

10.4 Measurement Data

Test Date

: Nov. 14, 2002

Temperature : 25

Humidity: 60 %

- 1) 2402 MHz : the dwell time is $0.417\text{ms} \times 30 = 12.510\text{ ms}$
- 2) 2441 MHz : the dwell time is $0.417\text{ms} \times 30 = 12.510\text{ ms}$
- 3) 2480 MHz : the dwell time is $0.417\text{ms} \times 30 = 12.510\text{ ms}$

The maximum time of occupancy for a particular channel is 249.9 msec in any 30 second period, which is less than the 400 msec allowed by the rules; therefore, it meets the requirements of this section.

Note : 1. Please see appendix 5 for Plotted Data

2. The expanded uncertainty of dwell time on each channel tests is 2dB.

11 OUTPUT POWER MEASUREMENT

11.1 Standard Applicable

For direct sequence system, according to 15.247(b), the maximum peak output power of the transmitter shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz and VBW to 1 MHz.
4. Measure the highest amplitude appearing on spectral display and record the level to calculate result data.
5. Repeat above procedures until all frequencies measured were complete.

11.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Hewlett-Packard	8564E	04/14/2003
Attenuator	Weinschel Engineering	1	N/A

11.4 Measurement Data

Test Date : Nov. 14, 2002 Temperature : 25 Humidity: 60 %

- 1) 2402 MHz : Output Peak Power is 12.83 dBm = **19.18** mW
- 2) 2441 MHz : Output Peak Power is 13.33 dBm = **21.52** mW
- 3) 2480 MHz : Output Peak Power is 13.83 dBm = **24.15** mW

Note : 1. Please see appendix 6 for Plotted Data

2. The expanded uncertainty of output power measurement tests is 2dB.

12 100 kHz BANDWIDTH OF BAND EDGES MEASUREMENT

12.1 Standard Applicable

According to 15.247(c), if any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in § 15.209(a), whichever results in the lesser attenuation.

12.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

12.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Hewlett-Packard	8564E	04/14/2003
Plotter	Hewlett-Packard	7440A	N/A

12.4 Measurement Data

Test Date

: Nov. 14, 2002

Temperature : 25

Humidity: 60 %

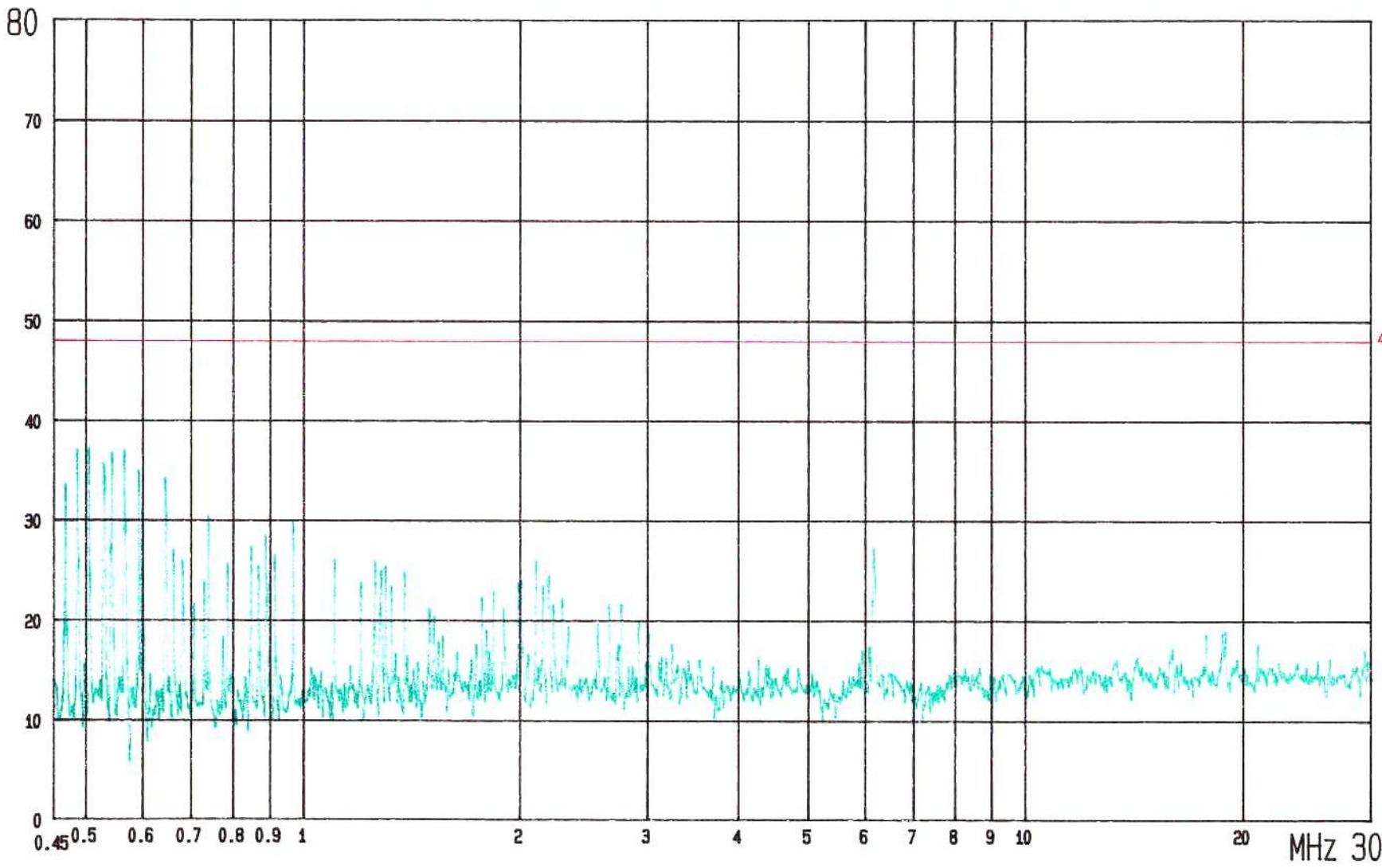
- a) Lower Band Edge : All emissions in this 100kHz bandwidth are attenuated more than 20dB from the carrier.
- b) Upper Band Edge : All emissions in this 100kHz bandwidth are attenuated more than 20dB from the carrier.

Note : 1. Please see appendix 7 for Plotted Data

2. The expanded uncertainty of the 100 KHz bandwidth of band edges tests is 1000Hz.

Appendix 1 : Plotted Data of Power Line Conducted Emissions

dBuV



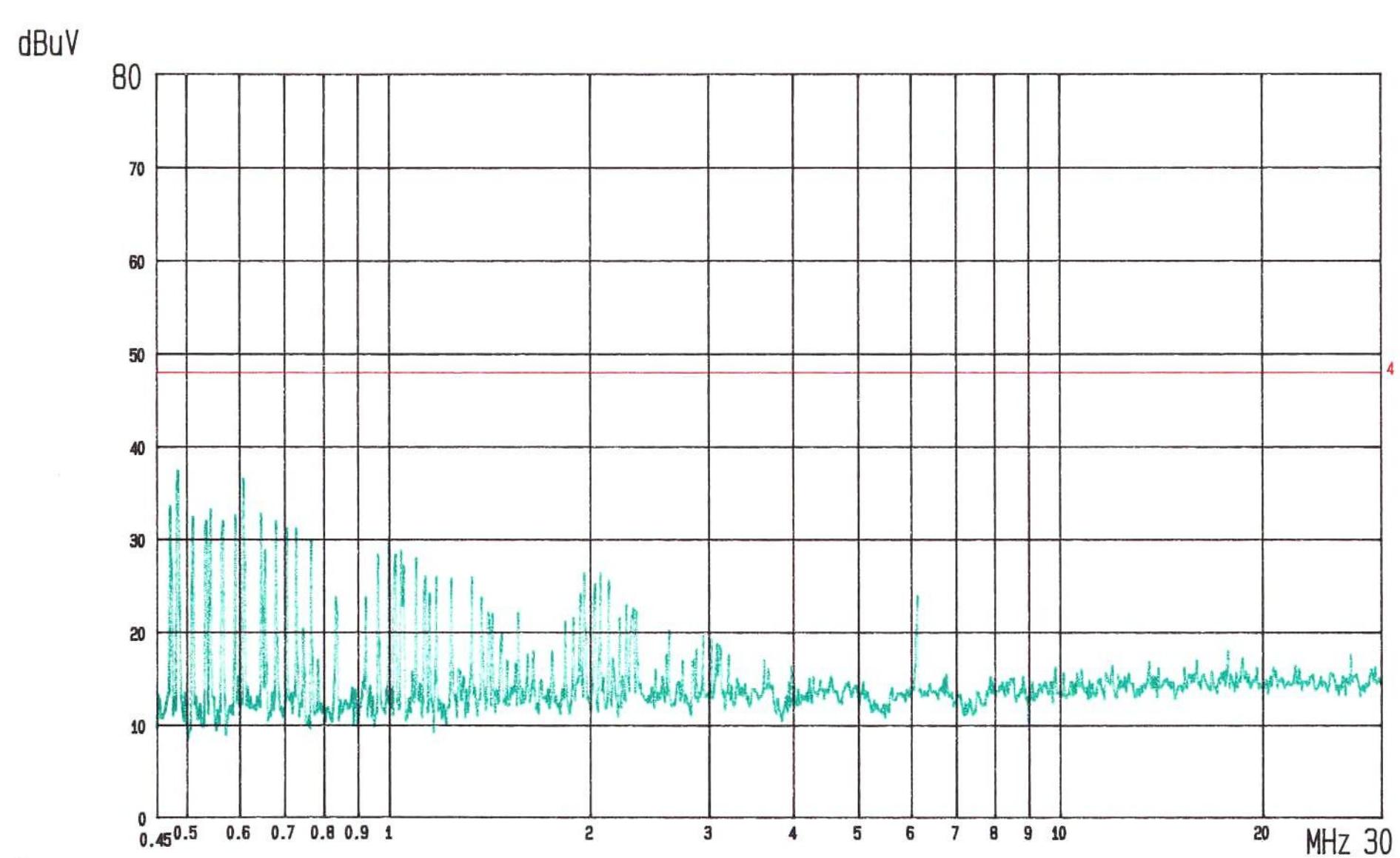
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CONDUCTED TEST
MODEL: BT3021

MODE: CH LO

4: QP
LISN: N

CLASS B LIMIT
ETC EMI LAB.



