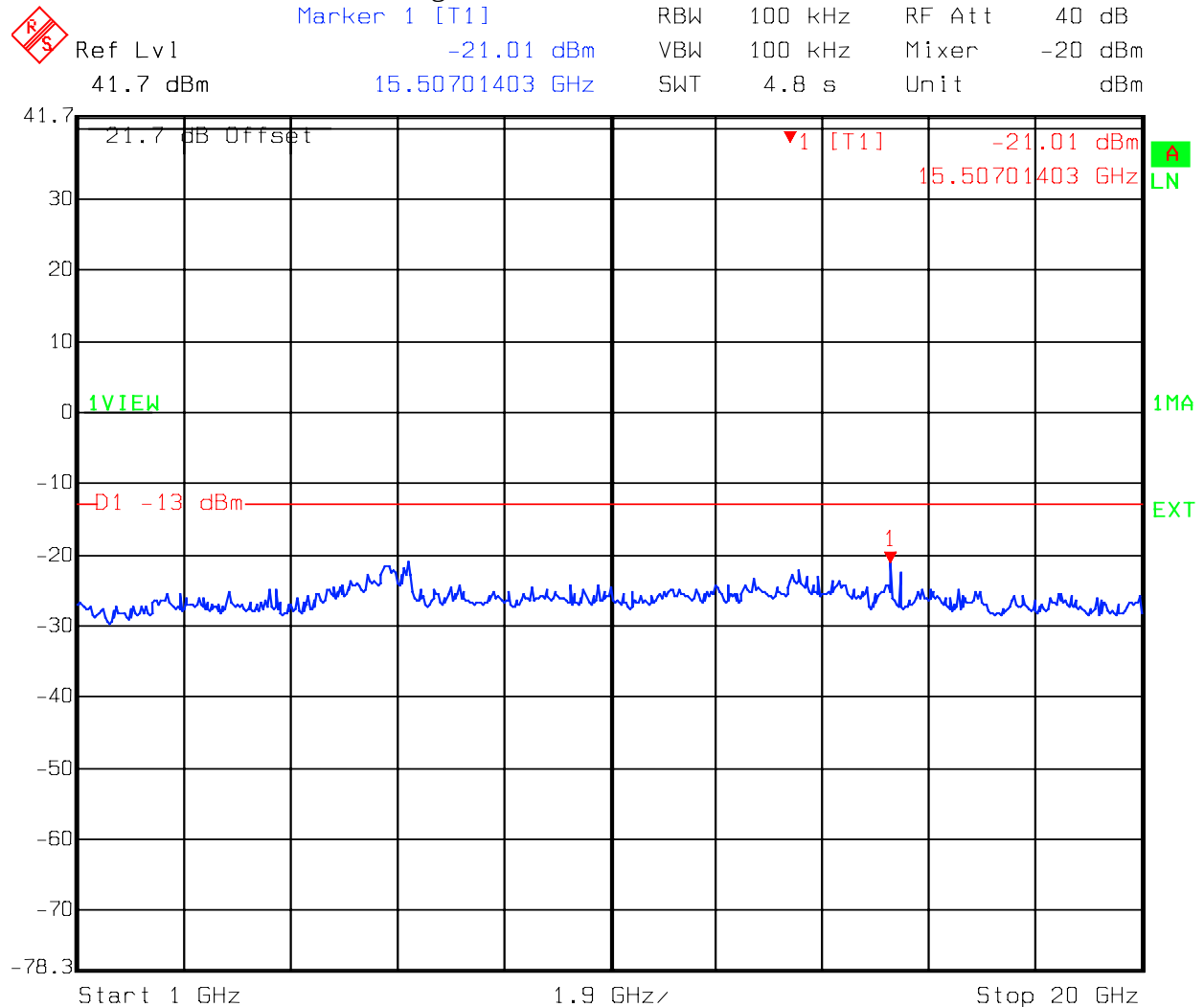


Date: 30.JUL.2004 00:59:41

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Lower Channel Analog

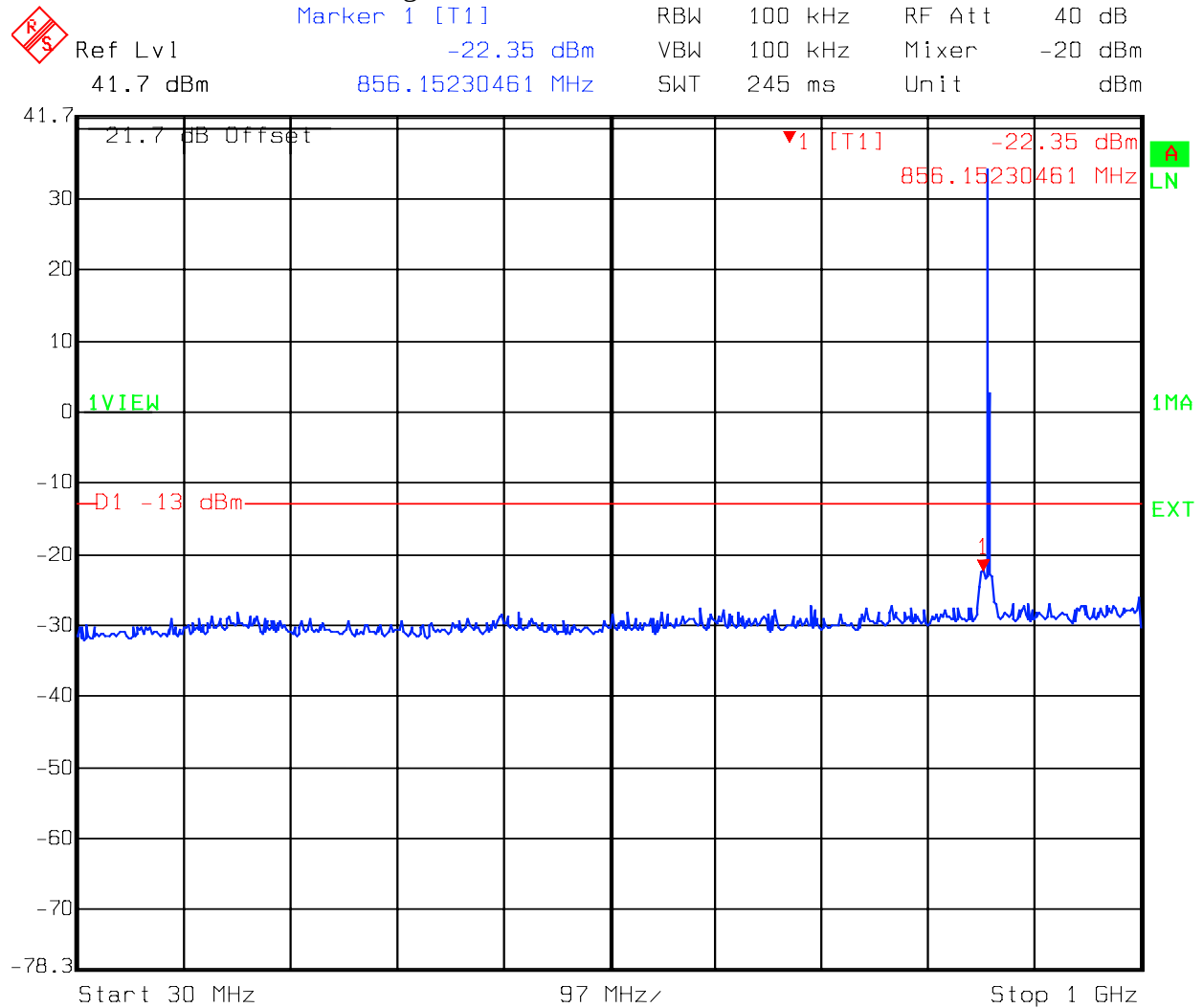


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EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Mid Channel Analog

