ITS Intertek Testing Services

FCC Part 15.247 Test Report
for
Western Multiplex Corporation
on the
Spread Spectrum Radio
Model: 31260
FCC ID: HZB-S58-04

Test Report #: J99022866e
Date of Report: December 14, 1999

Job #: J99022866
Date of Test: October 15, 1999

Total No. of Pages Contained in this Report: 18 + data pages

NVLAP®

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Table of Contents

1.0 Summary of Tests

MODEL:31260
FCC ID:HZB-S58-04

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(d)	Pass
Out of Band Antenna Conducted Emission	15.247(c)	Pass
Out of Band Radiated Emission	15.247(c)	N/A
Radiated Emission in Restricted Bands	15.35(b)(c)	Pass
AC Conducted Emission	15.207	Pass
Radiated Emission from Digital Part	15.109	Pass
Radiated Emission from Receiver L.O.	15.109	Not Applicable
Processing Gain Measurements	15.247(e)	Provided by applicant
Antenna Requirement	15.203	Pass

Test Engineer: _____ Date: 12/15/99
Ollie Moyrong

EMC Site Manager: Xi-Ming Yang for Date: 12/27/99
David Chernomordik, Ph.D.
EMC Site Manager

2.0 General Description

2.1 Product Description

The Western Multiplex Model 31260 is a 5.8 GHz, 2xE1 spectrum radio used for point-to-point fixed wireless interconnection.

A pre-production version of the sample was received on October 15, 1999 in good condition.

Overview of Spread Spectrum Radio

Applicant	Western Multiplex Corporation
Trade Name & Model No.	Western Multiplex Corporation / 31260
FCC Identifier	HZB-S58-04
Use of Product	Point-to-point fixed wireless interconnect
Manufacturer & Model of Spread Spectrum Module	Western Multiplex Corporation
Type of Transmission	Direct Sequence
Rated RF Output (mW)	209
Frequency Range (MHz)	5730-5845
Number of Channel(s)	12
Antenna(s) & Gain, dBi	29
Processing Gain Measurements	[X] Will be provided to ITS for submission with the application [ ] Will be provided directly to the FCC reviewing engineer by the client or manufacturer of the spread spectrum module
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	Western Multiplex Corporation 1196 Borregas Ave. Sunnyvale CA 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

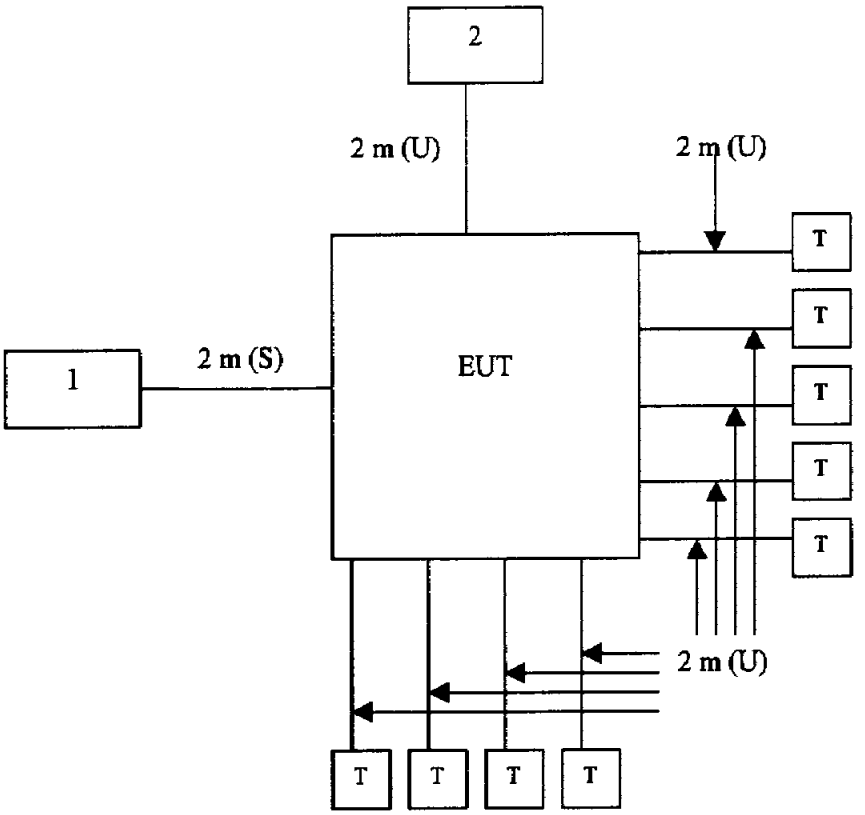
The open area test site and conducted measurement facility used to collect the radiated data is site 1. This test facility and site measurement data have been fully placed on file with the FCC and NVLAP accredited.

3.0 System Test Configuration

3.1 Support Equipment and description

Item #	Description	Model No.	Serial No.	FCC ID
1	HP Power Supply	6296A	2234A-04750	N/A
2	Comsat Antenna	P-57C24N-1	129415	N/A

3.2 Block Diagram of Test Setup



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

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

For emissions testing, the EUT was setup to transmit continuouisly to simplify the measurement methodology. Care was taken to ensure porper power supply voltages during tesing. The transmitting signal was set to low, middle, 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 Western Multiplex Corporation prior to compliance testing):

No modifications were made by Intertek Testing Services

3.7 Additions, deviations and exclusions from standards

No additions, deviations, or exclusions were made to the standard.

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b):

Requirements:
The maximum peak output power shall not exceed 1 Watt. Systems operating in the 5725-5850 MHz band, used exclusively for fixed, point-to-point operations, may employ transmitting antenna with directional gain greater than 6 dB without any corresponding reduction in transmitting peak output power.

[X] 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.

[ ] The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for maximum RES BW and power was read directly in dBm. External attenuation and cable loss were compensated for using the OFFSET function of the analyzer.

Max. antenna gain =29		
Frequency (MHz)	**Output in dBm**	**Output in mWatt**
Low Channel: 5735	23.2	209.0
Mid Channel: 5800	23.2	209.0
High Channel: 5840	20.5	112.0

Cable loss: __0__ dB External Attenuation: __0__ dB

Cable loss, external attenuation:
[ ]added to SA raw reading [X] included in OFFSET function

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

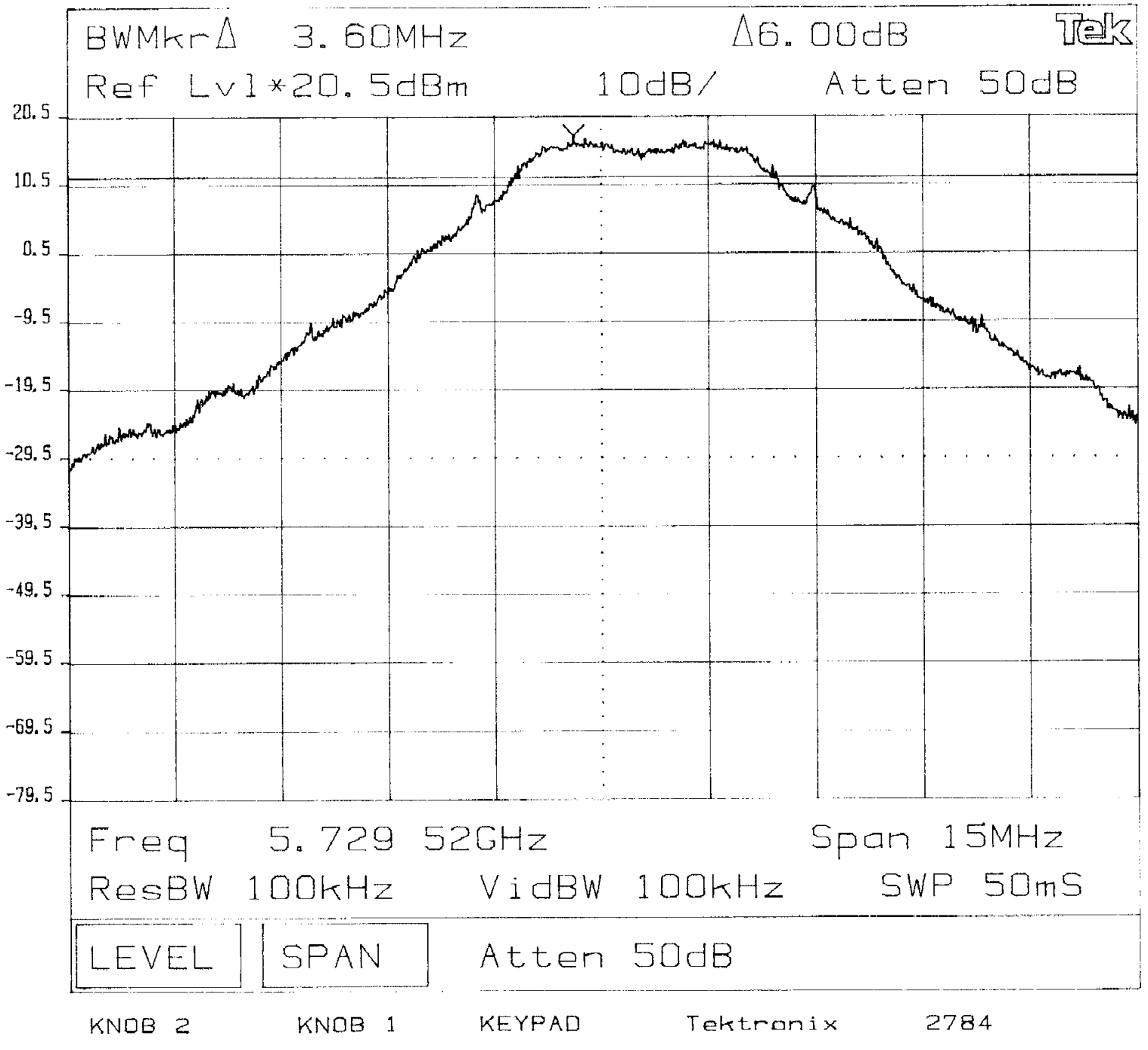
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

Frequency (MHz)	Max. 6 dB Bandwidth (kHz)
5730	3600

Refer to the following plots for 6 dB bandwidth sharp:

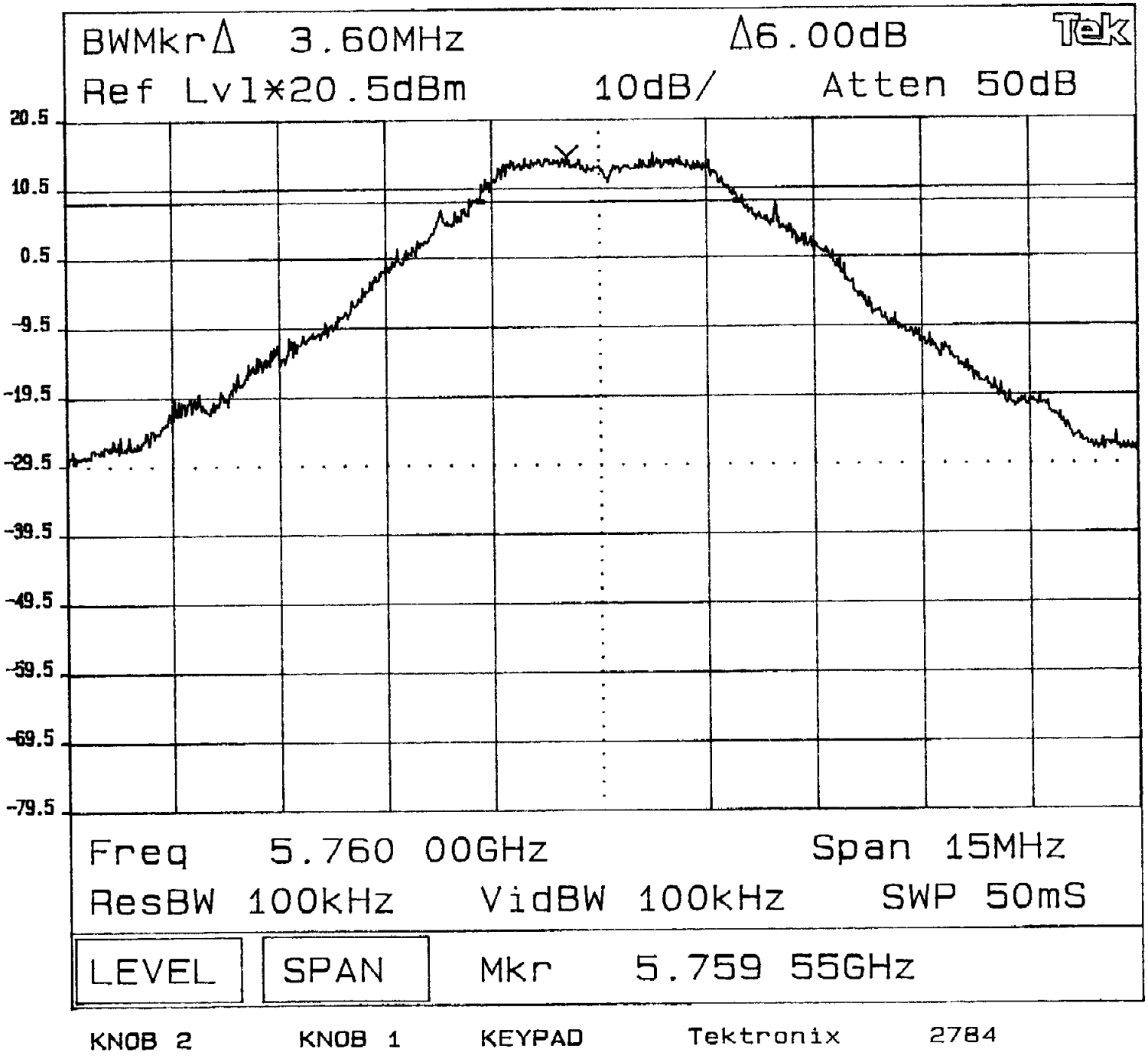
Plot 2a: Low Channel 6 dB RF Bandwidth
Plot 2b: Middle Channel 6 dB RF Bandwidth
Plot 2c: High Channel 6 dB RF Bandwidth

Plot 2a



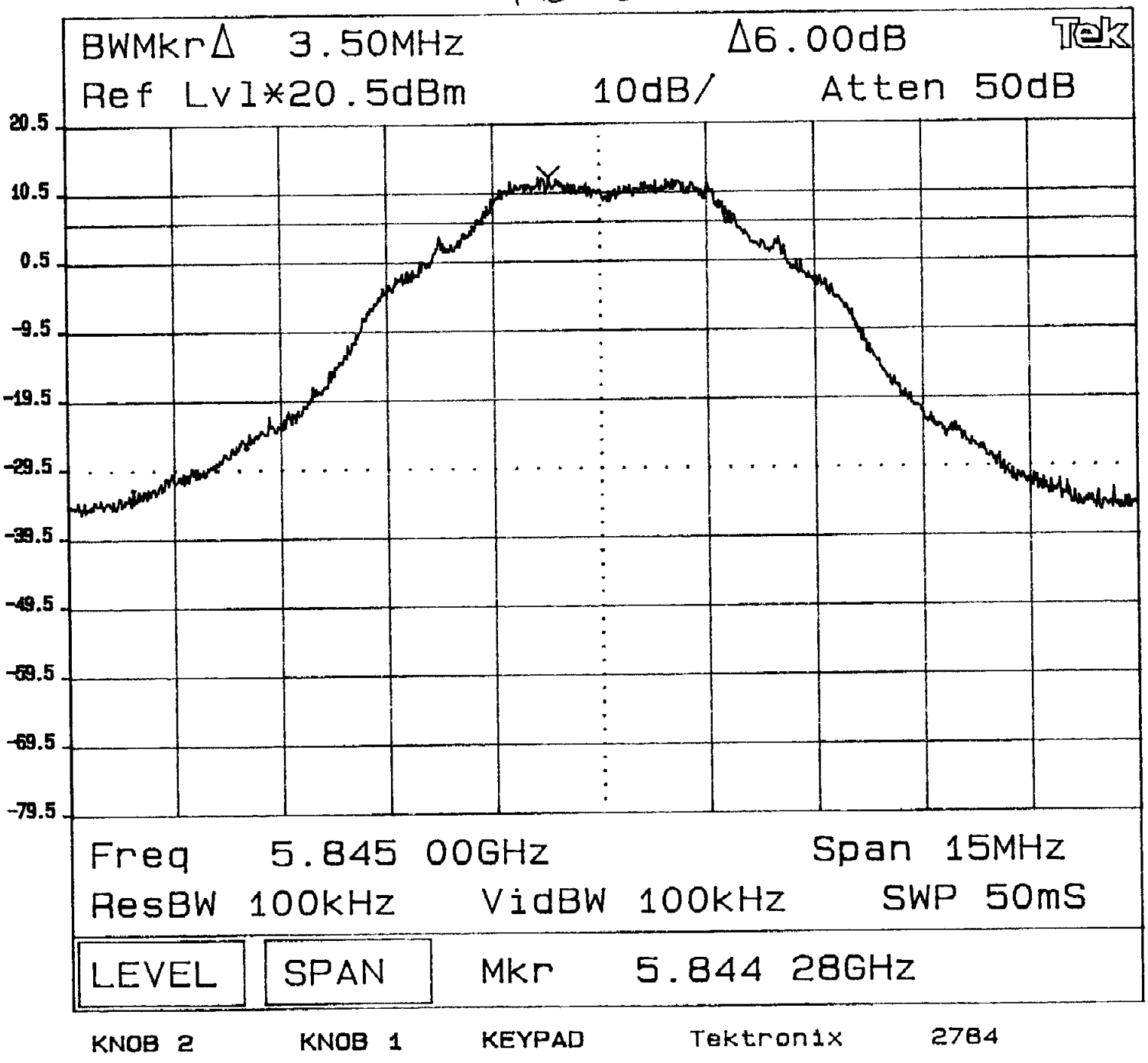
Low Channel
6dB

Plot 2b



Mid Channel
6 dB

Plot 2c



High Channel
6 dB

4.3 Maximum Power Density Reading, FCC Rule 15.247(d):

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

SWEEP TIME (SEC) = (Fstop, kHz - Fstart, kHz)/3 kHz

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.

