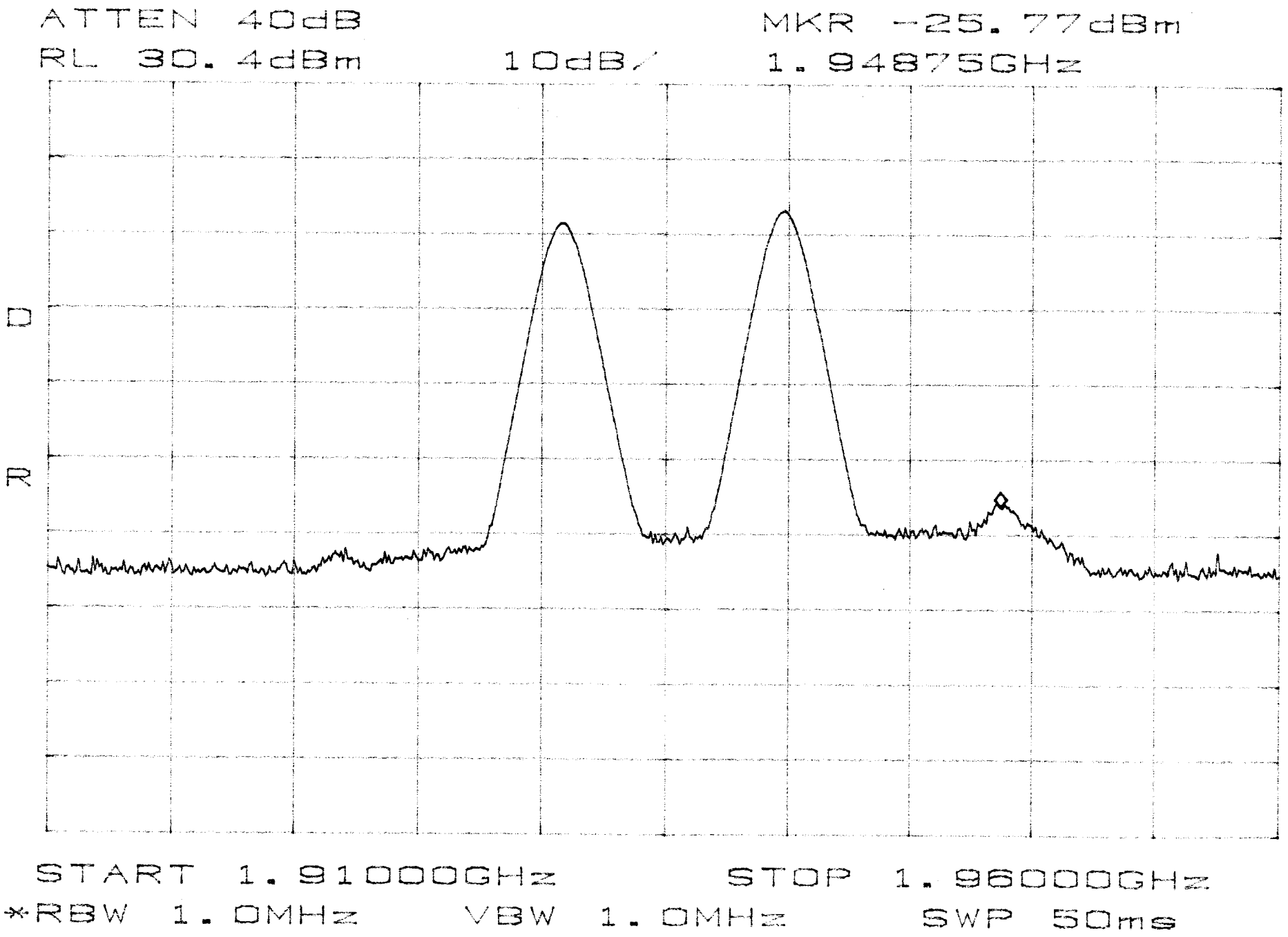
A radiated emission scan was also made with the EUT's antenna replaced with a termination to demonstrate case radiation compliance to the –13 dBm requirement at the 3 carrier frequencies. Radiated emissions from the EUT are measured in the frequency range of 30 to 20000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 10 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees. The field strength levels were measured per ANSI C63.4. The EUT is then replaced with a tuned dipole antenna (below 1 GHz) or horn antenna (above 1 GHz). The substitute antenna was placed in the same polarization as the test antenna. A signal generator was used to generate a signal level that matched the level measured from the EUT. The signal generator level minus the cable loss from the signal generator to the substitute antenna plus the substitute antenna gain equals the spurious power level. The 10 highest frequencies are listed below. No signals were detected at harmonic frequencies.

Frequency MHz	dBuV/m(from EUT)	Substitution power level - dBm
497	72.9	-25.9
355	61.7	-37.1
568	59.9	-38.9
284	57.7	-41.1
213	54.9	-43.9
1136	54.5	-44.3
710	53.8	-45
639	53.2	-46.1
781	52.1	-46.7
994	51.9	-46.9

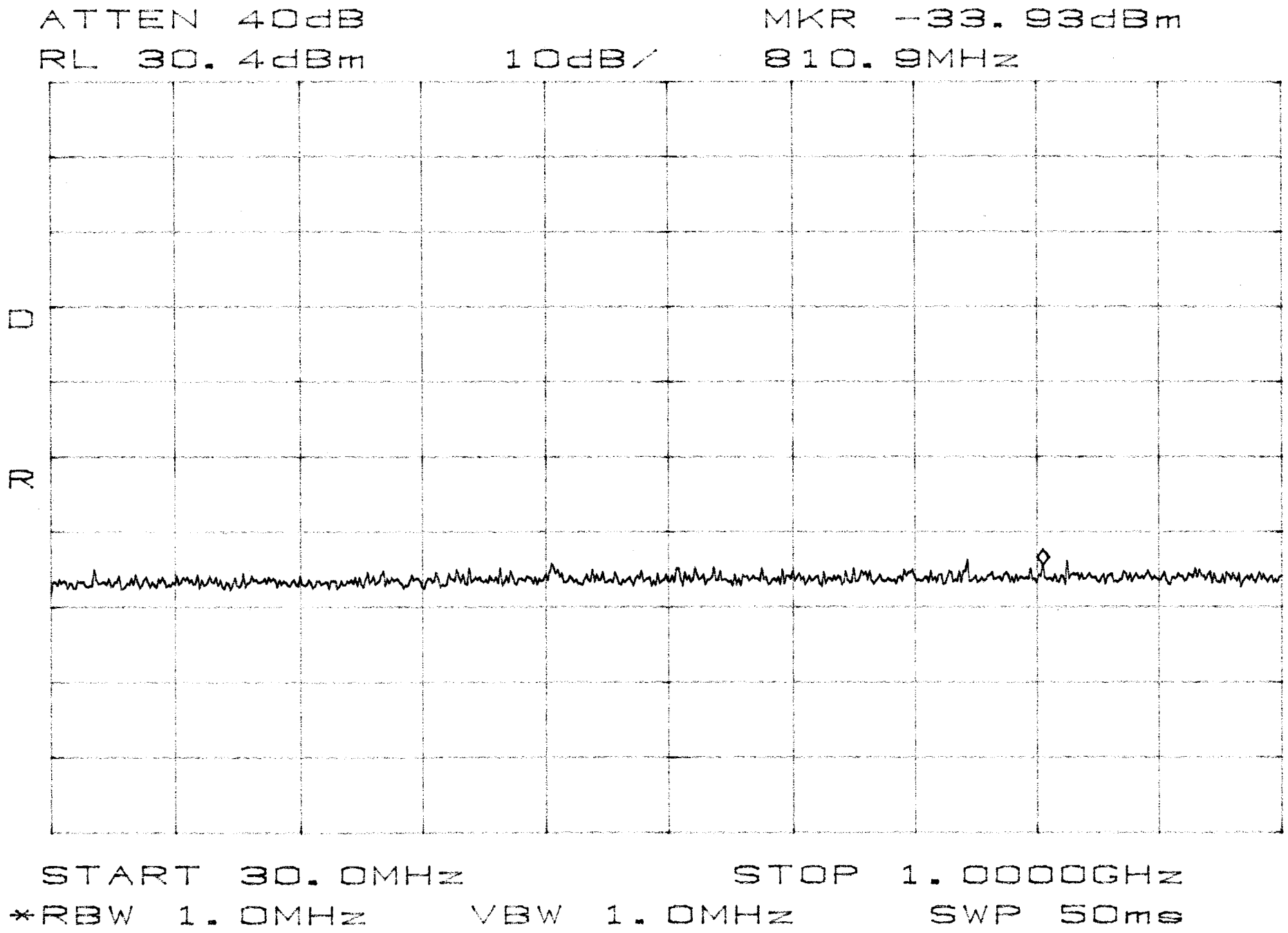
Inter-modulation Test for ADC Inc. Digivance 1900 MHz ICS System Models DGVI-312110DHU and DGVI-313110DRU.

The intermodulation products test was performed for each bandwidth setting of the EUT. Two tests were preformed with each modulation type. Test 1 was with 2 signals input to the EUT at lower end channels. Test 2 was with 2 signals one at a lower end channel and one at a higher end channel. The modulations types tested were CDMA, TDMA, and FM (1kHz @8kHz deviation). An investigation was made from 30MHz to the 10^{th} Harmonic of the highest fundamental frequency (~20GHz). The following plots show the results.

