

4.3 Power Density

Requirement:

For fixed point-to-point U-NII devices operating in 5.25-5.35 GHz band peak power spectral density shall not exceed 11 dBm in any 1 MHz band (for antenna gain up to 6 dBi).

Procedure:

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

The spectrum analyzer Resolution Bandwidth was set to 1 MHz and Video Bandwidth was set to 7 MHz. The START and STOP frequencies were set to the band edges of the maximum output passband. The spectrum analyzer was set to video average, 100 sweeps were used. Maximum peak-power spectral density reading was recorded.

Result:

Frequency MHz	Power Density dBm	EIRP Limit dBm	Maximum Allowed Antenna Gain dBi
5275	3.5	17.0	13.5
5325	2.6	17.0	14.4

Refer to the following plots for power density data:

Plot 2a: Low Channel Power Density

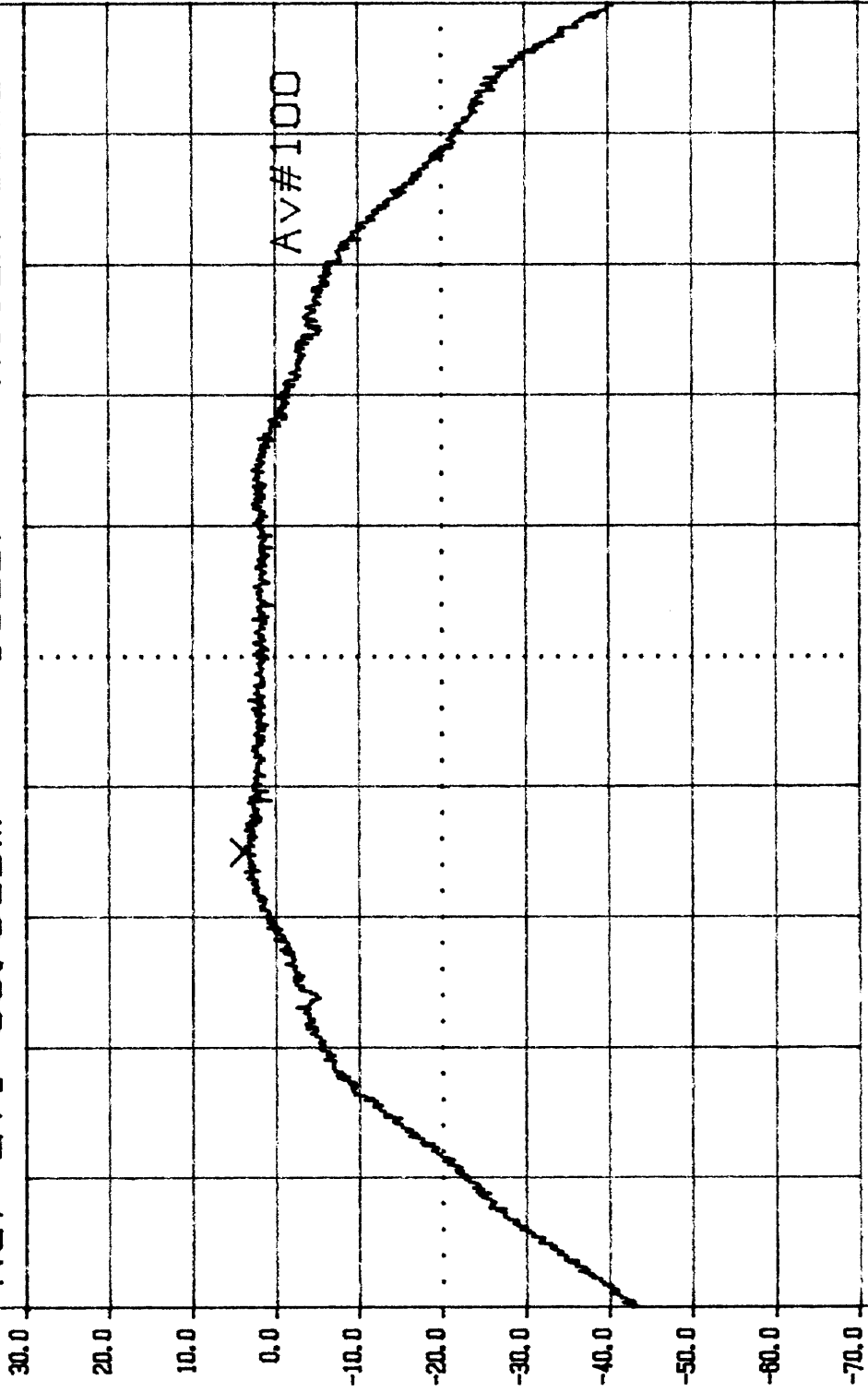
Plot 2b: High Channel Power Density

Note:

1. As it is written in section 4.1, the Output Power should be reduced by 13.0 dB to meet the EIRP requirement with antenna gain 23.5 dBi. In this case, the Power Density will reduce on the same scale, so it will be in compliance with EIRP Power Density Limit.
2. When a higher gain antenna is used, the Output Power will be reduced further and, as a result, further down the Power Density.

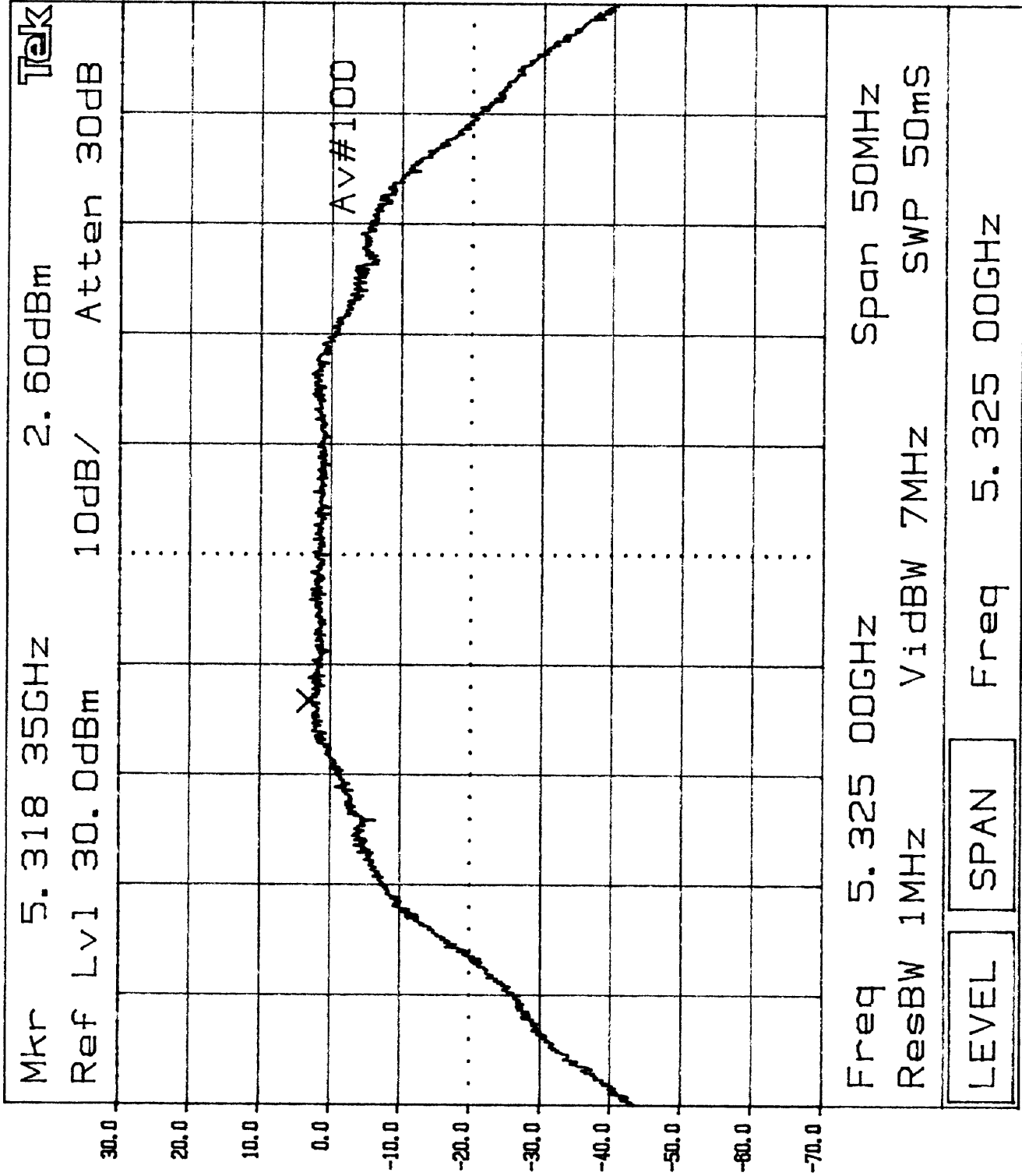
Mkr 5.267 50GHz 3.50dBm Tak

Ref Lvl 30.0dBm 10dB/ Atten 30dB



Freq 5.275 00GHz Span 50MHz
ResBW 1MHz VidBW 7MHz SWP 50ms

LEVEL SPAN Freq 5.275 00GHz



Plot 2.6

- 4.4 The ratio of the peak excursion of the modulation envelope to the peak power
FCC Rule 15.407(a)(6)

Requirement:

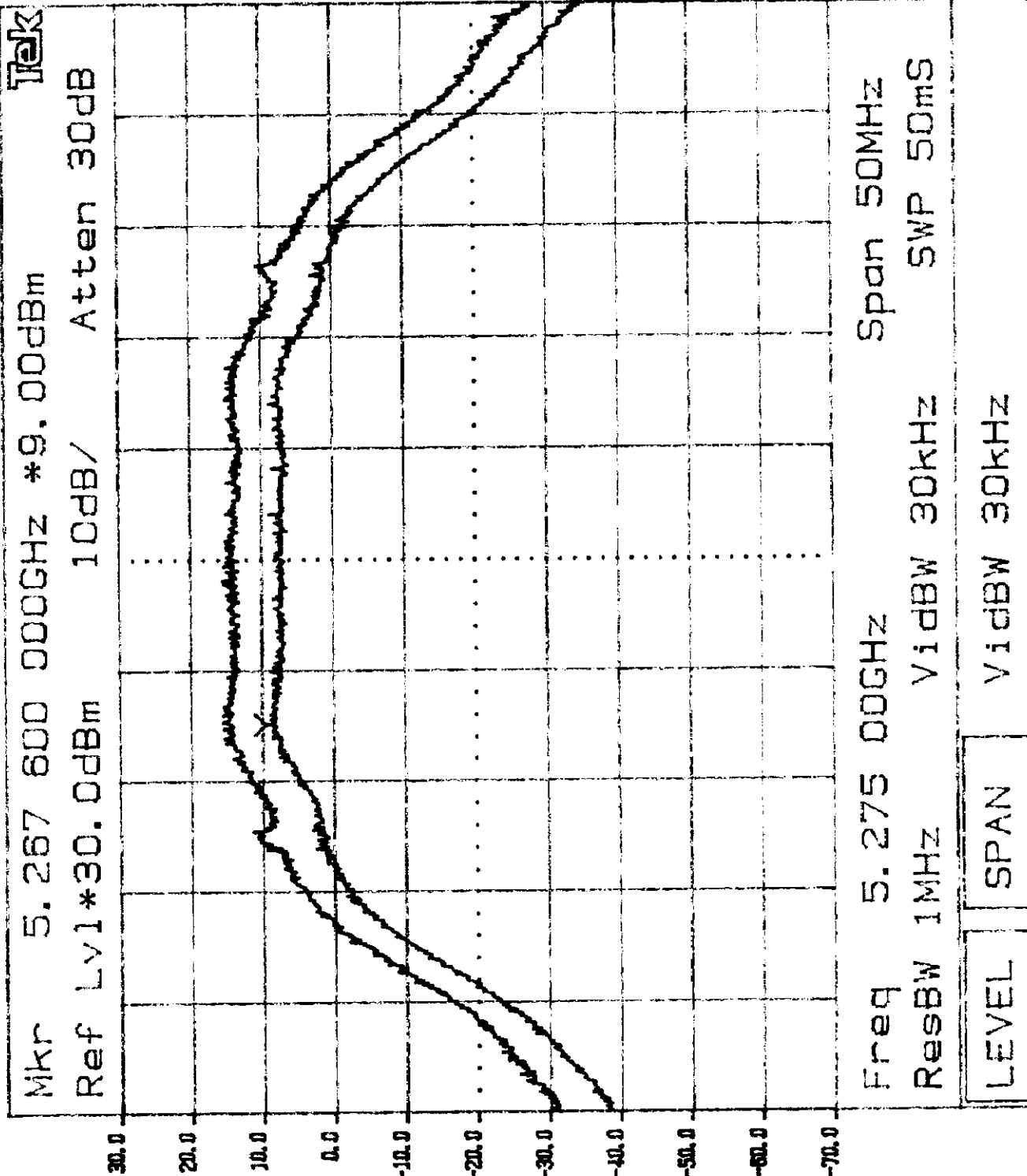
The ratio of the peak excursion of the modulation envelope to the peak transmit power shall not exceed 13 dB.

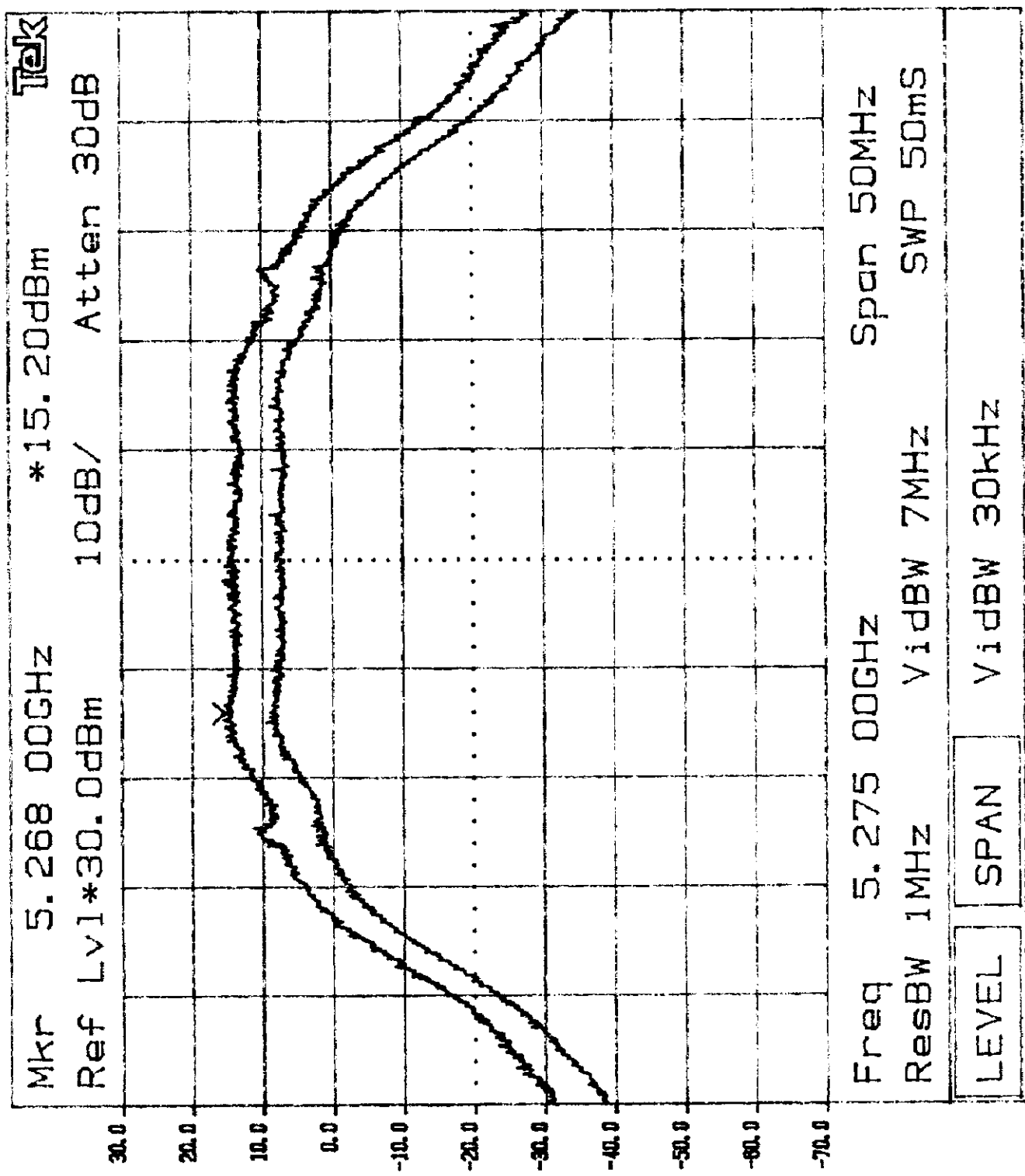
Procedure:

Spectrum Analyzer was connected to the output of the EUT. The Resolution Bandwidth was set to 1 MHz. Two plots were made in each band: with the Video Bandwidth set to 7 MHz and with the Video Bandwidth set to 30 kHz. The difference between spectrum analyzer readings indicates the ratio of the peak excursion of the modulation envelope to the peak transmit power.

Test Result:

See attached plots 3.a1, 3.a2 and 3.b1, 3.b2. for the ratio of the peak excursion of the modulation envelope to the peak power. The maximum Ratio is 6.3 dB





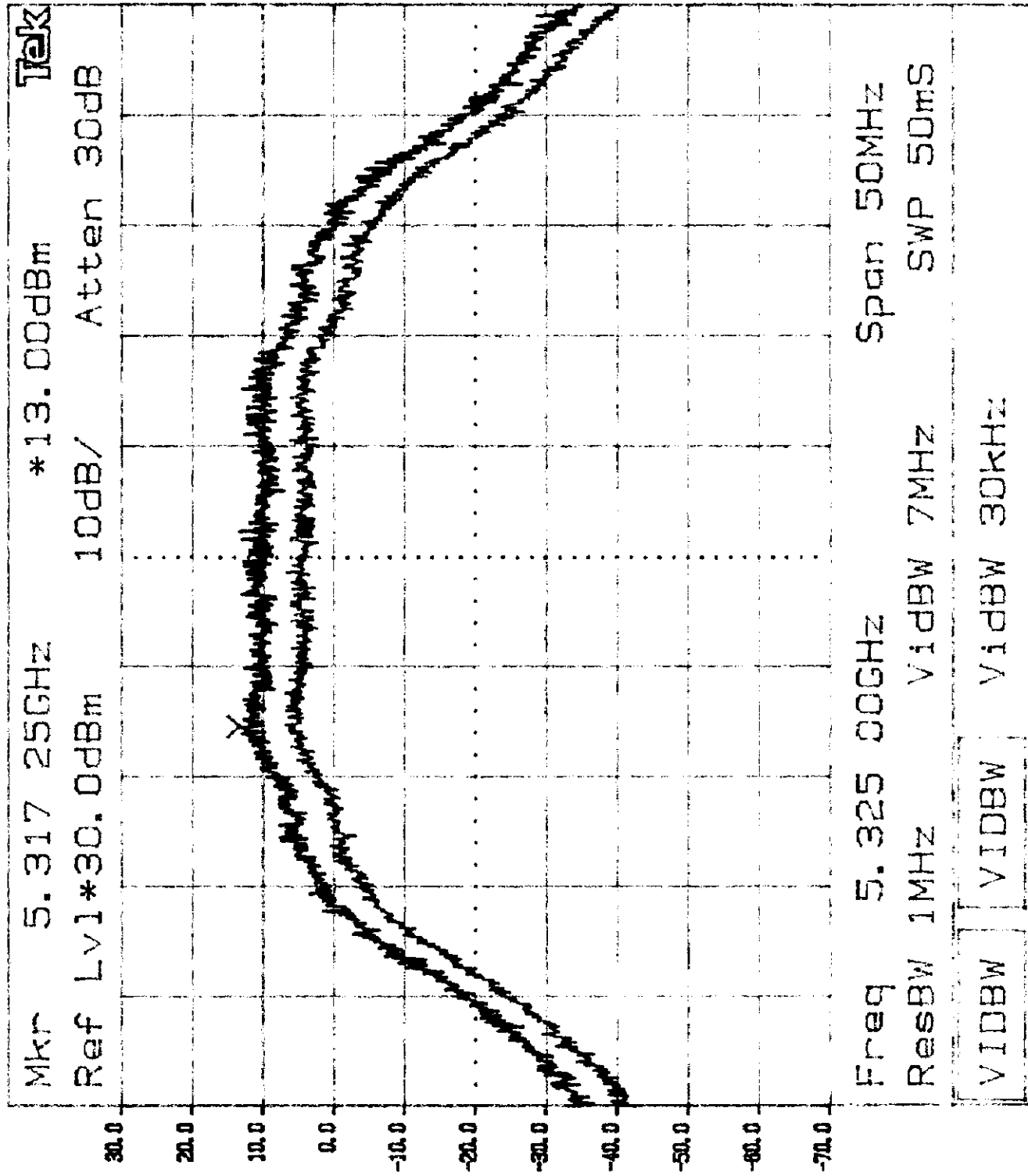
WAVEFORM A:

Atten 30dB
Freq 5.275 00GHz
Ref Lvl*30.0dBm
ResBW 1MHz
Span 50MHz
SWP 50mS
10dB/
VidBW 7MHz

WAVEFORM B:

Atten 30dB
Freq 5.275 00GHz
Ref Lvl*30.0dBm
ResBW 1MHz
Span 50MHz
SWP 50mS
10dB/
VidBW 30kHz

Plot 3 & 2



WAVEFORM A:

Atten 30dB

Freq 5.325 00GHz

Ref Lvl*30.0dBm

ResBW 1MHz

Span 50MHz

SWP 50mS

10dB/

VidBW 7MHz

WAVEFORM B:

Atten 30dB

Freq 5.325 00GHz

Ref Lvl*30.0dBm

ResBW 1MHz

Span 50MHz

SWP 50mS

10dB/

VidBW 30kHz

Plot 361

4.5 Out-of-Band Conducted Emissions FCC Rule 15.407(b)

Requirement:

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

Procedure:

Spectrum Analyzer was connected to the output of the EUT. For frequencies above 1 GHz, the Resolution Bandwidth was set to 1 MHz, and average measurements were performed. For frequencies below 1 GHz, the Resolution Bandwidth was set 100 kHz, and peak measurements were performed. Several plots were made in the frequency range from 30 MHz to 40 GHz.

