Intertek Testing Services

APPLICATION FOR FCC CERTIFICATION

U-NII Device

Glenayre Western Multiplex
Model: 27710

FCC ID: HZB-U58/45

Job # J99014962
Report #J99014962d

Number of Pages: 17 pp. + Supporting Data and Documents

Date of Report: June 21, 1999

Table of Contents

1.0 **Summary of Tests**

Glenayre Western Multiplex - MODEL: 27710
FCC ID: HZB-U58/45

TEST	REFERENCE	RESULTS
Max. Output power	15.407 (a)	Pass
26 dB Bandwidth	15.407 (a)	Not Applicable
Max. Power Density	15.407 (a) (5)	Pass
Out of Band Emissions	15.407 (b)	Pass
Radiated Emission in Restricted Bands	15.407 (b) (6), 15.205	Pass
AC Conducted Emission	15.407 (b) (5), 15.207	Pass
Radiated Emission from Digital Part	15.407 (b) (5), 15.209	Pass
Radiated Emission from Receiver L.O.	15.209	Not Applicable
Antenna Requirement	15.203	Pass

Test Engineer: Xi-Ming Yang Date: 7-15-99
Xi-Ming Yang

EMC Site Manager: cell: MZ for Date: 7/15/99
David Chernomordik

2.0 General Description

2.1 Product Description

The Model No.: 27710 is a U-NII Single Band Radio in the frequency range: 5.725-5.825 GHz.

A pre-production version of the sample was received on June 3, 1998 in good condition.

Overview of the product

Applicant	**Glenayre Western Multiplex**
Trade Name & Model No.	**27710**
FCC Identifier	**HZB-U58/45**
Use of Product	Point-to-point fixed wireless interconnect
Manufacturer	Glenayre Western Multiplex
Type of Transmission	QPSK
Rated RF Output (mW)	295 mW
Frequency Range (MHz)	5.725 – 5.825 GHz
Number of Channel(s)	2
Antenna(s) & Gain, dBi	23 dBi
Antenna Requirement	[ ] The EUT uses a permanently connected antenna. [ ] The antenna is affixed to the EUT using a unique connector which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector. [X] The EUT requires professional installation (attach supporting documentation if using this option).
Manufacturer name & address	Glenayre Western Multiplex 1196 Borregas Avenue Sunnyvale, California 94089

2.2 Related Submittal(s) Grants

None.

2.3 Test Methodology

Both AC mains line-conducted and radiated emissions measurements were performed according to the procedures in ANSI C63.4 (1992). Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Data Sheet"** of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is site 1.This test facility and site measurement data have been fully placed on file with the FCC and NVLAP accredited.

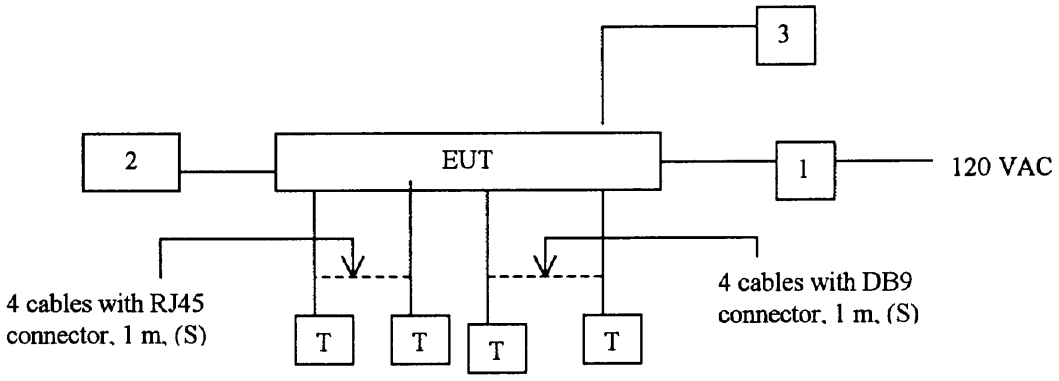
3.0 System Test Configuration

3.1 Support Equipment and description

The FCC ID's for all equipment used in the tested system (included inserted cards, which have grants) are:

Item #	Description	Model No.	Serial No.	FCC ID
1	EXTEH Power Supply	EP-3003	N/A	N/A
2	Telephone	M7100	N/A	N/A
3	Gabriel Antenna	DFP	N/A	N/A

3.2 Block Diagram of Test Setup



* = EUT ** = No ferrites on video cable	S = Shielded, U = Unshielded	F = With Ferrite T = Termination

3.3 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions.

For radiated emission measurements, the EUT is attached to a cardboard box (if necessary) and placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power without modulation.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Detector function is in peak mode. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

3.5 Mode of Operation during Test

Transmitting signal on low and high frequencies.

3.6 Modifications Required for Compliance

The following modifications were installed during compliance testing in order to bring the product into compliance (Please note that this list does not include changes made specifically by Glenayre Western Multiplex prior to compliance testing):

No modifications were made to the EUT by Intertek Testing Services.

3.7 Additions, deviations and exclusions from standards

No additions, deviations or exclusion have been made from standard.

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.407(a):

Requirement:

For fixed point-to-point U-NII devices operating in 5.725-5.825 GHz band, the peak transmit power shall not exceed the lesser of 30 dBm or 17 dBm+10Log(B) where B is the 26dB emission bandwidth in MHz (for antenna gain up to 23 dBi).

Test Procedure

The antenna port of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

Test Result

Band 5.725-5.825 GHz, Max. antenna gain = 23 dBi			
Frequency (MHz)	Output in dBm	Output in mW	Limit in mW
Low Channel: 5756.0	24.7	295.1	1000
High Channel: 5794.1	23.4	218.8	1000

Cable loss: __0__dB External Attenuation: __0__ dB

Cable loss, external attenuation: is included in OFFSET function

4.2 Minimum 26 dB RF Bandwidth, FCC Rule 15.407(a): (for calculation only)

Test Procedure

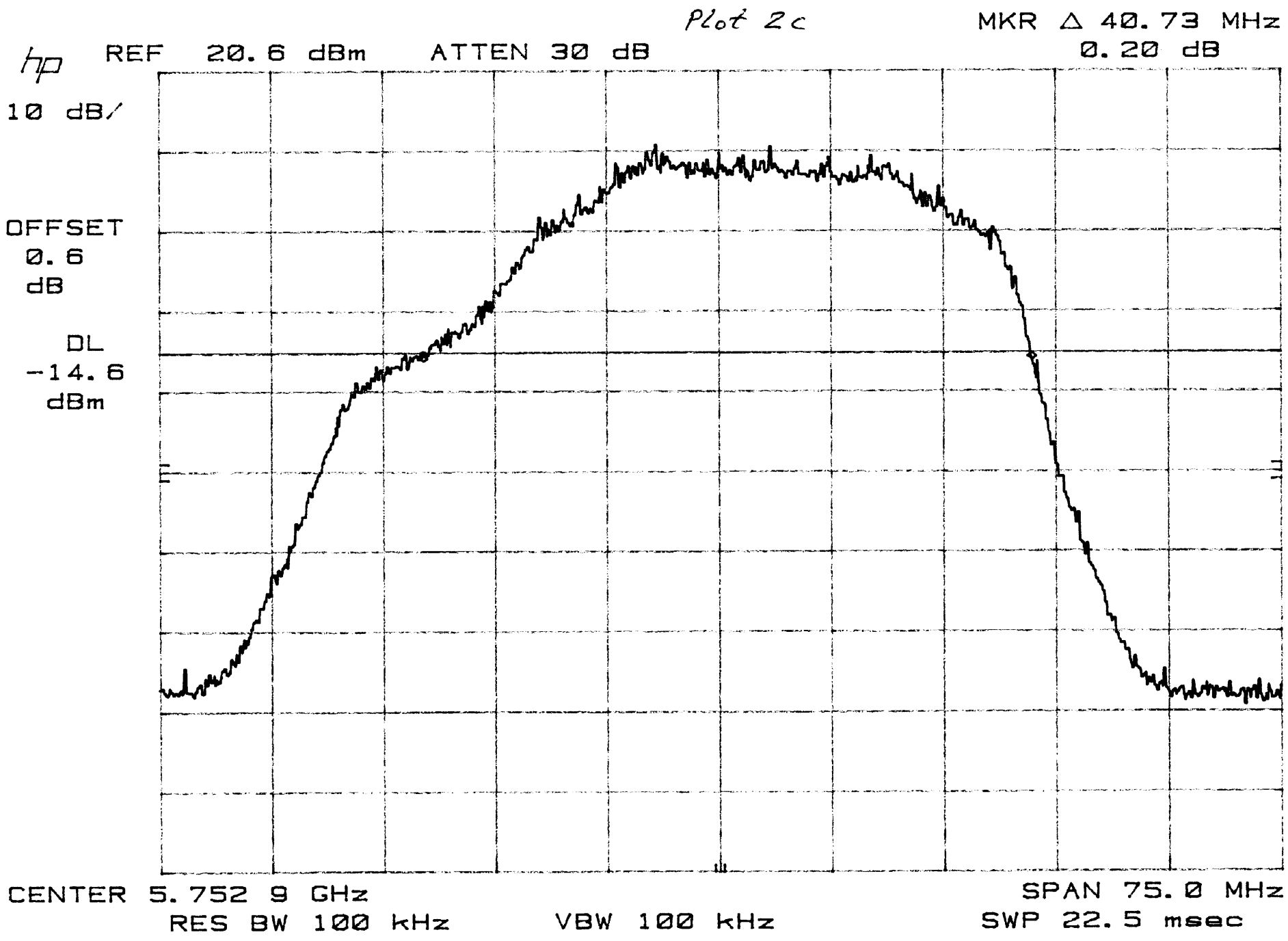
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 26 dB lower than PEAK level. The 26 dB bandwidth was determined from where the channel output spectrum intersected the display line.

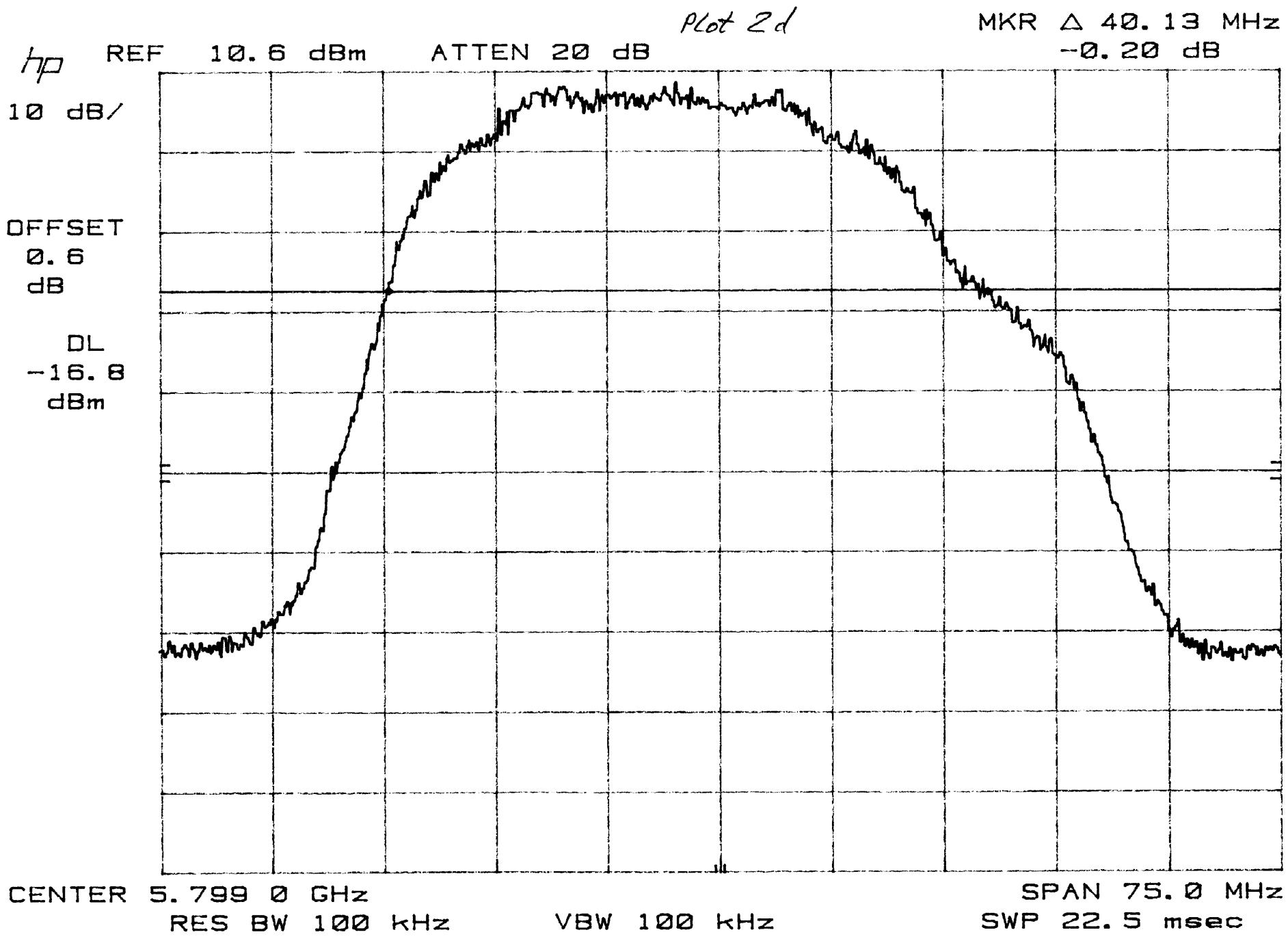
Test Result

Frequency (MHz)	26 dB Bandwidth (MHz)
5756.0	40.7
5794.1	40.1

Refer to the following plots for 26 dB bandwidth:

Plot 2c: 5.725-5.825 GHz band, Low Channel, 26 dB RF Bandwidth
Plot 2d: 5.725-5.825 GHz band, High Channel, 26 dB RF Bandwidth


Plot 2c
MKR Δ 40.73 MHz
0.20 dB
hp
REF 20.6 dBm
ATTEN 30 dB
10 dB/
OFFSET
0.6
dB
DL
-14.6
dBm
CENTER 5.752 9 GHz
RES BW 100 kHz
VBW 100 kHz
SPAN 75.0 MHz
SWP 22.5 msec


Plot 2d
MKR Δ 40.13 MHz
-0.20 dB
hp REF 10.6 dBm ATTEN 20 dB
10 dB/
OFFSET
0.6
dB
DL
-16.8
dBm
CENTER 5.799 0 GHz
SPAN 75.0 MHz
RES BW 100 kHz
VBW 100 kHz
SWP 22.5 msec

4.3 Maximum Power Density, FCC Rule 15.407(a)(3):

Requirement:

For fixed point-to-point U-NII devices operating in 5.725-5.825 GHz band the peak power spectral density shall not exceed 17 dBm in any 1 MHz band for antenna gain up to 23 dBi.