Frequency (MHz)	Power Density (dBm)
5729.465	1.2

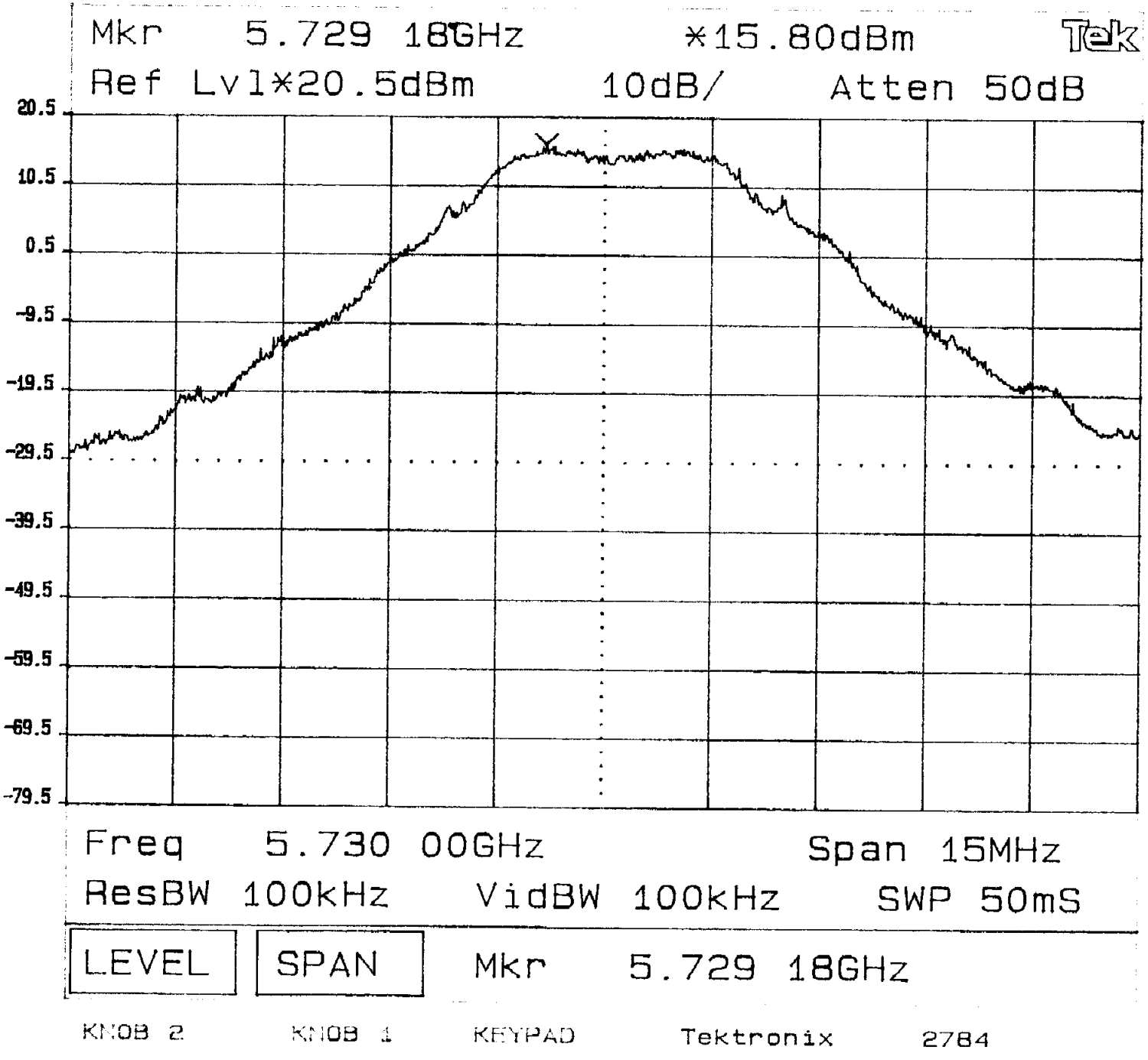
Frequency Span = 600 kHz

Sweep Time = Frequency Span/3 kHz
= 200 seconds

Refer to the following plots for power density data:

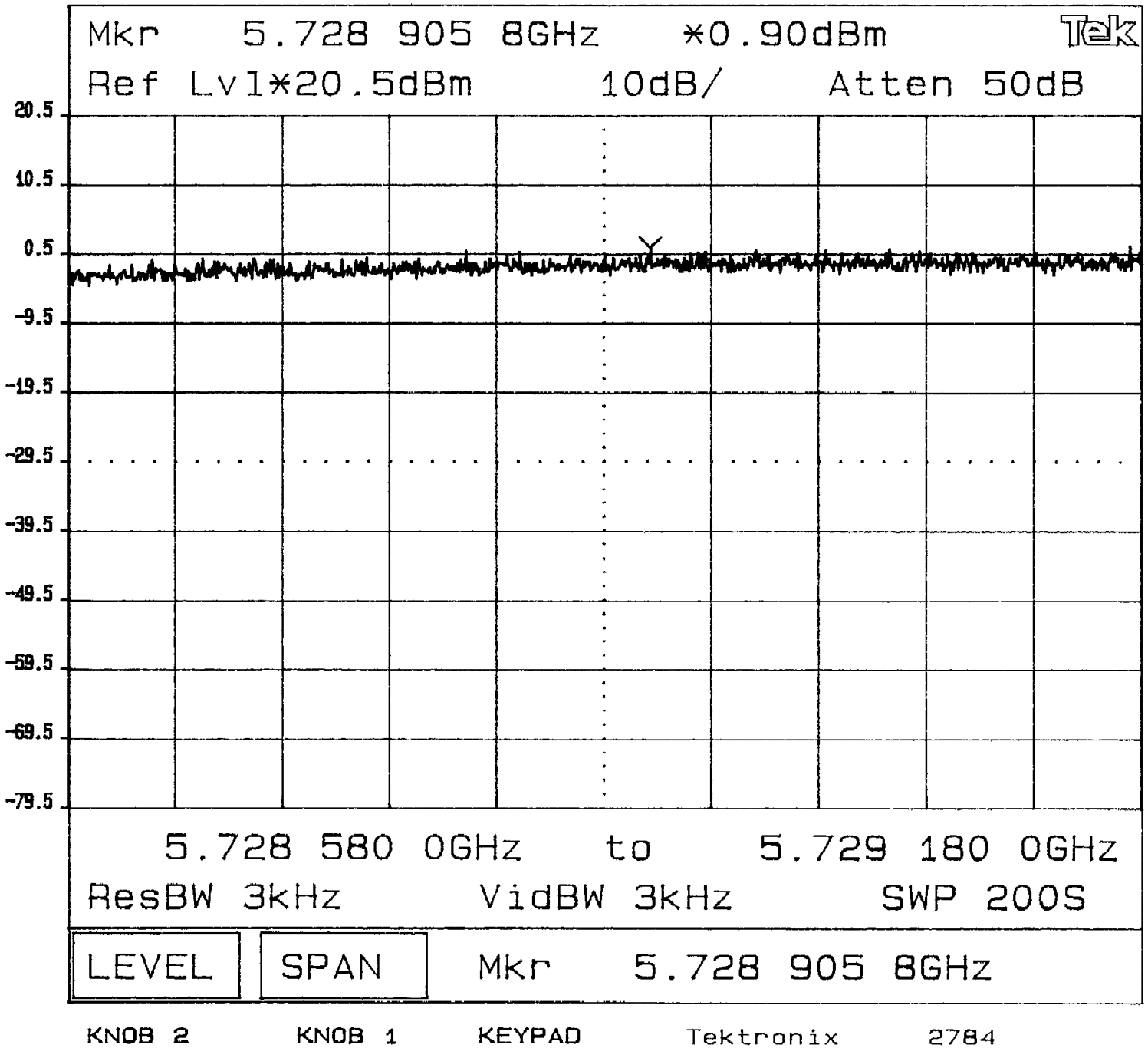
Plot 3a1-3a3: Low Channel Power Density
Plot 3b1-3b3: Middle Channel Power Density
Plot 3c1-3c3: High Channel Power Density