Result:

Refer to the following plots and data tables (on the next page) for out-of-band conducted emissions data:

Plot 4.a1 – 4.a8: Low Channel, 5275 MHz.

Plot 4.b1 – 4.b9: High Channel, 5325 MHz.

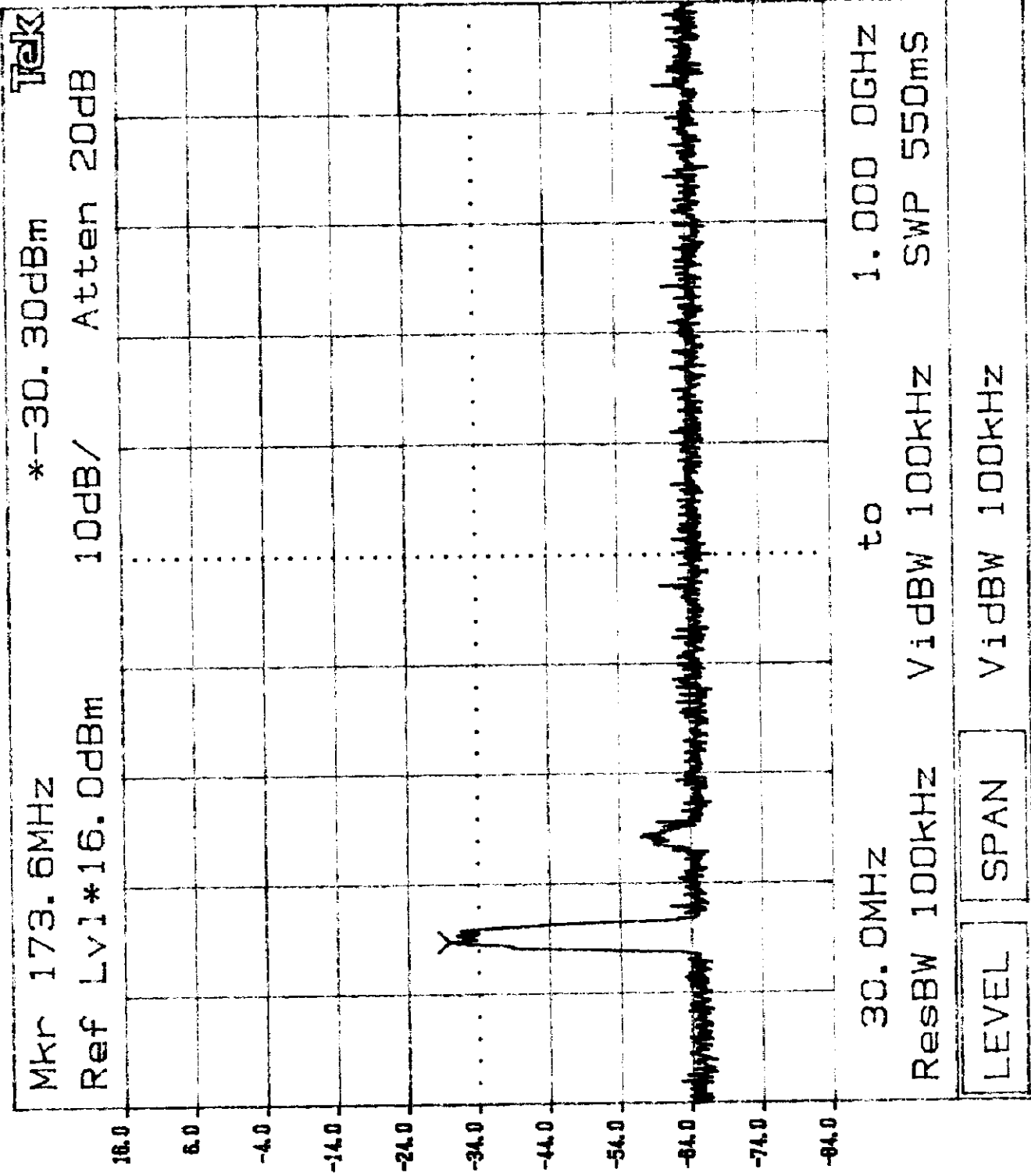
The antenna used for this application has the gain equals 23.5 dBi, therefore the output power will have to be reduced by 0.4 dB.

Operating frequency	Frequency, MHz	Level, dBm	Limit, dBm/MHz	Maximum allowed antenna gain, * dBi
5275 MHz	5150	-57.2 from plot 4.a4	-27.0	30.2
	5350	-65.6 from plot 4.a6	-27.0	38.6

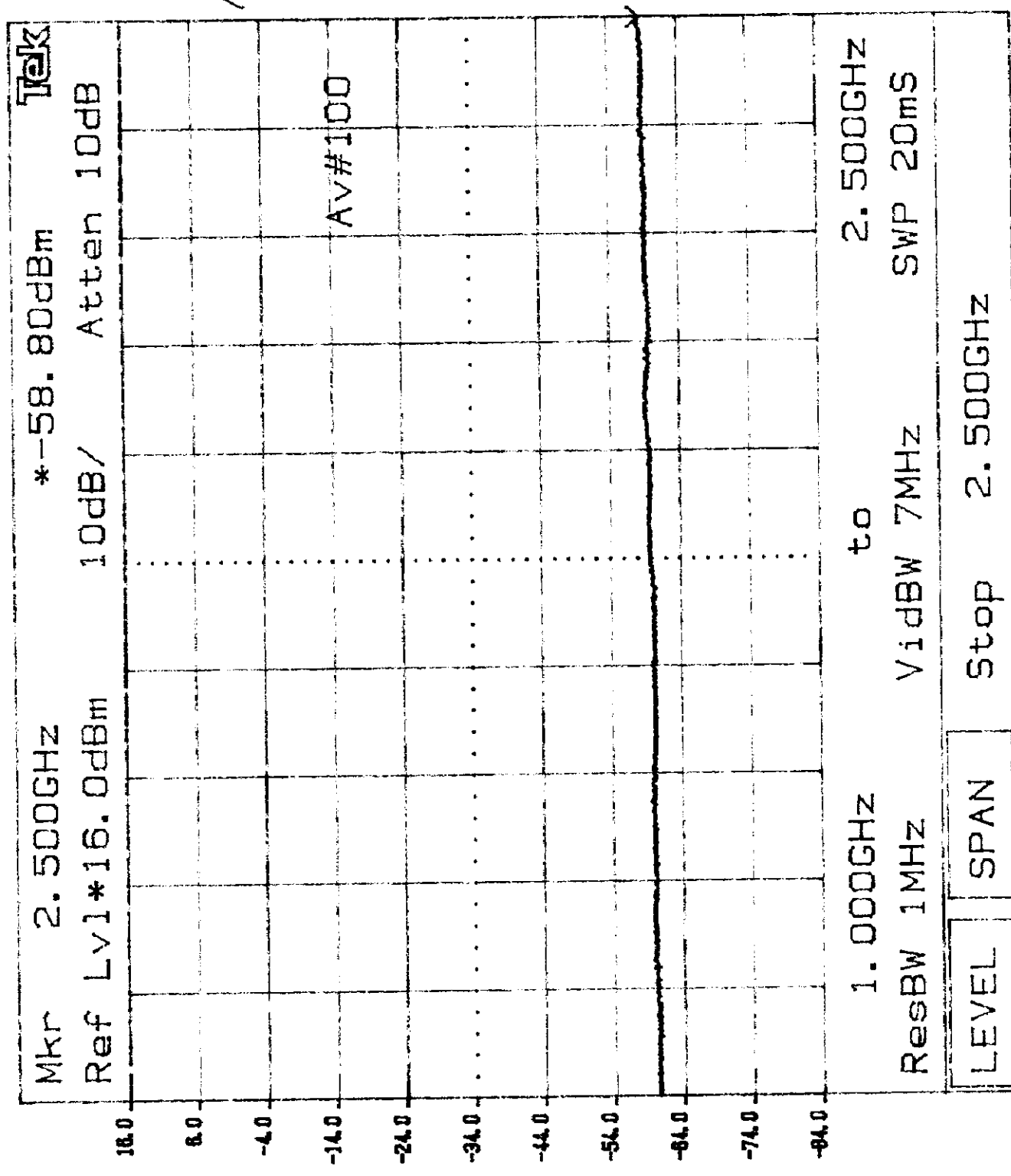
Operating frequency	Frequency, MHz	Level, dBm	Limit, dBm/MHz	Maximum allowed antenna gain, * dBi
5325 MHz	5150	-58.3 from plot 4.b5	-27.0	31.3
	5350	-40.1 from plot 4.b7	-17.0	23.1

* Maximum antenna gain without reducing the Output Power.