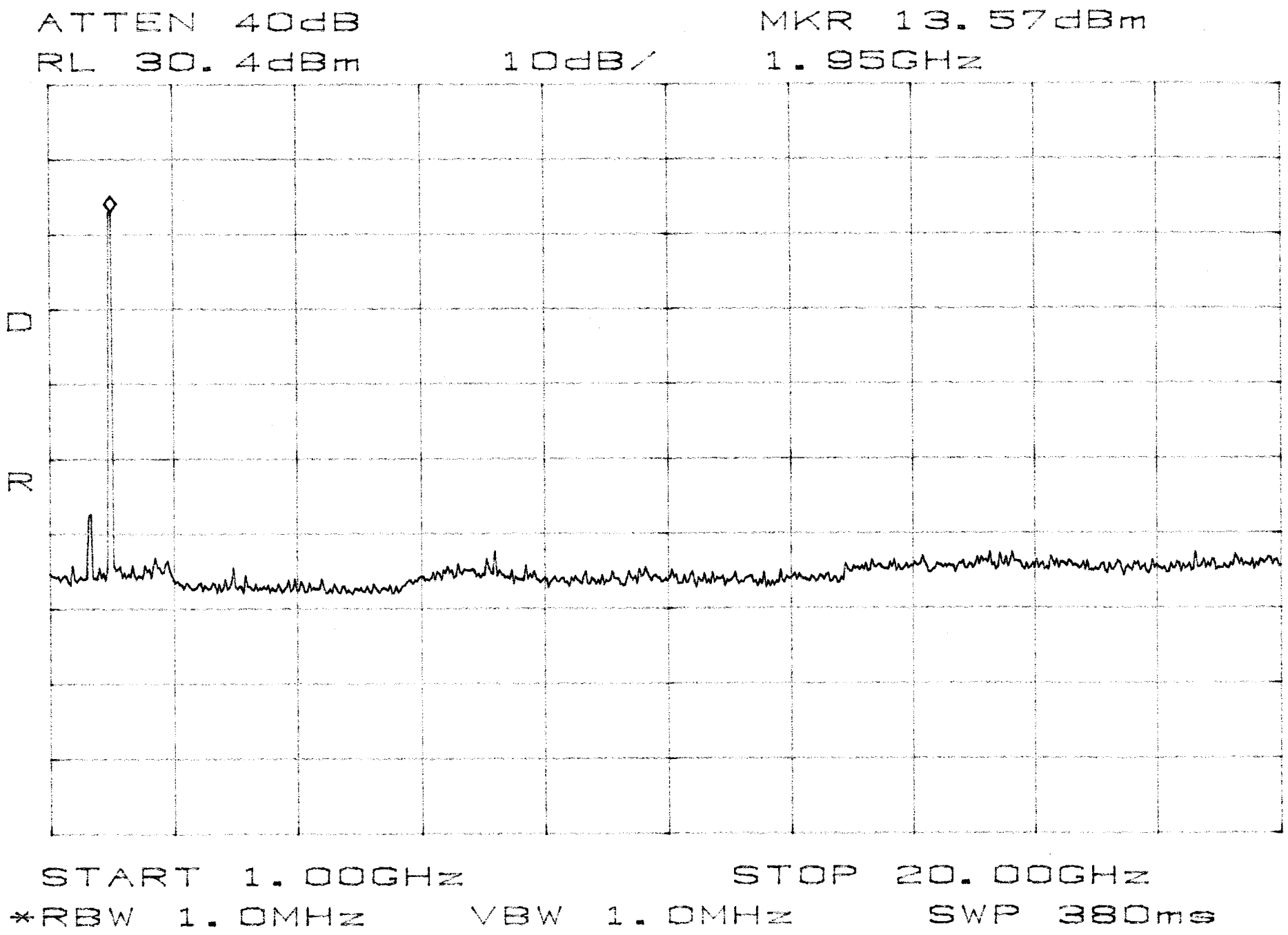
Band A, D Fm Intermod
close



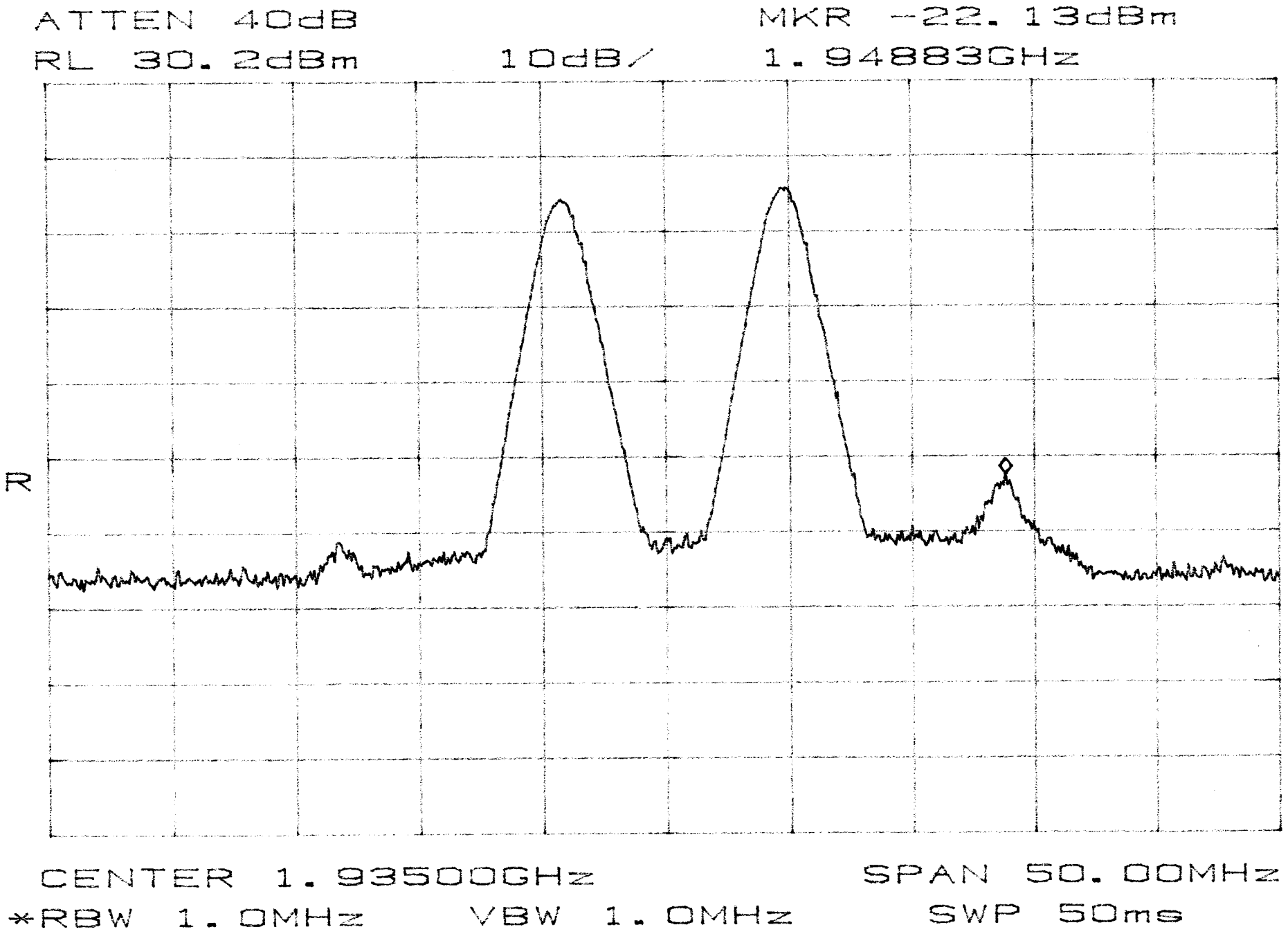
Band A,D FM Intermod
close



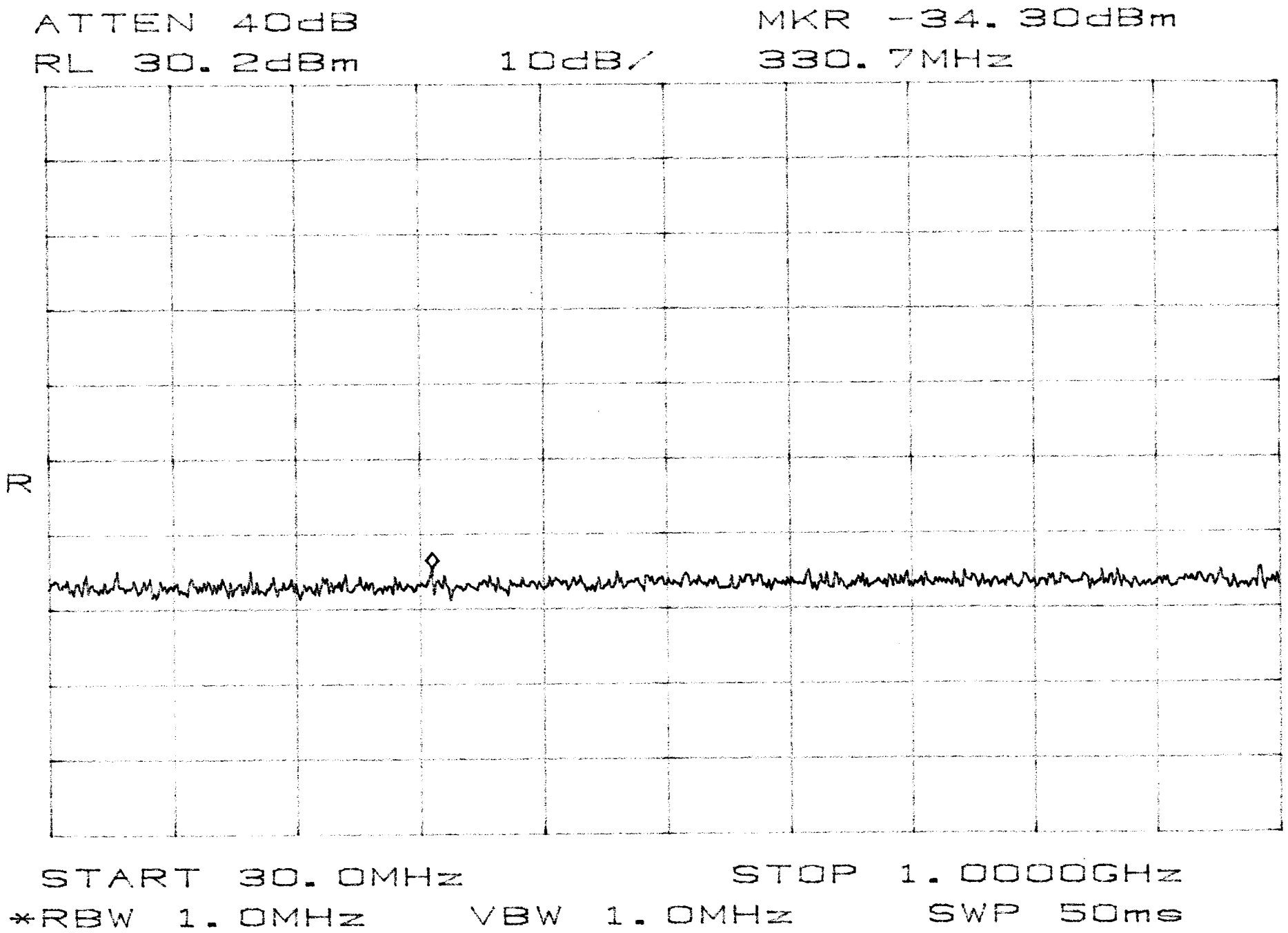
Band A,D Fm Intermod
close



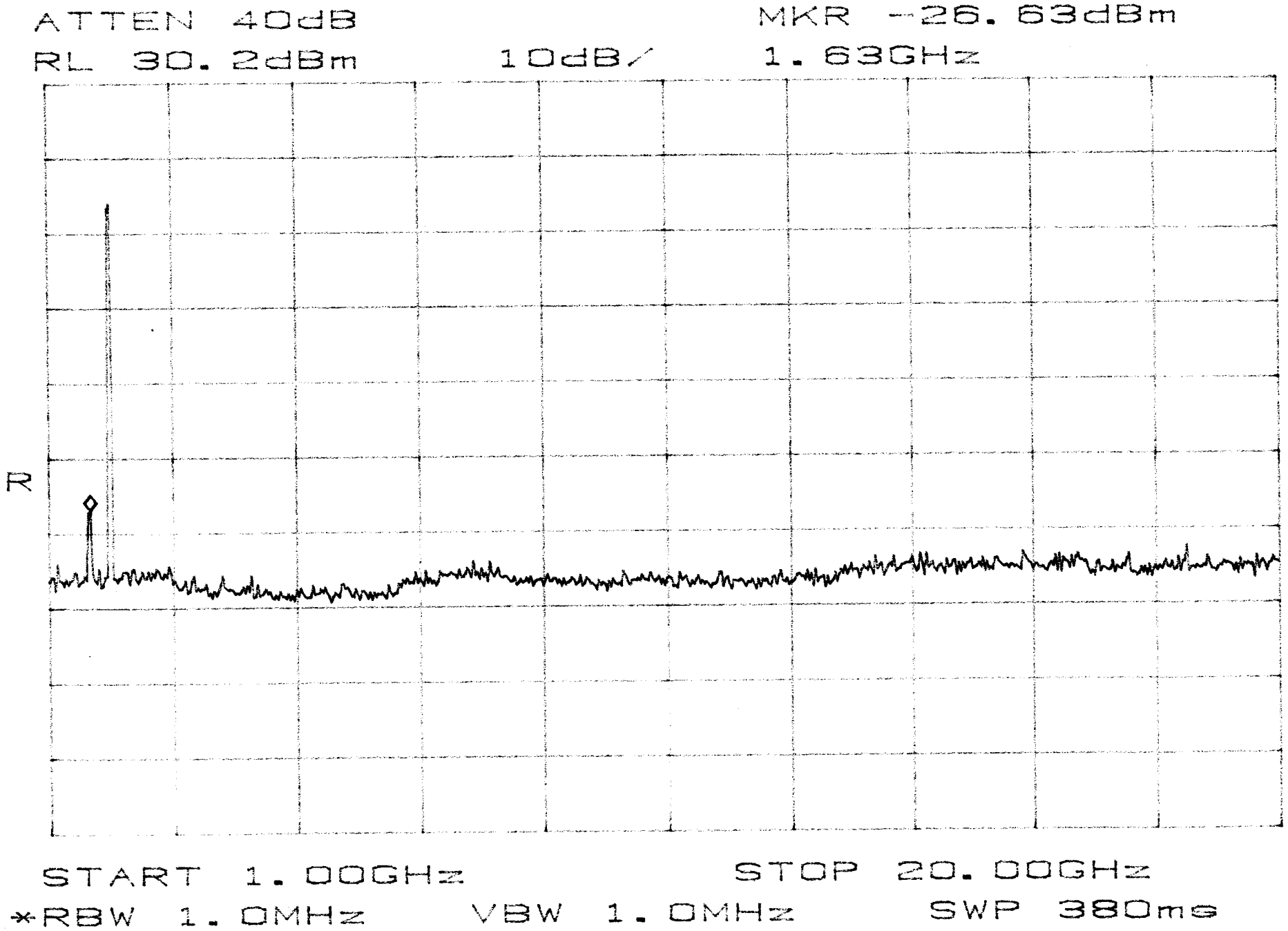
Band A, D TDMA Intermod.
close



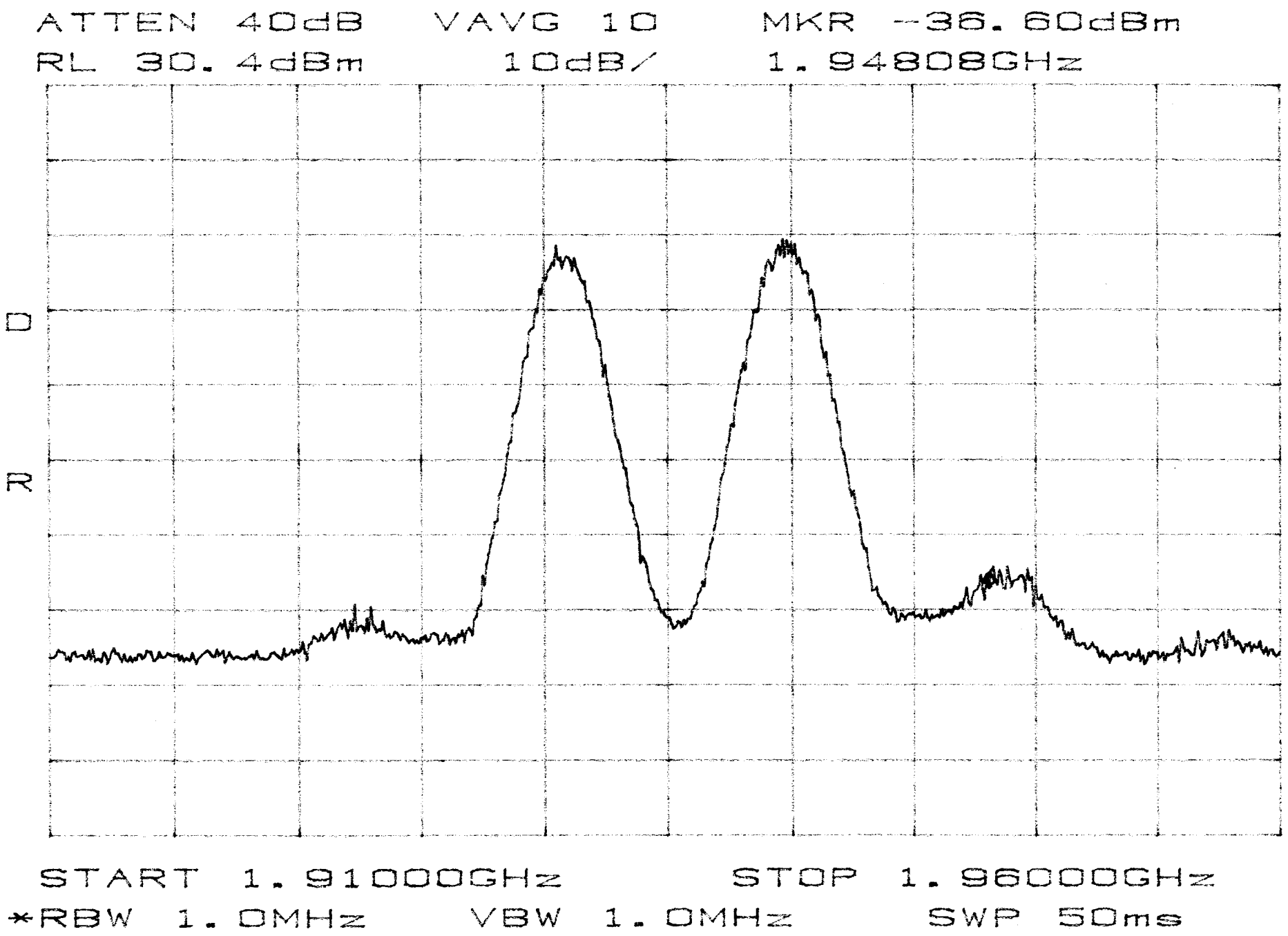
Band A,D TDMA Intermod.
close



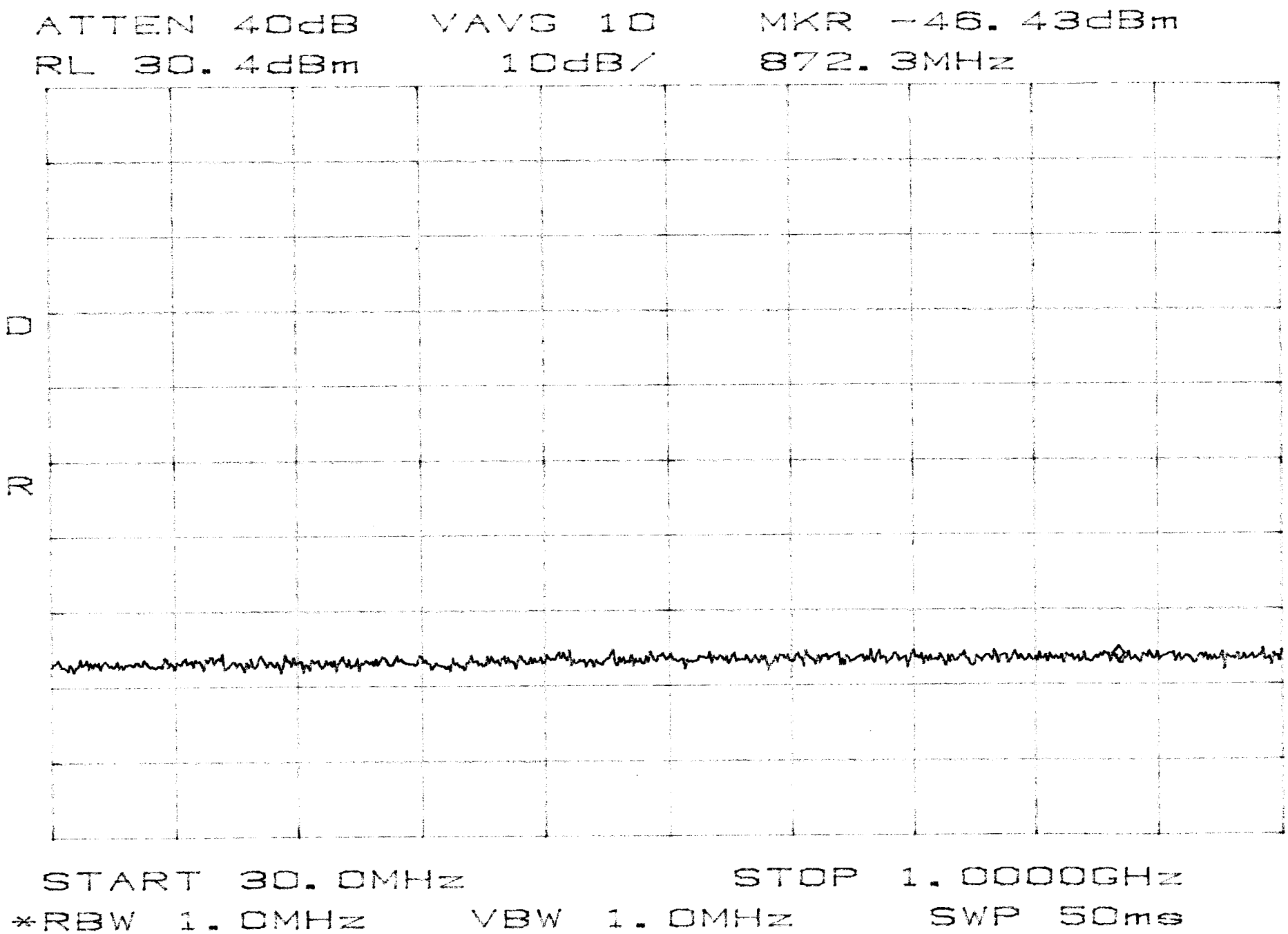
Band A,D TDMA Intermod.
close



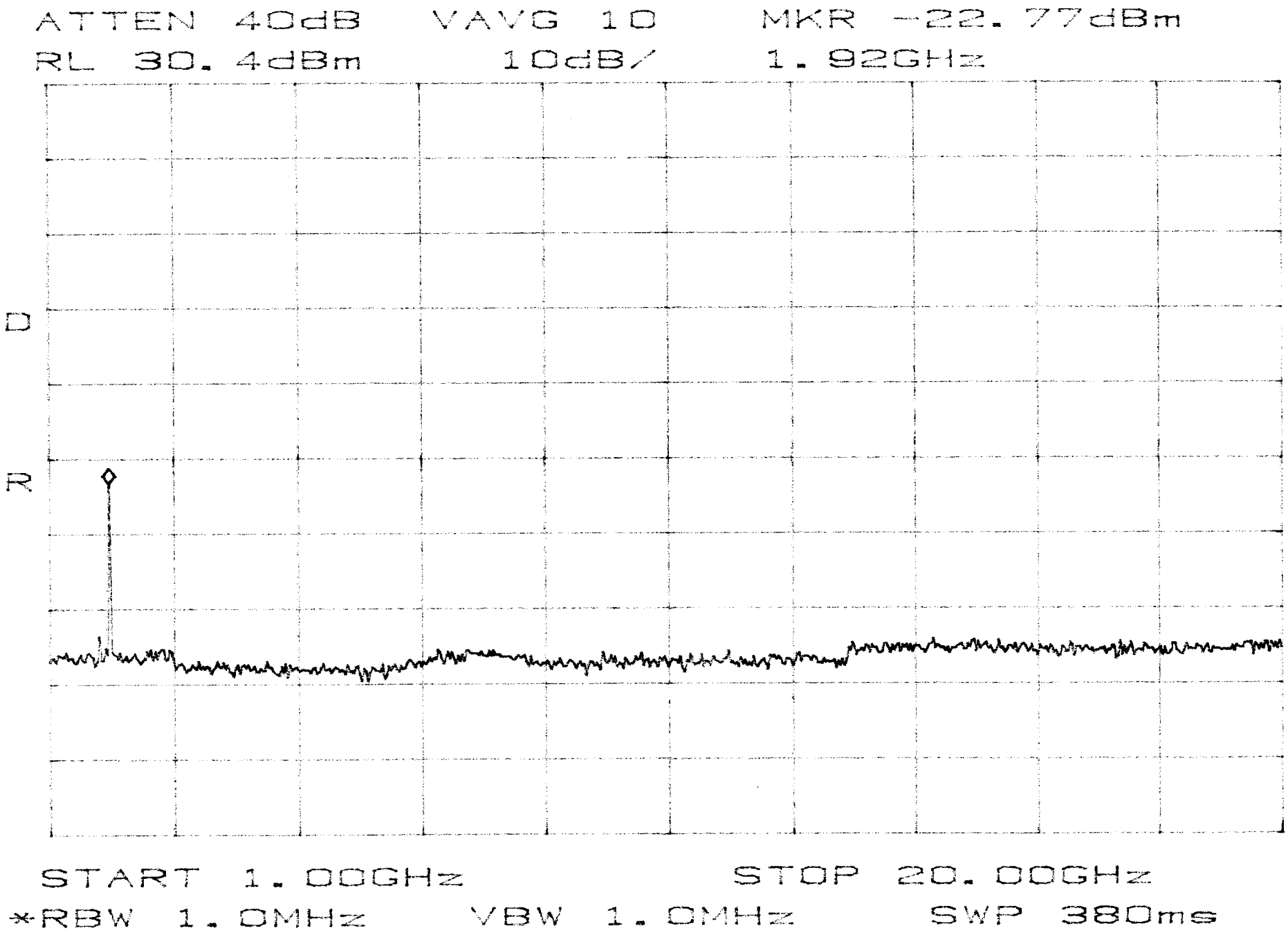
Band A.D CDMA Intermod
close



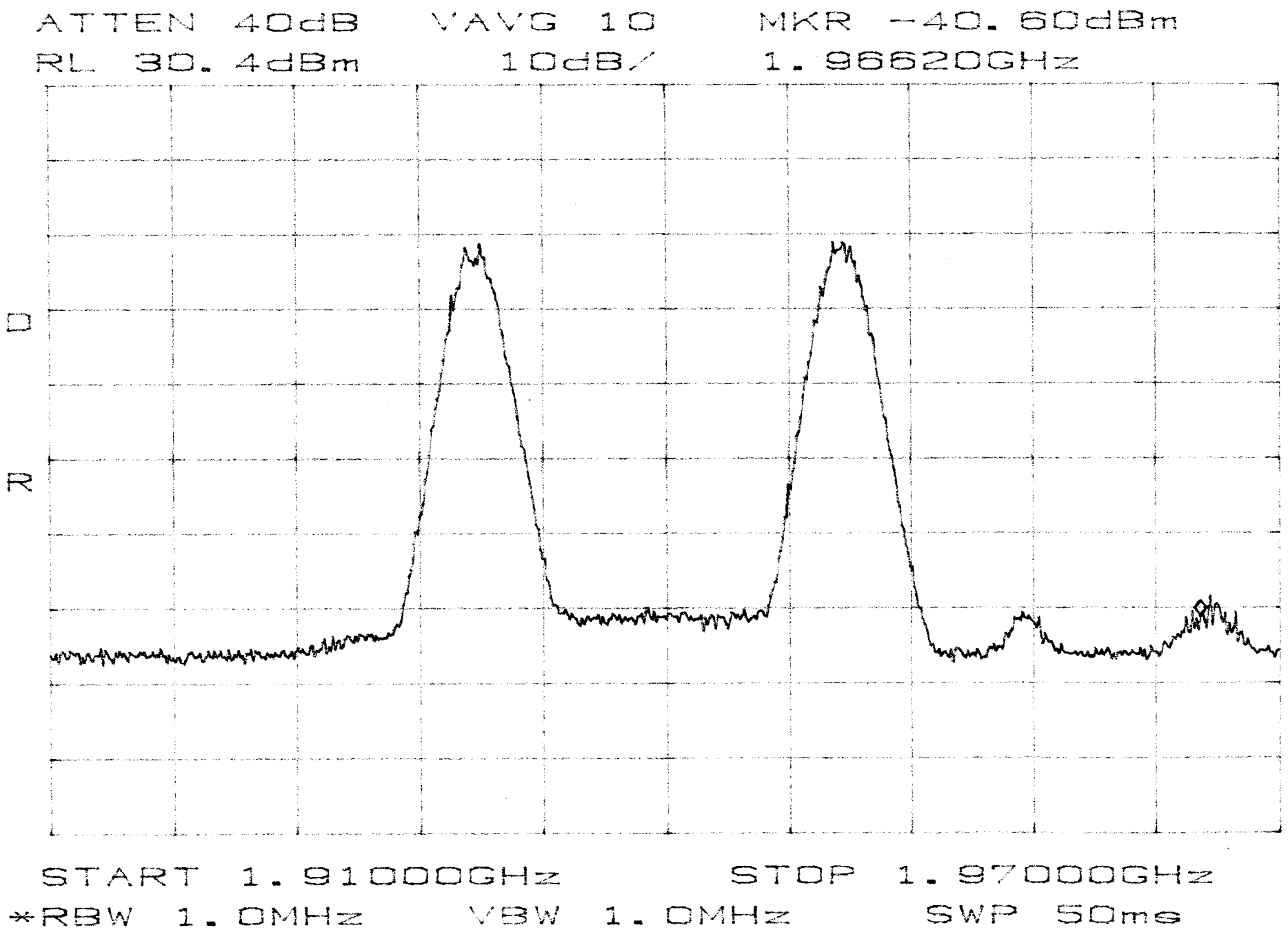
Band A,D CDMA Intermod
close



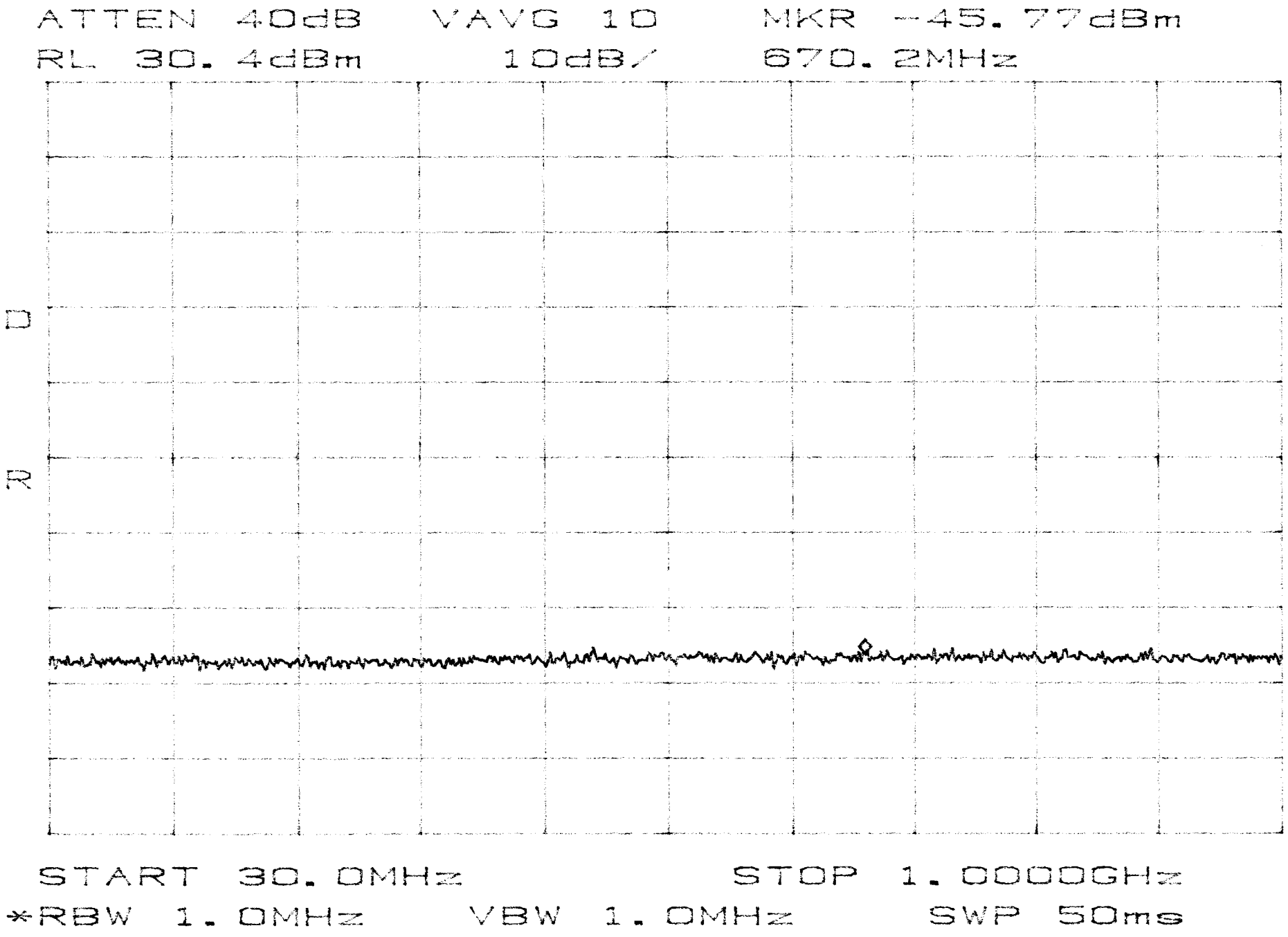
Band A,D CDMA Intermod
close



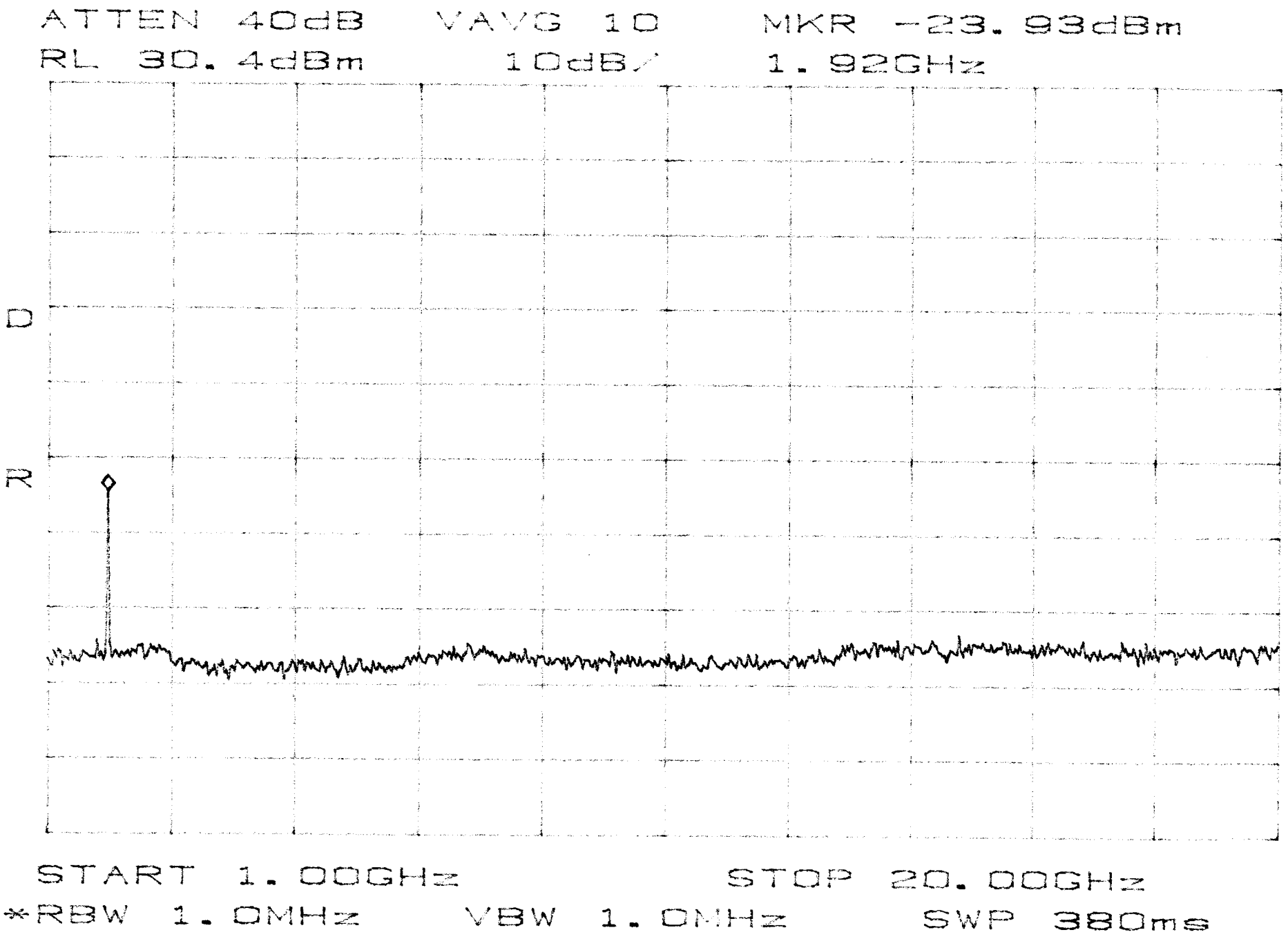
Band A,D CDMA Intermod
apart



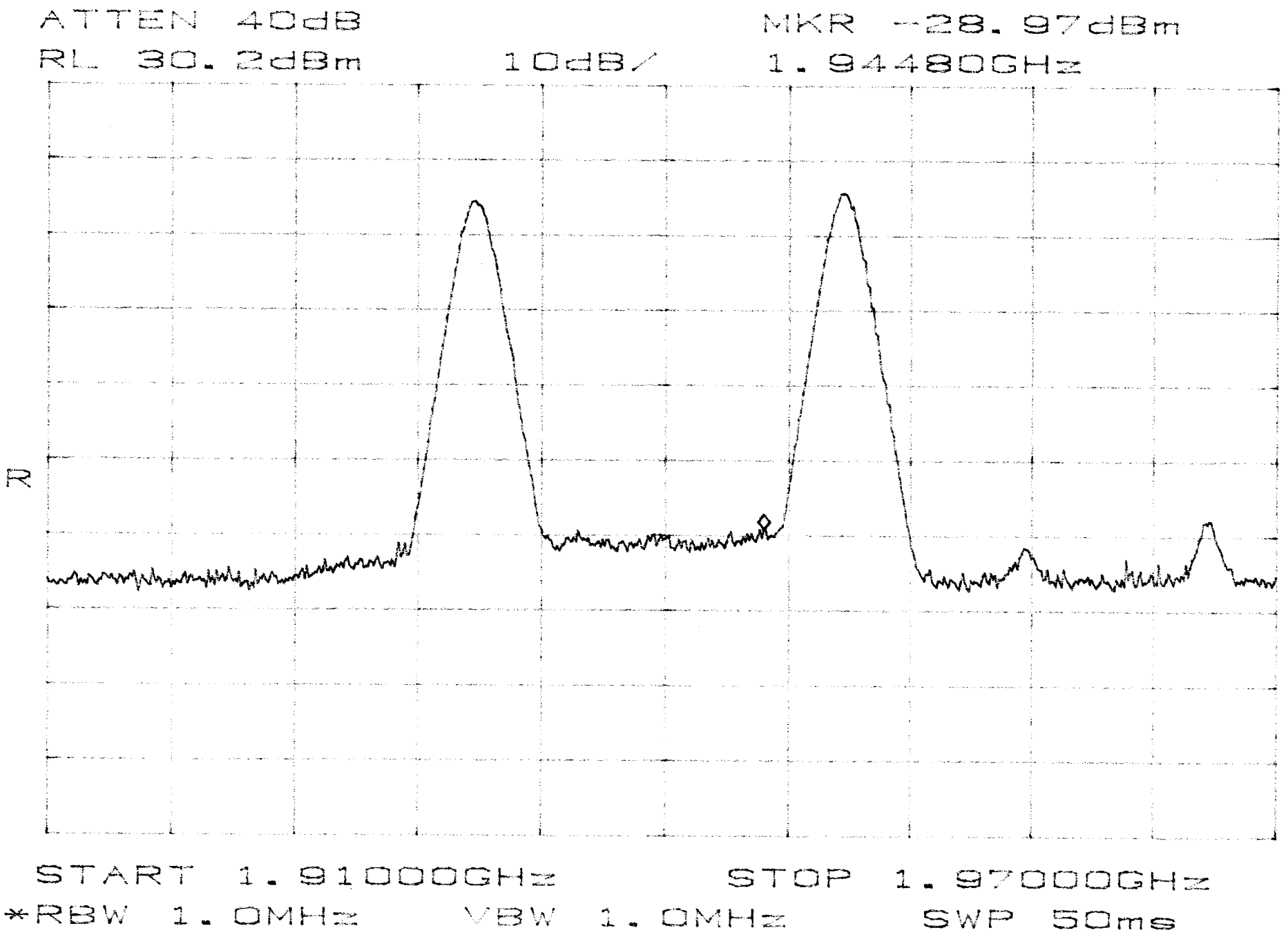