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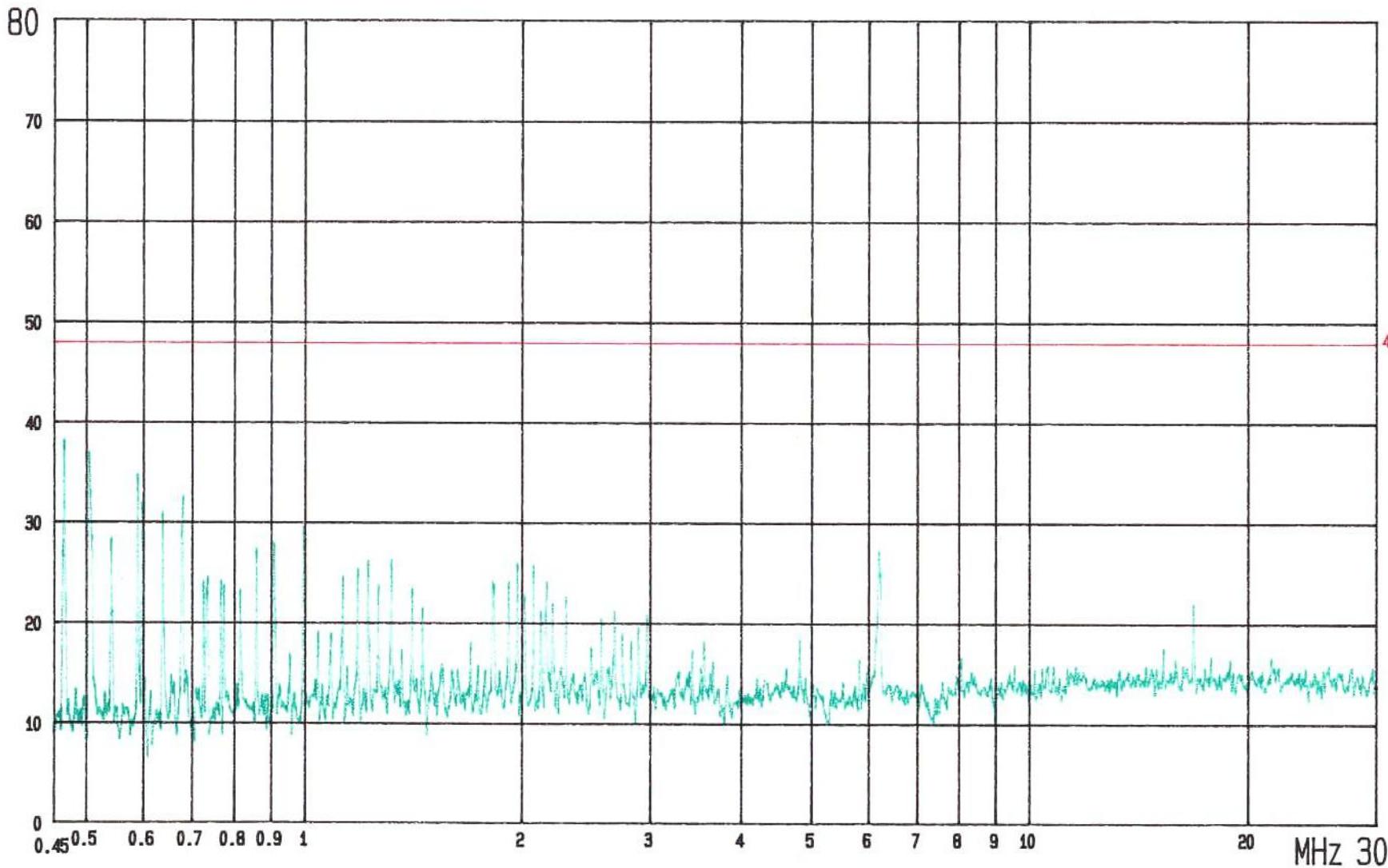
CONDUCTED TEST
MODEL: BT3021

MODE: CH LO

4: QP
LISN: L1

CLASS B LIMIT
ETC EMI LAB.

dBuV



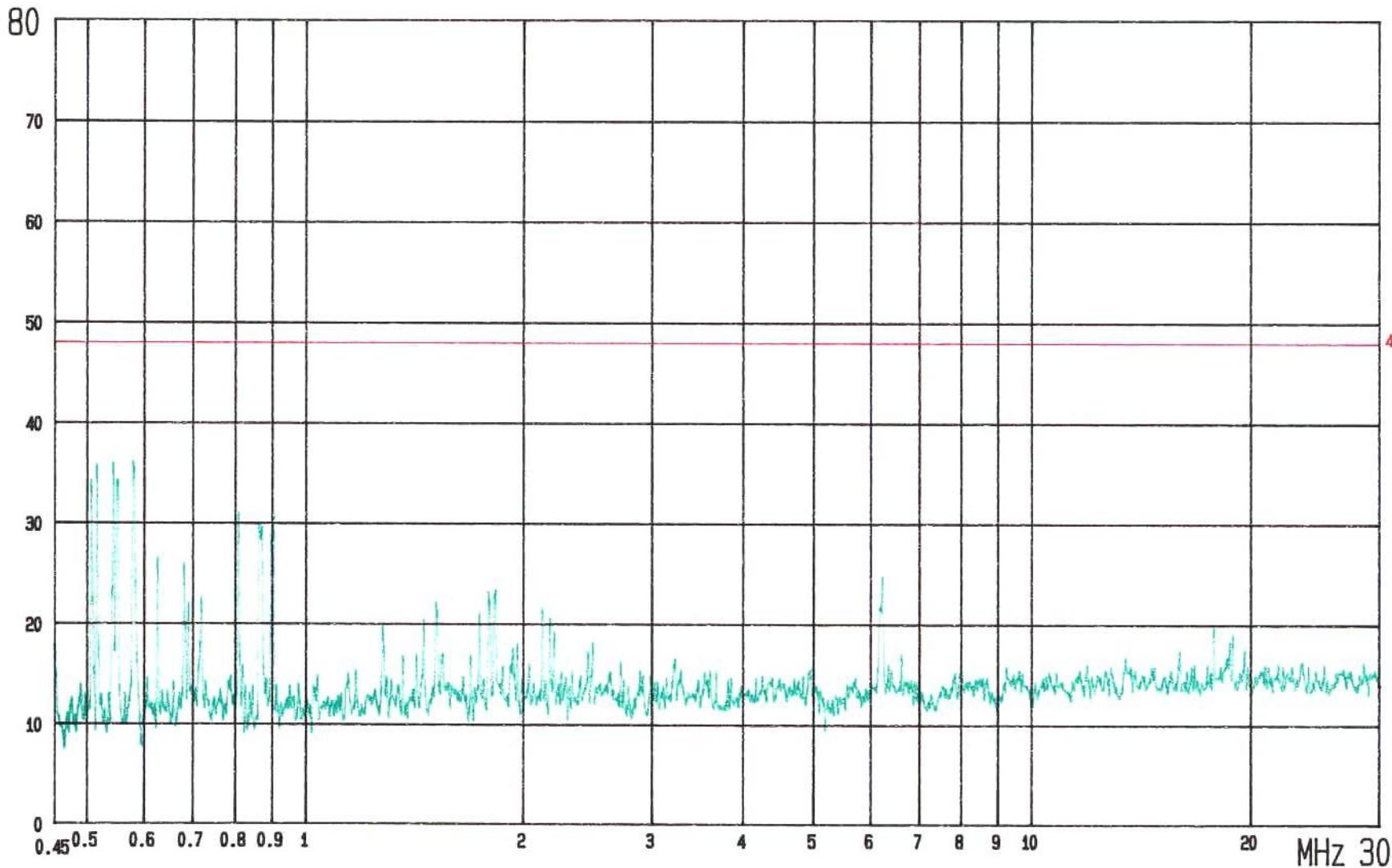
CONDUCTED TEST
MODEL: BT3021

MODE: CH MID

4: QP
LISN: N

CLASS B LIMIT
ETC EMI LAB.

dBuV



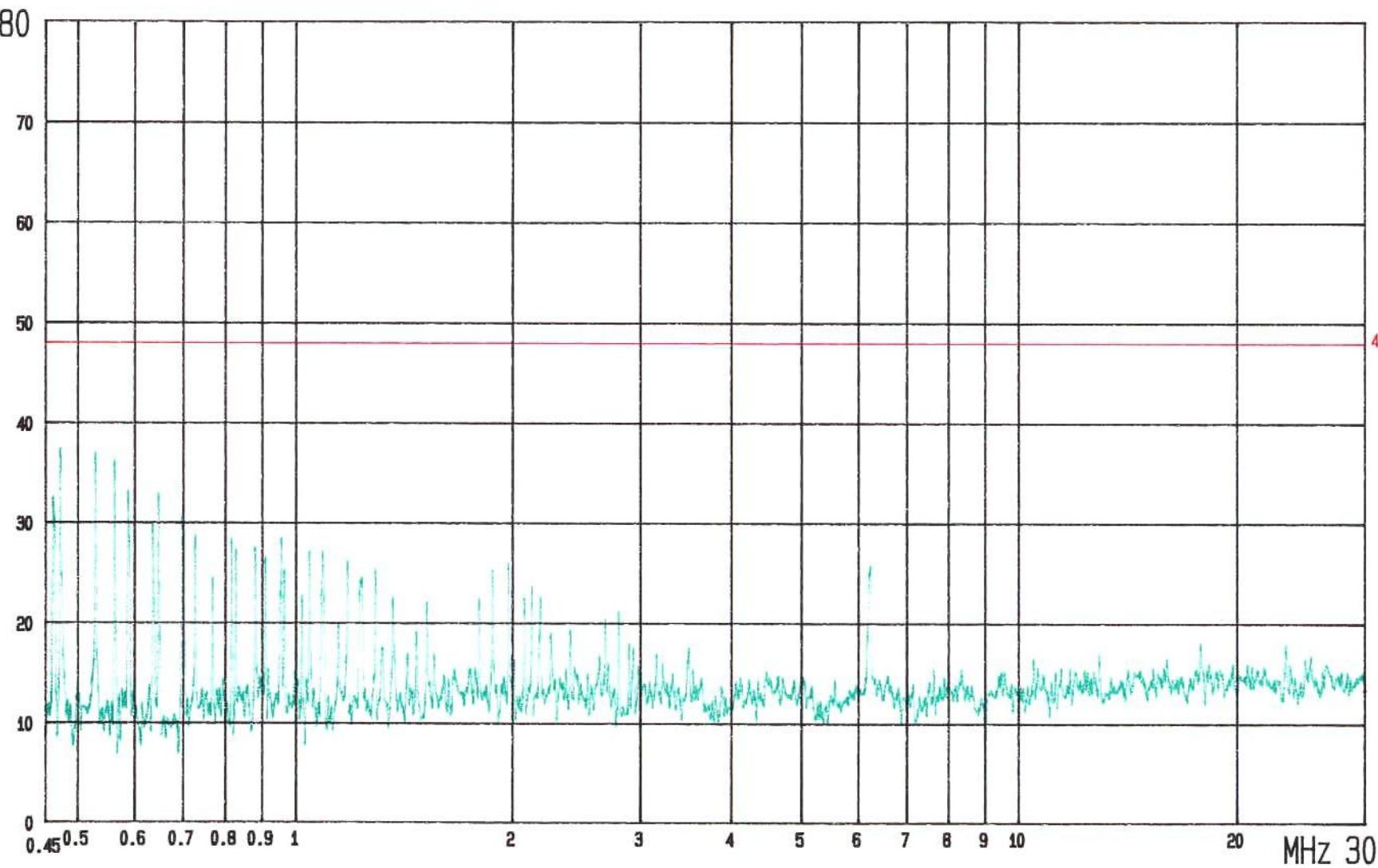
CONDUCTED TEST
MODEL: BT3021

MODE: CH MID

4: QP
LISN: L1

CLASS B LIMIT
ETC EMI LAB.

