

TESTED BY ORTEL CORPORATION
CONDUCTED MEASUREMENT INFORMATION

Test Equipment Used:

Signal Generator HP8648C, Hewlett Packard
Spectrum Analyzer HP8563E, Hewlett Packard
-RF cables (with SMA connectors), 7/16 to N connectors, N to SMA connectors, attenuation pad (for
repeater output), and passive external combiner used for two tone testing.

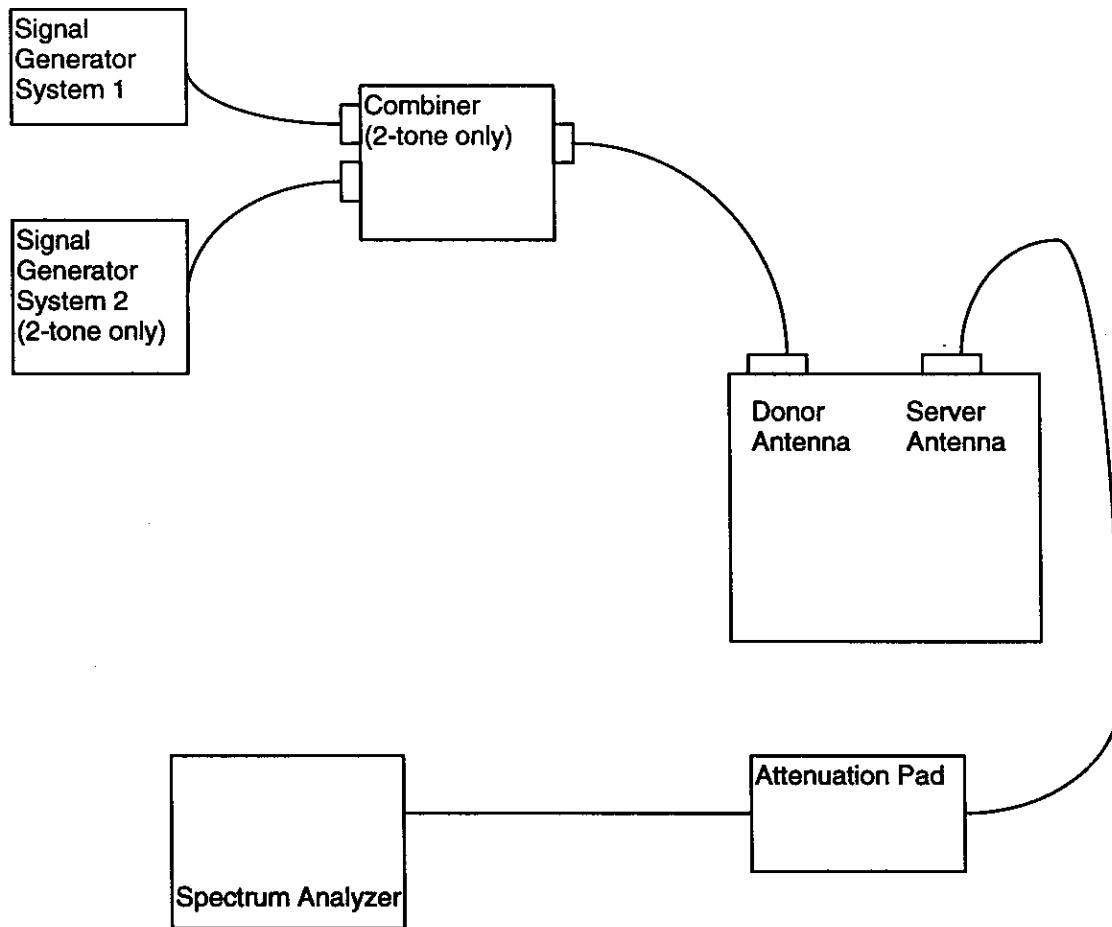
Tests performed for E/F-bands

2.985, 2.989, 2.991, and 24.238 and In/Out

Test setup on next page.

CONDUCTED MEASUREMENT TEST SETUP

TESTED BY ORTEL CORPORATION



Downlink mode shown. For uplink, swap antenna connections at the repeater.

NOTE: All cables, connectors, and the attenuation pad are calibrated out at the

UL Low
E/F Band

Output
 $P_{out} = -48.8 \text{ dBm @ } 1885.2 \text{ MHz (Ch.1)}$

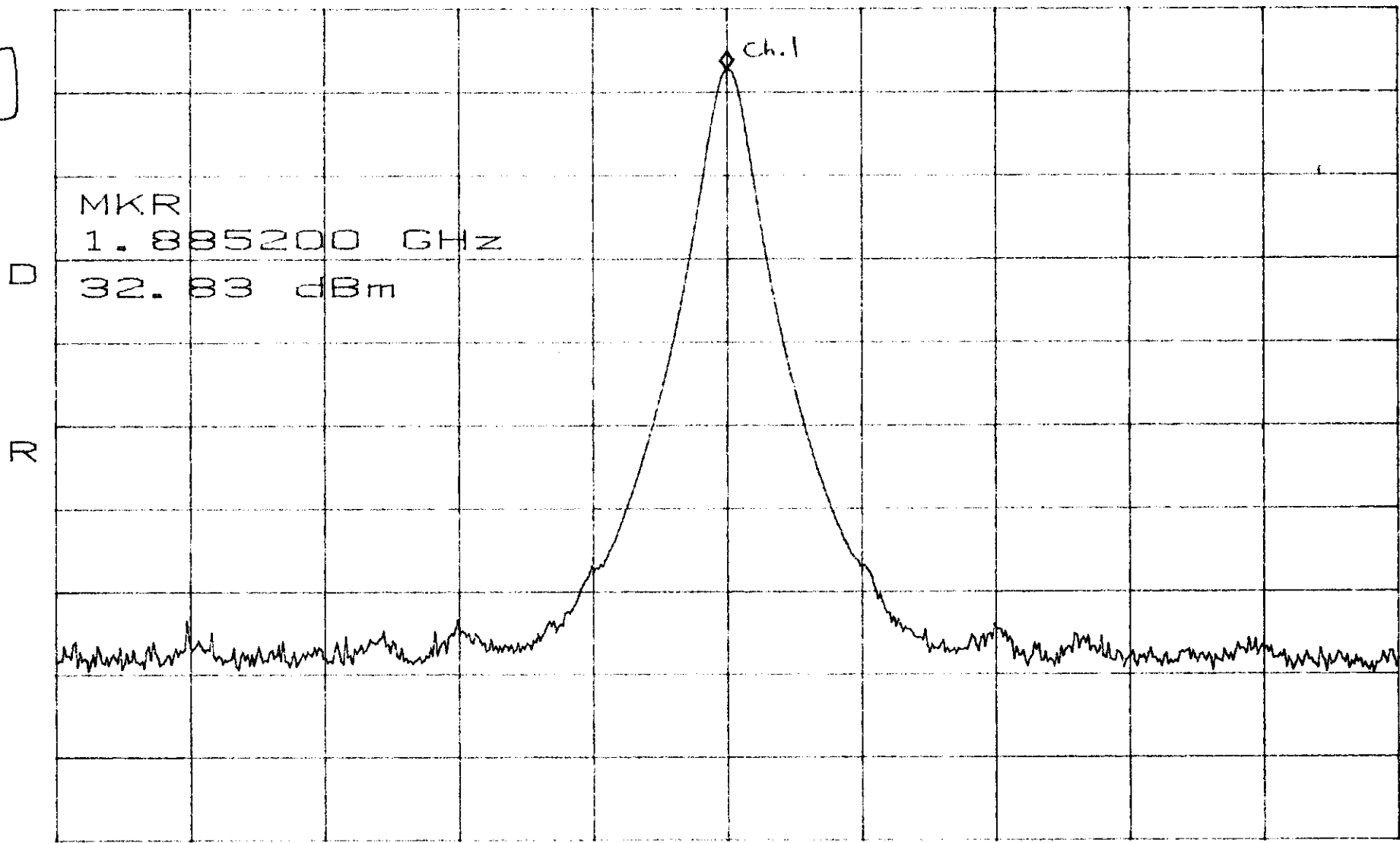
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

CH
10dB/

MKR 32.83dBm
1.885200GHz

2.985



CENTER 1.885200GHz

SPAN 2.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

UL Low
E/F Band

Output

9/23/98
LB41901

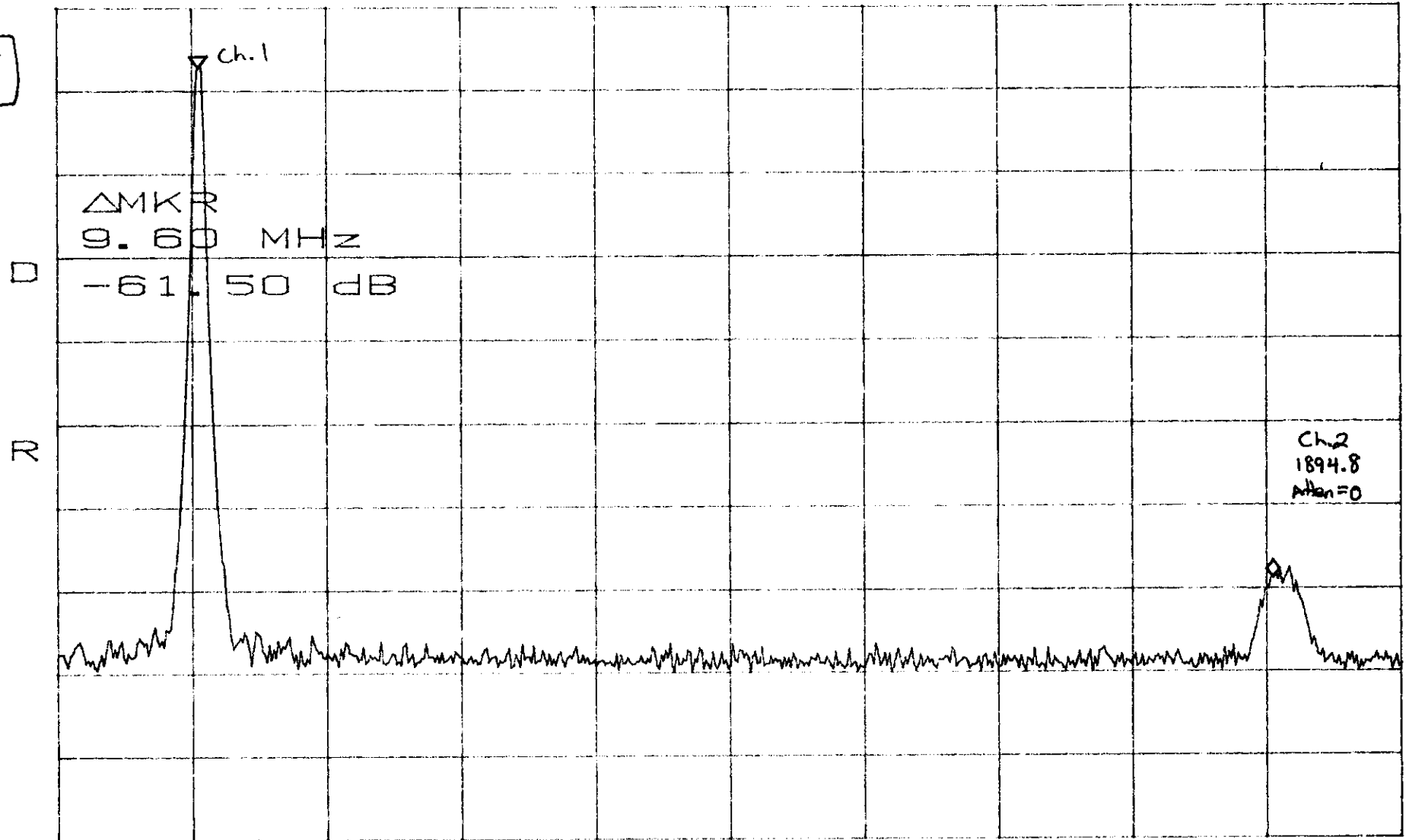
$P_{in} = -48.8 \text{ dBm}$ @ 1885.2 MHz (Ch.1)

*ATTEN 30dB
RL 40.0dBm

CW
10dB/

$\Delta\text{MKR} -61.50\text{dB}$
9.60MHz

2.985



START 1.88400GHz

STOP 1.89600GHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

UL Mid
E/F Band

Output
 $P_{in} = -49.2 \text{ dBm @ } 1890 \text{ MHz (Ch.1)}$

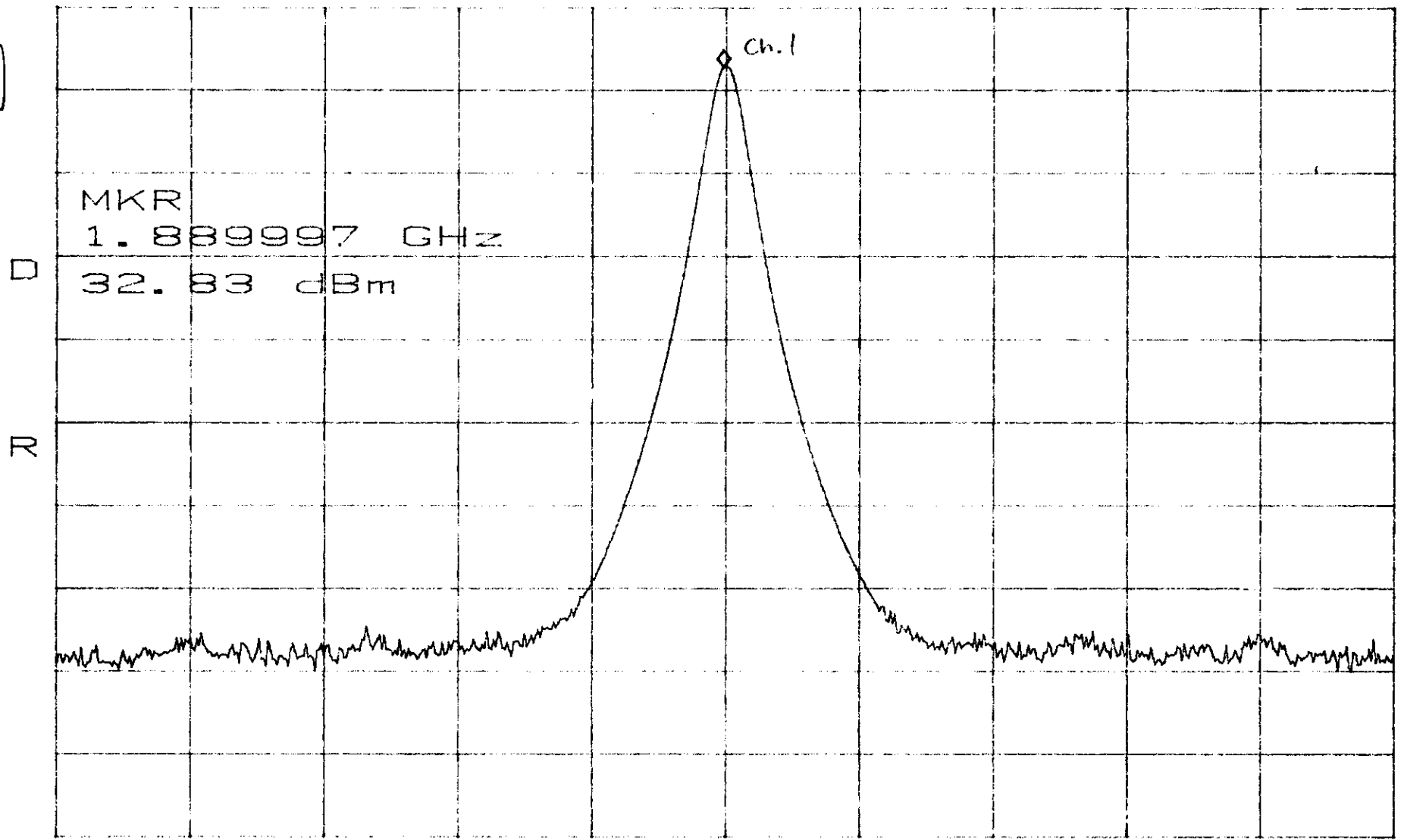
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

CW
10dB/

MKR 32.83dBm
1.889997GHz

2.985



CENTER 1.890000GHz SPAN 2.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

UL Mid
E/F Band

Output

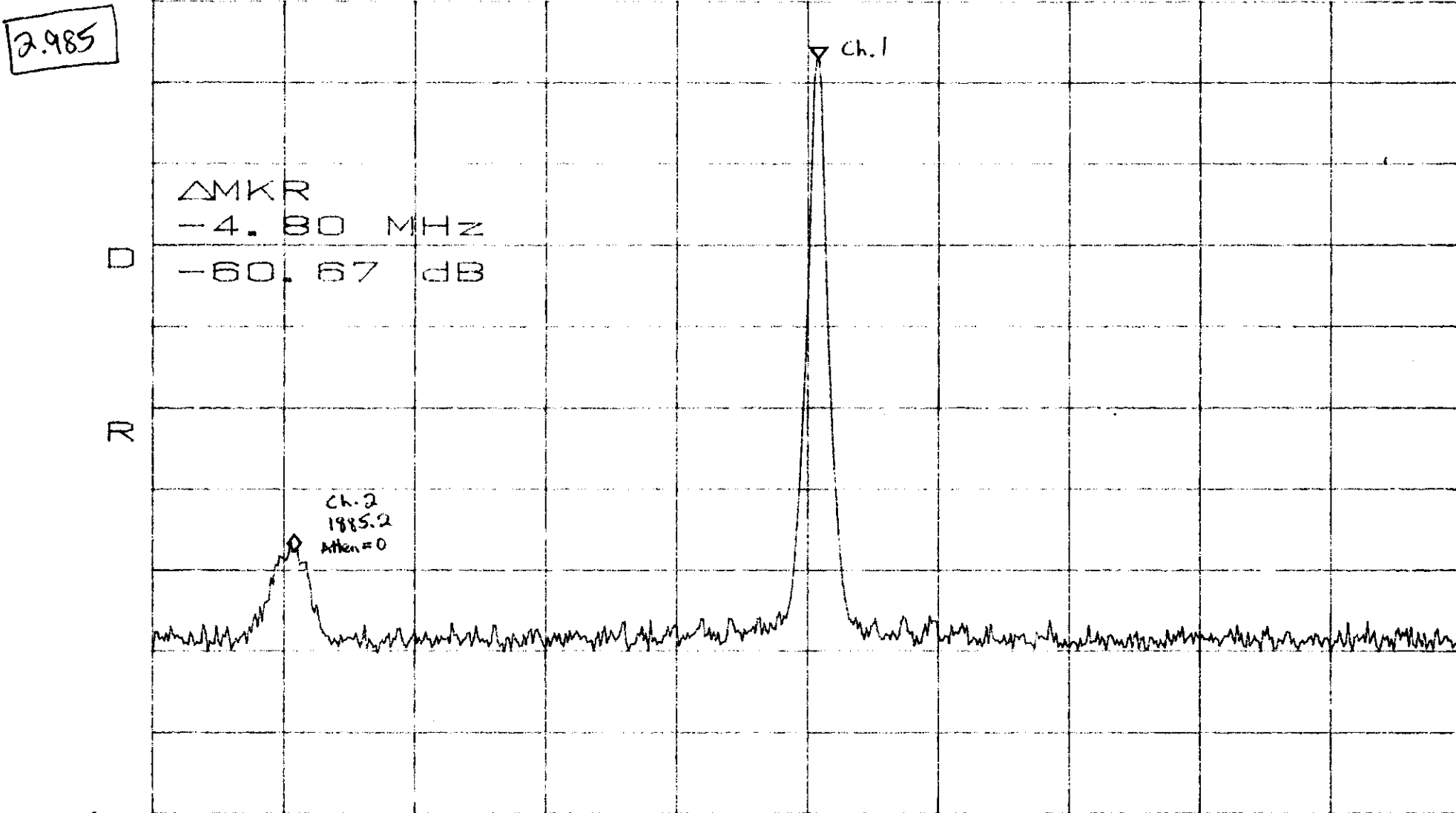
9/23/98
LB41901

$P_{in} = -49.2 \text{ dBm}$ @ 1890 MHz (Ch.1)

*ATTEN 30dB
RL 40.0dBm

cw
10dB/

$\Delta MKR -60.67 \text{ dB}$
 -4.80 MHz



START 1.88400GHz

STOP 1.89600GHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

UL High
E/F band

Output
 $P_{in} = -48.4 \text{ dBm @ } 1894.8 \text{ MHz (Ch.1)}$

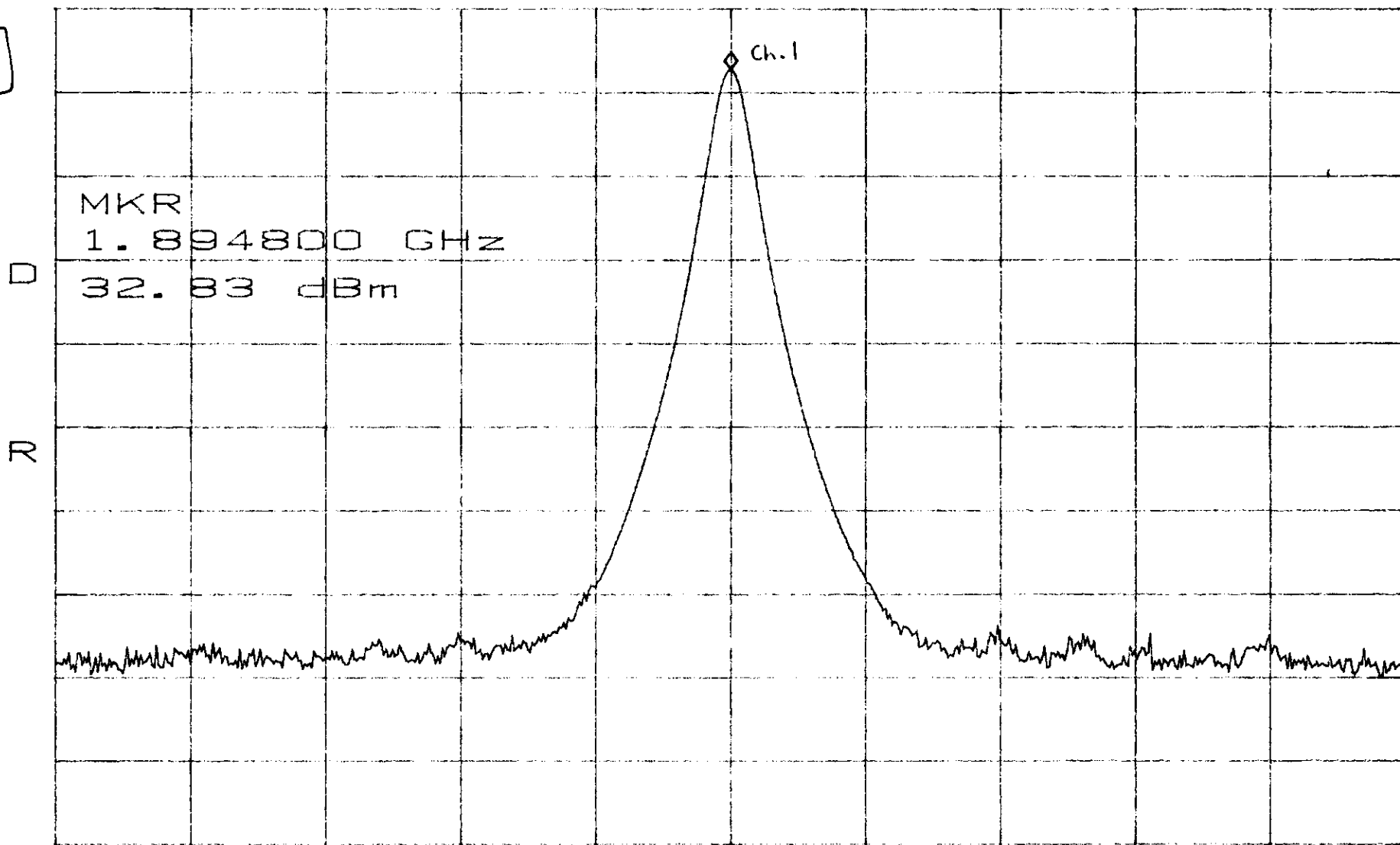
9/23/98
LB41901

*ATTEN 30dB
BPO 0.0dBm
RL 40.0dBm

ch
10dB/

MKR 32.83dBm
1.894800GHz

2.985



CENTER 1.894800GHz SPAN 2.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

UL High
E/F band

Output
 $P_{in} = -48.4 \text{ dBm} @ 1894.8 \text{ MHz (ch.1)}$

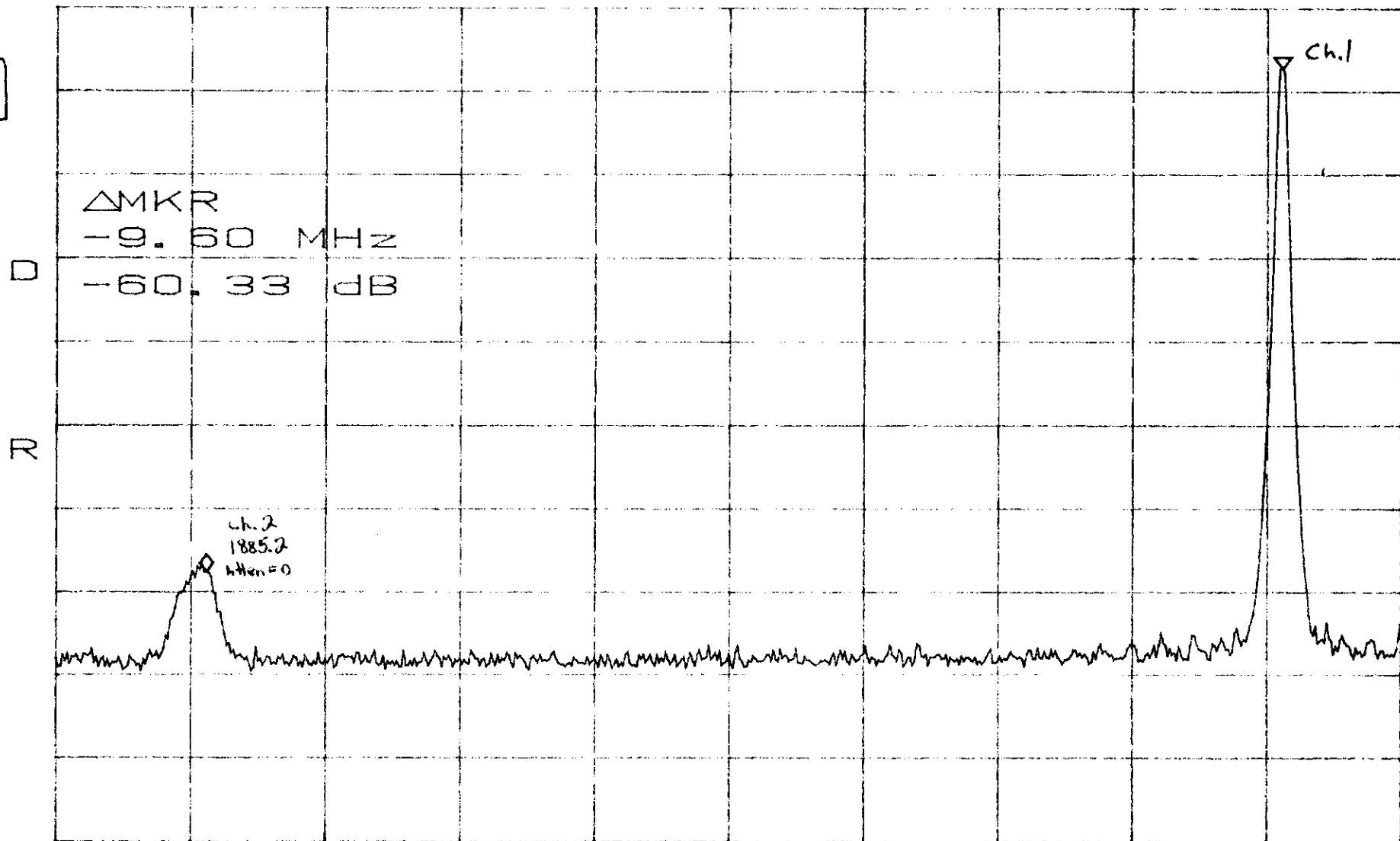
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

cw
10dB/

$\Delta \text{MKR} -60.33 \text{ dB}$
 -9.60 MHz

2.985



START 1.88400GHz

STOP 1.89600GHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Low

E/F Band

*ATTEN 30dB

RL 40.00dBm

Output

$P_{in} = -55.5 \text{ dBm}$ @ 1965.2 MHz (ch.1)