Test 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 and Video Bandwidths were set to 1 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.

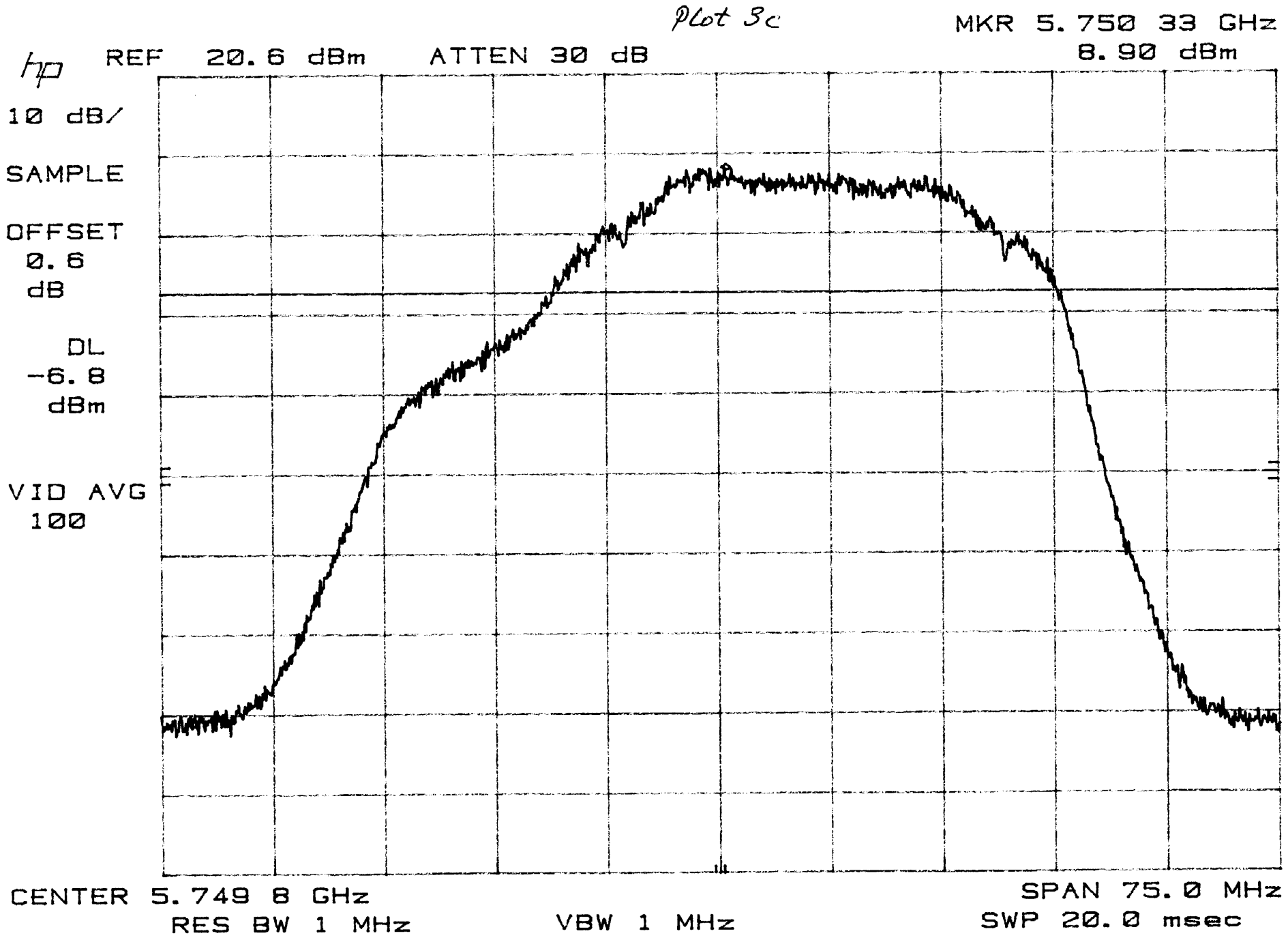
Test Result

Frequency (MHz)	Power Density (dBm)	Limit (dBm)
5756.0	8.9	17
5794.1	8.3	17

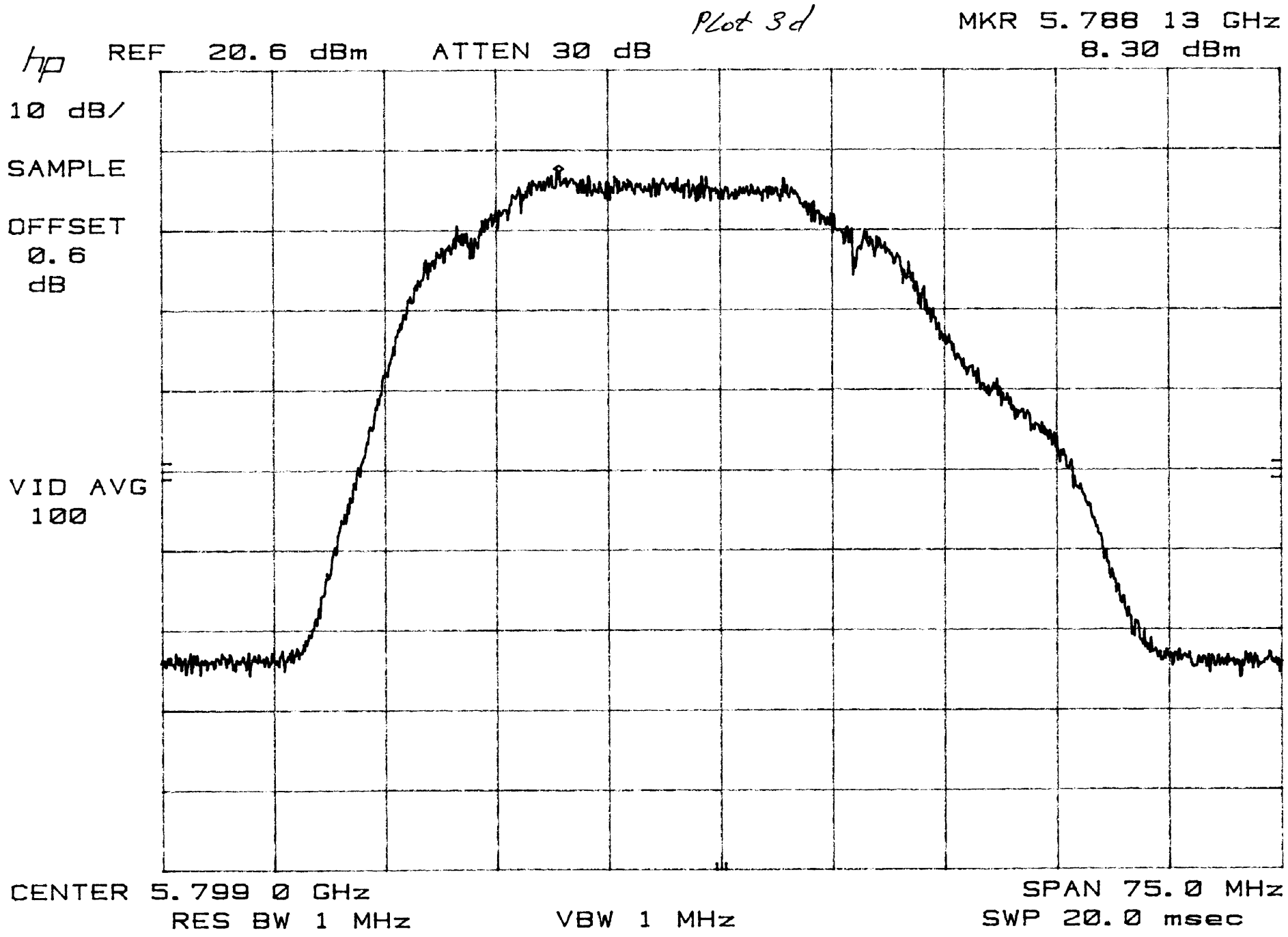
Refer to the following plots for Power Density data:

Plot 3c: 5.725-5.825 GHz band, Low Channel Power Density
Plot 3d: 5.725-5.825 GHz band, High Channel Power Density

Plot 3c


MKR 5.750 33 GHz
8.90 dBm
REF 20.6 dBm
ATTEN 30 dB
10 dB/
SAMPLE
OFFSET
0.6
dB
DL
-6.8
dBm
VID AVG
100
CENTER 5.749 8 GHz
RES BW 1 MHz
VBW 1 MHz
SPAN 75.0 MHz
SWP 20.0 msec

Plot 3d


hp
REF 20.6 dBm
ATTEN 30 dB
MKR 5.788 13 GHz
8.30 dBm
10 dB/
SAMPLE
OFFSET
0.6
dB
VID AVG
100
CENTER 5.799 0 GHz
RES BW 1 MHz
VBW 1 MHz
SPAN 75.0 MHz
SWP 20.0 msec

4.4 Out of Band Conducted Emissions, FCC Rule 15.407(b):

Requirement:

For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of –17 dBm/MHz: for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27 dBm/MHz.

Test Procedure

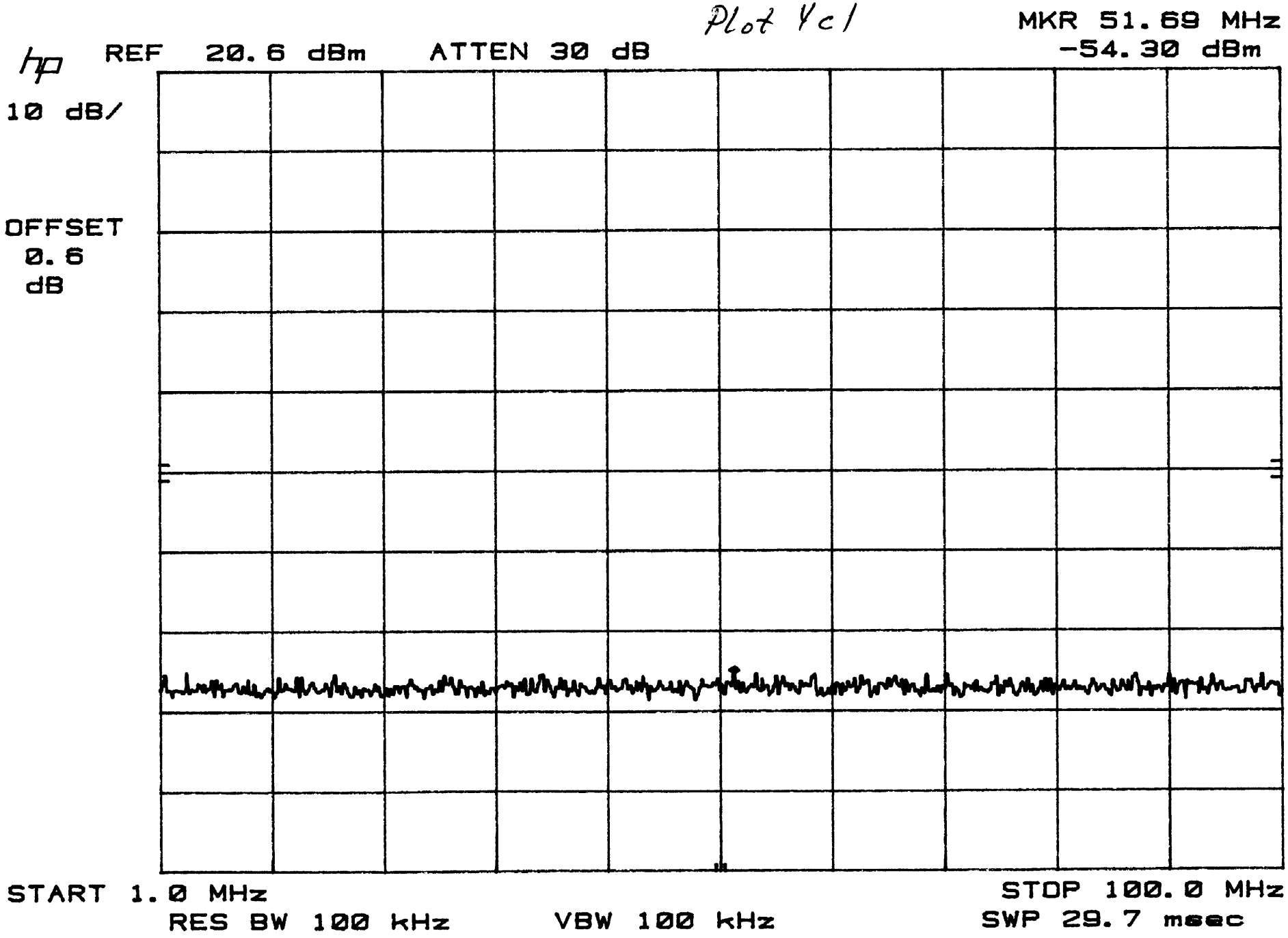
The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