dBuV



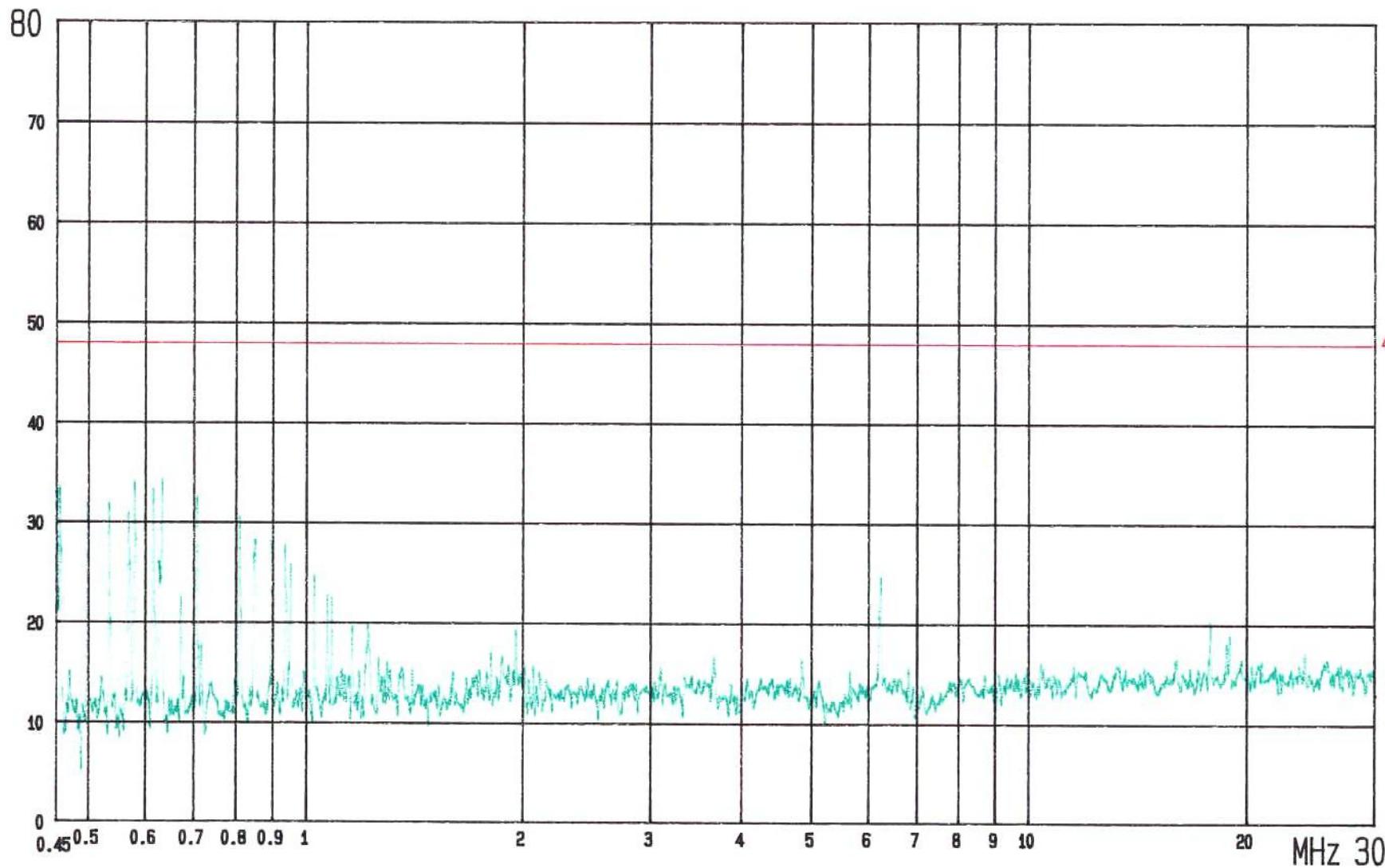
CONDUCTED TEST
MODEL: BT3021

MODE: CH HI

4: QP
LISN: N

CLASS B LIMIT
ETC EMI LAB.

dBuV



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CONDUCTED TEST
MODEL: BT3021

MODE: CH HI

4: QP
LISN: L1

CLASS B LIMIT
ETC EMI LAB.