cw

10dB/

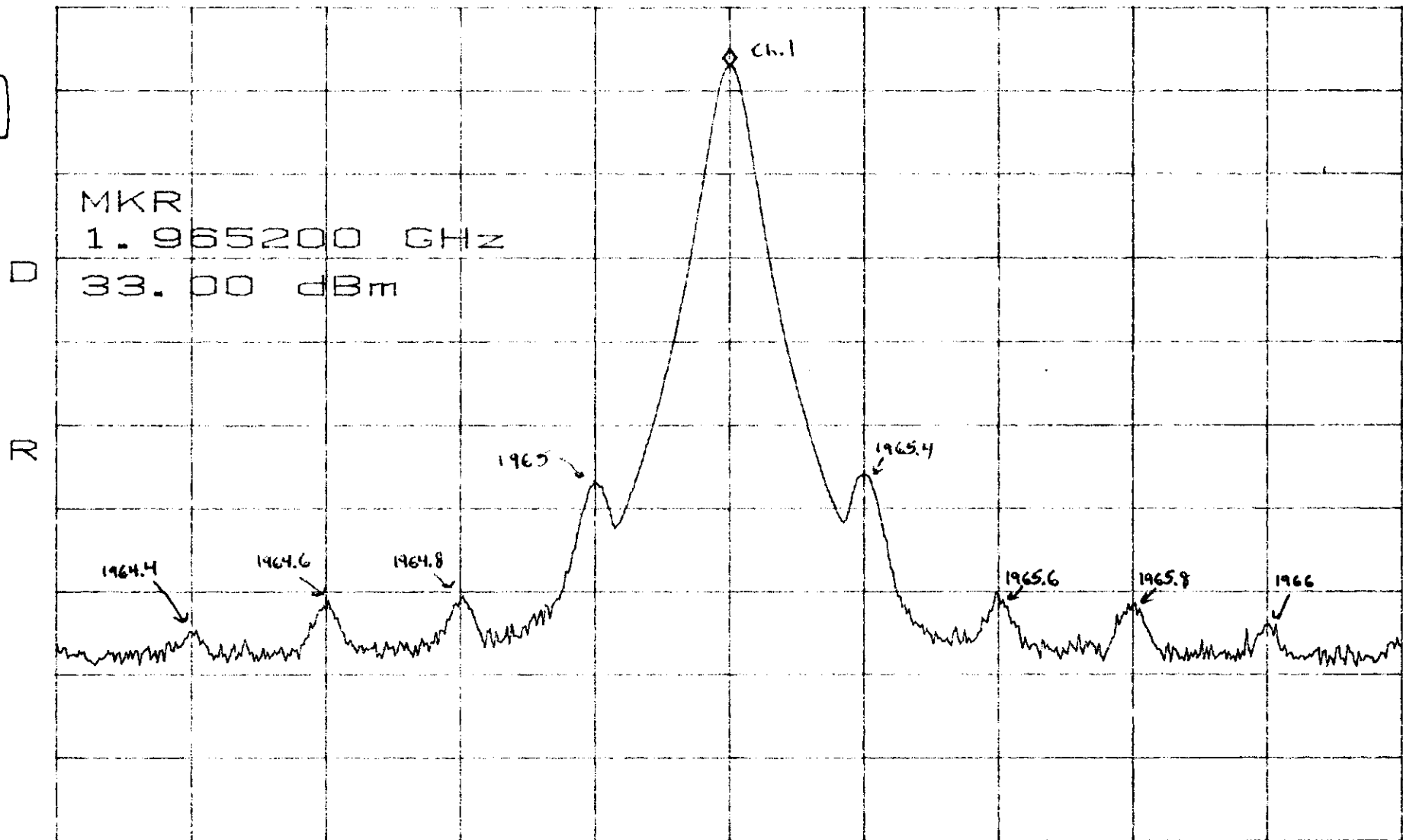
9/23/98

LB41901

MKR 33.00dBm

1.965200GHz

2.985



CENTER 1.965200GHz

SPAN 2.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Low
E/F Band

*ATTEN 30dB
RL 40.00dBm

Output

$P_{in} = -55.5 \text{ dBm @ } 1965.2 \text{ MHz (Ch.1)}$
cw

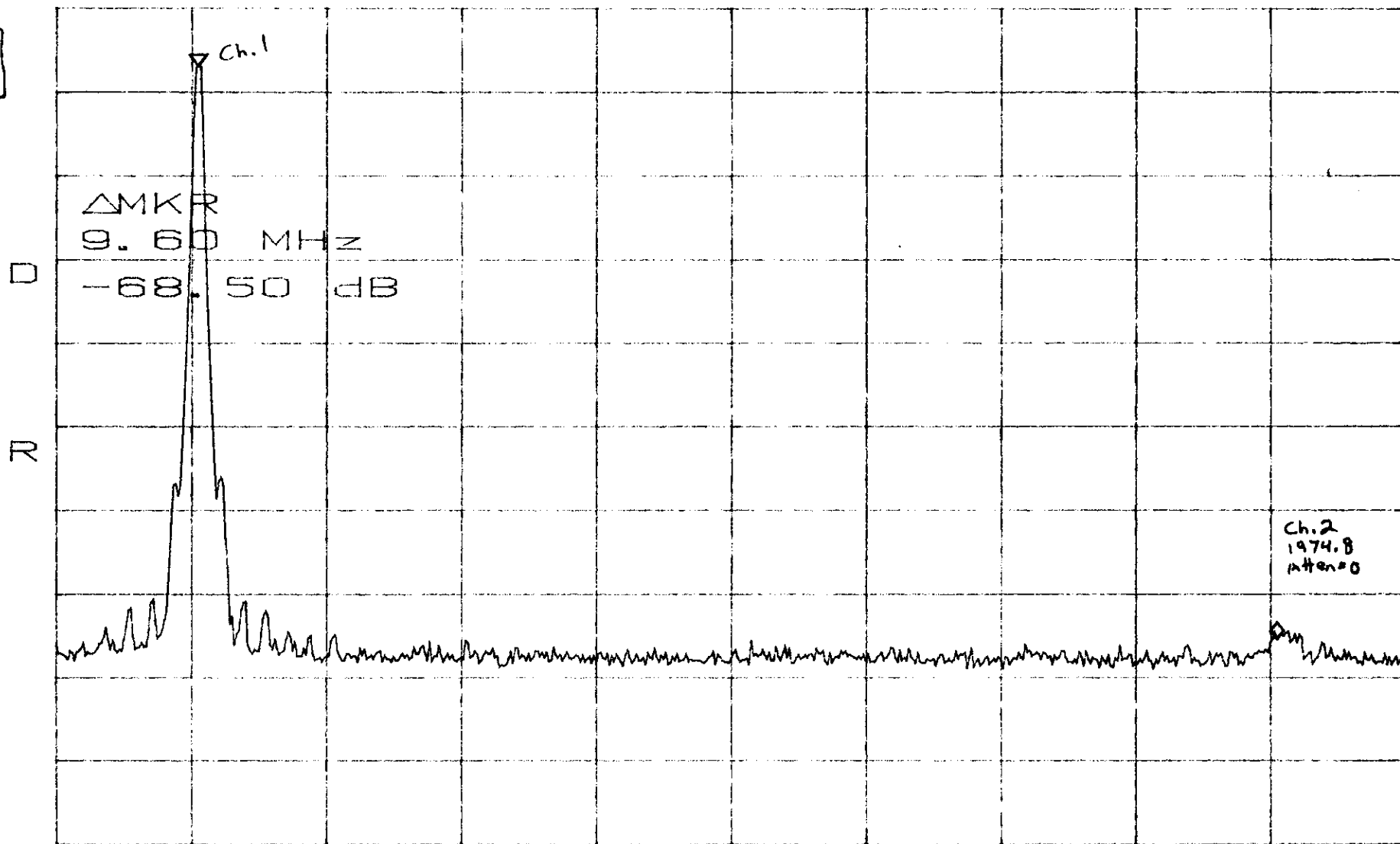
10dB/

9/23/98
LB41901

$\Delta \text{MKR} -68.50 \text{ dB}$

9.60MHz

2.985



START 1.96400GHz

STOP 1.97600GHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Mid
E/F Band

Output
 $P_{in} = -55.6 \text{ dBm @ } 1970 \text{ MHz (ch.1)}$

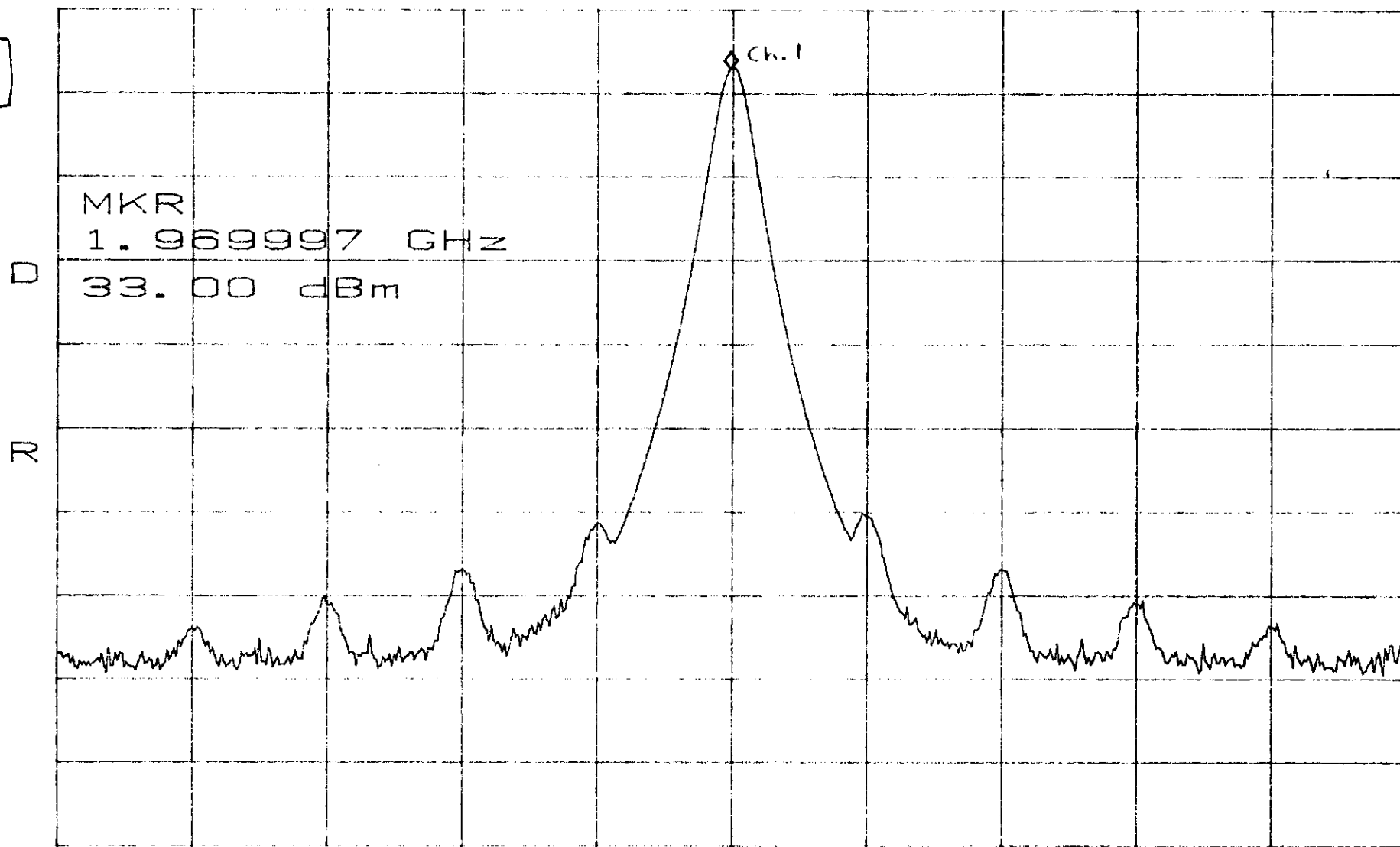
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

CH
10dB/

MKR 33.00dBm
1.969997GHz

2.985



CENTER 1.970000GHz SPAN 2.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

DL Mid
E/F band

Output
 $P_{in} = -55.6 \text{ dBm @ } 1970 \text{ MHz (Ch.1)}$

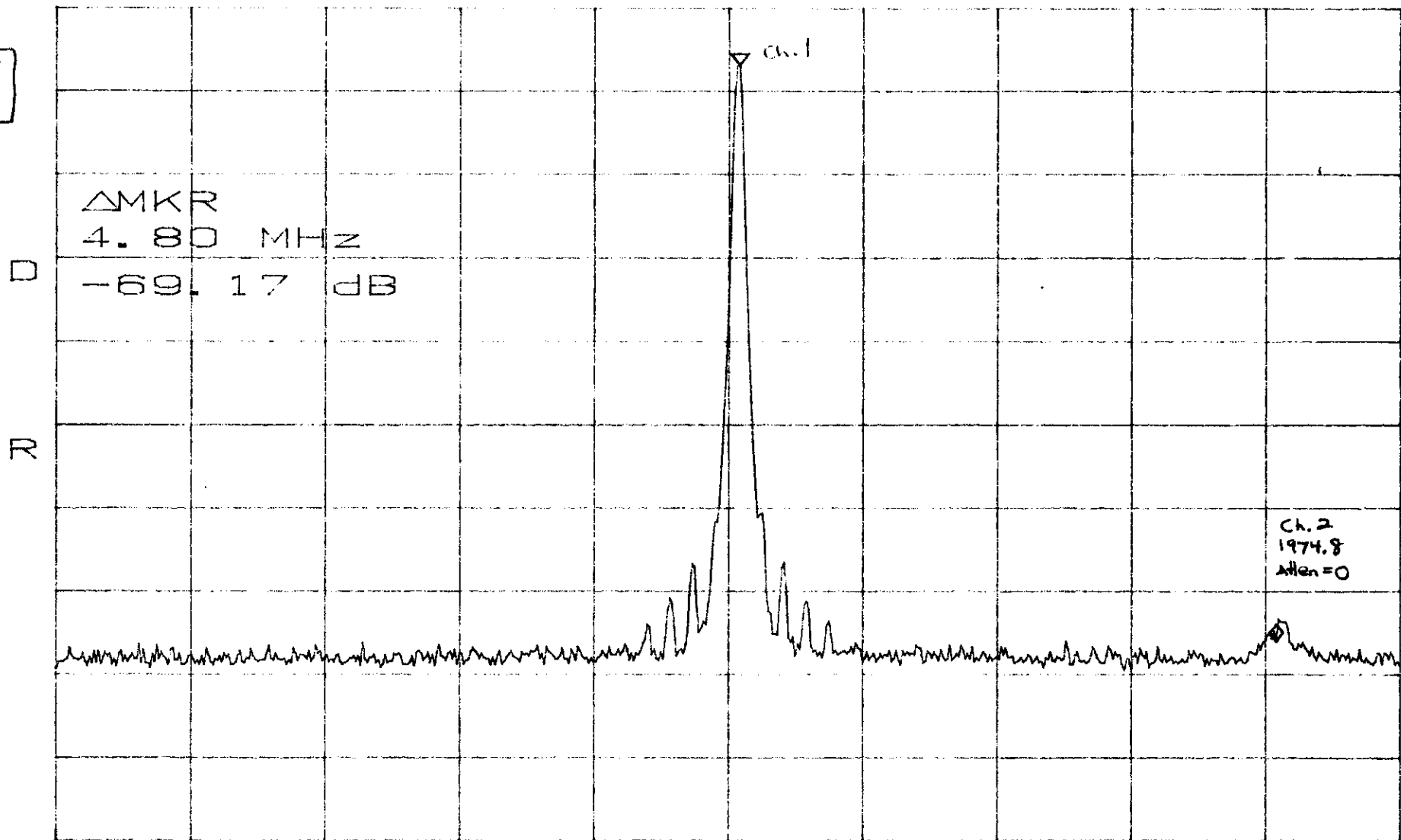
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

cw
10dB/

$\Delta \text{MKR} -69.17 \text{ dB}$
4.80MHz

2.985



START 1.96400GHz STOP 1.97600GHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

DL High
E/F Band

Output

9/23/98

LB41901

$P_{out} = -55.5$ dBm @ 1974.8 MHz (ch.1)

*ATTEN 30dB

CW

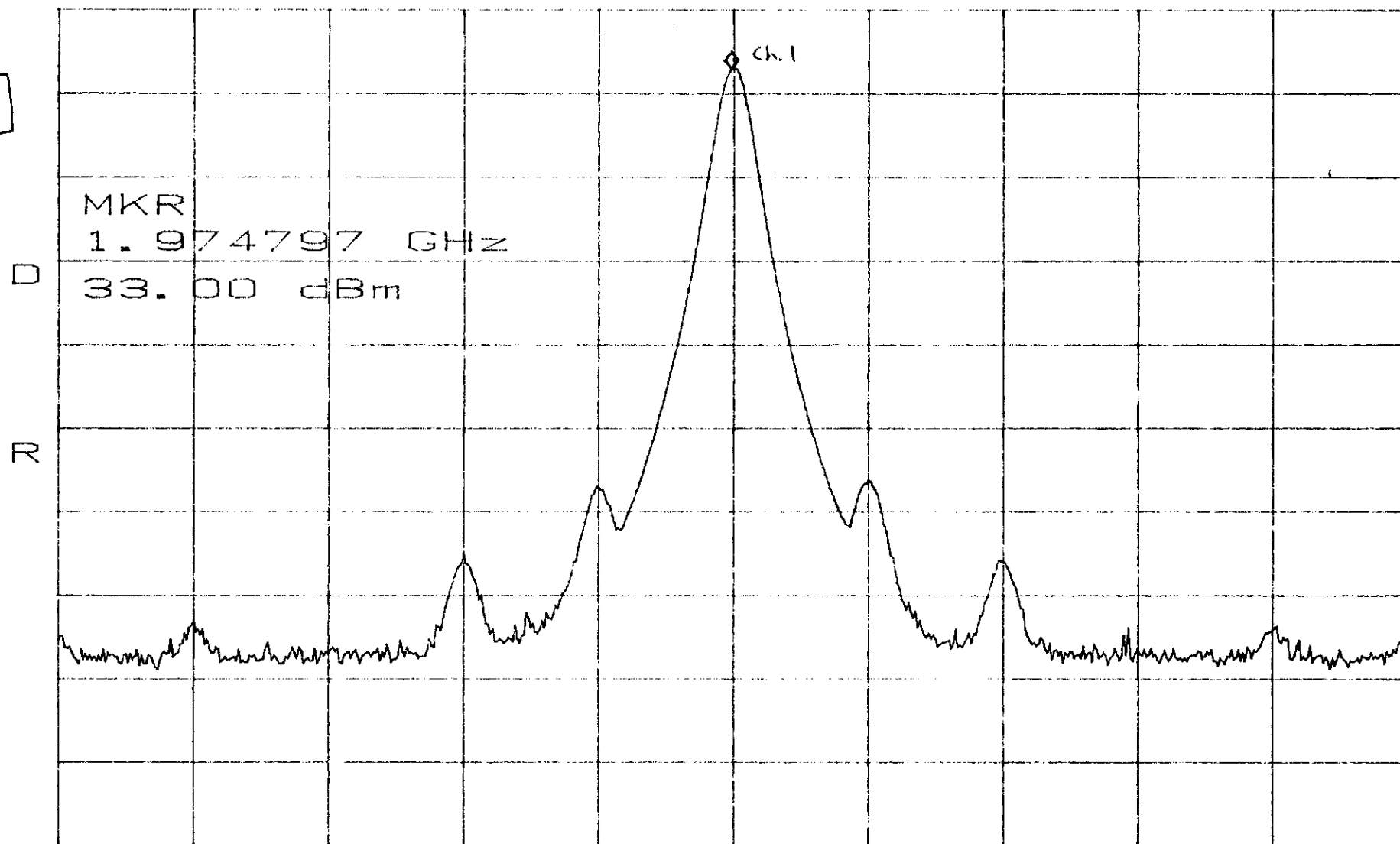
MKR 33.00dBm

RL 40.0dBm

10dB/

1.974797GHz

2.985



CENTER 1.974800GHz

SPAN 2.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL High
E/F Band

Output
 $P_{out} = -55.5 \text{ dBm @ } 1974.8 \text{ MHz (Ch.1)}$

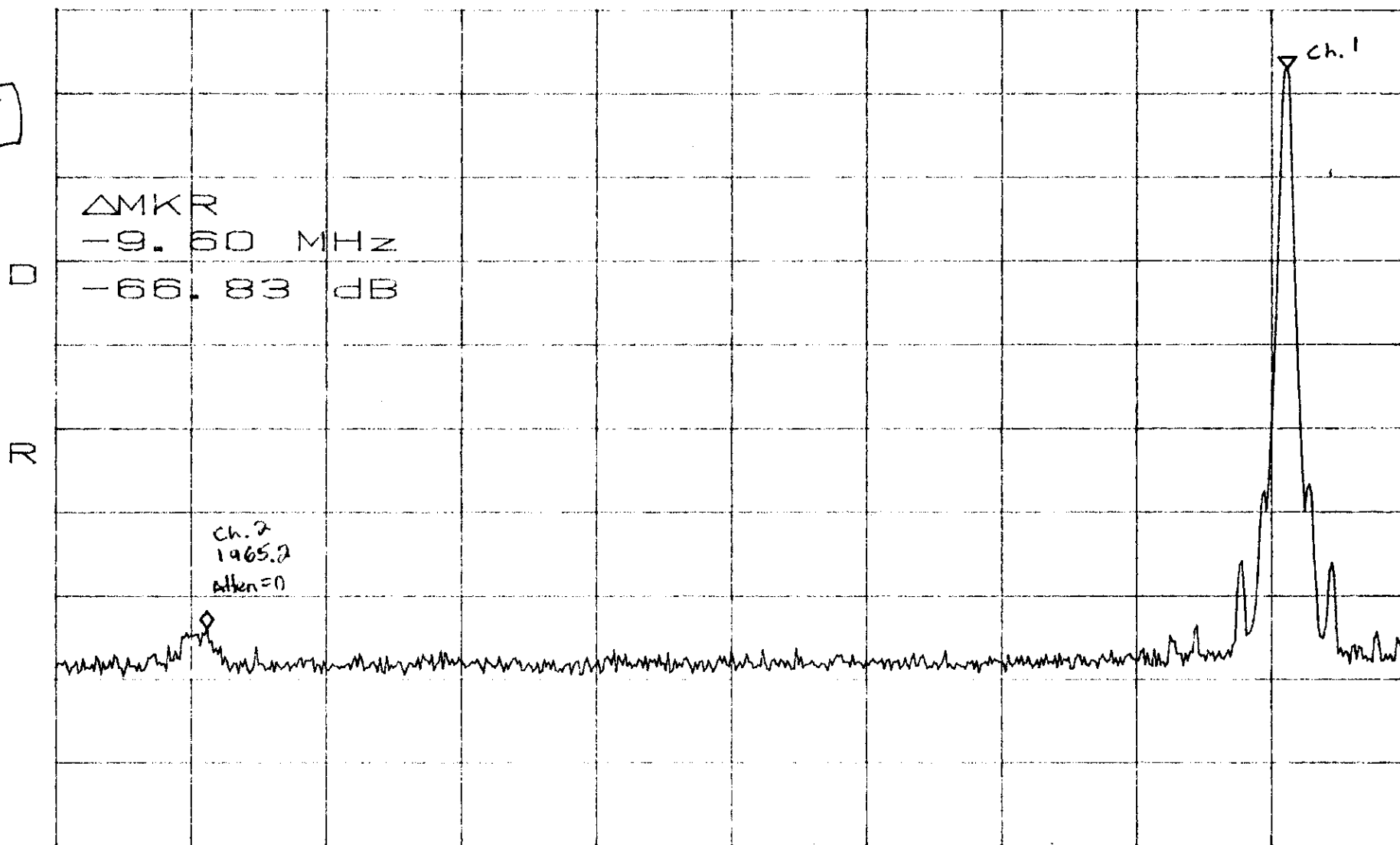
9/23/98
LBH/901

*ATTEN 30dB
RL 40.0dBm

ch
10dB/

$\Delta MKR -66.83 \text{ dB}$
-9.60MHz

2.985



START 1.964000GHz

STOP 1.976000GHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Low
E/F Band

Occupied BW
CW

9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

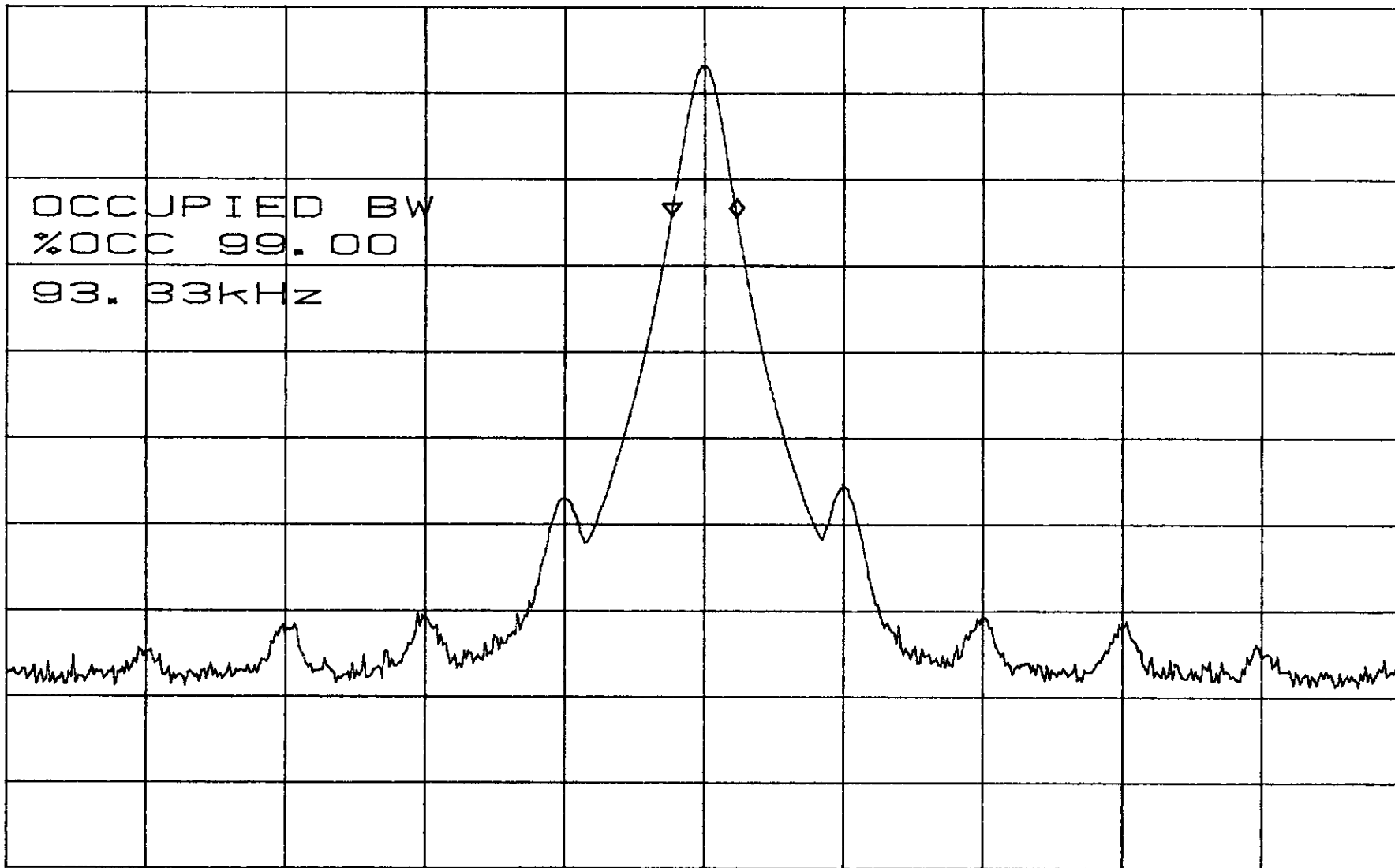
10dB/

Δ MKR - .16dB
93kHz

2.989

D
R

OCCUPIED BW
%OCC 99.00
93.33kHz



CENTER 1.965200GHz

SPAN 2.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Mid
E/F Band

Occupied BW
cw source

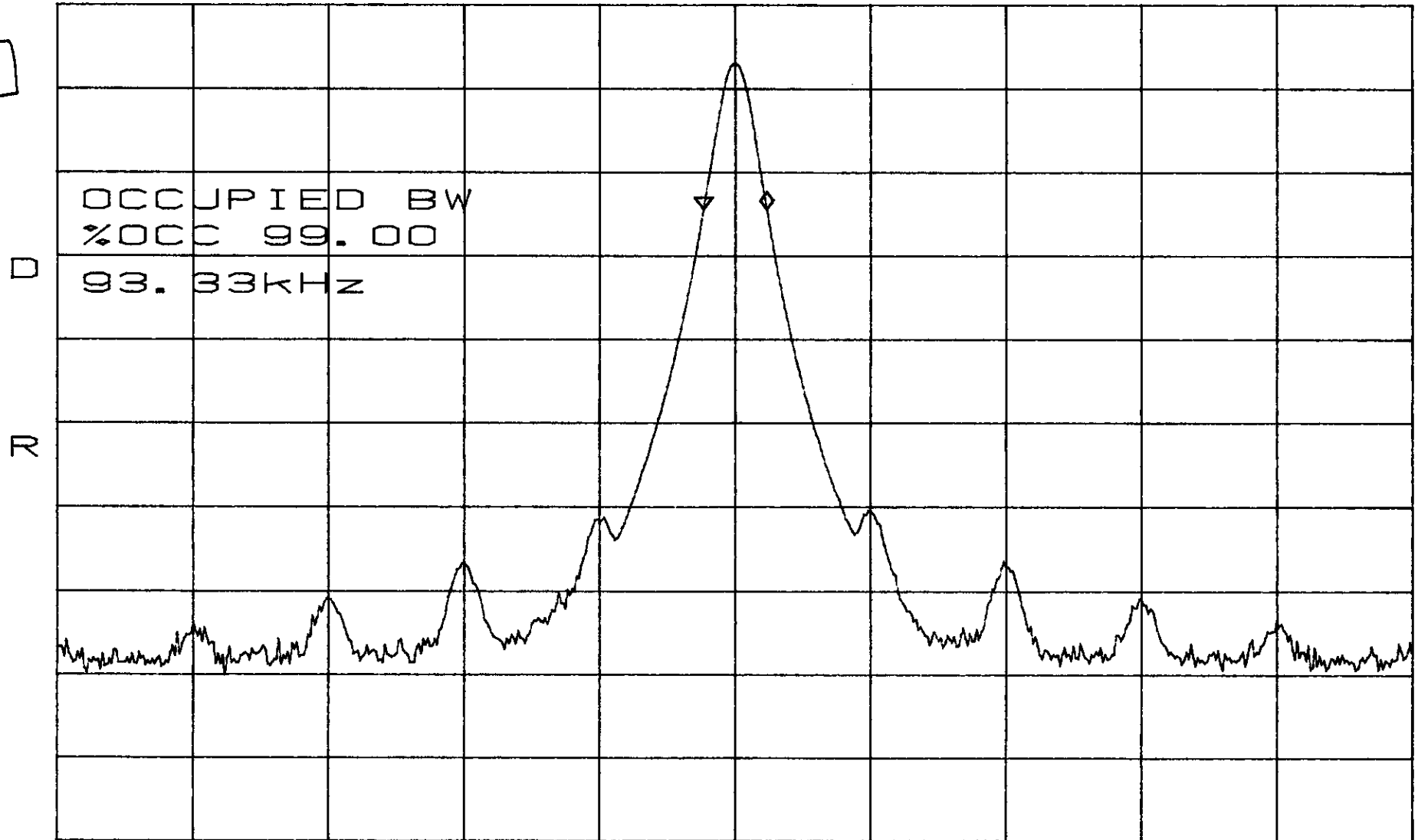
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