Test Result

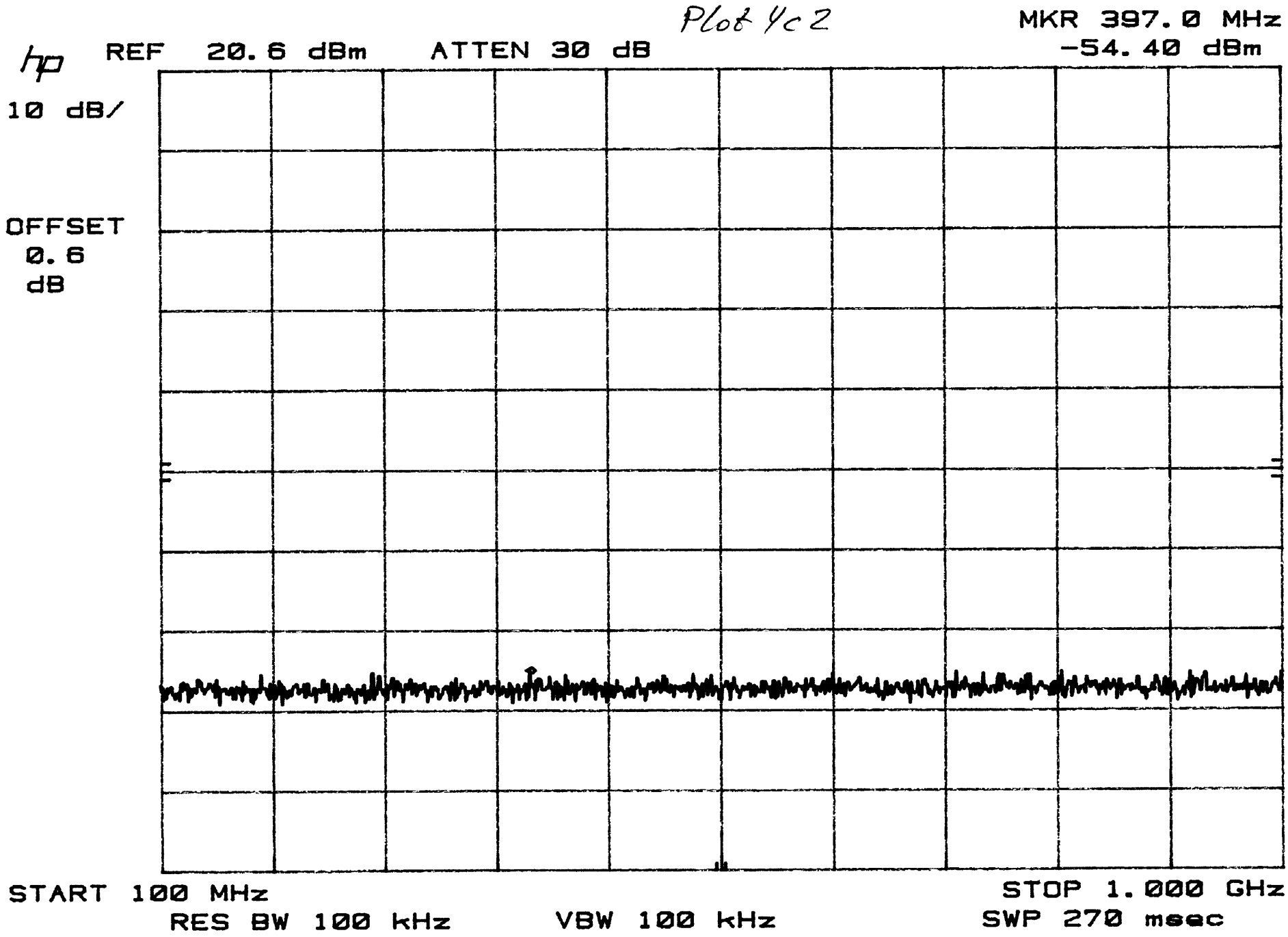
Refer to the following plots for out of band conducted emissions data:

Plot 4c1 – 4c10: 5.725-5.825 GHz band, Low Channel Emissions
Plot 4d1 – 4d9: 5.725-5.825 GHz band, High Channel Emissions

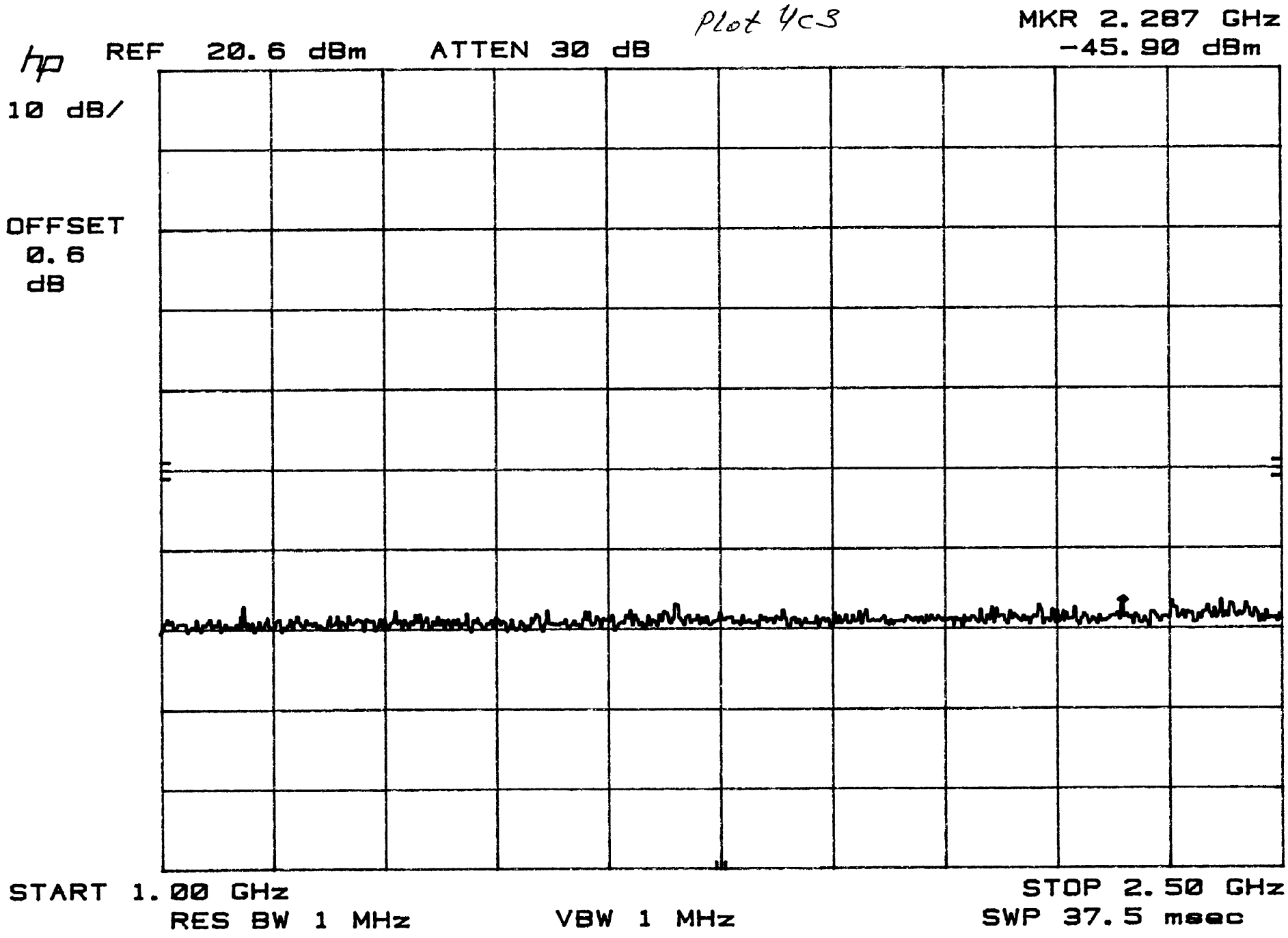
Plot Ycl


hp
REF 20.6 dBm
ATTEN 30 dB
MKR 51.69 MHz
-54.30 dBm
10 dB/
OFFSET
0.6
dB
START 1.0 MHz
RES BW 100 kHz
VBW 100 kHz
STOP 100.0 MHz
SWP 29.7 msec

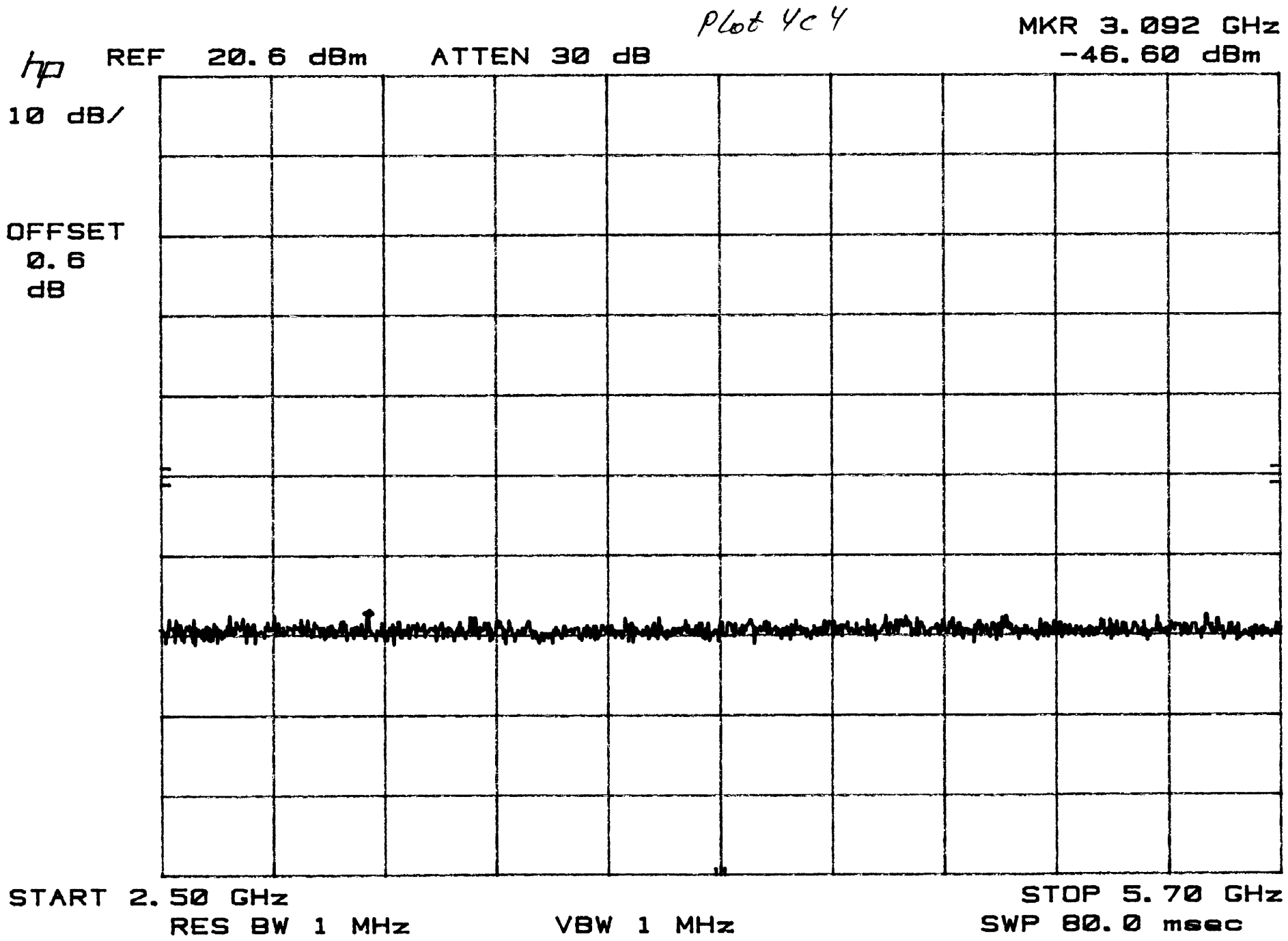
Plot 4c 2

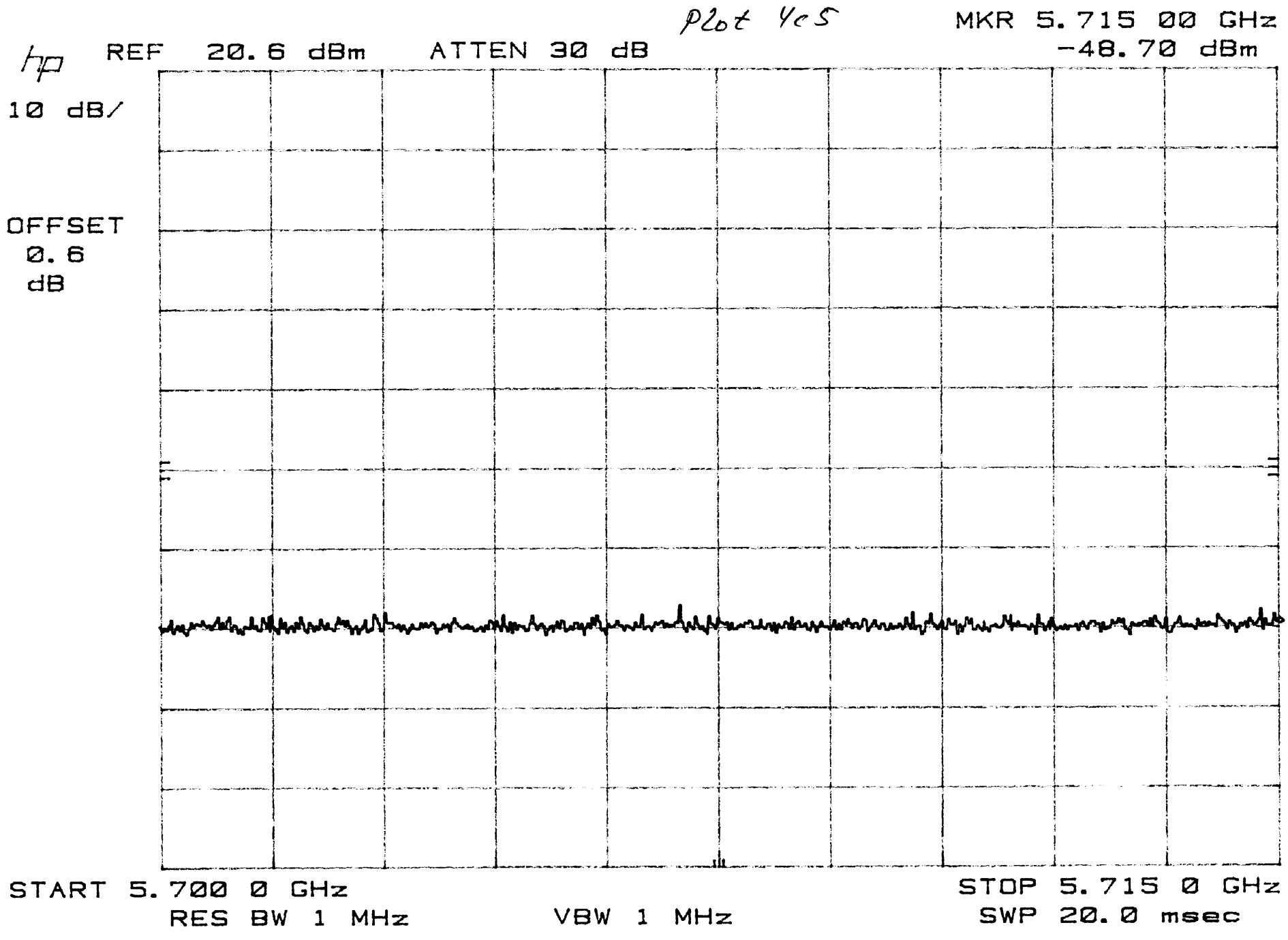

MKR 397.0 MHz
-54.40 dBm
REF 20.6 dBm
ATTEN 30 dB
10 dB/
OFFSET
0.6
dB
START 100 MHz
STOP 1.000 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 270 msec