Plot 3a1



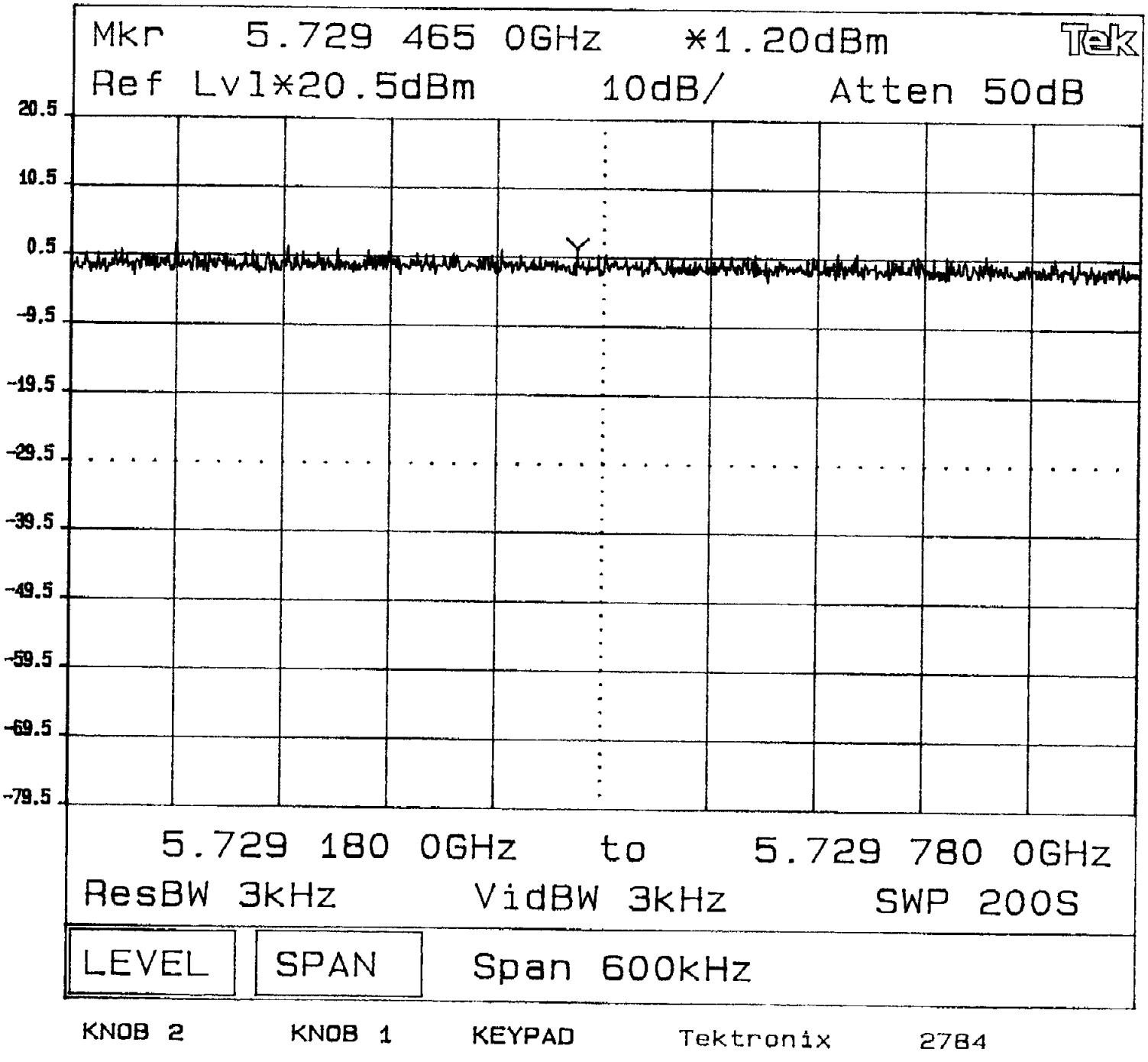
Low Channel Power Density

Plot 3a2



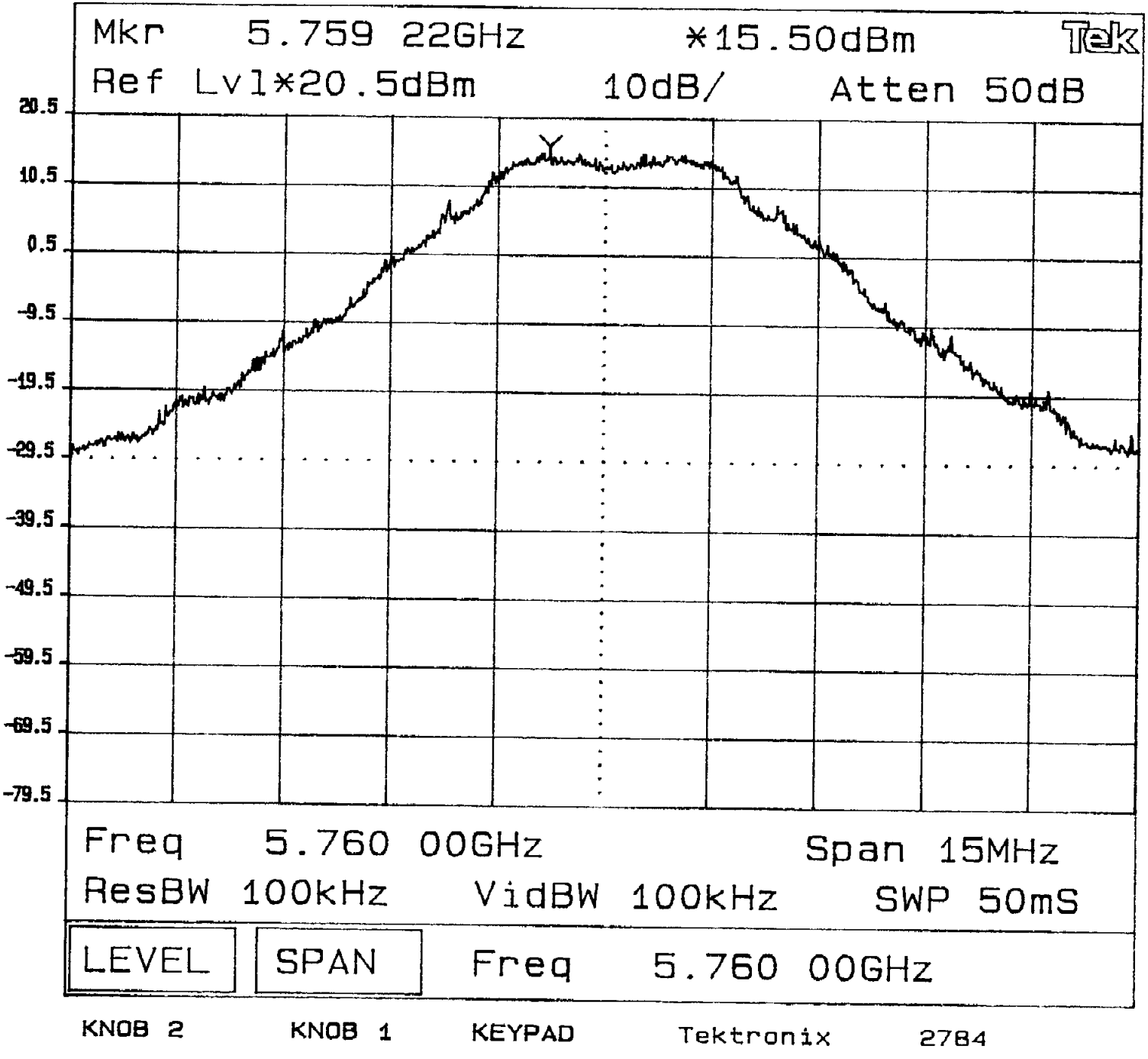
Low Channel
Power Density

Plot 3a3



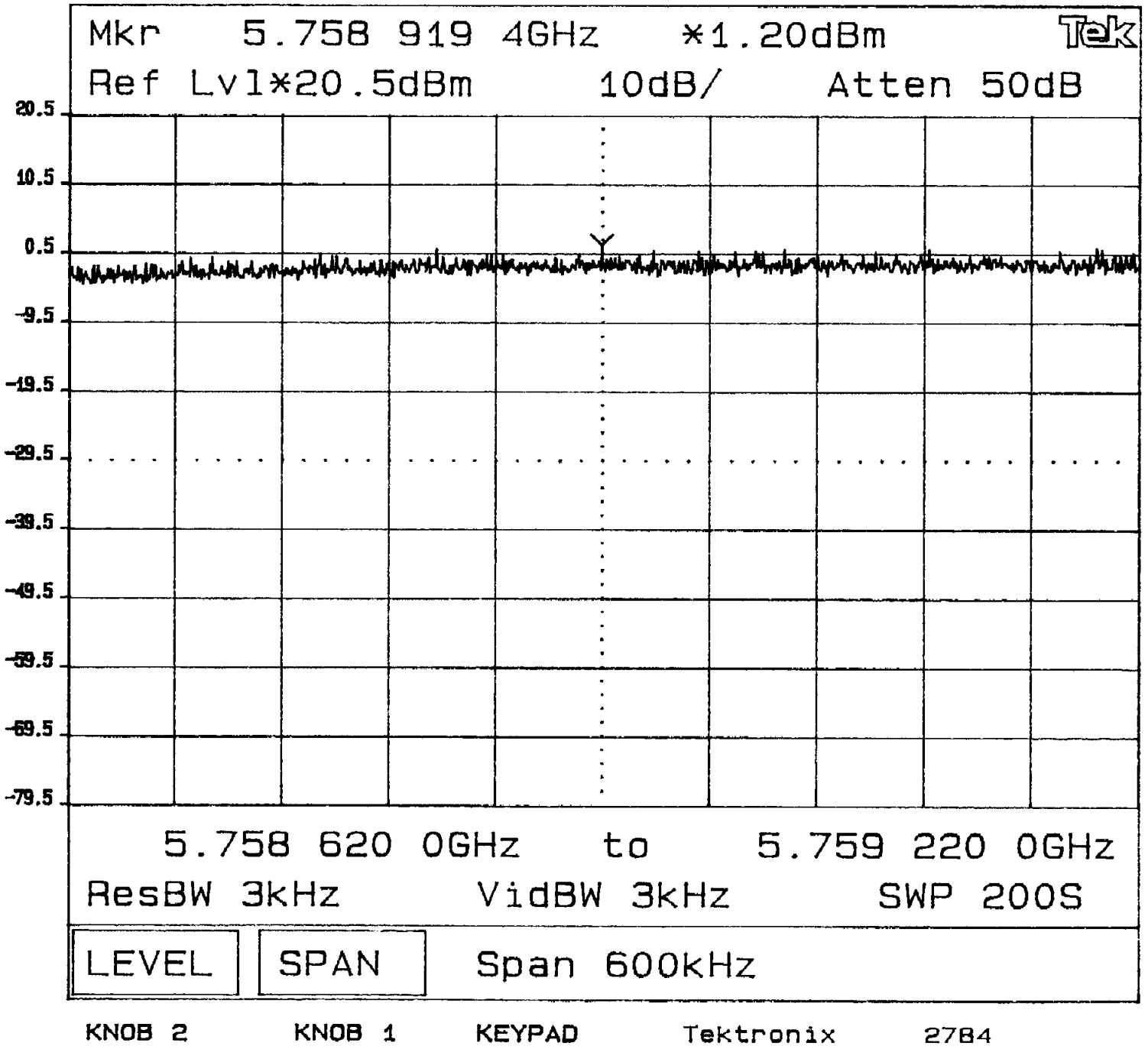
Low Channel
Power Density

Plot 3b1



Mid-Channel Power Density

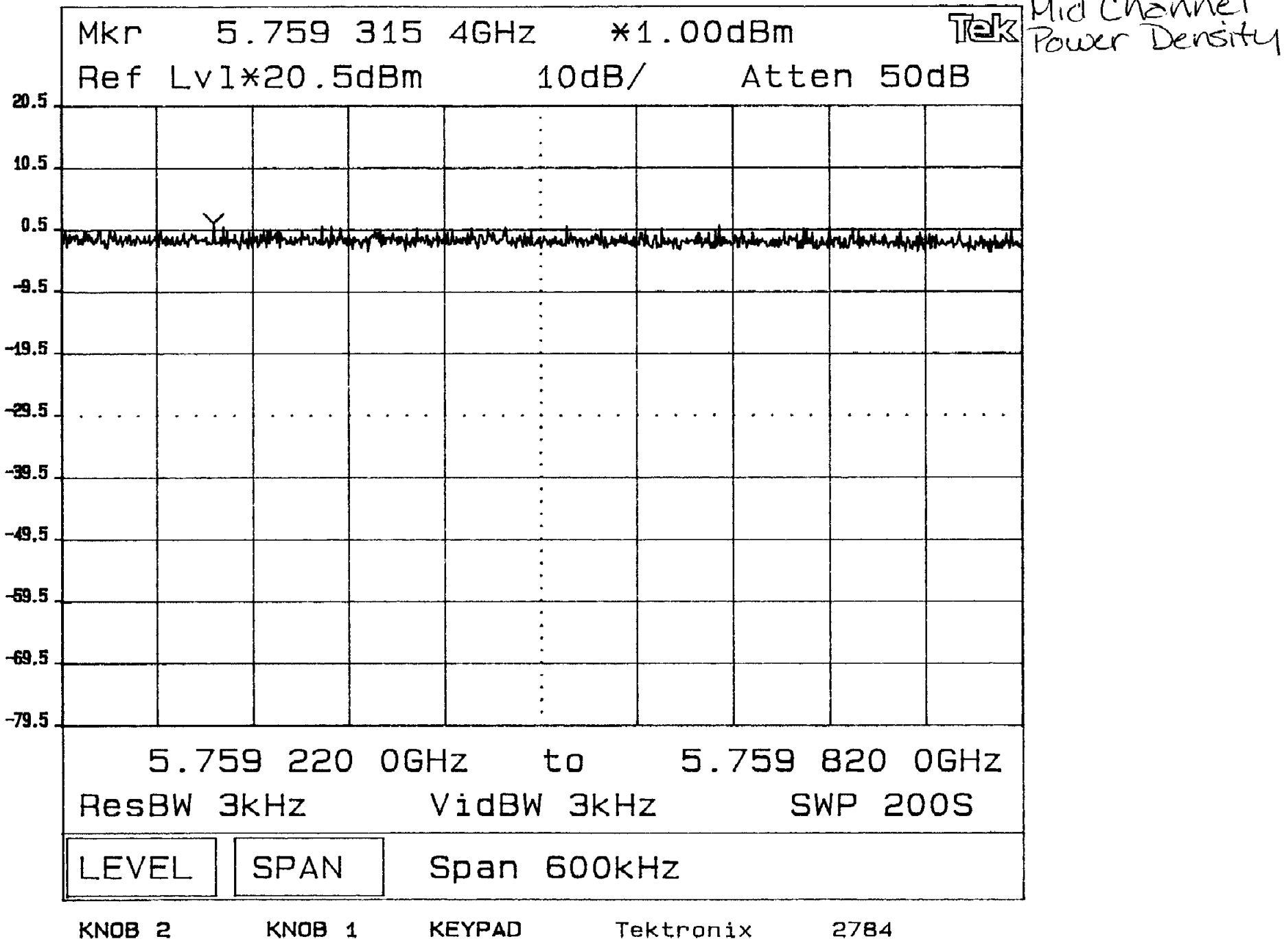
Plot 3b2



Mid Channel Power Density

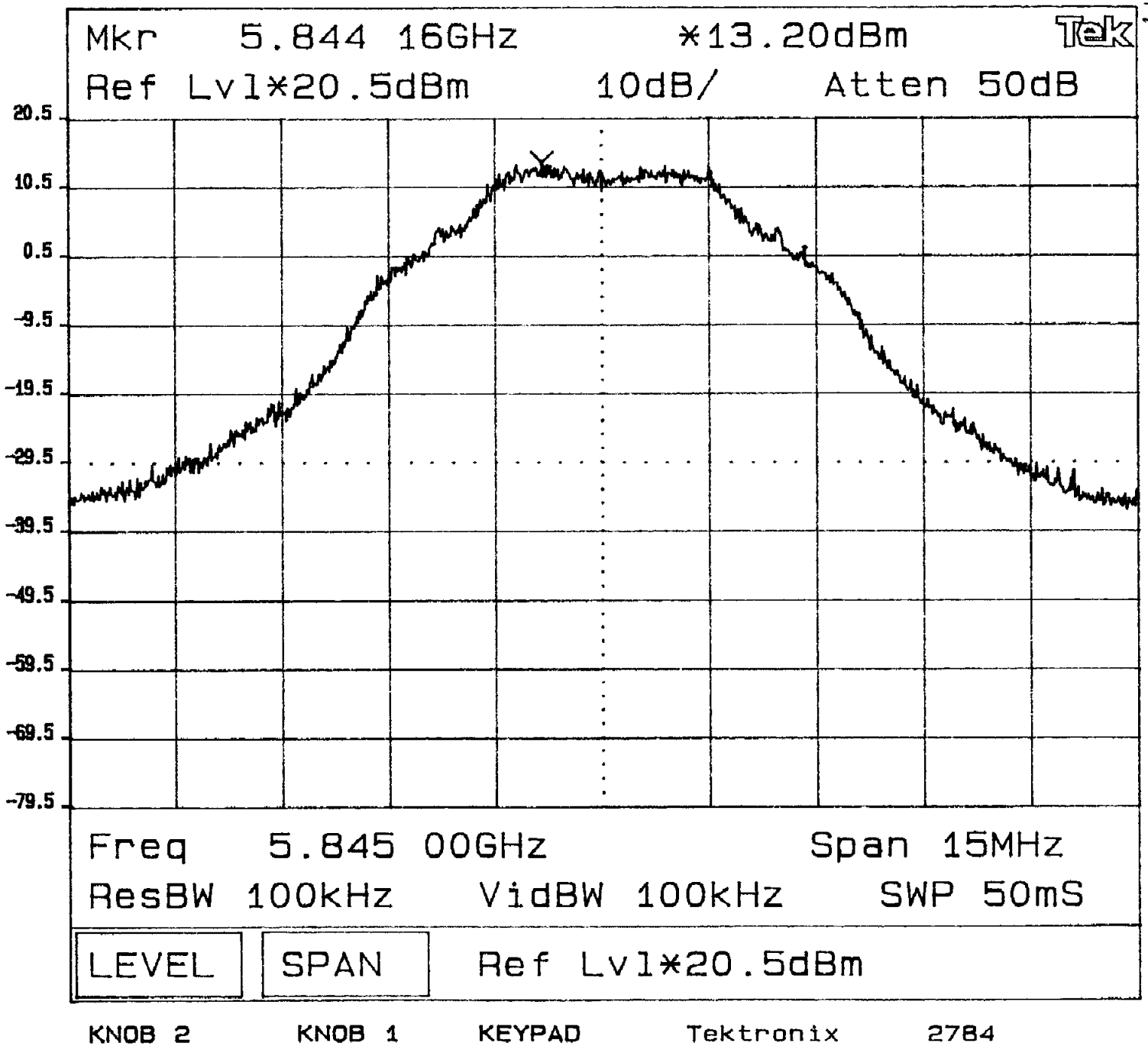
Plot 3b3

Mid Channel
Power Density



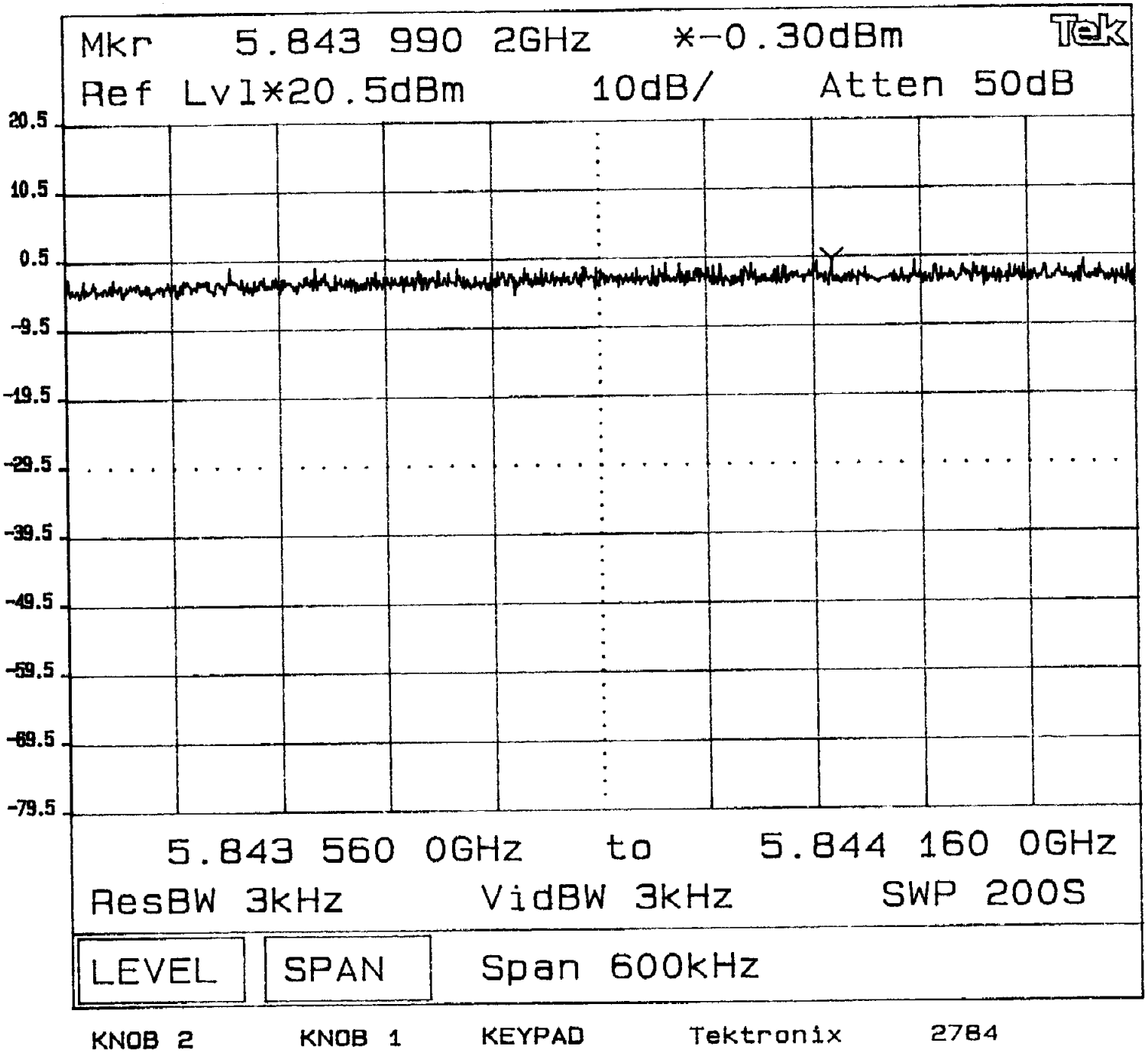
Plot 3c1

High Channel Power Density



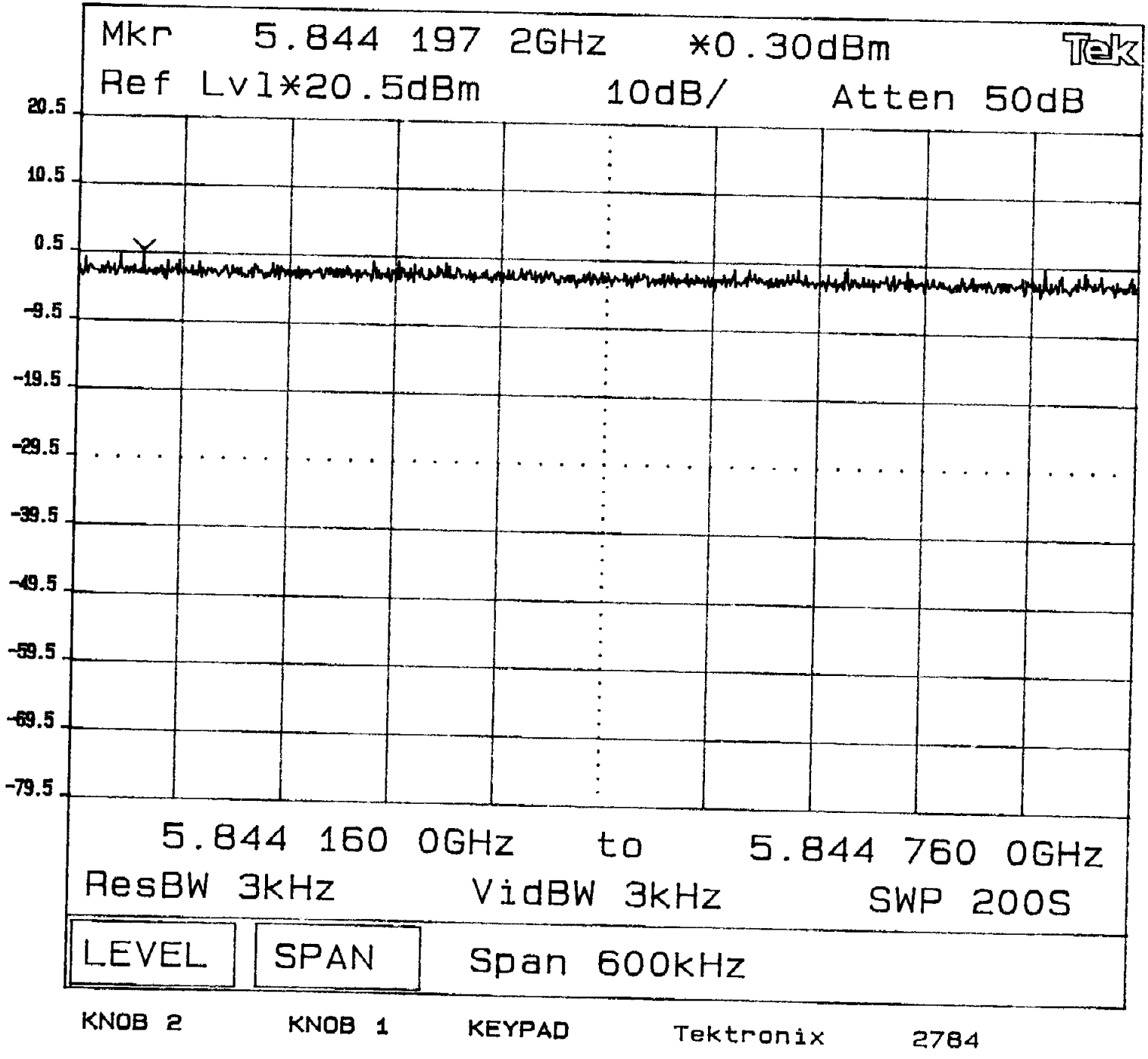
Plot 3c2

High Channel
Power Density



Plot 3c3

High Channel
Power Density



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

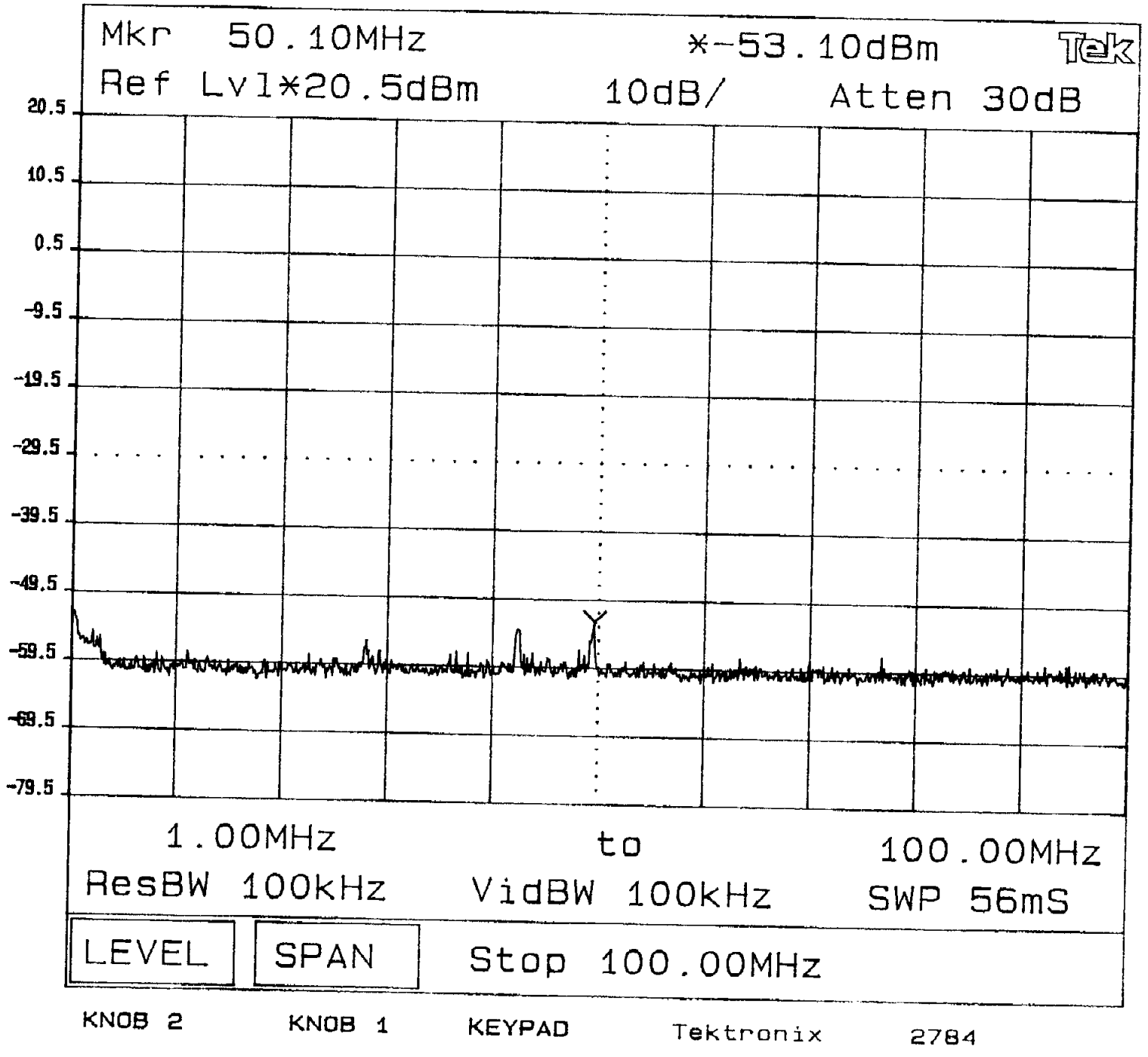
In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated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