10dB/

ΔMKR 0dB
93kHz

2.989



CENTER 1.970000GHz

SPAN 2.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL High
E/F Band

Occupied BW
CW

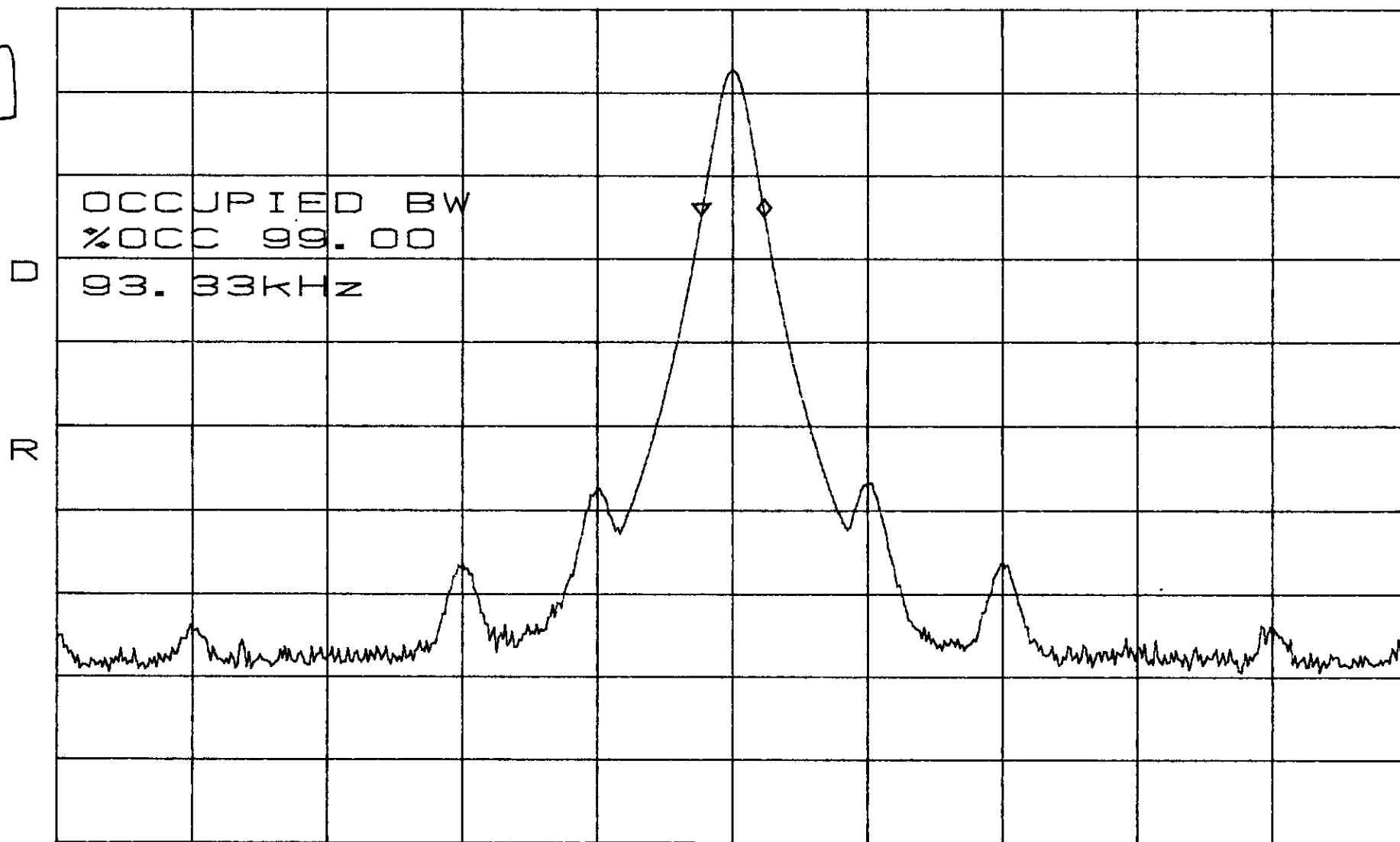
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

ΔMKR -.16dB
93kHz

10dB/

2.989



CENTER 1.974800GHz

SPAN 2.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

UL Low
E/F Band

Occupied BW
CW

9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

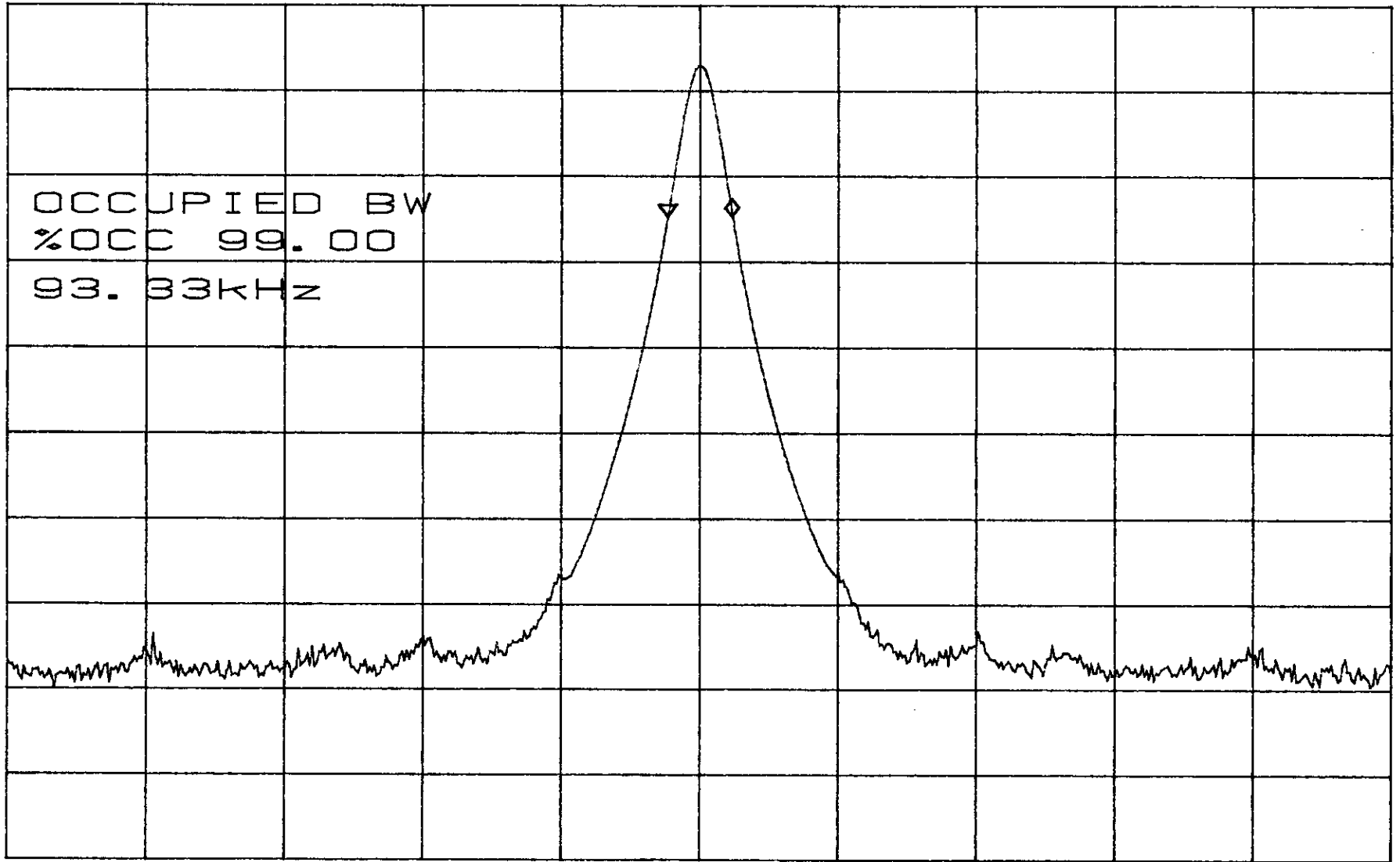
10dB/

Δ MKR 0dB
93kHz

2.989

D
R

OCCUPIED BW
%OCC 99.00
93.33kHz



CENTER 1.885200GHz SPAN 2.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

UL Mid
E/F Band

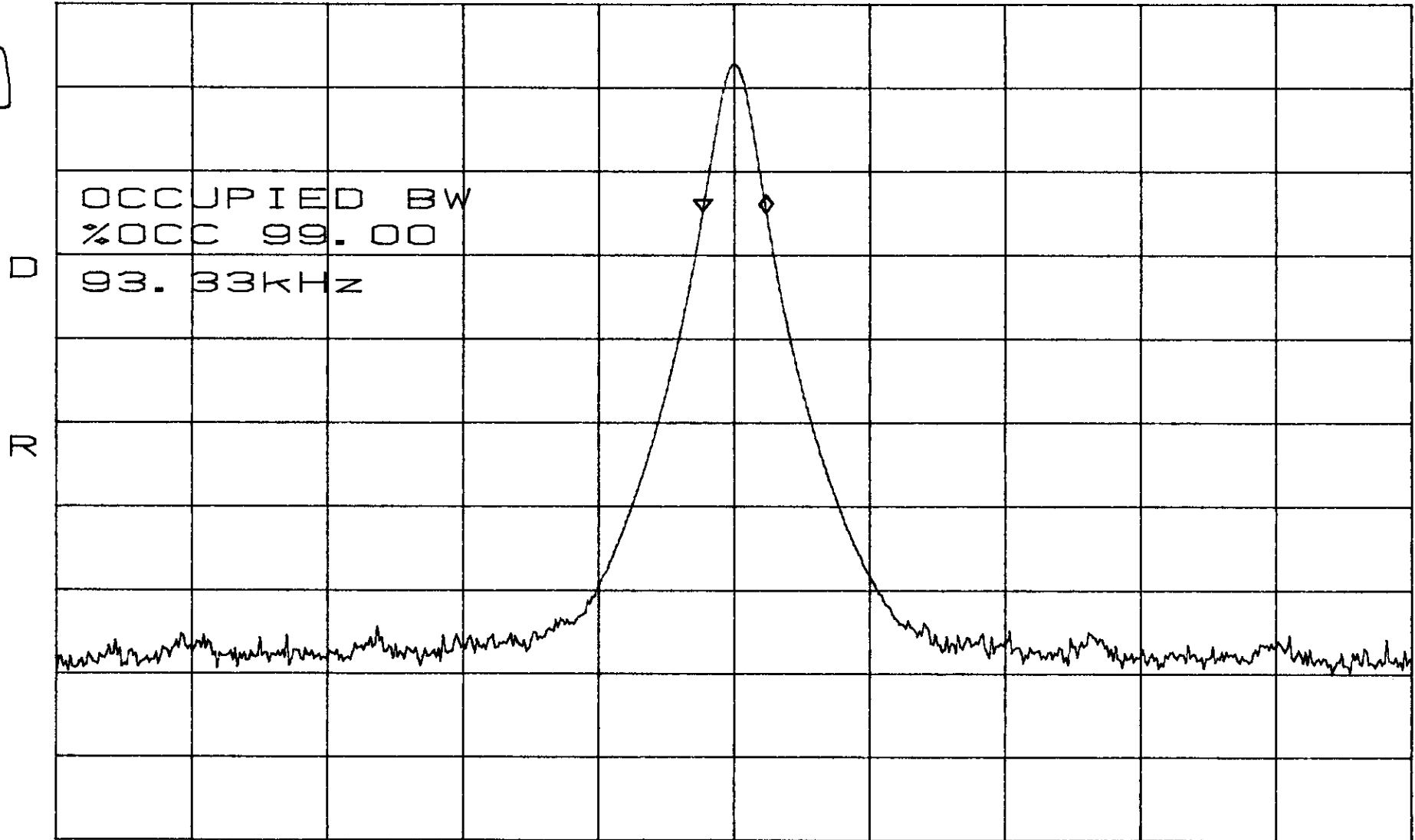
Occupied BW
cw

9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

Δ MKR -.16dB
93kHz

2.989



CENTER 1.890000GHz
*RBW 30kHz *VBW 30kHz

SPAN 2.000MHz
SWP 50.0ms

UL High
E/F Band

Occupied BW
cw

9/23/98
LB41901

*ATTEN 30dB
BPOB
RL 40.0dBm

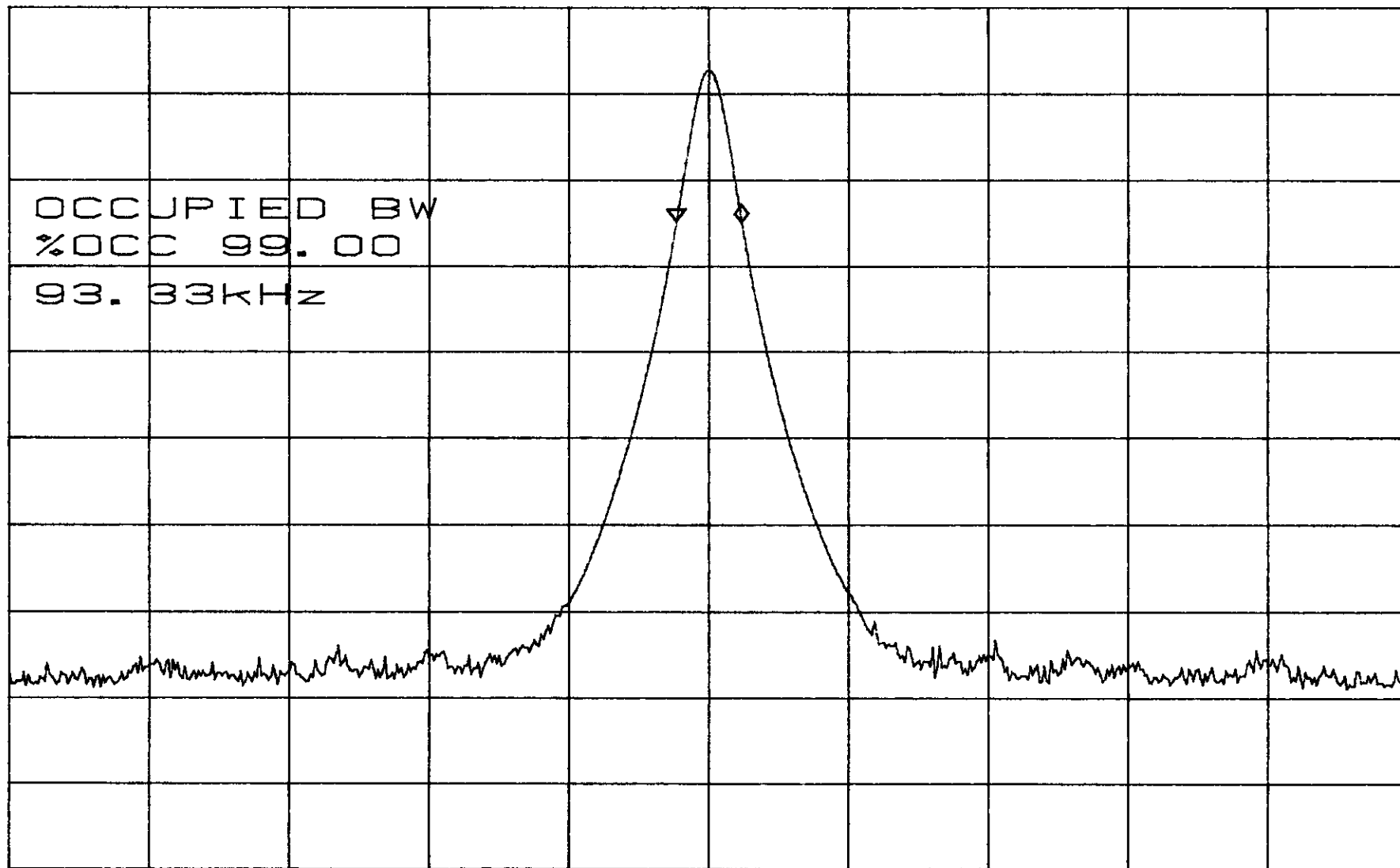
10dB/

Δ MKR -.16dB
93kHz

2.989

OCCUPIED BW
%OCC 99.00
93.33kHz

D
R



CENTER 1.894800GHz

SPAN 2.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Low
E/F Band

cw

9/23/98
LB41901

*ATTEN 30dB

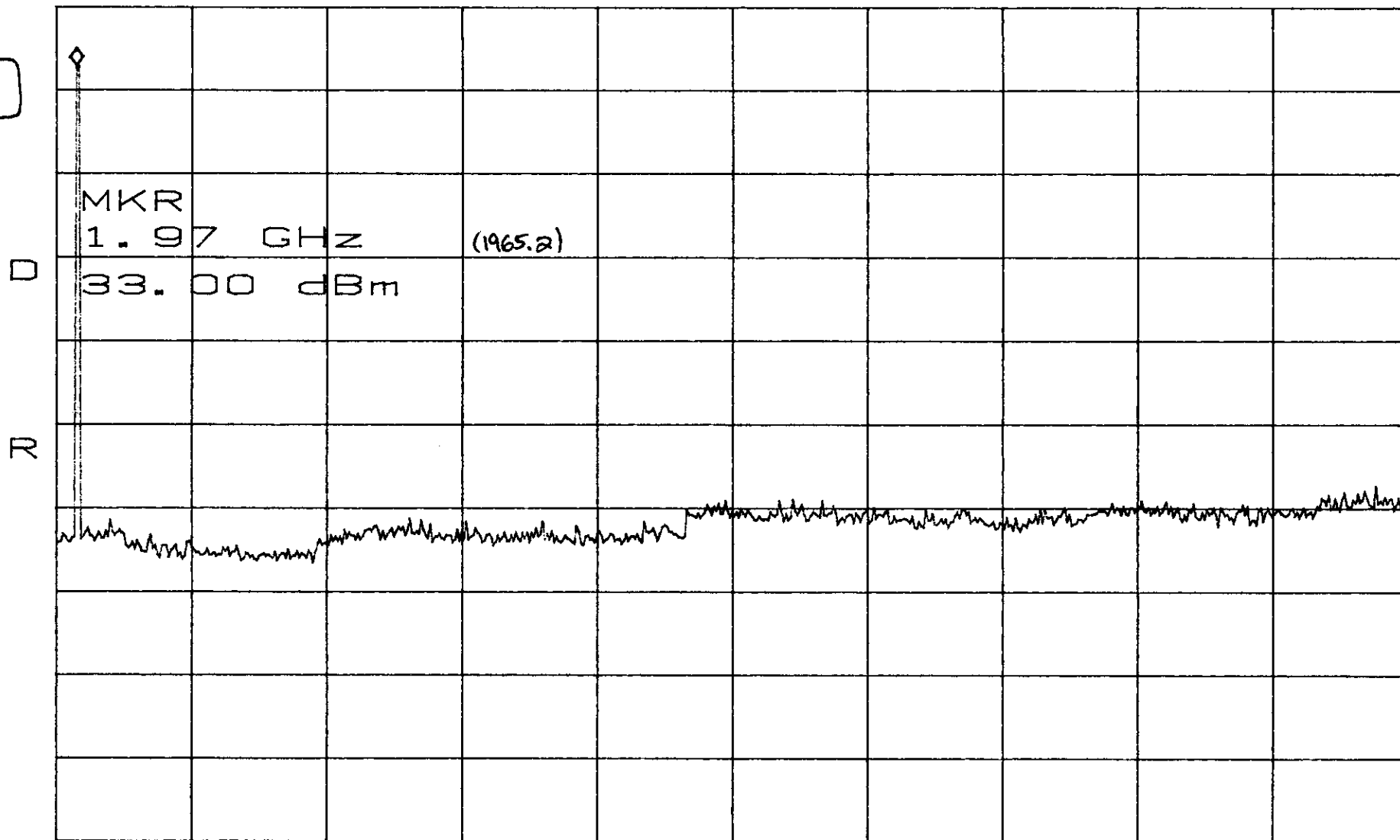
MKR 33.00dBm

RL 40.0dBm

10dB/

1.97GHz

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

DL Mid
E/F Band

CW

9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

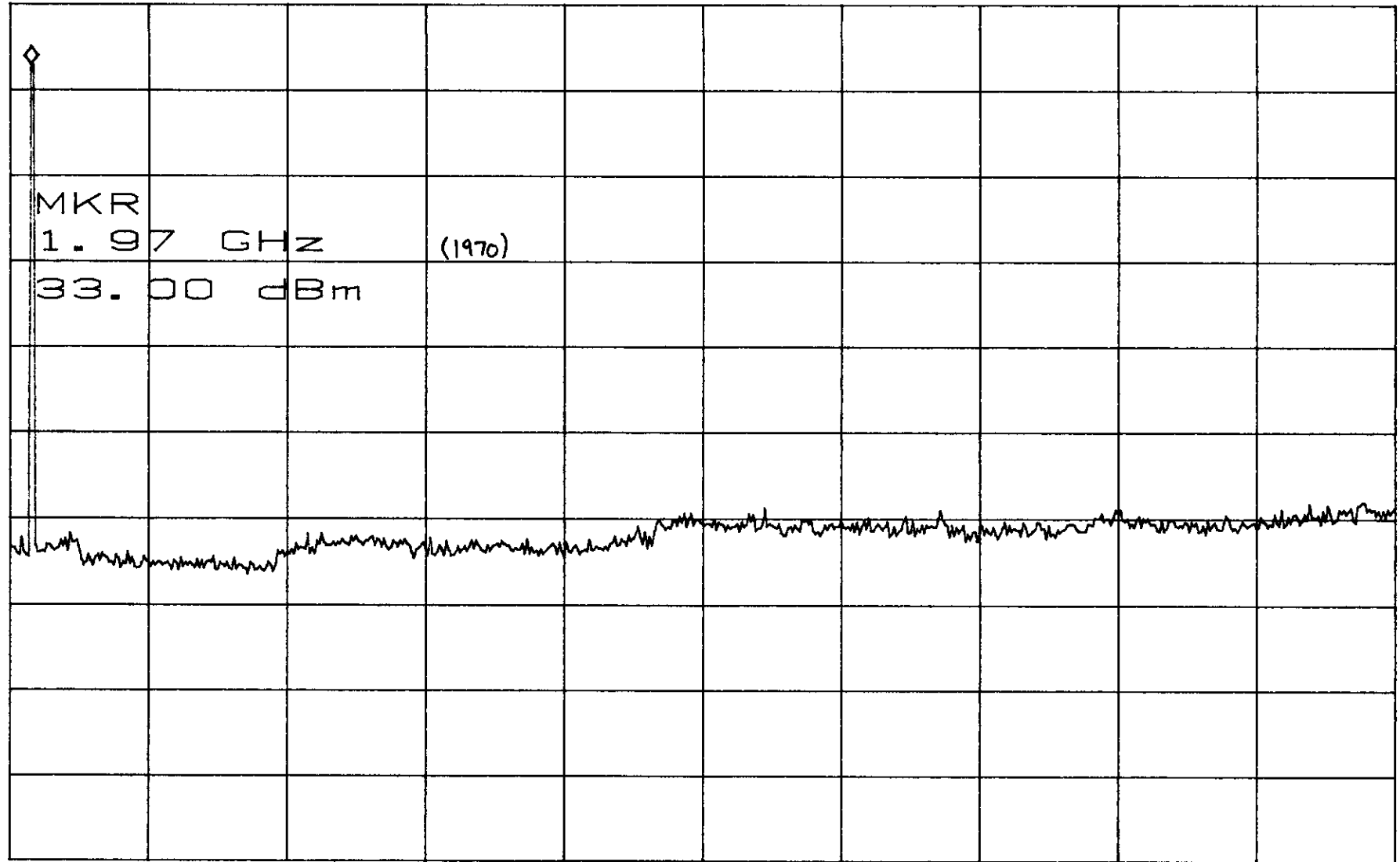
10dB/

MKR 33.00dBm
1.97GHz

2.991

MKR
1.97 GHz (1970)
33.00 dBm

R



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

DL High

E/F Band

CW

9/23/98

LB41901

*ATTEN 30dB

MKR 32.83dBm

RL 40.0dBm

10dB/

1.97GHz

2.991

D

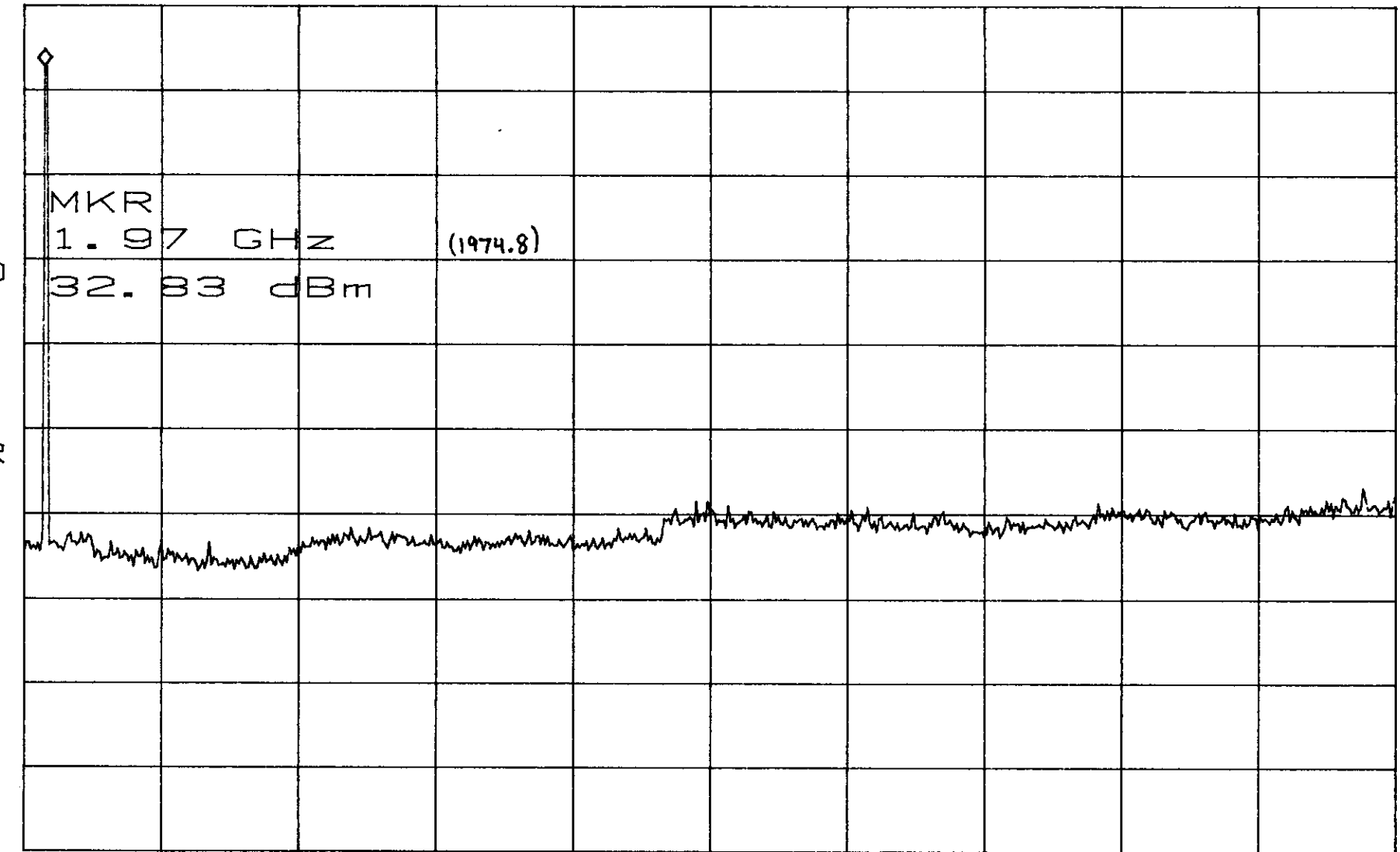
R

MKR

1.97 GHz

(1974.8)