Plot 4c3

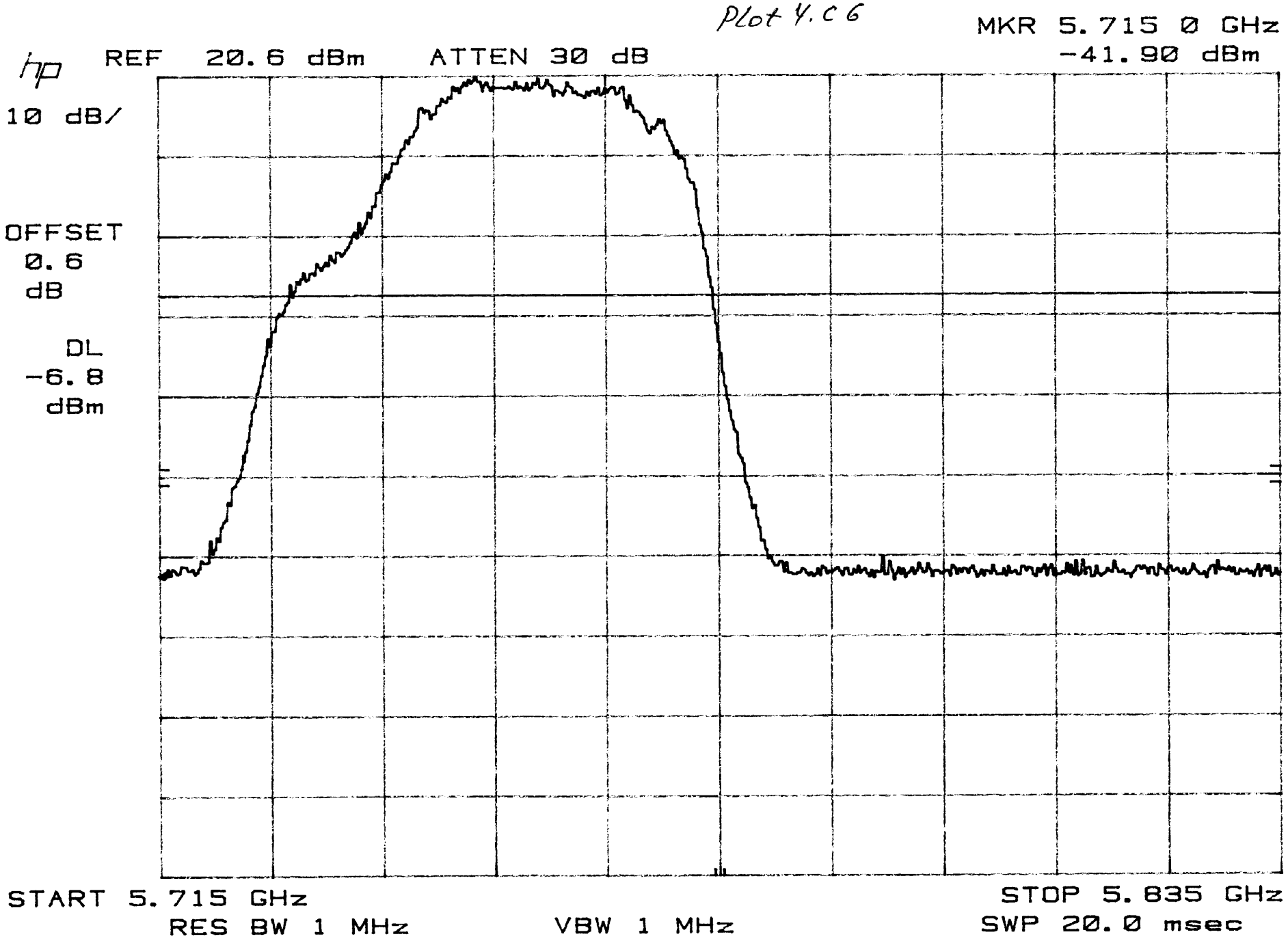

REF 20.6 dBm
ATTEN 30 dB
MKR 2.287 GHz
-45.90 dBm
10 dB/
OFFSET
0.6
dB
START 1.00 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 2.50 GHz
SWP 37.5 msec

Plot 4c 4

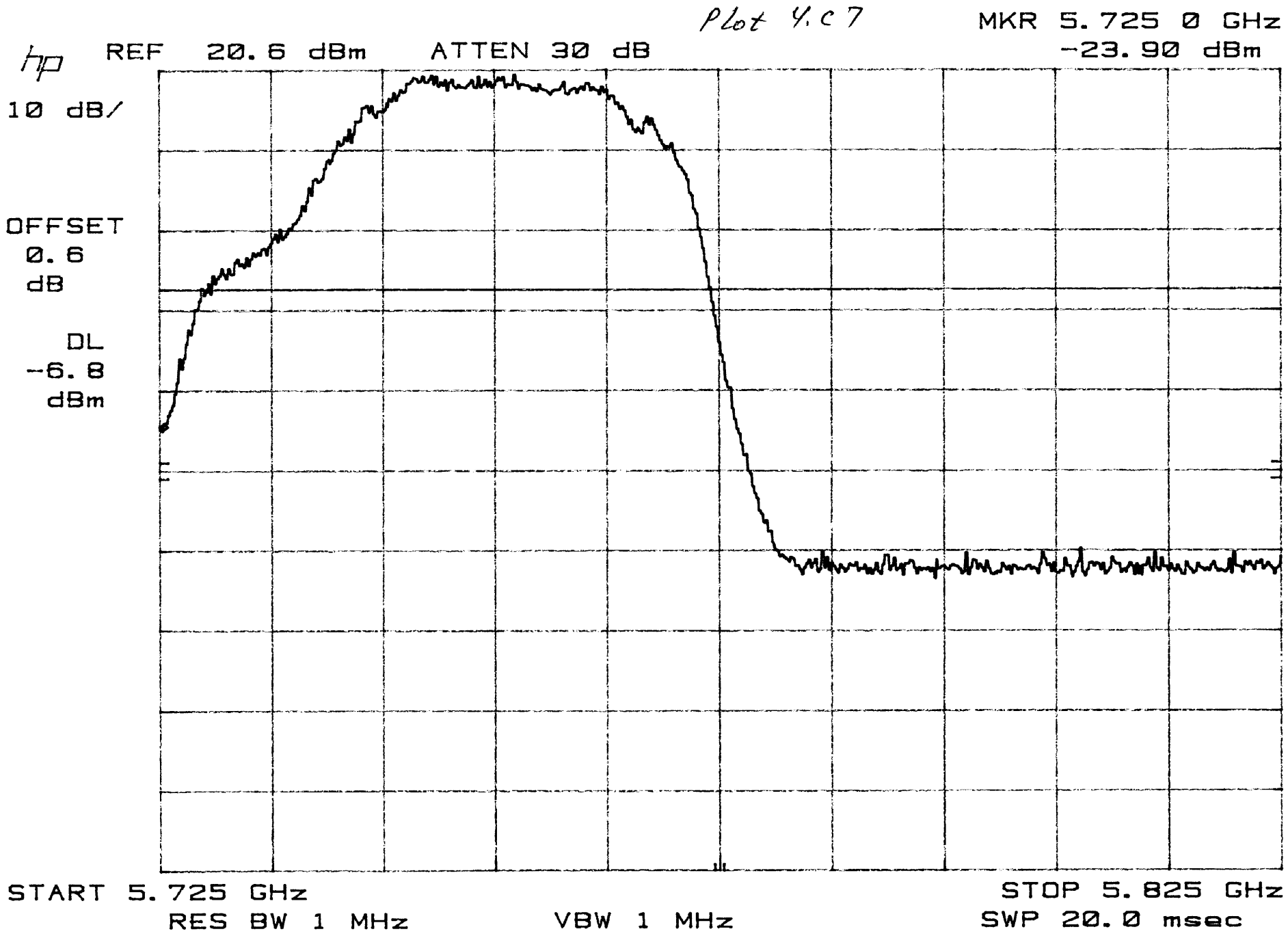

hp
REF 20.6 dBm
ATTEN 30 dB
MKR 3.092 GHz
-46.60 dBm
10 dB/
OFFSET
0.6
dB
START 2.50 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 5.70 GHz
SWP 80.0 msec


Plot 4c5
MKR 5.715 00 GHz
-48.70 dBm
hp
REF 20.6 dBm
ATTEN 30 dB
10 dB/
OFFSET
0.6
dB
START 5.700 0 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 5.715 0 GHz
SWP 20.0 msec

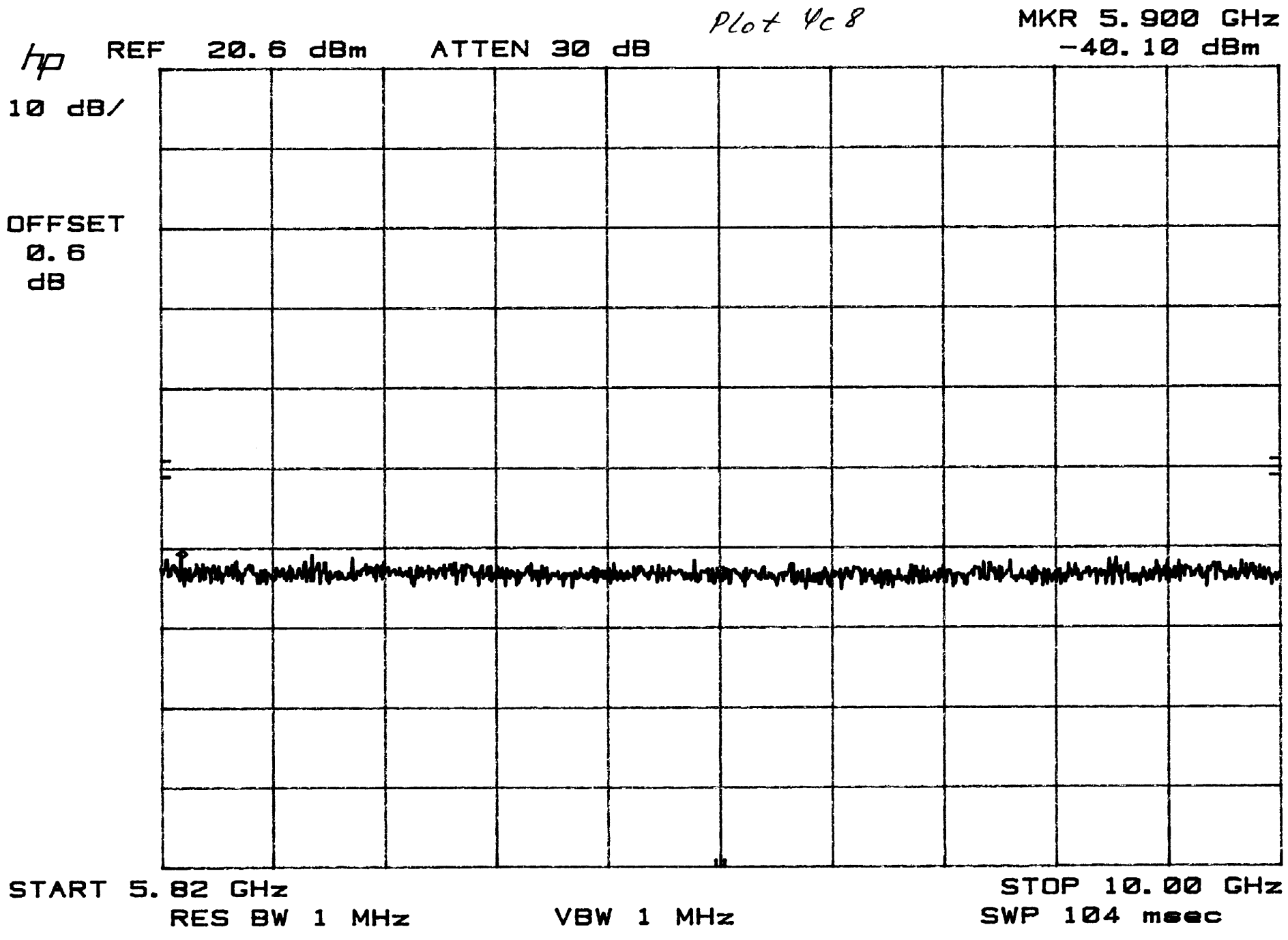
Plot 4.C 6


hp
REF 20.6 dBm
ATTEN 30 dB
MKR 5.715 0 GHz
-41.90 dBm
10 dB/
OFFSET
0.6
dB
DL
-6.8
dBm
START 5.715 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 5.835 GHz
SWP 20.0 msec

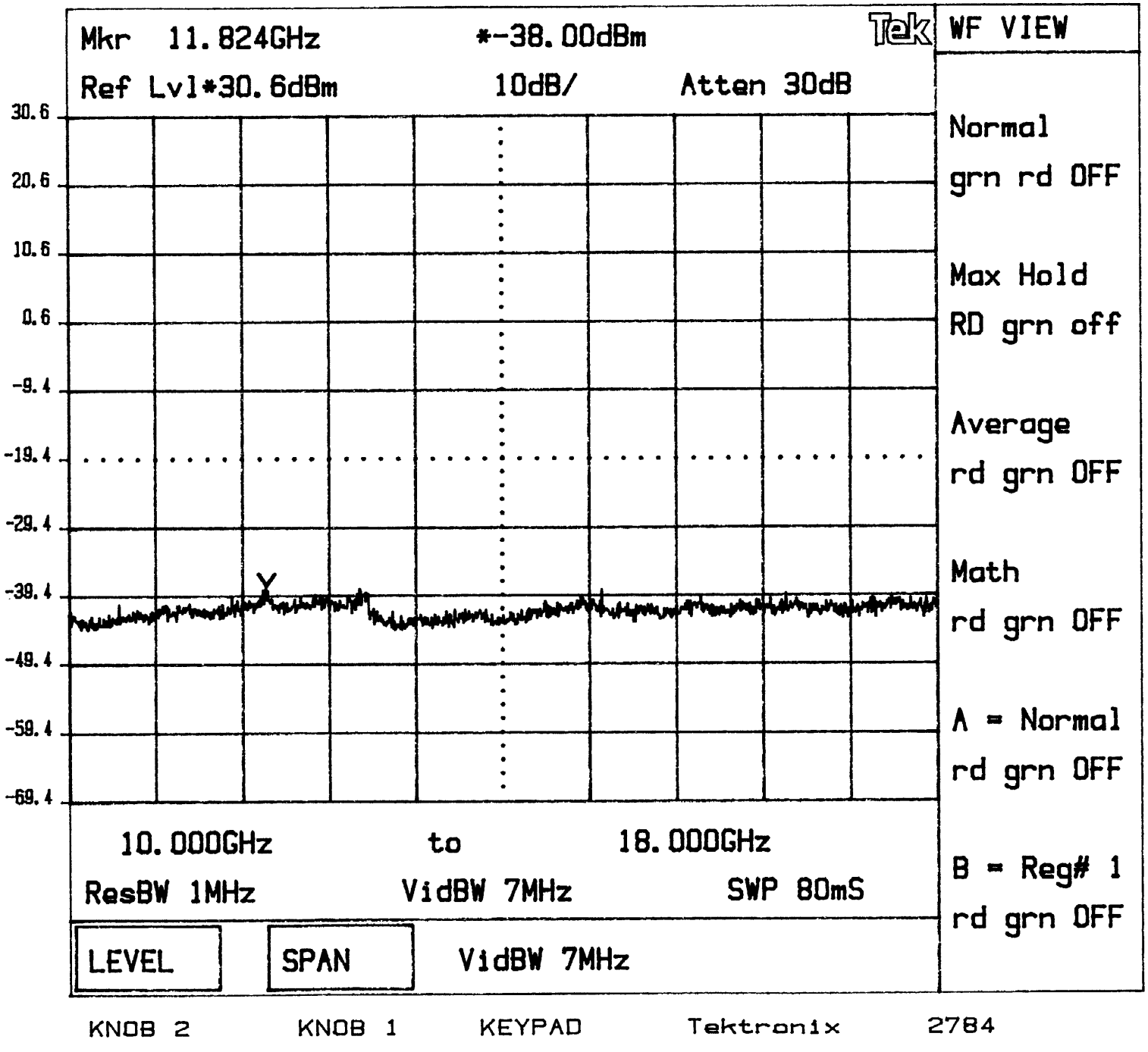
Plot 4.c 7


hp
REF 20.6 dBm
ATTEN 30 dB
MKR 5.725 0 GHz
-23.90 dBm
10 dB/
OFFSET
0.6
dB
DL
-6.8
dBm
START 5.725 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 5.825 GHz
SWP 20.0 msec

