1.0 Summary of Tests

Glenayre Western Multiplex - MODEL: 31650
FCC ID: HZB-LYNX62

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
RF Antenna Conducted Emission	15.247(c)	Pass
Radiated Emissions in Restricted Bands	15.247(c), 15.209(a)	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

EMC Site Manager: David Chernomordik Date: 6/1/98
David Chernomordik

2.0 General Description

2.1 Product Description

The Glenayre Western Multiplex LYNX.sc2 Model 31650 is a 2.4 GHz spread spectrum radio.

Overview of Glenayre Western Multiplex LYNX.sc2 Model 31650

Applicant	Glenayre Western Multiplex
Trade Name & Model No.	Glenayre Western Multiplex, Model 31650
FCC Identifier	HZB-LYNX62
Use of Product	Point-to-Point Fixed Wireless Interconnect
Manufacturer & Model of Spread Spectrum Module	Glenayre Western Multiplex LYNX.sc2
Type of Transmission	Direct Sequence
Rated RF Output (mW)	190
Frequency Range (MHZ)	2421.0 - 2462.5
Number of Channel(s)	2
Antenna(s) & Gain, dBi	27.7
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 (refer to the letter on the next page).
Manufacturer name & address	Glenayre Western Multiplex 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

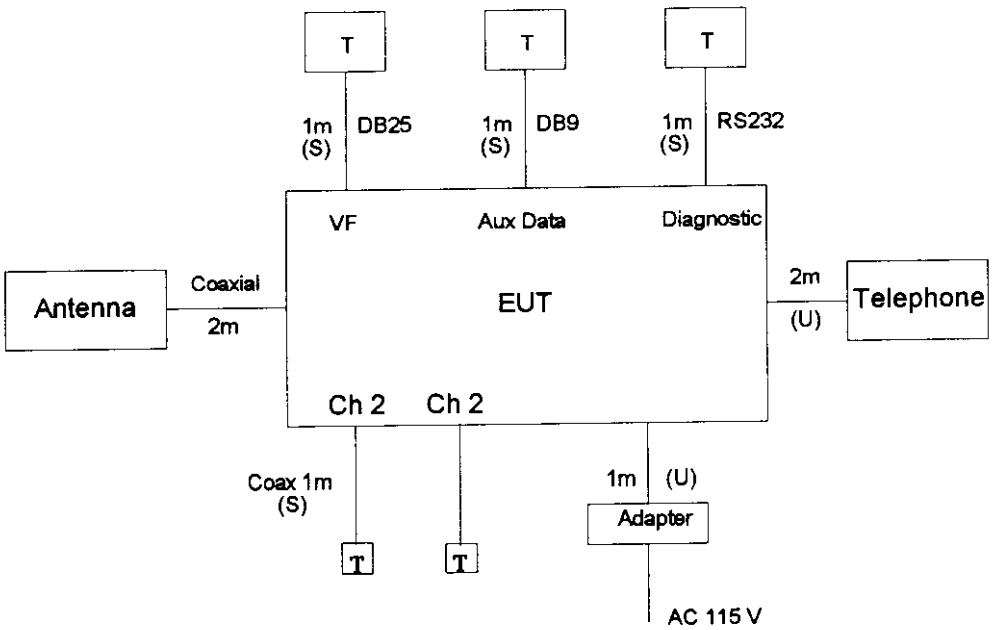
The open area test site and conducted measurement facility used to collect the radiated data is located at Menlo Park, California. This test facility and site measurement data have been fully placed on file with the FCC.

3.0 System Test Configuration

3.1 Support Equipment

1. AC Adapter ZVC65NT24E
2. AT&T Telephone, M/N: 2500DMCTC, S/N: 88104
3. Comset RSI Antenna, M/N: P2448G

3.2 Block Diagram of Test Setup



S = Shielded
U = Unshielded
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.

The signal is maximized through rotation on a turntable. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

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 and receiving T1 test pattern.

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.

4.0 Measurement Results

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

Requirement:

For antennas with gains of 6 dBi or less , maximum allowed transmitter output is 1 watt (+30 dBm).

For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

Procedure:

[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 maximun RES BW and power was read directly in dBm. External attenuation and cable loss were compensated for using the OFFSET function of the analyzer.

Results:

Max. antenna gain = 27.7 dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
2421.0	22.8	189.5
2462.5	22.8	190.0

Cable loss: 0 dB External Attenuation: 0 dB

Cable loss, external attenuation: ☐ included in OFFSET function

EUT maximum output = 30 - (27.7-6)/3 = 22.8 dBm

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

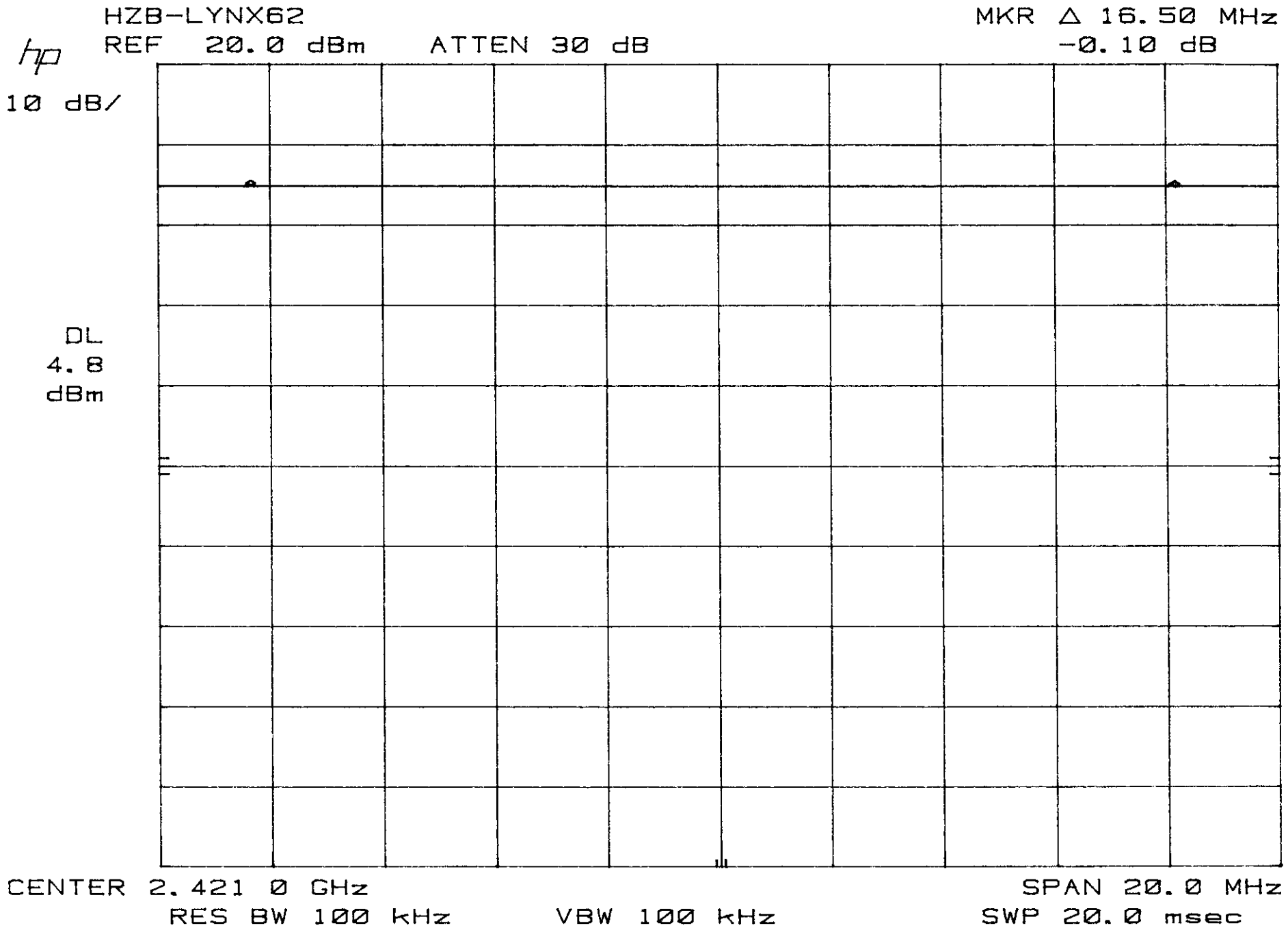
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than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

Frequency (MHz)	Min. 6 dB Bandwidth
2421.0	16.5 MHz

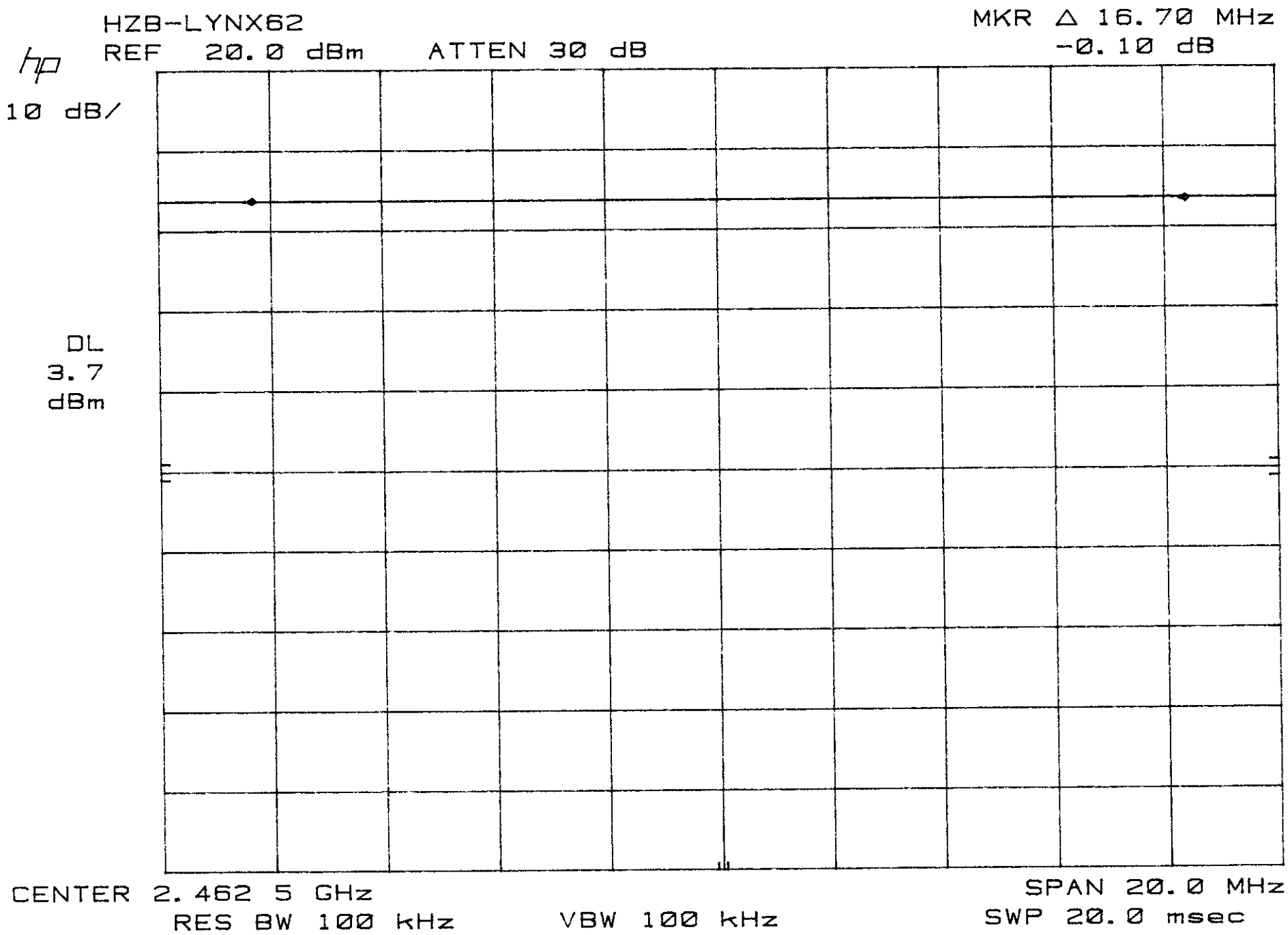
Plots attached:

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

Plot 2a


HZB-LYNX62
MKR Δ 16.50 MHz
REF 20.0 dBm
ATTEN 30 dB
-0.10 dB
hp
10 dB/
DL
4.8
dBm
CENTER 2.421 0 GHz
SPAN 20.0 MHz
RES BW 100 kHz
VBW 100 kHz
SWP 20.0 msec

Plot 2.6


HZB-LYNX62
REF 20.0 dBm
ATTEN 30 dB
MKR Δ 16.70 MHz
-0.10 dB
10 dB/
DL
3.7
dBm
CENTER 2.462 5 GHz
SPAN 20.0 MHz
RES BW 100 kHz
VBW 100 kHz
SWP 20.0 msec

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)
2421.0	-3.6

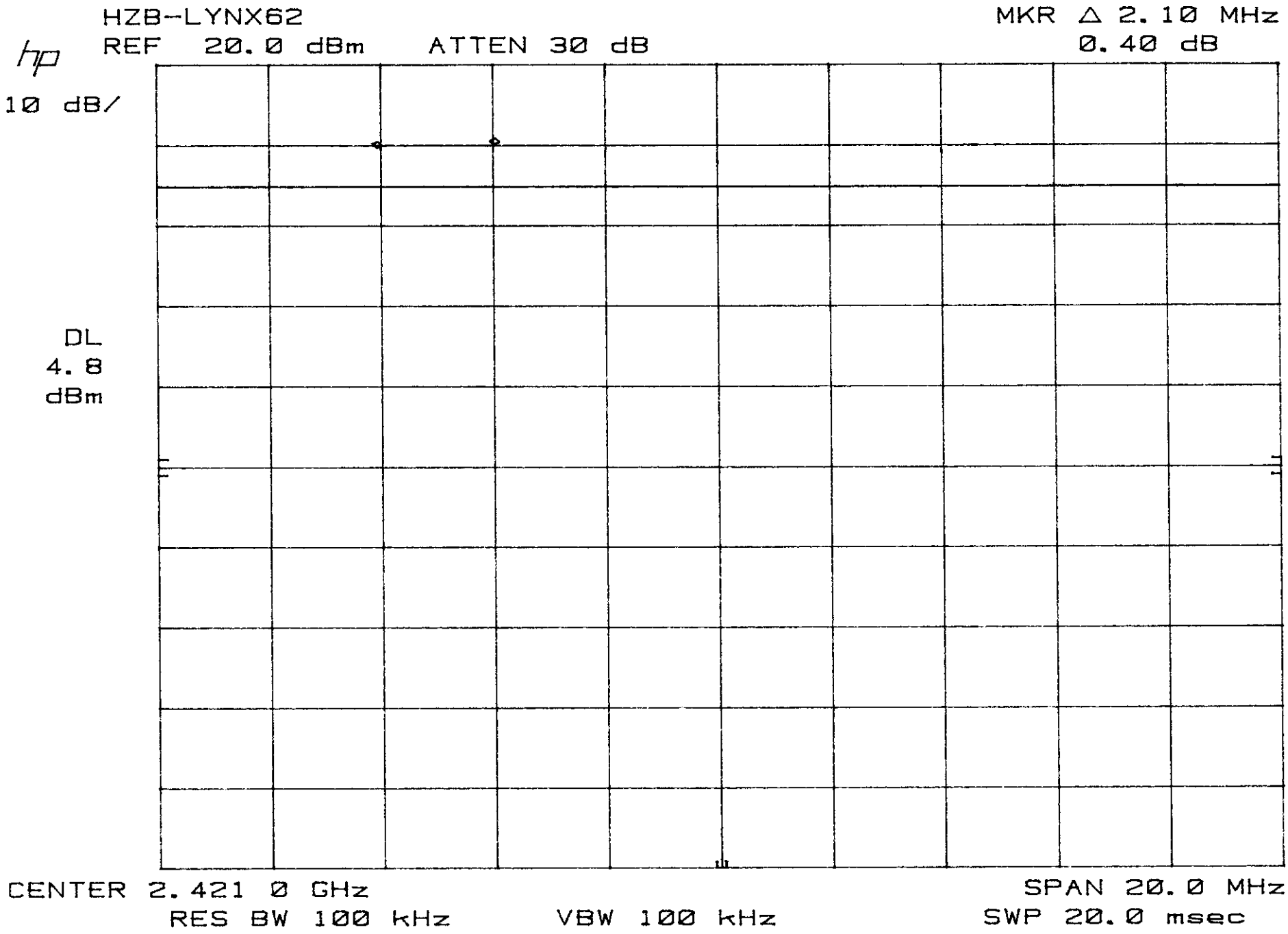
Frequency Span = 2100 kHz

Sweep Time = Frequency Span/3 kHz = 700 seconds

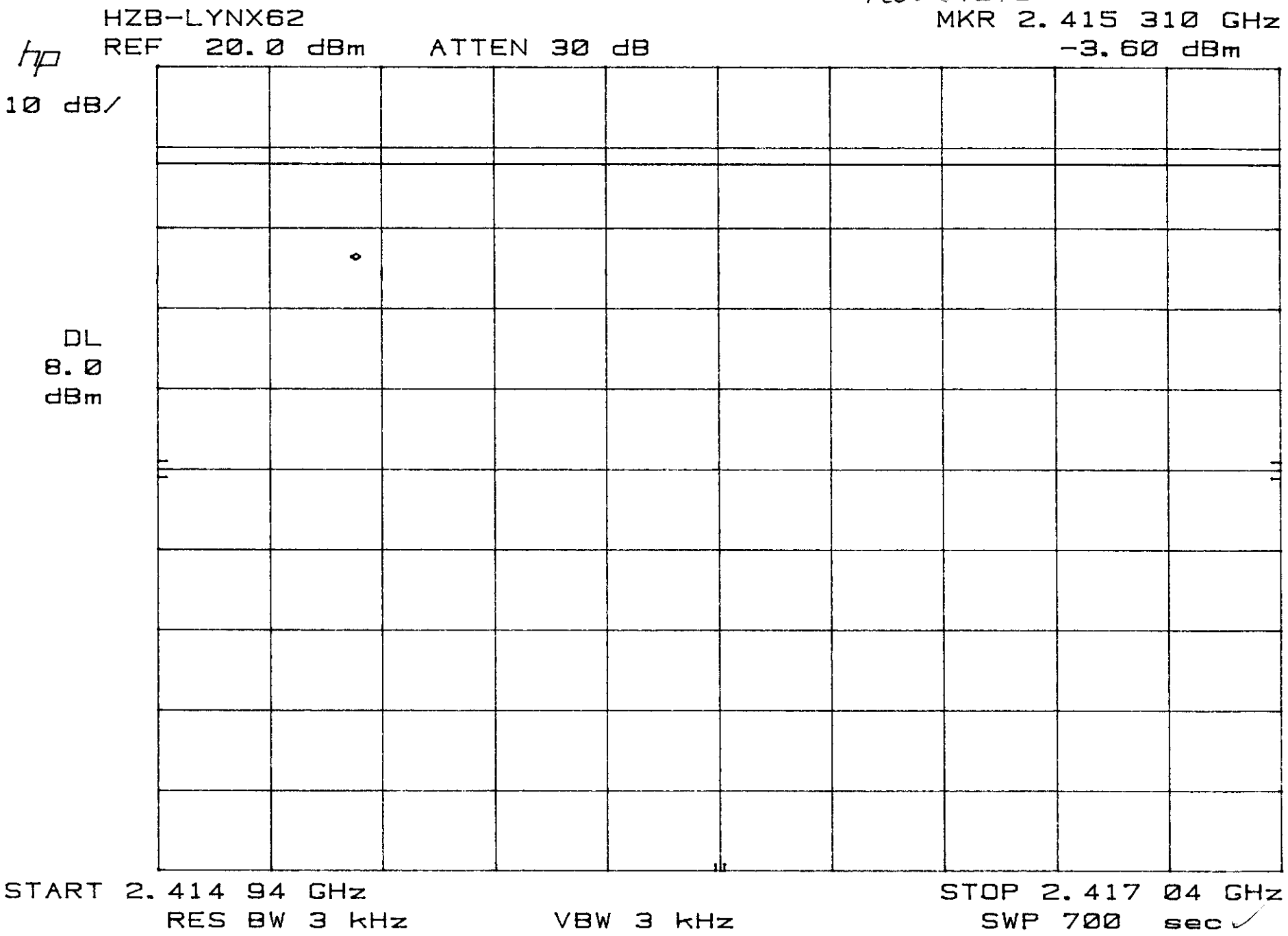
Plots attached:

Plot 3a.1 - 3a.2: Low Channel Power Density
Plot 3b.1 - 3b.2: High Channel Power Density