32.83 dBm



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

UL Low

E/F Band

CW

9/23/98

LB41901

*ATTEN 30dB

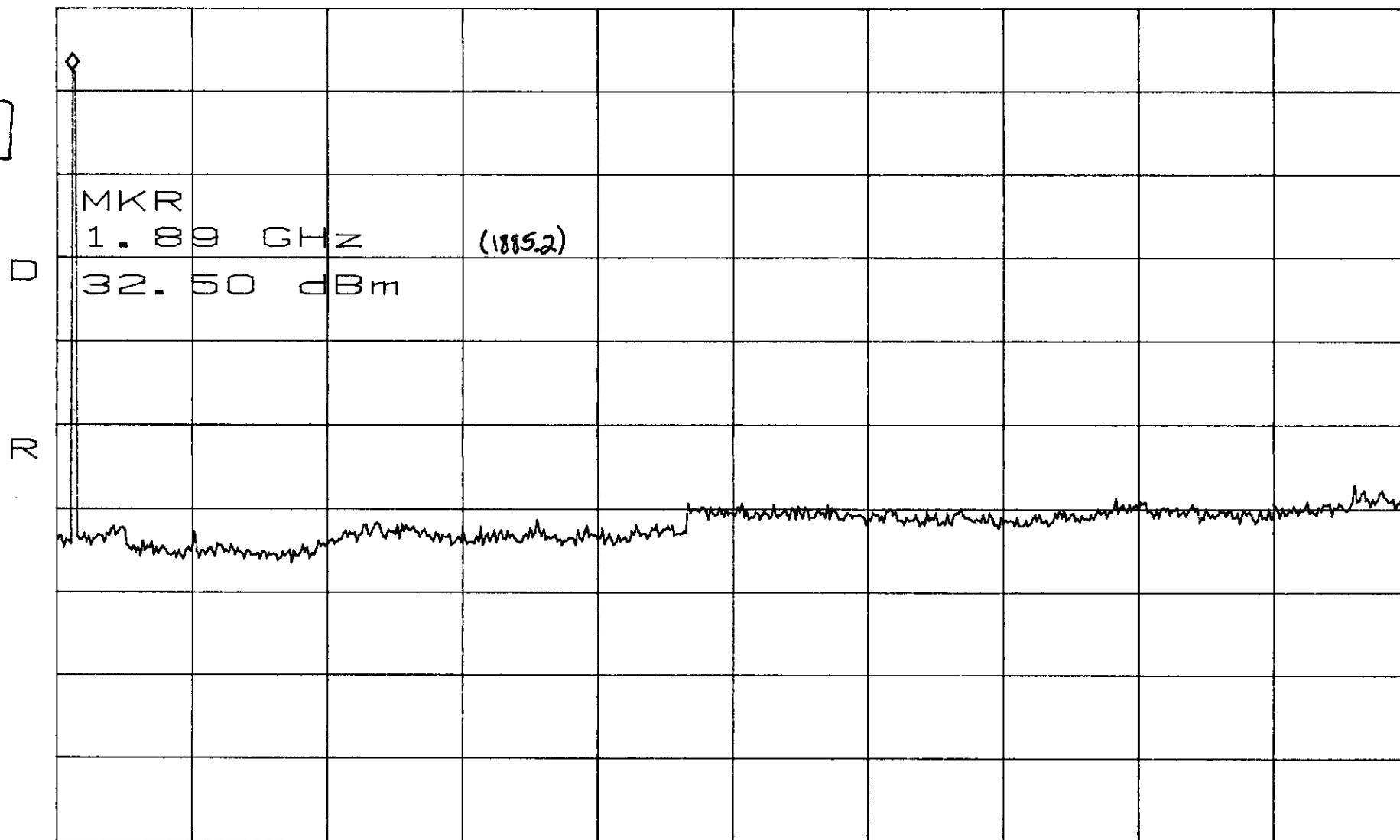
RL 40.0dBm

MKR 32.50dBm

1.89GHz

10dB/

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

UL Mid
E/F Band

CW

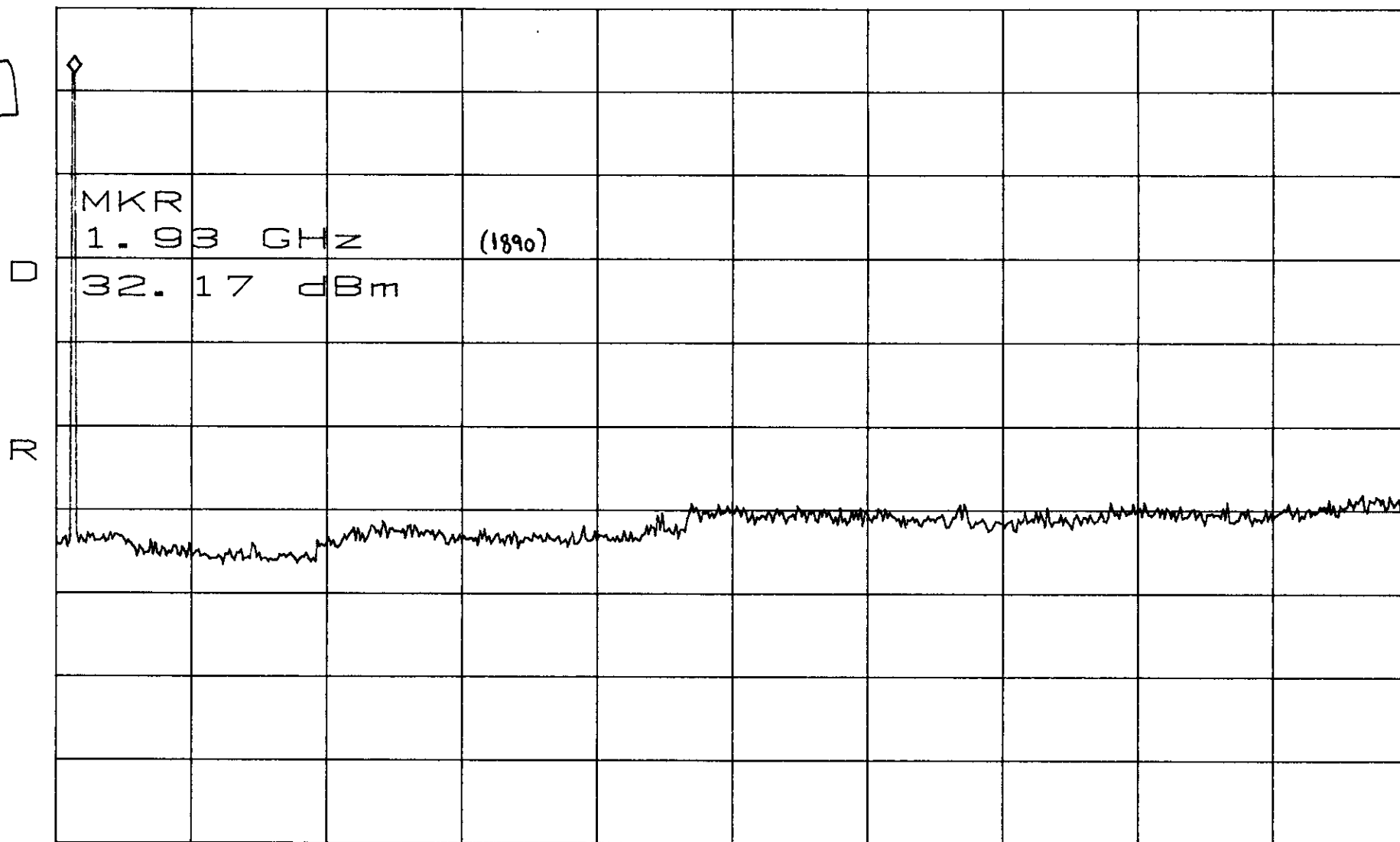
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

10dB/

MKR 32.17dBm
1.93GHz

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

UL High
E/F Band

CW

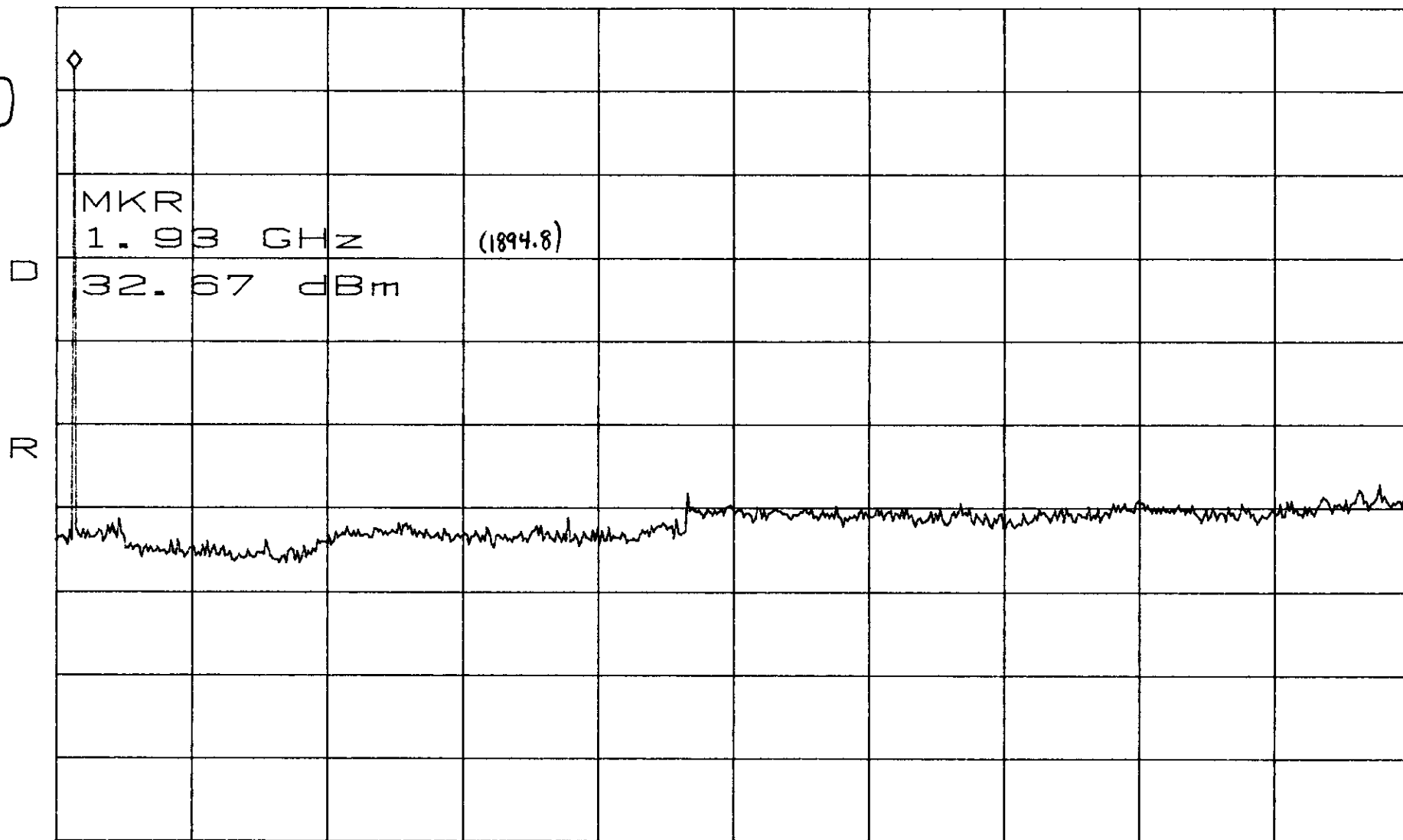
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

MKR 32.67dBm
1.93GHz

10dB/

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

DL Low
E/F Band

Output
cw

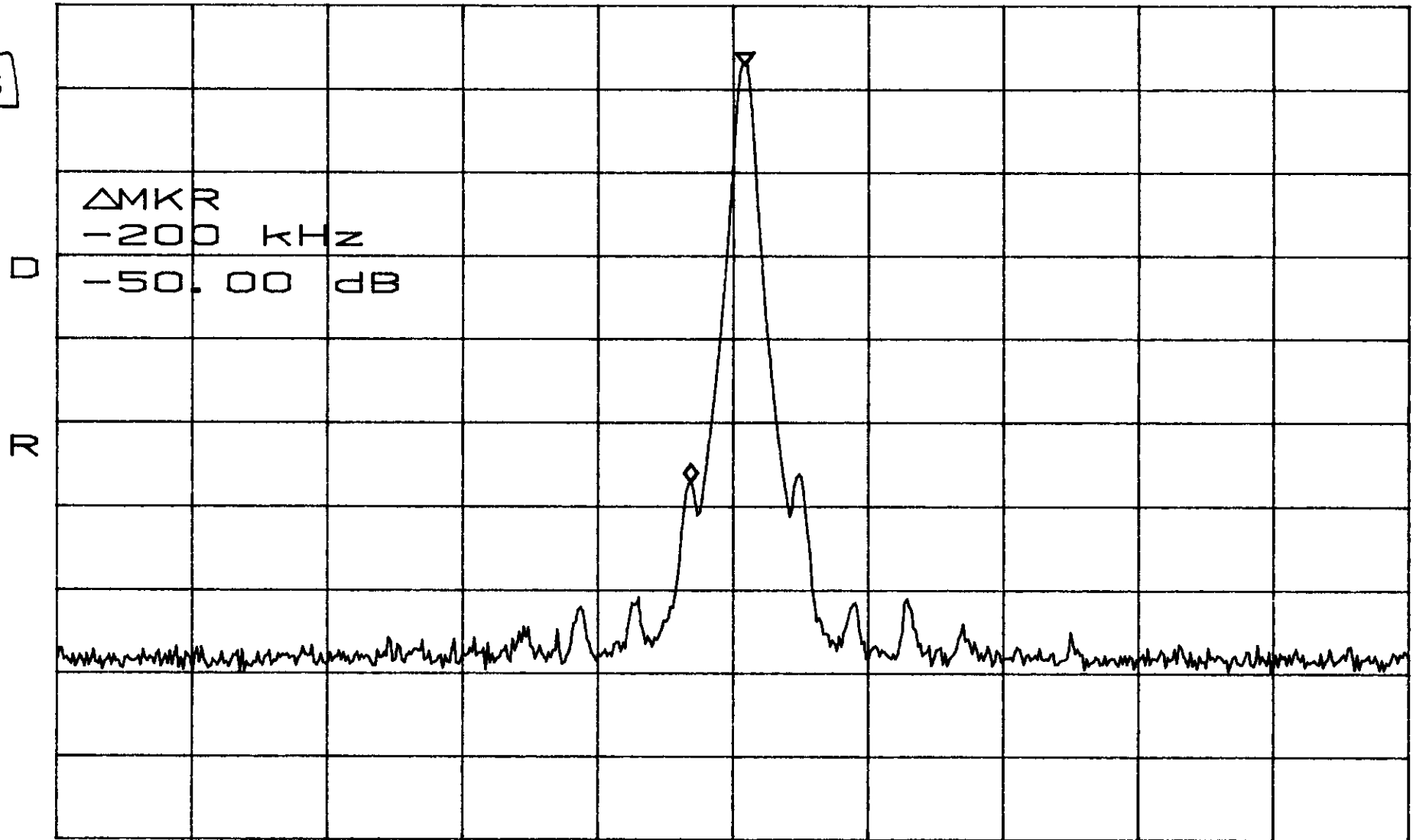
9/23/98
LB41961

ATTEN 30dB
RL 40.0dBm

10dB/

ΔMKR -50.00dB
-200kHz

24.238



CENTER 1.965200GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Low

E/F Band

ATTEN 10dB

RL 0dBm

Input

cw-source

10dB/

9/23/98

LB41901

MKR -56.00dBm

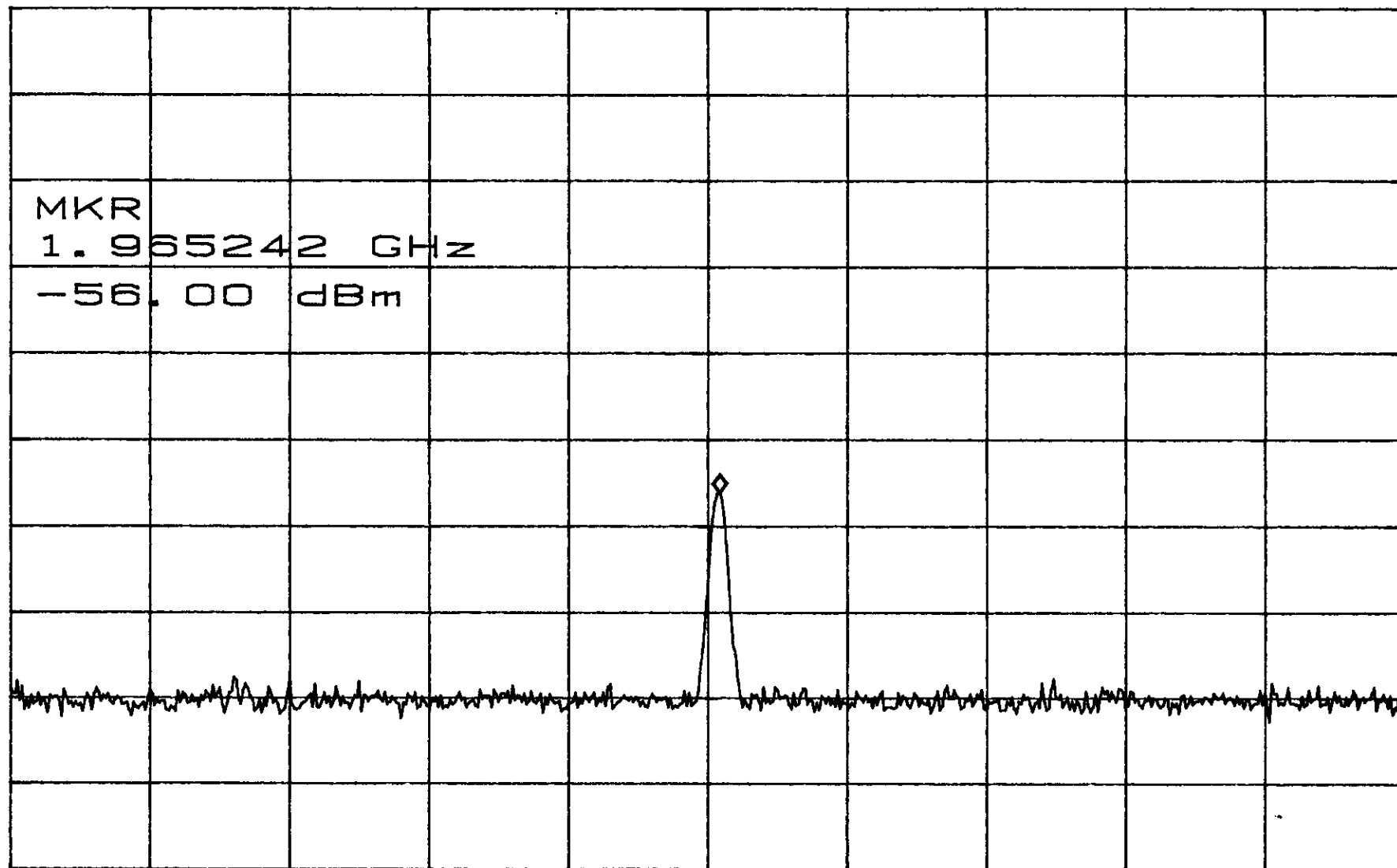
1.965242GHz

24.238

MKR

1.965242 GHz

-56.00 dBm



CENTER 1.965200GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Low
E/F Band

Output
cw

9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

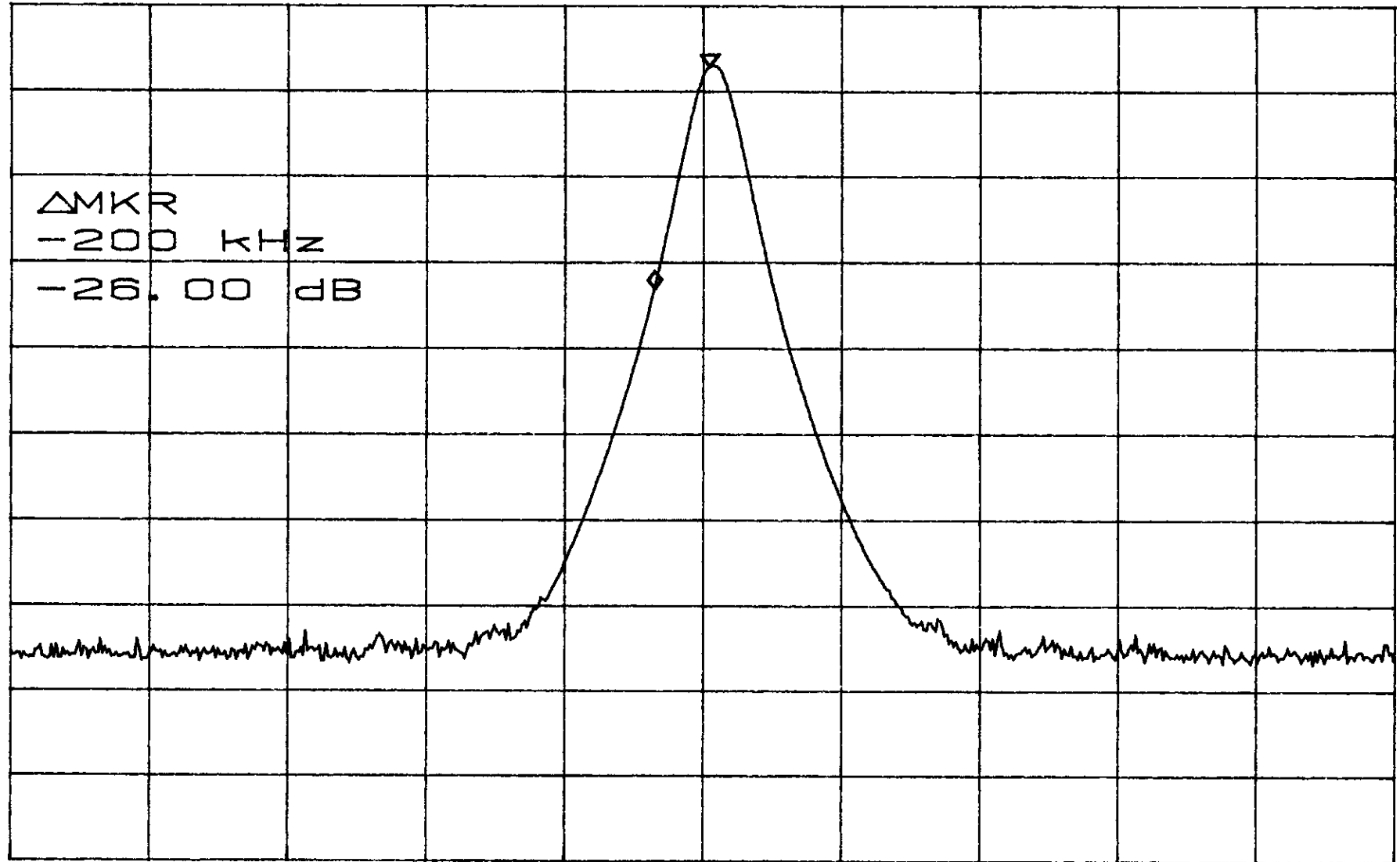
Δ MKR -26.00dB
-200kHz

24.238

Δ MKR
-200 kHz
-26.00 dB

D

R



CENTER 1.965200GHz

SPAN 5.000MHz

*RBW 100kHz

*VBW 30kHz

SWP 50.0ms

DL Low
E/F Band

Output
cw

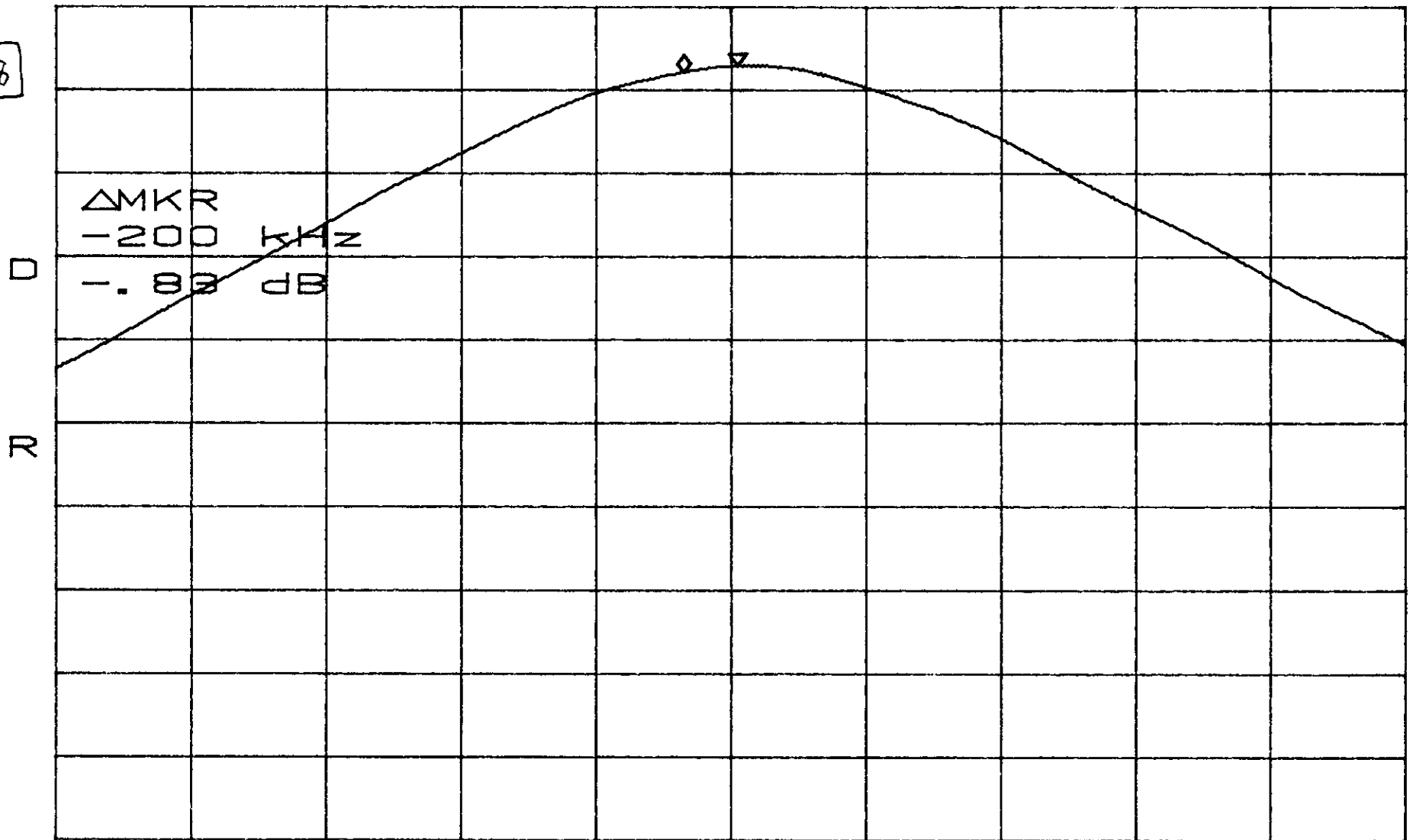
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -.83dB
-200kHz

24.238



CENTER 1.965200GHz SPAN 5.000MHz
*RBW 1.0MHz *VBW 1.0MHz SWP 50.0ms

DL Low
E/F-Band

Output
cw

9/23/98
LB41901

ATTEN 30dB

RL 40.0dBm

10dB/

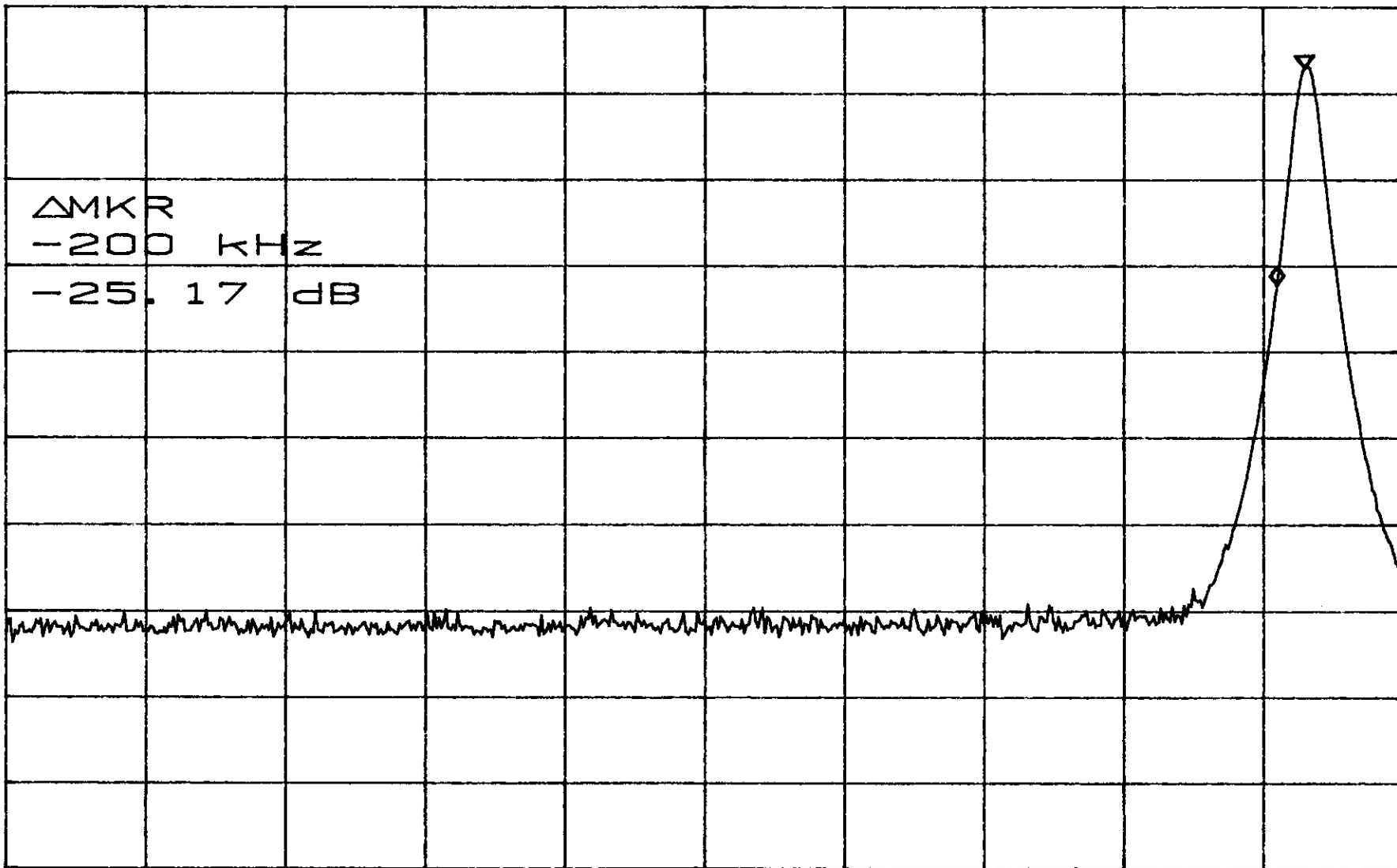
Δ MKR -25.17dB

-200kHz

24.238

0
R

Δ MKR
-200 kHz
-25.17 dB



CENTER 1.96100GHz

SPAN 10.00MHz

*RBW 100kHz

*VBW 1.0MHz

SWP 50.0ms

DL Low
E/F Band

Output
CW-source

9/23/98
LB41901

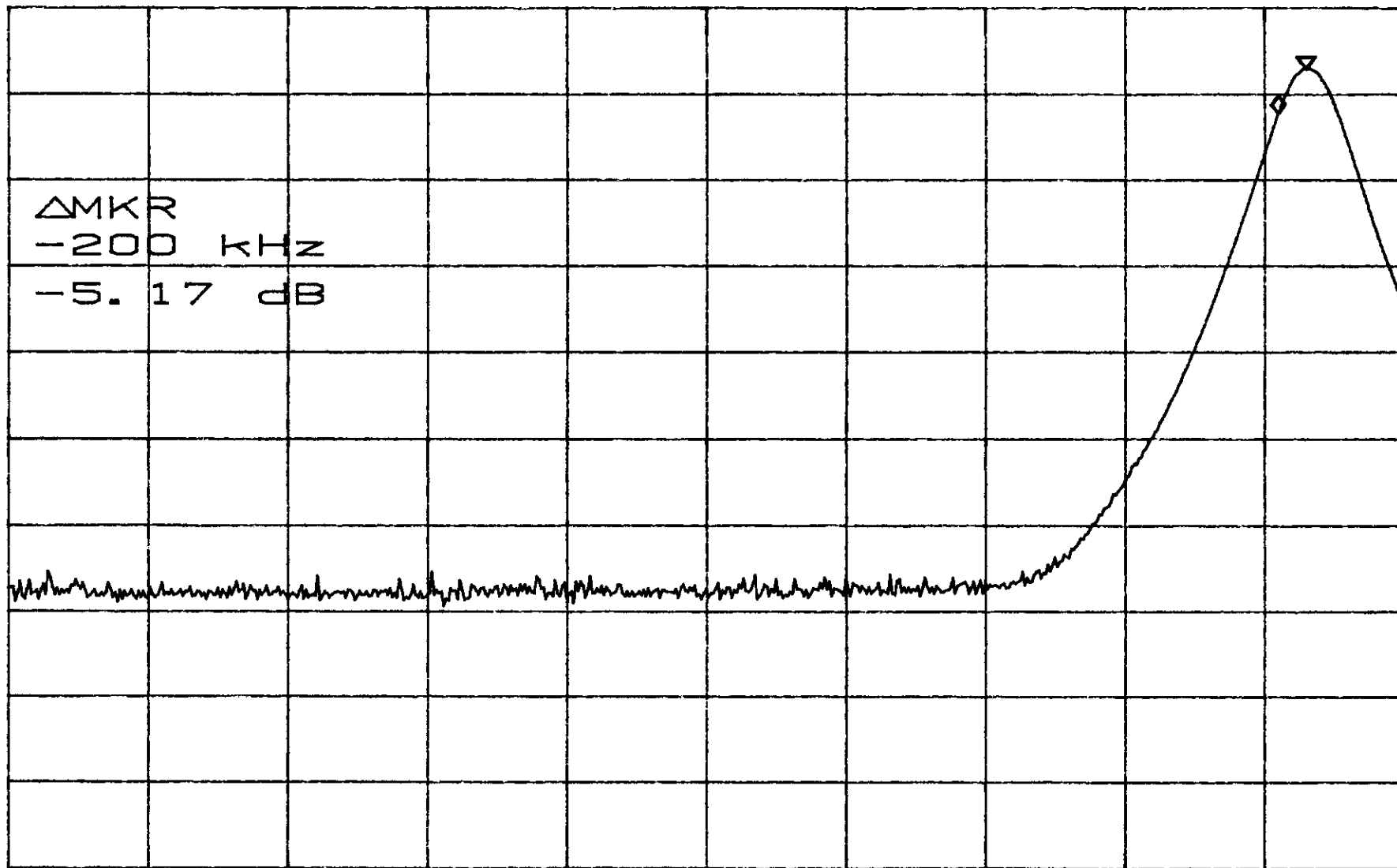
ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -5.17dB
-200kHz