Appendix 2 : Plotted Data for Separation of Adjacent Channel

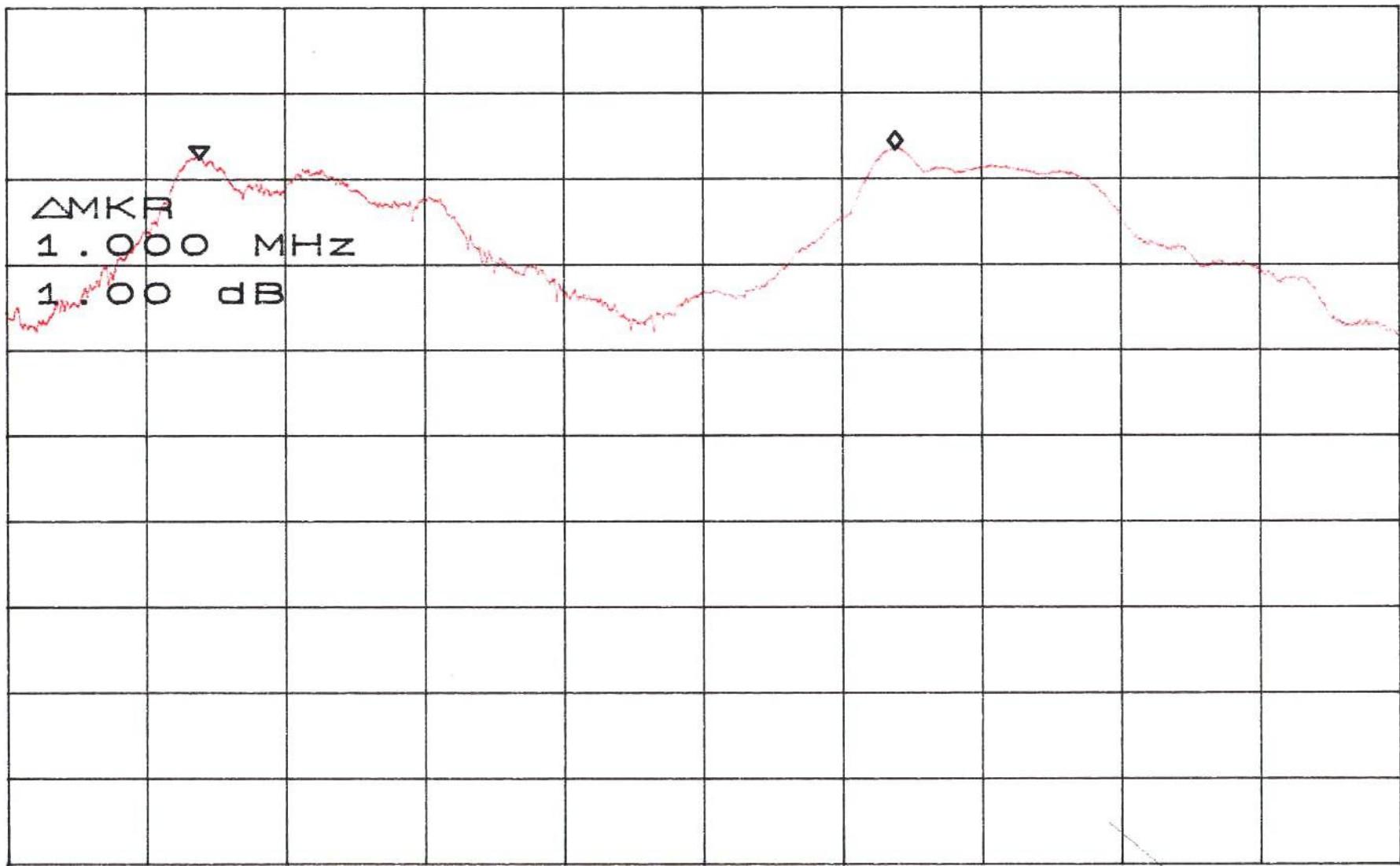
ATTEN 40dB

RL 30.0dBm

ΔMKR 1.00 dB

1.000MHz

10dB/



CENTER 2.402500GHz

*RBW 100kHz

VBW 100kHz

SPAN 2.000MHz

SWP 50.0ms

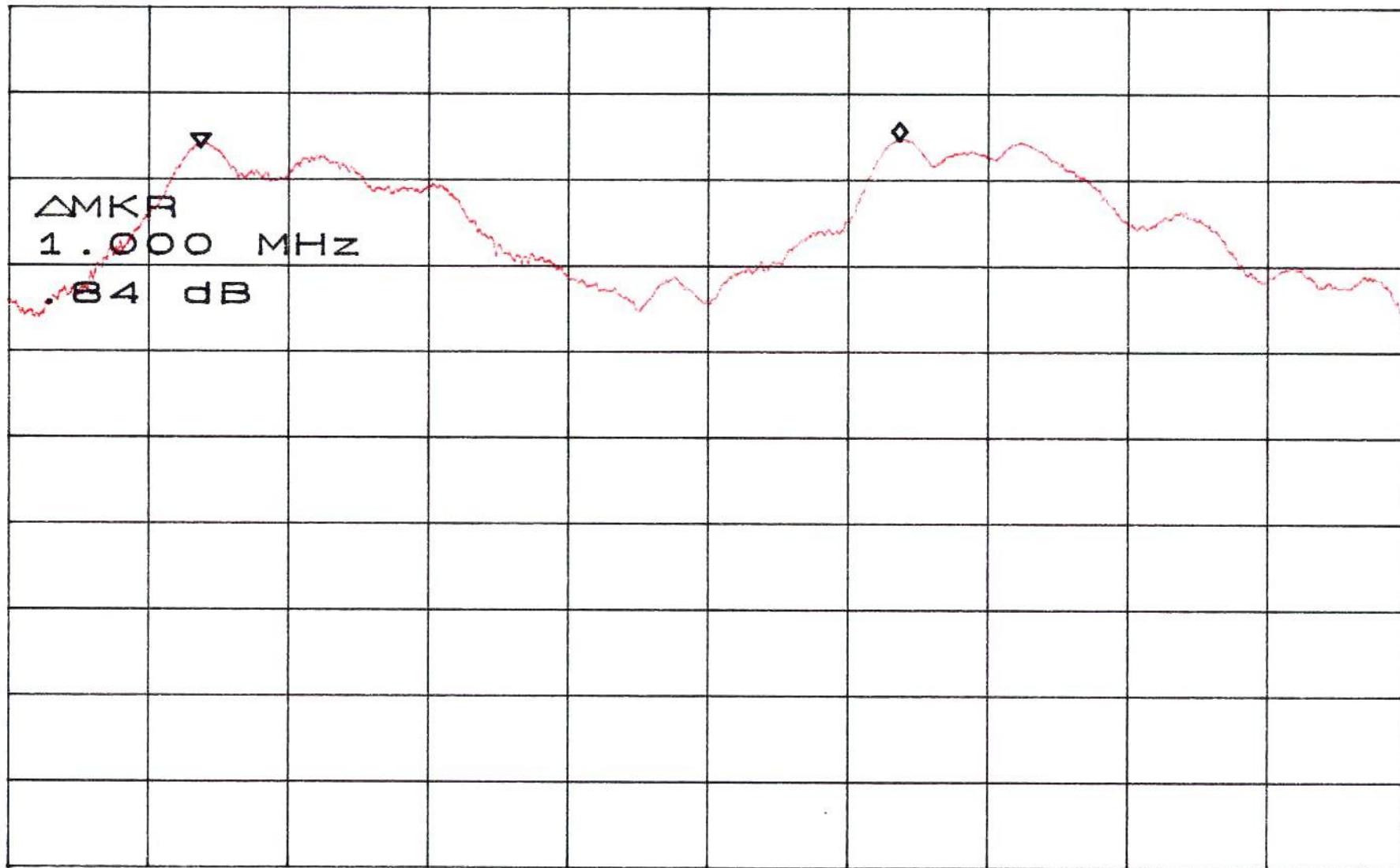
ATTEN 40dB

RL 30.0dBm

10dB/

ΔMKR .84dB

1.000MHz



CENTER 2.441500GHz

SPAN 2.000MHz

*RBW 100kHz

VBW 100kHz

SWP 50.0ms

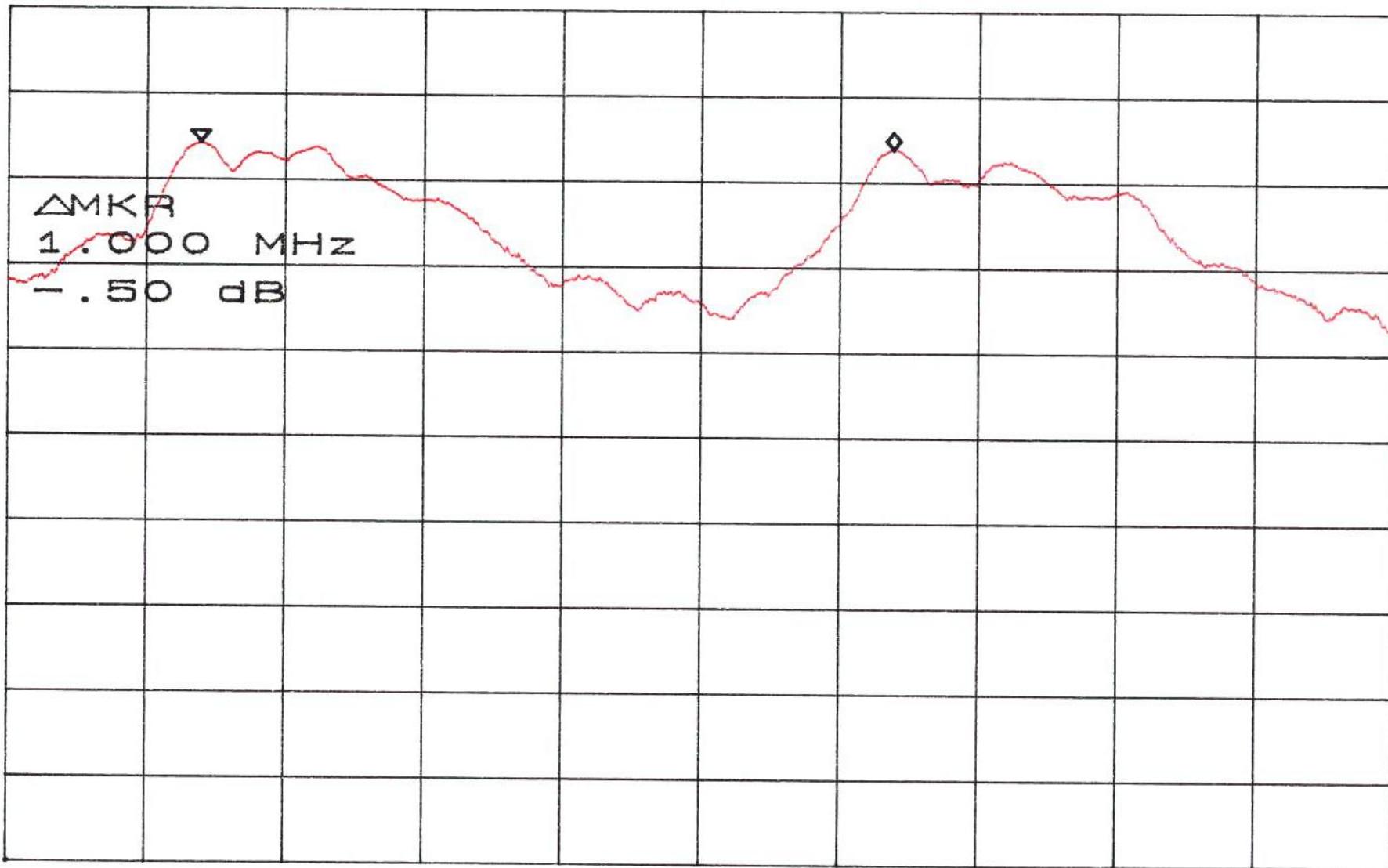
ATTEN 40dB

RL 30.0dBm

10dB/

ΔMKR -.50dB

1.000MHz



CENTER 2.479500GHz

SPAN 2.000MHz

*RBW 100kHz

VBW 100kHz

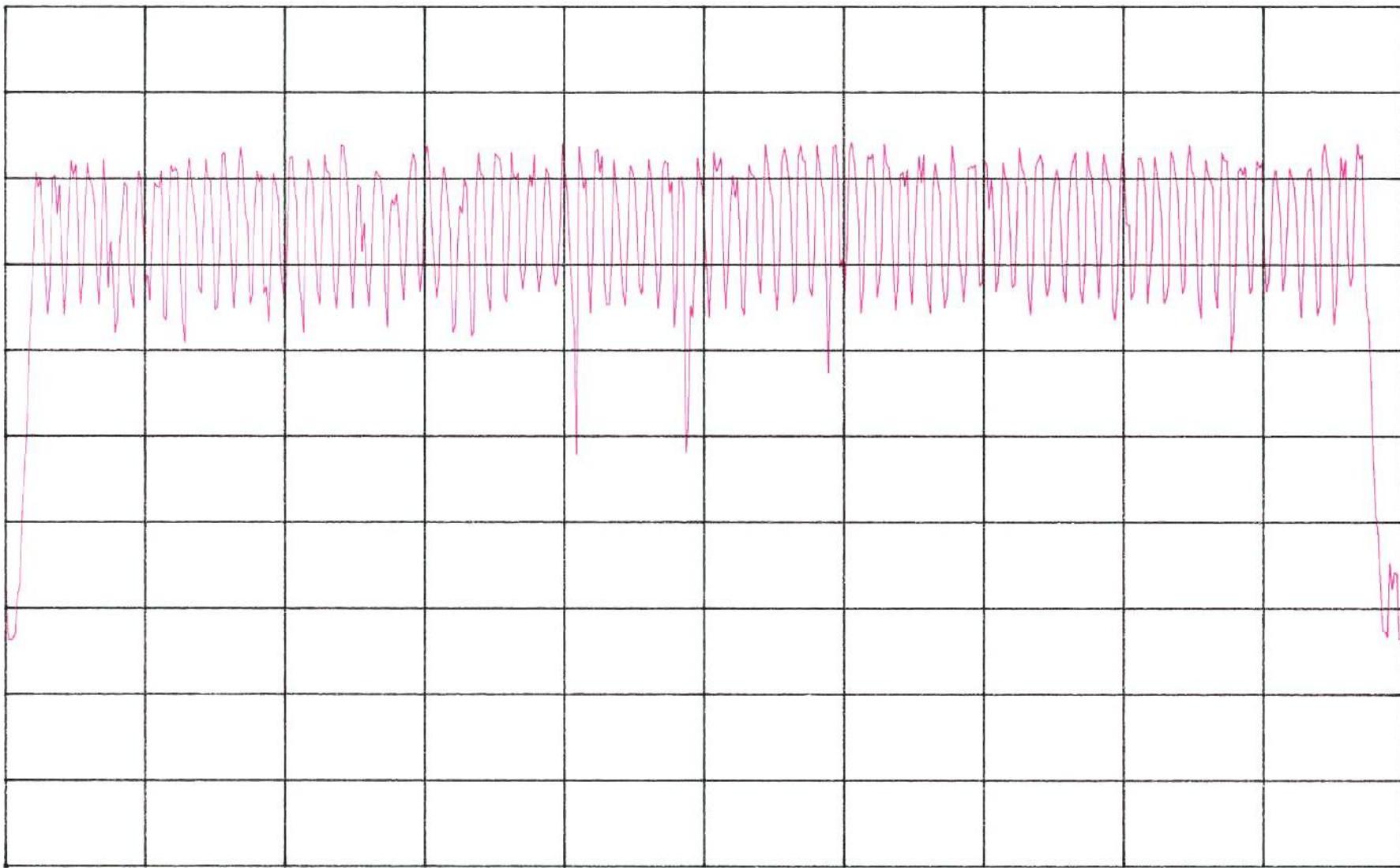
SWP 50.0ms

Appendix 3 : Plotted Data for Total Used Hopping Frequencies