Band A, D CDMA Intermod
apart



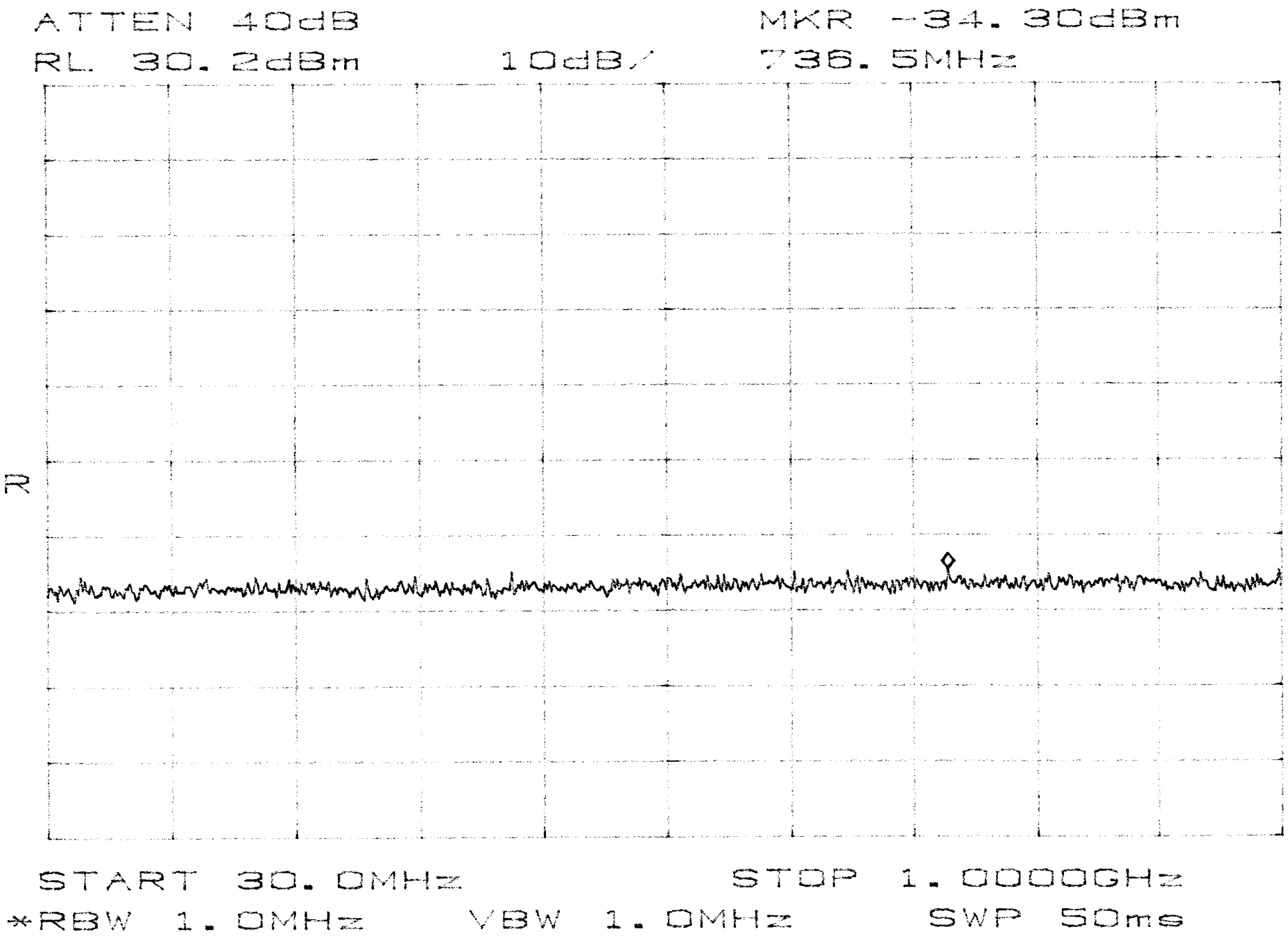
Band A,D CDMA Intermod
apart



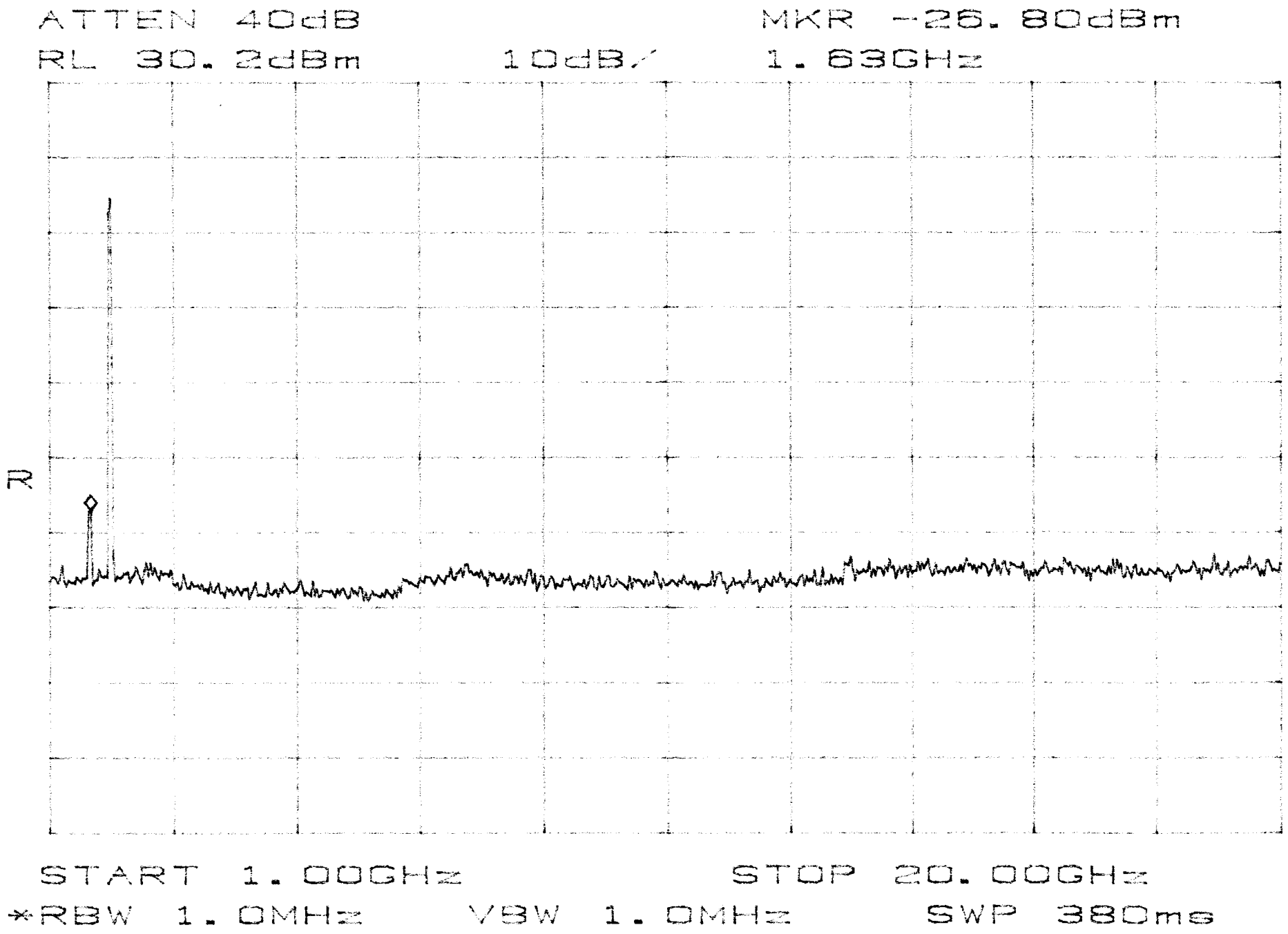
Band A,D TDMA Intermod
apart



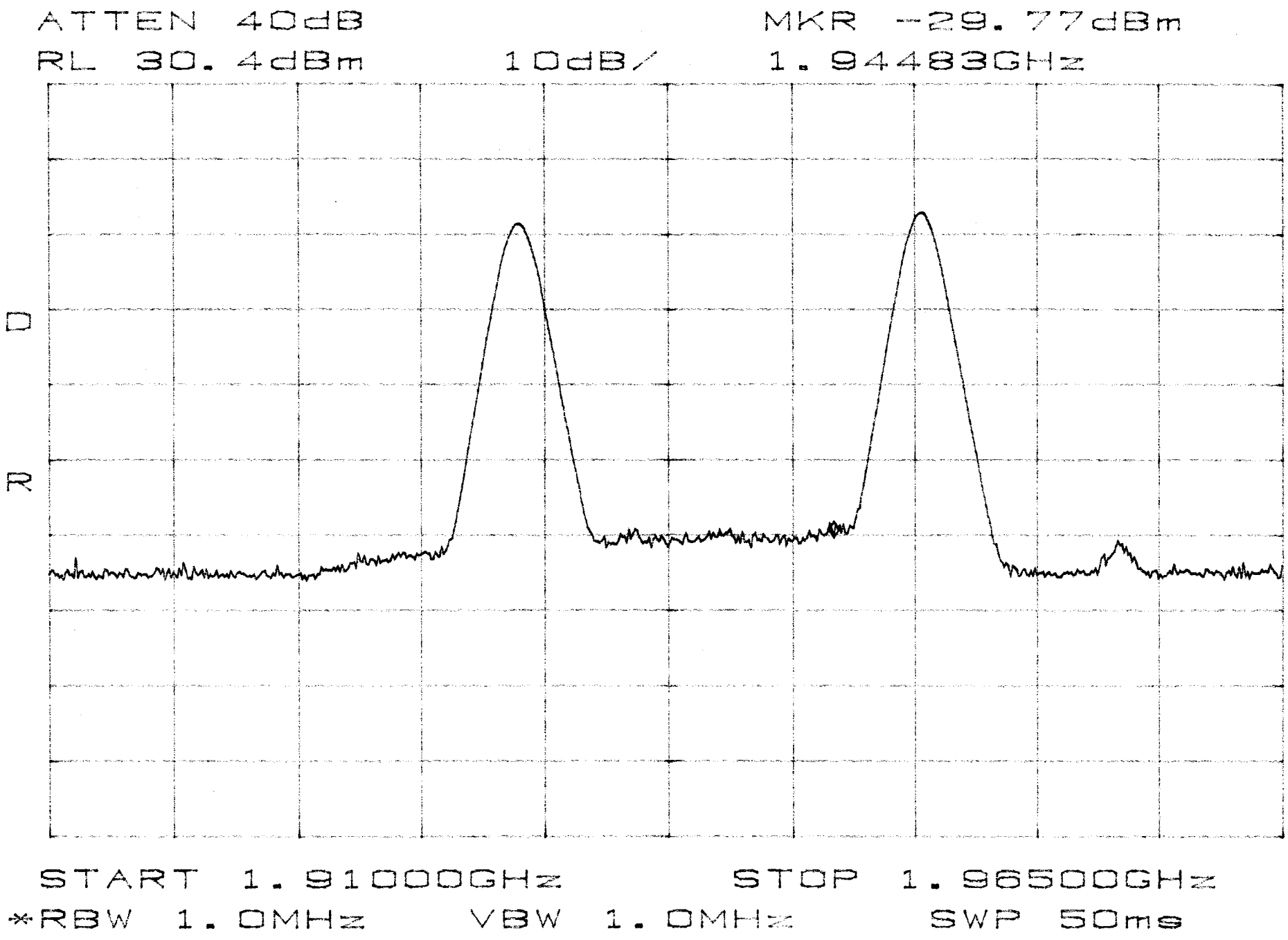
Band A,0 TDMA Intermod
apart



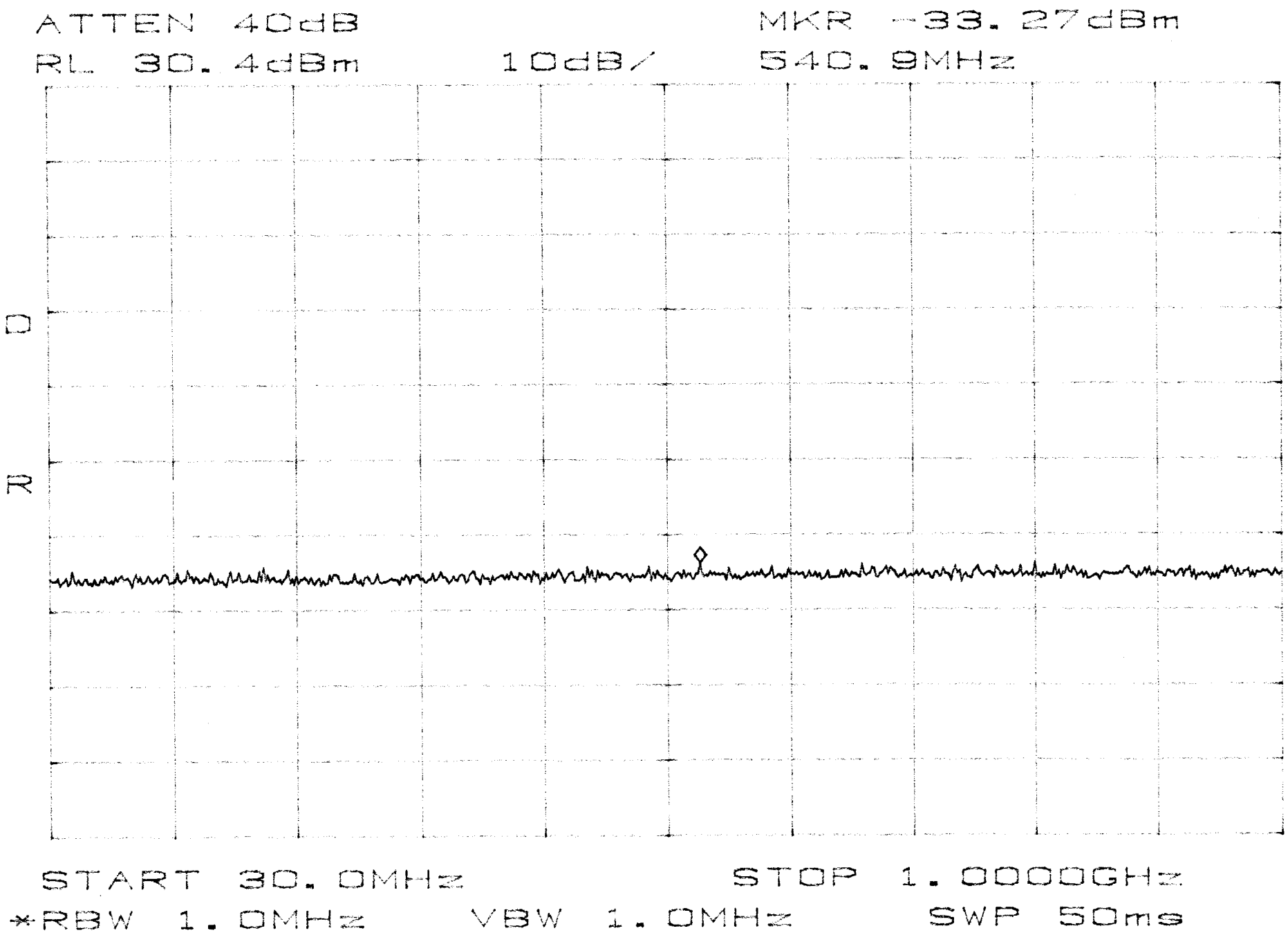
Band A,D TDMA Intermod.
apart



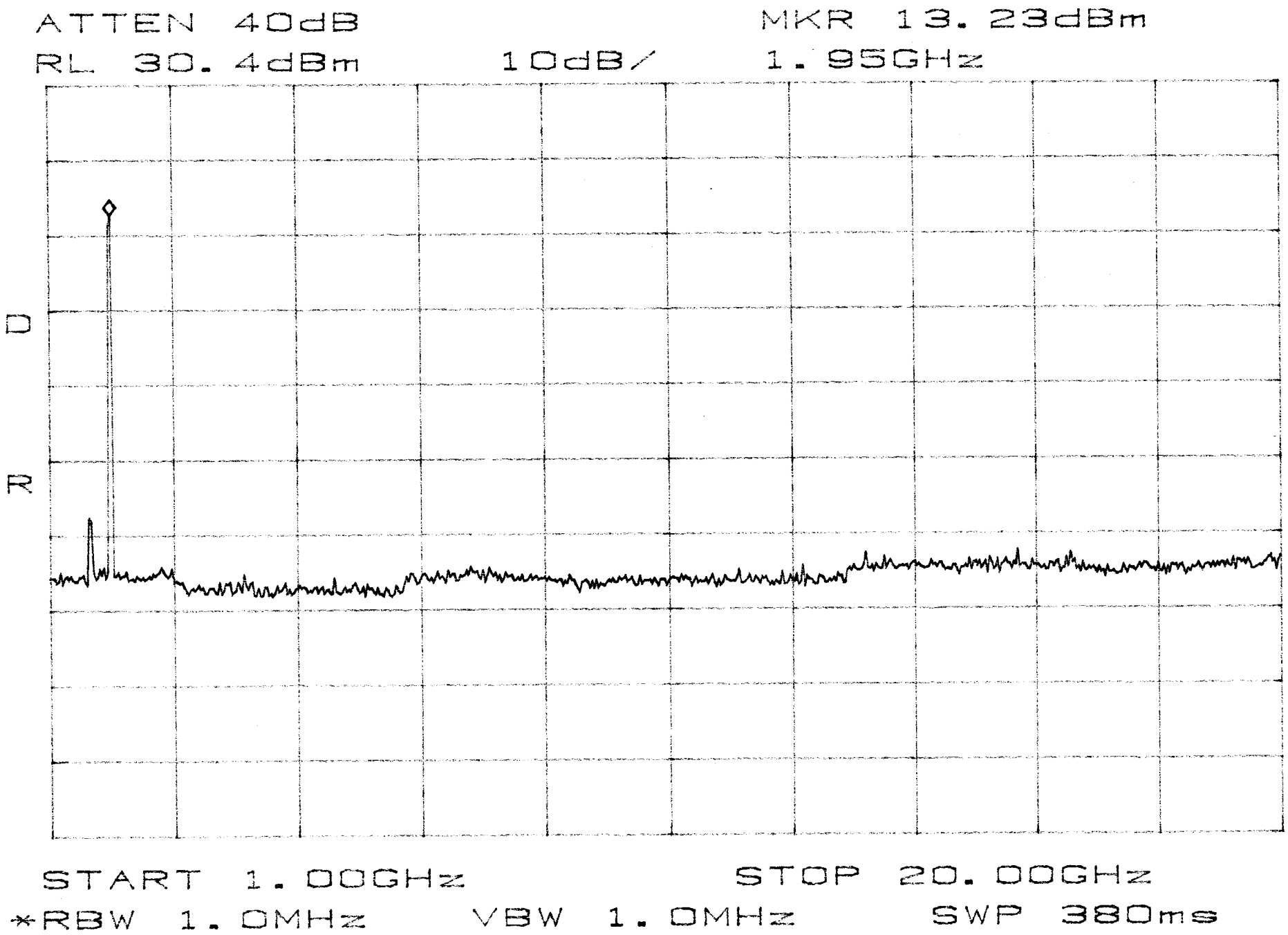
Band A,D FM Intermod
apart



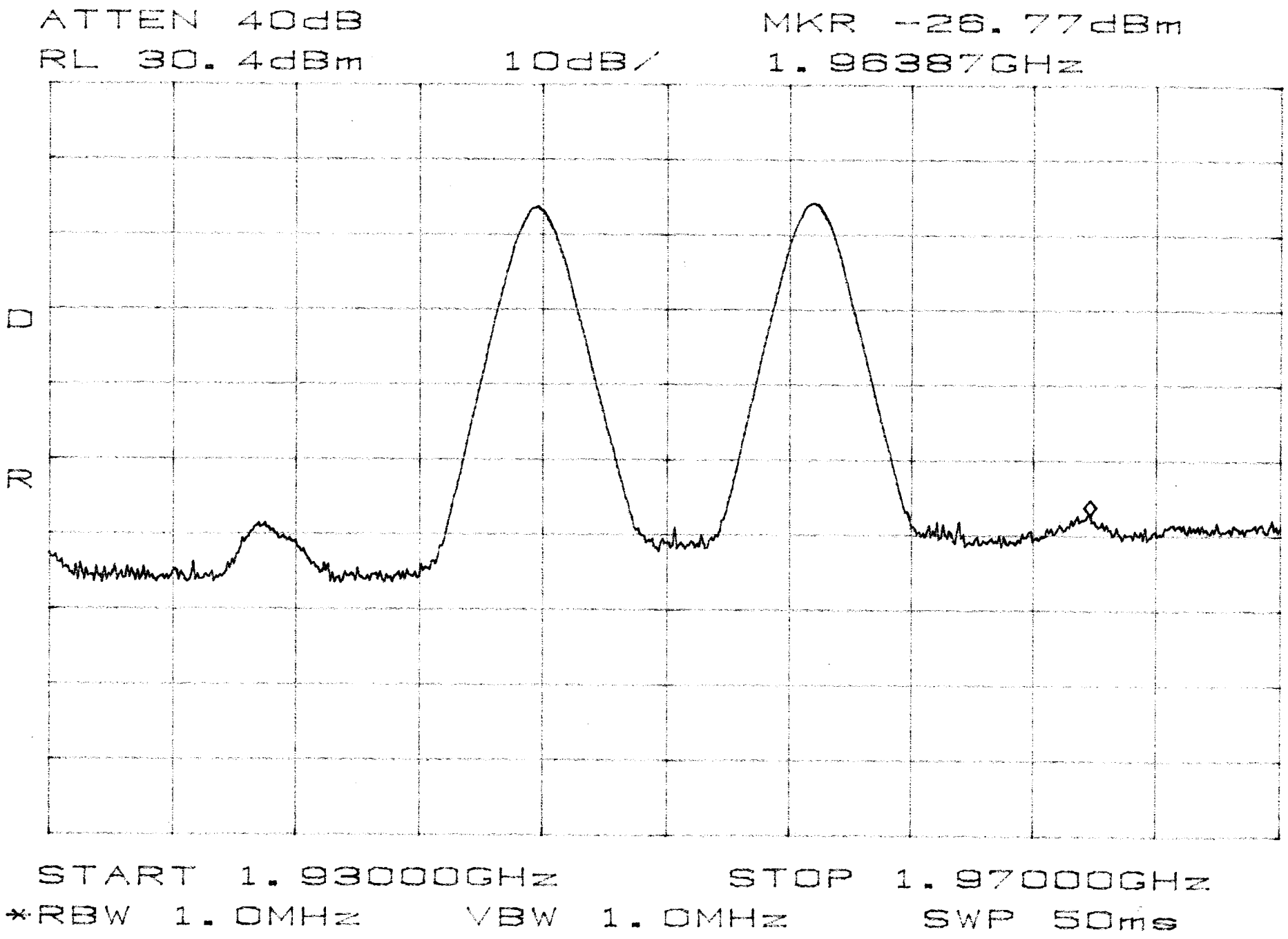
Band A, D FM Intermod
apart



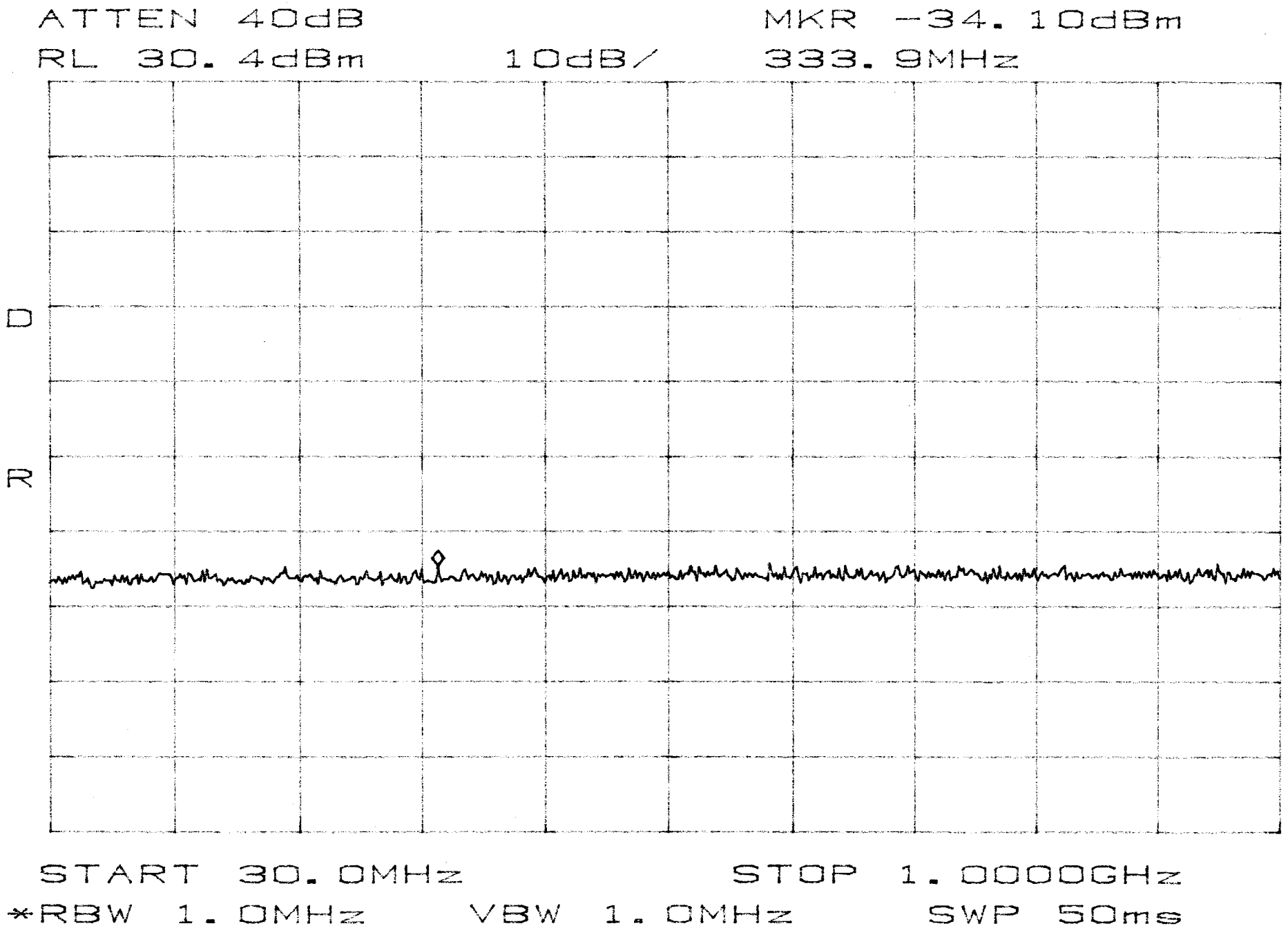
Band A,D FM Intermod
apart



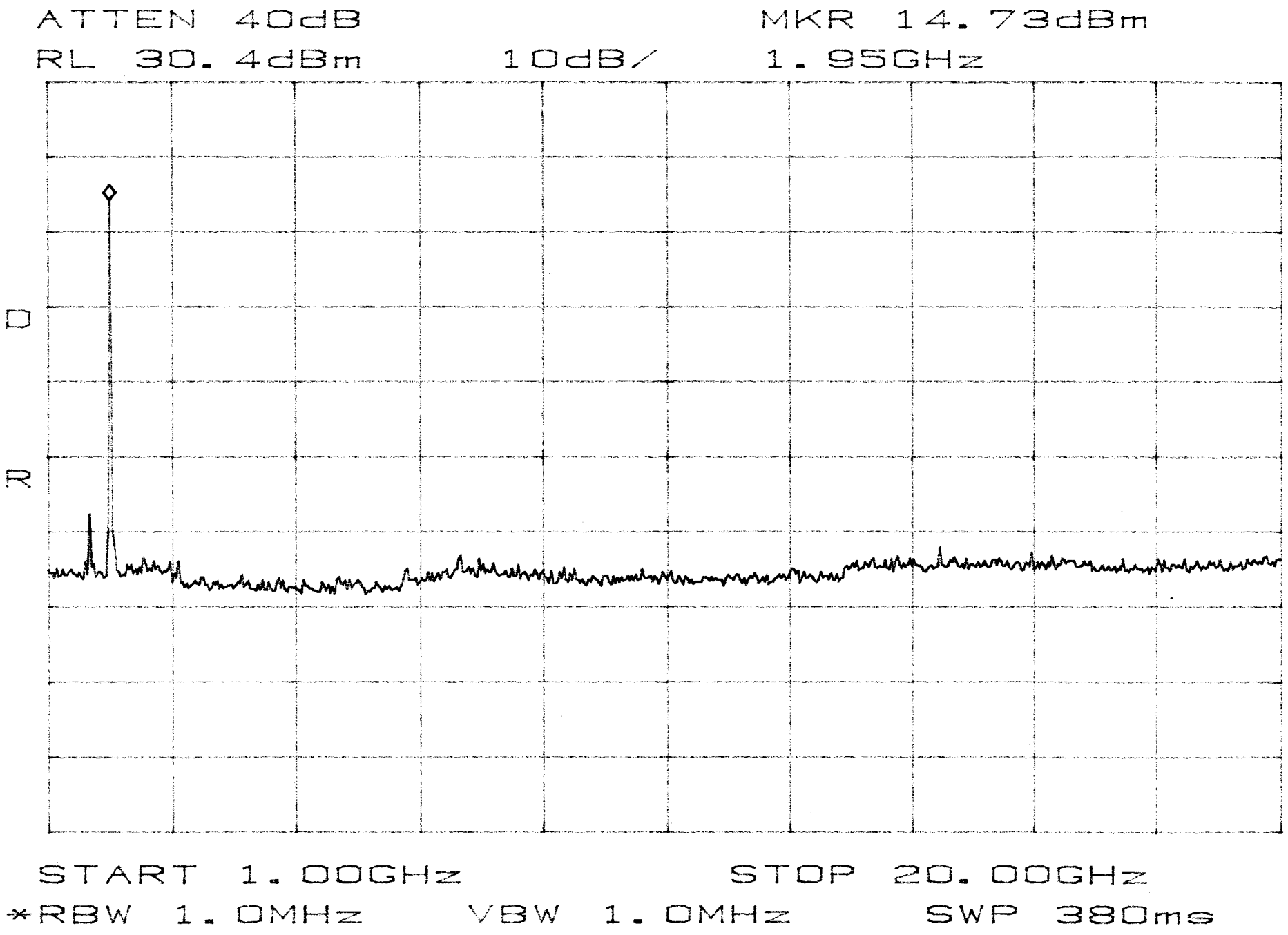
Band D,B,E FM Intermod
close



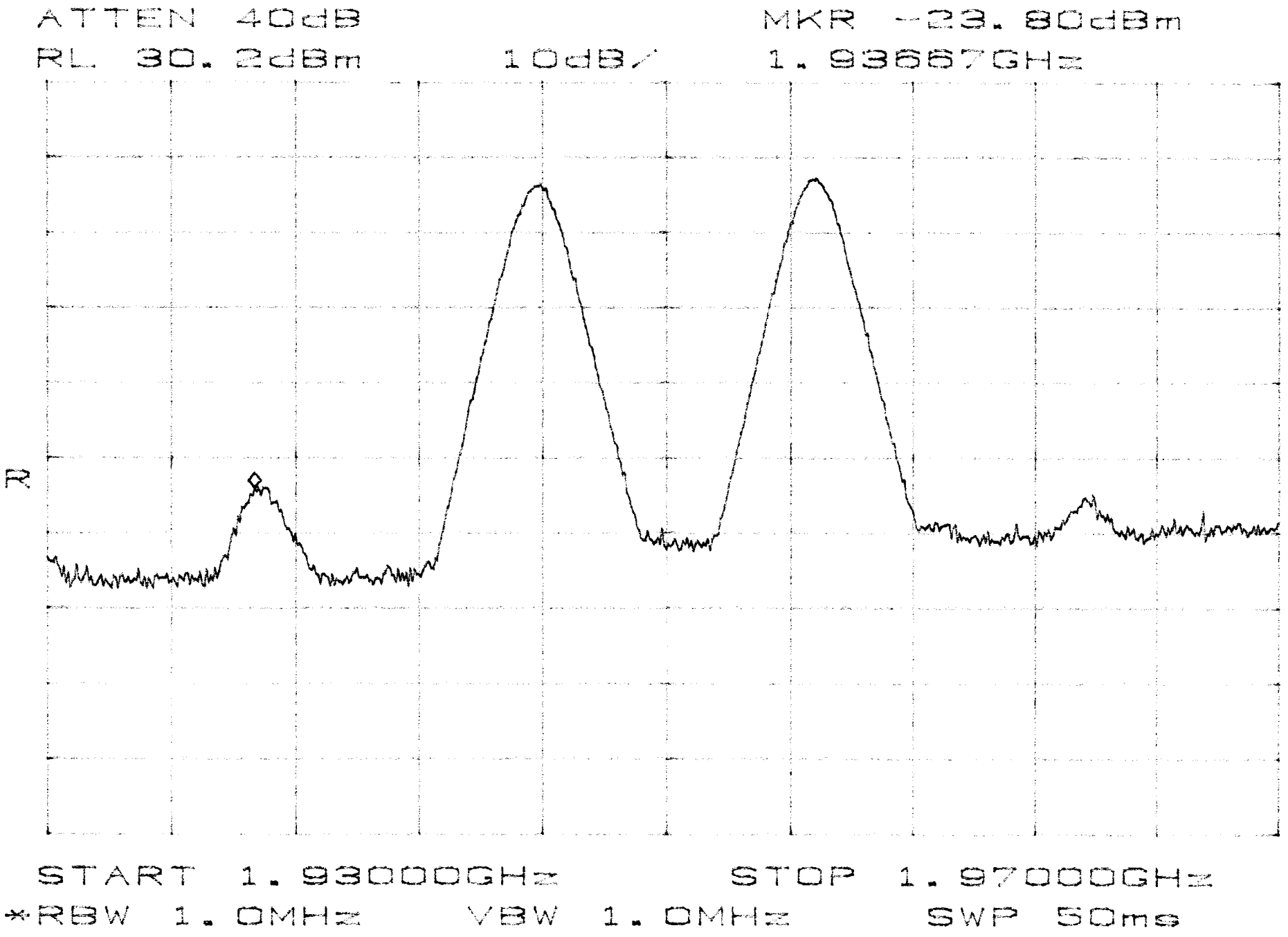
Band D,B,E Fm Intermod
close



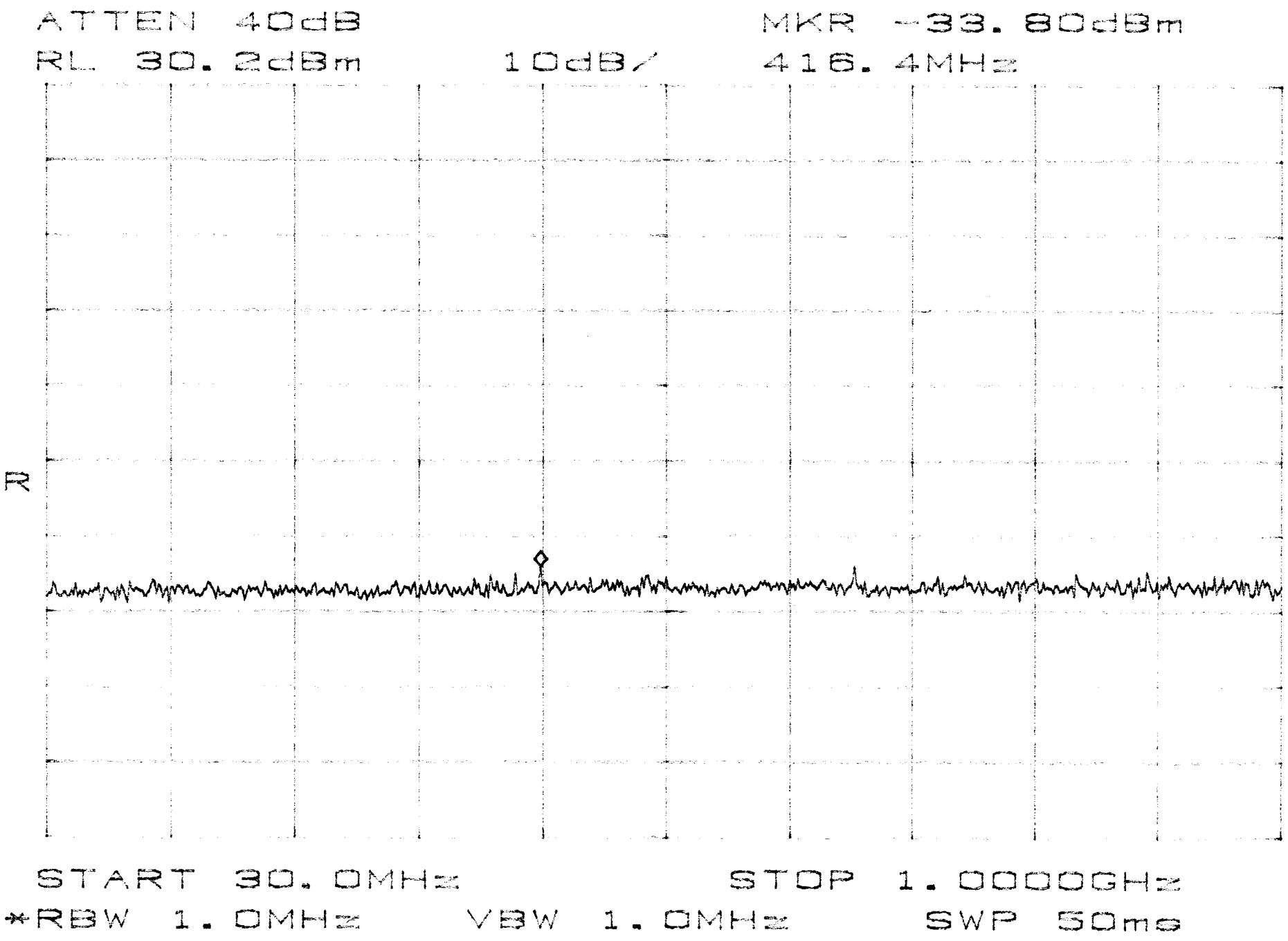
Band D,B,E FM Intermod
close



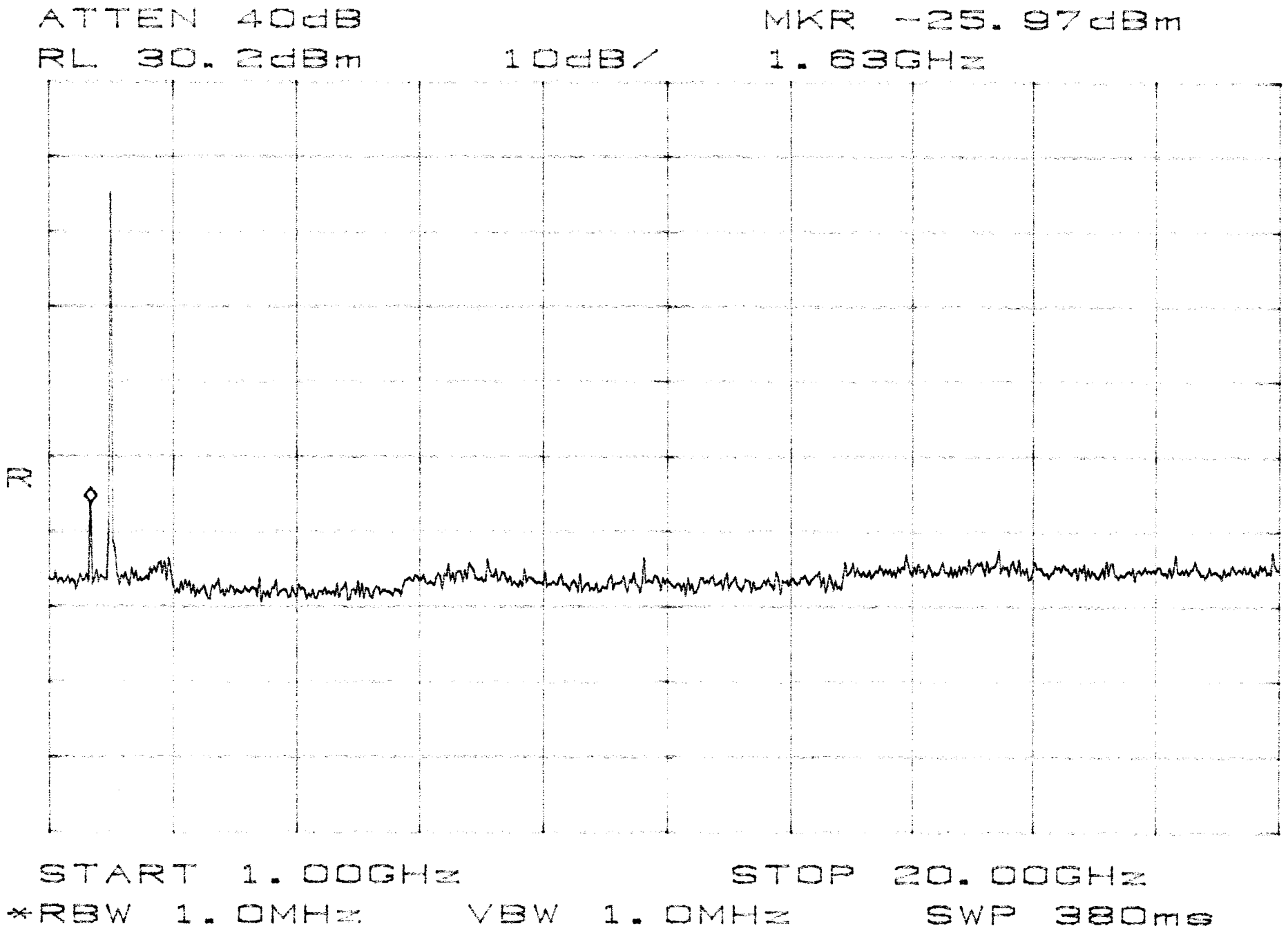