24.238

D
R
 Δ MKR
-200 kHz
-5.17 dB



CENTER 1.96100GHz SPAN 10.00MHz
*RBW 300kHz *VBW 1.0MHz SWP 50.0ms

DL High
E/F Band

DL Output
cw Source

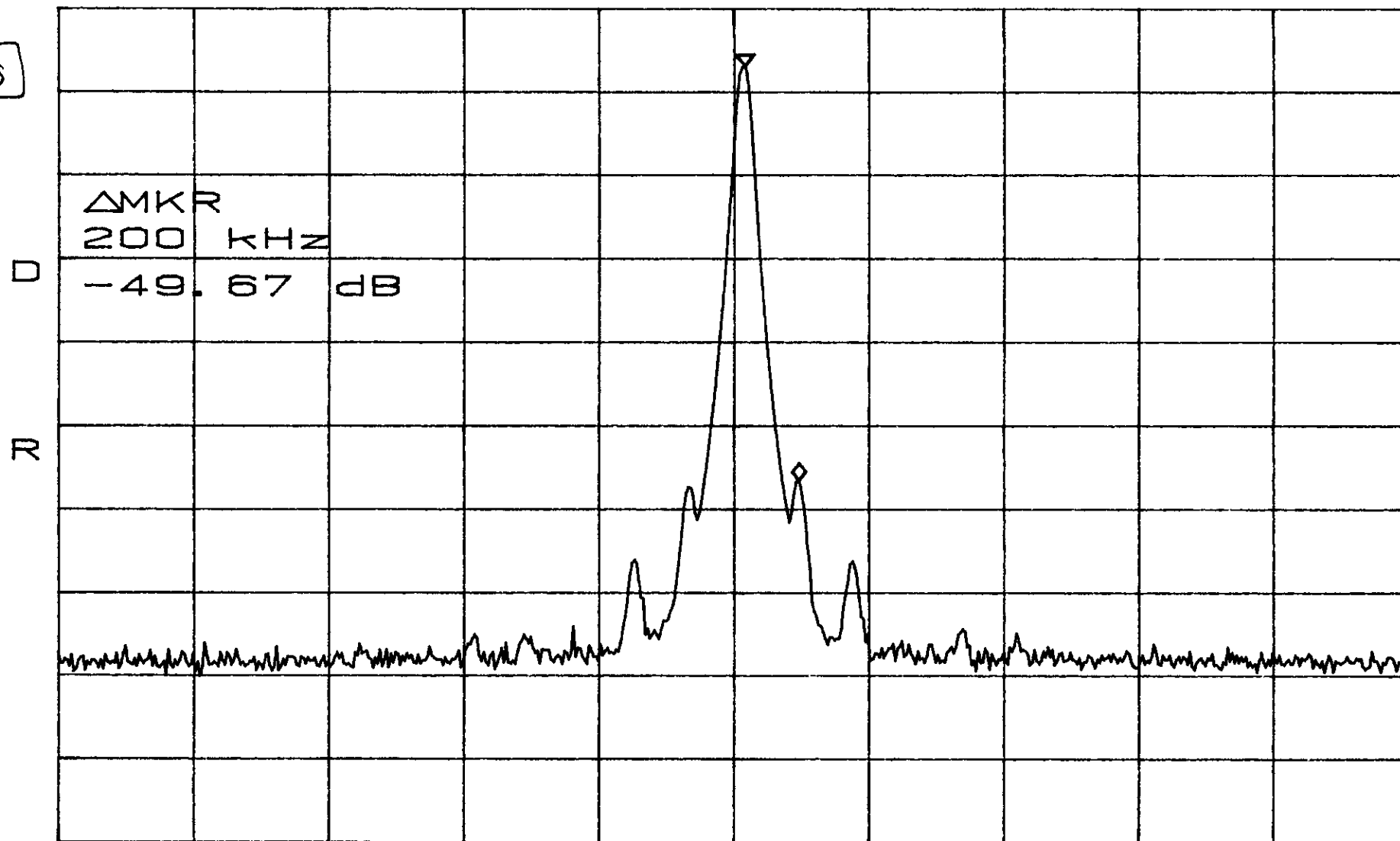
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -49.67dB
200kHz

24.298



CENTER 1.974800GHz SPAN 5.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

DL High

E/F Band

ATTEN 10dB

RL 0dBm

Input

cw source

9/23/98

LB41901

MKR -55.33dBm

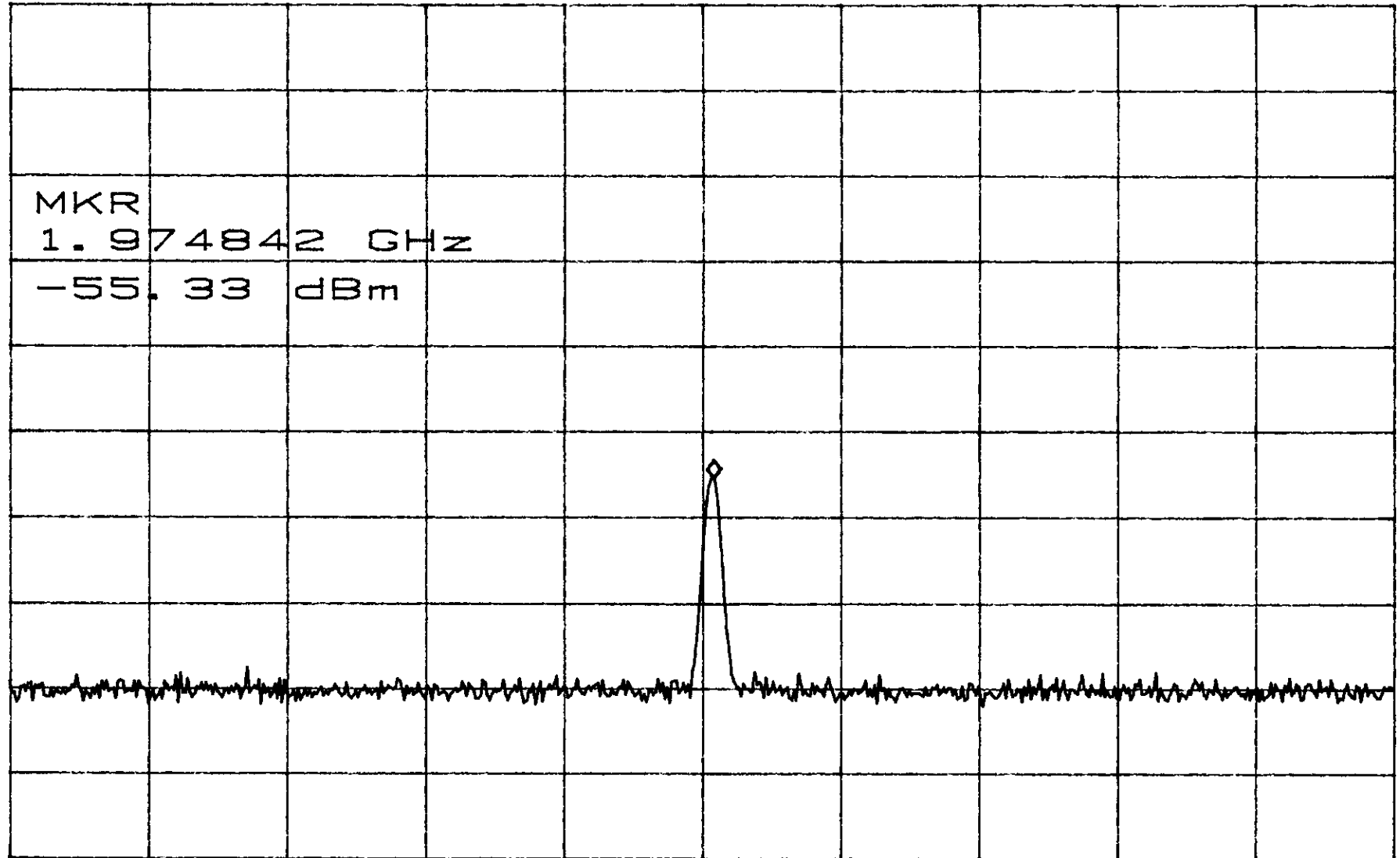
1.974842GHz

24.238

MKR

1.974842 GHz

-55.33 dBm



CENTER 1.974800GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL High

E/F Band

Output

cw

9/23/98

LB41901

ATTEN 30dB

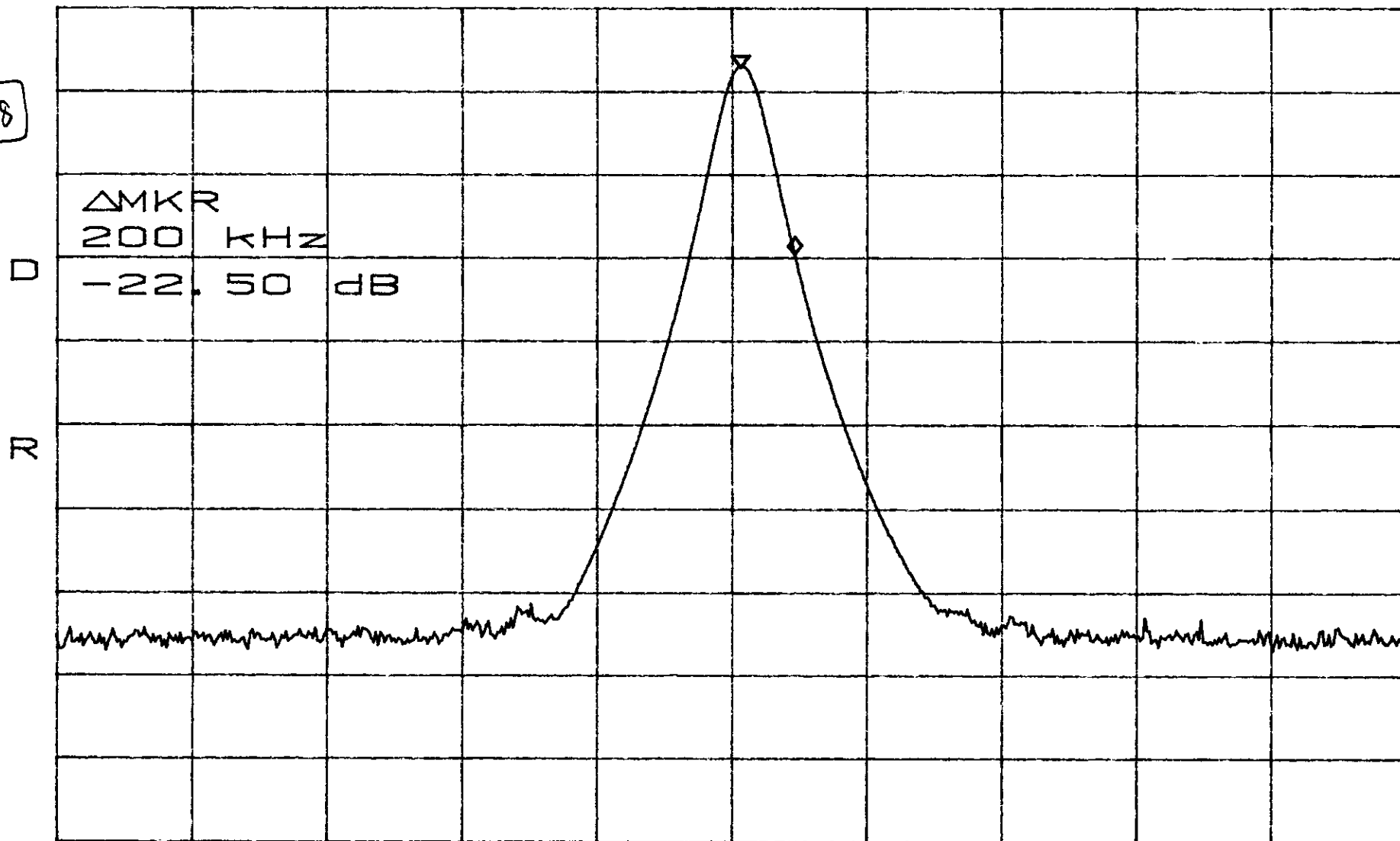
RL 40.0dBm

Δ MKR -22.50dB

10dB/

200kHz

24.238



CENTER 1.974800GHz

SPAN 5.000MHz

*RBW 100kHz

*VBW 30kHz

SWP 50.0ms

DL High
E/F Band

Output
cw

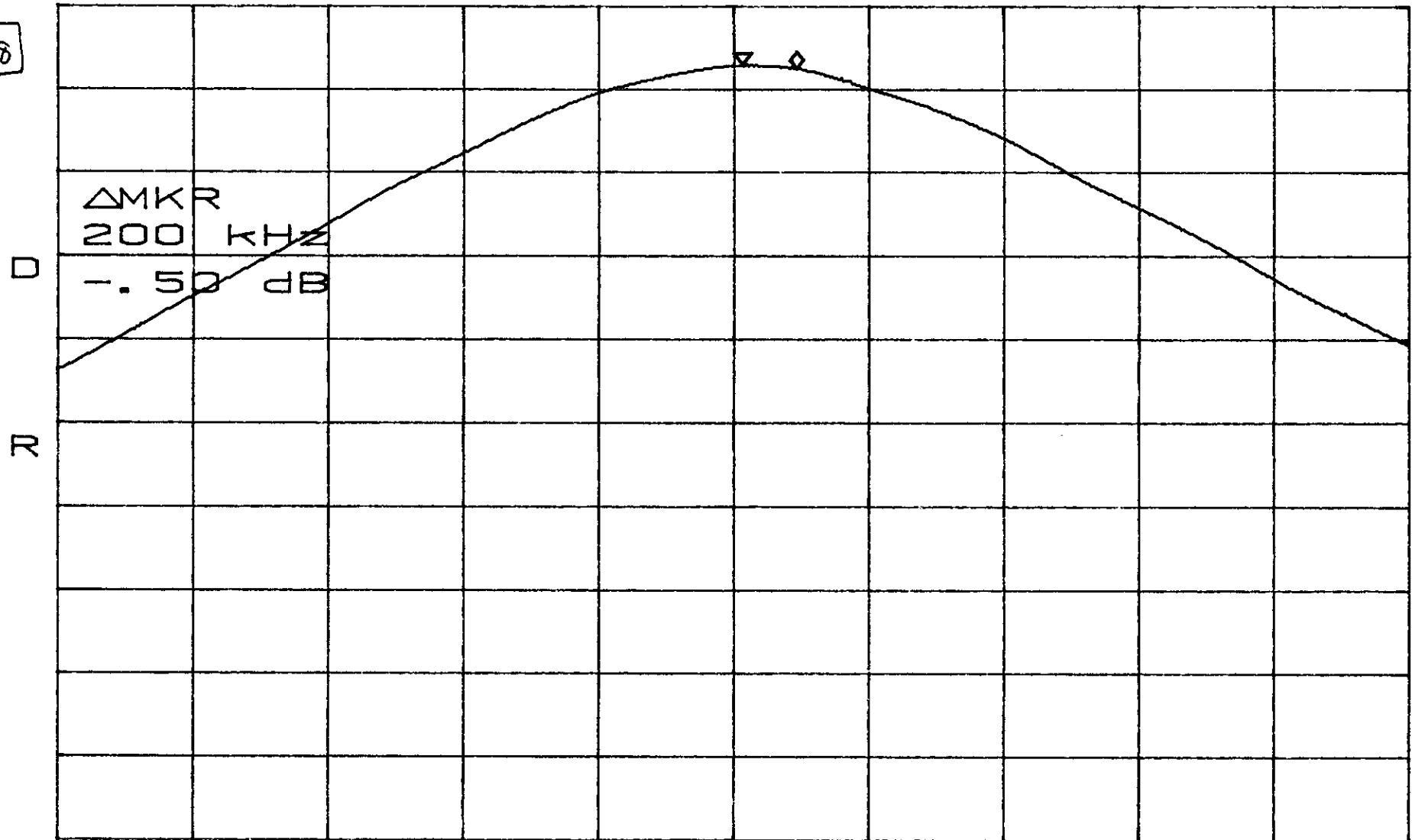
9/23/98
LB41901

ATTEN 30dB
BPO 0.0dBm
RL 40.0dBm

10dB/

Δ MKR -.50dB
200kHz

24.238



CENTER 1.974800GHz SPAN 5.000MHz
*RBW 1.0MHz *VBW 1.0MHz SWP 50.0ms

DL High
E/F Band

Output
cw

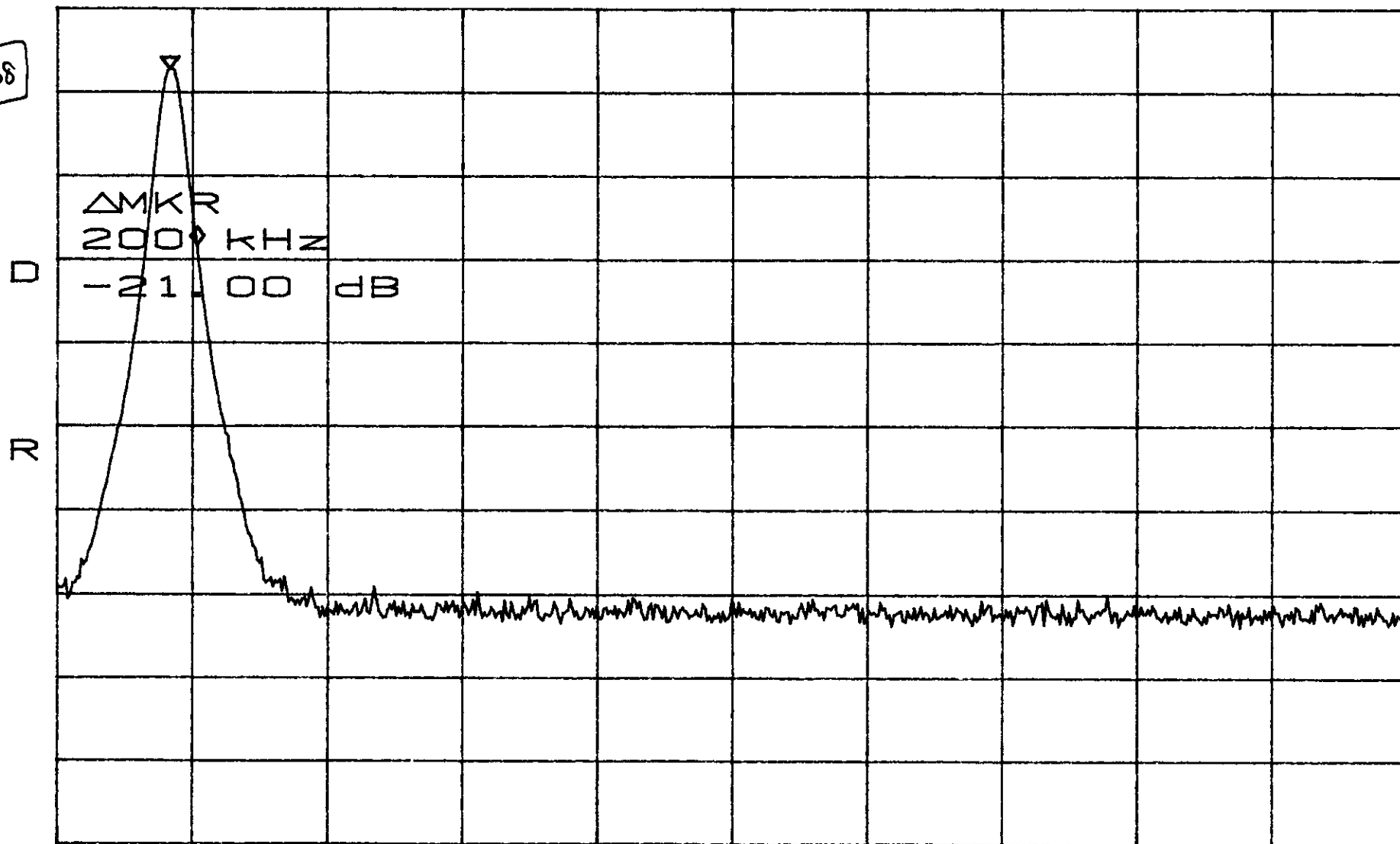
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -21.00dB
200kHz

24.238



CENTER 1.97900GHz SPAN 10.00MHz
*RBW 100kHz *VBW 1.0MHz SWP 50.0ms

DL High
E/F Band

Output
cw

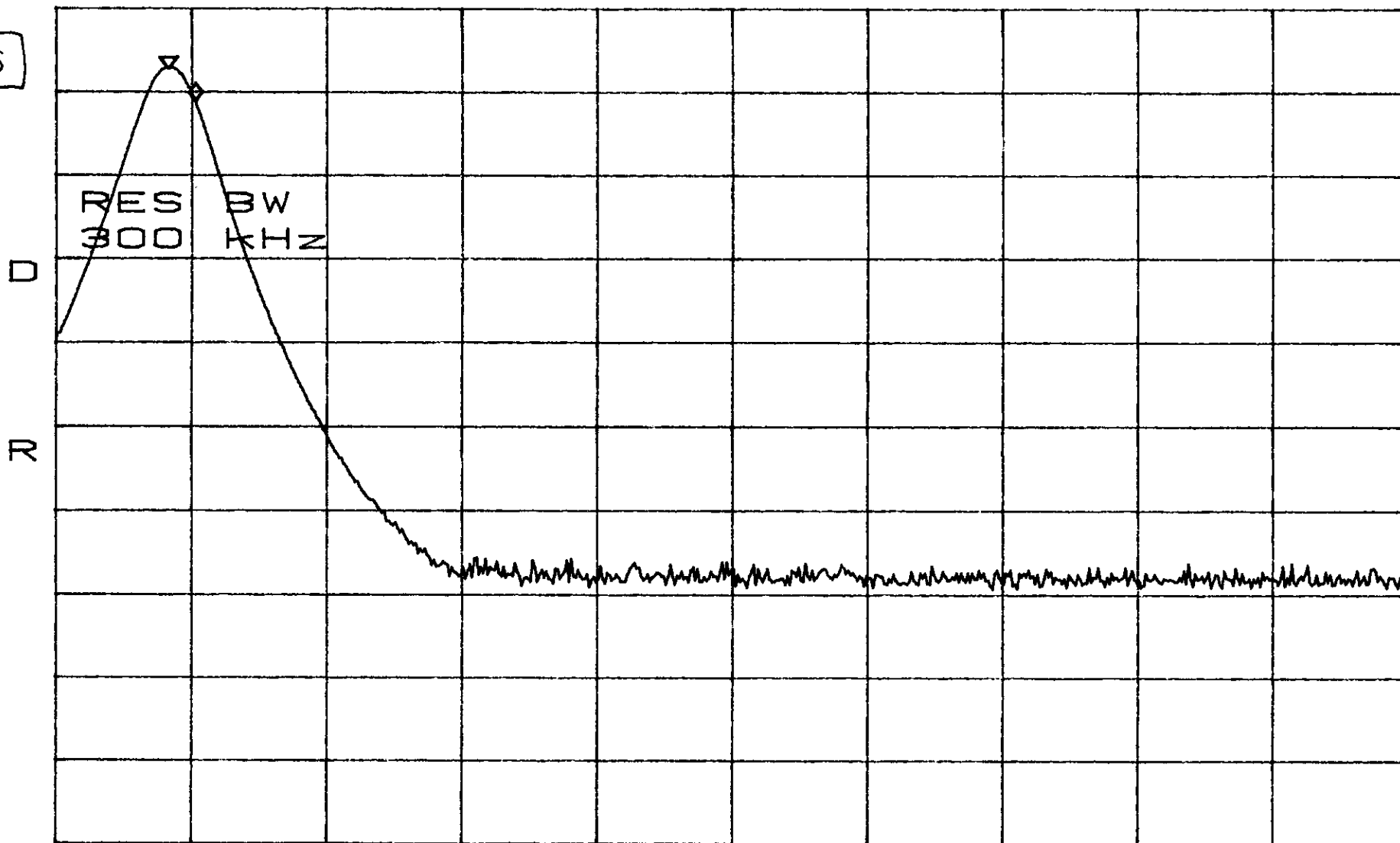
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -3.83dB
200kHz