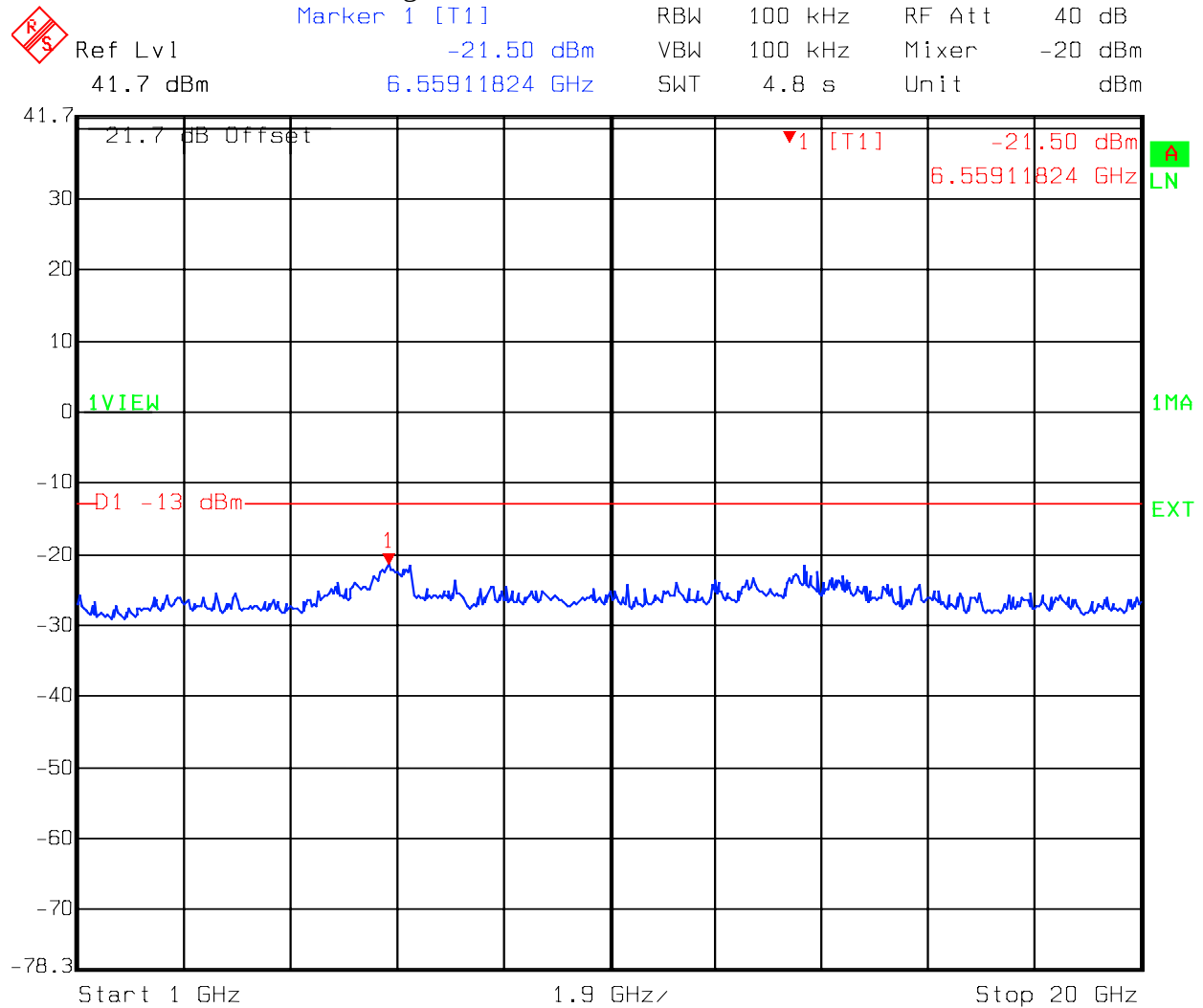


Date: 30.JUL.2004 01:08:01

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Mid Channel Analog

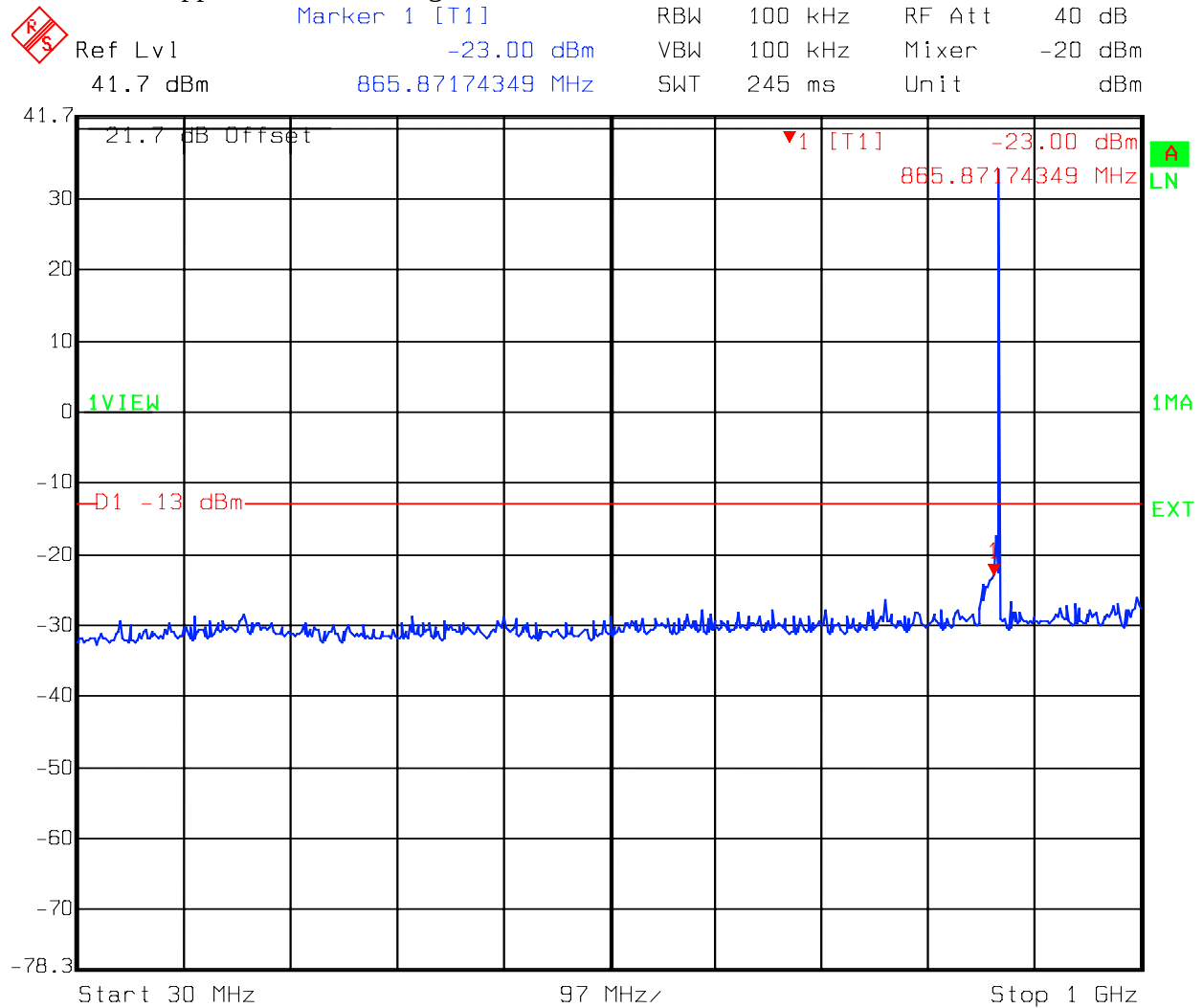


Date: 30.JUL.2004 01:06:33

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Upper Channel Analog