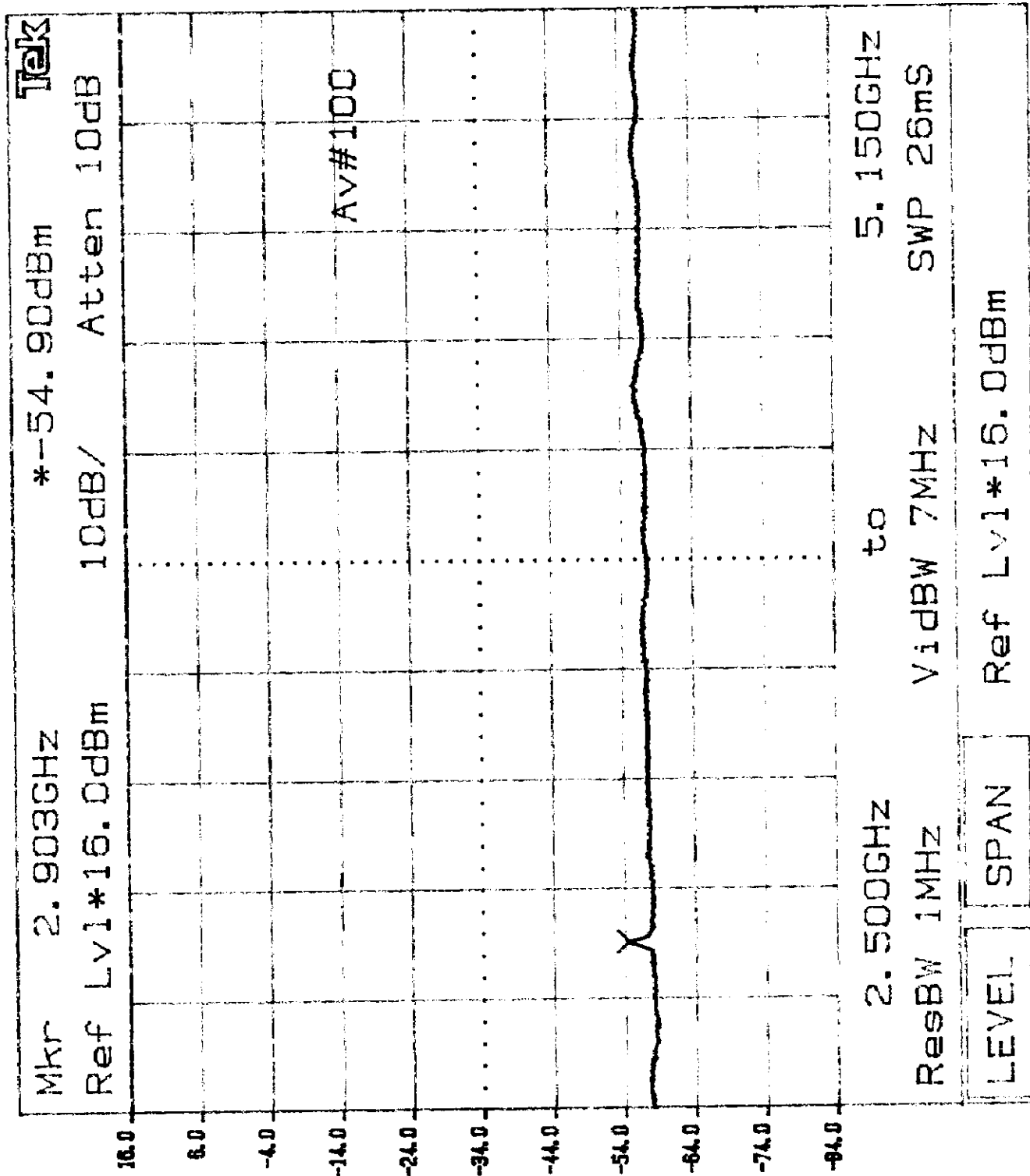
Plot 421



Plot 4a2



Plot 423



2784

Tektronix

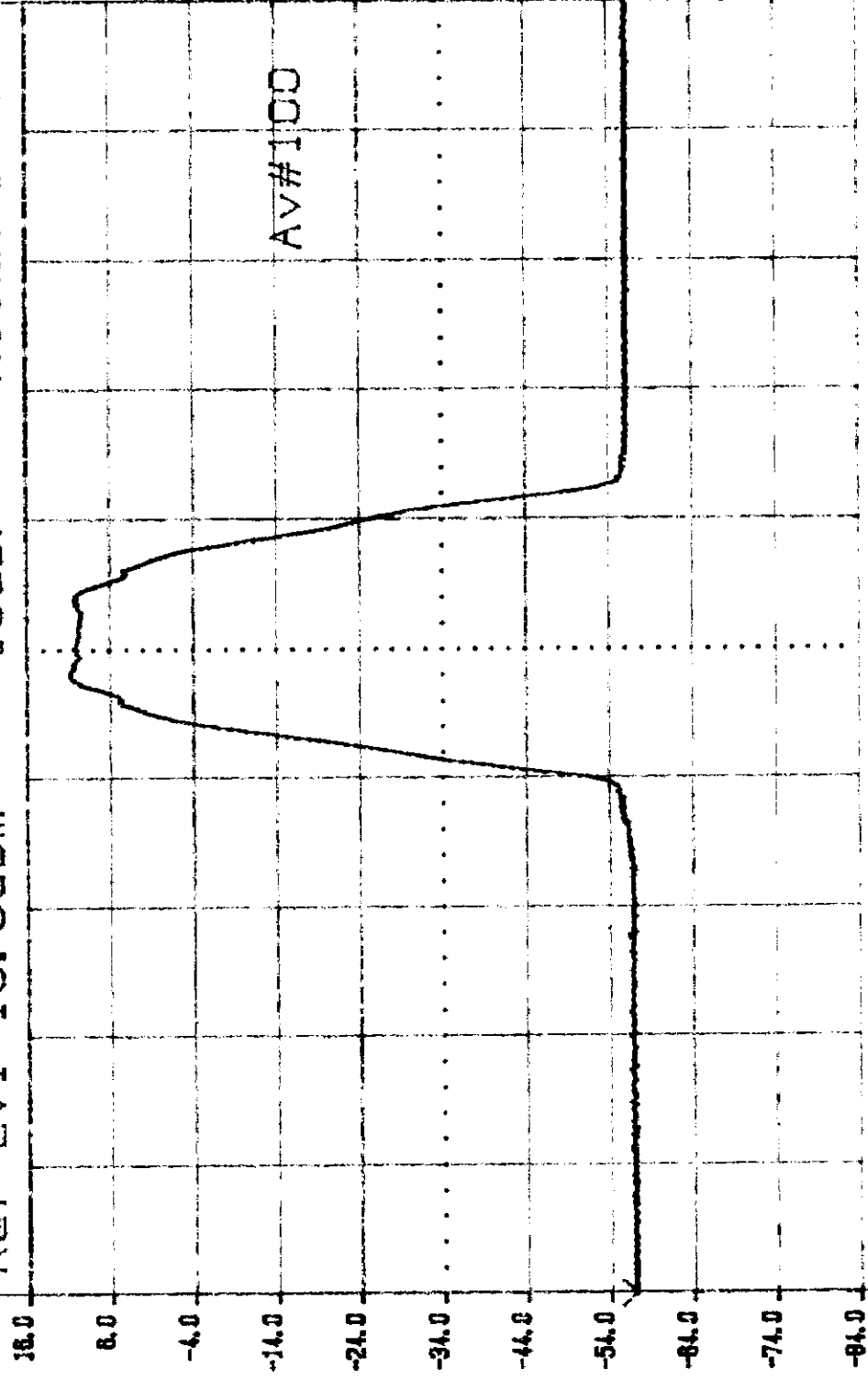
KEYPAD

KNOB 1

KNOB 2

Mkr 5.150 0GHz *-57.20dBm Tek