24.238



CENTER 1.97900GHz

SPAN 10.00MHz

*RBW 300kHz

*VBW 1.0MHz

SWP 50.0ms

UL Low

E/F Band

Output

cw

9/25/98

LB41901

*ATTEN 30dB

RL 40.0dBm

10dB/

Δ MKR -59.33dB

-200kHz

24.238

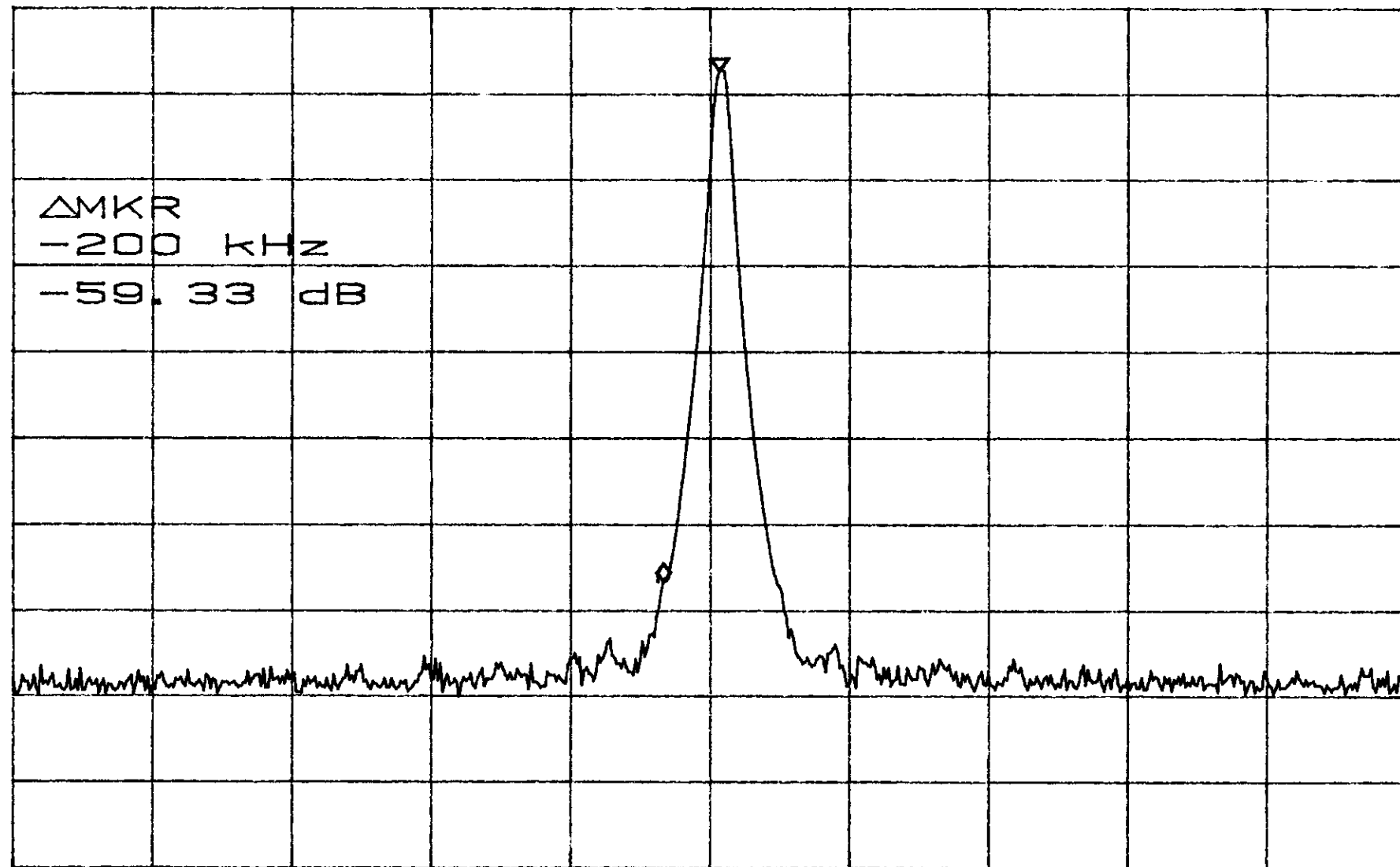
D

Δ MKR

-200 kHz

-59.33 dB

R



CENTER 1.885200GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

UL Low
E/F Band

Input
cw source

9/25/98
L841901

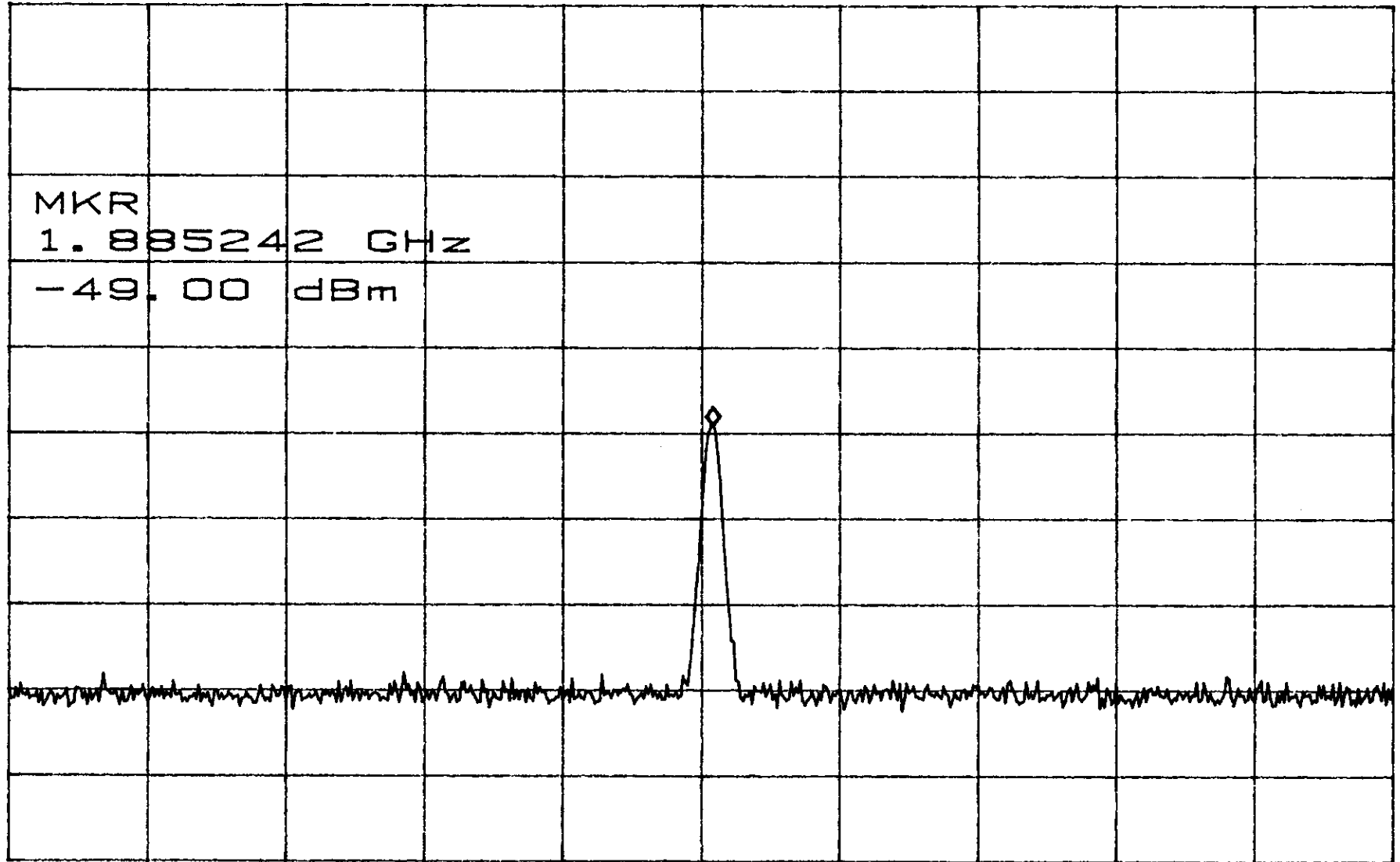
ATTEN 10dB
RL 0dBm

10dB/

MKR -49.00dBm
1.885242GHz

24.238

MKR
1.885242 GHz
-49.00 dBm



CENTER 1.885200GHz
*RBW 30kHz *VBW 30kHz

SPAN 5.000MHz
SWP 50.0ms

UL Low

E/F Band

ATTEN 30dB

RL 40.0dBm

Output

cw

10dB/

9/25/98

LB41901

Δ MKR -25.34dB

-200kHz

24.236

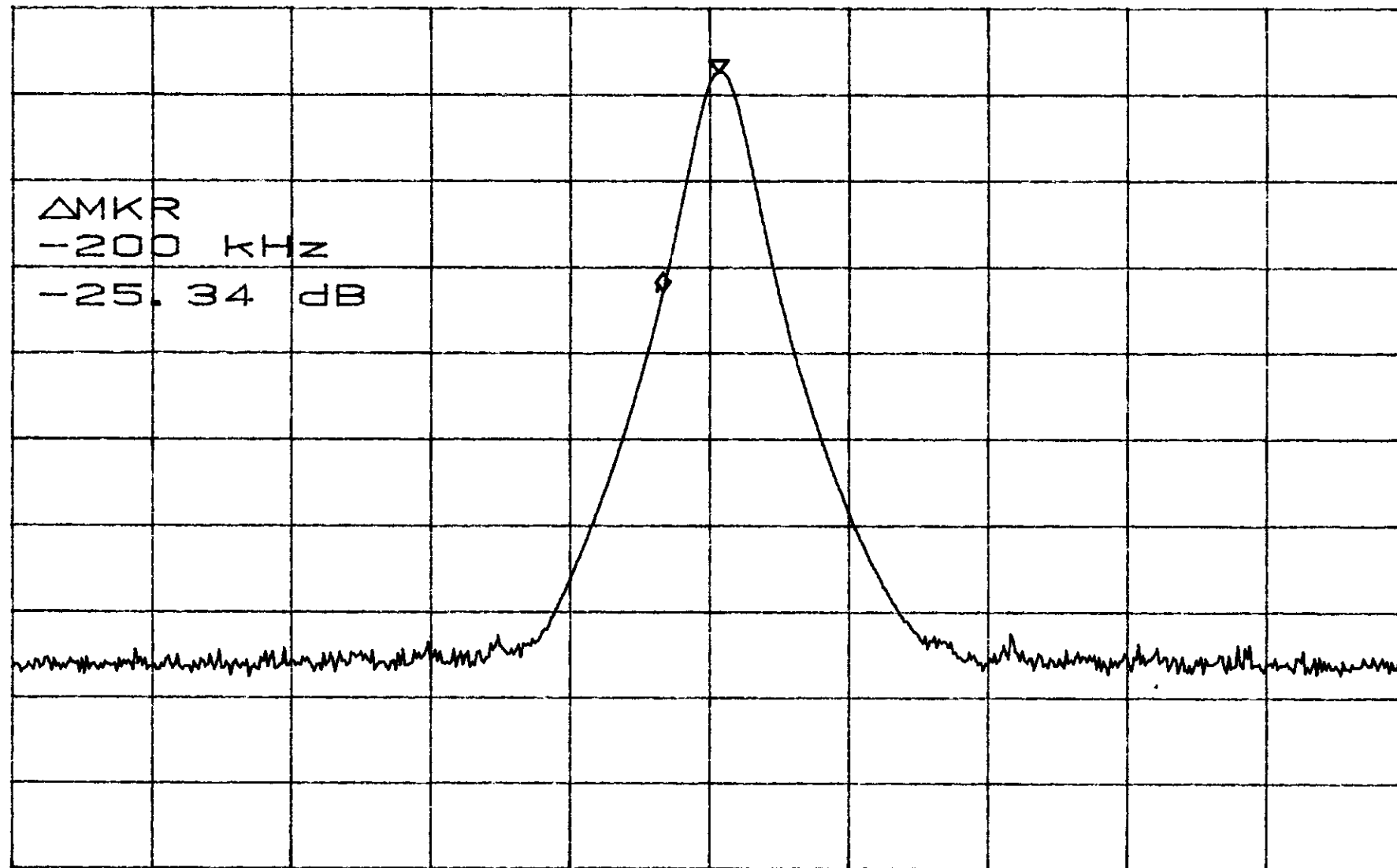
D

Δ MKR

-200 kHz

-25.34 dB

R



CENTER 1.885200GHz

SPAN 5.000MHz

*RBW 100kHz

*VBW 30kHz

SWP 50.0ms

UL Low
E/F Band

Output
cw

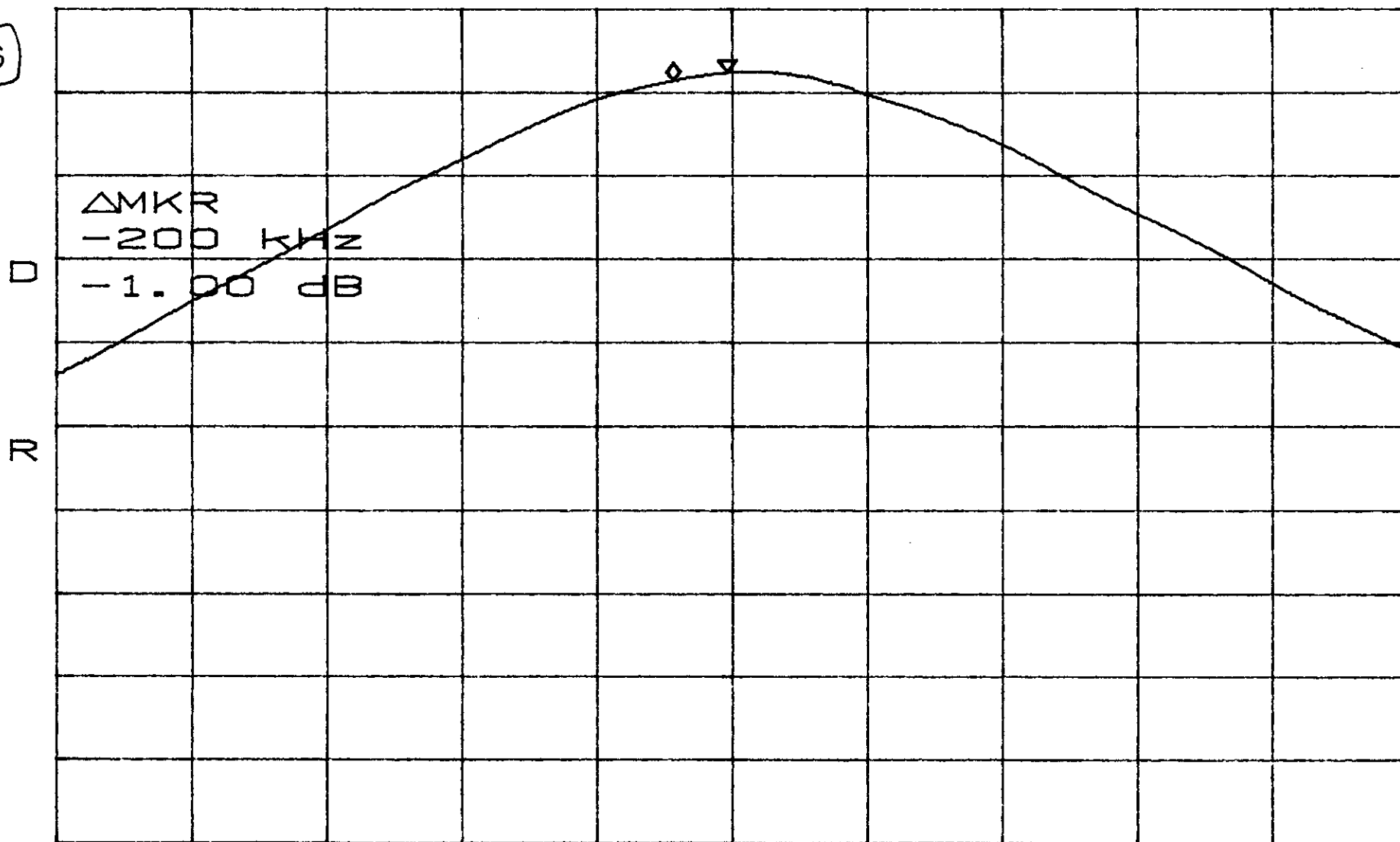
9/25/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -1.00dB
-200kHz

24.238



CENTER 1.885200GHz SPAN 5.000MHz
*RBW 1.0MHz *VBW 1.0MHz SWP 50.0ms

UL Low
E/F Band

Output
cw

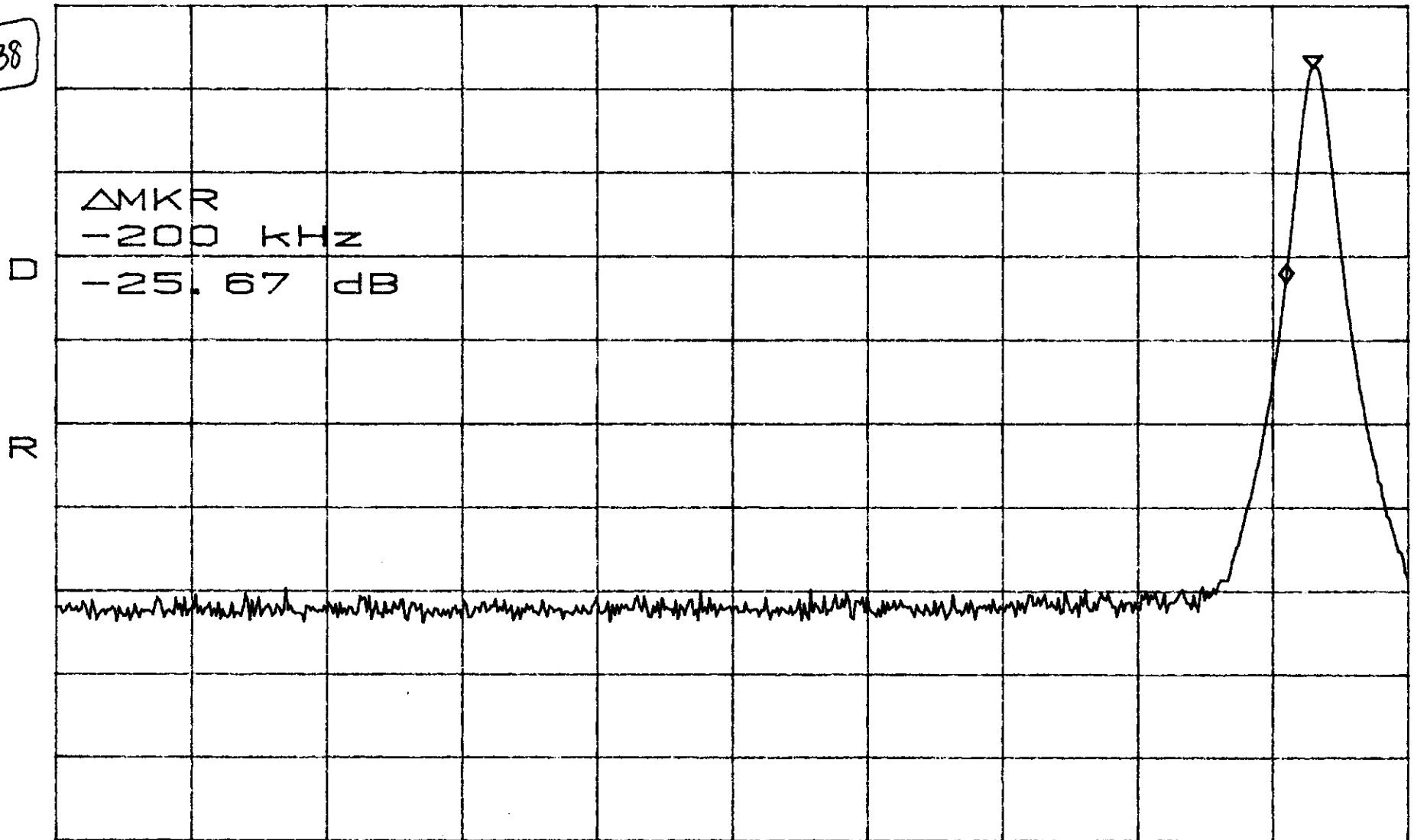
9/25/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/
BPO1