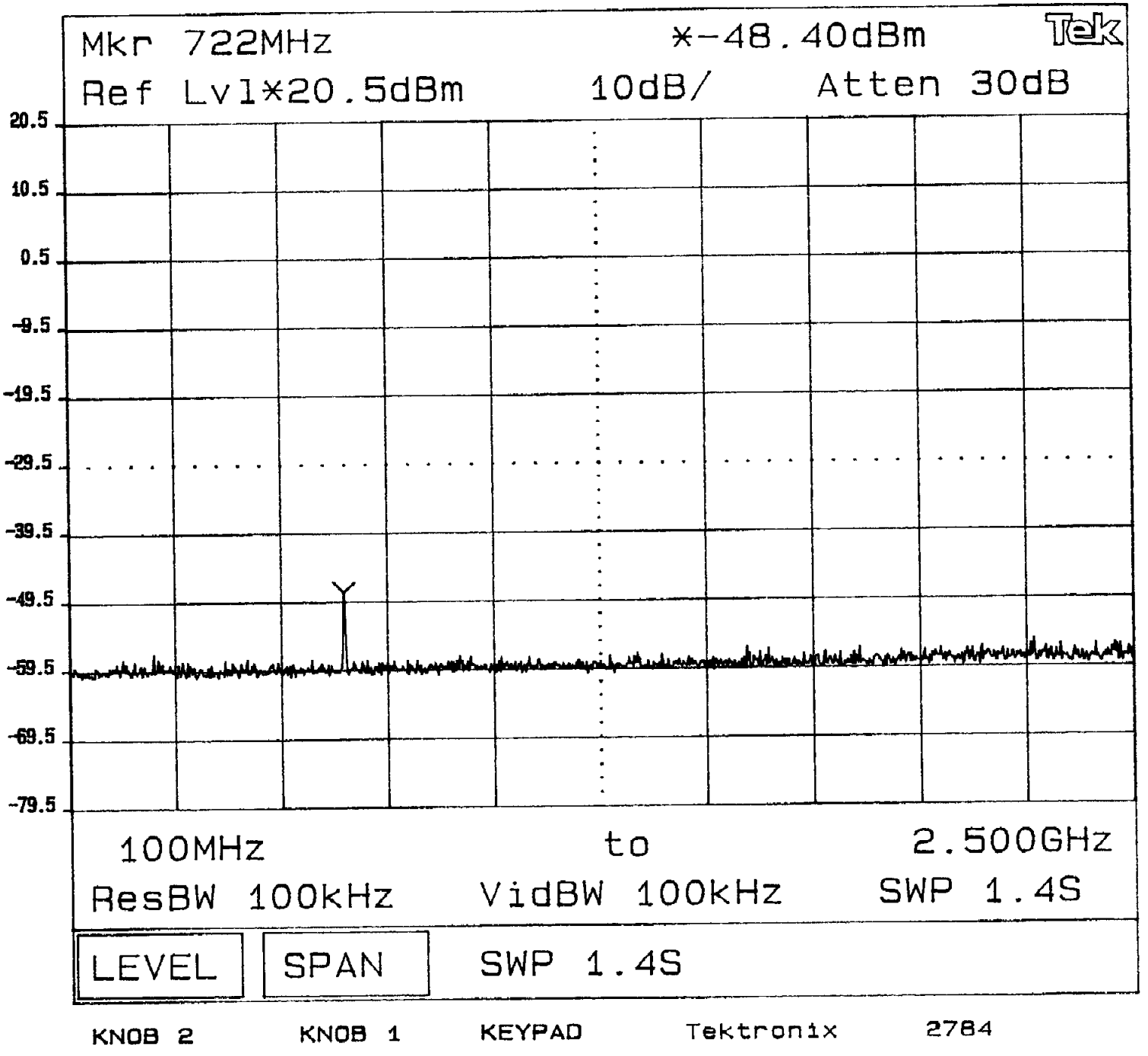
Refer to the following plots for out of band conducted emissions data:

Plot 4a.1 - 4a.4: Low Channel Emissions
Plot 4b.1 - 4b.3: Middle Channel Emissions
Plot 4c.1 - 4c.4: High Channel Emissions

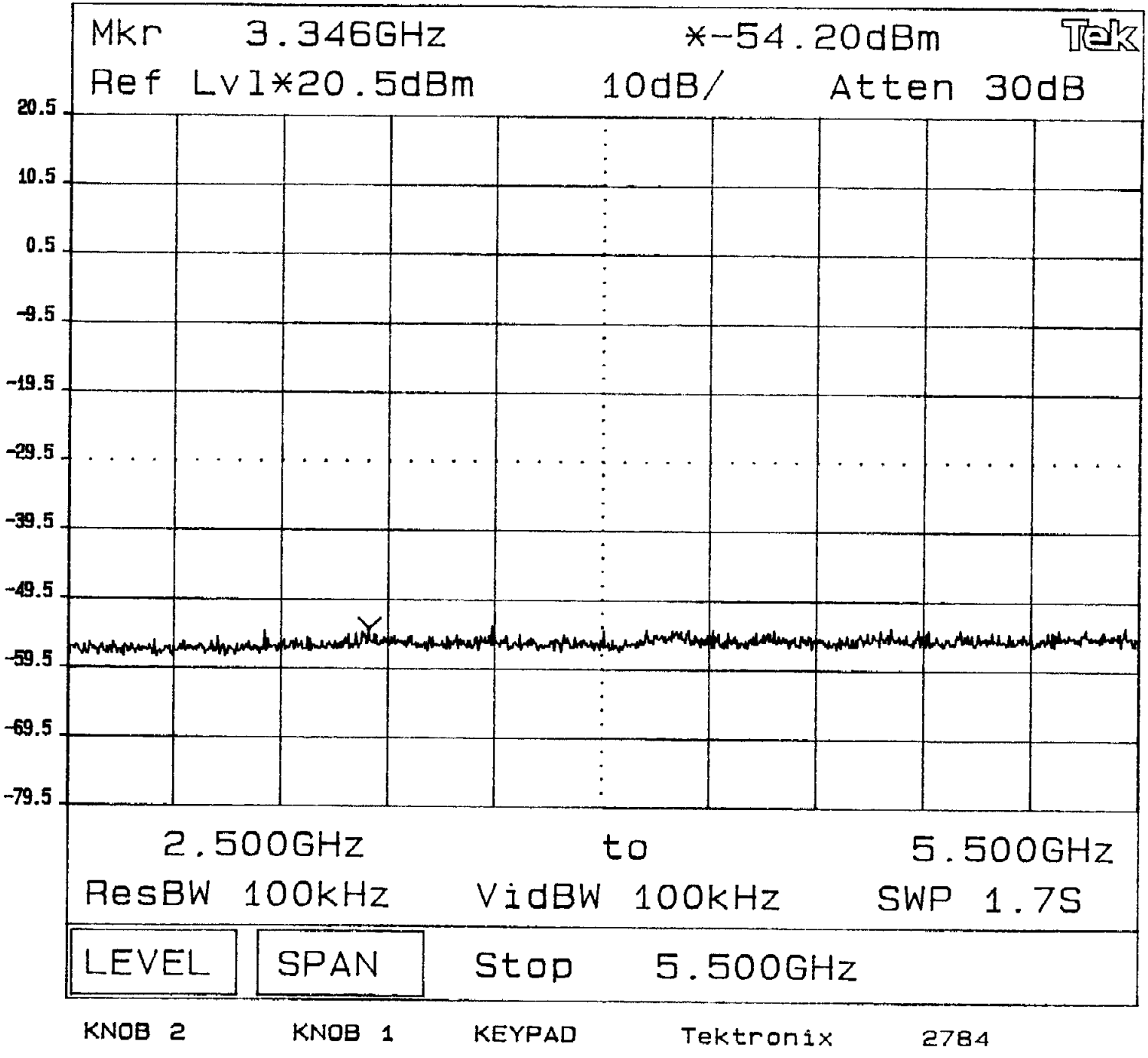
Plot 4a.1


Mkr 50.10MHz
*-53.10dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
1.00MHz
to
100.00MHz
ResBW 100kHz
VidBW 100kHz
SWP 56mS
LEVEL
SPAN
Stop 100.00MHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

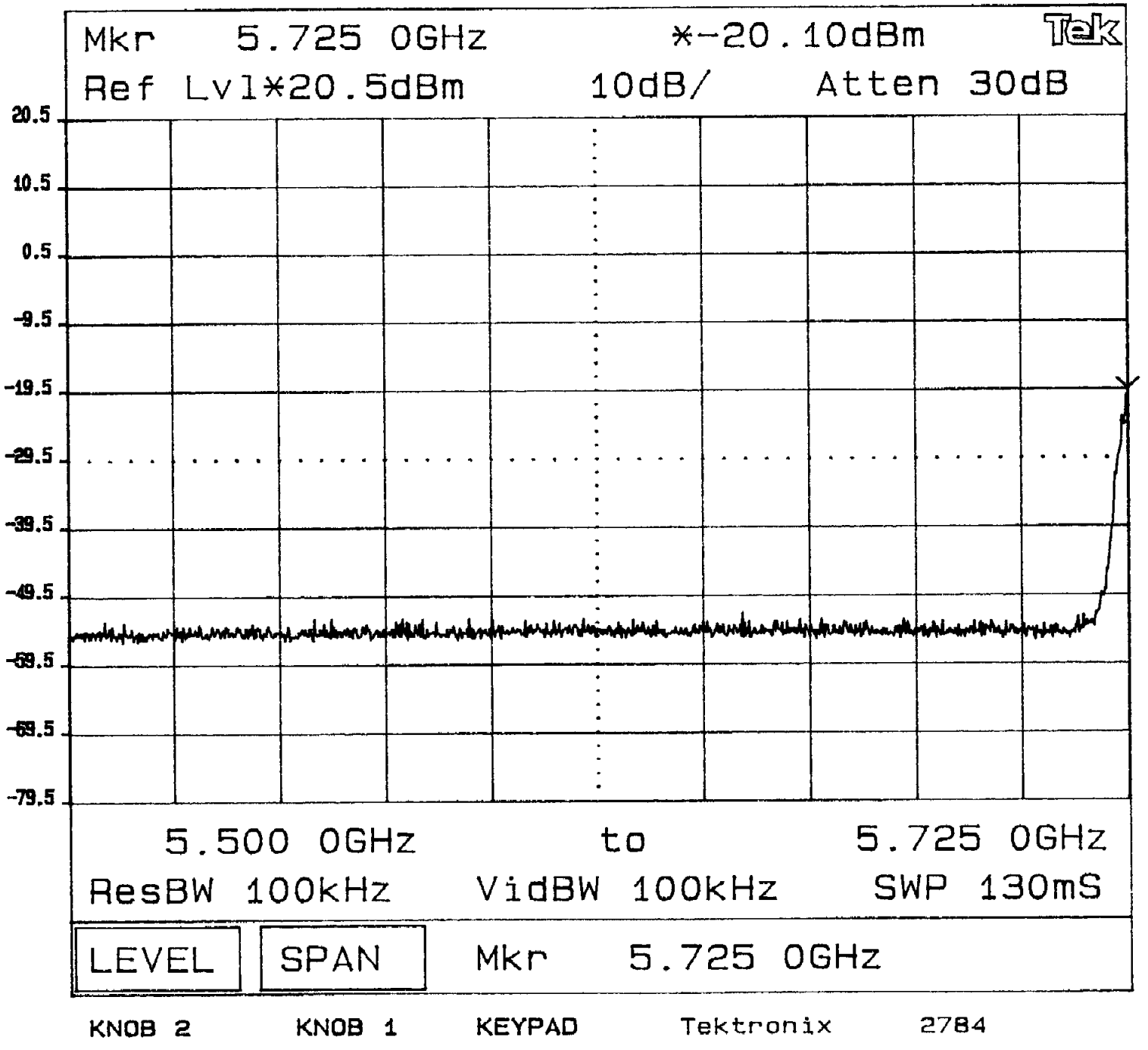
Plot 4a.2


Mkr 722MHz
*-48.40dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
100MHz
to
2.500GHz
ResBW 100kHz
VidBW 100kHz
SWP 1.4S
LEVEL
SPAN
SWP 1.4S
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

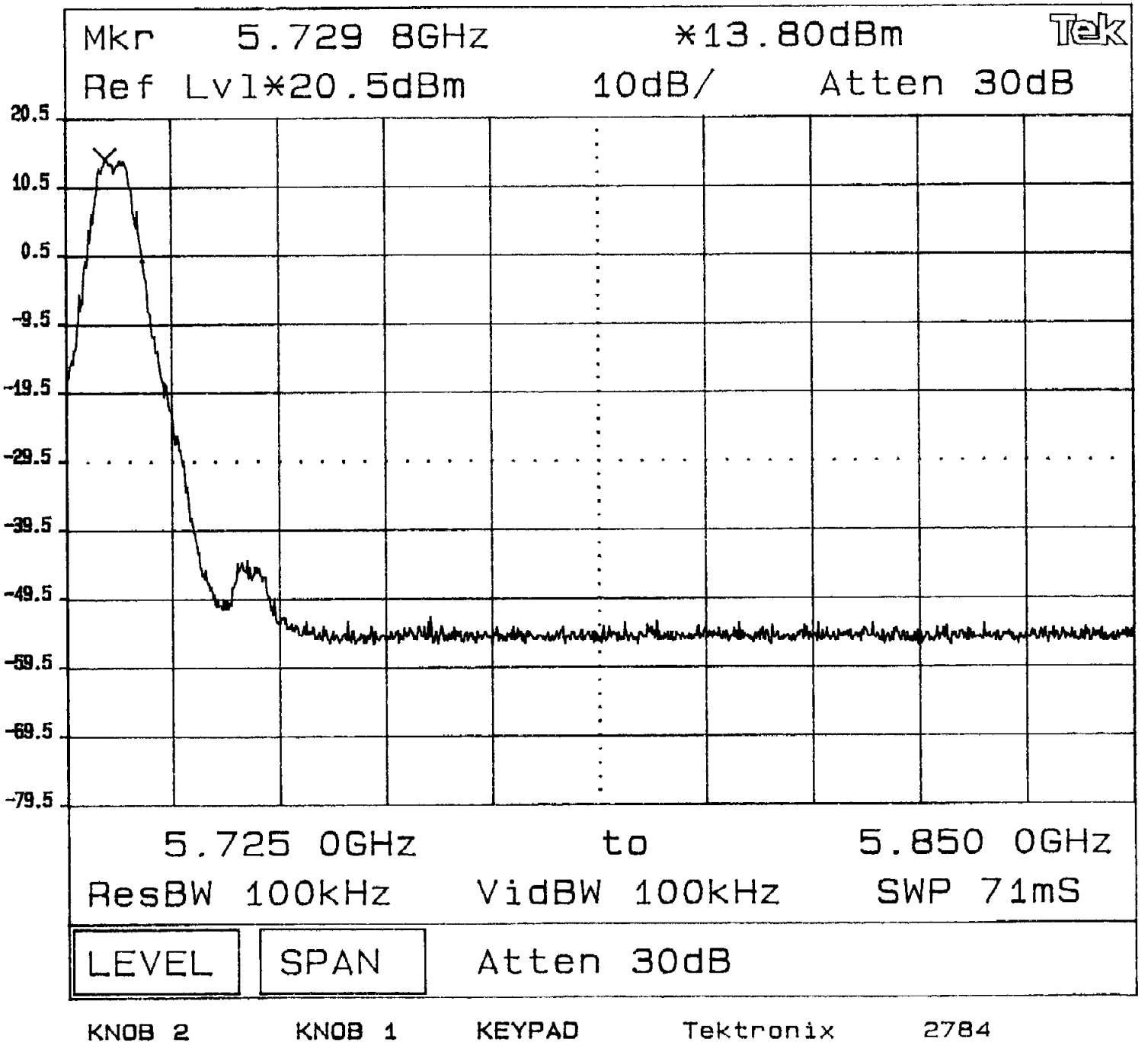
Plot 4a.3


Mkr 3.346GHz
*-54.20dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
2.500GHz
to
5.500GHz
ResBW 100kHz
VidBW 100kHz
SWP 1.7S
LEVEL
SPAN
Stop 5.500GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