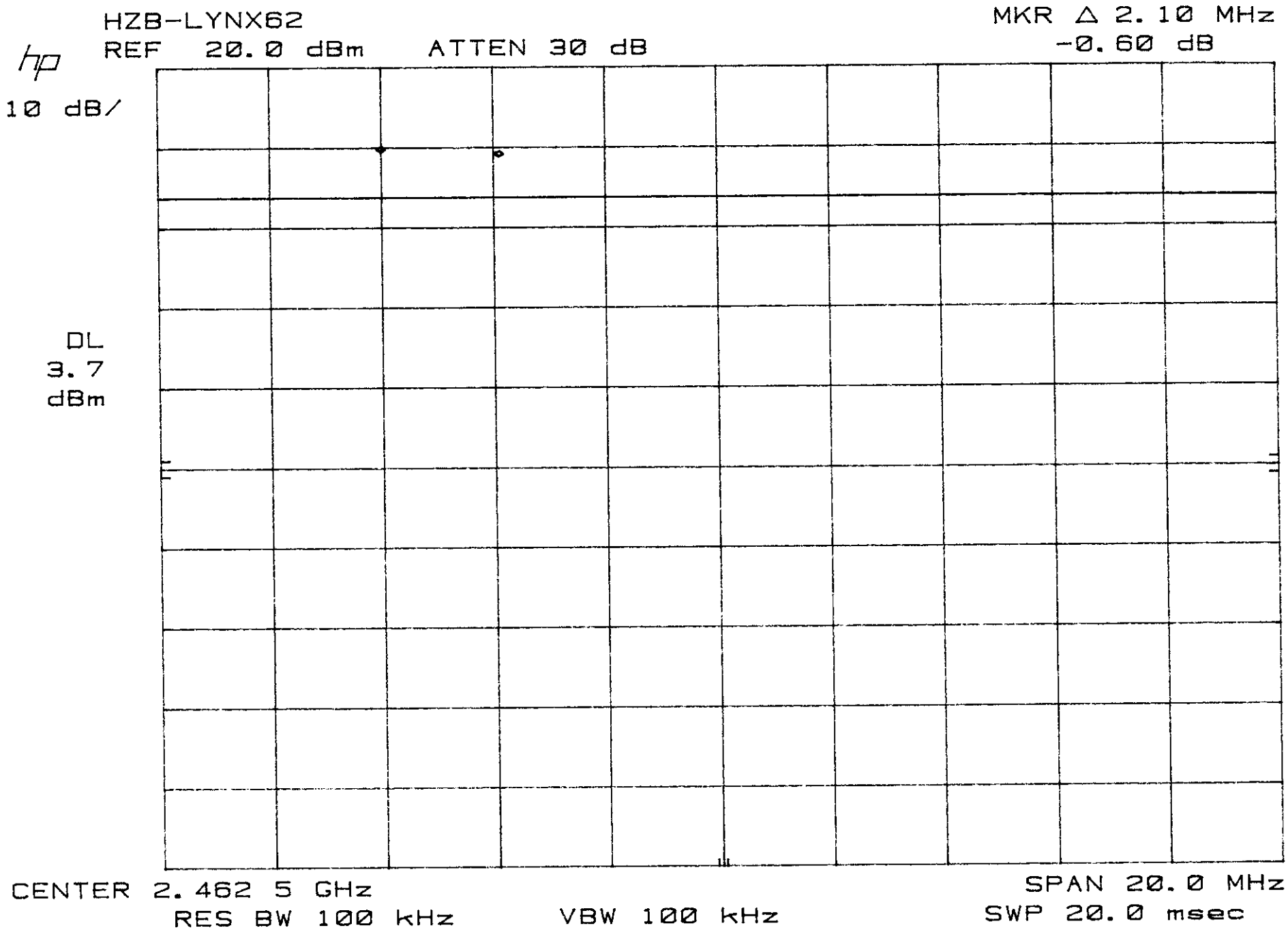
Plot 3.2.1


HZB-LYNX62
REF 20.0 dBm
ATTEN 30 dB
MKR Δ 2.10 MHz
0.40 dB
10 dB/
DL
4.8
dBm
CENTER 2.421 0 GHz
SPAN 20.0 MHz
RES BW 100 kHz
VBW 100 kHz
SWP 20.0 msec

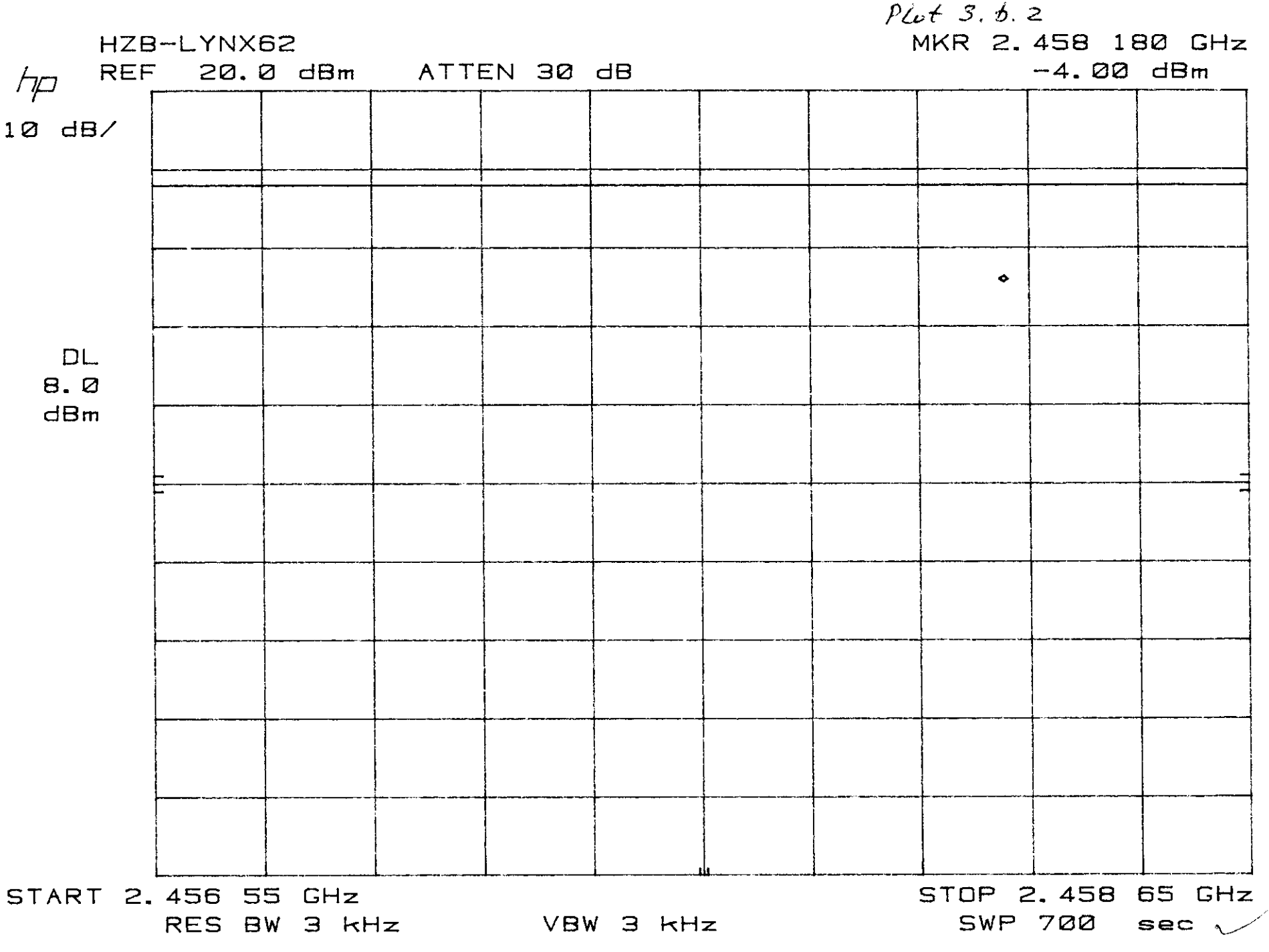
Plot 3.2.2


HZB-LYNX62
REF 20.0 dBm
ATTEN 30 dB
MKR 2.415 310 GHz
-3.60 dBm
10 dB/
DL
8.0
dBm
START 2.414 94 GHz
RES BW 3 kHz
VBW 3 kHz
STOP 2.417 04 GHz
SWP 700 sec

Plot 3.6.1


HZB-LYNX62
REF 20.0 dBm
ATTEN 30 dB
MKR Δ 2.10 MHz
-0.60 dB
10 dB/
DL
3.7
dBm
CENTER 2.462 5 GHz
RES BW 100 kHz
VBW 100 kHz
SPAN 20.0 MHz
SWP 20.0 msec

Plot 3.6.2


HZB-LYNX62
MKR 2.458 180 GHz
REF 20.0 dBm
ATTEN 30 dB
-4.00 dBm
10 dB/
DL
8.0
dBm
START 2.456 55 GHz
STOP 2.458 65 GHz
RES BW 3 kHz
VBW 3 kHz
SWP 700 sec

4.4 RF Antenna Conducted Emissions, FCC Rule 15.247(c):

Requirement:

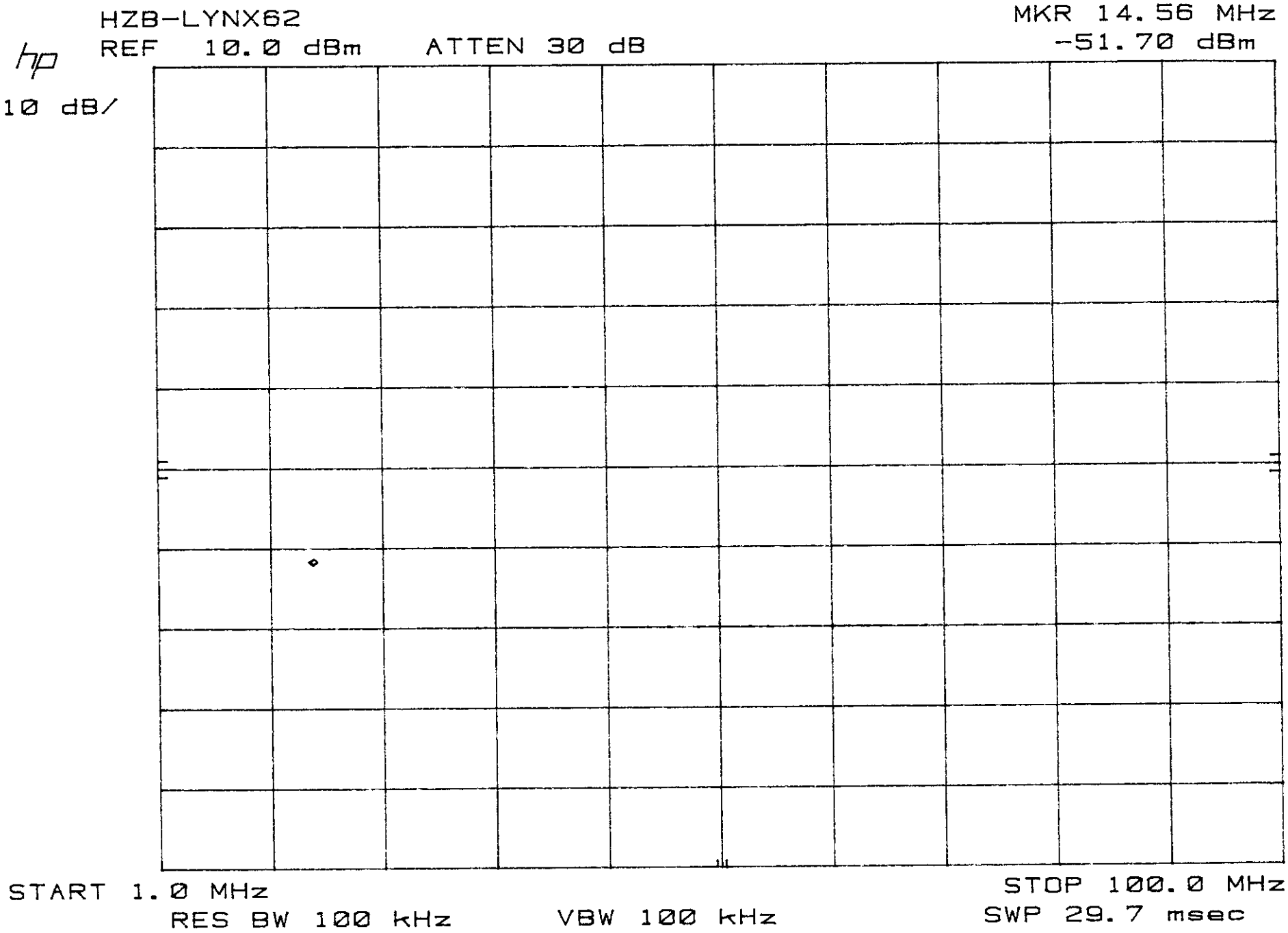
In any 100 kHz bandwidth outside the EUT passband, the RF power shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

Test Result

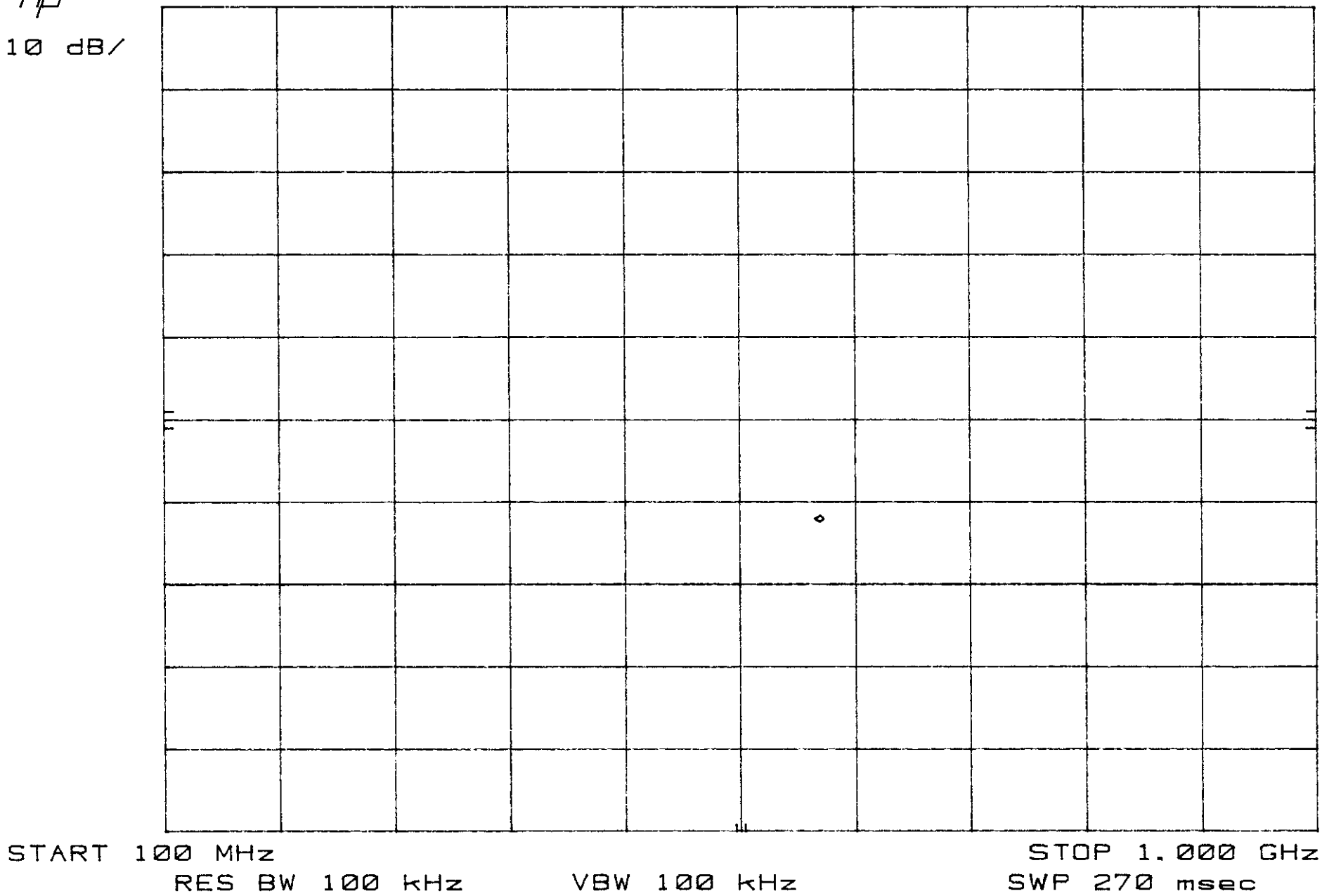
Refer to the following plots for the antenna conducted emissions data:

Plot 4a.1 - 4a.6: Low Channel Emissions
Plot 4b.1 - 4b.4: High Channel Emissions

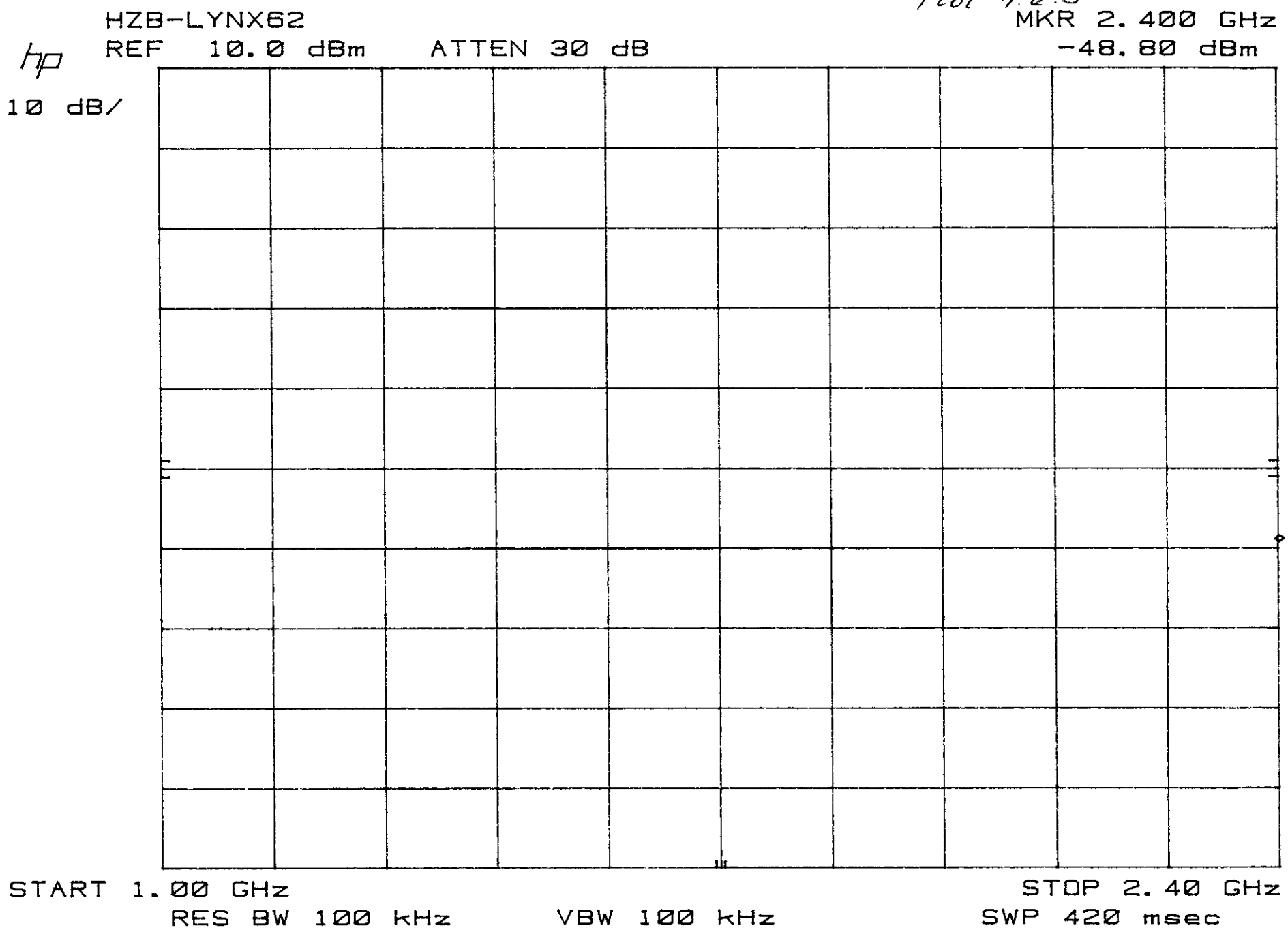
Plot 4.2.1


HZB-LYNX62
REF 10.0 dBm
ATTEN 30 dB
MKR 14.56 MHz
-51.70 dBm
10 dB/
START 1.0 MHz
RES BW 100 kHz
VBW 100 kHz
STOP 100.0 MHz
SWP 29.7 msec