Band D, B, F TDMA Intermod.
close



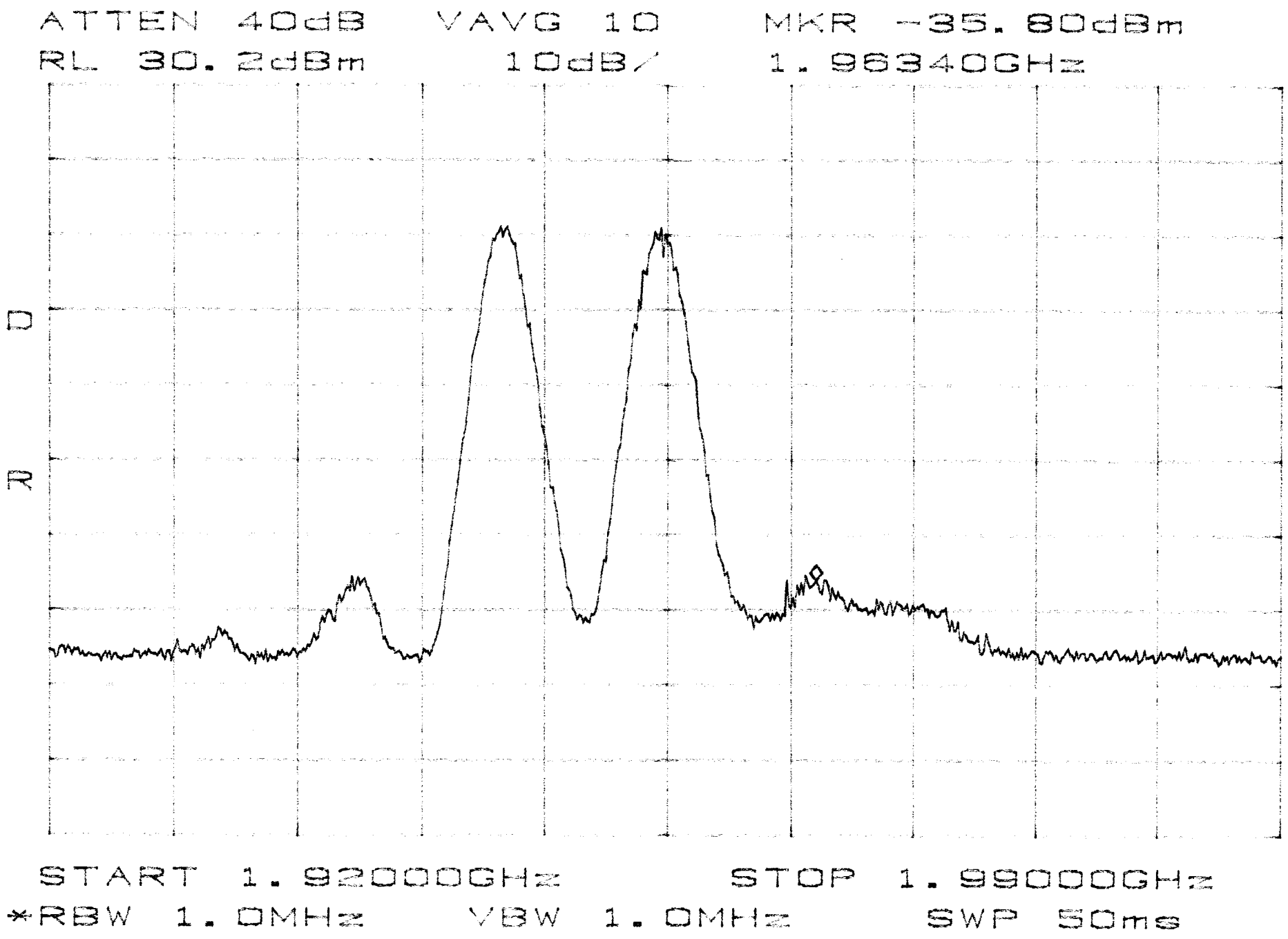
Band D, B, E TDMA Intermod.
close



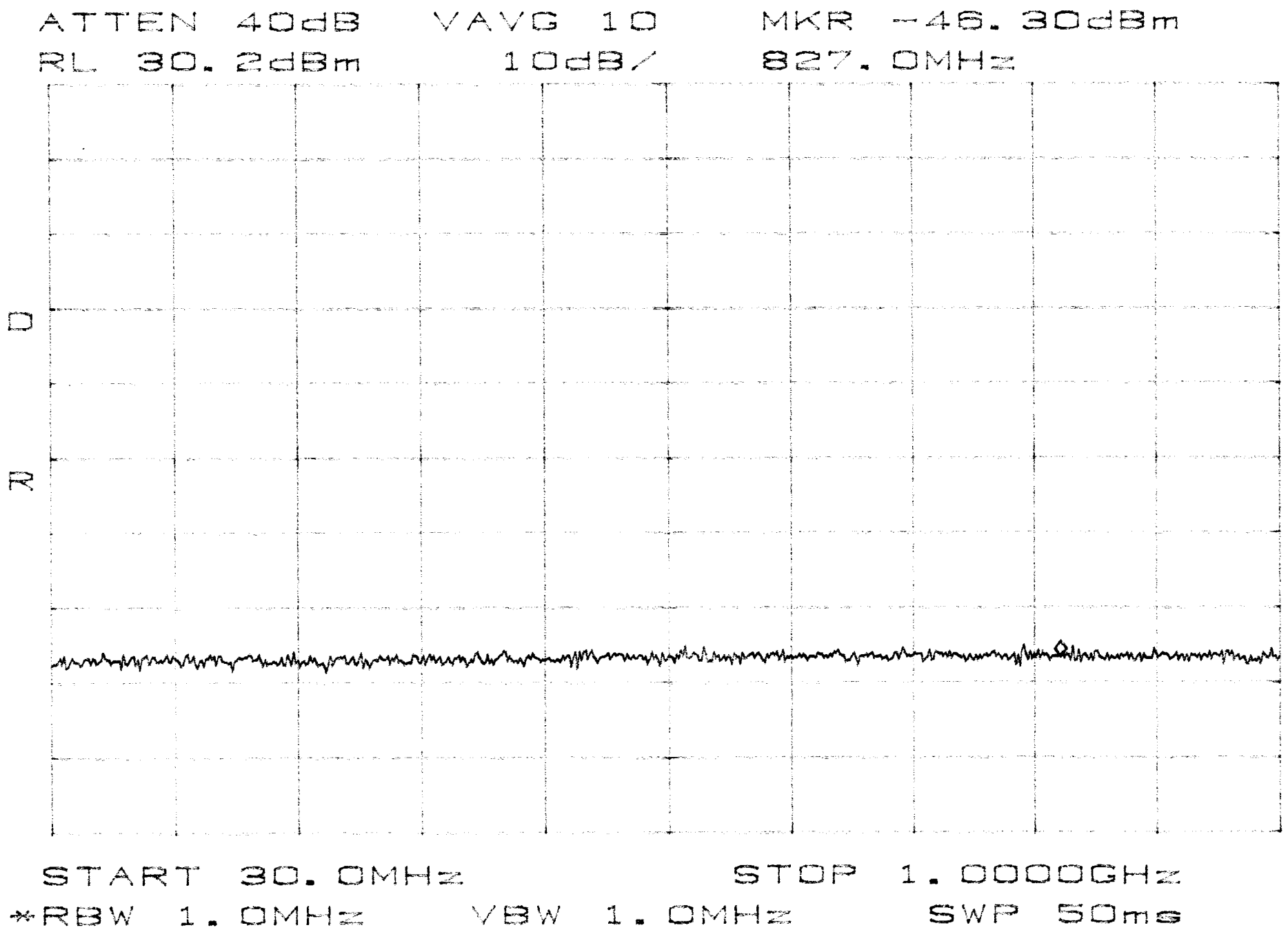
Band D.B.E TDMA Intermod.
close



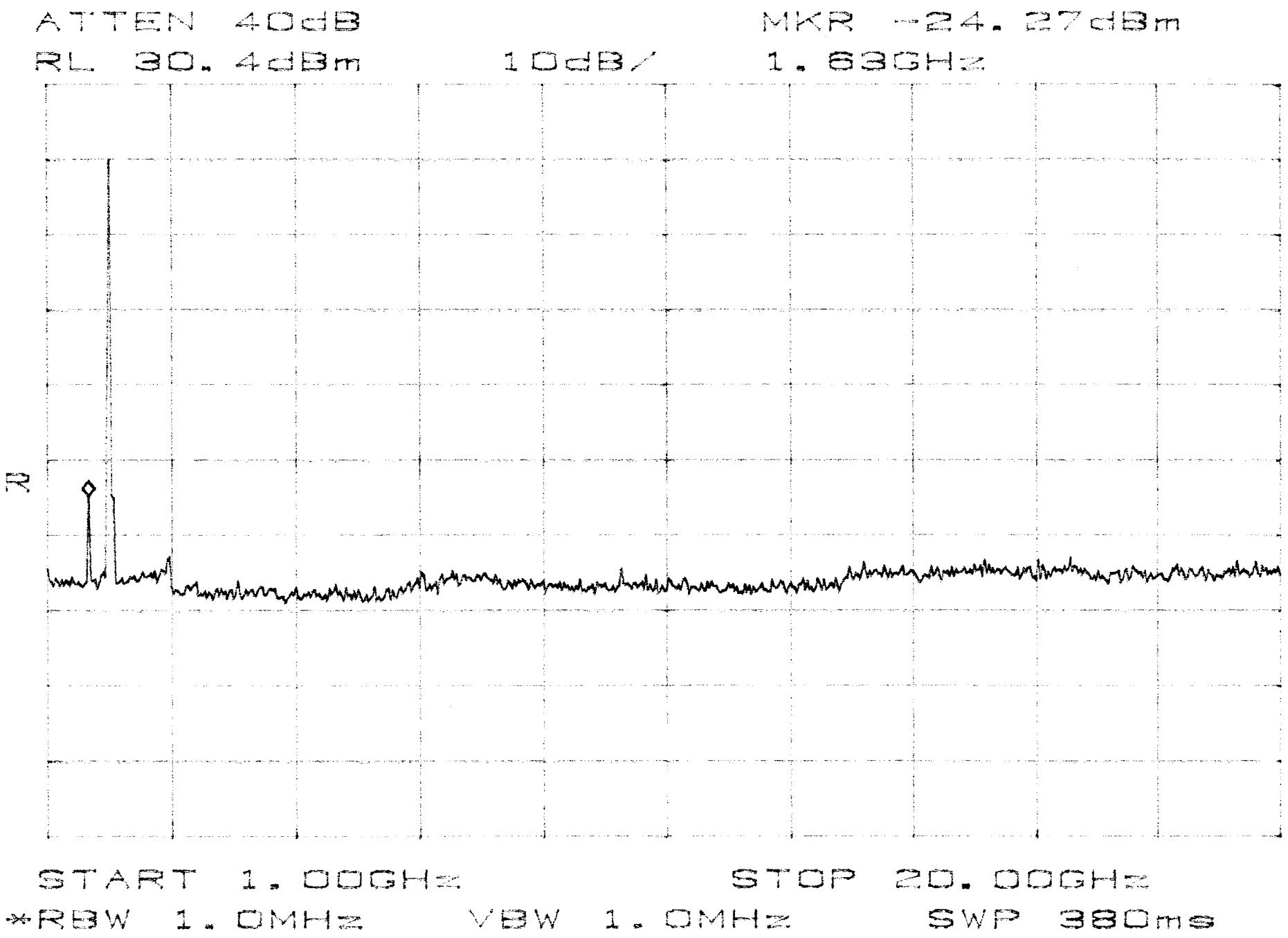
Band D,B,E CDMA Intermod
close



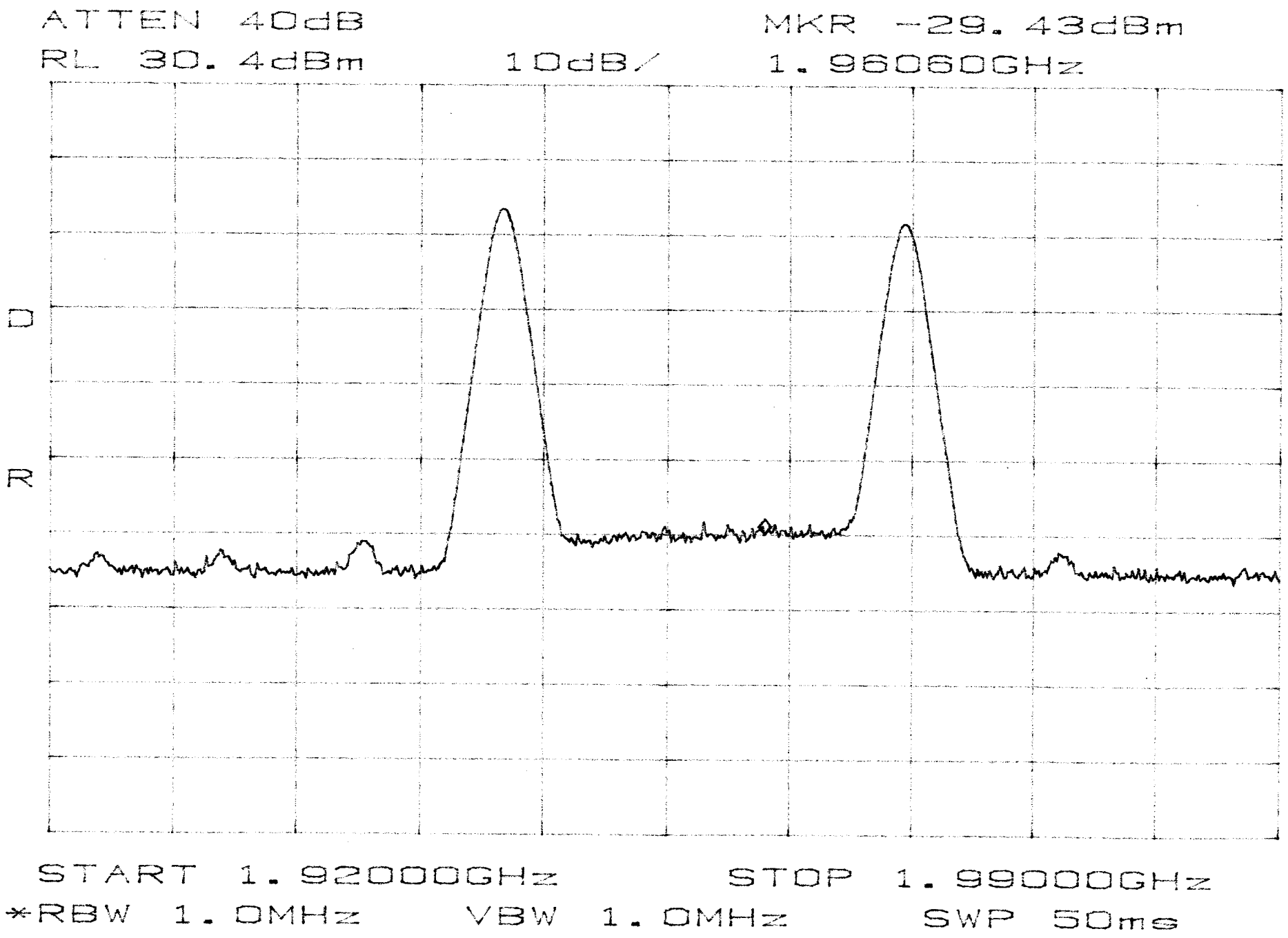
Band D, B, E CDMA Intermod close



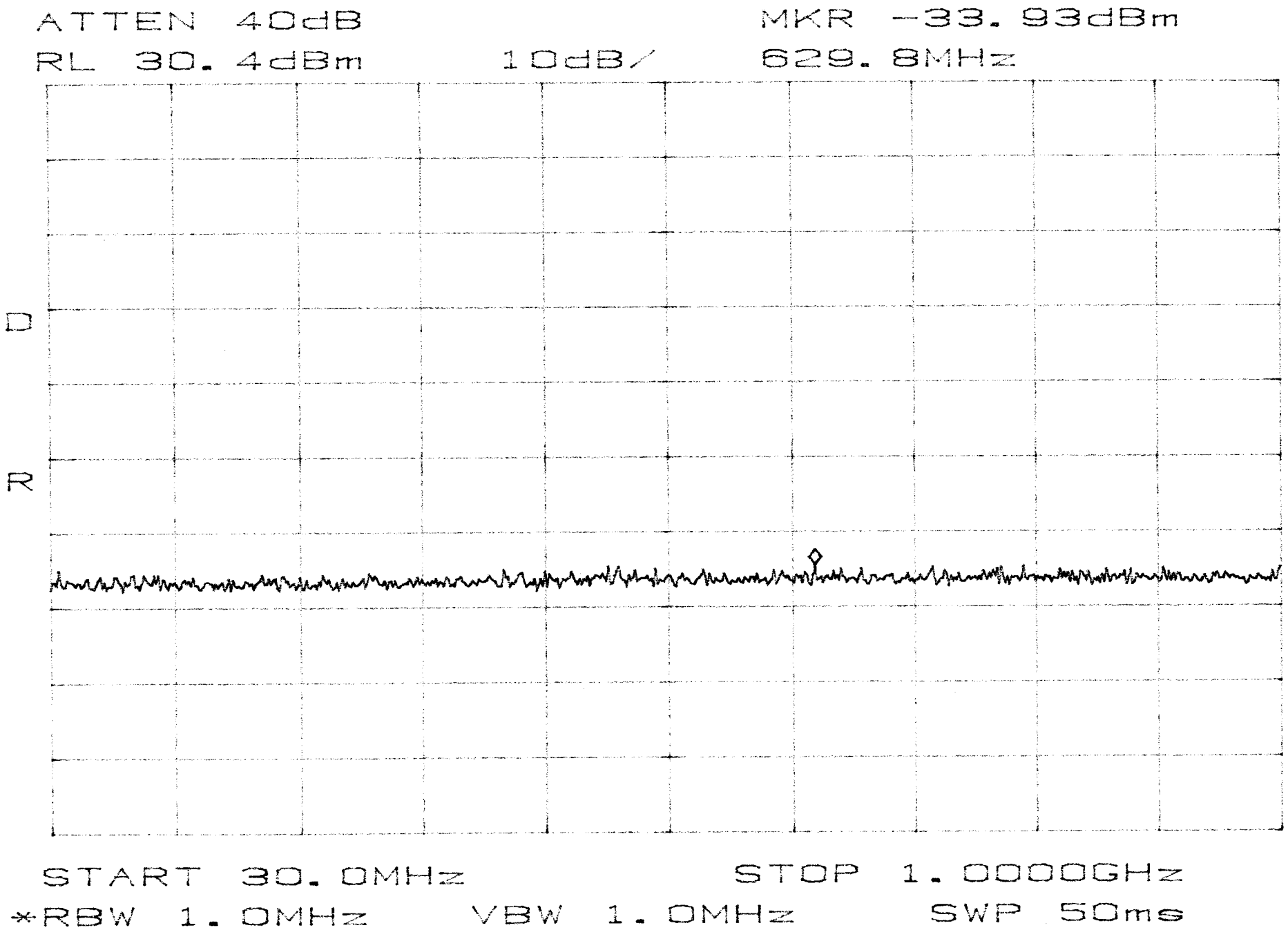
Band D, B, E CDMA Intermod
close



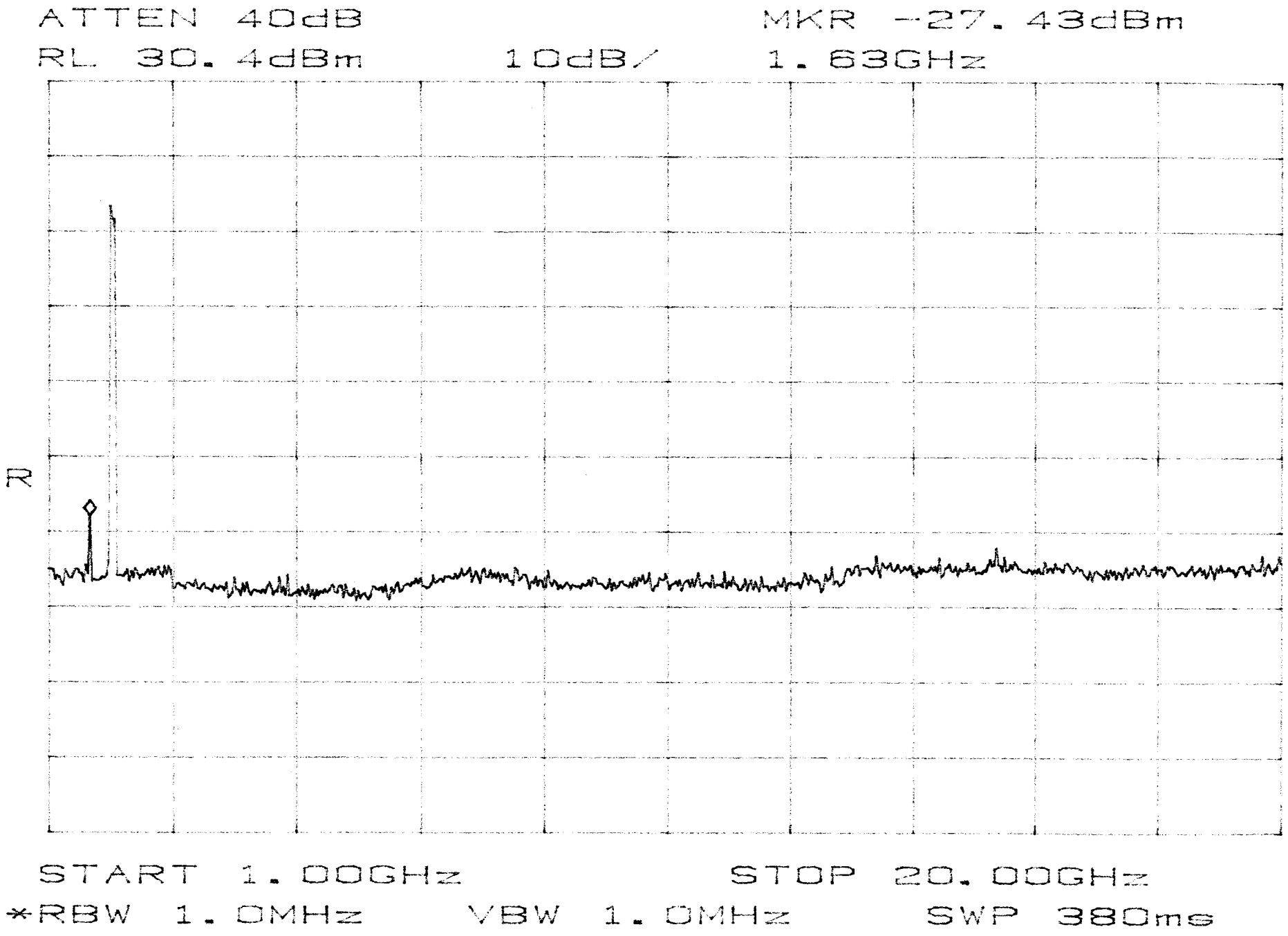
Band D.B.E Fm Intermod
apart



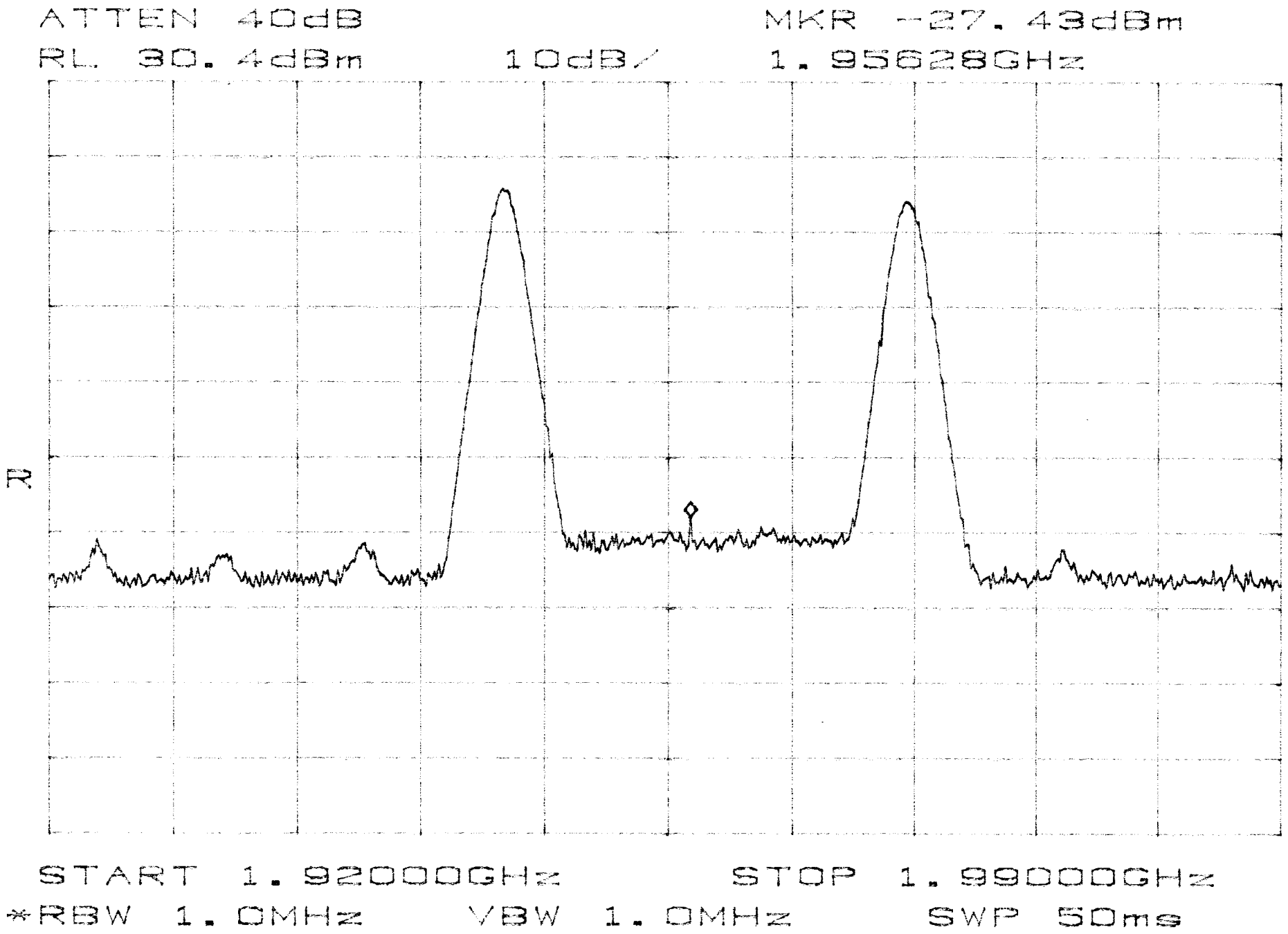
Band D, B, E Fm Intermod
apart



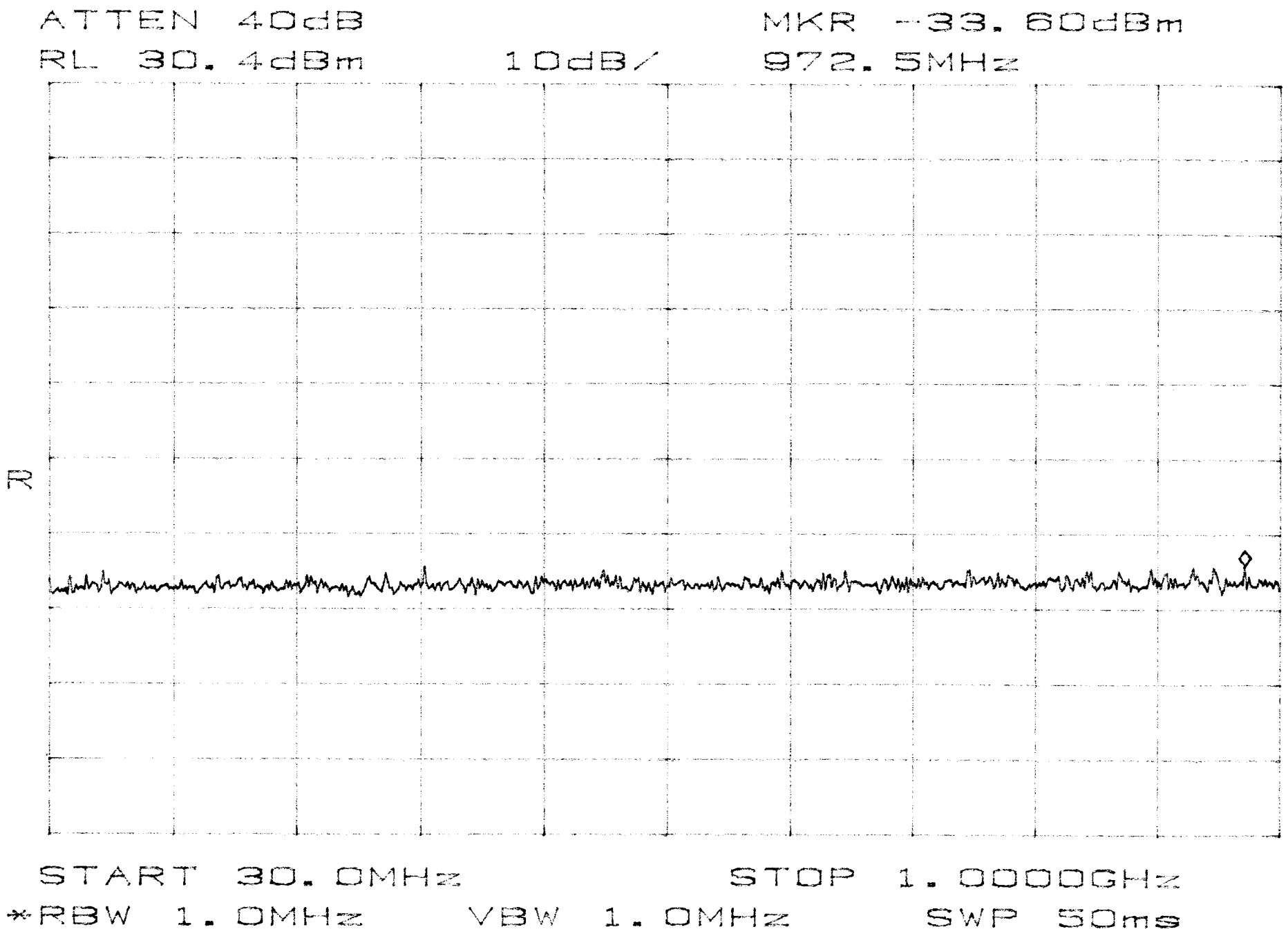
Band D,B,E Fm Intermod
apart



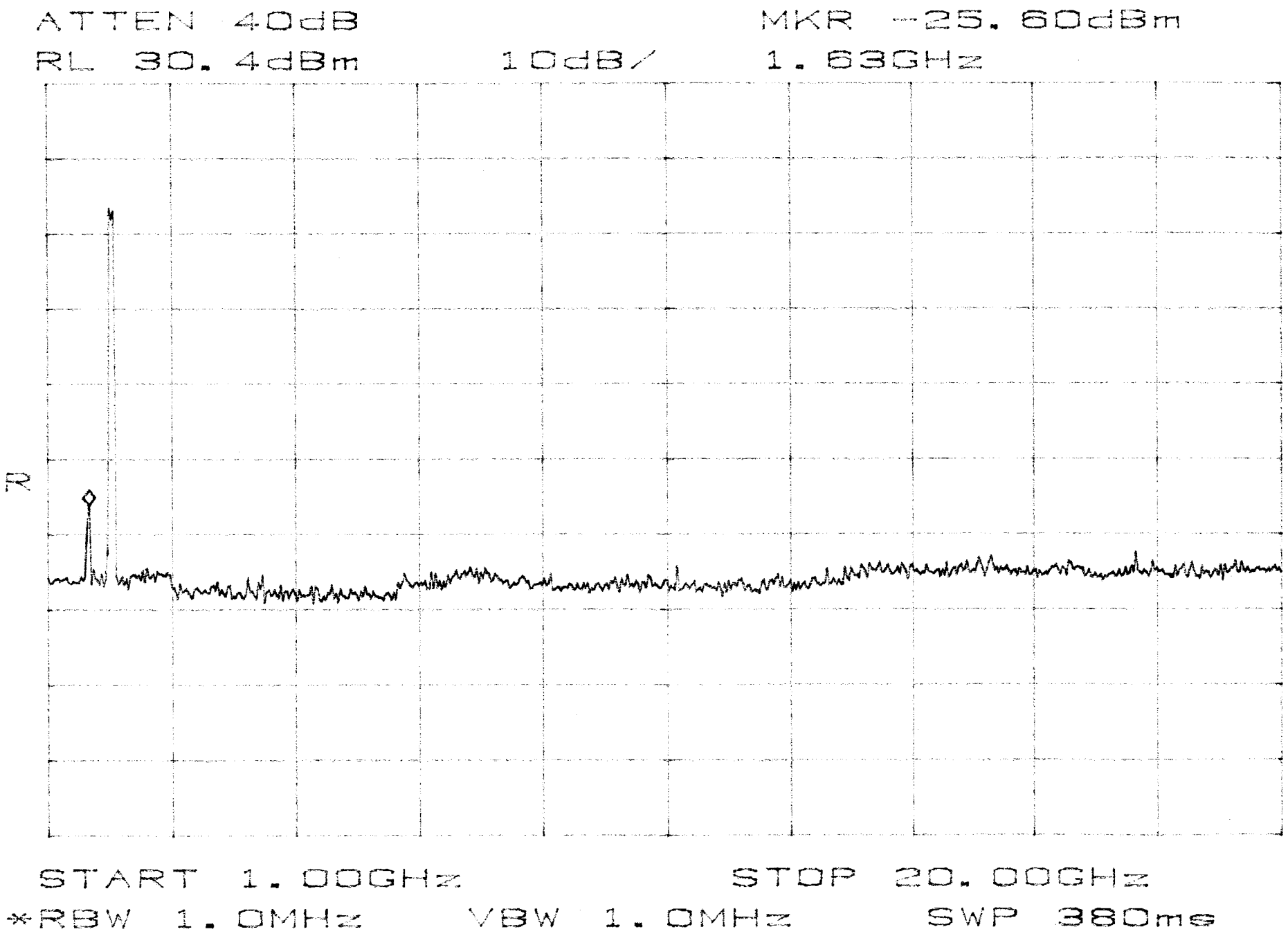
Band D,B,E TDMA Intermod
apart



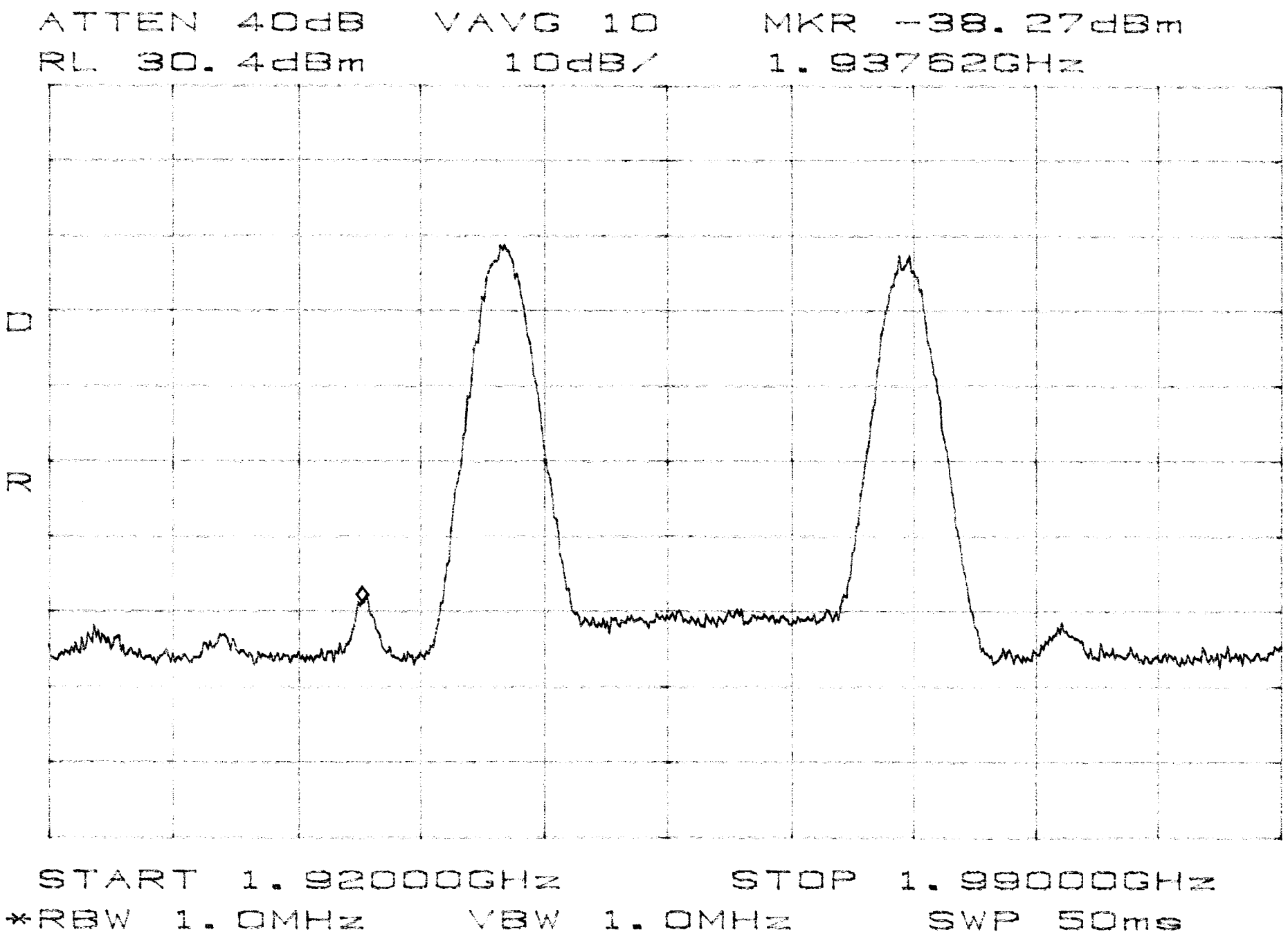
Band D, B, E TDMA Intermod apart



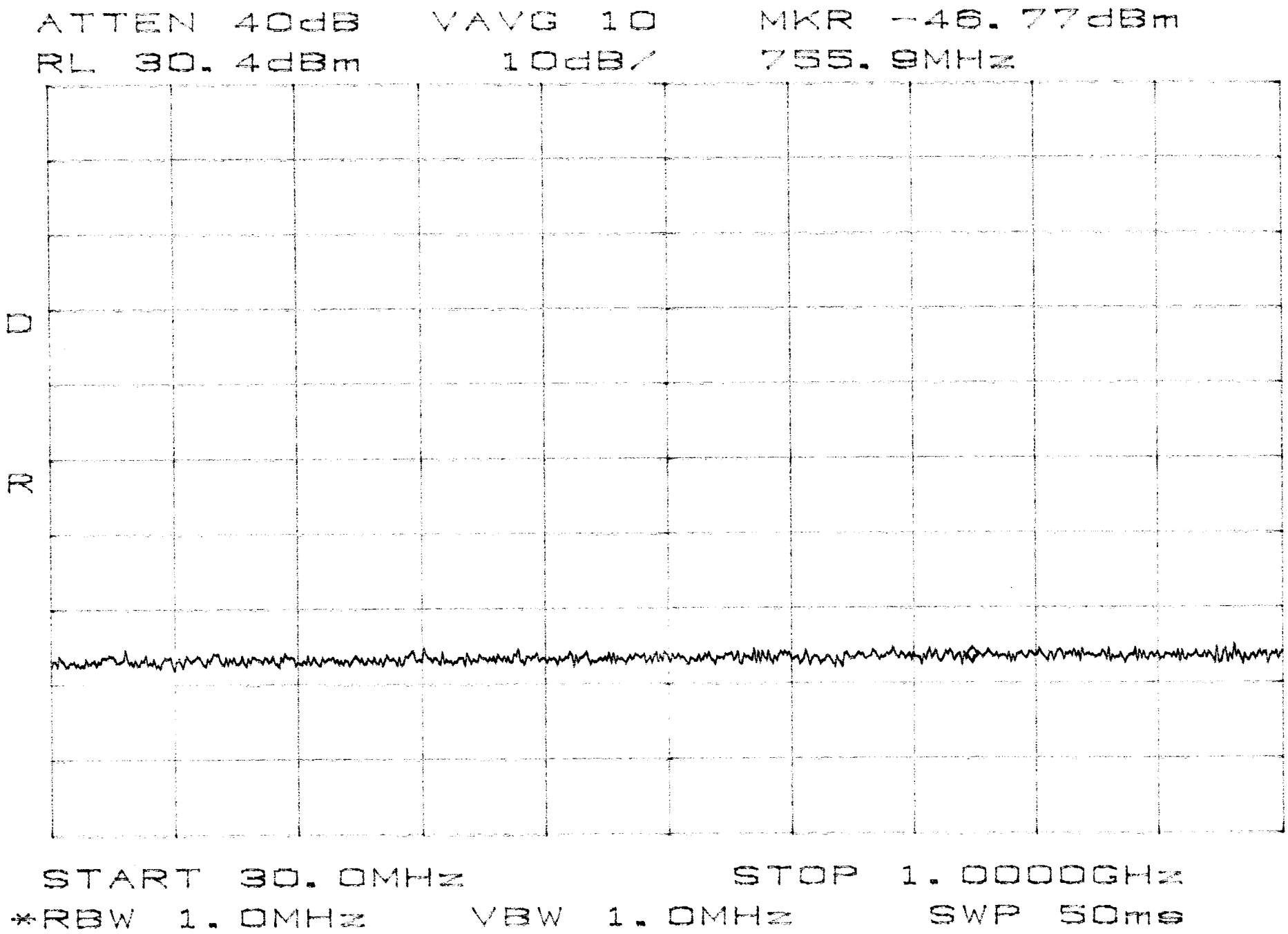
Band D,B,E TDMA Intermod
apart



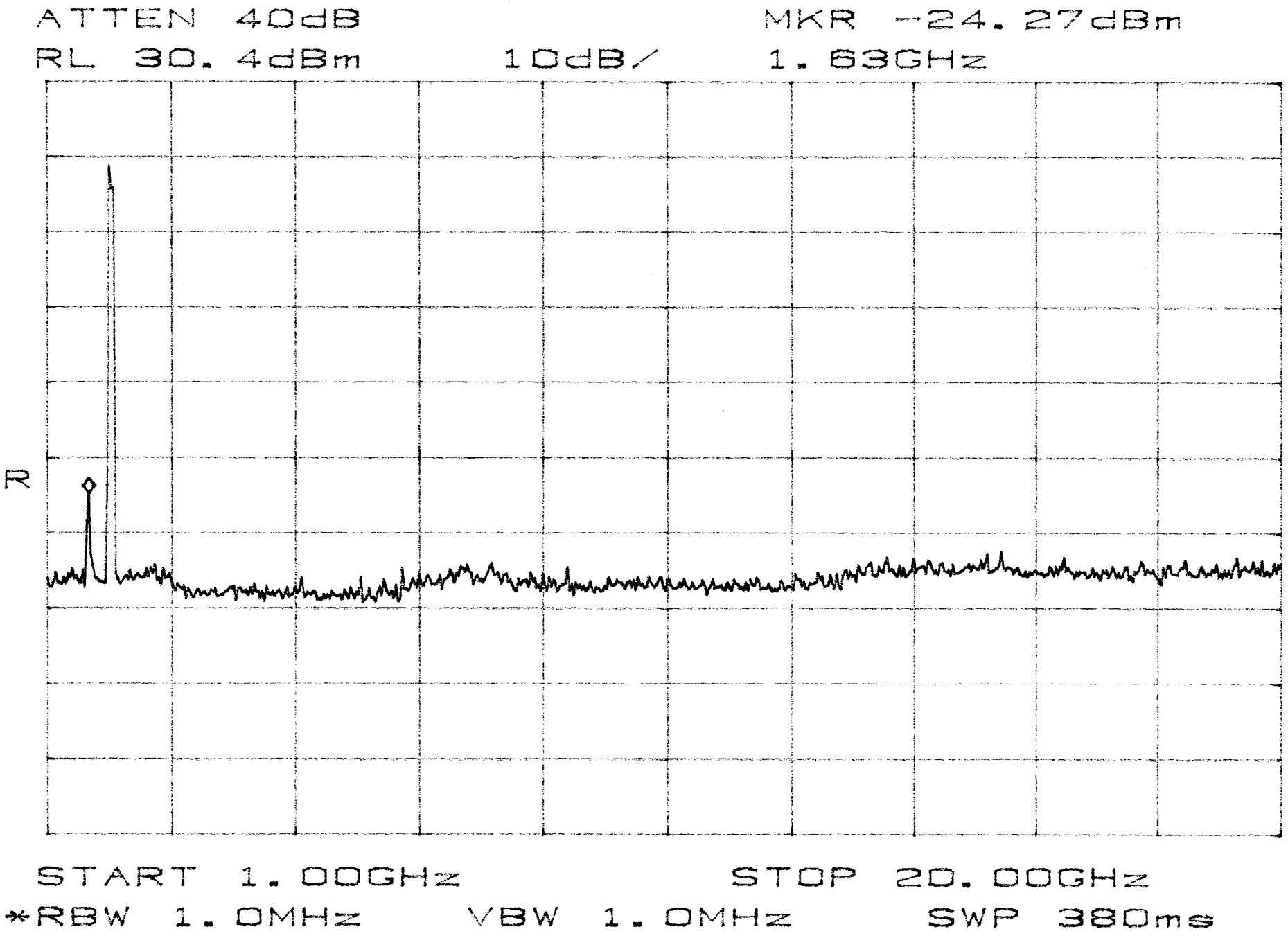
Band D,B,F CDMA Intermod
apart



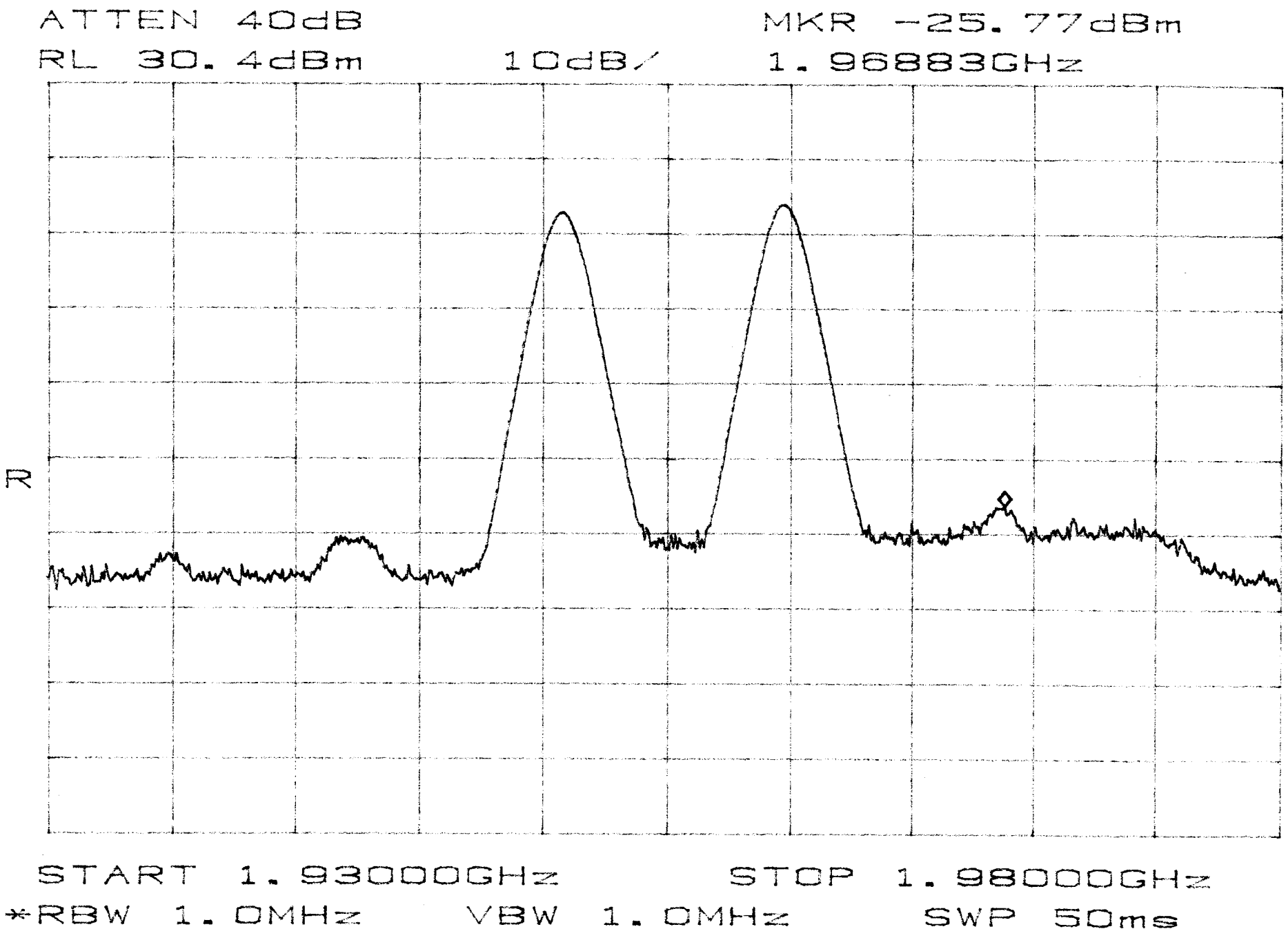
Band D,B,F CDMA Intermod
apart



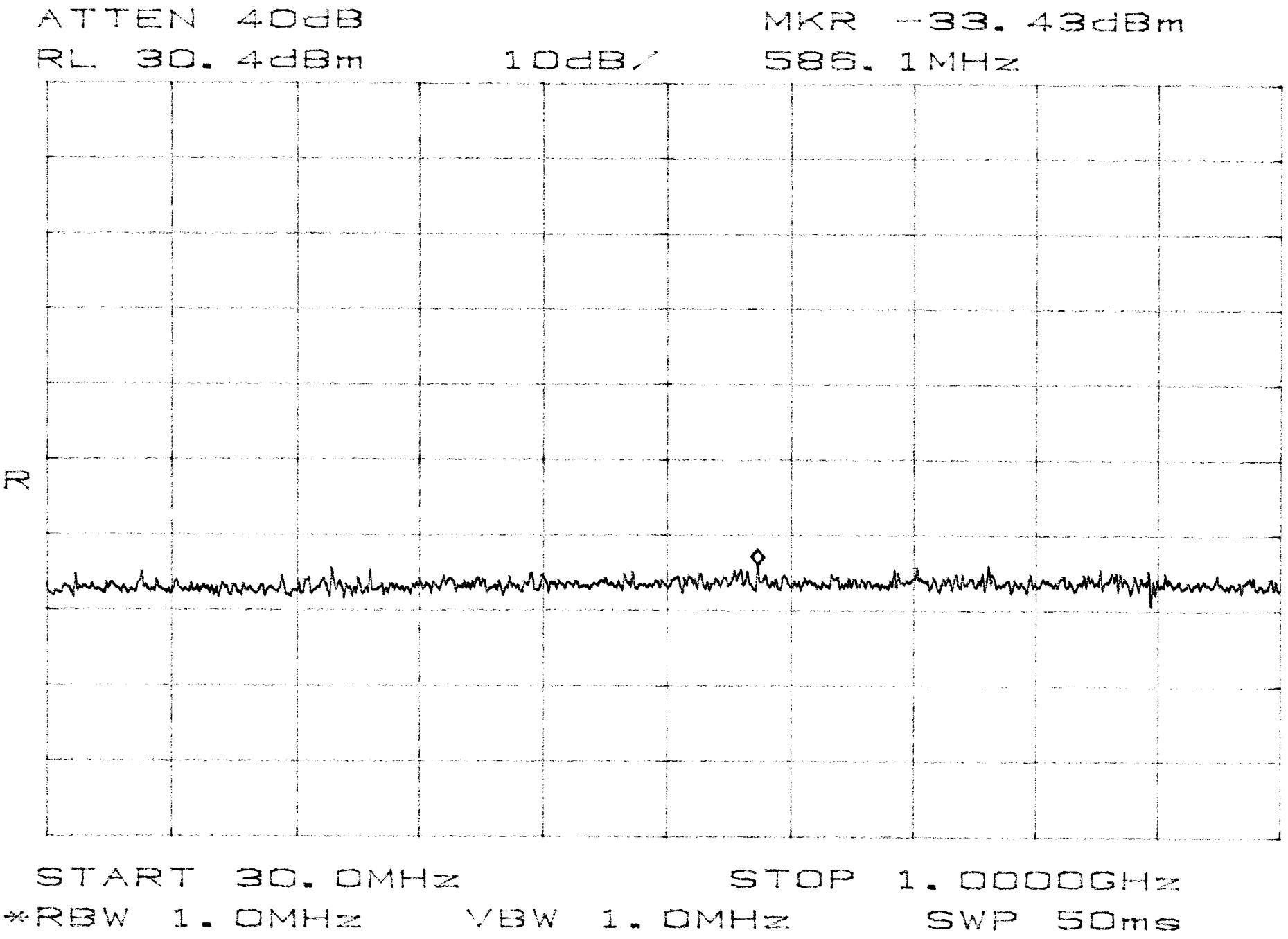
Band D,B,E CDMA Intermod
apart



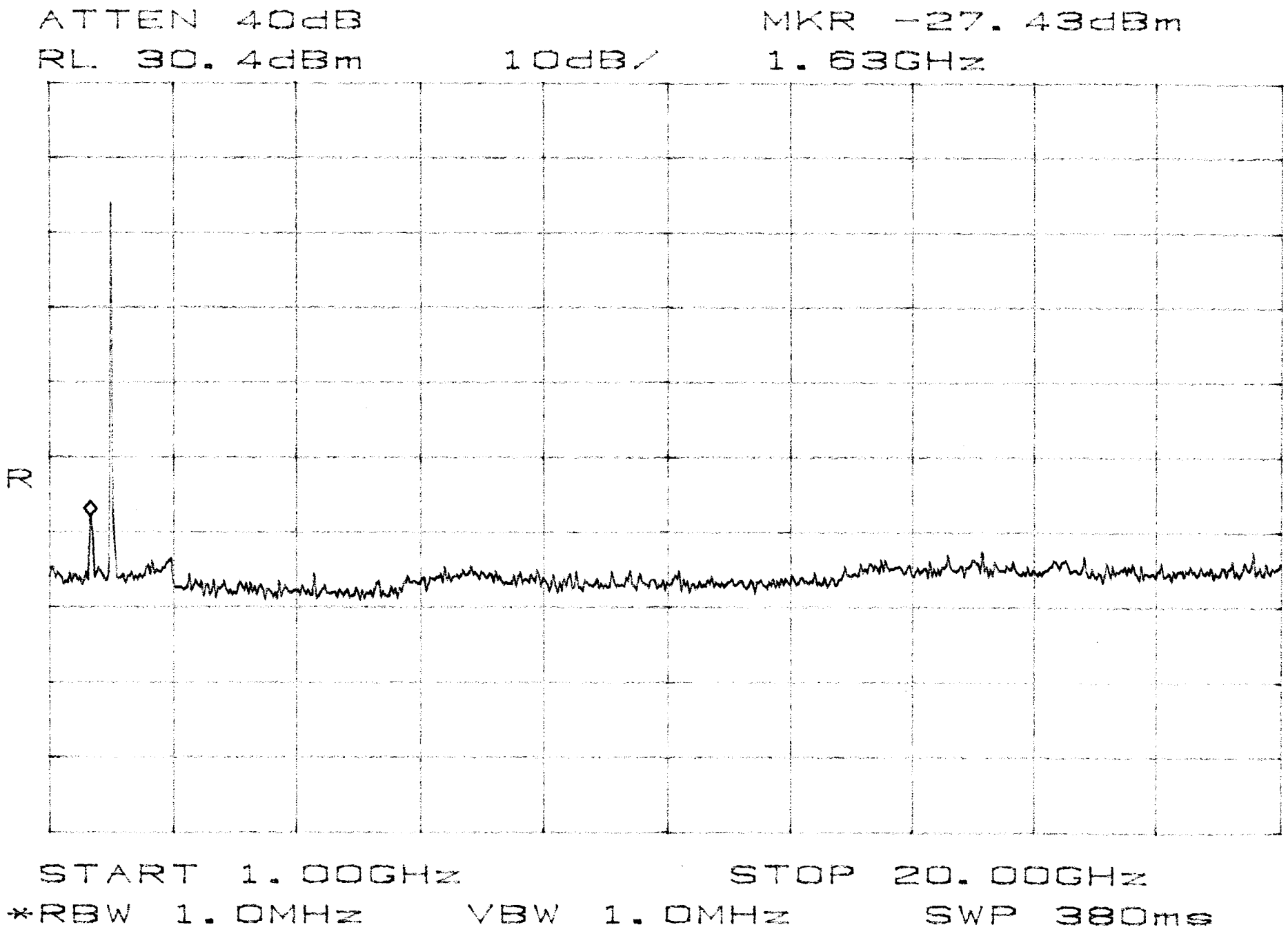
Band B, E, F FM Intermod
close



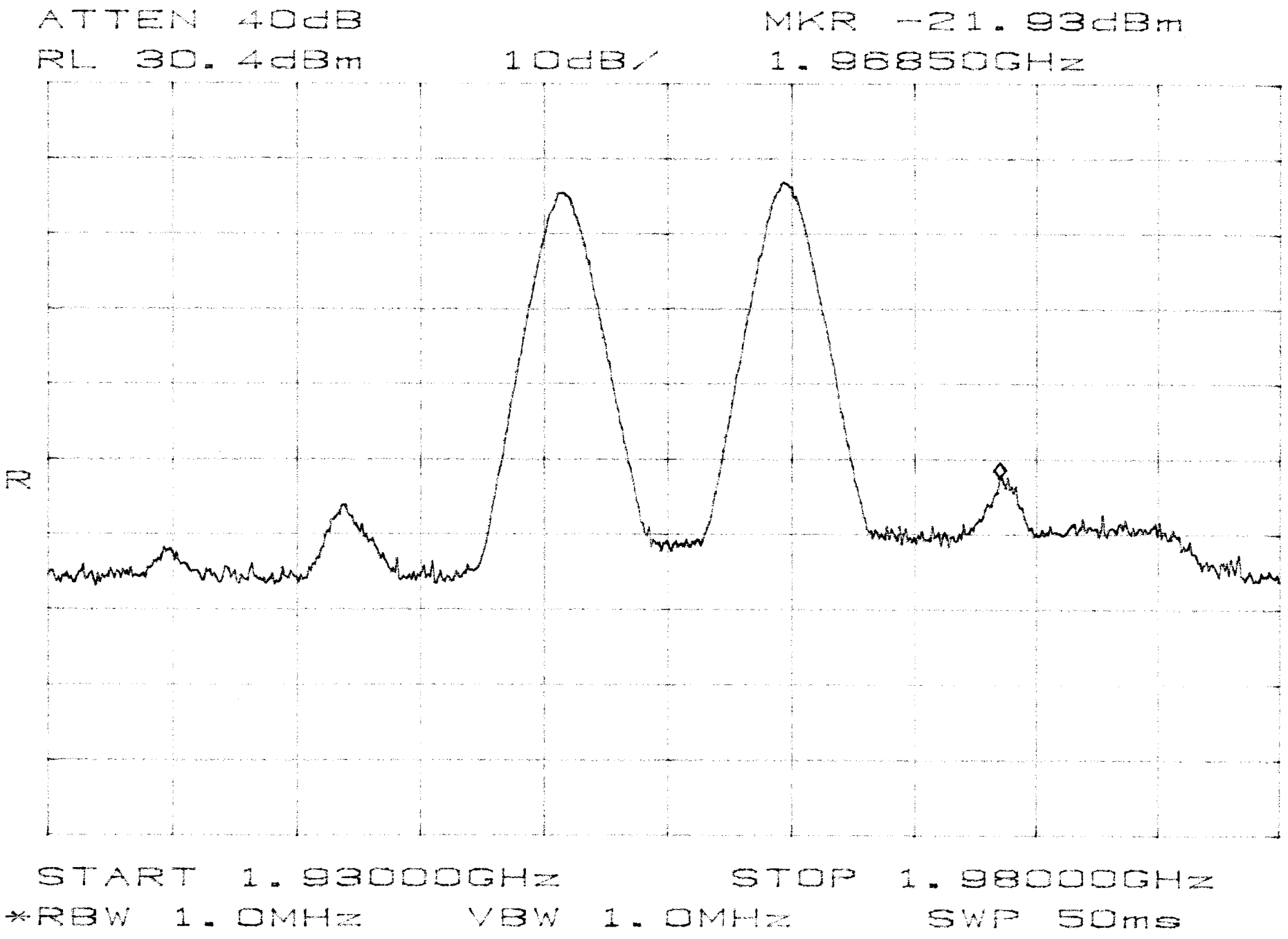
Band B, E, F FM Intermod
close



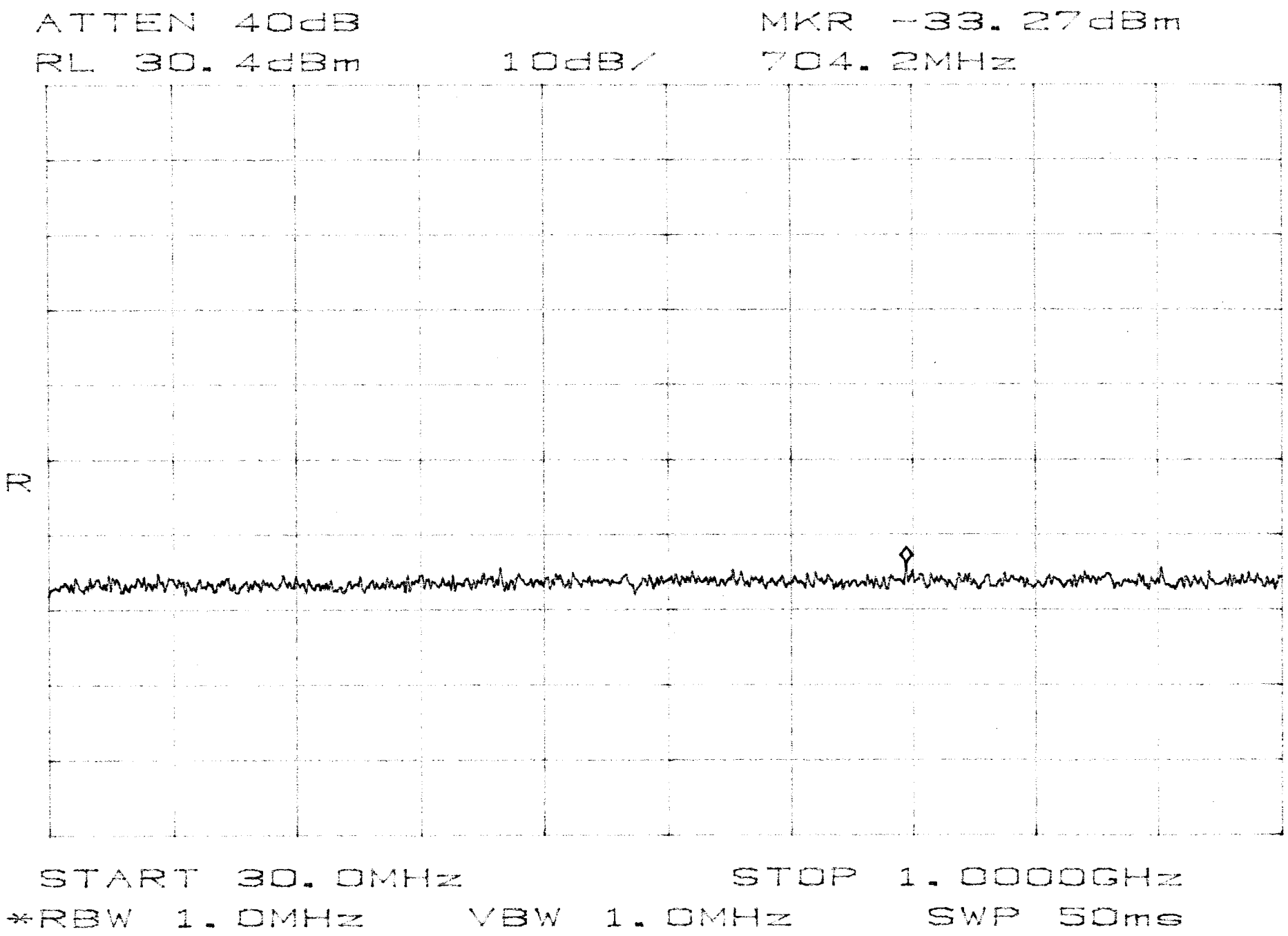
Band B,E,F Fm Intermod
close



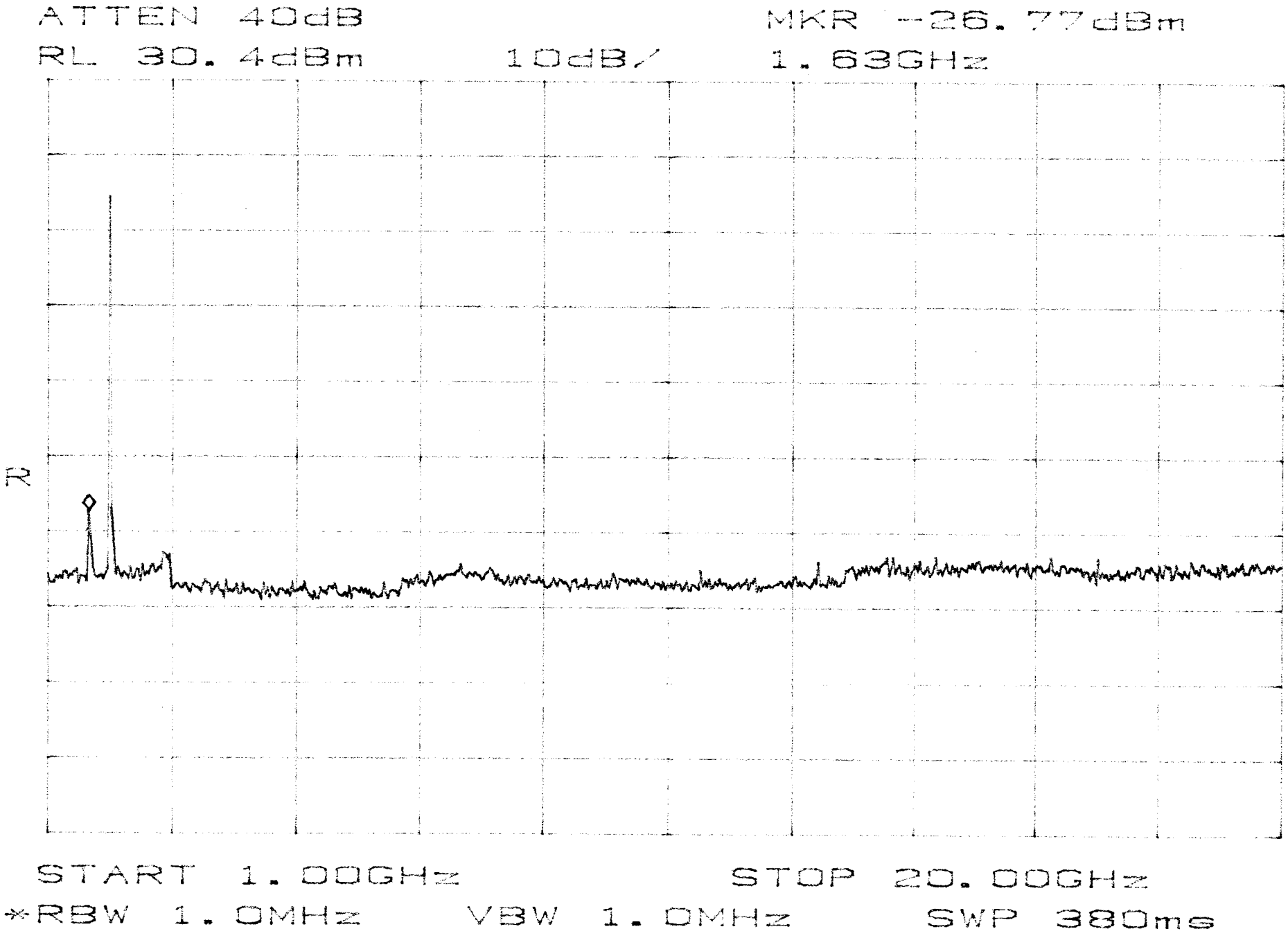
Band B,E,F TDMA Intermod
close



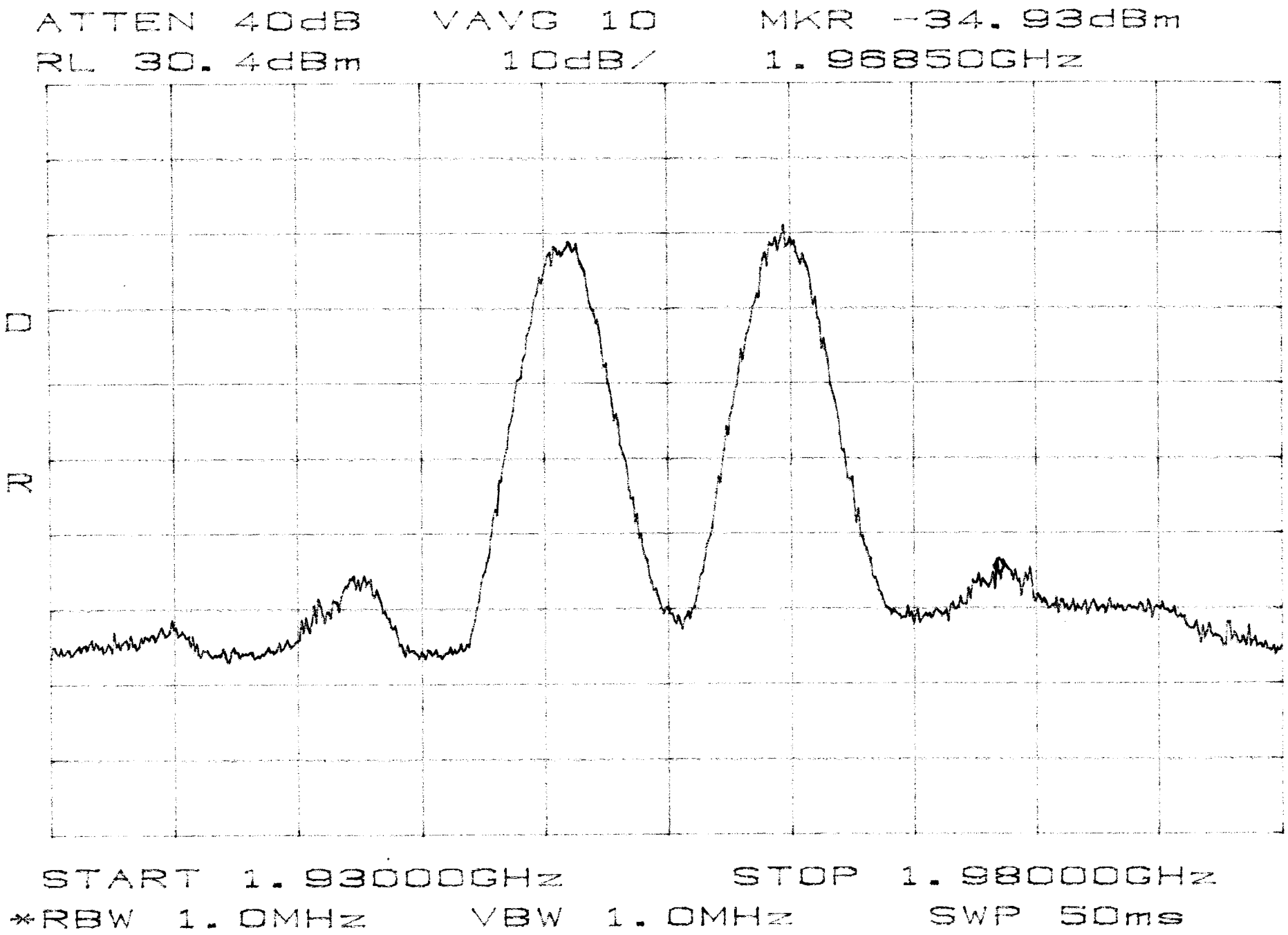
Band B, E, F TDMA Intermod
close



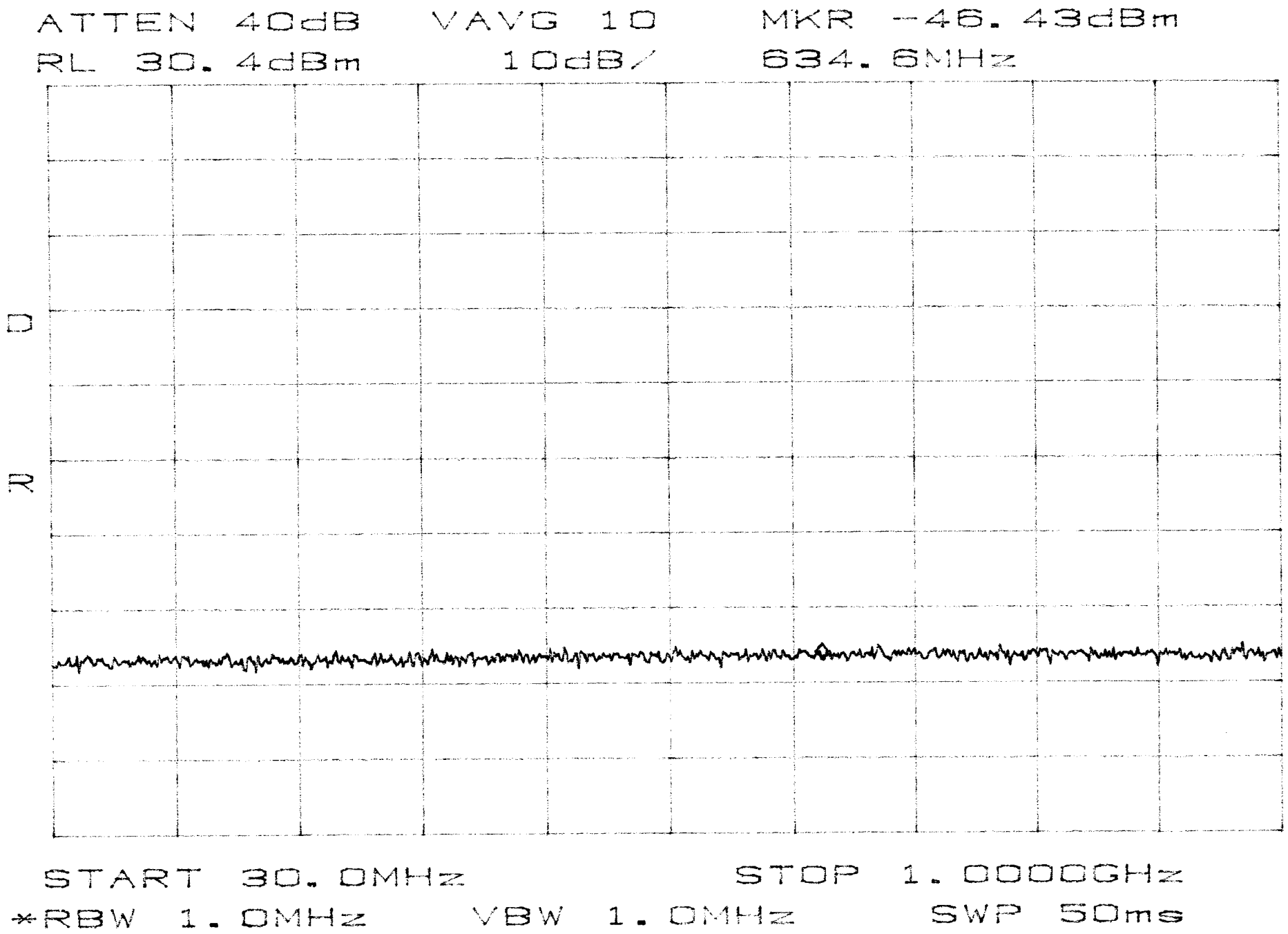
Band B,E,F TDMA Intermod
close



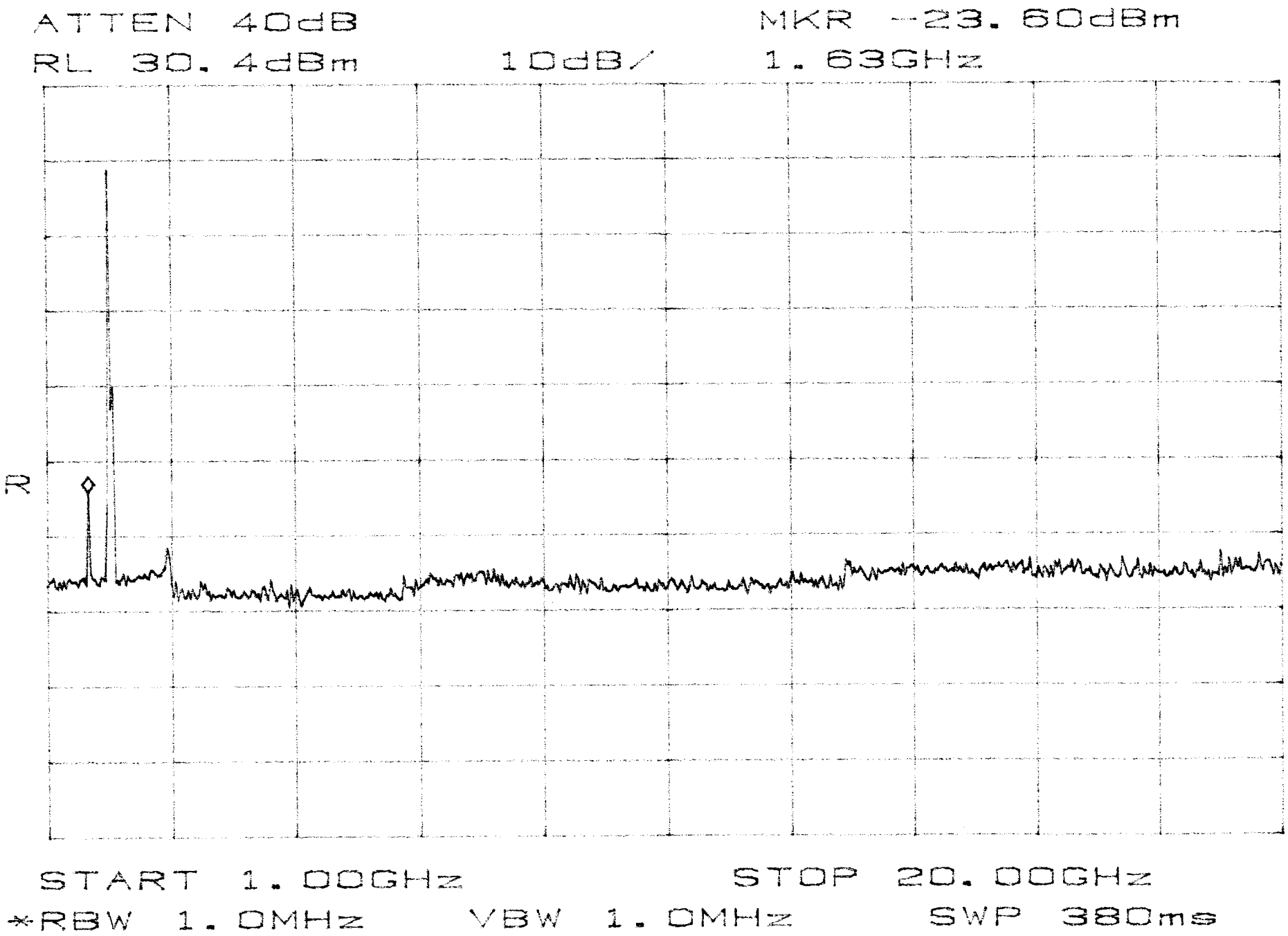
Band B, E, F CDMA Intermod
close



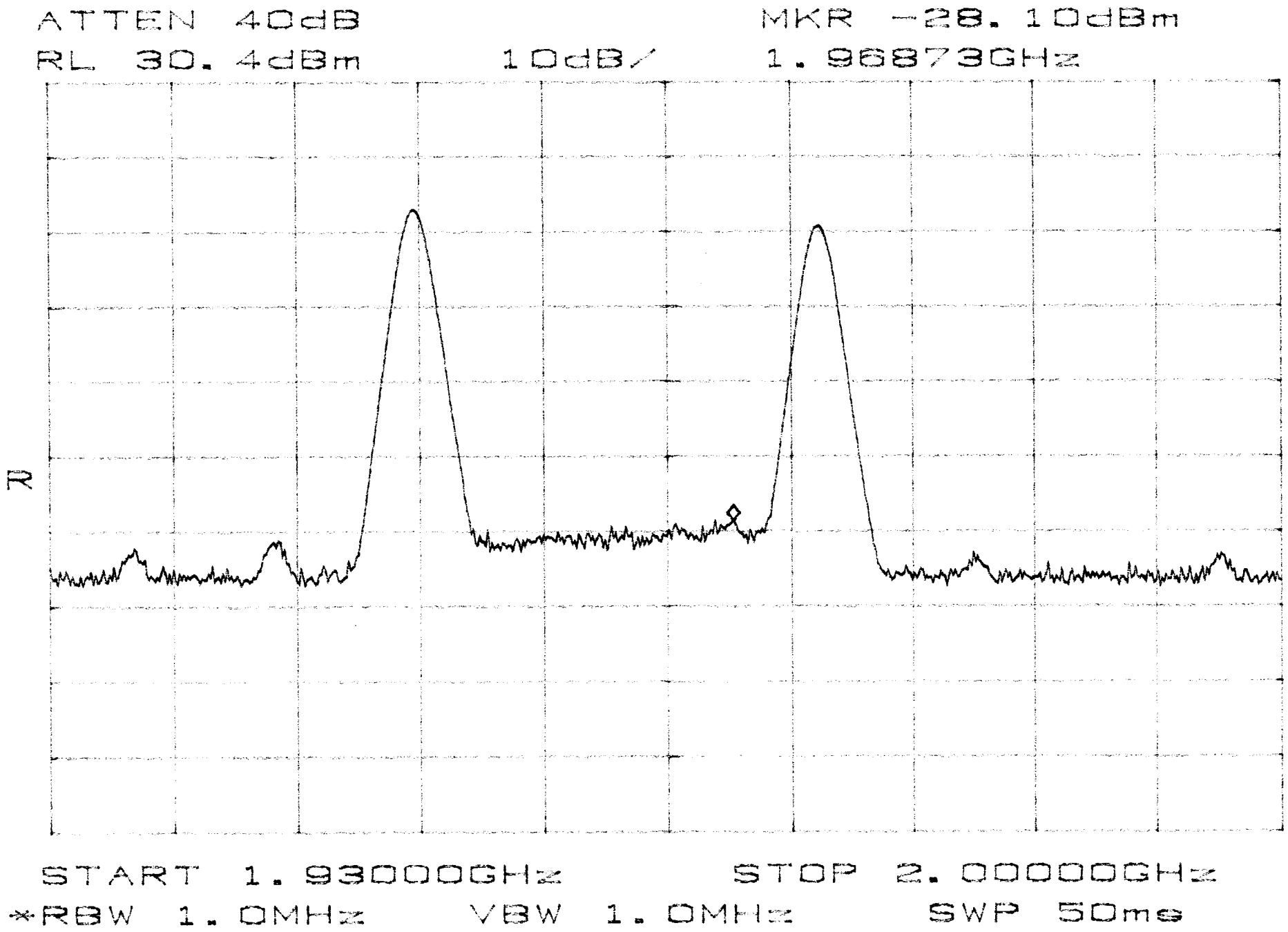
Band B,F,F CDMA Intermod
close



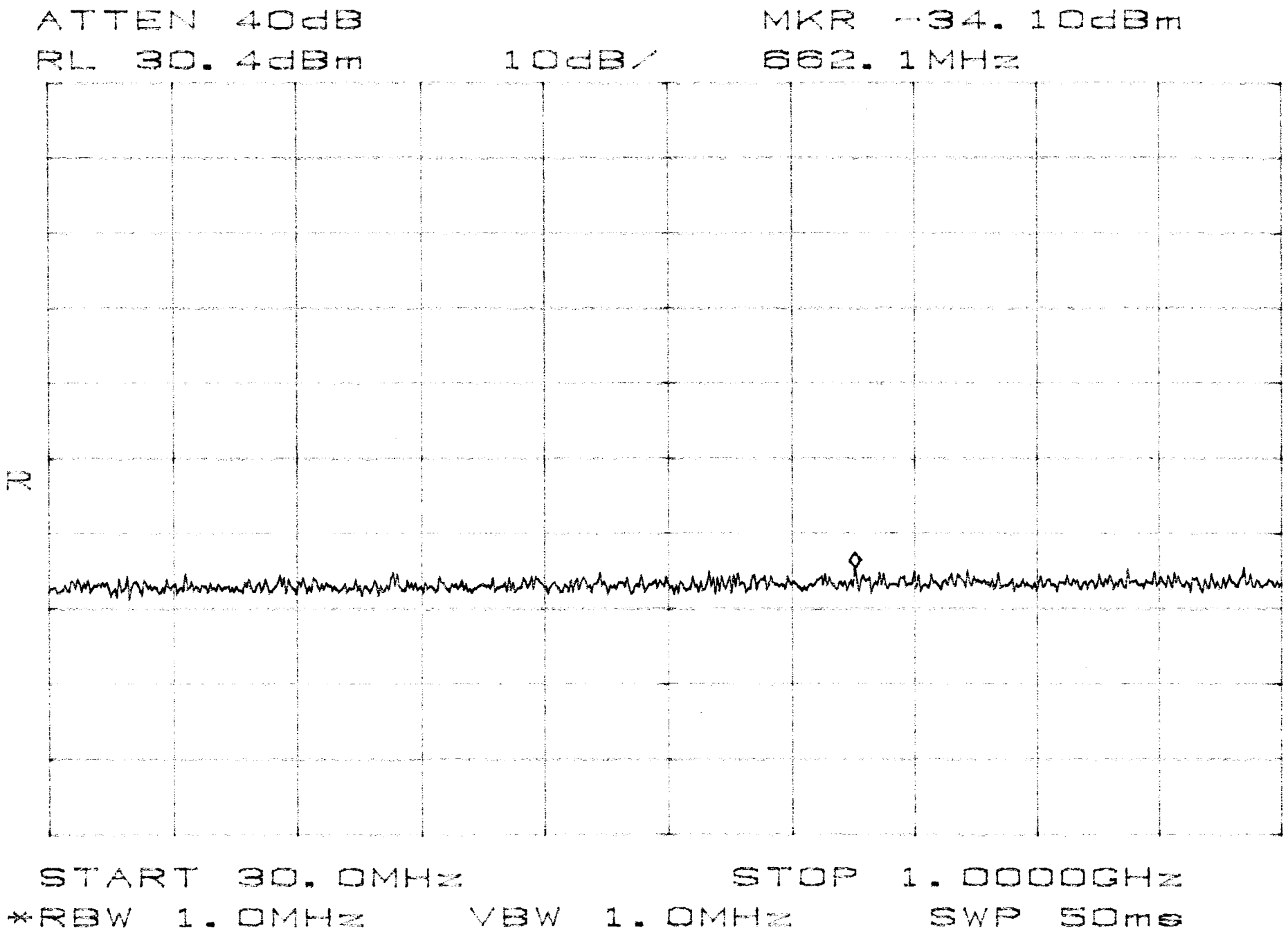
Band B, E, F CDMA Intermod
close



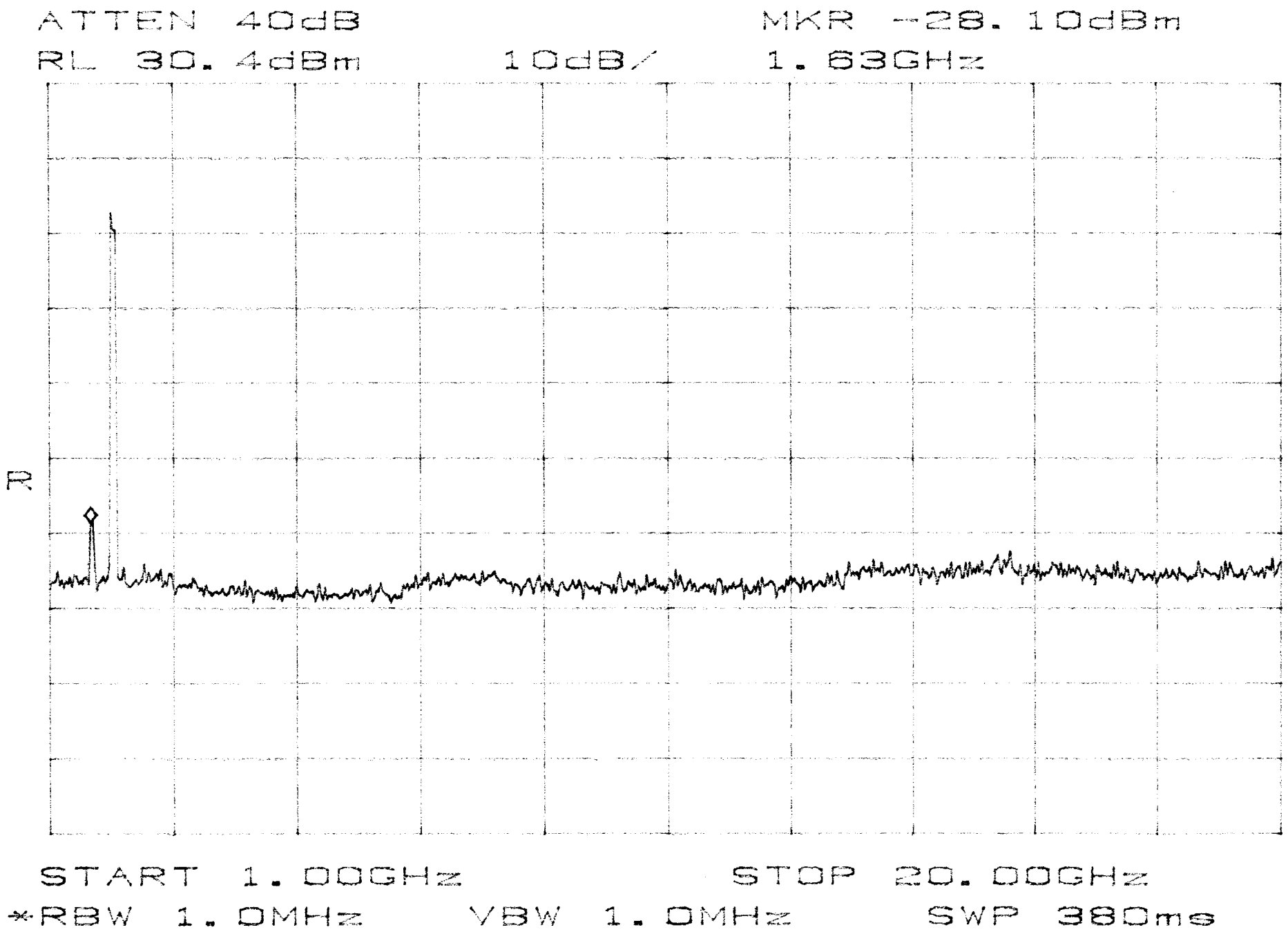
Band B, F, F FM Intermod
apart



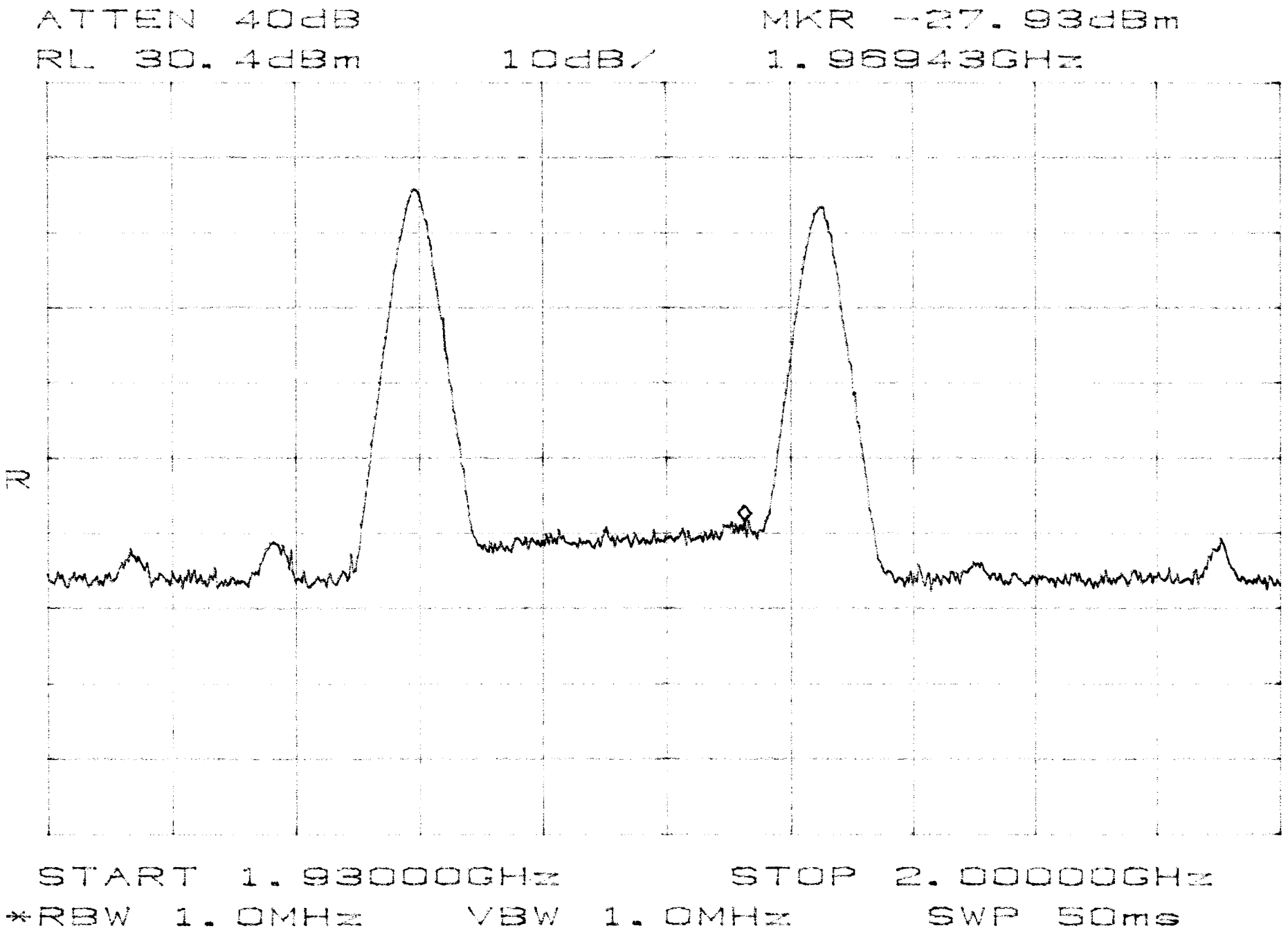
Band B,E,F Fm Intermod
apart



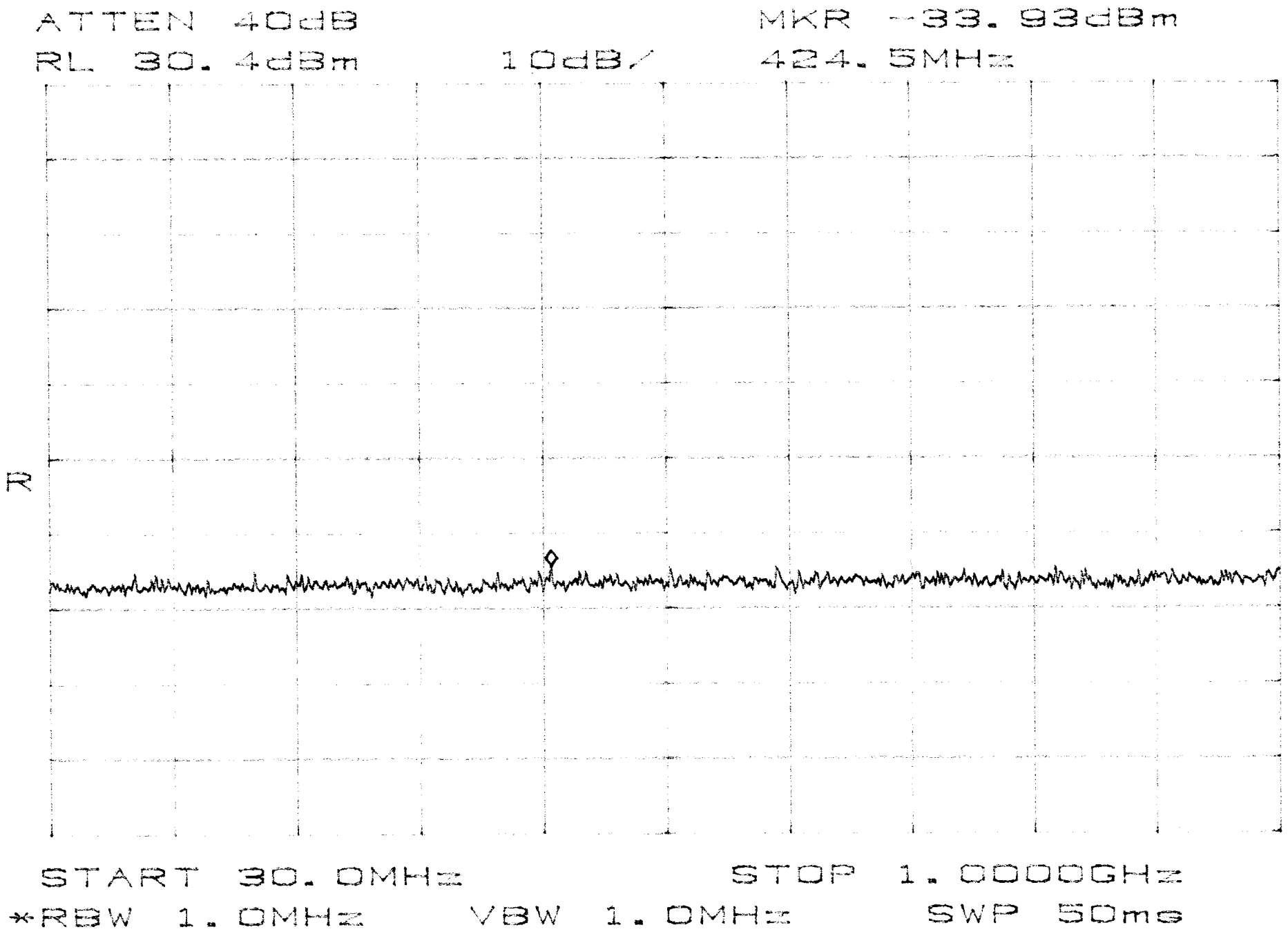
Band B, F, F FM Intermod
apart



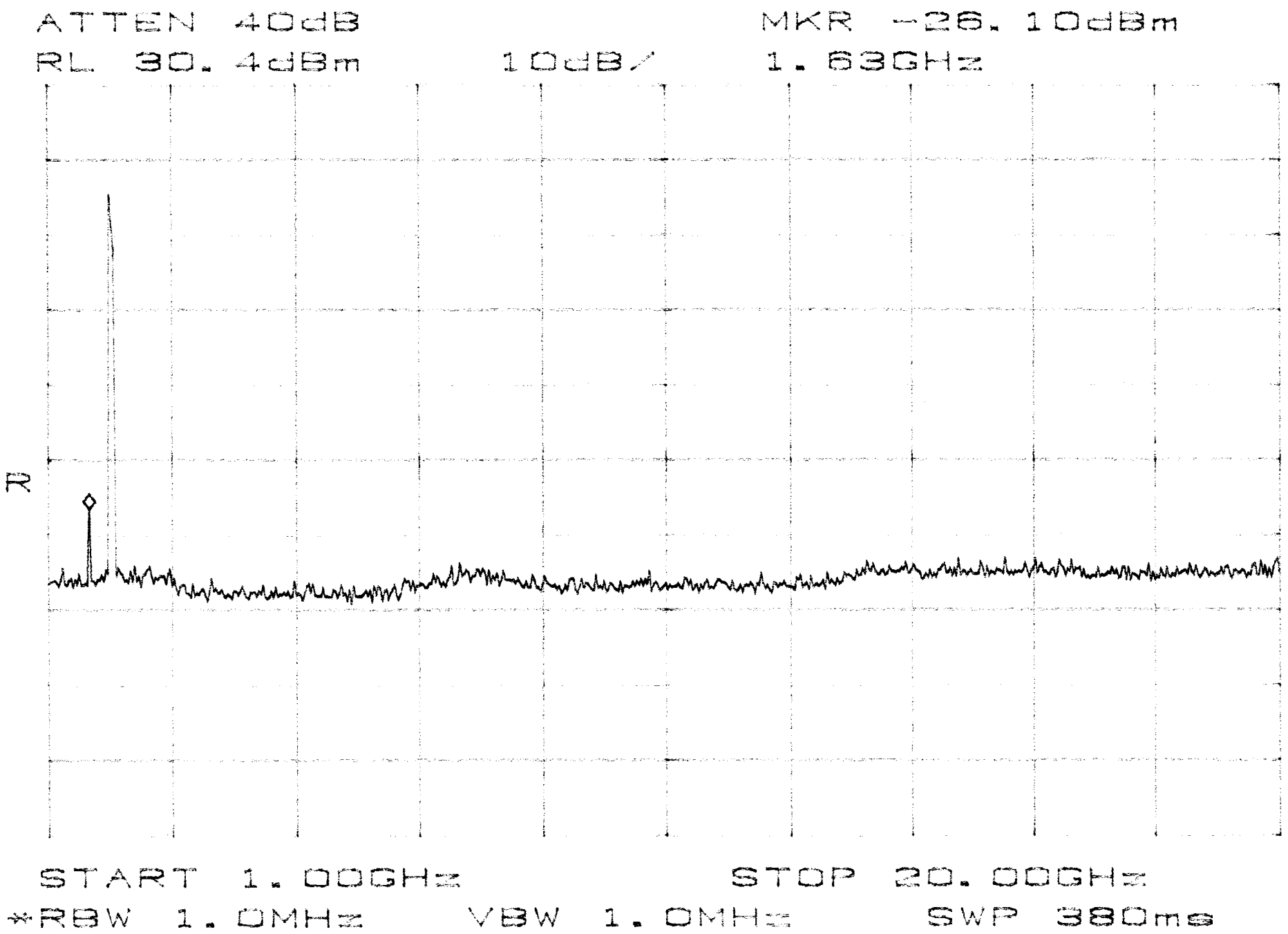
Band B, F, F TDMA Intermod
apart



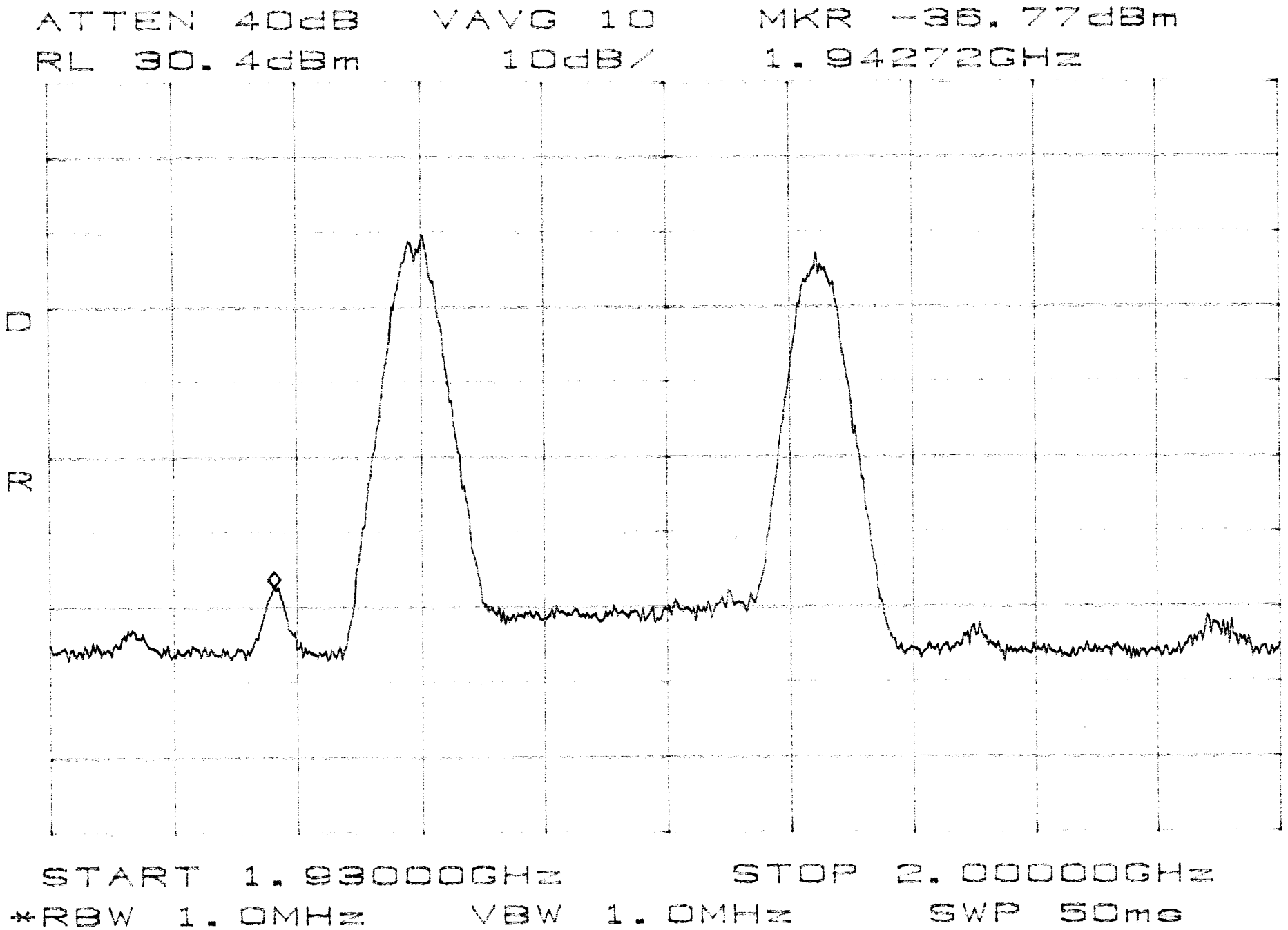
Band B,E,F TDMA Intermod
apart



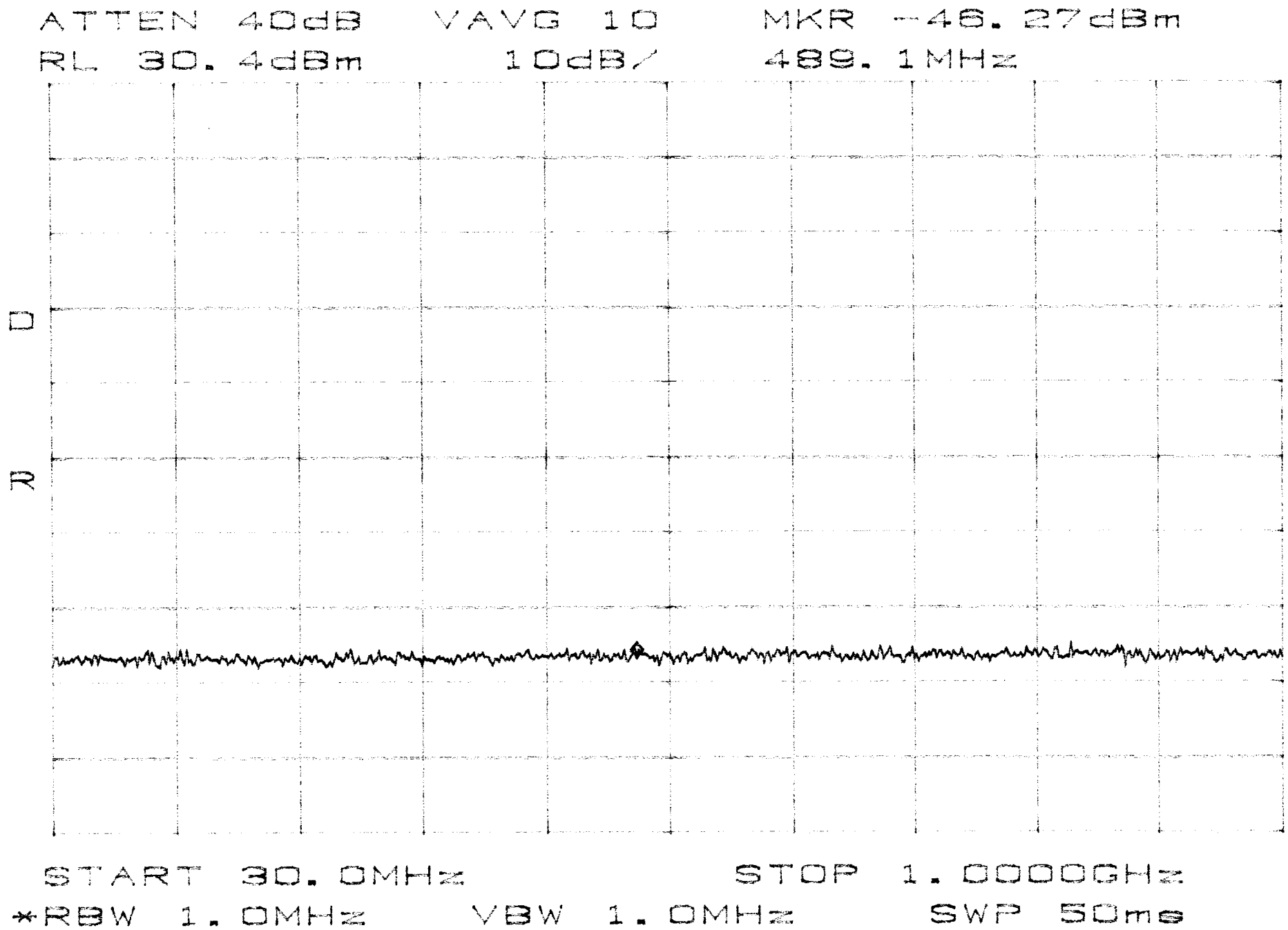
Band B,E,F TDMA Intermod
apart



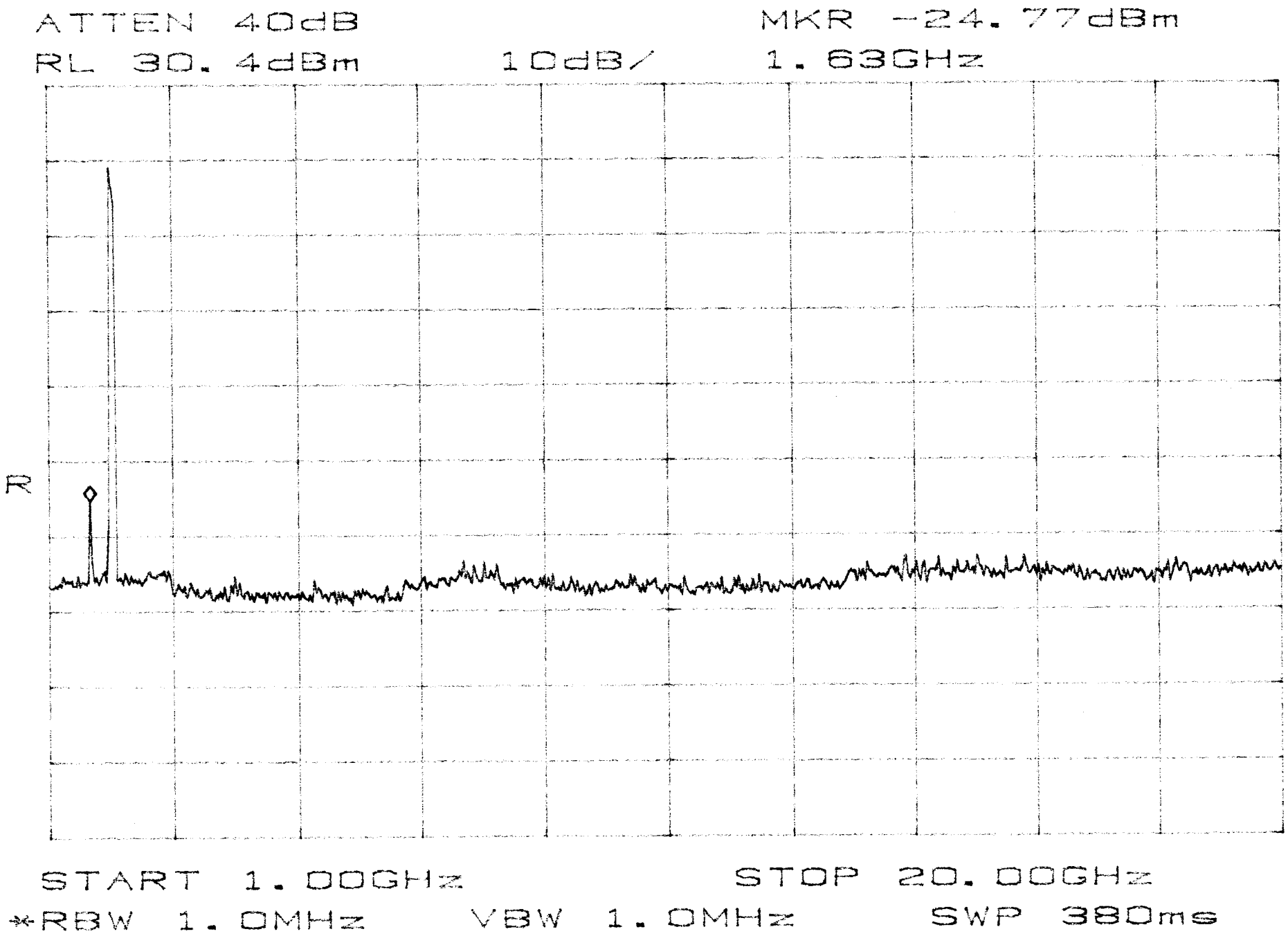
Band B,E,F cpmA Intermod
apart



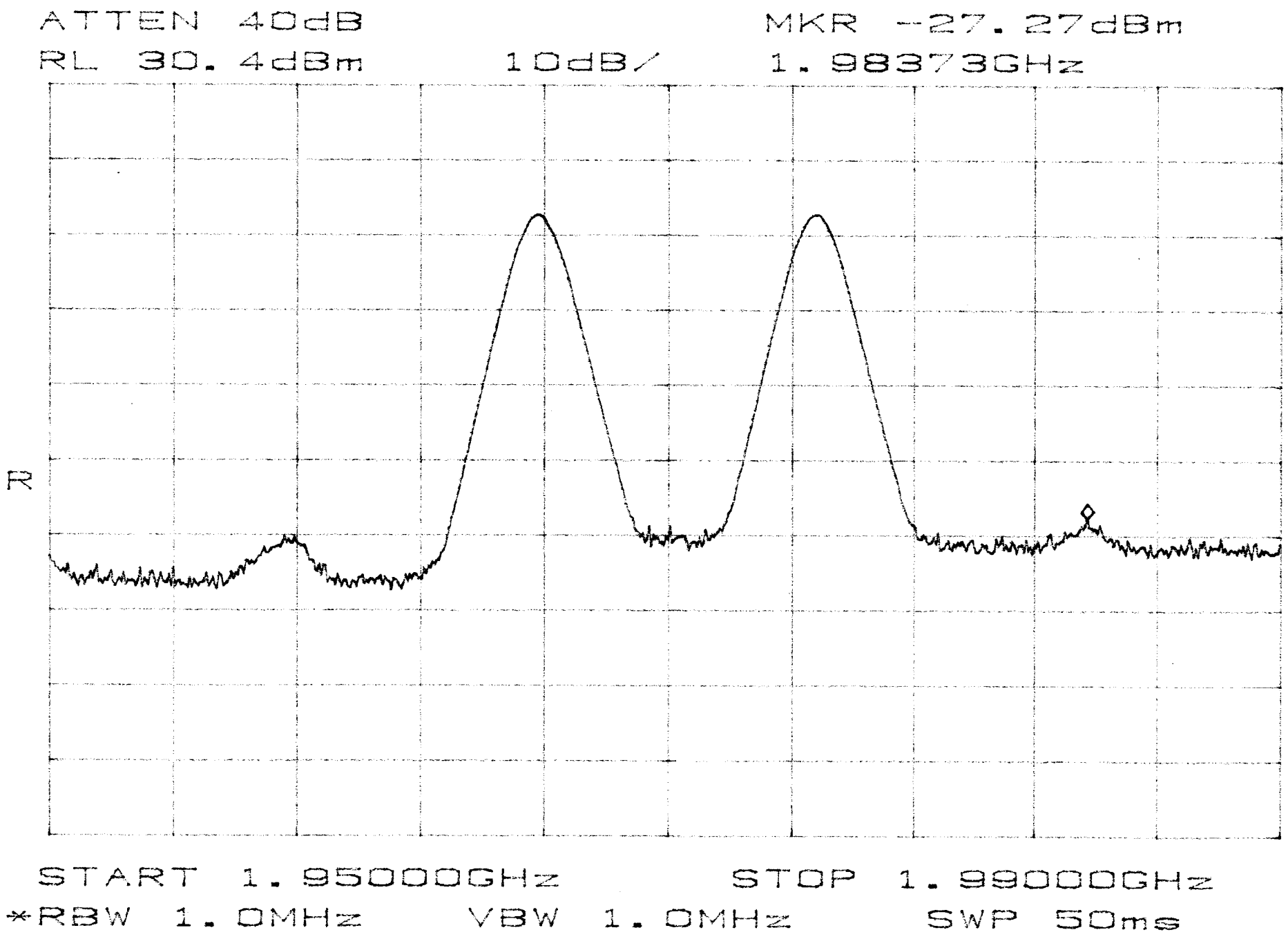
Band B, E, F CDMA Intermod
apart



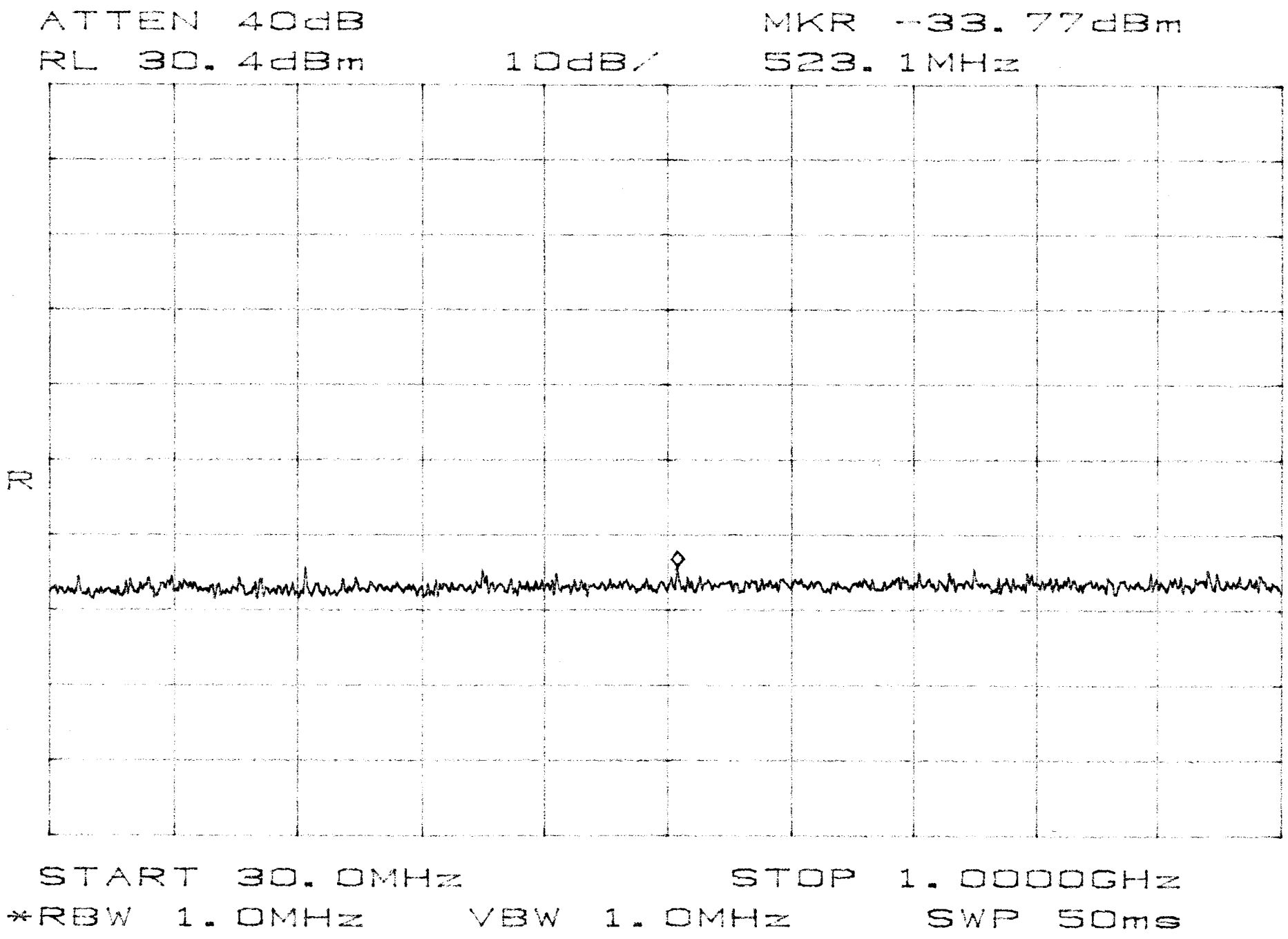
Band B, E, F CDMA Intermod
apart



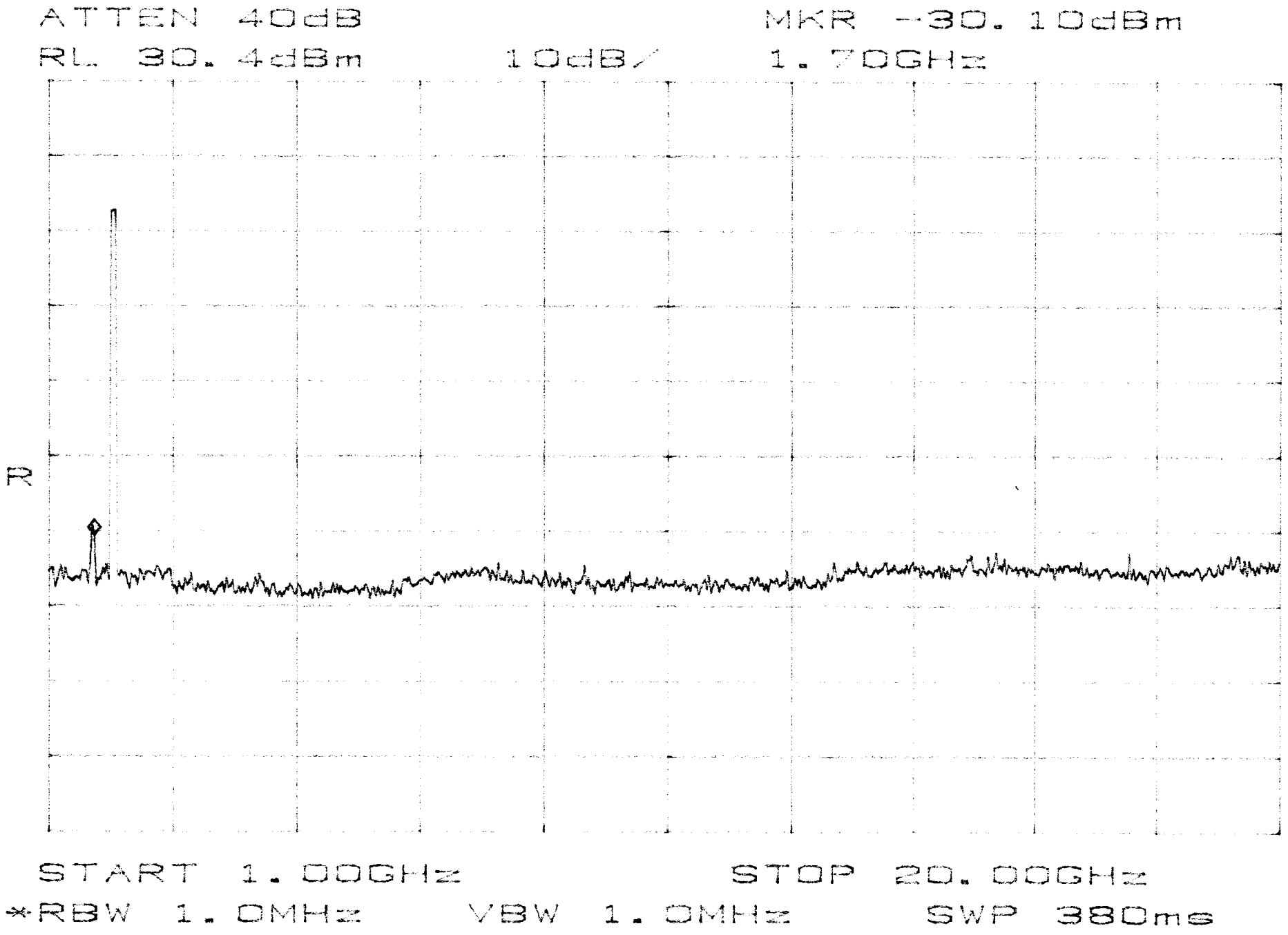
Band E,F,C Fm Intermod
close



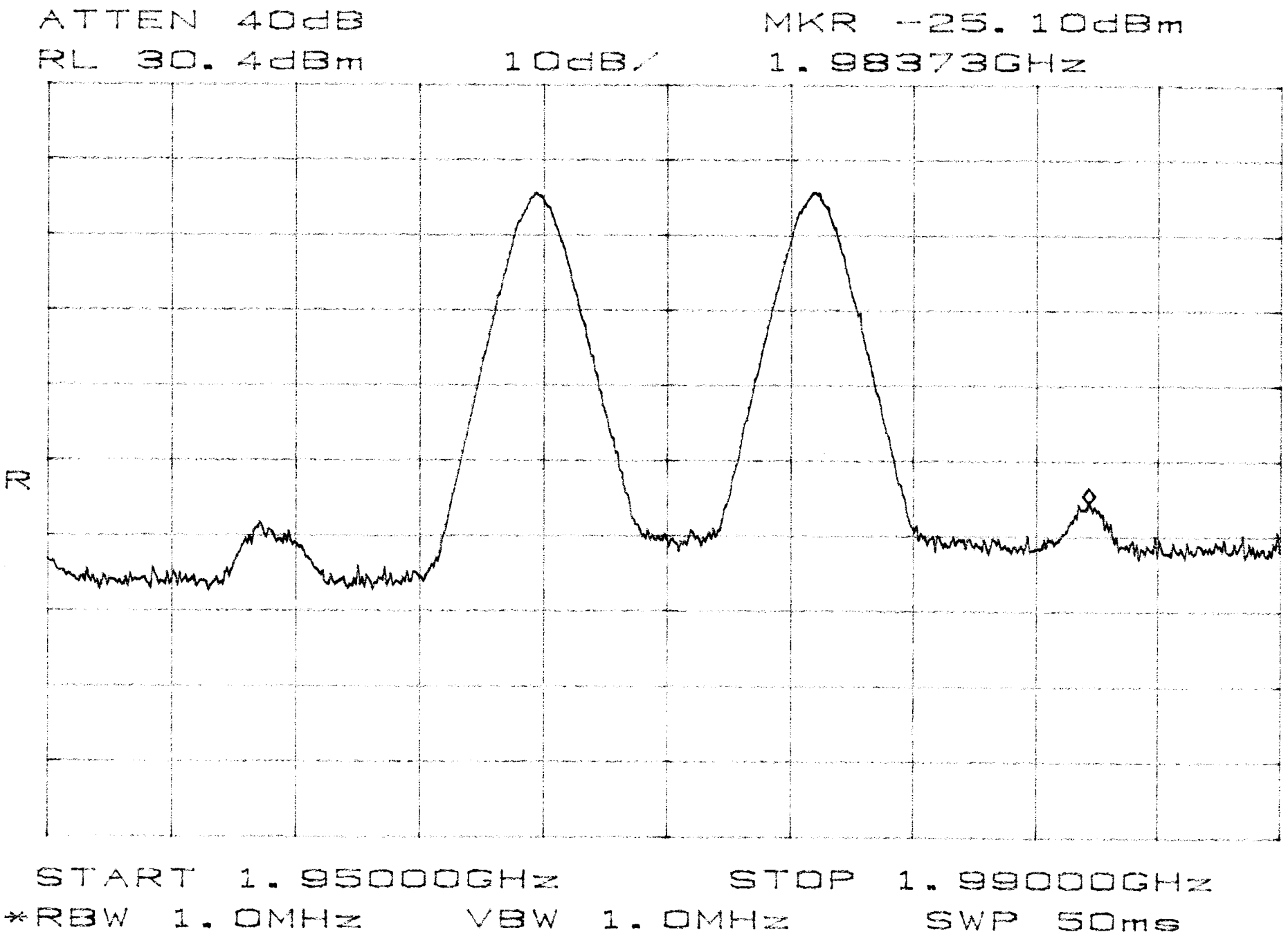
Band F,F,C FM Intermod
Close



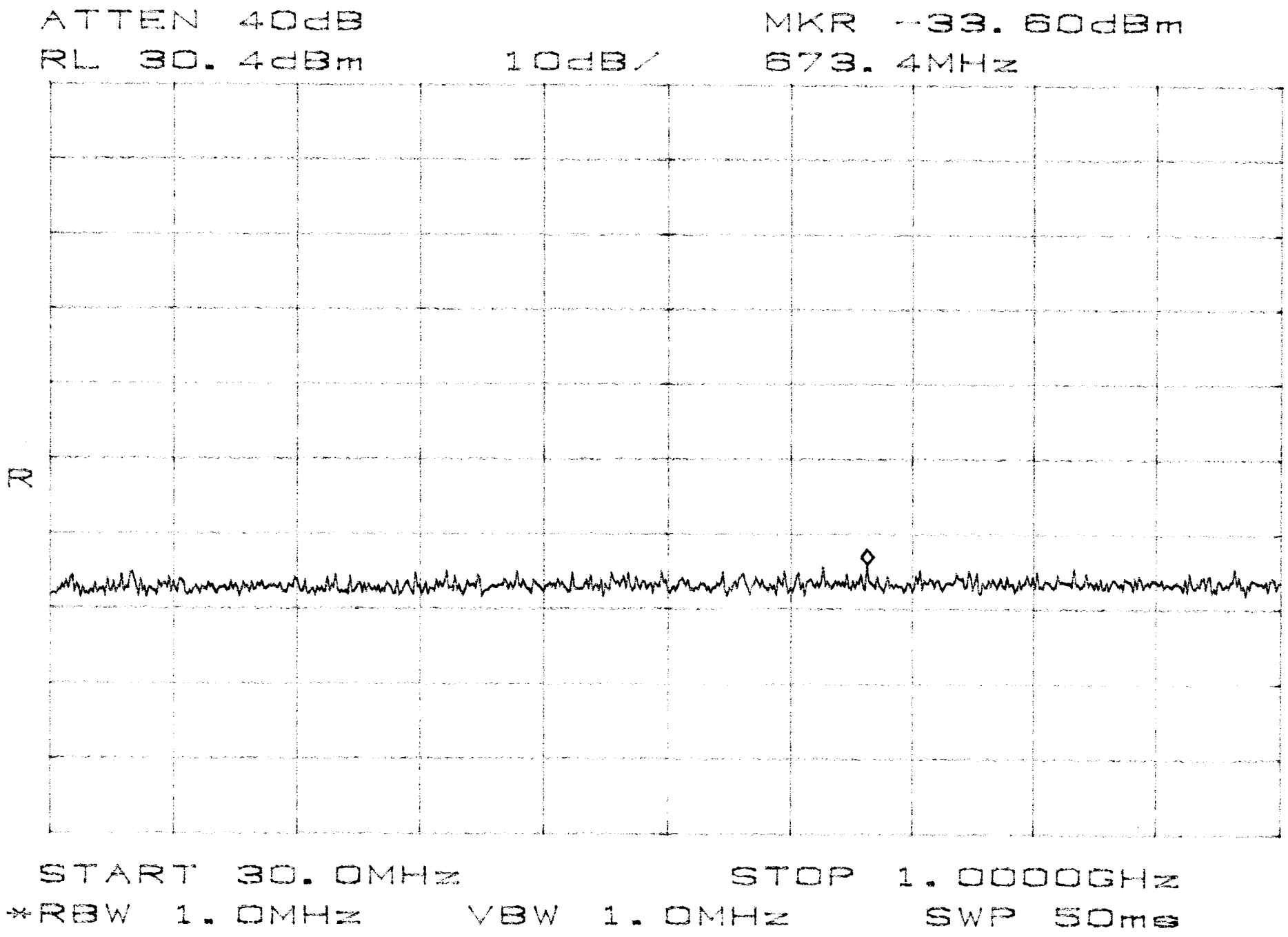
Band E,F,C Fm Intermod
close



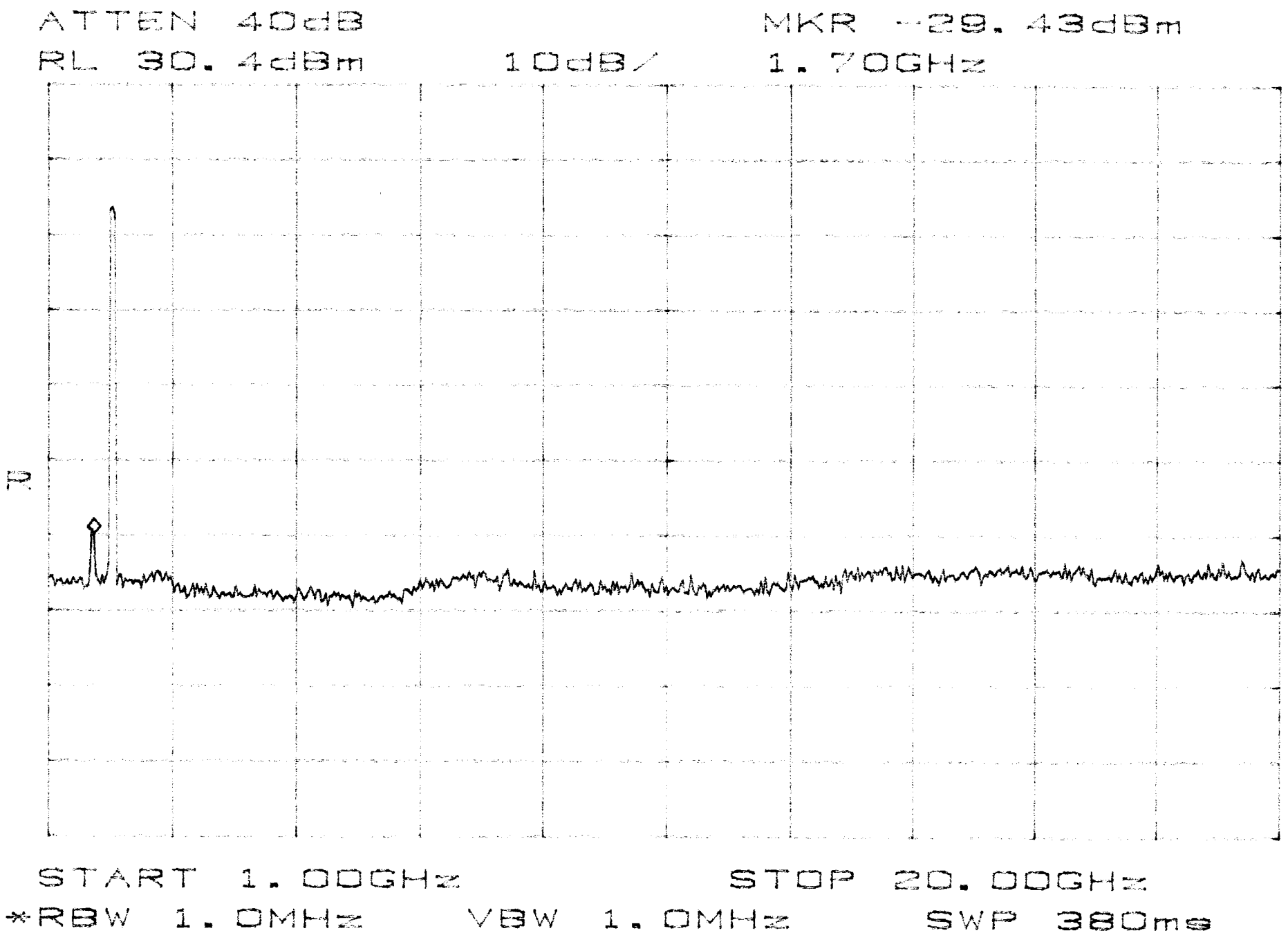
Band F, F, C TDMA Intermod
close



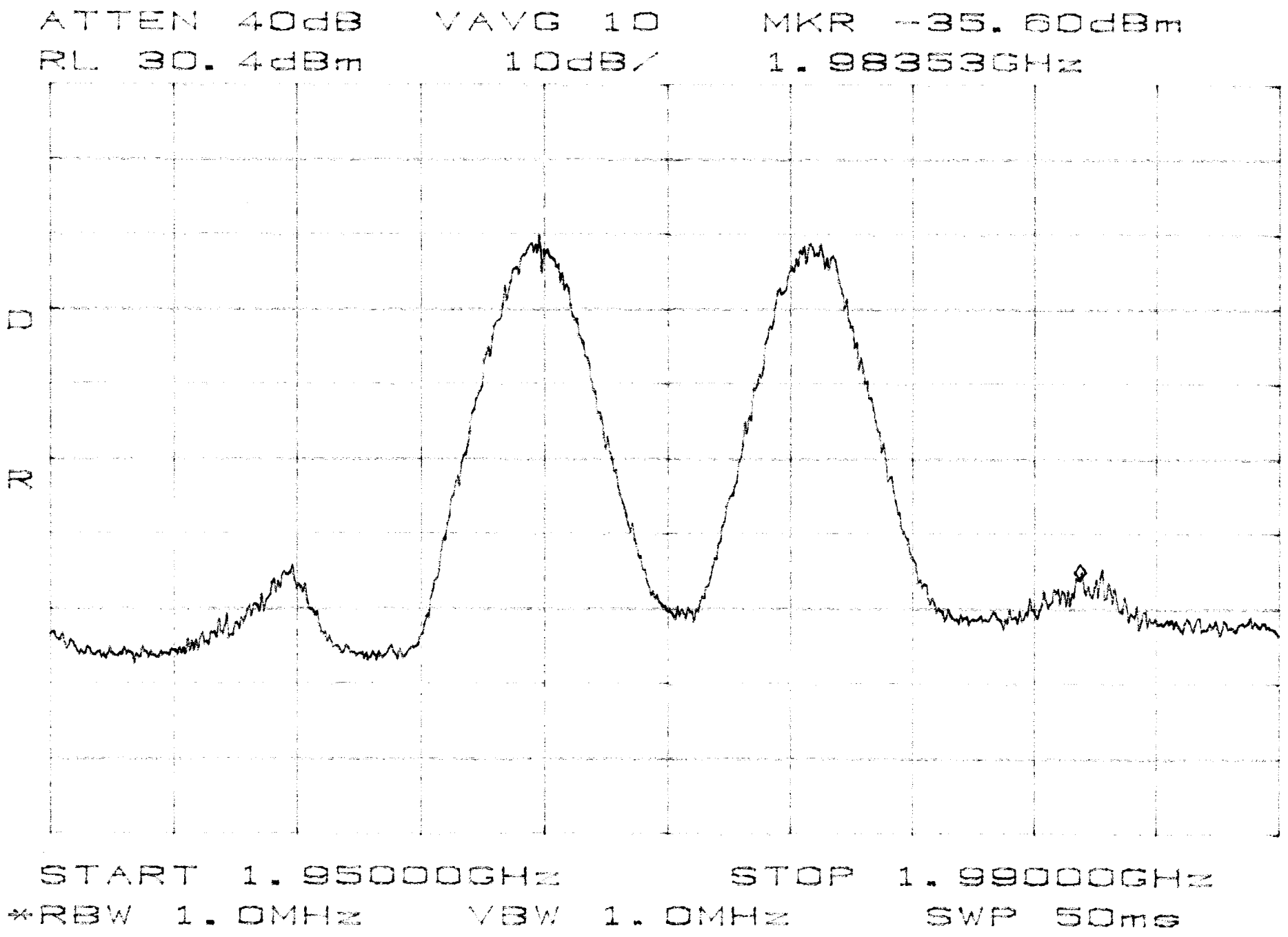
Band F, F, C TDMA Intermod
close



Band E,F,C TDMA Intermod
close



Band E,F,C CDMA Intermod close



Band E,F,C CDMA Intermod
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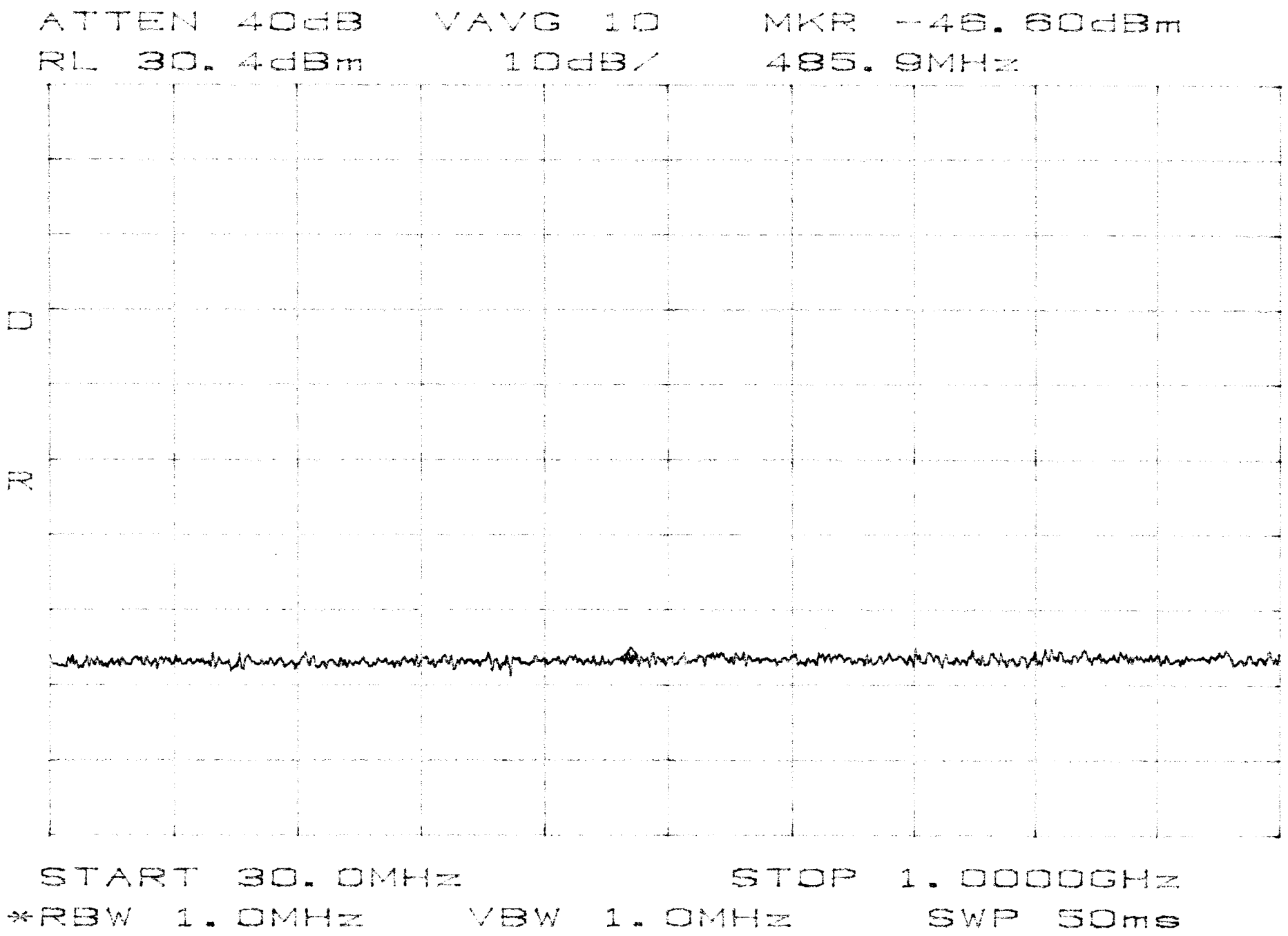
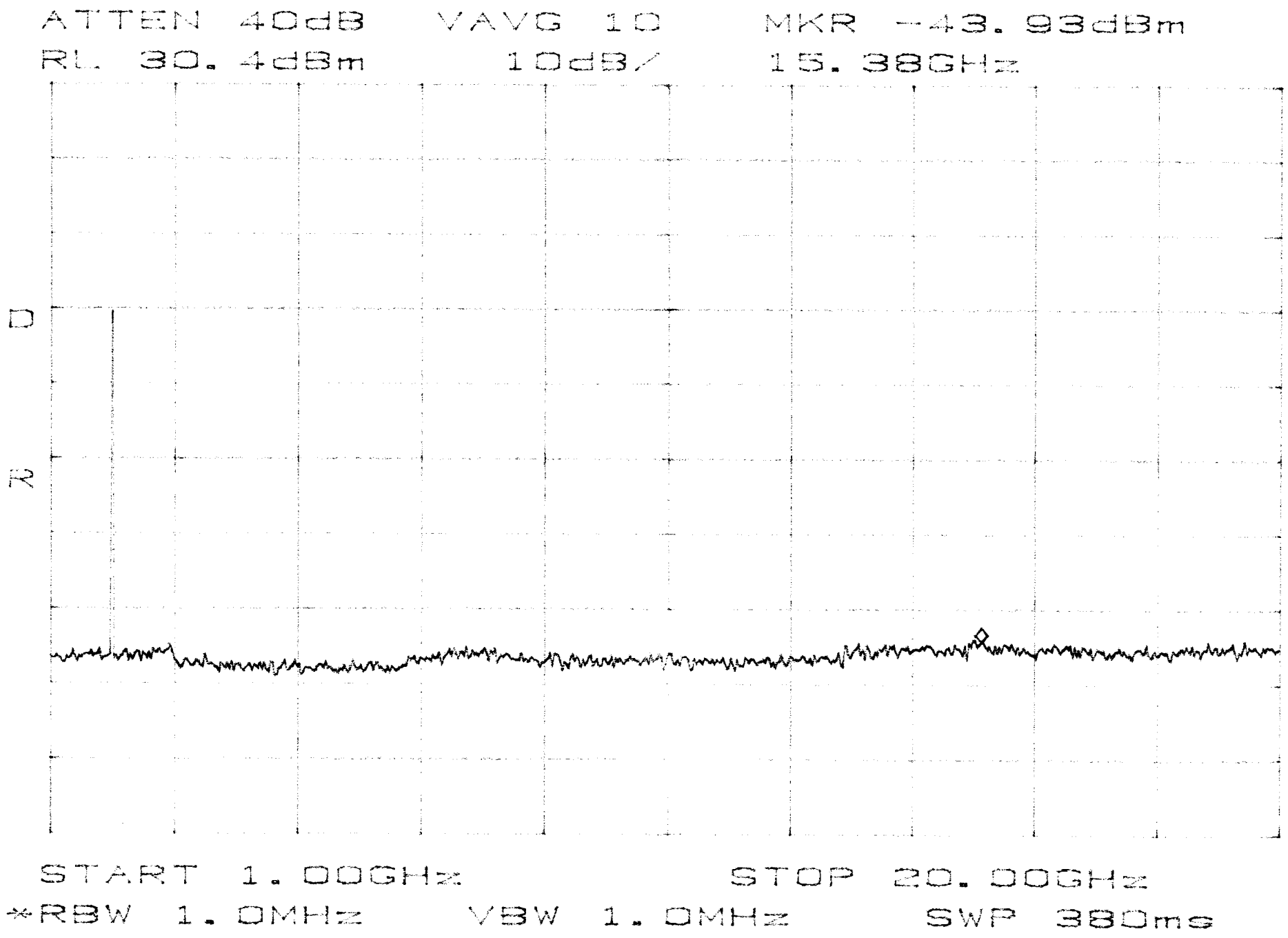
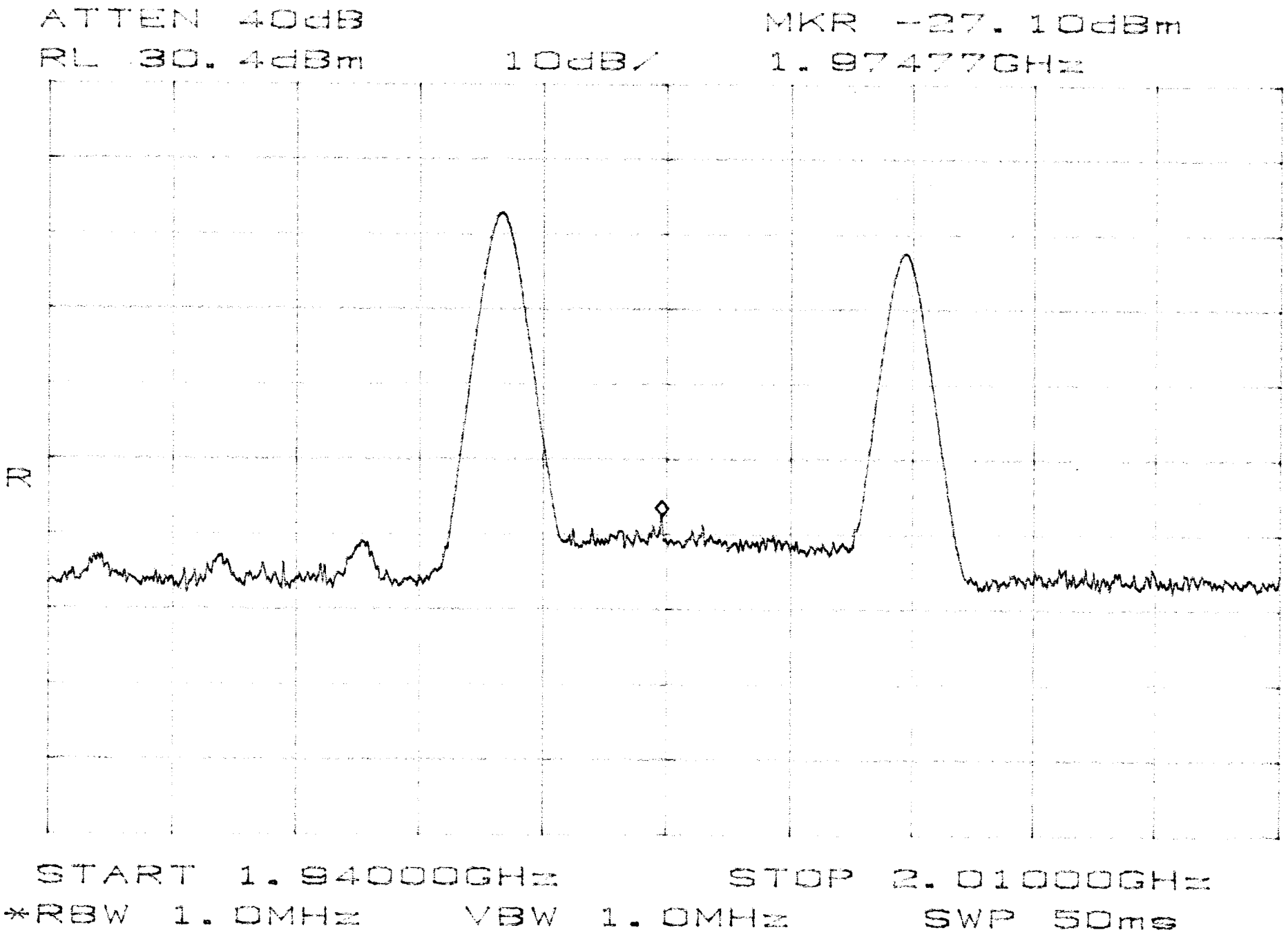