Ref Lvl*16.0dBm 10dB/ Atten 10dB

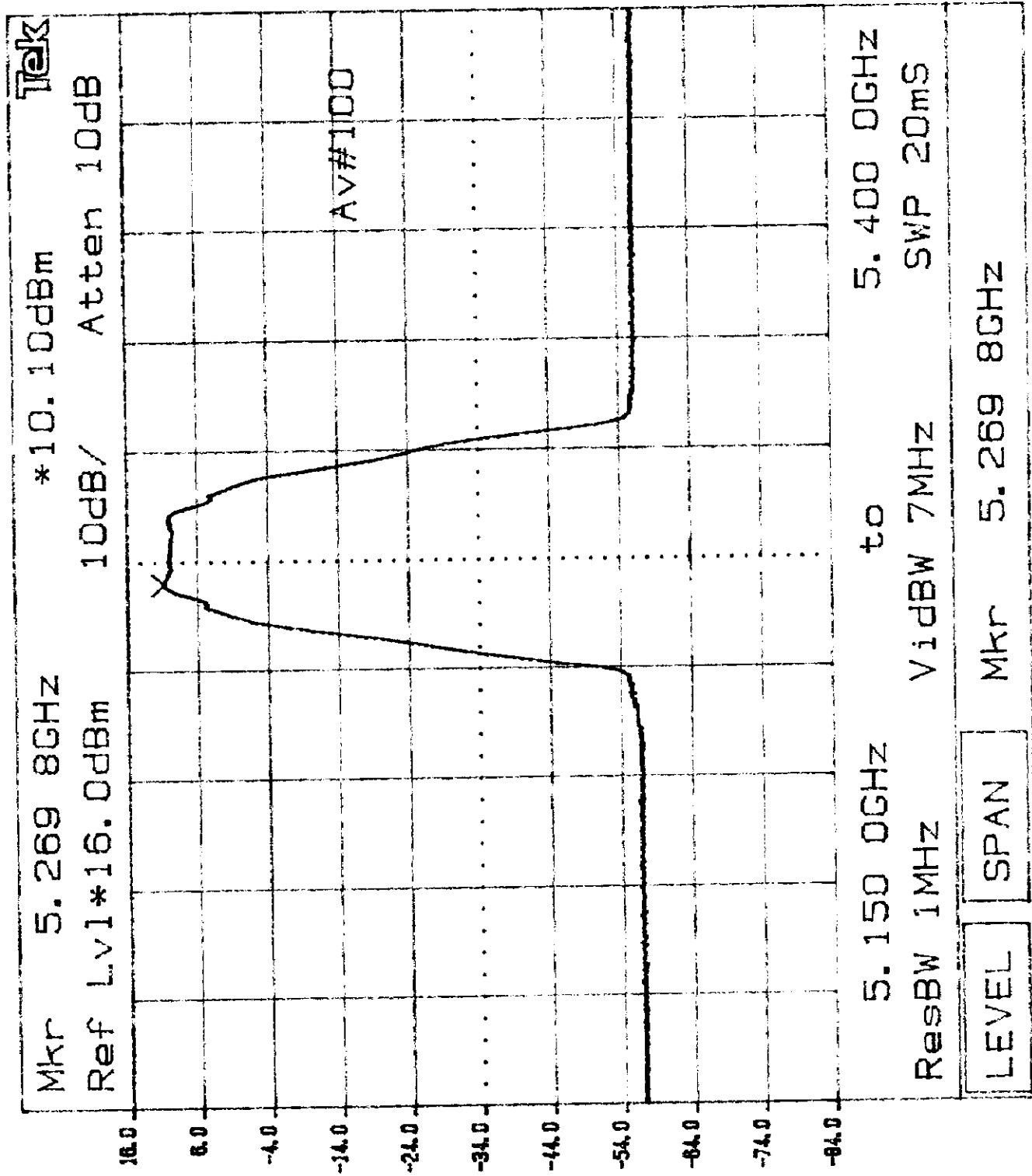


5.150 0GHz to 5.400 0GHz
ResBW 1MHz VidBW 7MHz SWP 20mS

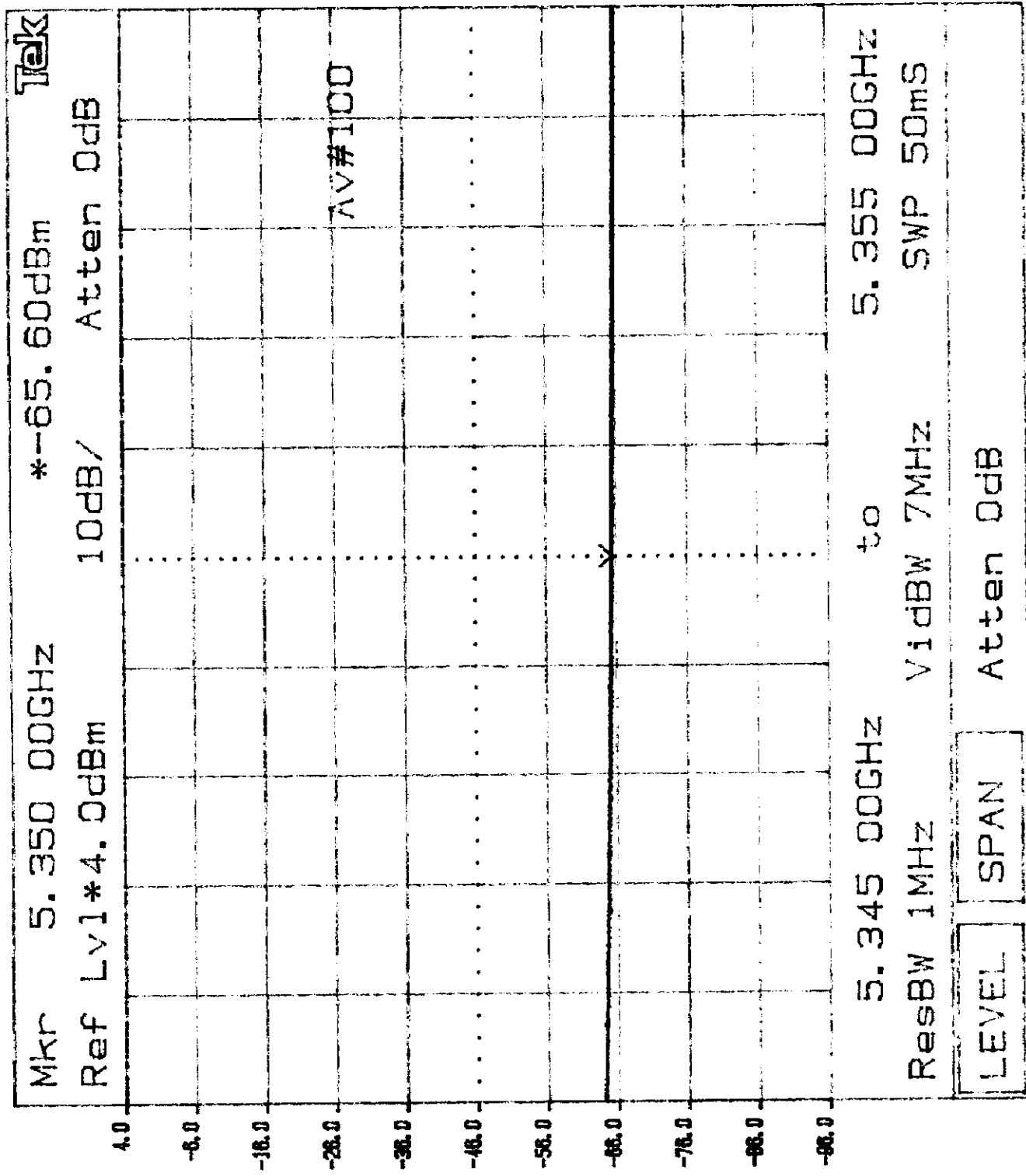
LEVEL SPAN