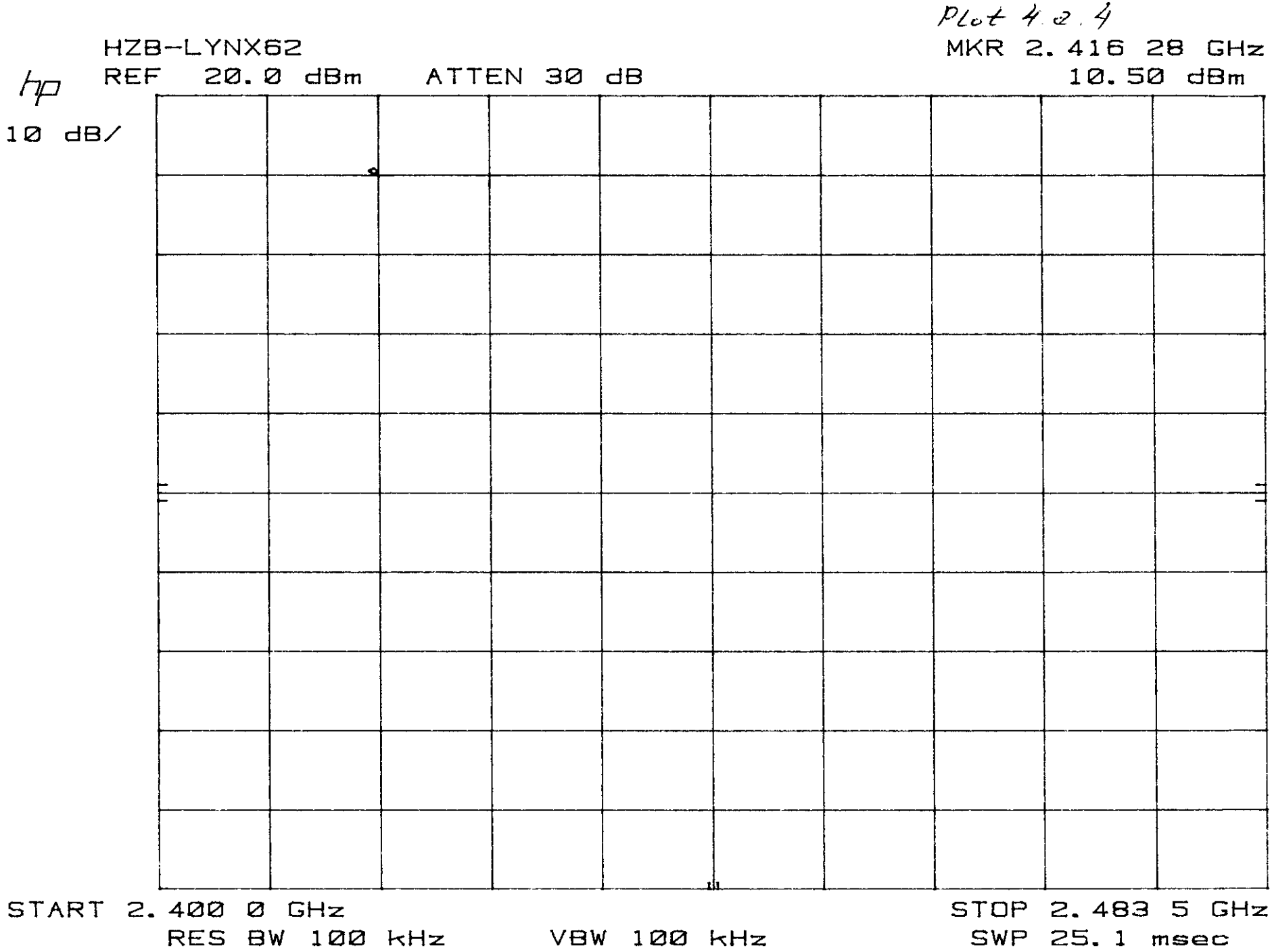
Plot 4.2.2


HZB-LYNX62
REF 10.0 dBm
ATTEN 30 dB
MKR 611.2 MHz
-52.00 dBm
10 dB/
START 100 MHz
RES BW 100 kHz
VBW 100 kHz
STOP 1.000 GHz
SWP 270 msec

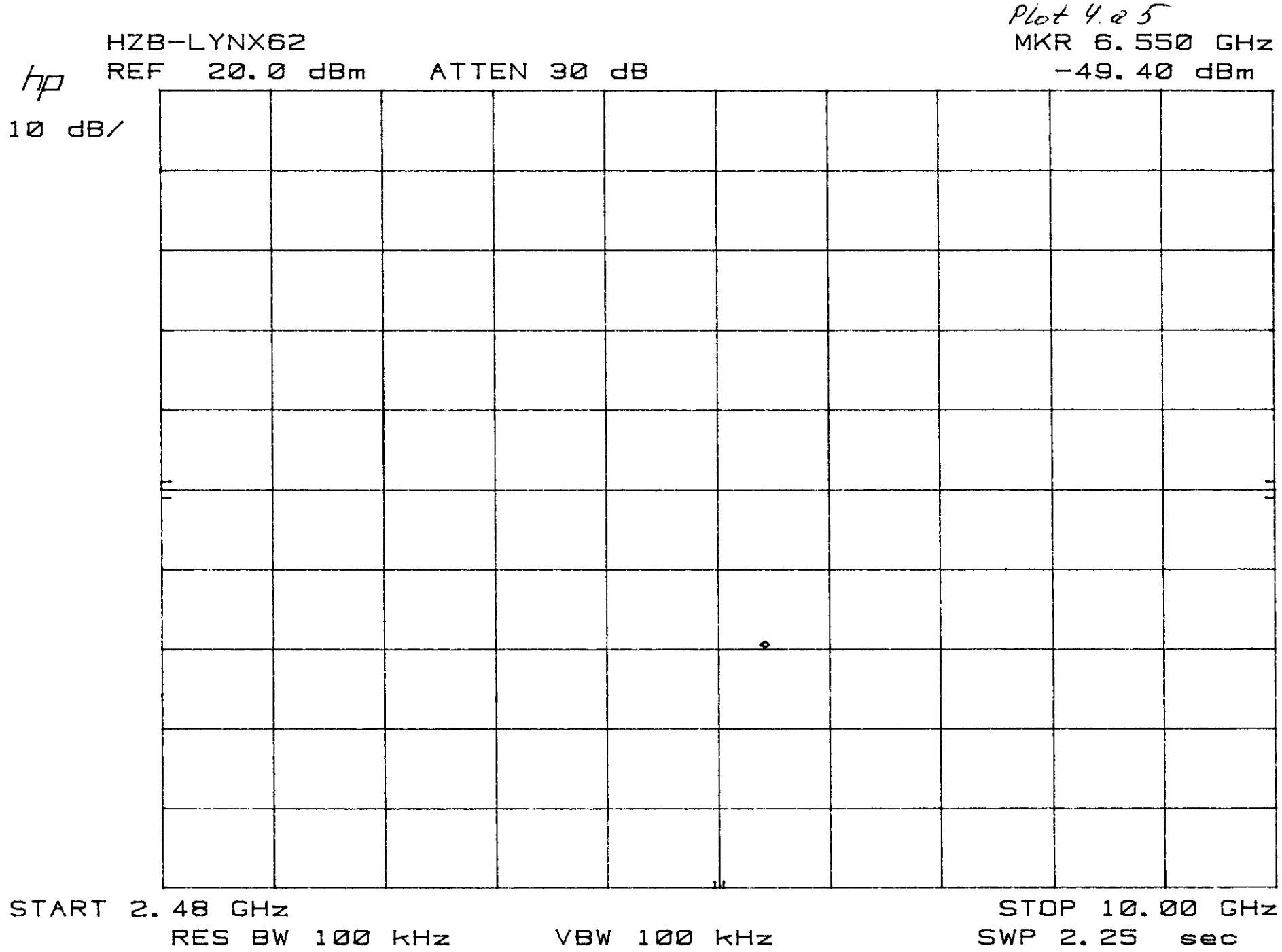
Plot 4.2.3


HZB-LYNX62
REF 10.0 dBm
ATTEN 30 dB
MKR 2.400 GHz
-48.80 dBm
10 dB/
START 1.00 GHz
STOP 2.40 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 420 msec

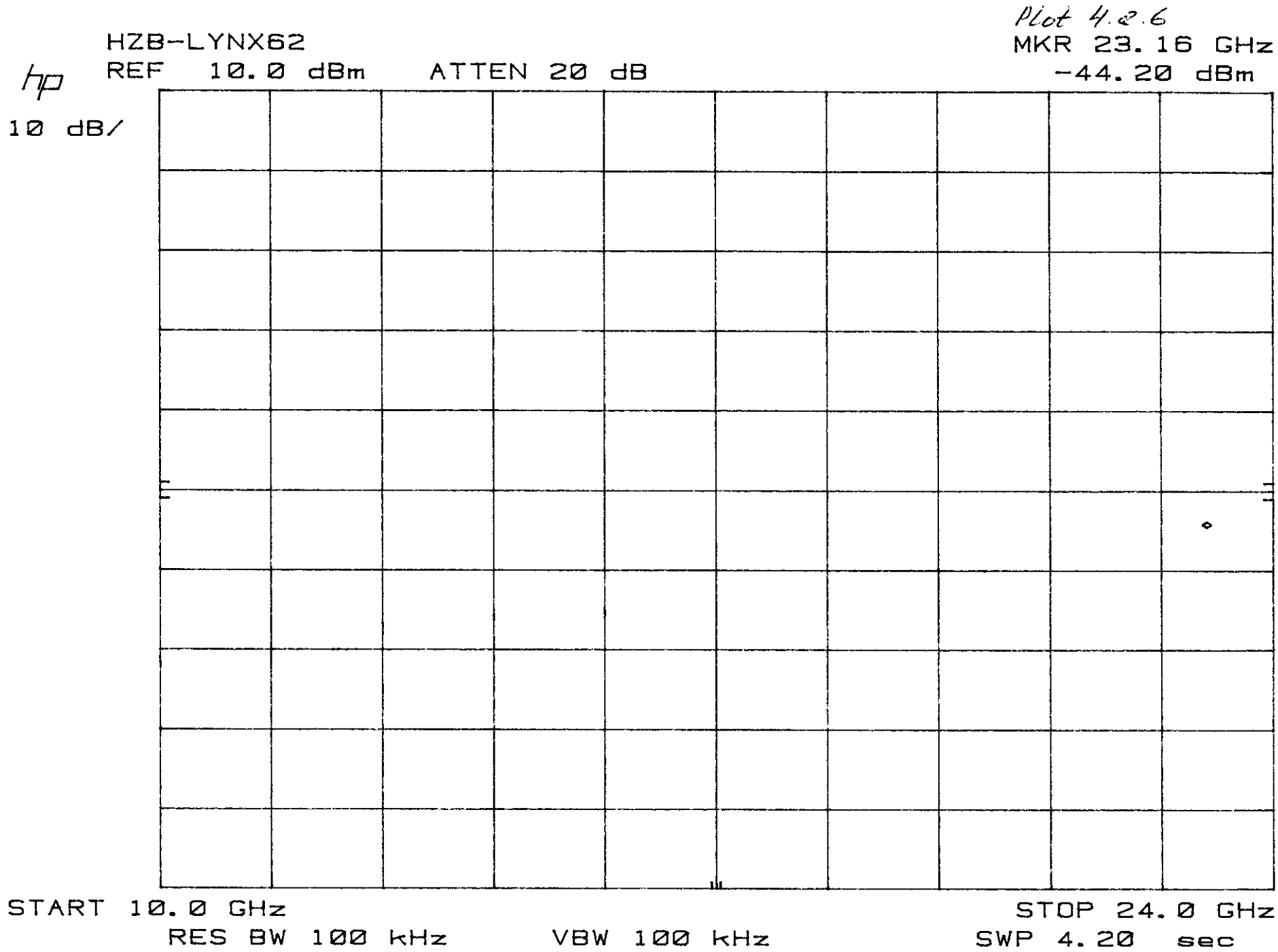
Plot 4.2.4


HZB-LYNX62
MKR 2.416 28 GHz
REF 20.0 dBm
ATTEN 30 dB
10.50 dBm
10 dB/
START 2.400 0 GHz
STOP 2.483 5 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 25.1 msec

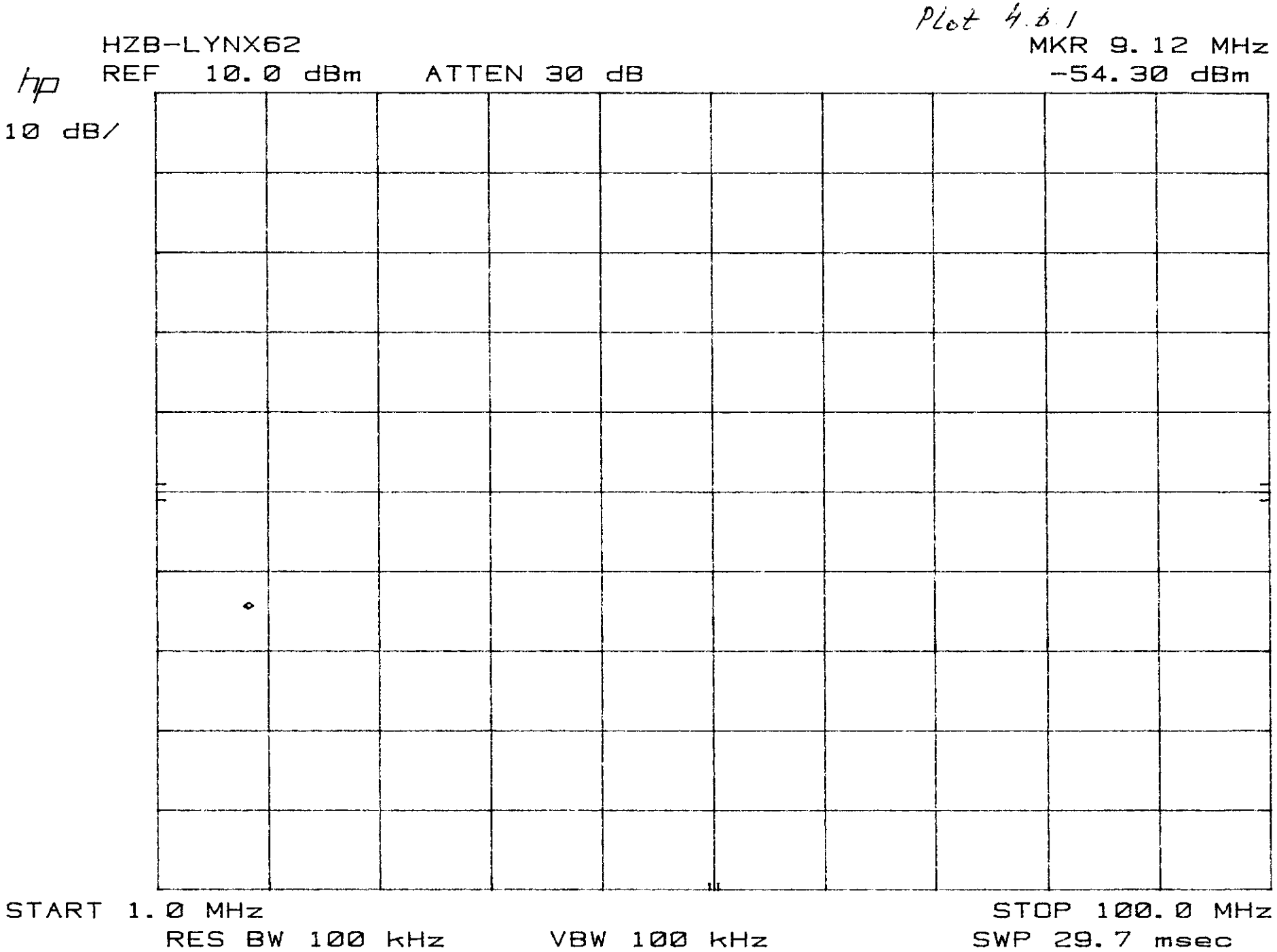
Plot 4 of 5


HZB-LYNX62
REF 20.0 dBm
ATTEN 30 dB
MKR 6.550 GHz
-49.40 dBm
10 dB/
START 2.48 GHz
STOP 10.00 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 2.25 sec

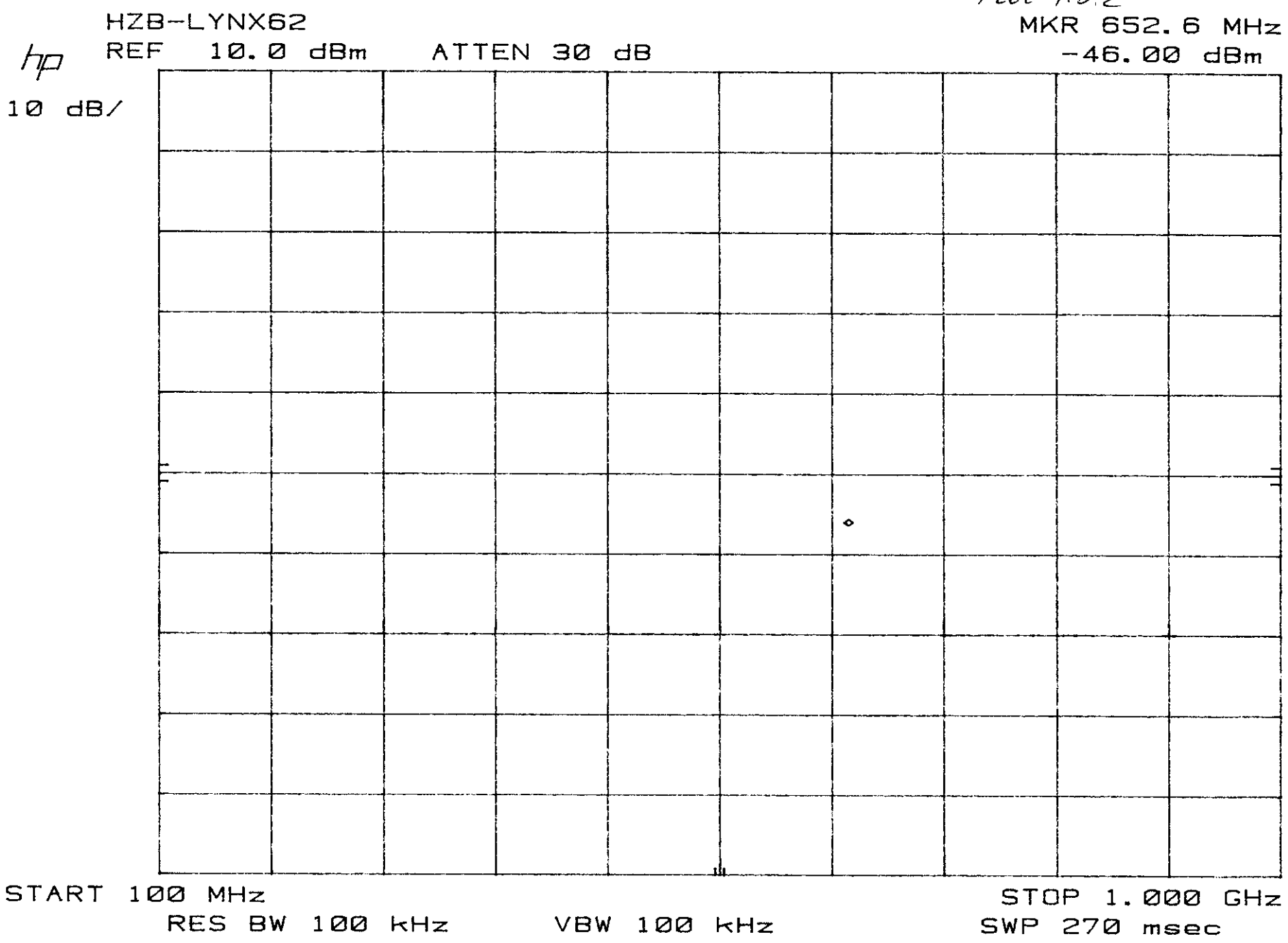
Plot 4.2.6


HZB-LYNX62
REF 10.0 dBm
ATTEN 20 dB
MKR 23.16 GHz
-44.20 dBm
10 dB/
START 10.0 GHz
STOP 24.0 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 4.20 sec