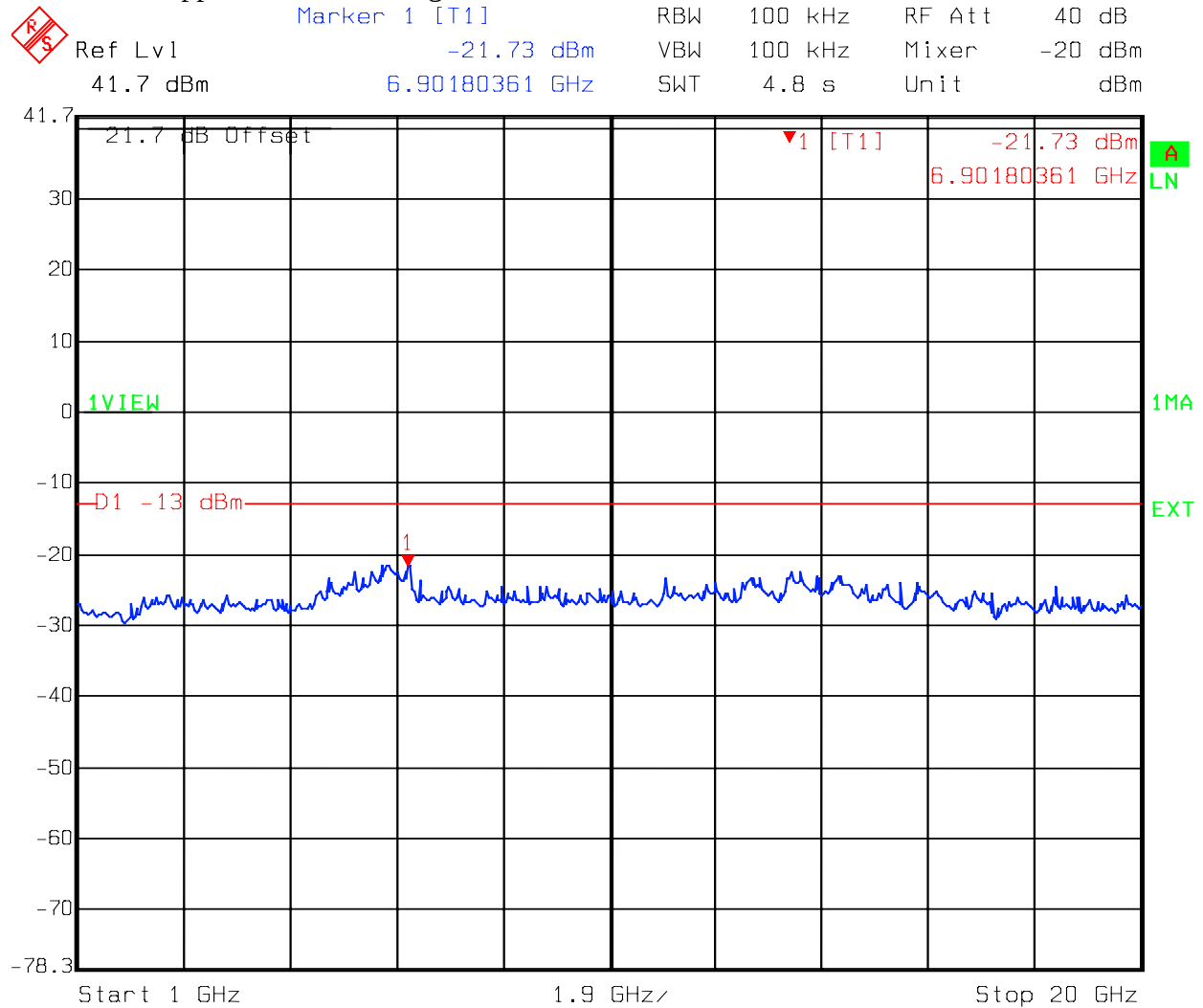


Date: 30.JUL.2004 01:12:25

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Downlink - Upper Channel Analog

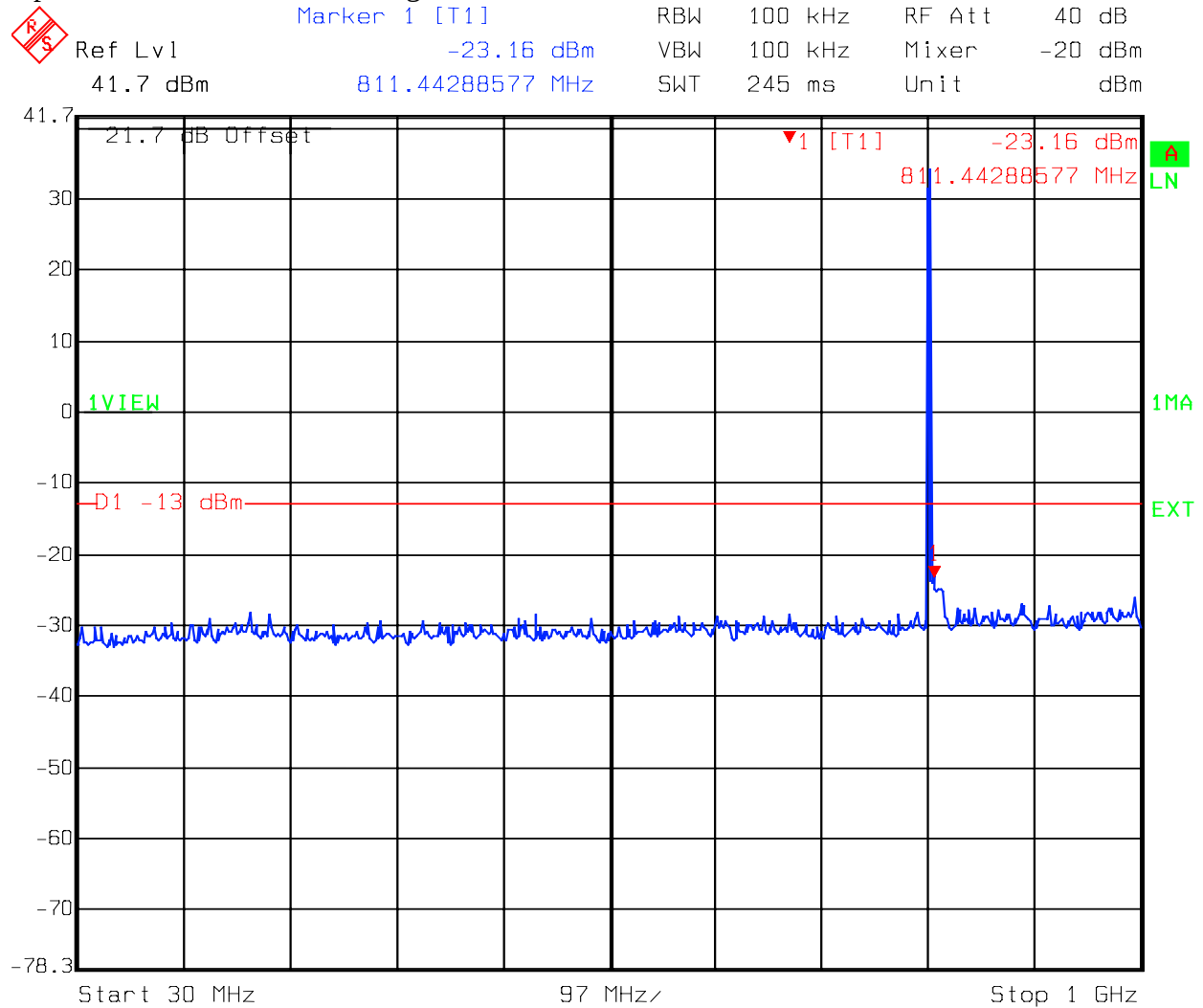


Date: 30.JUL.2004 01:13:11

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink – Lower Channel, Analogue