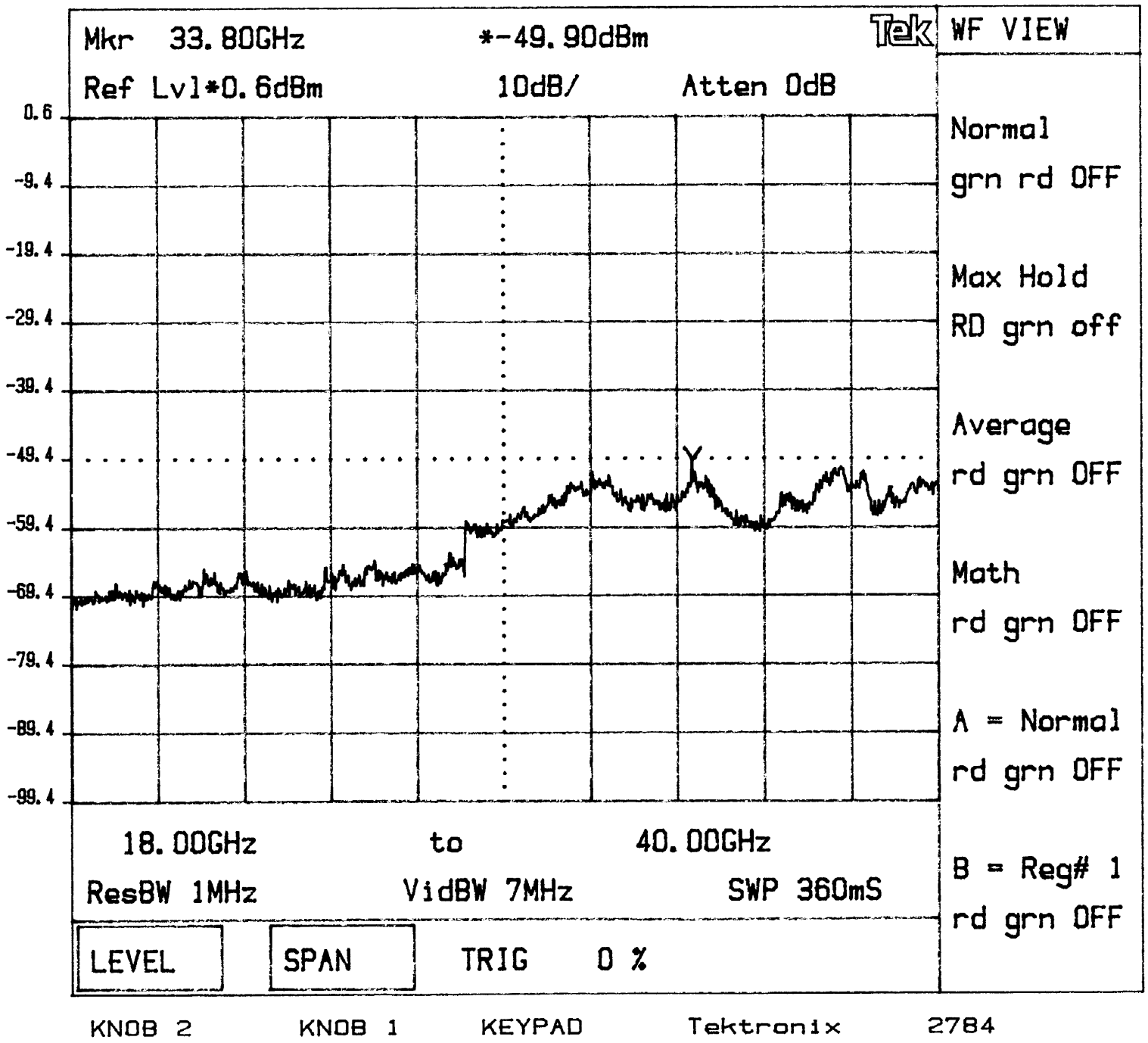
Plot 4c 8


REF 20.6 dBm
ATTEN 30 dB
MKR 5.900 GHz
-40.10 dBm
10 dB/
OFFSET
0.6
dB
START 5.82 GHz
STOP 10.00 GHz
RES BW 1 MHz
VBW 1 MHz
SWP 104 msec

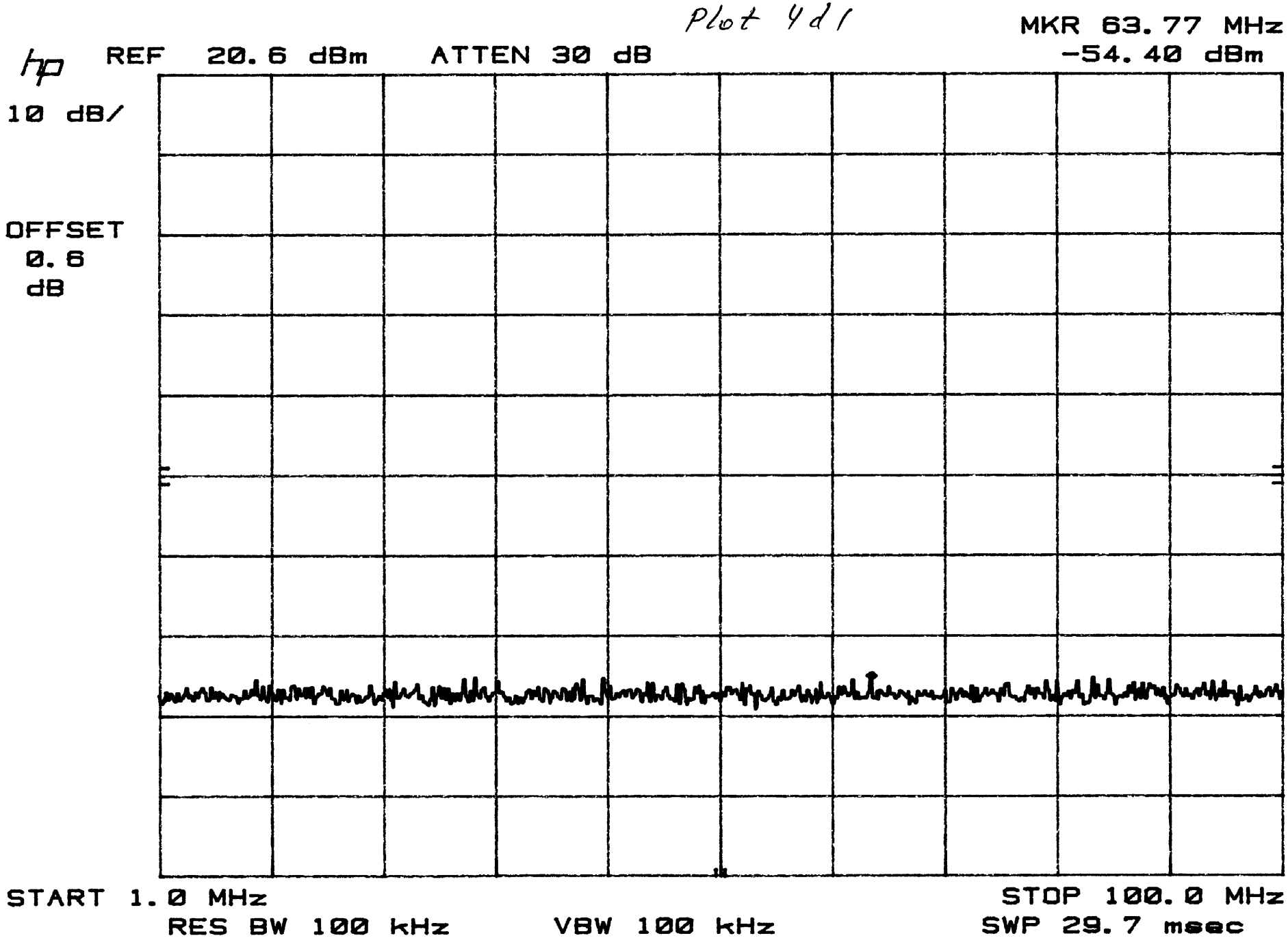
Plot 4c 9

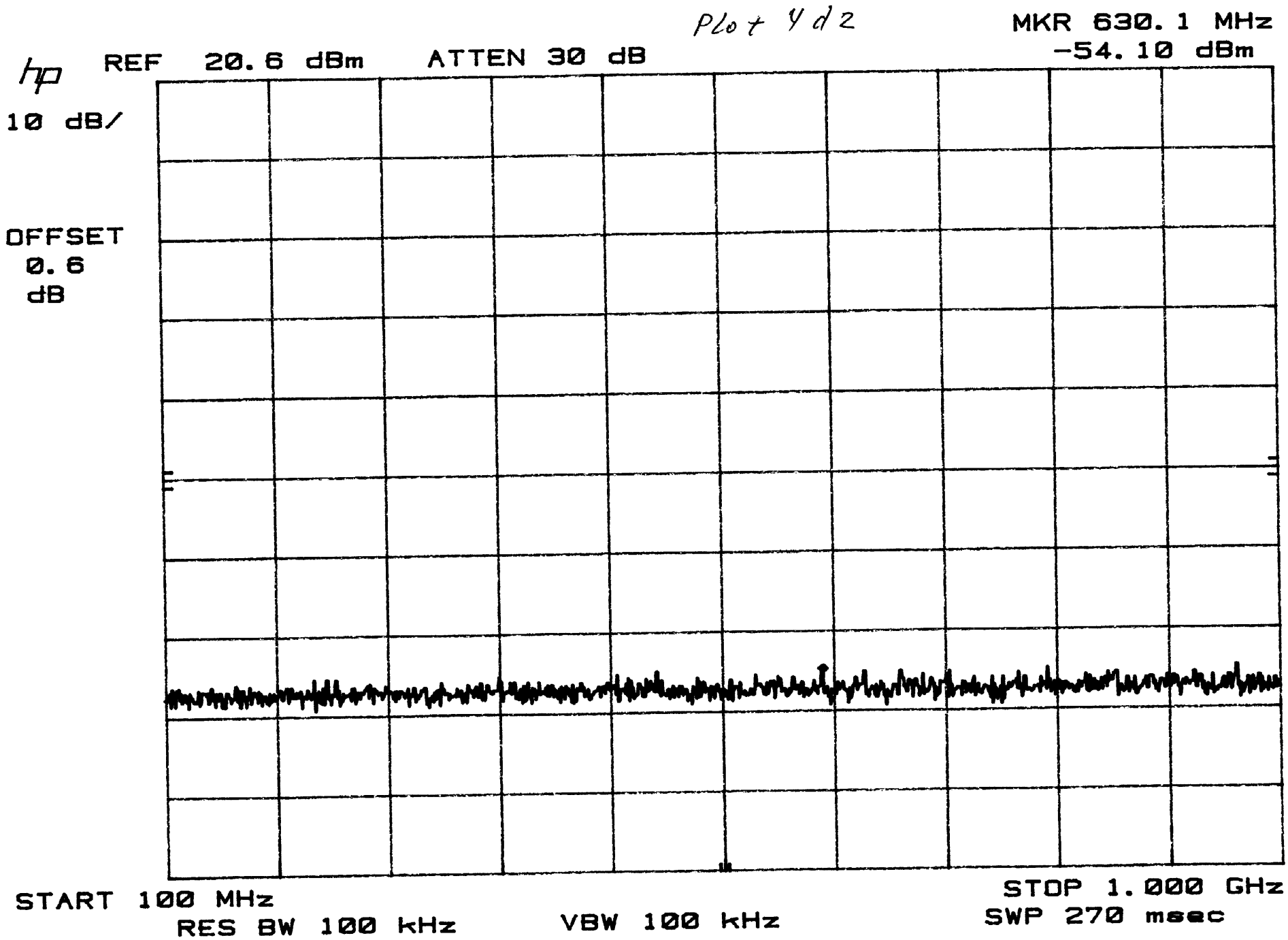

Mkr 11.824GHz
*-38.00dBm
Tek
WF VIEW
Ref Lvl*30.6dBm
10dB/
Atten 30dB
30.6
20.6
10.6
0.6
-9.4
-19.4
-29.4
-39.4
-49.4
-59.4
-69.4
Normal
grn rd OFF
Max Hold
RD grn off
Average
rd grn OFF
Math
rd grn OFF
A = Normal
rd grn OFF
B = Reg# 1
rd grn OFF
10.000GHz
to
18.000GHz
ResBW 1MHz
VidBW 7MHz
SWP 80mS
LEVEL
SPAN
VidBW 7MHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