ATTEN 40dB

RL 30.0dBm

10dB/



START 2.40000GHz

STOP 2.48350GHz

*RBW 100kHz

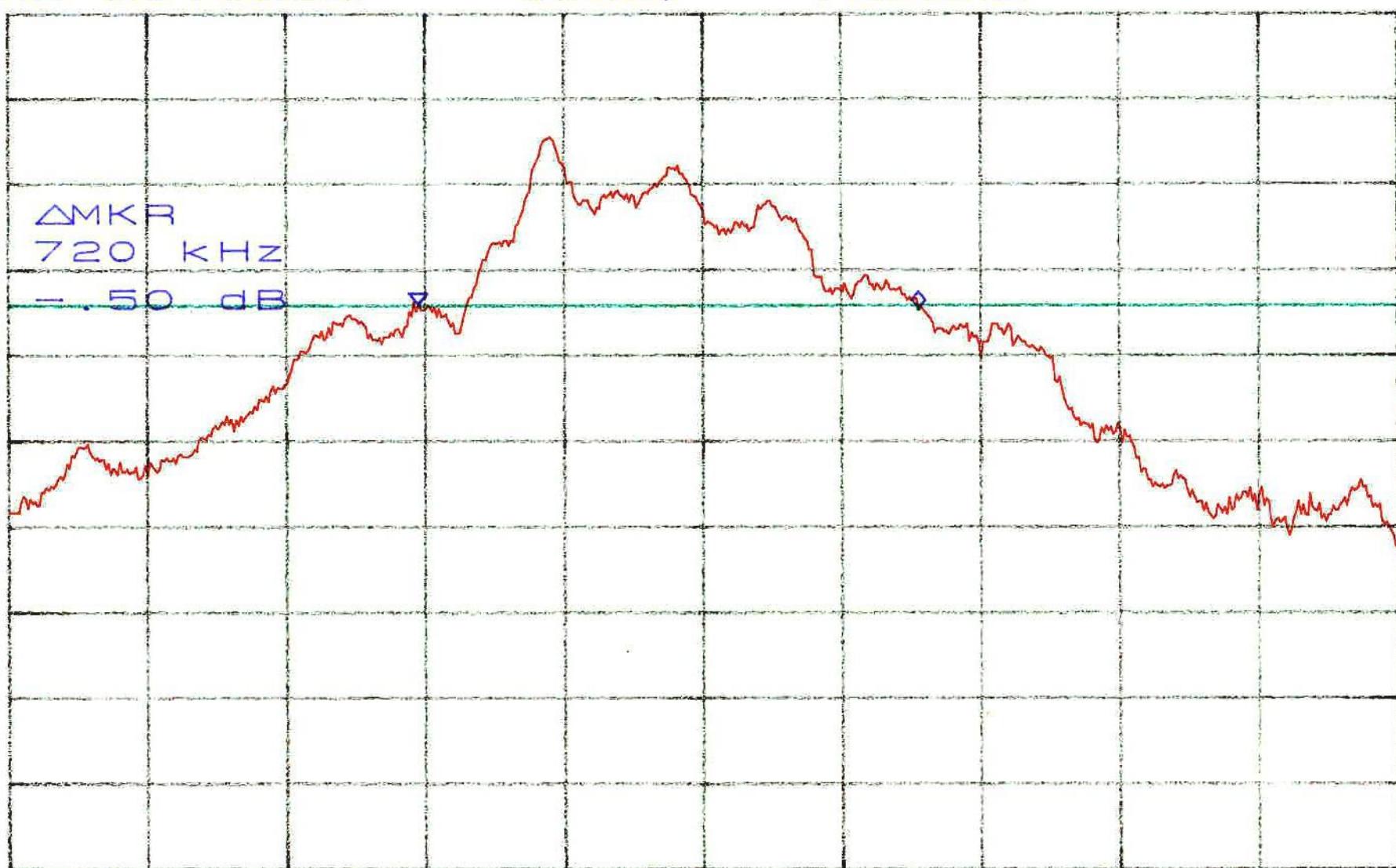
VBW 100kHz

SWP 50.0ms

Appendix 4 : Plotted Data for Channel Bandwidth

*ATTEN 40dB
RL 30.0dBm

△MKR -.50dB
720kHz



CENTER 2.402000GHz
*RBW 30kHz

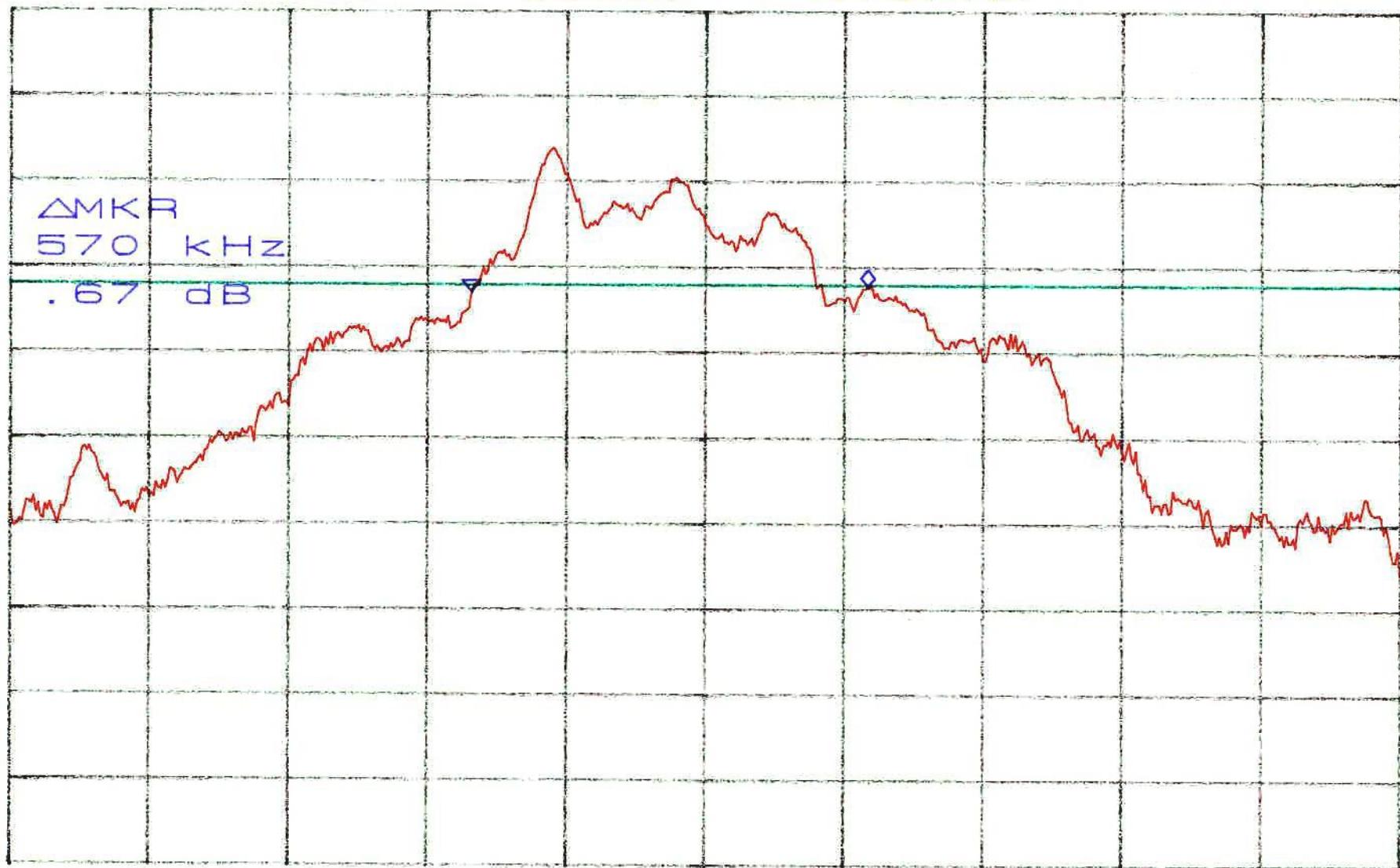
*VBW 100kHz

SPAN 2.000MHz
SWP 50.0ms

*ATTEN 40dB
RL 30.0dBm

10dB/

ΔMKR .67dB
570kHz



CENTER 2.441000GHz

*RBW 30kHz

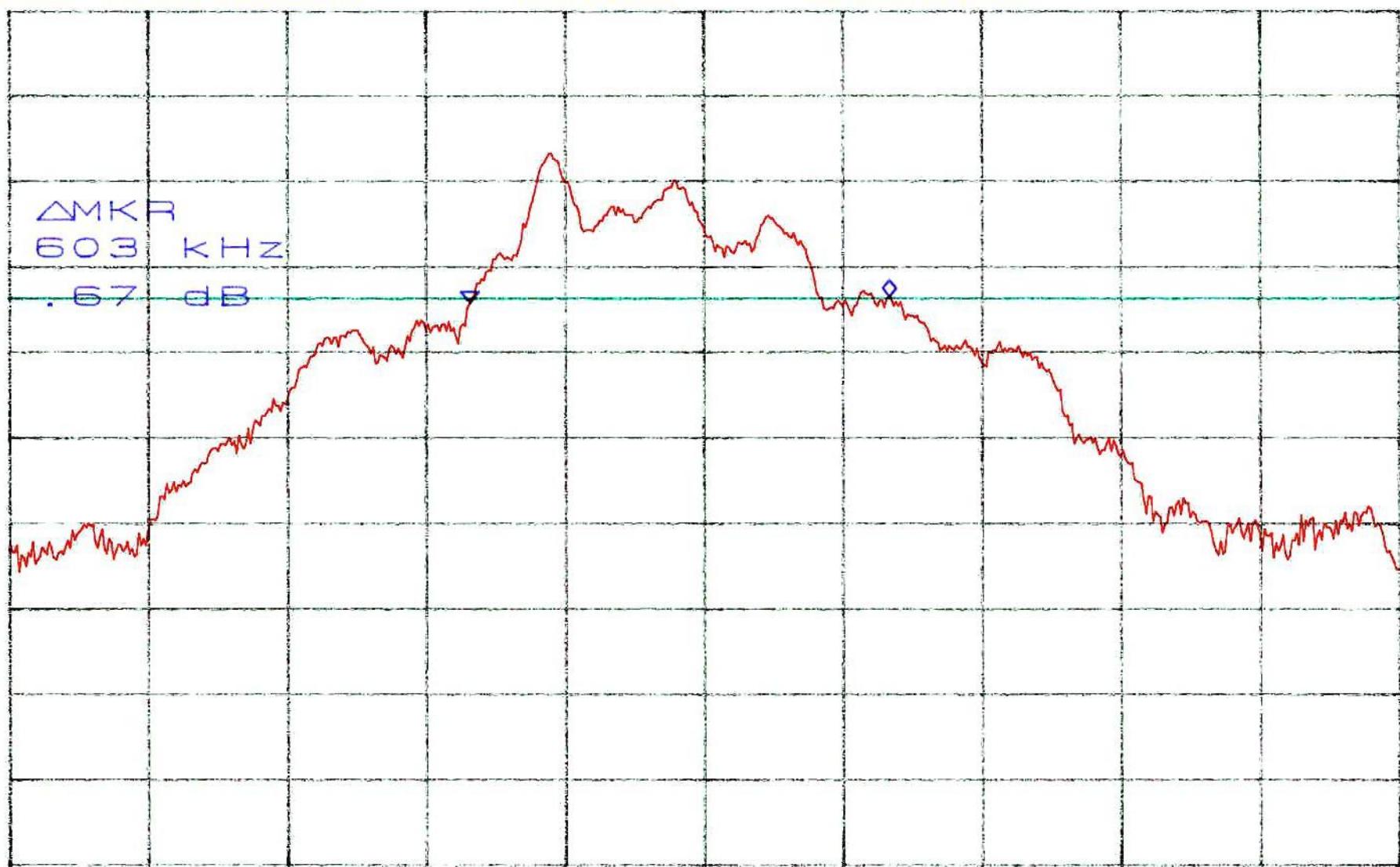
*VBW 100kHz

SPAN 2.000MHz

SWP 50.0ms

*ATTEN 40dB
RL 30.0dBm

△MKR .67dB
10dB/ 603kHz



CENTER 2.480000GHz

SPAN 2.000MHz

*RBW 30kHz

*VBW 100kHz

SWP 50.0ms

Appendix 5 : Plotted Data for Channel Dwell Time