Plot 424

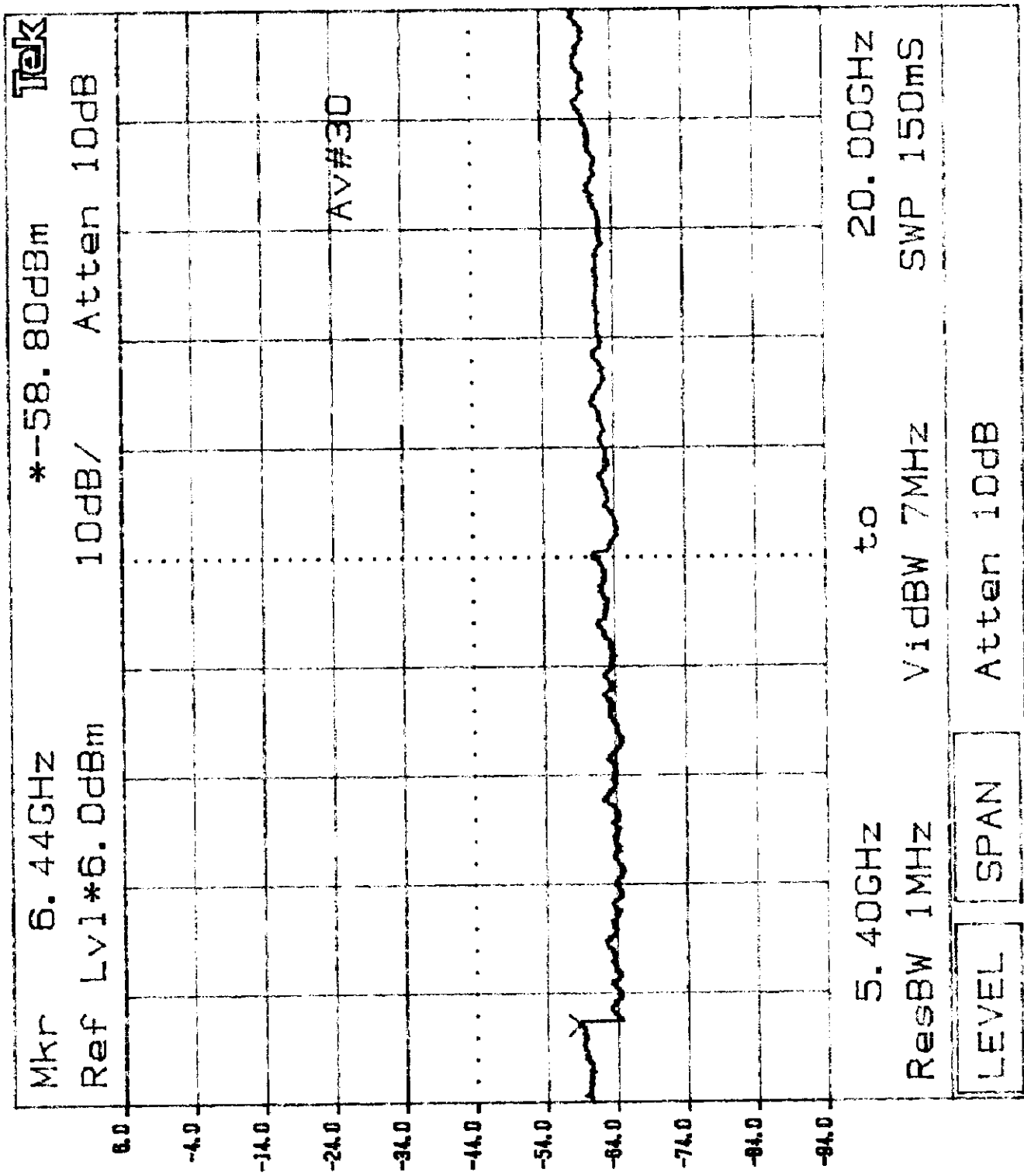
Plot 425



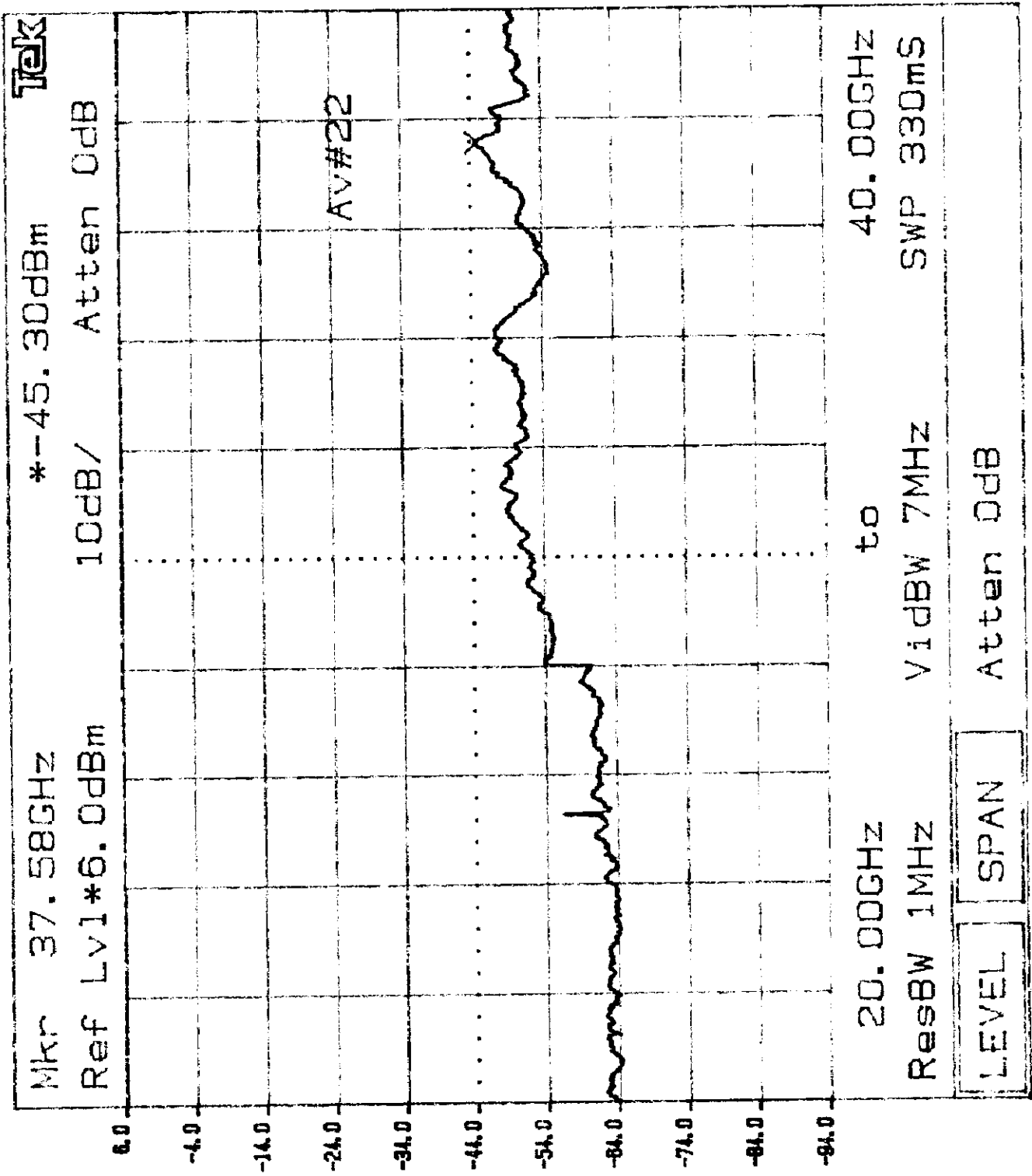
Plot Y26



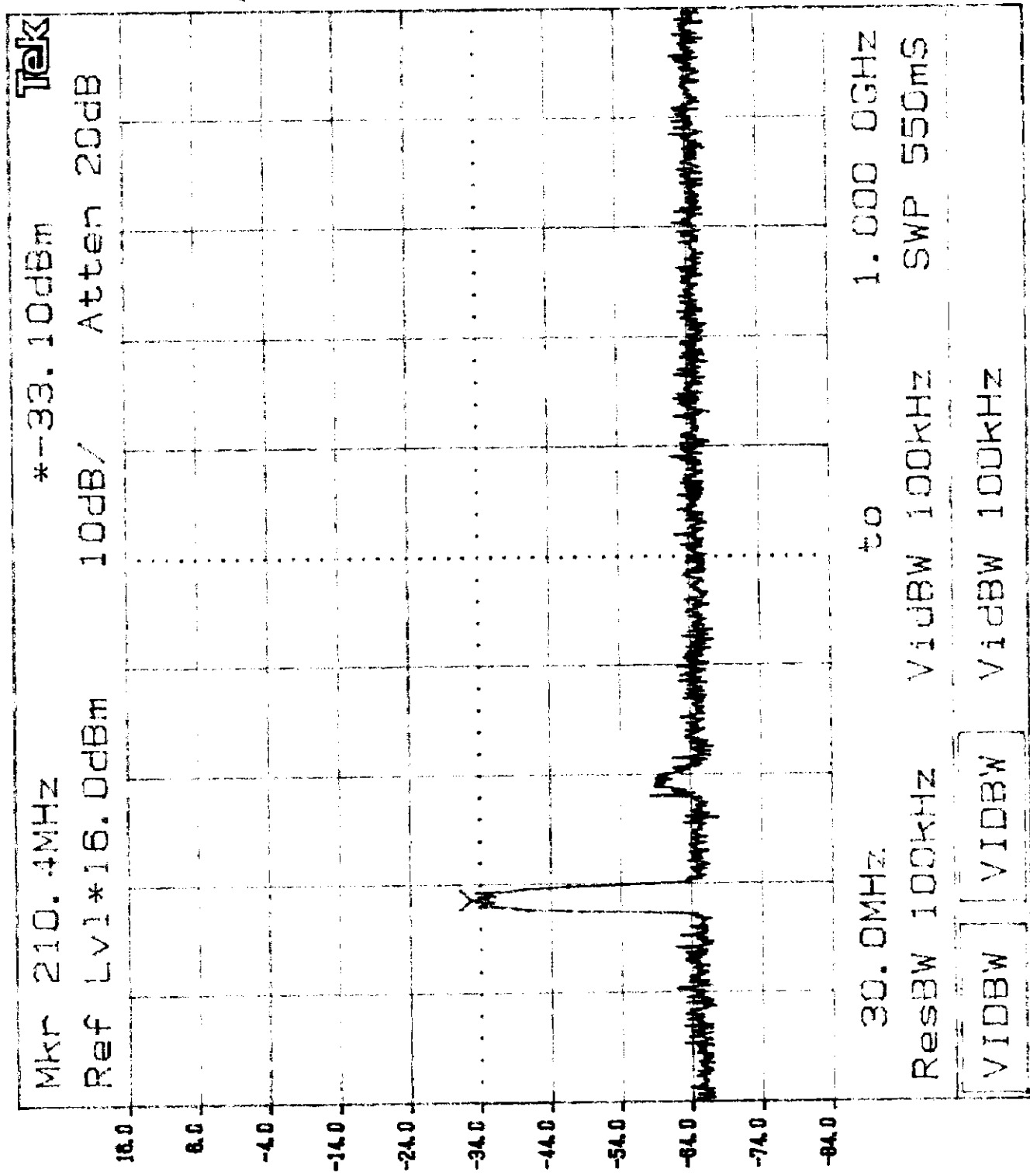
Plot 427



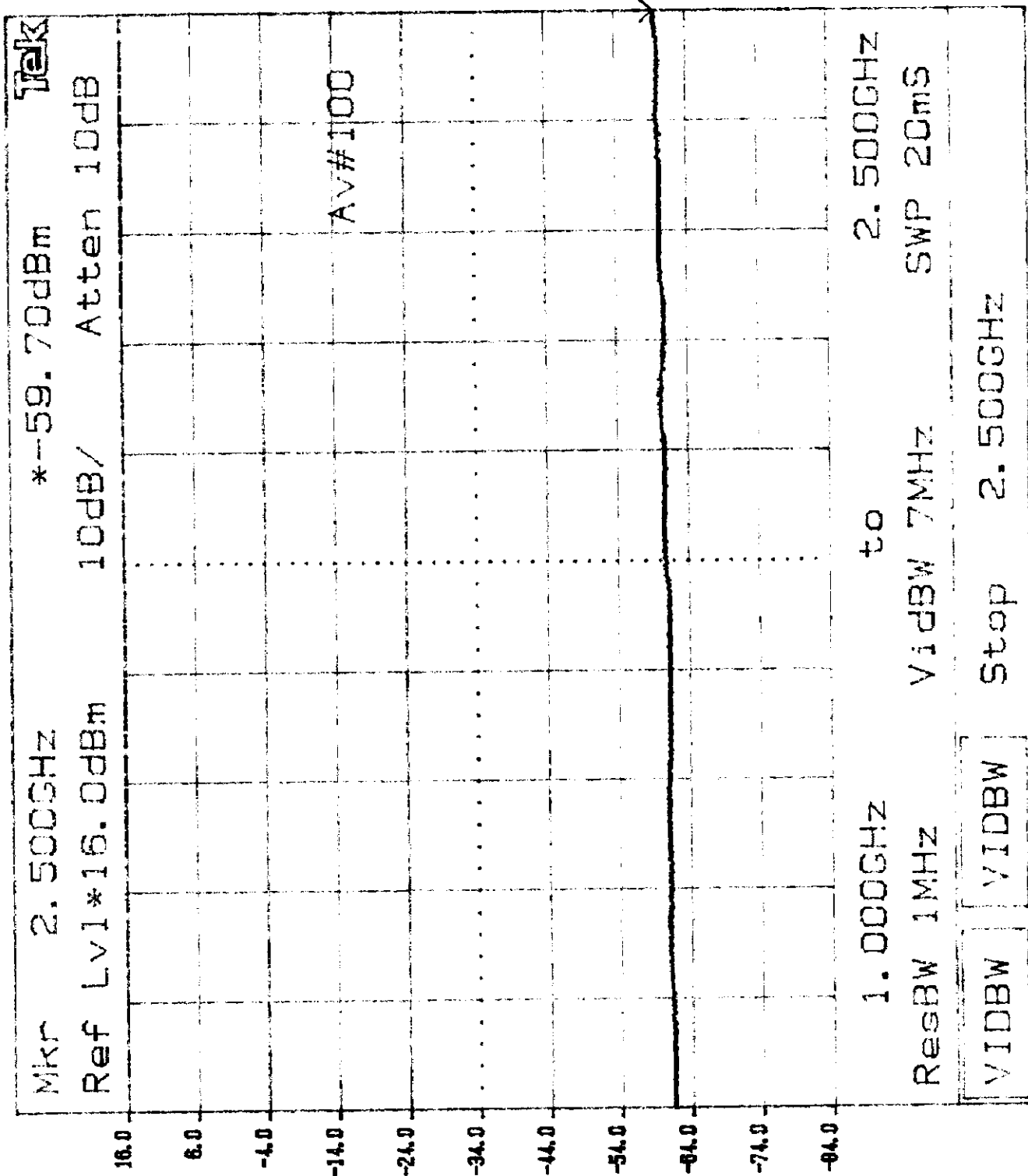