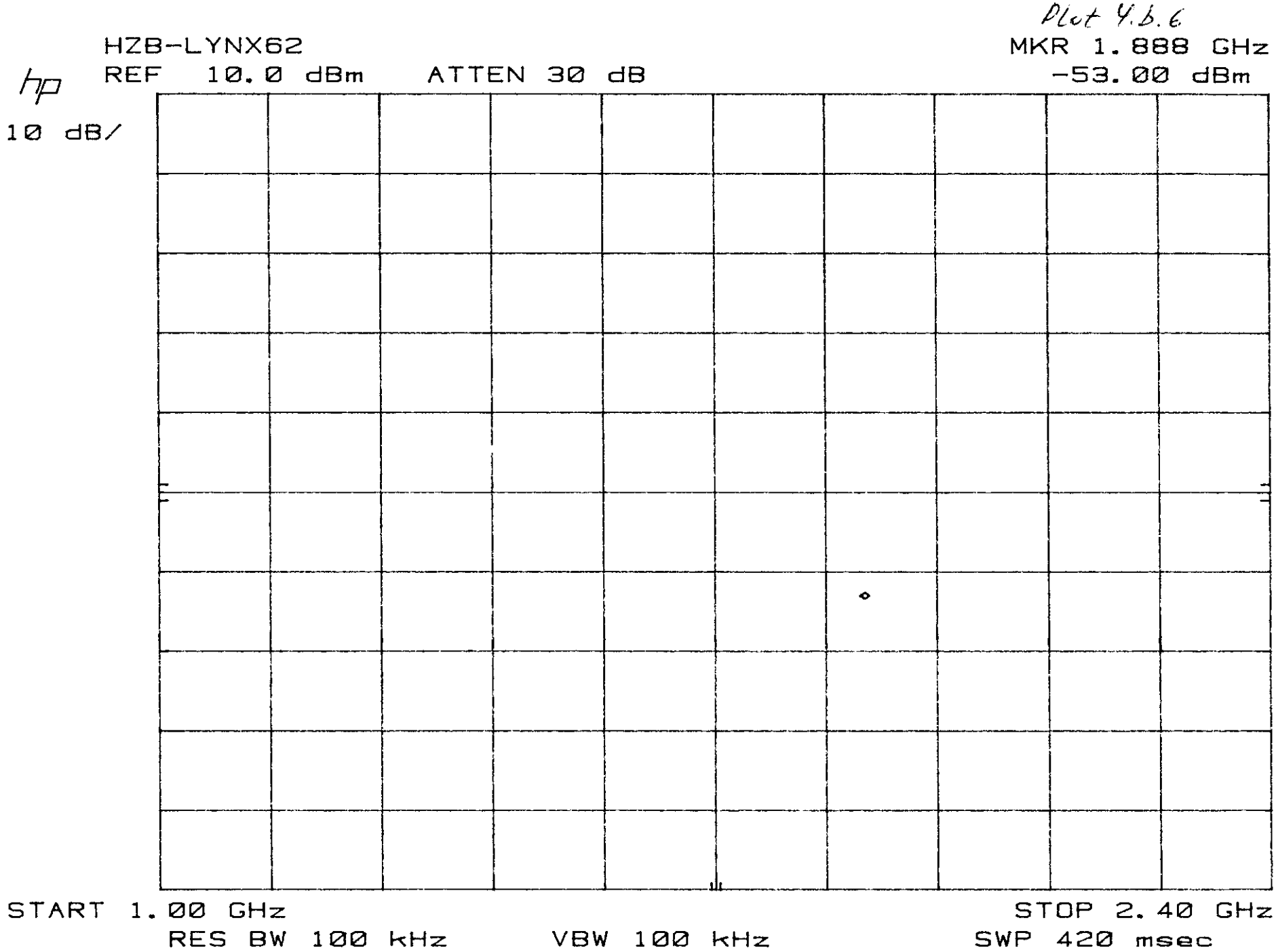
Plot 4.6.1


HZB-LYNX62
REF 10.0 dBm
ATTEN 30 dB
MKR 9.12 MHz
-54.30 dBm
10 dB/
START 1.0 MHz
STOP 100.0 MHz
RES BW 100 kHz
VBW 100 kHz
SWP 29.7 msec

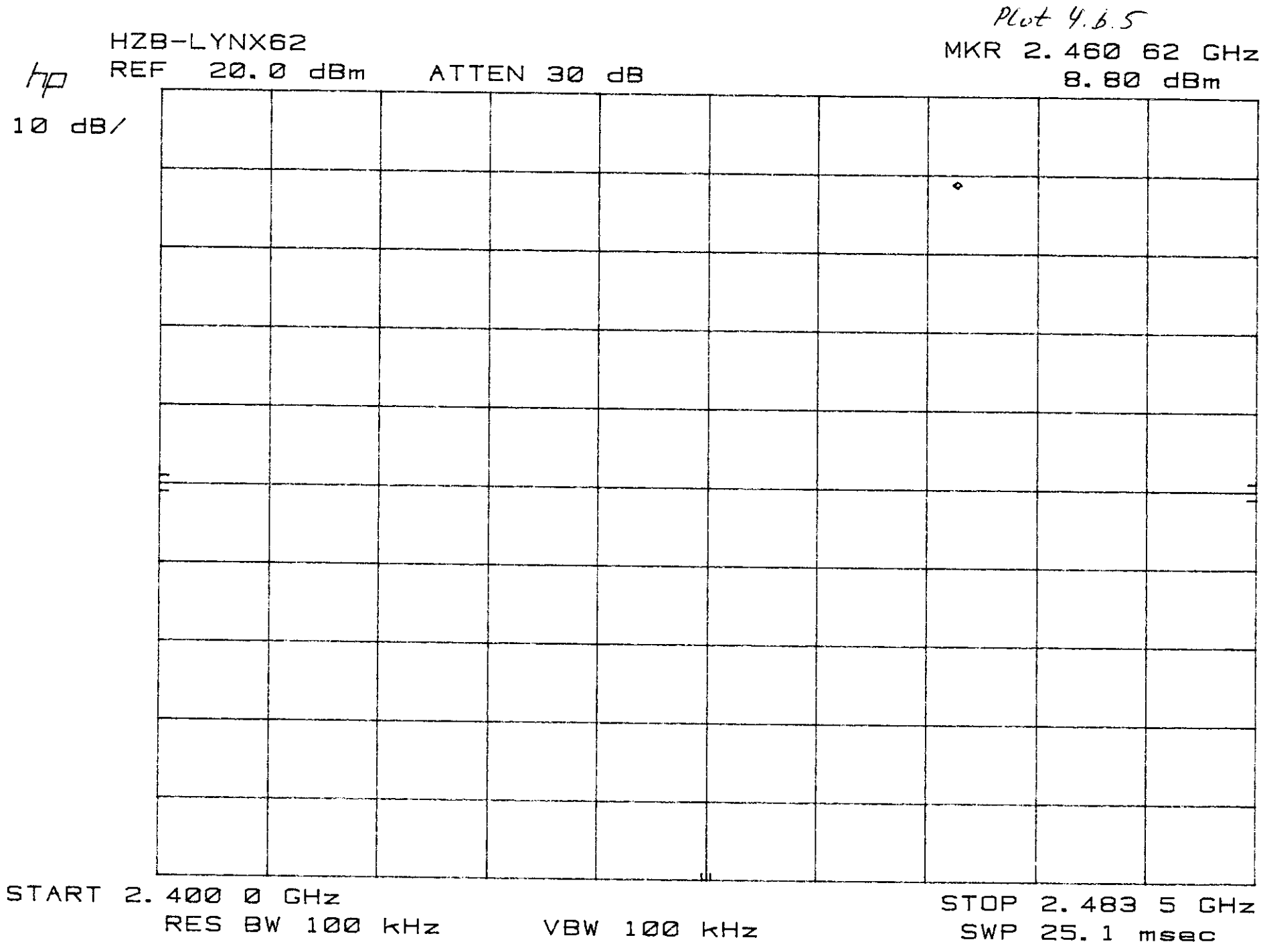
Plot 4.6.2


HZB-LYNX62
REF 10.0 dBm
ATTEN 30 dB
MKR 652.6 MHz
-46.00 dBm
10 dB/
START 100 MHz
RES BW 100 kHz
VBW 100 kHz
STOP 1.000 GHz
SWP 270 msec

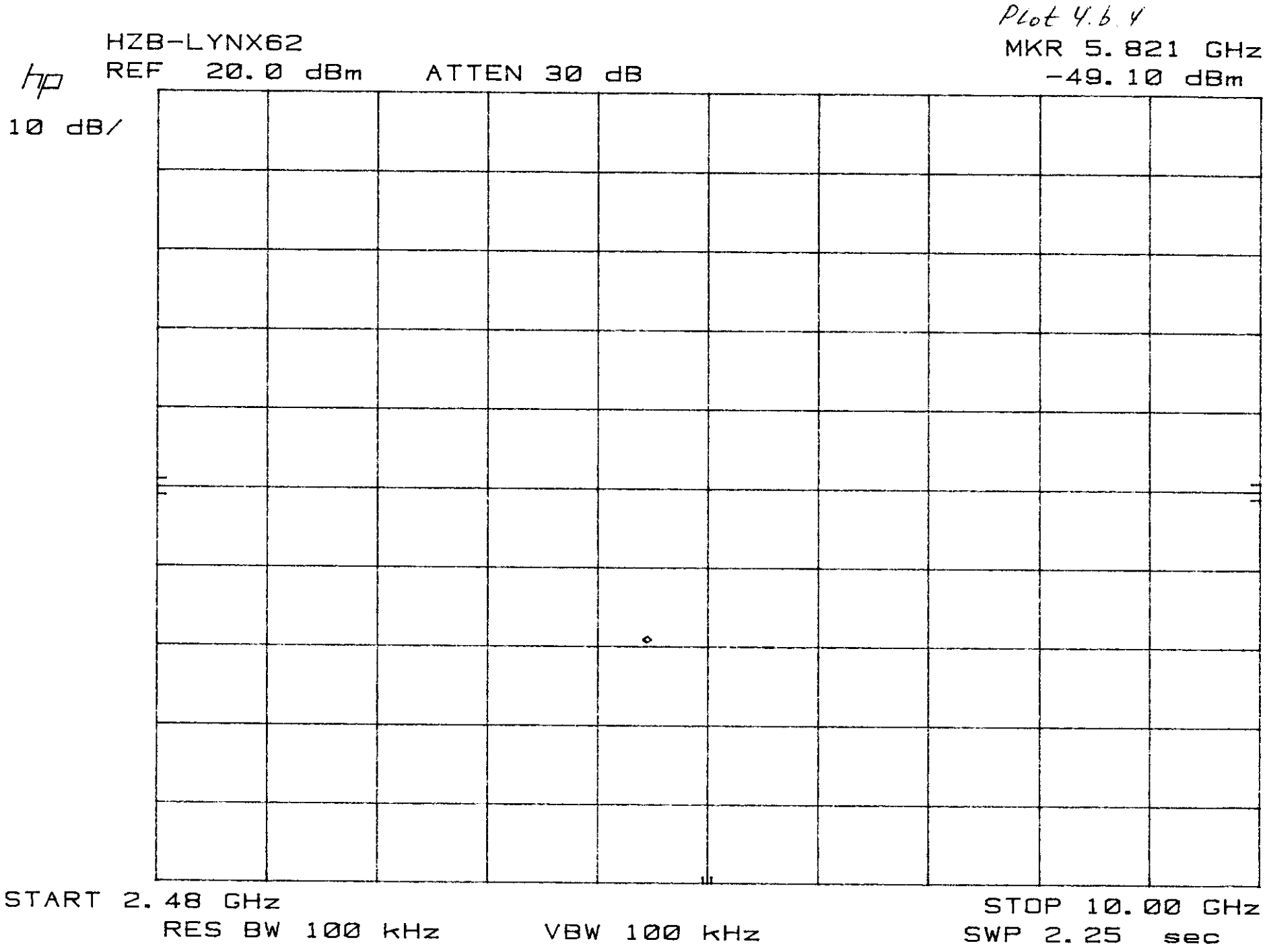
Plot 4.b.6


HZB-LYNX62
MKR 1.888 GHz
REF 10.0 dBm
ATTEN 30 dB
-53.00 dBm
10 dB/
START 1.00 GHz
STOP 2.40 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 420 msec

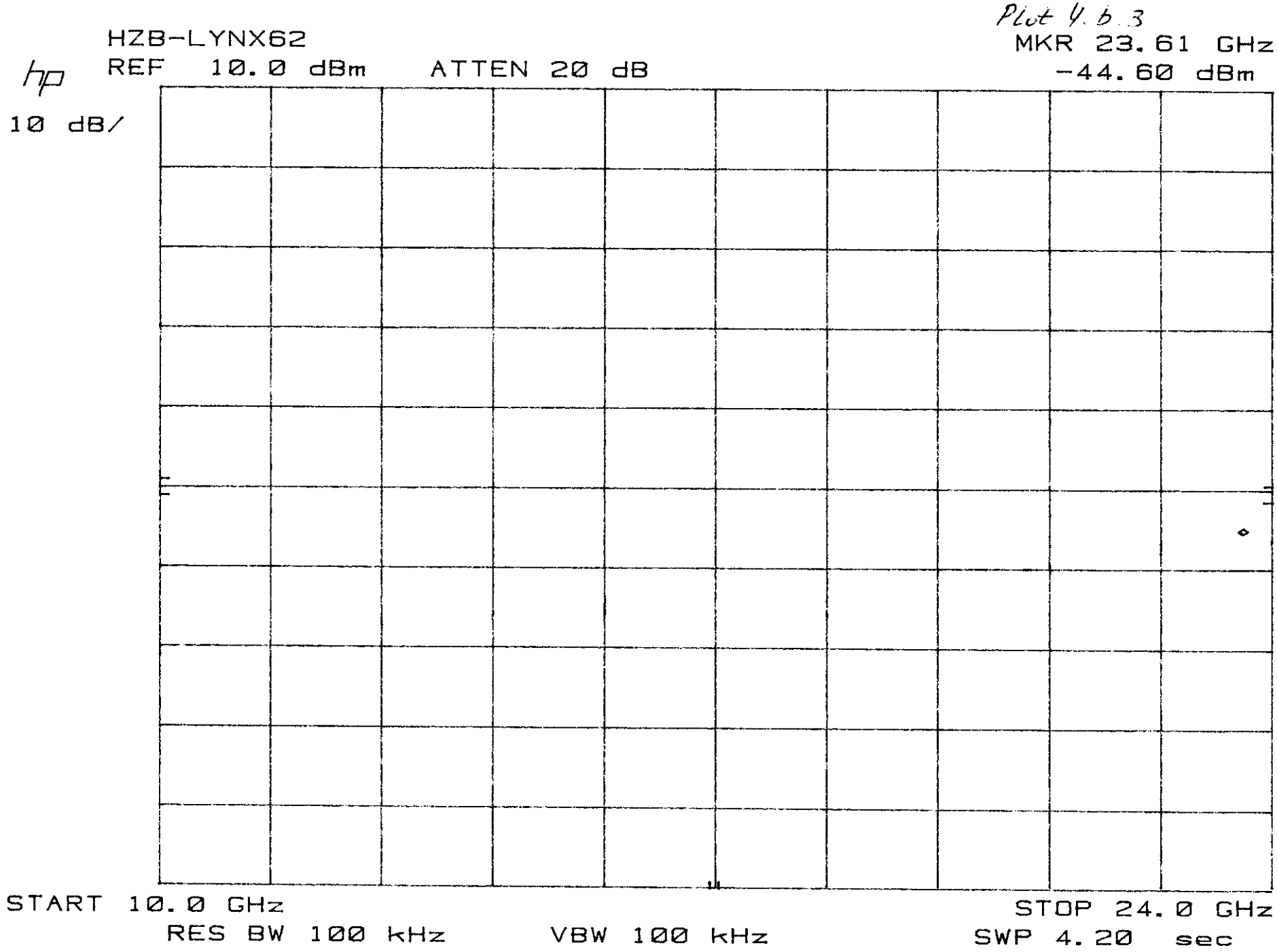
Plot 4.6.5


HZB-LYNX62
REF 20.0 dBm
ATTEN 30 dB
MKR 2.460 62 GHz
8.80 dBm
10 dB/
START 2.400 0 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 2.483 5 GHz
SWP 25.1 msec

Plot 4.6.4


HZB-LYNX62
REF 20.0 dBm
ATTEN 30 dB
MKR 5.821 GHz
-49.10 dBm
10 dB/
START 2.48 GHz
RES BW 100 kHz
VBW 100 kHz
STOP 10.00 GHz
SWP 2.25 sec

Plot 4.6.3


HZB-LYNX62
REF 10.0 dBm
ATTEN 20 dB
MKR 23.61 GHz
-44.60 dBm
10 dB/
START 10.0 GHz
STOP 24.0 GHz
RES BW 100 kHz
VBW 100 kHz
SWP 4.20 sec

4.5 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.247(c), 15.209(a):

Radiated emission measurements were performed from 30 MHz to 24000 MHz. Analyzer resolution is 100 kHz or greater for frequencies from 30 MHz to 1000 MHz and 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. All measurements were performed with peak detection and average detection (above 1 GHz) unless otherwise specified.

On the following pages, the emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter is in full radiated power.

The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz.

The transmitter was setup to transmit at the higthest channel. The spectrum analyzer with resolution bandwidth 1 MHz was connected to the antenna terminal of the transmitter. The antenna conducted emissions in the band 2400 - 2483.5 MHz were measured and ploted. The difference (delta) between the levels on fundamental frequency and on the frequency 2483.5 MHz was determined. Then the field strength (E_0 in dBuV/m) of radiated emission at the fundamental frequency at 3 m was measured.

The radiated emission (E_1 in dBuV/m) at 2483.5 MHz was calculated as follows

$$E_1 = E_0 - \text{delta}$$

The same procedure was used to measure the radiated emissions at the frequency 2390 MHz and down to 2310 MHz.

For the test results, refer to the attached data sheets and plots.

Model: LYNX 31650
Site: 1
Engineer: D. Chernomordik
Mode: Transmitting frequency 2421 MHz

FCC Part 15.247 Radiated Emissions in Restricted Bands

D 77.8 dB

Frequency MHz	Antenna Polariz. H/V	De-tector	Reading dBuV	Antenna Factor dB(1/m)	Pre-amp correc+CL dB	Dist. Correct. dB	Field Strength dB(uV/m)	Limit dB(uV/m)	Margin dB
2421.0	V	Ave.	94.1	30.5	2.3	0 ***	126.9	-	-
2390.0	V	Ave.	-	-	-	-	49.1 **	54.0	-4.9
2421.0	V	Peak	103.5	30.5	2.3	0 ***	136.3	-	-
2390.0	V	Ave.	-	-	-	-	58.5 **	74.0	-15.5
4842.0	V	Ave.	23.8	33.1	-21.3	-9.5	26.1	54.0	-27.9
4842.0	V	Peak	33.6	33.1	-21.3	-9.5	35.9	74.0	-38.1
7263.0	V	Ave.	22.5	37.2	-20.0	-9.5	30.2	54.0	-23.8
7263.0	V	Peak	33.7	37.2	-20.0	-9.5	41.4	74.0	-32.6
12105	V	Ave.	23.2	39.0	-18.6	-9.5	34.1	54.0	-19.9
12105	V	Peak	33.4	39.0	-18.6	-9.5	44.3	74.0	-29.7
19368	V	Ave.	22.6	40.3	-17.1	-9.5	36.3	54.0	-17.7
19368	V	Peak	34.0	40.3	-17.1	-9.5	47.7	74.0	-26.3

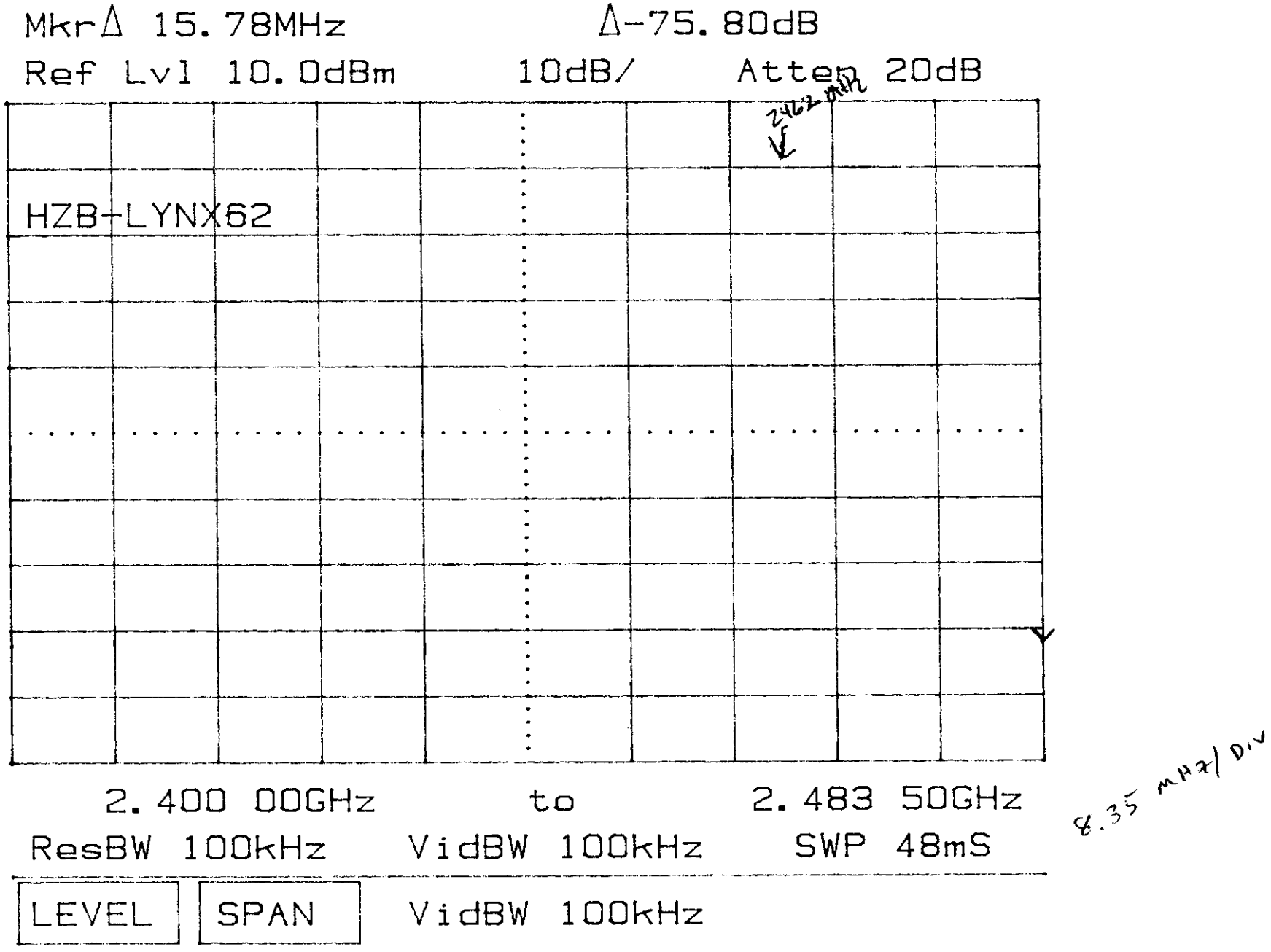
Output Power Level 22.8 dBm
** Field Strength was calculated using a "delta" method, as described in section 4.5
*** Measurements were made at 3m (all other measurements were made at 1 m)