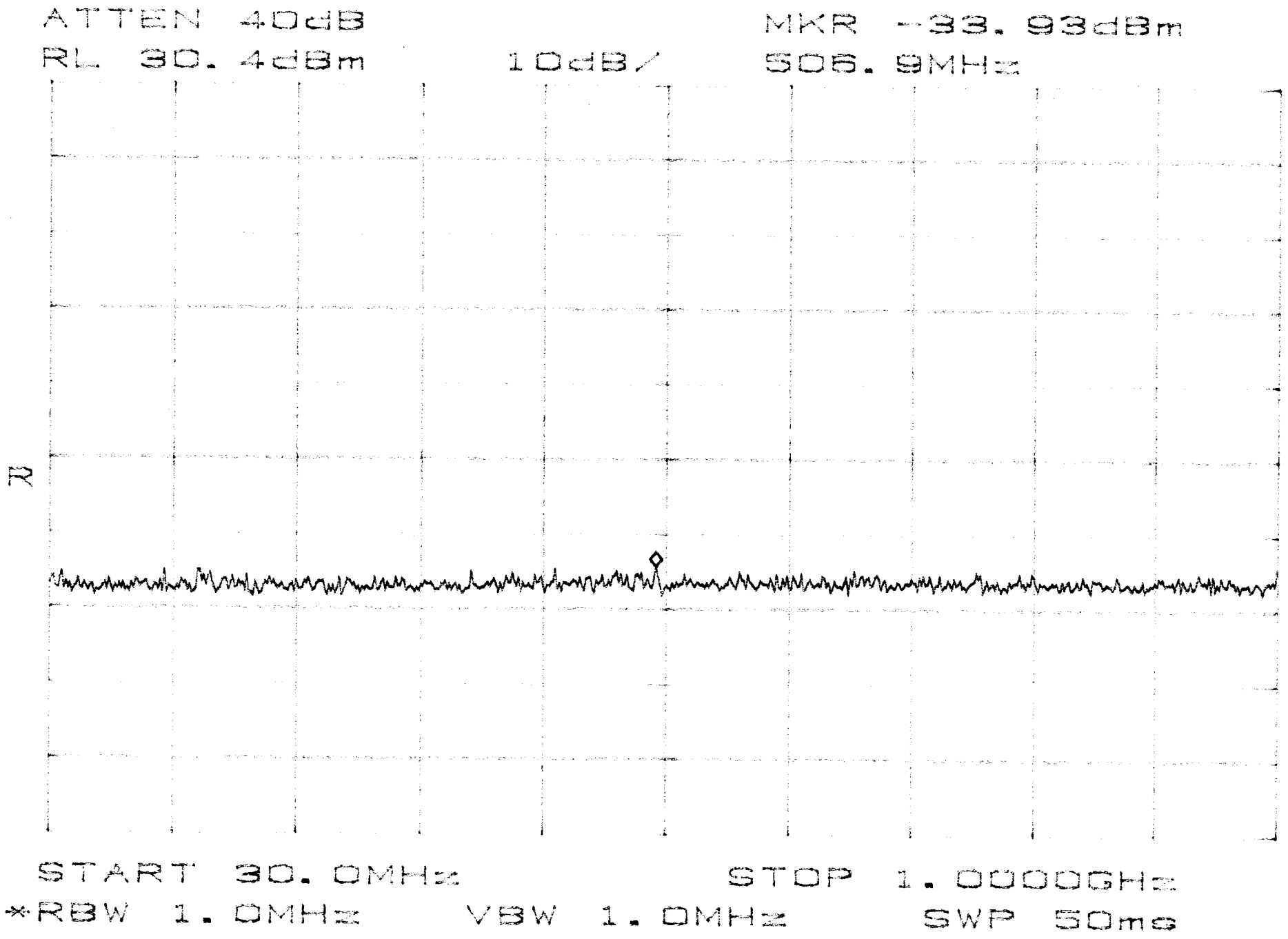
Board E,F,C CDMA Intermod close



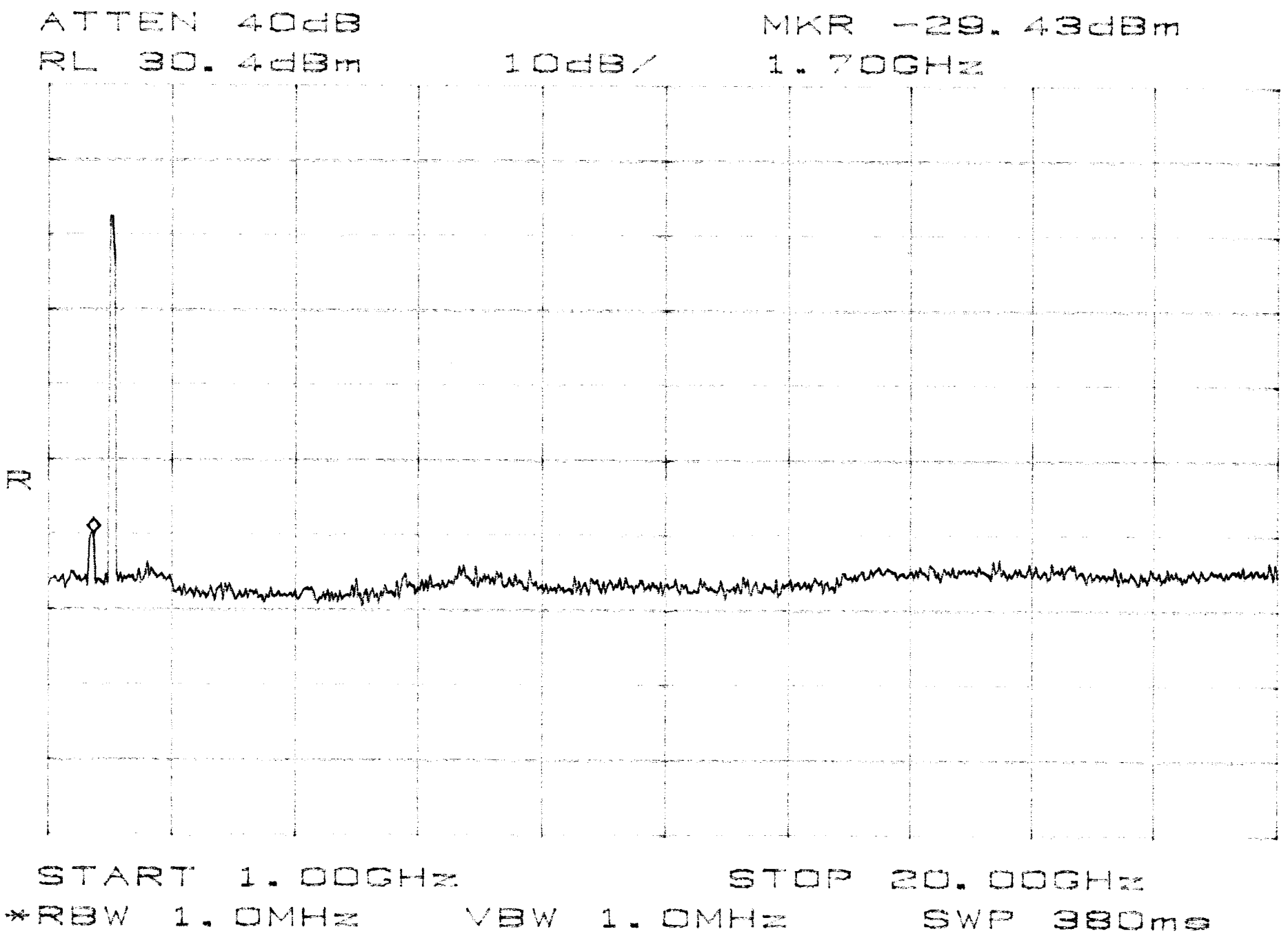
Band E, F, C FM Intermod
apart



Band F, F, C FM Intermod
apart



Band E, F, C Fm Intermod
apart



Band F, F, C TDMA Intermod
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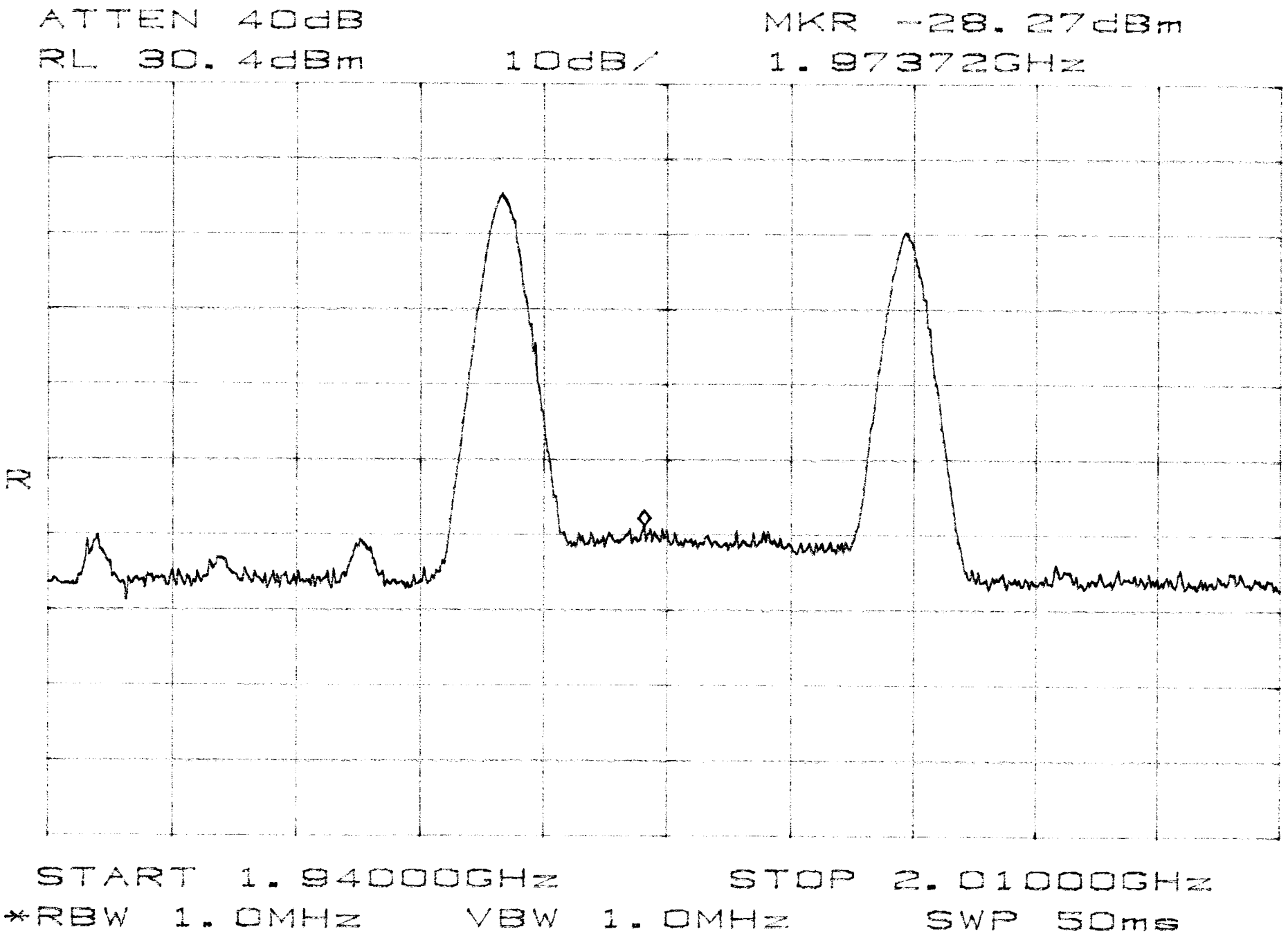
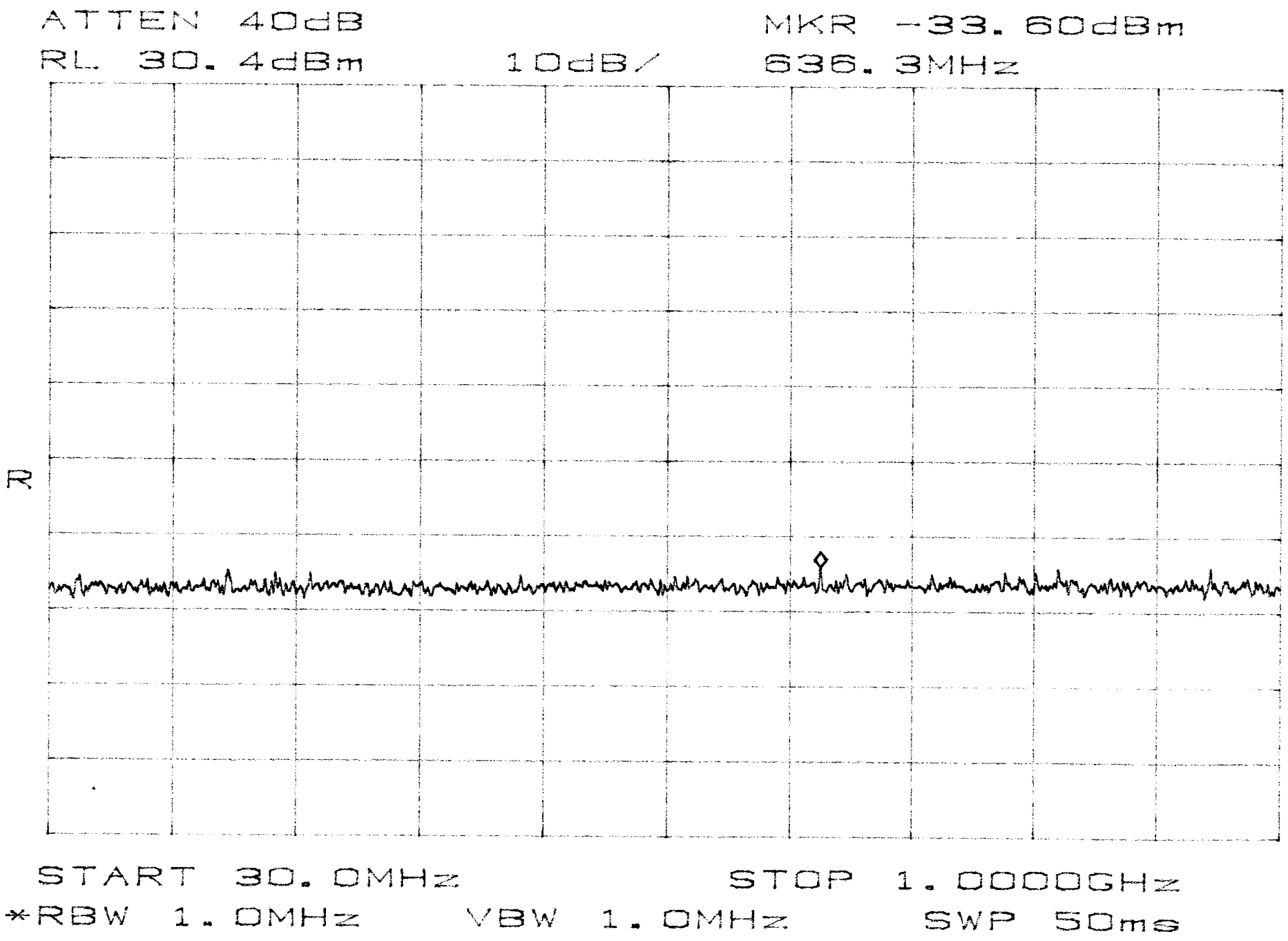
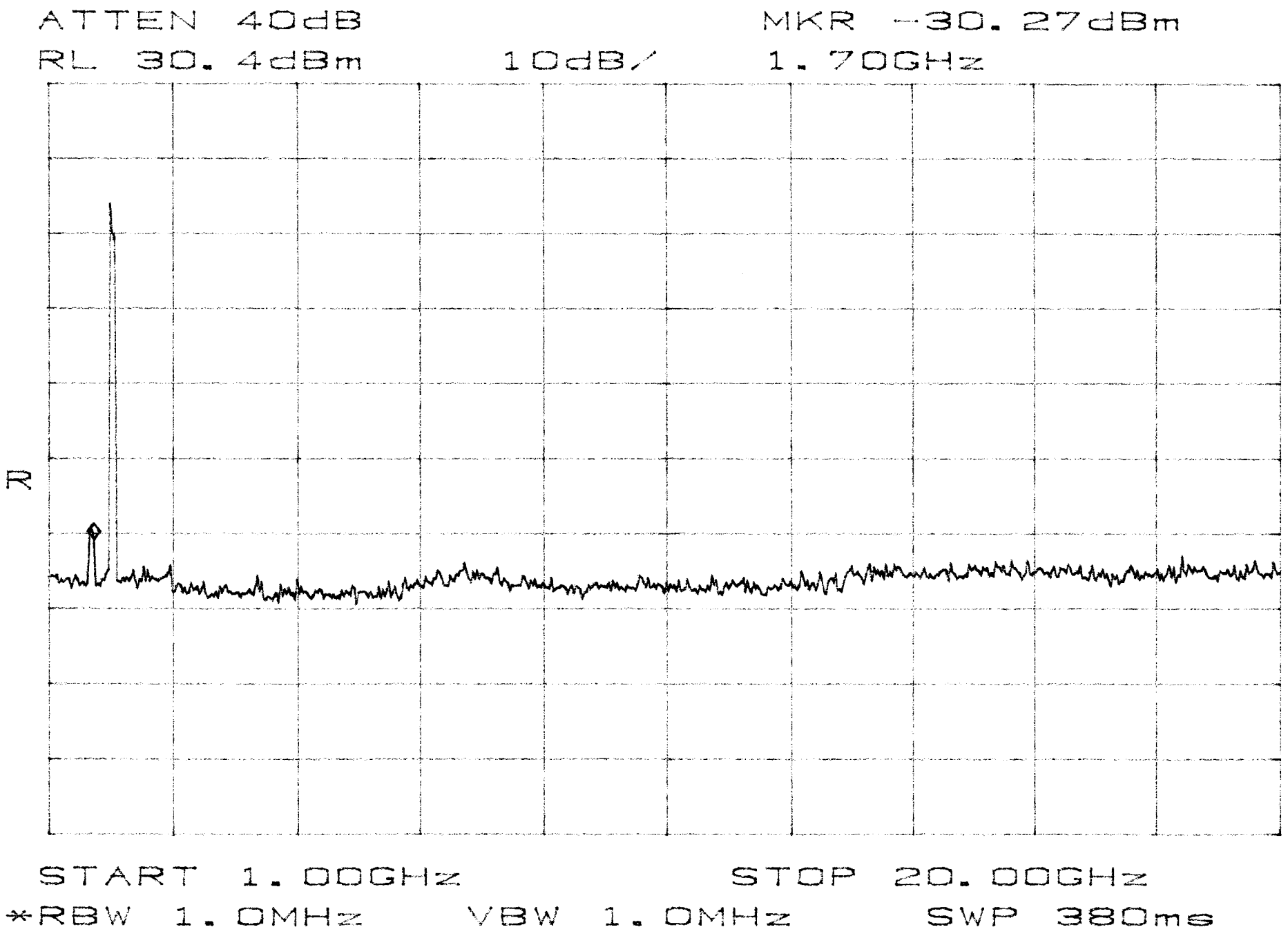


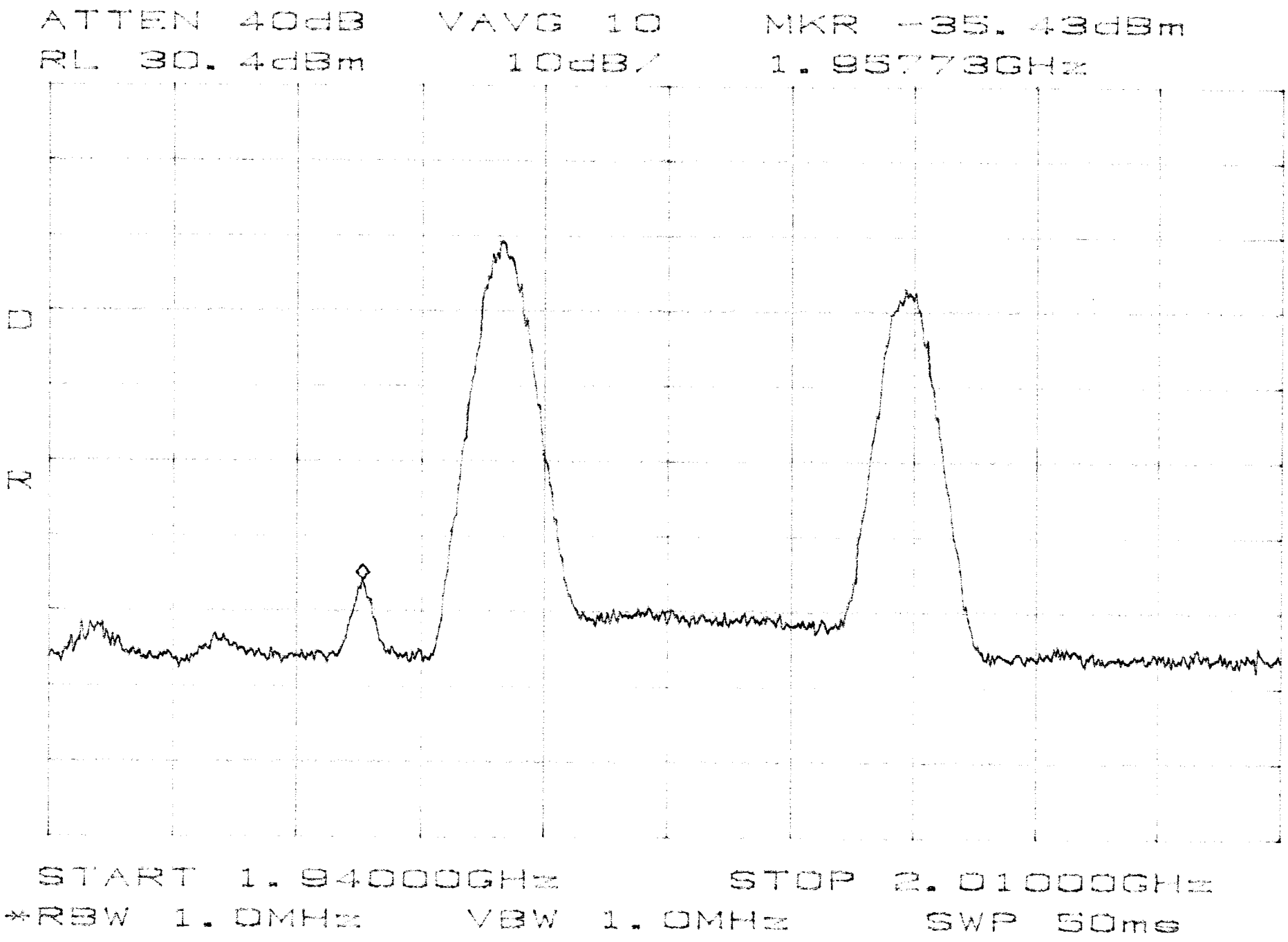
Band F, F, C TDMA Intermod
apart



Band F, F, C TDMA Intermod
apart



Band E, F, C CDMA Intermod
apart



Band E, F, C CDMA Intermod
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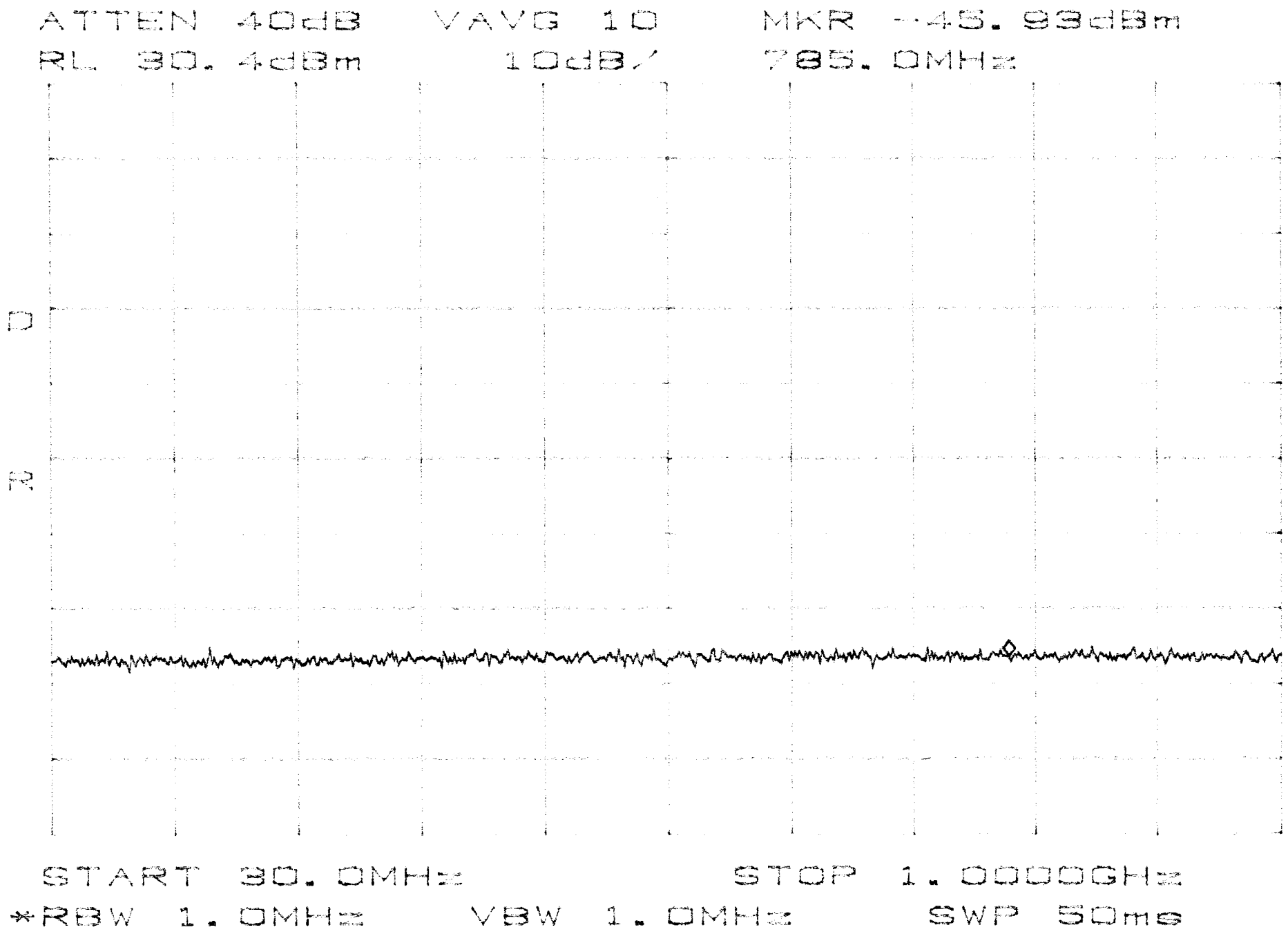
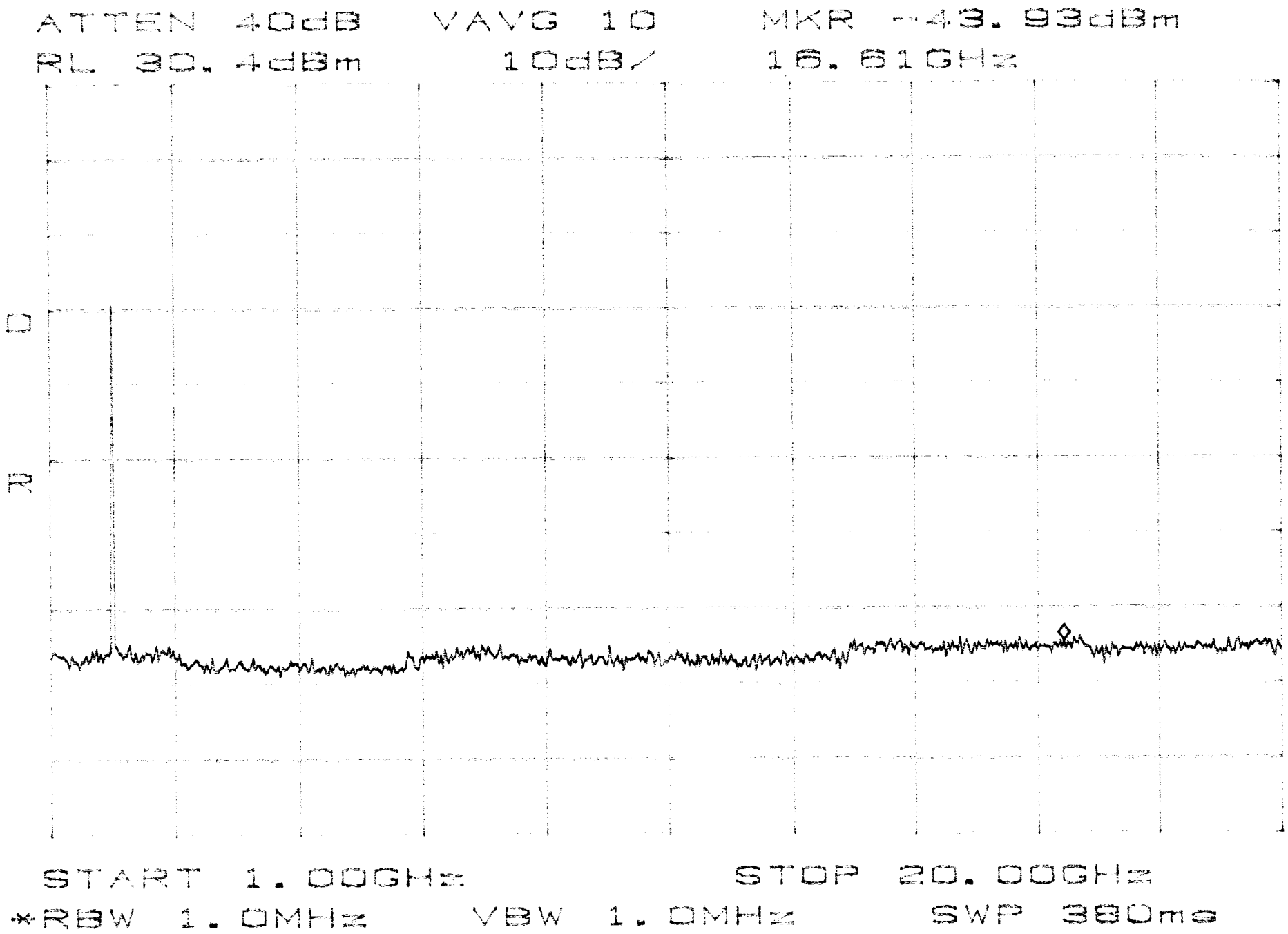


Band E,F,C CDMA Intermod
apart



Equipment Under Test (EUT) Test Operation Mode - Emission tests :

The device under test was operated under the following conditions during emissions testing:

☐ - Standby

☐ - Test program (H - Pattern)

☐ - Test program (color bar)

☐ - Test program (customer specific)

☐ - Practice operation

■ - Normal Operating Mode

☐ - _____

Configuration of the device under test:

The following peripheral devices and interface cables were connected during the measurement:

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

■ - unshielded power cable

■ - unshielded cables

■ - shielded cables MPS.No.: _____

☐ - customer specific cables

☐ - _____

☐ - _____

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DEVIATIONS FROM STANDARD:

None

GENERAL REMARKS:

SUMMARY:

The requirements according to the technical regulations are

■ - met

☐ - **not** met.

The device under test does

■ - fulfill the general approval requirements mentioned on page 3.

☐ - **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date: 30 April 2001

Testing End Date: 14 June 2001

- TÜV PRODUCT SERVICE INC -

Reviewed By:
E. J. Borgstrom

Tested By:
G. S. Jakubowski

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TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Screen Room

WILD RIVER LAB
Large Test Site

See Test Setup Exhibit

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Test setup photos of AC line conducted emissions

See Test Setup Exhibit

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Radiated emission (case radiation) test setup photos

See Test Setup Exhibit

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Appendix A

Product Information Form

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

Form

EMC Test Plan and Constructional Data Form

PRODUCT SERVICE

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE.

Applicant -- ***NOTE: This information will be input into your test report as shown below.***
Press the F1 key at any time to get HELP for the current field selected.

Company: ADC Inc.

Address: PO Box 1101
Minneapolis, MN 55440-1101

Contact: Merritt Pulkrabek Position: Compliance Engineer

Phone: 952 233-6495 Fax: 952 233-6388

E-mail Address: merritt_pulkrabek@adc.com

General Equipment Description -- ***NOTE: This information will be input into your test report as shown below.***

EUT Description In-building wireless communication system

EUT Name Digivance In-building Coverage Solution

Model No.: DGVI-3XXXXXDHU and DGVI-3XXXXXDRU Serial No.: FCC1

Product Options:

Configurations to be tested: Typical unit Host Unit with Remote Unit

Test Objective

- ☐ EMC Directive 89/336/EEC (EMC) Std:
- ☐ Machinery Directive 89/392/EEC (EMC Std:
- ☐ Medical Device Directive 93/42/EEC (EMC) Std:
- ☐ Vehicle Directive 72/245/EEC (EMC) Std:
- ☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC)

- ☒ FCC: Class ☐ A ☐ B Part 24
- ☐ VCCI: Class ☐ A ☐ B
- ☐ BCIQ: Class ☐ A ☐ B
- ☐ Canada: Class ☐ A ☐ B
- ☐ Australia: Class ☐ A ☐ B
- ☐ Other:

TÜV Product Service Certification Requested

- ☐ Attestation of Conformity (AoC)
- ☐ Certificate of Conformity (CoC)
- ☐ International EMC Mark (IEM)
- ☐ Compliance Document

Protection Class (N/A for vehicles) ☐ Class I ☐ Class II ☐ Class III

(Press **F1** when field is selected to show additional information on Protection Class.)

Form

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

Attendance

Test will be: ☒ Attended by the customer ☐ Unattended by the customer

Failure - *Complete this section if testing will not be attended by the customer.*

If a failure occurs, TUV Product Service should:

☐ Call contact listed above, if not available then stop testing. (After hrs phone): _____

☐ Continue testing to complete test series.

☐ Continue testing to define corrective action.

☐ Stop testing.

EUT Specifications and Requirements

Length: 9" Width: 9" Height: 4" Weight: 15 LB

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 100-230 VAC (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: 1

Current (Amps/phase(max)): 5 Current (Amps/phase(nominal)): 2

Other _____

Other Special Requirements

None

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)

Office Building

EUT Power Cable

☐ Permanent OR ☒ Removable Length (in meters): < 3

☐ Shielded OR ☒ Unshielded

☐ Not Applicable

Form

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

EUT Interface Ports and Cables

Interface					Shielding							
Type	Analog	Digital	Qty	Yes	No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
EXAMPLE: *RS232*	☐	☒	*2*	☒	☐	*Foil over braid*	*Coaxial*	*Metallized 9-pin D-Sub*	*Characteristic Impedance*	*6*	☒	☐
RF (Coax)	☒	☐	3	☒	☐			N or SMA or DIN	50 ohms	9	☒	☐
Fiber	☐	☒	6	☐	☒						☒	☐
DC Power	☒	☐	6	☐	☒			Cat 5		9	☒	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐

Form

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

EUT Software.

Revision Level: None

Description: None

EUT Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Typical (Forward signal transfer from Host to Remote unit Via Fiber. Using a multable modulation types

2.

3.

EUT System Components -- List and describe all components which are part of the EUT. For FCC testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc.)

Description	Model #	Serial #	FCC ID #
Digital Host Unit	DGVI-312110DHU	FCC1	
Digital Remote Unit	DGVI-313110DRU	FCC1	

Form

EMC Test Plan and Constructional Data Form

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)

Description	*Model #*	*Serial #*	*FCC ID #*

Oscillator Frequencies

Frequency	*Derived Frequency*	*Component # / Location*	*Description of Use*

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
Power One	MPU150-S261		☒ Switched-mode: (Frequency) 200KHz ☐ Linear ☐ Other:
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*

Form

EMC Test Plan and Constructional Data Form

Critical EMI Components (Capacitors, ferrites, etc.)				
Description	***Manufacturer***	***Part # or Value***	***Qty***	***Component # / Location***

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

(PLEASE INSERT "**ELECTRONIC SIGNATURE**" BELOW IF POSSIBLE)

Authorization Signatures

Customer authorization to perform tests according to this test plan.	Date
Test Plan/CDF Prepared By (please print)	Date
Reviewed by TÜV Product Service Associate	Date