ATTEN 40dB

RL 30.0dBm

10dB/

ΔMKR -.17dB

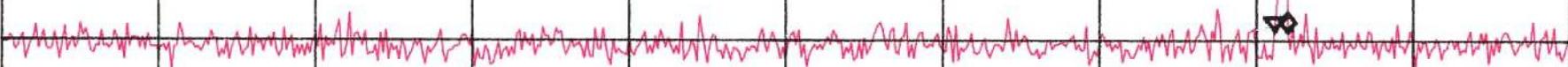
417 μs

dB

ΔMKR

417 μs

-.17 dB



CENTER 2.402000000GHz

SPAN 0Hz

*RBW 1.0MHz

VBW 1.0MHz

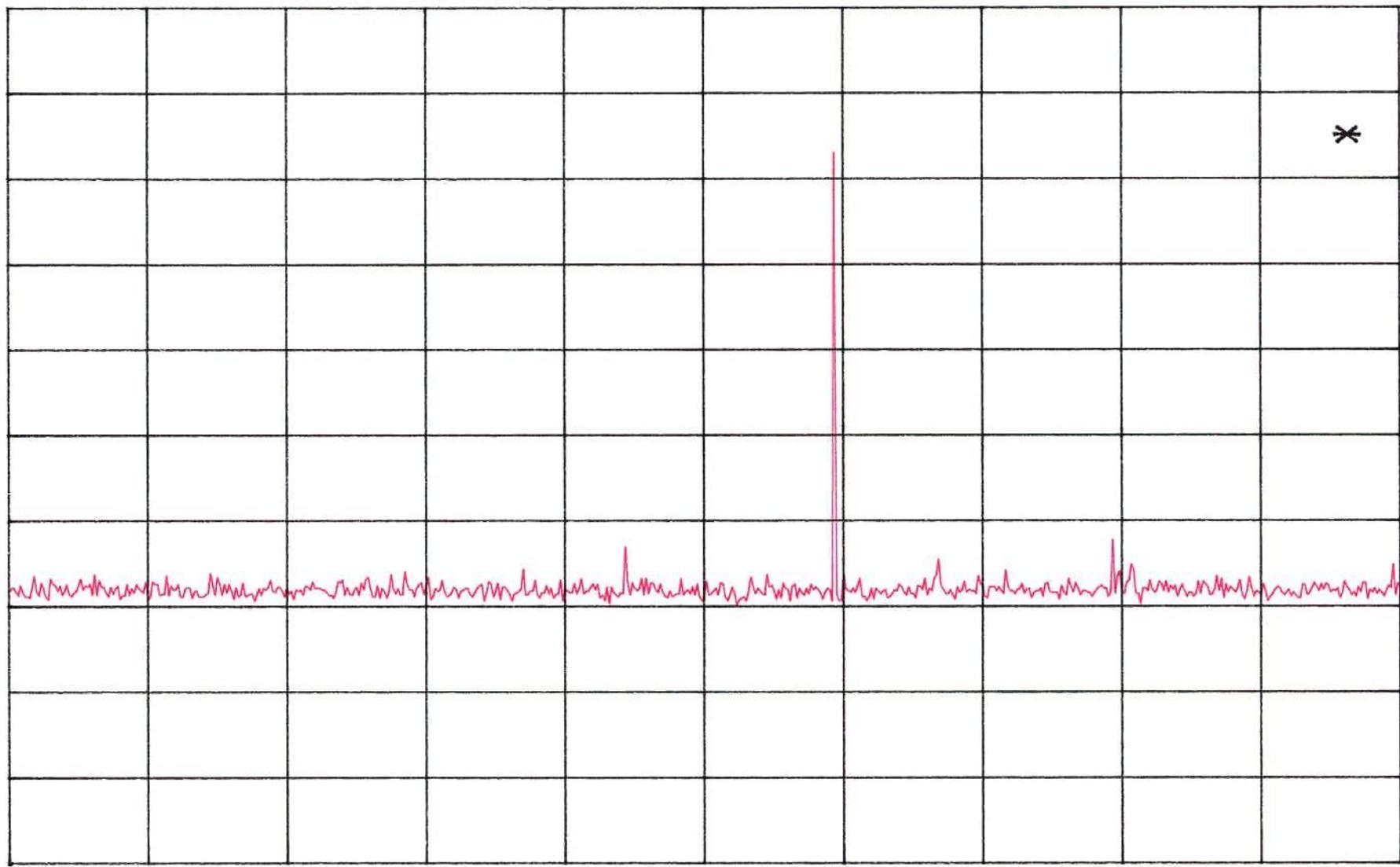
*SWP 50.0ms

ATTEN 40dB

RL 30.0dBm

10dB/

dB



CENTER 2.402000000GHz

SPAN 0Hz

*RBW 1.0MHz

VBW 1.0MHz

*SWP 1.00sec

ATTEN 40dB

RL 30.0dBm

10dB/

ΔMKR -.33dB

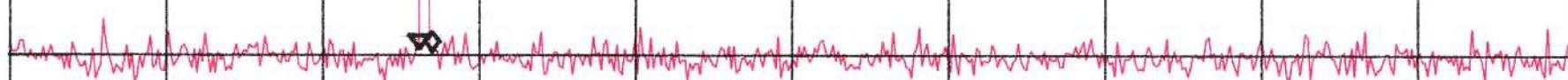
417 μs

D B

ΔMKR

417 μs

-.33 dB



CENTER 2.441000000GHz

SPAN 0Hz

*RBW 1.0MHz

VBW 1.0MHz

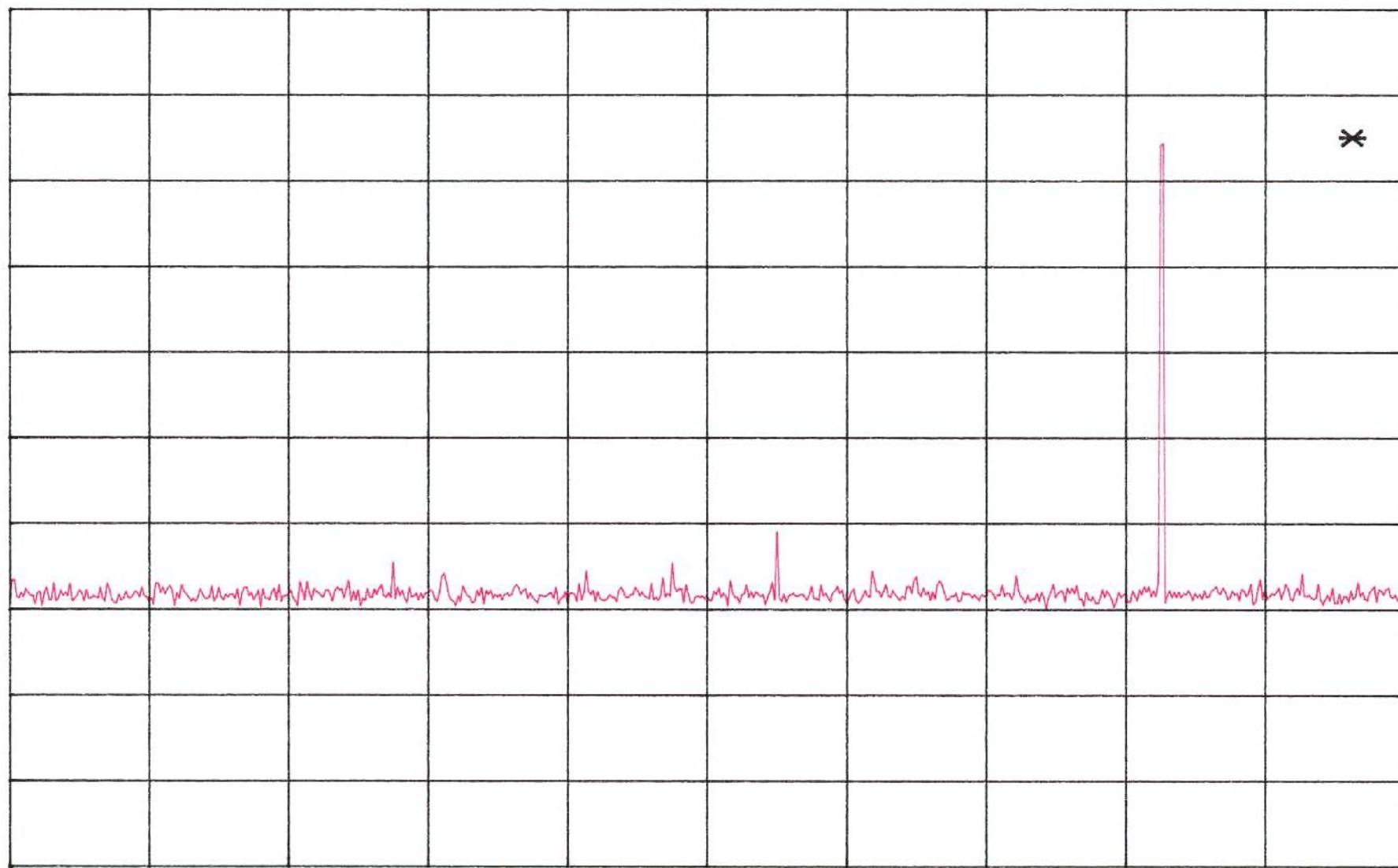
*SWP 50.0ms

ATTEN 40dB

RL 30.0dBm

10dB/

dB



CENTER 2.441000000GHz

SPAN OHZ

*RBW 1.0MHz