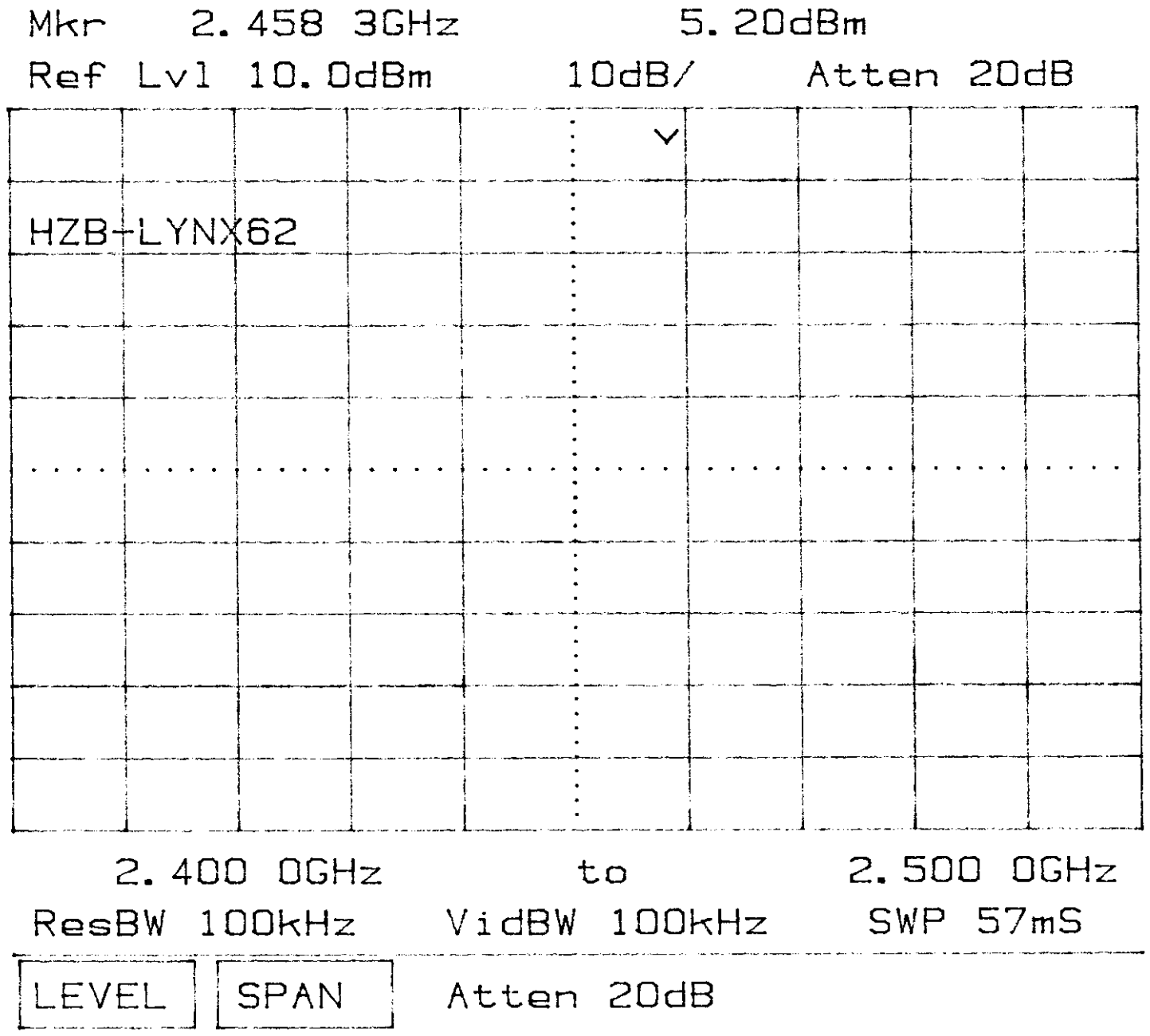
Model: LYNX 31650
Site: 1
Engineer: D. Chernomordik
Mode: Transmitting frequency 2462.5 MHZ

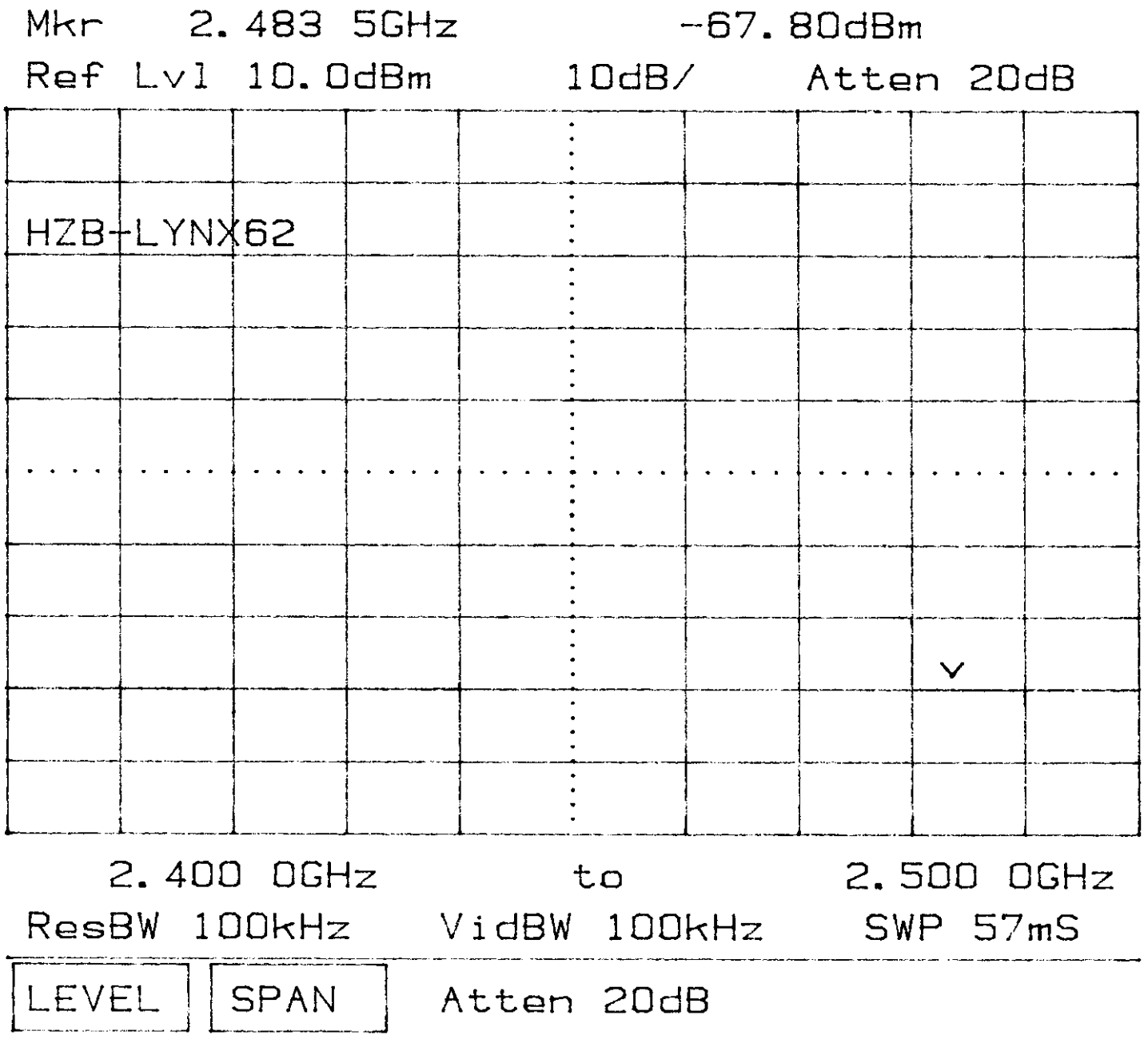
FCC Part 15.247 Radiated Emissions in Restricted Bands

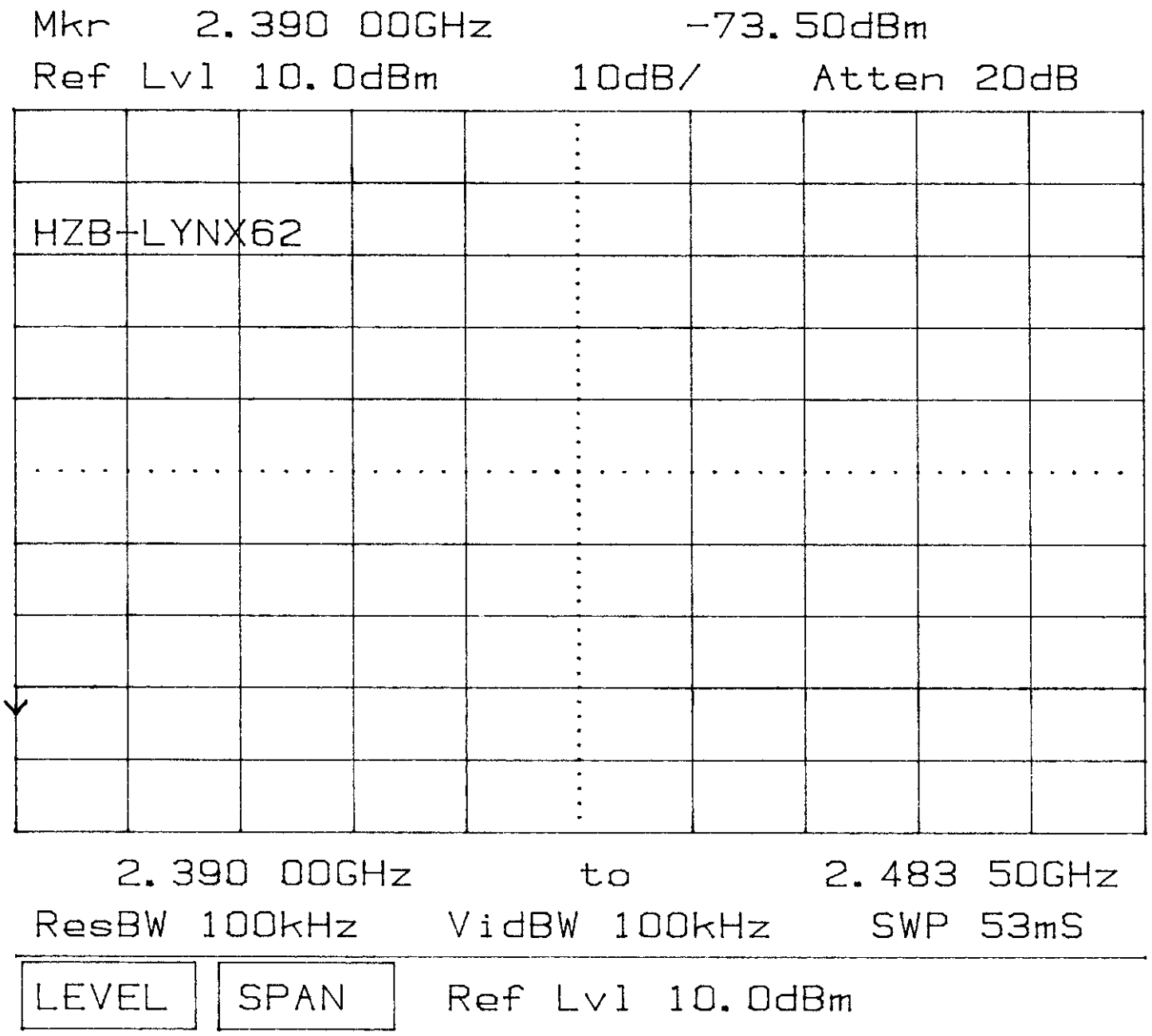
Frequency MHZ	Antenna Polariz. H/V	De-tector	Reading dBuV	Antenna Factor dB(1/m)	Pre-amp correc+CL dB	Dist. Correct. dB	Field Strength dB(uV/m)	Limit dB(uV/m)	Margin dB
2463.0	V	Ave.	93.0	30.5	2.3	0 **	125.8	-	-
2483.5	V	Ave.	-	-	-	-	50.0 *	54.0	-4.0
2463.0	V	Peak	102.9	30.5	2.3	0 **	135.8	-	-
2483.5	V	Peak	-	-	-	-	60.0 *	74.0	-14.0
4925.0	V	Ave.	25.0	33.1	-21.5	-9.5	27.1	54.0	-26.9
4925.0	V	Peak	34.8	33.1	-21.5	-9.5	36.9	74.0	-37.1
7388.6	V	Ave.	23.6	37.2	-20.2	-9.5	31.1	54.0	-22.9
7388.6	V	Peak	33.8	37.2	-20.2	-9.5	41.3	74.0	-32.7
12315	V	Ave.	22.4	39.0	-19.0	-9.5	32.9	54.0	-21.1
12315	V	Peak	31.8	39.0	-19.0	-9.5	42.3	74.0	-31.7
19705	V	Ave.	23.0	40.3	-17.5	-9.5	36.3	54.0	-17.7
19705	V	Peak	33.5	40.3	-17.5	-9.5	46.8	74.0	-27.2
22169	V	Ave.	26.5	40.5	-15.0	-9.5	42.5	54.0	-11.5
22169	V	Peak	37.3	40.5	-15.0	-9.5	53.3	74.0	-20.7

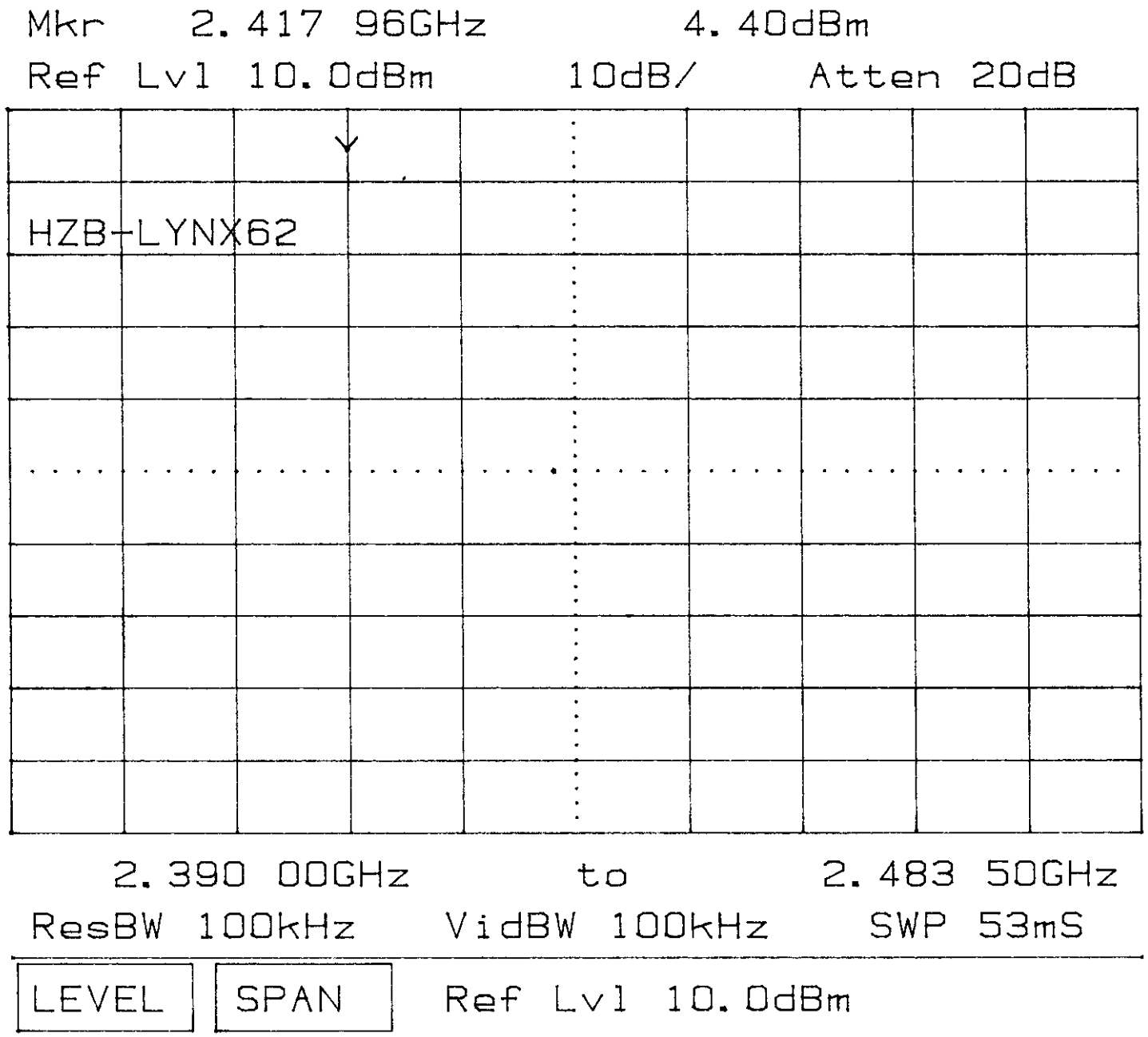
* Field Strength was calculated using a "delta" method, as described in section 4.5
** Measurements were made at 3m (all other measurements were made at 1 m)

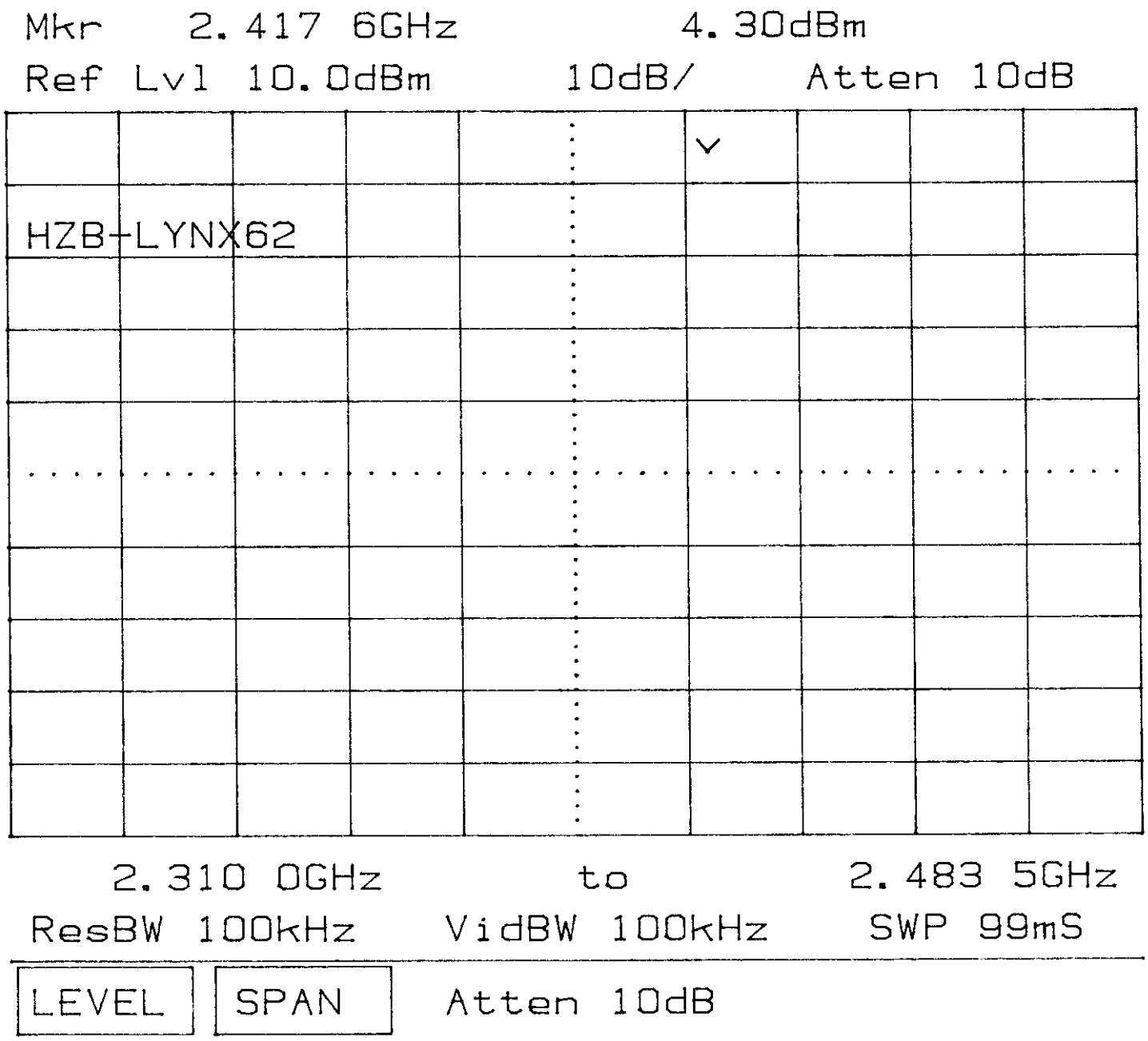

MkrΔ 15.78MHz
Δ-75.80dB
Ref Lvl 10.0dBm
10dB/
Atten 20dB
2462 mHz
HZB-LYNX62
2.400 00GHz
to
2.483 50GHz
ResBW 100kHz
VidBW 100kHz
SWP 48mS
LEVEL
SPAN
VidBW 100kHz
8.35 MHz/ DIV


Mkr 2.458 3GHz
5.20dBm
Ref Lvl 10.0dBm
10dB/
Atten 20dB
HZB-LYNX62
2.400 0GHz
to
2.500 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 57mS
LEVEL
SPAN
Atten 20dB


Mkr 2.483 5GHz
-67.80dBm
Ref Lvl 10.0dBm
10dB/
Atten 20dB
HZB-LYNX62
2.400 0GHz
to
2.500 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 57mS
LEVEL
SPAN
Atten 20dB


Mkr 2.390 00GHz
-73.50dBm
Ref Lvl 10.0dBm
10dB/
Atten 20dB
HZB-LYNX62
2.390 00GHz
to
2.483 50GHz
ResBW 100kHz
VidBW 100kHz
SWP 53mS
LEVEL
SPAN
Ref Lvl 10.0dBm

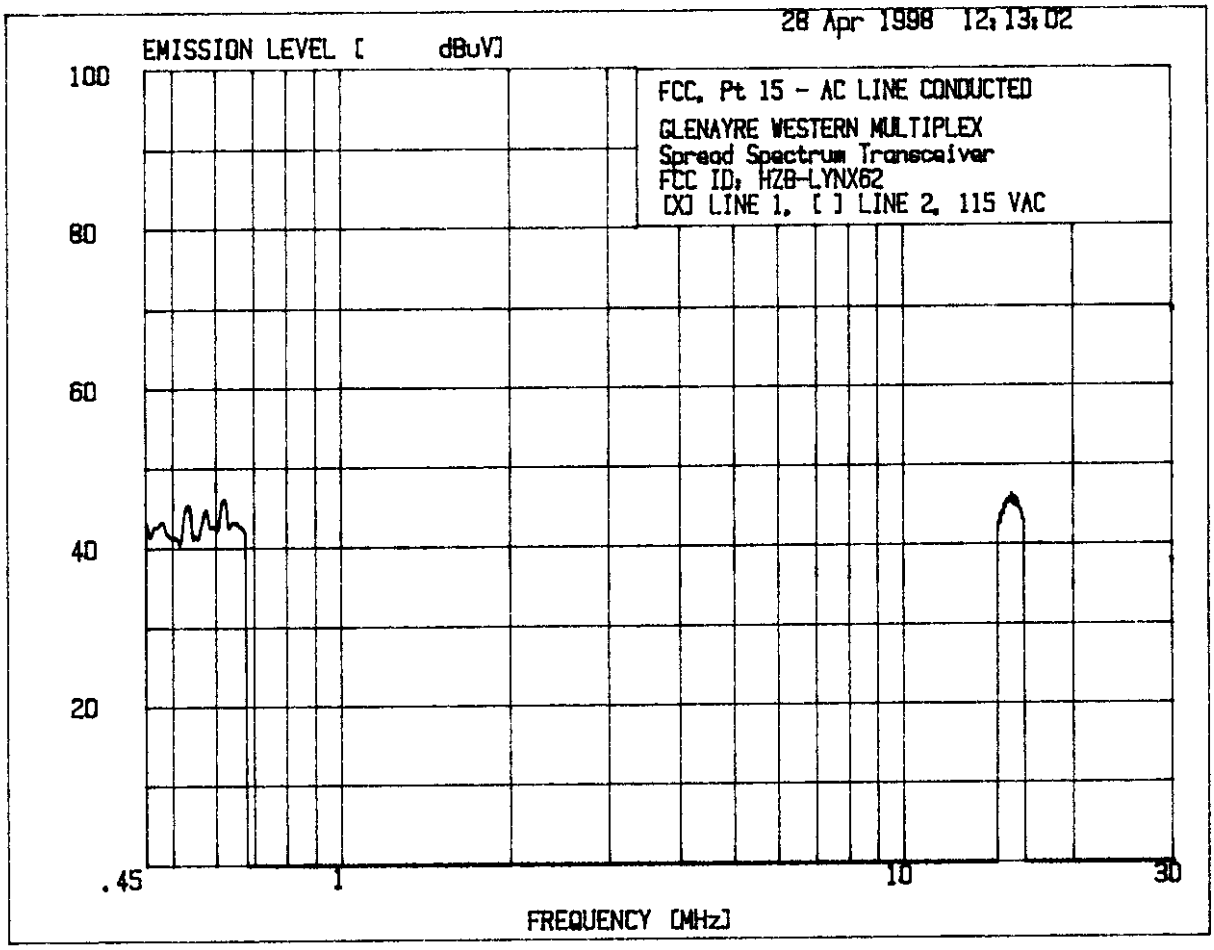

Mkr 2.417 96GHz 4.40dBm
Ref Lvl 10.0dBm 10dB/ Atten 20dB
HZB-LYNX62
2.390 00GHz to 2.483 50GHz
ResBW 100kHz VidBW 100kHz SWP 53mS
LEVEL
SPAN
Ref Lvl 10.0dBm

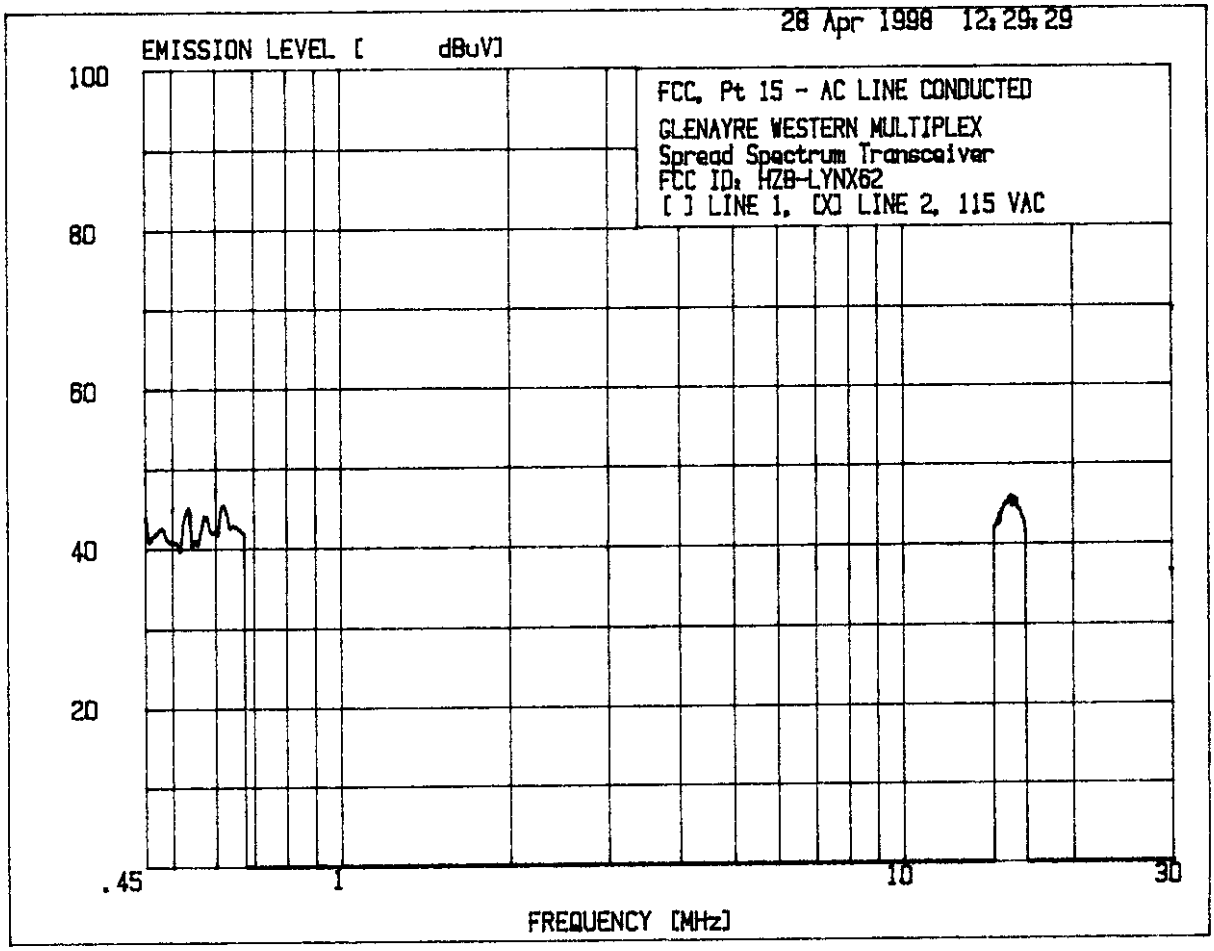

Mkr 2.417 6GHz
4.30dBm
Ref Lvl 10.0dBm
10dB/
Atten 10dB
HZB+LYNX62
2.310 0GHz
to
2.483 5GHz
ResBW 100kHz
VidBW 100kHz
SWP 99mS
LEVEL
SPAN
Atten 10dB

4.8 AC Line Conducted Emission, FCC Rule 15.207:

[ ] Not required; battery operation only

[x] Test data attached


28 Apr 1998 12:13:02
EMISSION LEVEL [dBuV]
100
80
60
40
20
FCC, Pt 15 - AC LINE CONDUCTED
GLENAYRE WESTERN MULTIPLEX
Spread Spectrum Transceiver
FCC ID: HZB-LYNX62
[X] LINE 1, [ ] LINE 2, 115 VAC
.45
1
10
30
FREQUENCY [MHz]


28 Apr 1998 12:29:29
EMISSION LEVEL [dBuV]
100
80
60
40
20
FCC, Pt 15 - AC LINE CONDUCTED
GLENAYRE WESTERN MULTIPLEX
Spread Spectrum Transceiver
FCC ID: HZB-LYNX62
[ ] LINE 1, [X] LINE 2, 115 VAC
.45
1
10
30
FREQUENCY [MHz]

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

[ ] Not required - No digital part

[X] Test results are attached

Model: LYNX 31650
Site: 1
Engineer: D. Chernomordik

FCC Part 15.209 Radiated Emissions

Frequency MHz	Antenna Polariz. H/V	De-tector	Reading dBuV	Antenna Factor dB(1/m)	Cable Loss dB	Dist. Correct. dB	Field Strength dB(uV/m)	Limit at 3 m dB(uV/m)	Margin dB
34.0	V	Peak	18.5	12.7	0	0	31.2	40.0	-8.8
39.9	V	Peak	16.9	10.9	0	0	27.8	40.0	-12.2
50.4	V	Peak	18..0	6.9	0	0	24.9	40.0	-15.1
160.0	V	Peak	11.7	9.8	0.4	0	21.9	43.5	-21.6
177.0	H	Peak	29.4	9.0	0.5	0	38.9	43.5	-4.6
236.0	H	Peak	25.6	11.6	0.6	0	37.8	46.0	-8.2
427.7	H	Peak	16.6	16.9	0.8	0	34.3	46.0	-11.7
435.1	H	Peak	12.5	17.5	0.8	0	30.8	46.0	-15.2
2392.5*	V	Ave.	10.5	27.8	2.8	-9.5 **	31.6	54.0	-22.4
2351.0*	V	Ave.	12.3	27.8	2.8	-9.5 **	33.4	54.0	-20.6

* LO frequences
** Measurements were made at 1 m
All other emissions not reported are at least 20 dB below the limit.

4.11 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

4.12 Processing Gain Measurements, FCC Rule 15.247(e)

Requirement:

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.

Result:

[x] Refer to attached test procedure and data sheets provided by the manufacturer.

[ ] Refer to circuit analysis and processing gain calculations provided by manufacturer.

5/15/98

Processing Gain Test for LYNX sc2 (2T)

Test Setup:
The processing gain was measured using the CW jamming margin method described by the FCC recommended test procedure, as described in Appendix C of FCC-96-36 (Part of the NPRM regarding ET Docket 96-8), as enclosed for reference. The specific test diagram is illustrated below.

All test equipment and the EUT were allowed to warm up for four hours 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 highest channel at 2462.5 MHz, over a range of $\pm$ 12.5 MHz. The measurements made across the center $\pm$ 10.2 MHz should be used for calculation of Gp since that bandwidth represents the receiver passband.

For the carrier signal, a level 50 dB above threshold was chosen so that thermal noise would not effect the processing gain measurements. The measured threshold of the receive radio was -90 dBm at BER = 1×10^{-6}, therefore the signal level of the transmit radio was -40 dBm measured at the input of the receive radio. The measured signal level of this same signal at the output of the 3 dB hybrid was –9.95 dBm (Ps), used for calculating C/I and Gp.

For the jammer signal, 0 dBm at the generator corresponds to –10.7 dBm (Pj) at the 3 dB hybrid output. This figure is also used for calculating C/I and Gp.

Test Equipment:

Signal Generator	Marconi 2031
Power Meter	HP435B/8484A
BER Test Set	Fireberd 6000

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: Pg –10.7 dBm at power meter test port (calculated in spreadsheet)

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

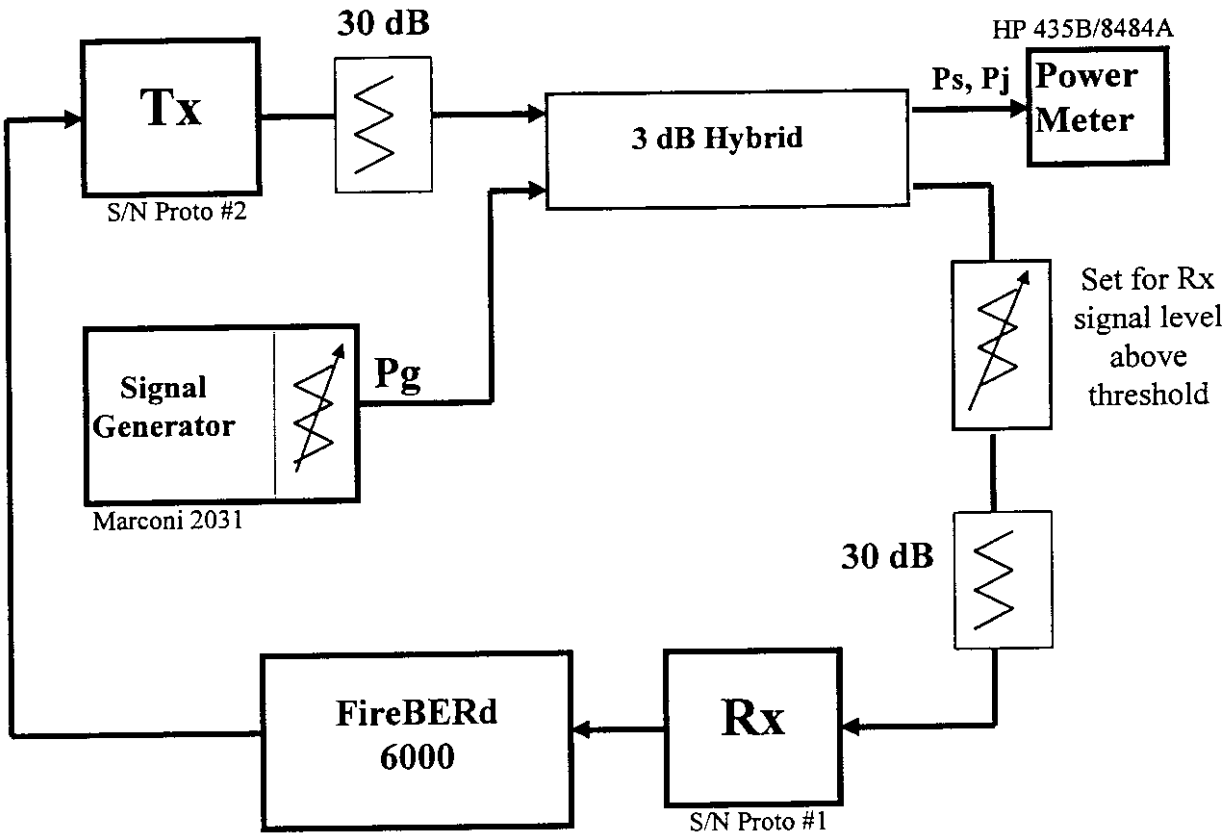
J/S: Jammer to Signal ratio, Pj-Ps (dB) (calculated in spreadsheet)

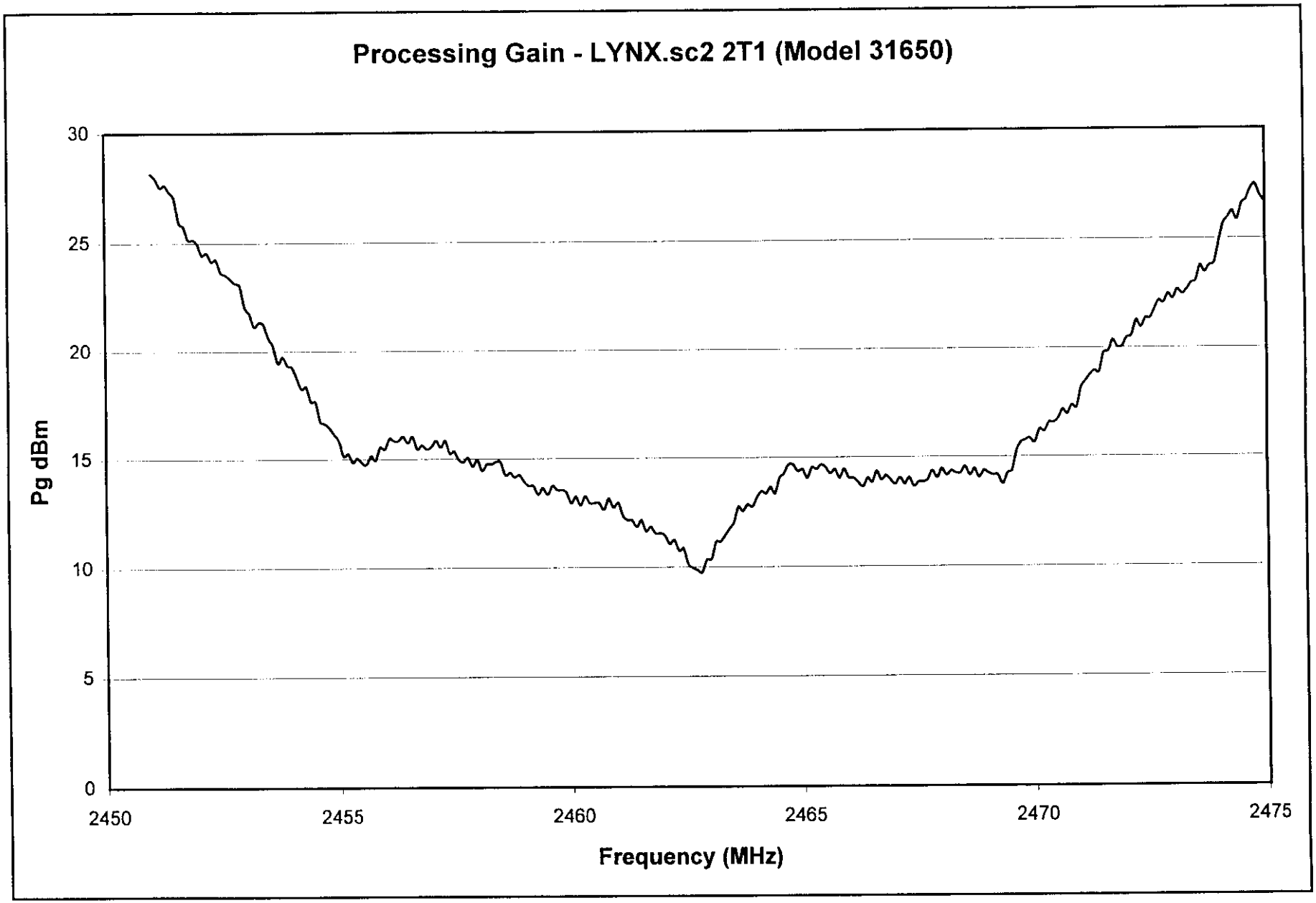
Gp: Processing Gain: (S/N)o + J/S + Lsys where:

Lsys = 2 dB
(S/N)o = 14.0 dB for QPSK and BER = 10^{-6} (see curve provided)
therefore: Gp = 14.0 + 2 + J/S = 16.0 + J/S (calculated in spreadsheet)

Only 5 measurements inside the ±10.2 MHz passband of the receiver give Gp results that did not meet the minimum required value of 10 dB. Since 408 steps make up this passband, the 5 measurement points that did not meet specification fall well within the allowed elimination of the worst 20% measurements (see spreadsheet and plotted results).

Processing Gain Test Equipment Setup




Processing Gain - LYNX.sc2 2T1 (Model 31650)
Pg dBm
30
25
20
15
10
5
0
2450
2455
2460
2465
2470
2475
Frequency (MHz)

2T 2.4 GHz Lynx SC Processing Gain Measurement 5/11/98

meas #	f MHz	Gp dBm	Pg dBm	Pj dBm	Ps dBm	J/S dB
1	2451	28.15	13.4	2.7	-9.95	-12.65
2	2451.05	27.85	13.1	2.4	-9.95	-12.35
3	2451.1	27.95	13.2	2.5	-9.95	-12.45
4	2451.15	27.75	13	2.3	-9.95	-12.25
5	2451.2	27.55	12.8	2.1	-9.95	-12.05
6	2451.25	27.75	13	2.3	-9.95	-12.25
7	2451.3	27.65	12.9	2.2	-9.95	-12.15
8	2451.35	27.35	12.6	1.9	-9.95	-11.85
9	2451.4	27.35	12.6	1.9	-9.95	-11.85
10	2451.45	27.35	12.6	1.9	-9.95	-11.85
11	2451.5	27.05	12.3	1.6	-9.95	-11.55
12	2451.55	26.55	11.8	1.1	-9.95	-11.05
13	2451.6	25.95	11.2	0.5	-9.95	-10.45
14	2451.65	25.75	11	0.3	-9.95	-10.25
15	2451.7	25.75	11	0.3	-9.95	-10.25
16	2451.75	25.55	10.8	0.1	-9.95	-10.05
17	2451.8	25.15	10.4	-0.3	-9.95	-9.65
18	2451.85	25.05	10.3	-0.4	-9.95	-9.55
19	2451.9	25.15	10.4	-0.3	-9.95	-9.65
20	2451.95	25.25	10.5	-0.2	-9.95	-9.75
21	2452	24.95	10.2	-0.5	-9.95	-9.45
22	2452.05	24.55	9.8	-0.9	-9.95	-9.05
23	2452.1	24.45	9.7	-1	-9.95	-8.95
24	2452.15	24.65	9.9	-0.8	-9.95	-9.15
25	2452.2	24.55	9.8	-0.9	-9.95	-9.05
26	2452.25	24.25	9.5	-1.2	-9.95	-8.75
27	2452.3	24.15	9.4	-1.3	-9.95	-8.65
28	2452.35	24.15	9.4	-1.3	-9.95	-8.65
29	2452.4	24.25	9.5	-1.2	-9.95	-8.75
30	2452.45	24.05	9.3	-1.4	-9.95	-8.55
31	2452.5	23.65	8.9	-1.8	-9.95	-8.15
32	2452.55	23.45	8.7	-2	-9.95	-7.95
33	2452.6	23.55	8.8	-1.9	-9.95	-8.05
34	2452.65	23.55	8.8	-1.9	-9.95	-8.05
35	2452.7	23.35	8.6	-2.1	-9.95	-7.85
36	2452.75	23.05	8.3	-2.4	-9.95	-7.55
37	2452.8	23.15	8.4	-2.3	-9.95	-7.65
38	2452.85	23.25	8.5	-2.2	-9.95	-7.75
39	2452.9	23.05	8.3	-2.4	-9.95	-7.55
40	2452.95	22.55	7.8	-2.9	-9.95	-7.05
41	2453	22.05	7.3	-3.4	-9.95	-6.55
42	2453.05	21.85	7.1	-3.6	-9.95	-6.35
43	2453.1	21.75	7	-3.7	-9.95	-6.25
44	2453.15	21.45	6.7	-4	-9.95	-5.95
45	2453.2	21.15	6.4	-4.3	-9.95	-5.65

20dB passband

46	2453.25	21.05	6.3	-4.4	-9.95	-5.55
47	2453.3	21.35	6.6	-4.1	-9.95	-5.85
48	2453.35	21.55	6.8	-3.9	-9.95	-6.05
49	2453.4	21.25	6.5	-4.2	-9.95	-5.75
50	2453.45	20.85	6.1	-4.6	-9.95	-5.35
51	2453.5	20.65	5.9	-4.8	-9.95	-5.15
52	2453.55	20.55	5.8	-4.9	-9.95	-5.05
53	2453.6	20.25	5.5	-5.2	-9.95	-4.75
54	2453.65	19.75	5	-5.7	-9.95	-4.25
55	2453.7	19.45	4.7	-6	-9.95	-3.95
56	2453.75	19.55	4.8	-5.9	-9.95	-4.05
57	2453.8	19.75	5	-5.7	-9.95	-4.25
58	2453.85	19.65	4.9	-5.8	-9.95	-4.15
59	2453.9	19.35	4.6	-6.1	-9.95	-3.85
60	2453.95	19.25	4.5	-6.2	-9.95	-3.75
61	2454	19.25	4.5	-6.2	-9.95	-3.75
62	2454.05	19.15	4.4	-6.3	-9.95	-3.65
63	2454.1	18.75	4	-6.7	-9.95	-3.25
64	2454.15	18.35	3.6	-7.1	-9.95	-2.85
65	2454.2	18.25	3.5	-7.2	-9.95	-2.75
66	2454.25	18.35	3.6	-7.1	-9.95	-2.85
67	2454.3	18.35	3.6	-7.1	-9.95	-2.85
68	2454.35	17.95	3.2	-7.5	-9.95	-2.45
69	2454.4	17.65	2.9	-7.8	-9.95	-2.15
70	2454.45	17.65	2.9	-7.8	-9.95	-2.15
71	2454.5	17.65	2.9	-7.8	-9.95	-2.15
72	2454.55	17.25	2.5	-8.2	-9.95	-1.75
73	2454.6	16.75	2	-8.7	-9.95	-1.25
74	2454.65	16.55	1.8	-8.9	-9.95	-1.05
75	2454.7	16.65	1.9	-8.8	-9.95	-1.15
76	2454.75	16.65	1.9	-8.8	-9.95	-1.15
77	2454.8	16.45	1.7	-9	-9.95	-0.95
78	2454.85	16.15	1.4	-9.3	-9.95	-0.65
79	2454.9	16.15	1.4	-9.3	-9.95	-0.65
80	2454.95	16.15	1.4	-9.3	-9.95	-0.65
81	2455	15.85	1.1	-9.6	-9.95	-0.35
82	2455.05	15.45	0.7	-10	-9.95	0.05
83	2455.1	15.15	0.4	-10.3	-9.95	0.35
84	2455.15	15.15	0.4	-10.3	-9.95	0.35
85	2455.2	15.25	0.5	-10.2	-9.95	0.25
86	2455.25	15.15	0.4	-10.3	-9.95	0.35
87	2455.3	14.85	0.1	-10.6	-9.95	0.65
88	2455.35	14.85	0.1	-10.6	-9.95	0.65
89	2455.4	15.05	0.3	-10.4	-9.95	0.45
90	2455.45	15.05	0.3	-10.4	-9.95	0.45
91	2455.5	14.85	0.1	-10.6	-9.95	0.65
92	2455.55	14.65	-0.1	-10.8	-9.95	0.85
93	2455.6	14.75	0	-10.7	-9.95	0.75
94	2455.65	15.05	0.3	-10.4	-9.95	0.45
95	2455.7	15.15	0.4	-10.3	-9.95	0.35
96	2455.75	14.95	0.2	-10.5	-9.95	0.55
97	2455.8	14.95	0.2	-10.5	-9.95	0.55

98	2455.85	15.25	0.5	-10.2	-9.95	0.25
99	2455.9	15.55	0.8	-9.9	-9.95	-0.05
100	2455.95	15.55	0.8	-9.9	-9.95	-0.05
101	2456	15.45	0.7	-10	-9.95	0.05
102	2456.05	15.55	0.8	-9.9	-9.95	-0.05
103	2456.1	15.95	1.2	-9.5	-9.95	-0.45
104	2456.15	16.05	1.3	-9.4	-9.95	-0.55
105	2456.2	15.85	1.1	-9.6	-9.95	-0.35
106	2456.25	15.65	0.9	-9.8	-9.95	-0.15
107	2456.3	15.85	1.1	-9.6	-9.95	-0.35
108	2456.35	16.05	1.3	-9.4	-9.95	-0.55
109	2456.4	16.05	1.3	-9.4	-9.95	-0.55
110	2456.45	15.85	1.1	-9.6	-9.95	-0.35
111	2456.5	15.75	1	-9.7	-9.95	-0.25
112	2456.55	15.85	1.1	-9.6	-9.95	-0.35
113	2456.6	16.05	1.3	-9.4	-9.95	-0.55
114	2456.65	15.75	1	-9.7	-9.95	-0.25
115	2456.7	15.45	0.7	-10	-9.95	0.05
116	2456.75	15.45	0.7	-10	-9.95	0.05
117	2456.8	15.65	0.9	-9.8	-9.95	-0.15
118	2456.85	15.75	1	-9.7	-9.95	-0.25
119	2456.9	15.45	0.7	-10	-9.95	0.05
120	2456.95	15.35	0.6	-10.1	-9.95	0.15
121	2457	15.55	0.8	-9.9	-9.95	-0.05
122	2457.05	15.85	1.1	-9.6	-9.95	-0.35
123	2457.1	15.85	1.1	-9.6	-9.95	-0.35
124	2457.15	15.65	0.9	-9.8	-9.95	-0.15
125	2457.2	15.55	0.8	-9.9	-9.95	-0.05
126	2457.25	15.75	1	-9.7	-9.95	-0.25
127	2457.3	15.85	1.1	-9.6	-9.95	-0.35
128	2457.35	15.65	0.9	-9.8	-9.95	-0.15
129	2457.4	15.25	0.5	-10.2	-9.95	0.25
130	2457.45	15.25	0.5	-10.2	-9.95	0.25
131	2457.5	15.35	0.6	-10.1	-9.95	0.15
132	2457.55	15.25	0.5	-10.2	-9.95	0.25
133	2457.6	14.95	0.2	-10.5	-9.95	0.55
134	2457.65	14.75	0	-10.7	-9.95	0.75
135	2457.7	14.85	0.1	-10.6	-9.95	0.65
136	2457.75	15.15	0.4	-10.3	-9.95	0.35
137	2457.8	15.05	0.3	-10.4	-9.95	0.45
138	2457.85	14.85	0.1	-10.6	-9.95	0.65
139	2457.9	14.65	-0.1	-10.8	-9.95	0.85
140	2457.95	14.85	0.1	-10.6	-9.95	0.65
141	2458	14.95	0.2	-10.5	-9.95	0.55
142	2458.05	14.65	-0.1	-10.8	-9.95	0.85
143	2458.1	14.45	-0.3	-11	-9.95	1.05
144	2458.15	14.45	-0.3	-11	-9.95	1.05
145	2458.2	14.75	0	-10.7	-9.95	0.75
146	2458.25	14.85	0.1	-10.6	-9.95	0.65
147	2458.3	14.75	0	-10.7	-9.95	0.75
148	2458.35	14.65	-0.1	-10.8	-9.95	0.85
149	2458.4	14.85	0.1	-10.6	-9.95	0.65

150	2458.45	14.95	0.2	-10.5	-9.95	0.55
151	2458.5	14.85	0.1	-10.6	-9.95	0.65
152	2458.55	14.45	-0.3	-11	-9.95	1.05
153	2458.6	14.25	-0.5	-11.2	-9.95	1.25
154	2458.65	14.35	-0.4	-11.1	-9.95	1.15
155	2458.7	14.35	-0.4	-11.1	-9.95	1.15
156	2458.75	14.15	-0.6	-11.3	-9.95	1.35
157	2458.8	14.15	-0.6	-11.3	-9.95	1.35
158	2458.85	13.95	-0.8	-11.5	-9.95	1.55
159	2458.9	14.25	-0.5	-11.2	-9.95	1.25
160	2458.95	14.25	-0.5	-11.2	-9.95	1.25
161	2459	13.95	-0.8	-11.5	-9.95	1.55
162	2459.05	13.65	-1.1	-11.8	-9.95	1.85
163	2459.1	13.75	-1	-11.7	-9.95	1.75
164	2459.15	13.85	-0.9	-11.6	-9.95	1.65
165	2459.2	13.75	-1	-11.7	-9.95	1.75
166	2459.25	13.35	-1.4	-12.1	-9.95	2.15
167	2459.3	13.35	-1.4	-12.1	-9.95	2.15
168	2459.35	13.55	-1.2	-11.9	-9.95	1.95
169	2459.4	13.65	-1.1	-11.8	-9.95	1.85
170	2459.45	13.55	-1.2	-11.9	-9.95	1.95
171	2459.5	13.35	-1.4	-12.1	-9.95	2.15
172	2459.55	13.45	-1.3	-12	-9.95	2.05
173	2459.6	13.75	-1	-11.7	-9.95	1.75
174	2459.65	13.85	-0.9	-11.6	-9.95	1.65
175	2459.7	13.55	-1.2	-11.9	-9.95	1.95
176	2459.75	13.45	-1.3	-12	-9.95	2.05
177	2459.8	13.55	-1.2	-11.9	-9.95	1.95
178	2459.85	13.65	-1.1	-11.8	-9.95	1.85
179	2459.9	13.45	-1.3	-12	-9.95	2.05
180	2459.95	13.15	-1.6	-12.3	-9.95	2.35
181	2460	12.95	-1.8	-12.5	-9.95	2.55
182	2460.05	13.15	-1.6	-12.3	-9.95	2.35
183	2460.1	13.25	-1.5	-12.2	-9.95	2.25
184	2460.15	13.05	-1.7	-12.4	-9.95	2.45
185	2460.2	12.85	-1.9	-12.6	-9.95	2.65
186	2460.25	12.95	-1.8	-12.5	-9.95	2.55
187	2460.3	13.25	-1.5	-12.2	-9.95	2.25
188	2460.35	13.25	-1.5	-12.2	-9.95	2.25
189	2460.4	12.95	-1.8	-12.5	-9.95	2.55
190	2460.45	12.75	-2	-12.7	-9.95	2.75
191	2460.5	12.95	-1.8	-12.5	-9.95	2.55
192	2460.55	13.05	-1.7	-12.4	-9.95	2.45
193	2460.6	12.95	-1.8	-12.5	-9.95	2.55
194	2460.65	12.65	-2.1	-12.8	-9.95	2.85
195	2460.7	12.65	-2.1	-12.8	-9.95	2.85
196	2460.75	12.95	-1.8	-12.5	-9.95	2.55
197	2460.8	13.15	-1.6	-12.3	-9.95	2.35
198	2460.85	12.95	-1.8	-12.5	-9.95	2.55
199	2460.9	12.75	-2	-12.7	-9.95	2.75
200	2460.95	12.85	-1.9	-12.6	-9.95	2.65
201	2461	12.95	-1.8	-12.5	-9.95	2.55

202	2461.05	12.75	-2	-12.7	-9.95	2.75
203	2461.1	12.35	-2.4	-13.1	-9.95	3.15
204	2461.15	12.15	-2.6	-13.3	-9.95	3.35
205	2461.2	12.15	-2.6	-13.3	-9.95	3.35
206	2461.25	12.25	-2.5	-13.2	-9.95	3.25
207	2461.3	12.15	-2.6	-13.3	-9.95	3.35
208	2461.35	11.85	-2.9	-13.6	-9.95	3.65
209	2461.4	11.85	-2.9	-13.6	-9.95	3.65
210	2461.45	12.15	-2.6	-13.3	-9.95	3.35
211	2461.5	12.15	-2.6	-13.3	-9.95	3.35
212	2461.55	11.95	-2.8	-13.5	-9.95	3.55
213	2461.6	11.65	-3.1	-13.8	-9.95	3.85
214	2461.65	11.65	-3.1	-13.8	-9.95	3.85
215	2461.7	11.85	-2.9	-13.6	-9.95	3.65
216	2461.75	11.75	-3	-13.7	-9.95	3.75
217	2461.8	11.55	-3.2	-13.9	-9.95	3.95
218	2461.85	11.35	-3.4	-14.1	-9.95	4.15
219	2461.9	11.55	-3.2	-13.9	-9.95	3.95
220	2461.95	11.65	-3.1	-13.8	-9.95	3.85
221	2462	11.45	-3.3	-14	-9.95	4.05
222	2462.05	11.15	-3.6	-14.3	-9.95	4.35
223	2462.1	11.05	-3.7	-14.4	-9.95	4.45
224	2462.15	11.25	-3.5	-14.2	-9.95	4.25
225	2462.2	11.25	-3.5	-14.2	-9.95	4.25
226	2462.25	10.95	-3.8	-14.5	-9.95	4.55
227	2462.3	10.75	-4	-14.7	-9.95	4.75
228	2462.35	10.75	-4	-14.7	-9.95	4.75
229	2462.4	10.85	-3.9	-14.6	-9.95	4.65
230	2462.45	10.65	-4.1	-14.8	-9.95	4.85
231	2462.5	10.15	-4.6	-15.3	-9.95	5.35
232	2462.55	9.85	-4.9	-15.6	-9.95	5.65
233	2462.6	9.95	-4.8	-15.5	-9.95	5.55
234	2462.65	10.05	-4.7	-15.4	-9.95	5.45
235	2462.7	9.85	-4.9	-15.6	-9.95	5.65
236	2462.75	9.65	-5.1	-15.8	-9.95	5.85
237	2462.8	9.75	-5	-15.7	-9.95	5.75
238	2462.85	10.05	-4.7	-15.4	-9.95	5.45
239	2462.9	10.35	-4.4	-15.1	-9.95	5.15
240	2462.95	10.25	-4.5	-15.2	-9.95	5.25
241	2463	10.35	-4.4	-15.1	-9.95	5.15
242	2463.05	10.65	-4.1	-14.8	-9.95	4.85
243	2463.1	11.15	-3.6	-14.3	-9.95	4.35
244	2463.15	11.25	-3.5	-14.2	-9.95	4.25
245	2463.2	11.15	-3.6	-14.3	-9.95	4.35
246	2463.25	11.15	-3.6	-14.3	-9.95	4.35
247	2463.3	11.45	-3.3	-14	-9.95	4.05
248	2463.35	11.75	-3	-13.7	-9.95	3.75
249	2463.4	11.75	-3	-13.7	-9.95	3.75
250	2463.45	11.75	-3	-13.7	-9.95	3.75
251	2463.5	12.05	-2.7	-13.4	-9.95	3.45
252	2463.55	12.45	-2.3	-13	-9.95	3.05
253	2463.6	12.75	-2	-12.7	-9.95	2.75

254	2463.65	12.65	-2.1	-12.8	-9.95	2.85
255	2463.7	12.55	-2.2	-12.9	-9.95	2.95
256	2463.75	12.65	-2.1	-12.8	-9.95	2.85
257	2463.8	12.85	-1.9	-12.6	-9.95	2.65
258	2463.85	12.85	-1.9	-12.6	-9.95	2.65
259	2463.9	12.75	-2	-12.7	-9.95	2.75
260	2463.95	12.85	-1.9	-12.6	-9.95	2.65
261	2464	13.15	-1.6	-12.3	-9.95	2.35
262	2464.05	13.45	-1.3	-12	-9.95	2.05
263	2464.1	13.45	-1.3	-12	-9.95	2.05
264	2464.15	13.35	-1.4	-12.1	-9.95	2.15
265	2464.2	13.35	-1.4	-12.1	-9.95	2.15
266	2464.25	13.65	-1.1	-11.8	-9.95	1.85
267	2464.3	13.65	-1.1	-11.8	-9.95	1.85
268	2464.35	13.45	-1.3	-12	-9.95	2.05
269	2464.4	13.35	-1.4	-12.1	-9.95	2.15
270	2464.45	13.65	-1.1	-11.8	-9.95	1.85
271	2464.5	14.05	-0.7	-11.4	-9.95	1.45
272	2464.55	14.25	-0.5	-11.2	-9.95	1.25
273	2464.6	14.25	-0.5	-11.2	-9.95	1.25
274	2464.65	14.35	-0.4	-11.1	-9.95	1.15
275	2464.7	14.65	-0.1	-10.8	-9.95	0.85
276	2464.75	14.85	0.1	-10.6	-9.95	0.65
277	2464.8	14.65	-0.1	-10.8	-9.95	0.85
278	2464.85	14.35	-0.4	-11.1	-9.95	1.15
279	2464.9	14.35	-0.4	-11.1	-9.95	1.15
280	2464.95	14.45	-0.3	-11	-9.95	1.05
281	2465	14.45	-0.3	-11	-9.95	1.05
282	2465.05	14.25	-0.5	-11.2	-9.95	1.25
283	2465.1	14.05	-0.7	-11.4	-9.95	1.45
284	2465.15	14.35	-0.4	-11.1	-9.95	1.15
285	2465.2	14.55	-0.2	-10.9	-9.95	0.95
286	2465.25	14.55	-0.2	-10.9	-9.95	0.95
287	2465.3	14.45	-0.3	-11	-9.95	1.05
288	2465.35	14.45	-0.3	-11	-9.95	1.05
289	2465.4	14.65	-0.1	-10.8	-9.95	0.85
290	2465.45	14.75	0	-10.7	-9.95	0.75
291	2465.5	14.55	-0.2	-10.9	-9.95	0.95
292	2465.55	14.25	-0.5	-11.2	-9.95	1.25
293	2465.6	14.25	-0.5	-11.2	-9.95	1.25
294	2465.65	14.45	-0.3	-11	-9.95	1.05
295	2465.7	14.45	-0.3	-11	-9.95	1.05
296	2465.75	14.15	-0.6	-11.3	-9.95	1.35
297	2465.8	14.05	-0.7	-11.4	-9.95	1.45
298	2465.85	14.25	-0.5	-11.2	-9.95	1.25
299	2465.9	14.45	-0.3	-11	-9.95	1.05
300	2465.95	14.35	-0.4	-11.1	-9.95	1.15
301	2466	14.05	-0.7	-11.4	-9.95	1.45
302	2466.05	13.95	-0.8	-11.5	-9.95	1.55
303	2466.1	14.05	-0.7	-11.4	-9.95	1.45
304	2466.15	14.05	-0.7	-11.4	-9.95	1.45
305	2466.2	13.85	-0.9	-11.6	-9.95	1.65

306	2466.25	13.55	-1.2	-11.9	-9.95	1.95
307	2466.3	13.65	-1.1	-11.8	-9.95	1.85
308	2466.35	13.95	-0.8	-11.5	-9.95	1.55
309	2466.4	14.05	-0.7	-11.4	-9.95	1.45
310	2466.45	13.85	-0.9	-11.6	-9.95	1.65
311	2466.5	13.85	-0.9	-11.6	-9.95	1.65
312	2466.55	14.05	-0.7	-11.4	-9.95	1.45
313	2466.6	14.35	-0.4	-11.1	-9.95	1.15
314	2466.65	14.25	-0.5	-11.2	-9.95	1.25
315	2466.7	13.95	-0.8	-11.5	-9.95	1.55
316	2466.75	13.95	-0.8	-11.5	-9.95	1.55
317	2466.8	14.15	-0.6	-11.3	-9.95	1.35
318	2466.85	14.15	-0.6	-11.3	-9.95	1.35
319	2466.9	13.95	-0.8	-11.5	-9.95	1.55
320	2466.95	13.65	-1.1	-11.8	-9.95	1.85
321	2467	13.75	-1	-11.7	-9.95	1.75
322	2467.05	14.05	-0.7	-11.4	-9.95	1.45
323	2467.1	14.05	-0.7	-11.4	-9.95	1.45
324	2467.15	13.85	-0.9	-11.6	-9.95	1.65
325	2467.2	13.75	-1	-11.7	-9.95	1.75
326	2467.25	13.95	-0.8	-11.5	-9.95	1.55
327	2467.3	14.05	-0.7	-11.4	-9.95	1.45
328	2467.35	13.95	-0.8	-11.5	-9.95	1.55
329	2467.4	13.65	-1.1	-11.8	-9.95	1.85
330	2467.45	13.65	-1.1	-11.8	-9.95	1.85
331	2467.5	13.85	-0.9	-11.6	-9.95	1.65
332	2467.55	13.95	-0.8	-11.5	-9.95	1.55
333	2467.6	13.85	-0.9	-11.6	-9.95	1.65
334	2467.65	13.75	-1	-11.7	-9.95	1.75
335	2467.7	13.95	-0.8	-11.5	-9.95	1.55
336	2467.75	14.25	-0.5	-11.2	-9.95	1.25
337	2467.8	14.35	-0.4	-11.1	-9.95	1.15
338	2467.85	14.15	-0.6	-11.3	-9.95	1.35
339	2467.9	14.05	-0.7	-11.4	-9.95	1.45
340	2467.95	14.35	-0.4	-11.1	-9.95	1.15
341	2468	14.45	-0.3	-11	-9.95	1.05
342	2468.05	14.35	-0.4	-11.1	-9.95	1.15
343	2468.1	14.15	-0.6	-11.3	-9.95	1.35
344	2468.15	14.05	-0.7	-11.4	-9.95	1.45
345	2468.2	14.35	-0.4	-11.1	-9.95	1.15
346	2468.25	14.45	-0.3	-11	-9.95	1.05
347	2468.3	14.25	-0.5	-11.2	-9.95	1.25
348	2468.35	14.15	-0.6	-11.3	-9.95	1.35
349	2468.4	14.25	-0.5	-11.2	-9.95	1.25
350	2468.45	14.55	-0.2	-10.9	-9.95	0.95
351	2468.5	14.55	-0.2	-10.9	-9.95	0.95
352	2468.55	14.25	-0.5	-11.2	-9.95	1.25
353	2468.6	14.15	-0.6	-11.3	-9.95	1.35
354	2468.65	14.25	-0.5	-11.2	-9.95	1.25
355	2468.7	14.45	-0.3	-11	-9.95	1.05
356	2468.75	14.25	-0.5	-11.2	-9.95	1.25
357	2468.8	14.05	-0.7	-11.4	-9.95	1.45

358	2468.85	14.05	-0.7	-11.4	-9.95	1.45
359	2468.9	14.35	-0.4	-11.1	-9.95	1.15
360	2468.95	14.45	-0.3	-11	-9.95	1.05
361	2469	14.25	-0.5	-11.2	-9.95	1.25
362	2469.05	14.05	-0.7	-11.4	-9.95	1.45
363	2469.1	14.15	-0.6	-11.3	-9.95	1.35
364	2469.15	14.25	-0.5	-11.2	-9.95	1.25
365	2469.2	14.15	-0.6	-11.3	-9.95	1.35
366	2469.25	13.85	-0.9	-11.6	-9.95	1.65
367	2469.3	13.75	-1	-11.7	-9.95	1.75
368	2469.35	13.95	-0.8	-11.5	-9.95	1.55
369	2469.4	14.25	-0.5	-11.2	-9.95	1.25
370	2469.45	14.25	-0.5	-11.2	-9.95	1.25
371	2469.5	14.35	-0.4	-11.1	-9.95	1.15
372	2469.55	14.65	-0.1	-10.8	-9.95	0.85
373	2469.6	15.25	0.5	-10.2	-9.95	0.25
374	2469.65	15.65	0.9	-9.8	-9.95	-0.15
375	2469.7	15.65	0.9	-9.8	-9.95	-0.15
376	2469.75	15.55	0.8	-9.9	-9.95	-0.05
377	2469.8	15.75	1	-9.7	-9.95	-0.25
378	2469.85	15.95	1.2	-9.5	-9.95	-0.45
379	2469.9	15.85	1.1	-9.6	-9.95	-0.35
380	2469.95	15.65	0.9	-9.8	-9.95	-0.15
381	2470	15.65	0.9	-9.8	-9.95	-0.15
382	2470.05	15.95	1.2	-9.5	-9.95	-0.45
383	2470.1	16.25	1.5	-9.2	-9.95	-0.75
384	2470.15	16.25	1.5	-9.2	-9.95	-0.75
385	2470.2	16.15	1.4	-9.3	-9.95	-0.65
386	2470.25	16.25	1.5	-9.2	-9.95	-0.75
387	2470.3	16.55	1.8	-8.9	-9.95	-1.05
388	2470.35	16.75	2	-8.7	-9.95	-1.25
389	2470.4	16.55	1.8	-8.9	-9.95	-1.05
390	2470.45	16.55	1.8	-8.9	-9.95	-1.05
391	2470.5	16.75	2	-8.7	-9.95	-1.25
392	2470.55	17.05	2.3	-8.4	-9.95	-1.55
393	2470.6	17.15	2.4	-8.3	-9.95	-1.65
394	2470.65	16.95	2.2	-8.5	-9.95	-1.45
395	2470.7	16.95	2.2	-8.5	-9.95	-1.45
396	2470.75	17.15	2.4	-8.3	-9.95	-1.65
397	2470.8	17.35	2.6	-8.1	-9.95	-1.85
398	2470.85	17.35	2.6	-8.1	-9.95	-1.85
399	2470.9	17.25	2.5	-8.2	-9.95	-1.75
400	2470.95	17.55	2.8	-7.9	-9.95	-2.05
401	2471	18.15	3.4	-7.3	-9.95	-2.65
402	2471.05	18.45	3.7	-7	-9.95	-2.95
403	2471.1	18.45	3.7	-7	-9.95	-2.95
404	2471.15	18.45	3.7	-7	-9.95	-2.95
405	2471.2	18.75	4	-6.7	-9.95	-3.25
406	2471.25	19.05	4.3	-6.4	-9.95	-3.55
407	2471.3	18.95	4.2	-6.5	-9.95	-3.45
408	2471.35	18.75	4	-6.7	-9.95	-3.25
409	2471.4	18.85	4.1	-6.6	-9.95	-3.35

410	2471.45	19.35	4.6	-6.1	-9.95	-3.85
411	2471.5	19.75	5	-5.7	-9.95	-4.25
412	2471.55	19.75	5	-5.7	-9.95	-4.25
413	2471.6	19.85	5.1	-5.6	-9.95	-4.35
414	2471.65	20.05	5.3	-5.4	-9.95	-4.55
415	2471.7	20.35	5.6	-5.1	-9.95	-4.85
416	2471.75	20.35	5.6	-5.1	-9.95	-4.85
417	2471.8	20.05	5.3	-5.4	-9.95	-4.55
418	2471.85	19.85	5.1	-5.6	-9.95	-4.35
419	2471.9	20.05	5.3	-5.4	-9.95	-4.55
420	2471.95	20.35	5.6	-5.1	-9.95	-4.85
421	2472	20.45	5.7	-5	-9.95	-4.95
422	2472.05	20.35	5.6	-5.1	-9.95	-4.85
423	2472.1	20.55	5.8	-4.9	-9.95	-5.05
424	2472.15	20.95	6.2	-4.5	-9.95	-5.45
425	2472.2	21.25	6.5	-4.2	-9.95	-5.75
426	2472.25	21.15	6.4	-4.3	-9.95	-5.65
427	2472.3	20.95	6.2	-4.5	-9.95	-5.45
428	2472.35	21.05	6.3	-4.4	-9.95	-5.55
429	2472.4	21.35	6.6	-4.1	-9.95	-5.85
430	2472.45	21.55	6.8	-3.9	-9.95	-6.05
431	2472.5	21.35	6.6	-4.1	-9.95	-5.85
432	2472.55	21.35	6.6	-4.1	-9.95	-5.85
433	2472.6	21.75	7	-3.7	-9.95	-6.25
434	2472.65	22.05	7.3	-3.4	-9.95	-6.55
435	2472.7	22.15	7.4	-3.3	-9.95	-6.65
436	2472.75	21.95	7.2	-3.5	-9.95	-6.45
437	2472.8	22.05	7.3	-3.4	-9.95	-6.55
438	2472.85	22.35	7.6	-3.1	-9.95	-6.85
439	2472.9	22.45	7.7	-3	-9.95	-6.95
440	2472.95	22.35	7.6	-3.1	-9.95	-6.85
441	2473	22.25	7.5	-3.2	-9.95	-6.75
442	2473.05	22.35	7.6	-3.1	-9.95	-6.85
443	2473.1	22.65	7.9	-2.8	-9.95	-7.15
444	2473.15	22.75	8	-2.7	-9.95	-7.25
445	2473.2	22.45	7.7	-3	-9.95	-6.95
446	2473.25	22.45	7.7	-3	-9.95	-6.95
447	2473.3	22.65	7.9	-2.8	-9.95	-7.15
448	2473.35	22.95	8.2	-2.5	-9.95	-7.45
449	2473.4	22.95	8.2	-2.5	-9.95	-7.45
450	2473.45	22.85	8.1	-2.6	-9.95	-7.35
451	2473.5	23.05	8.3	-2.4	-9.95	-7.55
452	2473.55	23.45	8.7	-2	-9.95	-7.95
453	2473.6	23.75	9	-1.7	-9.95	-8.25
454	2473.65	23.55	8.8	-1.9	-9.95	-8.05
455	2473.7	23.45	8.7	-2	-9.95	-7.95
456	2473.75	23.55	8.8	-1.9	-9.95	-8.05
457	2473.8	23.75	9	-1.7	-9.95	-8.25
458	2473.85	23.85	9.1	-1.6	-9.95	-8.35
459	2473.9	23.85	9.1	-1.6	-9.95	-8.35
460	2473.95	24.05	9.3	-1.4	-9.95	-8.55
461	2474	24.75	10	-0.7	-9.95	-9.25

20dB passband

462	2474.05	25.35	10.6	-0.1	-9.95	-9.85
463	2474.1	25.65	10.9	0.2	-9.95	-10.15
464	2474.15	25.75	11	0.3	-9.95	-10.25
465	2474.2	25.95	11.2	0.5	-9.95	-10.45
466	2474.25	26.25	11.5	0.8	-9.95	-10.75
467	2474.3	26.25	11.5	0.8	-9.95	-10.75
468	2474.35	26.05	11.3	0.6	-9.95	-10.55
469	2474.4	25.85	11.1	0.4	-9.95	-10.35
470	2474.45	26.05	11.3	0.6	-9.95	-10.55
471	2474.5	26.55	11.8	1.1	-9.95	-11.05
472	2474.55	26.75	12	1.3	-9.95	-11.25
473	2474.6	26.75	12	1.3	-9.95	-11.25
474	2474.65	26.85	12.1	1.4	-9.95	-11.35
475	2474.7	27.25	12.5	1.8	-9.95	-11.75
476	2474.75	27.55	12.8	2.1	-9.95	-12.05
477	2474.8	27.45	12.7	2	-9.95	-11.95
478	2474.85	27.05	12.3	1.6	-9.95	-11.55
479	2474.9	26.95	12.2	1.5	-9.95	-11.45
480	2474.95	26.95	12.2	1.5	-9.95	-11.45
481	2475	26.65	11.9	1.2	-9.95	-11.15

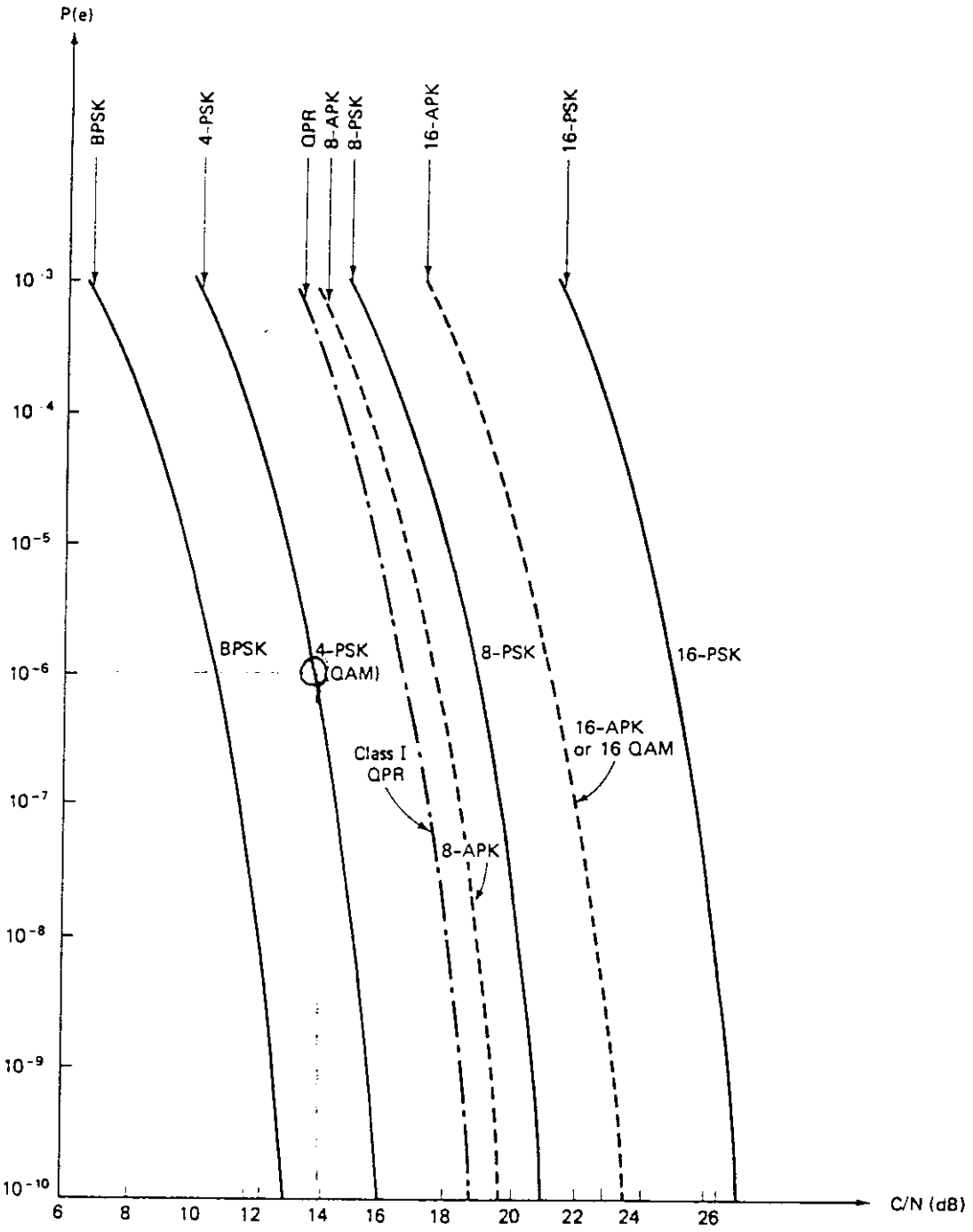


Fig. 3.21. $P(e)$ performance of M-ary PSK, QAM, QPR, and M-ary APK coherent systems. The rms C/N is specified in the double-sided Nyquist bandwidth.

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

4.13 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] No duty cycle correction was used.

5.0 Equipment Photographs

Photographs of the EUT are attached.

7.0 Technical Specifications

7.1 Circuit Diagram

See the attached confidential package.

7.2 Theory of Operation and Block Diagram

See the attached confidential package.

7.3 Antenna gain and Mounting Information

See the attached page.

GRID ANTENNAS

1990-2700 MHz

SPECIFICATIONS

- Wind loading characteristics to 45% of comparable size solid parabolas.
- Cross polarization discrimination response better than solids.
- Survival: 125 MPH with 1/2 inch radial ice.

Diameter	Model Number	U.S. FCC Category	Gain - dBi Low	Gain - dBi Mid	Gain - dBi High	Half Power B/W	F/B Ratio	Max VSWR Std.	Max VSWR Low	Windthrust 100 MPH
Dual Band Antennas 1990-2110 & 2450-2500 MHz										
			@2050	@2475	@2050					
4'	P-22WA48G		26.0	27.6	8.0		34	1.3	-	250
6'	P-22WA72G		29.5	31.0	5.4		38	1.3	-	500
8'	P-22WA96G		31.9	33.6	4.1		40	1.25	-	800
10'	P-22WA120G		33.8	35.5	3.3		44	1.25	-	1300
12'	P-22WA144G		35.5	37.0	2.7		46	1.25	-	1500
15'	P-22WA180G		37.2	38.9	2.2		46	1.25	-	2700
2200-2300 MHz										
4'	P-23A48G		26.4	26.6	26.8	7.6	36	1.3	1.15	250
6'	P-23A72G		29.9	30.1	30.3	5.1	38	1.3	1.10	500
8'	P-23A96G		32.2	32.4	32.6	3.8	40	1.1	1.06	800
10'	P-23A120G		34.4	34.6	34.8	2.8	42	1.1	1.06	1300
12'	P-23A144G		35.9	36.1	36.3	2.5	44	1.1	1.06	1500
15'	P-23A180G		37.9	38.1	38.2	2.0	46	1.1	1.06	2700
2290-2450 MHz										
4'	P-24LA48G		26.7	27.0	27.3	7.0	34	1.3	1.15	250
6'	P-24LA72G		30.2	30.5	30.8	4.7	37	1.3	1.10	500
8'	P-24LA96G		32.7	33.0	33.3	3.5	38	1.1	1.08	800
10'	P-24LA120G		34.7	35.0	35.3	2.8	42	1.1	1.08	1300
12'	P-24LA144G		36.3	36.6	36.9	2.4	40	1.1	1.08	1500
15'	P-24LA180G		38.2	38.5	38.8	1.9	48	1.1	1.08	2700
2300-2500 MHz										
3'	P-24A36G		25.3	25.7	26.0	8.4	28	1.5	—	97
4'	P-24A48G		26.8	27.5	27.7	6.7	34	1.3	1.15	250
6'	P-24A72G		30.1	30.8	31.1	4.4	37	1.3	1.10	500
8'	P-24A96G		32.6	33.5	33.6	3.5	38	1.1	1.08	800
10'	P-24A120G		34.7	35.1	35.6	2.8	42	1.1	1.08	1300
12'	P-24A144G		36.1	36.8	37.3	2.4	40	1.1	1.08	1500
15'	P-24A180G		38.1	38.6	39.1	1.9	48	1.1	1.08	2700
2480-2700 MHz										
4'	P-25A48G		27.6	28.0	28.3	6.0	27	1.3	1.15	250
6'	P-25A72G		31.0	31.4	31.8	4.2	38	1.3	1.10	500
8'	P-25A96G		33.5	33.9	34.3	3.3	36	1.1	1.06	800
10'	P-25A120G		35.5	35.8	36.2	2.7	42	1.1	1.06	1300
12'	P-25A144G		37.0	37.4	37.8	2.7	42	1.1	1.06	1500
15'	P-25A180G		38.9	39.3	39.6	1.8	47	1.1	1.06	2700

Model used for testing

2300-2700 MHz On Application

PLEASE USE PROPER SUFFIX WHEN ORDERING.

G = Pressurized, 7/8" EIA Termination
GL = Pressurized, 7/8" EIA Termination, Low VSWR
GF = Non Pressurized, 7/8" EIA Termination
GN = Non Pressurized, N Female Termination