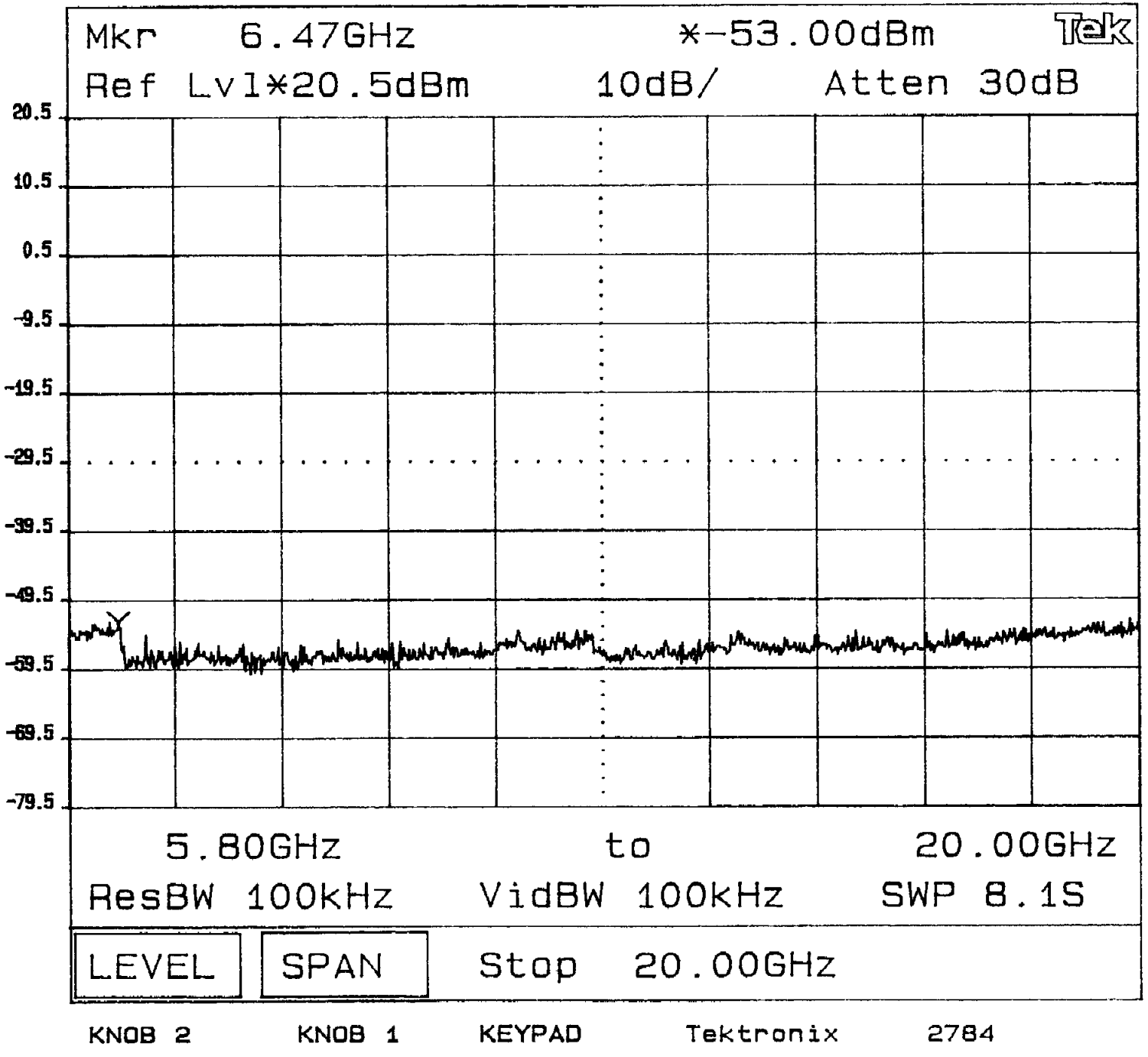
Plot 4a.4


Mkr 5.725 0GHz
*-20.10dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
5.500 0GHz
to
5.725 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 130mS
LEVEL
SPAN
Mkr 5.725 0GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

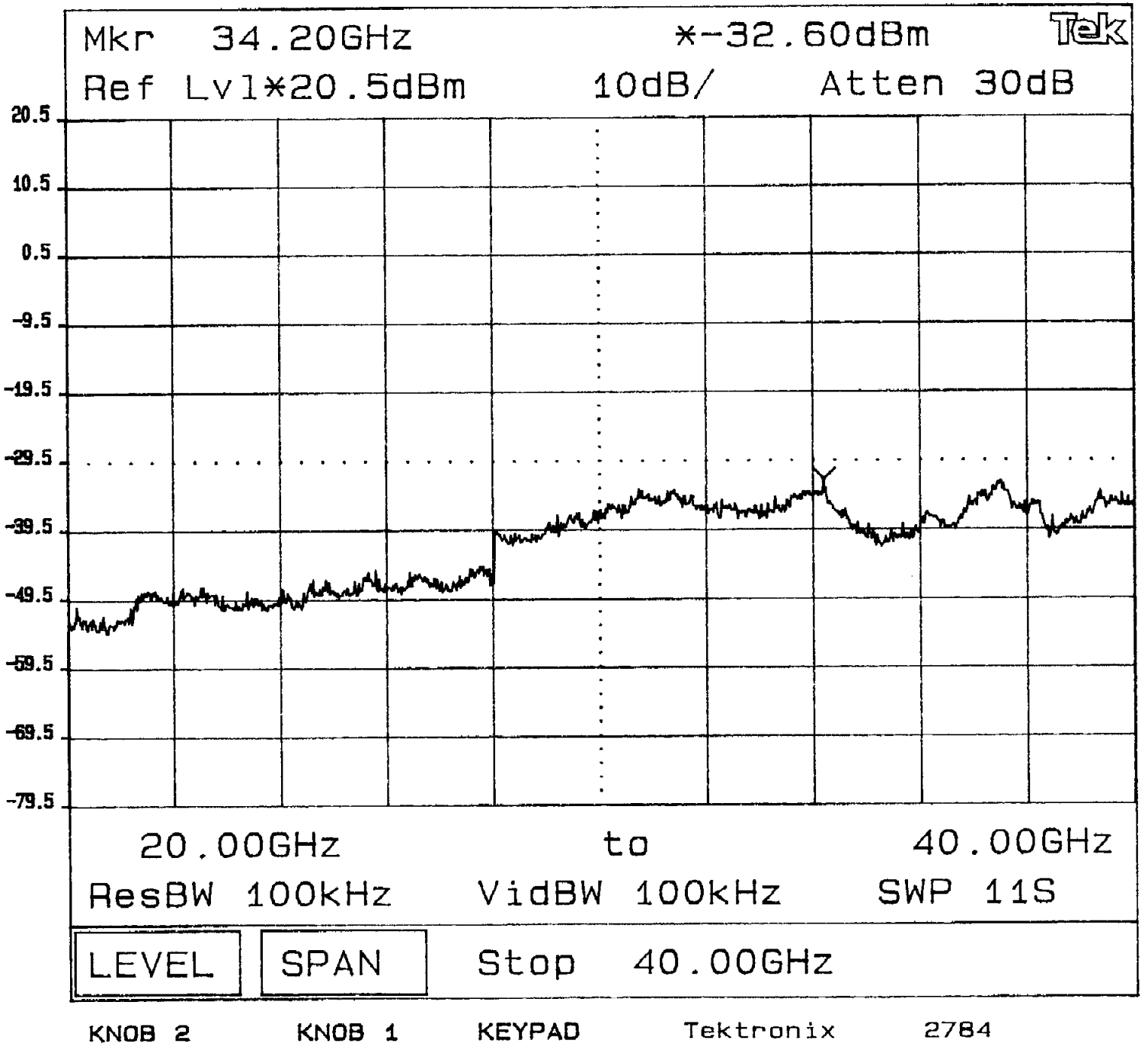
Plot 4a.5


Mkr 5.729 8GHz
*13.80dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
5.725 0GHz
to
5.850 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 71mS
LEVEL
SPAN
Atten 30dB
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

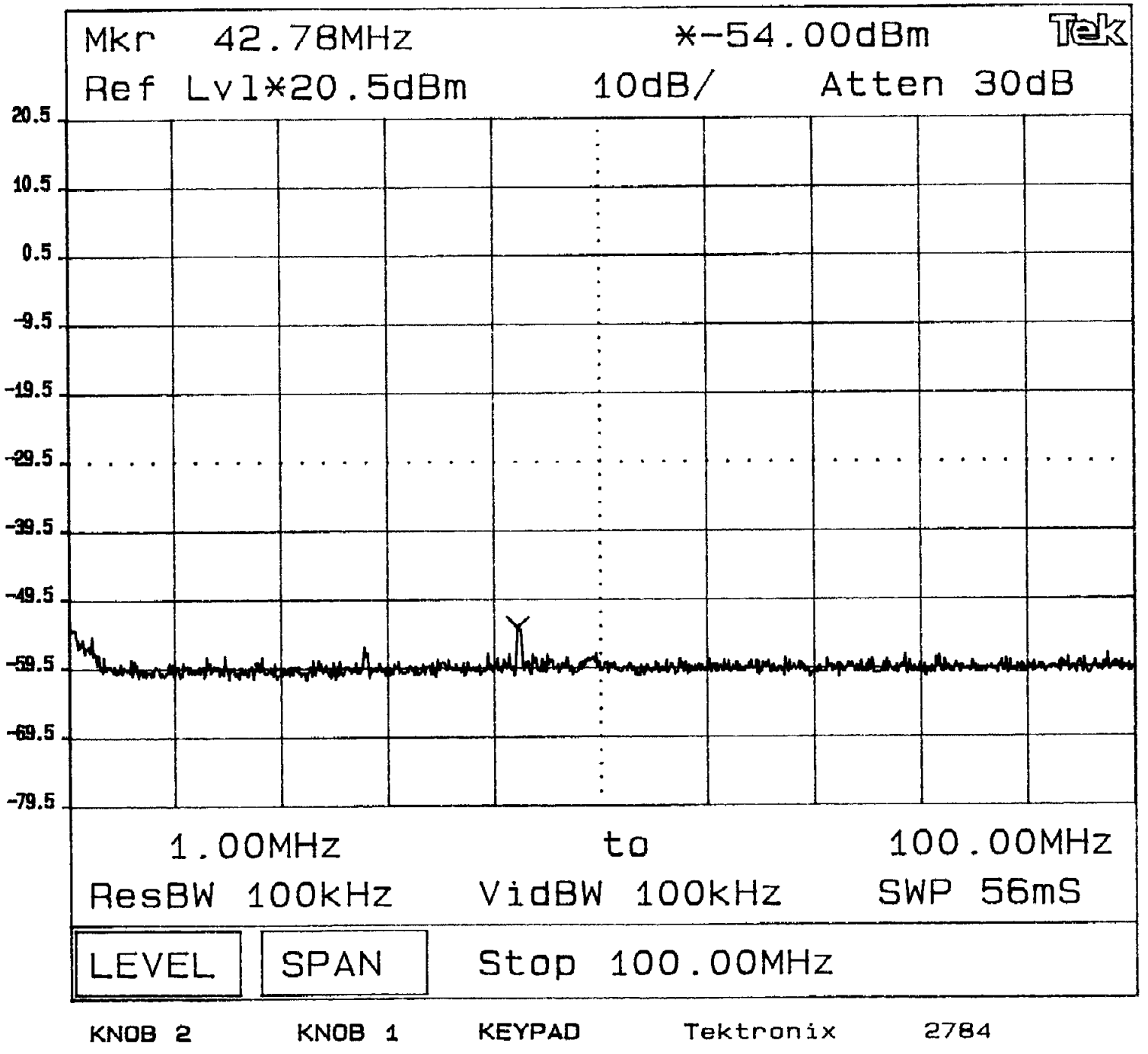
Plot 4a.6


Mkr 6.47GHz
*-53.00dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
5.80GHz
to
20.00GHz
ResBW 100kHz
VidBW 100kHz
SWP 8.1S
LEVEL
SPAN
Stop 20.00GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

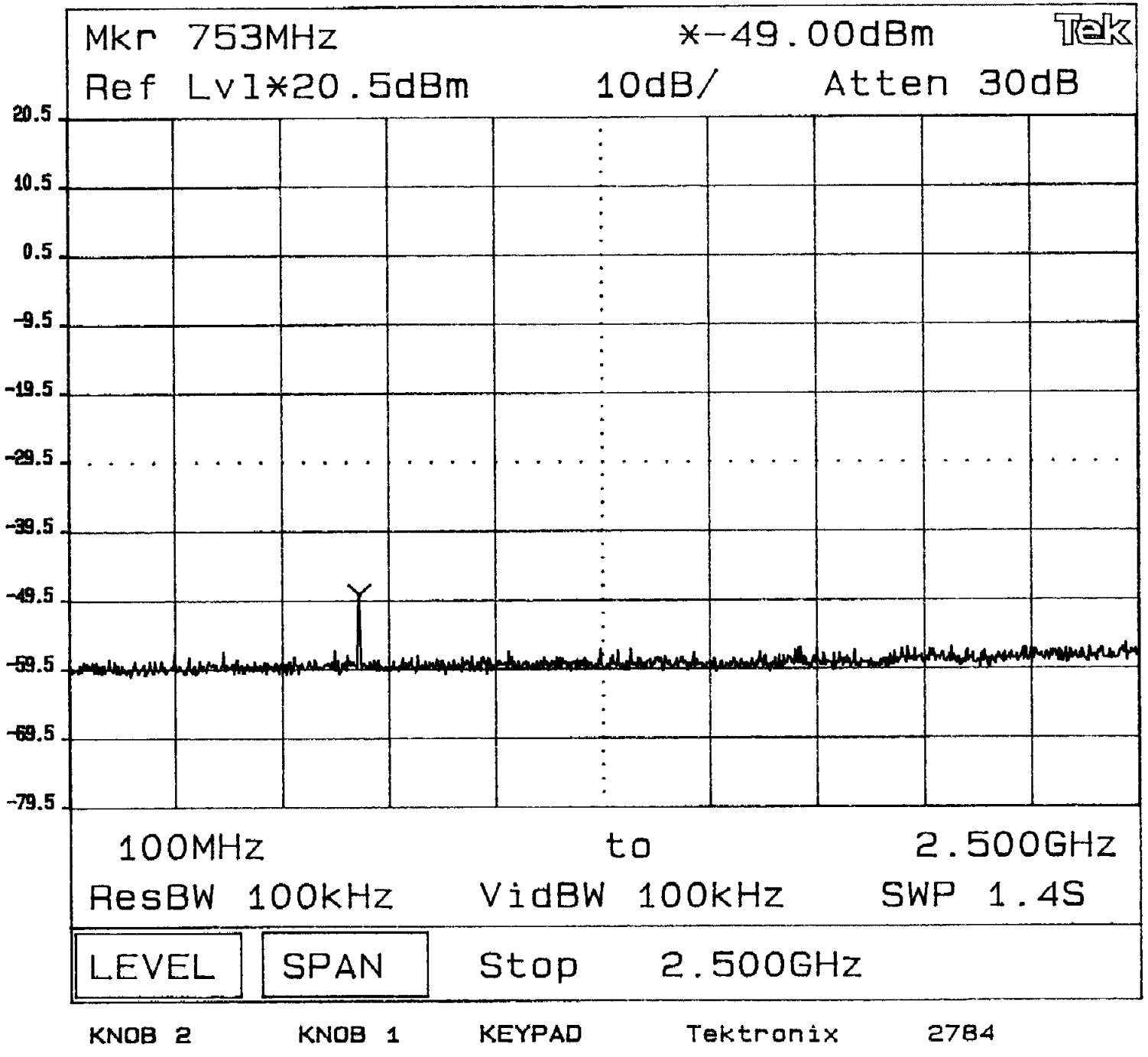
Plot 4a.7


Mkr 34.20GHz
*-32.60dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
20.00GHz
to
40.00GHz
ResBW 100kHz
VidBW 100kHz
SWP 11S
LEVEL
SPAN
Stop 40.00GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

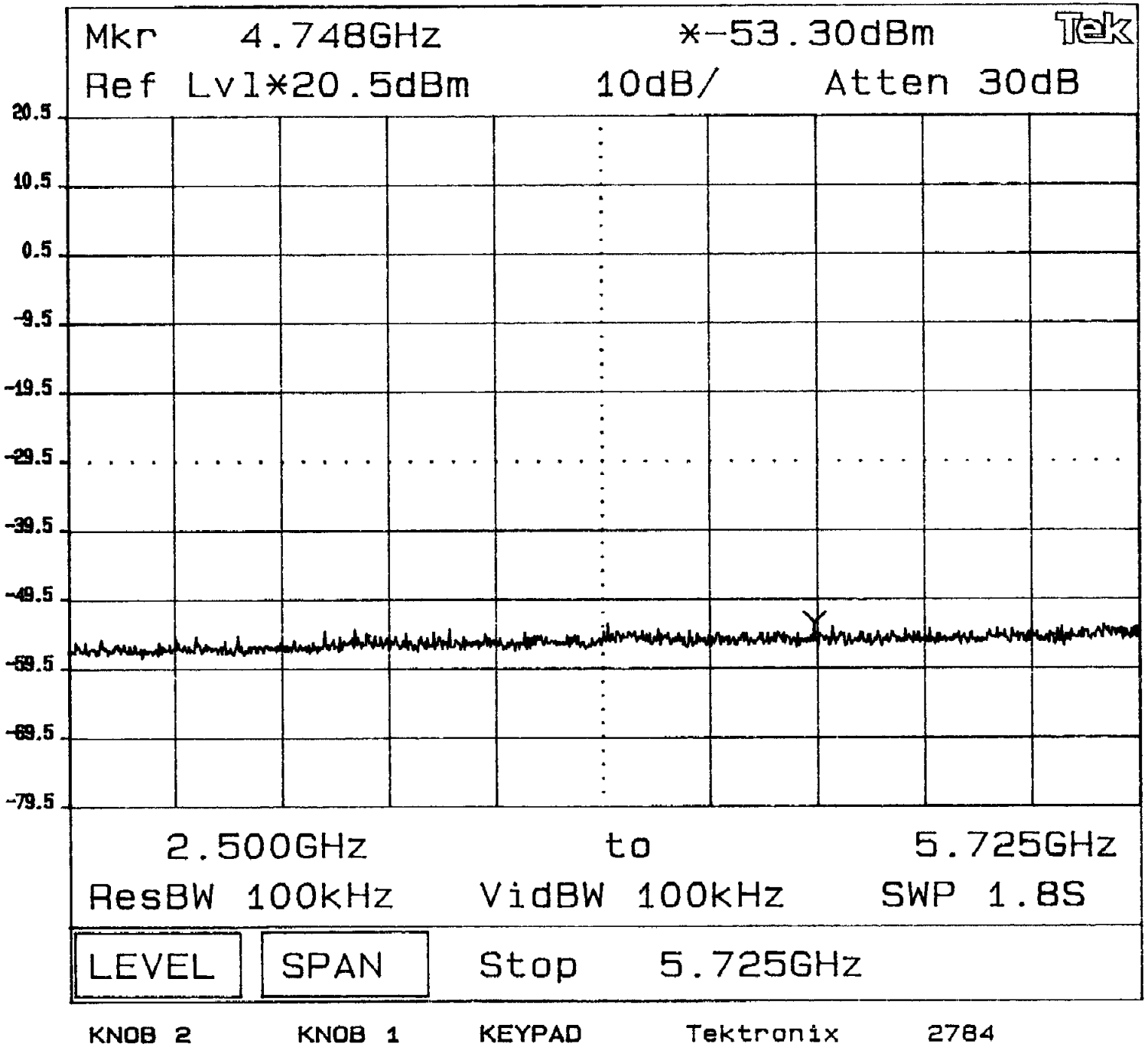
Plot 4b.1


Mkr 42.78MHz
*-54.00dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
1.00MHz
to
100.00MHz
ResBW 100kHz
VidBW 100kHz
SWP 56mS
LEVEL
SPAN
Stop 100.00MHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