Plot 4c10

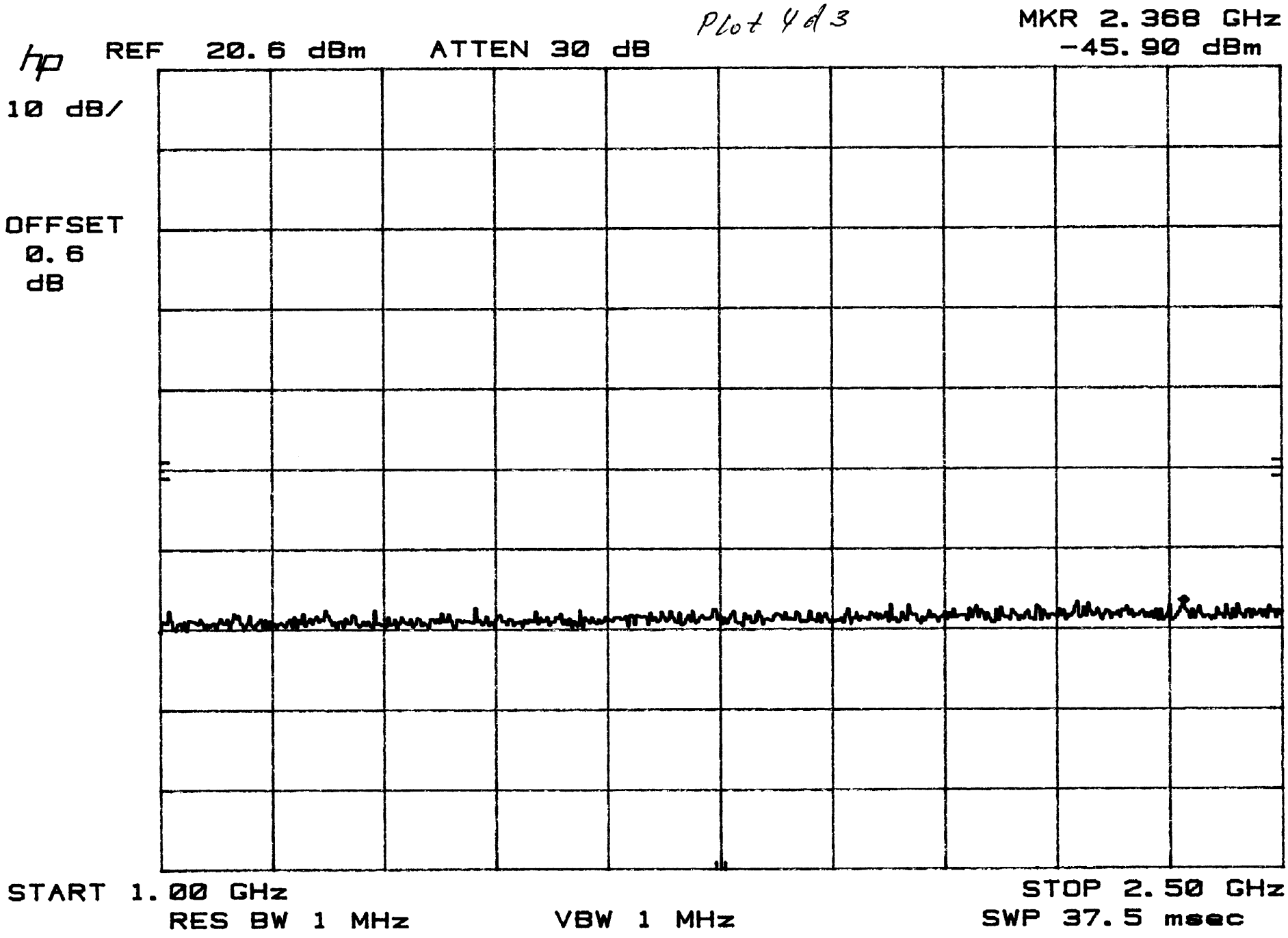

Mkr 33.80GHz
*-49.90dBm
Tek
WF VIEW
Ref Lvl*0.6dBm
10dB/
Atten 0dB
0.6
-9.4
-19.4
-29.4
-39.4
-49.4
-59.4
-69.4
-79.4
-89.4
-99.4
Normal
grn rd OFF
Max Hold
RD grn off
Average
rd grn OFF
Math
rd grn OFF
A = Normal
rd grn OFF
B = Reg# 1
rd grn OFF
18.00GHz
to
40.00GHz
ResBW 1MHz
VidBW 7MHz
SWP 360mS
LEVEL
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

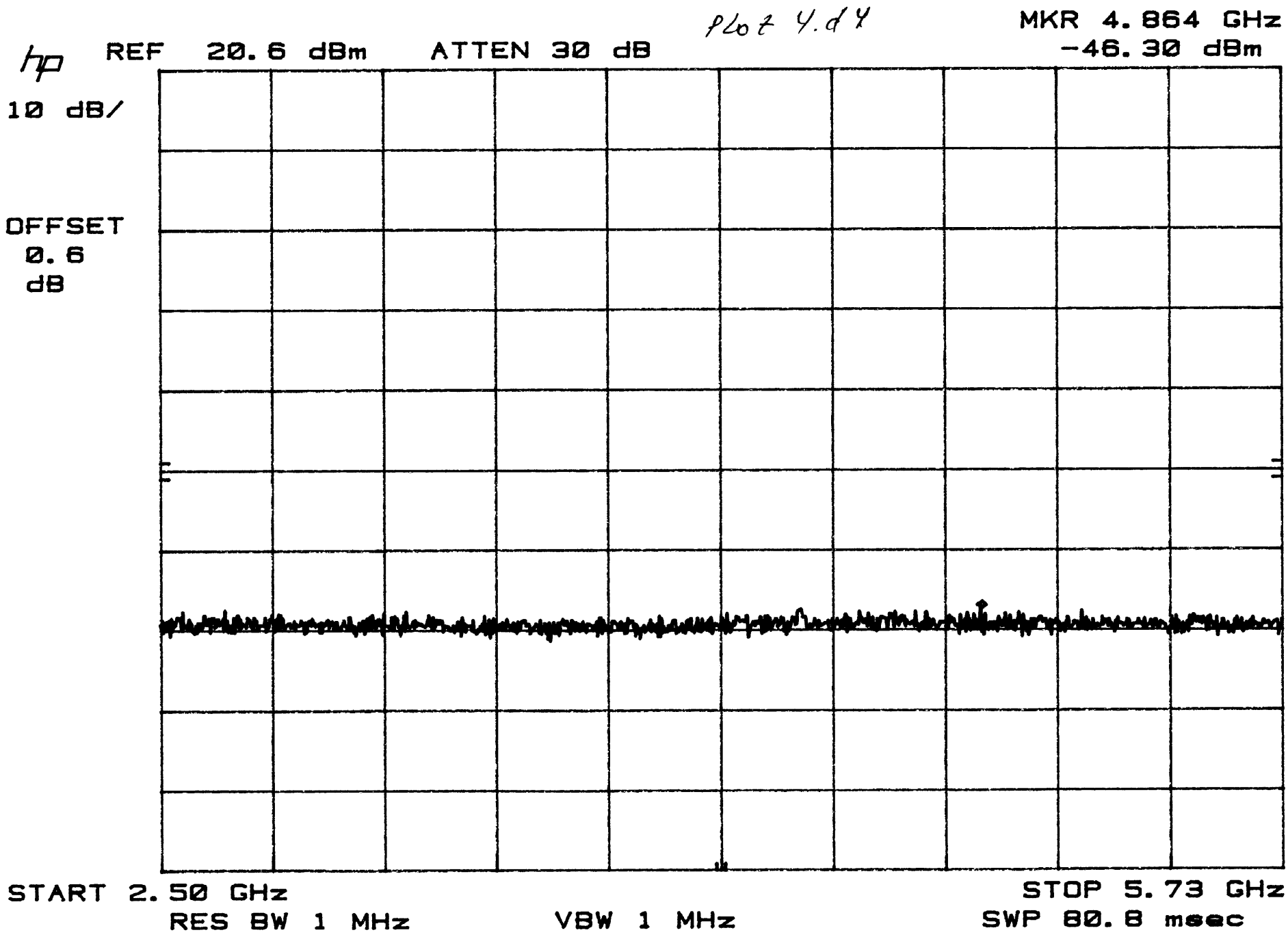
Plot 4d1


MKR 63.77 MHz
-54.40 dBm
REF 20.6 dBm
ATTEN 30 dB
10 dB/
OFFSET
0.6
dB
START 1.0 MHz
STOP 100.0 MHz
RES BW 100 kHz
VBW 100 kHz
SWP 29.7 msec

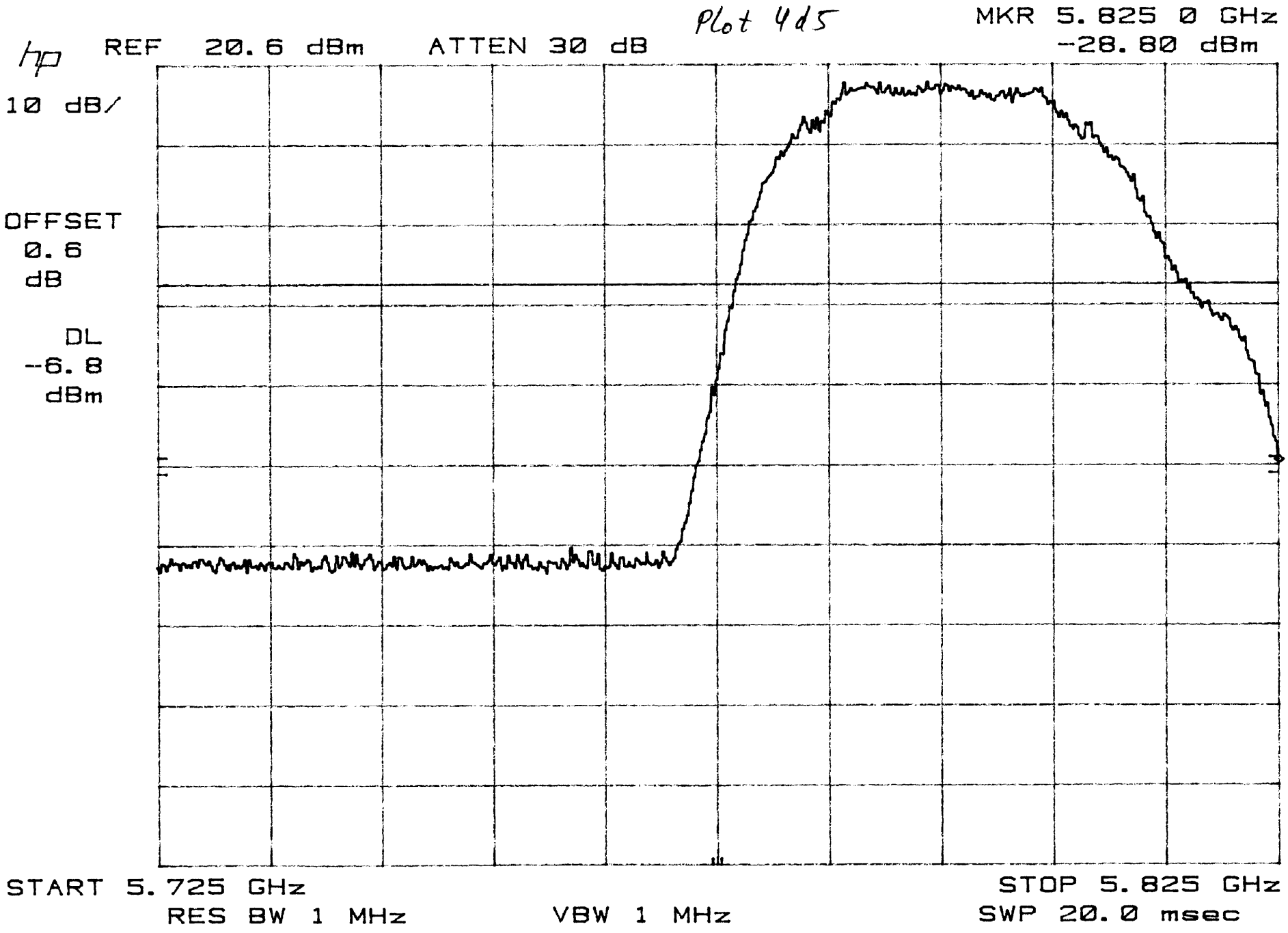

Plot Yd2
MKR 630.1 MHz
-54.10 dBm
hp
REF 20.6 dBm
ATTEN 30 dB
10 dB/
OFFSET
0.6
dB
START 100 MHz
RES BW 100 kHz
VBW 100 kHz
STOP 1.000 GHz
SWP 270 msec

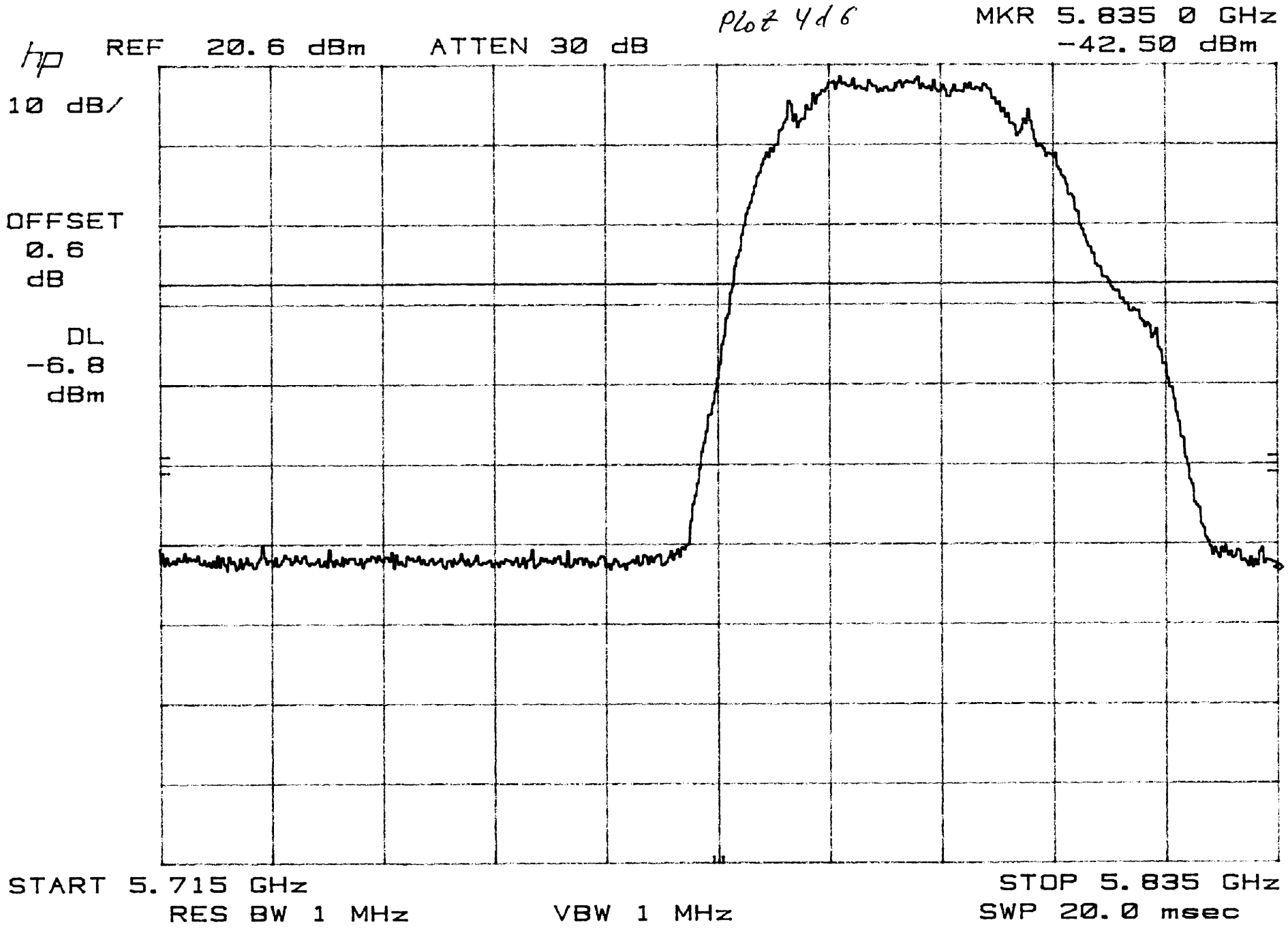
Plot 4 of 3


REF 20.6 dBm
ATTEN 30 dB
MKR 2.368 GHz
-45.90 dBm
10 dB/
OFFSET
0.6
dB
START 1.00 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 2.50 GHz
SWP 37.5 msec