VBW 1.0MHz

*SWP 1.00sec

ATTEN 40dB

RL 30.0dBm

ΔMKR 1.50dB

10dB/

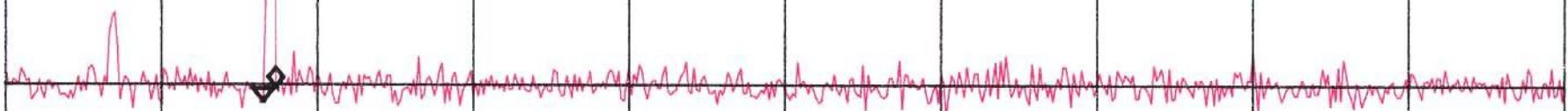
417 μs

D S

ΔMKR

417 μs

1.50 dB



CENTER 2.480000000GHz

SPAN 0Hz

*RBW 1.0MHz

VBW 1.0MHz

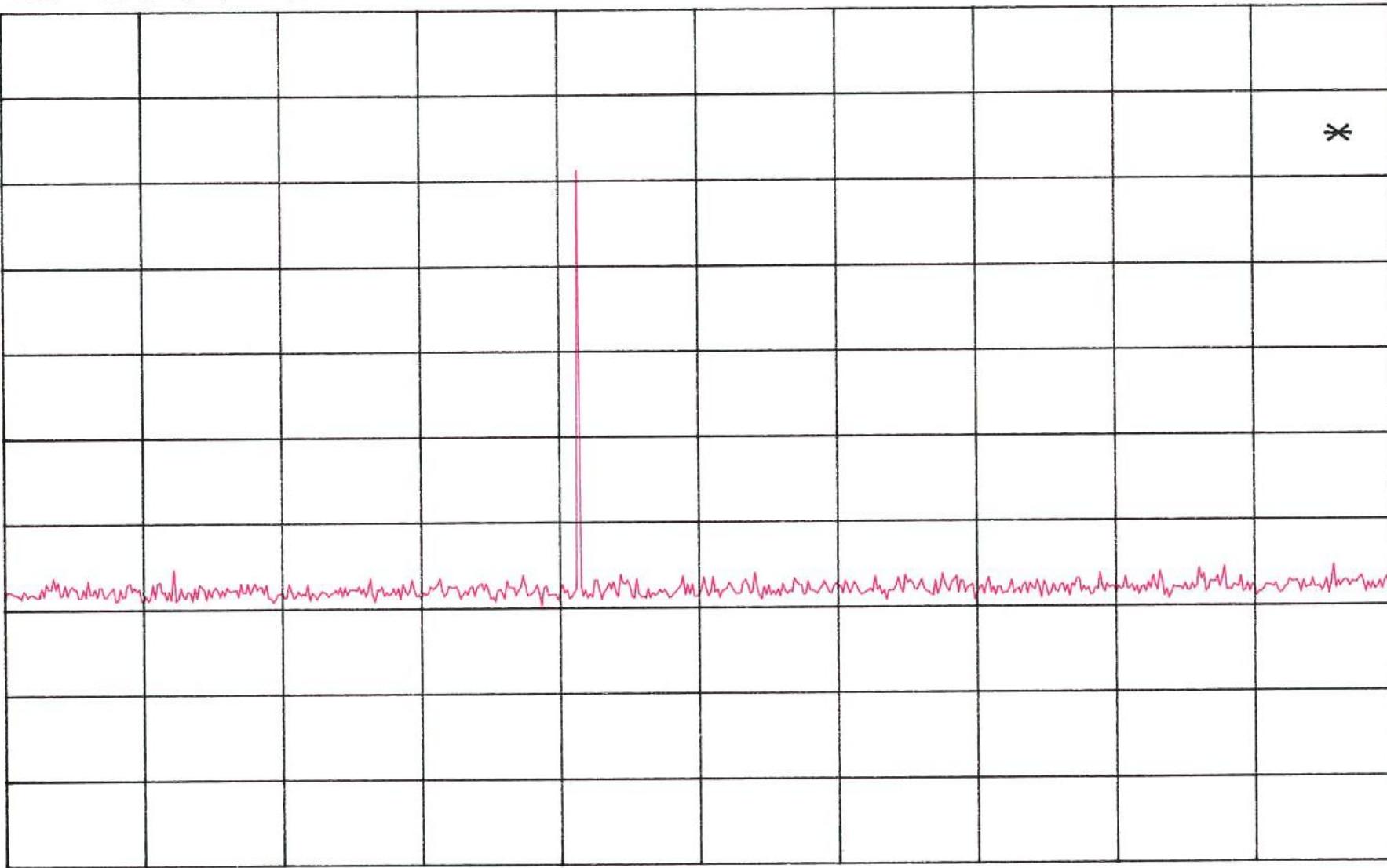
*SWP 50.0ms

ATTEN 40dB

RL 30.0dBm

10dB/

dB



CENTER 2.480000000GHz

SPAN 0Hz

*RBW 1.0MHz

VBW 1.0MHz

*SWP 1.00sec

Appendix 6 : Plotted Data for Output Peak Power

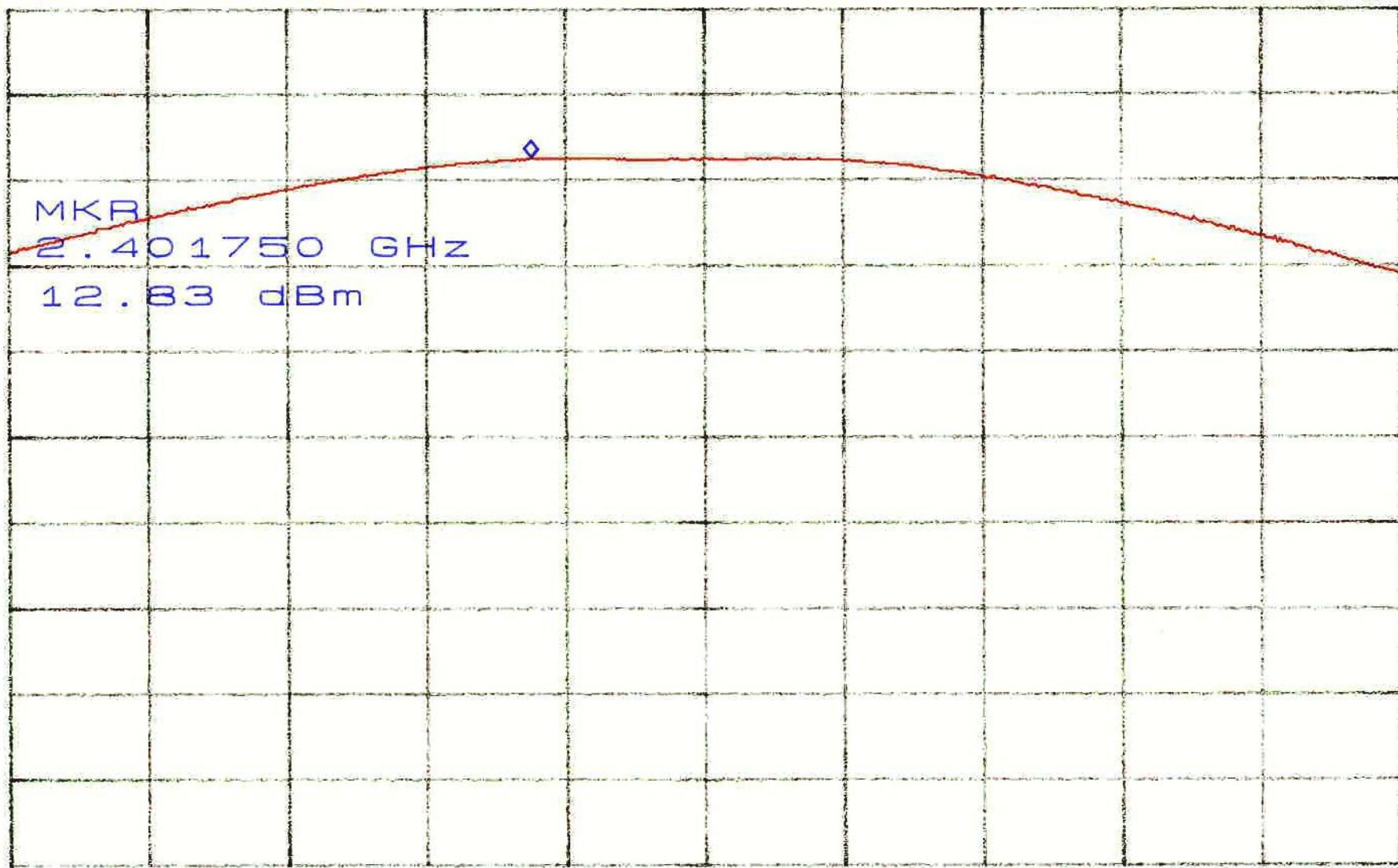
*ATTEN 40dB

RL 30.0dBm

10dB/

MKR 12.83dBm

2.401750GHz



CENTER 2.402000GHz

*RBW 1.0MHz

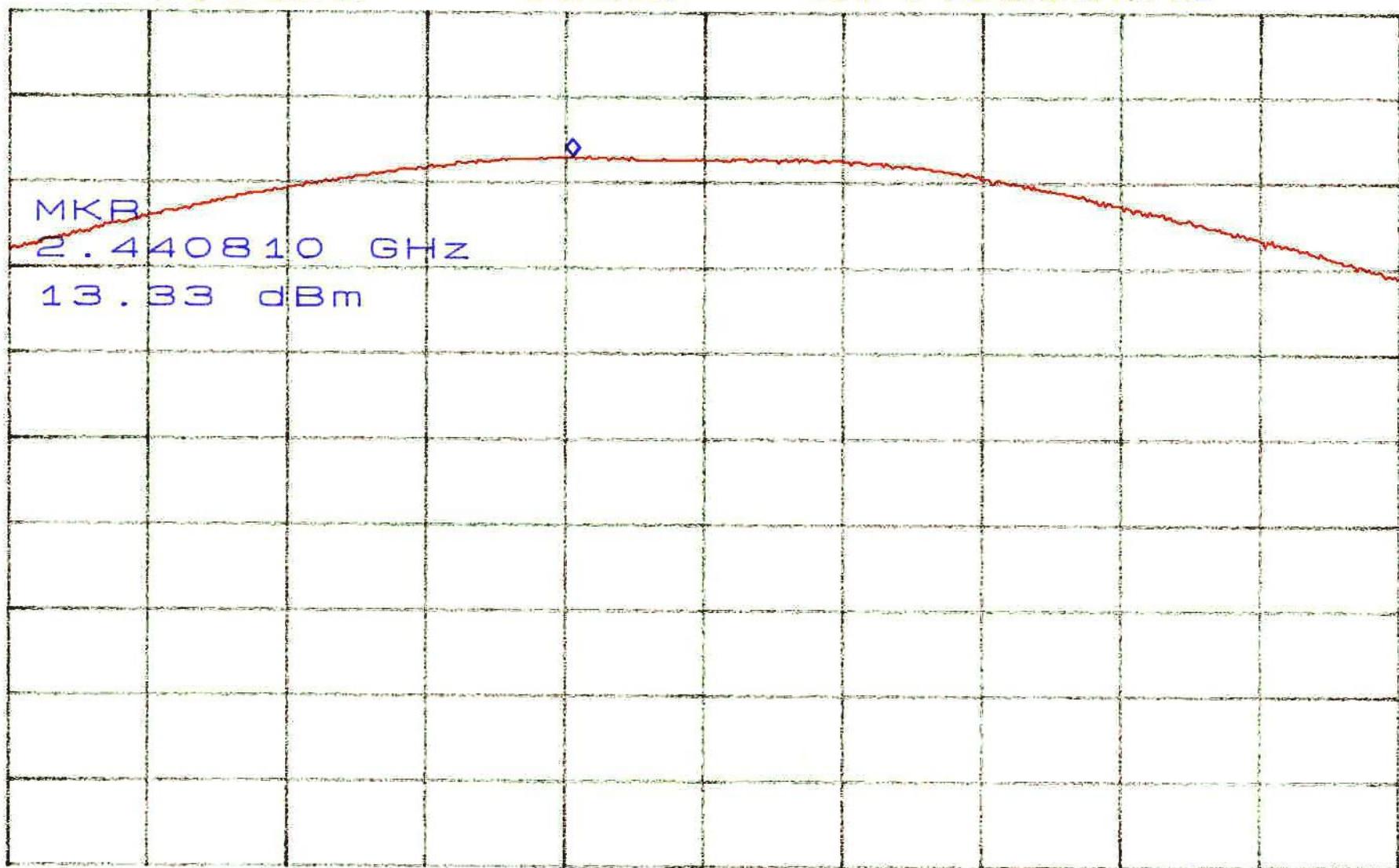
VBW 1.0MHz

SPAN 2.000MHz

SWP 50.0ms

*ATTEN 40dB
RL 30.0dBm

MKR 13.33dBm
2.440810GHz



CENTER 2.441000GHz

SPAN 2.000MHz

*RBW 1.0MHz

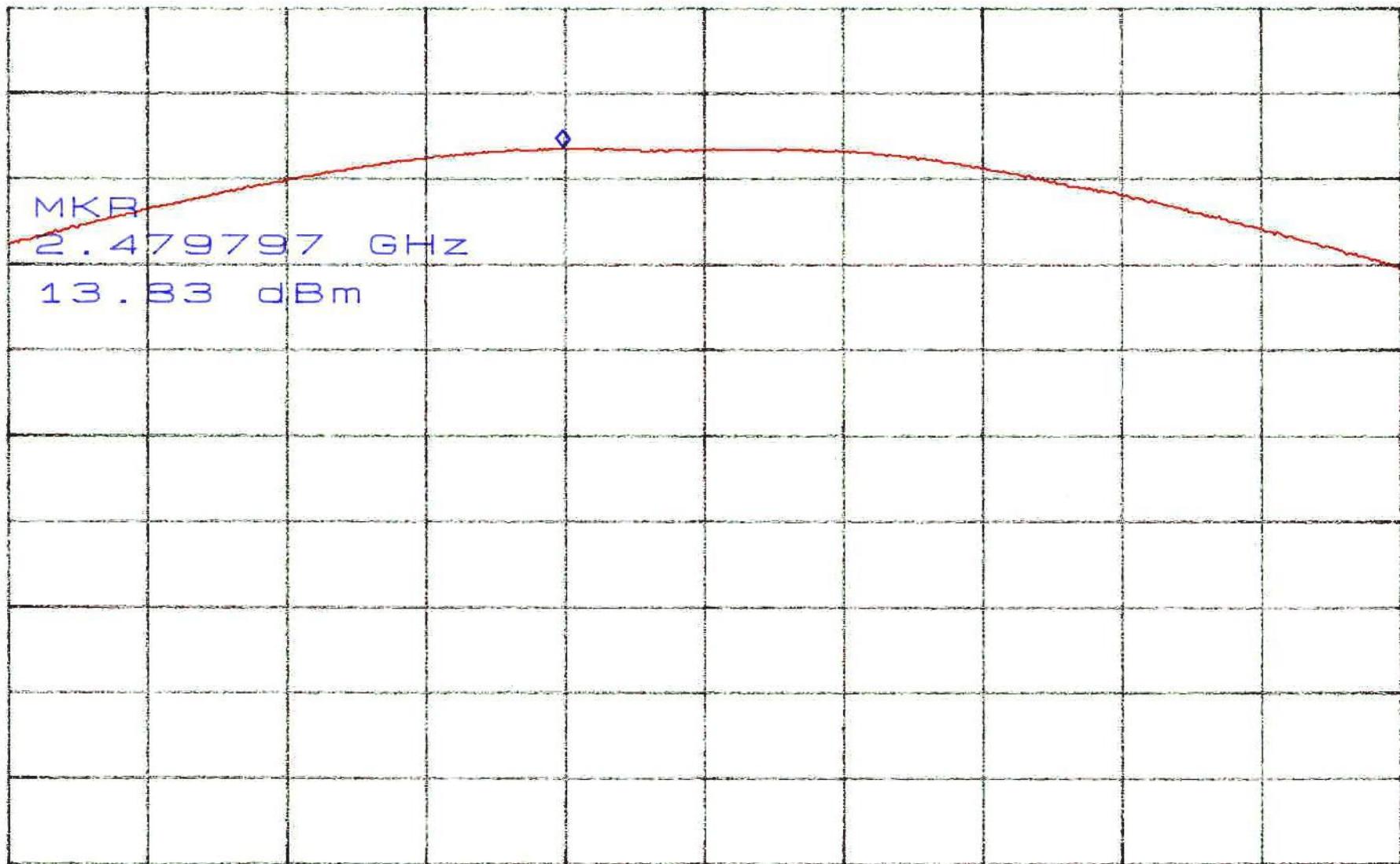
VBW 1.0MHz

SWP 50.0ms

*ATTEN 40dB
RL 30.0dBm

10dB/

MKR 13.83dBm
2.479797GHz



CENTER 2.480000GHz

*RBW 1.0MHz

VBW 1.0MHz

SPAN 2.000MHz

SWP 50.0ms

Appendix 7 : Plotted Data for 100 kHz Bandwidth from Band Edge

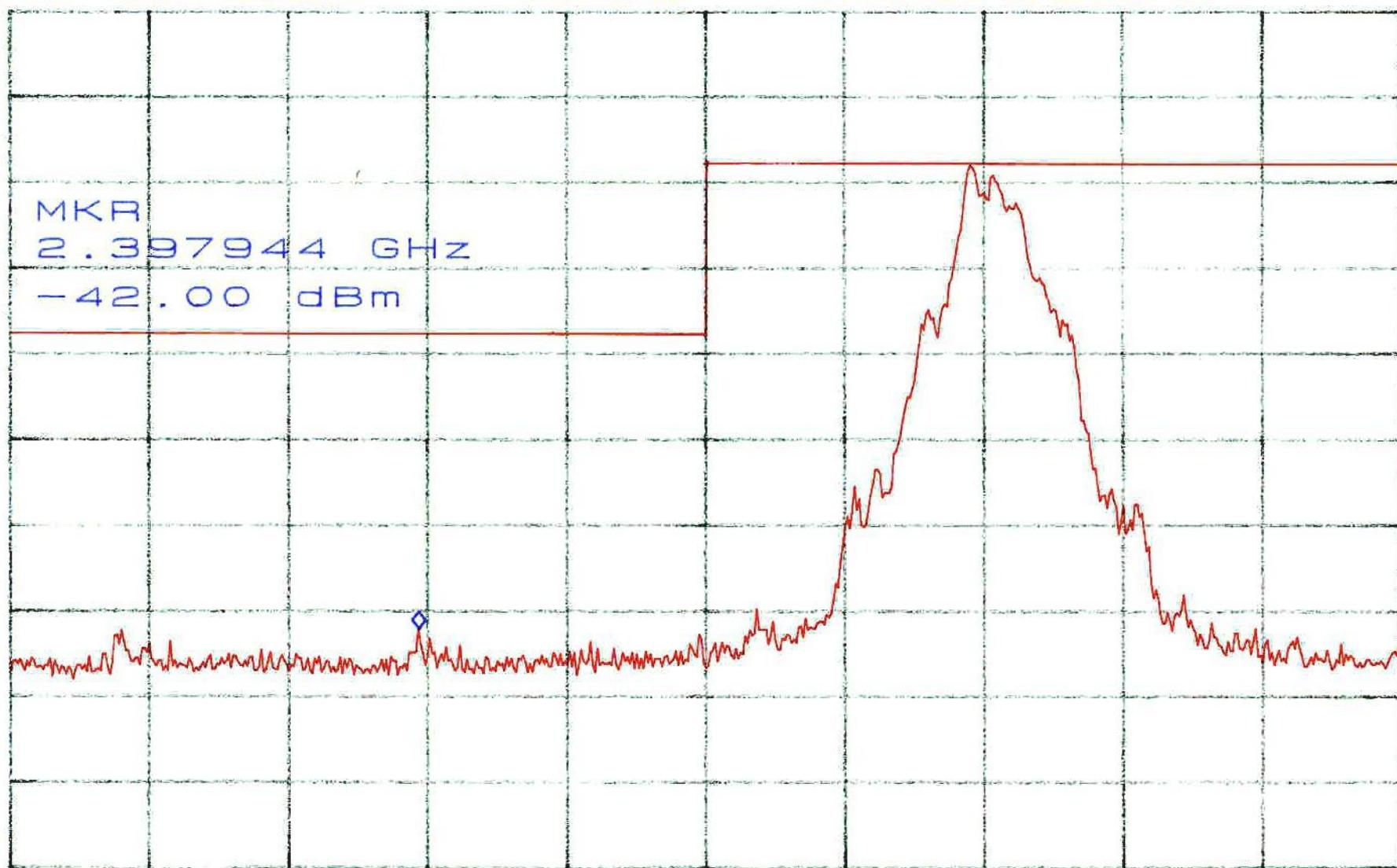
*ATTEN 40dB

RL 30.0dBm

10dB/

MKR -42.00dBm

2.397944GHz



CENTER 2.400000GHz

*RBW 100kHz

VBW 100kHz

SPAN 9.950MHz

SWP 50.0ms

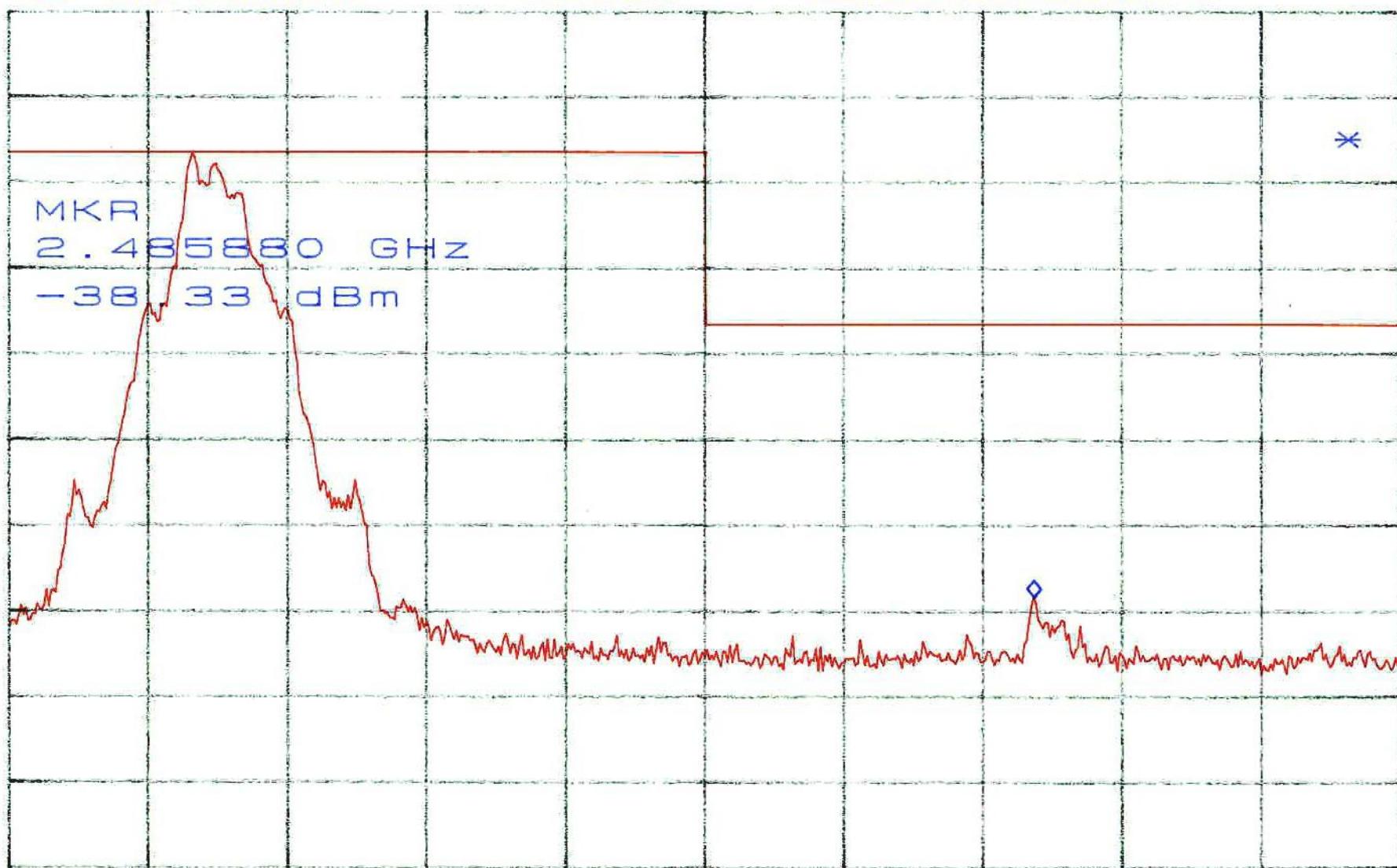
*ATTEN 40dB

RL 30.0dBm

MKR -38.33dBm

10dB/

2.485880GHz



CENTER 2.483525GHz

SPAN 9.950MHz

*RBW 100kHz

VBW 100kHz

SWP 50.0ms