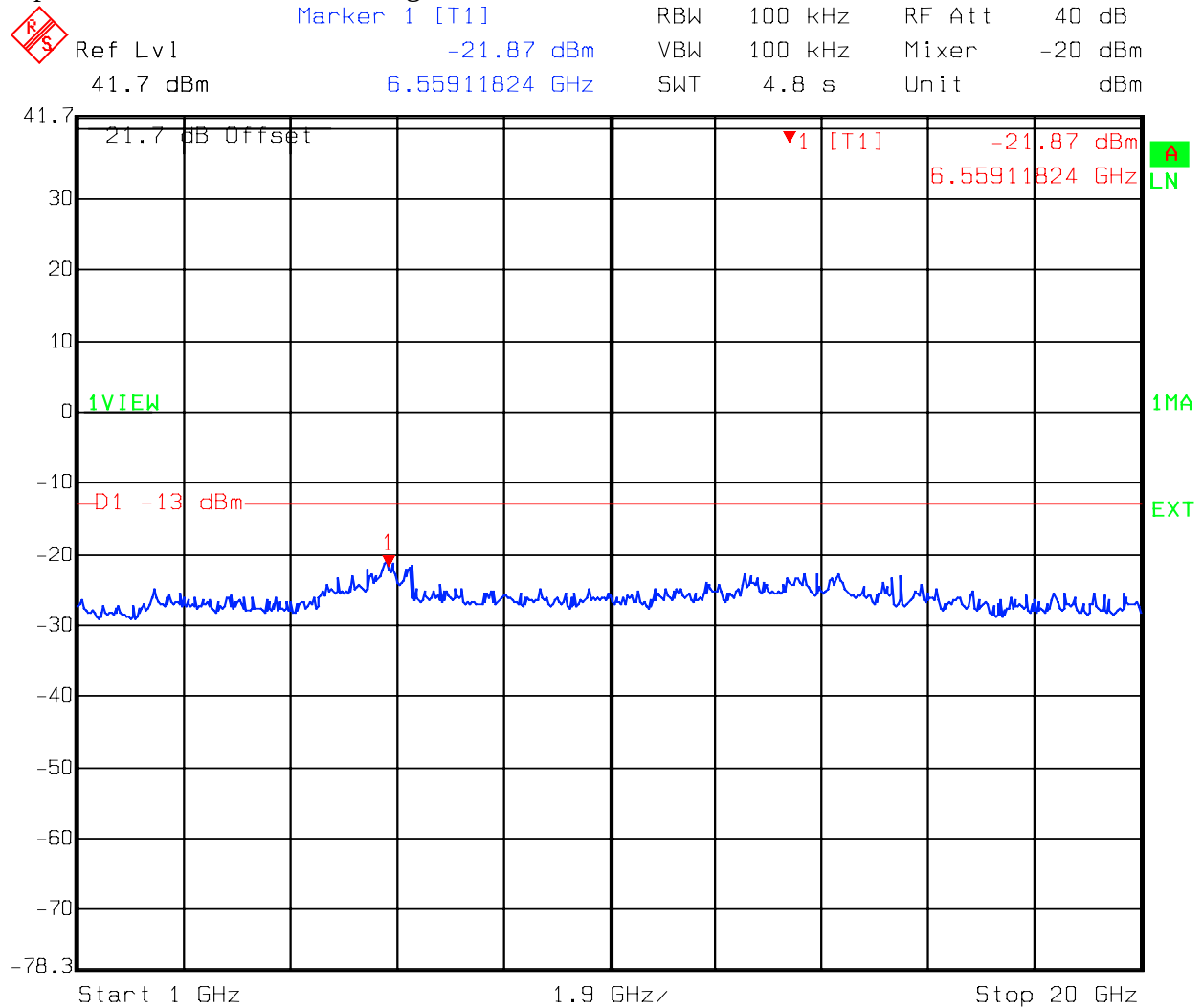


Date: 30.JUL.2004 01:27:18

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink – Lower Channel, Analogue

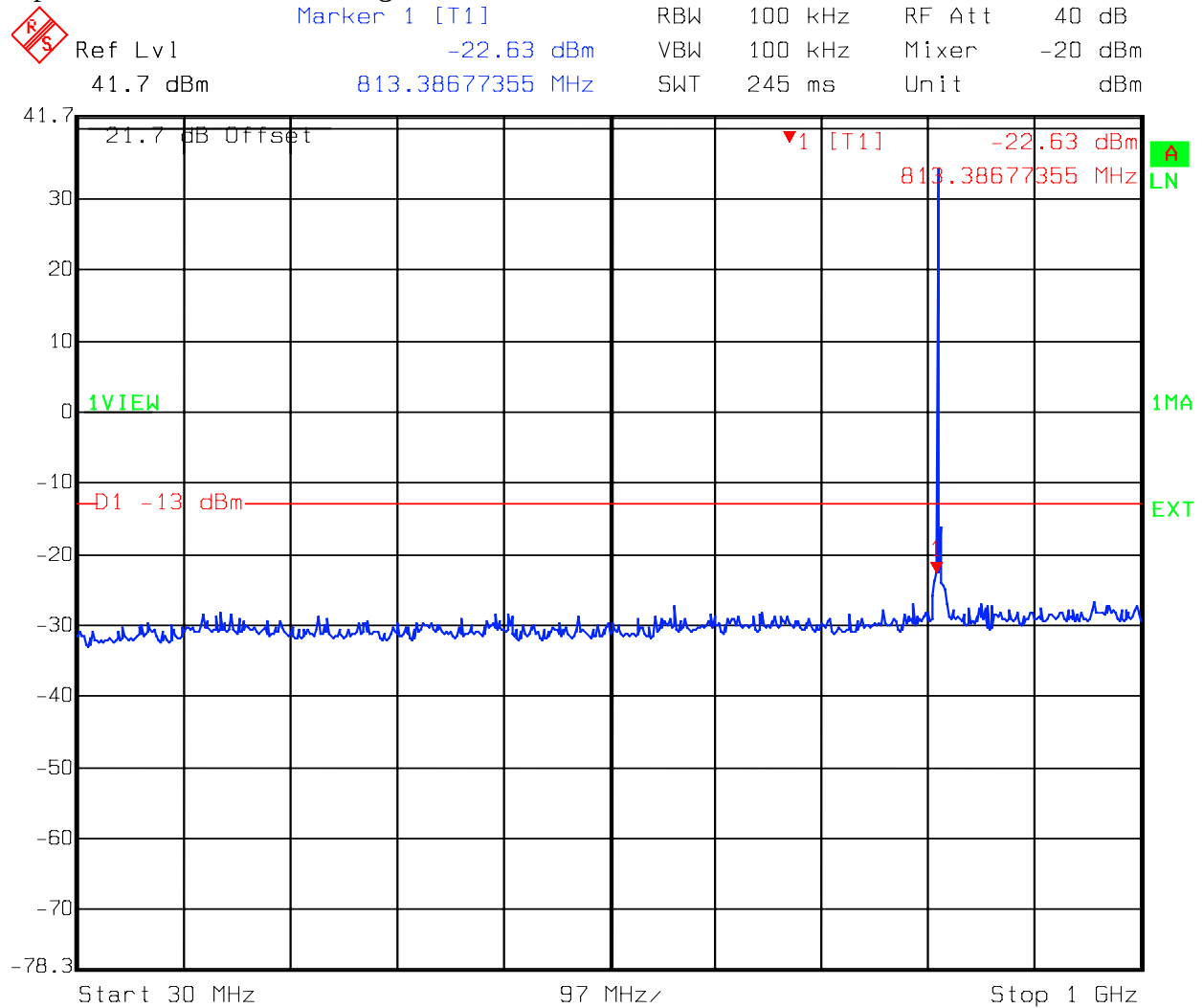


Date: 30.JUL.2004 01:27:57

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink – Mid Channel, Analogue

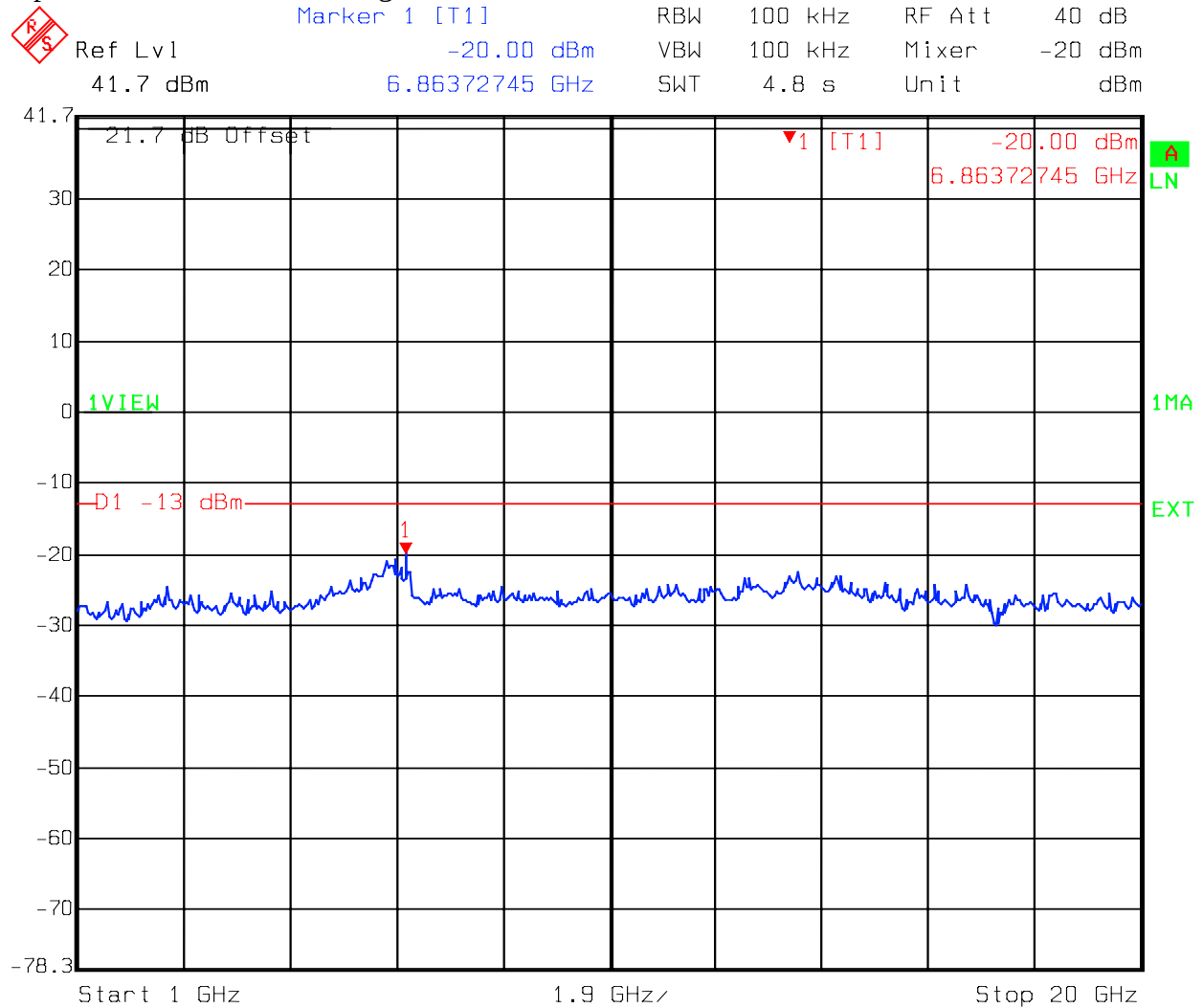


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EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