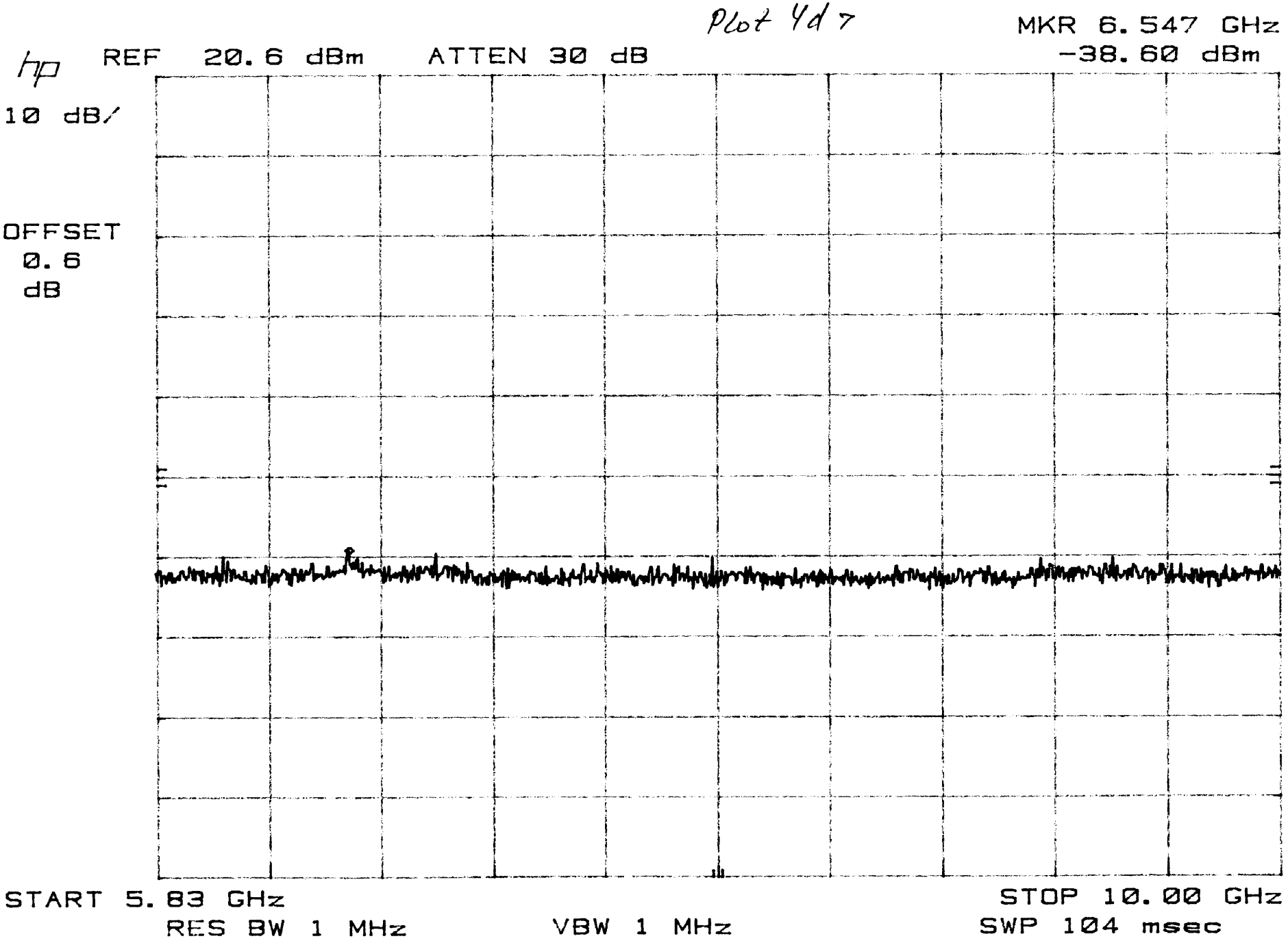

plot 4.d4
MKR 4.864 GHz
-46.30 dBm
REF 20.6 dBm
ATTEN 30 dB
10 dB/
OFFSET
0.6
dB
START 2.50 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 5.73 GHz
SWP 80.8 msec

Plot 4d5

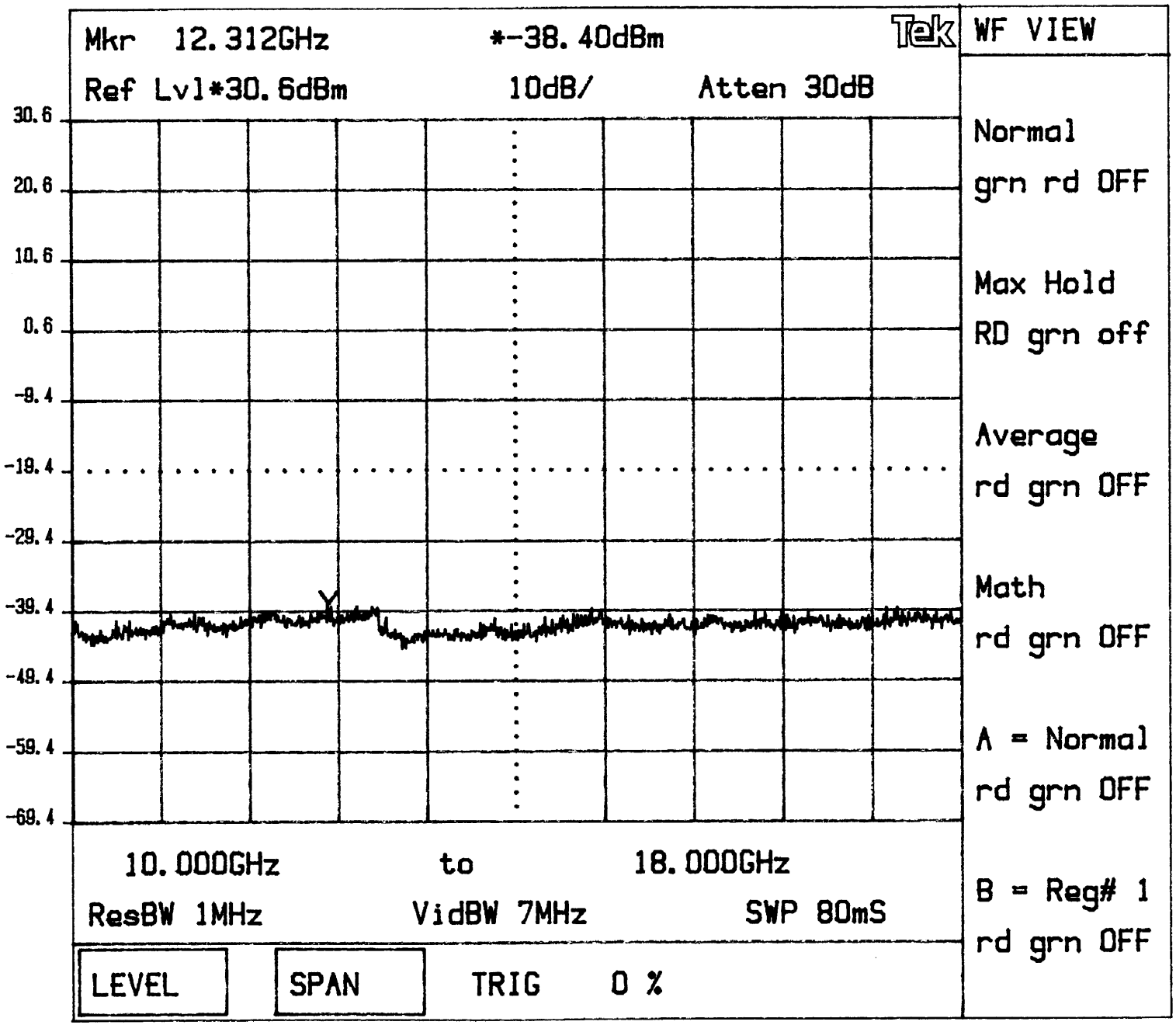

hp
REF 20.6 dBm
ATTEN 30 dB
MKR 5.825 0 GHz
-28.80 dBm
10 dB/
OFFSET
0.6
dB
DL
-6.8
dBm
START 5.725 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 5.825 GHz
SWP 20.0 msec


Plot 4d 6
MKR 5.835 0 GHz
-42.50 dBm
hp
REF 20.6 dBm
ATTEN 30 dB
10 dB/
OFFSET
0.6
dB
DL
-6.8
dBm
START 5.715 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 5.835 GHz
SWP 20.0 msec

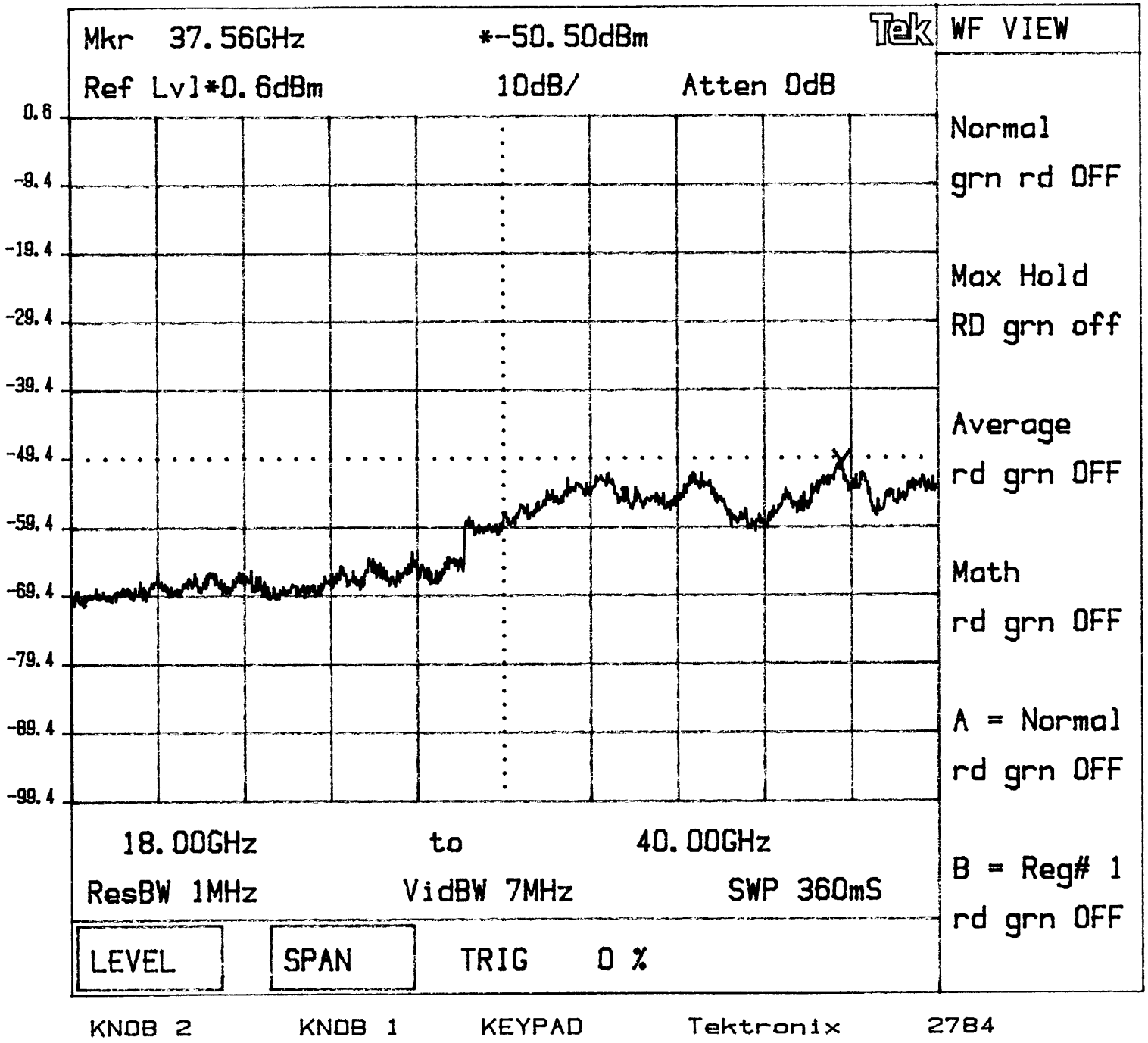
Plot 4d 7


hp
REF 20.6 dBm
ATTEN 30 dB
MKR 6.547 GHz
-38.60 dBm
10 dB/
OFFSET
0.6
dB
START 5.83 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 10.00 GHz
SWP 104 msec

Plot 4.d8


Mkr 12.312GHz
*-38.40dBm
Tek
WF VIEW
Ref Lvl*30.6dBm
10dB/
Atten 30dB
30.6
20.6
10.6
0.6
-9.4
-19.4
-29.4
-39.4
-49.4
-59.4
-69.4
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
10.000GHz
to
18.000GHz
ResBW 1MHz
VidBW 7MHz
SWP 80mS
LEVEL
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

Plot 4 of 9


Mkr 37.56GHz
*-50.50dBm
Tek
WF VIEW
Ref Lvl*0.6dBm
10dB/
Atten 0dB
0.6
-9.4
-19.4
-29.4
-39.4
-49.4
-59.4
-69.4
-79.4
-89.4
-99.4
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
18.00GHz
to
40.00GHz
ResBW 1MHz
VidBW 7MHz
SWP 360mS
LEVEL
SPAN
TRIG
0 %
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

4.5 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.205:

Radiated emission measurements were performed from 30 MHz to 40,000 MHz. Analyzer resolution is 100 kHz or greater for 30 MHz to 1000 MHz, 1 MHz for frequencies above 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. Above 1000 MHz measurements were performed with peak and average detection.

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

To show compliance at the band-edges frequencies, the "delta" method was used.

Company: **Glenayre Western Multiplex**
Project #: **J99014962**
Model: **27710**
Engineer: **Xi-Ming Yang**
Date of test: **June 7, 1999**

FCC 15.407 Radiated Emissions

5.725-5.825 GHz Band, High Channel 5794.1 MHz

Frequency	Antenna Polarity	Reading	Antenna Factor	Cable Loss	Pre-amp	Distance Factor	Duty cycle	Corrected Reading	Limit	Margin
MHz	H/V	dB(uV)	dB/m	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
11588.2	V	42.6	41.2	5.1	39.7	0.0	0.0	49.2*	74.0	-24.8
11588.2	V	34.1	41.2	5.1	39.7	0.0	0.0	40.7	54.0	-13.3

5.725-5.825 GHz Band, Low Channel 5756 MHz

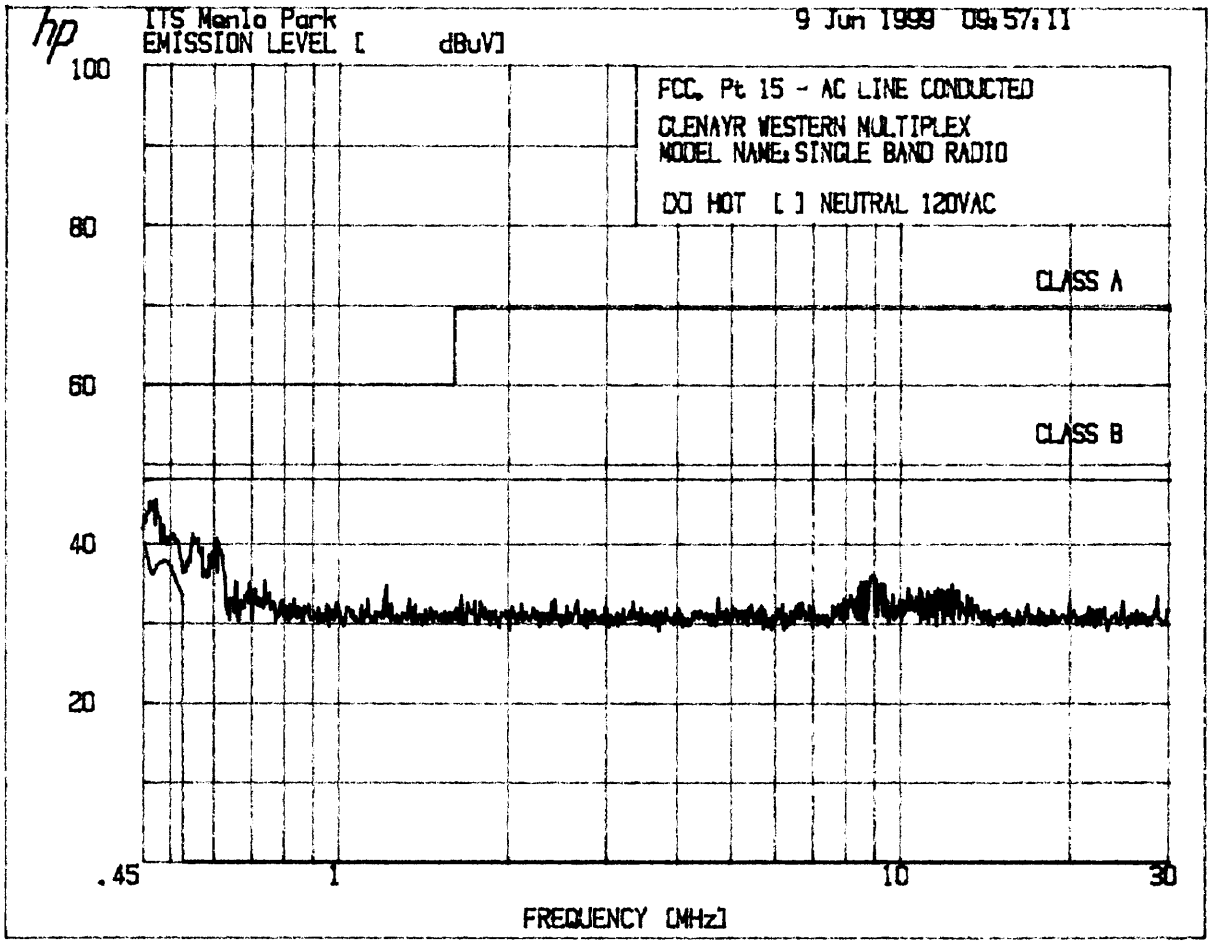
Frequency	Antenna Polarity	Reading	Antenna Factor	Cable Loss	Pre-amp	Distance Factor	Duty cycle	Corrected Reading	Limit	Margin
MHz	H/V	dB(uV)	dB/m	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
11512.0	V	42.5	41.2	5.1	39.7	0.0	0.0	49.1*	74.0	-24.9
11512.0	V	34.0	41.2	5.1	39.7	0.0	0.0	40.6	54.0	-13.4
23024.0	V	42.6	40.4	7.5	24.2	-9.5	0.0	56.8*	74.0	-17.2
23024.0	V	33.8	40.4	7.5	24.2	-9.5	0.0	48.0	54.0	-6.0

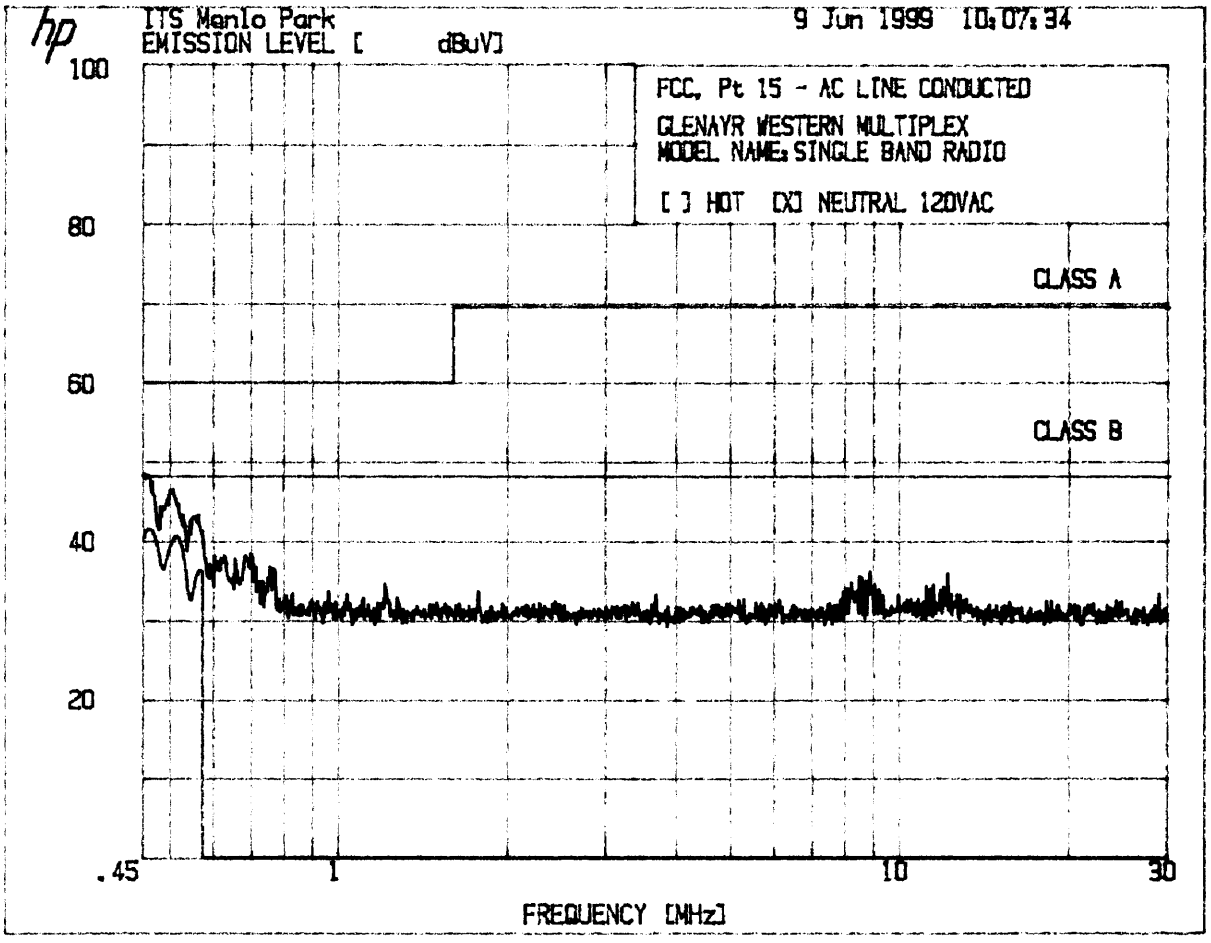
Note: 1. All readings were taken at 3 m, except for 23 GHz, which was taken at 1 m.
2. Negative signs (-) in the margin column signify levels below the limit.
3. Readings with (*) are peak readings, all others are average.

4.6 AC Line Conducted Emission, FCC Rule 15.207:

[ ] Not required; battery operation only

[x] Test data attached


ITS Manlo Park
9 Jun 1999 09:57:11
EMISSION LEVEL [dBuV]
FCC, Pt 15 - AC LINE CONDUCTED
GLENAYR WESTERN MULTIPLEX
MODEL NAME: SINGLE BAND RADIO
[X] HOT [ ] NEUTRAL 120VAC
CLASS A
CLASS B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]


ITS Manlo Park
9 Jun 1999 10:07:34
EMISSION LEVEL [dBuV]
FCC, Pt 15 - AC LINE CONDUCTED
GLENAYR WESTERN MULTIPLEX
MODEL NAME: SINGLE BAND RADIO
[ ] HOT [X] NEUTRAL 120VAC
CLASS A
CLASS B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

ITS Menlo Park 9 Jun 1999 10:07:34

3. FCC CFR 47, Pt 15
3.1 FCC, Pt 15 - AC LINE CONDUCTED

GLENAYR WESTERN MULTIPLEX
MODEL NAME:SINGLE BAND RADIO

[ ] HOT [X] NEUTRAL 120VAC

PEAKS FOUND ABOVE 36 dBuV

PEAK#	FREQ (MHz)	AMPL(dBuV)
1	.5125	46.5
2	.5682	43.3
3	.6087	38.2
4	.6620	37.6
5	.7050	38.5
6	.7635	36.8
7	8.924	36.2

ITS Menlo Park 9 Jun 1999 09:57:11

3. FCC CFR 47, Pt 15
   3.1 FCC, Pt 15 - AC LINE CONDUCTED

GLENAYR WESTERN MULTIPLEX
MODEL NAME:SINGLE BAND RADIO

[X] HOT [ ] NEUTRAL 120VAC

PEAKS FOUND ABOVE 36 dBuV

PEAK#	FREQ (MHz)	AMPL(dBuV)
1	.4732	45.4
2	.4772	45.6
3	.5550	41.3
4	.6113	40.7
5	.6164	40.3
6	8.961	36.1

4.7 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.

4.8 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

Company: **Glenayre Western Multiplex**
Project #: **J99014962**
Model: **27710**
Engineer: **Xi-Ming Yang**
Date of test: **June 7, 1999**

FCC 15.407 Radiated Emissions

Frequency	Antenna Polarity	Reading	Antenna Factor	Cable Loss	Pre-amp	Distance Factor	Duty cycle	Corrected Reading	Limit	Margin
MHz	H/V	dB(uV)	dB/m	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
50.0	V	26.0	7.2	0.5	0.0	0.0	0.0	33.7	40.0	-6.3
80.0	V	26.0	6.5	0.5	0.0	0.0	0.0	33.0	40.0	-7.0
100.0	V	32.0	7.9	0.5	0.0	0.0	0.0	40.4	43.5	-3.1
160.0	V	27.8	9.8	0.5	0.0	0.0	0.0	38.1	43.5	-5.4
165.1	V	24.8	9.5	0.5	0.0	0.0	0.0	34.8	43.5	-8.7
175.0	V	27.0	9.7	0.5	0.0	0.0	0.0	37.2	43.5	-6.3
185.8	V	27.0	9.6	0.6	0.0	0.0	0.0	37.2	43.5	-6.3
200.0	V	27.0	10.5	0.6	0.0	0.0	0.0	38.1	43.5	-5.4
275.0	H	17.0	13.0	0.6	0.0	0.0	0.0	30.6	46.0	-15.4
300.0	H	27.5	14.4	0.7	0.0	0.0	0.0	42.6	46.0	-3.4
350.0	H	21.9	16.3	0.7	0.0	0.0	0.0	38.9	46.0	-7.1
375.0	H	25.0	16.2	0.7	0.0	0.0	0.0	41.9	46.0	-4.1
400.0	H	24.0	16.9	0.7	0.0	0.0	0.0	41.6	46.0	-4.4
507.9	H	23.0	18.5	0.7	0.0	0.0	0.0	42.2	46.0	-3.8
525.0	H	22.6	19.3	0.7	0.0	0.0	0.0	42.6	46.0	-3.4

Note: 1. All measurements were made at 3 meters.
2. Negative signs (-) in the margin column signify levels below the limit.

4.9 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
	See transmitter timing diagram provided by manufacturer
X	Not applicable.

5.0 List of Exhibits

Exhibit 1 **ID Label Format**

Exhibit 2 **ID Label Location**

Exhibit 3 **Equipment Photographs**

Exhibit 4 **Block Diagram**

Exhibit 5 **Circuit Diagram**

Exhibit 6 **Test Setup Photos**

Exhibit 7 **Theory of Operation**

Exhibit 8 **Instruction Manual**

Exhibit 9 **Antenna Information**