Plot 428



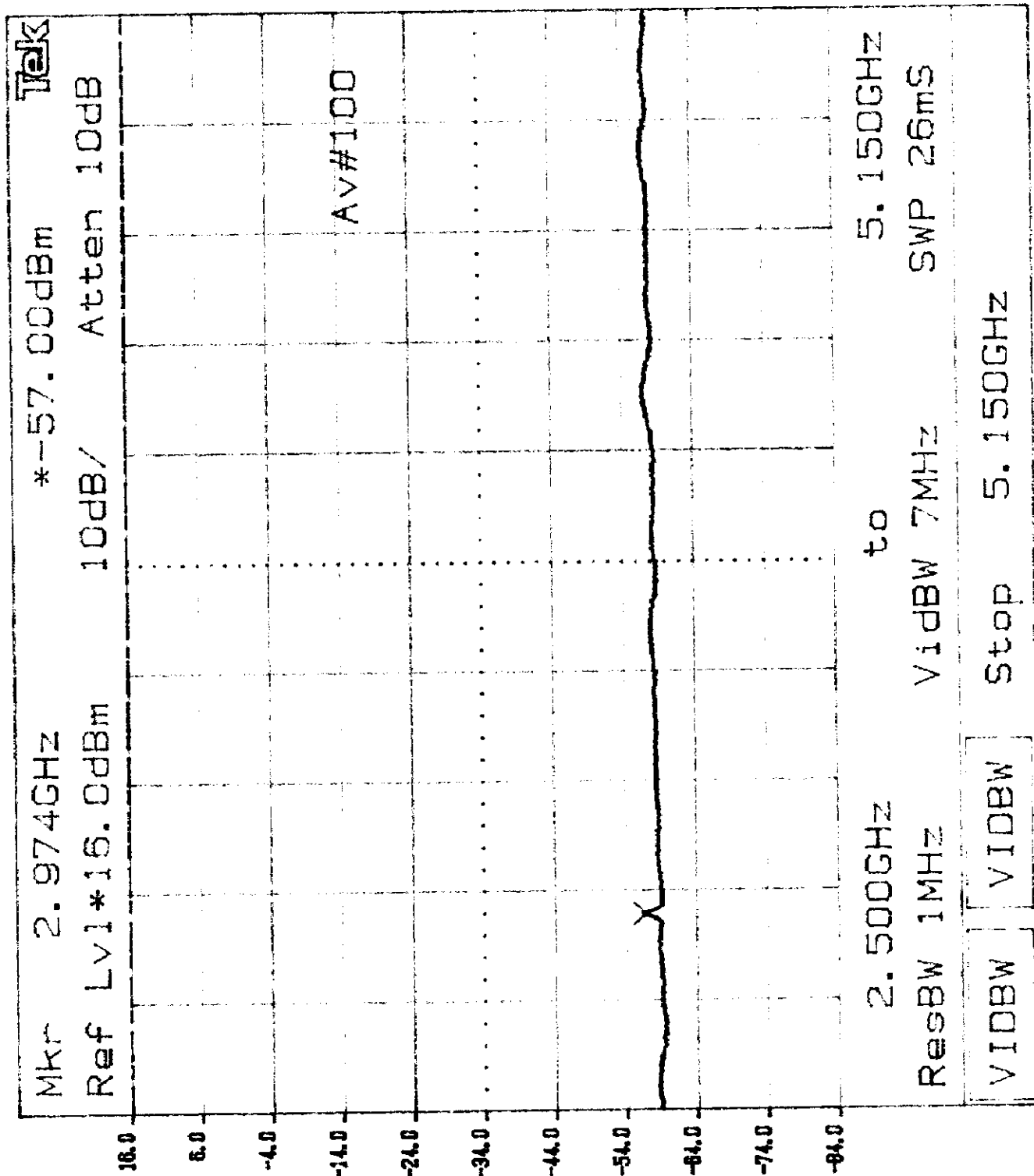
Plot 4 b1



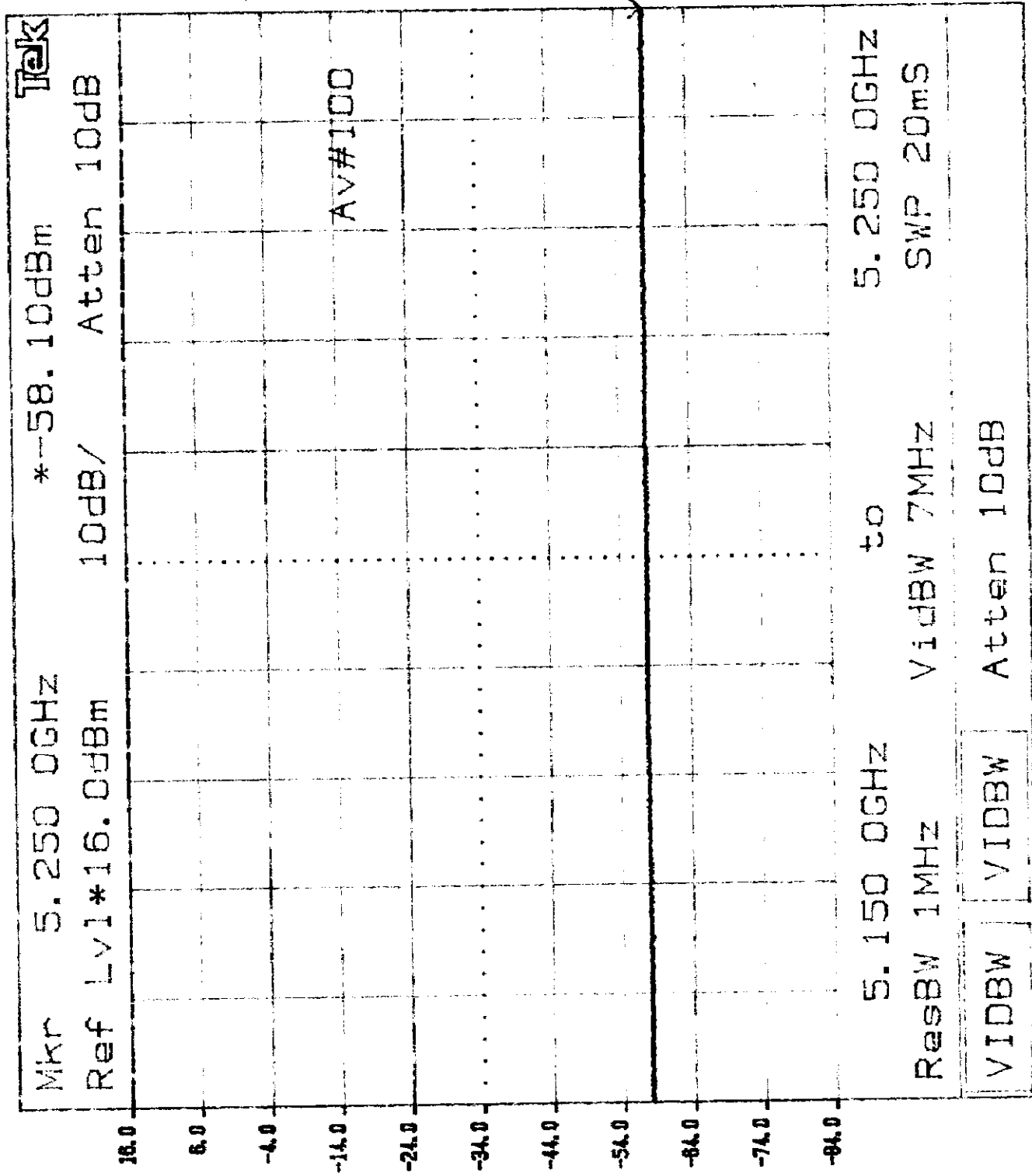
Plot 462



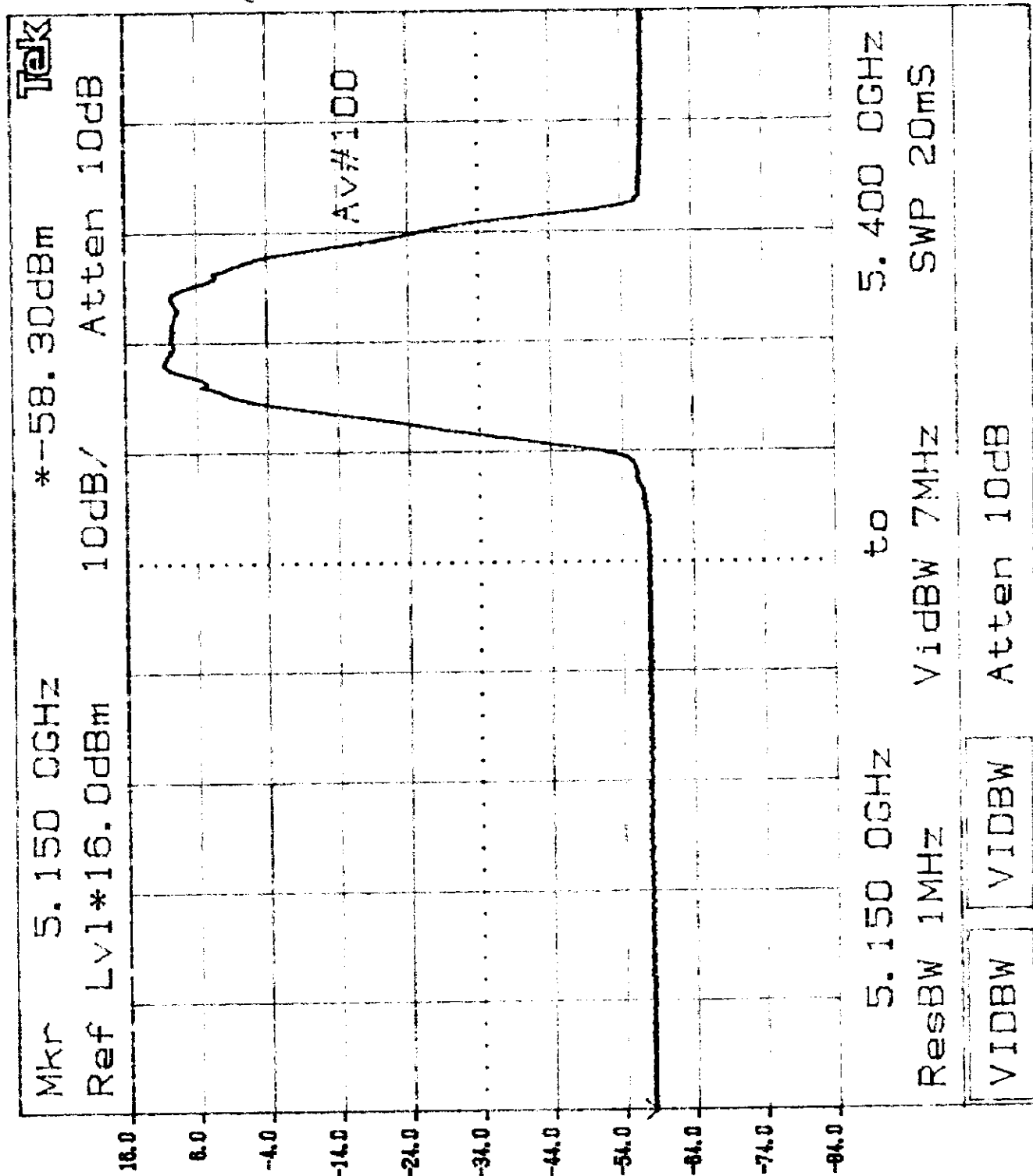
Plot 463