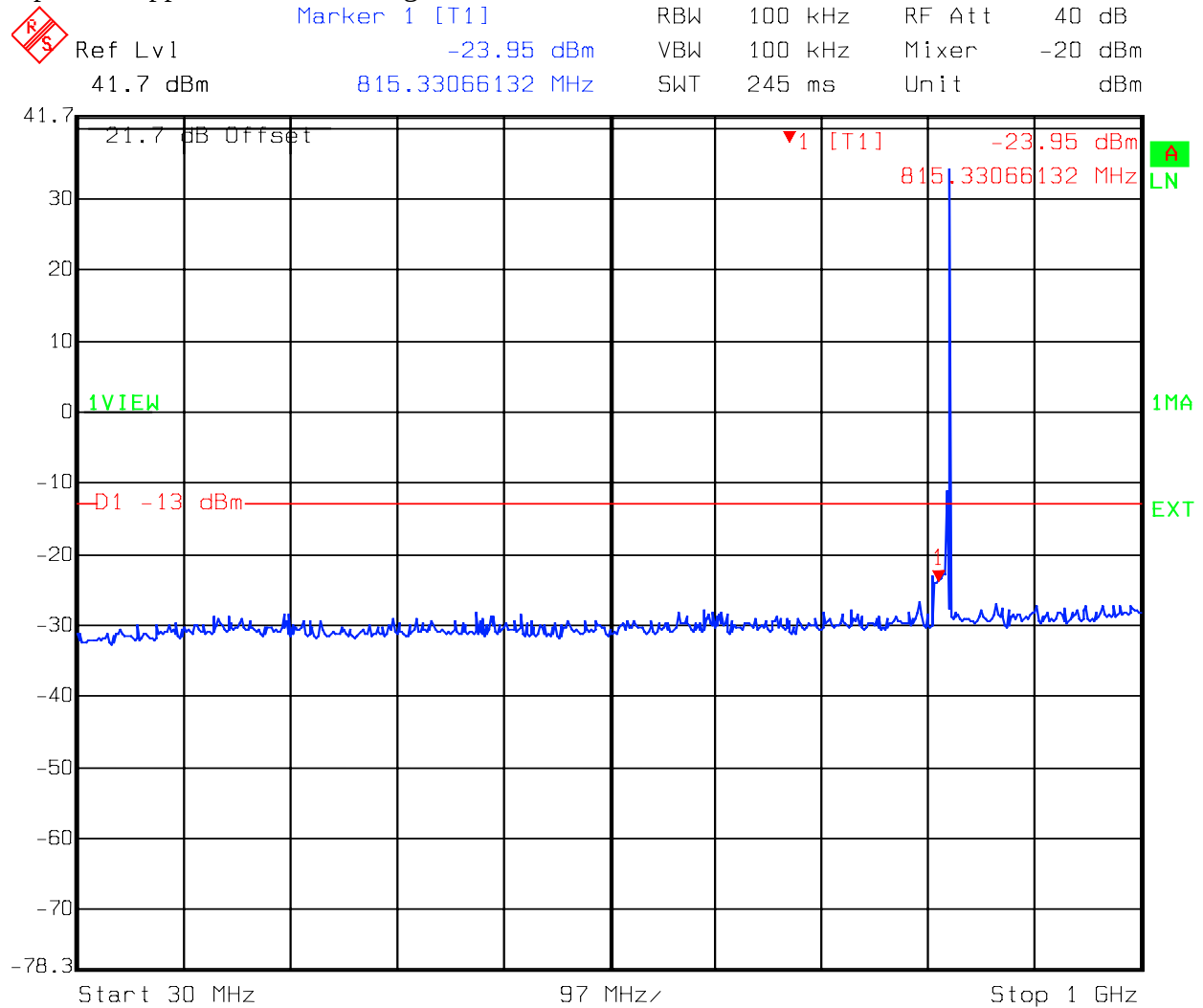
Uplink – Mid Channel, Analogue



EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink – Upper Channel, Analogue

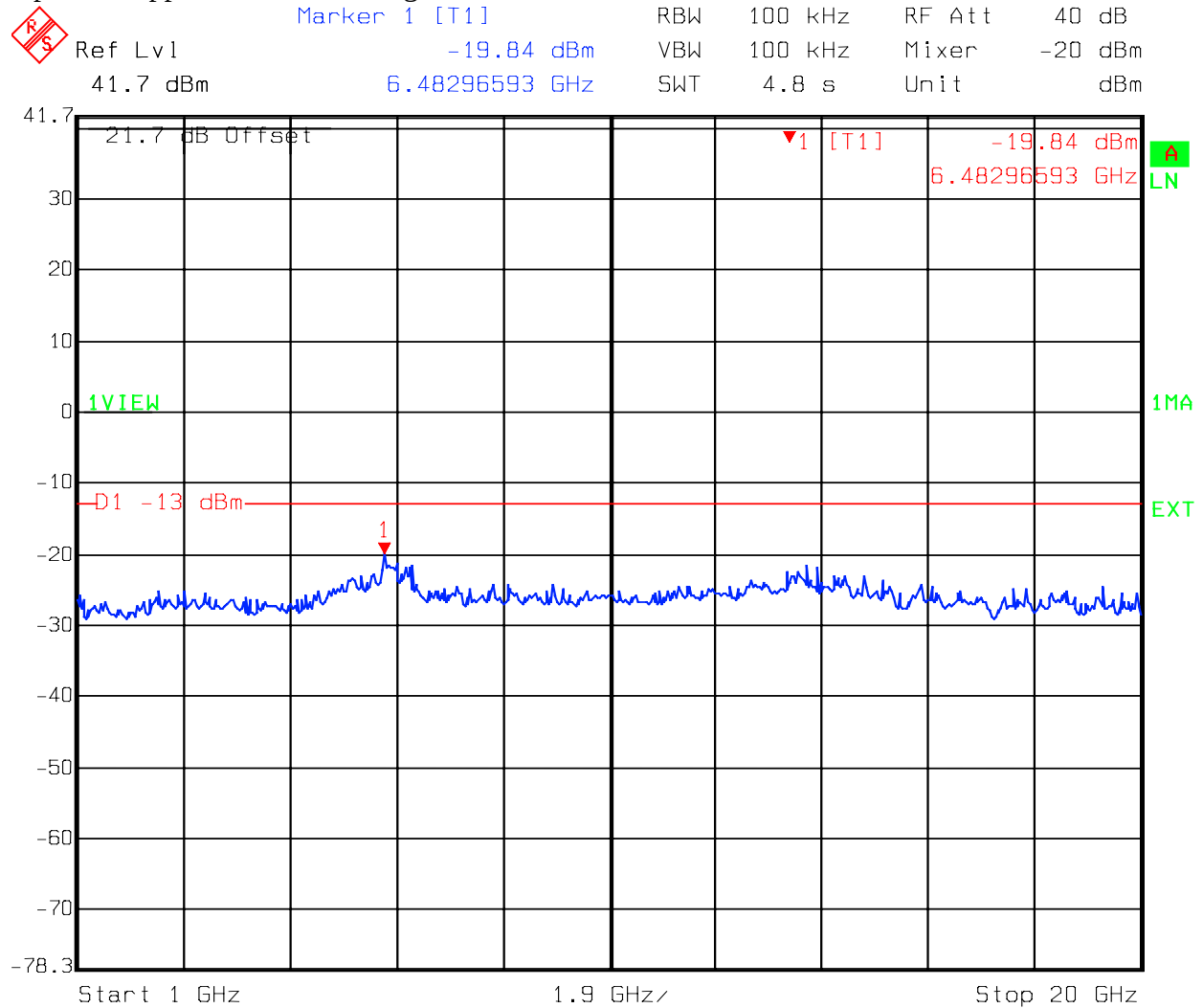


Date: 30.JUL.2004 01:19:37

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink – Upper Channel, Analogue