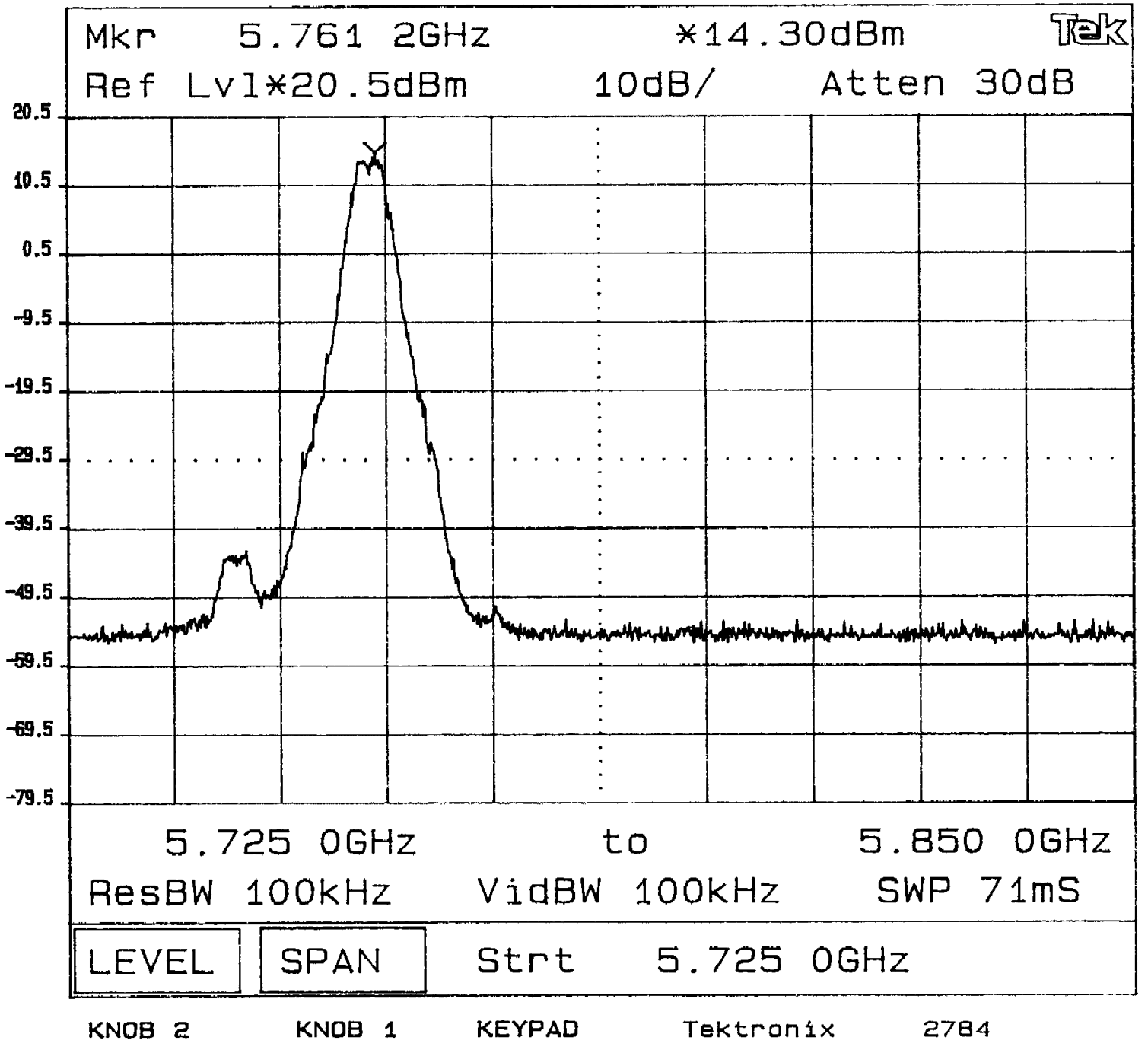
Plot 4b.2


Mkr 753MHz
*-49.00dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
100MHz
to
2.500GHz
ResBW 100kHz
VidBW 100kHz
SWP 1.4S
LEVEL
SPAN
Stop 2.500GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

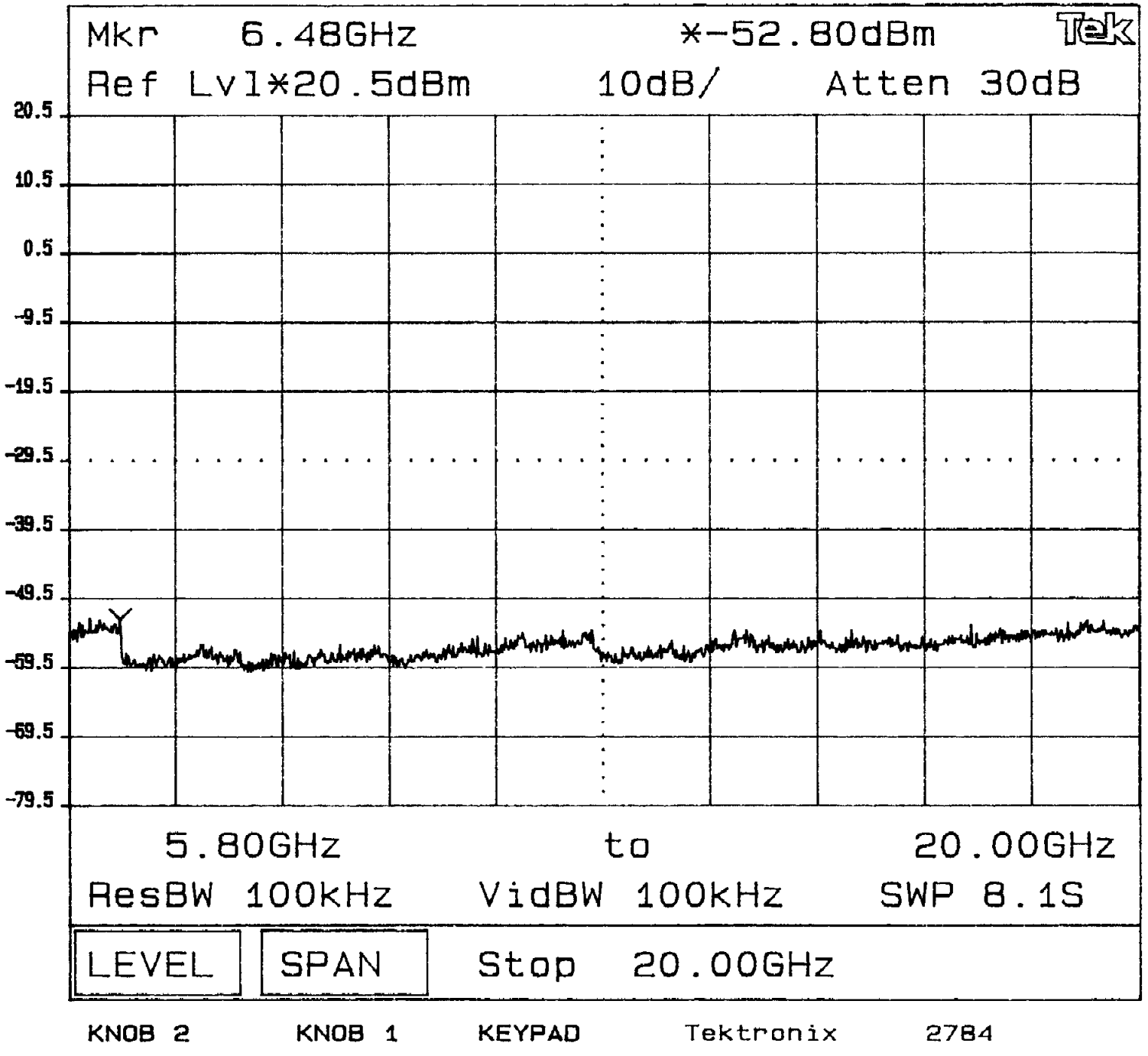
Plot 4b.3


Mkr 4.748GHz
*-53.30dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
2.500GHz
to
5.725GHz
ResBW 100kHz
VidBW 100kHz
SWP 1.8S
LEVEL
SPAN
Stop 5.725GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

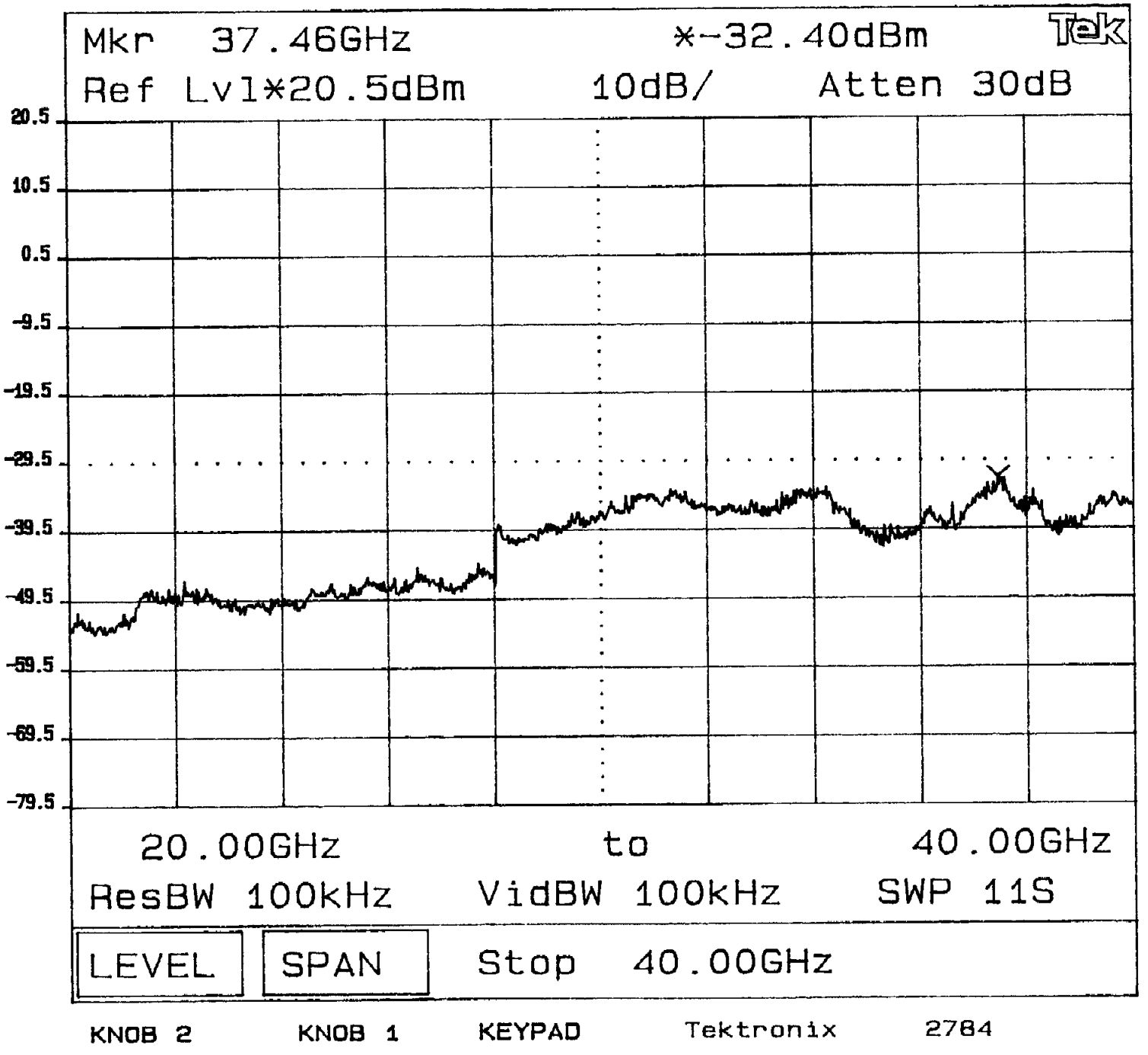
Plot 4b.4


Mkr 5.761 2GHz
*14.30dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
5.725 0GHz
to
5.850 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 71mS
LEVEL
SPAN
Strt 5.725 0GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

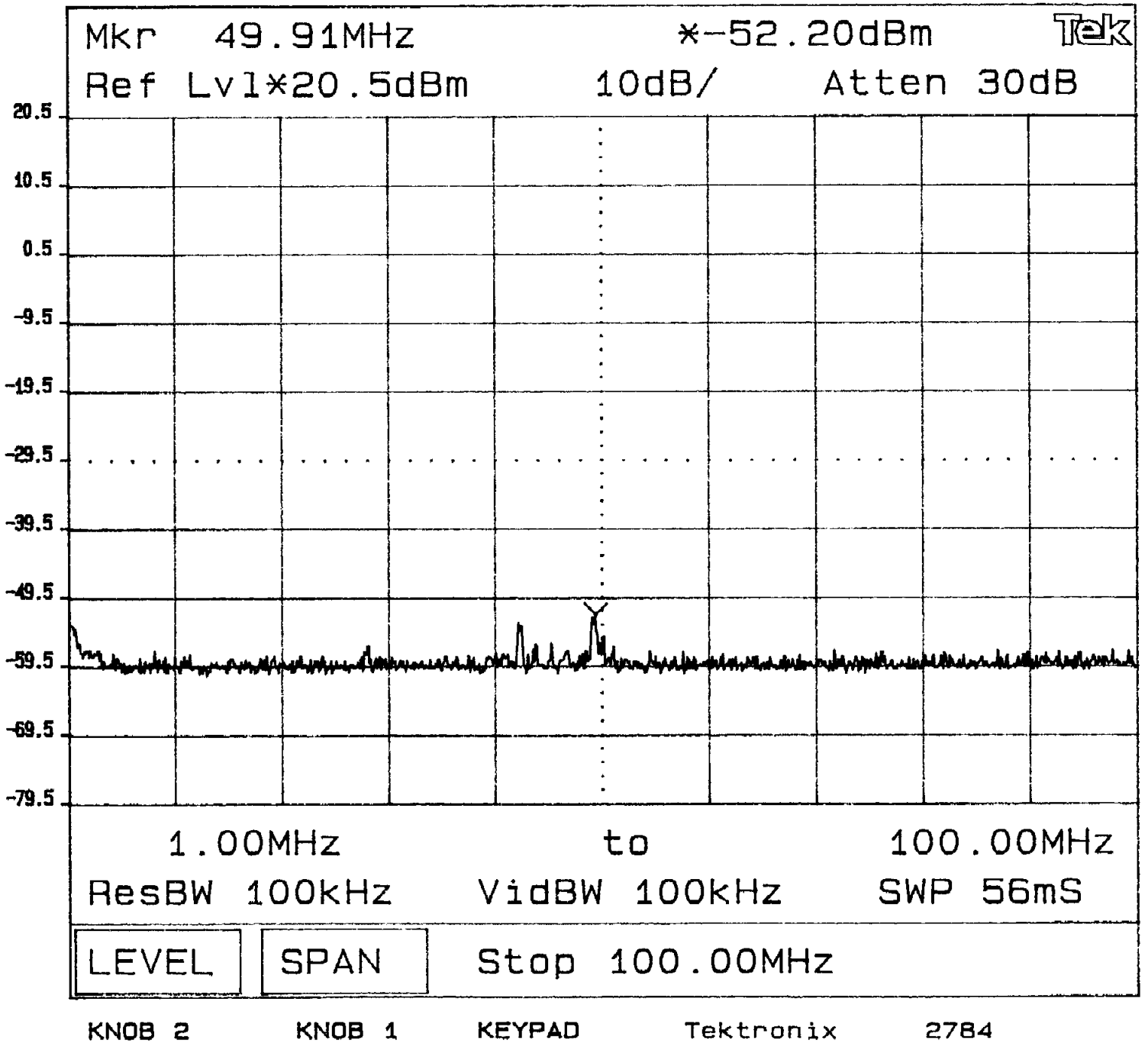
Plot 4b.5


Mkr 6.48GHz
*-52.80dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
5.80GHz
to
20.00GHz
ResBW 100kHz
VidBW 100kHz
SWP 8.1S
LEVEL
SPAN
Stop 20.00GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

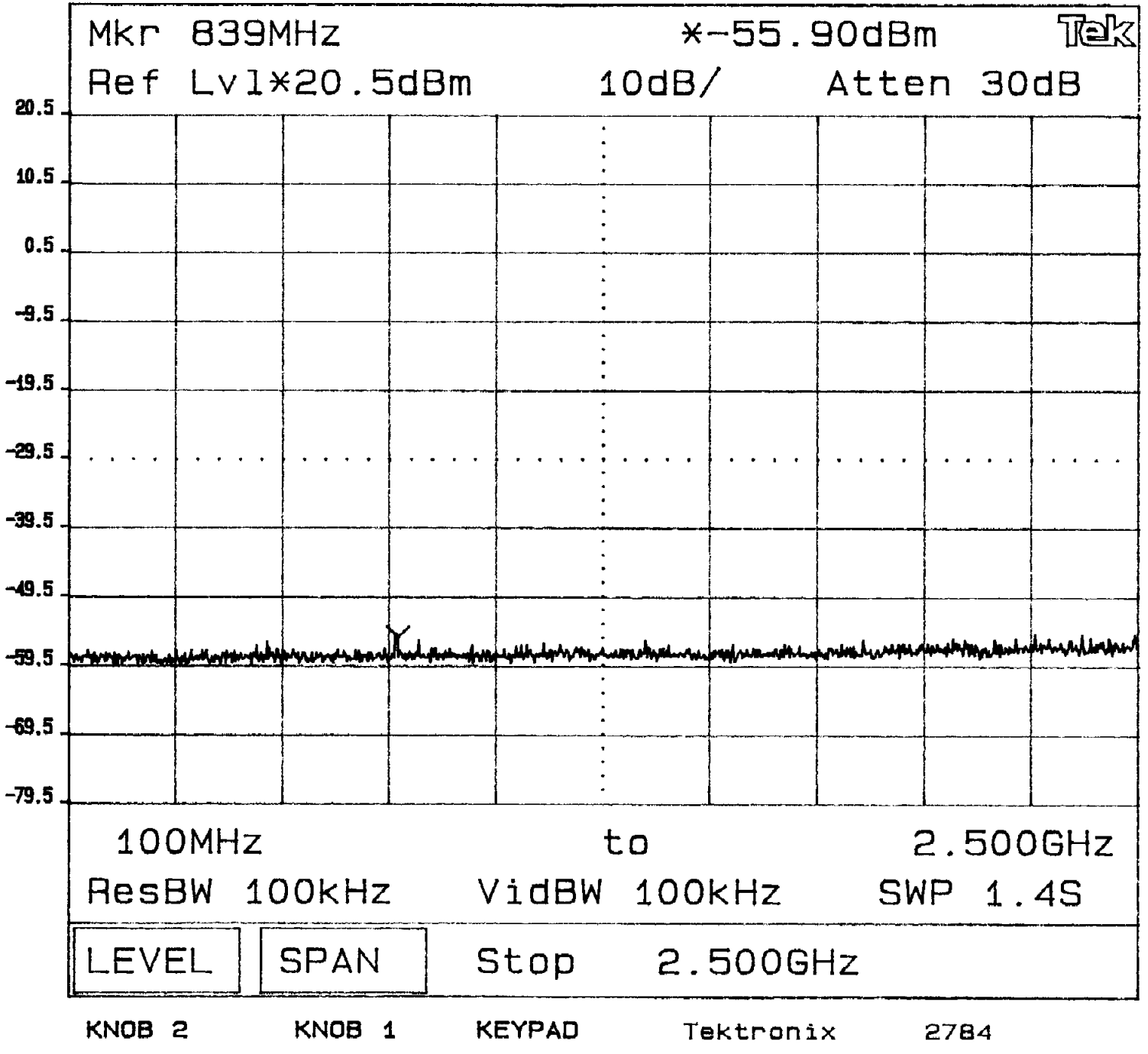
Plot 46.6


Mkr 37.46GHz
*-32.40dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
20.00GHz
to
40.00GHz
ResBW 100kHz
VidBW 100kHz
SWP 11S
LEVEL
SPAN
Stop 40.00GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

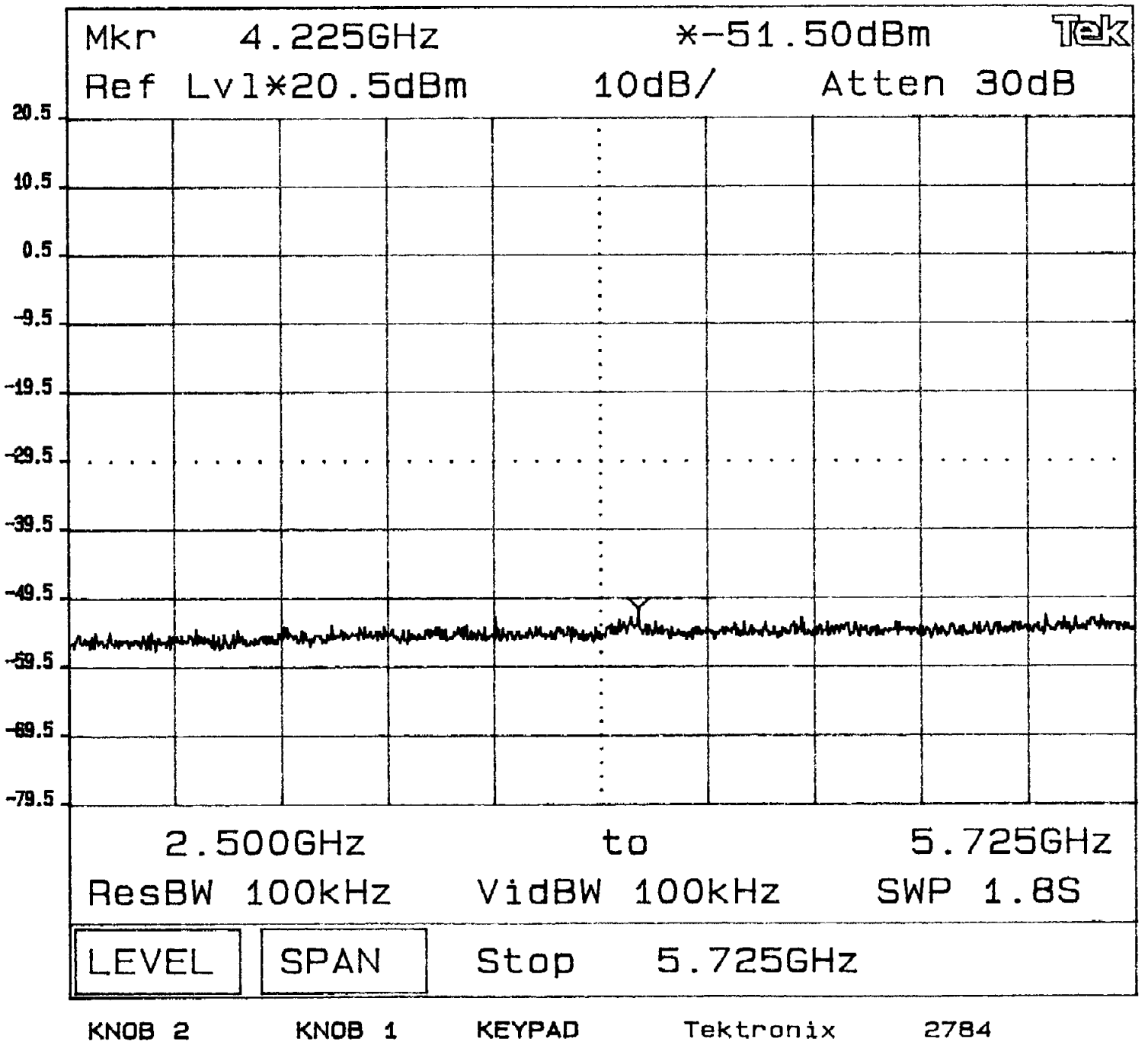
Plot 4c1


Mkr 49.91MHz
*-52.20dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
1.00MHz
to
100.00MHz
ResBW 100kHz
VidBW 100kHz
SWP 56mS
LEVEL
SPAN
Stop 100.00MHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

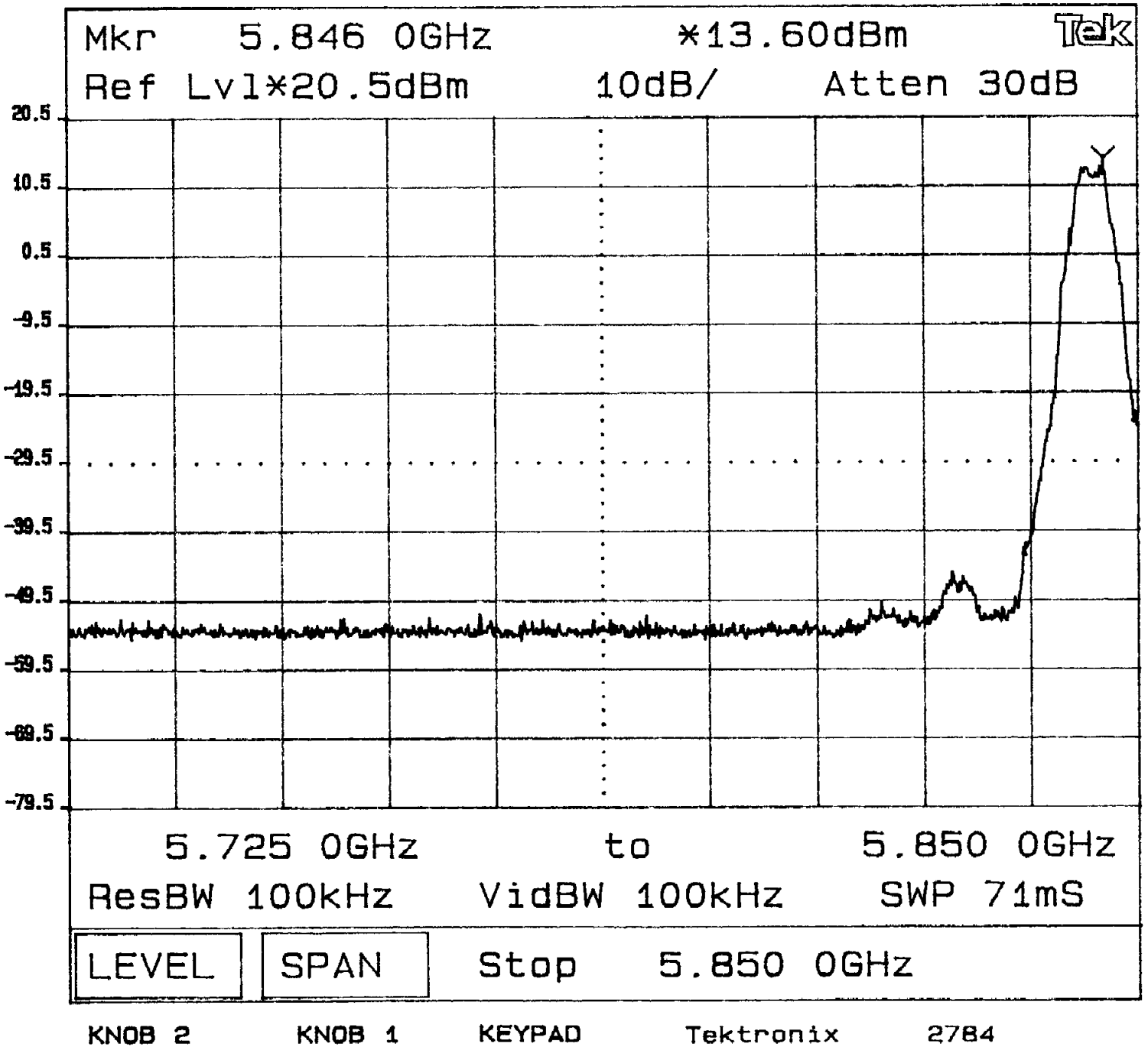
Plot 4c2


Mkr 839MHz
*-55.90dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
100MHz
to
2.500GHz
ResBW 100kHz
VidBW 100kHz
SWP 1.4S
LEVEL
SPAN
Stop 2.500GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

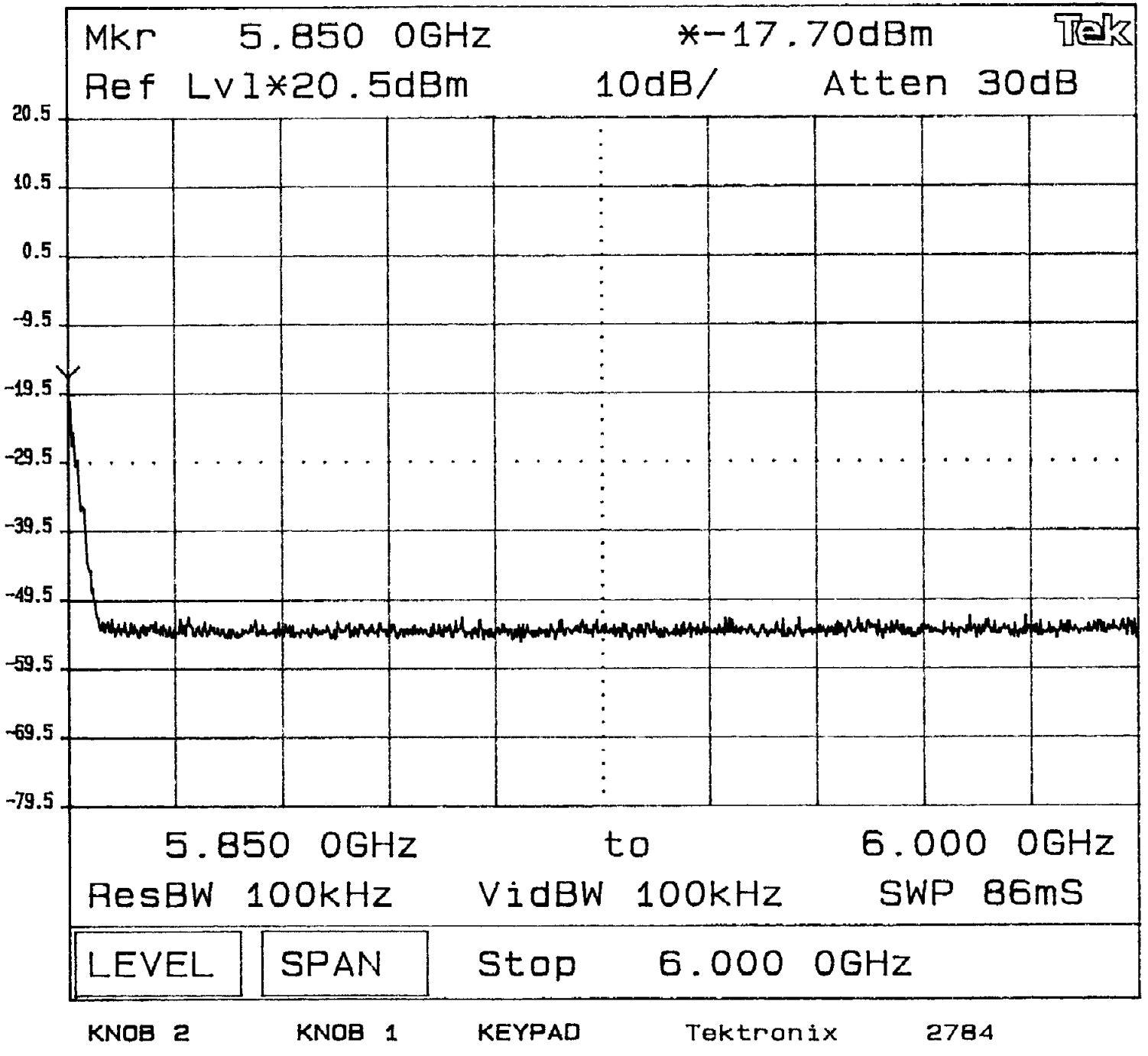
Plot 4c3


Mkr 4.225GHz
*-51.50dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
2.500GHz
to
5.725GHz
ResBW 100kHz
VidBW 100kHz
SWP 1.8S
LEVEL
SPAN
Stop 5.725GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

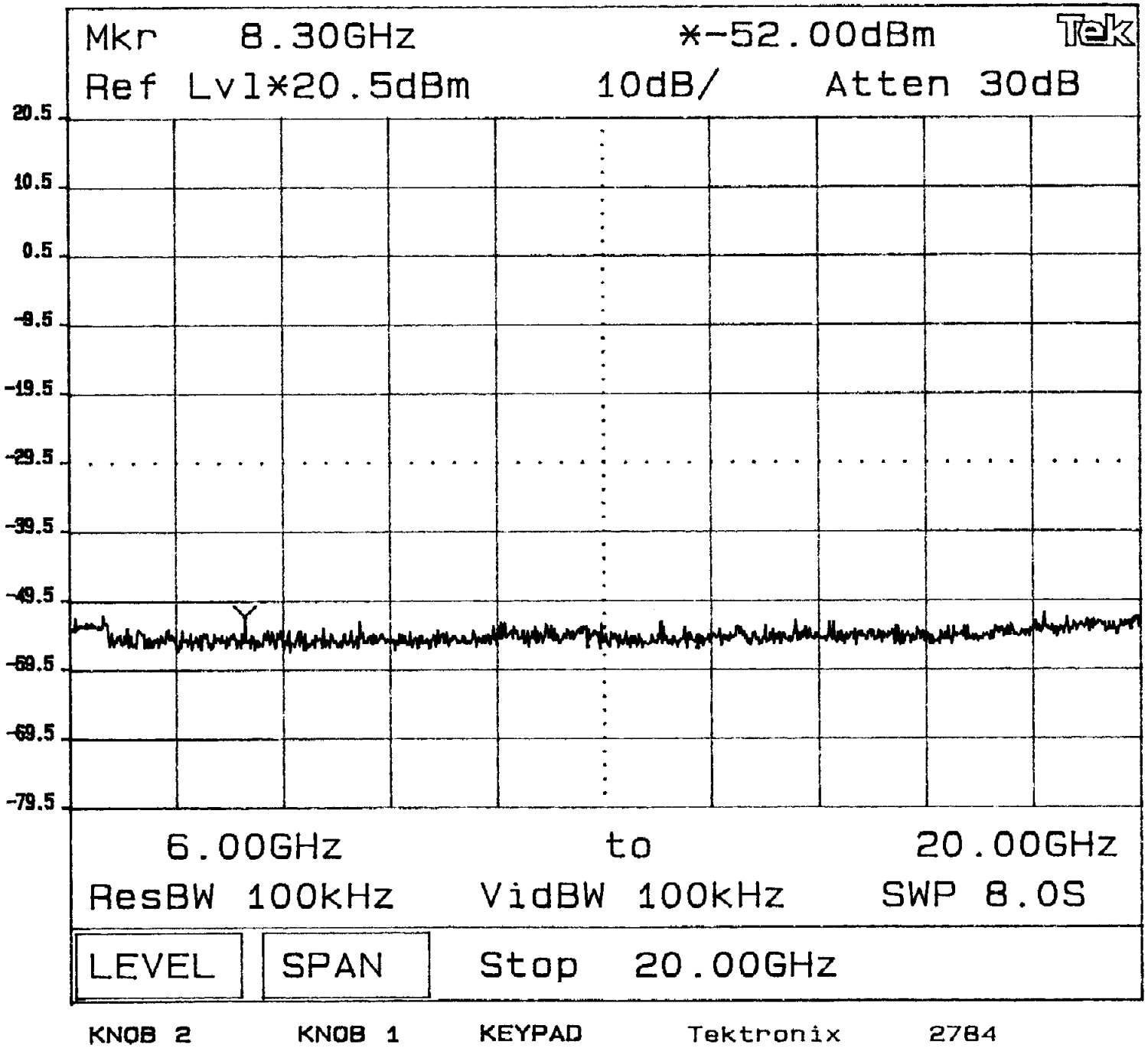
Plot 4 of 4


Mkr 5.846 0GHz
*13.60dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
5.725 0GHz
to
5.850 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 71mS
LEVEL
SPAN
Stop 5.850 0GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