Δ MKR -25.67dB
-200kHz

24.238



CENTER 1.88100GHz SPAN 10.00MHz
*RBW 100kHz *VBW 1.0MHz SWP 50.0ms

UL Low
E/F Band

Output
cw

9/25/98
LB41401

ATTEN 30dB
RL 40.0dBm

10dB/

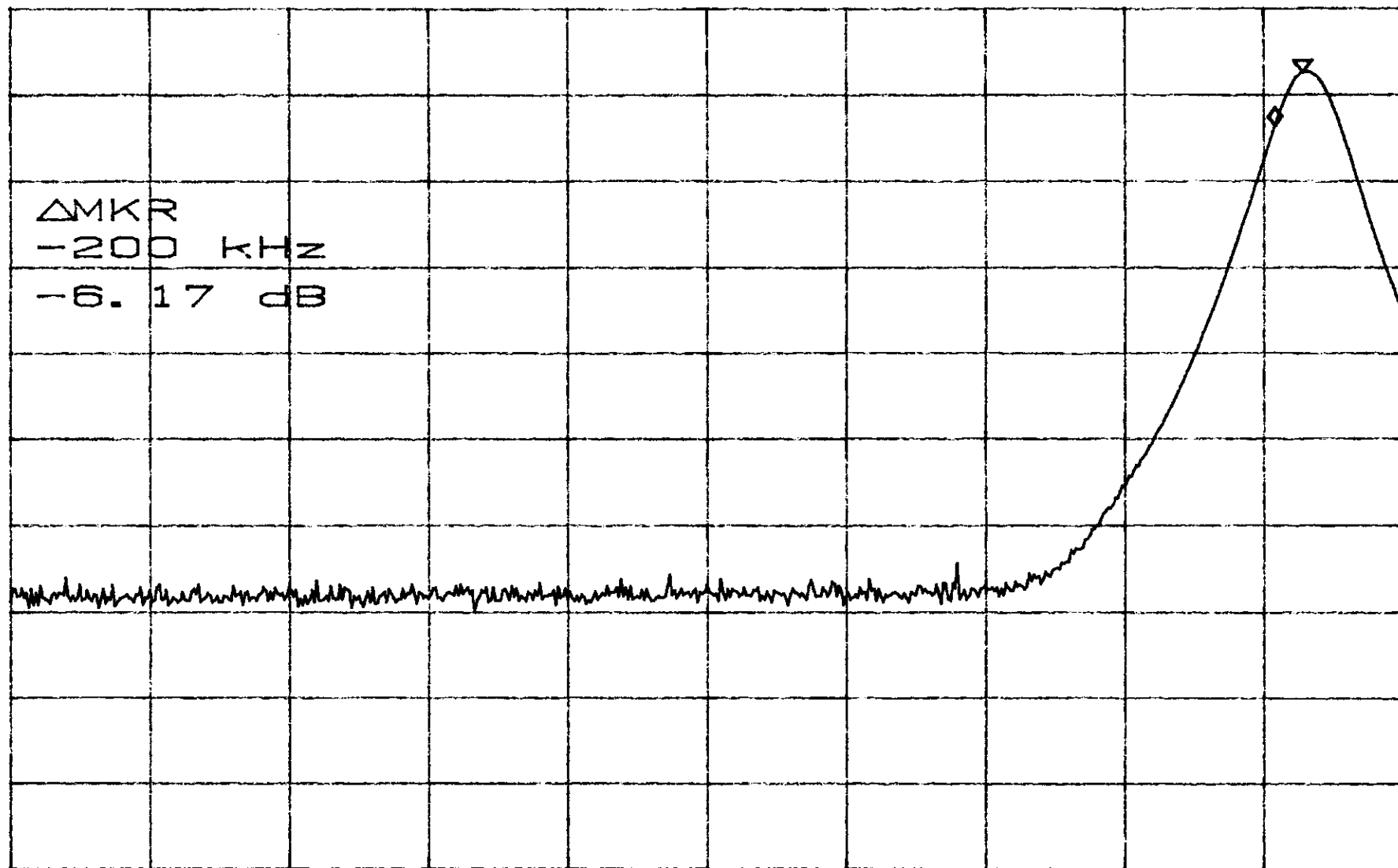
Δ MKR -6.17dB
-200kHz

24.238

Δ MKR
-200 kHz
-6.17 dB

D

R



CENTER 1.88100GHz

SPAN 10.00MHz

*RBW 300kHz

*VBW 1.0MHz

SWP 50.0ms

UL High
E/F Band

Output
cw

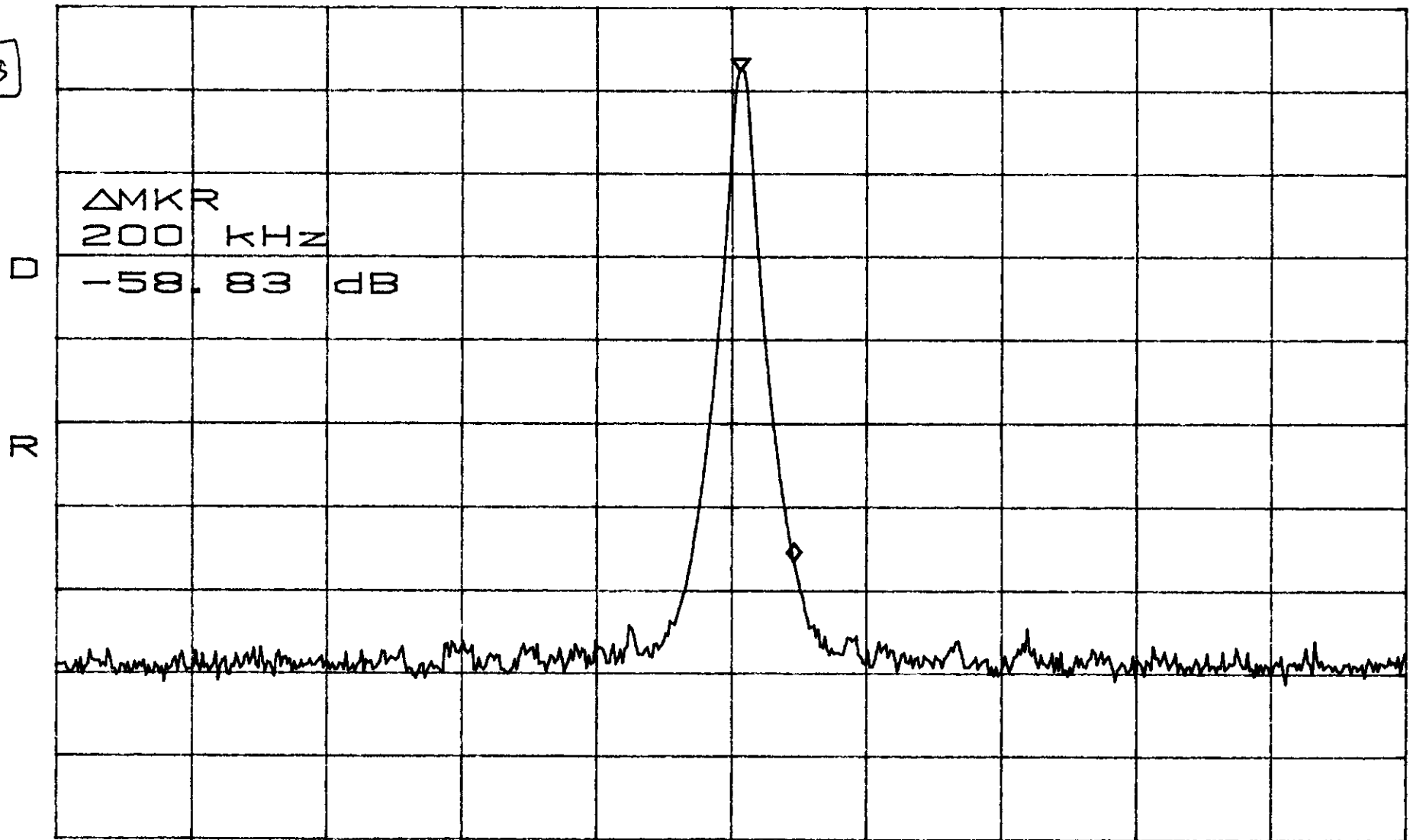
9/25/98
LB41901

*ATTEN 30dB
RL 40.0dBm

Δ MKR -58.83dB
200kHz

10dB/

24.738



CENTER 1.894800GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

UL High
E/F Band

Input

9/25/98
LB41901

*ATTEN 10dB

CW Source

MKR -49.17dBm

RL 0dBm

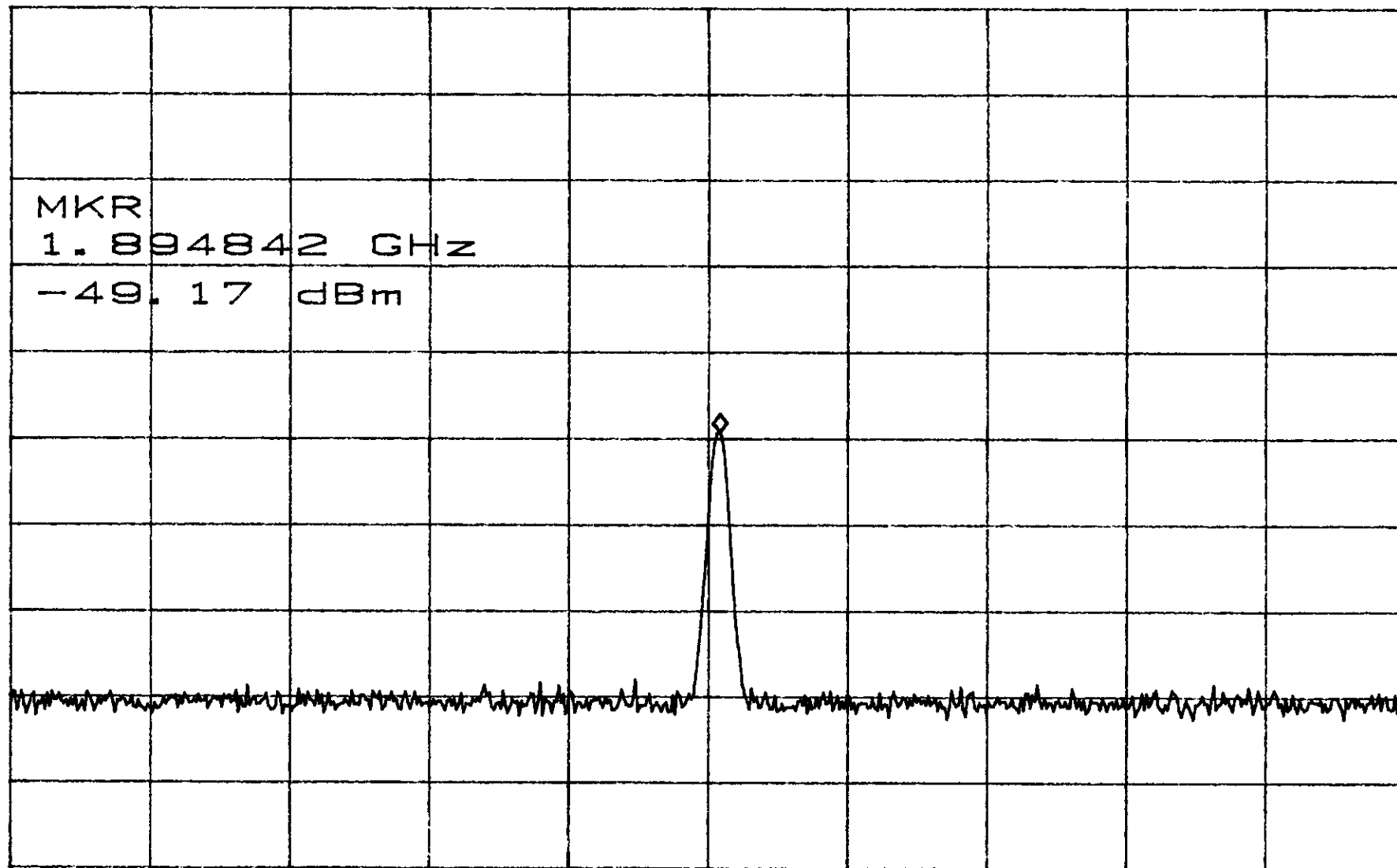
10dB/

1.894842GHz

24.238

D

MKR
1.894842 GHz
-49.17 dBm



CENTER 1.894800GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

UL High
E/F Band

Output

9/25/98
L841901

*ATTEN 30dB

cw

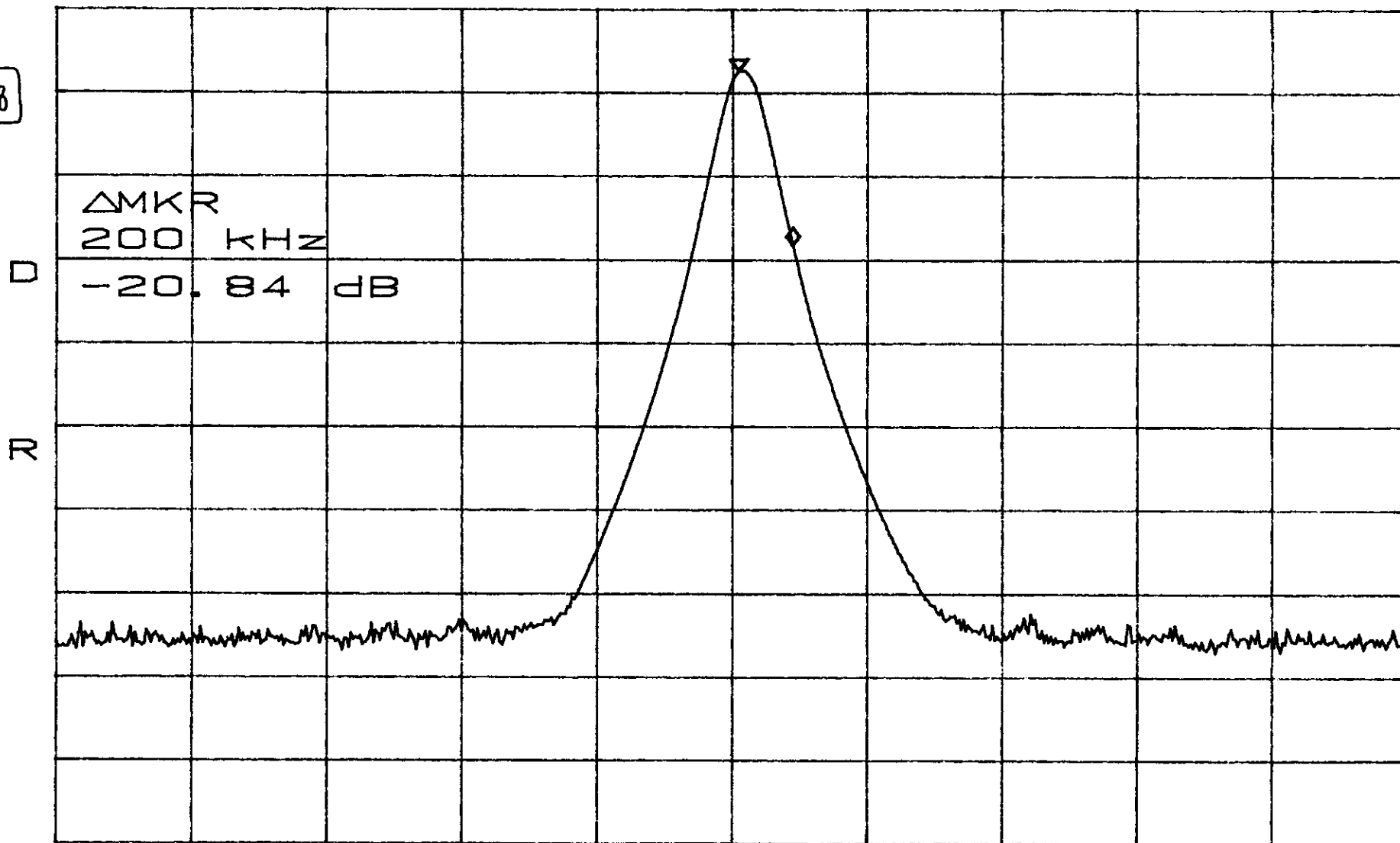
Δ MKR -20.84dB

RL 40.0dBm

10dB/

200kHz

24.238



CENTER 1.894800GHz

SPAN 5.000MHz

*RBW 100kHz

*VBW 30kHz

SWP 50.0ms

UL High
E/F Band

Output
CW

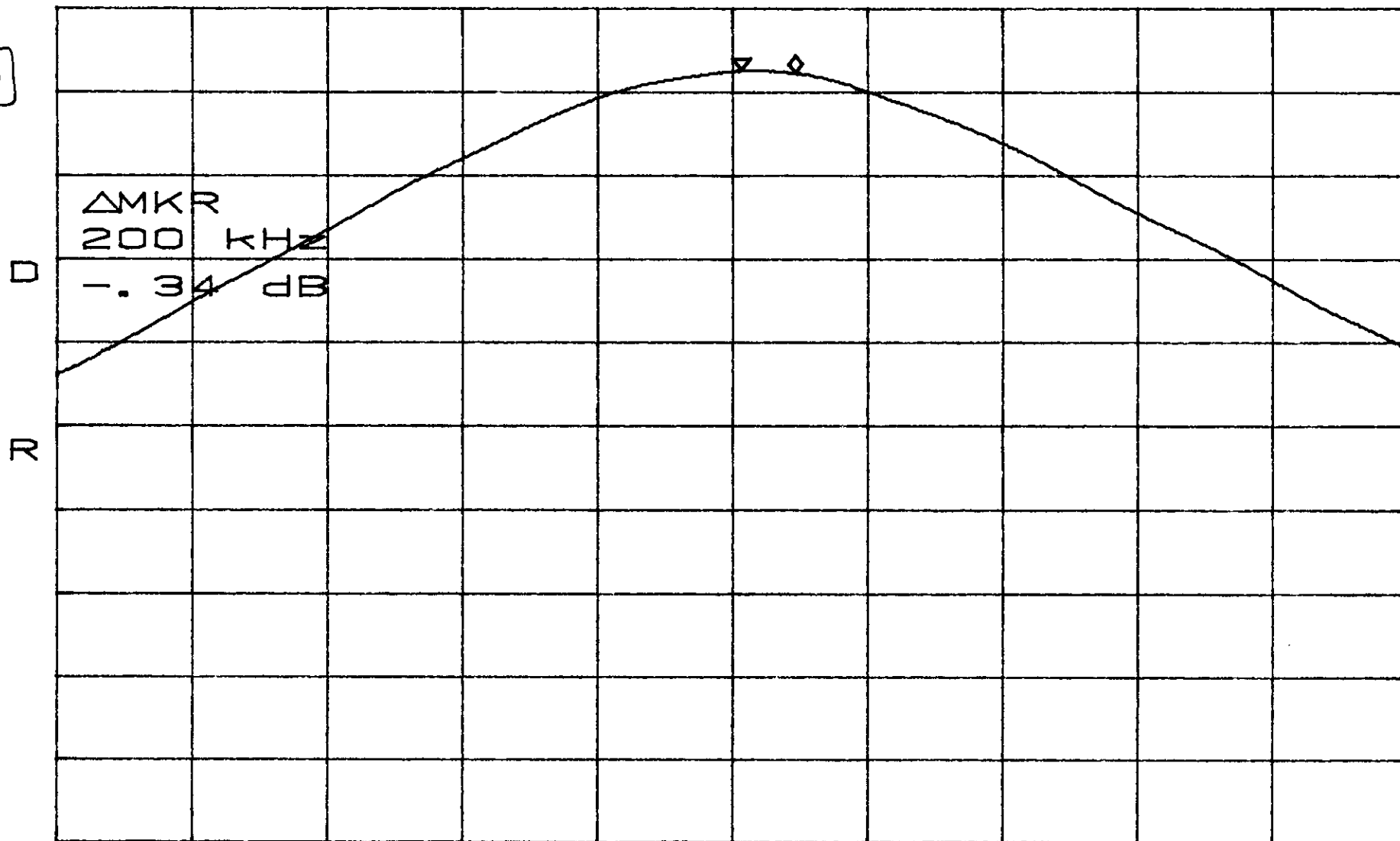
9/25/98
LB41901

*ATTEN 30dB
BPOE
RL 40.0dBm

10dB/

Δ MKR -.34dB
200kHz

24.236



CENTER 1.894800GHz

SPAN 5.000MHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 50.0ms

UL High
E/F Band

Output
cw

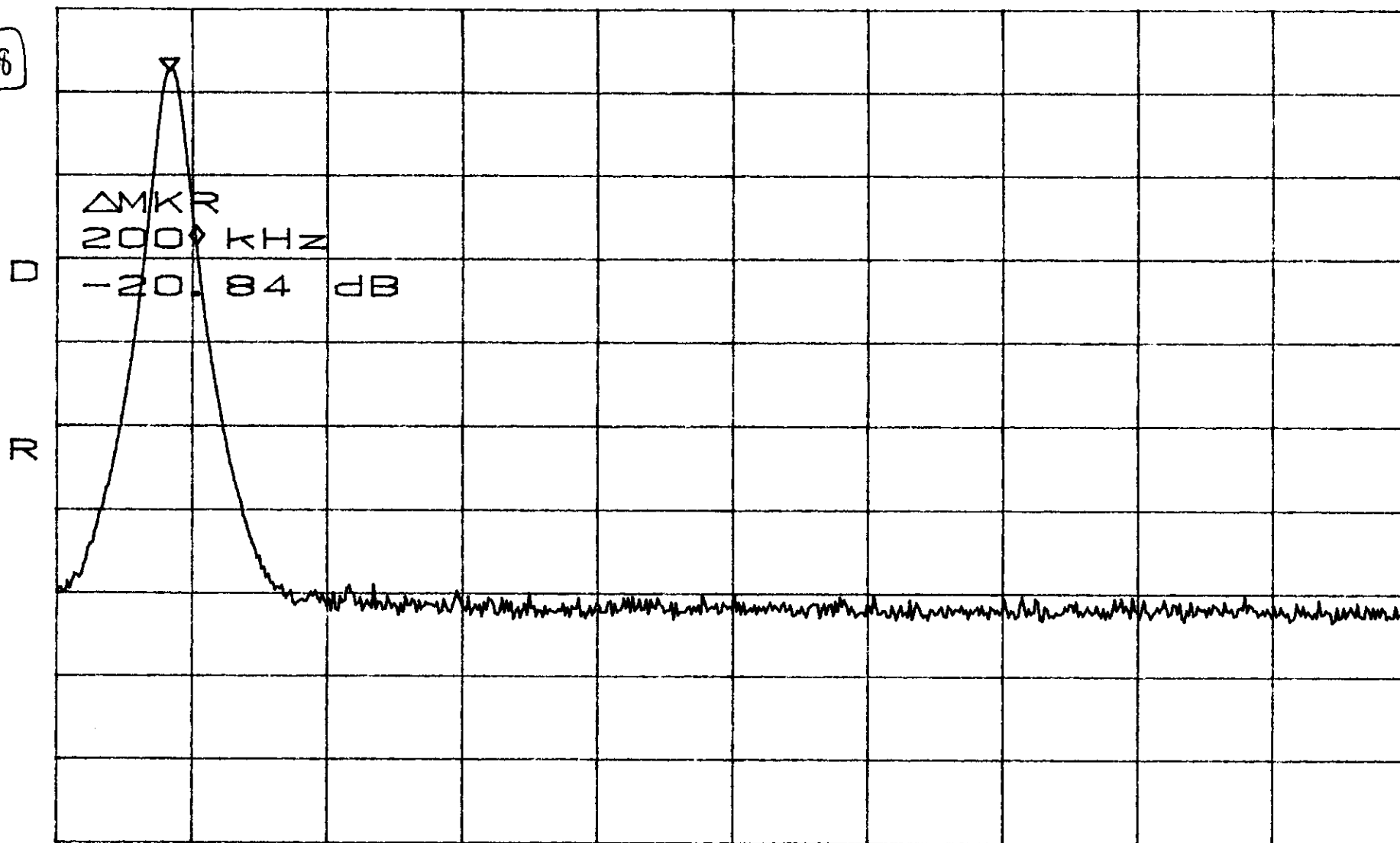
9/25/98
LB41901

*ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -20.84dB
200kHz

24.296



CENTER 1.89900GHz
*RBW 100kHz *VBW 1.0MHz

SPAN 10.00MHz
SWP 50.0ms

UL High
E/F Band

Output
cw

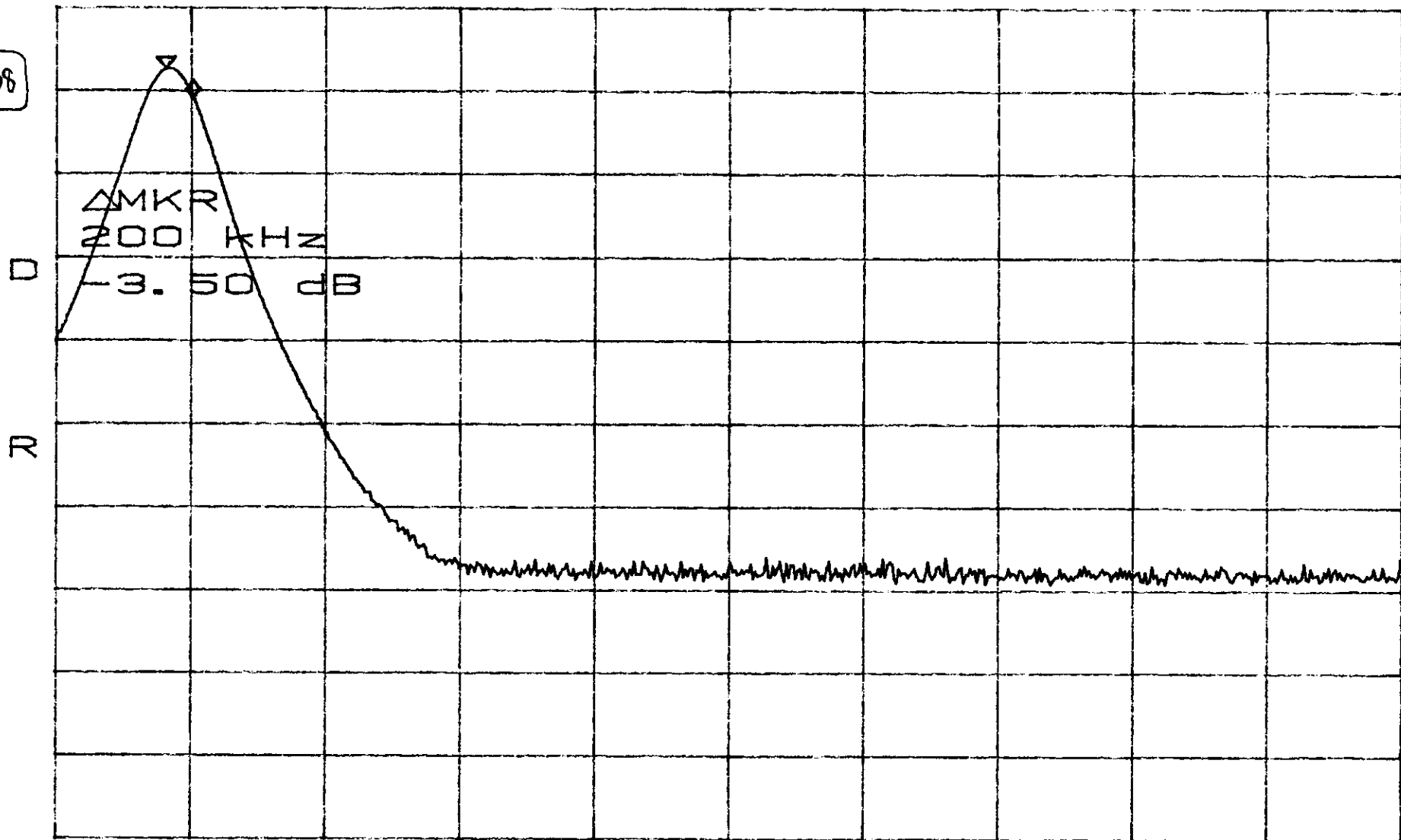
9/25/98
LB41901

*ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -3.50dB
200kHz

24.238



CENTER 1.89900GHz
*RBW 300kHz *VBW 1.0MHz

SPAN 10.00MHz
SWP 50.0ms

DL Low
E/F Band

Input
cw

9/23/98
LB41901

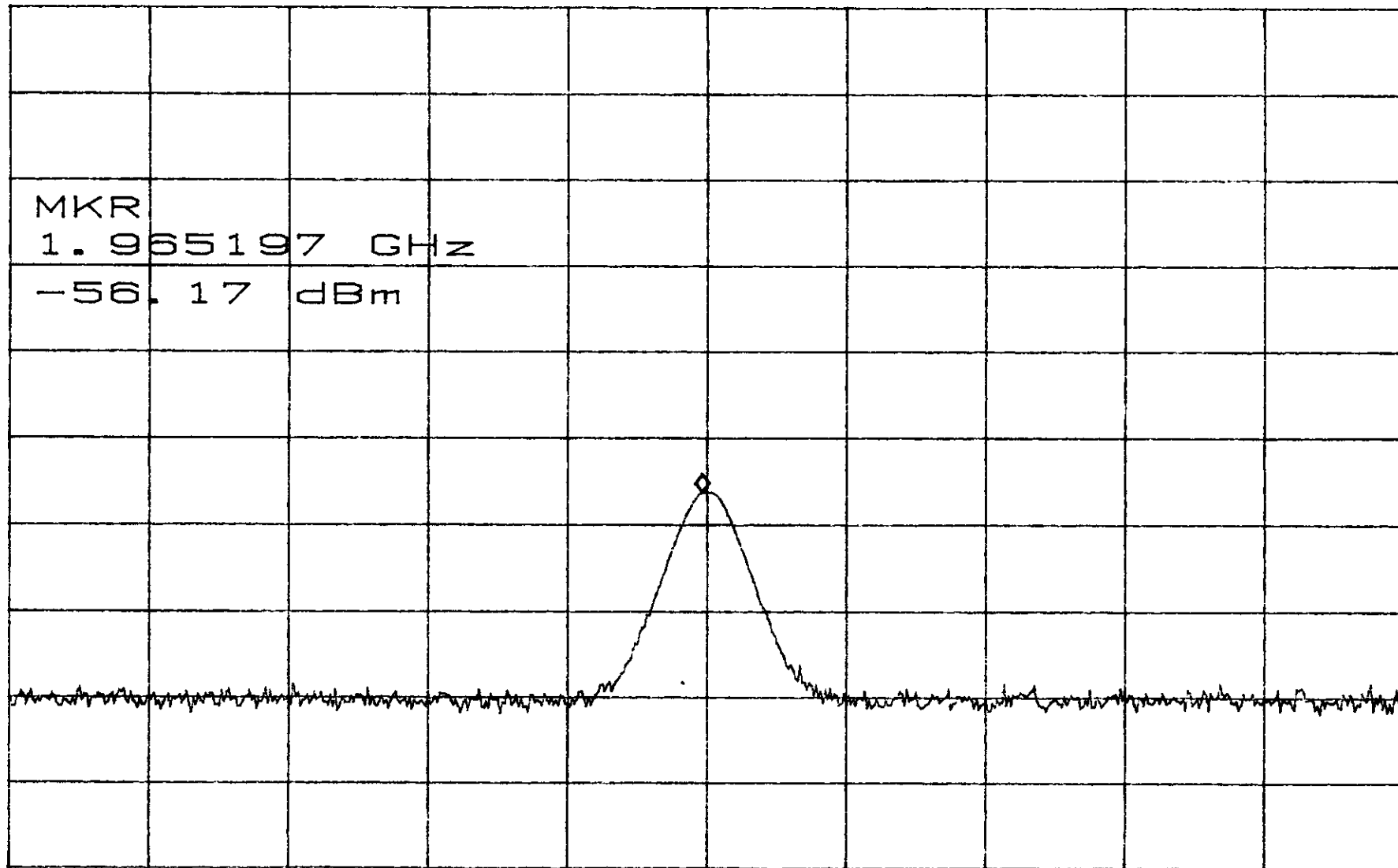
ATTEN 10dB
RL 0dBm

10dB/

MKR -56.17dBm
1.965197GHz

In/out

D
MKR
1.965197 GHz
-56.17 dBm



CENTER 1.965200GHz SPAN 1.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

DL Low
E/F Band

Output
CV

9/23/98
LB41901

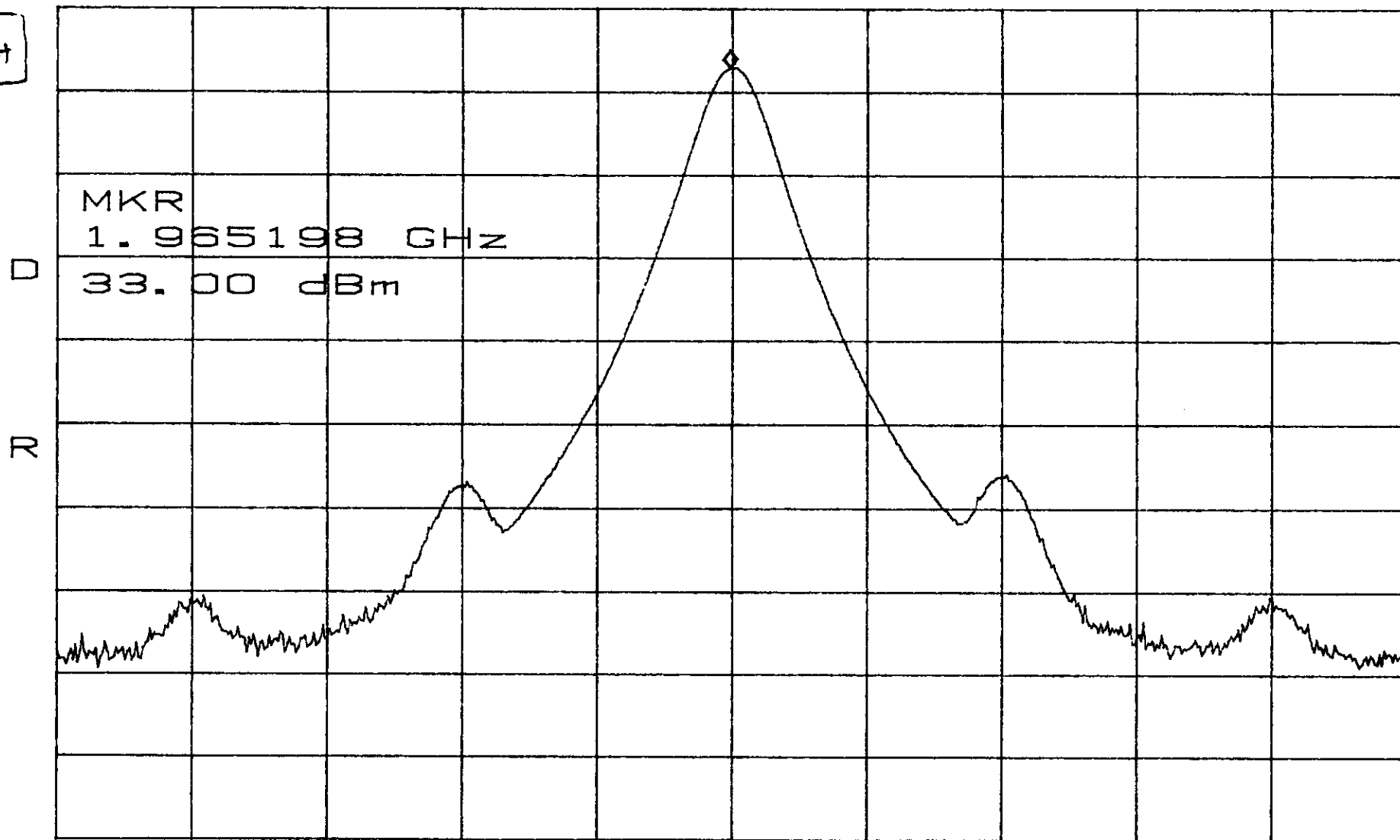
ATTEN 30dB

RL 40.0dBm

MKR 33.00dBm

1.965198GHz

In/Out



CENTER 1.965200GHz

SPAN 1.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Mid
E/F Band

Input
cw

9/23/98
LB41901

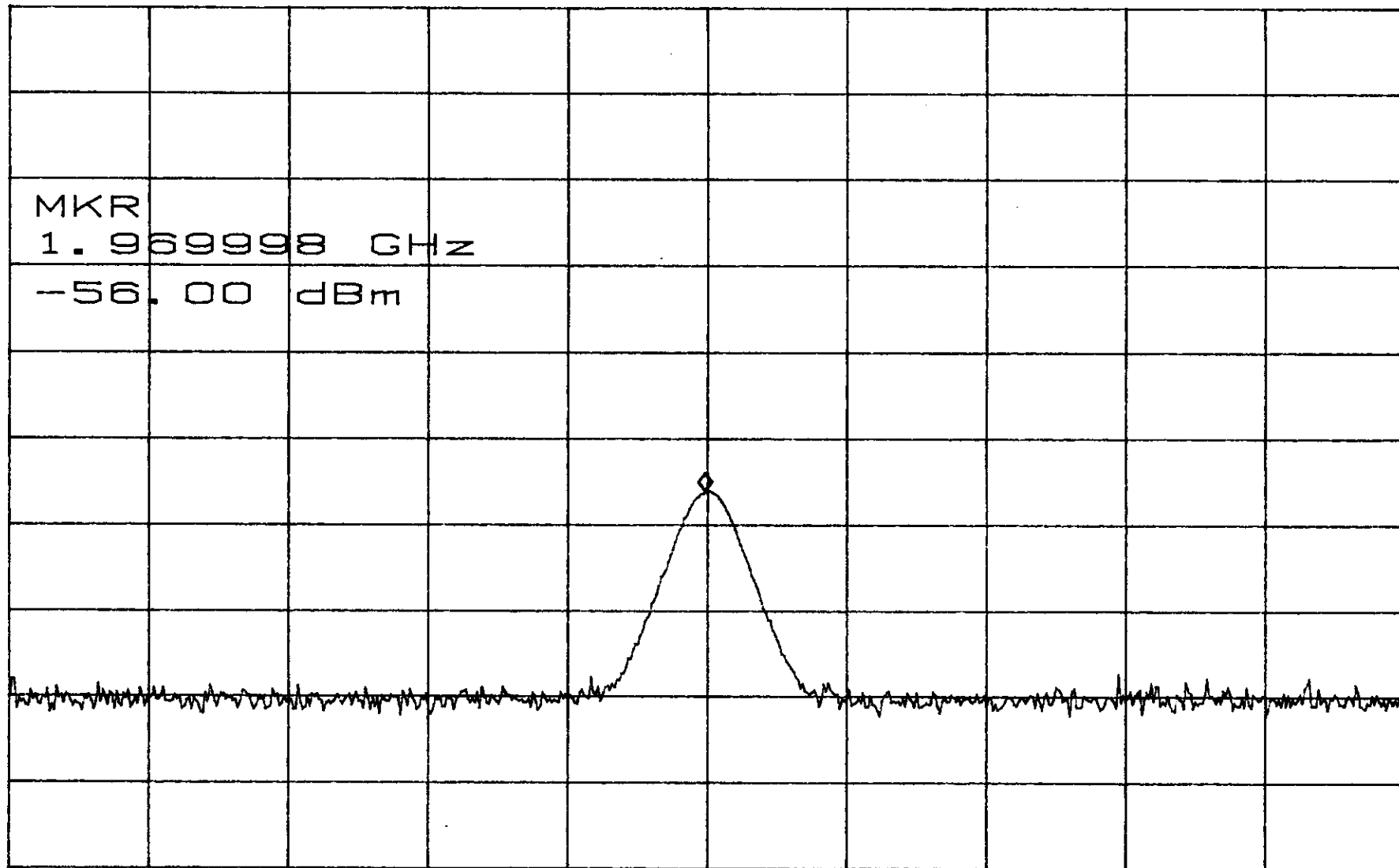
ATTEN 10dB
RL 0dBm

10dB/