Date: 30.JUL.2004 01:20:18

EQUIPMENT: MR803P-TR RepeaterPROJECT NO.: **4L0457R**

Section 6. Field Strength of Spurious Emissions

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.993
TESTED BY:	DATE:

Test Results: Complies**Test Data:** No Emissions found within 20dB of Limit. Noise from was greater than 20dB below limit. Frequency range scanned from 30MHz to 20GHz**Note:** See page A5 for applicable limit.**Equipment Used:****Measurement Uncertainty:** +/- 3.6 dB**Temperature:** 21 °C**Relative Humidity:** 51 %

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink – Vertical

ERP Substitution Method										
Page <u>1</u> of <u>1</u>						Complete <u>X</u>				
Job No.: 4L0457R		Date: 7/30/04				Preliminary _____				
Specification: CFR 47, Part 90		Temperature(°C): <u>23</u>								
Tested By: <u>Brian Boyea</u>		Relative Humidity(%) <u>43</u>								
E.U.T.: <u>MR803P-TR Repeater</u>										
Configuration: <u>Uplink</u>										
Sample No: _____										
Location: <u>AC 3</u>		RBW: <u>1 MHz</u>				Measurement				
Detector Type: <u>Peak</u>		VBW: <u>1 MHz</u>				Distance: <u>3 m</u>				
Test Equipment Used										
Antenna: <u>1304</u>		Directional Coupler: _____								
Pre-Amp: <u>1016</u>		Cable #1: <u>1484</u>								
Filter: _____		Cable #2: <u>1485</u>								
Receiver: <u>795</u>		Cable #3: <u>1483</u>								
Attenuator #1: _____		Cable #4: _____								
Attenuator #2: _____		Mixer: _____								
Additional equipment used: _____										
Measurement Uncertainty: <u>+/-3.6 dB</u>										
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBi)	Limit (dBm)	ERP (dBm)	ERP (mW)	Polarity	Comments
1612	-62.0	31.0		32.4	9.4	-13	-54.0	0.000004	V	Uplink 806 Channel
2418	-62.2	34.2		33	8.9	-13	-52.1	0.000006	V	
3224	-64.0	39.8		32.7	10.1	-13	-46.8	0.000021	V	
4030	-63.3	45.3		33	10.3	-13	-40.7	0.000086	V	
4836	-64.8	44.0		33.2	10.8	-13	-43.2	0.000048	V	
5642	-64.7	39.8		33	11.4	-13	-46.5	0.000023	V	
6448	-66.5	40.5		31.6	11.7	-13	-45.9	0.000026	V	
7254	-66.0	40.8		32.9	10.9	-13	-47.2	0.000019	V	
8060	-64.7	42.8		32.9	11.2	-13	-43.6	0.000044	V	
1630	-62.7	31.0		32.4	9.4	-13	-54.7	0.000003	V	Uplink 815 Channel
2445	-62.2	34.2		33	8.9	-13	-52.1	0.000006	V	
3260	-64.3	39.8		32.7	10.1	-13	-47.1	0.000020	V	
4075	-64.8	45.3		33	10.3	-13	-42.2	0.000061	V	
4890	-63.0	44.0		33.2	10.8	-13	-41.4	0.000072	V	
5705	-64.8	39.8		32	11.4	-13	-45.6	0.000028	V	
6520	-66.2	41.3		31.6	11.5	-13	-45.0	0.000032	V	
7335	-65.5	40.8		32.9	10.9	-13	-46.7	0.000022	V	
8150	-64.3	42.8		33	11.2	-13	-43.3	0.000047	V	
1642	-62.7	31.0		32.4	9.4	-13	-54.7	0.000003	V	Uplink 821 Channel
2463	-63.0	34.2		33	8.9	-13	-52.9	0.000005	V	
3284	-63.8	39.8		32.7	10.1	-13	-46.6	0.000022	V	
4105	-64.7	45.3		33	10.3	-13	-42.1	0.000062	V	
4926	-65.7	44.0		32.7	10.8	-13	-43.6	0.000044	V	
5747	-65.3	39.8		31.9	11.4	-13	-46.0	0.000025	V	
6568	-66.3	41.3		31.6	11.5	-13	-45.1	0.000031	V	
7389	-65.2	40.8		32.9	10.9	-13	-46.4	0.000023	V	
8210	-64.7	42.8		33	11.2	-13	-43.7	0.000043	V	

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Uplink – Horizontal

ERP Substitution Method										
Page <u>1</u> of <u>1</u>						Complete <u>X</u>				
Job No.: 4L0457R		Date: 7/30/04				Preliminary _____				
Specification: CFR 47, Part 90		Temperature(°C): <u>23</u>								
Tested By: <u>Brian Boyea</u>		Relative Humidity(%) <u>43</u>								
E.U.T.: <u>MR803P-TR Repeater</u>										
Configuration: <u>Uplink</u>										
Sample No: _____										
Location: <u>AC 3</u>		RBW: <u>1 MHz</u>				Measurement				
Detector Type: <u>Peak</u>		VBW: <u>1 MHz</u>				Distance: <u>3 m</u>				
Test Equipment Used										
Antenna: <u>1304</u>		Directional Coupler: _____								
Pre-Amp: <u>1016</u>		Cable #1: <u>1484</u>								
Filter: _____		Cable #2: <u>1485</u>								
Receiver: <u>795</u>		Cable #3: <u>1483</u>								
Attenuator #1: _____		Cable #4: _____								
Attenuator #2: _____		Mixer: _____								
Additional equipment used: _____										
Measurement Uncertainty: <u>+/-3.6 dB</u>										
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBi)	Limit (dBm)	ERP (dBm)	ERP (mW)	Polarity	Comments
1612	-62.5	33.0		32.4	9.4	-13	-52.5	0.00	H	Uplink 806 Channel
2418	-62.8	37.0		33	8.9	-13	-49.9	0.00	H	
3224	-64.7	36.3		32.7	10.1	-13	-51.0	0.000008	H	
4030	-64.3	34.8		33	10.3	-13	-52.2	0.000006	H	
4836	-64.5	35.5		33.2	10.8	-13	-51.4	0.000007	H	
5642	-65.2	37.8		33	11.4	-13	-49.0	0.000013	H	
6448	-66.5	38.7		31.6	11.7	-13	-47.7	0.00	H	
7254	-65.2	40.3		32.9	10.9	-13	-46.9	0.00	H	
8060	-65.5	42.5		32.9	11.2	-13	-44.7	0.000034	H	
1630	-62.3	33.0		32.4	9.4	-13	-52.3	0.000006	H	Uplink 815 Channel
2445	-63.0	37.0		33	8.9	-13	-50.1	0.000010	H	
3260	-65.0	36.3		32.7	10.1	-13	-51.3	0.000007	H	
4075	-65.2	34.8		33	10.3	-13	-53.1	0.00	H	
4890	-62.0	35.5		33.2	10.8	-13	-48.9	0.000013	H	
5705	-64.7	37.8		32	11.4	-13	-47.5	0.000018	H	
6520	-66.7	39.2		31.6	11.5	-13	-47.6	0.000017	H	
7335	-65.8	40.3		32.9	10.9	-13	-47.5	0.000018	H	
8150	-65.5	42.5		33	11.2	-13	-44.8	0.000033	H	
1642	-63.5	33.0		32.4	9.4	-13	-53.5	0.000004	H	Uplink 821 Channel
2463	-62.7	37.0		33	8.9	-13	-49.8	0.000010	H	
3284	-64.3	36.3		32.7	10.1	-13	-50.6	0.000009	H	
4105	-63.3	34.8		33	10.3	-13	-51.2	0.000008	H	
4926	-64.8	35.5		32.7	10.8	-13	-51.2	0.000008	H	
5747	-66.3	37.8		31.9	11.4	-13	-49.0	0.000013	H	
6568	-66.8	39.2		31.6	11.5	-13	-47.7	0.000017	H	
7389	-65.8	40.3		32.9	10.9	-13	-47.5	0.000018	H	
8210	-65.5	42.5		33	11.2	-13	-44.8	0.000033	H	