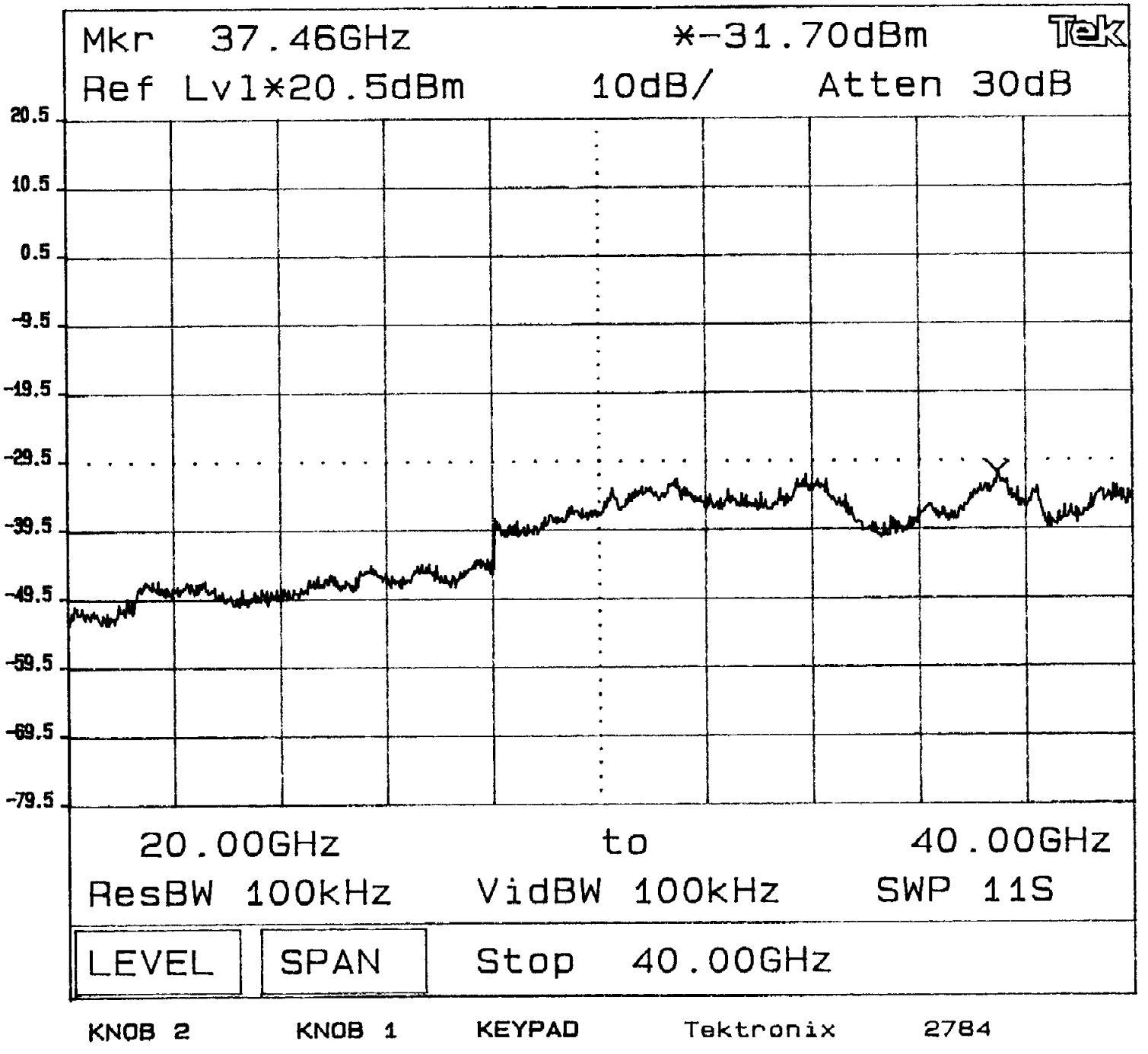
Plot 4c5


Mkr 5.850 0GHz
*-17.70dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
5.850 0GHz
to
6.000 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 86mS
LEVEL
SPAN
Stop 6.000 0GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

Plot 4c6


Mkr 8.30GHz
*-52.00dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
6.00GHz
to
20.00GHz
ResBW 100kHz
VidBW 100kHz
SWP 8.0S
LEVEL
SPAN
Stop 20.00GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

Plot 4c7


Mkr 37.46GHz
*-31.70dBm
Tek
Ref Lvl*20.5dBm
10dB/
Atten 30dB
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
-79.5
20.00GHz
to
40.00GHz
ResBW 100kHz
VidBW 100kHz
SWP 11S
LEVEL
SPAN
Stop 40.00GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

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

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

Radiated emission measurements were performed from 30 MHz to 40 GHz. 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 or quasi-peak detection below 1 GHz and with peak and average detection above 1 GHz.

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

ITS Intertek Testing Services

Job No.: J99026235
Company: Glenayre Western Multiplex
Model: "2E1"
Test Mode: Tx @ Low Channel 5730.2 MHz
Engineer: Ollie Moyrong
Date: October_15_1999

FCC Part 15.247 Radiated Emissions

Frequency (MHz)	Spec. Analyz. Detector	Antenna Location (m)	Antenna Polariz. (H/V)	Reading (dBuV)	Antenna Factor (dB/m)	Preamp (dB)	Correction Factor (dB)	Cable Loss (dB)	Duty Cycle (dB)	Corrected Reading (dBuV/m)	Limit At 3 m (dBuV/m)	Margin (dB)
11460.4	A	3.0	V	18.0	42.1	-33.0	0.0	10.1	0.0	37.2	54.0	-16.8
11460.4	P	3.0	V	28.5	42.1	-33.0	0.0	10.1	0.0	47.7	74.0	-26.3
22920.8	A	1.0	H	24.9	44.0	-24.0	-9.5	9.5	0.0	44.9	54.0	-9.1
22920.8	P	1.0	H	37.3	44.0	-24.0	-9.5	9.5	0.0	57.3	74.0	-16.7

Notes: Negative signs (-) in the Margin column signify levels below the limit.

ITS Intertek Testing Services

Job No.: J99026235
Company: Glenayre Western Multiplex
Model: "2E1"
Test Mode: Tx @ Mid Channel 5760.2 MHz
Engineer: Ollie Moyrong
Date: October_15_1999

FCC Part 15.247 Radiated Emissions

Frequency (MHz)	Spec. Analyz. Detector	Antenna Location (m)	Antenna Polariz. (H/V)	Reading (dBuV)	Antenna Factor (dB/m)	Preamp (dB)	Correction Factor (dB)	Cable Loss (dB)	Duty Cycle (dB)	Corrected Reading (dBuV/m)	Limit At 3 m (dBuV/m)	Margin (dB)
11520.4	A	3.0	V	17.7	42.1	-33.0	0.0	10.1	0.0	36.9	54.0	-17.1
11520.4	P	3.0	V	27.8	42.1	-33.0	0.0	10.1	0.0	47.0	74.0	-27.0
23040.8	A	1.0	H	25.2	44.0	-24.0	-9.5	9.5	0.0	45.2	54.0	-8.8
23040.8	P	1.0	H	36.9	44.0	-24.0	-9.5	9.5	0.0	56.9	74.0	-17.1

Notes: Negative signs (-) in the Margin column signify levels below the limit.

ITS Intertek Testing Services

Job No.: J99026235
Company: Glenayre Western Multiplex
Model: "2E1"
Test Mode: Tx @ High Channel 5845.1 MHz
Engineer: Ollie Moyrong
Date: October_15_1999

FCC Part 15.247 Radiated Emissions

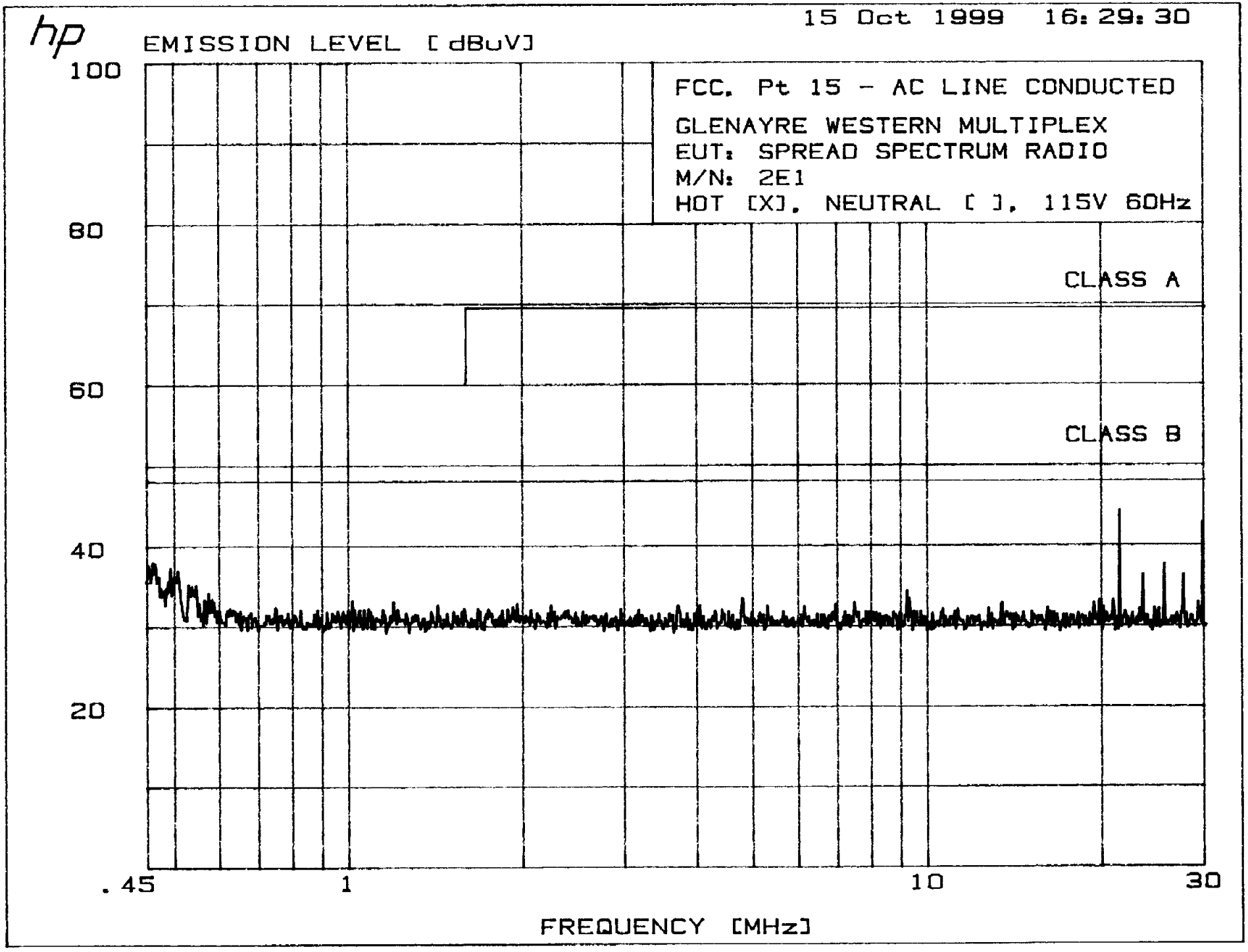
Frequency (MHz)	Spec. Analyz. Detector	Antenna Location (m)	Antenna Polariz. (H/V)	Reading (dBuV)	Antenna Factor (dB/m)	Preamp (dB)	Correction Factor (dB)	Cable Loss (dB)	Duty Cycle (dB)	Corrected Reading (dBuV/m)	Limit At 3 m (dBuV/m)	Margin (dB)
11690.2	A	3.0	V	17.8	42.1	-33.0	0.0	10.1	0.0	37.0	54.0	-17.0
11690.2	P	3.0	V	29.9	42.1	-33.0	0.0	10.1	0.0	49.1	74.0	-24.9

Notes: Negative signs (-) in the Margin column signify levels below the limit.

4.7 AC Line Conducted Emission, FCC Rule 15.207:

[ ] Not required; battery operation only

[X] Test data attached


15 Oct 1999 16:29:30
EMISSION LEVEL [dBuV]
FCC. Pt 15 - AC LINE CONDUCTED
GLENAYRE WESTERN MULTIPLEX
EUT: SPREAD SPECTRUM RADIO
M/N: 2E1
HOT [X], NEUTRAL [ ], 115V 60Hz
CLASS A
CLASS B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

15 Oct 1998 16:28:30

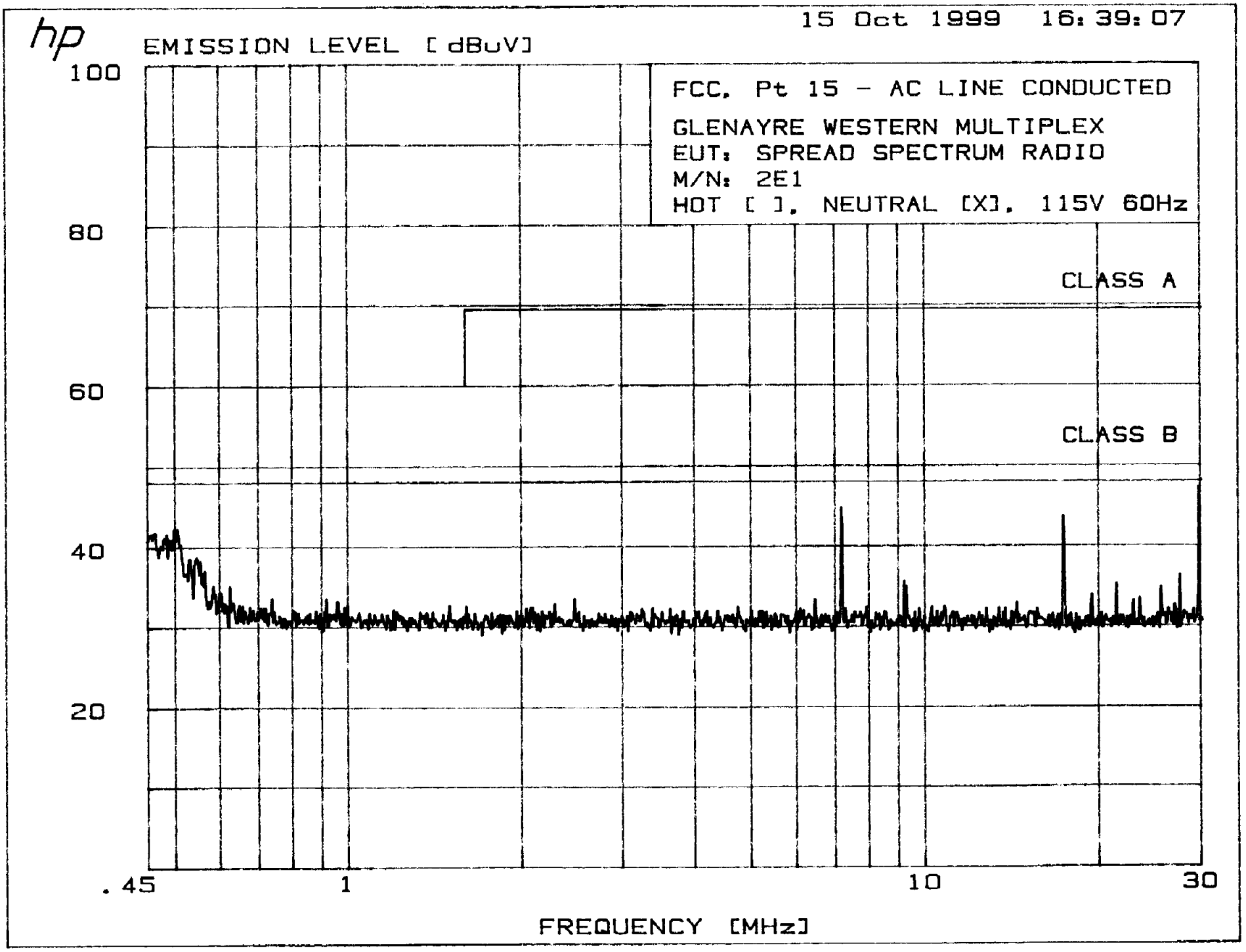
3. FCC CFR 47, Pt 15

3.1 FCC, Pt 15 - AC LINE CONDUCTED

GLENAYRE WESTERN MULTIPLEX
EUT: SPREAD SPECTRUM RADIO
M/N: 2E1
HOT [X], NEUTRAL [ ], 115V 60Hz

PEAKS FOUND ABOVE 35 dBuV

PEAK#	FREQ (MHz)	AMPL(dBuV)
1	.4958	37.3
2	.5104	37.0
3	.5322	35.3
4	21.45	44.4
5	23.52	35.4
6	25.58	37.7
7	27.59	36.4
8	29.75	42.9


15 Oct 1999 16:39:07
EMISSION LEVEL [dBuV]
100
80
60
40
20
FCC. Pt 15 - AC LINE CONDUCTED
GLENAYRE WESTERN MULTIPLEX
EUT: SPREAD SPECTRUM RADIO
M/N: 2E1
HOT [ ], NEUTRAL [X], 115V 60Hz
CLASS A
CLASS B
.45
1
10
30
FREQUENCY [MHz]

15 Oct 1998 15:39:07

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

GLENAYRE WESTERN MULTIPLEX
EUT: SPREAD SPECTRUM RADIO
M/N: 2E1
HOT [ ], NEUTRAL [X], 115V 60Hz

PEAKS FOUND ABOVE 35 dBuV

PEAK#	FREQ (MHz)	AMPL(dBuV)
1	.5082	42.3
2	.5481	38.7
3	.6268	35.1
4	7.174	44.8
5	9.228	39.7
6	9.305	35.0
7	17.39	43.7
8	21.45	35.3
9	27.69	36.4
10	29.75	47.3

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.

ITS Intertek Testing Services

Job No.: J99026235
Company: Glenayre Western Multiplex
Model: "2E1"
Test Mode: Tx @ Mid Channel 5760.2 MHz
Engineer: Ollie Moyrong
Date: October_15_1999

FCC Part 15.109 Class B Radiated Emissions

Frequency (MHz)	Antenna Location (m)	Antenna Polariz. (H/V)	Reading (dBuV)	Antenna Factor (dB/m)	Preamp (dB)	Correction Factor (dB)	Cable Loss (dB)	Corrected Reading (dBuV/m)	Limit At 3 m (dBuV/m)	Margin (dB)
40.0	3.0	V	48.2	7.8	-28.2	0.0	0.7	28.5	40.0	-11.5
50.0	3.0	V	46.7	6.0	-28.2	0.0	0.8	25.3	40.0	-14.7
59.0	3.0	V	48.7	4.9	-28.2	0.0	0.8	26.2	40.0	-13.8
65.5	3.0	H	43.9	6.4	-28.2	0.0	0.8	22.9	40.0	-17.1
73.7	3.0	V	49.0	6.5	-28.2	0.0	0.8	28.1	40.0	-11.9
80.0	3.0	V	47.2	7.0	-28.2	0.0	0.8	26.8	40.0	-13.2
120.0	3.0	V	46.8	7.4	-28.0	0.0	1.0	27.2	43.5	-16.3
153.1	3.0	V	38.6	11.2	-27.8	0.0	1.2	23.2	43.5	-20.3
163.9	3.0	V	45.8	9.1	-27.8	0.0	1.2	28.3	43.5	-15.2
172.0	3.0	V	47.1	8.9	-27.8	0.0	1.2	29.4	43.5	-14.1
188.4	3.0	V	45.2	9.6	-27.8	0.0	1.3	28.3	43.5	-15.2
196.6	3.0	H	43.7	10.7	-27.8	0.0	1.3	27.9	43.5	-15.6
204.8	3.0	V	46.7	10.8	-27.8	0.0	1.3	31.0	43.5	-12.5
270.4	3.0	H	41.6	12.7	-27.9	0.0	1.6	28.0	46.0	-18.0

Notes: Negative signs (-) in the Margin column signify levels below the limit.
Readings followed by a '*' are Quasi-peak measurements. All other readings are peak measurements.
All other emissions not reported are at least 10 dB below the applicable limits.
Frequency range of investigation is 30 MHz - 1 GHz.

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.

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)

[X] Duty cycle correction was not used.