MKR -56.00dBm
1.969998GHz

In/out

MKR
1.969998 GHz
-56.00 dBm



CENTER 1.970000GHz
*RBW 30kHz *VBW 30kHz

SPAN 1.000MHz
SWP 50.0ms

DL Mid

E/F Band

ATTEN 30dB

RL 40.0dBm

Output

cw

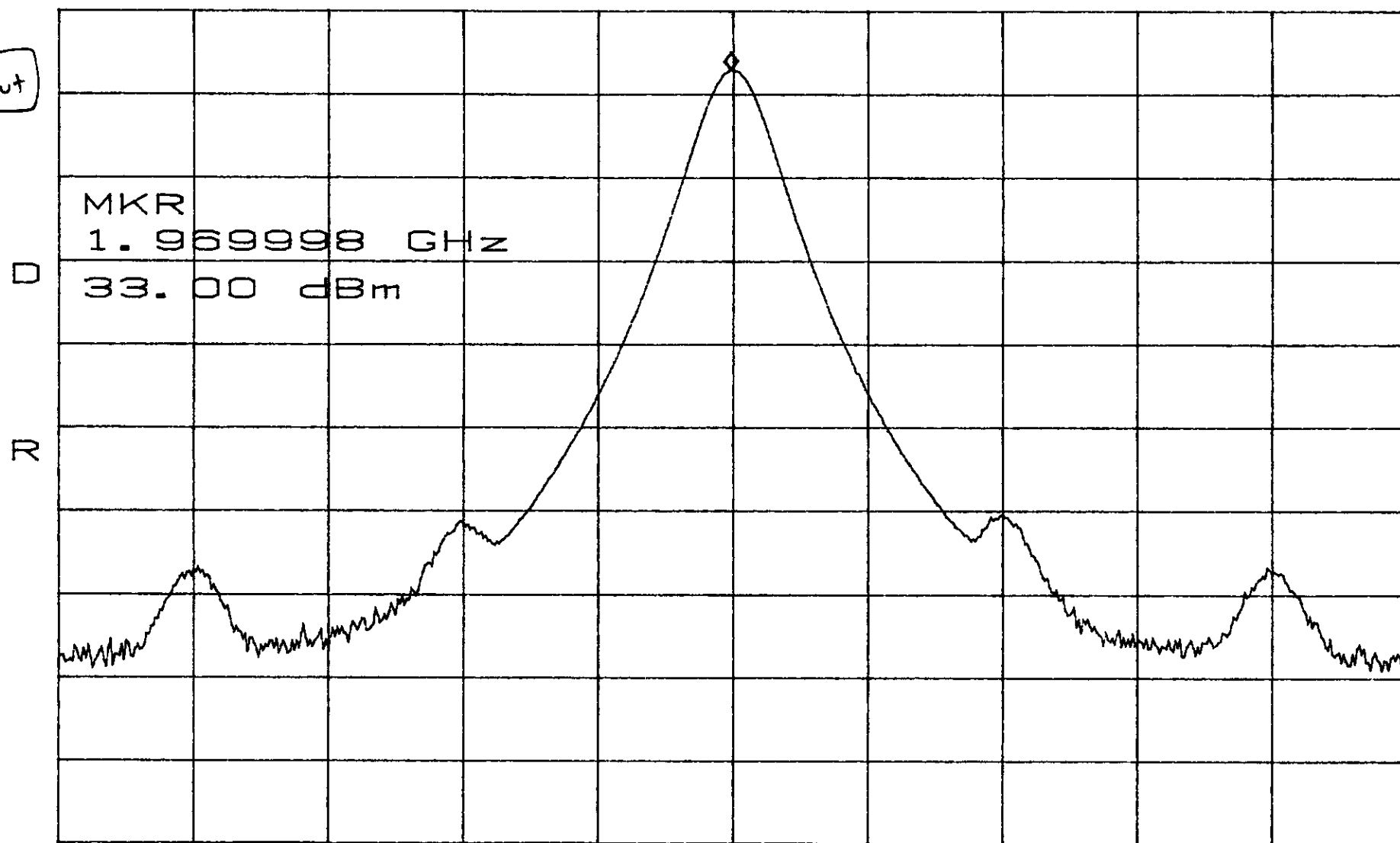
9/23/98

LB41901

MKR 33.00dBm

1.969998GHz

In/Out



CENTER 1.970000GHz

SPAN 1.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL High
E/F Band

Input

9/23/98
LB41901

ATTEN 10dB

cw

MKR -55.67dBm

RL 0dBm

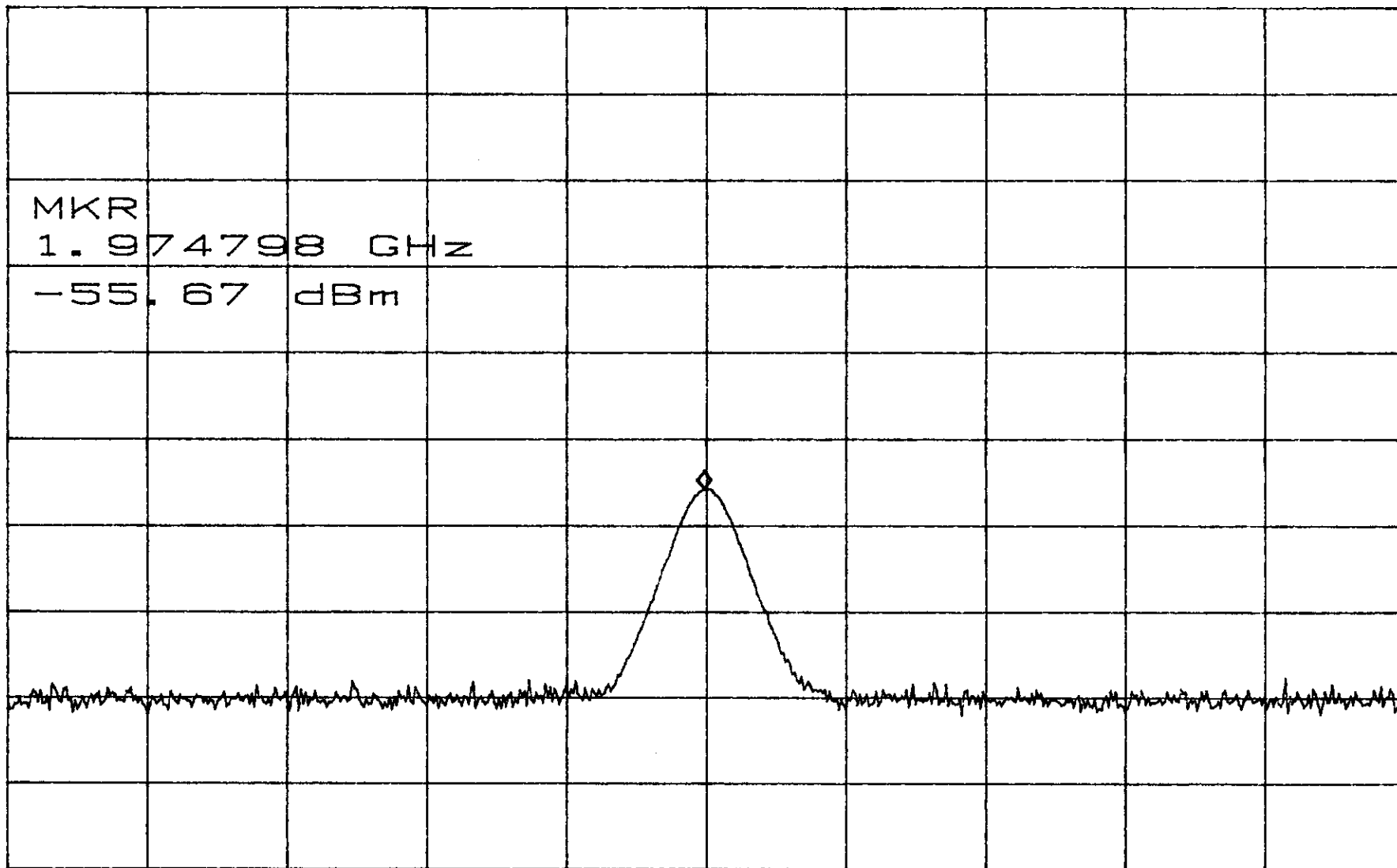
10dB/

1.974798GHz

In/out

D

MKR
1.974798 GHz
-55.67 dBm



CENTER 1.974800GHz

SPAN 1.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL High
E/F Band

Output
CW

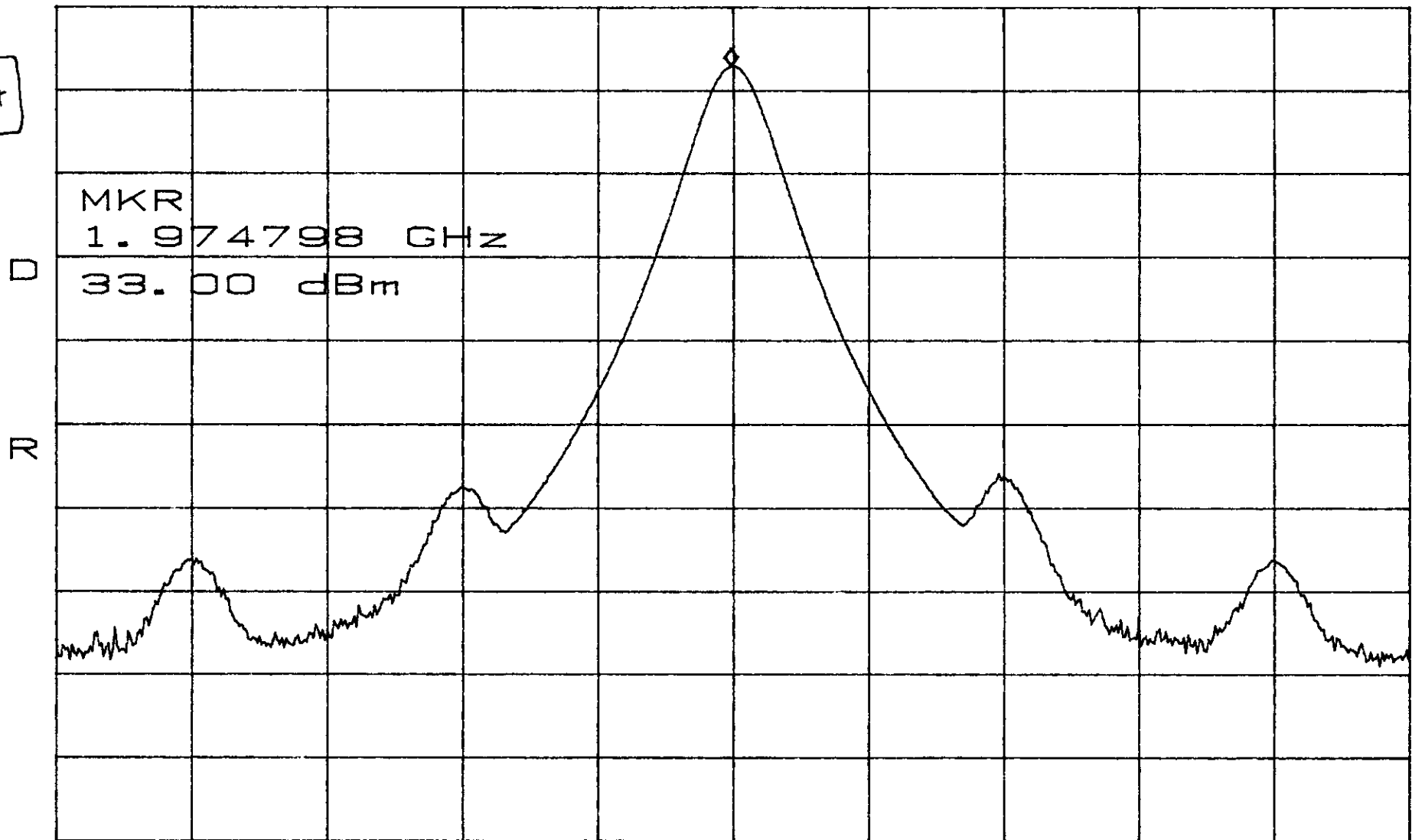
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

MKR 33.00dBm
1.974798GHz

In/Out



CENTER 1.974800GHz SPAN 1.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

UL Low
E/F Band

Input
CW

9/23/98
LB41901

ATTEN 10dB
RL 0dBm

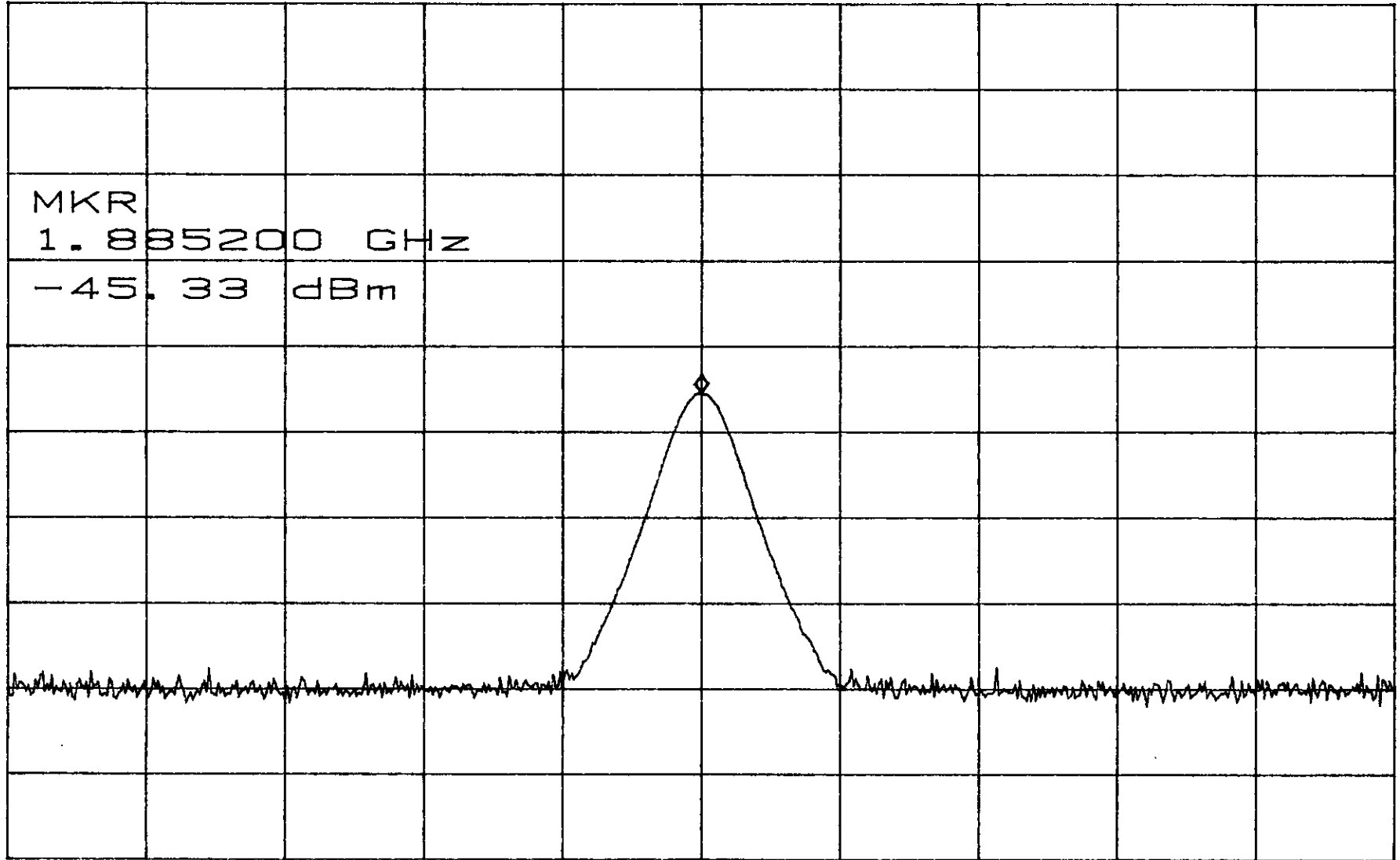
10dB/

MKR -45.33dBm
1.885200GHz

In/Out

D

MKR
1.885200 GHz
-45.33 dBm



CENTER 1.885200GHz SPAN 1.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

UL Low
E/F Band

Output
CW

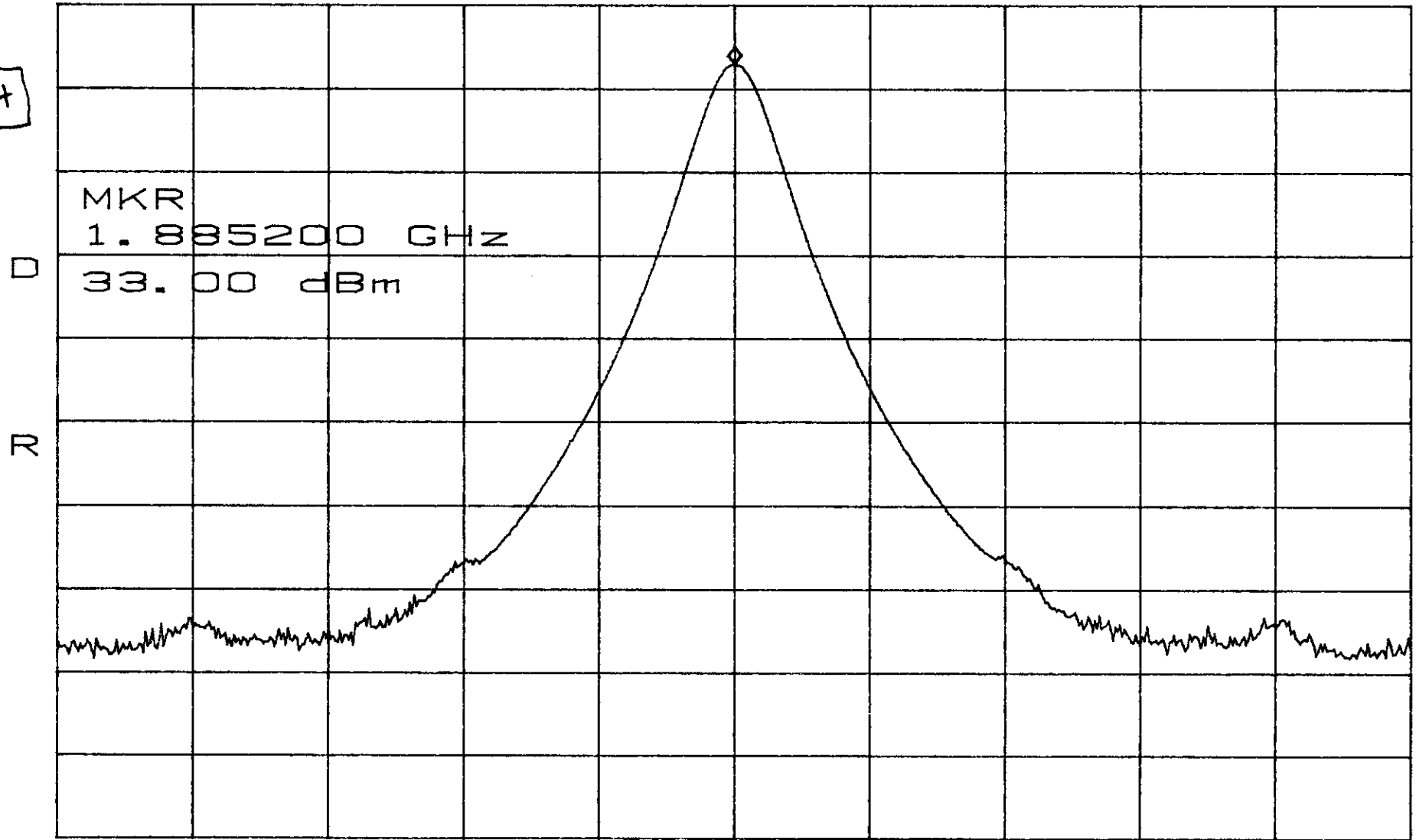
9/23/98
LB41901

*ATTEN 30dB
RL 40.0dBm

10dB/

MKR 33.00dBm
1.885200GHz

In/Out



CENTER 1.885200GHz SPAN 1.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

UL Mid
E/F Band

Input
cw

9/23/98
LB41901

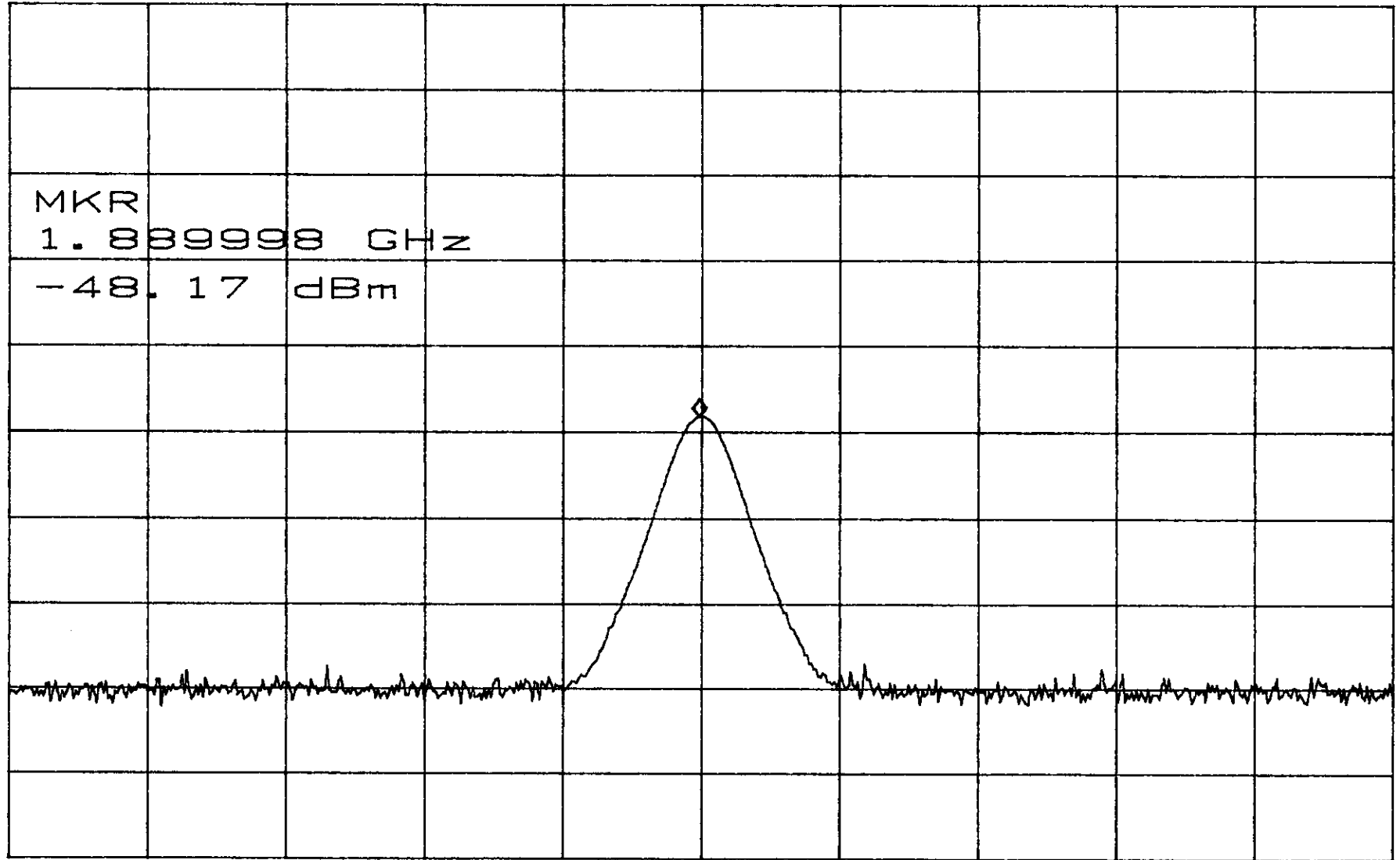
ATTEN 10dB
RL 0dBm

10dB/

MKR -48.17dBm
1.889998GHz

In/Out

MKR
1.889998 GHz
-48.17 dBm



CENTER 1.890000GHz SPAN 1.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

UL Mid
E/F Band

Output
cw

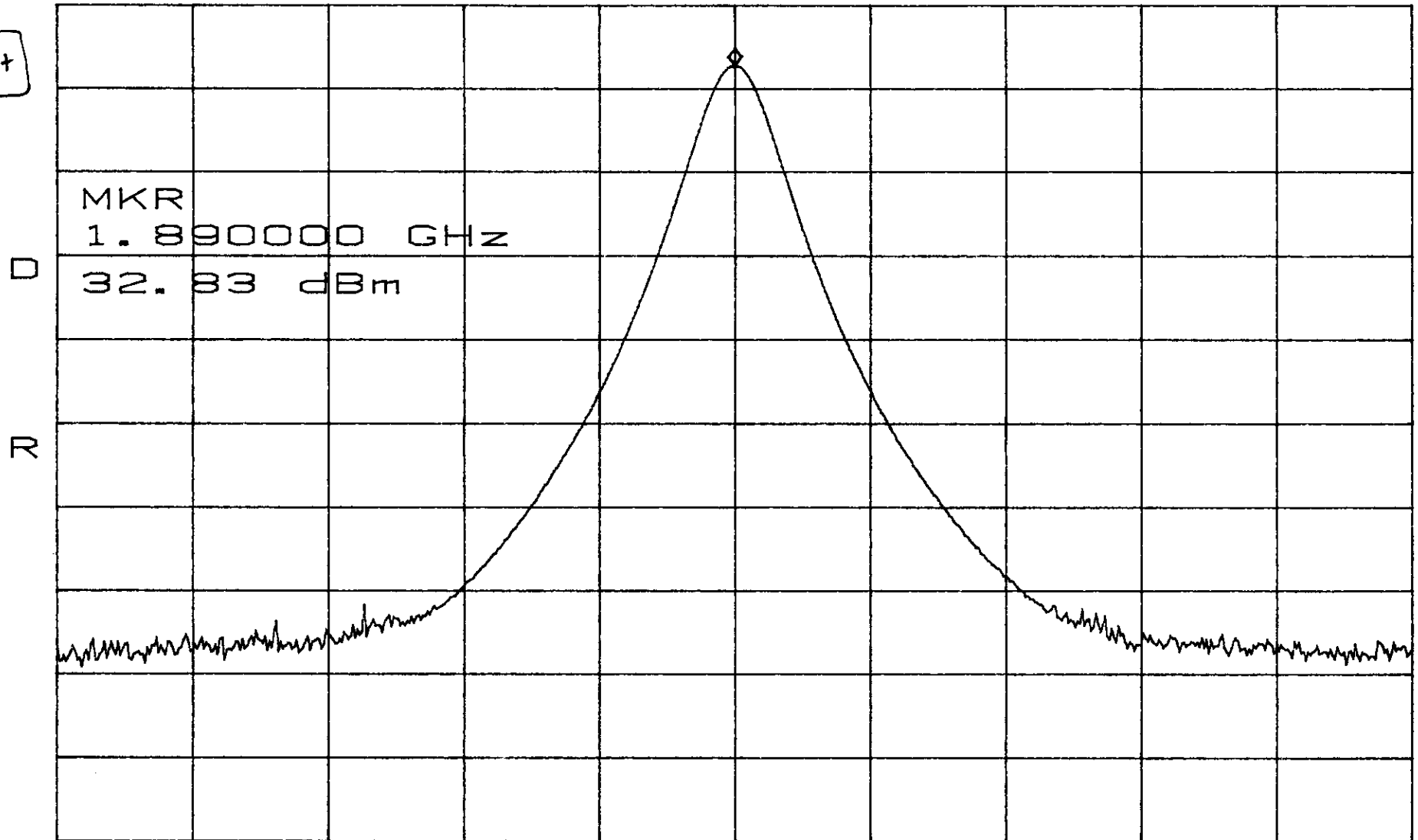
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

MKR 32.83dBm
1.890000GHz

In/out



CENTER 1.890000GHz SPAN 1.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

UL High
E/F Band

Input
cw

9/23/98
LB41901

ATTEN 10dB

RL 0dBm

MKR -47.00dBm

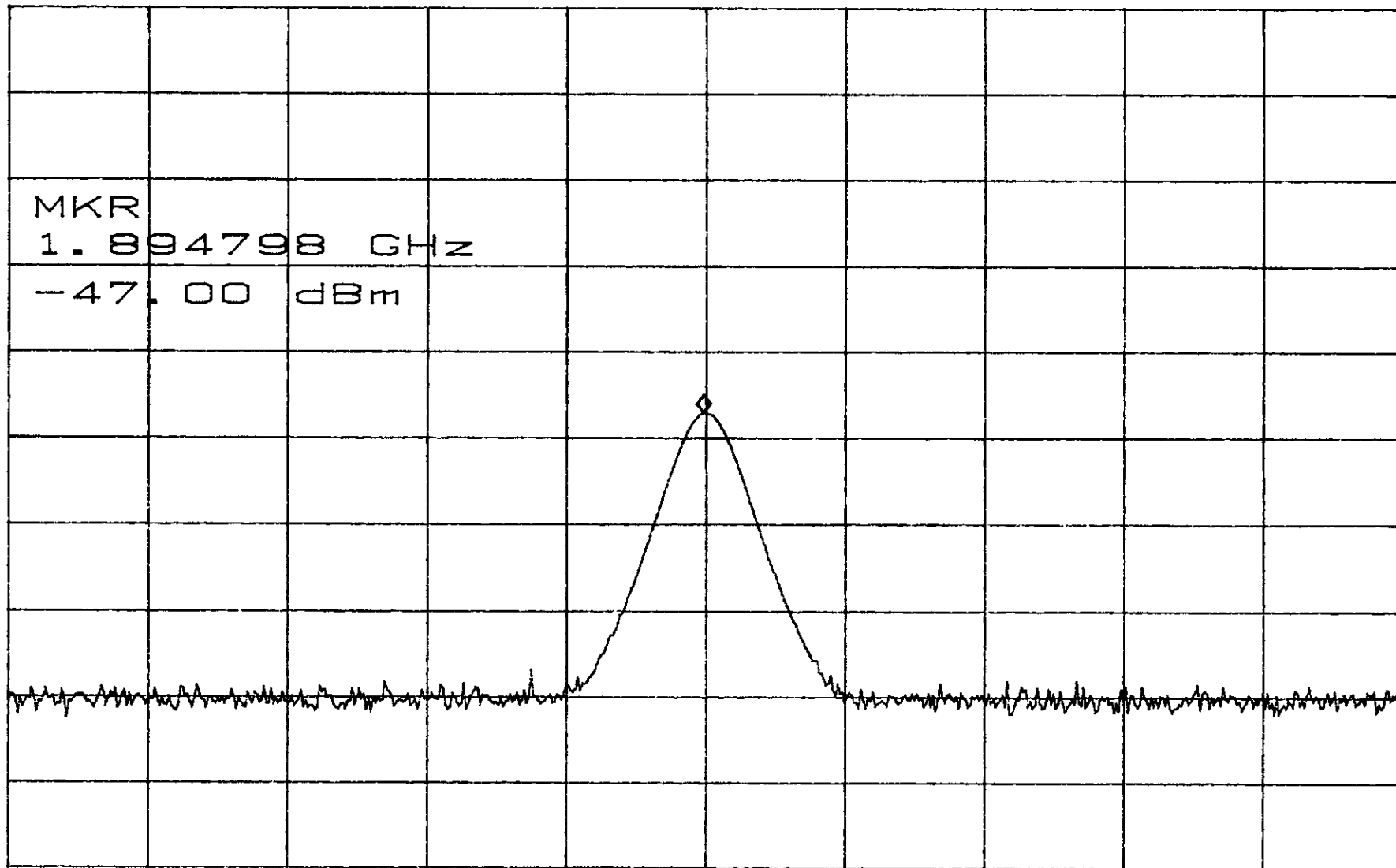
10dB/

1.894798GHz

In/Out

D

MKR
1.894798 GHz
-47.00 dBm



CENTER 1.894800GHz

SPAN 1.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

UL High
E/F Band

Output
cw

9/23/98
LB41901

ATTEN 30dB

RL 40.0dBm

MKR 32.83dBm

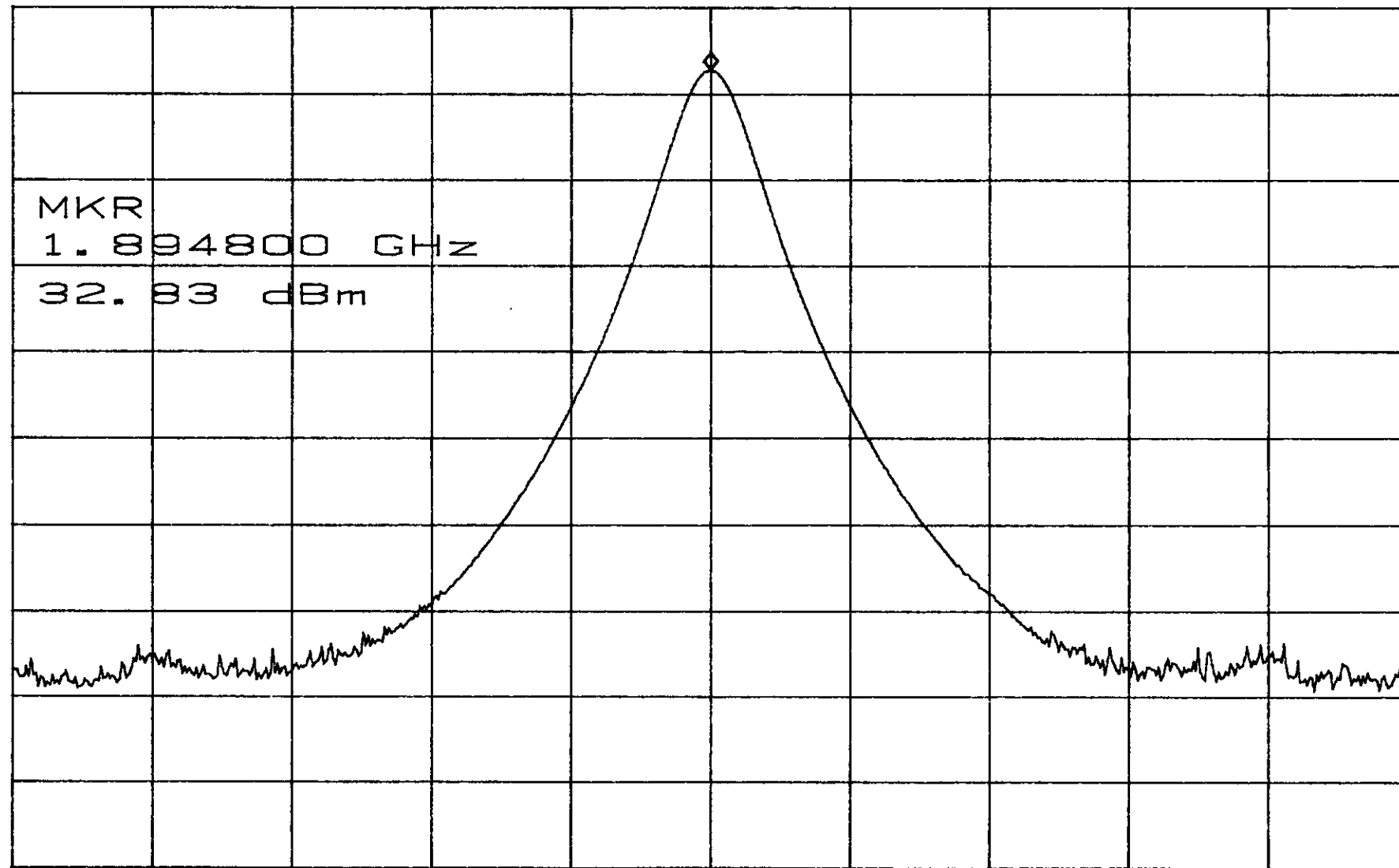
1.894800GHz

In/Out

D

R

MKR
1.894800 GHz
32.83 dBm



CENTER 1.894800GHz

SPAN 1.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms