4.4 Out of Band Conducted Emissions, FCC Rule 15.247(c):

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the following plots for out of band conducted emissions data:

Plot B4a.1 - B4a.6: Low Channel Emissions
Plot B4b.1 - B4b.6: Middle Channel Emissions
Plot B4c.1 - B4c.8: High Channel Emissions

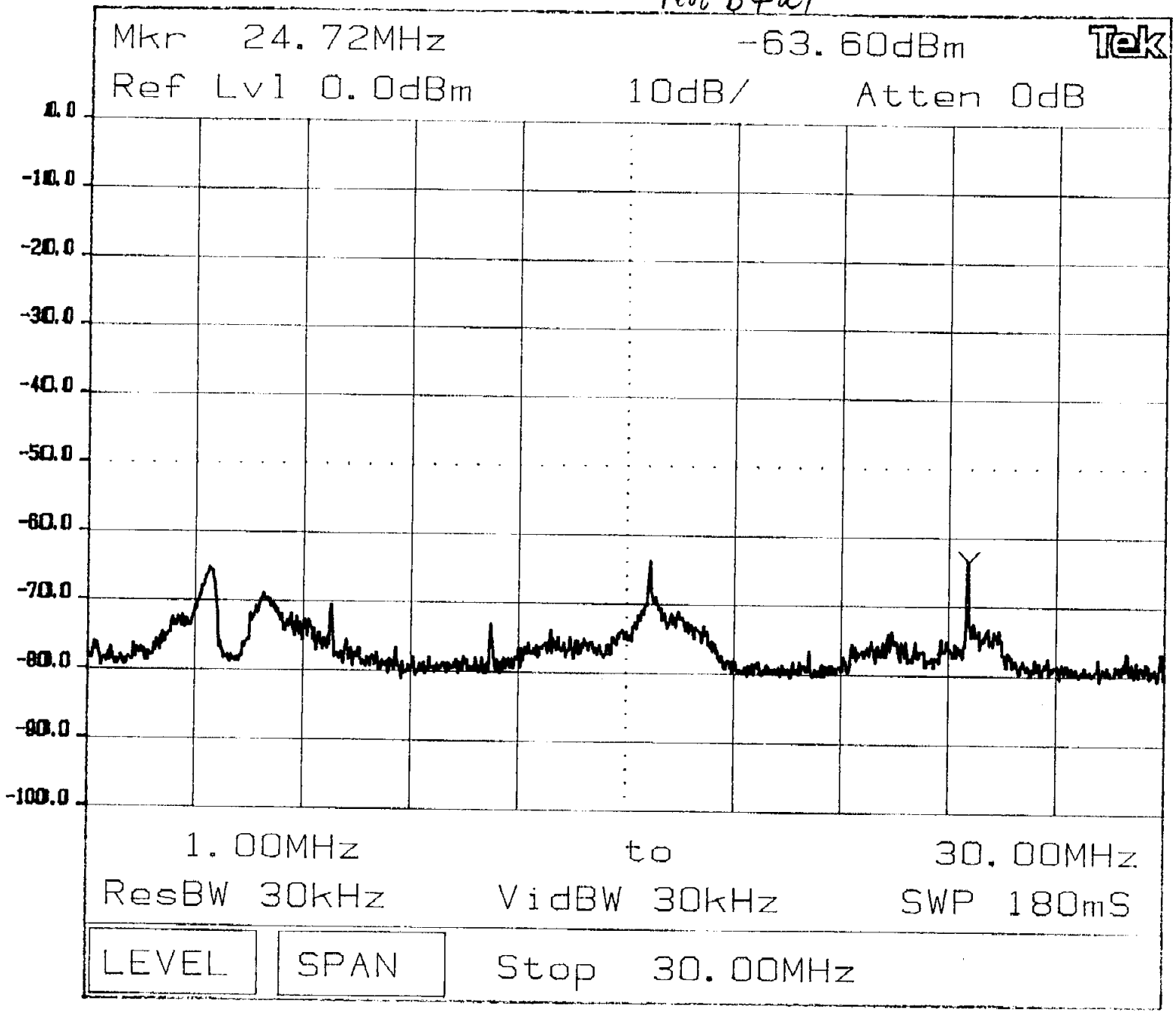
Plot H4a.1 - H4a.7: Low Channel Emissions
Plot H4b.1 - H4b.6: Middle Channel Emissions
Plot H4c.1 - H4c.6: High Channel Emissions

4.5 Out of Band Radiated Emissions (for emissions in 4. above that are less than 26 dB below carrier), FCC Rule 15.247(c):

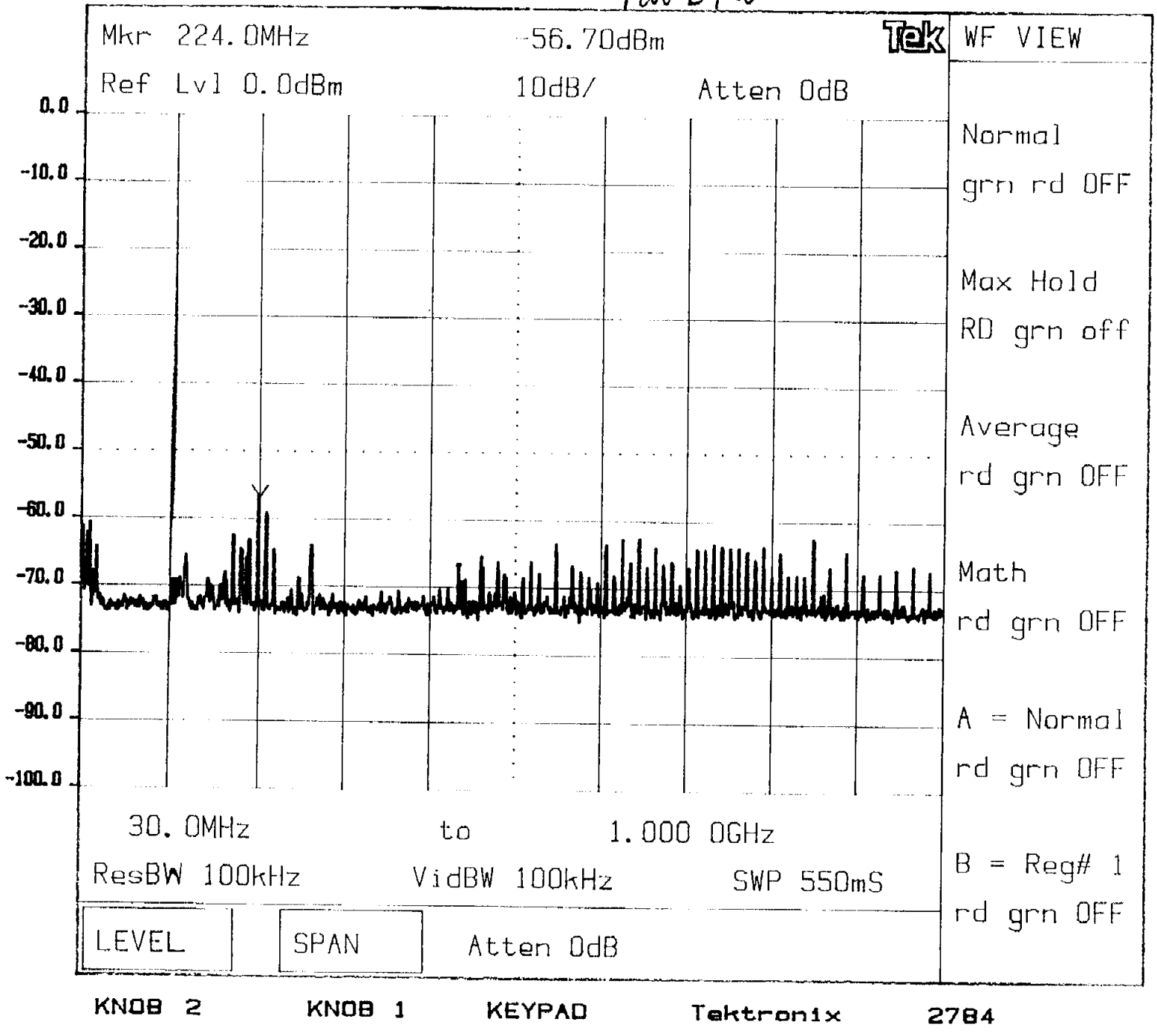
For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[x] Not required
[ ] See attached data sheet

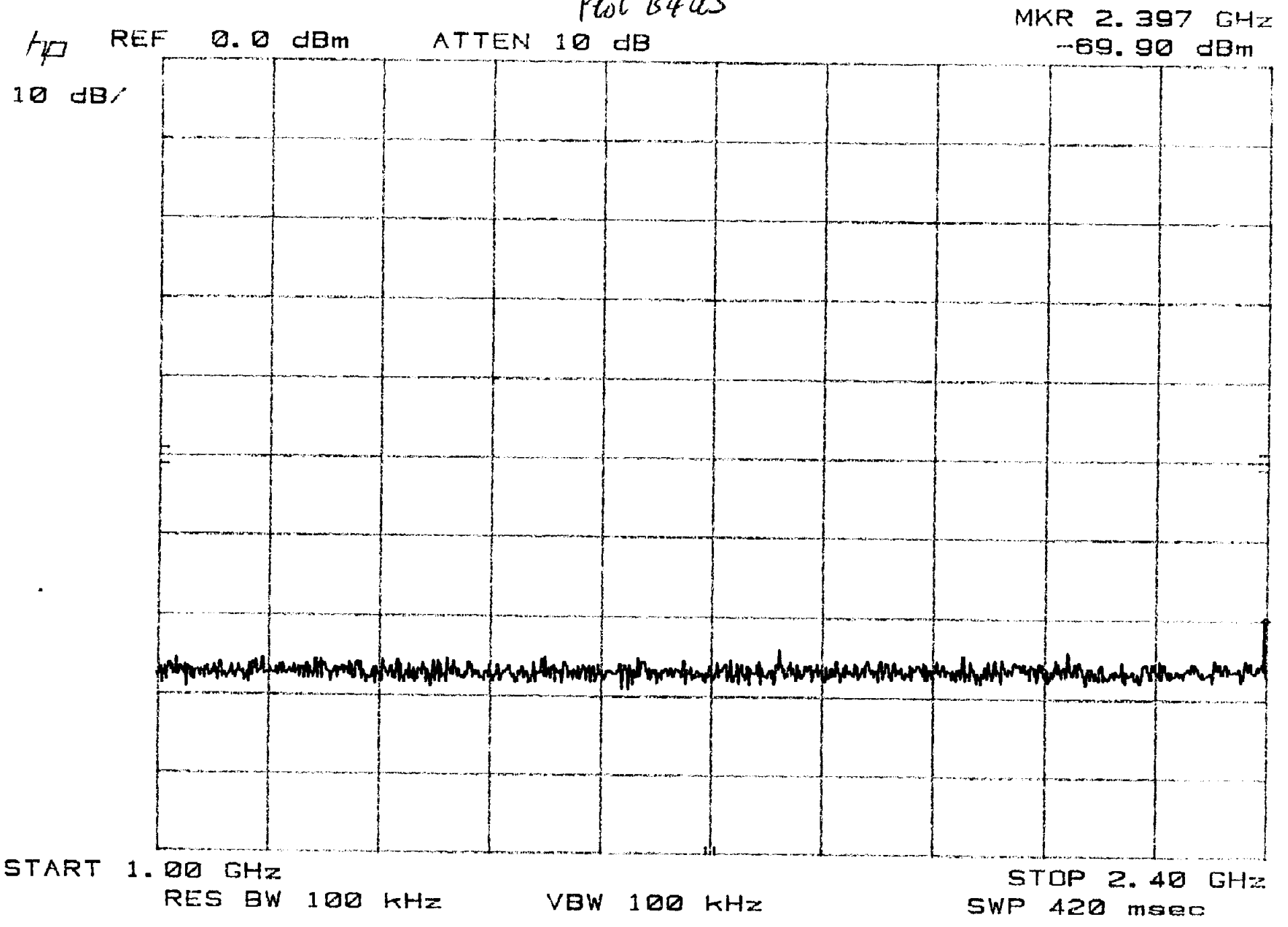
Plot B421


Mkr 24.72MHz
-63.60dBm
Tek
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
1.00MHz
to
30.00MHz
ResBW 30kHz
VidBW 30kHz
SWP 180mS
LEVEL
SPAN
Stop 30.00MHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

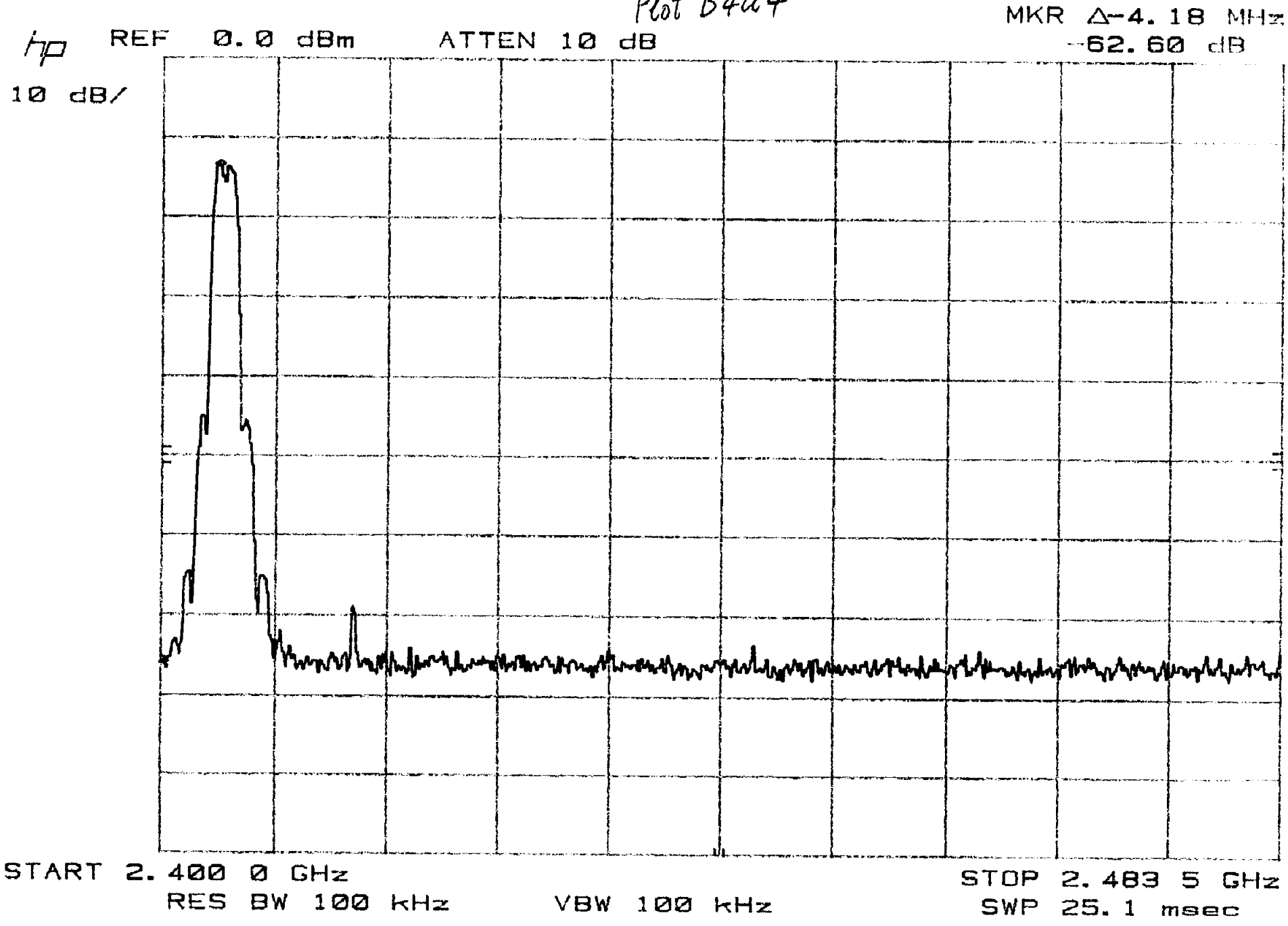
Plot B4a2


Mkr 224.0MHz
-56.70dBm
Tek
WF VIEW
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Normal
grn rd OFF
Max Hold
RD grn off
Average
rd grn OFF
Math
rd grn OFF
A = Normal
rd grn OFF
B = Reg# 1
rd grn OFF
30.0MHz
to
1.0000GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
LEVEL
SPAN
Atten 0dB
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

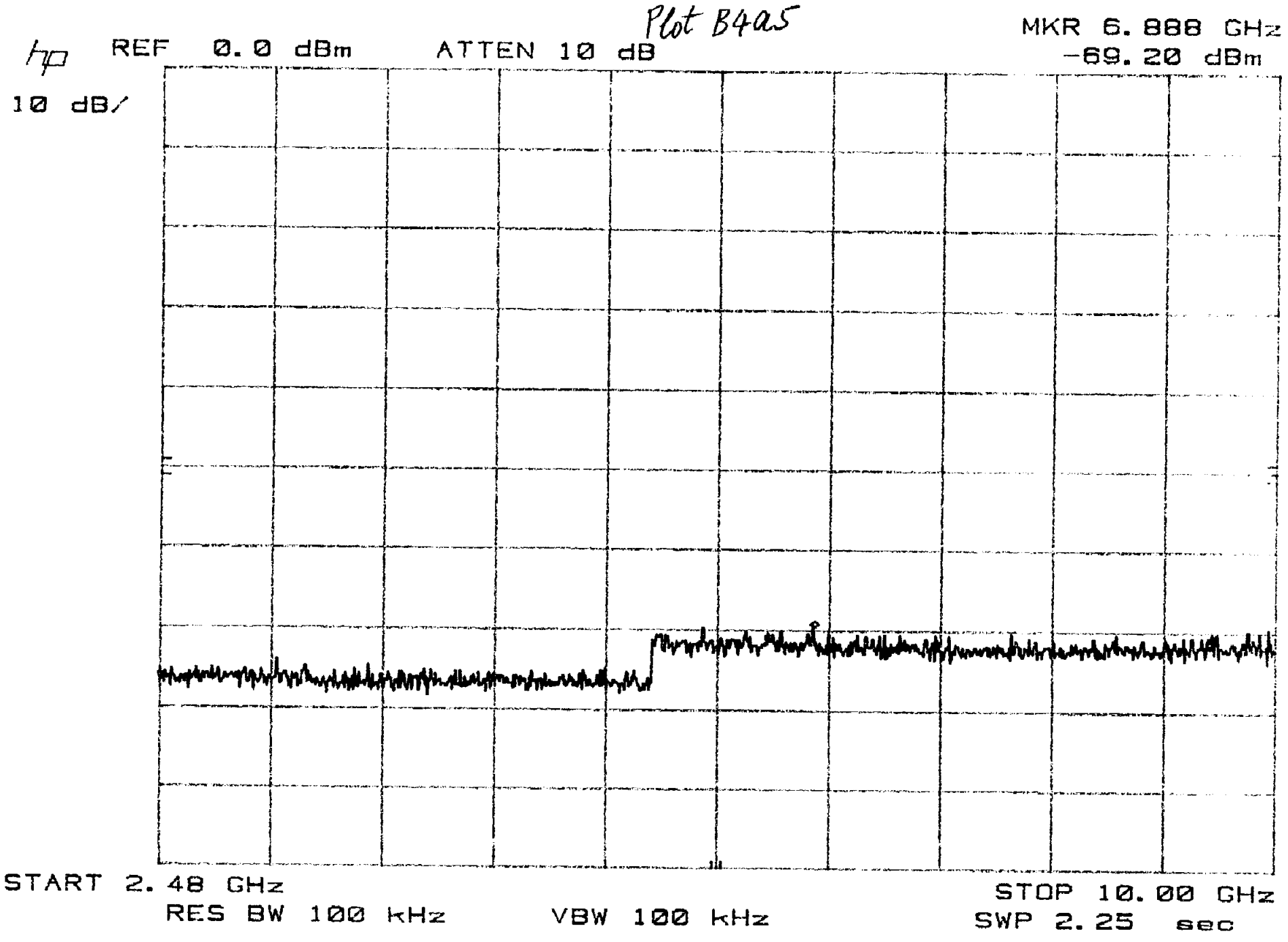
Plot B403


hp
REF 0.0 dBm
ATTEN 10 dB
MKR 2.397 GHz
-69.90 dBm
10 dB/
START 1.00 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.40 GHz
SWP 420 msec

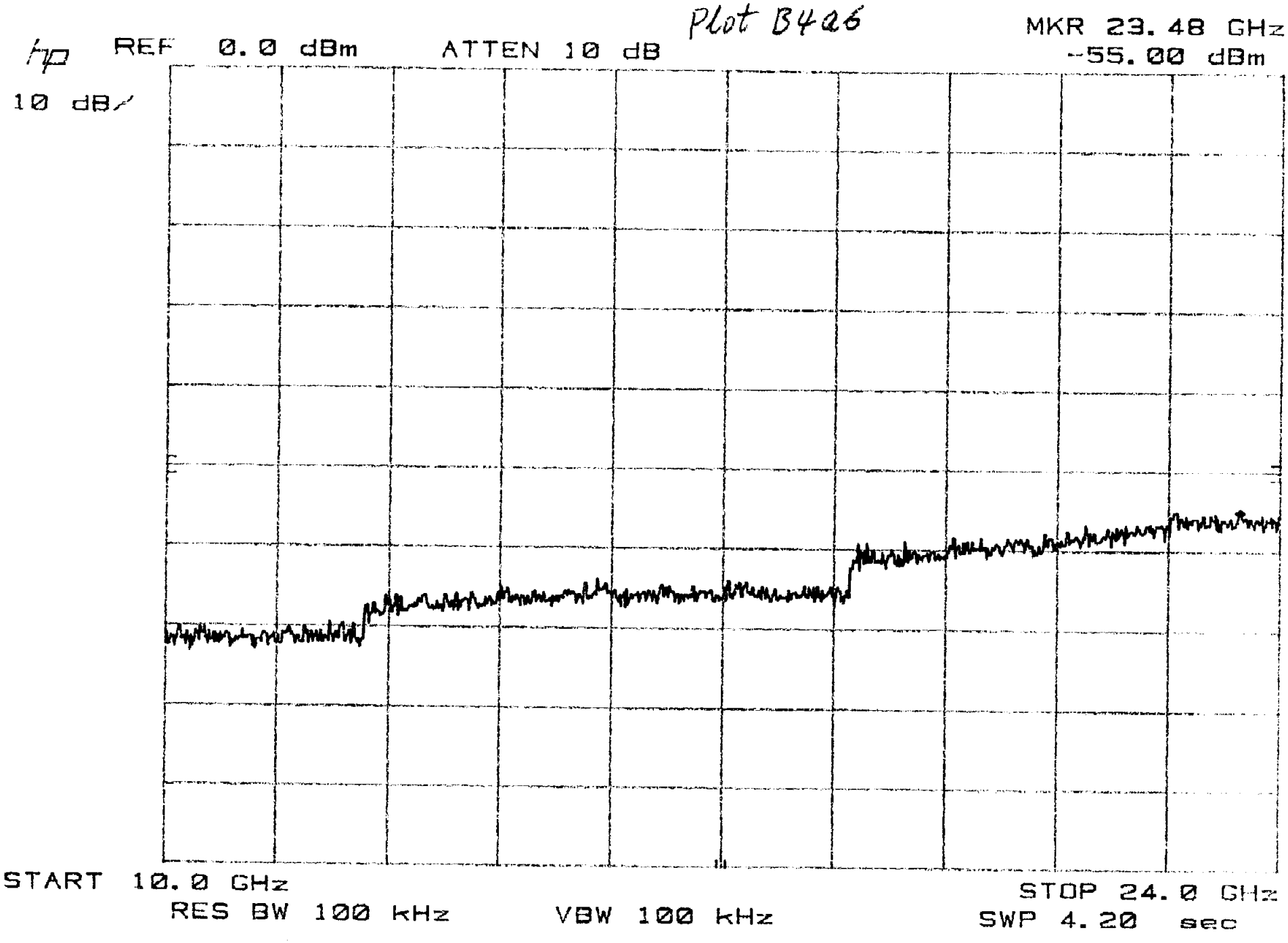
Plot B4a4


hp
REF 0.0 dBm
ATTEN 10 dB
MKR Δ-4.18 MHz
-62.60 dB
10 dB/
START 2.400 0 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.483 5 GHz
SWP 25.1 msec

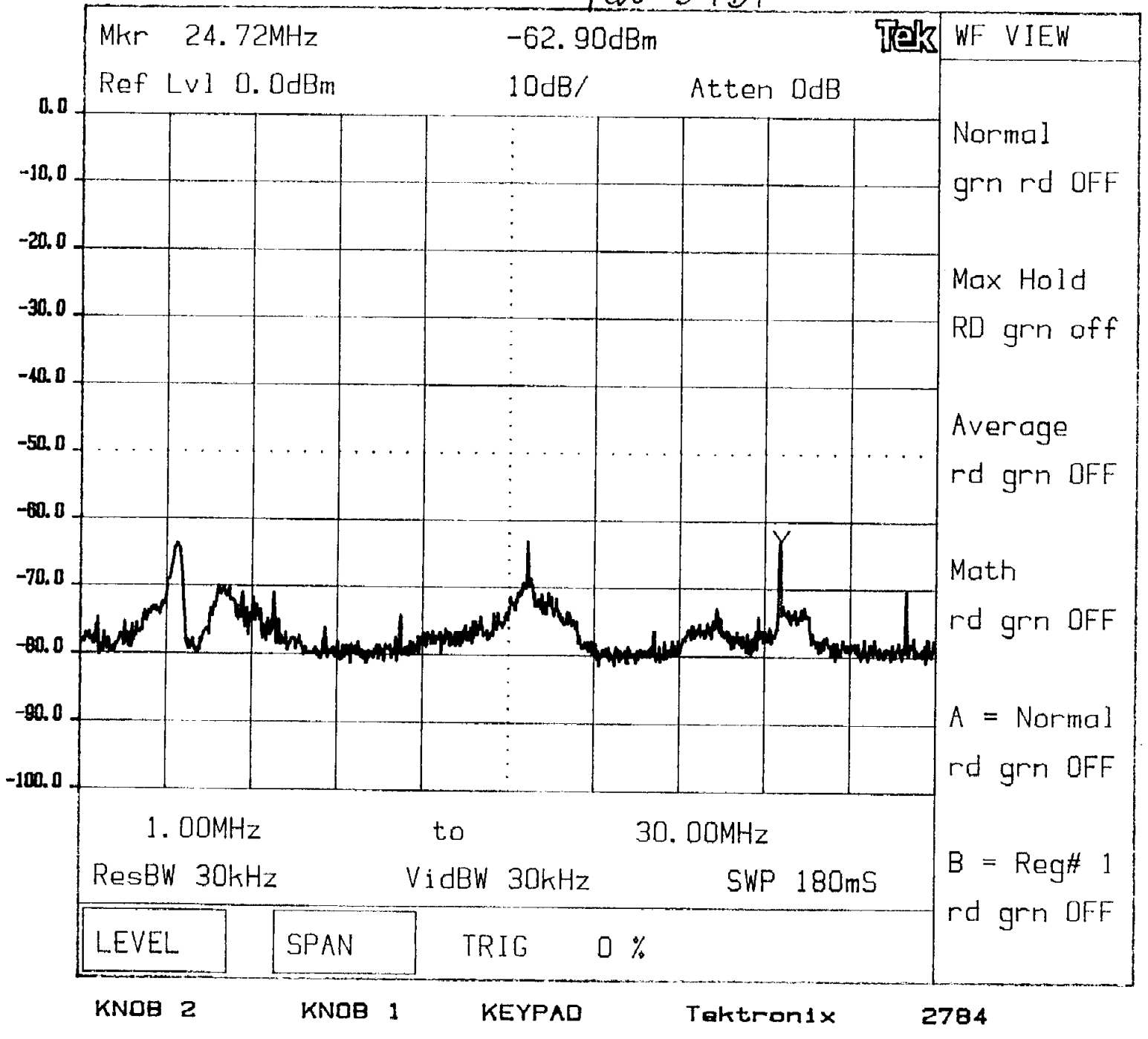
Plot B4a5


hp
REF 0.0 dBm
ATTEN 10 dB
MKR 6.888 GHz
-69.20 dBm
10 dB/
START 2.48 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 10.00 GHz
SWP 2.25 sec

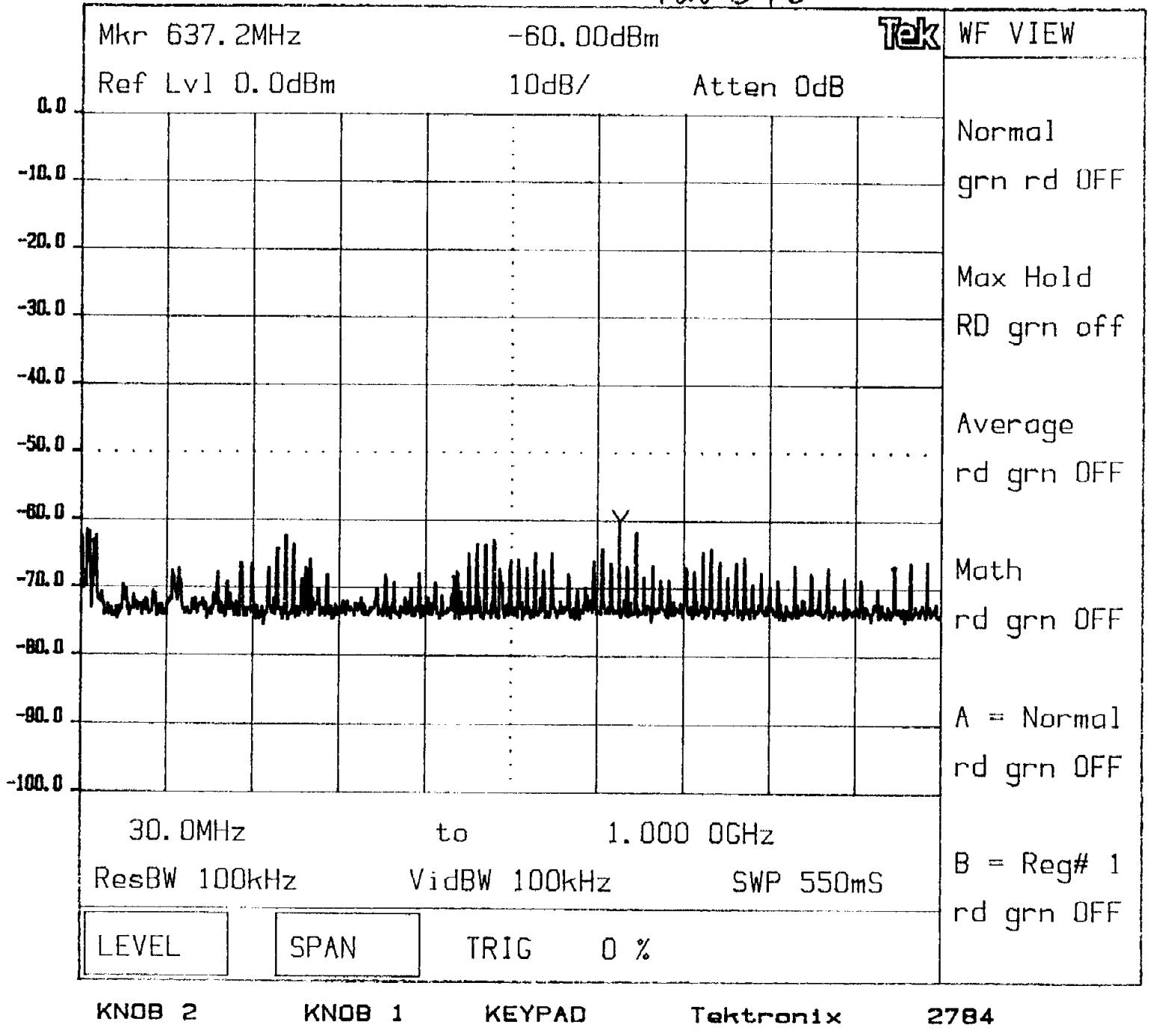
Plot B406


hp
REF 0.0 dBm
ATTEN 10 dB
MKR 23.48 GHz
-55.00 dBm
10 dB/
START 10.0 GHz
STOP 24.0 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 4.20 sec

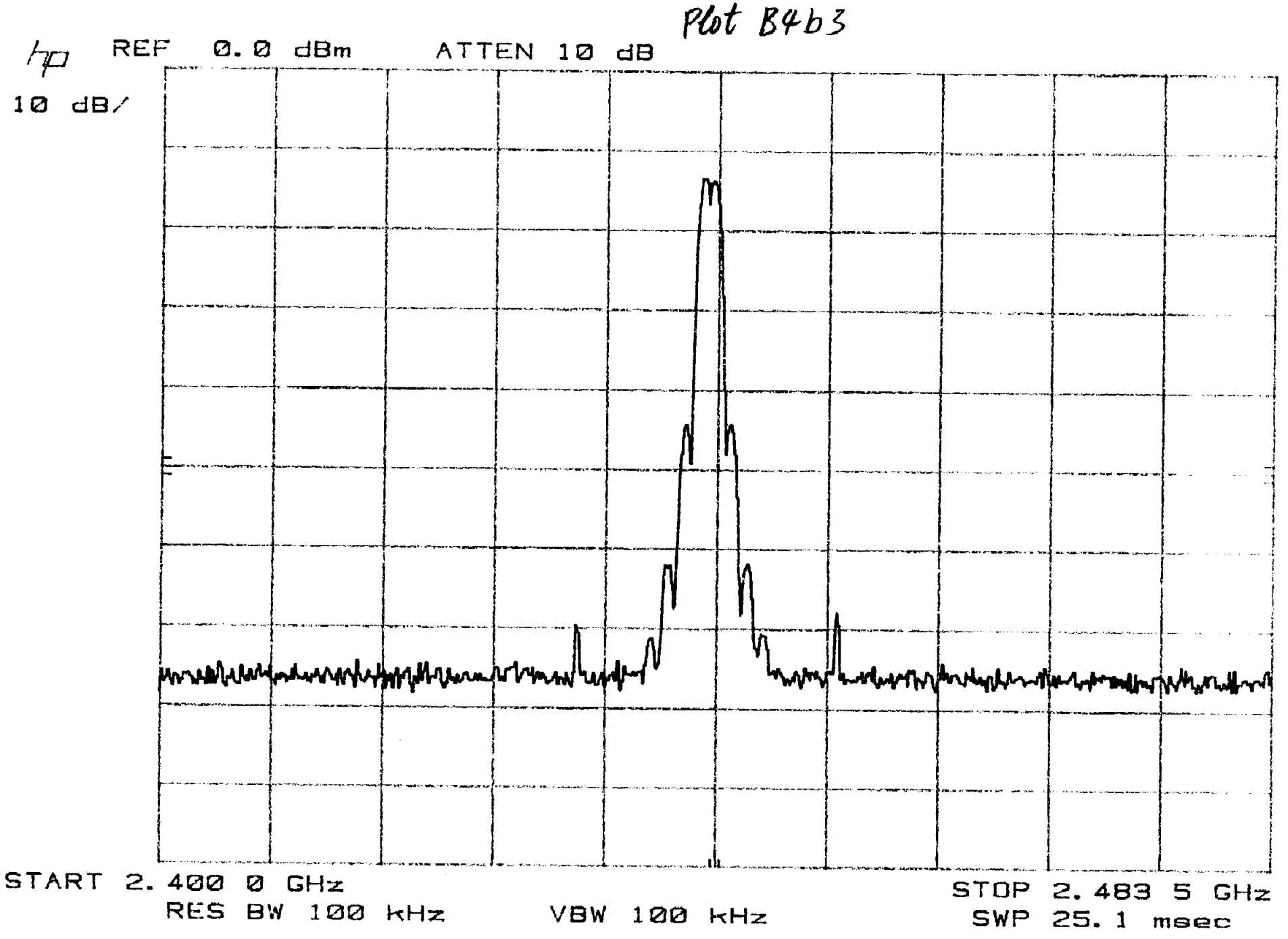
Plot B4b1


Mkr 24.72MHz
-62.90dBm
Tek
WF VIEW
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Normal
grn rd OFF
Max Hold
RD grn off
Average
rd grn OFF
Math
rd grn OFF
A = Normal
rd grn OFF
B = Reg# 1
rd grn OFF
1.00MHz
to
30.00MHz
ResBW 30kHz
VidBW 30kHz
SWP 180mS
LEVEL
SPAN
TRIG 0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

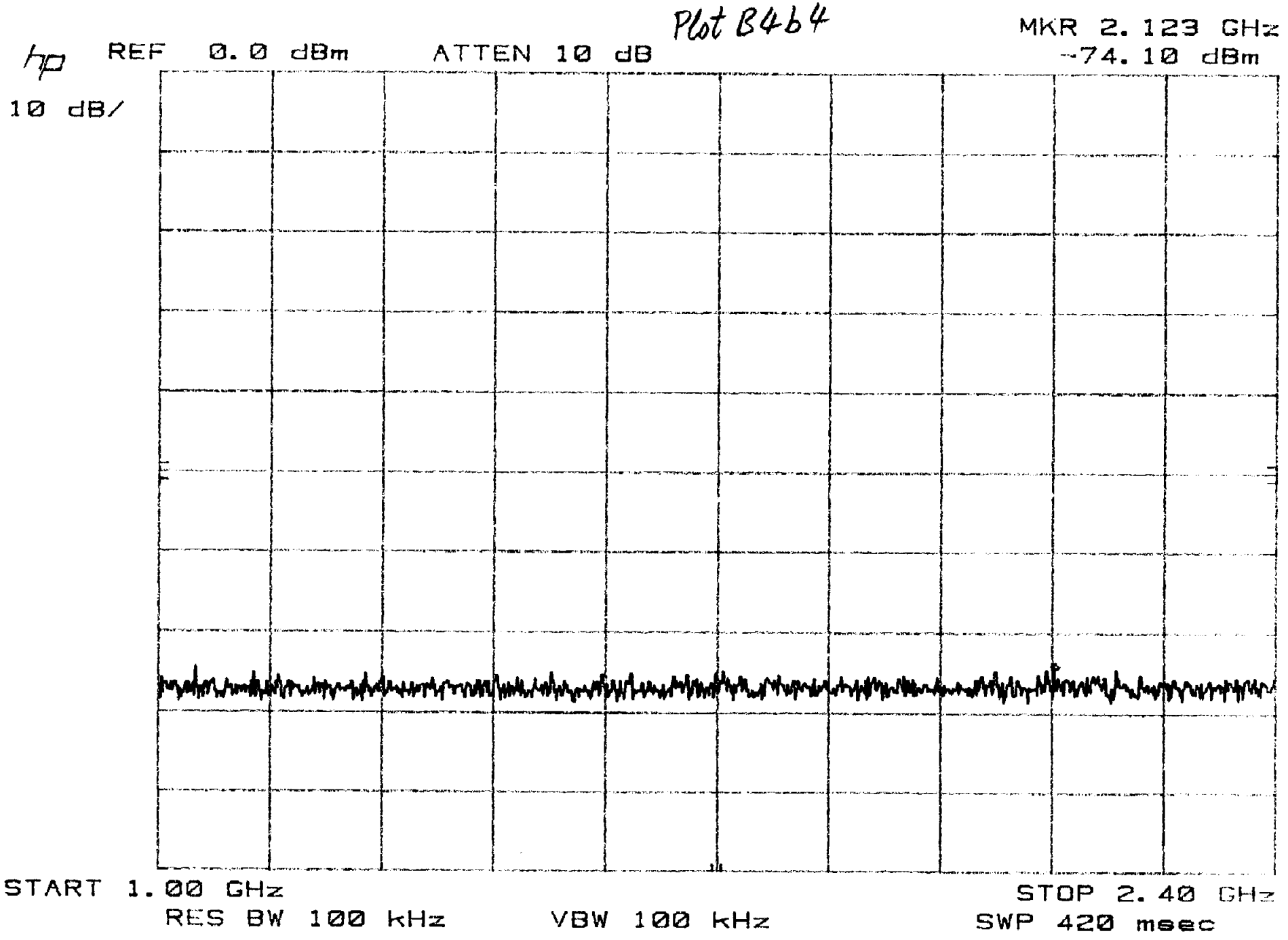
Plot 1346z


Mkr 637.2MHz
-60.00dBm
Tek
WF VIEW
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Normal
grn rd OFF
Max Hold
RD grn off
Average
rd grn OFF
Math
rd grn OFF
A = Normal
rd grn OFF
B = Reg# 1
rd grn OFF
30.0MHz
to
1.0000GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
LEVEL
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

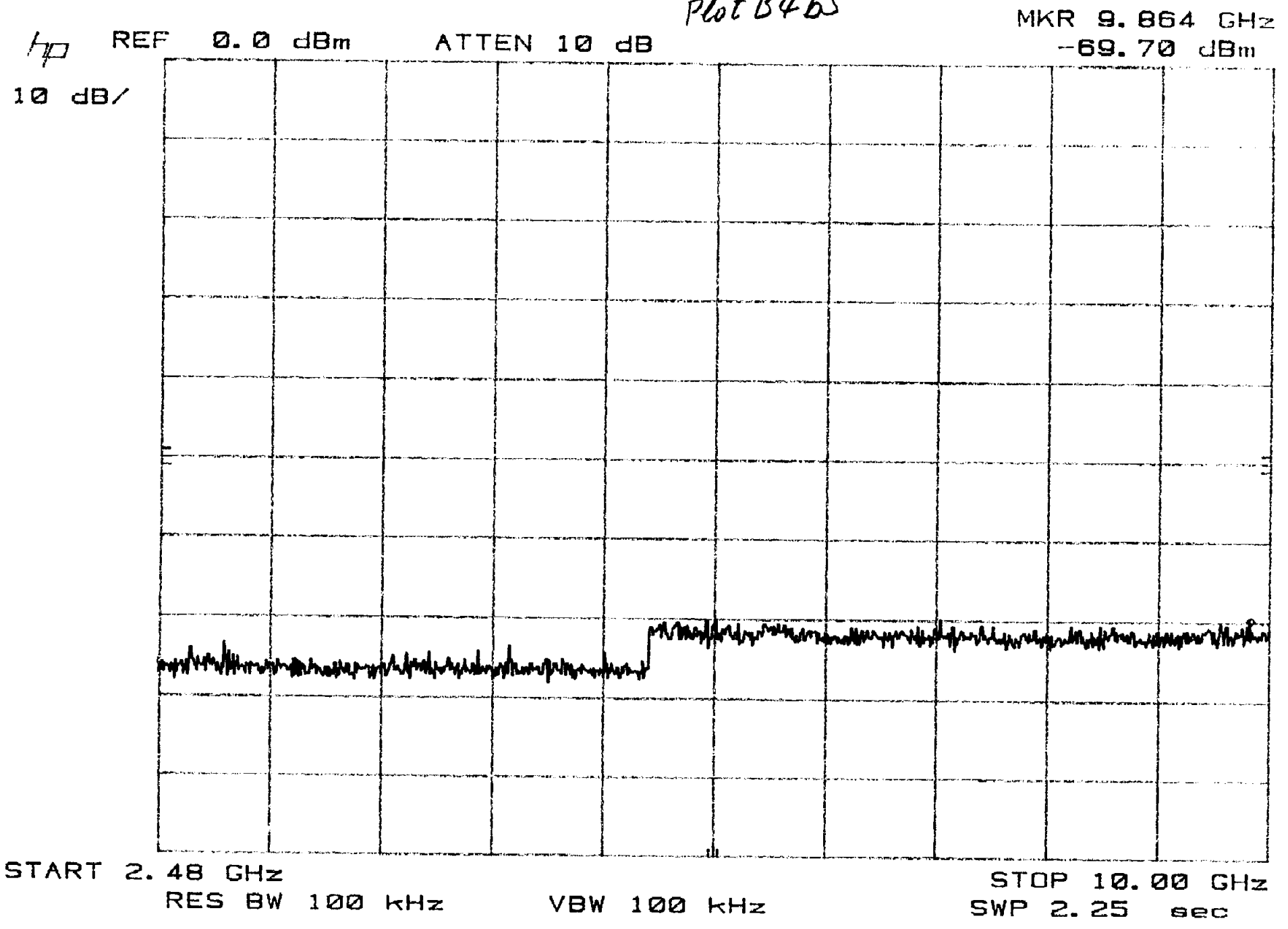
Plot B4b3


REF 0.0 dBm
ATTEN 10 dB
10 dB/
START 2.400 0 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.483 5 GHz
SWP 25.1 msec

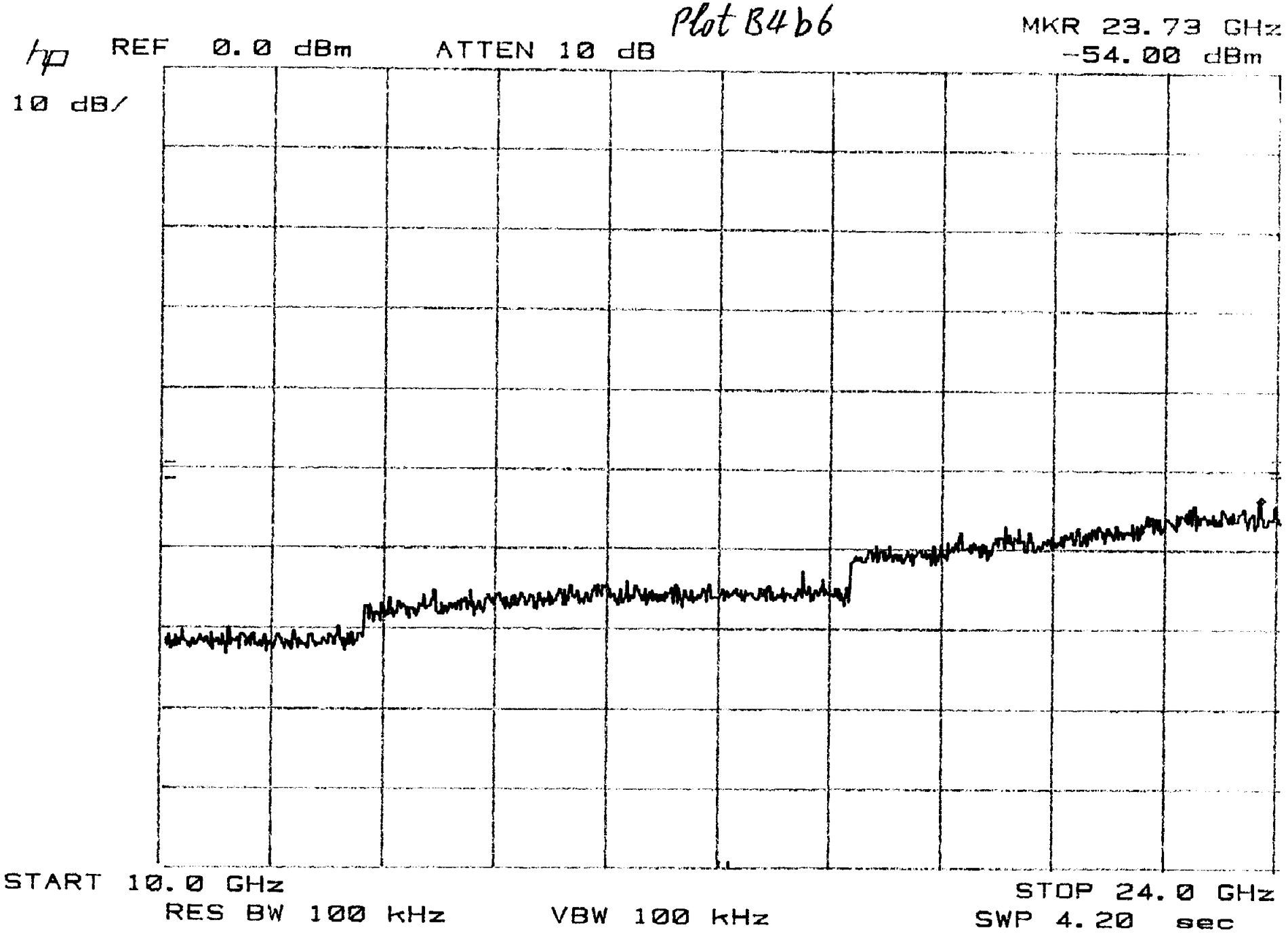
Plot B464


hp
REF 0.0 dBm
ATTEN 10 dB
MKR 2.123 GHz
-74.10 dBm
10 dB/
START 1.00 GHz
STOP 2.40 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 420 msec

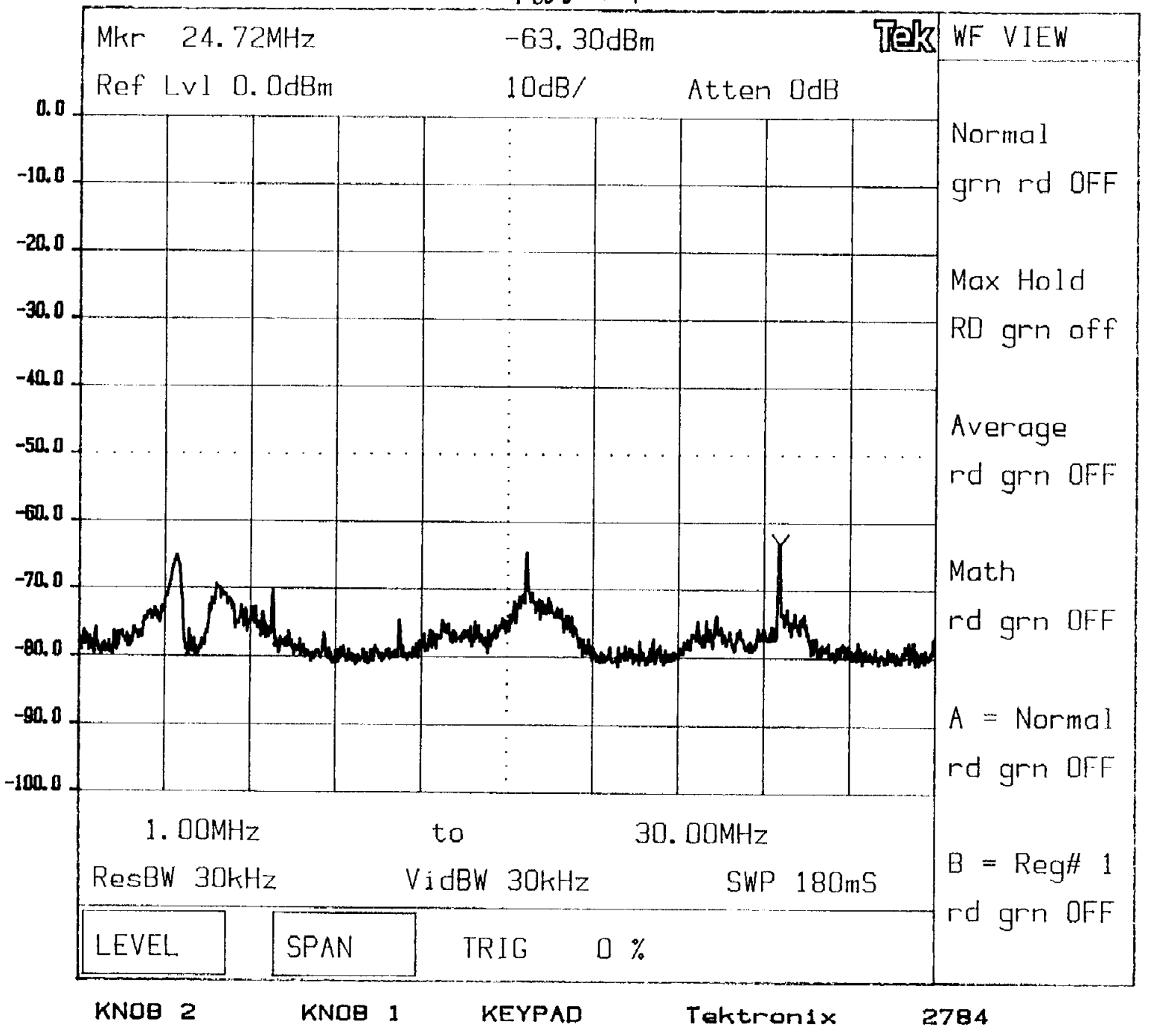
Plot B465


REF 0.0 dBm
ATTEN 10 dB
MKR 9.864 GHz
-69.70 dBm
10 dB/
START 2.48 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 10.00 GHz
SWP 2.25 sec

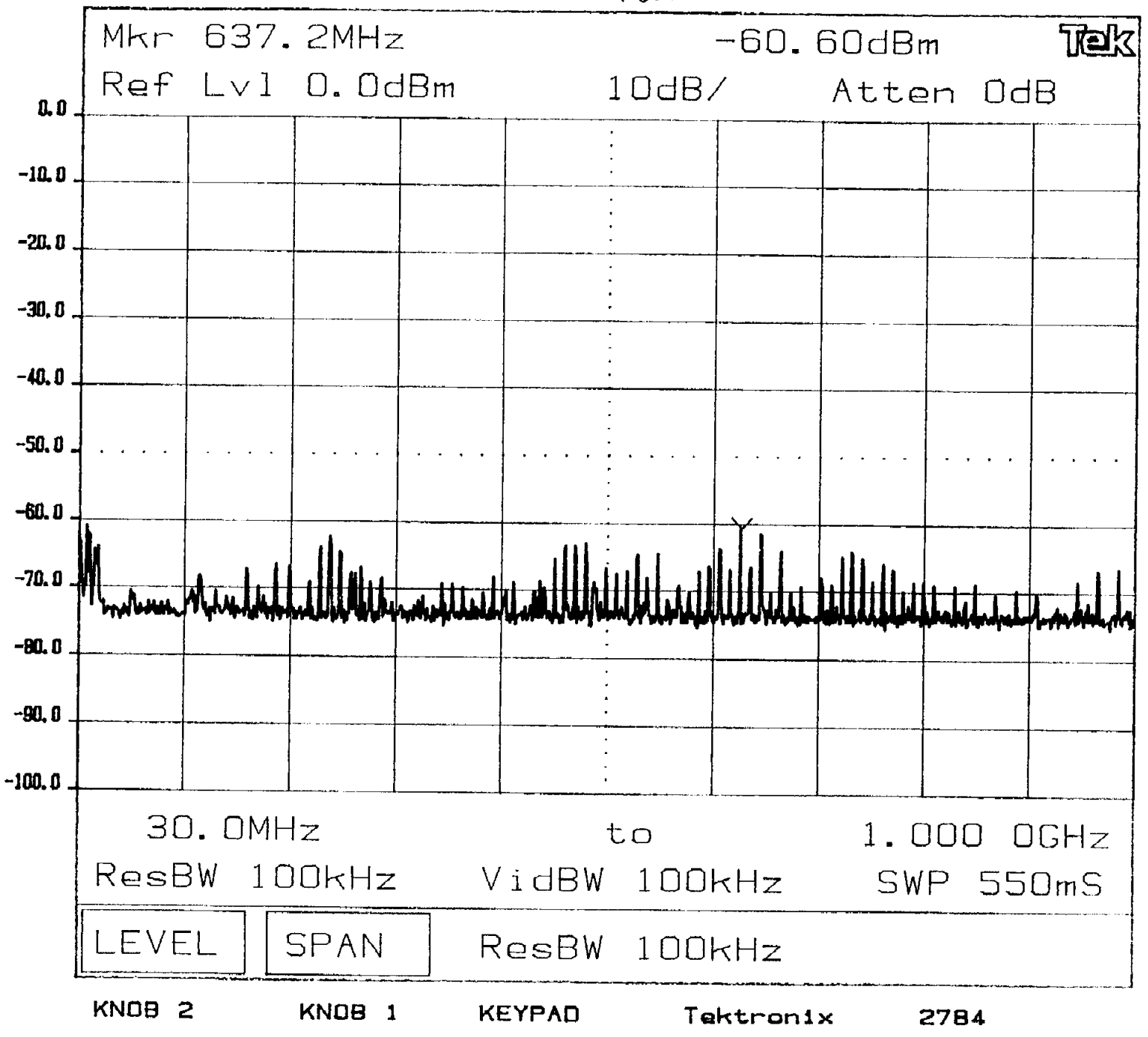
Plot B4b6


REF 0.0 dBm
ATTEN 10 dB
MKR 23.73 GHz
-54.00 dBm
10 dB/
START 10.0 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 24.0 GHz
SWP 4.20 sec

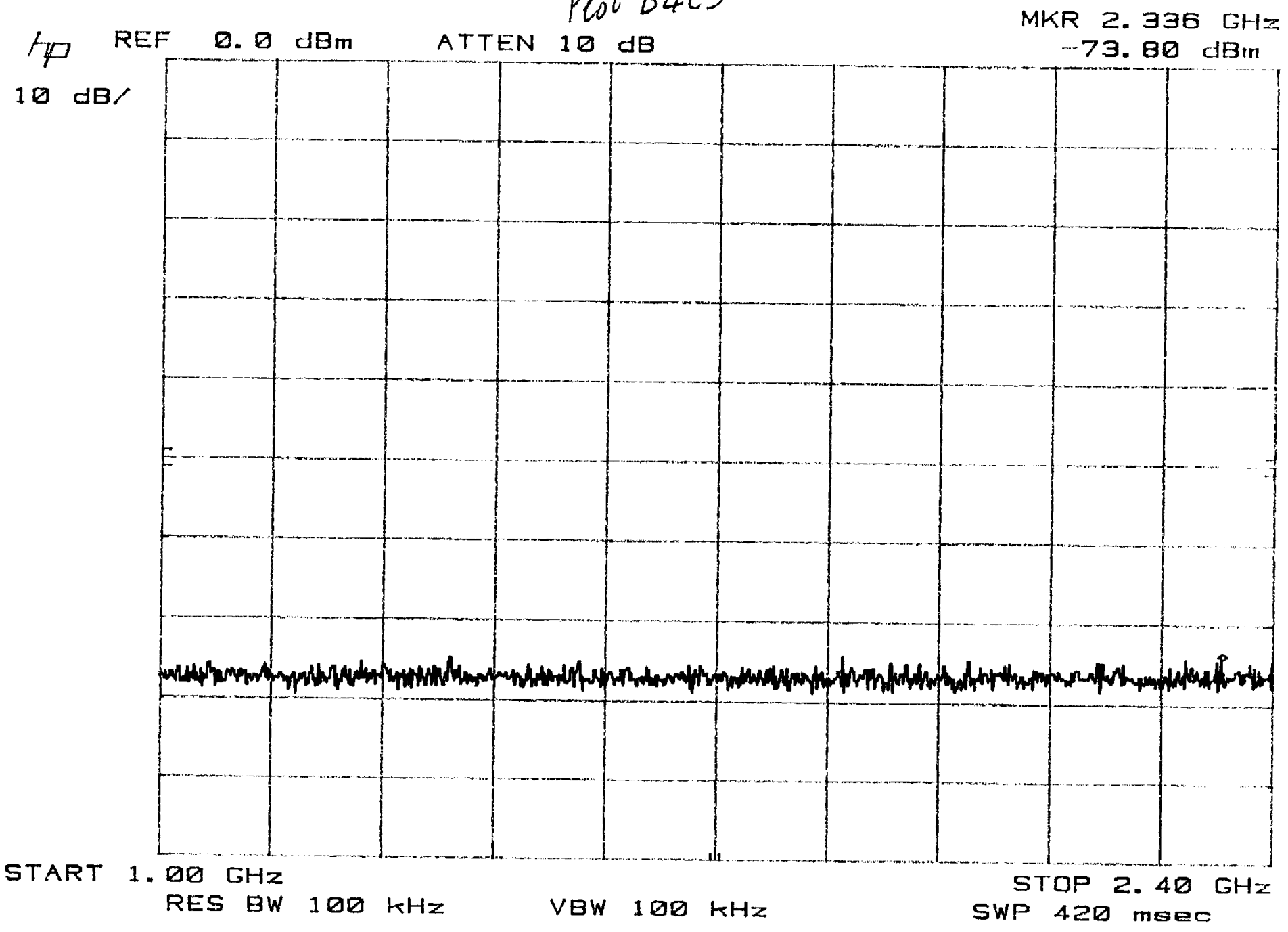
Plot B4C1


Mkr 24.72MHz
-63.30dBm
Tek
WF VIEW
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Normal
grn rd OFF
Max Hold
RD grn off
Average
rd grn OFF
Math
rd grn OFF
A = Normal
rd grn OFF
B = Reg# 1
rd grn OFF
1.00MHz
to
30.00MHz
ResBW 30kHz
VidBW 30kHz
SWP 180mS
LEVEL
SPAN
TRIG 0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

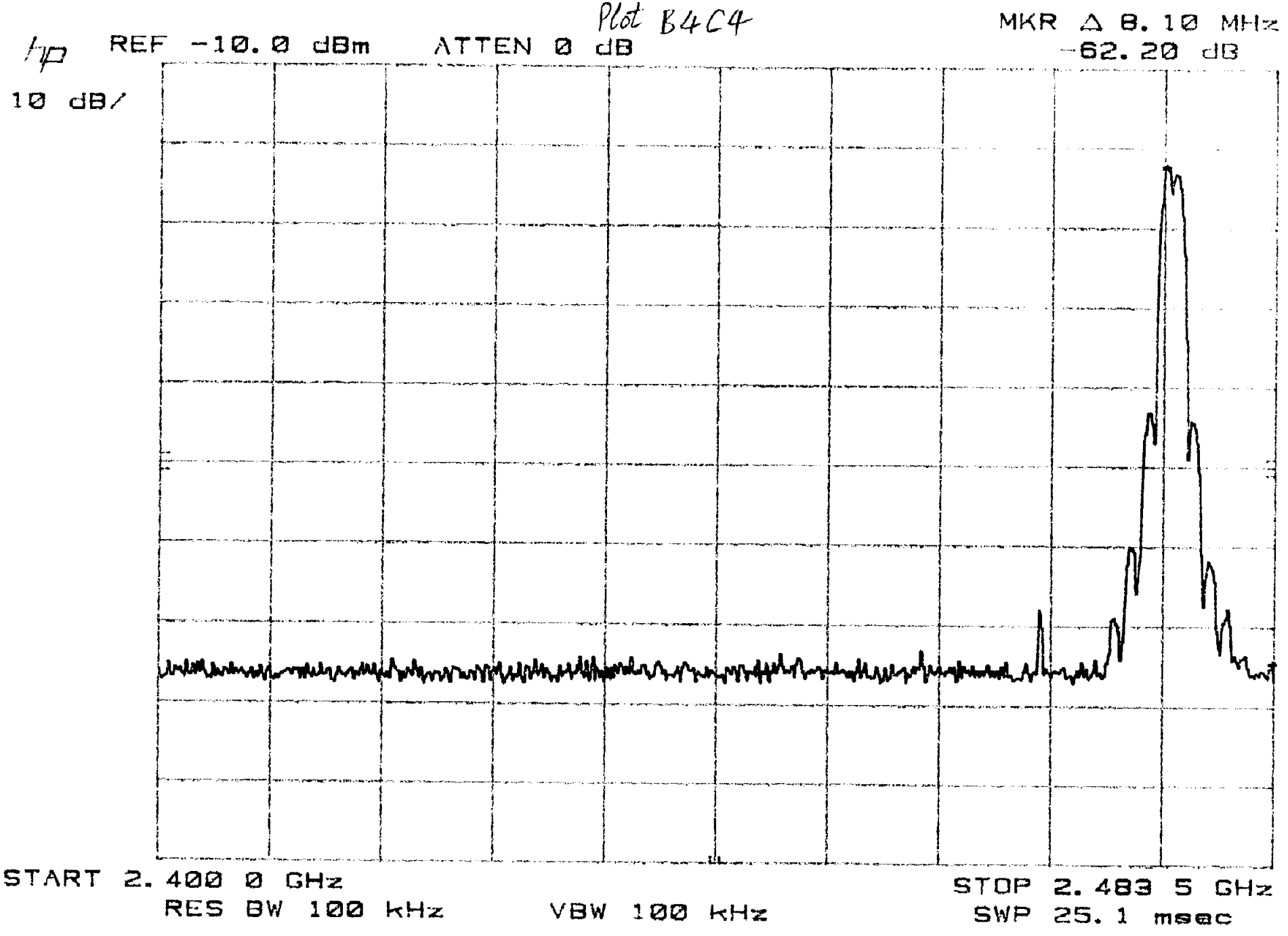
Plot B4C 2


Mkr 637.2MHz
-60.60dBm
Tek
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
30.0MHz
to
1.000 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
LEVEL
SPAN
ResBW 100kHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

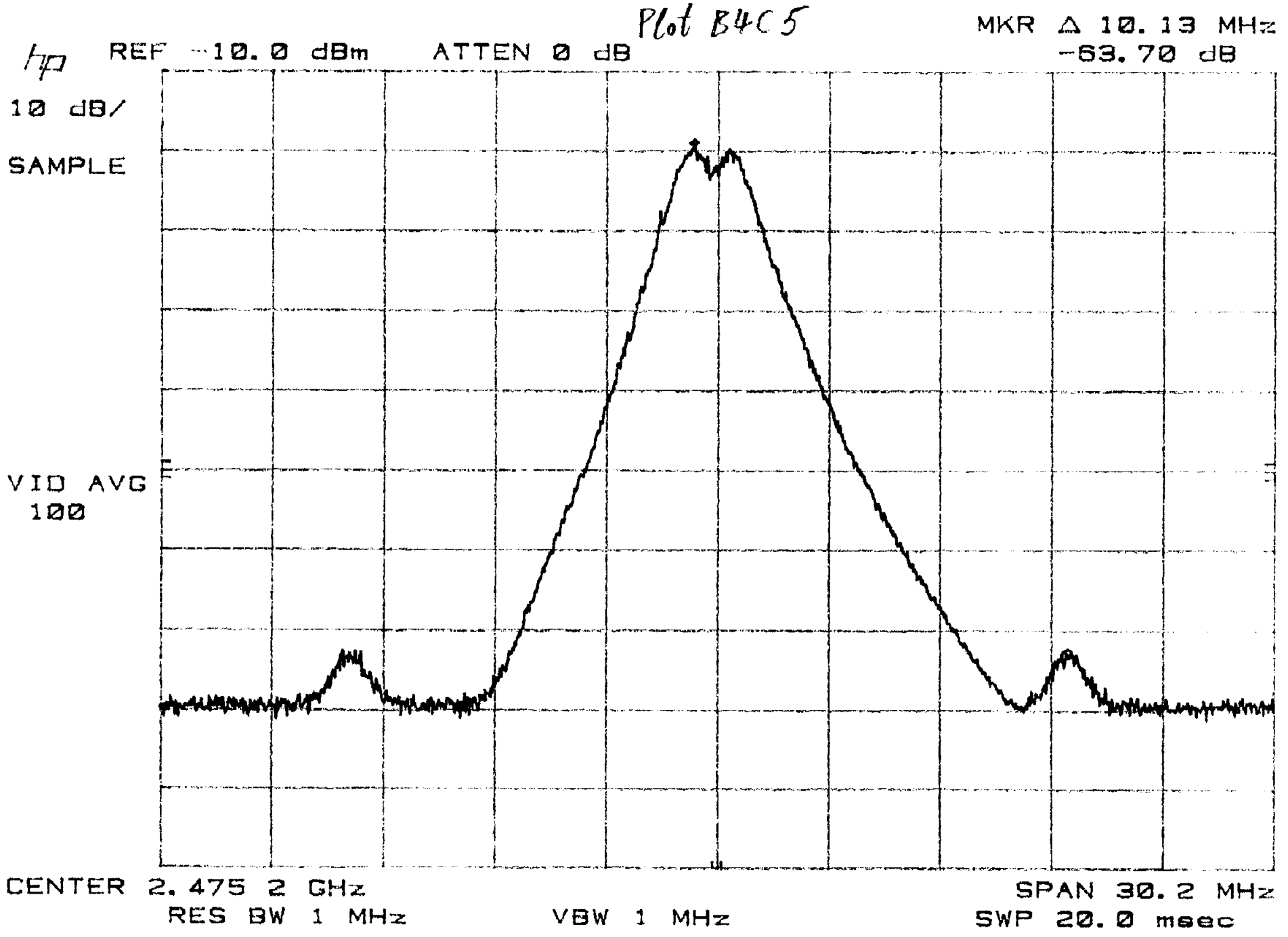
Plot B4C3


hp
REF 0.0 dBm
ATTEN 10 dB
MKR 2.336 GHz
-73.80 dBm
10 dB/
START 1.00 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.40 GHz
SWP 420 msec

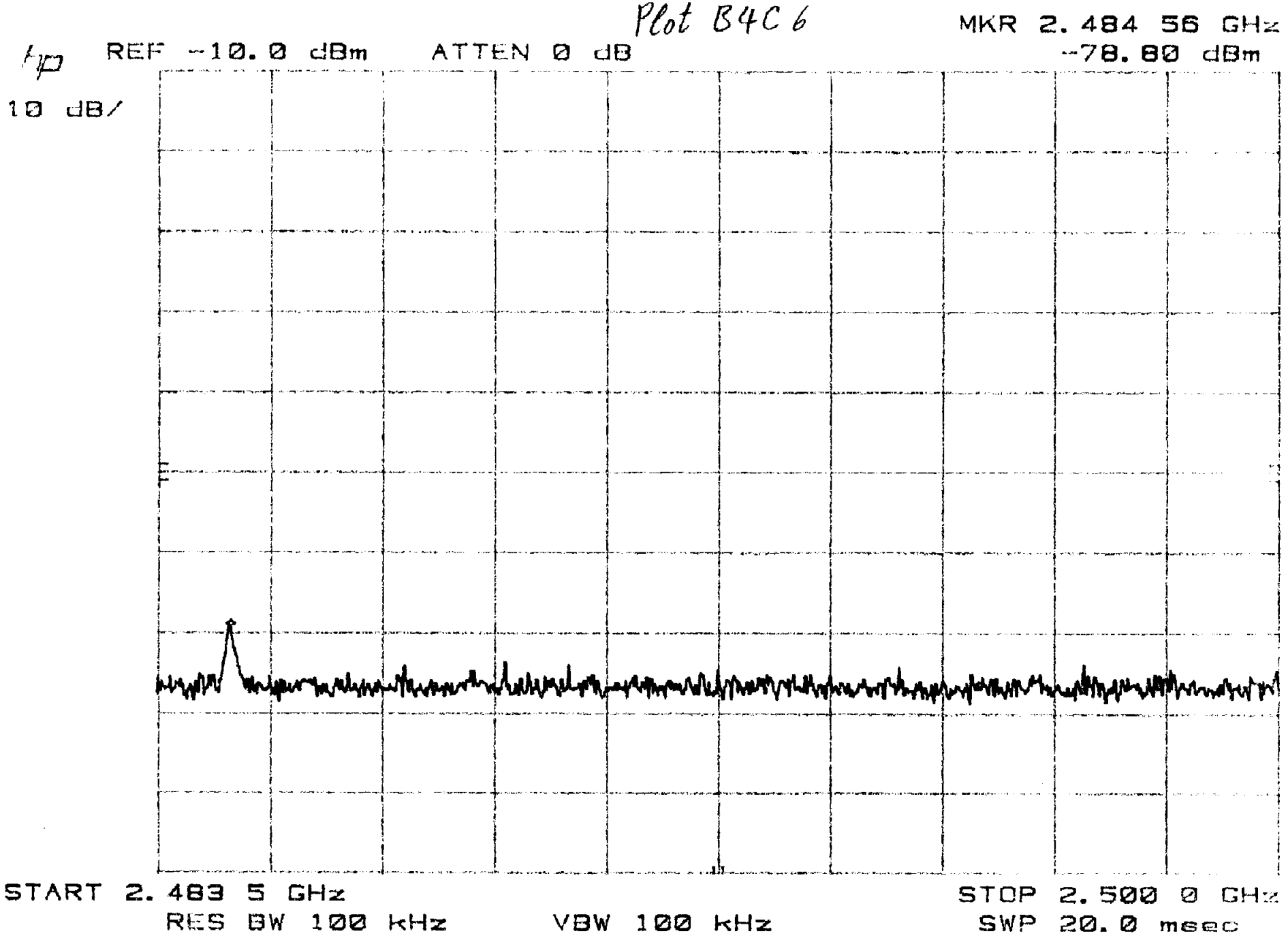
Plot B4C4


hp
REF -10.0 dBm
ATTEN 0 dB
MKR Δ 8.10 MHz
-62.20 dB
10 dB/
START 2.400 0 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.483 5 GHz
SWP 25.1 msec

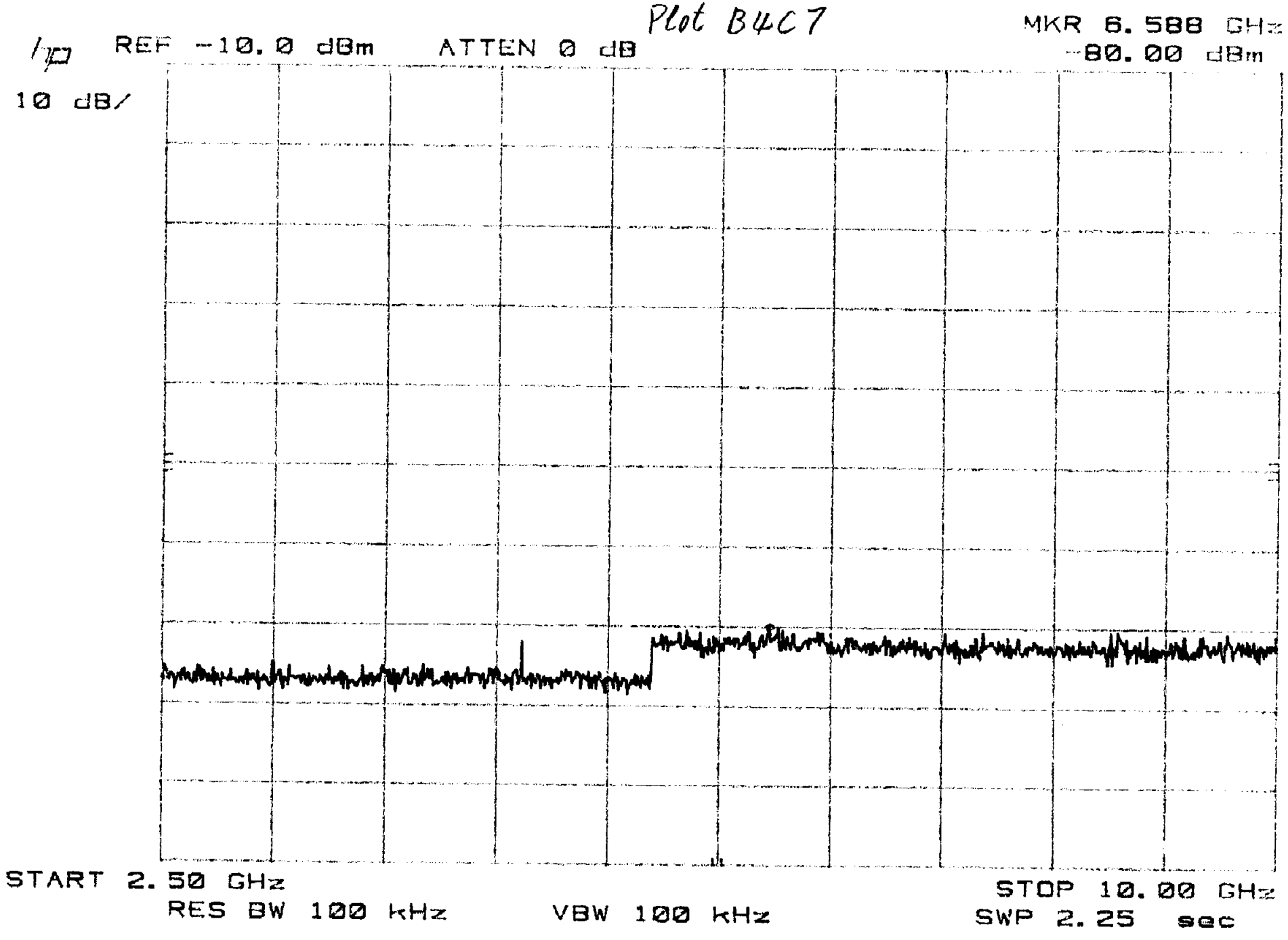
Plot B4C 5


hp
REF -10.0 dBm
ATTEN 0 dB
MKR Δ 10.13 MHz
-63.70 dB
10 dB/
SAMPLE
VID AVG
100
CENTER 2.475 2 GHz
SPAN 30.2 MHz
RES BW 1 MHz
VBW 1 MHz
SWP 20.0 msec

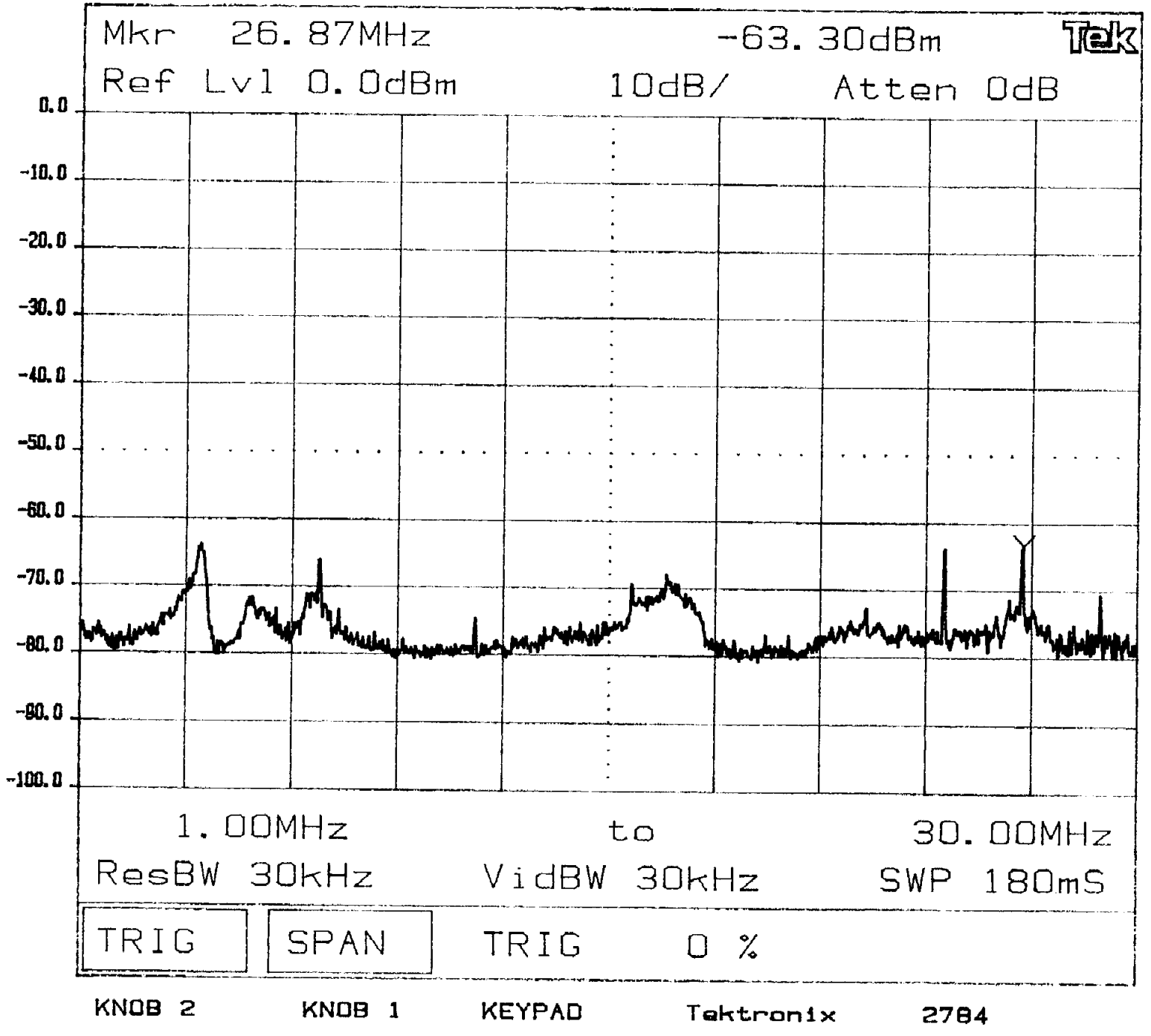
Plot B4C 6


hp
REF -10.0 dBm
ATTEN 0 dB
MKR 2.484 56 GHz
-78.80 dBm
10 dB/
START 2.483 5 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.500 0 GHz
SWP 20.0 msec

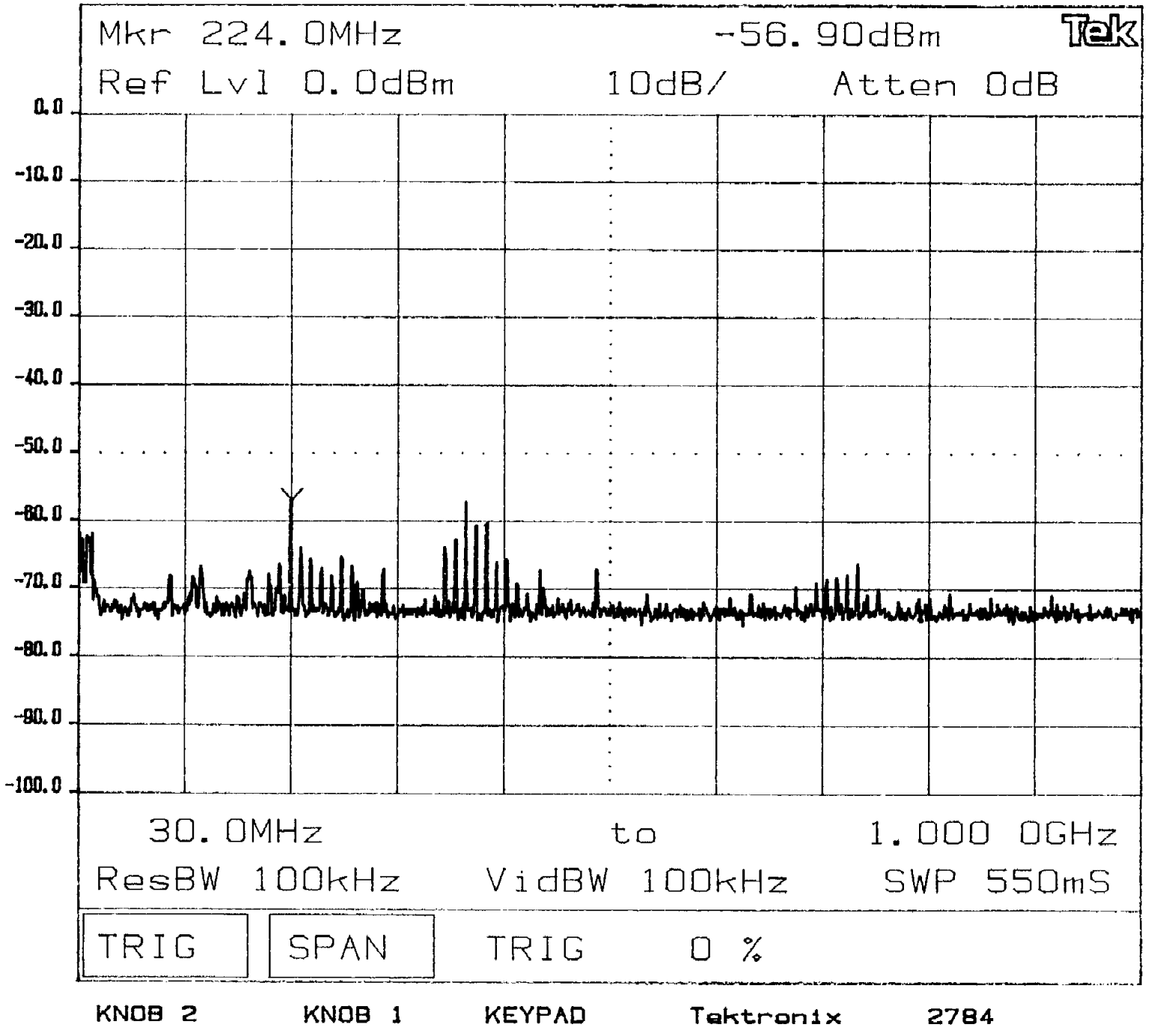
Plot B4C7


1Rb
REF -10.0 dBm
ATTEN 0 dB
MKR 6.588 GHz
-80.00 dBm
10 dB/
START 2.50 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 10.00 GHz
SWP 2.25 sec

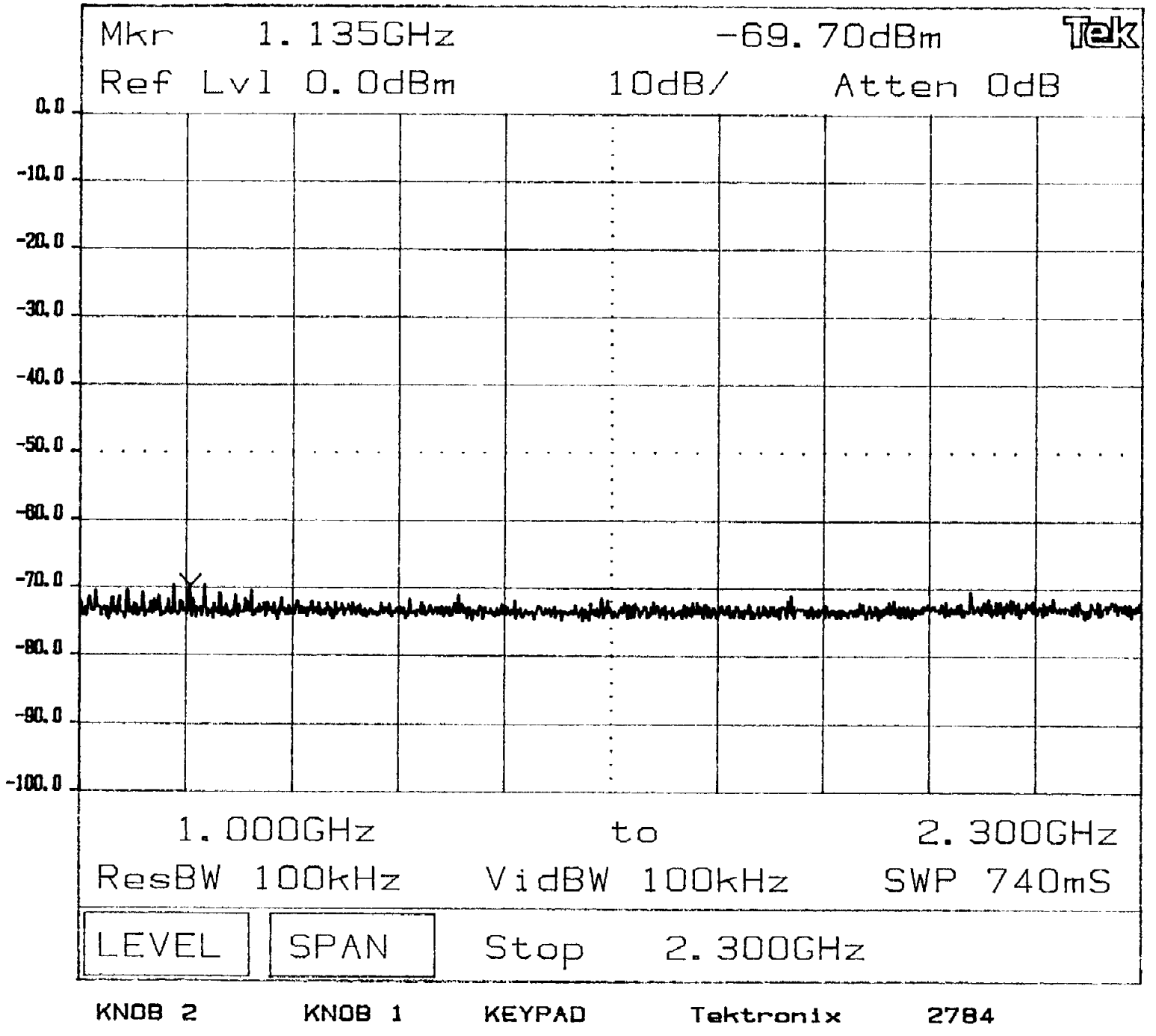
Plot H4a1


Mkr 26.87MHz
-63.30dBm
Tek
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
1.00MHz
to
30.00MHz
ResBW 30kHz
VidBW 30kHz
SWP 180mS
TRIG
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

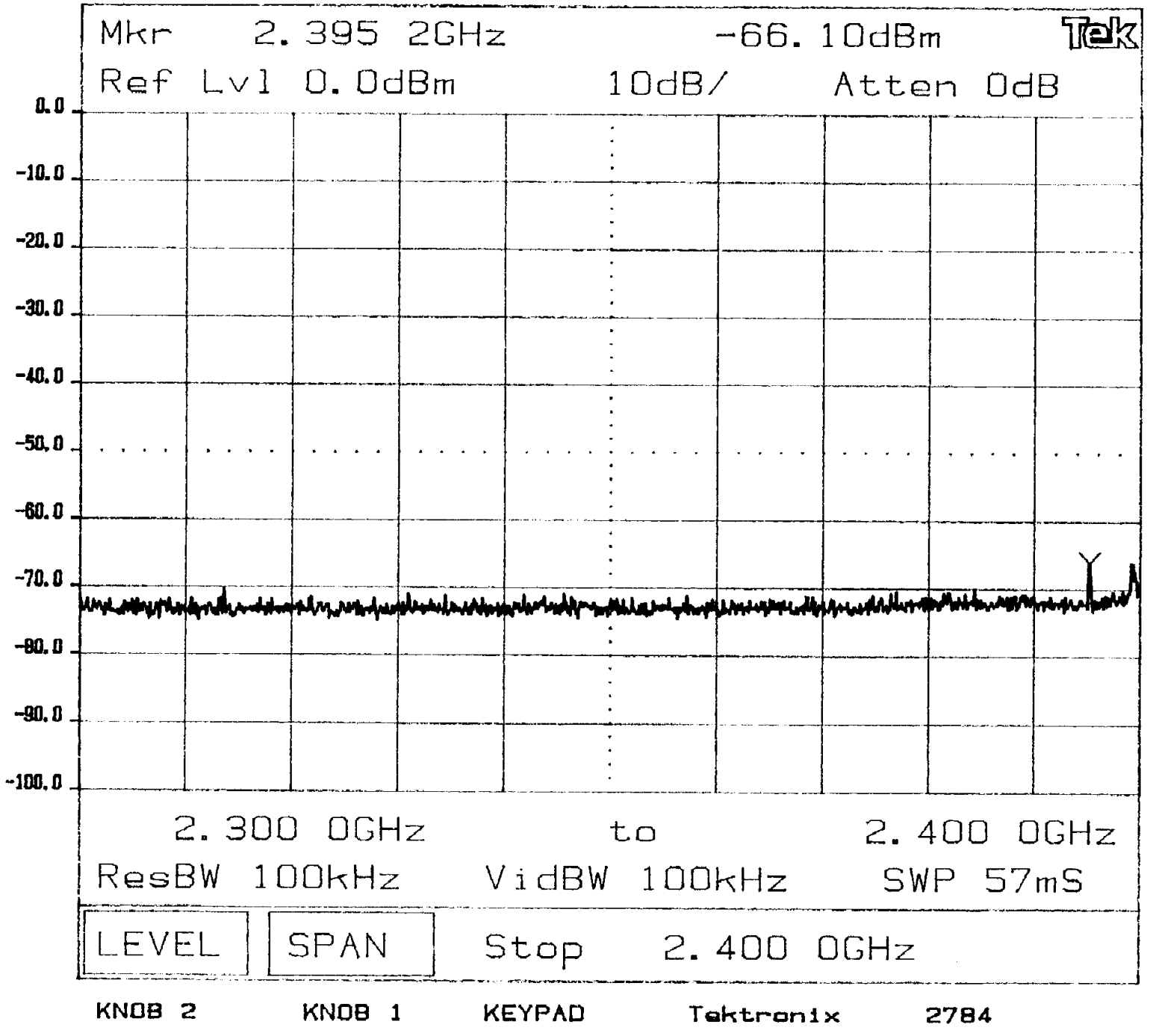
Plot H4a2

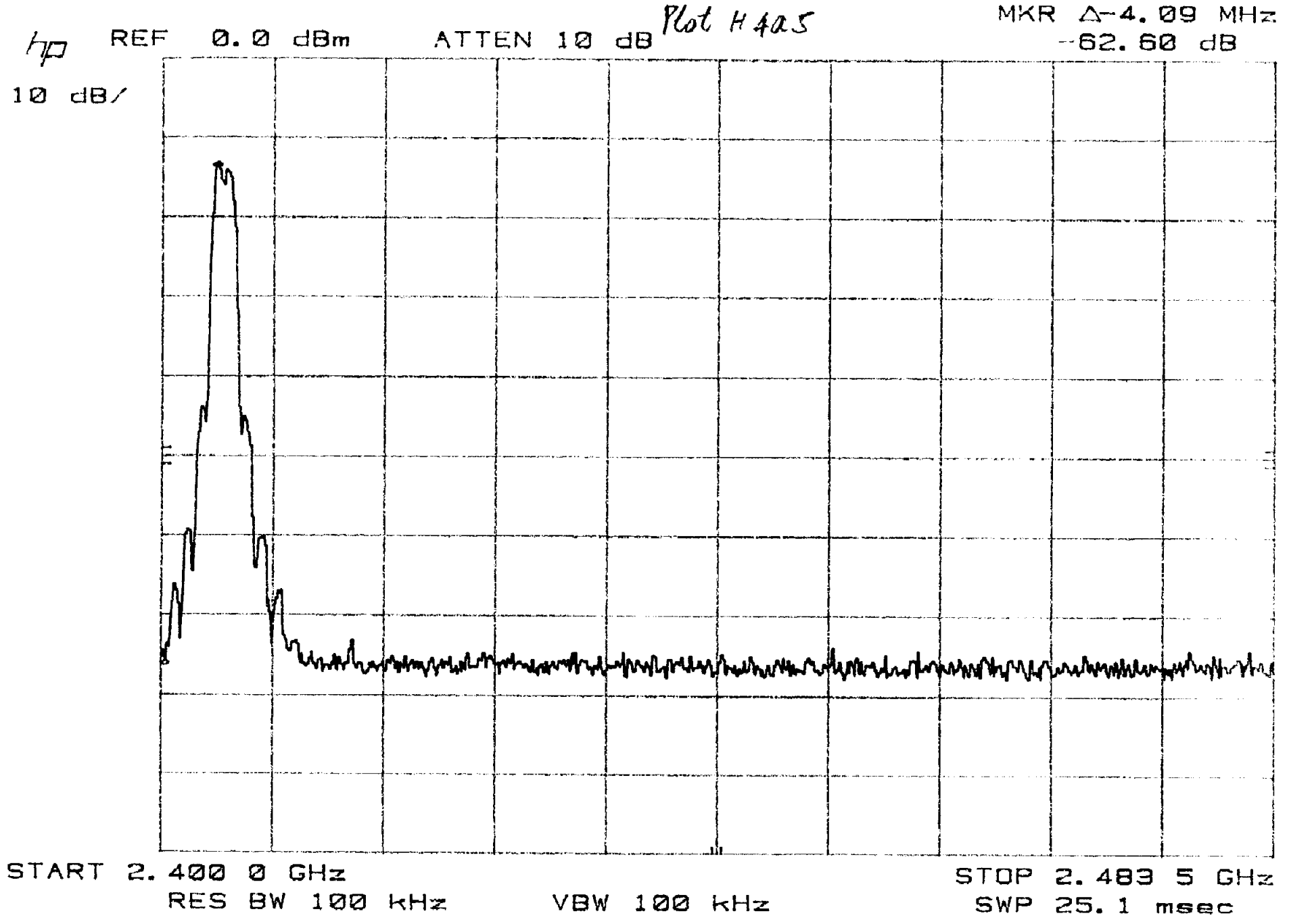

Mkr 224.0MHz
-56.90dBm
Tek
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
30.0MHz
to
1.000 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
TRIG
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

Plot H4a3

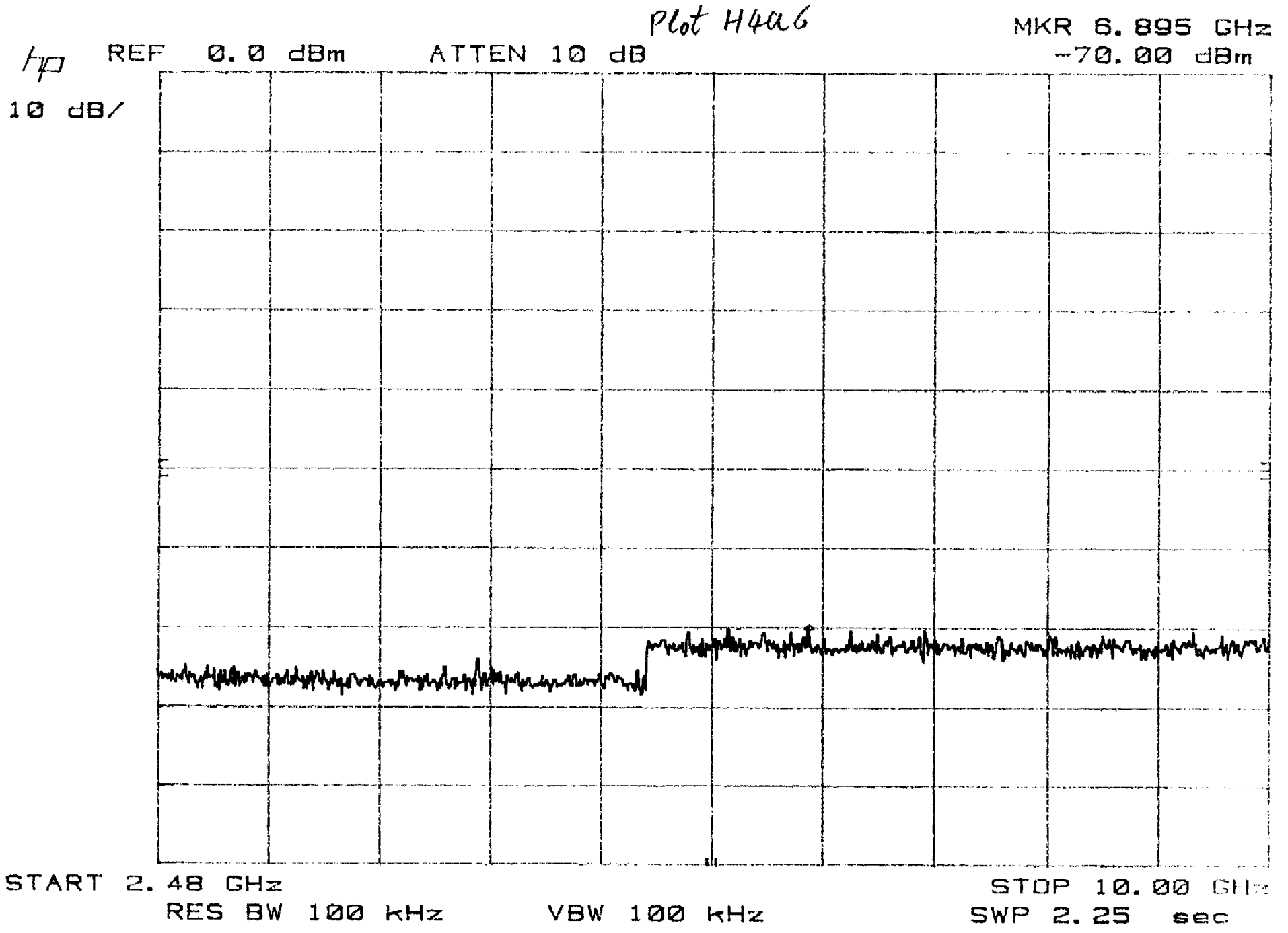

Mkr 1.135GHz
-69.70dBm
Tek
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
1.000GHz
to
2.300GHz
ResBW 100kHz
VidBW 100kHz
SWP 740mS
LEVEL
SPAN
Stop 2.300GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

Plot H4a4

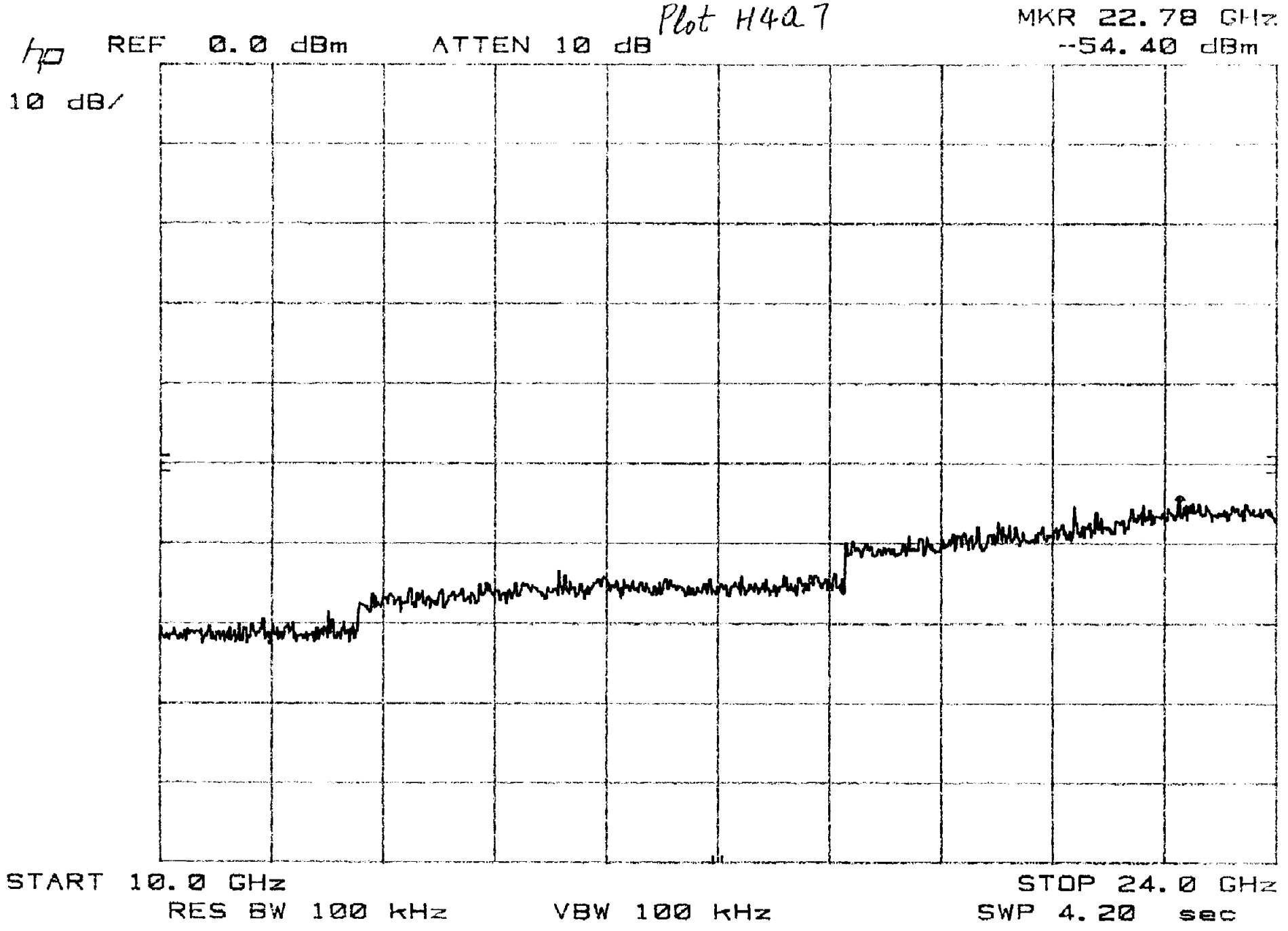

Mkr 2.395 2GHz -66.10dBm
Tek
Ref Lvl 0.0dBm 10dB/ Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
2.300 0GHz to 2.400 0GHz
ResBW 100kHz VidBW 100kHz SWP 57mS
LEVEL
SPAN
Stop 2.400 0GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


hp
REF 0.0 dBm
ATTEN 10 dB
Plot H425
MKR Δ-4.09 MHz
-62.60 dB
10 dB/
START 2.400 0 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.483 5 GHz
SWP 25.1 msec

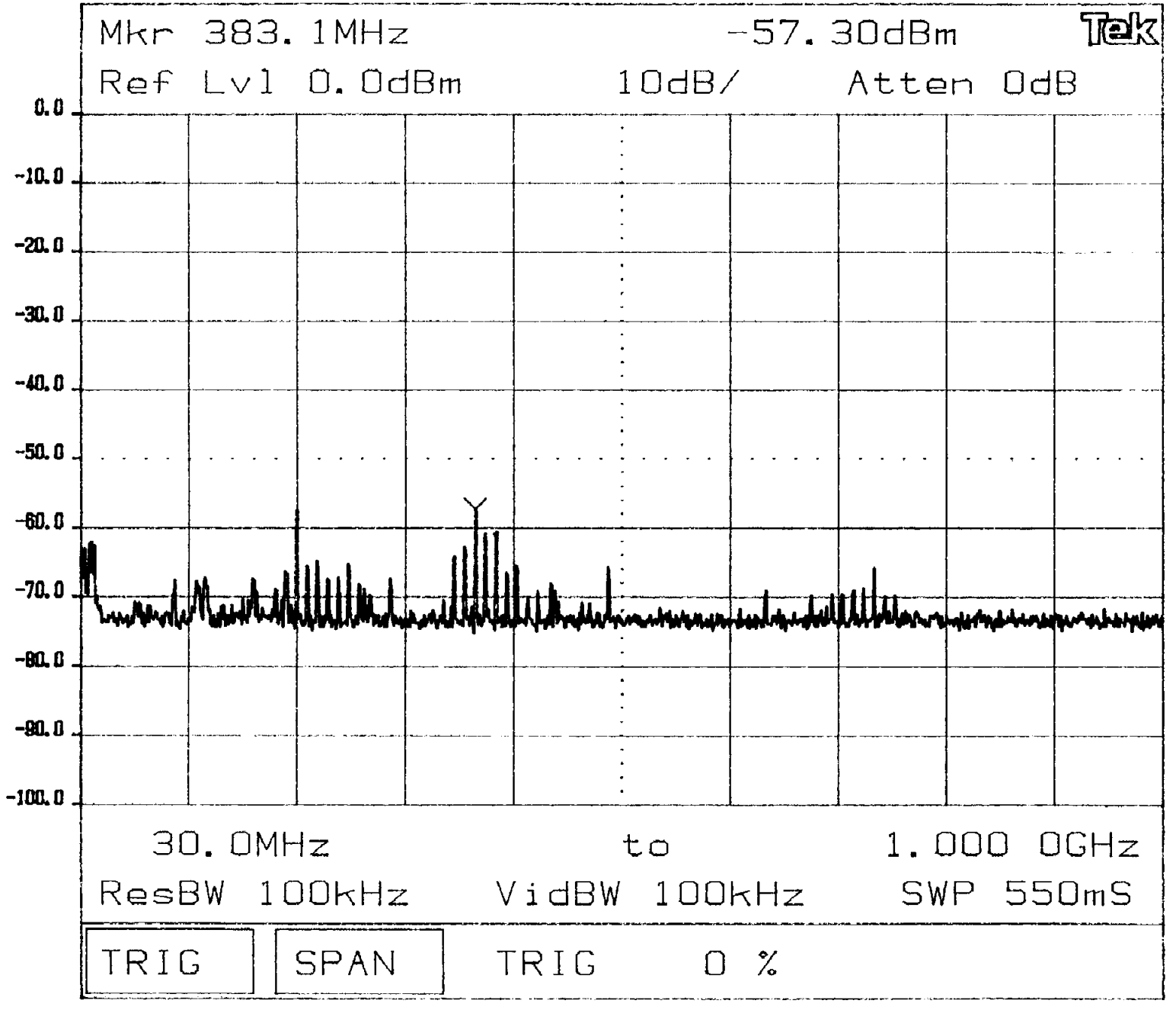
Plot H4a6


hp
REF 0.0 dBm
ATTEN 10 dB
MKR 6.895 GHz
-70.00 dBm
10 dB/
START 2.48 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 10.00 GHz
SWP 2.25 sec

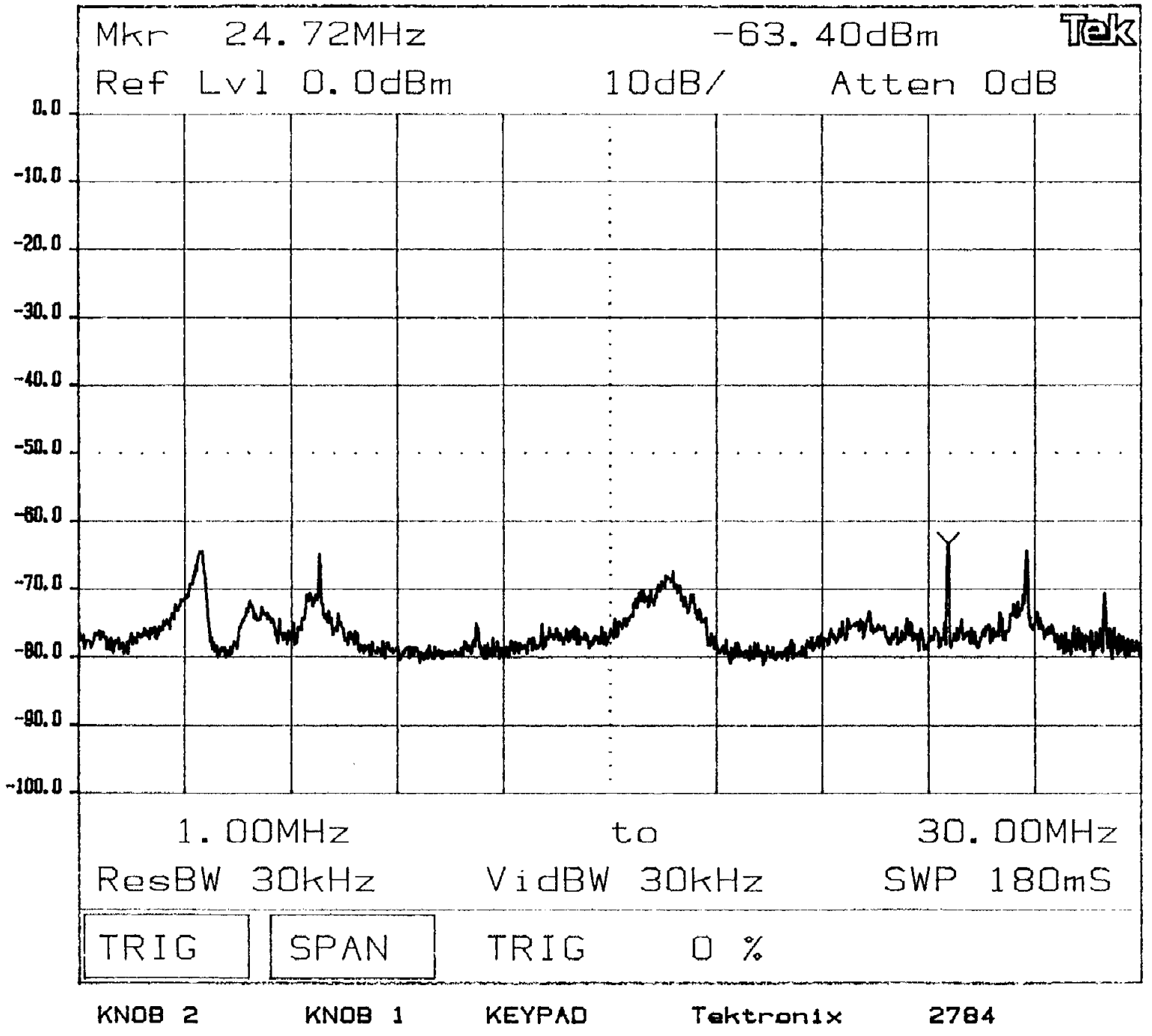
Plot H4a 7


REF 0.0 dBm
ATTEN 10 dB
MKR 22.78 GHz
-54.40 dBm
10 dB/
START 10.0 GHz
STOP 24.0 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 4.20 sec

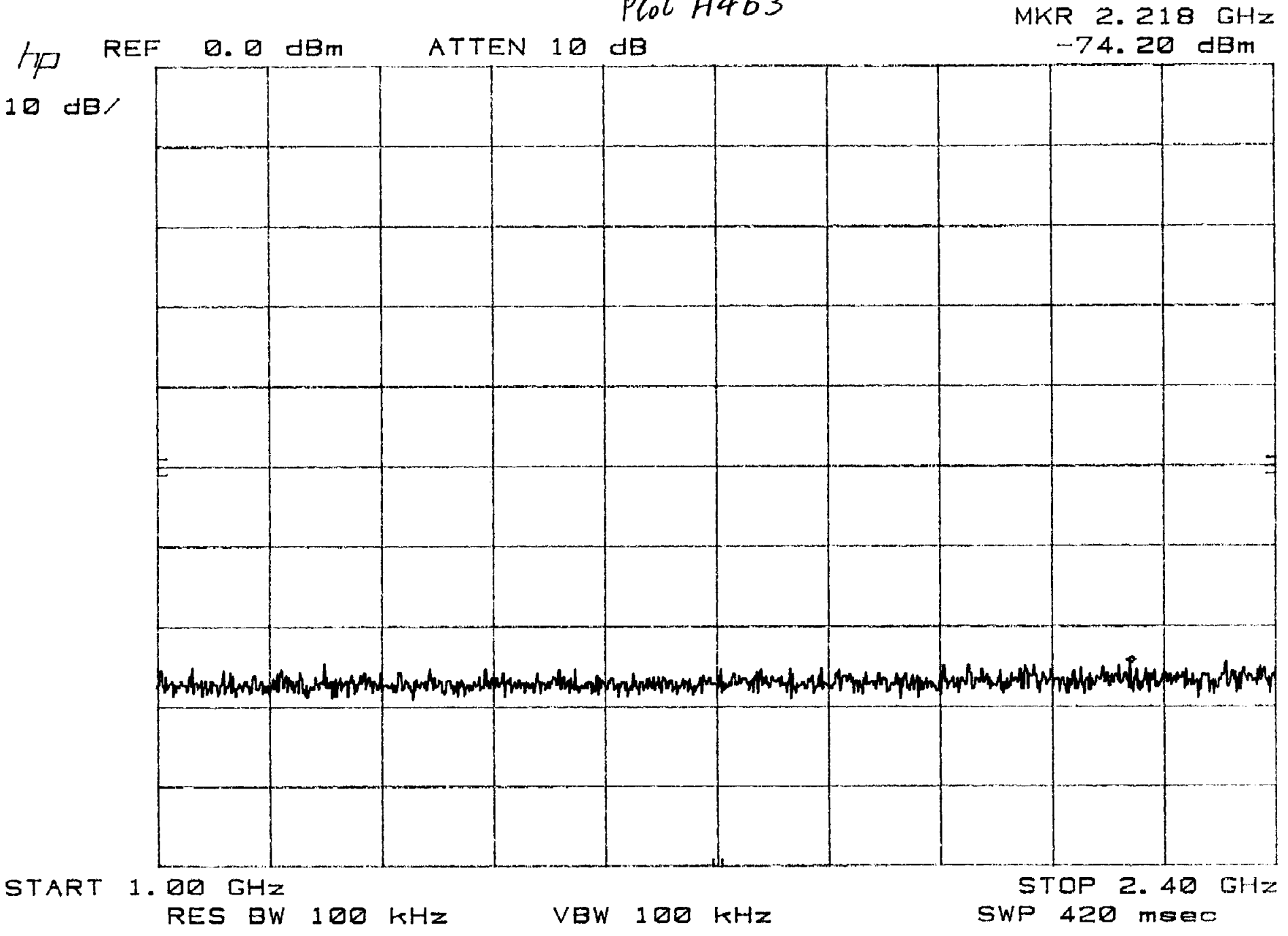
Plot H461


Mkr 383.1MHz
-57.30dBm
Tek
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
30.0MHz
to
1.000 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
TRIG
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

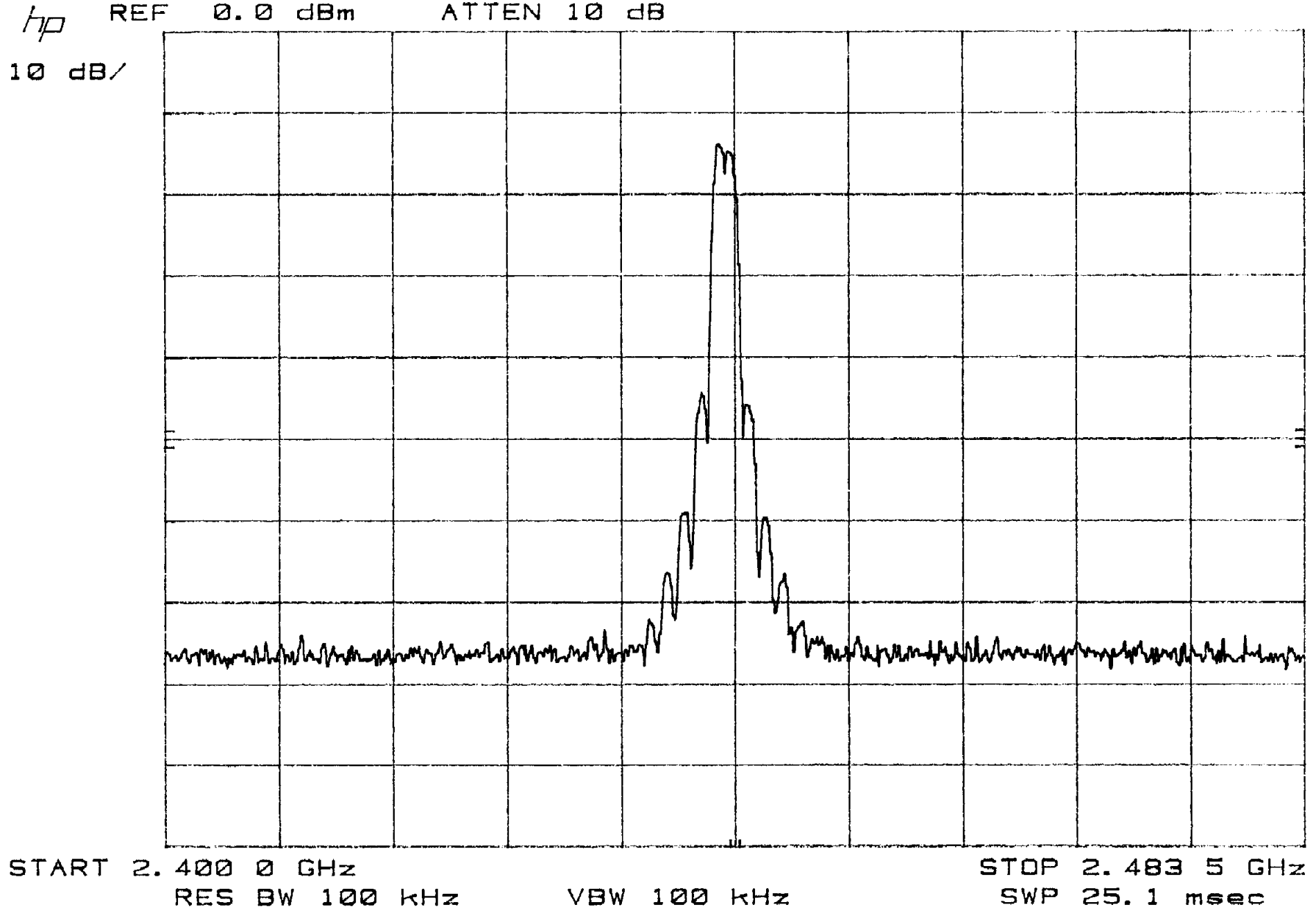
Plot H4b2


Mkr 24.72MHz
-63.40dBm
Tek
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
1.00MHz
to
30.00MHz
ResBW 30kHz
VidBW 30kHz
SWP 180mS
TRIG
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