PROJECT NO.: 4L0457R

ERP Substitution Method

Preliminary

Distance: 3 m

Measurement Uncertainty:	+/-3.6 dB
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EQUIPMENT: MR803P-TR Repeater

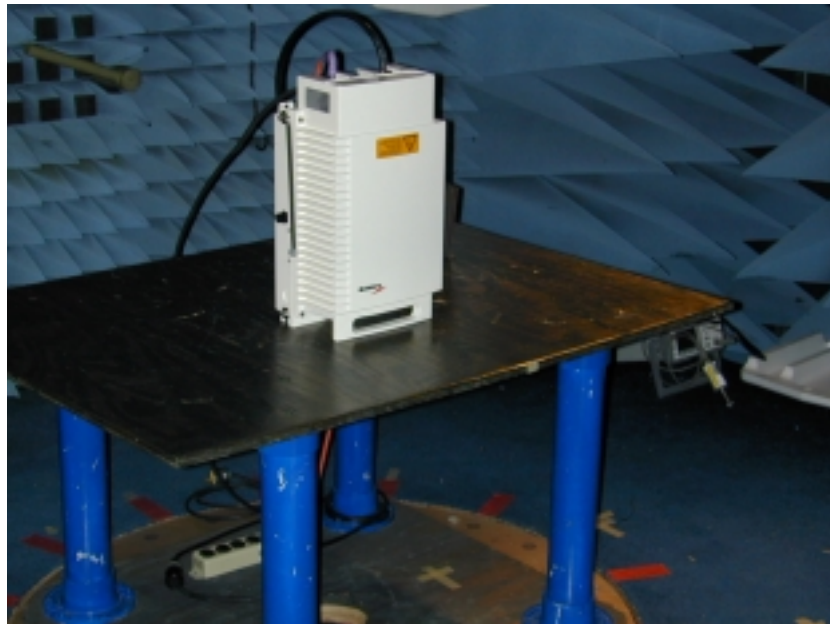
PROJECT NO.: 4L0457R

Downlink – Vertical

[illegible]

Photographs of Test Setup

FRONT VIEW



REAR VIEW



Nemko USA

FCC PART 90, SUBPART I
PRIVATE LAND MOBILE REPEATER

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: **4L0457R**

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 2.995
TESTED BY:	DATE:

Test Results: **Not Applicable.**

Measurement Data: See attached tables.

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

Section 8. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	03/22/04	03/23/06
1052	I/Q MODULATION GENERATOR	Rhode & Schwarz AMIQ	DE30619	CNR	CNR
1053	SIGNAL GENERATOR	ROHDE & SCHWARZ SMIQ 03	DE22081	09/10/03	09/09/04
1626	CABLE, 5 ft	MEGAPHASE 10311 1GVT4	N/A	CBU	N/A
1627	CABLE, 5 ft	MEGAPHASE 10312 1GVT4	N/A	08/29/03	08/28/04
1092	COMBINER	MINI-CIRCUITS ZA3PD-1.5	NONE	CBU	N/A
1073	Attenuator prog 110DB	Hewlett Packard 33305	1145A01938	N/A	N/A
1051	Radio Communication Analyzer	Rhode & Schwarz CMTA-54	835875/002	03/12/04	03/12/05
973	CABLE, .5m	KTL RG223	N/A	09/02/03	09/01/04
1471	10 db Attenuator DC 18 Ghz	MCL Inc. BW-S10W2 10db-2WDC	NONE	CBU	N/A
1973	CABLE, 1m	KTL 0	N/A	08/14/03	08/13/04
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	10/27/03	10/26/04
795	SWITCHING AMPLIFIER	ELGAR SW 5250A	834	05/07/04	05/07/05
1483	Cable 4m	Storm PR90-010-144	N/A	08/14/03	08/13/04
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	08/24/03	08/23/04
1585	Terminator	MECA 401-1	None	CBU	N/A

Nemko USA

FCC PART 90, SUBPART I
PRIVATE LAND MOBILE REPEATER

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: **4L0457R**

ANNEX A - TEST METHODOLOGIES

Nemko USA

FCC PART 90, SUBPART I
PRIVATE LAND MOBILE REPEATER

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

NAME OF TEST: RF Power Output	PARA. NO.: 2.985
--------------------------------------	-------------------------

Minimum Standard: Para. No. 90.205(a). The maximum allowable station ERP is dependent upon the stations HAAT and required service area and will be authorized in accordance with Table 1 of 90.205(d).

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.

Nemko USA

FCC PART 90, SUBPART I
PRIVATE LAND MOBILE REPEATER

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

NAME OF TEST: Spurious Emissions at Antenna Terminals	PARA. NO.: 2.991
--	-------------------------

Test Method: RBW: 1% of emission bandwidth in the 0 - 1 GHz range.
1 MHz at frequencies above 1 GHz.

VBW=RBW

The spectrum is searched up to 10 times the fundamental frequency.

EQUIPMENT: MR803P-TR RepeaterPROJECT NO.: 4L0457R

NAME OF TEST: Occupied Bandwidth**PARA. NO.: 2.989****Minimum Standard:** Para. No. 90.210, see table 1 below for applicable mask.**Table 1**

Frequency Band (MHz)	Mask for equipment with Low Pass Filter	Mask for equipment without Low Pass Filter
Below 25	A or B	A or C
25 - 50	B	C
72 - 76	B	C
150 - 174	B, D or E	C, D or E
150 Paging only	B	C
220 - 222	F	F
421 - 512	B, D or E	C, D or E
450 paging only	B	H
806 - 821/ 851 - 866	B	G
821 - 824/ 866 - 869	B	H
896 - 901/ 935 - 940	I	J
902 - 928	K	K
929 - 930	B	G
Above 940	B	C
All other bands	B	C

Nemko USA

FCC PART 90, SUBPART I
PRIVATE LAND MOBILE REPEATER

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

NAME OF TEST: Field Strength of Spurious	PARA. NO.: 2.993
---	-------------------------

Minimum Standard: Para. No. 90.210, see table 1 for applicable mask.

Test Method: The substitution antenna method as described in EIA/TIA 603 was used. The field strength of the emission is measured and recorded. The EUT is then replaced with an antenna of known gain. A calibrated signal is fed to the substitution antenna and adjusted to obtain the previously recorded field strength level. The erp is the signal fed to the substitution antenna.

EQUIPMENT: MR803P-TR Repeater

PROJECT NO.: 4L0457R

NAME OF TEST: Frequency Stability**PARA. NO.: 2.995**

Minimum Standard: Para. No. 990.213. The transmitter carrier frequency shall remain within the assigned frequency below in ppm.

Table 2

Frequency Band (MHz)	Fixed And Base Stations	Mobile Stations	
		> 2 Watts o/p pwr	< 2 Watts o/p pwr
Below 25	100	100	200
25 - 50	20	20	50
72 - 76	5	-	50
150 - 174	5	5	5
220 - 222	0.1	1.5	1.5
421 - 512	2.5	5	5
806 - 821	1.5	2.5	2.5
821 - 824	1.0	1.5	15
851 - 866	1.5	2.5	2.5
866 - 869	1.0	1.5	1.5
869 - 901	0.1	1.5	1.5
902 - 928	2.5	2.5	2.5
929 - 930	1.5	-	-
935 - 940	0.1	1.5	1.5
1427 - 1435	300	300	300
Above 2450	-	-	-