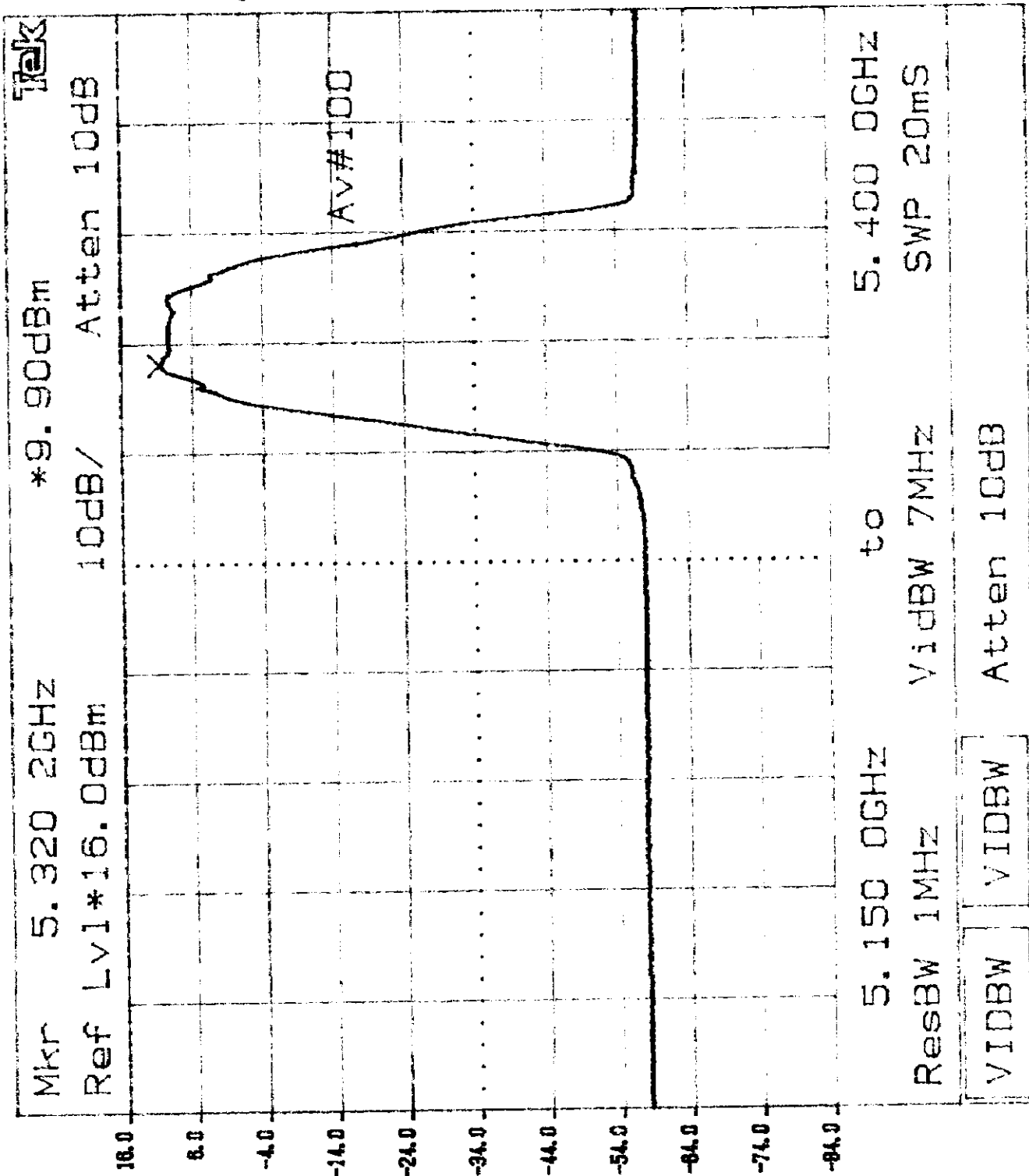
Plot 464



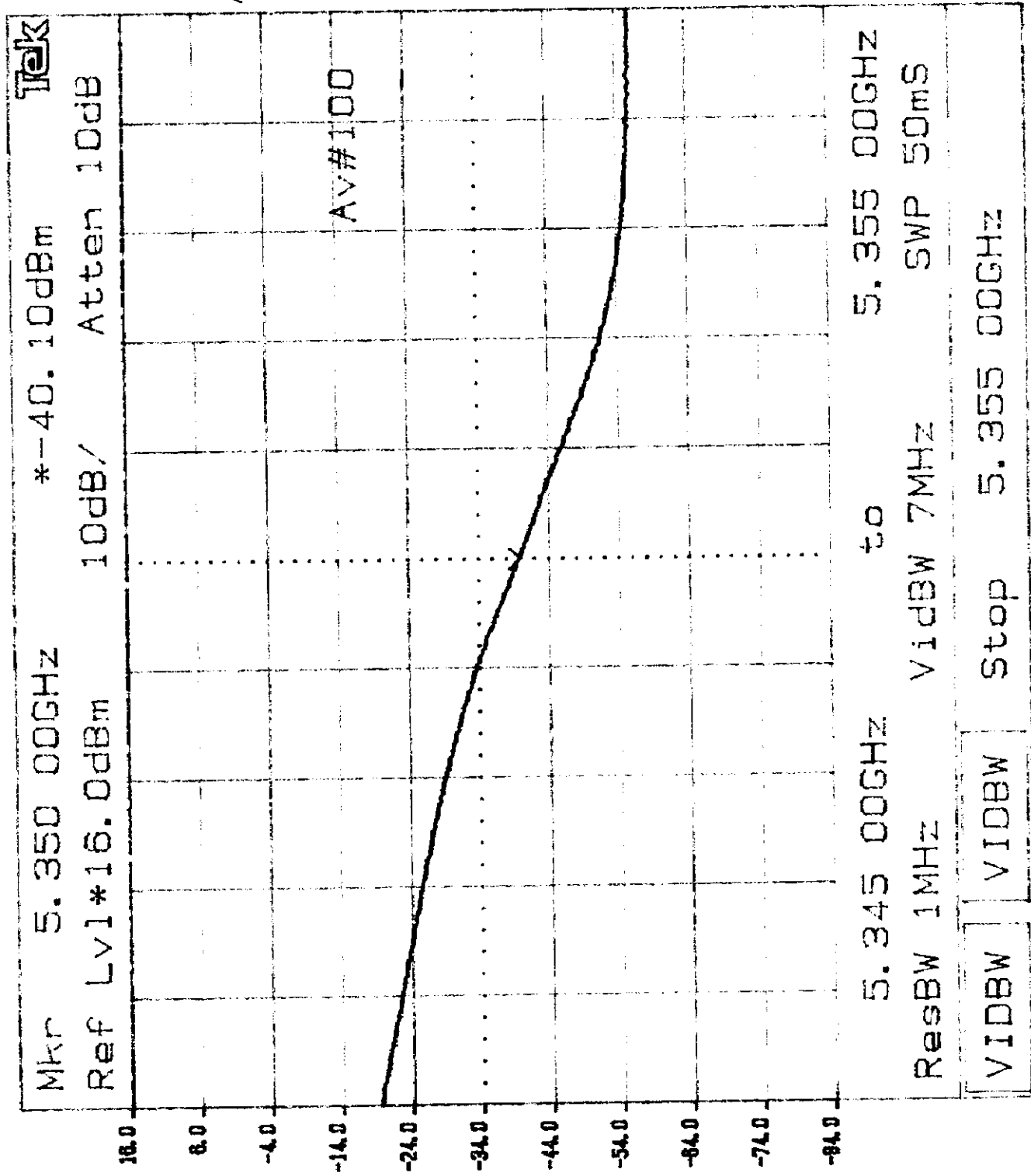
Plot 465



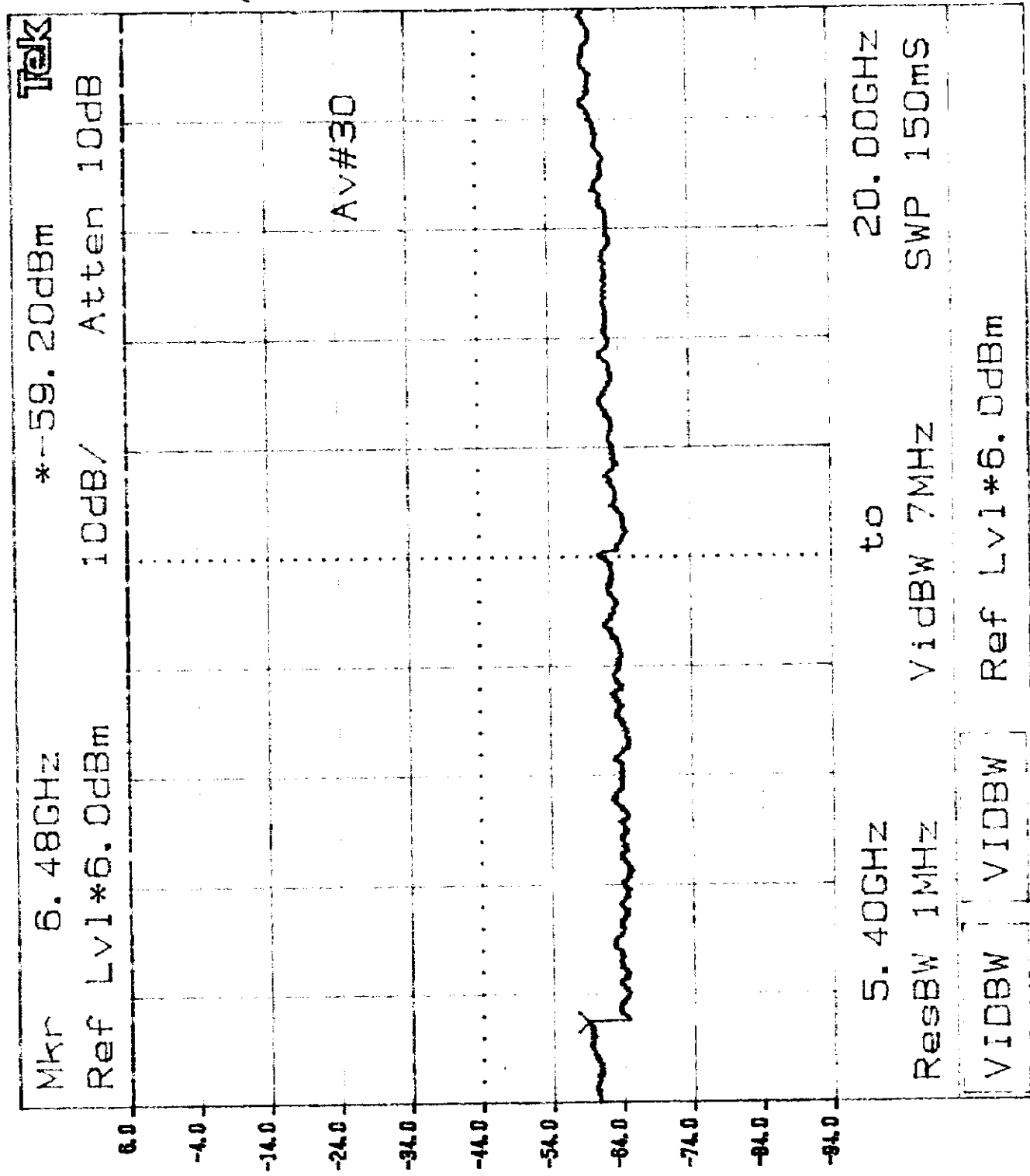
Plot 466



Plot 467



Plot 468



Plot 469