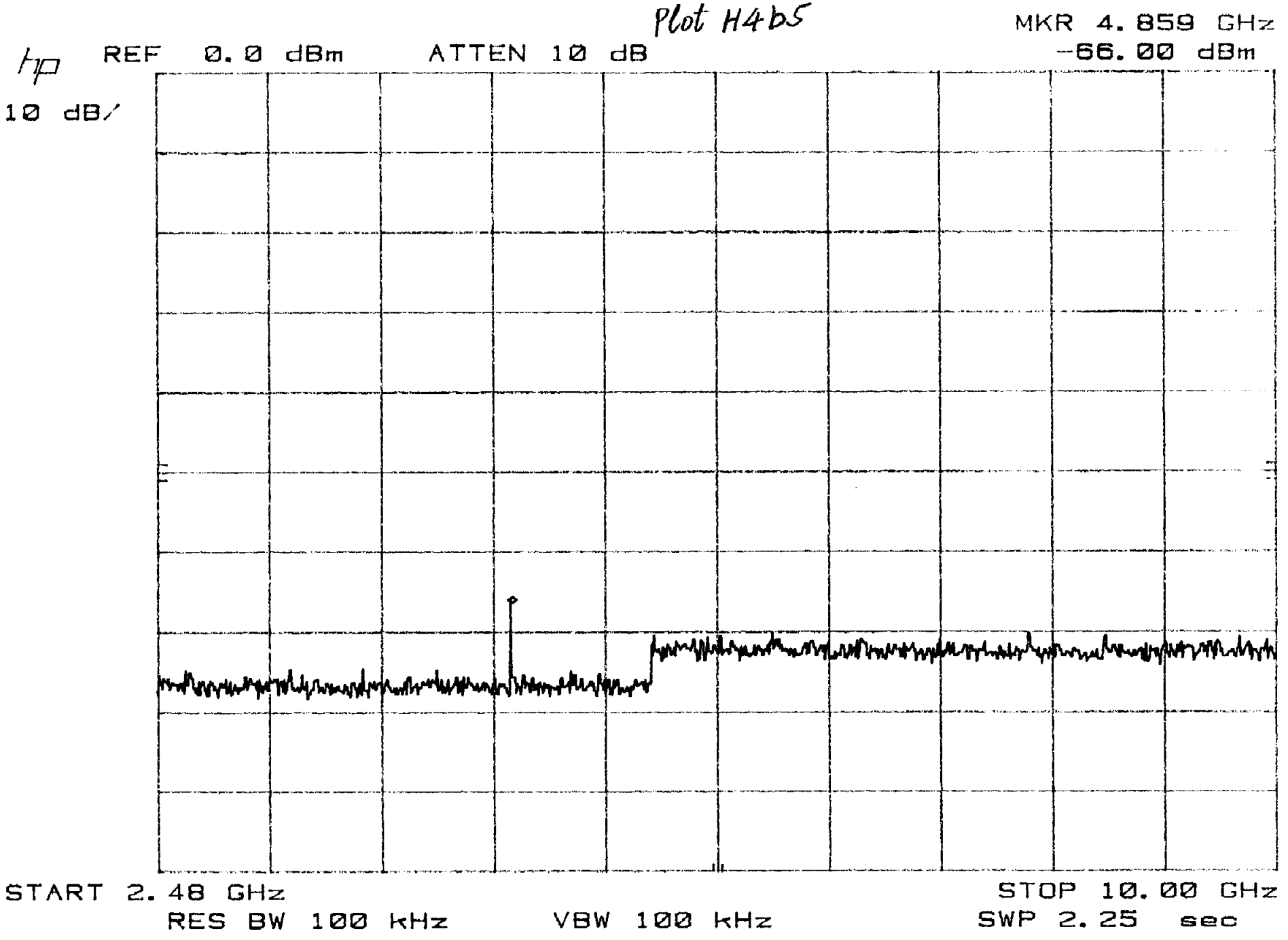
Plot H4b3


hp
REF 0.0 dBm
ATTEN 10 dB
MKR 2.218 GHz
-74.20 dBm
10 dB/
START 1.00 GHz
STOP 2.40 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 420 msec

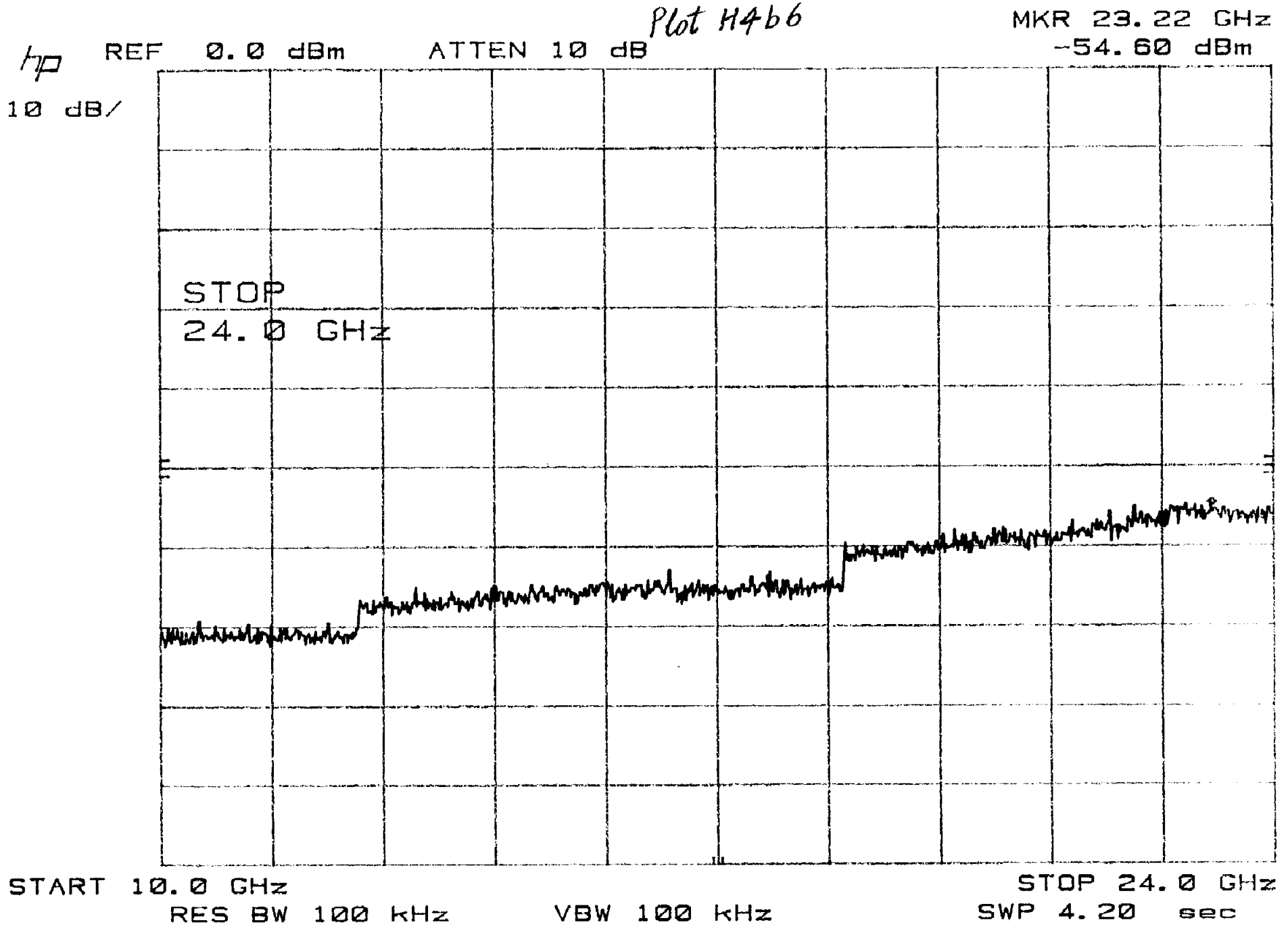
Plot H4b4


hp REF 0.0 dBm ATTEN 10 dB
10 dB/
START 2.400 0 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.483 5 GHz
SWP 25.1 msec

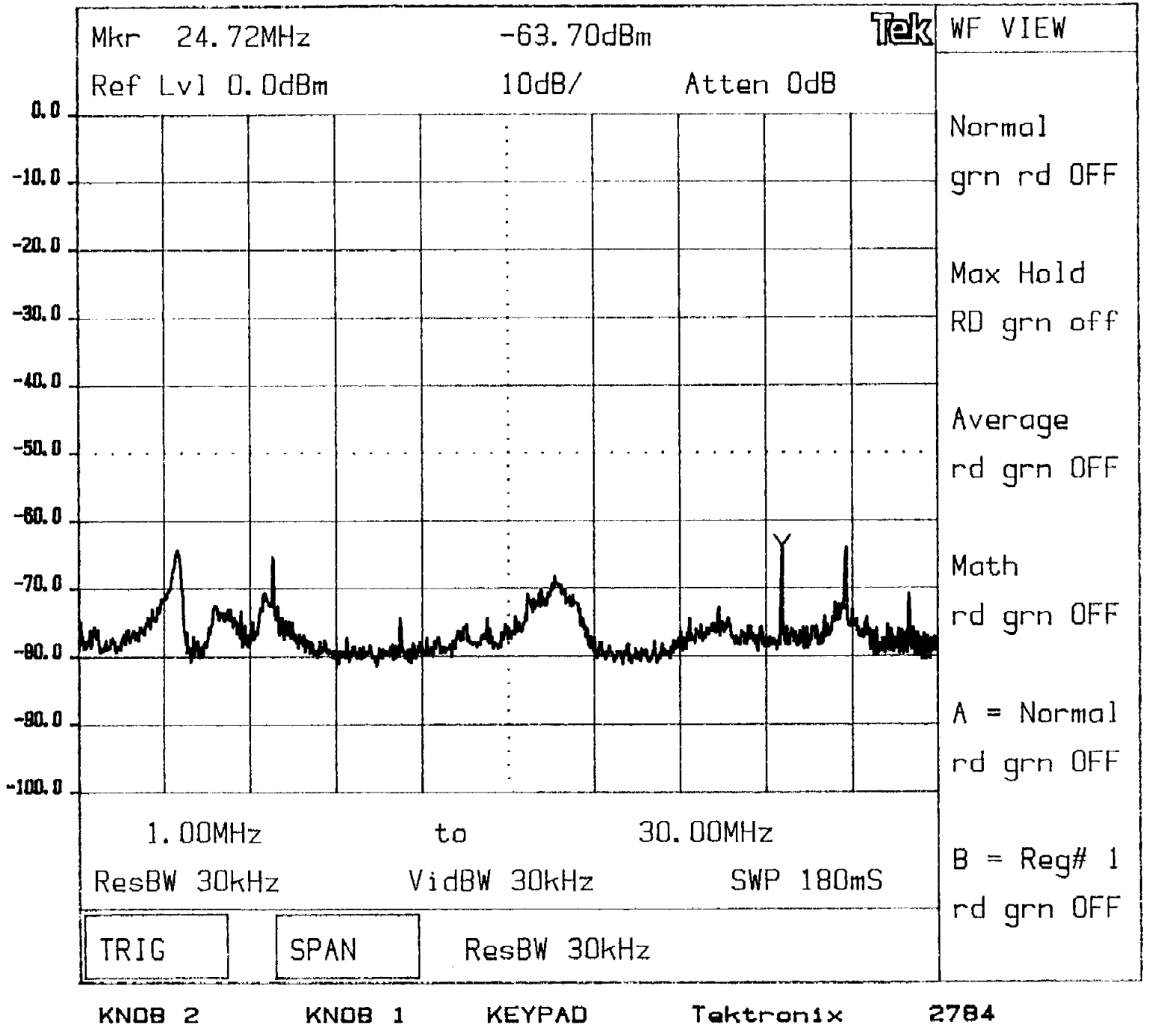
Plot H4b5


hp
REF 0.0 dBm
ATTEN 10 dB
MKR 4.859 GHz
-66.00 dBm
10 dB/
START 2.48 GHz
STOP 10.00 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 2.25 sec

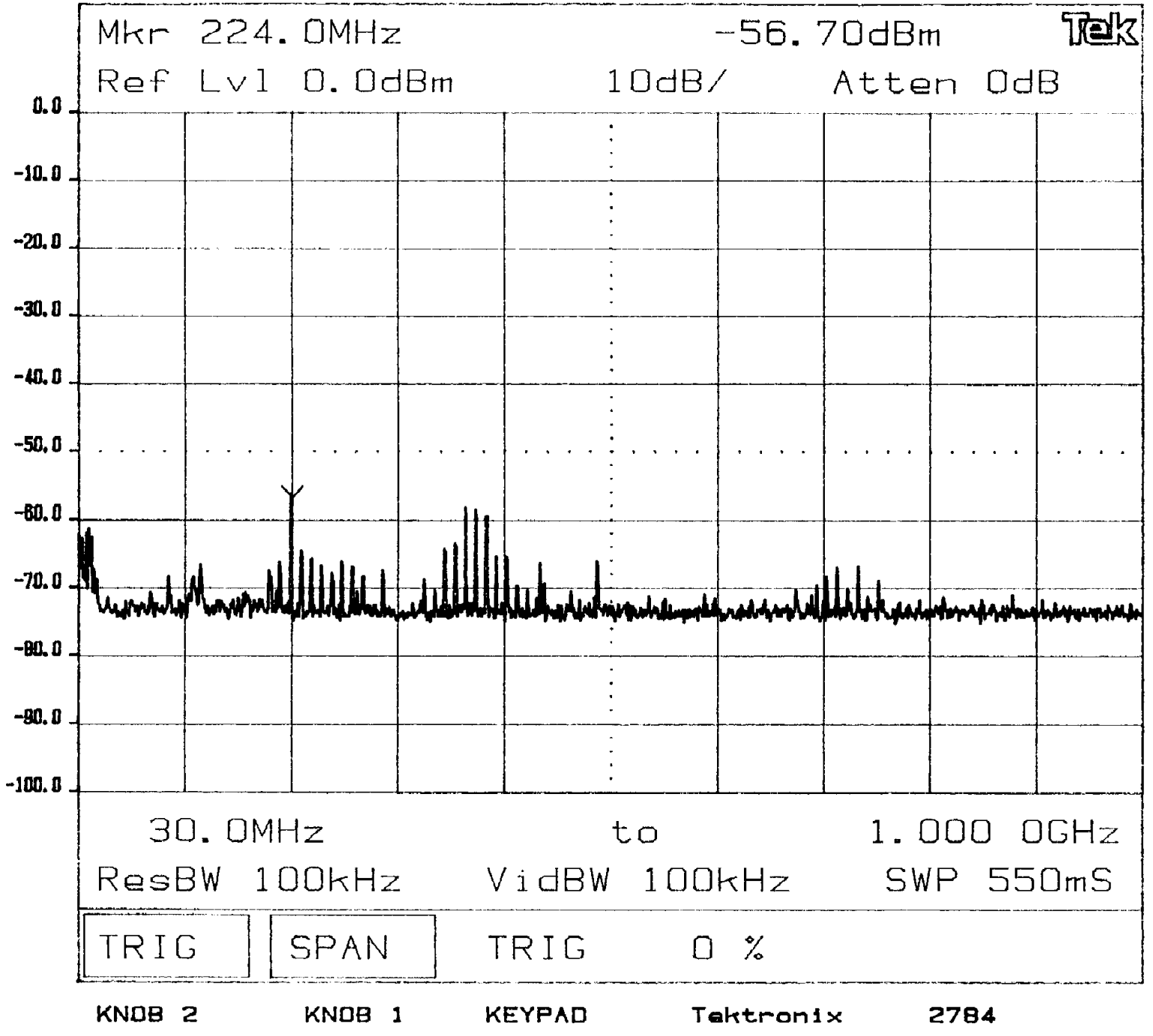
Plot H4b6


REF 0.0 dBm
ATTEN 10 dB
MKR 23.22 GHz
-54.60 dBm
10 dB/
STOP
24.0 GHz
START 10.0 GHz
STOP 24.0 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 4.20 sec

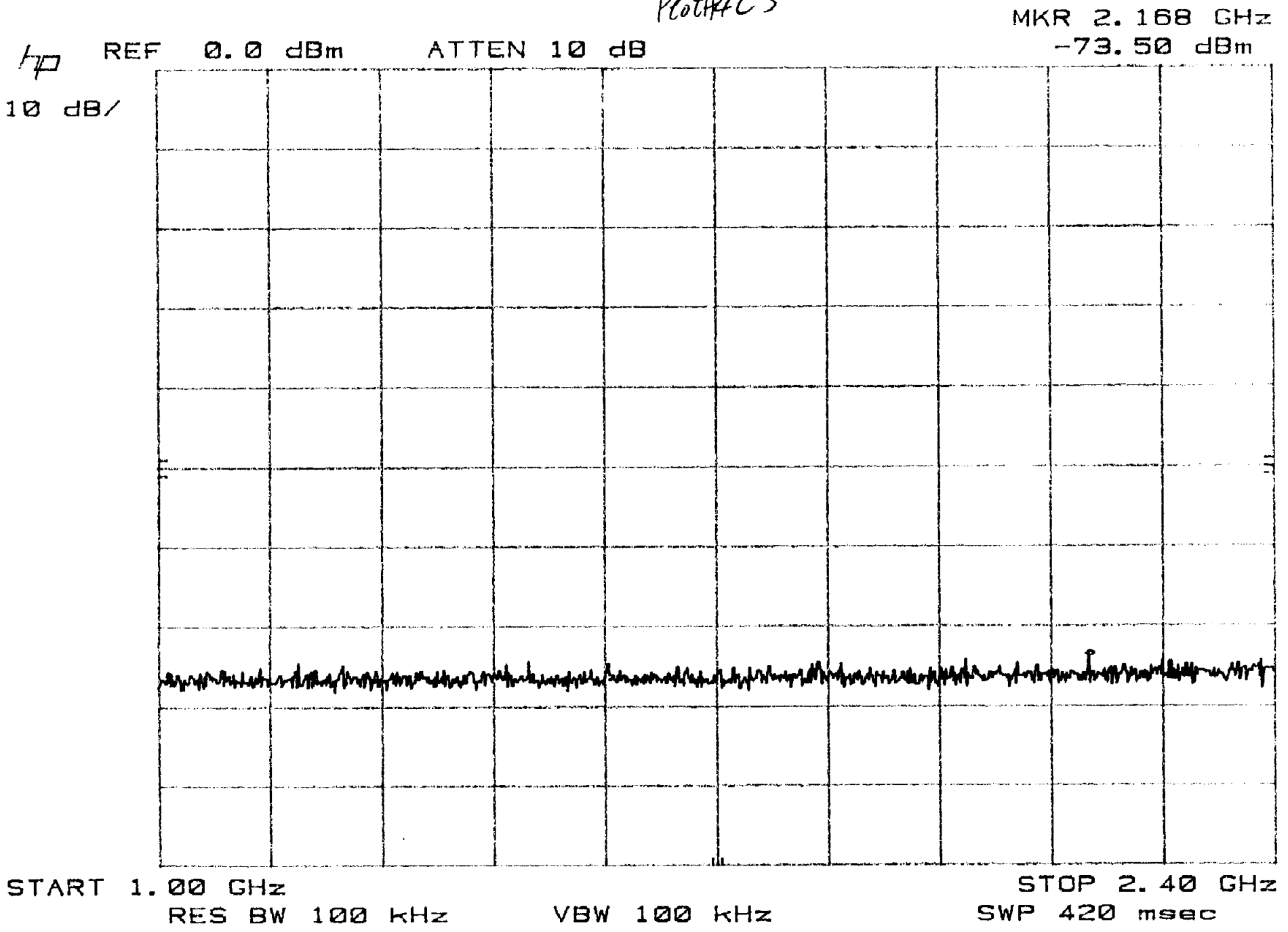
Plot H4C1


Mkr 24.72MHz
-63.70dBm
Tek
WF VIEW
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Normal
grn rd OFF
Max Hold
RD grn off
Average
rd grn OFF
Math
rd grn OFF
A = Normal
rd grn OFF
B = Reg# 1
rd grn OFF
1.00MHz
to
30.00MHz
ResBW 30kHz
VidBW 30kHz
SWP 180mS
TRIG
SPAN
ResBW 30kHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

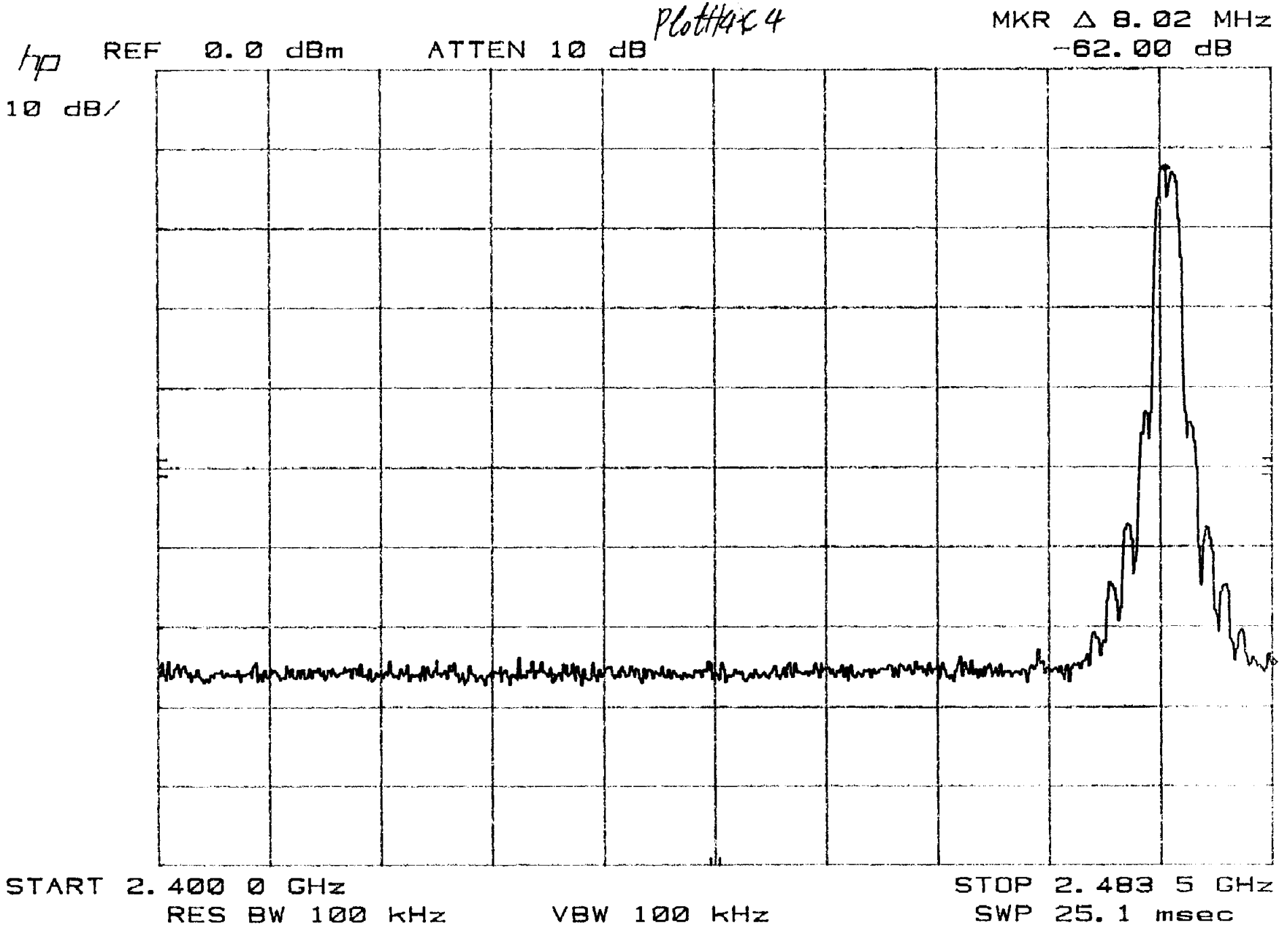
Plot H4C2


Mkr 224.0MHz
-56.70dBm
Tek
Ref Lvl 0.0dBm
10dB/
Atten 0dB
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
30.0MHz
to
1.000 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
TRIG
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

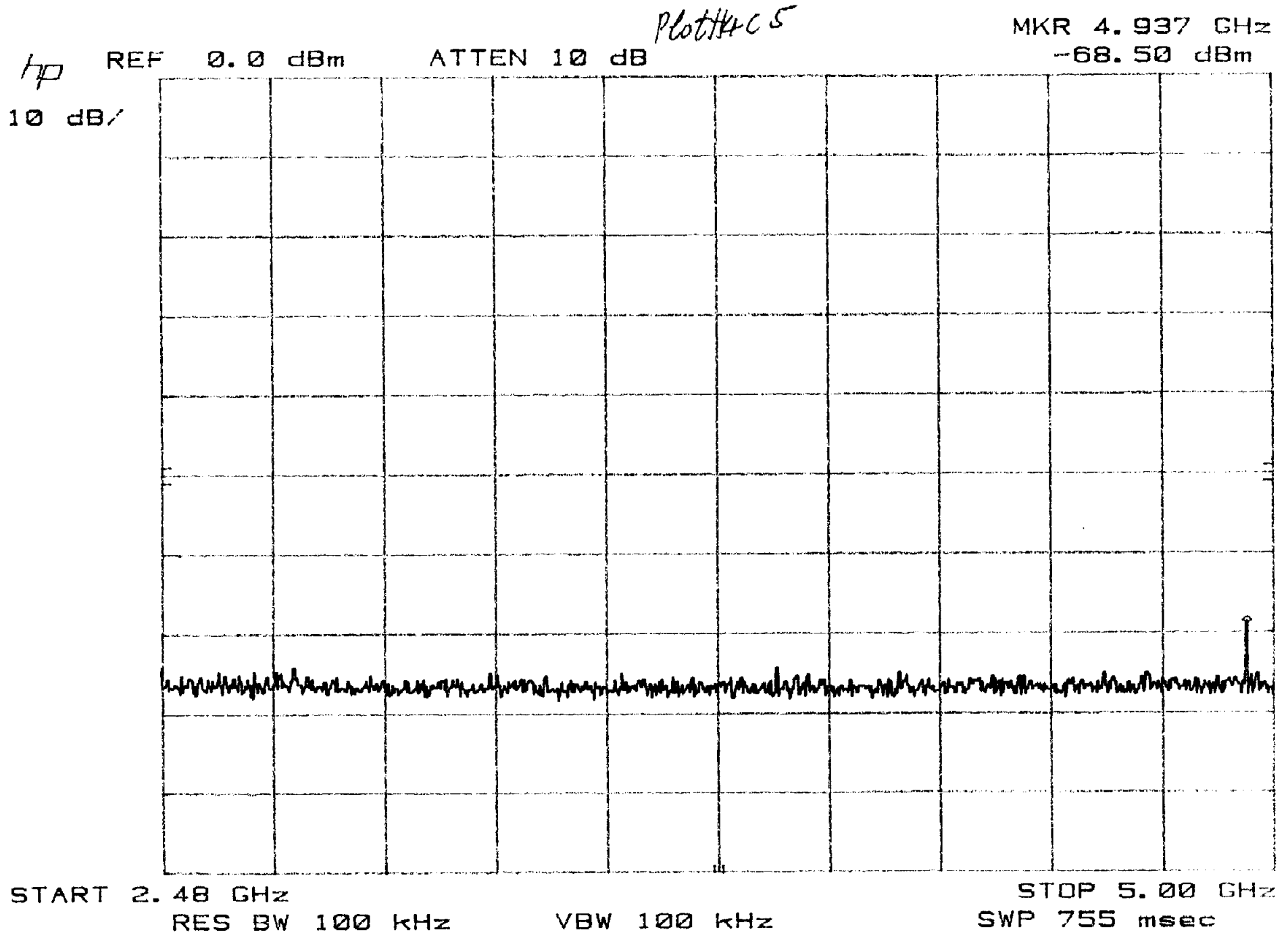
Plot #4 C 3


MKR 2.168 GHz
-73.50 dBm
REF 0.0 dBm
ATTEN 10 dB
10 dB/
START 1.00 GHz
STOP 2.40 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 420 msec

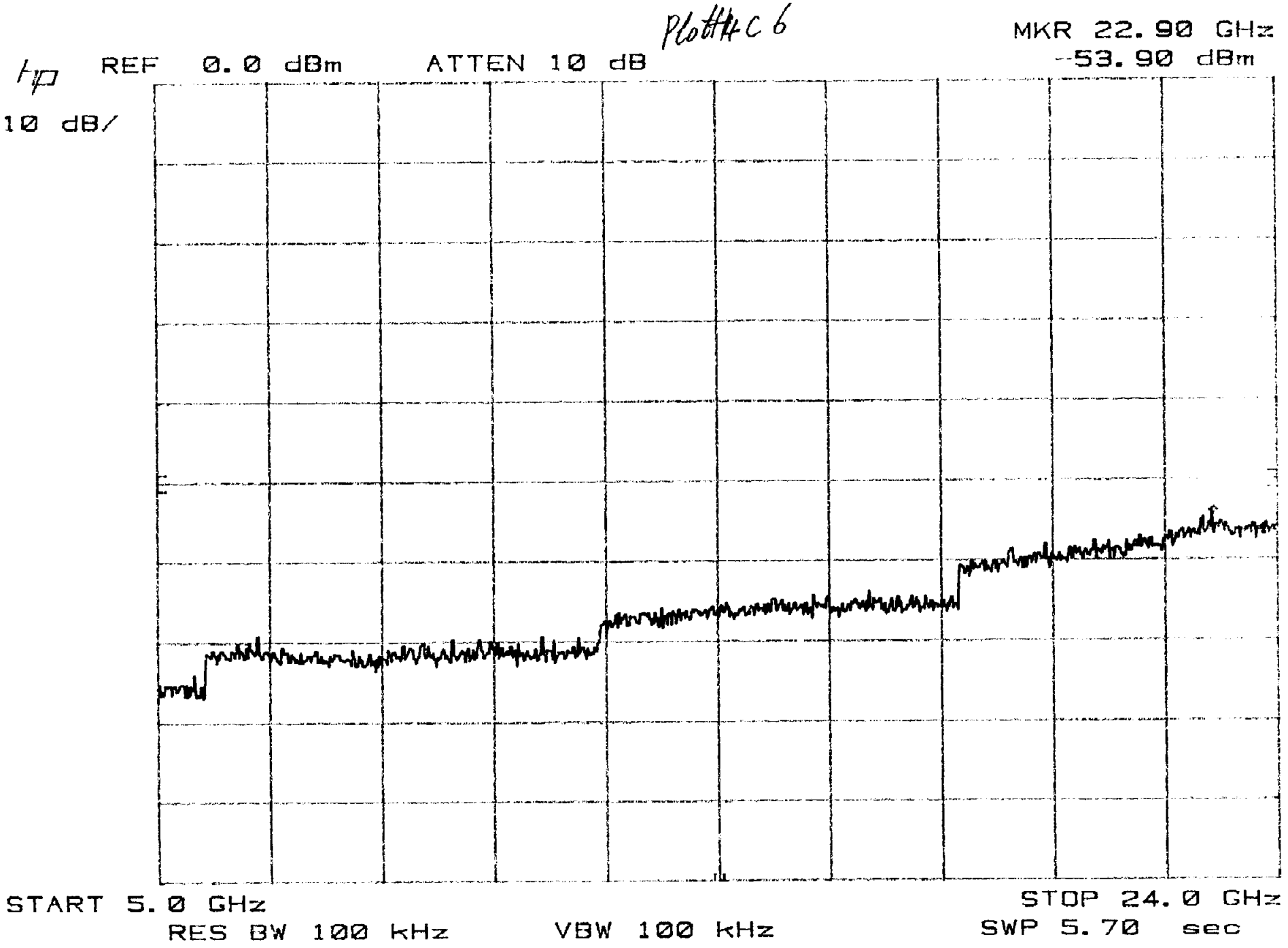
Plot #4


hp
REF 0.0 dBm
ATTEN 10 dB
MKR Δ 8.02 MHz
-62.00 dB
10 dB/
START 2.400 0 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.483 5 GHz
SWP 25.1 msec

Plot #4 C 5


REF 0.0 dBm
ATTEN 10 dB
MKR 4.937 GHz
-68.50 dBm
10 dB/
START 2.48 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 5.00 GHz
SWP 755 msec

Plot #4 C 6


MKR 22.90 GHz
-53.90 dBm
hp
REF 0.0 dBm
ATTEN 10 dB
10 dB/
START 5.0 GHz
STOP 24.0 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 5.70 sec

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Radiated emission measurements were performed from 30 MHz to 2400 MHz. Analyzer resolution is 100 kHz or greater for 30 MHz to 1000 MHz, 1 MHz for >1000 MHz.

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

In addition, the field strength at the band-edge frequency f = 2483.5 MHz was calculated as follows:

$E_f = E_0 - \Delta$
where E_0 is the field strength at the fundamental frequency (high channel)
Δ is "delta" from Plots B4c5 (for Base) and H4C4 (for handset)

The results are:

$E_f = 114.7 - 62.0 = 52.7$ dBuV/m (for handset)
$E_f = 115.0 - 63.7 = 51.7$ dBuV/m (for base)

which are below the limit (54 dBuV/m)

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	TT System LLC	**Model #:**	IBM-2.4GIG	**Standard**	FCC § 15.247 (R.B.)
EUT:	Cordless Phone Hand set	**S/N #:**		**Limits**	11
Project #:	J99030602	**Test Date:**	December 28, 1999	**Test Distance**	3 meters
Test Mode:	Tx @ 2404.8MHz	**Engineer:**	Xi-Ming Y.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	11	14	21	8	10	0	0	0	12	0
Model:	LPB-2520A	EMCO 3115	3160-9	CDI_P100 0	AFT18855	None	None	None	Gm_M+ L	None

Frequency	Reading	Detector	Ant	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m	dB(μV/m)	dB
4809.50	44.0	Peak	14	8	H	35.4	28.1	3.2	0.0	54.5	74.0	-19.5
4909.55	36.3	Ave.	14	8	H	35.4	28.1	3.2	0.0	46.8	54.0	-7.2
7214.35	39.0	Peak	14	8	H	37.8	28.0	4.3	0.0	53.1	74.0	-20.9
7214.35	29.4	Ave.	14	8	H	37.8	28.0	4.3	0.0	43.5	54.0	-10.5
12024.00	42.4	Peak	14	10	V	42.3	39.1	5.9	0.0	51.5	74.0	-22.6
12024.00	34.3	Ave.	14	10	V	42.3	39.1	5.9	0.0	43.4	54.0	-10.7
19238.40	40.5	Peak	21	13	V	40.2	23.3	7.7	-9.5	55.6	74.0	-18.4
19238.40	30.4	Ave.	21	13	V	40.2	23.3	7.7	-9.5	45.5	54.0	-8.5

Notes:

a) D.C.F.:Distance Correction Factor

b) Insert. Loss (dB) = Cable A + Cable B + Cable C.

c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss - Transducer Loss - Duty Relaxation (transmitter only).

d) Negative signs (-) in Margin column signify levels below the limits.

e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

f)Reading above 18 GHz was taking at 1m distance.

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	TT System LLC	**Model #:**	IBM-2.4GIG	**Standard**	FCC § 15.247 (R.B.)
EUT:	Cordless Phone Hand set	**S/N #:**		**Limits**	11
Project #:	J99030602	**Test Date:**	December 28, 1999	**Test Distance**	3 meters
Test Mode:	Tx @ 2440.8MHz	**Engineer:**	Xi-Ming Y.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	11	14	21	8	10	0	0	0	12	0
Model:	LPB-2520A	EMCO 3115	3150-9	CDI_P100 0	AFT18855	None	None	None	Grn_M+ L	None

Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
4881.55	46.0	Peak	14	8	H	35.4	28.1	3.2	0.0	56.5	74.0	-17.5
4881.55	38.3	Ave.	14	8	H	35.4	28.1	3.2	0.0	48.8	54.0	-5.2
7322.35	40.0	Peak	14	8	H	37.8	28.0	4.3	0.0	54.1	74.0	-19.9
7322.35	32.9	Ave.	14	8	H	37.8	28.0	4.3	0.0	47.0	54.0	-7.0
12204.00	42.1	Peak	14	10	V	42.3	39.1	5.9	0.0	51.2	74.0	-22.9
12204.00	34.2	Ave.	14	10	V	42.3	39.1	5.9	0.0	43.3	54.0	-10.8
19526.40	40.3	Peak	21	13	V	40.3	23.3	7.7	-9.5	55.5	74.0	-18.5
19526.40	30.1	Ave.	21	13	V	40.3	23.3	7.7	-9.5	45.3	54.0	-8.7

Notes:

a) D.C.F.:Distance Correction Factor

b) Insert. Loss (dB) = Cable A + Cable B + Cable C .

c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only)

d) Negative signs (-) in Margin column signify levels below the limits.

e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

f)Reading above 18 GHz was taking at 1m distance.

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	TT System LLC	**Model #:**	IBM-2.4GIG	**Standard**	FCC § 15.247 (R.B.)
EUT:	Cordless Phone Base	**S/N #:**		**Limits**	11
Project #:	J99030602	**Test Date:**	December 28, 1999	**Test Distance**	3 meters
Test Mode:	Tx @ 2475.0MHz	**Engineer:**	Xi-Ming Y.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	11	14	21	8	10	0	0	0	12	0
Model:	LPB-2520A	EMCO 3115	3160-9	CDI_P1000	AFT18S55	None	None	None	Gm_M+L	None

Frequency	Reading	Detector	Ant	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
4949.96	42.0	Peak	14	8	V	33.9	28.1	3.2	0.0	51.0	74.0	-23.0
4949.96	36.4	Ave.	14	8	V	33.9	28.1	3.2	0.0	45.4	54.0	-8.6
7425.00	44.6	Peak	14	8	V	38.0	28.0	4.3	0.0	58.9	74.0	-15.1
7425.00	37.4	Ave.	14	8	V	38.0	28.0	4.3	0.0	51.7	54.0	-2.3
12375.00	42.0	Peak	14	10	V	42.3	39.1	5.9	0.0	51.1	74.0	-23.0
12375.00	34.0	Ave.	14	10	V	42.3	39.1	5.9	0.0	43.1	54.0	-11.0
19800.00	40.0	Peak	21	13	V	40.3	23.3	7.7	-9.5	55.2	74.0	-18.8
19800.00	30.0	Ave.	21	13	V	40.3	23.3	7.7	-9.5	45.2	54.0	-8.8
22275.00	42.0	Peak	21	13	V	40.3	23.3	7.9	-9.5	57.4	74.0	-16.6
22275.00	32.0	Ave.	21	13	V	40.3	23.3	7.9	-9.5	47.4	54.0	-6.6

Notes:

a) D.C.F.:Distance Correction Factor

b) Insert. Loss (dB) = Cable A + Cable B + Cable C

c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss - Transducer Loss - Duty Relaxation (transmitter only).

d) Negative signs (-) in Margin column signify levels below the limits.

e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

f)Reading above 18 GHz was taking at 1m distance.

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	TT System LLC	**Model #:**	IBM-2.4GIG	**Standard_**	FCC § 15.247 (R.B.)
EUT:	Cordless Phone Base	**S/N #:**		**Limits**	11
Project #:	J99030602	**Test Date:**	December 28, 1999	**Test Distance_**	3 meters
Test Mode:	Tx @ 2404.8MHz	**Engineer:**	Xi-Ming Y.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	11	14	21	8	10	0	0	0	12	0
Model:	LPB-2520A	EMCO 3115	3160-9	CDI_P100 0	AFT18855	None	None	None	Grn_M+ L	None

Frequency	Reading	Detector	Ant	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
4809.50	46.0	Peak	14	8	V	33.9	28.1	3.2	0.0	55.0	74.0	-19.0
4909.55	40.0	Ave.	14	8	V	33.9	28.1	3.2	0.0	49.0	54.0	-5.0
7214.35	38.0	Peak	14	8	V	38.0	28.0	4.3	0.0	52.3	74.0	-21.7
7214.35	28.0	Ave.	14	8	V	38.0	28.0	4.3	0.0	42.3	54.0	-11.7
12024.00	42.3	Peak	14	10	V	42.3	39.1	5.9	0.0	51.4	74.0	-22.7
12024.00	34.3	Ave.	14	10	V	42.3	39.1	5.9	0.0	43.4	54.0	-10.7
19238.40	40.4	Peak	21	13	V	40.2	23.3	7.7	-9.5	55.5	74.0	-18.5
19238.40	30.2	Ave.	21	13	V	40.2	23.3	7.7	-9.5	45.3	54.0	-8.7

Notes:

a) D.C.F. Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits
e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.
f)Reading above 18 GHz was taking at 1m distance.

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	TT System LLC	**Model #:** IBM-2.4GIG	**Standard_**	**FCC § 15.247 (R.B.)**	
EUT:	Cordless Phone Base	**S/N #:**	**Limits**	11	
Project #:	J99030602	**Test Date:** December 28, 1999	**Test Distance_**	3	meters
Test Mode:	Tx @ 2440.8MHz	**Engineer:** Xi-Ming Y.	**Duty Relaxation**	0	dB

	Antenna Used			Pre-Amp Used		Cable Used				Transducer Used
Number:	11	14	21	8	10	0	0	0	12	0
Model:	LPB-25284	EMCO 3115	3160-9	CDI_P1000	AFT18655	None	None	None	Gm_M+L	None

Frequency	Reading	Detector	Ant	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m	dB(μV/m)	dB
4881.55	44.0	Peak	14	8	H	35.4	28.1	3.2	0.0	54.5	74.0	-19.5
4881.55	39.1	Ave.	14	8	H	35.4	28.1	3.2	0.0	49.6	54.0	-4.4
7322.35	40.0	Peak	14	8	V	38.0	28.0	4.3	0.0	54.3	74.0	-19.7
7322.35	32.0	Ave.	14	8	V	38.0	28.0	4.3	0.0	46.3	54.0	-7.7
12204.00	42.3	Peak	14	10	V	42.3	39.1	5.9	0.0	51.4	74.0	-22.7
12204.00	34.3	Ave.	14	10	V	42.3	39.1	5.9	0.0	43.4	54.0	-10.7
19526.40	40.4	Peak	21	13	V	40.3	23.3	7.7	-9.5	55.6	74.0	-18.4
19526.40	30.2	Ave.	21	13	V	40.3	23.3	7.7	-9.5	45.4	54.0	-8.6

Notes:

a) D.C.F. Distance Correction Factor

b) Insert. Loss (dB) = Cable A + Cable B + Cable C

c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss - Transducer Loss - Duty Relaxation (transmitter only)

d) Negative signs (-) in Margin column signify levels below the limits

e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

f)Reading above 18 GHz was taking at 1m distance.

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	TT System LLC	**Model #:**	IBM-2.4GIG	**Standard_**	**FCC § 15.247 (R.B.)**
EUT:	Cordless Phone Hand set	**S/N #:**		**Limits**	11
Project #:	J99030602	**Test Date:**	December 28, 1999	**Test Distance_**	3 meters
Test Mode:	Tx @ 2475.0MHz	**Engineer:**	Xi-Ming Y.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	11	14	21	8	10	0	0	0	12	0
Model:	LPB-2520A	EMCO 3115	3160-9	CDI_P1000	AFT18655	None	None	None	Gm_M+L	None

Frequency	Reading	Detector	Ant	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
4949.96	47.4	Peak	14	8	H	35.4	28.1	3.2	0.0	57.9	74.0	-16.1
4949.96	40.7	Ave.	14	8	V	33.9	28.1	3.2	0.0	49.7	54.0	-4.3
7425.00	42.0	Peak	14	8	H	37.8	28.0	4.3	0.0	56.1	74.0	-17.9
7425.00	33.7	Ave.	14	8	H	37.8	28.0	4.3	0.0	47.8	54.0	-6.2
12375.00	42.3	Peak	14	10	V	42.3	39.1	5.9	0.0	51.4	74.0	-22.7
12375.00	34.2	Ave.	14	10	V	42.3	39.1	5.9	0.0	43.3	54.0	-10.8
19800.00	40.5	Peak	21	13	V	40.3	23.3	7.7	-9.5	55.7	74.0	-18.3
19800.00	30.3	Ave.	21	13	V	40.3	23.3	7.7	-9.5	45.5	54.0	-8.5
22275.00	42.2	Peak	21	13	V	40.3	23.3	7.9	-9.5	57.6	74.0	-16.4
22275.00	32.1	Ave.	21	13	V	40.3	23.3	7.9	-9.5	47.5	54.0	-6.5

Notes:

a) D.C.F. Distance Correction Factor

b) Insert. Loss (dB) = Cable A + Cable B + Cable C

c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only)

d) Negative signs (-) in Margin column signify levels below the limits.

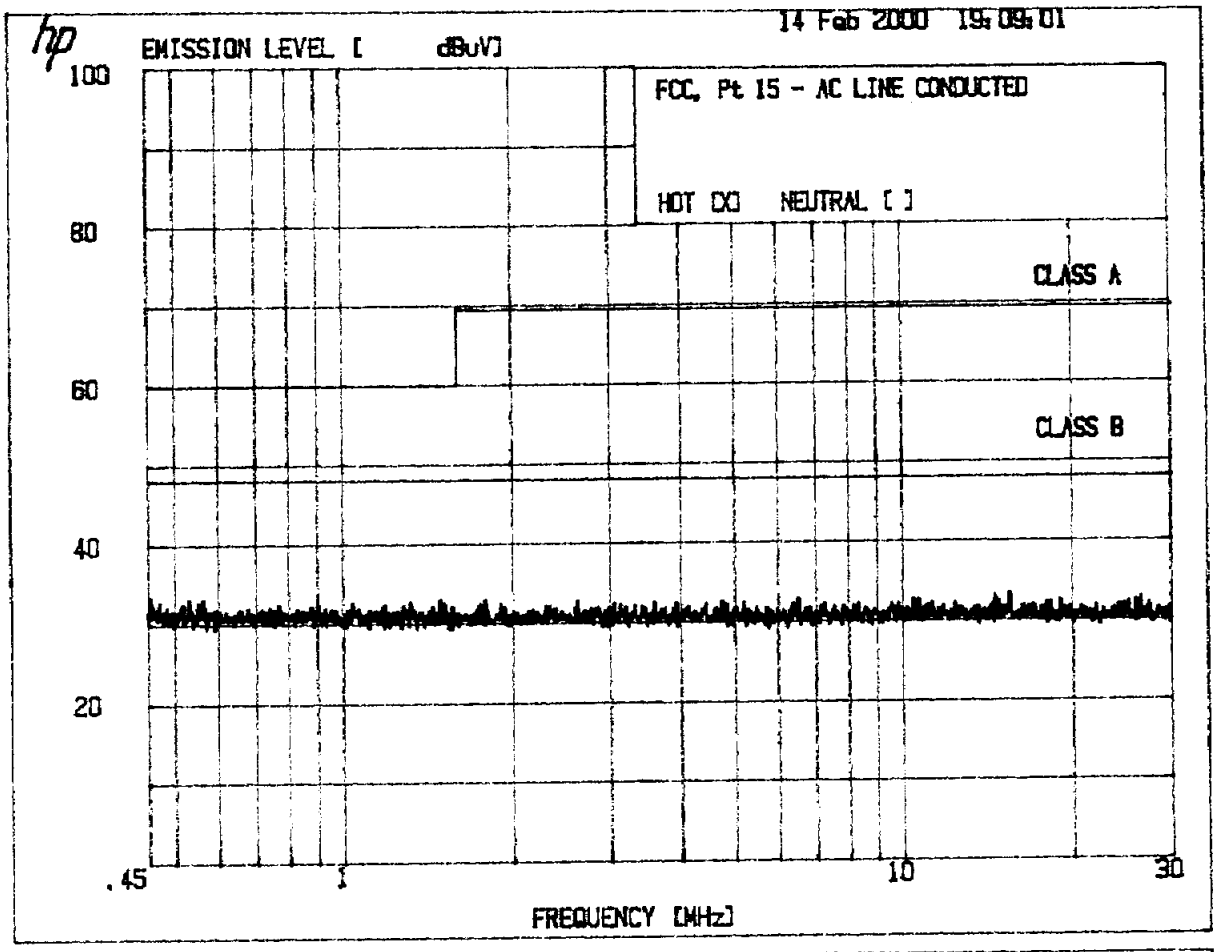
e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

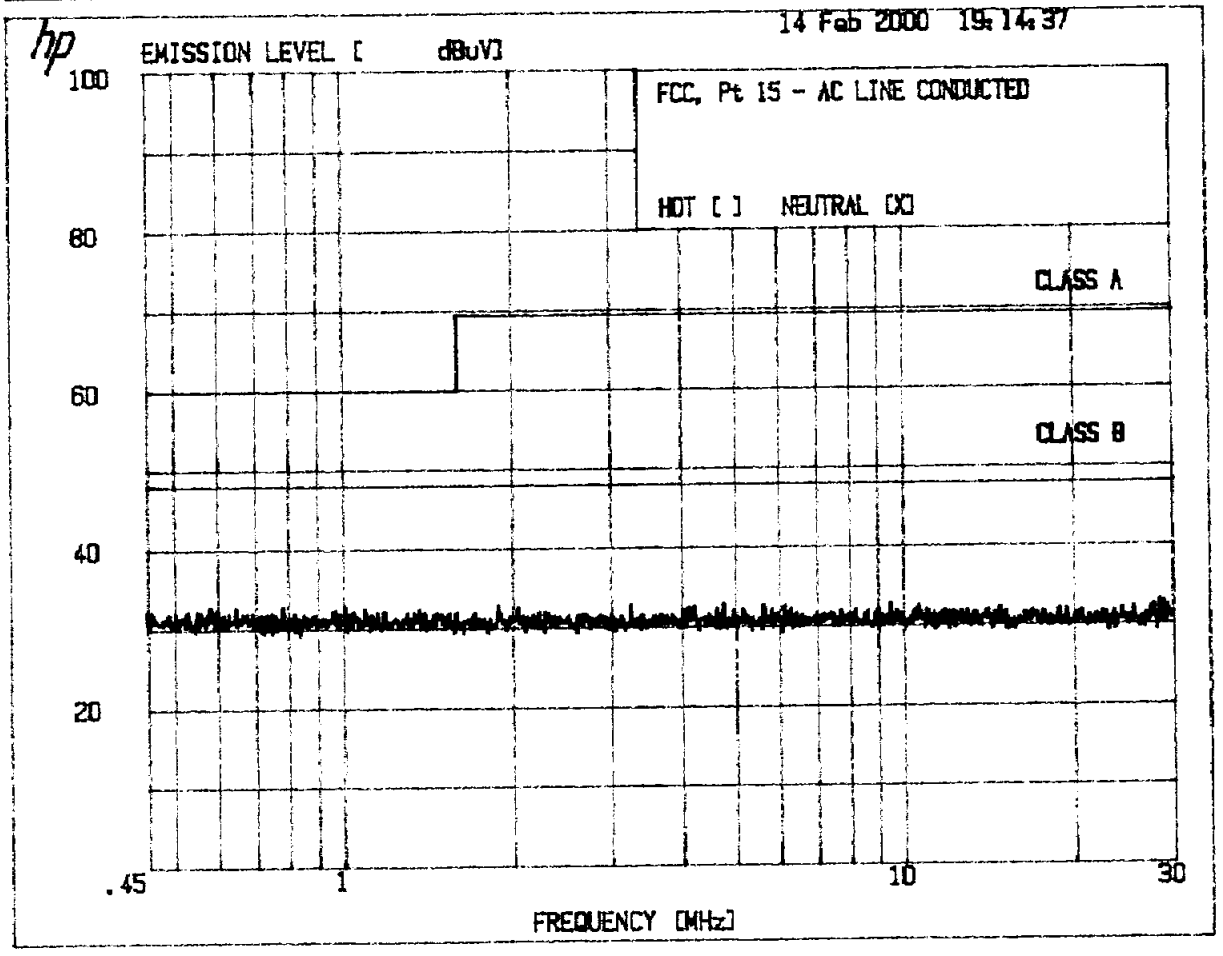
f)Reading above 18 GHz was taking at 1m distance.

4.7 AC Line Conducted Emission, FCC Rule 15.207:

[ ] Not required; battery operation only

[X] Refer to the attached test data.


14 Feb 2000 19:09:01
EMISSION LEVEL [dBuV]
FCC, Pt 15 - AC LINE CONDUCTED
HOT [X] NEUTRAL [ ]
CLASS A
CLASS B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]


14 Feb 2000 19:14:37
EMISSION LEVEL [dBuV]
FCC, Pt 15 - AC LINE CONDUCTED
HOT [ ] NEUTRAL [X]
CLASS A
CLASS B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

4.8 Radiated Emissions from Digital Section of Transceiver (Transmitter), FCC Ref: 15.109

[ ] Not required - No digital part
[X] Test results are attached
[ ] Included in the separate DOC report.

4.9 Radiated Emissions from Receiver Section of Transceiver (L.O. Radiation), FCC Ref: 15.109, 15.111

[X] Not required - EUT operation above 960 MHz only

[ ] Not required - EUT is transmitter only

[ ] Not performed; exempt until June 1999

[ ] Test results are attached

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	TT System LLC	**Model #:**	IBM-2.4GIG	**Standard**	FCC § 15.209
EUT:	Cordless Phone Base	**S/N #:**		**Limits**	3
Project #:	J99030602	**Test Date:**	December 28, 1999	**Test Distance**	3 meters
Test Mode:	Rx	**Engineer:**	Xi-Ming Y	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	11	14	21	5	10	13	0	0	1	0
Model:	LPB-2520A	EMCO 3115	3160-9	CDI_P950	AFT18855	ACO/400	None	None	Site 1	None

Frequency	Reading	Detector	Ant. #	Amp. #	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(μV)	P/A/Q			H/V	dB(1/m)	dB	dB	dB	dB(μV/m	dB(μV/m)	dB
38.12	30.0	Peak	11	5	V	16.8	18.6	0.3	0.0	28.5	40.0	-11.5
47.92	32.0	Peak	11	5	V	14.2	18.7	0.7	0.0	28.2	40.0	-11.8
153.50	41.7	Peak	11	5	V	9.1	18.9	1.2	0.0	33.1	43.5	-10.4
182.40	44.6	Peak	11	5	V	9.9	18.9	1.2	0.0	36.8	43.5	-6.7
192.00	38.7	Peak	11	5	V	10.1	18.7	1.3	0.0	31.4	43.5	-12.1
441.60	34.0	Peak	11	5	H	16.4	16.9	2.1	0.0	35.6	46.0	-10.4
460.80	32.4	Peak	11	5	H	16.9	16.5	2.0	0.0	34.8	46.0	-11.2
480.00	33.0	Peak	11	5	H	17.6	16.5	2.0	0.0	36.1	46.0	-9.9
537.60	33.3	Peak	11	5	H	19.2	16.6	2.2	0.0	38.1	46.0	-7.9
556.80	33.0	Peak	11	5	H	18.4	15.8	2.7	0.0	38.3	46.0	-7.7
614.40	32.0	Peak	11	5	H	18.8	15.7	2.2	0.0	37.3	46.0	-8.7
672.00	32.1	Peak	11	5	H	20.2	15.3	2.8	0.0	39.8	46.0	-6.2
710.40	29.0	Peak	11	5	H	20.7	14.7	2.5	0.0	37.5	46.0	-8.5
748.80	28.0	Peak	11	5	H	21.1	14.7	2.5	0.0	36.9	46.0	-9.1

Notes:

a) D.C.F. Distance Correction Factor

b) Insert. Loss (dB) = Cable A + Cable B + Cable C.

c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only).

d) Negative signs (-) in Margin column signify levels below the limits.

e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

ITS Intertek Testing Services

Radiated Emissions Test Data

Company:	TT System LLC	**Model #:**	IBM-2.4GIG	**Standard**	FCC § 15.209
EUT:	Cordless Phone Hand set	**S/N #:**		**Limits**	3
Project #:	J99030602	**Test Date:**	December 28, 1999	**Test Distance**	3 meters
Test Mode:	Rx	**Engineer:**	Xi-Ming Y.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	11	14	21	5	10	13	0	0	1	0
Model:	LPB-2520A	EMCO 3115	3160-9	CDI_P950	AFT18855	ACO/400	None	None	Site 1	None

Frequency MHz	Reading dB(μV)	Detector P/A/Q	Ant #	Amp. #	Ant. Pol. H/V	Ant. Factor dB(1/m)	Pre-Amp dB	Insert. Loss dB	D. C. F. dB	Net dB(μV/m)	Limit @3m dB(μV/m)	Margin dB
192.00	30.0	Peak	11	5	V	10.1	18.7	1.3	0.0	22.7	43.5	-20.8
268.80	35.3	Peak	11	5	H	13.5	18.2	1.6	0.0	32.2	46.0	-13.8
288.00	36.0	Peak	11	5	H	13.2	17.8	1.6	0.0	33.0	46.0	-13.0
460.80	32.9	Peak	11	5	H	16.9	16.5	2.0	0.0	35.3	46.0	-10.7
480.00	32.0	Peak	11	5	H	17.6	16.5	2.0	0.0	35.1	46.0	-10.9
499.20	29.0	Peak	11	5	H	18.0	16.5	2.0	0.0	32.5	46.0	-13.5
508.80	25.0	Peak	11	5	H	17.6	16.6	2.2	0.0	28.2	46.0	-17.8

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Notes:

a) D.C.F. Distance Correction Factor

b) Insert. Loss (dB) = Cable A + Cable B + Cable C

c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only)

d) Negative signs (-) in Margin column signify levels below the limits.

e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

4.10 Processing Gain Measurements, FCC Rule 15.247(e)

The processing gain shall be determined from the ratio in dB of the signal to noise ratio with the system spreading code turned OFF, to the signal to noise ratio with the system spreading code turned ON, as measured at the demodulated output of the receiver. The processing gain shall be at least 10 dB for a direct sequence spread spectrum system.

X	Refer to attached test procedure and data sheets.
	Refer to circuit analysis and processing gain calculations provided by manufacturer.

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEEP function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

Duty cycle = Maximum ON time in 100 msec/100

Duty cycle correction, dB = 20 * log(DC)

	See attached spectrum analyzer chart(s) for transmitter timing
X	Not applicable, duty cycle was not used.

Procesing Gain Test for WDC-9000

Test Setup Description:

The processing gain was measured using the CW jamming margin method described by FCC recommended test procedure, as described FCC-97-114. The specific test diagram is illustrated below.

All test equipment and the EUT were allowed to warm up for one hour prior to start of test to minimize drift over time. All test equipment had valid calibration. Calibration of carrier and interferer levels was performed several times during testing with no observed changes.

The measurements were performed at the mid center channel at 2440.8 MHz, over a range of 2441.8-2439.8 MHz. The measurements made across the center (+/-) 1 MHz should be used for calculation of Gp since that bandwidth represents the receiver passband. The computer set signal was (+/-) 1 MHz to handset and receive the signal from base.

A signal level 20 dB above threshold was chosen so that thermal noise would not effect the processing gain measurements. The measured threshold of the radio was –92 dBm at BER = 1 X 10^{6}, therefore the signal was –72 dBm. The measured signal level at the output of the 6 dB splitter was –42 dBm (PSA), used for calculating Gp.

For the jammer signal, -44 dBm at the generator corresponds to –70 dBm (Pj) at the input of base phone. This figure was also used for calculating Gp.

Test Equipment:

HP Signal Generator, Model No. 8672A
HP Spectrum Analyzer, Model No.: 8566B

Explanation of Results:

The following notations are used on the spreadsheet data:

Pg: Power at Generator in dBm (as indicated by generator display)

Pj: Power of interferer

Ps: Power of carrier at power meter test report (initial calibration)

J/S: Jammer to Signal ratio, Pj-Ps (dB) (calculated in spreadsheet)

Gp: Processing Gain = S/N)o + Lsys + J/S:\
Where Lsys = 1 dB (system loss);
(S/N)o = 14.0 dB for GMSK at BT = 0.5;
Gp = 11.0 + 1 + J/S = 12 + J/S

All measurements inside the (+/-)1 MHz passband of the receiver give Gp results that exceed the minimum required value of 10 dB. Elimination of the worst 20% measurements was therefore not needed in order to meet the requirements (see spreadsheet and plotted results).

ITS Intertek Testing Services

Company: TT system LLC
Project #: J99030602
Model: IBM-2.4GIG
Engineer: Xi-Ming Yang
Date of test: December 29, 1999

Processing Gain

Frequency MHz	Pg dBm	Pj dBm	Psa(handset) dBm	Ps(handset) dBm	J/S dB	Gp dB
2441.80	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2441.75	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2441.70	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2441.65	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2441.60	-36.5	-62.5	-40.2	-70.2	7.7	19.7
2441.55	-42.0	-68.0	-40.2	-70.2	2.2	14.2
2441.50	-41.5	-67.5	-40.2	-70.2	2.7	14.7
2441.45	-41.0	-67.0	-40.2	-70.2	3.2	15.2
2441.40	-41.5	-67.5	-40.2	-70.2	2.7	14.7
2441.35	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2441.30	-44.5	-70.5	-40.2	-70.2	-0.3	11.7
2441.25	-45.5	-71.5	-40.2	-70.2	-1.3	10.7
2441.20	-45.0	-71.0	-40.2	-70.2	-0.8	11.2
2441.15	-43.5	-69.5	-40.2	-70.2	0.7	12.7
2441.10	-43.0	-69.0	-40.2	-70.2	1.2	13.2
2441.05	-42.8	-68.8	-40.2	-70.2	1.4	13.4
2441.00	-38.0	-64.0	-40.2	-70.2	6.2	18.2

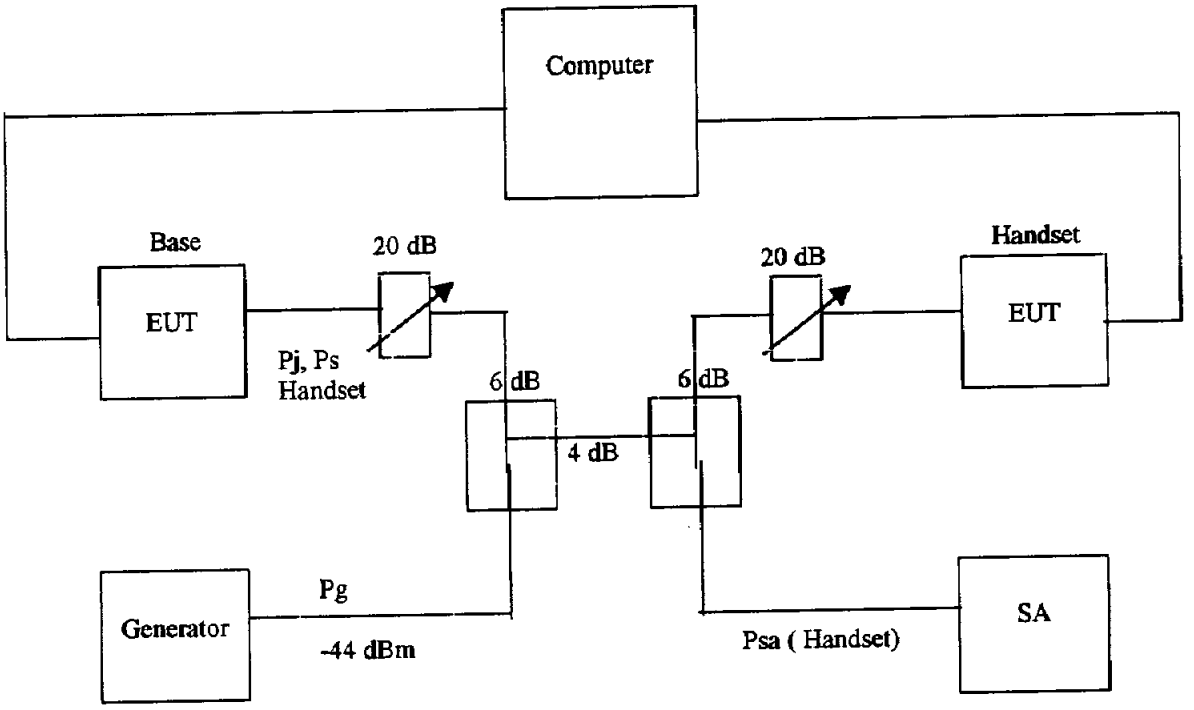
ITS Intertek Testing Services

Company: TT system LLC
Project #: J99030602
Model: IBM-2.4GIG
Engineer: Xi-Ming Yang
Date of test: December 29, 1999

Processing Gain

Frequency MHz	Pg dBm	Pj dBm	Psa(handset) dBm	Ps(handset) dBm	J/S dB	Gp dB
2440.95	-43.0	-69.0	-40.2	-70.2	1.2	13.2
2440.90	-41.0	-67.0	-40.2	-70.2	3.2	15.2
2440.85	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2440.80	-39.0	-65.0	-40.2	-70.2	5.2	17.2
2440.75	-38.0	-64.0	-40.2	-70.2	6.2	18.2
2440.70	-42.5	-68.5	-40.2	-70.2	1.7	13.7
2440.65	-42.0	-68.0	-40.2	-70.2	2.2	14.2
2440.60	-38.5	-64.5	-40.2	-70.2	5.7	17.7
2440.55	-43.0	-69.0	-40.2	-70.2	1.2	13.2
2440.50	-42.0	-68.0	-40.2	-70.2	2.2	14.2
2440.45	-43.0	-69.0	-40.2	-70.2	1.2	13.2
2440.40	-42.0	-68.0	-40.2	-70.2	2.2	14.2
2440.35	-43.5	-69.5	-40.2	-70.2	0.7	12.7
2440.30	-43.5	-69.5	-40.2	-70.2	0.7	12.7
2440.25	-40.5	-66.5	-40.2	-70.2	3.7	15.7
2440.20	-39.5	-65.5	-40.2	-70.2	4.7	16.7
2440.15	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2440.10	-42.0	-68.0	-40.2	-70.2	2.2	14.2
2440.05	-41.0	-67.0	-40.2	-70.2	3.2	15.2
2440.00	-38.0	-64.0	-40.2	-70.2	6.2	18.2
2439.95	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2439.90	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2439.85	-37.0	-63.0	-40.2	-70.2	7.2	19.2
2439.80	-37.0	-63.0	-40.2	-70.2	7.2	19.2

Test Setup Diagram



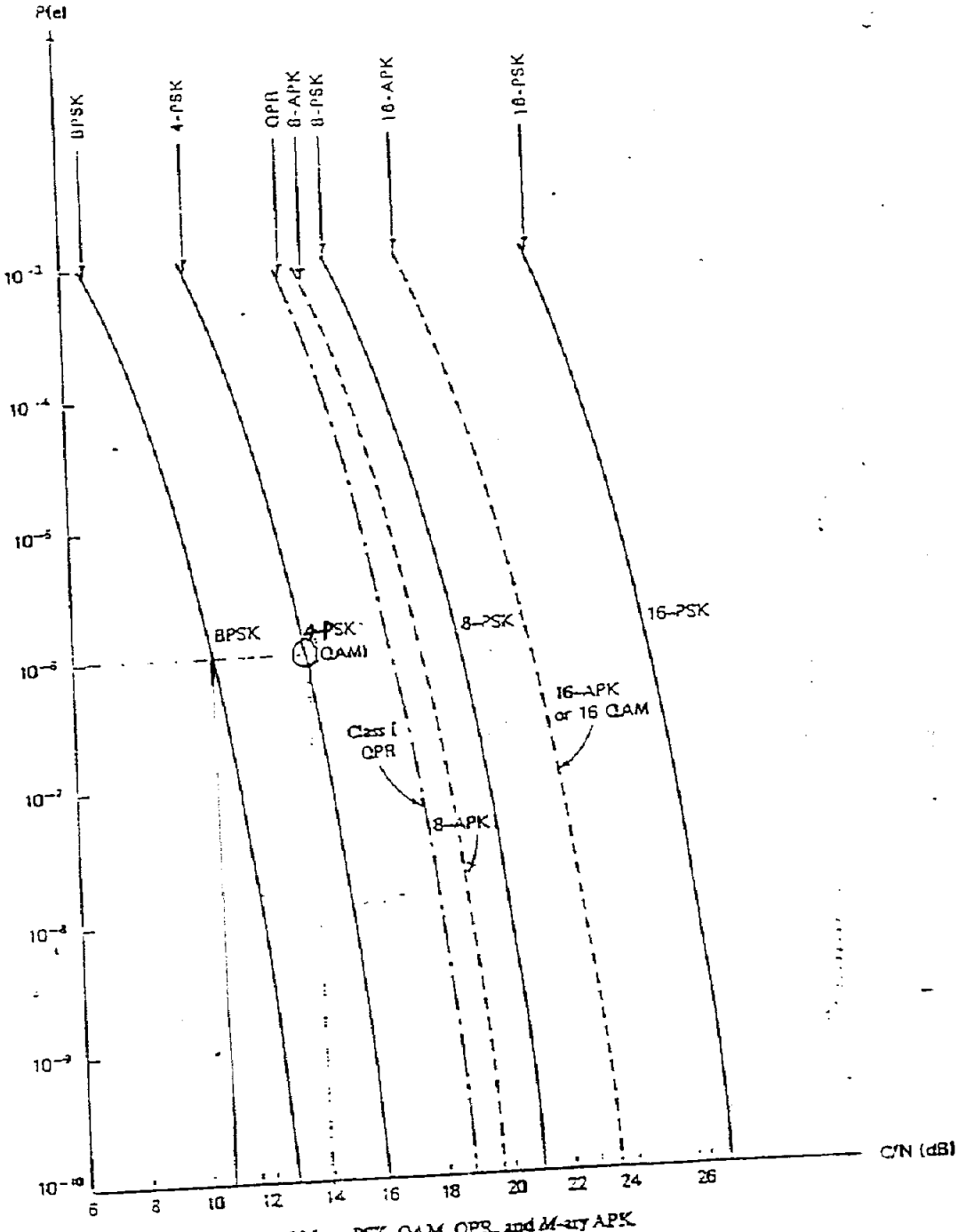


Fig. 3.21. $P(e)$ performance of M-ary PSK, QAM, QPR, and M-ary APK coherent systems. The rms C/N is specified in the double-sided Nyquist bandwidth.

Figure showing offset for QPSK (4-PSK) modulation C/N offset (14 dB).
(Obtained from DIGITAL COMMUNICATIONS: Microwave Applications, by Kamilo Feher, Prentice-Hall Inc., 1981)

5.0 Miscellaneous Information or Other Comments

None.