Nemko USA

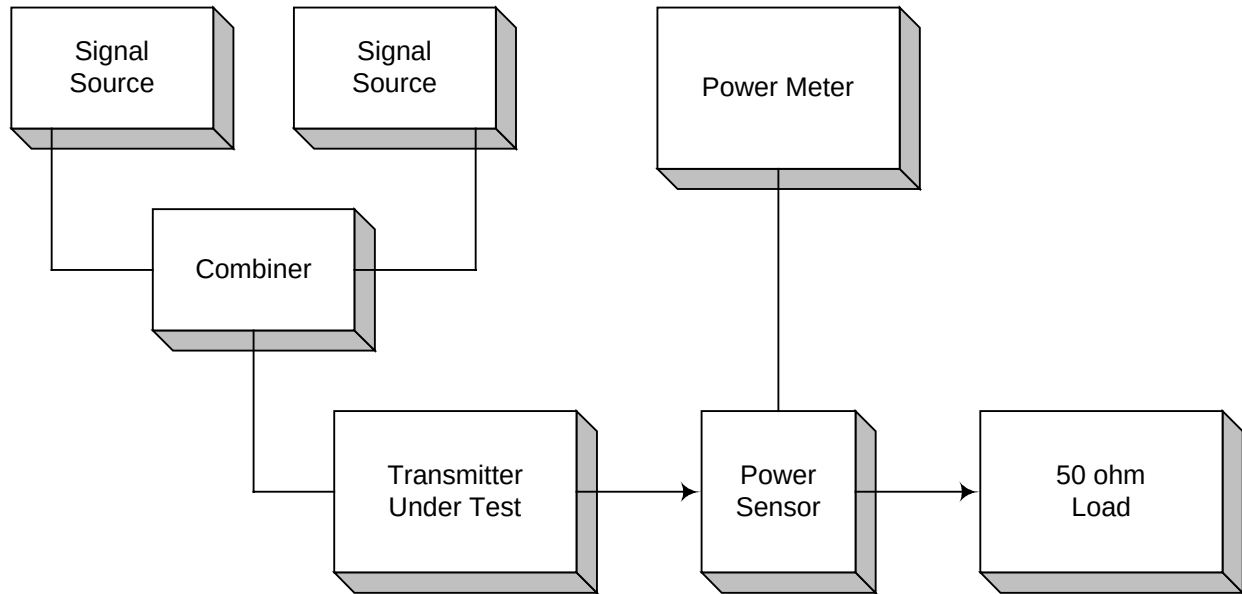
FCC PART 90, SUBPART I
PRIVATE LAND MOBILE REPEATER

EQUIPMENT: MR803P-TR Repeater

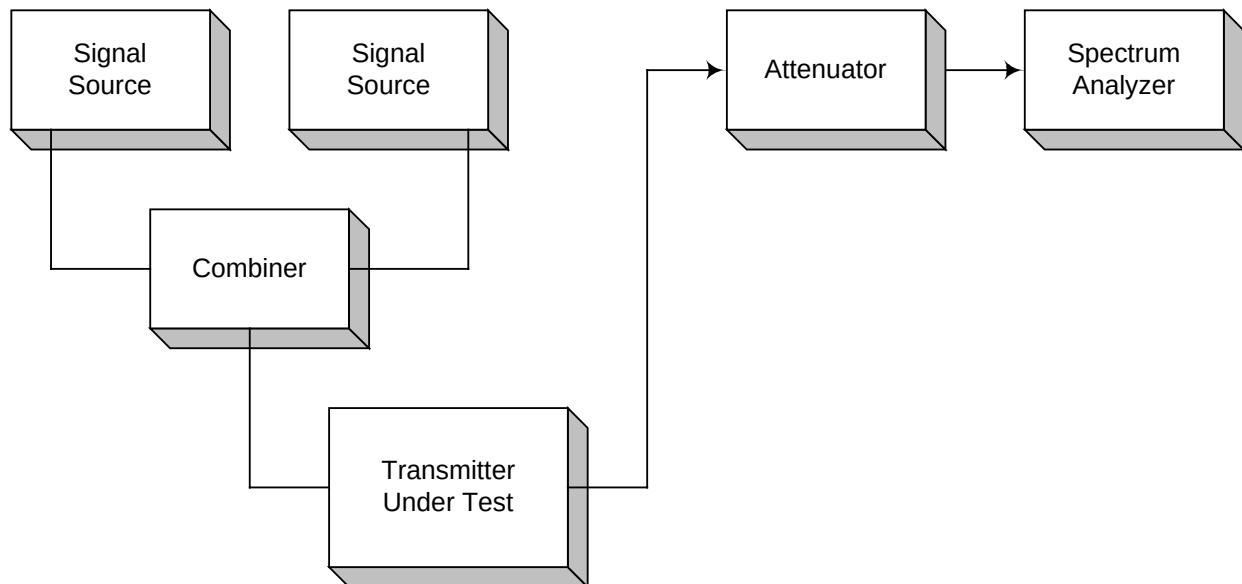
PROJECT NO.: **4L0457R**

ANNEX B - TEST DIAGRAMS

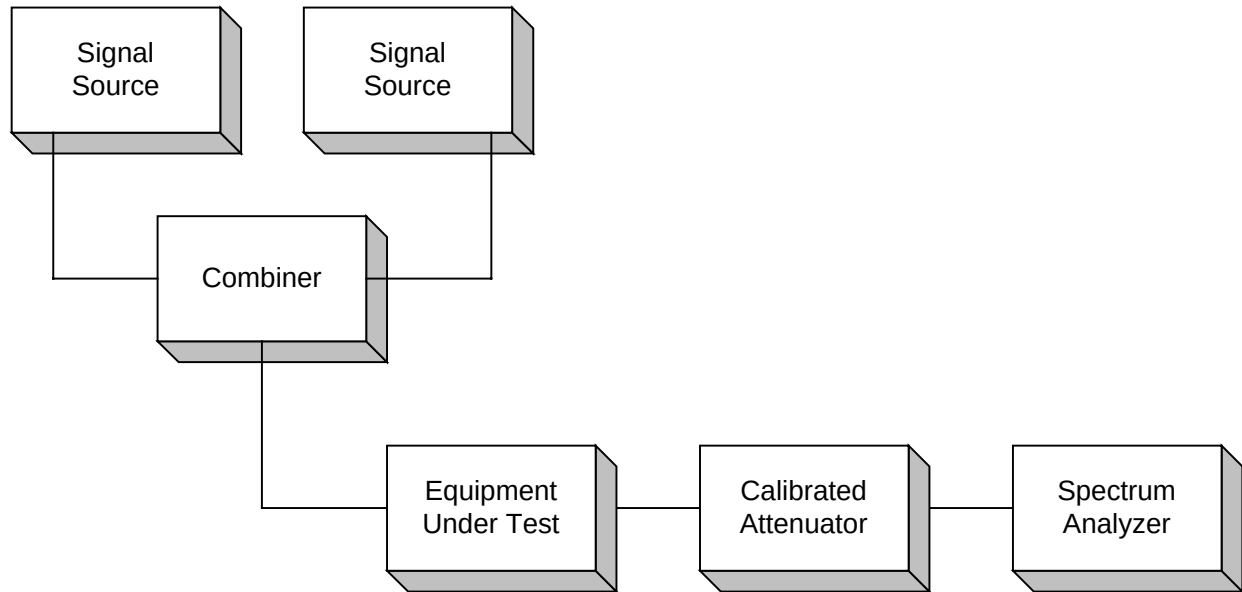
Para. No. 2.985 - R.F. Power Output



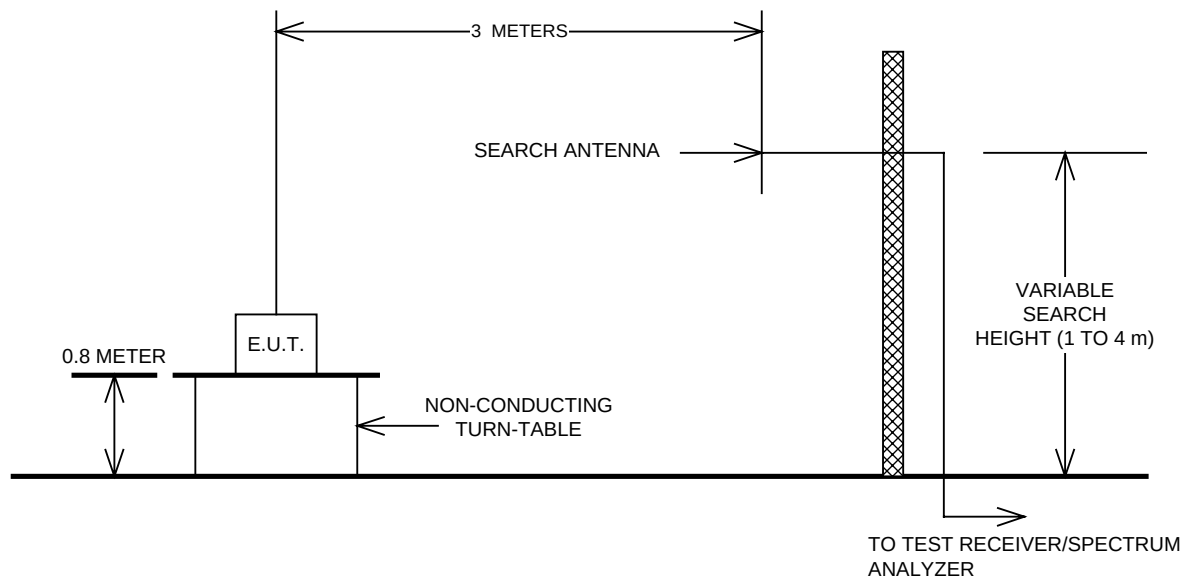
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 - Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability

